



Welcome to the 2018 FRPA  
Conference!

# PARK SUSTAINABILITY AND RESILIENCY

FRPA 2018 | August 27

**AECOM**

# Learning Objectives

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- Understand sustainability and resiliency principles and practices
- Identify how sustainability and resiliency practices can be incorporated in to parks
- Recognize the benefits of incorporating these practices in to your parks



01 Introduction

02 Concepts of Sustainability and Resiliency

03 Resiliency Efforts in Miami

04 Morningside Park Resilient and Sustainable design

05 Summary and Conclusion



Researchers recently estimated the value of New York's Central Park at \$500 billion. At \$28 million an acre, this urban park is the **most highly valued ecosystem on the planet.**

National Geographic has identified the Miami Metropolitan Area as the worlds most vulnerable urban area in terms of potential asset loss at a total of \$1 Trillion



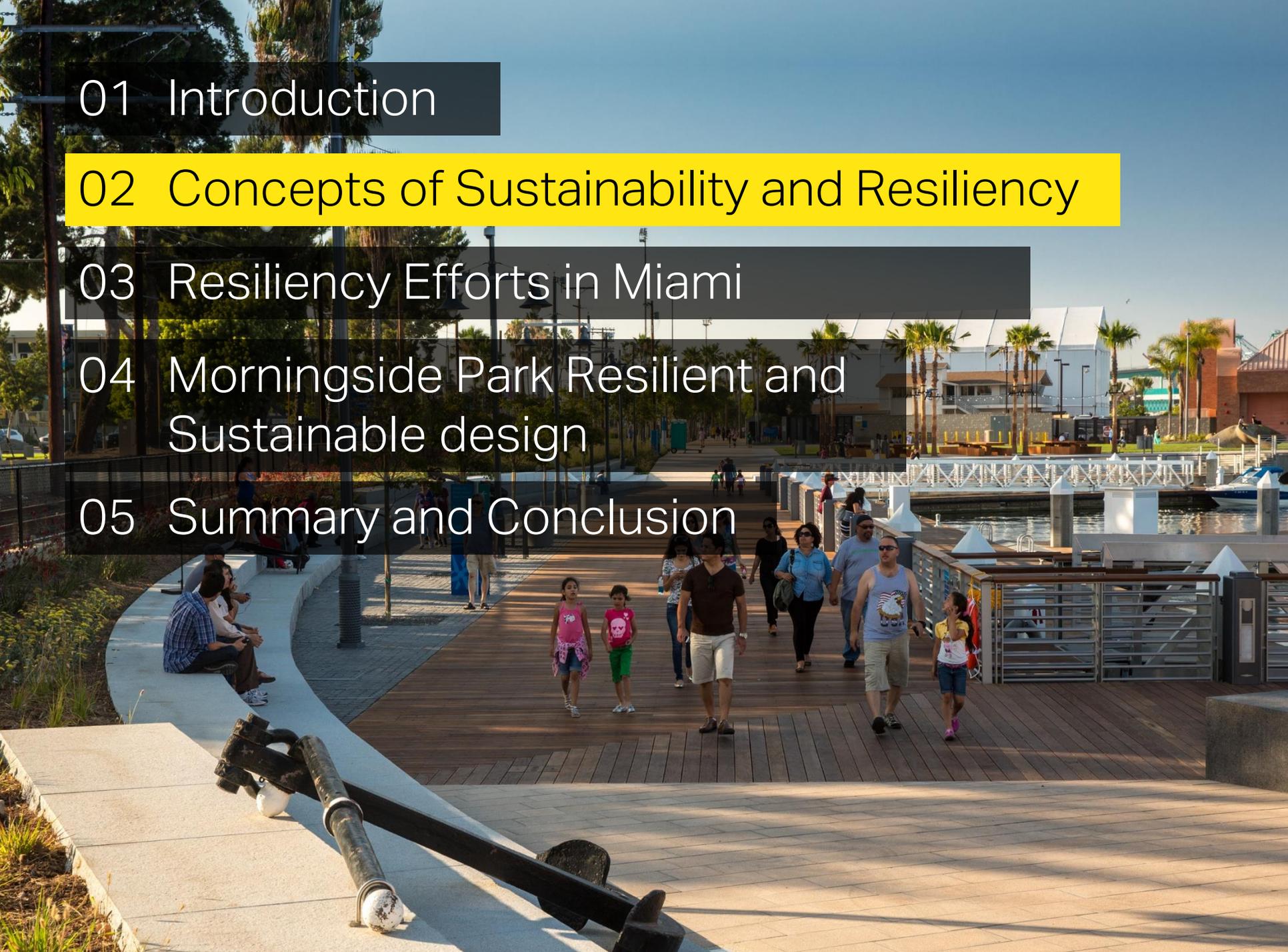
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# What is Sustainability

## Definition:

- *An approach or process that allows for continued use or benefit of a resource without destroying it.*
- *Preservation of resources through management.*



Source: Ft. Lauderdale Parks

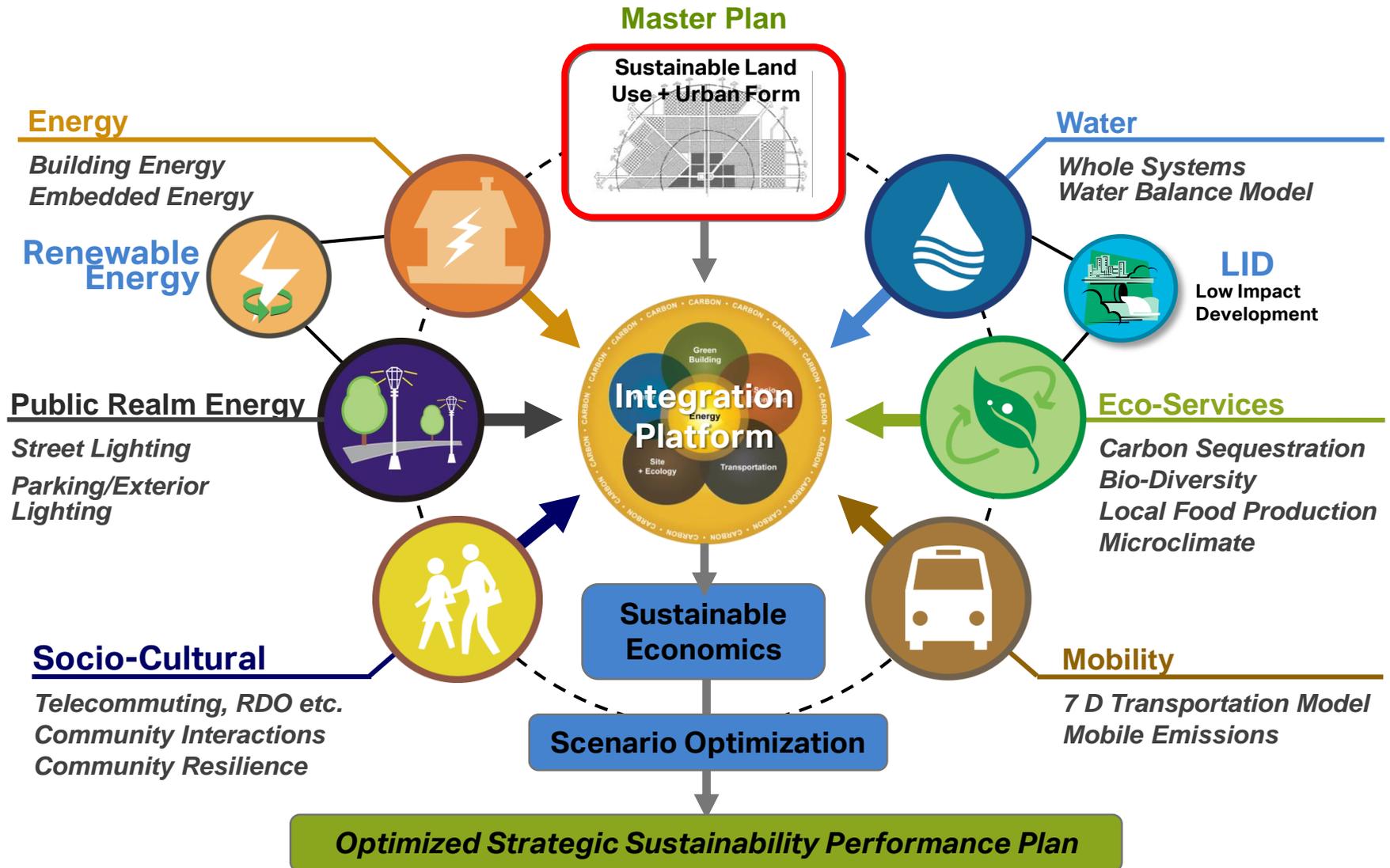
# What makes a park sustainable?

