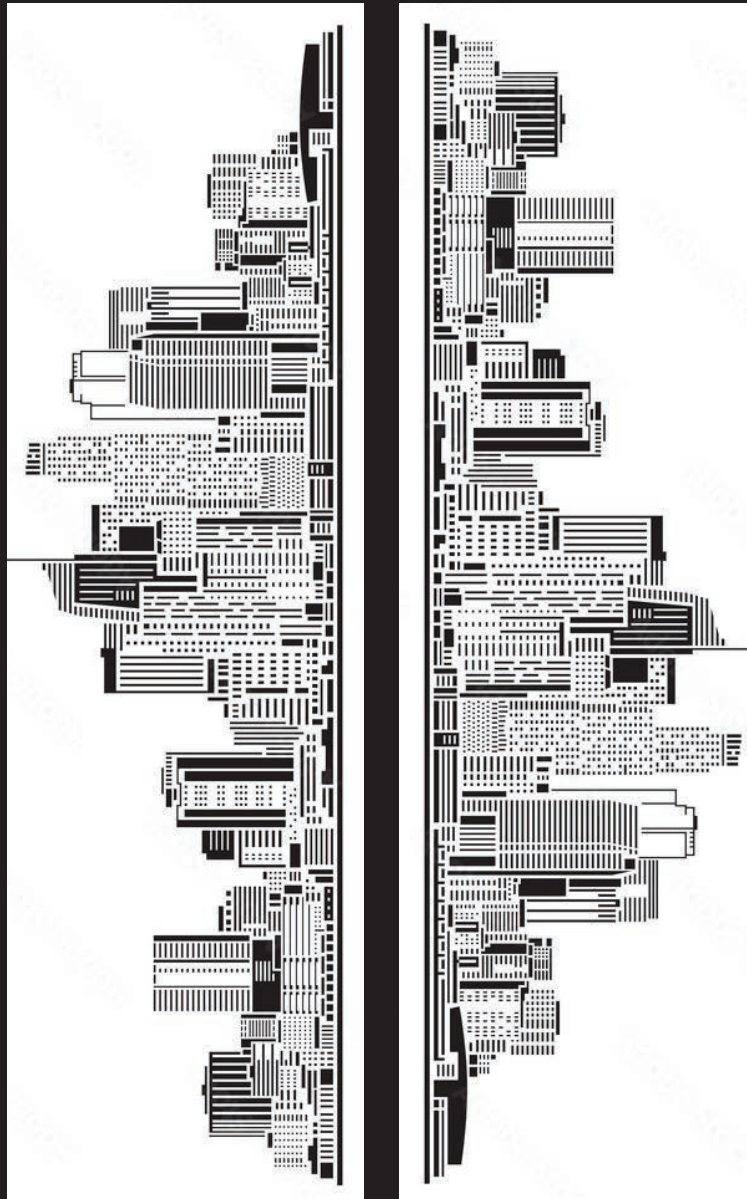


# CAPTURE

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THE WATER CRISIS IN LOS ANGELES



C P  
LA

SIENA WAGNER

March/2023

[siwagner@calpoly.edu](mailto:siwagner@calpoly.edu)

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# INTRODUCTION.

## PROBLEM

The Climate Crisis is attacking California's water supply, leaving cities vulnerable to water insecurity. Climate change is altering the amount and timing of precipitation, snowpack, and runoff. There is more rain, less snow, and less spring runoff. This is bad news for California. The state's water infrastructure is fed by mountain snowpack and we do not currently have the infrastructure to capture or hold rainwater. These changes are predicted to dramatically decrease water availability.

Zooming into Los Angeles County, a water starved urban metropolitan region, they import 55% of its water supply, all of which are fed by snowpack. Only 45% is sourced locally -- 35% from local ground and surface water and 10% from recycled water. The looming threat of climate change presents forces California to rethink its water future. Localizing the water supply instead of depending on unreliable imports through water harvesting and groundwater recharge is integral to water security.

## LOCATION

Capture looks to Ballona Creek, a major waterway in Los Angeles County, to test water harvesting and groundwater recharge techniques. I want to acknowledge that Ballona Creek stands on the traditional homelands of the Gabrielino-Tongva tribe -- the original inhabitants of the Los Angeles Basin.

## WATER RECHARGE

Ballona Creek, originally a distributary of the Los Angeles River, helps recharge the Los Angeles Basin—the largest groundwater source of Los Angeles County. Groundwater basins can be successfully recharged through existing and restored natural channel bottoms or percolation of rainwater. Unfortunately, Ballona Creek can no longer recharge the groundwater because it has been channelized.

## DESIGN APPROACH

Capture will de-channelize Ballona Creek to enable groundwater recharge. The design employs a mix of channel modification typologies, to safely retrofit the existing concrete channel. Ballona Creek will be transformed from a neglected, lifeless, storm drain, to a bountiful, biodiverse, community hotspot. Instead of being fenced off from the community, Ballona Creek's edge will be open and seamlessly integrated into the urban fabric. Users can easily wayfind from the city's streets, to the water's edge. The 8.5 mile creek will be an urban oasis full of life, dazzled with community amenities and stunning views.

Capture design circles around land use. Ballona Creek's edge is divided into urban, residential, and natural edges. Each edge condition will have a select program and list of channel modifications.

# GOALS + OBJECTIVES.

## DESIGN A SYSTEM TO CRISIS IN LOS ANGELES

DROUGHT. WATER SCARCITY. FLOOD.

### FOSTER STEWARDSHIP OF BALLONA CREEK.

Provide public access to the site.

Maximize access to the site, so that users can easily visit and build a relationship with Ballona Creek.

Integrate socio-cultural site elements to draw users to Ballona Creek.

Implement educational signage across the site to reconnect users with the land's flora, fauna, and natural systems.

### ENHANCE ENVIRONMENTAL EQUITY.

Provide multi-modal transportation on-site and to the site's gateways to foster equal access.

Increase the number of gateways to maximize access.

Build pedestrian bridges that connect the urban matrix with the waterfront.

Removal of fencing that separates low-income housing areas from the creek.

# TO RELIEVE THE WATER ILES.

## MITIGATE FLOODING.

Employ channel modification that can safely handle 100-year and 500-year flood events.

Support ecological regeneration to create a self-supporting ecosystem that will defend the city against flood events.

Stop building in high flood risk areas.

Implement flood-resistant architecture.

## IMPROVE WATER QUALITY.

Restore riparian buffers to filter out water pollutants.

Seed plants that uptake and remove pollutants from the water.

Implement retention basins that allow water to be deep cleaned through slowed infiltration.

## RECHARGE GROUNDWATER.

Increase green space for water percolation to recharge the underground water table.

Implement retention basins.

De-channelization.

Restore and reintegrate waterways into the city matrix to recharge the underground water table.



## LO-TEK

## DESIGN BY RADICAL

## INDIGENISM

BY : JULIA WATSON

### Summary

Lo-TEK is “a design movement to rebuild an understanding of indigenous philosophy and vernacular architecture that generates sustainable, climate-resilient infrastructures”. The theory deconstructs the confines that a majority of Westerners abide by in order to open people’s minds to indigenous technologies. Watson identifies technology as a mythology brought about by the Enlightenment—a European intellectual movement of the late 17th and 18th centuries emphasizing reason and individualism rather than tradition. She recognizes the term technology as a construct, influenced by humanism, colonialism, and racism, used to invalidate indigenous innovation. Alongside the Enlightenment, indigenous practices were outcasted by the Age of Industrialization. The movement effectively distanced humanity from natural systems and it is commonplace to associate the Industrial Revolution with environmental degradation. Human caused environmental degradation has landed us into the era of the Anthropocene—our current geological period characterized by the undeniable negative impact of humanity on Earth’s climate and environment. Watson looks to indigenous technologies, as native culture works with nature instead of dominating it, to procure solutions to the current climate crisis. Lo-TEK investigates lesser-known local technologies, traditional ecological knowledge (TEK), indigenous cultural practices, and mythologies passed down as songs or stories” and “explores the intersection of design and radical indigenism”. The term radical indigenism is important to define as it “rebuilds an understanding of indigenous philosophies in relation to design to generate sustainable and climate resilient infrastructures”.

### Application

The theory of Lo-TEK is foundational to Indigenous Solutions as it is driven by the theory’s rationale and looks to apply native philosophies and technologies to mitigate water scarcity in the city of Los Angeles.

## Summary

Resilient design seeks to create resilient communities that can survive the challenges of climate change. The goal of the approach is to “retrofit our communities to recover more quickly from extreme events, now and in the future”. Resilient design advocates for the implementation of adaptive, multi-layered systems that work with nature to build our defenses instead. Multi-layered systems are superior safety wise and economically as they are able to sustain their vital functions, are cost effective, and provide practical solutions. As said by ASLA, “the best defenses are adaptive like nature”. The founding pillars of resilient design are risk reduction, scalability and diversity, multiple co-benefits, and regeneration. Risk reduction seeks to adapt and redevelop communities to increase safety and improve ecological and human health. It asks communities to stop building in high risk environments and reduce urban sprawl. Scalable diversity offers a multi-layered protective system that can safely fail from a catastrophic event. Multiple co-benefits touch on the profits that humans, wildlife, fauna, and natural systems receive from resilient design by implementing a holistic system. Lastly, regeneration is the power to come back stronger after natural disaster events.

## Application

The theory of Resilient Design is a cornerstone of Indigenous Solutions and will use its principles to create solutions to water scarcity in Los Angeles.

# RESILIENT DESIGN

BY : ASLA

# DESIGN WITH NATURE

BY : IAN L. MCHARG

## Summary

Design with Nature embodies putting Earth and all her flora and fauna first. The theory is motivated by environmental degradation and seeks to design a world where humans and the natural environment can live harmoniously. He acknowledges man's destructive role towards Earth and argues that there is a lack of urgency amongst humanity around the climate crisis, writing “despite nature's many earlier warnings, the pollution and destruction of the natural environment has gone on, intensively and extensively, for the last three hundred years, without awakening a sufficient reaction...”. Design with Nature recognizes that modern technology, “through its hasty and unthinking application of scientific knowledge or of technical facility, has been defacing the environment and lowering its habitability”. The theory's constructive environmental design is centered around ecology - the branch of knowledge within biology, dealing with the relations of organisms to one another and their physical surroundings. Ecology drives Design with Nature's effort to constitute a balanced and self-renewing environment. The approach does so while simultaneously preserving “man's biological prosperity, social cooperation, and spiritual stimulation”. Design with Nature is translating into design via the “layer-cake method” which in simple terms is suitability analysis.

