

The Casco Shoreway

University at Buffalo / State University of New York

2

Faculty

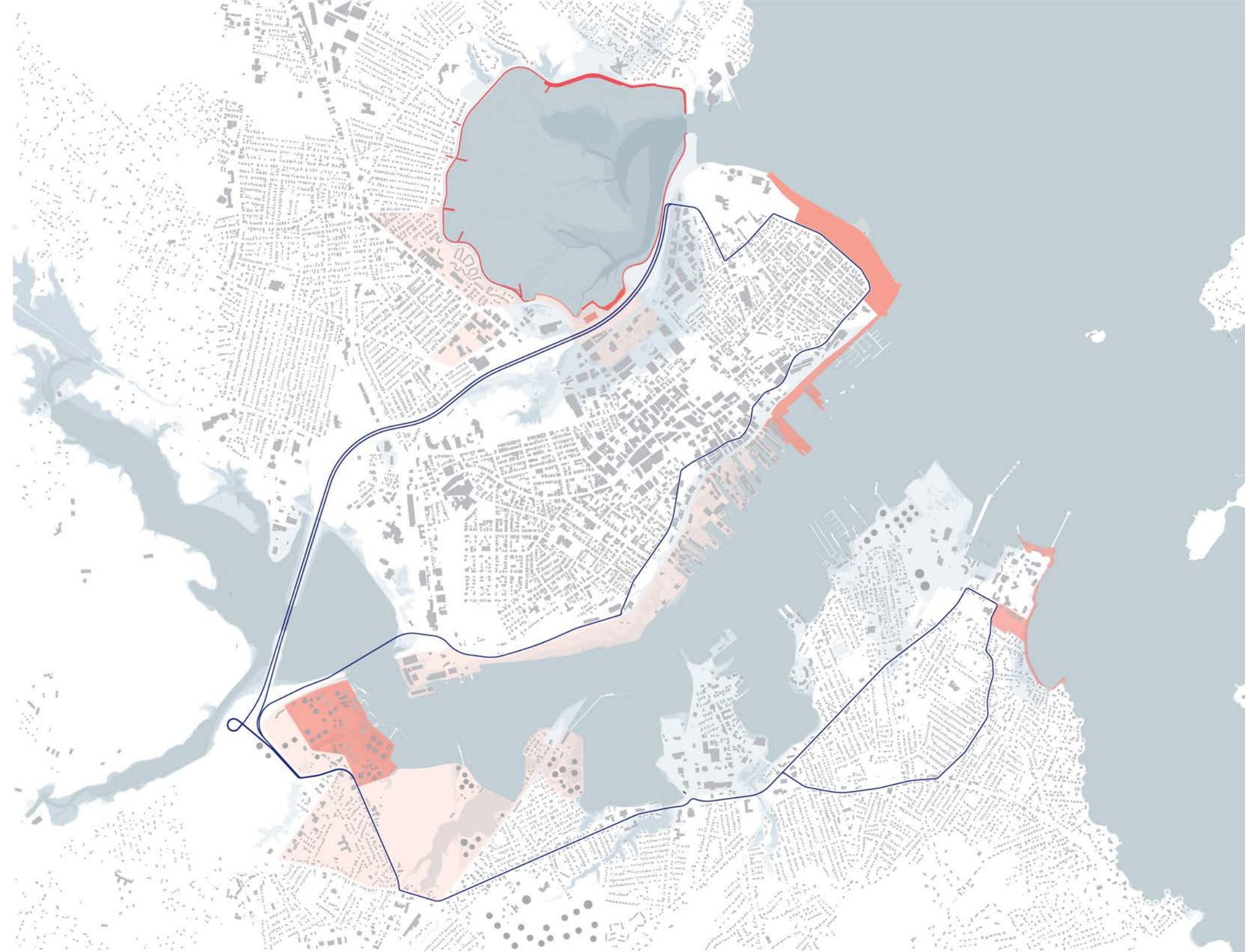
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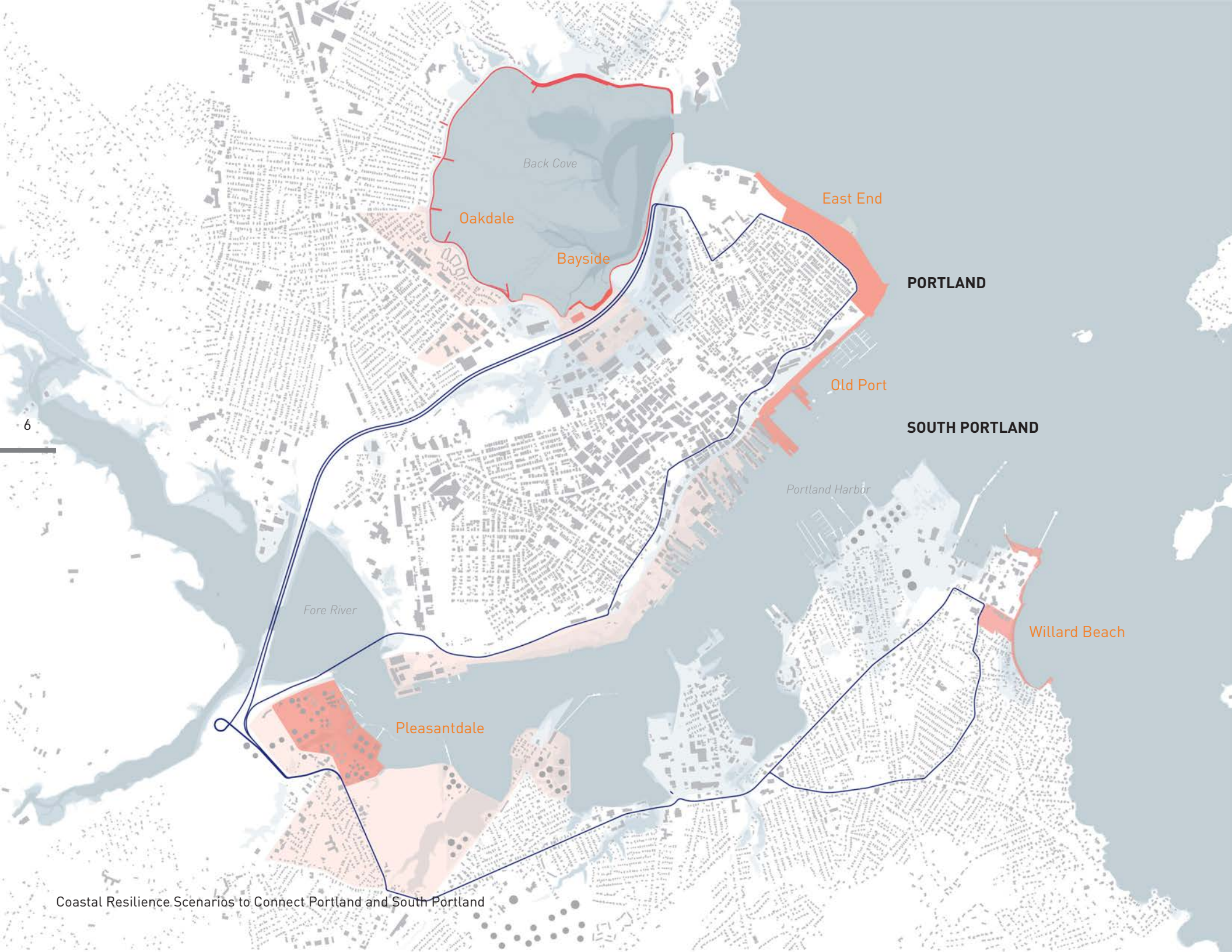
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1 VISION The Casco Shoreway





"Portland isn't just the working waterfront. It is many neighborhoods that share a bay. We want a resilient shoreline that can connect all people in this area."

- Resident of South Portland.

The neighborhoods of Portland and South Portland have the potential to form a cohesive necklace of public space destinations that connect people to natural environments and to one another.

Two Cities, One Shoreline

Downtown Portland is a testament to resilience, weathering challenges like fires, floods, and famine, and much of the city's redevelopment efforts have naturally centered in this historic hub. The eastern seaboard's most important working waterfronts is at the southern edge of the Portland peninsula, but the salt marshes, public spaces, critical ecologies, and vital public spaces that encompass it are disconnected from one another, and from the entirely second city of South Portland. 295 severs the connection between the city and the back cove, while underutilized park space and tourism traffic congest Commercial Street before the enclave of the working waterfront effectively "ends" the edge well before South Portland, even though the impacts of flood events and future flood events impact the shorelines of both of cities.

We propose an eight mile **Casco Shoreline** that dissolves the disparities between the Portlands. From the mudflats of Oakville to fisherman's point at Willard Beach with a naturalized shoreline along the Back Cove, East End, Portland Harbor, the Fore River, and around Bug Light Park into Casco Bay, it offers strategies to mitigate coastal flood risk from SLR and storm surge while creating green pockets of mixed use: public space, housing, and landscape.

PROJECT PRINCIPLES

Coastal Plus Approach

This plan aims to develop innovative “coastal-plus” solutions that address the shared challenges posed by sea level rise, focusing on areas where diverse shoreline contexts and populations intersect. These strategies are designed to provide adaptive responses across three critical timescales: near-term (2030), medium-term (2050), and long-term (2090).

Cross Bay Districts, Shared Resilience

The goal of the Casco Shoreline is to reduce the disparities in resilience between Portland and South Portland neighborhoods by creating linked Cross Bay Districts that:

- [1] Mitigate the Impact of Sea Level Rise and Storm Flooding
- [2] Build All-Abilities Access and Social Mobility
- [3] Promote Habitat, Housing and Human Health
- [4] Generate Place-Based Economies



THE EXISTING CONDITION



1 TWO PORTLANDS
Two cities, shared climate impacts, different experiences

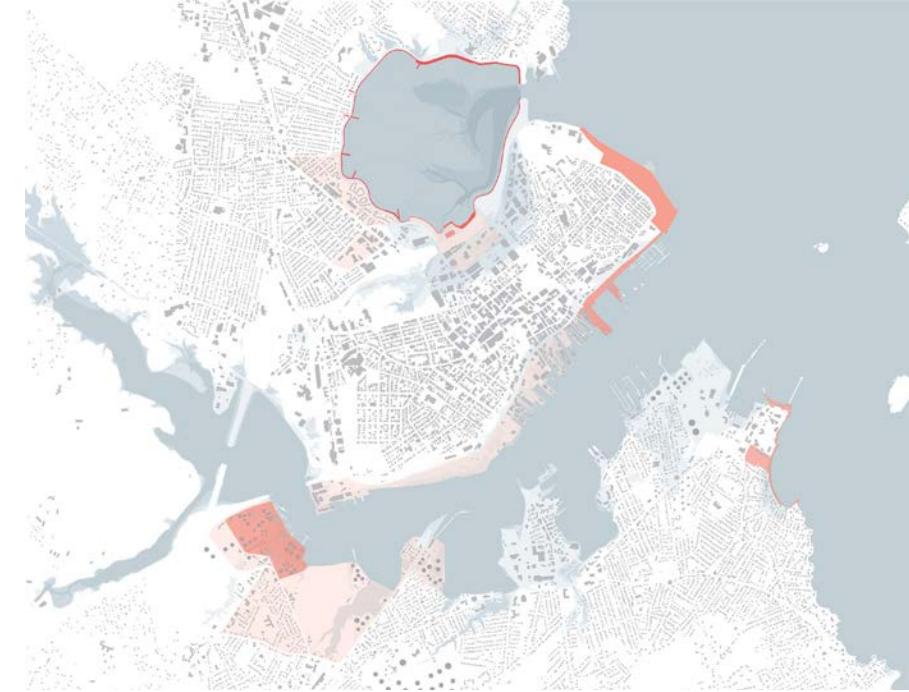
COASTAL FLOOD RISK AND MITIGATION INFRASTRUCTURE TYPES



2 NEIGHBORHOOD BY NEIGHBORHOOD RESPONSE
Focus on where current and future inundation, access, and growth converge

- MI 1** Adapt to Rising Sea Levels
- MI 2** Strategic Retreat from Vulnerable Areas
- MI 3** Defend Against Storm Surges
- MI 4** Control Erosion and Minimize Wave Impact

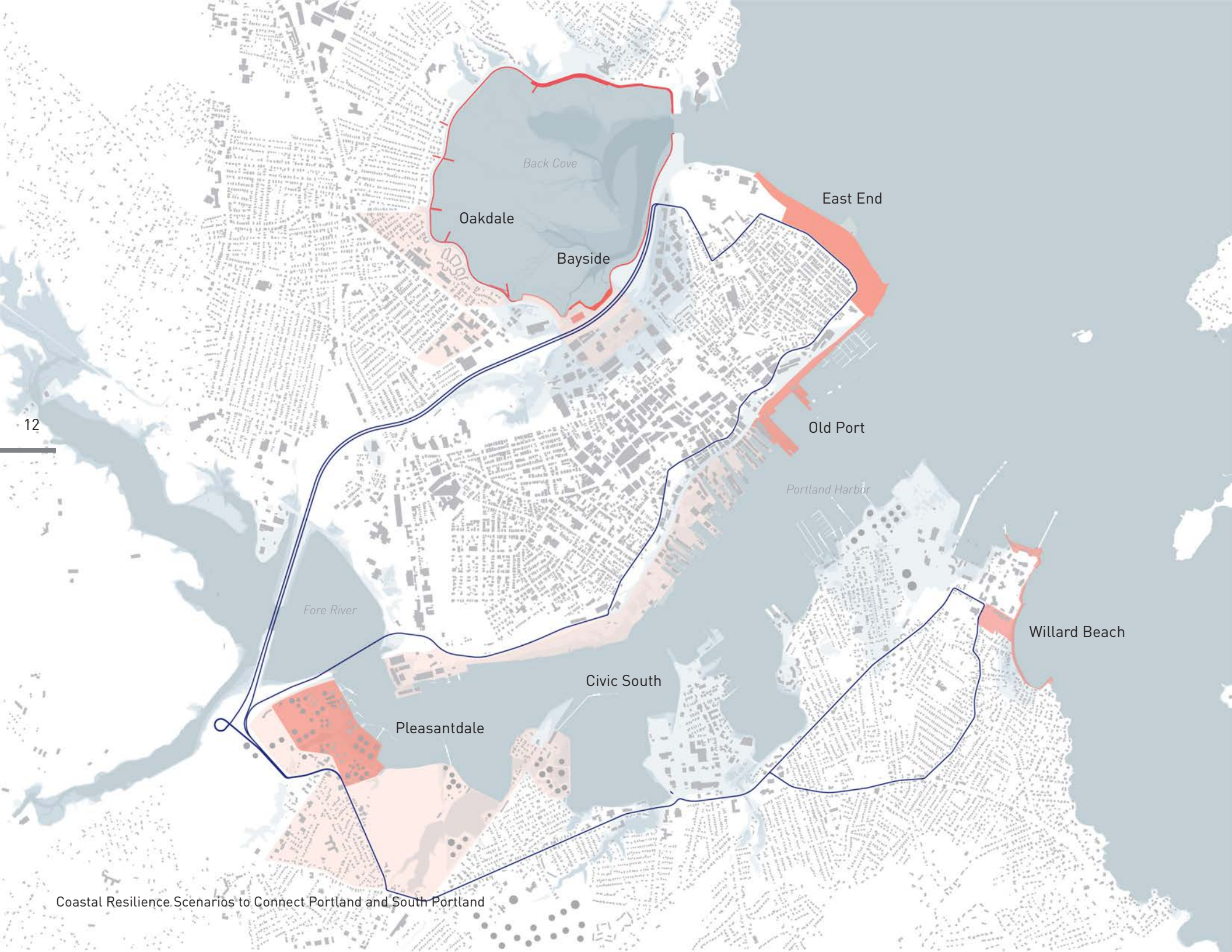
SIX CROSS-BAY DISTRICTS AND RESILIENCE IMPACT AREAS



3 REDUCE CITY WIDE AND LOCAL CONNECTION DISPARITIES
Connect neighborhoods in critical investment areas to coastal environments and to one another.

ONE ADAPTABLE BUS RAPID TRANSIT (BRT) LOOP





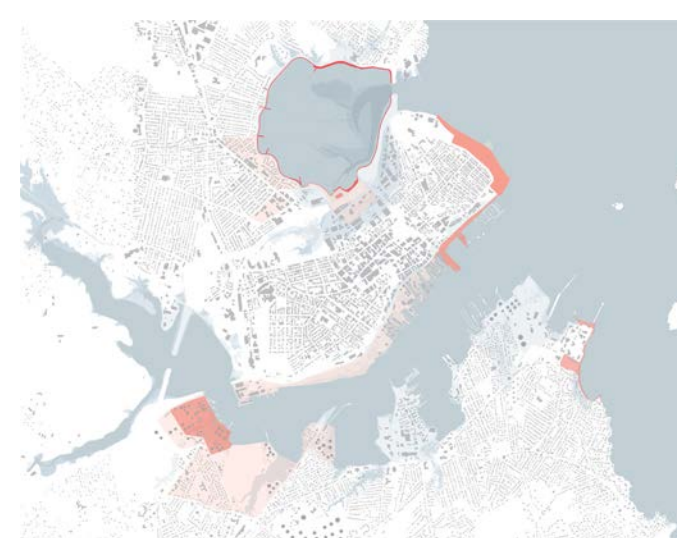
1 UNITE THE TWO PORTLANDS

Reduce the uneven development of climate vulnerabilities.



2 NEIGHBORHOOD RESILIENCE ACTIVATION PLANS

Nature based solutions where compound inundation, access, and growth converge.



3 REDUCE CITY WIDE AND LOCAL CONNECTION DISPARITIES

Connect neighborhoods in critical investment areas to coastal environments and to one another.



