

SHIFTING SHORELINES: SEA LEVEL RISE ON THE SAUSALITO WATERFRONT

SWA SUMMER PROGRAM 2011



SHIFTING SHORELINES: SEA LEVEL RISE ON THE SAULALITO WATERFRONT
SWA INTERN PROGRAM 2011

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swa 2011 **SUMMER PROGRAM**
bring your ideas

SWA started its summer program in 1972 to forge stronger connections between academics, theory & practice.

Submission Deadline: March 1, 2011

Deliverables: Letter of Interest, Resume,
Letters of Recommendation + Portfolio
(11x17 maximum)

Eligibility: You must be a student +
be returning to School in Fall 2011

Mail Hard Copy Submissions to:
SWA 2011 Summer Program
2200 Bridgeway
Sausalito, CA 94965

Date of Notification: March 15, 2011

For Details Visit:
<http://www.swagroup.com/Students.html>



SWA SUMMER STUDIO

Every year, SWA offers a summer program for students of landscape architecture from around the world. The program consists of four one-week design studios followed by a month-long internship at one of the SWA offices. The one-week intensive studios explore issues-oriented design problems that are reinforced by field trips and critiques. SWA principals direct the studios, and distinguished academics and professionals serve on review juries. Because SWA is a group practice, students

learn how a wide range of individuals can contribute to a variety of project types and scales. SWA selects its summer interns in a manner that reflects our belief in the group practice. All staff members in the host office review the student portfolios and select their top choices. In recent years, the program has attracted students from leading U.S. Universities and diverse locations including Egypt, Slovenia, Taiwan, Korea, China, Scotland and Canada. In the past 36 years of hosting the summer

program, over 200 students have participated, 47 of whom have become full-time employees of SWA, and four of whom have become SWA Principals.

The selected finalists represent some of the most talented and promising young designers in the country. At the end of the program, students leave with a strong attachment to the projects they've worked on and a greater understanding of their own potential as design professionals. In 2011 SWA received over 125 portfolios.

At the close of the summer, the six students joined a long list of students who have interned at SWA over the last 39 years, many of whom have gone on to become leading landscape architects and designers in the field including several SWA principals.



internship schedule

● **STUDIO 01**
**DEFINING IDEAS FOR
A SHIFTING SHORELINE**
Marco Esposito, *Principal*
Masato Kametani
Josselyn Ivanov

● **STAKEHOLDER JURY**

● **STUDIO 02**
URBAN DESIGN VISION
Rene Bihan, *Principal*
Sehyoung Kang
Conway Chang

● **PROJECT INTRODUCTION-**
Rene Bihan, *Principal*
Sehyoung Kang
Conway Chang

● **STAKEHOLDER JURY**

WEEK 01 : DEFINING IDEAS

WEEK 02 : URBAN DESIGN VISION

● **FIELD TRIP**
San Francisco Waterfront:
Marco Esposito, *Principal*
Joe Newton
Masato Kametani

● **LUNCH CONVERSATIONS**
Brad McCrea
*Bay Conservation and
Development Commission*
TOPIC: Sea Level Rise in Bay Area

Sherie McChaile
Point Reyes Bird Observatory
TOPIC: Sausalito and the North Bay

● **LUNCH CONVERSATIONS**
Stewart Brand
Whole Earth Disciplines
TOPIC: Sausalito Houseboats and
Adaptations to Sea Level Rise

● **WEEKEND FIELD TRIP**
Urban San Francisco:
Rene Bihan, *Principal*

● **PROJECT INTRODUCTION**
Marco Esposito, *Principal*
Masato Kametani
Josselyn Ivanov

● **STUDIO 03**
SCI-ART DISCOVERY CENTER
Kinder Baumgardner, *Principal*
Ricardo Supiciche
Don Xu

● **STAKEHOLDER JURY**

● **STUDIO 04**
OBJECT DESIGN
Chuck McDaniel, *Principal*
Ellen Burke
Erica Huang

● **STAKEHOLDER JURY**
FINAL STUDIO PRESENTATION

WEEK 03 : SCI-ART DISCOVERY CENTER

WEEK 04 : OBJECT DESIGN

● **LUNCH CONVERSATION**
Chris Tellis
Yellow Ferry Harbor
TOPIC: Building for Life on the Water

● **WEEKEND FIELD TRIP**
NORTH BAY: WINE COUNTRY
Napa, Sonoma
Larry Reed, *Principal*

● **SITE VISIT**
Downtown Sausalito
Sausalito Waterfront

● **WEEKEND FIELD TRIP**
THE EAST BAY:
Oakland, Berkeley
Caroline Templeton
Zach Davis

STUDENT PROFILES



RICHARD CROCKETT
University of California, Berkeley

"I am currently a graduate student in the landscape architecture and the city planning programs at the University of California, Berkeley. My undergraduate degree is in environmental design from the University of Minnesota. Prior to coming to Berkeley, I worked for a landscape design company in Nanjing, China. I've also worked for a non-profit community design and planning organization in St. Paul, Minnesota and the City of San Francisco Recreation and Parks Department. Through my studies I have pursued a position at the intersection of planning and design working with a diverse array of systems and scales. Understanding how people etch out a life in bio physical systems and how these systems etch out life in the city is, to me, the beauty of landscape and the challenge of landscape architecture."



KATE HAYES
University of Virginia

"Landscape architecture is my passion. Influenced by my suburban upbringing and my interdisciplinary science background, I am fascinated with the ecological, cultural, and social regenerative qualities of this design discipline. With a B.S. in Earth Systems - a major focused on human interactions with our natural and built environments - I have approached landscape architecture from a systems perspective. My eclectic work experience - from working at a sustainable buildings company to coaching high school rowing - and travel abroad have also been influential in my career path. Having completed my first of three years of graduate school at University of Virginia, I find that I am drawn to the particularities of site, creating spaces that bring out natural processes and use geology as a fundamental underlying structure or armature. As geology operates on a regional scale, I am fascinated with bringing its science and its structure down to the room and human scales."

**HYUNJOO NAM**

University of Pennsylvania

"I am currently a Master's Degree student in landscape architecture at the University of Pennsylvania, and I received my Bachelor of Fine Art in painting in Ewha Womans University in Seoul, Korea in 2009. My varied background in both fine arts and landscape design prompts me to bring to the table the creative tools and practical abilities necessary to adapt and grow in a new environment. Landscape architecture is the best discipline through which I can give free reign to my personal reinterpretation of a space, transcending traditional forms and experimenting with underutilized space. Thinking outside the box, I do not limit the scope of my design to the canvas but use a broader perspective. Landscape designers have both the responsibility and the privilege to bring life to the inanimate components of a structure. By doing so, my vision is to bring people closer to their surroundings, creating an environment that harmonizes the two and stimulates dialogue between these forces."

**FAN QI**

University of Pennsylvania

"I am currently a graduate student in the MLA program at the University of Pennsylvania. Before coming to the US, I worked as an architect in China and attained a Bachelor of Architecture degree at Zhejiang University.

I grew up in the Chinese metropolis Chongqing, nicknamed "Mountain City." It is located in the mountains on the upstream of the Yangtze River with spectacular urban and natural juxtapositions. These images of my childhood heightened my awareness of how human beings live and overlap with nature.

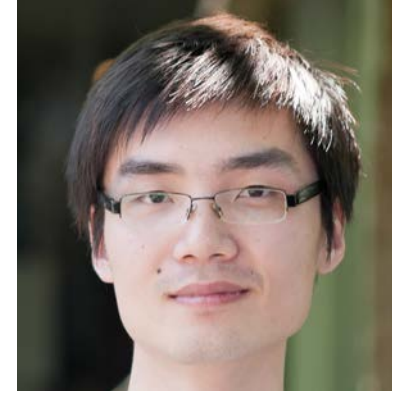
After several years of studying and working in the architecture field, combined with memories of my Mountain City, I realized the gap between nature and human structure. The challenges in their integration lead me to pursue landscape urbanism with a new perspective and with my own approach to the urban issue."

**MIA SCHARPIE**

Harvard University

"I am fascinated by the layers—geologic, environmental, historic, economic, and social—that stack up in time and create space. At its core, this is a poetic interest, but it engages my love for science, social science and art. I studied Urban Studies and have work experience in architecture and at Public Architecture, a nonprofit based in San Francisco that creates a range of options for engaging in design as a civic venture.

I love the diversity of scales landscape architects address. From larger questions of city-wide sustainability, to the intimate feel of materials and views at human scale, we have to be generalists and specialists in both ideas and space. On the big scale, I am interested in how natural systems can be a more integrated part of cities, and how cities can function more ecologically. I'm also very interested in whether and how landscape architecture can address socioeconomic issues and act as an economically empowering force."

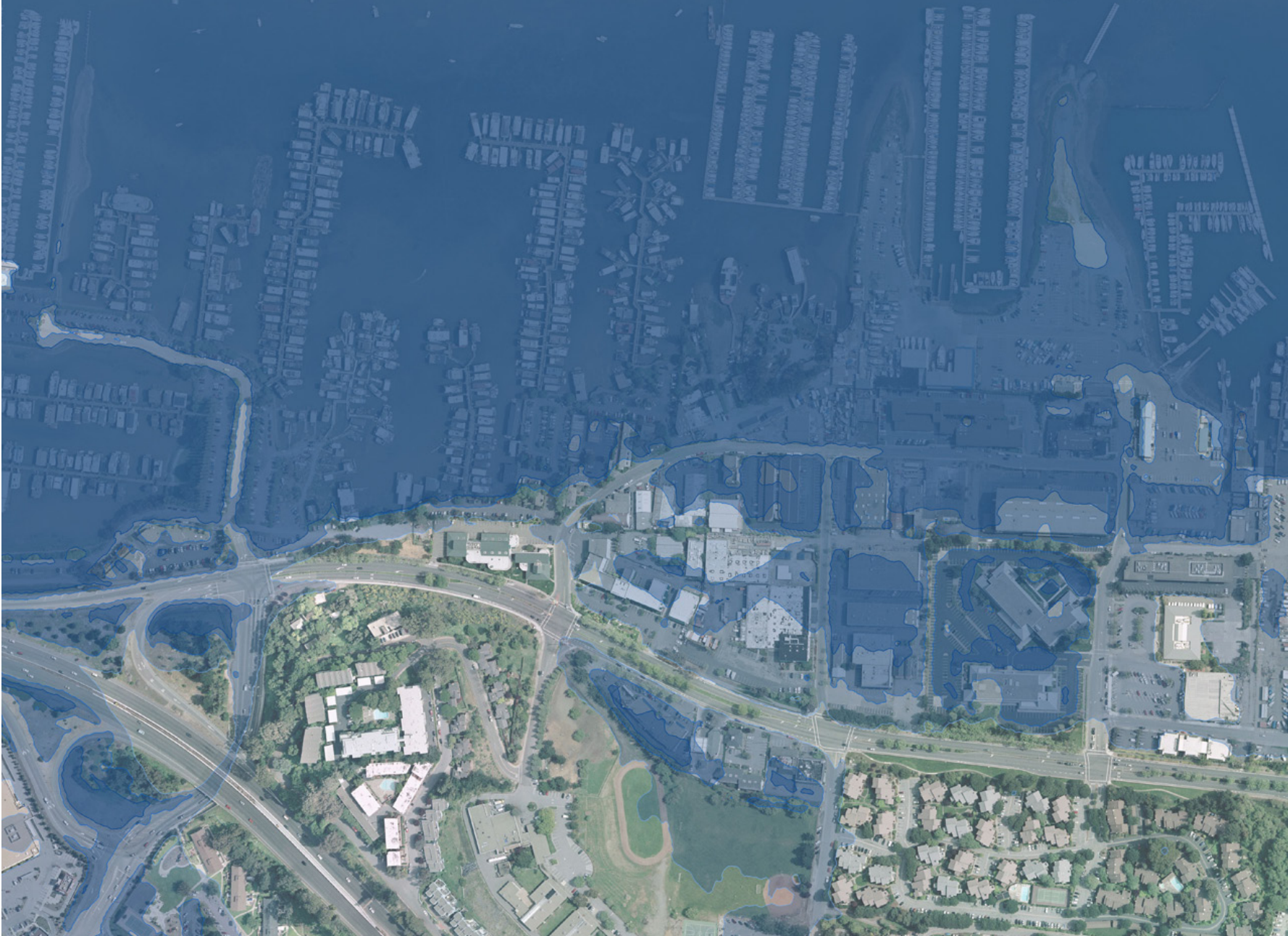
**YIZHOU XU**

Harvard University

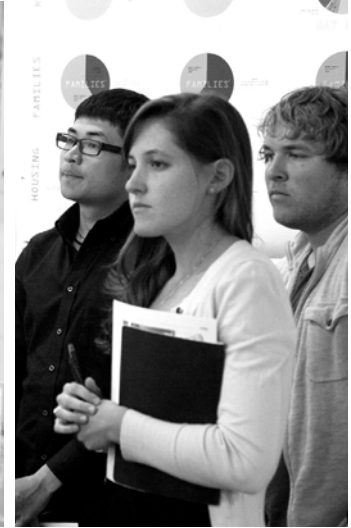
"I majored in urban planning at Zhejiang University in China before being a master of landscape architecture candidate in Harvard Design School. With this background, I have found that in today's complex society, we have to use multidisciplinary strategies to solve problems in cities, from city scale planning to neighborhood scale design to detailing every tree and so on, and so on. This is why I decided to study landscape architecture after receiving my planning degree.

Photography has been another strong interest over the past ten years. Photography inspires me to travel and offers me a tool to get people thinking about the environment. The goal of my photographs is not to capture picturesque scenery, but to transmit a message, bear witness, and move things forward. I feel more like a journalist than an artist, because I attempt to communicate information through my photographs."

Sausalito's waterfront: areas susceptible to inundation by 2050 and 2100.







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SAUSALITO IS KNOWN FOR ITS WATERFRONT LOCATION, TOURISTS, ANNUAL ART FESTIVAL AND WW-II SHIPYARD. WITH SEA LEVEL

SAUSALITO, CALIFORNIA

Student participants in SWA's 2011 Summer Program were tasked with examining the problems and opportunities resulting from sea level rise along Sausalito's waterfront, using a variety of viewpoints, scales and comparisons. Each week's studio problem was directed by a principal from one of SWA's offices, supported by an associate and staff member from Sausalito. Outside speakers contributed technical insights. Each week concluded with an afternoon presentation of student work, attended by a panel of experts and local stakeholders.

Elizabeth Shreeve, Principal
2011 Summer Program Director

The City of Sausalito, California (pop. 7,200) is known for its waterfront location, tourists, annual Art Festival and WWII shipyard, and for an eclectic and somewhat underdeveloped waterfront of houseboats, harbors, boat builders, and industrial or office buildings. With sea levels predicted to rise significantly in the coming decades, this waterfront community—like all located on bays and ocean fronts—will need to change and adapt.

What does a shifting shoreline mean for Sausalito's urban form, infrastructure, and potential to evolve as a compact, sustainable and compelling waterfront community? How is it possible to design something that is itself in the process of changing? Starting with

grounding in Sausalito's unique character and an examination of strategies anticipated by some other Bay Area cities, we studied specific impacts of sea level rise on natural and human environments.

We applied examples of urban waterfronts worldwide—including design competitions from New York and San Francisco, innovations from the Netherlands, and SWA's current work on coastal and riverfront cities worldwide—to explore design concepts for the waterfront located right outside the door of our Sausalito office. We discovered that Sausalito's future is both political and controversial, but our work stayed focused on physical planning and design ideas.



PREDICTED TO RISE SIGNIFICANTLY IN THE COMING DECADES, THIS WATERFRONT COMMUNITY WILL NEED TO CHANGE AND ADAPT.

**WEEK
01**

**DEFINING IDEAS
FOR A SHIFTING
SHORELINE**

Working as a group, the students examined the area's natural and man-made systems to understand the dynamic forces that shape the Sausalito waterfront (100 acres). These systems included historic, socio-economic, cultural, transportation, land use, topographic form, building massing, hydrology, ecology, and climate. The result was an analytical framework that considers stakeholder concerns, documents systemic forces, and provides a base for each student to generate initial visions for the site's next 100 years.

**WEEK
02**

**URBAN DESIGN:
100 ACRES**

Students developed urban design plans that built on week one's broad studies and responded to the specific characteristics of Sausalito. We questioned what opportunities the rising sea level poses for Sausalito. We challenged the group to conceptualize new forms, urban spaces, mix of uses, and efficient utilization of land. How can urban design embrace the past and the future? How can waterfront cities adjust to a continually changing shoreline? Parks, plazas, trails, corridors and new building concepts would be some of the building blocks for this week's urban design proposals.

**WEEK
03**

**SITE DESIGN:
10 ACRES**

Based on studies from Weeks 1 and 2, each student selected a preferred site on which to test a given program on approximately 10 acres. Programs for site designs focused on the idea of a "Sci-Art Museum" featuring an innovative integration of Science and Art programs through architecture, media, immersive environments and interactive exhibitions. Students addressed approaches to sea level rise through their site-level explorations.

**WEEK
04**

**OBJECT DESIGN:
1 ACRE**

The final studio focused on a specific program for approximately one acre along the water's edge. Each student defined an object or small scale design problem of their choosing, building on their previous weeks work and the character of Sausalito, past and future. They explored the nature of designed spaces through individual elements such as bridges, buildings, walkways, sculptures, water features, lighting fixtures, seating, shelters, or walls.

WEEK
01

DEFINING IDEAS
FOR A SHIFTING
SHORELINE

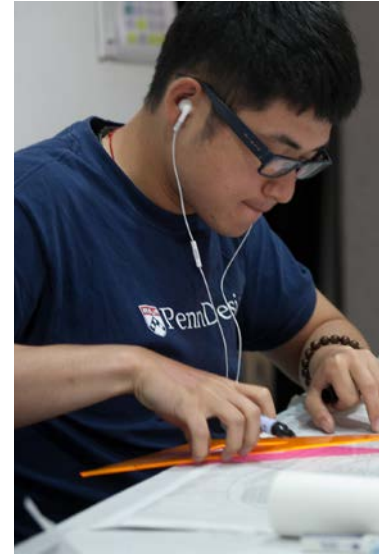
The first week of the Summer Program focused on inventory, analysis, and initial visioning for the Sausalito waterfront. Working as a group, the students examined the area's natural and man-made systems to understand the dynamic forces that shape the Sausalito waterfront (approximately 100 acres), including historic, socio-economic, cultural, transportation, land use, topographic form & building massing, hydrologic, ecological, and climate (including sea level rise). The end result was an analytical framework that considered stakeholder concerns, documented systemic forces, and provided a base of information for each student to generate an initial reaction and vision for the site's next 100 years.

The first week of the Summer Intern Program focused on inventory, analysis, and visioning for the Sausalito Waterfront.



WEEK ONE: DEFINING IDEAS FOR SEA LEVEL RISING

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STUDENTS EXAMINED THE AREA'S NATURAL AND MAN-MADE SYSTEMS TO UNDERSTAND THE DYNAMIC FORCES





THAT SHAPE THE SAUSALITO WATERFRONT, AND GENERATED AN INITIAL VISION FOR THE SITE'S NEXT 100 YEARS.



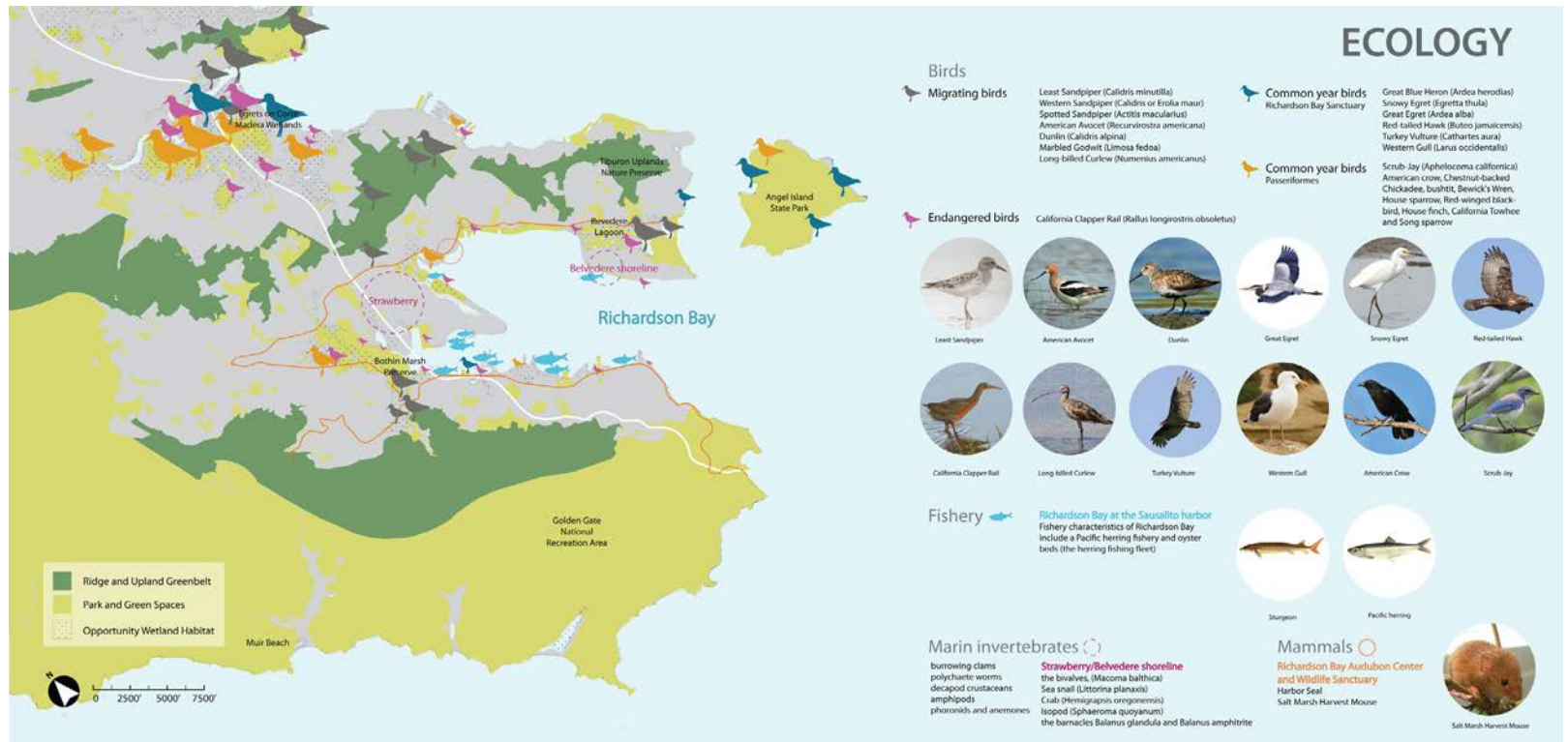
SITE RESEARCH

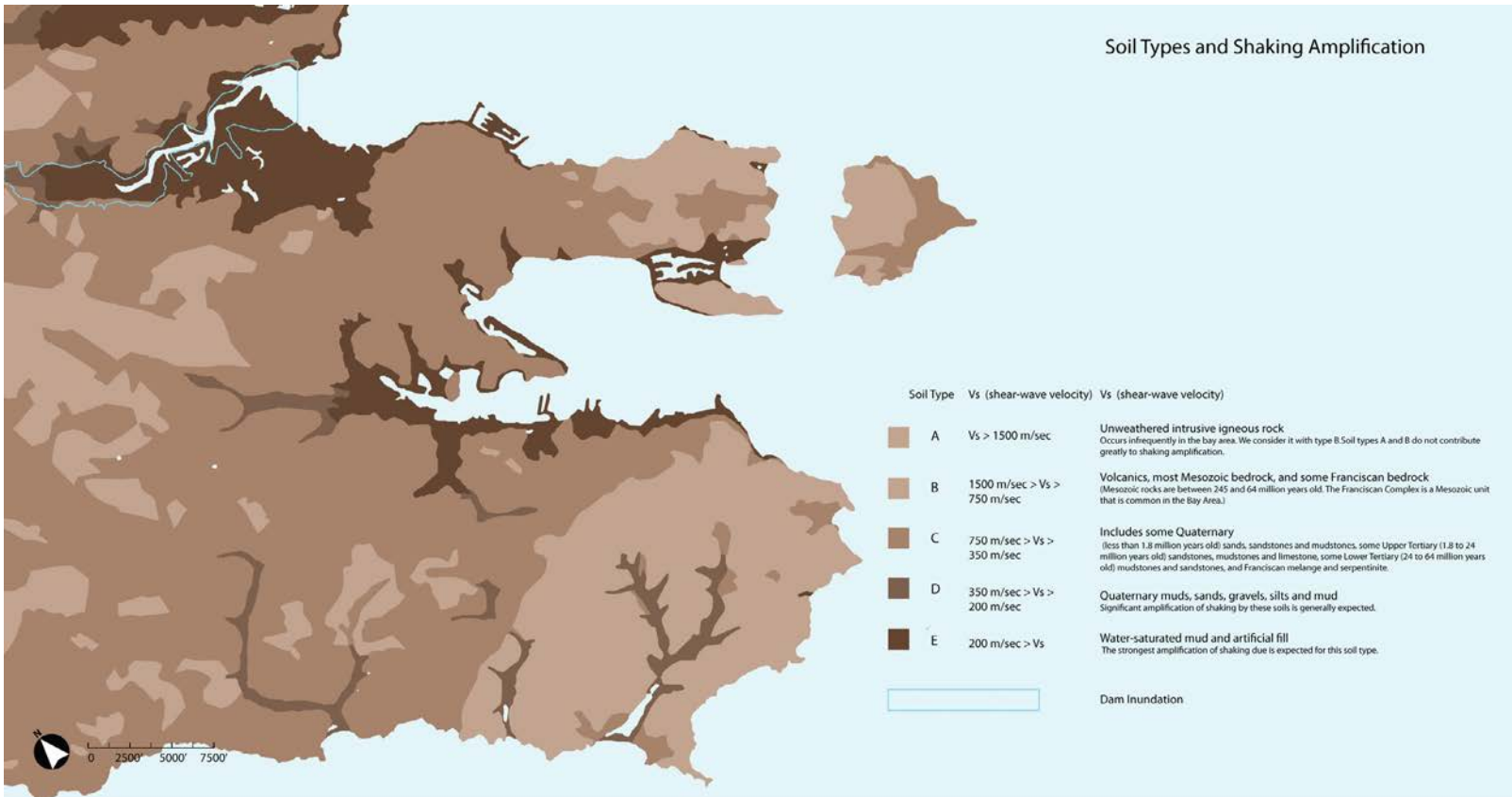
Ecology

Richardson Bay, and the Sausalito waterfront, supply an important ecological area with significant estuarine resources, birdlife, mammalian species and marsh plants. Birds are abundant in Richardson Bay, with over one million migratory visitors each winter, many of which utilize the upper mudflats and

Bothin Marsh associated with the area west of the U.S. Route 101. Migrating birds that winter regularly at Richardson Bay include the least sandpiper, western sandpiper, spotted sandpiper, american avocet, dunlin, marbled godwit, greater yellowlegs, willet, long-billed curlew and dowitchers. The California clapper rail,

a non-migratory endangered species, is a special resident of Bothin Marsh and Downtown Sausalito, indicating environmental pollution. Richardson Bay also includes a Pacific herring fishery and oyster beds. The herring fishing fleet serving all of San Francisco Bay is based in Richardson Bay at the Sausalito harbor.





