Hazen

February 17th, 2026

TOWN OF JUPITER

Town-Wide Flood Vulnerability Assessment

TOWN OF JUPITER

This work was funded in part through a grant agreement from the Florida Department of Environmental Protection's (FDEP's) Office of Resilience and Coastal Protection Resilient Florida Program. The views, statements, findings, conclusions, and recommendations expressed herein are those of the author(s) and do not necessarily reflect the views of the State of Florida or any of its subagencies.

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Agenda

- Background
- Critical Asset Inventory
- Model Development
- Flood Scenario Summary
- Exposure Analysis
- Sensitivity Analysis
- Focus Areas
- Next Steps

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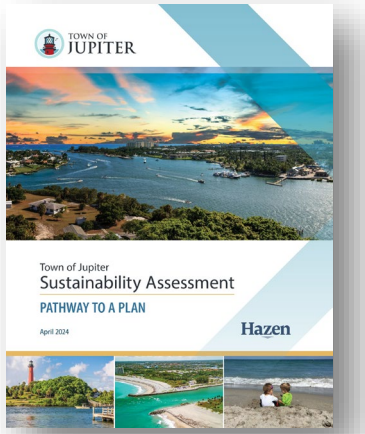
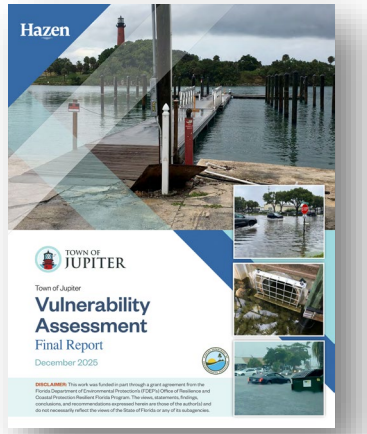
Background





Strategic Initiative

- Develop a sustainability plan document for the Town

Environmental Task Force

- Recommended completing a Vulnerability Assessment

Vulnerability Assessment

- Grant funded study through FDEP Resilient Florida Program

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Why This Is the Right Approach

- Florida faces worsening extreme weather and sea-level rise
- Jupiter's coastal location increases flood risk
- Evaluation of current and future flood scenarios supports proactive planning and long-term community resilience

Florida Statute 380.093 provides a framework and grant funding to help communities plan and invest in reducing flood risk

- Compliant study allows Jupiter to be eligible for grant funding
- Created stormwater model can be leveraged for future flood control projects

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Vulnerability Assessment Process

What is a Comprehensive Vulnerability Assessment?

A process of evaluating current and future flood risks including sea level rise and how this impacts the community's critical assets.

- Identify Town's Critical and Regionally Significant Assets
- Develop a Town-Wide Stormwater Model to simulate flooding across multiple scenarios
- Exposure Analysis: Identify extent of flooding across all scenarios
- Sensitivity Analysis: Measure impact of flooding on assets and assign risk scores
- Identify focus areas for mitigation and minimizing impacts

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Key Findings

The **highest risk scores** are concentrated in northern portions of Jupiter due to coastal proximity and low elevation reflecting the older development era

Of 587 **Critical Assets, 361 showed some flooding vulnerability** in at least one (1) model scenario indicating room for resilience improvements

More than **50% of roadway segments were at least 80% flooded** in one or more scenarios.

Emergency **potable water inter-connects** and wells critical to **water supply**, and some wastewater **lift stations** showed **high vulnerability, especially in low-lying areas**.

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Critical and Regionally Significant Assets

What is a Critical Asset?

Vital community elements and resources ranging from roadways and evacuation routes to culturally significant landmarks like Sawfish Bay. Also included are essential facilities, like fire stations, utility infrastructure, parks and beaches.

Total Asset Count
587

Critical Infrastructure
309

Transportation Assets and Evacuation Routes
122

Natural, Cultural, and Historical Resources
95

Critical Community and Emergency Facilities
61

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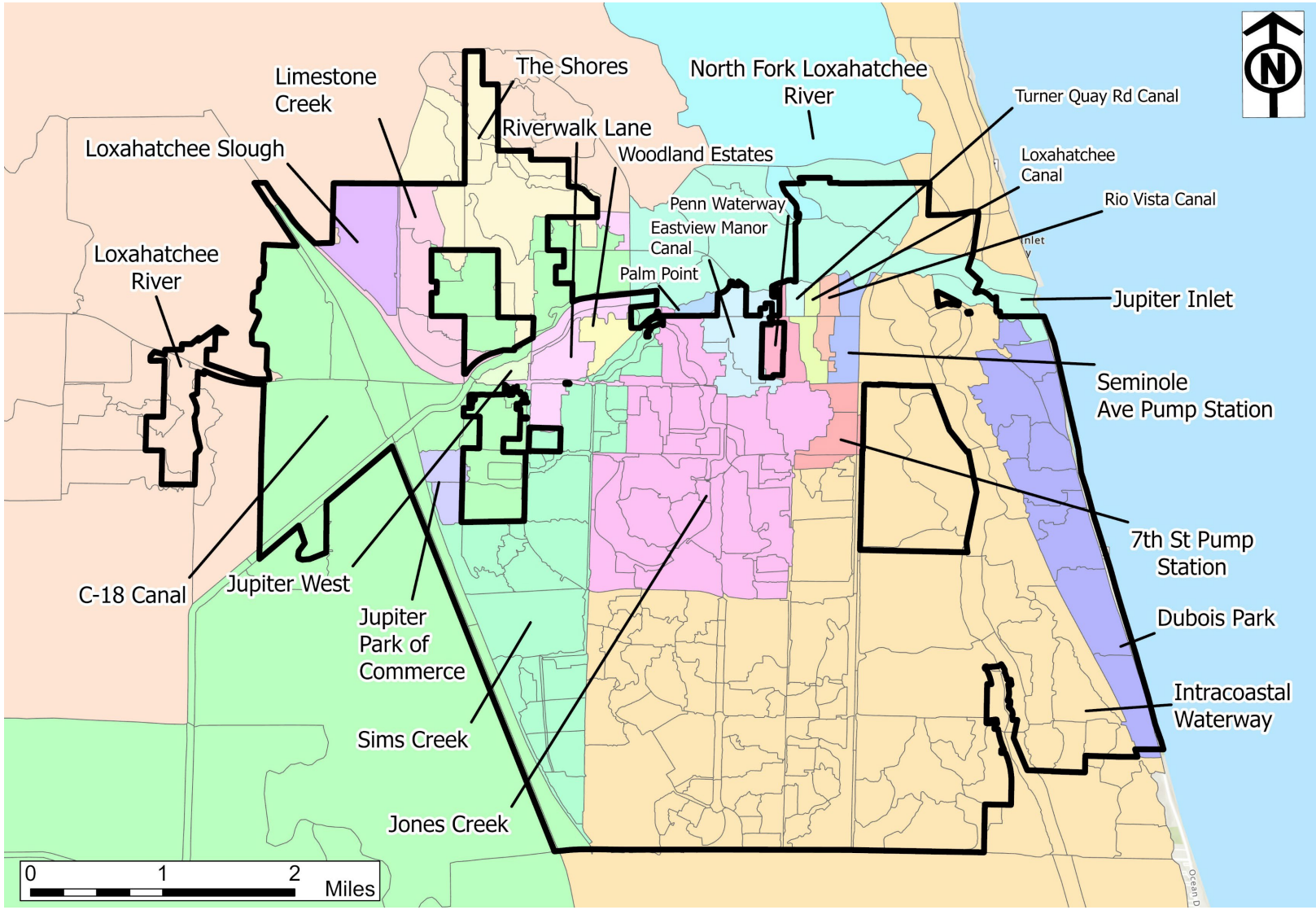
Model Development

- Sourced Data
  - Digital Elevation Models and Bathymetry
  - Land Cover/Land Use data
  - Soils data
- Incorporated the Town's existing stormwater infrastructure database