18 2 CONTEXT



1. RE-WILDING THE CITY

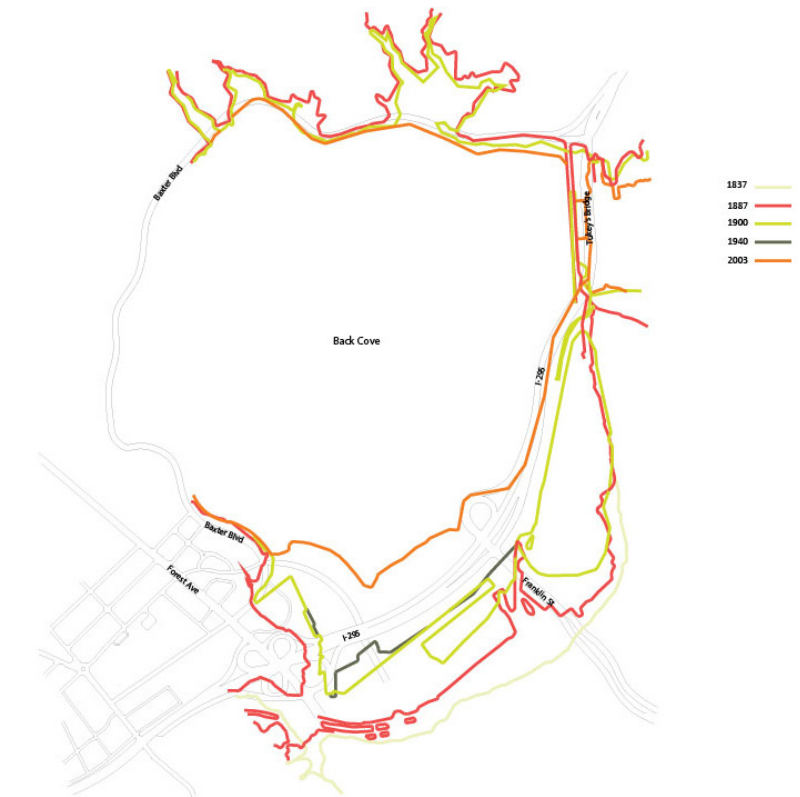
Enhance connection to natural environment



Portland's parks, trails, cemeteries, bike routes, and memorials

2. CONSTRUCTING A RESILIENT SHORE

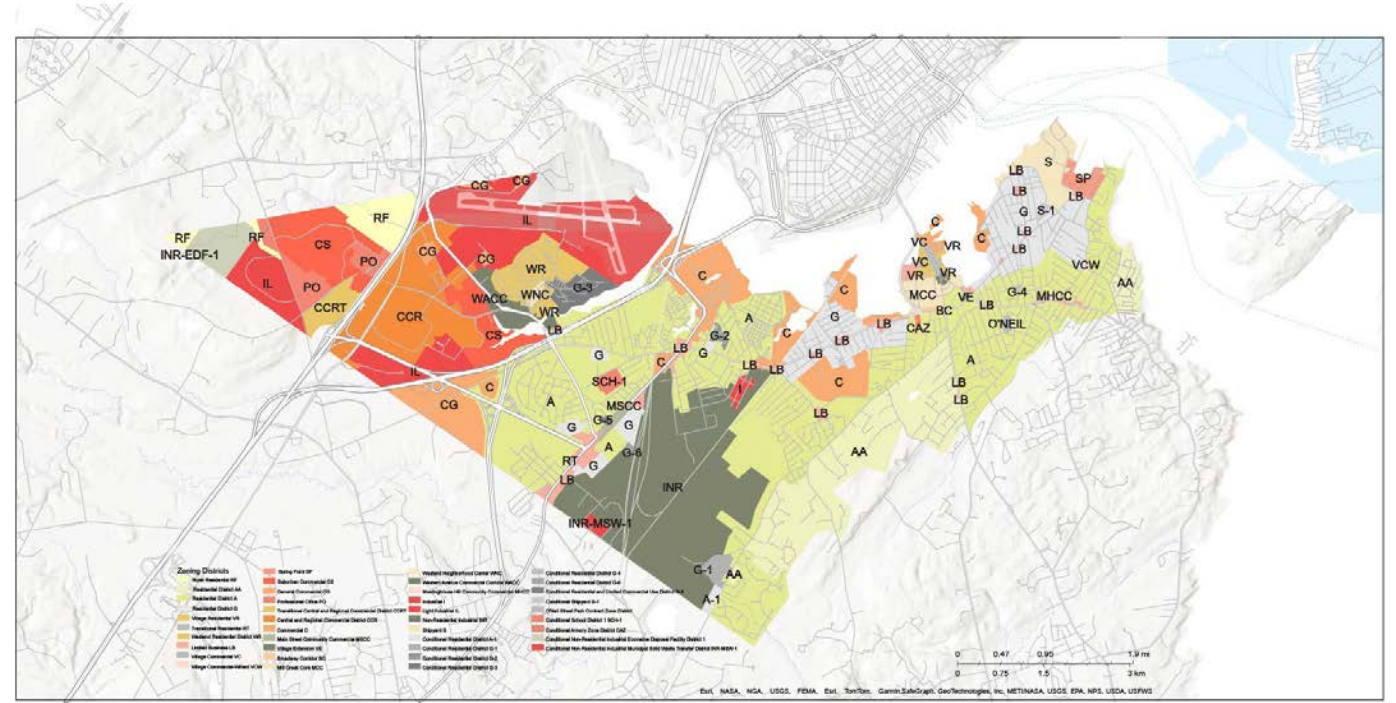
Modifying Portland's history of constructing the shore.



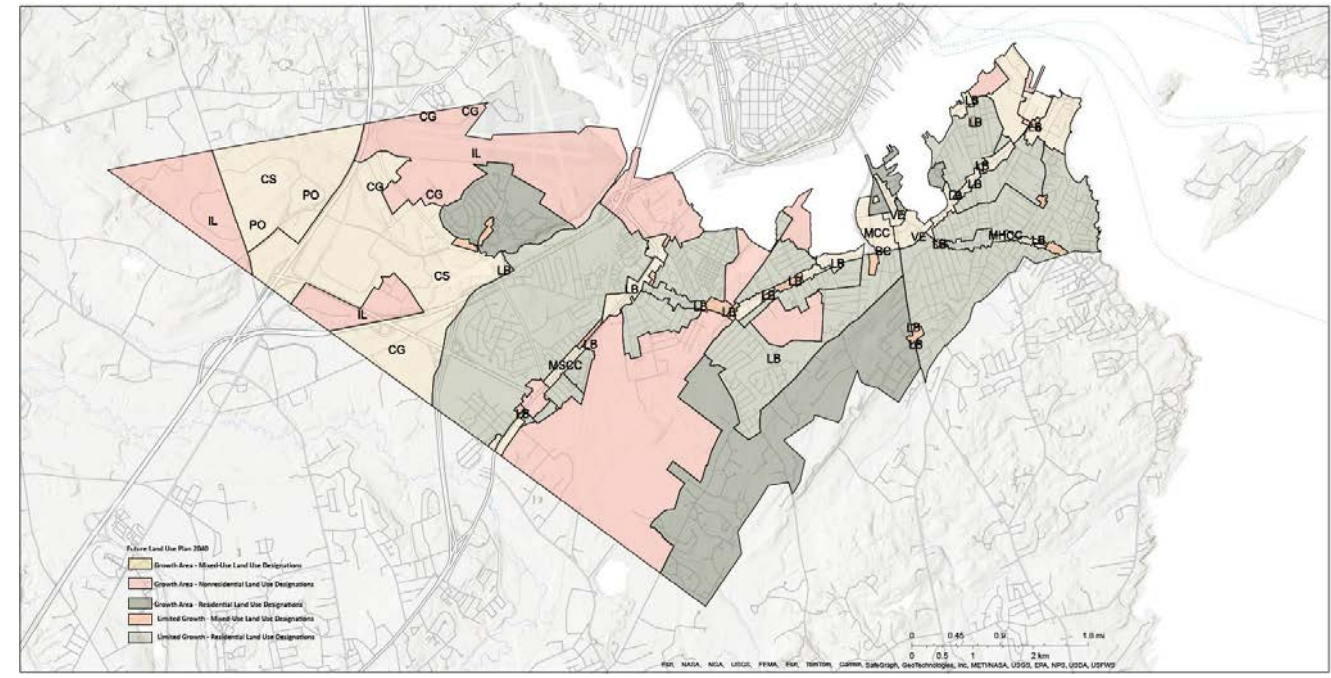
The constructed shoreline of the Back Cove

3. ACCESS TO WELLNESS

Ensure all citizens and critters have safe environments to live.



South Portland - Current Land Use



South Portland - Projected Land Use



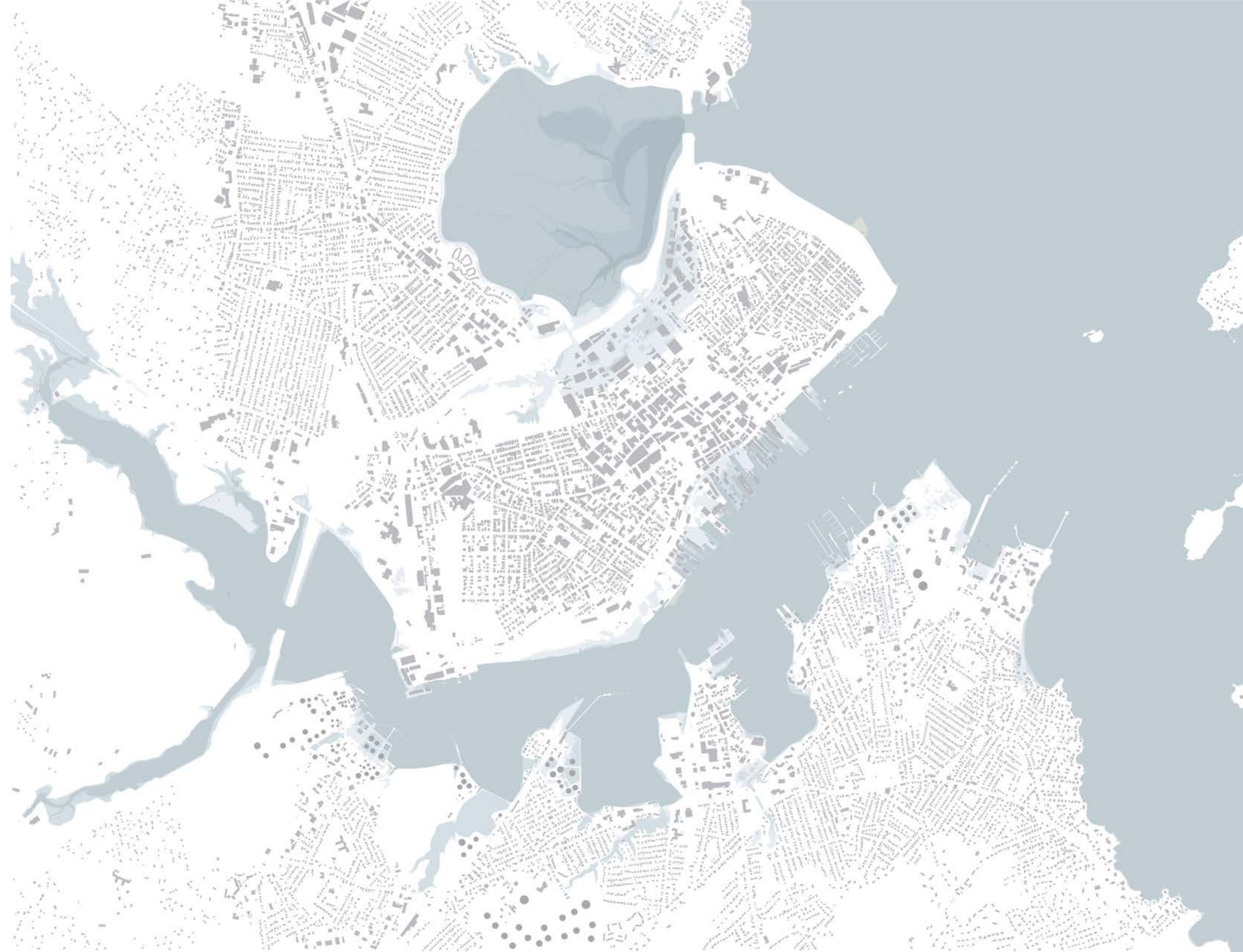
3 COASTAL FLOOD RISKS

COASTAL FLOOD RISK

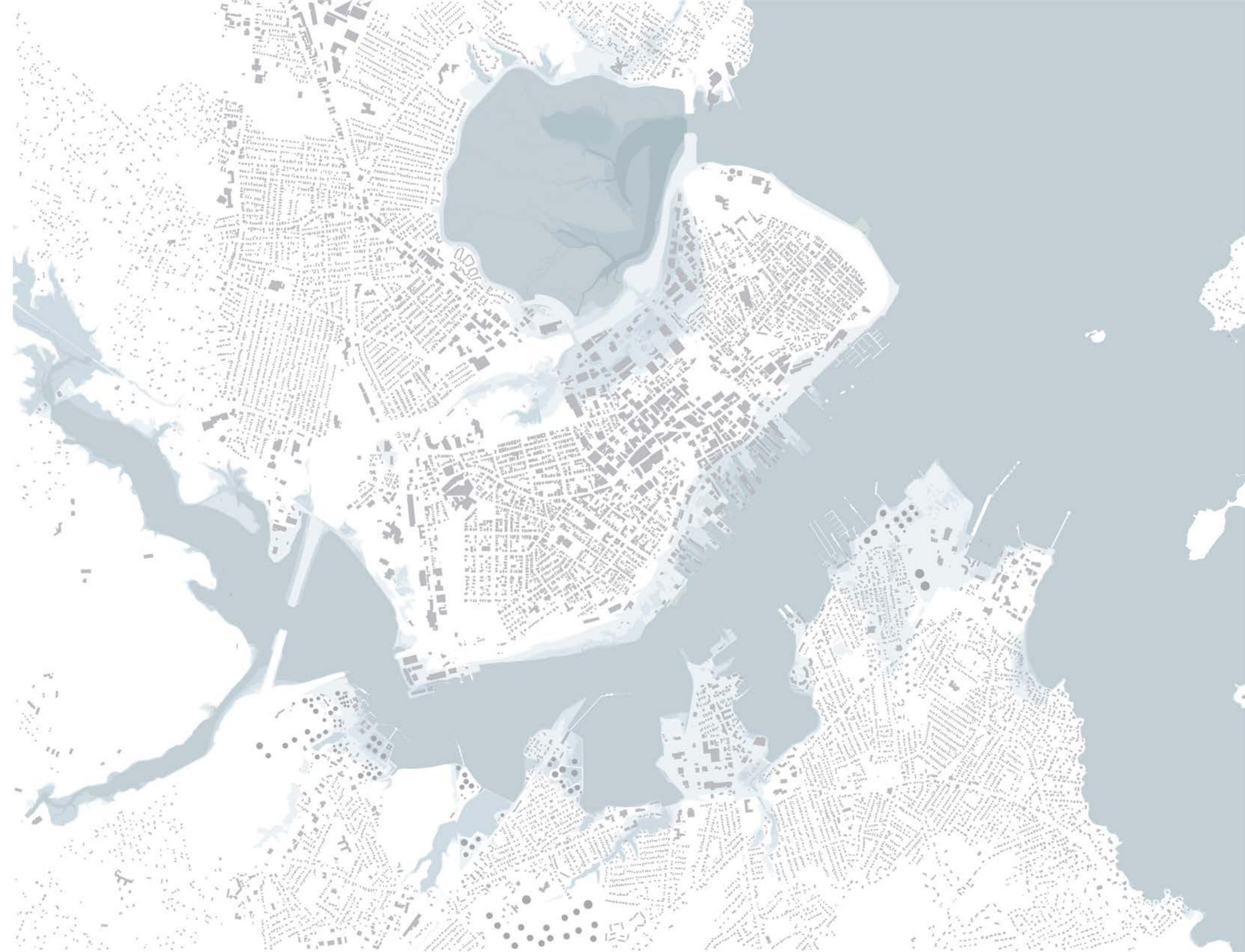
SHORT TERM + 1.6



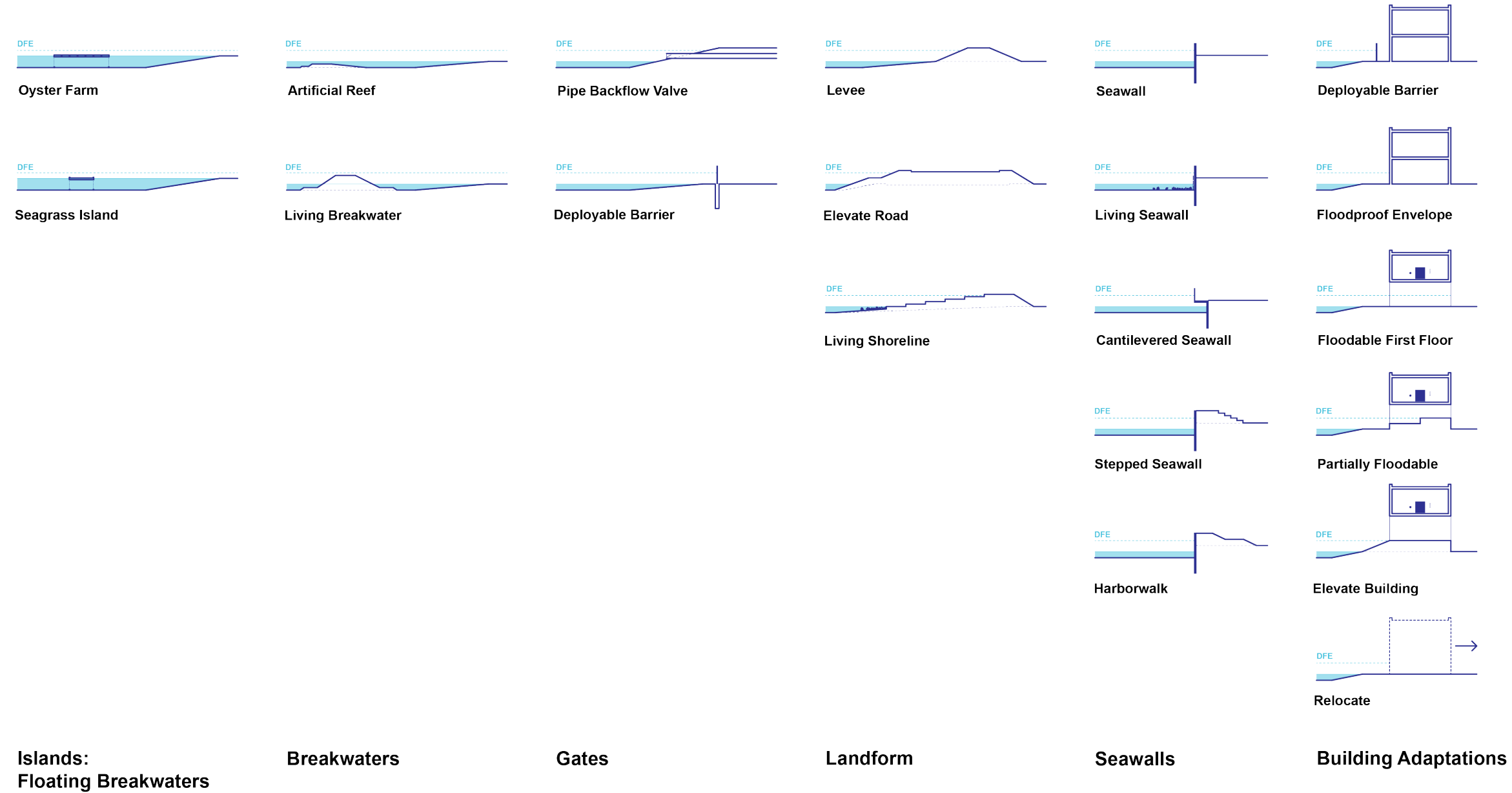
MEDIUM TERM + 3.1'



LONG TERM + 8.8'



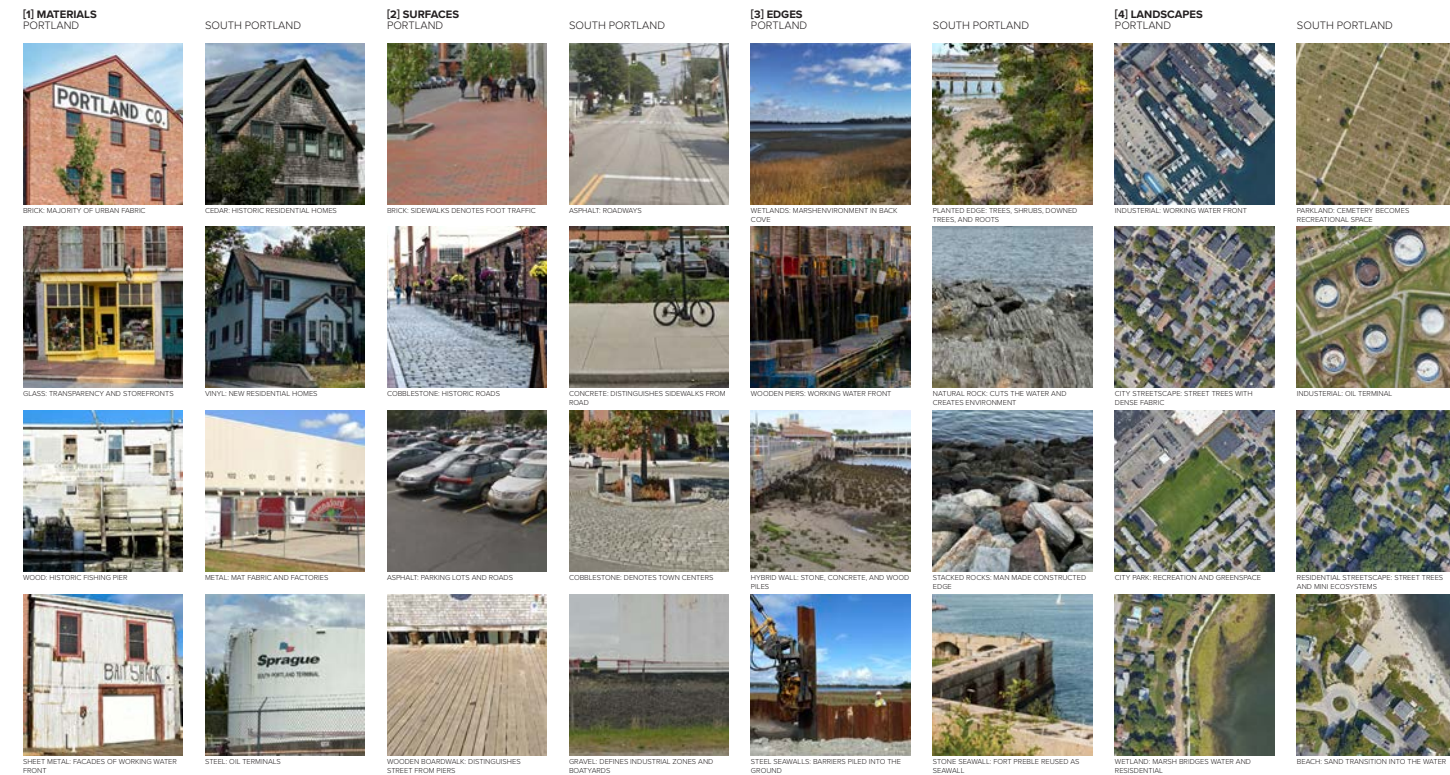
ATLAS OF FLOOD MITIGATION INFRASTRUCTURES



COASTAL FLOOD MITIGATION INFRASTRUCTURE

DESIGN PRIORITIES

URBAN DNA
CATALOG: MATERIALS, SURFACES, EDGES, AND LANDSCAPES



Adapt to Rising Sea Levels
Strategic Retreat from Vulnerable Areas
Defend Against Storm Surges
Control Erosion and Minimize Wave Impact

