
Charlotte County Vulnerability Assessment

BOCC Meeting

June 23rd 2026



Hurricane Milton • Punta Gorda, FL

Presentation Agenda

1

Project Background

2

Current and Future Flood Risk

2.1

Chronic Flood Risk

2.2

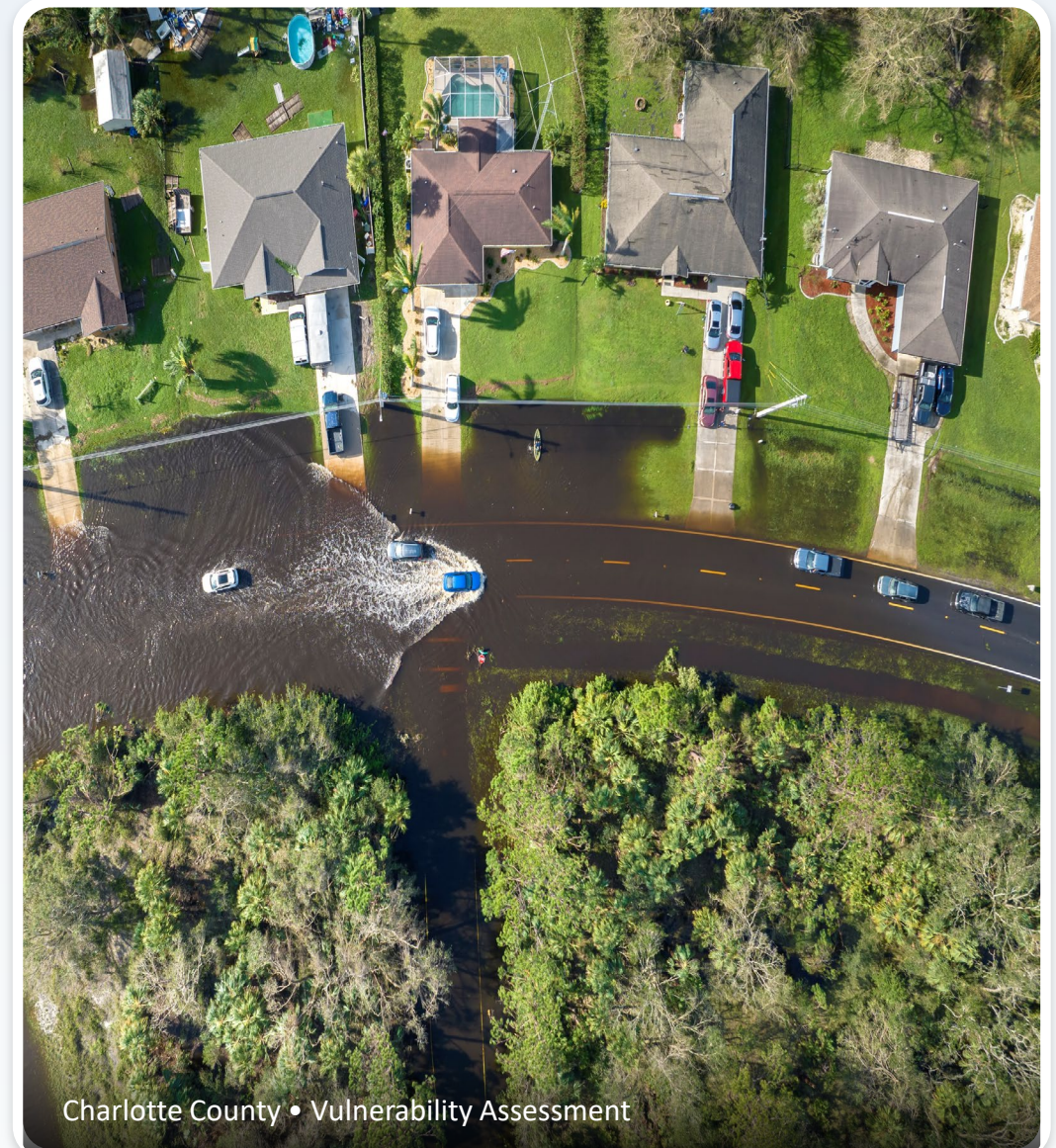
Acute Flood Risk

3

Strategic Decision-Making

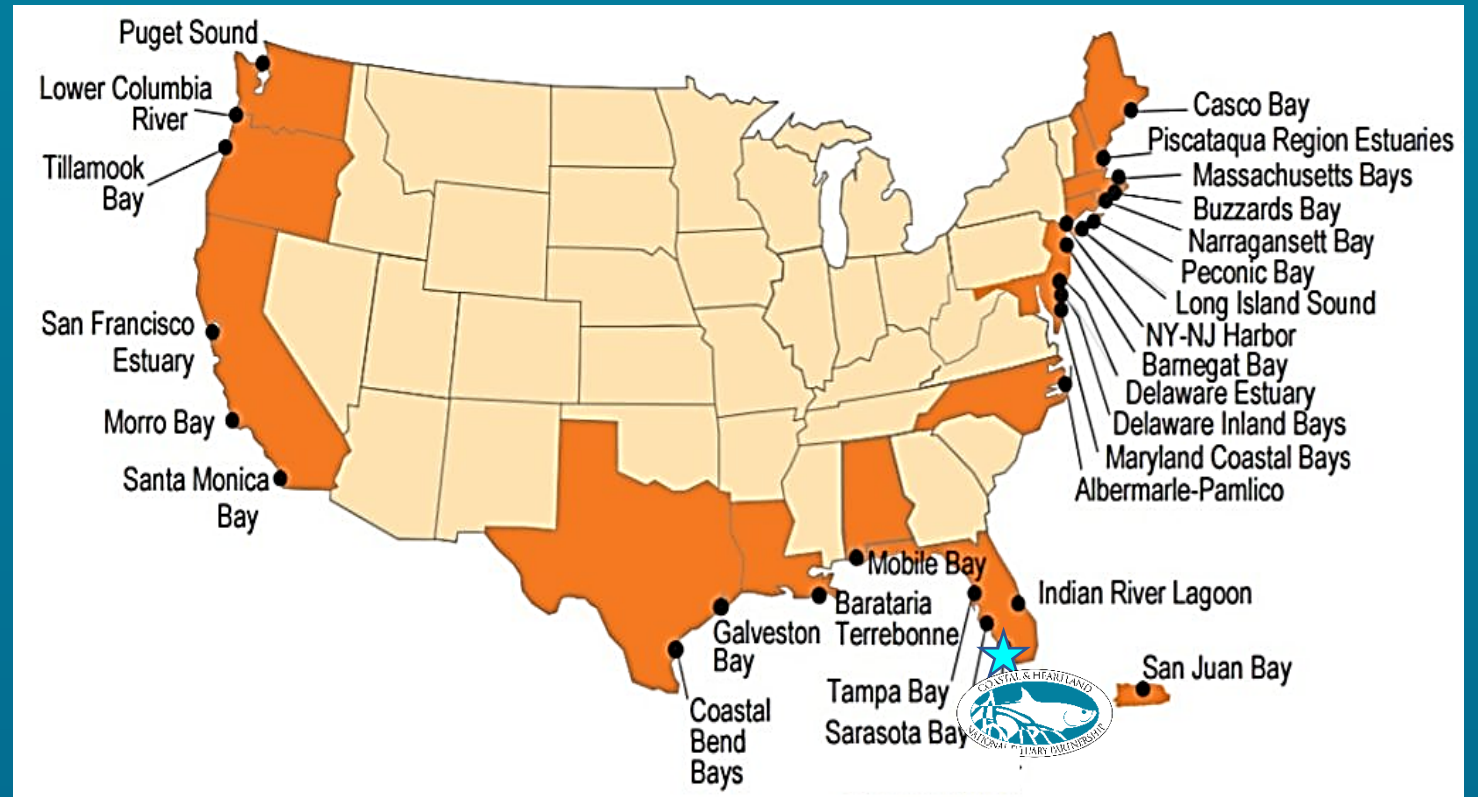
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Discussion & Next Steps



Charlotte County • Vulnerability Assessment

Coastal & Heartland National Estuary Partnership



- Part of US EPA National Estuary Program, funded by US Congress
- Across 10 counties in Central and Southwest Florida, including Charlotte Harbor and the Peace and Myakka River basins.



