ADAPTIVE APPROACH:
LEVERAGING A CREATIVE MANAGEMENT METHODOLOGY FOR COASTAL RESILIENCE ON VIRGINIA'S EASTERN SHORE

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

by

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advised by

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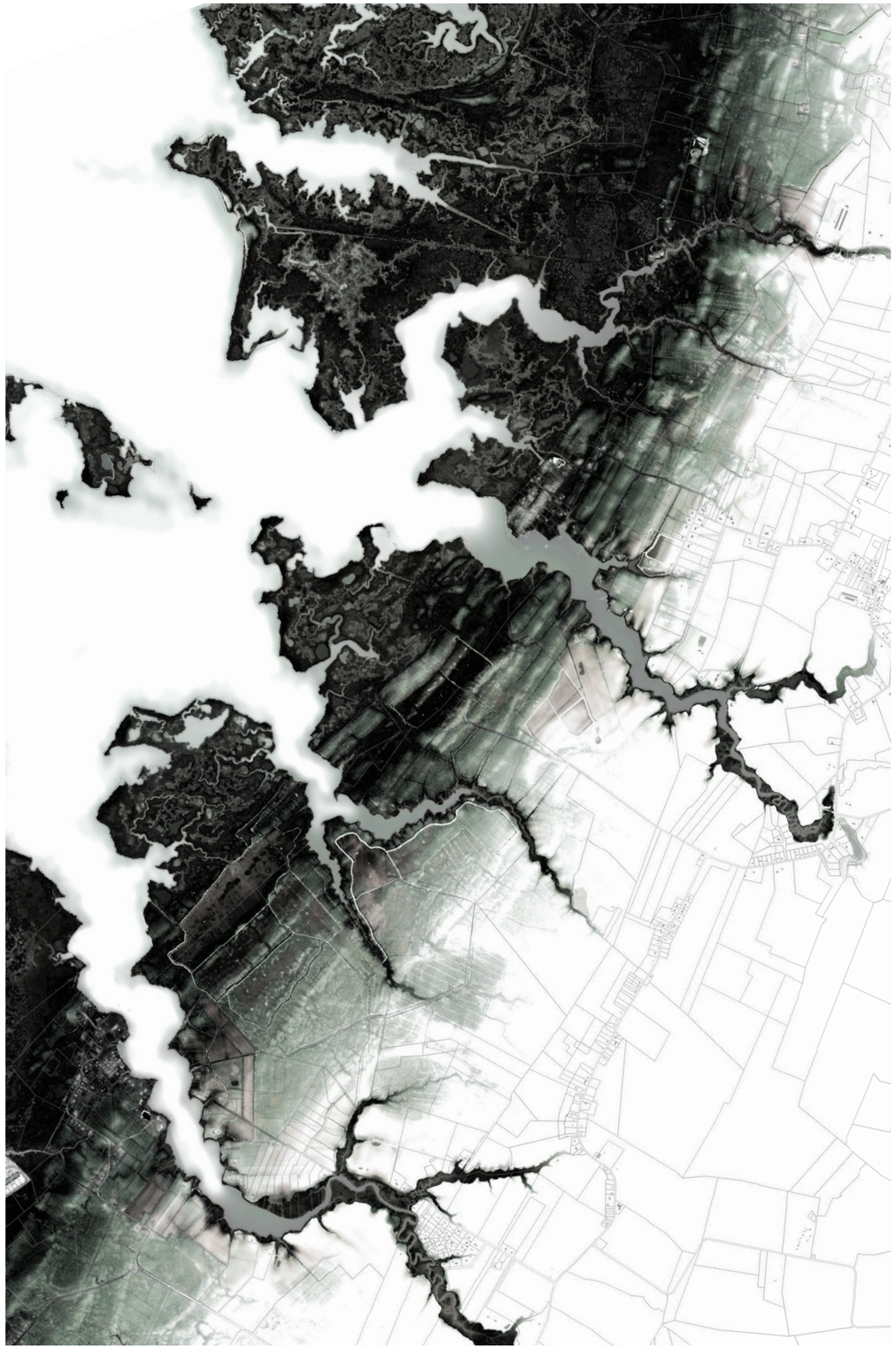
ABSTRACT

The Eastern Shore of Virginia faces an existential threat to its culture, communities (all species), economies, and landscape. This threat comes not from the up-to-18' of projected sea level rise over the next five generations (125 years), but from the consequences of current "solutions" of retreat, displacement, and proceeding business-as-usual. This thesis project proposes that long-term resilience is only possible by embracing the uncertainty and inevitability of change, engaging with rural perspectives and practices, and applying normative practices of landscape architecture to create responsive economies, hydrologies, and topographies.

Through a vision for Virginia's Eastern Shore inspired by a creative management methodology, I propose dynamic and adaptive spatiotemporal reorganization of tidal projections through small-scale, low-cost landscape design guidelines inspired and co-produced by long-term farmers and landowners. I leverage and adapt existing techniques, knowledge, and land-based practices such as ditch filling, tree felling, and dredge placement to guide the aeolian, fluvial, and tidal forces that build, erode, and reshape the land at larger scales of time and space. The Eastern Shore, like any rural coastal community, already has the forms, forces, and practices required to adapt to coastal change. Landscape architecture provides the projective and responsive approach required to realize this vision.



