

GREENING THE GREY:

A Resilient Vision for Urban Shorelines Utilizing
a Case Study at Brittany Bay Park, Miami Beach

MIAMI BEACH
RISING
ABOVE

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MIAMI BEACH RISING ABOVE

All Factors



King Tide



Waves



Rainfall



Storm Surge



Sea Level Rise



Rising Groundwater

Rainfall

Storm Surge

Waves

King Tides & Rising Groundwater

Sea Level Rise

SCALING RESILIENCE IS ESSENTIAL FOR THE COMPLEXITIES WE FACE

RESILIENCE IS NOT A SLOGAN, IT IS ACTION



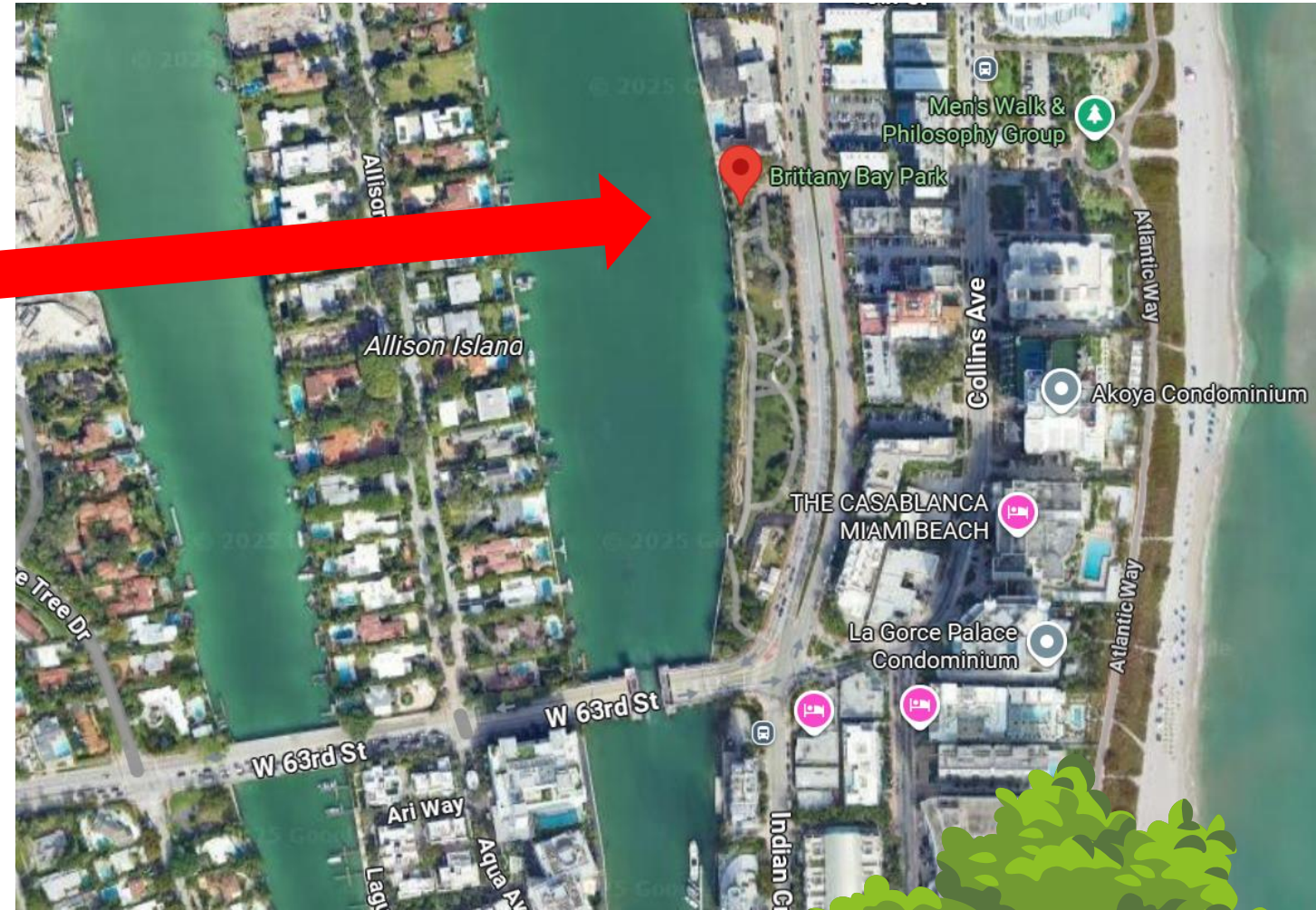
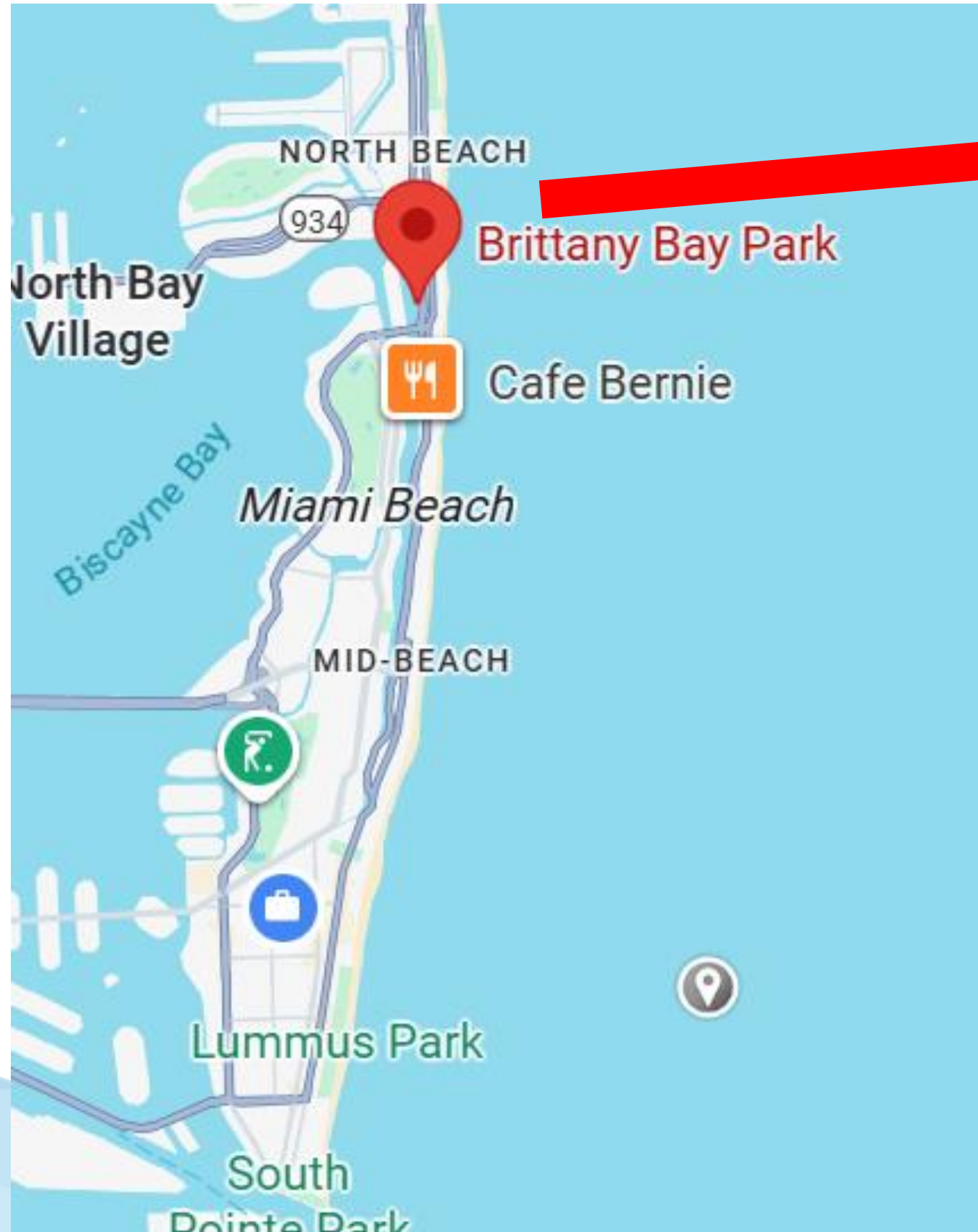
The Brittany Bay Park Living Shoreline project enhances climate resilience through a nature-based approach in a dense urban setting.

