Coconut Creek Vulnerability Assessment

City Commission Meeting

February 8th, 2024

Coconut Creek
Butterfly Capital of the World®

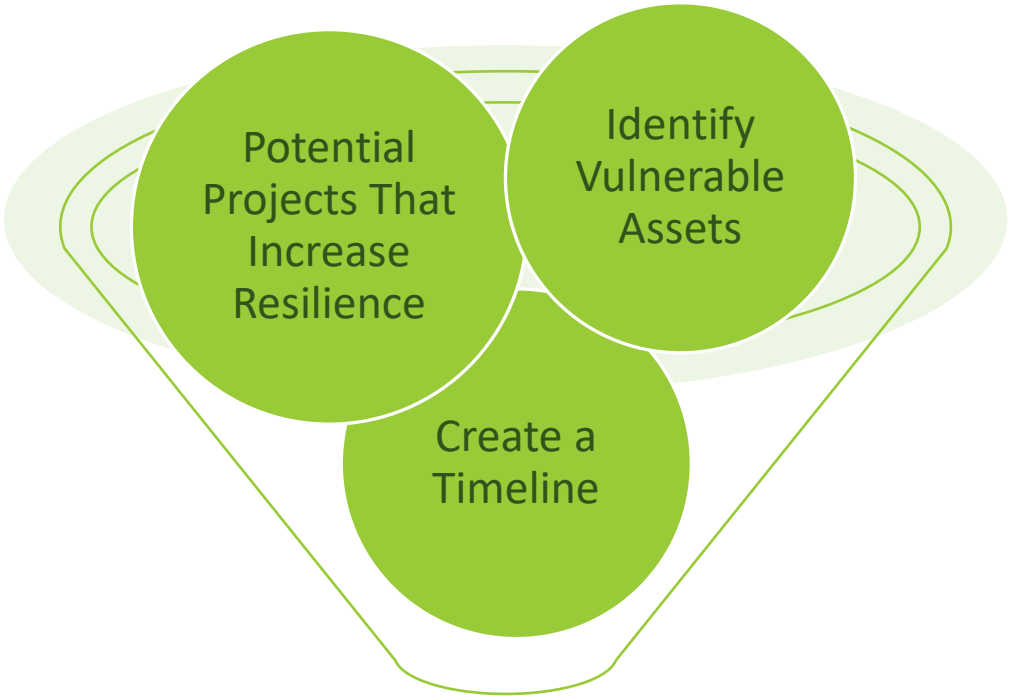
WGI

WHAT IS A VULNERABILITY ASSESSMENT?

A vulnerability assessment helps a community determine which **physical, social, and cultural** assets are likely to be impacted by future flooding, rain events, and heat.

Vulnerability assessments provide the necessary information to make **impactful change** and **resiliently plan for the future**.

WHAT ARE THE BENEFITS?

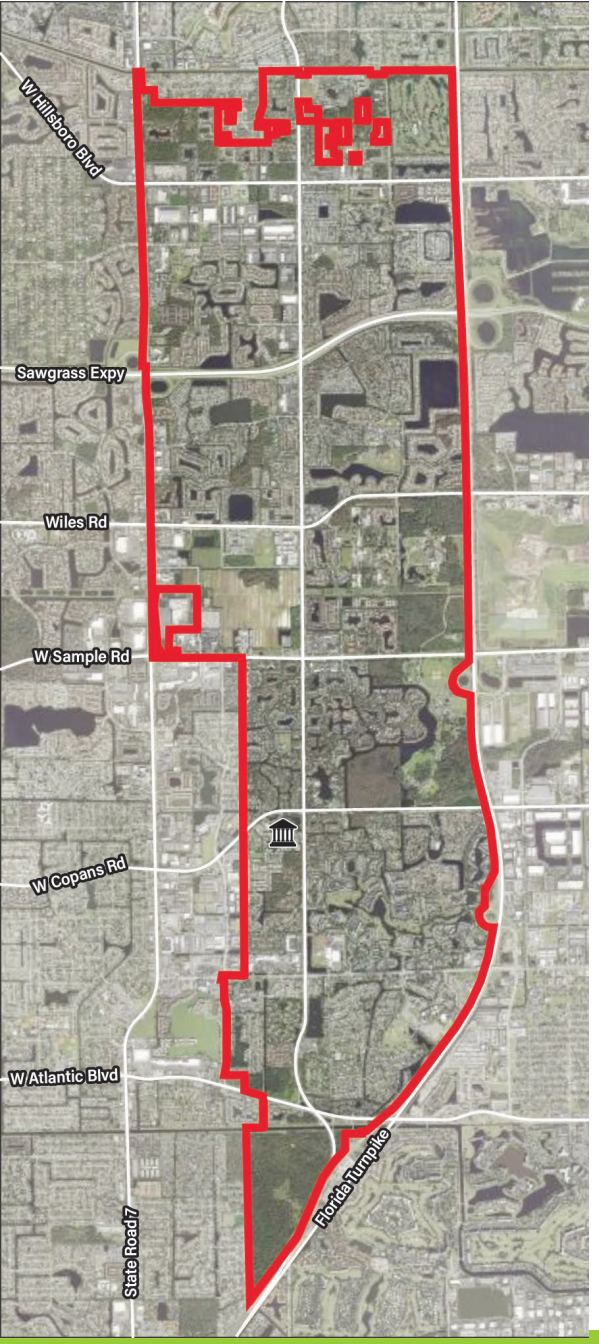


Coconut Creek can…

- Due diligence to identify need for additional studies & projects
- Apply for federal/state/non-profit **grant funding opportunities**
- Effectively plan for the immediate and future **resilience** of the community
- This study is the first step only!