Uniting Central and Southwest Florida to Protect Water and Wildlife

CHNEP'S ROLE IN THIS PROJECT

- For this project, CHNEP is providing:
 - Funding for Contractor's work (WSP)
 - Project management support
 - Technical review of deliverables
 - Public education and outreach
 - Public project data access on CHNEP Water Atlas



CHNEP is also planning to assist long-term in the implementation of County's Vulnerability Assessment and Adaptation Action Area Plans.

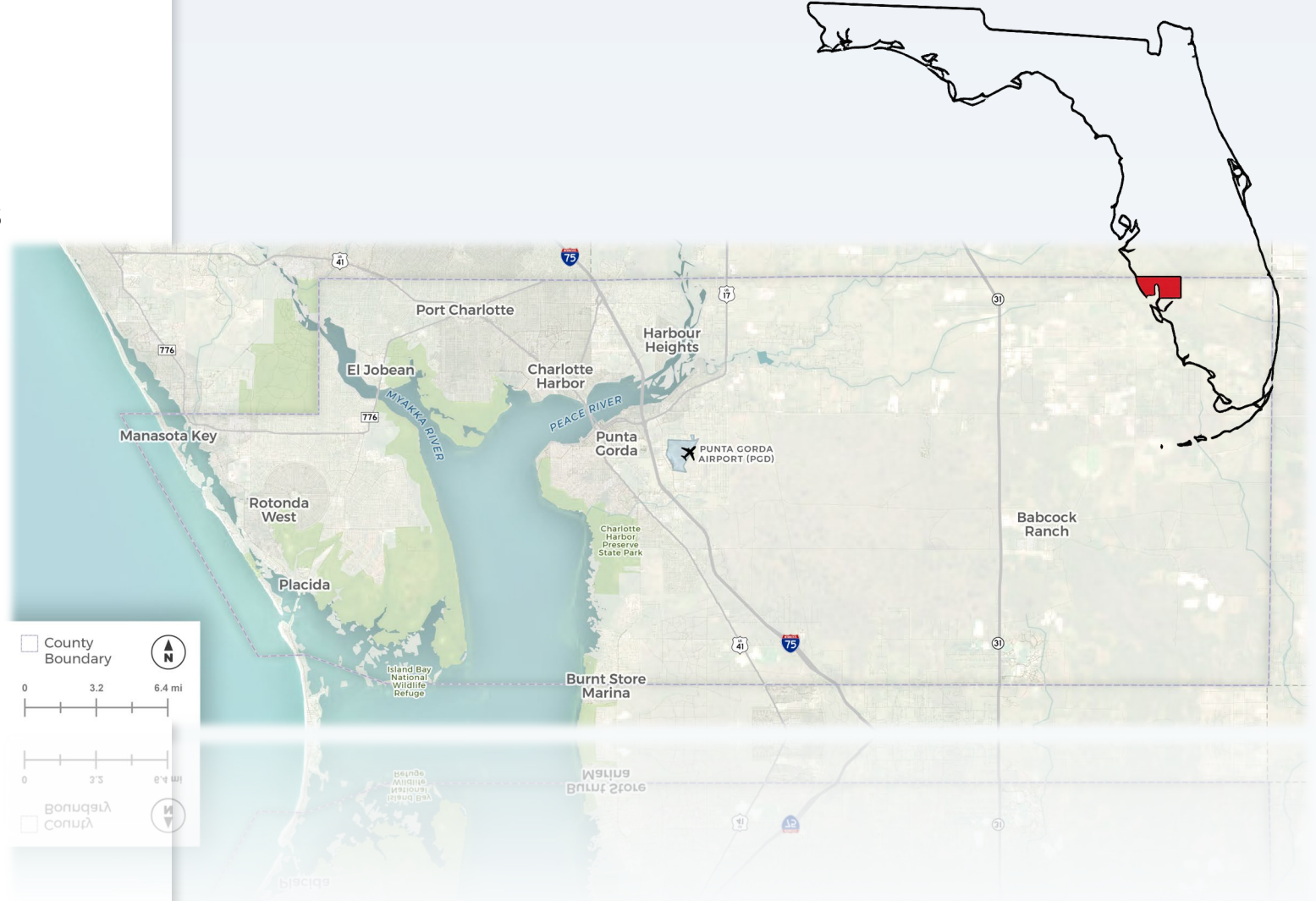


The Project Will

- ✓ Identify flooding impacts and risks to Charlotte County now and in the future.
- ✓ Develop a decision-making process that works with various support programs.
- ✓ Help the County fulfill the requirements of the DEP (Department of Environmental Protection) program, improving its prospects for securing future fundings.

Funded By

Coastal & Heartland National Estuary Partnership (CHNEP): EPA-IIJA funding for the National Estuary Program



Scope

Identify the **vulnerabilities** of Charlotte County's infrastructure, communities, and natural assets to **flooding hazards** and strengthen long-term resilience.



Flood Concerns

Chronic vs. Acute Comparison

CHRONIC (DAILY CONDITION)

Ongoing, gradual flooding conditions that worsen over time



Sea Level Change

Rising ocean levels affect coastal and estuarine areas



Tidal Flooding

Regular high-tide inundation in low-lying zones



Groundwater Rise

Elevated water table infiltrates underground infrastructure



Wetland Transition

Environmental areas shifting from land to water

ACUTE (EXTREME EVENT)

Sudden, severe flooding from major coastal storms



More Severe & Frequent Storm Surge

Charlotte County's experience with recent storms highlights the growing impact of coastal storm events. **As storms become more intense,** proactive measures are essential to limit future damage to communities and infrastructure.

Critical Assets in Charlotte County

Asset categorization is a foundational step in the Vulnerability Assessment, organizing findings by function and meeting FDEP grant requirements.



