



EasyGrantsID: 84028

National Fish and Wildlife Foundation – National Coastal Resilience Fund 2024, Full Proposal

Title: Finalizing a Design for Transformative Marsh Habitat Restoration and Protection in Mobjack Bay (VA)

Organization: Virginia Marine Resources Commission

Grant Information

Title of Project

Finalizing a Design for Transformative Marsh Habitat Restoration and Protection in Mobjack Bay (VA)

Total Amount Requested	\$ 678,150.00
Matching Contributions Proposed	\$3,275,460.00
Proposed Grant Period	01/01/ 2025 - 12/31/ 2026

Project Description

Employ innovative methods to enhance living shoreline and marsh area along Mobjack Bay. Project will optimize designs for restoring marshes, dunes, beaches, and seagrass to protect tidal natural resources, the local coastal community and businesses, and historic and key cultural communities.

Project Abstract

The Guinea Marshes of Mobjack Bay and surrounding communities within the lower Chesapeake Bay region of Virginia have historically experienced substantial shoreline erosion and loss due to sea level rise, land use change, and extreme storms. As a result, NOAA and partners in academic, non-profit, and state and local government sectors have identified the Guinea Marshes as a priority candidate for restoration, shoreline erosion reduction, oyster habitat enhancement, and future marsh migration. This project aims to finalize a design for and determine the feasibility of using traditional (e.g., plantings) and natural and engineered methods (e.g., breakwaters, berm removal, runnels, dredge material) to innovatively restore, enhance, and protect marshes, dunes, beaches, and seagrass within the Guinea Marshes. This project also aims to continue stakeholder relationships (e.g., public meetings, community engagement implementation plan) to finalize the project design and to develop a future land procurement plan for incorporating marsh migration into long-term conservation strategies. Overall, this project will provide ecologic and economic benefits to the Guinea Marshes by protecting a vulnerable rural coastal community from further land loss and storm impacts, restoring essential habitat for fish, birds, oysters, and blue crabs, and ensuring fishers and recreators continue to have access to the aquatic resources provided by the lower Chesapeake Bay and surrounding marsh ecosystems.

Organization and Primary Contact Information

Organization	Virginia Marine Resources Commission
Organization Type	State or Local Government
City, State, Country	,,

Region (if international)

Primary Contact	Rachael Lee Peabody
Position/Title	Director of Coastal Policy
Phone and E-mail	757-247-8027 x ; rachael.peabody@mrc.virginia.gov

Additional Contacts



NFWF

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Role	Name
Other Authorized Personnel	Andrew Larkin
Other Authorized Personnel	Benjamin Sagara



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Project Location Information

Project Location Description	Guinea Marsh Wildlife Management Area, Mobjack Bay, lower Chesapeake Bay, Gloucester County, Virginia
Project Country(ies)	North America - United States
Project State(s)	Virginia
Project Congressional District(s)	District 1 (VA)

Permits and Approvals

Permits/Approvals Description:

Permits/Approvals Status:

Permits/Approvals Agency-Contact Person:

Permits/Approvals Submittal-Approval Date:



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Activities and Outcomes

Funding Strategy: Capacity, Outreach, Incentives

Metric: Resilience - Outreach/ Education/ Technical Assistance - # govt entities
participating

Required: Recommended

Description: Enter the number of municipalities, local, state, and federal government
entities participating in the project, and add the names of these institutions in the notes and
their primary role.

Starting Value	3.00 # gov't entities participating
Target value	7.00 # gov't entities participating

Note:

Funding Strategy: Capacity, Outreach, Incentives

Metric: Resilience - Outreach/ Education/ Technical Assistance - # people reached

Required: Recommended

Description: Enter the number of people meaningfully engaged in the process of the
proposed project. Please indicate the groups targeted by outreach efforts and how they will
be engaged.

Starting Value	20.00 # people reached
Target value	150.00 # people reached

Note: The project proposes 3 public meetings and a community organizer that will conduct
individual surveys asking residents cultural context of the marshes, hopes for the future, and
to inform the design.

Funding Strategy: Planning, Research, Monitoring

Metric: Resilience - Restoration planning/design/permitting - # E&D plans developed

Required: Recommended

Description: Enter the number of Engineering and Design plans developed. Generally there
will be one plan per project to be constructed.

Starting Value	0.00 # E&D plans developed
Target value	1.00 # E&D plans developed

Note:



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Organization: Virginia Marine Resources Commission

I. PERSONNEL									\$26,774.68
Staff Name	Position	Annual Salary	Project Hours	Hourly Rate	LOE (%)	Project Salary	% Fringe	\$ Fringe	Total Personnel
Brandy Battle	Grants Manager	\$66,777.84	208.00	\$32.1	10	\$6,677.78	50.00	\$3,338.89	\$10,016.68
Unfilled (TBD)	Wetlands Planner	\$57,000.00	416.00	\$27.4	20	\$11,400.00	47.00	\$5,358.00	\$16,758.00
Totals						\$18,077.78		\$8,696.89	\$26,774.68

II. TRAVEL	\$3,460.00
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Domestic Airfare – Per Flight

Purpose/Destination	Unit Cost	Quantity	Total Cost
Round Trip Tickets to Attend Conference	\$700.00	2	\$1,400.00
SubTotal			\$1,400.00

International Airfare – Per Flight

Purpose/Destination	Unit Cost	Quantity	Total Cost
SubTotal			\$0.00

Train – Per Ticket

Purpose/Destination	Unit Cost	Quantity	Total Cost
SubTotal			\$0.00



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Rental Car – Per Day

Purpose/Destination	Days/Duration	Unit Cost	Quantity	Total Cost

SubTotal **\$0.00**

Taxis – Per Trip

Purpose/Destination	Unit Cost	Quantity	Total Cost

SubTotal **\$0.00**

Mileage – Per Mile

Purpose/Destination	Unit Cost	Quantity	Total Cost
Trips to Guinea Marsh	\$0.66	1000	\$660.00

SubTotal **\$660.00**

Gasoline – Per Gallon

Purpose/Destination	Unit Cost	Quantity	Total Cost

SubTotal **\$0.00**

Per Diem (M&IE) – Per Day

Purpose/Destination	Days/Duration	Unit Cost	Quantity	Total Cost

SubTotal **\$0.00**



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Lodging – Per Night

Purpose/Destination	Days/Duration	Unit Cost	Quantity	Total Cost
Hotel for Conference	2	\$350.00	2	\$1,400.00

SubTotal **\$1,400.00**

Meals (no M&IE) – Per Meal

Purpose/Destination	Days/Duration	Unit Cost	Quantity	Total Cost

SubTotal **\$0.00**

III. EQUIPMENT **\$0.00**

Item Name	Description	Unit Cost	Quantity	Total Cost

IV. MATERIALS & SUPPLIES **\$0.00**

Type	Purpose	Unit of Measure	Unit Cost	Quantity	Total Cost

V. CONTRACTUAL SERVICES **\$570,000.00**

Subcontract/Contract – Per Agreement

Contractor Name	Description	Total Cost
TBD	Resilience Feasibility, Elevation Surveys, Designs	\$300,000.00
TBD	Pre-construction Living Resource Monitoring	\$130,000.00
TBD	Community Partnership, Outreach, and Engagement	\$65,000.00



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SubTotal **\$495,000.00**

Subgrant – Per Agreement

Subrecipient	Description	Total Cost
Department of Wildlife Resources	Land Conservation Suitability Assessment	\$75,000.00

SubTotal **\$75,000.00**

VI. OTHER DIRECT COSTS **\$7,590.00**

Type	Purpose	Unit of Measure	Unit Cost	Quantity	Total Cost
Boat Travel	Fees for Law Enforcement	Per Day	\$600.00	10	\$6,000.00
Registration	Conference		\$795.00	2	\$1,590.00

VII. TOTAL DIRECT COSTS **\$607,824.68**

VIII. INDIRECT COSTS **\$70,325.32**

Explanation of Modified Total Direct Cost Base(MTDC)	Rate Type	NICRA Expiration	\$MTDC	Rate(%)	Total Cost
Total Direct Salaries, Travel, Contractual Services, & Other Direct Costs	Fixed	6/30/2023	\$607,824.68	11.57	\$70,325.32

IX. TOTAL PROJECT COSTS **\$678,150.00**



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Budget Narrative

Budget Narrative:

1. Personnel

Personnel - Brandy Battle will manage the financial administration of the funds from within VMRC's Finance office (10% of Brandy's time). The Wetlands Planner, which will be primarily funded by a CZM grant will provide project management of the project (10% of work load).

2. Travel

Domestic Airfare - Per Flight - Two individuals (Rachael Peabody and Wetlands Planner) will attend a key conference, most like Restore Americas Estuaries and present this project. The exact conference is to be determined, so costs are estimated based on allowable GSA rates for round-trip airfare.

International Airfare - Per Flight -

Train - Per Ticket -

Rental Car - Per Day -

Taxis - Per Trip -

Mileage - Per Mile - 10 trips from Fort Monroe, VA, to Gloucester, VA (100 miles) will be taken for a total of 1,000 miles. The per mile cost is the 2023 standard mileage rate of the Internal Revenue Service.

Gasoline - Per Gallon -

Per Diem (M&IE) - Per Day -



Title: Finalizing a Design for Transformative Marsh Habitat Restoration and Protection in Mobjack Bay (VA)
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Lodging - Per Night -	Two individuals will attend a key conference. The exact conference is to be determined, so costs are estimated based on allowable GSA rates and cursory searches for hotel rooms.
Meals (No M&IE) - Per Meal -	

3. Equipment

Equipment -

4. Materials and Supplies

Materials and Supplies -

5. Contractual Services

Subcontract/Contract - Per Agreement -	Three RFPs will be conducted for: 1) An environmental consulting firm or research institution will be hired to develop a comprehensive ecosystem and community resilience feasibility report, LiDAR elevation surveys, and final engineered construction designs. 2) to conduct pre-construction living resource monitoring, encompassing the examination of biological aspects of the shoreline. These include vegetation surveys, oyster structure assessments, and comprehensive fish surveys using cutting-edge E-DNA and E-RNA technology. 3) A firm will be hired to organize and coordinate robust community engagement and partnerships. This includes the development of impactful digital and printed outreach materials and the coordination of community involvement in project steering, volunteer initiatives, and educational events.
Subgrant - Per Agreement -	The Virginia Department of Wildlife Resources (DWR) will be subawarded to conduct a land conservation suitability assessment. The project cost is based on previous costs of similar RFPs.



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6. Other Direct Costs

Other Direct Costs -

1) Ten days of boat travel using VMRC vessels will be conducted in Guinea Marsh. VMRC law enforcement personnel require \$600 per day for boat travel and boat costs. 2) Two individuals will attend a key conference. The exact conference is to be determined, so the Restore America's Estuaries annual Coastal and Estuarine Summit was used to estimate conference fees.

7. Indirect Costs

Indirect Costs -

VMRC has a NICRA of 11.57%. The indirect request will support building and office expenses, IT needs, and other overhead expenses within the Environmental Policy Division.



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Matching Contributions

Matching Contribution Amount:	\$3,000,000.00
Type:	Cash
Status:	Received
Source:	National Oceanic and Atmospheric Administration
Source Type:	Federal
Description:	Funds received for implementing oyster restoration projects around the project area.

Matching Contribution Amount:	\$275,460.00
Type:	In-kind
Status:	Pledged
Source:	NOAA - CZM BIL Capacity
Source Type:	Federal
Description:	Capacity funding to hire and retain a Wetlands Restoration Coordinator for 3 years at the VMRC

Total Amount of Matching Contributions:	\$3,275,460.00
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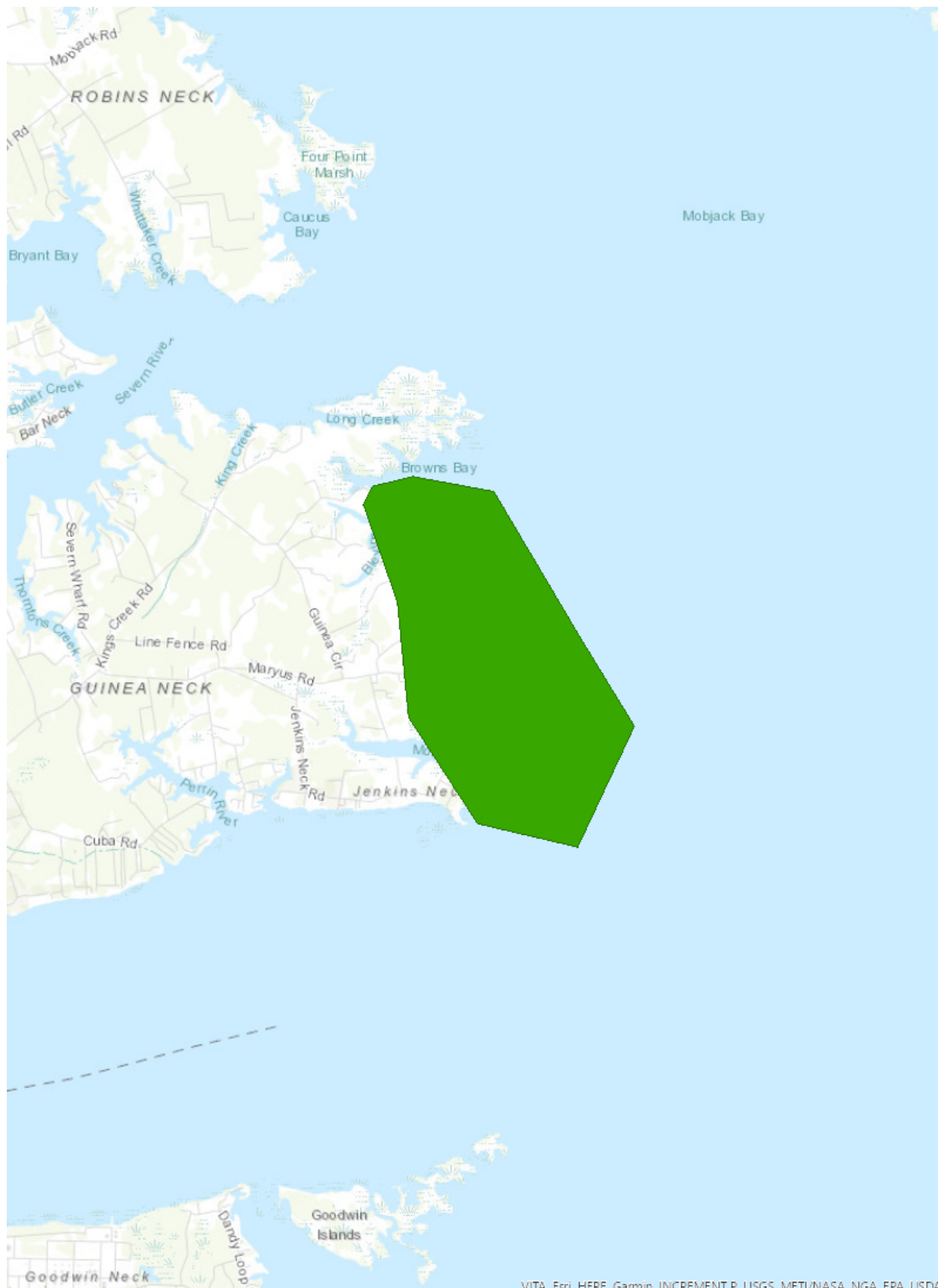
NFWF