WHAT THIS STUDY IS NOT?

- No advanced data collection necessary; relies on existing sources
- No development of climate models; uses scientifically accepted processes
- Does not allocate City funds or deprioritize certain projects; will be used as one factor during decision-making

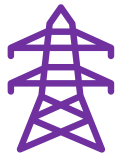


STUDIED THREATS

- Storm Surge and Sea-Level Rise
- Rainfall Induced (Compound) Flooding
- Groundwater Inundation
- Extreme Heat

CITYWIDE ASSETS

Transportation assets and evacuation routes - bridges, bus stops, parking structures, state/county/local roads



Critical infrastructure - communications infrastructure, solid waste debris sites, drinking water, stormwater, wastewater infrastructure, EV/PV charging

Critical community and emergency facilities –city hall, colleges/schools, community centers, government facilities, grocery stores, healthcare facilities

Natural, cultural, and historical resources – public/private parks, protected lands, surface water, wetlands

DATA SOURCES

- NOAA
- Broward County
- FDOT
- City of Coconut Creek
- City of Margate
- USGS
- US Census Bureau
- Florida State Emergency Response Team (SERT)

OUTREACH

STEERING COMMITTEE

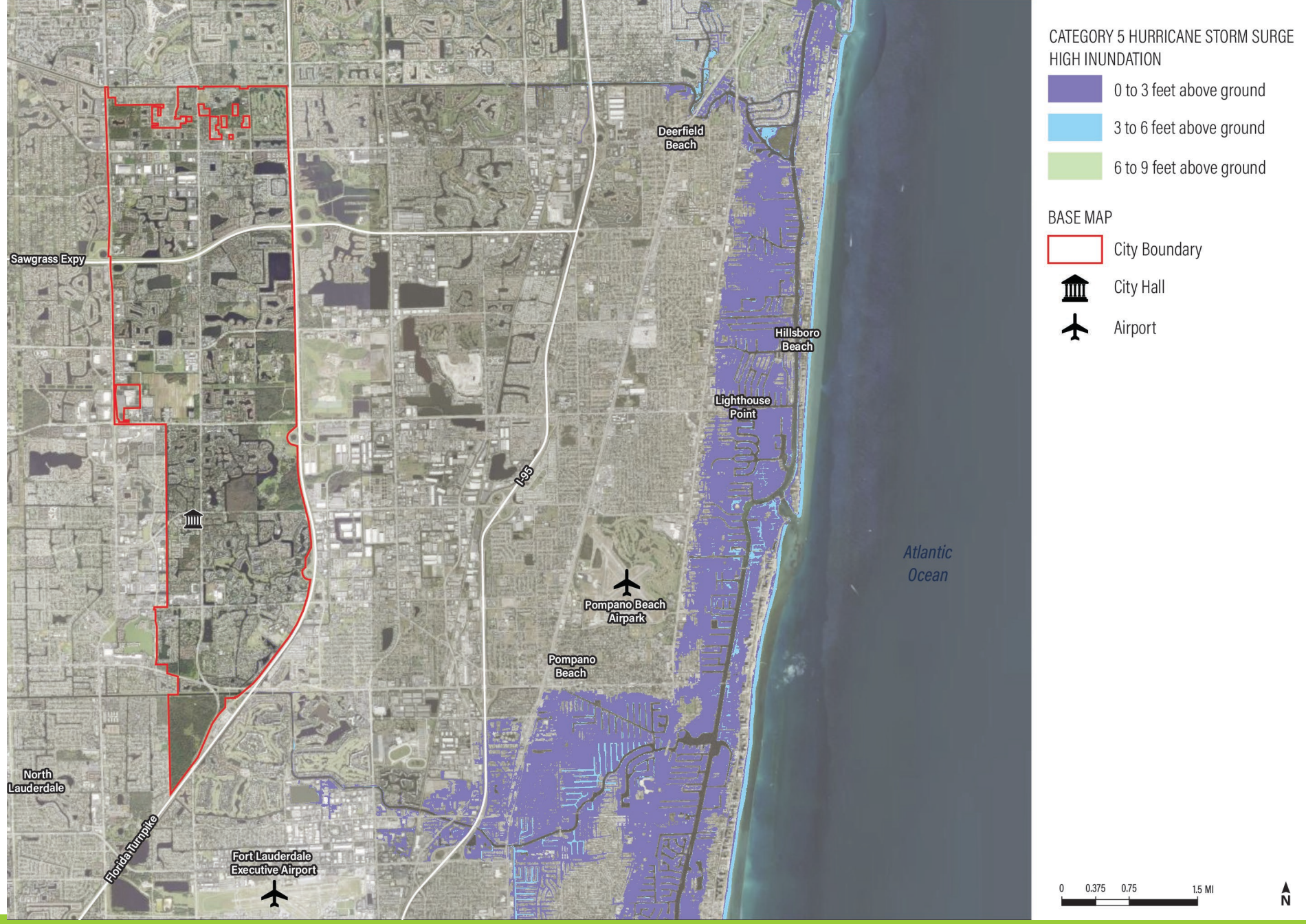
- Feedback on assets
- Areas of concern
- Metrics for extreme heat
- Asset-threat pairings
- Project review