## Application

The theory of Design with Nature is critical to Indigenous Solutions as aiding in water scarcity in relief for Los Angeles necessitates healthy natural systems. I will utilize the “layer method” created by Ian McHarg to redesign Los Angeles to work with nature.

# CASE STUDIES.

NEW  
YORK  
CITY

SEA  
RANCH

NEW  
YORK  
CITY

SEA  
RANCH

CAN  
THOU

SPONGE  
CITY

WATER  
URBANISM:  
BEIRA

CAN  
THOU

SPONGE  
CITY

WATER  
URBANISM:  
BEIRA



#### [HURRICANE SANDY]

Hurricane Sandy generated the highest storm tide ever recorded in New York, reaching nearly 14 feet in height with approximately 9 feet of storm surge. The storm wiped out entire coastal communities with its flood waters.



#### [AFTER EFFECTS]

Hurricane Sandy washed away entire buildings, but those on piers remained.

## SEA RANCH

LOCATION : NORTHERN CALIFORNIA

DESIGNER : LAWRENCE HALPRIN

### Summary

Sea Ranch is an exemplary piece of architecture demonstrating climate responsive design. This fantastic community development's architecture was designed by Joseph Esherick, Donlyn Lyndon, Charles Moore, and Richard Whitaker, and the master plan was designed by the infamous landscape architect Lawrence Halprin. Sea Ranch was birthed in the 1960s and is located along 10 miles of Northern California coastline. Each building was sited to work with the topography in order to alter the natural environment as little as possible, protect the buildings from weather, and take advantage of viewsheds. It is a beautiful hybrid of modernist and regionalist architectural style that seamlessly works with the landscape.

### Design Implications

Sea Ranch is a perfect example for how to design with nature. Capture will emulate Lawrence Halprin's strategies used to design the master plan of Sea Ranch to locate site elements that highlight the areas natural features and work with the land. Capture will also incorporate Sea Ranch's regional style, pulling design inspiration from the natural landscape.



# NEW YORK CITY

DESIGNER : THADDEUS PAWLOWSKI

## Summary

New York City was decimated by Hurricane Sandy in 2012. New York has 520 miles of coastline, all extremely vulnerable to more frequent and powerful storms that arised with climate change. New York City had insufficient infrastructure to handle these storms, leaving communities devastated. Pawlowski worked to create climate resilient solutions for the city, and focused his pursuitson investing in housing. He specifically worked on private housing owned by the middle class that were in identified flood zones. Pawlowski put the housing vulnerable to flooding on piers to elevate the residences above the water line, effectively protecting them from flood.

## Design Implications

The project in New York City is a prime example of implementing flood resistant architecture to aid major metropolitan cities suffering from floods. Capture will look to place landscape features in flood prone areas on piers, and will create practical solutions with minimal disturbance to residents routines. Proposing solutions to the water crisis that match modern living is essential for successful implementation.



### [ARCHITECTURE]

Sea Ranch building by architects Joseph Esherick, Donlyn Lyndon, Charles Moore, and Richard Whitaker demonstrating climate responsive architecture.



### [MASTER PLAN]

Sea Ranch master plan by Lawrence Halprin, showcasing environmentally mindful planning.



#### [FLOATING MARKETS]

The city has adapted to its low lying water climate and is home to floating river markets.



#### [FLOOD ADAPTATION]

The project reconnects the movement and flow of the urban hydrological cycle to the city of Can Tho. Canals are greened and recharge parks are introduced, providing opportunities for aquifer recharge and flood mitigation. The project activates the canal's edges, seamlessly integrating them into Can Tho's urban fabric.

## SPONGE CITY

LOCATION : CHINESE CITIES

DESIGNER : KONGJIAN YU

### Summary

Sponge City is a conceptual project working to solve China's impending water crisis. China is facing water shortages and flooding due to urbanization, overexploitation, and pollution which is being exacerbated by climate change. The project uses integrated urban water management (IUWM) to mitigate flooding, water pollution, and water scarcity. It transforms cities from being impermeable systems to "sponges" through: open green spaces, green roofs, porous design, water savings and recycling. These sponge systems absorb, store, infiltrate, and purify rainwater, allowing cities to be self-sufficient with water. It also uses urban wells to access infiltrated water.

### Design Implications

Capture will translate the integrated urban water management utilized in Sponge City, to help relieve the City of Los Angeles' water crisis. Capture shall explore the following design elements used in Sponge City: open green space, green roofs, porous design, water savings, and recycling.

# WATER URBANISM: CAN THO

DESIGNER : KATE ORFF AND THE COLUMBIA GSAPP  
URBAN DESIGN PROGRAM WATER URBANISM STUDIO

## Summary

Can Tho, Vietnam is historically a riverian society: people existed for centuries in a watery landscape. The native people designed a thriving riverian society that worked with nature's patterns, instead of trying to control them. Transportation and architecture was flood oriented, using a system of boating canals and floating river. Unfortunately, outside real estate speculators built highways over the native's canals and paved urban development, causing constant urban flooding. Pawlowski is actively working to reintegrate canals into the city's development pattern to promote climate resiliency.

## Design Implications

The project in Can Tho demonstrates how to live with nature and embrace natural systems in our cities. Similar to Can Tho, Los Angeles was also a naturally flooding landscape that was canaled and controlled by Westerners. Capture will look to this project to reintegrate Los Angeles with its natural water systems through river restoration.



### [WATER CAPTURE]

Envisioning how spaces dedicated to water capturing can double as public park space with multi-level systems.



### [BIORETENTION]

Displaying how water can be slowed down and retained for water recharge with redirection systems on the river's edge.





## [PROBLEM]

In March of 2019 Cyclone Ida destroyed Beira, Mozambique and left the community in shambles.



## [SOLUTION]

Focus site illustrating a multi-level water management system that welcomes flooding in the urban fabric while keeping citizens safe.

# LOS ANGELES RIVER REVITALIZATION

LOCATION : LOS ANGELES, CA

DESIGNER : STUDIO-MLA

## Summary

The Los Angeles River Revitalization by Studio-MLA was born out of a design competition that sought to revitalize 32 miles of a concrete-lined channelized river into a public greenspace. The team focused on watershed health and sustainability through diligent site analysis. The project goals were to revitalize the river, restore habitat, connect parks to poor neighborhoods, create connectivity via greenways, improve flood capacity and water quality. The design successfully reconnected the tributaries originating in the surrounding mountains that feed the Los Angeles River.

## Design Implications

The project is very similar to Caputree, being a waterfront revitalization and de-channelization project. Capture will look to the Los Angeles River Revitalization for its master plan typology. The master plan is broken down into three layers: river network, open space network, urban network. These features highlight ecological and community connectivity, serving to create a unified urban-natural landscape.

# WATER URBANISM: BEIRA

DESIGNER : KATE ORFF AND THE COLUMBIA GSAPP  
URBAN DESIGN PROGRAM WATER URBANISM STUDIO

## Summary

The project Water Urbanism: Beira transforms the vulnerable and damaged waterfront city to resilient and thriving in the face of climate change threats. In March of 2019 Beira was left in shambles by Cyclone Ida. The storm destroyed large swaths of property and crops, wiping out 90% of buildings, killing hundreds, and causing a humanitarian crisis as thousands were displaced and left without basic needs. Orff and the team curated a design solution supported by natural and social capital, maximizing the value of nature, economy, and ecology to provide Beira with a resilient recovery from Cyclone Ida and long term security.

## Design Implications

Capture will look to the project's design approach, basing solutions off of natural and social capital to provide a long term and beneficial solution to the water crisis in Los Angeles.



### [RIVERFRONT]

Reimagined Los Angeles riverfront, with ample room for recreation, walking, and seating. The new waterfront is embedded into a designed urban forest. The design also provides wetland plants that serve to clean the water.



### [MASTER PLAN]

The master plan analyzes the river network, open space network, and urban network to revitalize the river and connect citizens to the waterfront.





#### [FORM EXPLORATION]

The project utilized a unique pin impression plate to explore alternative forms for the pier and tests it in model form.



#### [BUILT FORM]

The vegetation on the pier mocks the vegetation on the streetscape in order to draw users from the street on-site.

## MIDDELFART HARBOR FRONT

LOCATION : MIDDELFART, DENMARK

DESIGNER : EFFEKT

### Summary

Middelbart Harbor Front is the vision for a new neighborhood in the center of Middelbart. The project is located on a former industrial site between the city center and ocean and seeks to reconnect the city to nature and the ocean. Effekt's goals include afforestation, increased biodiversity, circular resource thinking, affordability, and social diversity. The design has a large green axis that connects pedestrian infrastructure to the waterfront. The character and planting transition with the land use from a dominantly paved urban landscape to a park typology to a coastal park.

### Design Implications

Capture will look to Middelbart Harbor Front's seamless transition from urban to waterfront. The project does an amazing job of utilizing planting to make the transition comfortable. Also, Capture will focus on creating strong axis so that users can easily navigate from the city to the waterfront, even if their views are obstructed by buildings.

# LITTLE ISLAND PARK

LOCATION : PIER 54, HUDSON RIVER, NY

DESIGNER : HEATHERWICK STUDIO

## Summary

Little Island Park is an amazing example of alternative design. Heatherwick Studio was asked to design a new pier that serves as a public park and outdoor performance space. The design inspiration came from the structural remnants of the surrounding piers after the area was struck by Hurricane Sandy--hundreds of old wooden piles poked out of the Hudson River. The idea translated the broken wood piers into the concrete supports for the new structure. The result produced a unique wavy like pier with 132 pre-cast concrete supports also referred to as "pots" that support plant life.

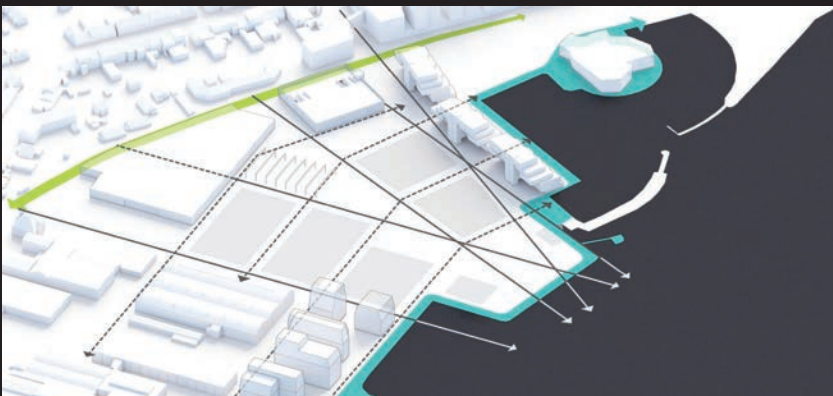
## Design Implications

Capture will look to Little Island Park for its unique form exploration. Utilizing a pin impression plate is a simple, quick, and effective way to explore a variety of channel modifications. Also, the pier is an inspiring example of alternative form exploration. There are no bounds to form expression.



