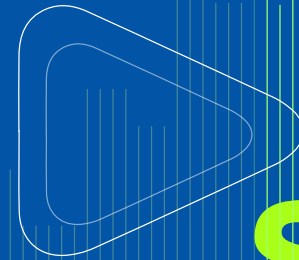


2018 Summer Student Program Introduction
Urbanism, Infrastructure, and Ecology at
San Francisco's Northern Waterfront



SF

BAYWATCH

AQUATIC PARK

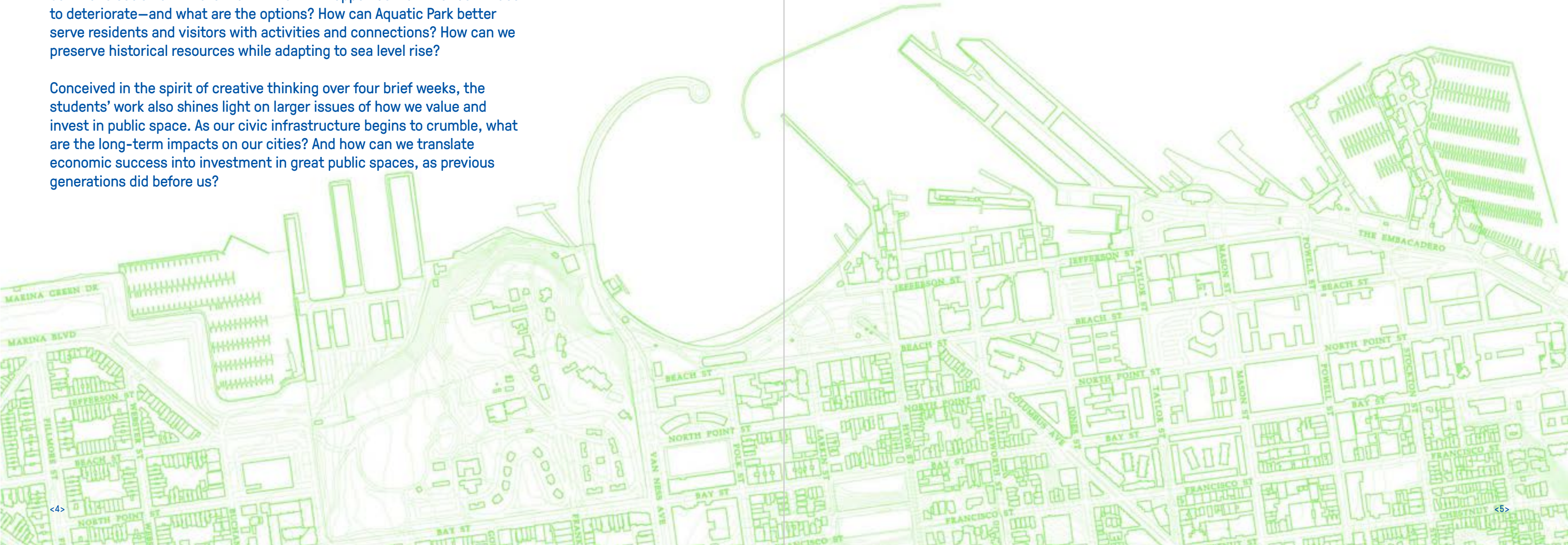
An iconic emblem of San Francisco's heritage. A place to watch fireworks, build a sandcastle, climb aboard a historic ship. A place where people can touch the bay—and a place we all take for granted. The Muni Pier, built over 80 years ago to serve a growing city with recreation, is threatened by structural decay. Tides are advancing ever higher and closer to the heart of San Francisco's most popular tourist district. The city's northern shoreline, like so many beloved urban waterfronts, calls for new solutions.

Regenerative and resilient infrastructure, conceived in concert with natural systems and based in the shared urban landscape, may prove to be the infrastructure of the future. By raising questions—by delving into vision—the conversation begins.

BAYWATCH SF

SWA's 2018 summer student program tackled serious issues confronting San Francisco's north waterfront. What will happen as Muni Pier continues to deteriorate—and what are the options? How can Aquatic Park better serve residents and visitors with activities and connections? How can we preserve historical resources while adapting to sea level rise?

Conceived in the spirit of creative thinking over four brief weeks, the students' work also shines light on larger issues of how we value and invest in public space. As our civic infrastructure begins to crumble, what are the long-term impacts on our cities? And how can we translate economic success into investment in great public spaces, as previous generations did before us?



I. Introduction

- Baywatch SF ⁽¹⁰⁾
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- Students ⁽¹⁶⁾

II. Place + Potential

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I. INTRODUCTION



BAYWATCH SF

Urbanism, Infrastructure & Ecology at San Francisco's Northern Waterfront



Aquatic Park sits at the confluence of geography and history, the connection of local and federal lands, and the coming together of commercial and civic uses—and it is challenged by aging infrastructure, sea level rise, and the myriad demands of a dynamic city.

SWA's 2018 summer student program ventured into this complex territory to explore how design can create coherence and renew character for the future of this unique urban beach. The summer program afforded students a world-class opportunity to engage in a project,

exchanging fresh ideas, knowledge, and perspectives. Their explorations and inquiries reveal a diverse range of opportunities, pose new questions, and set the stage for creative, comprehensive planning and investment.



The summer program afforded students a world-class opportunity to engage in a project, exchanging fresh ideas, knowledge, and perspectives.

SWA Summer Program



WEEK 01	PLACE AND POTENTIAL Analysis and Discovery of Context	WEEK 02	THE URBAN SCENE Urban Design at District Scale	WEEK 03	DESIGN OF SITE Focus on Aquatic Park	WEEK 04	THE DESIGNED OBJECT Focus on Detail
	June 11-15		June 18-22		June 25-29		July 02-06

Our students focus on a real-world design problem enhanced by expert specialists and weekly critiques.

For over 50 years, SWA has conducted a summer student program to train select groups of students in landscape architecture, planning, and urban design. Our students focus on a real-world design problem enhanced by expert specialists and weekly critiques featuring distinguished design professionals, public officials, local stakeholders, and residents. Following the studio, the students disperse to our offices for a four-week internship.

The goal of the 2018 summer program's four-week studio was to conceptualize possibilities for catalytic, sustainable, and resilient interventions at a range of scales, starting with the larger urban context of San Francisco's north waterfront and focusing down to Aquatic Park, and then to specific objects or places within the park.



Each week will be led by different SWA faculty, with Elizabeth Shreeve and René Bihan (Principals, SWA San Francisco) and San Francisco staff providing continuity for the program's duration. Guest speakers provided perspectives on a variety of issues. Weeks 2 and 3 ended with juried presentations of student work, and the studio concluded with a final "reveal" and

reception at the end of Week 4. We are enormously grateful for the generosity of the many individuals and organizations who contributed their time as speakers, experts, and inspirations for our students. (Please see list on pages 112-113.)

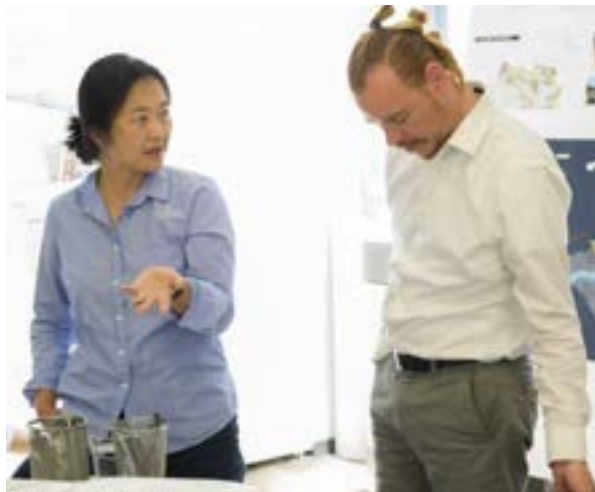
SWA Summer Program



Bay Area professional experts, non-profit and public agency stakeholders partnered with SWA's



design leaders to inform the summer program.



Students



SWA's 2018 program gathered an international group of eight students from leading university programs.

1. Adele Meidine

École Nationale Supérieure de Paysage

2. Yinghua Hua

Washington University in St. Louis

3. Jesse Foster Thomas

University of Illinois at Urbana-Champaign

4. Hanqing Zhao

University of California at Berkeley

5. Roberto Astudillo

University of Michigan

6. Xuezhen (Esther) Xie

Cornell University

7. Phia Sennett

Harvard University

8. Sujing Sun

University of Washington

Students



ADELE MEIDINE

École Nationale Supérieure de Paysage

I am Adele Meidine, an MLA graduate student studying landscape architecture at ENSP in Versailles, France. I grew up in Chantilly, a countryside surrounded by forest, with a magnificent castle garden designed by Le Notre. As a kid, I dreamed of being a pilot; more recently, I've discovered a personal affinity for the interface where sky and earth meet in dynamic balance. I am driven by the beauty of satellite views.

In a world of constant change, I am an optimist. Two-thirds of the world's population will be located in urban areas by 2050, placing great importance on considerate and inspired design-thinking. My vision is that of an integrated, all-encompassing urban system, measurable down to the scale of plants. I believe we have the ability to see the world through the eyes of a poet adept in the act of witnessing.



YINGHUA HUA

Washington University in St. Louis

Landscape architecture carries a variety of significant meanings for our lives: as the design of environments of both ecology and society, as a means to achieve aesthetic outcomes, and as a process to evoke emotional responses. As a graduate student from Washington University in St. Louis, I enjoy observation, collection, discovery, and design. I like to take on challenges and use creative thinking to engage in the real world of project practice. My experience in different types of landscape architecture study, both in China and the United States, has given me a strong sense of conceiving and analyzing the environment and representing it in both two-dimensional and three-dimensional ways.

The magic of the Baton Rouge Lakes Project, designed by SWA confirmed my decision to be an intern with the firm. I appreciate the opportunity to work with the other seven summer students and the wonderful people from SWA's other offices. I believe this summer program experience has made a deep, super-excellent impact on my studies and professional life.



JESSE FOSTER THOMAS

University of Illinois at Urbana-Champaign

I am a master's student of urban planning at the University of Illinois Urbana-Champaign, where I have been focusing my studies on design and active transportation. As a native of Chicago, I've been interested in cities from a very young age. Public transit influenced me even as a baby—my first word was “bus”!

My internship at SWA has bolstered my growing interest in the physical design of places, as I've seen and participated in SWA's fantastic work in landscape architecture and urban design. The summer program has helped me see how much influence we, as designers, can have on how people interact with their environment and each other. Entering the fields of urban design and planning is a pivot for my career path, where I have already worked for the U.S. federal government and in management consulting. I hope to apply my previous skills in data analysis to merge proficiency in design with data as it applies to improving the built environment. Ultimately, I want to make cities more equitable, sustainable, and beautiful places for people.



HANQING ZHAO

University of California at Berkeley

I was born and raised in China. I received my bachelor's degree in Environmental Design from the University of Manitoba, and am about to start my second year of the MLA program at UC Berkeley. I have always believed that one has to be a good person in order to become a good landscape architect. I am working very hard on the first part.

As a student of landscape architecture, I am especially drawn to vernacular design, food production and the aesthetic of agriculture, and site construction details and process. I am interested in the global issues of natural systems and the physiology of all living things, especially insects and marine creatures.

During SWA's summer program I've made great friends, met some of the most talented folks in this profession, and exposed myself to the issues and challenges of the field and of myself. I am excited to bring new questions and confusions into my second year of graduate study.



ROBERTO ASTUDILLO

University of Michigan

Born and raised in the Chicagoland area, I have always been interested in the social and ecological dynamics of the spaces between buildings and how they contribute to great places. Urban systems and their dynamics inspire me to understand how they power cities and become a platform for the spreading of knowledge and ideas. As a landscape architecture student at the University of Michigan, I have had numerous opportunities to explore urban dynamics from Detroit to Madrid, experiencing the uniqueness of diverse places in a rapidly globalizing and connected world.

My experience at SWA has revealed the immense diversity found in the design world. Landscape architecture has allowed me to further embrace my background in the sciences and training in classical music towards design ideas. I hope to one day contribute to the field through research-based design and academia. I'm interested in how landscape can help influence positive transitions that embrace local ecology, increase social equity, and celebrate valuable cultural assets, preparing the region for a sustainable and global future.



XUEZHEN (ESTHER) XIE

Cornell University

As an undergraduate student pursuing concurrent degree in landscape architecture and urban and regional studies in Cornell University, I have been passionate about urban design and equity planning. I believe in the power of good design to make strong, positive social progress.

Born and raised in Ningbo, China, I was motivated by my curiosity about cities to explore the world. Prior to this summer, I spent a year studying in Europe. My study in Copenhagen, Denmark exposed me to innovative design approaches and social ideologies. While in Rome, Italy, I was able to learn about the complex historical layers that compose European cities and began to think about the significance of urban informality. This summer with SWA provides me with opportunity to reflect on my ambition for creating social impacts through landscape design and challenges me with the complexity and restraints of site. I am intrigued by creating inclusive urban spaces for socialization and interaction for diverse user groups.



PHIA SENNETT

Harvard University

I am Phia Sennett, an MLA student at Harvard University Graduate School of Design. Growing up in Blaine, Washington, a small town on the U.S./Canada border, my early life was spent surrounded by water – small bays, mud flats, estuaries, and a mile-long spit along the Salish Sea. My interest in the relationship between land, sea, the arts, and people's livelihoods led me to the study of geography (at University of North Carolina) and visual and media studies (at Duke University). Filmmaking, including documentary, experimental and virtual reality, initially helped me understand the storied histories of landscapes and the value of design. Now, as a student of landscape architecture, I ground my work in acts of hindsight and foresight, forging multi-disciplinary connections with unexpected partners, technologies, materials and methodologies. During my career I hope to contribute to design projects that enliven and empower users during an era of rapid urbanization and unprecedented climate change. For the second portion of the SWA Summer Program, I am working in New York at SWA/Balsley.



SUJING SUN

University of Washington

I am Sujing, a graduate student from the University of Washington, Seattle. I studied landscape architecture in China and worked two years in Shanghai before pursuing further study at UW. My special interest lies in sustainable design within multiple scales, especially resilient waterfront and ecological strategic proposals. As an environmental systems thinker on a mission, I look for miscommunications between people and their ecosystems, not to mention the crises that climate change will bring to us. I think landscape architects should not only provide great ideas to improve our daily lives, but also share the challenges and opportunities to foster environmental justice and a resilient, sustainable future.

Tapping into these complex and dynamic changes, I believe landscape designers can collaborate with multidisciplinary experts to design beyond traditional professional boundaries. I appreciate that the SWA program provides such a platform, with boundless chances for us to explore and create this summer.

Students



Each student defined a creative response to the challenges of sea level rise, infrastructure, and the



dynamic balance of the land-sea urban ecosystem.



II. PLACE+POTENTIAL



Site Visit



Students explored the area’s natural and man-made systems to understand the dynamic forces that



shaped Aquatic Park, then generated an initial vision for the site’s next 100 years.





WEEK
01

Place + Potential

San Francisco's north waterfront presents an array of physical, economic, and cultural influences. To establish their understanding of Aquatic Park and its context, the students toured the site with representatives of the National Park Service and Fort Mason Center. Working in pairs, they delved into research and synthesis of four key topic areas:

History + Places

Land Use

Environment

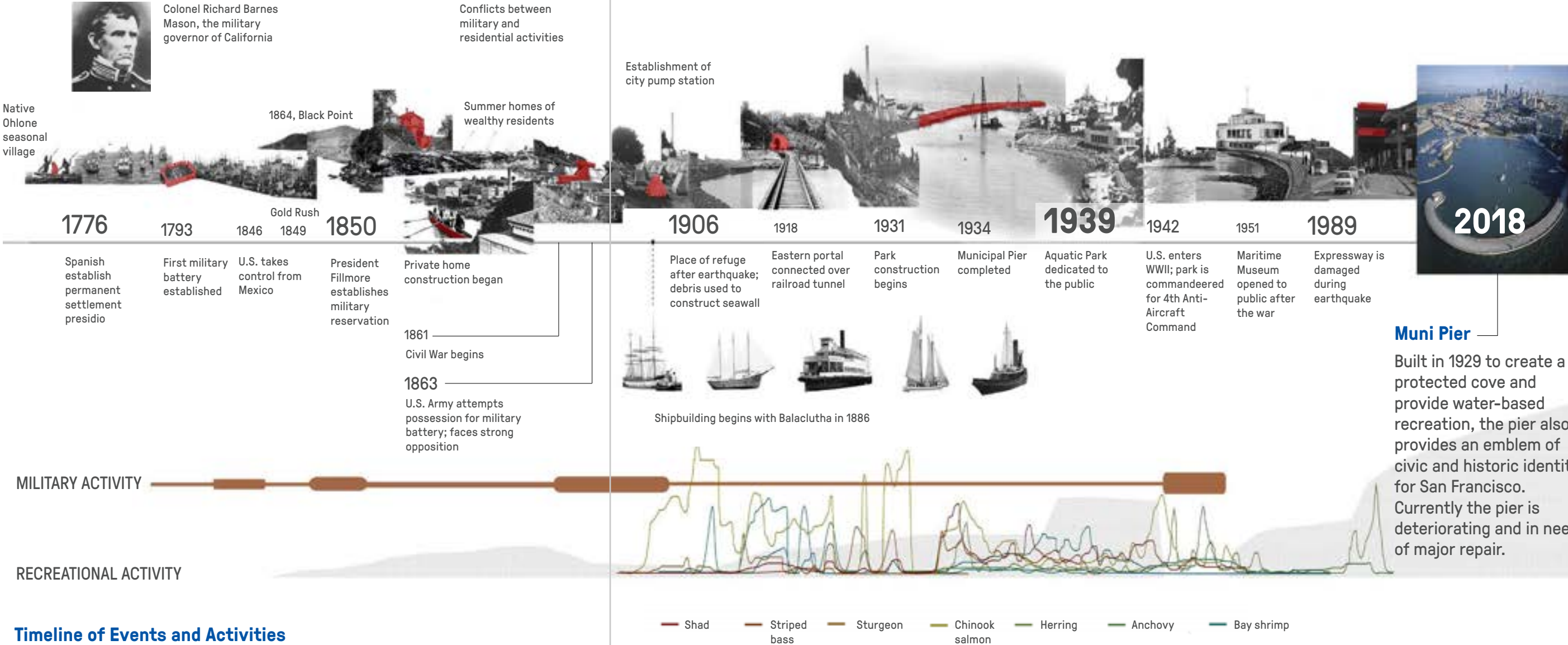
Connectivity

History + Places

San Francisco’s northern waterfront, including Aquatic Park and Fort Mason, offers a rich and complex history that led to the dynamic and multifaceted character of the place as we experience it today.

Due to its strategic location, the north waterfront served as a fortress in 1793, when Spanish colonizers established the first military battery at the Castillo de San Joaquin. Fort Mason served as an Army post for more than 100 years, initially as a coastal defense site and subsequently as a military port facility. During World War II, it was the principal port for the Pacific campaign. The entire fort area is listed as a historic district on the National Register of Historic Places, with over 49 buildin

Along with military activity, the waterfront also has a long tradition of residential and recreational purposes. Construction of private homes, along with various recreational activities, began in the 1850s, shortly after the Gold Rush. During the Civil War period, the United States Army reclaimed possession for its military importance, with strong opposition from the residents. After the great 1906 earthquake and fires that destroyed much of San Francisco, Fort Mason served as a place of refuge. The City’s emergency pump station was subsequently constructed as a precaution against potential future disasters.



History + Places

Aquatic Park was identified early as a prime location for waterfront access. The park and municipal pier (Muni Pier) were constructed in the 1930s, first as a city endeavor and then as a WPA (Works Projects Administration) project. Recreation has been the predominant activity since then, except for the interruption of World War II when the area returned to military use.

The Park includes a fleet of historic ships at Hyde Street Pier, exhibits and activity spaces at the Maritime Museum and Research Center, the beach with its swimming, boating, and leisure activities, and Muni Pier, popular for viewing, fishing, biking, and walking. A major event onsite is the July 4th Fireworks, when thousands of people come to enjoy the view.

The San Francisco shoreline has changed dramatically due to the landfill in the past century. Research shows that the landfill has a higher hazard of liquefaction compared to actual bedrock. The sea-level rise will again change the shoreline in the future. The area's historic fishing industry has declined in recent years due to the impacts of overfishing, habitat destruction, introduction of non-native species, and watershed pollution.

Currently, under the auspices of the San Francisco Maritime National Historical Park (SF Maritime Park), Aquatic Park offers a variety of attractions and opportunities to learn about the Pacific Coast's rich maritime history.