1

Critical Infrastructure

Water, wastewater, stormwater, and power systems essential to county operations

2

Critical Community & Emergency Facilities

Schools, hospitals, shelters, fire stations, and emergency response centers

3

Transportation & Evacuation Routes

Roads, bridges, and key corridors for emergency evacuation and daily mobility

4

Natural, Cultural & Historic Resources

Parks, preserves, waterways, and heritage sites that define the county

Critical Assets in Charlotte County

Spatial distribution of critical assets across the county

Critical Infrastructure

90 facilities | **362** lift stations

Critical Community & Emergency Facilities

257 buildings

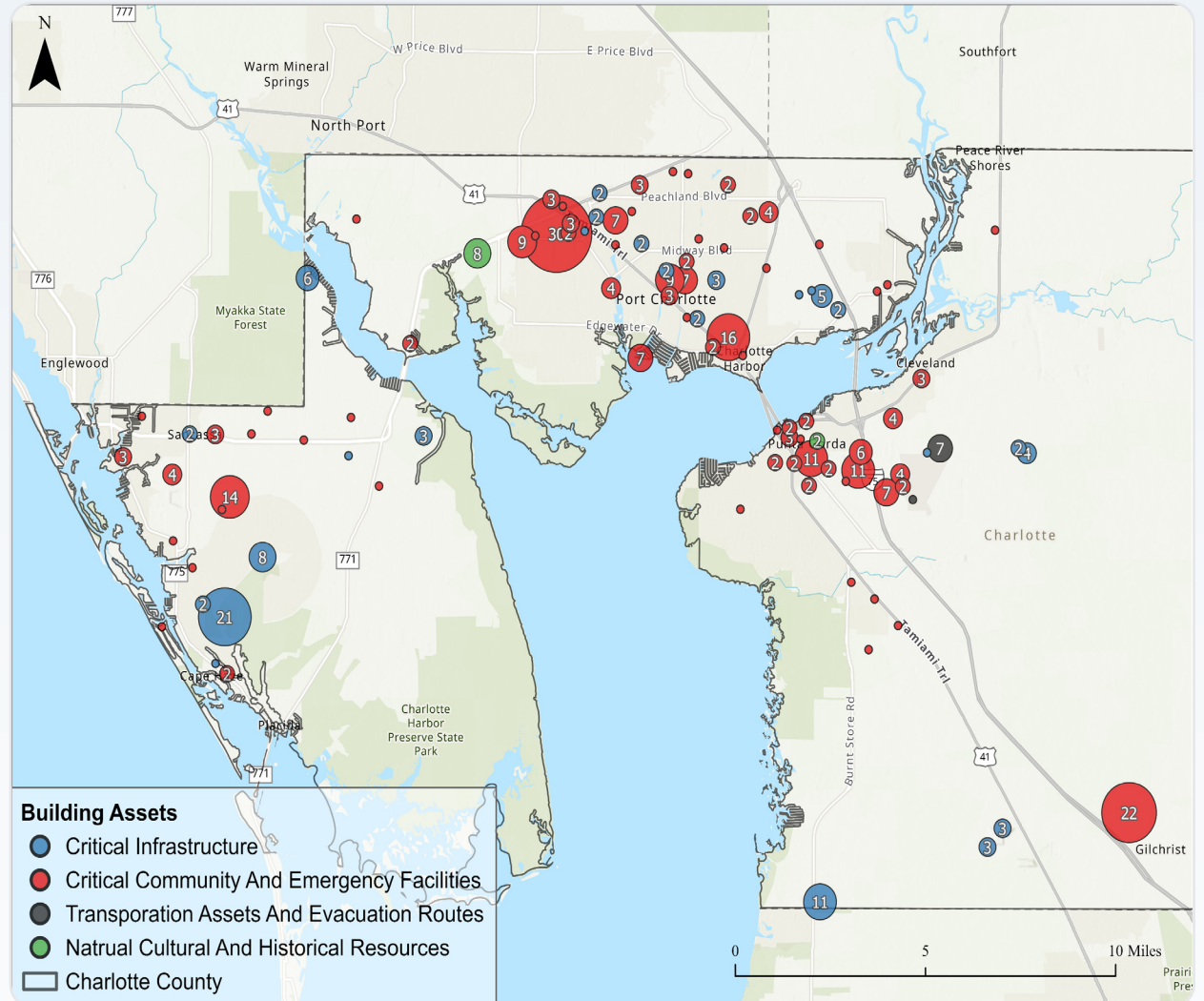
Transportation & Evacuation

491 mi roads | **45** bridges | **25** mi rail

Natural, Cultural & Historic

657K ac conservation | **418K** ac wetlands

9 historic bridges | **30** parks



Time Horizons and Planning Considerations



TODAY
2026

Immediate Term

Take immediate action to protect the community and its infrastructure from current flood hazards.



NEAR FUTURE
2040

In the Near Future

Implement strategies and actions that ensure our community remains resilient as conditions evolve.



LONG TERM
2070

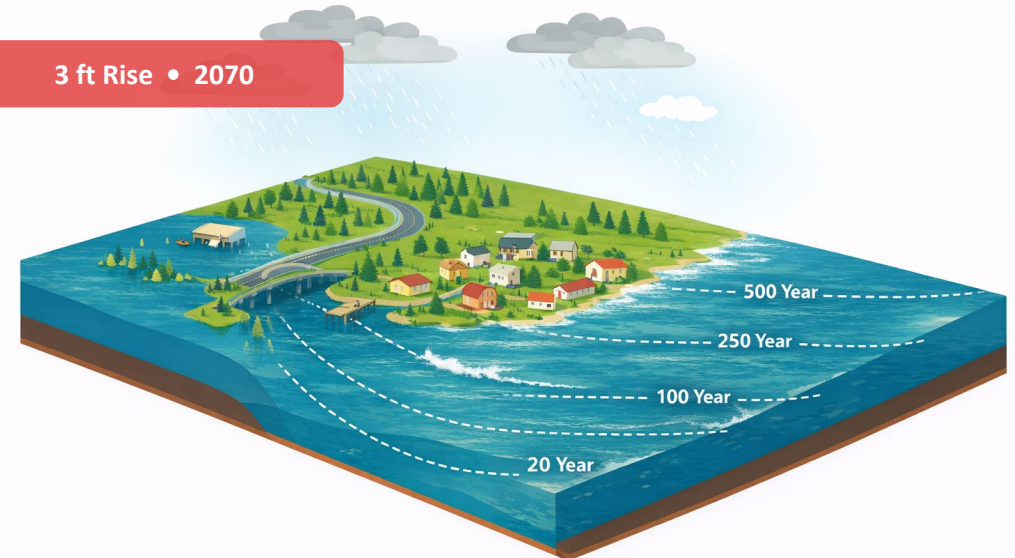
A More Distant Future

Introduce actions that will ensure long-term resilience for the county as sea levels continue to rise.

1 ft Rise • 2040



3 ft Rise • 2070

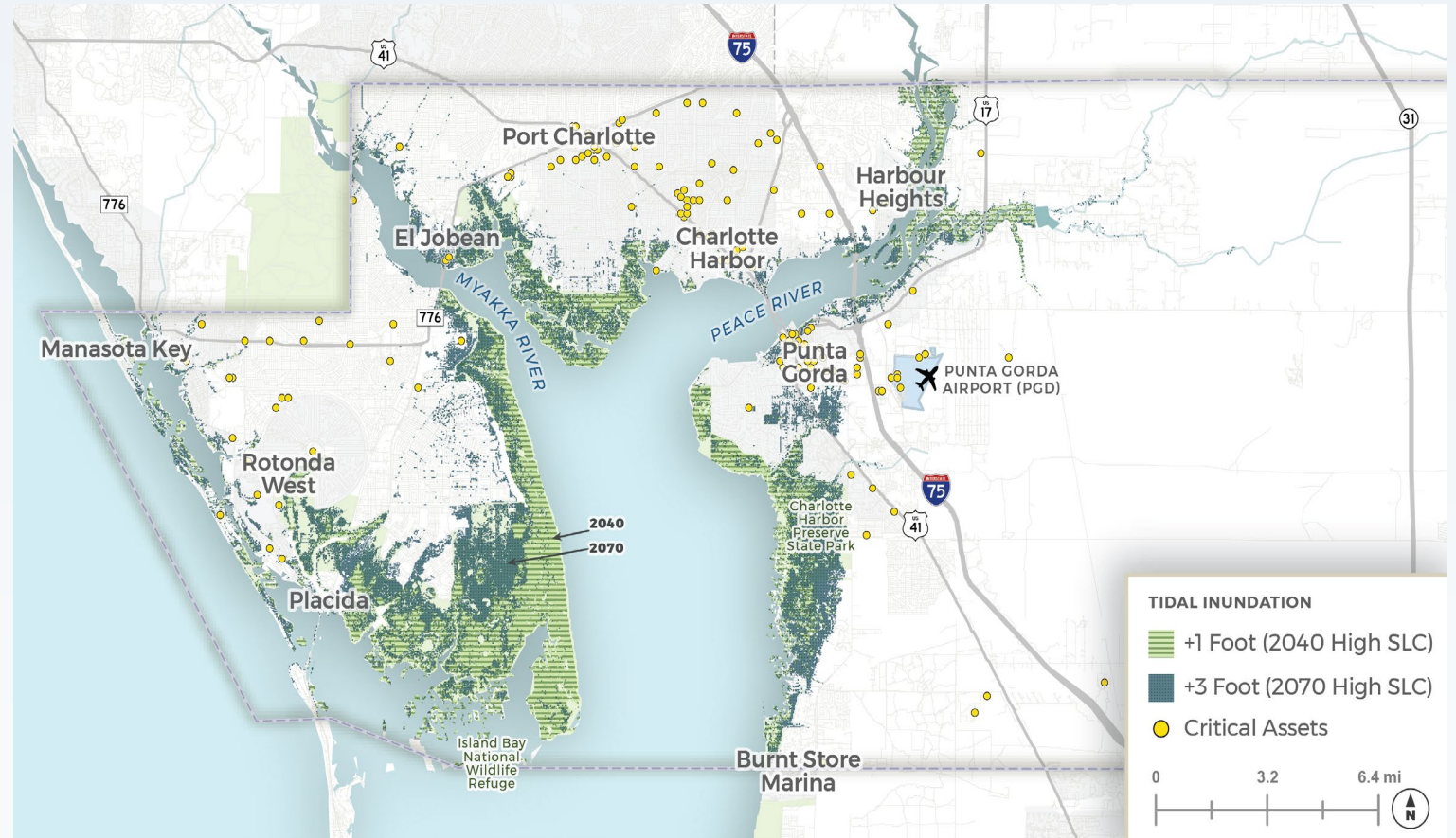


Sea Level Change and Tidal Flooding

Areas potentially affected by recurrent tidal flooding under projected sea level change. It affects low-lying coastal and estuarine areas even in the absence of storms.