Completed in 2023, the \$2.8 million project aligns with the City's Sea Level Rise Adaptation Plan, Resilient305 strategy and Biscayne Bay Task Force recommendations.

It showcases a scalable “green-grey” infrastructure model that blends natural and engineered solutions for coastal protection.

Where is Brittany Bay Park?

MIAMI BEACH
RISING
ABOVE



Pre-Construction Conditions



Primary Goals

- Shoreline Stabilization
- Reduced Flooding
- Habitat Restoration and Preservation
- Stormwater Quality Improvement
- Public Access and Recreation
- Tree Canopy Expansion



Regulatory Limitations

- This project is located within the Biscayne Bay Aquatic Preserve.
- Regulated at the local (Miami-Dade County DERM), state (FDEP), and federal level (USACE).
- Dredging and/or filling is either (1) extremely complicated or (2) wholly denied by the regulatory agencies.



How do we work around this limitation?

Cut into the uplands!

Leave the existing failing seawall and mature coastal vegetation like mangroves and buttonwoods in-place.

Install tidal connectivity infrastructure.

Construct a riprap revetment.

Place mangrove propagules at the lowest elevation within the revetment.

Install native coastal wetland species throughout the shoreline.



Funding and Partners



- Secured grants from the Florida Inland Navigation District (FIND) Waterway Assistance Program in 2013 and 2014. These state-level grants enabled partial funding of the first-phase construction costs:
 - Seawall Design and Construction: \$320,000
 - Seatwall Design and Construction: \$1,385,600
- With the foundational seawall system in place, the project transitioned into Phase Two - a bold effort to develop a living shoreline and renovate the broader park landscape. This stage prioritized ecological health, habitat restoration, public accessibility, and climate adaptation.
- Voter-approved General Obligation Bond funding for the project.
- \$150,000 grant from The Nature Conservancy and \$375,000 from Florida Power and Light Company (FPL) through the NextEra Foundation.
- Total Phase II Project cost: \$2.8million





Community Engagement and Co-Benefits

- access to nature: mangrove and water
- public education opportunities
- biodiversity benefits
- neighborhood heat reduction
- cultural placemaking



Replicable & Scalable

- Hybrid seawall + living shoreline
- ADA-accessible public amenities
 - Partner funding model
 - Monitoring framework
- Can be used for similar sites within Biscayne Bay
- Design took into account permitting considerations
 - Stakeholder engagement critical for buy-in
- Combats misconceptions about designing and constructing mangrove shorelines

Scale = 40 feet



Exercise Stations

Seatwall

Overlook deck

Seatwall

Living shoreline/
Native landscape

Exercise Stations

Bike racks

Parking

Indian Creek Drive

Bench and trash
receptacles

Exercise Stations

Bench and trash
receptacles

Multituse path/
walkway

Indian Creek Drive

W. 63rd Street





Post-Construction 2023

CONCLUSIONS / LESSONS LEARNED:



- Highlights the value of integrating natural infrastructure into urban coastal environments.
- Demonstrates the importance of cross-sector collaboration, long-term ecological monitoring, and community-oriented design.
- The living shoreline helps protect against sea level rise and extreme weather while restoring ecological function.
- It promotes public access to resilient, nature-based spaces that connect people to climate solutions.

IGUANAS LOVE MANGROVES



How is the shoreline faring two-years post-construction (2025)?



King Tide

October 7, 2025



This park, and adjacent roadways,
used to flood from seawall
overtopping and compound
flooding.



Now, the tidal
connection keeps the
rising water levels
within the new living
shoreline



THANK YOU!