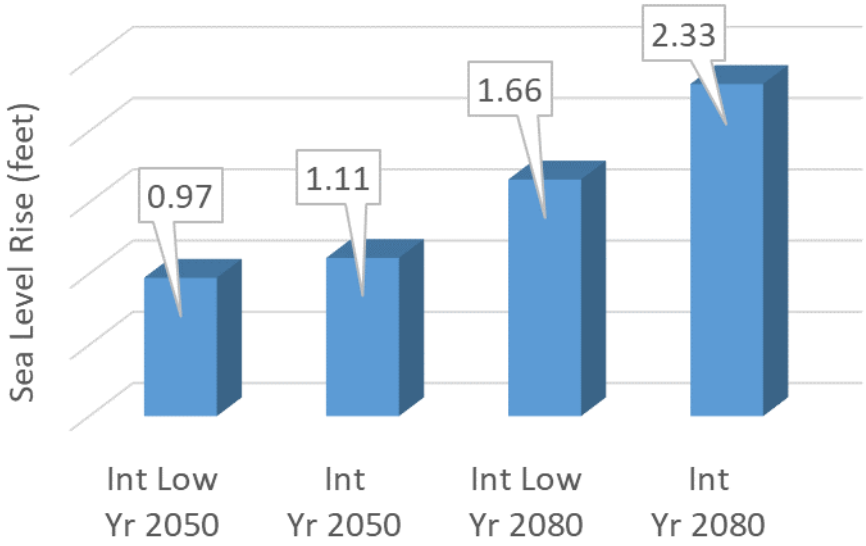


Flood Scenario Summary

31 Model Scenarios That Incorporate:

- **Rainfall** (SFWMD)
- **Tidal Conditions** (High Tide & Storm Surge)
- **Sea Level Rise** (NOAA)
- **Current and Future Planning Horizons**

10-yr, 24-hr (9.3”)	25-yr, 72-hr (13.5”)
100-yr, 72-hr (18.4”)	500-yr, 72-hr (25.4”)



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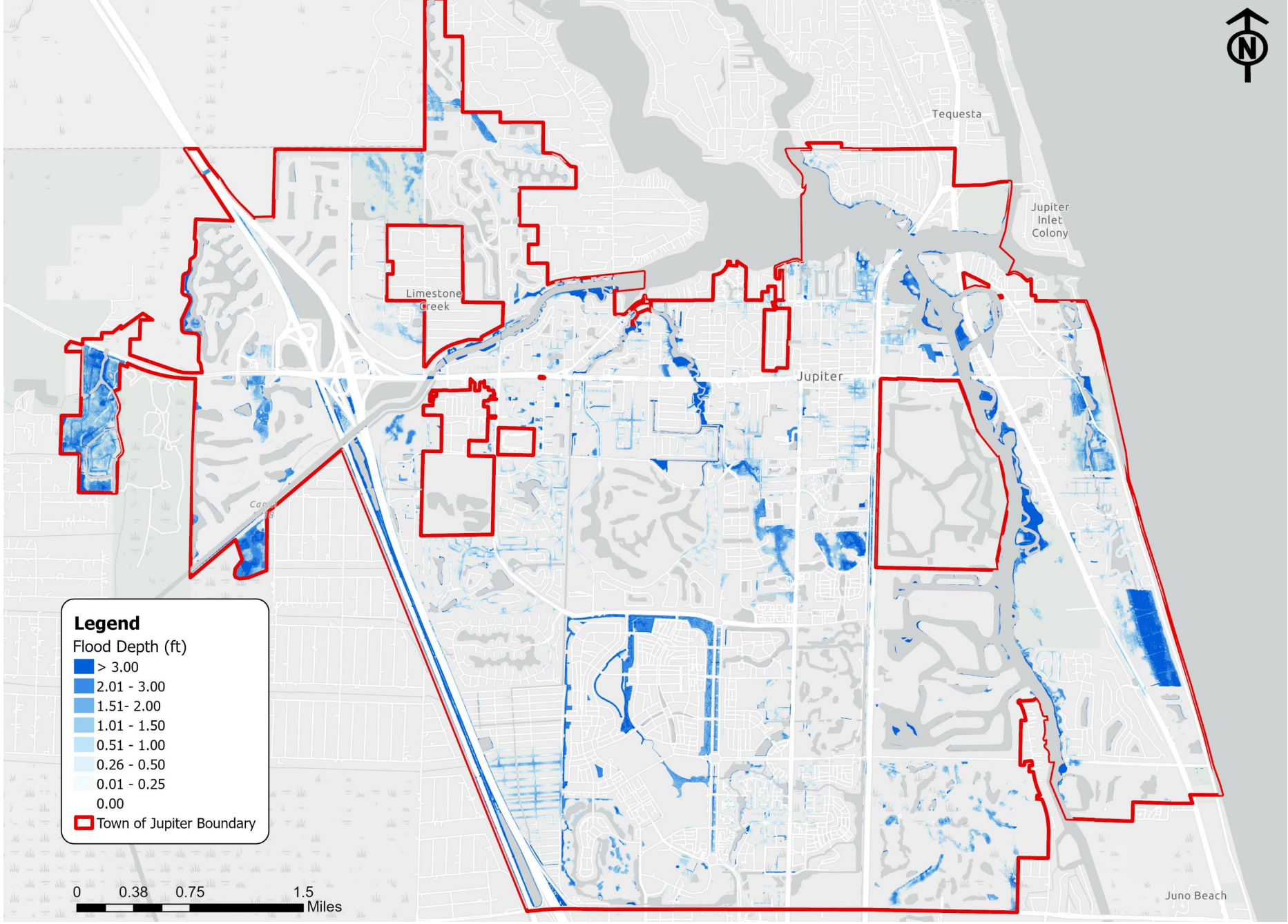
Scenario 1

