

Infra-Edge: Coastal Resilience in Galveston

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INFRA EDGE:

Coastal Resilience in Galveston



Browning Photo/Houston



Trudy LeDoux

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INTRODUCTION

Abstract

The landscape of coastal neighborhoods around the world is undergoing a great transformation because of the effects of climate change and storm impact. These coastal regions currently function as homes for thousands of people and have an important historical significance. If there is no attention given to these regions and the problems they face now, then it will be substantially harder to find solutions to these issues in the future.

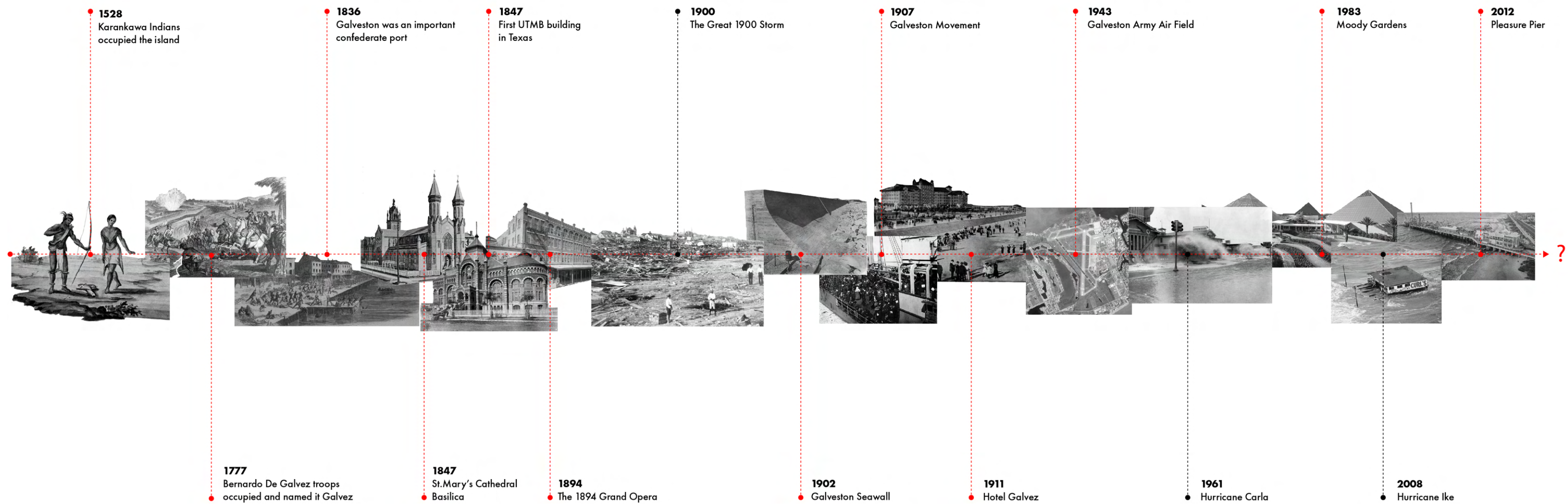
The project investigates Galveston; an island found on the southeast Texas coast. It is a phenomenon which faces environmental challenges but continues to overcome them. This idea of rebuilding and resilience is the base of inspiration for the project. The proposal suggests new architectural and urban strategies using the existing pier typology and deals with these things:

- 1. promoting the natural ecology
- 2. encouraging tourism and economic growth
- 3. functioning as a storm buffer
- 4. providing emergency amenities





BACKGROUND



History

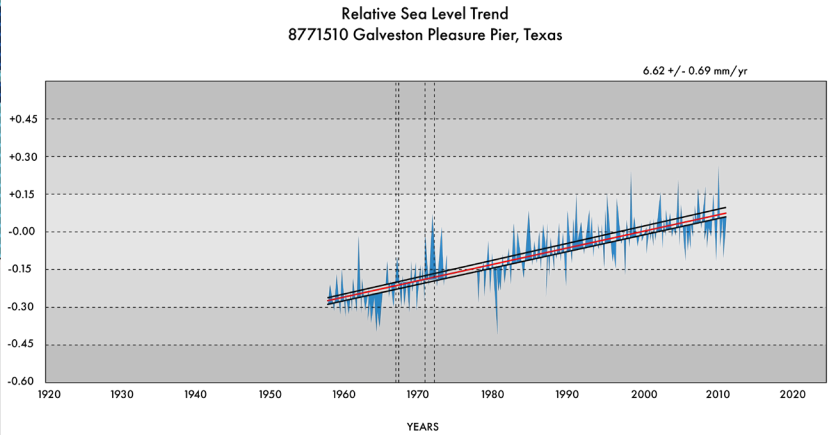
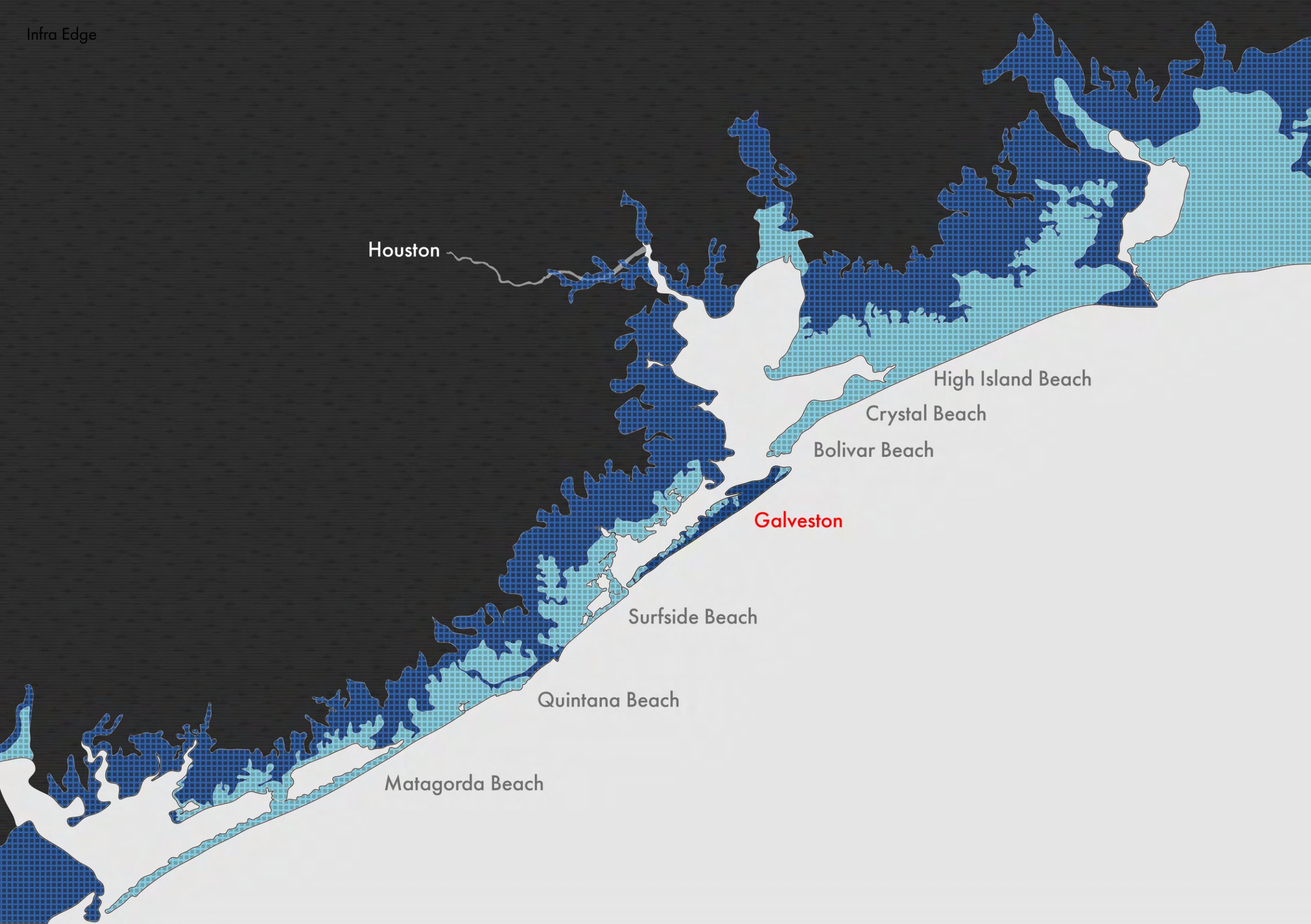
Galveston has a past which contains a mixture of good and bad times. Galveston's golden age was during the late 19th century, but the island was hit by various hurricanes and storms which halted its growth as a city. But after these events the city has made continuous efforts to reconstruct and preserve historical buildings and districts hence continued to thrive. Today, the island is an entertainment oasis with distinct venues, restaurants, and other activities. Among the other attractions such as moody gardens and Schlitterbahn waterpark is the famous "pleasure pier."

