

not for HUMANS

An exploration into the politics, hidden signatures and conflicts that are shaping our environments

Alejandro Marin | Columbia GSAPP

This work is the culmination of one year at GSAPP. Working as an interdisciplinary practitioner, journalism was at the core of my research. My focus during my time at GSAPP was not to centralize the human in our designs and solutions but rather decentralize the human body from all design. This was in order to explore new pathways in which new discussions could be led from the perspective of non-humans and reveal deeper spatial problematic entanglements within our space, race, culture and politics. The work here is not meant to be a divider between humans and non-humans but an attempt to open up conversations when perspectives are shifted and other practices meet within architecture. This work is an exploration of life cycles between other species and humans in our built environment.

Politics are inherent within our work and therefore need to be addressed. This portfolio is just the start of a journey that begins addressing issues where politics, culture, and race clash with one another. This research is not meant to provide a perfect solution nor is it meant to be the only solution. The main goal is to reveal hidden signatures that are in plain sight affecting our environments, our bodies and other species. For this we need to question how the human body starts to interact within these moments to create entanglements from which non-humans and humans can participate together to address this issues.

This portfolio is an exploration into the new role of an architect in an era where the Anthropocene and Capitalocene meet. An era where the role of the architect is not one of designing beautiful objects but rather a multi-faceted role of journalist, politician, activist, writer that is constant friction with the outside forces that are shaping our environment. Just like journalists, we need to become aware of the issues that are affecting our spaces and address them in our work; not hide them away behind beautiful objects. I started my journey at Columbia wanting to challenge the role of the architect in our society and I leave here not as architect but as a journalist, writer and researcher. I aim to be a multidisciplinary practitioner with the goal of revealing the struggle of our current forms of practice and the impact they have in our environment.

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TOWARDS A TRANS-SPECIES ARCHITECTURE

A manifesto for a world after humans

Plants are the only living organisms that unite all species: humans and non-humans. Through the air we share, their waste is what paves the way for so many other species to live and interact with each other. Humans have always tried to separate themselves from all other non-humans, from the physical body to the spaces they inhabit, like a malignant tumor, and replace them with artificial environments. Consequentially normalizing the artificial over the natural and creating inhabitable spaces and social inequalities. To break away from the artificial and relink the human body with its roots, architecture should be considered as a mutualistic organism that promotes growth and hospitality of other species on which humans depend, like plants and bacteria. Tabula rasa needs to be re-thought, not as a clean slate without consequence or context, rather an opportunity to create fluidness between the ecological context, the building and the non-human species on which humans rely. Since architecture would always be a method of disruption even if it is not intended to, buildings need to become a tool for natural regeneration that is constantly adapting to new life cycles. Cycles in which architecture is not neutral but a root for entanglements of trans-species and hospitalities. Blurring the line between what coexists outside or inside, linking once again the human body to the environment in which non-human species are immersed within the same spaces to promote equity and equality.



Lina Bo Bardi: Ladeira da Misericórdia, Salvador de Bahia.

Breaking away from domestication of the “Natural”

To break clean from this vicious circle, we need to reconsider the relationships of the building with the territorial context in which it sits. Let's take as an example Lina Bo's glass house. This effortless architecture breaks clean from the domestication of the natural by blurring boundaries between the architectural elements and the territorial ones. Fusing both the plants and architecture where one could not differentiate what comes first in the design; the plants, the building or the human. All nestled into one design as if nature drove the concept of the building allowing the non-human species to be prioritized over the house without the necessity of domestication of species and embracing uncertainty from them and the building.

Decentralizing the human body as the main actor in the built environment

Humans have used the built environment as an extension of their body separating other species, bacteria and themselves from the rest of the world, creating hierarchies from which the humans sit on top. However if we extract the human as the center of the built environment to which all other species are subjected and instead break the hierarchy and give the same priority to non-humans from which humans share so much biologically and spatially, it would allow for a new order of spaces, materials, hierarchies, users and actors within the buildings that would promote the human body as a hospitable organism.

Architecture as living organism that promotes Trans-species and hospitalities

If the buildings are extensions of the human body from which multiple organisms inhabit and coexist with each other, our body's makeup and ability to host other bacteria should translate into the building makeup as an organism that is constantly changing and adapting to the environment. Take into consideration Casa Cirell as an example where the building becomes an extension of the body from which non-humans can cohabit with the human body in one singular space breaking down hierarchies of control by rooting the building in the ground as if it was born of the sediments and makeup of the earth sharing the spatial and material membrane as humans and non-humans do.

Redefining Tabula rasa in a world where humans and non-humans have to live together

Tabula rasa has been defined as the moment in which architects can do whatever they want because there is no context "clean slate", but in a world where humans and non-humans have to coexist together there would always be a territorial and species context from which the building is disrupting and constructed. From the soil, to the animals and plants that depend on that ecosystem would require tabula rasa to be re-thought not as a clean slate but as a mutualistic organism that would benefit humans and non-humans with the territorial context in which it is rooted.

Neutrality towards Trans-Species architecture its useless unless we remove it from the equation

Ladeira da Misericordia by Lina Bo is the perfect example of architecture abandoning its neutrality and acting as the ambassador of growth and hospitality between humans and plants. From which each other can grow together or separately even if humans cease to exist. Not giving humans the center stage but rather aligning itself with the species on which we depend and are linked to the most promoting the ecology in the space in which it inhabits to grow alongside humans in a non-orthogonal relationship.

Architecture not as a form of shelter but as a mutualistic organism

The building is an artificial environment which shelters the human from other organisms and serves one species, however if it is thought as a mutualistic organism it would mean the building would become a stage which is made up from the work of both humans and non-humans that would benefit both and the ecosystems in which they inhabit. Just like Lina Bo's drawings for Sesc Pompeia of the ecosystem made up by both the humans and non humans living in the same space would open the door for different programmatic and spatial qualities blurring both the outside and inside.

How do we draw the human as a cloud of bacterial relationships

To take trans-species and hospitalities a step further, understanding how the human body is made up of thousands of different bacterial relationships would set up the base to understand what kind of mutualistic relationship can be the most beneficial to the human body and other species depending on how the territorial context of the building is set up. Drawing the human not as a single body but as an ecosystem of multiple organisms would mean the Vitruvian man would need to be rethought, not as man, but as multiple membranes of organisms and their relationships with each other setting up micro and macro non-humans and human relationships with the built environment.

Materials vs Non-Human species

Setting up architecture as a mutualistic organism would mean that the makeup of the building would have to shift to allow other organisms to be hosted within the building walls, ceilings, et cetera. Lina Bo's Nova Prefeitura de São Paulo elevations drawing take on this new vision of different types of materiality that is driven by the necessity to host other life in the building from which it can grow and benefit humans as well. Bo's sketches of insects provide a glimpse at a response of materiality and spatial arrangement that architecture already has and can be further explored.

How do we define interior vs exterior in a mutualistic relationship

For a fluid relationship between other species and humans, the interior needs to be redefined, not part of the human body, but as something on which other species can cohabit. Although this doesn't mean that eventually they would all share the exact same ecosystem from outside to inside but instead benefit greatly from one another to improve what's best for humans and non-humans. Breaking hierarchies used in the spaces where humans are central, now shifted to prompt the growth of other species. It is key that both exterior and interior can move between one another where life cycles are necessary. For example, Bo's Teatro Oficina blurs lines between exterior and interior and breaks down the hierarchy of the human as the main character while allowing the performance of the building to take on multiple faces.

Air, light and color as part of hospitable relationships

Hospitable relationships do not only belong to the physical elements but those elements which inhabit our spaces without any physical bodies. The air, bacteria, light and color can all become hospitable partners in this relationship. Bo's House in Morumbi blurs the boundaries between outside and inside by allowing the bacteria to flow in the interior space with no physical boundaries separating them. The color allows the light to bounce and experience the house as it was always raining reflecting the outside world within the blue tiles. This clear line provides an ecosystem that benefits both humans and non-humans living inside and outside the house, even the furniture is designed like the trees outside the house to never interrupt the flow of light and air throughout the house, as if a bird could come and go whenever it pleased.

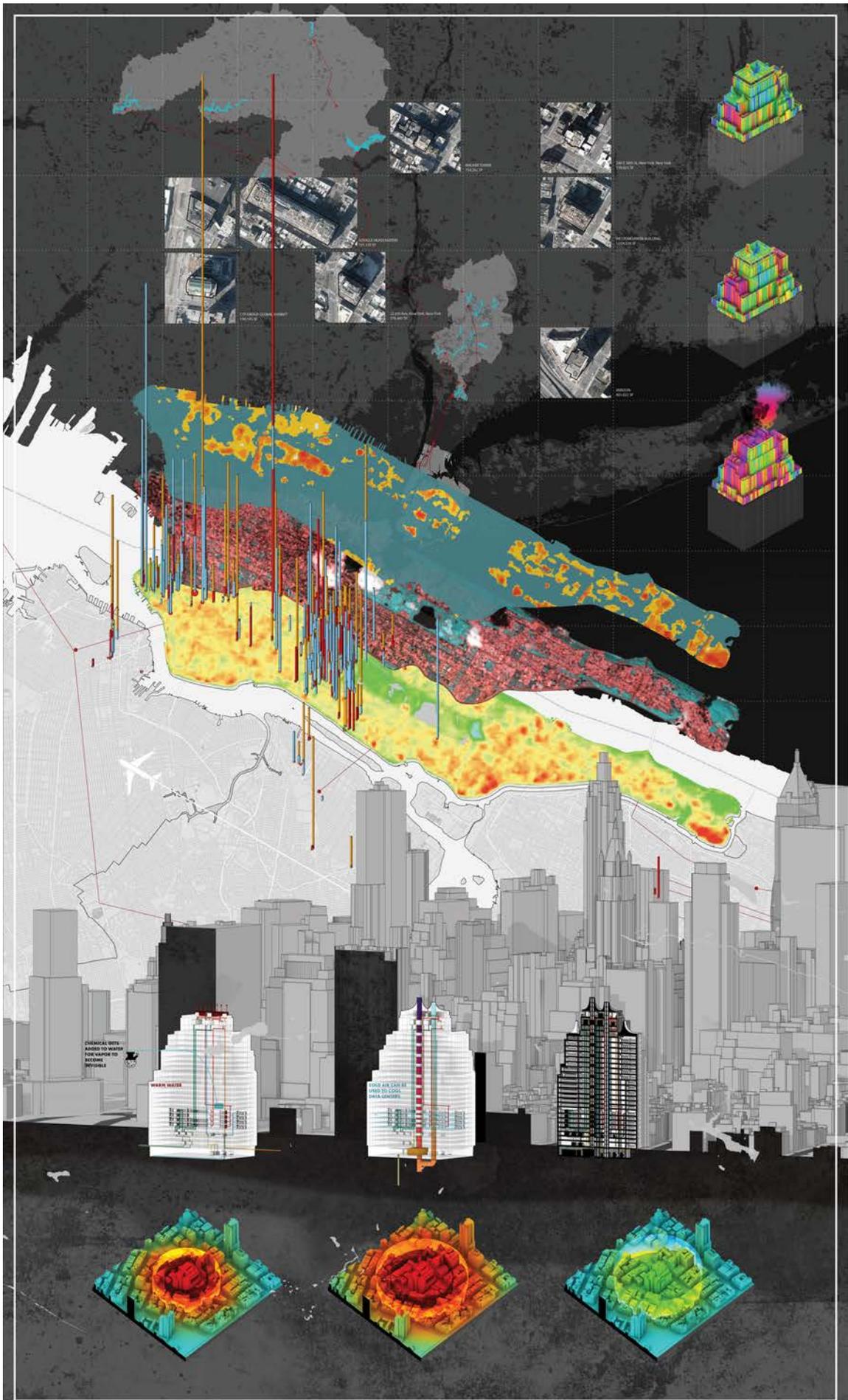
Trans-Species in architecture can help promote equality and gender.

