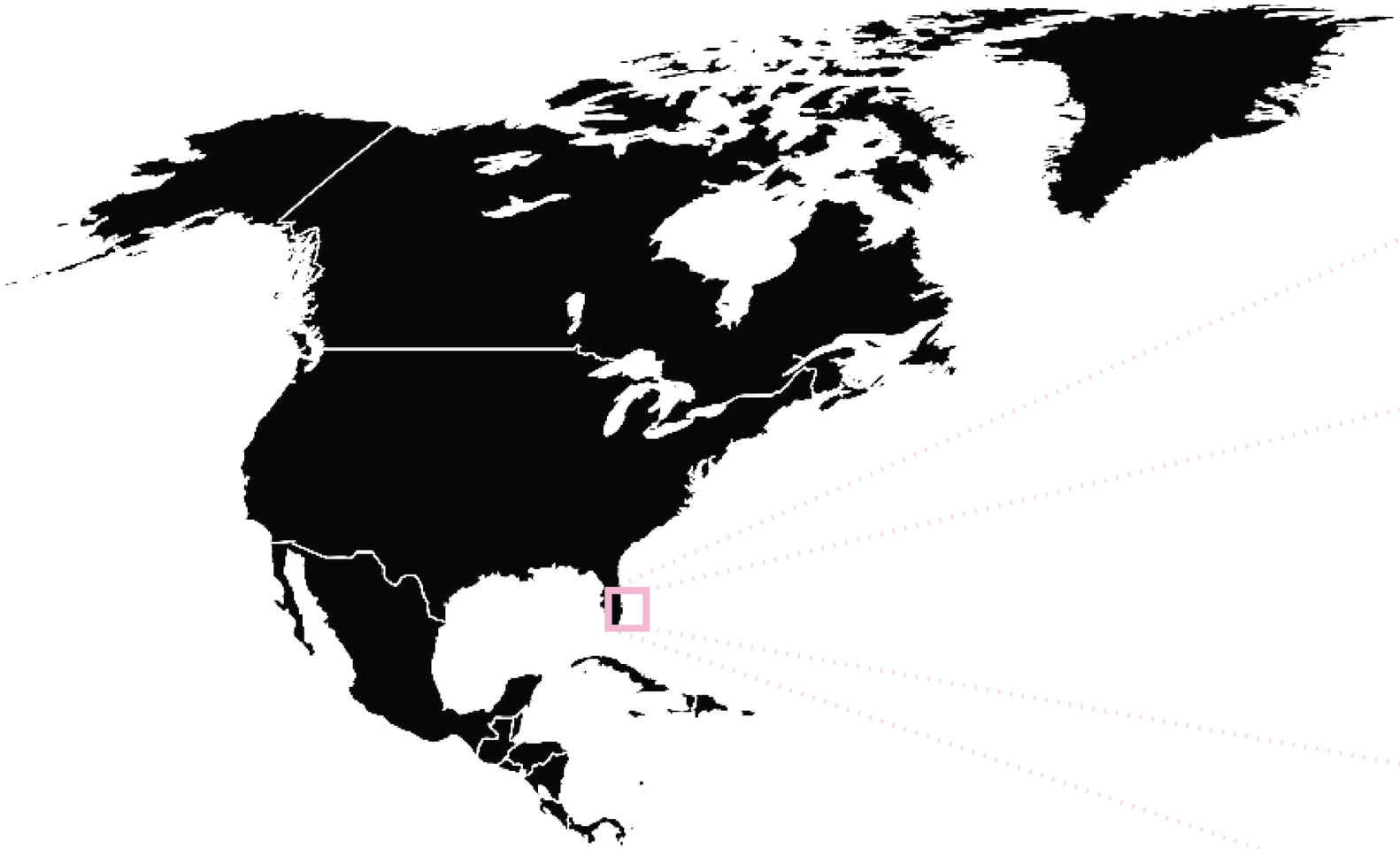
A (NEW) FUTURE FOR MIAMI BEACH

MARINA DONDRAS FLOWSCAPES MSC 3 P5 07.11.2017



JACOB ESCOBEDO

MIAMI BEACH





MIAMI BEACH, FLORIDA

PROBLEM



“WE ARE CONFIDENT WE CAN MAKE INVESTMENTS OVER TIME, THAT WE CAN LEARN FROM OUR MISTAKES AND CREATE A NEW CITY… IT’S GOING TO BE TOMORROW LAND, NOT YOUR GRANDMOTHER’S MIAMI BEACH.”

Susanne Torriente_Miami Beach Resilience Officer

GLOBALLY ONE OF THE HIGHEST RISK AREA’S IN TERMS OF COASTAL FLOODING

LIMITED SOLUTIONS

/ HIGLY URBANIZED METROPOLITAN REGION

/ UNDERGROUND AQUIFER PROVIDING 1/3 OF FLORIDA OF DRINKING WATER IS AT RISK OF BEING SALINATED

/ CLIMATE CHANGE DENIAL NO GOVERNMENTAL SUPPORT: SOLUTION SHOULD BRING QUALITATIVE PUBLIC SPACE

/ FRAGMENTED COASTAL DEFENSE: PRIVATE-PUBLIC

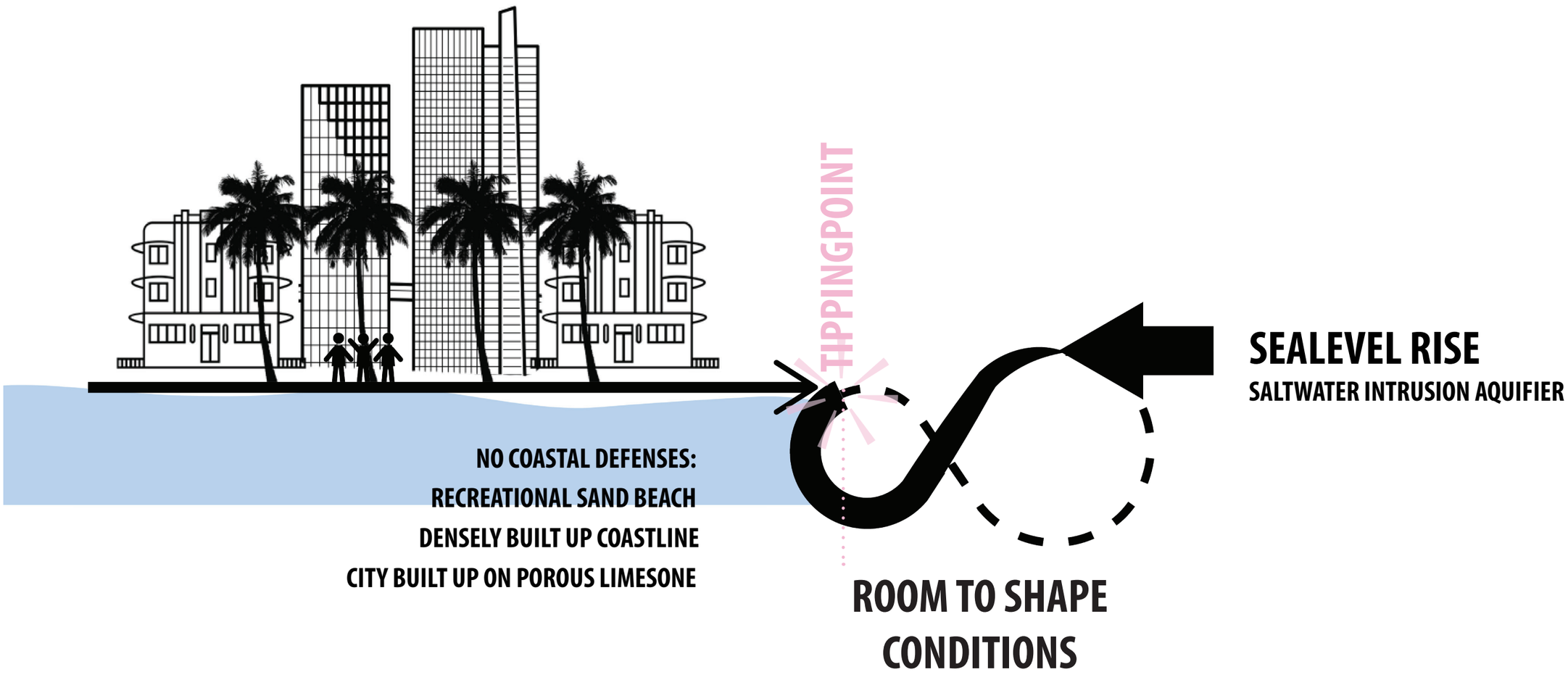
/ (SUNNY DAY) FLOODING CAUSES STREET WATER RUN OFF TO BE LET DIRECTLY INTO BISCAYNE BAY

INTEGRAL DESIGNPROPOSAL IS CHALLENGING BECAUSE OF UNCERTAINTY IN THE PROGRESSION OF SEALEVELRISE AND FRAGMENTATION OF THE COASTLINE.

INCREMENTAL SOLUTIONS WILL EVENTUALLY LEAD TO DISRUPTION TO THE STRONGLY WATER RELATED CULTURE.

THE REVOLT VS THE REMEMBER

THE CLASH BETWEEN LONG LINE SHAPING THE CITY AND CATACLYSTIC EFFECT OF SEALEVELRISE



A (NEW) FUTURE FOR MIAMI BEACH

How can Miami Beach, adapt itself to a changing climate and in what way can this process be used to create new spatial configurations and generate new landscape qualities in the scale of Biscayne Bay, taking into consideration the existing spatial-cultural dynamic of the city in relation to water?

- How does the land-water continuum in the region and city work? And how does a changing climate influence that?

- How was the spatial-cultural character of the city in relation to water shaped?

- What are the coastal defences now?

- Which are the possible interventions dealing with changing climate and which are most fitting to the existing spatial dynamic, culture of Miami Beach and the natural system of the Biscayne Bay?

- What new opportunities does an integral redevelopment of the coastal front create for the quality of the City of Miami Beach?

- How can we deal with the fragmentation of the coast and involvement of different actors in time to realize an integral coastal strategy?

REVOLT AS PART OF THE REMEMBER

“MIAMI IS A PLACE OF THE FUTURE. ... I WRITE ABOUT A WORLD THAT HAS DISSAPEARED IN A WORLD THAT IS BEING BORN.” - ISAAC BASHEVIS SINGER

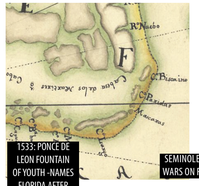
(IN MIAMI CITY OF THE FUTURE, T.D. ALLMAN.)

SOUTH FLORIDA

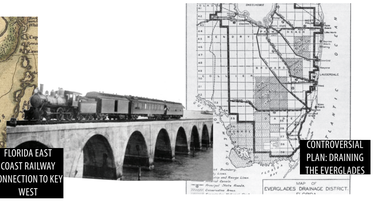
MIAMI

MIAMI BEACH

GROWTH MIAMI BEACH







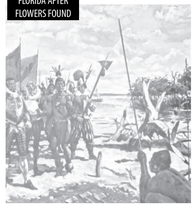


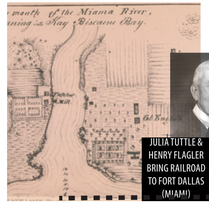






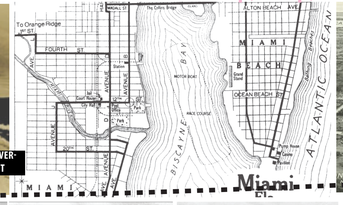


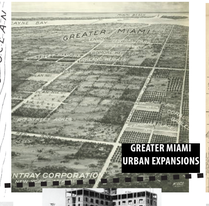


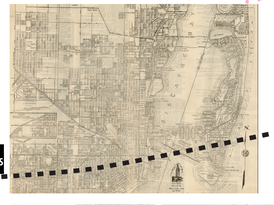










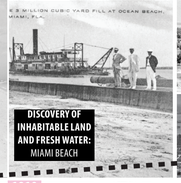




















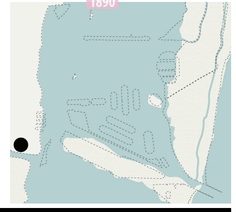


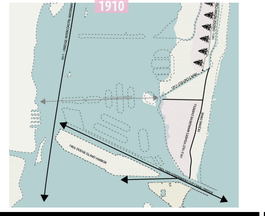


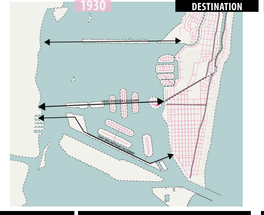


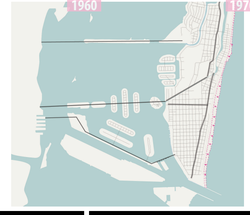


1880 1890 1900 1910 1920 1930 1940 1950 1960 1970 1980 1990 2000 2010









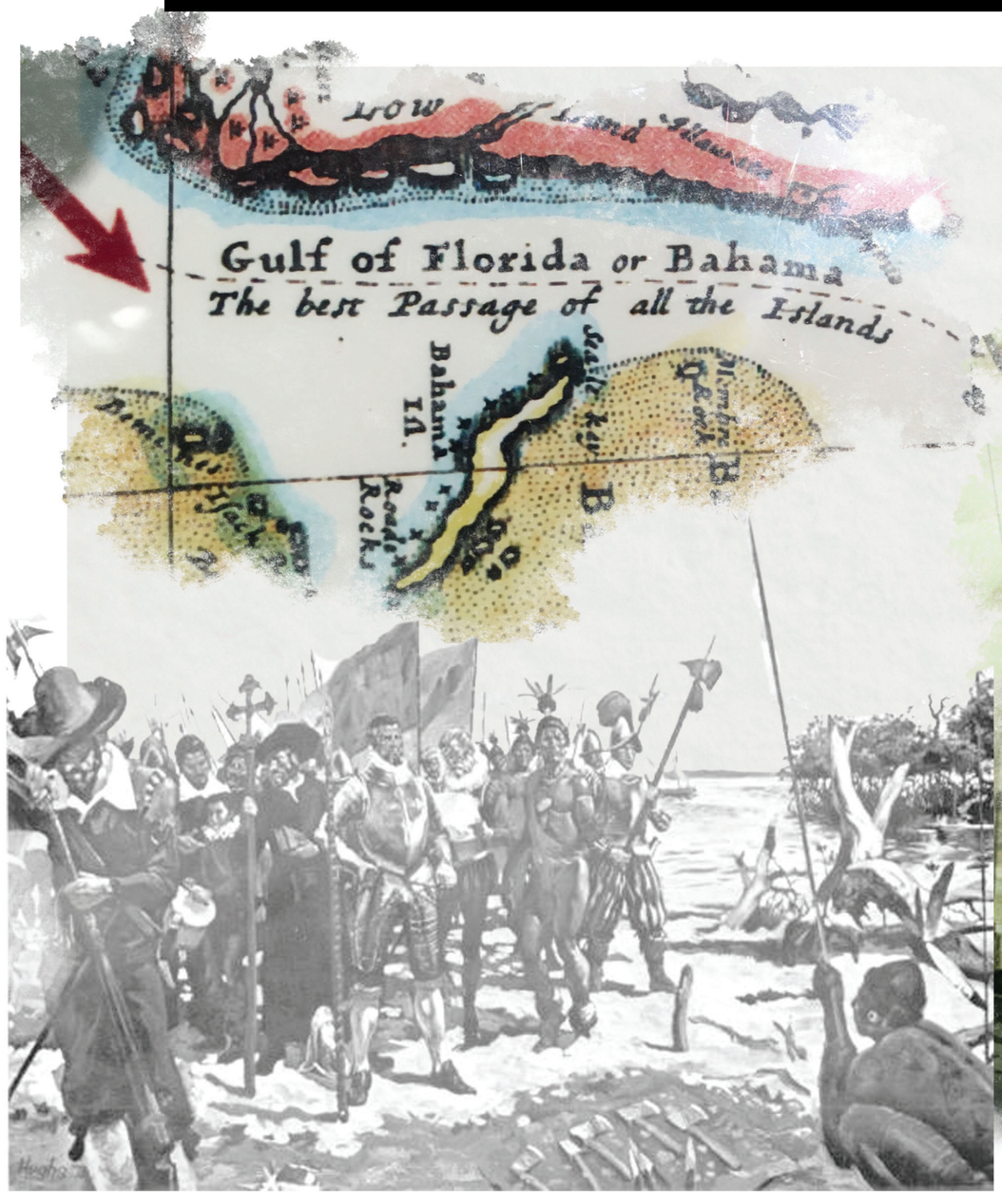
CONQUERING THE WILD | DISCOVERING THE DREDGE & FILL | DEVELOPMENT AND CRASH | ART DECO BOOM | WAR AND TENSION | RESTORING TOURISM | MIAMI VICE & HURRICANE ANDREW | URBAN GROWTH & UNCERTAINTY

