# City of Venice, Florida
# Resilience Plan

**2020-09ENG**

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TAYLOR ENGINEERING, INC.

# Resilience Plan
# City of Venice, Florida

Final Report

Prepared for
City of Venice
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by

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## 1.0 EXECUTIVE SUMMARY

In 2020, the City of Venice initiated a resilience planning project to understand the vulnerabilities to coastal flooding and proactively develop strategies for a more resilient community. The City received grant funding from the Florida Department of Environmental Protection's (FDEP) Resilient Coastlines Program to evaluate potential flood risks to infrastructure and identify adaptation strategies for future planning and implementation. This study is the first of a multi-phased effort to increase the City's resilience to flooding and storm events. The objective of this study is to develop actionable steps to plan and implement projects to reduce vulnerability and mitigate flood risks.

The City contracted Taylor Engineering, Inc. (consultant) to perform the analysis and resilience planning effort using four primary steps consistent with the Florida Adaptation Planning Guidebook (2018):

1. Background Review and Data Identification (Context) – The project team reviewed City and County datasets to assess the quantity and quality of information available about public infrastructure to support the vulnerability assessment. The review focused on coastal flooding impacts to critical facilities and historic properties. The team also reviewed regional planning documents to understand sea level trends and scenarios used by neighboring communities, municipalities, and partners for future planning. The consultant and City staff collaborated to identify which City-owned infrastructure and historic resources were critical for the vulnerability assessment.

2. Vulnerability Assessment – This analysis compared relevant site/structure elevations of the critical assets identified by the City to the anticipated water levels for nine flood inundation scenarios. These scenarios are a combination of present-day water levels, two future sea level rise projections, and two tropical storm-generated water levels. Maps and tables provided in this report illustrate the locations and details of the City's vulnerable assets.

3. Adaptation and Resilience Strategies – Following completion of the vulnerability assessment, the project team identified four geographic focus areas that consisted of high densities of vulnerable public assets. A matrix of adaptation and resilience strategies summarizes implementation options for each of the vulnerable assets identified within the focus areas.

4. Public Outreach and Website – Community engagement was more challenging due to the COVID-19 pandemic, however the use of a variety of online platforms allowed the project team to interact with stakeholders in a variety of different ways. Public outreach to stakeholders consisted of three public presentations to the City's Environmental Advisory Board, a social media campaign, an online survey, and an interactive website.

5. Resilience Planning Summary Report – the report herein summarizes the vulnerability assessment results, recommended adaptation and resilience strategies, and proposed City Comprehensive Plan addenda to address resilience.

## 2.0 BACKGROUND AND DATA IDENTIFICATION

The City of Venice is in southwest Florida, within Sarasota County and fronting the Gulf of Mexico. Venice offers approximately 4 miles of sandy beaches and nearly 10 miles of shoreline along the bay and inland waterways with Venice Inlet connecting the back bay areas to the open waters of the Gulf. The City's proximity to the Gulf of Mexico and tidally influenced inland bays and waterways poses an increased risk of flooding during high tides, extreme rain and storm events. In addition, rising sea levels and increased storm frequency and intensities have elevated the City's desire to proactively plan for and mitigate potential adverse impacts. In 2020, the City of Venice initiated a resilience planning project to understand the vulnerabilities to coastal flooding and proactively develop strategies for a more resilient community. The City received grant funding from the Florida Department of Environmental Protection's (FDEP) Resilient Coastlines Program to evaluate potential flood risks to infrastructure and identify adaptation strategies for future planning and implementation. This study is the first of a multi-phased effort to increase the City's resilience to flooding and storm events. The objective of this study is to develop actionable steps to plan and implement projects aimed to reduce vulnerability and mitigate flood risks to maintain the City's critical infrastructure and unique historic character.

### 2.1 Resilience Planning Guidance

According to the FDEP's Florida Resilient Coastlines Program's Florida Adaptation Planning Guidebook (FDEP, 2018), Florida's first organized adaptation planning effort was the Southeast Florida Climate Leadership Summit in 2009. The Florida Legislature passed the Community Planning Act (CPA) in 2011. Although not required, local governments could identify and develop Adaptation Action Areas (AAA) to address the impacts of sea level rise and in doing so, qualify for grant assistance. In 2013 the Florida Department of Economic Opportunity (DEO) began a 5-year effort titled *Community Resiliency Initiative: Planning for Adaptation to Sea Level Rise* to examine the statewide framework and best practices for integrating climate adaptation into existing local and state-wide planning processes.

Experience and results from the initial group of local planning grants under this DEO effort led to passage of SB 1094 in 2015, which is informally known as the "Peril of Flood" statute. This law requires consideration of future flood risk from storm surge and sea level rise in local government Comprehensive Plans. Specifically, Florida Statute Section 163.3178(2)(f)1 now includes sea level rise as one of the causes of flood risk that must be addressed in the "…redevelopment principles, strategies, and engineering solutions" to reduce flood risk. This study of adaptation and resilience serves as The City of Venice's response to these requirements. Performance of a vulnerability assessment also forms the basis for complying with the "Peril of Flood" Comprehensive Plan requirements as found in Section 163.3178(2)(f)(1-6), Florida Statutes. The Florida Adaptation Planning Guidebook (FDEP, 2018) was used as a basis for this study.

### 2.2 Infrastructure Data

The first step in evaluating the City's risk to flooding is collecting detailed information needed to perform a vulnerability analysis. While vulnerability is often interchangeable with 'risk' when measuring hazard impacts, the National Oceanic and Atmospheric Administration (NOAA) definition of vulnerability is "the potential for loss of, or harm/damage to, exposed assets largely due to complex interactions among natural processes, land use decisions, and community resilience" (FDEP, 2018). The purpose of a

vulnerability assessment is to help a municipality or community identify and prioritize which structural and social assets are likely to be impacted by future coastal flooding and sea level rise.

In collaboration with City staff, the project team identified 258 publicly owned critical facilities, 21 historic buildings, and 4 historic districts to assess for coastal flooding vulnerability. In order to conduct a 'best practices' vulnerability assessment of critical facilities, historic structures, and historic districts, the following data should be included: a) building location, b) first floor elevations (FFE), c) lowest adjacent grade elevations (LAG). In evaluating vulnerability, the projected elevation of various coastal flood scenarios is compared to the building's FFE to assess the risk exposure, sensitivity, and adaptive capacity of these assets. However, based on detailed review of the County Property Appraiser's database and City-provided data, much of this information was not available for publicly owned buildings. The City provided elevation certificates, which detail a structure's FFE and LAG, for 27 of the 258 publicly owned buildings assessed. For the remaining structures, the project team derived the LAG using digitized Sarasota County building footprints together with digital elevation models (DEM) from the 2007 FDEM topographic LiDAR and supplemental 2017 NOAA LiDAR datasets. A full list of datasets used in the analysis is as follows:

- 2007 FDEM topographic LiDAR (3.8 ft horizontal & 0.6 ft vertical accuracy)
- 2017 NOAA topographic/bathymetric LiDAR (1.0 m horizontal & 0.3 m vertical accuracy)
- ArcMap World Imagery basemap
- Google Earth Pro satellite imagery
- County building footprints
- County utilities locations
- City elevation certificates
- City floodproofing certificates
- City CAT flood location questionnaires
- City stormwater system locations
- National Register of Historic Places
- State Historic Preservation Office master site file of historic structures
- City of Venice GIS historic and downtown district shapefiles
- NOAA tide gauge, St. Petersburg, water level observations, 1947-2020
- FEMA stillwater elevations from proposed Flood Insurance Rate Map Study

The properties analyzed for this study were sorted into three categories: critical public facilities, historic properties, and historic districts. Privately owned buildings were not included in this phase of the assessment. The historic districts were evaluated based on percentage of surface inundation within the district limits.

## 2.3 Inundation Scenarios

This analysis uses a Geographic Information System (GIS)-based assessment of the City's public infrastructure with respect to sea level rise projections and tropical storm surge stillwater elevations (SWEL**).** The elevations of publicly owned buildings are compared to future sea level rise thresholds and storm surge inundation depths.

The sea level rise projections used to establish the City's vulnerability thresholds originate from two credible source documents, the 2013 Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (AR5) and the 2018 U.S. Global Change Research Program (USGCRP) Fourth National Climate Assessment Report (NCA4). The IPCC does not carry out research nor does it monitor climate

related data. The lead authors of IPCC reports assess currently available information about climate change from a variety of published sources. The most recent IPCC report was published in 2013. The IPCC's Sixth Assessment Report is expected to be publicly available in 2022. The IPCC's working groups and subsequent reports are well-respected in the international scientific community. The sea level rise projections in the IPCC AR5 are based on future projections of greenhouse gas quantities in Earth's atmosphere. The projections, called Representative Concentration Pathways (RCP), are future scenarios related to the concentration of carbon dioxide in the atmosphere. The AR5 report included four scenarios: RCP 2.6, RCP 4.5, RCP 6.0, and RCP 8.5. The RCP numbers denote radiative forcing in units of Watt per square meter ($m^2$) of sunlight.

The second set of sea level rise projections used to establish the City's vulnerability thresholds originated from the USGCRP NCA4, released in November 2018. The USGCRP consists of 13 federal agencies, with NOAA serving as the lead agency for the NCA4 report. The report is based on an assessment of the peer-reviewed scientific literature, with ongoing participation of scientists and federal and non-federal stakeholders. The NCA4 report's sea level rise projections included six scenarios, created by NOAA: Low, Intermediate-Low, Intermediate, Intermediate-High, High, and Extreme, as shown in **Figure 2.1**

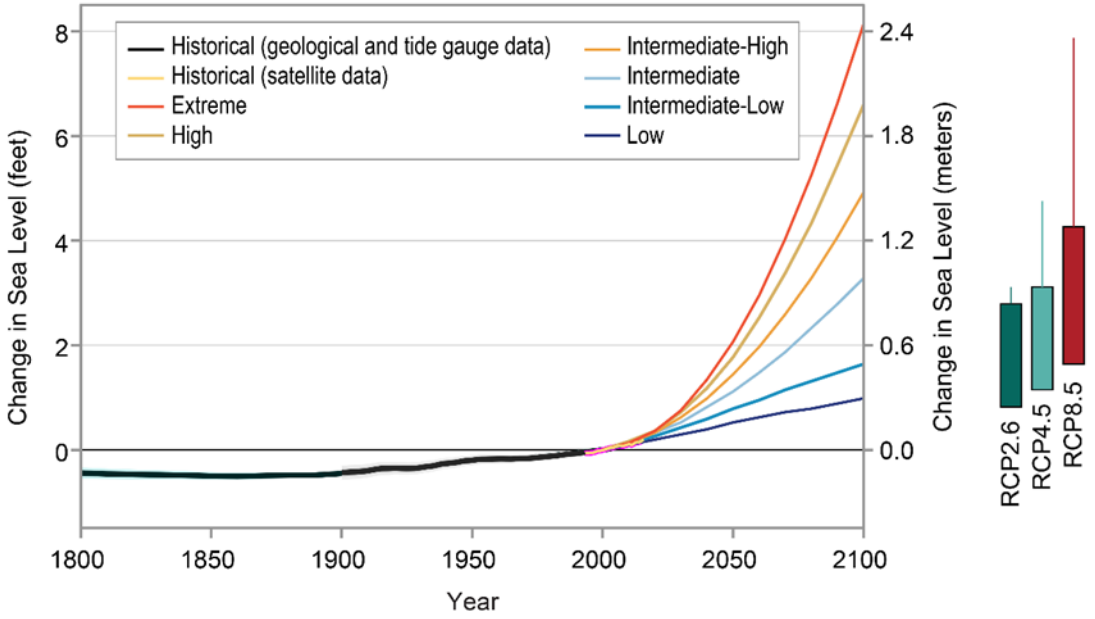



**Figure 2.1 Sea Level Rise Projections (USGCRP, 2018)**

Figure 2.1 is a graphic from the 2018 USGCRP NCA4 showing the historic sea level trend, six sea level scenarios, and the IPCC AR5 sea level rise projections. Vertical bars on the right side of the graphic are the RCP from the 2013 IPCC AR5 report. Vertical lines above the RCP bars show a possible increase in Antarctic contribution due to new ice sheet data available in 2016 after the IPCC AR5 report was published. The figure does not show RCP 6.0 because its sea level rise range is similar to RCP 4.5.

**Table 2.1** lists the likelihood of the six sea level scenarios pictured in Figure 2.1, with the highest projections having minimal probability of occurrence. The National Oceanic and Atmospheric Administration (NOAA) ranks each scenario's likelihood based on the IPCC's Representative Concentration Pathways.

**Table 2.1 Probabilities of Occurrence of NOAA Sea Level Rise Scenarios (Sweet et al., 2017)**

| Sea Level Rise Scenario | RCP2.6 | RCP4.5 | RCP8.5 |
|---|---|---|---|
| Low (0.3m) | 94% | 98% | 100% |
| Intermediate-Low (0.5m) | 49% | 73% | 96% |
| Intermediate (1m) | 2% | 3% | 17% |
| Intermediate-High (1.5m) | 0.4% | 0.5% | 1.3% |
| High (2m) | 0.1% | 0.1% | 0.3% |
| Extreme (2.5m) | 0.05% | 0.05% | 0.1% |

Taylor Engineering recommended the City of Venice examine flooding thresholds for this vulnerability analysis of 1.5 ft and 3 ft sea level rise, annotated on Figure 2.1. These thresholds were chosen because the 1.5 ft rise will most likely occur within the time horizon of the City's 2050 Comprehensive Plan or a homeowner's 30-year mortgage, while the 3 ft sea level rise is more suitable for planning Capital Improvement Projects with a 50-year design life. The 0 ft horizontal line on the graphic coincides with 1990, which U.S. federal agencies use as a benchmark for measuring sea level change. The 1.5 ft sea level change, annotated on the figure, shows that the mean sea level in the United States is expected to rise 1.5 ft between 1990 and 2040, if using the Extreme scenario. Depending on which sea level rise scenario is used, 1.5 ft of sea level rise may occur as late as 2090, for example, if using the Intermediate-Low scenario. The annotated 3 ft of sea level rise may occur between 1990 and 2060, with the Extreme scenario. However, it is possible that 1.5 ft or 3 ft of sea level change may occur after 2100, beyond the range of this graphic.

For comparison of sea level scenarios, Taylor Engineering researched and reviewed thirty local and regional planning documents for cities such as Sarasota, Tampa, St. Petersburg, Sanibel, Captiva, Pelican Cove, Punta Gorda, and Lee and Sarasota counties, summarized in Appendix C. The sea level rise projections used by these communities for planning were similar to Taylor Engineering's recommendations. For example, the Tampa Bay Regional Planning Council's 2019 Climate Science Advisory Panel estimated 1 ft to 2.5 feet by 2050 and 2 to 8.5 feet by 2100. The 2017 City of Sarasota Climate Adaptation Plan studied 1 ft, 2 ft, 4 ft, and 6 ft of sea level rise above current mean sea level and estimated 1 ft to 1.5 ft increase of sea level by 2050. The 2019 Punta Gorda Climate Adaptation Plan Update analyzed 1.5 ft and 3 ft of sea level rise in their vulnerability analysis. Cape Coral's 2017 Climate Change Resiliency Strategy, co-authored with the SW FL Regional Planning Council used the IPCC scenarios, but did not plan to a specific sea level rise elevation.

Several of these planning documents included the contribution of coastal storms to future flood conditions, one example being three tropical storm surge types: 25 year (approximately a 4% annual chance) flood, 100 year (1% annual chance) flood, and 500 year (0.2% annual chance). In this particular study, the 100-year (1%) compared with the 500-year (0.2%) storm models yielded results too similar to justify inclusion in this study. The 50-year and 100-year models are sufficient to identify any areas of practical concern with the City of Venice.

Nine scenarios were selected for the exposure analysis consisting of three sea level (rise) scenarios and three storm surge flooding types. These scenario combinations are listed in **Table 2.2**.

**Table 2.2 Flood Inundation Scenarios**

| Sea Level Rise Scenario | Storm Surge Flood Scenario |
|---|---|
| 2020 water level (MHHW) | No storm surge |
| 2020 water level (MHHW) | 2% annual chance flood (50 yr) |
| 2020 water level (MHHW) | 1% annual chance flood (100 yr) |
| 1.5 ft sea level rise | No storm surge |
| 1.5 ft sea level rise | 2% annual chance flood (50 yr) |
| 1.5 ft sea level rise | 1% annual chance flood (100 yr) |
| 3 ft sea level rise | No storm surge |
| 3 ft sea level rise | 2% annual chance flood (50 yr) |
| 3 ft sea level rise | 1% annual chance flood (100 yr) |

The three sea level rise states were Mean Higher High Water (MHHW) to simulate a low inundation, 1.5 ft for medium inundation, and 3 ft for high inundation. The three tropical storm surge types analyzed were the no storm surge (MHHW scenario), 50 year (2% annual chance) flood and 100 year (1% annual chance) flood. The MHHW scenario, defined as "the average of the higher high water heights of each tidal day observed over the National Tidal Datum Epoch" (NOAA). This is representative of today's nuisance, chronic, or sunny day flooding, also called 'king tides.' The occurrence of nuisance flooding will continue to increase with the rate of sea level rise and can be further influenced by the tides and onshore winds.

## 3.0 VULNERABILITY ASSESSMENT

### 3.1 Methodology

This analysis uses a Geographic Information System (GIS)-based assessment of the City's public infrastructure with respect to sea level rise projections and tropical storm surge (stillwater) elevations (SWEL). The elevations (known or estimated) of publicly owned buildings were compared to future sea level rise thresholds and storm surge inundation depths. The GIS-based vulnerability analysis compares the water elevation for various inundation scenarios using both a simple 'bathtub' model and a modified bathtub model. A bathtub model simply identifies all areas below a target elevation as potentially flooded, regardless of hydrologic connectivity. The bathtub model was used for the 50 year (approximate 2% annual chance) flood plus 1.5 ft of sea level rise shown for comparison on one graphic. The modified bathtub model, used for all other scenarios, applies a hydrologic connectivity filter to remove isolated inundated areas not connected to a major waterway. The City's stormwater infrastructure GIS layer was used to inform these hydrologic connections in the model.

Several flood inundation scenarios were evaluated using FEMA Stillwater Elevation (SWEL) data, created as part of a Flood Insurance Rate Map study. The SWEL represents the storm surge (not including waves or wave runup) calculated using an ADCIRC computer model analysis which runs hundreds of historic storms over a given topography and bathymetry. For this analysis, the 50 year (2% annual chance) flood and the 100 year (1% annual chance) flood inundation scenarios were chosen and analyzed with and without sea level rise. **Figure 3.1** presents one example inundation scenario using the 50 year (2% annual chance) flood plus 1.5 ft of sea level rise to identify areas of vulnerability. Additional inundation maps and a tabular summary of the model results are in Appendix A.


**Figure 3.1 Venice Island Inundation Map under the 2% SWEL plus 1.5 FT SLR Scenario**

## 3.2 Assumptions

For many buildings in this study, the first floor elevations were not in the available data. An accurate first floor elevation for structures is a critical input to a vulnerability analysis. Given lack of FFE's for much of the City, assumptions were made for each flooding scenario. A building or parcel is considered at risk for each given scenario if 25% or more of the building footprint outline was inundated. While the levels of inundation can range from mere inches to several feet based on actual topographic elevations and FFE's, a 25% surface area inundation assures every potential at risk structure and facility is considered in the planning.

## 3.3 Inundation Scenarios and Results

A positive outcome of this assessment is that the critical and historic assets identified for evaluation by the City in this initial phase received minimal flooding at the two future sea level rise projections without the addition of storm surge. Three of the four historic districts show no flooding with future sea level rise, the exception being the Eagle Point Historic District which consists of low-lying waterfront properties. The number of critical and historic assets at risk of flooding increases with the addition of the 2% (50 year) and 1% (100 year) annual chance storm surge water levels, as expected. Although these storm surge events occur infrequently, when added to future sea level rise projections, the number of critical assets at risk increases. Few of the City's critical assets are at risk to sea level rise by itself, as shown by this analysis. The rationale for this is twofold: 1) the City's ground elevation relative to future sea level rise is higher than many other coastal communities in Florida, 2) the City and County strive not to locate critical assets in floodprone areas.

The low inundation, present day nuisance flooding scenario of MHHW shows no flooding of any of the three categories (facilities, historic buildings, historic districts). The medium inundation scenario of 1.5 ft sea level rise indicates no flooding of facilities or properties, with only 2% flooding of Eagle Point Historic District. The high inundation scenario of 3 ft sea level rise indicates potential risk at 4 critical facilities and 7% flooding of the Eagle Point Historic District. Table 3.1 provides a summary of those results in tabular form.

**Table 3.1 Vulnerabilities with MHHW, 1.5 Ft and 3 Ft Sea Level Rise Inundation Scenarios**

| Flooding Scenario | No. of Critical Facilities at Risk | No. of Historic Buildings at Risk | Percent of Acreage Inundation |
|---|---|---|---|
| MHHW | None | None | None |
| 1.5 ft Sea Level Rise | None | None | 2% Eagle Point Historic District |
| 3.0 ft Sea Level Rise | 4 | None | 7% Eagle Point Historic District |

When the 50-year (2% annual chance) storm surge scenario is added to sea level rise, a distinct increase in flooding occurs. The MHHW with 50-year scenario indicates flooding at 29 critical structures, zero historical buildings and 72% flooding of Eagle Point Historic District. The 1.5 ft SLR with 50-year scenario indicates inundation at 41 critical structures, 2 historic buildings, and 99% flooding of Eagle point Historic District. 3.0 ft SLR with 50-year flood scenario shows 60 critical facilities and 4 historic properties

affected, and 100% flooding of Eagle Point Historic District. Those results are represented in tabular form in **Table 3.2.**

**Table 3.2 Vulnerabilities with Increased Sea Levels and 2% Annual Change Storm Surge Scenarios**

| Flooding Scenario | No. of Critical Facilities at Risk | No. of Historic Buildings at Risk | Percent of Acreage Inundation |
|---|---|---|---|
| MHHW + 2% Annual Chance SWEL | 29 | None | 72% Eagle Point Historic District |
| 1.5 ft Sea Level Rise + 2% Annual Chance SWEL | 41 | 2 | 99% Eagle Point Historic District |
| 3.0 ft Sea Level Rise + 2% Annual Chance SWEL | 60 | 4 | 100% Eagle Point Historic District |

As anticipated, the 100-year (1% annual chance) inundation scenarios show the most critical facilities at risk. The MHHW with the 100-year identifies 41 critical facilities, 2 historic properties and 96% flooding of Eagle Point Historic District. The 1.5 ft SLR with 100-year scenario includes 58 critical facilities, 4 historic properties, and 94% flooding of Eagle Point Historic District. As anticipated, a 'worst-case' scenario is that of 3.0 ft SLR combined with the 100-year inundation. This model shows flooding at 87 out of the 258 critical facilities and 5 out of the 21 historic buildings. All four historic districts are affected: 100% flooding of Eagle Point Historic District, 23% of John Nolen Plan of the City of Venice, 9% of Edgewood Historic District and 1% of the Downtown Venice Architectural Control District (ACD). Those results are represented in tabular form in **Table 3.3.**

**Table 3.3 Vulnerabilities with Increased Sea Levels and 1% Annual Change Storm Surge Scenario**

| Flooding Scenario | No. of Critical Facilities at Risk | No. of Historic Buildings at Risk | Percent of Acreage Inundation |
|---|---|---|---|
| MHHW + 1% Annual Chance SWEL | 41 | 2 | 94% Eagle Point Historic District |
| 1.5 ft Sea Level Rise + 1% Annual Chance SWEL | 58 | 4 | 96% Eagle Point Historic District |
| 3.0 ft Sea Level Rise + 1% Annual Chance SWEL | 87 | 5 | 100% Eagle Point Historic District<br>23% John Nolen Plan<br>9% Edgewood Historic District<br>1% Downtown Venice ACD |

**Table 3.4** summarizes the percentage of critical assets, historic assets, and areas of the four historic districts of the City inundated in each of the nine flood inundation scenarios.

