South Florida Resilient Redesign

Suburban Community

Western Miami-Dade County

Kingdom of the Netherlands

MIAMI CENTER FOR ARCHITECTURE & DESIGN

AIA Miami

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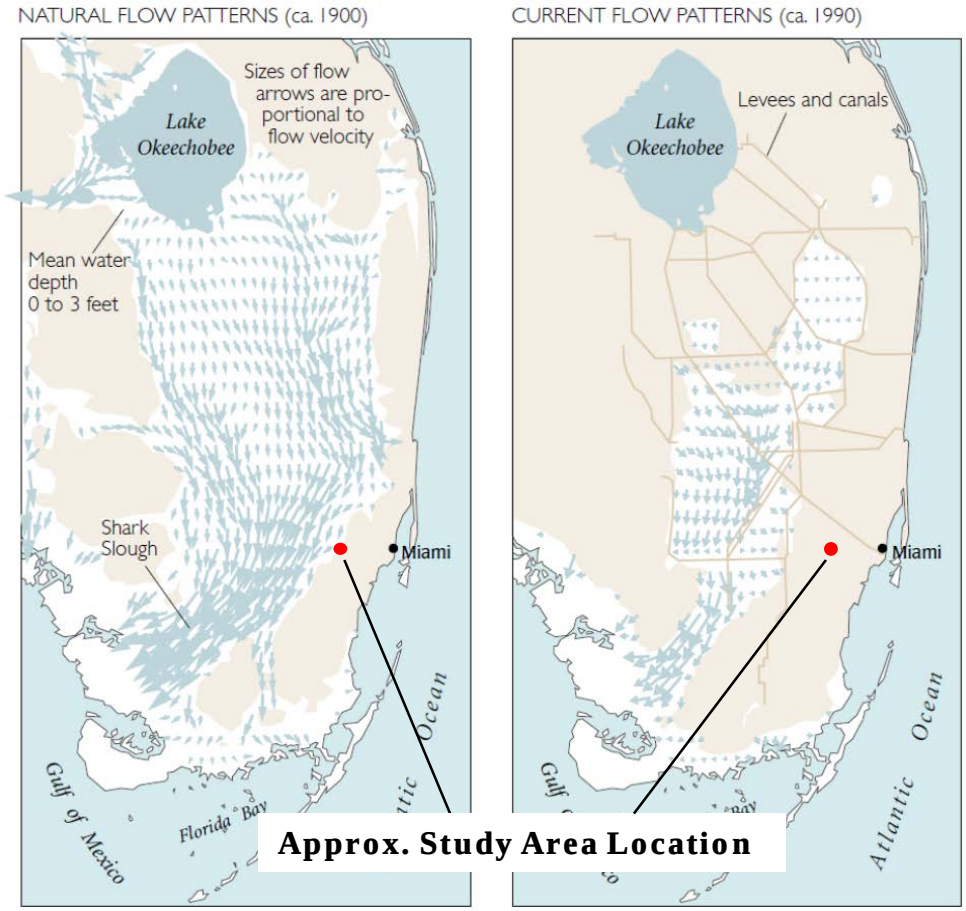
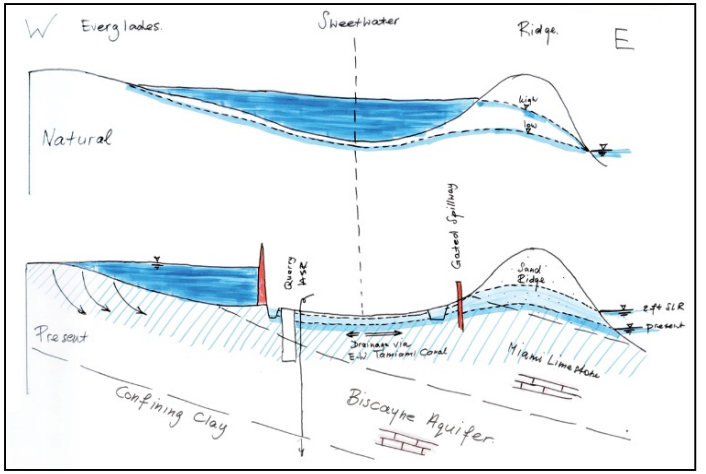
Site Overview

- "This place was once the Everglades, and when it rains, it remembers!"
- Low-lying inland suburban area that is currently experiencing prolonged flooding
- 5 square miles in western Miami-Dade County
- Population of ±73,260 and 27,375 housing units
- Many structures were built prior to flood criteria requirements

