PRESERVING POST-LANDSCAPES: RECONSTITUTING LOST TERRITORY THROUGH IMPERMANANT ARCHITECTURE

A non-degree-required thesis submitted to the
Master of Architecture Program
Department of Architecture

by

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This project has felt like the work of a lifetime being forged in real time. I've never felt so unsure of myself or so close to unlocking my full potential as I have in the year that has elapsed since I started working on a thesis. It has changed immeasurably over that time, and I would like to thank everyone who participated in helping me through this incredible experience.

I would first like to thank my advisor Peter Waldman for inspiring me to see beneath the surface of things and to find the freedom in nature. Your guidance is something I valued immensely even when I was unable to express my intentions fully.

Matthew Jull & Sasson Rafailov, my thesis professors, for helping me in the struggle to articulate this thesis and understand its faults.

Erin Putalik, who's influence during the early days of this project opened my eyes to the constructed environment, and in doing so fundamentally changed this thesis and my trajectory as an architect.

My thesis cohort, who's work and insight constantly amazed me, and whose company I greatly appreciated on the many long nights in the studio.

My parents. Hope Derrick, my mom, for giving me a connection to South Carolina that has been a continual wellspring of inspiration. Marc Turner, my dad, for instilling me with an outsider's perspective and a critical eye for history that shaped this project.

And most of all to Kaitlyn Crow, my partner, without whom I wouldn't have been able to survive this experience. The constant conversations, reassurances, acts of kindness, site visits, and late dinners in the studio are memories I will always cherish, even more so than the thesis that came from them. I love you.

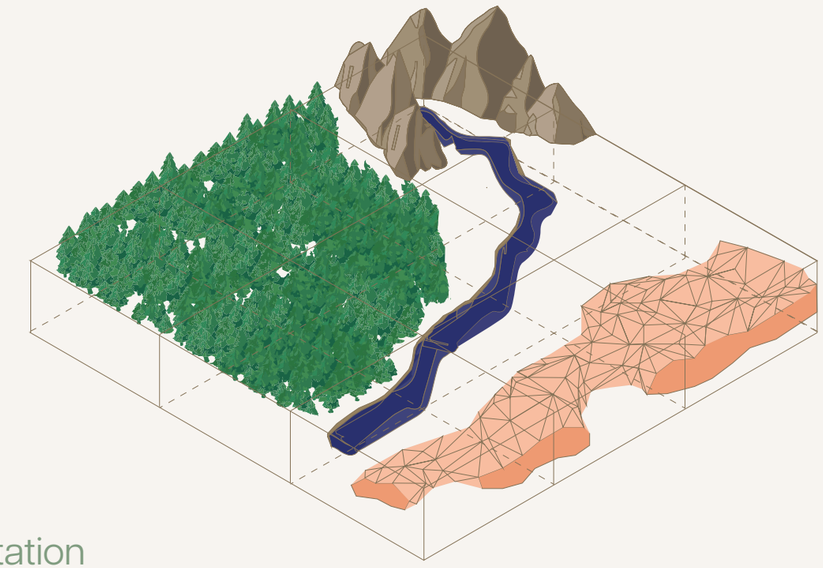
Abstract

Worldwide environmental and political crises threaten assumed conditions of stability undergirding contemporary legal frameworks of property. As an abstract and static mechanism for ordering the landscapes, property is not suited to the increasingly chaotic state of our environment, nor is the fixed and isolationist architecture it propagates. Accepting these escalating changes as insurmountable, in opposition to individualist and preservationist ideologies governing current responses to climate change, presents the potential for a new architectural paradigm based in adaptability and collective mobilization of resources.

This project doesn't propose a utopian model for propertyless society. Instead, it employs existing preservation frameworks specific to the Ashley River Historical District in Charleston, SC, the site of this project, as a mechanism for reconstituting a shared historical landscape of enslavement, rice growing, and phosphate extraction. By reading these sites in relation to each other and broader historical movements informing property, an understanding of the extractive nature of property and its consequences is made apparent, compounded by sea-level rise reshaping the area.

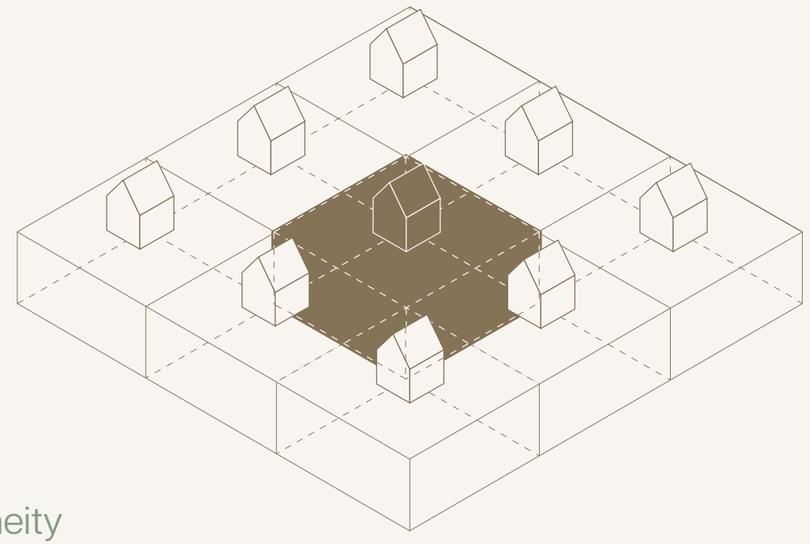
Architecture as a static medium cannot be perpetually maintained. This project suggests a model for preservation that reconciles architecture, landscape, and time. It is composed of three parts; a series of structures embedded in their site, a migratory structure which moves between sites, and a connective path network. The embedded buildings extend the landscape, marking environmental change and facilitating movement of the mobile architecture. This structure adapts to each new site, producing a record of migration and its initial site, reconstructing the lost landscape.

Contents



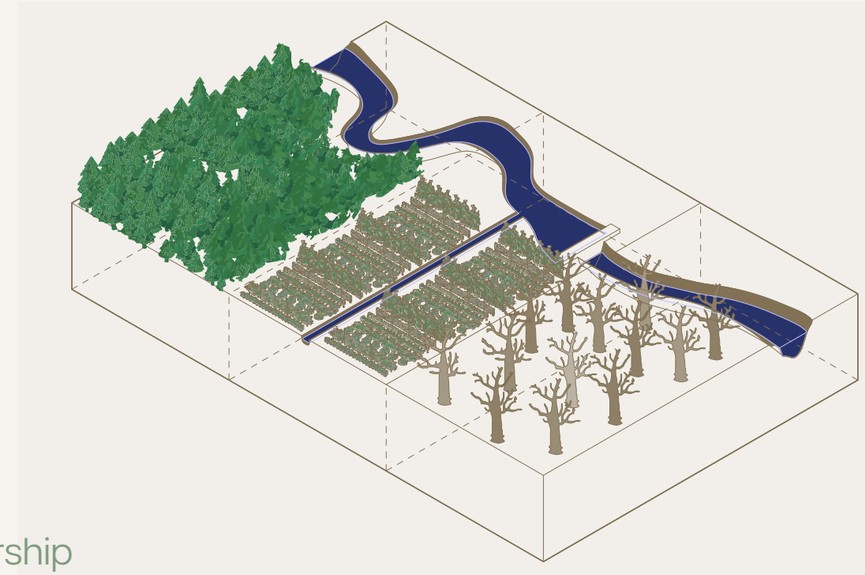
Segmentation

The primary mechanism of property is division; the segmentation of a continuous landscape into consumable parcels. The holistic landscape and its multitude of overlapping systems is considered chaotic and thus inefficient, necessitating an overarching ordering system.



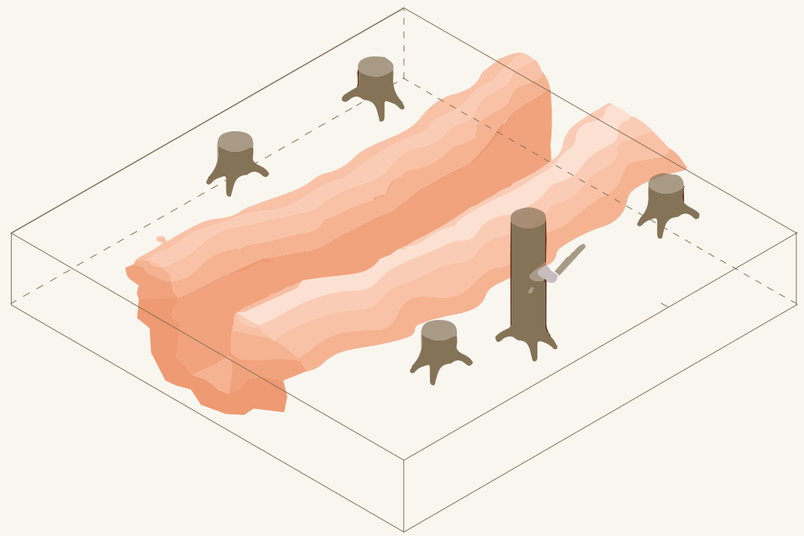
Homogeneity

Segmentation produces an individual relationship with the environment in opposition to its surroundings. This dichotomy produces an isolationist architecture that is limited to the partial engagement of broader systems fractured by property.



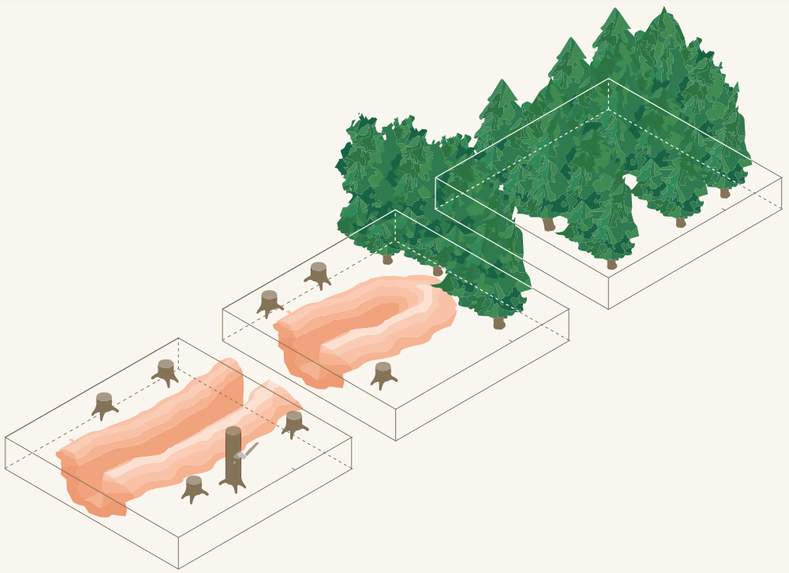
Ownership

Individuation of the landscape places primacy on the influence of the owner over their property. The owner's unique mode of interaction with land with their defined space further reinforces the segmentation of the landscape and its systems.



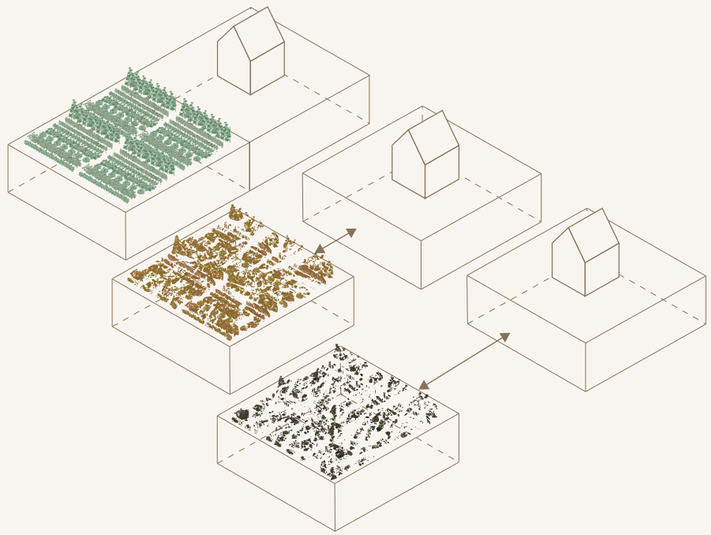
Extraction

Ownership entails complete control over the productive capacity and material resources confined to property. This enables the degradation and disruption of natural systems for immediate material benefit, limiting the regenerative capacity of the land, thus devaluing it.