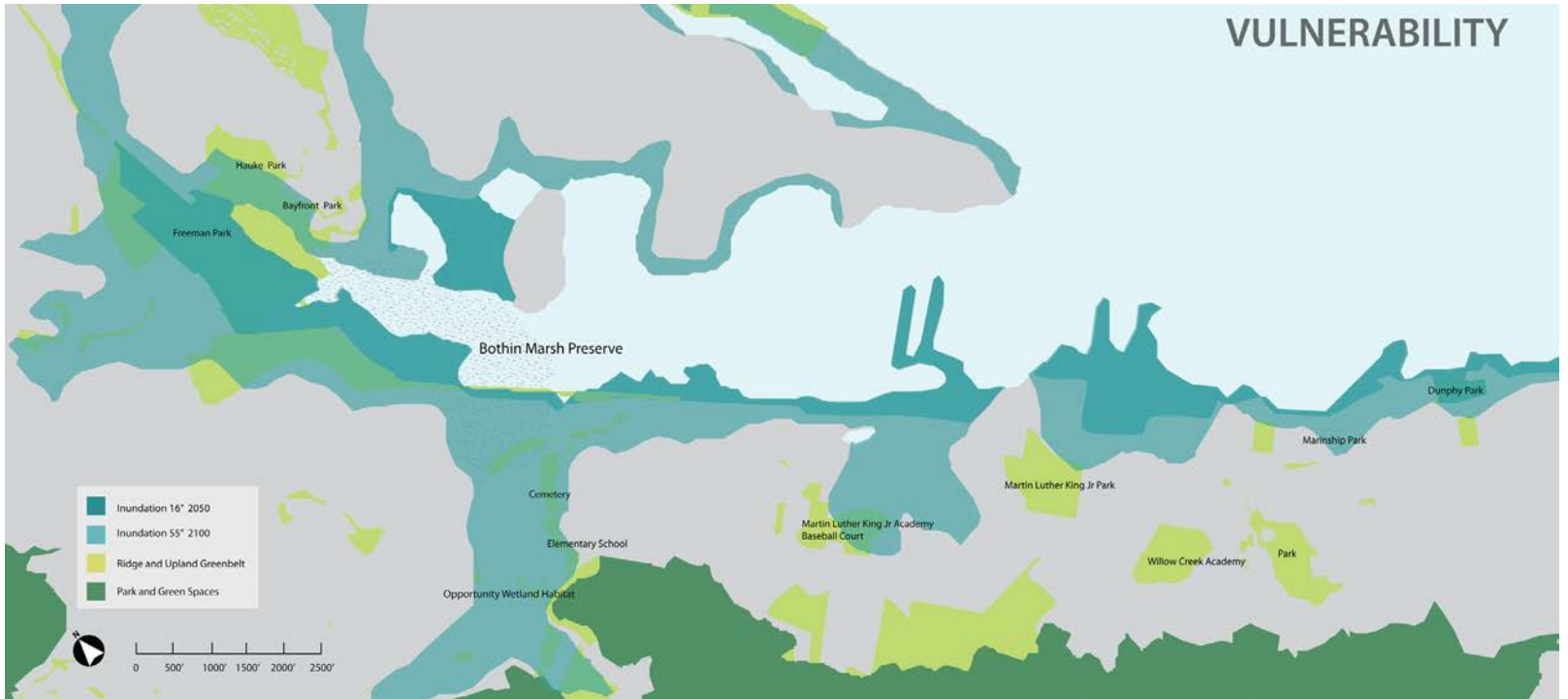
Geology

Ground shaking is the primary cause of earthquake damage to man-made structures. One contributor to the site amplification is the velocity at which the rock or soil transmits shear waves (S-waves). Shaking is stronger where the shear wave velocity is lower. The National

Earthquake Hazards Reduction Program (NEHRP) has defined five soil types based on their shear-wave velocity (Vs). We have modified these definitions slightly, based on studies of earthquake damage in the Bay Area. Our site primarily includes water-saturated mud and artificial fill.

The strongest amplification of predicted shaking is expected for these soil types.

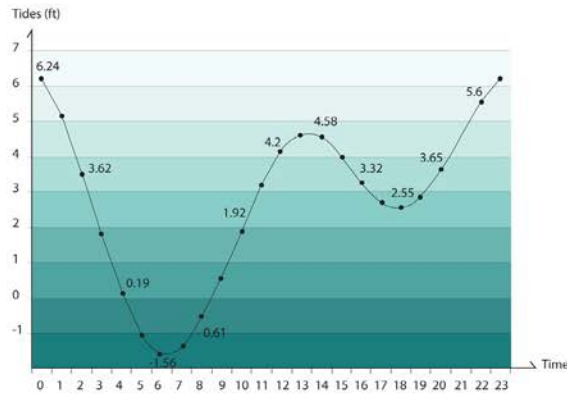
Vulnerability



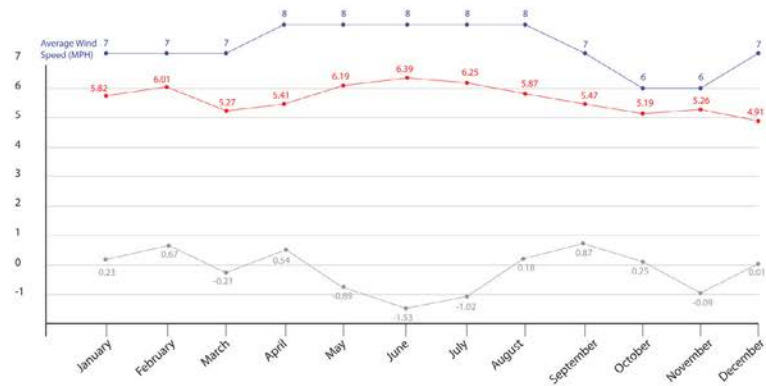
Tidal Analysis



Daily Tides in Sausalito



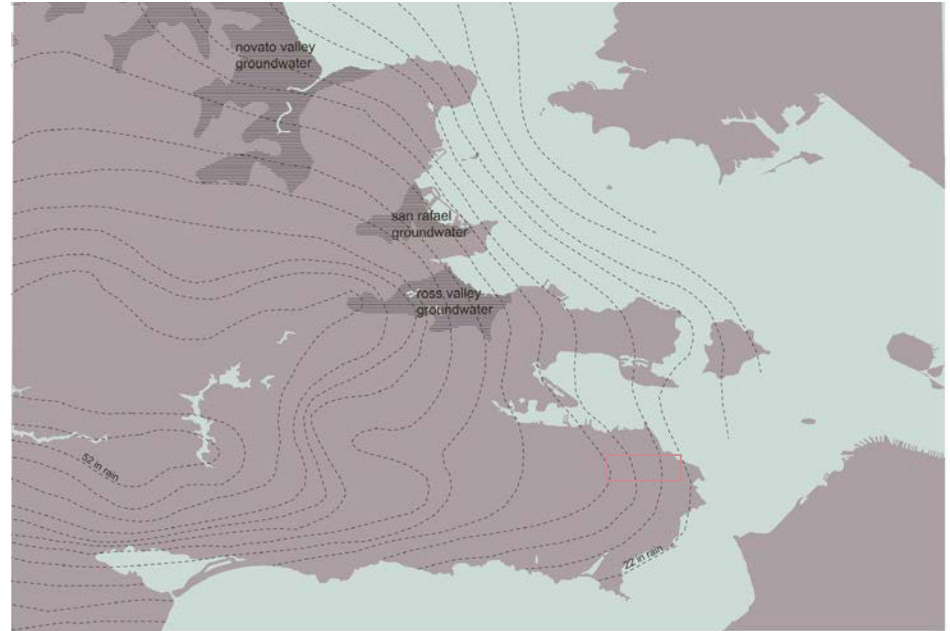
Monthly Tides and Winds in Sausalito



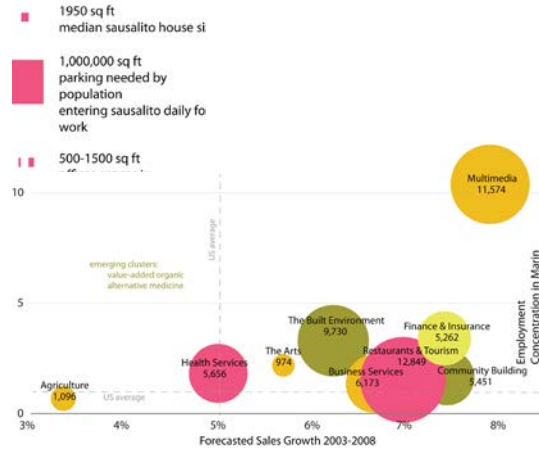
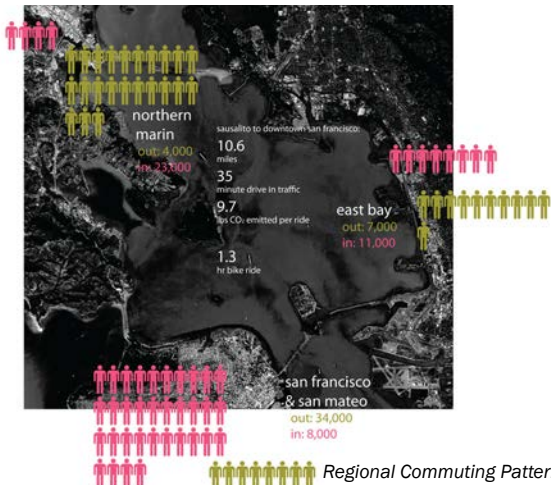
Hydrology

Sausalito sits at the meeting of the Marin Headlands meet Richardson Bay. A sharp rain gradient extends from the hilly areas, where Sausalito and the rest of Marin County's potable water comes from, and the site itself, which only receives around 23 inches of rain a year. Sausalito residents use a great deal more water than their watershed receives. Like the surrounding region, the rain pattern is also seasonal, with rain gauges in the area reporting between 3-4 inches of rain in winter months, and close to zero in the summer months. Ninety percent of the potable water in the Marin County Municipal Water District is pumped at least once, due to Marin's mountainous terrain. Some water is pumped up to 6 times before reaching its destination.

While there are mountainous streams uphill of the Marinship site, none of these streams traverse the site above ground; they are released via underground pipes at the shoreline.



Regional and Local Hydrology

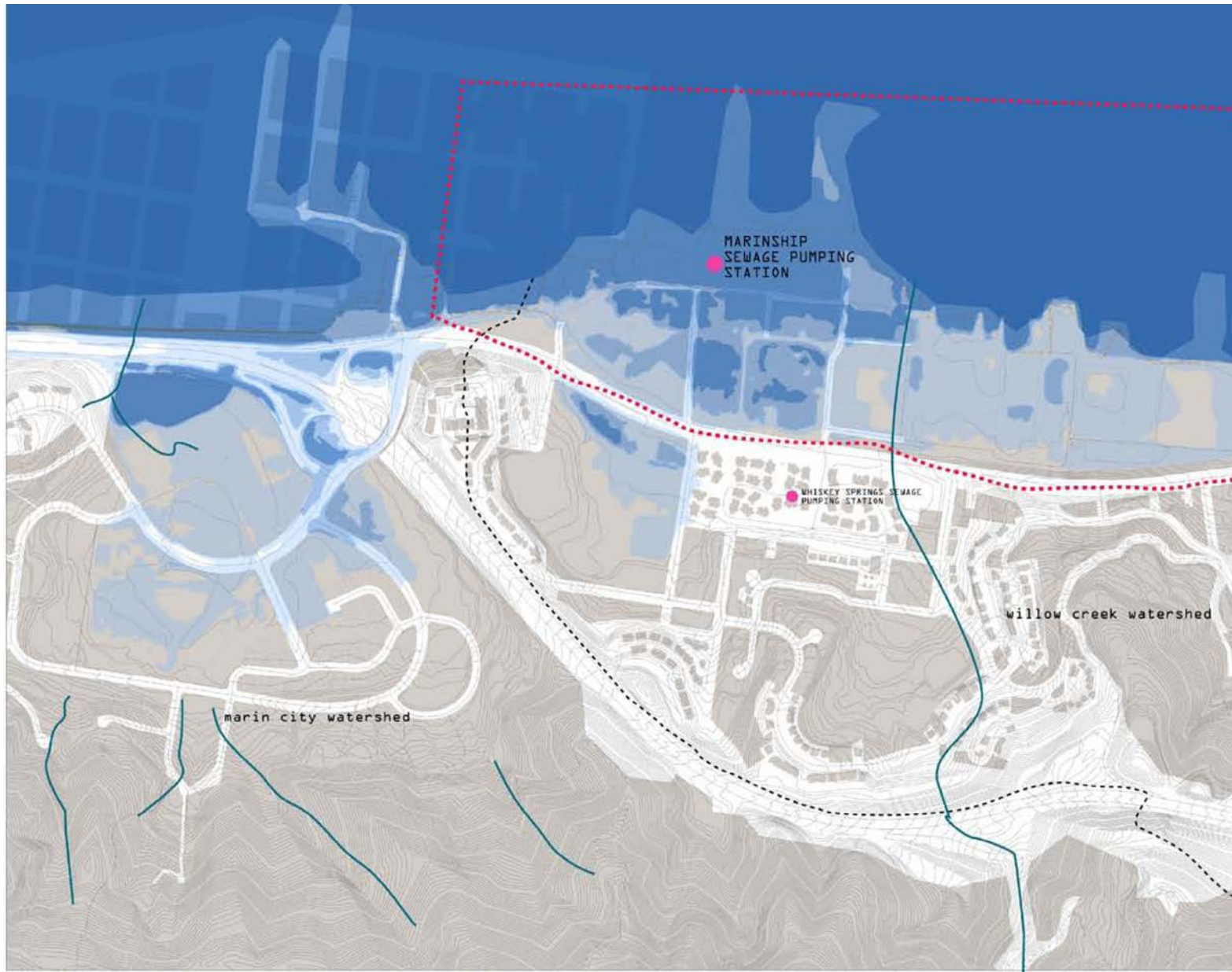


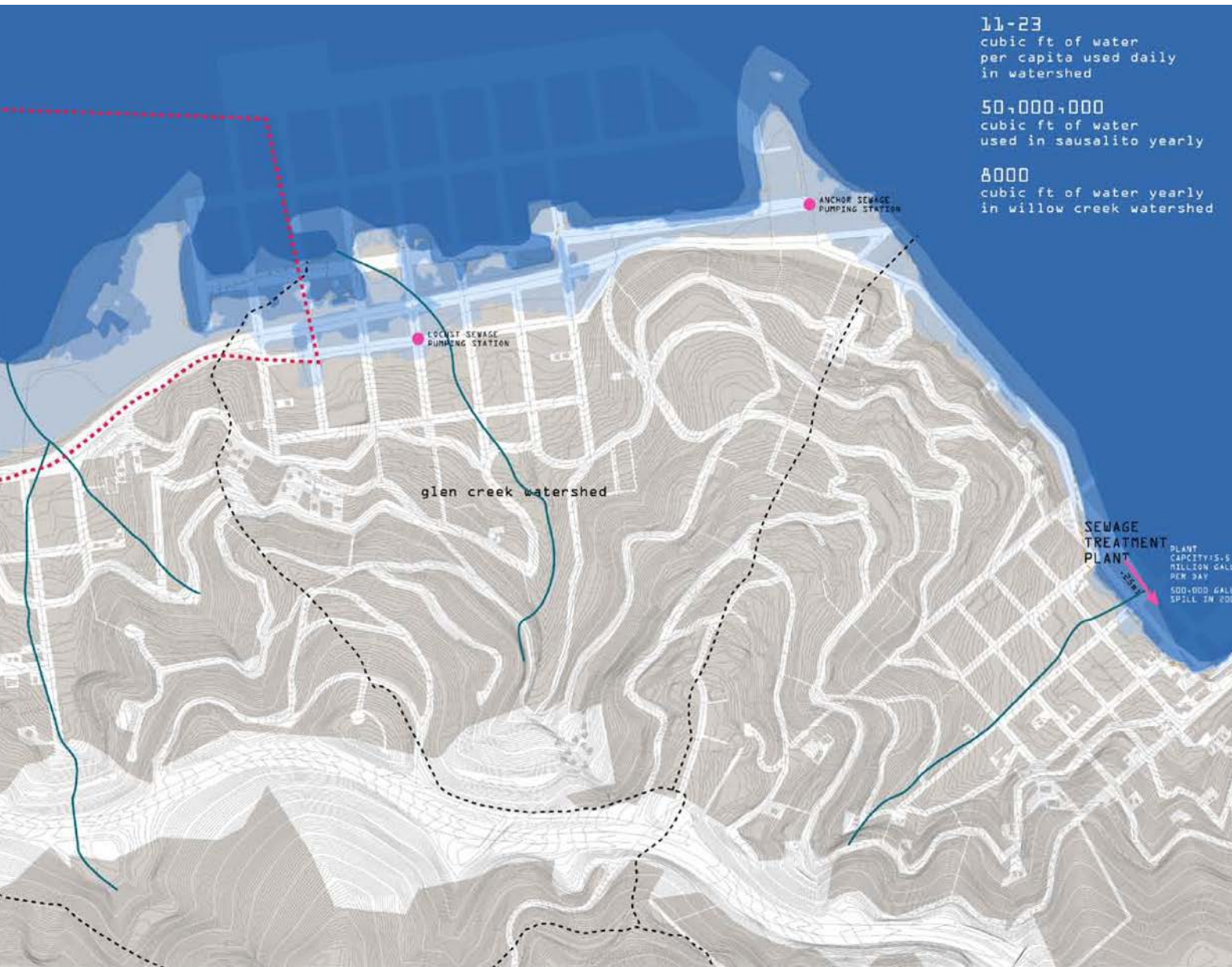
Marinship Property Rates and Major Vacancies

Economics

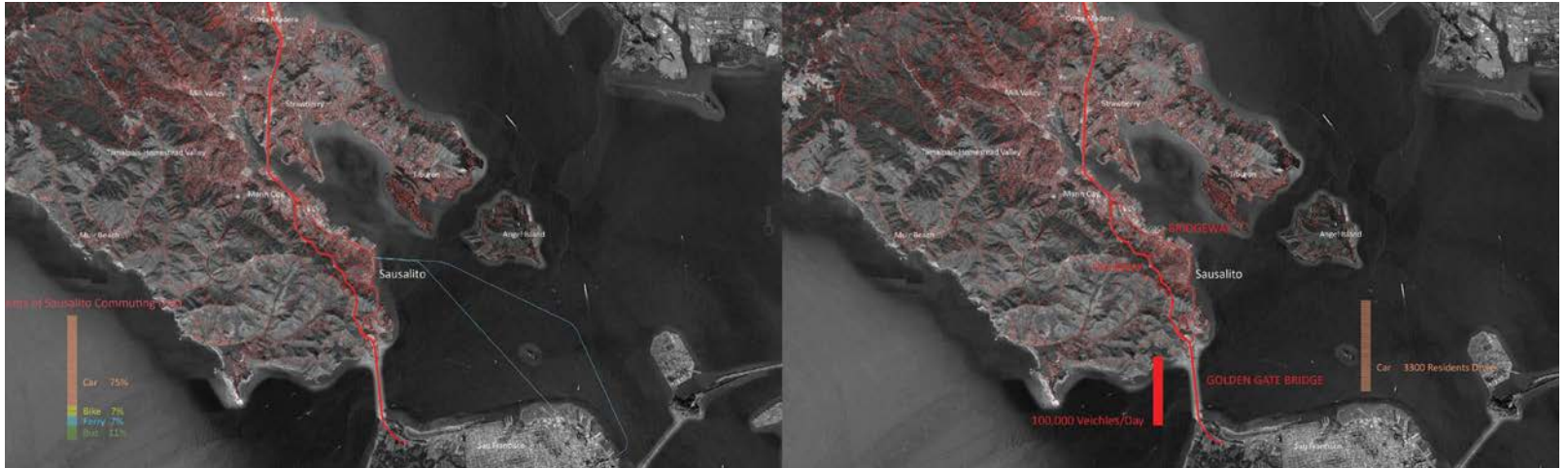
A large number of workers commute out of Marin County into San Francisco daily, mostly by car and mostly alone. Simultaneously, workers in more affordable areas to the north commute into jobs in southern Marin. The average southern Marin housing price in 2004 was \$685,000, with the 1990's to the early 2000's showing a 95% increase in housing prices and only a 24.5% increase in average household salary, according to a report by the Marin Economic Forum.

Yet there is a more subtle story. One in three businesses in Marin county are home-based, and in Sausalito, one in ten working residents work from home. Small and medium-sized businesses are growing faster than larger ones in Marin County, and the Economic Forum predicts that creative and intellectual capital-driven industries such as multimedia, green design, and specialized consulting will be the fastest growing sectors in the county. While the average commercial rent in southern Marin is \$3.07 per square foot, many of the Marinship commercial properties go for closer to \$2.75 per square foot. According to the Sausalito Chamber of Commerce, the office rental sizes most in demand are 500 to 1,500 square feet. Although the large warehouses in the Marinship district can be easily subdivided, the larger context of the site lacks restaurants and amenities for workers, and the district has several large, and numerous small vacancies.

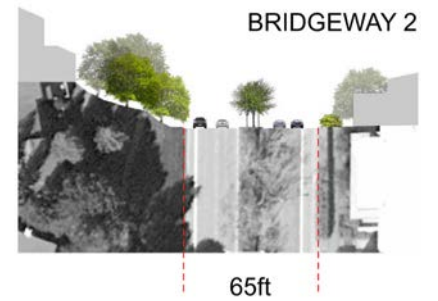
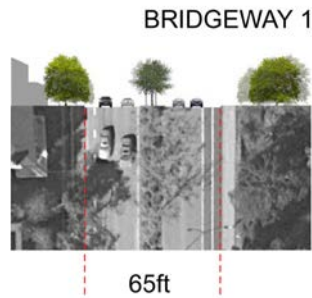
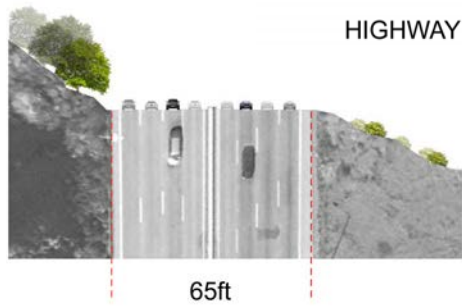




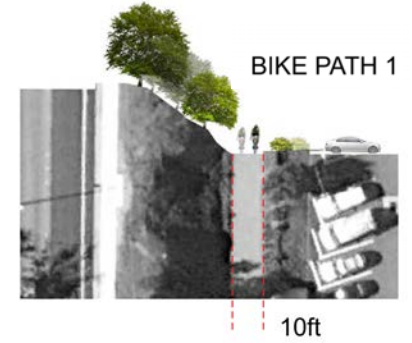
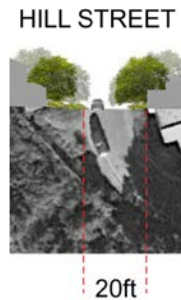
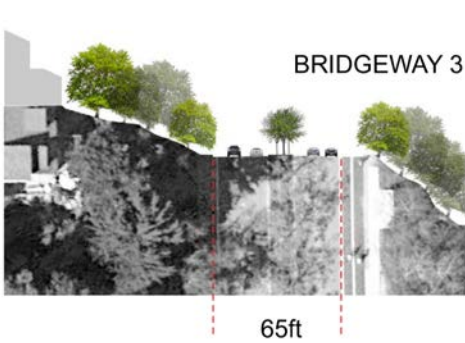
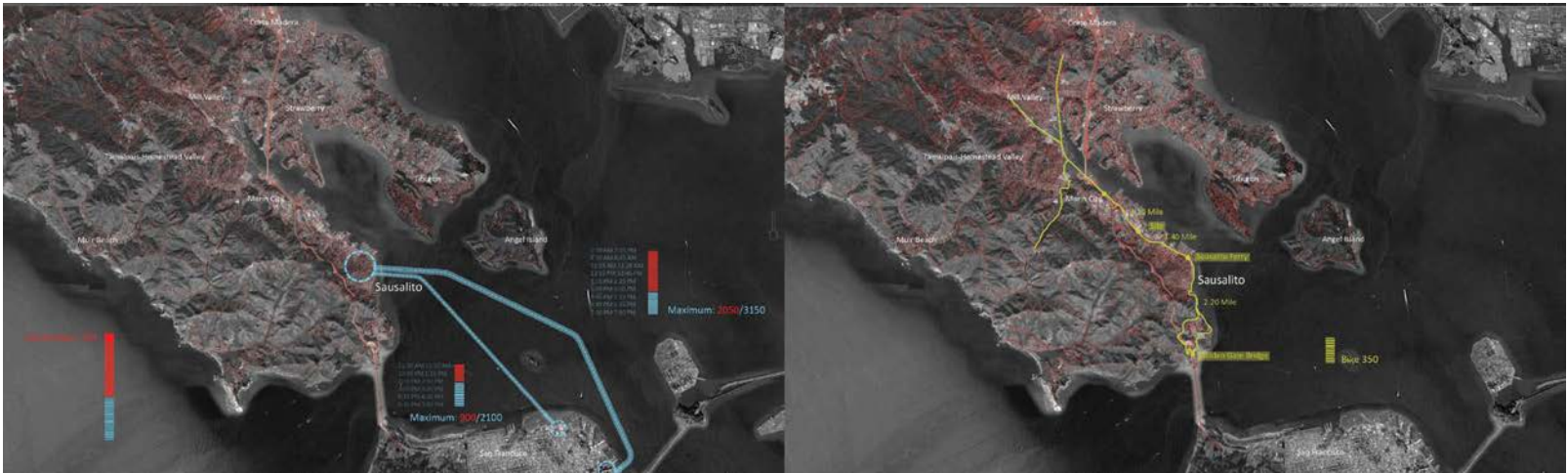
Traffic