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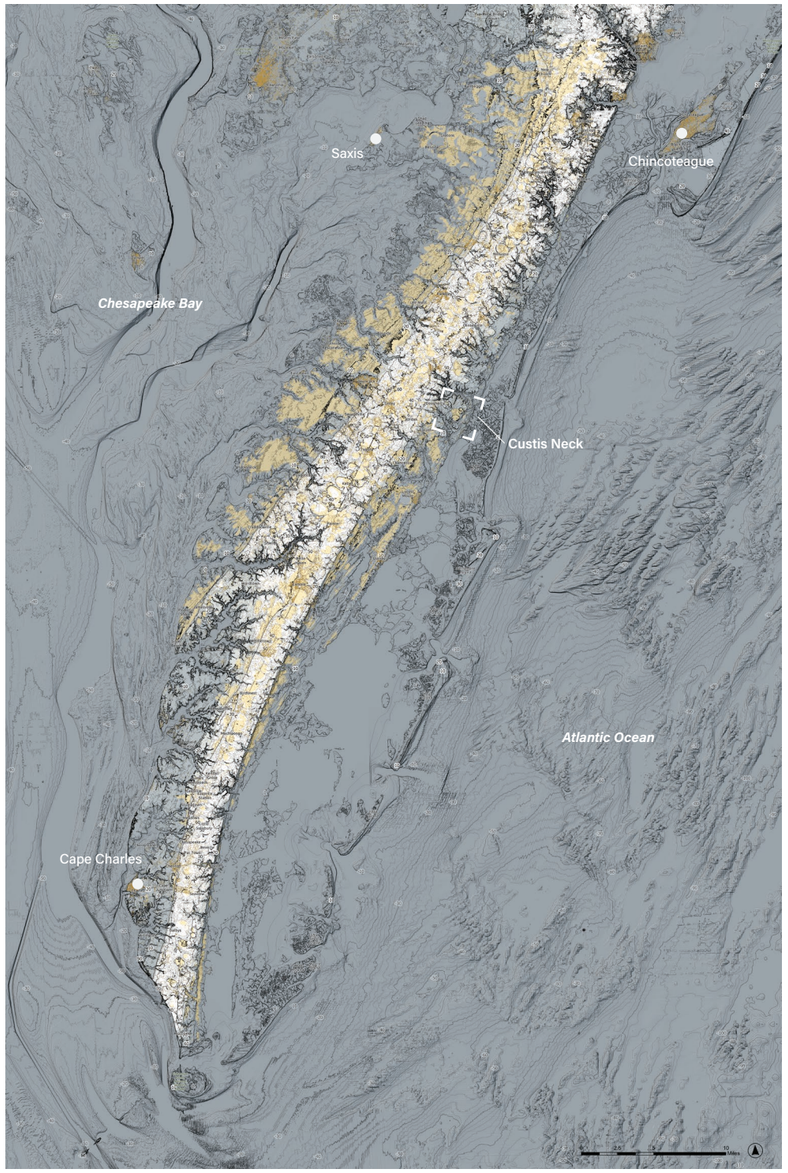
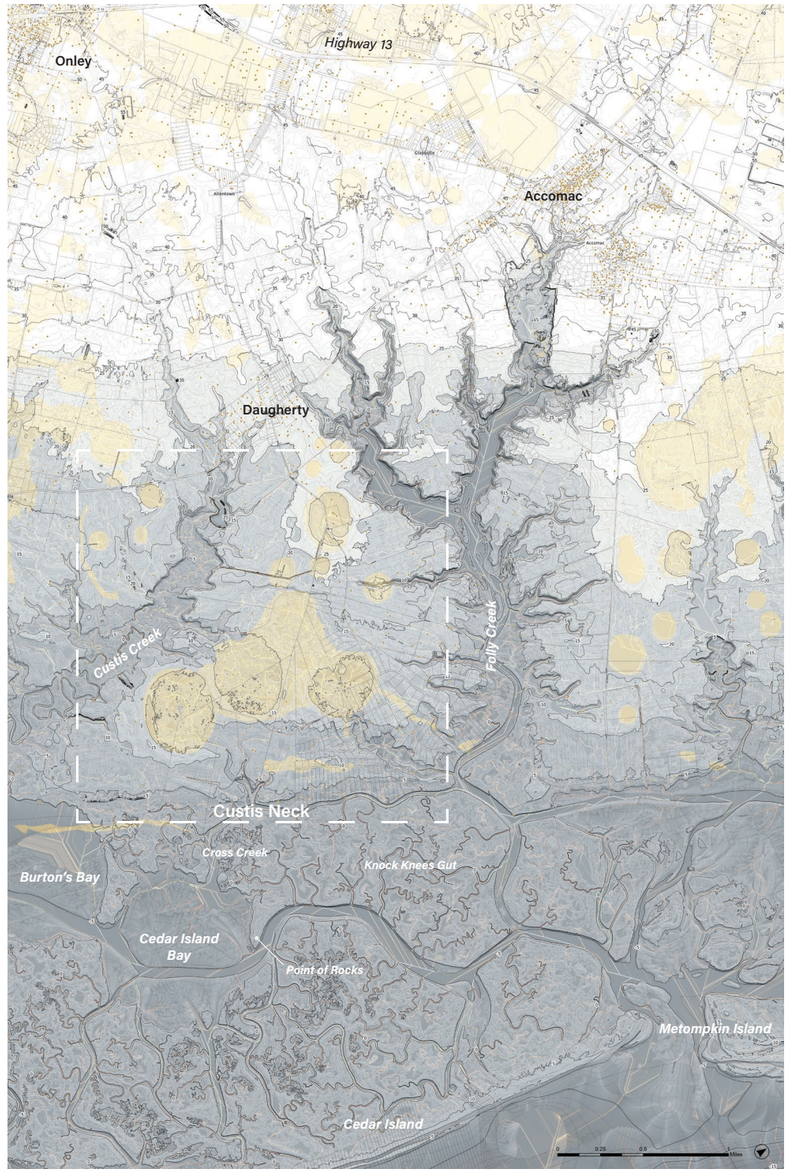


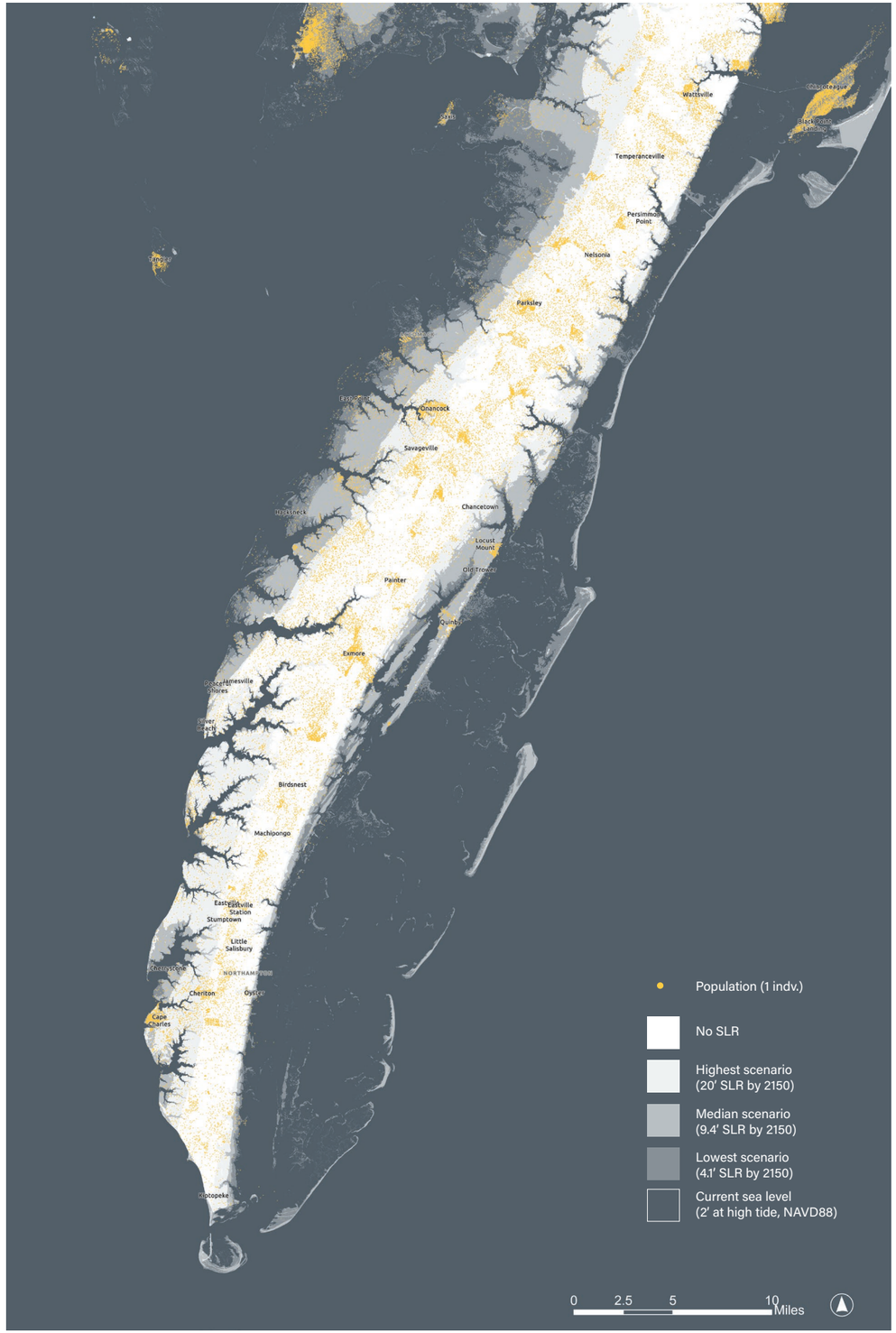
Freshwater aquifer recharge resisting saltwater encroachment