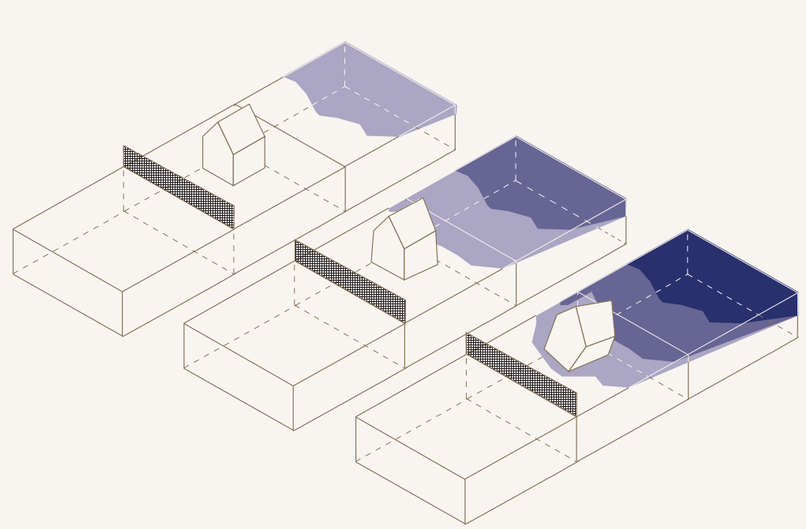
Expansion

The availability of unutilized land enables systemic depletion, as land owners aren't incentivized to sustain its productive capacity as a means of self preservation. The necessity of undepleted land for continued extraction propagates the systemic expansion of property to provide access to unutilized resources.



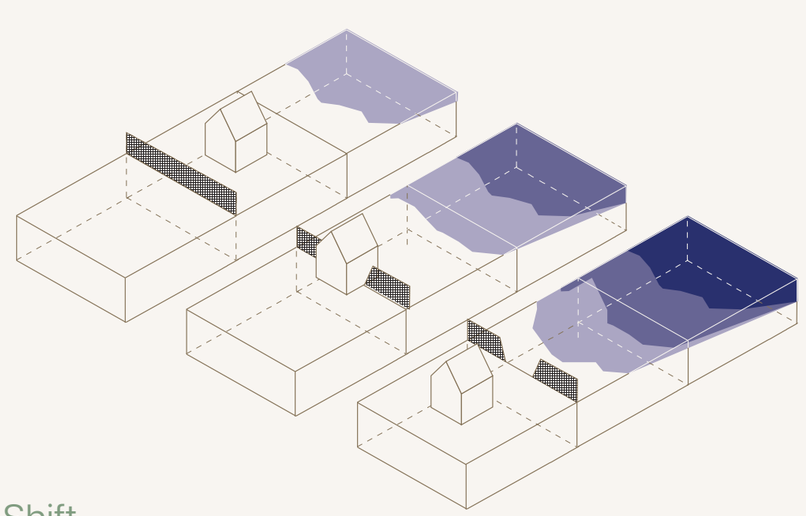
Preservation

Architecture that aestheticizes wealth accumulation enabled by property, constitutes the major focus of contemporary conservation practices. These conservation efforts are conducted in perpetuity, promoting a false notion of historical and material stability inherent to property.



Static Architecture

Architecture is made static by its relationship to property, being either in a perpetual state of preservation or held in reserve for future property development. Architecture constituent to property restricts any built potentials which are responsive to broader environment, economic, social, and political systems.

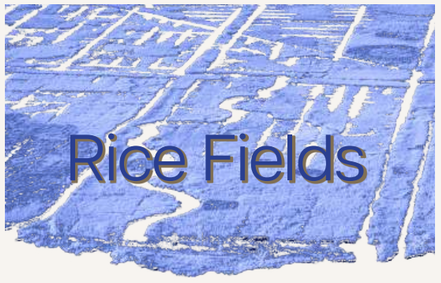


Paradigm Shift

It is essential to reassess the relationship of architecture, landscape, and property. New conceptions of property can produce new architectures, ones which allow for dynamic response to a dynamic environment.

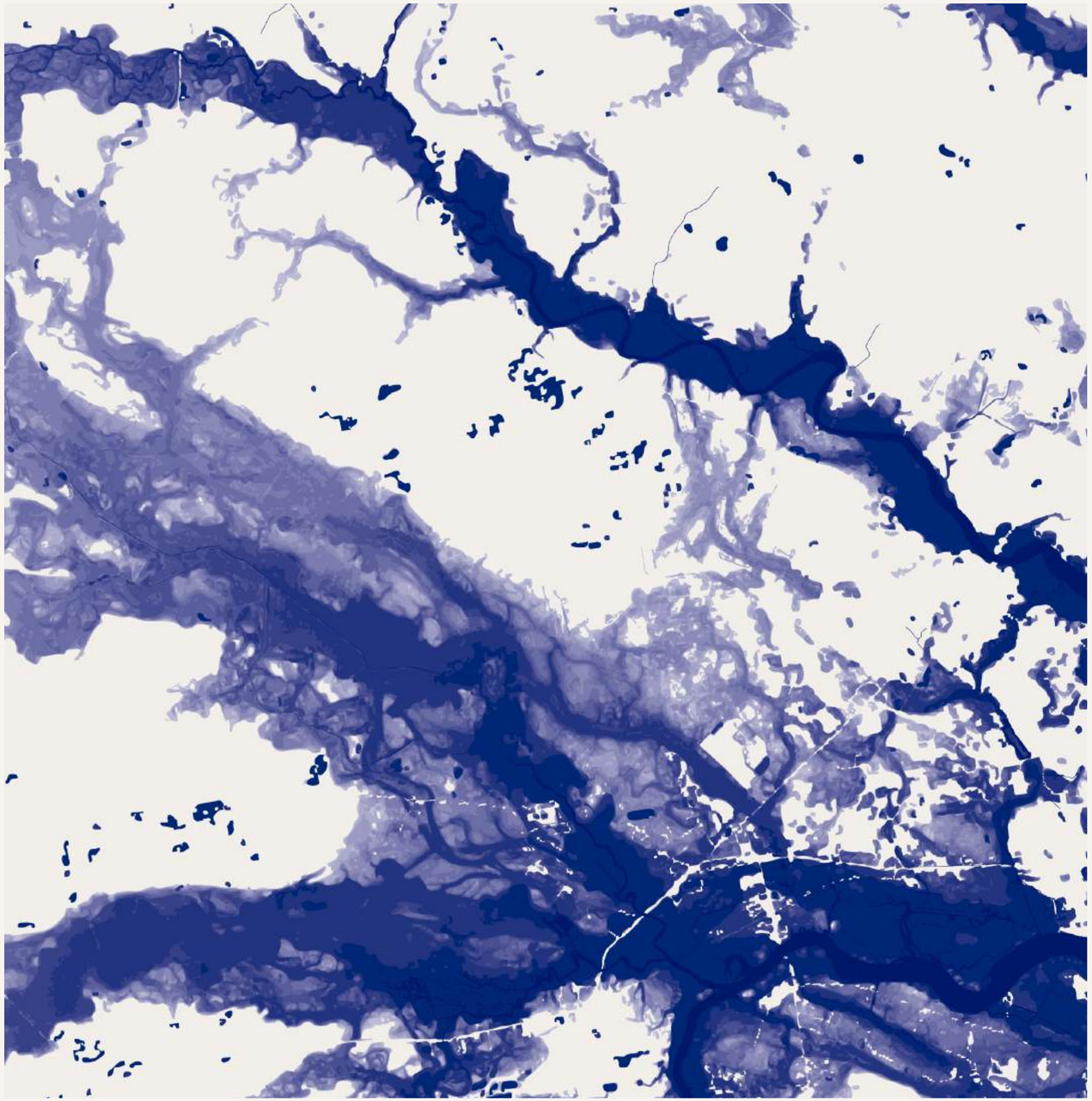
Water

The dominant force dictating the history of the site has been its relationship to water. Plantation ecologies manifested out of exploitation of wetlands and tidal systems. The discovery of rice as a commercially viable crop accelerated the enslavement of Africans from the Rice Coast with unique knowledge of rice planting, making Charleston one of the wealthiest cities in America. While this area has been historically sustained by water, accelerating sea level rise threatens to reassert historical marsh conditions on the site.



Rice planting as a colonial enterprise adapted traditional african agricultural practices to the european grid, catalyzing the expansive transformation of Lowcountry wetlands into a contiguous plantation ecology. However, planters weren't able to realize an ideal grid in the irregular marsh geography. The pattern of extant rice fields reveal that the formal arrangement of plantations was ultimately a negotiation between the formal logic of water and static property boundaries.

Irrigation networks quickly evolved to more efficiently exploit natural water cycles. The early innovation of reservoir fed rice fields prompted the development of higher ground first. Complex systems of embankments and manually operated sluice gates called rice trunks allowed laborers to methodically control the movement of water. As colonists and slaves became more familiar with their environment, tidally fed rice fields became more prevalent, allowing planters to tidally regulate low lying areas along rivers and swamp land.

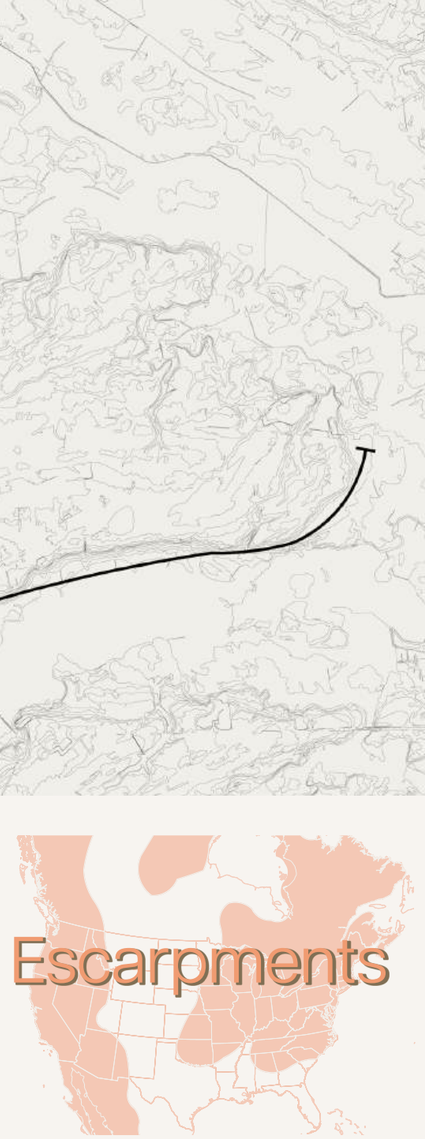


This irrigation network, originally developed to efficiently drain rice fields and swampland, has now become a primary vector for sea level rise. The rate of sea level rise in Charleston is currently about half an inch per year with the expectation that it will continue to accelerate without significant environmental regulation. Within the next 300 years, all of the land encompassed by these former plantations will be inundated and innaccessible.