Catalyze New Blue and Green Economies

Promote Energy Transitions

Revival of Existing Assets

Create and Reclaim Parkland

Promote Sensitive Densification

Prioritize New and Aging Mainers

Establish and Evolve Coastal Environments

Revitalizing Outmoded Infrastructure

PROJECT AREAS	West Back Cove	East Back Cove	East End	Old Port	Sprague	Willard Beach
Adapt to Rising Sea Levels	X			X		
Strategic Retreat from Vulnerable Areas		X				X
Defend Against Storm Surges			X		X	X
Control Erosion and Minimize Wave Impact						
Catalyze New Blue and Green Economies		X		X		
Promote Energy Transitions				X	X	
Revival of Existing Assets	X		X		X	X
Create and Reclaim Parkland	X		X	X	X	
Promote Sensitive Densification		X			X	X
Prioritize New and Aging Mainers		X	X	X		X
Establish and Evolve Coastal Environments	X	X	X	X	X	X
Revitalizing Outmoded Infrastructure		X	X	X	X	X

36 **4 CROSS BAY COASTAL RESILIENCE DESIGN SOLUTIONS**





38

AFTER THE BEACH

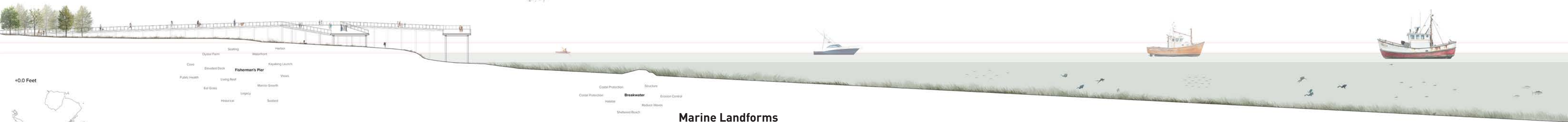
Community-Coast Connections, Marine Habitat Repair

Anushka Ahire, James Metzger, and Bobby Zhao



Coastal Resilience Scenarios to Connect Portland and South Portland

Layers of Public Deck and Habitat

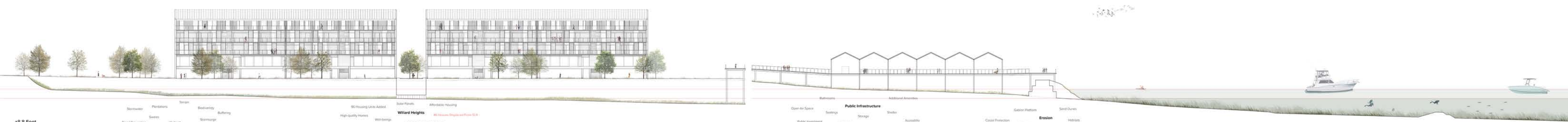


+0.0 Feet



40

Marine Landforms



+8.8 Feet



Housing Hybrids

Coastal Commons

2090

Willard Beach Coastal Commons



2030

Willard Beach House





1 Recreation + Sequestration Inlet 2030



2



3



4



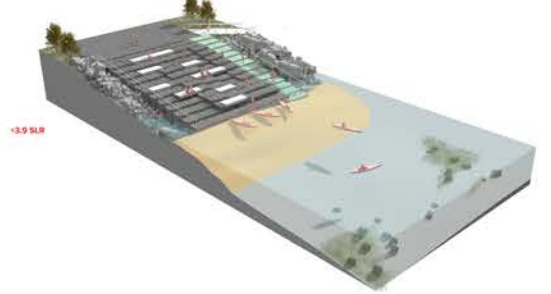
1 Sea Theater



2



3



4



1 Coastal Commons



2



3



4



2030

Willard Beach House





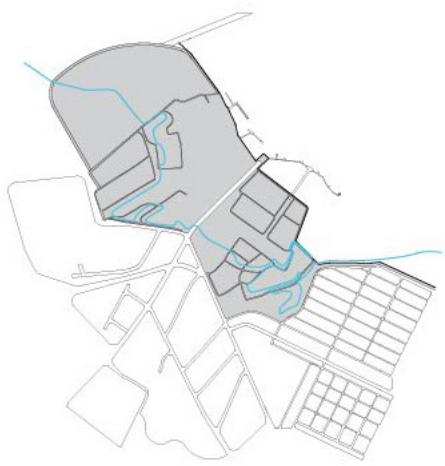
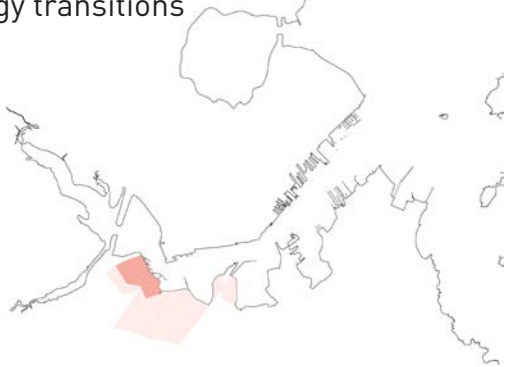
SPRAGUE TERMINAL AND FOREST CITY

From fragmented land uses to a connected field of energy transitions

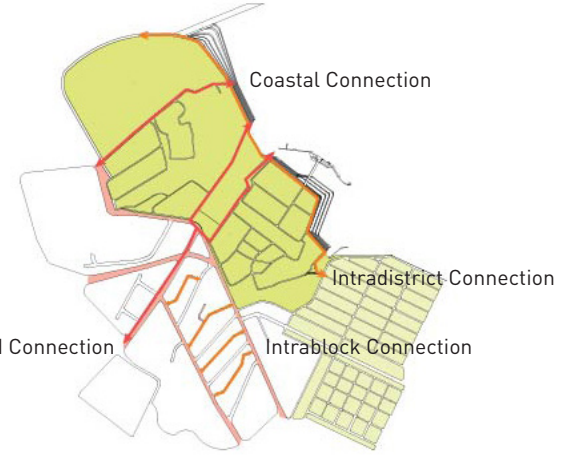
Ian DeWald and Nayarit Tineo

Remembrance of the history of petroleum and shifting to a new world of resilience and renewable energy.

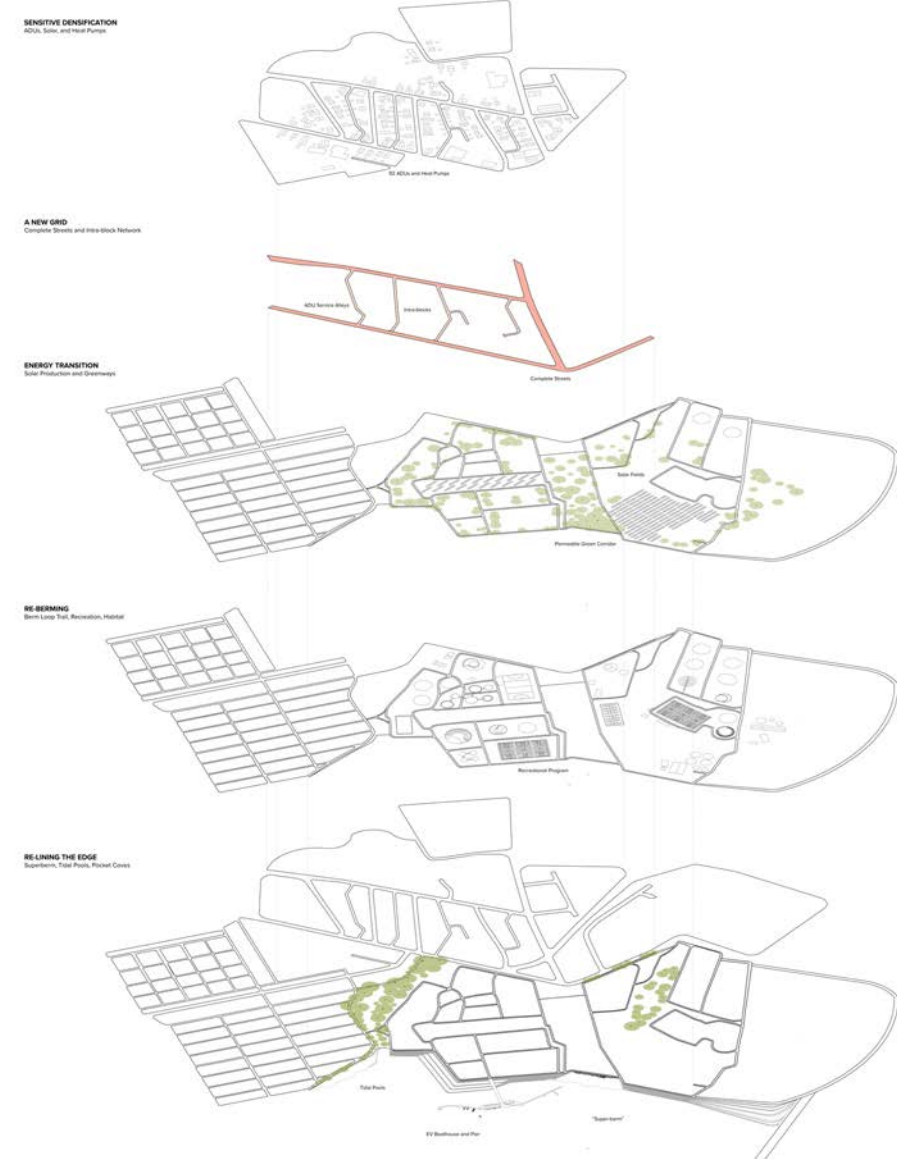
Coastal Resilience Scenarios to Connect Portland and South Portland

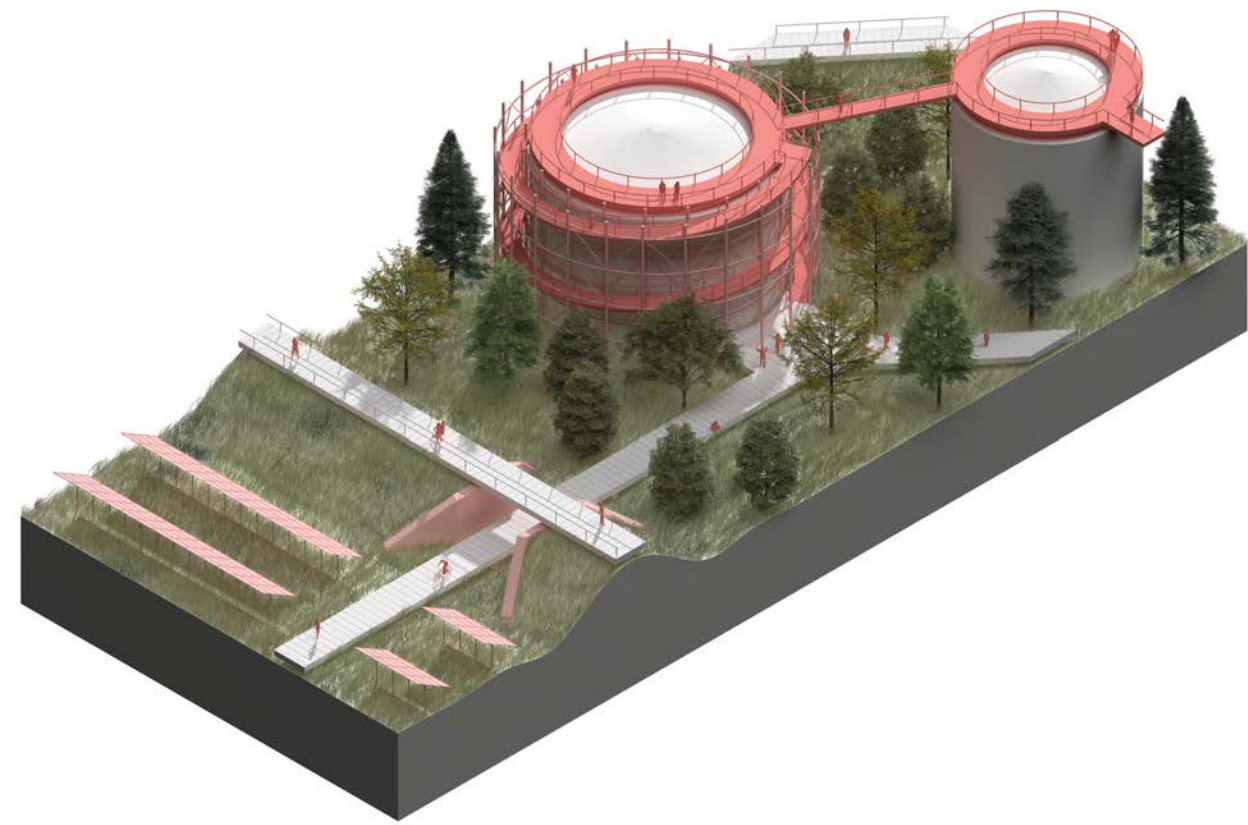
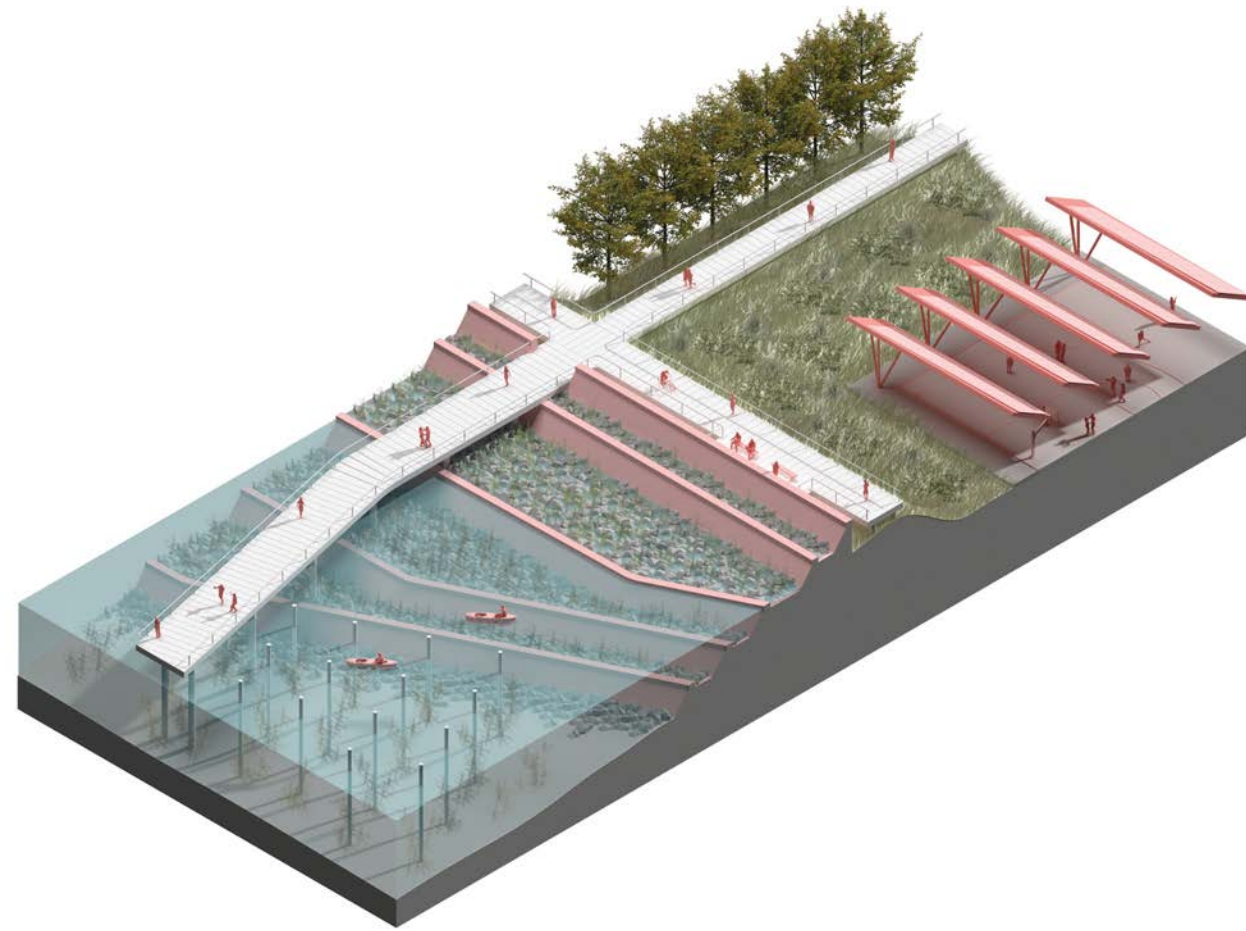
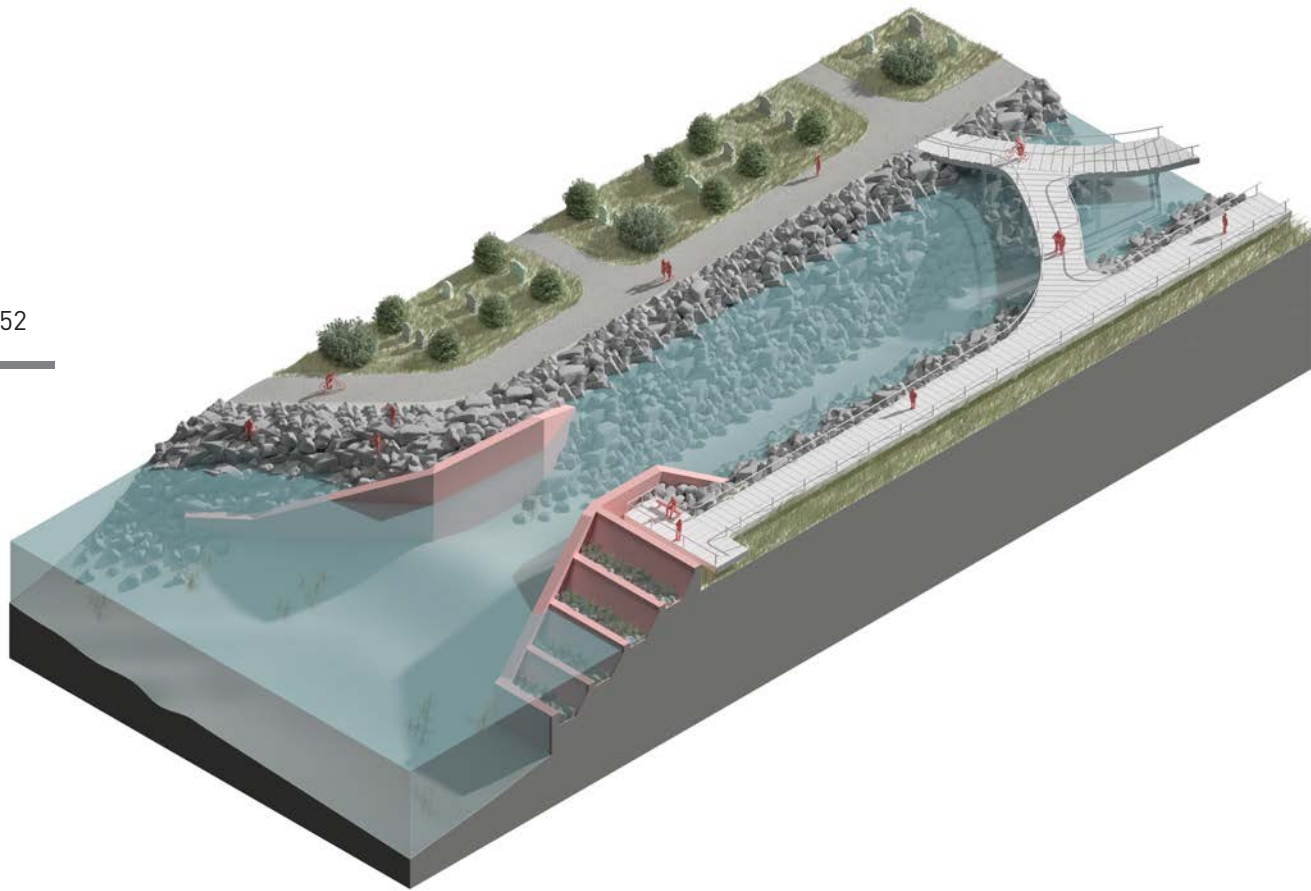


BEFORE
An inaccessible hardscape dominated by gated, disconnected waterfront and petroleum storage tanks.