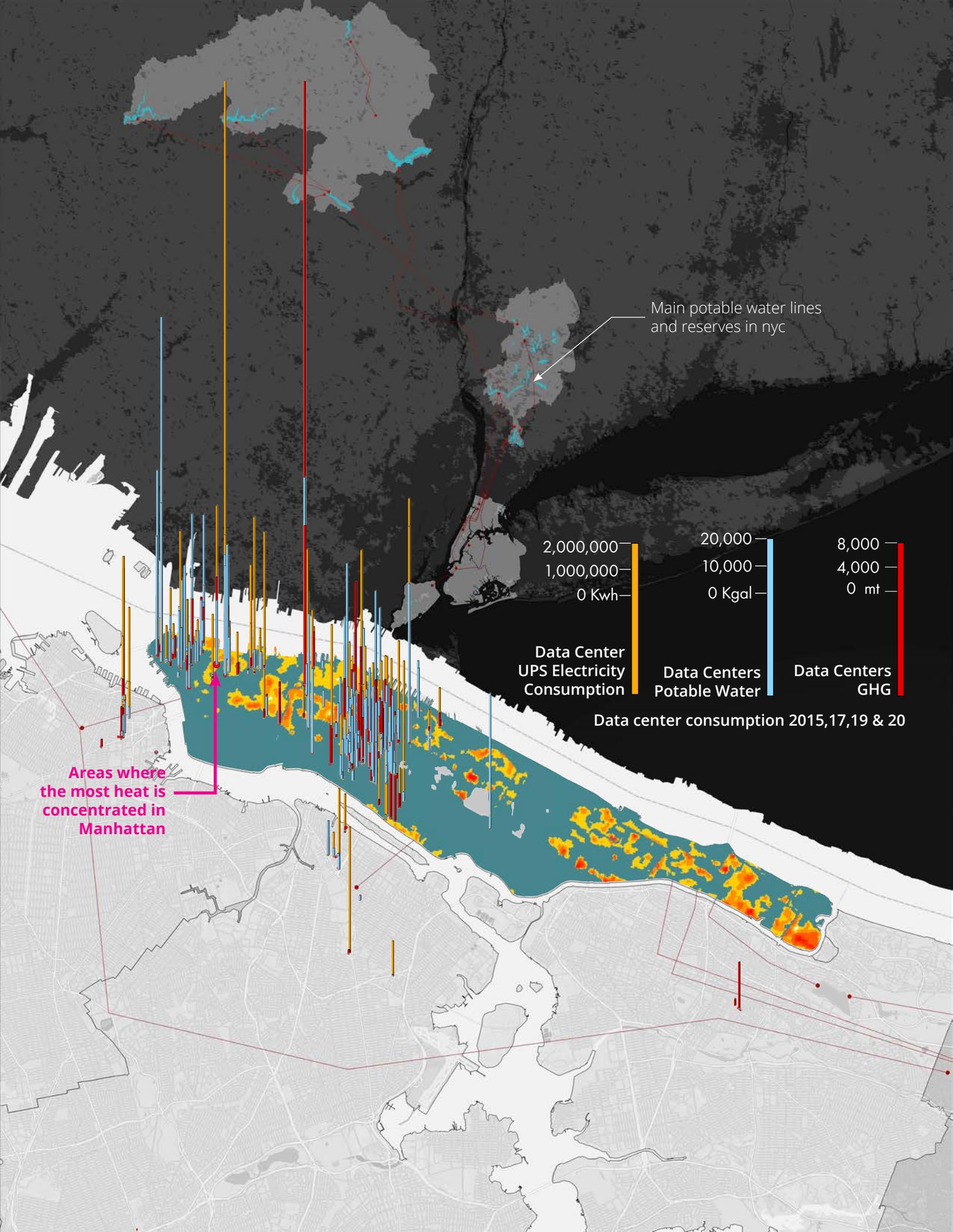
It is evident that artificial architecture has been used to further divide society into multiple categories where some benefit more than others. But perhaps in a trans-species world where the lines are blurred for whom the spaces belong, architecture can begin to address the issues that are needed the most and benefit those who have less. If architecture is re-thought as a mutualistic organism that can evolve and change it would allow humans to take care of plants that can provide for them and the houses to be thought as a living organism as well as to provide new methods of construction that can be organic and accessible built with other organisms and species.

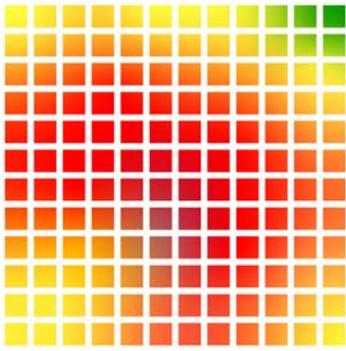
A JOURNEY THROUGH DATA CENTERS

Towards a Transparent Environmental Accounting

This project envisions a future of care where humans and non-humans act as a singular unit to democratize spaces lost through careless politics and provides an appropriate space to remember those for whom the parks have been named and since forgotten. Remembrance is coming to the forefront this century and how we remember people is more important than ever. It is important to ask: how can we elevate those memories and create care and love for our communities with the tools we have on hand? Both of the parks were named after extraordinary people. Emanuel de Dios and Dunningham fought for what they believed and, most importantly, they fought for their communities. Their work was lost and their names forgotten through ill-designed and misused public space. Plants, however, have been used throughout history to remember those we have lost and used to create care for those we remembered. The relationships between the parks and non-humans is meant to address the care and love that exist in the community. Through the use of pollinators and simple interventions within the existing elements of the parks, they can create community collaboration and exposure for those who need it most.



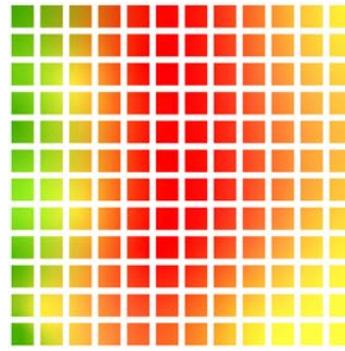




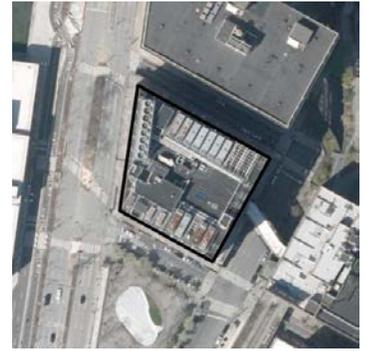
72C



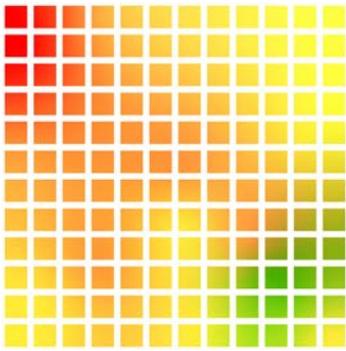
WESTERN UNION BUILDING
1,074,536 SF



69C



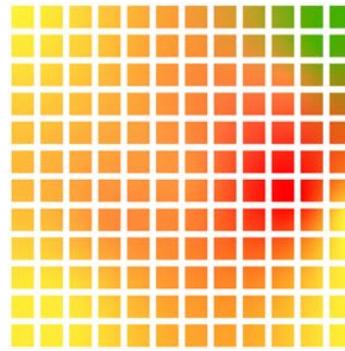
GOOGLE HEADQUARTERS
731,135 SF



69C



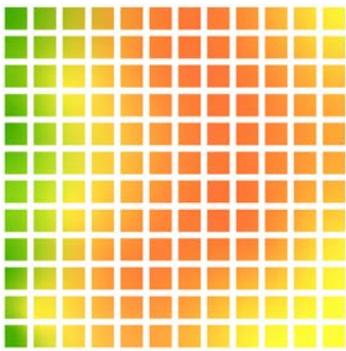
VERIZON
401,022 SF



68C



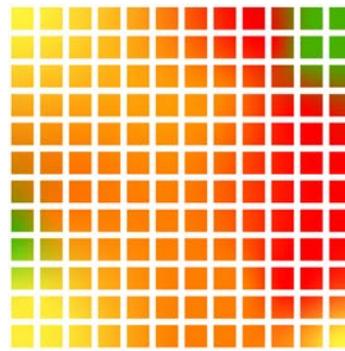
32 6th Ave, New York, New York
378,441 SF