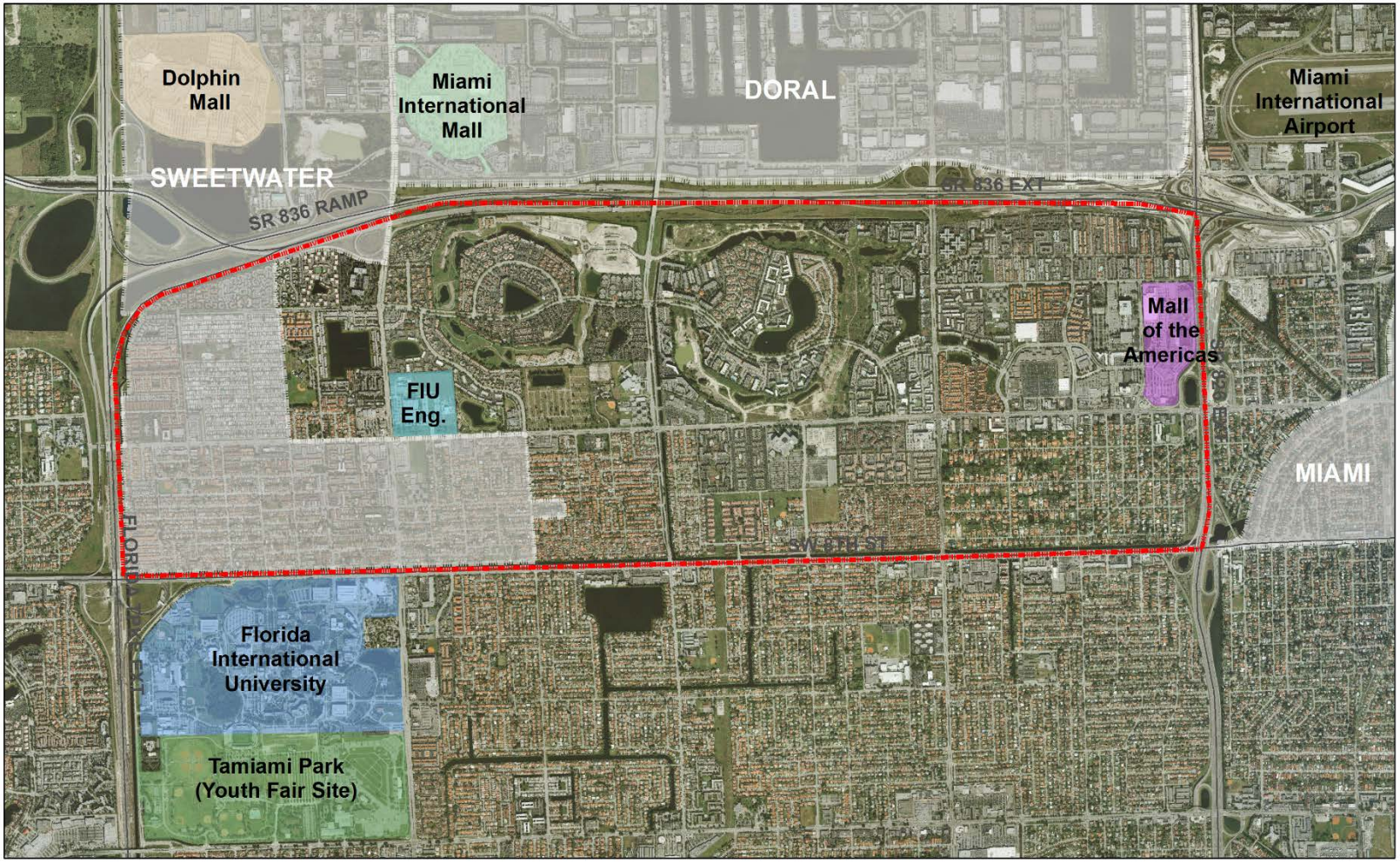


Site Overview

- Higher elevations to the east and west increase the likelihood of flooding in the area.
- The area has low land elevations and a high average water table.
  - Vulnerable to flooding
  - Shallow unsaturated zone in which to store additional water
- The area has experienced repetitive losses due to flooding.
- Issues are expected to be compounded by the impacts of sea level rise.