AFTER
A revitalized, accessible green waterfront powered by renewable energy, offering seamless connectivity.







PHASE 01 (1.6' SLR)

- Paint 16 Oil Tanks.
- Provide 22 ADUs and Heat Pumps to plug into aging housing stock.

PHASE 2.1 (3.9' SLR)

- Create Intra-Berm program.
- Provide an additional 88 ADUs and Heat Pumps.

PHASE 2.2 (3.9' SLR)

- Plant trees for permeable greenways.
- Transition existing streets to become complete streets.
- Install Solar Fields.
- Provide recreational program intra-berm.
- Transition existing pier to EV boat charging station.

PHASE 2.3 (3.9' SLR)

- Reconstruct edge to be an engineered "super-berm".

PHASE 3 (8.8' SLR)

- Provide additional recreational program intra-berm.
- Install decked lower trail that moves between berms.



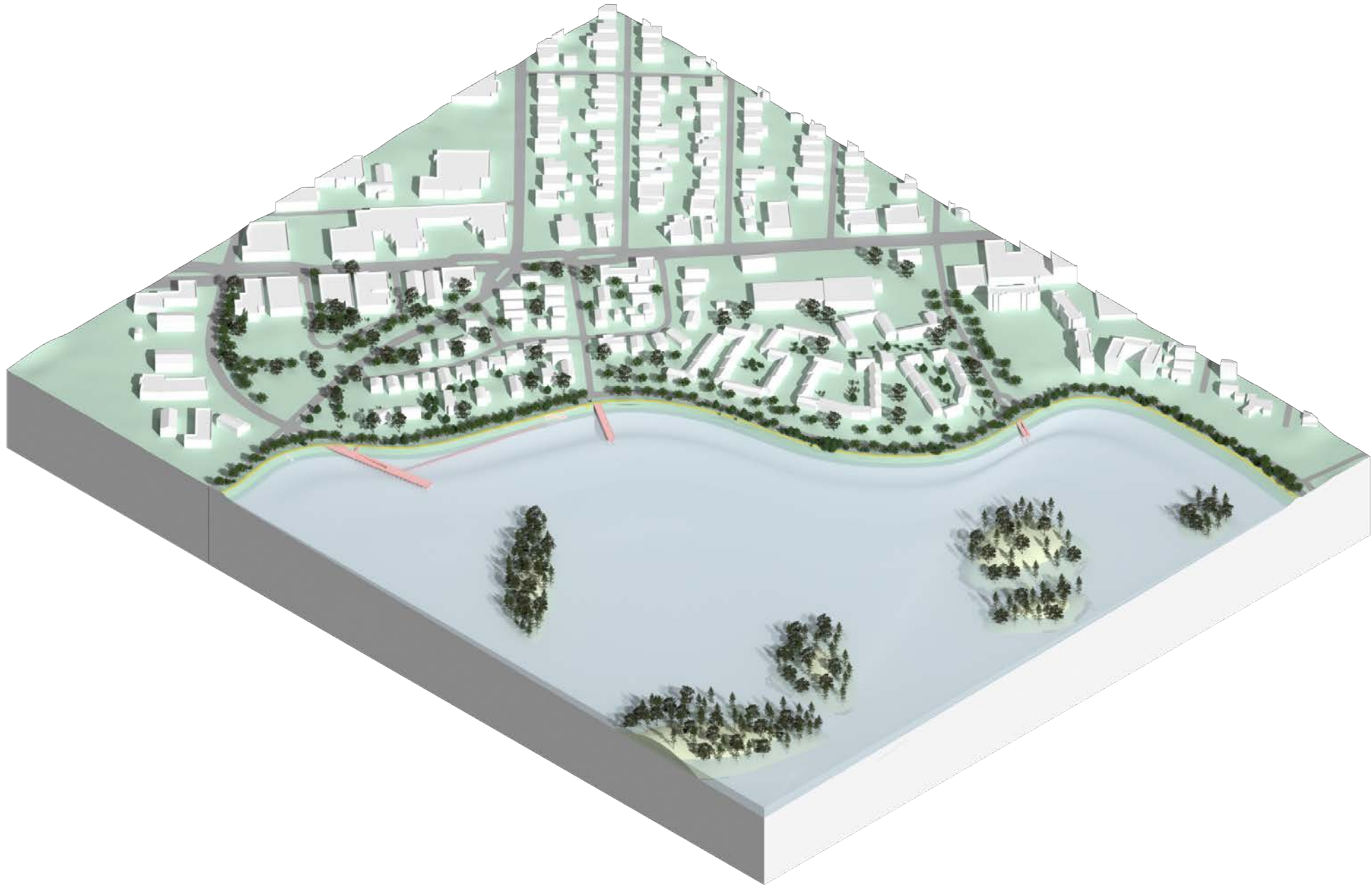
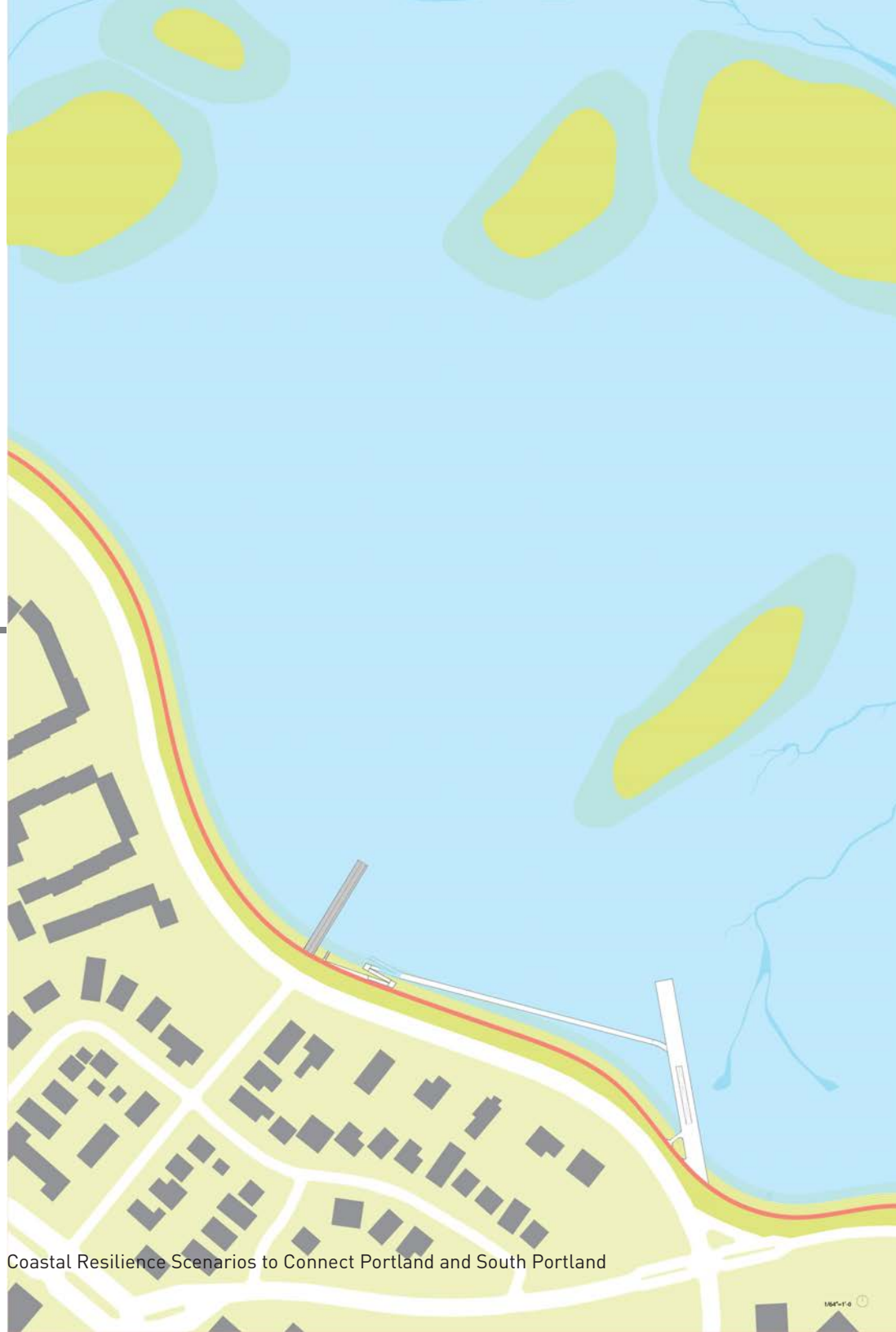


BACK COVE WEST

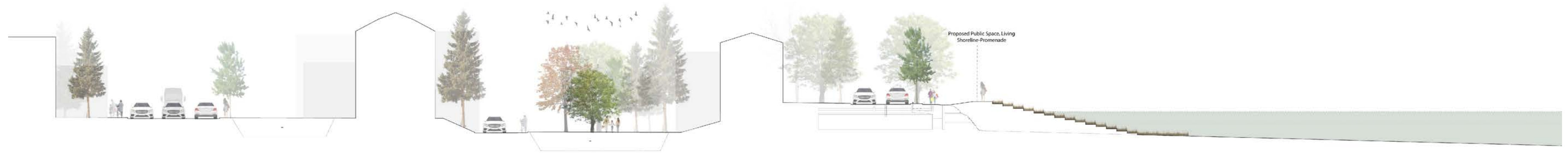
Toward place-based research labs

Carol Recinos Luna and Satya Gangupati

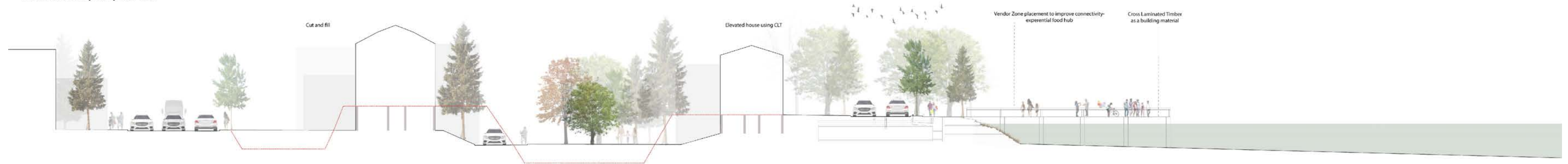




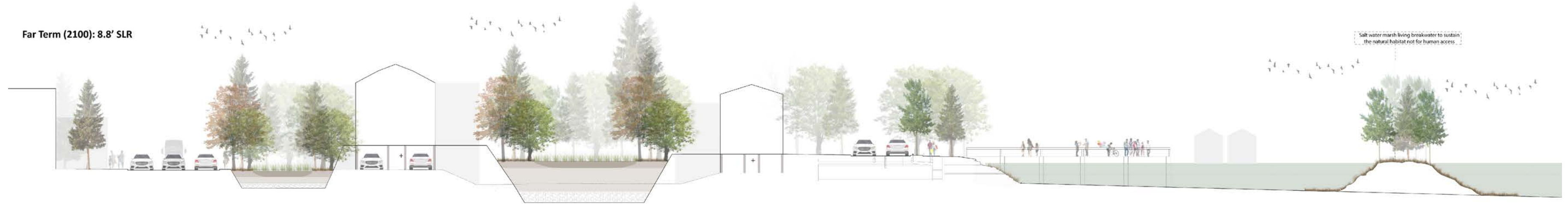
Near Term (2050): 1.6' SLR

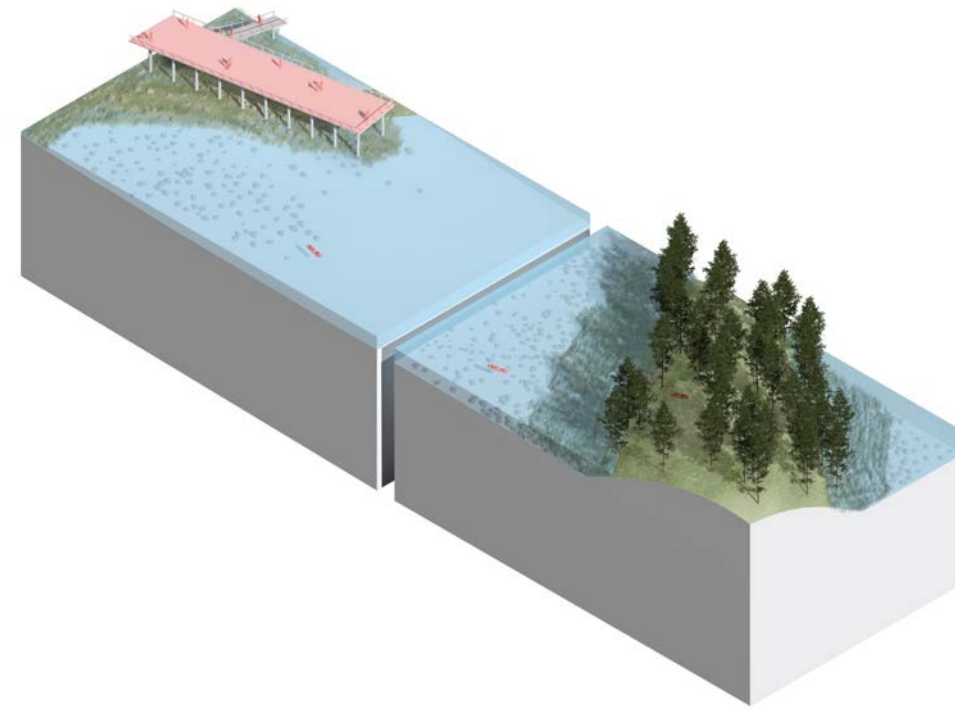
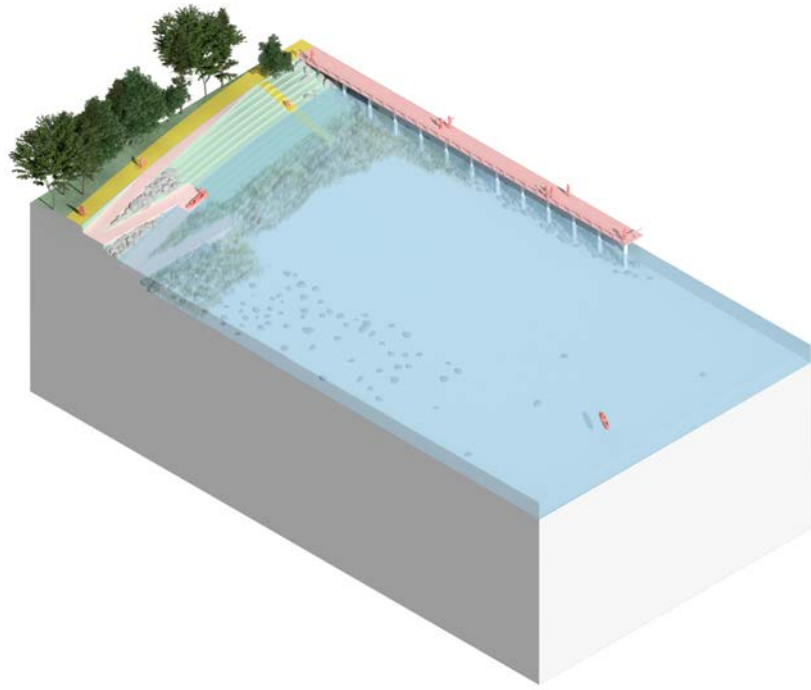


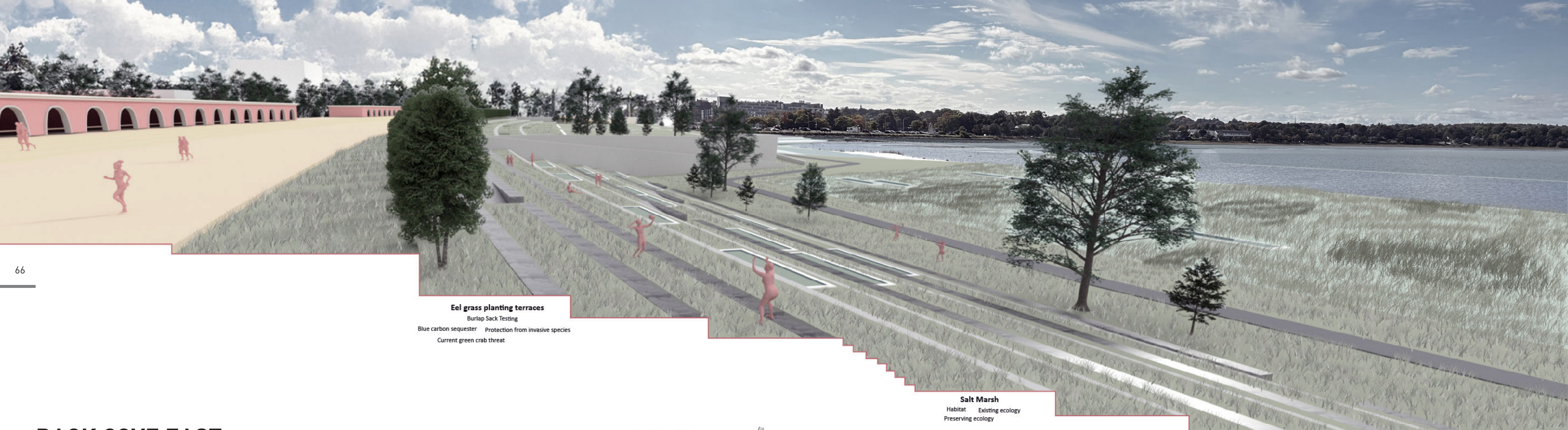
Medium Term (2070): 3.9' SLR



Far Term (2100): 8.8' SLR







Eel grass planting terraces

- Burlap Sack Testing
- Blue carbon sequester
- Protection from invasive species
- Current green crab threat

Salt Marsh

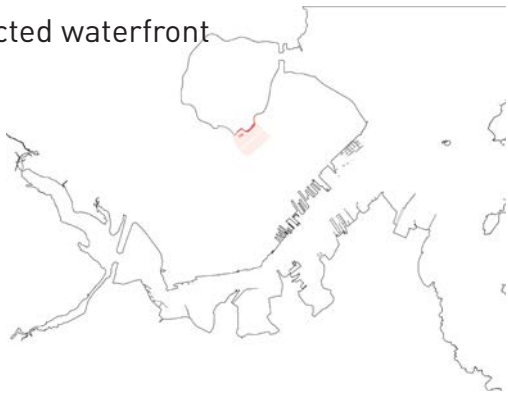
- Habitat
- Existing ecology
- Preserving ecology

BACK COVE EAST

From a fragmented shore to a protected and interconnected waterfront

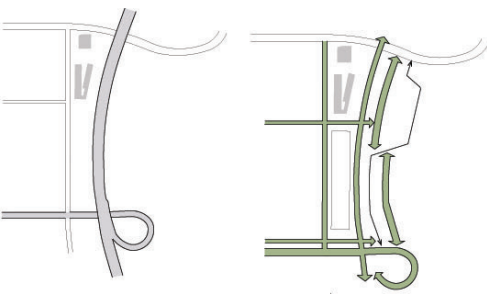
Chase Carpenter and Julia Ferone

The reimagined infrastructure of the I-295 barrier transforms the site's relationship with the city, creating a dynamic blend of hard and soft terraces, public recreational spaces, ecological preservation, and experimental landscapes. This revitalization fosters a new commercial waterfront, integrating urban identity with nature and community use.