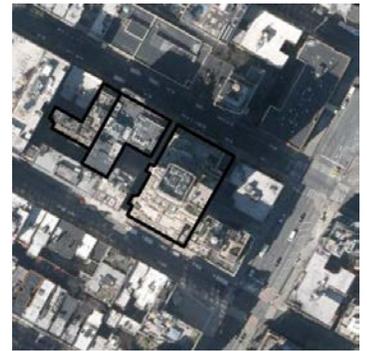
68C



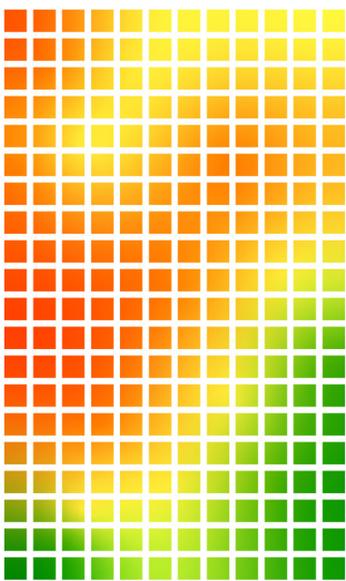
CITI GROUP GLOBAL MARKET
196,145 SF



69C



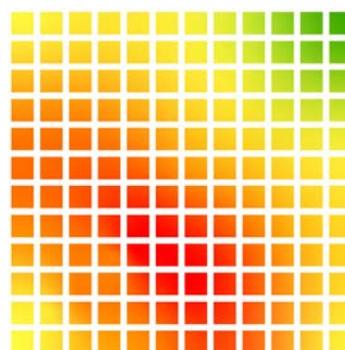
WALKER TOWER
154,262 SF



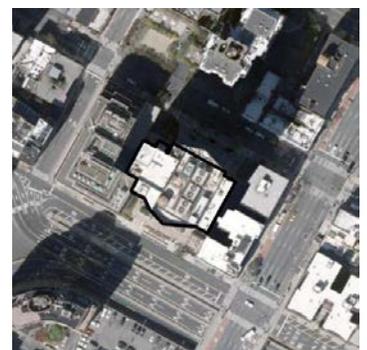
70C



GOOGLE HEADQUARTERS

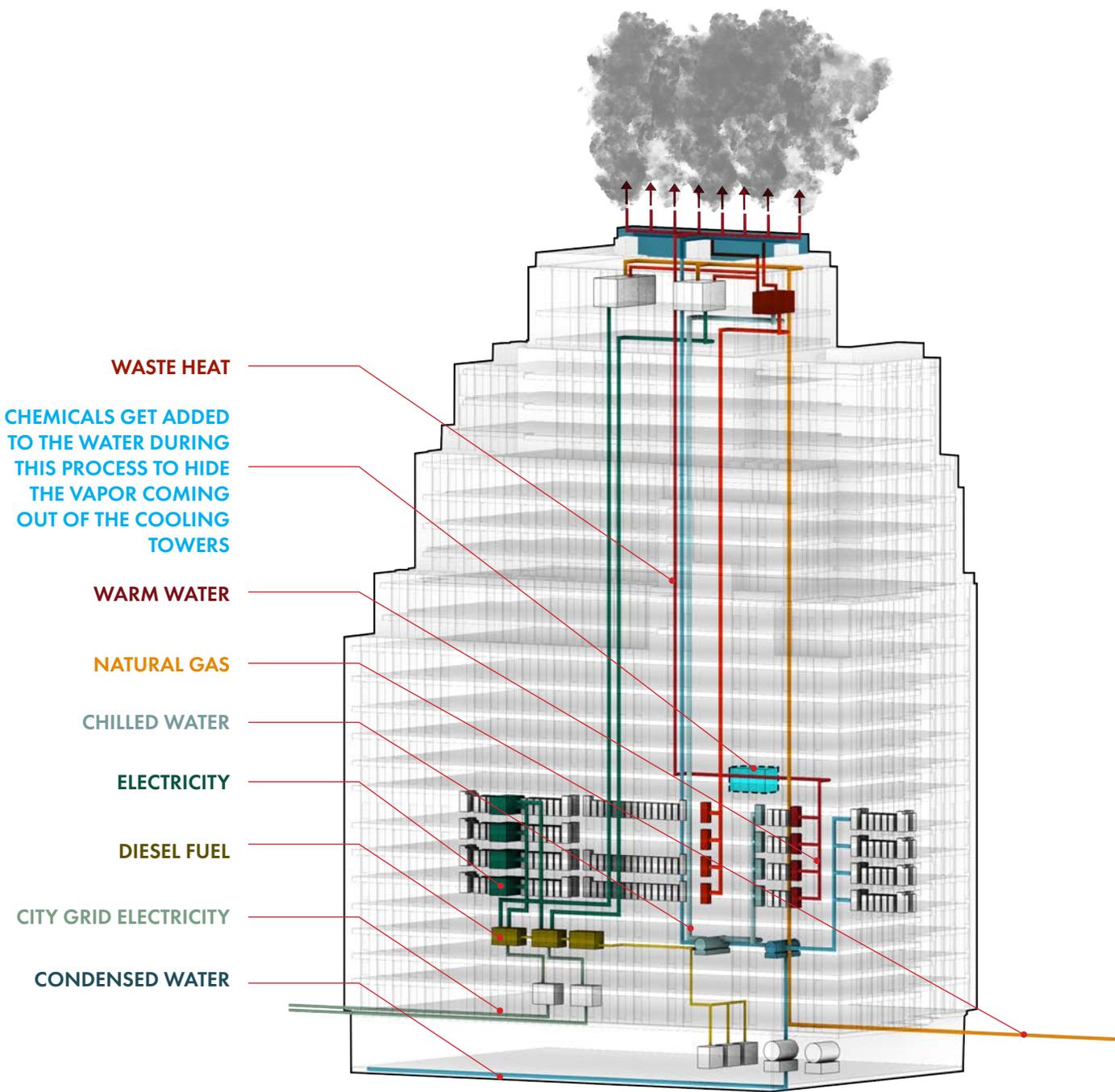


69C

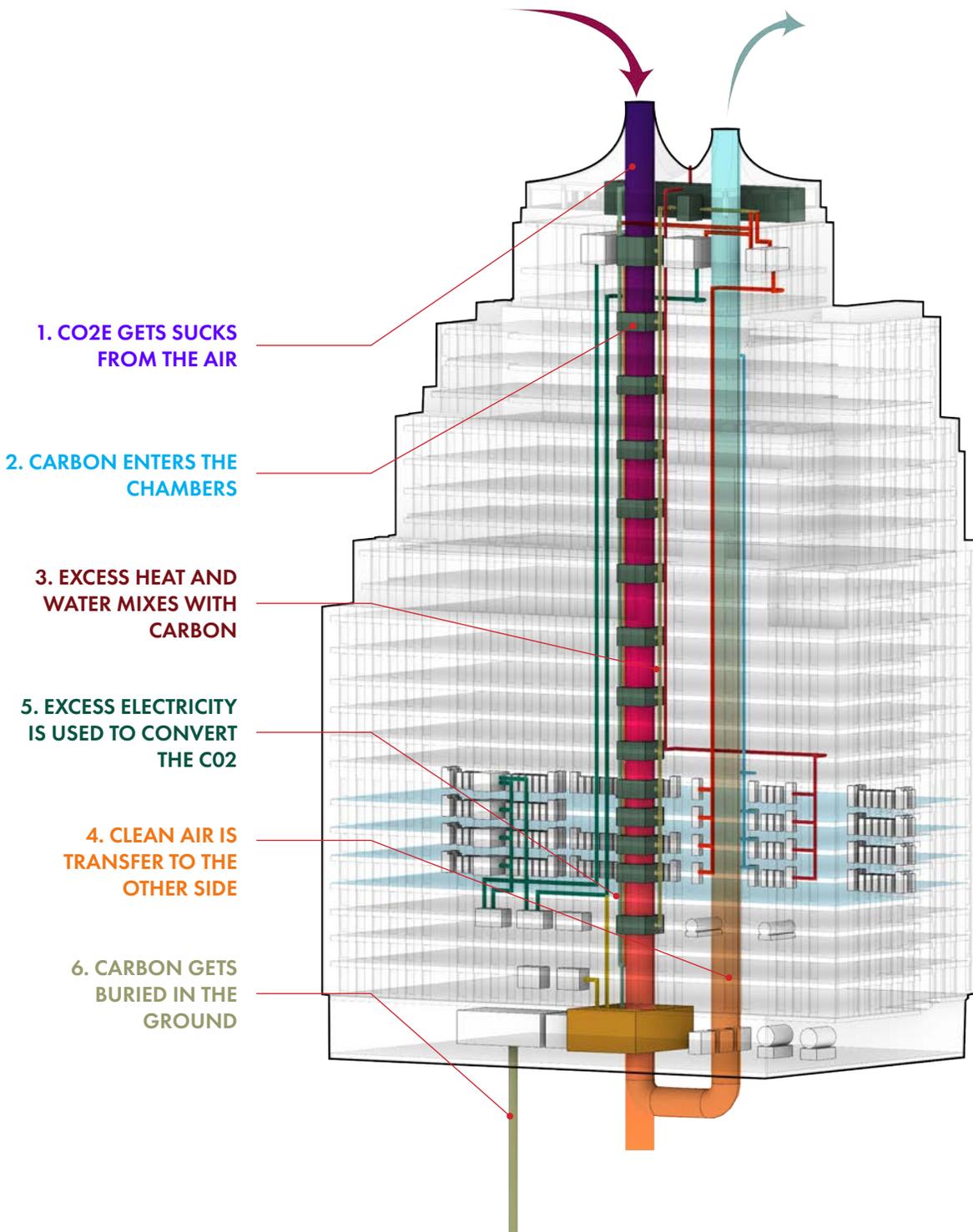


240 E 38th St, New York, New York
139,825 SF

SURFACE TEMPERATURE ANALYSIS OF THE MOST CARBON INTENSIVE DATA CENTERS IN MANHATTAN



STRUCTURE USED IN A DATA CENTER



PROPOSED INTERVENTION

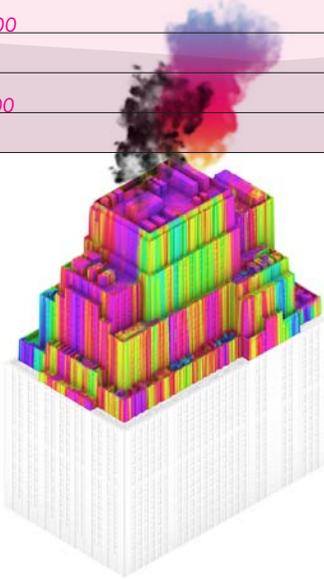
50,000,000 CF of Steam
50,000 Metric tons of Co2e

30,000,000
30,000

10,000,000
10,000

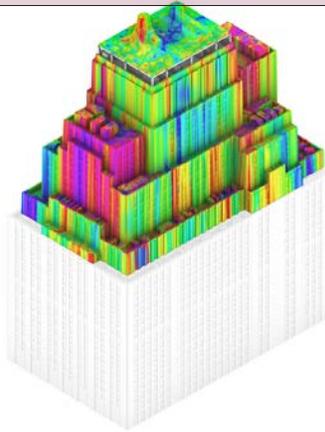
0 CF

20% Goal for water and CO2
by 2025 UN

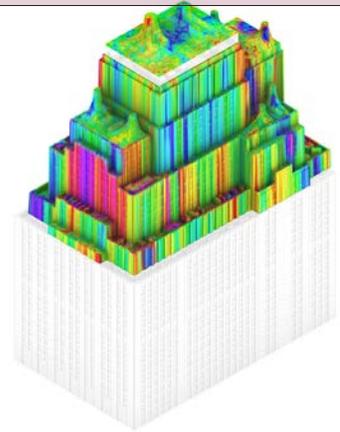


**CURRENT ROOF UNDER
PROJECTED FLIR IMAGING**

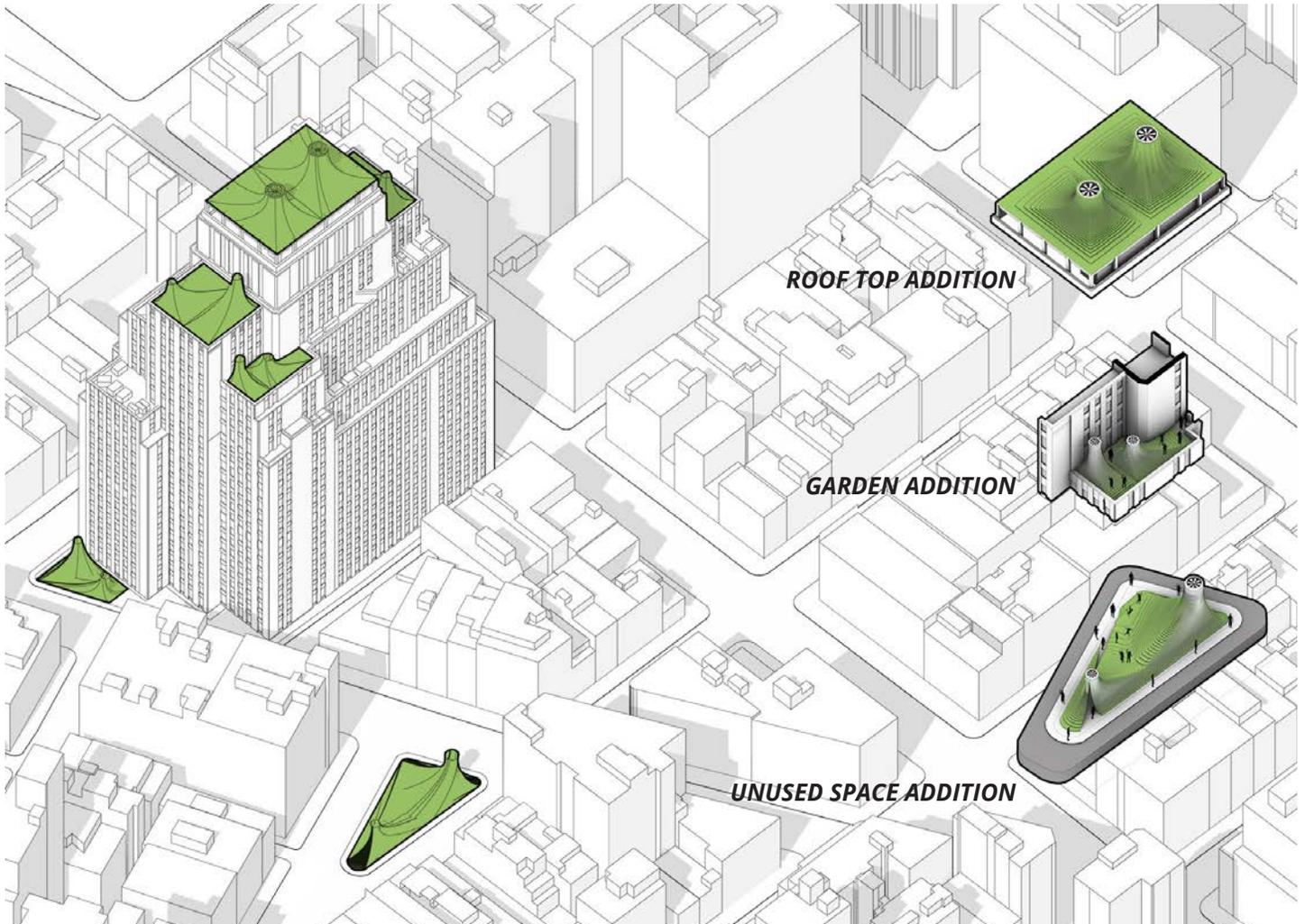
About 2% of the water used
in data centers is released as
steam

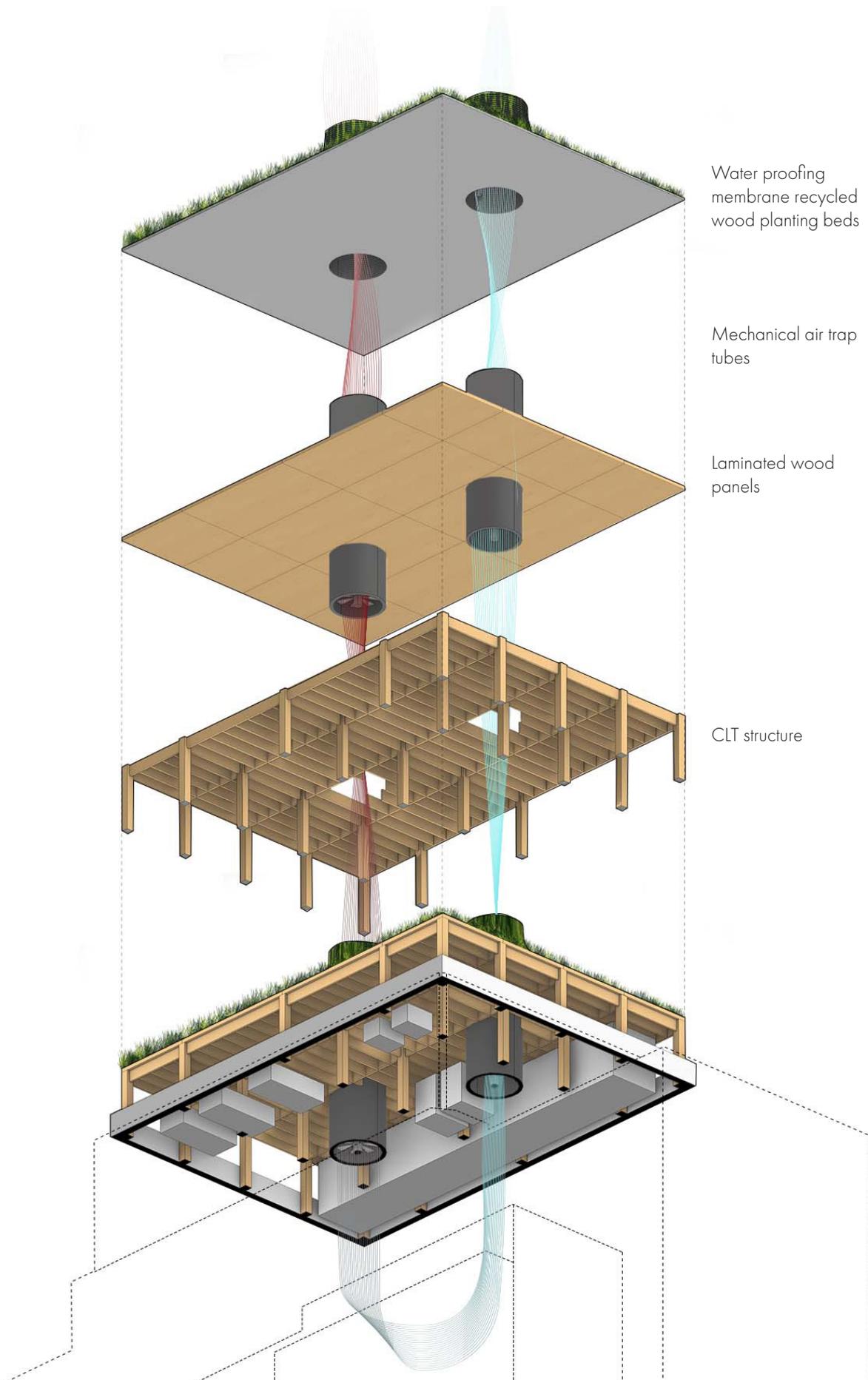


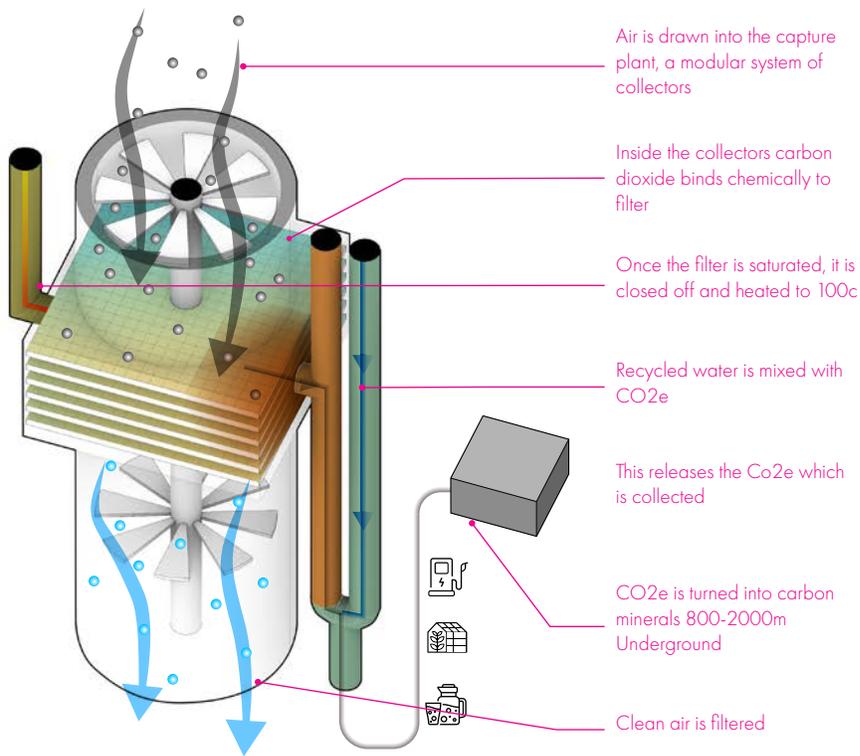
**PROPOSED PROJECTION
WITH ONE INTERVENTION**



**PROPOSED PROJECTION WITH
MULTIPLE INTERVENTIONS**









Proposed solution with Direct Carbon Traps placed throughout the building and block