Site Overview



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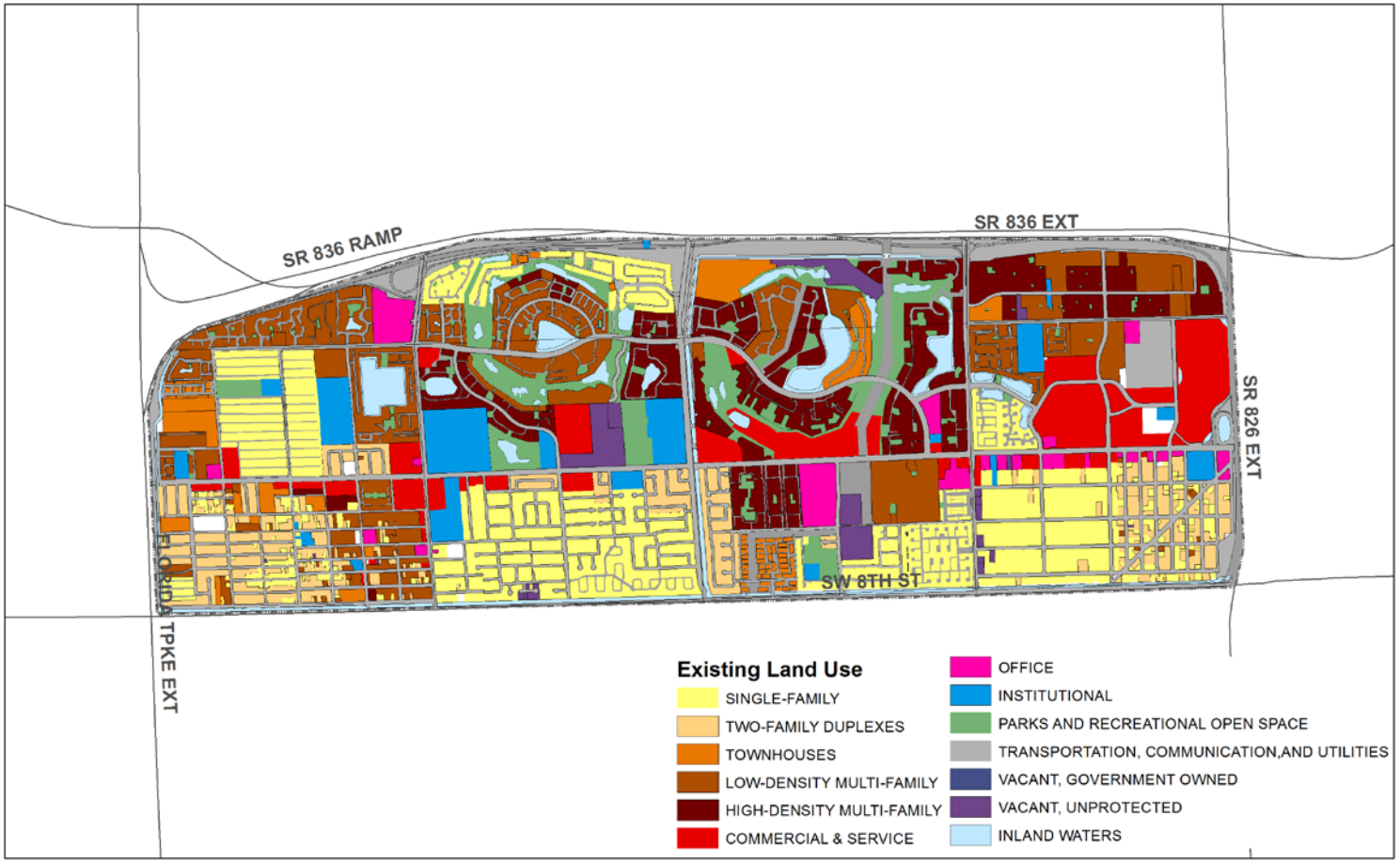
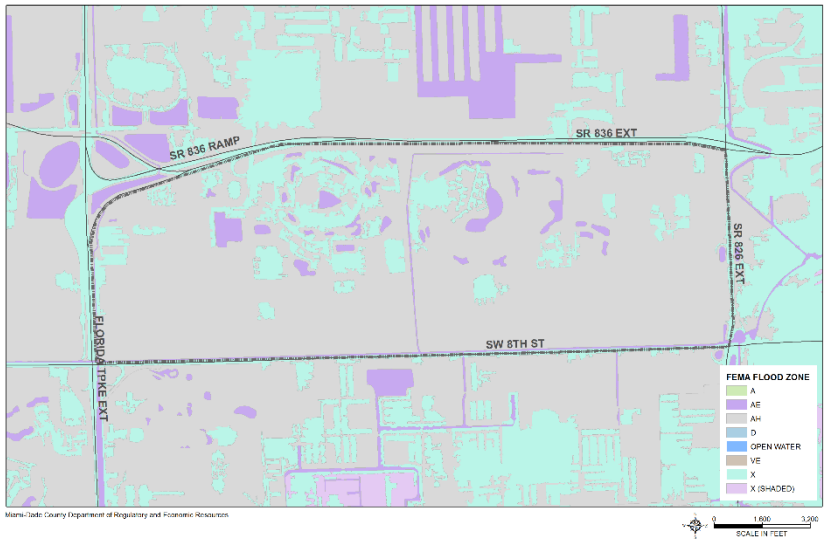
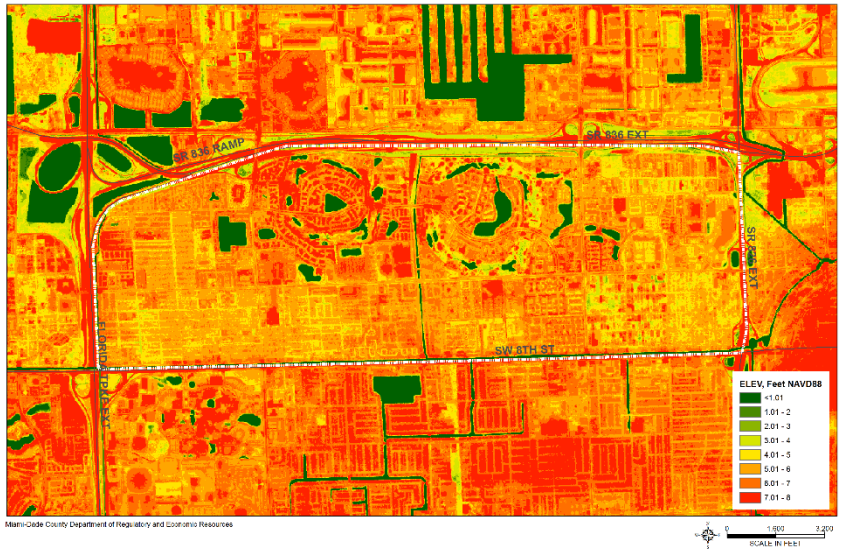