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The following pages contain the uploaded documents, in the order shown below, as provided by the applicant:

Upload Type	File Name	Uploaded By	Uploaded Date
NCRF Pre and Full Proposal Narrative 2024	2024_NCRF_Narrative.pdf	Peabody, Rachael	07/02/2024
Project Map	Tidal Marsh Adaptation Project Guinea Marsh Meeting Worksheet.pdf	Peabody, Rachael	07/02/2024
Letters of Support	Letters_of_Support.pdf	Peabody, Rachael	07/02/2024
Photos - Jpeg	GuineaMarshNCRFphoto1.jpg	Peabody, Rachael	07/02/2024
Photos - Jpeg	GuineaMarshNCRFphoto2.jpg	Peabody, Rachael	07/02/2024
Photos - Jpeg	GuineaMarshNCRFphoto3.jpg	Peabody, Rachael	07/02/2024
Statement of Litigation	Statement_of_Litigation.pdf	Peabody, Rachael	07/02/2024
Board of Trustees, Directors, or equivalent	Board of Trustees_NFWF.pdf	Peabody, Rachael	07/02/2024
Applicant Controls Questionnaire (Pre 3.25.24)	Applicant_Controls_Questionnaire_FINAL_VMRC2024.pdf	Peabody, Rachael	07/02/2024
Other Documents	Mobjack Summary_NATRX Report.pdf	Peabody, Rachael	07/02/2024

The following uploads do not have the same headers and footers as the previous sections of this document in order to preserve the integrity of the actual files uploaded.



NCRF *PRE-PROPOSAL* – Narrative Template

PART I – PROJECT OVERVIEW

1. This multifaceted design and planning proposal aims to sustain and strengthen the ecological vitality of tidal salt marshes in the lower Chesapeake Bay, Virginia's historic fishing communities and businesses, and local private property by implementing comprehensive ecosystem restoration and long-range planning strategies at Guinea Marsh Wildlife Management Area and adjacent publicly owned marsh islands. The project proposes to finalize the design and planning of a large-scale project to enhance and safeguard over 1,000 acres of high quality connected tidal marshes in Virginia's Mobjack Bay. This large natural marsh system, which has long served as critical natural infrastructure and vital fish and wildlife habitat, is under significant threat of severe coastal erosion and marsh vegetation loss (drowning) alongside rising sea levels and more frequent and intense storms. These hazards also threaten the vulnerable rural coastal communities and populations of the Guinea areas of Gloucester County, Virginia, specifically their homes, nature-based businesses, local heritage, and infrastructure (i.e. roads, bridges, underground utility).
2. The project builds upon previous initiatives within NOAA's Middle Peninsula Habitat Focus area, established in 2022. This national program concentrates efforts on habitat restoration and coastal resilience in specific regions of national ecological importance. Notable contributions include: 1) NOAA's Coastal Wetlands Plan for the York River, Piankatank River, and Mobjack Bay, referencing and prioritizing Guinea Marshes for restoration; 2) the Nearshore Oyster Restoration Siting and Prioritization Tool, funded by NOAA, identifying optimal areas for shoreline erosion reduction and oyster habitat enhancement; 3) a NOAA-funded project evaluating nature-based solutions at Guinea Marsh, utilizing the Virginia Institute of Marine Science (VIMS) oyster siting tool and other analyses to design intertidal oyster structures; and 4) VIMS Shoreline Studies preliminary design for Guinea Marsh restoration, featuring erosion reduction, tidal wetlands and submerged aquatic vegetation restoration, and SAV restoration using resilient genetic strains.
5. The project outlines four distinct nature-based solutions aimed at enhancing ecological and community resilience. First, it proposes restoring coastal habitats such as marshes, dunes, beaches, and submerged aquatic vegetation (SAV) through traditional methods like beach nourishment, plantings, and hydrological alterations. Second, it proposes safeguarding approximately 3 miles of shoreline, encompassing tidal marsh creeks, bays, and beaches, from erosion and storm surge impacts by utilizing a combination of natural and engineered living shoreline structures, including rock and oyster breakwaters. Third, it provides an avenue for evaluating innovative large-scale tidal wetland restoration practices, such as using dredged material to fortify existing marsh elevation, removing historical berms, and creating runnels to improve water flow and sediment deposition. Lastly, it aims to develop an acquisition and conservation plan for future land procurement or conservation easement acquisition, particularly focusing on uplands adjacent to Guinea Marsh, to incorporate marsh migration into long-term planning and conservation strategies, thereby ensuring mutually beneficial outcomes for both communities and habitats.
6. The Guinea Marsh's natural shorelines, eroding up to 5 feet per year, present an ideal setting for implementing nature-based living shoreline restoration. Enhancing this large tidal marsh ecosystem will benefit local upland property owners through improved storm protection and water quality. Additionally, it will support the historic and vital commercial and recreational fishing communities and the aquatic wildlife they rely on. The expansive Guinea Marsh complex offers a prime opportunity for large-scale restoration efforts and the establishment of marsh migration corridors in the lower Chesapeake. The proposed approach involves utilizing techniques outlined in section 5, including the use of dredge materials and other emerging restoration methods, alongside evaluating potential land or conservation easement acquisitions. The preliminary design includes up to 7,000 linear feet of sill or breakwater structures in high-energy areas and 8,930 linear feet of intertidal oyster habitat to



conserve threatened marshes and dunes. Additionally, the plan aims to design the restoration of approximately 3 acres of dunes, beaches, and wetlands. Lastly, collaborating with VIMS staff will facilitate a feasibility assessment for submerged aquatic vegetation (SAV) restoration in Mobjack Bay, incorporating up to 24 acres of experimental SAV habitat restoration to study seed stock survival.

7. 1) 90-100% final engineering and design plans for the restoration/conservation project 2) continued/expanded stakeholder engagement efforts including three public meetings to inform the final design and surveys to the local community 3) baseline natural resource monitoring report from surveys of vegetation, fish, and wildlife 4) tidal marsh resilience feasibility report assessing the potential use of beneficial dredge material, the removal of historic berms to restore natural tidal inundation, SAV habitat restoration, exploring the creation of runnels to improve water flow, and sediment deposition, and 5) land or conservation easement acquisition suitability assessment report. 6.) A community engagement implementation plan with local community partners described in section 10.

8. The long-term utility and sustainability of the project is promising because the proposed project takes place on public lands and is the result of the partnership of the natural resource agencies that regulate and manage these public resources in the project areas. The end result would be a final restoration design, fully informed by local stakeholders for the proposed project and would be a large step towards seeking funding and partners for restoration implementation. This project aims to address both sustainability and regenerative/restorative practices in the face of a changing climate. The Chesapeake Bay needs both to ensure existing marshes survive long enough for quality marsh to migrate and to establish in higher elevation areas.

9. The entities who have been engaged and will continue to be engaged include: The Middle Peninsula Planning District Commission/Middle Peninsula Chesapeake Bay Public Access Authority (MP-PAA), a regional entity representing local governments and local Guinea Marsh public landowner. The Guinea Heritage Association. The Virginia Waterman’s Association. Knott Alone – Hold Fast, local veteran’s organization involved in habitat restoration. Local oyster aquaculture businesses including Matheson Oyster Company and Big Island Aquaculture. The rural Guinea communities of Mobjack Bay in Gloucester County that would benefit from this project include Achilles, Maryus, Severn, and Perrin.

10. In addition to continued engagement with the above partners from the community, additional key partners and stakeholders outside of the community include the Virginia Marine Resources Commission (VMRC), the project lead and the steward of the Commonwealth’s marine resources, the Virginia Department of Wildlife Resources (VDWR), who owns the largest portion of the Guinea Marshes, the Guinea Marsh Wildlife Management Area, and the Middle Peninsula Chesapeake Bay Public Access Authority, who owns the remaining portions of the Guinea Marshes.

11.

Community(ies)	Race/Ethnicity	Poverty Rate	Low Income %	Annualized Unemployment Rate
Achilles, Maryus, Perrin, Severin (Gloucester Co., VA)	92% white, 8% people of color	9%	18%	3%

The Guinea Marsh complex and nearby communities, as viewed through ADAPT VA and EPA EJ Screen data, are the focus of our grant proposal. In the Mobjack Bay area, vulnerabilities are evident: a notable portion of residents have less than a high school education (59th percentile) and are over the age of 64 (72-90th percentile), increasing their susceptibility to natural hazards. Gloucester County and Mathews County, home to the complex, also have the highest number of commercial fishing license holders, emphasizing the economic reliance on a sector heavily impacted by environmental changes such as rising sea levels. Projections for 2050 and 2090, show increasing risks spreading westward from Guinea Marsh, affecting land use, infrastructure, and



critical habitats across the region.

12. The projected community resilience benefits to implementing the project design for marsh and dune restoration include increased and sustained protection from anticipated frequent and intense coastal storms and related erosion to public and private properties including homes for approximately 500 residents, businesses including 2 adjacent oyster farms, and numerous local roads, docks, and piers. Other projected benefits include the preservation of public lands that supports local public recreational opportunities, including hunting, fishing, kayaking, and birding. The mobjack bay and Guinea marshes also boasts one of the healthiest and abundant beds of SAV and largest contiguous tracks of tidal wetlands in Virginia, which also makes it one of the most productive fisheries nursery within the Bay. This project proposes to sustain and enhance these important natural infrastructures.

13. The marsh restoration project offers significant benefits to fish species and essential fish habitat, including 11 federally managed species such as Atlantic Butterfish, Bluefish, and Summer Flounder, while also supporting iconic Chesapeake Bay species like striped bass, oysters, diamondback terrapins, and blue crabs. Additionally, restoration of high marshes provides crucial nesting habitat for Eastern Black Rails and American Black Ducks which are flagship species for the Atlantic Coast Joint Venture facing substantial threats from sea-level rise and urbanization. Restoring marsh habitat for black ducks also aligns with regional restoration goals outlined in the Chesapeake Bay Watershed Agreement.

Not Applicable Questions: 3. N/A, 4. N/A, 13. N/A, 14. N/A, 15. N/A 16. N/A

PART II – SCOPE OF WORK

A. Methods and Activities:

1. Comprehensive Existing Conditions Survey Report

In order to confidently design the most effective habitat enhancement and protection strategies for the high energy shorelines of Guinea Marsh, we first propose to produce a Comprehensive Existing Conditions Survey Report (25% of budget). The report will include a.) detailed project area information including a topographic elevation survey of the marsh and tidal water interface, b.) bathymetric bottom surveys of the surrounding tidal waters to map viable access routes and develop effective transportation methodology, c.) hydrologic analysis to account for current and anticipated sea level, daily wave action, and episodic flooding events, and d.) any other necessary due diligence reporting that may arise (i.e. cultural resources or protected species surveys). The existing conditions report will include e.) a survey of SAV (coverage mapping, species composition, and relative abundance), with a particular focus on Browns Bay, a zone that has notably lost considerable coverage in recent years, likely due to decreased protection as the leading shoreline of Guinea Marsh continues to erode. The SAV survey report will dive into anticipated trade offs between potential impacts to SAV needed to protect specific marsh features (e.g. spits, points, peninsulas) that maintain harbored embayments with thriving SAV and low energy interior marsh shorelines, a topic not thoroughly discussed and understood from a regulatory context. Additional baseline data will be gathered related to vegetation and fisheries utilization utilizing innovative eDNA techniques.

These extensive surveys of the marsh complex will allow us to pinpoint prospective sites for SAV restoration, the beneficial application of sediment in ecosystem restoration and enhancement efforts, and other innovative adaptive management strategies identified in the Tidal Marsh Resilience Feasibility Report. This comprehensive survey report would serve as the foundation for the proposed final designs and would function as the baseline we will use to closely monitor the effectiveness of future implementation efforts and other environmental



changes occurring at Guinea Marsh. These efforts support a holistic and effective strategy for the long-term conservation and enhancement of tidal marsh ecosystems in the study area, which will ultimately inform future conservation efforts and restoration projects in the region to ensure the continued health and vitality of these invaluable coastal habitats.

2. Community Engagement Implementation Plan

10% of the budget will be dedicated to community engagement activities. A community engagement implementation plan will be developed to ensure community needs are met throughout the project. The rural Guinea communities of Gloucester County along the southern end of Mobjack Bay that would directly benefit from this project are underserved communities as defined by the White House Executive Order 1395, which includes “persons who live in rural areas.” The people in these communities depend on the Guinea marshes to protect their homes and businesses, support aquaculture and commercial fisheries, and provide coastal recreation. Throughout the project, a strong collaborative partnership with community organizations will be maintained. The community organizations that have already agreed to support the project include the Guinea Heritage Association (GHA), the Virginia Waterman’s Association, and the local veteran’s program, Knott Alone-Hold Fast. To amplify community engagement and embrace the historical context, a specialized firm will be contracted to develop a community and heritage outreach program, which will be included in the community engagement implementation plan. To ensure we respect the rich local heritage and integrate community contributions, a minimum of three official public meetings will be organized including these specific groups so they have ample opportunity to review plans, comment, and incorporate their priorities into the project design.

