ACTIVE LAYER-ING

or

Unfolding decisions from Questions in the Contemporary Architectural Practice

Maria Paula Rico - MSAAD

2024-2025

ACTIVE LAYERING

This selection of work is built around what **I've come to call Active Layering, It is not a method. It is a position; the practice of deliberately selecting and intersecting the visible and the invisible. It is a reflection on architecture's capacity to generate the conditions** in which chosen layers interact: materially, socially, culturally, politically, and ecologically.

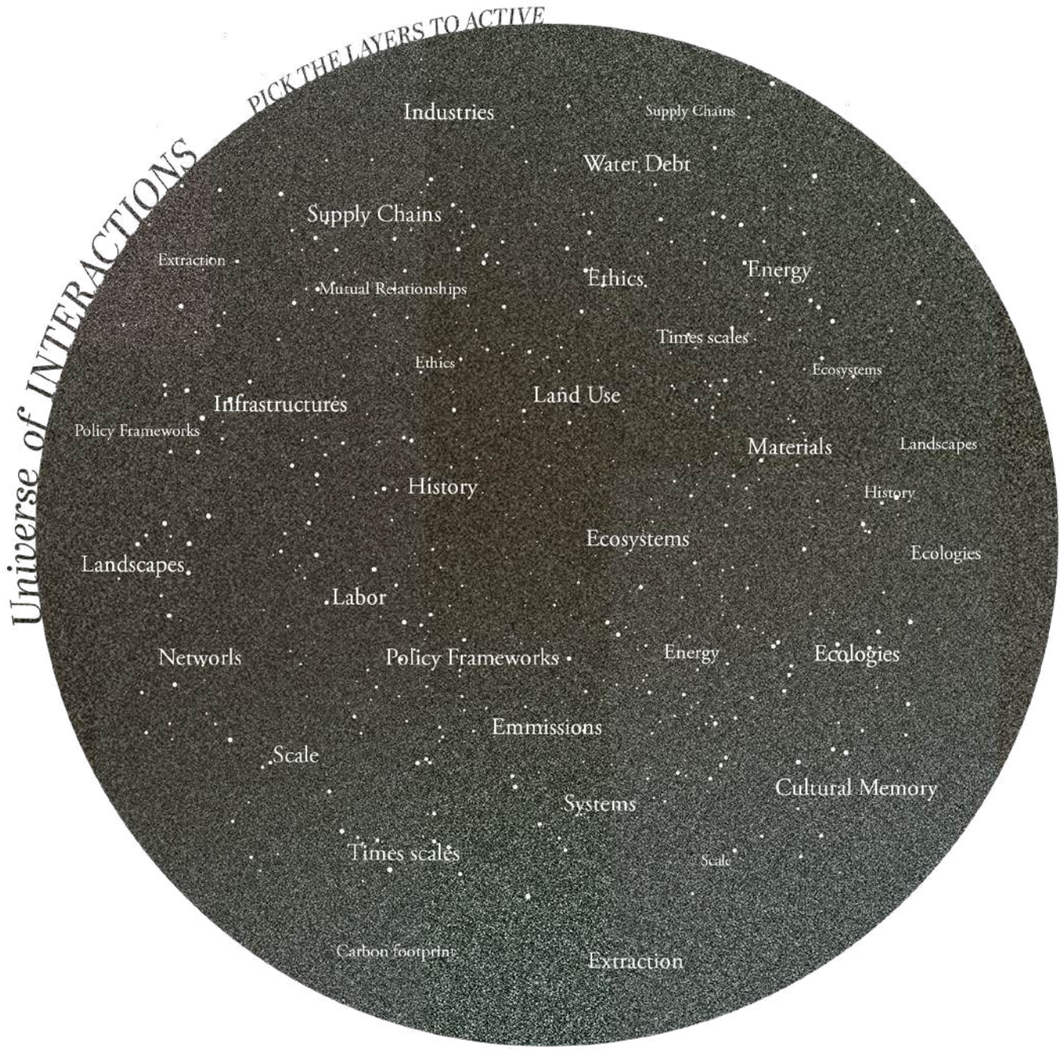
I came to GSAPP searching for the questions that are shaping the contemporary architectural discipline. I wasn't looking for answers. I was looking for friction, for doubt, for urgency. I wanted to understand what is on the verge of transforming how we practice, who we design for, and what architecture can become.

But I found more than questions, questions are just the beginning. **Architecture is not just about asking, Architecture is about actively making decisions from what we ask.** And through those decisions, architecture brings layers together; activating new interactions, shifting relationships, and revealing hidden dynamics. It bridges scales, reshapes systems, and redefines the boundaries of what architecture can engage with. **This capacity to activate; to make things interact, is where I believe the true power of architecture lies.**That was one of the most revealing insights I gained during my time at GSAPP.

The possibilities are endless, some layers are visible: materials, structure, space. But most of them are hidden: histories, climates, politics, actors, ecologies, networks, systems, time. To choose which layers to reveal, which to emphasize,which to merge, **are never neutral decitions. They are political, ecological, cultural, social and material. That choice is an architectural act.**

In a world that demands more ethical, ecological, and systemic thinking, architecture it must become an act of inquiry, and more importantly, a practice of critical action. These projects and essays are looking for these layered condition either testing them at different scales or looking for ideas to bring them together. Each unfolds and experiment, a reflection.

This is the beggining of something meaninful,
This is work in progress,
This is what I stand for.



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Advanced Studio IV, Summer 2024
Studio Critic: Nerea Calvillo
Project - Research
Location: Pelham Bay Park, New York, NY
Autors: María Paula Rico - Madhura Kadam

01

Rock's Rituals

From de-colonial landscape terraforming to microbial inhabitation
Envisions of a future for Pelham Bay Park that transcends human-centric narratives

This project integrates cultural history, ecological processes, and community engagement to reshape the landscape while challenging colonial legacies. The park's historical layers include deep connections to boulders that highlights their role in the region's ecological cycles and traditional rituals, serving as landmarks for wars, daily rituals and sacred sites to the Siwanoy Native American tribe. Over time, the park's landscape has been altered by landfill operations, which buried significant portions of the estuary ecosystem under layers of waste. The project seeks to unearth these buried narratives by repurposing the waste rocks from New York's mines as foundations to rewrite the landscape, forming new pathways and coastal barriers for a future rooted in resilience, ecological restoration, and cultural reclamation.

The rocks, once used as tools for colonial expansion to fuel the growth of New York City, will now serve as a medium for reshaping the park. Central to this process is community involvement, with rituals conducted around key historical rocks to honor the park's cultural heritage. By weaving together these elements, the project challenges colonial legacies . These efforts are also a response to the challenges posed by climate change, promoting the creation of adaptive landscapes that evolve with ecological shifts. The ritual of transformation of the park will thus reflect its rich history while also preparing it for a resilient future amidst rising temperatures and evolving ecosystems for other species to thrive.



















The Hidden Histories

Located in the Bronx borough in the northeast of New York City,

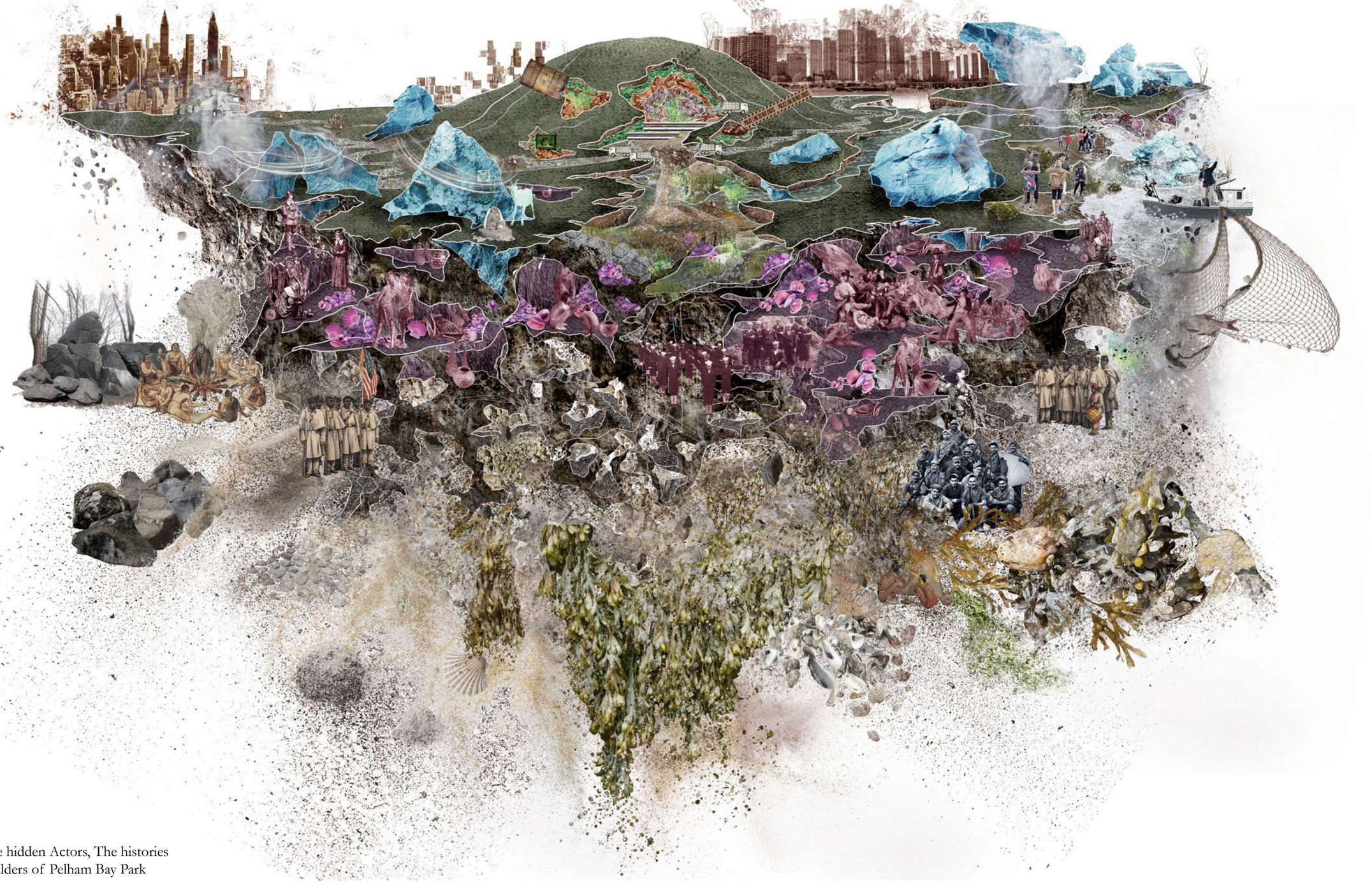
Pelham Bay Park is a burial place, where layers of histories have been co-existing:
a toxic landfill,
an artificial beach,
a fragile estuary ecosystem,
and the unique magic rocks with an intricate history of rituals.

The Native American tribe, 'The Siwanoy', inhabited the area before the arrival of the first Dutch and English settlers. They believed these big rocks were placed by their guardian Manitou; an omnipresent spirit inhabiting everything; from the land, to living creatures and events.

Geological science however began identifying them as glacial erratics or Boulders:

"Pieces that were detached from larger rocks during the last glaciation; transported thousands of kilometers by glacial movement and eventually deposited randomly across the landscape as the ice melted"

While Geological knowledge dispelled the magic, Rocks, once revered as eternal supporters of life, were reduced to mere commodities for the mining industry. An Industry that, through extraction and displacement, fueled colonialism expansion and the growth of the metropolis; New York.



▲ Collage, The hidden Actors, The histories Behind the boulders of Pelham Bay Park

Rock's as supporters of life and memory

As Manhattan and the Bronx started to grow, so did the garbage disposal problems. Pelham Bay Park faced the consequences.

The creation of Orchard beach in 1930s was in fact a solution to deal with this problem. Tons of garbage from Manhattan were disposed off, to connect two islands of the park and then covered with sand;
By 1963, NYC Sanitation Department adopted a similar strategy, Pelham Bay's Landfill was opened in response to the Bronx's domestic garbage disposal needs.

Both the landfill and Orchard Beach buried over 1,000,000 m² of the coastal and estuary ecosystem areas

In this process, different types of rocks that once sustained the ecological cycles of various life forms, previously abundant in Pelham Bay, were also buried;
And with them,
Rockweed,
Oysters,
and Moss.

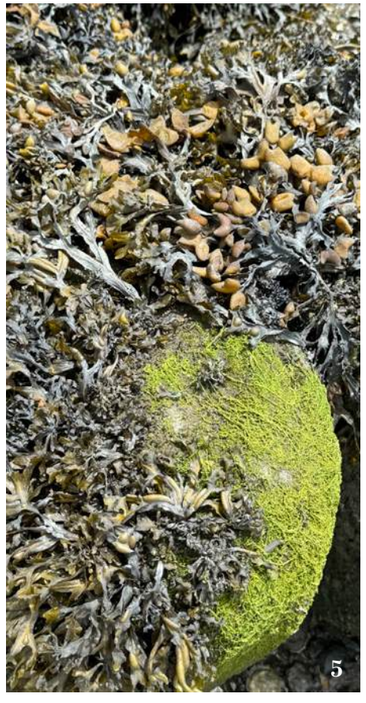
▶
1. Landfill
2. Stuarine Ecosystem
3. Orchard Beach - Landfill
4. Boulders
5. Rockweed
6. Oyster
7. Moss


1


2


3


4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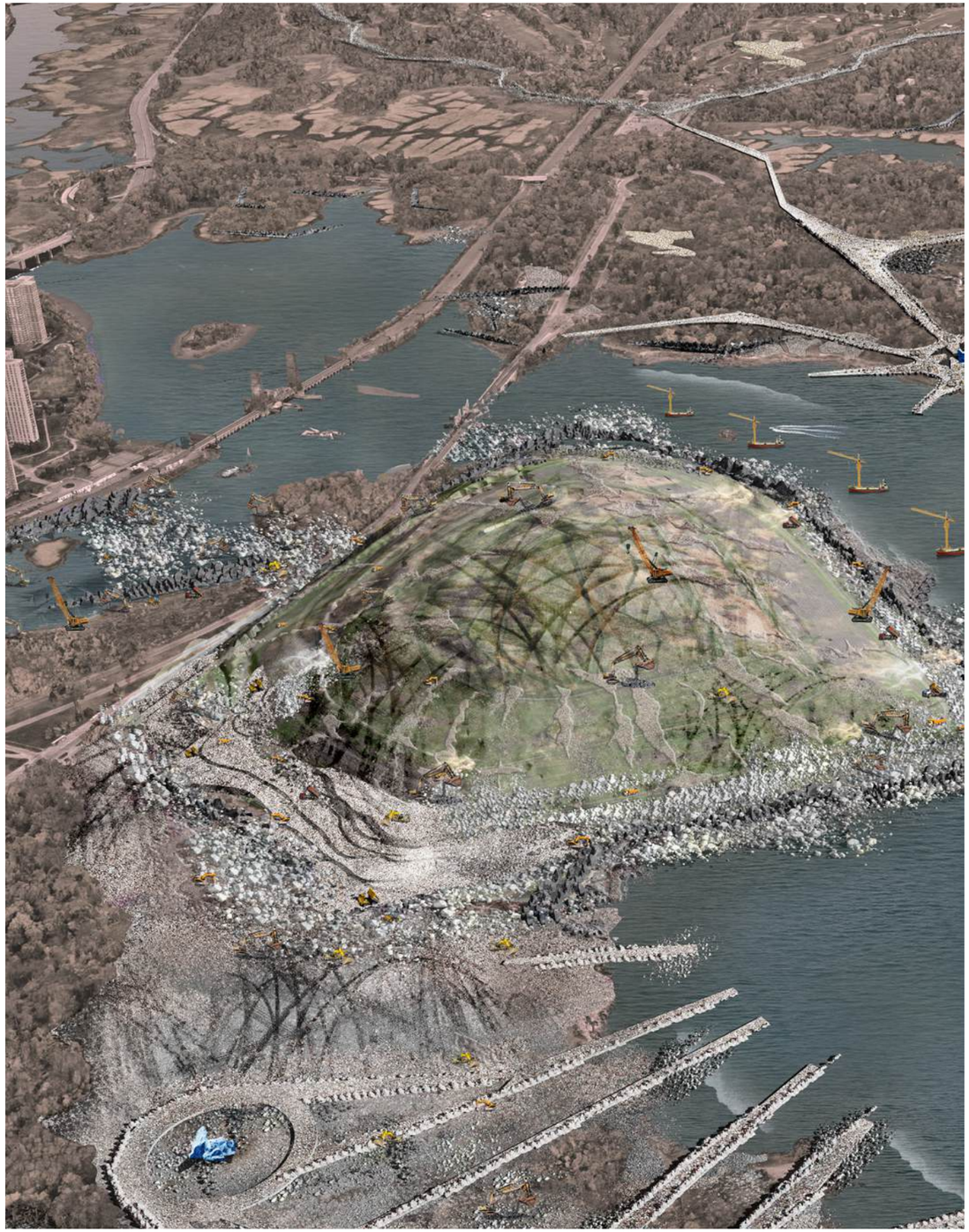
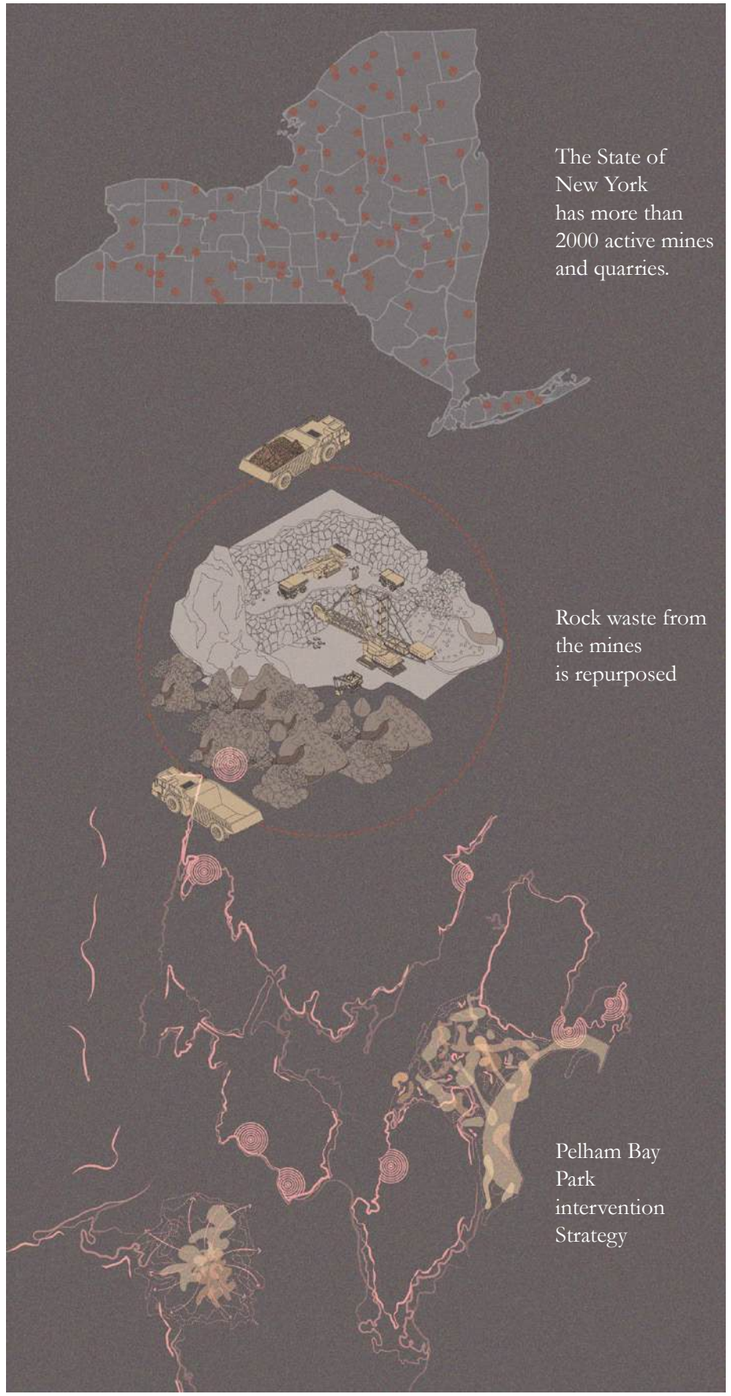




Phase 01
Rock waste from mines

We are going to continue land-filling with rocks

To bring back to the top layer what has been buried:

The forgotten communities, the rituals and the non-human inhabitants,

We will do so, through rock's rituals through terraforming.

In the first stage, rocks will be brought from the 2,000 mines that operate in The State of New York. We will use the rock waste of their extraction. Which is between 90% and 30% of the total volume.

The rock waste from these mines comprises different types of rocks in various sizes, from boulders to gravel and sand.

New regulations prevent mining companies from accumulating the rock waste around mines.

This waste will be transported to Pelham Bay, repurposing the space left behind in the mines for re-vegetation.

Phase 02
Rituals

We aim to challenge the landscapes of colonialism and ‘the green’ by covering the park with rocks. The rituals will commence through four main strategies

- From Dropping on the landfill,
- and Writing from the magic rocks
- To accumulating in the coastal areas,
- and Adding to the flat lands

Heavy machinery like trucks financed by The State of New York mines and in collaboration with New York Environmental department will release the rocks.

Gravel and sand will be disposed in different ways creating different scenarios, allowing human motion to foster processes of erosion.

Personal ceremonies and rituals around the beach, golf courses, and other flatlands will be encouraged,

with different types and sizes of gravel, sand and rocks.

Phase 03-
Terraforming to microbial inhabitation

This process will continue, along with the construction barriers and habitats where rockweed, the base of the estuary ecosystem's food chain, will thrive. These bio-construction efforts will naturally continue as the coastline expands inward, capturing the land.

year

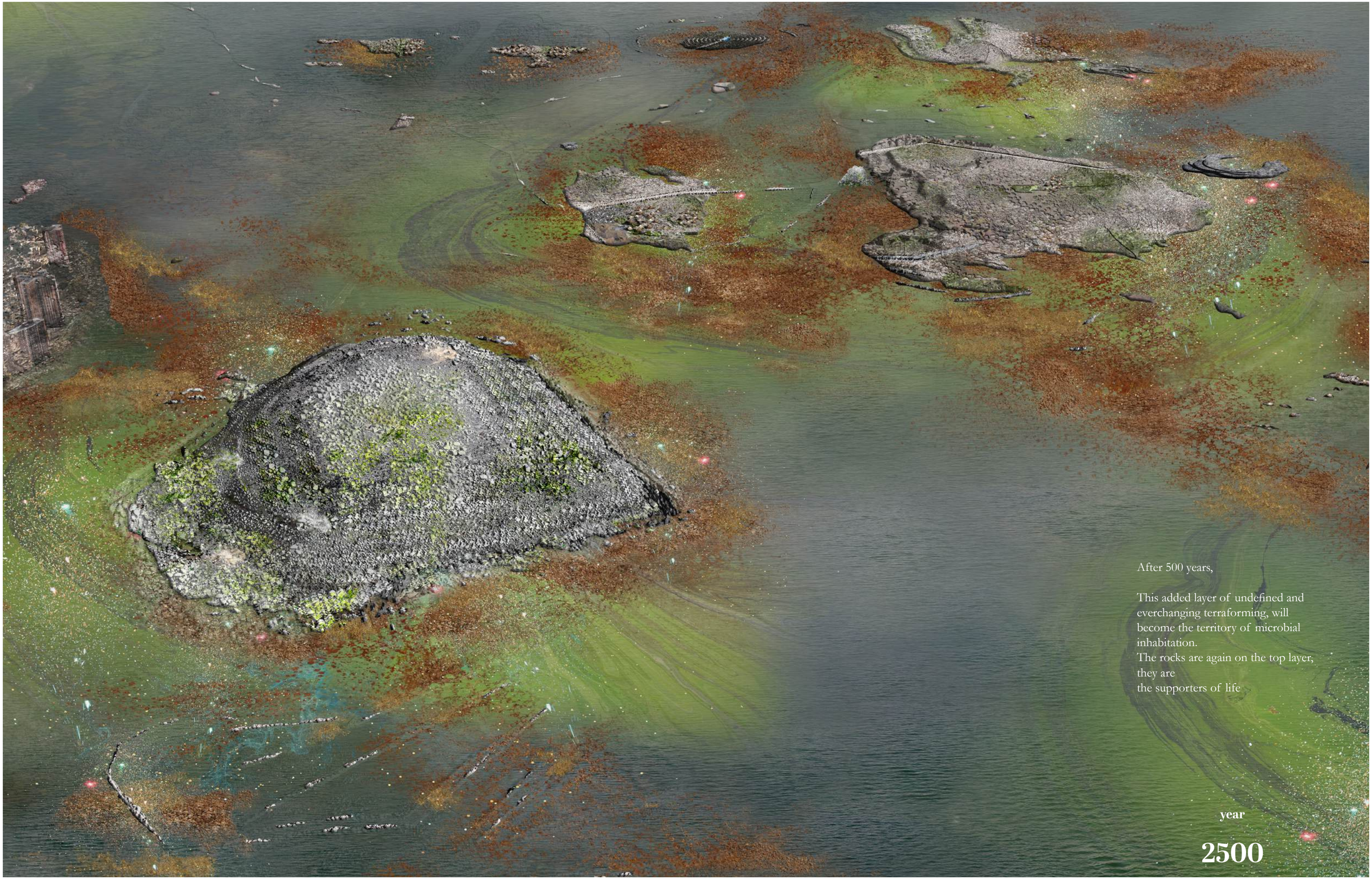
2040

As climate change progresses, rising temperature will cause trees to die,

while rising sea levels will allow other ecosystem species like phytoplankton to thrive

year

2080



After 500 years,

This added layer of undefined and everchanging terraforming, will become the territory of microbial inhabitation.
The rocks are again on the top layer, they are
the supporters of life

year

2500

Advanced Studio V, Fall 2024
Studio Critics: Leslie Gill, Khoi Nguyen
Project - Research
Location: Arctic Tundra Zone and
Whistler, Canada.
Author: María Paula Rico

02

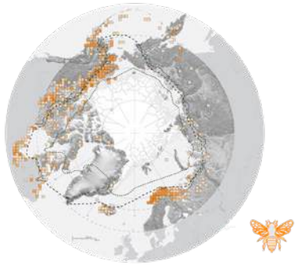
Arctic's Botanical Archive

Tundra Plants and Pollinators, from Temporal Outposts to Botanical Corridors

The project explores the relationships between Arctic tundra plants and their pollinators: flies, bees, butterflies, and moths, vital to the ecosystem. As the Arctic undergoes rapid changes, many species risk disappearing before being fully studied. The project proposes an integrated system of modular outposts and an archive to document and preserve these interactions.