## Key Themes

- Environmental stewardship
- Integration of built and natural systems
- Clear goals and objectives
- Ability to measure & quantify performance
- High Performing Systems that enhance social, environmental and economic co-benefits (TBL)



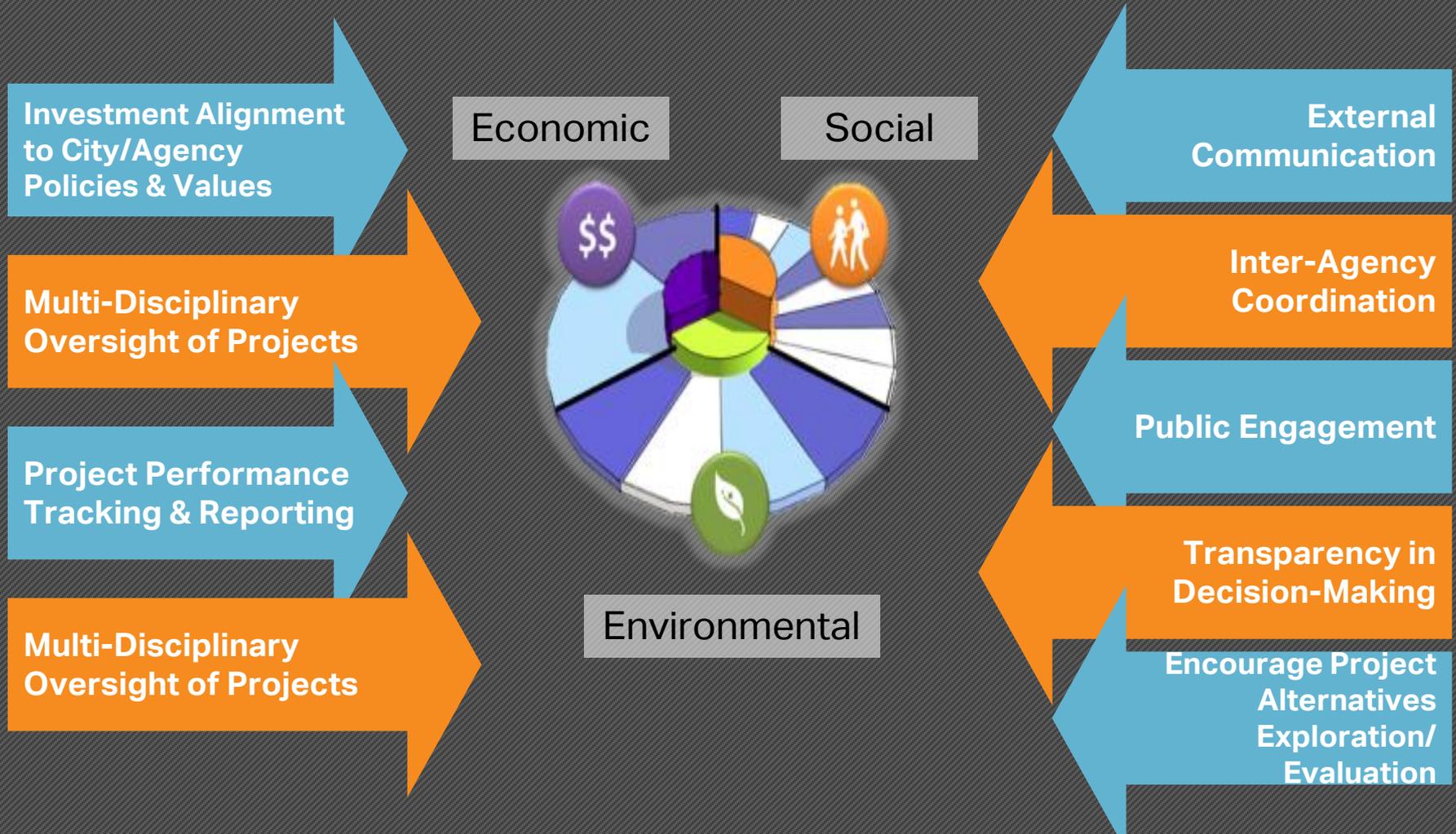
# Integrated Sustainability Framework:





# Triple Bottom Line (TBL)

Quantifying Financial, Social and Environmental Benefit



# TBL Tool Applied to Park Projects



## CIP Prioritization & Evaluation

Triple Bottom Line Assessment



Remove TBD  Weight Criteria Equally [Show / Hide Scores](#)

Project Name: **ST-121Z**

Description: System of connected concrete storage detention structures under parking and roadway.

### ECONOMIC *weighting*

- E1** Property Values ◀ | ▶ 3
- E2** Employment Generation (direct) ◀ | ▶ 3
- E3** Tourism ◀ | ▶ 3

### DELIVERY *weighting*

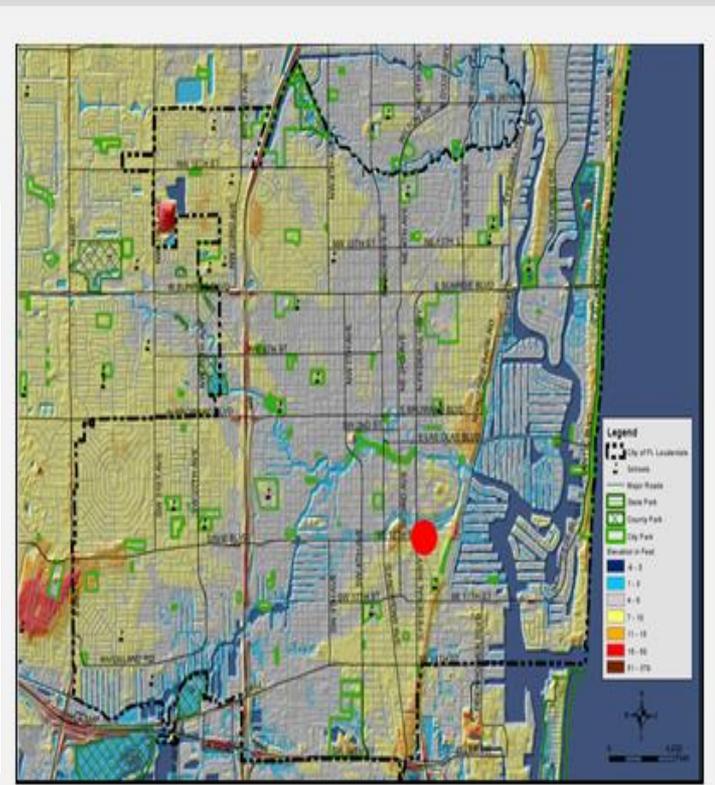
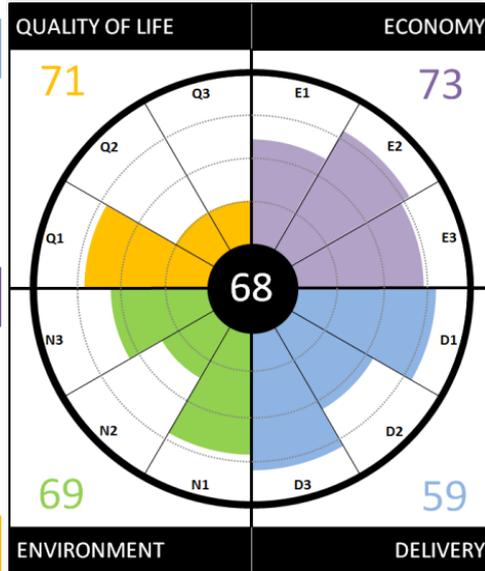
- D1** Project Feasibility ◀ | ▶ 3
- D2** Cost to Community ◀ | ▶ 3
- D3** Policy Compliance ◀ | ▶ 3

### ENVIRONMENT *weighting*

- N1** Resiliency to Sea Level Rise/Flooding ◀ | ▶ 3
- N2** Ecology and Habitat ◀ | ▶ 3
- N3** Climate ◀ | ▶ 3

### QUALITY OF LIFE *weighting*

- Q1** Public Health ◀ | ▶ 3
- Q2** Recreation ◀ | ▶ 3
- Q3** Connectivity ◀ | ▶ 3



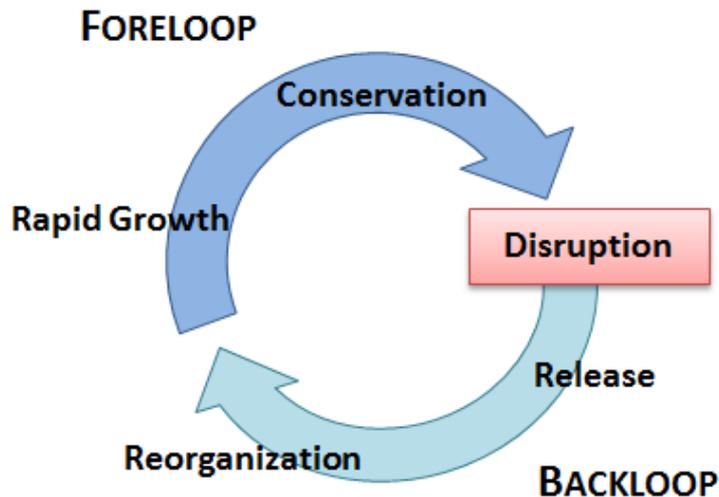
PROJECT PERFORMANCE INDICATOR METRICS

Notes: All criteria are scored from -100 (negative) to +100 (positive) relative to performance and impacts of the project to the criterion. Negative impacts are shown in red.

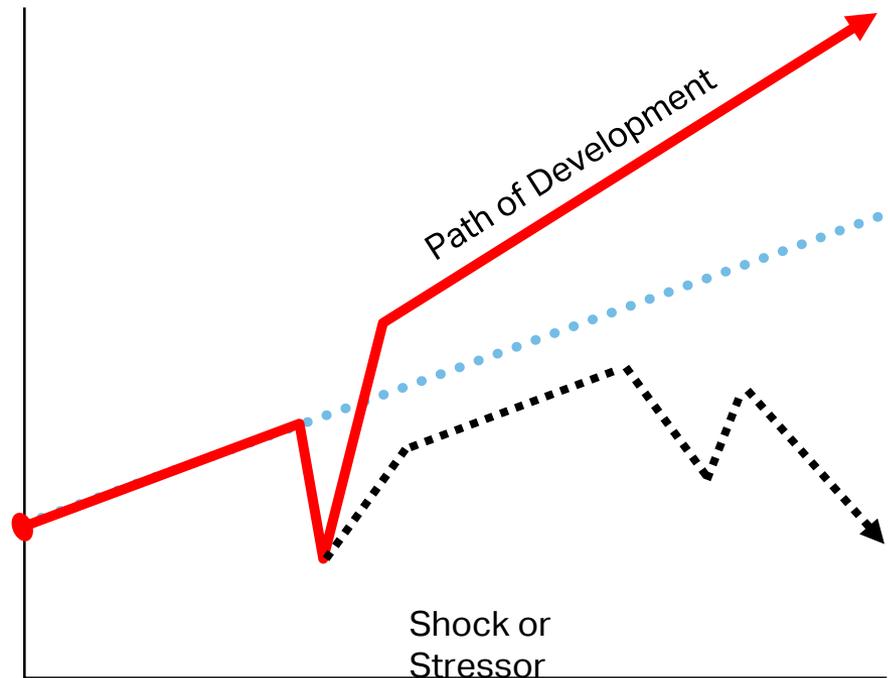
# What is Resilience?