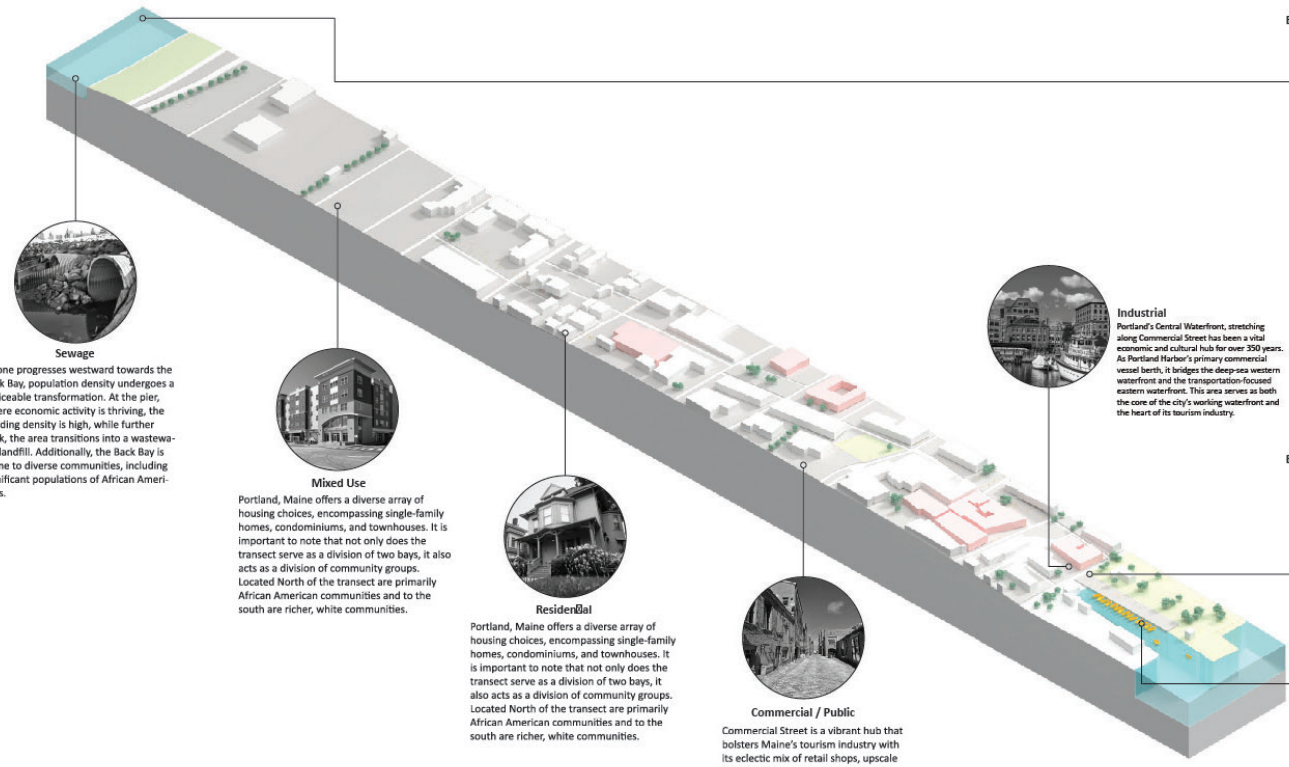
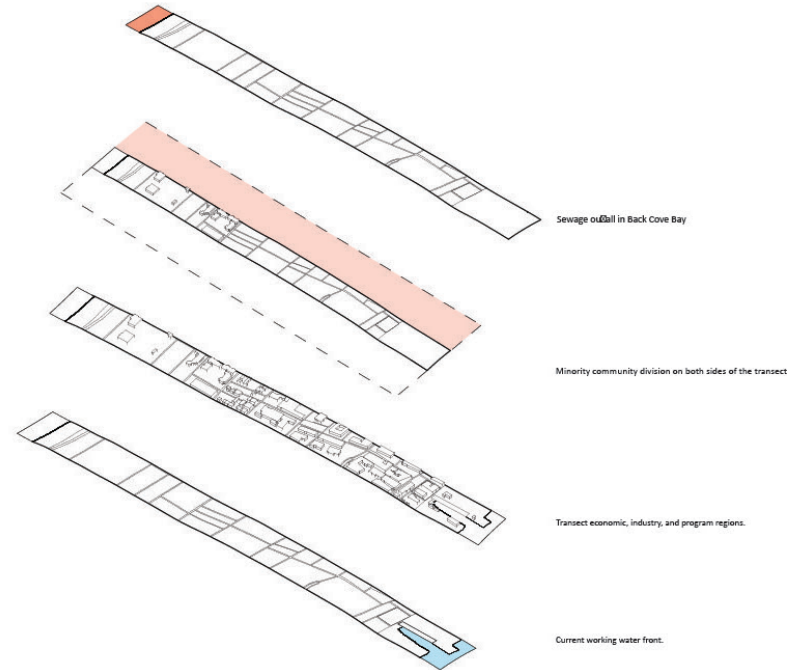


Back Cove East

The reimagined infrastructure of the I-295 barrier transforms the site's relationship with the city, creating a dynamic blend of hard and soft terraces, public recreational spaces, ecological preservation, and experimental landscapes. This revitalization fosters a new commercial waterfront, integrating urban identity with nature and community use.



In the Casco Bay watershed, sewer systems built up until the mid-twentieth century often used pipes that combined sewage with rainwater and discharged this mixture directly into nearby waters. Although these pipes are usually rerouted to wastewater treatment plants today, heavy rainfall can still overwhelm the system's capacity or the plant itself. When this happens, the overflow—complete with pollution—is discharged straight into water bodies. To address this issue, combined sewer overflows (CSOs) are regulated, and municipalities are mandated to take steps to reduce these discharges.



Sewage
As one progresses westward towards the Back Bay, population density undergoes a noticeable transformation. At the pier, where economic activity is thriving, the building density is high, while further back, the area transitions into a wastewater landfill. Additionally, the Back Bay is home to diverse communities, including significant populations of African Americans.



Mixed Use
Portland, Maine offers a diverse array of housing choices, encompassing single-family homes, condominiums, and townhouses. It is important to note that not only does the transect serve as a division of two bays, it also acts as a division of community groups. Located North of the transect are primarily African American communities and to the south are richer, white communities.



Residential
Portland, Maine offers a diverse array of housing choices, encompassing single-family homes, condominiums, and townhouses. It is important to note that not only does the transect serve as a division of two bays, it also acts as a division of community groups. Located North of the transect are primarily African American communities and to the south are richer, white communities.



Commercial / Public
Commercial Street is a vibrant hub that bolsters Maine's tourism industry with its eclectic mix of retail shops, upscale dining, live music, and guided tours.



Industrial
Portland's Central Waterfront, stretching along Commercial Street has been a vital economic and cultural hub for over 350 years. As Portland Harbor's primary commercial vessel berth, it bridges the deep-sea western waterfront and the transportation-focused eastern waterfront. This area serves as both the core of the city's working waterfront and the heart of its tourism industry.

EDGE ONE: SoB Edge / Industrial Edge

BACK BAY

- Back Bay is not contributing to the success of Portland's economy
- Suffering ecologies due to sewage overflow



Undeveloped Infrastructure



Vacant Parcels / Large Parking Lots

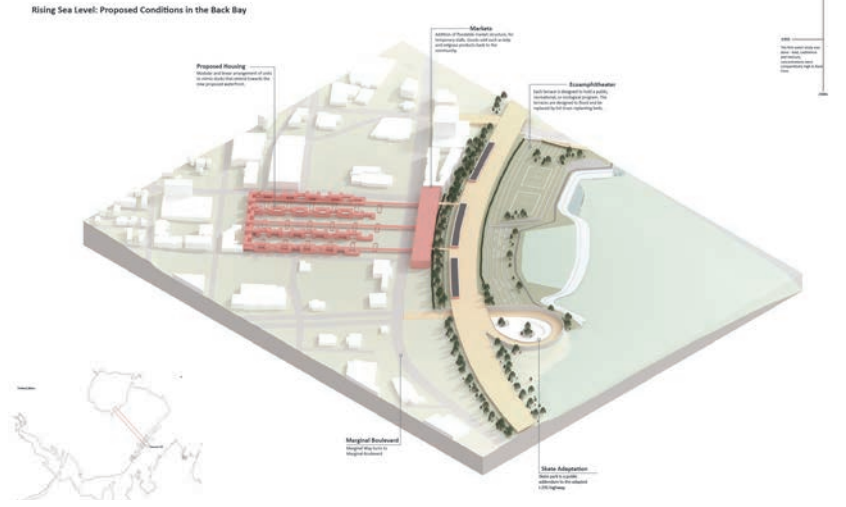
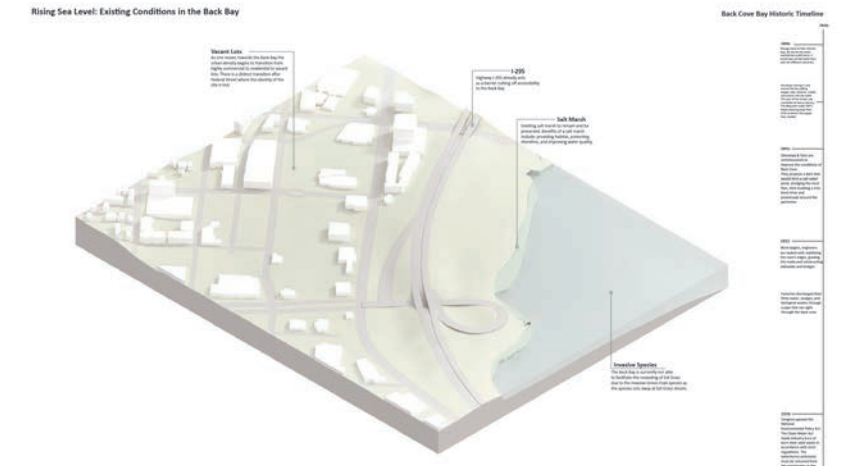
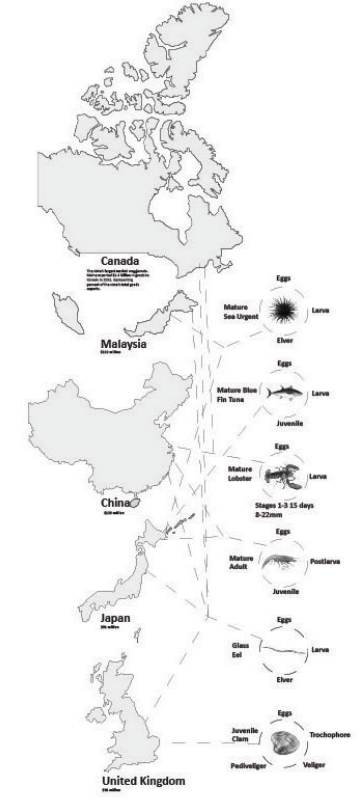
EDGE TWO: SoB Edge / Industrial Edge



Commercial street populated with restaurants and shops

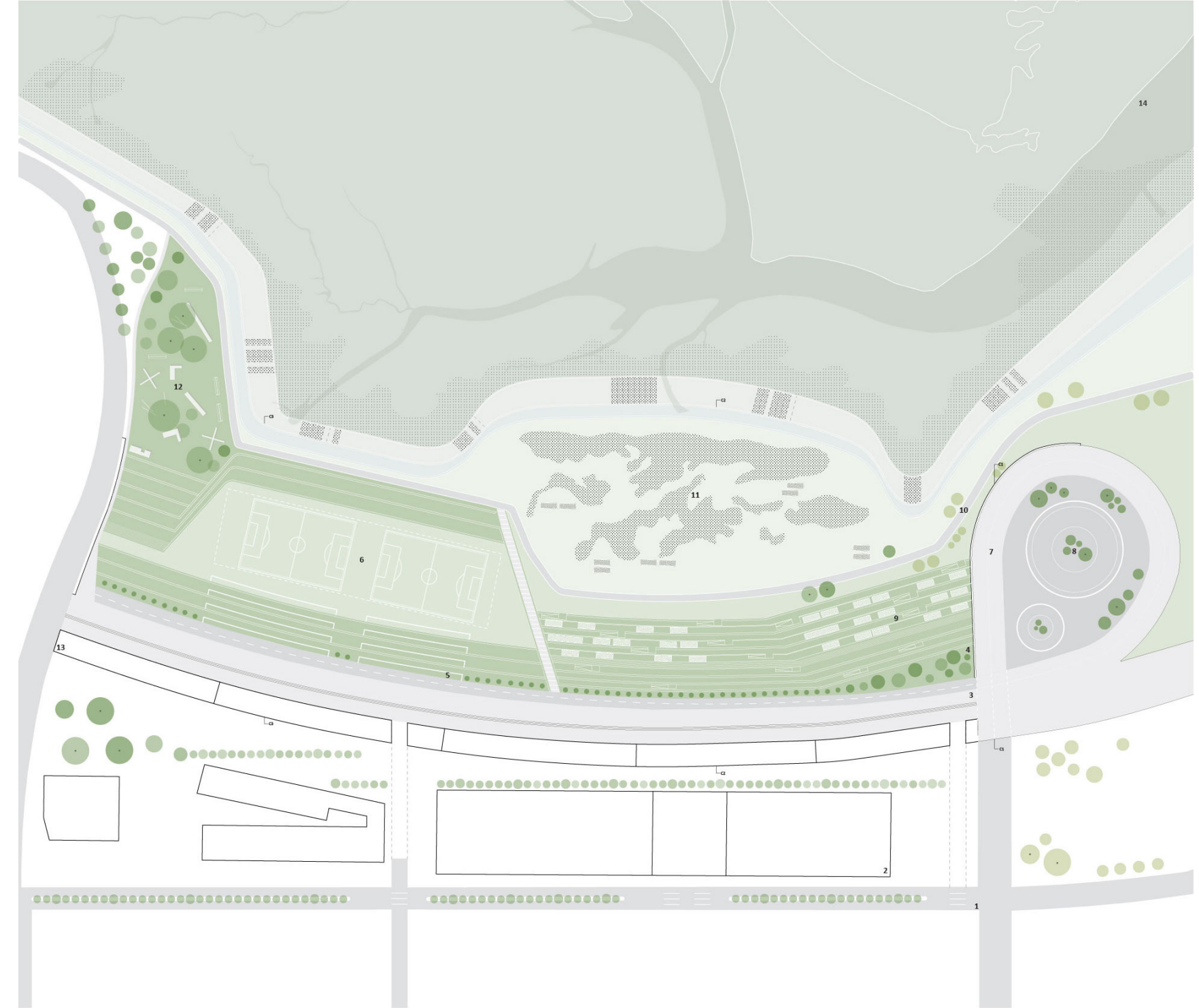
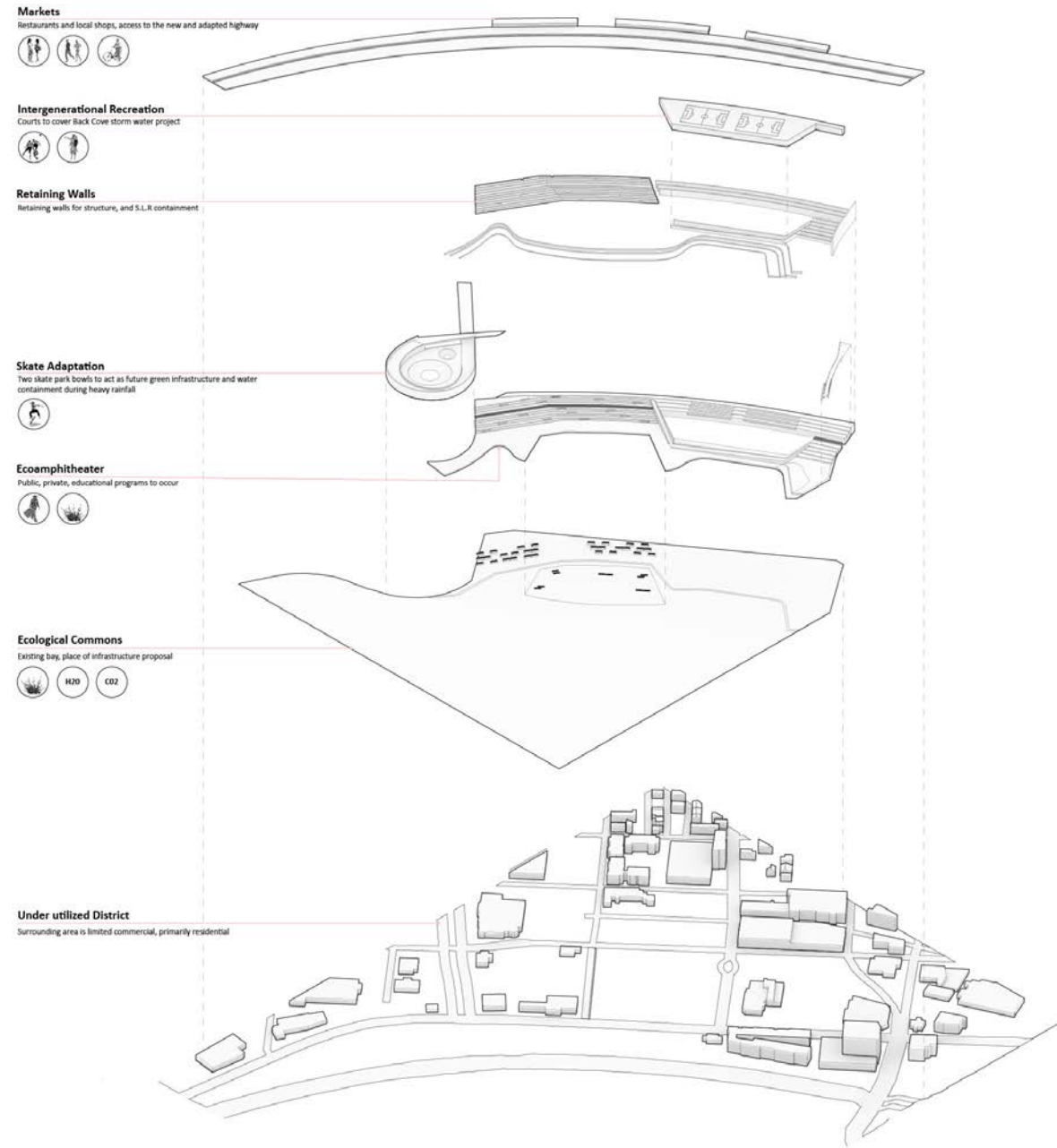
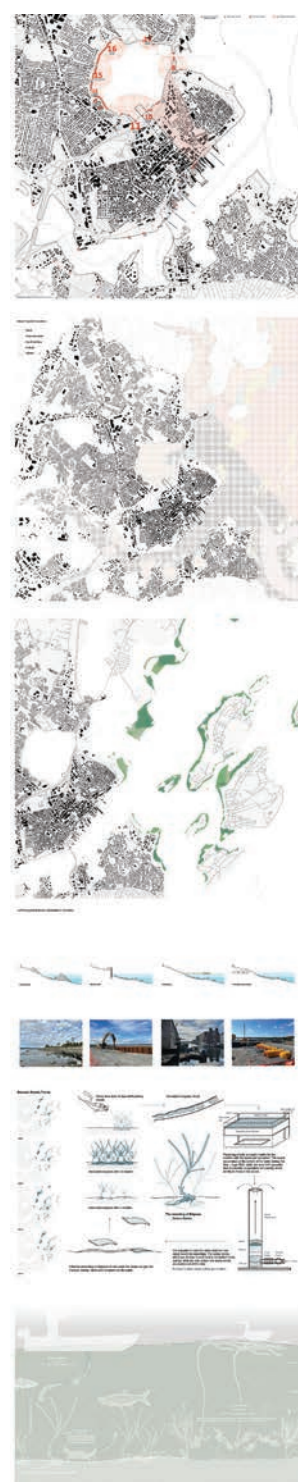