AMBASSADOR PROGRAM

- Areas of concern
- Focus area
- Prioritize strategies

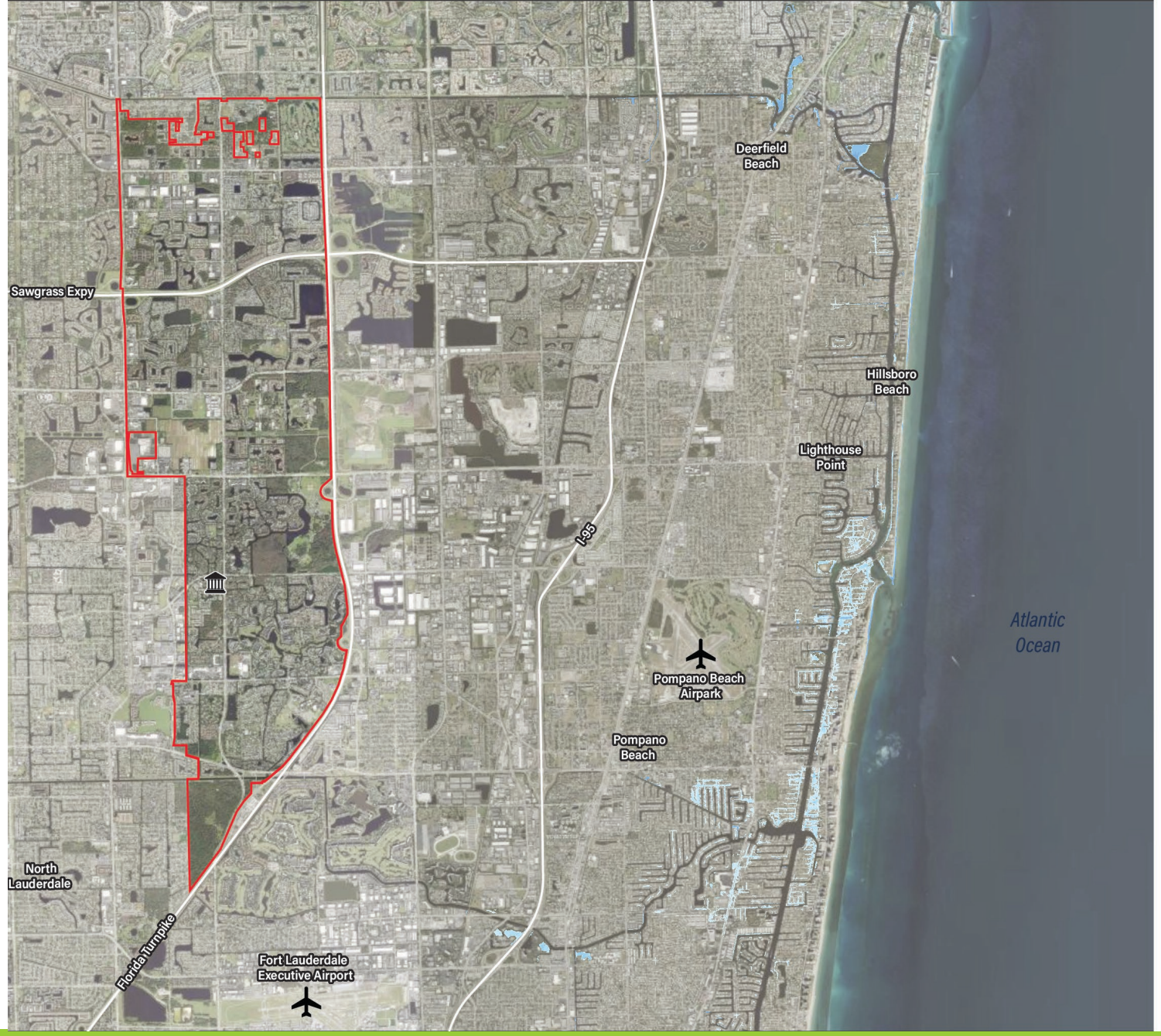
Storm Surge

- No direct impact
- Consider regional impacts



Sea Level Rise

- No direct impact
- Consider regional impacts
  - Population migration
  - Infrastructure services



Rainfall Induced (Compound) Flooding

STEP 1

Scenario Code	Event Probability	Event Duration	SLR Projection	Planning Horizon	Storm Surge
VA-21	100-yr	72-hour	2017 NOAA Intermediate Low	2040	Storm Surge (Cat 5)
VA-24	100-yr	72-hour	2017 NOAA Intermediate High	2040	Storm Surge (Cat 5)
VA-27	100-yr	72-hour	2017 NOAA Intermediate Low	2070	Storm Surge (Cat 5)
VA-30	100-yr	72-hour	2017 NOAA Intermediate High	2070	Storm Surge (Cat 5)

STEP 2

Score	Criteria
No exposure (0)	Flood elevation is 6 inches or more below the asset elevation.
Low (1)	Flood elevation is 0.01 inches to 5.99 inches below the asset elevation
Moderate (2)	Flood elevation is up to 6 inches higher than the asset elevation.
High (3)	Flood elevation is greater than 6.01 inches higher than the asset elevation.