Stono River Marsh

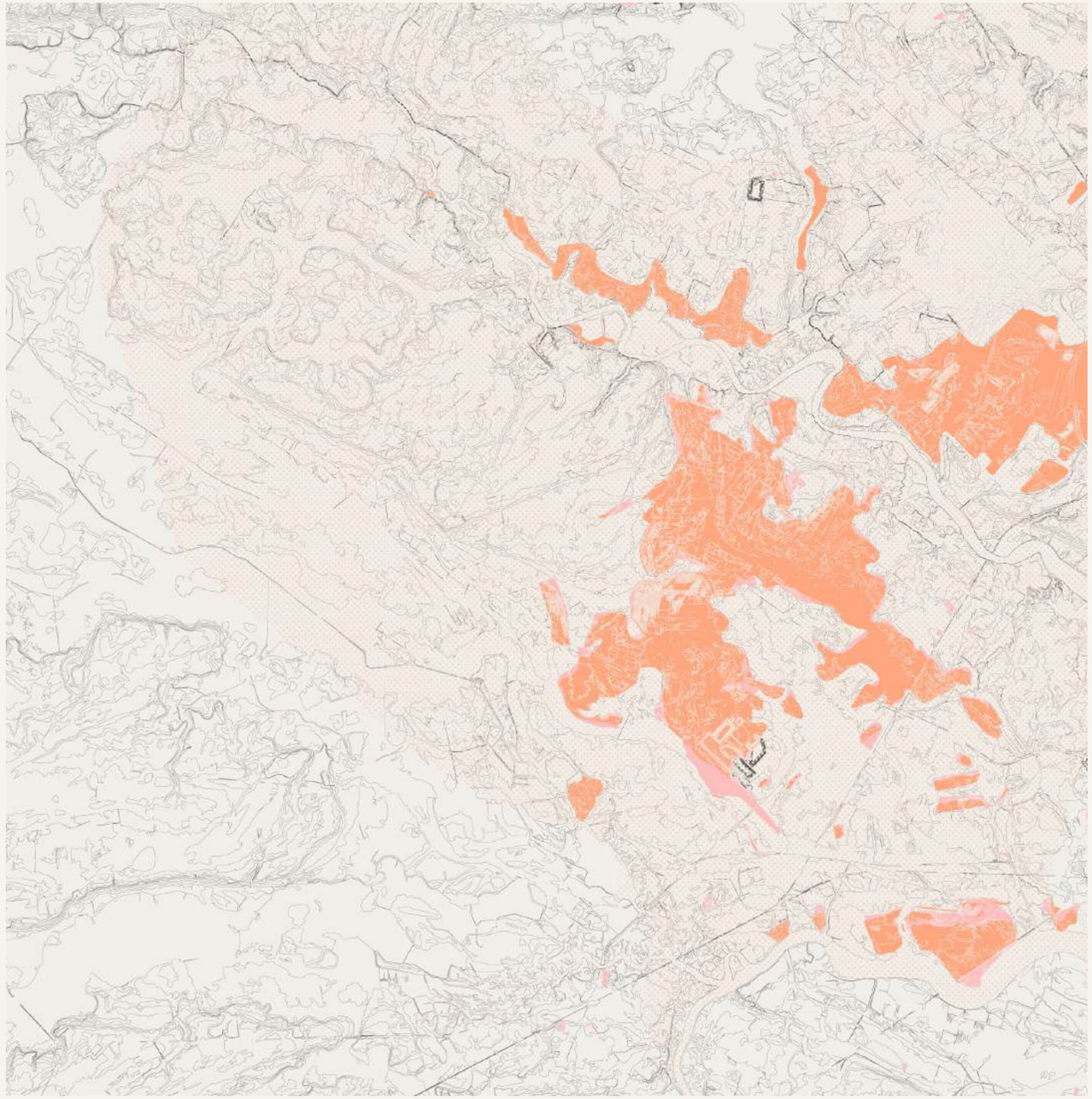
Geology

Geology provides a petrified record of processes and ecologies that have continuosly shaped this landscape. Land forms like escarpment demarcate the edge of ancient oceans and provide a record of erosion shaping the region's topography. Phosphate deposits also prove the site's history as wetlands. Following the civil war and collapse of the plantation economy, phosphate mining to create fertilizer triggered the early industrialization of Charleston. The decline of industrial activity was ushered in by the 1886 earthquake, a 7.2 magnitude siesmic event with its epicenter at the Woodstock fault line which bisects the site. While the area is still siesmically active, subsidence rep esents a greater threat to soil stability. Much of the site is composed of infill from phosphate spoils and expansive earthworks projects which converted former swamp land into rice fields.



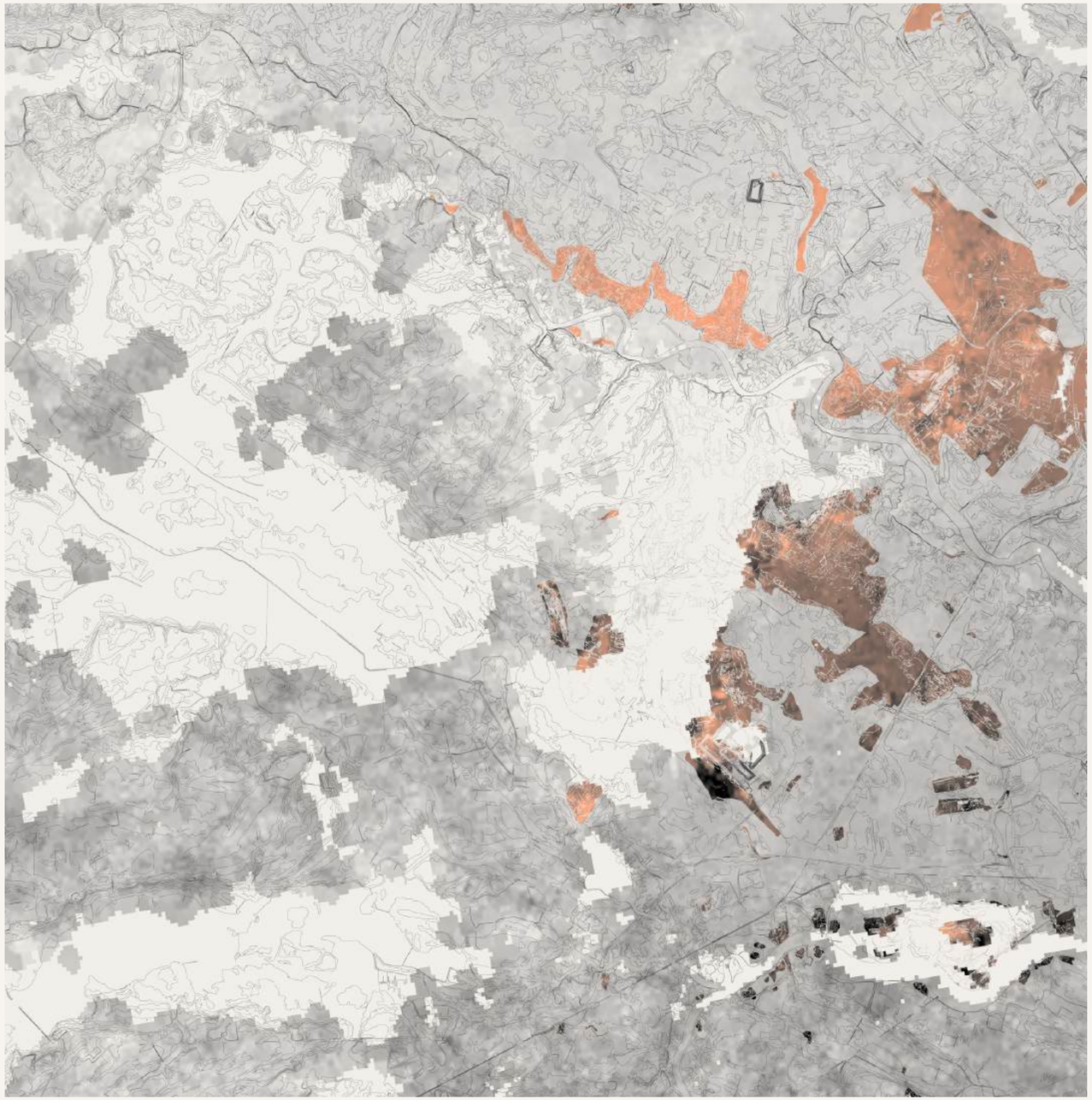
Escarpments

Escarpments are deposits of sediment left at the edge of ancient oceans. The ridgelines they form mark areas of high ground and document fluvial erosion of rivers chasing the retreat of lower sea levels.

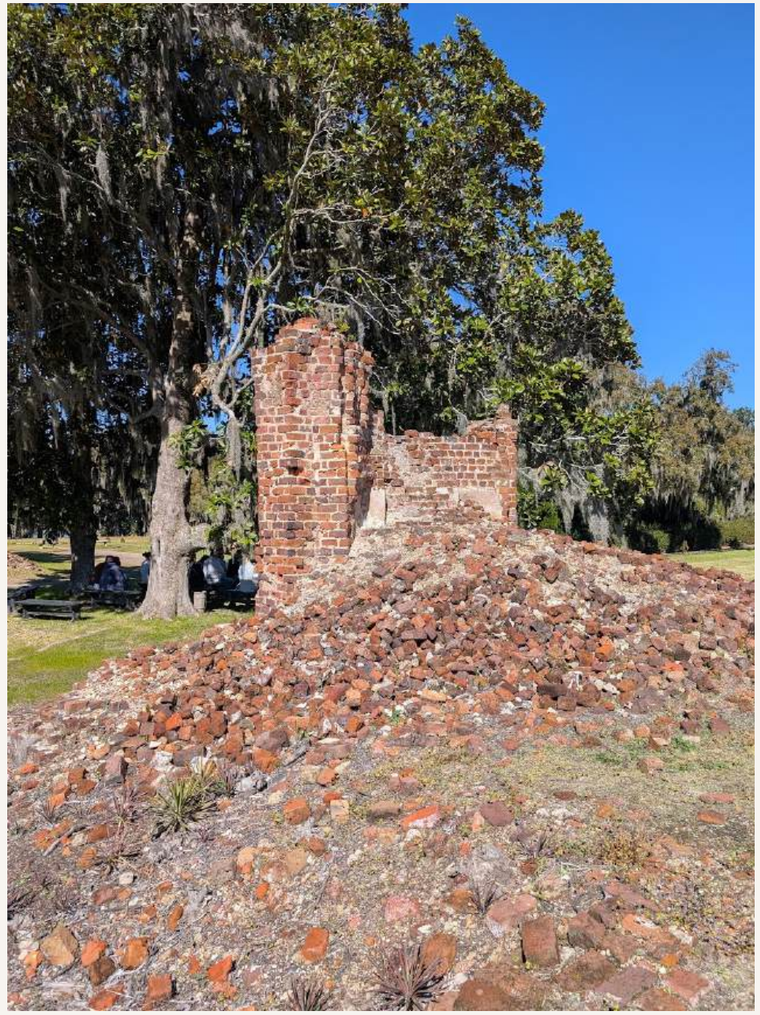


Phosphate

The prevalence of mineral phosphate in this area further informs our understanding of the ancient history of the site as having been a wetland as it continues to be today. Phosphate forms through the calcification of decaying organic matter, and as such each phosphate nodule is essentially seeded by fossils. Follow emancipation and the collapse of the plantation system, former plantation owners turned to phosphate mining, which had become commercially viable as the dispossession of large plantation holdings and the small scale land use of sharecropping necessitated the introduction of synthetic fertilizers to compensate for nutrient depleted topsoil.



Loose soil from phosphate mining and continued seismic activity also make the area highly susceptible to subsidence. In tandem with sea level rise and perpetually escalating flood risk, the site is under constant threat of erosion and erasure.



Middleton Place Ruins Following 1886 Earthquake

Geomorphology

Geomorphological features that preserve the negotiation between labor and natural systems on the site are particularly threatened by sea level rise. The dendritic forms of wetlands bounding the site are incompatible with the gridded logic of the rice fields. Sustained flooding will inevitably wash out many of the embankments and phosphate ditches, reshaping the landscape, further obfuscating the historical relation of property to labor exploitation and material extraction, which is embedded in the duality of these features that often demarcate the borders of their original property.