**"Planning for tomorrow, today."**

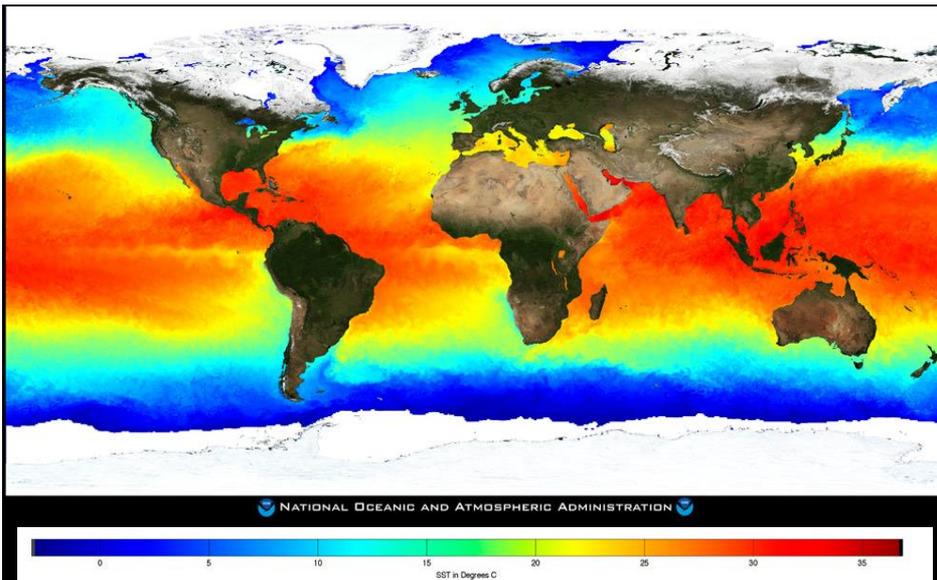
The capacity of **individuals, communities, institutions, businesses** and **systems** to *survive, adapt, and grow* no matter what kinds of **chronic stresses** and **acute shocks** they experience.



Source: The Resilience Dividend, Rodin 2014

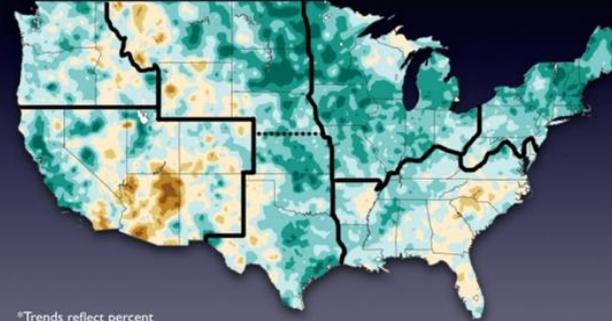


# Global and Regional Climate Hazards



## CHANGING RAINFALL PATTERNS

- AVERAGE U.S. PRECIPITATION UP 5% -



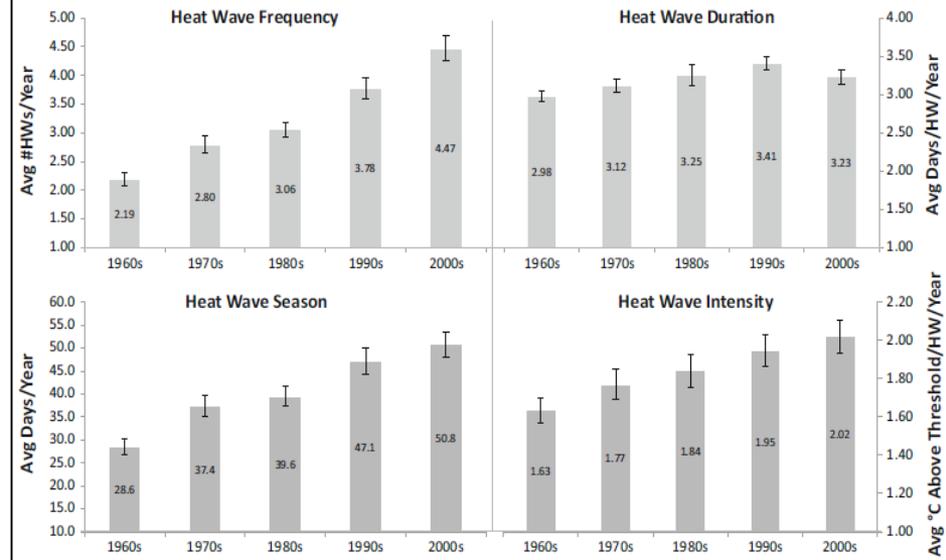
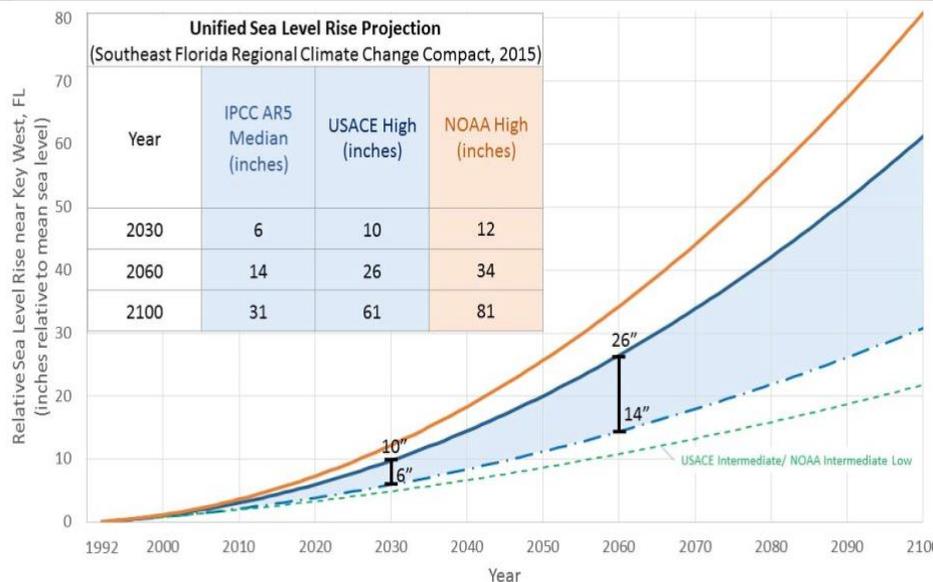
- North East: +8%
- Midwest: +9%
- Southern Great Plains: +8%
- Rest of country: mixed increases and decreases

\*Trends reflect percent changes in climatic averages from 1901-1960 to 1991-2012

Source: Fig. 2.12 National Climate Assessment 2014

< -15%    > 15%

CLIMATE CENTRAL

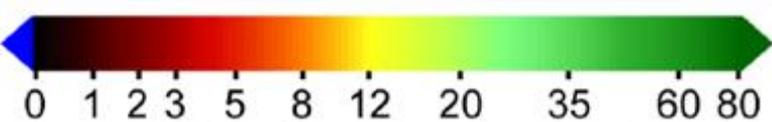


# Climate Hazards in Florida

## Sea Level Risks

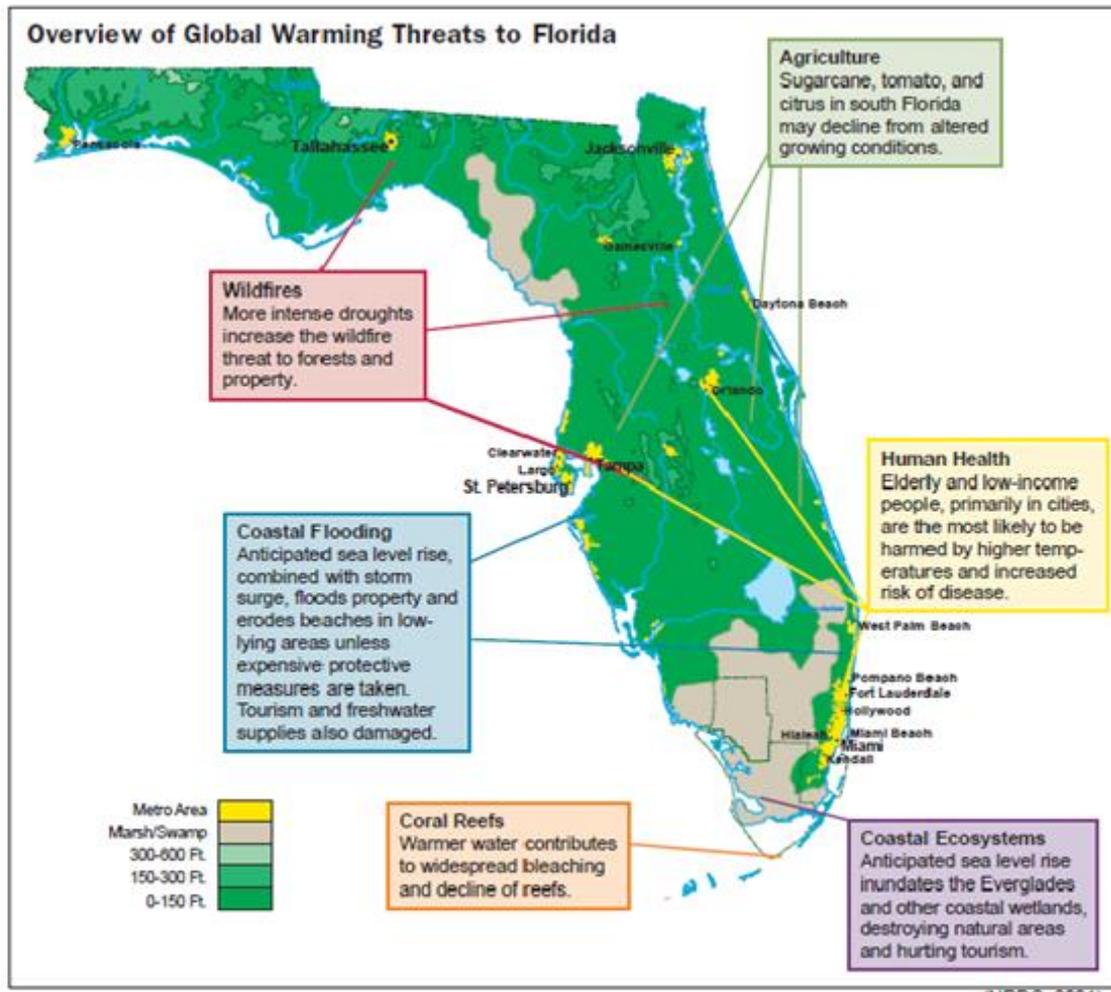


Based on SRTM30 PLUS v. 2.0



Height Above Sea Level (m)