10-yr Storm

2025 Planning Horizon

Normal High Tide



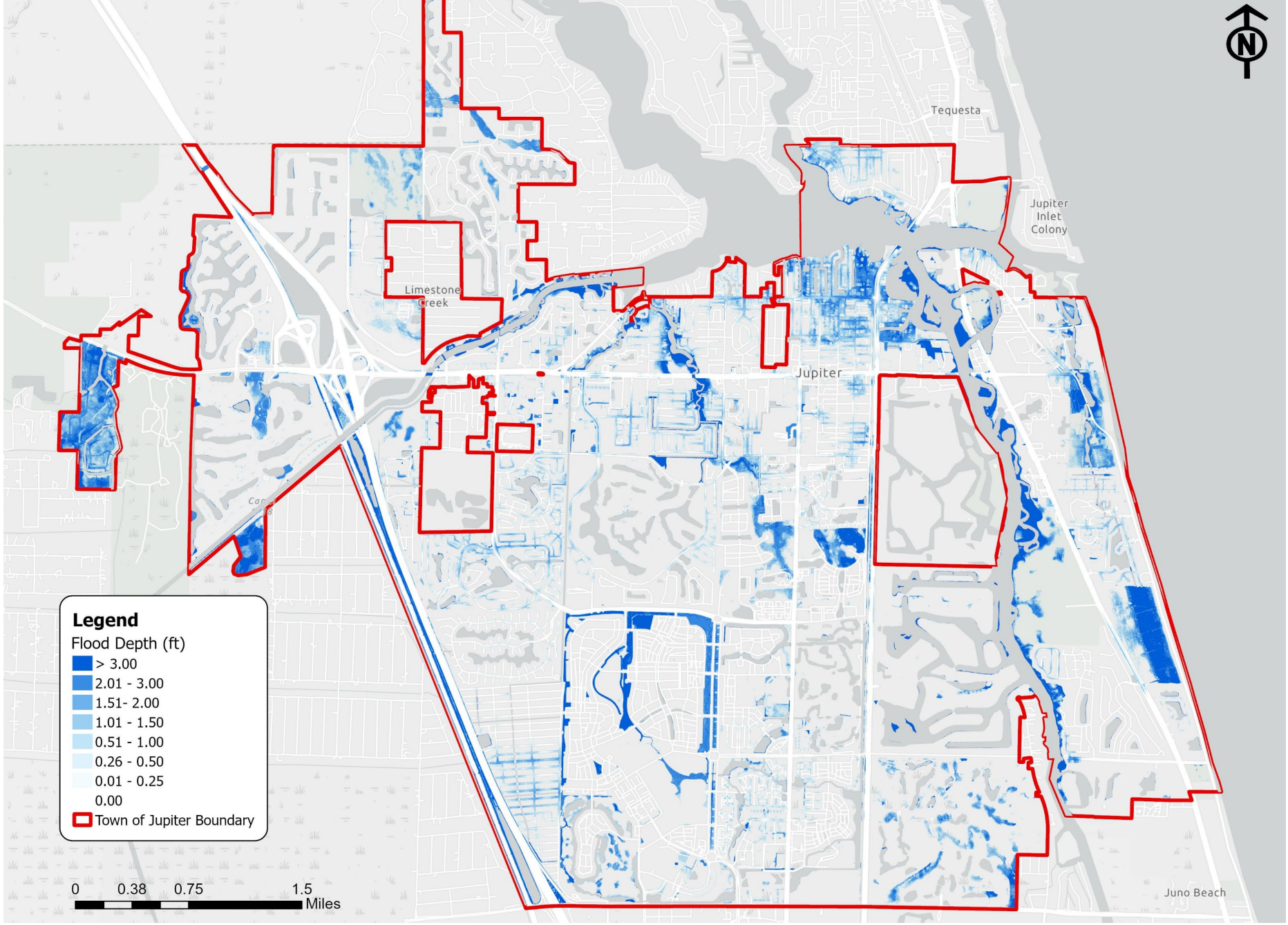
Scenario 13

10-yr Storm

NOAA Intermediate SLR Projection

2080 Planning Horizon

Normal High Tide



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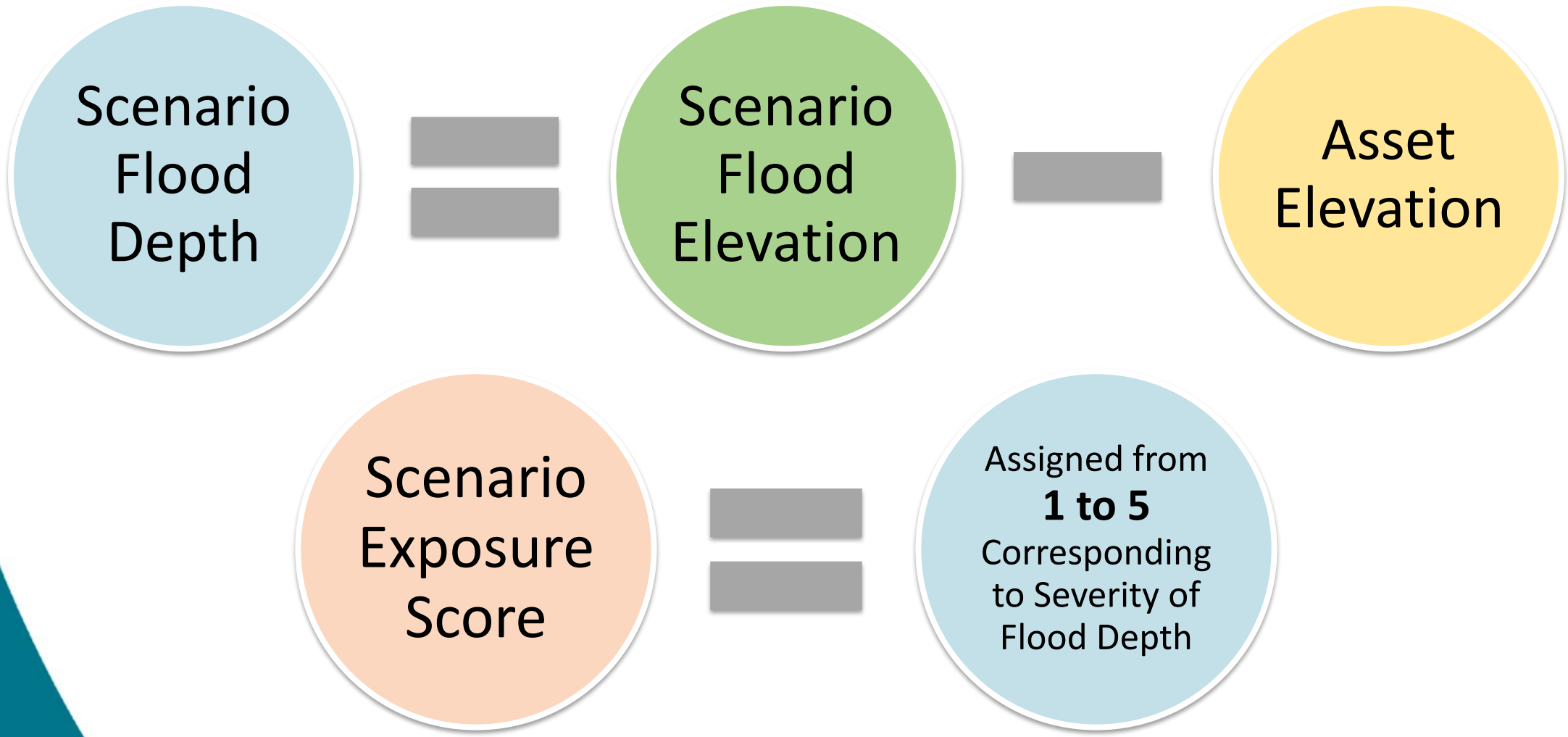
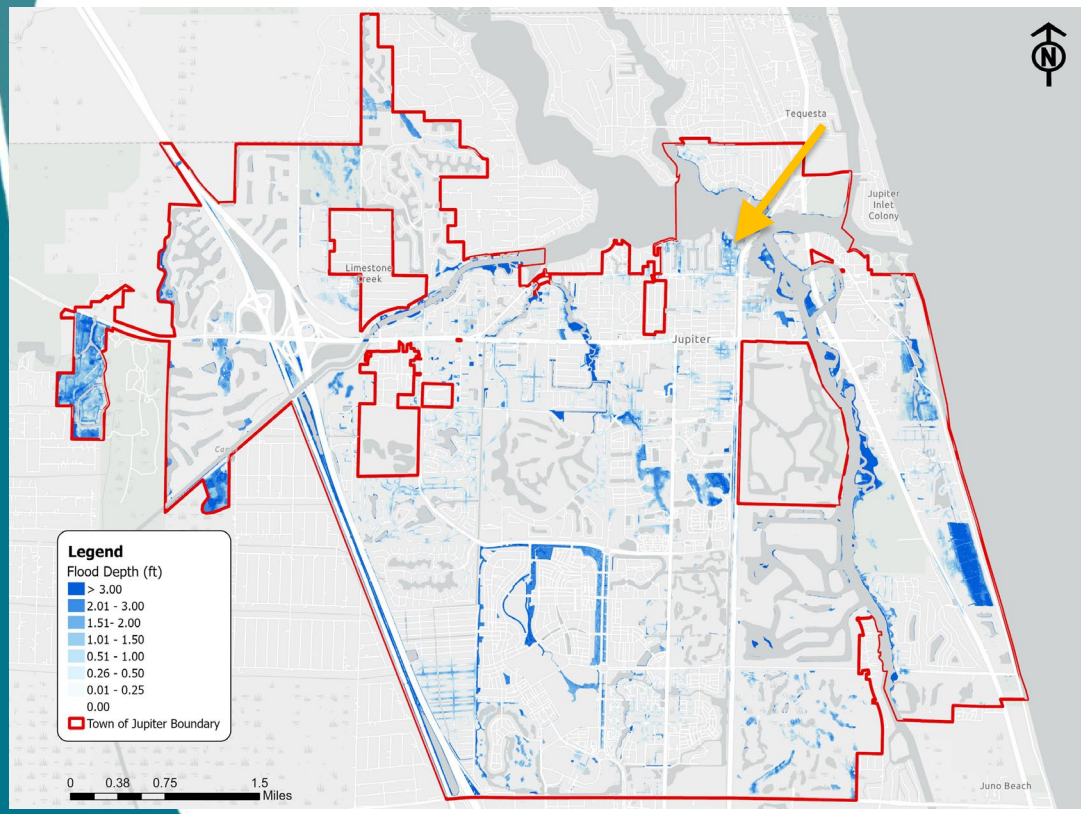
Exposure Analysis

Identify the depth of water for each flooding scenario and simulate flood vulnerabilities for each critical asset to produce a corresponding exposure score