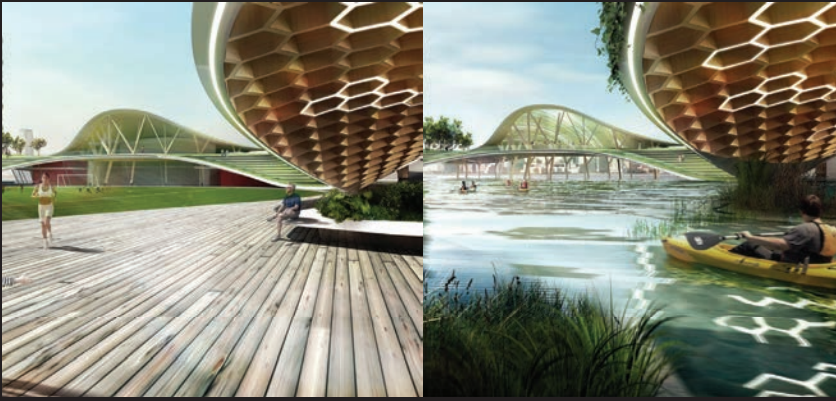
### [WATERFRONT]

The design playfully embraces the ocean, redirecting water inland to create safe swimming pools for beach goers.



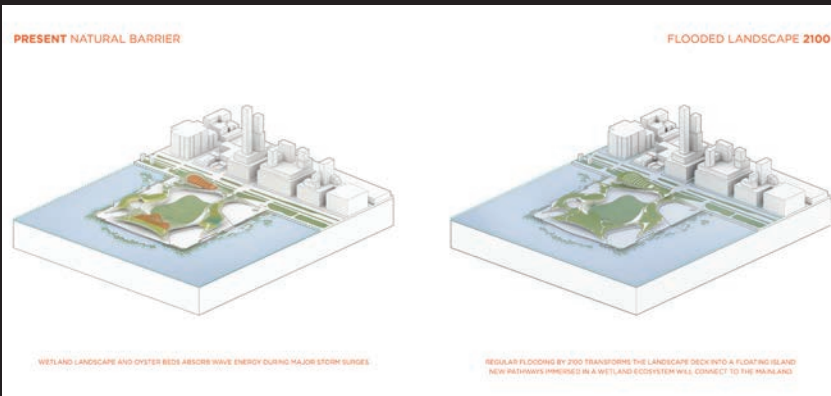
### [CONNECTIVITY]

Tall buildings in the city obstruct eyeline connections to the ocean, so the design utilizes strong axis to guide users from the city center to the waterfront.



#### [FLOOD]

The design embraces flood, creating multi-use spaces for dry and flooded conditions. In dry conditions this space serves as a deck and in flooded conditions users can kayak.



#### [MULTI-LEVEL]

Flood waters are welcomed across the site. The multi-level design allows the landscape deck to become a floating island when storm surges occur. The island is permanently connected to the mainland via lifted pathways.

## CASINO MIDDELKERKE

LOCATION : BELGIUM

DESIGNER : ZJA

### Summary

Casino Middelkerke design objectives were to reinforce the sea embankment, enhance the quality of the public space by removing car traffic, and unify the boulevard with the city square. The team took advantage of the opportunity to memorialize history--remembering Middelkerke as a thriving town on the medieval island of Testerep by renewing the spaces relationship with the natural beach, dune, and gully landscape. They did this through the creation of an artificial dune which they call a 'landscaper' that merges building function with open space.

### Design Implications

Capture will look to Casino Middelkerke's multi-purpose structure and its nature-based form. The design mocks the landscape's dune complex, preserving the areas natural beauty, whilst having the necessary infrastructure to hold back water.

# PIER 40

LOCATION : PIER 40, HUDSON RIVER, NY

DESIGNER : DFA

## Summary

Pier 40 envisions New York City's Hudson waterfront under the guise of sea level rise. Sea levels are expected to rise 11-30 inches by 2050 and between 50-75 inches by 2100. The vast majority of buildings in the area are not designed to accommodate these rises in sea level. Pier 40 serves as a model for. Through pile analysis, DFA identified areas fit for supporting program development, focusing on recreational use and affordable housing.

## Design Implications

Capture looks to Pier 40's multi-use design. The project welcomes floodwaters into the urban matrix, instead of trying to keep water out. Capture will use this strategy to celebrate flooding, utilizing the weather event as an opportunity for new recreational activities instead of being a time of limitation



### [FORM]

The landscape form mimics the area's natural dune complex, preserving the area's natural beauty.



### [LEVELS]

The building has multiple levels that create new views of the ocean and safety from storm surges.



# PRECEDENTS.

## NEW YORK CITY



Imagining a coastal community incorporating flood-resistant architecture to live in harmony with Marina Del Rey's flood-prone coast.

## SEA RANCH



Visualizing the City of Marina Del Rey from an aerial view if urban development was moved out of the 500 year flood zone. White is the 500 year flood zone, black is land, and grey is the ocean.

## CAN THOU



Looking to the historic Los Angeles River edge to envision the city line cohabitating with the flood plain.

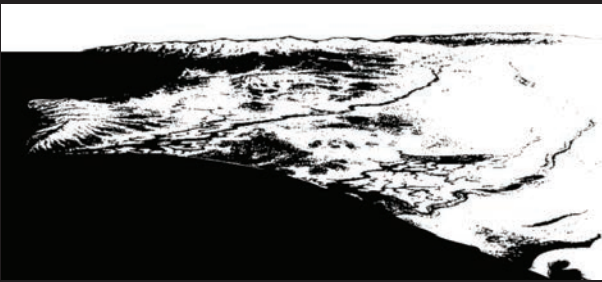


## SPONGE CITY



Visualizing the increase in greenspace within downtown Los Angeles if all buildings had green roofs. White is non-porous surfaces, black is proposed porous surfaces, and grey is existing porous surfaces.

## WATER URBANISM: BEIRA



Ecological network following the Los Angeles Basin's natural flow and floodlines. Black is the ecological network and white is urban areas.

# SITE INVENTORY.

## HOUSES

### "KIYS"

FORM: DOME-SHAPED BRUSHED HOUSES.

HOW: MADE FROM WILLOW TREE BRANCHES PLANTED INTO THE GROUND IN A CIRCLE. TOPS OF THESE POLES WERE THEN BENT TOWARD THE CENTER. TULE RUSHES AND OTHER STIFF GRASSES WERE LAYERED AND TIED TO THE FRAME FOR INSULATION.

## FOOD

### SEAFOOD

KELP  
SHARK  
SHELLFISH  
CLAMS  
SEALS  
SEA LIONS

### LAND ANIMALS

SQUIRREL  
RABBIT  
DEER MEAT

### PLANTS

ACORN CAKES  
BOWL  
SEEDS  
NUTS  
FRUITS AND BERRIES  
HONEY

## CANOEES

### TIAT

USE: TRADE AND FISHING

FORM: MADE OF PINE TREES AND DRIFTWOOD

HOW: WOOD CUT WITH WHALEBONE + DEER ANTLERS + STONE. SANDED WITH ROUGH STONES. BURIED IN WET SAND TO SHAPE THE PLANKS. FIRES WERE BUILT ON TOP OF THE SAND TO DRY. TIED TOGETHER WITH ROPE AND PLANT FIBERS. FILL HOLES AND CRACKS WITH BEACH TAR TO BE WATERTIGHT.

# TONGVA

## C U L T U R E

### CLOTHES

#### CHILDREN

NAKED.

#### MEN

ANIMAL SKIN AROUND THE HIPS. CAPES MADE OF ANIMAL HIDES OR FUR WHEN COLD.

#### WOMEN

SKIRTS MADE OF THIN STRIPS OF BARK, TULE GRASSES, OR LEATHER. CAPES MADE OF ANIMAL HIDES OR FUR WHEN COLD.

#### SHOES

BAREFOOT. FOR LONG TRIPS OR PICKING CERTAIN FRUITS THEY WORE SANDALS MADE FROM YUCCA PLANT FIBERS.

#### TATTOOS

BLUE-BLACK LINES ON FOREHEADS AND CHINS. DONE WITH NEEDLE-TIPPED YUCCAS AND ASH.

#### HAIR

BRAIDS.

#### JEWELRY

EARRINGS. NECKLACES. BRACELETS. MADE FROM WHALES TEETH + STONE + BEADS + FEATHERS + SHELLS.

#### BASKET WEAVING

WHAT: WEAVED TOGETHER A VARIETY OF TULE RUSHES AND OTHER GRASSES.

#### CANOE BUILDING

WHAT: TIED WOODEN PLANKS TOGETHER AND LAYERED THEM WITH TAR TO PREVENT LEAKS.

#### FISHING

WHAT: CAUGHT FISH IN NETS OR ON LINES WITH HOOKS OF BONE OR SHELL. SEALS AND SEA LIONS WERE HUNTED USING SPEARS OR HARPOONS.

#### HUNTING

WHAT: USED BOOMERANGS (MAKANAS) AND BOWS AND ARROWS

### BASKETS

#### TRINKET

USE: HOLD TREASURES AND MONEY.

FORM: SMALL AND ROUND. SMALL OPENING ON TOP.

#### CRADLEBOARD

USE: CARRYING BABIES.

FORM: MADE OF CLOSELY WOVEN SOFT SPONGY TULE WEEDS.

#### CANTEEN

USE: HOLDING WATER.

FORM: SMALL MOUTH OPENING. WOVEN VERY TIGHT AND SEALED WITH TAR.

#### WINNOWING

USE: SEPARATE LEAVES AND STEMS FROM GRAIN.

FORM: MADE OF TWIGS

#### COOKING

USE: COOKING.

HOW: SET OVER MORTAR ROCKS. ACORN MEAL COULD BE GROUND AND COLLECTED ON THE SIDE OF THE BASKET.

FORM: BOTTOMLESS.

#### PARCHING

USE: ROASTING SEEDS.

HOW: PLACE HOT COALS AND SEEDS IN PARCHING BASKET. TOSS IN A CONTINUOUS MOTION SO THE BASKET WILL NOT BURN.

### JOBS

# TONGVAANGAR

THE WORLD OF TONGVA

Los Angeles Basin

Santa Barbara Island

San Nicholas Island

Santa Catalina Island

San Clemente Island





# SAY OUR NAMES

Achois. Ahaugna. Ahwaugna. Akuuragna. Ajaarvongna. c.  
Apachiagna. Ashawagna. Atavsangna. Atavayagna. Awigna.  
Alyeupkigna. Azucsagna. **OVER** Cahugna.  
Chokishgna. Chowigna. Cucamogna.  
Engvangna. Guaspita. Hahamongna. Homhoangna. Houtgna.  
Huachongna. Hutukgna. Huutngna. Isantkagna. Isanthcogna.  
Joatngna. Juyubit. Kenyaangna. Kinkipar. Komiikrangna.