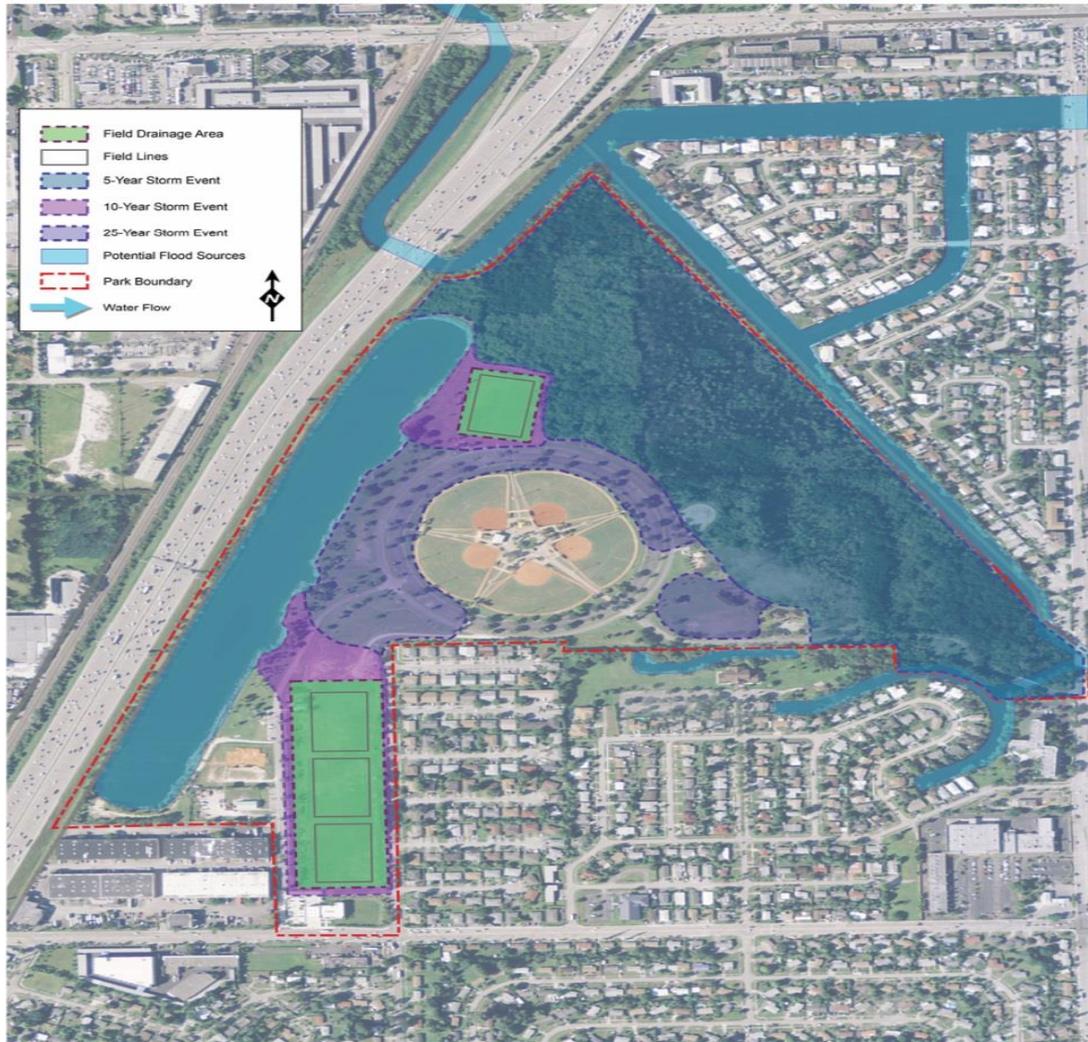
[http://www.beachapedia.org/File:Florida\\_Sea\\_Level\\_Risks.png](http://www.beachapedia.org/File:Florida_Sea_Level_Risks.png)



(NRDC, 2001)

# Resilient Strategies in Parks

## Fort Lauderdale Parks Master Plan Highlights



**Figure 4-9: Typical Sunken Field Detention Basin**

In flood events, water is directed into the sunken fields from multiple directions, transforming the field and its surrounding banks into a detention basin.



Water continues to fill the basin until the capacity is reached. In the case of Mills Pond Park, a series of fields can be treated as tiered basins, where one fills first and then overflows into the next if necessary. Note that the light post are encased concrete pillars.



Once the flood event is over and the basins are stabilized, the fields begin to drain the water, and are restored to their original state, with artificial turf ready for immediate play.



# Sustainable Strategies in Parks

## Fort Lauderdale Parks and Recreation System Master Plan Highlights

Figure 4-7: Prototypical Community Park and Sustainable Strategies



### Lighting and Energy

- 5 **LED Light Fixtures** - reduce energy consumption and maintenance and replacement costs.
- 6 **Dark Sky Compliance** - minimizes light pollution and unnecessary energy consumption.
- 7 **Solar Panels on Pavilions and Light Fixtures** - provides alternative energy source for amenities at the point of need.
- 8 **Large Wind Turbines** - provides additional energy to the park site, as well as education value for alternative energy demonstration.



### Sustainable Amenities

- 13 **Reusable Materials** - use of recyclable materials reduces landfill needs.
- 14 **Green Roofs** - incorporates water filtration into vertical structures with large surface areas.



### Drainage and Water Filtration

- 9 **Swales** - grading the site to drain into swales allows for efficient drainage and storage, and can be designed to benefit drainage from surrounding areas.
- 10 **Rain Gardens** - provides drainage and water filtration for surface runoff from adjacent areas.
- 11 **Native Plants** - use of native plants allows for naturally stabilized areas and decreased maintenance and irrigation needs.
- 12 **Educational Signage** - increases awareness of the importance of natural systems, stormwater management, water quality, and sustainable energy.



### Community Gardens

- 15 **Edible Plants** - helps increase education and awareness of health and wellness, urban agriculture and food access.
- 16 **Sustainable Irrigation** - utilize cisterns, water barrels, and drip irrigation for irrigation with on-site water sources.



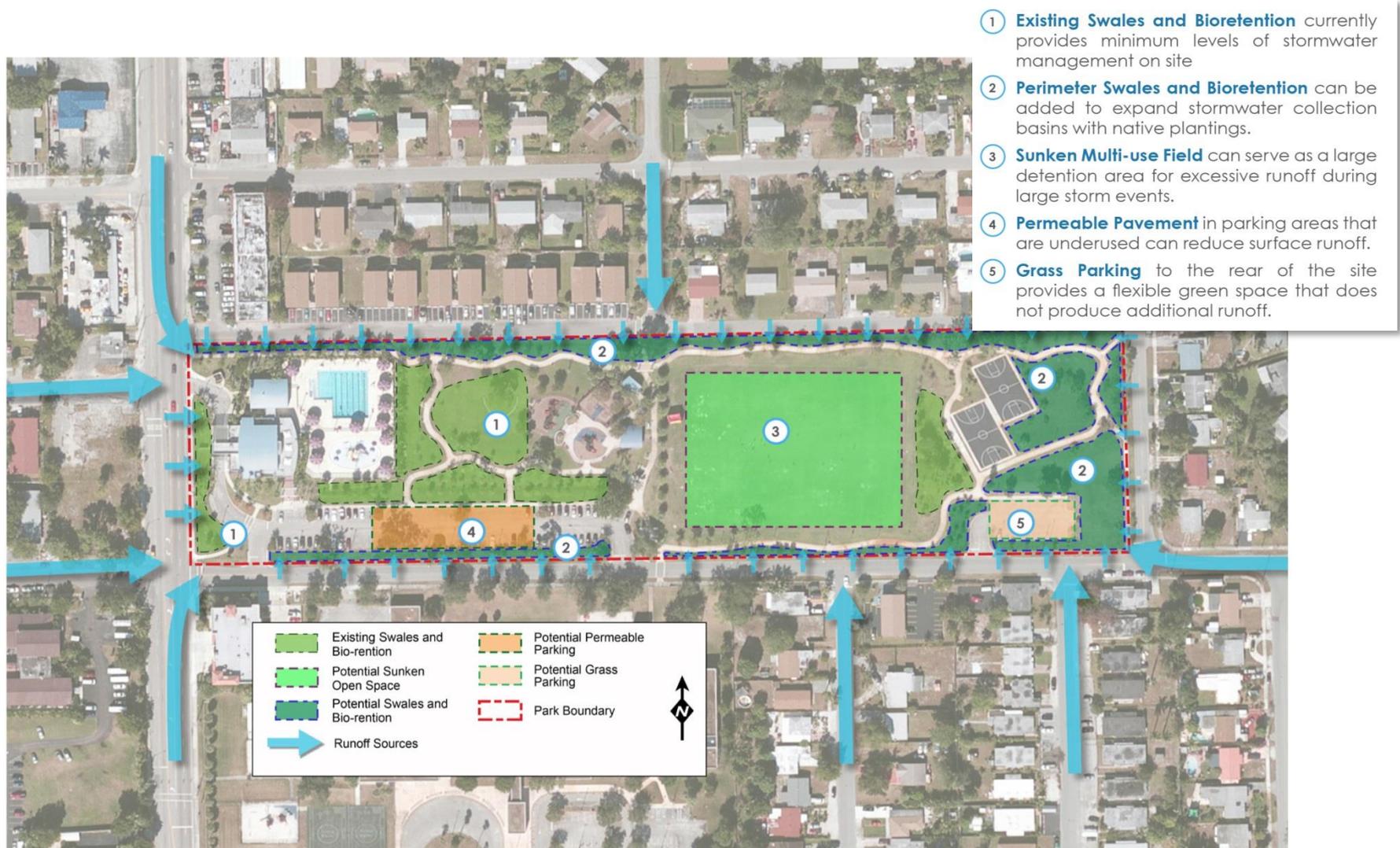
### LID Parking

- 1 **Permeable Pavement** - reduces surface runoff and allows for water filtration.
- 2 **Grass Parking** - serves as flexible green space and overflow parking when needed, reduces surrounding temperatures.
- 3 **Shade Trees** - provide aesthetic benefits and reduces heat in parking area.
- 4 **Heat Islands/ Rain Gardens** - provide shade for temperature reduction, increased tree canopy and water filtration.