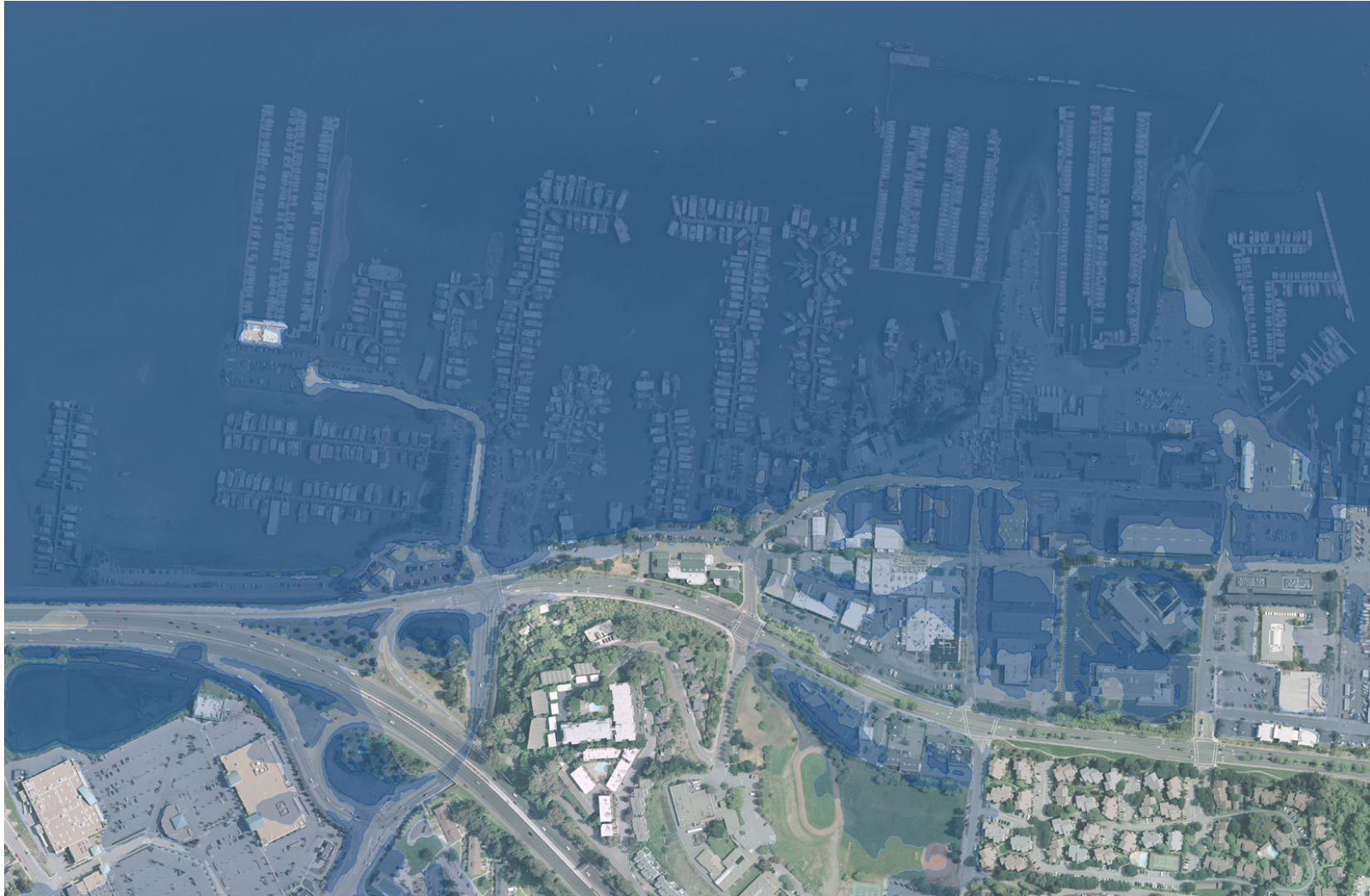
Sausalito Street Typologies



Traffic



Vulnerable to Inundation in 2050 & 2100

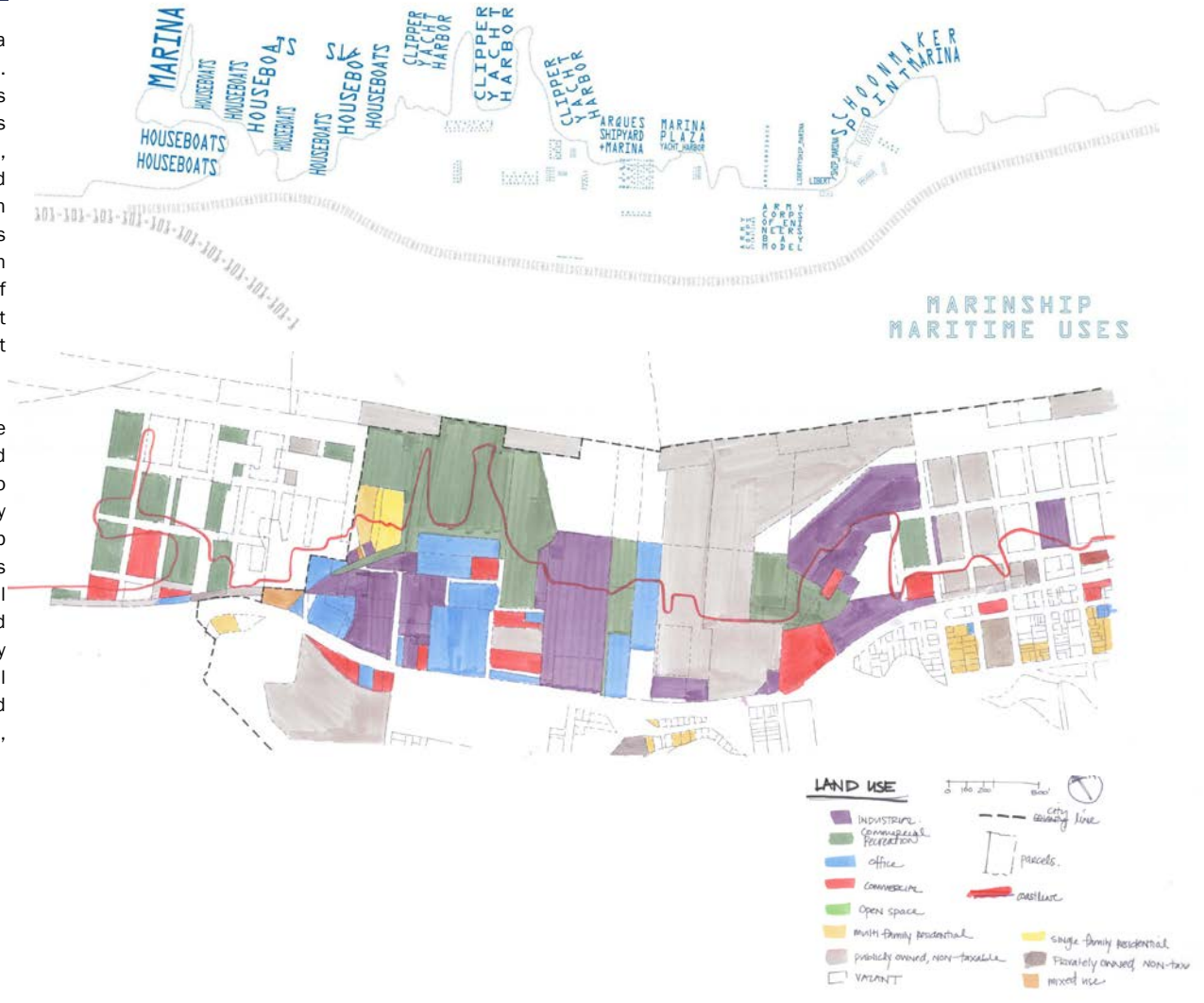




Land Use

While the Marinship district includes a variety of uses, each is relatively mixed. However, each use is strictly defined by its individual parcel. The primary land uses are commercial, recreational, industrial, and office, with dispersed retail uses and a small residential community in the north area adjacent to the houseboat docks (not shown on this map). This diagram also reveals the large square footage of vacant space in Marinship, a cue that at least parts of the site or buildings are not attractive to companies or individuals.

Examination of land use reveals the relatively disorderly parcel size and organization of Marinship compared to the regulated pattern of the adjacent city and marine blocks. Similarly, Marinship lacks clear roadway and access rights of way which further adds to its overall disorganization. The parcels that extend across the existing shoreline (noted by red line) and into the water are a historical remnant - Sausalito had once planned to extend its shoreline out to the black, dashed line.



Social Events

This diagram shows the population density during special events through the year, revealing greater use intensities.

The color pixels on the left reflect the annual houseboat tour, which is a very important event in Sausalito. The middle

dense area is a green open space that hosts the Sausalito Art Festival every September. It attracts 50,000 visitors every year. The city hall of Sausalito, located in the east of the site, serves as a venue for many events and activities

throughout the year.

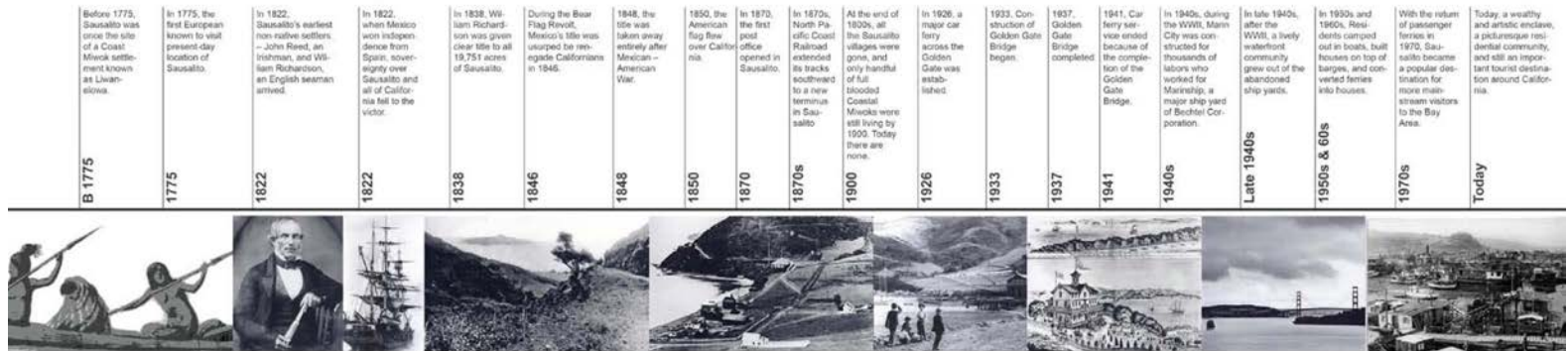


Density of Social Events and Activities

Physical History



Historical Events





Building Footprints

Grain & Texture

The grain and texture of Marinship is quite apparent when compared to the retail and residential neighborhoods to the west, across Bridgeway Avenue, and to the adjacent houseboat communities and marinas to the east. The massive building footprints on the site dwarf the finer texture of the boat community and the buildings of Sausalito's typical city blocks. Additionally, the consistency of the urban fabric varies within the site, in contrast to the relatively even pattern of the adjacent communities. The overwhelming size of the buildings on site can be attributed to their past use as part of World War II shipyards. In this diagram, the dotted red line represents the existing shoreline and the dashed red line represents Bridgeway Avenue.

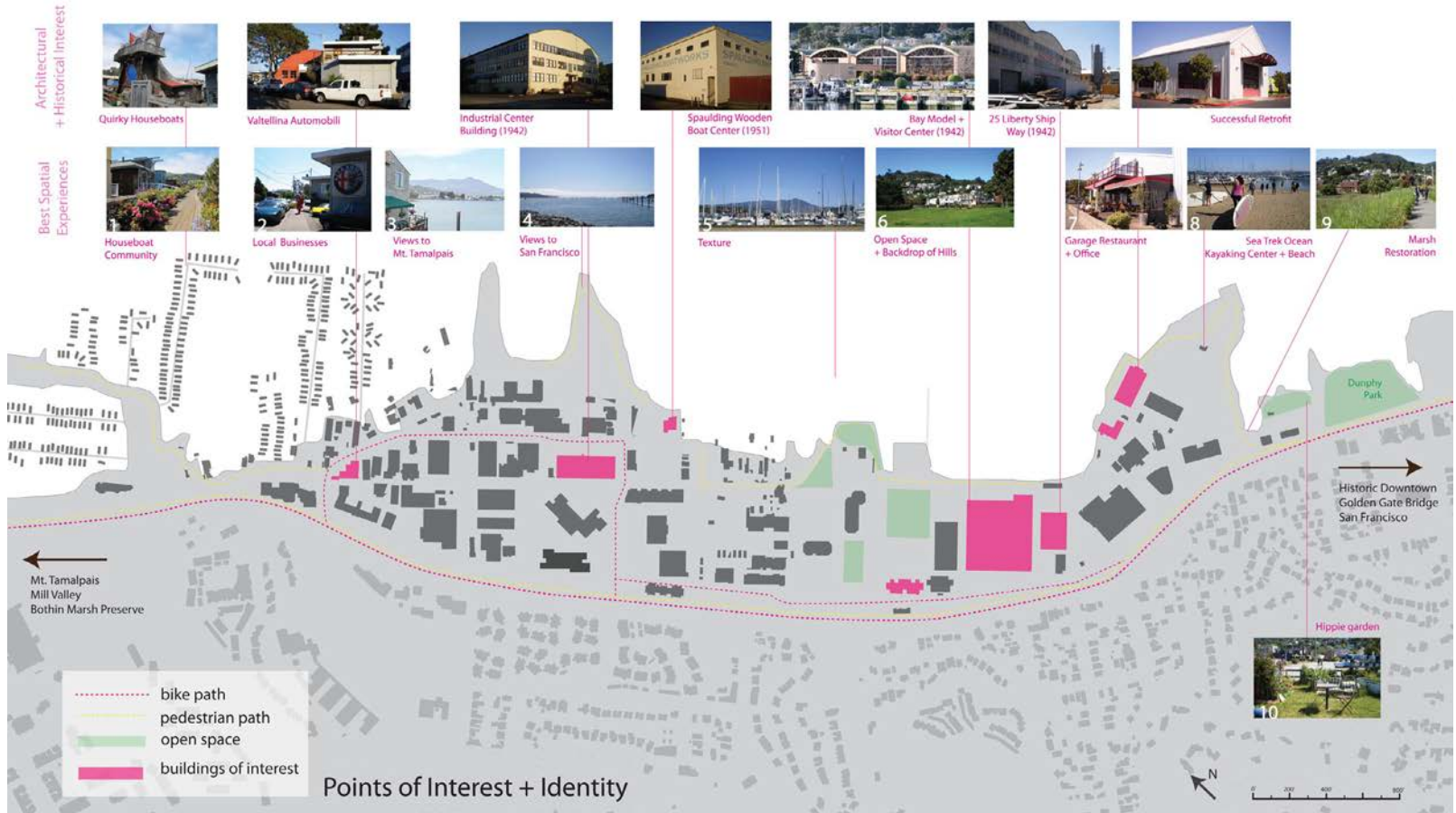


Open Space & Parking Lots

Open Space & Parking Lots

The Marinship district is dominated by asphalt and gravel parking lots. Furthermore, in observing the site over the course of several weeks, it was noted that many of these parking lots were relatively empty for the majority of the day. Both diagram and observation suggest that the supply of parking overwhelms the demand for it. In contrast, there is instead a great need for more open green space, which is extremely limited along this potentially high value waterfront.

Points of Interest & Identity



Points of Interest & Identity

Marinship is a unique site, sharing some of the best and the worst qualities of Sausalito. Historically, the site is most well known for its use as a shipyard during WWII, originally constructed to build Liberty Ships. Many buildings of architectural and historical interest from this period still exist on site. Several of these buildings have been restored and retrofitted for reuse. For example, the Industrial Center Building currently houses artist studios and other small businesses. Another WWII building is now home to the popular Bay Model and Visitor Center. On the south end of the site, a community of buildings has been retrofitted to serve as

small offices and restaurants, such as Le Garage. Other buildings continue their use in the maritime industry, such as Spaulding Wooden Boat Center, one of the last wooden boat builders in the area. The remaining historical buildings of interest, while deteriorating and in disrepair, add to the character of the overall site. Additionally, the intermittent bike and pedestrian paths in Marinship make it difficult to navigate between these points of interest through the site.

Marinship also has some great spatial experiences. The houseboat community located north of the site is an example of

a sustainable and successful community, and therefore can be seen as a model for future growth. Views are punctuated by the pattern of sailboat masts in the marinas against the backdrop of the hills on one side and the Bay on the other. Similarly, the site offers magnificent views north to Mount Tamalpais and south towards San Francisco. Other successful spaces in Marinship include a man-made beach where groups of kayakers, paddle boarders, and swimmers take advantage of the waterfront. A large area of marsh restoration also provides a natural oasis of green with a field of parking lots. Lastly, a variety of local businesses across the

site, such as Heath Pottery and Valtellina Automobili, provide an intimate, local character to an otherwise dispersed and disorganized area.

These divergent characteristics, both spatial and architectural, form the identity of the Marinship district and set the stage for design explorations that address future growth and sea level rise.

Summary

There are several important factors that contribute to the future of the Sausalito waterfront. Historic, socio-economic/cultural, transportation, land use, topographic form & building massing, hydrologic, ecological, and climate concerns are vital in understanding how the waterfront will potentially shift over time. These factors intersect to create a network that is constantly in flux, requiring future analysis and design to integrate

all systems in order to ensure a healthy transition for the Sausalito waterfront.

WEEK
02

URBAN DESIGN: 100 ACRES

What opportunities does sea level rise pose for Sausalito? The second week studio challenged the group to conceptualize new forms, urban spaces, mix of uses, and efficient utilization of land. How can urban design embrace the past and the future? How can waterfront cities adjust to a continually changing shoreline? Parks, plazas, trail systems, corridors and new building concepts provided some of the building blocks for this week's urban design proposals.

In week two, the students developed urban design plans that built on week one's broad studies and responded to the specific characteristics of Sausalito.



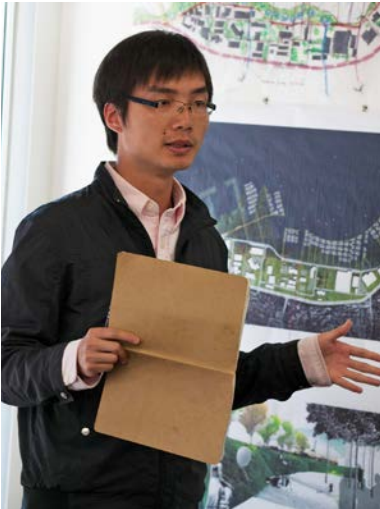
WEEK TWO: URBAN DESIGN VISION

40



MAKING DESIGN DECISIONS IS DIFFICULT, BUT MAKING DESIGN DECISIONS





FOR 100 YEARS FROM NOW IS AN EVEN MORE CHALLENGING ENDEAVOR.



SACRIFICE + TRANSFORM

Yizhou Xu



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Yizhou's idea is to use a process-based design strategy to solve the sea level rise problem, sacrificing one part of the site to protect the rest and changing the site step by step, and eventually to be a self-regulating eco system – a place of nature process, time and interaction.

In his scheme, one third of the site would be used as a buffer zone for the rest of the site, offering marsh landscape for people and habitats for animals. Meanwhile, utilizing existing material as a resource for new project construction could make the proposal more feasible, economical and sustainable. Also, his strategy includes the solution for soil, water and plants that are the key elements for a successful landscape design.

PHASING

Sea level rise is not an instant change, but a process. A process-based design seems perfect for a changing process.

The process begins with the existing conditions including many storage buildings and extensive paving but few trees. The goal is to use the debris of these constructions on the existing waterfront to elevate and eventually protect the rest of the site from the sea level rise. Also, the current hard-paved waterfront could be transformed into a wetland in future.

Phase I: Remove pavement and infrastructure underground. Use debris of buildings and pavements to build dikes and levees.

Phase II: Plant trees and other plants to improve the soil condition, and prepare to transform structural soil to wet lands.

Phase III: Use some of the trees to build new walking/biking system, new docks, and boathouses. Transplant the rest of the trees to the reserved land to improve the

environment of the site.

Phase IV: Use tree pits as rainwater catchments, and create continuous water features with streams. Plant marsh plants and bioswales to protect the levees, and use them as a filter for water drained from the community.

Phase V: With sea level rising, waterfront would be transformed to wetlands, providing a variety of wildlife habitats.



Existing Condition



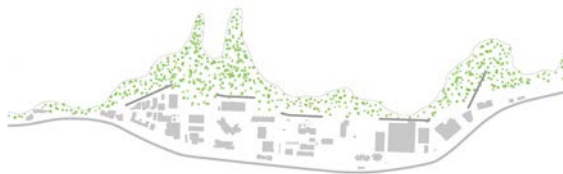
Phase III: 30 Years



Phase I: 5 Years



Phase IV: 50 Years

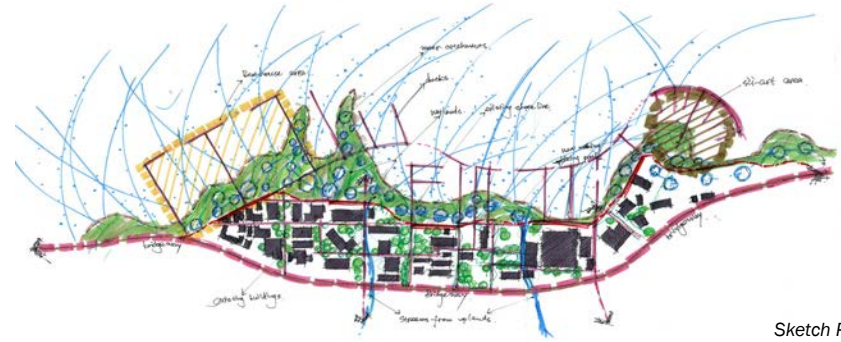


Phase II: 10 Years

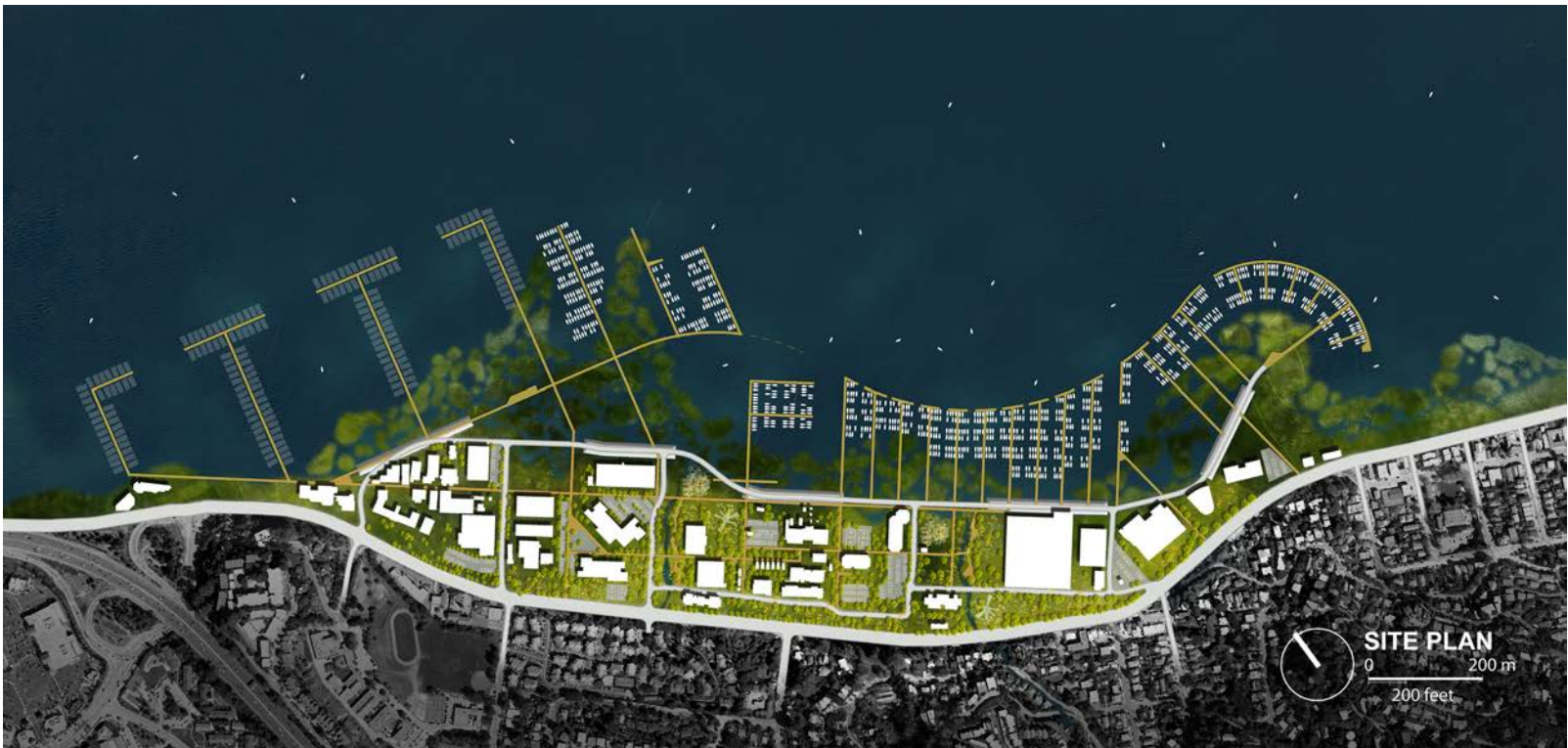


Phase V: 100 Years

“Sometimes retreating is the best way of advancing, and a small sacrifice brings much more than expected.”

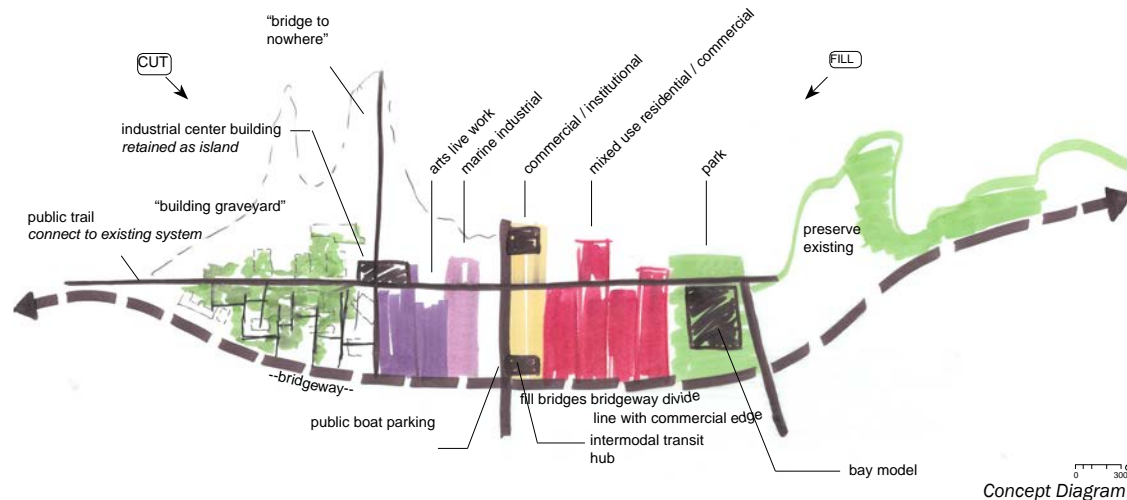


Sketch Plan



ABANDON & DENSIFY

Mia Scharphie



Concept Diagram

Mia responded to rising sea level while also supporting the small-scale and home-based businesses in Sausalito, providing amenities for its aging population, and facilitating working opportunities that don't require commuting. Her scheme proposes a simple cut and fill strategy, taking land from one part of the site and using it to fortify the rest of the site. Fill builds up a series of programmatic 'bars' that jut off of Bridgeway at the places where the grade difference between Bridgeway and the current site is the greatest; in this way, and by putting development on the edge, the current divide that exists between the shore and the hills is mediated. These bars are built to be above sea level in a FEMA flood in 2100, but each has a strategy for responding if

levels continue to rise. In the mixed-use neighborhood, homes can be 'unclicked' from the grid and floated so that although land might become sea, no net real estate is lost. Other strips have levees, and some have floodable structures.

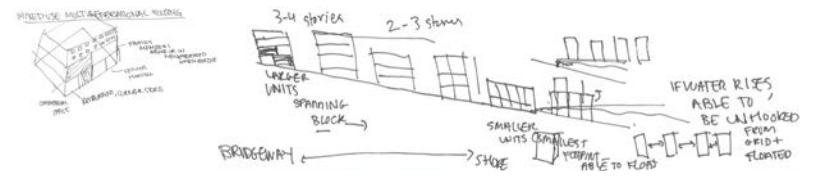
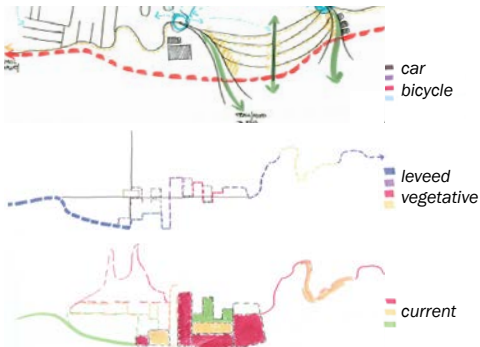
The mixed-use multigenerational zone is oriented to host the small-scale creative businesses which are common in the area, and their modular layout allows room for growth and expansion as companies develop. While all units can serve as either live or work spaces, the bottom floors of many of the buildings host smaller dwellings to serve as senior apartments. The mixed-use nature of the neighborhood means that amenities, supplies and outdoor experiences are easily accessed

by pedestrians.