Kowagna. Kuruvugna. Lukupangna. Masaugna.  
Maugna. Momwahomomutngna. Moniikangna.  
Motuucheyngna. Moyogna. Muuhungna.  
Nacaugna. **100** Okowvinjha.

Ongoovangna.  
Ongobehangna.  
Pahav. Pasbengna. Pasinogna.  
Paxauxa. Peruksngna. Pimocagna.  
Pimugna. Pubugna. Puntitavjatngna.  
Pwingkuipar. Quapa. Saangna.  
Sawayagna. Sehatgna.  
Sheshiikuanungna. Shiishongna.

Shwaagna. Sibagna. Sisitcanogna. Siutcangna. Sonagna.  
Suangna. Tajauta. **VILLAGES** Tibagna.  
Toibigna. Topagna.  
Torojoatngna. Totongna. Tovimongna. Toviseagna.  
Tuyugna. Wajijangna. Watsngna. Weningna. Wenot.  
Wikangna. Yangna.

# SACRED SITES

## 4 SACRED RIVERS

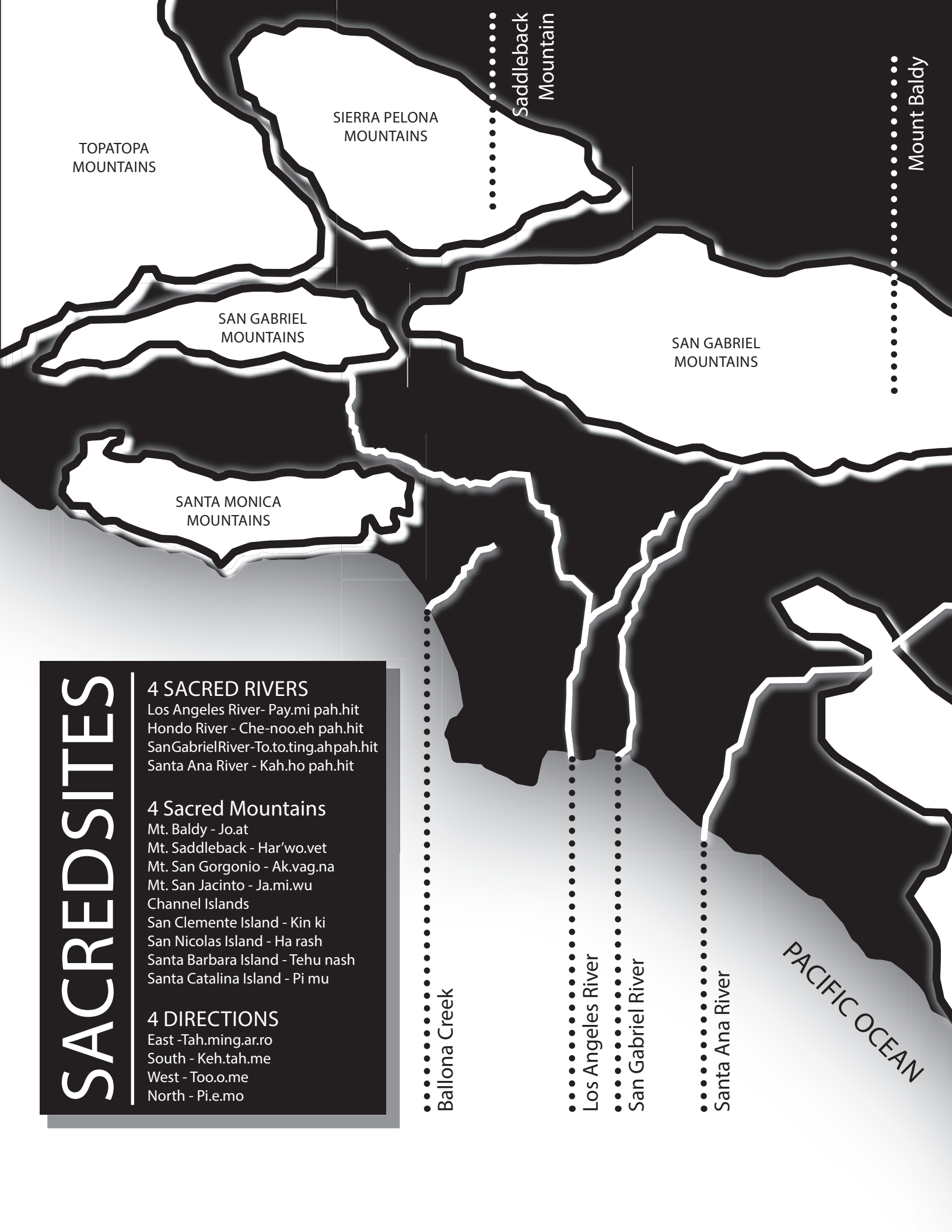
Los Angeles River - Pay.mi pah.hit  
Hondo River - Che-noo.eh pah.hit  
San Gabriel River - To.to.ting.ah pah.hit  
Santa Ana River - Kah.ho pah.hit

## 4 Sacred Mountains

Mt. Baldy - Jo.at  
Mt. Saddleback - Har'wo.vet  
Mt. San Gorgonio - Ak.vag.na  
Mt. San Jacinto - Ja.mi.wu  
Channel Islands  
San Clemente Island - Kin ki  
San Nicolas Island - Ha rash  
Santa Barbara Island - Tehu nash  
Santa Catalina Island - Pi mu

## 4 DIRECTIONS

East - Tah.ming.ar.to  
South - Keh.tah.me  
West - Too.o.me  
North - Pi.e.mo



# TONGVA



SAN BERNADINO  
MOUNTAINS

San Gorgonio Mountain

Mount San Jacinto

SAN JACINTO  
MOUNTAINS

SANTA ANA  
MOUNTAINS

SANTA ANA  
MOUNTAINS

VALLECITO  
MOUNTAINS

# CALIFORNIA

M E G A D R O U G H T

CA  
FACES  
ITS  
FIRST  
MEGA  
DROUGHT  
IN 1,200  
YEARS

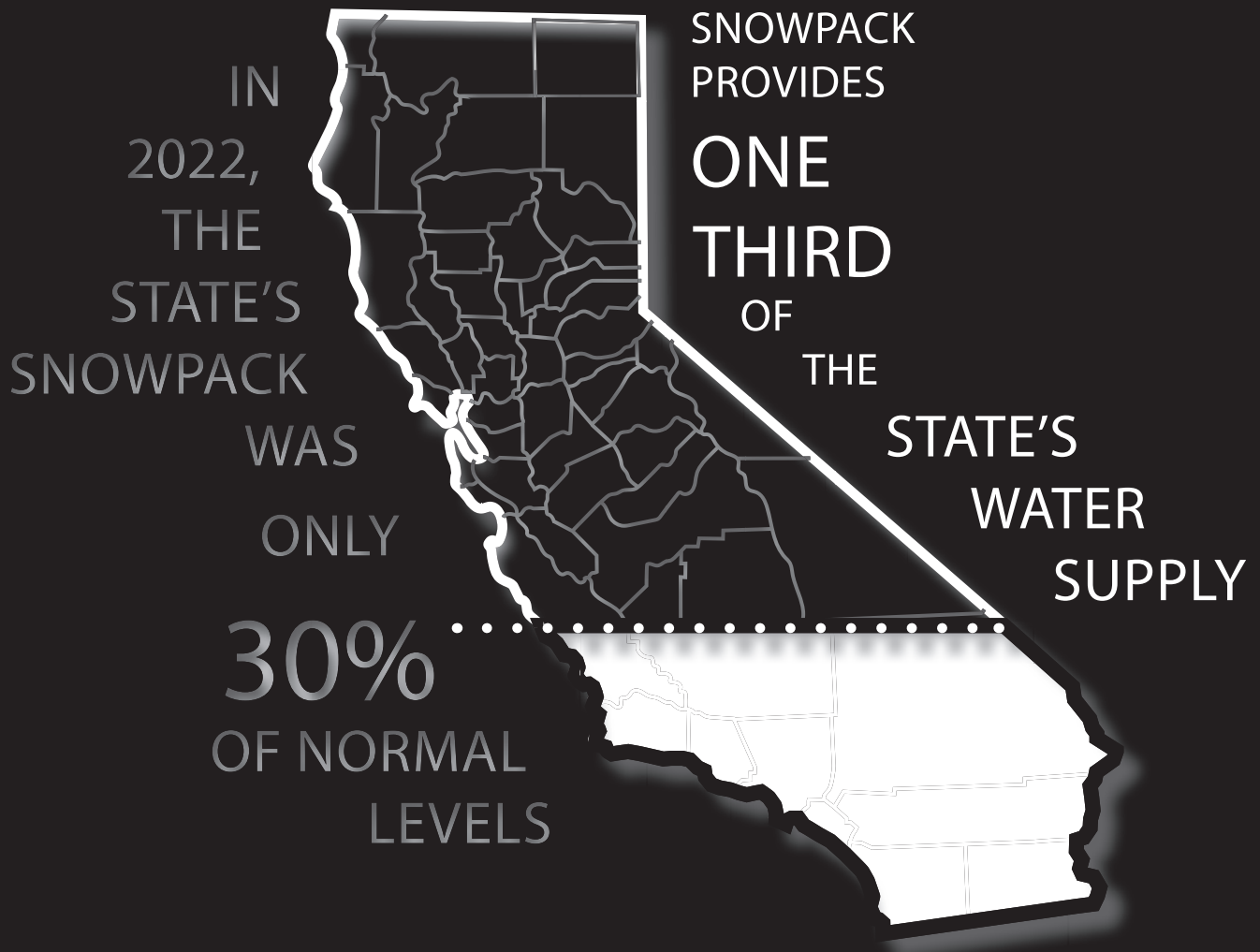
EARTH'S  
WARMING  
CLIMATE  
HAS  
MADE  
THE  
WESTERN  
DROUGHT  
ABOUT  
40%  
MORE  
SEVERE