Wetlands are the natural state of this site, though their current extents are relegated to the edges of property where changes brought on by natural forces are either too severe or unpredictable to have justified their development. The capacity of marshes to deter flooding and manage sea level rise has been neglected, but sea level rise will ensure the marsh migration.

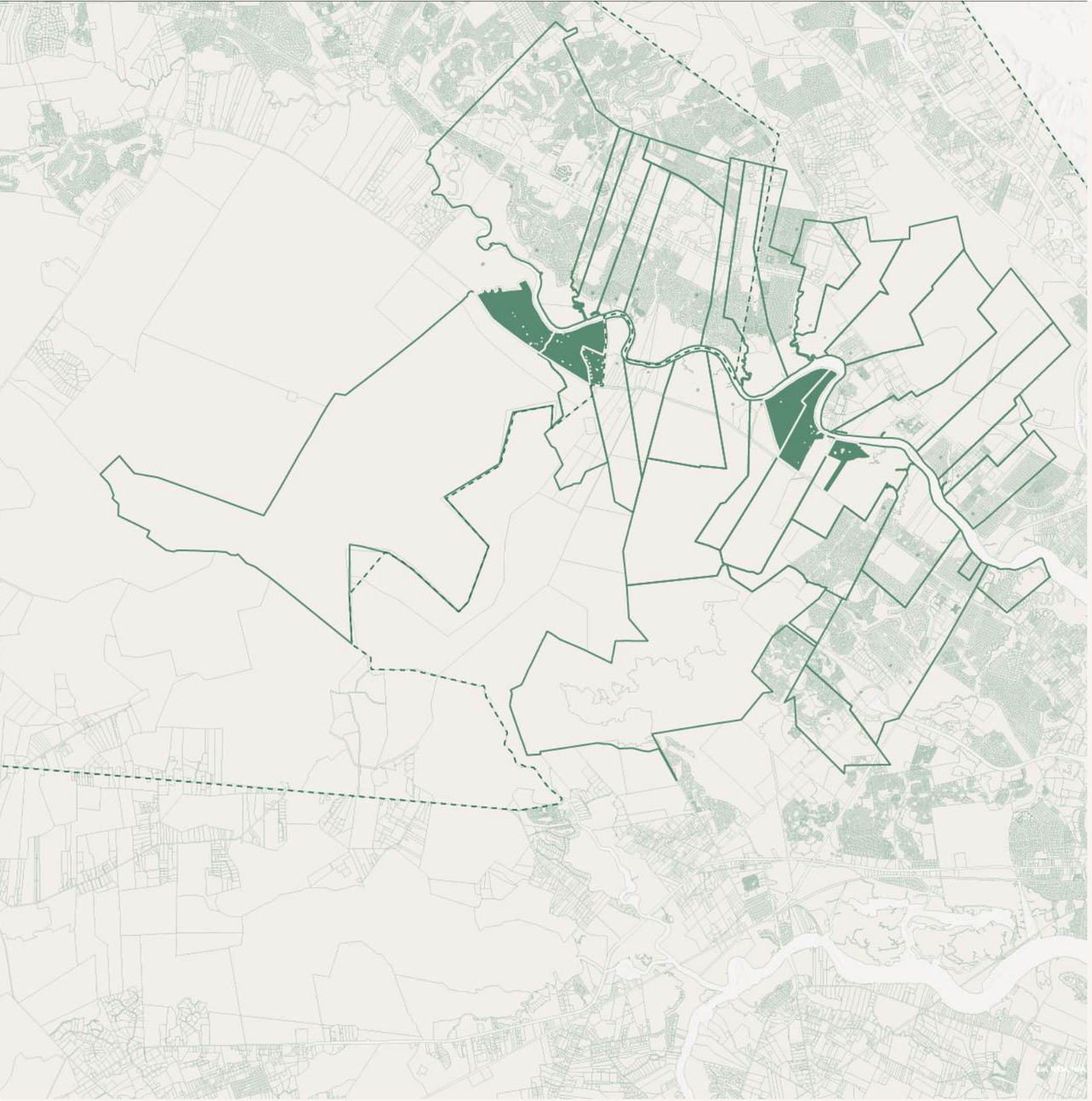
Embankments are constructed barriers intended to control the movement of water between individual rice fields. The engineering techniques employed to build these structures were brought over from Africa, where berms were interwoven with mangrove swamps. In the colonial context they were adapted to the rigid geometric logic of European aesthetics and a burgeoning capitalist restructuring of land.

Remains of Embankment Near Stono River

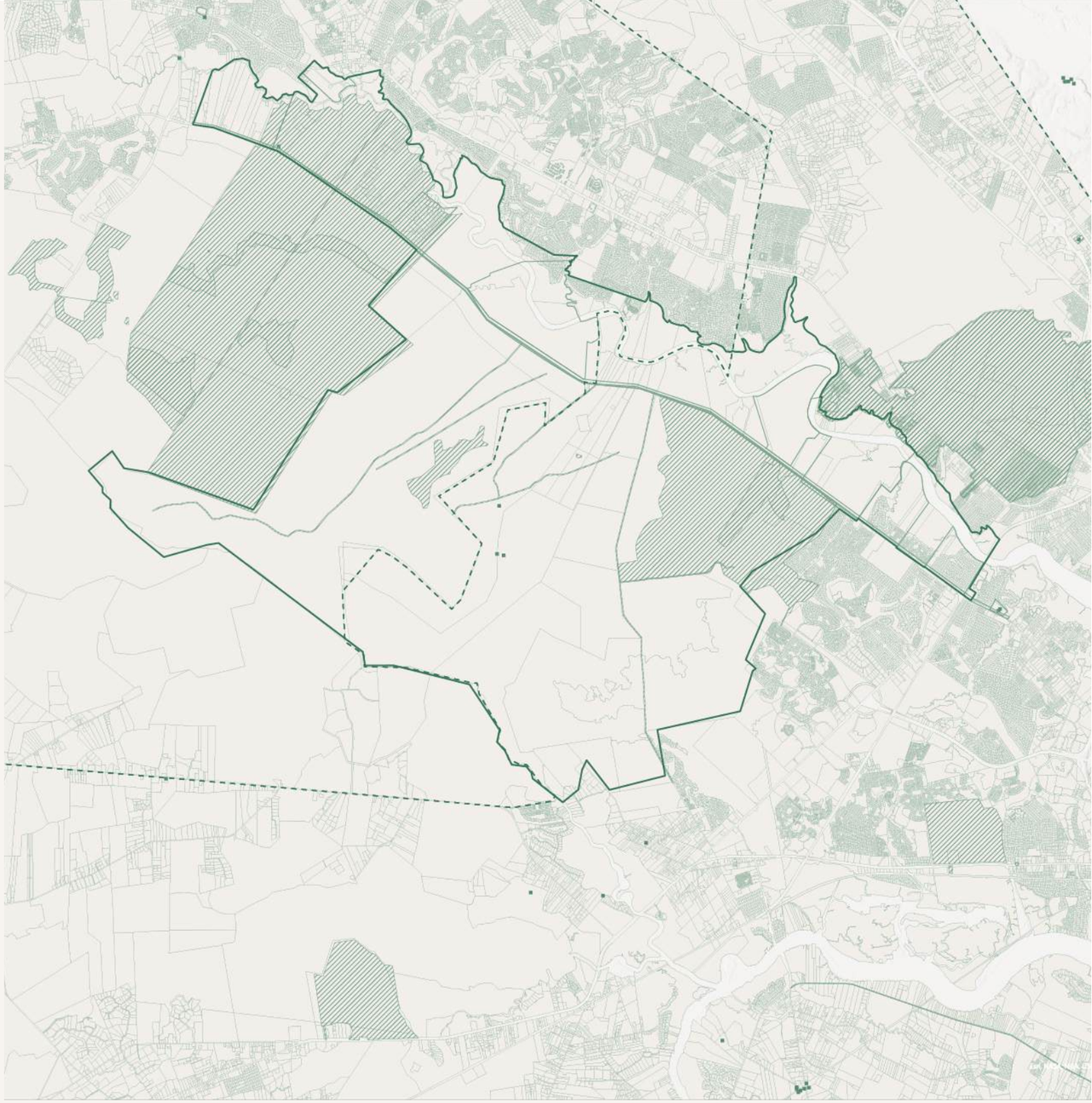
The organic forms of phosphate ditches mark the transition from exploitative land use to extractive land use. Each mine is composed of dozens of parallel trenches bending to conform to environmental forces like topography and water, as well as property boundaries.

Property

While the persistence of sea level rise presents the most significant threat of erasure to this site at this time, historically, the area had been subject to extensive erasure in the wake of the civil war and subsequent economic restructuring of the South. This transitional period marks the shift of land from plantation agrarianism, to speculative asset, to sites of extraction, a process accelerated by industrialization. None of the antebellum plantations persist in their original form, and those that remain, have dissociated sites of labor from the aestheticized accumulation of wealth embodied by plantation architecture. The preservation of these structures constitute the primary driver of preservation efforts in the area, and have consequently been adapted to tourist sites. This conscious decoupling further serves to obfuscate the unfulfilled promise of the site as a vehicle for reparations. Anchoring narratives of these landscapes to the architecture they produce fundamentally denies the agency of the landscape itself and the actions of slaves and laborers who shaped them, and perpetuates notions of material stability incompatible with the changing environmental dynamics of the site.



Prior to the civil war, the Ashley River was lined with plantations. Following Sherman's March in 1865 the majority of these properties were razed or abandoned, voiding a continuous occupation and history of the site. Only Middleton Place, Magnolia Plantation, and Drayton Hall have retained some of their original property, however the preservation of these sites was contingent upon selling off vast tracts of their land to extractive phosphate mining and logging industries. Their greatly diminished property concentrates the historical legacy of these sites to the surviving plantation architecture, dissociating the aestheticized accumulation of wealth embodied by these manor homes from the sites of exploitation and extraction that sustained them.