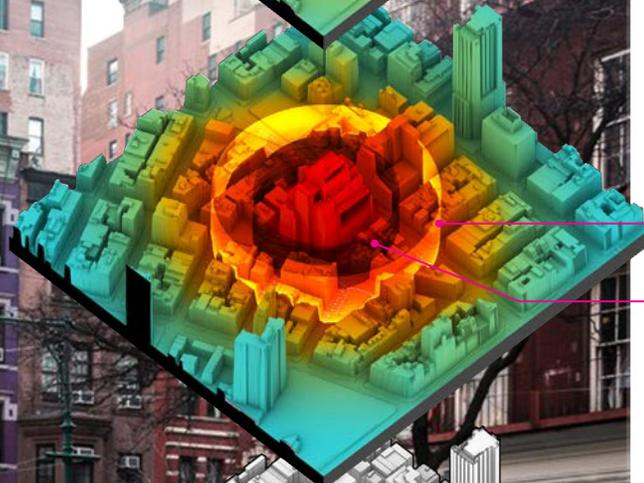


FUTURE:

60,000,000 Cubic feet of Steam released in the atmosphere

35,000 Metric tons CO₂e released in the atmosphere

This is based on the growth register from previous years.



CURRENT:

40,104,166 Cubic feet of Steam released in the atmosphere

24,953 Metric tons CO₂e released in the atmosphere



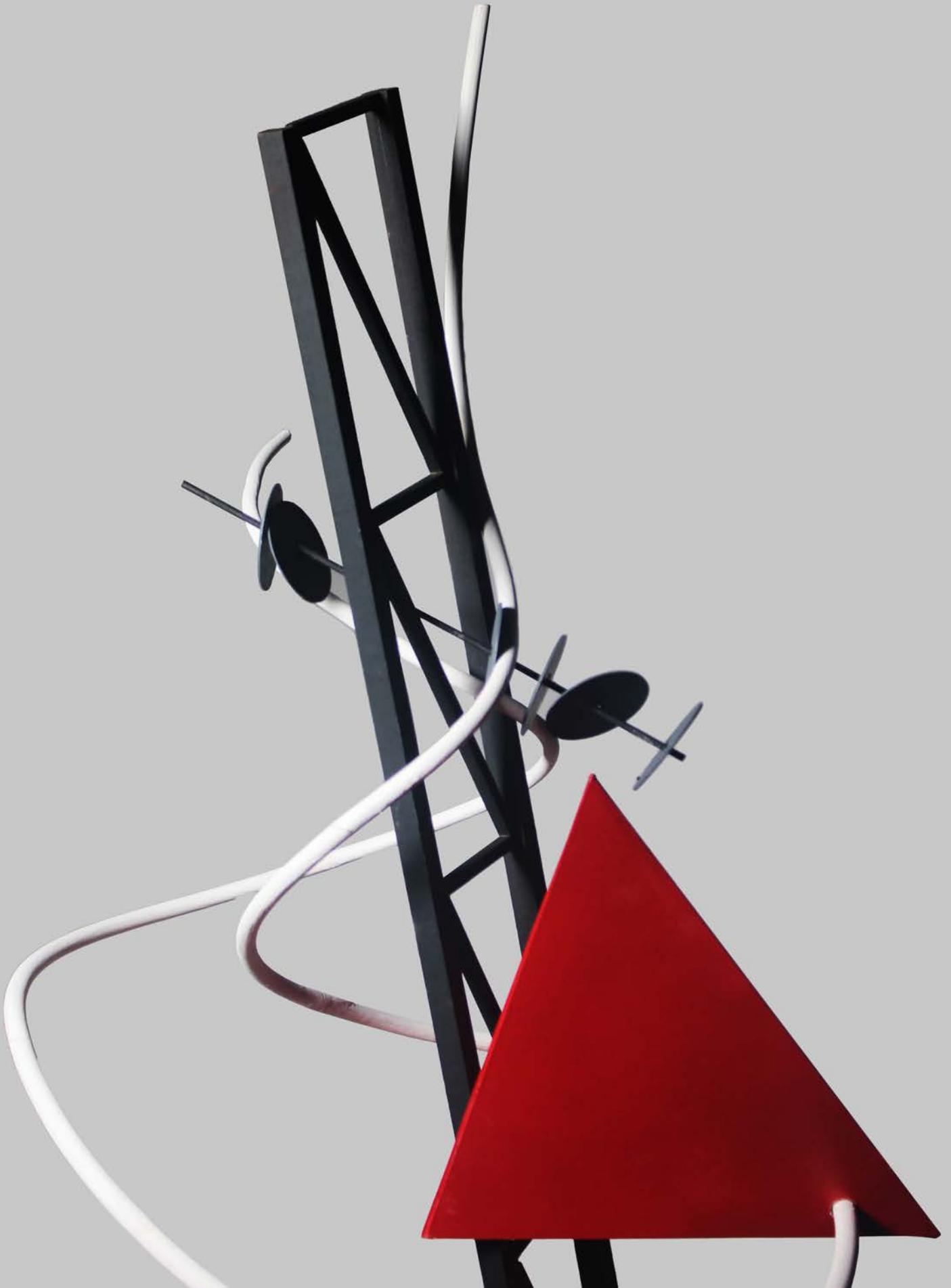
**PROPOSED SITE
WESTER UNION**

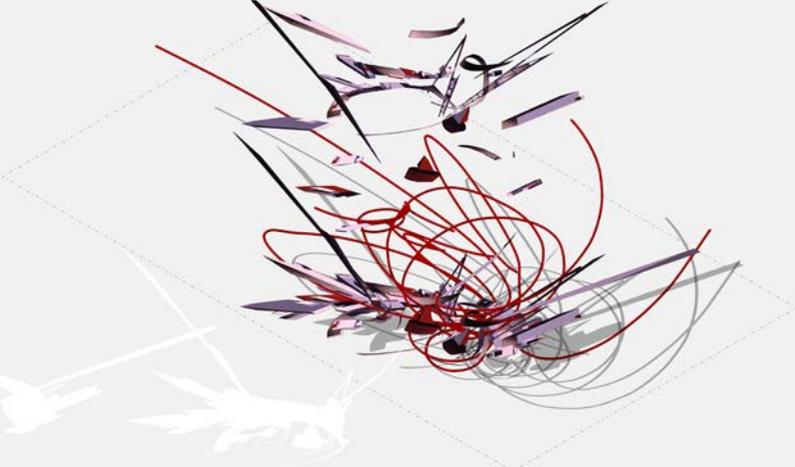
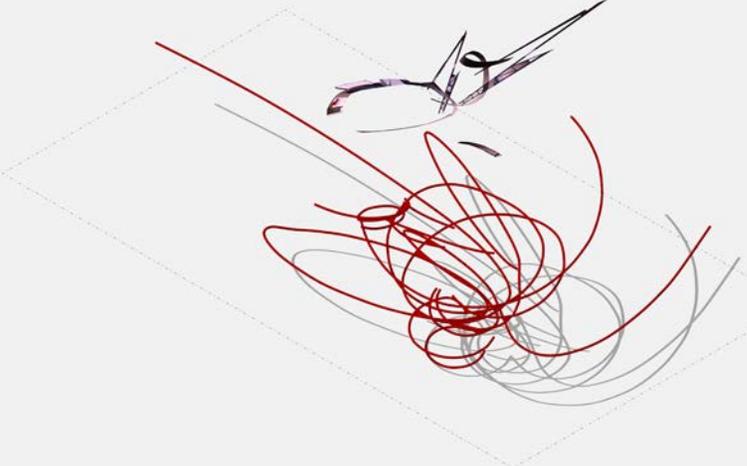
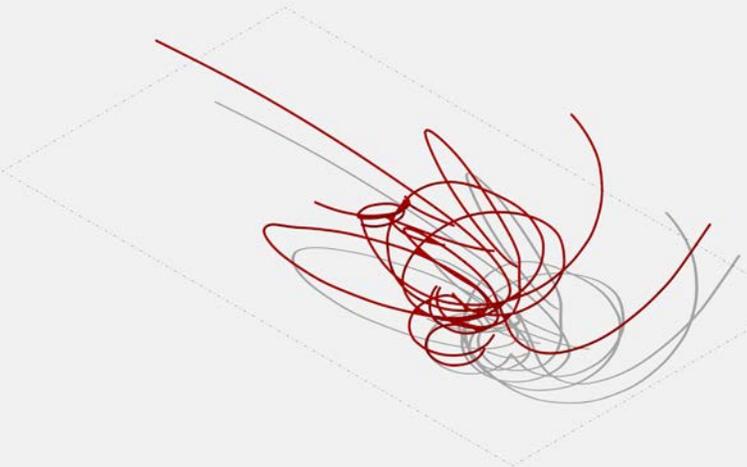
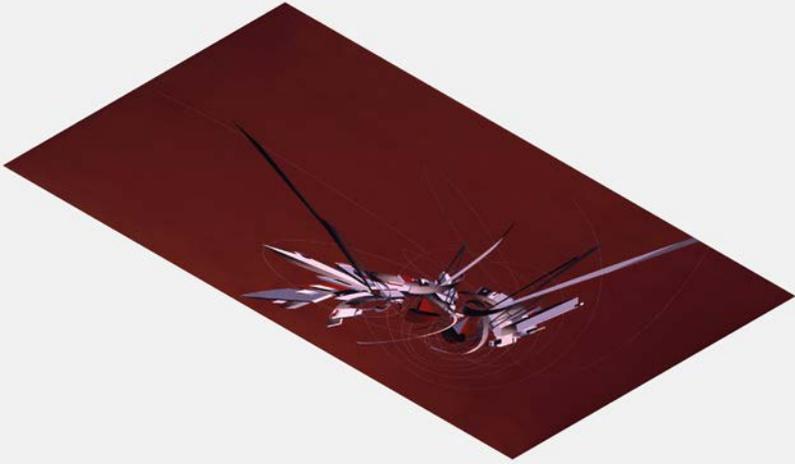


