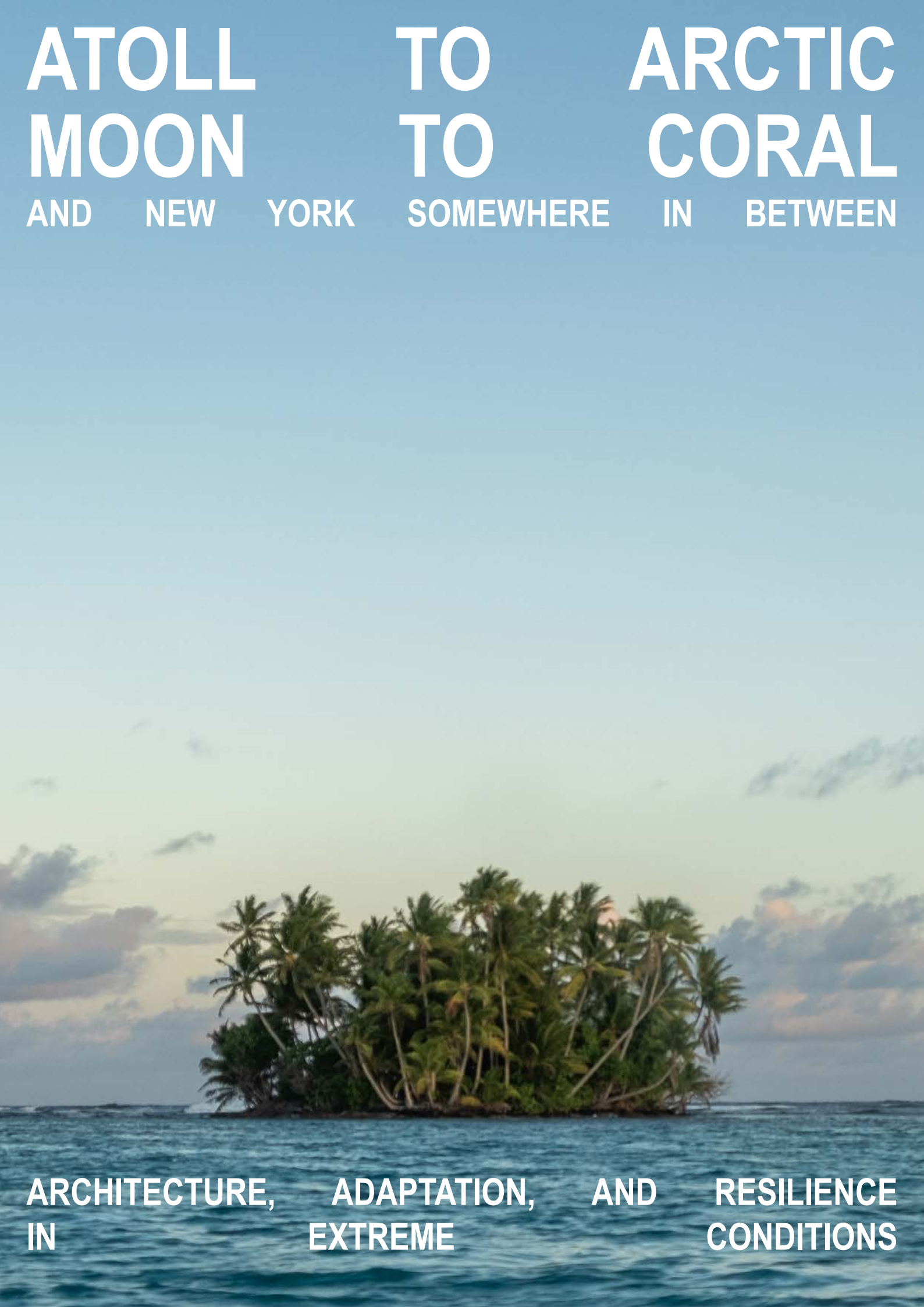
ATOLL TO ARCTIC
MOON TO CORAL
AND NEW YORK SOMEWHERE IN BETWEEN



ARCHITECTURE, ADAPTATION, AND RESILIENCE IN EXTREME CONDITIONS

ARCHITECTURE TODAY IS NOT DEFINED BY PERMANENCE, BUT BY TRANSITION.

Atoll to Arctic, Moon to Coral, and New York Somewhere In Between is a journey through architectures shaped by movement, memory, and matter. This portfolio begins in Tuvalu, where rising waters blur land and sea boundaries, and a low-tech tidal sensor becomes both a scientific tool and a cultural ritual. It moves through the Pacific and South America, where coastal communities reimagine public space through small-scale interventions and material care. Further north, in the Arctic waters of Norway, cold-water corals emerge as architects of marine biodiversity, silent, ancient, and endangered, calling for architectural responses attuned to fragility and time. From coral nurseries to inflatable pavilions in New York, each project is grounded in atmospheric practices and local ecologies, shaped by climate and culture.

This body of work navigates between the planetary and the personal, between the slow time of geological change and the urgency of social and environmental adaptation. Moon cycles pull tides, coral skeletons archive centuries, and urban ruins wait to be reinhabited. Architecture here is not a static object, but a medium for sensing, caring, and responding, a means of reading the world and making space within it. The portfolio traverses oceans and cities, laboratories and landscapes, guided by the belief that architecture can hold contradiction, offer continuity, and create openings between what is disappearing and what might still be preserved. From island to ice, bamboo to brick, reef to ruins, this is a search for forms of resilience, reverence, and renewal.

All images are taken by me, Anna Schmitz unless stated otherwise.

LIQUID GROUNDS: ECOLOGIES IN FLUX
WATERS IN MOTION

ATMOSPHERIC PRACTICES: LIGHT, URBAN AIR, EPHEMERAL FORMS

MEMORY, MATTER, AND ADAPTIVE REUSE

Moving Waters proposes an infrastructural and epistemological framework for coexisting with water in Tuvalu, one of the most vulnerable nations to sea level rise. The project starts by acknowledging that, in Tuvalu, water is not just a threat but rather a relational medium; fluid, sovereign, and profoundly embedded in cultural life. Instead of opposing the inevitable encroachment of tides, Moving Waters advocates for a form of oceanic inhabitation grounded in observation and care.

This project focuses on the gravitational interplay between ocean tides and the lunar cycle, developing a low-tech water sensor designed to convert planetary forces into data accessible to the community and deployed locally. Installed around the islands of Tuvalu, the sensor serves as both a tool and a ritual, providing predictive capabilities while reaffirming indigenous knowledge systems that have long interpreted ocean currents, stars, and tides as part of daily life. Through this apparatus, water is sensed not only as a rising threat but as a living archive of Tuvaluan territory, identity, and environmental stewardship.

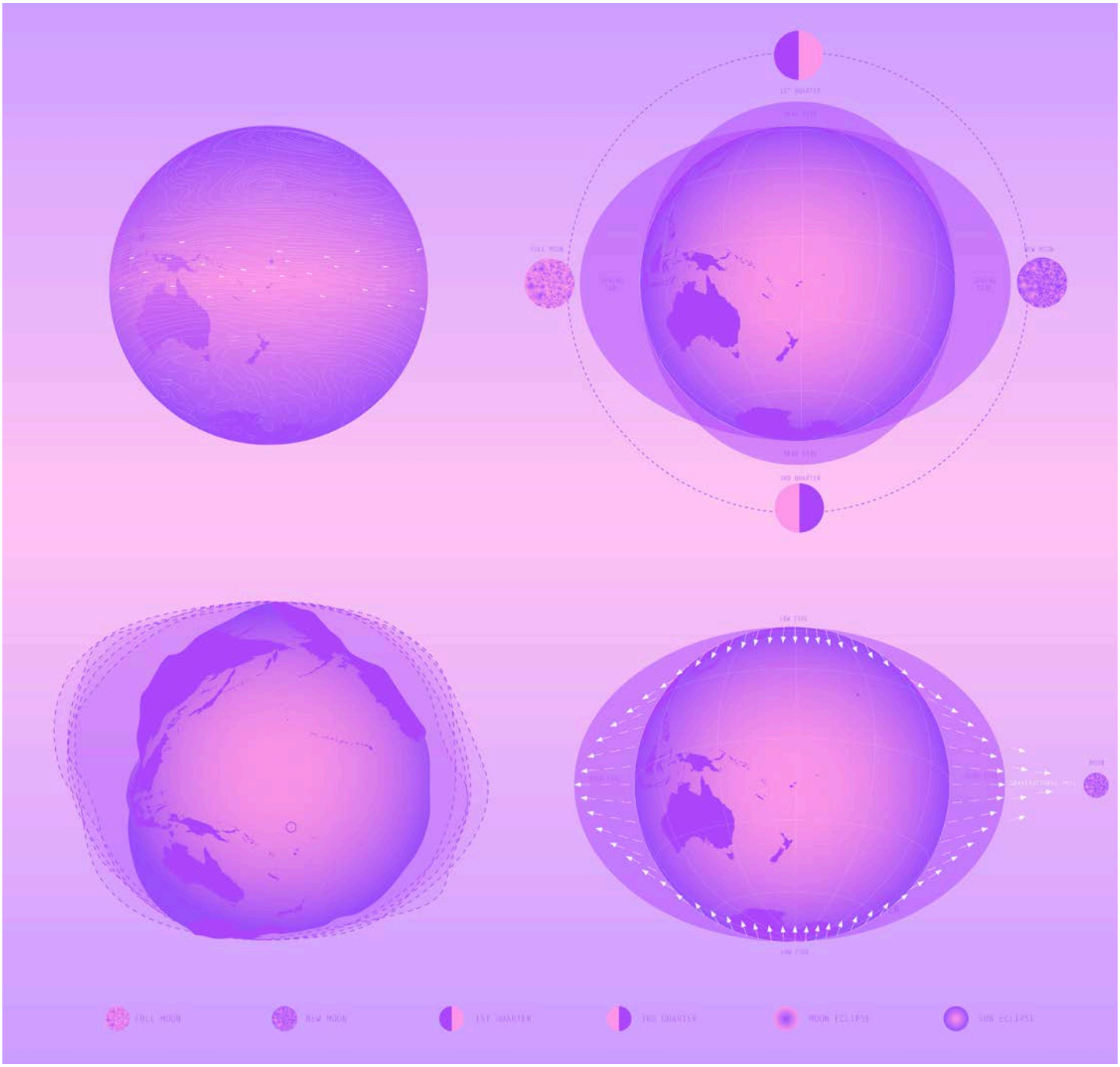
Tuvalu's fluid geographies challenge conventional notions of territory and statehood. The project frames the sea as a field of sovereignty to be read, sensed, and engaged with. As rising waters blur the line between land and ocean, the sensor provides situated knowledge and a poetic approach, anchoring Tuvalu's sovereignty in motion rather than stasis. Moving Waters envisions a future where communities stay connected to their environment through intimate observations of tidal movements and celestial patterns. It is a call to decentralise climate sensing, recover relational practices of ocean literacy, and ensure that Tuvaluans, like their waters, continue to move, deliberately, collectively, and with agency.

Advanced Studio VI
Prof. Marina Verzier Otero
Prof. Dan Miller
Paula Vilaplana
Individual Work

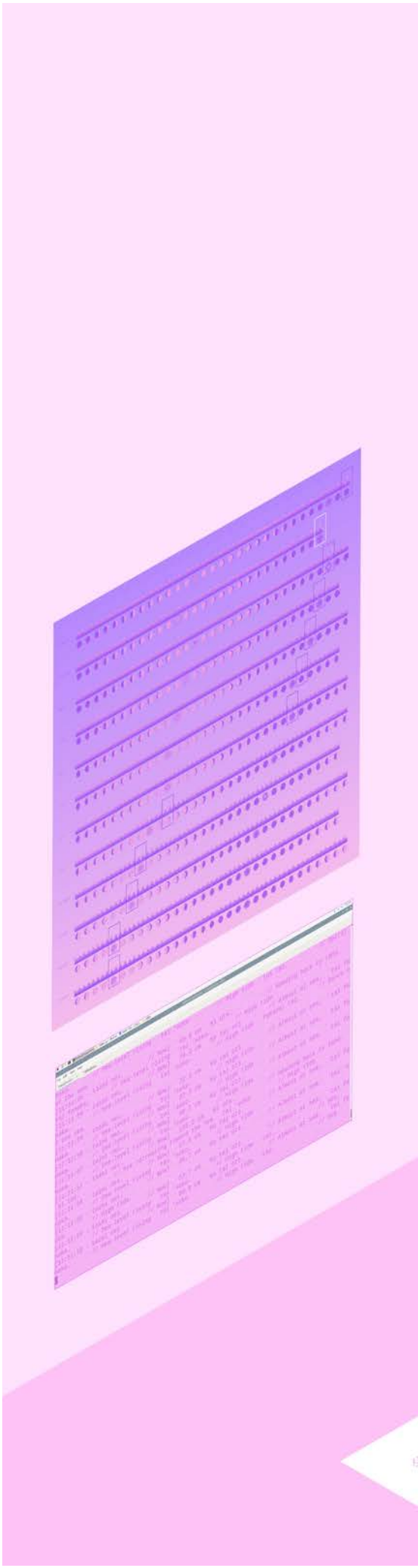
right: moving waters, natural forces, wind, currents

MOVING WATERS
reading and sensing oceanic space in tuvalu

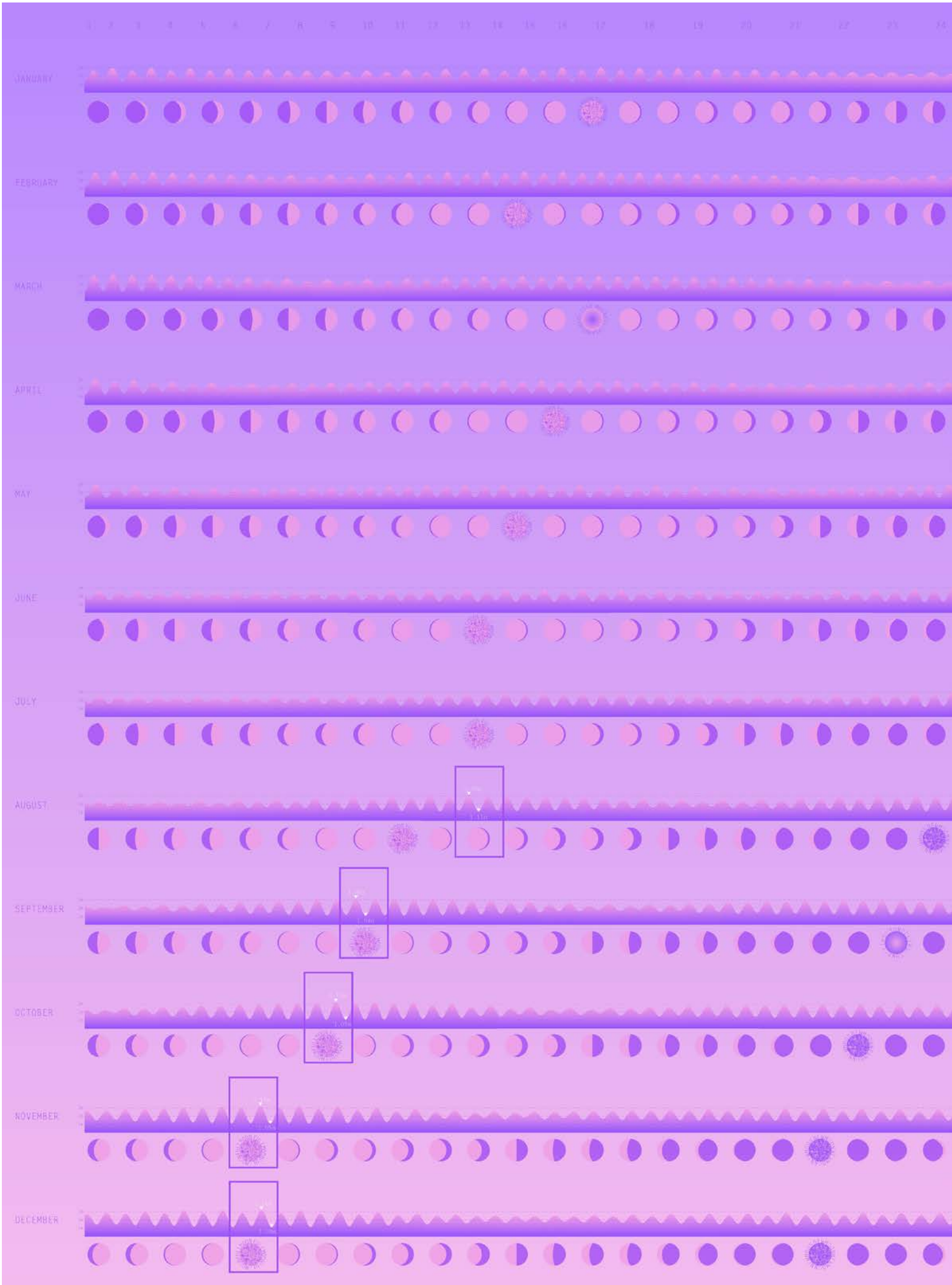
01

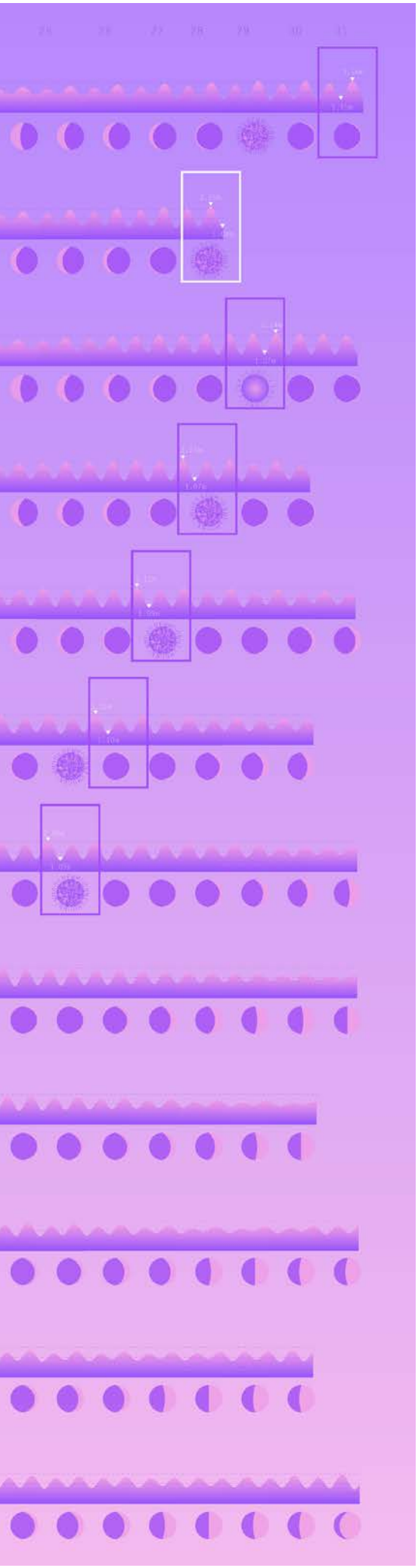


right: final exhibition mock up of Moving Waters



“There are no more suitable people on earth to be guardians of the world’s largest ocean than those for whom it has been home for generations.” our seas of islans, Epeli Haufa


JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER



tidal prediction calendar for tuvalu 2025 with indicated high and low tides, new moon, full moon, sun eclipse, kind tides

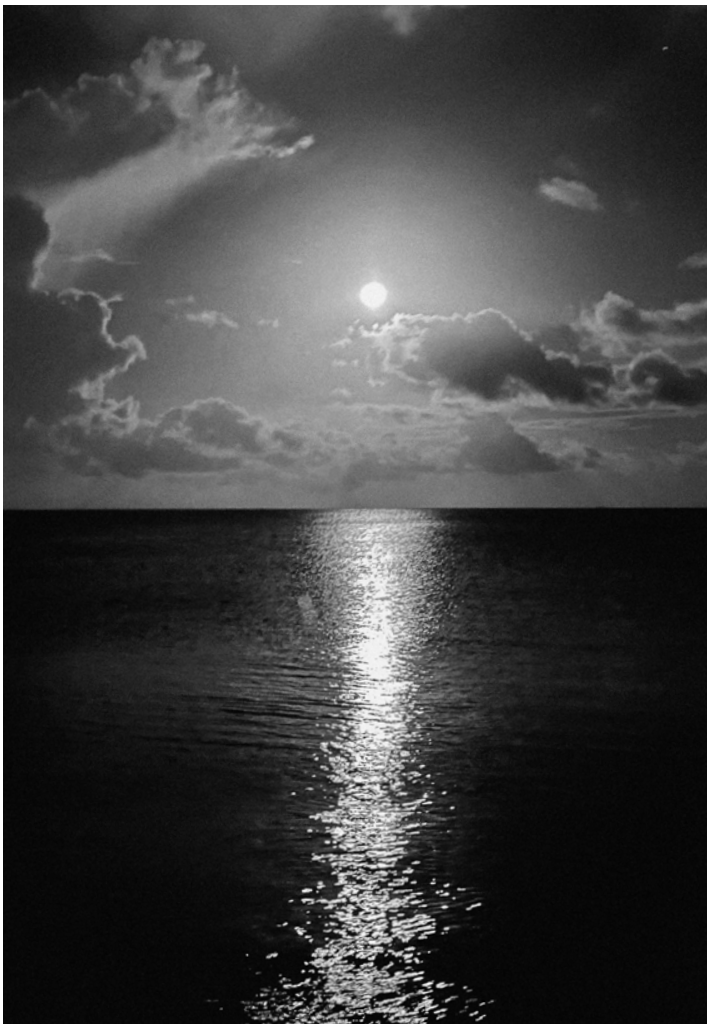
Perpetuity is not the illusion of permanence, but the truth of return. It is the ocean's breath, drawn long and deep by the moon's slow hand. Tuvalu exists within this breath, never fixed, never lost, always becoming. The moon does not anchor; it calls. It's pull stirs the tides, reshaping coastlines and carrying stories in currents. Tuvalu follows this movement not to vanish but to endure differently. Here, survival is not stasis but transformation.

Land may recede, but presence remains in the rhythm of tides, in the moon's steady orbit, in ceremonies timed to lunar phases. What the water covers, the memory reveals. What the map cannot hold, the ocean carries. The sea, once framed as emptiness, now speaks of continuity. It is a living archive, a moving boundary, a foundation of sovereign motion. And above it, the moon traces the same path it always has a witness, a guide, a rhythm older than borders.

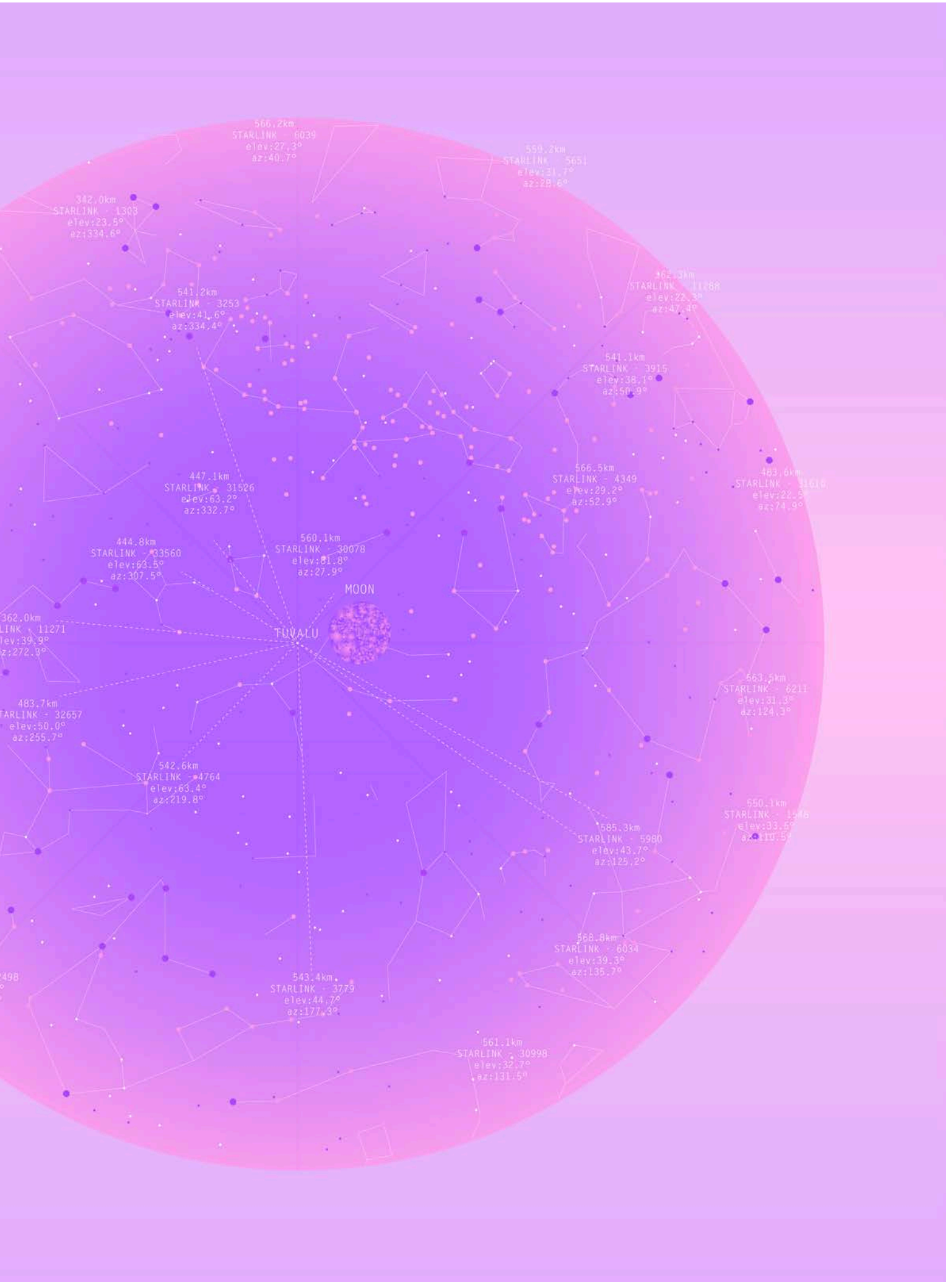
Perpetuity, for Tuvalu, is not rooted in land, but in the tidal choreography of survival. It is presence in motion, written in water, kept in time by the moon.

moonrise in funafuti, tuvalu on the 11th of march 2025

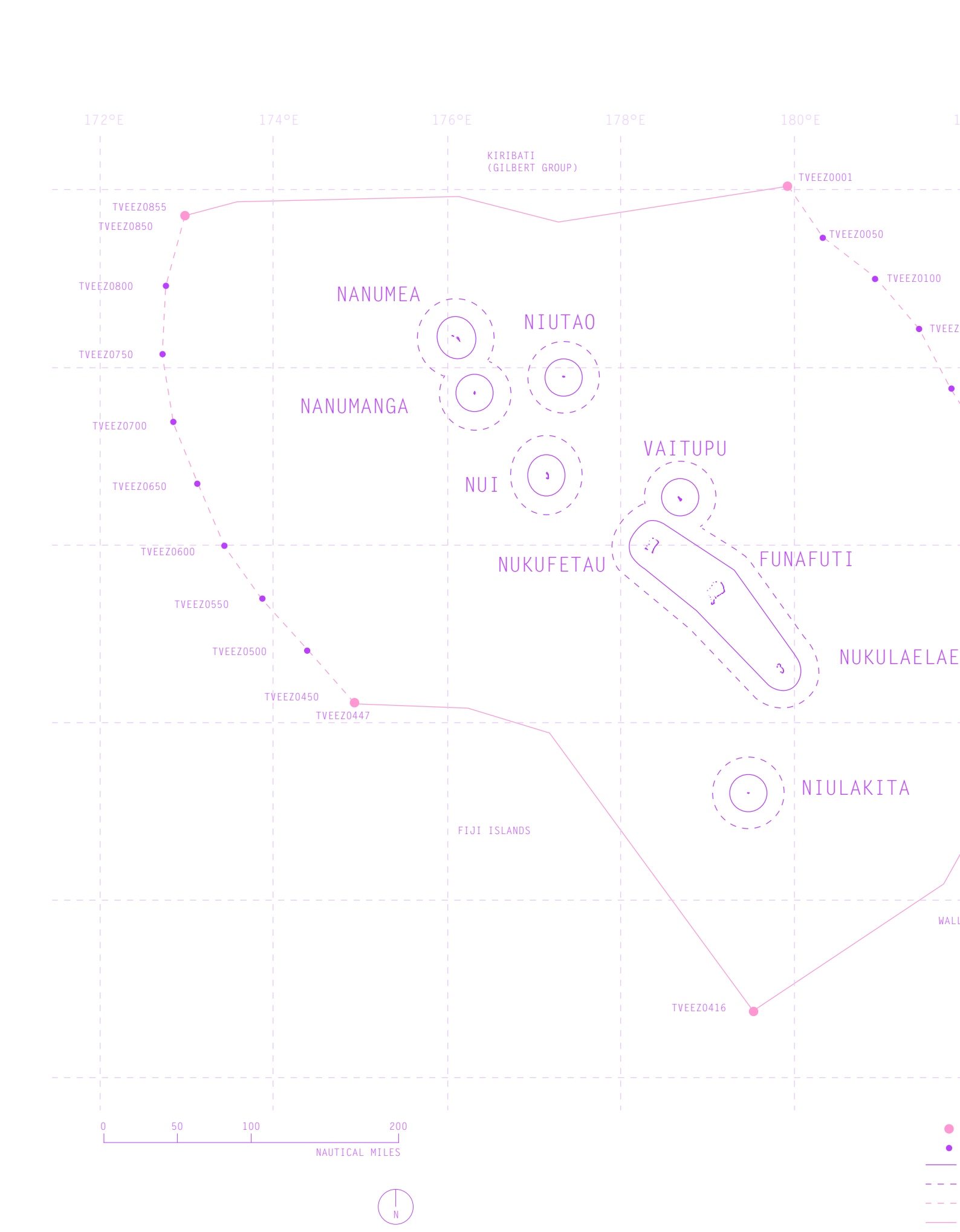
right: celestial network above tuvalu, overlay of starlinks showing the sky-pollution of new technologies