A major project objective is to celebrate the historical importance of these marsh lands in the final design. Elements that contribute to bolstering GHA’s mission of preserving the unique history and culture of Guinea will be incorporated into the project. The region has a rich cultural heritage that has long been a focal point of Virginia’s fishing industry, dating back to the 1600s. This community is deeply rooted in the seafood industry, and the strong family connections with the water are central to its identity. This cultural legacy will be honored and enhanced throughout the project. The GHA expresses enthusiasm about leveraging this project to complement existing community programs, including exhibits at the GHA local museum, the annual Guinea Jubilee, and expanding environmental education in coastal ecosystems through their youth education program, “Wonders of the Water.” Upon future implementation, the project will facilitate enhancement programs for the GHA, including youth field days at the project sites, thereby increasing public access.

3. 90% Shoreline Restoration and Protection Project Designs

The largest portion of the budget, 38%, will be used to create a 90% final engineering and design plan set to safeguard approximately 3 miles of shoreline and protect over 1,000 acres of adjacent tidal marshes, creeks, and bays from future erosion and storm surge impacts. Along shoreline areas with the highest energy and greatest wetland loss, designs will include 7,000 linear feet of marsh toe revetment/sills and other breakwater structures. Up to 8,930 linear feet of intertidal oyster habitat structures (~128 segments) will be designed in moderate wave energy areas where we can maximize the co-benefits of shoreline protection through wave attenuation, enhance oyster/fish habitat diversity, and improve water quality. These shoreline protection measures will be coupled with approximately 2 acres of marsh, dune, and beach restoration to provide habitat for high marsh nesting birds including rails and waterfowl, diamondback terrapins, and the federally threatened [northeastern beach tiger beetle](#) which is known to occur north and south of Guinea Marsh. Natural and engineered living shoreline structures, including rock and oyster breakwaters, will be incorporated into the final engineering and design plans. Coastal habitats such as marshes, dunes, beaches, and SAV will be restored through traditional methods like beach nourishment, plantings, and hydrological alterations.

Final designs will be guided by survey information and will build off of previously created preliminary designs offered by the reputable Shoreline Studies Program, with location selection further informed by the [VIMS Shoreline Change Mapping System](#), the NOAA-funded [VIMS Nearshore Oyster Restoration Siting and Prioritization Tool](#), [Adapt VA](#), and other prioritization tools. These proposed final designs to protect the leading edge of Guinea Marsh will complement by the recently completed final designs provided by Natrx resulting from a 2023 NOAA-backed Greenfin Studio grant award which proposes intertidal oyster structures exclusively in the lower-to-moderate wave energy areas along the interior marsh edge at Guinea Marsh WMA and other MP-PAA owned marsh islands.

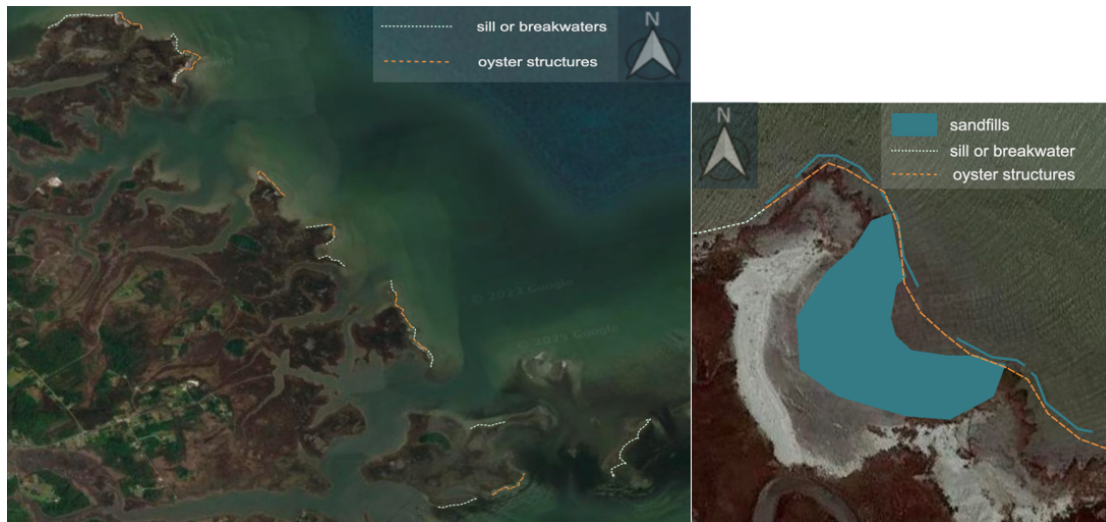


Figure 1. Preliminary designs provided VIMS Shoreline Studies for shoreline protection and oyster habitat enhancement along the leading edge of the Guinea Marsh tidal wetland complex and surrounding marsh islands.



Figure 2. (Left) Recommendations by the VIMS Nearshore Oyster Restoration and Prioritization Tool for intertidal oyster habitat restoration areas, and (Right) the 1937/38 shoreline location (red line) on a 2021 aerial base map provided by the VIMS, Shoreline Studies Program, Shoreline Evolution GIS MAP.

Our project team will contract with a reputable coastal engineering firm, and with continued guidance from VIMS's Shoreline Studies Program, we will ensure precision in the project's designs and surveys. This firm will be tasked with developing the final designs and for conducting pre-construction surveys (see below), including the topographic, bathymetric, and hydrologic analysis needed to effectively design detailed high energy shoreline



protection plans. As the overseeing regulatory authority for shoreline projects, VMRC brings over 50 years of project review expertise, and as project lead, has the utmost vested interest in ensuring this project adheres to state-specific resilience standards while maintaining long-term effectiveness. Both VDWR and the MP-PAA, property owners of the proposed project area, have decades of experience in implementing shoreline restoration and enhancement projects on other state and locally owned lands.

4. Innovative Coastal Wetland Resilience Strategy Assessments

Concurrent with final design creation, we propose to identify qualified contractors to produce two additional reports; a.) a Tidal Marsh Resilience Feasibility Assessment to document the potential use of innovative management and restoration techniques, and b.) a Land Conservation Suitability Assessment which would allow VDWR and MP-PAA to develop long-range land easement and acquisition strategies for Guinea Marsh. Through these initiatives, we aim to achieve the overarching goals of community and ecosystem resilience for Guinea Marsh by understanding what is needed to fortify the ecosystem against sea-level rise and a changing environment. 20% of the budget will be dedicated to these assessment activities.

a. Tidal Marsh Resilience Feasibility Assessment

As a first step to enhancing the long-term stability of this regionally important wetland ecosystem, a tidal marsh resilience feasibility report will be developed to evaluate innovative large-scale wetland restoration practices. The assessment will incorporate several crucial components to address the challenges and opportunities associated with these critical coastal habitats. Specifically, the report will explore using dredged materials to fortify existing marsh elevation and restore shorelines, building non-structural living shorelines in low wave energy environments through marsh plantings, coir logs, or oyster reefs installed along the shoreline (grading if necessary/feasible), removing historical berms to restore natural tidal inundation, and creating runnels or tidal creek extensions to improve tidal flow and sediment deposition. The strategic utilization of dredge material to bolster the resilience of tidal marshes is a pivotal component of the project's commitment to enhancing community and ecosystem resilience in the face of climate hazards and aligns seamlessly with VMRC's primary resilience policy objective of increasing the beneficial use of dredge sediments in Virginia.

b. Land Conservation Suitability Assessment

The proposed land conservation suitability assessment would develop conservation easement strategies and acquisition plans for future land procurement for the surrounding area, focusing on adjacent lands and potential marsh migration areas. In doing so, we will be able to effectively incorporate marsh migration into our long-term planning so we are ready to deal with this emerging issue as new funding opportunities arise. VDWR would work with MP-PAA and an identified consultant to develop innovative strategies to offer the community easement and purchase options for lands they are no longer interested in owning. Sustained investment in Guinea Marsh will be one of the most effective strategies to maintain quality large-scale tidal wetland habitat in tidewater Virginia through a changing environment and rising sea levels.

B. Implementation Timeline and Milestones:

Phase 1 Project Initiation and Planning

January-March 2025

- Assemble project team and establish roles and responsibilities.
- Develop a detailed project plan and timeline.
- Conduct initial stakeholder consultations and community outreach.

April-June 2025

- Review proposals and choose contractors
- Onboard contractors



Phase 2: Community Engagement and Design Development

July-December 2025

- Begin community engagement through targeted meetings and surveys
- Establish control sites for the preconstruction baseline
- Begin pre-construction surveys
- Work with project partners, steering committee, and contractors in the development of the resilience feasibility document and project design
- Work towards 40% restoration design plans by December 2025 and 50% resilience feasibility analysis

Phase 3: Community Engagement and Design Progress

January-April 2026:

- Host public meetings and workshops to gather input.
- Incorporate feedback into project designs and plans.
- Achieve 70% restoration design by April
- Achieve 70% resilience feasibility analysis by April.
- Finalize community engagement strategy for implementation phase
- Engage regulatory decision makers on the design concepts

Phase 4: Finalize Engineering Designs and Plan Documentation

May-October 2026

- Refine and finalize habitat restoration engineered designs.
- Prepare detailed cost estimates and project budget.
- Create final grant report and holistic plan concepts

Phase 5: Project Completion

November - December 2026

- Ensure smooth transition to implementation phase, if applicable.

C. Monitoring Project Impact:

- **Completion of Feasibility Study:** 1 resilience plan completed
- **Engineered Designs:** 90% engineered habitat restoration design
- **Land Conservation Suitability Assessment:** 1 assessment report
- **Baseline Monitoring Data Report:** 1 complete baseline monitoring report with associated data.
- **Community Interaction:** At least 3 public meetings and individual surveys sent to community members.

D. Project Team & Partners:

Virginia Marine Resources Commission (Rachael Peabody, Director of Environmental Policy) - VMRC has a full-time grant manager and a full administrative, finance, and procurement team to work on the financial administration of the funds with at least 10 federal grants managed annually. VMRC's Director of Environmental Policy (Rachael Peabody) serves as the supervisor and policy manager over all natural resource regulatory divisions within the agency.

Virginia Department of Wildlife Resources (Ben Sagara, Wetlands Biologist) - Serves as the property owners of Guinea Marsh Wildlife Management Area and will assist VMRC in all aspects of project delivery. VDWR has full-time, administrative, finance, grant, and real property teams able to administer grant funds and oversee project delivery. DWR's Wetlands Biologist (Ben Sagara) serves as the Department's statewide subject-matter



expert and project leader and will assist in the coordination and development of all design, surveys, and reports produced.

NOAA Chesapeake Bay Office (Andrew Larkin, Senior Program Analyst) - Will provide technical assistance, facilitate access to agency personnel/expertise to help inform the design, and coordination services in support of this project within NOAA's Habitat Focus Area. Has worked on numerous marine resource habitat restoration projects in Virginia, including grants management support.

Middle Peninsula Chesapeake Bay Public Access Authority (Lewie Lawrence, Director, and Curt Smith, Deputy Director) - Leading authorities on grant management and resilience planning for the Middle Peninsula of Virginia as well as property owners of the marsh islands.

Virginia Institute of Marine Science - The VIMS Center for Coastal Resources Management has provided consultation for baseline report methodology for this grant and VIMS will be a primary scientific advisor during the planning and design phases of the project.

E. Other (Optional):

Through this process, the project partnership is attempting to progress the state's collective understanding of novel or scarcely used techniques in order to push regulatory and science boundaries in Virginia so we are better able to incorporate effective strategies as our physical and geopolitical environments change. With these final designs and associated surveys, reports, and assessments, we will have the capability to better understand innovative shoreline and wetland restoration and enhancement techniques, including those that involve the beneficial use of dredge sediment, and we will be able to address conflicts and trade-offs between shoreline and sea level rise protection strategies and existing sensitive habitats (i.e. existing marsh and SAV habitats). There is not a partnership and site in Virginia better suited to pursue this scale of innovative nature-based solution planning and design.

F. Uploads & Descriptions:

1. GuineaMarshNCRFphoto1.jpg; Ben Sagara; This image shows a moderate wave energy shoreline environment at Guinea Marsh WMA at mid-tide along Monday Creek with approximately 2.5 feet vertical and undercut banks. Note active bank failure and sloughing in the foreground of the photo and loss of vegetative cover on the marsh platform due to increased exposure as the leading edge erodes, only increasing future erodibility.
2. GuineaMarshNCRFphoto2.jpg; Ben Sagara; This high wave energy point along the northern end of the large marsh Island at Guinea Marsh WMA has greatly reduced in size (both width and elevation) and is no longer able to protect the tidal creeks, bays, SAV beds, and marshes harbored behind.
3. GuineaMarshNCRFphoto3.jpg; Ben Sagara; This photo was taken at Guinea Marsh WMA along the southeastern extent of Brown's Bay on a high falling tide where a highly exposed point continues to quickly erode. Increased exposure to wind and wave action threatens this interior harbored embayment and the high quality SAV beds of special concern safeguarded within. Also note the eroding and diminishing dunes and beaches along the high energy shorelines of Guinea Marsh which once were able to support nesting waterfowl and other high marsh dependent birds.