Year	Intermediate Low (ft)	Intermediate High (ft)
2040	Near Future= 1 ft	
2070	Long Term= 3 ft	

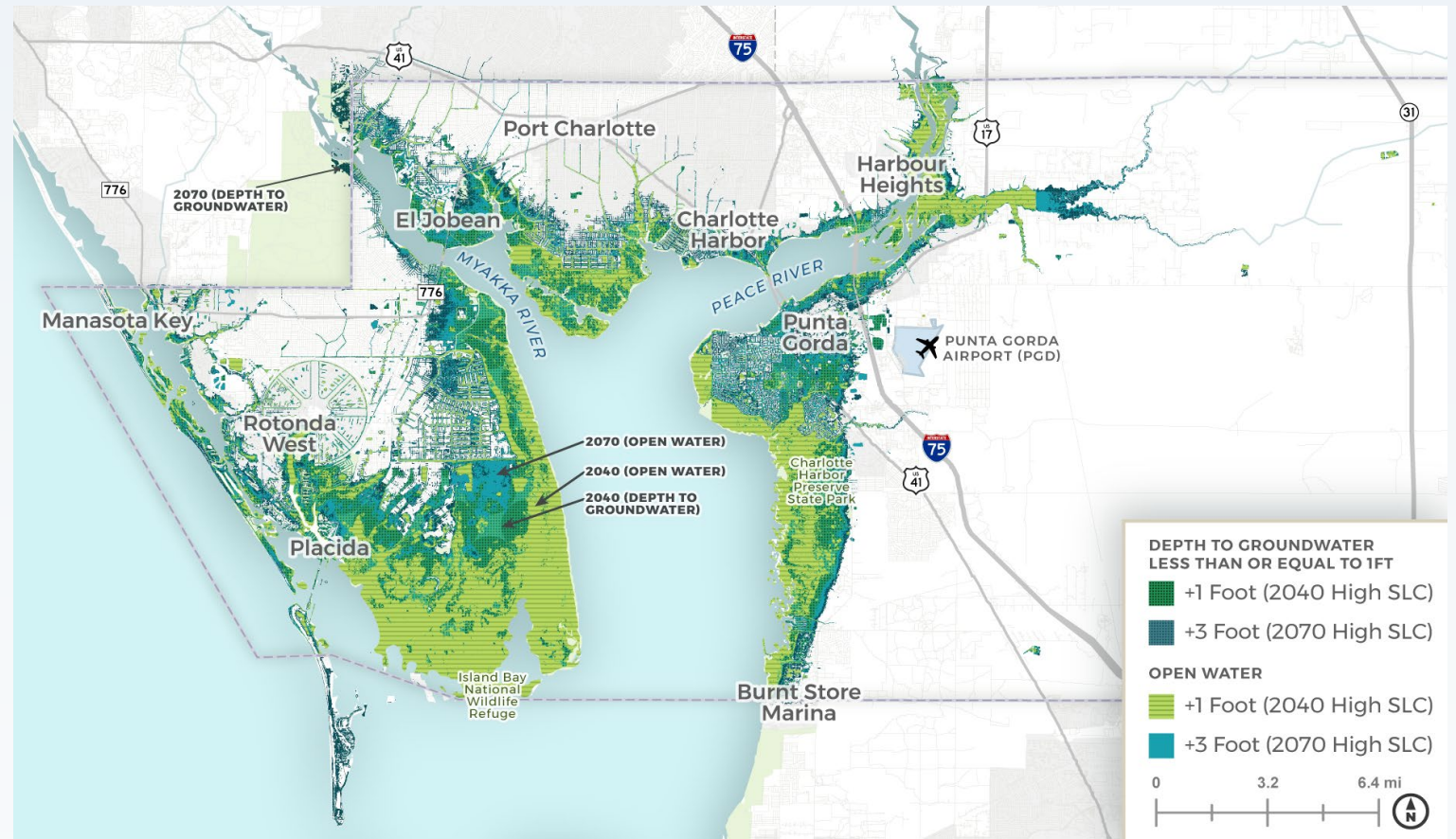
Source: NOAA 2017



Source: NOAA Office for Coastal Management, Sea Level Rise Viewer. (2025).

Rising Groundwater

As sea levels change, groundwater tables can also rise, threatening underground utilities, foundations, and septic systems.



Source: NOAA Office for Coastal Management, Sea Level Rise Viewer. (2025).

Potential Natural System Area Transition under Sea Level Change

Protective wetlands along Charlotte Harbor, including mangrove forests and marshes within parks like Charlotte Harbor Preserve State Park, face significant ecological shifts.