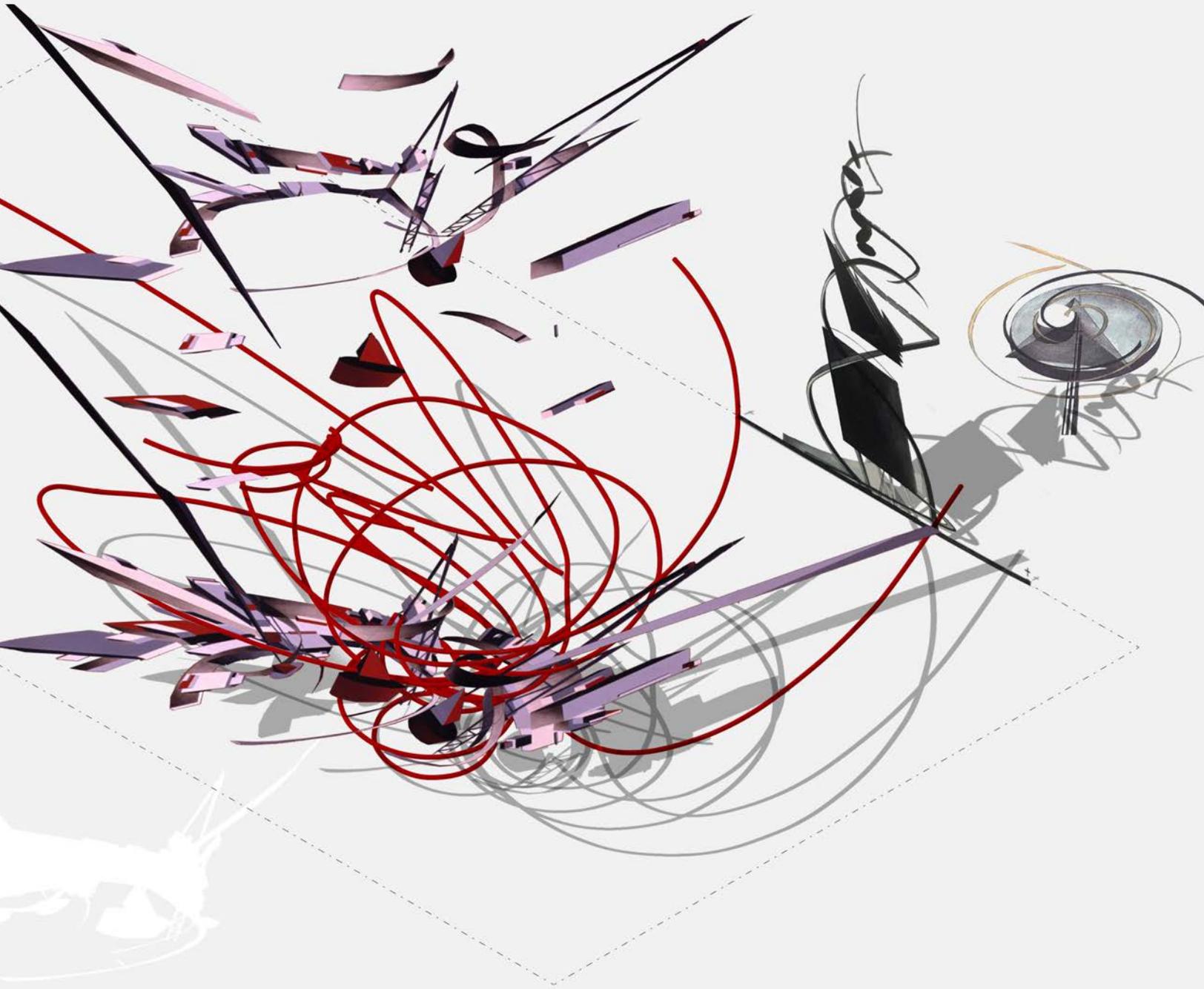
TEKTONIK WORLDWIND

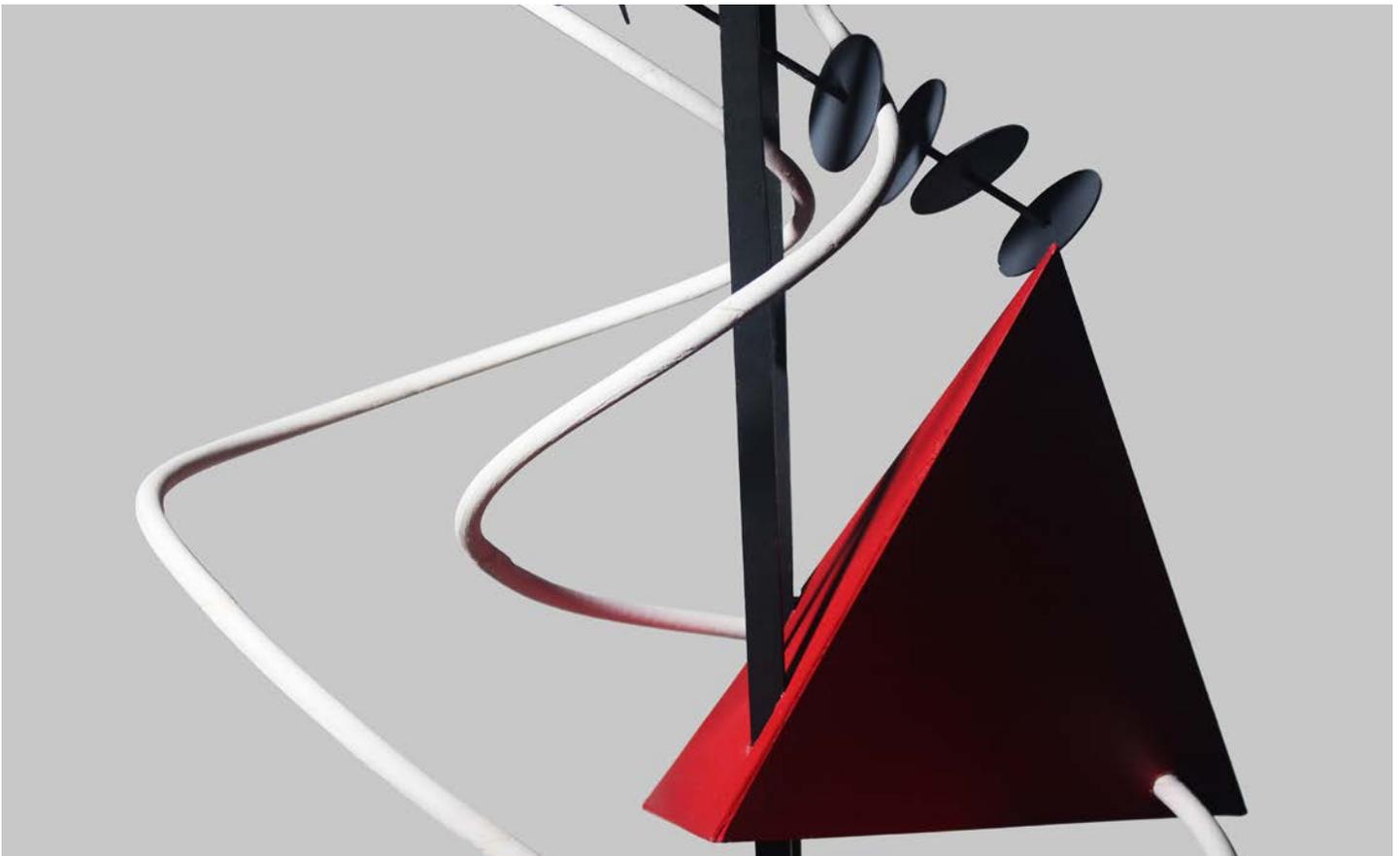
A Visual Journey for Zaha Hadid Artistic Vision

Tektonik World-wind is an interpretation and examination of the paintings that marked Zaha Hadid career from the AA to the exhibition at the Guggenheim finishing with the Great Utopia. This interpretation aims at establishing connections from her past work, Russian suprematism and the Tatlin tower from which she drew inspiration to complete this exhibition. Although early sketches for the Guggenheim museum and a proposal for an installation never happened this model aims at connecting what could have been if those sketches and Tatlin tower merged into one.













OPEN MULTIPLE
PATHS TO CROSS

POLLINATOR

PRESERVE THEATER UNDER
POLLINATOR

PRESERVE
PLANTINGS AREAS

PRESERVE
PLANTINGS AREAS

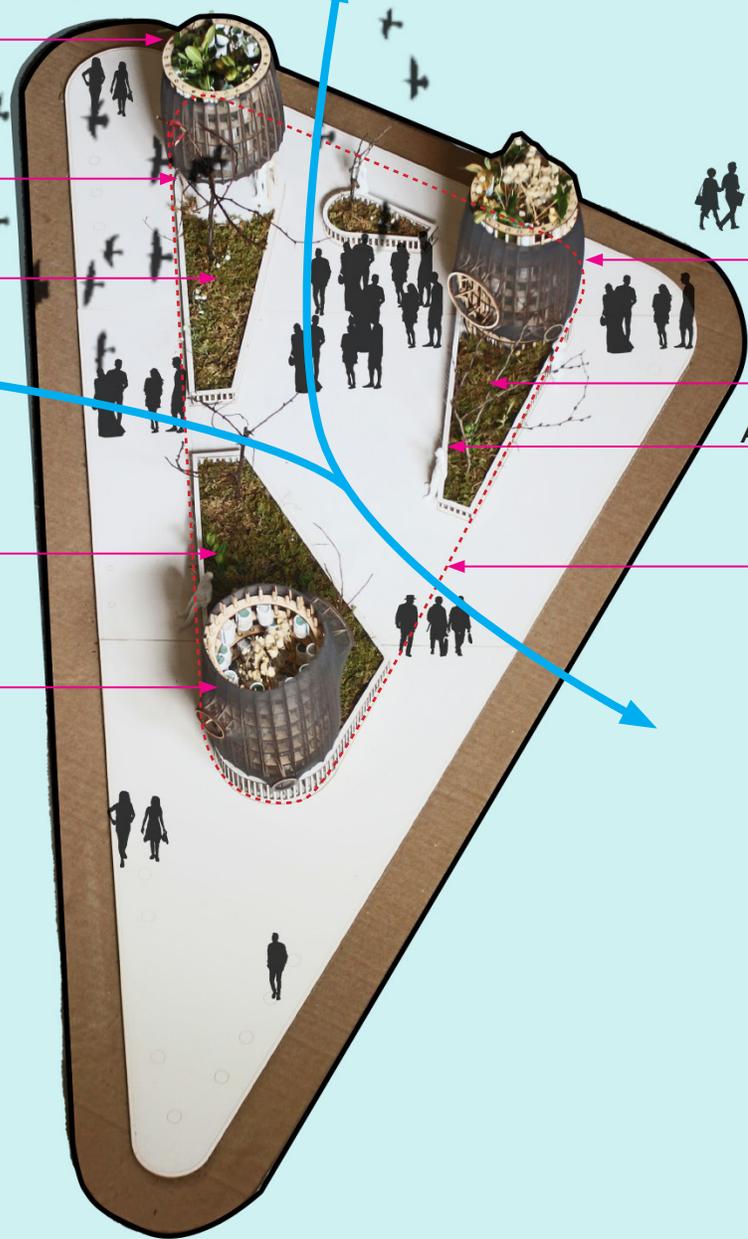
MUSHROOM FARM

POLLINATOR

PRESERVE
PLANTINGS

ADD FLEXIBLE SEATING

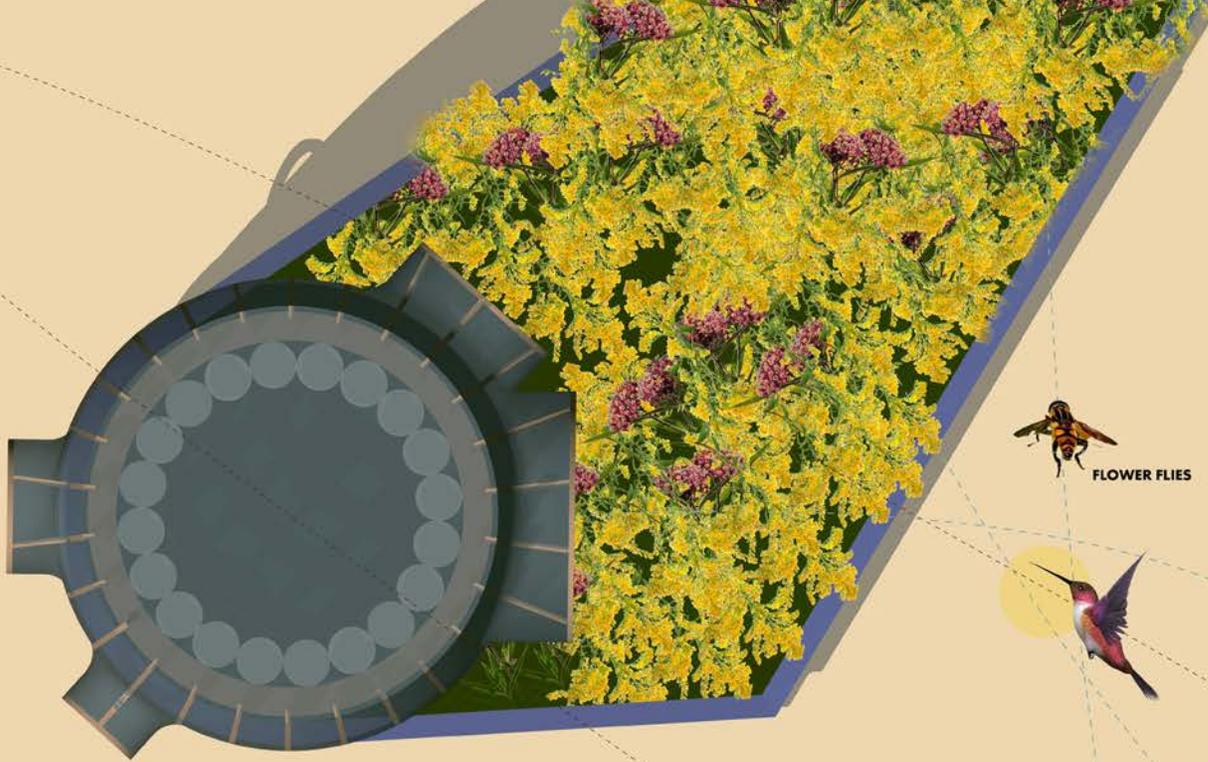
BREAKING THE
EXISTING FENCE











FLOWER FLIES



HAWK MOTHS



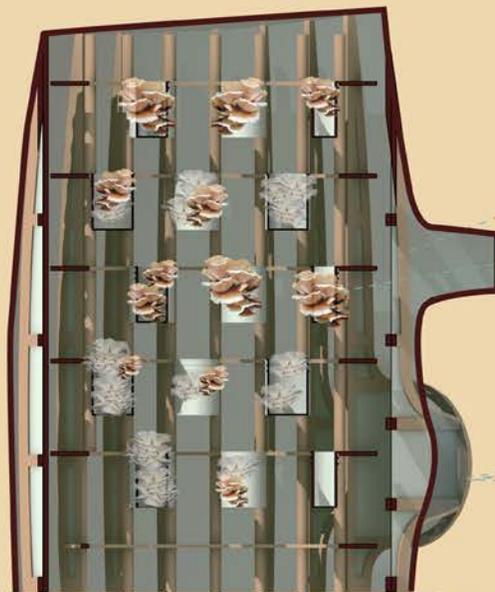
BROWN BELTED BUMBLE BEE



HUMM



OYSTER MUSHROOM





MINING BEE (FOOD)



HUMMINGBIRD



BLACK SWALLOWTAIL BUTTERFLY



GOLDENROD SOLDIER BEETLE



HUMMINGBIRD

COMMON EVENING PRIMROSE

GRAY GOLDENROD
FIELD THISTLE

COMMON MILKWEED

EARLY GOLDENROD

COMMON CINQUEFOIL

SOLIDAGO GIGANTEA

WRINKLELEAF
GOLDENROD

CANADA GOLDENROD
SEASIDE GOLDENROD

rAADio SEASON 3

Where did we go wrong with ethics in architecture?