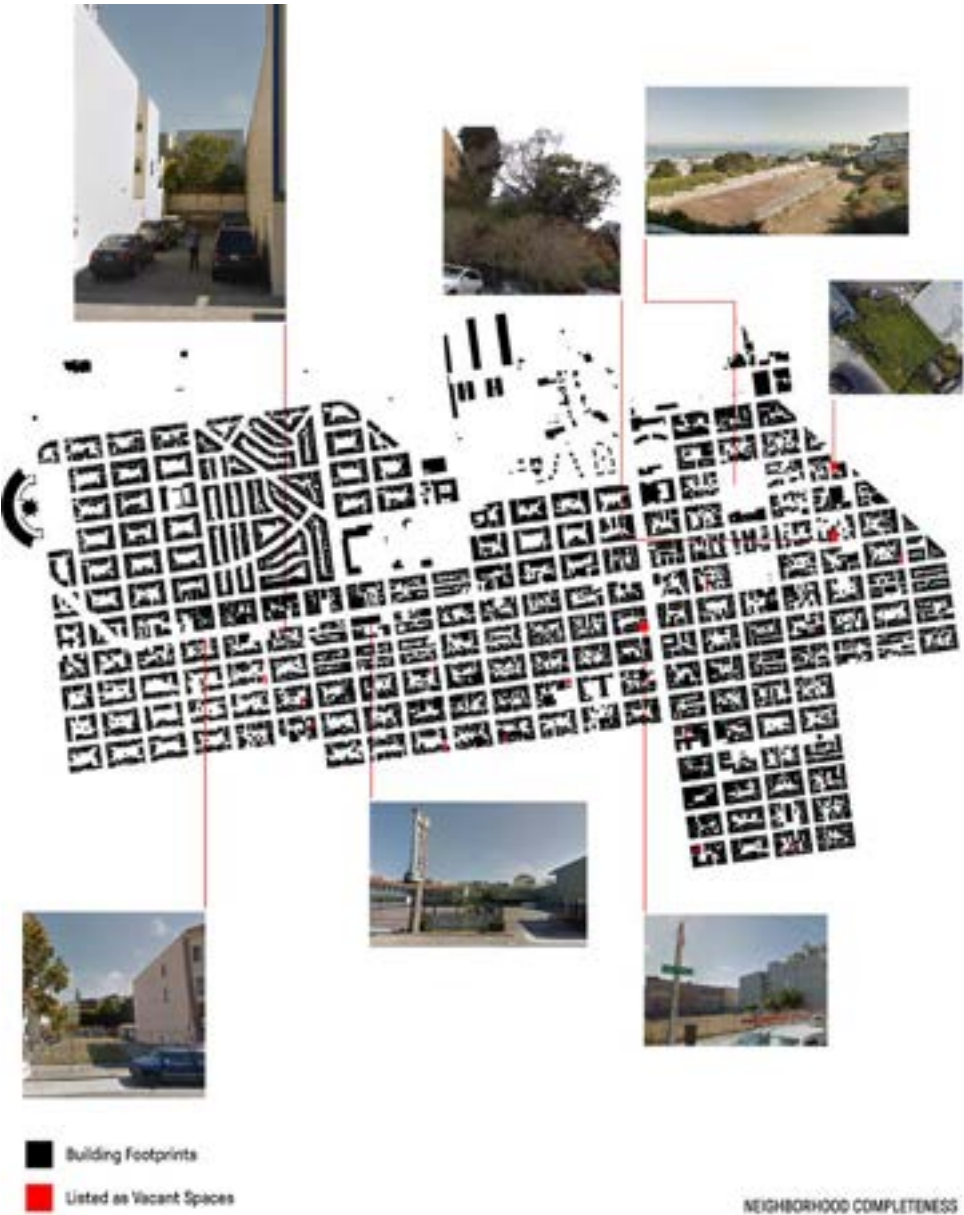
Adjacencies

Next to Aquatic Park, Fisherman's Wharf represents San Francisco's most popular tourist attraction, with an estimated 15 million visitors per year. At Lower Fort Mason, the Fort Mason Center for Arts + Culture supports a vibrant mix of tenants and gatherings.

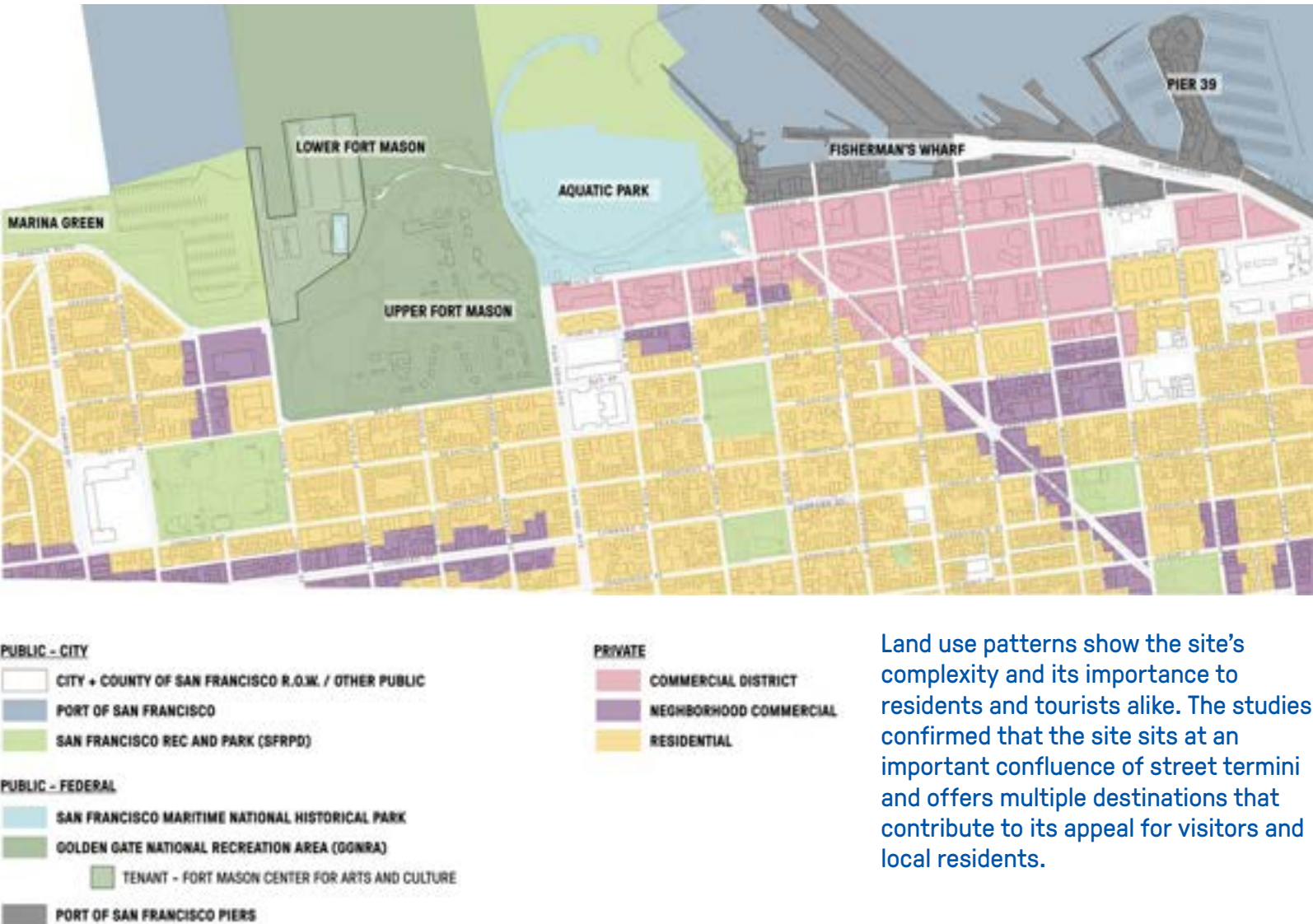
Land Use

Land use patterns indicate the important mechanisms that power the urban form of this site and region. Our analyses addressed current jurisdictional and use patterns—including the complex adjacencies of National Park Service, City and Port of San Francisco, and private lands—as well as current demographic characteristics. The district’s strong retail and tourist economy complements the Bay Area’s technology sector. Fisherman’s Wharf’s cultural significance, along with the natural beauty of Crissy Field and the Presidio, establish the site as a bridge connecting significant landmarks within the City.

We also examined the existing urban form of the site by identifying the current ownership and oversight structure within the region, city and streetscape projects, and the current economic climate.



Two major districts around our site, Marina and Russian Hill, are dominated by relatively young, wealthy, and highly educated people.



Land use patterns show the site’s complexity and its importance to residents and tourists alike. The studies confirmed that the site sits at an important confluence of street termini and offers multiple destinations that contribute to its appeal for visitors and local residents.

Land Use

Our studies point to the gap between the high level of visitation that Fisherman's Wharf generates and the significant investments needed to address aging infrastructure on nearby public lands. Aquatic Park does create revenue through the tourist industry: a major source of revenue is the 270-room Argonaut Hotel. The hotel leases space in the Haslett Warehouse Building from the National Park Service. The Argonaut is one of many hotels in the Fisherman's Wharf district. Together, these hotels generated \$250 million in hotel expenditures in 2017, according to the San Francisco Business Times. Yet the federal parks need additional revenue streams to address the site's aging infrastructure, the largest investment being the reconstruction of Municipal Pier, projected to cost between \$111 and \$130 million.

We concluded that tourists and locals make use of the district in unique ways. The two user groups seldom interact in that their movement and behavior is specialized. Points of intersection often correspond with circulation crossings, which are challenging to navigate. Stakeholders have proposed a variety of transportation options, including reuse of the historic train tunnel that connects east-west under Black Point at Fort Mason. Seismic upgrades for the tunnel could require approximately \$10 million, an expense comparable to upgrades required at Hyde Street Pier. A proposed cable car extension from Fisherman's Wharf through Aquatic Park to Lower Ft. Mason is estimated to cost \$28 million.

Through demographic studies we identified age diversity, income, and homeownership characteristics of residents of the surrounding area.

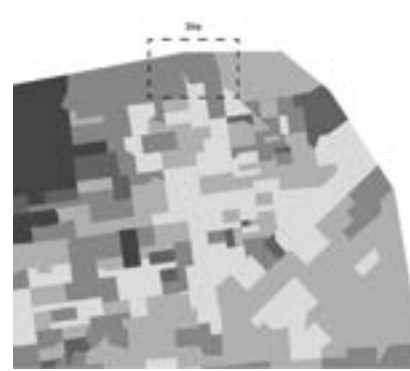
Underutilized | Opportunity Areas



Demographic Data



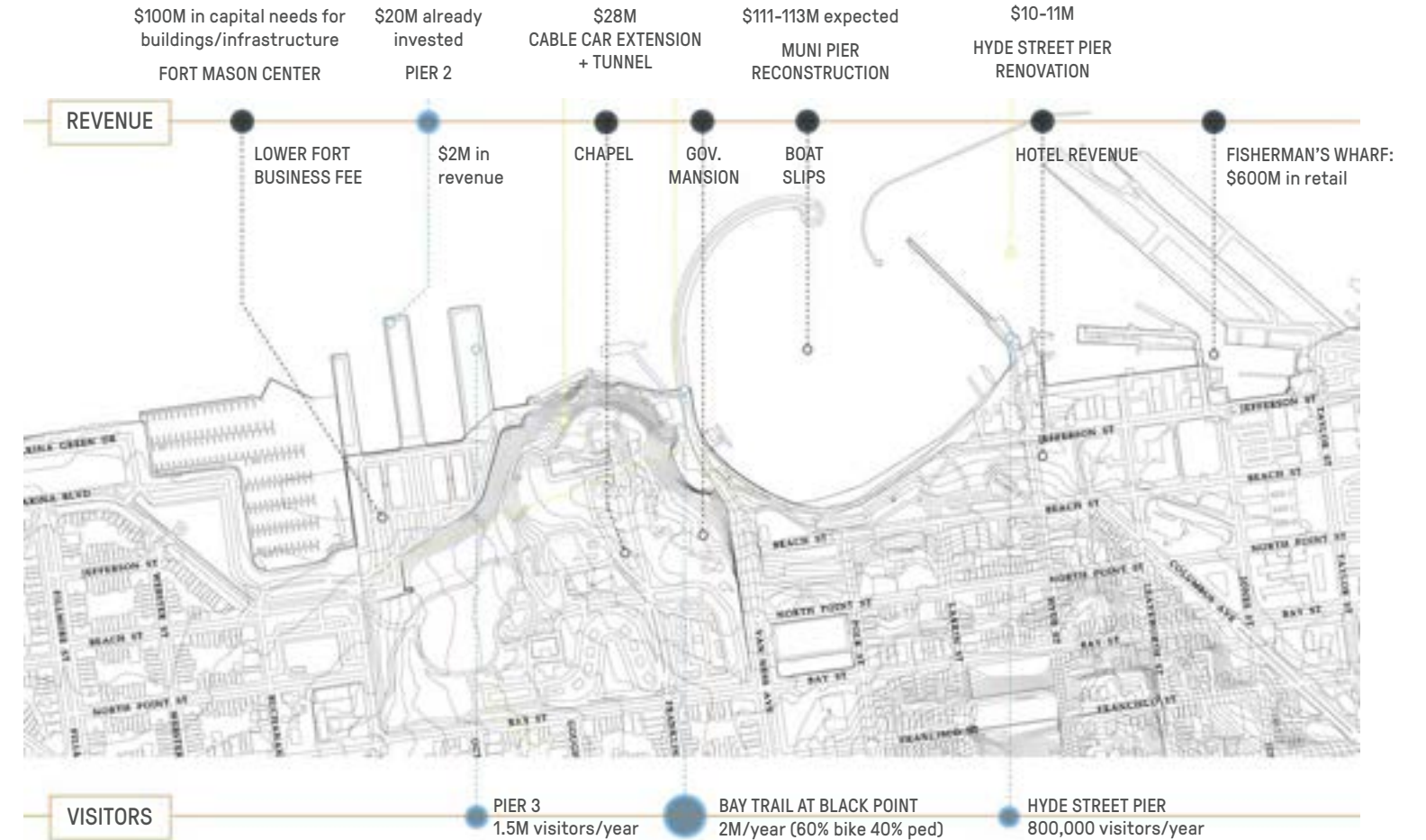
DEMOGRAPHIC DENSITY
1 Dot = 25
• Over 65
• 35 to 64 Years Old
• 18 to 34 Years Old
• Under 18 Years Old



DEMOGRAPHIC UNDER THE AGE OF 18
By Census Block
0% - 5%
6% - 10%
11% - 15%
16% - 20%
21% - 40%

Areas of Special Interest and Associated Investment Required

SWA 2018 Summer Student Program



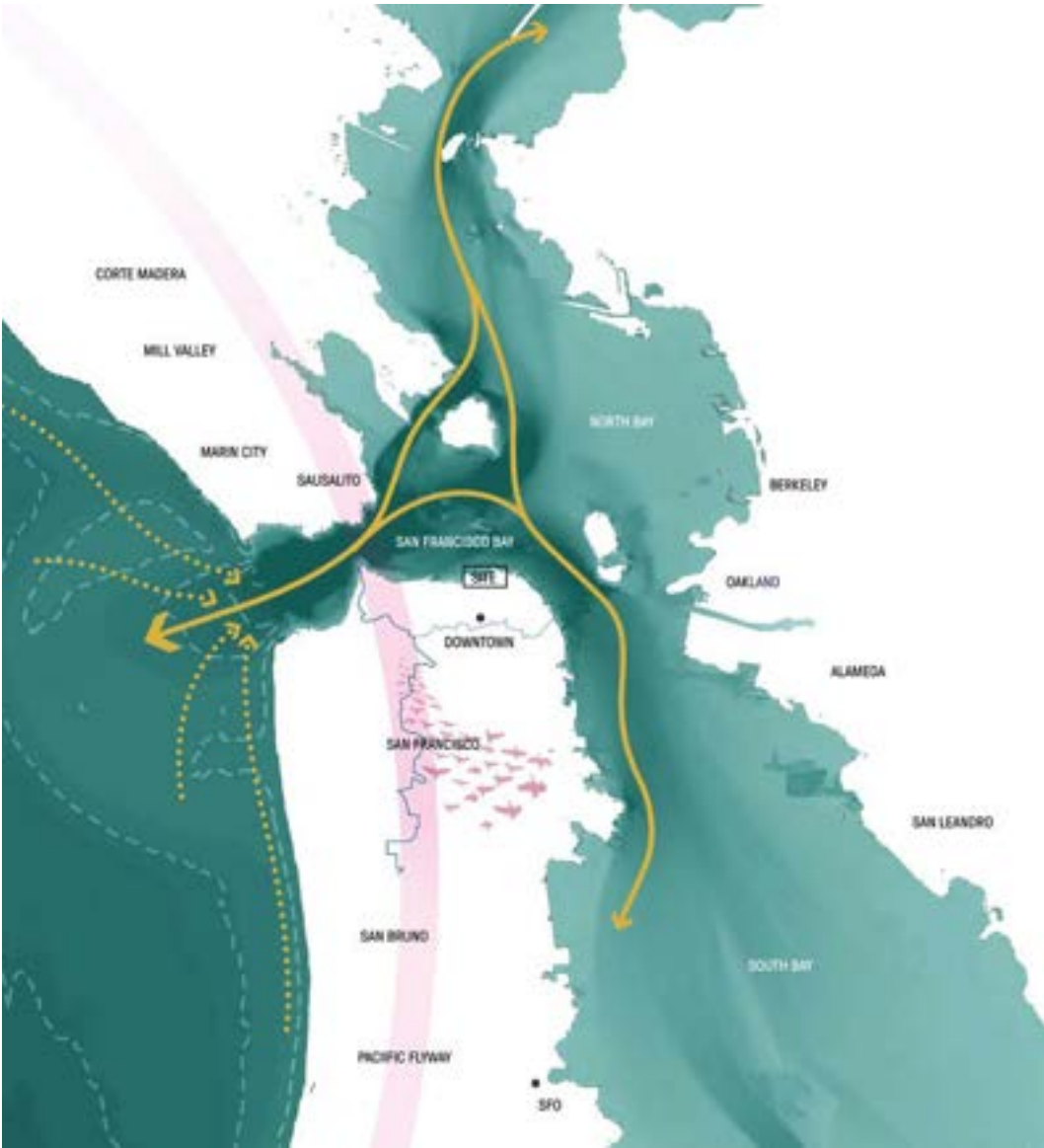
While researching these proposals, we recognized the potential to influence land use patterns. Specifically, we are interested in how commercial opportunities might initiate patterns of land use that have a radiating effect on surrounding neighborhoods. We labeled areas of special interest that we saw as having potential for invigorating underutilized spaces or concentrating investment, including new activities or

transportation solutions. Through research, we saw parallels with the Chicago riverfront, a previously inaccessible space that is now an important spot for commercial activity; Brooklyn Bridge Park, where access to water shaped the conceptual framework; and Governor's Island, where topography plays a key role in place-making and the re-activation of sites.

Environment

Natural processes and human developments have shaped the San Francisco's Bay Area, where ecology and urbanity maintain a dynamic balance.

Ocean flows from the west meet the inland watershed flows from the east around the mouth of the Bay, stimulating turbulence and creating abundant sediments. San Francisco is a stepping stone on the Pacific Flyway corridor from Alaska to Patagonia for migratory birds. Surrounding mountains and green parks contribute to a rich ecology and diverse recreational destinations. Within this rich environment, Aquatic Park represents one unique pearl of a larger open space system.



The San Francisco Bay Area: where ecology and urbanity maintain a dynamic balance.

The configuration and environment of San Francisco's waterfront have changed through both natural processes and human development. Historically, the Bay Area represents a natural paradise with abundant and varied habitats for marine species; however, 80 percent of its natural marshlands have been destroyed by human activity including hydraulic mining, groundwater utilization, marine infrastructures, and levee construction, vastly reducing the mudflats and marshland that provide natural cushions between the sea and the land. Sea level rise exacerbates the impacts of these losses, opening up potential for flooding and wave impacts on shorelines areas. An analysis of historical geography reveals the earlier shoreline and how much of the north and east waterfront, including most areas under Port jurisdiction, sits atop landfill.



Environment

Environmental factors at Aquatic Park itself require consideration of the relationships between topography, climate, species (plant and animal), and ocean influences. Aquatic Park benefits not only from the sheltering function of the pier, but also from the cleansing action of the tides and currents of the larger bay system. Black Point, at Fort Mason, represents the last remaining portion of San Francisco’s rocky shoreline, with a distinct mix of native species and nesting habitat for protected species like the San Bruno and Mission blue butterflies. Other parts of the study area consist of mudflat, which is more subject to shoreline erosion while supporting diverse habitats. The presence of eelgrass, for example, is a refuge habitat for the fishes that are food for rare birds (such as the brown pelican) and marine mammals.

SITE ANALYSIS PROJECTED SEA LEVEL RISE BY 2100



GEOLOGICAL CHARACTERISTICS: SF NORTH WATERFRONT



Sea level rise presents an immediate and dramatic threat to the north waterfront.

In particular, higher tides are expected for Hyde Street Pier and the Fisherman’s Wharf area, which is also adjacent the city’s primary seawall, undergoing its own resilience project now. Adaptations to future flooding conditions—while preserving the area’s character, history, and tourism economy—posed a critical design challenge for our studio explorations.



Connectivity

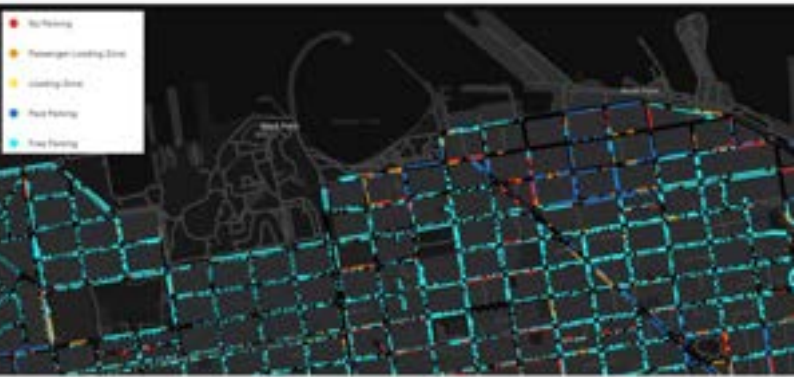
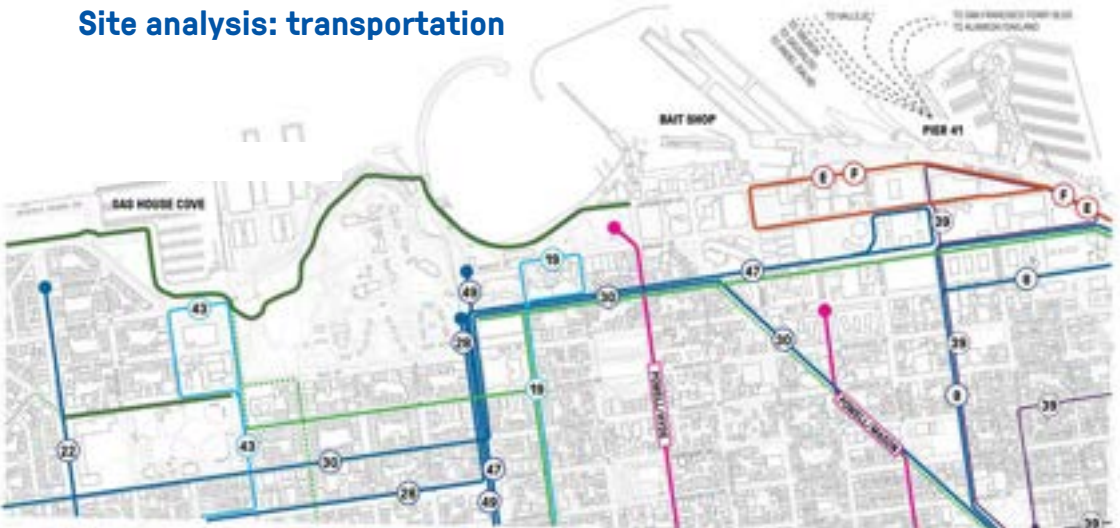
Analysis of connectivity considered the many possibilities for access to and within the north waterfront—cable car, buses, ferries, streetcar, walking, driving, biking, carshare, and even future autonomous vehicles.