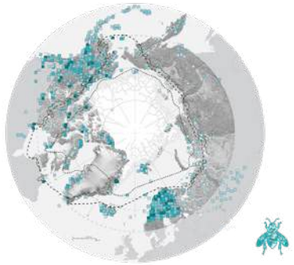
The outposts adapt to the tundra's five subzones, ranging from the High Arctic to the southernmost regions. These modular structures support plant growth, enable ecological research, and provide living conditions for researchers. Using local materials and minimal-impact construction, the outposts create microhabitats for pollinators and collect ecological data unique to each region. Designed to undergo entropy and decay, the outposts leave behind structures fostering continued ecological interactions.

The archive, located in Whistler, Canada, serves as a static collection of tundra data collected from the outpost and a living repository in case the tundra disappears. Temporal garden walls generate microclimates with varied shadow and light conditions, while terraces use topography to retain water and maintain soil moisture. As climate shifts, gardens will migrate higher up to the mountain, forming a botanical corridor, while the memory of the tundra and its pollinators is preserved in a living archive.

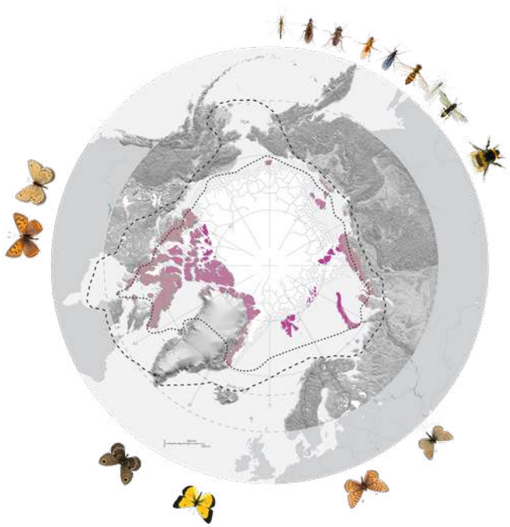


Bees

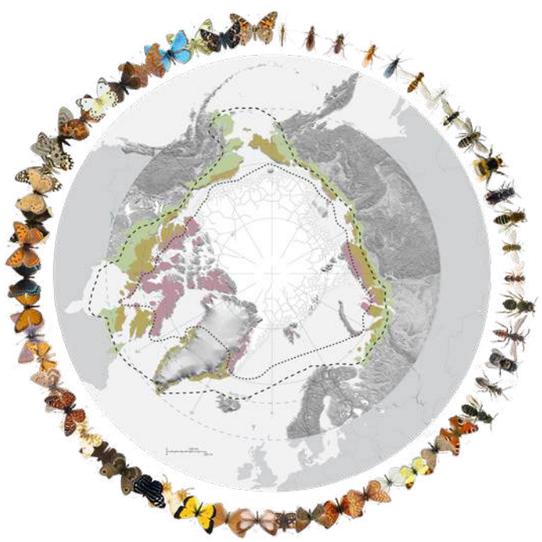
Butterflies and Moths



Flies



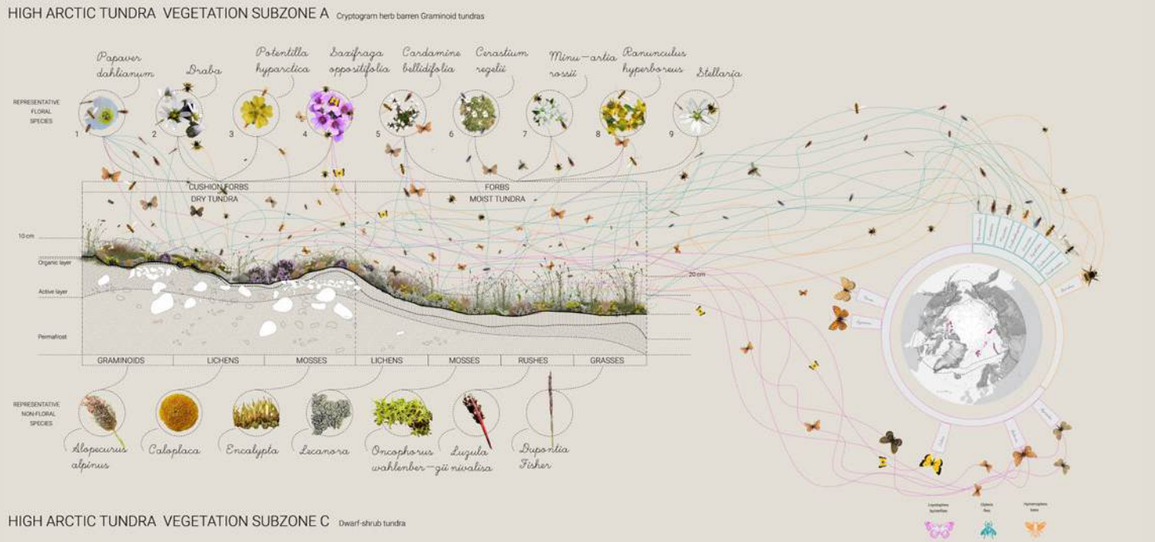
High Arctic variety

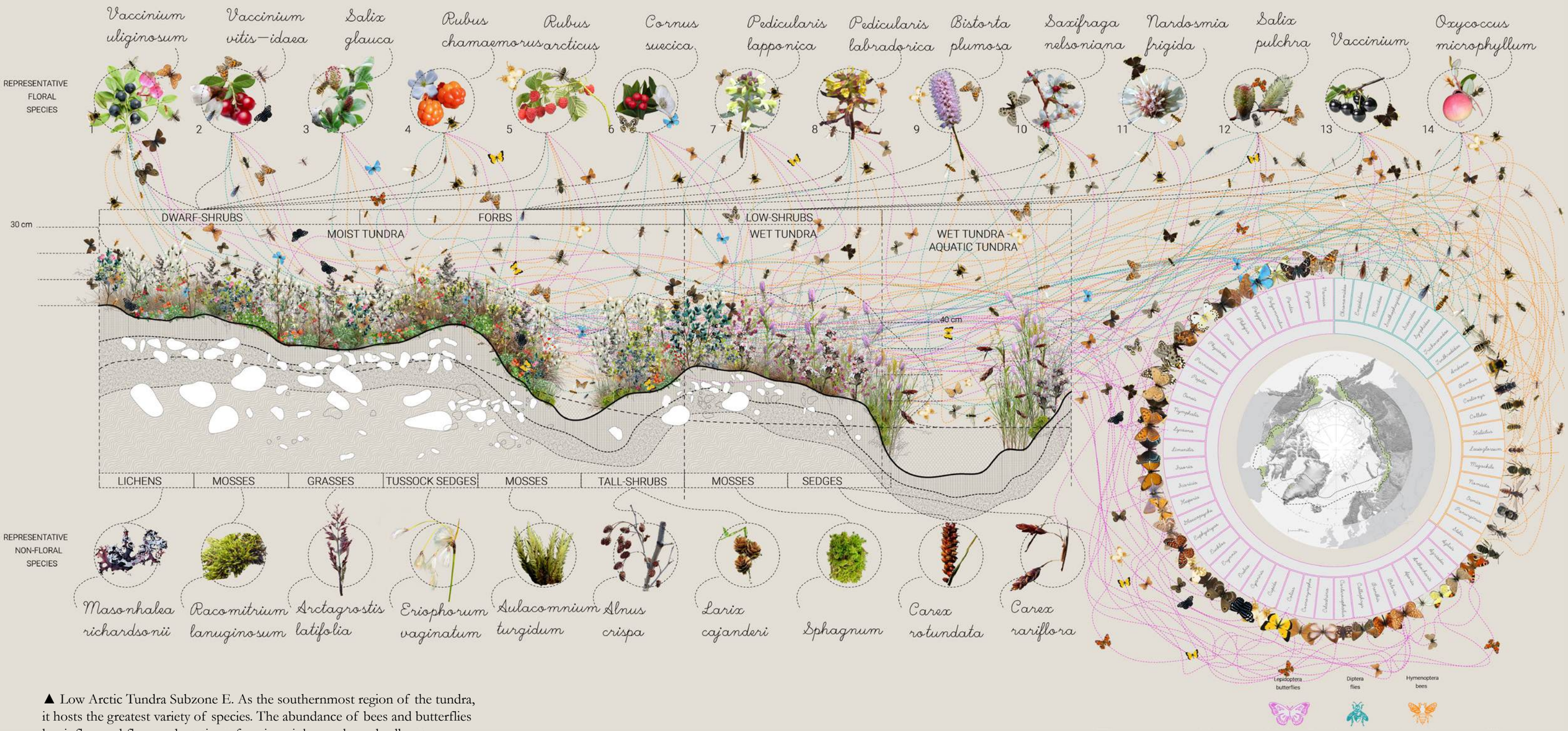


Low Arctic Variety

▲ The tundra begins where trees stop growing, comprising vegetation in the High and Low Arctic. Diagrams depict the distribution according to species and tundra regions. Flies are more abundand in the most extreme Arctic climates while bees, butterflies and moths trhive better in southern latitudes.

► That means that the landscape from north to south has significant variations and complex relationships. Pollinators shape the Landscape, their preferences and relationships with plants depends on their vision.





▲ Low Arctic Tundra Subzone E. As the southernmost region of the tundra, it hosts the greatest variety of species. The abundance of bees and butterflies has influenced flower adaptations: favoring pink, purple, and yellow tones over white, which is more common in the northern regions due to the predominance of flies over other pollinators.

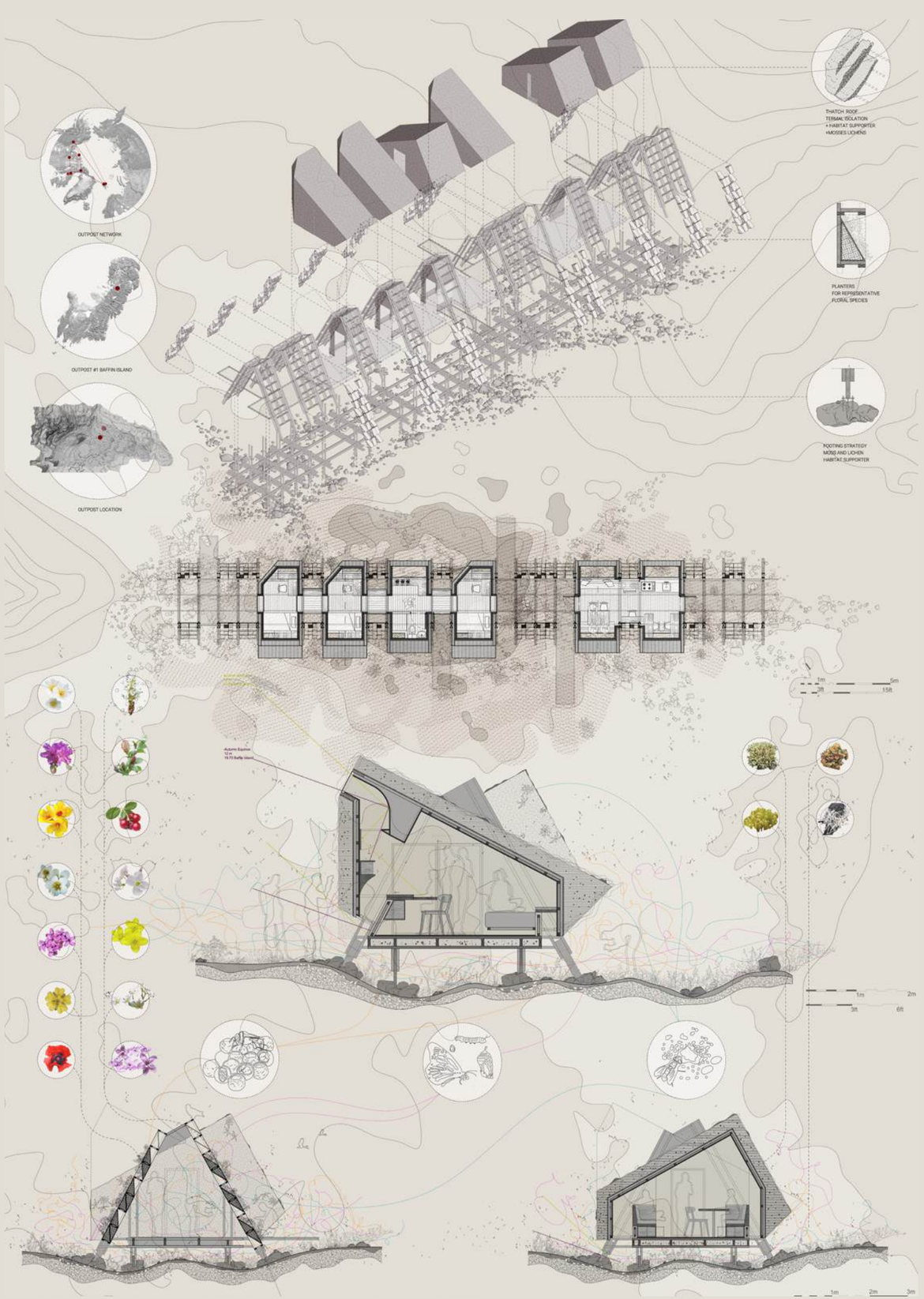
Network Of Outpost
Collecting the data - revealing the interactions

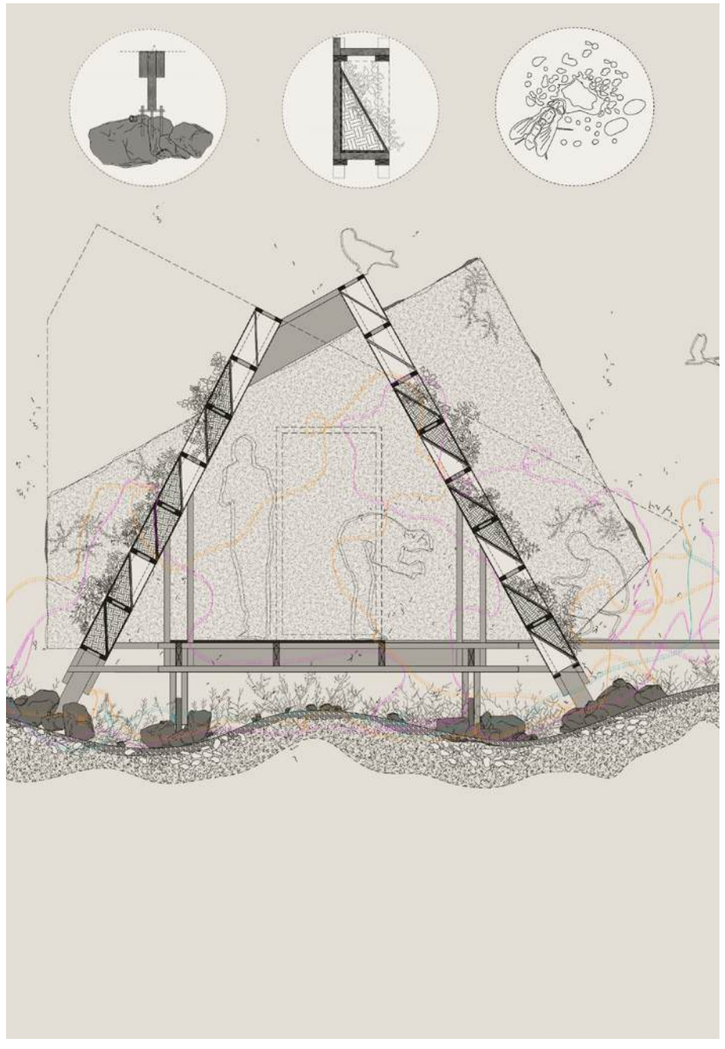
The tundra ecosystem is undergoing rapid changes:
Like thawing permafrost, and forest encroachment.
As a result, tundra plants and pollinators are disappearing before they can be fully studied.

The archive will document and preserve both physical samples and digital data of plant-pollinator relationships.For that purpose, the project is divided in two parts:

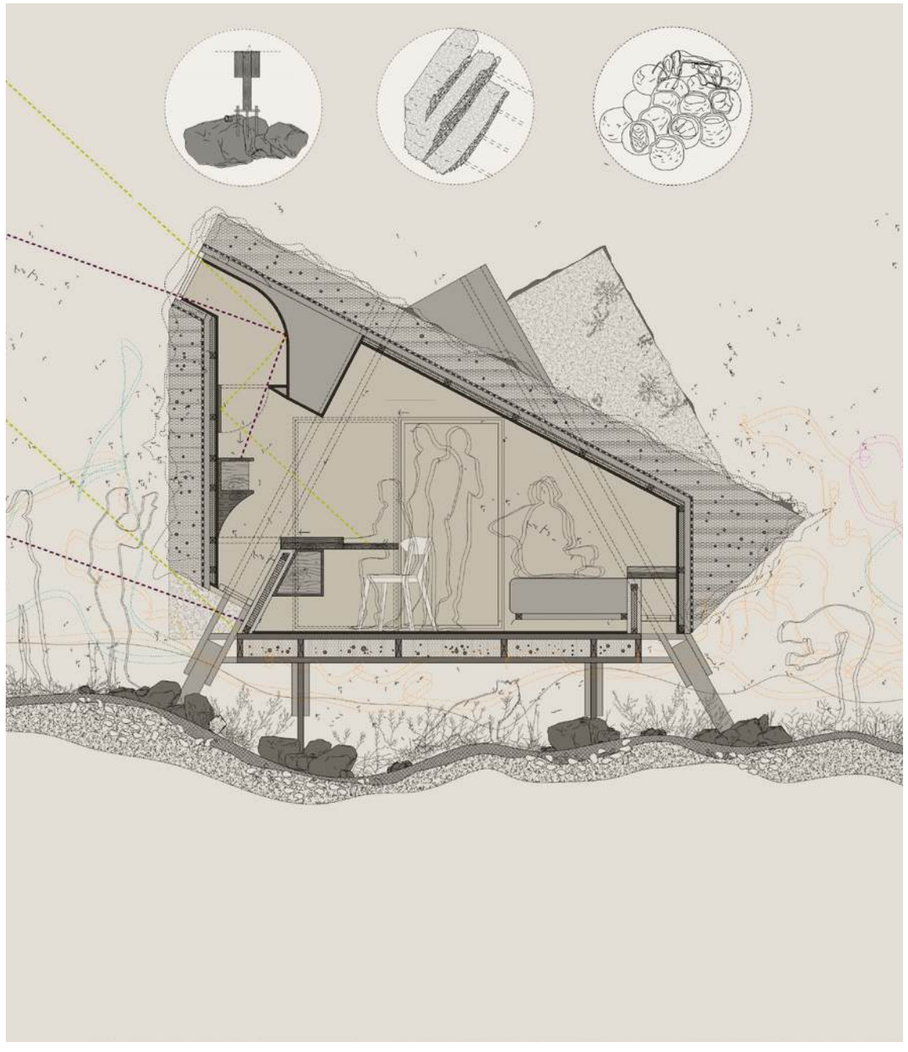
1. The outpost as a network in the 5 different tundra regions, for comprehensive data collection across tundra
2. The archive where data will be storage and shared.

► The outposts are modular, adaptable to different tundra regions and topographies. They aim to support plant growth, enable ecosystem studies, while providing basic living conditions for researchers.

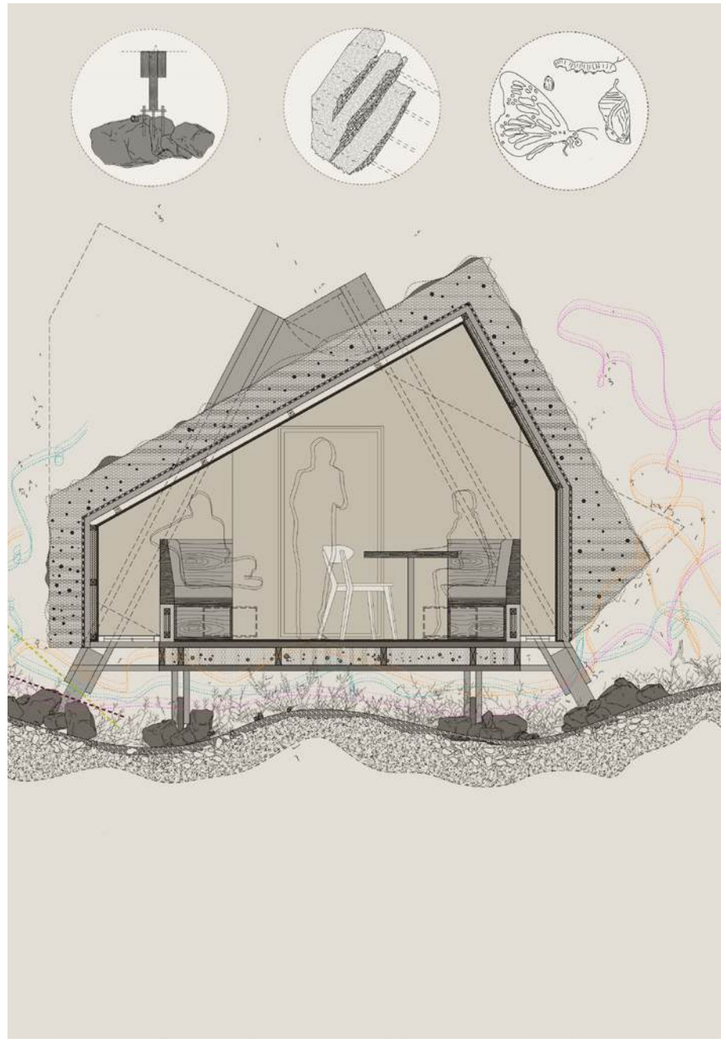




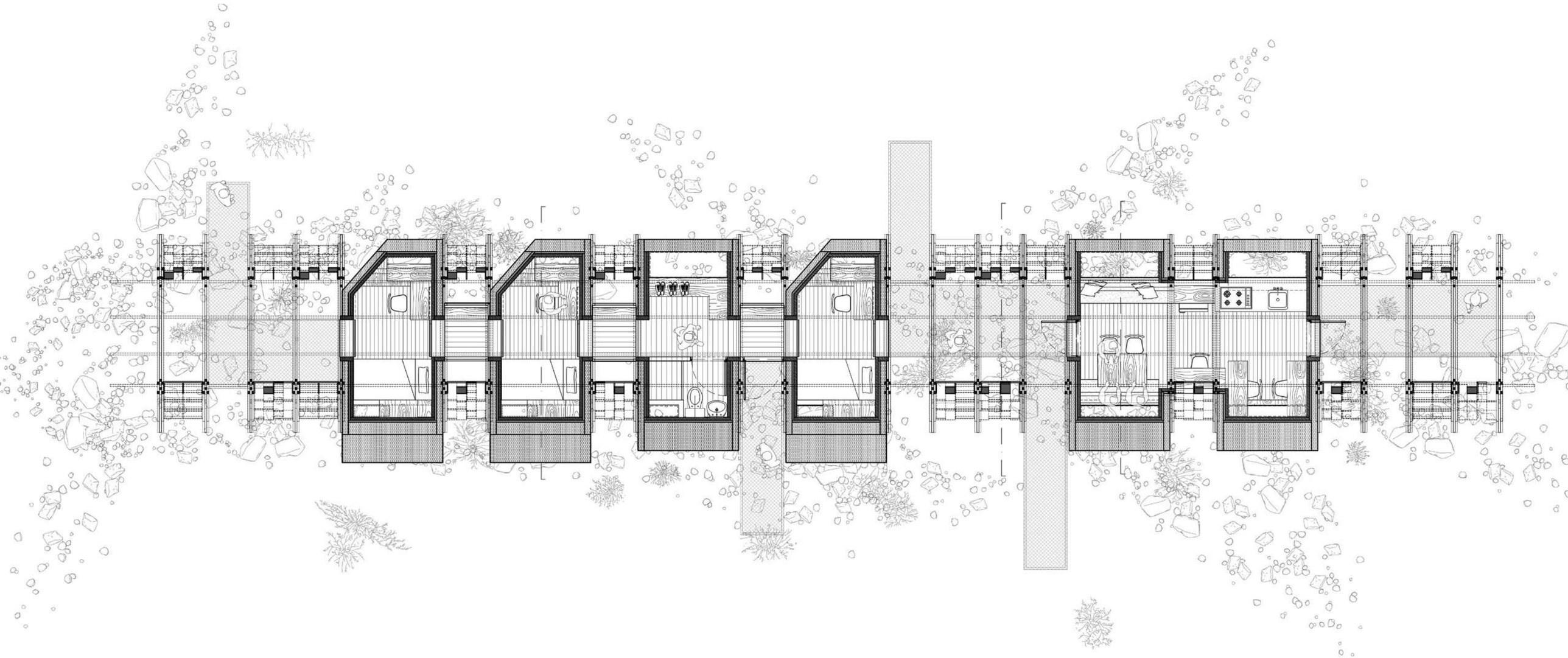
▲ One module is dedicated to plant growth, offering flexibility to accommodate root depth, soil and different sunlight exposure, creating microclimates for studying flower blooming.