STEP 3

WILL THE ASSET BE IMPACTED OR DAMAGED IF IT FLOODS?	
Score	**Criteria**
1	No, the asset will not be affected
2	Yes, mildly
3	Yes, damage will be significant but reversible
4	Yes, damage will be significant and irreversible

STEP 4

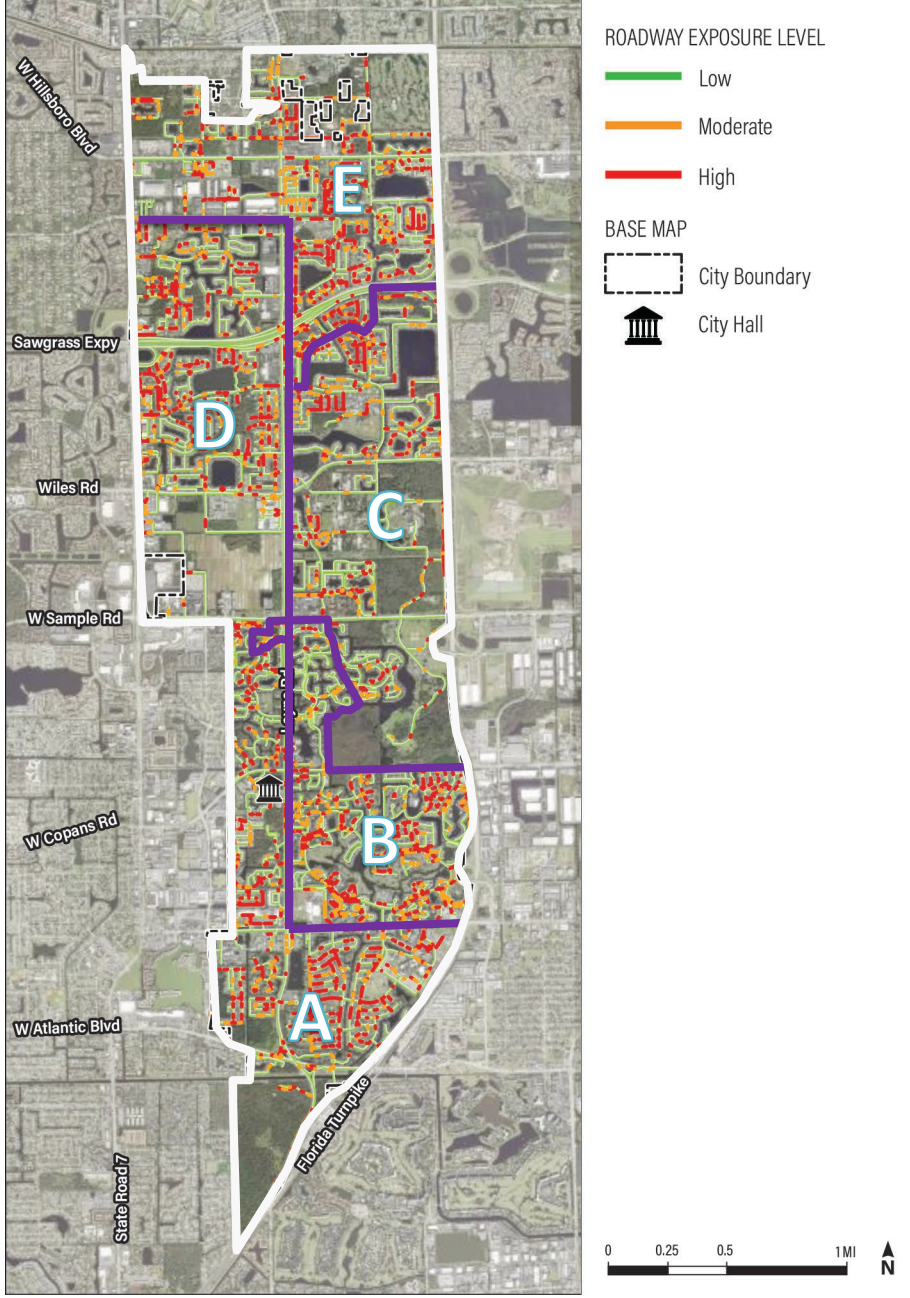
Prioritization based on medium to high vulnerability & risk

Rainfall Induced (Compound) Flooding

Roads

57 lanes miles/24% of roadways

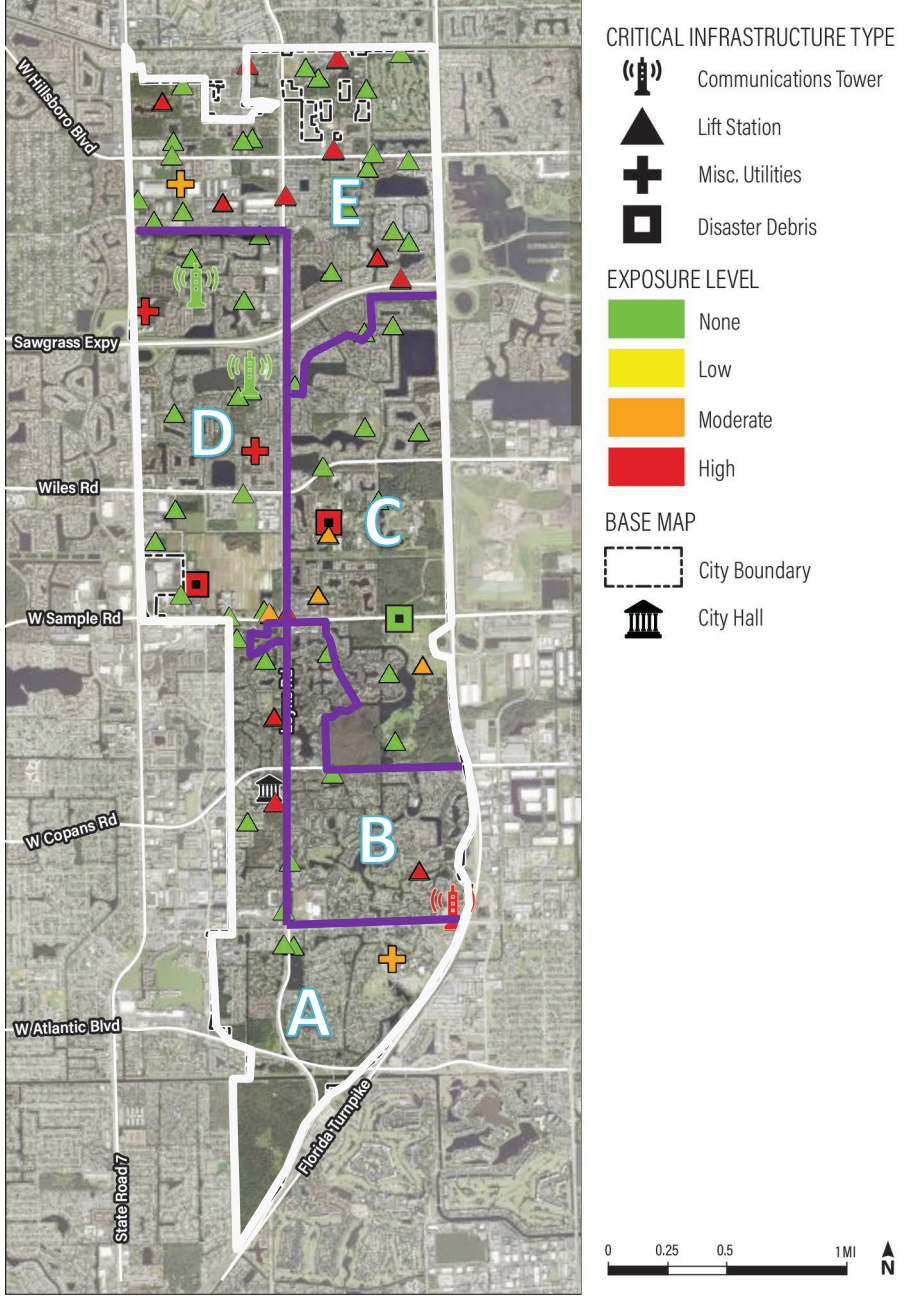
- Almost all are City-owned roads, local roads