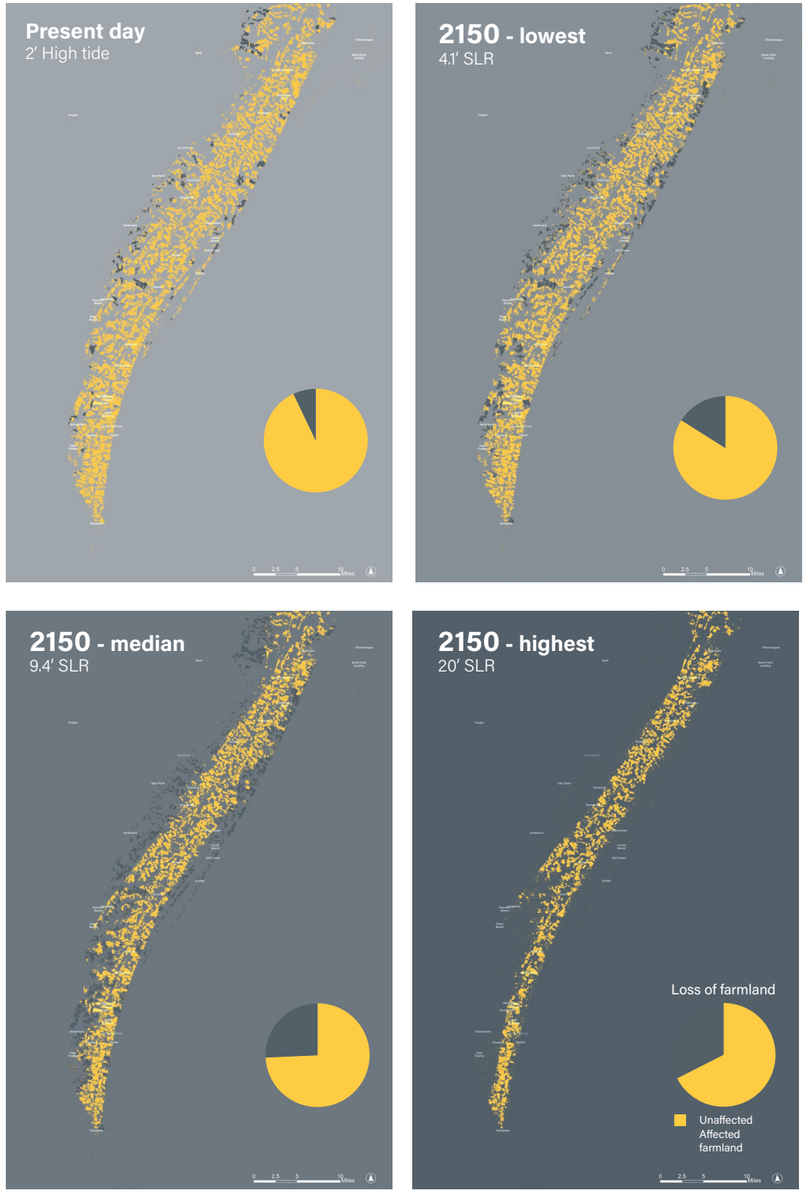
Delmarva bays (depressional wetlands) on Seaside, near Accomac

Through a vision for Virginia's Eastern Shore inspired by a creative management methodology, I am proposing in this thesis project a dynamic and adaptive spatiotemporal reorganization of tidal projections through small-scale, low-cost landscape design guidelines inspired and co-produced by long-term farmers and landowners. Specifically, I leverage and adapt existing local techniques, knowledge, and land-based practices to create an adaptive and adaptable toolkit of tactics and strategies such as: converting land from agriculture to aquaculture to remain productive, filling ditches to alter hydrology, and harvesting timber stands to facilitate marsh migration.

My framework is situated in and sensitive to the Shore's landscape and communities, arising from two years of resilience-focused research and community engagement in the region (funded by Virginia Sea Grant (Luegering) & LAF's Kenneth Brooks Thesis Research Scholarship). It's my belief that long-term coastal resilience is only possible by embracing the uncertainty and inevitability of change, engaging with local perspectives and lifeways, and applying landscape methods to support the long-term function of local economies, hydrologies, and topographies, an approach that I am testing here.



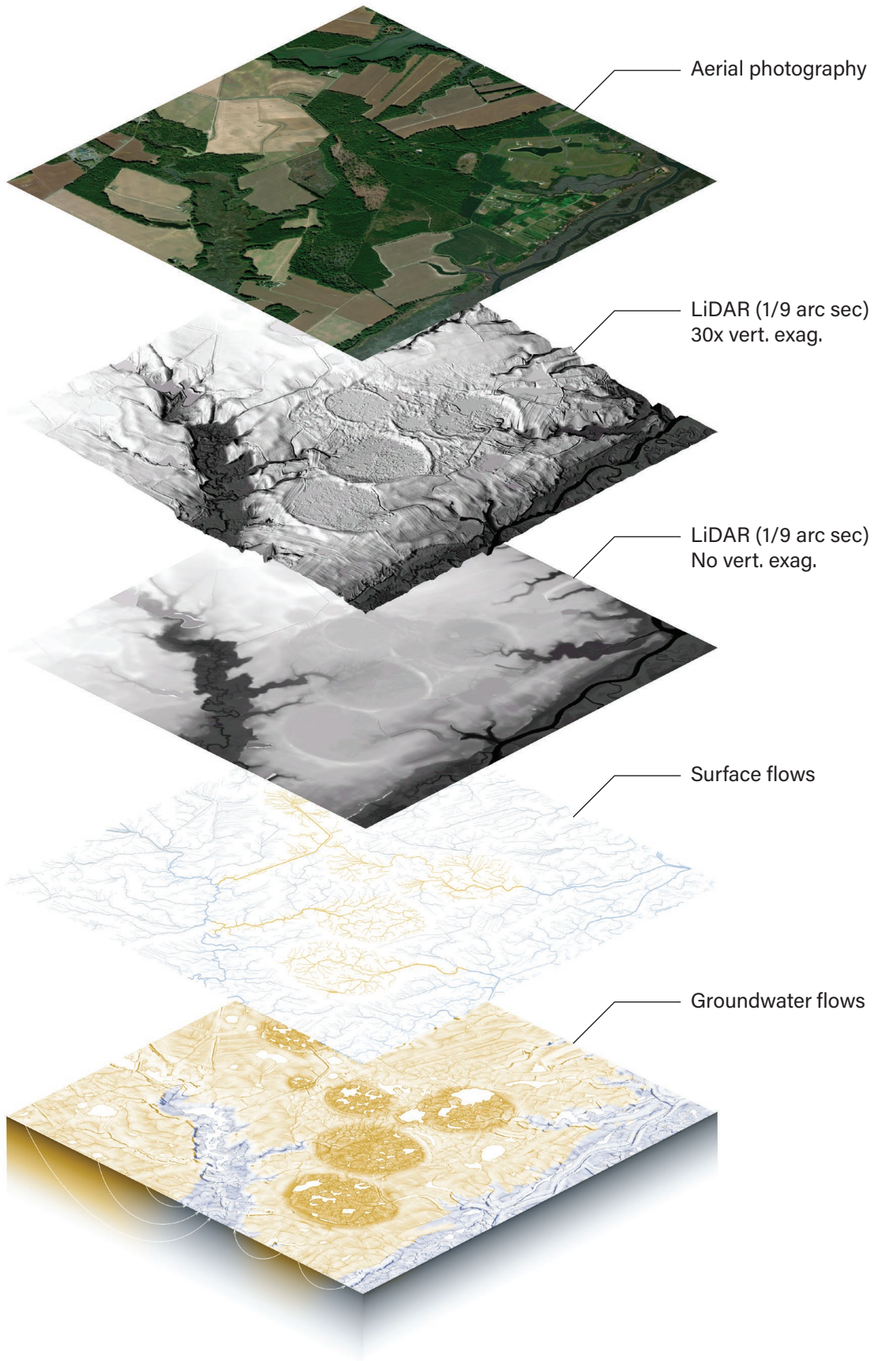
Sea level rise scenarios on the Eastern Shore of Virginia