Tidal Marsh Adaptation Project

Guinea Marsh Proposal Support

Meeting Worksheet DRAFT

Tidal Marsh Adaptation Mapper Link:

<https://skeo.maps.arcgis.com/apps/mapviewer/index.html?webmap=4b398a7151c746a08f407a1842a9fa1b>

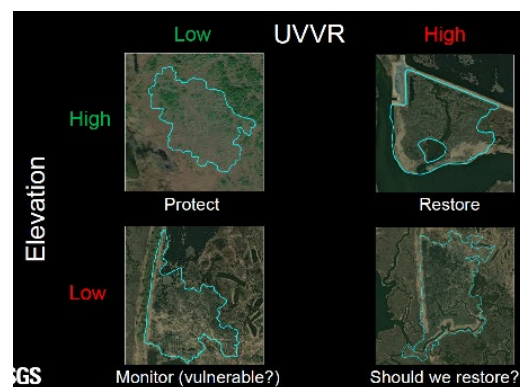
Tidal Marsh Adaptation Mapper Data (Relevant to Guinea Marsh)

- Existing Marsh Area
- Marsh Characteristics
 - Health (UVVR)
 - Lifespan
 - Tidal Range
 - Elevation
- Adaptive Capacity
 - Marsh migration corridors
- Vulnerability
 - Sea level rise
- Coastal Protection
 - Shoreline inventory
 - Shoreline change
- Habitat
 - Land use
 - Hardened shorelines
 - SAV
 - ACFHP Mid-Atlantic Estuarine Analysis, Diadromous Analysis
 - Projected habitat transitions
 - Projected marsh change
 - Natures Network
- Underserved Communities
 - VA EJ Screen: poverty level, communities of color
 - FEMA Risk Index (census tracts)
- Water Quality
 - Water quality data needed for VA? (e.g., MD Trust Fund Priority Zones)
- State Targeted Priorities
 - Conserve Virginia priority areas
- Partner Engagement Active Projects and Areas of Interest
 - Middle Peninsula Coastal Wetland Sites
- Protected lands (public and private land under easement)
 - VA Protected Lands
 - Department of Defense Lands

Potential Example Scenarios

1. Coastal Wetland Synthesis Scenarios

These scenarios are based on the [NOAA Landscape Scale Marsh Resilience Framework](#) marsh resilience categories and a decision matrix shared by Neil Ganju and team's geospatial analysis, which correlated elevation and UVVR to guide marsh actions. Additional scenarios using marsh lifespan data, which include sediment deficit considerations, are in development.



a. **Protection Scenario:** Use data to identify *healthy marshes* that are susceptible to SLR and have the potential to migrate. Indicators:

- Good Existing Marsh Integrity (UVVR)
- High Climate Change Risk (subject to SLR)
- High Adaptive Capacity (migration potential, public lands)

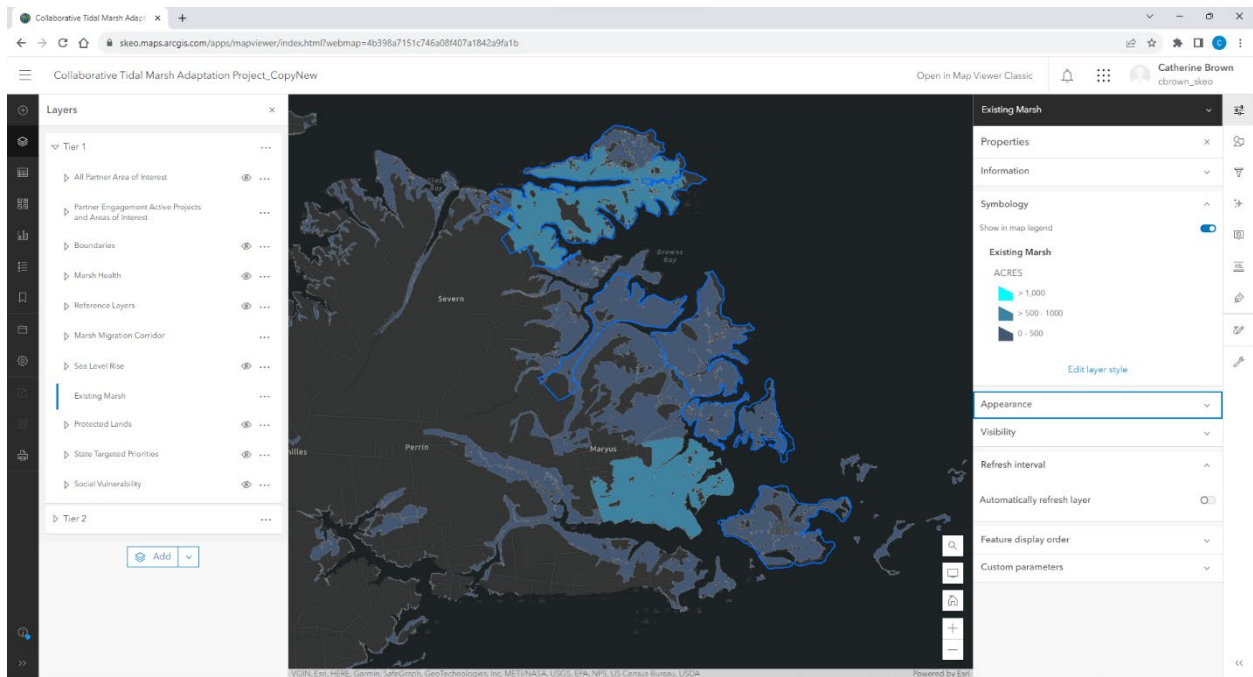
Indicator	Data Layer
High Marsh Integrity	○ UVVR ○ Lifespan
High Vulnerability to Sea Level Rise	○ Existing Tidal Marsh Layer ○ NOAA Sea Level Rise Scenarios (2050 and 2090 Intermediate and Intermediate High) ○ Sea Level Rise Inundation (NOAA) 2-4 ft
High Adaptive Capacity	○ Marsh Migration Models (MMCE) ○ TNC Coastal Resiliency ○ Protected Lands

b. **Restoration Scenario:** Use data to identify *degraded marshes* that are susceptible to SLR and have the potential to migrate.

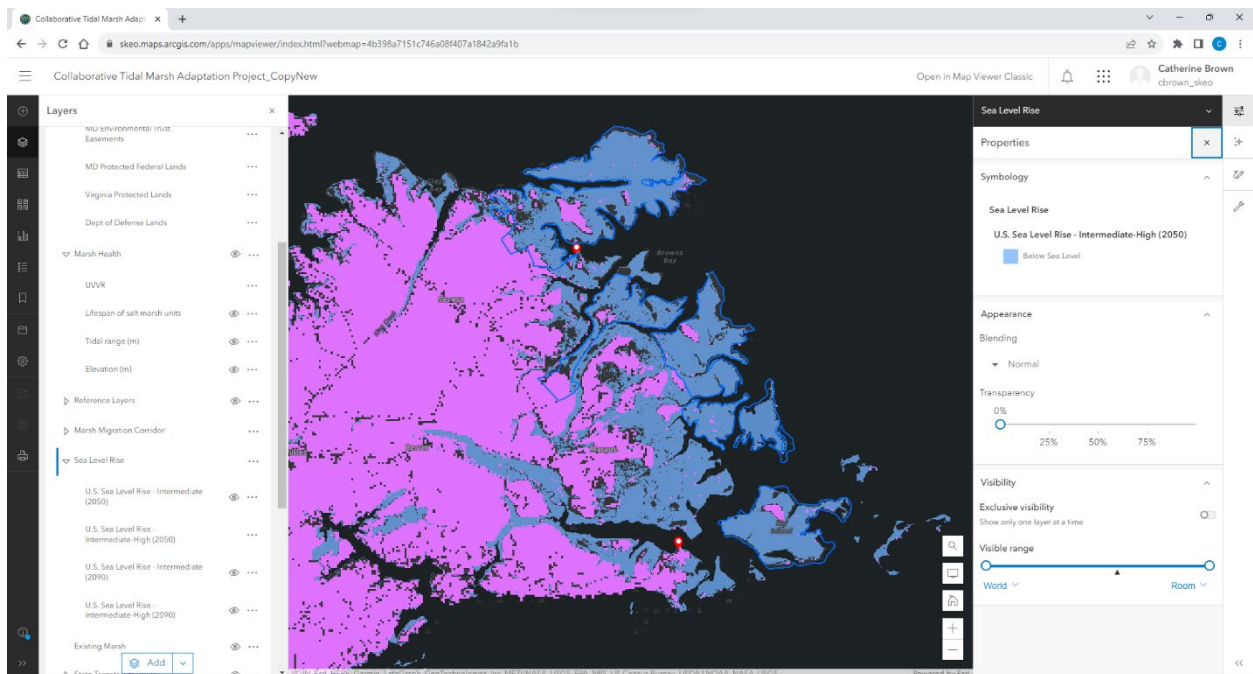
- Degraded Existing Marsh Integrity/Condition
- High Climate Change Risk
- High Adaptive Capacity

Indicator	Data Layer
Low Marsh Integrity	○ UVVR ○ Lifespan
High Vulnerability to Sea Level Rise	○ Existing Tidal Marsh Layer ○ NOAA Sea Level Rise Scenarios (2050 and 2090 Intermediate and Intermediate High) ○ Sea Level Rise Inundation (NOAA) 2-4 ft
High Adaptive Capacity	○ Marsh Migration Corridor Envelope (MMCE) ○ TNC Coastal Resiliency ○ Protected Lands

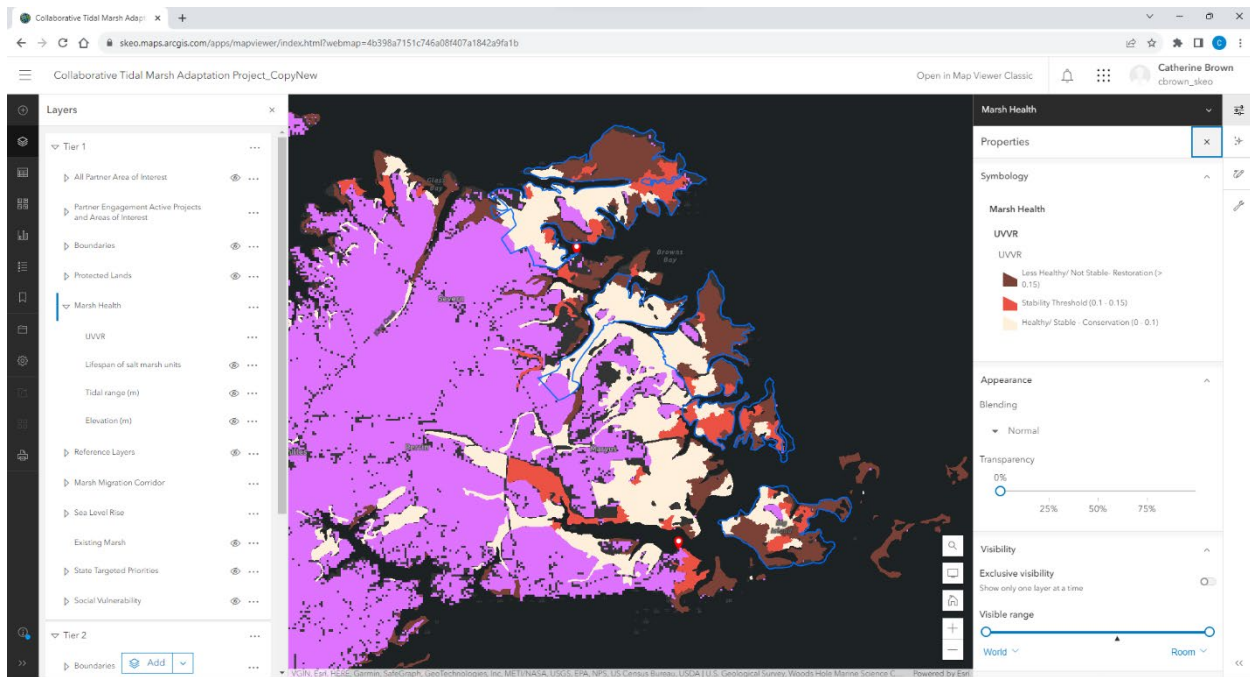
Existing Marshes and Guinea Marsh Complex



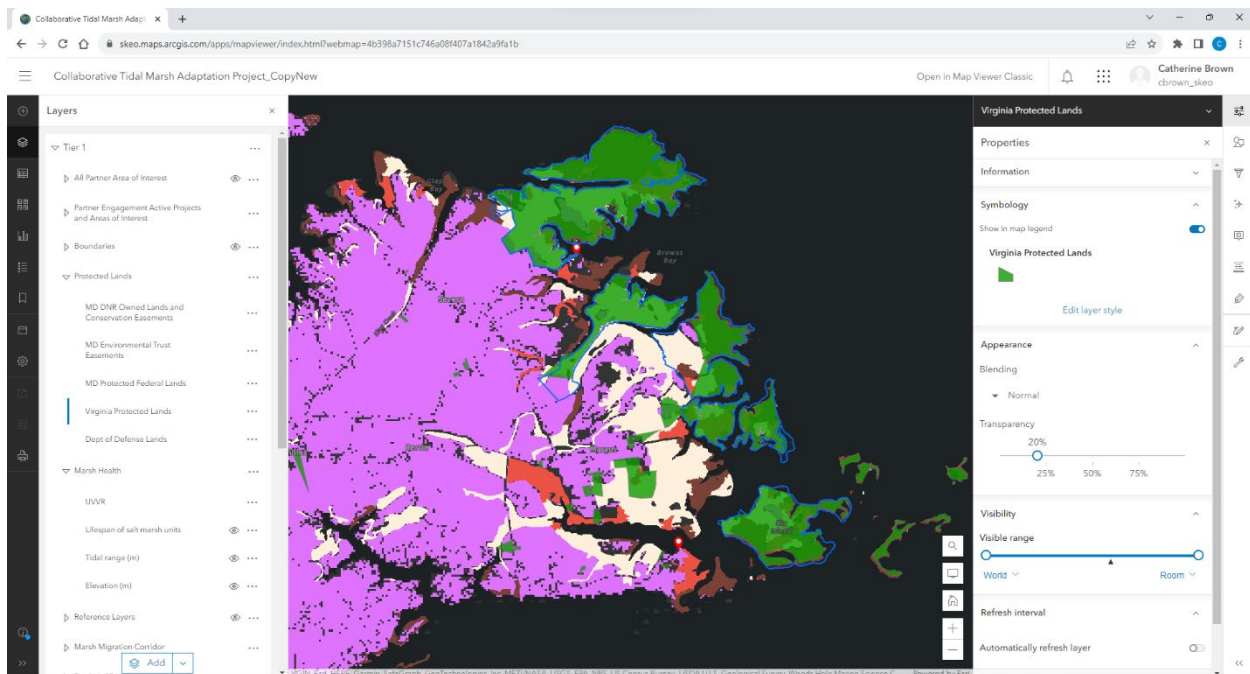
Marsh Migration Corridor Envelope (2') NOAA SLR Int-High (2050)



Marsh Health (UVVR) and Marsh Migration Corridor Envelope (2')



Marsh Health (UVVR) and Marsh Migration Corridor Envelope (2') with VA Protected Lands



The screenshot shows the ArcGIS Map Viewer interface. The main map area displays a coastal region with various land use and elevation data. The 'Layers' panel on the left lists several layers, including 'Sea Level Rise' and 'Adaptive Capacity'. The 'Adaptive Capacity' layer is selected, and its legend is visible on the right. The legend shows a color-coded scale for 'Adaptive Capacity' values: 0 (light green), 1 (dark green), 10 (orange), 11 (light blue), 100 (dark blue), 101 (medium blue), 110 (dark brown), and 111 (yellow). The map also shows 'Existing Marsh' and 'State Targeted Priorities' layers. The 'Properties' panel on the right shows the 'Adaptive Capacity' layer selected, with a legend and a 'Blending' dropdown set to 'Normal'. The 'Transparency' slider is set to 0%.