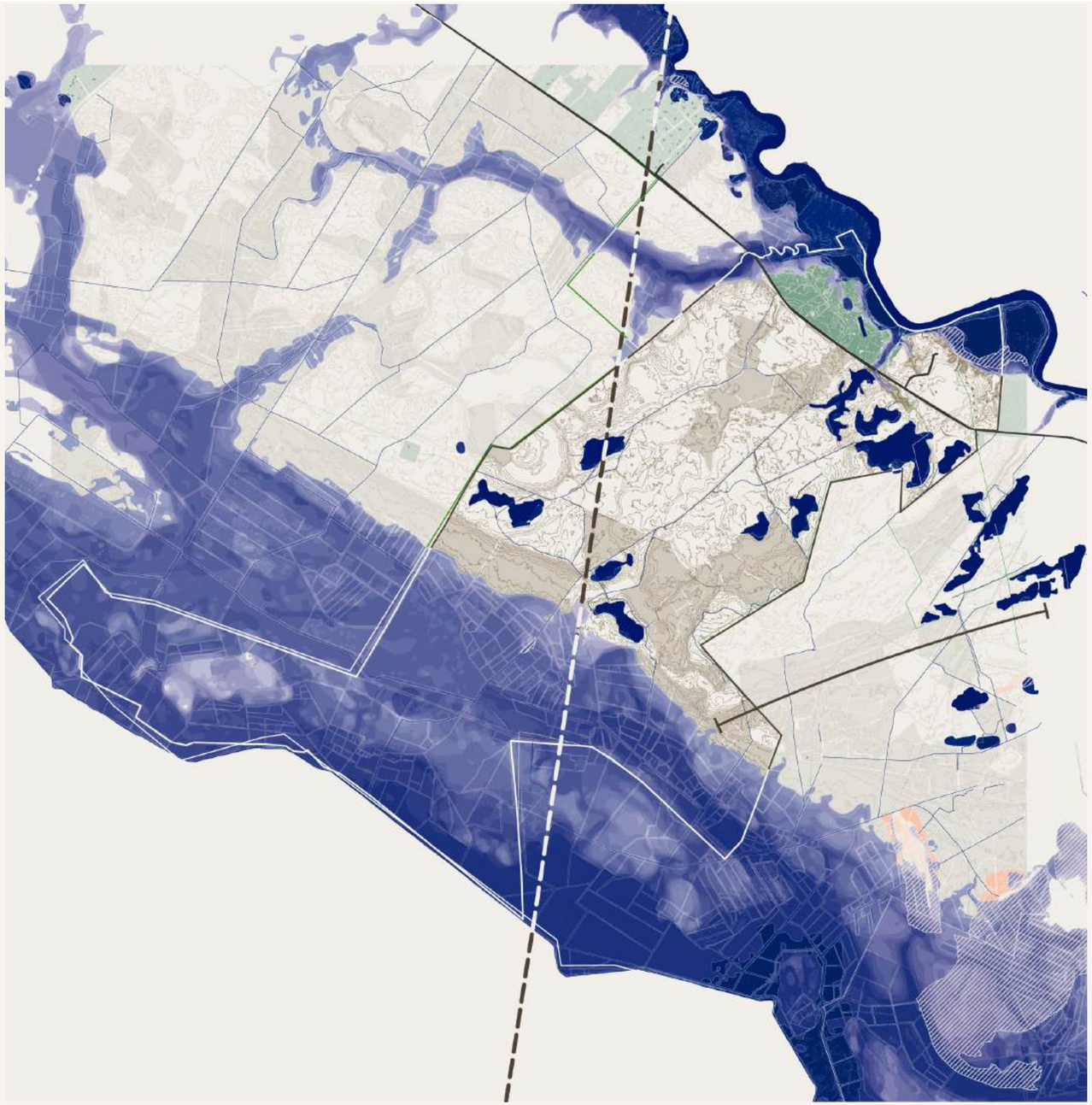


In 1994 the Ashley River Historic District was added to the National Register of Historic Places. The area at this time primarily encompassed land on either side of the Ashley River bounded by Ashley River Road, reflecting the priority of preserving plantation architecture. In 2010 the boundary of the ARHD was expanded to include the landscape of phosphate rice fields and phosphate mines that were associated with the original plantation properties. While these sites remain largely inaccessible, the recognition of these historically important landscapes suggests a shifting preservation ideology. However the extents of site boundaries continued to be defined by its association with architecture as the north west and south east borders represent the property extents of Middleton Place and the Charleston Mining and Manufacturing Company (controlled by a former owner of Drayton Hall)

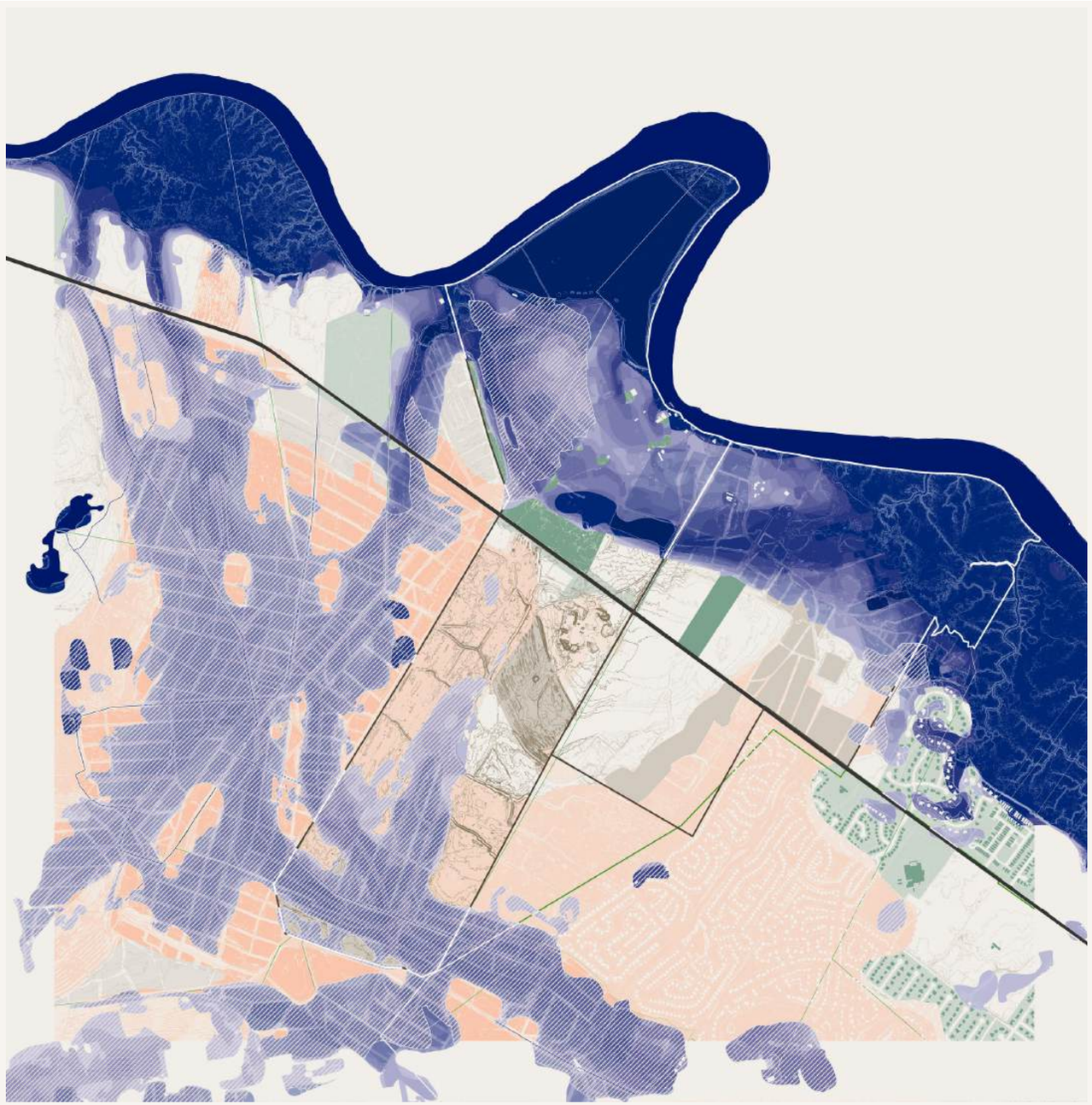
This emphasis of plantation architecture further detracts from the notable absence of architecture on the lands south of Ashley River Road. In 1865, Sherman issued Special Field Order No. 15, stipulating that all land between the Ashley River and the St. John River in Florida, set 30 miles back in from the coast be redistributed to emancipated slaves. This is the famous 40 acres and a mule promise, an unfulfilled promise of reparations that challenges the continued private ownership of the remaining plantations and the land they formerly occupied.

Drayton Hall

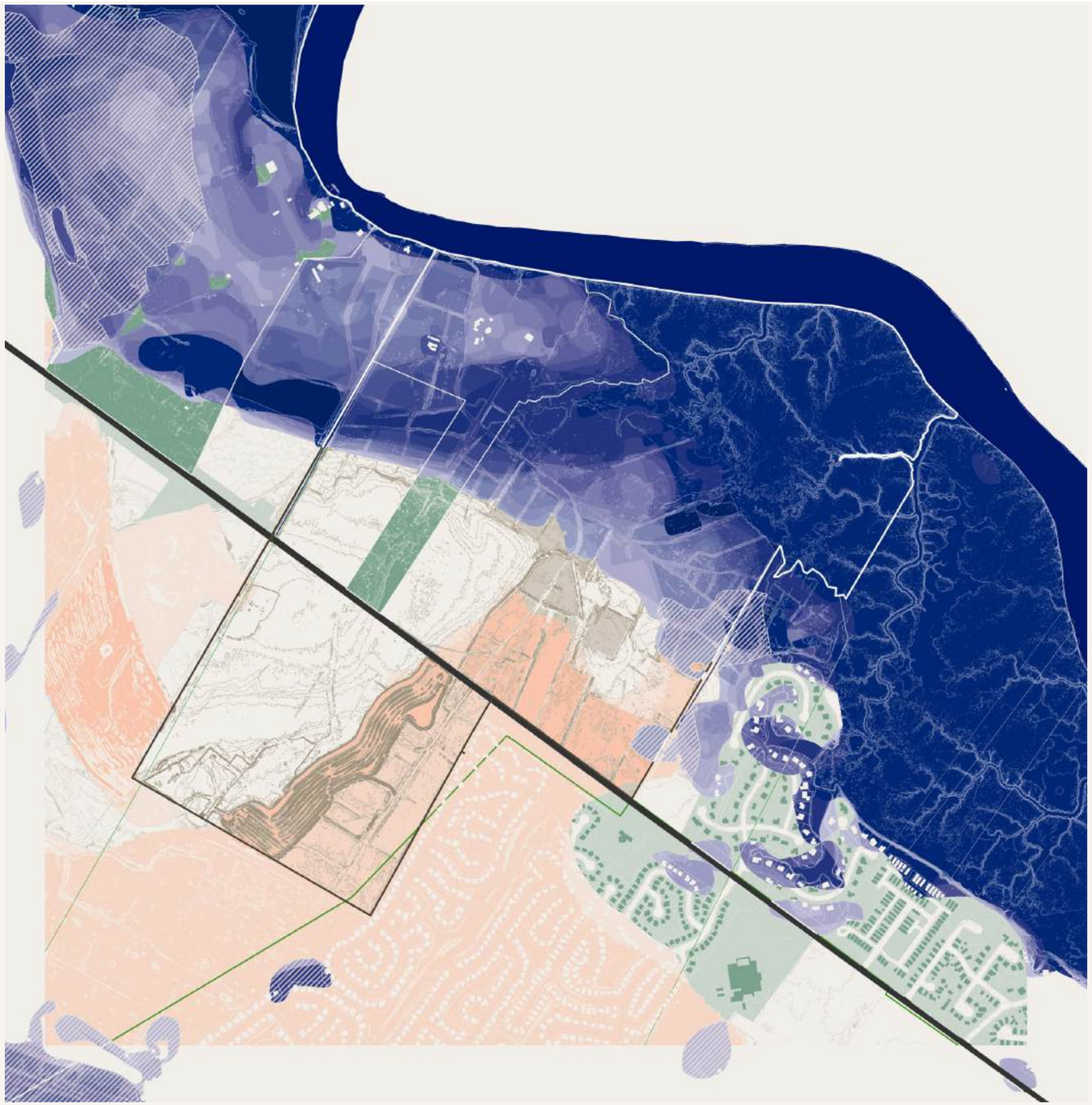
The overlay of these systems allows us to see that all of the landscape is subject to change. So, how can we justify the preservation of these landscapes and their architecture in perpetuity? Accepting that vast portions of this landscape will be made innaccessable by changes in the environment, the built area of the site is confined solely to the delta between initial site boundary and final site boundaries. This choice adapts the current preservation framework of the Ashley River Historic District to include all land in the area projected to be affected by sea level rise over the course of the next 200 years.