# CALIFORNIA

S S N N O O W W P P A A C C K K



# LOS ANGELES

W A T E R S O U R C E S



CALIFORNIA AQUEDUCT

SOURCE: SACRAMENTO-SAN JOAQUIN DELTA

LOS ANGELES AQUEDUCT

SOURCE: EASTERN SIERRA NEVADA MOUNTAINS

COLORADO AQUEDUCT

SOURCE: ROCKY MOUNTAINS

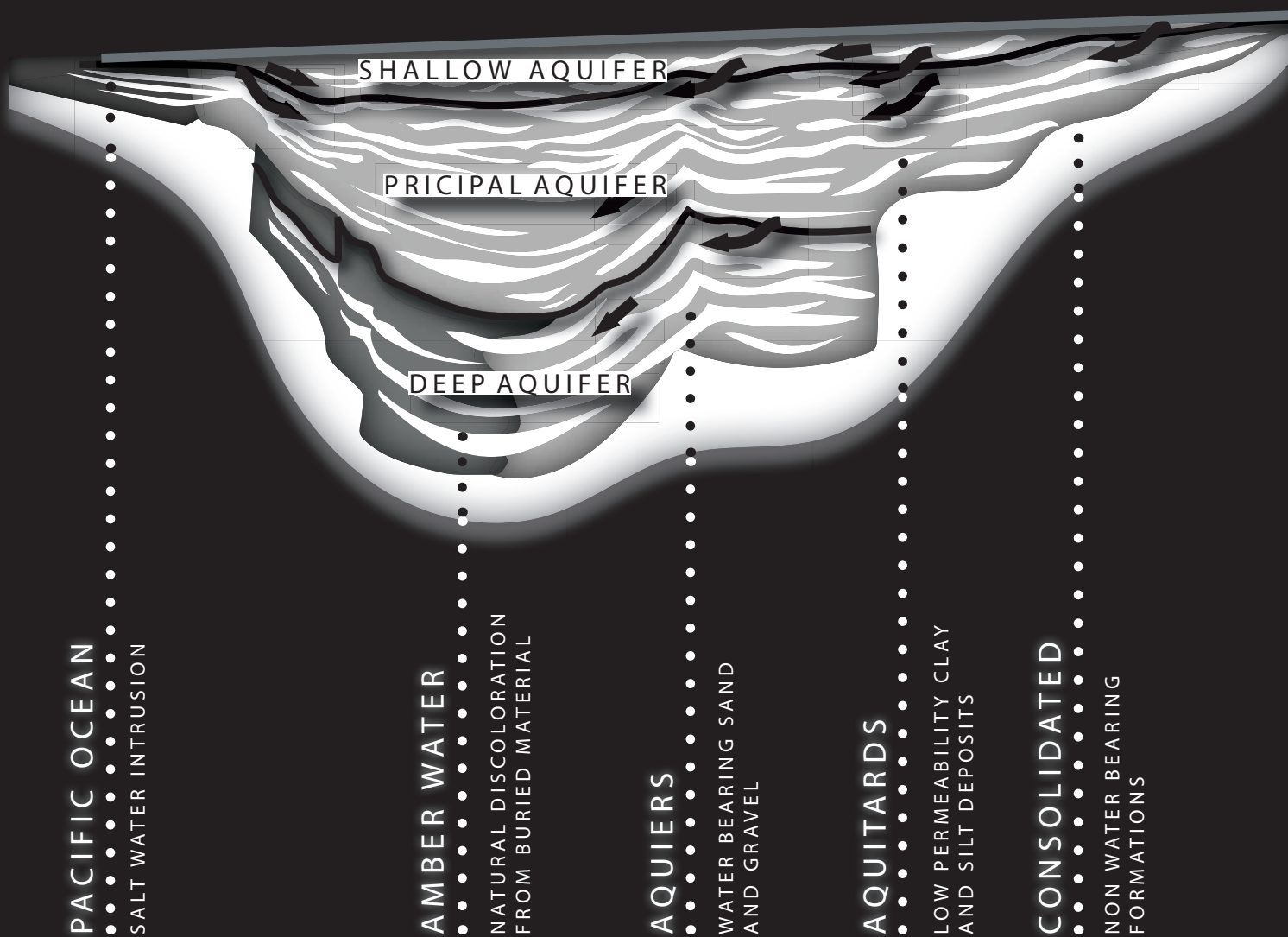
55%  
IMPORTED

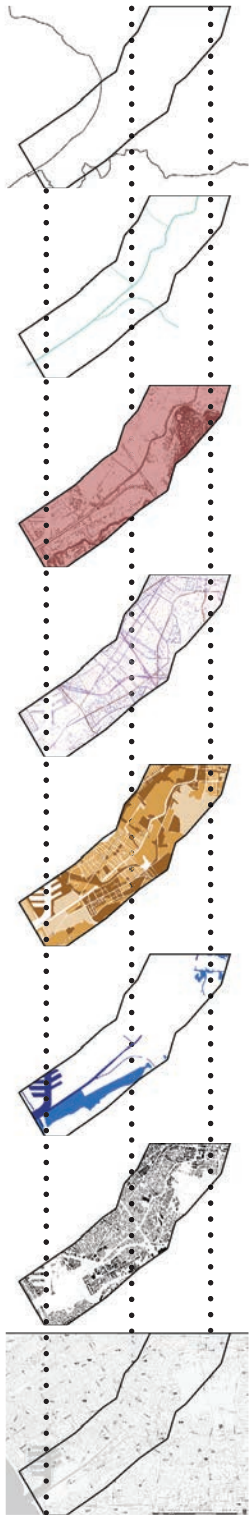
35%  
LOCAL

10%  
RECYCLED

# LABASIN

AQUIFER - RECHARGE  
A Q U I F E R - R E C H A R G E





WATERSHED.

WATERWAYS.

SLOPE.

CIRCULATION.


LAND USE.

FLOOD.

BUILDINGS.



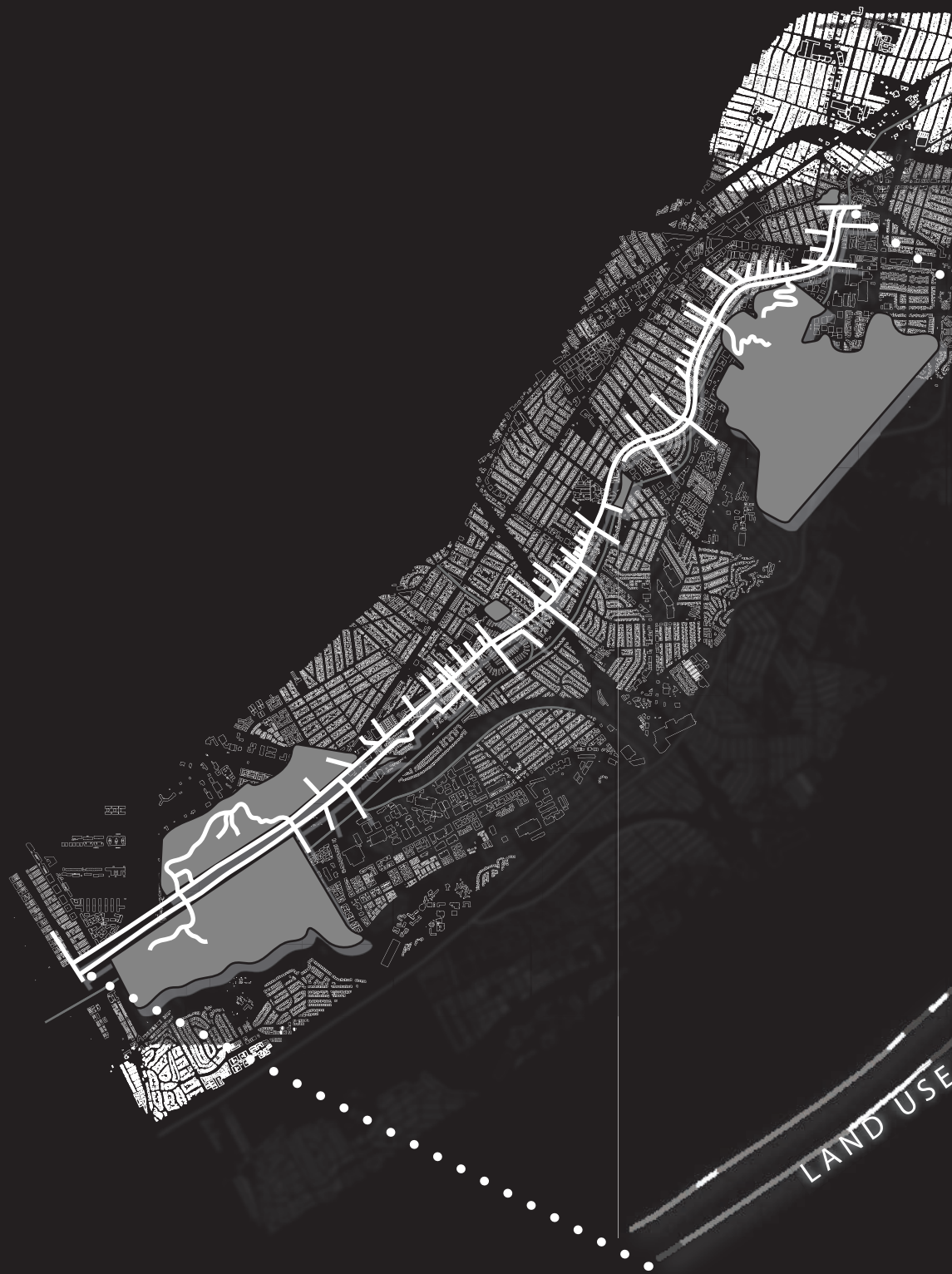
# BALLONA CREEK



80% OF LA  
RAINFALL  
GETS DUMPED  
INTO THE  
OCEAN  
BECAUSE  
THERE IS  
NO WAY TO  
COLLECT AND  
RE-USE IT  
- USC VITERBI