37,315 acres

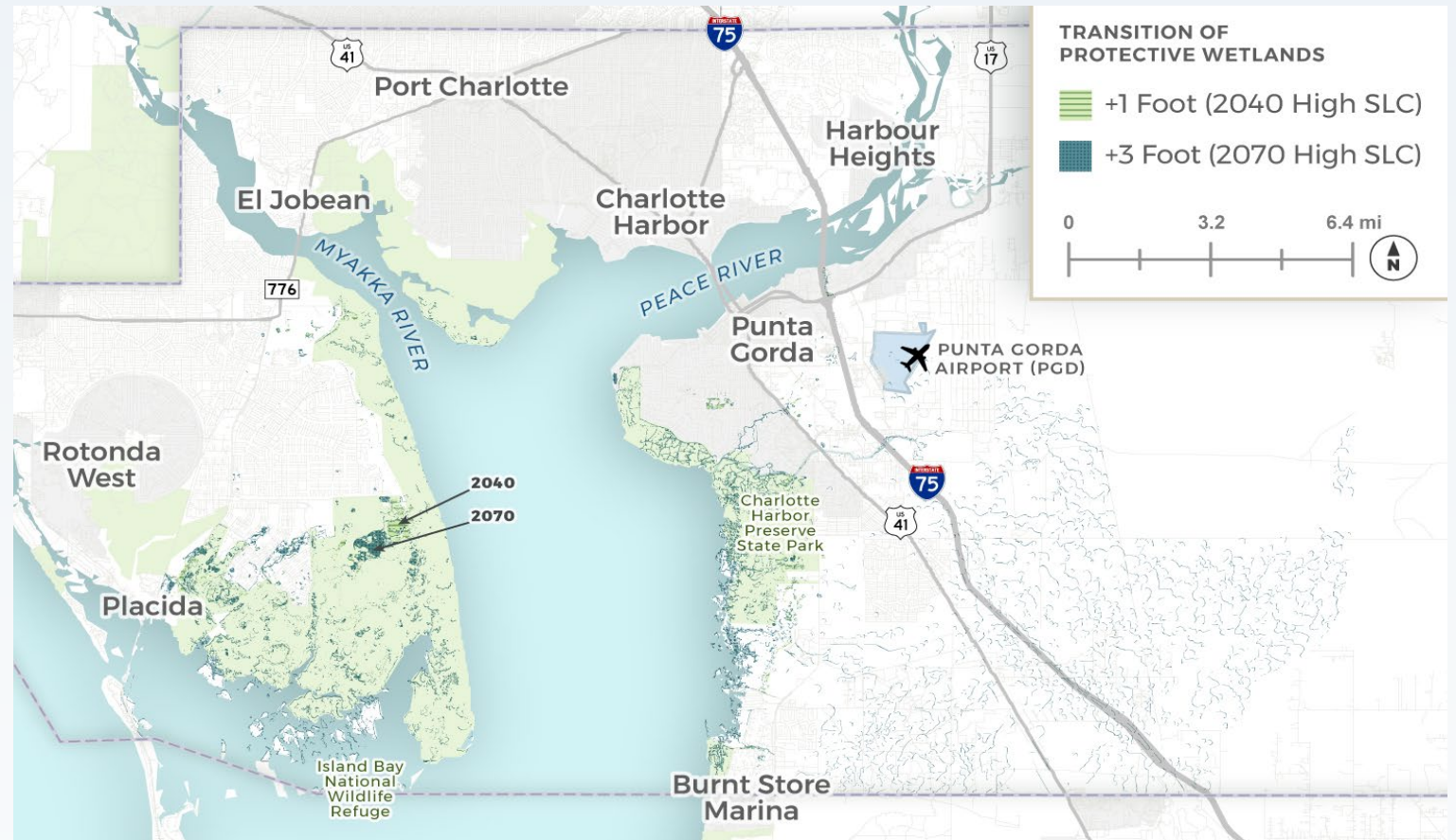
Current protective wetlands

-355 acres

Lost by 2040

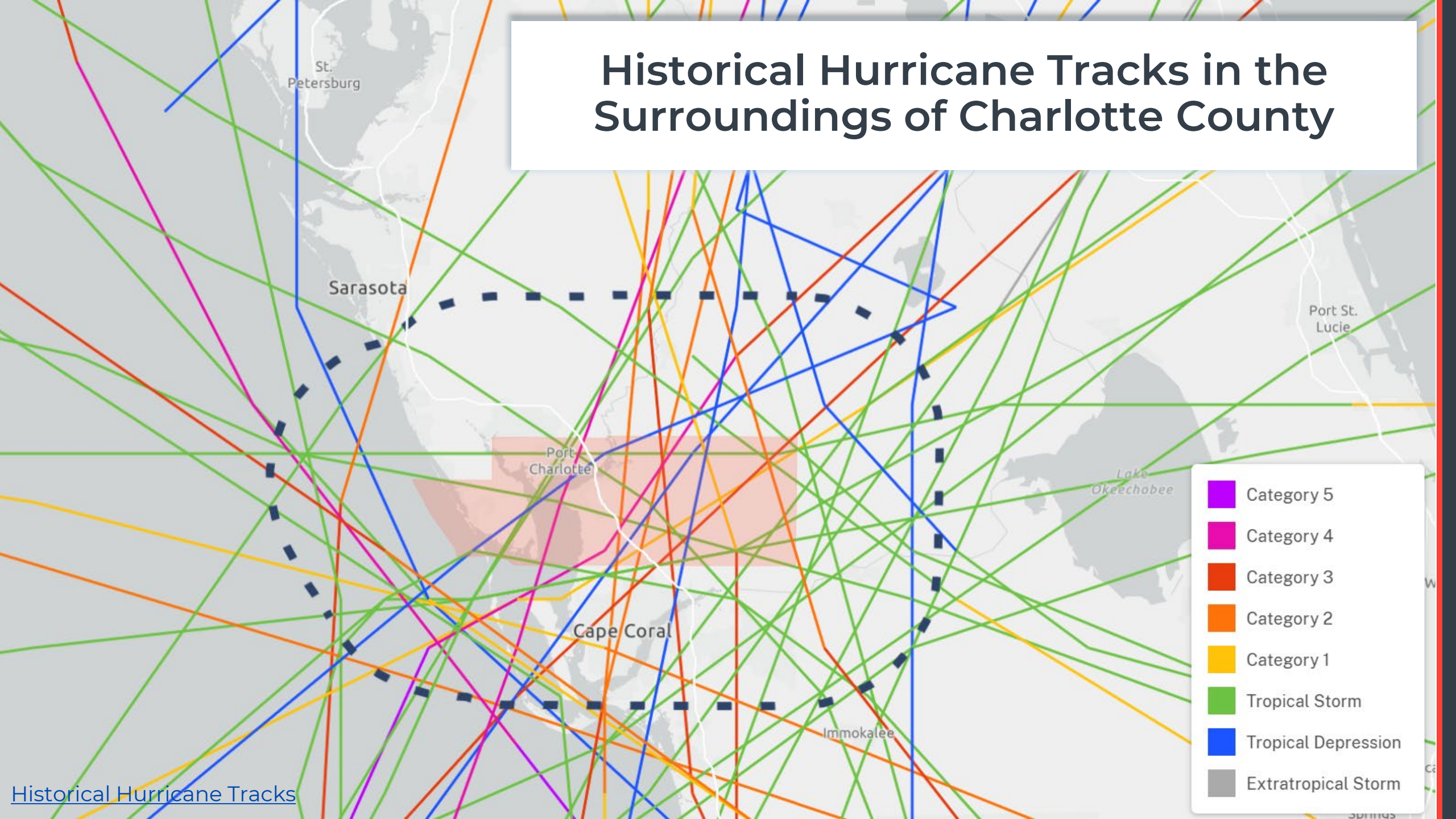
-2,175 acres

Total lost by 2070



Source: NOAA Office for Coastal Management, Sea Level Rise Viewer. (2025).

Historical Hurricane Tracks in the Surroundings of Charlotte County



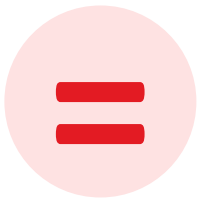
- Category 5
- Category 4
- Category 3
- Category 2
- Category 1
- Tropical Storm
- Tropical Depression
- Extratropical Storm

What is the 100-Year Event?