One of the most important touristic destinations found in Galveston is the "pleasure pier" Before the current "pleasure pier" existed, its predecessor stood from 1943 to 1961. This pier jutted out into the Gulf of Mexico about 1200 ft and was 120 ft wide. It had both a convention and exhibition hall which were located on the primary parts of the pier. The middle part was an amphitheater for concerts and for movie projections. At the very tip of the pier, farther to the sea was known as the "T" Head, one of the most popular fishing spots of the time.

However, in 1961 Hurricane Carla damaged the structures on the surface beyond repair and the pier was eventually demolished. In 1965. The USS Flagship Hotel was built 1965 but also scrapped after hurricane Ike in 2008. In summer 2012 the "pleasure pier" opened to the public and ever since then has been a major destination. Places like this are prone to destructions due to the ever present threat of storms and climate change.



DISASTER



Disaster

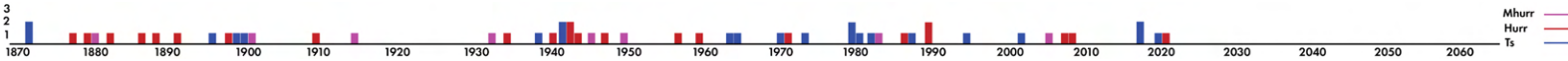
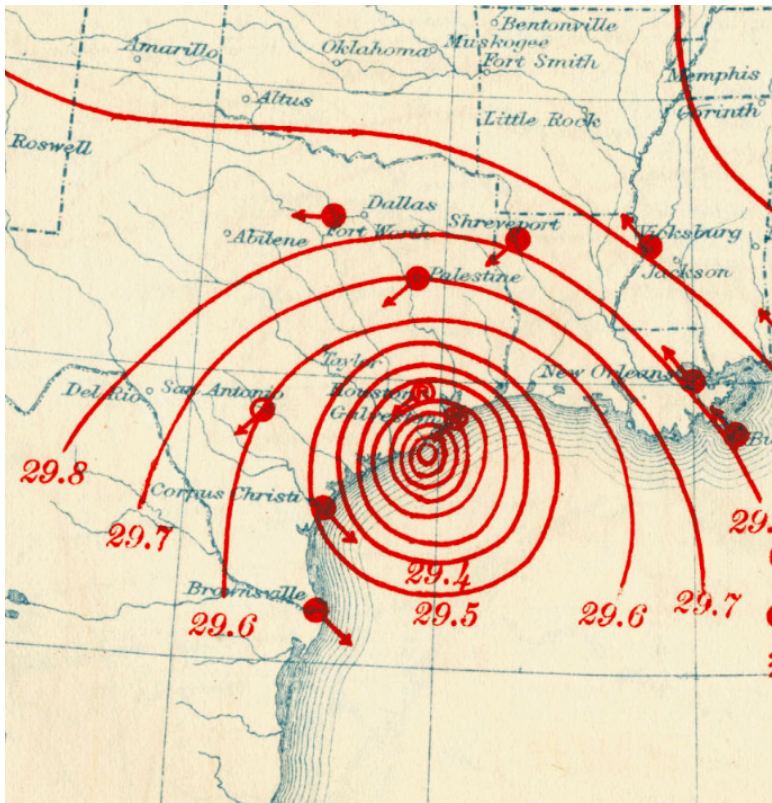
The effects of climate change keeps increasing across the globe. In Galveston, the sea level has risen 18 inches since the 1950's and has continued accelerating. According to simulations done by Climate Central, Galveston is projected to be under water in the next 100 years if sea level rise continues to accelerate (worst-case scenario).

However, other issues can be seen today that result from the issues from climate change. For instance, people that live these regions may experience flooding when it is sunny and there are no signs of rain. This kind of flooding is known as "high tide flooding" which occurs with an increased level of high tides resulting from sea level rise, subsidence, and erosion of natural barriers. This type of flooding threatens the residents living there since the excess water inundates many homes, streets, and sewage systems.

Another issue for Galveston is the ever-present threat of storms from the gulf. The island's geographic location is at the front lines and makes it extremely vulnerable.

It is a long narrow barrier island which runs parallel to the mainland's coastal shoreline. The closest major city is Houston, which is about 45 miles north-west from Galveston. The island itself is a natural island completely surrounded by water and placing it in between mainland and ocean. Infrastructure and architectural design are important factors that can provide some resilience in different coastal ecologies. Much more dense development of building materials like concrete to create hard edges can be designed to more readily withstand storm effects.

The threat of these storms remains one big issue for the residents of the city. For example, the city was devastated from the hurricane of 1900 and it is the greatest natural disaster in US history. The city has seen various storms, and even in 2008 more recently it was hit by hurricane IKE, which caused mayhem to the island. However, after the seawall was placed in response to the great hurricane of 1900, it has mitigated much of the damage done to the island by these storms. However, the seawall on its own is not sufficient, there should be a larger infrastructure which can aid the seawall. There should be another line of defense, which will serve as a barrier against storm surge.

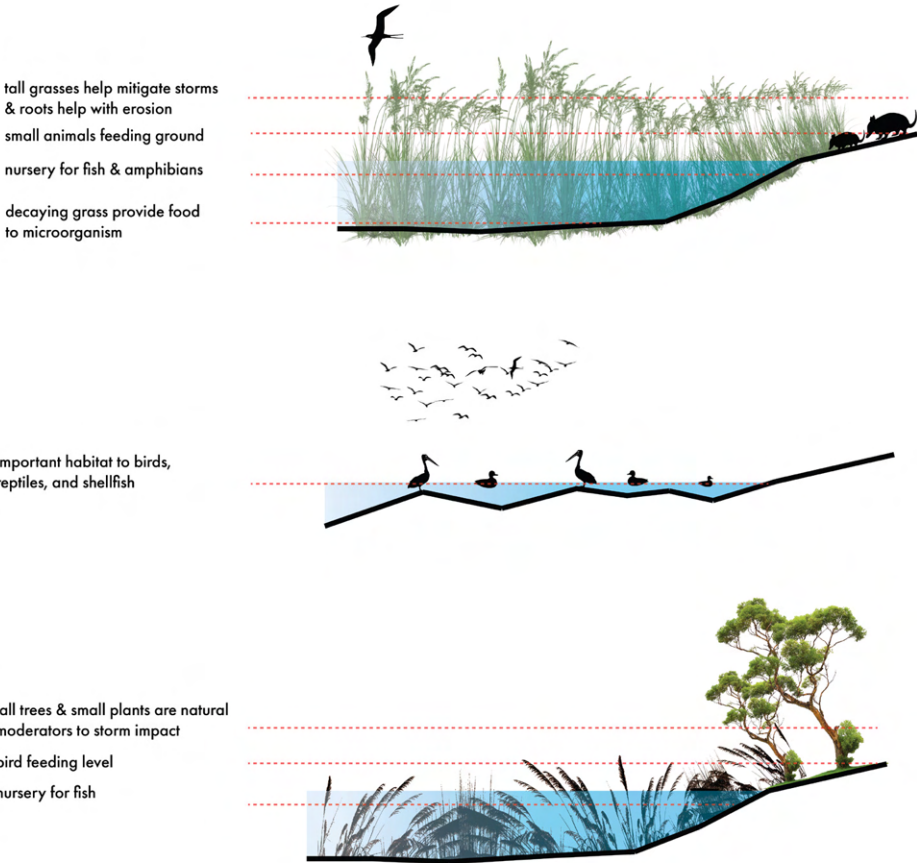




Nature

Ecology is an important element which lives currently in and around the island. Various animal and plants live on the island and continue to thrive and expand. Life on the edge can vary around the island. Biodiversity and ecological resilience are primarily located on the perimeter of the island typically in the shifting wetland areas. Some areas near the beach side also contains much greenery and life.