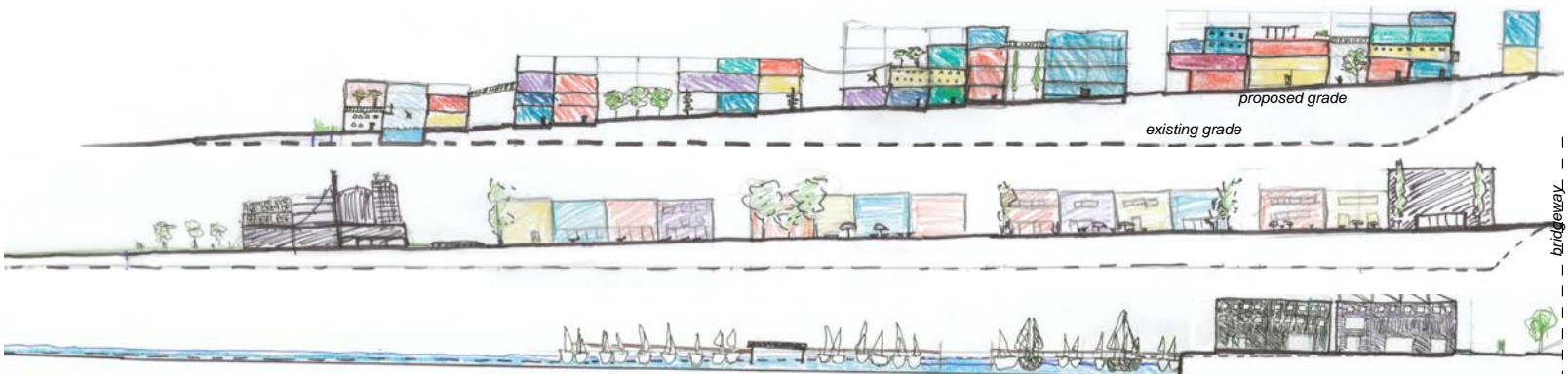
The area from which land is taken currently hosts industrial scale buildings, scattered almost haphazardly across the site. These buildings have unengaging exteriors, but often contain beautiful structural frames. As the land is taken from these areas, the exteriors of the buildings will be stripped off. The bones of the buildings will be sealed and allowed to remain as a 'building graveyard.' It will be both a testament to the development that used to exist before humans altered the climate, and will become the structure and viewing platform for a new water-filled 'art park' with installation pieces that viewers can enjoy from platforms on the structures, or by boat.



“The project address rising sea level while also supporting the small-scale and home-based businesses in Sausalito, providing amenities for its aging population, and capitalizing on the quirky, artistic history of the site.”



Sketch of Housing System and Future Flood Resiliency



Sections of Programmatic Bars
from top to bottom: residential, commercial/institutional, marine industrial

TRAYS

Richard Crockett

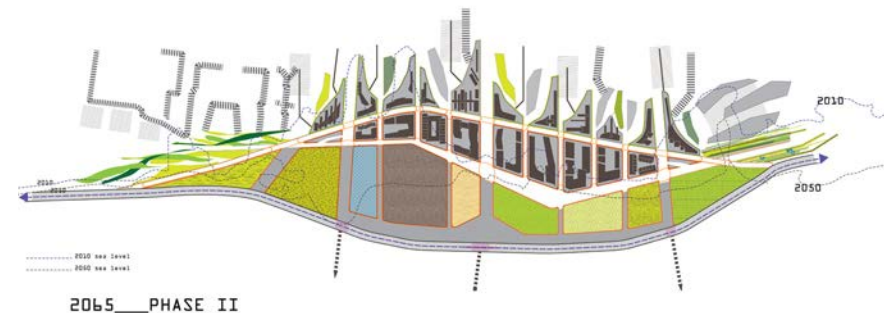
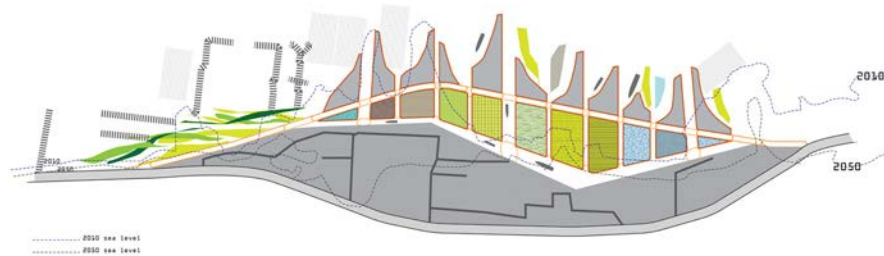
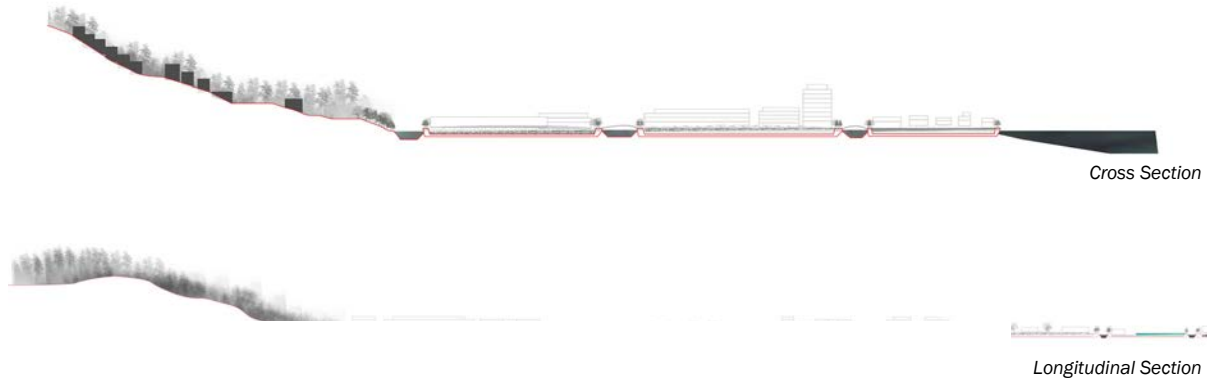


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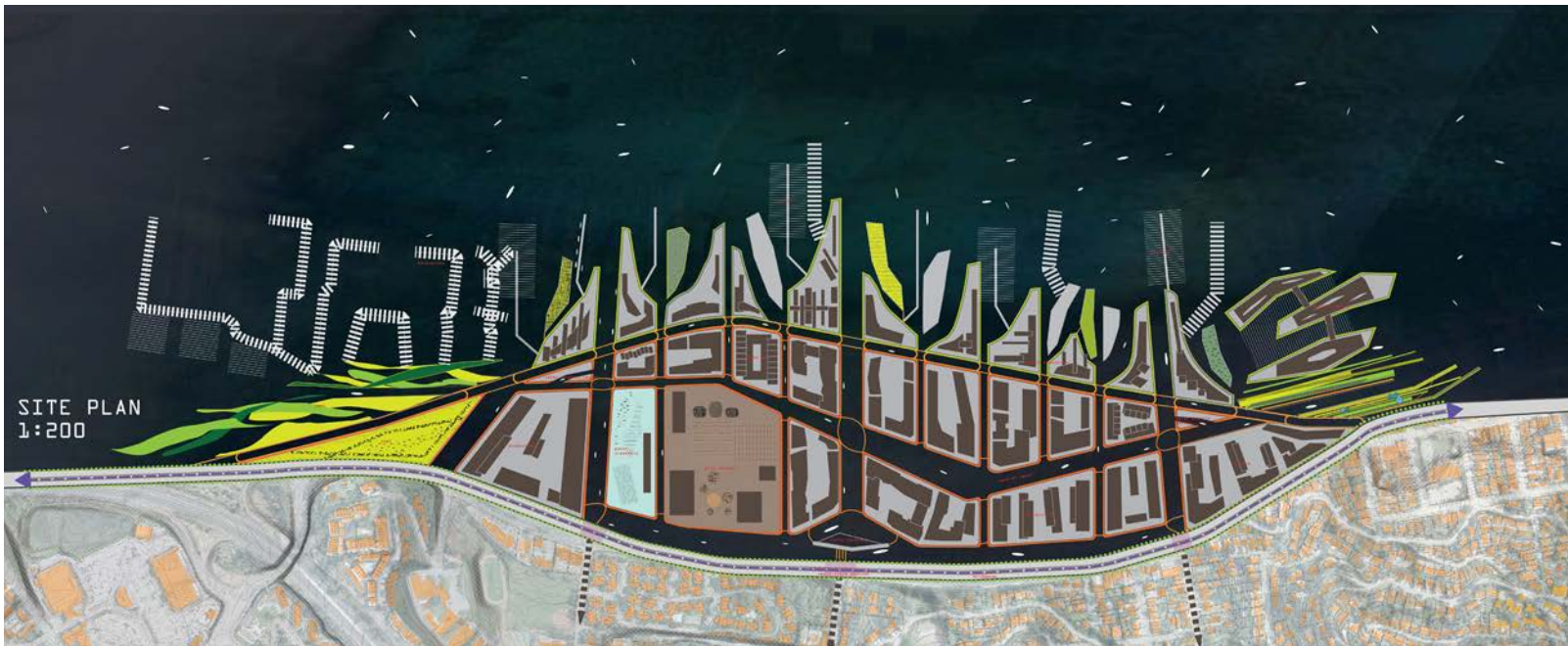
This concept is about building a new neighborhood around adaptability in the face of uncertainty. It's a way for a locality to have control over their response to sea level rise through an adaptive and production based urbanism. This concept takes inspiration from Marinship's culture and heritage by preserving and catering to the marine industrial uses that now characterize the site and by creating a new "water city" where canals and the bay are integral to the way people and goods get around.

Central to the scheme is the idea of 'trays' forming the new neighborhood structure. New blocks are organized and surrounded

"TRAYS' is a vision for a community to have complete autonomy over their response to sea level rise. It's a plan for an adaptable and production based urbanism. "



2065 PHASE II



Site Plan

by levees that are built to be expandable, and filled as the water rises and land uses change. Marinship will be prepared for temporary and diverse uses. The trays will be made on site from constructed soil at the new soil factory. The material will be exported throughout the bay to protect community against sea level rise. The new material, which is similar to what lines canal banks in some developing

countries, is made out of compost (from the city of Sausalito), sand from the ocean, bay mud from dredging, and cement.

The trays are highly adaptable based on land use. When land becomes obsolete from the rising water, trays can take a productive function such as agriculture, aquaculture, salt ponds, wetlands, and

water treatment. When they are to be developed, trays can be expanded as the sea level rises.

The new Marinship will be about water transport and marine industry. To deal with the removal of personal vehicles from Marinship, several options will be available: water taxi, a Marin shoreline

circulator, a ferry to San Francisco, the proposed Sonoma-Marín SMART train, and the new neighborhoods.

INTERTIDAL PARK

Hyunjoo Nam



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Hyunjoo Nam proposed public shoreline spaces and infrastructure in response to future sea level rise. Although smaller patches of wetlands dot the Richardson Bay shoreline, large tracts exist in the some parts. Living shorelines benefit society. Wetlands filter pollutants out of water, sequester carbon, provide recreational open space, and create critical habitat for fish, wildlife and millions of organisms that live in tidal mud and are the basis of aquatic food chains. To protect various natural sources, this design proposes an "Intertidal Park" that can amplify different experiences of high and low tide.

"The strategy is to create a valuable public shoreline space and infrastructure by contrasting and amplifying the different experiences of low and how tide."

Precedent Images

PELAMIS SEA SNAKE_Orkney, Northern Scotland



The tube, created by Scottish company Pelamis Wave Power, is the length of about five train carriages and sits on the ocean's surface like a sea snake.

The device converts wave power into electricity: wave motion pushes hydraulic rams into a generator, which in turn, pressurizes oil that is used to drive a turbine.



Tidal Power Plant_ la rance, France

BAY WATCH_Cape Cod, MA



The demand for Cape Cod's resources is apparent in its recent but rapid growth. The increase of recreational use, commercial and residential development, and the resultant pollution threaten delicate coastal ecologies and disrupt the open, visual character which is crucial for the tourist economy.

We propose a wet park; a mutable working ground for the enjoyment and awareness of the connectivity of hydrological functions. Our strategy bridges the high maintenance, relatively low diversity of recreational land and the low maintenance, high diversity of wetlands through the appropriation of an agricultural framework to organize variable habitat and programmatic zones.



FLOATING POWER PLANT_Denmark



The floating device has successfully demonstrated the capacity to generate both hydraulic power from waves interacting with floats and electricity from wind using turbines mounted on the platform.

A model wave energy generator floats on the waters near Limfjorden, Denmark. It consists of two pontoons hinged down in the middle with a hydraulic power system placed in the middle to turn wave power into electricity.

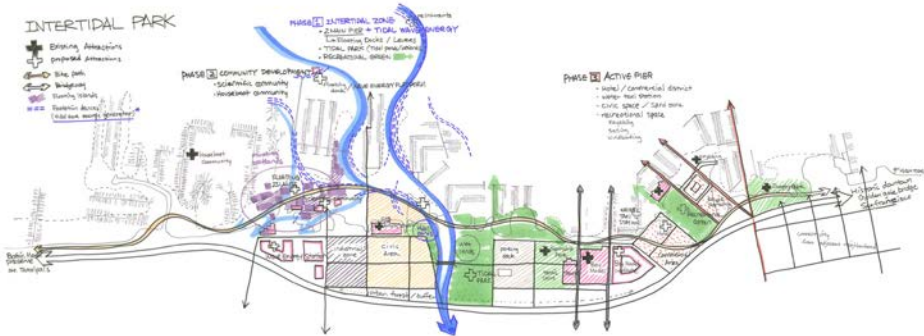
Although earlier experiments with wave power faced problems in rough seas, global wave and tidal power has an estimated energy potential of 2,000 Gigawatts.

WAVE DRAGON_Milford Haven, Dyfed, UK



The proposed Wave Dragon at the test station. Wave Dragon is the first offshore wave energy converter to produce power to the grid.

The platform includes a crane, mobile work platform and a container with measuring equipment, underwater camera, weather monitoring equipment, security equipment etc.



In the scheme, floating devices along the shorelines harness the tidal wave energy that benefits the adjacent community. The devices function as pedestrian paths, bike paths, view spot, steps, and promenades.

Phase 1: Intertidal Zone

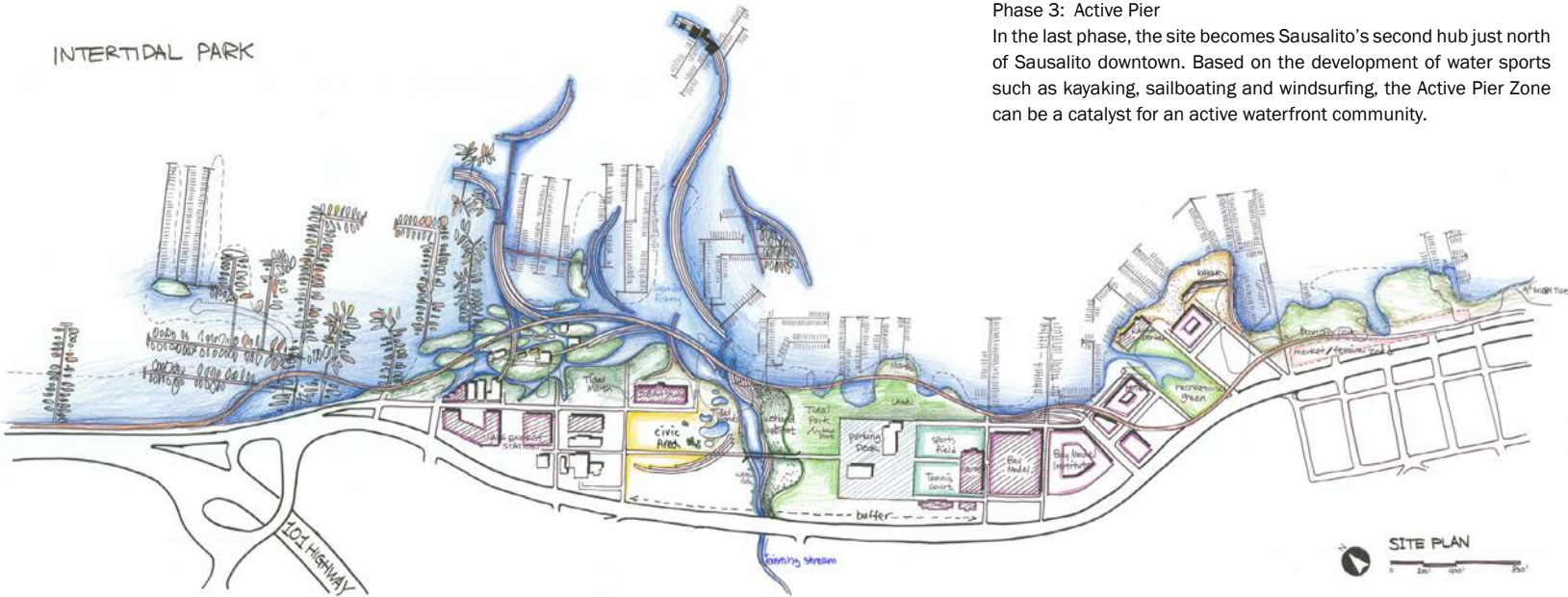
With the floating devices, water flows into the town to connect existing stream, creating tidal park and recreational green spaces. In the intertidal zone, the floating devices help to create park and civic area susceptible to future inundation. Water flows through a series of shallow tidal ponds and wetlands.

Phase 2: Community Development

The district's scientific community can participate in establishing a Wave Energy Station that harvests wave energy predicted as part of the sea level rise. Furthermore, existing houseboat communities are developed more in this phase.

Phase 3: Active Pier

In the last phase, the site becomes Sausalito's second hub just north of Sausalito downtown. Based on the development of water sports such as kayaking, sailboating and windsurfing, the Active Pier Zone can be a catalyst for an active waterfront community.



RIDGES AND VALLEYS

Kate Hayes



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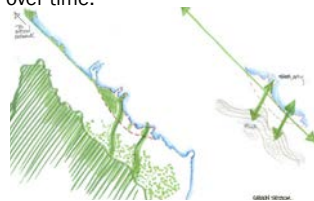
“By extenuating the juxtaposition between valley and ridge, coupled with a new, adaptable community, the scheme reveals a very gradual process that unfolds over time.”



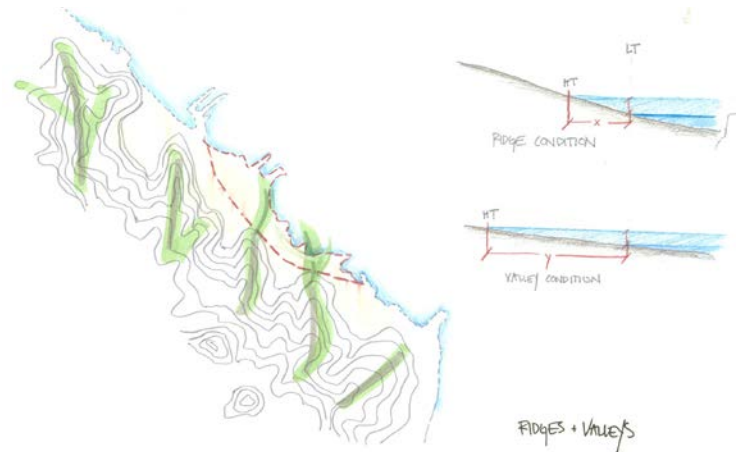
Aerial Perspective of Site Plan

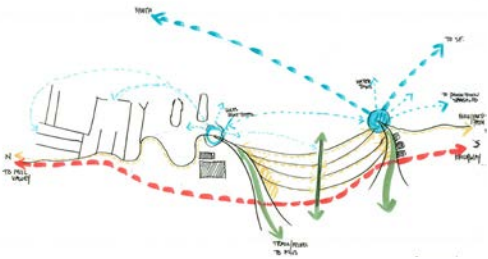
Kate’s strategy to address the inevitable issue of sea level rise in Sausalito is based on the main landscape typology of the region: ridges and valleys. She proposed extending the natural, existing ridgelines of the Sausalito hills down and across the site through the design of two land bridges. Acting as social and ecological corridors, these land bridges would effectively capture and redirect the currently disconnected flows to, from, and through the site - reconnecting the hills with the Bay, and Sausalito with its waterfront. Additionally, the urban fabric of the proposed mixed-use, valley community would be adaptable, built to succumb to rising water levels and designed to remain functional even when inundated.

Ridge and valley conditions are dynamic in their interaction with changing water levels, both in terms of daily tidal and long term sea level rise; the impacted horizontal distance varies drastically per condition. By extenuating the juxtaposition between valley and ridge, coupled with a new, adaptable community, the scheme reveals a gradual process that unfolds over time.

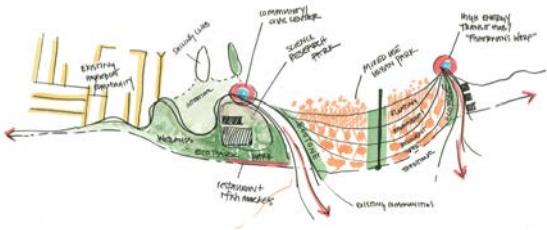


Land bridges as “green fingers” - an ecological extension of the existing green system.





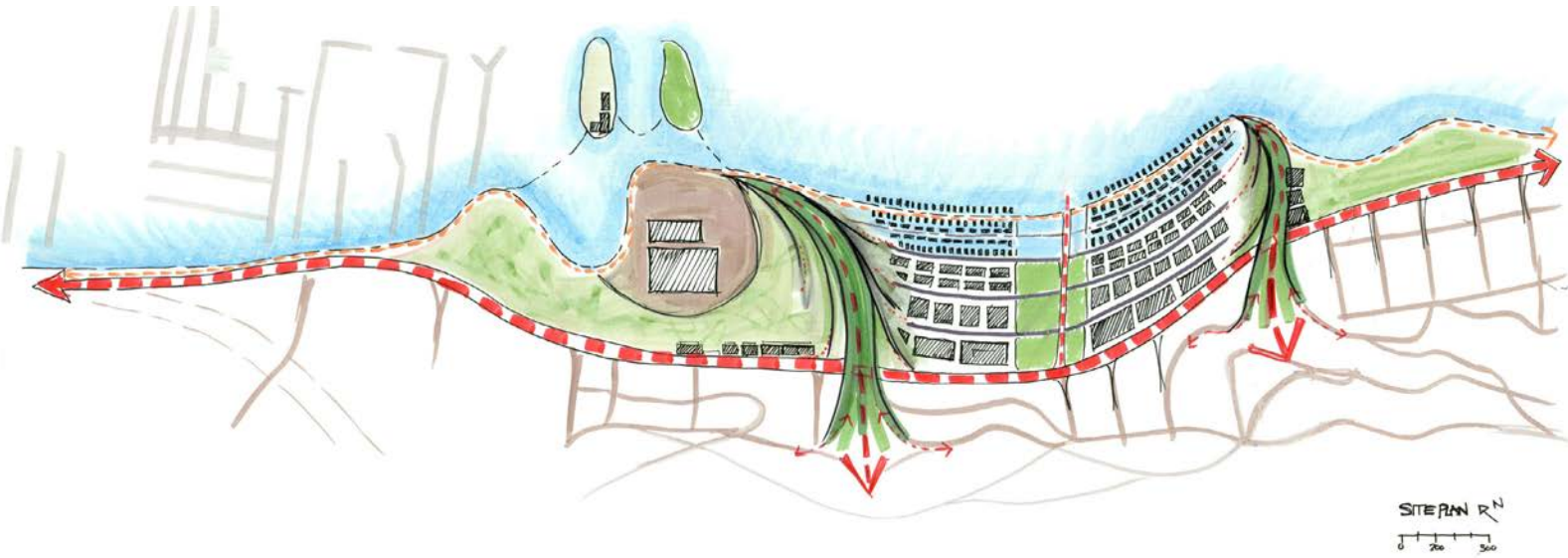
Circulation



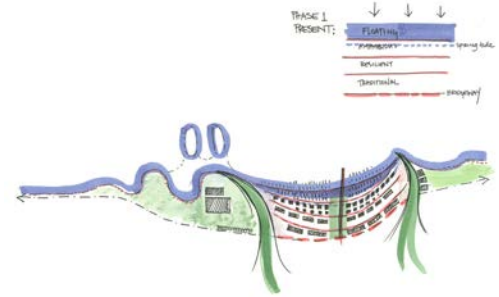
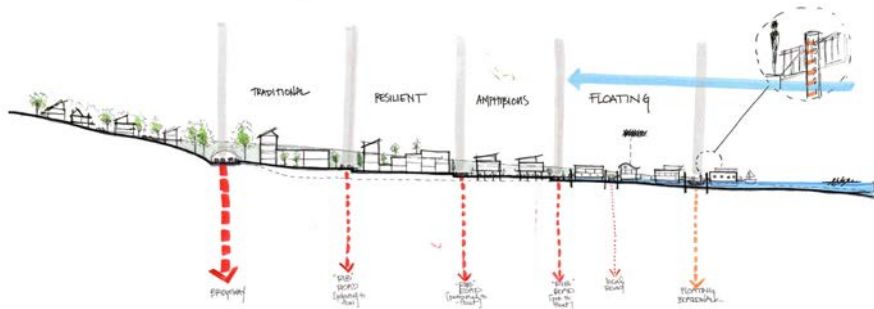
Land Use

Circulation along the site is defined by existing Bridgeway Boulevard with ties into the site via the proposed land bridges. A new pedestrian and bike path, designed to eventually float, parallels the existing shoreline and creates a continuous alternative to the existing intermittent path. At the tips of the two land bridges stand a local community and civic center and a high energy transit hub.

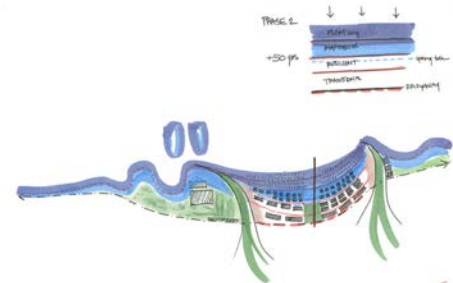
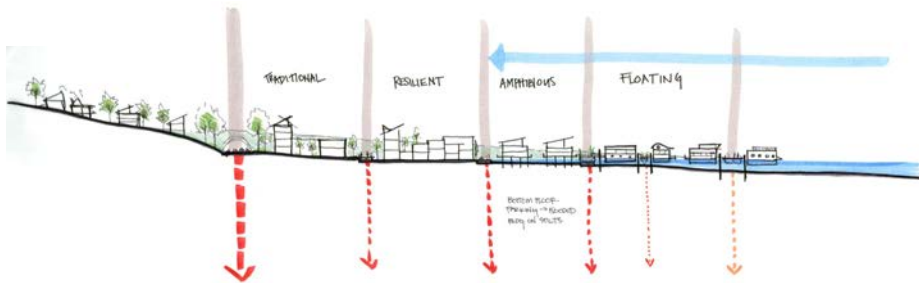
In addition to reconnecting the hills with the Bay, the land bridges redefine two spatial valleys and an ecotone that acts as a threshold between ridge and valley. The first valley, an ecopark, forms an extension of the existing greenway and houses the new Global Research Center for the Study of Sea Level Rise in the historic, WWII Industrial Center Building.