Methodology



Exposure Analysis Example
Old Town Hall

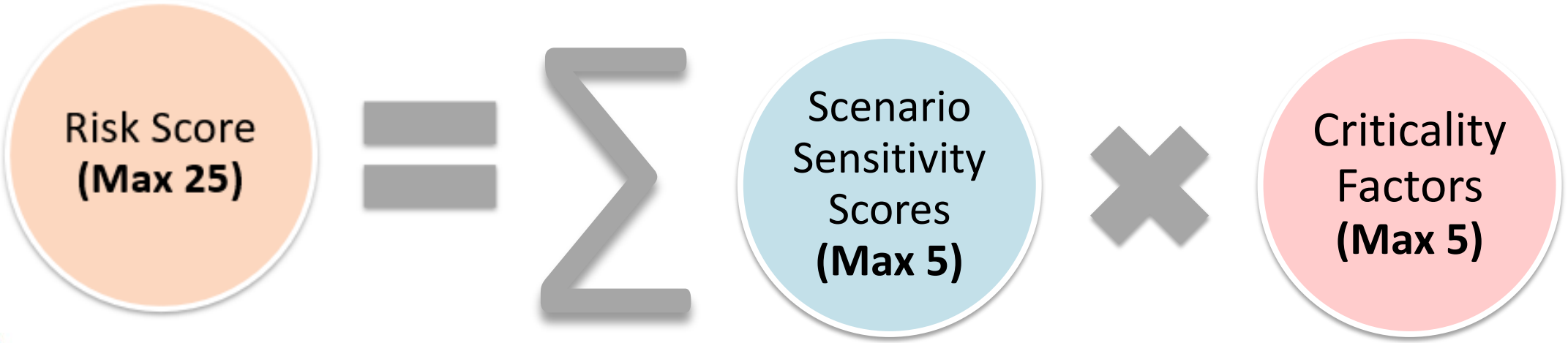


	Scenario Description	Flood Depth (ft)	Exposure Level	Exposure Score
Scenario 1	- Current Day - 10-yr Rainfall - No SLR - Normal High Tide	-0.3	Minimal (-0.5 to 0 ft)	1
Scenario 2	- Current Day - 25-yr Rainfall - No SLR - Normal High Tide	1	Medium (0.5 to 1 ft)	3
Scenario 3	- Current Day - 100-yr Rainfall - No SLR - Normal High Tide	2.2	Severe (>2 ft)	5
Scenario 4	- Year 2050 - 10-yr Rainfall - Int-Low SLR - Normal High Tide	0.2	Low (0 to 0.5 ft)	2
Scenario 5	- Year 2050 - 25-yr Rainfall - Int-Low SLR - Normal High Tide	1.5	High (1 to 2 ft)	4

Sensitivity Analysis

Measure the impact of flooding on assets considering the likelihood of the modelled scenario and criticality of the asset to produce a final risk score

Methodology



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Scenario Weighting Factor

Assigns a higher weight to flood scenarios with greater likelihood of occurrence

Scenario No.	Rainfall Event	Sea Level Rise	Planning Horizon	Tidal Condition	Overall Weight
1	10-year	N/A	2025 - Current	Normal High Tide	14%
2	25-year				9%
3	100-year				7%
4	10-year	2022 NOAA Intermediate Low			4%
5	25-year				3%
6	100-year				2%

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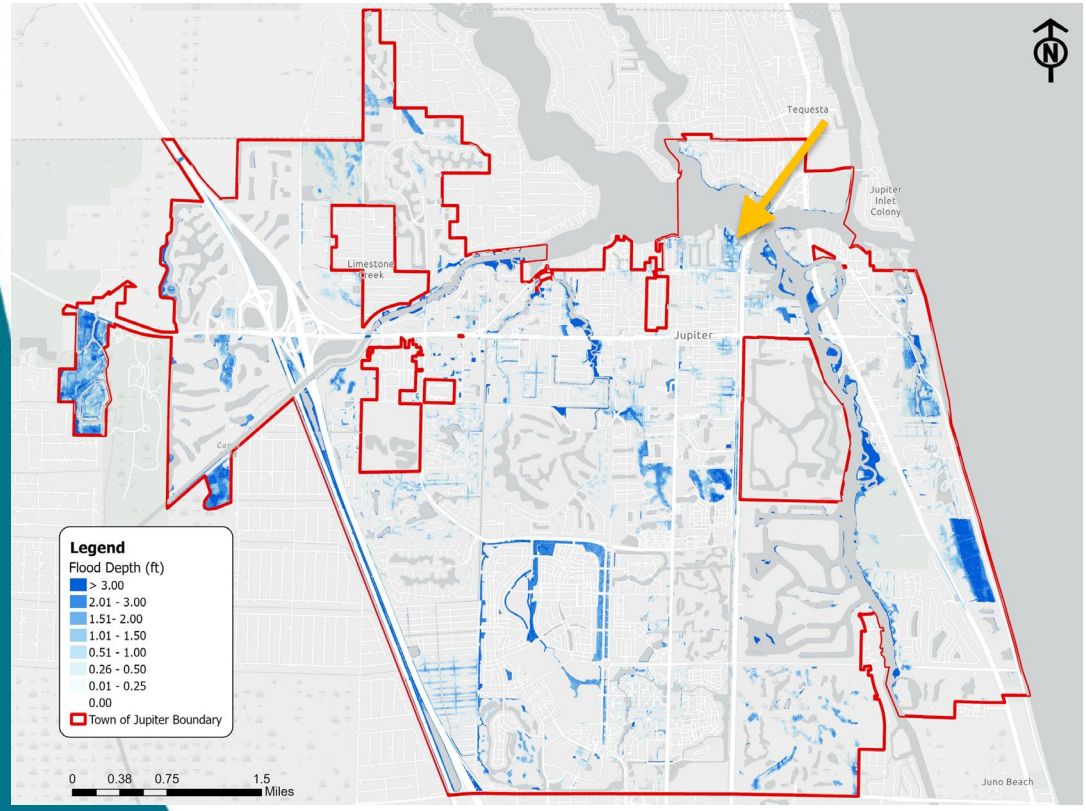
Sensitivity Analysis Example
Old Town Hall

Exposure Scores are adjusted for likelihood of each scenario



	Flood Depth (ft)	Exposure Score	Scenario Weight	Sensitivity Score
Scenario 1	-0.3	1	14%	0.14
Scenario 2	1	3	9%	0.27
Scenario 3	2.2	5	7%	0.35
Scenario 4	0.2	2	4%	0.08
Scenario 5	1.5	4	3%	0.12

Overall Sensitivity Score:
Sum of Scores Calculated for all 31 Scenarios

Old Town Hall = 3.7 out of 5.0

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Criticality Factors

Multipliers that adjust asset sensitivity scores based on:

- Critical Services to Town Residents
- Occupancy During a Storm
- Potential for Structural Damage
- Roadway Classification

Critical Infrastructure

Transportation Assets and Evacuation Routes

Critical Community and Emergency Facilities

Natural, Cultural, and Historical Resources

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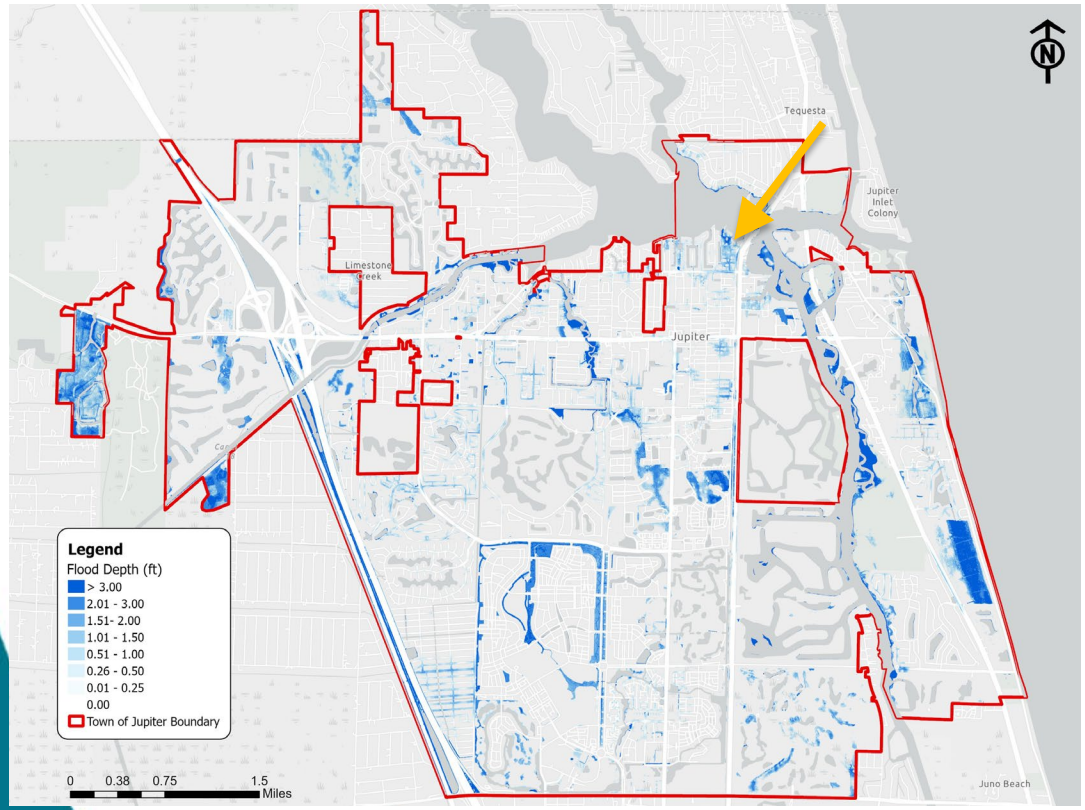
Final Risk Score
Old Town Hall

Sensitivity Scores are adjusted for Criticality Factors to produce a final Risk Score



Overall Sensitivity Score *x* Criticality Factor

3.74 *x* 2.20

- ✓ *Building does **not** support critical services*
- ✓ *Building **unlikely** to be occupied during a storm*
- ✓ ***High** likelihood for structural damage*

Final Risk Score
8.2 out of 25

Key Findings

The **highest risk scores** are concentrated in northern portions of Jupiter due to coastal proximity and low elevation reflecting the older development era

Of 587 **Critical Assets, 361 showed some flooding vulnerability** in at least one (1) model scenario indicating room for resilience improvements

More than **50% of roadway segments were at least 80% flooded** in one or more scenarios.