The “Unethical” season dives deep into what it means to be ethical in our profession, practice, and academia. Our goal is to unpack and uncover the intricacies of ethics in areas such as Disciplines, Technology, and Labor, in a world that is full of political, cultural, and social complexities. We won’t be defining ethics, but instead, we aim to explore its viscosity as architecture evolves.

Episode 2 "White Noise"

Guest speaker: Emanuel Admassu

By: Zhoufei Tang and Alejandro Marin

In this episode, we are asking do architects have to be Ethical beyond their buildings? What is the relationship between architectural content and container to re-imagine the dynamics of socio-political contexts?

AM: *It's very easy in our society to stand up and call yourself an activist. I think the medium just allows you to do it much more freely, whether you actually make an impact or not. I think that that's where you gotta be careful today and I think that's where you're coming from with your work. I find this duality very interesting because it's a delicate balance.*

EA: *I would not say I'm an activist. We try to produce work that raises consciousness. And we do that through our writing, we do that through the images, through the arguments. We are generating ideas and putting them out in the world. Hoping that those ideas will be taken up by someone else. But, the role of the activists is slightly different, the role of the activist is much more explicit and much more pointed and specific results or solutions are imagined or proposed.*

ZT: *Our problem with biennales is that they become slogan performative and in a sense this is what invalidates the work and makes them look like they are presenting for the queen. How do you invalidate the performance and work within the context of the biennial?*

EA: *So, I think there's performative aspect to these biennales, that we have to be really cautious about and knowing that context, we have to challenge ourselves and say "what would introduce a certain level of critical consciousness and revelation into this environment? You know?" and in our case, we're testing what we can do within that context. Some of these terms are overused. A lot of the terms have lost meaning because they've been applied to so many contexts. and so, we have to make work knowing that there is that tendency towards desensitizing and kind of making everything the now, and making everything a regurgitation.*

Episode 7 "To be or not to be"

By: Armita Perovani and Alejandro Marin

In this episode we are asking we are asking "how compensations, unions and licensing are entangled in our professional world"

AM: *Another minority group in this industry that is often not talked about are international students. How can unions protect international students?*

Doesn't matter what background you are, you're all coming together to negotiate your contracts, your wages and working conditions with the employer. A collective of everyone working together, so you're not at a disadvantage negotiating. At the end of the day unionizing and collective action is protected by the National Labor Relations Act, which is a federal law. The law does not care about your visa status, all workers are protected workers. You're all protected by the law and your right to organize is protected.

AP: *On top of all these struggles, why is it more difficult to become a licensed architect than a medical practitioner? NCARB profits grow over the years as the passing rates are kept low. On top of this, compensation for both getting a license and maintaining it is extremely expensive, especially for new grads with crippling student debt and very low compensations.*

Once we've reached a certain union density. If enough firms have unionized workers, we can build political power on a larger scale, because we hear about other industries, where Unions can set policies that benefit their workers, adjacent industries like construction unions. For example, for city contracts, they must hire unionized workers and that's because unionized workers in the construction industry have enough power to influence the government to make these policies. There is nobody advocating for workers in architecture in a collective. If we build enough Union density, we can push to advocate for political change on a larger scale.

INFECTIOUS BORDERS

Propagating Borders through Infectious means; Red heart fungus and the Redcockaded Woodpecker

This project titled “Infectious Borders: Recovering the forest through the Red Cockaded Woodpecker and the Red Heart Fungus” aims to explore the complex relationship between the ecosystem, humans, and non-humans, and to develop strategies to protect and restore the biodiversity of forests threatened by the extractive methods of the biomass industry. The project is set in North Carolina, which is considered one of the most ecologically bio-diverse regions of the US due to its rich ecosystem in wetlands and bottom-lands. However, the forests and multiple species face mass extinction due to the industrial logging practices of companies like Enviva in North Carolina and across the USA.

The project proposes using the Red Cockaded Woodpecker, a keystone species, and the Red Heart Fungus, as agents of invisible intervention to recover forests across federal and private borders. The project also explores the legal framework that can be used to protect the habitats of endangered species and to enact laws that prevent the destruction of forests. Through a series of drawings and diagrams, the project presents a landscape strategy to spread the Red Heart Fungus and the Red Cockaded Woodpecker across the affected regions and to create a network of human-nonhuman collaboration for the invisible activism required to recover forests. The project aims to inspire a rethinking of our relationship with nature and to develop sustainable practices for the preservation of the environment.

GAME
Come board to solve while the problems.

U-Boats
Cargo ships leaving Chesapeake port are intercepted by small submarines carrying carbon sequestering myxobolus bacteria that is injected into the many tons of wood pellets that are consumed by the factories, helping sequester the carbon released into the atmosphere during the pellet making process.

Forensic Drones
Covered areas flying above the forest factory, observe and map factory processes, people, transportation, export, and post the information in a database. The drones also note degraded human and non-human population and pollution levels, verify all information to create an algorithm that represents the variations. The created structure in form is used to provide solutions to affected beings.

Subsidizing
Stop the money flow from EU into the forest plant and bringing back to the communities that are more affected to create spaces where we can sustain new ecosystems.

Neoh's Arc
Boats shipping pellets across the Ocean, are canalized workshops that use the wood pellets to create habitats for flora and fauna. Some drift into the EU and repair endangered species, and return to the waters forever.



Occupying Enviro
An art to show how other industries can be removed for biomass production, getting big logging companies out of business. The large infrastructure of factories can be reimagined as coastal foundations for affected agents and animals to live.

Hacking transportation
Creating architectural parasites that attached to the cars and ships that transport the pellets in order to allow waste water to be captured in special containers.

Capitalist Solution for a Capitalist Country
Make the landscape of the weekend profitable to alternative means of businesses which in turn protect the ecosystem from climate change and give back a profit to all stakeholders.

Guerrilla Architecture
This approach uses the community to fight back in the forests that are being cut by inserting new endangered species such as the Yellow Throated Blue. Cyanobacteria or Myxobolus prevent grass-plant which would wipe some of the forests protected areas through more shift attention that would eventually become part of the ecosystem.

Palermical Elections
Convert Enviro into a polling book for US elections.

Dome
An polluted, emerging heat forest factories are caught in a floating film surrounding the factory infrastructure. The film is periodically removed, cleaned and replaced.

Noise
Powerful noise from factories is used to generate power. Architectural means that generate electrical energy from sound waves will be applied to an insulating surface around the factory.



On ground legalities
In alliance with Dogwood and other groups, citizens at "Antarctica" or "Arctic" kept their attention to the oppressed community to create a vision of assistance for terminals.

Hacking housing
This intervention tackles the communities that have been rapidly profited by Enviro's clear cutting and pollution by redefining what housing could be where the ecosystem and the space struggle as one. Humans and non-humans being together and working as one to rehabilitate the forest lot through clear cutting while protecting the land as one.

More seed more problems
This project uses the community to create opportunities that would allow them to return the forest with special trees that have been lost to deforestation.



Hydro-habitat
Protection for aquatic animals from the chemicals of pesticides. Structures that would serve natural habitats for endangered fish, oysters and turtles. Promoting the oysters and fighting the pesticides. "Hydrohabitat".

Pellets bombs
Can we use the pellets of the pellet that are already in circulation, can give them back to the forest for the soil to take up and non-wasteful and self-renewing?



Plug-in Cell Resistance
An artificial or plug-in resistance subject to attack to trees that provide the trees being cut. This element can have a physical aspect that can impact with the habitat of the wetlands and help in the preservation of endangered species.

Hacking the Lows
Under the endangered species and the community can resist the global and globally listed by the organisms that are found in the forest. This resistance uses recycled over forest organisms to those endangered species and plants to come back and forest. Following the 1000 trees for the cutting and stopping Enviro before they were lost to come back.



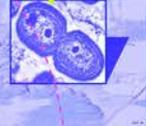
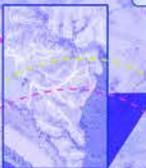
Visualizing Pesticides
This approach uses to use a special conversation, the interview with myxobolus and chemicals used in the pesticides to indicate the effects that are in the ecosystem and visualize its effect on the various and non-humans.

After math
This project assembles structures which carry biological organisms such as cyanobacteria, algae and fungi that trigger physical change in the landscape allowing the soil and species such as fishes, birds and bees to inhabit in the structure and colonize it, growing the ecosystem and eventually based on the foundation for the seeds to germinate and spread in order to also reproduce once and for all.

Non-Human Airport
This migration airport would be species such as birds or insects have a safe space where the organisms they carry and where they provide can be protected to rehabilitate the soil and other important organism like fungi and bacteria from which wetlands are depend on. This is a non-human airport that aims to create actual rehabilitation through the movement of species.



Bacteria
Fast Growth Promoting Phosphorus (FGPM) can be introduced with multiple recycling systems through the ecosystem to promote growth of plants and trees.