**Table 3.4 Summary of Vulnerability Analysis – Percent Inundated by Each Flood Scenario**

| | Total Number of Assets Evaluated (or Square Ft for District) | MHHW | 1.5 ft SLR | 3.0 ft SLR | 2% Annual Chance Flood | 1% Annual Chance Flood | 1.5 ft SLR + 2% Annual Chance | 1.5 ft SLR + 1% Annual Chance | 3.0 ft SLR + 2% Annual Chance | 3.0 ft SLR + 1% Annual Chance |
|---|---|---|---|---|---|---|---|---|---|---|
| Critical Assets | 258 | 0% | 0% | 2% | 11% | 16% | 16% | 22% | 23% | 34% |
| Historic Assets | 21 | 0% | 0% | 0% | 0% | 10% | 10% | 19% | 19% | 24% |
| Edgewood Historic District | 1,224,335 | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 9% |
| Eagle Point Historic District | 653,998 | 0% | 2% | 7% | 72% | 96% | 99% | 94% | 100% | 100% |
| John Nolen Plan | 34,595,339 | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 23% |
| Downtown Venice ACD | 4,994,235 | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% |

## 3.4 Focus Area Selection

Upon completion of the vulnerability analysis, Taylor Engineering and City staff identified and prioritized vulnerable infrastructure from the inventoried list of assets for further focus. A preliminary review of the inundation by geographic region was performed to potentially group vulnerable infrastructure together based on defined characteristics. A sensitivity analysis was performed to identify preliminary vulnerable focus areas and subsequent comprehensive adaptation strategies. Focus areas were defined and evaluated using the following criteria:

1. Geographic areas with the greatest density/highest concentration of identified critical facilities and historic infrastructure,

2. Geographic areas that have a variety in the types of infrastructure, and

3. Geographic areas that have vulnerable critical facilities and historic infrastructure in close proximity to one another, and

4. Geographic areas with similar elevations and surrounding conditions.

As a result, four (4) focus areas were identified, as shown in **Figure 3.2**, labeled as: Tarpon Center Drive, Curry Creek, Hatchet Creek, Villas Drive, and the Airport region.

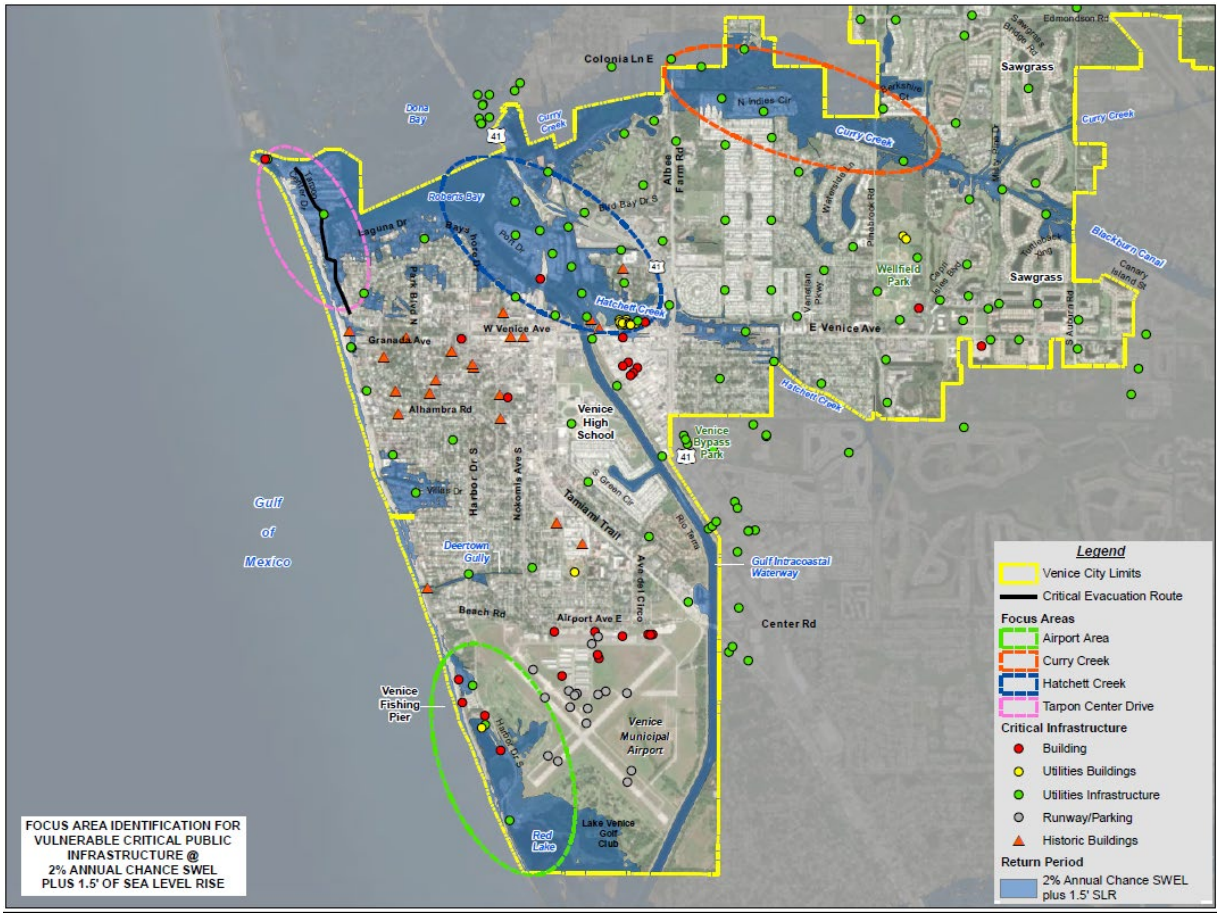



**Figure 3.2 Overview of Assigned Focus Areas**

Within each focus area, Taylor Engineering evaluated the degree of vulnerability and adaptive capacity for each asset under each inundation scenario to develop a comprehensive range of adaptation strategies, described in Section 4.0.

## 4.0 ADAPTATION STRATEGIES

Adaptive Capacity is "the ability of a system to adjust to climate change, to moderate potential damages, to take advantage of opportunities, or to cope with the consequences (FDEP, 2018). Adaptation is defined by the Intergovernmental Panel for Climate Change (IPCC) as "the process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects" (IPCC, 2013). Adaptation strategies can be classified by a variety of categories depending on the climate threat.

A common classification for adaptation options for sea level rise, originated by the IPCC's 1990 Coastal Zone Management Subgroup (CZMS), includes these three categories: (1) accommodate, (2) protect, and (3) (managed) relocation/retreat. This categorization of adaptation strategies is the worldwide standard still in use today with the addition of a fourth category, entitled avoidance (Haasnoot et al., 2019). Four main adaptation categories are outlined and explained below:

1. Accommodation – Accommodation strategies alter physical design of vulnerable structures to allow the structure or land use to stay in place with modification. Examples are elevation of properties, wet floodproofing of structures, land-use planning, flood insurance, flood hazard mapping, and timely flood warnings to inform the public and encourage well-organized evacuations.

2. Protection – Protection strategies are structurally defensive measures that directly project vulnerable structures, allowing them to be left largely unaltered. Examples are living shorelines, seawalls, beach and dune nourishment, and stormwater management.

3. Managed Relocation – Retreat from areas of infrastructure where protection or accommodation will not be efficient or effective. This strategy can be voluntary, incentivized, or conducted gradually. Examples are government buyouts of repetitive loss properties, rolling easements, removing critical infrastructure from flood hazard zones, development controls, zoning changes, and land-use planning.

4. Avoidance – Avoidance involves guiding new development away from areas that are subject to coastal hazards and can be done by implementing policy and/or offering incentives.

Communities can use a combination of these planned adaptation strategies to reduce the potential impacts caused by sea level rise. The four adaptation strategies listed above may be universal, however each adaptation method must be specifically tailored to the local focus area or individual property. There is no singular "one size fits all" method to adapt various communities or structures to sea level rise. The selection of an applicable and effective adaptation method requires assessment of multiple factors, such as cost, time to construct, impact on the infrastructure and surrounding area, timeline when needed, and type of adaptation.

### 4.1 Recommended Adaptation Strategies

Specific adaptation and resilience strategies recommended for the City of Venice are described and categorized below.

Accommodation

Elevate Finished First Floor: Even though the land of an existing or new structure may be subject to flooding during future storm events, an elevated finished first floor allows the foundation to become inundated but prevents water intrusion above the foundation and into the building or facility.

Elevate Structure: This adaptation strategy already exists at many publicly owned buildings within the City of Venice; one such example is the Fins building at the Venice Fishing Pier. By elevating an entire structure as well as its critical electrical and mechanical systems, the facility will likely sit above flood levels expected at future sea level rise scenarios.

Elevate Utilities: While not a viable solution for all utilities, many utilities can be elevated so inundation levels will not affect the function and operation of that utility.

Flood Resistant Materials (Wet Floodproofing): Flood resistant materials, such as masonry walls and concrete or tile floors, are recommended where flooding is expected. Using these materials to construct and finish the structure allows the asset to accommodate the flooding and continue to function during the flood and after the water has subsided.

Flood Vents: A relatively low-cost option to retrofit an existing structure to withstand flood damage is to install flood vents and conduct wet floodproofing. In this alternative, the crawlspace, basement, or attached garage of a building is adapted to allow water to flow into it, flooding the structure as the water rises. An advantage of this option is that the building does not sustain extensive structural damage since the hydrostatic pressure of the water pushing on the building's exterior walls is equalized by the water pressure inside the building. This method also prevents a structure from becoming buoyant and floating off its foundation. **Photograph 4.1** illustrates flood vents in use within the City of Venice.

**Photograph 4.1 Flood Vents on S. Brohard Park Restroom in Venice**

Protection

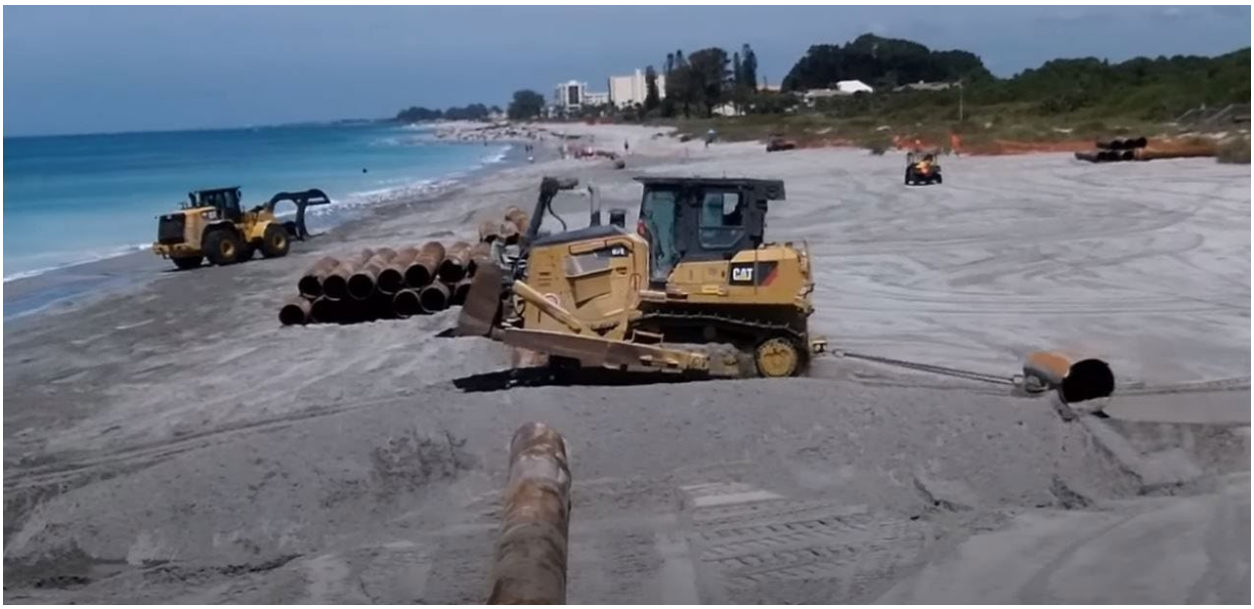
Backup Generator: Backup generators can be installed to provide necessary electricity to critical facilities should flooding cause power grid failures. The City of Venice employees this strategy at the water treatment facility as shown in **Photograph 4.2**.

**Photograph 4.2 Backup Generator (Wastewater Lift Station LS-07)**

Check Valves: Sunny day" or "nuisance" flooding is caused when stormwater drains backflow from a combination of high tide, onshore winds, and sea level rise. A short-term solution to combat this type of flooding is to install check valves at the outfalls of stormwater pipes as shown in **Photograph 4.3.**

**Photograph 4.3 Stormwater Check Valve for Backflow Prevention**

Dune/Beach Nourishment: In 2015, the City of Venice completed placement of approximately 720,000 cubic yards along 3.2 miles of beach (FDEP, 2020). The additional sand placement provides further storm surge protection for adjacent structures and facilities. **Photograph 4.4** shows the beach nourishment project during construction.



**Photograph 4.4 Venice Beach Nourishment Project**

Flood Barrier: Another relatively cost-effective measure to prevent flood damage to a large area, such as a road, is a flood barrier. These barriers are not recommended in a beachfront area which is subject to excessive wind and wave forces due to hurricanes. They are also not recommended in an area which is subject to flash flooding or moderate to fast velocity flooding. **Photograph 4.5** shows an example of such a flood barrier.

**Photograph 4.5 Gravel Filled Containers that Form a Flood Barrier**

Flood Gates: Flood gates function similarly to flood barriers; however, they are unique in that they only effective if the outer building walls and foundation are initially flood resistant (i.e. masonry). Flood gates close and seal to prevent water intrusion into the entrances of buildings and facilities. **Photograph 4.6** illustrates how a flood gate can protect large critical infrastructure in conjunction with a flood resistant masonry wall.

**Photograph 4.6 Masonry Floodwall with Engineered Temporary Flood Gates (FEMA, 2013)**

Temporary Flood Barrier: Temporary flood barriers differ from flood wrapping in that they are typically rigid structures that can be anchored to the outside foundation and walls of a structure. These barriers are design to take a higher-level inundation scenario compared to flood wrapping. **Photograph 4.7** shows a temporary flood barrier in place.

**Photograph 4.7 Temporary Flood Barrier Protecting Building Entryway**
**(http://www.flood-barriers.com/floodpanel.html)**

Temporary Flood Wrap: A temporary flood wrap consists of a heavy-duty plastic barrier that wraps the base of a structure and anchored by weights, sandbags for example, to prevent water intrusion. This method is effective against short duration, low level flood events. **Photograph 4.8** illustrates use of a temporary flood wrap.

**Photograph 4.8 Temporary Plastic Sheeting Installation (Aragon, 2017)**

Managed Relocation

Raising Land: While potentially costly for existing structures and facilities, new development is well suited to elevate the land prior to construction, ultimately raising the structure's foundation above potential inundation levels.

Relocate Structure: Relocation occurs either when a facility is rebuilt in a new location away from flood prone areas or if the entire structure is moved. In 1991, the Triangle Inn was slated for demolition, but instead was acquired by the City of Venice and deemed a historic landmark. The city relocated the building 500 feet south as shown in **Photograph 4.9.** The Lord-Higel House, built in 1896, was moved from its original location on Roberts Bay to its present location on city-owned property at 409 Granada Avenue.

**Photograph 4.9 Relocation of the Triangle Inn**
(**https://www.venicemuseum.org/historical-resources/**)

## 4.2 Application of Recommended Adaptation Strategies by Focus Area

As defined by the Florida Adaptation Guidebook, focus areas are the selected locations which "will receive a majority of the adaptation strategy attention" (FDEP, 2018). Specific adaptation strategies recommended for the City of Venice were assigned to each focus areas and include: accommodating strategies which allow water to flow through or around such as elevating, wet floodproofing, flood vents, and elevated backup generators; protective measures such as temporary flood barriers, flood gates or flood wrap, and check valves for critical structures which cannot be moved; incorporating nature-based protective adaptations such as dune restoration, beach nourishment, and living shorelines; and relocating assets or rebuilding them on higher land which is not susceptible to future flooding. Tables 4.1 through 4.4 illustrate an example adaptation matrix for each of the City's focus areas, showing which recommended strategies apply for each of the area's vulnerable critical assets.

The Curry Creek Focus Area, shown in **Figure 4.1,** contains the largest land footprint of the four areas. Encompassing 354 (approximate) acres of land within the City of Venice limits, 245 acres (69%) show inundation at the 1.5 feet of sea level rise and the 50-year (2% annual chance) storm surge scenario. The Curry Creek area contains eight critical facilities, all of which are city or county-owned facilities. Most of the land use within this focus area is private residential dwellings. Curry Creek is tidally influenced and susceptible to sea level rise and storm surge inundation.

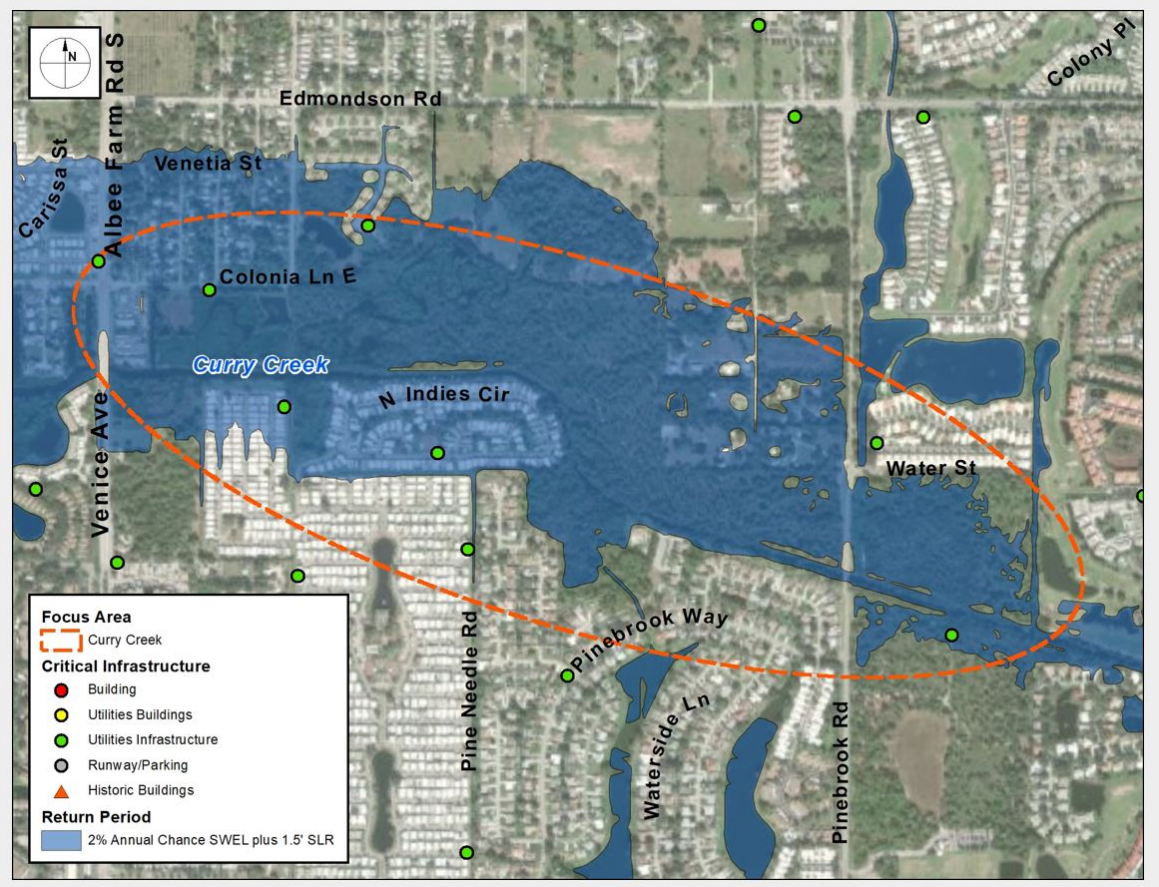



**Figure 4.1 Curry Creek Focus Area Map and Legend**

**Table 4.1** lists the adaptation strategies described on the previous pages**,** with checkmarks matching those recommended for at-risk infrastructure in the Curry Creek Focus Area. Green shading illustrates those strategies already implemented by the City. Light blue shading indicates adaptation projects that are listed in the Capital Improvement Plan and funded by the City.

**Table 4.1 Curry Creek Adaptation Matrix**

| ADAPTATION STRATEGIES FOR CURRY CREEK FOCUS AREA | | | | | | | |
|---|---|---|---|---|---|---|---|
| STRUCTURE | ELEVATE FINISHED FIRST FLOOR | ELEVATE STRUCTURE | ELEVATE UTILITIES | FLOOD RESISTANT MATERIALS | FLOOD VENTS | BACKUP GENERATOR | INSTALL CHECK VALVE |
| LIFT STATION UTILITIES LS 20 | | | ✔ | ✔ | | ✔ | ✔ |
| LIFT STATION UTILITIES LS 21 | | | ✔ | ✔ | | ✔ | ✔ |
| LIFT STATION UTILITIES LS 32 | | | ✔ | ✔ | | ✔ | ✔ |
| LIFT STATION UTILITIES LS 42 | | | ✔ | ✔ | | ✔ | ✔ |
| LIFT STATION UTILITIES LS 49 | | | ✔ | ✔ | | ✔ | ✔ |
| LIFT STATION UTILITIES LS 62 | | | ✔ | ✔ | | ✔ | ✔ |
| LIFT STATION COUNTY OWNED LS-405-0476 | | | ✔ | ✔ | | ✔ | ✔ |
| WELL UTILITIES WELL 1E | | | ✔ | ✔ | | ✔ | ✔ |

| STRUCTURE | DUNE RESTORATION & BEACH NOURISHMENT | FLOOD BARRIER | FLOOD GATES | TEMPORARY FLOOD BARRIER | TEMPORARY FLOOD WRAP | RAISING LAND | RELOCATE STRUCTURE |
|---|---|---|---|---|---|---|---|
| LIFT STATION UTILITIES LS 20 | | ✔ | | | | | ✔ |
| LIFT STATION UTILITIES LS 21 | | ✔ | | | | | ✔ |
| LIFT STATION UTILITIES LS 32 | | ✔ | | | | | |
| LIFT STATION UTILITIES LS 42 | | ✔ | | | | | |
| LIFT STATION UTILITIES LS 49 | | ✔ | | | | | |
| LIFT STATION UTILITIES LS 62 | | ✔ | | | | | |
| LIFT STATION COUNTY OWNED LS-405-0476 | | ✔ | | | | | |
| WELL UTILITIES WELL 1E | | ✔ | | | | | ✔ |

Tarpon Center Drive, selected as the second focus area for analysis, is located on the northwest corner of the Island of Venice (**Figure 4.2**). The Tarpon Center area is the smallest land acreage of the four focus areas, covering 128 acres but with 95 acres inundated at the 1.5 feet of sea level rise and 50-year (2% annual chance) storm surge scenario. Consequently, it has the highest percentage (74%) of inundation of the chosen focus areas under this modeled flood scenario. While the area only contains 4 critical facilities, Tarpon Center Drive is a primary evacuation route for all residents located north of the intersection of Tarpon Center Drive and The Esplanade N. The area does not include the South Jetty pavilion because the Finished Floor Elevation (FFE) is above the SWEL (Storm Surge Stillwater Elevations).