So much transportation complexity to digest! Our visits to the site and talks with stakeholders helped us learn how people typically move through and around the site. Managing conflicts between cyclists and pedestrians and the need for clearer entrances and routing were recurring themes. We identified specific nodes in and around the site that were underperforming and identified points that could serve as better gateways for orientation. We concluded that the site functions as a key connection between areas along the north waterfront, but could be performing a lot better.

Nodes needing better connectivity



Site analysis: transportation



Area of terminus

Transit lines terminate at the north waterfront (yellow circles indicate frequency of use)



Connectivity

Analysis of the frequency of transit drop-off points, using overlapping circles of 500 feet in radius, indicates that the Fisherman’s Wharf area sees the heaviest travel, with user density decreasing to the west.

Currently, there are seven routes, including biking from Crissy Field, five bus routes (Muni bus 28, 30 and 49, and the cable car and historic streetcar) from the south of city. Further extensions are planned or are under study. The F line (historic streetcar) stops before reaching Aquatic Park, which breaks connectivity between Aquatic Park and Fisherman’s Wharf.

The Black Point hill interrupts east-west connections between Aquatic Park and Fort Mason, with only the historic, non-ADA pathway providing a route for bicyclists and walkers; this represents a “missing link” in the popular bike connection to the Golden Gate Bridge.

Finally, we found the possibility of reopening the historic railroad tunnel to be intriguing. Should it be used for transit—or as a bicycle/pedestrian linkage? If the latter, how could the tunnel be made to feel safe? What about lighting and public art?

Some of the most compelling information came from the fitness app, Strava, which revealed the site’s patterns for runners, bikers, and swimmers in the site and informed our thoughts about where interventions were needed.

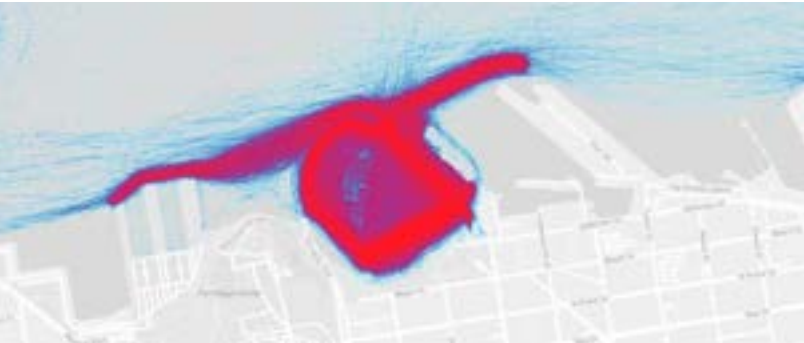
Cycling



Running



Swimming



Mobility patterns at the North Waterfront (from Strava app)

A

✓ - near the F-line
- various land uses surrounding

✗ - no wayfinding
- parking at entrance
- vehicles use intersection for U-turns
- blocked view of Aquatic Park gardens

B

✓ - drop-off point
- good view of the bay

✗ - no wayfinding
- street parking takes up space
- U-turn for vehicles frequently use
- blocked view of Aquatic Park

C

✓ - has a sense of entrance
- retail along the street
- Powell/Hyde's terminal
- good vegetation

✗ - small sign
- street parking takes up space

D

✓ - vegetation on two sides
- good view of the bay and mountains

✗ - streetparking takes up space
- small sign
- stands sometimes block the entrance
- two paths are divided

E

✓ - Maritime Museum
- two separate paths
- Muni bus 19 stop

✗ - no wayfinding
- parking blocks the entrance

F

✓ - good view of the bay
- open space for entrance

✗ - no wayfinding
- no sign
- parking and fence block the entrance
- single land use surrounding

G

✓ - connection to Fort Mason
- good view of the bay
- terminus of Muni bus 49/28

✗ - small sign
- street parking blocks the entrance

Based on these observations, we concluded that the entry points to the Aquatic Park gateways need to be strengthened. Improved wayfinding would help to orient visitors and provide a stronger and more unified identity for Aquatic Park and adjacent GGNRA and non-park lands.

III. EXPLORATIONS





With the first week's site analyses as a foundation, each student identified an "exploratory theme" that they wished to conceptualize—first as an urban design inquiry and then at a project and more detailed object or "place" scale. In no particular order, the thematic explorations are:

1. Confluence

Adèle Meidine

2. Maritime Gallery

Yinghua Hua

3. Strategic Connection

Jesse Foster Thomas

4. Aquaculture Pier

Hanqing Zhao

5. Citing Water

Roberto Astudillo

6. Play! Play! Play!

Xuezhen (Esther) Xie

7. Archipelago

Phia Sennett

8. Living Dunes

Sujing Sun

Confluence



Adèle Meidine
École Nationale Supérieure
de Paysage



Confluence

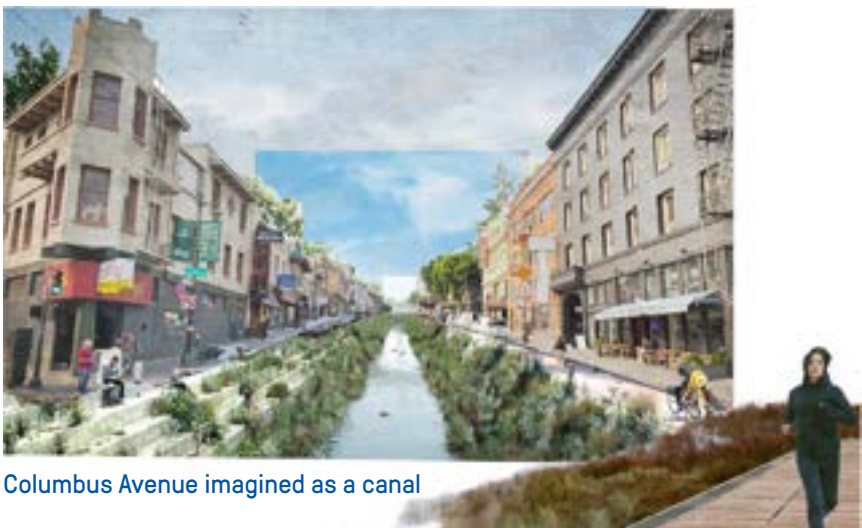
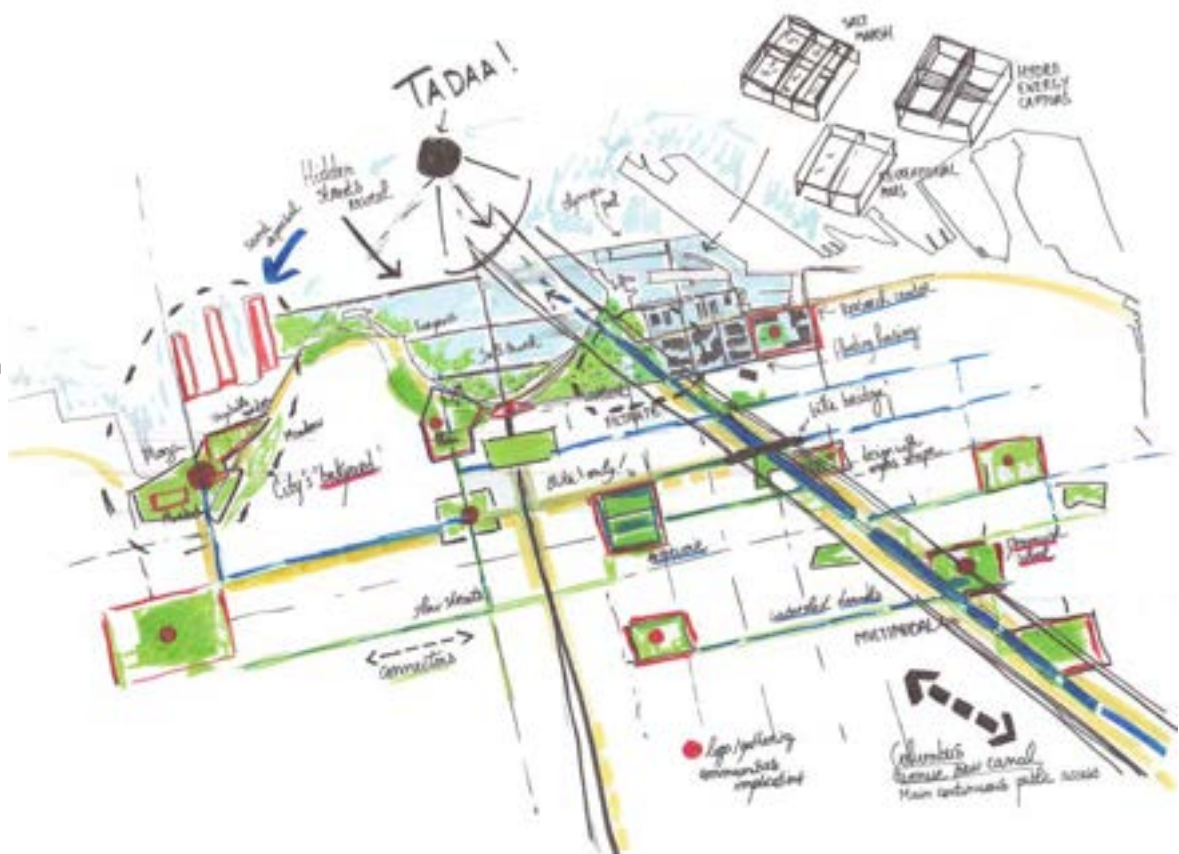
WEEK
02

The Urban Scene

Aquatic Park sits at the confluence of three dynamics: people, land, and water. At the urban district scale, I was interested in how these dynamic influences come together within this generous open space.

-People: The flow of people experiencing the site move mostly from east to west, with the Golden Gate Bridge as a final destination. San Francisco is currently considered the third worst city in the United States for commuters. The waterfront represents a heavily trafficked zone.

-Land: Over time, people have steadily extended the street grid of San Francisco by filling the bay. This 1861 map shows streets in the site that had never been built (Lewis Street, Britton Street, and Jefferson Street). I was inspired by the process of revealing the hidden streets, with a poetic tribute to the history of San Francisco.



Columbus Avenue imagined as a canal

-Water: Today, as sea levels rise, we are facing the reverse situation: our built roadways will be inundated by the waters of the bay. How can Aquatic Park and its surroundings adapt to future flooding while preserving the character of an urban beach?



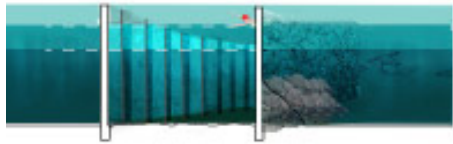
Confluence

WEEK
03

Design of Site

I believe that a waterfront only exists as a reflection of the city. That's why allowing the water come up Columbus Avenue—by revealing the formerly hidden streets at the edge as part of salt marsh grids, floating housing, or energy wave catchment—could bring a new relationship between people, water, and land.

Going deeper into the site of Aquatic Park, I decided to design at the confluence of three lines with water: the lines of body, city, and nature, in a dynamic balance.



By transforming the linear, curving structure of Muni Pier into a swimming pool, this negative space could allow people to enjoy the recreational purpose of the park within a protective armature that constantly changes with the tides. I decided to keep the existing

structure on one side and replace it on the other side with a natural jetty. This new access to the water could bring more people to enjoy the shoreline. As a new edge of the city, the terminus of Columbus Avenue can activate old infrastructure and bring new

activities and economies to the waterfront. By extending the streets (Columbus Avenue and Polk Street) as “fingers,” Aquatic Park is renewed with a botanical wetland garden and observatory.

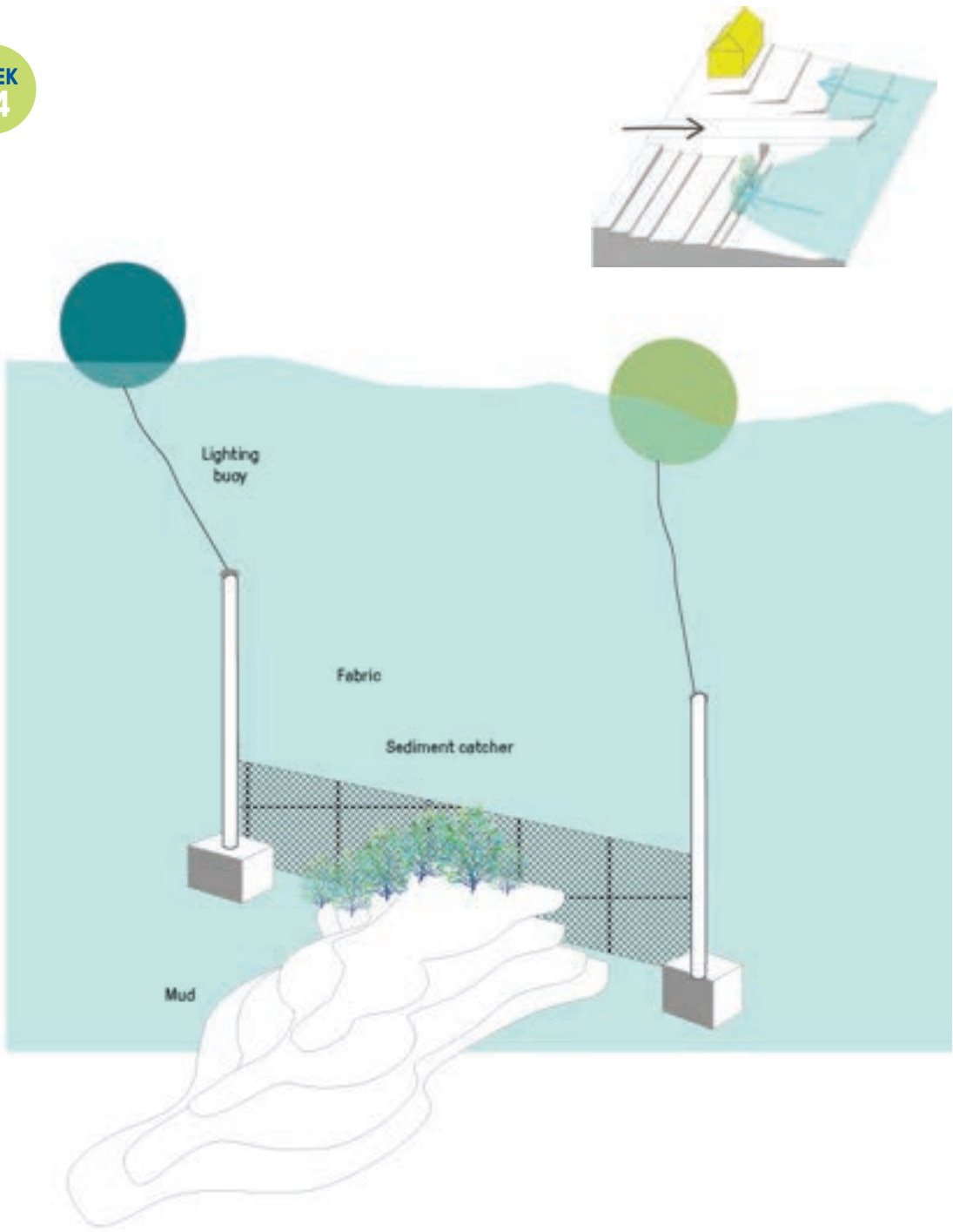
Confluence

WEEK
04

The Designed Object

During the last week, I had the chance to explore a designed object that shows natural components and interacts with the direct environment. Our visit to the Exploratorium inspired me to study the color of water, which is a scientific component that reveals the presence of phytoplankton and also can be an artistic gesture to remind people of the diversity and fragility of the water's composition.

My proposed installation aims to be a poetic tribute to the hidden streets of San Francisco, placed on the extended grid in the bottom of the waterbed and floating at the surface due to the movement of the tides and wind. By using a sediment catcher, this object, as it works as a system, could reveal the marine floor environment to the people of San Francisco.



Maritime Gallery



Yinghua Hua

Washington University in St. Louis



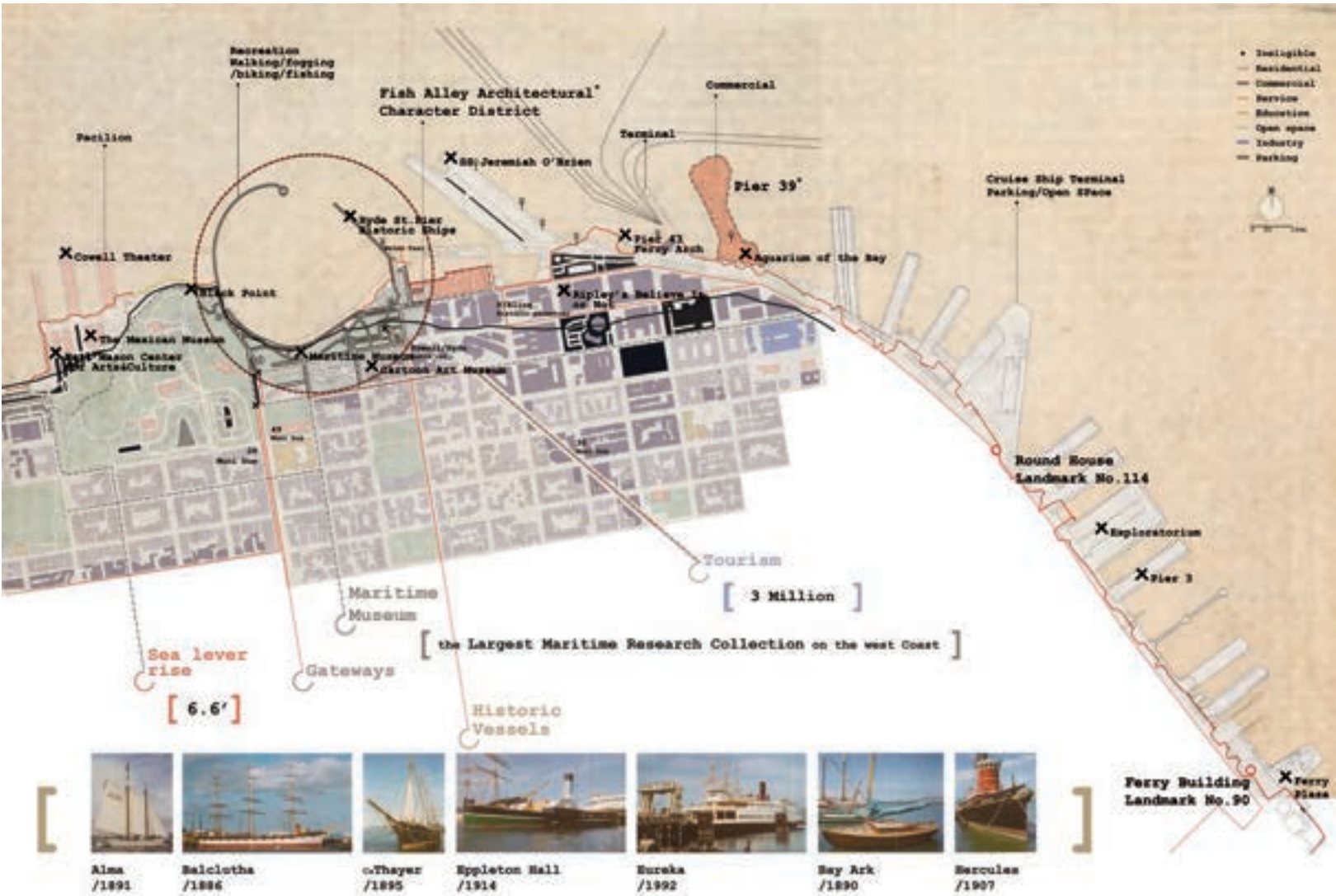
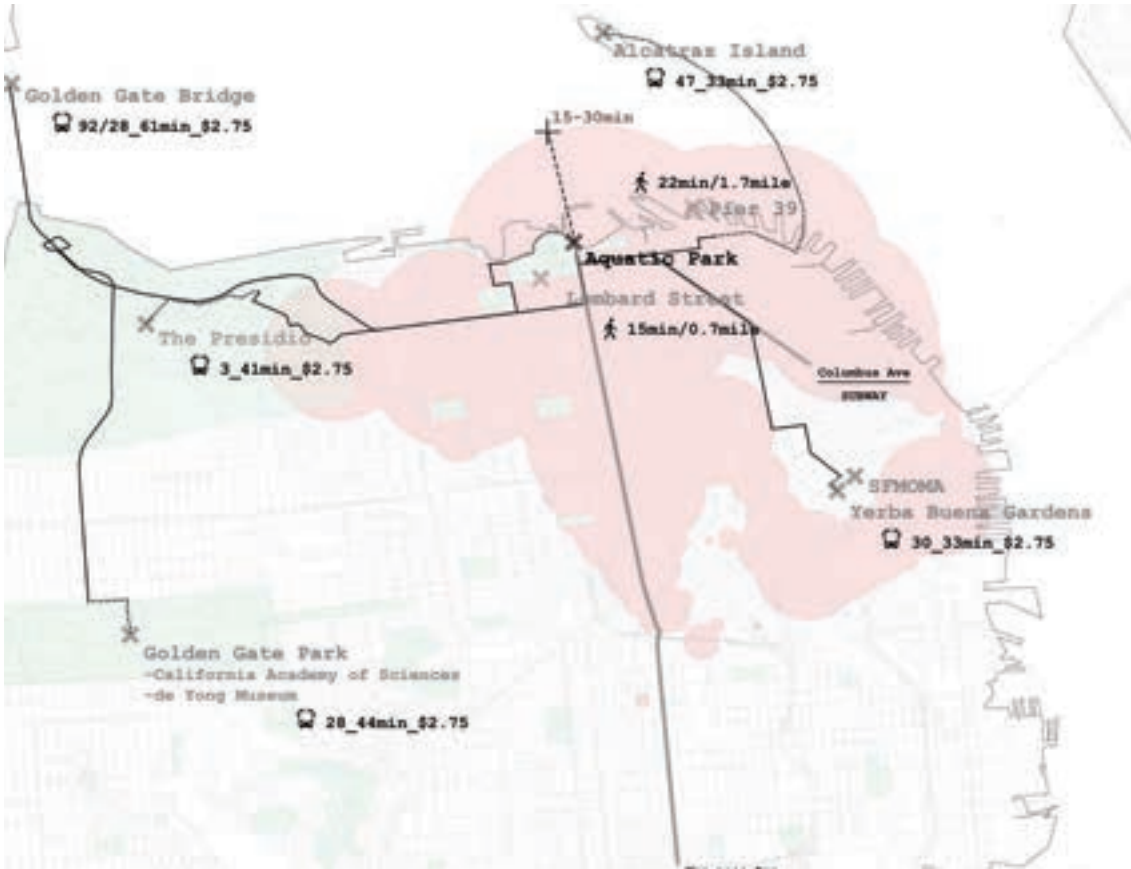
Maritime Gallery

WEEK 02

The Urban Scene

I identified two goals for the urban scale: First, to make three separate areas—Fisherman’s Wharf, Aquatic Park, and Fort Mason—into a continuous landscape by strengthening the functional programming and identity of Aquatic Park, and second, to activate the shoreline along these three parcels in a way that responds to sea level rise projections.