CONQUERING THE WILD

1533-1900



WARS ON FLORIDA





DISCOVERY DREDGE

1900-1920

POSSIBILITY FOR DEVELOPMENT

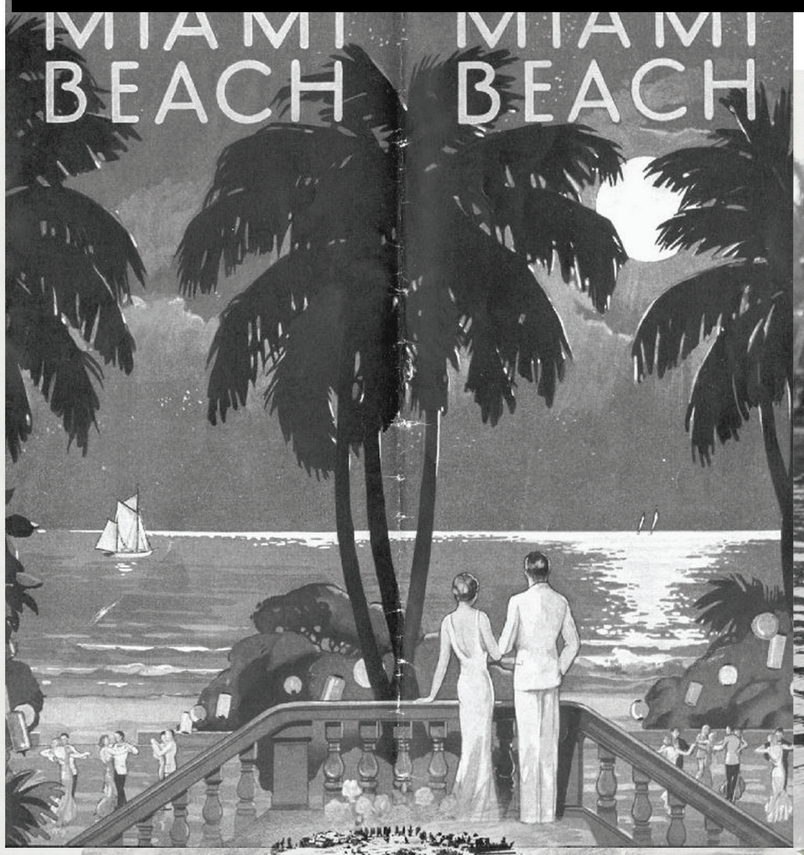


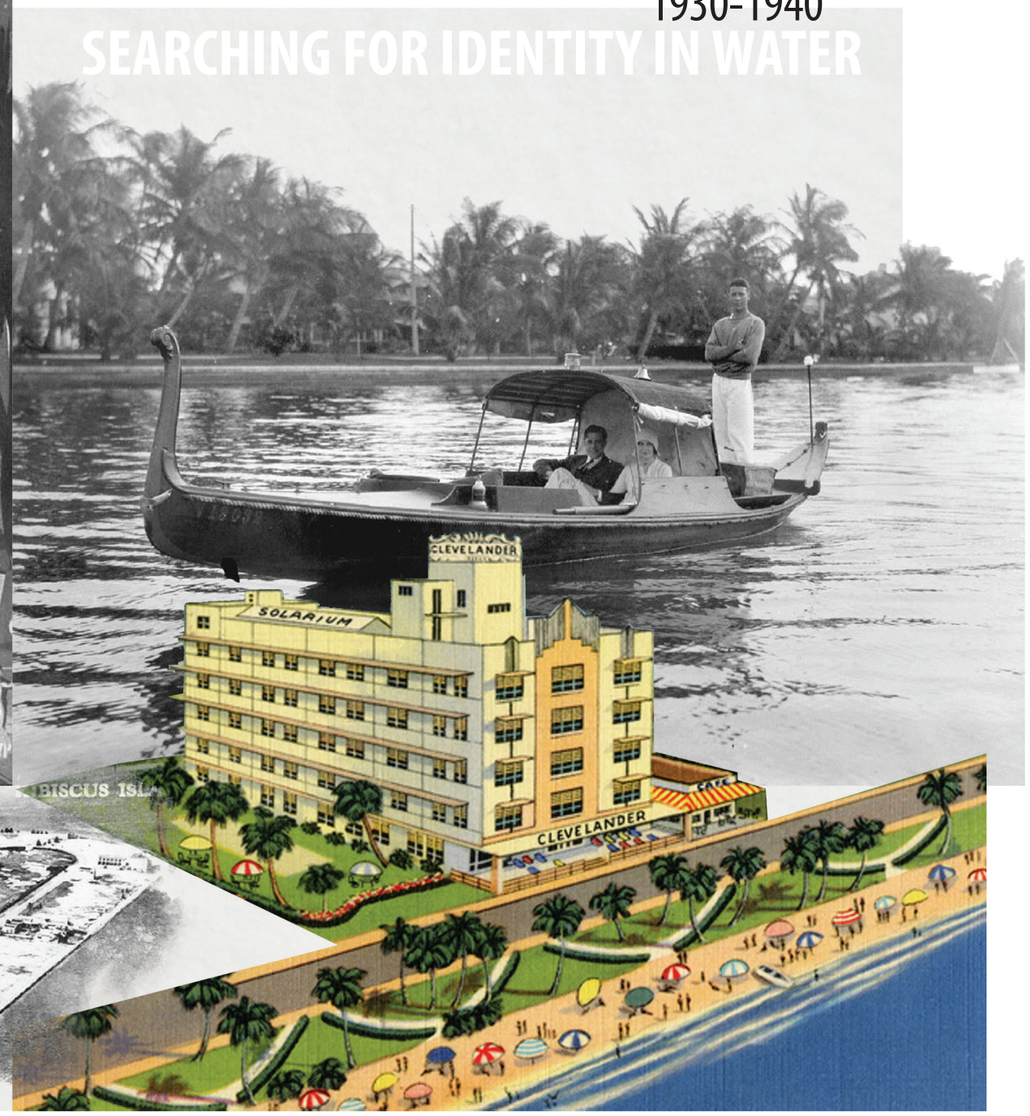


ART DECO BOOM MIAMI TOURIST DESTINATION

1930-1940

SEARCHING FOR IDENTITY IN WATER



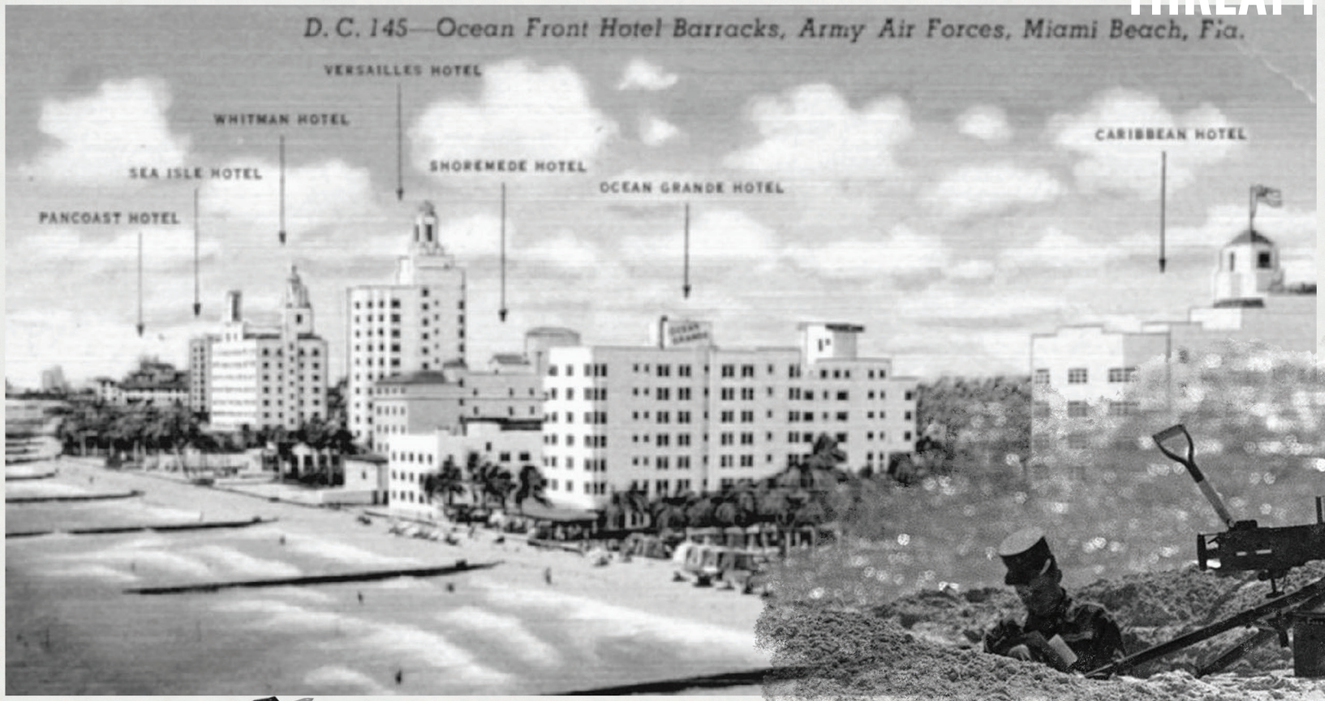




WAR AND TENSIONS

1940-1962

THREAT FROM THE SEA







RESTORING TOURISM

1970-1980

POSSIBILITY: WATER FOR TOURISM



MIAMI VICE + HURRICANE ANDREW

1980-2000





NARCO TRAFFICING BRINGS IN MONEY USED FOR URBAN DEVELOPMENT





HURRICANE ANDREW: DISSASTER INFLUX MIGRANTS CUBA

STILL FROM BRIAN DE PALMA'S CARFACE

FUTURE

UNCERTAINTY **“BUILDING LIKE THERE’S NO TOMORROW”**

POSSIBILITY: COASTAL REALESTATE DEVELOPMENT

THREAT: SEALEVELRISE



FUTURE

UNCERTAINTY **NO GOVERNMENTAL SUPPORT**

FLORIDA MARCH 8, 2015 4:00 AM

In Florida, officials ban term 'climate change'

HIGHLIGHTS

State environmental officials ordered not to use the terms “climate change” or “global warming” in any government communications, emails, or reports.





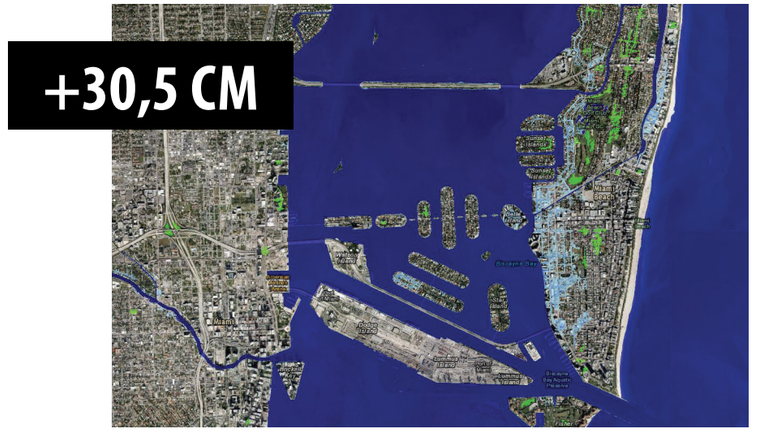
SEALEVEL RISE

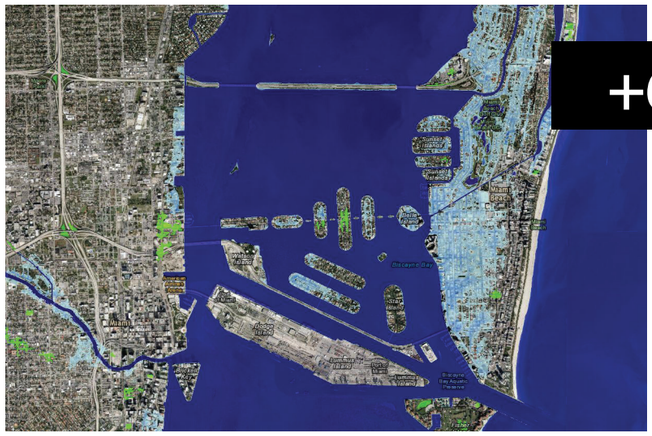
/ THE CITY WAS BUILT AT SEA LEVEL

/ EXTRA CHALLENGED BY SEALEVELRISE BECAUSE OF THE DENSELY BUILT UP COASTLINE

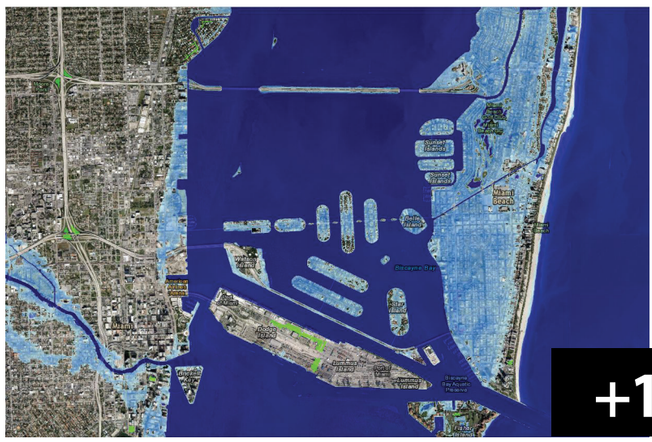
/ BUILT UP ON POREOUS LIMESTONE: MIAMI OOLITE, CONSISTING AN AQUAFIER THAT SUPPLIES A BIG PART OF FLORIDA OF THEIR DRINKING WATER. SEALEVELRISE RISKS UNDERGROUND SALTWATER INTRUSION INTO THE AQUAFIER THROUGH THE HOLES IN THE POREOUS LIMESTONE.