Furthermore, in addition to it's human population, Galveston also contains rich biological habitats. The water's edge, marshes and in-land wetlands form part of intense zones of biodiversity. Human habitats such as architecture or urbanism can be destructive to natural habitats but this proposal seeks to promote what exists under and above water. Some principles of landscape ecology promoted the idea of creating different landscape iterations .

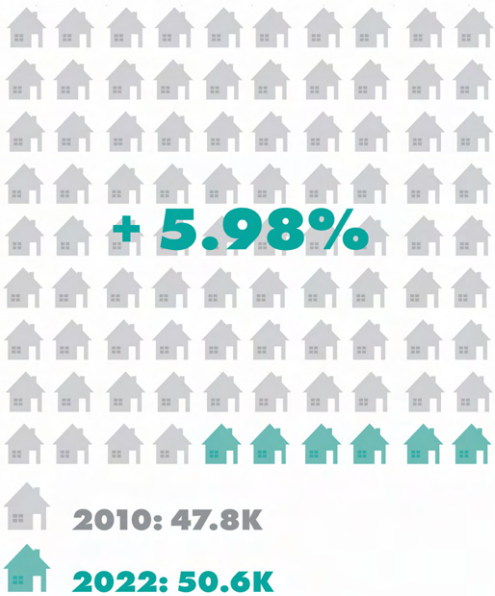




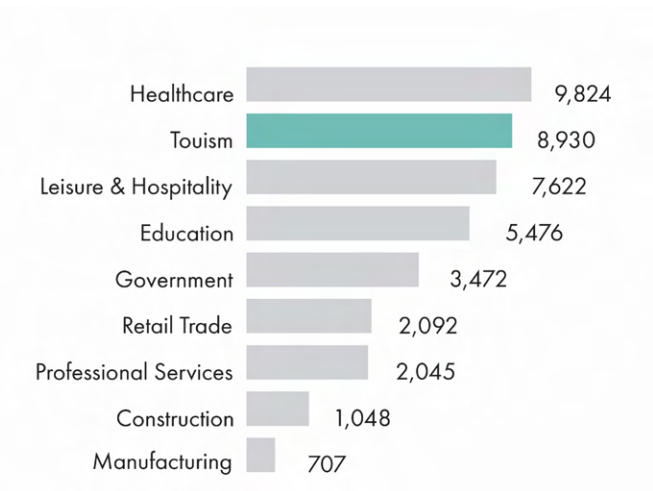


TOURISM

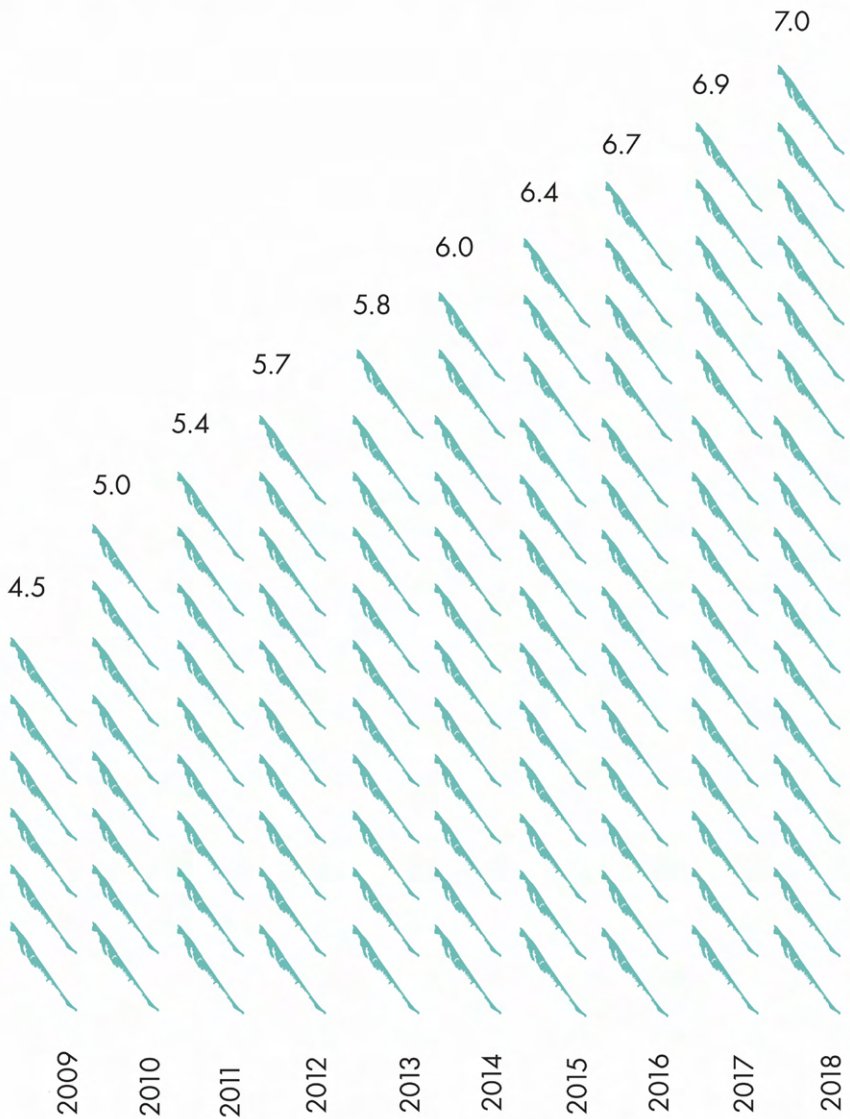
RESIDENT POPULATION



TOURISM EMPLOYEMENT

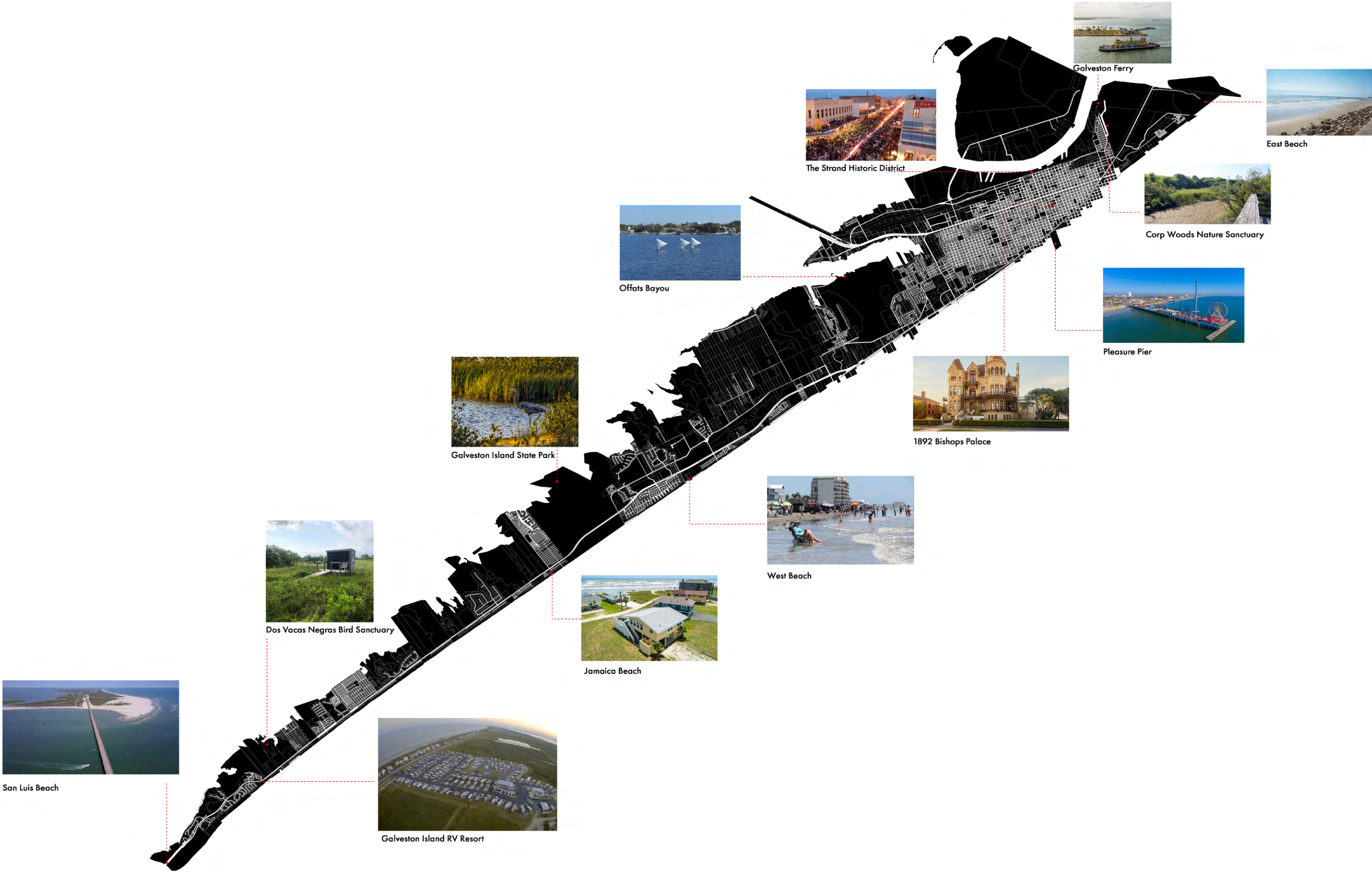


VOLUME OF VISITORS(MILLIONS)



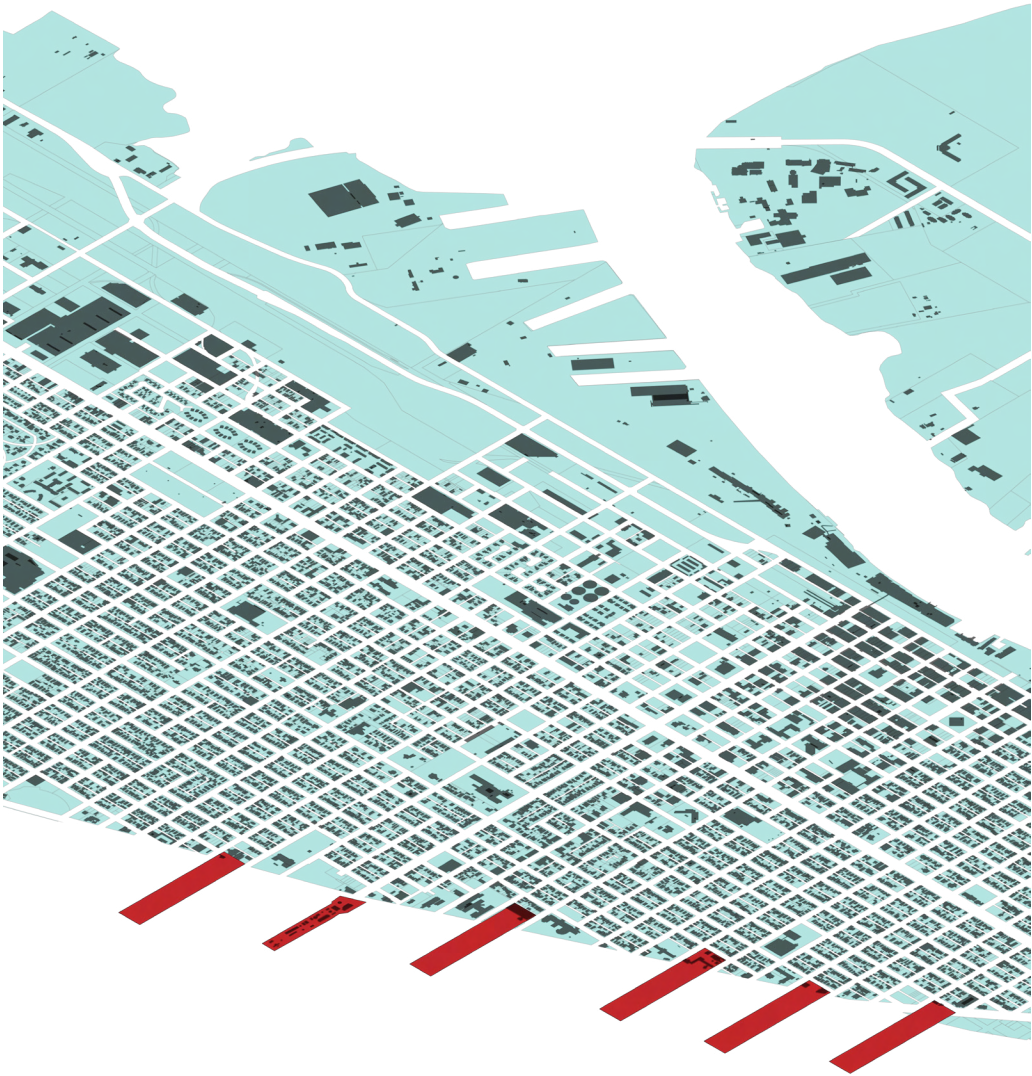
Tourism

Galveston, an island city found on the southeast Texas coast, today is thriving as an island with abundant tourism and historical landmarks. As the city of Houston continues to grow, many people will chase a place for entertainment and recreation. This place is Galveston; it is going to grow as a bigger touristic magnet, and it should provide more amenities for these waves of people. Today, the Island has attracted more than seven million tourists. The large number of tourists are an outcome of the investments and projects done relating to the re-nourishment of the beaches, the development of amenities /attractions, and festivals. In addition, Galveston is home to 50,446 (2019) people and that number continues to rise. These residents are at high risk for the future environmental challenges. The future of this place is greatly threatened by radically changing coastlines due to sea-level rise and the unpredictable impact of storms.