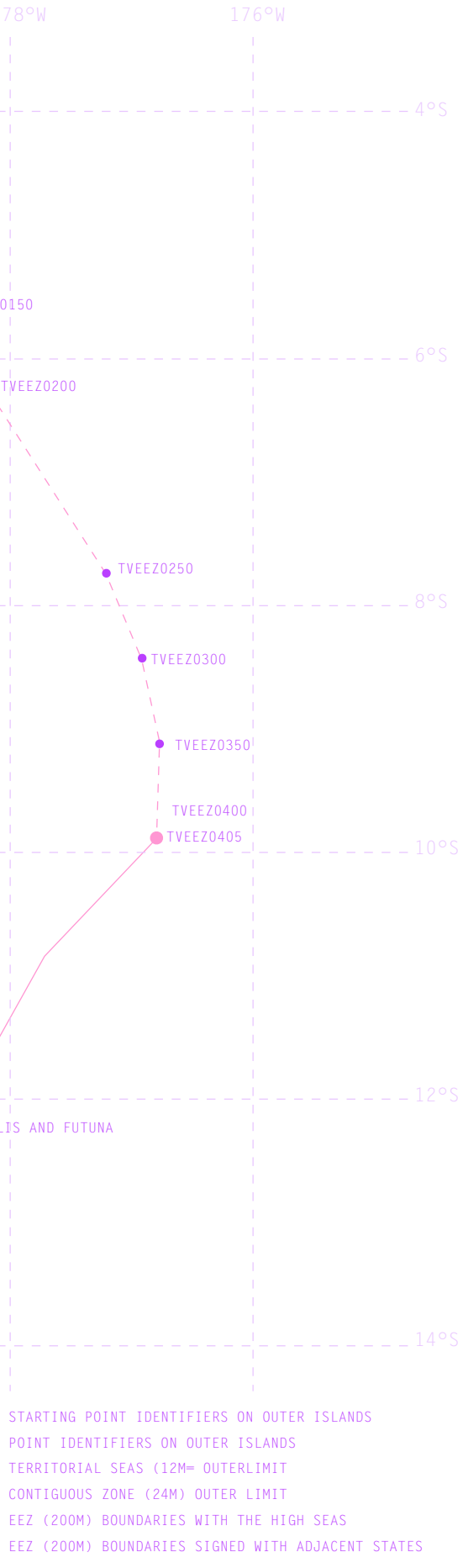


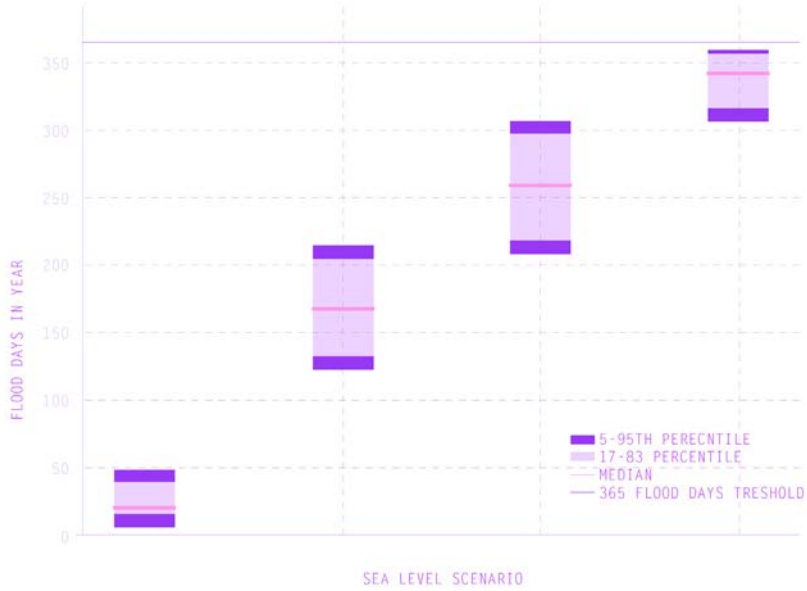
moonset in funafuti, tuvalu on the 13th of march 2025

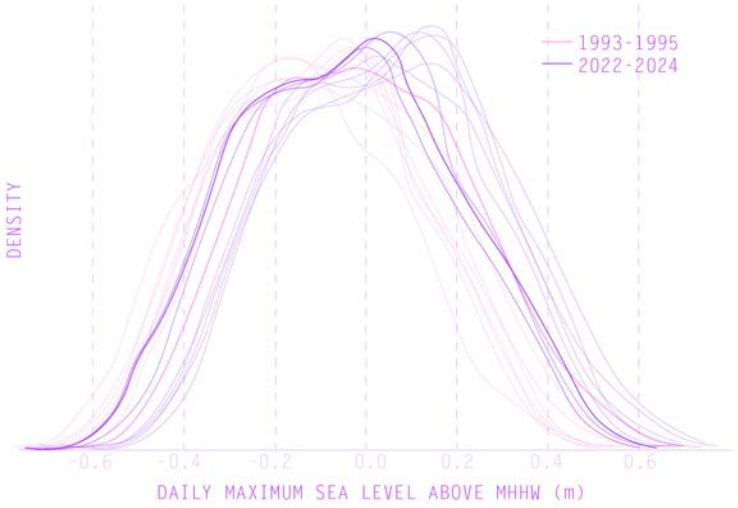

566.2km
STARLINK - 6039
elev:27.3°
az:40.7°
559.2km
STARLINK - 5651
elev:31.7°
az:28.6°
342.0km
STARLINK - 1303
elev:23.5°
az:334.6°
541.2km
STARLINK - 3253
elev:41.6°
az:334.4°
541.1km
STARLINK - 3915
elev:38.1°
az:50.9°
447.1km
STARLINK - 31526
elev:63.2°
az:332.7°
566.5km
STARLINK - 4349
elev:29.2°
az:52.9°
444.8km
STARLINK - 33560
elev:63.5°
az:307.5°
560.1km
STARLINK - 30078
elev:81.8°
az:27.9°
MOON
TUVALU
563.5km
STARLINK - 6211
elev:31.3°
az:124.3°
483.7km
elev:50.0°
az:255.7°
542.6km
STARLINK - 4764
elev:63.4°
az:219.8°
585.3km
STARLINK - 5980
elev:43.7°
az:125.2°
568.8km
STARLINK - 6034
elev:39.3°
az:135.7°
543.4km
STARLINK - 3779
elev:44.7°
az:177.3°
561.1km
STARLINK - 30998
elev:32.7°
az:131.5°

tidal pool in funafuti, captured on the 9th of march 2025, ground flooding located next to the airstip in the center of the island

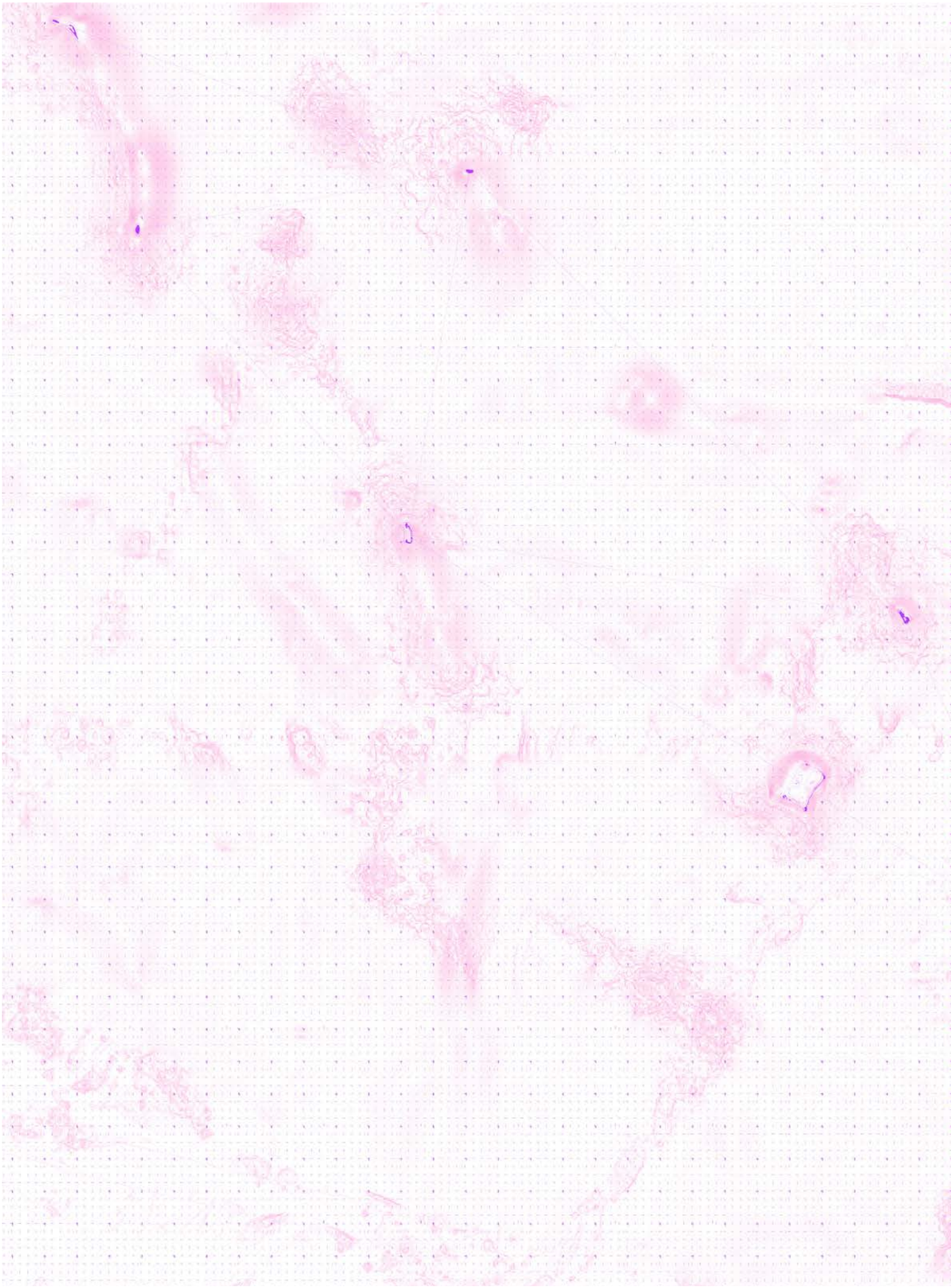

172°E
174°E
176°E
178°E
180°E
KIRIBATI
(GILBERT GROUP)
TVEEZ0001
TVEEZ0855
TVEEZ0850
TVEEZ0050
TVEEZ0100
TVEEZ0800
NANUMEA
NIUTAO
TVEEZ0750
NANUMANGA
TVEEZ0700
VAITUPU
TVEEZ0650
NUI
TVEEZ0600
NUKUFETAU
FUNAFUTI
TVEEZ0550
TVEEZ0500
NUKULAELAE
TVEEZ0450
TVEEZ0447
NIULAKITA
FIJI ISLANDS
TVEEZ0416
0
50
100
200
NAUTICAL MILES
N


178°W
176°W
4°S
0150
6°S
TVEEZ0200
TVEEZ0250
8°S
TVEEZ0300
TVEEZ0350
TVEEZ0400
TVEEZ0405
10°S
12°S
LIS AND FUTUNA
14°S
STARTING POINT IDENTIFIERS ON OUTER ISLANDS
POINT IDENTIFIERS ON OUTER ISLANDS
TERRITORIAL SEAS (12M= OUTERLIMIT
CONTIGUOUS ZONE (24M) OUTER LIMIT
EEZ (200M) BOUNDARIES WITH THE HIGH SEAS
EEZ (200M) BOUNDARIES SIGNED WITH ADJACENT STATES


FLOOD DAYS IN YEAR
350
300
250
200
150
100
50
0
5-95TH PERECNTILE
17-83 PERCENTILE
MEDIAN
365 FLOOD DAYS TRESHOLD
SEA LEVEL SCENARIO

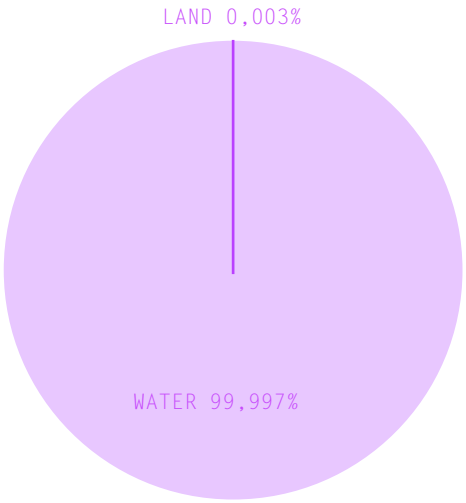

DENSITY
1993-1995
2022-2024
-0.6
-0.4
-0.2
0.0
0.2
0.4
0.6
DAILY MAXIMUM SEA LEVEL ABOVE MHHW (m)

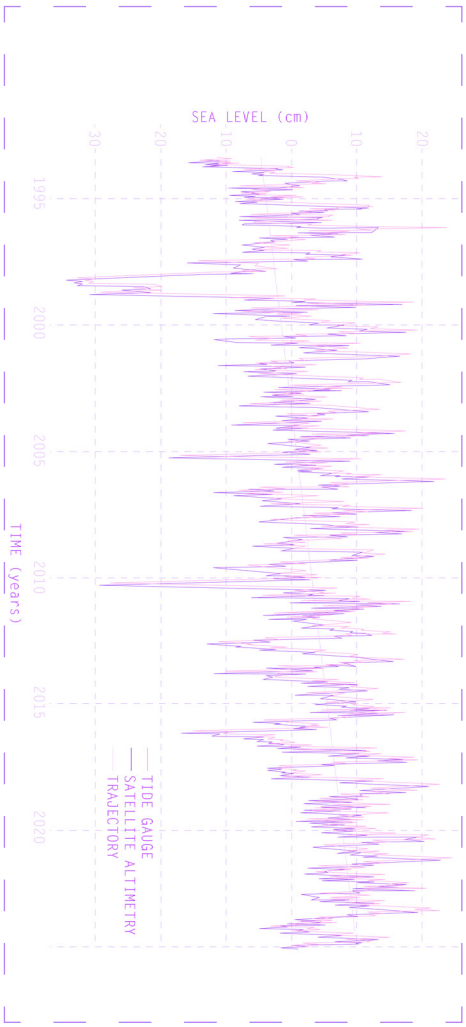

SEA LEVEL RISE (cm)
175
150
125
100
75
50
25
0
1.5°C
2.0°C
3.0°C
4.0°C
5.0°C
HIGH END
DEGREE OF WARMING BY 2100



left: map of islands of tuvalu, bathmetry, currents, reef extent

“Fluid Territory” - Territory, under UN Law of the Sea, is defined through fixed coordinates, landforms, baselines, and measurable zones. This reflects a Western narrative of place as static, enclosed, and legally bordered. Sovereignty is granted only where surface persists, rendering submergence a juridical erasure. Such frameworks collapse when confronted with fluid geographies and mobile epistemologies.





images taken in funafuti, tuvalu at low tide between 10:23 to 11:42am on the 10th of march 2025

images taken in funafuti, tuvalu at high tide between 17:23 to 18:42am on the 10th of march 2025

image taken from fisherboat
on 12th of march 2025

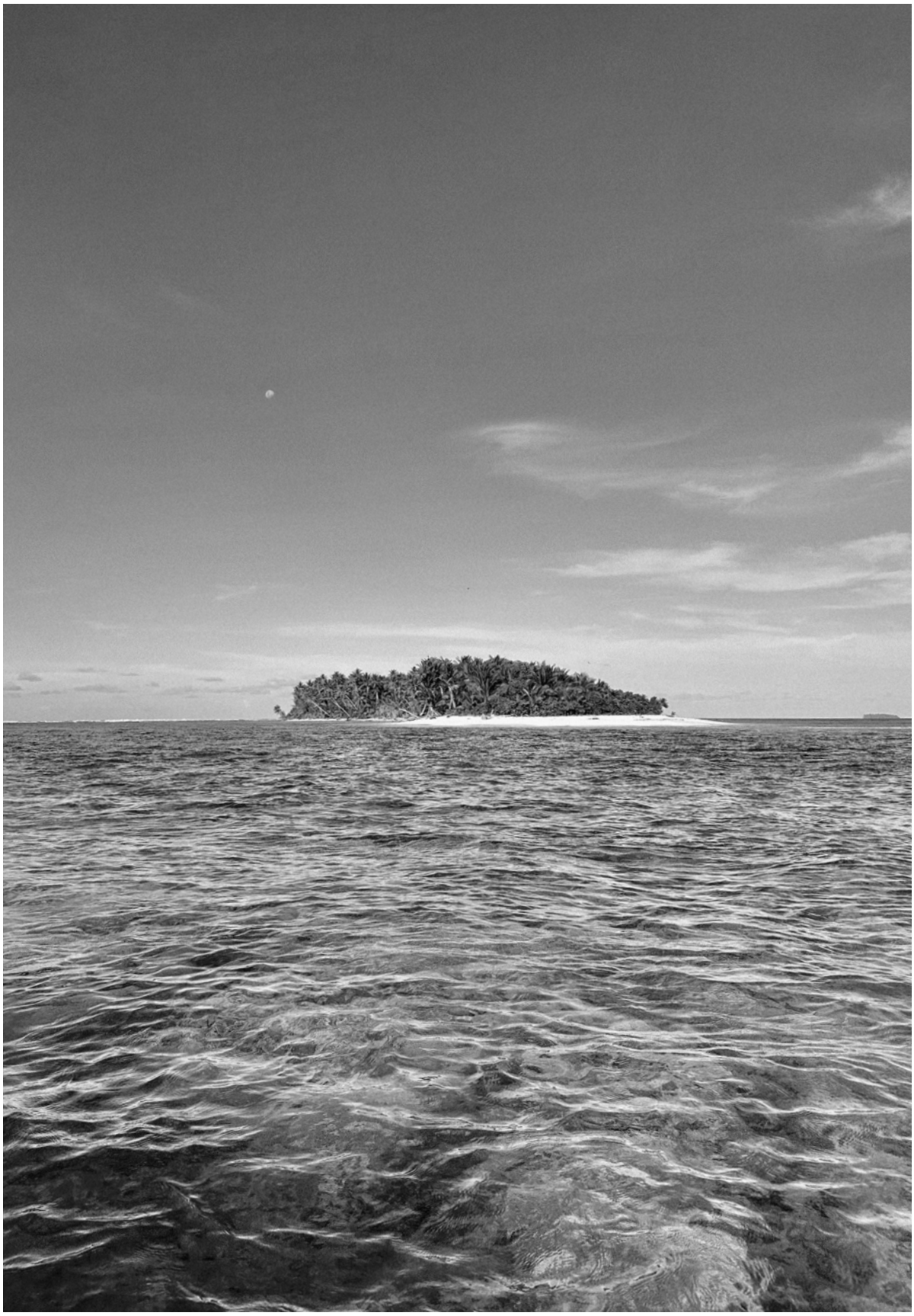
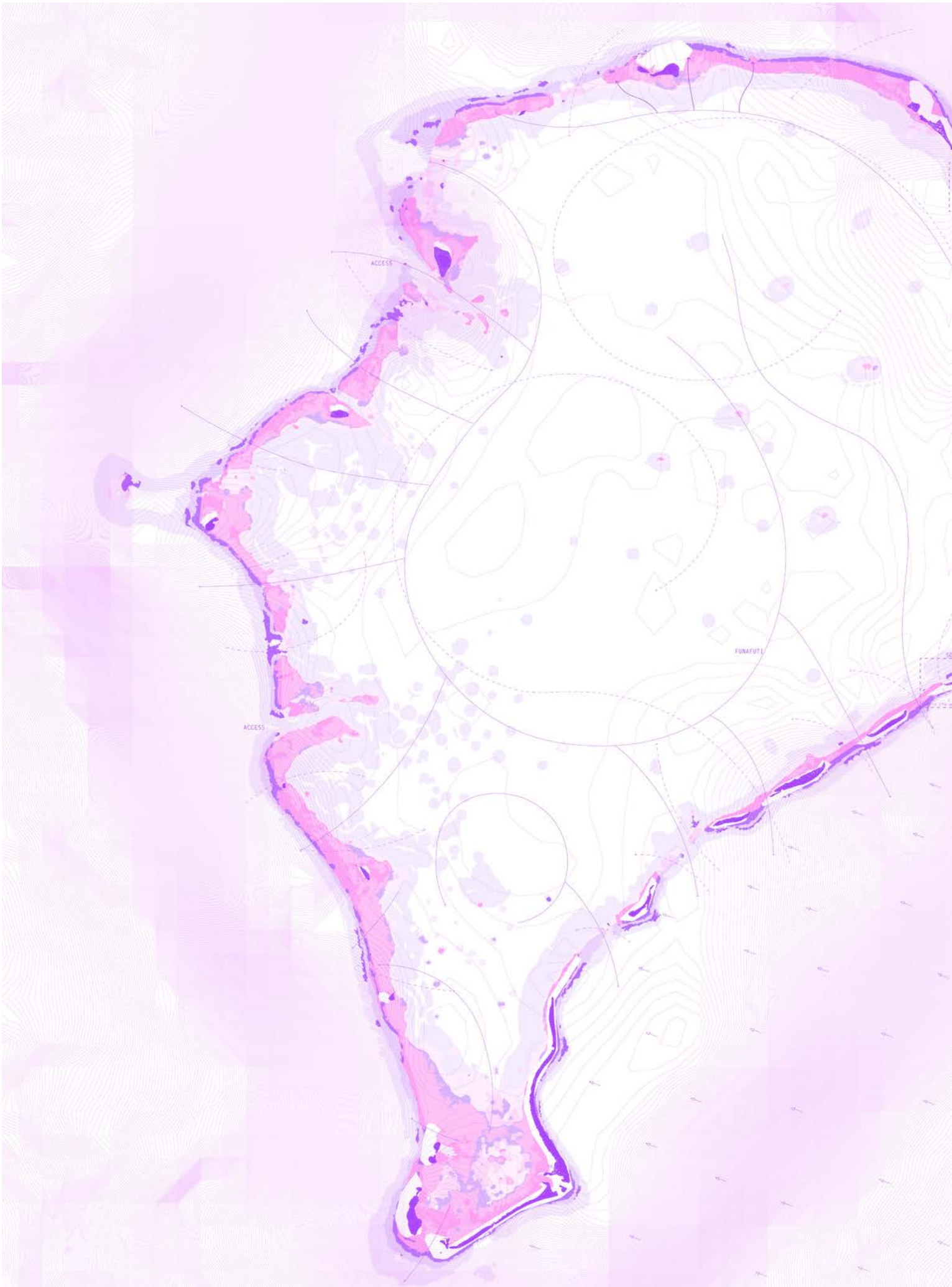
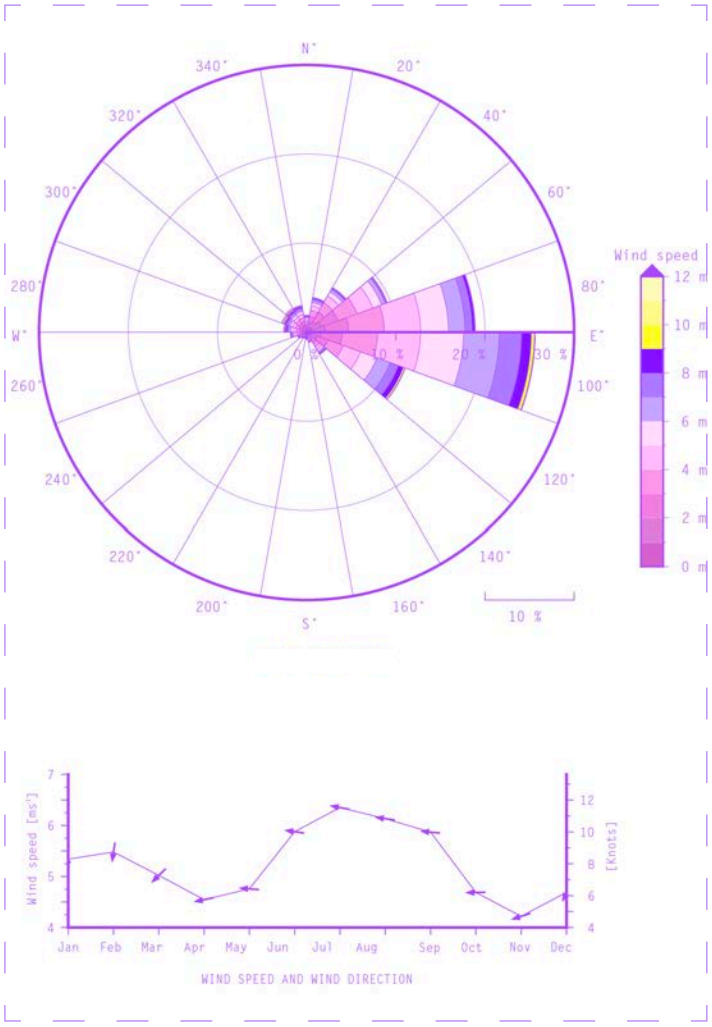


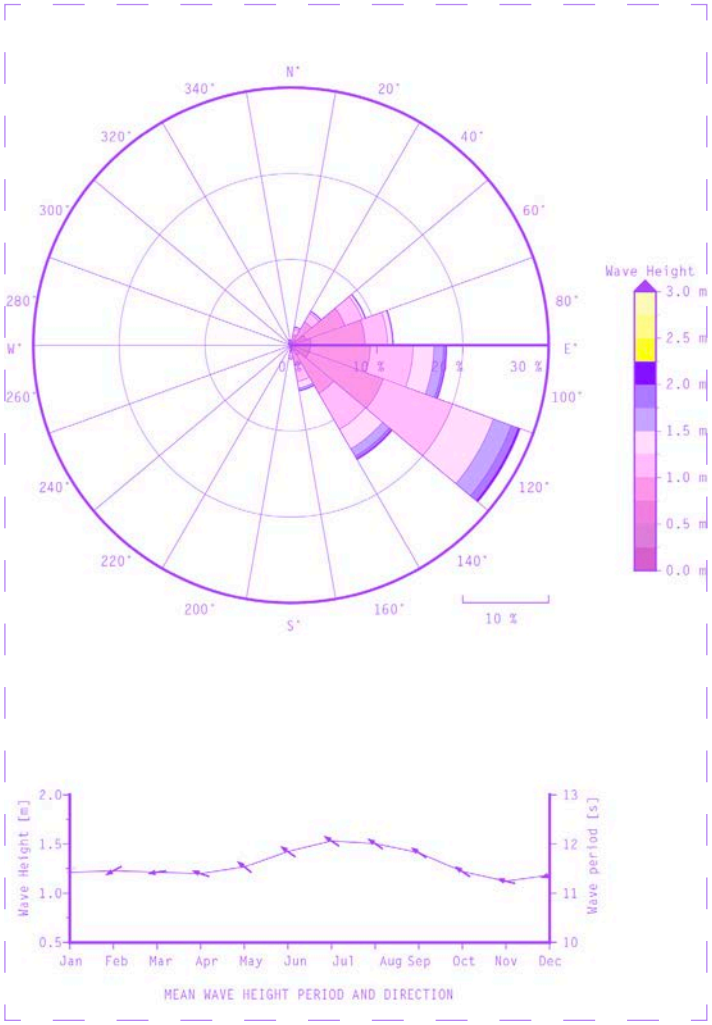
image captured early morning on the 10th of march 2025, showing the two sides of the rough ocean and the quiet lagoon and their close proximity


ACCESS
ACCESS
FUNAFUTI

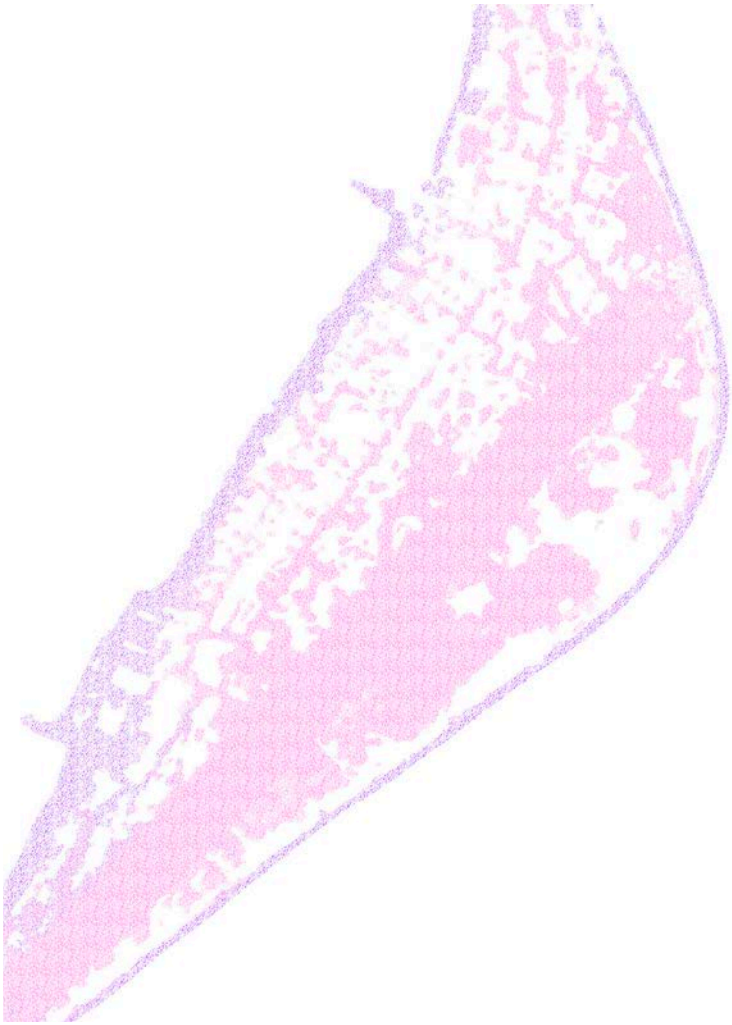
left: plan of funafuti island withreef extent, laggoon currents and wind movement

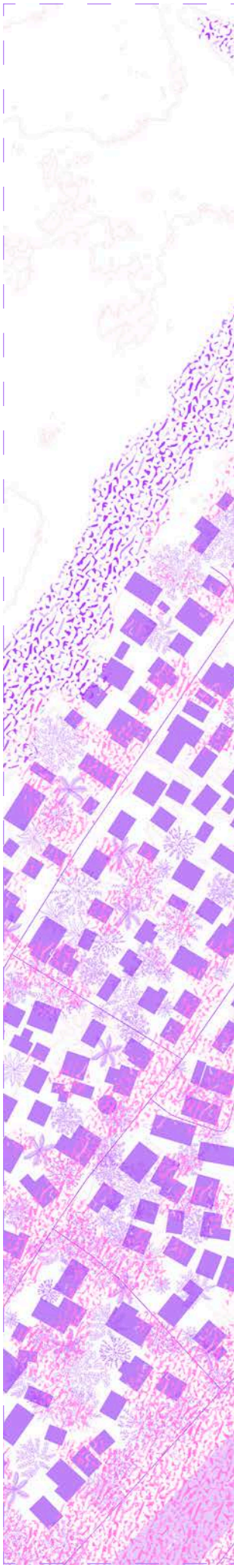


right top: wind rose funafuti
right bottom: wave direction



zoom of funafuti, tuvalu showing coastal flooding in purple and ground flooding in pink