2. Underserved and socially vulnerable communities.

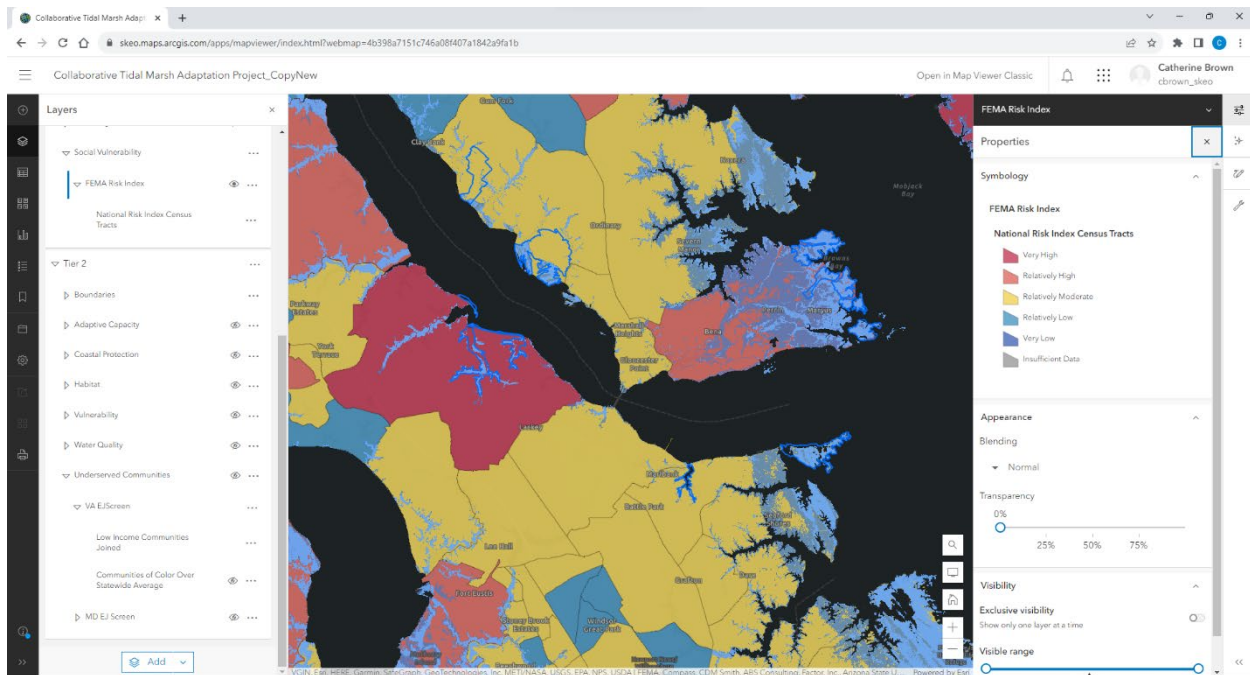
Use data to illustrate the increasing vulnerability of underserved communities adjacent to the Guinea Marsh as sea level rise leads to potential changes in land use, protection, infrastructure, and habitat.

Relevant data to consider:

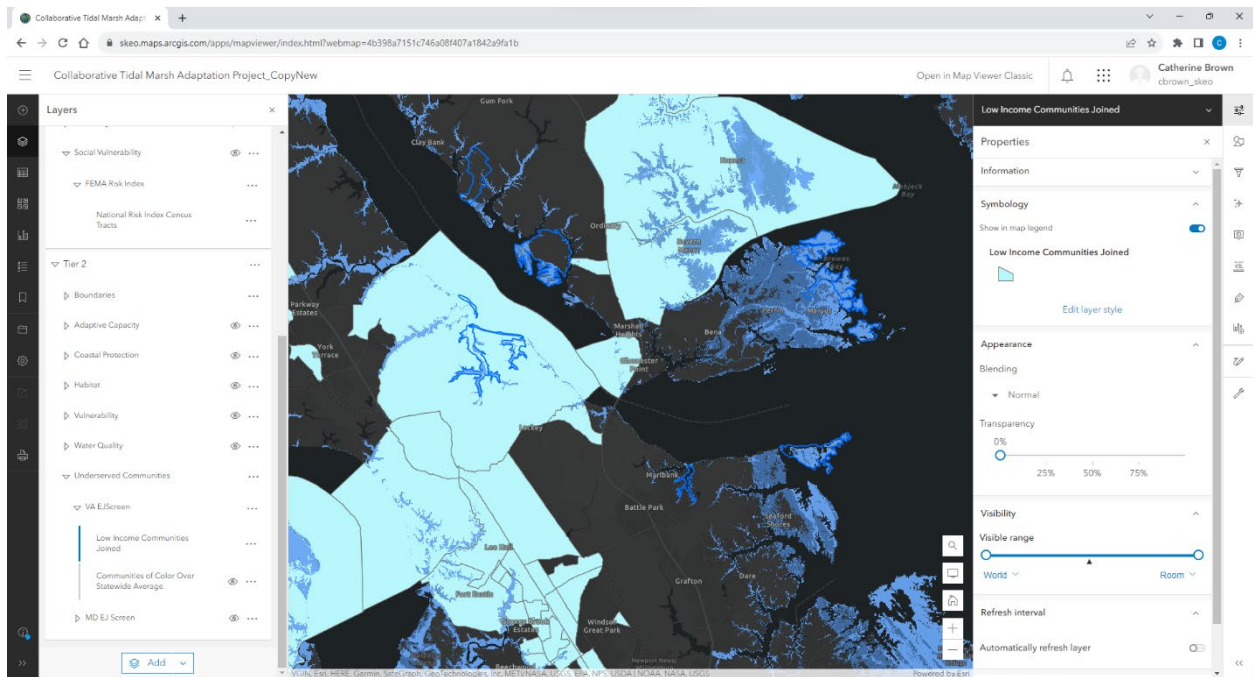
- Vulnerability: Sea level rise
- Underserved Communities: VA EJ Screen, FEMA Risk Index
- Adaptive Capacity: Marsh Migration Corridors
- Land Use: Agriculture, Development, Forests
- Habitat: Projected habitat transition, projected marsh change (coming online shortly)

Although Guinea Marsh Complex does not include high risk communities (due to low population present), data illustrates that adjacent areas are at risk, and will be highly vulnerable as sea level rise extends inland beyond Guinea Marsh complex. The Guinea Marsh complex supports coastal protection for nearby vulnerable populations. Marsh Migration Corridors adjacent to Guinea Marsh complex present potential opportunity to increase protection for inland communities particularly as sea level rises. Land use of the area adjacent to Guinea Marsh complex also indicates a unique opportunity to consider marsh migration strategies in an undeveloped area to increase coastal protection of nearby population centers.

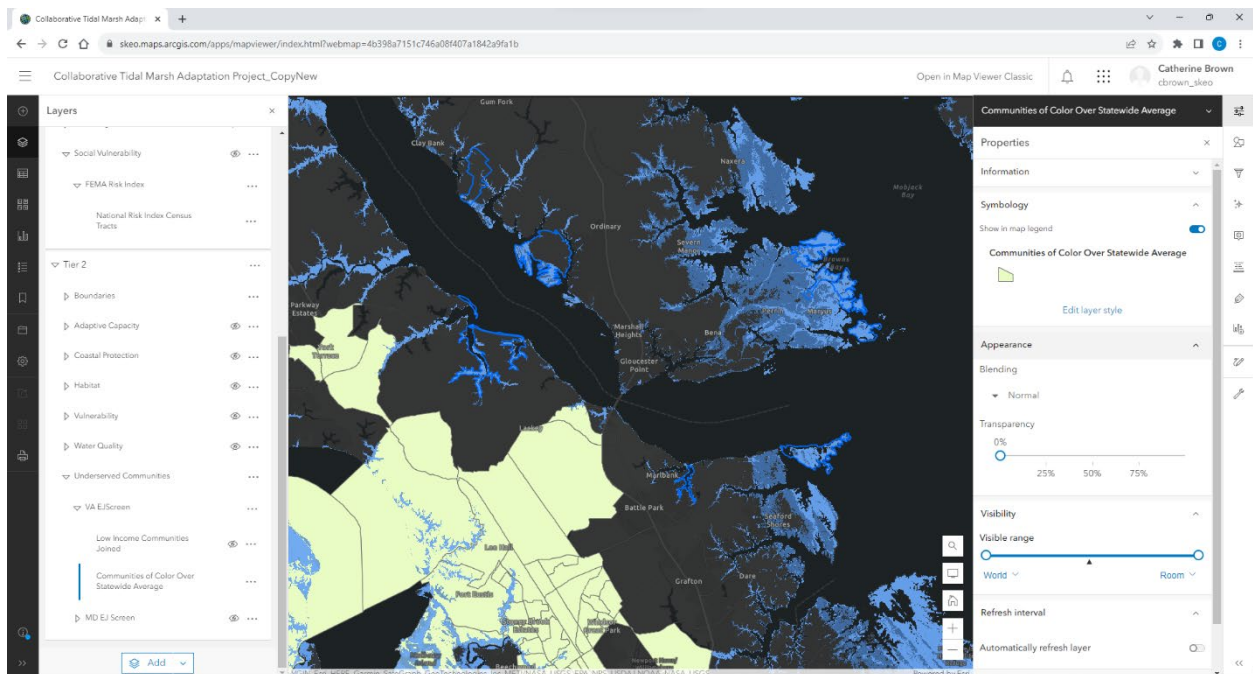
FEMA Risk Index, NOAA SLR Int High (2050, 2090)



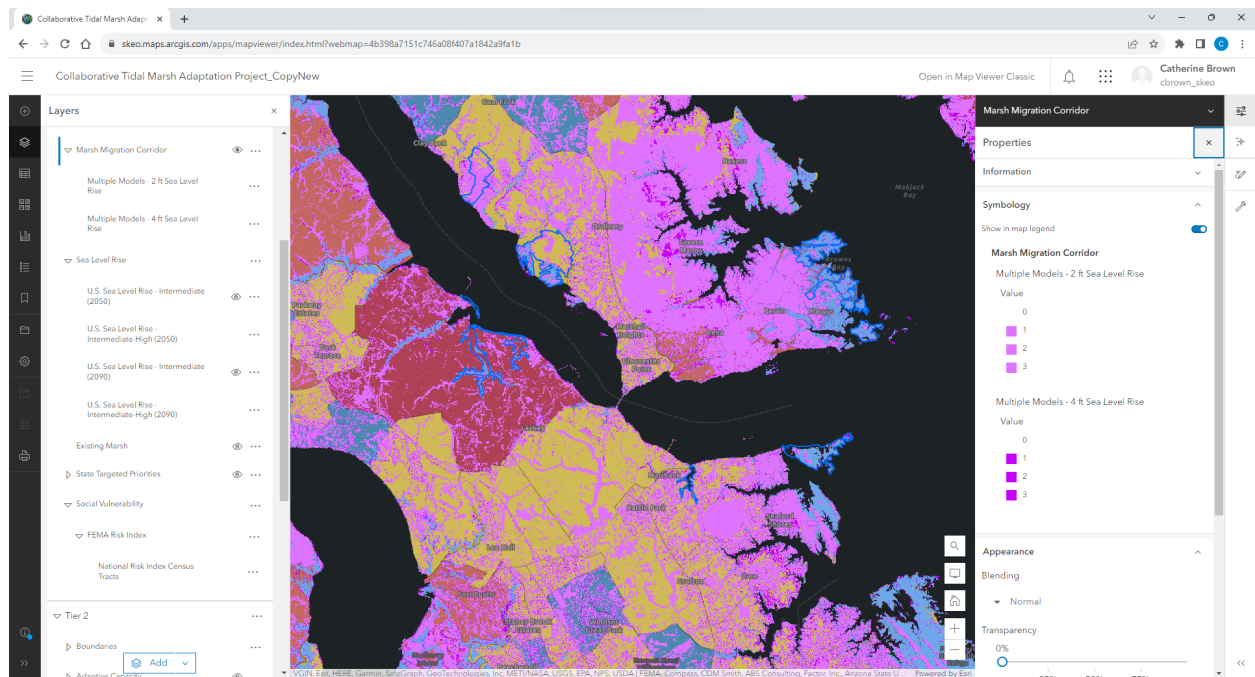
VA EJ Screen Low Income Communities, NOAA SLR Int High (2050, 2090)