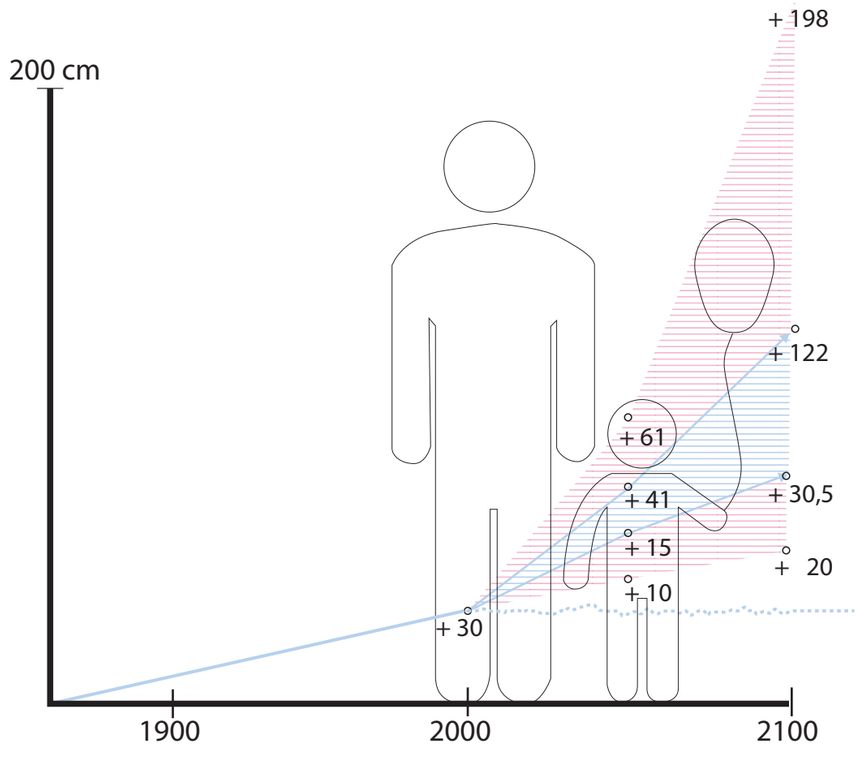
/ 400 MILLION DOLLAR PLAN FLOODWATER IS BEING PUMPED OUT TO THE BISCAYNE BAY UNTREATED, CAUSING PROBLEMS TO THE ECOSYSTEMS









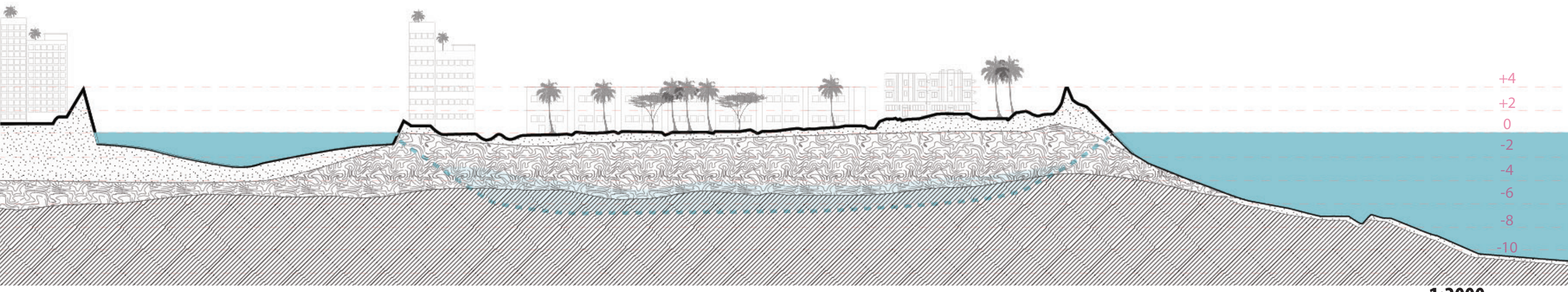


Statistics: ucsusa.org/sealevelrise



+198 CM

PROFILE 2017



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SEA WATER

SWEET WATER: AQUIFER 5,9M DEPTH

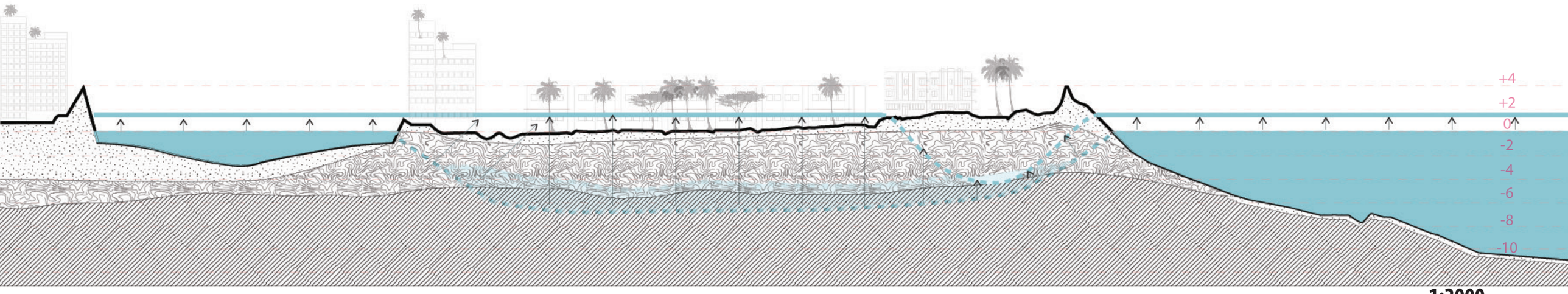
SEDIMENT

MIAMI OOLITE

BEDROCK

PROFILE 2100

SEALEVELRISE



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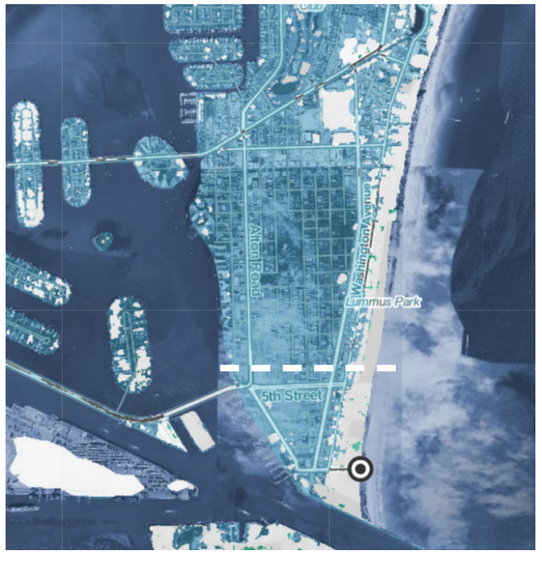