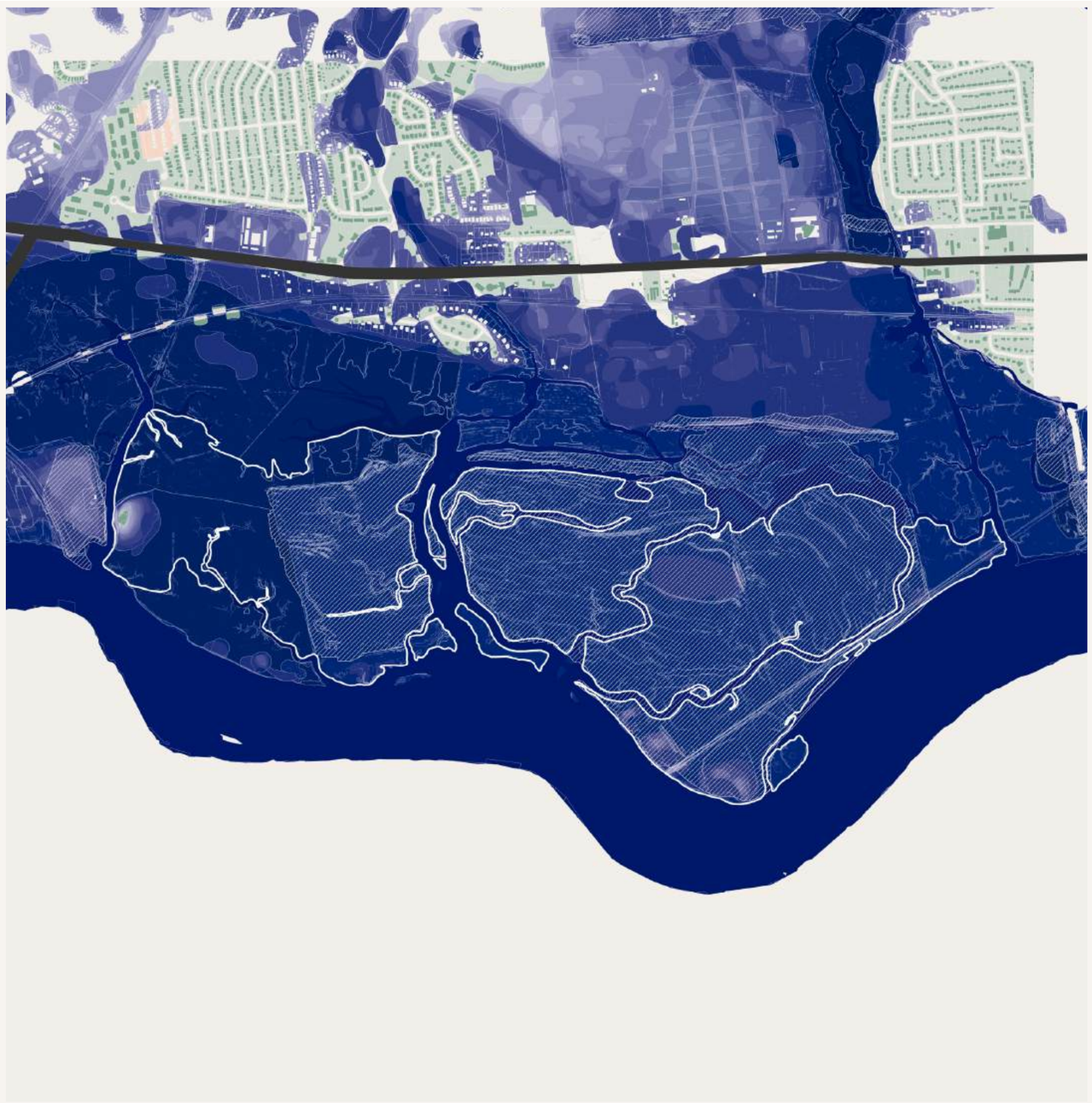
A plantation settled in the 1730's by John Williams, and was later inherited by the Middleton family. The sites borders stretch from the Ashley River to the Stono River Public Canal. It was a major rice production site and is home to the oldest landscaped gardens in the United States. The majority of its original architecture was destroyed during the civil war, and the sole remaining flanker building collapsed during the 1886 earthquake. This history of seismic activity and its rich geology reveal the broader geologic history of the area.



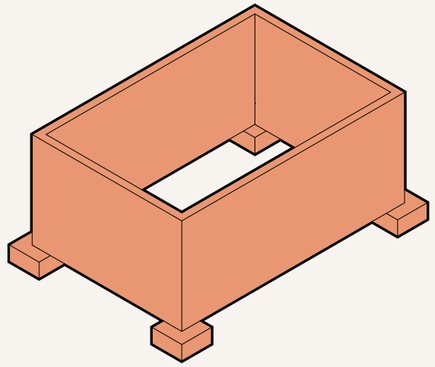
Magnolia plantation is one of the oldest plantations in South Carolina. It was settled by the Drayton family in 1679 who carried over their plantation operation in Barbados to the new colonial front in America. The original plantation structure was destroyed during the Civil war, but several of the original slave quarters have been maintained. The property possesses some of the best preserved examples of tidal and reservoir fed irrigation systems for rice farming, making it ideal to study the geomorphology and relationship to water of rice planting.



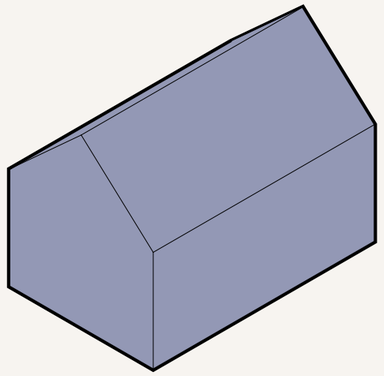
As well as being the first example of Palladian Architecture in North America, Drayton Hall is the site of the only remaining original plantation house on the Ashley River. Following the Civil War, it rented land to the first commercial mining operation in Charleston, the Charleston Mining and Manufacturing Company. This rich material history allows for a comprehensive reading of architecture and preservation efforts related to the territory as a whole.



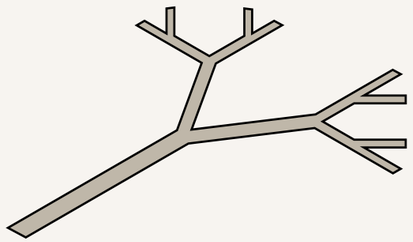
There is limited public information documenting the history of this site, however, it represents an ideal test case for documenting threatened landscapes, as the site is actively being inundated by sea level rise. As such, it contextualizes the history of labor and industrial activity in the area and the consequences incurred by the environment.



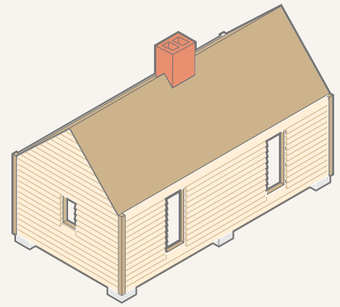
Embedded Structures act as an extension of their environment. In response to sea level rise, a new Embedded Structure is constructed at a new site approximating the conditions of the original, preserving a continuous relationship with the landscape. This process continues, producing a chain of Embedded Structures which serve as a substrate for Migratory Structures and anticipate their movement across the landscape. As individual sites are inundated by sea level rise, their material deterioration manifests a temporal record of the structure's migration.



Migratory structures are tied to a specific relationship between sea level and landscape features. They serve as a vessel for documenting the movement of the structure across its landscape, the conditions of its initial site, and the unique function of every subsequent embedded structure. Because no two sites are identical, the formwork of the embedded structures are subject to change in response to formal or programmatic needs dictated by each site. These individual traits are internalized by the migratory structure through formal interventions that reproduce the use and history of each site, and serve to document the entire migratory path.



The path network utilizes existing landscape features like canals and embankments to orient and connect the multiple migratory chains across the site. This allows the structures to be read both as a linear spatial and temporal progression as well as part of a broader system of composing the documentation and remembrance of the site. As a network, the paths must be adaptable to environmental changes as sea level rise presents a constant threat of destroying established connections. Prolonged use or highly trafficked paths may necessitate concrete interventions to stabilize crucial circulation nodes. The path network defines the extents of the site and ultimately facilitates the concentration of migratory structures to reconstitute the lost territory and eventual post-landscape.

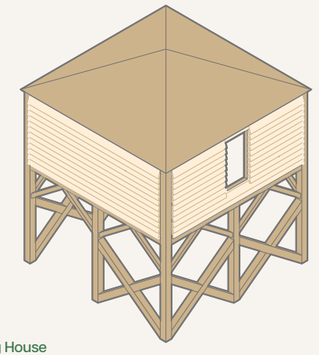


Slave Quarters

Typical duplex housing structures for slaves on plantations. One room on either side for entire kin groups. Similar to later tenant mining housing.

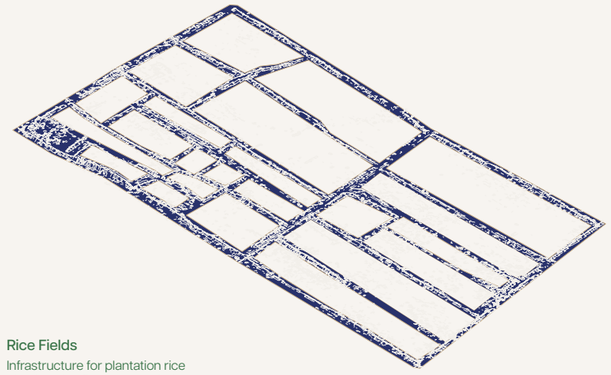
Historic Properties

Preserved properties associated with plantations and the remains of buildings associated with rice planting and phosphate mining.



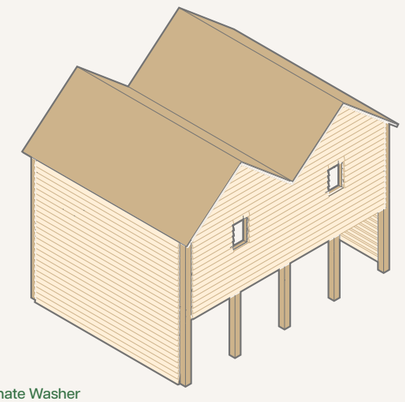
Winnowing House

Rice processing structure used to remove hull from grain by wind filtering rice that was poured from a trap door in the elevated floor.



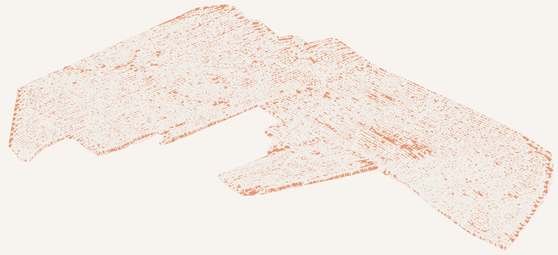
Rice Fields

Infrastructure for plantation rice planting; rice flats surrounded by a complex network of embankments and canals.