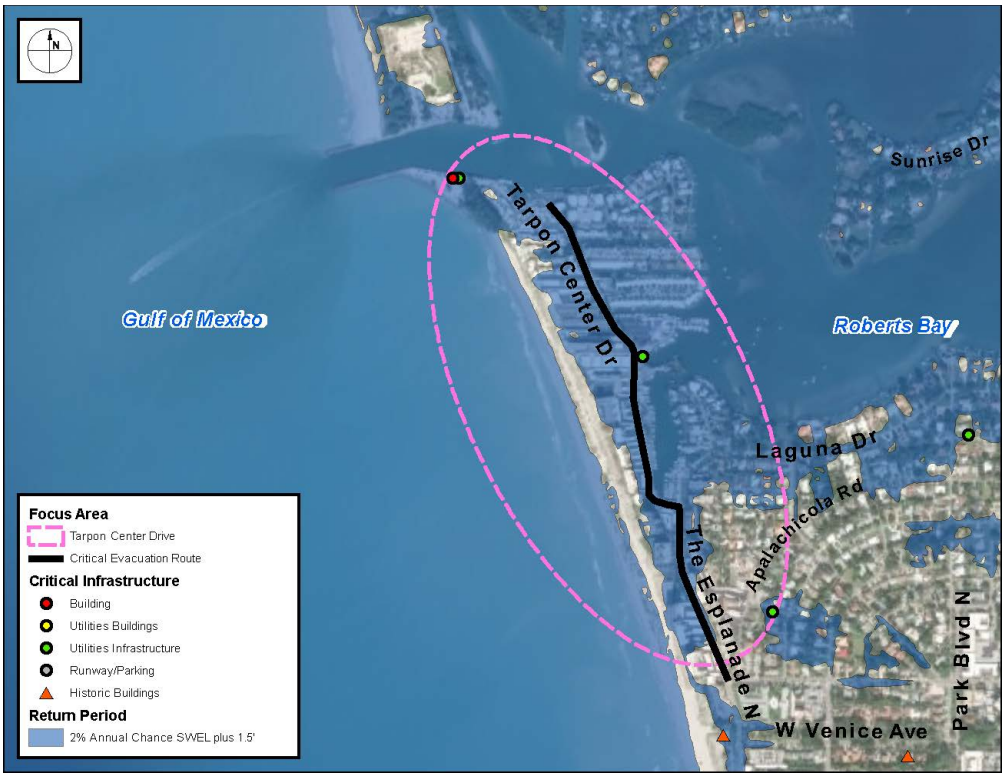



**Figure 4.2 Tarpon Center Drive Focus Area Map and Legend**

**Table 4.2** lists the adaptation strategies recommended for at-risk infrastructure in the Tarpon Center Drive Focus Area, with checkmarks matching each general strategy to specific structures. Green shading illustrates those strategies already implemented by the City.

**Table 4.2 Tarpon Center Drive Adaptation Matrix**

| ADAPTATION STRATEGIES FOR TARPON CENTER DRIVE FOCUS AREA | | | | | | | |
|---|---|---|---|---|---|---|---|
| STRUCTURE | ELEVATE FINISHED FIRST FLOOR | ELEVATE STRUCTURE | ELEVATE UTILITIES | FLOOD RESISTANT MATERIALS | FLOOD VENTS | BACKUP GENERATOR | INSTALL CHECK VALVE |
| BUILDING S. JETTY CONCESSIONS | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| LIFT STATION UTILITIES LS 04 | | | ✔ | ✔ | | ✔ | ✔ |
| LIFT STATION UTILITIES LS 05 | | | ✔ | ✔ | | ✔ | ✔ |
| LIFT STATION UTILITIES LS 72 | | | ✔ | ✔ | | ✔ | ✔ |

| STRUCTURE | DUNE RESTORATION & BEACH NOURISHMENT | FLOOD BARRIER | FLOOD GATES | TEMPORARY FLOOD BARRIER | TEMPORARY FLOOD WRAP | RAISING LAND | RELOCATE STRUCTURE |
|---|---|---|---|---|---|---|---|
| BUILDING S. JETTY CONCESSIONS | | ✔ | | ✔ | | | ✔ |
| LIFT STATION UTILITIES LS 04 | | ✔ | | | | | |
| LIFT STATION UTILITIES LS 05 | | ✔ | | | | | |
| LIFT STATION UTILITIES LS 72 | | ✔ | | | | | |

The Hatchett Creek Focus Area, shown in **Figure 4.3** includes 29 critical facilities and buildings, featuring the water treatment facility and the historic Venice Train Depot. Due to the concentration of critical facilities, utilities infrastructure, and historic buildings, this area is vital to the citizens of Venice. The Hatchett Creek Focus Area also contains the Eagle Point Historic District in the northwestern portion. The Eagle Point Historic district is comprised completely of private residential dwellings.

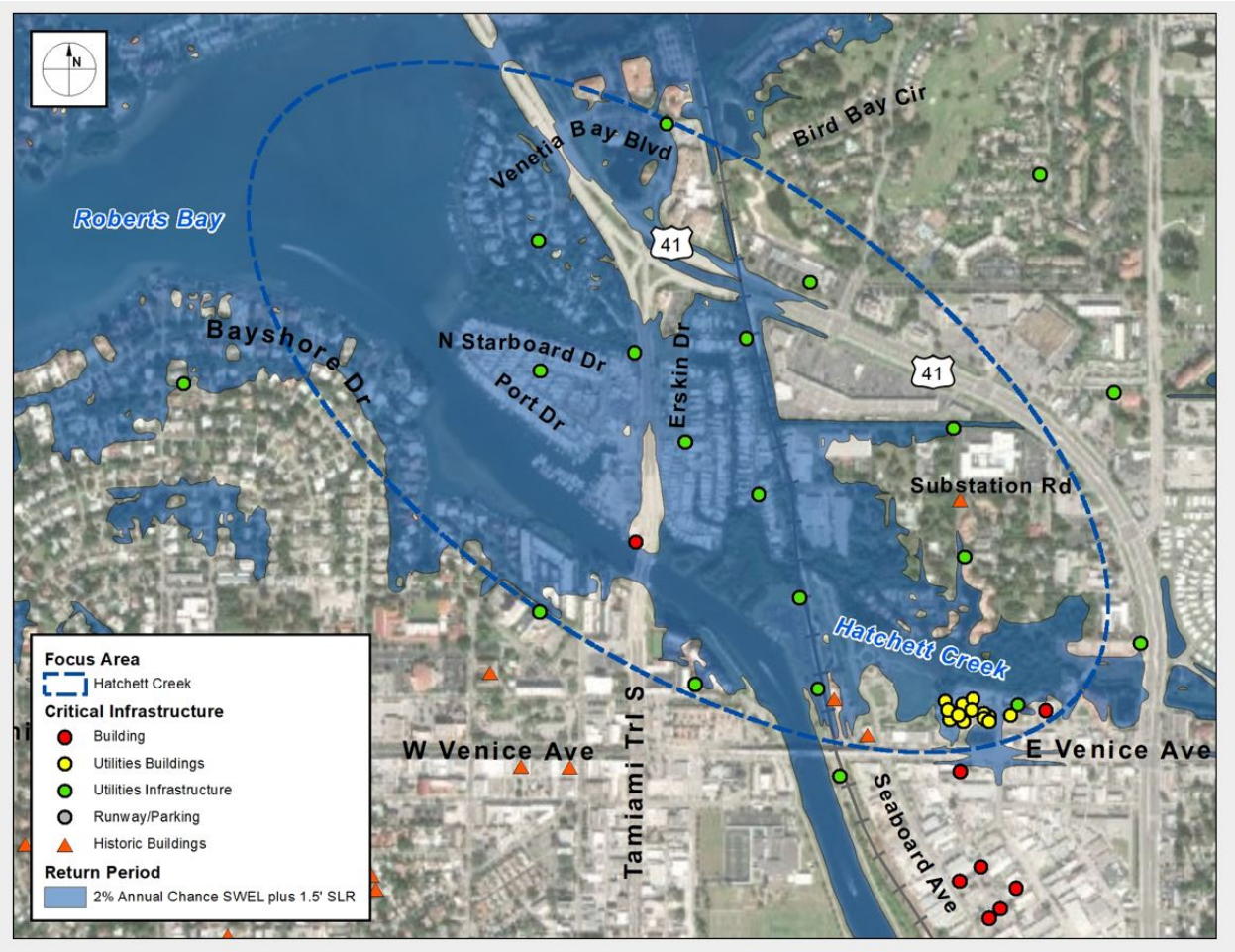



**Figure 4.3 Hatchett Creek Focus Area Map and Legend**

The vulnerability analysis shows that of the (approximate) 302 acres of land within this focus area, 177 acres (nearly 59%) are inundated at the 1.5 feet of sea level rise and 50-year (2% annual chance) storm surge scenario inundated. **Table 4.3** lists the recommended adaptation strategies for at-risk infrastructure in the Hatchett Creek Focus Area, with checkmarks matching each general strategy to specific structures. Green shading illustrates those strategies already implemented by the City. Light blue shading indicates adaptation projects that are listed in the Capital Improvement Plan and funded by the City.

## Table 4.3 Hatchett Creek Adaptation Matrix

| ADAPTATION STRATEGIES FOR HATCHETT CREEK FOCUS AREA | | | | | | | |
|---|---|---|---|---|---|---|---|
| STRUCTURE | ELEVATE FINISHED FIRST FLOOR | ELEVATE STRUCTURE | ELEVATE UTILITIES | FLOOD RESISTANT MATERIALS | FLOOD VENTS | BACKUP GENERATOR | INSTALL CHECK VALVE |
| BUILDING<br>FIRE STATION 2 | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | |
| HISTORIC BUILDING<br>VENICE DEPOT | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | |
| LIFT STATION<br>UTILITIES LS 13 | | | ✔ | ✔ | | ✔ | ✔ |
| LIFT STATION<br>UTILITIES LS 14 | | | ✔ | ✔ | | ✔ | ✔ |
| LIFT STATION<br>UTILITIES LS 24 | | | ✔ | ✔ | | ✔ | ✔ |
| LIFT STATION<br>UTILITIES LS 25 | | | ✔ | ✔ | | ✔ | ✔ |
| LIFT STATION<br>UTILITIES LS 46 | | | ✔ | ✔ | | ✔ | ✔ |
| LIFT STATION<br>UTILITIES LS 51 | | | ✔ | ✔ | | ✔ | ✔ |
| LIFT STATION<br>UTILITIES LS 64 | | | ✔ | ✔ | | ✔ | ✔ |
| LIFT STATION<br>UTILITIES LS 79 | | | ✔ | ✔ | | ✔ | ✔ |
| LIFT STATION<br>UTILITIES LS 80 | | | ✔ | ✔ | | ✔ | ✔ |
| UTILITIES<br>UTILITIES WATER TREATMENT | | | ✔ | ✔ | | ✔ | ✔ |
| UTILITIES<br>UTILITIES WATER TREATMENT | | | ✔ | ✔ | | ✔ | ✔ |
| UTILITIES<br>UTILITIES WATER TREATMENT | | | ✔ | ✔ | | ✔ | ✔ |
| UTILITIES<br>UTILITIES WATER TREATMENT | | | ✔ | ✔ | | ✔ | ✔ |
| UTILITIES<br>UTILITIES WATER TREATMENT EQUIP | | | ✔ | ✔ | | ✔ | ✔ |
| UTILITIES<br>UTILITIES WATER TREATMENT EQUIP | | | ✔ | ✔ | | ✔ | ✔ |
| UTILITIES<br>UTILITIES WT COMPRESSOR | | | ✔ | ✔ | | ✔ | ✔ |
| UTILITIES BUILDING<br>UTIL ELEVATE POTABLE TANK | | | | ✔ | | ✔ | |
| UTILITIES BUILDING<br>UTILITIES - MAINTENANCE SHOP | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | |
| UTILITIES BUILDING<br>UTILITIES - METER SHOP | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | |
| UTILITIES BUILDING<br>UTILITIES - POT WATER PUMPS | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| UTILITIES BUILDING<br>UTILITIES ACID BLDG | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | |
| UTILITIES BUILDING<br>UTILITIES ADMIN | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | |
| WELL<br>UTILITIES WELL 2A | | | ✔ | ✔ | | ✔ | ✔ |
| WELL<br>UTILITIES WELL 2W | | | ✔ | ✔ | | ✔ | ✔ |

| STRUCTURE | DUNE RESTORATION & BEACH NOURISHMENT | FLOOD BARRIER | FLOOD GATES | TEMPORARY FLOOD BARRIER | TEMPORARY FLOOD WRAP | RAISING LAND | RELOCATE STRUCTURE |
|---|---|---|---|---|---|---|---|
| BUILDING<br>FIRE STATION 2 | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| HISTORIC BUILDING<br>VENICE DEPOT | | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| LIFT STATION<br>UTILITIES LS 13 | | ✔ | | | | | |
| LIFT STATION<br>UTILITIES LS 14 | | ✔ | | | | | |
| LIFT STATION<br>UTILITIES LS 24 | | ✔ | | | | | |
| LIFT STATION<br>UTILITIES LS 25 | | ✔ | | | | | |
| LIFT STATION<br>UTILITIES LS 46 | | ✔ | | | | | |
| LIFT STATION<br>UTILITIES LS 51 | | ✔ | | | | | |
| LIFT STATION<br>UTILITIES LS 64 | | ✔ | | | | | |
| LIFT STATION<br>UTILITIES LS 79 | | ✔ | | | | | |
| LIFT STATION<br>UTILITIES LS 80 | | ✔ | | | | | |
| UTILITIES<br>UTILITIES WATER TREATMENT | | ✔ | | | | | |
| UTILITIES<br>UTILITIES WATER TREATMENT | | ✔ | | | | | |
| UTILITIES<br>UTILITIES WATER TREATMENT | | ✔ | | | | | |
| UTILITIES<br>UTILITIES WATER TREATMENT | | ✔ | | | | | |
| UTILITIES<br>UTILITIES WATER TREATMENT EQUIP | | ✔ | | | | | |
| UTILITIES<br>UTILITIES WATER TREATMENT EQUIP | | ✔ | | | | | |
| UTILITIES<br>UTILITIES WT COMPRESSOR | | ✔ | | | | | |
| UTILITIES BUILDING<br>UTIL ELEVATE POTABLE TANK | | | | | | | |
| UTILITIES BUILDING<br>UTILITIES - MAINTENANCE SHOP | | ✔ | | ✔ | ✔ | ✔ | ✔ |
| UTILITIES BUILDING<br>UTILITIES - METER SHOP | | ✔ | | ✔ | ✔ | ✔ | ✔ |
| UTILITIES BUILDING<br>UTILITIES - POT WATER PUMPS | | ✔ | | ✔ | ✔ | ✔ | ✔ |
| UTILITIES BUILDING<br>UTILITIES ACID BLDG | | ✔ | | ✔ | ✔ | ✔ | ✔ |
| UTILITIES BUILDING<br>UTILITIES ADMIN | | ✔ | | ✔ | ✔ | ✔ | ✔ |
| WELL<br>UTILITIES WELL 2A | | ✔ | | | | | ✔ |
| WELL<br>UTILITIES WELL 2W | | ✔ | | | | | ✔ |

The Airport Focus Area **(Figure 4.4)** is located on the southwest portion of the Island of Venice. This focus area encompasses 287 acres of land (approximate) and 10 critical facilities. Of the 287 acres, 135 acres will be inundated (47%) in the 1.5 feet of sea level rise and the 50-year (2% annual chance) storm surge scenario. This area was chosen as an adaptation focus area due to the variation of inundated facilities, including lift stations, utilities, buildings, and the airport southwest runway and taxiway.

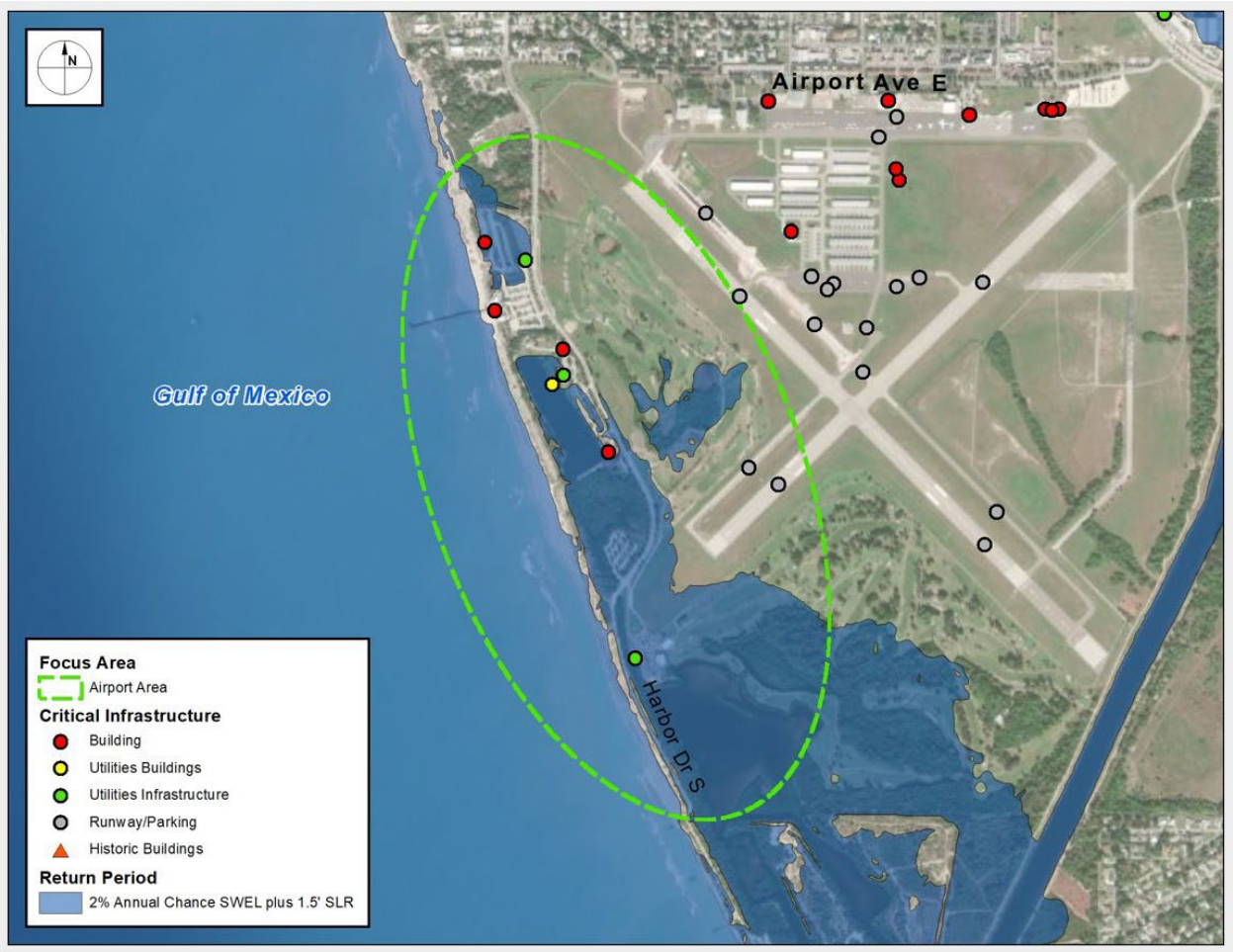



**Figure 4.4 Airport Focus Area Map and Legend**

**Table 4.4** lists the recommended adaptation strategies for at-risk infrastructure in the Airport Focus Area, with checkmarks matching each general strategy to specific structures. Green shading illustrates those strategies already implemented by the City. Light blue shading indicates adaptation projects that are listed in the Capital Improvement Plan and funded by the City.

## Table 4.4 Airport Adaptation Matrix

| ADAPTATION STRATEGIES FOR AIRPORT FOCUS AREA | | | | | | | |
|---|---|---|---|---|---|---|---|
| STRUCTURE | ELEVATE FINISHED FIRST FLOOR | ELEVATE STRUCTURE | ELEVATE UTILITIES | FLOOD RESISTANT MATERIALS | FLOOD VENTS | BACKUP GENERATOR | INSTALL CHECK VALVE |
| BUILDING SHARKYS | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| BUILDING, S. RESTROOM MAXINE BARRITT PARK | ✔ | ✔ | ✔ | ✔ | ✔ | | ✔ |
| LIFT STATION UTILITIES LS 00 | | | ✔ | ✔ | | ✔ | ✔ |
| LIFT STATION UTILITIES LS 41 | | | ✔ | ✔ | | ✔ | ✔ |
| LIFT STATION UTILITIES LS 87 | | | ✔ | ✔ | | ✔ | ✔ |
| RUNWAY SW RUNWAY | | | ✔ | ✔ | | | |
| RUNWAY SW RUNWAY TAXIWAY | | | ✔ | ✔ | | | |
| UTILITIES RC BLDG MAXINE BARRITT PARK | ✔ | ✔ | ✔ | ✔ | ✔ | | |

| STRUCTURE | DUNE RESTORATION & BEACH NOURISHMENT | FLOOD BARRIER | FLOOD GATES | TEMPORARY FLOOD BARRIER | TEMPORARY FLOOD WRAP | RAISING LAND | RELOCATE STRUCTURE |
|---|---|---|---|---|---|---|---|
| BUILDING SHARKYS | ✔ | ✔ | | ✔ | ✔ | ✔ | ✔ |
| BUILDING, S. RESTROOM MAXINE BARRITT PARK | ✔ | ✔ | | ✔ | ✔ | ✔ | ✔ |
| LIFT STATION UTILITIES LS 00 | ✔ | | | | | | |
| LIFT STATION UTILITIES LS 41 | ✔ | | | | | | |
| LIFT STATION UTILITIES LS 87 | ✔ | | | | | | |
| RUNWAY SW RUNWAY | | | | | | ✔ | ✔ |
| RUNWAY SW RUNWAY TAXIWAY | | | | | | ✔ | ✔ |
| UTILITIES RC BLDG MAXINE BARRITT PARK | ✔ | ✔ | | ✔ | ✔ | ✔ | ✔ |

The City will need a more detailed analysis of each structure to further refine the adaptation options. The next step requires updated FFE's, LAGs, and DEM to improve the specific flood depth which the asset may encounter in future flood scenarios. With better data, decision makers can assess the cost effectiveness and timeframe for when to best implement an adaptation strategy.

## 5.0 RECOMMENDATIONS AND NEXT STEPS

This Resilience Plan is the first step in a multi-phase adaptation plan for the City of Venice. Recommendations for next steps include collection of improved elevation data, possible changes to the City's Comprehensive Plan, establishing a flood baseline, prioritizing implementation projects on the County's Local Mitigation Strategy list and the City's Capital Improvement Plan, and pursuing grant funding for implementation. The rationale for each of these Phase I recommendations is summarized below:

Improved Elevation Data

More detailed elevation data of the City's critical infrastructure is required to assess the depth at which flooding occurs and the potential impact that flooding has on the facility. Understanding the degree of flooding is a key element for recommending which adaptation strategies are most applicable for each of the City's vulnerable assets and in what timeframe implementation would be most effective.

Establishing a Baseline of Acceptable Flood Risk

Several cities on the Atlantic Coast which experience high frequency nuisance flooding have established baselines of acceptable flood risk. This elevation serves as the minimum height which the city strives to build new public construction or major maintenance. For example, the City of St Augustine has rebuilt several aging seawalls to a height of 7 ft NAVD88. The City also protected their vulnerable wastewater treatment plant to that height and is constructing a new flood wall to the baseline. The City's 1% annual chance storm surge height is 6.9 ft NAVD88 at the seawall, which is the reasoning behind choosing that height.

Prioritized Projects for Implementation

The City of Venice should consider elevating critical roadways and seawalls as repairs/replacement become necessary. One example includes Tarpon Center Drive, which serves as the only evacuation route from the northern portion of the island. For this recommendation to be effective, a Baseline of Acceptable Flood Risk should be established first. Improved elevation data of these critical linear structures is a key component necessary to establish this baseline.

Another component which needs further study to determine the City's acceptable flood risk is increased precipitation due to climate change. This study did not include rainfall within the flood inundation scenarios, and further analysis of the City's stormwater drainage is recommended. Options for nature-based stormwater retention or filtration, such as wetland restoration or living shorelines, should also be explored. Notably, the City has identified a series of stormwater system upgrades and has plans to provide greater protection to the existing water treatment plant.

Prioritizing and Funding Implementation

Often the fiscal challenges related to adaptation and resilience delay this work. Including these projects in the County's Local Mitigation Strategy and the City's Capital Improvement Plan is a good strategy for increasing the chances of receiving federal or state funding to supplement the City's funds. Many grant opportunities for these adaptation projects exist, and typically the applications receive a higher evaluation score if the projects are listed on an official planning document as a priority.

Comprehensive Plan

The City should consider adding language to the Comprehensive Plan to address coastal resilience. Adding the risk of sea level rise to its Infrastructure Element and adaptation action areas would enhance the City's ability to prepare for future sea level rise by adding the flexibility and forethought needed as new climate change data becomes available. Recommended language to the City's Comprehensive Plan is included in Appendix D for consideration.