In the site studies, I was impressed by the declining visitor numbers in these three adjacent parcels: about 15 million visitors/year to Fisherman’s Wharf, the busiest attraction, compared with two million visitors/year to Aquatic Park and only one million visitors/year to Fort Mason. Fisherman’s Wharf benefits from easy access to Pier 39 and other city destinations, combined with proximity to nearby historical vessels and the local swimming and rowing clubs of the San Francisco Maritime Historical Park and Aquatic Park Cove. Weak connections both between Aquatic Park and Fisherman’s Wharf and Fort Mason and Aquatic Park deter visitors from proceeding further west along the north waterfront.



Maritime Gallery

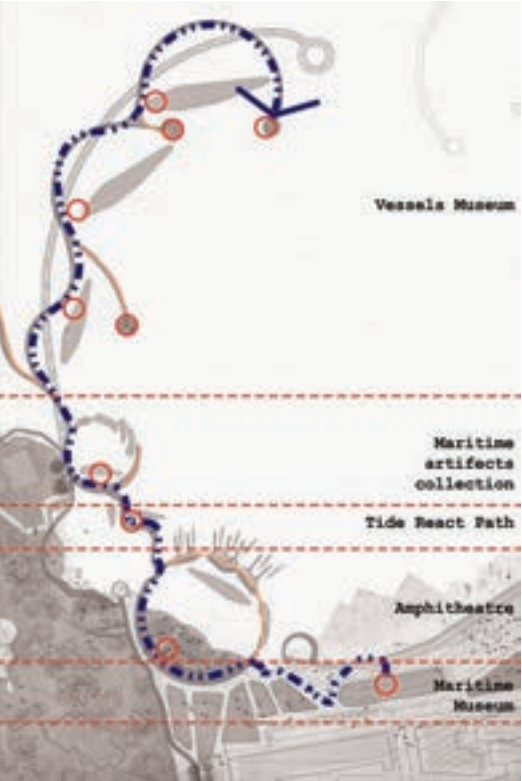
WEEK 03

Design of Site

During this week, I explored historic resources and possibilities for improving connections along the north waterfront. The San Francisco Maritime National Historical Park was created to preserve and interpret the Pacific maritime heritage. It's still the largest maritime research collection on the West Coast and in the National Park Service. According to the National Park Service, three million people come each year to visit the Maritime Museum, the beautiful historic vessels along the Hyde Street Pier, the arc-shaped Muni Pier, and the Maritime Library. Programs, including summer classes, bring people to experience the Aquatic Park landscape.



Maritime Gallery



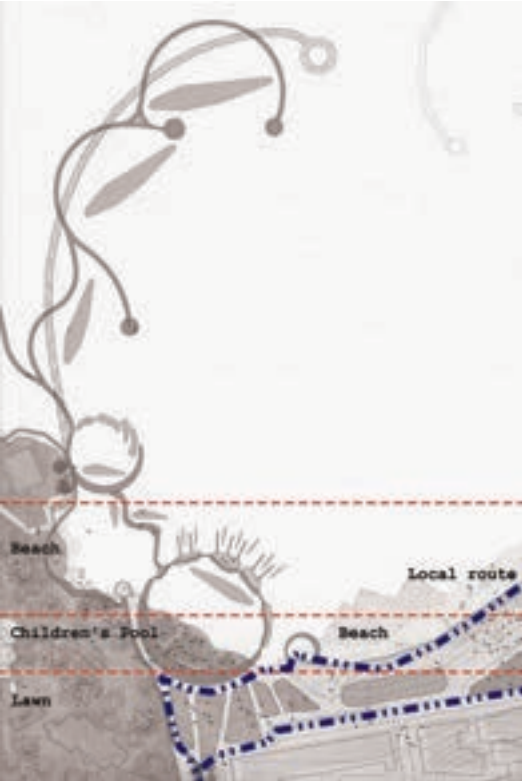
The Hyde Street Pier does not feel well-connected to the Maritime Museum. Secondly, as sea levels rise, the Hyde Street Pier will no longer serve as a viable location for exhibiting the historic vessels. Thirdly, the deteriorating state of the Muni Pier calls for decisive action in order to preserve it for future generations.

My proposal is to repurpose the Muni Pier as a Maritime Gallery by relocating the historic



vessels from Hyde Street Pier to Muni Pier. I propose to retain the pilings of Muni Pier and build a new boardwalk that will set up the possibility for a sequence of experiences to draw people along the north waterfront.

Different users will have different experiences within this Maritime Gallery. Visitors will follow the sequence of galleries and stop to visit different attractions and vessels. People on



bikes will mainly move along the shoreline, while swimmers and rowers will enjoy the cove. Groups of friends and families will remain primarily on the lawn and at the beach. However, I felt that the parts of the park could be organized to create more unified experience.

Maritime Gallery

WEEK
04

The Designed Object

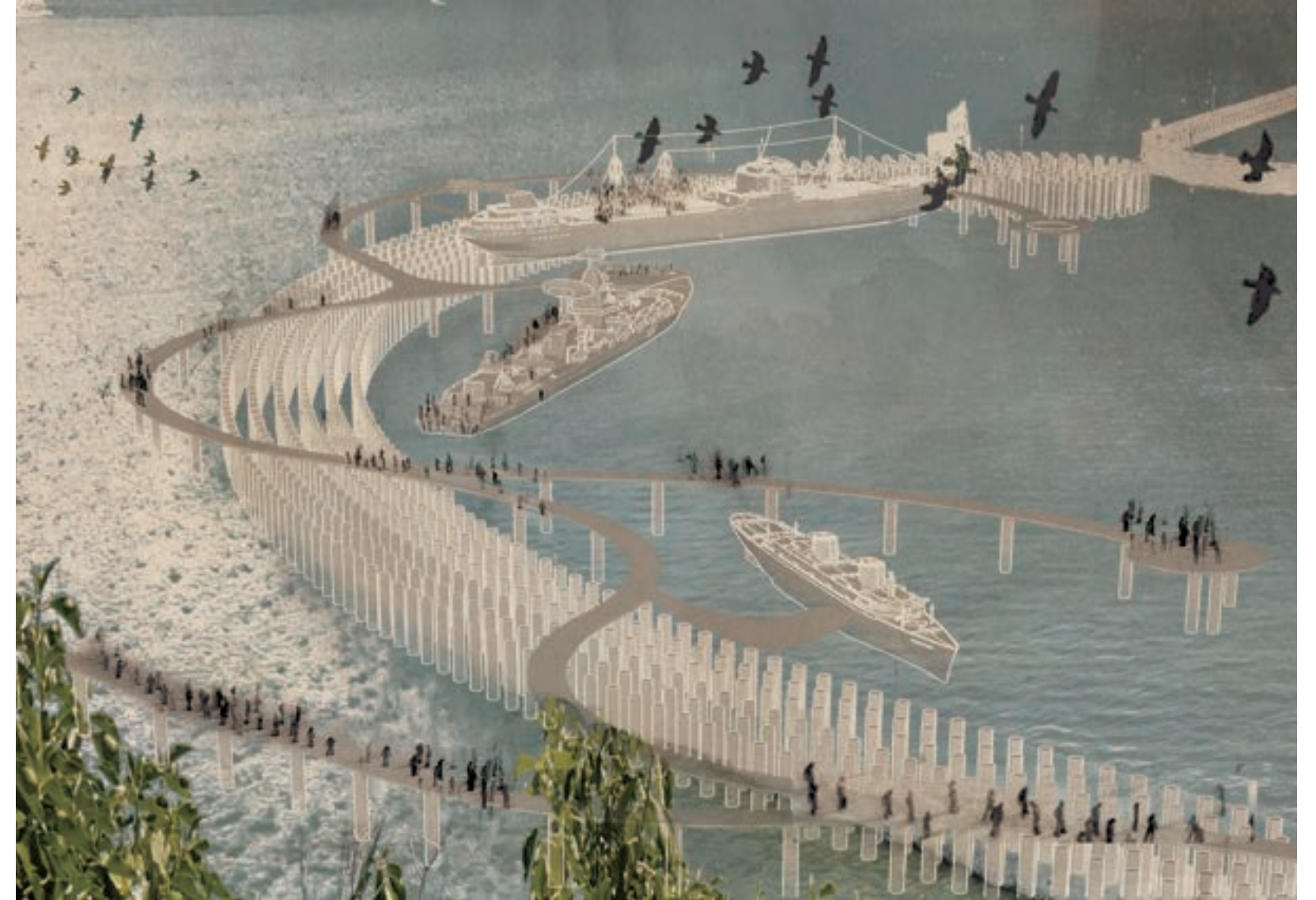
With a more unified historical/recreational experience provided by the new Maritime Gallery—and with future levels of flooding as expected at the Fisherman's Wharf area—the Aquatic Park site will begin to attract more visitors. This will shift the visitation rates, which currently decline from Fisherman's Wharf to Fort Mason. Most visitors will come to the beach, cove, and relocated exhibits of historic ships along the rebuilt Muni Pier. Moreover, by moving around on new shoreline boardwalks, visitors will be able to access Lower Fort Mason, thereby activating the intersection between Aquatic Park and Fort Mason and unifying what are now three separate parcels.

At the start of the Maritime Gallery, visitors will gain a comprehensive understanding of the maritime history inside the museum and then move out to explore the historic vessels. As visitors exit the Maritime Museum, the beach and shoreline can offer sculptures or other activities or exhibit collections that strengthen the interpretive system. Every ship will be renovated as part of a themed experience, so that museum, beach, and pier function as a whole.



A visitor's sequence starts with the Maritime Museum, moves to the amphitheater area and through the tidal area to a new craft art

collection area, and then finally reaches the new Maritime Pier, composed of the old pilings and relocated historic vessels.



Strategic Connection



Jesse Foster Thomas
University of Illinois at Urbana-Champaign



Strategic Connection

WEEK
02

The Urban Scene

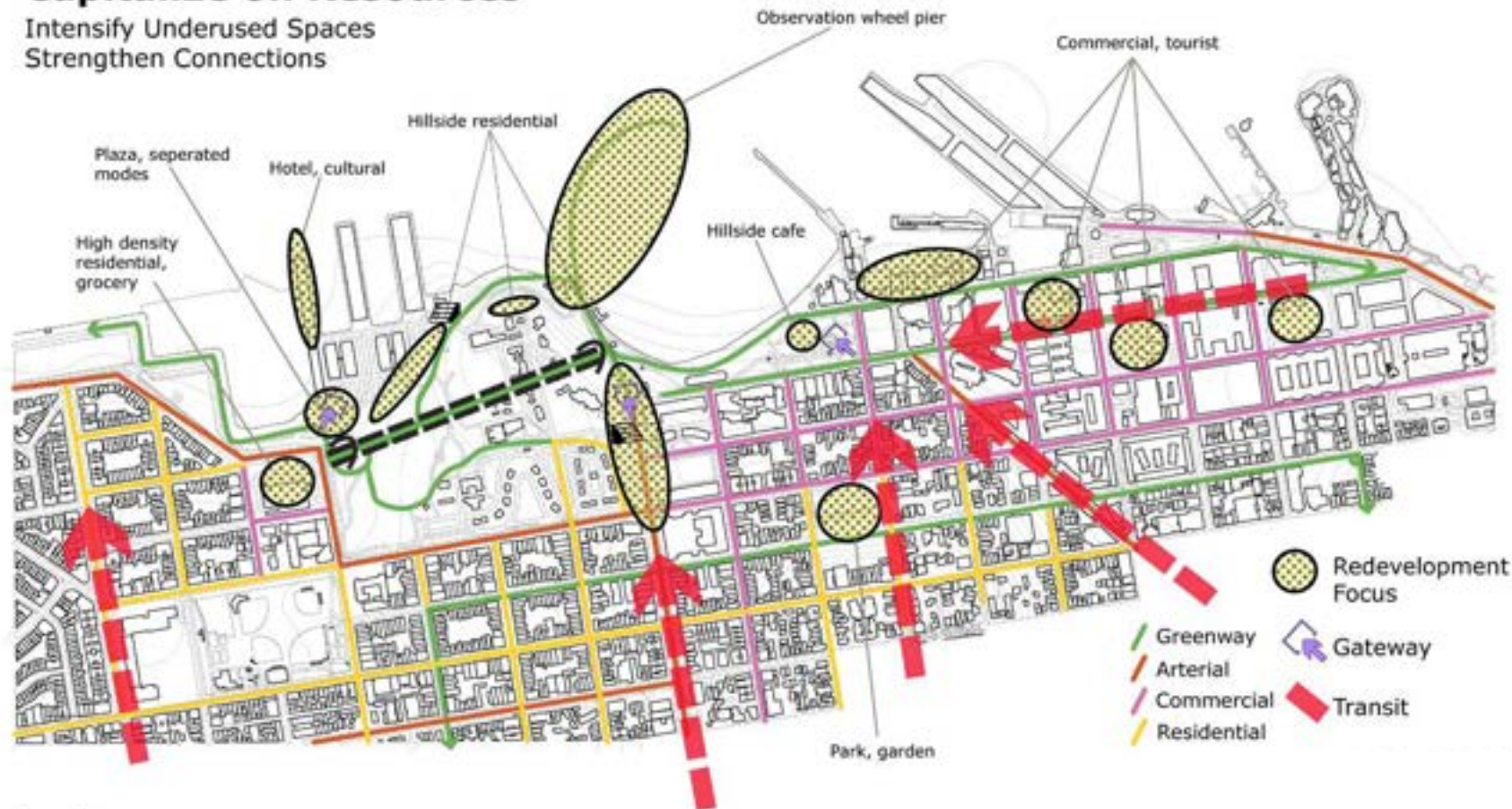
We know that the geography of the shoreline—in particular, the physical barrier of Black Point hill—discourages connections between Fisherman's Wharf, Aquatic Park, and Fort Mason, with a related decline in visitation from east to west. I started to think that the best way to establish Aquatic Park in people's mental maps would be to create a new iconic attraction. Placing this icon on the Muni Pier would distinguish Aquatic Park from other destinations and help to capitalize on the large investment needed to rebuild the pier in its current form. An observation wheel would be unique to Northern California and could help to capture the economic contribution that will be required from visitors, residents, and organizations.

To support such an icon, a lot of places around the pier will need strategic upgrades and interventions. In a form of "urban acupuncture," I identified several specific places that could support infill development including commercial space, housing, recreation, infrastructure repurposing, and more. I looked at the streets surrounding the site and proposed a new hierarchy that better fits the area's urban form and function, with emphasis on transit and pedestrian/bicycle mobility.



Capitalize on Resources

Intensify Underused Spaces
Strengthen Connections



By the week's end, I began thinking about the site's great physical resources, dealing with connectivity and otherwise, and identified a theme of Resource Capitalization for my proposals. I hoped that the theme would

capture my ideas on repurposing the tunnel for bike and pedestrian use, rebuilding the pier in its historic form, and intensifying available underutilized spaces within the site.

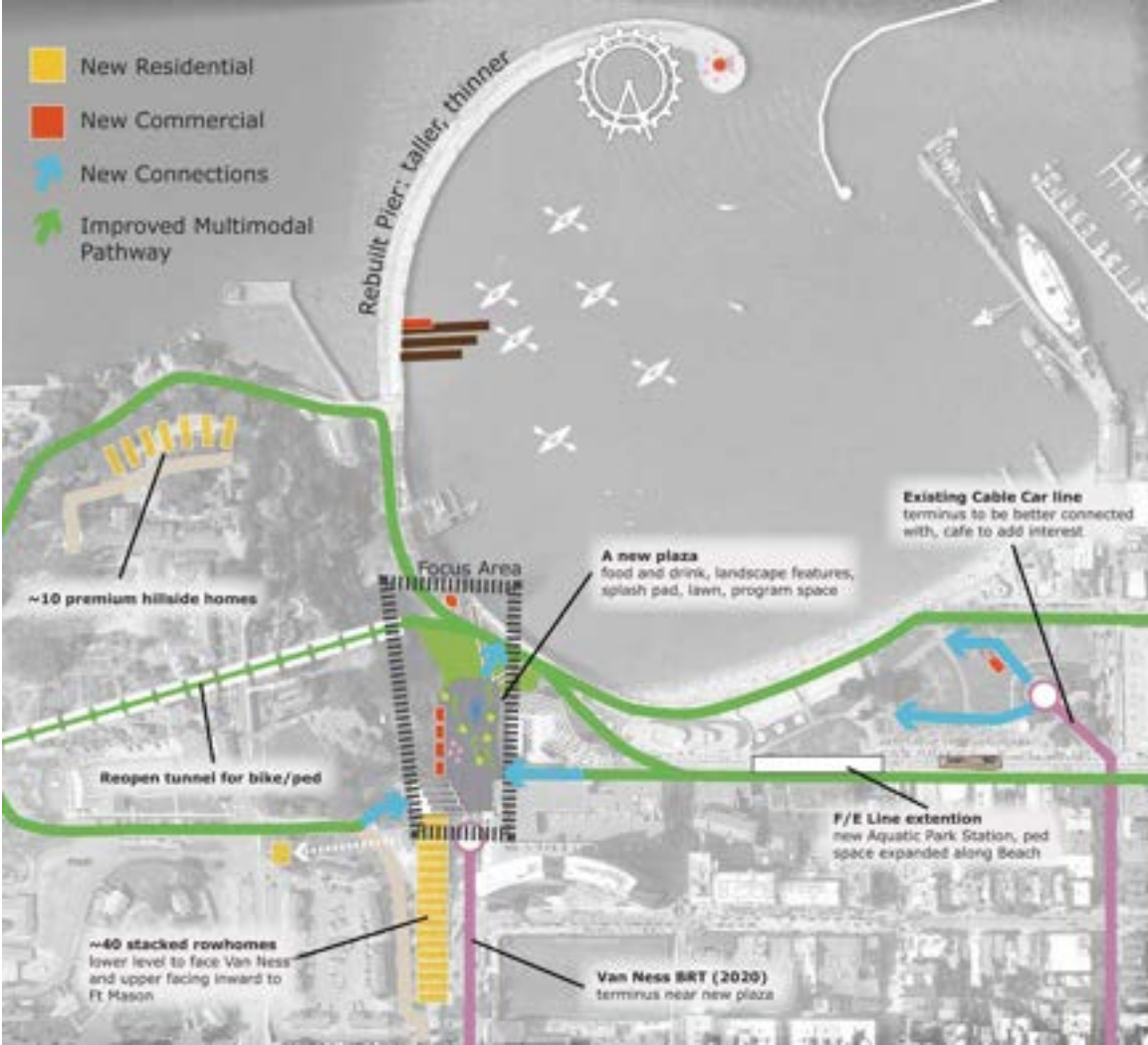
Strategic Connection

WEEK
03

Design of Site

During this week, I continued exploring the theme of Resource Capitalization, but narrowed my work to 1"=50' scale. My plan provided new connections, improved multi-modal pathways (including through the tunnel), a new observation wheel at the end of the pier, extension of the F-Line streetcar, and new commercial and recreational opportunities. I hoped to stay true to the idea of capitalizing on available, even near-term, opportunities on the site.

I identified a focus area where Van Ness Avenue enters the site as a key location for overall connectivity.



After working through several ideas, I landed on narrowing and then terminating Van Ness Avenue at a new public open space called Aquatic Plaza, introducing housing and replacing the current use of vehicular parking.