FRANK ANTONIO ALVAREZ

TECH INTERVENTIONS

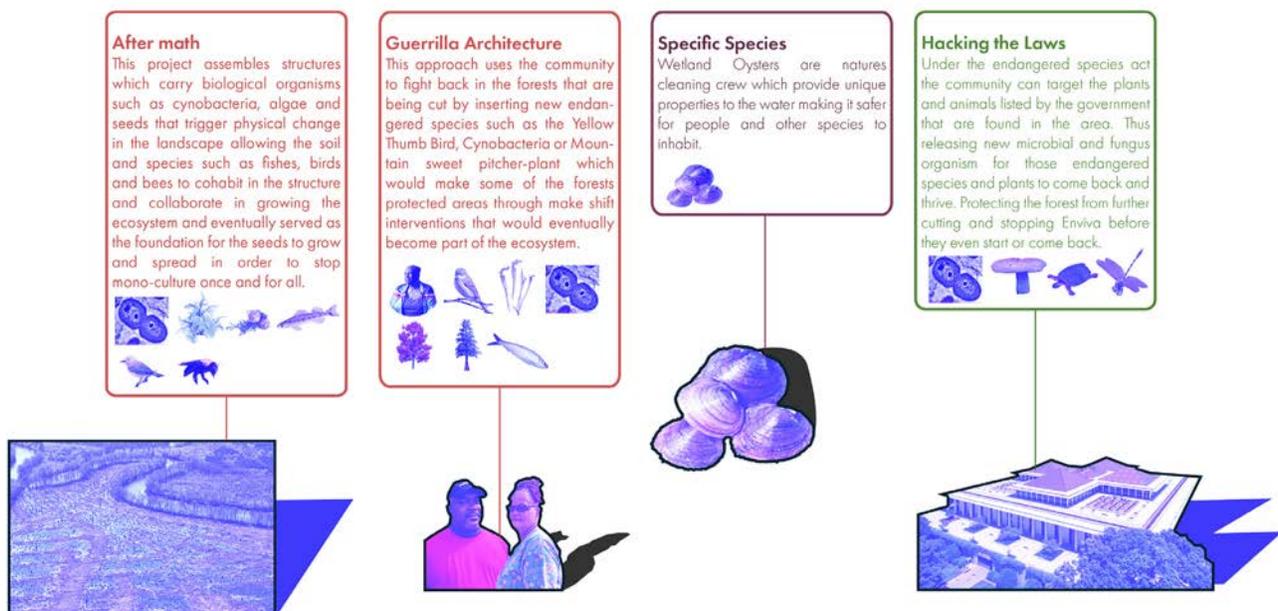
COMMUNITY OPERATIONS

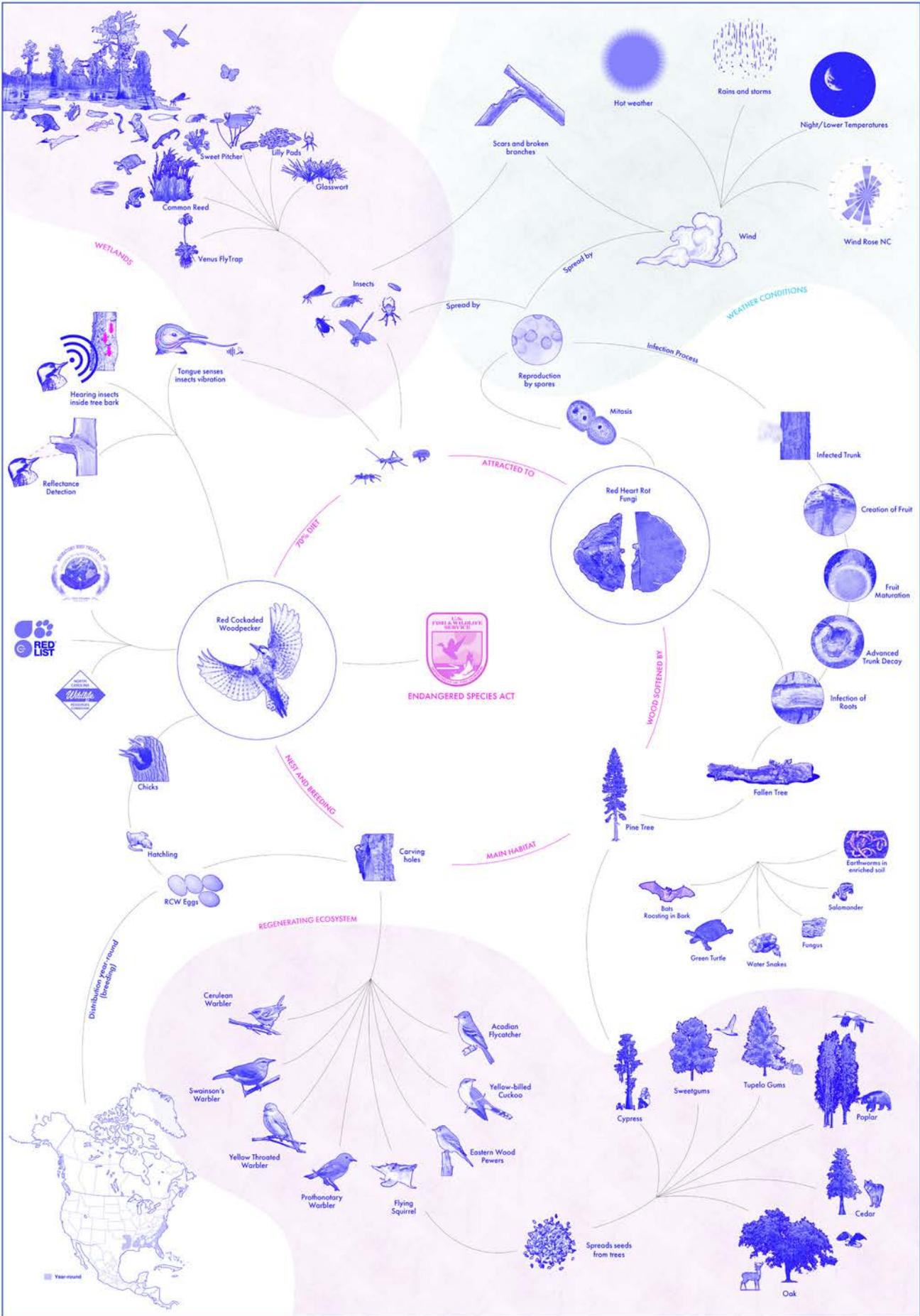
LEGALITY

NON HUMAN INTERVENTIONS

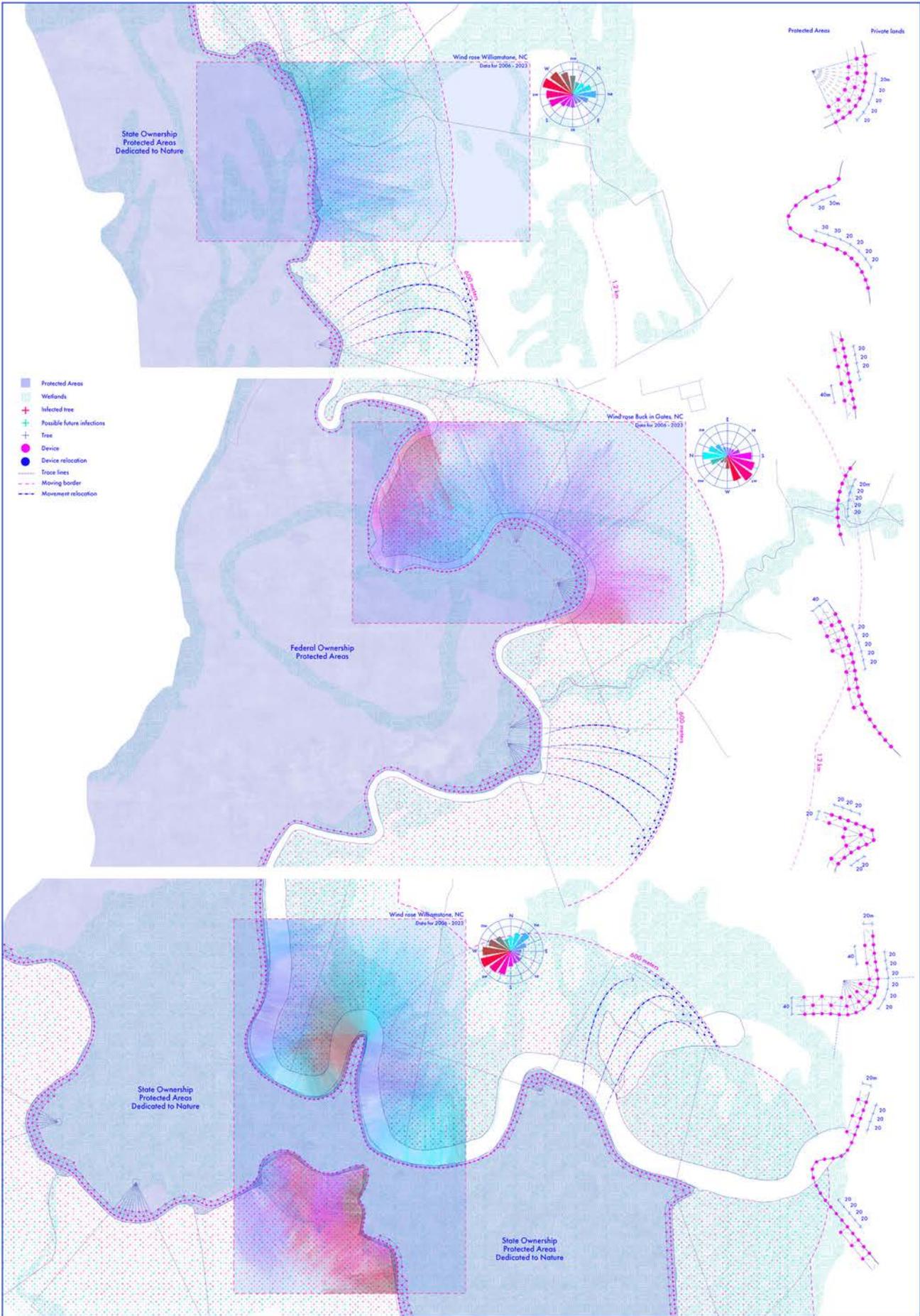
ACTIVIST IMPACT ON THE ECOSYSTEM

In order to understand the complexities between the impact of the forest, humans and non-humans, we created a repository of geographically set ideas that would allow us to understand the areas that are most affected and can have a bigger impact on the ecosystem. Through it, we were able to identify some speculative ideas to work with and combine: like **enacting laws, work with a specific species, and activist intervention for rehabilitating monoculture ecosystems.** This set of cards allows us to question how we can turn the forest into a political object.

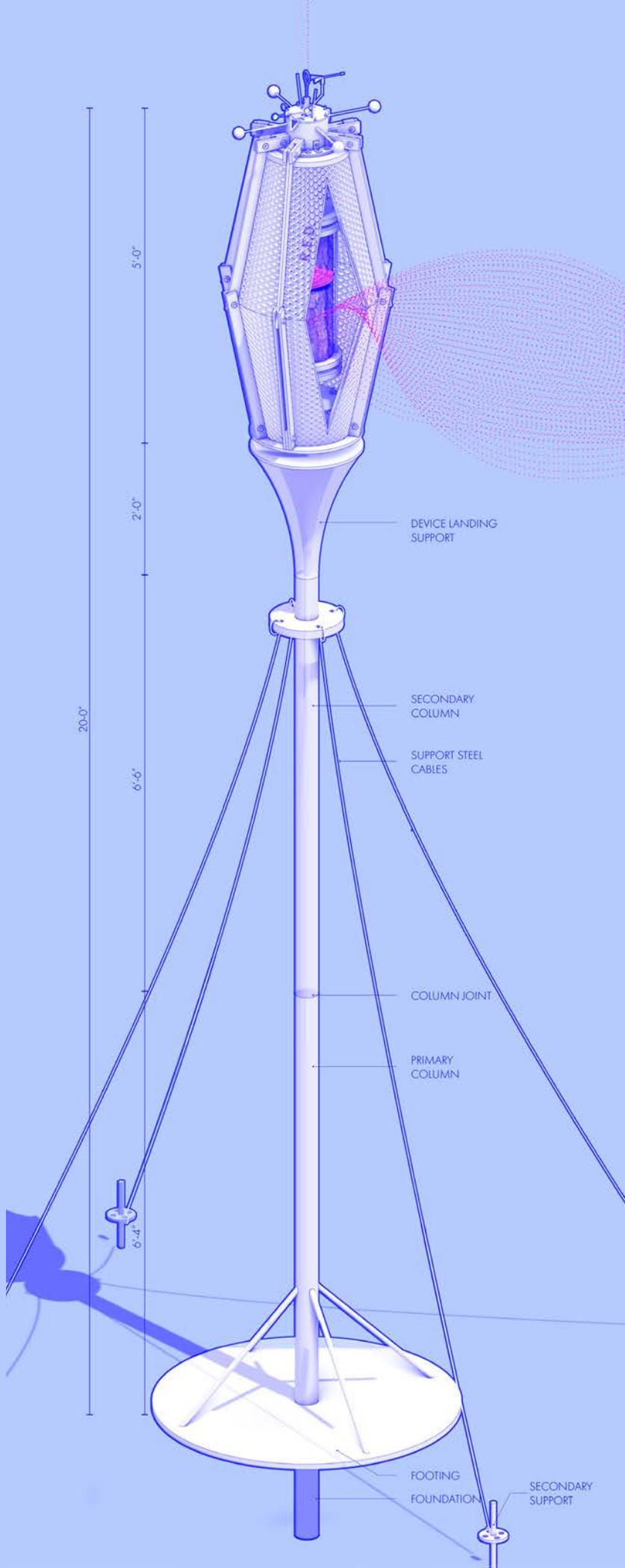


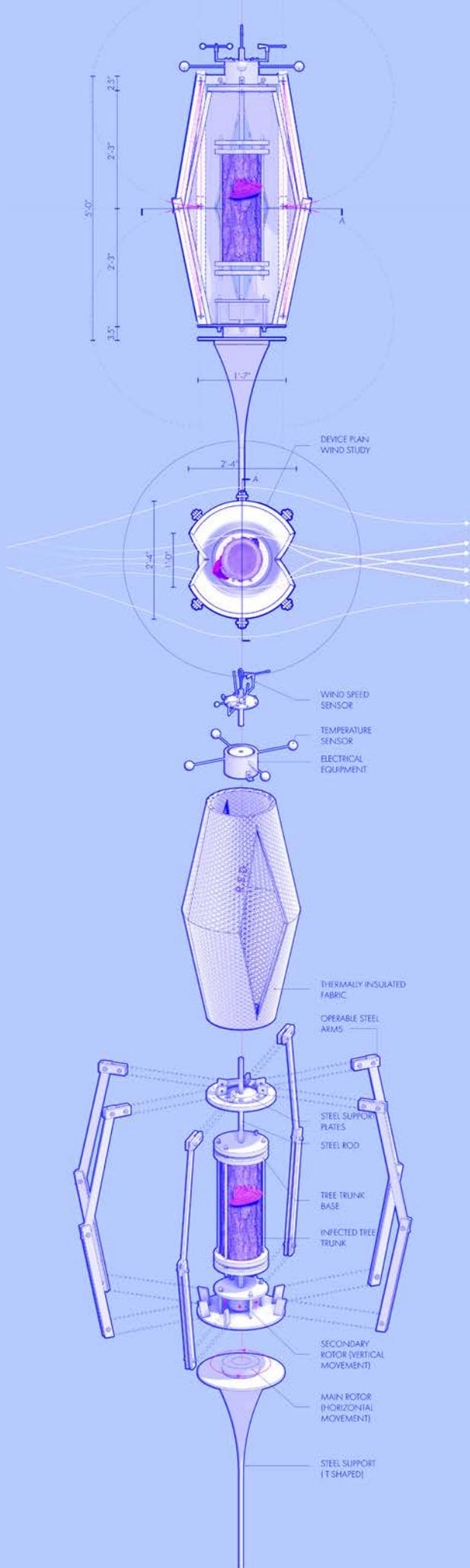


We are proposing a spatial but **unnoticeable activist intervention** that aims at protecting forests damaged by Enviva by enacting federal laws across borders and allowing entanglements between the **Woodpecker, the Red Heart Fungus and the forest. The Endangered Species Act protects species that are crucial to the ecosystem and the land they inhabit.** It states that the “critical habitat” is the specific areas that contain the physical or biological features that are essential to the conservation and reproduction of endangered and threatened species and that may need special management or protection.