## 6.0 REFERENCES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**APPENDIX A**
**Inundation Scenario Table and Maps**

"X" indicates this structure shows some degree of flood inundation at the corresponding flood scenario

| TYPE OF STRUCTURE | NAME | MHHW | 1.5 ft SLR | 3.0 ft SLR | 2% Annual Chance Flood | 1% Annual Chance Flood | 1.5 ft SLR + 2% Annual Chance | 1.5 ft SLR + 1% Annual Chance | 3.0 ft SLR + 2% Annual Chance | 3.0 ft SLR + 1% Annual Chance |
|---|---|---|---|---|---|---|---|---|---|---|
| Building | Airport Admin Bldg | | | | | | | | | |
| Building | Airport Antenna/Com Bldg | | | | | | | | | |
| Building | Airport Carport | | | | | | | | | |
| Building | Airport Carport | | | | | | | | | |
| Building | Airport Mfg Warehouse | | | | | | | | | |
| Building | Airport Tower Com Bldg | | | | | | | | | |
| Building | Airport Warehouse | | | | | | | | | |
| Building | City Hall | | | | | | | | | |
| Building | Community Center | | | | | | | | | |
| Building | Fins | | | | | | | | | X |
| Building | Fire Station 2 | | | | | | | | | X |
| Building | Fire Station 3 | | | | | | | | | |
| Building | Marine Patrol Building | | | | | | | | | |
| Building | N. Restroom | | | | | | | | | |
| Building | North Pier Pavilion | | | | | | | | | |
| Building | Public Safety Facility | | | | | | | | | |
| Building | Public Works Admin Bldg | | | | | | | | | |
| Building | Public Works Admin Bldg - new | | | | | | | | | |
| Building | Public Works Building | | | | | | | | | |
| Building | Public Works Maintenance | | | | | | | | | |
| Building | Public Works Parking Garage | | | | | | | | | |
| Building | Public Works Parking Garage | | | | | | | | | |
| Building | Purchasing Warehouse | | | | | | | | | X |
| Building | S. Jetty Concessions | | | | | | | | | X |
| Building | S. Restroom | | | | | | | | | X |
| Building | Sarasota County Sheriff | | | | | | | | | |
| Building | Suncoast Air Center | | | | | | | | | |
| Lift Station | County Owned LS-374-0538 | | | | | | | | | |
| Lift Station | County Owned LS-374-0545 | | | | | | | | | |
| Lift Station | County Owned LS-376-0527 | | | | | | | | | |
| Lift Station | County Owned LS-376-0539 | | | | | | | | | |
| Lift Station | County Owned LS-376-0542 | | | | | | | | | |
| Lift Station | County Owned LS-376-0549 | | | | | | | | | |
| Lift Station | County Owned LS-376-0570 | | | | | | | | | |
| Lift Station | County Owned LS-380-0485 | | | | X | X | X | X | X | X |
| Lift Station | County Owned LS-385-0481 | | | | | | | | | X |
| Lift Station | County Owned LS-385-0562 | | | | | | | | | X |
| Lift Station | County Owned LS-389-0930 | | | | | | | | | |
| Lift Station | County Owned LS-391-0528 | | | | | | | | | |
| Lift Station | County Owned LS-392-0864 | | | | | | | | | |
| Lift Station | County Owned LS-392-0920 | | | | | | | | | |
| Lift Station | County Owned LS-392-0927 | | | | | | | | | |
| Lift Station | County Owned LS-392-0928 | | | | | | | | | |
| Lift Station | County Owned LS-392-0929 | | | | | | | | | |
| Lift Station | County Owned LS-405-0476 | | | | X | X | X | X | X | X |
| Lift Station | County Owned LS-405-0569 | | | | | X | X | X | X | X |
| Lift Station | County Owned LS-413-0887 | | | | | | | | | |
| Lift Station | County Owned LS-426-0895 | | | | | | | | | |
| Lift Station | County Owned LS-427-0814 | | | | | | | | | |
| Lift Station | County Owned LS-427-0815 | | | | | | | | | |
| Lift Station | County Owned LS-427-0816 | | | | | | | | | |
| Lift Station | County Owned LS-428-0828 | | | | | | | | | |
| Lift Station | County Owned Unnamed LS | | | | | | | | | |

"X" indicates this structure shows some degree of flood inundation at the corresponding flood scenario

| TYPE OF STRUCTURE | NAME | MHHW | 1.5 ft SLR | 3.0 ft SLR | 2% Annual Chance Flood | 1% Annual Chance Flood | 1.5 ft SLR + 2% Annual Chance | 1.5 ft SLR + 1% Annual Chance | 3.0 ft SLR + 2% Annual Chance | 3.0 ft SLR + 1% Annual Chance |
|---|---|---|---|---|---|---|---|---|---|---|
| Lift Station | County Owned Unnamed LS | | | | | | | | | |
| Lift Station | County Owned Unnamed LS | | | | | | | | | X |
| Lift Station | County Owned Unnamed LS | | | | | | | | | X |
| Lift Station | County Owned Unnamed LS | | | | | | | | | |
| Lift Station | County Owned Unnamed LS | | | | | | | | | |
| Lift Station | County Owned Unnamed LS | | | | | | | | | |
| Lift Station | County Owned Unnamed LS | | | | X | X | X | X | X | X |
| Lift Station | County Owned Unnamed LS | | | | X | X | X | X | X | X |
| Lift Station | County Owned Unnamed LS | | | | X | X | X | X | X | X |
| Lift Station | County Owned Unnamed LS | | | | | | | | | |
| Lift Station | County Owned Unnamed LS | | | | X | X | X | X | X | X |
| Lift Station | County Owned Unnamed LS | | | | | | | | | X |
| Lift Station | County Owned Unnamed LS | | | | | | | | | |
| Lift Station | County Owned Unnamed LS | | | | | | | | | |
| Lift Station | County Owned Unnamed LS | | | | X | X | X | X | X | X |
| Lift Station | County Owned Unnamed LS | | | | X | X | X | X | X | X |
| Lift Station | County Owned Unnamed LS | | | | | | | | | |
| Lift Station | County Owned Unnamed LS | | | | X | X | X | X | X | X |
| Lift Station | County Owned Unnamed LS | | | | | | | | | |
| Lift Station | County Owned Unnamed LS | | | | | | | | | |
| Lift Station | County Owned Unnamed LS | | | | | | | | | |
| Lift Station | County Owned Unnamed LS | | | | | | | | | |
| Lift Station | County Owned Unnamed LS | | | | | | | | | |
| Lift Station | County Owned Unnamed LS | | | | | | | | | |
| Lift Station | County Owned Unnamed LS | | | | | | | | | |
| Lift Station | County Owned Unnamed LS | | | | | | | | | |
| Lift Station | County Owned Unnamed LS | | | | | | | | | |
| Lift Station | County Owned Unnamed LS | | | | | | | | | X |
| Lift Station | County Owned Unnamed LS | | | | | | | | | X |
| Lift Station | County Owned Unnamed LS | | | | | | | | | X |
| Lift Station | County Owned Unnamed LS | | | | | | | | | |
| Lift Station | County Owned Unnamed LS | | | | | | | | | X |
| Lift Station | County Owned Unnamed LS | | | | | | | | | X |
| Lift Station | County Owned Unnamed LS | | | | | | | | | |
| Lift Station | County Owned Unnamed LS | | | | | | | | | |
| Lift Station | County Owned Unnamed LS | | | | X | X | X | X | X | X |
| Lift Station | County Owned Unnamed LS | | | | X | X | X | X | X | X |
| Lift Station | County Owned Unnamed LS | | | | | | | | | |
| Lift Station | County Owned Unnamed LS | | | | | | | | | |
| Lift Station | County Owned Unnamed LS | | | | | | | | | |
| Lift Station | County Owned Unnamed LS | | | | | | | | | |
| Lift Station | County Owned Unnamed LS | | | | | | | | | |
| Lift Station | Utilities LS 00 | | | | | X | X | X | X | X |
| Lift Station | Utilities LS 01 | | | | | | | | | |
| Lift Station | Utilities LS 02 | | | | | | | | | X |
| Lift Station | Utilities LS 03 | | | | | X | X | X | X | X |
| Lift Station | Utilities LS 04 | | | | X | X | X | X | X | X |
| Lift Station | Utilities LS 05 | | | X | X | X | X | X | X | X |
| Lift Station | Utilities LS 06 | | | | | | | X | X | X |
| Lift Station | Utilities LS 08 | | | | | | | | | |
| Lift Station | Utilities LS 09 | | | | | | | X | X | X |

"X" indicates this structure shows some degree of flood inundation at the corresponding flood scenario

| TYPE OF STRUCTURE | NAME | MHHW | 1.5 ft SLR | 3.0 ft SLR | 2% Annual Chance Flood | 1% Annual Chance Flood | 1.5 ft SLR + 2% Annual Chance | 1.5 ft SLR + 1% Annual Chance | 3.0 ft SLR + 2% Annual Chance | 3.0 ft SLR + 1% Annual Chance |
|---|---|---|---|---|---|---|---|---|---|---|
| Lift Station | Utilities LS 10 | | | | | | | | X | X |
| Lift Station | Utilities LS 11 | | | | | | | | | X |
| Lift Station | Utilities LS 12 | | | | | | | | | |
| Lift Station | Utilities LS 13 | | | | X | X | X | X | X | X |
| Lift Station | Utilities LS 14 | | | | X | X | X | X | X | X |
| Lift Station | Utilities LS 15 | | | | | | | | | |
| Lift Station | Utilities LS 16 | | | | | | | | | |
| Lift Station | Utilities LS 17 | | | | | | | | | |
| Lift Station | Utilities LS 18 | | | | | | | | | |
| Lift Station | Utilities LS 19 | | | | | | | | | |
| Lift Station | Utilities LS 20 | | | | | | | | | |
| Lift Station | Utilities LS 21 | | | | X | X | X | X | X | X |
| Lift Station | Utilities LS 22 | | | | | | | | | |
| Lift Station | Utilities LS 23 | | | | | | | | | |
| Lift Station | Utilities LS 24 | | | | | | | X | X | X |
| Lift Station | Utilities LS 25 | | | | X | X | X | X | X | X |
| Lift Station | Utilities LS 26 | | | | | | | | | |
| Lift Station | Utilities LS 27 | | | | | | | | | |
| Lift Station | Utilities LS 28 | | | | | | | | | X |
| Lift Station | Utilities LS 29 | | | | | | | | | |
| Lift Station | Utilities LS 30 | | | | | | | | | X |
| Lift Station | Utilities LS 31 | | | | | | | | | |
| Lift Station | Utilities LS 32 | | | | X | X | X | X | X | X |
| Lift Station | Utilities LS 33 | | | | | | | | | |
| Lift Station | Utilities LS 34 | | | | | | | X | X | X |
| Lift Station | Utilities LS 35 | | | | | | | | | |
| Lift Station | Utilities LS 38 | | | | | | | | | |
| Lift Station | Utilities LS 39 | | | | | | | | | |
| Lift Station | Utilities LS 40 | | | | | X | X | X | X | X |
| Lift Station | Utilities LS 41 | | | X | X | X | X | X | X | X |
| Lift Station | Utilities LS 42 | | | | X | X | X | X | X | X |
| Lift Station | Utilities LS 43 | | | | | | | | | X |
| Lift Station | Utilities LS 44 | | | | | | | | | |
| Lift Station | Utilities LS 45 | | | | | | | | | |
| Lift Station | Utilities LS 46 | | | | X | X | X | X | X | X |
| Lift Station | Utilities LS 47 | | | | | | | | | X |
| Lift Station | Utilities LS 48 | | | | | | | | | |
| Lift Station | Utilities LS 49 | | | | X | X | X | X | X | X |
| Lift Station | Utilities LS 50 | | | | | | | | | X |
| Lift Station | Utilities LS 51 | | | | | | | X | X | X |
| Lift Station | Utilities LS 53 | | | | | | | | | |
| Lift Station | Utilities LS 54 | | | | | | | | | |
| Lift Station | Utilities LS 55 | | | | | | | | | |
| Lift Station | Utilities LS 56 | | | | | | | X | X | X |
| Lift Station | Utilities LS 57 | | | | | | | | | |
| Lift Station | Utilities LS 58 | | | | | | | | | |
| Lift Station | Utilities LS 59 | | | | | | | X | X | X |
| Lift Station | Utilities LS 60 | | | | X | X | X | X | X | X |
| Lift Station | Utilities LS 61 | | | | | X | X | X | X | X |
| Lift Station | Utilities LS 62 | | | | | | | | | X |
| Lift Station | Utilities LS 63 | | | | | | | | | |
| Lift Station | Utilities LS 64 | | | X | X | X | X | X | X | X |
| Lift Station | Utilities LS 65 | | | | | | | | | |

"X" indicates this structure shows some degree of flood inundation at the corresponding flood scenario

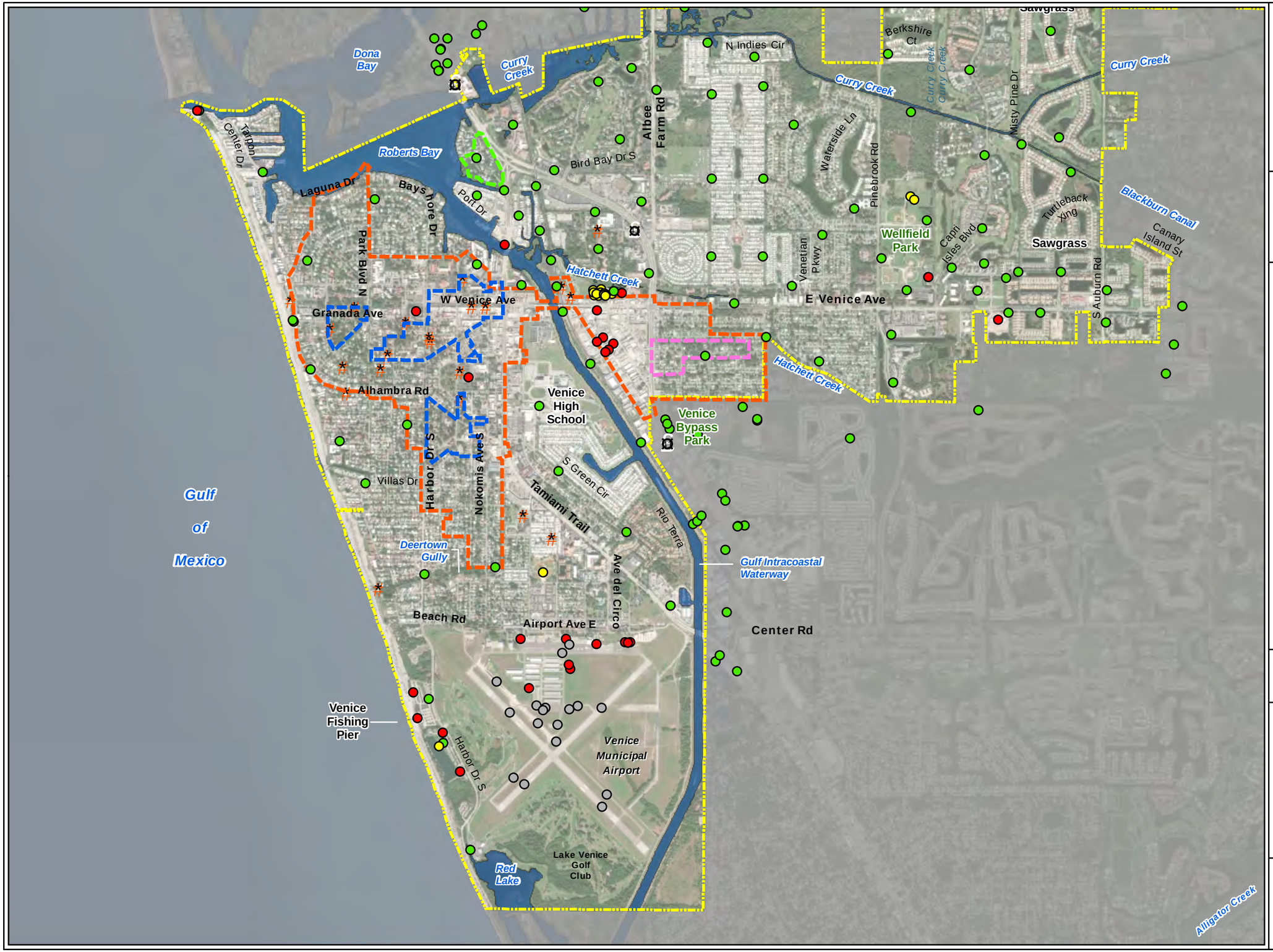
| TYPE OF STRUCTURE | NAME | MHHW | 1.5 ft SLR | 3.0 ft SLR | 2% Annual Chance Flood | 1% Annual Chance Flood | 1.5 ft SLR + 2% Annual Chance | 1.5 ft SLR + 1% Annual Chance | 3.0 ft SLR + 2% Annual Chance | 3.0 ft SLR + 1% Annual Chance |
|---|---|---|---|---|---|---|---|---|---|---|
| Lift Station | Utilities LS 67 | | | | | | | | | |
| Lift Station | Utilities LS 68 | | | | | | | | | |
| Lift Station | Utilities LS 69 | | | | | | | | | X |
| Lift Station | Utilities LS 70 | | | | | | | | | |
| Lift Station | Utilities LS 71 | | | | | | | | | |
| Lift Station | Utilities LS 72 | | | | X | X | X | X | X | X |
| Lift Station | Utilities LS 73 | | | | | | | | | |
| Lift Station | Utilities LS 74 | | | | | | | | | |
| Lift Station | Utilities LS 75 | | | | | | | | | |
| Lift Station | Utilities LS 76 | | | | | | | | | |
| Lift Station | Utilities LS 77 | | | | | | | | | |
| Lift Station | Utilities LS 78 | | | | | | | | | |
| Lift Station | Utilities LS 79 | | | | | | | X | X | X |
| Lift Station | Utilities LS 80 | | | | X | X | X | X | X | X |
| Lift Station | Utilities LS 81 | | | | | | | | | |
| Lift Station | Utilities LS 82 | | | | | | | | | |
| Lift Station | Utilities LS 83 | | | | | | | | | |
| Lift Station | Utilities LS 84 | | | | | | | | | |
| Lift Station | Utilities LS 85 | | | | | | | | | |
| Lift Station | Utilities LS 86 | | | | | | | | | |
| Lift Station | Utilities LS 87 | | | | | | | X | X | X |
| Lift Station | Utilities LS 88 | | | | | | | | | |
| Lift Station | Utilities LS 89 | | | | | | | | | |
| Lift Station | Utilities LS 90 | | | | | | | | | |
| Lift Station | Utilities LS 91 | | | | | | | | | |
| Lift Station | Utilities LS 92 | | | | | | | | | |
| Pump Station | Eng Stormwater PS 020301 | | | | | | | | | |
| Pump Station | Eng Stormwater PS N0101S01 | | | | X | X | X | X | X | X |
| Pump Station | Eng Stormwater PS S010201 | | | | | | | | | X |
| Runway/Parking | Center East Parking Taxiway | | | | | | | | | |
| Runway/Parking | Center Parking Taxiway | | | | | | | | | |
| Runway/Parking | Center West Parking Taxiway | | | | | | | | | |
| Runway/Parking | Central North Aircraft Parking | | | | | | | | | |
| Runway/Parking | Central South Aircraft Parking | | | | | | | | | |
| Runway/Parking | East Central Aircraft Parking | | | | | | | | | |
| Runway/Parking | NE Runway | | | | | | | | | |
| Runway/Parking | North Aircraft Parking | | | | | | | | | |
| Runway/Parking | North Parking Taxiway | | | | | | | | | |
| Runway/Parking | NW Runway | | | | | | | | | |
| Runway/Parking | NW Runway Taxiway | | | | | | | | | |
| Runway/Parking | NW Runway Taxiway | | | | | | | | | |
| Runway/Parking | NW Runway Taxiway Center | | | | | | | | | |
| Runway/Parking | SE Runway | | | | | | | | | |
| Runway/Parking | SE Runway Taxiway | | | | | | | | | |
| Runway/Parking | SW Runway | | | | | | | | | X |
| Runway/Parking | SW Runway Taxiway | | | | | | | | X | X |
| Utilities | Utilities Maintenance Shop | | | | | | | | | |
| Utilities | Utilities Maintenance Shop | | | | | | | | | |
| Utilities | Utilities RC Bldg | | | | X | X | X | X | X | X |
| Utilities | Utilities Storage | | | | | | | | | |
| Utilities | Utilities Storage | | | | | | | | | |
| Utilities | Utilities Storeage | | | | | | | | | |
| Utilities | Utilities Test Lab | | | | | | | | | |

"X" indicates this structure shows some degree of flood inundation at the corresponding flood scenario

| TYPE OF STRUCTURE | NAME | MHHW | 1.5 ft SLR | 3.0 ft SLR | 2% Annual Chance Flood | 1% Annual Chance Flood | 1.5 ft SLR + 2% Annual Chance | 1.5 ft SLR + 1% Annual Chance | 3.0 ft SLR + 2% Annual Chance | 3.0 ft SLR + 1% Annual Chance |
|---|---|---|---|---|---|---|---|---|---|---|
| Utilities | Utilities Wastewater | | | | | | | | | |
| Utilities | Utilities Wastewater | | | | | | | | | |
| Utilities | Utilities Wastewater Admin | | | | | | | | | |
| Utilities | Utilities Wastewater Bldg | | | | | | | | | |
| Utilities | Utilities Wastewater Bldg | | | | | | | | | |
| Utilities | Utilities Water Storage Tank | | | | | | | | | |
| Utilities | Utilities Water Treatment | | | | | | | X | X | X |
| Utilities | Utilities Water Treatment | | | | | | | X | X | X |
| Utilities | Utilities Water Treatment | | | | | | | X | X | X |
| Utilities | Utilities Water Treatment | | | | | | | X | X | X |
| Utilities | Utilities Water TreatmentEquip | | | | | | | X | X | X |
| Utilities | Utilities Water TreatmentEquip | | | | | | | X | X | X |
| Utilities | Utilities WT Compressor | | | | | X | X | X | X | X |
| Utilities Building | Util Elevate Potable Tank | | | | | X | X | X | X | X |
| Utilities Building | Util Elevated Potable Tank | | | | | | | | | |
| Utilities Building | Util RC Storage Tanks | | | | | | | | | |
| Utilities Building | Util RC Storage Tanks | | | | | | | | | |
| Utilities Building | Util Wastewater Bldg | | | | | | | | | |
| Utilities Building | Util Wastewater Treatment | | | | | | | | | |
| Utilities Building | Util Wastewater Treatment | | | | | | | | | |
| Utilities Building | Util Wastewater Treatment | | | | | | | | | |
| Utilities Building | Util Wastewater Treatment | | | | | | | | | |
| Utilities Building | Util Wastewater Treatment | | | | | | | | | |
| Utilities Building | Util Wastewater Treatment | | | | | | | | | |
| Utilities Building | Util Wastewater Treatment | | | | | | | | | |
| Utilities Building | Utilities - Maintenance Shop | | | | | X | X | X | X | X |
| Utilities Building | Utilities - Meter Shop | | | | | X | X | X | X | X |
| Utilities Building | Utilities - Pot Water Pumps | | | | | | | X | X | X |
| Utilities Building | Utilities Acid Bldg | | | | | X | X | X | X | X |
| Utilities Building | Utilities Admin | | | | | | | X | X | X |
| Utilities Building | Utilities Bldg | | | | | | | | | |
| Utilities Building | Utilities Bldg | | | | | | | | | |
| Utilities Building | Utilities Building | | | | | | | | | |
| Well | Utilities Well 1E | | | | | X | X | X | X | X |
| Well | Utilities Well 2A | | | X | X | X | X | X | X | X |
| Well | Utilities Well 2W | | | | | X | X | X | X | X |
| Well | Utilities Well 3E | | | | | | | | | |
| Well | Utilities Well 3W | | | | | | | | | X |
| Well | Utilities Well 4E | | | | | | | | | |
| Well | Utilities Well 4W | | | | | | | | | |
| Well | Utilities Well 6E | | | | | | | | | |
| Well | Utilities Well 7E | | | | | | | | | |
| Well | Utilities Well 7W | | | | | | | | | |
| Well | Utilities Well 8W | | | | | | | | | |
| Well | Utilties Well 2E | | | | | | | | | |
| Well | Utilties Well 8E | | | | | | | | | |