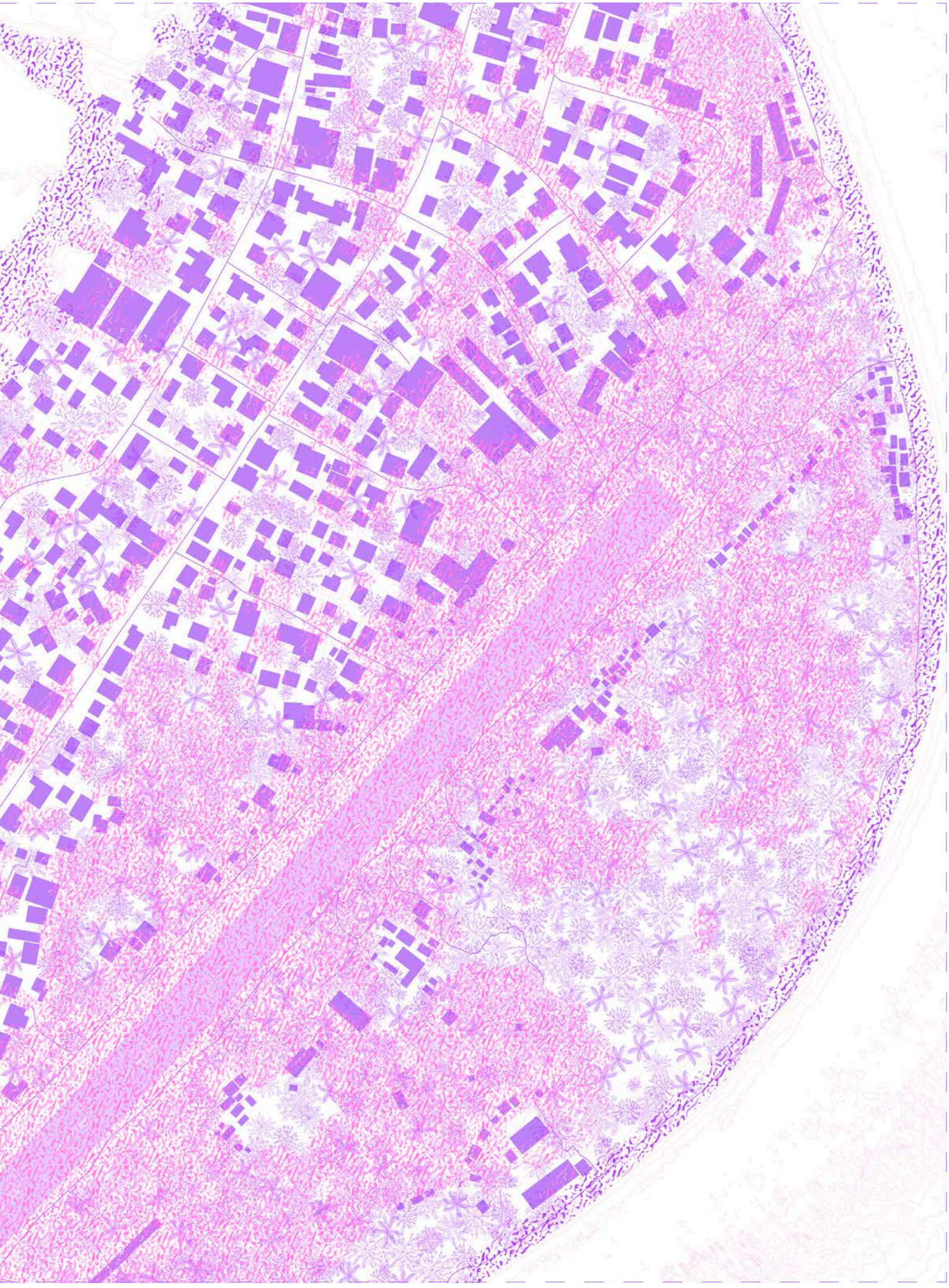


image taken same position
changing - moving ocean
11:03 am

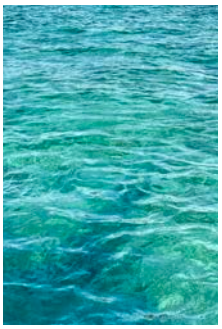


image taken same position
changing - moving ocean
11:27 am

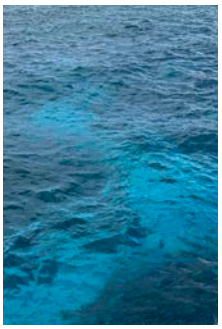
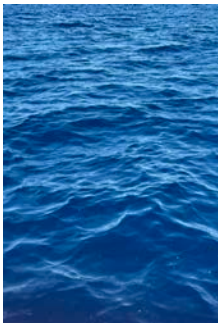


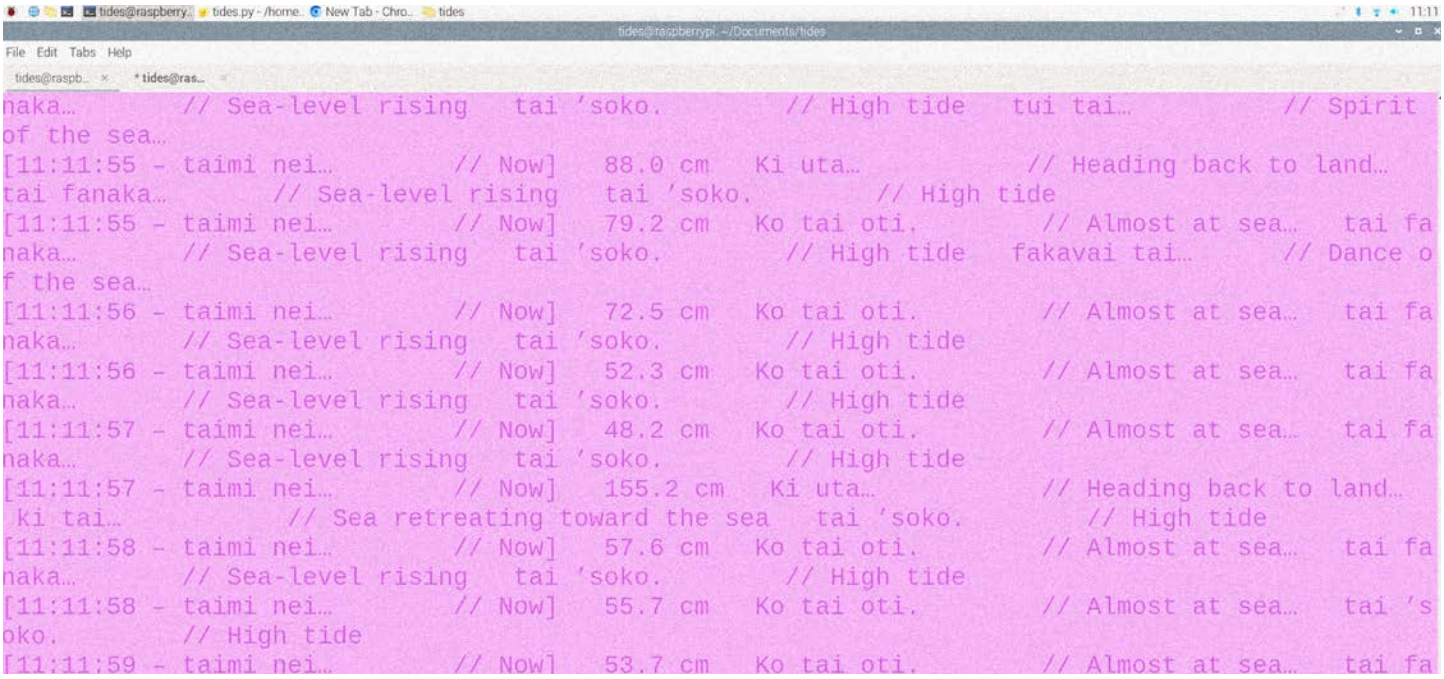
image taken same position
changing - moving ocean
11:52 am

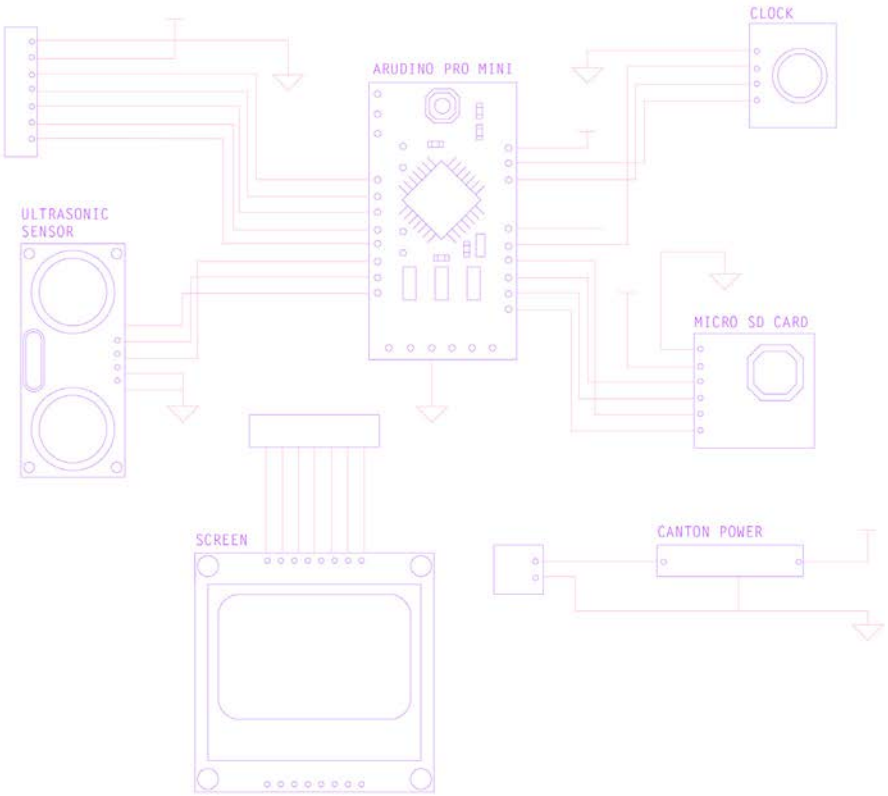


“Oceania is vast, Oceania is expanding. Oceania is hospitable and generous. Oceania is humanity rising from the depths of brine and regions of fire deeper still, Ocean is us. We are the sea, we are the Ocean, we must wake up to this ancient truth.”

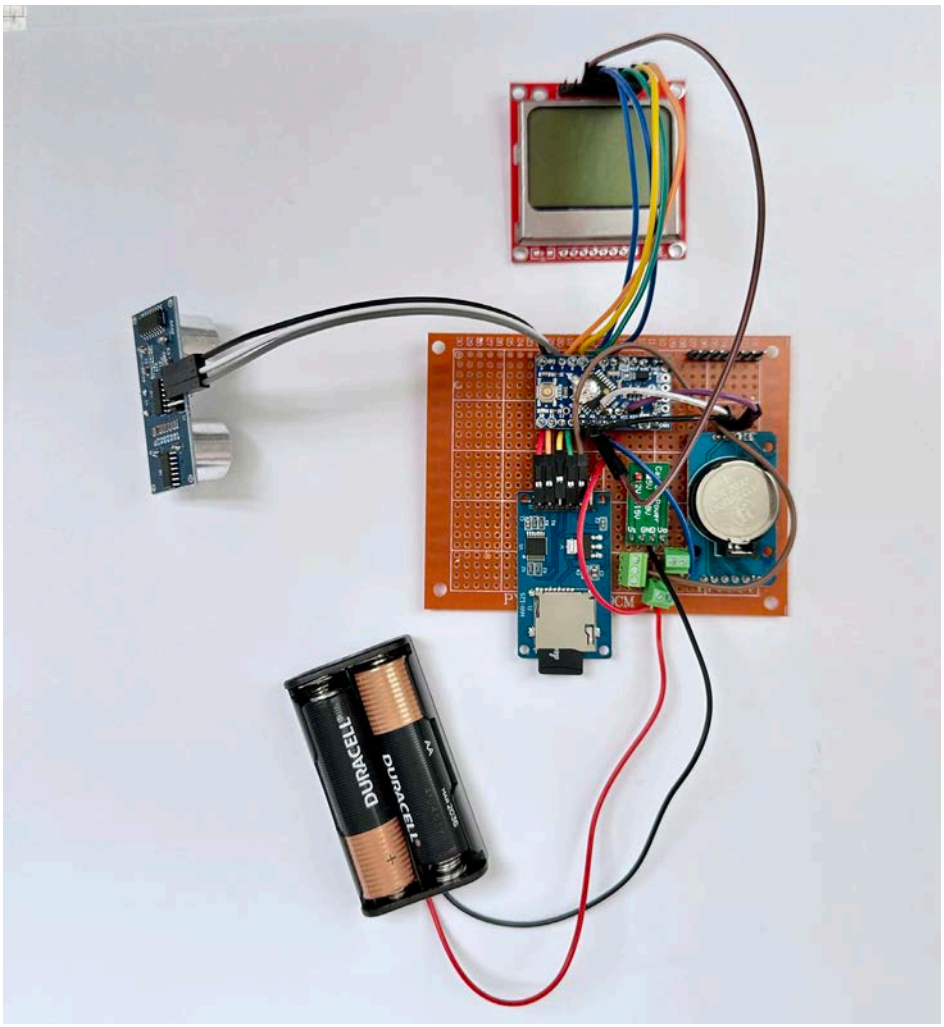
Epeli Hau’ofa

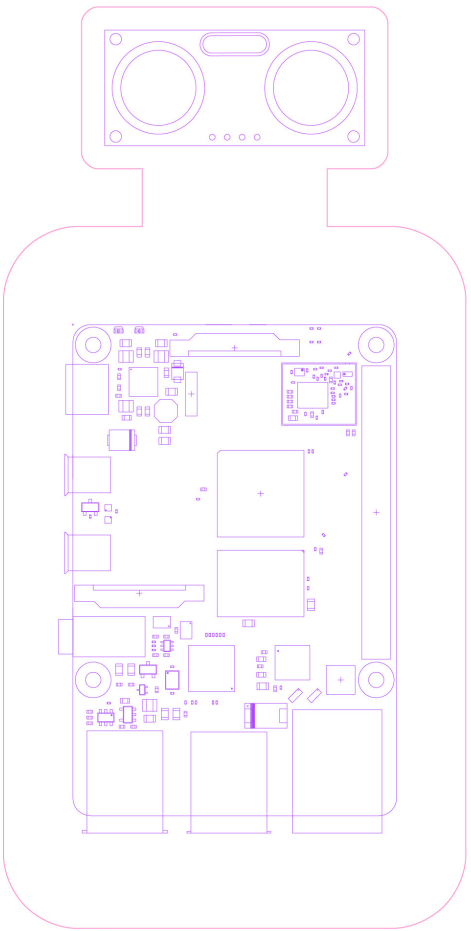
Sensing Sovereignty in Motion: Developing Low-Tech Ocean Sensors to Read Tides, Preserve Knowledge, and Empower Tuvaluan Communities

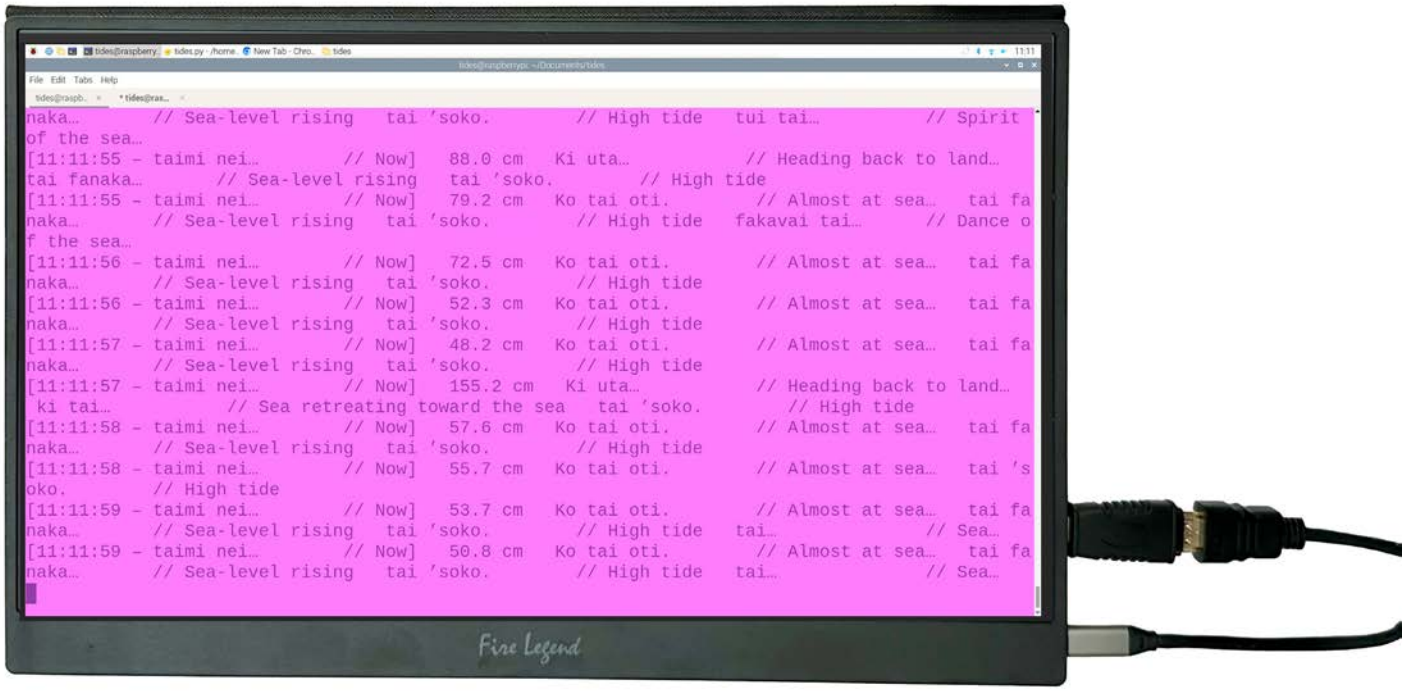




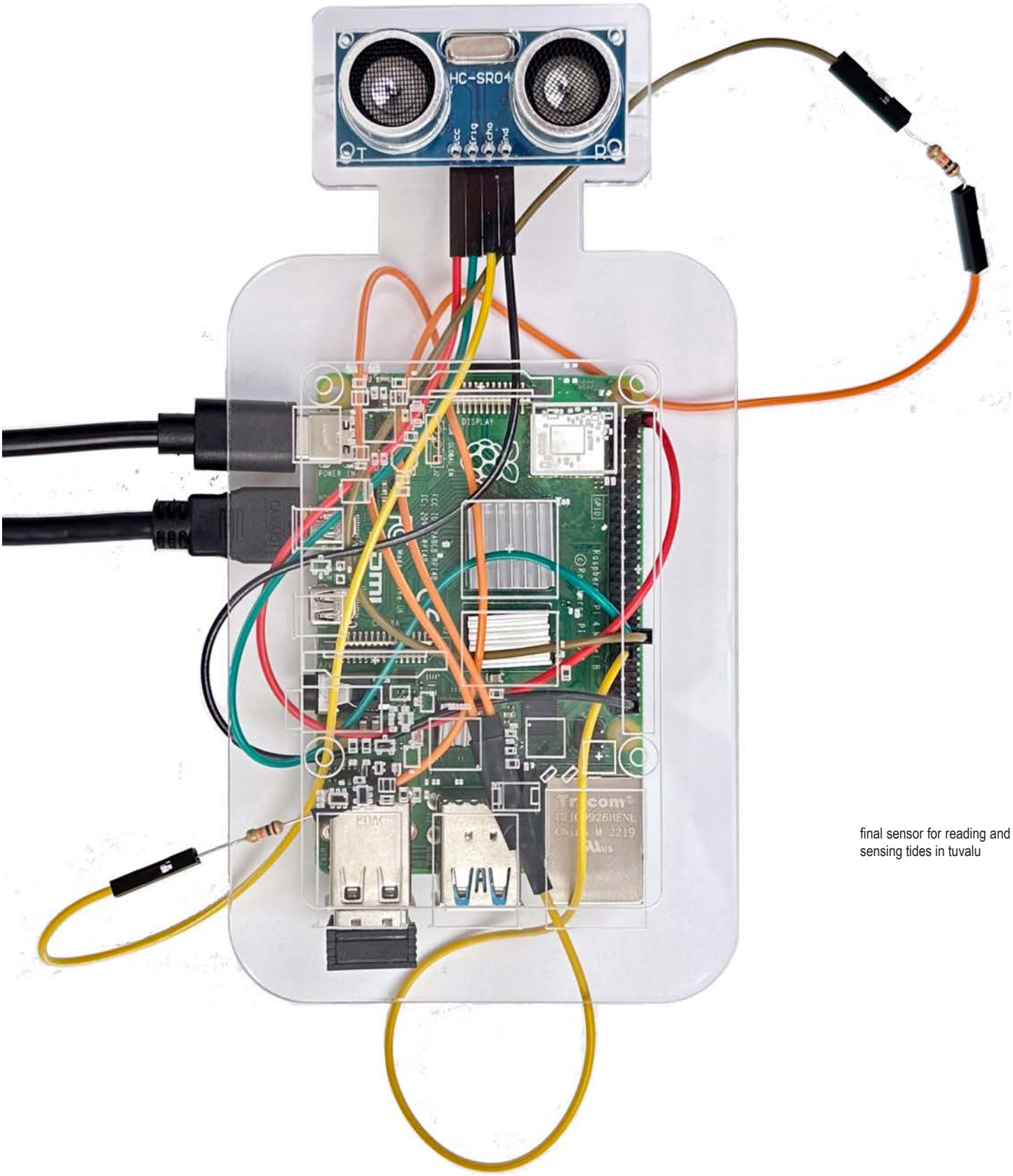
In Tuvalu, where land barely rises above the sea and tides speak louder than borders, creating a low-tech tidal sensor becomes both a pragmatic tool and a cultural gesture. During the development phase, two prototypes were constructed, one built with Arduino, the other with Raspberry Pi. While the Arduino version provided a foundational framework, the Raspberry Pi prototype emerged as fully functional, capable of recording and transmitting real-time tidal data in locally meaningful ways. Guided by the ultrasonic waves, this sensor listens rather than merely measures, translating planetary movements into accessible data grounded in community context. Installed across the islands, it doesn't replace traditional knowledge but resonates with it, echoing ancestral practices of reading stars, swells, and winds. As king tides increasingly blur the boundary between land and ocean, this sensor reads water not just as a threat, but as memory, territory, and time. In its simplicity lies resilience; in its function, a quiet resistance to disappearance. Moving Waters envisions not just a technological intervention, but an act of sensing sovereignty fluid, deliberate, and enduring.







“approach”:	“Ko tai oti.//Almost at sea...”,
“depart”:	“Ki uta...//Heading back to land...”,
“low_tide”:	“tai ‘masa.//Low tide”,
“high_tide”:	“tai ‘soko.//High tide”,
“rise”:	“tai fanaka...//Sea-level rising”,
“fall”:	“ki tai.//Sea retreating toward the sea”,
“now”:	“taimi nei//Now”,
“breath”:	“tai.//Sea...”,
“spirit”:	“tui tai//Spirit of the sea...”,
“dance”:	“fakavai tai..//Dance of the sea...”,



final sensor for reading and sensing tides in tuvalu

Coastal acupuncture engages with local Punta Blanca residents to create urban anchors for community growth. Through comprehensive interviews, local community members voiced a need for communal spaces, such as markets and areas for youth activities. The project's approach creates anchors for public spaces to grow community amenities. The project is grounded in the urban strategy of **"COASTAL ACUPUNCTURE,"** which establishes urban anchors around the main street and public beach access.These anchors serve as focal points for community interaction and can vary in size and function based on local desires.

This adaptable model cc can be applied to other coastal and inland communities, offering both temporary and permanent structures as needed. A catalog of eight urban anchors have been developed in Punta Blanca, including a pier, a water tower, and an island. These structures are primarily constructed using bamboo - a local sustainable and versatile material, allowing for experimentation in scale and form. This project aims to create a vibrant, functional environment that reflects the unique character of Punta Blanca while addressing the community's social and economic needs.

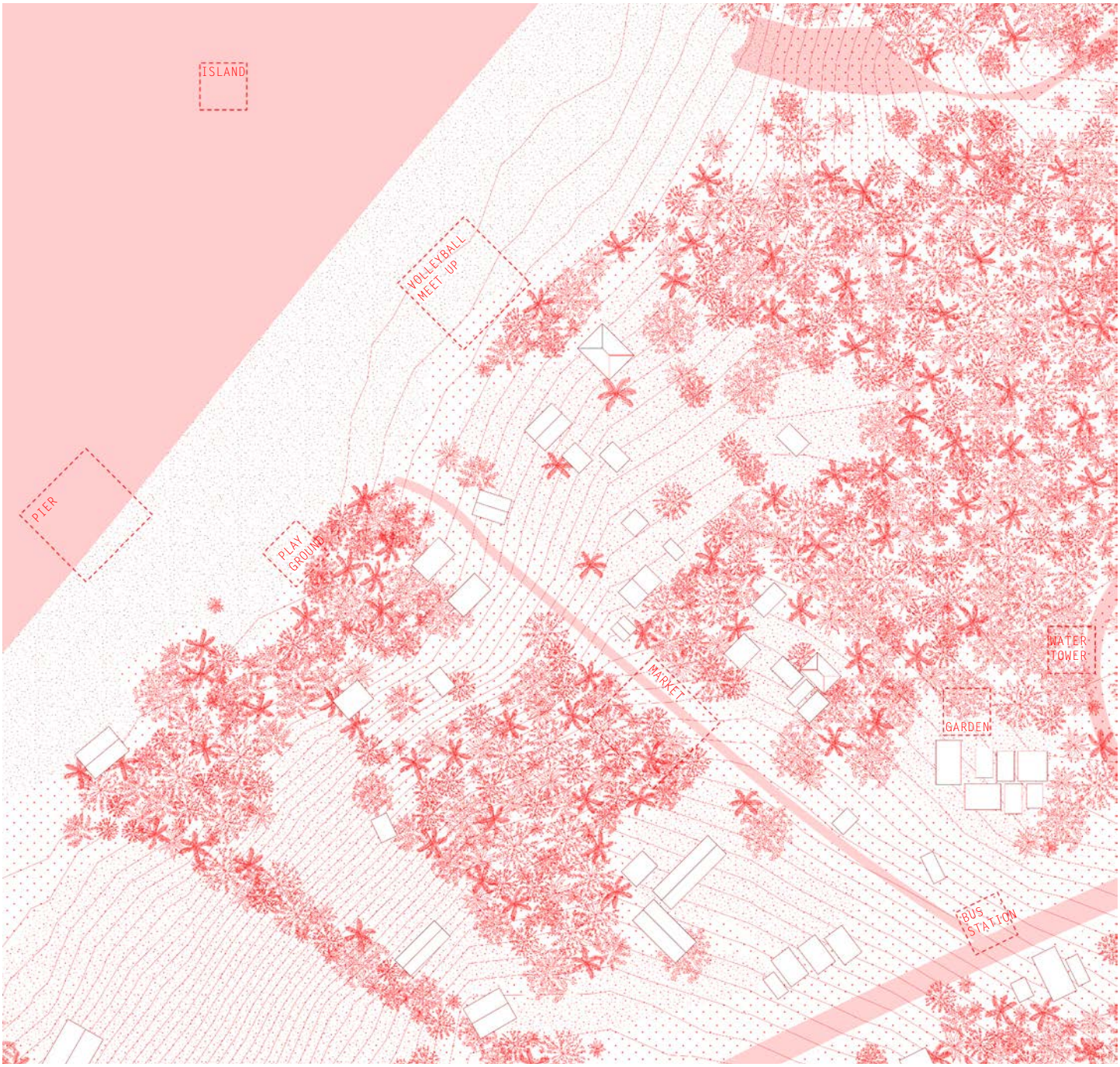
Right to the Beach
Advanced Studio Summer
Prof. David Barragan
Partner Lauren Jian

left: masterplan punta blanca and urban anchors

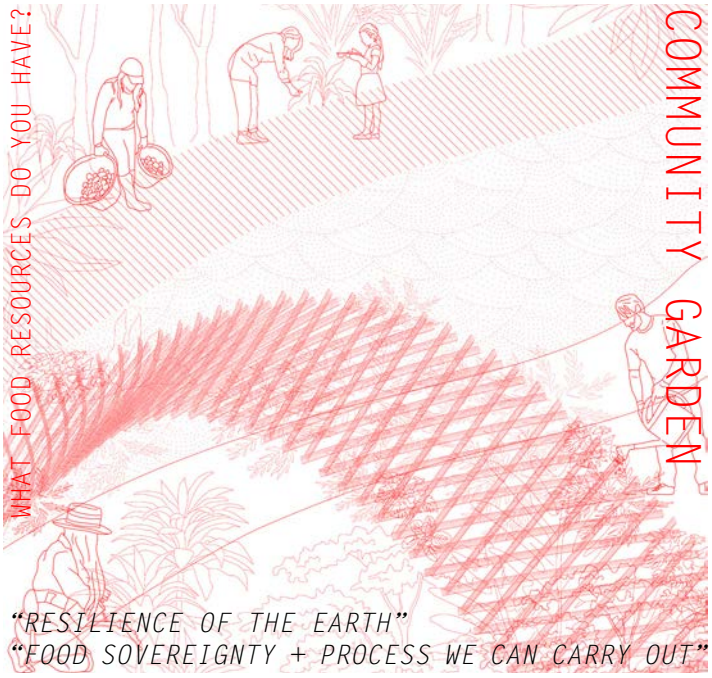
COASTAL ACUPUNCTURE

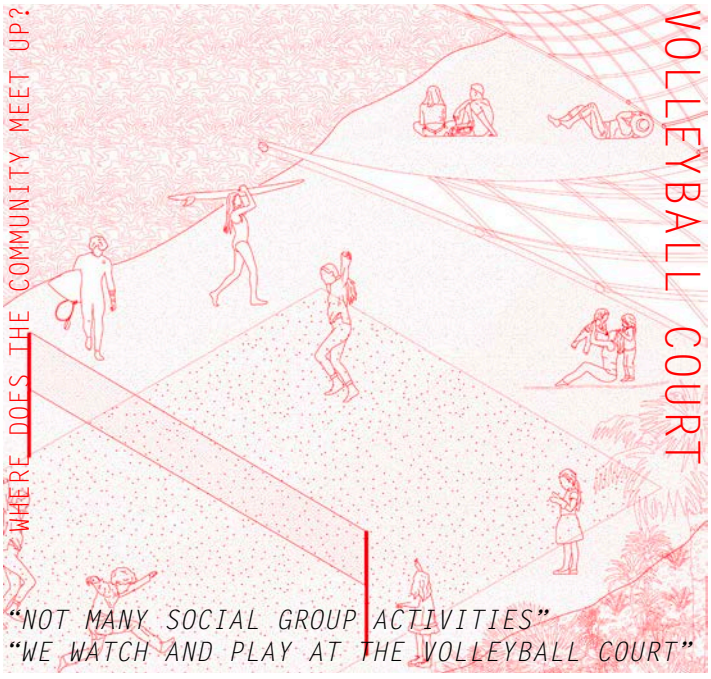
community growth through urban anchors in punta blanca

02




MARKET
ARE YOU MISSING ANY RESOURCES?
"NO MARKET"
"WE HAVE SOME RESOURCES BUT POORLY MANAGED"


COMMUNITY GARDEN
WHAT FOOD RESOURCES DO YOU HAVE?
"RESILIENCE OF THE EARTH"
"FOOD SOVEREIGNTY + PROCESS WE CAN CARRY OUT"