▲ The footing strategy uses tundra boulders, providing support without digging while allowing the growth of lichens and mosses.These modules also account for light management, ensuring all interior light remains indirect.



▲ Living modules use thatch roofs for insulation, where moss and lichen can grow providing shelters for pollinators to overwinter.

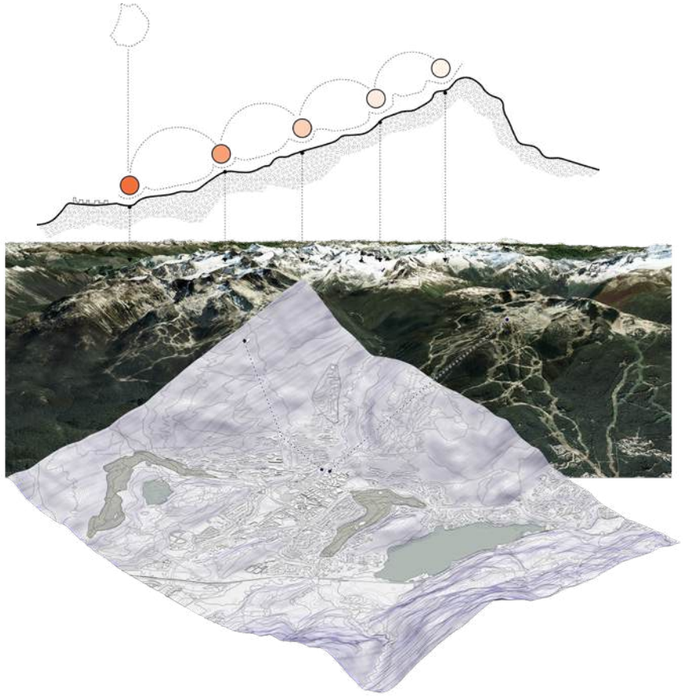


▲ Each outpost will collect unique ecological data, reflecting its specific location.

▲ The thatch roofs are made from dry grasses found in the Tundra Region, designed to create a living habitat for moss, lichens, and pollinators, while also providing thermal insulation.

▲ Their life cycle is defined by an intentional process of entropy. Over time, as human activity recedes, the modules are designed to decay and disassemble gradually, some through material biodegradation, others through the natural forces of wind, frost, and permafrost movement.

▲ This allows the modules to merge back into the tundra, creating microhabitats that continue to support pollinators and plant growth even after the modules are no longer in active use. Select components of the structures, however, are preserved and carefully transported to the permanent Archive.

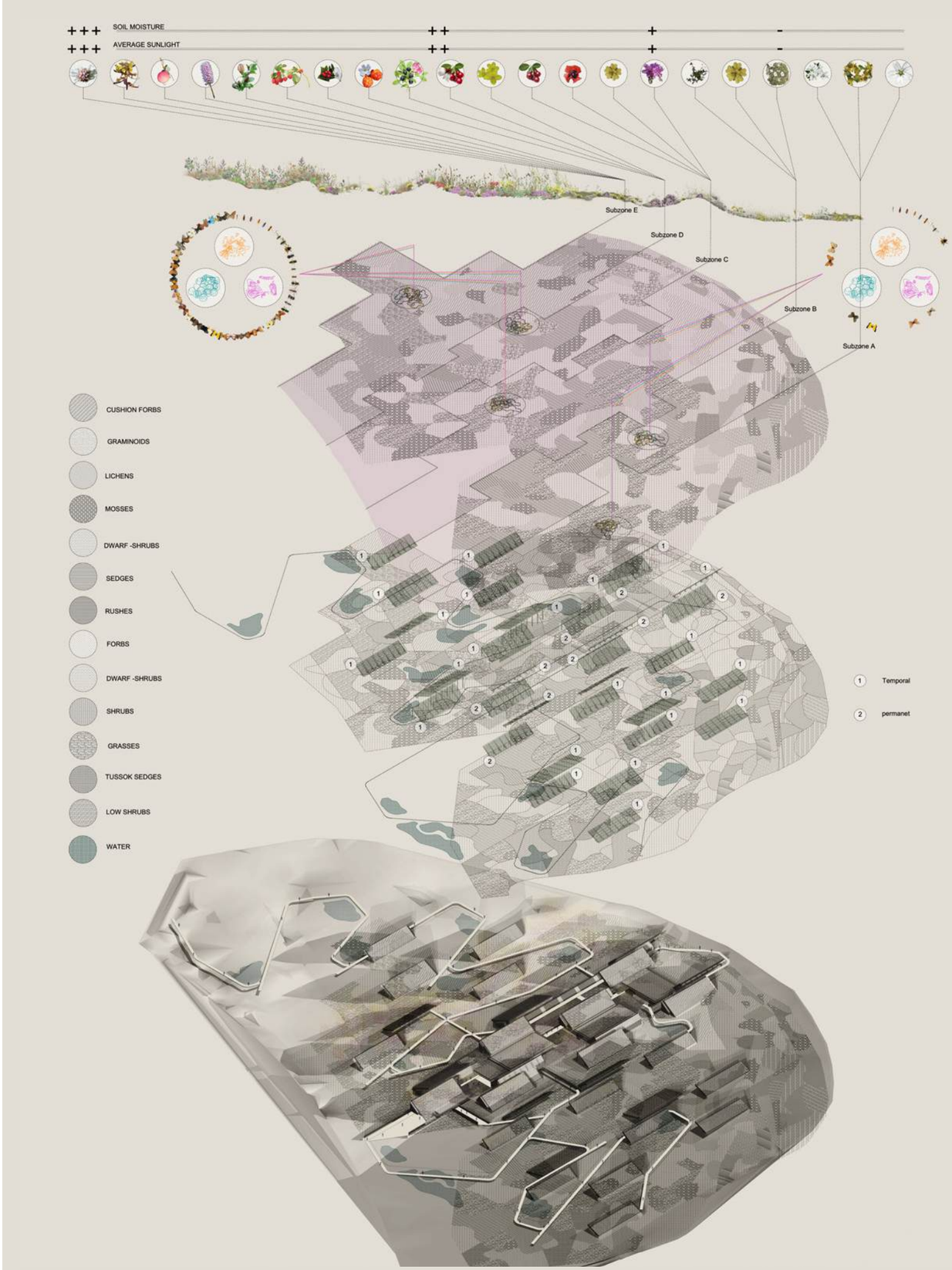


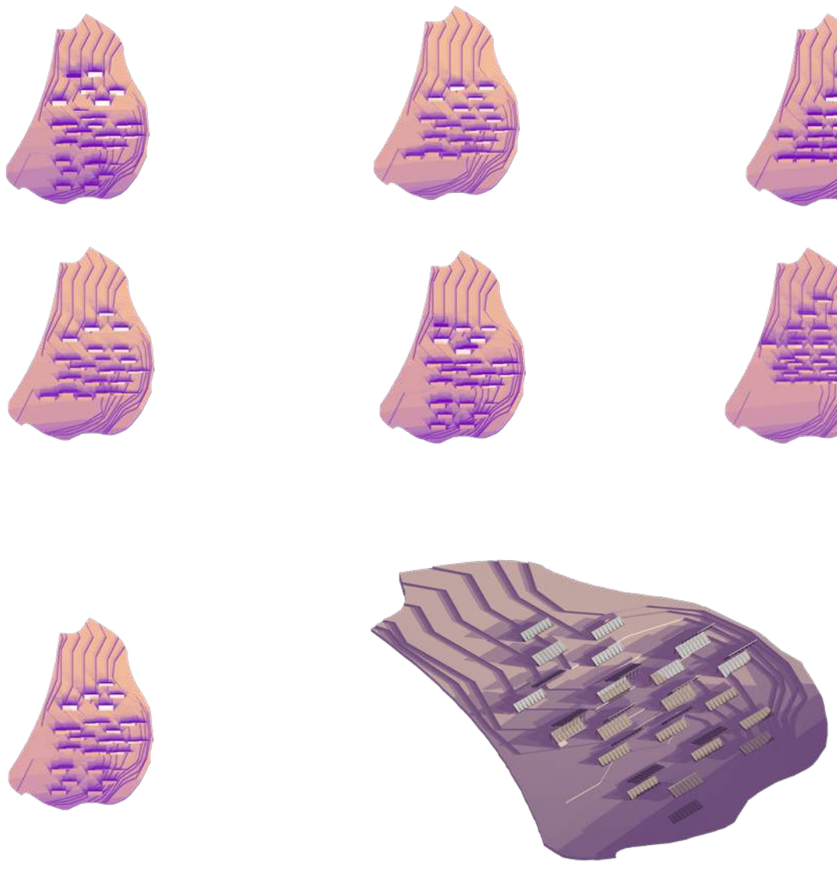
The Archive - Preserving The Arctic Tundra Memory Making Botanical Corridors

The concept of temporal repositories forms the foundation of the second part of the project: The Archive.
It serves as both a static collection of tundra DNA data from the outpost and a living repository in case the tundra disappears.
This requires specific microclimatic conditions and an accessible location.
The Vancouver area is ideal due to its proximity to key research institutions and varied topography. Whistler, with its extensive ski infrastructure, mountain gondolas, and year-round facilities, provides a suitable site for the living repository.
Its elevation gradients create distinct microclimates, enabling the formation of a botanical corridor where tundra species can be cultivated, studied, and allowed to adapt over time.

▲ Whistler, Canada, Location. The first phase of The Archive will be located near the town at the base of the mountain. The existing Ski infrastructure will facilitate the creation of the gardens according to zones.

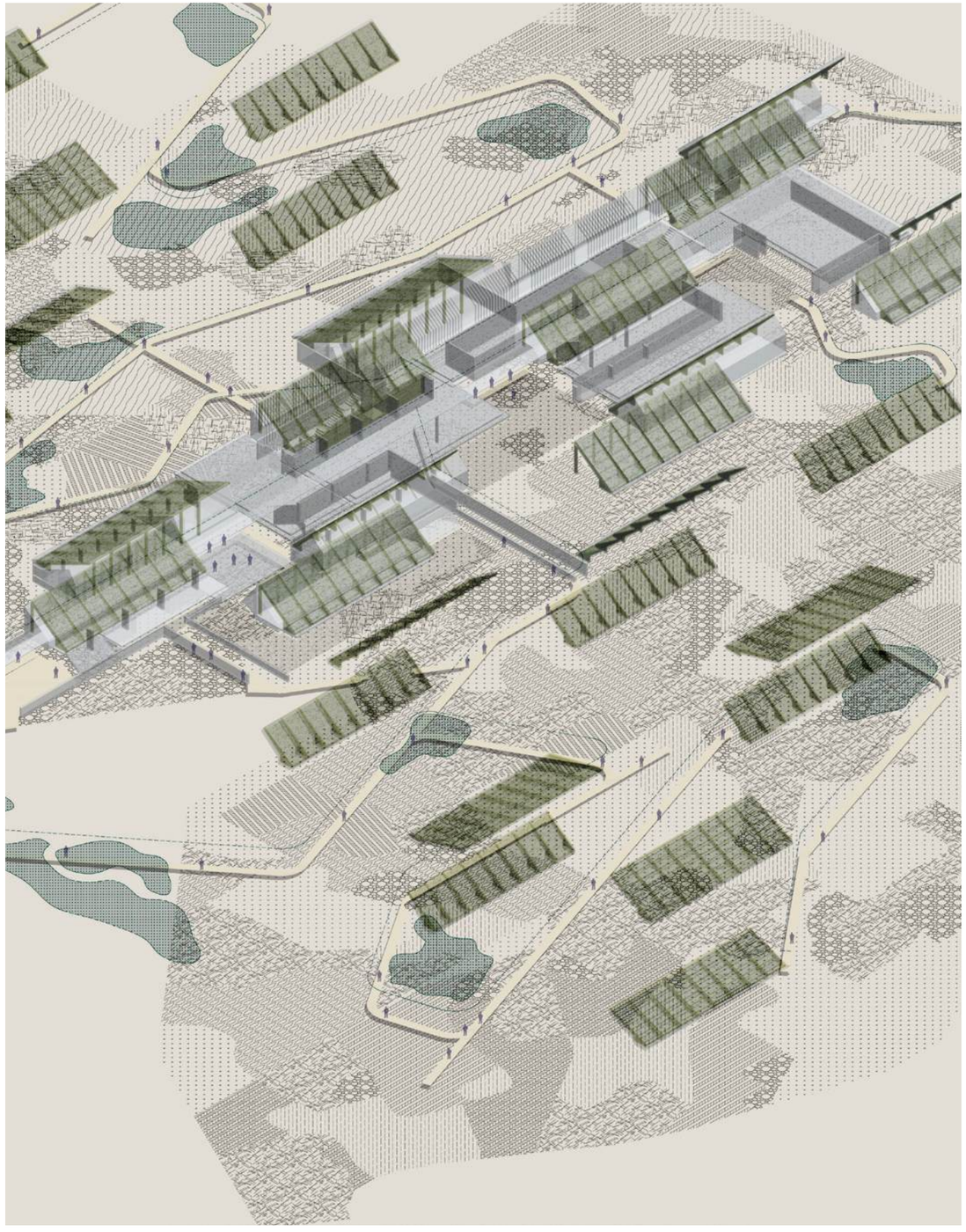
► Main Strategy for the first phase and the permanent research facility at the base of the mountain.

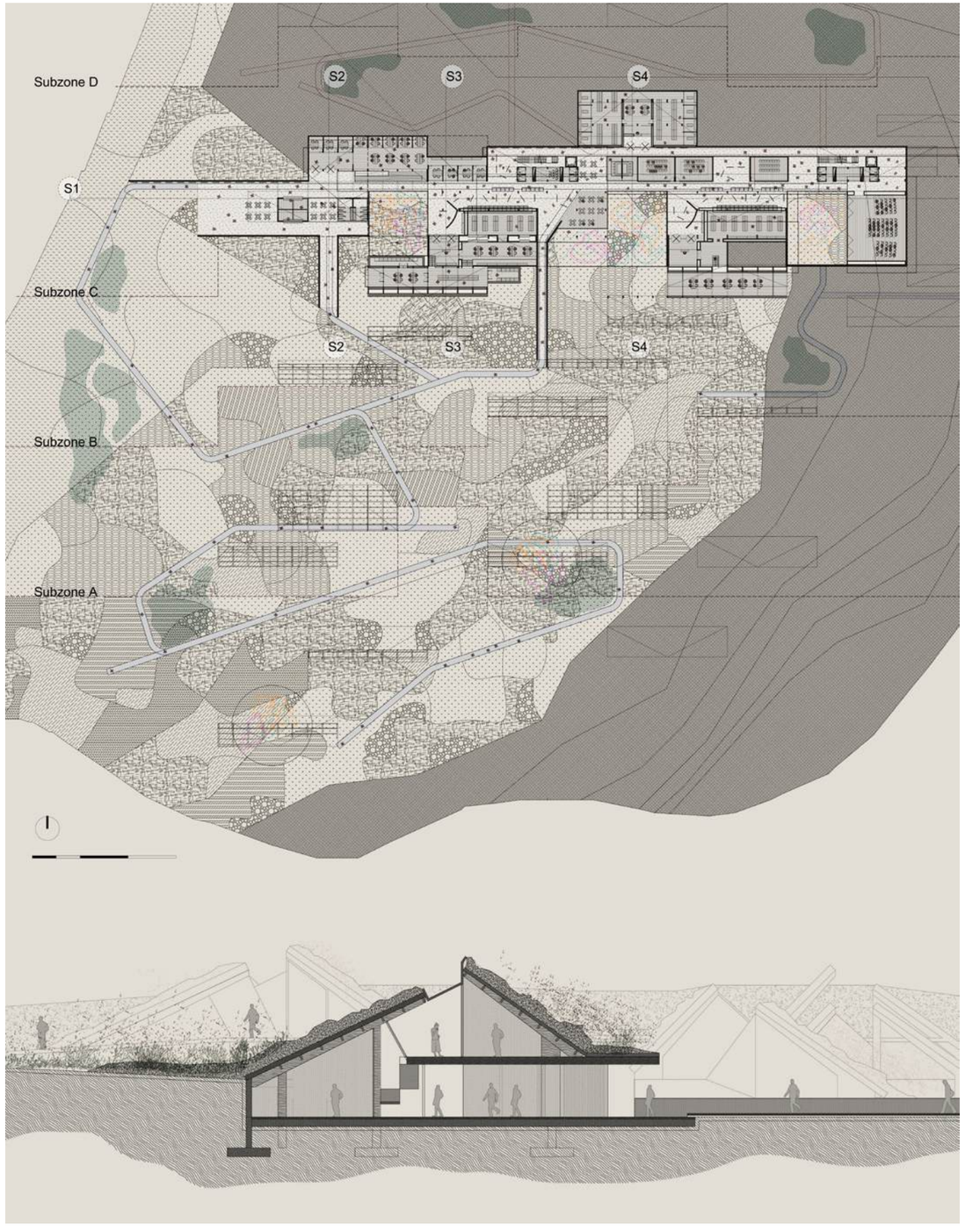




▲ Shadow study for the location of the garden walls.

► Temporal garden walls serve as microclimate generators, providing different conditions of shadow and light. Wall slopes address shadow requirements for each tundra subzone, while topography is used to create terraces that retain water and maintain soil moisture.

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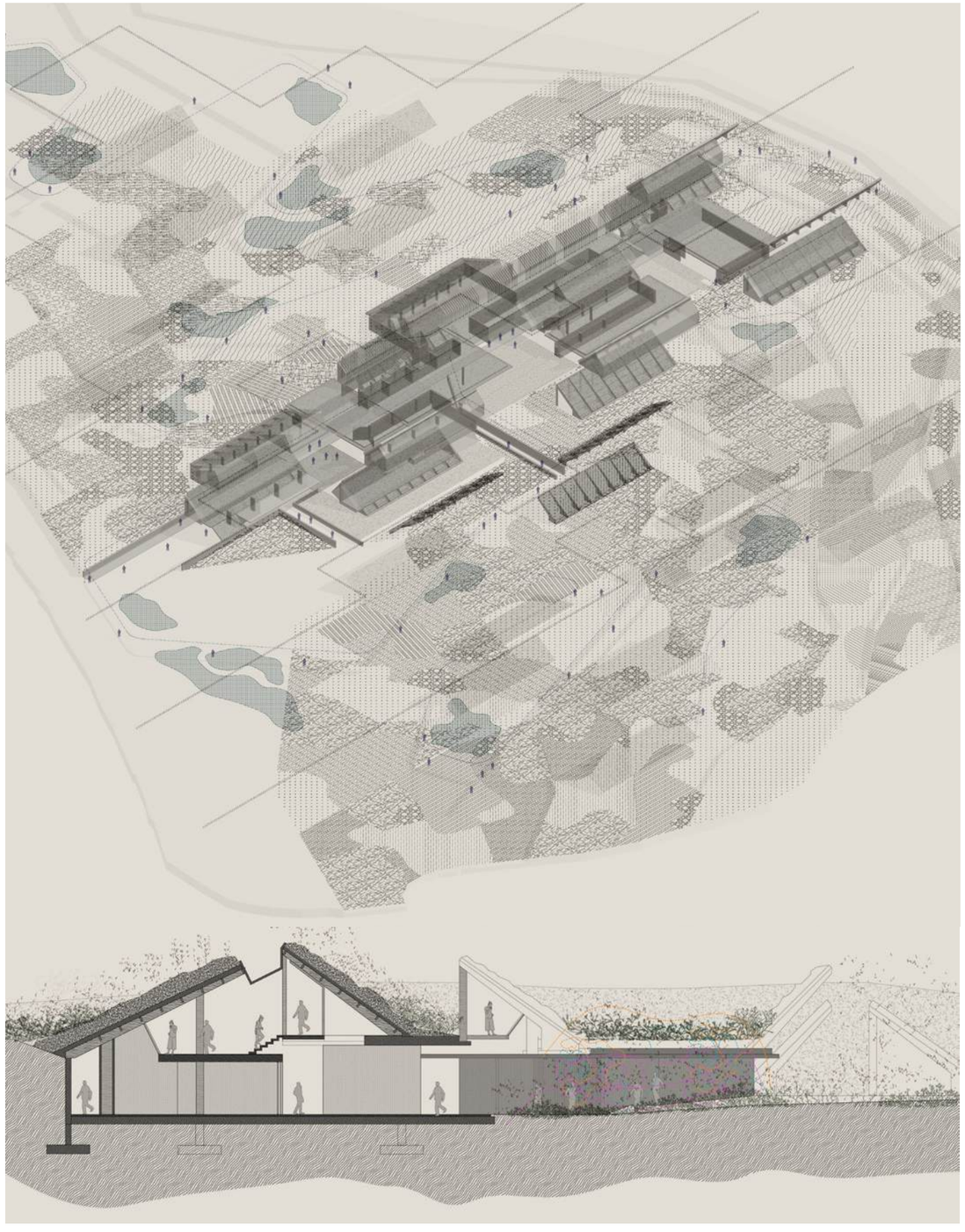
Subzone B
Subzone A



S2

S3

S4

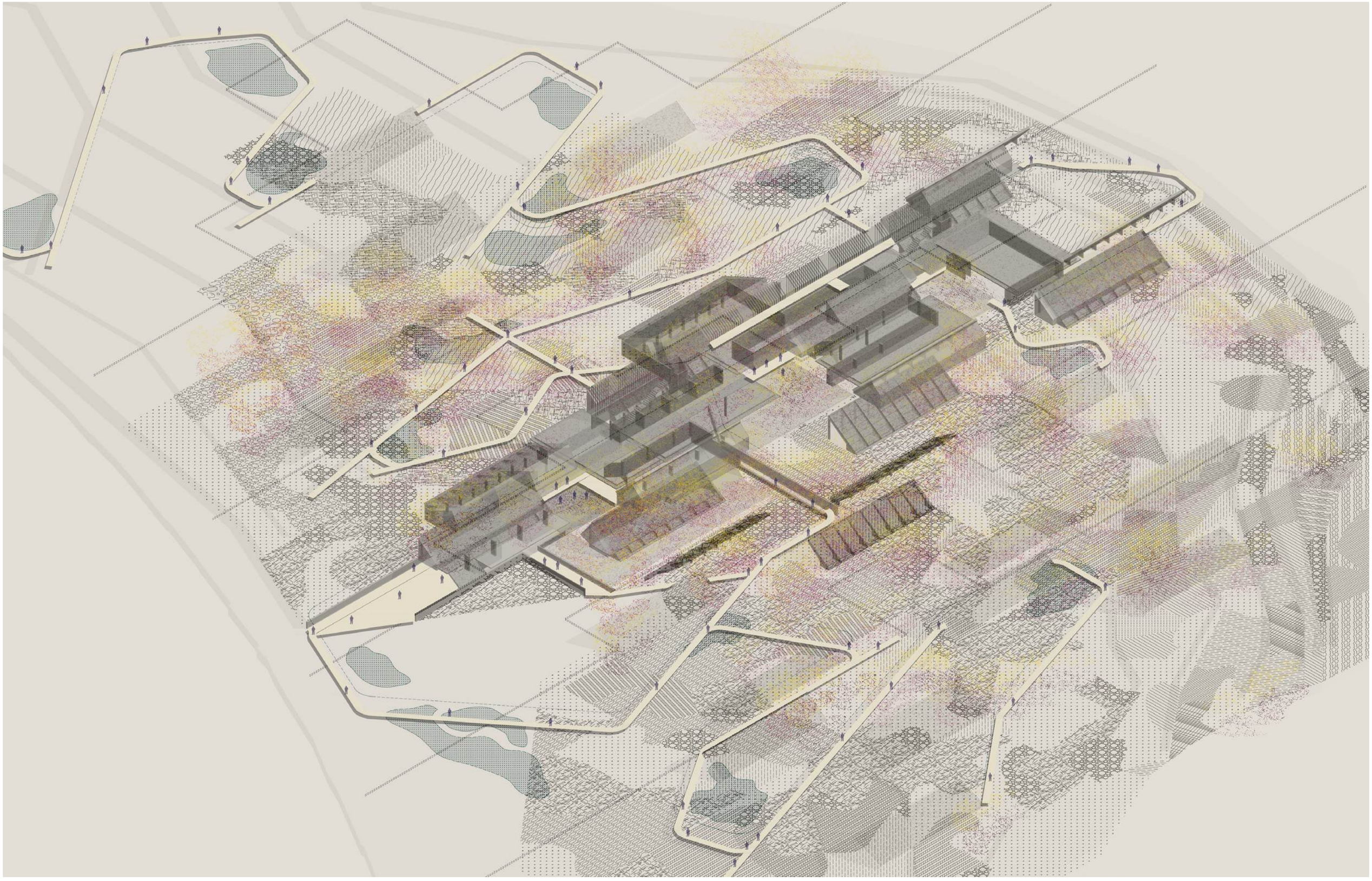
S2

S3

S4

► A permanent structure within the gardens will store physical and digital data collected from the outposts, serving as a centralized hub for research, education, and conservation.

Two main circulation paths will intersect, connecting both sides of the site. Integrating it with the living archive and functioning as an open-air museum.