"X" indicates this structure shows some degree of flood inundation at the corresponding flood scenario

| TYPE OF STRUCTURE | NAME | DESCRIPTION | ADDRESS | MHHW | 1.5 ft SLR | 3.0 ft SLR | 2% Annual Chance Flood | 1% Annual Chance Flood | 1.5 ft SLR + 2% Annual Chance | 1.5 ft SLR + 1% Annual Chance | 3.0 ft SLR + 2% Annual Chance | 3.0 ft SLR + 1% Annual Chance |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Historic Building | 600 Substation Rd | Private residence | 600 SUBSTATION RD | | | | | | | | | X |
| Historic Building | 613 W VENICE AVE | Private residence | 613 W VENICE AVE | | | | | | | | | |
| Historic Building | Beach Pavillion | Beach Pavillion | 101 THE ESPLANADE NORTH | | | | | X | X | X | X | X |
| Historic Building | Blalock House | Private residence | 241 HARBOR DRIVE SOUTH | | | | | | | | | |
| Historic Building | Copeland, Senator House | Private residence | 710 ARMADA RD S | | | | | | | | | |
| Historic Building | Farley, Walter House | Private residence | 1100 SUNSET DR | | | | | | | X | X | X |
| Historic Building | HERRON HOUSE | Private residence | 615 ALHAMBRA RD | | | | | | | | | |
| Historic Building | Hotel Venice | Hotel | 200 N NASSAU ST | | | | | | | | | |
| Historic Building | HUDSON HOUSE | Private residence | 616 VALENCIA RD | | | | | | | | | |
| Historic Building | Johnson--Schoolcraft Building | Apartment | 201-203 W VENICE AVE | | | | | | | | | |
| Historic Building | Jon Barrick Home | Private residence | 409 NASSAU ST S | | | | | | | | | |
| Historic Building | Levillain--Letton House | Private residence | 229 HARBOR DRIVE SOUTH | | | | | | | | | |
| Historic Building | Lord-Higel House | Private residence | 409 GRANADA | | | | | | | | | |
| Historic Building | Manhattan Produce Building | Park Bldg. | 301 E VENICE AVE | | | | | | | X | X | X |
| Historic Building | Municipal Mobile Home Park Community Center | Community Center | 780 FIRENZE AVE E | | | | | | | | | |
| Historic Building | Rogers House | Private residence | 512 VALENCIA RD | | | | | | | | | |
| Historic Building | Rose Hill Apartments | Apartment | 504 ARMADA RD S | | | | | | | | | |
| Historic Building | Triangle Inn | Museum | 315 S NASSAU ST | | | | | | | | | |
| Historic Building | Valencia Hotel and Arcade | Commercial | 229 W VENICE AVE | | | | | | | | | |
| Historic Building | Venice Depot | Train Station | 303 E VENICE AVE | | | | | X | X | X | X | X |
| Historic Building | Venice Presbyterian Church | Church | 825 THE RIALTO | | | | | | | | | |





Taylor Engineering, Inc.
1800 2nd Street, Suite 714
Sarasota, FL 34236
CERTIFICATE OF AUTHORIZATION # 4815


# MEAN HIGHER HIGH WATER CRITICAL PUBLIC INFRASTRUCTURE AND HISTORIC AREAS WITHIN CITY LIMITS

## *Legend*

- Venice City Limits

**Critical Infrastructure**

- Building
- Utilities Buildings
- Utilities Infrastructure
- Runway/Parking

**Historic Areas/Buildings**

- Downtown Venice
- Eagle Point Historic District
- Edgewood Historic District
- John Nolen Plan of the City of Venice
- Historic Buildings

**Return Period**

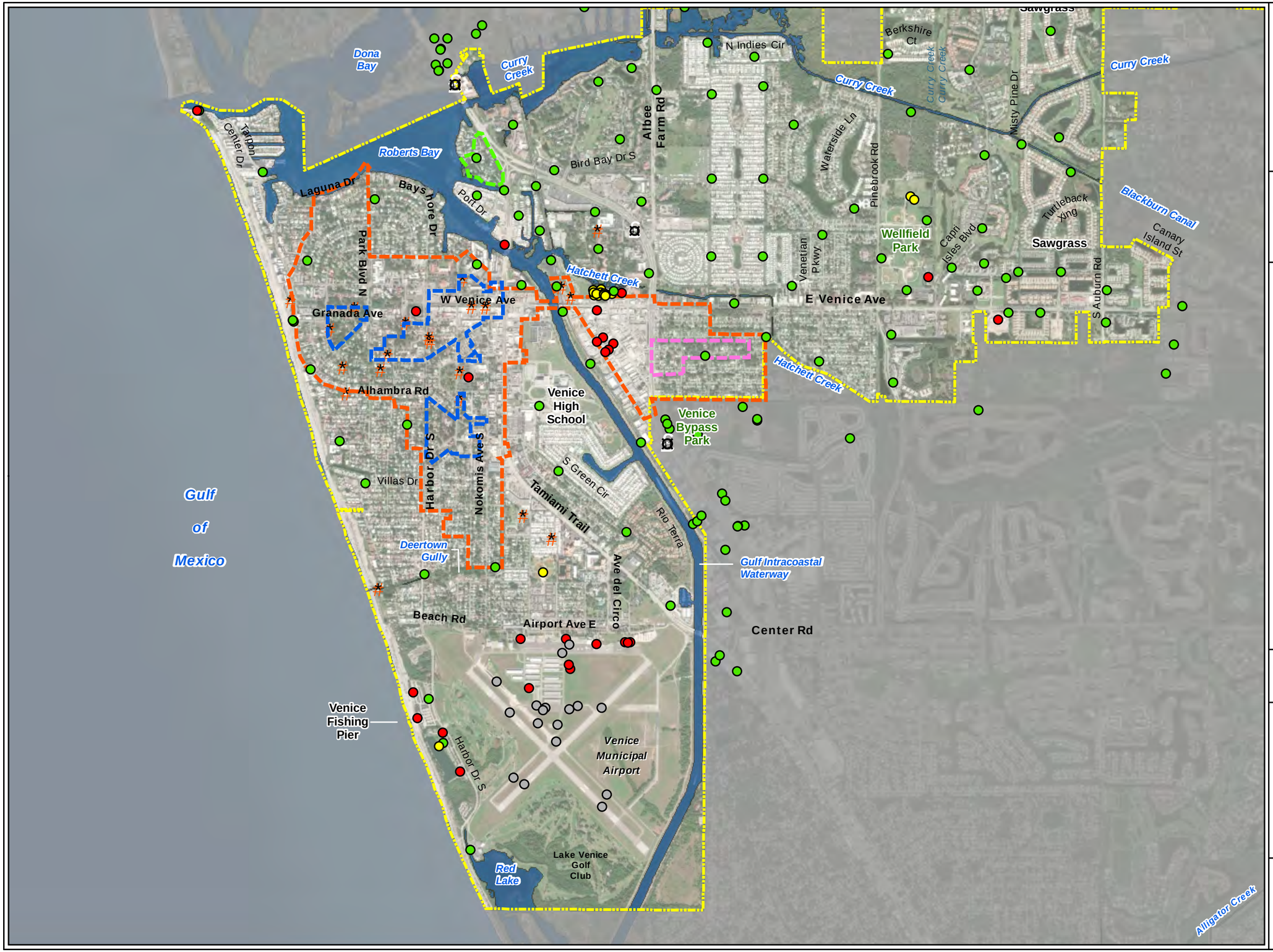
- Mean Higher High Water

0 2,500 5,000
FEET

N

SARASOTA COUNTY, FL

Disclaimer: This figure is not intended to show the exact location of flooding and does not account for all variables affecting future flooding such as ground water impacts, changing precipitation patterns, future construction, or erosion. As such, actual future flooding may differ from this graphic. This graphic should be used strictly as a planning reference tool and not for navigation, permitting, insurance rating, or other legal or regulatory purposes.





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# 1.5' OF SEA LEVEL RISE CRITICAL PUBLIC INFRASTRUCTURE AND HISTORIC AREAS WITHIN CITY LIMITS

***Legend***

- Venice City Limits

**Critical Infrastructure**

- Building
- Utilities Buildings
- Utilities Infrastructure
- Runway/Parking

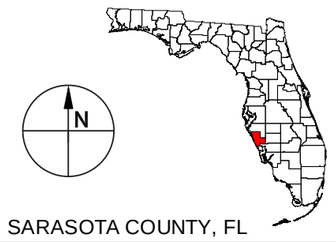
**Historic Areas/Buildings**

- Downtown Venice
- Eagle Point Historic District
- Edgewood Historic District
- John Nolen Plan of the City of Venice
- Historic Buildings

**Return Period**

- 1.5' of Sea Level Rise

0 2,500 5,000
FEET




SARASOTA COUNTY, FL

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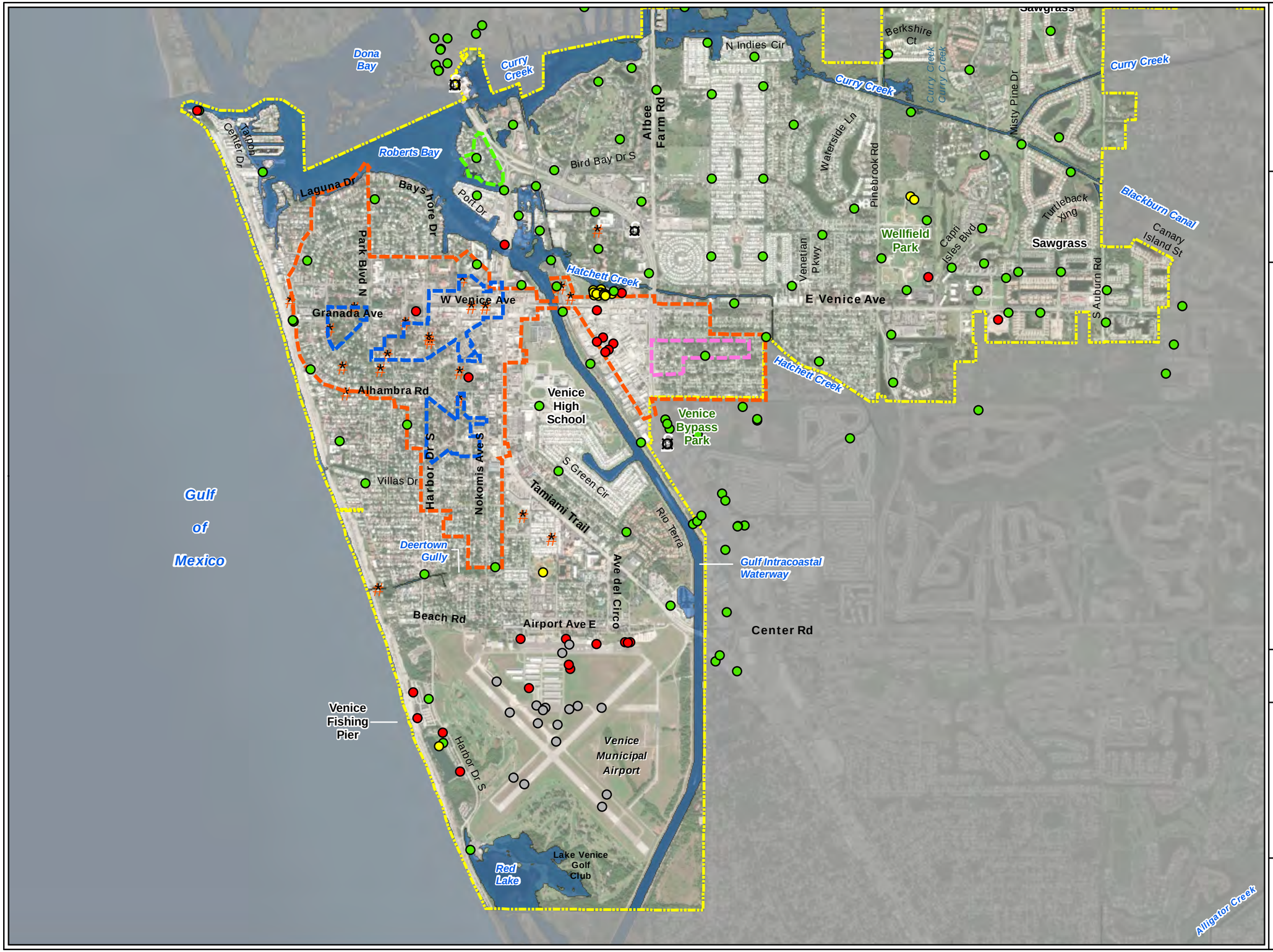



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# 3' OF SEA LEVEL RISE CRITICAL PUBLIC INFRASTRUCTURE AND HISTORIC AREAS WITHIN CITY LIMITS

***Legend***

- Venice City Limits

**Critical Infrastructure**

- Building
- Utilities Buildings
- Utilities Infrastructure
- Runway/Parking

**Historic Areas/Buildings**

- Downtown Venice
- Eagle Point Historic District
- Edgewood Historic District
- John Nolen Plan of the City of Venice
- Historic Buildings

**Return Period**

- 3' of Sea Level Rise

0 2,500 5,000
FEET

N

SARASOTA COUNTY, FL

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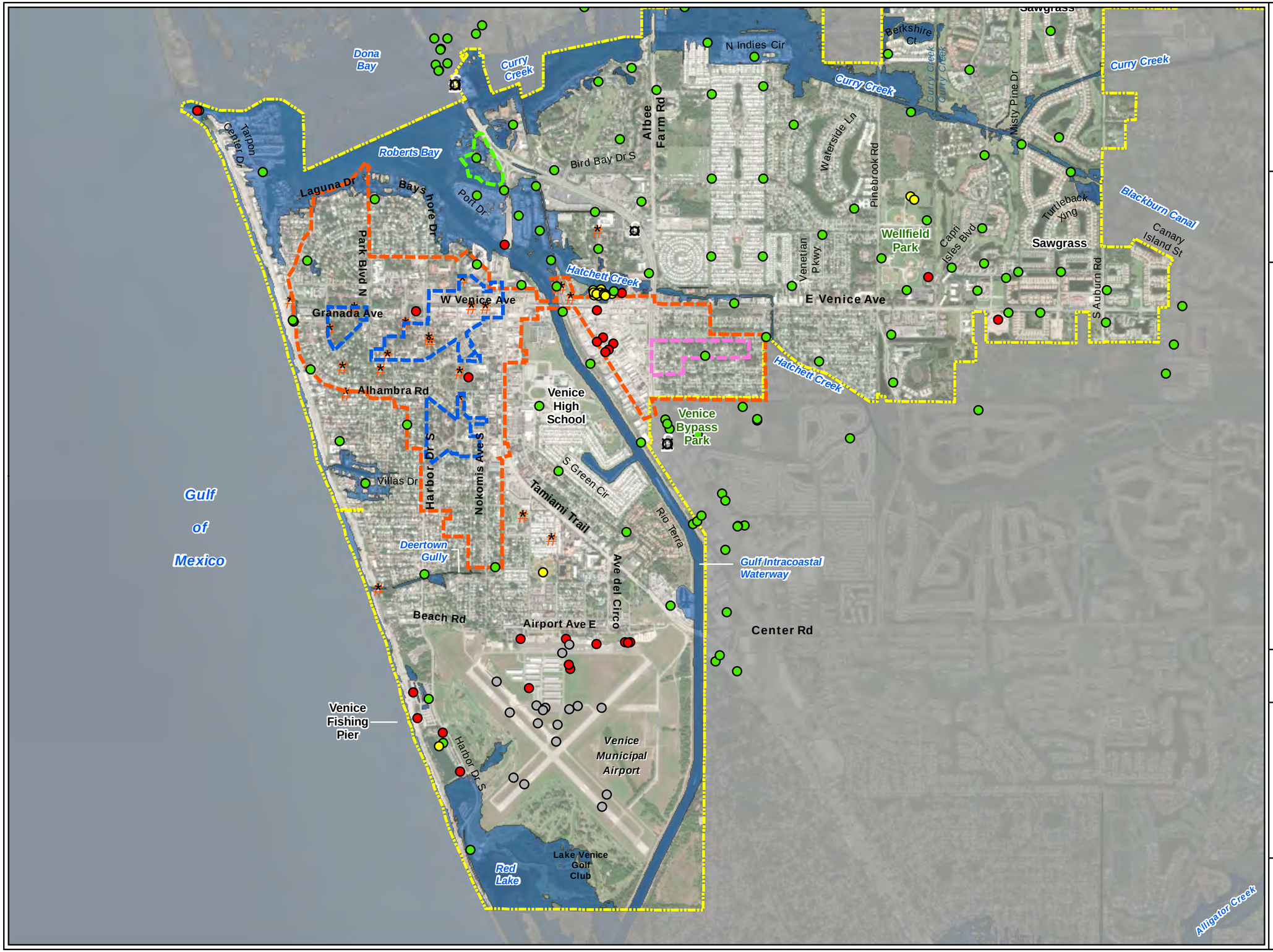



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# 2% ANNUAL CHANCE SWEL CRITICAL PUBLIC INFRASTRUCTURE AND HISTORIC AREAS WITHIN CITY LIMITS

***Legend***

- Venice City Limits

**Critical Infrastructure**

- Building
- Utilities Buildings
- Utilities Infrastructure
- Runway/Parking

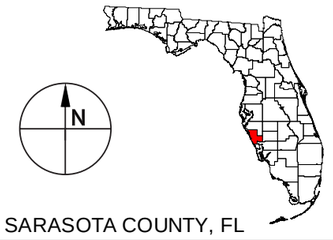
**Historic Areas/Buildings**

- Downtown Venice
- Eagle Point Historic District
- Edgewood Historic District
- John Nolen Plan of the City of Venice
- Historic Buildings

**Return Period**

- 2% Annual Chance SWEL

0 2,500 5,000
FEET




SARASOTA COUNTY, FL

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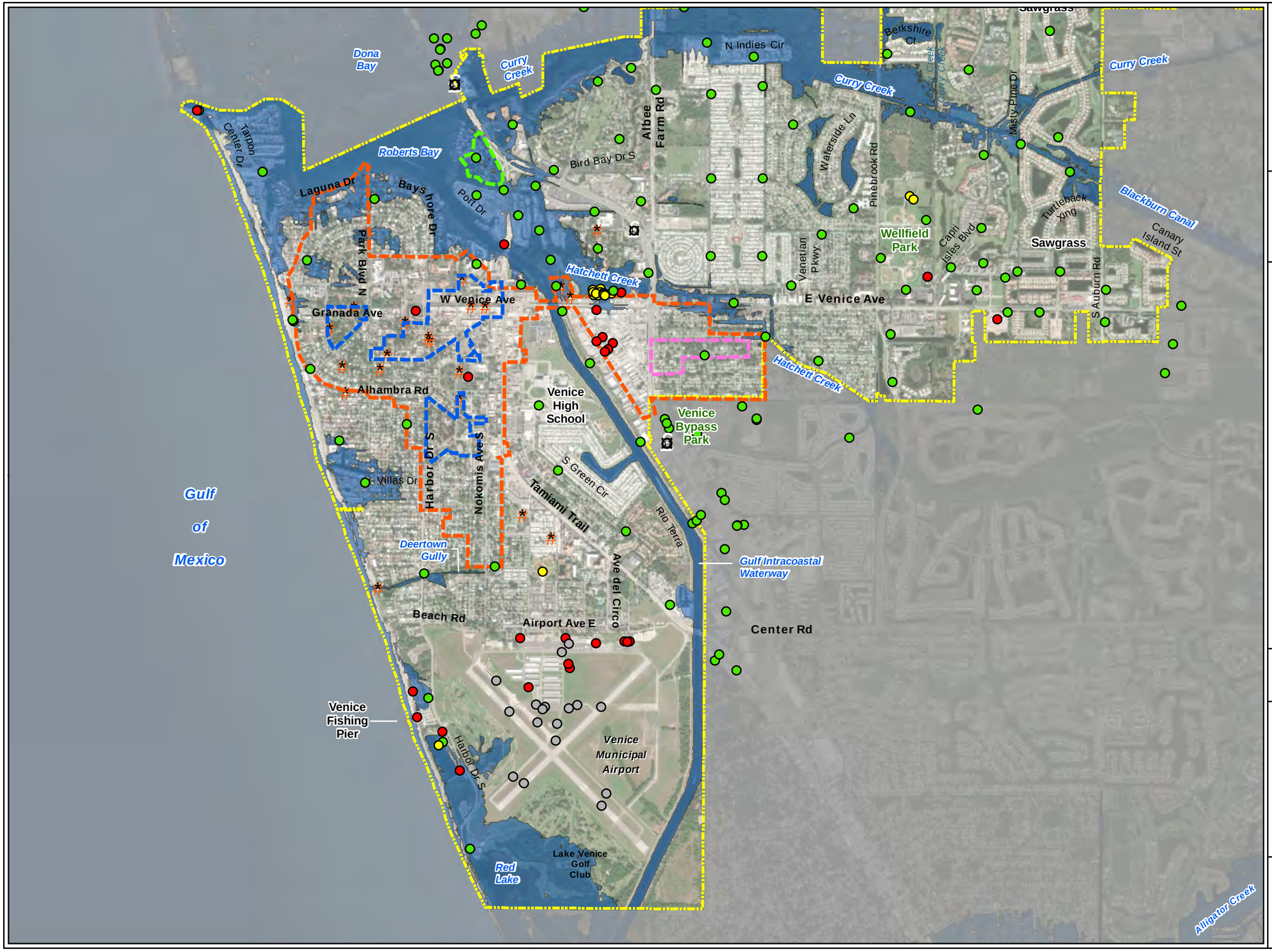



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**2% ANNUAL CHANCE SWEL PLUS 1.5' OF SEA LEVEL RISE CRITICAL PUBLIC INFRASTRUCTURE AND HISTORIC AREAS WITHIN CITY LIMITS**

***Legend***

- Venice City Limits

**Critical Infrastructure**

- Building
- Utilities Buildings
- Utilities Infrastructure
- Runway/Parking

**Historic Areas/Buildings**

- Downtown Venice
- Eagle Point Historic District
- Edgewood Historic District
- John Nolen Plan of the City of Venice
- Historic Buildings

**Return Period**

- 2% Annual Chance SWEL plus 1.5' SLR

0 2,500 5,000
FEET

N

SARASOTA COUNTY, FL

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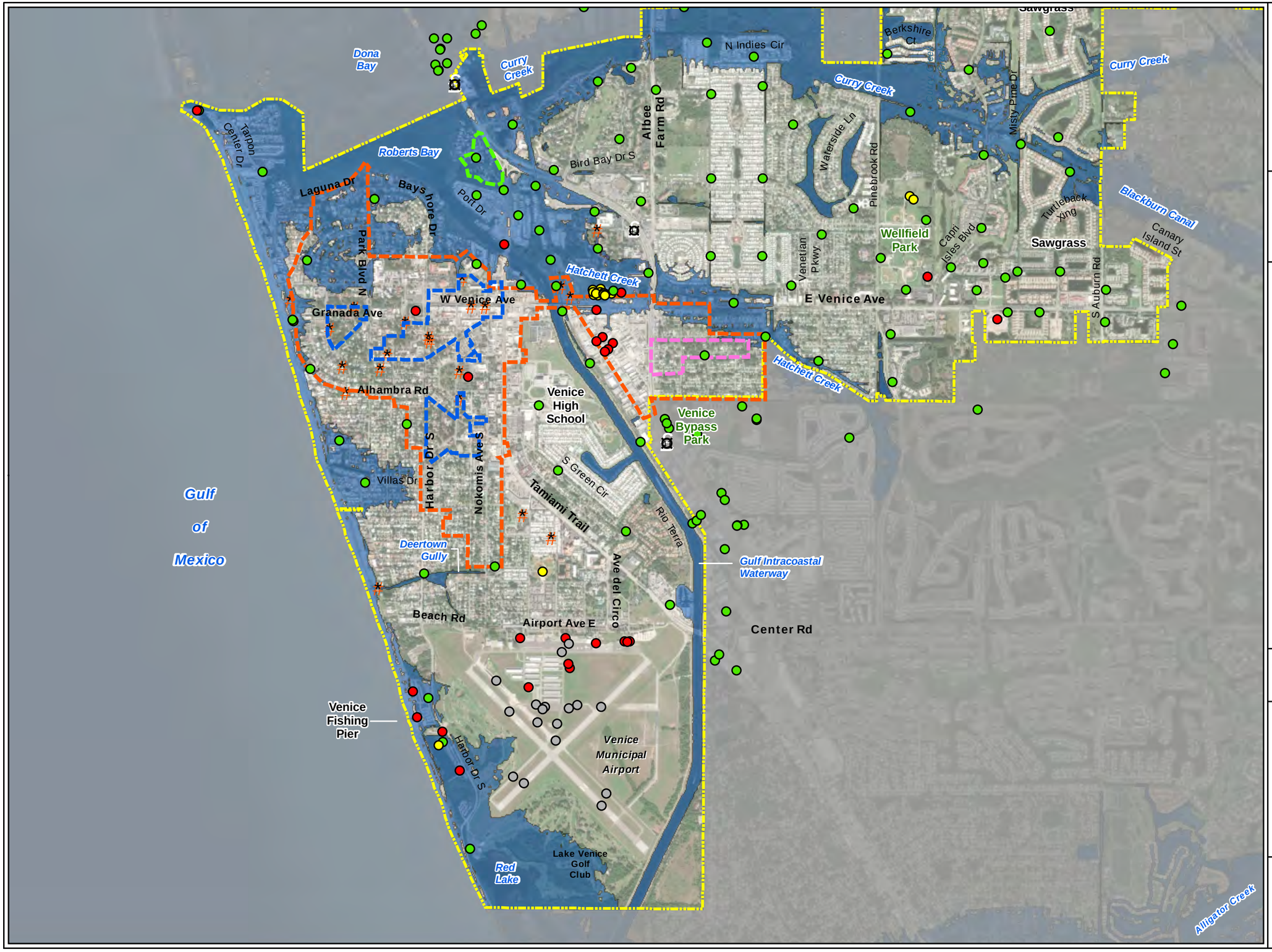