Rainfall Induced (Compound) Flooding

Critical Infrastructure

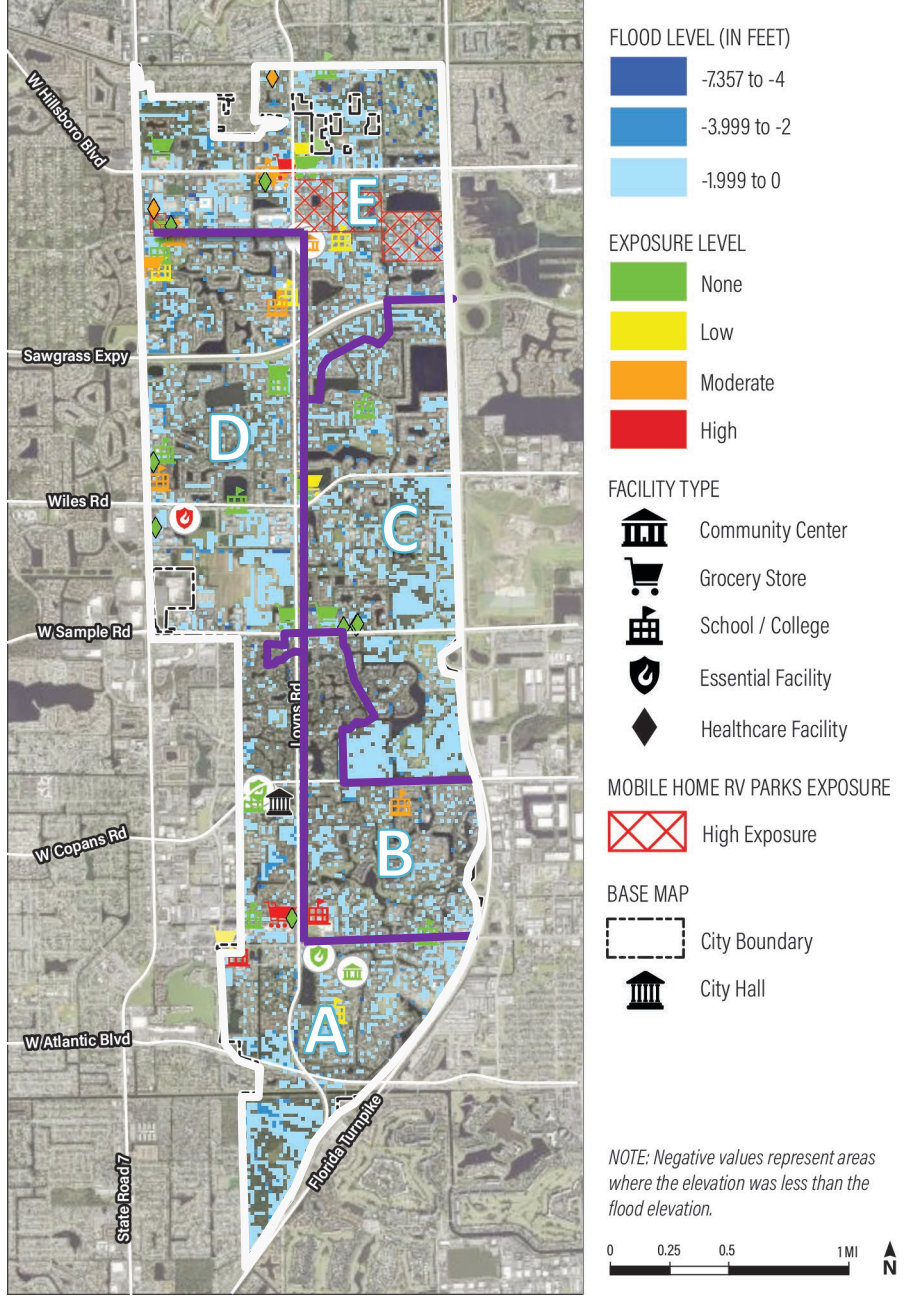
- 9 lift stations
- T-Mobile South communication tower
- Site 1 & Site 2 disaster debris management sites
- FPL Substation, Broward Tank, Utilities Eng. Building, & Hilton Tank