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Focus Areas

Geographic areas with critical assets having higher flood risk to focus adaptation planning

- 11 Focus Areas were identified based on:
  - Flood risk (Risk Scores > 5)
  - Density of critical assets
  - Community and economic importance
  - Historical vulnerability

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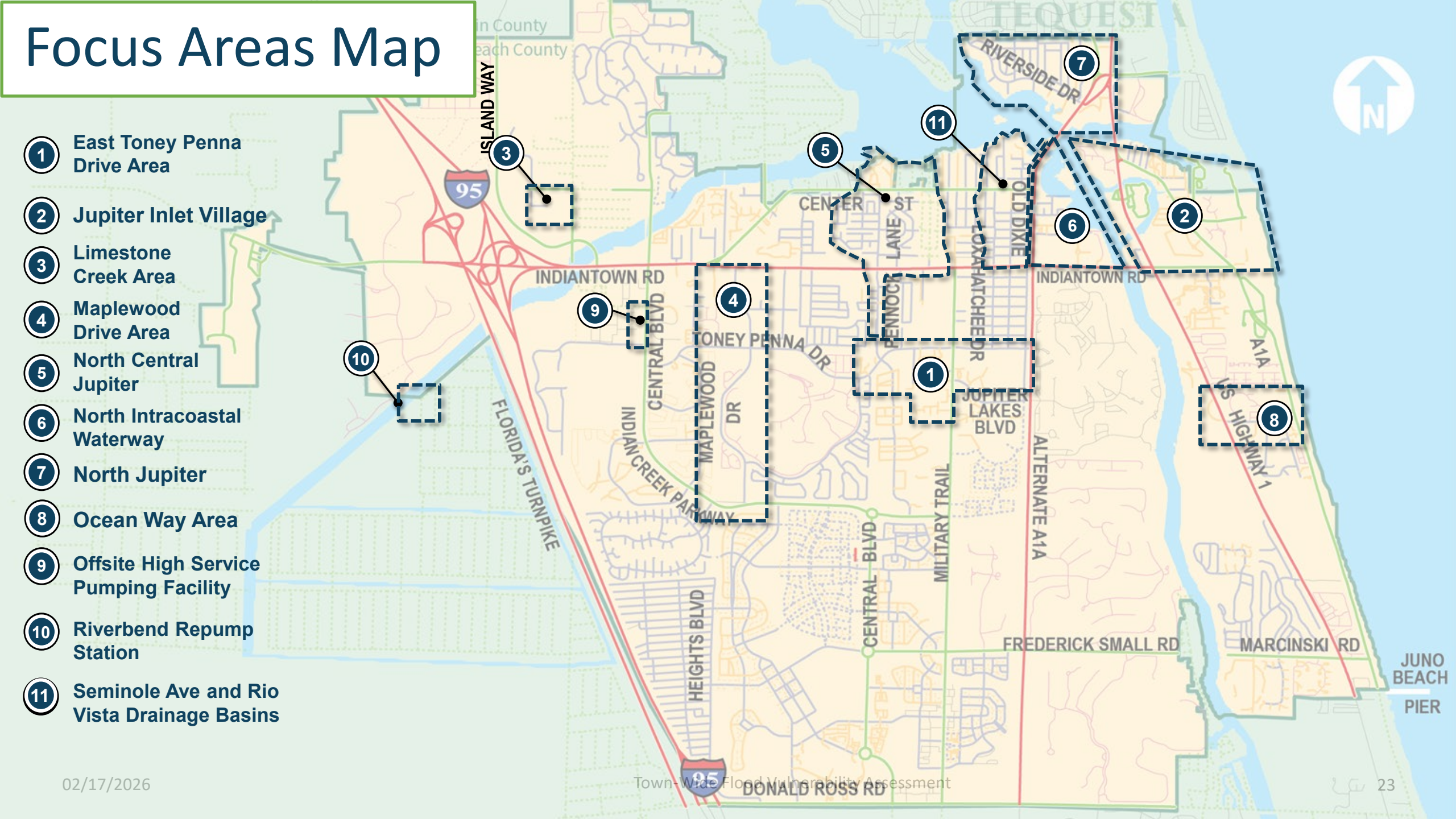
Focus Areas Map



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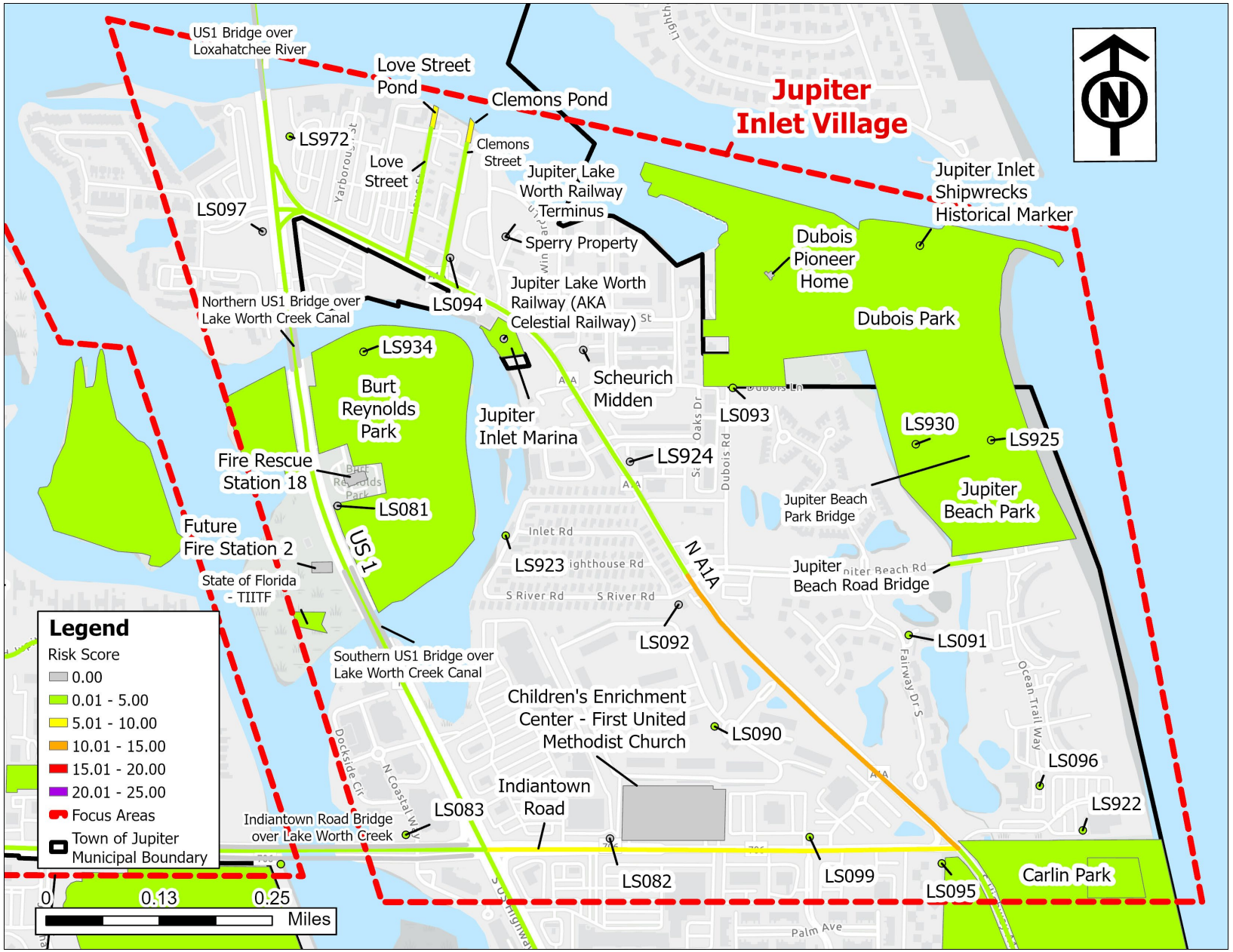
Jupiter Inlet Village Area