SEA WATER

SWEET WATER: AQUIFER

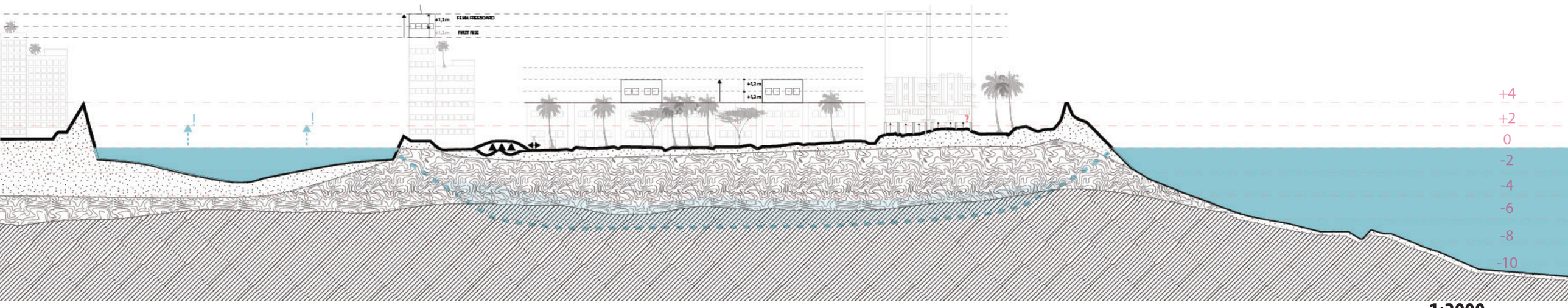
SEDIMENT

MIAMI OOLITE

BEDROCK

PROFILE 2018

ANTICIPATING SEALEVELRISE



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SEA WATER

SWEET WATER: AQUIFER 5,9M DEPTH

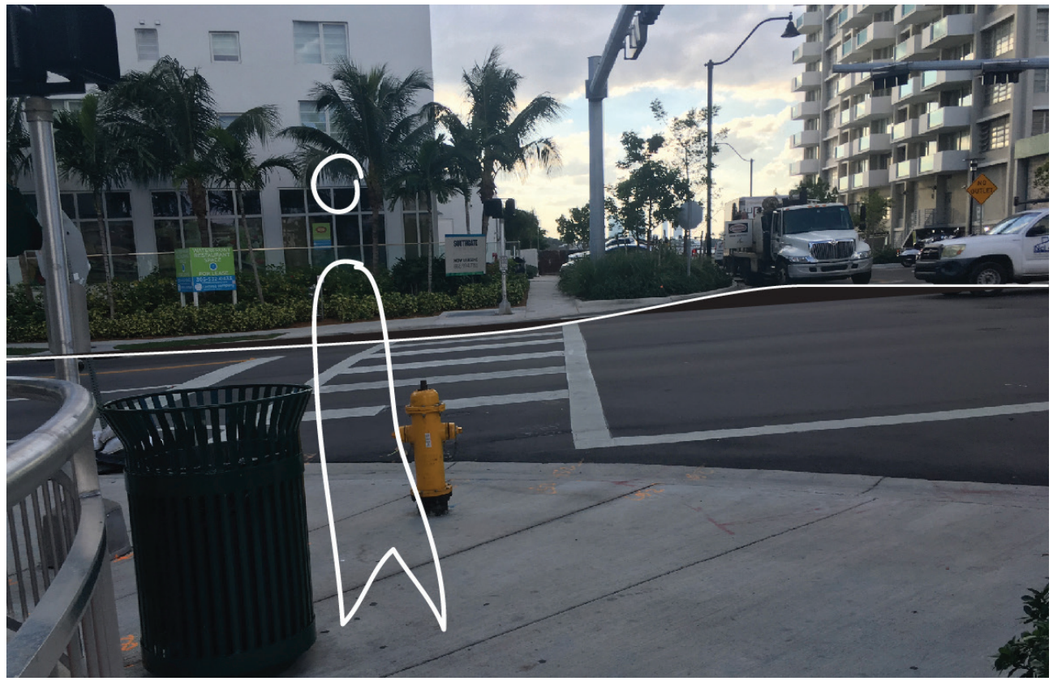
SEDIMENT

MIAMI OOLITE

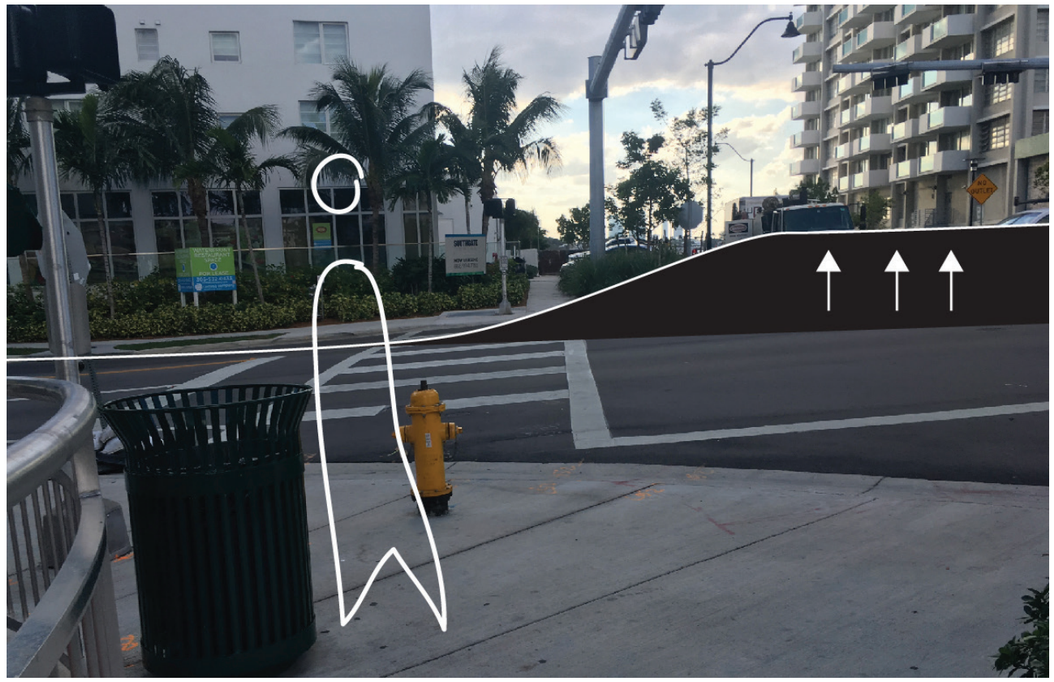
BEDROCK

INCREMENTAL SOLUTIONS

NOW



ANTICIPATING WORST CASE SCENARIO - +198 cm







EFFECT ON BUILDING TYPOLOGY



ORIGINAL ART DECO HOTELS
1925-1935
± 2 LEVELS



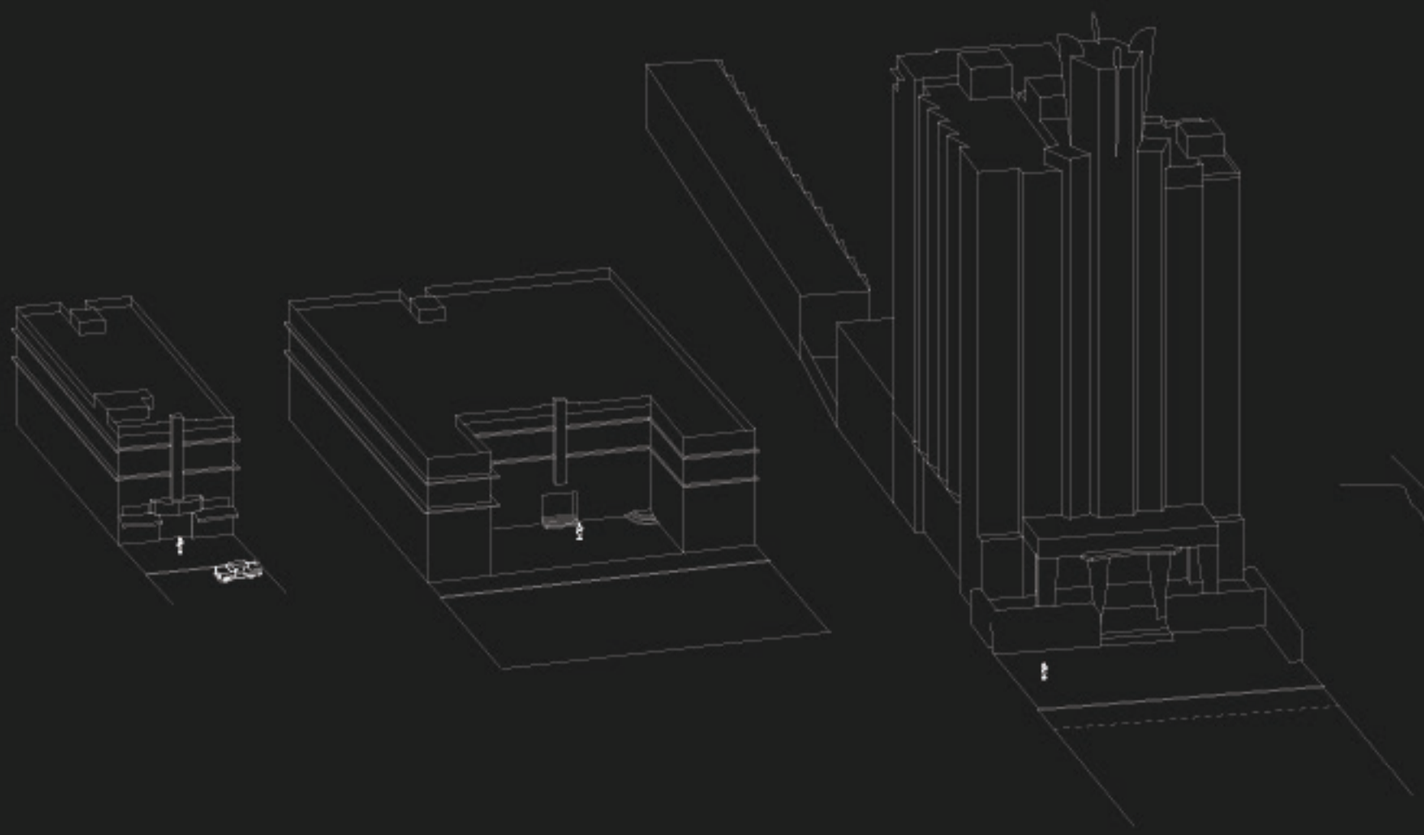
MIXED HOUSING
1940-2016
2-4 LEVELS

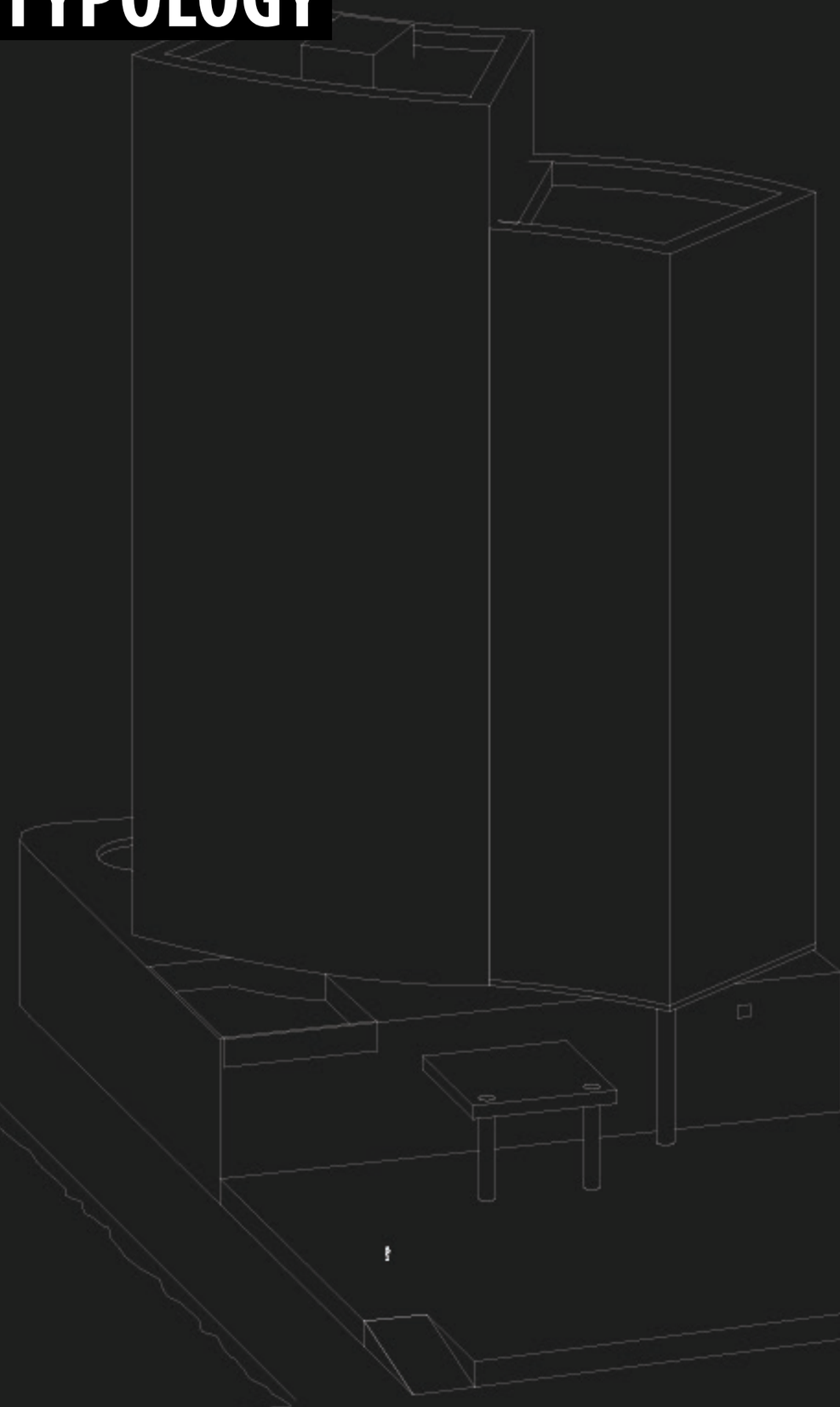


ART DECO HIGHRISE
1940-1995
<20 LEVELS



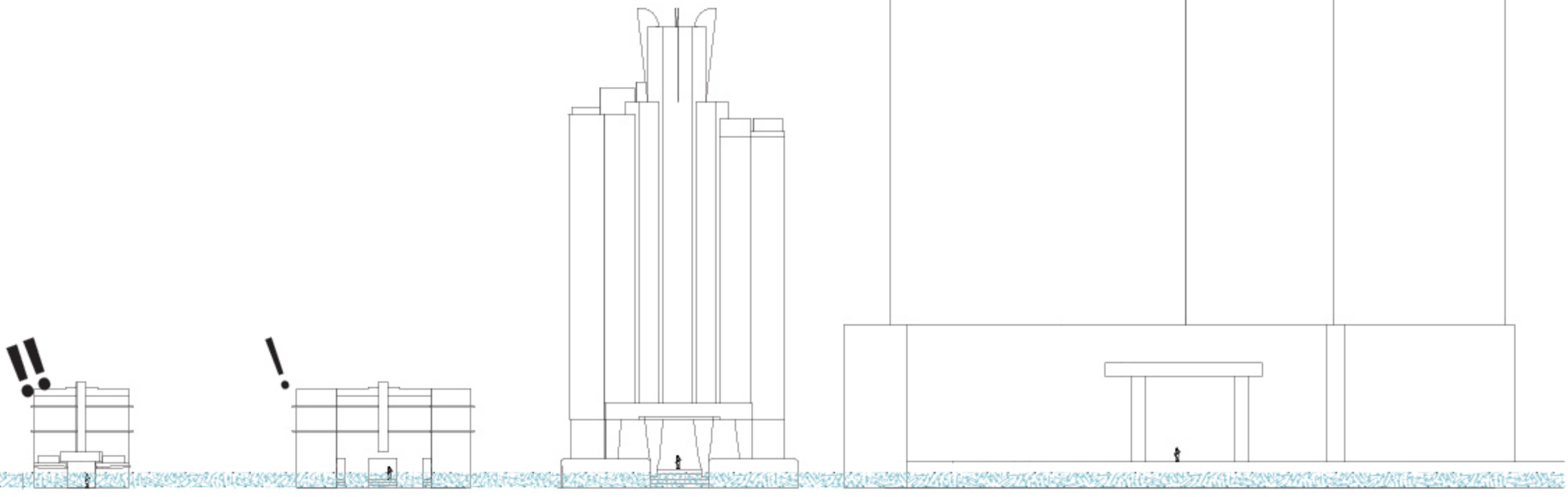
CONTEMPORARY HIGHRISE
1995-2016
20-50 LEVELS





EFFECT ON BUILDING TYPOLOGY

	MONUMENTAL ART-DECO	ECLECTIC	MONUMENTAL ART-DECO	CONTEMPORARY HIGHRISE
Age	90 years	40-1 years	60 years	10-0 years
Monumental status	Heritage	Mixed styles, no monumental status	Heritage	No monumental status
Flexibility	○○○○○	●●●●○	●●○○○	●●●●●
Zone	Commercial: MXE Mixed use entertainment	Residential multifamily, low /medium intensity	Commercial: MXE Mixed use entertainment	Residential multifamily, medium/ high intensity / Commercial bayside.
Median household income	$25,035	$24,701	$25,035	$143,750
Median Listing price	$443,750	$265,354	$509,709	$1,476,875