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**2% ANNUAL CHANCE SWEL PLUS 3' OF SEA LEVEL RISE CRITICAL PUBLIC INFRASTRUCTURE AND HISTORIC AREAS WITHIN CITY LIMITS**

***Legend***

- Venice City Limits

**Critical Infrastructure**

- Building
- Utilities Buildings
- Utilities Infrastructure
- Runway/Parking

**Historic Areas/Buildings**

- Downtown Venice
- Eagle Point Historic District
- Edgewood Historic District
- John Nolen Plan of the City of Venice
- Historic Buildings

**Return Period**

- 2% Annual Chance SWEL plus 3' SLR

0 2,500 5,000
FEET

N

SARASOTA COUNTY, FL

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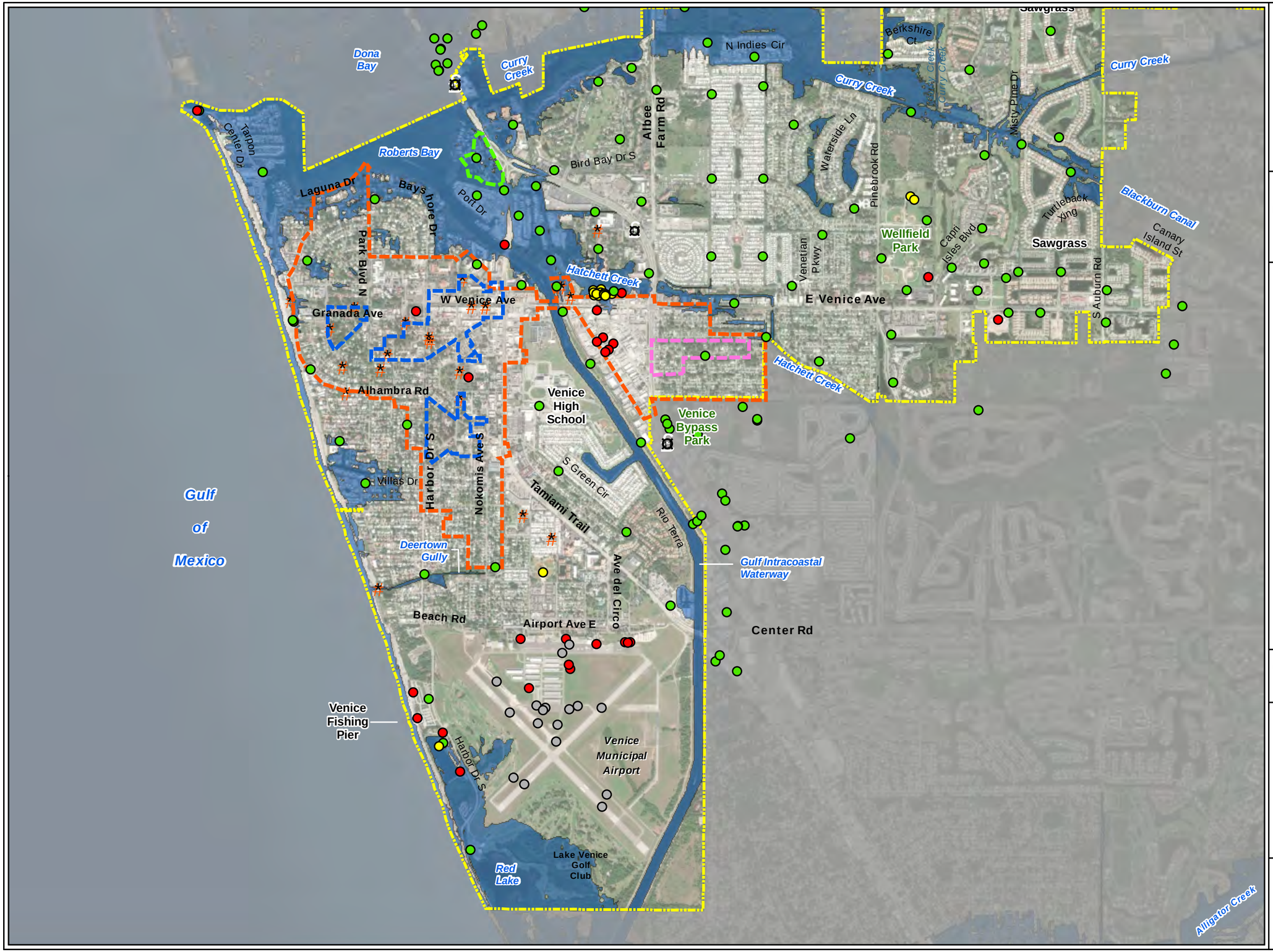



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# 1% ANNUAL CHANCE SWEL CRITICAL PUBLIC INFRASTRUCTURE AND HISTORIC AREAS WITHIN CITY LIMITS

***Legend***

- Venice City Limits

**Critical Infrastructure**

- Building
- Utilities Buildings
- Utilities Infrastructure
- Runway/Parking

**Historic Areas/Buildings**

- Downtown Venice
- Eagle Point Historic District
- Edgewood Historic District
- John Nolen Plan of the City of Venice
- Historic Buildings

**Return Period**

- 1% Annual Chance SWEL

0 2,500 5,000
FEET

N

SARASOTA COUNTY, FL

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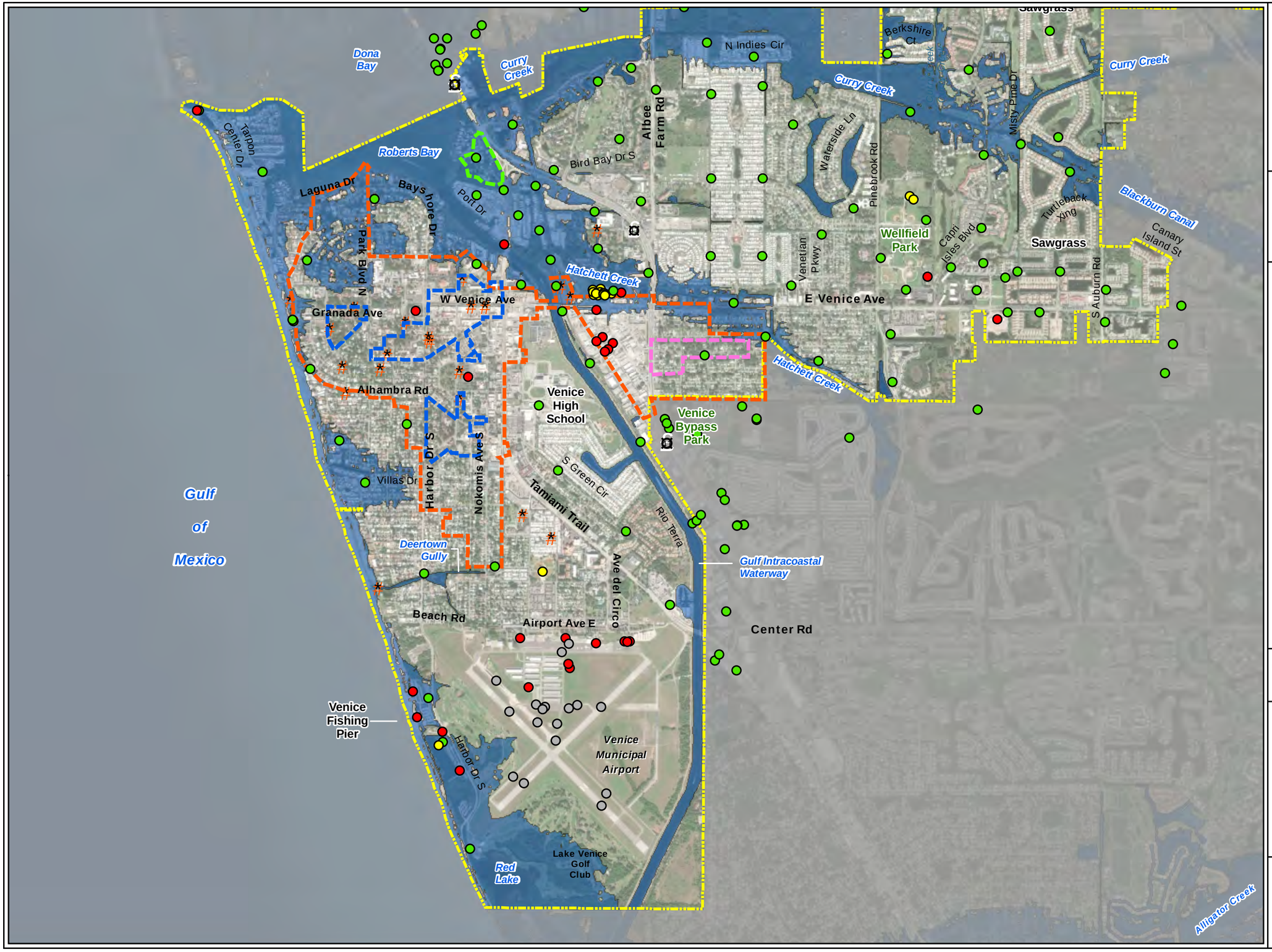



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***Legend***

- Venice City Limits

**Critical Infrastructure**

- Building
- Utilities Buildings
- Utilities Infrastructure
- Runway/Parking

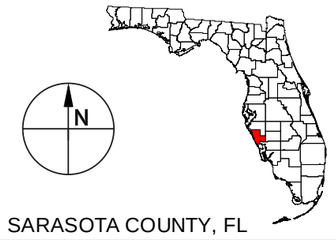
**Historic Areas/Buildings**

- Downtown Venice
- Eagle Point Historic District
- Edgewood Historic District
- John Nolen Plan of the City of Venice
- Historic Buildings

**Return Period**

- 1% Annual Chance SWEL plus 1.5' SLR

0 2,500 5,000
FEET

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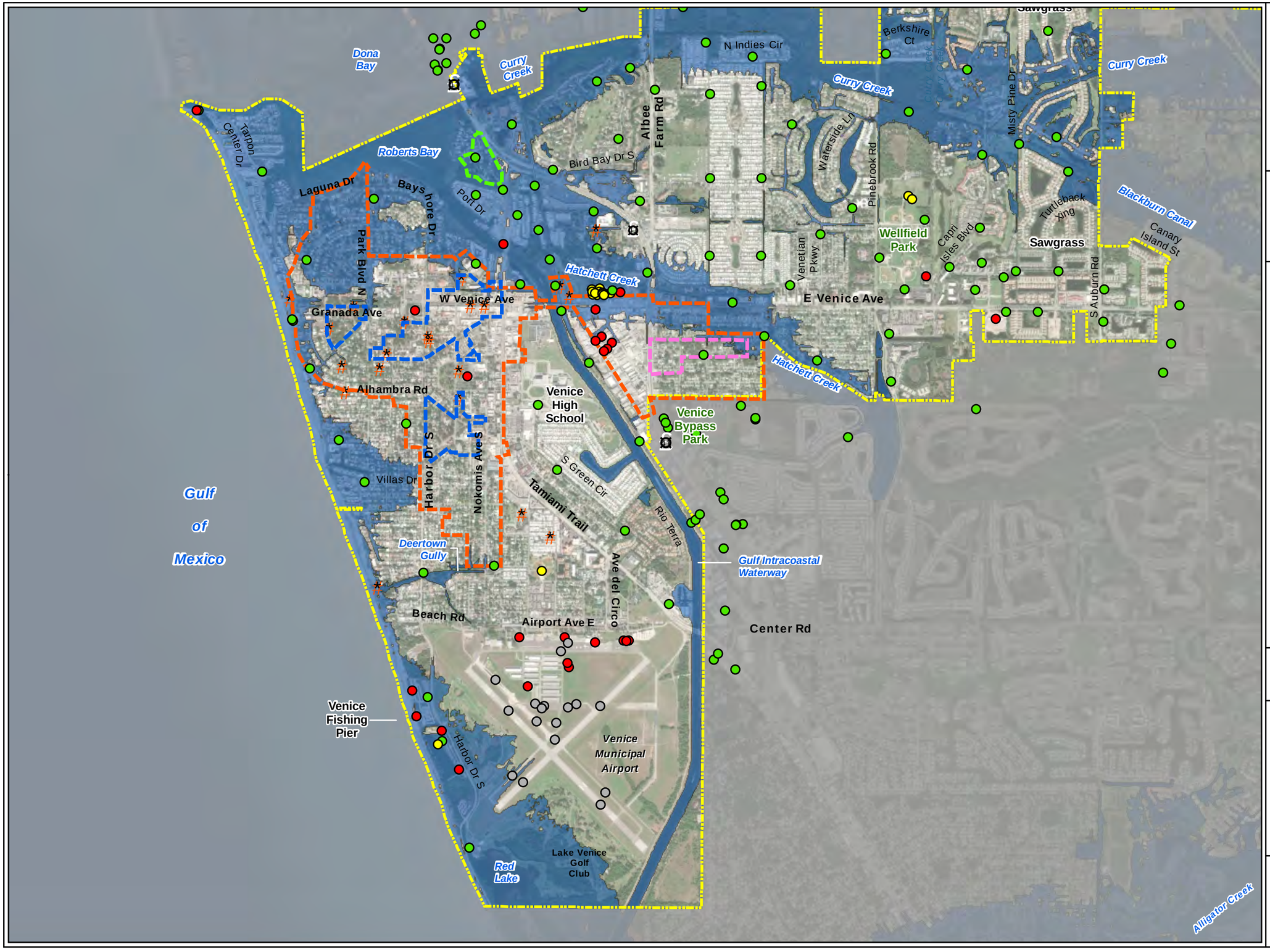



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# 1% ANNUAL CHANCE SWEL PLUS 3' OF SEA LEVEL RISE CRITICAL PUBLIC INFRASTRUCTURE AND HISTORIC AREAS WITHIN CITY LIMITS

## Legend

- Venice City Limits

**Critical Infrastructure**

- Building
- Utilities Buildings
- Utilities Infrastructure
- Runway/Parking

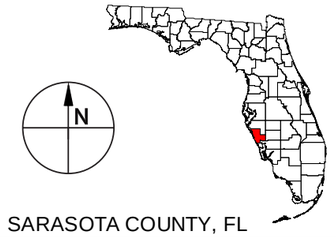
**Historic Areas/Buildings**

- Downtown Venice
- Eagle Point Historic District
- Edgewood Historic District
- John Nolen Plan of the City of Venice
- Historic Buildings

**Return Period**

- 1% Annual Chance SWEL plus 3' SLR

0 2,500 5,000
FEET

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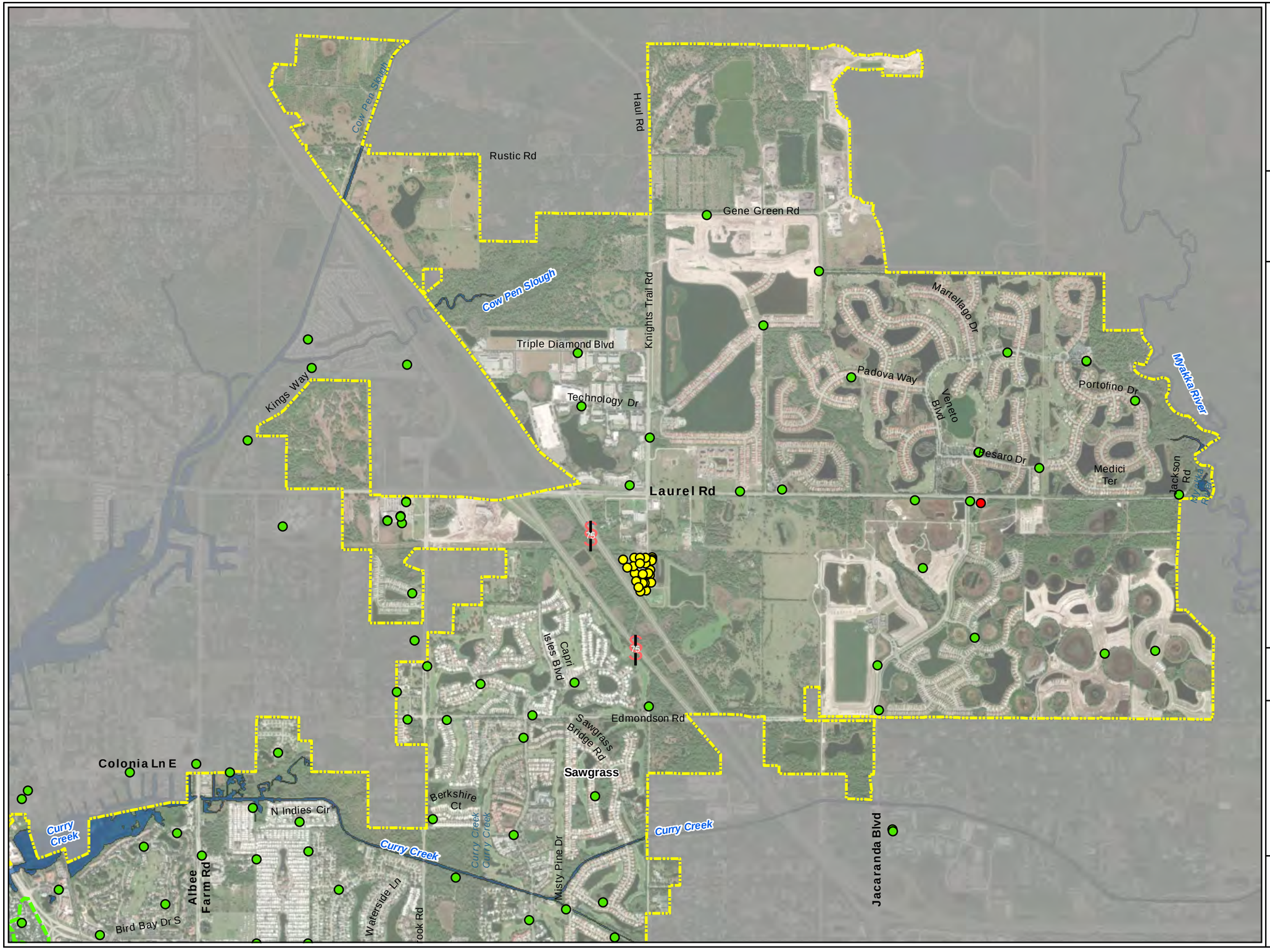


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# MEAN HIGHER HIGH WATER CRITICAL PUBLIC INFRASTRUCTURE AND HISTORIC AREAS WITHIN CITY LIMITS

## *Legend*

- Venice City Limits

**Critical Infrastructure**

- Building
- Utilities Buildings
- Utilities Infrastructure
- Runway/Parking

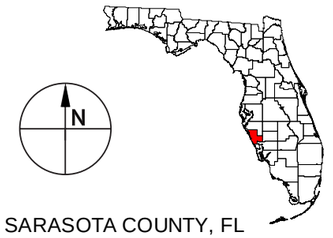
**Historic Areas/Buildings**

- Downtown Venice
- Eagle Point Historic District
- Edgewood Historic District
- John Nolen Plan of the City of Venice
- Historic Buildings

**Return Period**

- Mean Higher High Water

0 2,500 5,000
FEET




SARASOTA COUNTY, FL

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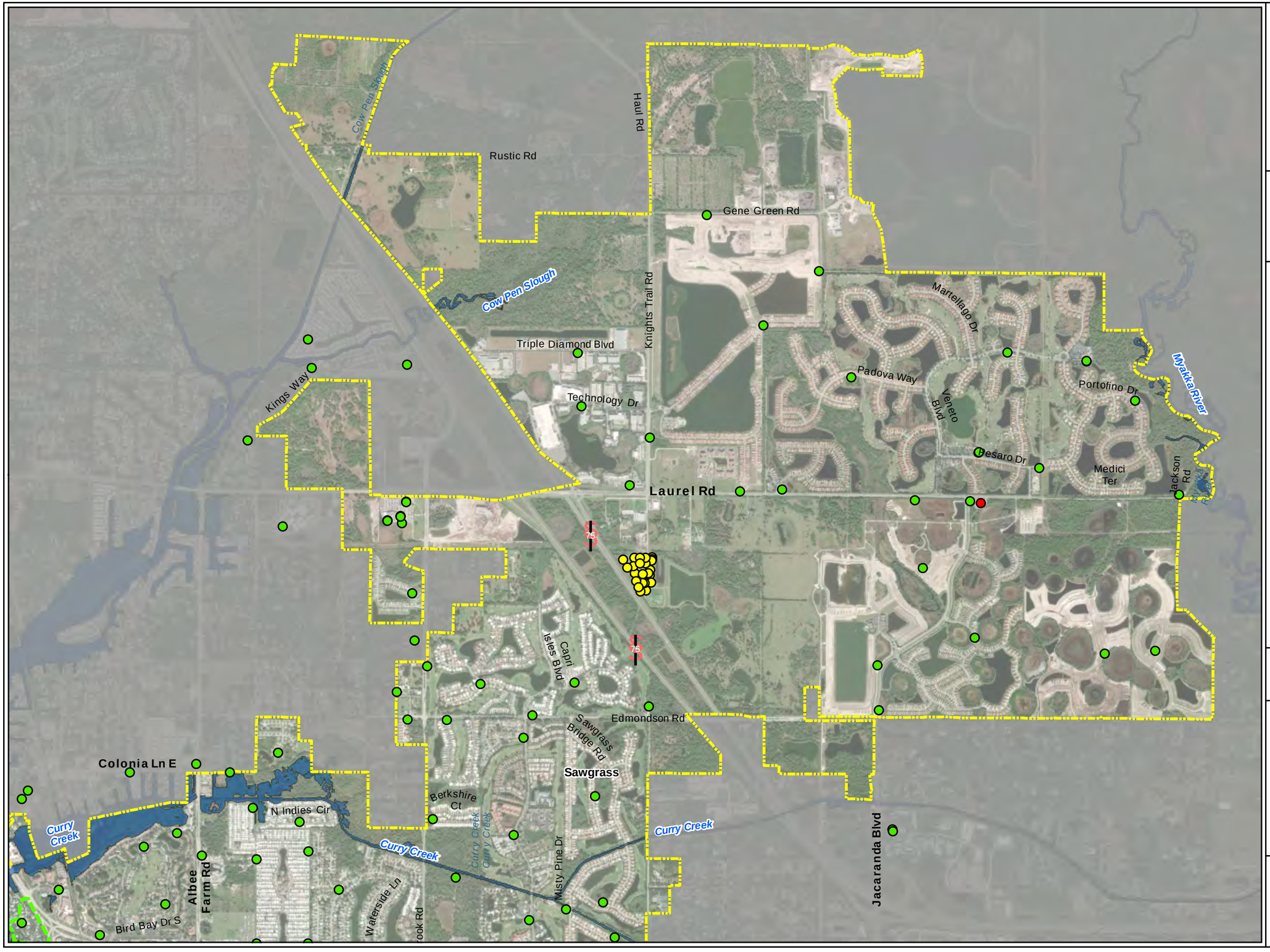



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**1.5' OF SEA LEVEL RISE**
**CRITICAL PUBLIC INFRASTRUCTURE**
**AND HISTORIC AREAS**
**WITHIN CITY LIMITS**