# PROGRAM.





# NATURAL

WATER ACCESS  
OVERLOOKS  
PICNIC AREAS  
RETENTION BASINS  
FISHING

# RESIDENTIAL

WATER ACCESS  
OVERLOOKS  
PLAYGROUNDS  
FITNESS TRAILS  
COMMUNITY GARDEN  
GREEN BELTS

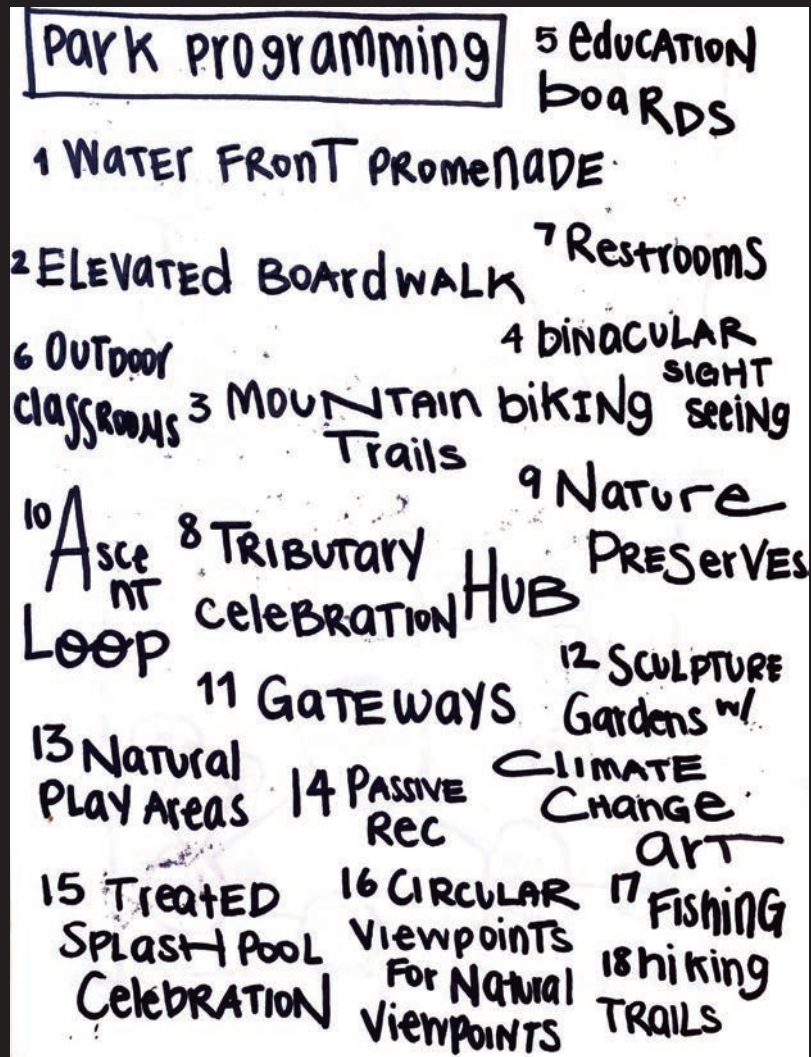
# URBAN

FOOD TRUCKS  
LUNCH AREAS  
CLASSROOMS  
FARMERS MARKETS  
MAKERS MARKETS  
MOVIE SCREENINGS  
BEER GARDENS  
ART EXHIBITS  
EVENT SPACES  
PROMENADES

URBAN NATURAL RESIDENTIAL

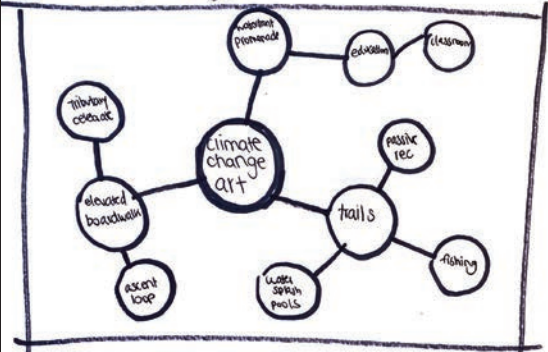
# BUBBLE DIAGRAMS.

## PROGRAM

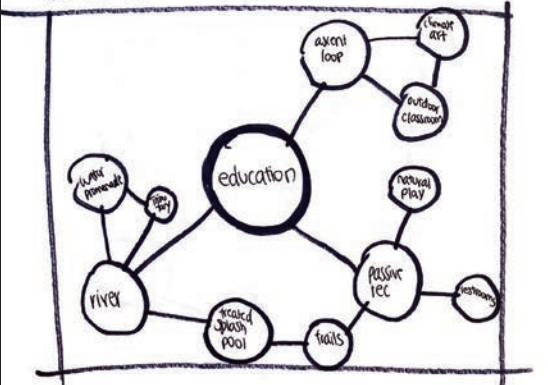




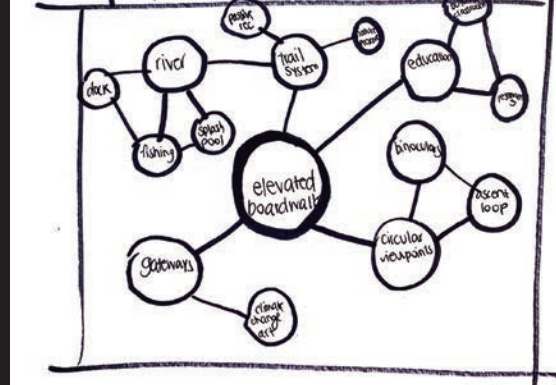
# 1 climate change art



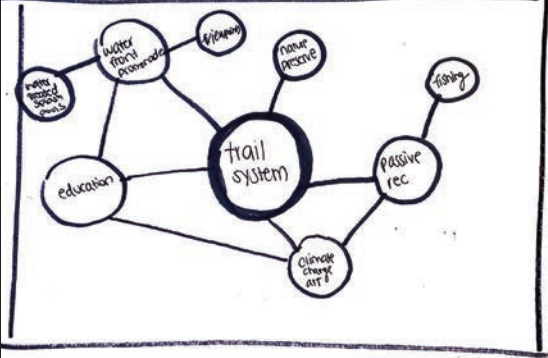
# 2 education



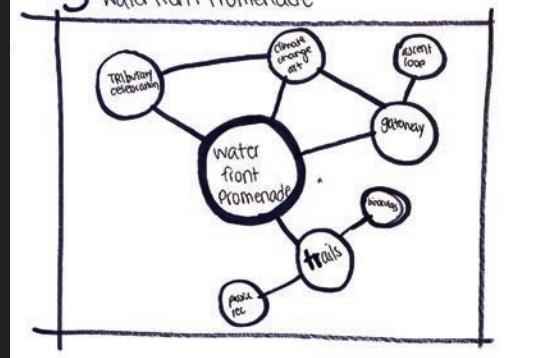
# 4 elevate



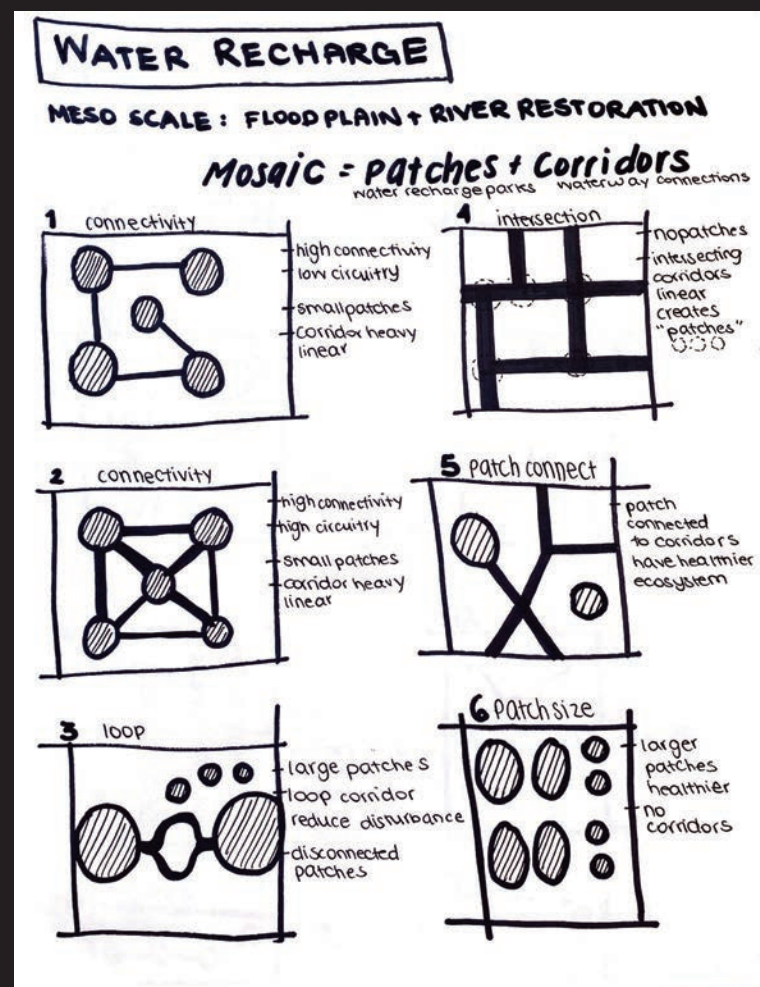
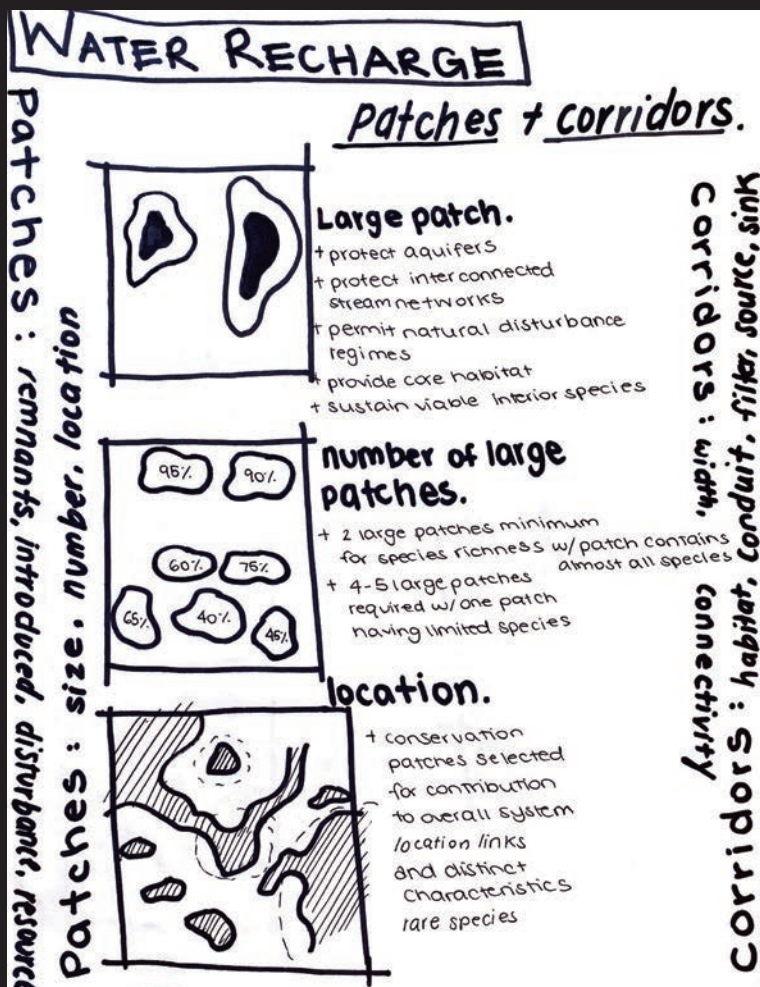
# 3 trails