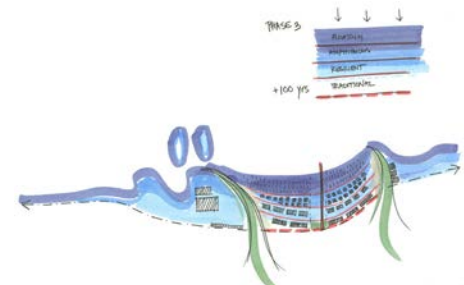
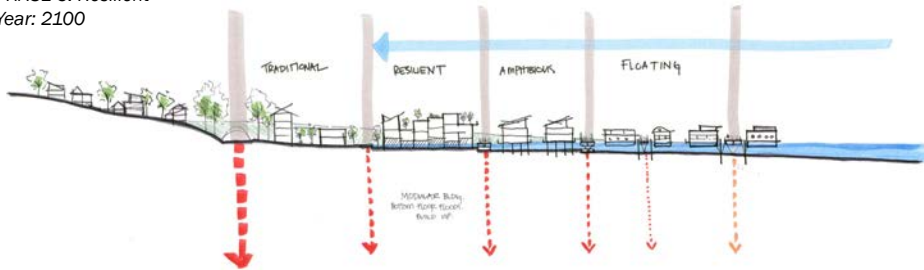
PHASE 1: Floating
Year: present



PHASE 2: Amphibious
Year: 2050



PHASE 3: Resilient
Year: 2100



Phasing: Sections

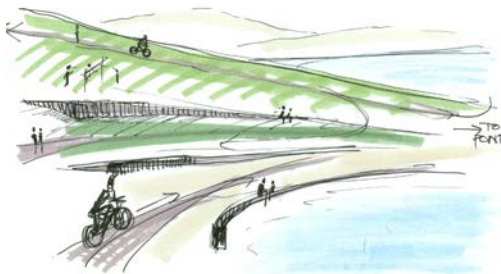
Phasing: Plans

With wetland habitat at the front door, scientists can actively engage the surrounding community in their research. As water levels rise, this ecopark will eventually flood and become another protected harbor of the Bay.

The second valley is occupied by an urban park, built to withstand and adapt to rising sea level. The striated structure of this new community attempts to make the gradual change more visible overtime, creating an experience and therefore a better understanding of the phenomenon of sea level rise. A prototype for other waterfront developments, this new community can be identified by four main, terraced zones suited to various water levels: floating, amphibious, resilient, and traditional. As water levels rise, this infrastructure adapts. Ground floor parking structures of amphibious structures flood and become buildings on stilts. And resilient modular buildings abandon their ground floors and in response, build up.



Conceptual Model and Sketches



With a strong, central spine and high density development, the design goal of this new urban park is to have a similar experience and feeling as the successful houseboat communities nearby. Building on the intertwining systems, or spatial heirarchy, of communal space, this new community would foster the connectivity of the land bridges and encourage an adaptable lifestyle. Furthermore, the overall inrastructure of this new mixed-use community would promote a gradual transition from depending on cars to increasingly relying on biking and walking. Similarly, as water levels rise, transit will move from primarily land to water-based.

TETHERED ISLANDS

Fan Qi



“The developed islands are tethered along the floating deck connecting to the land.”



Houseboat Community



Floating Wetland Belt



Floating Deck

Fan Qi started with the treasures of the site, including the houseboat community. With his history and cultural values, his scheme explores how, with slow water level change, residents will notice the sea level rise and connect the houseboat community to the variable shoreline.

The overall urban design concept builds a floating deck along the original shoreline, keeping the houseboat community, creating a floating wetland belt along the deck and developing five new ‘islands’ for the future. The houseboat community is a valuable treasure of Sausalito and a worldwide example of sustainable response to sea level rise.

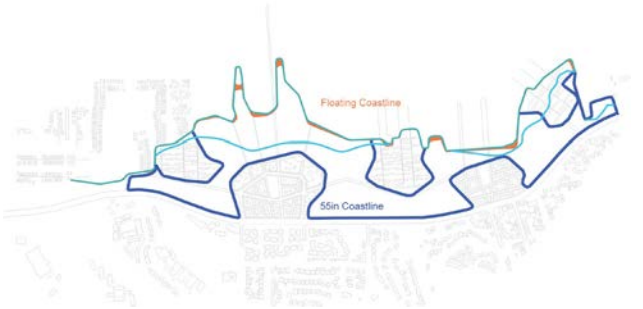
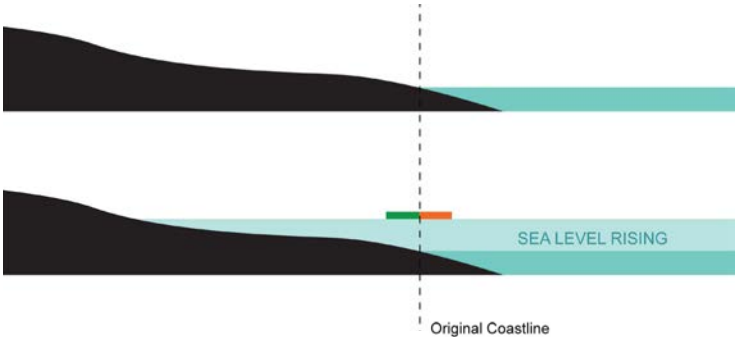
The “Floating Deck” will be built along the

original shoreline. It can float with rising sea levels and be used as a recreational space for biking, jogging, and swimming. The floating deck can also be a historic reminder of the original shoreline, helping people notice the issue of sea level rise. The “Floating Wetland Belt” will be built along the floating deck to provide a beautiful and creative landscape image. The floating wetland can filter pollution, such as oil spills, and function as a landscape and ecological system.

The “Tethered Islands” consist of five new urban development within the site. Three islands serve to expand the old houseboat community into a new “water town”. Two islands expand the uphill community public and entertainment uses.

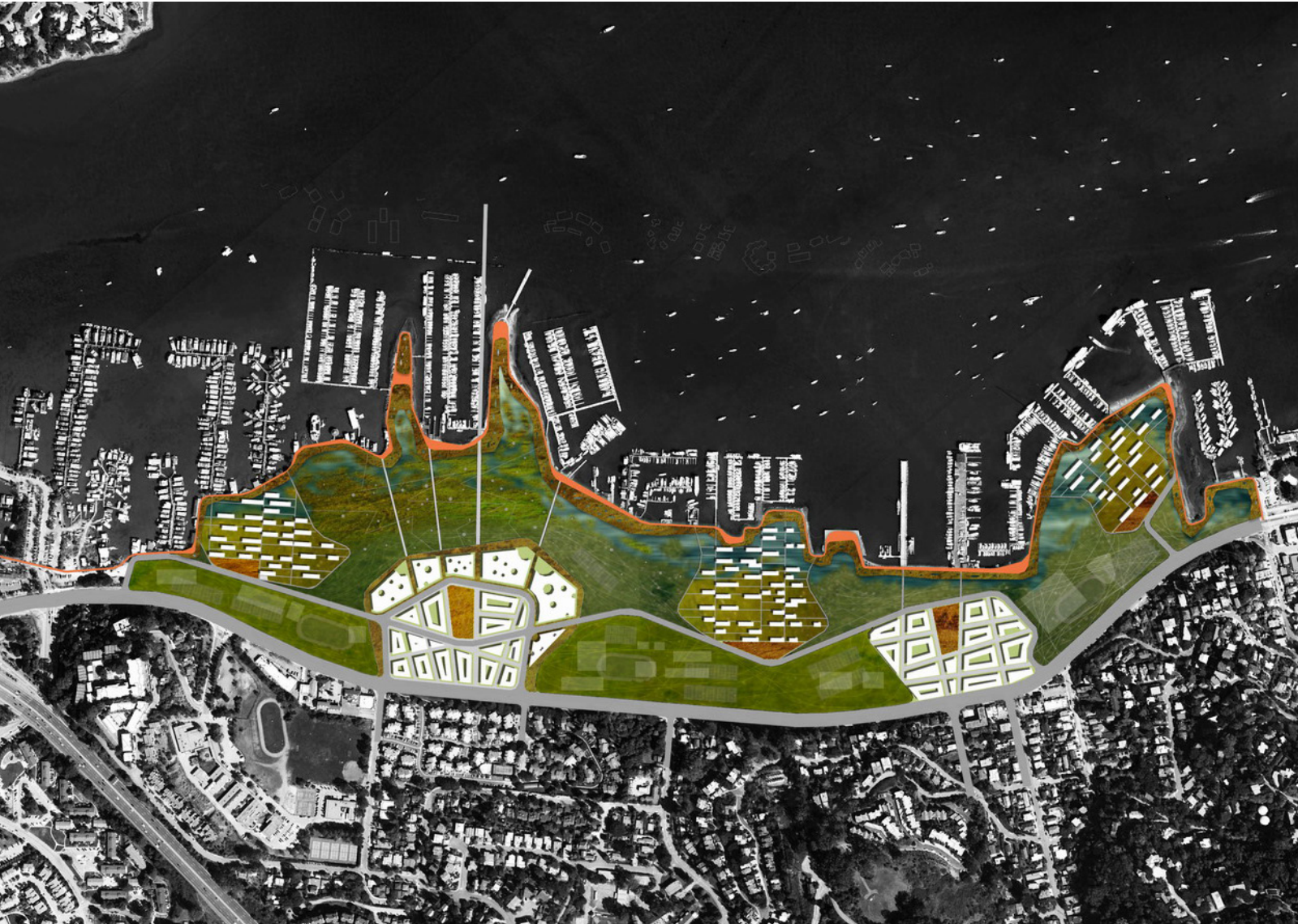
Overall, this scheme draws on key features of the houseboat community and the shoreline to preserve and reorganize the community, reinforcing culture, character and history of Sausalito.

“The original shoreline is the historic sign of the city which also notices the people of the sea level rise happening each day.”



The sketch of the ideas of tethered islands





WEEK
03

SITE DESIGN: 10 ACRES

Based on Weeks 1 and 2 studies, each student selected a preferred site of approximately 10 acres on which to test a site-scale design approach. As a starting point, the students began with a common program of a “Sci-Art Museum” featuring an innovative integration of Science and Art programs through architecture, media, immersive environments and interactive exhibitions that could highlight and interpret sea level rise.

In week three, the students envisioned a new Sci-Art Discovery Center to test their idea in a site design scale.



WEEK 3: SITE DESIGN

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THE TRANSITION FROM URBAN DESIGN TO SITE SCALE CHALLENGED THE STUDENTS TO





FURTHER DEVELOP THEIR LARGER STRATEGIES INTO MORE INTIMATE SCHEMES.



LAND BRIDGE PARK

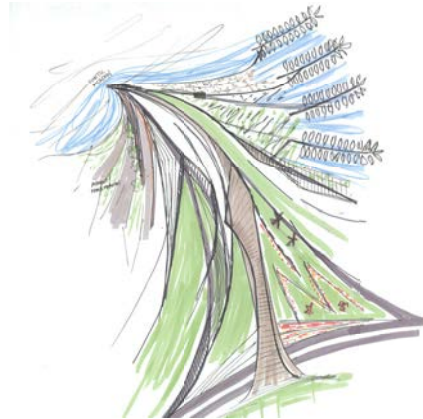
Kate Hayes



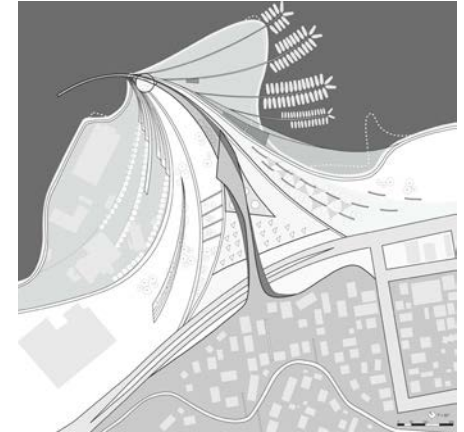
62

In the urban design phase of the project, Kate identified the defining landscape features of the region, ridges and valleys, and proposed extending the existing ridgelines down to the waterfront to reconnect Sausalito with its waterfront. In this site scale phase, Kate chose to focus on the design of the land bridge. Sausalito has an obvious shortage of public waterfront parks and open spaces. Kate proposed transforming the land bridge into a programmatic park to attract both locals and visitors. In addition to creating a social corridor, drawing people from both Bridgeway and the hills, the land bridge houses a Science-Art Center, a new attraction to Sausalito's locals and tourists.

“Together, the swooping features of the new Science-Art Center and the land bridge help to channel flows in, out, and through the greater site – reconnecting the hills with the Bay and Sausalito with its waterfront.”



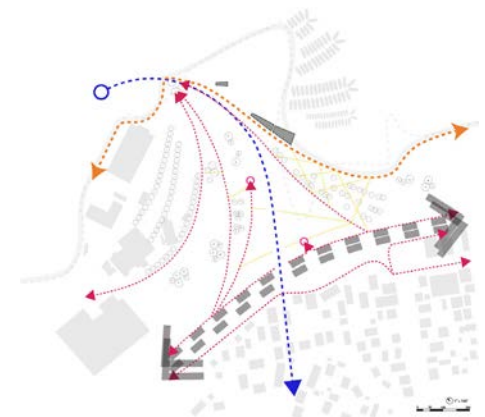
Conceptual Site Plan



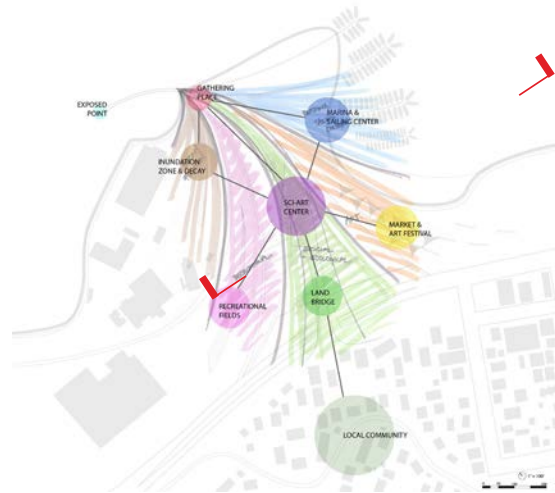
Site Plan



Conceptual Circulation Diagram



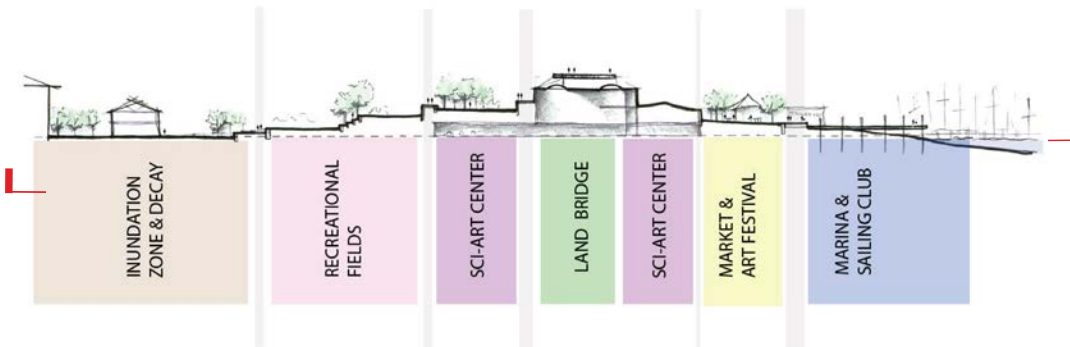
Circulation



Program

The new Sci-Art Center is an iconic structure, built into the massive landform. Together, the swooping features of the new Sci-Art Center and the land bridge help to channel flows in, out, and through the greater site.

The terraced waterfront park is heavily programmed, and each use is connected back to the central Sci-Art Center and rooted in the community of Sausalito by the land bridge. This new landform park will house the weekly market and annual Sausalito Art Festival as well as provide open recreational fields and intimate gathering spaces. The edges of the land bridge and park, where the slope flattens into valley, will eventually succumb to the advancing sea level. The east side is dedicated to the strong sailing culture of Sausalito while the west side will become an inundation zone of visible decay and degradation. Trees will transform to snags and the ridge will become the new shoreline as the water advances.



Section: Circulation and Program



Precedents

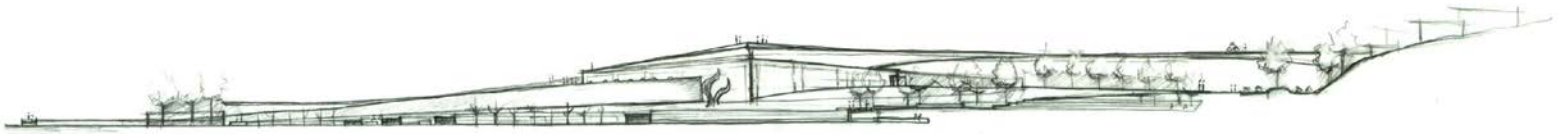


Yr 2011

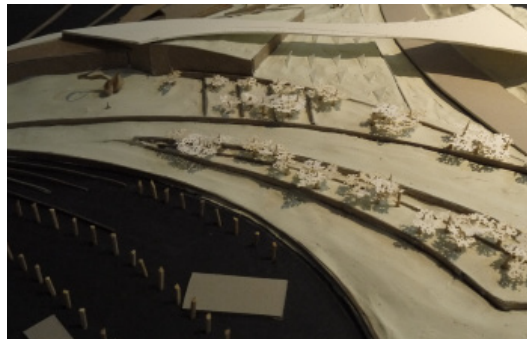


Yr 2100
Inundation Diagrams

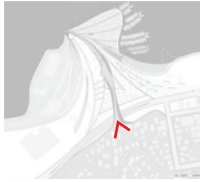
While its construction was not yet completely resolved at this stage of the design process, the land bridge has become a swooping, iconic figure, linking the hills, across Bridgeway, and down to the waterfront via the landform park. As the bridge descends from the hills, it transforms into the roof deck of the Sci-Art Center, and ends at long curving pier, where one is exposed to the elements. The poetic nature of the land bridge journey links sky with land with water. From the land bridge and roof deck, one can see the site change over time from the impact of sea level rise. The design fosters an experiential quality that brings people to the water and makes gradual sea level rise visible over time.



NW Elevation of Bridge and Science-Art Center



Clay and Chipboard Model of Land Bridge Park



Perspective looking across land bridge towards the Bay



Perspective looking into market and Art Festival space from Bridgeway



3 RINGS

Yizhou Xu

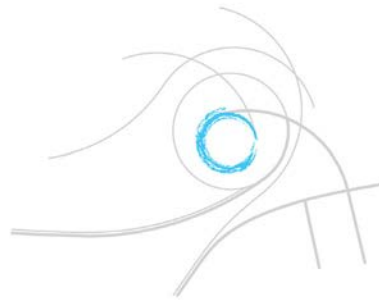
“Sea level rise is not an instant change, but a process. So a process-based design seems perfect for a changing process.”



66

In week three, Yizhou continued to develop process-based strategy at a smaller scale.

Three concentric circles divide the site into “safe area”, “waterfront edge” and a hybrid place that combines the two. This system could effectively accommodate rising sea levels over time, and also offers an amazing waterfront place for neighborhoods and visitors.



Ring 1

The inner ring is a closed levee that protects inland areas from the sea water in 100 years. This area could be used as the site for Sci-Art Center, and offers permanent parking areas.



Ring 2

The middle ring combines levees and floating paths. In near future, this area could offer a meadow venue for varied activities such as picnicking and sports. In 100 years, rising water will create a diverse shoreline offering people different experience of the waterfront.



Ring 3

The outer ring is a series of floating paths that offer people an opportunity to get close to the water and gain views of the sea.



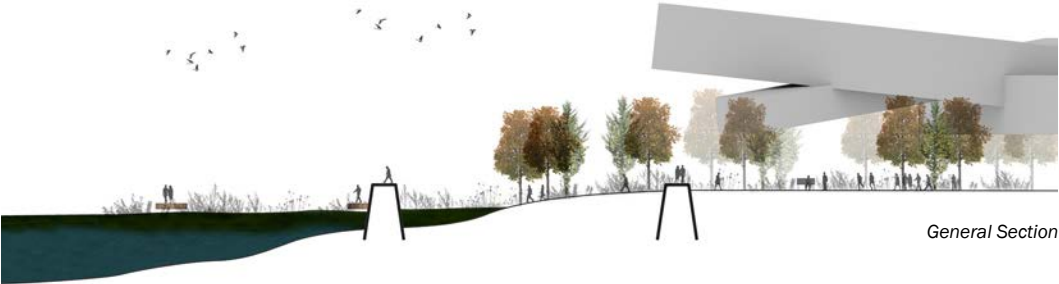
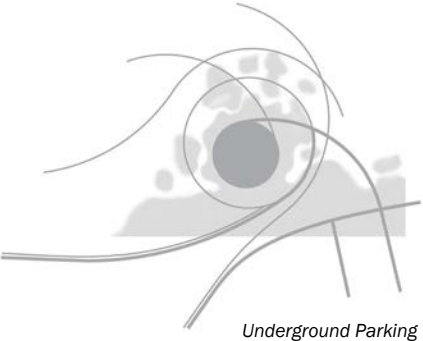
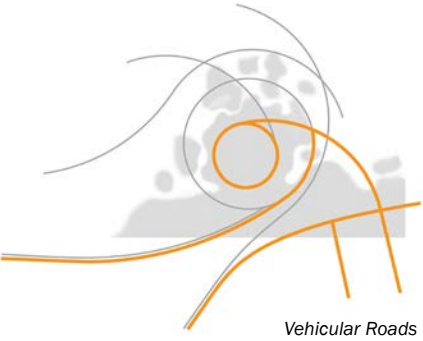
Levees



Wetland



Floating Paths



3 Years

Remove the existing pavement and buildings, using debris of buildings and pavements to build dikes and levee and elevate and protect the rest of the site.



01. Existing Condition



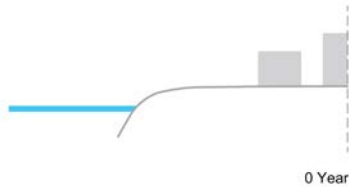
02. Remove and Fill



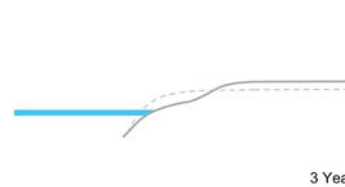
03. Tree Farm

5-10 Years

Tree farm: Plant trees to improve soil conditions and remediate existing soil problems of compaction and low nutrition. (Because structural soils at this point are too compact and short of nutrients, and the sci-art center building and the levees are under construction, trees cannot be planted here.)



0 Year



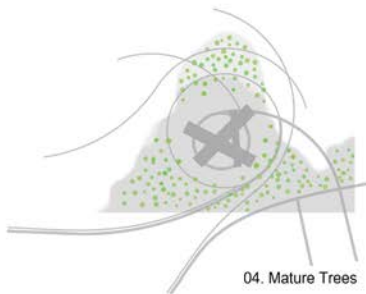
3 Year



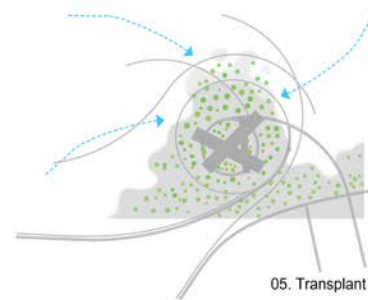
5 - 10 Year

15-20 Years

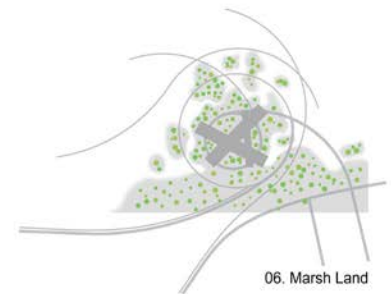
As sea level rise, transplant the trees to remove them from sea water infiltration. Remove some trees to build new docks and floating paths.



04. Mature Trees



05. Transplant



06. Marsh Land

30-50 Years

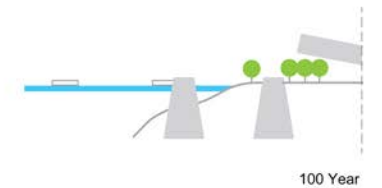
Keep water coming in, transplant the rest of the trees to the safe area to improve the inner ring's environment.



15 - 20 Year



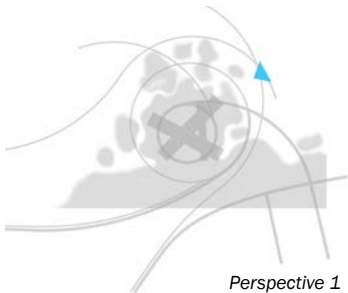
30 - 50 Year



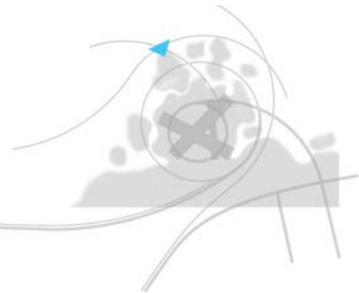
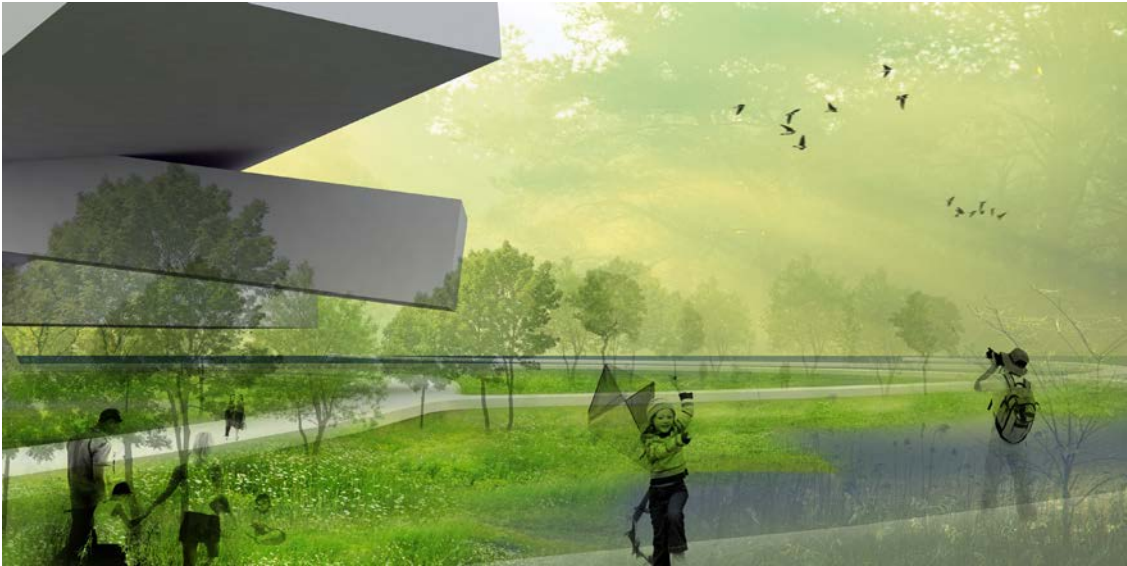
100 Year

100 Years

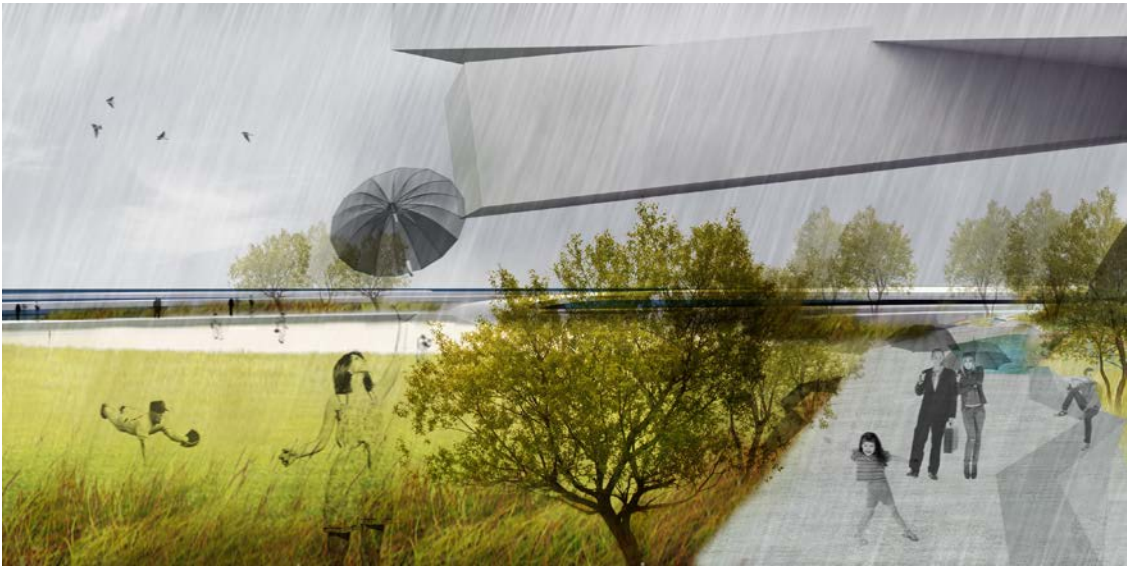
With sea level rising, waterfront would be transformed to wetlands, serving different species with more habitats to live in, creating a new landscape.