Advanced Studio VI, Spring 2025
Studio Critics: Eleni Petaloti, Leonidas Trampoukis
Project - Research
Location: New York City, US - Nakajima, Japan
Author: María Paula Rico

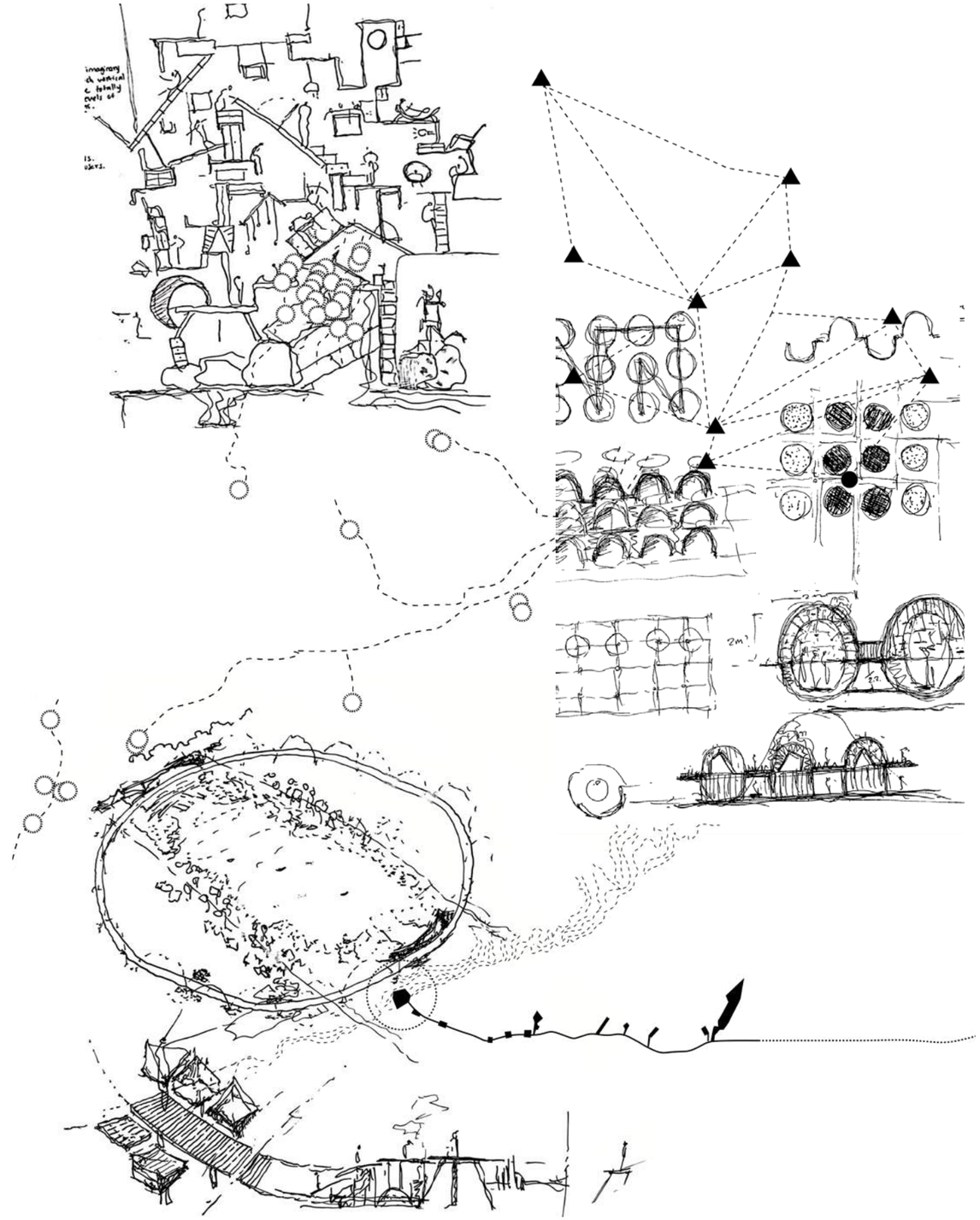
03

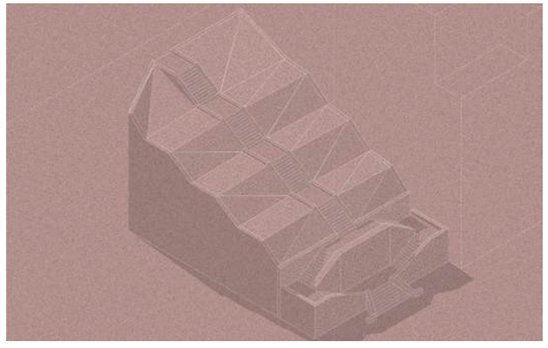
Conditions Of Interaction

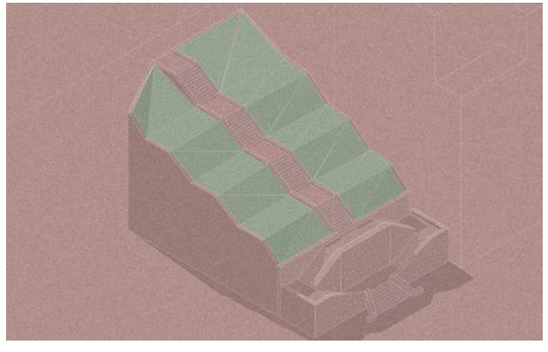
Three Projects engaging with the In-Between: Architecture Through Layers of Infrastructure, Ecology, and Time

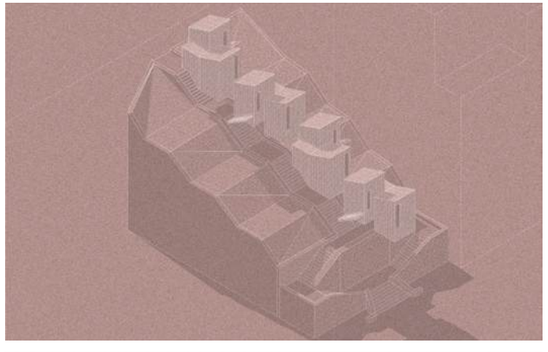
Conditions of interaction explores architecture as a practice of negotiation within ambiguous landscapes, where typologies dissolve, and the generation of new ways to interact among actors and elements becomes the central concern. The work unfolds through three different projects: private, semi-public, and public. Each situated in sites with ambiguous condition and multiple layers: an abandoned street staircase in the Bronx, a volcanic island in Japan, and a de-commissioned reservoir in New York City. These spaces, shaped by ecological, infrastructural, and historical contingencies, become tools to question program and agency.

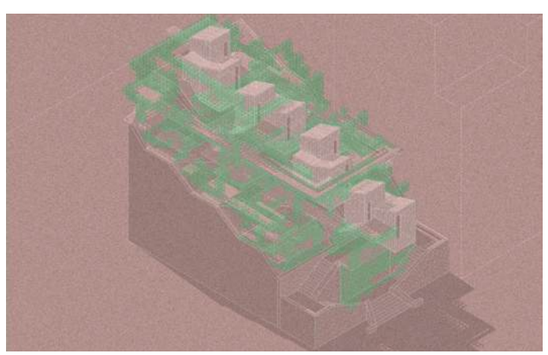
The private intervention, Habitat in Flux, reclaims neglected urban stairs as connective housing landscapes layered across topography. It proposes suspended domestic units and public gardens that challenge notions of property, permanence, and zoning. The semi-public project, Acoustic Ecosystem, transforms Nakajima Island into collective soundscape where mesh modules interact with wind, wildlife and sound, creating a dynamic instrument for ecological and acoustic exploration. Finally, the public proposal, Mutual Ecologies, activates Ridgewood Reservoir as a space of restoration, turning invasive species management into participatory ecological practice and linking three basins through a circular path that connect gardens, floating decks, and a public facility.
Together, these projects position architecture as a continuous, adaptive process; an active layering of systems, histories, and life forms, proposing new ways to inhabit uncertainty and reimagine shared futures.









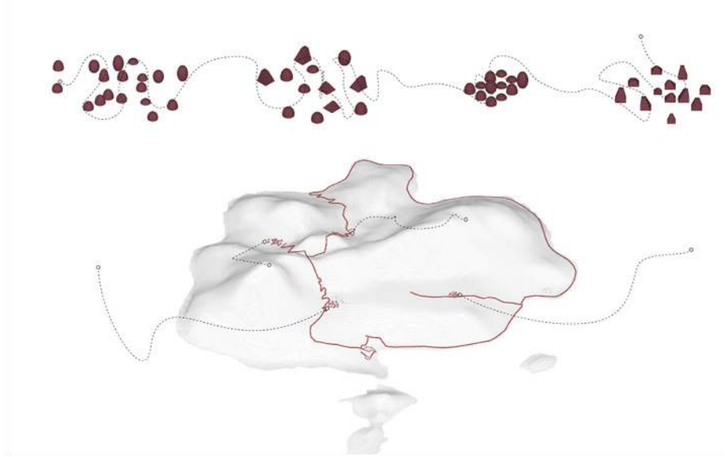


Habitat in Flux
Reclaiming the Abandoned Through Layered Domestic Space

Bronx, NYC

This project reclaims an abandoned street staircase in the Bronx as a layered domestic landscape, transforming a transitional piece of infrastructure into a site for living, growing, and gathering. Responding to the site's topography and history of neglect, suspended housing units and public gardens are embedded across a new structural grid. Detached from the ground and situated along the setback line, the housing challenges traditional ideas of property, ownership, and zoning. Paths and platforms weave across the terrain, creating porous thresholds between private and collective space. Here, architecture operates not as a fixed object but as a responsive field; activated through new interactions and layered across time.

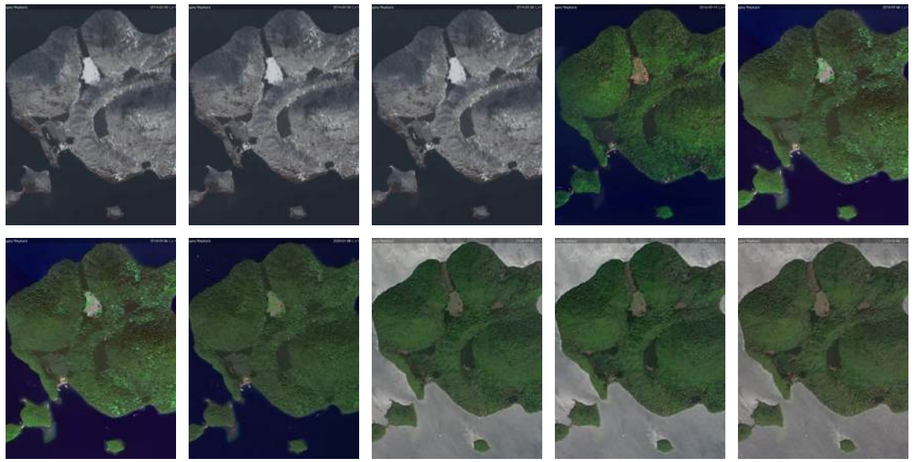
▲ This in between becomes a site of cohabitation, The Housing units operate as agents, independent and interdependent, generating a domestic field in motion.

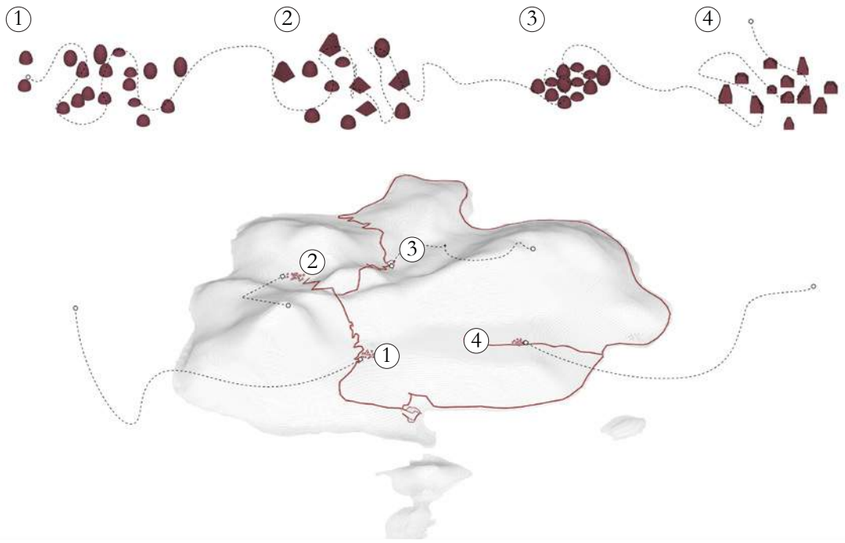


Acoustic Ecosystem
Interweaving Soundscapes, Species, and materials as Ecological Layers

Nakajima Island, Japan

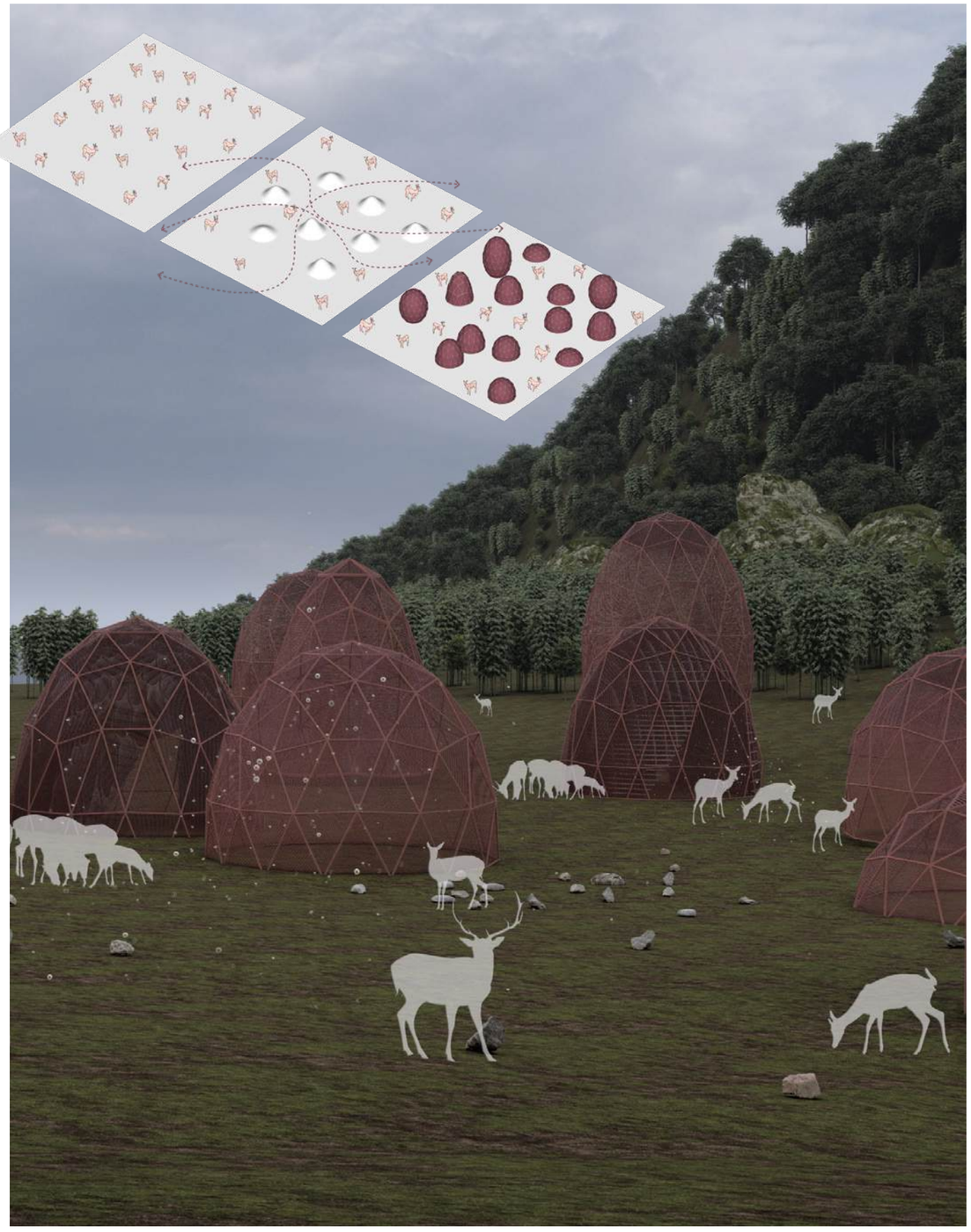
Set within the volcanic landscape of Nakajima Island, this project proposes a series of mesh modules that create an evolving soundscape. Positioned along an existing hiking trail, the modules record and broadcast sounds from the island's environment; wind, animals, vegetation, and volcano vibrations, while also capturing their own internal material transformations. The project responds to the island's ecological fragility, where restoration is challenged by a deer population introduced by humans and by harsh climate conditions. Through the creation of protective micro-topographies, the modules assist in reestablishing native vegetation. The installation is intentionally unfinished, conceived as a sensory instrument for ecological awareness and ongoing adaptation

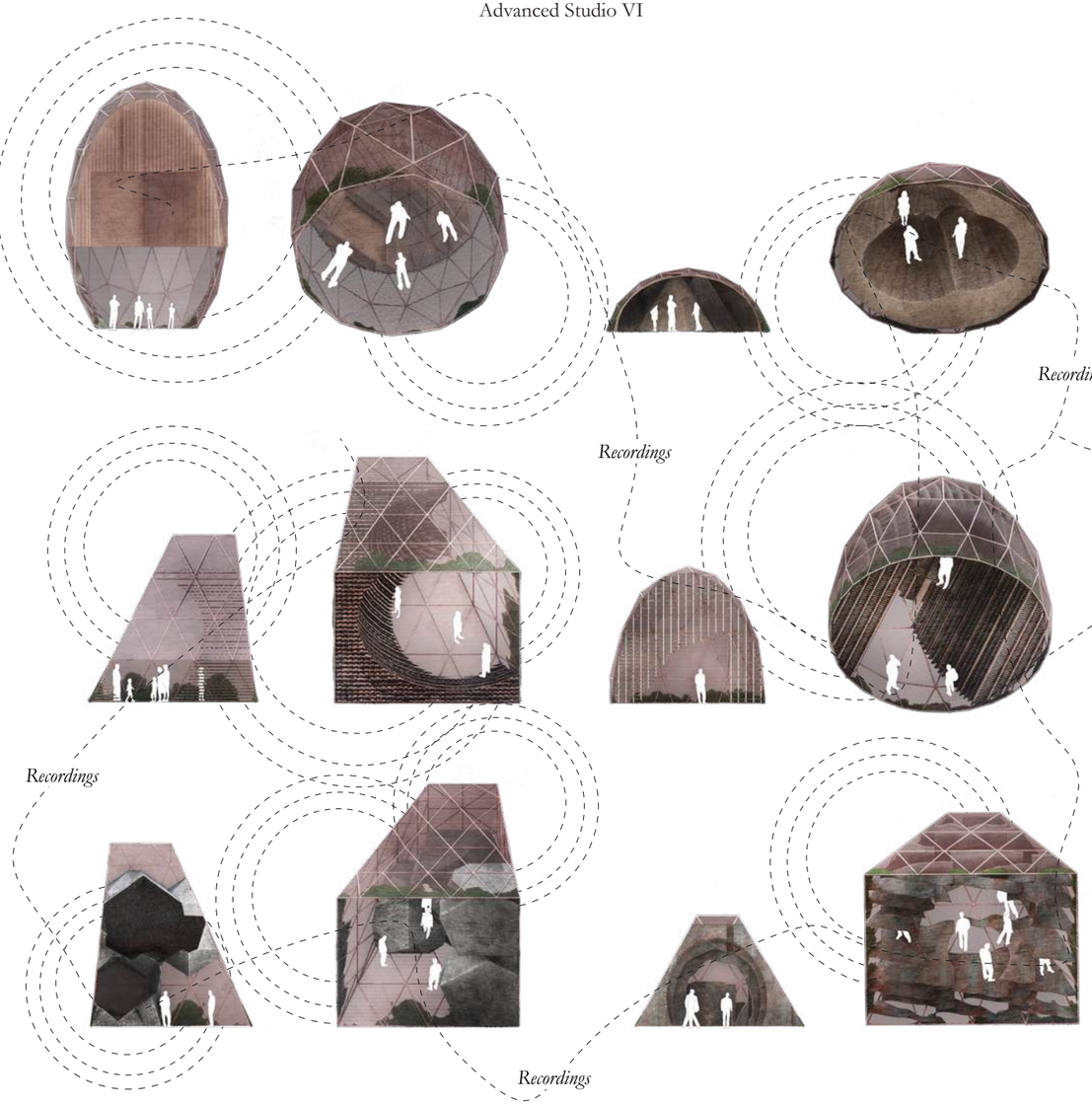


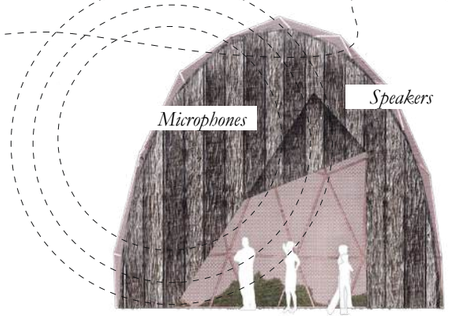


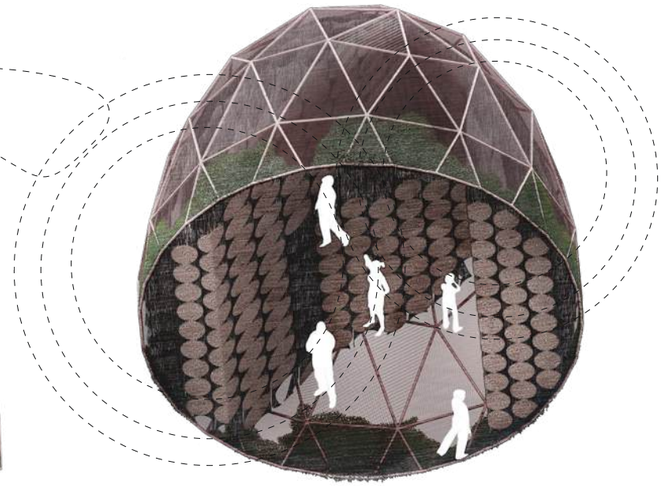
▲ The installation is composed of different modules positioned along the existing hiking path, where vegetation reclamation is still ongoing. These flattened parts have resisted full ecological succession, due to climate conditions and the overgrowth of a deer population introduced by humans sixty years ago.

► The installation aims to work with the landscape, creating topographies that protect certain areas from wind and redirect deer movement, helping ecosystems to reestablish.

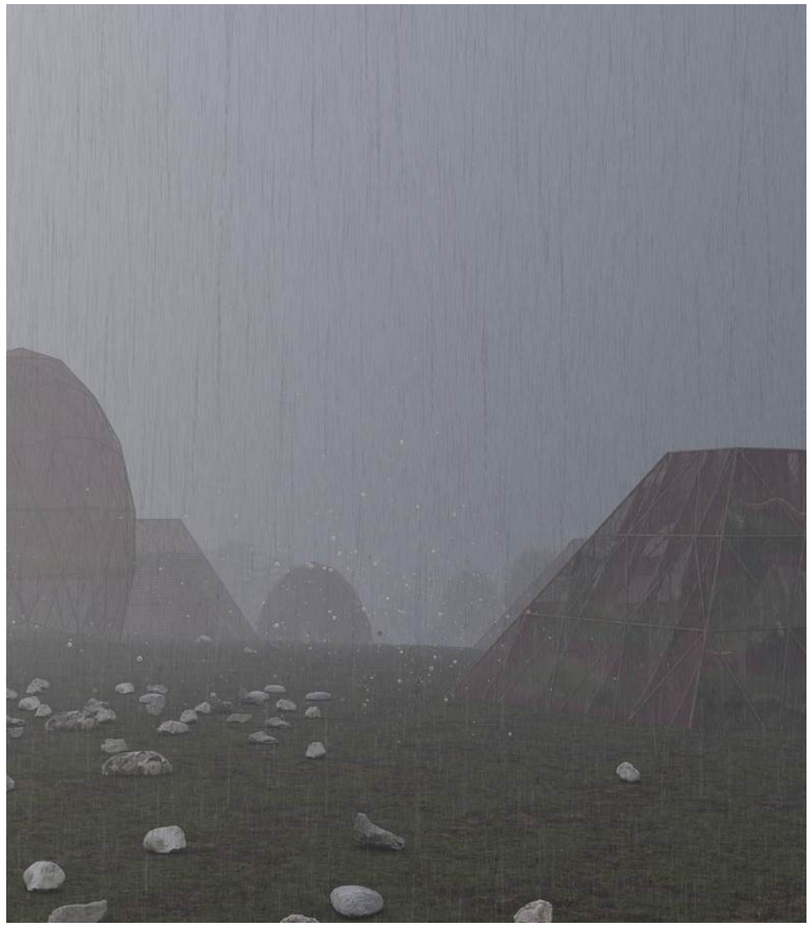








▲ Inside the modules the endless possibilities offered by the section foster of other interactions. Different materials fill the mesh-like structures, which undergo physical transformations through environmental exposure. Speakers inside the huts broadcast live recordings from various parts of the island and around it. At the same time, microphones capture the internal transformations of each module, where sound emerges through vibration and material distortion



▲ As visitors move between huts, the experience evolves, becoming a dynamic, endless auditory journey.While the device, intentionally unfinished, is an instrument for continuous sensory and ecological experimentation

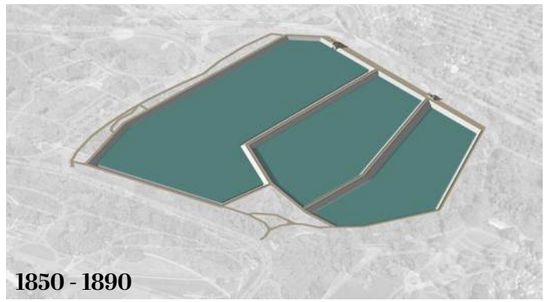
Mutual Ecologies
Reconfiguring an Abandoned Infrastructure Through Participatory and Ecological Layering

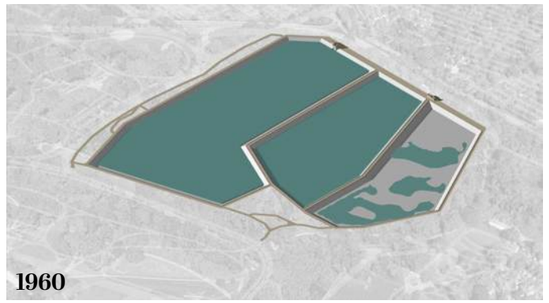
Ridgewood Reservoir, NYC

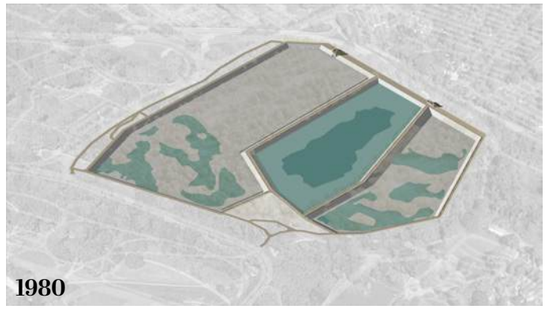
The Project inhabits a former water infrastructure and negotiates it into a layered system of ecological time zones. Once part of Brooklyn's 19th-century water supply, the project engages a landscape where decommissioned basins now host both endangered species and invasive plants. Fragmentation from past drainage cycles has resulted in eight distinct but fragile ecosystems.