A flood with a 1% chance of occurring in any given year

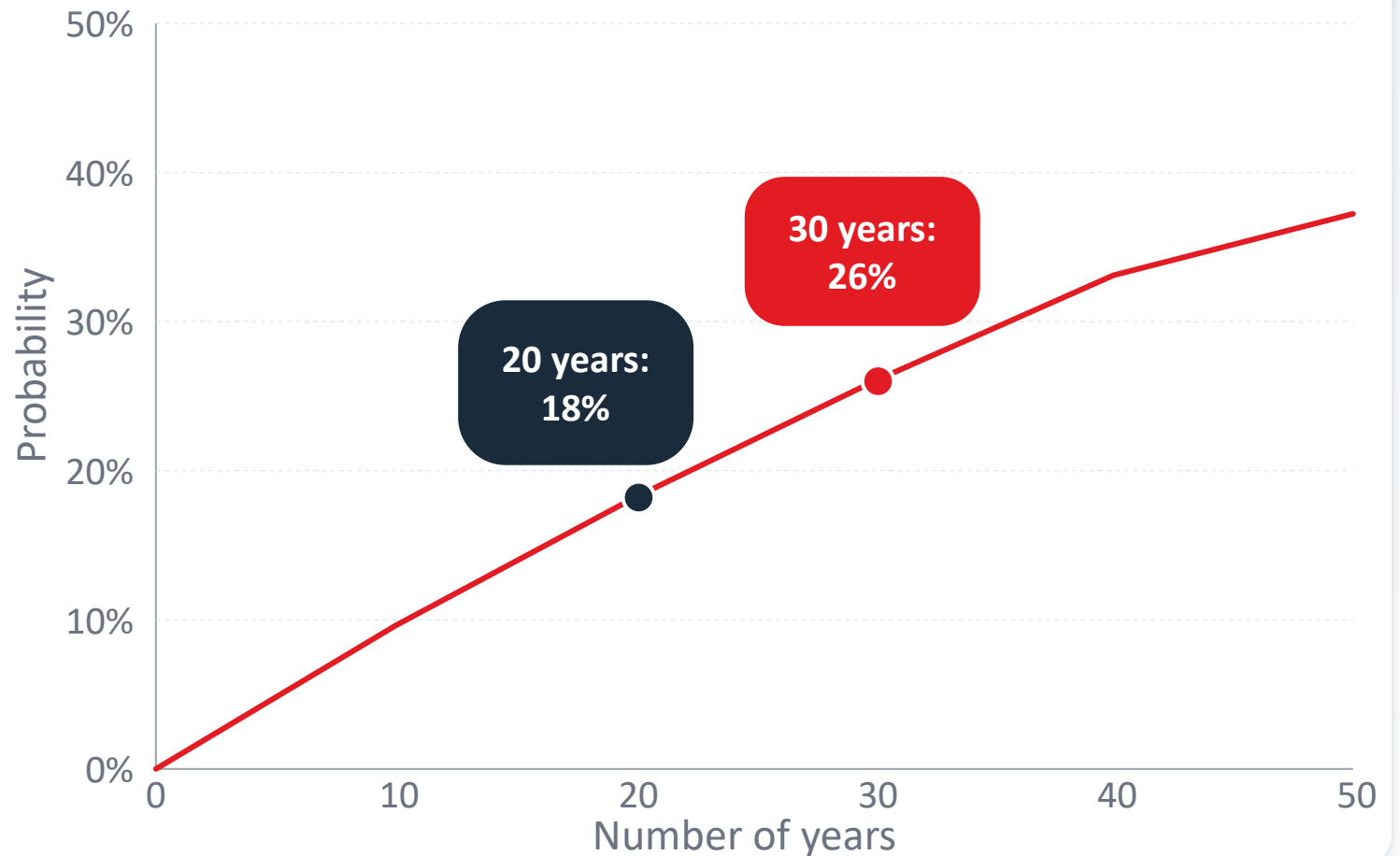


It happens once every 100 years

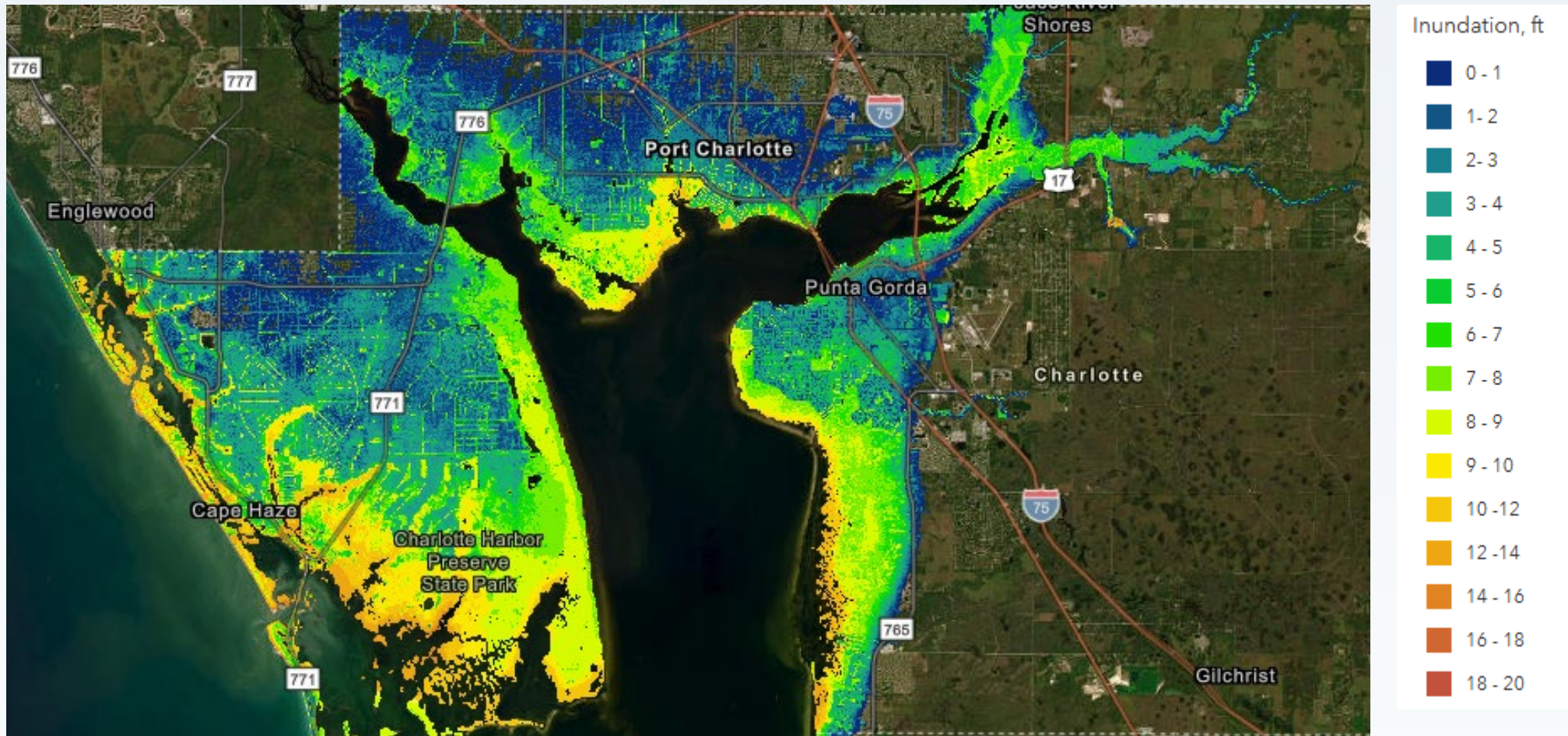


100-year events can, and often do, happen **more than once** within the same 100-year period.

Probability of a 100-year event occurring over time



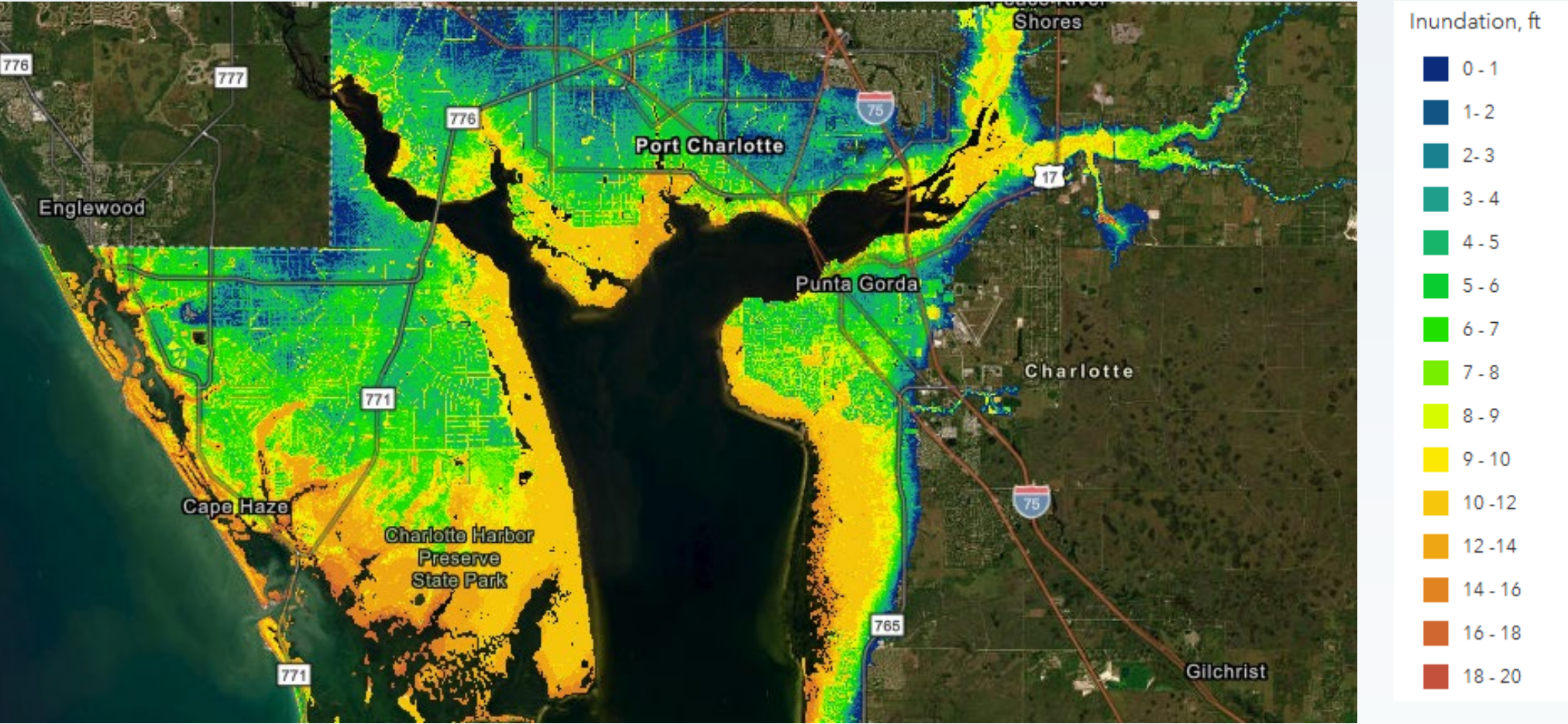
1% Storm Surge Flood Risk, Current Sea Level Conditions