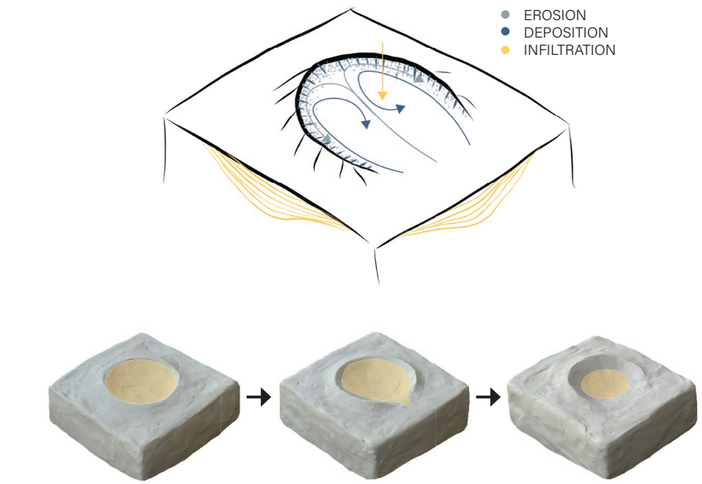
Virginia farmland over next 125 years, by NOAA scenario

In the next five generations (125 years) NOAA's most recent sea level rise projections for this location range from 2.3′ under the mildest circumstances and 18.2′ under the most extreme. This does not include the countless implications of sea level change like saltwater intrusion, increased wave height and storm surge, and ecosystem disturbance. For a community that can easily trace back their lineage 13 generations (names and stories included), 5 generations is not far off, yet a 16′ difference in projections make planning for change close to impossible.

In the face of this uncertainty - communities and individual farmers/ farming families are presented with few choices. Many continue to try with business-as-usual until it becomes economically impossible to persist in place. Many eventually choose to leave.

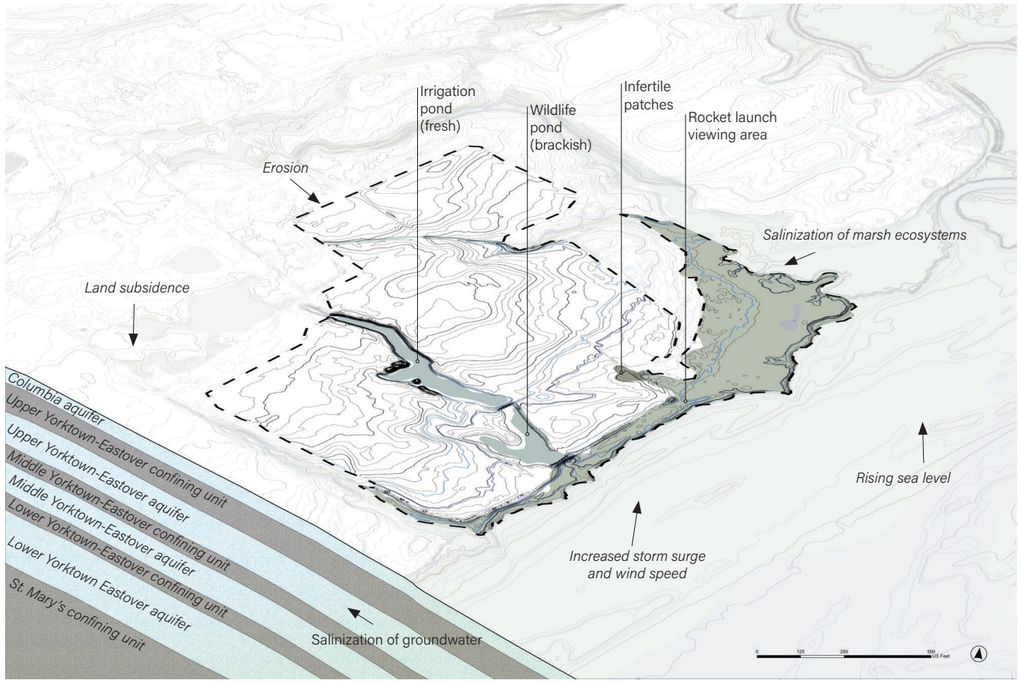


Hidden hydrologies of micro-topographies



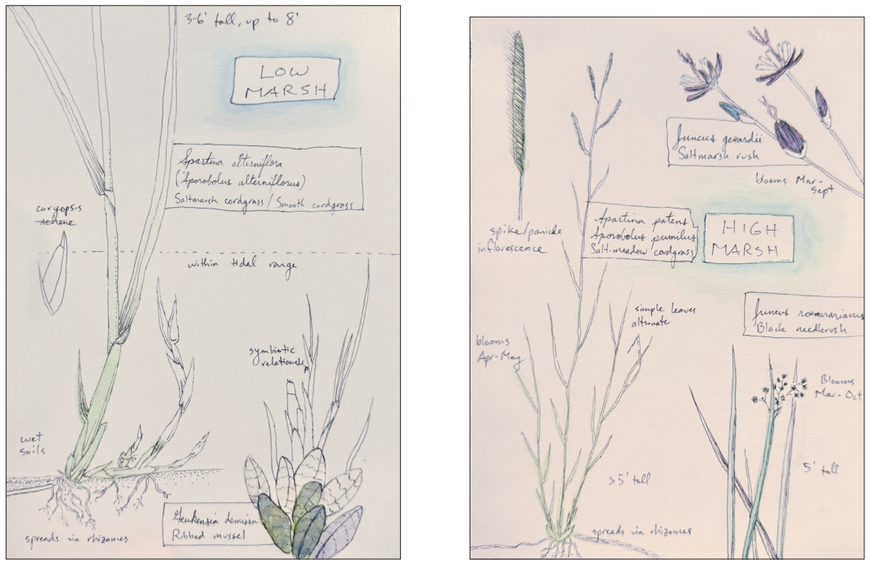
Formal study of Delmarva Bay depressional wetlands

No single solution will fix the compound challenges faced by those who hope to remain on their farms for coming generations. The existential threat to these communities and their culture, I believe, is not sea level rise or saltwater intrusion, but a lack of proactive and projective methods to imagine long-term and large-scale transformation of culture and community, in step with these forces of sea and salt.