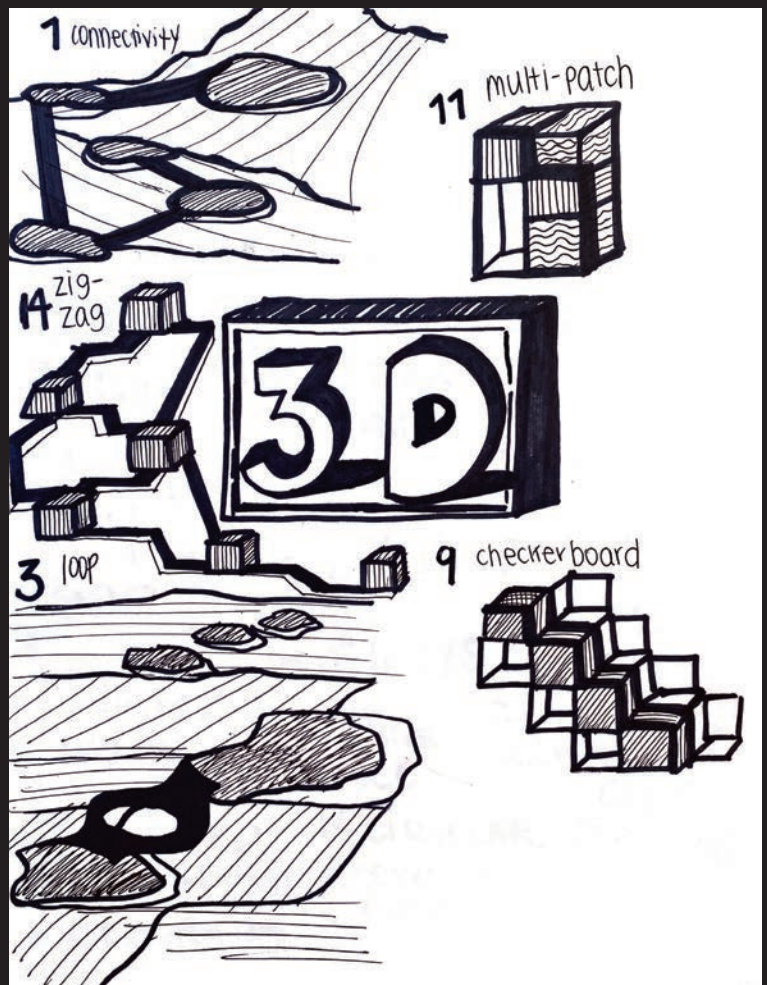
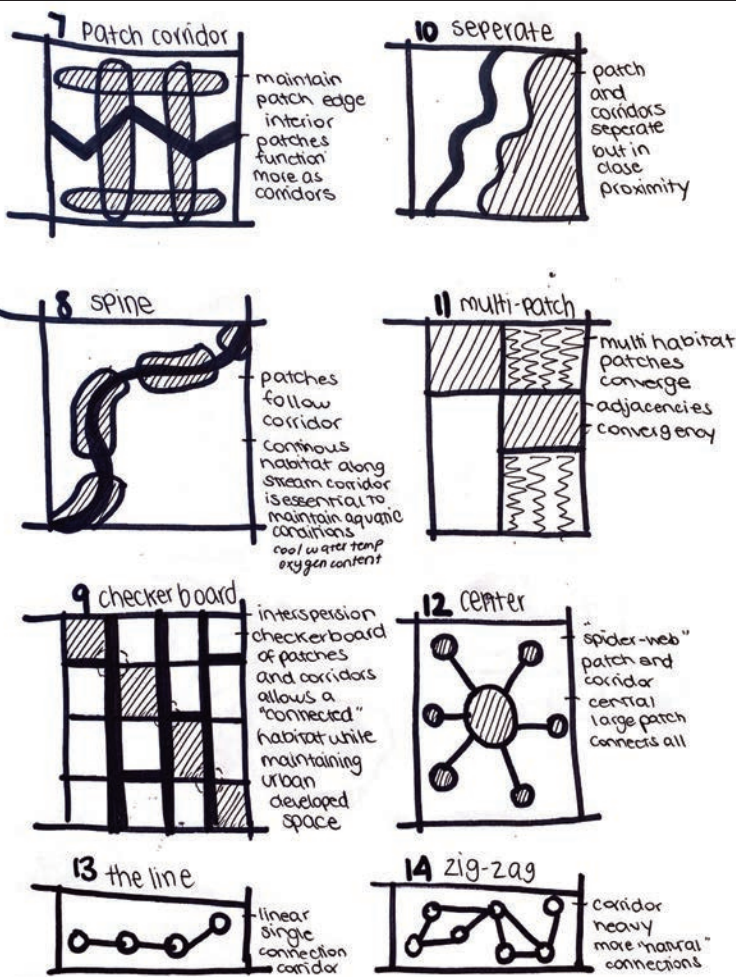
# 5 waterfront promenade



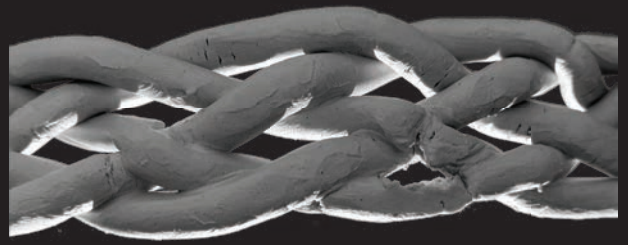
# CORRIDORS + PATCHES







# MODELS.



## BRAIDED.

- playful shadows dance on ground plane
- mimics the form of a Tongva basket
- braided form invites you forward



## GEOMETRIC.

- sharp shadows cover the ground and bridge
- geometric form stand as an art piece
- erratic form invites play and exploration



## WINGS.

- shadows emphasize swooping curves
- wing form pays hommge to native fauna
- swooping curves induce relaxation



# SCHEMATICS.

## BALLONA-CREEK

8 . 5 M I L L E S  
8 5 M I L L E S





# CHANNEL MODIFICATION TYPOLOGIES

L  
A  
I  
R  
E  
E  
T  
A  
M

BIOTECHNICAL EROSION.



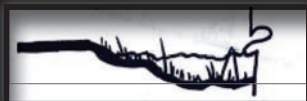
GABION WALL.



VEGETATED FILTER STRIPS.



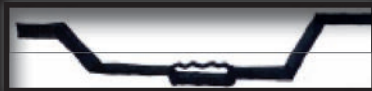
VEGETATED.



RIP-RAP.



CONCRETE.



SOFT-BOTTOM.



E  
P  
A  
H  
S

STAIRS.



WIDENED.



DEEPENED.



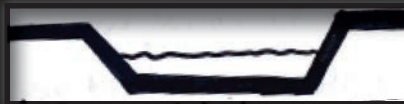
MIX SHAPED.



VERTICAL WALL.



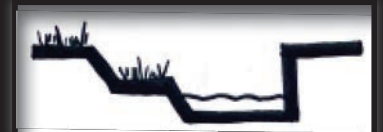
TRAPEZOIDAL.



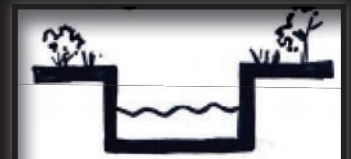
VEGETATED TERRACES.



RAMPS.



RETAINING WALL.



CHECK-DAM.



VEGETATED PLATFORM.



# MASTER-PLAN

## ENTRY PONTS

- 52 NEW ENTRY POINTS
- 10 EXISTING ENTRY POINTS
- 62 ENTRY POINTS

## PEDESTRIAN BRIDGES

- 15 NEW PEDESTRIAN BRIDGES

## GREEN SPACE

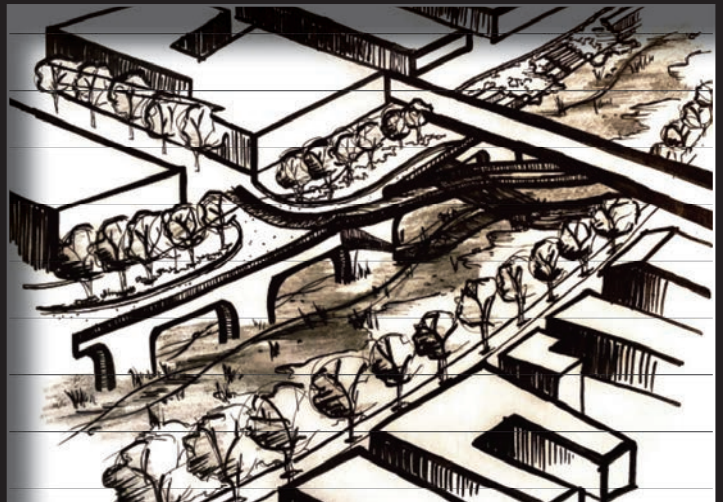
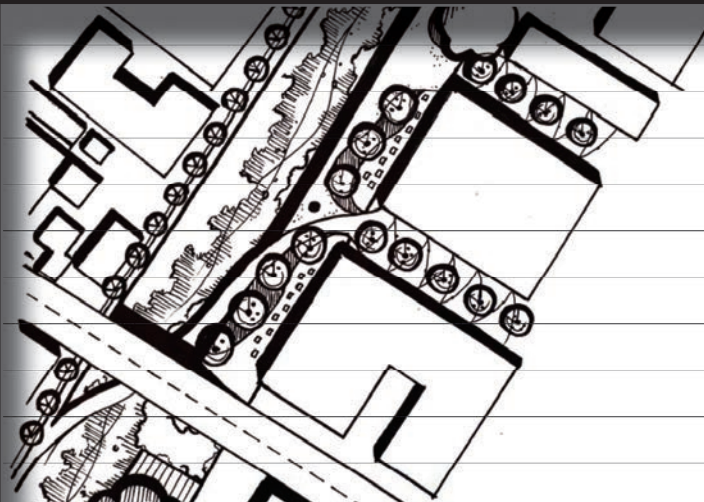
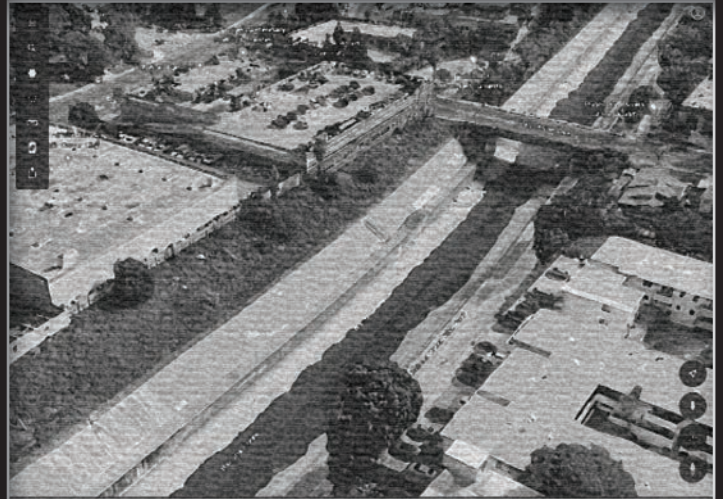
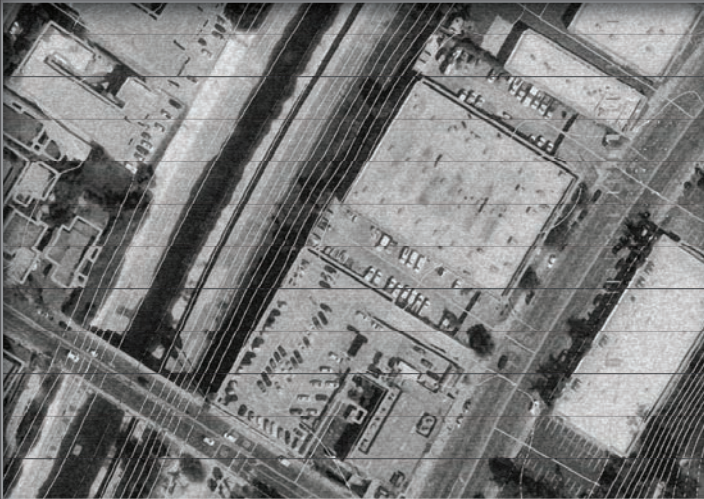
- 1 NEW PARK
- 6 EXISTING PARKS
- 7 PARKS