Perspective 1



Perspective 2



INTERTIDAL PARK

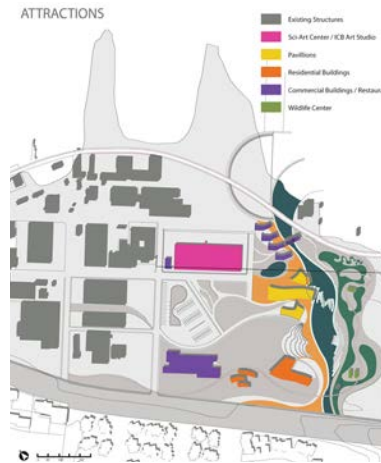
Hyunjoo Nam



Hyunjoo Nam was intrigued by the texture of the existing condition of two piers, changing the two piers into the main pier, which also has a floatation structure as a main attraction. These devices can capture small amounts of tidal wave energy at each location. Tidal energy generators can not only produce electricity, but also protect existing communities and new communities from inundation.

This area not only attracts visitors for its natural resources and recreation, but also for the houseboat community in Sausalito. Specifically, she proposed an intertidal park system along the bay area to explore coastal ecologies, which have the potential to become a natural park system including wetlands, wildlife habitat, tidal ponds and

“The strategy is to create a valuable public shoreline spaces and infrastructures by contrasting and amplifying the different experiences of low and high tide.”



Section



tidal piers.

By daylighting the stream to amplify the experiences of high tide and low tide, a new flow is created. Existing structures including Industrial Center Buildings (ICB) are a step in transforming the abandoned infrastructure and shoreline spaces into a programmatic area consisting of diverse green spaces, including an event lawn, lake park, amphitheater, courtyard, garden, and wetland, and various programmed spaces, including a promenade, pavilions, parks, bike and walking path in nature.

OPEN SPACE PROGRAM

1. Event Lawn / Recreational Field Sports Fields / Ceremony



2. Amphitheater



3. Urban Garden / Picnic Zone



4. Private Garden Residential Garden



5. Promenade



7. Mound



10. Civic Space / Pavillion

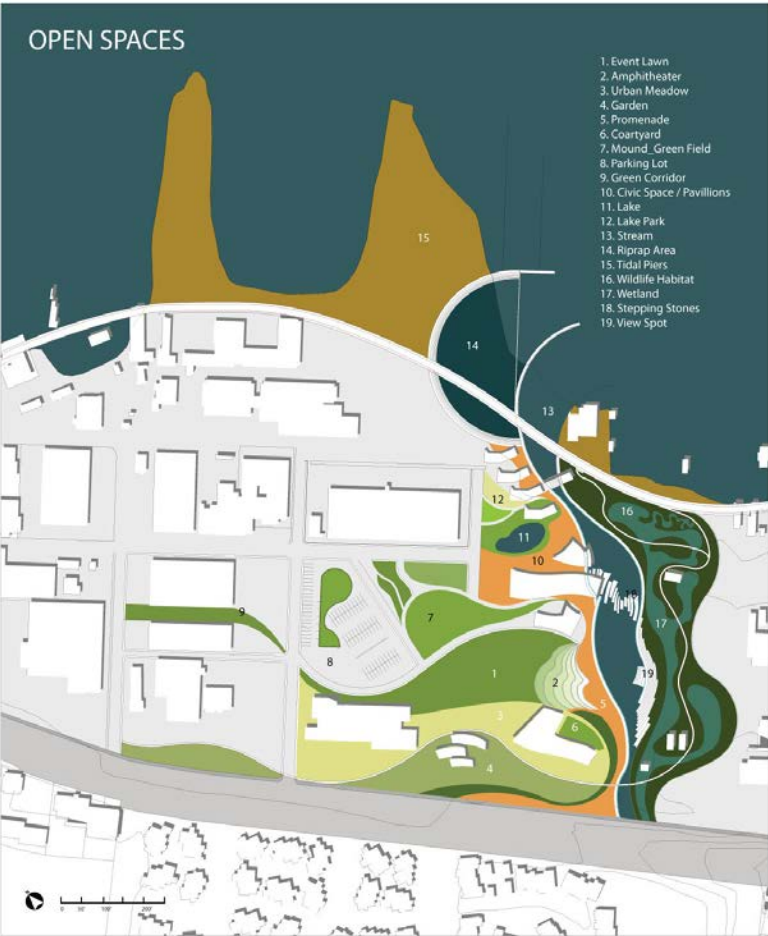


12. Lake Park



17. Wetland



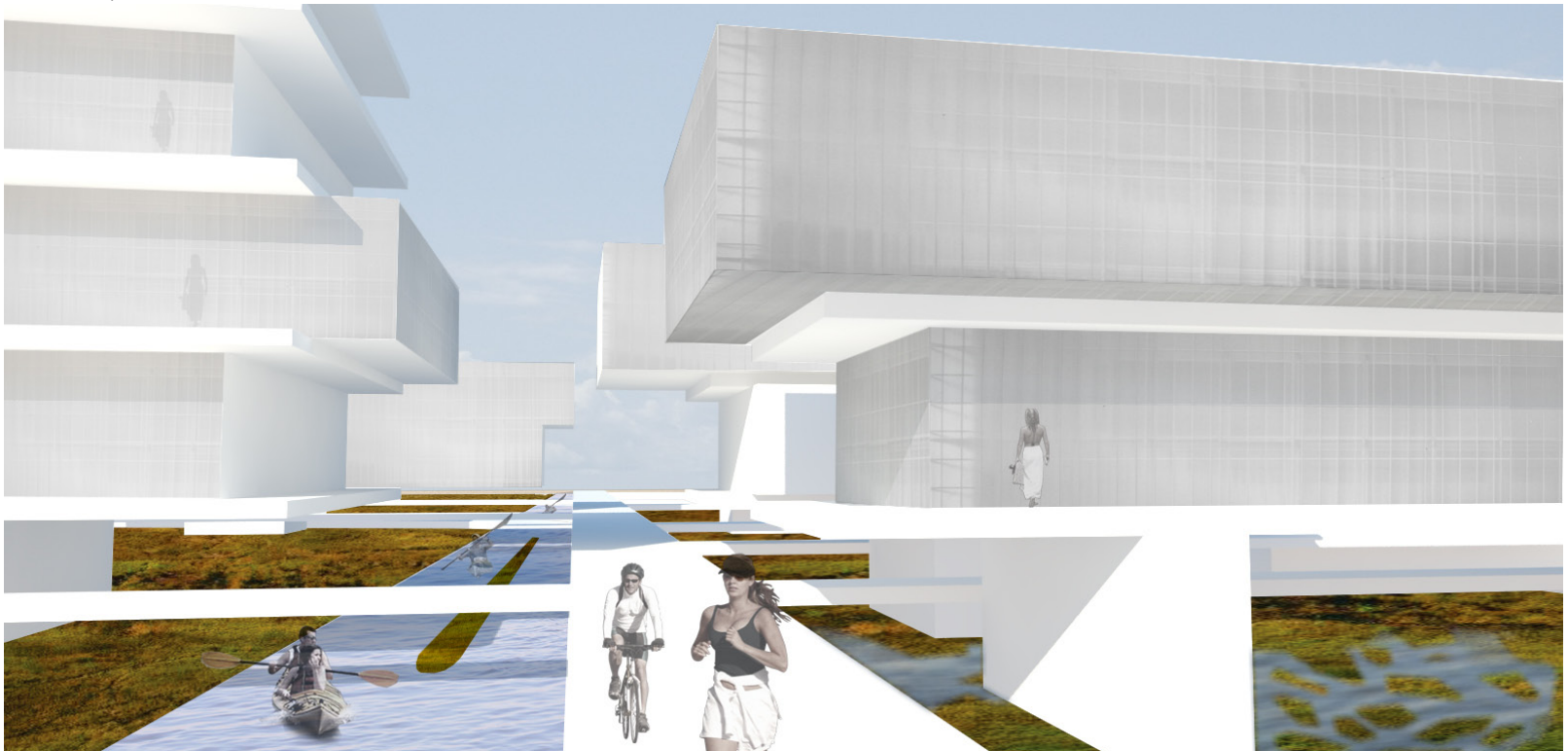


Perspectives



Contrast of recreational and restoration area on the stream

Perspectives



Pavillions, Amphitheater, and Promenade on the civic area along the stream

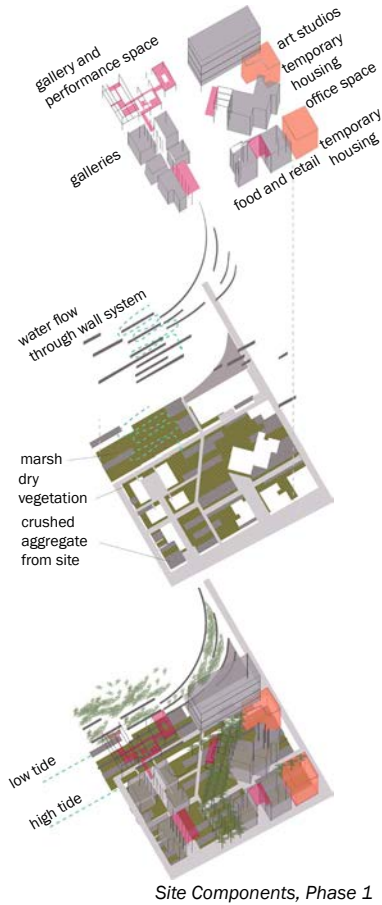
THE BUILDING GRAVEYARD

Mia Scharphie



74

Mia focused on the creation of a marine-arts park, termed 'the Building Graveyard', in the inundation area. Her phasing strategy carefully organized how to slowly abandon buildings as the sea moves in. In this scheme, the buildings become more transparent, stripped down entirely in the flooded areas, and are punched through and selectively opened in areas yet to be inundated. They will host art galleries and display spaces with the flooded environment adding to the context. Temporary housing will be added taking advantage of the temporary real estate to provide more affordable housing. Walls of industrial materials manage the daily tidal fluxes, making the daily change visible in flooded areas. In dry areas, pieces of these walls, which will be built out later as the waters rise, form smaller gardens within the current



View towards Shore



View from Deconstructed Building

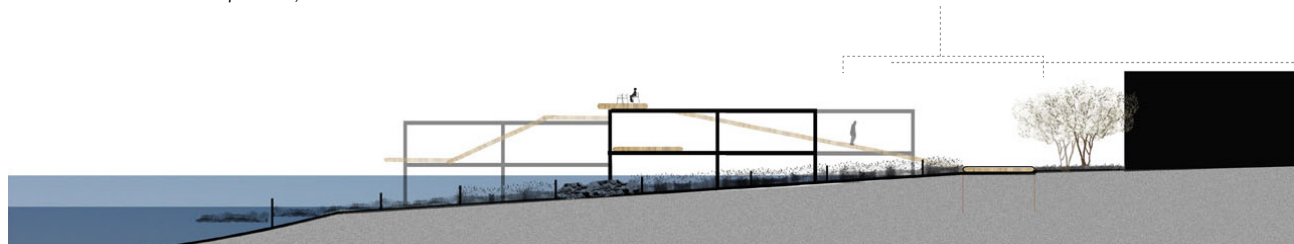
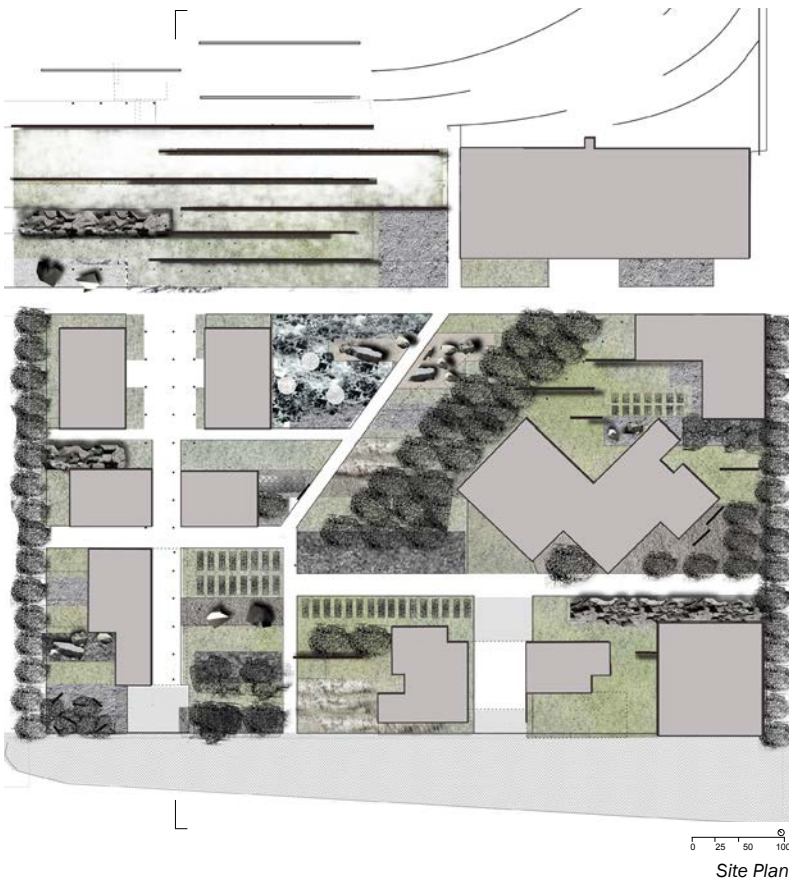
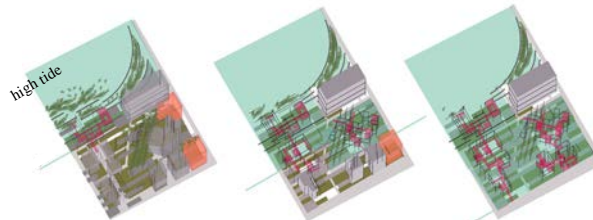


photo credits: filder users on2wheez, Rachel Ford James, galif548, Kimeron, Galileo55

photo credits: filder users on2wheez, Rachel Ford James, galif548, Kimeron, Galileo55



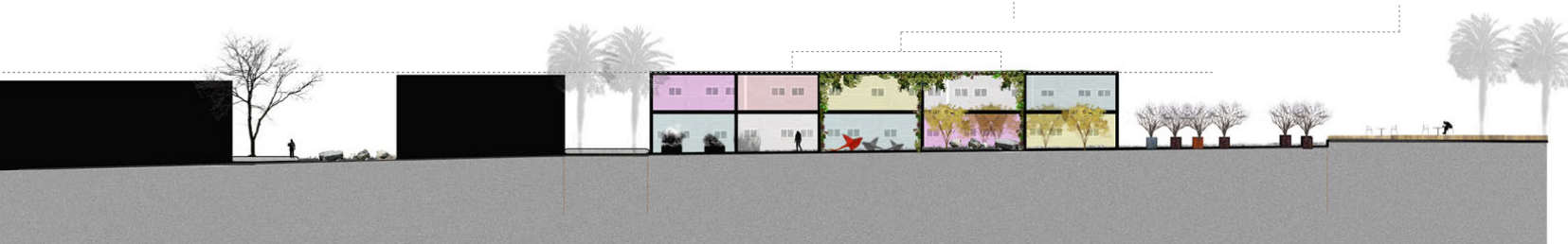
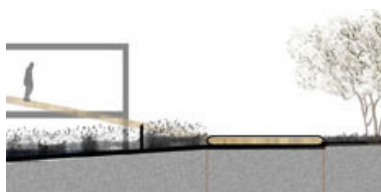
“The inundated area and its flooded building skeletons will become a platform for art and public experience”



Inundation Deconstruction, and Construction from left to right: 2030, 2060, 2100

large, unenclosed expanses of parking lot. Small scale gardens hosting art, community gardens and similar outdoor experiences fill these niches. Piles of aggregate of different sizes which will come from the site as it is being demolished, will also differentiate and divide these gardens. These piles will form

‘islands’ that will remain visible during low tide, even when the waters have risen.



Section

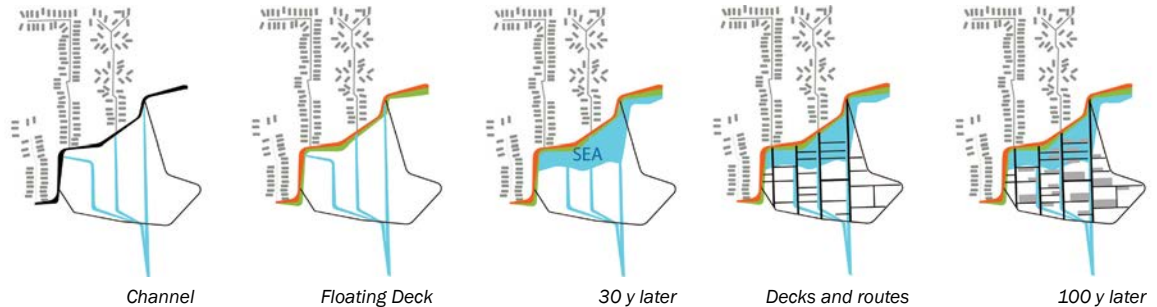
NEW WATER COMMUNITY

Fan Qi



76

“The new water community provides people with a different feeling of water compared to the old house boat community.”



Fan Qi focused on the urban design of the new water community this week, questioning what happens when sea levels rise and the new shoreline becomes closer. Fan’s proposal is to let the water enter the site and built over it, continuing his previous proposal. He tried to create a new water community living style which would be futuristic when compared to the old houseboat community. He concluded the following strategies to this site.

“Water”

Because it is a water community, water use is a key point in the first step. In order to lead the water into the site before the sea levels rise, Fan proposed three channels

from the roadway to the shoreline. He uses the sea water to build wetlands and habitats to remediate the constructed site.

“Floating Deck”

A floating deck structure will be built along the original shoreline and tied to the ground for the rising sea levels. This floating structure can be used as a boundary between the old and new water community and also as a connection between the old houseboat community and the land.

“Matrix Deck”

Matrix decks will be built as the skeleton of the new development. They are over

the water, acting as circulation between housing structures. The decks are parallel to the decks of the old houseboat community, making the two communities coordinate with one another.

“Flexibility”

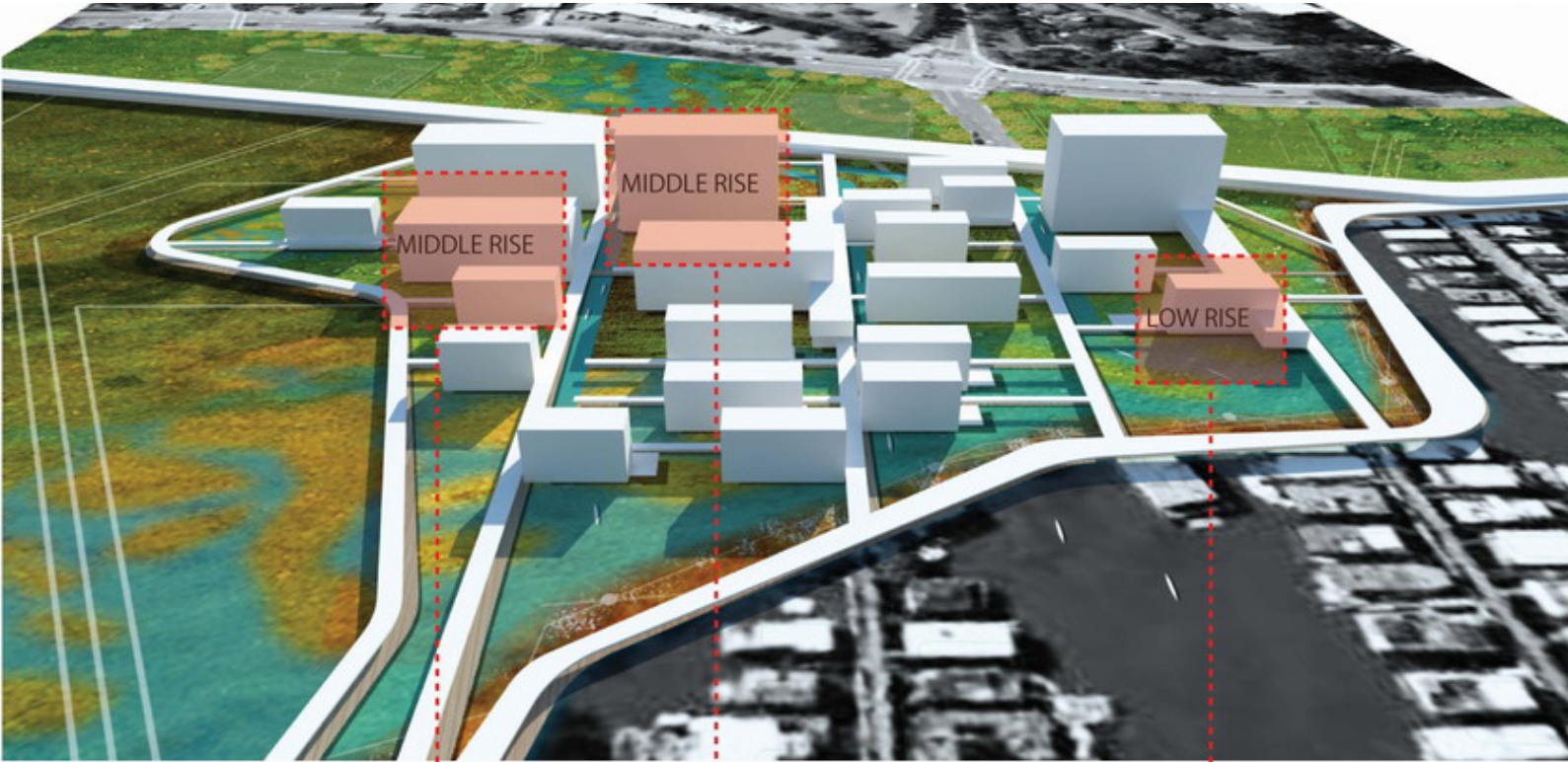
Because the amount the sea levels will rise is unknown, the flexibility of design is very important. Building on this strategy, the proposal includes building structures over the water or floating over it to make sure the new development can survive in the future.

“Water Activity”

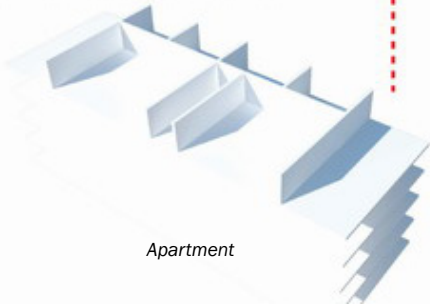
In order to make the water a more integral

part of the living experience, Fan’s proposal includes walls to increase its accessibility. To achieve this accessibility to residents, he designed channels for kayaking, the wetlands in the water, and the floating structure for circulation, with vehicles not permitted on the decks.

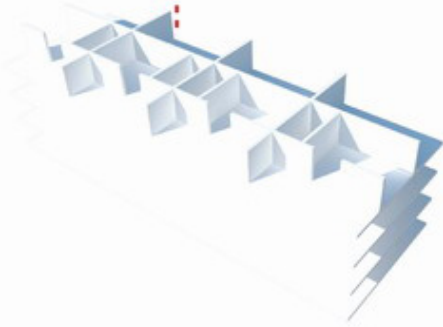
Overall, Fan’s goal is to provide people with a different living experience in a futuristic water community.