# Sustainable Strategies in Parks

## Fort Lauderdale Parks and Recreation System Master Plan Highlights



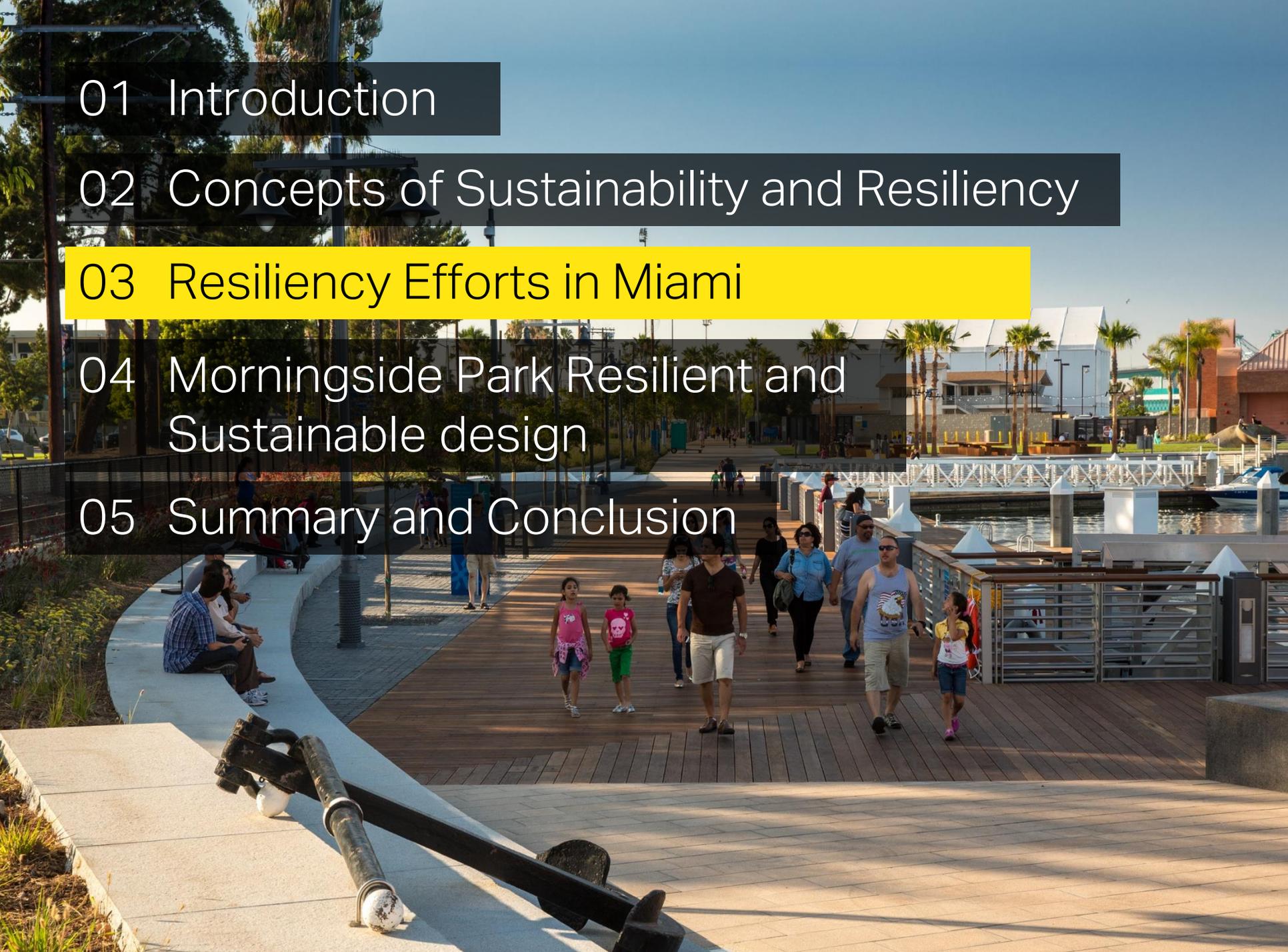
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# Hurricane Irma-Dinner Key



# Hurricane Irma-Dinner Key Miami City Hall



# Hurricane Irma-Peacock Park



## Our challenges continue.... King Tides October 5<sup>th</sup>, 2017 through November 5, 2017



Morningside Park



Peacock Park

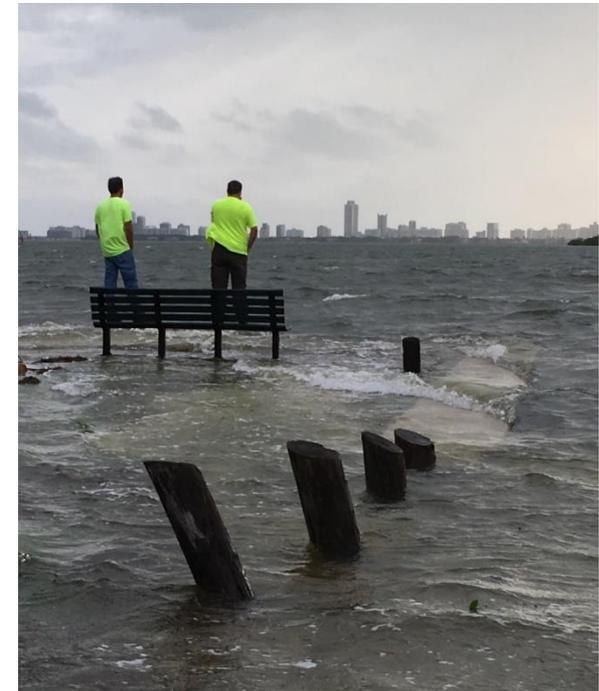
## King Tides



Kenneth M. Myers Park



## King Tides





- Resilient Redesign of Shorecrest
  - Recognizing Shorecrest's urgent vulnerability to flooding and diverse demographics, the City is using Shorecrest as a model for inter-disciplinary neighborhood adaptive planning.
  
- Sea Level Rise Committee
  - Provided staff support to the Sea Level Rise Committee- a volunteer committee charged with advising City Commission on policy recommendations to strengthen the City's resilience to sea level rise.
  
- Ecosystem Restoration and Tree Canopy
  - Investing in trees is a simple environmental design choice that yields numerous and diverse benefits. In addition to the well-known air purification benefits trees provide, their shades helps create more energy efficient and livable cities by lowering ambient temperatures.



## – Resilient Greater Miami and the Beaches

- Launched and complete Phase I of the Resilient Greater Miami and the Beaches Strategy development. Gathered input and ideas from over 3,000 residents, business owners, civic leaders and subject matter experts through focus groups, meetings, online questionnaires, and numerous speaking engagements.

## – Zika Response

- Office of Resilience and Sustainability is involved in ongoing Zika-related work, including public messaging and policy-related discussions. Zika virus and other vector-borne diseases will be addressed in the Resilient Greater Miami and the Beaches.

## – Launch of Stormwater Master Plan Update

- Supported the RFQ and selection of engineering firm to complete an updated Stormwater Master Plan that takes sea level rise and other increasing flood risks due to climate change into account while balancing economic, ecological, and equity considerations.



## – Hurricane Irma Response and Recovery

- Prior to hurricane season, the Office of Resilience and Sustainability (ORS) was instrumental in restructuring post-disaster recovery in the City of Miami. This included moving the management of FEMA's Public Assistance Program to the Finance Department and increasing training to build recovery capabilities and skills in City Staff.

## – King Tide Action Plan

- The City's first King Tide Action Plan was launched this year which focused on spreading King Tide awareness. Information was pushed out to all City residents about the dates and times of King Tides in addition to preparedness tips through both online and in person methods before the seasons began as well as prior to each flood event.

## – Strategic Plan Integration and Resilience Appendix to 2017-2018 Budget

- In coordination with the Office of Strategic Planning, Office of Resilience and Sustainability (ORS) introduced resilience related questions into the annual residents survey. ORS worked with the Office of Management and Budget to identify operational and capital improvements programs and investments across all departments that address the resilience priorities indicated in the resident survey.



## – Resilient Infrastructure Working Group

- Coordinated by the Chief Resilience Officer, the City formed an internal inter-department Resilient Infrastructure Working Group with the purpose of ensuring climate and other resilience considerations are appropriately recognized in capital improvement plans. This effort will help ensure that a holistic and strategic resilience-focused approach is used to prioritize where and when the City invests in infrastructure and capital improvements, accounting for both physical and socio-economic vulnerabilities in its assessments.

## – Miami Forever Bond

- Office of Resilience and Sustainability staff supported both the development of and outreach around the \$400 million Miami Forever Bond, which Miami voters approved in November 2017. \$192 million of the bond funding is set for investments in flood risk mitigation infrastructure.



## – Resilient Redesign of Jose Marti Park

- With support from the Van Alen Institute, City of Miami will invite an interdisciplinary design team to develop a community-involved, participatory design process for the resilient redesign of Jose Marti Park. Jose Marti Park sits in east Little Havana right on the Miami River and is vulnerable to seasonal high tide flooding. The process will involve researching and analyzing site and contextual elements, identifying opportunities and constraints, engaging stakeholders, and providing recommendations on a phased approach for implementation.

## – Ecosystem Restoration in Virginia Key

- Funding through a grant from National Fish and Wildlife Federation and Wells Fargo, Frost Science is leading an initiative in partnership with City of Miami and Miami-Dade County to demonstrate how community resilience can be built through a series of coastal restoration projects that involve volunteers.