- Supports local economy
- Historically significant
- Opportunity for additional study



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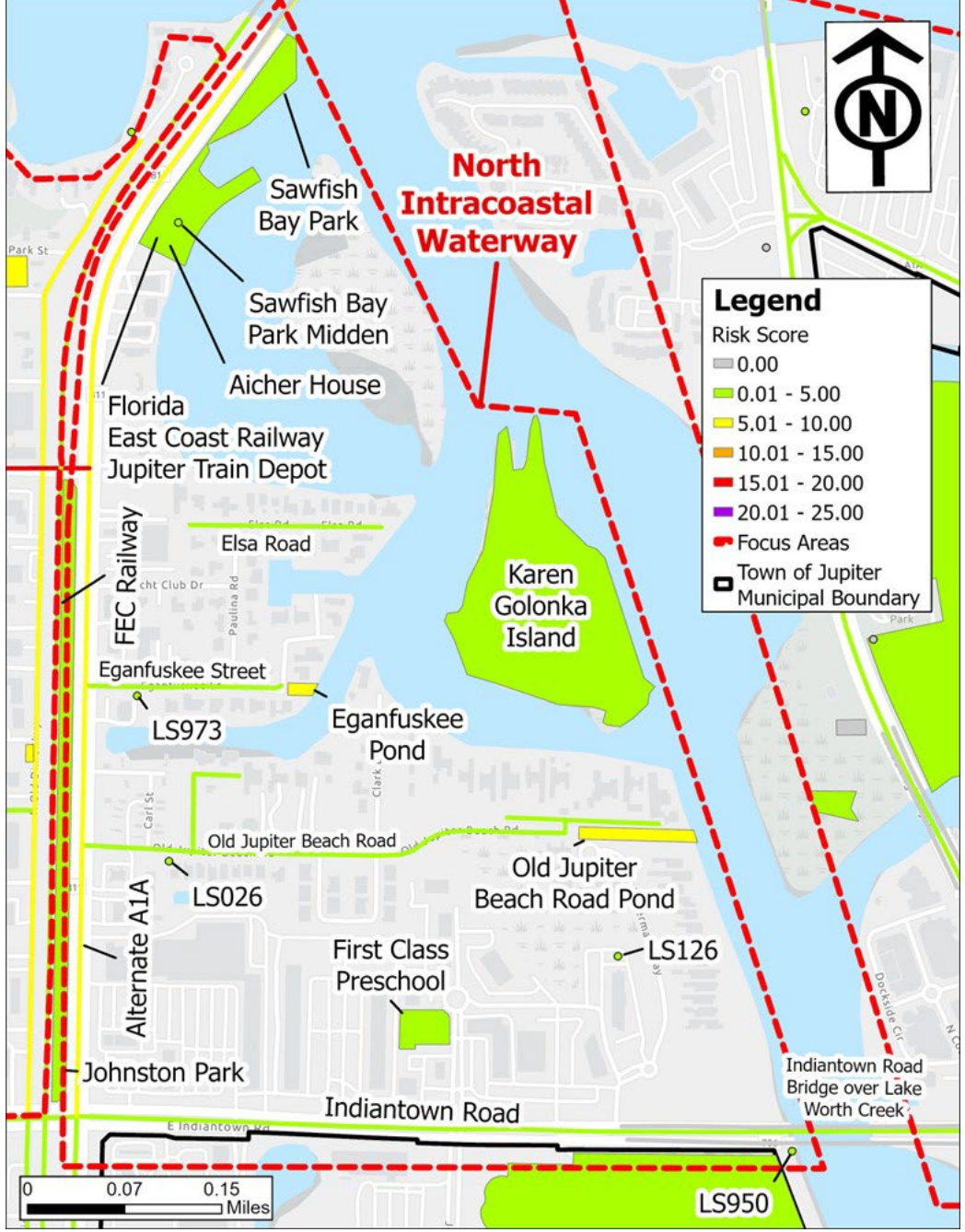
North Intracoastal Waterway

- Area previously identified at high risk for Sea Level Rise and Storm Surge
- Historically significant



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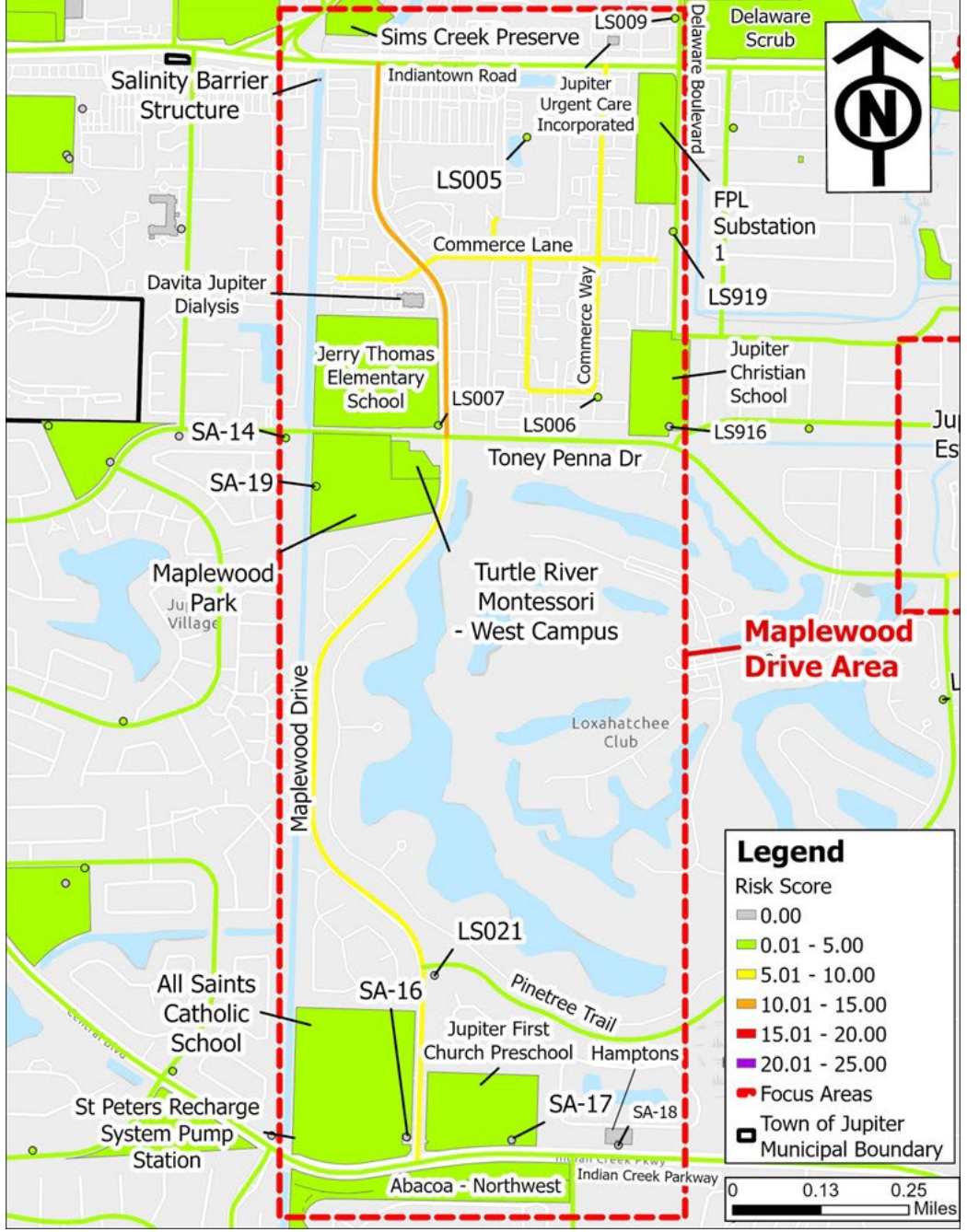
Maplewood Drive Area