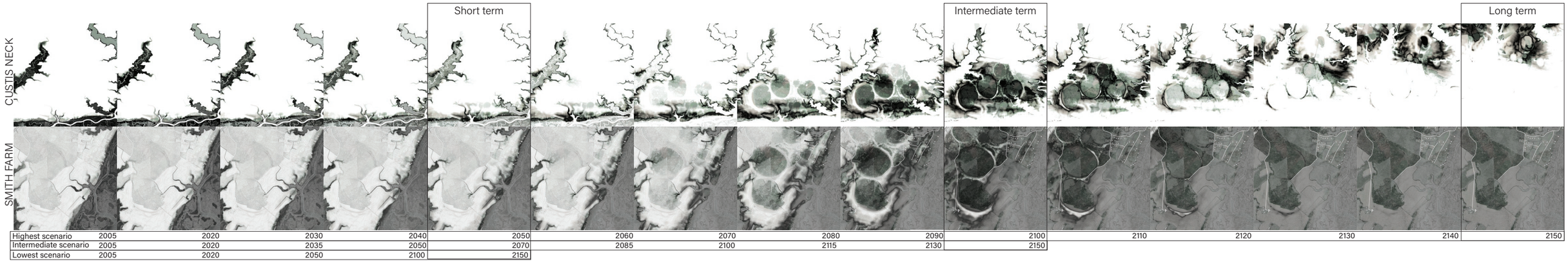
The forces and practices of sea level rise, Goshen Farm

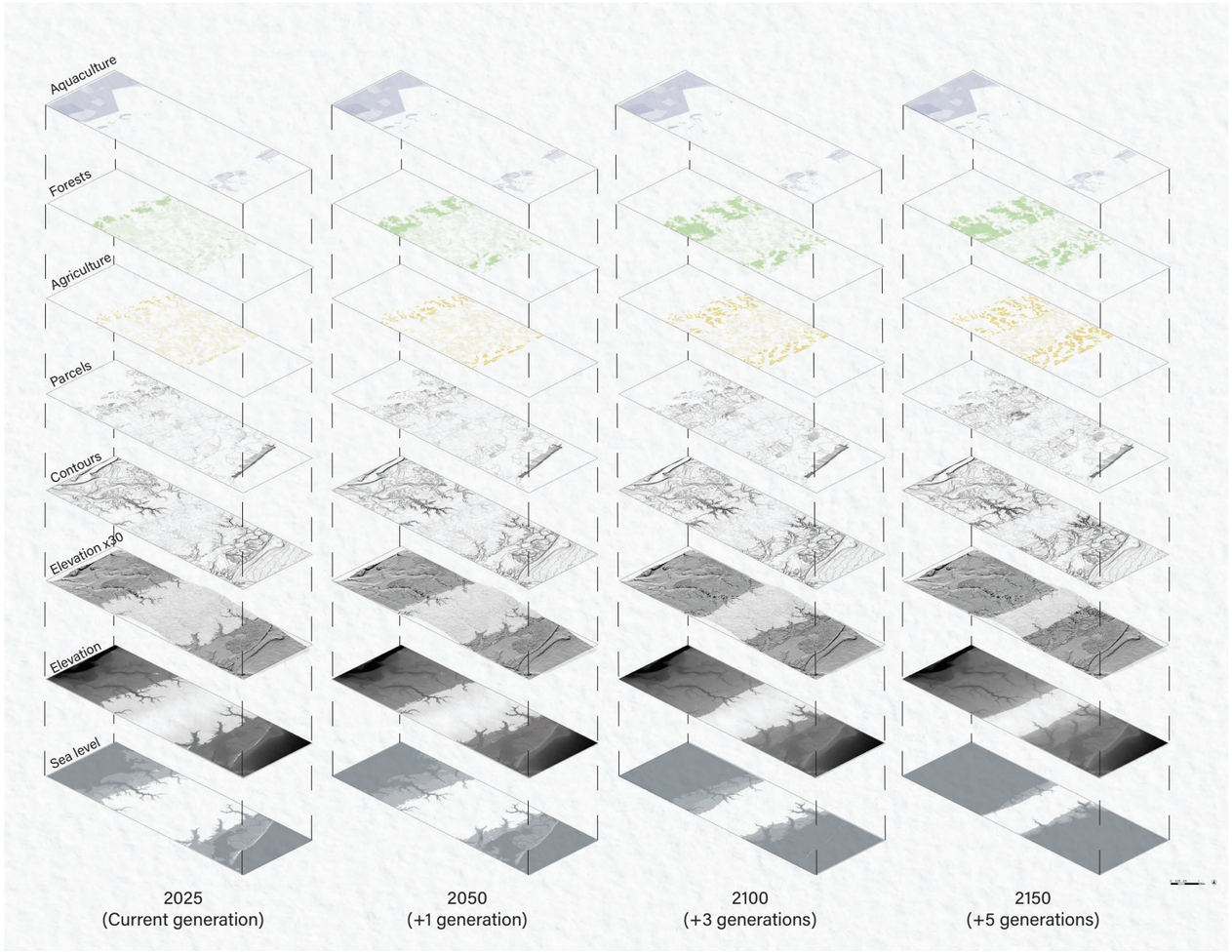
Within the design fields, projective, speculative, and visionary planning is often standard practice. Furthermore, recent developments in the field of Landscape Architecture have linked this long-term projective thinking to the responsive manipulation of grounded and everyday practices of landscape making and management. These methods can be leveraged to respond to the complexity and uncertainty of coastal change and envision a future for the Eastern Shore (and other regions) that is productive, attentive, and responsive.



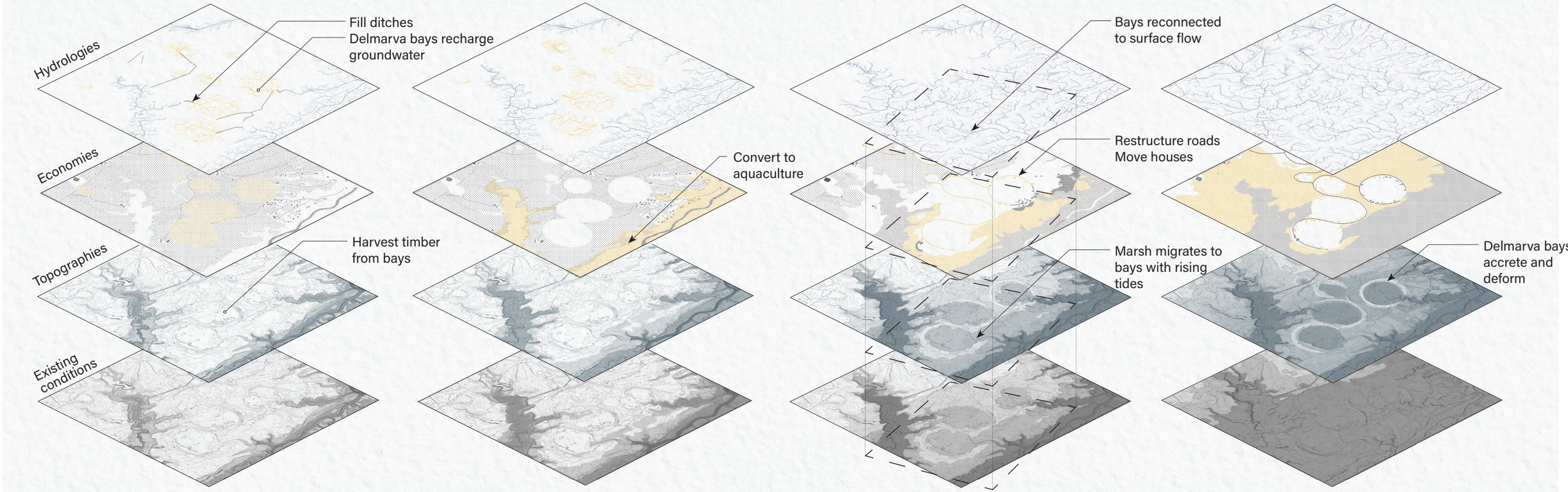
Coastal marshland ecologies tied to hydrology and topography