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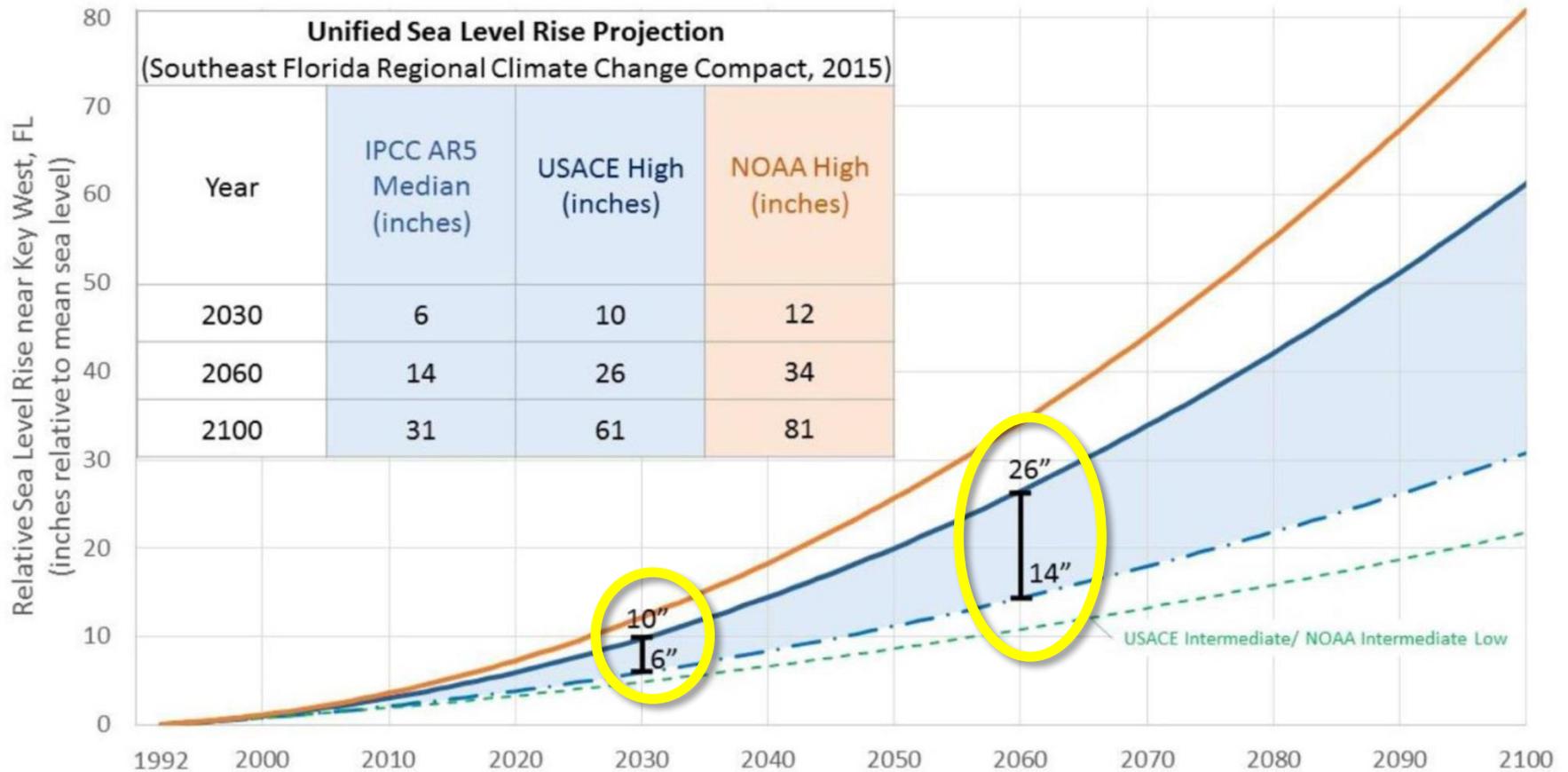


**DEPARTMENT OF PARKS AND RECREATION**

**MORNINGSIDE PARK GENERAL PLAN**

# RESEARCH AND ANALYSIS

## SEA LEVEL RISE



Sea-level rise projections from the Southeast Florida Regional Climate Compact's Sea Level Rise Working Group in 2015. These projections use the year 1991 and mean sea level in Key West, FL as the reference point. 1991 is the midpoint of the current National Datum Epoch (1983-2001, and the most commonly used baseline at present.

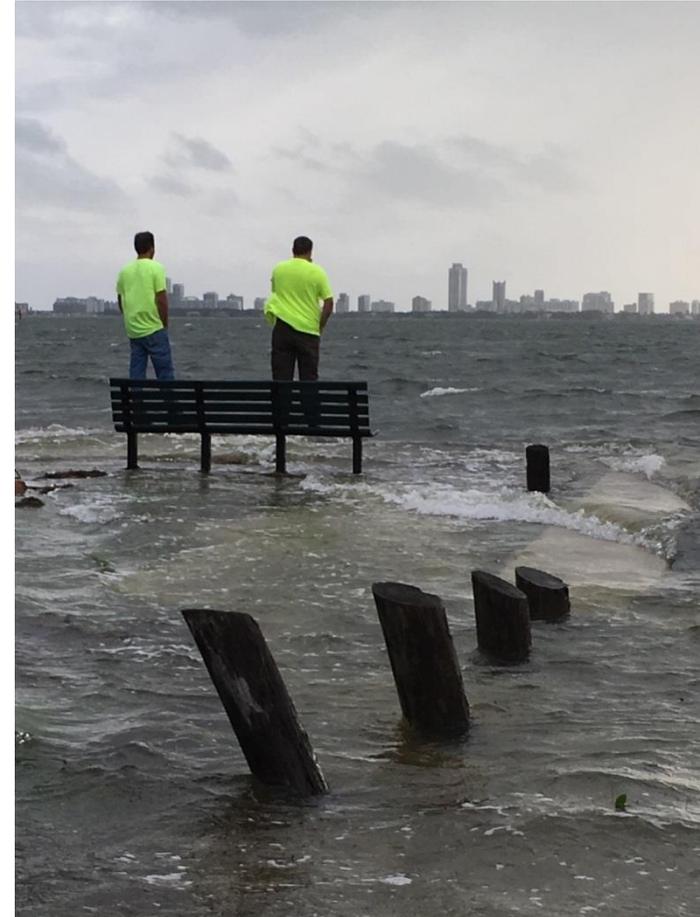
# RESEARCH AND ANALYSIS

## King Tides



# RESEARCH AND ANALYSIS

## King Tides



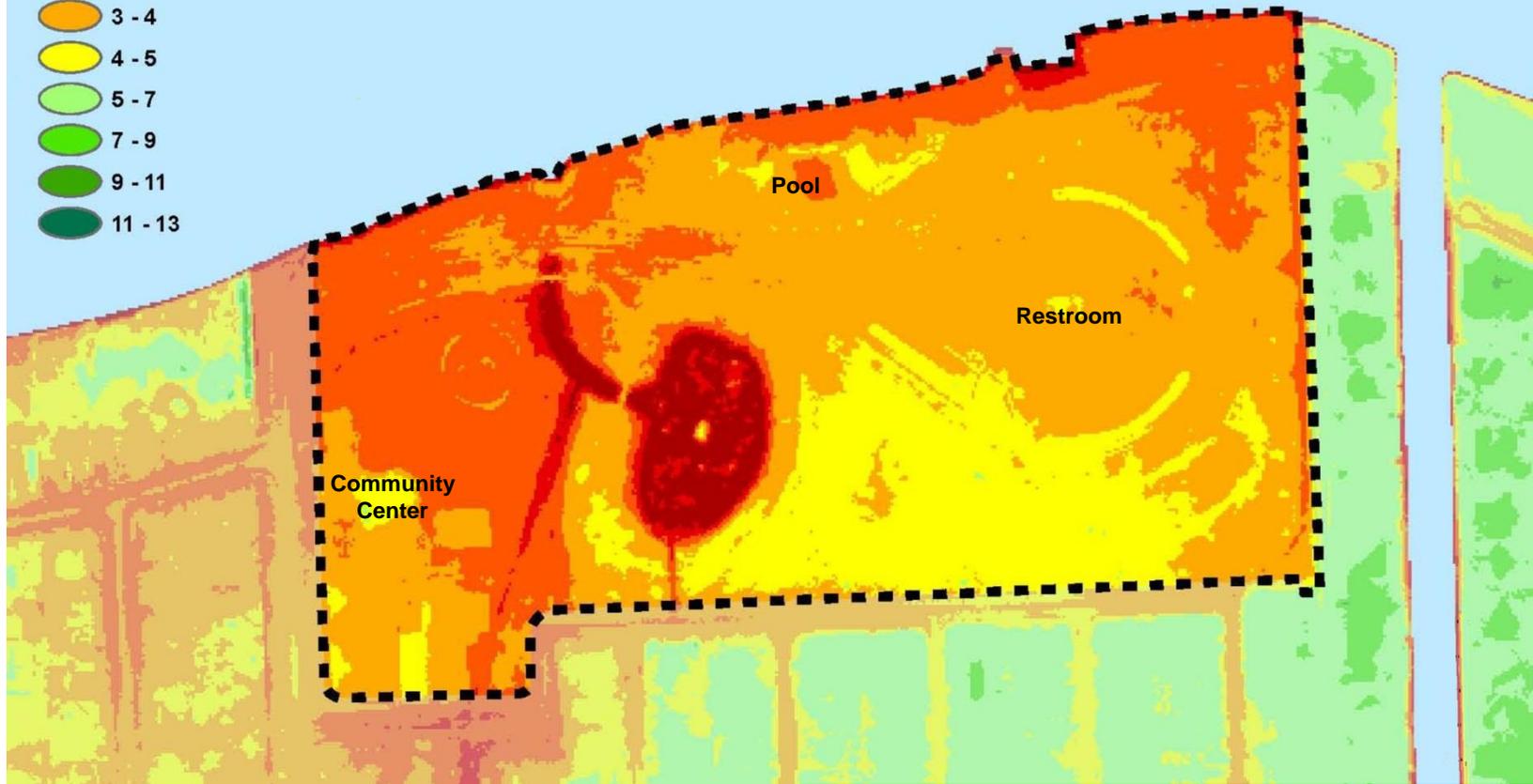
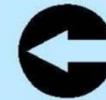
# RESEARCH AND ANALYSIS