1% Storm Surge Flood Risk, 1 ft Sea Level Change (2040)



1% Storm Surge Flood Risk, 3 ft Sea Level Change (2070)



Inundation by Storm Surge

Critical buildings and transportation assets exposed to storm surge under each scenario

Year	Critical Infrastructure	Critical Community and Emergency Facilities	Roadway	Railway	Bridge	Culvert
Today	43 buildings exposed	62 buildings exposed	158 miles of roadway	10 miles of railway	0 miles of bridges	0 miles of culverts
2040 SLC=1ft	49 buildings exposed	90 buildings exposed	197 miles of roadway	10 miles of railway	5 miles of bridges	1 miles of culverts
2070 SLC=3ft	64 buildings exposed	177 buildings exposed	272 miles of roadway	11 miles of railway	6 miles of bridges	3 miles of culverts

KEY TAKEAWAY

Exposure climbs sharply under the 2070 Intermediate High scenario, with **241 critical buildings and 272 miles of roadway at risk**

Preliminary Evaluation Summary

Percentage of county land area inundated under each scenario. Given Charlotte County's position adjacent to both coastal and riverine areas, these results are consistent with expectations.

HAZARD TYPE

Tidal Flooding

YEAR INTERMEDIATE HIGH INTERMEDIATE LOW

2040

2%

of county land

4%

of county land

2070

3%

of county land

8%

of county land

HAZARD TYPE

Storm Surge (100-year)

YEAR INTERMEDIATE HIGH INTERMEDIATE LOW

2040

21%

of county land

22%

of county land

2070

22%

of county land

26%

of county land

KEY TAKEAWAY

While tidal flooding exposure remains modest (2–8%), **storm surge is the dominant threat**, putting up to a quarter of county land at risk, consistent with Charlotte County's coastal and riverine geography.

Methodology Used to Calculate Consequence Costs for Each County Asset (Conceptual)

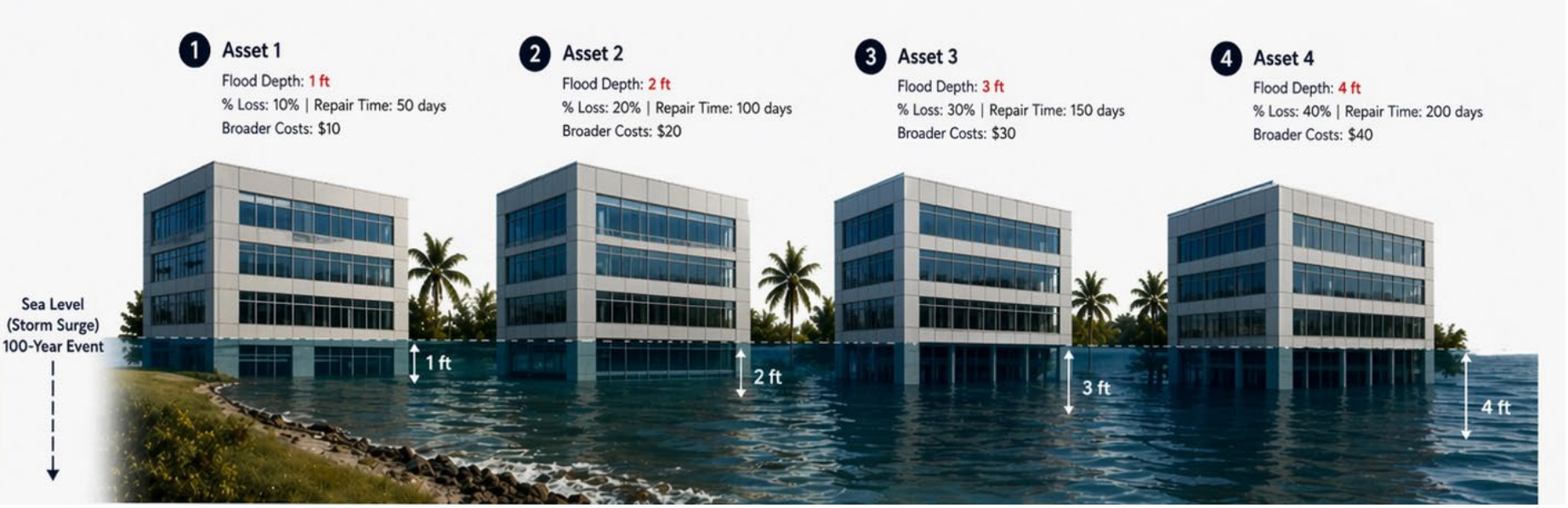
	Asset 1	Asset 2	Asset 3	Asset 4
Flood Depth (ft) for the Analysis Storm	1 ft	2 ft	3 ft	4 ft
% Loss (building & contents)	10%	20%	30%	40%
Repair Time (days)	50	100	150	200
Broader Economic Costs (relocation, rental, etc.)	\$10	\$20	\$30	\$40

KEY TAKEAWAYS

Deeper flooding = greater community economic loss
Assets with greater losses rank higher for priority action

HAZUS methodology
FEMA's real-world flood damage and loss library, widely applied by FDEP, FDEM, FHWA, HUS, and USACE

Grounded in real-world cost data
Loss estimates reflect actual repair costs and broader indirect impacts by building type and properties (via national datasets)



Under the same 100-year storm surge event (same sea level), flood depth increases as elevation decreases. This leads to greater losses, longer repair times, and higher economic costs for assets closer to the coast.

Prioritization List

Critical facilities assessed across time horizons • 41 facilities included • Current priority based on Costs of Damage and Service Loss • Further refinement based on broader community impact

CURRENT CONDITIONS

Today

15 facilities at risk

• 4 High • 5 Medium • 6 Low

HIGH PRIORITY (4)

- Myakka River Elementary School
- Charlotte High School
- Baker Center Head Start
- Lemon Bay High School

MEDIUM PRIORITY (5)

- Punta Gorda Middle School*
- Life Care Center of Punta Gorda
- Justice Center
- Meadow Park Elementary School
- Neil Armstrong Elementary School

SLR = 1 FT

2040

19 facilities at risk

• 12 High • 1 Medium • 6 Low

HIGH PRIORITY (12)

- All 4 from Today + 8
- Punta Gorda Middle School*
- Life Care Center of Punta Gorda
- Justice Center
- Meadow Park Elementary School
- Neil Armstrong Elementary School
- Peace River Elementary School *
- Sallie Jones Elementary School*
- Deep Creek Elementary School *

MEDIUM PRIORITY (1)

- Verandas Of Punta Gorda*

SLR = 3 FT

2070

41 facilities at risk

• 15 High • 10 Med • 16 Low

HIGH PRIORITY (15)

- All 12 from 2040 + 3
- Port Charlotte Artificial Kidney Center
- Florida Southwestern State College
- Medical Examiner*

MEDIUM PRIORITY (10)

- County Administration*
- Charlotte County Community Development
- Port Charlotte High School *
- and 7 others

Facilities marked with an asterisk (*) include one or more buildings assumed to have a first-floor elevation of 0.5 ft due to data limitations and may require further evaluation.