Indicators:
Juncus gerardii, *Sporobolus pumilus*, *Borrichia frutescens*

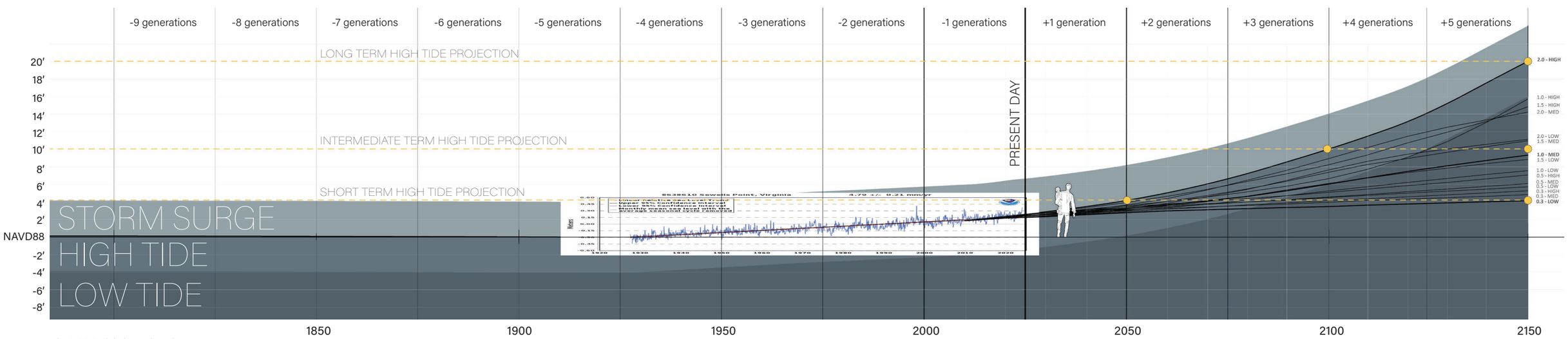




Landscape succumbing to rising tides

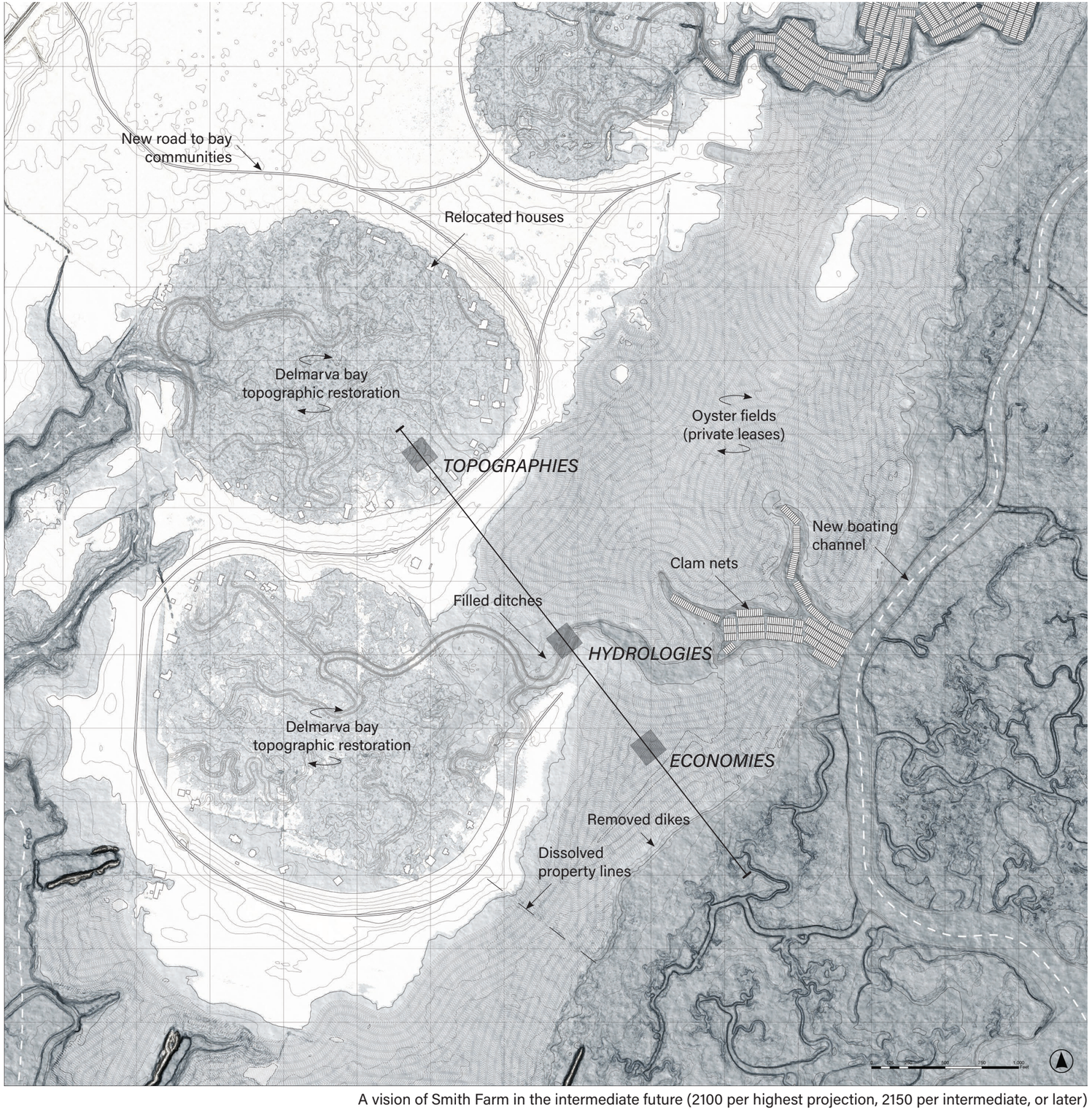


Designing large-scale reorganization of shorelines and infrastructures, Custis Neck, Seaside