 Morningside Park

Elevation (ft NAVD88) \*



0 125 250 500 Feet



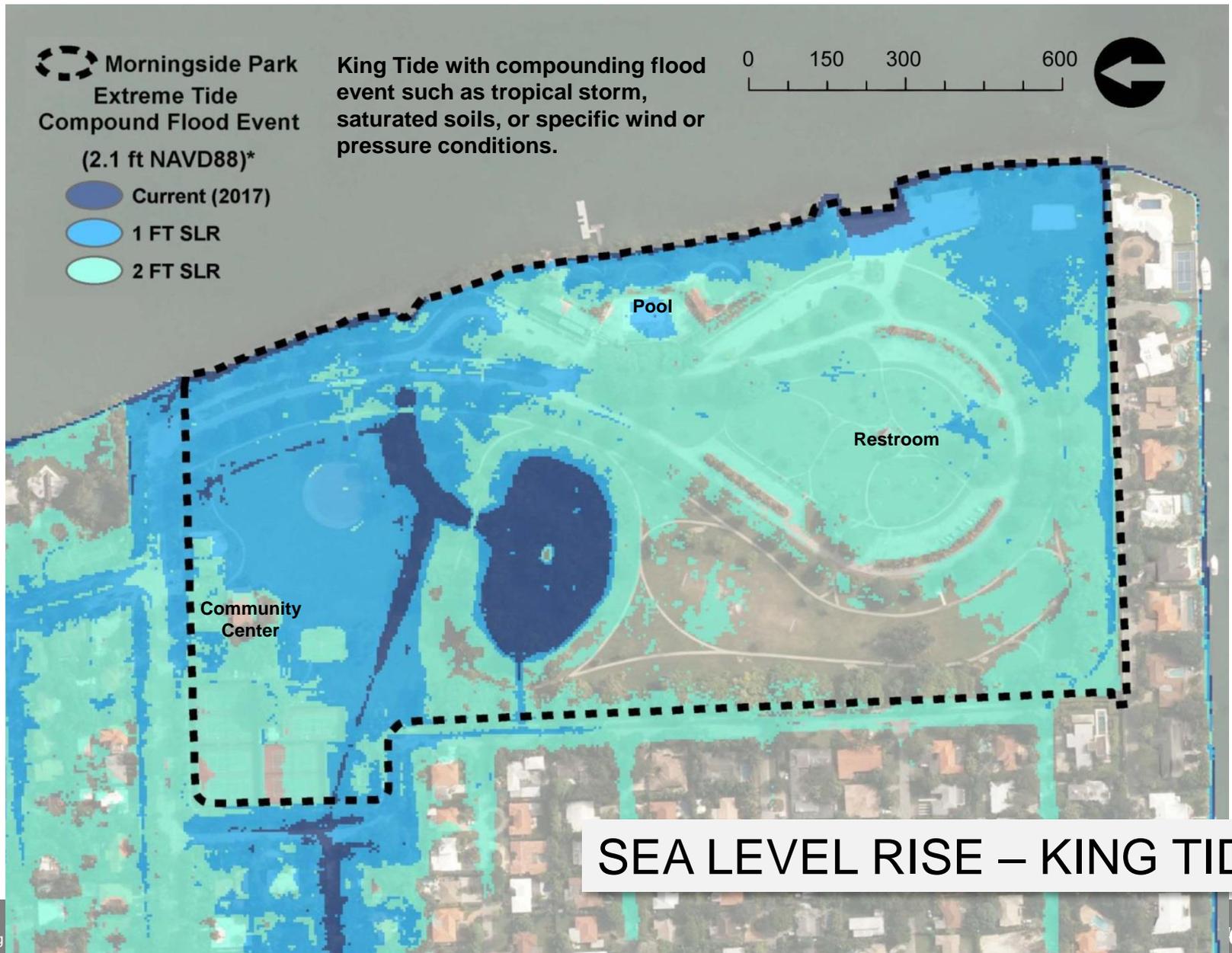
TOPOGRAPHY

# RESEARCH AND ANALYSIS

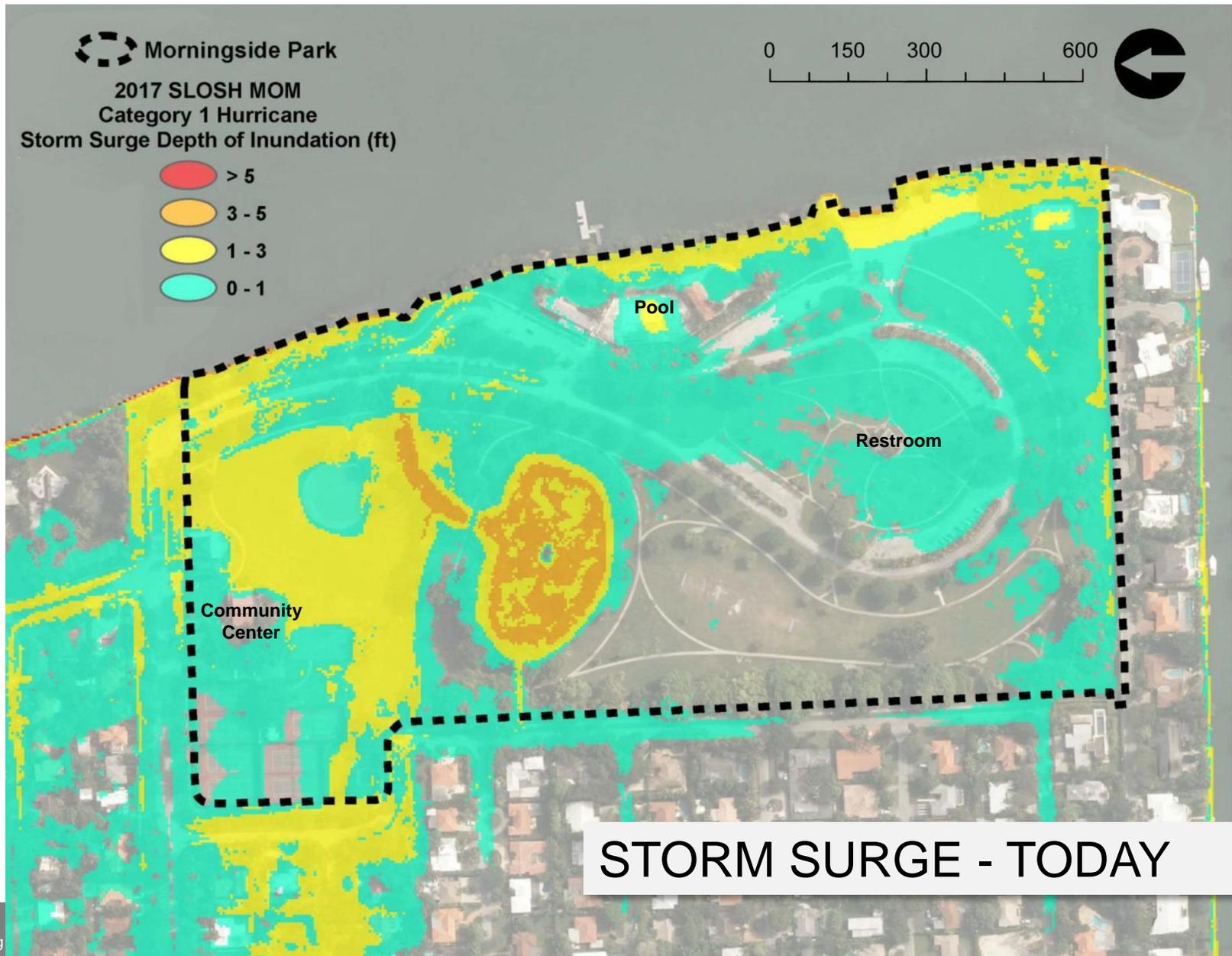
## FLOOD ZONE



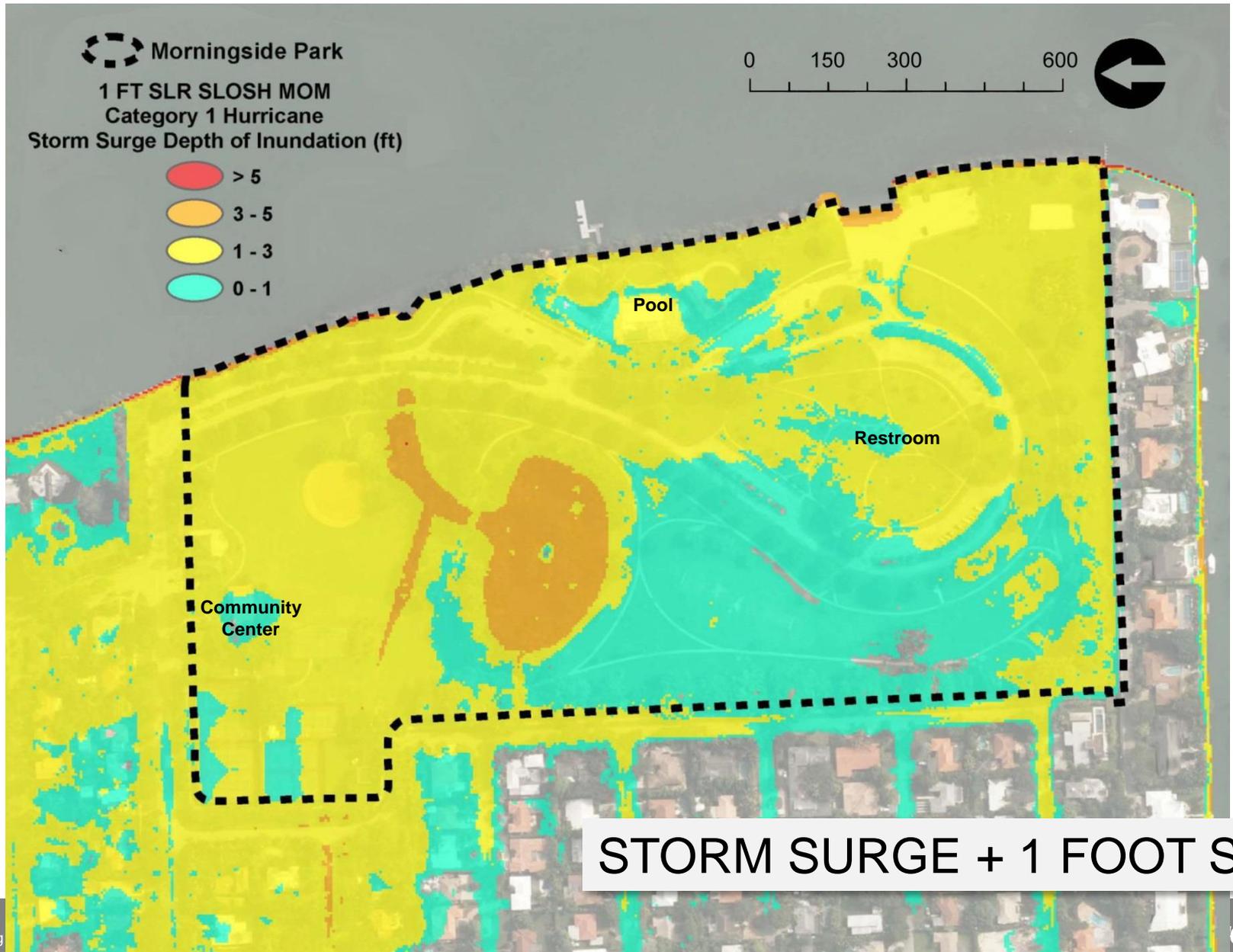
# RESEARCH AND ANALYSIS



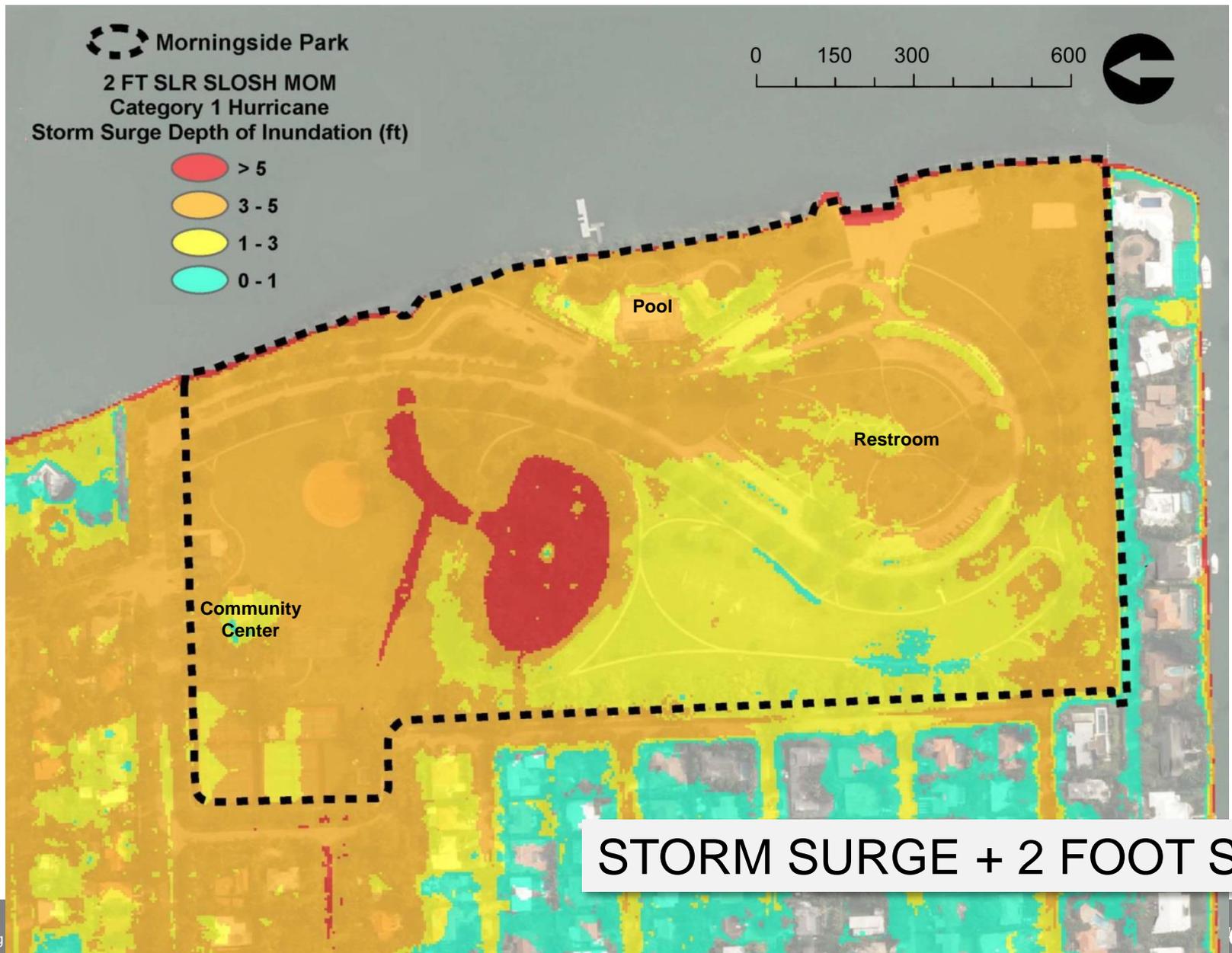
# RESEARCH AND ANALYSIS



# RESEARCH AND ANALYSIS



# RESEARCH AND ANALYSIS



# OBJECTIVES

## Sustainability & Maintenance

- Develop water management system, improve drainage
- Improve park's overall maintenance
- Enhance natural elements for education and resiliency
- Add more trees to park
- Keep/maintain views to bay
- Reduce asphalt, but maintain parking number



# CONCEPTS

## Sustainability & Maintenance



Maintain views of Bay/  
selectively trim  
vegetation

Add more  
canopy trees

Improve  
drainage /  
increase  
stormwater  
capacity in park

# CONCEPTS

## Sustainability & Maintenance



Pervious pavement for boat ramp parking

Selective pervious pavement

Enhance educational access to lake

# CONCEPTS

## Sustainability & Maintenance



Natural coastal infrastructure / living shoreline

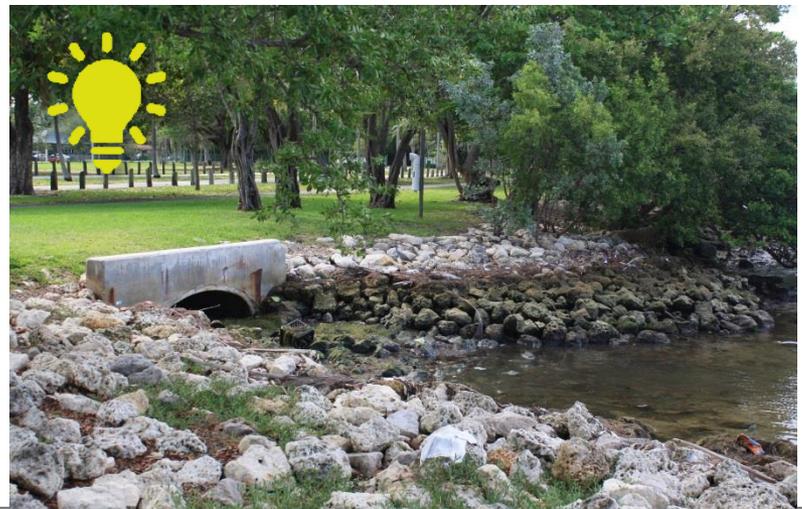
Add outfall flaps to reduce tidal impacts

Improve lighting / dark sky compliant

Enhance water quality through vegetation and on-site temporary storage

# CONCEPTS

## Sustainability & Maintenance



# CONCEPTS

## Sustainability & Maintenance

### LIVING SHORELINES – SOLUTIONS



RiverCamps On West Bay  
(Bay County, FL)



# CONCEPTS

## Sustainability & Maintenance

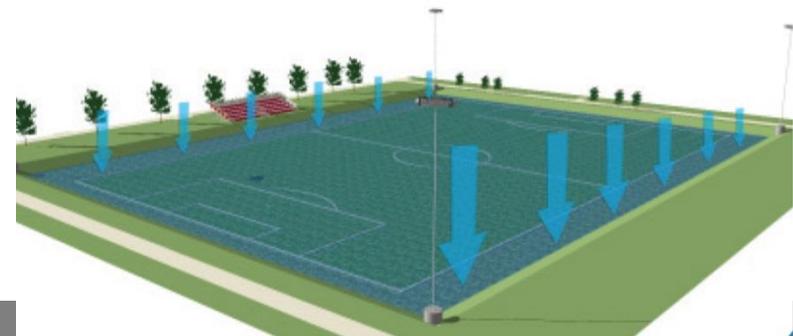