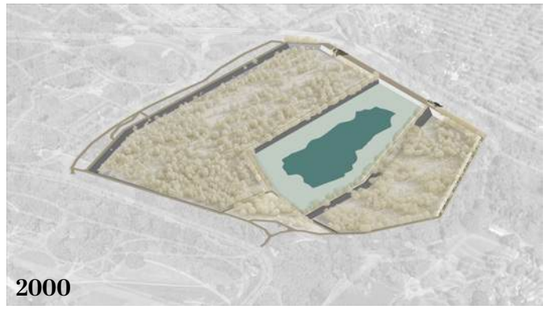
The proposal introduces a circular path connecting the three basins through a sequence of gardens that invite public participation in replanting native species. Harvested phragmites are transformed into compost, enriching the soil for greater biodiversity. Two boat decks activate passive water movement to suppress regrowth, while the site remains open to recreational and ecological uses.

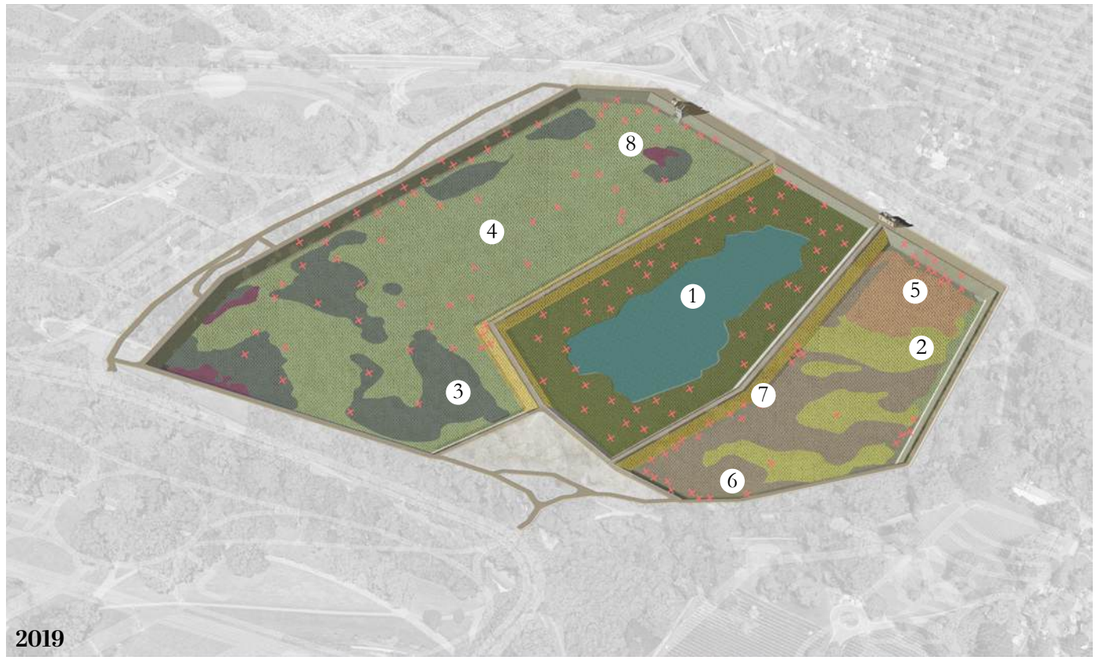
In its final phase, the two historic gatehouses are reimagined as a continuous public facility: a continuous path that hold a plant nursery, a space for education and historical memory, and a research center. Rather than impose form, the architecture works with ecological processes and social engagement to reconfigure the reservoir as a shared landscape of care. It becomes a space where environmental maintenance, public memory, and spatial transformation are layered into an evolving urban commons.







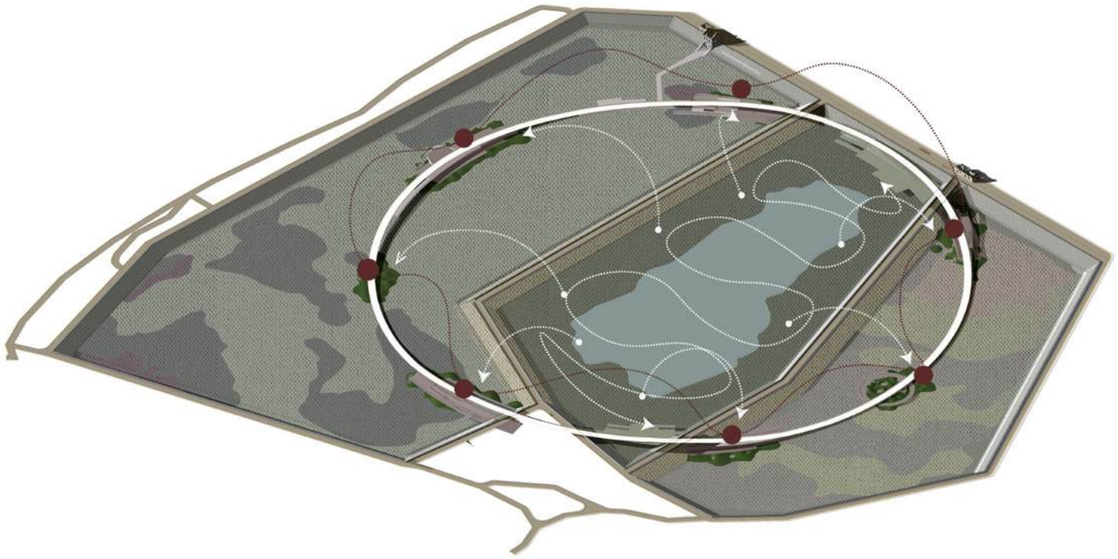




▲ Between 1850 - 1890 The three basins when operate were full with water, by 1960 when decommissioned, the East Basin was drained first. 30 years later, the West Basin was also drained, though some areas retained rainwater. Over time, vegetation colonized these basins at different moments. Invasive species (x)such as Australian phragmites and Japanese knotweed also found the ideal conditions to thrive, because they were favored by the fragmented conditions of the old infrastructure. Volunteer groups have tried to remove them, but eradication alone is not enough to keep and long-lasting balance.

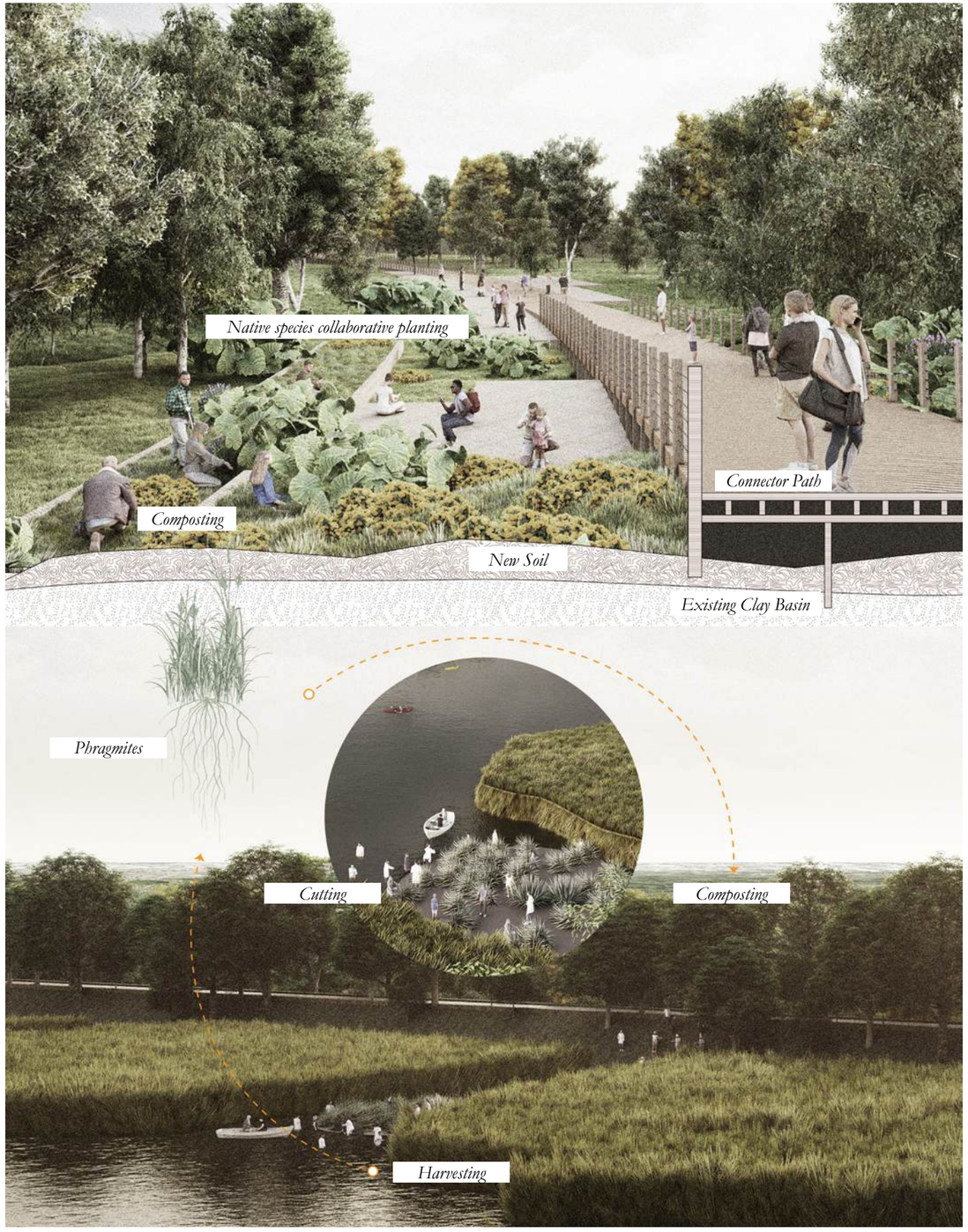
▲ Today, eight local endagered distinct ecosystems exist, but small and disconnected. Since Invasive species are everywhere, native species must encounter genetic diversification if they want to subsist.

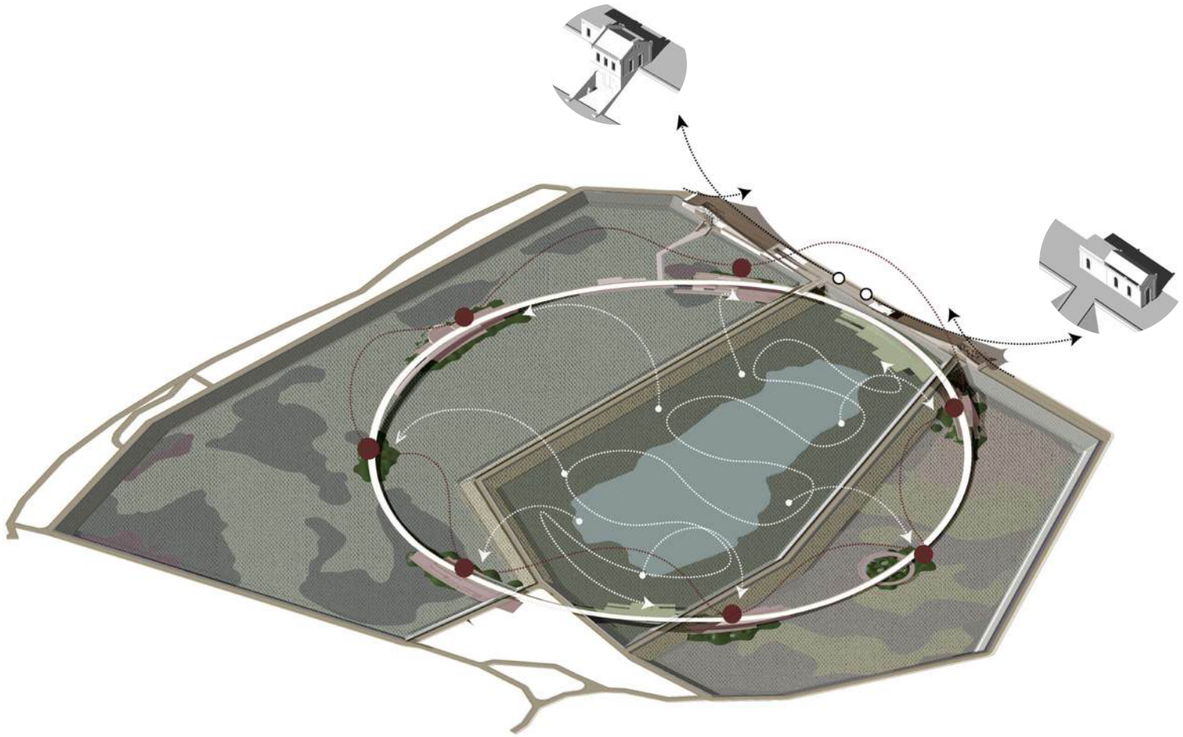
1. Fresh water pond
2. Shrub scrub Wetland
3. Grey Birch Savannah
4. Upland Forest
5. Birch – Maple Swamp
6. Mature Coastal Swamp Forest
7. Mature Forest
8. Bog



▲The project proposes reimagining new mutualistic relationships through public engagement, a layer is added, the new circular path that connects the three basins, through a sequence of gardens that invite volunteers to move, interact and replant local species.

► As part of the restoration strategy, harvested invasive species are transformed into compost on-site. This process not only manages ecological imbalance but also generates nutrient-rich soil to support native plant growth across the reservoir's gardens. Composting becomes both a maintenance tactic and a material layer within the larger ecological system.





▲In a final stage, the two historic gatehouses are integrated as part of a continuous public building.

► The public connector act as: a nursery for native plants, a space for education and historical memory. and a public space defined by participation and open to reconfiguration.

History of Archictectural Theory, Fall 2024
Professor: Mark Wigley
History - Theory
Author: María Paula Rico

04

Reflections about Architecture, Animal, Human: The Asymmetrical Condition by Catherine Ingraham

Ingraham's argument taps into broader, multidisciplinary discussions around post-humanism, climate responsibility, and ethical considerations regarding the status of non-human life. By questioning architecture's historical "indifference" to other forms of life and proposing a theoretical shift, the text reflects the influence of these contemporary concerns, addressing the urgent need for architectural discourse to evolve.

Architecture, Animal, Human: The Asymmetrical Condition is deeply rooted in the question of life and its relationship with architecture. It also delves into the relationship between architecture and the history of the idea of biological life. Her argument interrogates architecture's historical indifference to life and proposes an expanded framework that integrates biological, ecological, and philosophical concerns, fundamentally challenging how architectural discourse could be proposed.

By bridging architecture with other fields, Ingraham positions architecture as a tool for interdisciplinary discourse, opening up the invitation to external voices to influence over architectural discourse. This approach is not just provocative and controversial but, as she establishes, necessary for addressing the complex challenges that architecture faces today.

Is Architecture, Animal, Human: The Asymmetrical Condition a theory?

The answer to this question may be debated, on the one hand Architecture, Animal, Human can be argued as a work of theory because of the analysis of its central argument is situated in a specific historical context. As Ingraham mentions, she identifies herself as a theorist, therefore she is implicit attract to the necessity to use historical periods to place her argument.

The three periods in which she frames her argument (renaissance, enlightenment and present day) are entangled with previous ideas or theories on mind, matter, ethics, and biological interdependence, even if such questions have rarely been explicitly related to architecture, and here is an important point to consider whether or not this piece is an architectural theory.

On the other hand, the text challenges assumptions derived from other established architecture theories, and therefore could be placed also as one and constructs a cohesive argument for the necessity of shifting those assumptions. For instance, it critiques the anthropocentric ideals embedded in modernist texts, such as Le Corbusier's The City of Tomorrow, which assume that human life is superior over other forms of life. By addressing such biases, the book makes a case for rethinking these positions.

However, this is not a conventional piece of architectural theory. It departs significantly from definitive affirmations or manifesto-like positions regarding typology, function, form, or aesthetics, as other architectural pieces do. Instead, it positions itself as a force that pushes the boundaries of architectural discourse into interdisciplinary realms. The text introduces a series of points supporting this boundary expansion, delving into speculative territory and exploring controversial ideas with implications for architecture as a discipline, rather than focusing on practical or technical design aspects.

Through this, Ingraham ventures into a domain that many architectural theories have not explored: the intersection between architecture and life sciences.

Her assertion that architecture, as a stablished field, emerged simultaneously with, or shortly after, biology and taxonomy introduces a significant conceptual shift.

This allows for a continuous interchange of ideas between architecture and these disciplines.

This radically challenges the traditional notion of architecture as a separate and self-contained discipline, suggesting instead that it could be considered part of, or even a result of, other disciplines. This perspective undermines the long-standing claim of architecture as an isolated and pristine field, a stance that is likely to be controversial and divisive within the discipline.

Her open critique to the anthropocentric view of architecture inherent in traditional architectural theory challenges the discipline to consider non-human entities as part of its ethical and ecological framework. This shift requires a fundamental rethinking of architecture's purpose and its historical emphasis on human-centered design principles. It also risks alienating audiences who view architecture as a human endeavor, rooted

in human culture and society. Whether if in the future this piece could be consider as relevant addition to the architectural theory discourses will be the final judge about labeling of her work.

The objective

While it is evident that the book aims to provide a new perspective that could contribute to the conception of the actual discourse and purpose of architecture, it is necessary further analysis to explain which is the specific objective that aims to persuade a more inclusive understanding of architecture beyond human needs alone.

One of the most important points is when she mentions the way in which the concept of life is brought into an argument (no matter the field), as a way to shift the direction of the argument itself, and instantly adds a unique dynamic and energy to the discussion. For her, the concept of life represents a force in which curiosity and desire appear; making life an activator of architecture. Therefore, this is used in her argument as a catalyzer to induce the main objective that is to open the discussion that was mentioned above to establish a preliminary way, a minimum direction, on the formulation of more questions around the complexity of this subject matter.

Analyzing the Theory's core argument, structure and methodology
While the question of life is the framework of the book, Ingraham is also very specific saying that the book is about the relationship between architecture and the history of the idea of biological life, as mentioned earlier in this essay. The description of why the condition between life and architecture is Asymmetric is also a central argument: Architecture, whether considered a technical or artistic discipline, requires a precondition of human biological and psychological life, but this does not necessarily implicate that life is always embedded within architecture. As a matter of fact, architecture has tended to be more indifferent to life. On the other hand, life is always in constant seek of expansion and self-privilege; Ingraham points that this characteristic of life is a coined truth and could be applied to both humans and animals. And even when the consideration of this concept seems completely obvious, life has rarely been in the center of architectural discourse, and that is when this Asymmetrical relationship between life and architecture appears. In proposing that architecture has been operating at an asymmetrical distance from life, Ingraham risks destabilizing the conventional boundaries of architectural discourse.

The discipline, traditionally focused on material, spatial, and functional constructs, is reframed as incomplete without life's variability and vitality as mentioned earlier, this challenges the autonomy of architecture, positioning it not as a self-contained field but as one fundamentally entangled

with biological, ecological, and philosophical dynamics. The stakes for Ingraham are high: the credibility of her interdisciplinary approach and its potential to redefine architectural theory depend on its reception.

If integrating life sciences and ethics into architectural discussions is dismissed as overly speculative or irrelevant, her critique of architecture's historical indifference to life may fail to inspire the paradigmatic shift she envisions.

In the introduction Ingraham outlines her methodology as a way to navigate the intricate relationship between history, theory, and life. She explains that her aim is not to prioritize theory over history or vice versa but to explore areas that might otherwise be inaccessible. Life, she notes, is both historical rooted in biological evolution and ahistorical in its lived immediacy, requiring a dual perspective that balances both aspects. This duality shifts the nature of inquiry, prompting different questions than those typically asked by historians or practitioners. For Ingraham, architectural theory occupies a unique, intermediary position between history and practice, leveraging its ability to engage both realms without being entirely bound to either.
Her critical framework addresses enduring architectural themes, such as representation, modernism, and computational theories, alongside broader philosophical and material questions of architectural meaning. Additionally, she investigates biological life to reconsider human life's significance in architecture.

The book's structure also reflects this interdisciplinary and comparative approach. Each chapter tackles a distinct theme: Life (Before), Life (After): Post-Animal Life, The Divide, Milieu, Animal Urbanism, and Processing. This chronological progression mirrors her argument's evolution, from historical antecedents of architectural indifference to contemporary challenges.

The 2006 edition's cover imagery also reinforces Ingraham's argument. According to the information that is found on the credits, the cover is composed by the superposition of two images: one corresponds to background birds and is taken from Jeremiah Dine's Natural Selection while the foreground birds are taken from Etienne-Jules Marey's study of movement, as depicted in Siegfried Giedion's Mechanization Takes Command. This juxtaposes the organic aspects of life with the scientific approach depicting the core argument of the book.
Ingraham's language, while academically rigorous, remains accessible, although she occasionally employs metaphorical rhetoric that requires deep investigation to understand the intention. This choice of language, along with her extensive documentation, give credibility to her proposals. On the other hand, the mentions in the acknowledgments of the book of very well known figures in the architectural field that have invited her to lecture in very prestigious institutions about these specific subjects. This talks about her respected position in the academic architecture field and probably provided her the confidence to venture into this complex argumentation.

Underlying Assumptions in Ingraham's Argument
Ingraham's argument presupposes certain assumptions and concepts; while it is possible to infer a lot of assumptions, this essay will highlight those that are the core of her argumentation and will serve as framing devices.

1.Architecture's historical indifference to life.

One of the stating points is the comparison of the duality between architecture in the context of mathematics and life with the assumption that architecture has been attached, since the Renaissance period, to these two concepts. Mathematics is considered "as the physicist's most dreaded weapon" and life "involved to be fully accessible to mathematics". Ingraham uses these two quotations from Austrian- Irish Physicist, Nobel prize winner, Erwing Schrödinger and his Book What is life? (1944). Schrödinger argues that space and time take place within the boundaries of living organisms that can be accounted for by physics and chemistry, asserting the duality between mathematics and life. For her, everyone who is interested in the problem of life in architecture should start by looking at Schrödinger's work. She also argues that this book generated significant shifts in both fields, genetics and physics, after

its publication, to compare what could the introduction of a more thorough understanding of life do to the concept of architecture.
This is a key component establishing her argumentation, she makes a very straightforward parallel between the problem of quantum physics in the 1950's, when concerns regarding the statical analysis of the physicist's usual study of objects, or non-living matter, with the complete different and separate world of living organisms, and where Schrödinger´s book suggested that these two fields should be brought together to compare their behavior, since both operate under the same rules.

According to Ingraham, contemporary architecture has the same problem. Schrödinger's solution to these contrapositions between life and physics is not based in a material reductionism or empiricism but a problem of mind and matter. This reflects a key component in her own structure, as it shows which should be the shift in the discussion in contemporary architecture, where the indifference to life should shift as well.

2.The interdependence between stability and change.

Using comparison again, Ingraham relates this to the relationship between the architect and the inhabitant, the active living in the passive, the animate in the inanimate as a sort philosophical paradox that in the contemporary architectural analysis have been left to the philosophers and writers. She mentions a list of chronological ideas from Plato to Deleuze where she criticizes the way in which all of them have used architecture as a canvas for their ideas but, surprisingly, they have left aside the question of life from the side of architecture.

On the other hand, she points out that architecture has been in a good position to take advantage of the philosophical paradoxes, and to make them work within their differences in a temporary way. For instance, this idea challenges traditional views of architecture as purely static and fixed, suggesting instead that architectural stability requires a dynamic relationship with life, one that embraces change.

3. The double condition of architecture that provides variability and variation.

Ingraham introduces the dual nature of architecture, which simultaneously offers variability and variation. This concept situates architecture as both a stabilizing force and a responsive system, capable of adapting to the shifting demands of life.

4.The problem of the animal in architecture.

Ingraham highlights the "problem of the animal" in architecture, which she frames as a historical and philosophical issue. Theological frameworks once marginalized animals as symbolic representations, while later philosophical

discourses relegated them to a lower existential status. Ingraham challenges these paradigms by considering the animal as alive in architecture in ways identical to human aliveness. As such, animals are eligible occupants of architecture, influenced by the formal realm of the building.