Housing Typology

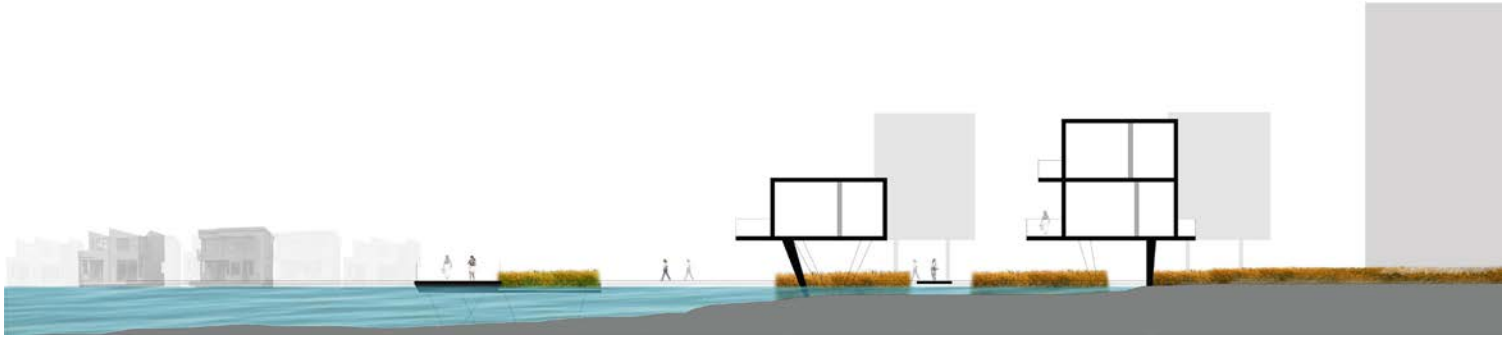


Apartment

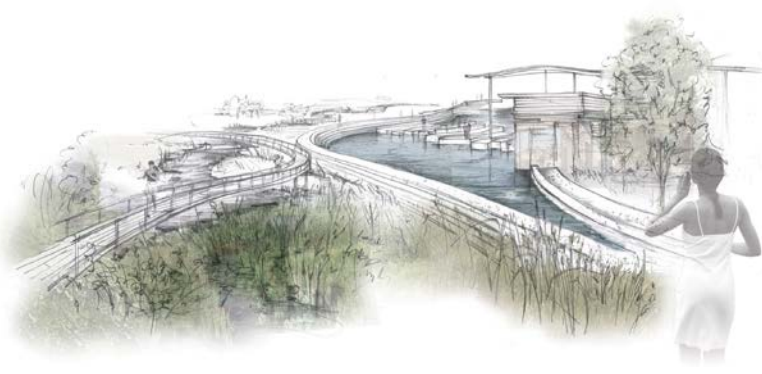


Individual House

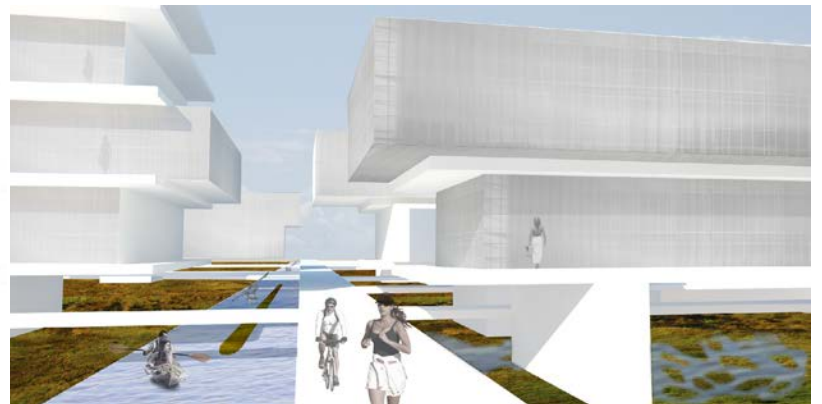




Section of the Water Community



Perspective from the floating deck



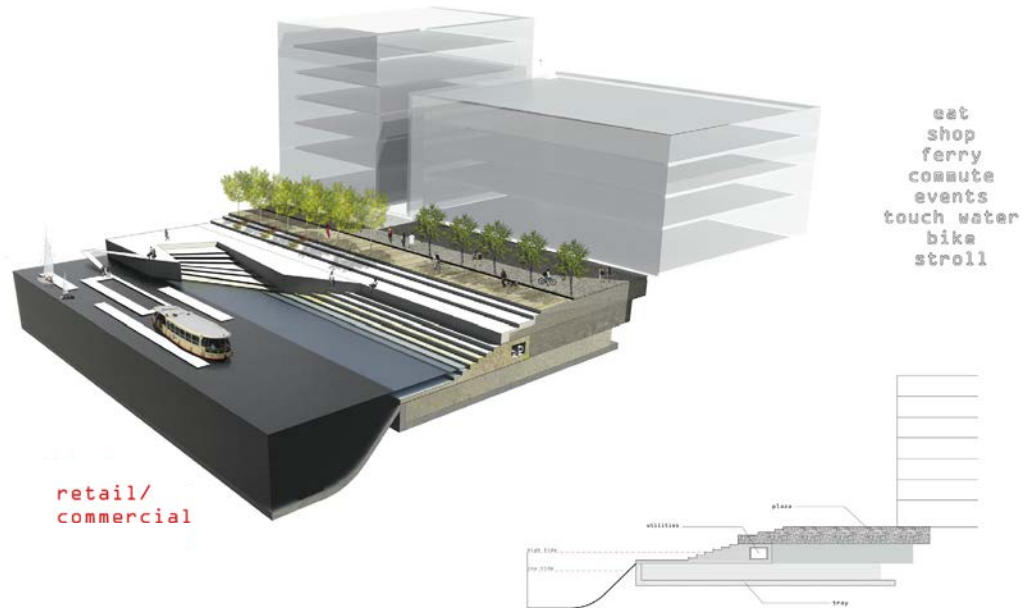
Perspective in the community



TRAYS: PUBLIC ENVELOPE

Retail Prototype

Richard Crockett



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This concept for site design for the new Marinship is a continuation of the urban design vision of 'trays' forming a new neighborhood structure around production and adaptability. Instead of focusing on a particular location within the new neighborhood, this site design phase aims to develop prototypes of the edge of the 'trays' called 'public envelopes.' The design puts emphasis on connecting the investment in the public space, with the land use of the parcel. In this way, the public investment will lay the stage for private development, and will be flexible as private development evolves. This shows the strength of planning a community around infrastructure planning, networks, and corridors.

The public envelope of the tray edge is designed to be adaptable as the response to sea levels rising evolves over the next 100 years. The public envelope acts as the space where the public investment will be both infrastructure to feed the neighborhood protection against rising sea levels, and public space investments that connect back to the neighborhood and embrace the bay water frontage based on the needs of land use.

Five prototypes were developed based on the primary land uses proposed for the new Marinship. In the retail/commercial prototype for example, the investment in landscape structures that are designed to move a large number of people between high density areas. The marine

industrial prototype, on the other hand, is designed to cater to the types of marine industries that are found in Marinship today. For that purpose different types of investments are proposed. The recreational/ecological prototype is designed to maximize the amount of horizontal space that is affected by the tides.

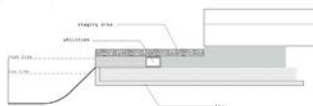
Residential Prototype

Recreational/Ecological Prototype

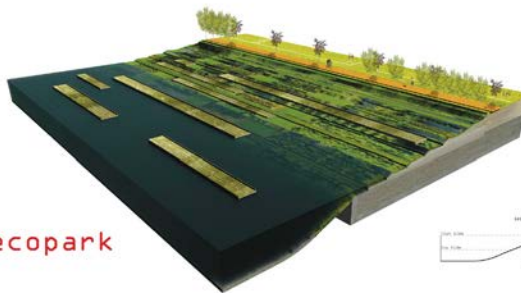
marine industrial



sail
repair
great
products
create
save
discover
product
community



ecopark



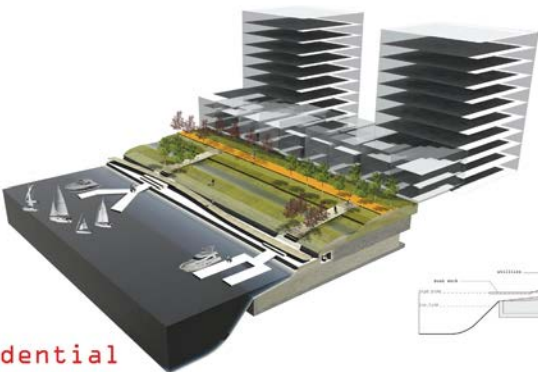
kayak
bike
fish
experience
habitat
swim
picnic
touch water
stroll
jog
discover



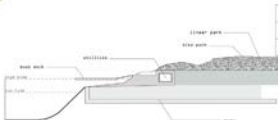
Marine Industrial Prototype

Production/Industrial Prototype

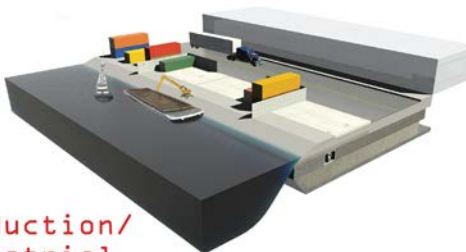
residential



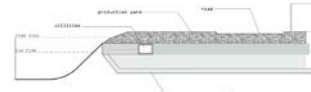
bike
jog
kayak
fish
play
picnic
swim
stroll
garden



production/
industrial



create
save
access
innovate
produce
landscape
seaport



WEEK
04

OBJECT DESIGN

In the final week, the studio focused on designing an object that further built upon the main strategies set out in the urban design and site design weeks. The character of Sausalito, past and future, and the nature of designed spaces may be expressed through individual elements such as bridges, buildings, walkways, sculptures, water features, lighting fixtures, seating, shelters, or walls.

In the final week, the studio will focus on detail design and individual elements such as bridges, buildings, walkways, sculptures, water features, lighting fixtures, seating, shelters, or walls.



WEEK FOUR: OBJECT DESIGN

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THE OBJECT DETAIL DESIGN HELPS BRING A PROJECT DOWN TO THE HUMAN BODY SCALE. THE MATERIAL, PAVING,





FORM, AND STRUCTURAL SELECTIONS INFLUENCE AND DRAW OUT THE MORE PARTICULAR QUALITIES OF A PROJECT.



POSITIVE REINFORCEMENT

Richard Crockett



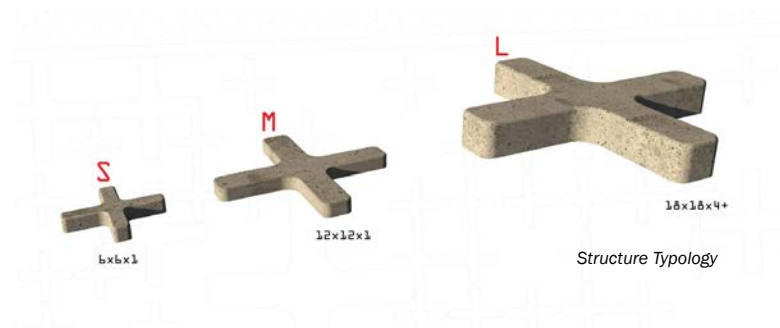
86

The aim of this object detail is to combine a mass produced, engineering structure used for bank reinforcement with a grading plan for an ecological edge. Inspiring this design are depression era projects using inexpensive materials for highly detailed design. This design takes inspiration from that time in our history. It also seeks to mesh the realms of engineering, infrastructure, and landscape architecture.

By converging the '+' shaped concrete structures with an undulating landform at the bay edge creates a large range of different micro-climatic conditions for ecologies to develop. The '+' shaped forms will capture water, sediments, organic material, and plant life throughout



"This is a vision for the tidal zone where the bay meets the land to be shaped by a common, vernacular engineering structure in a way that is elegant and maximizes ecological production."



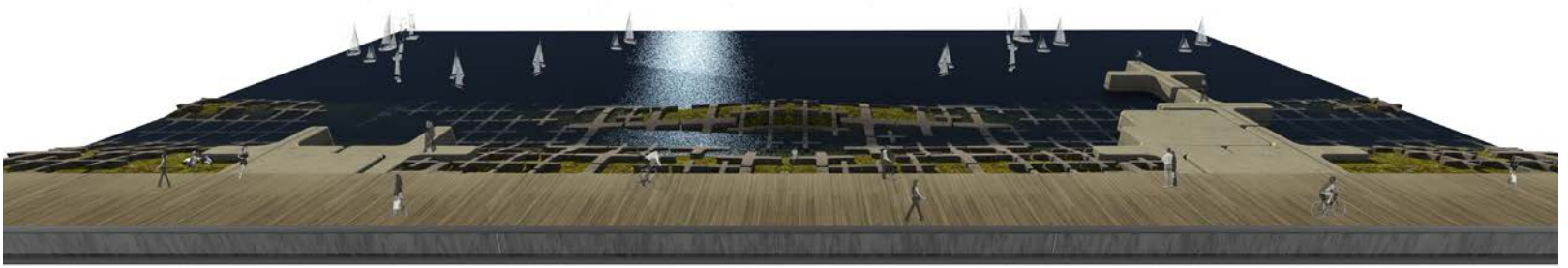
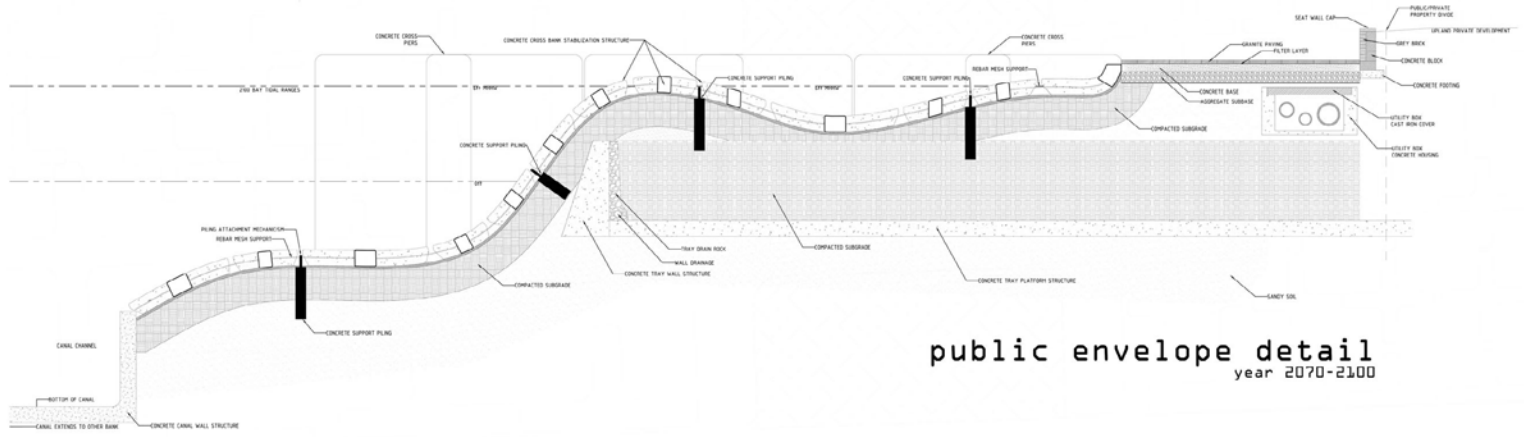
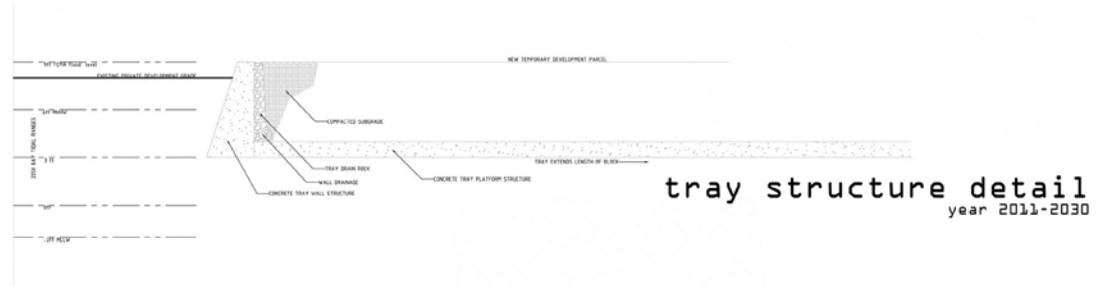


Site Plan

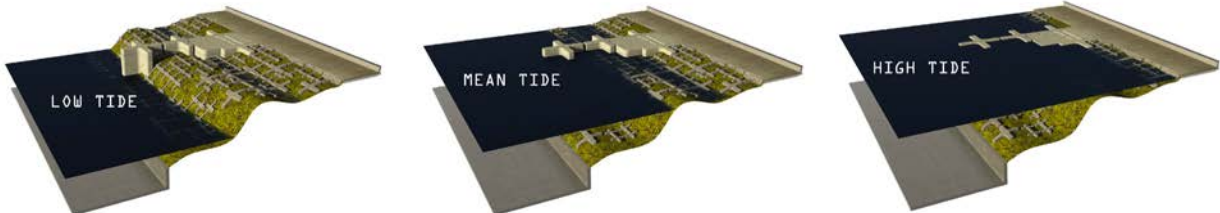
different tidal stages. Based on temporal conditions of the tidal ranges, the ecology may establish itself for a day, a week, or a year. In this way, an artificial ecology is created that can potentially be more productive and adaptable to sea level rise than a natural system. In addition, these '+' structures are modular and highly adaptable. They will vary in size from small to large and take different forms based on their location and needs. One can imagine marine industrial and production uses being able to retrofit the structures for their needs.

This design argues for the importance of human intent in any ecological design. Without obvious human intervention and intent in an ecological design, the public will simply see 'nature' and not a constructed ecology that is healthy for our shared resources. In this way, the importance of stewardship and care will be clear. The design fits in the larger narrative of the trays and public envelopes proposed in earlier weeks. It values interventions that are modular, repeatable, cheap, serve dual purposes of landscape and infrastructure, and suggest human intention without being overbearing.

"The '+' shaped forms will capture water, sediments, creatures, plants as the tides come in and out. Based on time, the tidal ranges of that time of year or day, the



Perspective



Tidal Diagram



Perspective

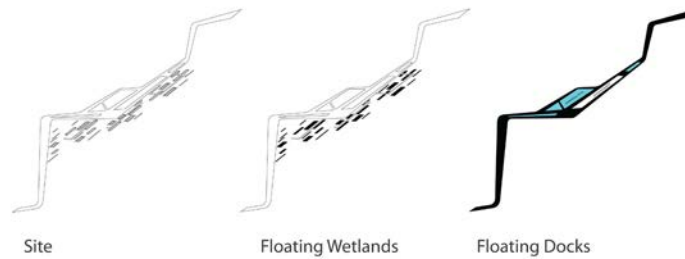
LINEAR FLOATING BOUNDARY

Fan Qi

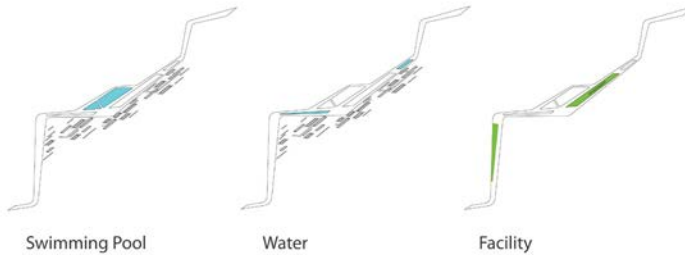


Fan focused on the very important floating boundary between the old houseboat community and new developed water community. To provide shared service and recreational facilities for the old and new houseboat communities, he designed the floating deck as not only a linear traffic corridor but also a public space of entertainment and communication with a beautiful landscape vision. He organized restaurants, swimming pools, bike paths, an urban balcony and functional wetland belt to create a creative urban space on the water along the original shoreline, changing the old houseboat community and attracting people from the new water town. His goal is to allow people to communicate and enjoy the new landscape.

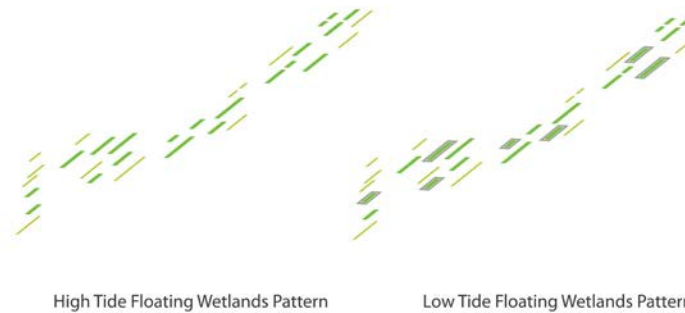
“The detail design is about how you are experiencing the site .”



The floating deck is tied to the ground along the original shoreline. And the wetland belt is designed as a landscape of linear pattern along the deck. This serves as attractive scenery with ecological function.



There are swimming pools attached to the floating deck. There are also facilities such as restaurant and cafe to attract people enjoy spare time here.

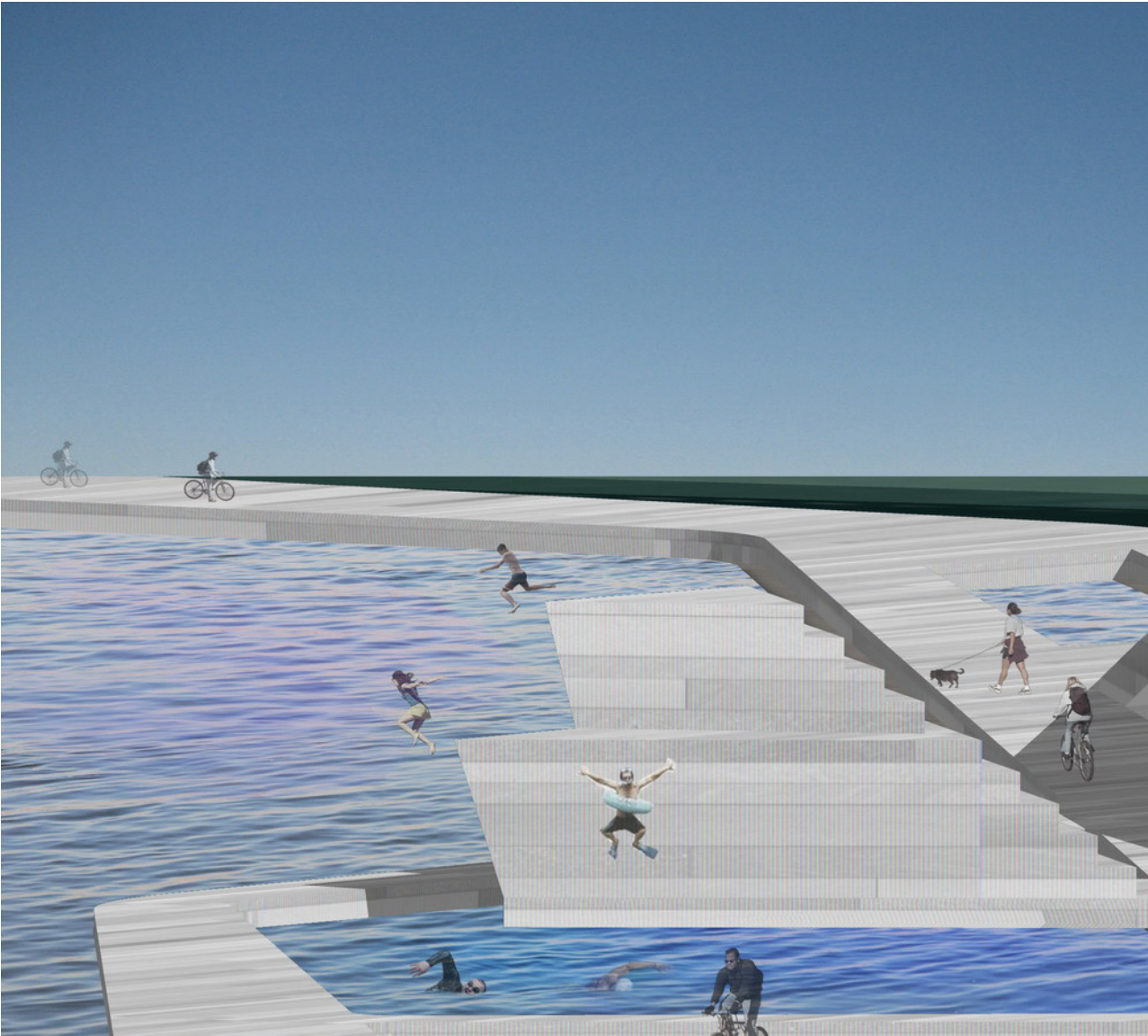


The linear pattern of the wetland belt changes continuously with tidal changes. Because some selected blocks are built on the ground, the area changes every hour with the tide levels. The blocks are intended to highlight the tidal changes and change the perspective of the viewer.



The floating deck is a vital component in the design, which connects the old houseboat community to the new water community. It provides people with different activities and facilities, creating a unique public space on the sea.

While walking and biking, people can touch the water, swim in the floating pool, and walk into the eco wetland. changing the old community and serving the new community.



Perspective of the floating swimming pool

DYNAMIC LANDSCAPE

Yizhou Xu



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Yizhou focused on recycling the existing urban environment, using the debris of pavement, buildings, and infrastructure as material for the new project, making the proposal more feasible, sustainable and economical.

The scheme offers people a different experience within which to approach the waterfront. For instance, people can directly access the open space, go through a narrow ramp to the open waterfront, or use a small performance venue at the waterfront.

Meanwhile, the serrated scheme maximizes the length of waterfront. Metal from the existing buildings and infrastructures will be used as materials for a metal net for the containment of concrete



debris. Additionally, steel can easily be removed from other recyclables because of its magnetic properties. Once separated, the steel is melted in a furnace and then poured into casters that roll the steel into sheets. Recycled steel cans may be made into new cars, girders for buildings, ships, or new food cans. Steel can also be continuously recycled retaining its strength and material qualities in the recycling process.

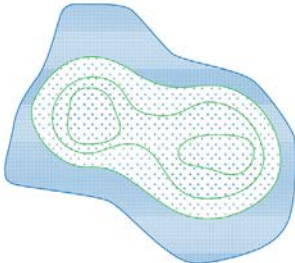
Recycling of concrete pavement is a relatively simple process. It involves splitting, removing and crushing concrete through an existing pavement into a material with a specified size and quality. Also, it can result in considerable savings since it saves the costs of transporting concrete to the landfill (as much as \$.25 per ton/mile), and eliminates the cost of disposal (as high as \$100 per ton).

With the rising sea level, dying trees could be used for wooden decks. It is a good way to save money and natural resources. In terms of tree species, eucalyptus is a smart choice as such species have desirable traits such as fast-growing sources of wood, producing oil that can be used for cleaning and acting as a natural insecticide.

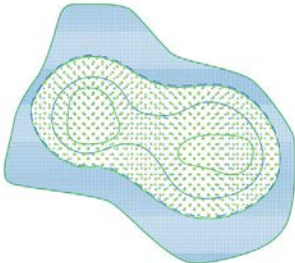
Dynamic Water Level

Water levels continually fluctuate, enabling the wet lands to act as a habitat for a greater number of birds during rainy seasons and high tide, as well as providing people with more dynamic spaces and paths in dry seasons and low tide.

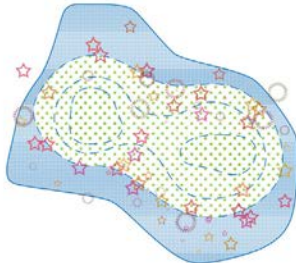
Because long-term predictions cannot be made the design is open-ended, and these drawings represent only one possibility. Yizhou's scheme focuses on creating a framework for the site, allowing it to develop and transform independently.



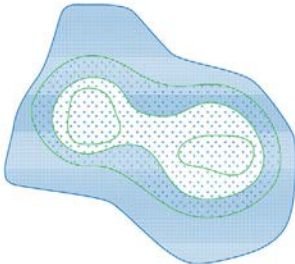
Low Tide



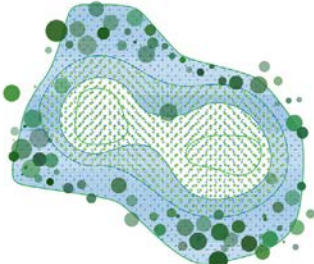
Lowest Water Level



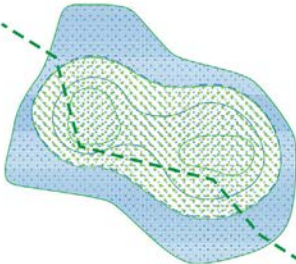
Dynamic Activities



High Tide



Vegetation



Ephemeral Paths



High Tide



Low Tide

FLOATING DINNER PARTY

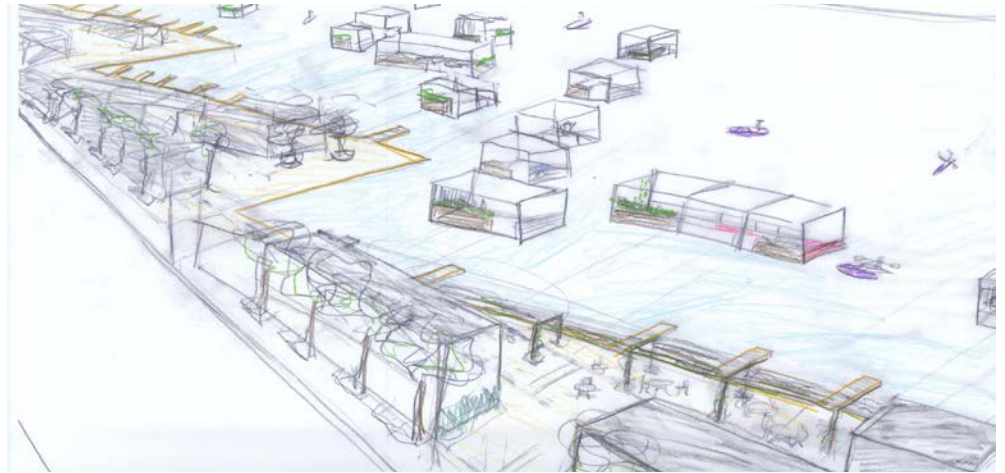
Mia Scharphie



Dining Raft Plan and Elevation

Mia's object is a raft for a floating restaurant to be docked on shore as Bridgeway Blvd. becomes the new shore. These rafts will be tethered to the current shore, and could be released to allow for a meal at sea. Diners would have Richardson Bay as their ambiance and be served by waiters on canoes or kayaks.