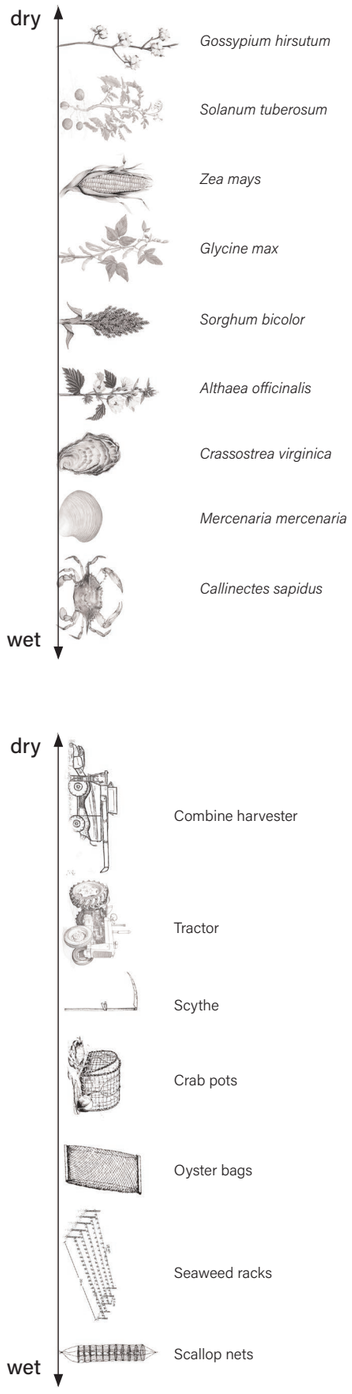
NOAA's 2022 tidal projections

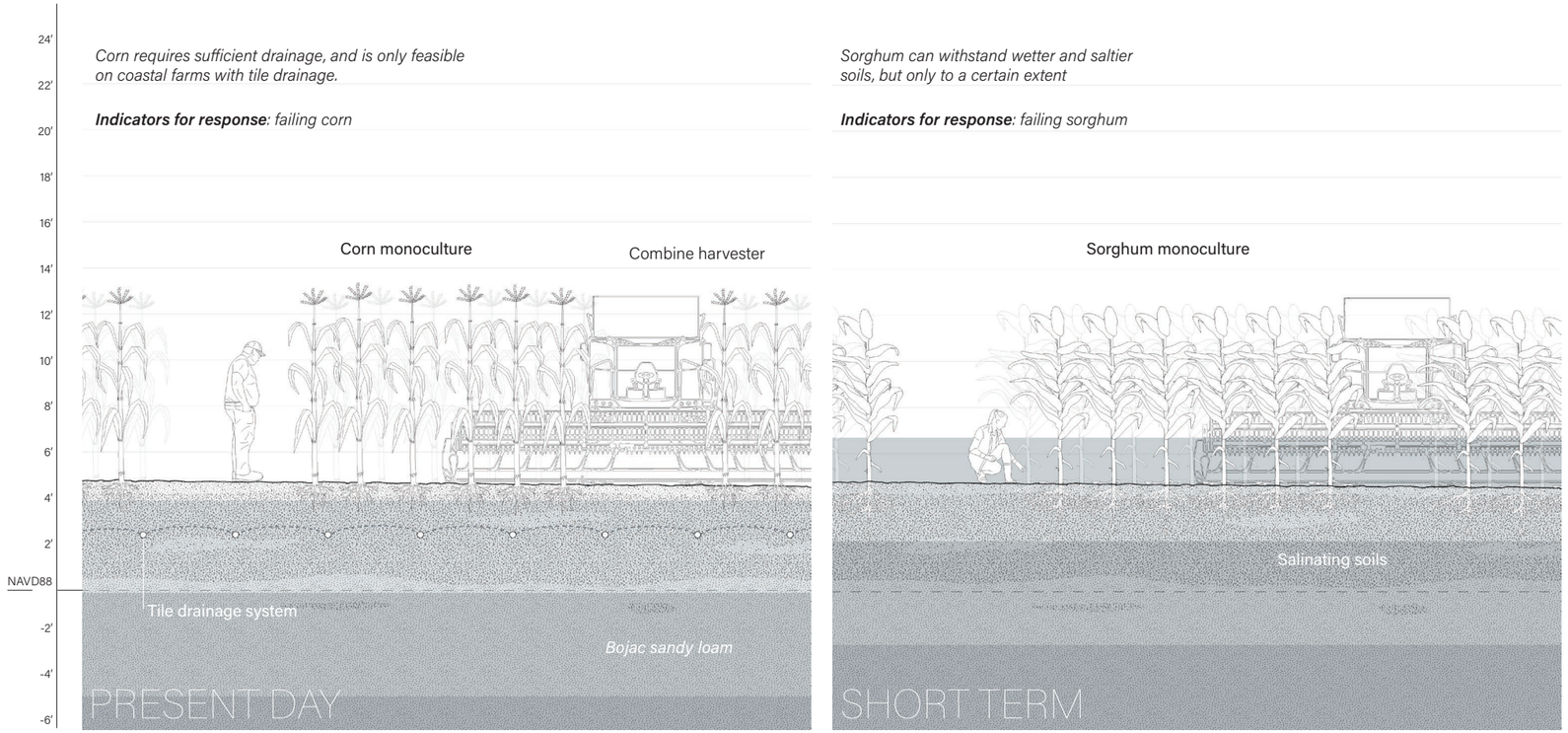
Existing conditions at Smith Farm (2024)



A vision of Smith Farm in the intermediate future (2100 per highest projection, 2150 per intermediate, or later)