- Major, Town-Owned Road
- Vital for transport to school and home
- Opportunity for additional study



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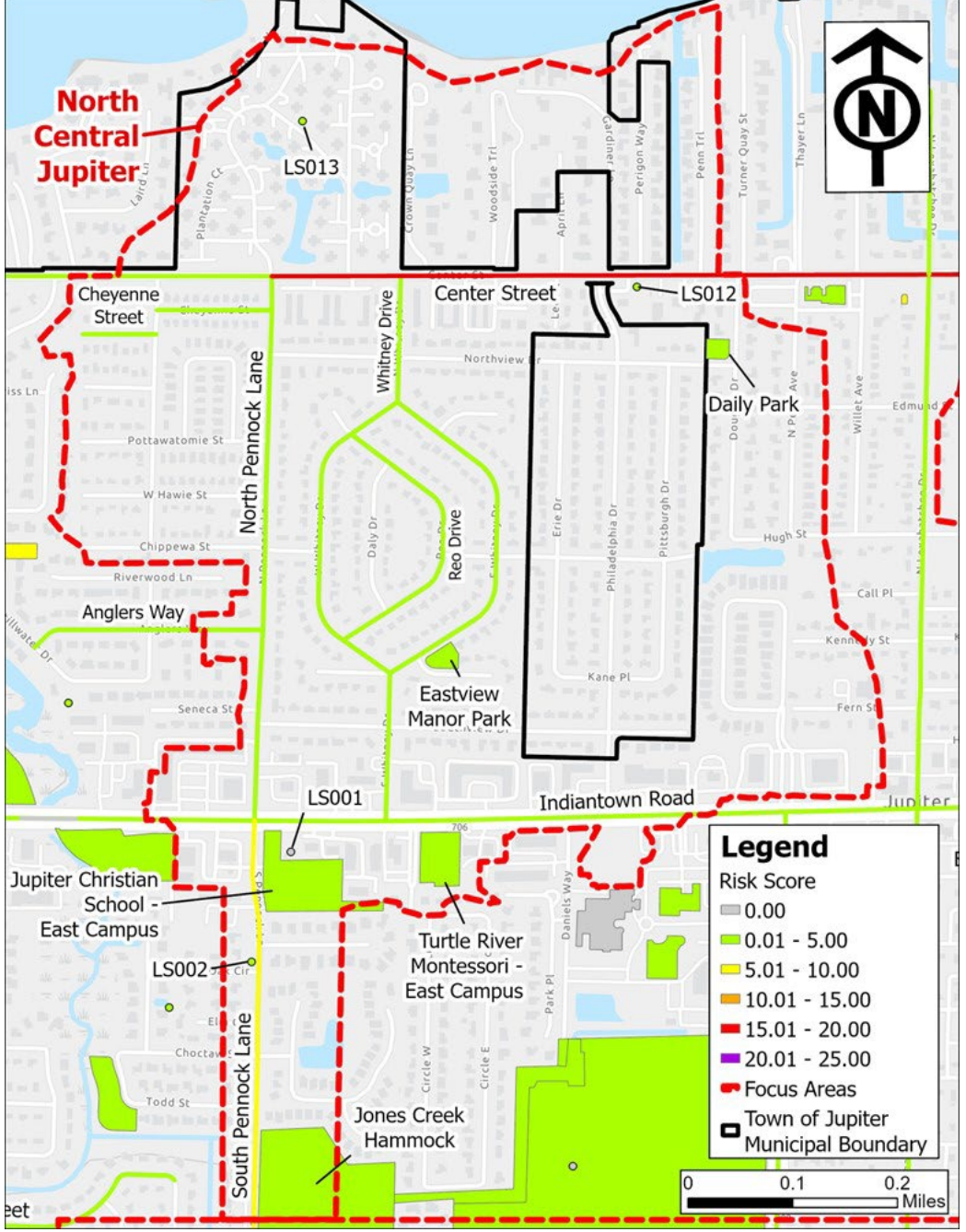
North Central Jupiter

- Major and local roads that support transport to homes and businesses
- History of nuisance flooding



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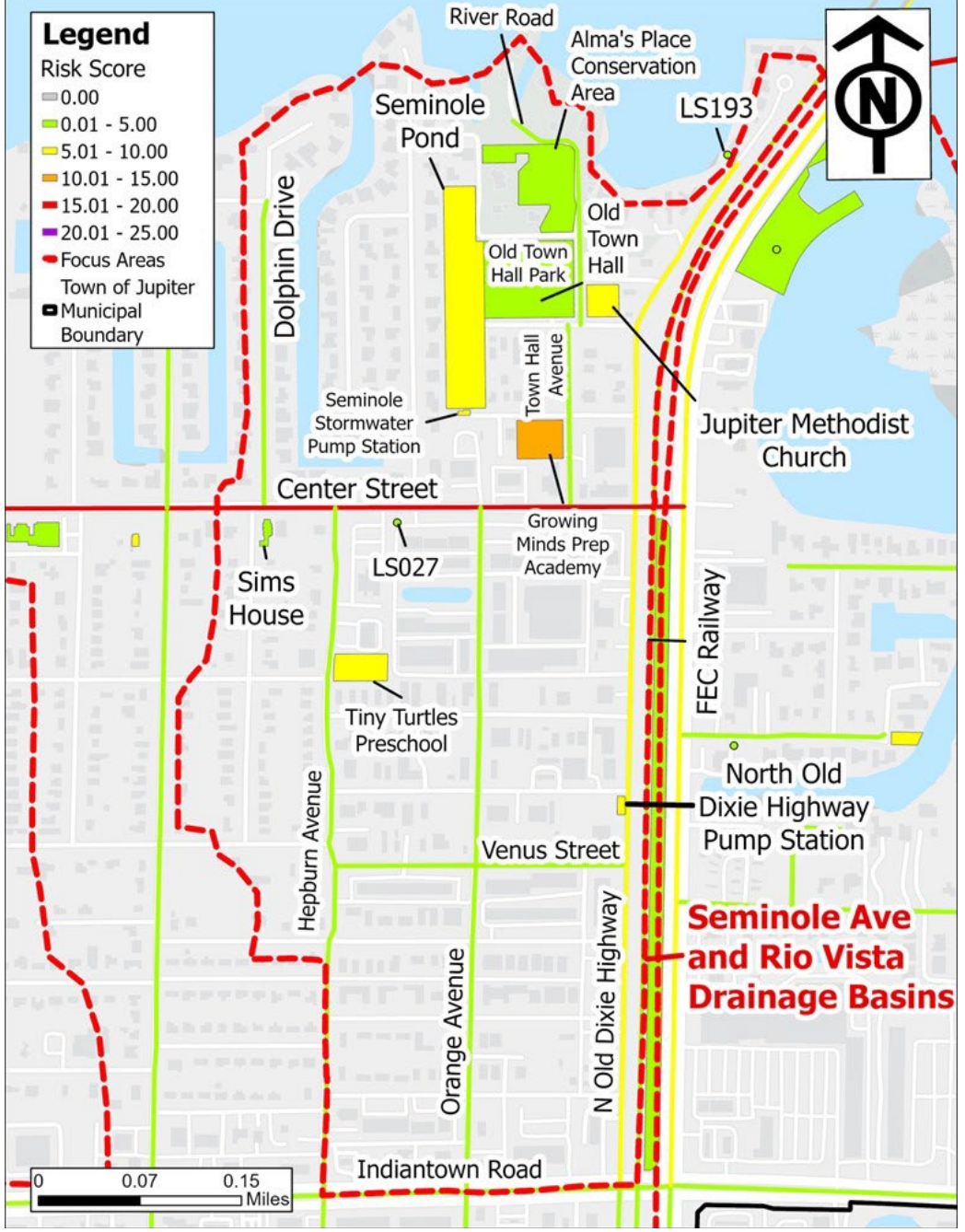
Seminole Ave and Rio Vista Drainage Basins

- Major and local roads that support transport to homes and businesses
- History of nuisance flooding



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Previous Improvements

Stormwater Utility Mission: To minimize the risk of flooding and improve stormwater quality

- Stormwater Pump Stations
  - Seminole, NE 7th Avenue, Old Dixie
- Pine Gardens North and South
- Jupiter Inlet Village
- Elsa and Paulina Roads
- North A1A