Drainage

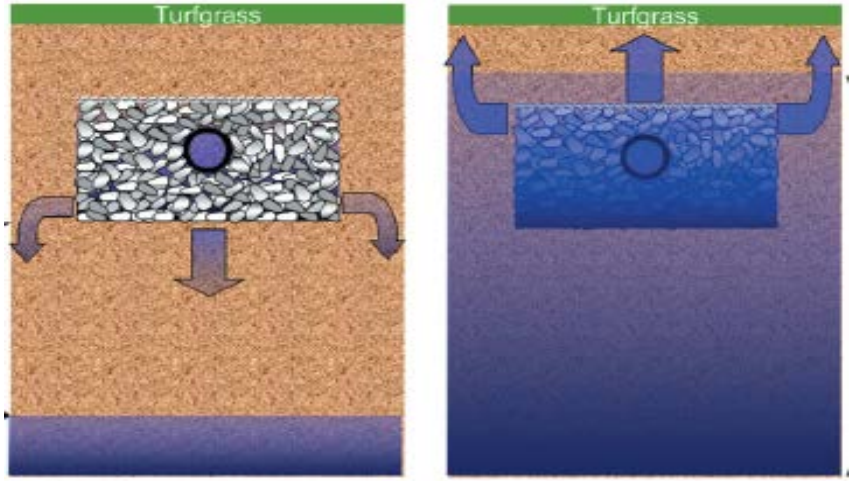
- North of Flagler Street, stormwater generally flows to the wet detention areas, then to groundwater by infiltration.
- Southern portion served by a system of swales and french drains connected to a force main and pump station that discharges into the Tamiami Canal.
- The Tamiami Canal conveys stormwater by gravity from west to east along its entire length and discharges to the Miami River.
- SLR is expected to decrease the unsaturated zone storage which directly reduces the capacity of the drainage systems.

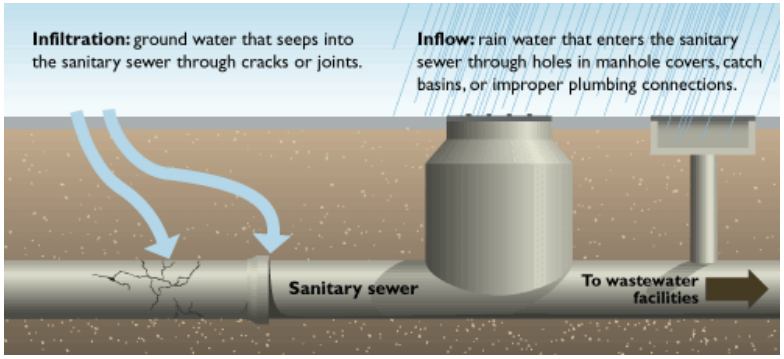




Water/Wastewater Infrastructure

- Most areas connected to central water and wastewater service, southeastern portion utilizes individual septic tanks.
- The effectiveness of septic systems may be compromised by rising groundwater levels.
- Wastewater infrastructure experiencing infiltration/inflow from groundwater entering the system.
  - Reduces the available system capacity and increases capital costs and O&M costs.