Recommended Actions: Countywide



Risk Assessment & Data Integration

Integrate climate projections into
land-use & capital planning



Floodplain Management & Development Policy

Encourage elevation retrofits for high-
risk structures



Nature-Based Solutions & Risk Reduction

Incorporate land acquisition
strategies to create natural
buffer/retention areas



Funding & Implementation

Strengthen cross-department
resilience coordination



Community Engagement

Launch public education campaign
on flood risks & county actions

Recommended Actions: Asset-Specific

Infrastructure & Emergency Services



Wastewater Treatment

- Improve power redundancy with backup generators
- Explore solar + battery storage for lift station resilience



Emergency Response (Fire Stations)

- Install deployable flood barriers at entry points
- Protect backup power and fuel storage from floodwater



Healthcare Facilities

- Develop contingency plans for critical medical services

Public Services & Government



Schools & Shelter Facilities

- Elevate electrical, HVAC & generators above flood levels
- Improve stormwater drainage around campuses



Community Facilities

- Retrofit facilities to support emergency operations



Local Government & Admin

- Protect critical IT infrastructure from flood exposure

Parks, Transportation & Homeowners



Parks & Natural Areas

- Expand living shorelines on waterfront parks
- Modernize stormwater systems with resilient design



Transportation Infrastructure

- Deploy green infrastructure (bioswales, permeable surfaces) near bridges



Homeowner Flood Resilience

- Build partnerships for residential resilience funding access

Current County Advancements in Resiliency

- Storms silver lining: disaster events provide the opportunity to rebuild for resiliency
- Commission mandate: Integrate resiliency into our infrastructure
- Further planning for the future: stormwater, floodplains, rain, and tides



Future Port Charlotte Beach Park Community Facility (Artist Rendering)

This is a start...

The VAAP is a first step

This plan establishes the foundation for enhancing Charlotte County's resilience to climate change. Additional action is needed to implement its findings.

Critical infrastructure identified

The FDEP framework provides a first pass at understanding flood risk, focusing on critical assets where action should be taken first.

Community-wide resilience matters

Prioritizing resilience should also consider the broader consequences of disruption to county systems and community services.

June 2026

2026-2027

Draft Vulnerability Assessment Meeting

Final Vulnerability BOCC Meeting

Flood Scenario Related Data and ACUNE

Sensitivity Analysis

Action Areas

Vulnerability Assessment

Prioritization Risk Refinement

County Adaptation Plan

Community Engagement and Support

FIRST PUBLIC MEETING
November 6, 2024

SECOND PUBLIC MEETING
May 21, 2026

MEETING #1 — NOV 6, 2024

Participation

Mostly residents of Punta Gorda and Port Charlotte.

Top Concerns

Widespread flooding from heavy rainfall and tidal surge; strong demand for resilience action.

Outcomes

Top asset priorities set: Water/Wastewater, Health Care, Public Safety.

MEETING #2 — MAY 21, 2026

Participation

Residents from multiple neighborhoods

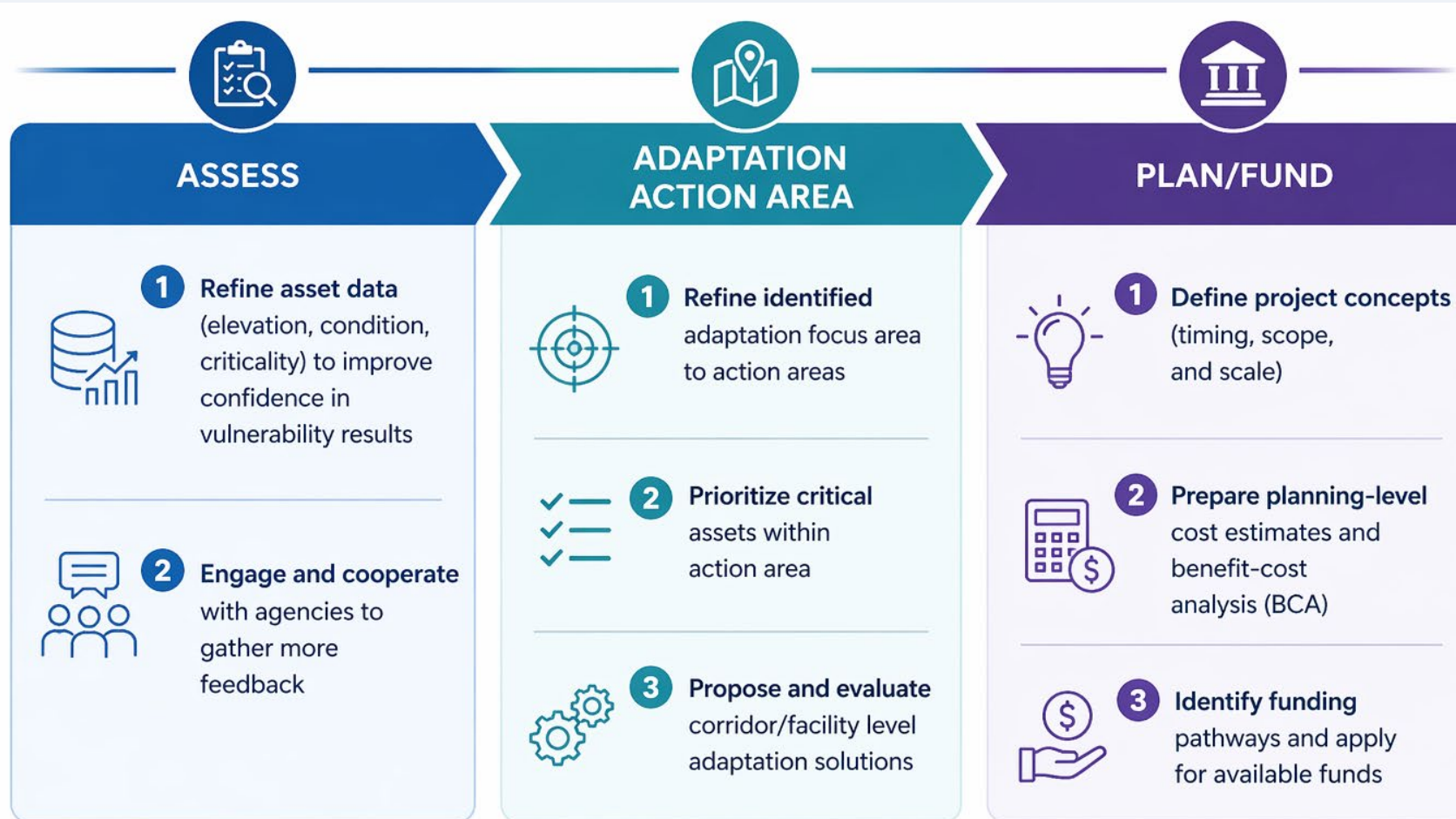
Top Concerns

Slow recovery, rising groundwater, septic risks, and funding constraints.

Outcomes

Feedback will refine recommendations and strengthen funding requests.

Next Steps



A collaborative, data-driven process to **identify vulnerabilities**, **prioritize actions**, and **secure funding** for a more resilient future.

—
Thank you!



Hurricane Milton • Punta Gorda, FL