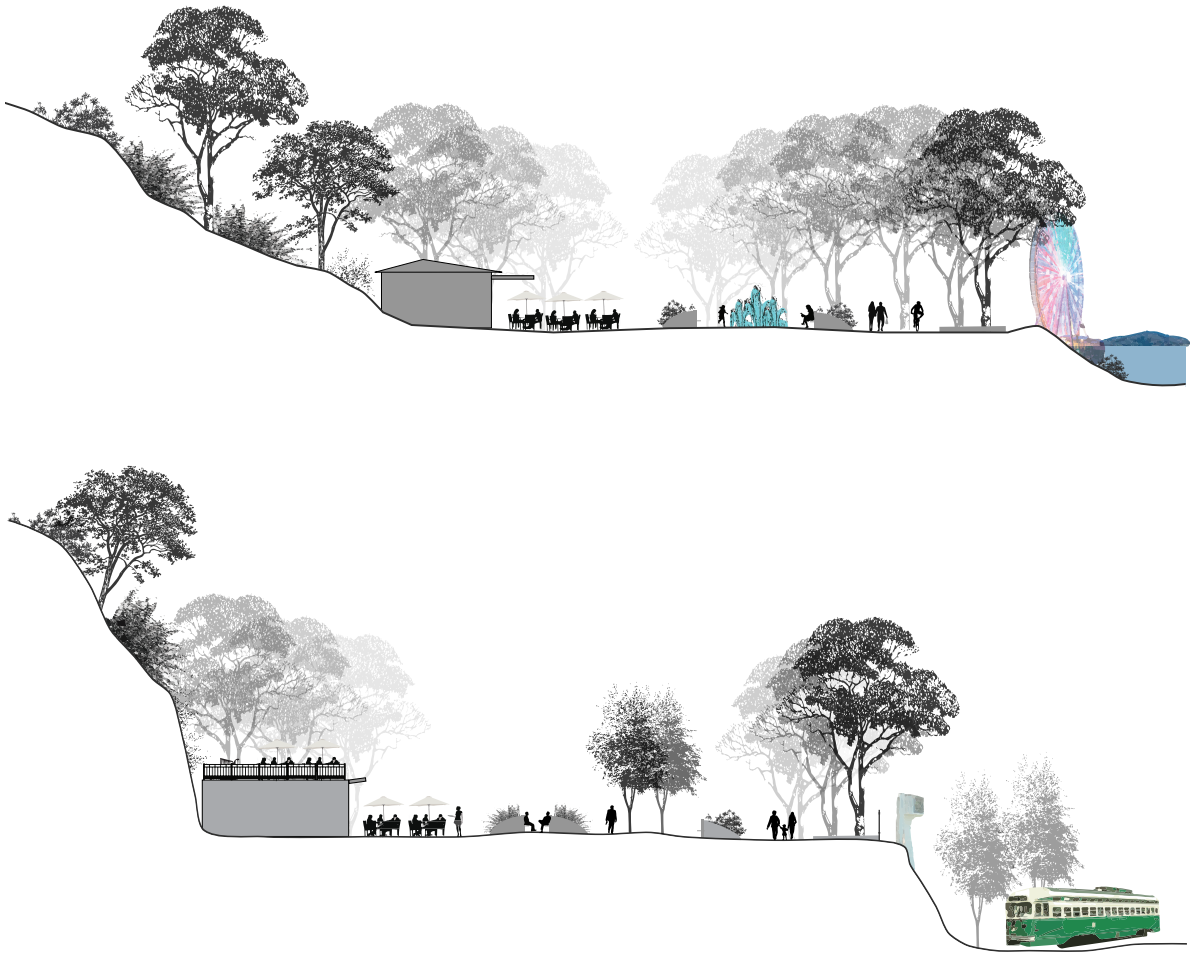


Strategic Connection

WEEK
04

The Designed Object

In the final week, I refined my overall theme and developed program and design for the plaza, with consideration of what Aquatic Plaza could mean for the overall site. Considering my theme, I struggled to reconcile whether my ideas would diminish a quality of the site that many currently find to be one of its best. We heard from several users of the park that they enjoy the more secluded, mysterious character of parts of the north waterfront. Creating a new icon on the pier, with better connections, and adding a new urban plaza would almost certainly make the site a more “known entity.” Having mulled it over, I decided that maximum activation of this site, given the location, would best benefit the city.



During the week I worked on a montage to portray the energizing effect the new terminus of Van Ness and Aquatic Plaza. With guidance from the week’s mentors, I moved away from the technical terminology of “Resource Capitalization” and changed my title to “Strategic Connections.” This was also true to my original interest in connectivity and highlighted the importance of improved access to and within Aquatic Park, including a rebuilt but raised and narrowed Muni Pier to replace the existing deteriorating structure.

One of our guest presenters, a San Francisco Municipal Transportation Agency (SFMTA) planner, said that people want to have the experience of moving around San Francisco. I used that idea as inspiration for my proposal. Prepping for the final presentation was a rush, but things came together. I hope that I could provide a little inspiration about the possibilities of the site to stakeholders and all those who are interested in the future of Aquatic Park.

Aquaculture Pier



Hanqing Zhao
University of California at Berkeley



Aquaculture Pier

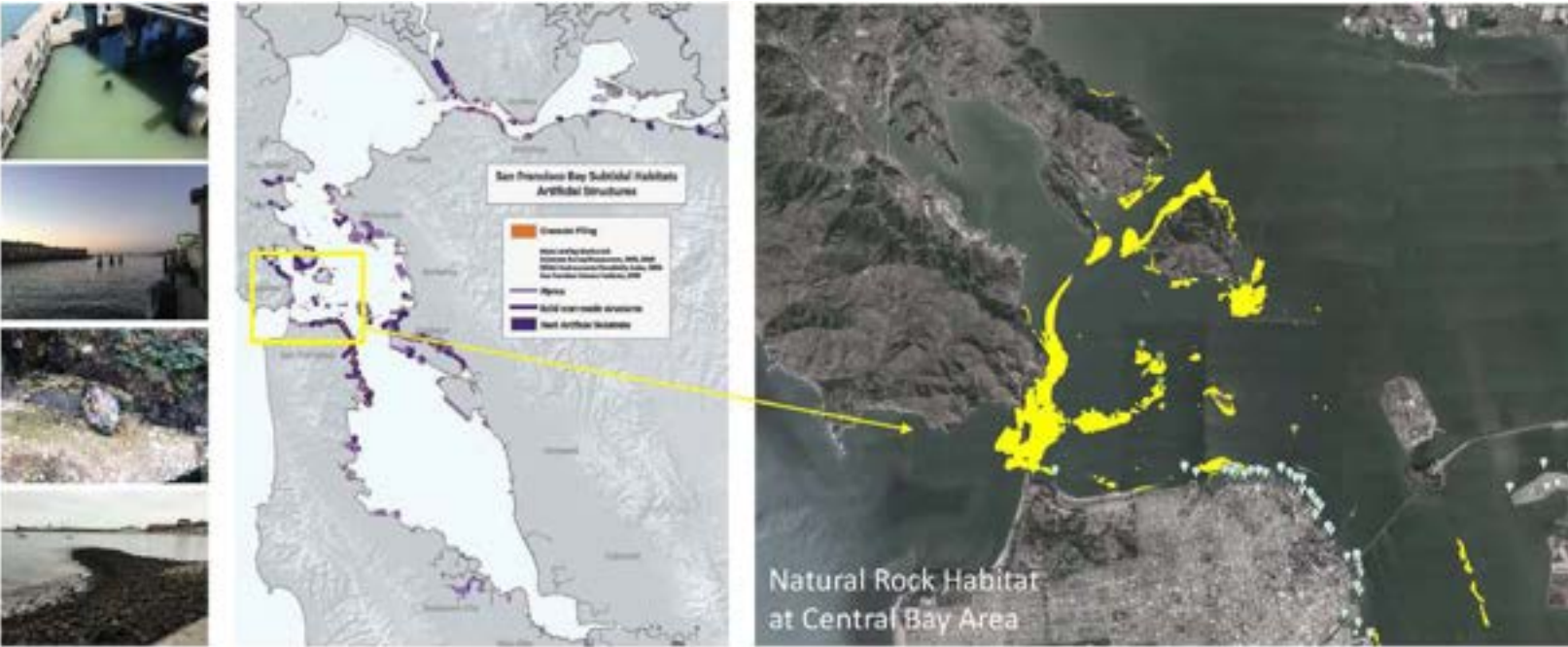
WEEK
02

The Urban Scene

San Francisco Bay used to be the biggest commercial fishing center on the West Coast. Salmon, shad, and striped bass all used to be netted in the Bay and Delta, and oysters were harvested commercially in the Bay in the late 1800s. While Fisherman’s Wharf remains the center of Northern California’s commercial

and sport fishing fleets, the harvesting of fish and shellfish within the Bay is no longer active; likewise, sport fishing operates under strict limits. Reasons include overfishing and restrictions on consumption to minimize the effect of bioaccumulation of contaminants, especially the methylmercury generated from

the Gold Rush era’s hydraulic mining. The demand for Dungeness crab continues. Their original habitat was the East Bay’s sand beaches, and by 2000 they could still be captured around Golden Gate Bridge. Today, crab fishermen must go outside the Bay and into the Pacific Ocean.



San Francisco Bay Subtidal Goals Report: Distribution of Artificial Structures in San Francisco Bay
<http://www.sfbay.org/Goals/Goals/ArtificialStructures.pdf>
San Francisco Bay Regional Scale of Rock Habitat



The historic Fisherman’s Wharf remains in a dominant position in San Francisco’s tourist industry. As one of the “must-go” spots, it attracts millions of visitors each year to seafood restaurants and fish markets that serve both visitors and locals. Unfortunately the seafood is no longer locally harvested, but captured outside the Golden Gate or shipped from elsewhere.

On the other hand, it is encouraging to see how marine creatures have adapted to artificial structures in the Bay, such as riprap, seawalls, piers, and pilings. This is a sign of improved water quality and can be an inspiration for future infrastructure design. Concrete, wood, and other artificial materials share properties with natural rock, the original habitat for most shellfishes and algae which provides food resources for fishes and crabs. Rock habitat represents the foundation for restoration of marine species.

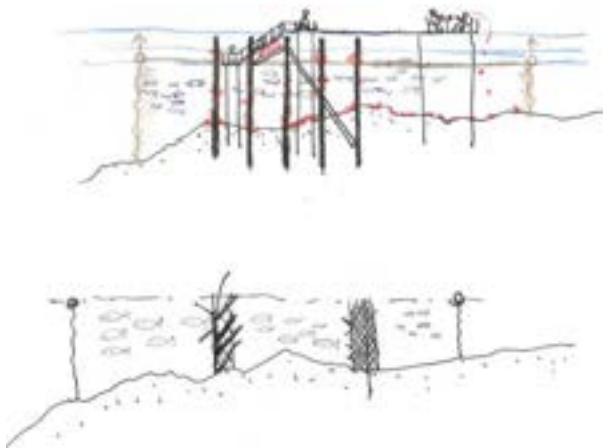
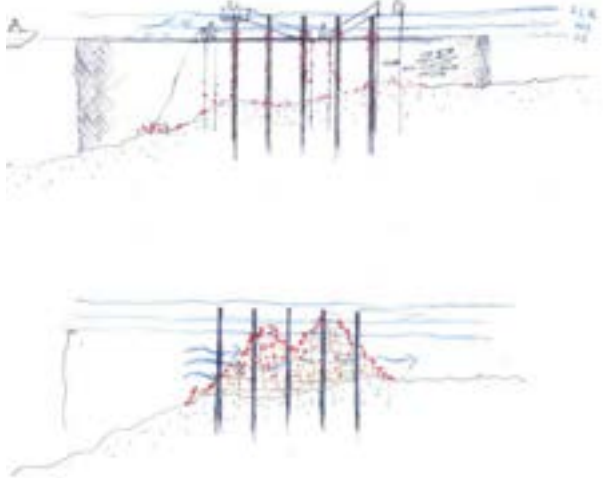
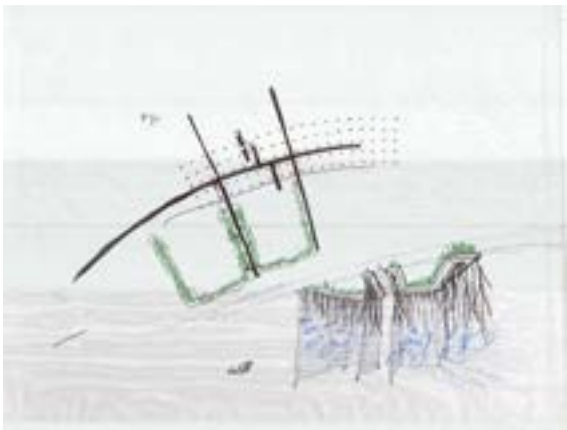
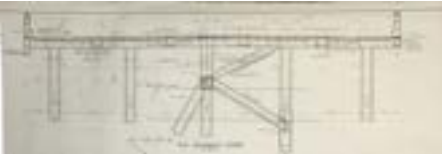


Aquaculture Pier

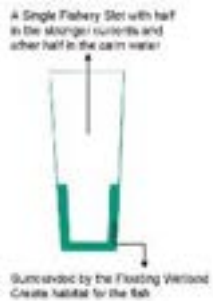
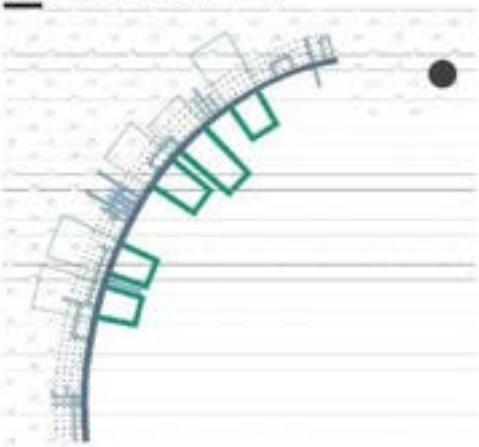
WEEK
03

Design of Site

At this particular site, I see the opportunity of introducing aquaculture production as an activity that builds the local economy and ecological awareness. It is a more sustainable and environmentally friendly way of supporting the high demand for seafood, with distribution of the local harvest directly into local restaurants. The more attention we pay to food resources, the better we can communicate the problems of pollution and the threats of sea level rise. These issues are urgent! What's even more critical is to raise our awareness. Only when more people start to pay attention will we start to deal with the issues.

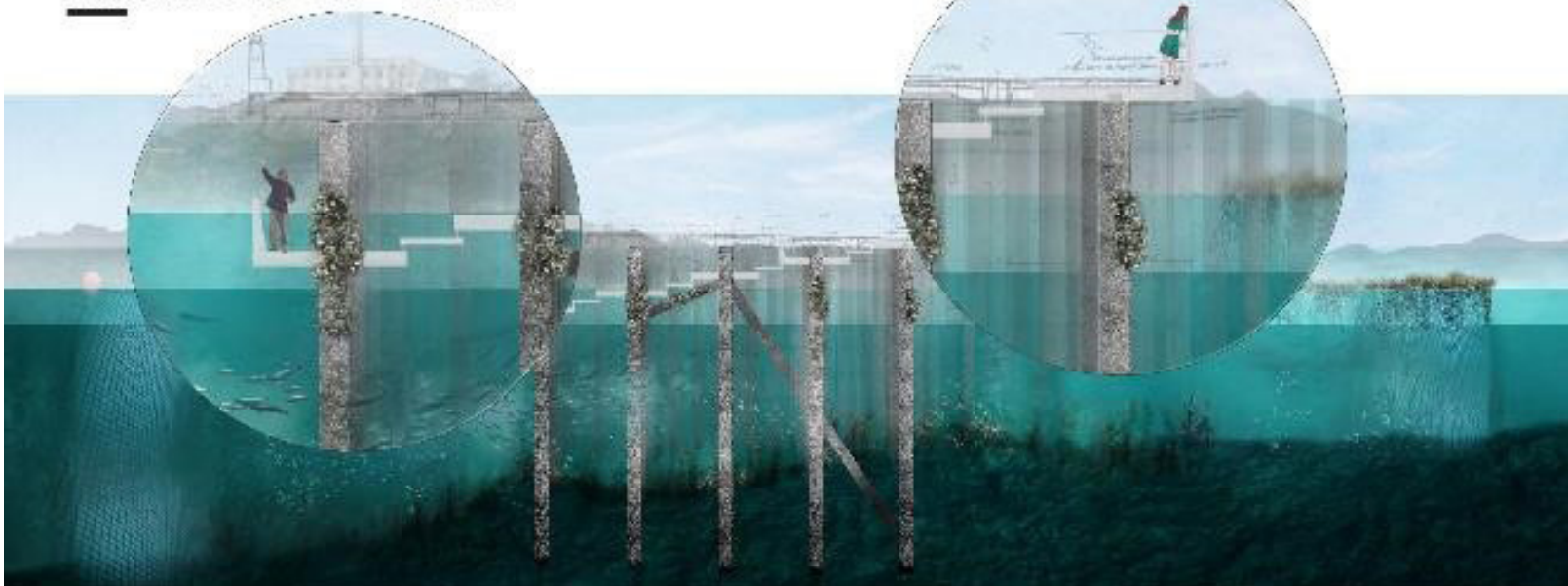


AQUACULTURE PIER



My proposals aim to redraw connections between food resources, ecosystem health, and the tourism industry at San Francisco's north waterfront. By reconstructing Muni Pier as an "Aquaculture Pier," we can explore opportunities for restoration along with the creation of sustainable aquaculture production in order to repurpose aging infrastructure and give it a new life.

AQUACULTURE PIER

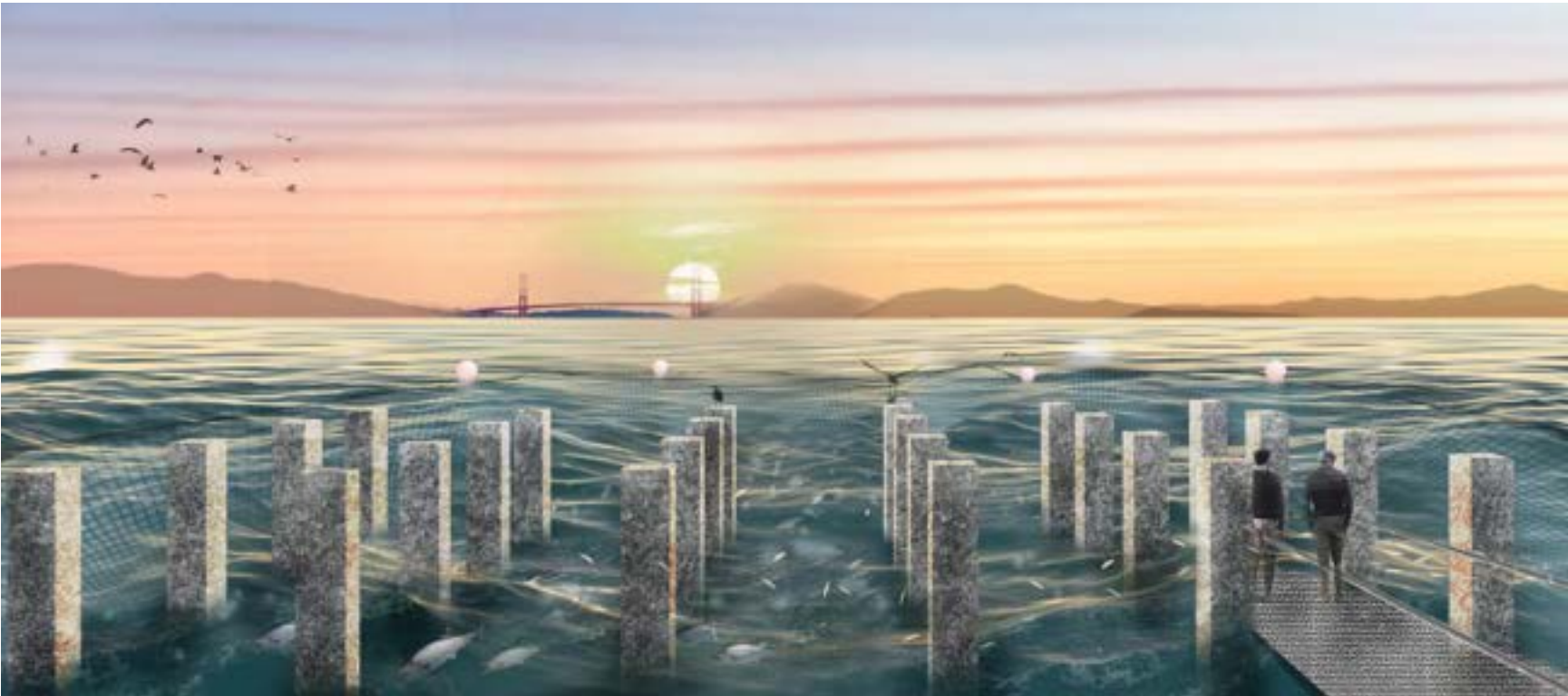


Aquaculture Pier

WEEK
04

The Designed Object

The concept proposes to reconstruct the Muni Pier platform for vehicles and pedestrians, leave the piles and wave baffles to retain the function of reducing wave energy, and introduce structures for fish and shellfish cultivation. By doing this, we are daylighting the original intention of the pier, which was designed and constructed to create a protected waterfront and cove for recreational usage. New pathways on one side of the pile will support pedestrian access out into the Bay, with views to the aquaculture fishery slots, the Golden Gate Bridge, and the larger bay. Beside this primary pathway are secondary routes that interact with intertidal zone; these will be underwater at current high tide and, with sea level rise, will eventually flood, but will always provide the opportunity for people to get closer to the water and marine life in the water and on the pilings.