RESIDENTIAL NATURAL URBAN



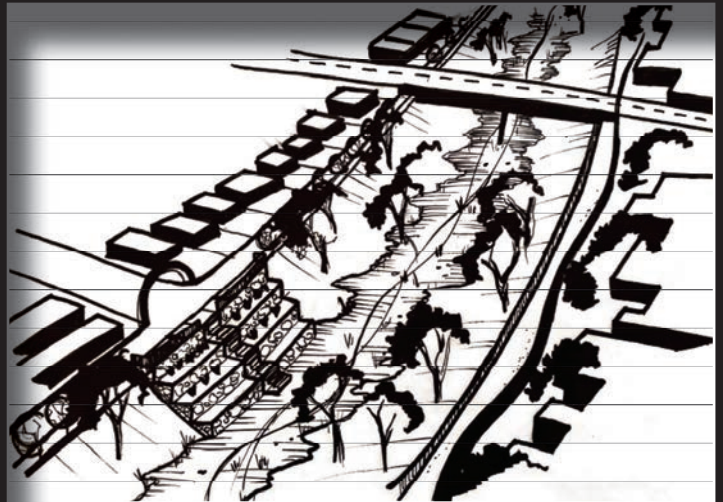
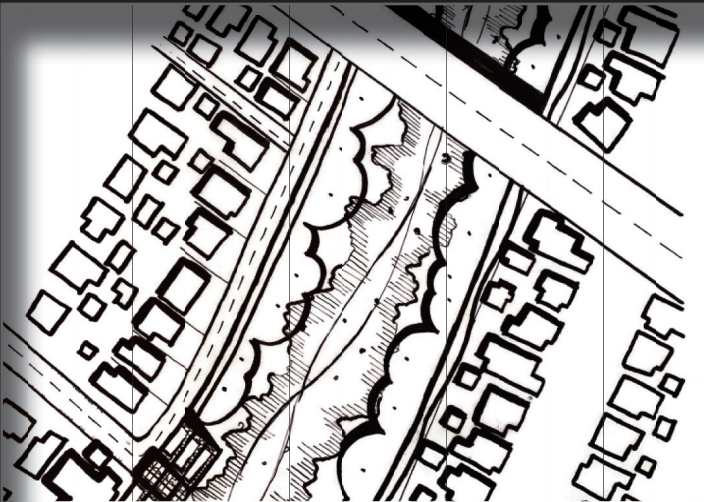
# U R B A N



OVERLOOKS. WATER ACCESS. FOOD TRUCKS. LUNCH AREAS. CLASSROOMS.  
FARMERS MARKETS. MAKERS MARKETS. MOVIE SCREENINGS. BEER GARDENS.  
ART EXHIBITS. EVENT SPACES. PROMENADES.



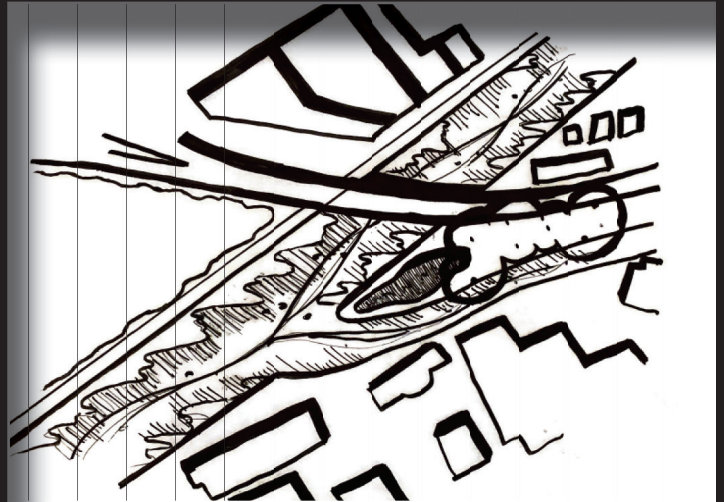
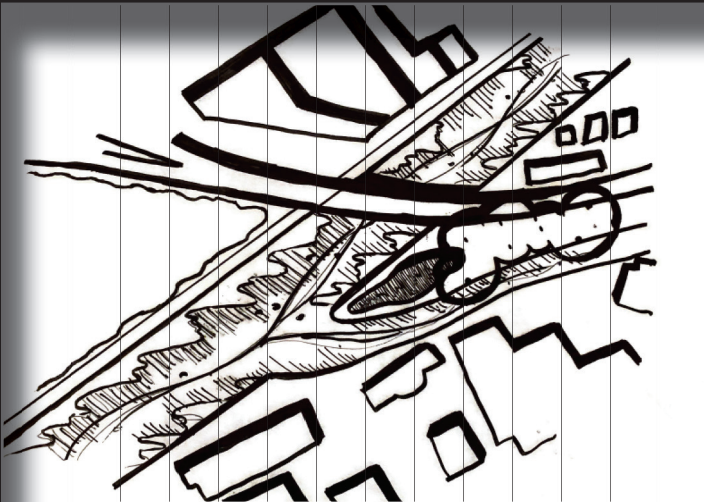
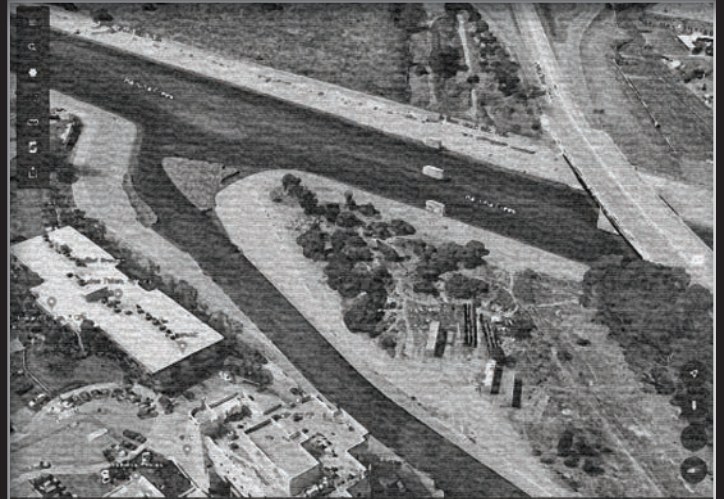
# RESIDENTIAL



OVERLOOKS. WATER ACCESS. PLAYGROUNDS. FITNESS TRAILS.  
COMMUNITY GARDEN. GREEN BELTS.



# N A T U R A L



OVERLOOKS. WATER ACCESS. PICNIC AREAS. RETENTION BASINS.



# C A P T U R E

## R E F L E C T I O N



### ACCOMPLISHMENTS

THIS QUARTER I FOCUSED MY PROBLEM, SELECTED A SITE, CREATED A DESIGN APPROACH, INVESTIGATED SOLUTIONS, AND EXPLORED DIGITAL RENDERING.

### STRENGTHS

THROUGH THIS PROCESS I FOUND THAT I AM GOOD AT DIAGRAMING, PROBLEM SOLVING, AND THAT MY DESIGNS ARE LOGIC BASED AND WELL THOUGHT OUT.

### CHALLENGES

CAPTURE PUSHED ME IN MANY WAYS. THE MOST DIFFICULT ONE BEING BRIDGING LANDSCAPE ARCHITECTURE AND HYDROLOGY. I AM NOT A HYDROLOGIST OR AN EXPERT ON NATURAL RESOURCES MANAGEMENT, SO IT WAS A STEEP LEARNING CURVE. I THREW MYSELF INTO RESEARCH AND MET WITH MANY PROFESSORS AT CAL POLY TO FULLY COMPREHEND THE FACTORS NECESSARY TO ACHIEVE WATER SECURITY. BEING A SCIENTIFIC BASED PROJECT, A LOT OF MY TIME WAS SPENT IN RESEARCH, AND I DID NOT HAVE AS MUCH TIME TO DESIGN. SECOND, COMPUTER GRAPHICS. THIS QUARTER IS MY FIRST TIME EXPLORING DIGITAL GRAPHICS. UP UNTIL NOW, I HAVE NOT HAD A MACHINE THAT COULD RUN THE PROGRAMS NECESSARY FOR DIGITAL RENDERING. IT TOOK A LONG TIME TO LEARN ALL OF THE PROGRAMS, BUT THE WAIT WAS WORTH IT. THIRD, I HAVE NEVER WORKED WITH A SITE THIS LARGE BEFORE. IT WAS EXTREMELY DIFFICULT FOR ME TO APPROACH THIS MUCH LAND AND DETERMINE HOW TO BEST SHOWCASE MY VISION.

### GOALS

MY GOALS FOR NEXT QUARTER INCLUDE: BETTER TIME MANAGEMENT TO MEET DEADLINES, IMPROVED TIMELINESS, STORMWATER AND FLOOD TESTING, DESIGN EXPLORATION, AND DIGITAL RENDERING.