Rainfall Induced (Compound) Flooding

Critical Community Facilities

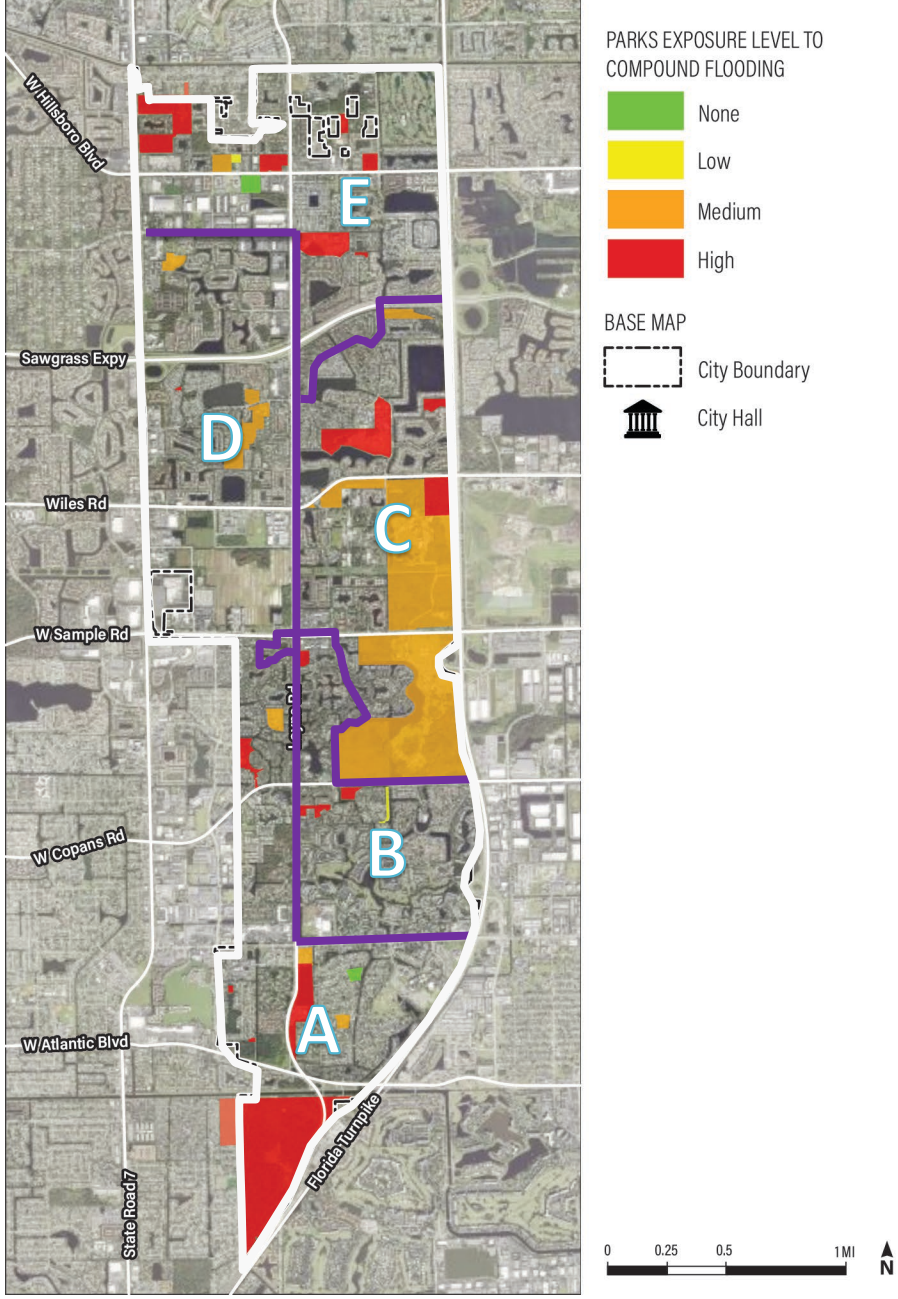
- 5 grocery stores
- Coconut Creek Community Center
- 6 schools/colleges
- Coconut Creek Fire Rescue Station 113
- All mobile home parks



Rainfall Induced (Compound) Flooding

Parks, Preserves, Natural Areas

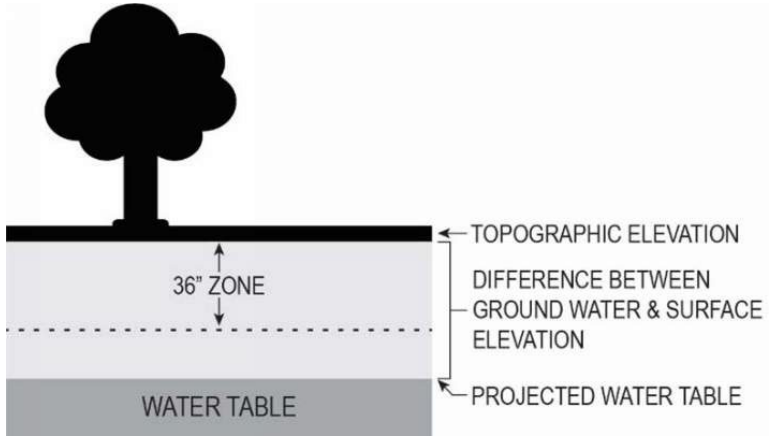
- 22 parks (79%)
- 10 protected natural lands (91%)