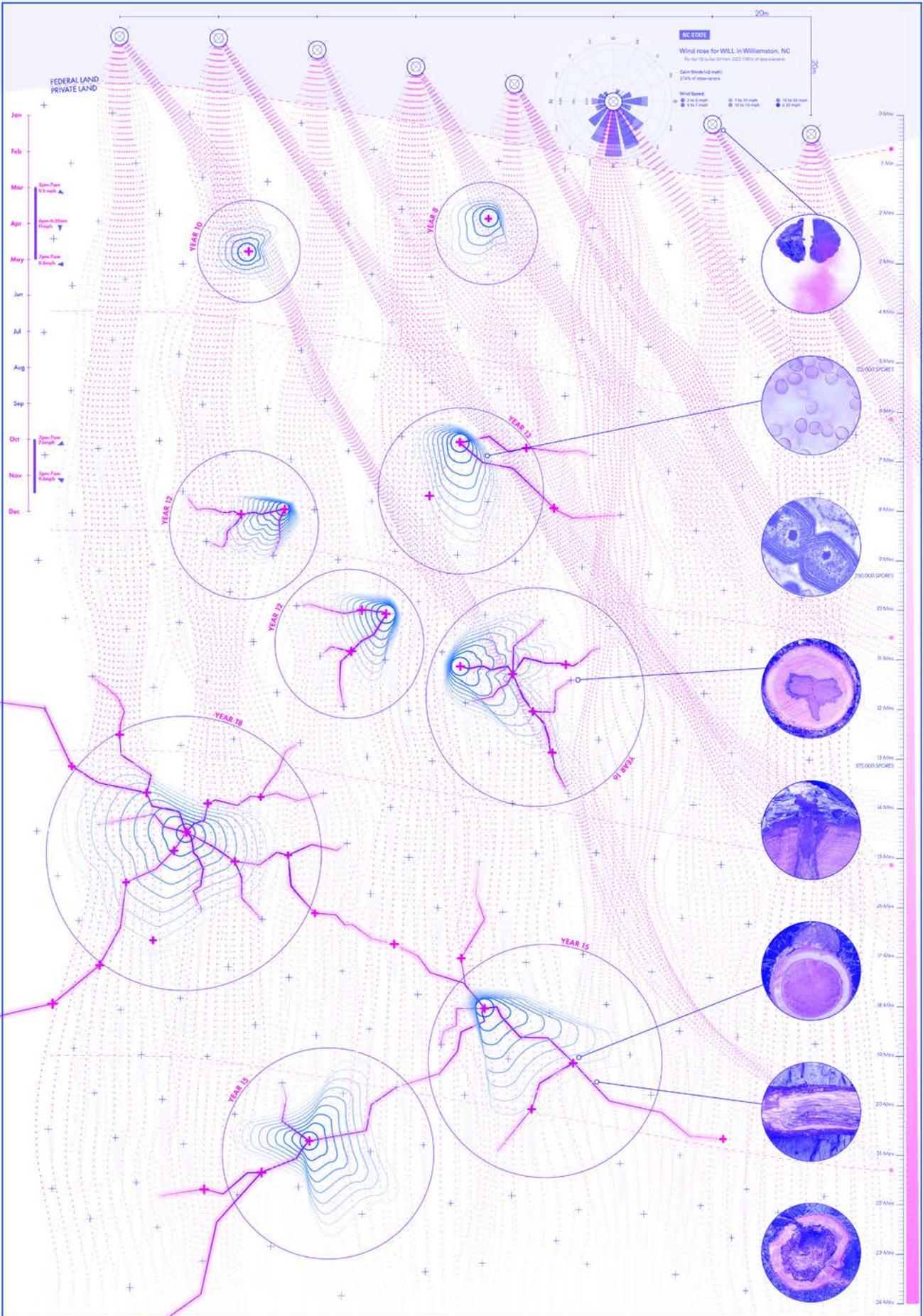


We started by identifying the borders between the federal, state owned lands and private lands in North Carolina to initiate a strategy through the landscape that challenges and expand the borders of protected lands using non-human allies. **We plan to use a network of devices to distribute fungal spores using the wind as a means of dispersal.** Our goal is to attract woodpeckers to new habitats in order to promote forest protection and enforcement of laws by achieving a balanced level of infection across borders.





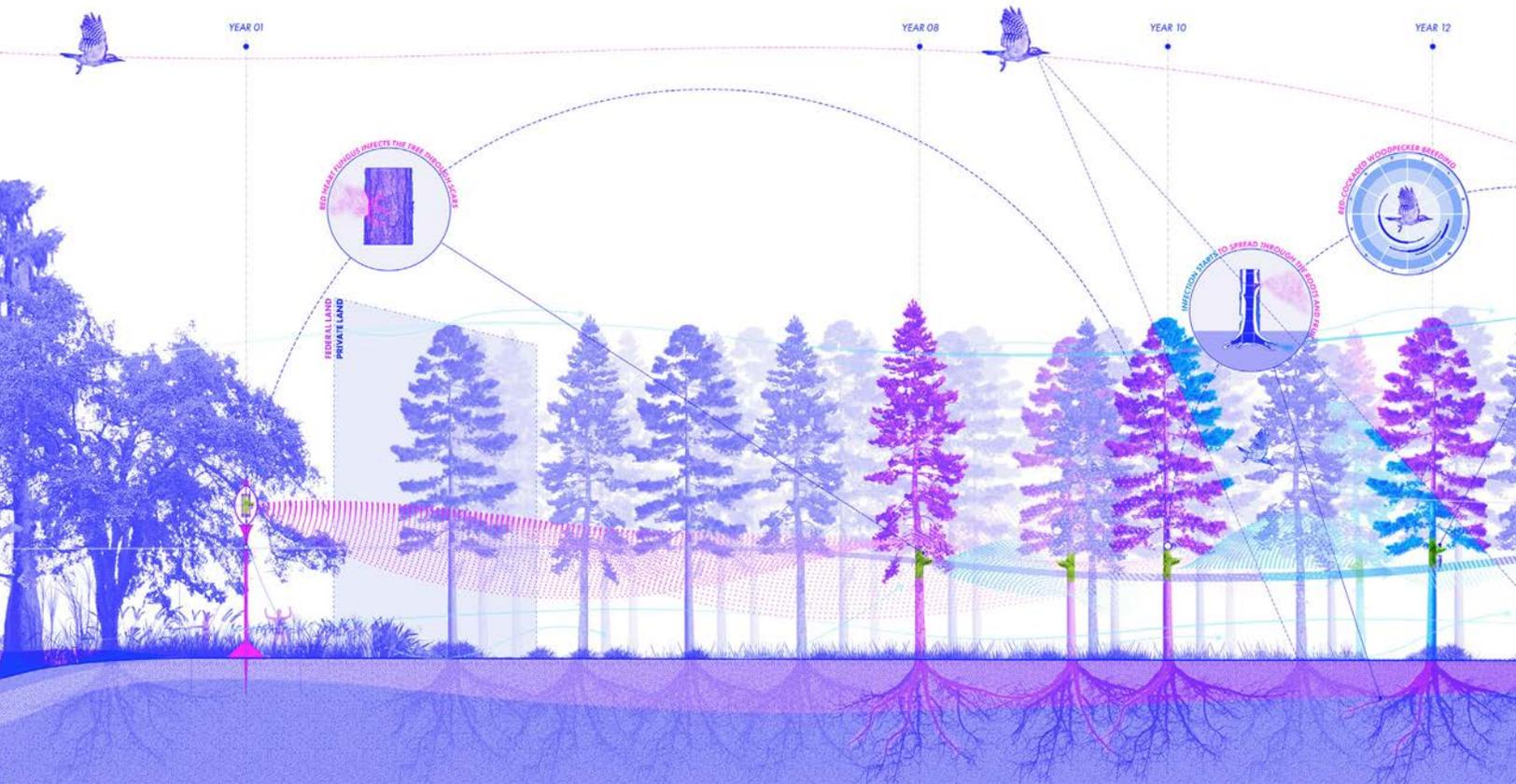
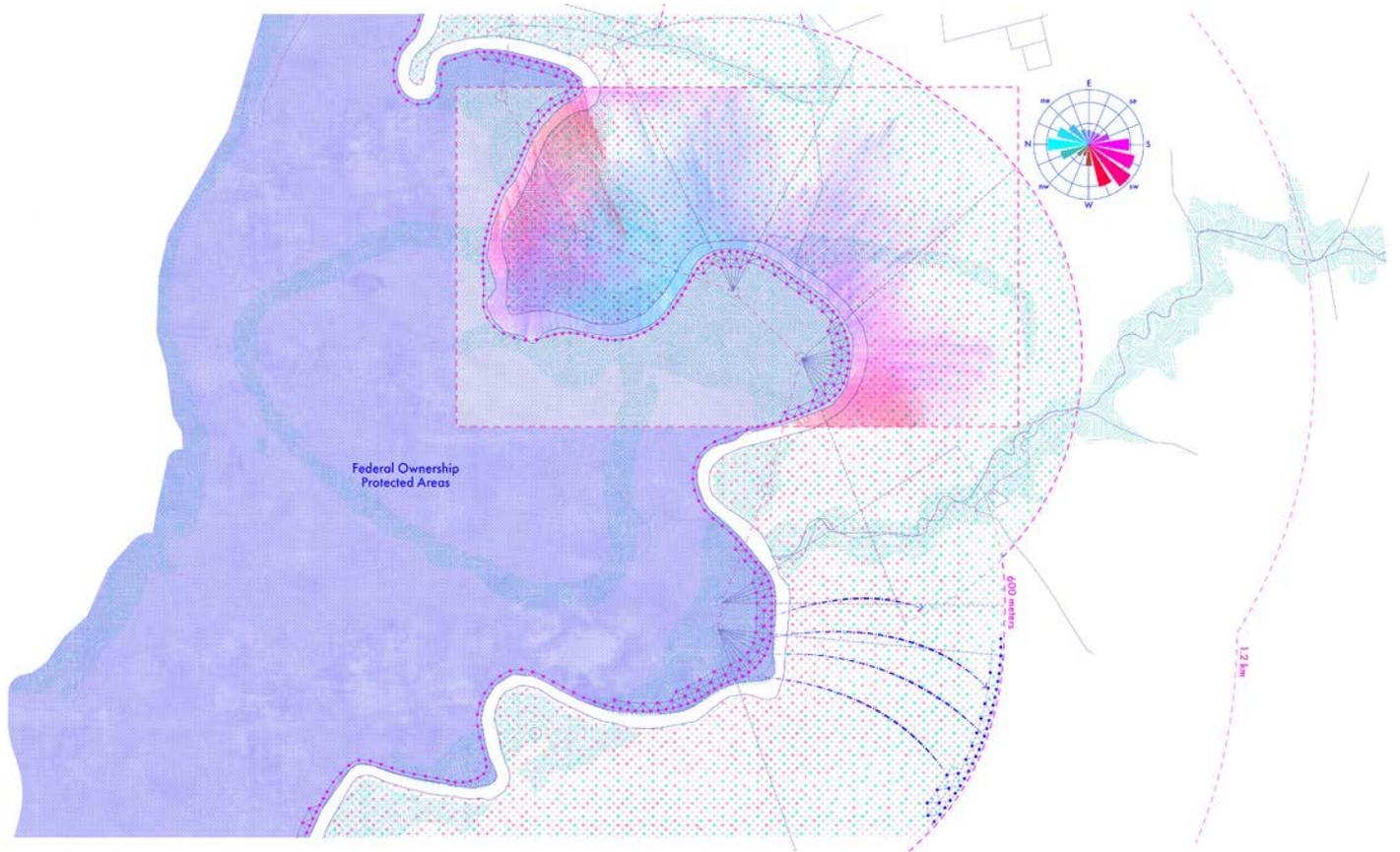
The device would carry a tree trunk with the fruit of the red heart fungus placed 25 feet above the ground where it can open and rotate automatically based on the wind and temperature of the site, releasing the spores below the branches of the pines where most wounds are located for spores to access the bark



Around 1 million spores will spread over 30 minutes, affecting 20% of trees that will themselves becoming capable of releasing spores within a decade.

When the spores are released, male and female cells enter the cracks of the pine trees, allowing the fungus to grow inside the tree, **invisible for many years and invulnerable to any pesticides used by Envivia.**

The spores begin to consume its sap and branch out a fruit that looks and feels as part of the tree. This fruit would allow the fungus to further spread its spores again including some of the roots.



Our goal is not to create a perfect solution to a major problem but rather to challenge borders, landscapes, laws and treat healthy infections as possible interventions where non-human alliances lead to activism in the Capitalocene era. To navigate our intricate world of laws using keystone species that could open up the conversation to **envisage a future of rehabilitation where humans are not at the center stage but rather an ally of the non-human and life cycles as the possible solution to rehabilitate forests that have been lost to the biomass industry.** From small organisms to big interventions!



Special thanks to my professors for this incredible journey at Columbia,

Trasncalarities

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Reinventing Living

Luis E Carranza

Extreme Design

Mark Wigley

History of Technology

Lucia Allais

Immeasurable Sites

Emanuel Admassu

*Sincerely,
Alejandro Marin*