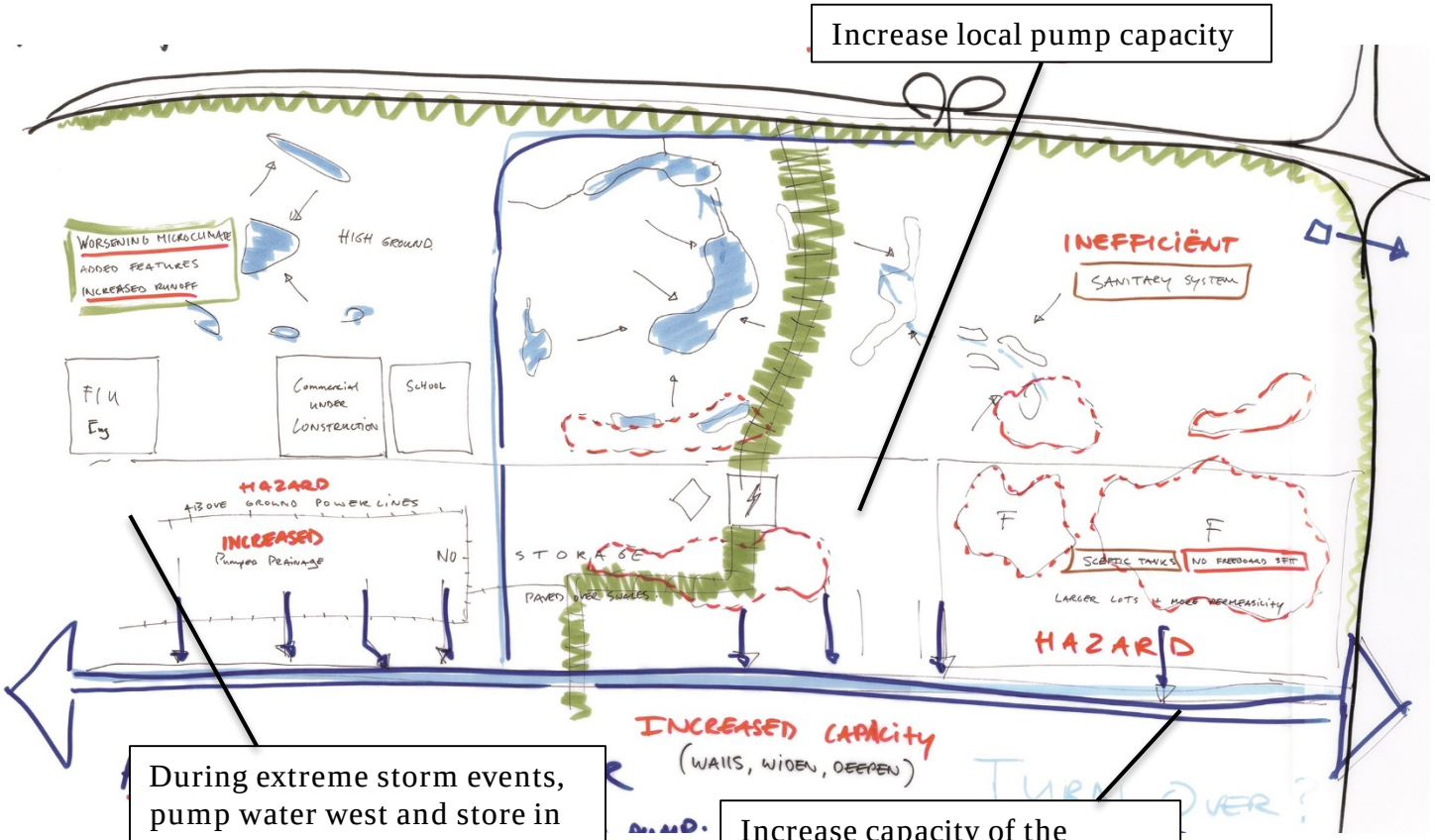
Design Concepts/Scenarios

- Project Team presented 3 scenarios that represent various levels of intervention.
  - The Engineering Approach
    - Builds on completed/planned engineering projects
    - Increase local pump capacity and capacity of the Tamiami Canal (both east and west) by widening or building walls.
  - The Incremental Approach
    - Based on small steps of intervention towards resilience
  - The Resilient Redesign Scenario
    - Encourages “living-with-the-water” rather than fighting against it

The Engineering Approach

- Based on intensifying the technical management of the water system.
- Builds on projects that have already been implemented or are underway in the area
  - Emergency Detention Basin - complete
  - Tamiami Canal Flood Control Wall
    - Portions complete, remaining portions scheduled for 2015
  - Stormwater pumps currently operated by the County and the City of Sweetwater

The Engineering Approach



The Engineering Approach

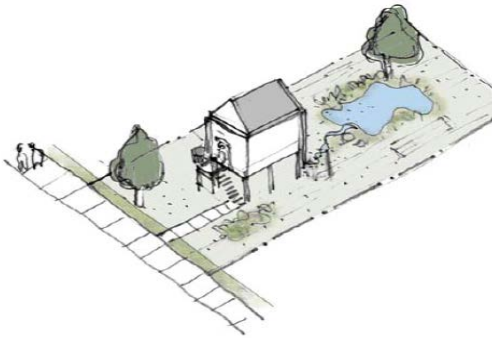
- The Project Team concluded:

An approach in which problems are resolved through "engineered fixes" as they arise would lead to increased costs without addressing the underlying problems and would not support the long-term sustainability of the area.