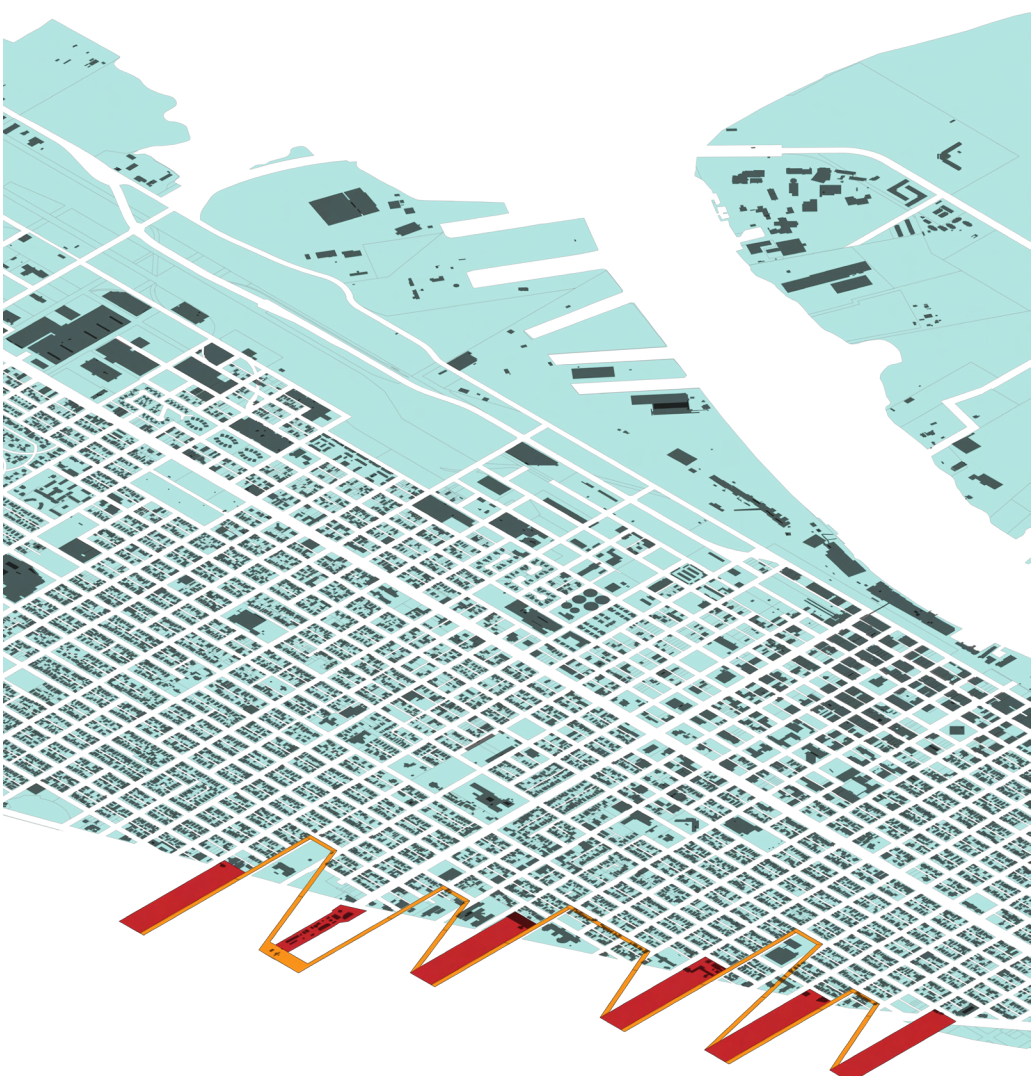




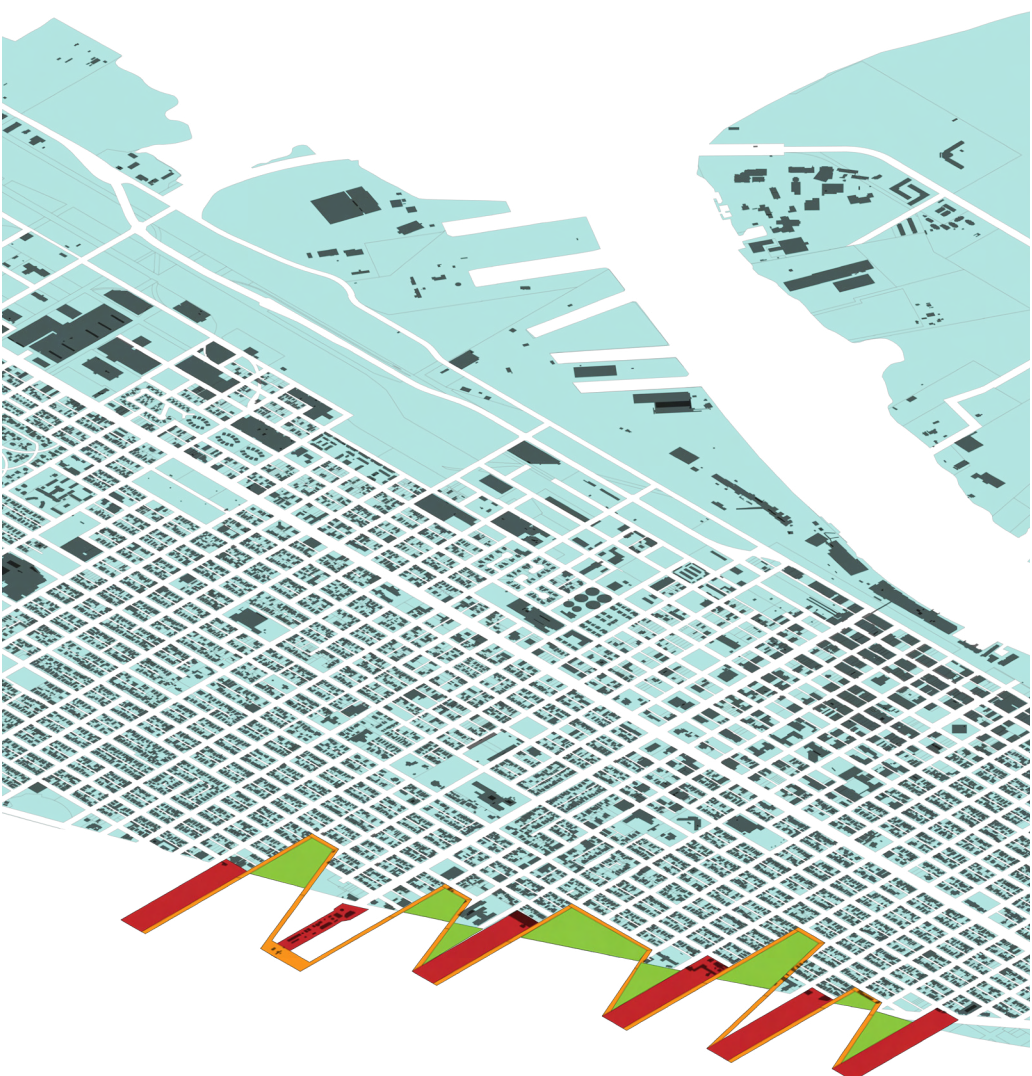
1. Extension to water



2. Connection to Urban Fabric



3. Integration of Nature



NATURE:
Conservation (Wetland)
Park
Trails
Camping/RV
Dog Park
Fishing



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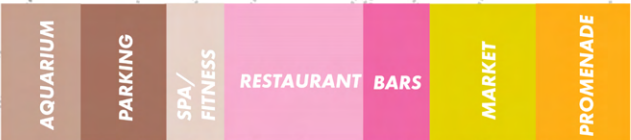
COMMUNITY
Learning Center
Historical Center
Museum
Housing
Transportation



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TOURISM
Restaurant
Market
Aquarium
Hotels
Promenade

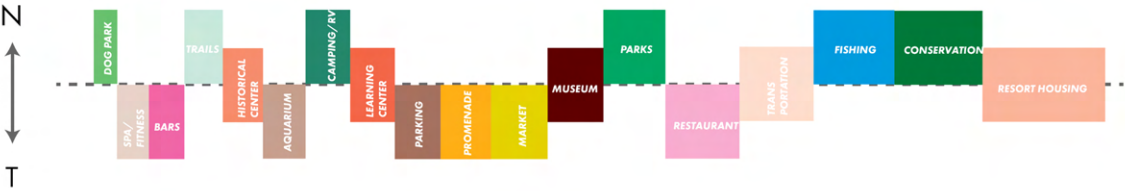


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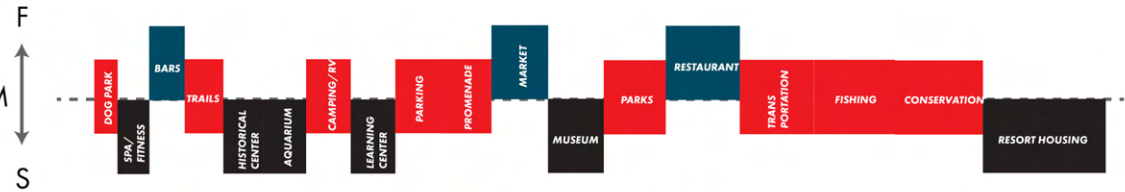
NORMAL