***Legend***

- Venice City Limits

**Critical Infrastructure**

- Building
- Utilities Buildings
- Utilities Infrastructure
- Runway/Parking

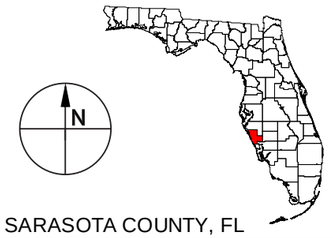
**Historic Areas/Buildings**

- Downtown Venice
- Eagle Point Historic District
- Edgewood Historic District
- John Nolen Plan of the City of Venice
- Historic Buildings

**Return Period**

- 1.5' of Sea Level Rise

0 2,500 5,000
FEET




SARASOTA COUNTY, FL

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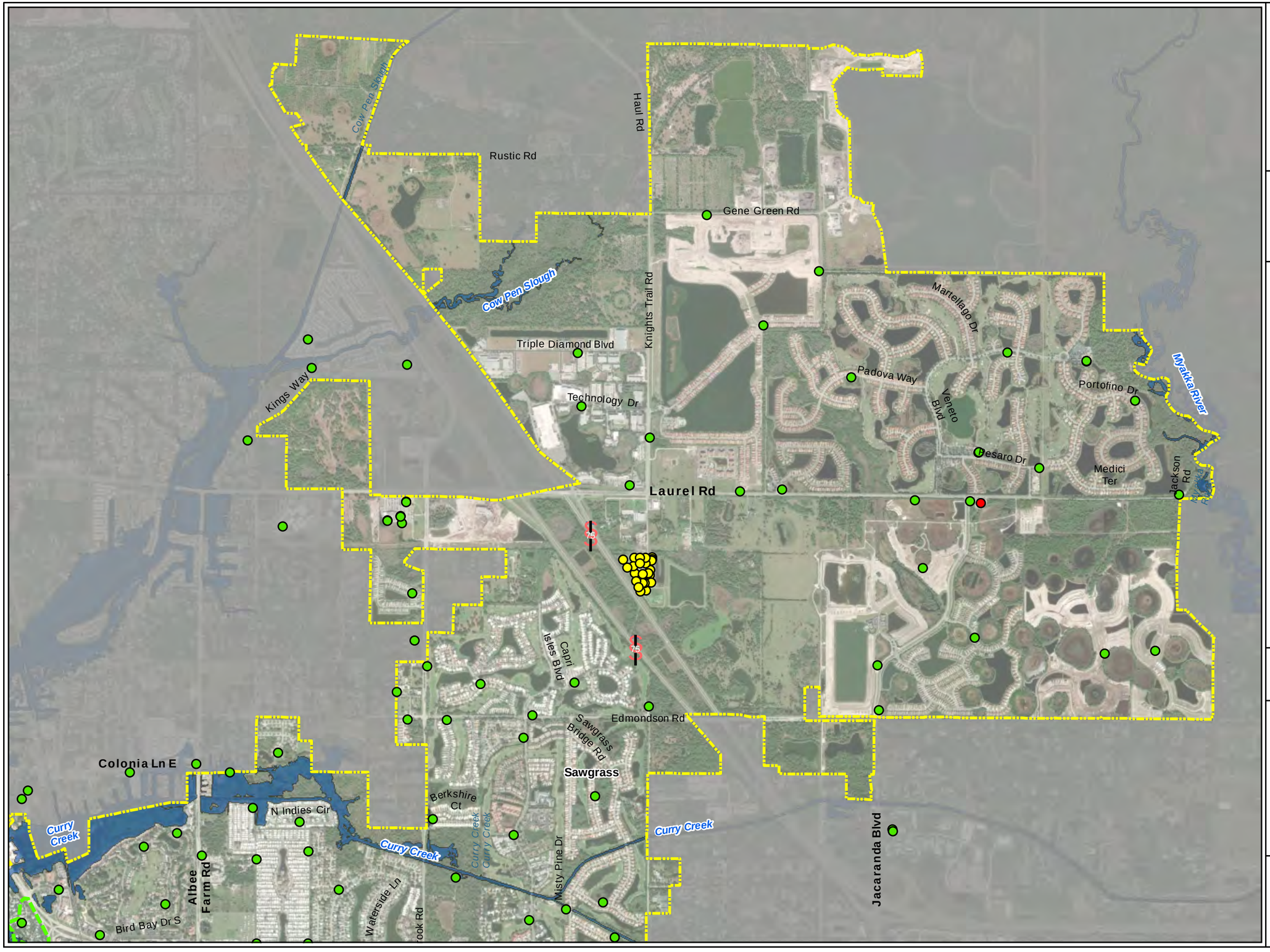



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# 3' OF SEA LEVEL RISE CRITICAL PUBLIC INFRASTRUCTURE AND HISTORIC AREAS WITHIN CITY LIMITS

## Legend

- Venice City Limits

**Critical Infrastructure**

- Building
- Utilities Buildings
- Utilities Infrastructure
- Runway/Parking

**Historic Areas/Buildings**

- Downtown Venice
- Eagle Point Historic District
- Edgewood Historic District
- John Nolen Plan of the City of Venice
- Historic Buildings

**Return Period**

- 3' of Sea Level Rise

0 2,500 5,000
FEET

N

SARASOTA COUNTY, FL

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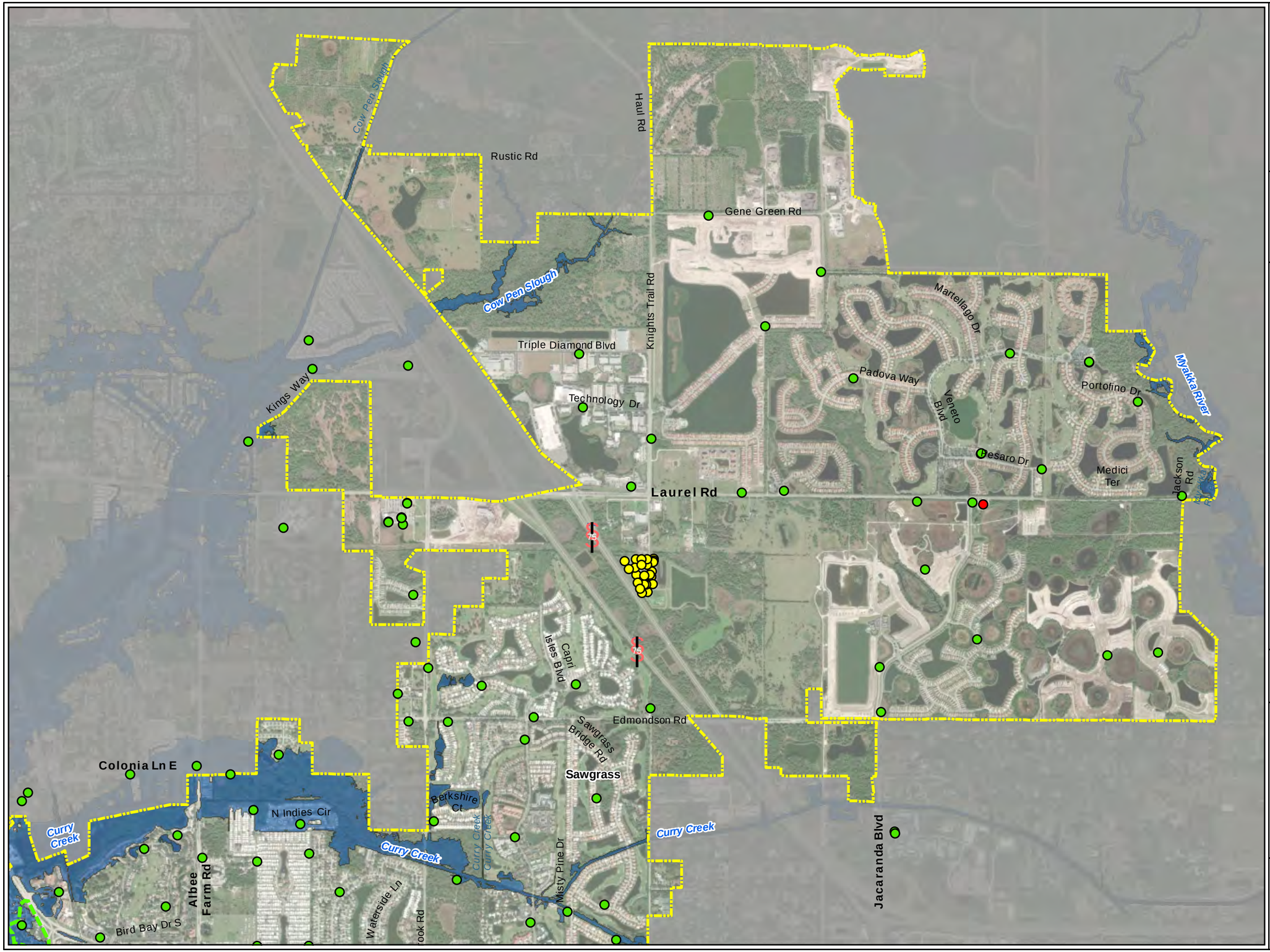



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**2% ANNUAL CHANCE SWEL CRITICAL PUBLIC INFRASTRUCTURE AND HISTORIC AREAS WITHIN CITY LIMITS**

***Legend***

- Venice City Limits

**Critical Infrastructure**

- Building
- Utilities Buildings
- Utilities Infrastructure
- Runway/Parking

**Historic Areas/Buildings**

- Downtown Venice
- Eagle Point Historic District
- Edgewood Historic District
- John Nolen Plan of the City of Venice
- Historic Buildings

**Return Period**

- 2% Annual Chance SWEL

0 2,500 5,000
FEET

N

SARASOTA COUNTY, FL

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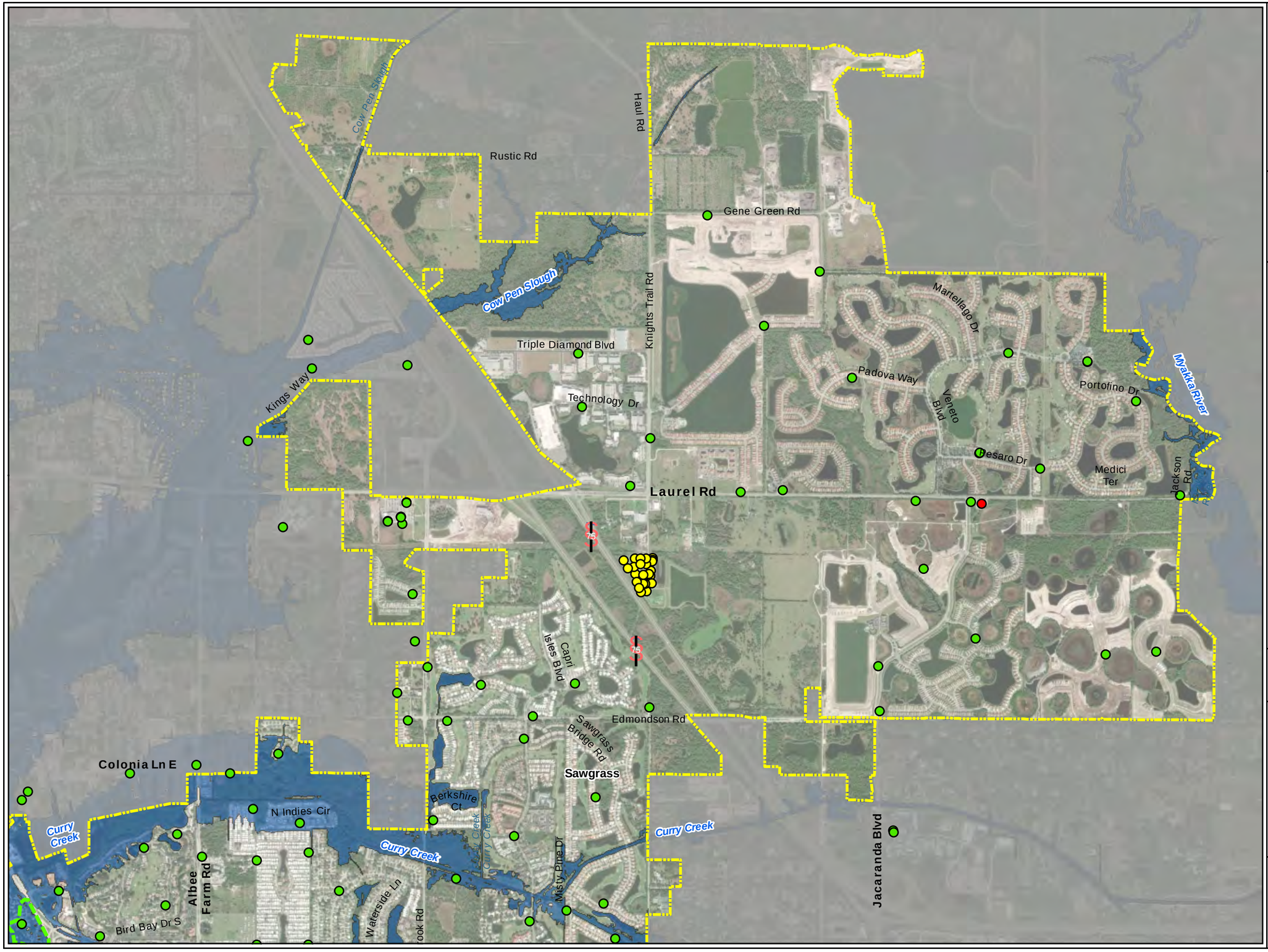



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# 2% ANNUAL CHANCE SWEL PLUS 1.5' OF SEA LEVEL RISE CRITICAL PUBLIC INFRASTRUCTURE AND HISTORIC AREAS WITHIN CITY LIMITS

## Legend

- Venice City Limits

**Critical Infrastructure**

- Building
- Utilities Buildings
- Utilities Infrastructure
- Runway/Parking

**Historic Areas/Buildings**

- Downtown Venice
- Eagle Point Historic District
- Edgewood Historic District
- John Nolen Plan of the City of Venice
- Historic Buildings

**Return Period**

- 2% Annual Chance SWEL plus 1.5' SLR

0 2,500 5,000
FEET

N

SARASOTA COUNTY, FL

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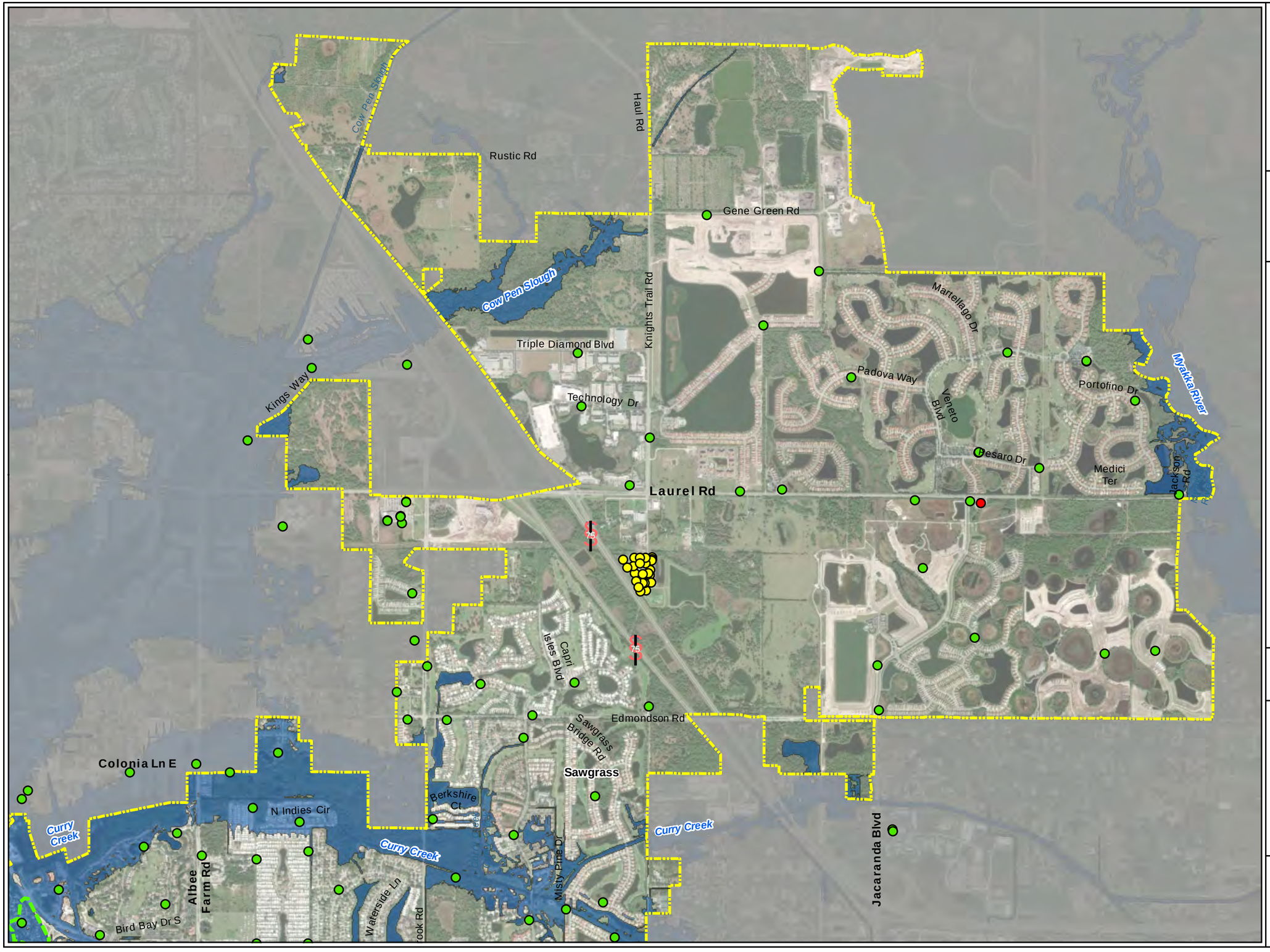



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# 2% ANNUAL CHANCE SWEL PLUS 3' OF SEA LEVEL RISE CRITICAL PUBLIC INFRASTRUCTURE AND HISTORIC AREAS WITHIN CITY LIMITS

***Legend***

- Venice City Limits

**Critical Infrastructure**

- Building
- Utilities Buildings
- Utilities Infrastructure
- Runway/Parking

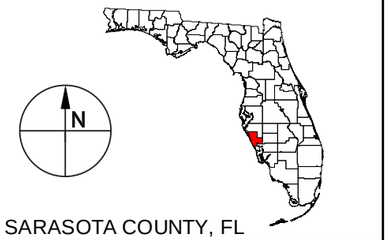
**Historic Areas/Buildings**

- Downtown Venice
- Eagle Point Historic District
- Edgewood Historic District
- John Nolen Plan of the City of Venice
- Historic Buildings

**Return Period**

- 2% Annual Chance SWEL plus 3' SLR

0 2,500 5,000
FEET




SARASOTA COUNTY, FL

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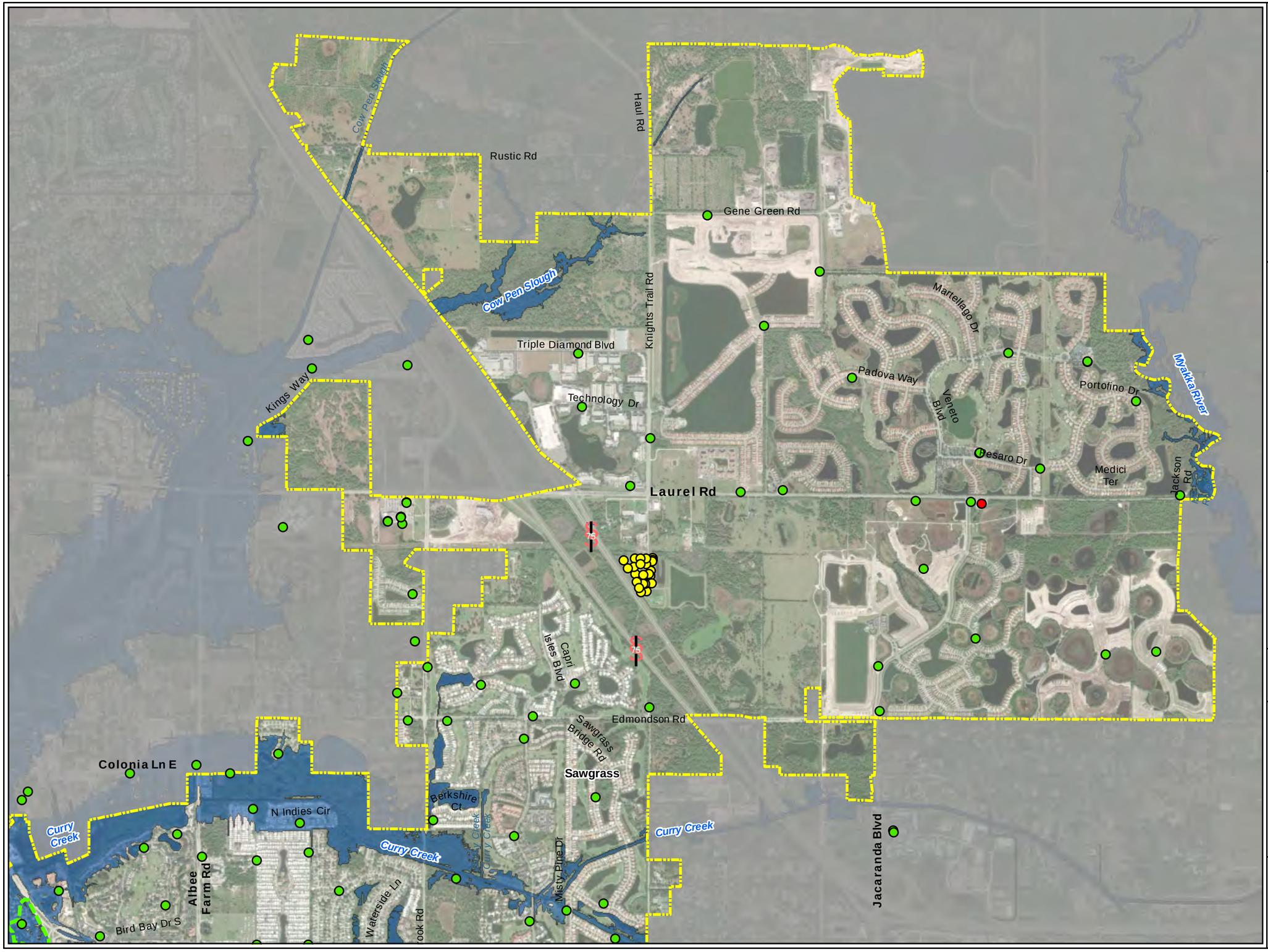



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# 1% ANNUAL CHANCE SWEL CRITICAL PUBLIC INFRASTRUCTURE AND HISTORIC AREAS WITHIN CITY LIMITS

## Legend

- Venice City Limits

**Critical Infrastructure**

- Building
- Utilities Buildings
- Utilities Infrastructure
- Runway/Parking

**Historic Areas/Buildings**

- Downtown Venice
- Eagle Point Historic District
- Edgewood Historic District
- John Nolen Plan of the City of Venice
- Historic Buildings