Photo of the Old Dixie Highway Pump Station

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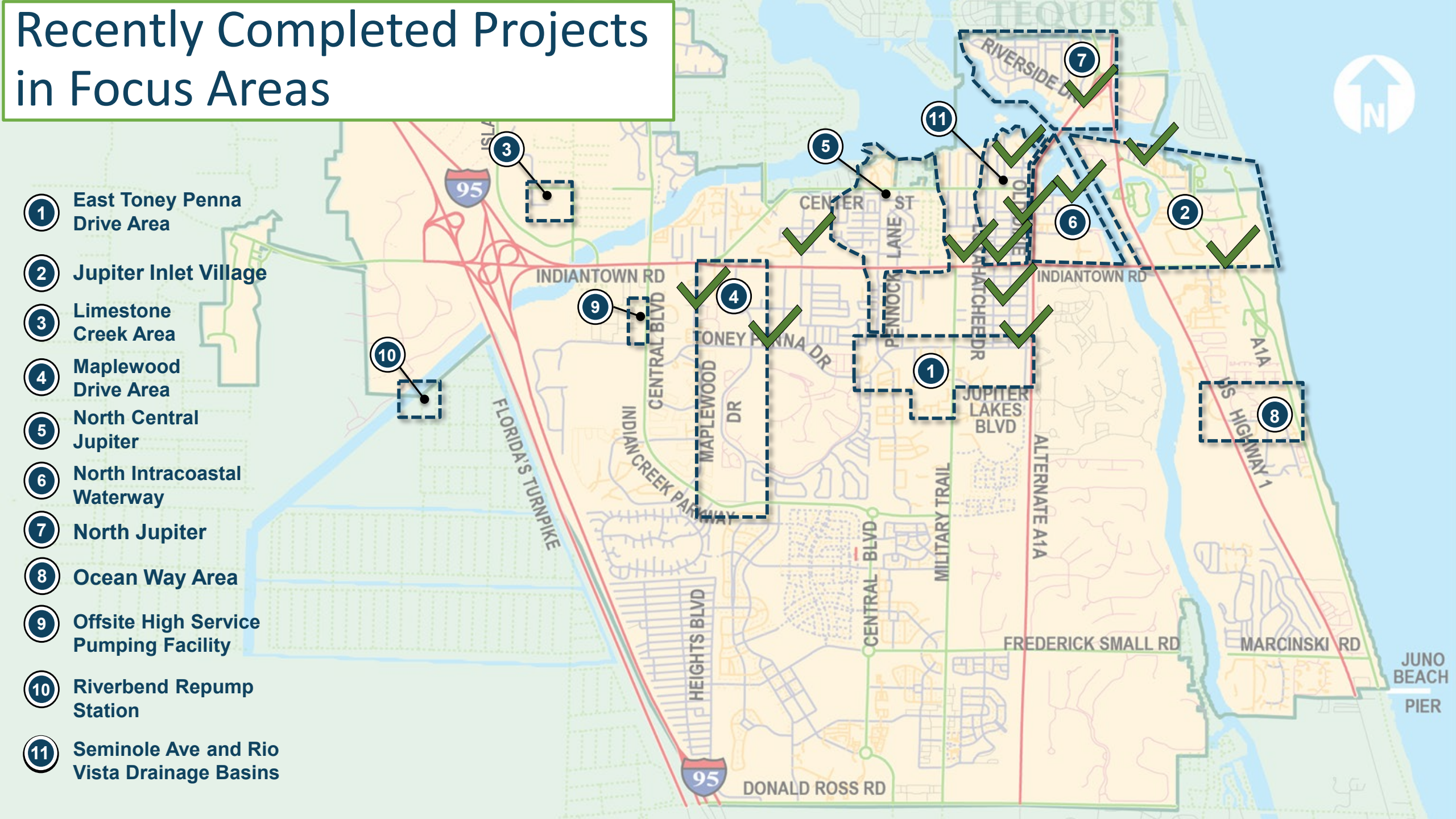
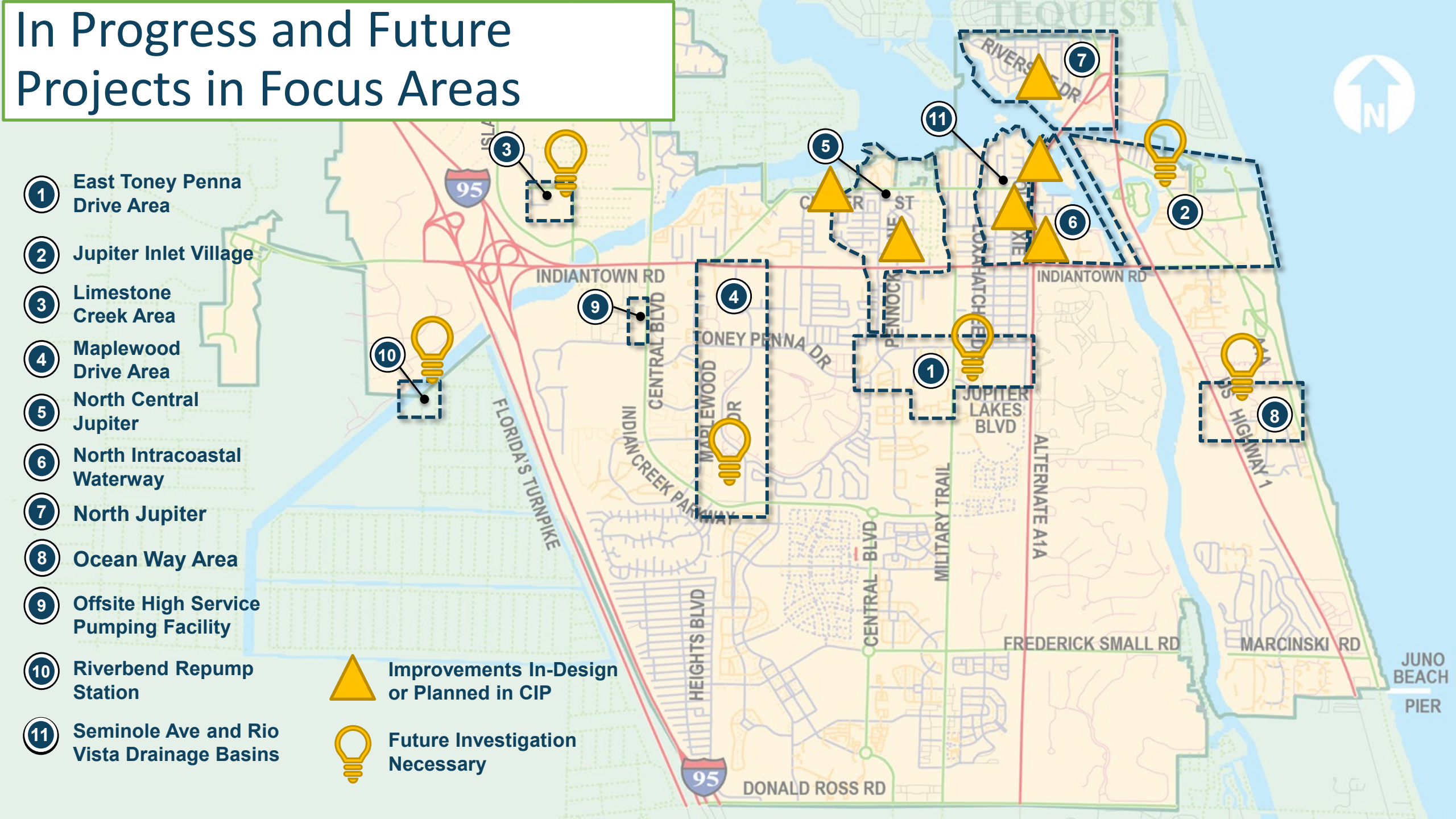
Recently Completed Projects in Focus Areas



In Progress and Future Projects in Focus Areas



Summary

- Flood risk is driven by a combination of **coastal storm surge**, **heavy rainfall**, and **elevated groundwater table**
- Future conditions are predicted to be worse than present day consistent with NOAA **sea level rise projections**
- Several critical infrastructure assets were identified as having **moderate to high vulnerability** under certain, future flood scenarios

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Next Steps

1

Near-Term Actions

Next 5 Years

- Integrate findings into Town-wide planning & CIP
- Review current policies & standards
- Pursue Grant Funding

2

Mid-Term Actions

Next 15 Years

- Strategically implement improvements
- Incorporate nature-based and hybrid solutions
- Update policies & standards
- Partner with neighboring municipalities

3

Long-Term Actions

Beyond 15 Years

- Evaluate need for additional investments
- Update Vulnerability Assessment
- Integrate adaptive management approaches

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