COASTAL DEFENSE

PUBLIC DEFENSE

PRIVATE DEFENSE

PUBLIC SPACES ON THE WATER

PUBLIC DEFENSE

PRIVATE DEFENSE

PUBLIC SPACES ON THE WATER

PUBLIC DEFENSE

PRIVATE DEFENSE

WALKING ROUTE

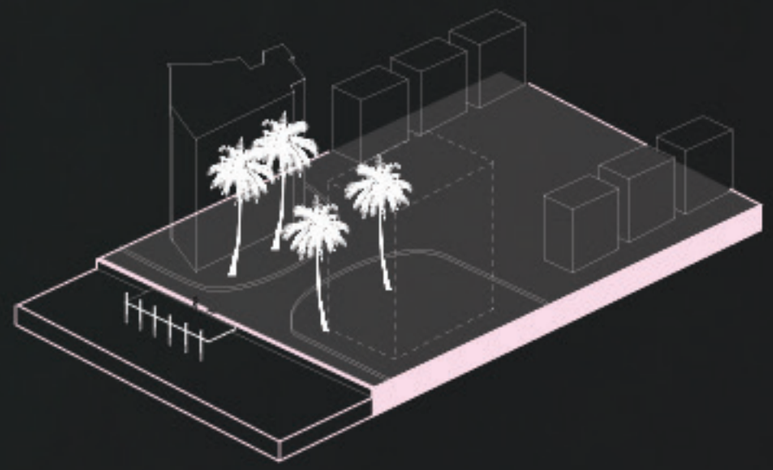
PUBLIC SPACES ON THE WATER

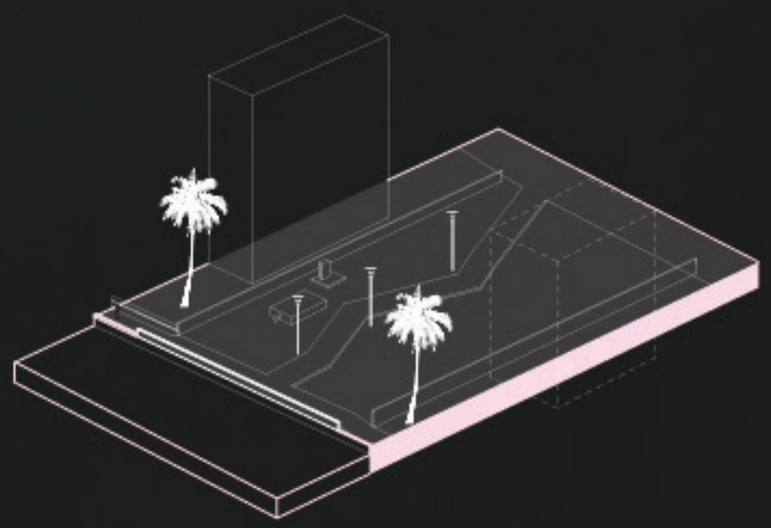
PUBLIC DEFENSE

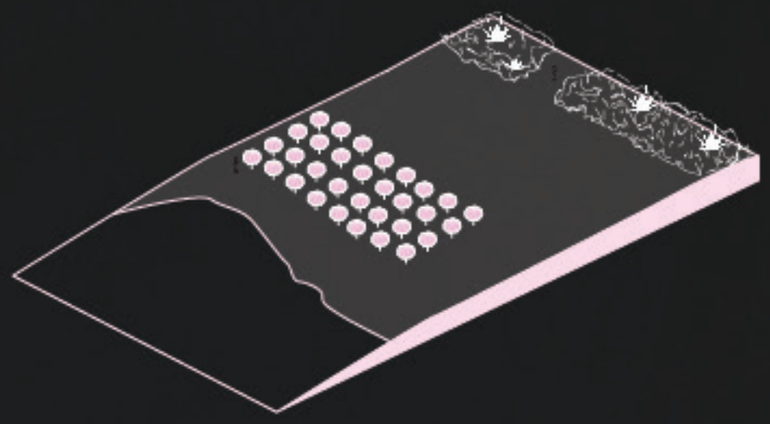
PRIVATE DEFENSE

WALKING ROUTE

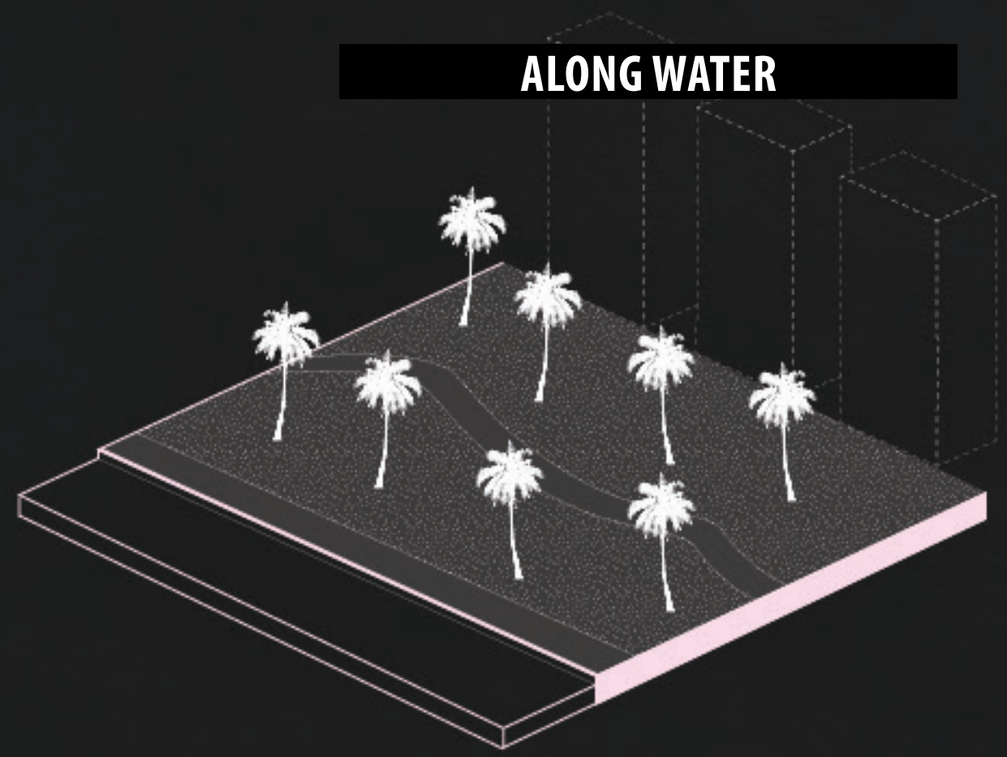
CONNECTING NEIGHBORHOOD AND WATER

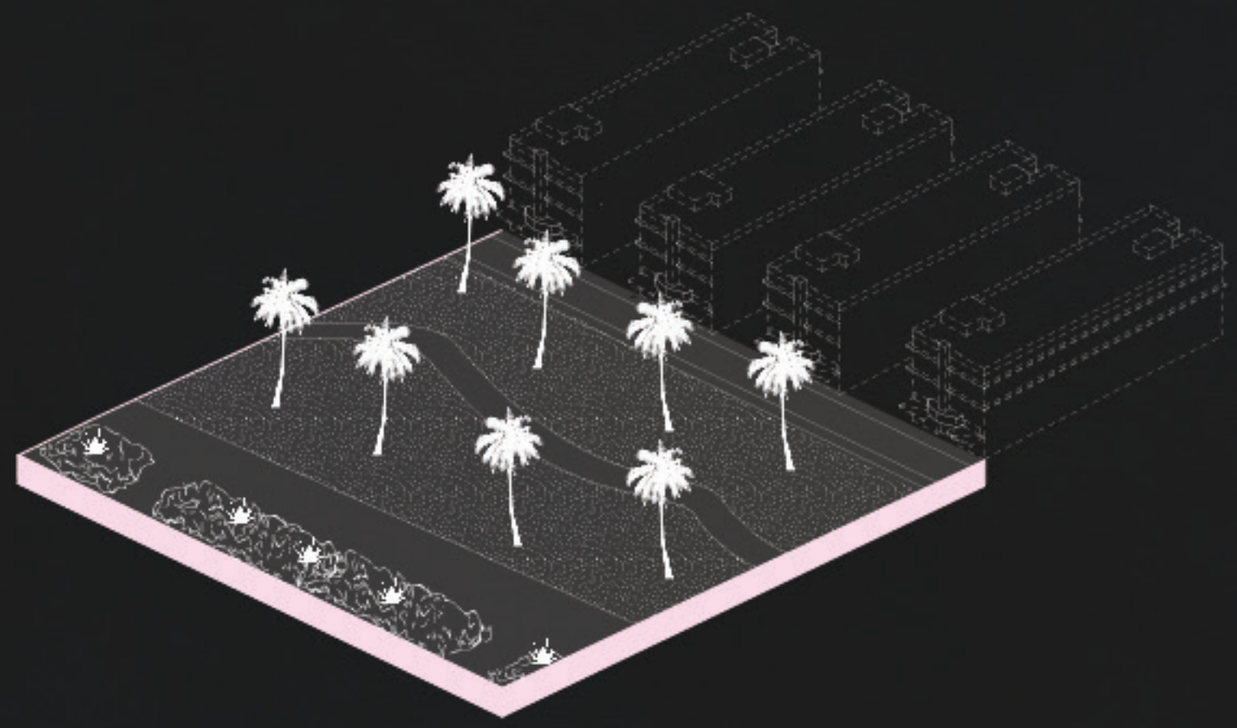






ALONG WATER





WATER RUNOFF

PUMP OUTLET

MAIN SEWAGE SYSTEM

WATER TREATHS INSIDE VS OUTSIDE

PUMP OUTLET

MAIN SEWAGE SYSTEM

FLOOD

FLOODPRONE AREA: BELOW SEALEVEL +20 CM

BELOW SEALEVEL +20 CM BUT ISOLATED

CRITICAL POINTS

CRITICAL POINT

CRITICAL CONNECTION

FLOODPRONE AREA: BELOW SEALEVEL +20 CM

BELOW SEALEVEL +20 CM BUT ISOLATED

CRITICAL POINTS: COASTAL DEFENSE



CRITICAL POINTS: APPROPRIATED





DESIGN SOLUTIONS FROM REMEMBER

LIVING WITH WATER



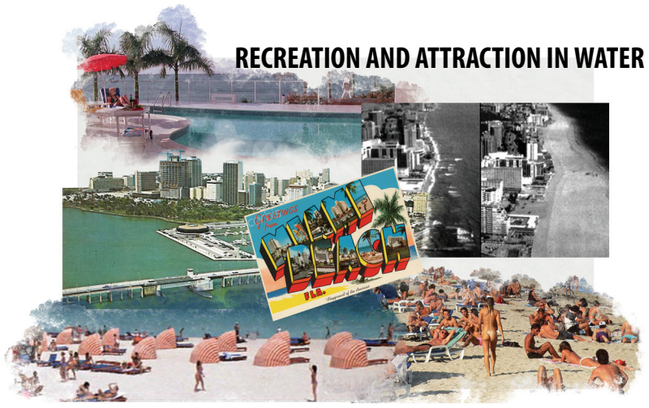
POSSIBILITY FOR DEVELOPMENT



FIND IDENTITY IN WATER



RECREATION AND ATTRACTION IN WATER



NATIVE ECOSYSTEM: MANGROVE SWAMP

ENGINEERED MANGROVE FORESTS

Reduce Storm damage

Natural growth: increase in soil volume through inflow of sedimentation and own organic matter, creating deep peaty soils.

Water purification: can deal with healthier streetwater run off and contribute to the ecosystem in Biscayne Bay

Good contact neighborhood and water

CULTURAL LAYER: DREDGE FILL

ATTACHING STRETCH OF LAND

Soil from dredging out government cut and other canals can be used.

Faster solution : more manageable in dealing with rapid sealevelrise

Creates public space

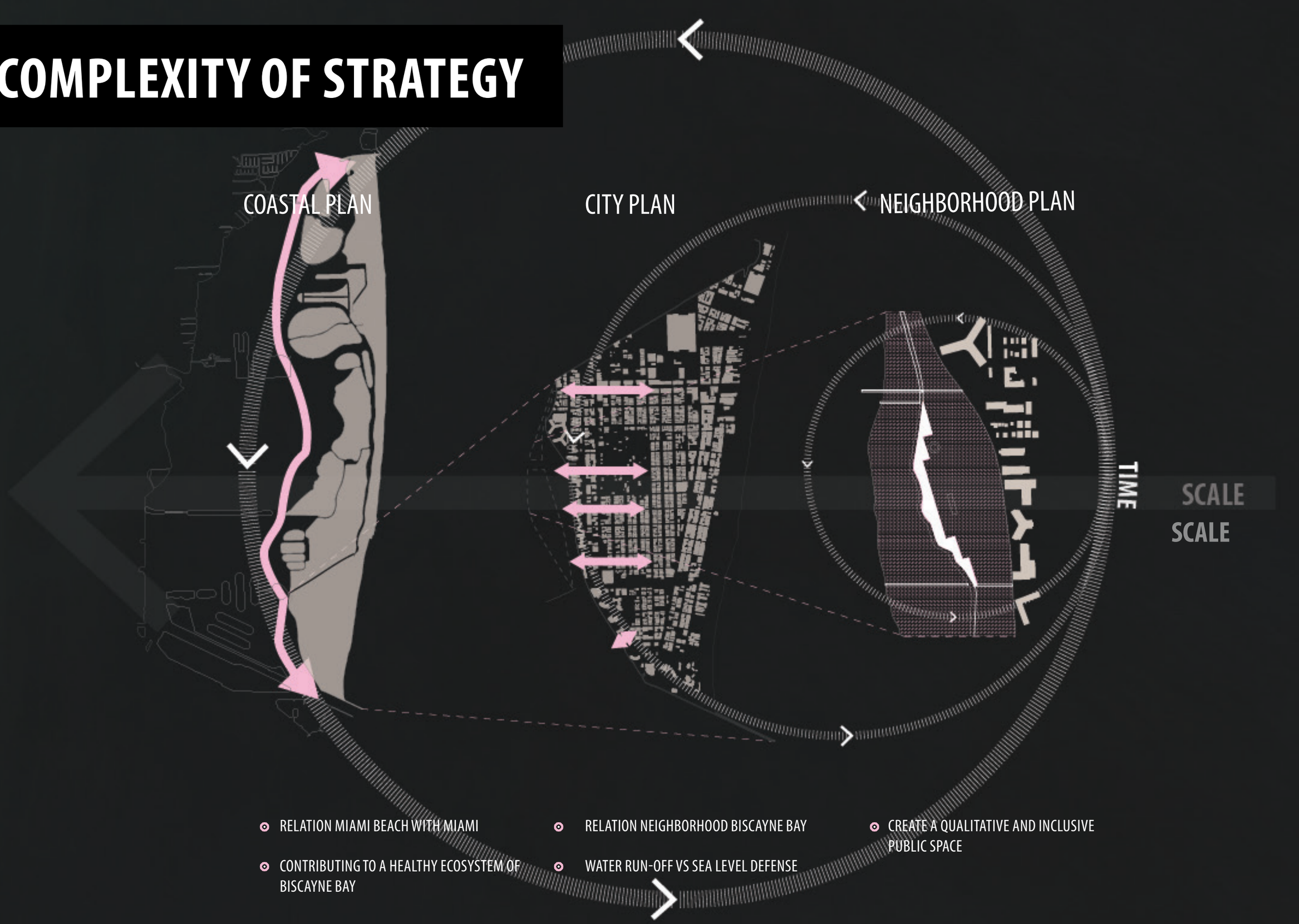
URBAN LAYER: DENSE COASTAL DEVELOPMENT

PRIVATE DEFENSE: SEAWALLS

Fast solution

Investment from private sector

COMPLEXITY OF STRATEGY



- RELATION MIAMI BEACH WITH MIAMI
- CONTRIBUTING TO A HEALTHY ECOSYSTEM OF BISCAYNE BAY
- RELATION NEIGHBORHOOD BISCAYNE BAY
- WATER RUN-OFF VS SEA LEVEL DEFENSE
- CREATE A QUALITATIVE AND INCLUSIVE PUBLIC SPACE

STRATEGY SCALE BISCAYNE BAY

FRAMEWORK PRINCIPLES

COASTAL PROTECTION

FLOOD PROTECTION

BUFFER ZONE TO FILTER STREET WATER RUN OFF BEFORE ENTERING THE BAY

RECREATION & INFRASTRUCTURE: BOAT TRAFFIC SHOULD BE ABLE TO PASS THROUGH
RELIEF OF THE UNDERGROUND IS USED TO BUILD UP THE ISLAND

RESTORE BISCAYNE BAY'S NATURAL COASTLINE

AN EDGE OF MANGROVE SWAMP

GREEN SPACE TO LINK DIFFERENT ECOSYSTEMS

NEW QUALITATIVE INCLUSIVE PUBLIC COAST
ADD ON TO COASTAL BOULEVARD
ATTACH TO CAUSEWAYS IN TIME:

CONNECTION TO MIAMI DADE
WITH RENOVATION CAUSEWAYS THIS CAN BE AN ECOSYSTEM CONNECTION
CAUSEWAYS BECOME PART OF WATER SYSTEM BY ACTING LIKE SLUICES



BISCAYNE BAY DYNAMICS

CURRENTS DIRECTION AND STRENGTH

DREDGED CANAL

RECREATIONAL AREA: MARINA

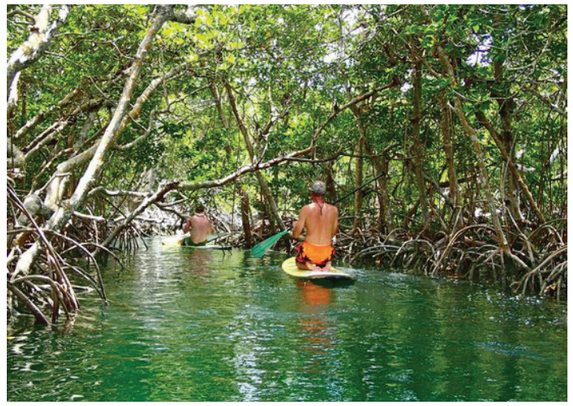
BOAT TRAFFIC OPENING

BISCAYNE BAY BOTTOM DEPTH LINE

GROWTH MANGROVES





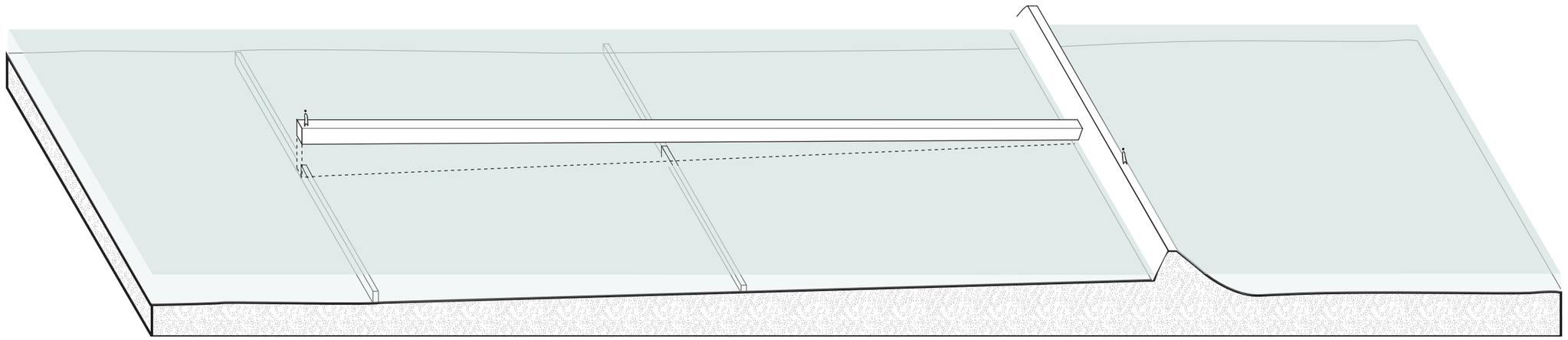




GROWTH OF THE SYSTEM



GROWTH OF THE SYSTEM





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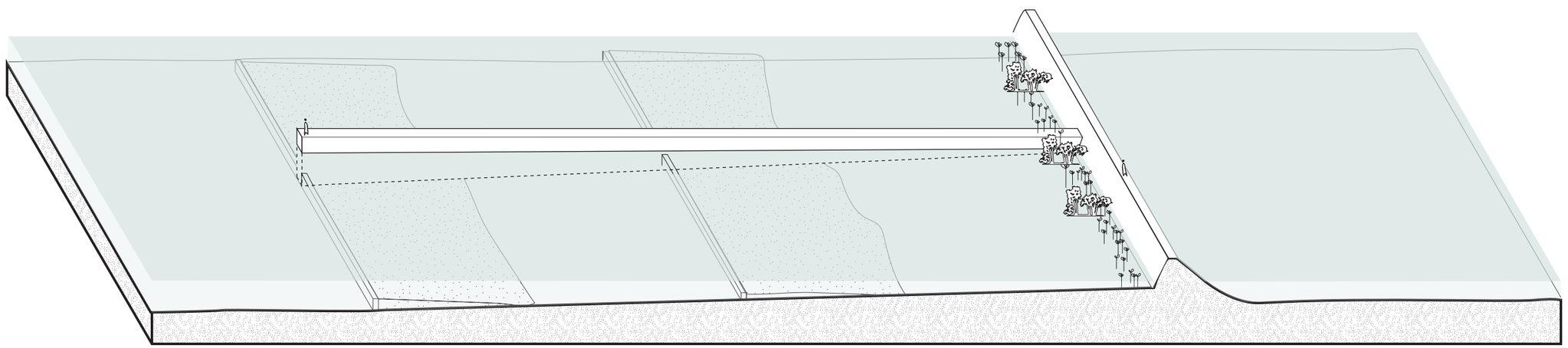