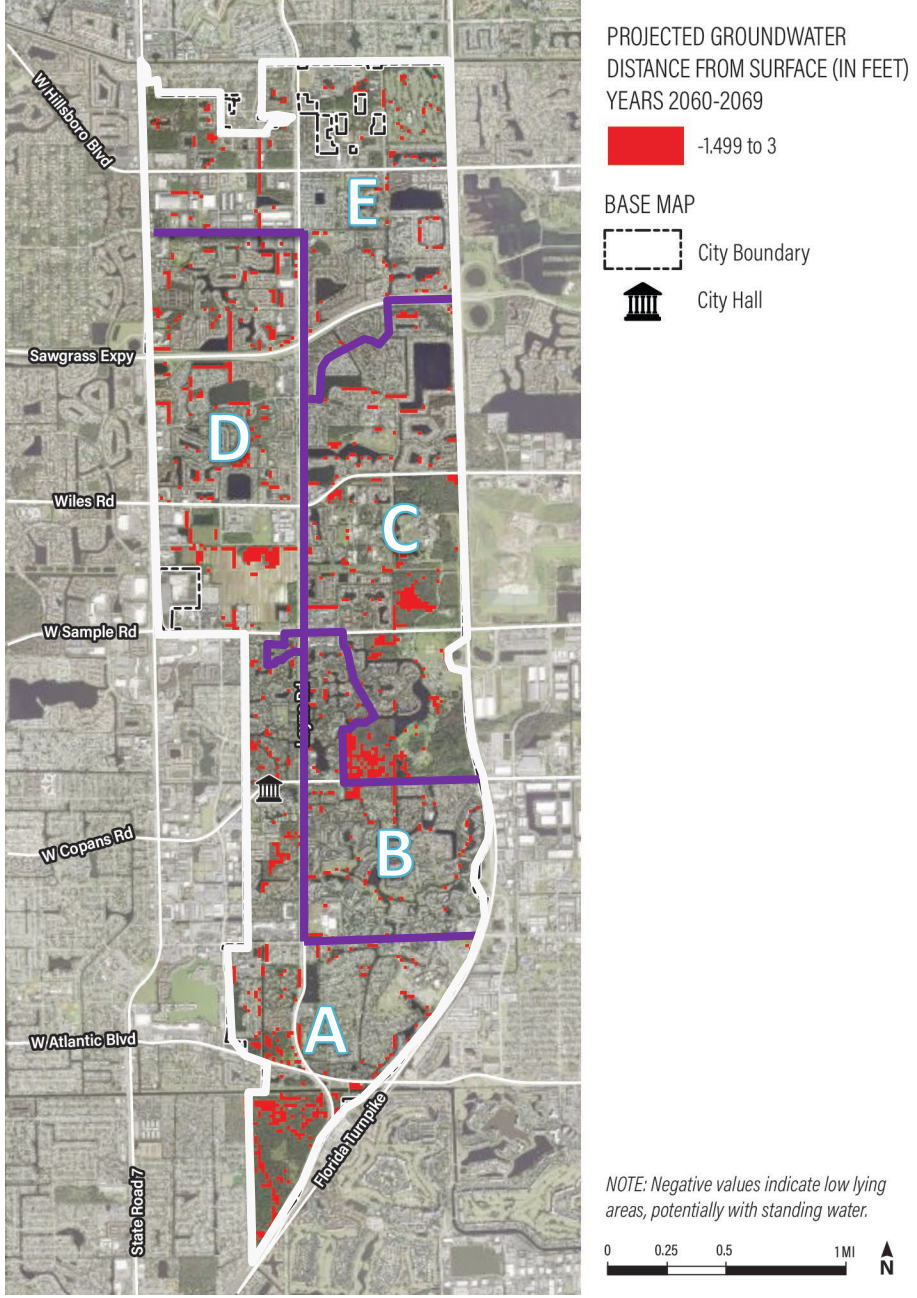


Groundwater Inundation

Groundwater within 36” of the surface

- Aligns with existing surface water areas
- No areas of significance outside of these surface water locations





Extreme Heat

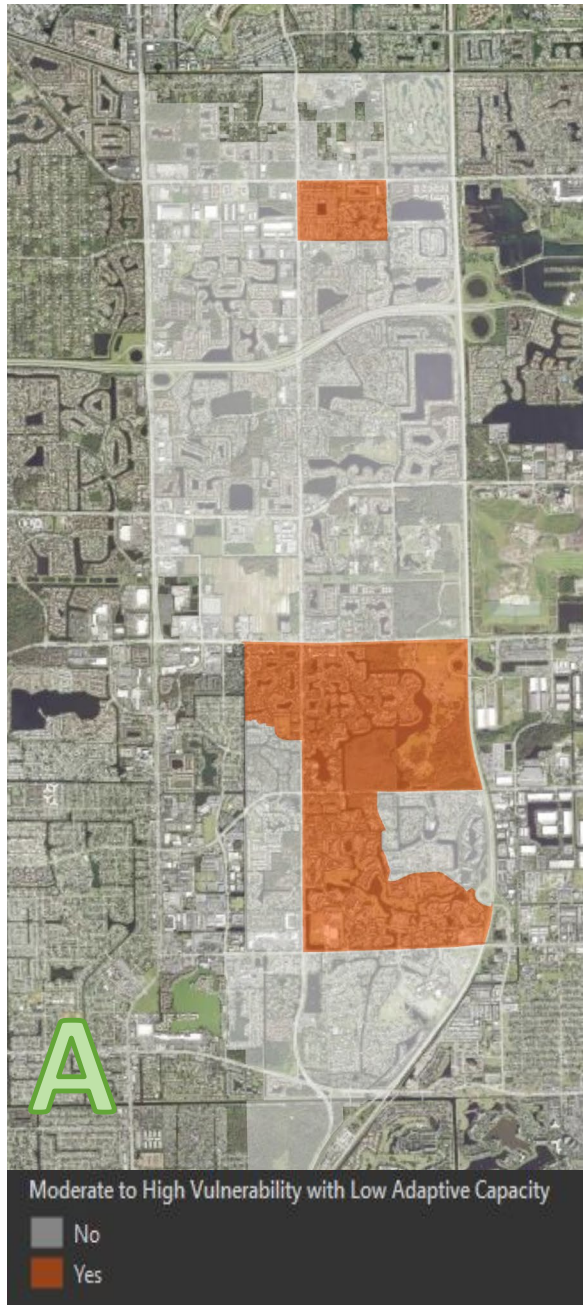
- Aged younger than 18 or older than 65
- Impervious coverage
- Tree canopy coverage