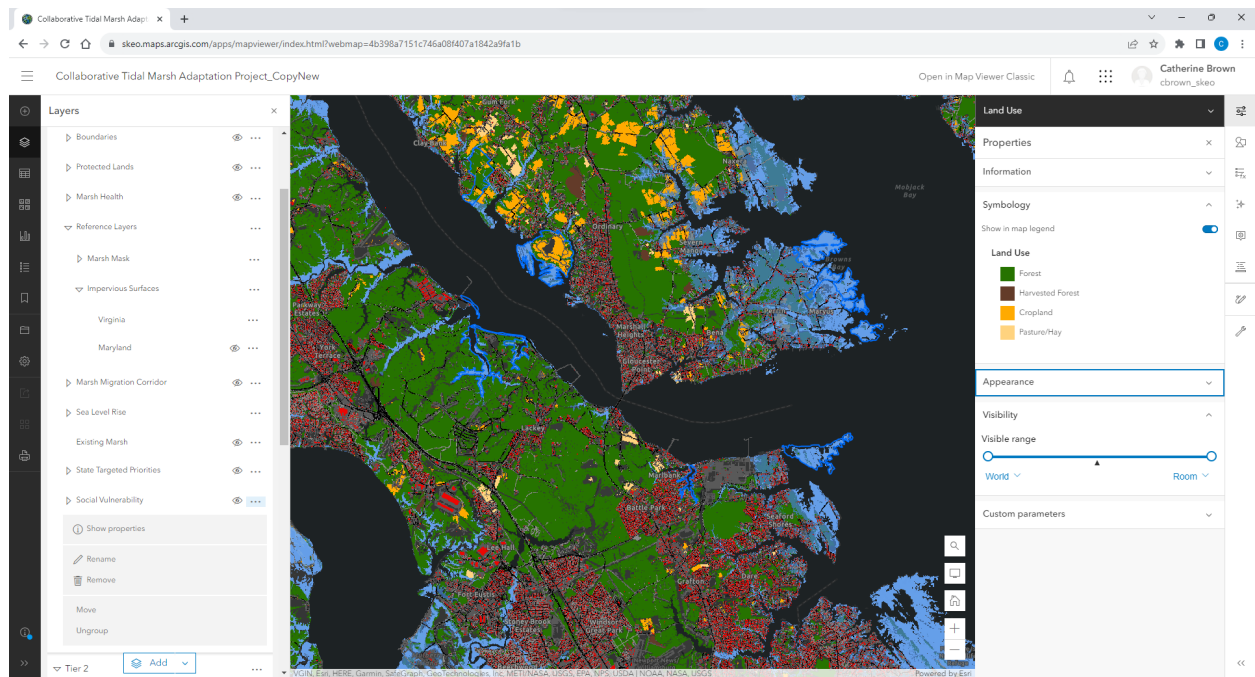
VA EJ Screen Communities of Color, NOAA SLR Int High (2050, 2090) and Guinea Marsh Complex



Marsh Health (UVVR), Marsh Migration Corridor Envelope (2', 4'), FEMA Risk Index, NOAA SLR Int High (2050, 2090)



Land Use, Impervious Surface (red), FEMA Risk Index, NOAA SLR Int High (2050, 2090)



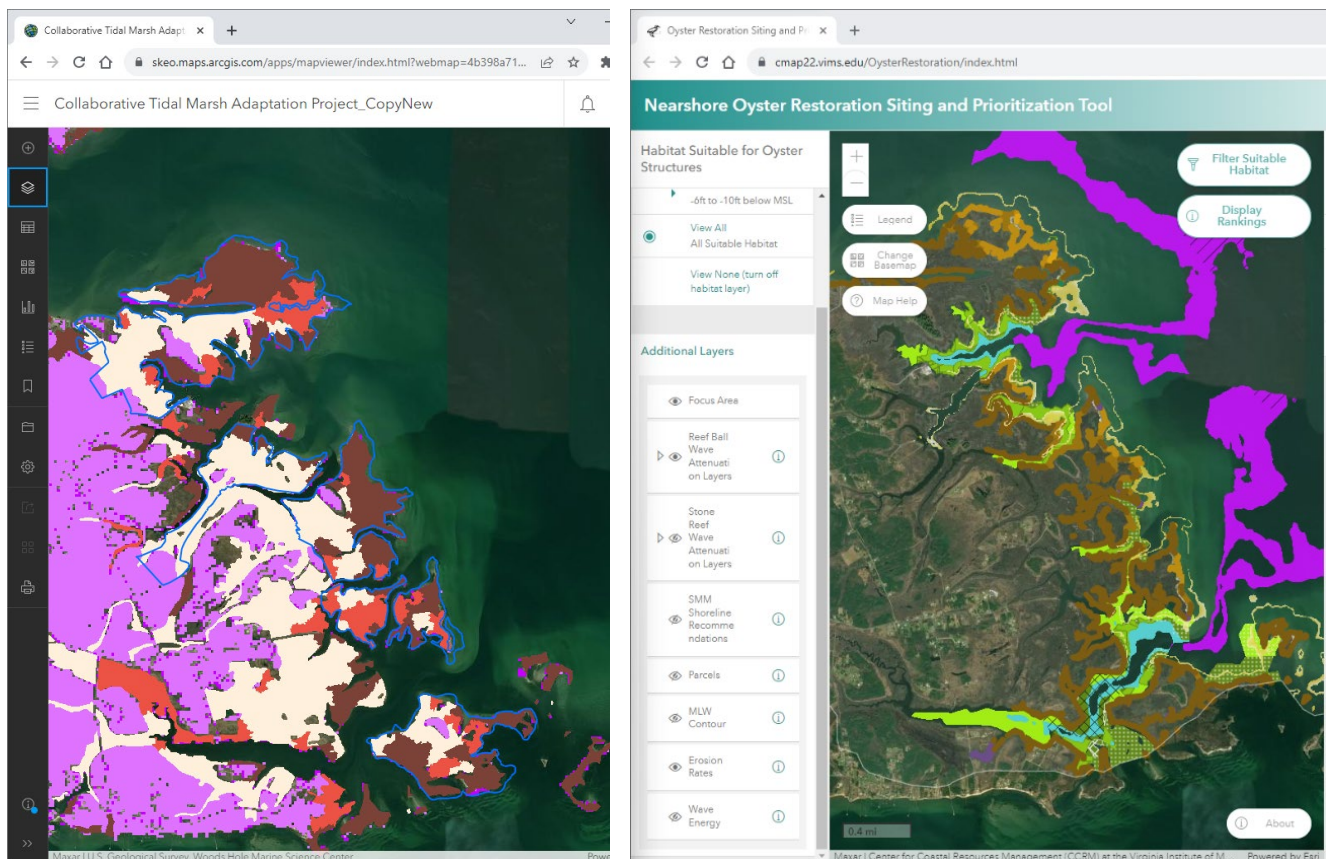
3. Linking opportunities to address coastal resilience with SAV and oyster restoration, while enhancing fish habitat

Use data to identify potential opportunities to align marsh adaptation, oyster restoration, oyster structure placement, shoreline protection, and fish habitat. This scenario might require us to use both the marsh adaptation mapper (TMAP) and the [oyster restoration mapper](#) (ORM) to develop insights.

Relevant data to consider:

- Vulnerability: Sea level rise, exposure (this is in the ORM)
- Marsh Health: UVVR, Tidal range, Elevation
- Habitat: SAV, Projected habitat transition, Projected marsh change
- Coastal Protection: Shoreline condition
- Adaptive Capacity: Marsh Migration Corridors
- ACFHP Mid-Atlantic Estuarine Analysis, Diadromous Analysis (fish habitat)
- (Perhaps additional data from ORM – will review and refine)

Real time comparison might provide insights about opportunities based on marsh migration corridors, marsh health, and strategies for offshore technologies that support habitat and can bolster resilience and adaptive strategies. This view of the maps side by side can help users consider marsh health and migration scenarios in context of habitat enhancement and adaptation.



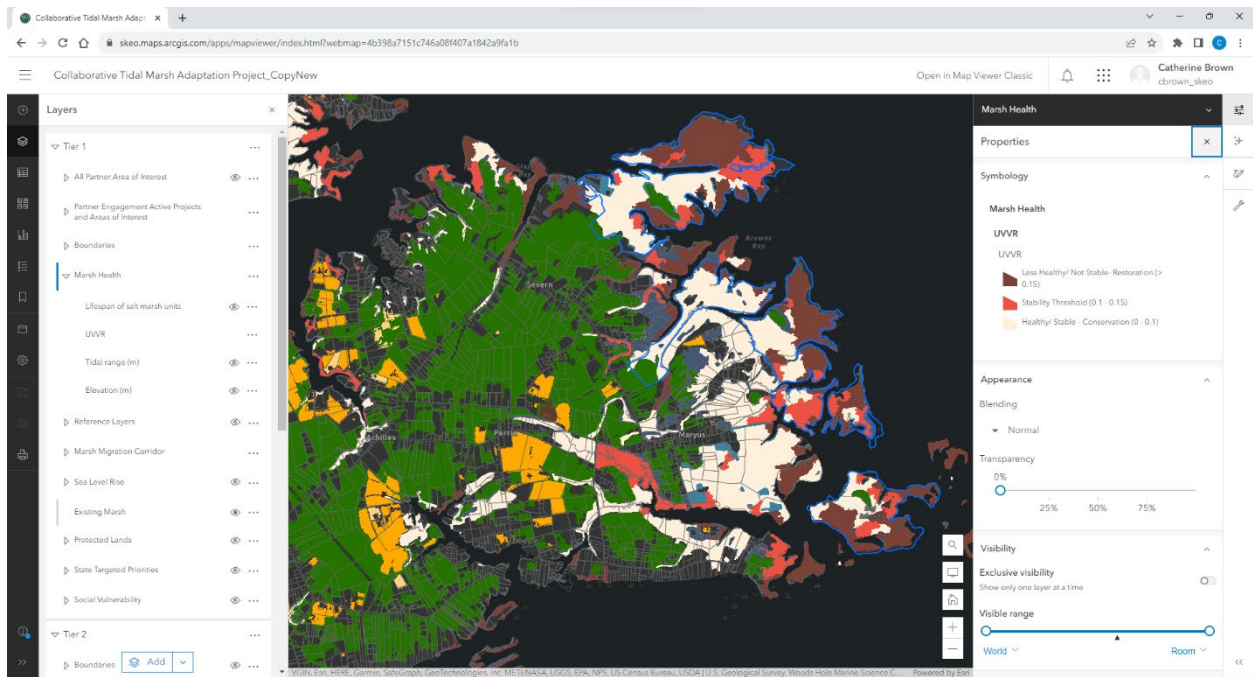
- Property acquisition studies (land use, marsh migration corridors, projected marsh and habitat transition, ownership).

Prioritize potential areas for marsh migration adjacent to publicly owned lands and healthy marshes that might be considered for acquisition to increase coastal resilience and enhance habitat over long term.

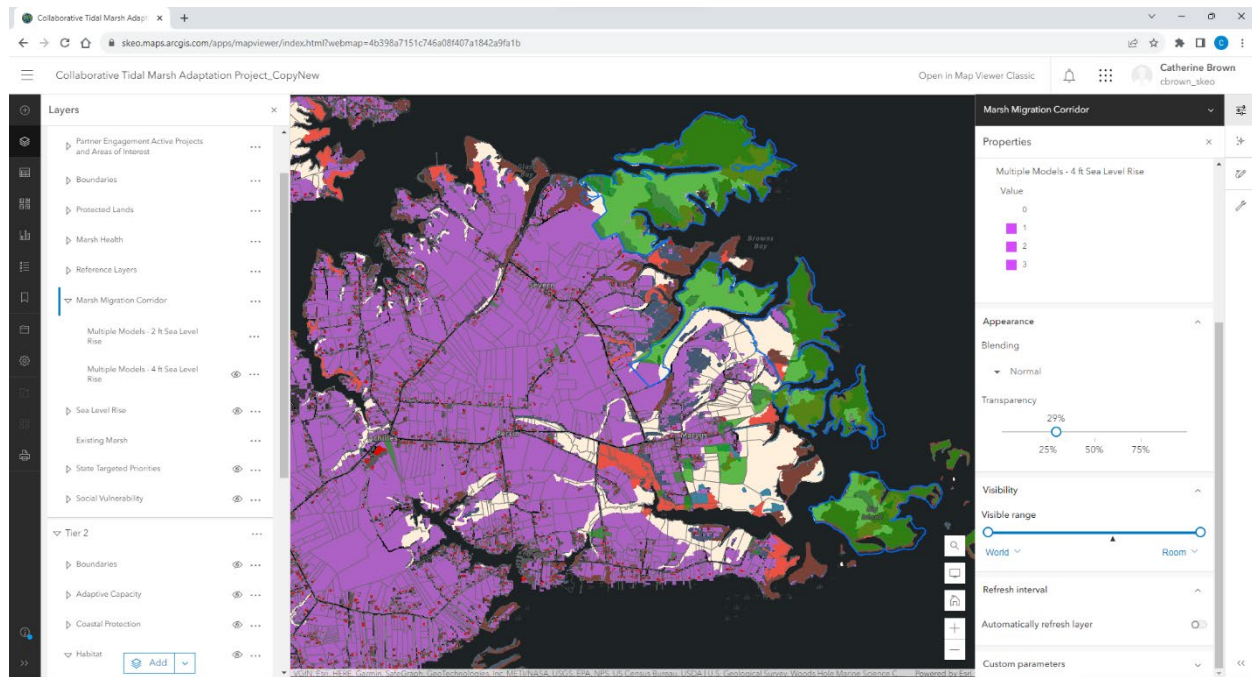
Relevant data to consider:

- Vulnerability: Sea level rise
- Adaptive Capacity: Marsh Migration Corridors
- Land Use: Agriculture, Development, Forests
- Habitat: Projected habitat transition, Projected marsh change, Natures Network

Land Use, Marsh Health (UVVR), Parcels



Marsh Migration Corridor Envelope (2'), Marsh Health (UVVR), Parcels





U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NOAA Chesapeake Bay Office
200 Harry S. Truman Parkway, Suite 460
Annapolis, MD 21401

June 28, 2024

Ms. Mirjam Kuzee
Program Director
National Fish and Wildlife Foundation
National Coastal Resilience Fund

Dear Ms. Kuzee,

I am writing in strong support of the Virginia Marine Resources Commission (VMRC) proposal for the NFWF National Coastal Resilience Fund. The proposal would result in a final engineered design for an innovative Guinea Marsh conservation and restoration project, informed by public engagement and scientific assessments. This project would be located within the NOAA Middle Peninsula Habitat Focus Area and the NOAA Chesapeake Bay Office (NCBO) is one of the collaborators on this proposal.