This disrupts anthropocentric assumptions and compels architecture to deal with the ethical and representational implications of non-human life. She questions whether architecture validates the equal conditions of animals and humans, a proposition that complicates traditional hierarchies of life within architectural theory. Human and animal life cannot be detached as they mean different things in different times.

5. The question of autonomy and post-humanism

Ingraham assumes that architecture's autonomy, long upheld by its human-centered foundations, must be reexamined in light of post-humanism. Post-humanism calls for an expanded ethical framework that includes non-human actors, and Ingraham's position challenges architecture to reconsider its relationship with life in this context. By proposing a post-animal framework, she invites architecture to move beyond its anthropocentric roots and engage with broader ecological and biological systems. As mentioned, this assumption questions the discipline's traditional boundaries, suggesting that architecture is no longer a self-contained entity.

6. The notion of architecture and life within a specific historical frame and the ahistorical nature of life as a subject.

Ingraham acknowledges the ahistorical nature of life, noting that biological life exists in a timeless state even as it is shaped by its history. This duality creates a challenge for architectural theory, which often relies on historical analysis. Ingraham presumes that the significance and objectives of architecture have shifted through history. Becoming human inherently involves an architectural dimension, meaning that from the moment humans developed a sense of identity, they also engaged with creating shelter, space, and structure. But it wasn't until the 18th century that architecture became a formal discipline, claiming a central role in shaping human life. She implies that this historical development affects how architecture is viewed today, often as a discipline centered around stability and order.

Ingraham admits that in order to create a boundary to her argument, she has been forced to comprise this historical development to three pivotal periods based on western ideas of architecture and life; the periods of the Renaissance, the Enlightenment, and contemporary time, each representing a distinct phase in architecture's evolving relationship with life.

The Renaissance, for instance, introduced human-centered ideals, where architecture aligned itself with humanism by emphasizing symmetry, proportion, and order in relation to the human body. This period marked architecture's initial big break from nature and animal life, reflecting a growing focus on human achievement and secular values.

The Enlightenment brought another significant shift, as scientific advancements led to the classification and separation of human and animal life, establishing clear distinctions between species and in which humans received a separated branch. This period saw the formalization of biology as a discipline, and the introduction of the homo sapiens and architecture began to align itself with scientific principles, categorizing and ordering spaces in a way that mirrored biological taxonomies: the introduction to architecture words like typology, organization, evolution, development. Architectural history as a discipline also emerged, further reinforcing the notion of architecture as a structured, systematic field focused on human needs and scientific precision. In this period the introduction of questions about human life and architecture that view the gradual emergence of this category of the "human" in biology, so from there the question she asks is how does a change in the status of human life in culture affects architectural ideas?

In contemporary times, genetic and computational developments have once again reshaped architecture's relationship with life. Advances in genetics challenge previous assumptions about species boundaries and the uniqueness of human life, leading to new ethical and ecological questions.

Ingraham points that the rise of digital and computational technologies in architecture has also introduced concepts like fluidity, adaptability, and generative design, which parallel the biological processes of evolution and adaptation. This period marks a potential shifttoward more responsive, life-centered architectural practices that consider environmental sustainability and the interconnectedness of all living beings.

7. The concept of post-animal life.

Ingraham assumes that architecture should consider the ethical implications of its impact on non-human life forms. This broadens the scope of architectural responsibility, challenging the discipline to integrate ecological consciousness as part of its fundamental core. Her mention to the animal rights claims by Peter Singer professor at Princeton University to introduce the advocation for a controvert ethical argument in which animals have equal moral status to humans is a way to introduce a framework that helps her to explain the concept of "post-animal life" in which she advocates for a more expansive, life-centered architectural discourse that embraces both human and non-human entities.

8. The classic architectural concerns of aesthetics (art), technology (science), and practicality (function) are not solely cultural or technical.

Ingraham assumes aesthetics, technology, and practivality are biological because that they address fundamental human needs and behaviors. By positioning architecture within a biological context, she suggests that it inadvertently mirrors life sciences, making it inherently complex and challenging to define.

9. The problem of life as technology vs. technology as alive

She also explores the tension between theorizing life as a form of technology and theorizing technology as a form of life. She acknowledges that while the former perspective is more readily accepted, the latter (viewing architecture as a living entity) is more challenging to substantiate. For Ingraham, architecture operates within this tension, shaping and being shaped by the technologies it employs and the life forms it interacts with.

10. Architecture as a Life Science

The final assumption a probably the most radical one could be that architecture is structurally a surreptitious form of life science. By framing architecture within the context of life sciences, she positions it as inherently tied to the biological processes it often seeks to control or replicate.

The questions that remain

The practical implications of Ingraham's theories for the field of architecture, particularly how they address tangible applications, remain ambiguous in this book. Although she acknowledges architects' efforts to reconcile modernist concerns such as plans and programs with contemporary emphases on surfaces and adaptability, the book provides limited guidance on how her inclusion of life might directly contribute to these reconciliations. While her work is a profound intellectual endeavor, it invites questions about how these theoretical insights could inform the pragmatic realities of architectural practice. Ingraham's theories, while enriching architectural discourse, are broad and speculative, making direct application to practice challenging. It's unclear if she intended these abstract ideas to influence practice or left their application open to interpretation.

Ingraham's approach to the political dimensions of architecture is similarly understated. While her reliance on scientific metaphors, as drivers of architectural thought is innovative, it leaves out critical social and political considerations that are integral to contemporary architectural debates.

This absence is notable given the increasingly political nature of discussions about architecture in the context of globalization. Although philosophy is central to her argument, her discussion of life is not necessarily framed as explicitly political.

On the other hand, it is not clear what is her position regarding other living species that are not necessarily animals or humans,as the text does not mention other life forms such as plants or microorganisms. These entities, especially microorganisms, have recently been acknowledged as key players in ecological systems due to advancements in technology and the possibility that we now have to see them. By only delve in the historic relationship between humans and animals, her framework risks perpetuating a hierarchical view of life, narrowing its relevance to the broader biological spectrum that architecture interacts with.

Finally, her reliance on Western philosophical and historical frameworks raises concerns about the inclusivity of her argument. While she honestly acknowledges that her approach is grounded in pivotal Western periods, this focus risks marginalizing non-Western traditions and perspectives, which, if included, could significantly enrich architectural discourse. In today's interconnected world, such exclusions may risk the applicability of her theories in addressing global challenges that demand a more comprehensive and culturally inclusive perspective.

Conclusion

Ingraham's work is a bold and necessary contribution to architectural discourse. Her call to expand the field's boundaries by integrating biological, ecological, and philosophical considerations challenges long-held assumptions and pushes the discipline into new territories. Despite its limitations, her effort to establish a foundation for a more inclusive and interdisciplinary architectural theory is an achievement worthy of recognition.

Her approach, however, is not without risks. By questioning foundational assumptions and adopting a radically interdisciplinary stance, Ingraham risks alienating traditionalists and diluting the core focus of architectural theory. The speculative and abstract nature of her arguments may also distance her work from practical immediate application.Ultimately, Ingraham's work is not a definitive roadmap but an invitation, a provocation to rethink architecture's role in an interconnected world. By fostering a dialogue for ongoing debate and exploration in architectural theory. The risks she takes in presenting such a radical approach may not only limit immediate acceptance, but also underscore the urgency and relevance of her vision for the future of architecture.

Construction Ecologies, Fall 2024
Professor: Tommy Schaperkotter
Elective - Research
Authors: María Paula Rico - Franco Nocioni

05

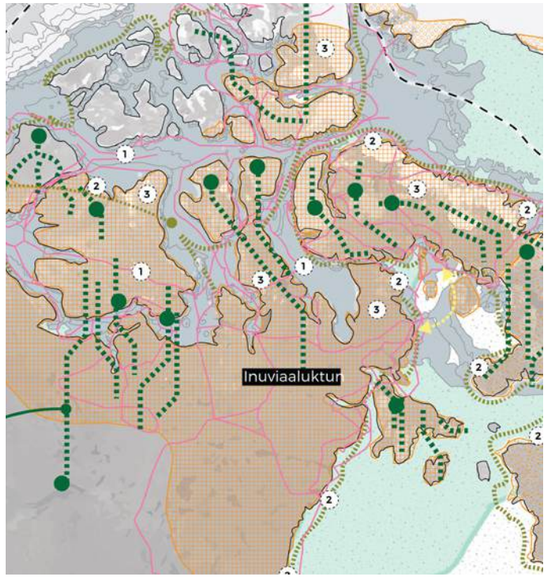
Nomadic Material Systems

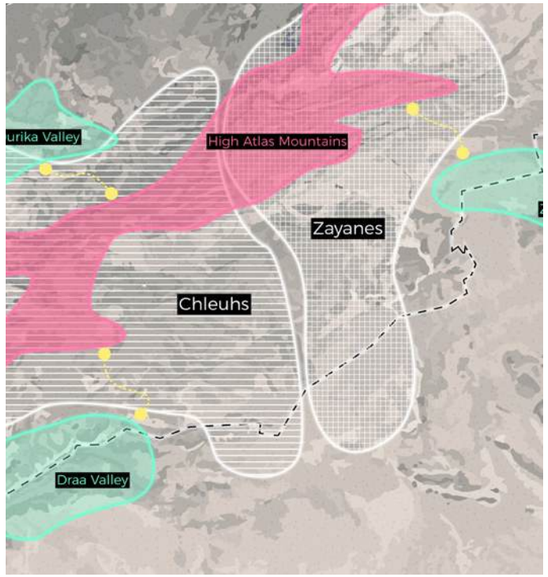
Unveiling the Hidden Relationships and Negotiations Between Construction, Environment, and Motion in Berber and Inuit Communities

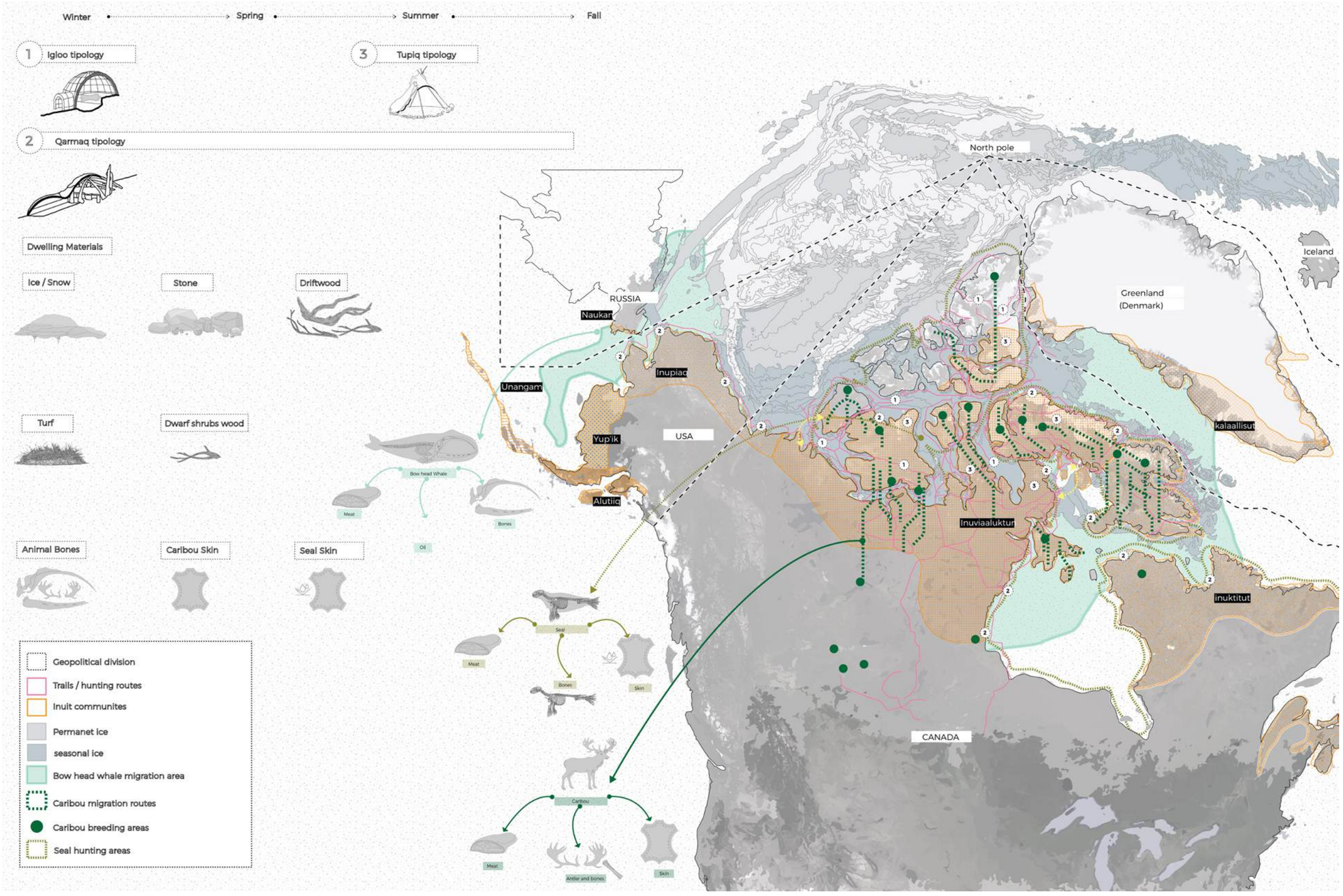
What role does mobility play in our understanding of settlement, and how can we rediscover the balance between permanence and impermanence in the way we inhabit the world?

This comparative research analyzes the building cultures of Inuit and Berber communities, two groups shaped by extreme environmental conditions and continuous movement. By tracing the logic behind their material choices, it reveals how architecture is deeply rooted in ecological awareness, mobility, and mutualistic relationships with other species, climate and the notion of resources and waste. The project challenges static conceptions of architecture by studying construction as an evolving ecological interaction; one where thermal performance, portability, and adaptability are not constraints, but intentional design layers. Through this lens, construction becomes a cultural and material negotiation between territory, time, and life.

Their construction systems are not the result of aesthetic decisions but of environmental negotiations, material constraints, and a deep awareness of the territories they inhabit.

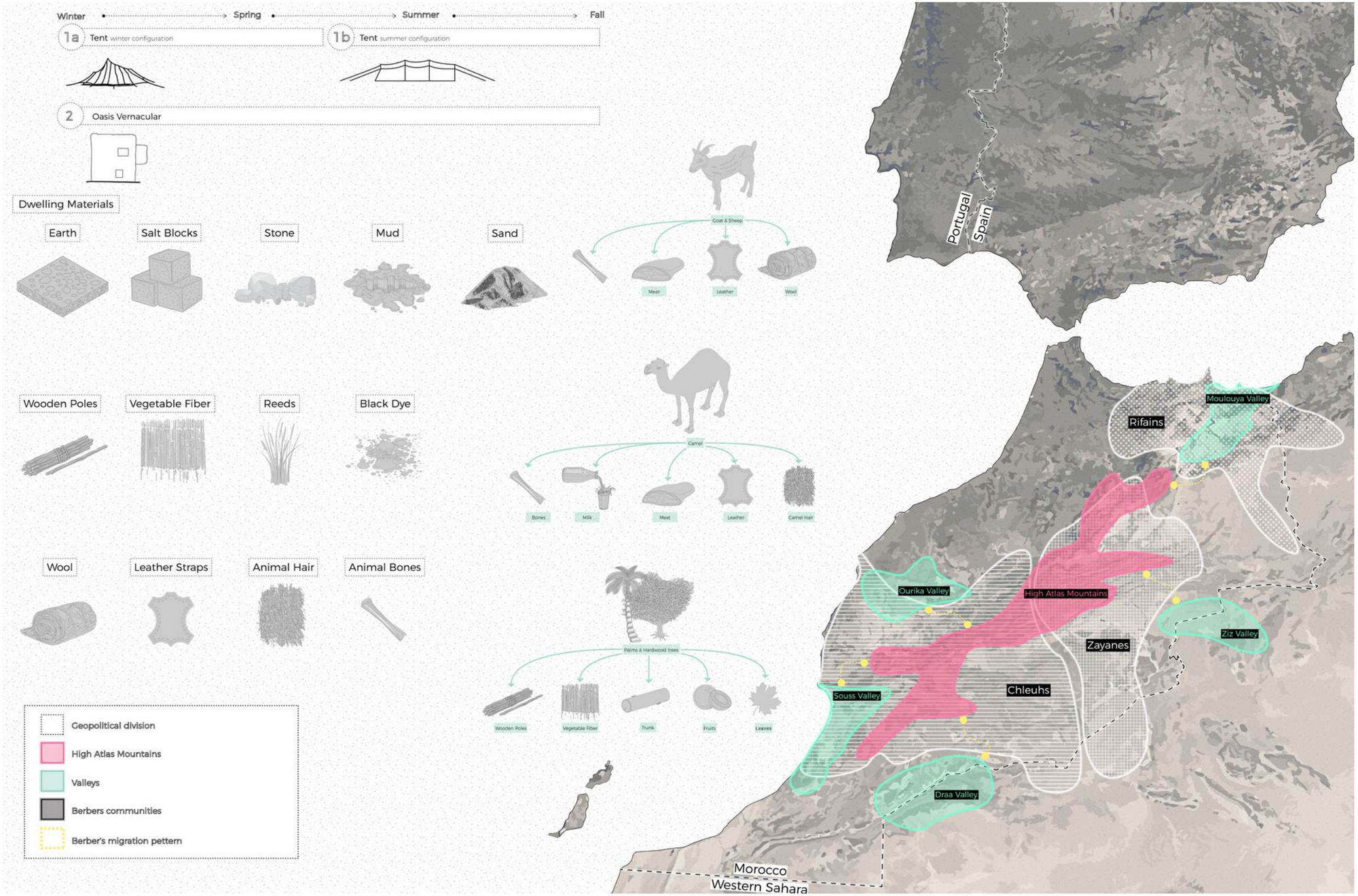




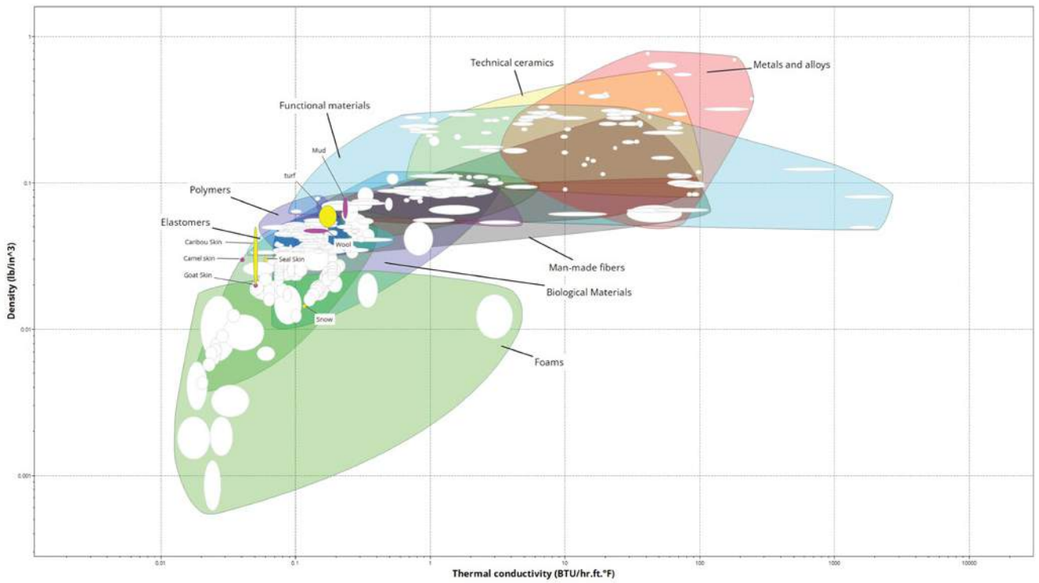


◀ The Inuit's relationship with migration, seasons, dwellings, and available materials is deeply interconnected and reflects their adaptability to the Arctic's extreme environment. Seasonal migrations followed the movement of animals like caribou, seals, and whales, which are vital for food, tools, and construction materials. During the harsh winters, Inuit communities built igloos from snow, an abundant insulating material, while in warmer months, they constructed tents using lightweight and portable animal skins and driftwood, accommodating their mobile lifestyle. For semi-permanent dwellings like qarmaqs, materials such as whale bones, fur, and stone are used, reflecting a more settled phase during resource-rich seasons.

This cyclical relationship between seasons, available resources, and dwelling types showcases the Inuit's ingenuity in sustainably utilizing their environment while adapting to seasonal and migratory demands.

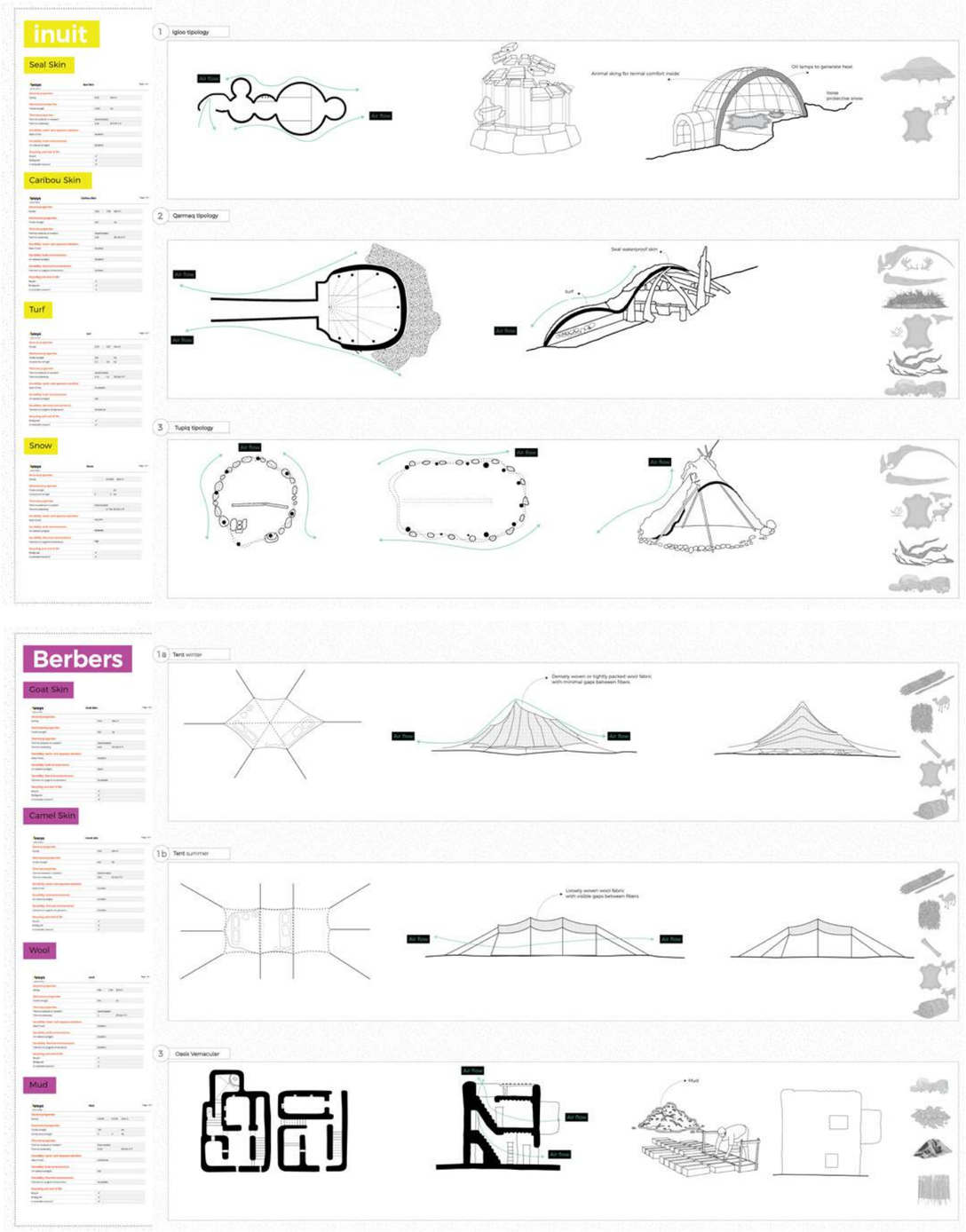


◀ For Berber communities, migration, seasons, dwellings, and available materials are deeply interconnected. Nomadic Berbers migrate seasonally, moving with their herds to access grazing lands in warmer months and retreating to sheltered areas during colder seasons. This mobility influences their use of lightweight, portable tents made from locally sourced materials like wool, goat hair, and wooden poles. In contrast, sedentary Berbers adapt to their environment with earthen dwellings, utilizing abundant materials like mud bricks, palm wood, and reeds in oases or fertile valleys. Both lifestyles reflect a deep relationship with the natural environment, balancing seasonal needs with sustainable resource use.



▲Despite their placement in vastly different latitudes: the frozen Arctic and the arid desert, the Inuit and Berber communities exhibit remarkable parallels in their architectural strategies. The properties of their main materials, as highlighted by Granta's classifications (foams, biological materials, and functional materials), are closely aligned, prioritizing low thermal conductivity, durability, and breathability to withstand environmental extremes. The comparison of thermal conductivity against density is a highly effective method for evaluating the performance of building materials, particularly in extreme climates.

► By analyzing materials through this lens, we can identify which resources provide the best insulation and energy regulation relative to their weight. For Inuit dwellings, the lightweight, low-density snow and skins ensure immediate insulation without structural bulk, essential for mobility and Arctic survival. In contrast, Berber materials such as mud and wool strike a balance between density (for thermal mass) and breathability, optimizing protection in hot desert conditions.