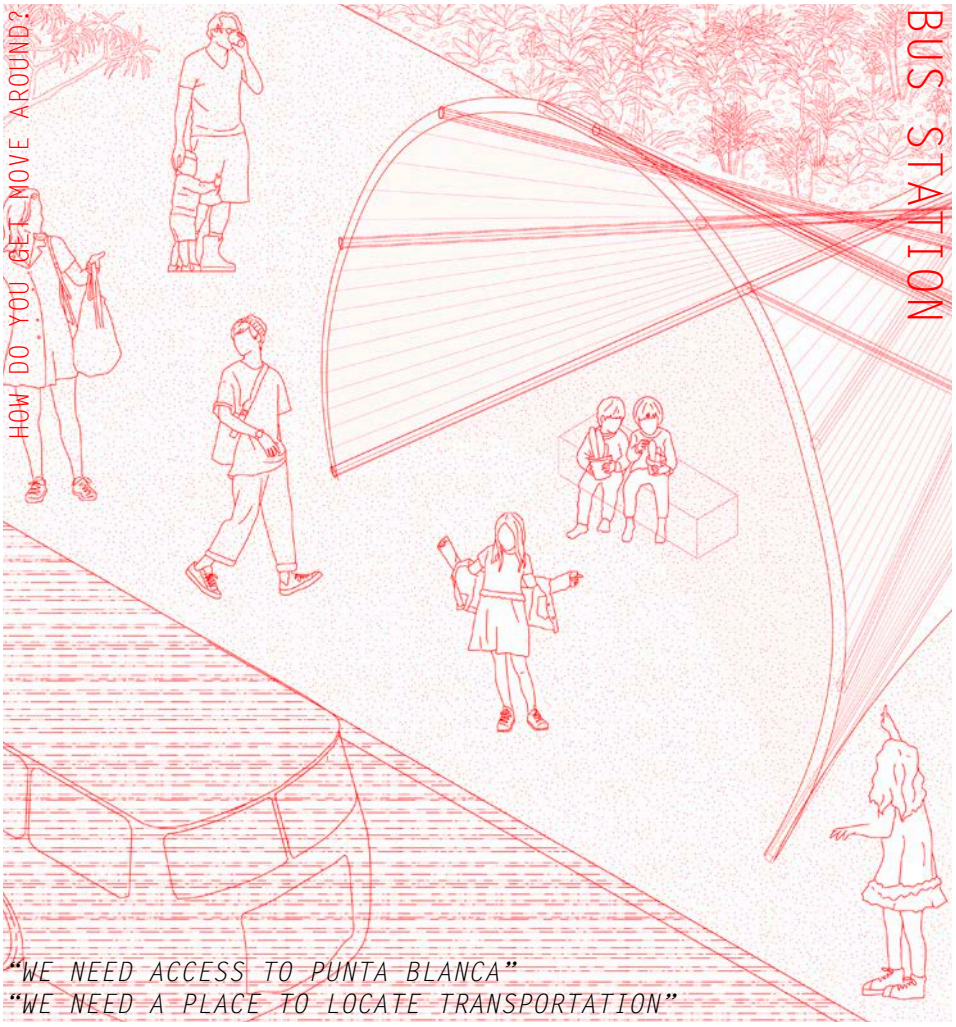

VOLLEYBALL COURT
WHERE DOES THE COMMUNITY MEET UP?
"NOT MANY SOCIAL GROUP ACTIVITIES"
"WE WATCH AND PLAY AT THE VOLLEYBALL COURT"

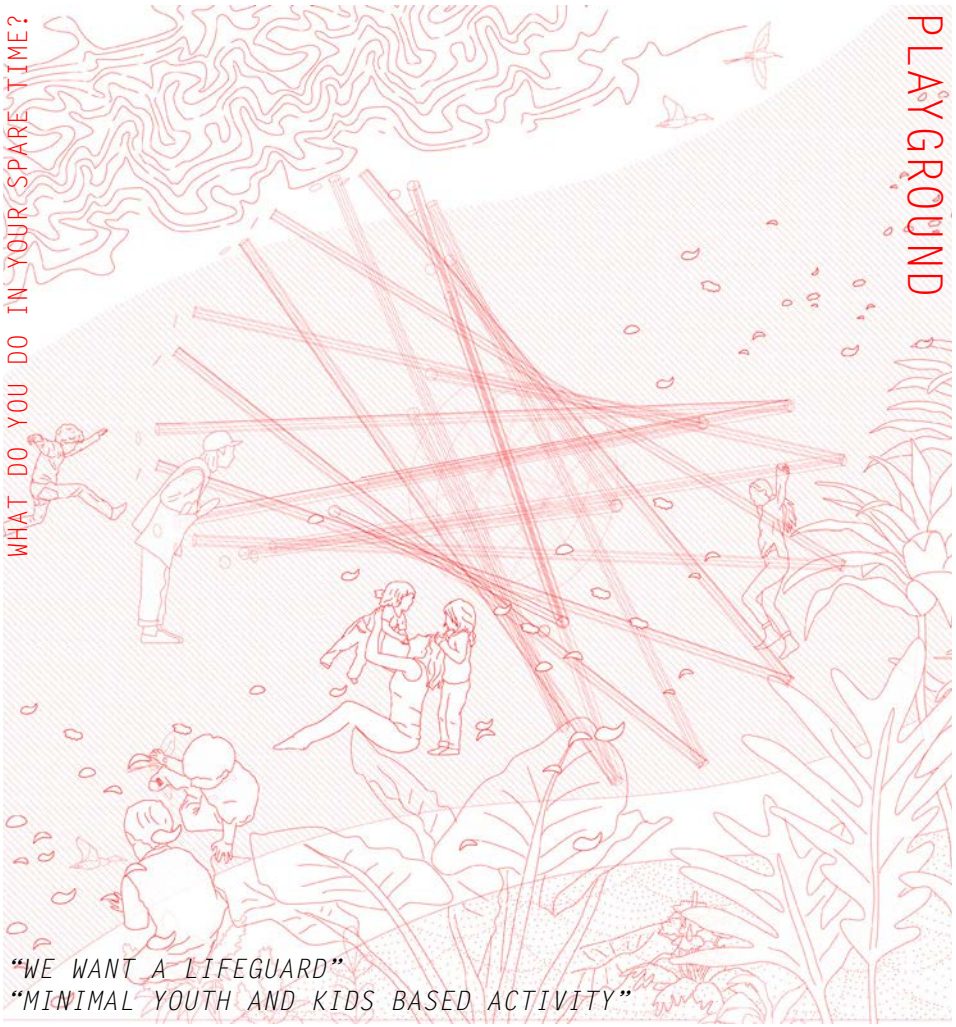

ISLAND
WHAT IS THE OCEAN TO YOU?
"WE HAVE RESPECT FOR THE OCEAN AND LOVE IT"


WATERTOWER
WHAT IS YOUR RELATIONSHIP WITH THE ENVIRONMENT?
"RESILIENCE OF THE EARTH"
"FOOD SOVEREIGNTY + PROCESS WE CAN CARRY OUT"

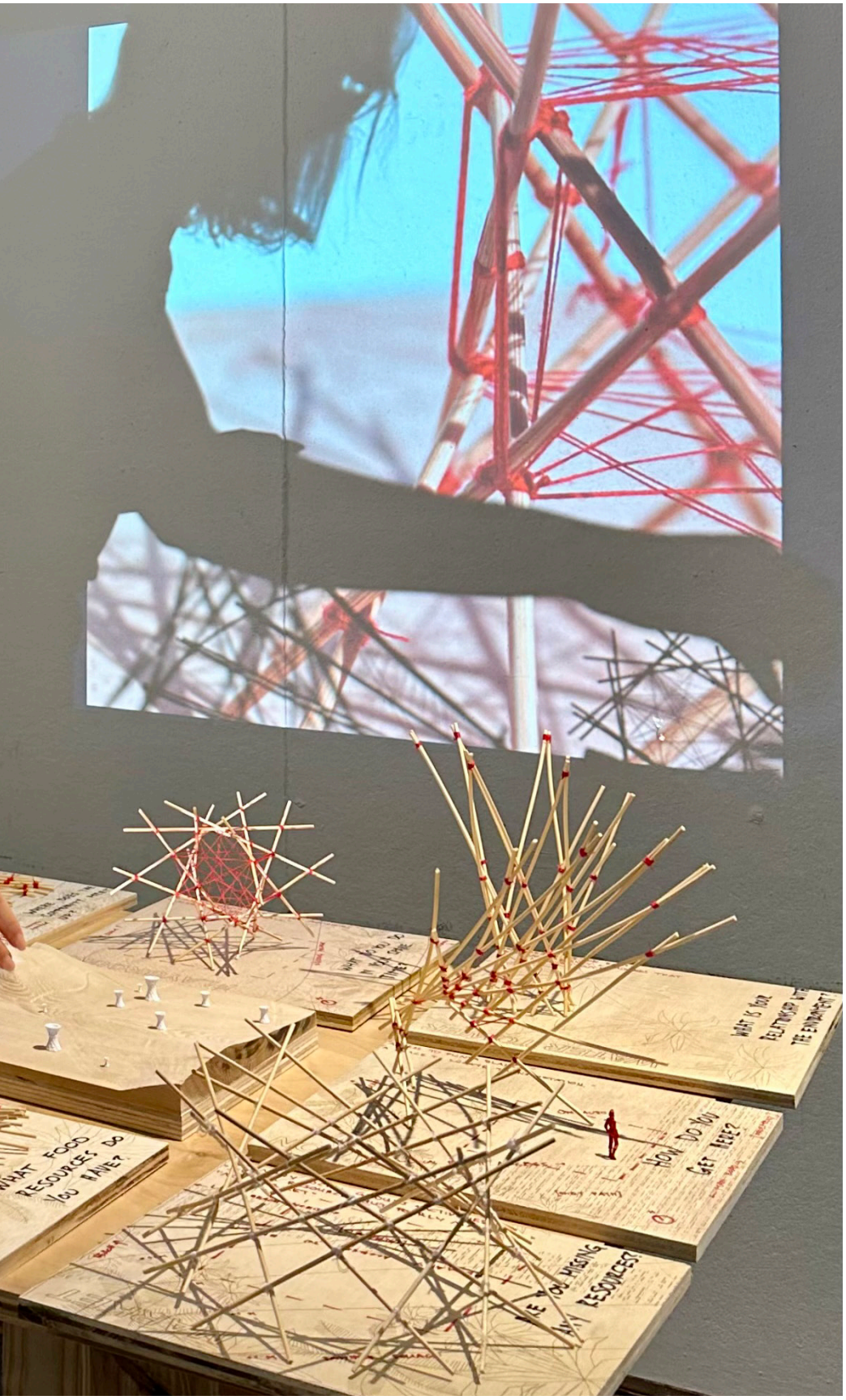

PIER
WHAT ARE LOCAL ACTIVITIES?
"WE FISH IN THE AREA SEASONALLY, A FRESH PRODUCT THAT CONTRIBUTES TO THE LOCAL ECONOMY"

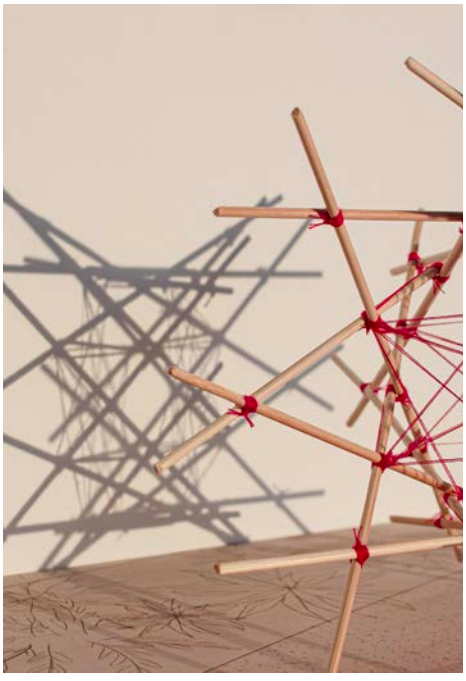
concept sketches of the urban anchors for punta blanca, based on the voice of the community, statements ofthe locals are highlighted in black

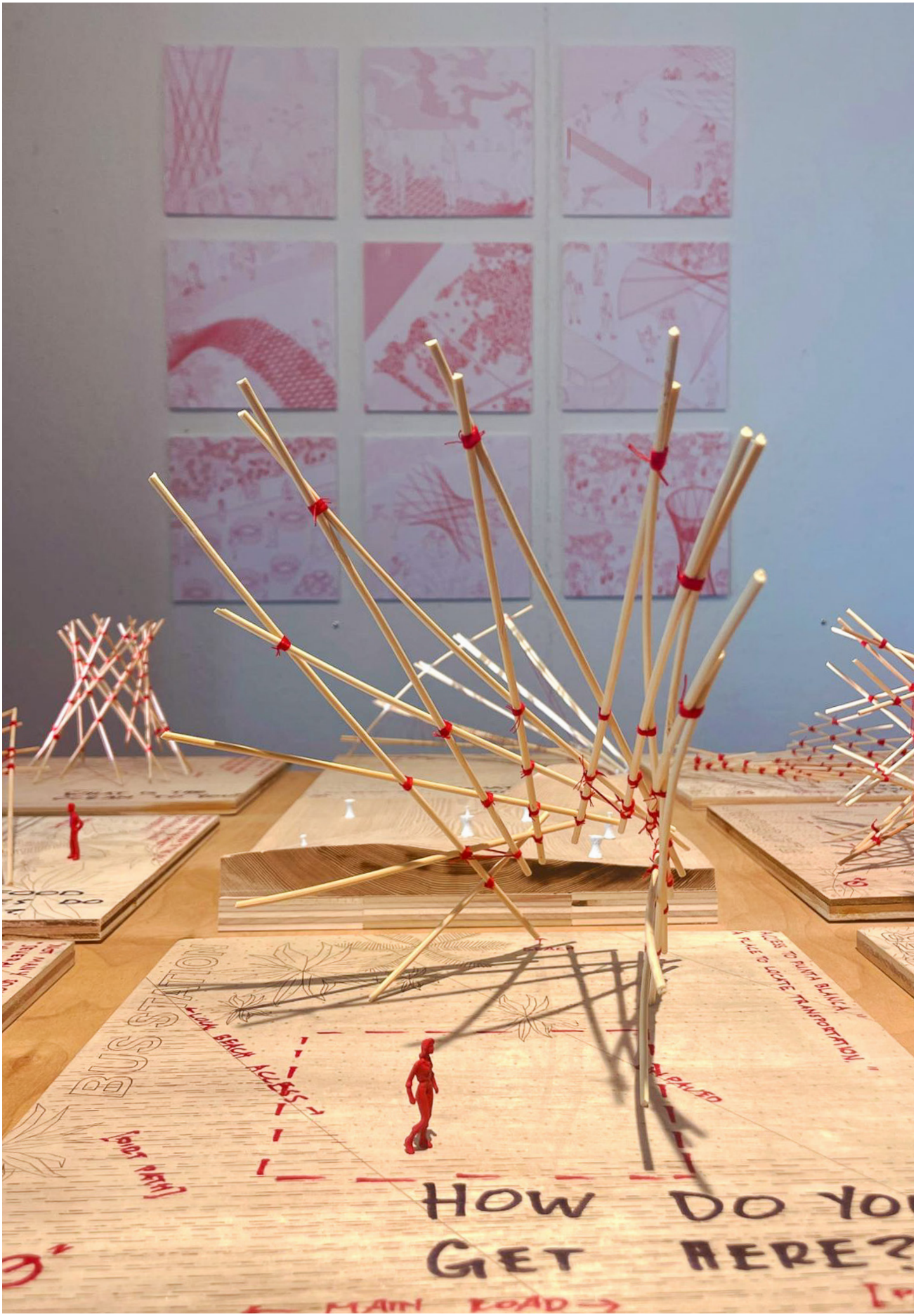




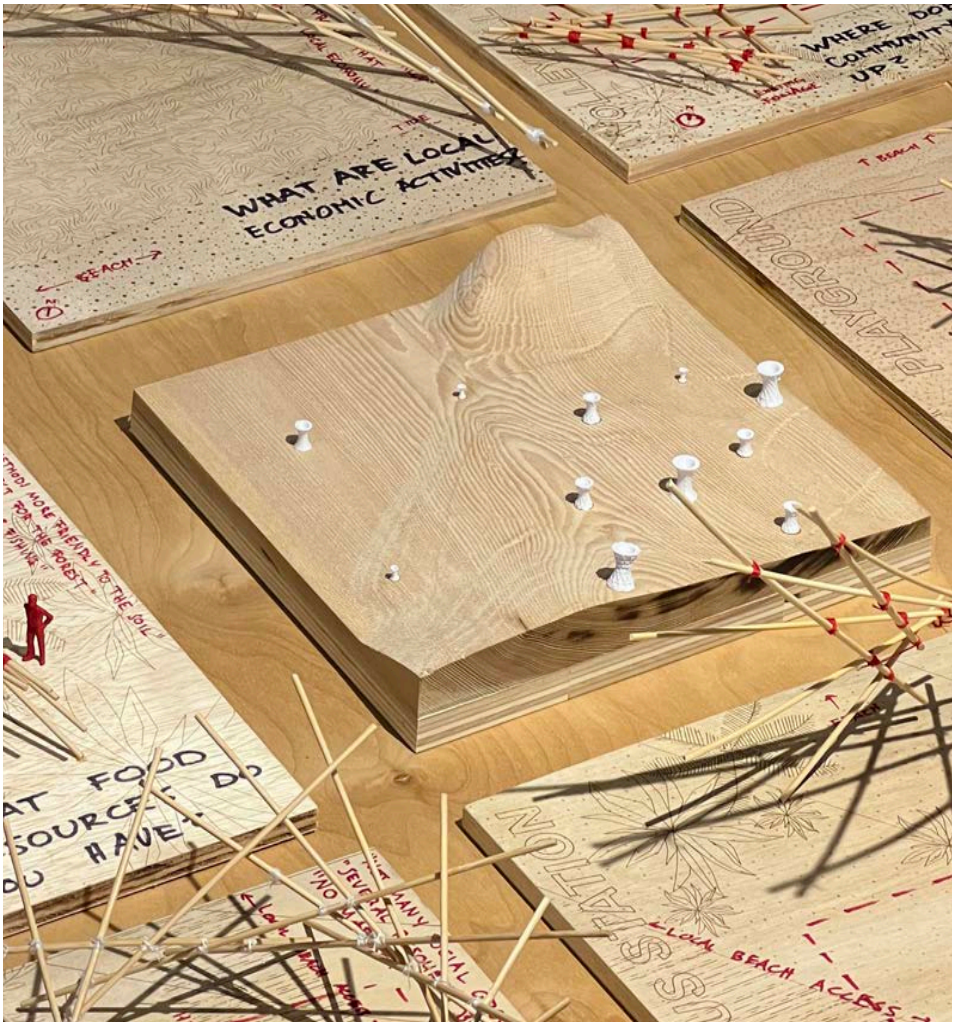
final exhibition of coastal acupuncture

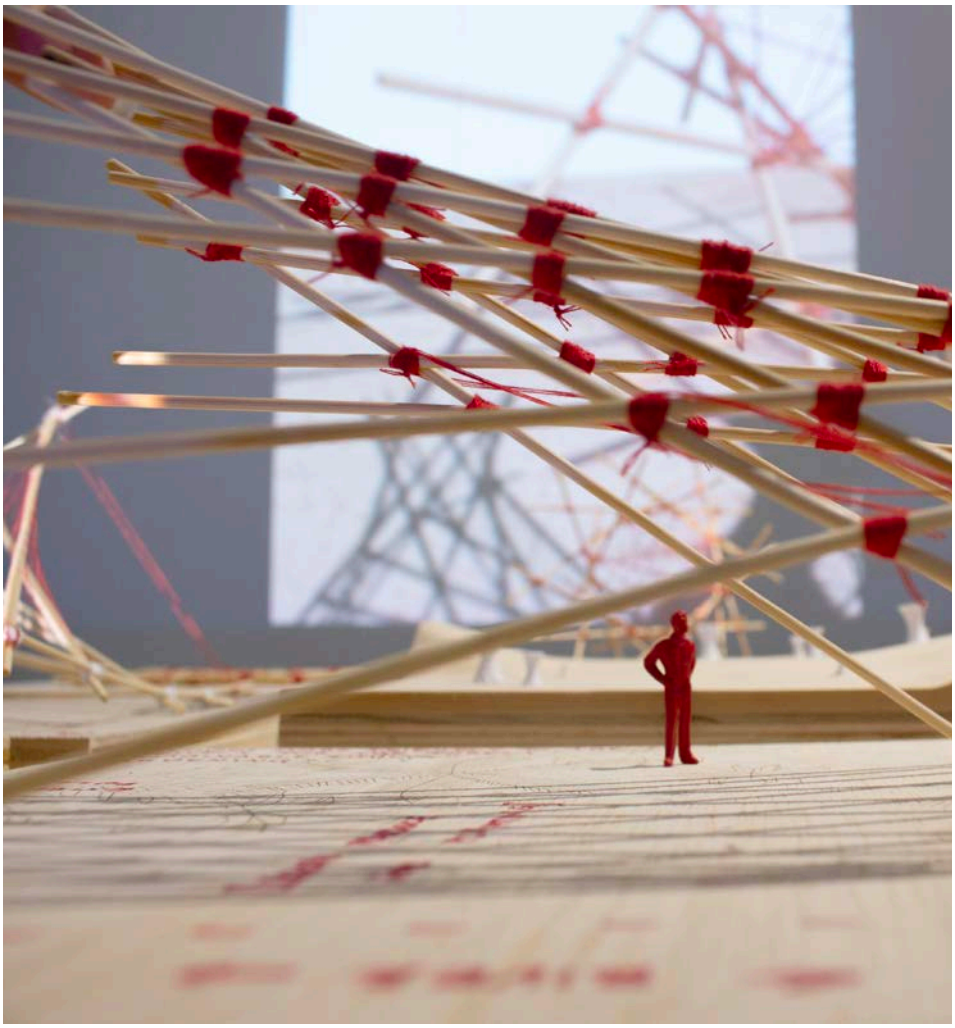

WHAT FOOD
RESOURCES DO
YOU HAVE?
HOW DO YOU
GET HERE?
WHAT IS YOUR
RELATIONSHIP WITH
THE ENVIRONMENT?




BUS STATION
HOW DO YO
GET HERE?

final exhibition of coastal acupuncture, model made from wood, bamboo and red thread





Cold-water corals are important ecosystem engineers, creating biodiversity hotspots in the deep sea that serve as vital habitats for up to 1,200 species. Thousands of years old, coral reefs form complex structures that provide shelter and nursery grounds for numerous marine organisms. Research on cold-water corals gained momentum in the last two decades due to advancements in deep-sea exploration technology. These ancient corals serve as valuable archives of past environmental conditions. Over 50% of cold-water coral ecosystems have been destroyed, mainly due to bottom trawling before their significance was recognized. The ongoing climate crisis poses additional threats, as warming waters and melting ice alter ocean currents and water properties. These changes directly impact cold-water corals, leading to significant shifts in ocean dynamics and the delicate ecosystems they support.

This research serves as the foundation of the architectural concept for the coral bank. Located in the north of Norway on the island of Sorøya, which borders the northernmost coral reef, Korallen, the project is set in a unique location where the main path encloses a bay that serves as the coral nursery. This path guides researchers and visitors from underwater, into the water, onto the rocks, and into the rocks. Inspired by the life cycle of the coral, the design includes two buildings: the wet lab in the water hosting a biobank, a coral nursery, and research facilities, while the dry lab in stone serves as the core structure with the archive and educational facilities. The path is essential, acting as the spine of the project with several facilities along the water. This innovative design facilitates essential research and conservation strategies for cold-water corals. It provides an immersive educational experience, allowing visitors to understand the importance of cold-water coral ecosystems and the urgent need for their protection.

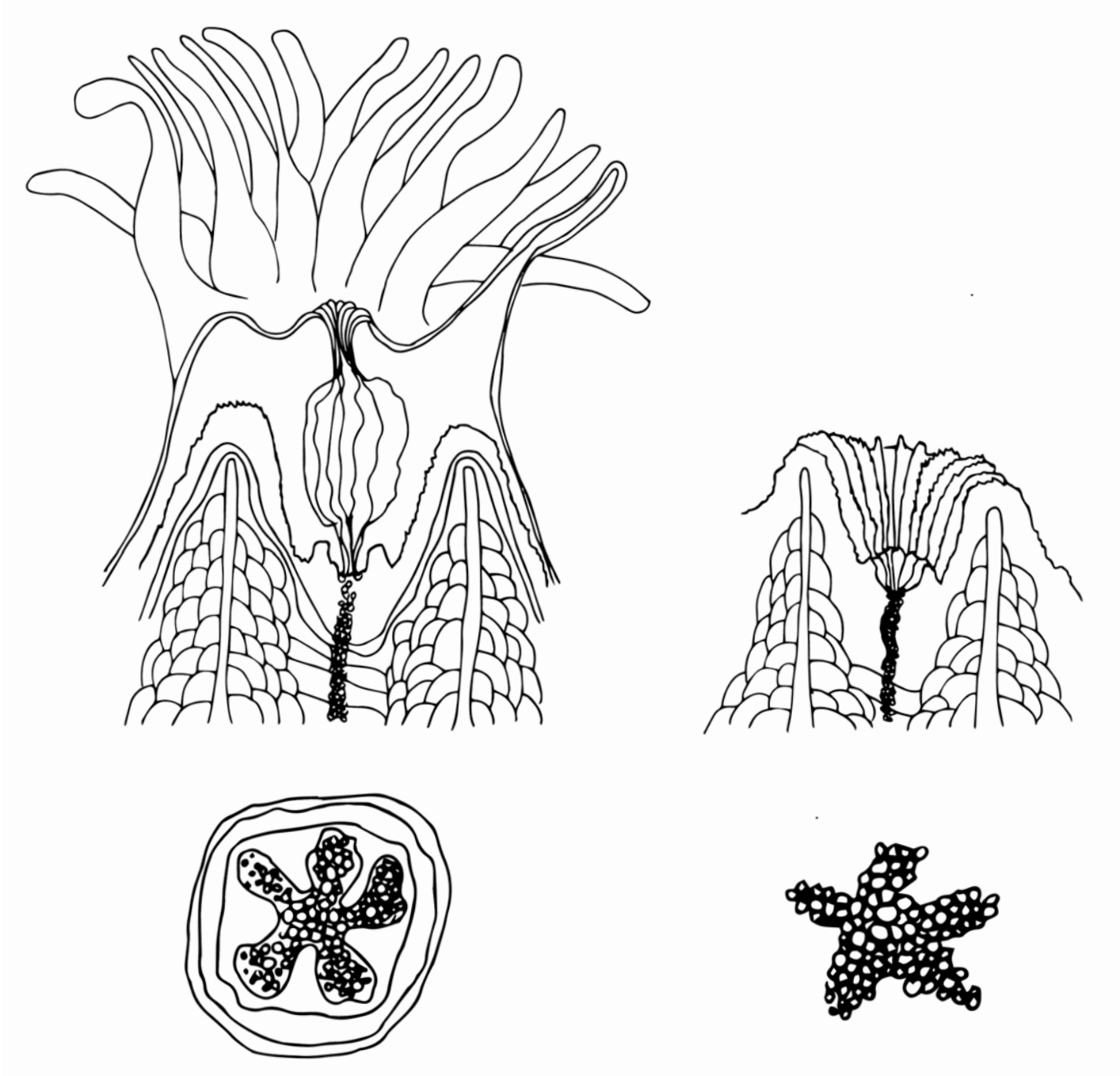
Melting Archive
Advanced Studio VI
Prof. Leslie Gill
Prof. Khoi Nguyen
Individual Work

right: final exhibition mock up of Moving Waters

LIVING CORAL BANK

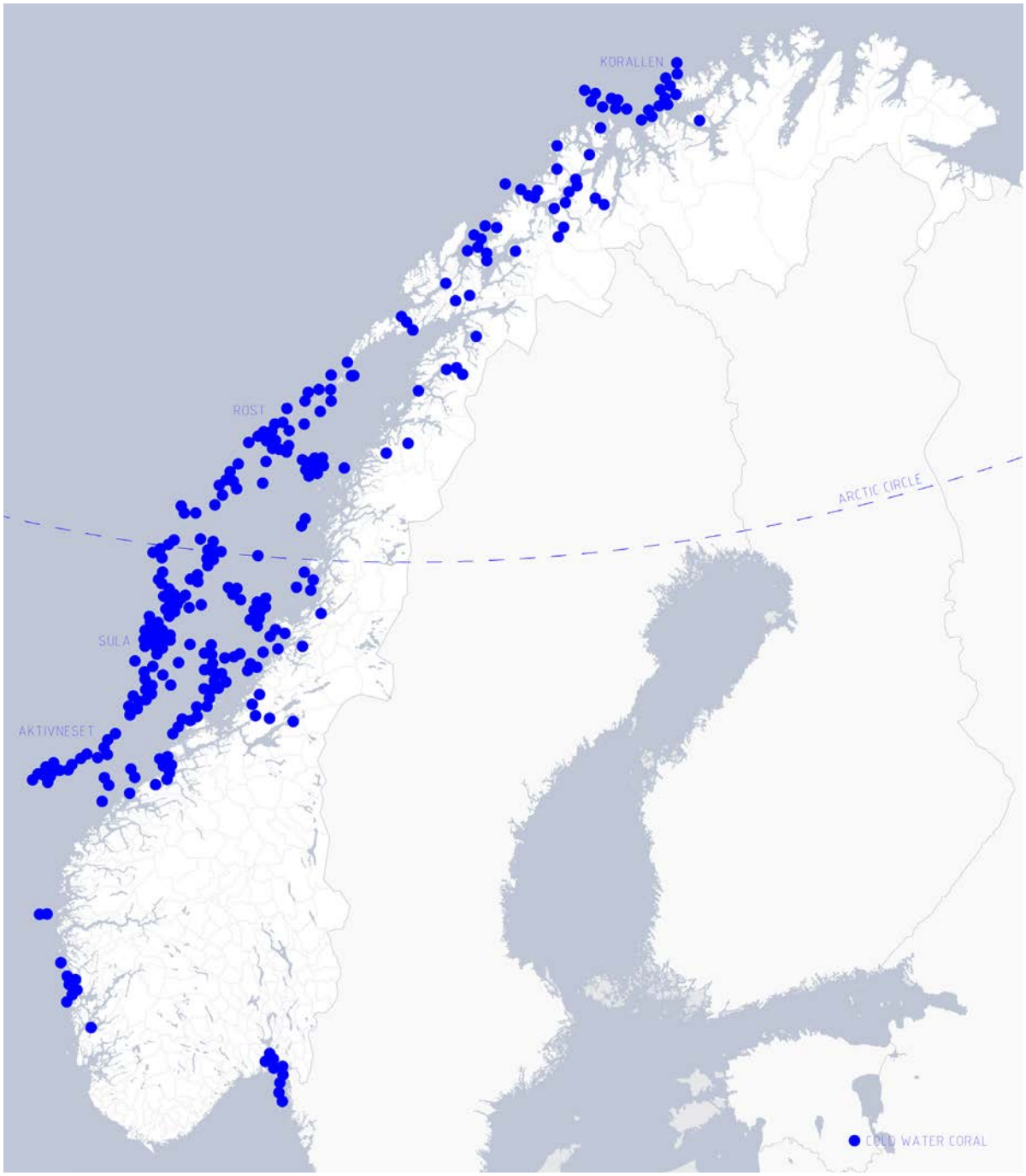
cold-water corals as architects of marine biodiversity

03




NORTH PACIFIC OCEAN
ALASKA US
CANADA
ARCTIC OCEAN
VICTORIA ISLAND
Q. ELISABETH I.
ELLESMERE I.
NORTH POLE
RUSSIA
SEVERNAYA ZEMLYA
FRANZ JOSEF LAND
GREENLAND DENMARK
SVALBARD NORWAY
GREENLAND SEA
NORWEGIAN SEA
ICELAND
SWEDEN
FINLAND
NORWAY
NORTH ATLANTIC OCEAN