Central for commerce and catches

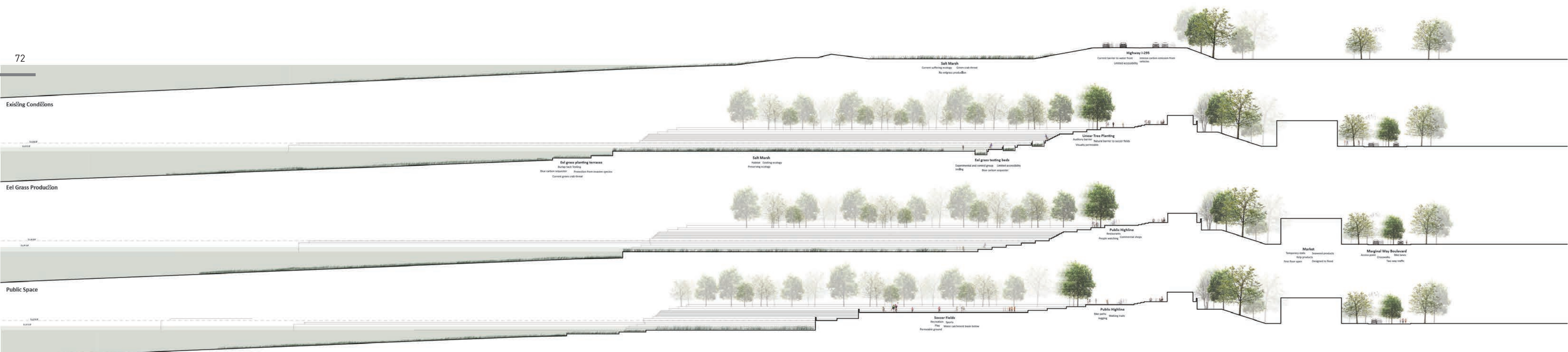
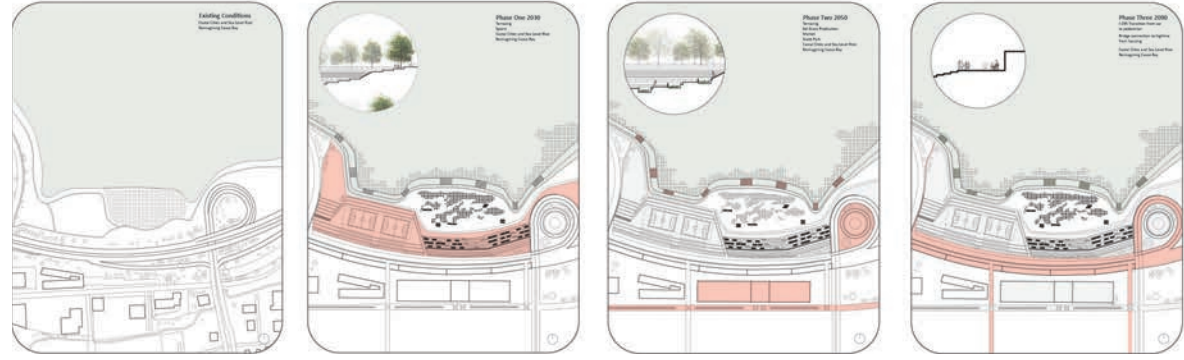


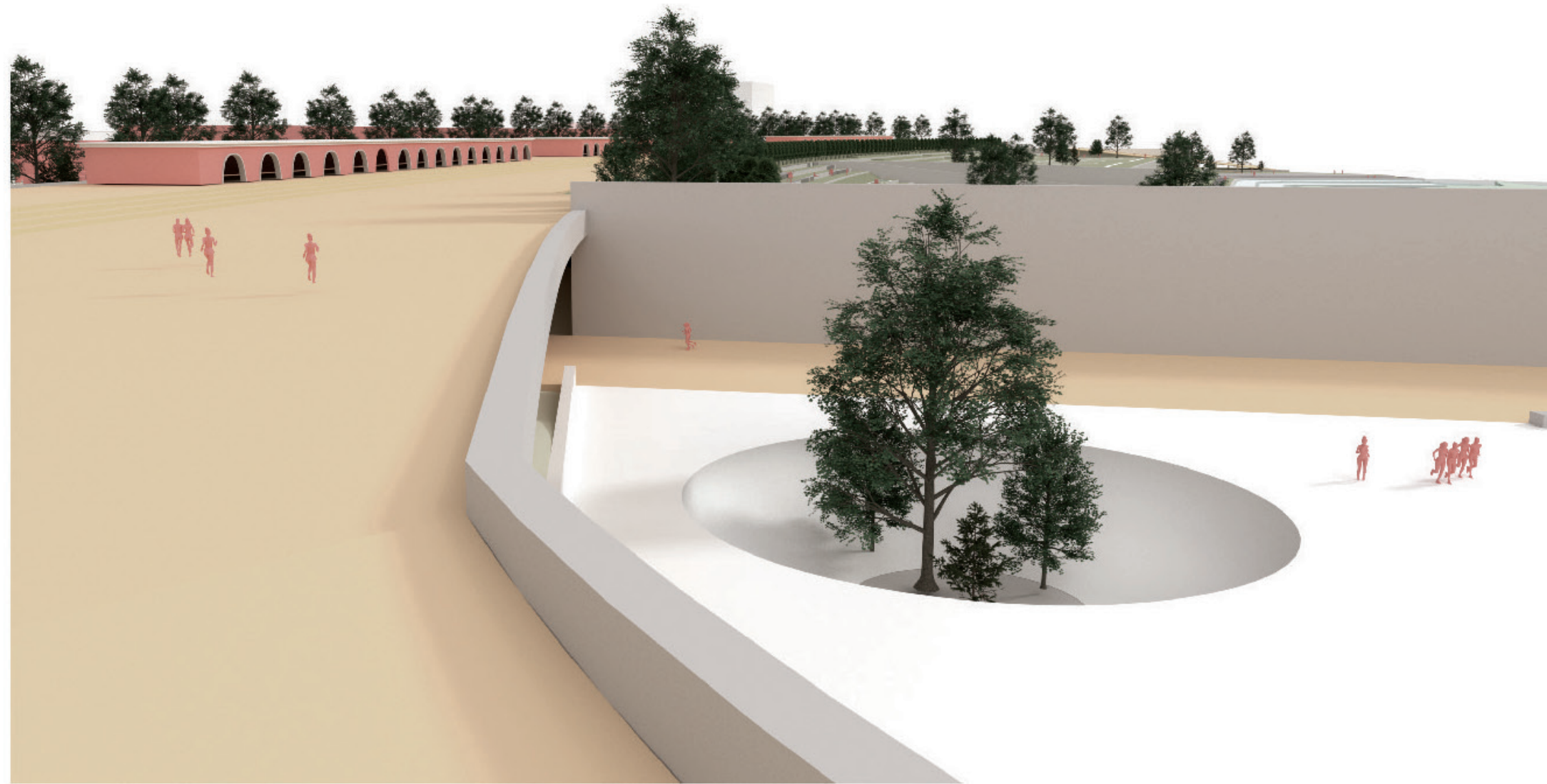
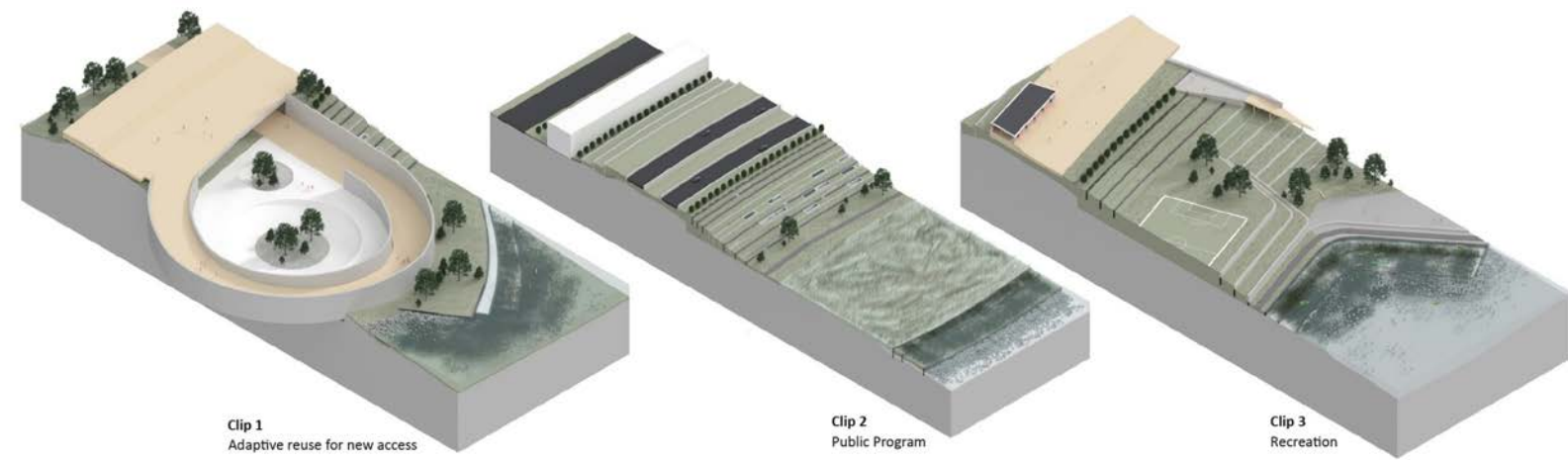
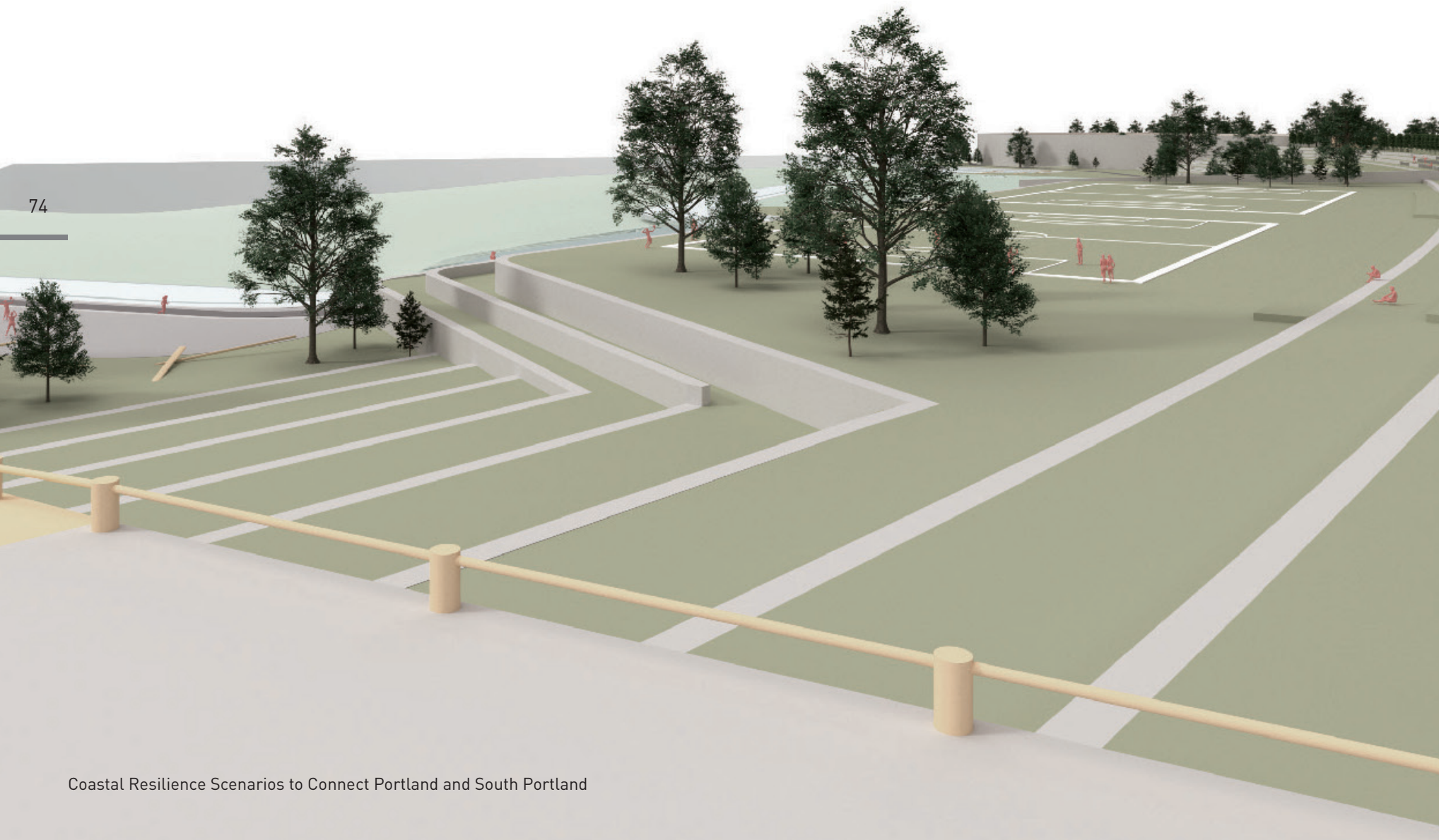
Back Cove Bay Historic Timeline

- 1700s: Initial settlement and trade.
- 1800s: Industrial waterfront development.
- 1900s: Residential expansion and infrastructure.
- 2000s: Modern development and waterfront revitalization.



- 1 - Marginal Way turned Boulevard
- 2 - Proposed commercial market stalls
- 3 - New proposed waterfront
- 4 - Vegetation berm safety and auditory barrier
- 5 - Landscape, terraced seating
- 6 - Soccer Courts
- 7 - Ramp on to new proposed waterfront
- 8 - Skate Park
- 9 - Eel Grass testing bed terrace
- 10 - Existing Back Cove Bay Trail
- 11 - Existing salt marsh
- 12 - Pocket Green space
- 13 - Restaurants and shops
- 14 - CSO Outfall Channels







76 BIKING TRAIL
 RUNNING WALKING GRASS NATURAL GROWTH POLLINATORS

FILTERED POOL
 SWIMMING HOT COLD CIRCULATION
 STEAM REGULATED

TIDAL POOL
 SWIMMING CURRENT COLD NATURAL
 SALT WATER

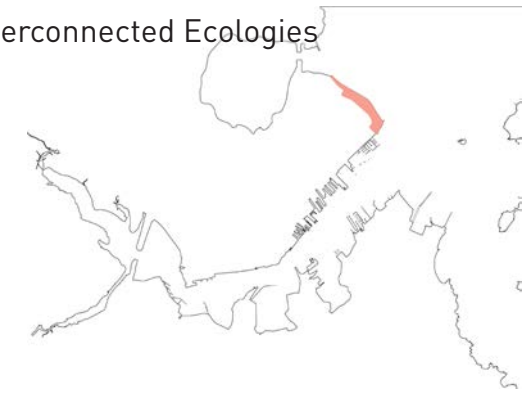
OPEN OCEAN
 SWIMMING COLD HABITAT
 ECOLOGY

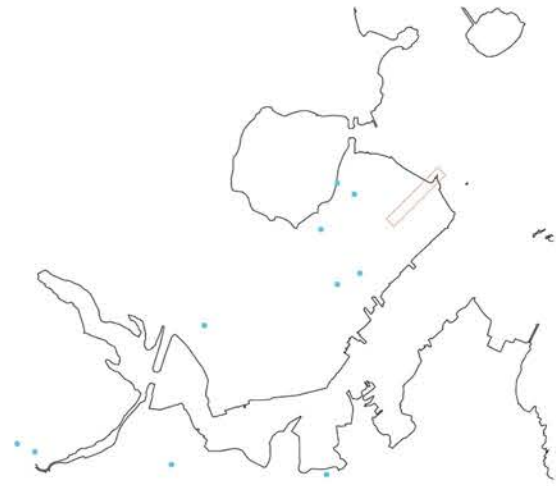
EASTERN PROMENADE

Transforming a Single-Use Shoreline into Dynamic, Interconnected Ecologies

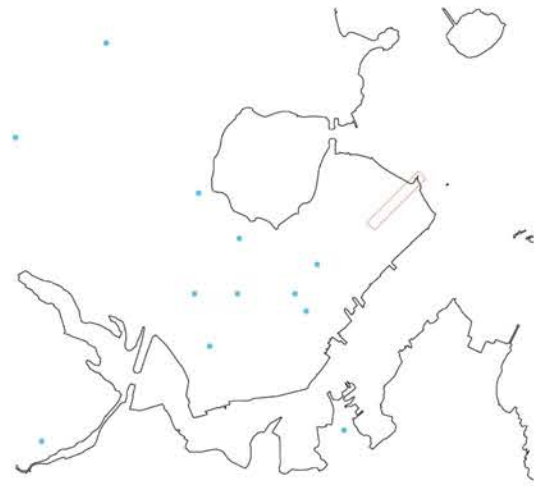
Ana Pereira and Ian Simmons

Designed to promote the health of human and non-human occupants, a system of cascading tidal pools and pockets create a diverse chain of uses and habitats.