The Outside In Project, Fall 2024
Professors: Galia Solomonoff,Laurie Hawkinson
Seminar - Installation
Location: Columbia University, NYC
Authors: Spring 2024 - Fall 2024
Students Seminar

06

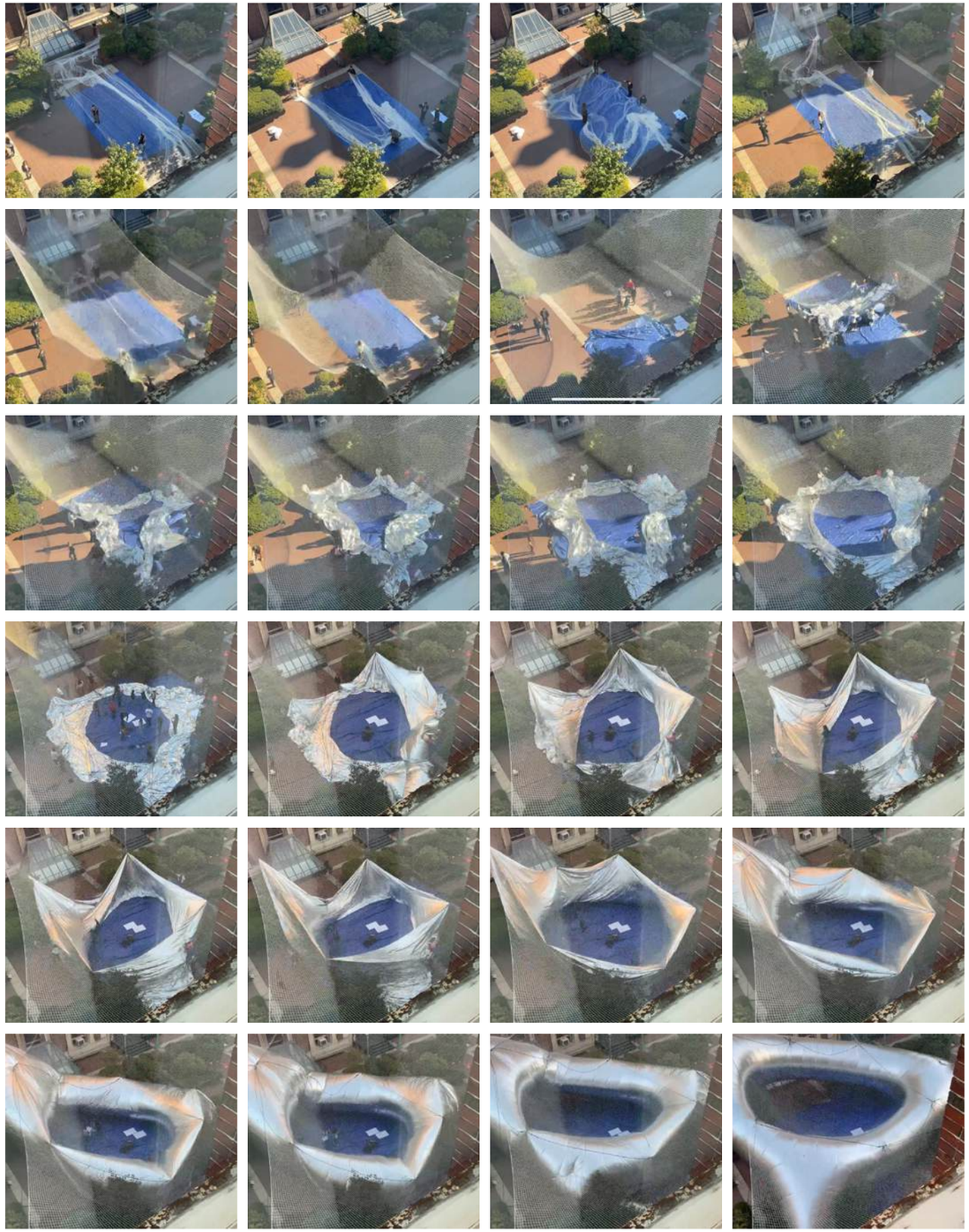
The Outside In - Cloud

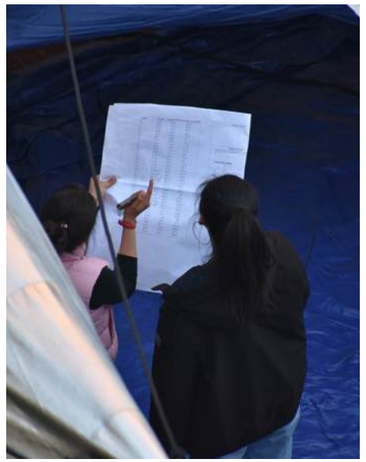
Outside In is a student-led collaborative inflatable pavillion design. an ephemeral installation that brought together actors, efforts, thinking, and strategies to make an idea physically possible. It is an experiment in collaboration

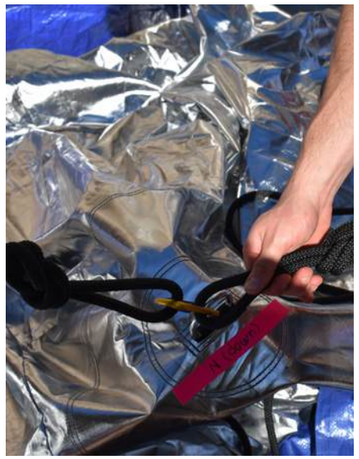
The project layered many forms of interaction: physical, social, environmental, and institutional. Suspended by 25 cables and powered by four blowers, the Cloud challenged the traditional boundaries between inside and outside, softness and structure, permanence and ephemerality. Its presence redefined Avery Plaza, turning an overlooked threshold into a shared space of reflection, gathering, and exchange.

From the beginning, the Cloud was a collaborative experiment a real test of how to move from theory to action. It involved coordination with structural engineers, inflatable manufacturers, university facilities, and our own classmates. **As part of the Drawing Team, my contribution focused on translating conceptual intentions into clear visual documents; drawings that served not only as tools for construction, but as bridges between design, fabrication, and communication. These drawings helped coordinate, before the installation, the amount of materials, and during the installation, the distribution of people and the way to explain how the anchoring systems were installed.**

For nine days, the Cloud became a vibrant hub: hosting the open-house, midterm reviews, lectures, concerts, yoga classes, and a community-led celebration. Its design was open-ended , not only in geometry, but in intention. It allowed people to shape their own experiences, and in doing so, created a space of meaning beyond the architectural object.

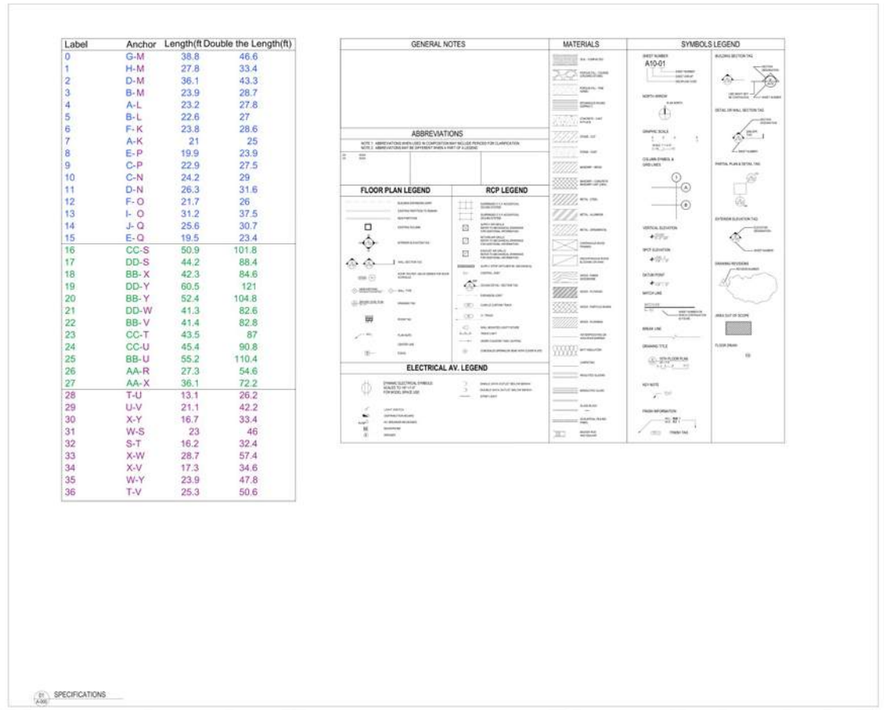




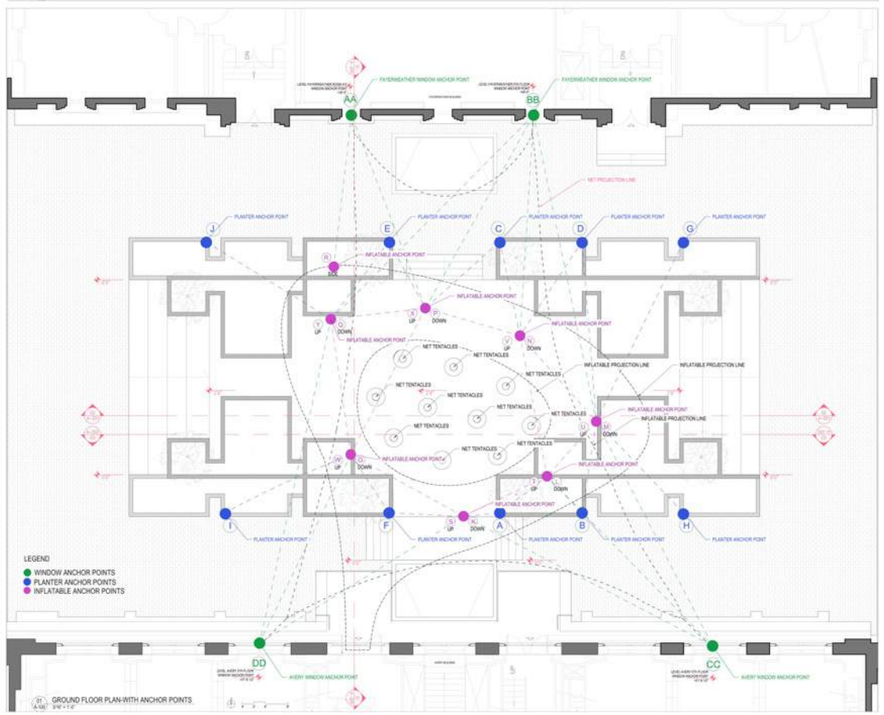


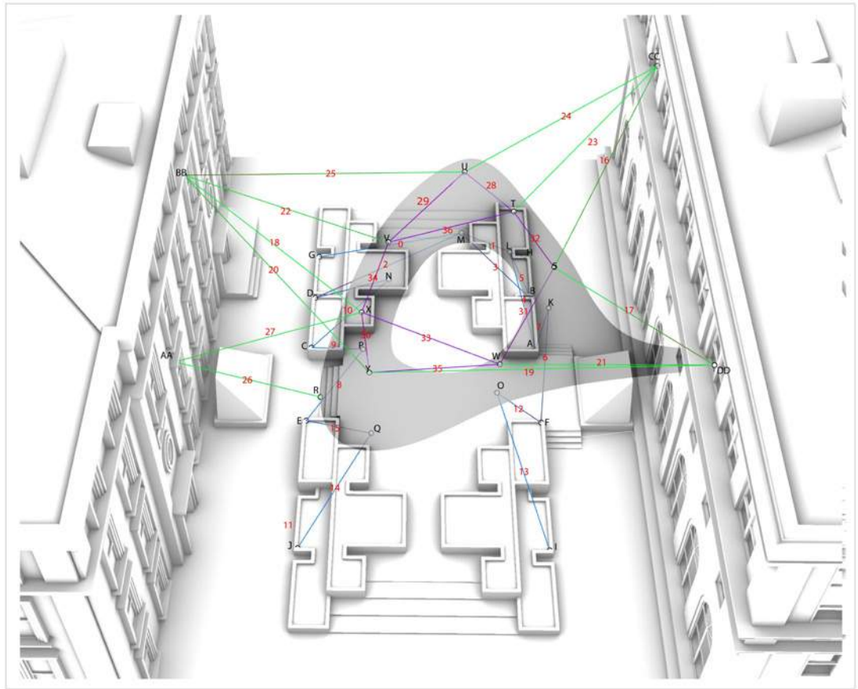
▲During installation, the drawings guided our team in real time. Using a color-coded system; blue (planter anchors), green (window anchors), and magenta (inflatable points), we labeled anchor locations on site, allowing for fast coordination and accurate setup.

► The color-coded is an alphanumeric system that maps all anchor locations, rope connections, and lengths, allowing for accurate coordination between the inflatable and its fixed support points.



Label	Anchor	Length(ft	Double the Length(ft)
0	G-M	38.8	46.6
1	H-M	27.8	33.4
2	D-M	36.1	43.3
3	B-M	23.9	28.7
4	A-L	23.2	27.8
5	B-L	22.6	27
6	F-K	23.8	28.6
7	A-K	21	25
8	E-P	19.9	23.9
9	C-P	22.9	27.5
10	C-N	24.2	29
11	D-N	26.3	31.6
12	F-Q	21.7	26
13	I- O	31.2	37.5
14	J- Q	25.6	30.7
15	E-Q	19.5	23.4
16	CC-S	50.9	101.8
17	DD-S	44.2	88.4
18	BB- X	42.3	84.6
19	DD-Y	60.5	121
20	BB- Y	52.4	104.8
21	DD-W	41.3	82.6
22	BB- V	41.4	82.8
23	CC-T	43.5	87
24	CC-U	45.4	90.8
25	BB- U	55.2	110.4
26	AA-R	27.3	54.6
27	AA- X	36.1	72.2
28	T-U	13.1	26.2
29	U-V	21.1	42.2
30	X-Y	16.7	33.4
31	W-S	23	46
32	S-T	16.2	32.4
33	X-W	28.7	57.4
34	X-V	17.3	34.6
35	W-Y	23.9	47.8
36	T-V	25.3	50.6





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STRUCTURAL
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INFLATABLE MANUFACTURING
AREA CUBICA, NATALIA SERRA

COLUMBIA UNIVERSITY
GSAPP AND FACILITIES

SPRING 2024 SEMESTER
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FALL 2024 SEMESTER
Devyanshi Arya, Qizhen Chen, Lula Chou, Daniel Hahn, Yun Jeong Han, Martina Hollmann, Laurent-Shixun Huang, Ka Heun Hyun, Lauren Jan, Adi Klein, Leslie Li, Lucy Li, Claire Nora Navin, Franco Daniel Nocioni, Rena Okamoto, Matija Pogorilic, Maria Paula Rico, Khushi Rakesh Saraiya, Anna Maria Schmitz, Longju Sun, Nikoletta Zakynthinou Xanthi, Hanyin Zhang, Joe Zhang, Yunhao Zhong, Manas Bhatia, Matilda Terrill

COLLABORATORS
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REVISIONS

NO.	DESCRIPTION	DATE
1.	FINAL ISSAUNCE	09/18/24

MOST UPDATED VERSION 9/18/24

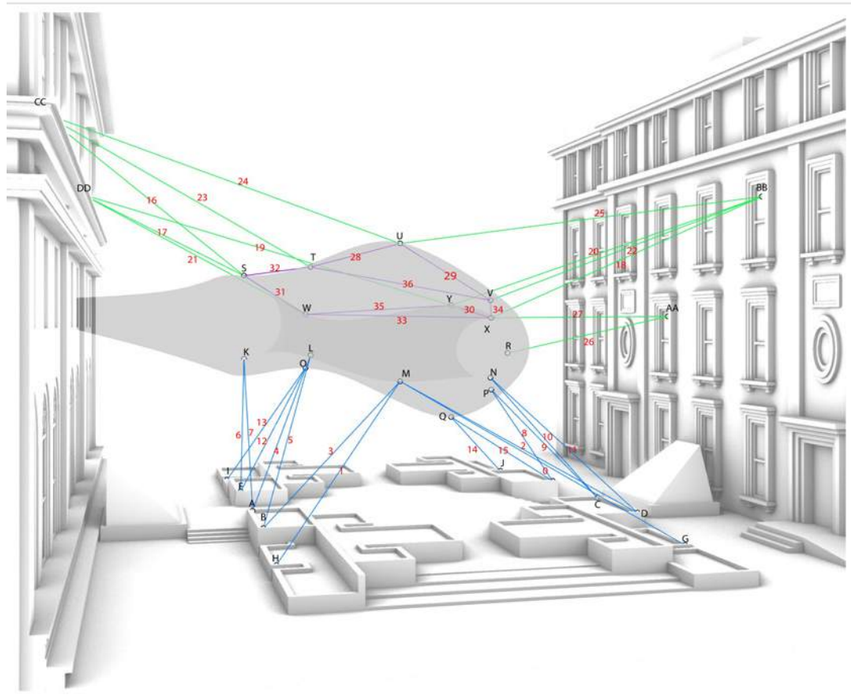
PROJECT
OUTSIDE IN II
INFLATABLE PAVILION
AVERY PLAZA, COLUMBIA UNIVERSITY

PROJECT
ANCHOR AND ROPE LABEL PERSPECTIVE

DRAWN BY: YZ
CHECKED BY: INITIALS OF LH, GS OR TS

A-110

OUTSIDE IN II INFLATABLE PAVILION '24



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INFLATABLE MANUFACTURING
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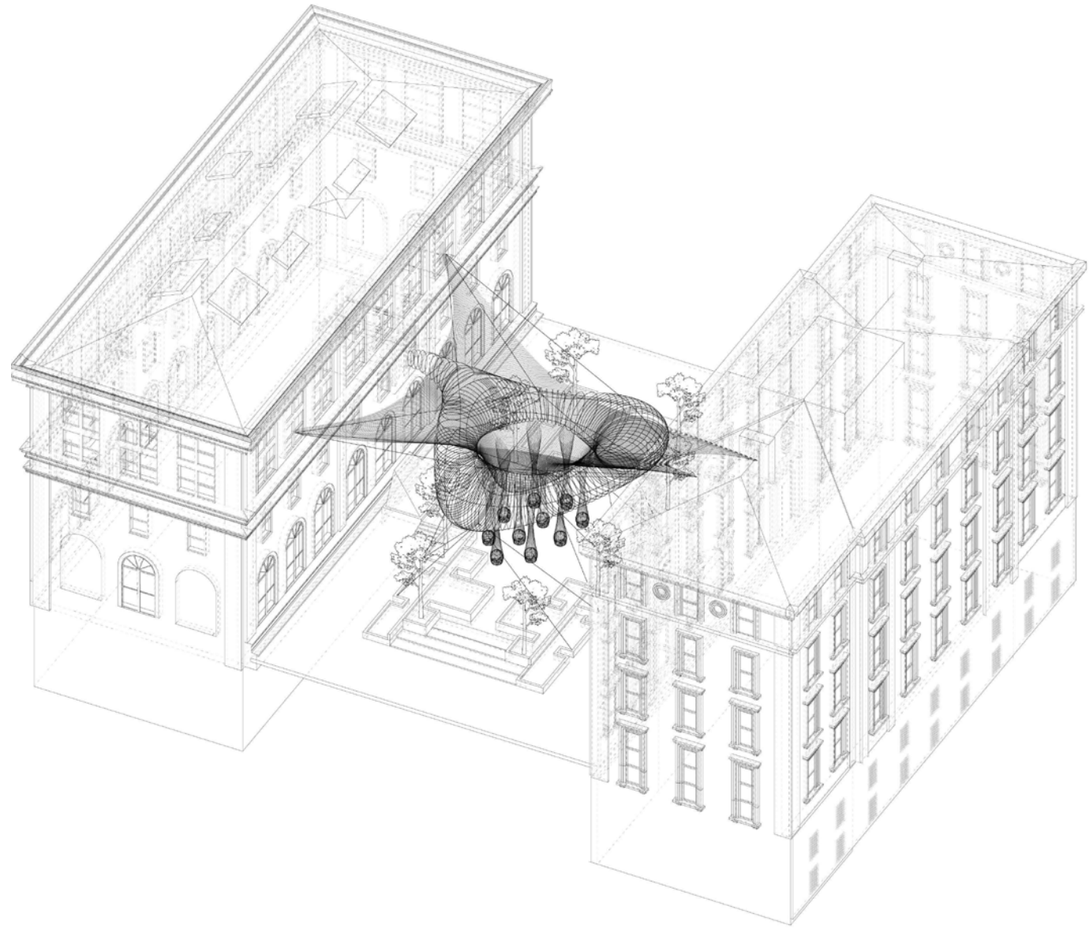
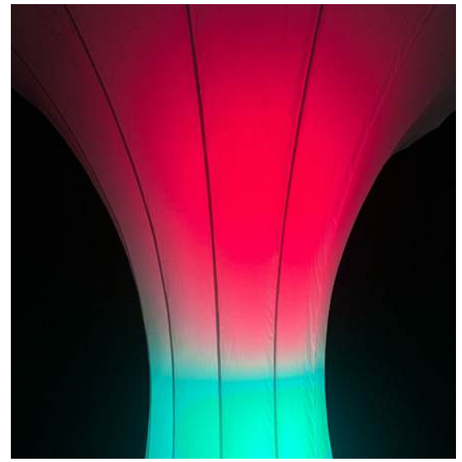
OUTSIDE IN II INFLATABLE PAVILION '24



▲To generate accurate rope lengths, we updated the 3D model with verified anchor locations and inflatable geometry. This allowed us to extract line-based measurements directly from the digital model.

◄ We coordinated with Area Cubica (Barcelona, manufacturer) using their installation manual to align the model with real on-site conditions.



▲►Personal Photographs from The Cloud

Carbon Footprint, Spring 2025
Professor: David Benjamin
Elective - Research
Author: María Paula Rico

07

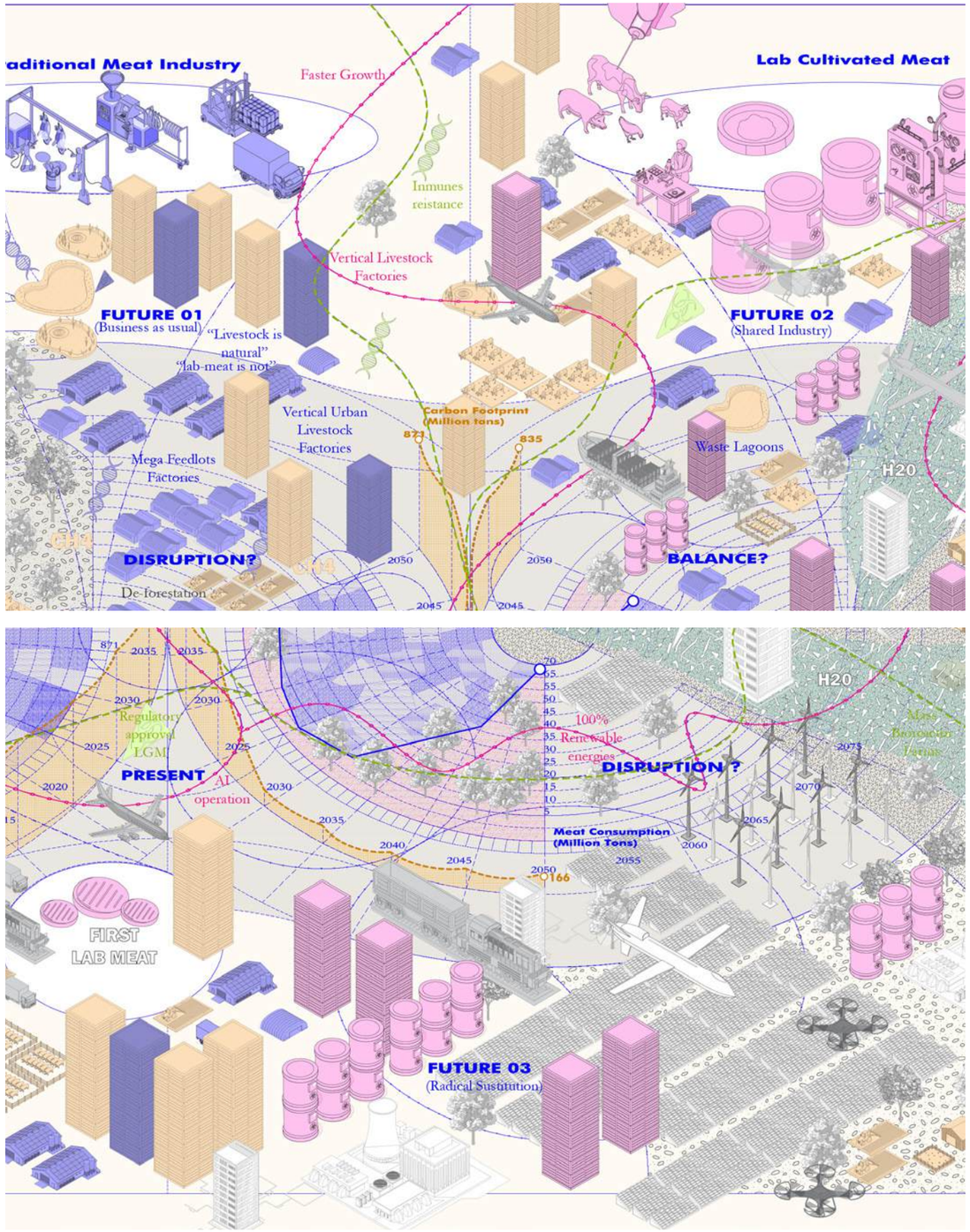
Alternative Futures

A speculative timeline, comparing the environmental impact of traditional and lab-grown meat across three possible futures.

This project investigates the carbon, water, and land footprints of meat production by comparing traditional livestock systems with emerging lab-grown alternatives. Beginning with 1960 as a baseline, it projects outcomes from 2026 to 2050 under three speculative futures: business-as-usual, gradual transition, and radical substitution.