Phosphate Washer

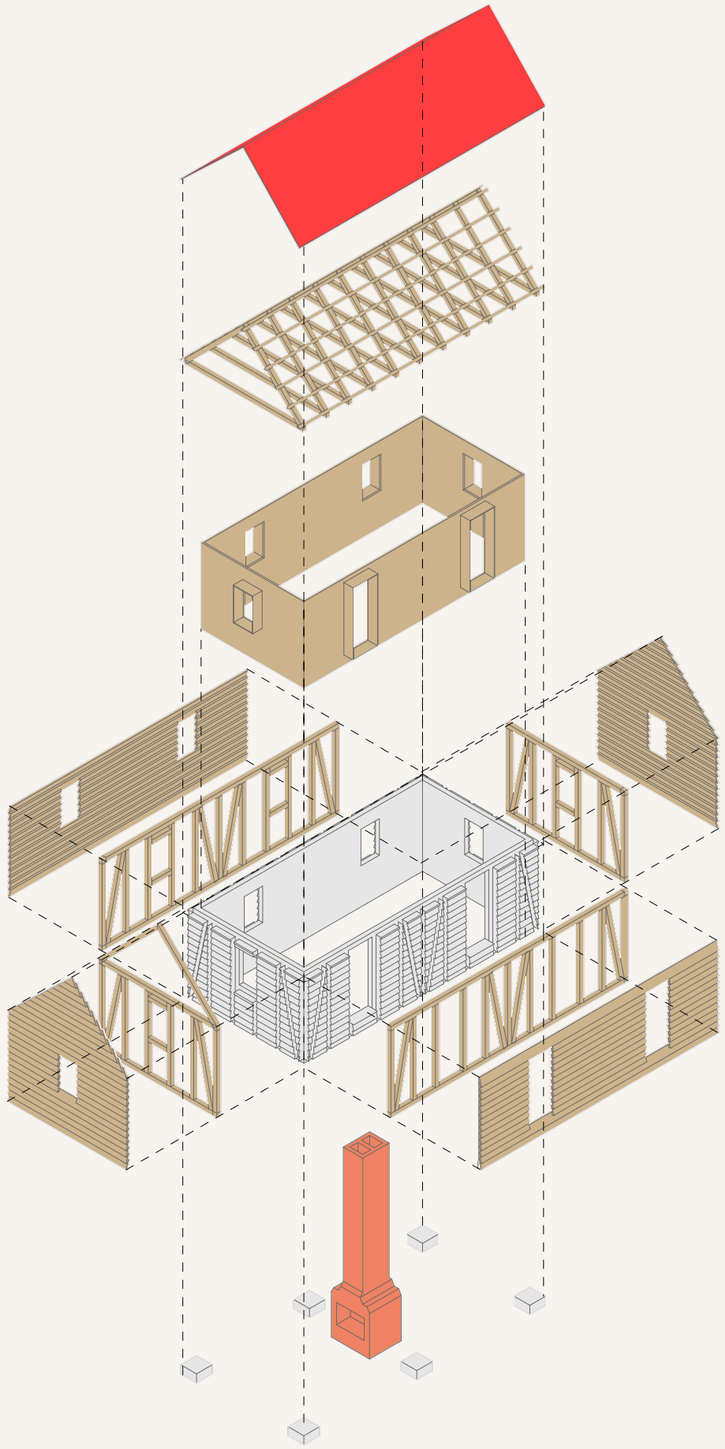
Multi level structure used to wash and process raw phosphate nodules. Often stilted to enable rail transport of phosphate.



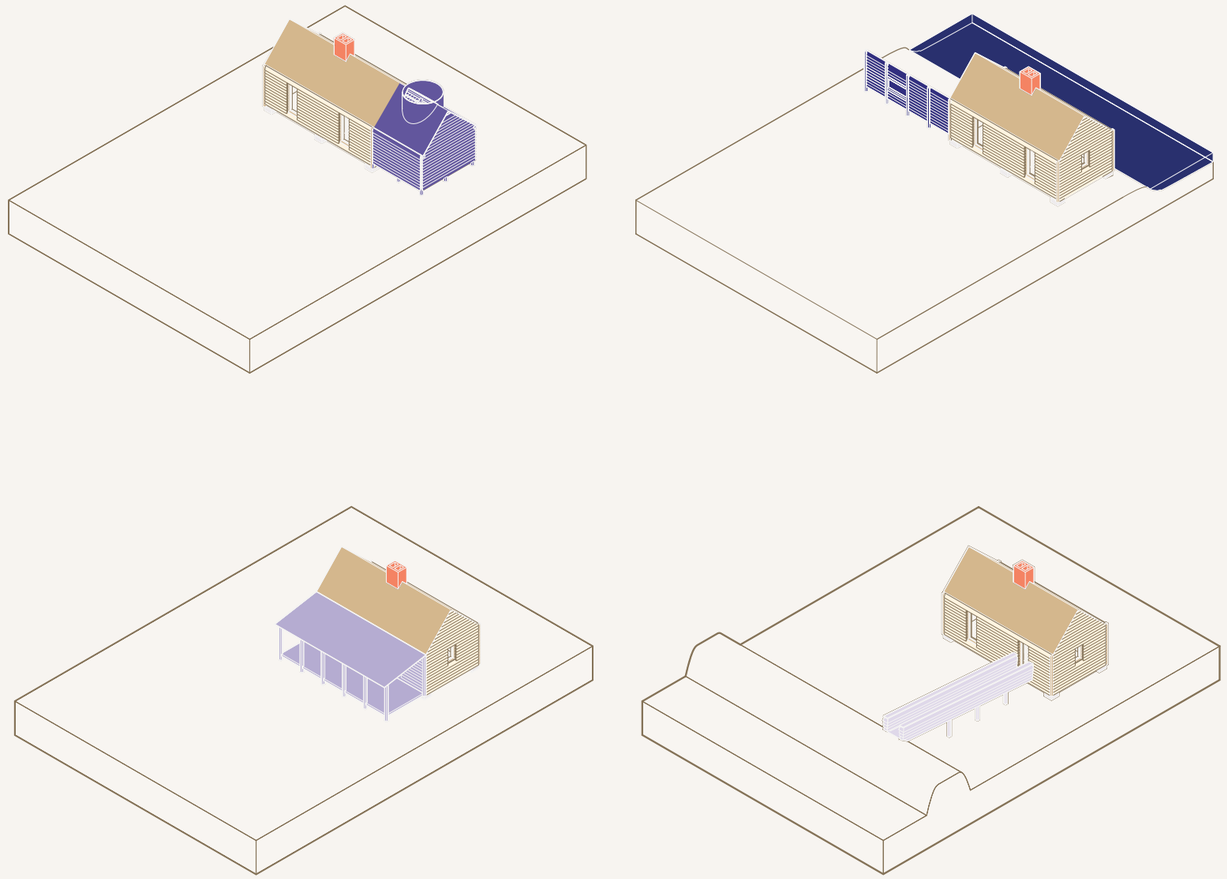
Phosphate Mines

Extractive process of surface mining which produces inorganic patterns of multiple parallel phosphate ditches.

Each building is a recreation of historical building types and associated landscape features - the slave quarters and historic structures, the winnowing house and rice fields, and phosphate washers and mines. Each type of structure embodies the modes of labor that produced the site features

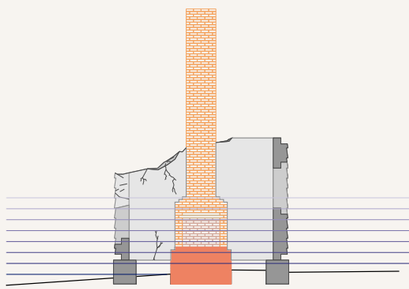


They are constructed using vernacular material which also serves as a formwork for a cast concrete impression of their interior wall space.



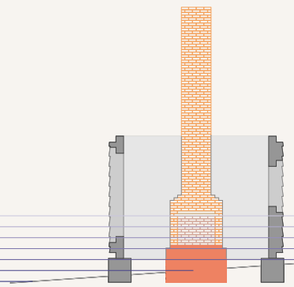
Because each site is unique, and the programs required by the preservation network are subject to change, each base structure will be adaptable to reflect and identify its given site and mark contrast from the original site.

Original Site



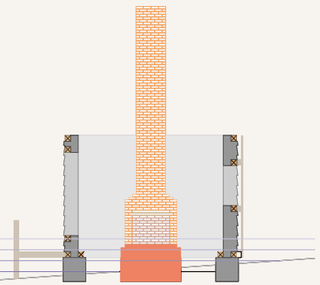
The structure has been completely innundated by sea level rise making the site completely inaccessible and accelerating material decay.

Second Site



Subject to multiple feet of sea level rise, making the structure mostly innaccessible. Because the structure is not completely innundated it functions as a marker for tidal variation, showing the

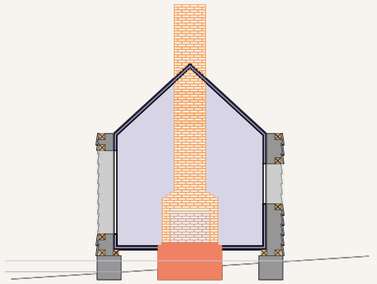
Third Site



Innundated by a few feet of sea level rise, the structure is still mostly accessible, but not suitable for occupation. Integral wooden supports allow temporary installations to be grafted to the embedded structure.

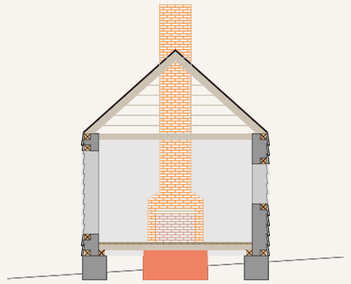
Leaving the wood framework in place will allow the exterior of the building to naturally decay, serving as a visual marker for the passage of time. The smaller wood elements will deteriorate fastest, exposing the concrete interior space. Eventually, the larger framing elements will also decay, leaving the inverse of its structure, and providing a place for the migratory structures to slot into. As each site becomes

Fourth Site



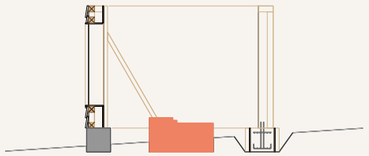
Sea level rise is beggining to encroach on the site. At this phase the embedded structure hosts the migratory structure, but being elevated from ground level it isn't in immediate threat of adverse climatic effects.

Fifth Site



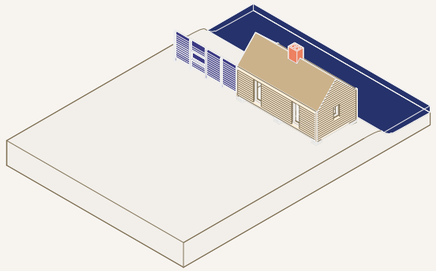
The site is not yet subject to sea level rise. This structure is the most recently completed embedded structure which serves as the base of opperations for anticipating and constructing the next migration.

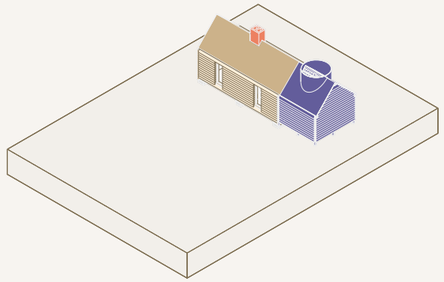
Flnal Site

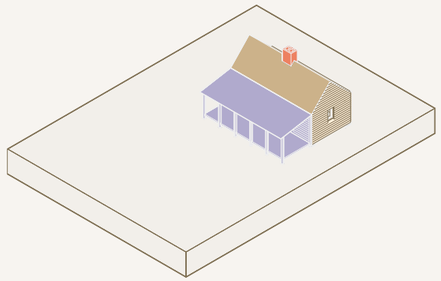


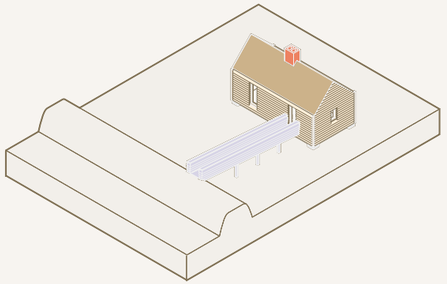
The construction of a new embedded structure, necessitated by sea level rise encroaching on the migratory structure. Upon completion, the migratory structure will shift to the previously completed embedded structure, and this new structure will become the new base of operations.

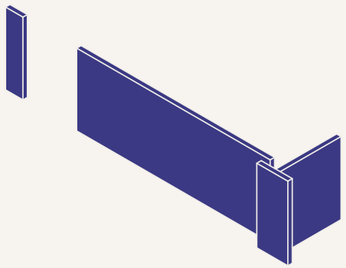
inundated by environmental forces, and the kinetic structure is forced to relocate, the base structure will be abandoned, but take on the new function of marking sea level rise and demarcating the extents of the lost landscape.