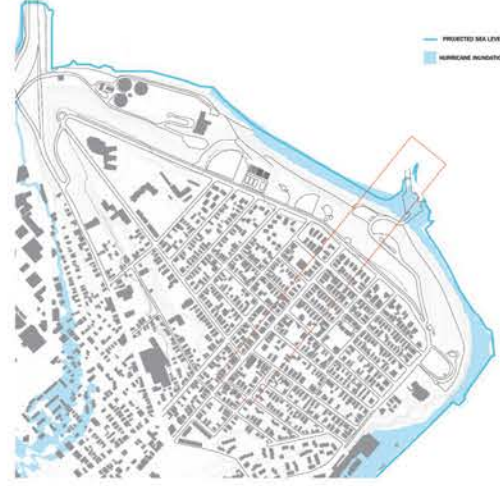




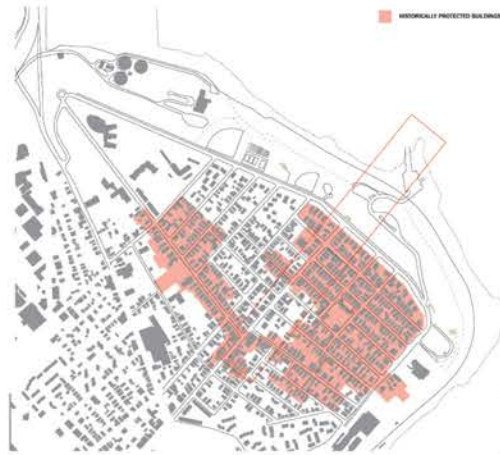
GYMS / INDOOR WORKOUT FACILITIES
PORTIONS OF PORTLAND LACK ACCESS TO NEARBY WORKOUT FACILITIES
1:30,000



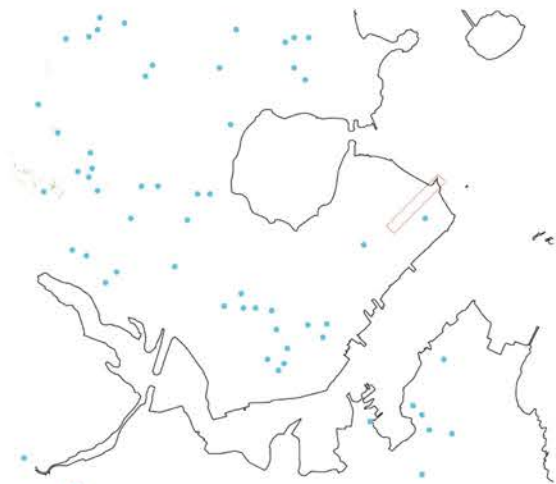
ALCOHOL AND DRUG ABUSE TREATMENT FACILITIES
22% OF ADULTS IN CUMBERLAND COUNTY REPORT REGULAR HEAVY DRINKING. OPIOID DEATHS REMAIN HIGH.
1:30,000



SEA LEVEL RISE AND STORM SURGE



HOUSING AND HISTORIC DISTRICT



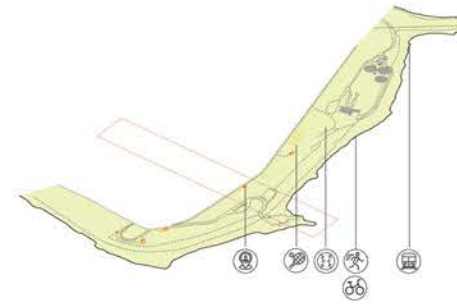
NURSING HOMES / ASSISTED LIVING FACILITIES
MANY OF PORTLAND'S NEW RESIDENTS ARE AT OR ABOVE RETIREMENT AGE
1:30,000



PARKS AND TRAILS
PARKS PROVIDE MUCH OF PORTLAND WITH ACCESS TO HEALTHY ACTIVITIES
1:30,000



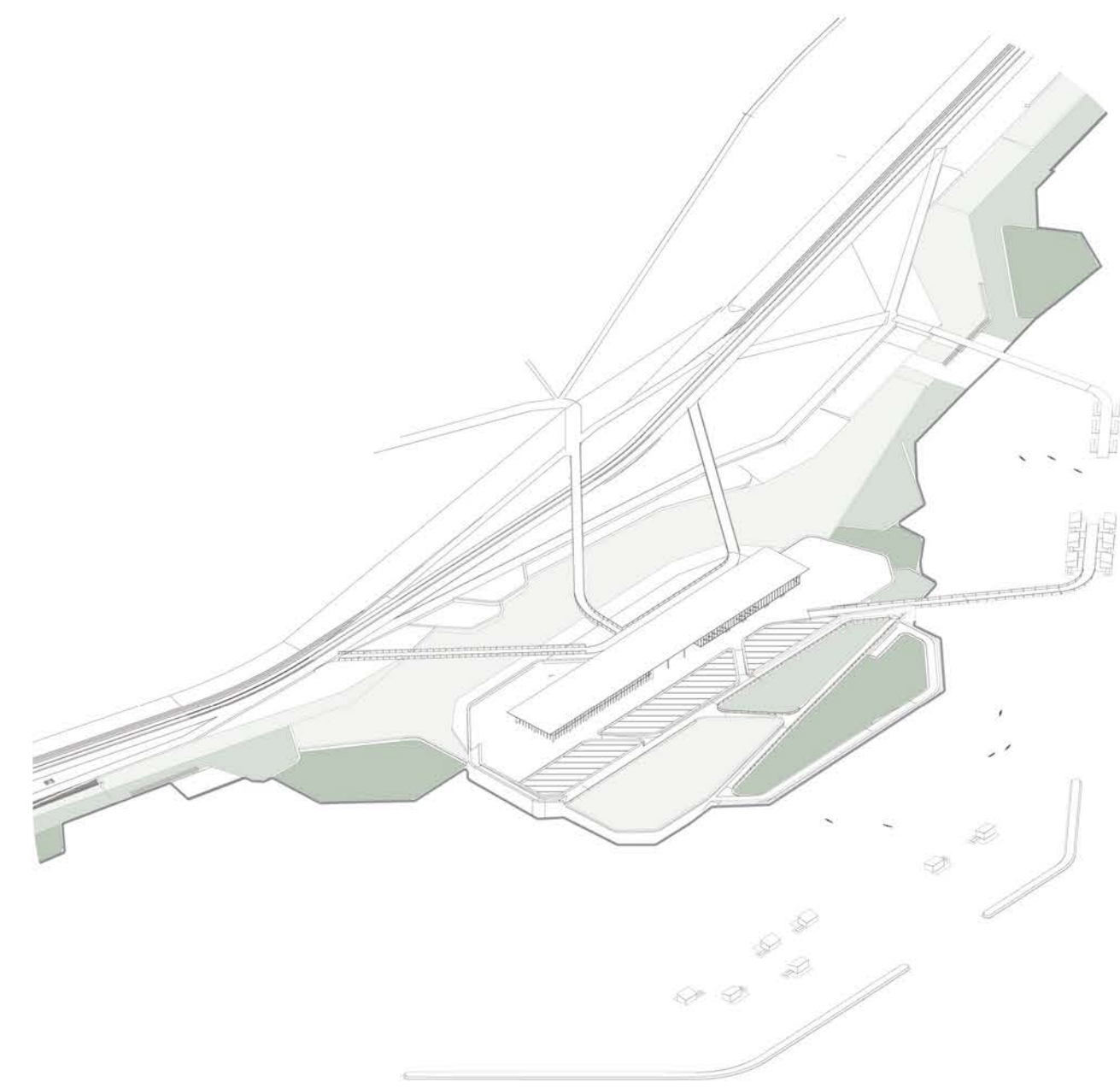
ZONED ACTIVITIES





80

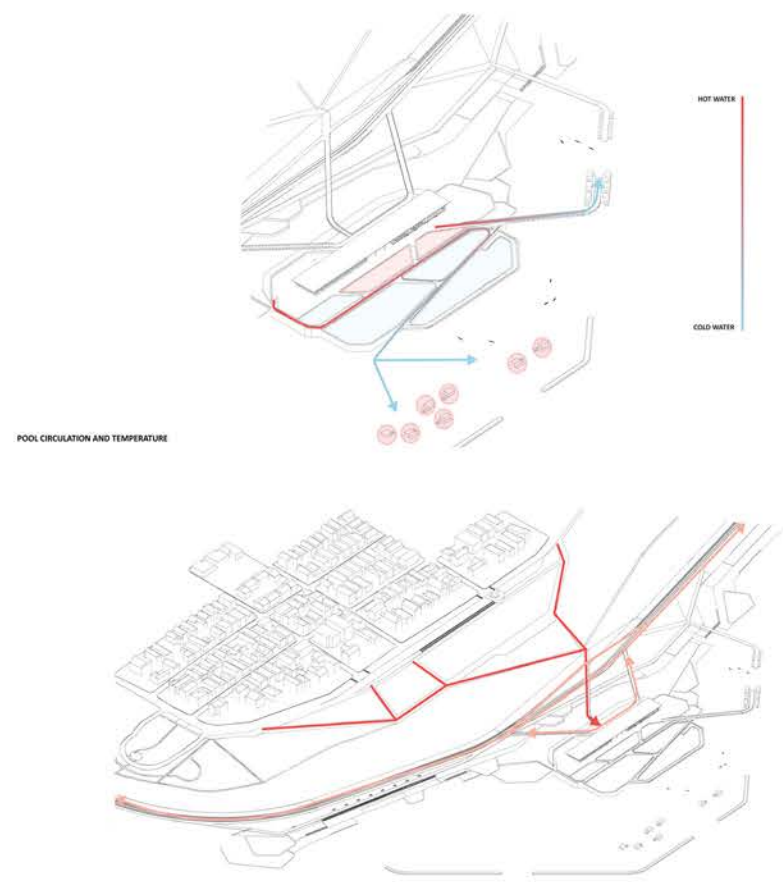
1 MM



FLOODING DIAGRAM

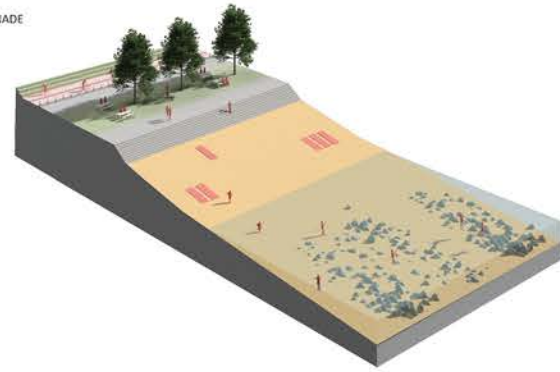


82

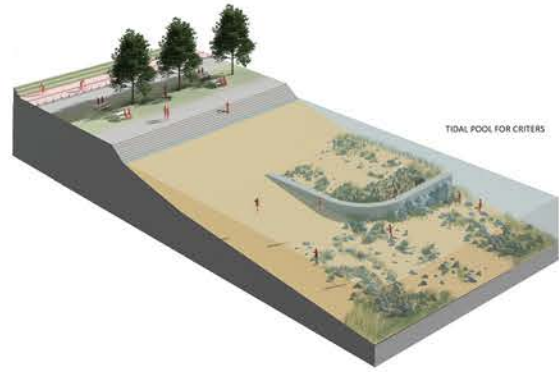


TODAY SEA LEVEL RISE

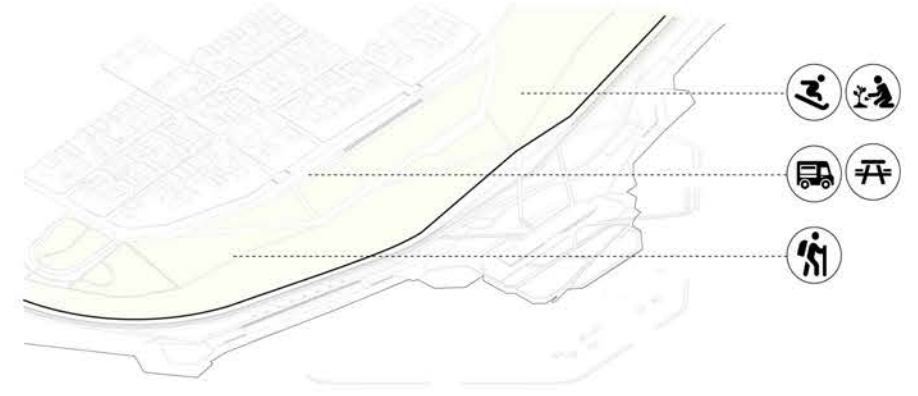
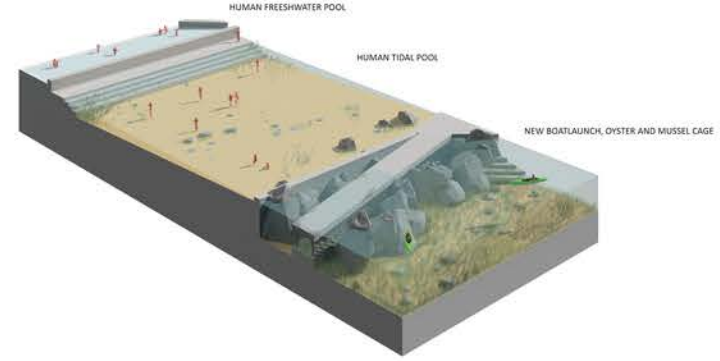
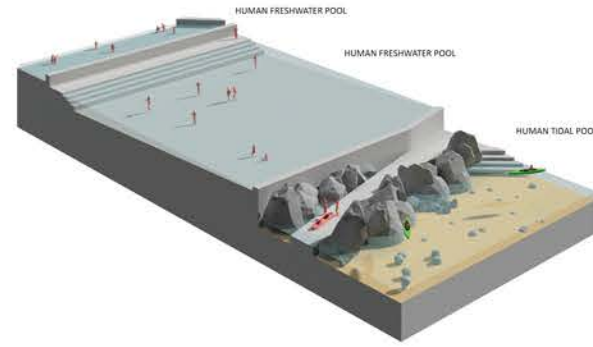
FROM BEACH TO PROMENADE



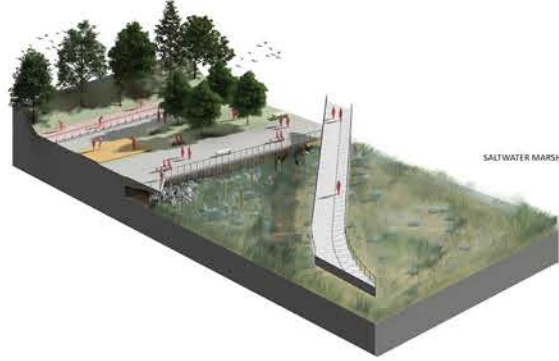
3 SEA LEVEL RISE



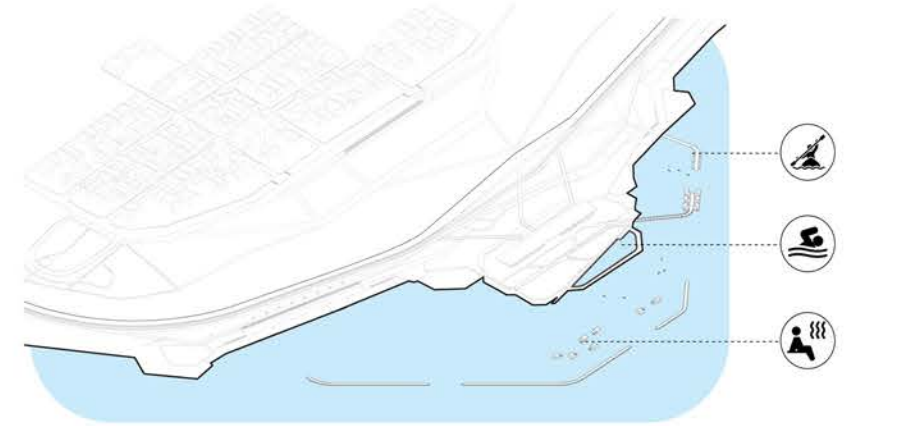
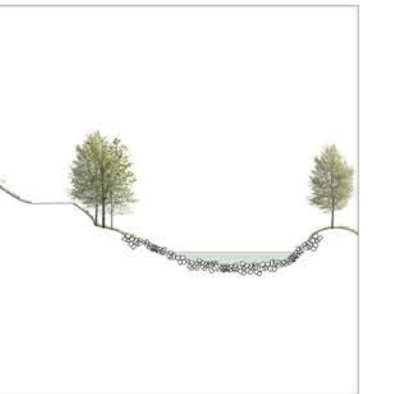
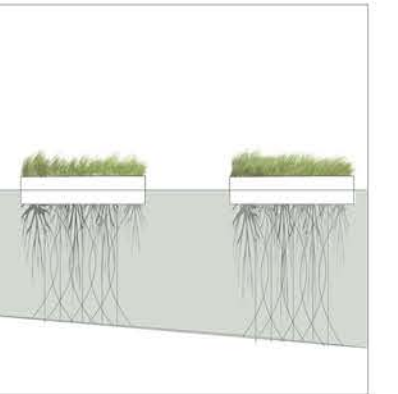
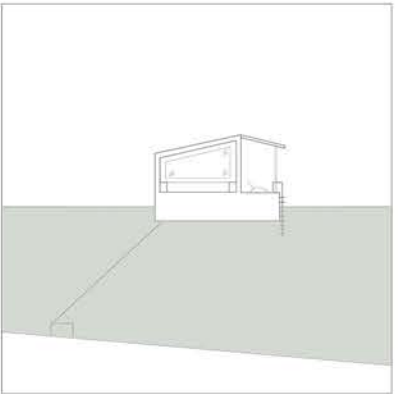
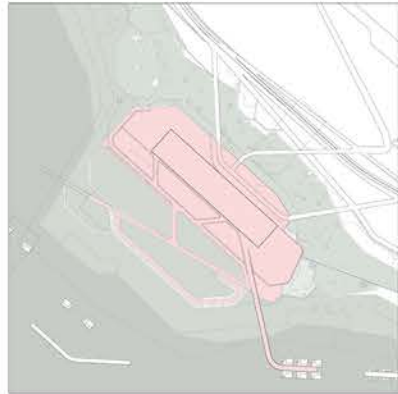
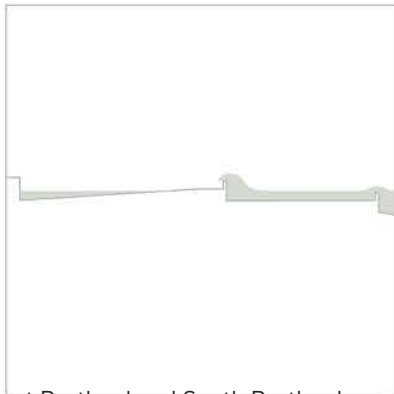
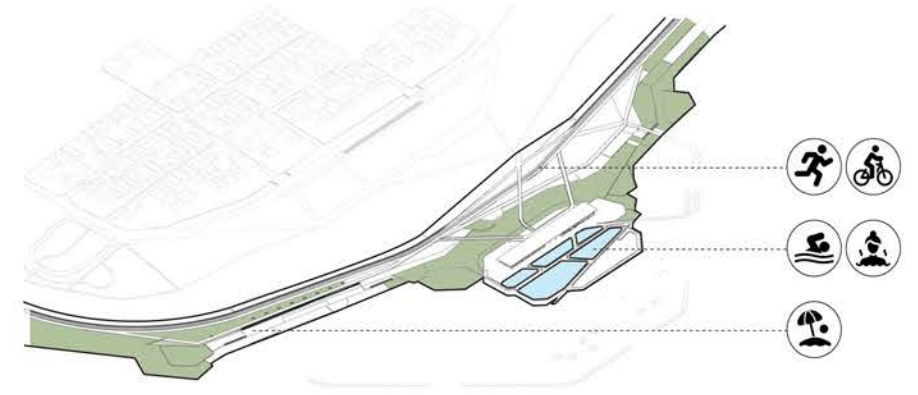
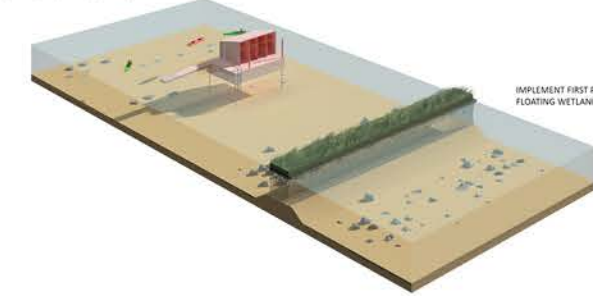
FROM HUMAN TO ECOLOGY