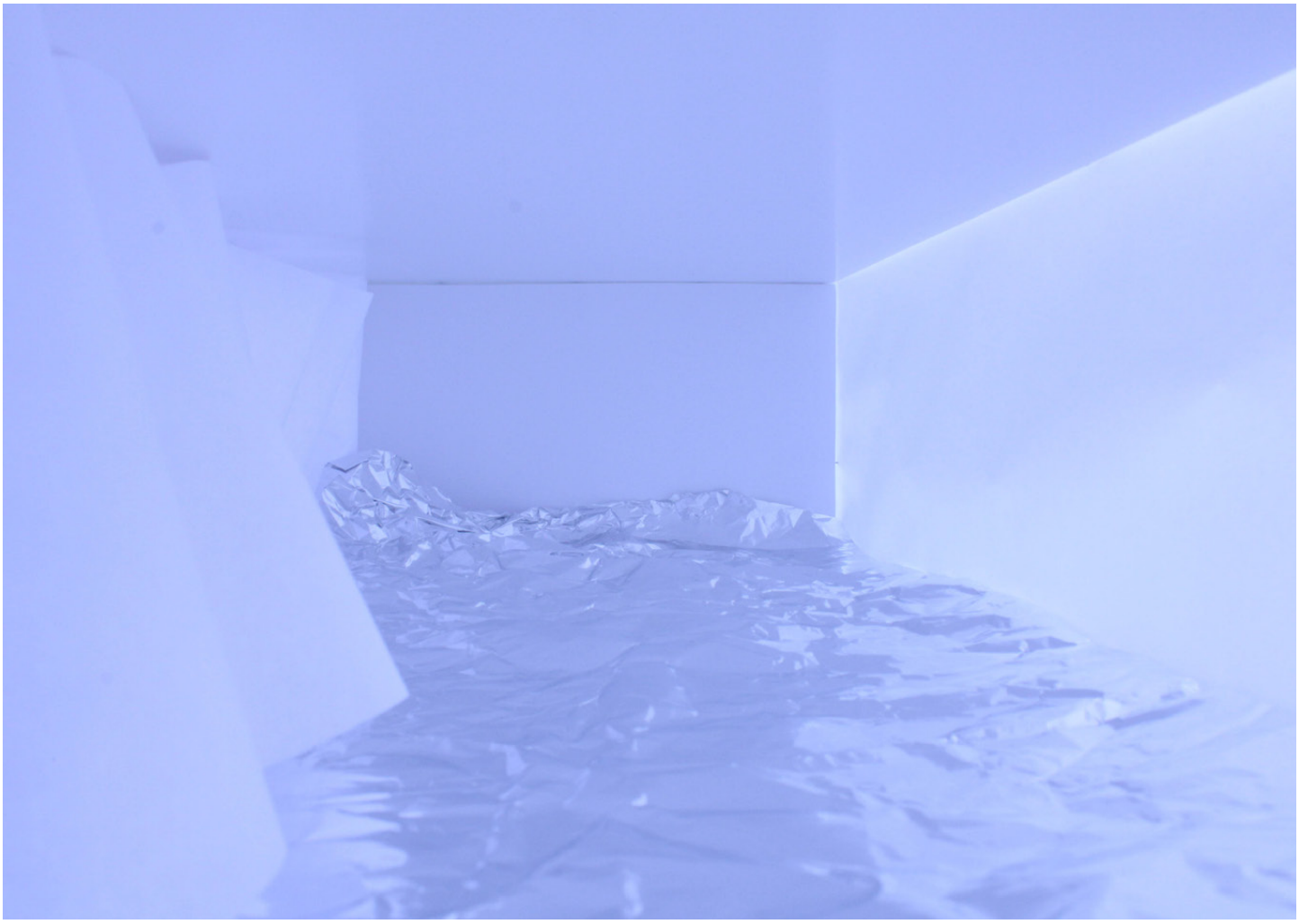
left: arctic with indicated cold water coral reefs
right: norway with indicated cold water coral reefs

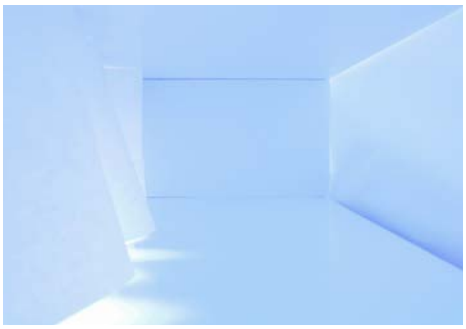


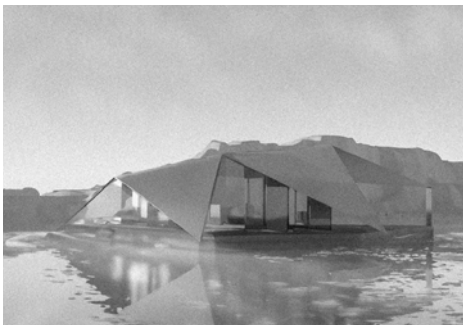
Cold-water corals thrive in the deep, dark, and frigid waters of the world's oceans. They form complex reef structures without relying on sunlight, serving as critical biodiversity hotspots that support countless marine species, regulate carbon cycles, and offer insight into the changing health of our oceans. Yet they remain vulnerable to damage from deep-sea trawling, ocean acidification, and climate change. Norway is home to some of the world's largest and most diverse cold-water coral reefs, including the massive Røst Reef off the Lofoten Islands. These reefs, primarily formed by the coral species Lophelia pertusa, thrive in deep, dark, and cold waters, often hundreds of meters below the surface. Unlike tropical corals, they do not rely on sunlight but feed on the nutrients from ocean currents. These fragile ecosystems are biodiversity hotspots, providing critical habitat for fish, crustaceans, and sponges. However, they are vulnerable to damage from bottom trawling and climate change, prompting conservation efforts to protect them. Off the coast of Sørøya in northern Norway lies the Korallen Reef complex, one of the world's northernmost known cold-water coral systems. Mainly composed of Lophelia pertusa, these reefs thrive in the deep, cold waters of the Barents Sea at depths between 144 and 364 meters. The largest reef stretches over a kilometre and rises to 30 meters from the seabed, forming a rich habitat for diverse marine life. These fragile structures, shaped by glacial geology and ocean currents, are vital ecological hotspots but face increasing threats from bottom trawling. Recognizing their importance, Norway has established marine protected areas to preserve these unique underwater landscapes.

Arctic light, with its rare clarity, low angle, and dramatic seasonal contrasts, is not just a backdrop but a shaping force in northern architecture. The physical study of Arctic light, observing its diffusion through mist, its reflection off snow and ice, and the elongated shadows it casts even at midday reveals how light behaves as both material and atmosphere. In winter, the absence of direct sunlight creates a world of subtle gradients, pushing architects to design with sensitivity to tone, orientation, and glow. In summer, the ceaseless daylight dissolves time, inviting open, permeable structures that engage the horizon. These conditions demand architectural responses that go beyond shelter, shaping spaces that modulate light, frame fleeting luminosities, and evoke presence through contrast. Understanding Arctic light through physical observation—its rhythms, its color shifts, its spatial effects—becomes essential to crafting architecture that resonates with the emotional and ecological realities of the far north.

right: study of behaviour of arctic light, tone and reflection



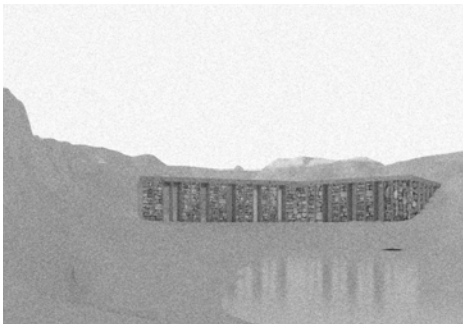


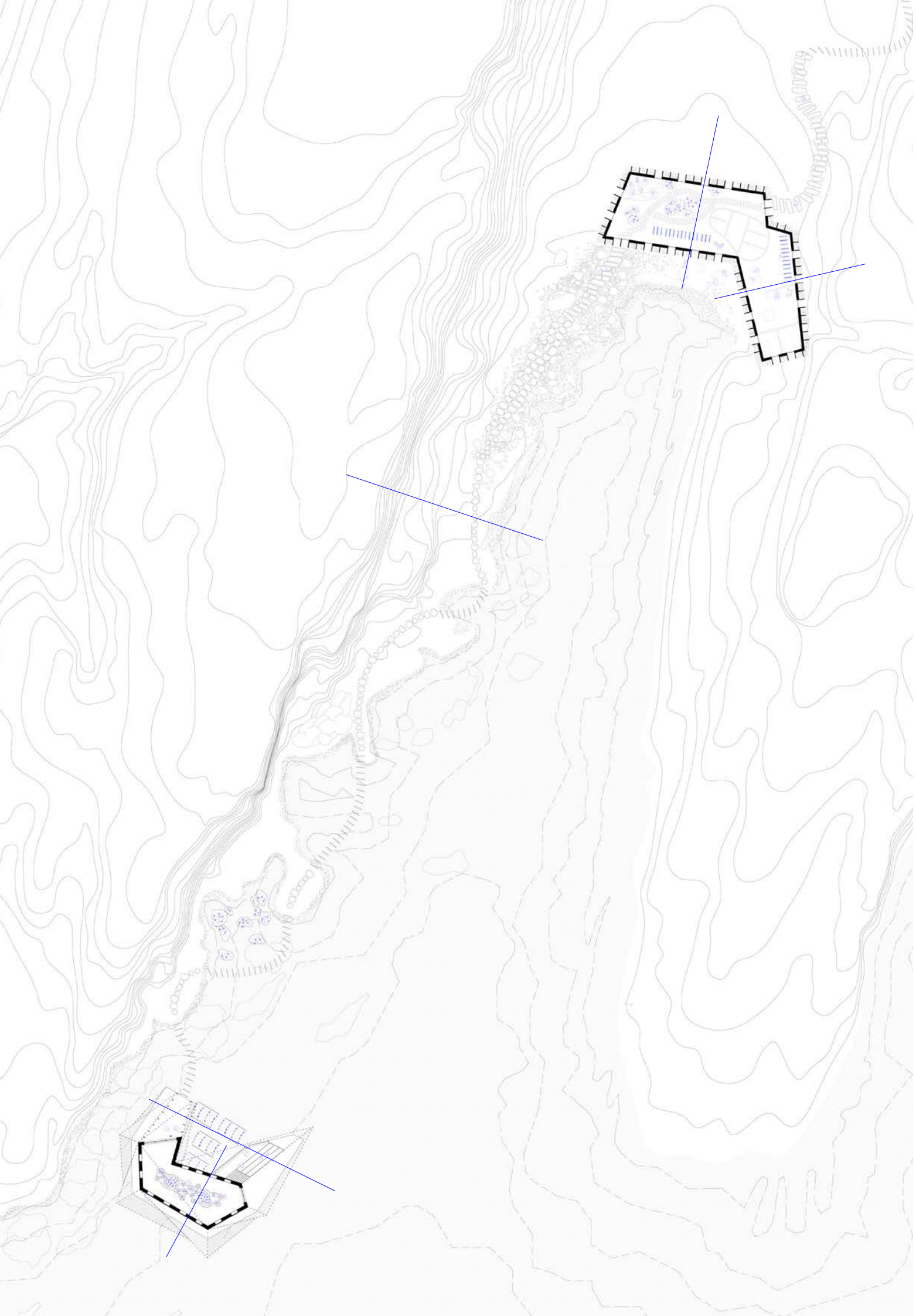


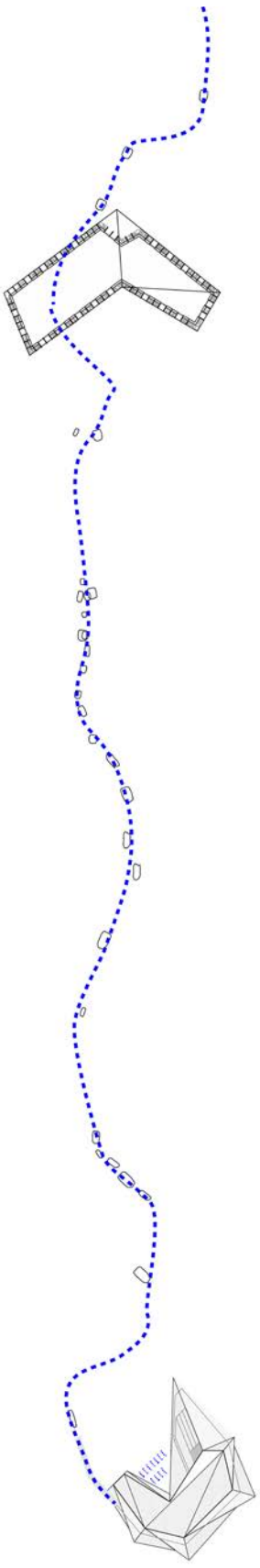
The wet lab is a living space where architecture and nature constantly converse. Positioned at the bay's edge, it emerges from the water like a bridge between humans and the ocean's quiet mysteries. Here, surrounded by the pulse of the sea, researchers find themselves integrated not only in the environment but within it, studying coral nurseries that grow beneath the surface, touching the ancient rhythms of these ecosystems. The design allows water to move freely through the building, flowing into labs and spaces where it becomes part of the research, guiding, nurturing, and inspiring new understanding. This is where science and life meet each tidal change, each wave that laps against the walls, deepening our connection to the fragile coral reefs that sustain so much of ocean life.

The architectural concept for the Coral Bank on the island of Sørøya, Norway, is a combination of form, function, and the natural environment, where the design is intertwined with the unique landscape and the delicate ecosystems of cold-water corals. At the core of the design is the connecting path, a vital element that serves as both a literal and metaphorical journey. This path leads visitors and researchers through the site, beginning underwater, where the living coral reefs thrive, and gradually bringing them onto the land and rock of the island. It moves through water, over stone, and into the heart of the research facilities, symbolising the flow of knowledge and the movement between the ocean's deep rhythms and the human need to understand, protect, and preserve. Together, the wet and dry labs form a dialogue balancing the ephemeral, fluid nature of ocean life and the enduring, permanent qualities of land. These two elements mirror corals' lifecycle: living in the water and growing slowly over millennia, each one a small but vital part of a larger whole. The connecting path is not just a physical route but a conceptual one a thread that ties the entire site together. It is a journey through the environment, offering visitors an opportunity to witness the coral reefs firsthand and guiding them through the scientific process and ecological narratives that unfold within the labs. The path moves seamlessly from water to rock, mirroring the relationship between the marine world and the terrestrial landscape. It embodies the ongoing relationship between humanity and nature, where knowledge and protection are not separate but intertwined.

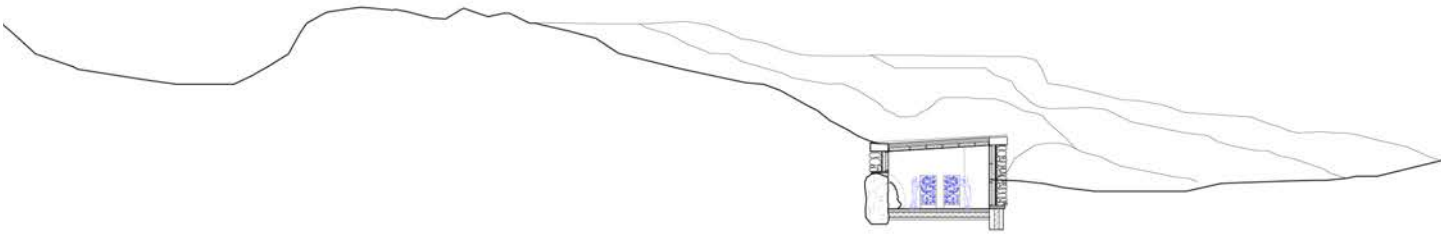
Above the water, the dry lab stands as a place of reflection and insight, carved into the rock like a sanctuary for thought. Its solid, enduring walls hold knowledge, both the data of today and the memories of a planet long past. This is where the past and future meet: the deep archives of coral history and environmental shifts are stored here, alongside the plans for their protection. The space is quiet, contemplative, a refuge where the urgency of the world below is felt, yet time slows, allowing ideas to grow and unfold. It is a place where visitors and researchers can pause, reflect, and understand the weight of what is at stake. Architecture embraces knowledge and memory here, grounded in the land yet deeply connected to the sea.



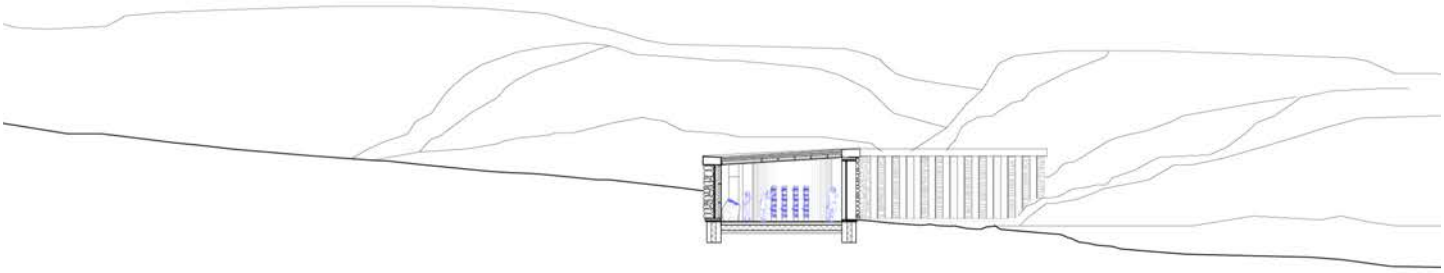




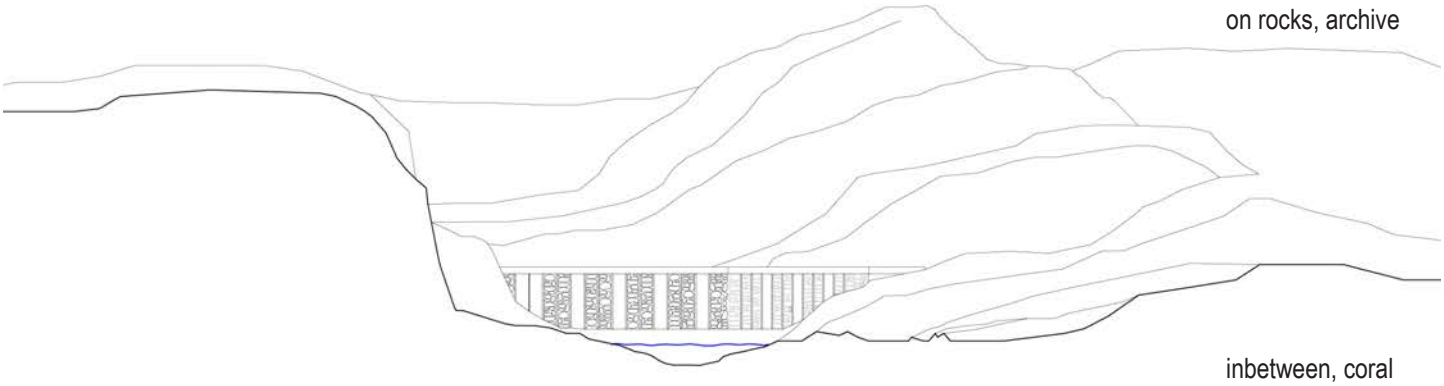
Architecture is not just the space we occupy, but the space where we connect, learn, and grow alongside nature. Like the steady, quiet growth of coral, it holds and nurtures life, offering protection and care, reminding us that every small act of attention shapes the lasting strength of something greater.