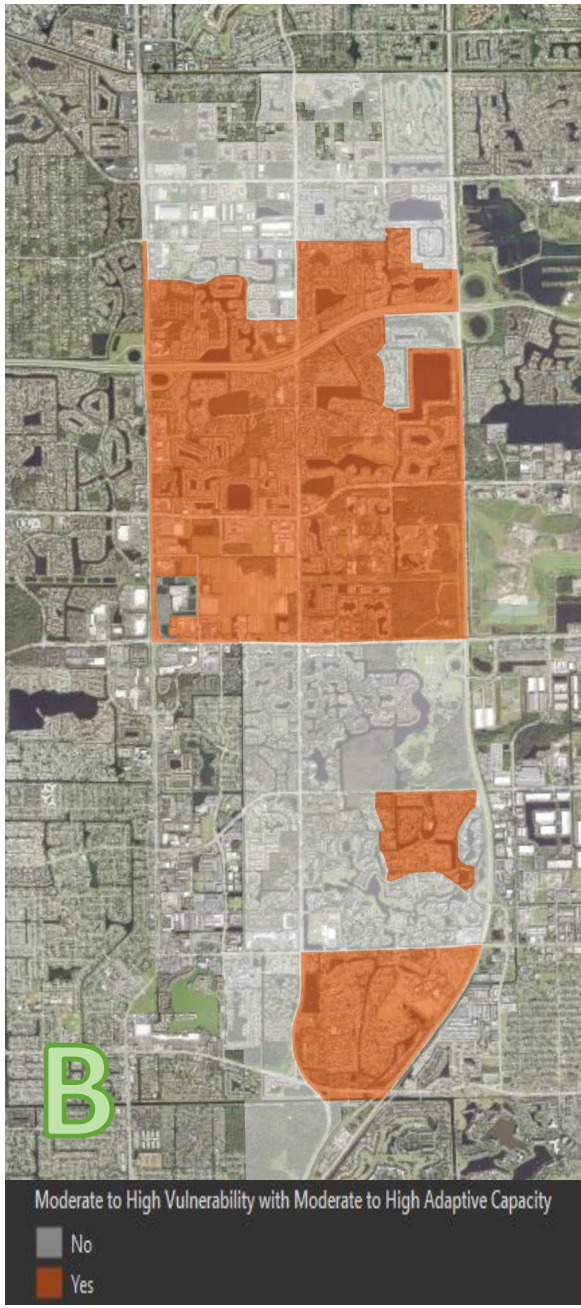
A <u>High Vulnerability/Low Adaptive Capacity</u>

1512 ac/19.6% of the city

B <u>High Vulnerability/High Adaptive Capacity</u>

3790 ac/49.3% of the city





Focus Areas

What are the City's priorities?

Geographic locations – specific neighborhoods or areas of the city

Types of assets – physical buildings; important road corridors

Population or demographics –highest population; vulnerable populations; employment centers

Adaptation Strategies

How can the City address the priorities?

Infrastructure – green infrastructure; asset hardening

Land Use, Building Codes & Standards –climate action plan; green building standards

Planning, Policy, & Management – revise city code; operations; internal practices

Capacity Building – partnerships with other public, private, non-profit organizations

Public Outreach – public engagement; communication; education

Funding and Financing – grants, loans; homeowner improvement programs

Focus Area 1:
Resiliency of the Built Environment

- Addresses extreme heat and rainfall/compound flooding
- Built environment = locations in which people live, work, and engage in various activities

POTENTIAL ADAPTATION STRATEGIES

1. Resiliency audit of land development code
2. Climate stressor impact fee

Focus Area 2: Socially Vulnerable Populations and Community Resilience

- Addresses extreme heat and rainfall/compound flooding
- Income, race, and age that predispose these residents as more vulnerable
- Ability of the residents to be able to withstand and recover from climate related events
- Community resilience = safeguard the socially vulnerable populations

POTENTIAL ADAPTATION STRATEGIES

1. Build community resilience through weatherization resources

2. Programs to evaluate and monitor community resilience of vulnerable populations

Focus Area 3: Transportation Assets and Performance

- Addresses rainfall/compound flooding
- Ability to move both resources and people during extreme events

POTENTIAL ADAPTATION STRATEGIES

1. Establish long-term monitoring program of asset quality
2. Designate alternative travel routes for flood events
3. Implement a local roads advisory program

Next Steps

- Receive and address tonight's comments
- Finalize report
- Submit documents for state grant compliance review
- Website for community distribution