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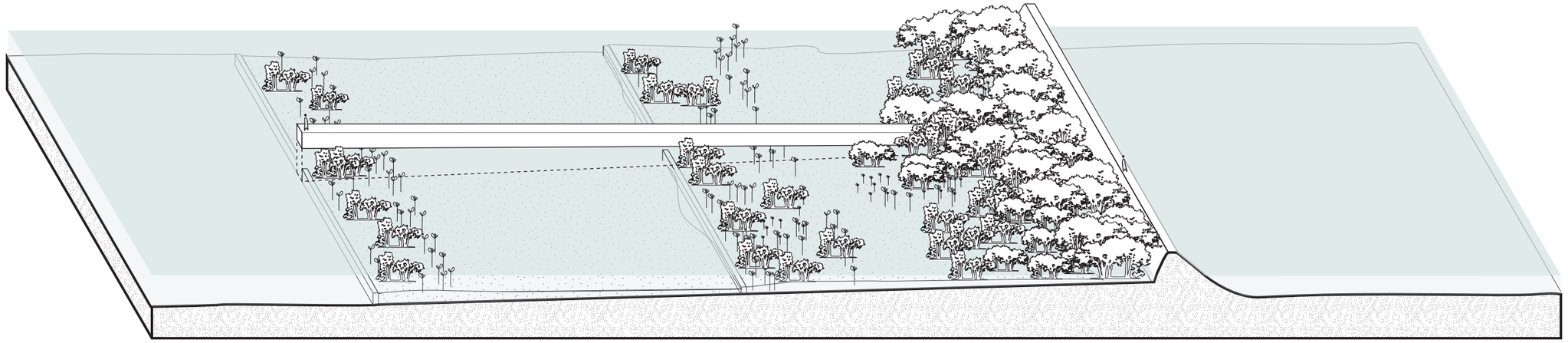

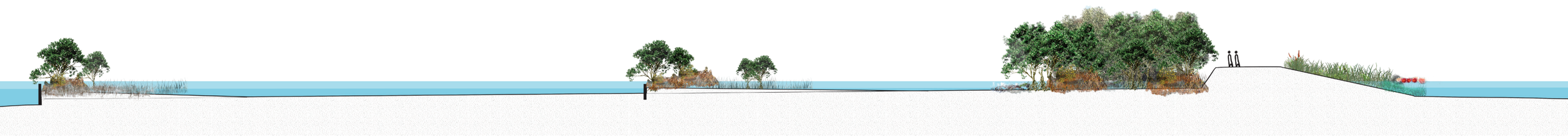

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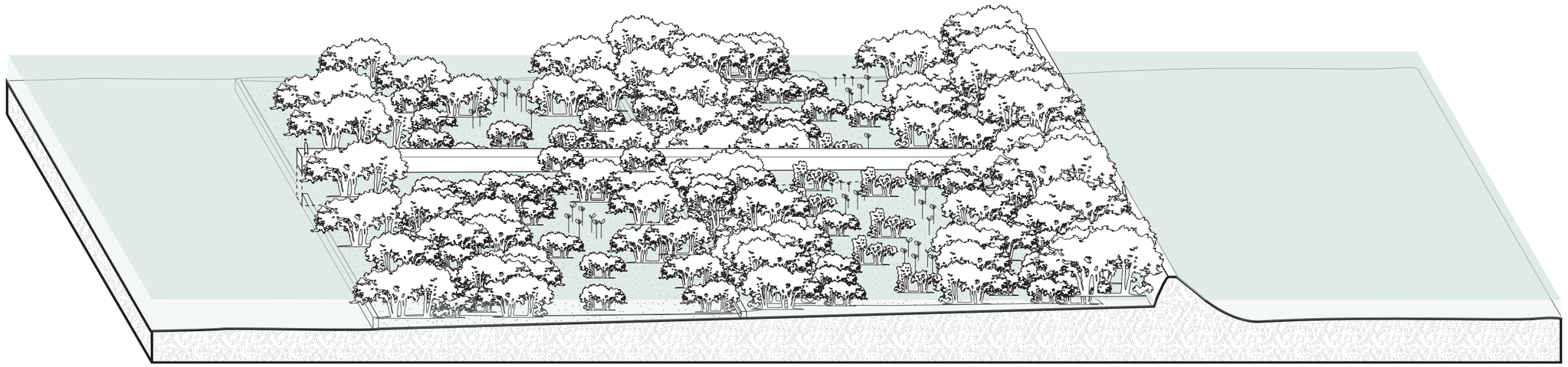



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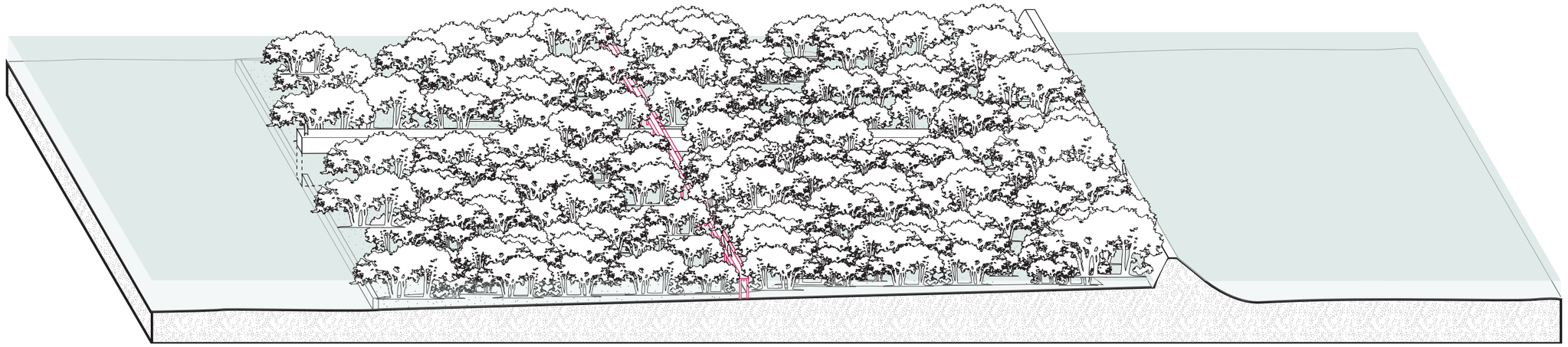



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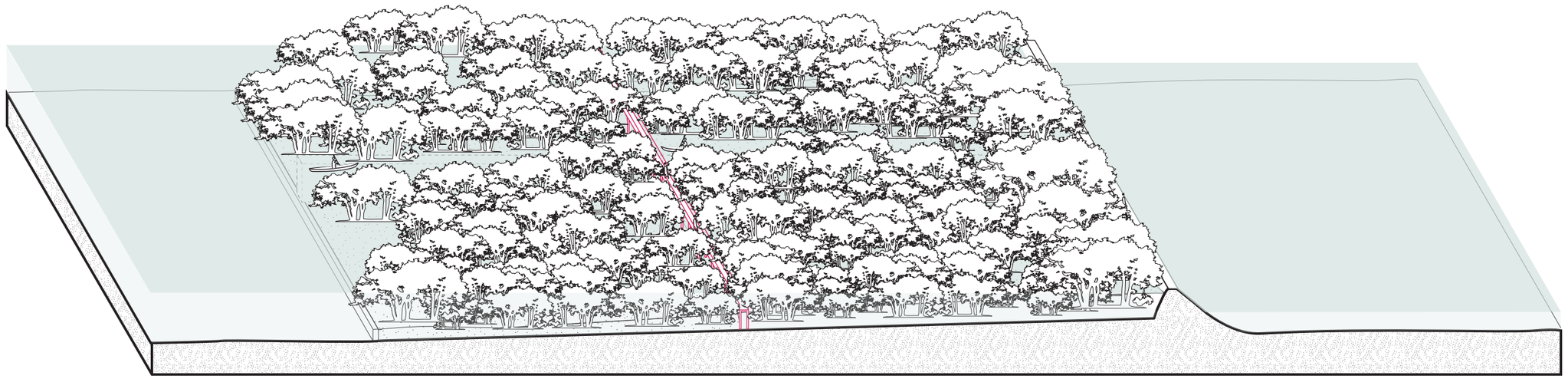
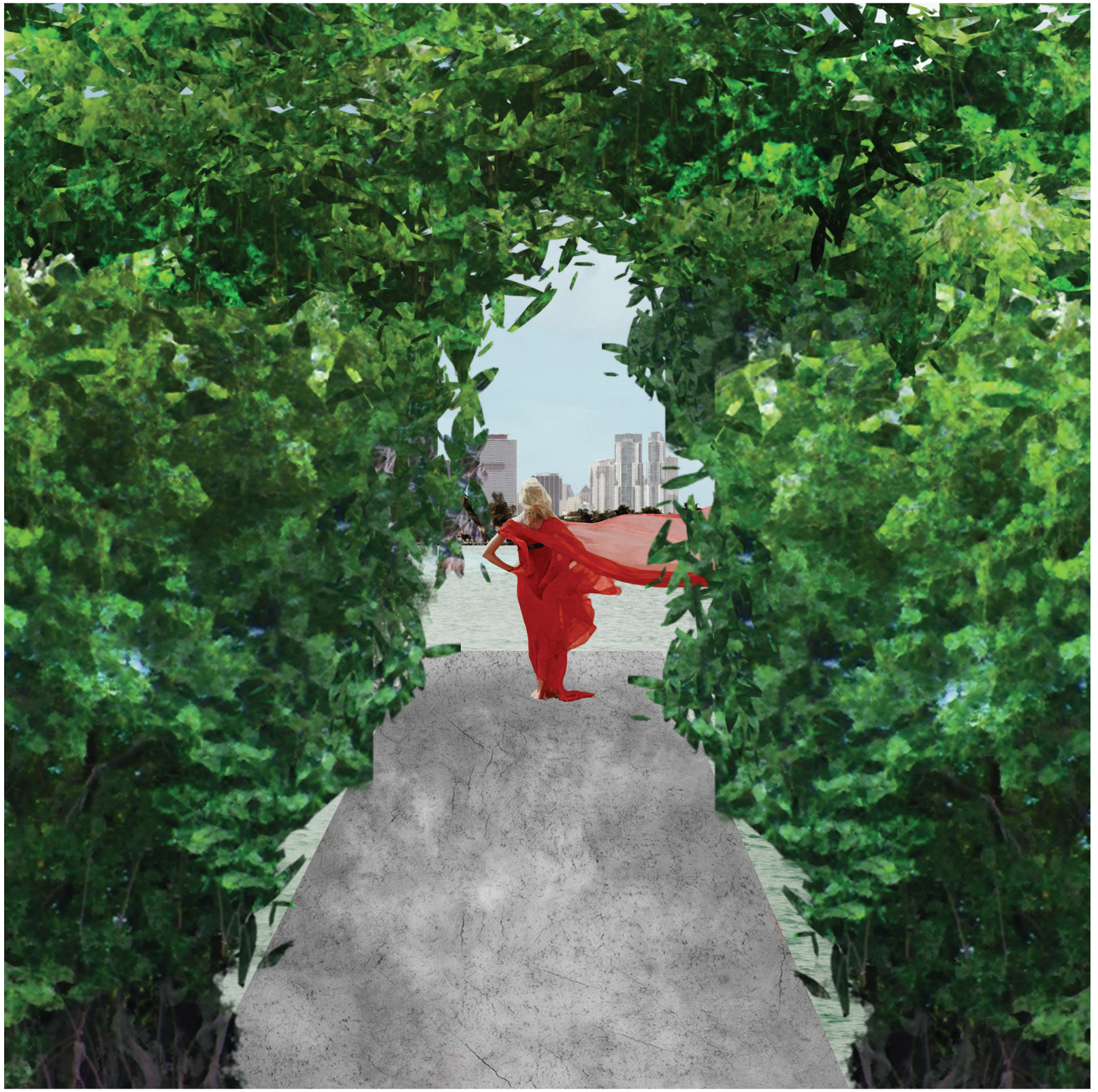




RELATION MANGROVES AND THE CITY









SCALE SOUTH BEACH

NEW WATERSYSTEM AND CANALS
CANALS CONNECTING TO NEW LAGUNA
PHYTO REMEDIATION IN CANALS
LAGUNA FUNCTIONS AS WATERBUFFER

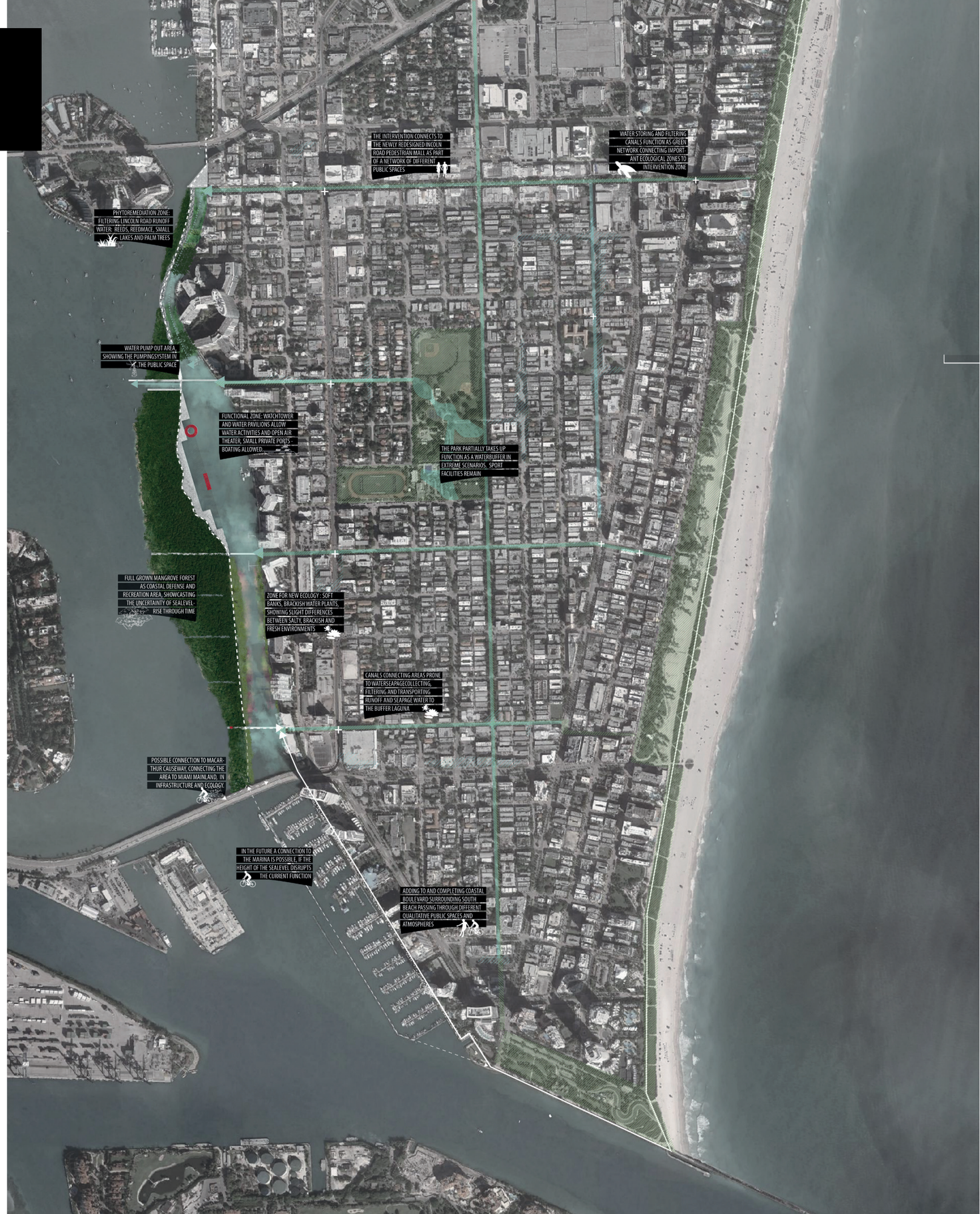
CONNECTION TO THE CITY
BRIDGES EXTENDING THE URBAN FABRIC
CREATING VIEWS TO MIAMI