NCBO is working with the NOAA Office for Coastal Management, the Virginia Coastal Zone Management Program, the Virginia Marine Resources Commission, the Virginia Department of Wildlife Resources, and other partners to accomplish the goals and objectives of the NOAA Middle Peninsula Habitat Focus Area. These goals include the implementation of tidal wetlands restoration and living shoreline projects in the York River, Piankatank River, and Mobjack Bay to reduce shoreline erosion, provide fish habitat, and improve coastal resiliency.

To this end, in 2023, NCBO led regional partners in the York River and Small Coastal Basins Roundtable to create the [Coastal Wetlands Plan for the York, Piankatank, and Mobjack Bay](#). The Coastal Wetlands Plan includes a list of recommended wetlands restoration and conservation sites in the region that were selected based on stakeholder consensus and expertise. The VMRC proposal includes two of these high-priority recommended sites, the Guinea Marsh Wildlife Management Area (GMWMA) and Big Island. The proposed project would also support other goals of the Coastal Wetlands Plan including conserving wetland migration corridors and prioritizing partnership building with underserved communities impacted by wetlands loss.

We pledge to support the proposed project with current and anticipated future funding for 1) a preliminary design for the placement of oyster structures to reduce shoreline erosion at GMWMA and 2) oyster reef restoration projects in subtidal and intertidal areas of Mobjack Bay adjacent to and potentially including GMWMA. We also pledge to support VMRC's outreach to regional stakeholders through our leadership of the York River Roundtable Habitat Restoration Steering Committee to enhance the collaborative design for this project.

NCBO would be pleased to respond to any questions you have or provide any additional views on this proposed project. Please do not hesitate to contact my staff person Andrew Larkin at andrew.w.larkin@noaa.gov or at 757.317.0442.

Sincerely,

Kevin Schabow
Acting Director





COMMONWEALTH of VIRGINIA

Department of Wildlife Resources

Travis Voyles
Secretary of Natural
and Historic Resources

Ryan J. Brown
Executive Director

Ms. Mirjam Kuzee
Program Director, National Coastal Resilience Fund
National Fish and Wildlife Foundation
1625 Eye Street NW, Suite 300
Washington, DC 20006

Dear Ms. Kuzee:

On behalf of the Virginia Department of Wildlife Resources (DWR), property owner of Guinea Marsh Wildlife Management Area, I would like to offer our strong support for the Virginia Marine Resources Commission's National Coastal Resilience Fund proposal titled "*Finalizing a Design for Transformative Marsh Habitat Restoration and Protection in Mobjack Bay*." This project aims to restore, enhance, and protect critical fish and wildlife habitat at Guinea Marsh, one of the largest tidal wetland complexes along Virginia's western Chesapeake Bay shoreline. Specifically, this initiative seeks to finalize a design of innovative shoreline restoration and protection measures to safeguard over 1,000 acres of tidal marshes, restore lost dunes, beaches, and submerged aquatic vegetation, and increase suitable oyster habitat along the southeastern edge of Virginia's Middle Peninsula, a recently designated NOAA Habitat Focal Area. The accompanying tidal marsh resilience feasibility report would assess the potential use of innovative management and restoration techniques and is the first step to enhancing the long-term stability of this regionally important wetland ecosystem.

When looking across the broader lower Chesapeake landscape, it is evident that the Guinea Marsh tidal wetland complex and surrounding rural landscape likely represents Virginia's best large-scale opportunity to protect existing quality marsh and target substantial marsh migration corridor zones for future protection. Other marsh systems of similar size and significance in the region have minimal space to migrate inland before abutting existing infrastructure and urbanization. The proposed land conservation suitability assessment would focus on adjacent lands and potential marsh migration areas which will allow DWR to develop long-range land easement and acquisition strategies at Guinea Marsh. Sustained investment in Guinea Marsh will be one of the most effective strategies to maintain quality large-scale tidal wetland habitat in tidewater Virginia through a changing environment and rising sea levels. Thank you so much for your consideration of this proposal.

Sincerely,

A handwritten signature in blue ink, appearing to read "Rebecca K. Gwynn".

Rebecca K. Gwynn
Deputy Director



MIDDLE PENINSULA CHESAPEAKE BAY PUBLIC ACCESS AUTHORITY

7/1/24

MEMBERS

Essex County

Hon. Sidney Johnson

Gloucester County

Hon. Christopher A. Hutson
(Vice-Chair)

King and Queen County

Vacant

King William County

Mr. Percy C. Ashcraft

Mathews County

Ms. Ramona Wilson

Middlesex County

Mr. Matt Walker

Town of Tappahannock

Mr. Eric Pollitt

Town of Urbanna

Mr. Ted Costin

Town of West Point

Mr. John B. Edwards, Jr.
(Chair)

Saluda Professional Center

125 Bowden Street

P. O. Box 286

Saluda, VA 23149-0286

Phone: (804) 758-2311

FAX: (804) 758-3221

email:

PublicAccess@mppdc.com

Ms. Mirjam Kuzee
Program Director, National Coastal Resilience Fund
National Fish and Wildlife Foundation
1625 Eye Street NW, Suite 300
Washington, DC 20006

Re. Letter of Support for the Virginia Marine Resources Commission's proposed project "Finalizing a Design for Transformative Marsh Habitat Restoration and Protection in Mobjack Bay (VA)."

Dear Ms. Mirjam Kuzee,

We would like to offer our support to VMRC's National and Coastal Resilience Fund proposal, specifically targeting the preservation and restoration of fish and wildlife habitat in Mobjack Bay. The project aims to finalize a design to enhance the resilience of vital tidal marsh ecosystems in the Guinea Marsh Wildlife Management Area and Mobjack Bay Guinea Marsh Islands (which we own) and implement SAV restoration.

This initiative seeks to safeguard over 1,000 acres of tidal marshlands, restore lost dunes and beaches, and increase suitable oyster habitat in the region. It also proposes targeted restoration of Submerged Aquatic Vegetation (SAV) in areas identified of concern from significant SAV loss. The accompanying resilience feasibility report is positioned to enhance the long-term stability of our regional ecosystems.

Anticipating active community engagement, we look forward to a raised awareness of the historic communities that have thrived in our region, fostering a deeper understanding of the ecosystems' pivotal role in supporting our community and businesses. The project aligns seamlessly with NFWF's mission to sustain, restore, and enhance the nation's fish, wildlife, plants, and habitats for current and future generations.

If you have any questions about our enthusiastic support for this proposal, please contact me at 804-758-2311 or by email at llawrence@mppdc.com.

Sincerely,

Lewis Lawrence
MPCBPAA Secretary



June 27, 2024

Ms. Mirjam Kuzee
Program Director
National Fish and Wildlife Foundation
National Coastal Resilience Fund

Re. Letter of Support for the Virginia Marine Resources Commission's proposed project "Finalizing a Design for Transformative Marsh Habitat Restoration and Protection in Mobjack Bay (VA)."

Dear Ms. Mirjam Kuzee,

We would like to offer our support of VMRC's National Fish and Wildlife Foundation (NFWF) National Coastal Resilience Fund proposal, specifically targeting the preservation and restoration of fish and wildlife habitat in the Mobjack Bay. The project aims to finalize a design to enhance the resilience of vital tidal marsh ecosystems in the Guinea Marsh Wildlife Management Area and Guinea Marsh Islands, as well as develop a Submerged Aquatic Vegetation (SAV) restoration plan. The proposed efforts align with the sustainability of our oyster business, directly impacting our local oyster aquaculture business by preserving key habitats and maintaining water quality. In addition, we look forward to working with the project team to avoid user conflicts and choose mutually beneficial restoration sites for SAV in Browns Bay.

This initiative seeks to develop a final plan to conserve over 1,000 acres of tidal wetlands, restore lost dunes and beaches, and increase suitable oyster habitat in the region. It also proposes to develop a targeted SAV restoration plan for areas of concern we have identified that have experienced significant SAV loss. The accompanying resilience feasibility report is positioned to enhance the long-term stability of our regional ecosystems.

Additionally, Matheson Oyster Company has successfully restored a historic working waterfront in Browns Bay and will soon embark on restoring a second. In both instances, we have prioritized the use of multiple engineers to create a master plan to guide all of our efforts. We have seen first-hand how crucial it has been to develop a final plan to help guide and focus our efforts.

Anticipating active community engagement, we look forward to a raised awareness of the historic communities that have thrived in our region, fostering a deeper understanding of the ecosystems' pivotal role in supporting our community and businesses. The project aligns seamlessly with NFWF's mission to enhance coastal community resilience and to sustain, restore, and enhance the nation's fish, wildlife, plants, and habitats for current and future generations.

Sincerely,

**Matheson
Oyster Co.**

Sarah Matheson-Harris & Eric Harris
Sarah: 804.815.5266 | **Eric:** 757.814.0634
sarah@mathesonoyster.com
eric@mathesonoyster.com
mathesonoyster.com
Gloucester, Virginia

Sarah Matheson-Harris
Owner & CMO

Eric Harris
CEO

Fwd: VMRC NFWF NCRF request

Sat, Jun 29, 2024 at 7:06 PM

From: Cathy Vogt <isopr4433@aol.com>
Date: June 21, 2024 at 8:28:27 PM EDT
To: isopr4433@aol.com
Subject: VMRC NFWF NCRF request

To Whom Concern,

As the owner of Vogt Oyster Company dba Big Island Aquaculture, I support VMRC's National Fish and Wildlife Foundation (NFWF) National Coastal Resilience Fund proposal, specifically targeting the preservation and restoration of fish and wildlife habitat in Mobjack Bay. I have lived on the Mobjack Bay since the 1980s and have been operating an oyster farm for the past 15 years. I have experienced changes in the region firsthand. The marshes that protect our property and the surrounding community and that provide habitat for so many fish and birds are breaking apart. I am thrilled that VMRC is proposing a project to help protect this special place along with the people and businesses that rely on it.

This project aims to finalize a design to enhance the resilience of vital tidal marsh ecosystems in the Guinea Marsh Wildlife Management Area and the Guinea Marsh Islands. The proposed efforts align with the sustainability of our oyster business, directly impacting our local oyster aquaculture business by preserving key habitats and maintaining water quality.

This initiative seeks to safeguard over 1,000 acres of tidal wetlands, restore lost dunes and beaches, and increase suitable oyster habitat in the region. It also proposes targeted restoration of Submerged Aquatic Vegetation (SAV) in areas where there has been significant SAV loss. The accompanying resilience feasibility report is positioned to enhance the long-term stability of our regional ecosystems.

We look forward to working with VMRC and other community members should this project be funded. The project aligns seamlessly with NFWF's mission to enhance coastal community resilience and to sustain, restore, and enhance the nation's fish, wildlife, plants, and habitats for current and future generations.

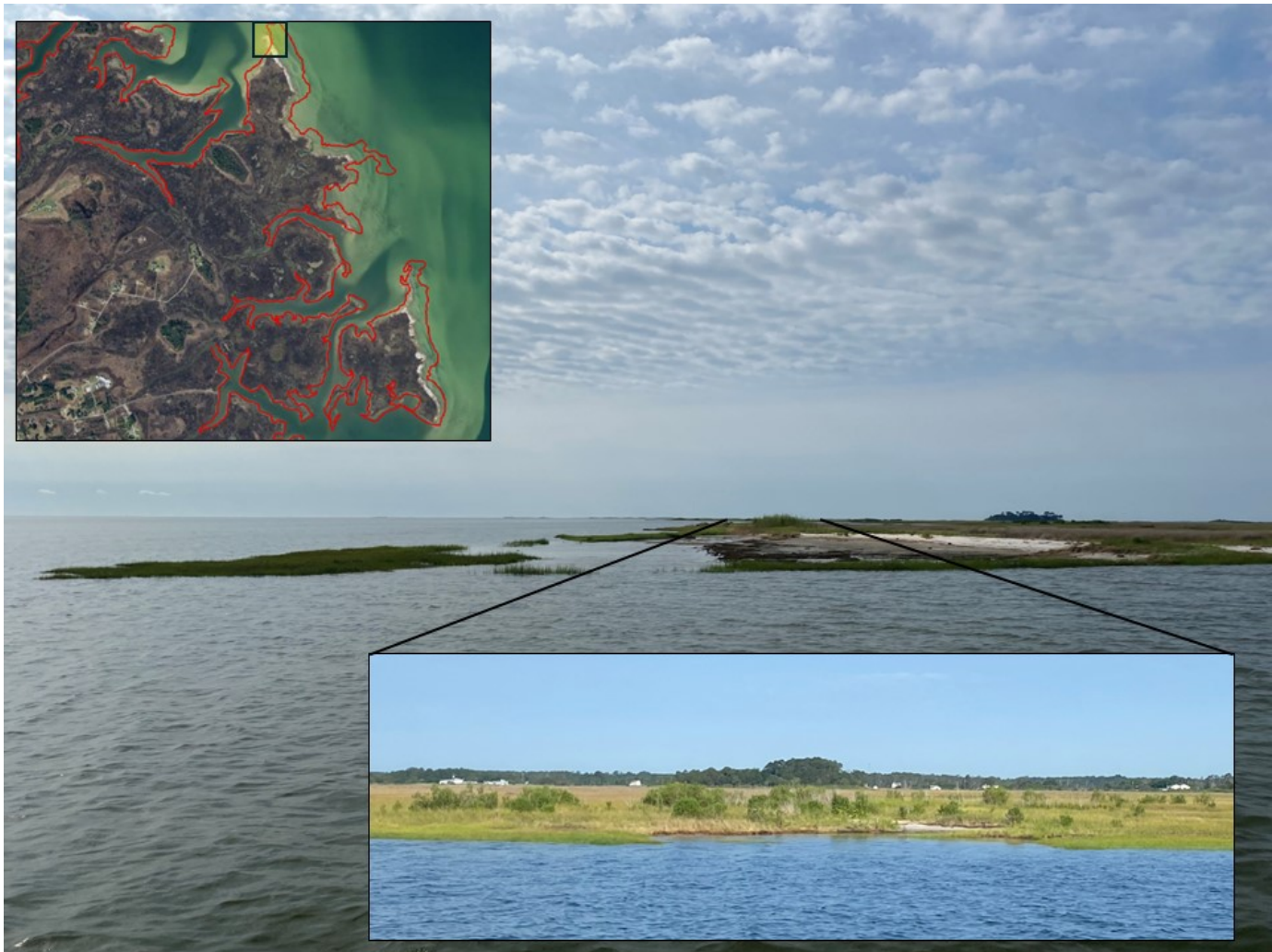
Sincerely,

Bruce Vogt

Owner









Statement of Litigation

Instructions: Save this document on your computer and complete. The final narrative should not exceed two (2) pages; do not delete the text provided below. Once complete, upload this document into the on-line application as instructed.