The aquaculture slot is designed to spread along the pier. Every unit contains two parts that cross the pier. On the west side, strong currents support open water habitat for fish, while quieter waters on the east side allow the fixed, rooted vegetation of a floating wetland and provide shelter and hiding habitat for fish.

These diverse living conditions can support a variety of species and life stages.

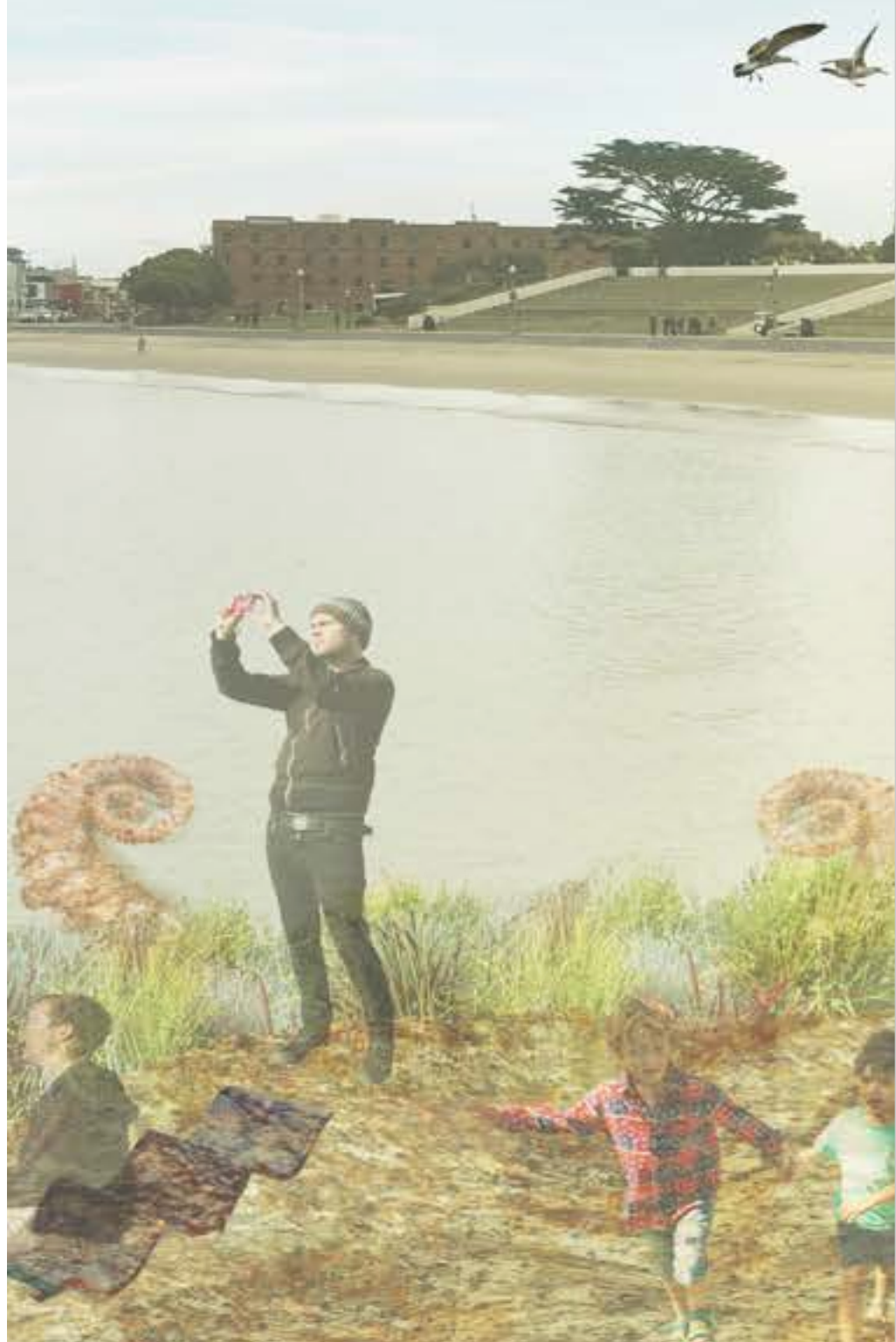
The resulting “ruined” structure creates an aquaculture layer that repurposes the pier without demolishing or rebuilding it completely. This is not an aquarium: you might

not see what you expected. But this is life. You may only see seaweed flowing with the current or spot a bird that you can’t name; you may see the tail of a whale or the head of a seal at this windy waterfront. You may also see the skins of the salmon reflecting the San Francisco sunset.

Citing Water



Roberto Astudillo
University of Michigan



Citing Water

WEEK
02

The Urban Scene

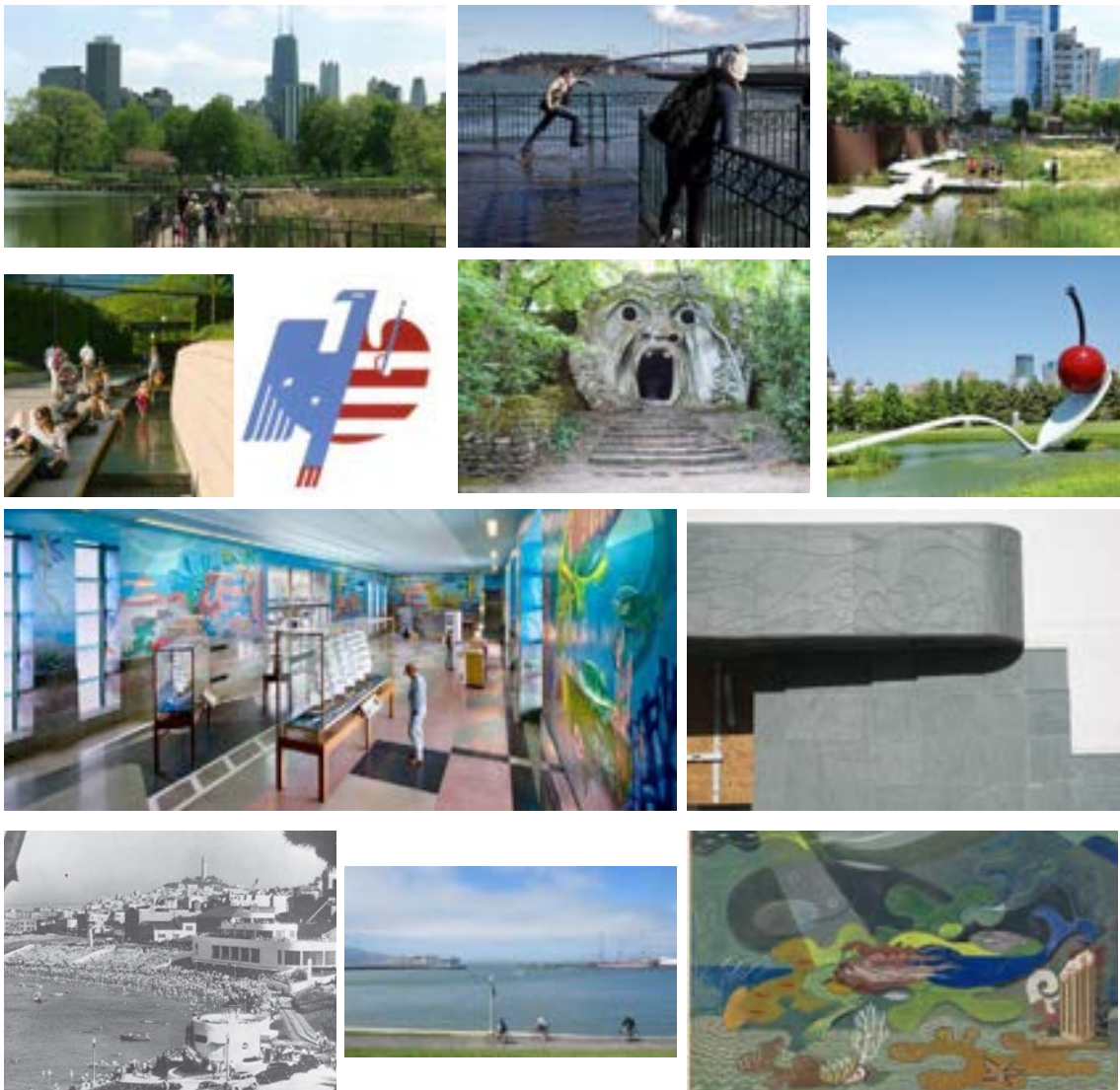
My interests focused on how to use multi-purpose, ecological infrastructure to create more vibrant connections and enhance the community experience.

I looked into the ecological and social patterns that drive the flow of resources at diverse scales. As a science-driven individual, I thoroughly examined the environmental group's analyses while reviewing literature to understand the unique ecosystem networks of the Bay Area. The constant issues of stormwater management and the future of sea level rise increase the vulnerability of many city assets.

At the social scale, I studied the networks that establish the mobility framework and the various spaces that construct the region's urban fabric, from figure diagrams to future climate stressors.

Lastly, an important topic was the pedestrian experience at the site and how our study area, as a terminus, could support more positive interactions between people and the environment.

Visual Inspiration:



Water as a force, water as an inspiration, water as the fabric that connects everything: this is a park that celebrates the role of water, how it captivates others and shapes the world around us.



By observing diverse factors, I identified opportunities and constraints for site improvements. Regional factors suggest various ways to enhance the social experience while increasing ecological values. These include interventions to remove barriers and soften edges and to connect important city streets to enable a more fluid transition to Aquatic Park. The site can essentially become a stronger part of the ecological networks of the Bay Area while also proving a unique experience to the world of visitors.

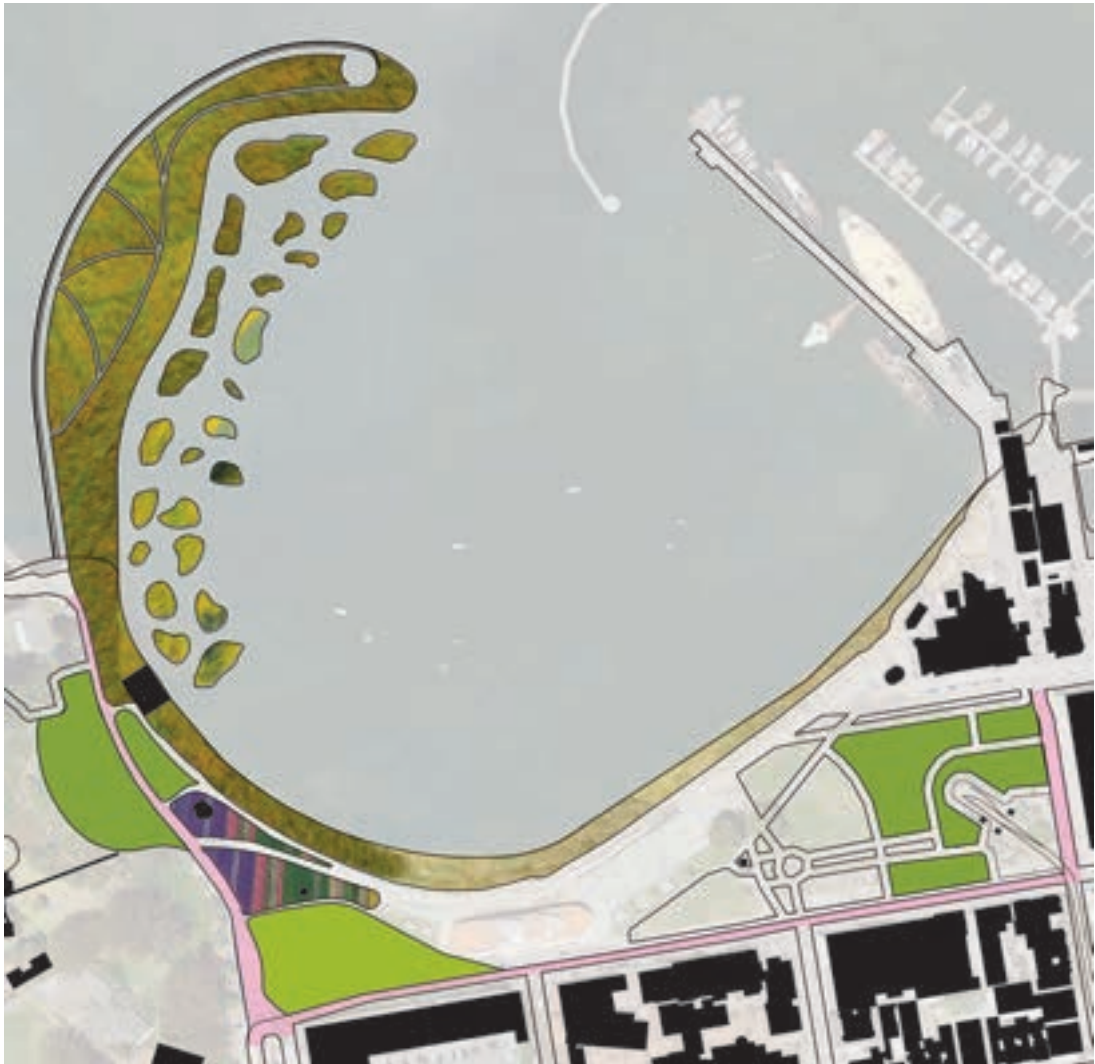
Citing Water

WEEK
03

Design of Site

Interventions at the site scale instill new experiences while enhancing ecological systems.

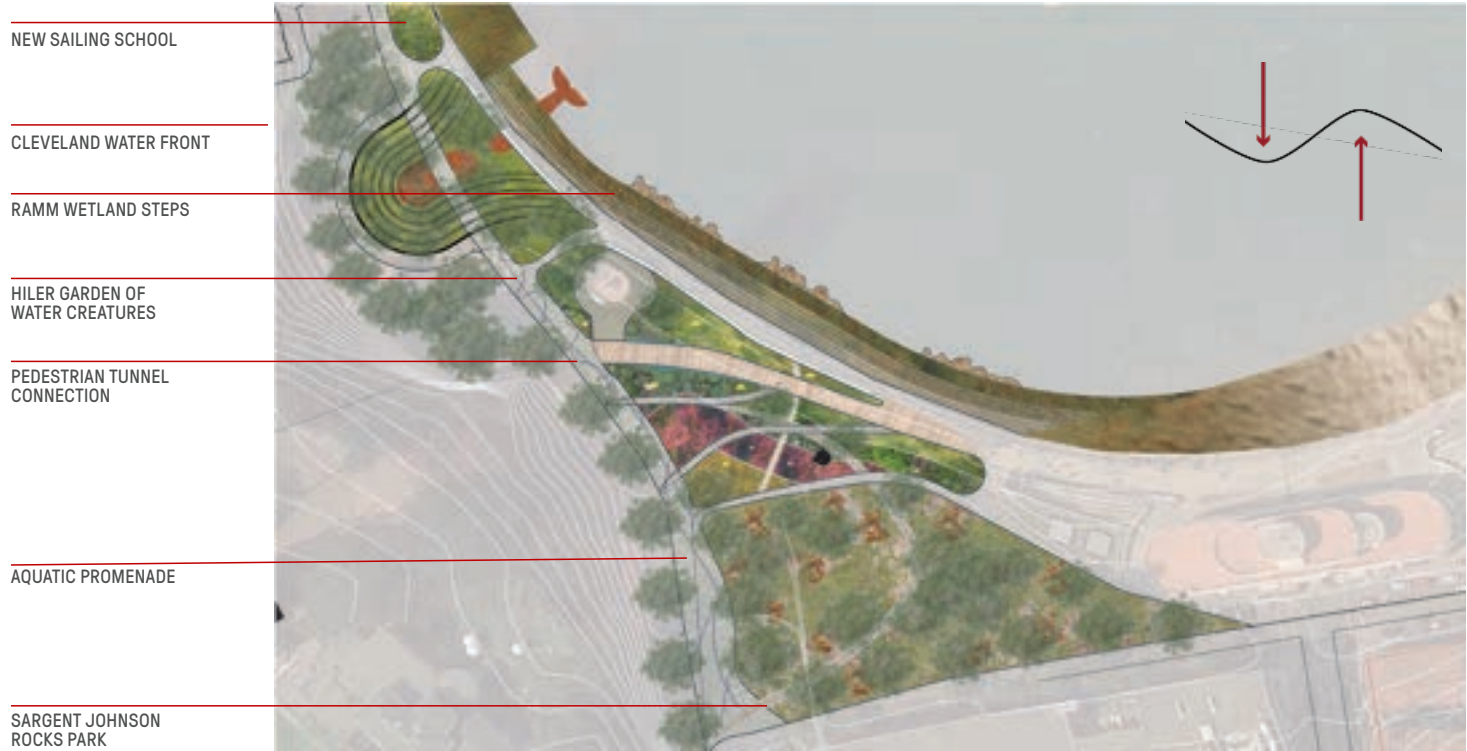
The terminus of Van Ness Avenue provides an opportunity to implement diverse soft edge elements and connect important nodes of the city, Fisherman's Wharf, Fort Mason, and beyond. Aquatic Park and the Maritime Museum represent icons of newly rediscovered history. The murals of Hilaire Hiler that adorn the Maritime Museum represent a history of San Francisco and the country that is much ignored by the public: artwork developed through the Federal Art Project during the Great Depression, signifying the need for the arts even in times of economic crisis. The abstract and unique character of the Hiler murals compels viewers to re-imagine a relationship with water, submerging perspective so that the visually obvious can be visually ambiguous.



Citing Water

WEEK
04

The Designed Object

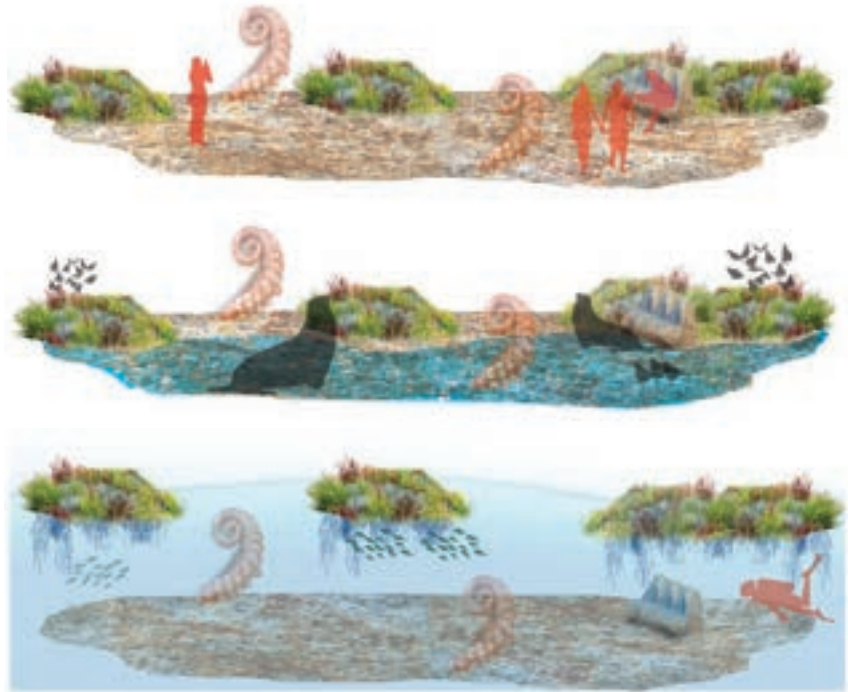


The site demonstrates the significance of water. This week’s design includes a series of pocket parks that commemorate the rich artistic history of the Maritime Museum over a foundation of ecological services responding to pressures of water. This becomes a story of

water, beginning with a raindrop falling down the slope of Van Ness Avenue, collecting the various pollutants of our everyday life. Droplets from Black Point and Van Ness enter the gardens, revealing the essence of water as it seeps through the plantings that adorn

the space. At the terminus of the new gardens, water enters the wetlands, where fresh water and ocean water merge and harmonize.

TRANSITIONAL SEASHORE BUFFER



Sculptural elements mimicking San Francisco’s historic coastline serve as platforms of time and people spaces in 2018, but ultimately give way to new natural environments and become underwater relics of the past.

As water flows down Van Ness, and sea level rise brings flood conditions, a new relationship emerges between ocean and storm waters. The idea of transitional spaces begins to influence the site in response to the increasing effects of climate change. Gardens at different ecological tiers, stormwater management, and wetlands provide a new aesthetic foundation that, with time, will transition and provide a seashore buffer along the coastlines.