RESTORE BISCAYNE BAY'S NATURAL COASTLINE
AN EDGE OF MANGROVE SWAMP
GREEN SPACE TO LINK DIFFERENT ECOSYSTEMS

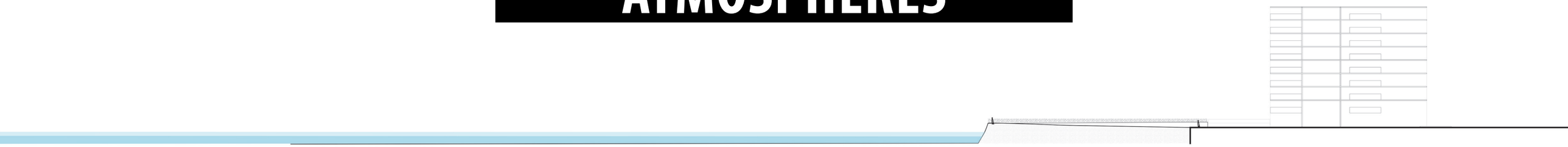
ZONES OF FUNCTION AND EXPERIENCE
3 ZONES - NORTH: PHYTOREMEDIATION SYSTEM
MIDDLE: CULTURE FUNCTION
SOUTH ECOLOGICAL EXPERIMENTATION

CONNECTING TO EXISTING STRUCTURES
RECREATIONAL: LINCOLN ROAD MALL
MACARTHUR CAUSEWAY
MARINA, SOUTH POINTE PARK AND LUMMUS PARK

ECOSYSTEM SERVICE: CONNECT NEW MANGROVES TO EXISTING BEACH LAND-SCAPE THROUGH GREEN CANALS AND CORRIDORS
MACARTHUR CAUSEWAY GREEN RENOVATION: CONNECT TO BIGGER MIAMI



ATMOSPHERES



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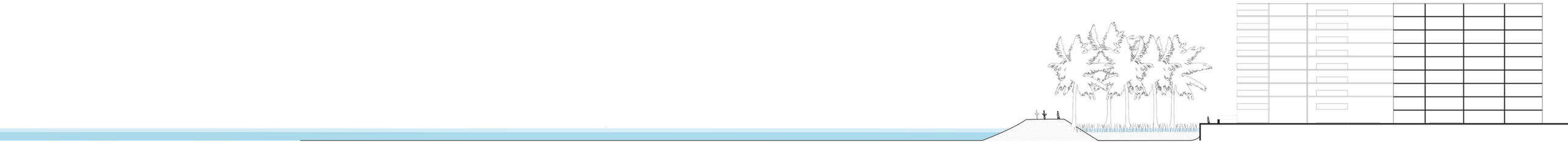

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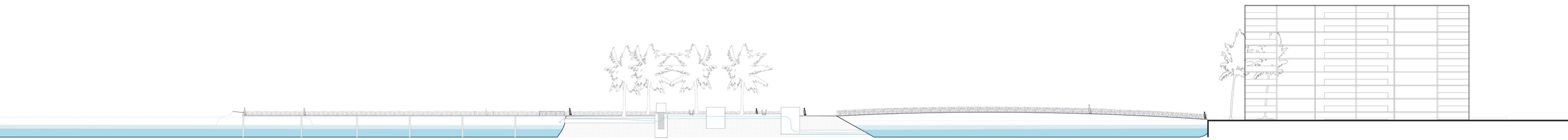

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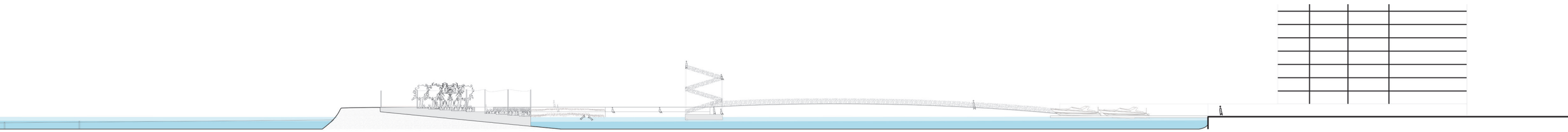

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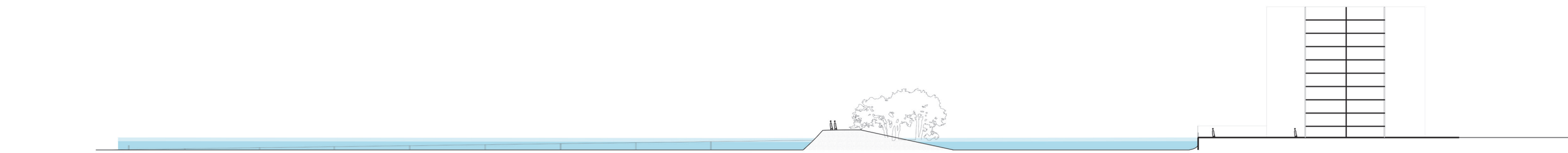

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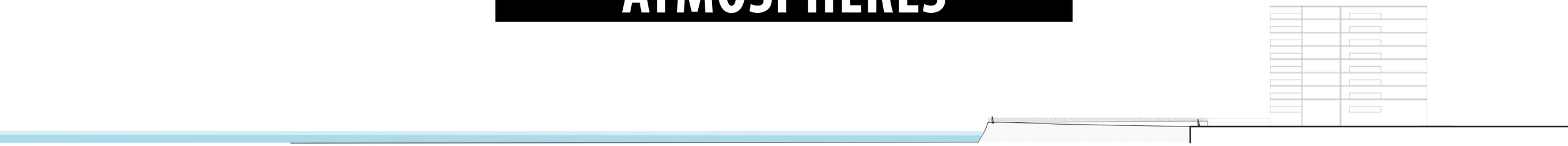
ATMOSPHERES



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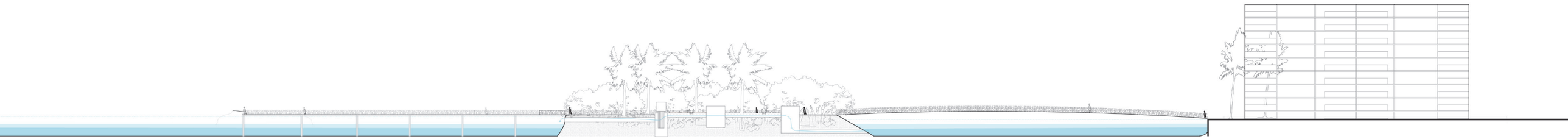

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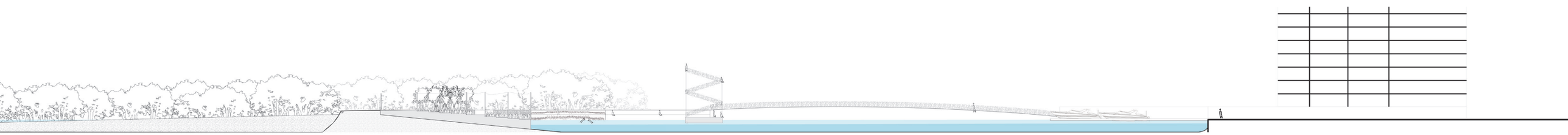

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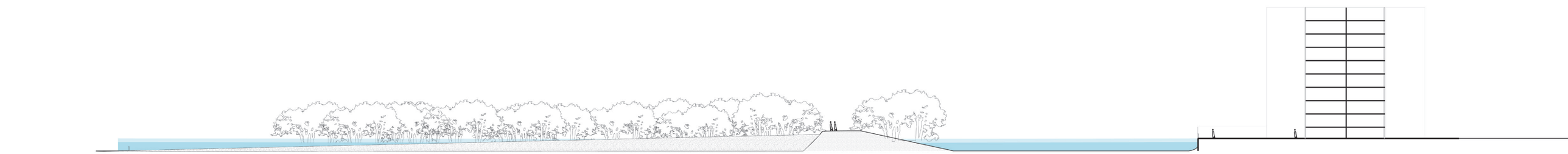


5

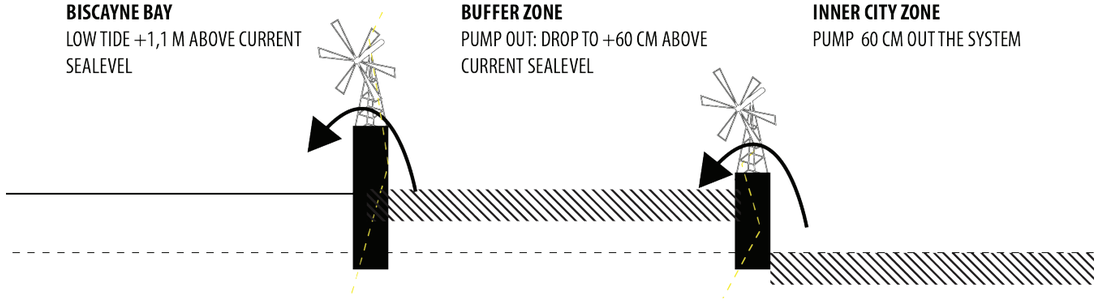
WATERSYSTEM



BISCAYNE BAY
LOW TIDE +1,1 M ABOVE CURRENT SEALEVEL

BUFFER ZONE
PUMP OUT: DROP TO +60 CM ABOVE CURRENT SEALEVEL

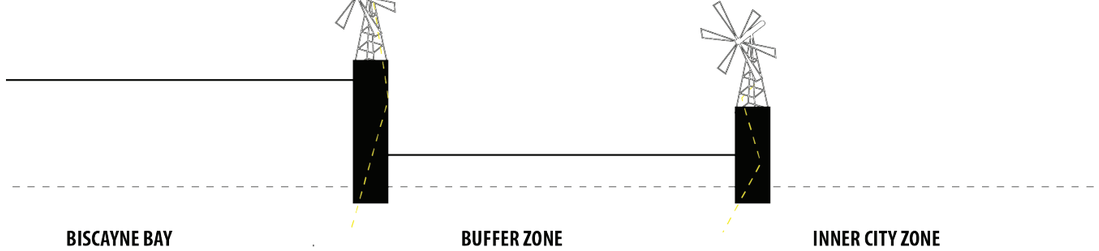
INNER CITY ZONE
PUMP 60 CM OUT THE SYSTEM



BISCAYNE BAY
HIGH TIDE 2 M ABOVE CURRENT SEAVEL

BUFFER ZONE
60 CM ABOVE CURRENT SEALEVEL

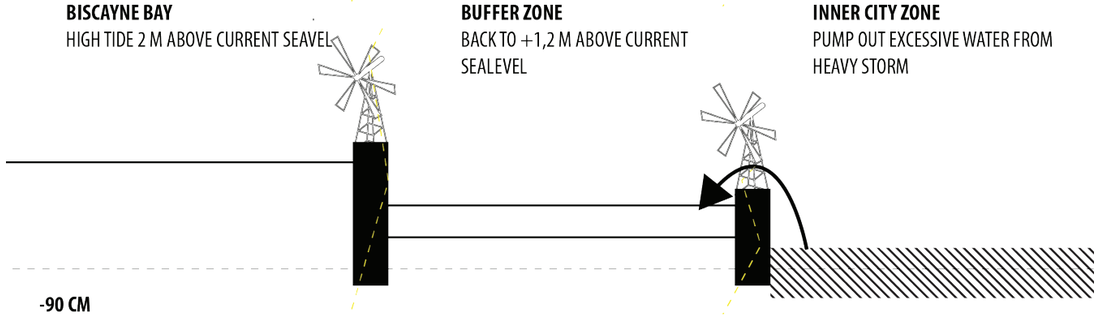
INNER CITY ZONE
80 CM WATER IN THE SYSTEM