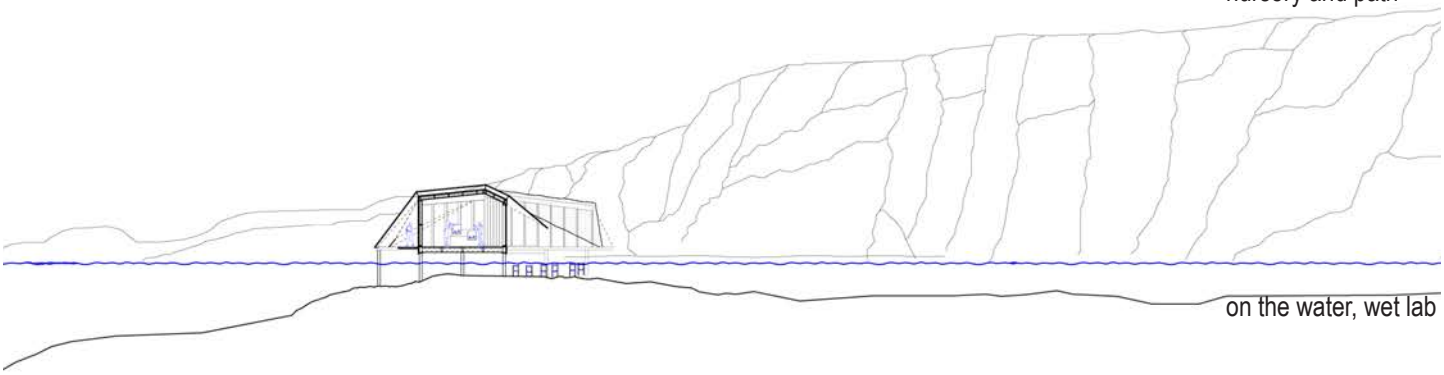
in the rocks, dry lab



on rocks, archive

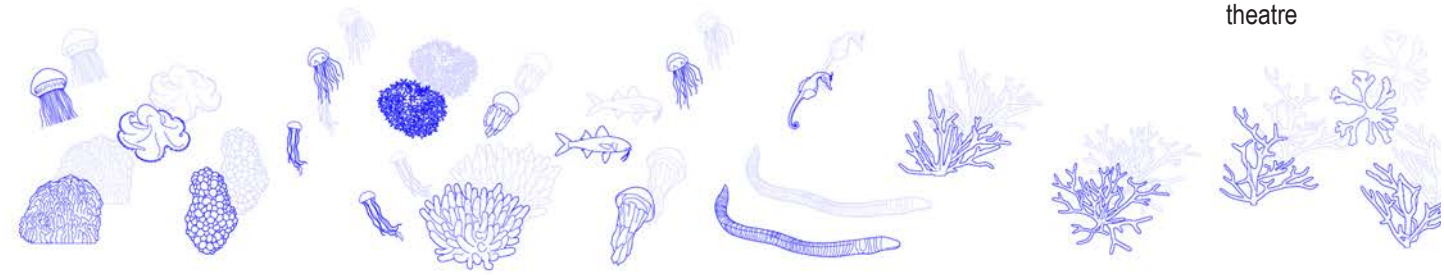


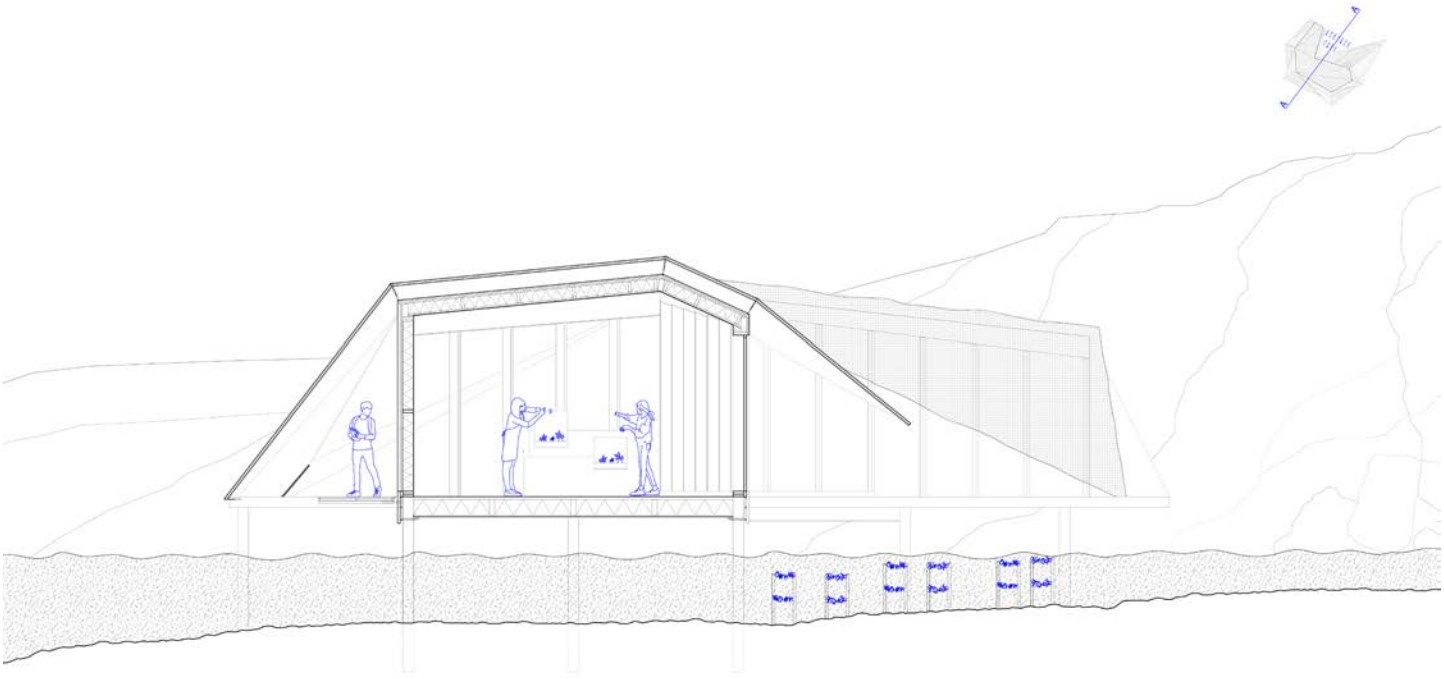
inbetween, coral nursery and path

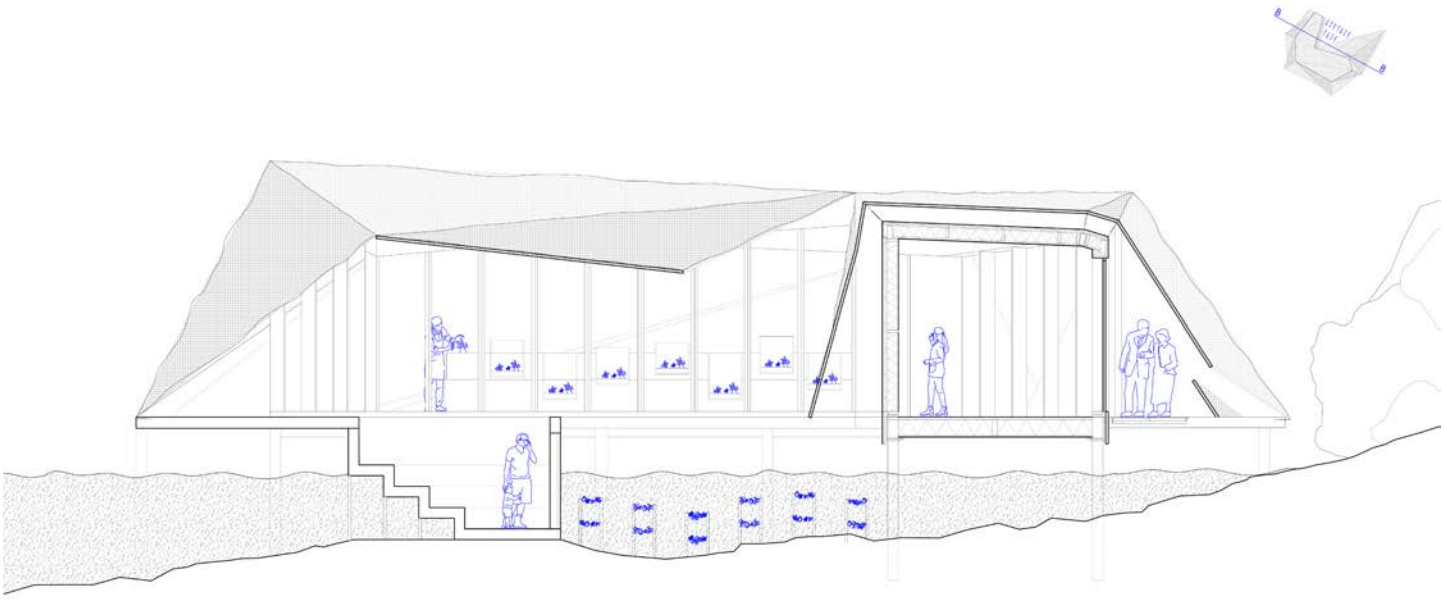


on the water, wet lab

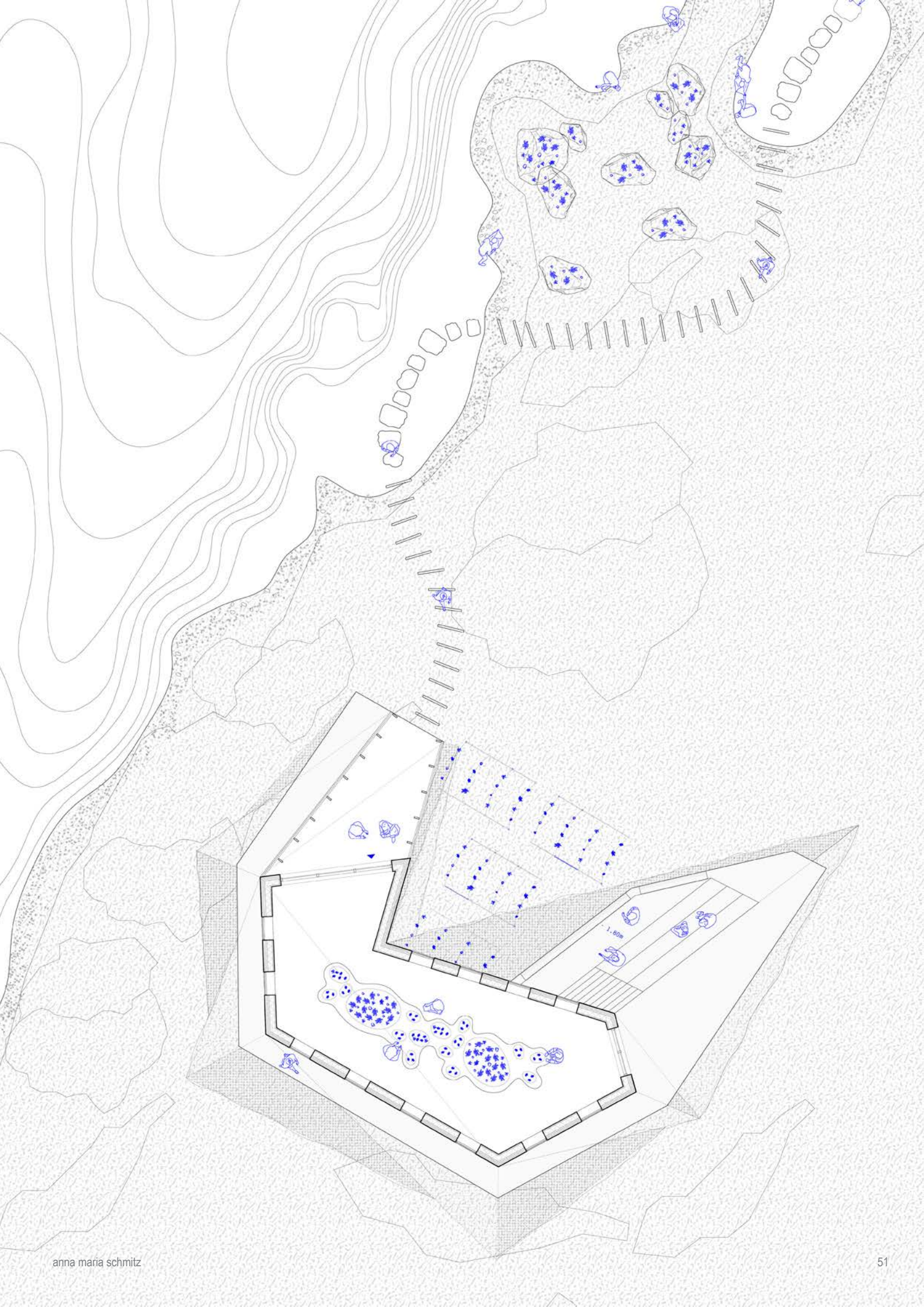
in the water, coral theatre

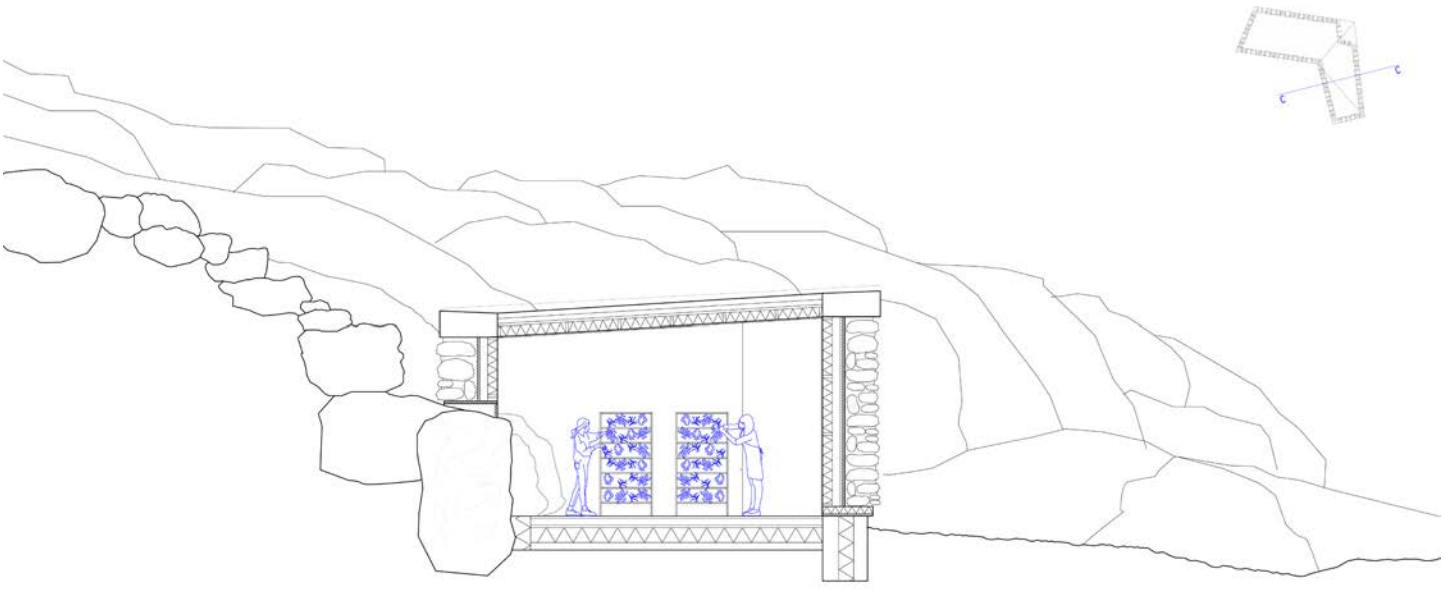


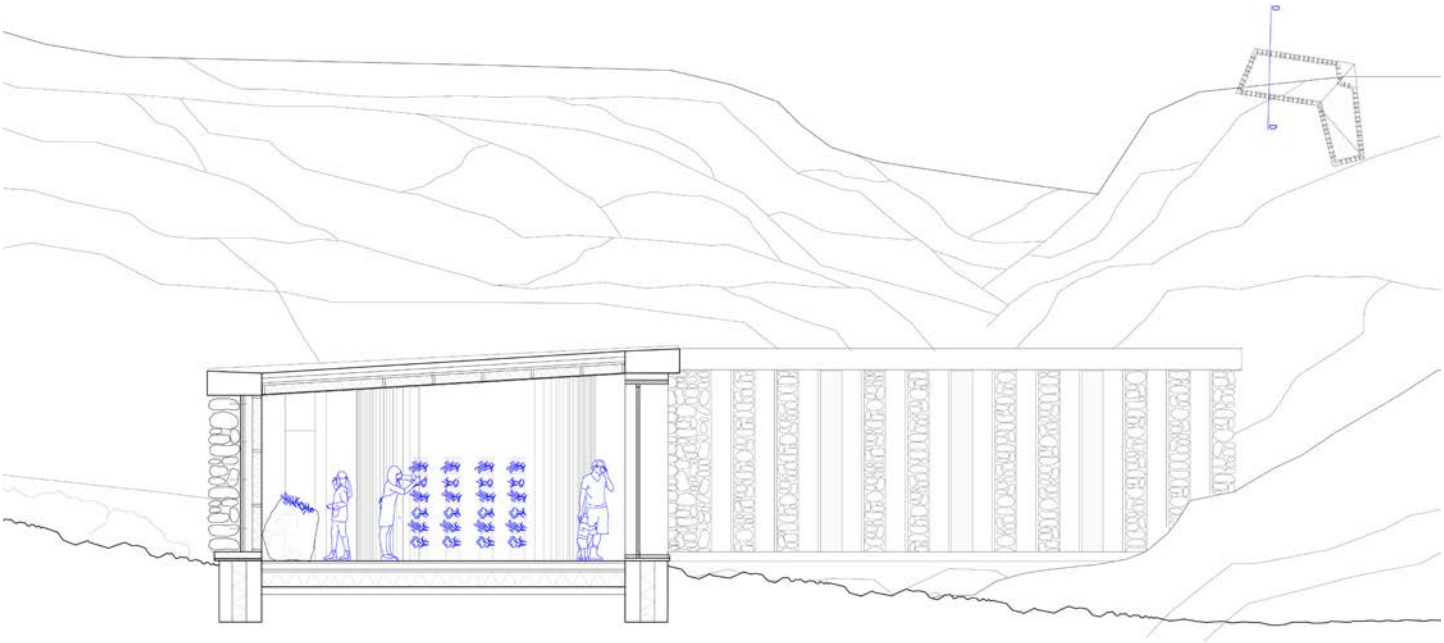




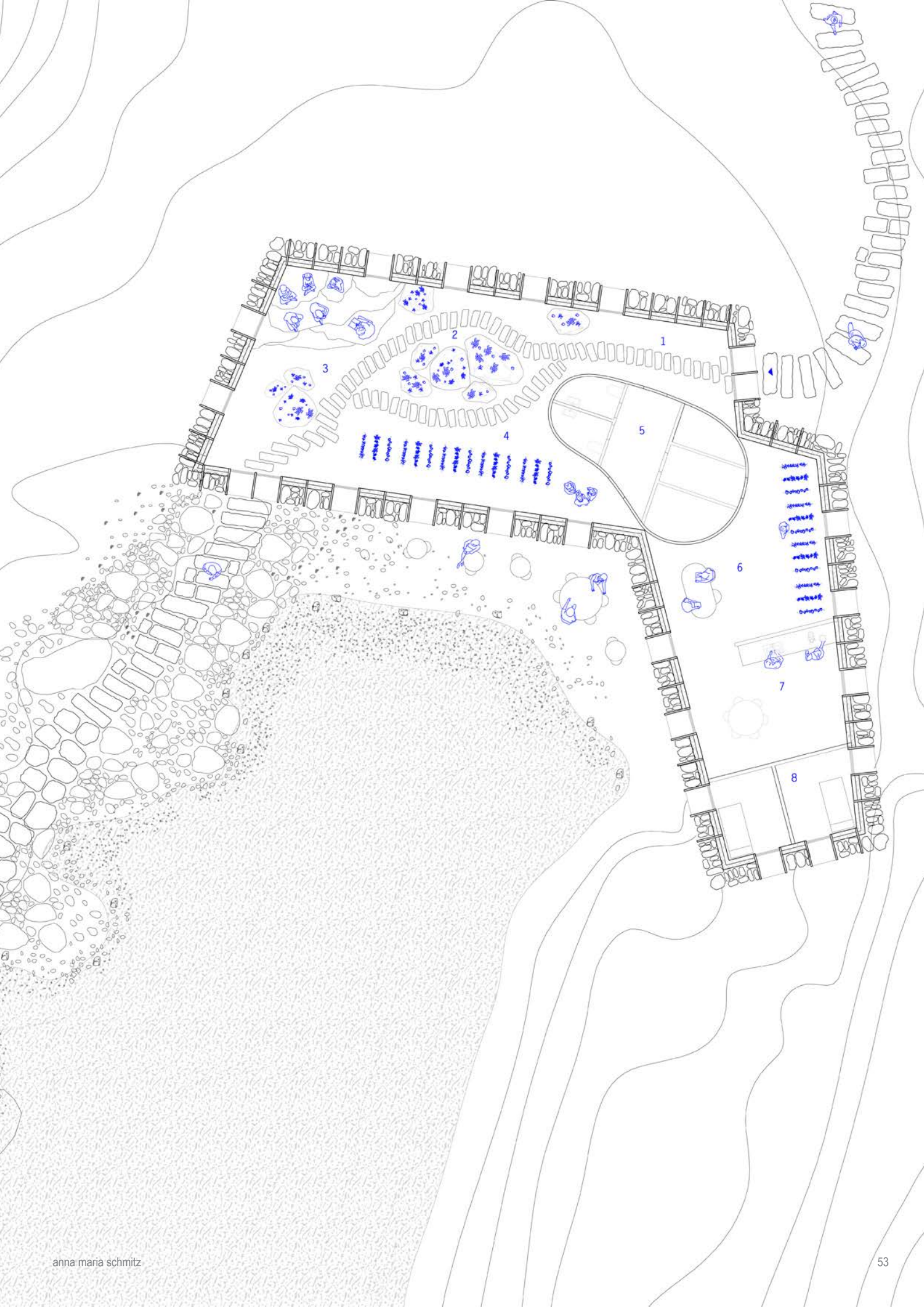
above: wet lab, on the water, section aa
below: wet lab, in the water section bb
right: living coral bank with natural and artificial nursery, wet lab plan


1.60m





above: dry lab, in the rocks, section cc
below: dry lab, on the rocks section dd
right: dry coral bank with encoded coral archive, dry lab plan


1
2
3
4
5
6
7
8

The Outside In Project is a student-led, collaborative inflatable pavilion design initiated by professors Laurie Hawkinson and Galia Solomonoff. The project is the culmination of two semesters of work Spring ’24 and Fall ’24 with guidance from Hubert Chang and teaching assistants Tristan Schendel and Syed Haseeb Amjad, covering both creative and technical aspects of the design-build process.

Cloud envisions a participatory experience that emphasizes the interconnectedness of peoples’ actions in shared spaces. Stretched above the inflatable is a large net that positions seating within which descends into the Plaza through the center, creating a space. Measuring 20 meters (66 feet) wide, and suspended by 25 cables, this floating inflatable reframes the relationship between Avery Hall and Avery Plaza, questioning notions of connectivity between interior and exterior spaces.

Powered by four electric blowers, the metallic form expands from the 400-level window and classroom, inviting visitors inside its contemplative interior and challenging boundaries of conditioned space. The pavilion encourages playful interaction between people, their environment, and one another. Cloud will be a highlight of GSAPP’s 2024 Open House, creating a provocation to bring the broader Columbia community and GSAPP together.

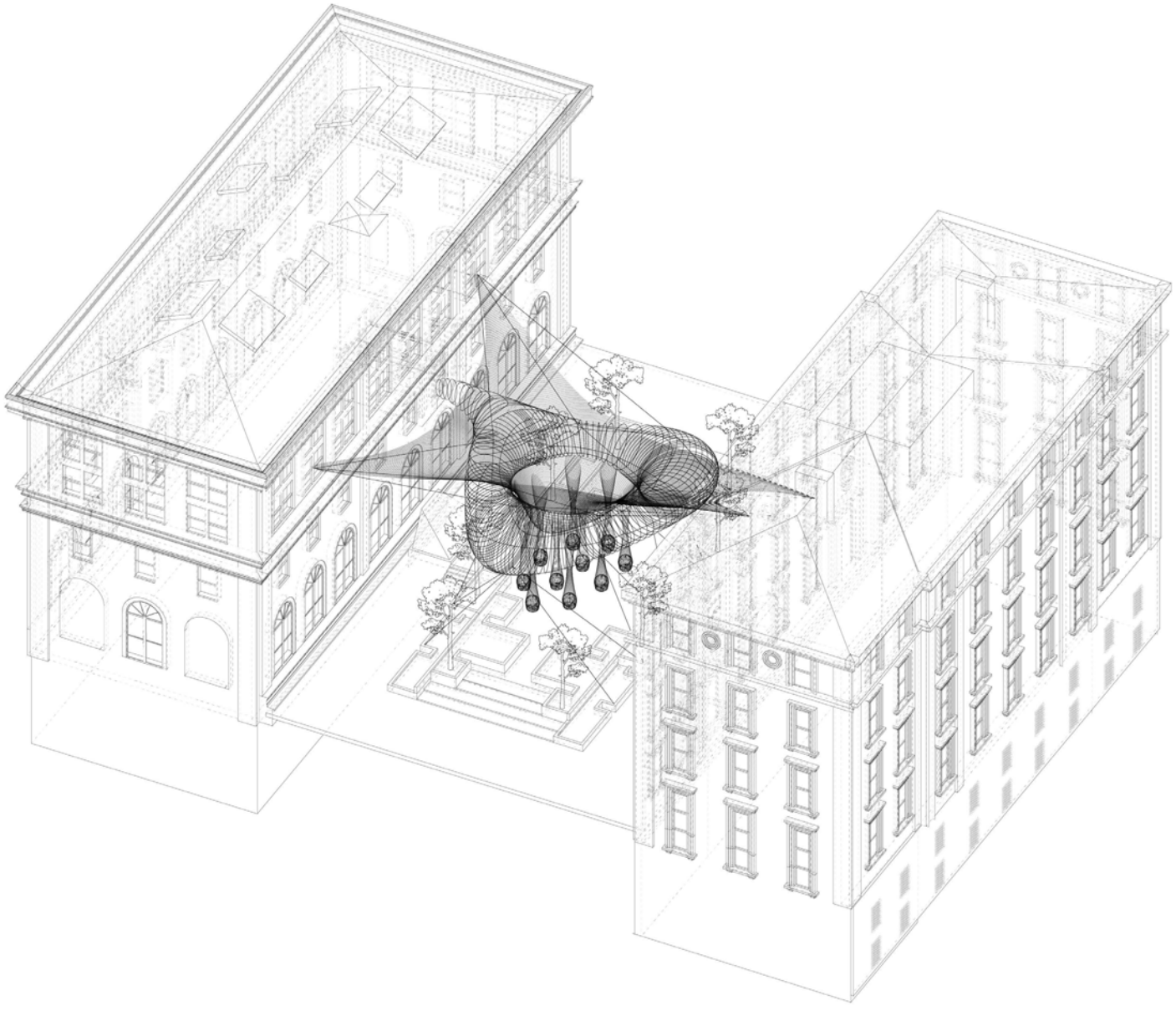
The Outside In Project
Prof. Laurie Hawkinson
Prof. Galia Solomonoff
Individual Photography
Group Project

right: diagram of cloud

CLOUD PAVILLION

inflatable intervention at avery plaza

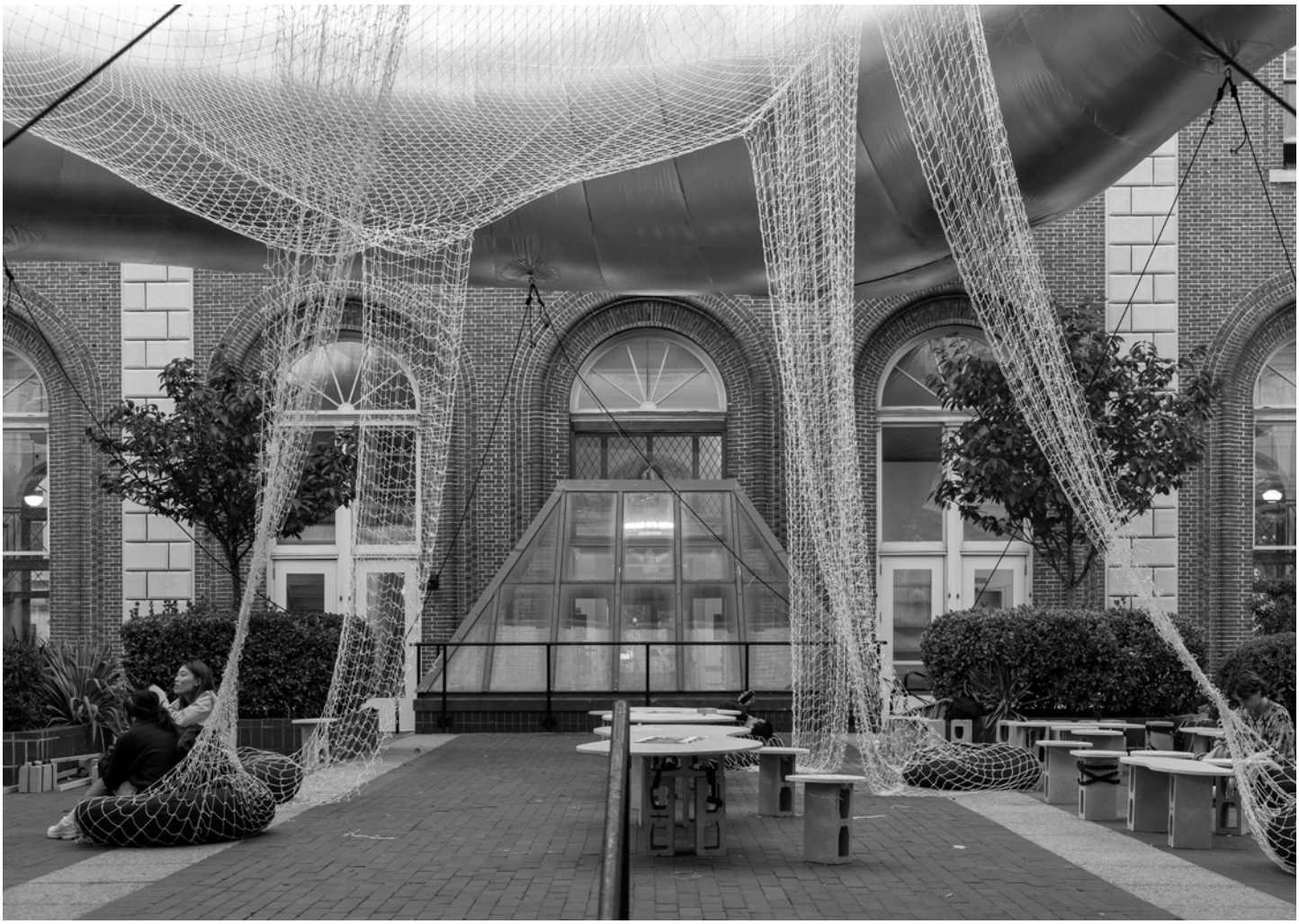
04



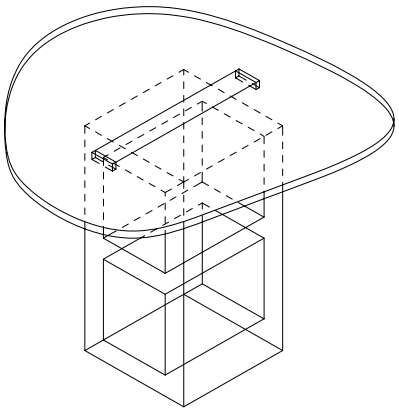
The Cloud envisions a participatory experience that highlights the interconnectedness of people's actions within shared spaces, inviting playful interaction between individuals, their surroundings, and one another

above: post installation the colud pictured from the south side

right: installing the net, image taken by Galia Solomonoff



right: furniture design, no adhesives used



Architecture Apropos Art
Design Seminar
Prof. Steven Holl
Prof. Dimitra Tsachrelia
Individual Project

This project explores the life, work, and legacy of Roberto Burle Marx (1909–1994), a pioneering Brazilian landscape architect, painter, sculptor and activist who redefined the field of modern landscape design by integrating art, ecology, cultural identity and especially native flora and fauna.

Often regarded as the father of tropical landscape architecture, Burle Marx viewed gardens as a form of living art, using native Brazilian flora as his palette and the land as his canvas. His designs were grounded in a profound understanding of Brazil's biodiversity, developed through extensive botanical expeditions across the Amazon and other native biomes. These expeditions not only informed his aesthetic choices but also positioned him as an early environmental activist, advocating for the preservation of Brazil's rich but threatened ecosystems.

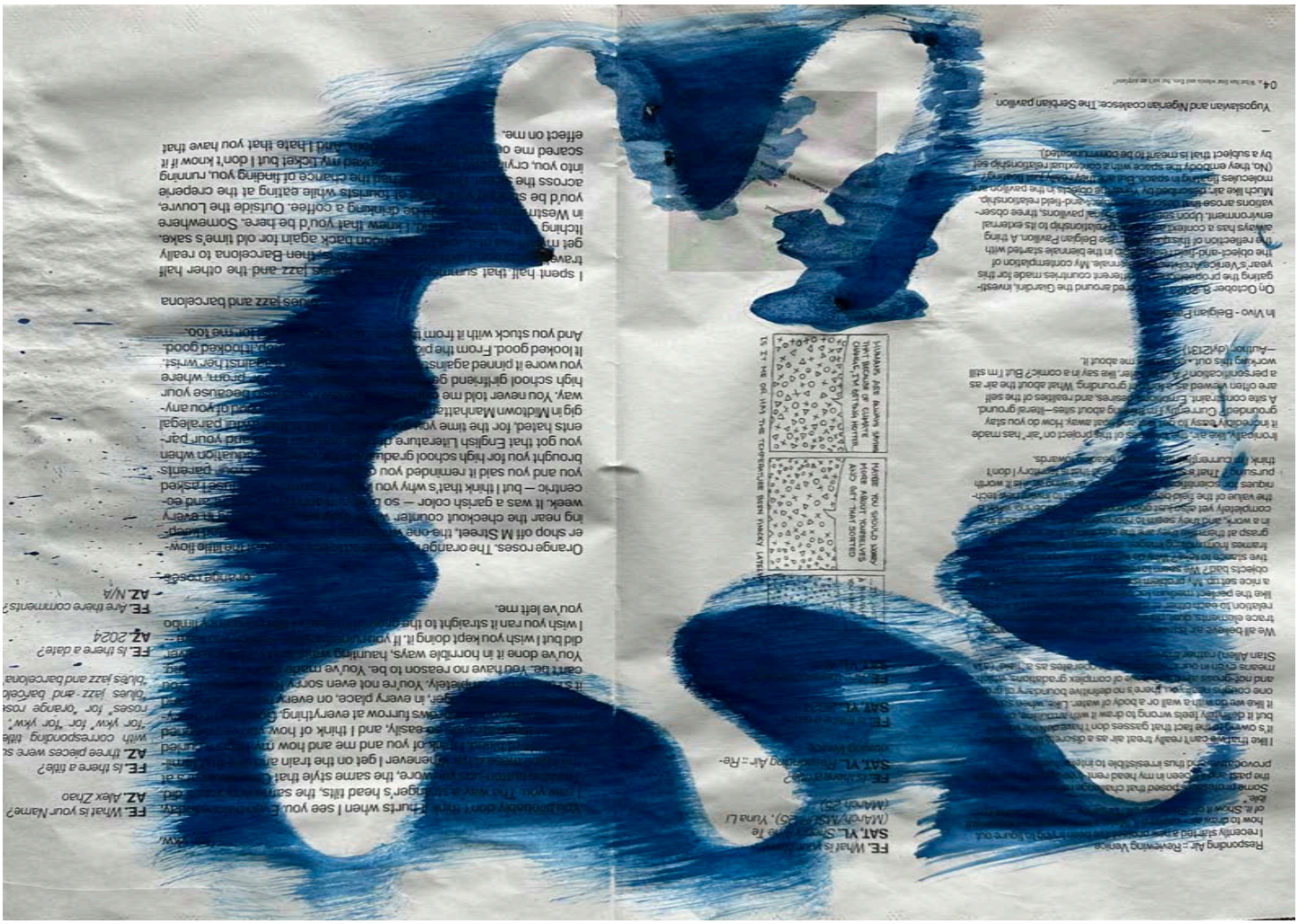
Burle Marx viewed design through both scientific and artistic lenses. His repeated journeys into threatened Brazilian nature, particularly the Amazon rainforest, were essential to his practice, resulting in the discovery of over 50 plant species and the preservation of countless others through his botanical collections at the Sítio Roberto Burle Marx. These expeditions provided the plant material and ecological knowledge that allowed him to construct landscapes as living, evolving systems rooted in Brazil's natural heritage.

right: negative of final project

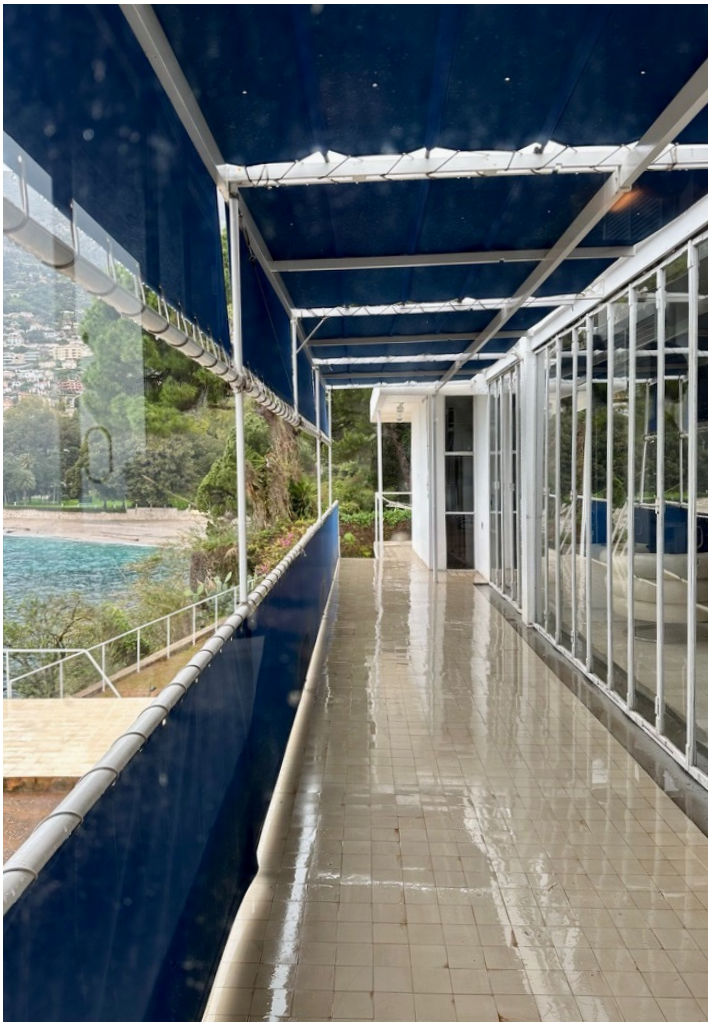
WATER AS MEDIUM/METAPHOR

the living landscapes of roberto burle marx

05

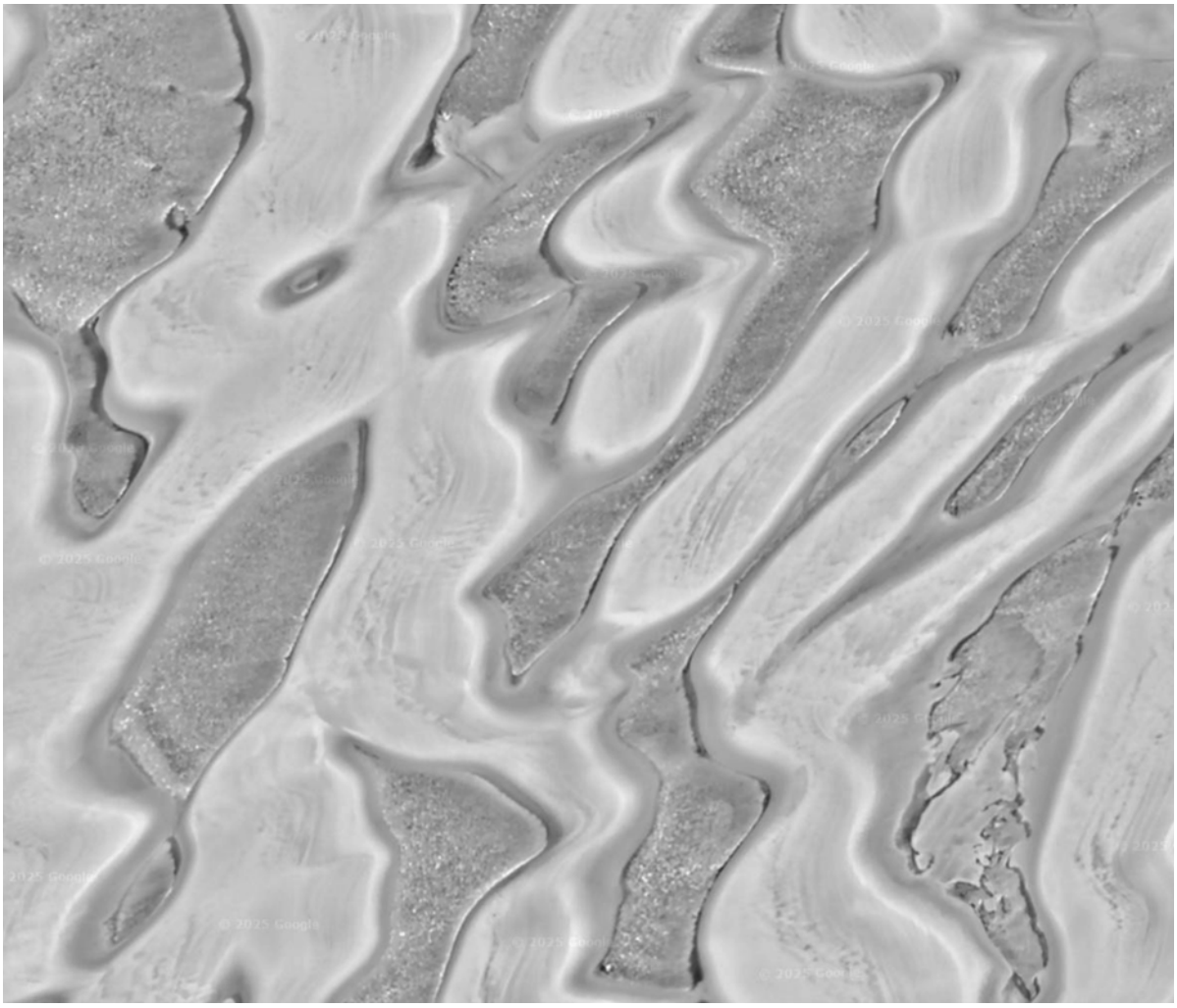


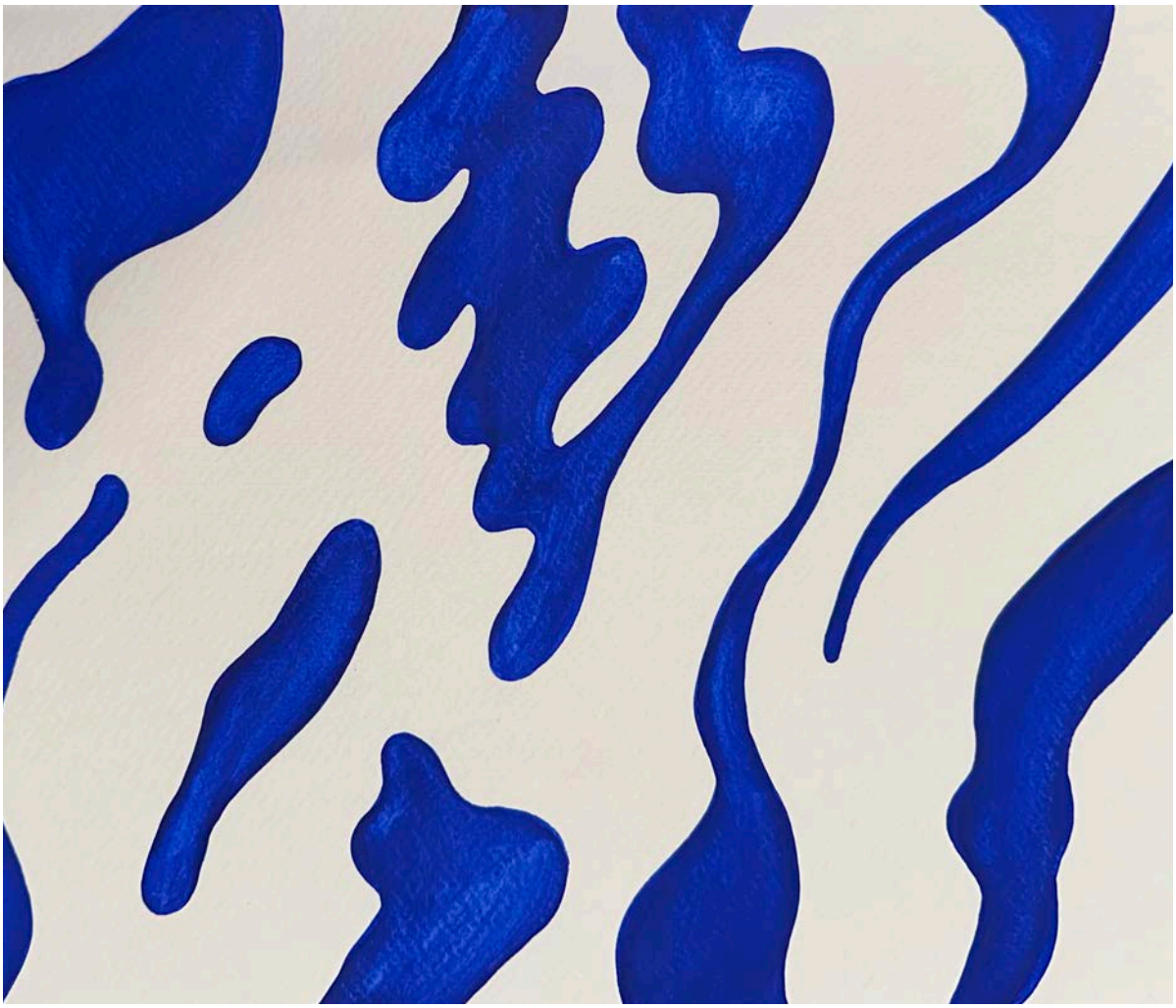
“To create, one must first question everything.” Eileen Gray



First iteration of Architecture Apropos Art, analysing Eileen Gray's statement, "To create, one must first question everything," which captures her innovative approach to architecture and design during her era. Her work on Villa E.1027 exemplifies this philosophy, as she challenged traditional design principles by prioritising functionality and harmony with the natural surroundings. The villa is aesthetically pleasing and carefully crafted to engage with and respond to human needs.