New cultural elements express ecological and aquatic relations are derived from the great artists whose work is housed in the Maritime Museum. The Hiler Murals evoke the mystery and whimsy of the ocean. As sea levels continue to rise, land and water enter into a new relationship. Through sculptural elements, the aquatic beasts that adorn the walls of the Maritime Museum become hidden features within park spaces. Sculptural elements take the form of sea creatures that

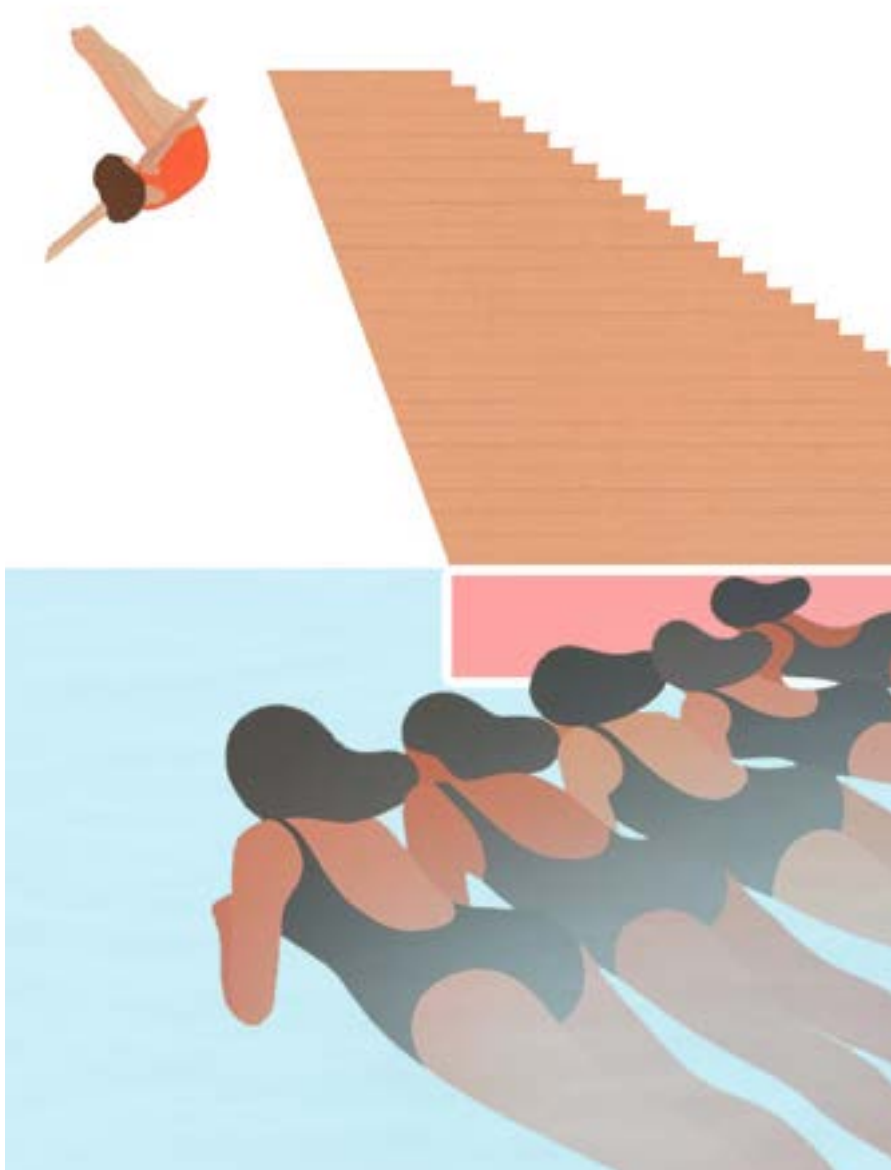
give the illusion of a mermaid coming out of the water, and wavy landforms mimic waves. The site’s layers focus on water and ecology, supplemented by the cultural history of the Maritime Museum. This new area bridges important cultural areas of San Francisco through a corridor of futuristic fantasy and whimsy.



Play! Play! Play!



Xuezhen (Esther) Xie
Cornell University

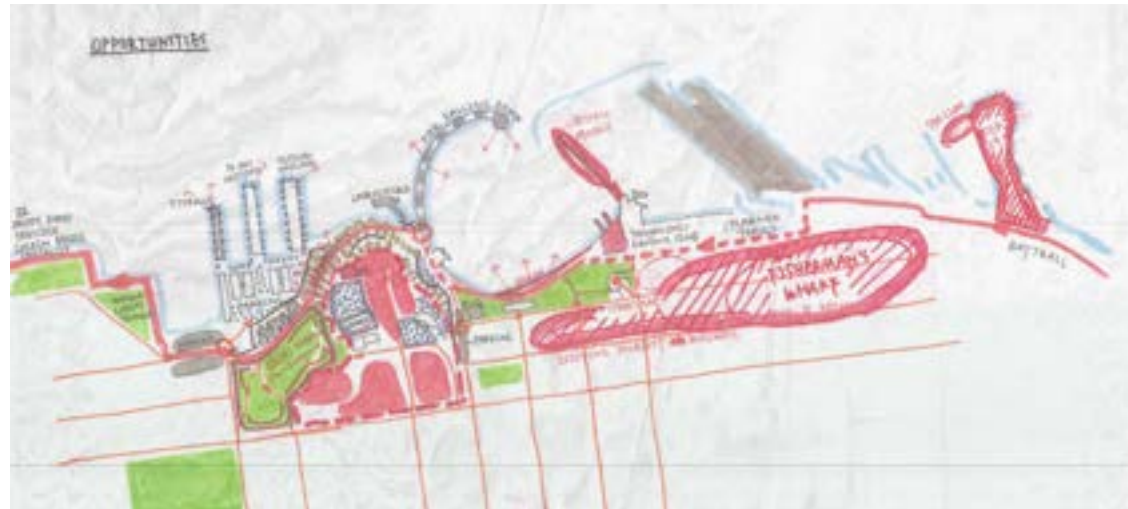
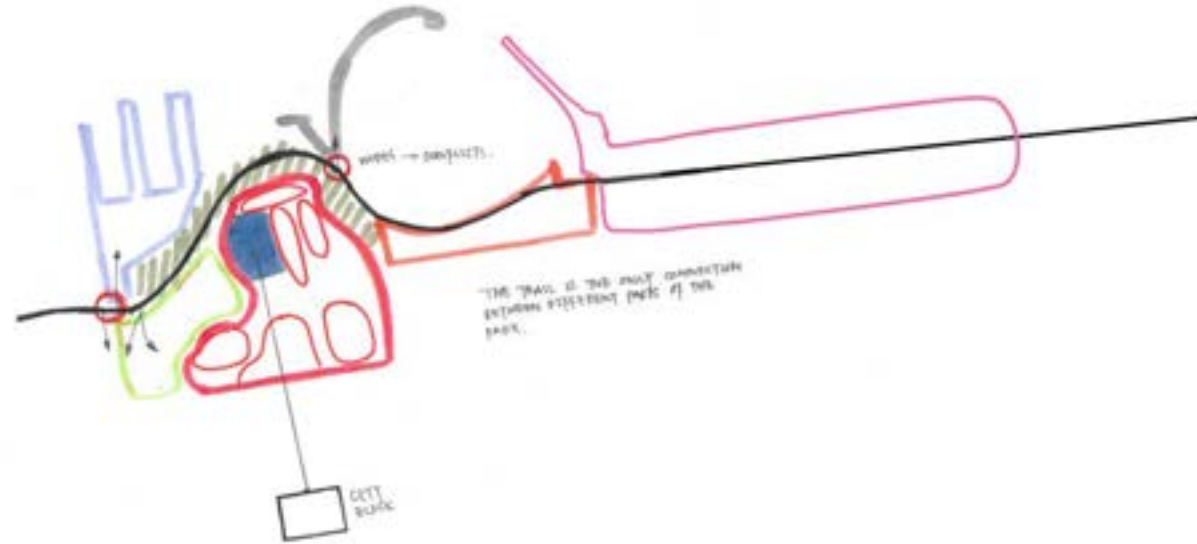


Play! Play! Play!

WEEK
02

The Urban Scene

I started by looking at people's experience along San Francisco's north waterfront area. To the west, the Presidio and Crissy Field represent strong natural influences; to the east lay more intensive urban districts, with industrial piers and destinations such as the Ferry Building, Exploratorium, and Fisherman's Wharf. From south to north, the experience transitions from residential to recreational and from private to public. Aquatic Park represents a meeting point between these realms, where characters converge.



Focusing on connectivity within the site, I proposed to preserve recreation as the primary activity while making underutilized space more open and public. Through the spatial analysis, I studied how the park is segregated into different parts by topography and vegetation. Fisherman's Wharf, beach, Muni Pier, upper and lower Fort Mason, and the Great Meadow are separated from each other, with the Bay Trail serving as a limited connection with conflicts at intersection points.

Through concept diagrams, I studied various interventions to improve connectivity and activate space. These include: improving the Bay Trail to build better connections from Fisherman's Wharf, Aquatic Park, and Fort Mason; introducing an accessible walkway between the beach and upper Fort Mason, and reconstructing the abandoned Alcatraz pier as a connection to lower Fort Mason through a floating pier. I also proposed a playground on the slope between the Great Meadow and

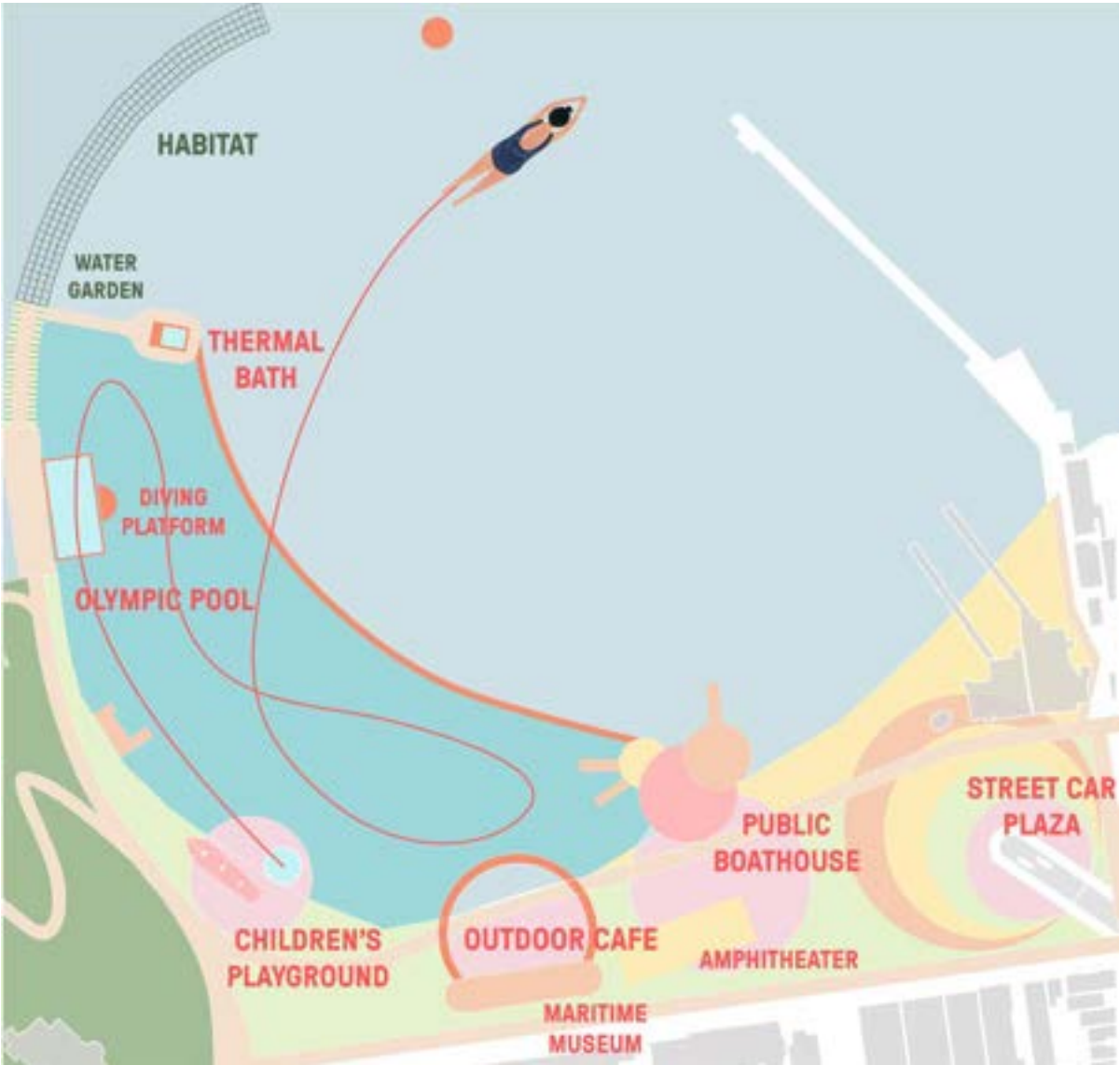
lower Fort Mason, and created an urban village within underutilized portions of upper Fort Mason with affordable housing and Airbnb to introduce more diverse user groups to the site.

Play! Play! Play!

WEEK
03

Design of Site

In this phase, I revisited the original purpose of Aquatic Park. The idea for a public park at Black Point Cove originated with recommendations made by landscape architect Frederick Law Olmsted in 1864. The Muni Pier was created to provide calm water for swimming, rowing, and different kinds of recreational activities. Yet based on our perception from the site visits, not many people swim here because conditions are windy and chilly. The large, open water cove without lifeguards seems dangerous to beginners, even though the water is calm.



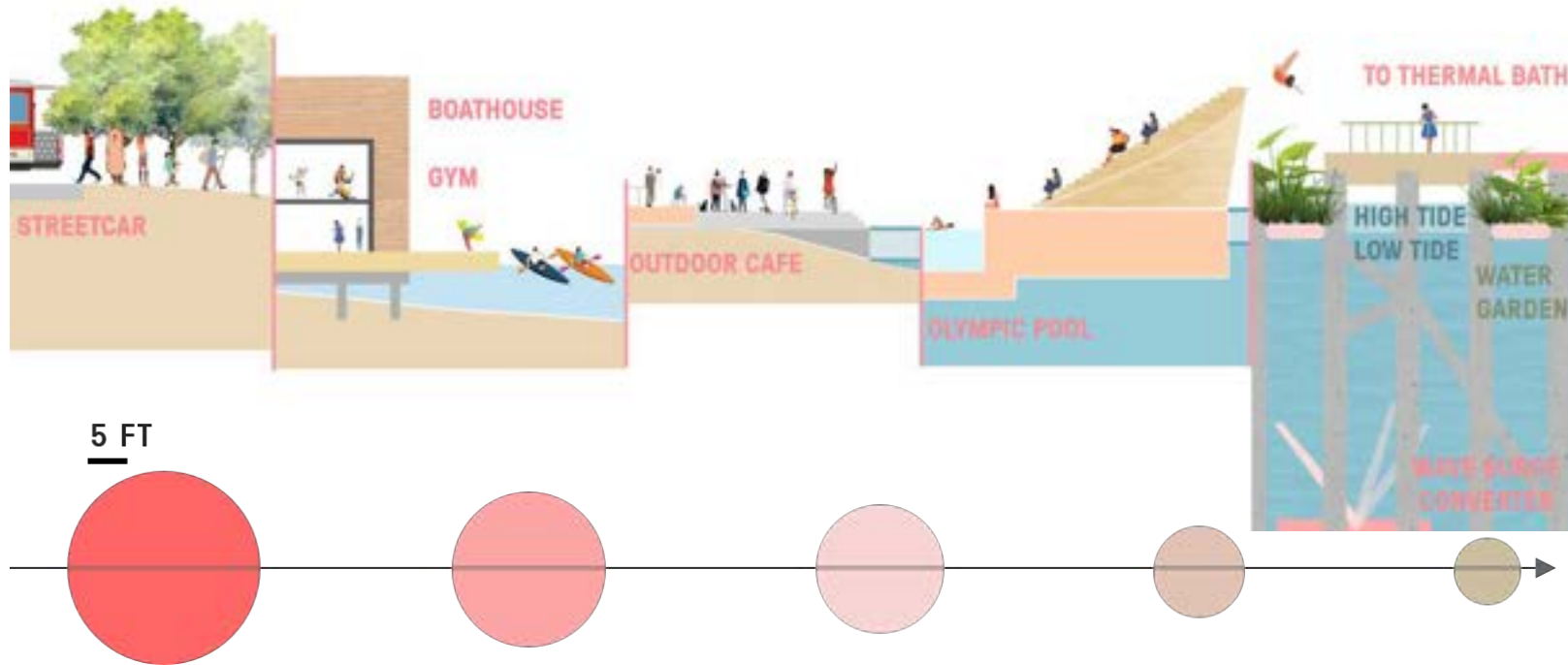
Therefore, I decided to create a public recreational park where everyone can play with water. A new arc barrier, roughly parallel to the Muni Pier, provides an armature for various programs to attract more diverse user groups. In my concept plan, a floating walkway creates a swimming area and connects the land with a floating lawn and diving platform. A boat-shaped playground with a children's pool will attract kids. These elements support a continuous swimming-learning experience. People learn swimming in the children's pool and the Olympic pool, then in the larger enclosed cove. If they become expert, they can eventually even swim into the bay water as members of the swim clubs do today.

For the deteriorating Muni Pier, I propose to retain part of it completely, take out the platform, and keep the pilings for the remainder to preserve its function as a breakwater. The pilings will also serve as the foundation for marine habitat. Wave surge converters between the pilings will convert the wave energy and provide energy for the thermal bath.

Play! Play! Play!

WEEK
04

The Designed Object



In this week, I revisited details in the concept plan and tried to connect people's experience in Aquatic Park with their experience at the large urban scale. Aquatic Park occupies the intersection between the natural influences from the west and the urban character to the east. Black Point represents the only remaining natural rocky shoreline along the waterfront, while the Muni Pier, cove, and beach are man-made. In essence, the site represents an interesting mix of natural and urban environments.

My concept is to create a continuous experience along the curve defined by Muni Pier. I re-organized the program along the arc so that as people move from land to water, the experience changes from city to nature, and from social to solitary.

Muni Pier receives four kinds of treatment. Starting from land to water, the first section retains the existing pier completely. For the second part, I removed the platform and proposed a narrower walkway, with floating

wetlands on both sides to create a water garden. For the third part, I removed the platform and created a habitat that is inaccessible to people. The pilings remain for protection purposes. At the end, the pilings will also be taken away, leaving an isolated island as a place for solitary experience.



Archipelago



Phia Sennett
Harvard University



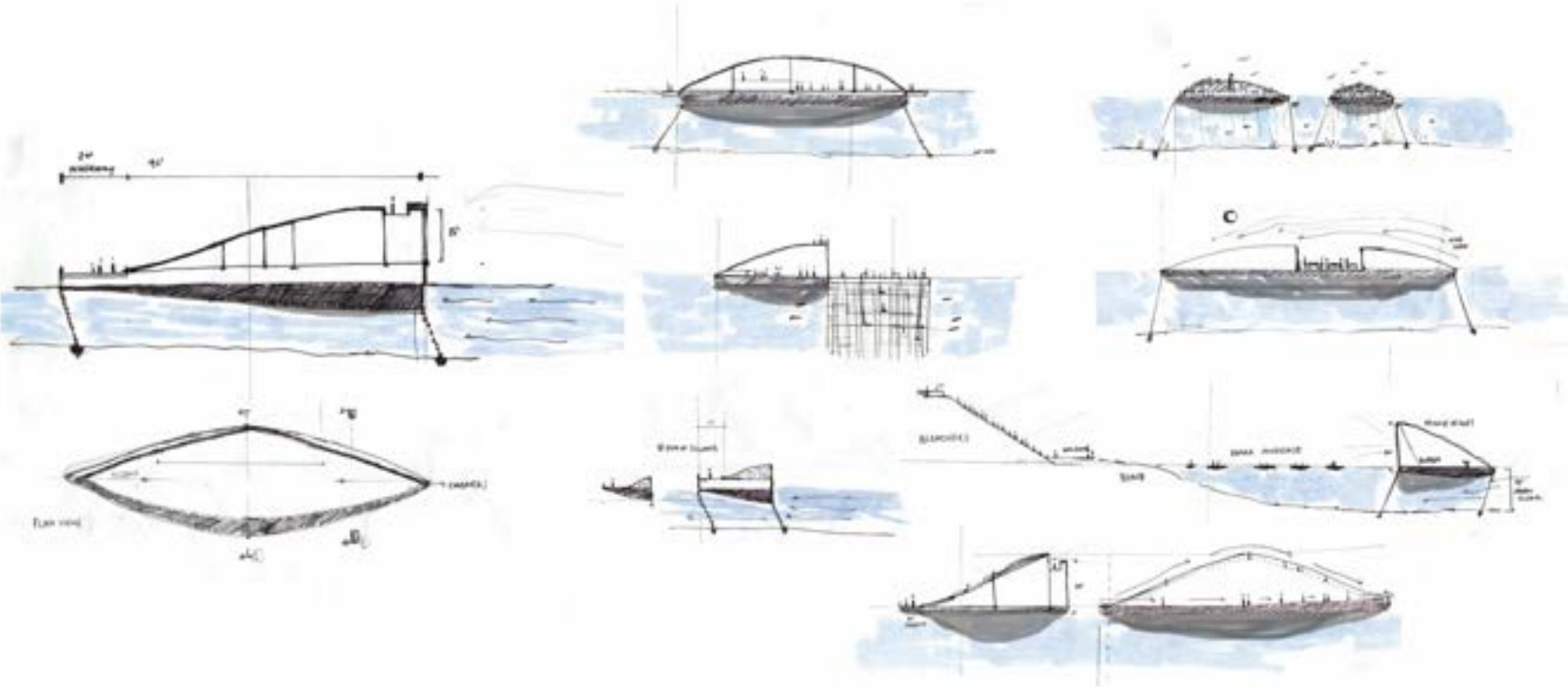
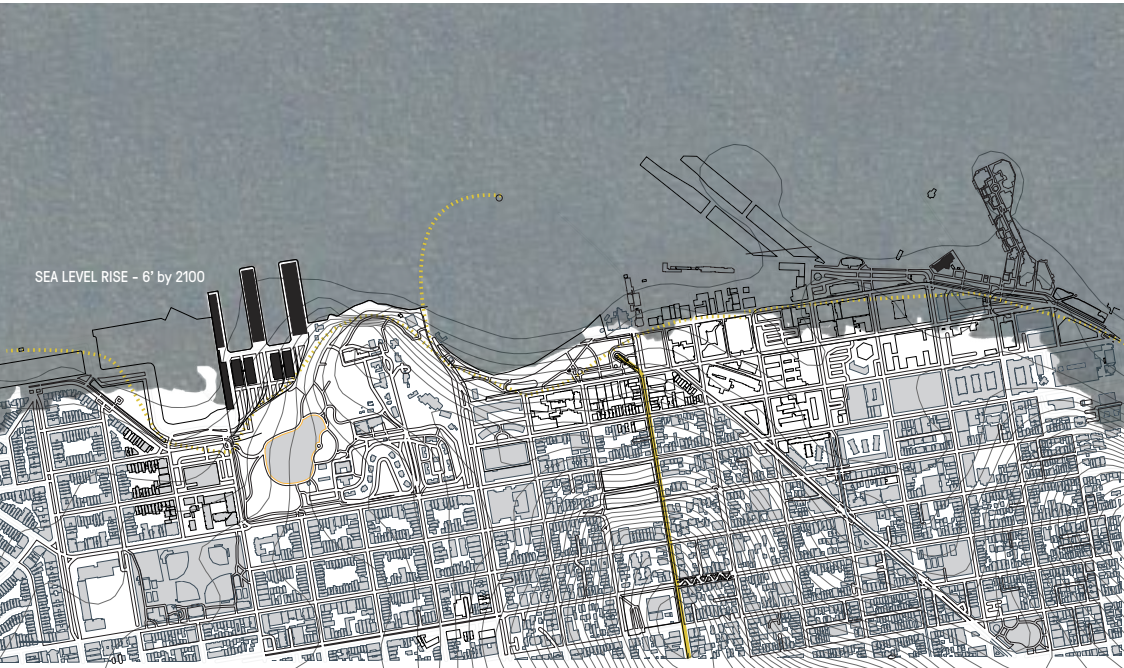
Archipelago

WEEK
02

The Urban Scene

Aquatic Park has long been an exceptional location along the San Francisco waterfront. Guarded by the Muni Pier and adjacent to the last remaining natural rocky shoreline, the park’s cove is the only place where people can safely swim. At Aquatic Park swimmers, paddle boarders, fishers, and waders participate in active waterfront experiences, enjoying a physical, psychological and visual break from the continuous hard edges of pavement and railings that dominate the urban shoreline.