There is a systemic divergence between these two protein systems. Traditional meat production is deeply entangled with land use, deforestation, feed crop cultivation, and methane emissions from livestock. It is an extractive model, visible through industrial feedlots, huge logistic chains and the transformation of rural landscapes.

In contrast, cultivated meat presents the possibility of detach protein from land and animals. If fully adopted, it could lead to significant emissions reductions, lower land demand, and the potential to recover wilderness. However, the shift also brings new uncertainties. Lab-grown meat relies heavily on bioreactors, nutrient media, and clean, potable water. Its future relies on high-density energy inputs, which raises key questions: What powers the post-livestock food system? Can renewables meet its industrial-scale demand? And how sustainable are its material and supply chain dependencies when scaled?



Traditional Meat Industry

Lab Cultivated Meat

Faster Growth

Inmunes reistance

Vertical Livestock Factories

PAST

FUTURE 01
(Business as usual)

"Livestock is natural"
"lab-meat is not"

FUTURE 02
(Shared Industry)

Vertical meat labs Factories

Mass Bioreactor Farms

H20

Manual Genetic Selection

Vertical Urban Livestock Factories

Carbon Footprint (Million tons)

871

835

Waste Lagoons

Carbon Footprint 400 (Million tons)

Mega Feedlots Factories

DISRUPTION?

BALANCE?

100% AI

Meat Consumption (Million Tons)

1950
1955
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050

547

De-forestation

GMO

Globalization
Cold Chains
Logistics

Regulatory approval LGM

PRESENT

AI operation

100% Renewable energies

DISRUPTION ?

Meat Consumption (Million Tons)

166

Packing logistics

CH4

FIRST LAB MEAT

MIT SYNTETHIC BIOLOGY

FUTURE 03
(Radical Sustitution)

LEGEND

- Carbon Footprint
- Consumption
- Technology Timeline
- Biotechnology Timeline
- Carbon Fooprint
- Traditional Meat Industry
- Lab Cultivated Meat Industry

Transcalarities, Summer 2024
Professors: Andrés Jaque - Bart-Jan Polman - Elena M'Bouroukounda
Case Study
Author: María Paula Rico

08

Environmental Violence

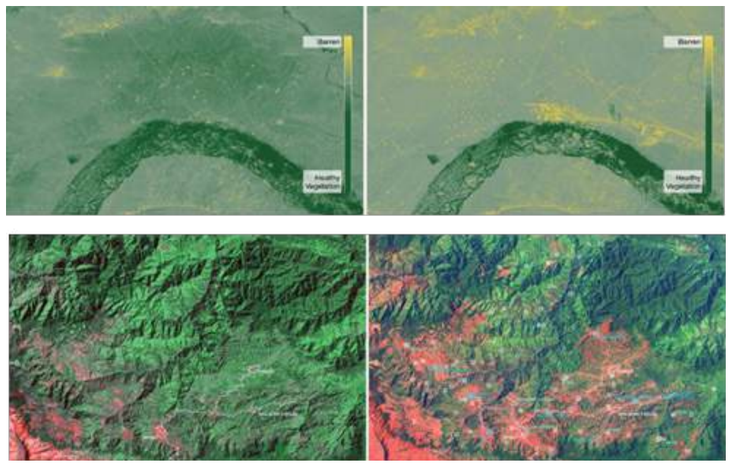
Architecture as Witness, Evidence, and Political Instrument

This essay investigates the entangled relationship between environmental destruction and systemic violence, using the work of Forensic Architecture as a lens to understand how spatial and technological tools can expose territorial injustice. Focusing on cases in Latin America, including the Mapuche lands in Argentina and the Ixil Triangle in Guatemala,it explores how environmental degradation, resource extraction, and military tactics have been used to erase indigenous presence and reshape land for exploitation. Through techniques like satellite imagery, ground truthing, photogrammetry, and geolocation, Forensic Architecture builds evidence across multiple scales, turning architecture into a critical instrument of accountability. In doing so, this research argues that architecture can operate not only as a form of spatial production but as a political act, one capable of making visible the often-invisible violence embedded in environmental transformation.

The Method of Forensic Architecture

Environmental violence encompasses the systematic and often politically-promoted destruction of the environment. This includes using environmental degradation as a tool of oppression and control, targeting marginalized communities and indigenous peoples through activities like mining, deforestation, pollution, indoctrination, and displacement in specific territories.

On the other hand, Forensic architecture is an agency that have been producing “spatial evidence within legal, political, and cultural contexts.” through the use of “cutting-edge techniques”. According to the Cambridge dictionary the word forensic means something “related to scientific methods of solving crimes, involving examining the objects or substances that are involved in the crime”. Thus, this interdisciplinary agency has supported their research presenting evidence using media and visual representation techniques that come from the analysis of data of diverse scientific sources and technologies (see figure 01).



◀ Figure 01. Both images depict satellite image analysis to compare the transformation of the territory over different periods.

The first sequence above relates to the project in Vaca Muerta, Argentina, where mining and fracking processes have taken place since 2013, generating contamination to the lands of Native Mapuches.

The sequence below shows the systematic destruction of the land through indoctrination; construction of settlement with a specific urban pattern and genocide of Ixil indigenous communities in Guatemala, led by the government since 1979.
formation.

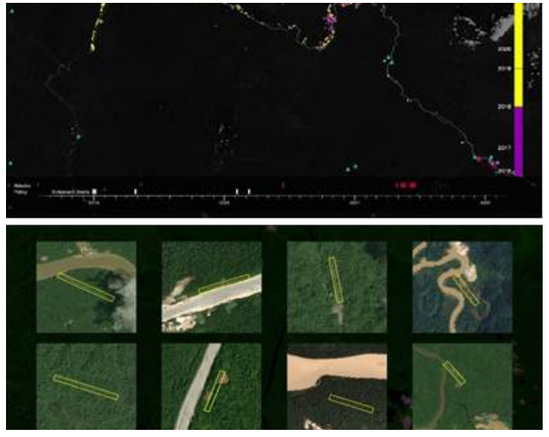
The understanding and broader dissemination to raise awareness, finance, or collaboration about their finding is one of their objectives; these efforts have led.

To promote active actions to restore memory or help fight the problem in most of the cases through legal processes . This particular case aims to explore the advantages and use of specific technologies to tackle complex and entangled themes in another way of understanding the scale of the territory.

Forensic architecture has used more than twenty different methodologies; that far from being specific to the field of architecture, have been used in other disciplines such as military, forensic science, cartography and geography.

For the specific cases related to the environmental violence, they have primarily used technologies and methodologies such as: Satellite pattern analysis, ground truth, geolocation and imagen complex This essay will explore how these technologies have been developed and how the agency has applied them to their research.

One prominent example is their investigation into gold mining and violence in the Amazon rainforest. Forensic Architecture used satellite imagery pattern analysis (see figure 02) and photogrammetry (see figure 03) to document the extent of environmental destruction caused by illegal mining operations. By analyzing changes in the landscape over time, they were



▲Figure 02. Using satellite images and pattern analysis, researchers identified construction patterns that reflect the existence of illegal airstrips related to illegal mining along the river course from 2017 to 2019. This technique, common in forensic science and military strategy, involves identifying and interpreting patterns to make sense of complex data. It is crucial in detecting consistent behaviors or changes over time (Forensic Architecture 2023).

▲Figure 03. This sequence of images, using photogrammetry techniques, explains the data analysis from a video of an attack on a Yanomami village. The data in the video helps too re construct in a 3d model the type of the boat and relate it to another video that criminals posted, depicting their intimidation practices to displace the population. (Forensic Architecture 2023).

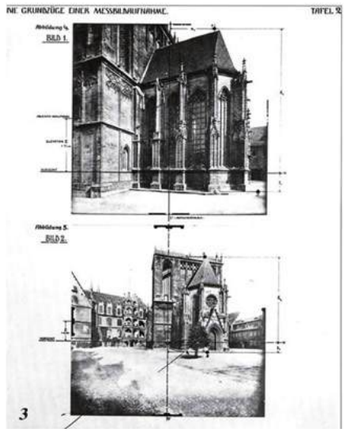
able to illustrate the rapid and devastating impact of mining activities and the actors of violent events on the forest and local communities.

The use of satellites is not new; this technology was developed during the Cold War in the context of military advancements and the geospatial race between the USA and USSR. The USSR launched the first satellite into orbit in 1957 (Gabrynowicz 2007).

But was until 1959 that the first satellite sent by USA obtained the first image of the earth (see figure 04). On the other hand, photogrammetry is a technique that consist of extracting 3D information from photographs or videos.

The process involves taking overlapping photographs to create the 3D, was first used by the Prussian architect Albrecht Meydenbauer in 1867 who produced some of the earliest topographic plans and elevation drawings using photographs . (see figure 05).

▲Figure 04. The first photo of Earth from a satellite in orbit obtained from Explorer VI Earth satellite. It shows a sun-lighted area of the Central Pacific Ocean and its cloud cover. The picture was made when the satellite was about 17,000 miles above the surface of the earth on August 14, 1959. (public domain)



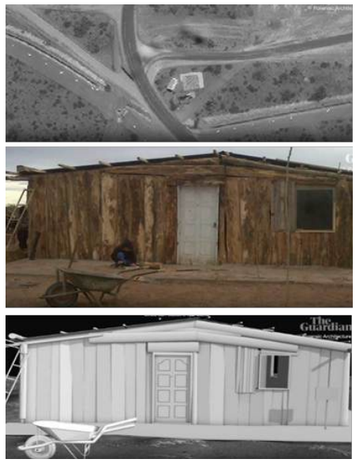
◀ Figure 05. Construction of the Meissen Cathedral began in 1266 on the site of a predecessor building. From 1423 onward, the Prince's Chapel was built in front of the original west portal. At the turn of the XIV century, efforts began to complete the cathedral with the towers that were planned but not executed in the Middle Ages. The drawings necessary for adapting to the existing building were provided by Meydenbauer through the evaluation of photogrammetric recordings. (Museum theulegium) crucial in detecting consistent behaviors or changes over time (Forensic Architecture 2023).

Another case developed by Forensic Architecture involved examining oil and gas pollution in Vaca Muerta, Argentina. Here, the team employed geolocation and ground truth methodology, which "is the technique of anchoring the results of computational or digital processes of photogrammetry and satellite image analysis combined with GPS coordinates" .

This approach helps connect the digital model to the analysis of real-world conditions (see Figure 06). In this specific case, it was used to trace the spread of contamination from fracking sites to nearby indigenous Mapuche lands.

This technology provided concrete evidence of the previous illegal occupation of the land by companies and actors interested in the trade and exploitation of the territory.

Finally, Forensic Architecture's innovative use of advanced technologies transcends traditional boundaries, offering a trans-scalar approach that reveals the interconnectedness of environmental destruction across local, regional, and global scales.



►Figure 06. Using geolocation and photogrammetric together with the ground through methodology, they were able to reconstruct one of the structures that was built before the big companies received permission from the government to exploit the area. The structure was intentionally burned after the agreement was signed to destroy evidence of the incursion and exploration of the Mapuche community's territory. Both ground truth and geolocation have been used extensively by the military to verify and analyze spatial data for strategic purposes (Forensic Architecture 2023).

By integrating spatial evidence collected through precise data from technologies developed for other fields into diverse political, legal, and cultural contexts, architecture emerges as a formidable force. It transforms into an analytical, territorial, and political agent, a powerful conduit for sensitivity, creativity, and activism. This approach not only deepens our understanding of environmental violence but also redefines the role of contemporary architecture itself.

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Metabolic Materials, Spring 2025
Professor: Michael Wang
Elective - Research - Exhibition
Authors: María Paula Rico - Martina Hollmann

09

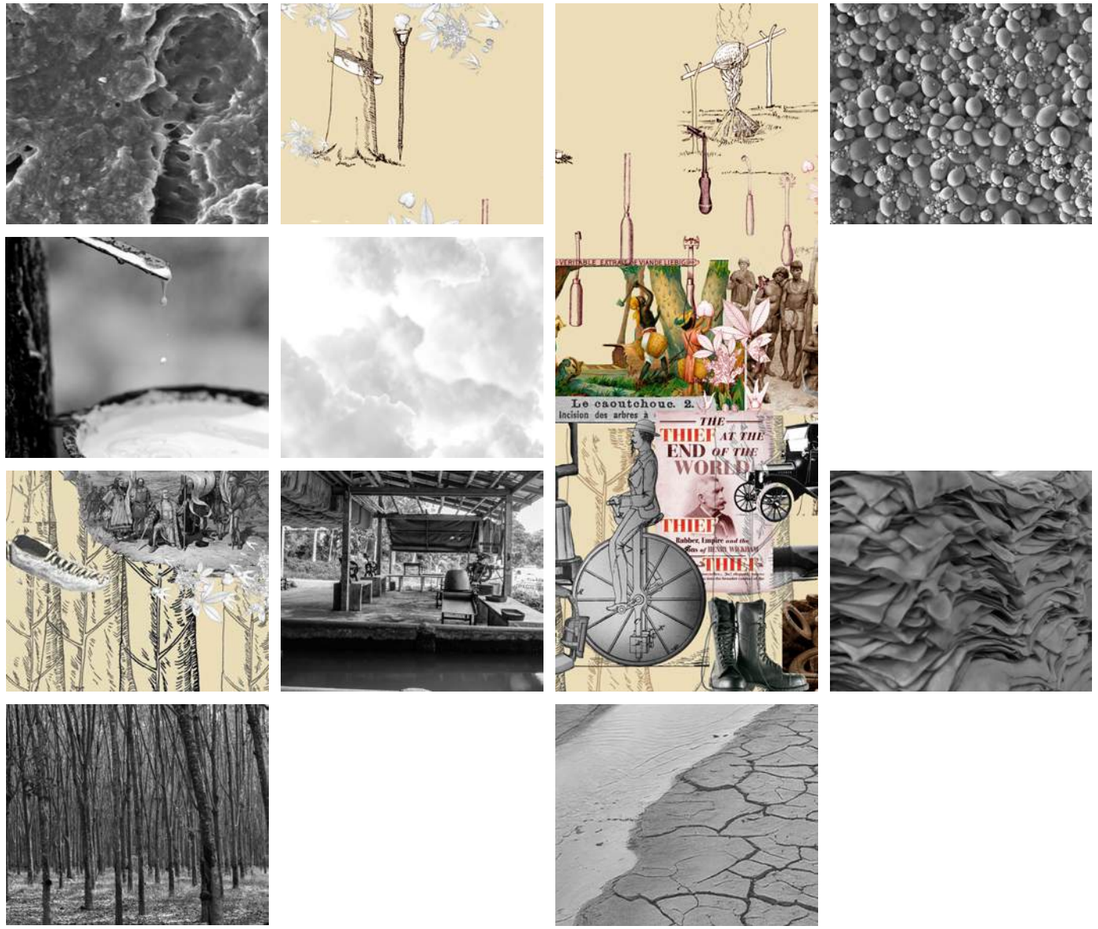
Roots of Thirst

Tracing the transformation of natural rubber through Water Cycles.

Water is an active force that defines rubber's material state, industrial impact, and ecological consequences

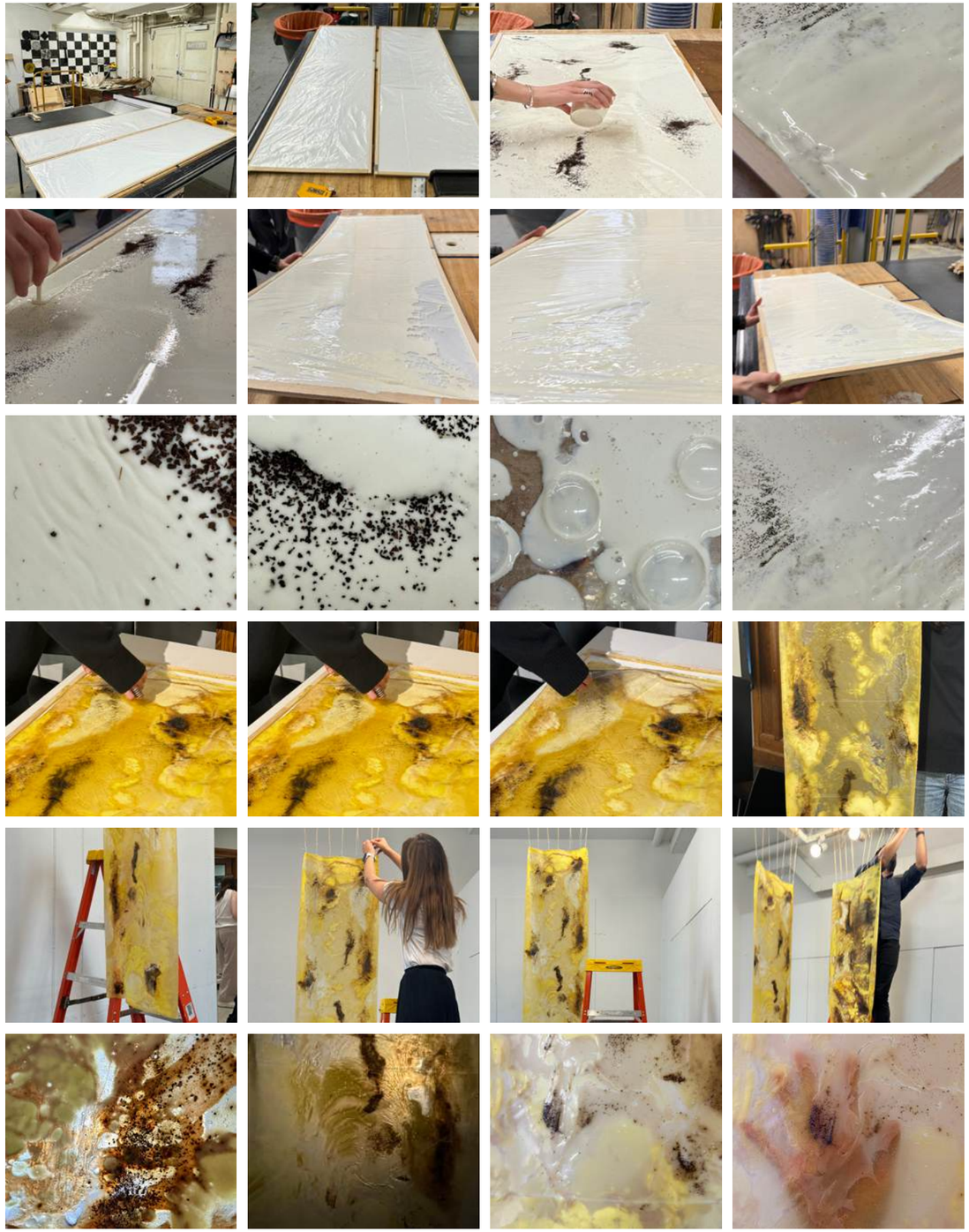
Water and rubber are entangled across multiple scales, from the microscopic structures embedded in the leaf and latex of Hevea brasiliensis to the broader disruptions of global water cycles caused by vast monoculture plantations. The transformation of natural rubber through the process of evaporation emerges not as a passive condition, but as an active, formative force, one that shapes rubber's materiality, propels its industrial expansion, and leaves deep ecological consequences.

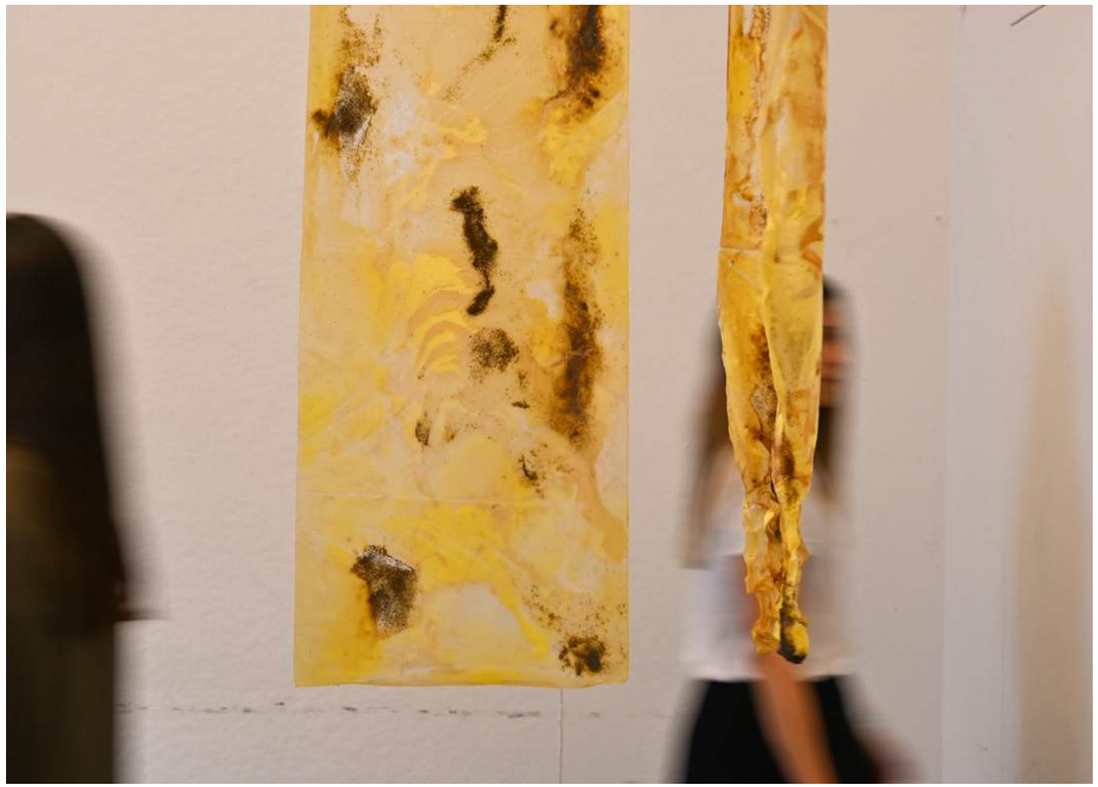
At the smallest scale, the shift from dispersed liquid latex to consolidated solid rubber marks the moment of water's disappearance, a quiet but irreversible material threshold. Expanding outward, the final project is an installation that exposes how rubber, soil, and atmospheric moisture interweave, altering local evapotranspiration patterns, draining ecosystems, and redirecting hydrological flows. These transformations reveal rubber's hidden "water debt", its silent contribution to drought, soil degradation, and systemic imbalance, made visible when the tree is extracted from its ecological niche and cultivated at industrial scales.



▲Water debt, Collage of metabolic relationships between water, latex, soil, and extraction systems. The imagery traces a material journey from Amazonian forests to monoculture plantations in Asia, revealing environmental and political layers embedded in rubber.

► Documentation of material testing, casting, and final installation. As natural latex shifts from liquid to solid. When water disappears, it leaves behind a hardened, plastic-like skin, a fossilized imprint of metabolic transformation.





▲ ► Roots of Thirst was exhibited as part of the MET-MAT Exhibition, Avery 400, Columbia University, April 22, 2025.

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Credits

01 - Rock's Rituals
From De-Colonial Landscape Terraforming to Microbial Inhabitation. Envisions Of a Future for Pelham Bay Park That Transcends Human-centric Narratives
Advanced Studio IV, Summer 2024
Studio Critic: Nerea Calvillo
Project - Research
Location: Pelham Bay Park, New York, NY
Autors: María Paula Rico - Madhura Kadam

02 - Arctic's Botanical Archive
Tundra Plants and Pollinators, from Temporal Outposts to Botanical Corridors
Advanced Studio V, Fall 2024
Studio Critics: Leslie Gill, Khoi Nguyen
Project - Research
Location: Arctic Tundra Zone and Whistler, Canada.
Author: María Paula Rico

03 - Conditions Of Interaction
Three Projects engaging with the In-Between: Architecture Through Layers of Infrastructure, Ecology, and Time
Advanced Studio VI, Spring 2025
Studio Critics: Eleni Petaloti, Leonidas Trampoukis
Project - Research
Location: New York City, US - Nakajima, Japan
Author: María Paula Rico

04- Reflections about Architecture, Animal, Human: The Asymmetrical condition by Catherine Ingraham
History of Archictectural, Theory, Fall 2024
Professor: Mark Wigley
History - Theory
Author: María Paula Rico

05-Nomadic Material Systems
Unveiling the Hidden Relationships and Negotiations Between Construction, Environment, and Motion in Berber and Inuit Communities
Construction Ecologies, Fall 2024
Professor: Tommy Schaperkotter
Elective - Research
Authors: María Paula Rico - Franco Nocioni

06-The Outside In - Cloud
Student-Led Collaborative Inflatable Pavillion
The Outside In Project, Fall 2024
Professors: Galia Solomonoff - Laurie Hawkinson
Seminar - Installation
Location: Columbia University, NYC
Authors: Spring 2024 - Fall 2024 Students Seminar

07-Alternative Futures
A Speculative timeline: Comparing The Environmental Impact Of Traditional and Lab-grown Meat Across Three Possible Futures.
Carbon Footprint, Spring 2025
Professor: David Benjamin
Elective - Research
Author: María Paula Rico

08-Environmental Violence
Architecture as Witness, Evidence, and Political Instrument
Transcalarities, Summer 2024
Professors: Andrés Jaque - Bart-Jan Polman - Elena M'Bouroukounda
Research
Author: María Paula Rico

09- Roots of Thirst
Tracing the transformation of natural rubber through Water Cycles.
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Galia Solomonoff
Laurie Hawkinson
Tommy Schaperkotter
David Benjamin

Inside there are no answers,

but there is

ACTIVE LAYER-ING

or

Unfolding decisions from Questions in the Contemporary Architectural Practice

Columbia GSAPP
Columbia University In The City Of New York

Maria Paula Rico - MSAAD
2024-2025