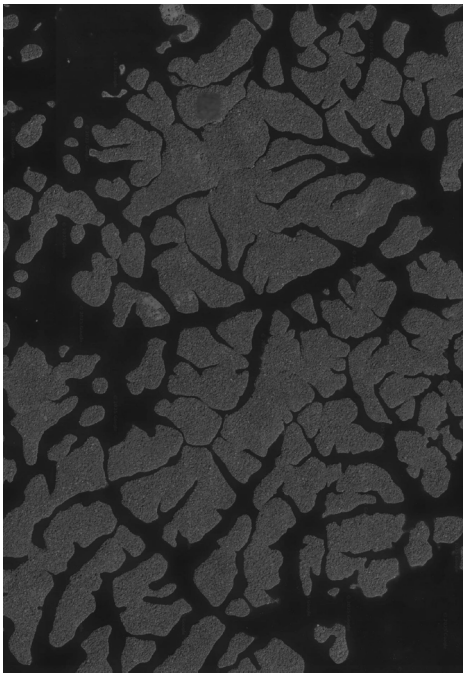
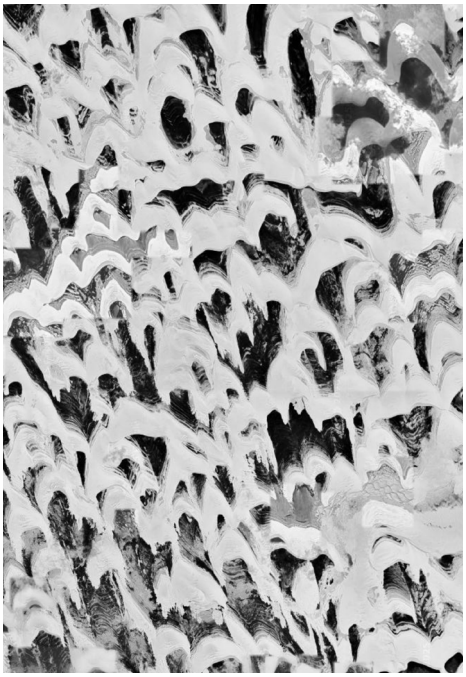
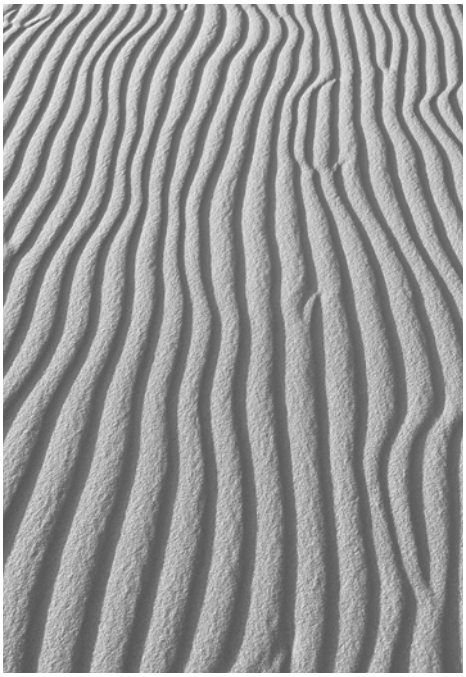
Every object within the space is purposefully designed to integrate seamlessly into the environment while serving multiple functions. This focus on how space is experienced reflects Gray's belief that architecture should enhance the quality of life for its inhabitants. She uses various materials like aluminium, tubular steel, and cork, which were innovative at that time and enabled seamless integration of indoor and outdoor spaces, as seen in the images taken by me in the E.1027 house. As a pivotal figure in the modernist movement, Gray's legacy inspires architects and designers, fostering environments that resonate with human experience.

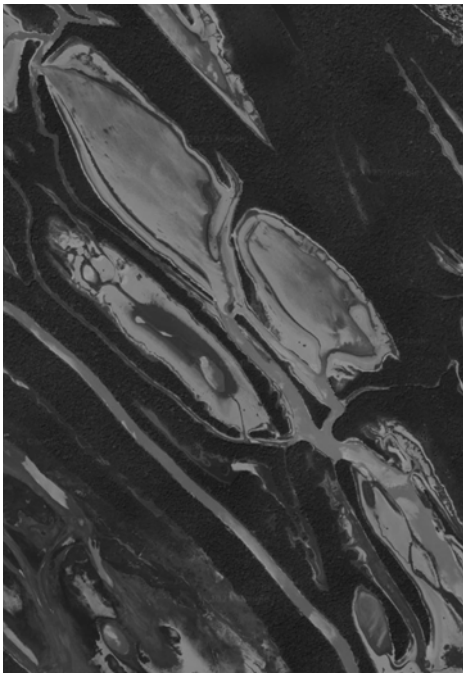
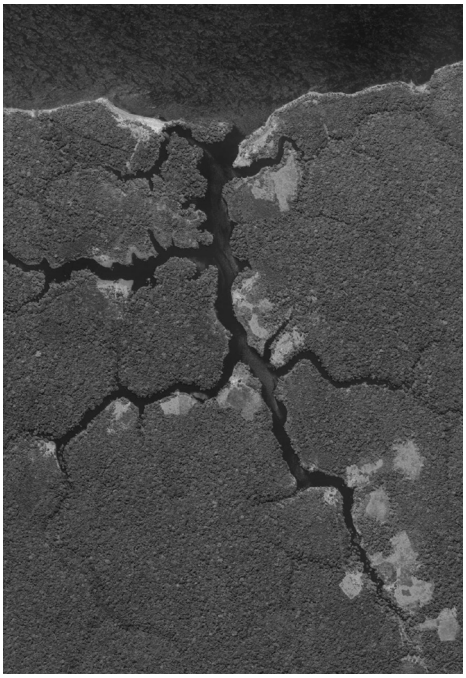


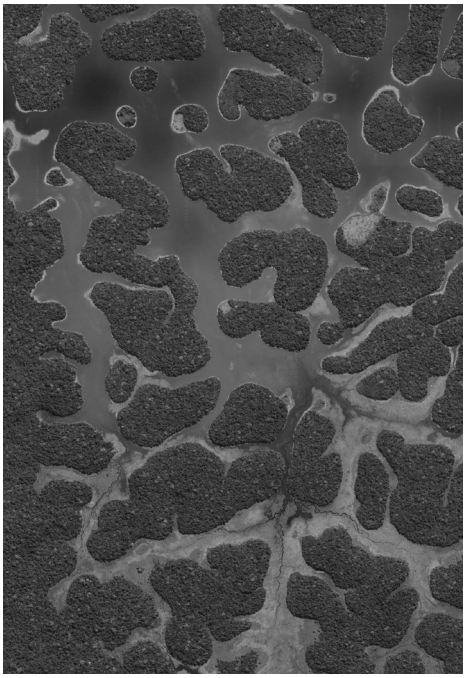


“Water is the lifeblood of a garden, flowing through its veins and giving it vitality.”

Roberto Burle Marx



left: collection of patterns of brazils landscape, images from google maps and from my own archive

“The aesthetic and functional qualities of a landscape are not determined solely by its appearance but by the experiences it provides, including its relationship to water and nature.” Roberto Burle Marx

My personal interest in this topic was shaped by firsthand experiences travelling through Brazil, including visits to the Lençóis Maranhenses National Park, the Brazilian Amazon, and numerous Burle Marx-designed landscapes in cities such as Rio de Janeiro, São Paulo, and Belo Horizonte. Experiencing Brazil’s remarkable ecosystems and urban gardens revealed the smooth integration of the natural with the constructed in Burle Marx’s work, prompting a more profound exploration of his philosophy and methods.

above: final model, gauche
painted on wood

Central to Burle Marx's design language is the use of biomorphic forms - fluid, organic shapes that mimic the rhythms of nature. His landscapes are structured around the presence of water in the form of winding lagoons, reflective pools, and curving pavements, all of which evoke a feeling of motion and transformation. His work bears strong formal and conceptual parallels to that of Jean Hans Arp, the Surrealist artist known for his sculptural abstractions derived from natural forms. While Arp's biomorphism remained in the domain of visual art, Burle Marx extended these principles into three-dimensional, ecological compositions, using soil, stone, water, and native flora as expressive materials.

right: sketch model, gauche painted on wood

Rendering Systems
Prof. Seth Thompson
Individual Project

In this course, I concentrated fully on designing a visualization that explores the dynamic qualities of light and reflection, particularly in extreme environmental conditions such as the Arctic. Using a prior model as the foundation, I developed a final scene composed of an image sequence that captures a spatial narrative through varying states—day and night, with and without ice. In this course, I concentrated fully on designing a visualization that explores the dynamic qualities of light and reflection, particularly in extreme environmental conditions such as the Arctic. Using a prior model as the foundation, I developed a final scene composed of an image sequence that captures a spatial narrative through varying states—day and night, with and without ice.

ARCTIC ICE AND LIGHT

building and visualizing ice and light

06

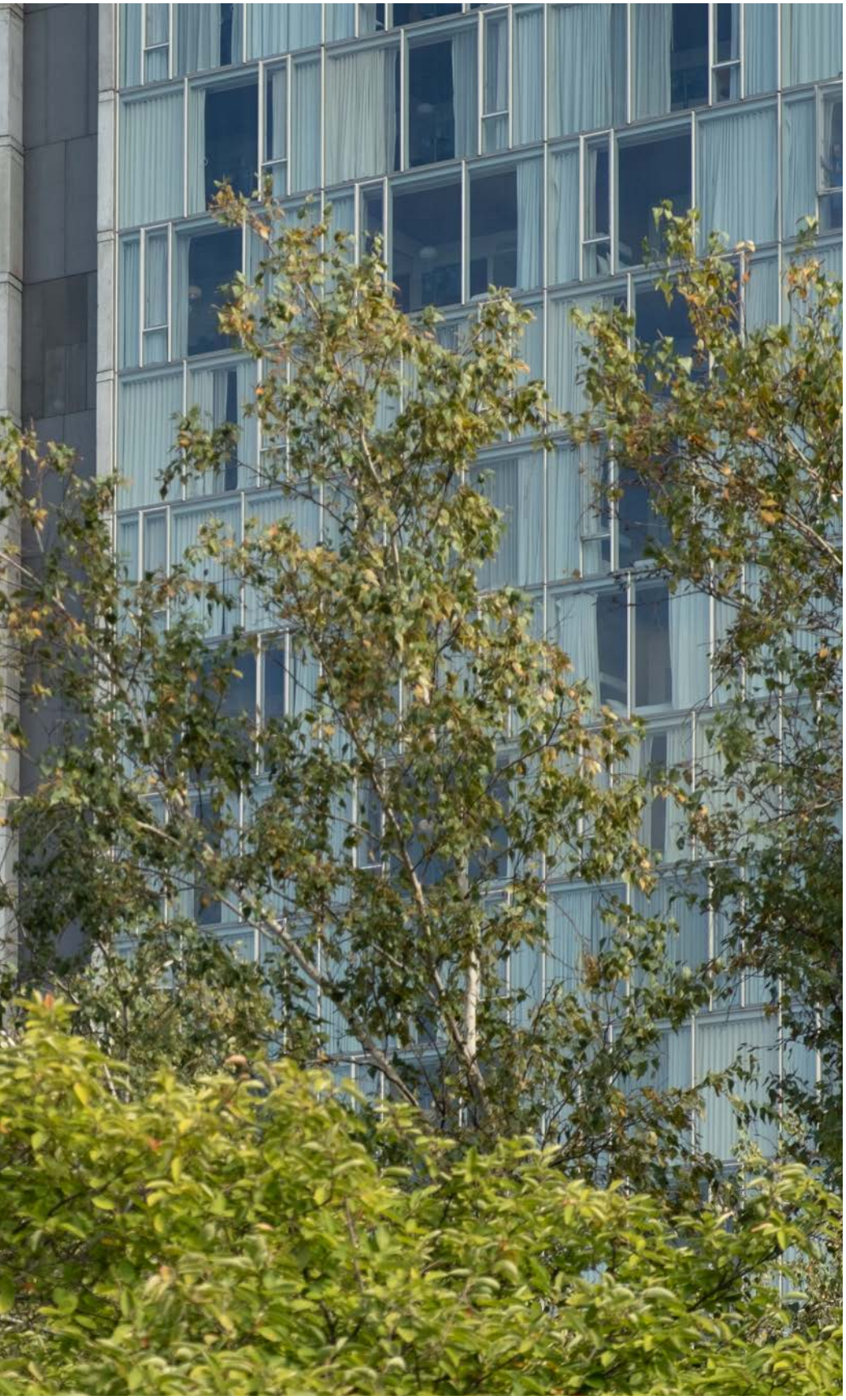
My final selection of photographs for the course focused on the presence of light and the spatial qualities found in the interstitial areas between buildings, especially facades and the in-between spaces that often go unnoticed. I was particularly interested in capturing the contrast between light and shadow, and how this dynamic interaction reveals architectural form and texture. This photographic inquiry was grounded in a broader examination of the relationship between architecture and photography, which is both symbiotic and, at times, problematic. As Susan Sontag notes in On Photography (1977), photography shapes not only what we see but how we see it, often standing in for direct experience. In this sense, architecture today is primarily mediated through images, with photographs becoming the primary way buildings are consumed and remembered.

The course began with exploring constructed interior and exterior spaces and introduced various methodological approaches to photographing architecture, ranging from the “objective” to the “expressive.” We discussed the iconic and the narrative and the potential for digression within architectural representation. Influenced by the rigorous typological studies of Bernd and Hilla Becher, I sought to explore structure, repetition, and form in a systematic yet personal way, using photography not only as documentation but as interpretation. The second half of the course extended beyond finished buildings and polished renderings, encouraging us to consider architecture as an evolving and experienced environment. Working both in the studio and on location, we engaged with technical, historical, and theoretical material while producing our own photographic responses to architectural space. Through this process, I aimed to create images that acknowledge photography’s limitations while leveraging its strengths to reframe how architecture is perceived.

CAPTURING THE INBETWEEN

architecture and its boundaries of light - a photographic inquiry

07



Unorthodox Practices
Prof. Juan Herreros
Individual Project

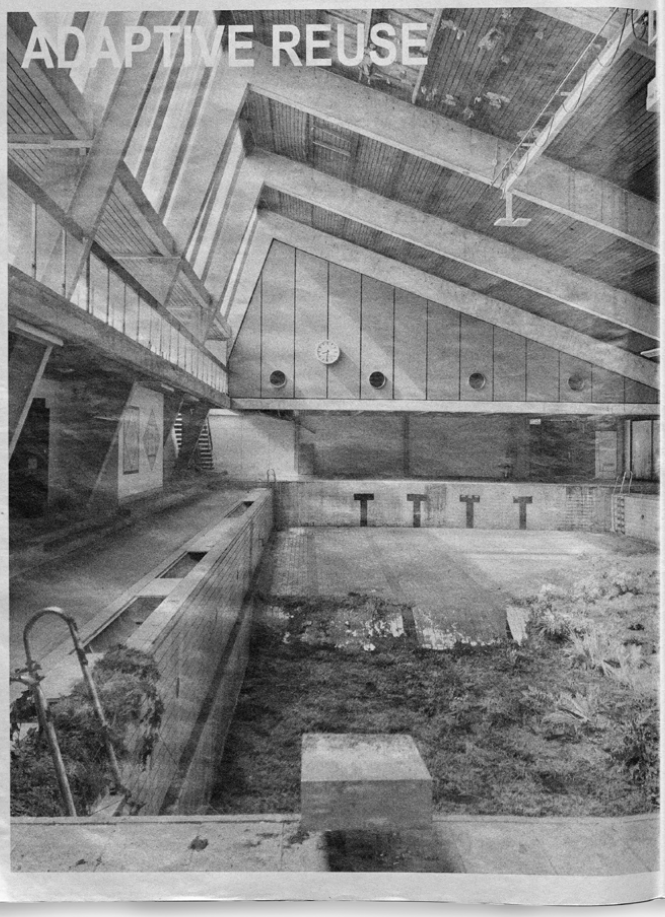
right: cover of final newspaper project

STUDIO UN_FERTIG
adaptive reuse in practice

08

STUDIO

UNFERTIG



ADAPTIVE REUSE

Adaptive reuse, a fundamental concept, involving the restoration of abandoned buildings to a functional state while preserving their architectural texture and cultural significance. The term "rehabilitate" denotes actions to protect and reactivate neglected structures. As argued by the Austrian art historian Alois Riegl, all remnants of the past are "historic" and form an "irreplaceable and irremovable link" in the chain of cultural development.

Rehabilitating vacant buildings through adaptive reuse allows the retention of their formal and material architectural textures as tangible connections to history. This practice recognizes the aesthetic, historical, scientific, social, and spiritual value that landmark buildings embody—a cultural significance belonging to present, past, and future generations. Adaptive reuse breathes new life into our built heritage while honoring the continuity of our environments. Vittorio Gregotti (1929-2020), an influential Italian architect and theorist, was a pivotal figure in examining the concept of modification as a significant conceptual instrument in architectural design.

Gregotti articulated the emergence of a "family of modification languages" that incorporated elements from memory and the objet trouvé, reflecting a growing interest in the notion of belonging to history. This represented a shift in architectural culture away from the tabula rasa idea of new beginnings towards an emphasis on generating new relationships with the existing built environment. Gregotti framed the architectural avant-garde as evolving into a critical and philosophical phenomenon involving "imitation, representation, or act of expression" intertwined with this notion of belonging.

He explained modification as a slow and complex transformation of ideas, articulating European rationalism's radical results while grounding the modification quality in a language of structural knowledge born out of non-coincidences in relationships, defying unitary gestures. Gregotti posited three key reasons driving the use of modification in design: urban and territorial transformation, significant differences in materials and providing respite from the intense creative process.

"THE GREENEST BUILDING IS ONE THAT IS ALREADY BUILT."

Carl Elefante's 2007

WORLD SCIENTISTS' WARNING TO HUMANITY

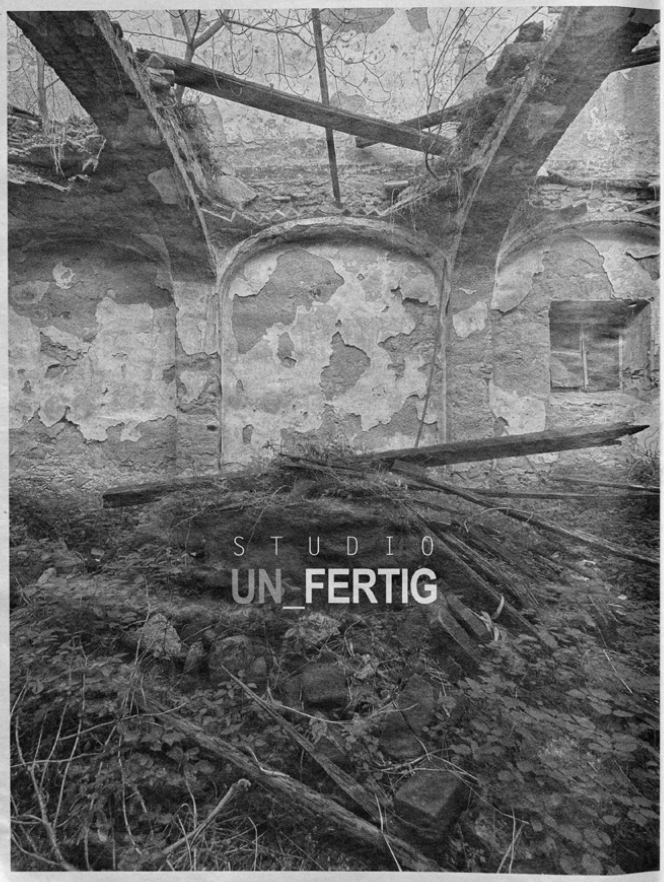
The 'World Scientists Warning to Humanity' is a significant document created over 25 years ago in 1992 to warn about climate change. It states that scientists are morally obligated to warn humanity of catastrophic threats; now, the manifesto has more than 15,000 scientists who signed the declaration (Krogh, 2020).

The second warning, published in 2017, explains the rapid collision course between nature and humans and the environmental destruction leading to ozone depletion, climate change, biodiversity destruction, marine life depletion, forest loss, and ocean dead zones and urges the significance of the ongoing population growth of humans (Ripple, 2017). In 2019, a third declaration was developed, including six interrelated steps to fight climate change: energy, short-lived, pollutants, nature, food, economy, and population (Krogh, 2020). This declaration is significant as it provides a comprehensive framework for addressing climate change.

Scientist James Lovelock explains that the earth is a unitary ecosystem formed by all living organisms, and the environment is a complex system where human beings are only a partner species in the great enterprise (Lovelock, 2009).

The earth, known as a blue-white icon, undergoes permanent changes: "The white ice fades away, the green of forest and grassland fades into the dun of desert, and the oceans lose their blue-green hue and turn a purer, swimming-pool blue as they, too, become desert. "Lovelock states the urgency of the situation on earth.

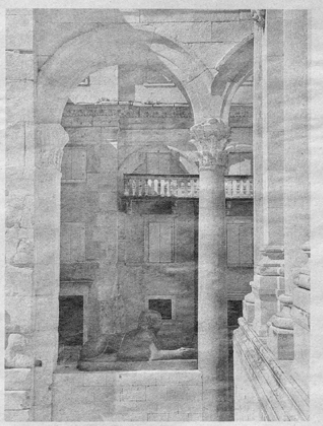
The Gaia theory clarifies the current phenomena and changes in environmental conditions. It manifests that we should try to "have a future in communion with our living planet to make her strong again and able to counter the disabling impacts that are due" (Lovelock, 2009).



WE TAKE CARE OF BUILDINGS AND OPERATE AT THE INTERSECTION OF THE EXISTING ENVIRONMENT AND BUILDING FROM THE GROUND, CULTIVATING LASTING SOCIETAL AND INTELLECTUAL ENGAGEMENT WHILE CAREFULLY CONSIDERING THE CONTEXT, HISTORY, AND ENVIRONMENT, RESPECTFUL OF THE PAST AND ADAPTABLE TO A DYNAMIC FUTURE.

LAYERS OF UN_FERTIG

A SHORT HISTORY OF THE LAYERED PALACE OF DIOCLETIAN IN SPLIT

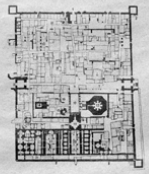


The reuse of Diocletian's Palace in Split demonstrates the long-standing tradition of adaptive reuse spanning centuries. Constructed between the late 3rd and early 4th centuries AD as a retirement residence for Emperor Diocletian, the palace's initial purpose was imperial luxury and defence.

After the fall of the Roman Empire, the structure was gradually transformed to meet new requirements, functioning as a fortress, a refuge during medieval times, and eventually as a residence area.

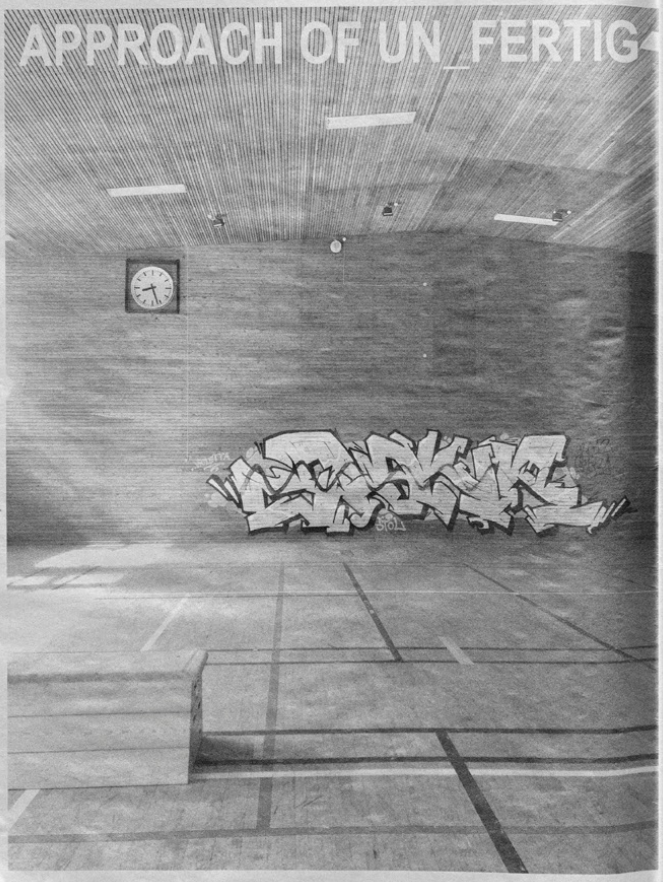
Throughout the Middle Ages and into the Renaissance, parts of the palace were repurposed into churches, homes, and civic buildings, with materials being reused in new constructions, reflecting a continuous process of adaptation.

This layered history highlights a timeline of evolving functions—initially imperial, then medieval, and finally modern—underscoring the importance of the concept of adaptive reuse since early times, as the structure was preserved and integrated into the city's fabric rather than replaced.



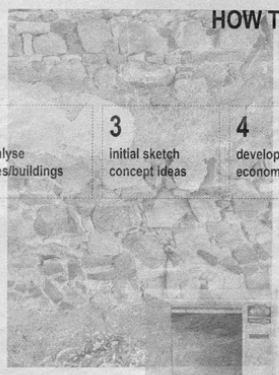
1_Golden-Gates, north main entrance
2_Silver Gates, eastern wall with the gates
3_Iron Gates, western wall with gates
4_Southern Walls with gates to sea
5_ Crossroad of main streets
6_Cordo, remains main longitudinal road
7_Decumanus, remain of transversal road
8_Arches to eastern street
9_Remains of the big north east building
10_Remains of the big north west building
11_Rectangule outer wall of warehouse
12_Peristil
13_Diocletian's Mausoleum (Cathedral)
14_Jupiters Temple (Bapistery)
15_Small round temples
16_Thermae, remains of bath house

APPROACH OF UN_FERTIG



HOW TO NOT DEMOLISH?

1	2	3	4	5
map vacant sites/buildings	analyse sites/buildings	initial sketch concept ideas	development economic analysis	find/involve potential investors

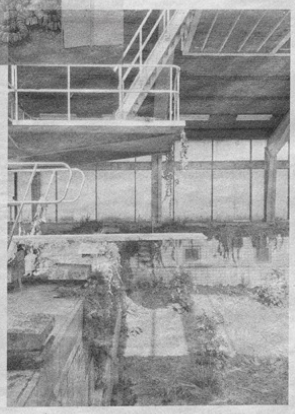


WHY TO NOT DEMOLISH?