The Incremental Approach

"small interventions – great results"

- Presents an incremental approach that combines public and private interventions, builds on the current built environment and is based on small steps of intervention towards resilience



Lot – Incentive planning

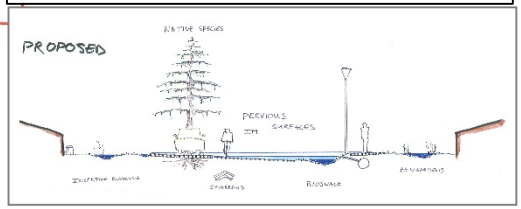
Streets – Green infrastructure

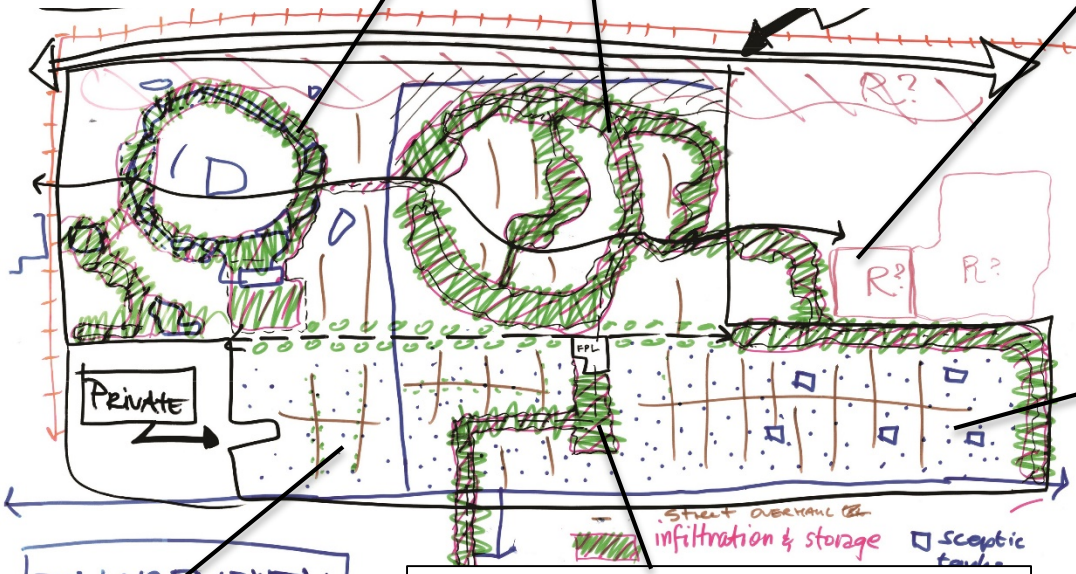
Neighborhood – Blue/green Network

The Incremental Approach

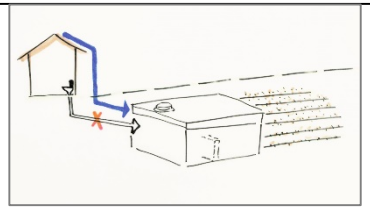
Use former golf courses to increase water storage capacity

Transform roads and parking lots into penetrable areas using porous materials, permeable pavements, bioswales, etc.



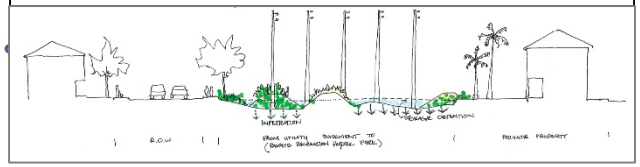


Once central sewer service is extended to the area, abandoned septic tanks can be used to store stormwater



Encourage/require property owners to store more stormwater on-site through increased retention and detention areas, rain barrels or rain gardens