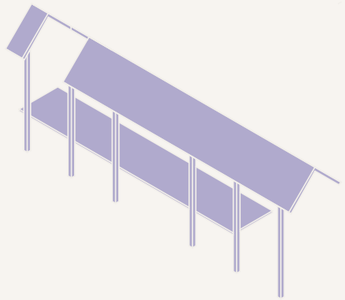




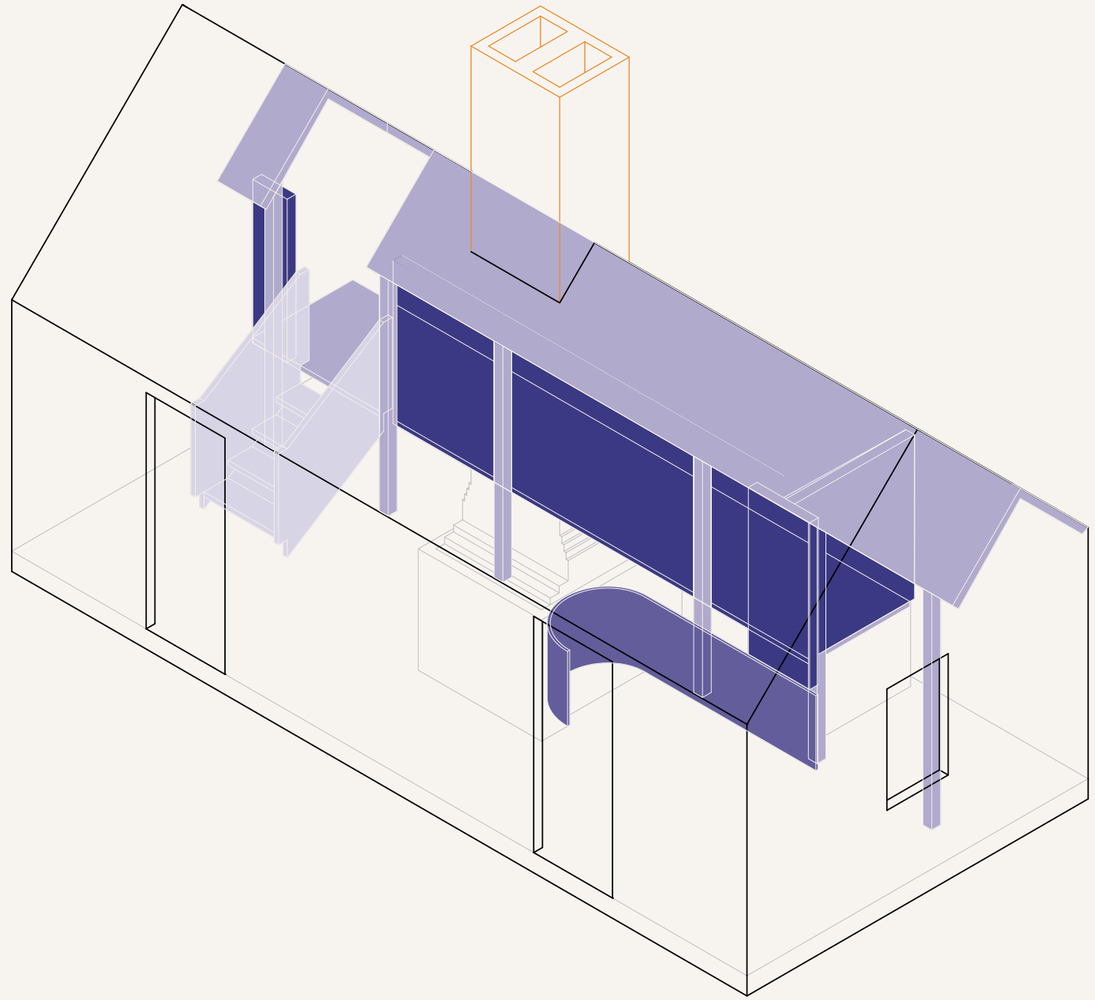




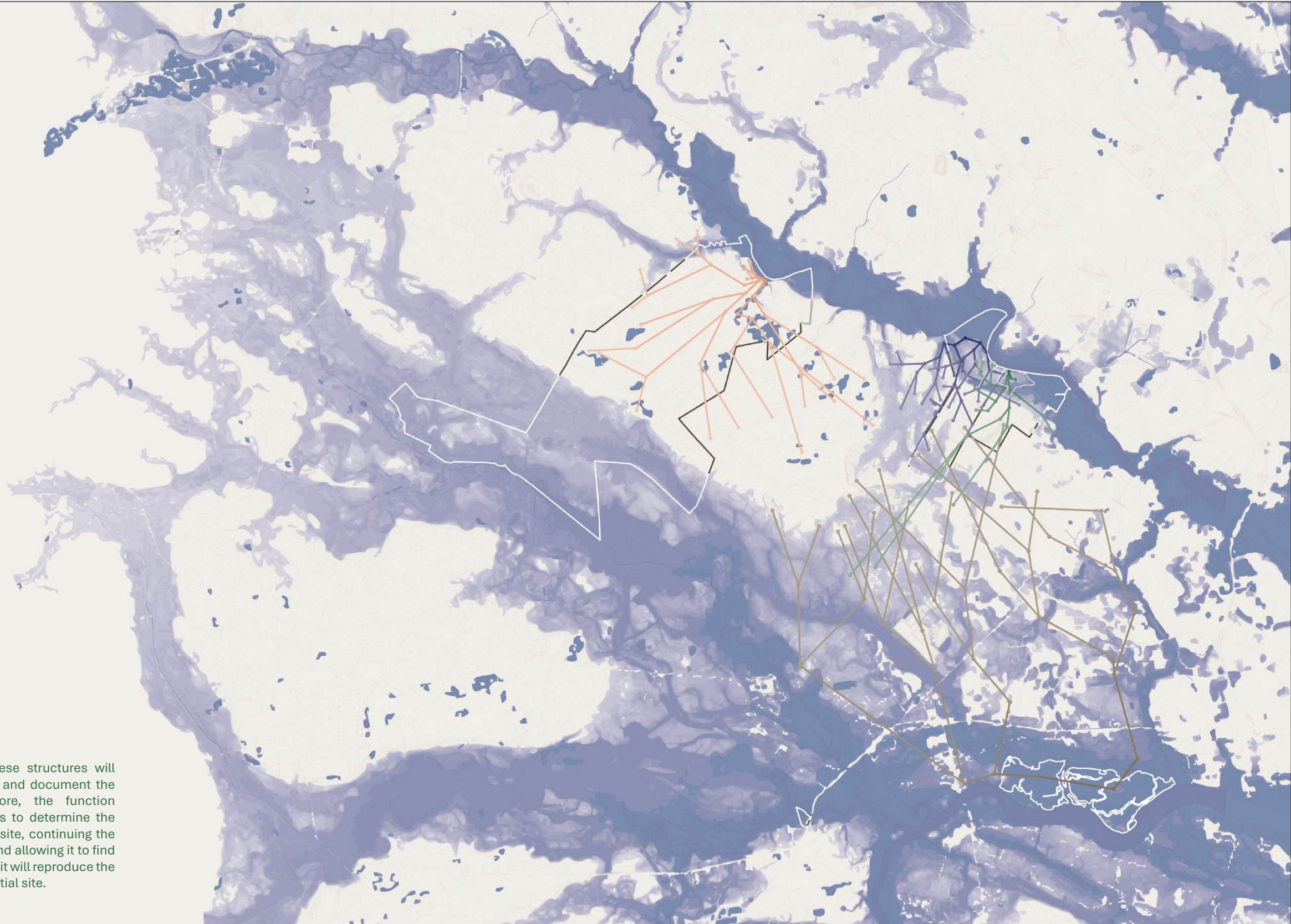




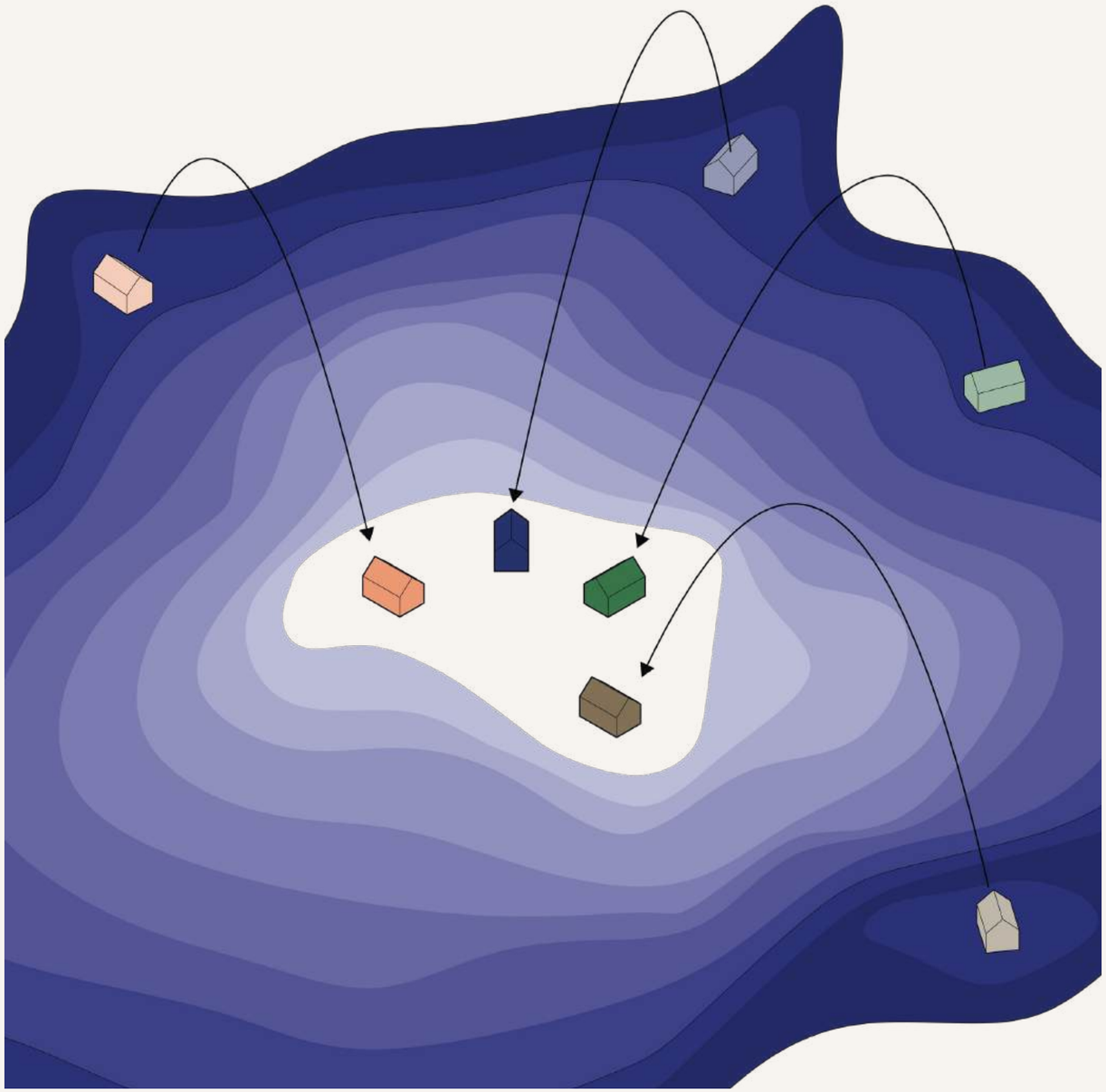
The migratory structure will move along a path in response to sea level rise. The location of each of these movements is dictated by environmental forces that reproduce the conditions of the migratory structure's initial site.



The unique features of each building, associated with each site, are the elements that the migratory structures will internalize into their architecture.



The network of these structures will enable us to study and document the landscape. Therefore, the function of each structure is to determine the location of its next site, continuing the mapping process and allowing it to find the next spot where it will reproduce the conditions of the initial site.



The migratory paths detail the extents of the site and how it changes. Ultimately, as the structures grow closer together and the territory shrinks due to sea level rise, it condenses the history embedded in the site into a smaller space, enabling the systems to be read more clearly.

Eventually, the site will be totally inaccessible, which will necessitate a relocation of the migratory structures. However, because the migratory structures contain their original site and document the lost landscape, you can access a record of the territory even after that territory is gone.

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