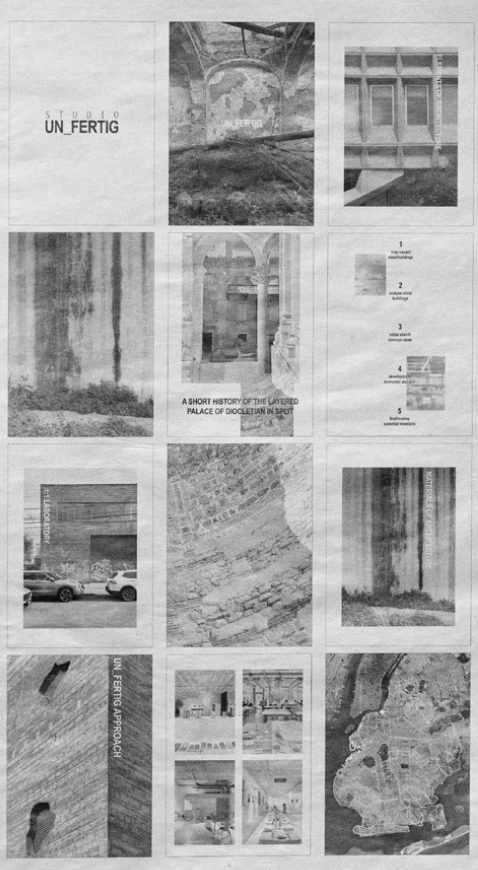
buildings account for approximately 40% of the world's carbon emissions

construction industry is responsible for extracting over 30% of the world's natural resources

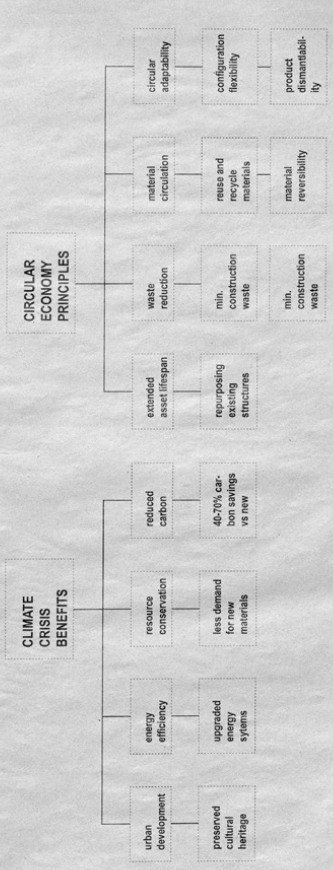
producing 25% of the world's solid waste



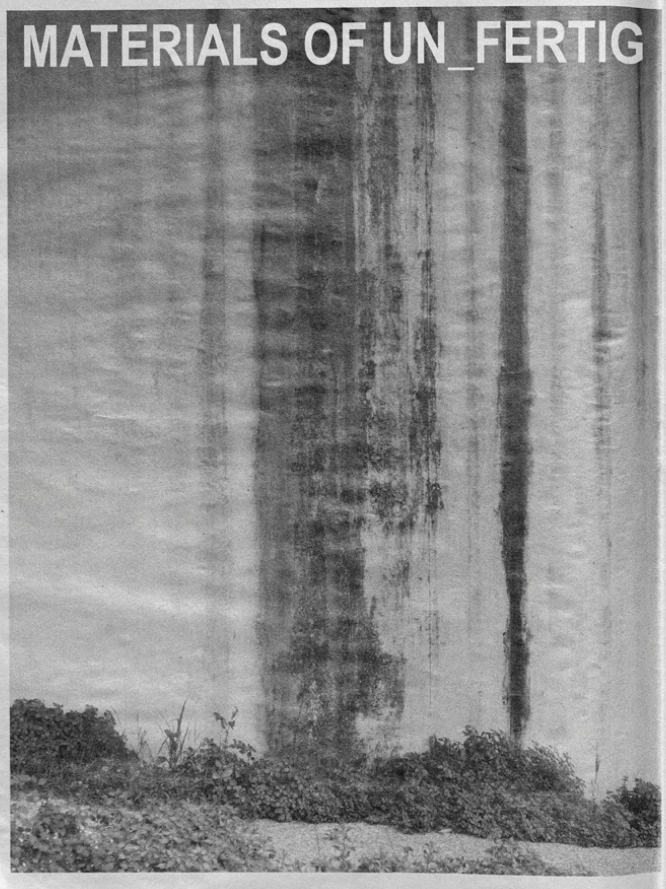
DISTRIBUTION OF UN_FERTIG



CIRCULARITY OF UN_FERTIG

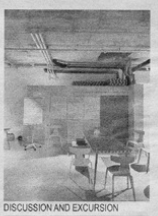


MATERIALS OF UN_FERTIG



CATALOUGE OF MATERIALS

LOCATION OF UN_FERTIG



DISCUSSION AND EXCURSION

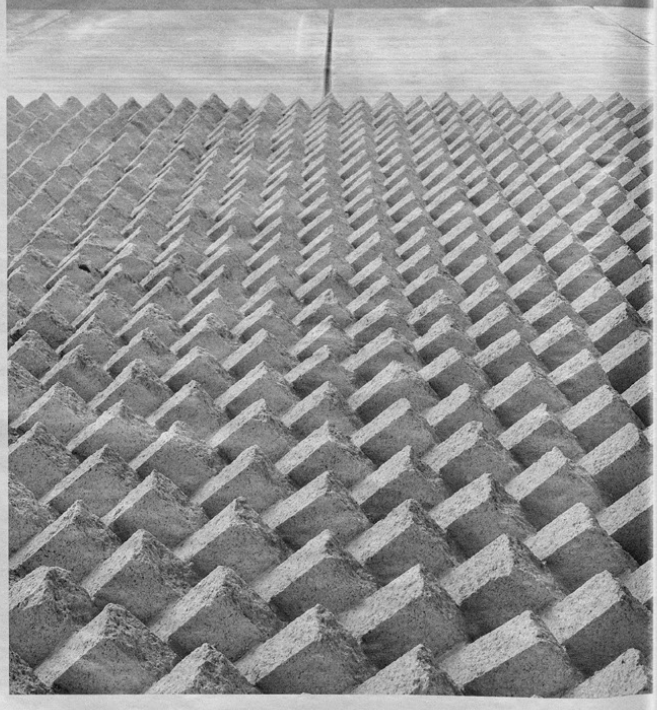
RESEARCH AND PUBLICATION

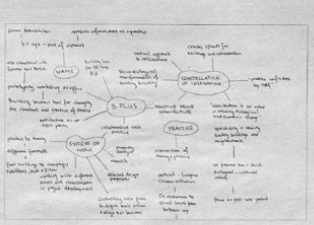
COMMUNAL STAMMTISCH

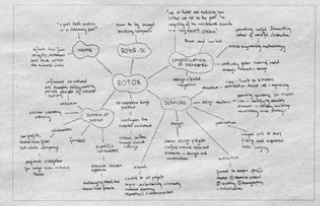
WORKSHOP AND MODEL LAB

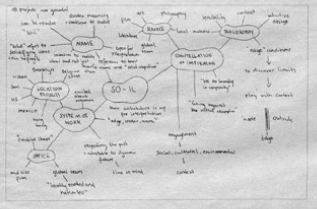
BROOKLYN NEW YORK

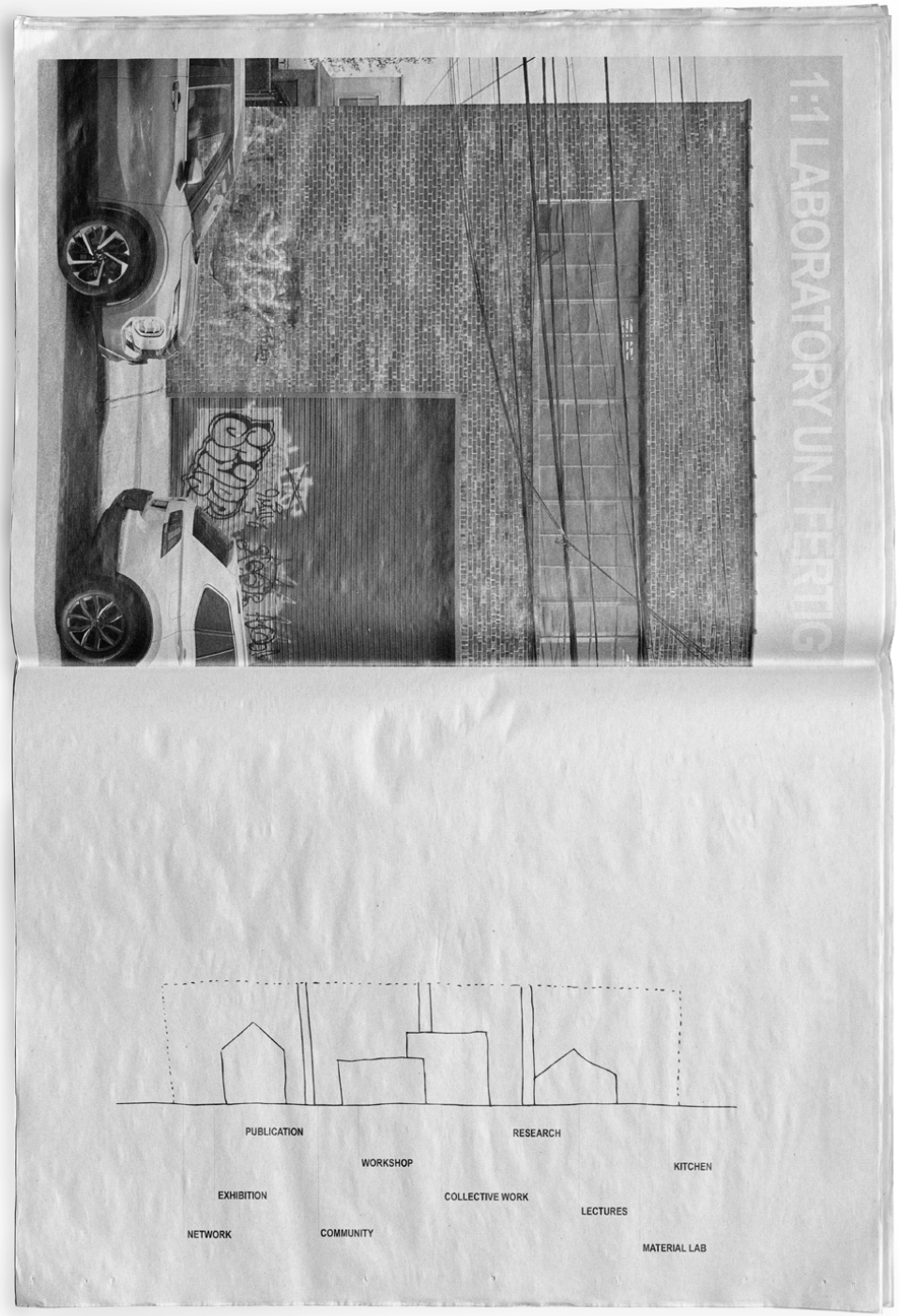
INSPIRATION OF UN_FERTIG

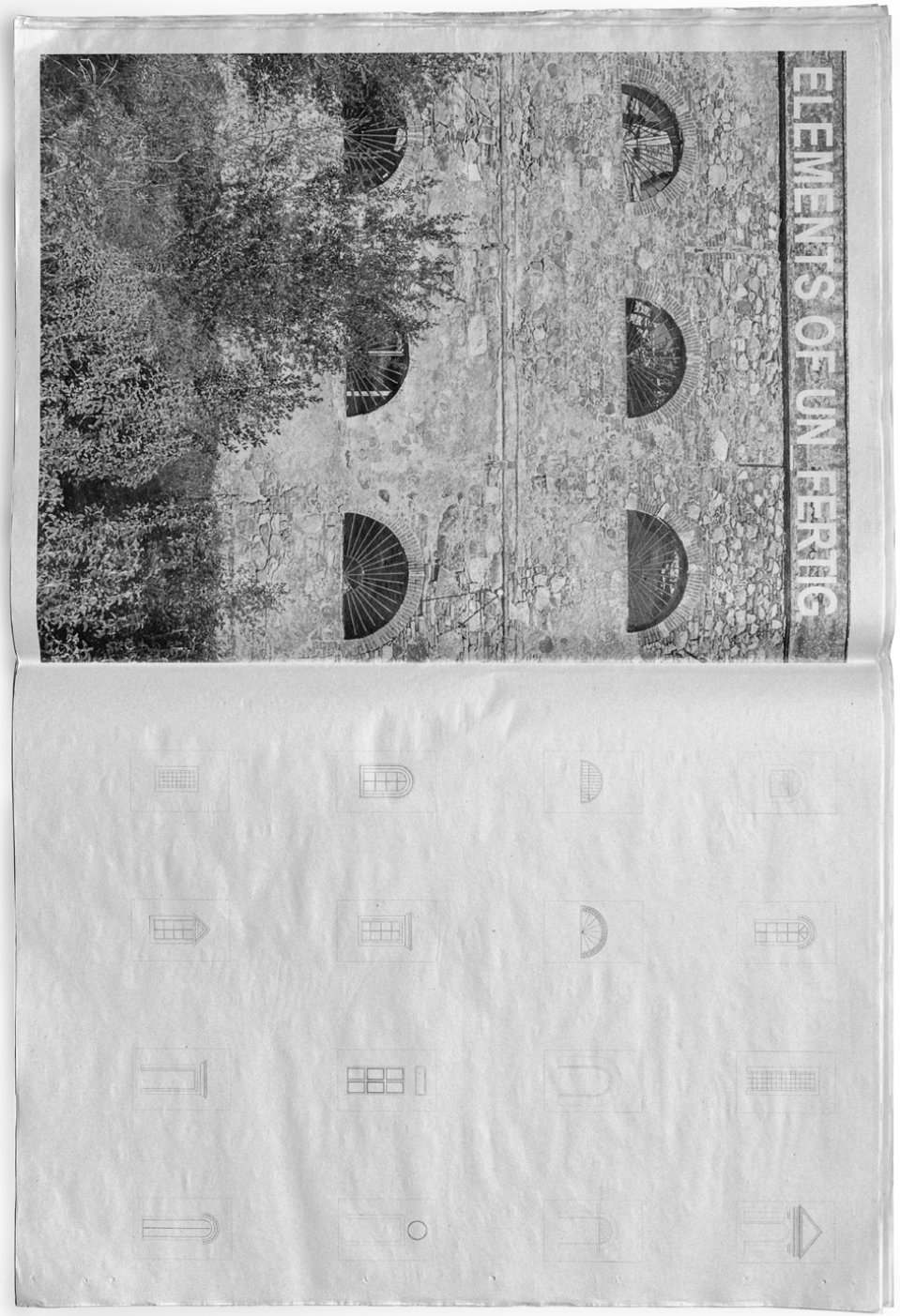









1:1 LABORATORY UN FERTIG
PUBLICATION
RESEARCH
WORKSHOP
KITCHEN
EXHIBITION
COLLECTIVE WORK
LECTURES
NETWORK
COMMUNITY
MATERIAL LAB


ELEMENTS OF UN FERTIG

History of NYC
Prof. Andrew Dollkart
Individual Research

The development of Bush Terminal in Sunset Park, Brooklyn, represents a transformative chapter in New York City's industrial and architectural history. Conceived in the late 19th century by Irving T. Bush, the terminal was envisioned as an integrated industrial complex that could efficiently manage the transfer of goods between ships, trains, and warehouses. The terminal, spanning nearly 200 acres at its peak, included deepwater piers, multi-story warehouses, factory loft buildings, and a railroad system. Architect William Higginson played a pivotal role in designing the factory lofts, using reinforced concrete to create fireproof, light-filled, and flexible industrial spaces. This forward-thinking approach made Bush Terminal a model of early 20th-century industrial planning, accommodating both large corporations and small businesses, and offering a wide range of services, from shipping logistics to worker amenities. By the early 20th century, the terminal had become a central hub for manufacturing and distribution, employing over 25,000 workers and playing a vital logistical role in both World Wars.

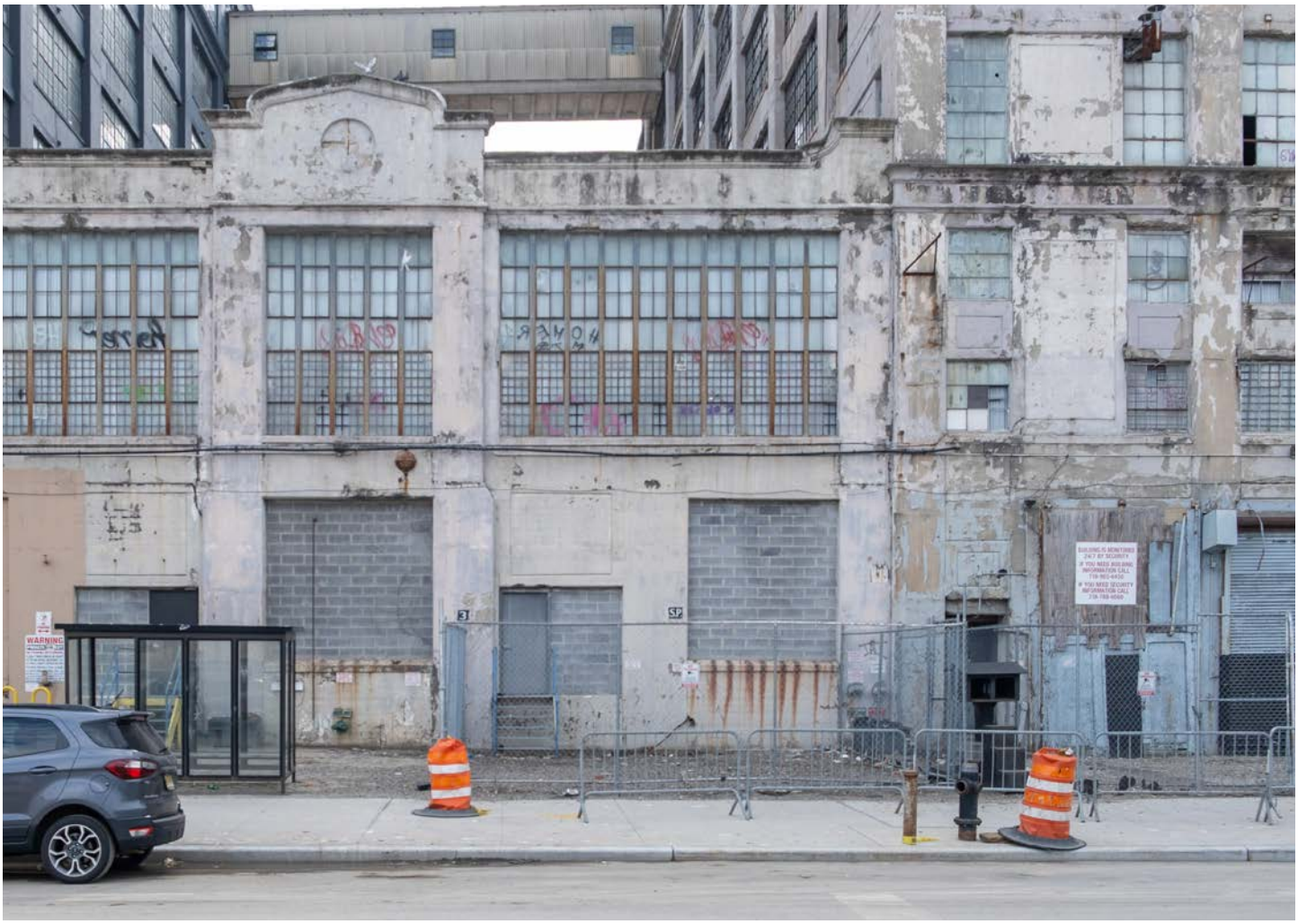
right: image of sunsetpark, april 2025

BUSH TERMINAL
Industrial Palimpsest in Brooklyn

09


COOL JULES
SR3369D

However, the postwar era brought significant challenges. Advances in shipping particularly containerisation and a shift toward trucking rendered Bush Terminal's break-bulk infrastructure obsolete. The terminal's railroad operations ceased in 1971, and while parts of the site continued to serve the garment industry, much of it fell into disrepair. In the 1980s and 1990s, efforts to rebrand the area as "Industry City" began, aiming to attract artists and small manufacturers, but widespread revitalisation did not take hold until the 21st century. Recent redevelopment, including the "Made in NY" initiative, has sought to preserve the site's historic structures while adapting them for contemporary use in creative and tech industries. Though some areas remain underutilised, Bush Terminal today is a powerful symbol of adaptive reuse and industrial heritage. It illustrates how architecture and urban planning can evolve to meet changing economic needs while honoring the legacy of innovation and labor that built the city's waterfront.



Casa Palestra, an installation by OMA (Office for Metropolitan Architecture), was featured at the 17th Triennale Milan in 1986. Curator Marco Bellini titled the exhibition “Il Progetto Domestico”(The Domestic Project). Besides selected architects, renowned historians like Anthony Vidler and Marco de Michelis were invited to contemplate the future of the domestic space. OMA’s proposal, titled “Casa Palestra” (The Gymnasium House), is a provocative contribution that critically challenges the perception of modern architecture as lifeless and uninhabited, reimagining Mies van der Rohe’s iconic Barcelona Pavilion from 1929 as a hedonistic space for sensual and physical exploration.

Casa Palestra directly engages with the bodily scale, where the hedonistic dimension is the fundamental motivation behind the project. OMA transforms the pavilion into a domestic environment dedicated to physical movement by encompassing exercise and bodily pleasure. The immersive and multisensory experience, with soundtracks of human voices and light effects, increases bodily awareness and saturates the space with life. This act of enlivening the pavilion and stimulating the human senses denounces modern architecture’s abstraction and perceived limits. OMA hired professional actors, staging intriguing performances inspired by the changing rooms of the Downtown Athletic Club in New York, blurring the line between sensuality and exercise. With these ambiguous actions between physical routine and intimate behaviour, OMA reclaimed the space for community, sociality, and human interaction in domestic spaces. The incorporated performative element transforms the interaction and blurs the lines between domestic living and physical exercise. This intervention confronted the conventional narratives and the views of modern architecture as detached from social dynamics and human experiences.

The Casa Palestra fundamentally connects with historical and political processes around postmodernism in architecture during the 1980’s. The radical reinterpretation of form and space partially defined the postmodern era when diversity, contradictions, and irony were embraced. With the exhibition, OMA critiqued modernist spaces’ socio-political constraints and rigid interpretations. OMA traced the discovery and the journey of the turbulent history of the Barcelona Pavilion from construction in 1929 to rediscovery in 1983. The Barcelona Pavilion was initially constructed to symbolise the progressive ideals of the Weimar Republic and represent Germany’s openness and pure vision after World War I.

During the Spanish Civil War, the pavilion was repurposed by the Spanish Republicans as their headquarters, quickly revealing the limitations of modern architecture in practical application. Damaged during the conflict, the pavilion was later dismantled and sent back to Germany by train, where its opulent marble was ironically used for Nazi propaganda films. OMA’s reinterpretation of the Barcelona Pavilion, transforming it into a sensual, provocative space, aimed to reveal the hidden dimensions of modern architecture. This design served as a statement in the socio-political landscape of the 1980s, marked by a transition from the welfare state to neoliberal policies, and evolving cultural norms in Europe.

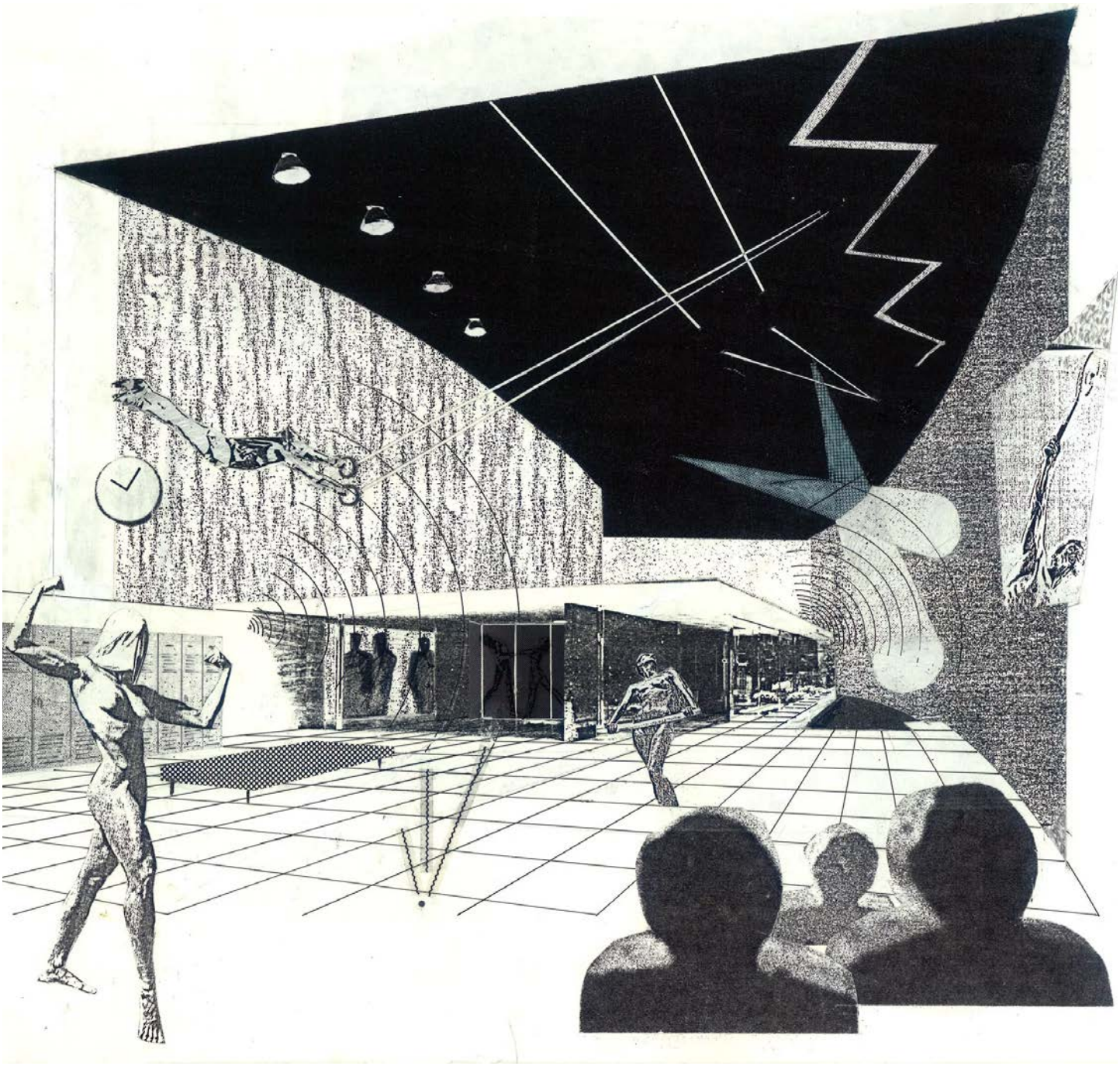
Through Casa Palestra, OMA demonstrated the potential of architecture to respond critically and reflect political changes, enabling the reinterpretation of spaces, challenging established norms, questioning traditional notions of domestic spaces, and engaging with the complexities of human experiences within built environments. There is a correlation between the presumption of modern architecture as an empty space, silencing, antisocial, and fascist. In contrast, the exhibition Casa Palestra portrays the opposite, a place filled with sound, realising the full potential of space and activating it through movement.

right: collage courtesy of OMA

CASA PALESTRA

sensory domesticity and the scale of the body in design

10



Arguments
Prof. Xiaoxi Xhen
James Heard
Individual Research

During the semester, eight contributors joined us to discuss their approach to architecture and present their projects. I have chosen Xu Tiantian's lecture as the basis of my discussion as I am very interested in the interdisciplinary, context-related and community-focused work of DnA Design and Architecture. Her work represents an innovative approach to rural revitalisation in China, employing what Tiantian terms "architectural acupuncture." This method focuses on subtle, localised interventions that engage with the cultural and social fabric of rural communities. Her projects are characterised by collaboration between the local communities and the use of natural materials, aiming to revitalise these areas both socially and economically. This essay explores the concept of rural revitalisation, Xu Tiantian's interpretation of related policies, her interaction with state clients, and the agency she demonstrates in adapting architectural programs. Additionally, a comparative analysis with By Bruther's approach will be conducted.

right: image taken in the countryside

Before the formal introduction of the Rural Revitalization Strategy in 2017, China had implemented several policies aimed at rural development. The Open-Door Policy and economic reforms initiated in 1978 under Deng Xiaoping laid the groundwork for future rural development by opening the economy to foreign investment and market-driven principles. Various poverty alleviation programs in the 1990s and 2000s focused on reducing rural poverty and improving living standards. In 2013, Xi Jinping's "Two Centennial Goals" emphasised rural development as a critical component of national progress. The Targeted Poverty Alleviation Campaign (2015-2020) aimed to lift millions of rural residents out of poverty, setting the stage for broader rural revitalisation efforts.

The concept of rural revitalisation aligns with China's national objectives, serving to advance cultural, urban, and rural development. This comprehensive strategy is designed to tackle the pervasive challenges in rural areas, including depopulation, cultural erosion, and economic stagnation. The policy aims to reconstruct these areas by promoting sustainable development, improving infrastructure, and enhancing the quality of life for rural residents.

RURAL REVITALISATION

Xu Tiantian

11

Xu Tiantian interprets this policy through her architectural projects, which serve as catalysts for social and economic transformation. By integrating local traditions and crafts into her designs, she ensures these projects resonate with the community's cultural heritage while opening new avenues for tourism and local engagement.

Xu Tiantian's concept of "architectural acupuncture" involves small-scale interventions that significantly impact the community. These projects are built by locals, who are often part of a close-knit community with a legacy of building knowledge. This approach empowers the community and ensures that the projects are sustainable and culturally relevant. After her lecture, I was interested in who is building these projects sand taking care of the maintenance. Tiantian explained that the "locals of the community build the projects as they are often one big family and hold a legacy and know how to build." This collaboration fosters a sense of ownership and pride among the residents, contributing to the project's long-term success.

As seen in the Sonyang Story Project, built using local materials and techniques, the pavilion reflects the region's cultural heritage and provides a space for storytelling and cultural exchange. This project exemplifies how architectural acupuncture can revitalise a community by creating a focal point for social interaction and tourism. When the state acts as a client, architects like Xu Tiantian must navigate complex bureaucratic structures while maintaining their design vision. Tiantian demonstrates agency by interpreting state programs flexibly, tailoring them to fit the unique needs of each community. Her ability to balance governmental objectives with local interests is a testament to her innovative approach to architecture. This flexibility is crucial in ensuring the project's intended purpose is revitalising rural areas while respecting the community's cultural identity.

In the Jinyun Quarries project, the local government acted as a client to transform abandoned quarries into cultural and recreational spaces. Xu

“locals of the community build the projects as they are, often one big family and hold a legacy and know how to build.” Xu Tian Tian

Tiantian’s design preserved the natural landscape while introducing new functions, such as a performance space and a visitor centre. This project highlights how collaboration with the state can lead to innovative solutions that benefit both the environment and the community.

Rural tourism is vital to Xu Tiantian’s projects, creating economic opportunities for local communities. However, Tiantian refrains from using the term “tourism” and instead prefers the concept of “circulation” to describe the movement of visitors. This approach offers economic benefits as well as valuable cultural exchange. For instance, Meizhou Island, which receives millions of pilgrims annually, is a model for how rural areas leverage their cultural assets to attract visitors. This influx of people stimulates local businesses and encourages the preservation of cultural heritage.

While Xu Tiantian’s work focuses on rural revitalisation in China, By Bruther, a Paris-based architectural firm, contrasts Xu Tiantian’s work with a different approach to similar challenges. By Bruther is known for its technical-driven approach with innovative and adaptable designs, often emphasising flexibility and multifunctionality in urban contexts.

Their projects, such as the Cultural and Sports Center in Saint-Blaise, France, one of Europe most densely populated neighbourhoods, demonstrate a commitment to creating spaces that serve diverse community needs and adapt to changing uses over time. In contrast to Xu Tiantian’s focus on preserving cultural heritage and engaging local communities, By Bruther’s work often emphasises modernity and adaptability. Their designs prioritise functionality and efficiency, using contemporary materials and construction techniques to create spaces accommodating various activities. While both firms aim to enhance community life and foster social interaction, their approaches reflect different cultural and contextual priorities.

Xu Tiantian’s work with DnA_Design and Architecture exemplifies a thorough and innovative approach to rural revitalisation in China. By engaging with local communities and employing “architectural acupuncture,” she has successfully revitalised rural areas, creating sustainable economic and social futures. Her projects serve as a model for how architects can work collaboratively with communities and state entities to achieve meaningful change. The comparison with Studio Bruther further highlights the importance of context-sensitive design, emphasising the need for architects to consider the broader implications of their work. As Tiantian states, “Architecture is not just about building; it’s about creating a dialogue with the community and the environment”.

Bibliography:

2022. The Architectural League NY . 31 May. Accessed 2024. https://archleague.org/event/current-work-xu-tiantian/.

Koty, Alexander Chipman. 2022. China Briefing . 10 March . Accessed 2024. https://www.china-briefing.com/news/chinas-rural-revitalization-strategy-opportunities-for-investment/.

Dongsheng Zhang, Wei Gao and Yiqing Lv. 2020. The Triple Logic and Choice Strategy of Rural Revitalization in the 70 Years since the Founding of the People’s Republic of China, Based on the Perspective of Historical Evolution. Review, Agriculture .

Hillman, Ben. 2023. The China Story . 18 December . Accessed 2024. https://www.thechinastory.org/from-poverty-elimination-to-rural-revitalisation-the-party-takes-charge/.