BISCAYNE BAY
HIGH TIDE 2 M ABOVE CURRENT SEAVEL

BUFFER ZONE
BACK TO +1,2 M ABOVE CURRENT SEALEVEL

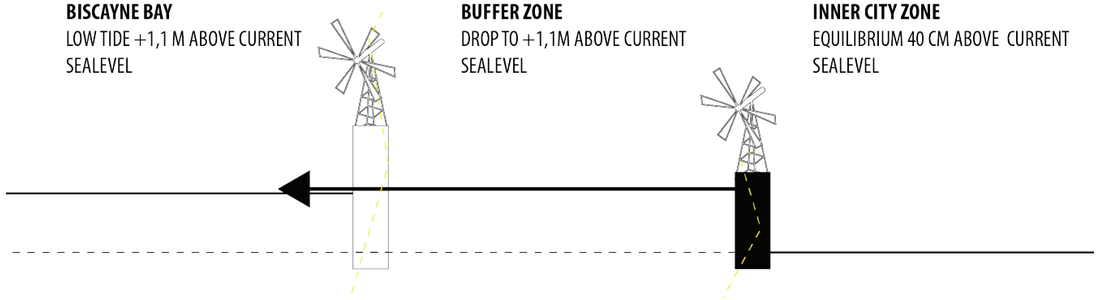
INNER CITY ZONE
PUMP OUT EXCESSIVE WATER FROM HEAVY STORM



BISCAYNE BAY
LOW TIDE +1,1 M ABOVE CURRENT SEALEVEL

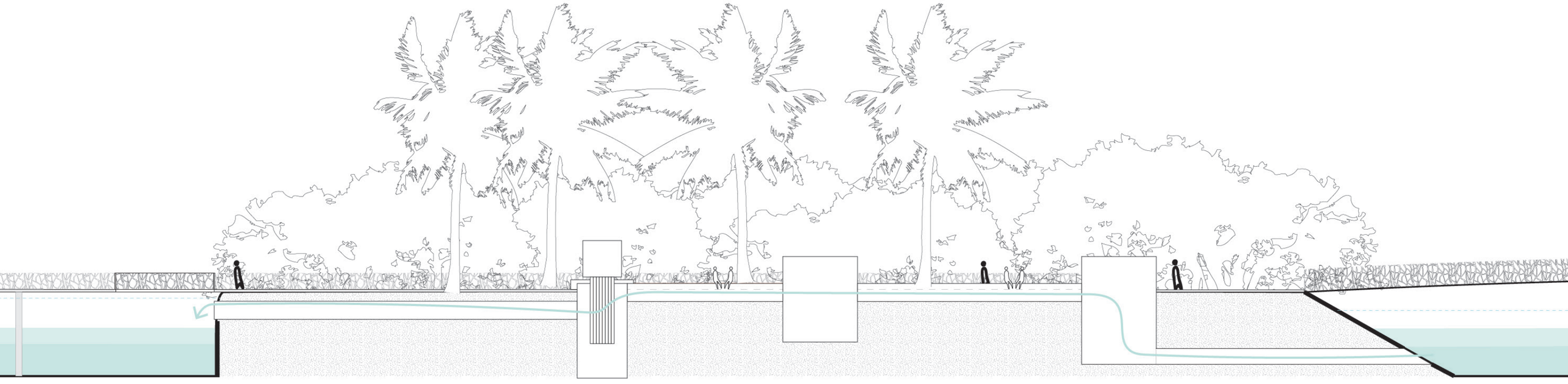
BUFFER ZONE
DROP TO +1,1M ABOVE CURRENT SEALEVEL

INNER CITY ZONE
EQUILIBRIUM 40 CM ABOVE CURRENT SEALEVEL





PUMPS IN THE PUBLIC SPACE



SCALE 10-14TH STREET

2018 - MANMADE INTERVENTION WITH CURRENT MEAN SEA LEVEL

SCALE 10-14TH STREET

SCALE 10-14TH STREET

SCALE 10-14TH STREET

SCALE 10-14TH STREET

2100 FULL GROWN FOREST AND MINIMUM OF+120 M WATER

DEPICTING FLORIDAS LANDSCAPE

AREA'S IN FLOOD LINE - LANDSCAPES THAT ARE VULNERABLE FOR CLIMATE CHANGE



COASTAL SCRUB

Saw & Bluestem palmetto, Seagrape (coccoloba uvifera), Prickly-pear cactus, Cocoplum (Chrysobalanus icaco), Shrub Verbena, Beach sunflower, Coontie, Nickerbean, Yucca.



HARDWOOD HAMMOCKS

Strangler fig, Gumbo-Limbo, Live-Oak, Mastic, Bustic, Lancewood, Ironwood, Poisonwood, Pigeon plum, Jamaica dogwood, Bahama lysiloma, Mahogany, Thatch palms and Manchineel.



SABAL PALM HAMMOCK

Sabal palm. Under-story plants include vines, grasses, ferns and various herbaceous plants, which are determined primarily by the type of soil and available moisture.



FLORIDA MARL PRAIRIE

Saw palmetto, Wire grass, Fetterbush, Tarflower, Gallberry, Blueberry, Broomsedge, Wax myrtle and St. Johnswort are a few of the many plants common to various Pine flatwoods habitats.



FLORIDA PINE FLATWOODS

Saw palmetto, Wire grass, Fetterbush, Tarflower, Gallberry, Blueberry, Broomsedge, Wax myrtle and St. Johnswort are a few of the many plants common to various Pine flatwoods habitats.

MATERIAL PALET






BURRO

CULTURAL ADAPTABILITY

FLEXIBLE ACCOMODATING SPACE

PLACE FOR POSSIBLE HIGH RISE DEVELOPMENT IN THE FUTURE

FLEXIBLE USE



FLEXIBLE USE



POSSIBLE DEVELOPMENT

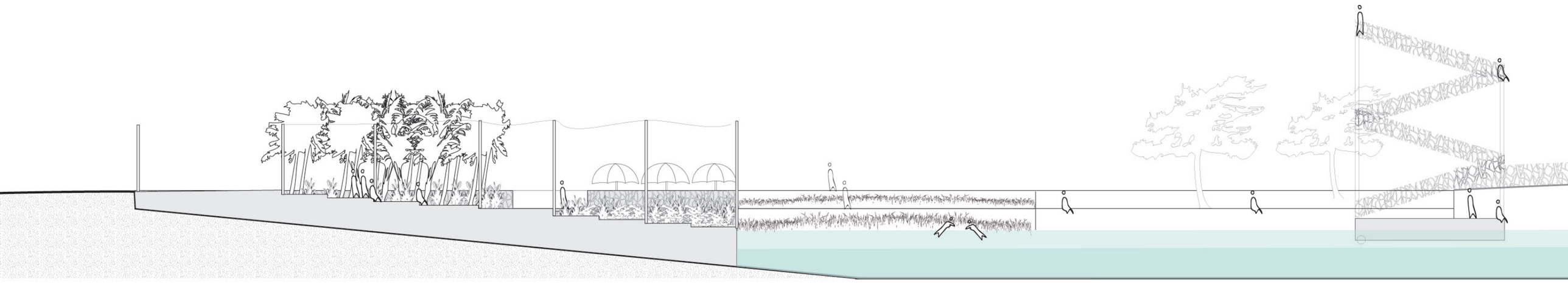




IMPLEMENTATION OF C.F. MØLLER'S GEYSER ON THE LOCATION

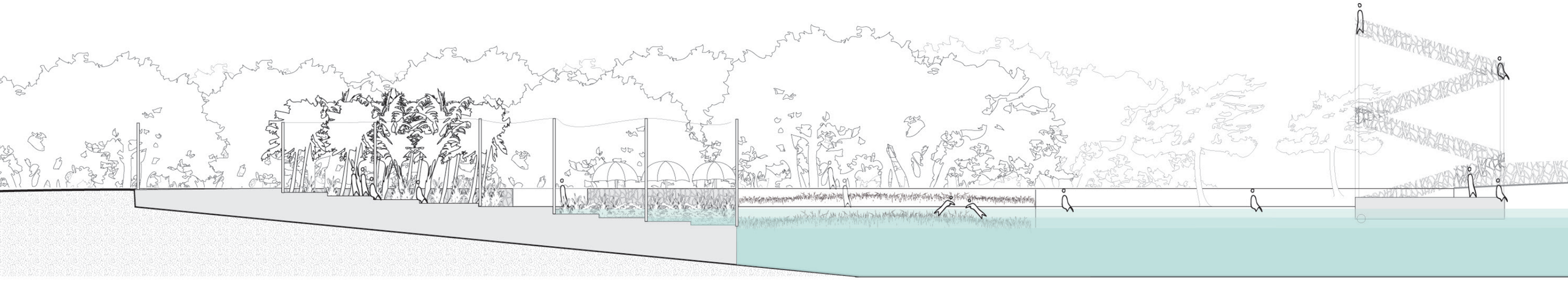
EXPERIENCING WATERFLUCTUATION

2020 - CURRENT WATERLEVEL

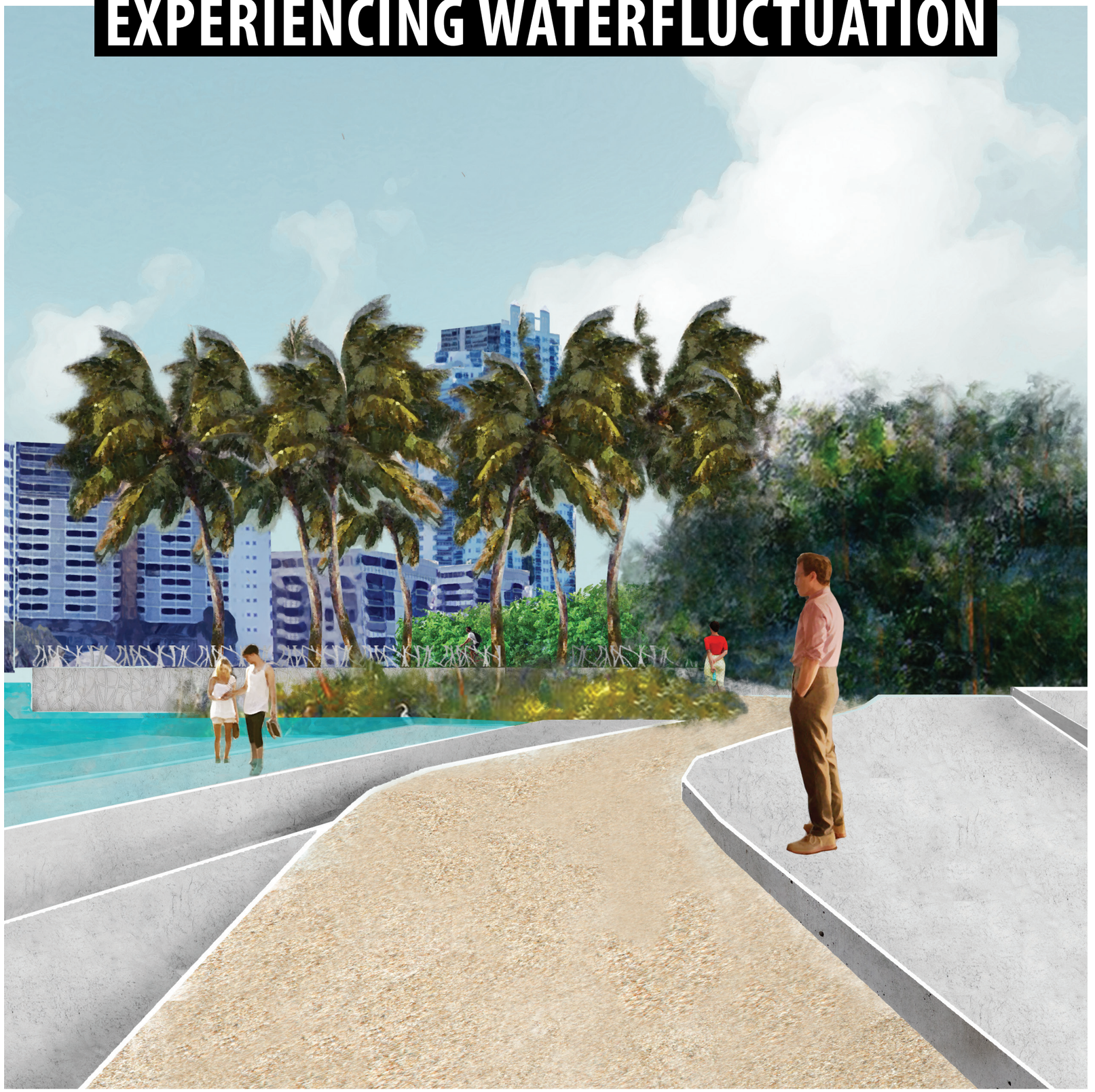


EXPERIENCING WATERFLUCTUATION

NEW EQUILIBRIUM OF +120 CM

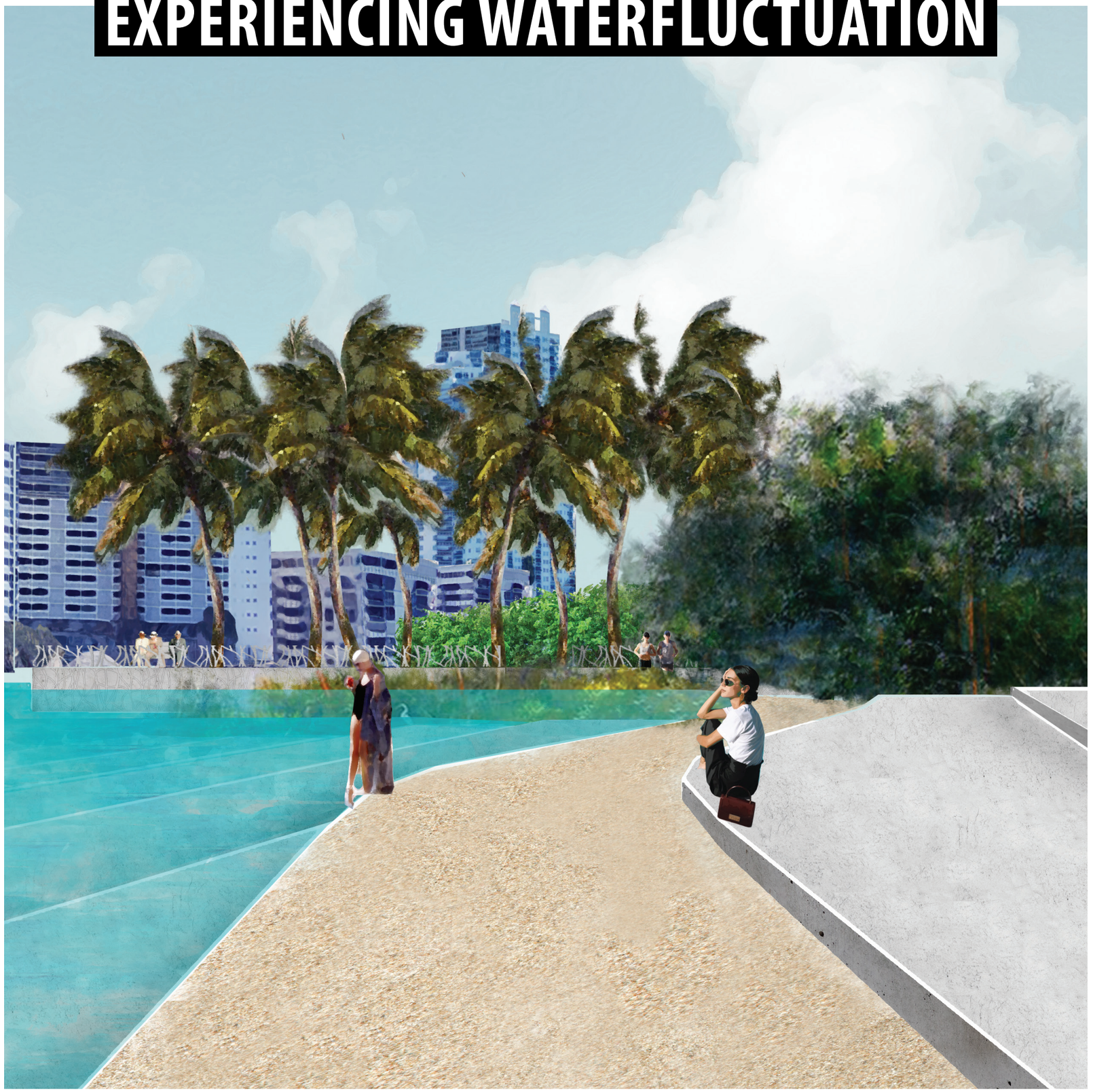


EXPERIENCING WATERFLUCTUATION



+60 CM

EXPERIENCING WATERFLUCTUATION



+120 CM

NEW FUTURE