Use utility line right-of-way to increase water storage capacity



The Resilient Redesign Approach

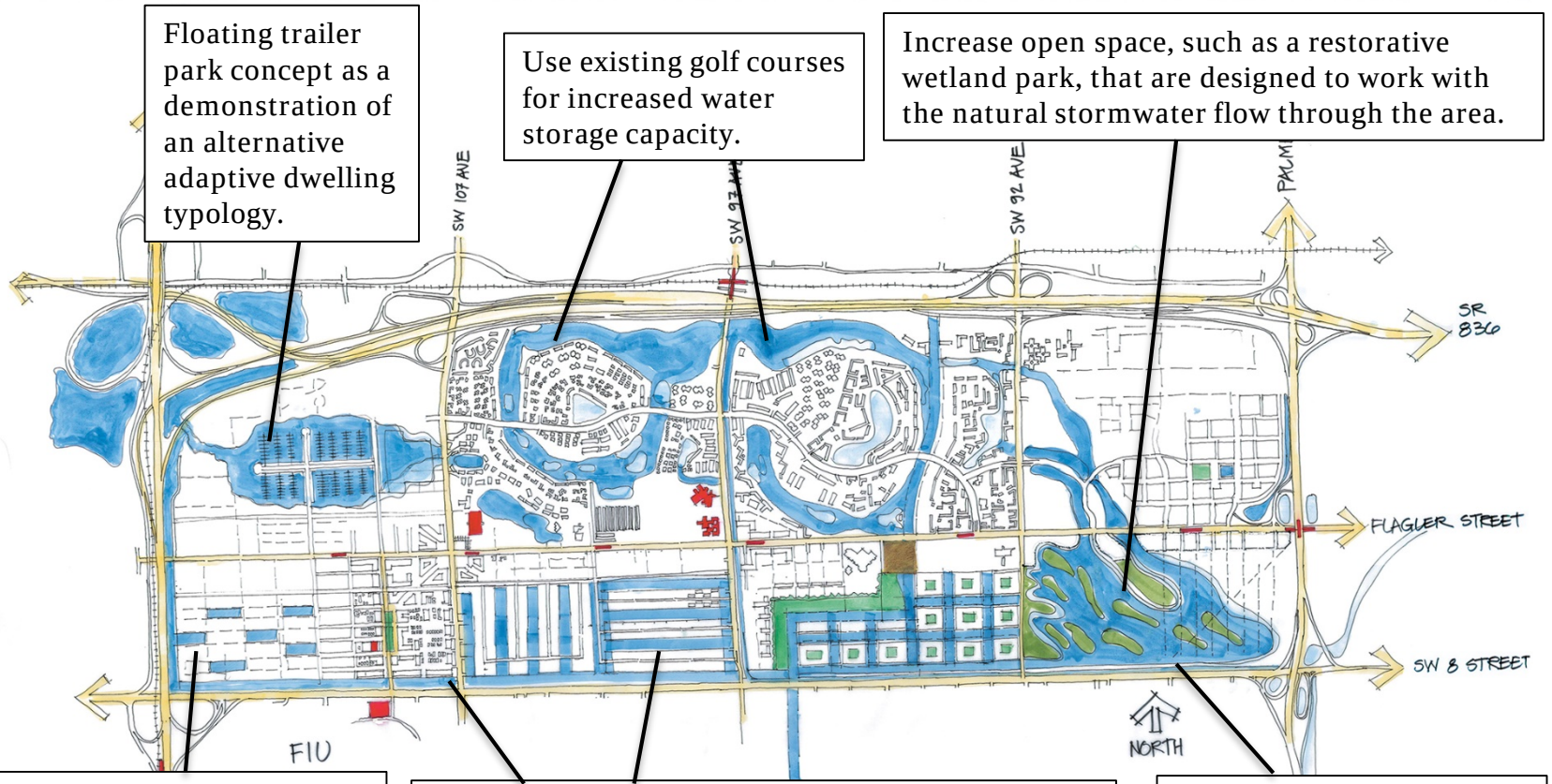
- Presents a bold redevelopment scenario for the Study Area that envisions voluntary land reassembly by the current residents in exchange for an equal or greater share in the development of a more sustainable development pattern.

- It builds on a number of unique strengths of the Study Area that can add value including a possible East-West extension of the mass transit system.

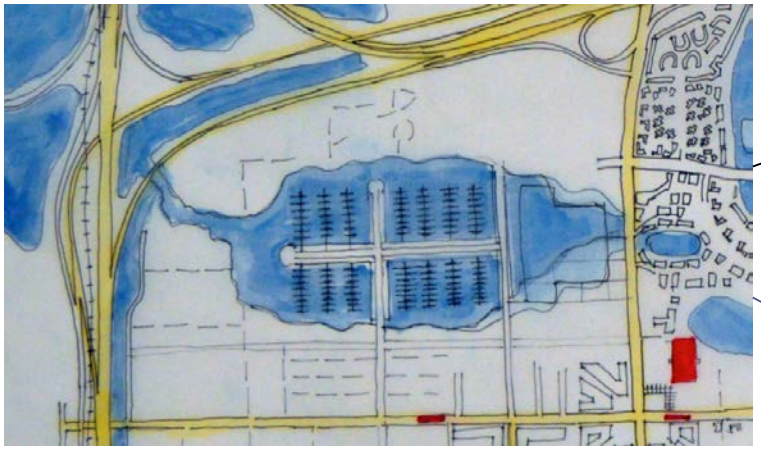
- By elevating the land using traditional cut-and-fill methods, the Resilient Redesign Approach encourages “living-with-the-water” rather than fighting against it with a series of engineering fixes.