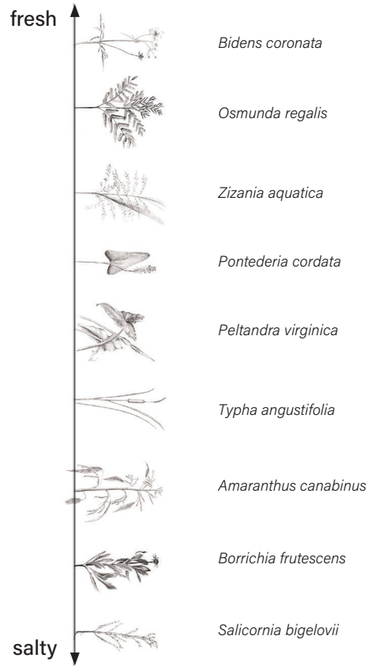
ECONOMIES

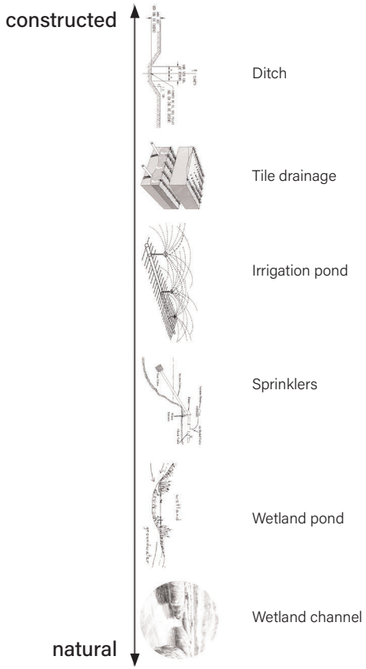


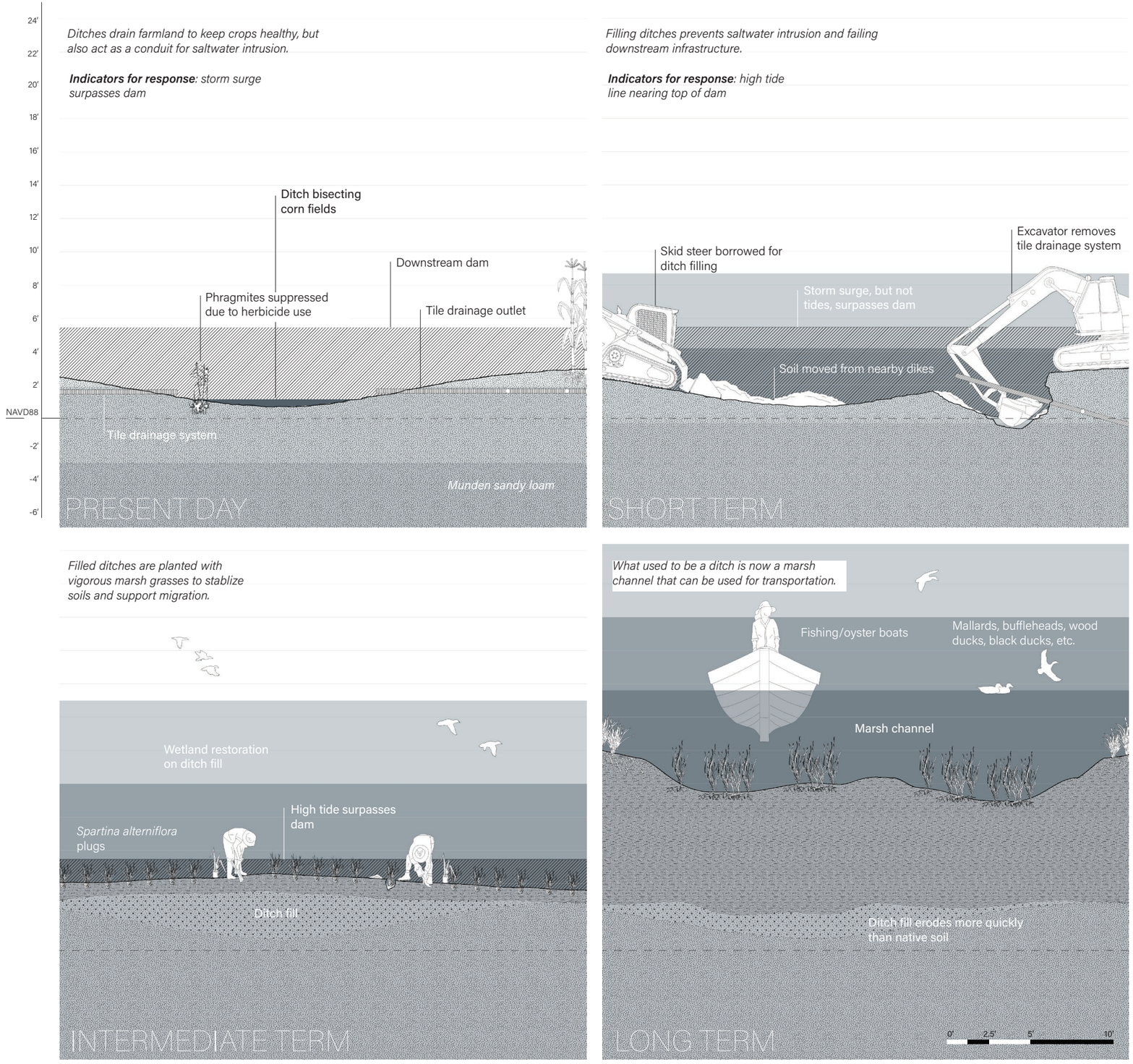


Agricultural landscapes faciliated to remain productive through change

HYDROLOGIES







Small-scale ditch filling to facilitate large-scale hydrological restoration

TOPOGRAPHIES

high

Iva frutescens

Baccharis halimifolia

Pluchea purpurascens

Phragmites australis

Spartina patens

Juncus roemerianus

Limonium nashii

Spartina alterniflora

Distichlis spicata

Cakile edentula

low

constructed

Dikes

Ditches

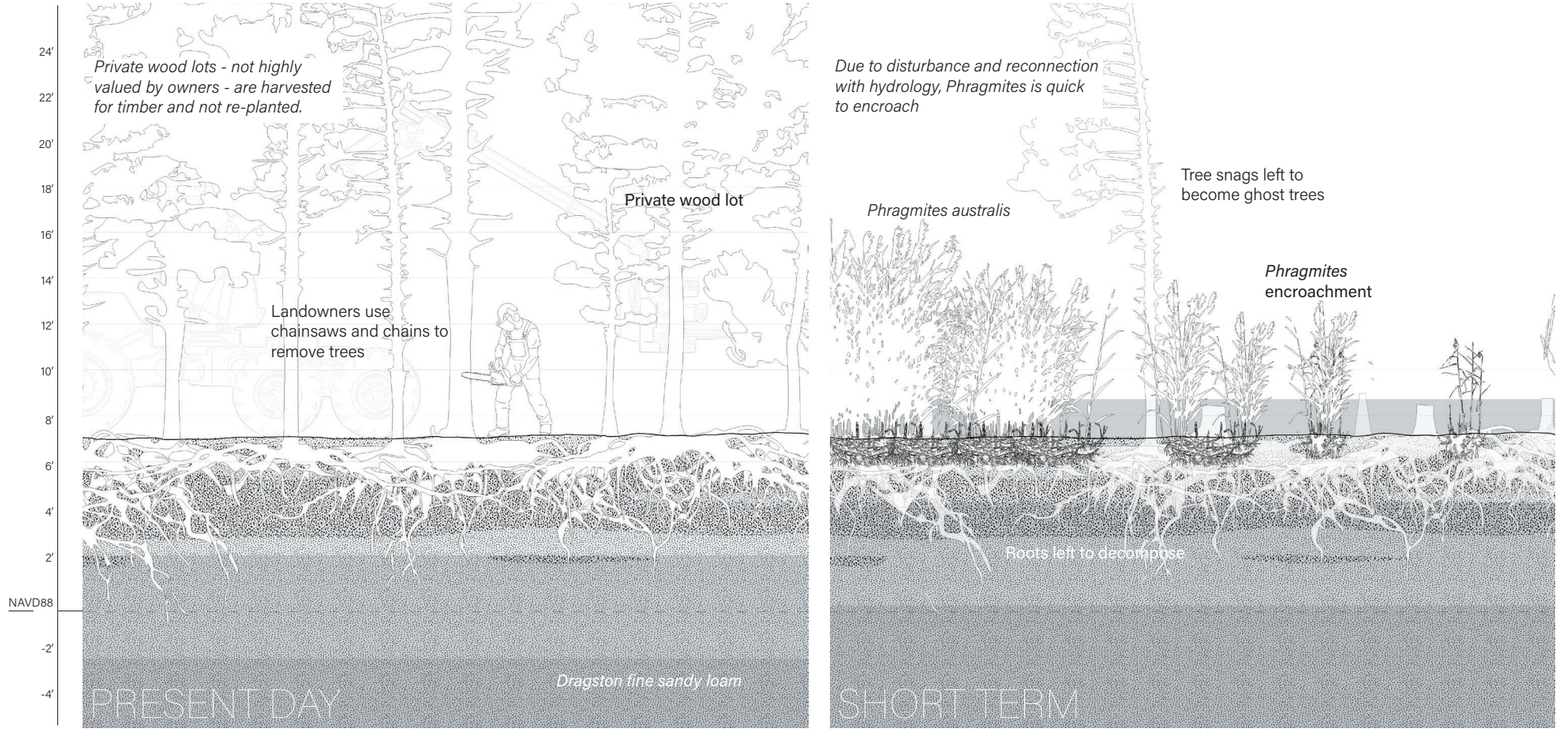
Dredging channels

Thin layer placement

Soil stabilization

Sediment accretion

natural



Felling timber stands on Delmarva bays allows for marsh migration and topographical reshaping

Nimble responsiveness transcends beliefs about sea level rise and long term projections. It’s bout responding to what you see and taking small transitional steps. These methods, approaches, and strategies are useful for both an older landowner who seeks innovative ways to proceed in a world without sea level rise, as well as adapt to extreme scenarios for long term resilience. Landscape architecture’s unique methodologies like creative management, developed for plant systems and applied to ecosystems, can be extended to and leveraged for economic, hydrologic, and topographic interventions to envision and realize new, prosperous futures for local and global coastlines.

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