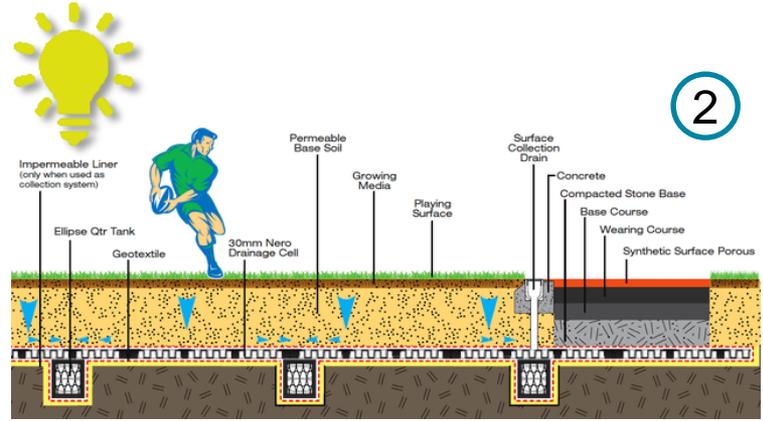


**Bryant Park - Lake Worth Lagoon,  
Palm Beach County: Completed 2012**  
*Funded by Palm Beach County and National  
Endowment for the Arts*



# CONCEPTS

## Sustainability & Maintenance



1. Example of curb cuts for drainage.
2. Examples of stormwater retention in athletic fields (1 millions gallons per sunken field for only 1.5')

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# Summary and Conclusions

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- Climate change, sea level rise, increased frequency of fires and severe storm events, requires us to consider resiliency strategies for our future
- Sustainability planning includes environmental, social and economic considerations, in a balanced, triple bottom line, approach
- Planning for Sustainability and Resiliency is critical in future park planning to insure the protection of assets, but is also a huge opportunity for park agencies to help solve community-wide problems while possibly securing long term development and maintenance funding
- Designing with Sustainability and Resiliency in mind does not require lessening the program opportunities of the park and can be beautiful as well as functional







# PARK SUSTAINABILITY AND RESILIENCY

FRPA 2018 | August 27

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# FRPA

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## FLORIDA RECREATION & PARK ASSOCIATION

For more information about the Florida Recreation and Park Association visit [www.frpa.org](http://www.frpa.org).

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