- Flood Protection + Quality of life + Healthy ecology + Sustainable urbanism + Vibrant local economy + Climate adaptation (microclimate) = **Resilient Redesign**

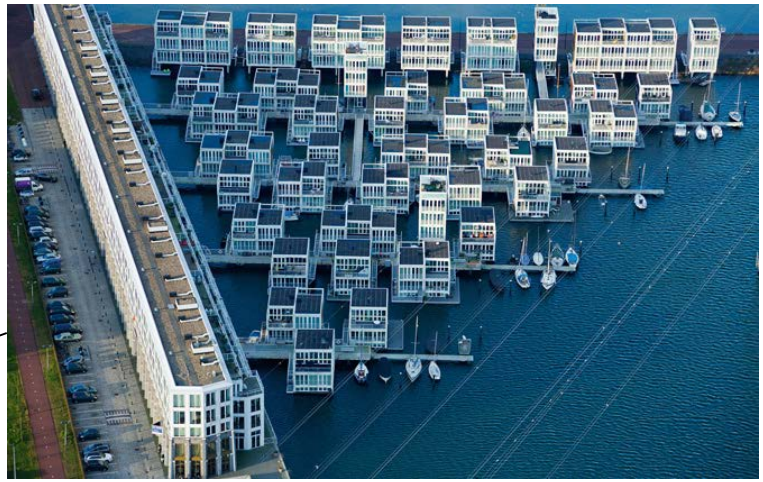
The Resilient Redesign Approach



Floating Trailer Park Concept

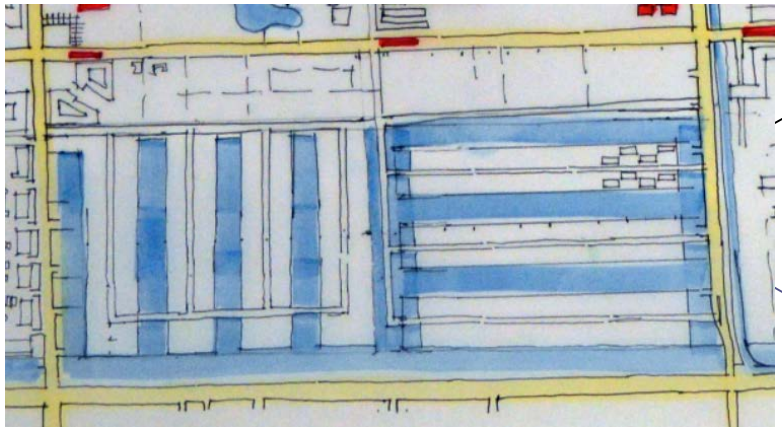


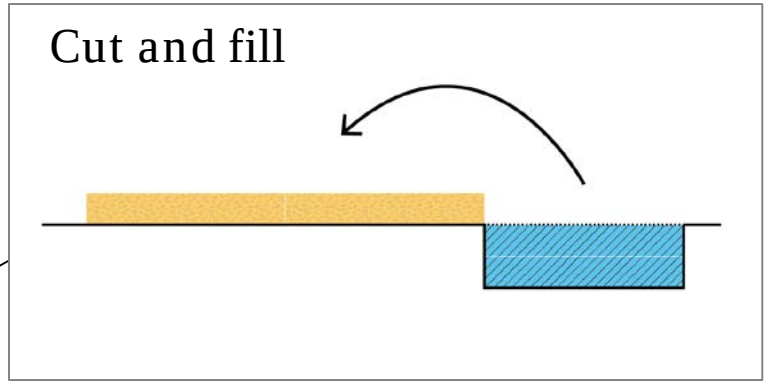
collectively

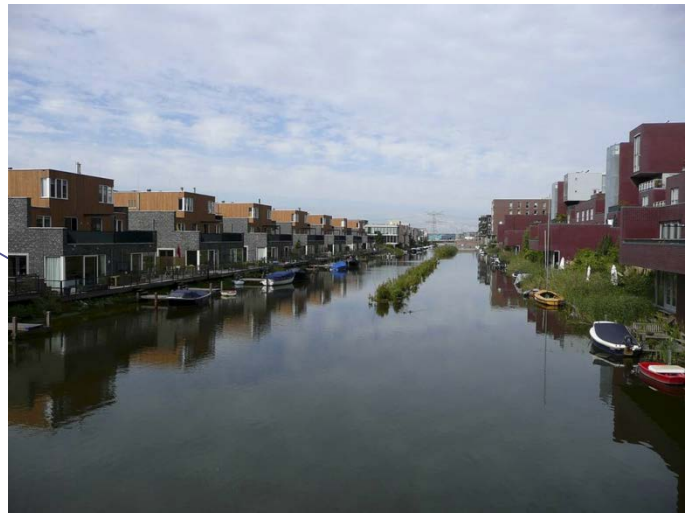


individually

Finger Canal Concept







Implementation

- Recommendations can provide prototypical solutions for areas with similar characteristics and vulnerabilities.
- Adaptation Action Areas (AAA)
  - Resilient redesign recommendations can be implemented through AAAs or similar designation.
  - State law allows local governments to designate vulnerable areas as AAAs and assign policies to address resilience.
  - Miami-Dade County adopted AAA policies into the CDMP last year and is currently determining the feasibility of designating AAAs.
  - Implementation may be different for each vulnerable area depending on unique circumstances and vulnerabilities.
  - Coordination with municipalities and stakeholders

Acknowledgements

Project Team (in alphabetical order):
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SOUTHEAST FLORIDA REGIONAL COMPACT CLIMATE CHANGE

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