During the first two weeks of the summer program, I learned that Aquatic Park takes on various meanings for various user groups. Creating mental maps helped me think through the different user experiences. I realized that visitors to the north waterfront are generally divided into two groups: tourists and locals. Tourist landmarks, destinations and circulation routes are concentrated along the waterfront’s edges.



Amenities in Fisherman’s Wharf, adjacent to Aquatic Park, generate around \$600 million in revenue every year. While it is an area buzzing with activity, the area is typically avoided by San Francisco locals who question its authenticity. Instead, local residents prefer to visit lower Fort Mason, the Great Lawn, and Aquatic Park Cove (for fishing and swimming).

Great urban parks are valued by both tourists and locals alike, and I came to realize that any sustaining design contribution to the park needs to consider opportunities for shared spaces. In our first week, we considered potential costs and revenue sources for major projects such as the cable car extension and Muni Pier reconstruction. These point to the

looming challenge of investment needed to restore aging infrastructure. Another challenge was identified through mapping sea level projections. The associated costs encouraged me to consider ways to design with dynamic and adaptable components that will withstand climate change and other tests of time.

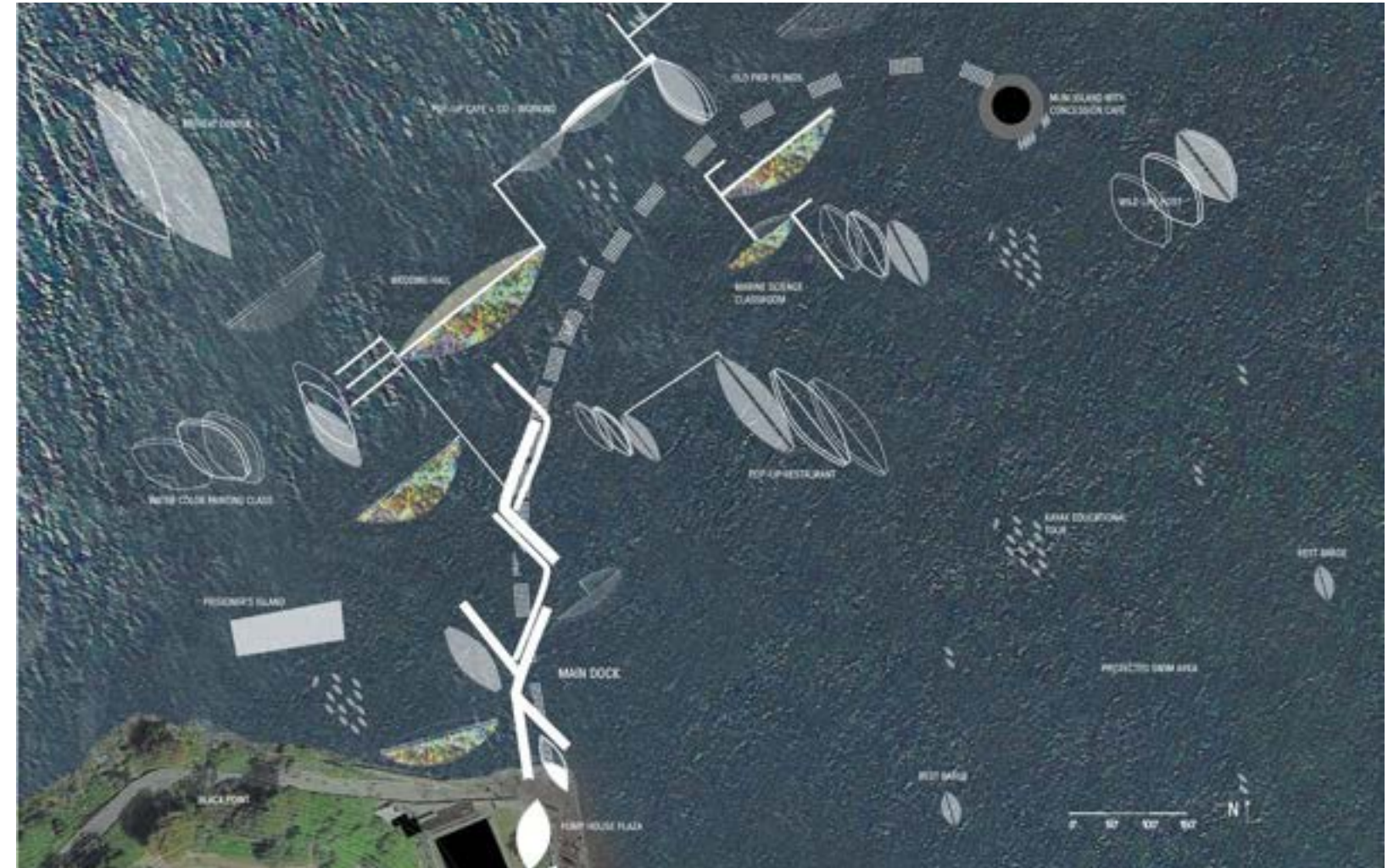
Archipelago

WEEK
03

Design of Site

During the third week I proposed a concept for a system of floating islands, Archipelago, which embraces the future by creating community space at Aquatic Park that is resilient to ongoing sea level rise. The floating islands would connect Aquatic Park with the greater Bay Area. A docking station would be a hub for cultural and ecological exchange.

Archipelago continues the site's precedent of waterfront engagement while offering an alternative to a complete reconstruction of Muni Pier. Modular and connectable floating islands host a variety of activities at Aquatic Park that are housed underneath public walkways. The design includes two types of platforms: 1) permanent, tethered venues, and 2) drifting platforms that support transitory functions such as art installations and habitat for migrating birds. A school science class might charter an island lab station, while an executive team gathers for a retreat in a conference center. Some of the islands are part of a movable "fleet," offering opportunities for Archipelago to serve as a regional hub for cultural, artistic and ecological exchanges.



Archipelago operates as a holistic system to mediate weather and break strong wind chop entering Aquatic Park Cove, and is intended to be a charismatic landmark sensitive to the surrounding landscape. One unifying characteristic of the islands is that they have living roofs. The distinct arching islands may

become a city icon—a sensitive foreground to the distant Marin County landscape. Over time, this system of islands will translate traditional onshore programs to offshore revenue. This prototype of floating programs will start a conversation about adaptation to climate change around the San Francisco Bay.

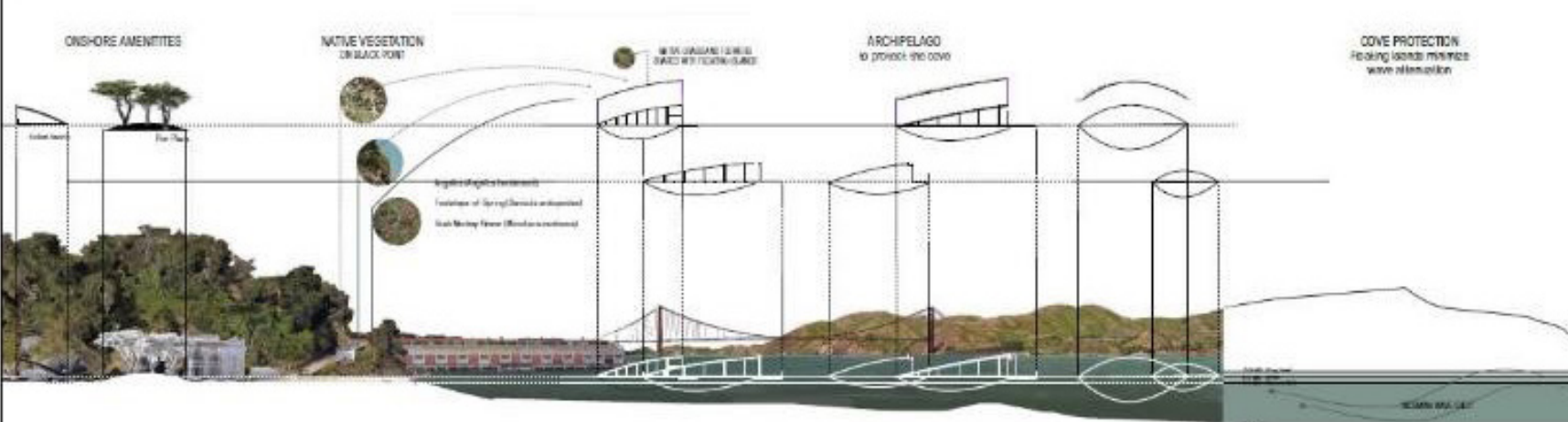
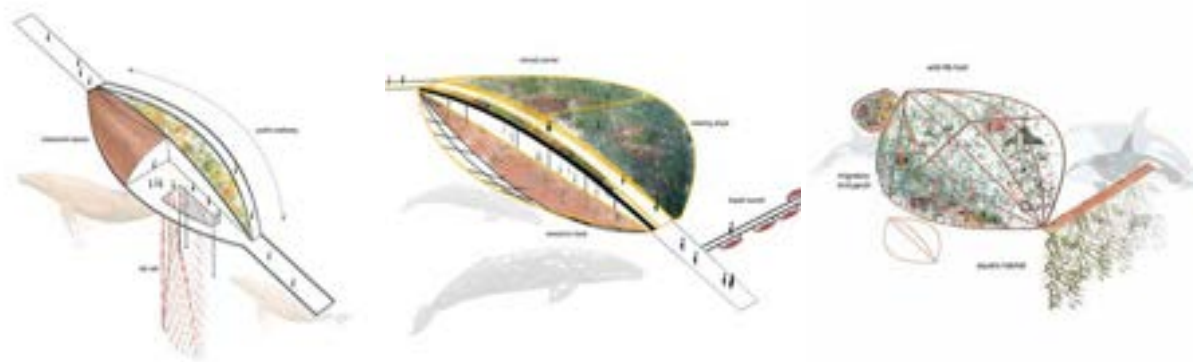
The main dock is designed to provide visitor access to Archipelago based on six feet of anticipated sea level rise by 2100 (with 12-foot surging King Tides). In this proposal, the spirit and performance of Aquatic Park is maintained by alternative forms of design rather than complete reconstruction of Muni

Archipelago

WEEK
04

The Designed Object

During Week 4, I swam in Aquatic Park Cove from the South End Rowing Club. While the 58-degree water temperature was daunting, swimming informed my design representations and vision for how people could make better use of the site. Aquatic Park can be a challenging place for recreation. Similar to the original intent for Muni Pier, the mounded islands are designed to protect the cove. Back at the SWA office we joked, comparing this experiential approach to method acting. Clearly, it is important for designers to actively engage with the places that they help shape. How to host a viewing deck? How can the islands block the powerful incoming winds?



Living Dunes



Sujing Sun
University of Washington



Living Dunes

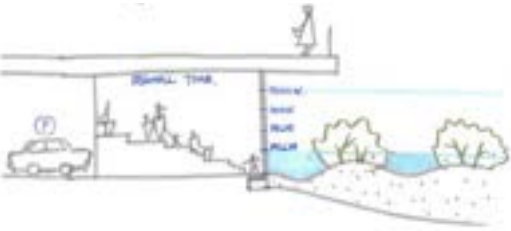
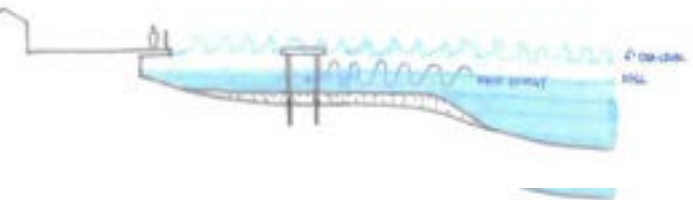
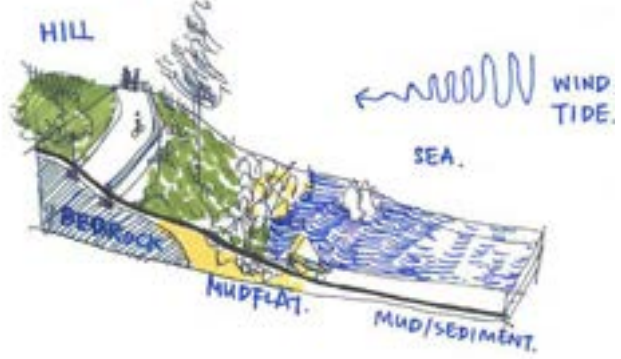
WEEK
02

The Urban Scene

My concept is called “living dunes,” which expresses the idea of creating soft edges to deal with tidal wave impacts and allowing the shoreline to evolve in response to natural forces. Adapting to sea-level rise and natural succession is a long timeframe; the approach will shape a resilient shoreline. By looking at how sand dunes are formed by wind, I am inspired by natural landforms and physical geology. Those insights encourage me to mimic natural processes and create living dunes by introducing oyster structures and reef balls.

The 80-year old Muni Pier is currently deteriorating and challenged by sea level rise. What is the best solution for the future?

My idea is to improve the pier as a living system. Years 1 to 5 will start off by building pilot infrastructure into the water to form a living breakwater system. Some of the framework structure can be re-cycled from fallen pier surface materials. This will protect the cove and beach even as the pier continues to deteriorate. Meanwhile, recreational functions will be reinforced by improving the landside access, creating new gathering spaces, and adding boating/ kayaking options.



Engaging the Seawall

In addition to the ecological infrastructures, the new seawall project offers an opportunity to engage with the shoreline. People could explore how the sediments interact with tidal impacts. Parking areas could be floodable when there is storm surge or disasters.



Living Dunes

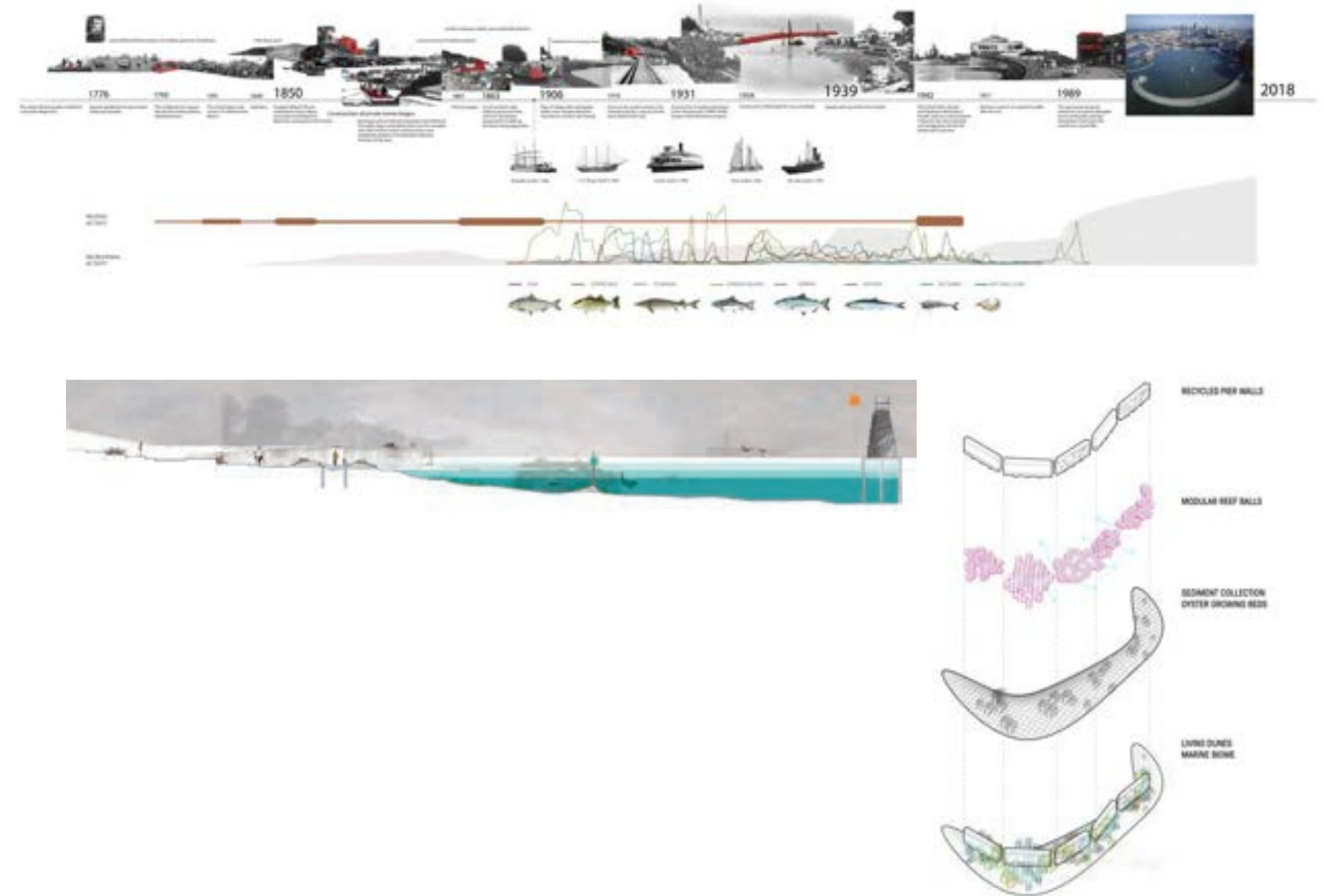
WEEK
03

Design of Site

My attitude towards Muni Pier is to let it degrade over time and create a ruin-scape in the future. By removing the pier platform, the daylighted pilings will communicate the essence of historical identity. The pier's concrete baffle system protects the swimmable cove by reducing wind and wave chop. Living dunes will replace this function through use of mesh webs and ecological structures. As sea levels rise and the pier degrades, an ecological baffle will maintain wave attenuation in a sustainable manner. In addition, the deteriorated materials can be recycled as oyster substrate.

From year 5 to year 10, the living dunes system will evolve. Based on the government's living shoreline research, oysters could grow and attach to the structure. Gradually they would begin to wrap the pier, creating a memorial island at the end. The gaps between the dunes will increase shallow habitat and encourage marine plants.

During years 10 to 50, as sea level rises further, living dunes will protect Aquatic Park from floods and wave action. People will experience the living system from the shore, the translucent deck, or by boat and swimming.



Living Dunes

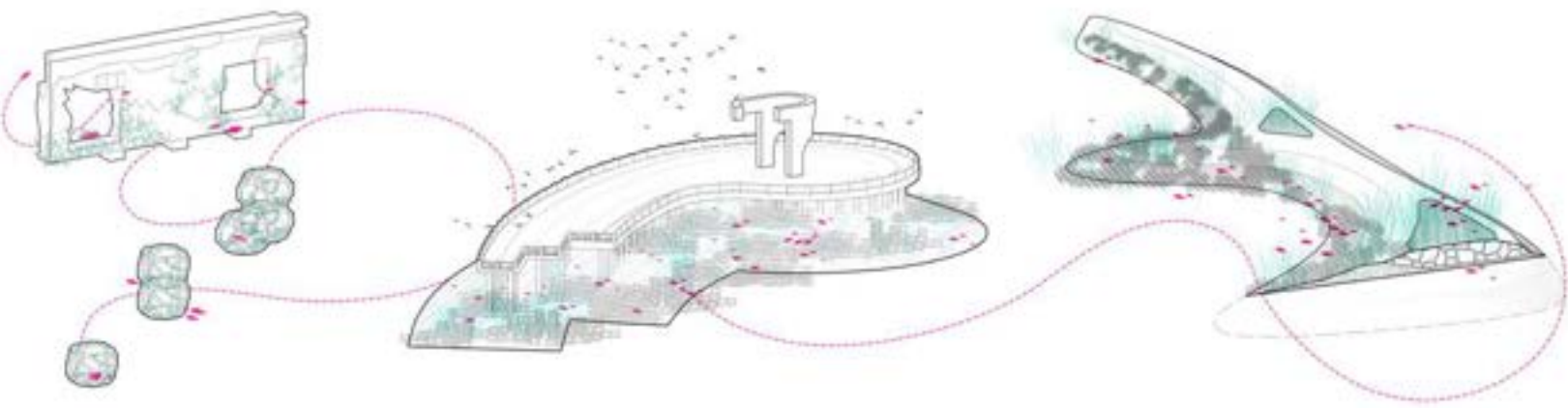
WEEK
04

The Designed Object

The proposed translucent deck creates a transformative waterfront destination designed to make people aware of ecological change under the water, providing families, children, and tourists with opportunities to observe the living structure and tidal changes over the long term.



LIVING INTERVENTIONS



IV. ACKNOWLEDGMENTS



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