**Return Period**

- 1% Annual Chance SWEL

0 2,500 5,000
FEET

N

SARASOTA COUNTY, FL

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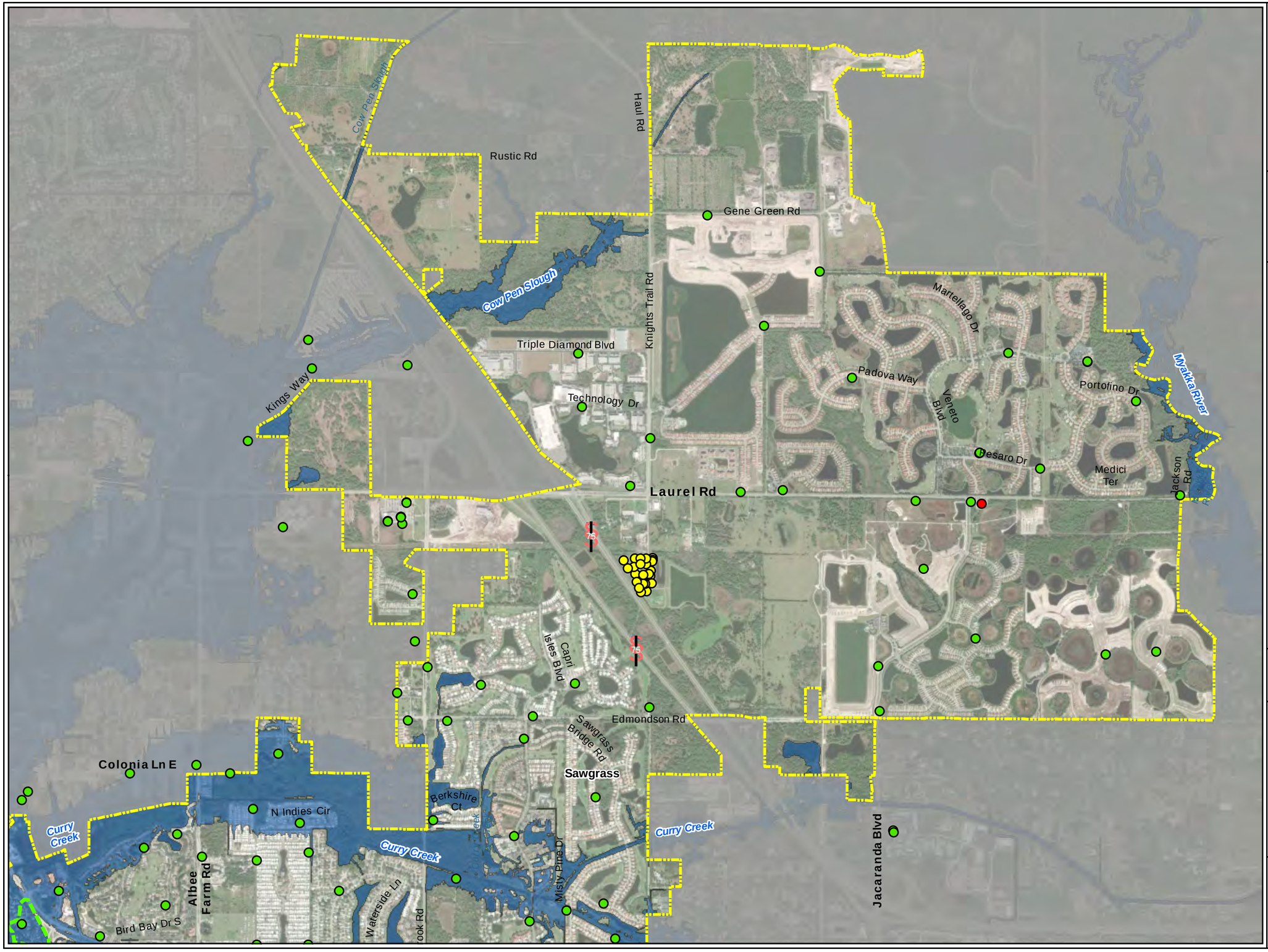


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# 1% ANNUAL CHANCE SWEL PLUS 1.5' OF SEA LEVEL RISE CRITICAL PUBLIC INFRASTRUCTURE AND HISTORIC AREAS WITHIN CITY LIMITS

## *Legend*

- Venice City Limits

**Critical Infrastructure**

- Building
- Utilities Buildings
- Utilities Infrastructure
- Runway/Parking

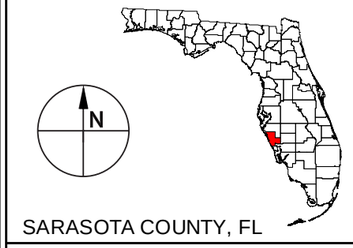
**Historic Areas/Buildings**

- Downtown Venice
- Eagle Point Historic District
- Edgewood Historic District
- John Nolen Plan of the City of Venice
- Historic Buildings

**Return Period**

- 1% Annual Chance SWEL plus 1.5' SLR

0 2,500 5,000
FEET

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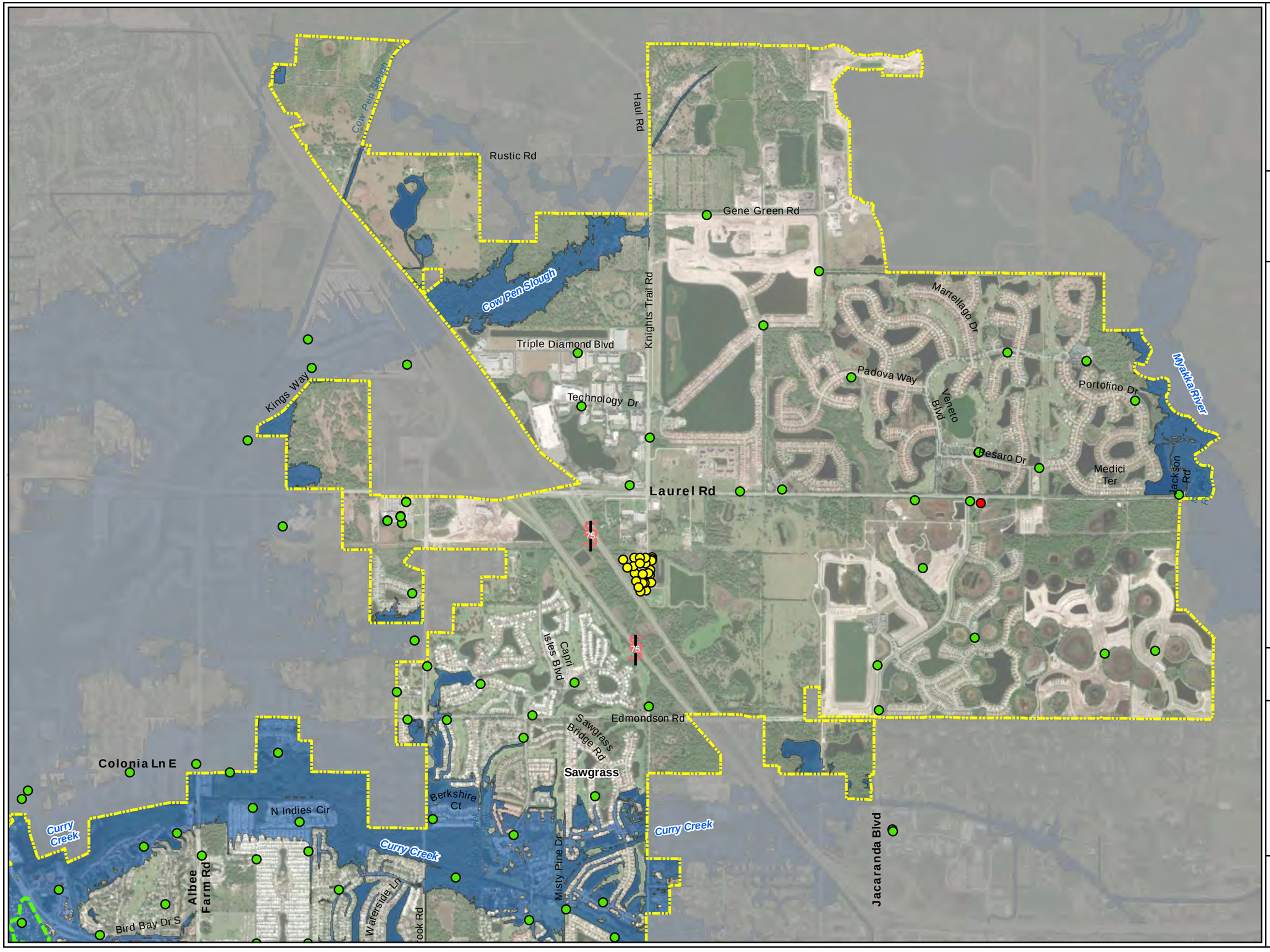



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# 1% ANNUAL CHANCE SWEL PLUS 3' OF SEA LEVEL RISE CRITICAL PUBLIC INFRASTRUCTURE AND HISTORIC AREAS WITHIN CITY LIMITS

## *Legend*

- Venice City Limits

**Critical Infrastructure**

- Building
- Utilities Buildings
- Utilities Infrastructure
- Runway/Parking

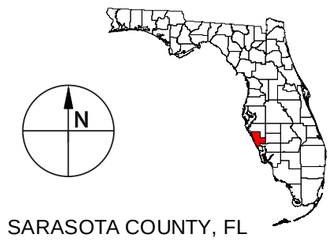
**Historic Areas/Buildings**

- Downtown Venice
- Eagle Point Historic District
- Edgewood Historic District
- John Nolen Plan of the City of Venice
- Historic Buildings

**Return Period**

- 1% Annual Chance SWEL plus 3' SLR

0 2,500 5,000
FEET




SARASOTA COUNTY, FL

Disclaimer: This figure is not intended to show the exact location of flooding and does not account for all variables affecting future flooding such as ground water impacts, changing precipitation patterns, future construction, or erosion. As such, actual future flooding may differ from this graphic. This graphic should be used strictly as a planning reference tool and not for navigation, permitting, insurance rating, or other legal or regulatory purposes.

**APPENDIX B**
**Summary of Local and Regional Planning Documents Reviewed**

| Document Title | Study Area | Date | URL |
|---|---|---|---|
| A Watershed Analysis of Permitted Coastal Wetland Impacts and Mitigation Methods within the Charlotte Harbor National Estuary Program Study Area | Charlotte Harbor National Estuary Program | 2011 | https://chnep.wateratlas.usf.edu/upload/documents/A_Watershed_Analysis_of_Permitted_Coasta.pdf |
| City of Cape Coral Climate Change Resiliency Strategy | City of Cape Coral | 2017 | https://www.swfrpc.org/wp-content/uploads/Projects/Ecosystem_Services/Cape_Coral_Climate_Change_Resiliency_Strategy_CCCCRS_20170630.pdf |
| Cape Coral Climate Change Vulnerability Assessment | City of Cape Coral | 2016 | https://www.swfrpc.org/wp-content/uploads/Projects/Ecosystem_Services/Cape_Coral_Climate_Change_Vulnerability_Assessment.pdf |
| City of Punta Gorda Adaptation Plan Update | City of Punta Gorda | 2019 | http://publicfiles.dep.state.fl.us/CAMA/Vulnerability-Assessments/R1814%20-%20City%20of%20Punta%20Gorda%20Climate%20Adaptation%20Plan%20Update%20and%20Living%20Shoreline%20Element.pdf |
| City of Sarasota Climate Adaptation Plan | City of Sarasota | 2017 | https://www.sarasotafl.gov/home/showpublisheddocument/6831/637394788346600000 |
| Integrated Sustainability Action Plan (ISAP): Technical Report & Appendices | City of St. Petersburg | 2019 | https://www.stpete.org/sustainability/integrated_sustainability_action_plan.php |
| Sea Level Rise Vulnerability Assessment for the City of Tampa | City of Tampa | 2015 | http://www.planhillsborough.org/wp-content/uploads/2017/01/Sea-Level-Rise-Vulnerability-Assessment-for-the-City-of-Tampa-rev5.pdf |
| City of Venice Water Supply Master Plan - Phase 2 | City of Venice | 2013 | https://www.venicegov.com/home/showdocument?id=1996 |
| City of Venice Floodplain Management Plan | City of Venice | 2020 | https://www.venicegov.com/home/showdocument?id=6973 |

| Document Title | Study Area | Date | URL |
|---|---|---|---|
| City of Venice Comprehensive Plan | City of Venice | 2017 | https://www.venicegov.com/home/showdocument?id=2342 |
| City of Venice Stormwater Management Plan | City of Venice | 1994 | https://apps.venicegov.com/covdata/coveng/Stormwater%20Management%20Plan%201994.pdf |
| City of Venice Stormwater Management Plan RESOLUTION NO. 2020-37 | City of Venice | 2020 | https://venice.legistar.com/LegislationDetail.aspx?ID=4661274&GUID=4DA221B4-5092-4D21-93B9-B09E5AD01216&Options=&Search= |
| Collier County Floodplain Management Plan | Collier County | 2015 | https://www.colliercountyfl.gov/home/showpublisheddocument/58898/635883137282070000 |
| Collier County Flood Risk Assessment | Collier County | 2014 | https://www.colliercountyfl.gov/home/showdocument?id=55885 |
| Lee County Climate Change Vulnerability Assessment | Lee County | 2011 | https://www.swfrpc.org/wp-content/uploads/Projects/Ecosystem_Services/Lee_County_Climate_Change_Vulnerability_Assessment.pdf |
| Lee County Climate Change Resiliency Strategy (CCRS) | Lee County | 2010 | https://www.swfrpc.org/wp-content/uploads/Projects/Ecosystem_Services/Lee_County_Climate_Change_Resiliency_Strategy.pdf |
| FDEP Work Plan City of Long Boat Key | Long Boat Key | 2018 | http://publicfiles.dep.state.fl.us/CAMA/FRCP/FY19-20-R1920-LongboatKey-WorkPlan.pdf |
| The Pelican Cove Community Climate Change Adaptation Plan and Vulnerability Assessment | Pelican Cove Community | 2017 | https://www.swfrpc.org/pelican-cove-climate-change-adaptation-plan/ |

| Document Title | Study Area | Date | URL |
|---|---|---|---|
| An Assessment of Coastal Vulnerability Due to Sea-level Rise and Increased Storminess, Sanibel and Captiva Islands, Florida | Sanibel, Captiva Islands | 2019 | http://publicfiles.dep.state.fl.us/CAMA/Vulnerability-Assessments/R1820%20-%20Florida%20Gulf%20Coast%20University%20-%20An%20Assessment%20of%20Coastal%20Vulnerability.pdf |
| Sarasota / Manatee Long Range Transportation Plan | Sarasota and Manatee County | 2020 | https://www.mympo.org/m/mandates/lrtp |
| Sarasota Bay Estuary Program Climate Vulnerability Assessment | Sarasota Bay | 2017 | http://chnep.wateratlas.usf.edu/upload/documents/SBEP-Sea-Level-Rise-Brochure-2014.pdf |
| Sarasota County Sea Level Rise Working Group | Sarasota County | 2021 | Not available online as of May 2021 |
| Sarasota County Vulnerability Assessment | Sarasota County | 2017 | https://sarasota.wateratlas.usf.edu/upload/documents/SAR-SLR-Vulnerability-Assessment-2017.pdf |
| Development of an Improved Model Watershed-scale Master Wetland Mitigation Strategy for Restoration, Protection and Public Projects for Local Governments | Southwest Florida | 2018 | https://www.swfrpc.org/wp-content/uploads/Projects/Ecosystem_Services/Master-Mititgation-Plan-Final-20181231.pdf |
| Climate Change Vulnerability Assessment and Adaptation Opportunities for Salt Marsh Types in Southwest Florida | Southwest Florida Salt Marshes | 2012 | https://www.epa.gov/arc-x/southwest-florida-assesses-salt-marsh-vulnerability-sea-level-rise |
| St. Pete Beach Sustainability Action Plan 2020 -2050 Presentation | St. Pete Beach | 2020 | https://www.stpetebeach.org/DocumentCenter/View/879/Coastal-Resiliency-Review-PDF?bidId= |
| FDEP Grant Work Plan City of St. Pete Beach | St. Pete Beach | 2019 | http://publicfiles.dep.state.fl.us/CAMA/FRCP/FY19-20-R1927-St.PeteBeach-WorkPlan-CO1.pdf |

| Document Title | Study Area | Date | URL |
|---|---|---|---|
| St. Pete Beach Sea Level Rise Adaptation Plan for Don Cesar Neighborhood Presentation | St. Pete Beach | 2020 | https://www.stpetebeach.org/DocumentCenter/View/1437/Sea-Lvel-Risde-Adaptation-Plan-for-Don-CeSar-Neighborhood-PDF |
| Resilient Tampa Bay: Transportation Pilot Program Project | Tampa Bay | 2020 | http://www.planhillsborough.org/resilient-tampa-bay-transportation/ |
| Recommended Projections of Sea Level Rise in the Tampa Bay Region | Tampa Bay | 2019 | http://www.tbrpc.org/wp-content/uploads/2019/07/CSAP_SLR_Recommendation_2019_Final.pdf |
| Tampa Bay Regional Planning Council Regional Resiliency Report | Tampa Bay | 2019 | http://publicfiles.dep.state.fl.us/CAMA/FRCP/FY16-17-CM741-TBRPC-RegionalResiliencyReport.pdf |

**APPENDIX C**
**Summary of Potential Grant Opportunities**

| Grant Name | Website | Due Dates |
|---|---|---|
| **Florida Department of Environmental Protection (DEP) Grants** | | |
| Resilience Planning Grant (RPG) | https://floridadep.gov/rcp/florida-resilient-coastlines-program/content/frcp-resilience-grants | Currently closed.<br>Estimated grant opening August 2021. |
| Resilience Implementation Grants (RIG) | https://floridadep.gov/rcp/florida-resilient-coastlines-program/content/frcp-resilience-grants | Currently closed.<br>Estimated grant opening August 2021. |
| Protecting Florida Together Grants | https://protectingfloridatogether.gov/state-action/grants-submissions | Offers a variety of grant types.<br>Submission dates vary by grant. |
| State Agency and Water Management District Grant Program | https://floridadep.gov/rcp/fcmp/content/grants | Currently closed.<br>Estimated grant opening mid-2021. |
| **Federal Emergency Management Agency (FEMA) Grants** | | |
| Hazard Mitigation Grant Program (HMGP) | https://www.fema.gov/hazard-mitigation-grant-program | Applications due within 12 months of the date of the Presidential Major Disaster Declaration |
| Pre-Disaster Mitigation (PDM) | https://www.fema.gov/pre-disaster-mitigation-grant-program | Currently Closed.<br>Estimated grant opening September 2021. |
| Flood Mitigation Assistance (FMA) | https://www.fema.gov/flood-mitigation-assistance-grant-program | Currently Closed.<br>Estimated grant opening September 2021. |
| Building Resilient Infrastructure and Communities (BRIC) | https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities/when-apply | Currently Closed.<br>Estimated grant opening September 2021. |
| **Florida Department of Economic Opportunity Community Development Block Grant - Mitigation (CDBG-MIT)** | | |
| Rebuild Florida Critical Facility Hardening Program | https://floridajobs.org/rebuildflorida/mitigation/rebuild-florida-critical-facility-hardening-program | Currently closed.<br>Estimated grant opening mid-2021. |
| Rebuild Florida General Planning Support Program | https://floridajobs.org/rebuildflorida/mitigation/rebuild-florida-general-planning-support-program | Currently closed.<br>Estimated grant opening mid-2021. |
| Rebuild Florida Mitigation General Infrastructure Program | https://floridajobs.org/rebuildflorida/mitigation/rebuild-florida-mitigation-general-infrastructure-program | Currently closed.<br>Estimated grant opening mid-2021. |
| **Miscellaneous Grants** | | |
| Florida Division of Historical Resources | https://dos.myflorida.com/historical/grants/ | Opens April 1, 2021.<br>Closes June 1, 2021. |
| National Fish and Wildlife Foundation (NFWF) National Coastal Resilience Fund | https://www.nfwf.org/programs/national-coastal-resilience-fund | Pre-proposal due date April 7, 2021.<br>Full proposal invitations mid-May 2021.<br>Full proposal by invite only due date June 23, 2021.<br>Closes June 1, 2021. |

**APPENDIX D**
**Recommended Comprehensive Plan Language**

## Recommended Changes to Venice's Comprehensive Plan

Objective is to create a more resilient Venice which anticipates the increased coastal flooding risk due to sea level rise and climate change. (additions are underlined, deletions are strike-throughs)

## *Coastal Management* (p37-38 of Comp Plan):

**Vision LU 3 - Coastal Management**
Coastal Management is an integral component of the City of Venice and the City's coastal areas are viewed as an asset within the community. Planning for the coastal areas provides the opportunity to coordinate development and redevelopment activities which may otherwise diminish these areas. The City desires to recognize the potential impacts of climate change and sea level rise and to improve resilience to their impacts by developing and implementing adaptation strategies and measures to protect human life, natural systems, property, and infrastructure while maintaining economic viability.

**Intent LU 3.2- Coastal Resilience Directives**
The City may develop and implement adaptation strategies for areas identified as vulnerable to coastal flooding, tidal events, storm surge, flash floods, stormwater runoff, salt water intrusion, and other impacts related to climate change or exacerbated by sea level rise, with the intent to increase the City's resilience.

**Strategy LU 3.2.1 – Coastal Resilience – Risk Identification**
The City should, through additional studies and periodically updated analyses, identify specific areas of the City vulnerable to coastal flooding, tidal events, storm surge, flash floods, stormwater runoff, salt water intrusion, and other impacts from seal level rise. Identification of high risk areas shall be included on a map or map series to be included in the Open Space Element of the Comprehensive Plan.

**Strategy LU 3.2.2 – Coastal Resilience – Adaptation Action Areas**
Adaptation strategy options may include the designation of Adaptation Action Areas (AAAs), as provided by Section 163.3164(1), Florida Statutes. The City will develop specific adaptation strategies for properties located in AAAs. Considerations for AAA designation may include, but not be limited to:

A. Areas which experience tidal flooding, or flooding due to extensive rainfall
B. Areas which have a hydrological connection to coastal waters
C. Locations which are within areas designated as evacuation zones for storm surge
D. Other areas impacted by stormwater/flood control issues

**Strategy LU 3.2.3 – Coastal Resilience – Adaptation Strategies**
Adaptation strategies to increase resilience to coastal flooding may include, but not be limited to:

A. Accommodation – alteration of existing structures to allow floodwaters to flow in or around vulnerable assets (e.g. elevated buildings and utilities, wet flood proofing, flood vents)
B. Protection – engineered structures (e.g. dunes, flood barriers, check valves) designed to keep flood waters away from critical infrastructure and vulnerable community assets
C. Managed relocation – moving or rebuilding a critical facility or community assets away from flood prone areas (e.g. relocation of a historic building or infrastructure, land acquisition)
D. Avoidance - guiding new development away from flood prone areas with policies and incentives (e.g. future land use, zoning, rolling easements, transfer of development rights)
E. Other strategies

**Strategy LU 3.24 – Coastal Resilience - Infrastructure**
The City shall identify public investments and infrastructure at risk to sea level rise and other climate related impacts, using the best available data and resources. Investment of public infrastructure within these areas shall include an assessment of the risk of climate change and coastal sea level rise and shall include mitigation strategies to minimize these risk.

**Strategy LU 3.2.5 – Coastal Resilience – Stormwater**
The City shall assess the elevation of the City's stormwater outfalls as part of a stormwater master plan review, with these elevations compared to future sea level rise scenarios, and appropriate adaptations implemented to prevent backflow "nuisance flooding."

**Strategy LU 3.2.6 – Coastal Resilience – Collaboration**
The City shall collaborate and coordinate with appropriate local, regional and state governmental agencies, to the extent possible, toward the implementation of AAA adaptation strategies.

**Strategy LU 3.2.7 – Coastal Resilience – Future Strategies**
The City shall pursue the best available data on climate change and sea level rise to maximize resilience as coastal hazards evolve. The City shall utilize any identified new and best available data to allow for adjustment to new risks and vulnerabilities before they arise, taking advantage of new technologies and adaptation strategies.

## *Infrastructure* (p97 of Comp Plan):

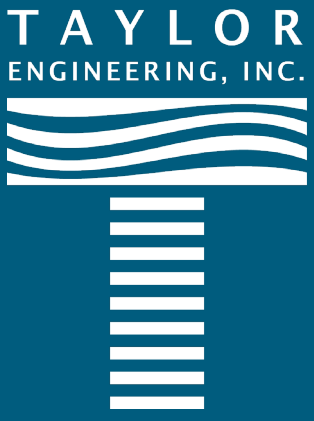
**Vision IN 1 - The City will provide public infrastructure services that meet the needs of the current and future populations, taking into consideration the fiscal and physical challenges of climate change and sea level rise.**

## *Capital Improvements*

**Vision IN 2 – To provide for the highly effective development, operation and maintenance of services and facilities, matching the City's needs with its financial and operational resources.**

**Intent IN 2.1 - Capital Improvements System**
The City shall utilize the Capital Improvements System for construction of public services, capital facilities, and infrastructure systems needed to:
1. Implement the Comprehensive Plan's planning framework
2. Accommodate the needs of current and future populations
3. Maintain and achieve adopted LOS standards
4. Meet existing service deficiencies by replacing obsolete or worn-out facilities
while acknowledging the current and future challenges due to climate change and sea level rise.

** The City of Venice previously satisfied the Peril of Flood requirements listed in Section 163.3178(2)(f), Florida Statutes, with specific language in Strategy OS 1.9.7 – Coastal Development Practices (p83 of Comp Plan). The recommendations in this document include additional language to address coastal resilience.*

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