The material palette is taken from the materials on site, and the original industrial history of the Marinship area. Wood forms the floor of the raft, into which pieces of metal scrap are inset. Planter boxes which divide the rafts from one another when they are docked hold aggregate that comes from the site as well as dry-tolerant vegetation. I-beams hold a retractable shade, and form the walls of the



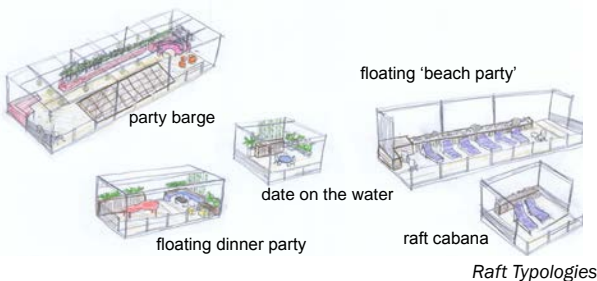
Dining Rafts along Bridgeway

raft which range from clear glass on the sea side, and strung cables which leave an open view of the surrounding water.

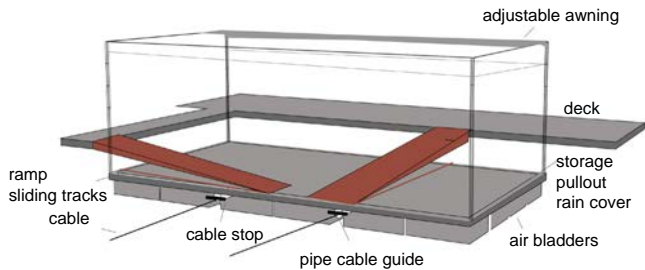
orders. There are endless possibilities for this typology that would create a new social landscape in the waters.

The dining raft is only one possible typology for this shoreline experience. There could be rafts for smaller parties, large floating dance parties, or beach-like lounges where kayak-bound waiters circulate taking drink

“The dining raft is only one possible typology for this shoreline experience, where kayak-bound waiters circulate taking drink orders.”



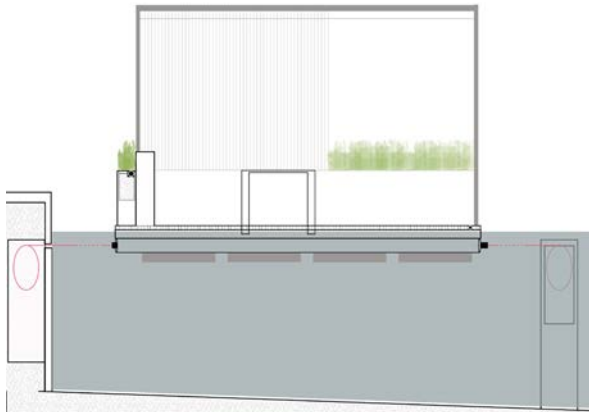
Raft Typologies



Raft Components



View from the Dining Raft



Section: Raft and Docking System

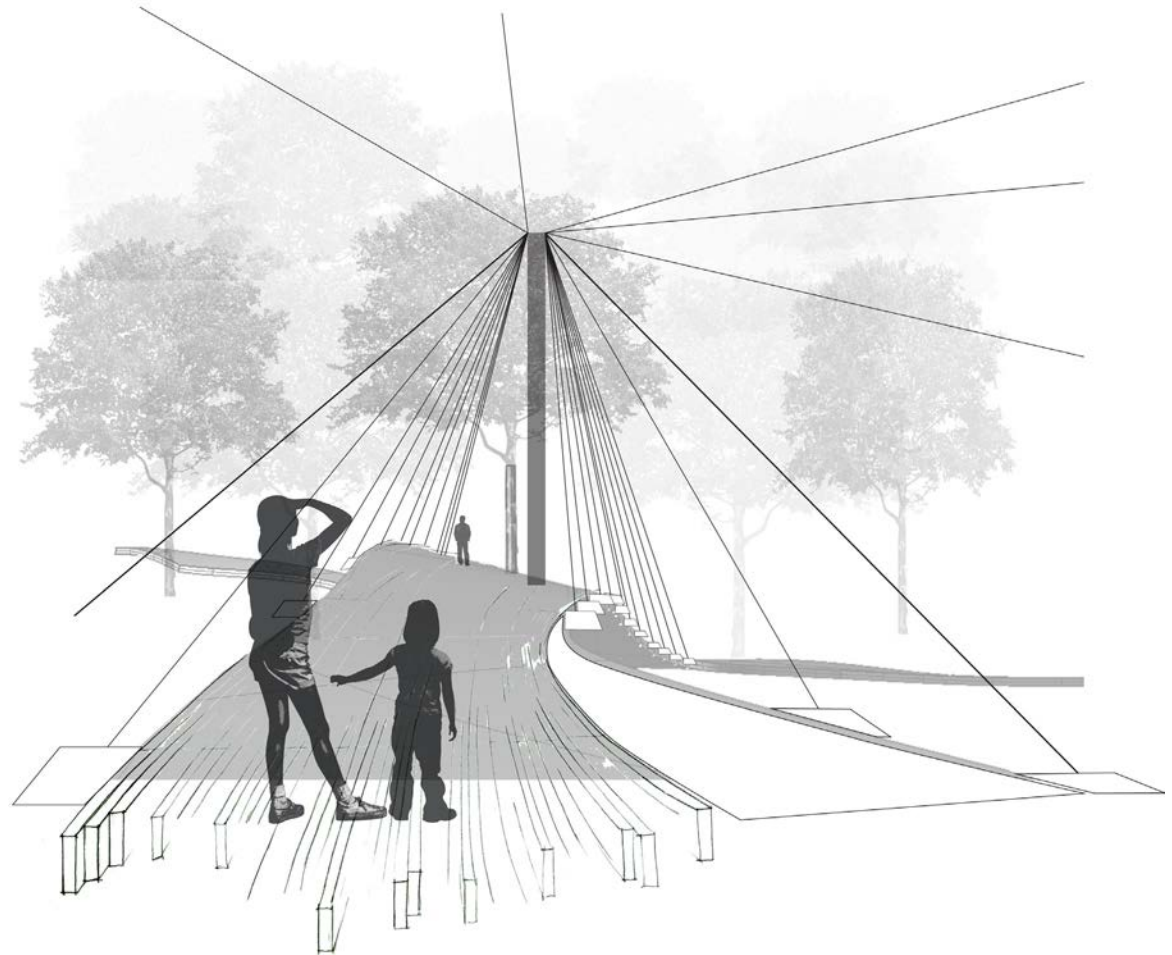
BRIDGE DETAIL

Kate Hayes

“Not only will the bridge provide the physical means to funnel flows of people to and from the proposed landform park, it will raise awareness of sea level rise through increased visibility of and experience with the Sausalito waterfront.”



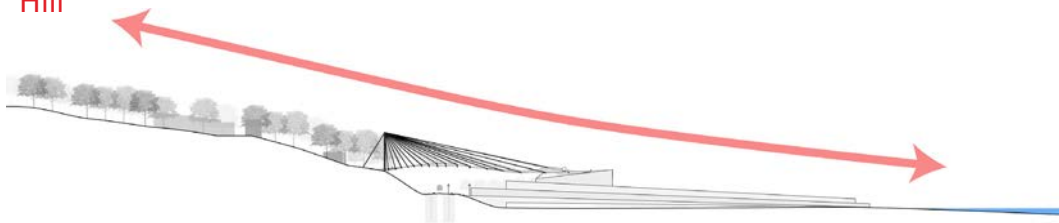
For the detail design phase of the project, Kate tackled the construction of the land bridge. The challenge was to design a bridge that effectively continued the landscape ridge typology across Bridgeway Blvd and to the landform park without literally creating a bridge made of land. With this goal in mind, she designed a poetic, architectural bridge in an effort ease the connection and link between Sausalito's hills and its waterfront, while also creating an iconic landmark for the city. In addition to the material construction of the bridge, Kate's focus was on the experience of crossing the bridge, as well as the different experiences of traveling to and from the hills and the waterfront. Despite the construction of such a large, iconic structure, the intent was to create a



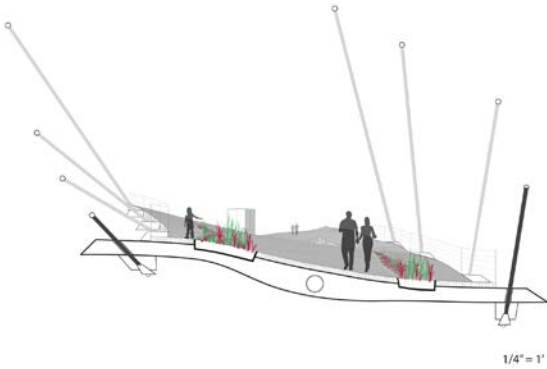
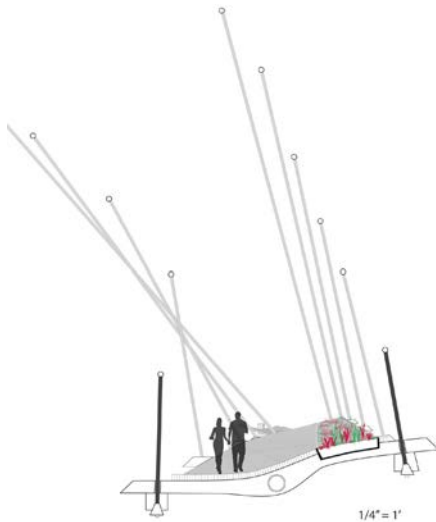
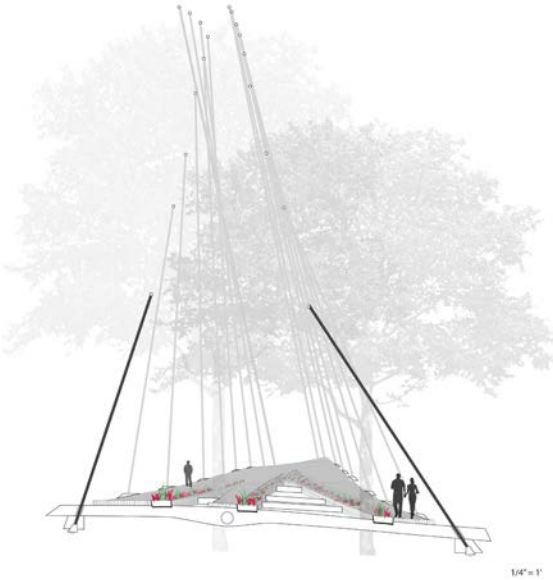
Perspective Looking Toward Hills

“The design goal of the bridge was to mimic and reinforce the ridge landform. This was accomplished by creating an undulating ground plane that is asymmetrically suspended and supported by whalebone steel structures.”

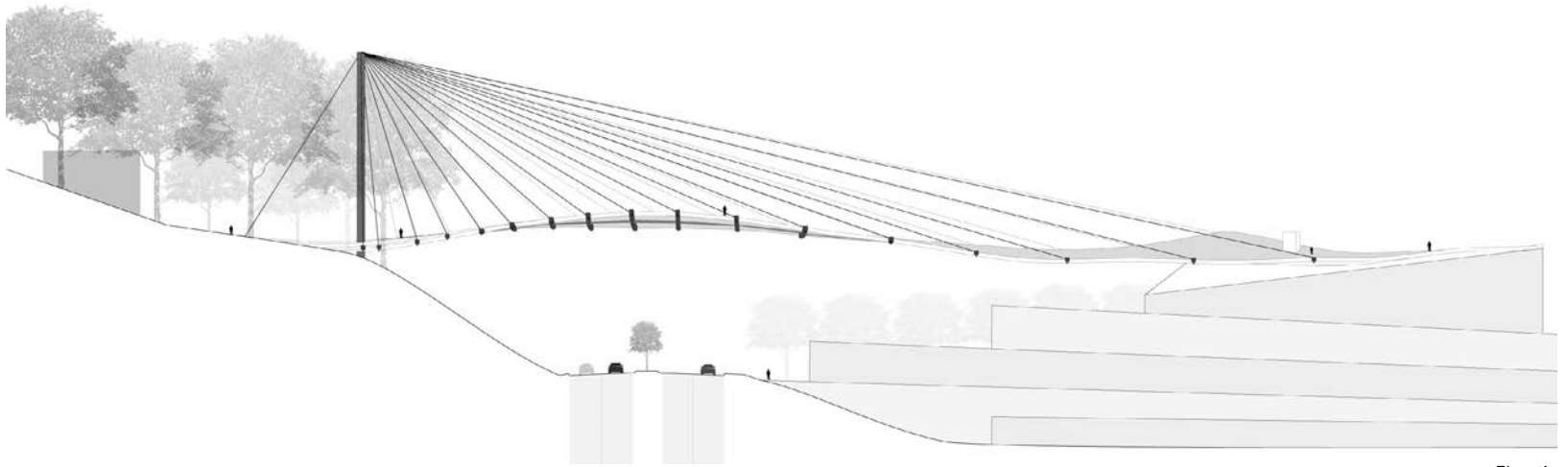
Hill



local and intimate experience by catering to the human scale and body proportions. The design goal of the bridge was to mimic and reinforce the ridge landform. This was accomplished by creating an undulating ground plane that is asymmetrically suspended and then supported by exposed whalebone-type steel structures. The bridge naturally emerges from the relatively dense forest of the hills. Three fingers, or paths, circumnavigate existing trees, and merge to become the main path on the bridge. The



Sectional Perspectives



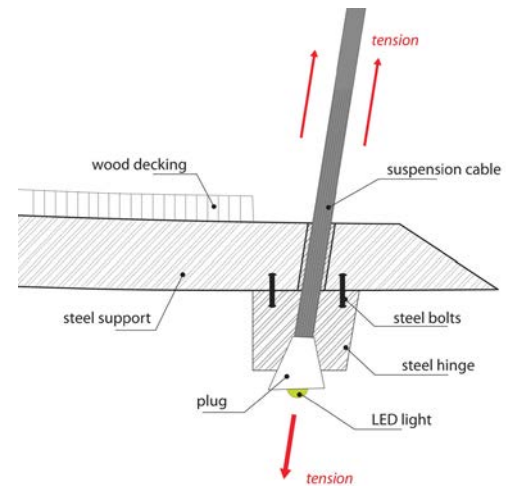
Elevation

density of the suspension cables reinforce the transition from dense forest to the open space of the landform park and to views out to and across the Bay.

Although the general line and curve of the bridge extends from the hill, through the park, and out to the end of dock in the Bay, the strict bridge is limited between the hills and the roof of the Science-Art Center. From this roof deck, visitors have a remarkable, birds-eye perspective view of the waterfront, a sight typically only seen from the private, residential hill homes. From here, one can watch the changing tides in the short term and the impact of sea level rise in the long term on this valley and ridge landform park.

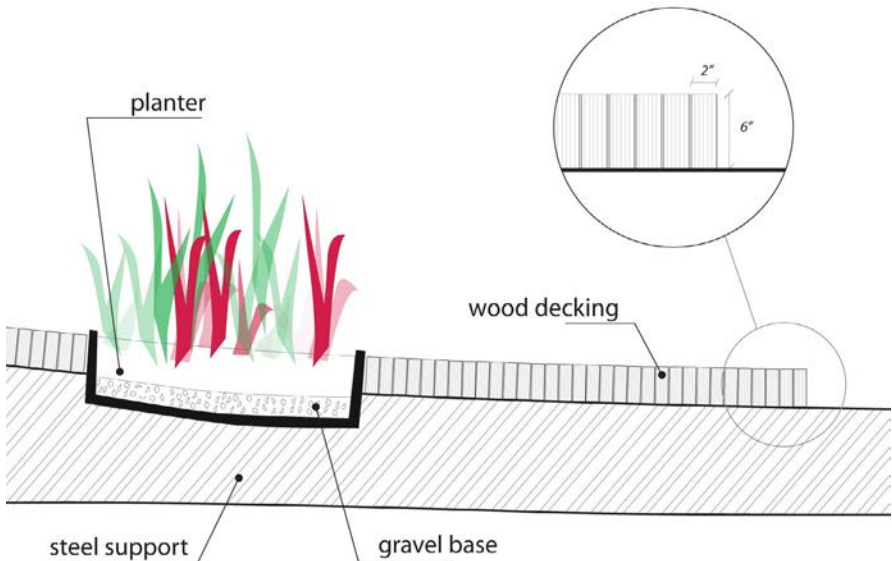
The underlying structure of the bridge is revealed in its everyday design. As one drives down Bridgeway Ave, they catch glimpses of the whalebone support system as the bridge curves upward and downward. The suspension cables, which appear to carry the tree canopy line across the busy road and over to the landform park, hold the steel supports by tension. At night, the ends of these joints light up, highlighting the landmark status of this iconic bridge.

The ground plane is constructed of flexible wood decking. The narrow width of the wood planks face up and provide a finer detail to the ground surface. The large, overall dimension of the wood decking is broken up

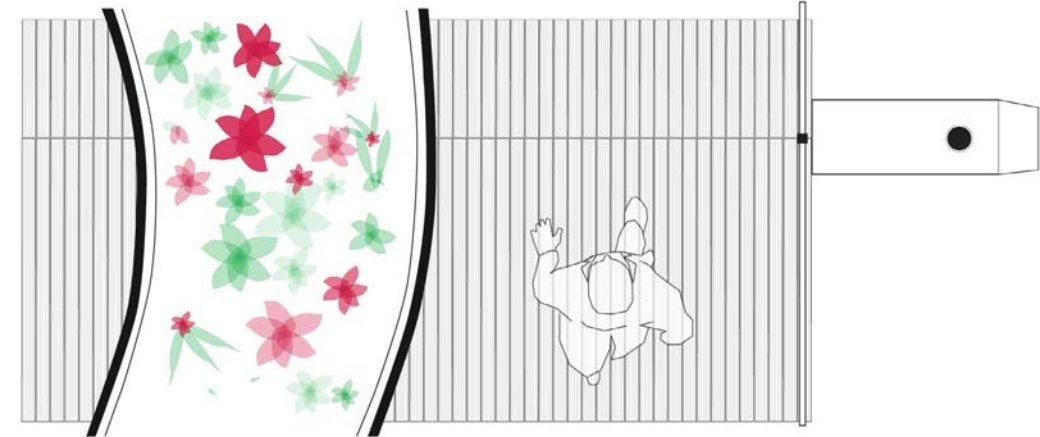


1" = 1'

Detail of Suspension Cable Joint



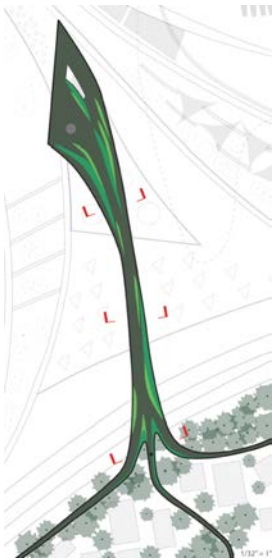
1" = 1"
Detail Section



1" = 1"
Detail Plan

and brought back to human scale by a series of linear planters that break up the main path into narrower segments. Additionally, the plantings are reminiscent of the original land bridge concept.

Overall, from its exit from the tree canopy and over Bridgeway Blvd to become the roof deck of the Science-Art Center, this bridge's primary function is to restore Sausalito's connection to the waterfront. Not only will it provide the physical means to funnel flows of people to and from the proposed landform park, but it will raise awareness of sea level rise through increased visibility of and experience with the



Plan

FLOATING WAVE

Hyunjoo Nam



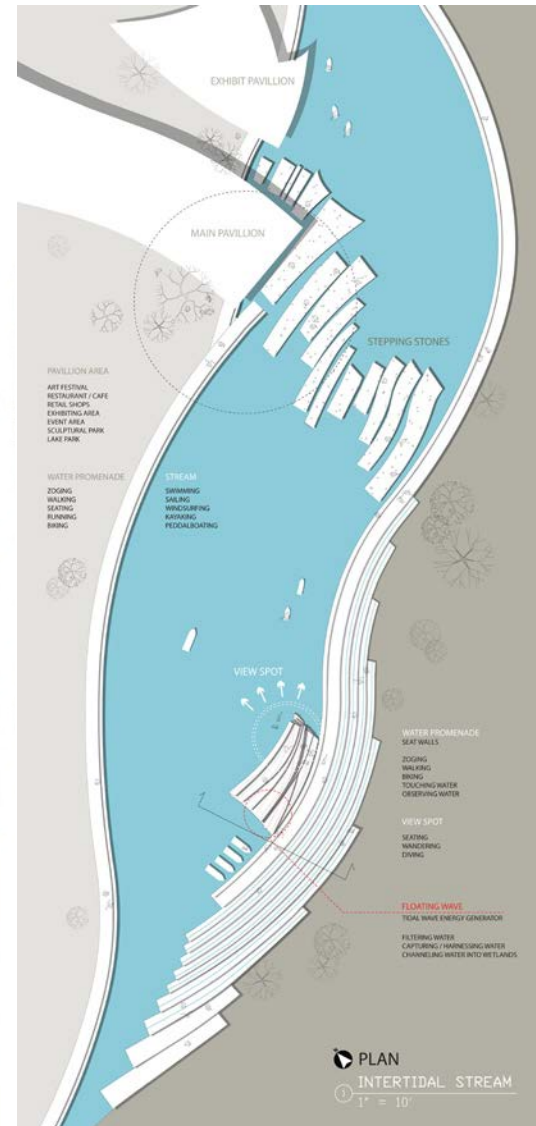
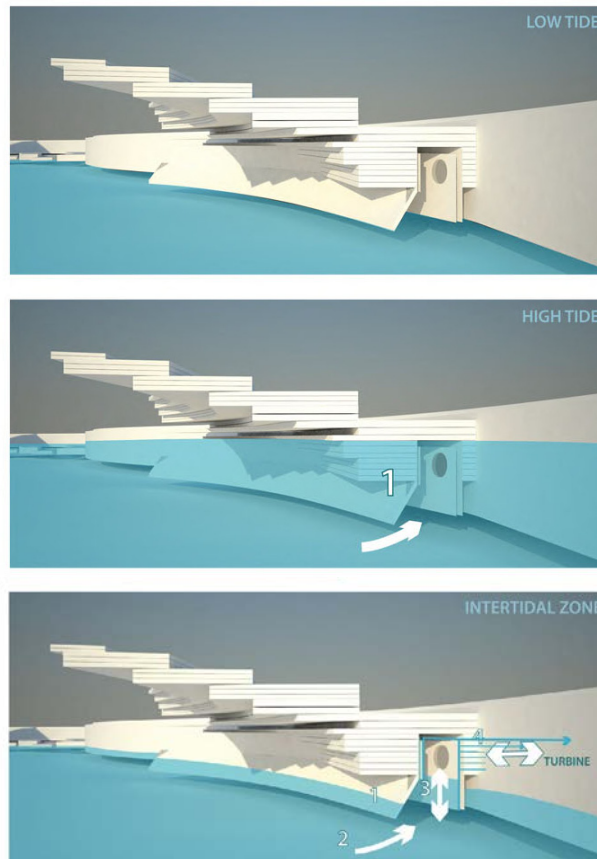
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Two Components of Energy Generator

These devices can capture a small amount of tidal wave energy at each location, produce electricity, and protect existing communities and new communities from inundation.

In this diagram of an Oscillating water column (OWC), the only outlets are at the bottom, where waves come in and out, and at the top, where a narrow passage connected to a turbine lets air in and out. As waves push air, the air rushes through the turbine passage.

The oscillating water column system allows water to enter the column and one narrow passage above to let air in and out.





“The Floating Waves look differently at the existing conditions against that of the tidal fluctuations, creating different emotions, feelings and activities that appear over time.”

As waves enter and fill the column with water, the interior air is pressurized, which forces the air through the opening above. The air drives a turbine, and then, as waves pull away, water rushes out, catching more air back down through the top, driving the turbine again.

Another terminator, an overtopping device, includes a wall that collects the water from

rising waves in a reservoir. The water can escape through an opening, but drives a turbine while passing through. The most famous kind of terminator, however, is Salter’s Duck, which includes a bobbing, cam-shaped (tear-shaped) head that drives a turbine. Though not fully realized, theoretically, this device would be the most efficient WEC.

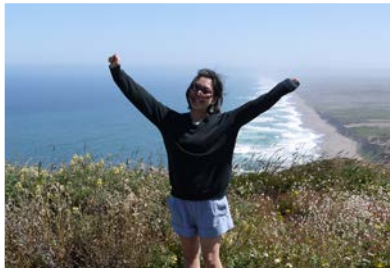
FIELD TRIPS



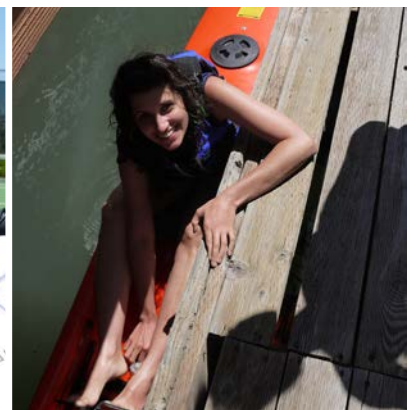
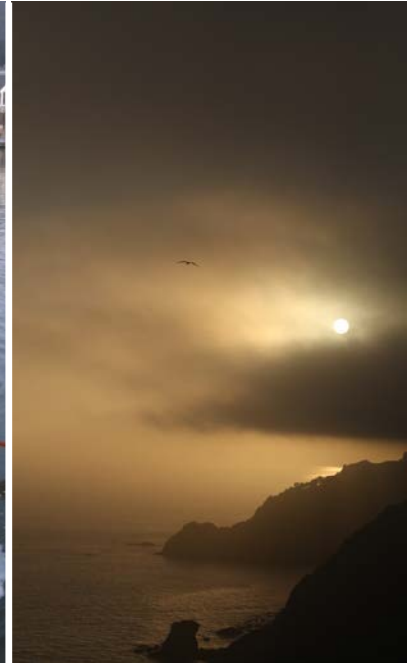
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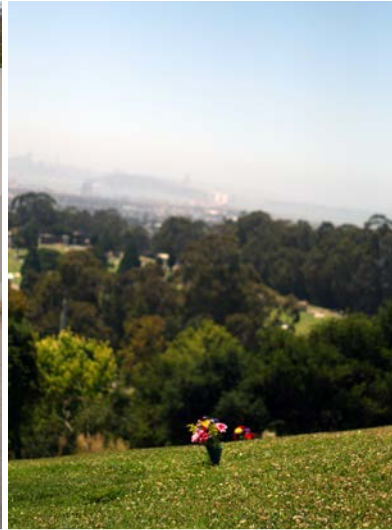
FIELD TRIPS



FIELD TRIPS



FIELD TRIPS



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DEDICATION

IN MEMORY OF MIKE GILBERT

SWA Principal and Board Member
Sausalito Friend

SITE PLAN
1:200