1

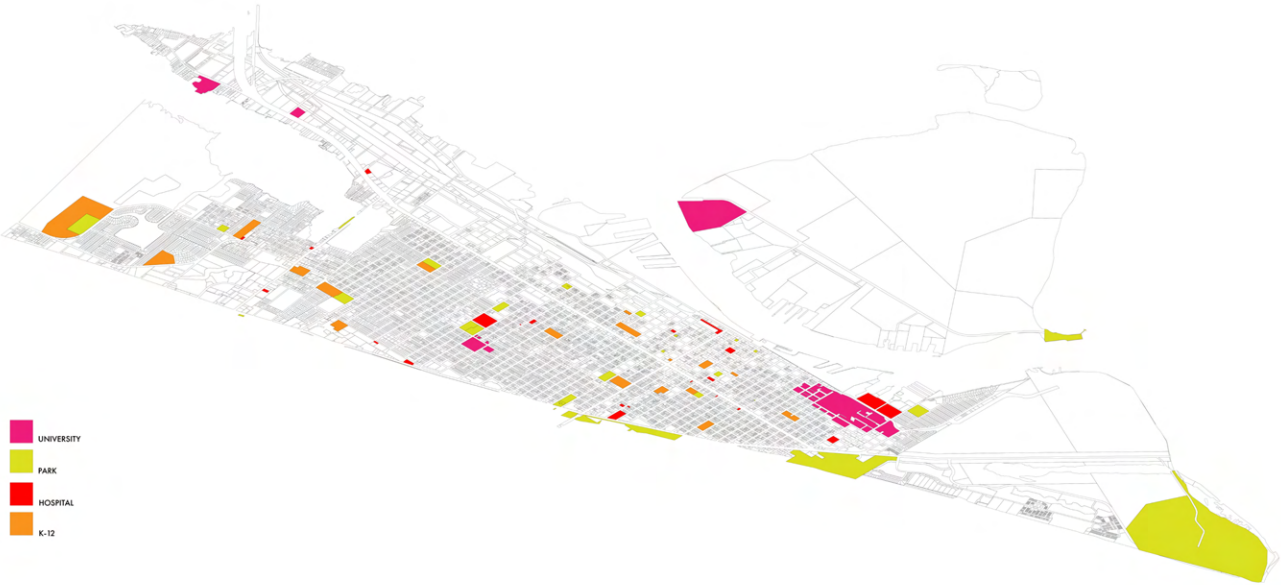


CRISIS

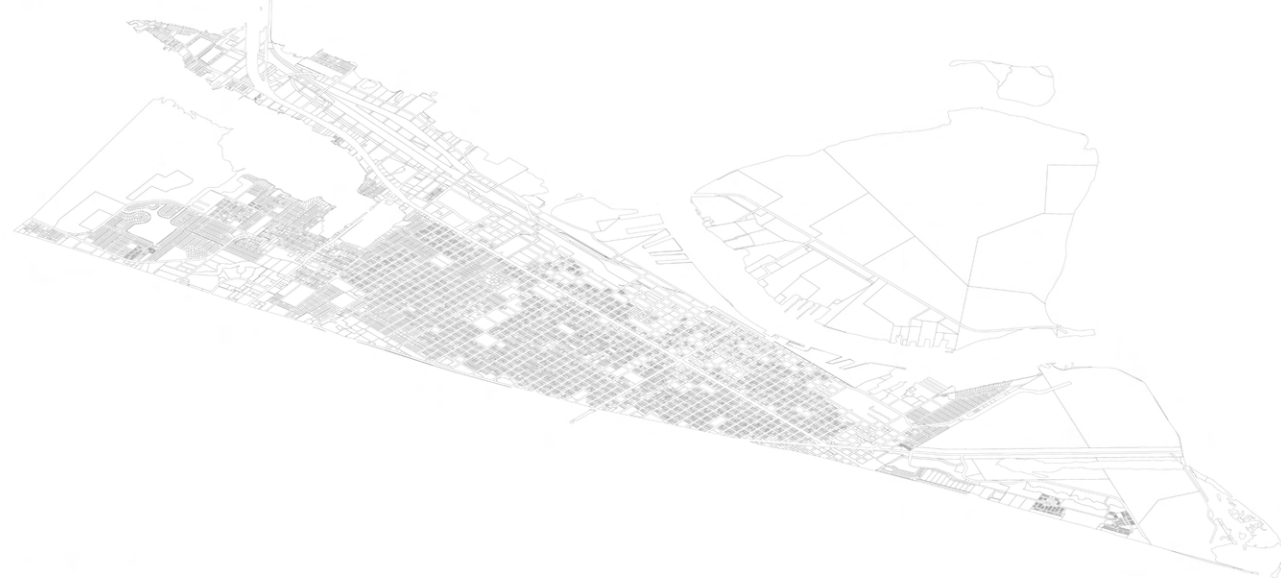
2



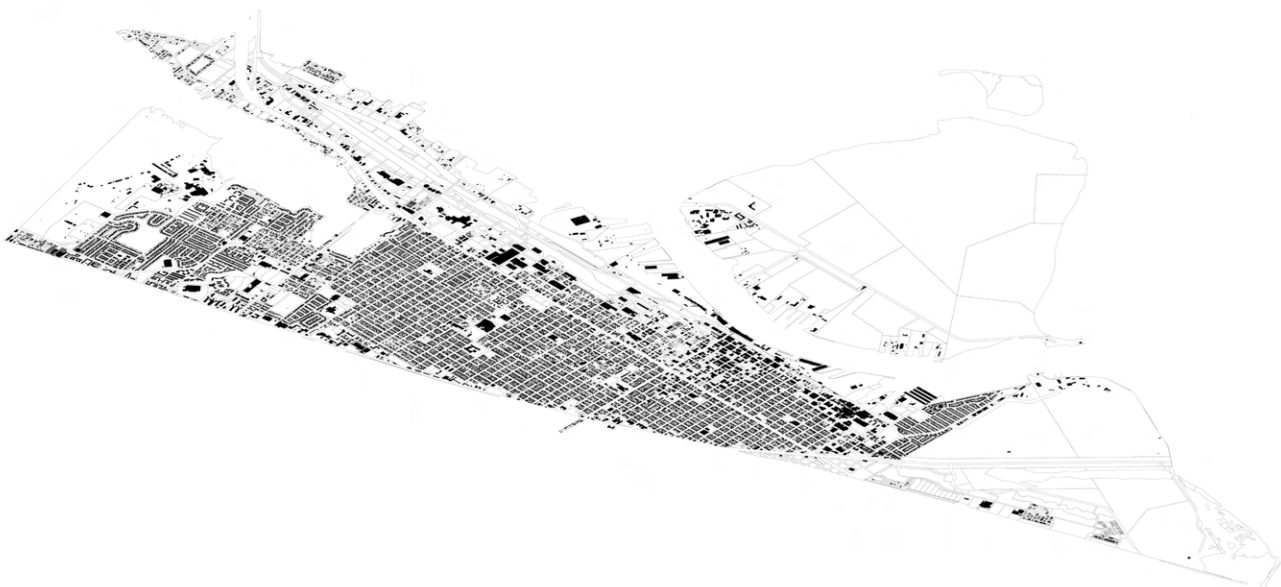
COMMUNITY PROGRAMS



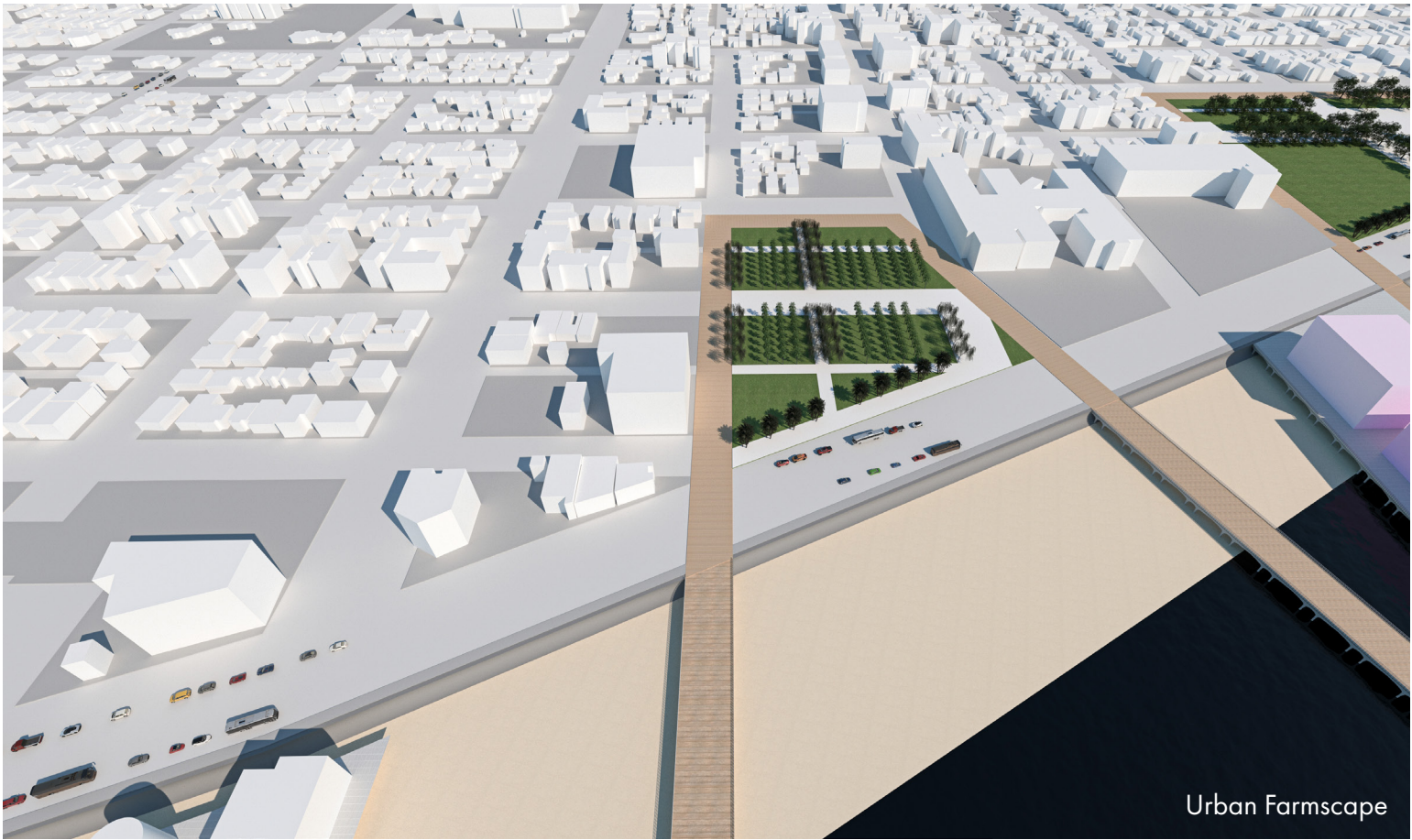
LAND DISTRIBUTION



CURRENT BUILDINGS







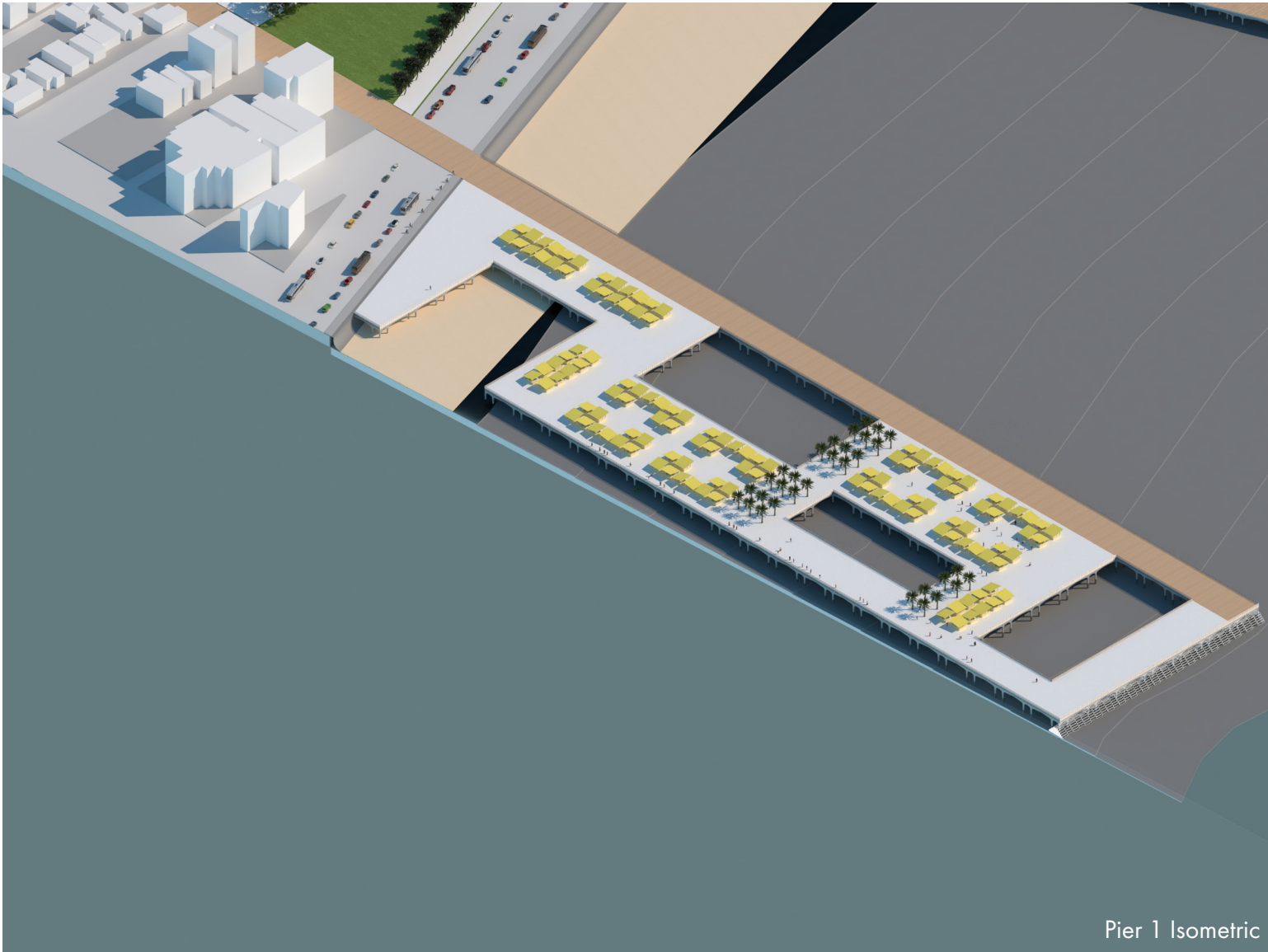
Urban Farmscape



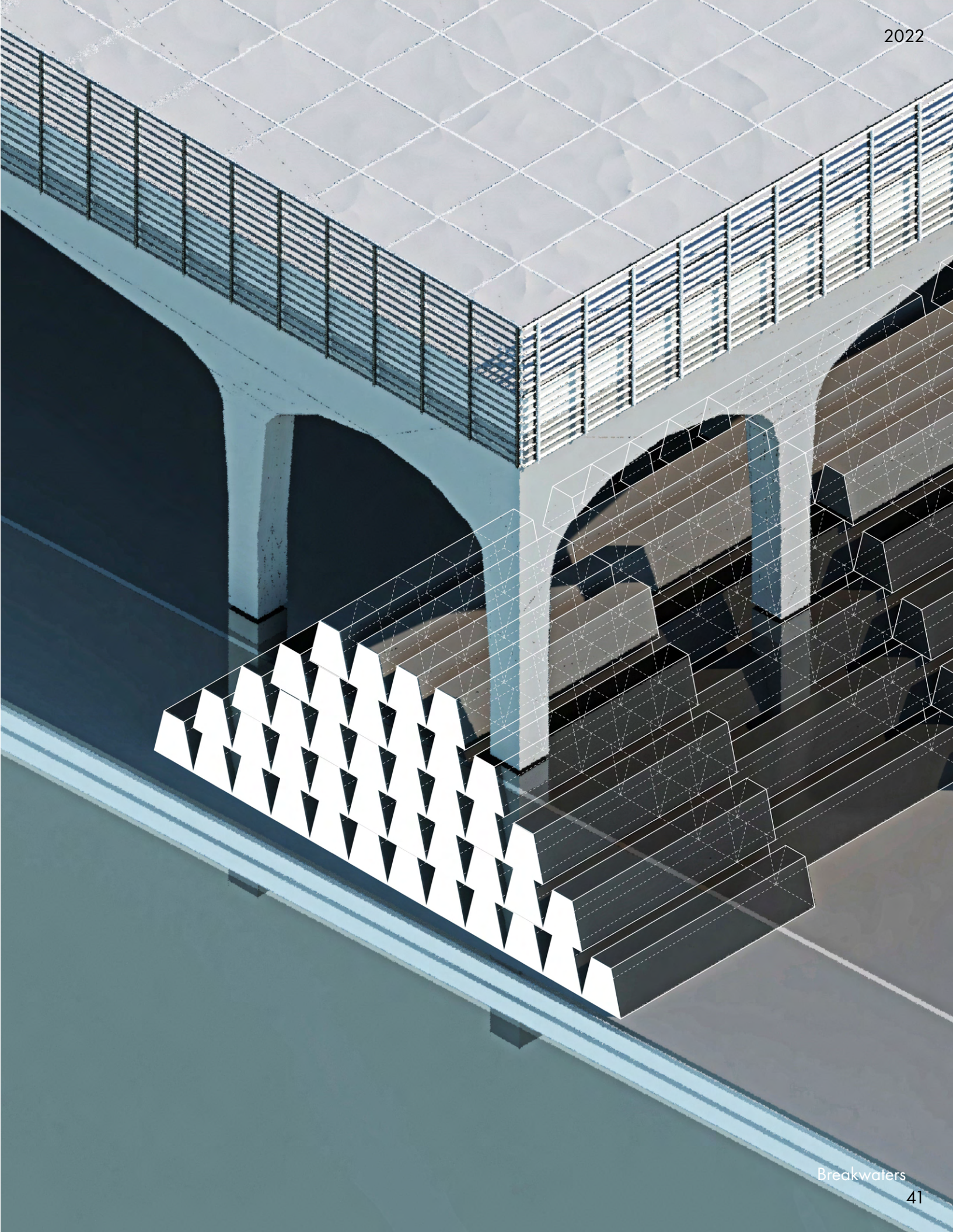
Gardenscape



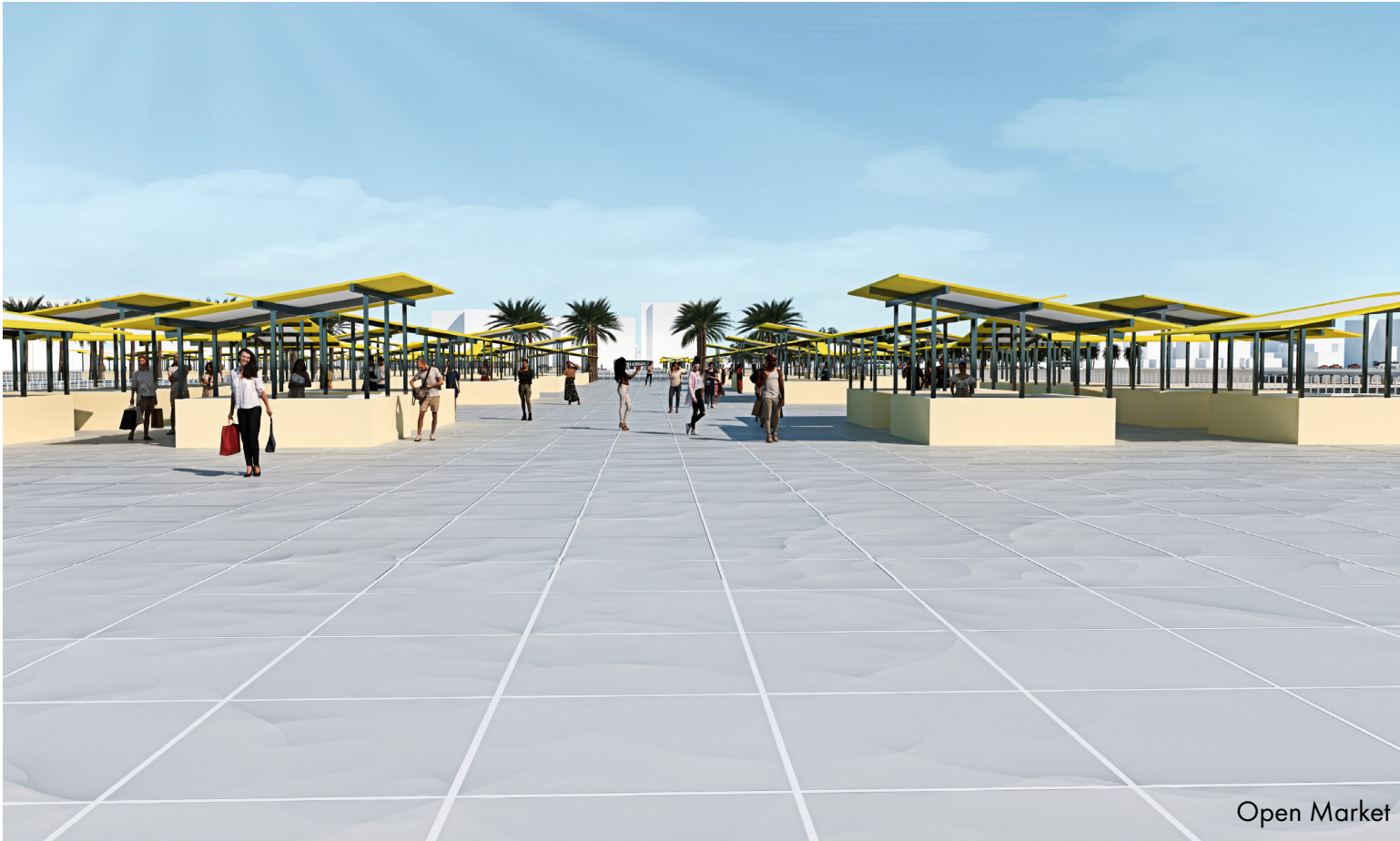
Playscape



Pier 1 Isometric



Breakwaters



Closing Statement

Infra-Edge is an architectural response to the environmental and cultural identity of Galveston. The proposal questions what can be done to help a city at constant risk of storms from the Gulf. While the proposal contains a scientific approach it also has one relating to Galveston's community. The new piers would have two sides: one is above the platform which has a touristic driven program and the other side which contains a buffer to mitigate wave energy. Lastly, the piers connect to the mainland to allow pedestrians to have easier access to the new infrastructure.

The project was chosen not necessarily to provide a solution but rather to bring awareness to coastal issues and as one possibility.

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