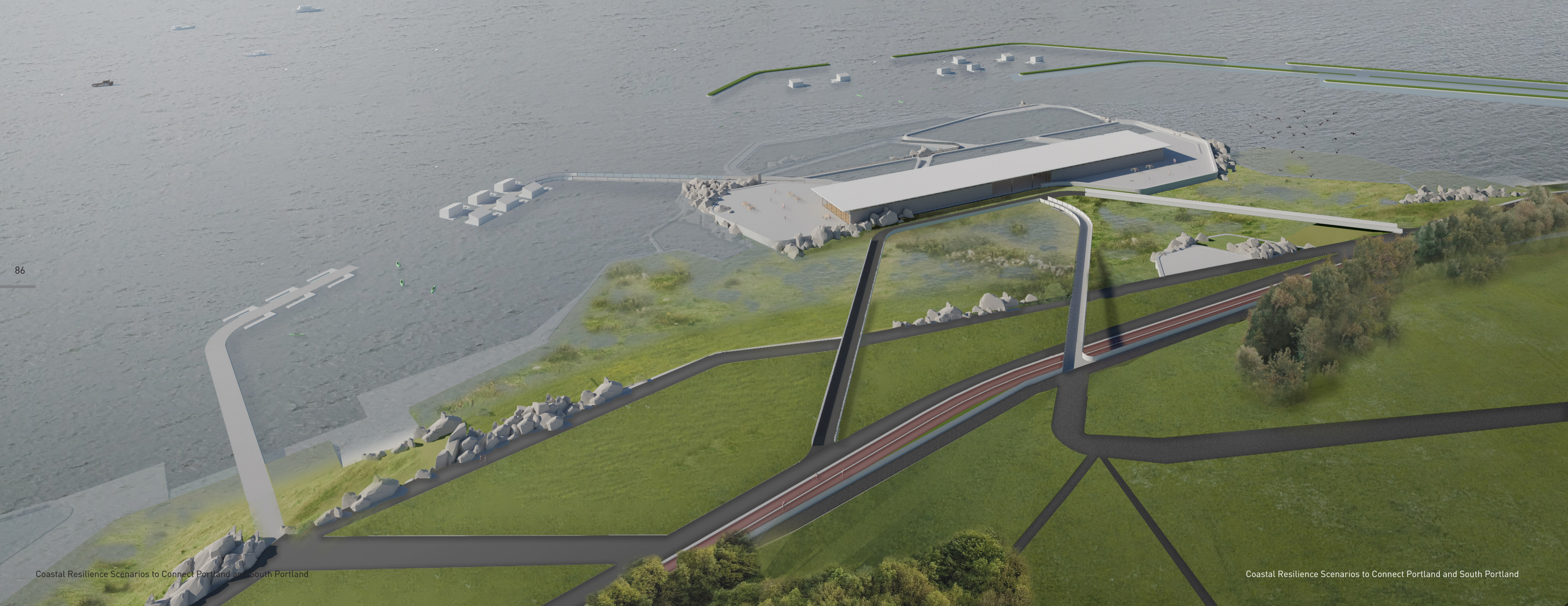


FROM GRASSLAND TO MARSHLAND



FROM FLOATING SAUNA TO FLOATING MARSH





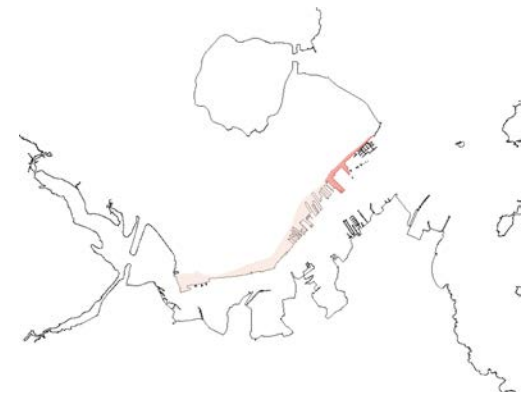


88

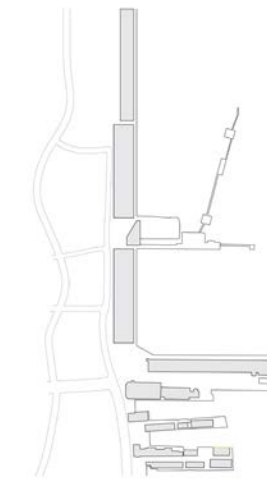
OLD PORT

Cultivating the Double Sided City

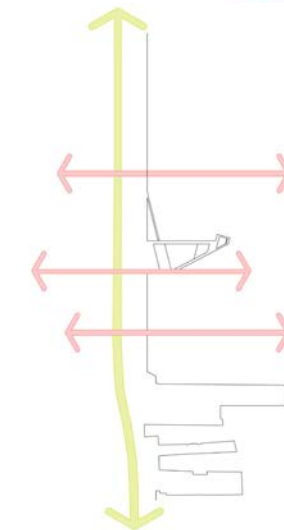
Gavin Carroll and Rishah Chopra



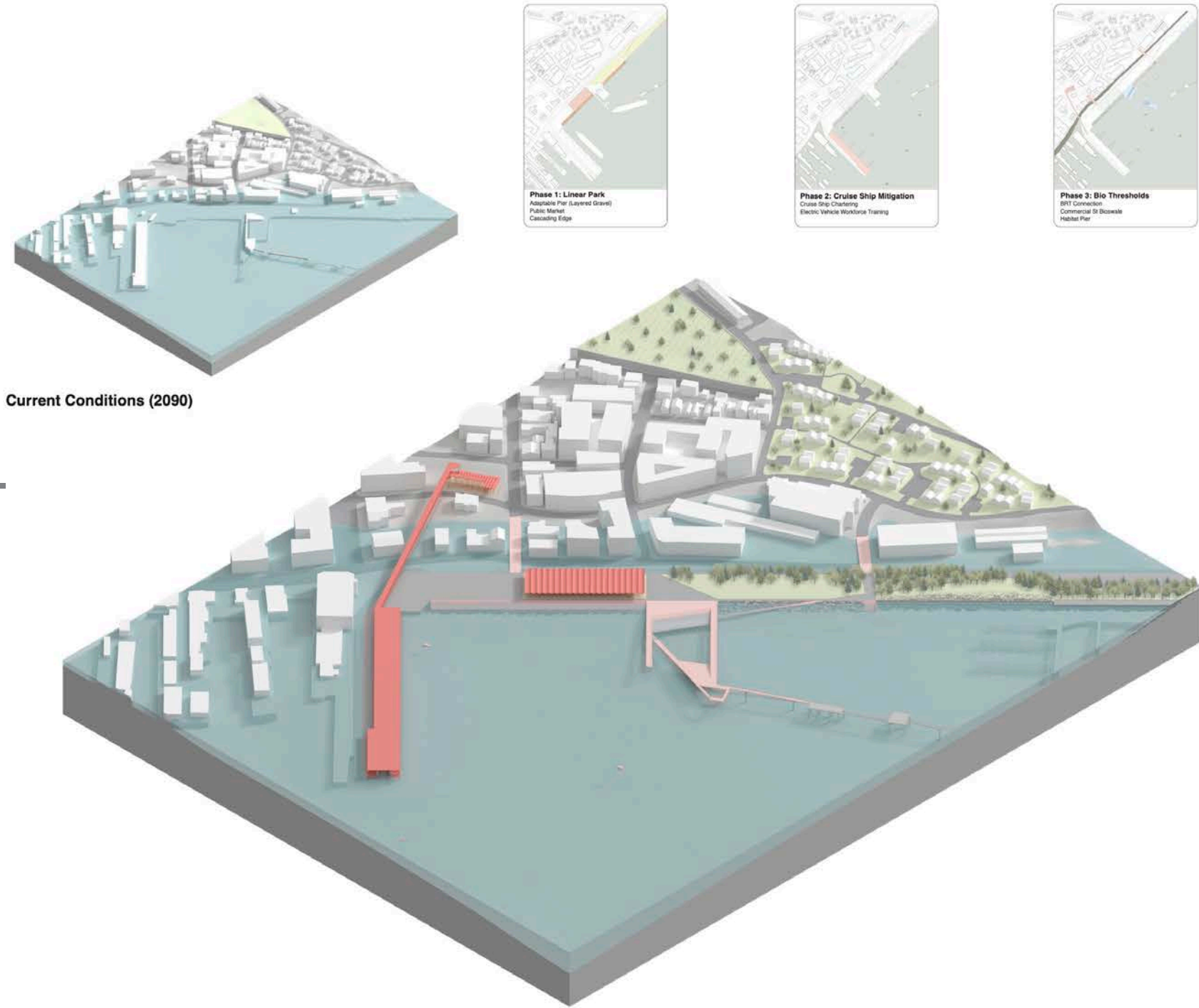
Coastal Resilience Scenarios to Connect Portland and South Portland



BEFORE
Blocked Waterfront
Disconnected Edge



AFTER
Accessible Waterfront
Double Sided City



Current Conditions (2090)

90

Proposed Site (2090)
 Coastal Resilience Scenarios to Connect Portland and South Portland



Coastal Resilience Scenarios to Connect Portland and South Portland

Infrastructure

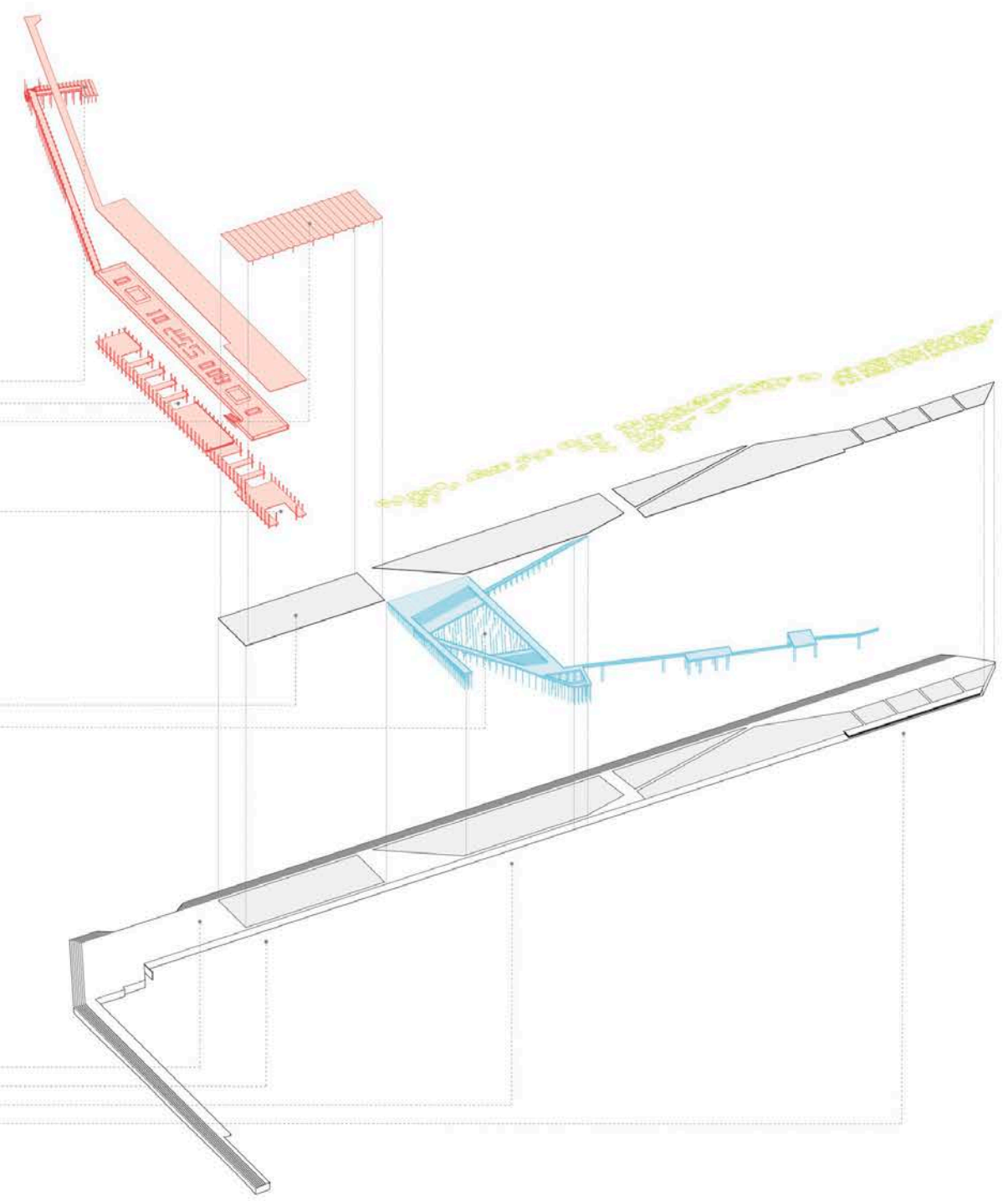
- BRT Connection
- Charter Boat Docking
- Public Market
- Electric Vessel Workforce Training

Public Infrastructure

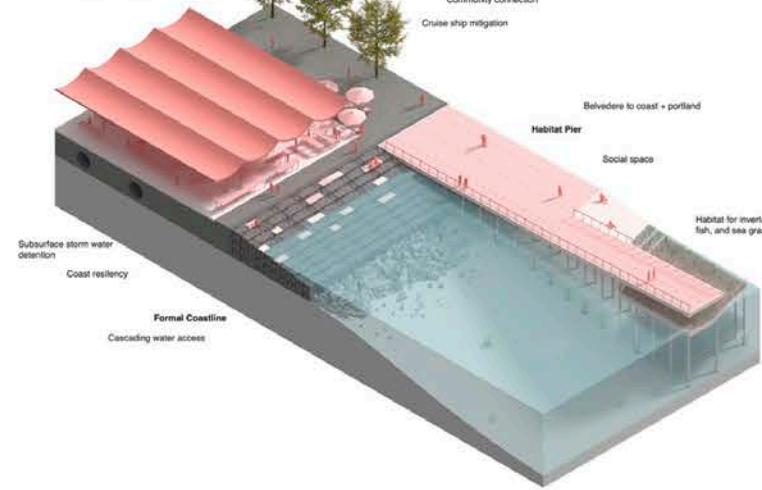
- Outdoor Green Space
- Habitat Pier

Test Bed

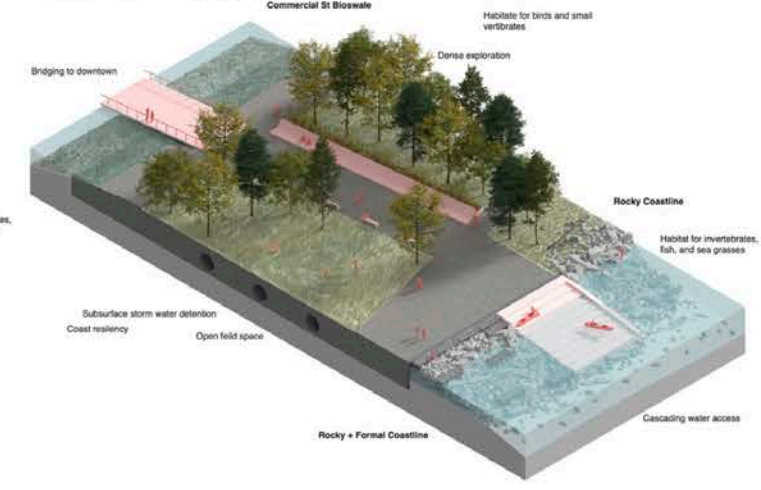
- Layered Gravel
- Formal Coast
- Informal Coast
- Rocky Coast



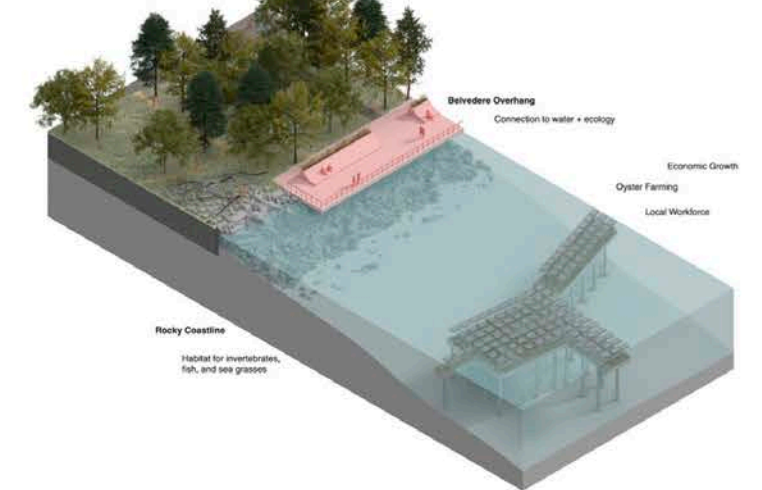
Public Working Waterfront
From Parking to Market



Double Sided City
Bridging Towards Water



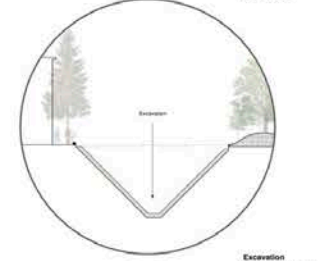
Belvedere Forest
Coastal + Rural Maine



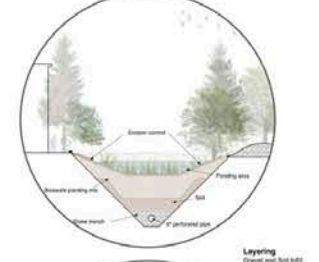
Existing Condition



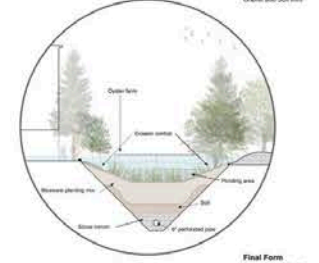
Description



Excavation



Layering

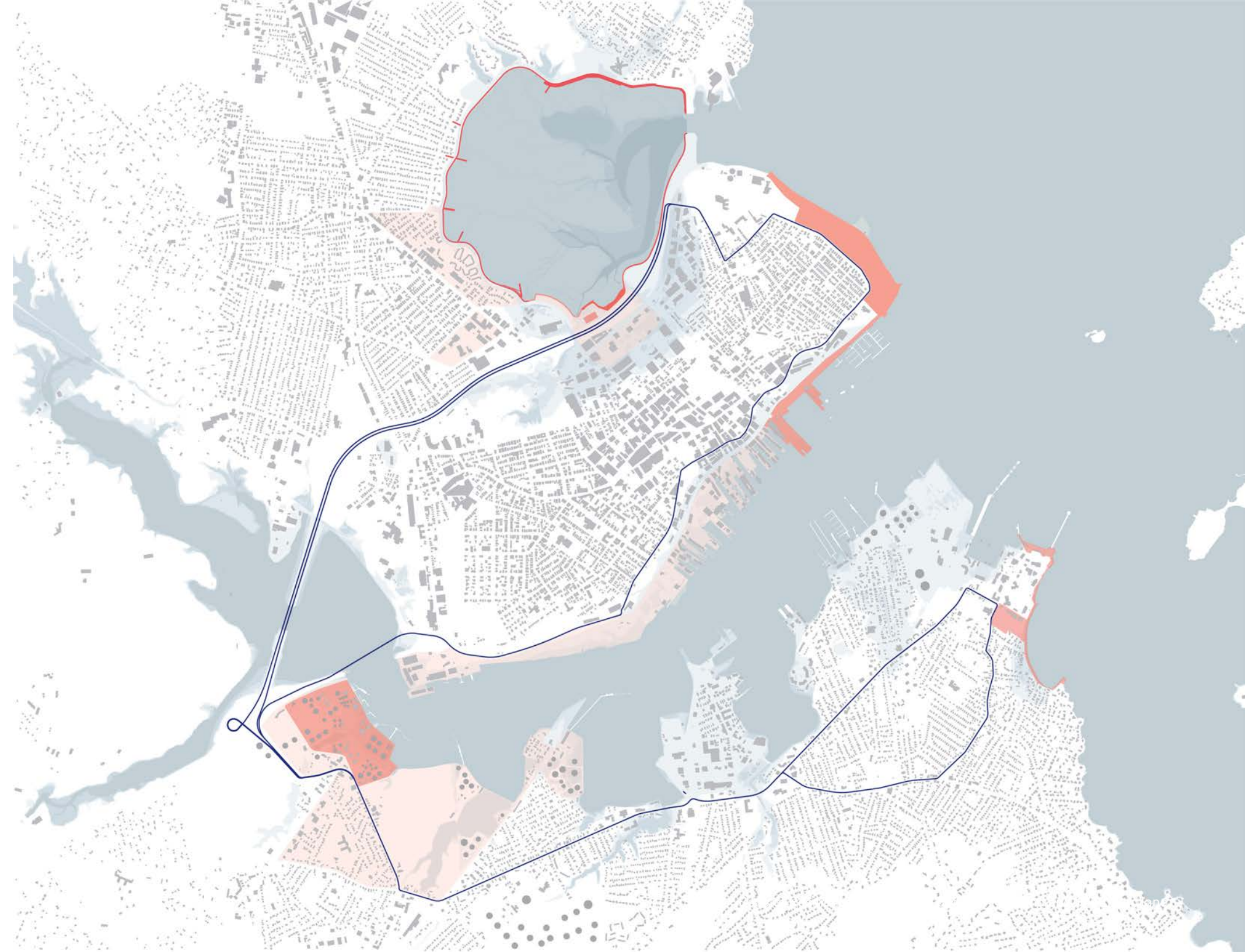


Final Form



The Casco Shoreway

University at Buffalo / State University of New York



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Jason Sowell

Students

Kielee Clement, Ian Simmons, Ian DeWald, Gavin Carroll, Carol Recinos Luna, Satya Swaroopini Gangupata, Rishabh Chopra, Ana Ines Pereira, James Metzger, Bobby Zhao, Anushka Ahire, Julia Ferone, Chase Carpenter, Andrew Hu, Nayarit Tineo