Litigation: In the space provided below, state any litigation (including bankruptcies) involving your organization and either a federal, state, or local government agency as parties. This includes anticipated litigation, pending litigation, or litigation completed within the past twelve months. Federal, state, and local government applicants are not required to complete this section. If your organization is not involved in any litigation, please state below.

Virginia Marine Resources Commission is a state agency and is therefore not required to complete this section.



COMMONWEALTH of VIRGINIA

Marine Resources Commission

380 Fenwick Road

Building 96

Fort Monroe, VA 23651

Travis A. Voyles
Secretary of Natural and Historic
Resources

Jamie L. Green
Commissioner

To: Whom It May Concern

From: Rachael Peabody, Director of Environmental Policy

Subject: Board of Trustees or Directors

I would like to clarify the organizational structure of the Virginia Marine Resources Commission VMRC.

The Virginia Marine Resources Commission is not a non-profit organization. It operates as a regulatory agency within the Commonwealth of Virginia. VMRC does not have a Board of Trustees overseeing its operations, unlike non-profits.

Regulatory rulemaking at VMRC is conducted through the Governor-appointed Commission. This Commission consists of members appointed by the Governor of Virginia to carry out the responsibilities outlined in the Code of Virginia related to marine resource management and conservation.

Rachael Peabody

Rachael Peabody, Director of Environmental Policy
Virginia Marine Resources Commission

An Agency of the Natural and Historic Resources Secretariat

www.mrc.virginia.gov

Telephone (757) 247-2200 Information and Emergency Hotline 1-800-541-4646

APPLICANT CONTROLS AND CAPABILITIES QUESTIONNAIRE



INSTRUCTIONS: The Applicant Controls Questionnaire (Questionnaire) is required with the submission of a NFWF full proposal. An authorized representative with adequate knowledge of your organization's capability, competence, resources, policies, and procedures should complete and sign the Questionnaire and submit it along with your organization's most recent Single Audit Report (if applicable). Please do not include copies of policies and procedures unless requested.

NFWF utilizes this Questionnaire to perform a risk assessment and determine an organization's eligibility and capacity to manage a NFWF award. Negative responses do not mean an organization is not eligible for an award. Depending on the type of award and the responses herein, NFWF may require additional documentation and/or reporting requirements to raise an organization's capacity and mitigate any potential compliance, audit, financial, or programmatic risks.

ORGANIZATION LEGAL NAME: Virginia Marine Resources Commission

ORGANIZATION EIN: 546001720

Audits and U.S. Federal Funding Experience: The following information provides insight into your organization's experience and performance in administering past awards.

1. Does your organization have a current Single Audit report (within the last two years) on file with the Federal Audit Clearinghouse?

☐ Yes

☒ No

2. If you responded "Yes" above, does your organization's most recent Single Audit report include any audit findings, material weaknesses, and/or significant deficiencies? If yes, please describe whether your organization has implemented the recommended corrective actions to address the findings. If you responded "No" above, select "N/A".

☐ Yes

☐ No

☒ N/A

[Enter response here.](#)

3. Has your organization been suspended or debarred from any government contracting process? If yes, please explain if the suspension and debarment are still in effect.

☐ Yes

☒ No

[Enter response here.](#)

APPLICANT CONTROLS AND CAPABILITIES QUESTIONNAIRE



4. Has your organization managed a federal award before? If yes, provide a summary of your most recent awards, including period of performance, awarding agency or pass-through entity, federal program, and size of award.

☒ Yes

☐ No

The VMRC manages several annual federal awards for many of our programs, including federal awards for the Marine Recreation Information Program (MRIP) from ASMFC, Observer Program funding through NOAA, and Joint Enforcement Funding through NOAA:

- Virginia Enforcement of Atlantic States Marine Fisheries Commission Fishery Management Plans; NOAA; 5 years; \$1,668,854.21.
- Sturgeon Observer Funding; NOAA; 5 years; \$1,104,545
- Mobjack Bay Oyster Restoration: NOAA; 3-years; \$3,000,000

5. In the past three (3) years has your organization, or any unit or office thereof, been audited by an external donor/funder or agent thereof? If yes, please list all such audits and attach copies of final audit reports (if available)

☐ Yes

☒ No

[Enter response here.](#)

Billing and Accounts Tracking Capacities: The following questions help NFWF understand your accounting practices to ensure both NFWF and your organization are able to comply with all funding source requirements.

6. Does your organization have a written accounting manual or written policies and procedures that outline the treatment and safeguarding of assets, methods of cost allocation, if applicable, document retention, cost allowability, etc.? If no, please explain.

☒ Yes

☐ No

[Enter response here.](#)

7. Does your accounting system (or other management system) allow organizational expenses to be tracked: (a) to a specific project on which your organization is working and, (b) to specific cost-type categories (e.g., personnel, supplies, travel, indirect, etc.)? If no, please describe the limits of expense tracking at your organization.

☒ Yes

☐ No

APPLICANT CONTROLS AND CAPABILITIES QUESTIONNAIRE



Enter response here.

APPLICANT CONTROLS AND CAPABILITIES QUESTIONNAIRE



8. Is your organization able to perform projects on a cost-reimbursable basis? If no, please note that advance payments are considered on a case-by-case basis and are dependent upon your organization's ability to minimize the time elapsing between the receipt and disbursement of funds.

☒ Yes

☐ No

[Enter response here.](#)

9. If your organization is funded by more than one funder, does the organization have procedures to prevent commingling of funds and to ensure costs are allocated fairly and consistently across the various funders? If no, please explain.

☒ Yes

☐ No

[Enter response here.](#)

10. Does your organization have a fraud prevention policy that enables the organization to detect, investigate, and report any fraudulent activity immediately? If no, please explain.

☒ Yes

☐ No

[Enter response here.](#)

11. Does your organization have a timekeeping system or documented process that allows staff time (including key personnel) to be tracked to specific funding sources supporting the project? If no, please explain.

☒ Yes

☐ No

[Enter response here.](#)

Organizational Policies and Procedures: The following questions help NFWF understand additional organizational practices to ensure compliance with varying funding source requirements.

12. Does your organization maintain formal evidence of employment with its employees, and conduct background checks for each employee before they are hired? If no, please explain.

☒ Yes

☐ No

[Enter response here.](#)

APPLICANT CONTROLS AND CAPABILITIES QUESTIONNAIRE



13. Does your organization maintain general liability insurance? If no, please explain.

☒ Yes

☐ No

Enter response here.

14. I certify that our organization maintains a written policy on conflict-of-interest that meets the requirements of the federal government. I also certify we will notify NFWF **in writing** if our organization finds a **potential** conflict of interest **relative** to a NFWF-funded project. If no, please explain why you do not feel a conflict-of-interest policy is necessary for your organization or the administration of this project.

☒ Yes

☐ No

Enter response here.

15. I certify that our organization maintains a non-discrimination policy, based on which we would report and act on any instances of potential discriminatory action on the basis of race, color, religion (creed), gender/sex, gender expression/gender identity, age, national origin, disability, marital status, sexual orientation, military status, ancestry, personal appearance, citizen status, pregnancy, child birth or related medical conditions, family responsibilities, matriculation, genetic information, and political or union affiliation, and etc. If not, please explain.

☒ Yes

☐ No

Enter response here.

Questions Specific to Budget Line Items in Your Proposal

16. Does your organization use documented procurement procedures for the acquisition of property or services that ensure full and open competition? If no, please explain. Select "N/A" if your project(s) does not involve the acquisition of property or contractual services.

☒ Yes

☐ No

☐ N/A

Enter response here.

APPLICANT CONTROLS AND CAPABILITIES QUESTIONNAIRE



17. Does your organization have a process for determining the appropriate legal instrument (grant agreement vs. contract for goods/services) and has an appropriate legal/contracting officer confirmed that your organization has the ability to implement the contractual arrangements as envisioned? Select "N/A" if your project(s) does not involve subawards or contractual services.

☒ Yes

☐ No

☐ N/A

Enter response here.

18. Does your organization maintain written policies for property management that include regular inventory audits/verifications? Select "N/A" if your project(s) does not involve equipment or real property.

☒ Yes

☐ No

☐ N/A

Enter response here.

I certify to the best of my knowledge and belief that the above information is true, complete, and accurate and that I am authorized to submit on behalf of the organization represented above.

SIGNATURE of Authorized Representative

Rachael Peabody

Date

7-1-2024

NAME AND TITLE

Rachael Peabody, Director of
Environmental Policy

APPLICANT CONTROLS AND CAPABILITIES QUESTIONNAIRE



Appendix 1: Glossary

Single Audit Report: Single Audit, previously known as the OMB Circular A-133 Audit, is an organization-wide financial statement and federal awards' audit of a non-federal entity that expends US\$750,000 or more in federal funds in one year.

Federal Audit Clearinghouse (FAC): FAC maintains a public database of completed audits, distributes single audit reporting packages to federal agencies, supports the Office of Management and Budget (OMB) in the oversight and assessment of federal award audit requirements, and helps auditors and auditees to minimize the reporting burden of complying with single audit requirements. For the purpose of this Questionnaire, NFWF would like to know whether your organization uploaded the most recent single audit report on FAC (if applicable).

Audit Finding: This refers to a material noncompliance with and violation of provisions of the applicable federal statutes, regulations, internal controls, and terms and conditions of the federal award.

Significant deficiency: This refers to a deficiency or a combination of deficiencies, in internal control over financial reporting, that is less severe than a material weakness. However, it is important enough to merit undertaking corrective action by your organization.

Material weakness: This refers to a deficiency, or a combination of deficiencies, in internal control, such that there is a reasonable possibility that a material misstatement of the organization's financial statements will not be prevented, detected, or corrected on a timely basis.

Corrective action: This refers to action taken by an audited organization to correct the identified deficiencies, produces recommended improvements, and demonstrates that deficiencies and audit findings are either invalid or do not warrant auditee action.

Suspension: This refers to an action taken by a debarring official to temporarily exclude or disqualify an organization or a person from bidding on, receiving, or participating in federally funded grants or contracts for a specific period pending the completion of an investigation, legal or administrative proceedings.

Debarment: This refers to an action taken by a debarring official that excludes or disqualifies a person or an organization for a specific period, generally not longer than three (3) years.

Federal award: This refers to financial assistance that a non-federal entity receives directly from a federal awarding agency or indirectly from a pass-through entity.

Awarding agency: This refers to a federal agency that awards a grant or other financial assistance to a recipient directly.

Pass-through entity: This refers to a non-federal entity that provides a sub-award to a sub-recipient to carry out part of a federal program.

APPLICANT CONTROLS AND CAPABILITIES QUESTIONNAIRE



Document retention: This refers to maintaining and keeping financial records, supporting documents, statistical records and all other non-federal entities records pertinent to the federal award.

Cost allowability: This refers to costs that could be incurred because they were allowed under a grant agreement. An allowable cost must be reasonable, such that a prudent person would pay for it.

Indirect costs: This refers to any cost that is not directly identified with a single cost objective but rather a combination of cost objectives.

Cost reimbursable: This refers to a contractual mechanism between two parties whereby payments are made for allowable costs incurred by the other party.

Fraud prevention policy: This refers to the implementation of a strategy to prevent, detect, and report fraudulent activities under an award.

Conflict of interest: This refers to a situation when an individual's personal interests could compromise his/her judgement.

Procurement: This refers to acquisition of goods and services pursuant to applicable procurement requirements.

Grant agreement: This is a legal instrument of financial assistance between a federal awarding agency or pass-through entity and a non-federal entity.

Contract: This is a legal instrument by which a recipient or sub-recipient purchases property or services to carry out the project or program under a federal award.

Equipment: This refers to tangible personal property including information technology (IT) systems having a useful life of more than one year and a per-unit acquisition cost which equals or exceeds the lesser of the capitalization level established by the non-federal entity for financial statement purposes or US\$5,000.

Real property: This means land including land improvements, structures, and appurtenances excluding moveable machinery and equipment.

APPLICANT CONTROLS AND CAPABILITIES QUESTIONNAIRE



Appendix 2: Useful Resources and References

1. Single Audit Requirements: <https://www.ecfr.gov/current/title-2/subtitle-A/chapter-II/part-200/subpart-F>
2. Financial management requirements (<https://www.ecfr.gov/current/title-2/subtitle-A/chapter-II/part-200/subpart-D/section-200.302>)
3. Subrecipient and contractor determinations (<https://www.ecfr.gov/current/title-2/subtitle-A/chapter-II/part-200/subpart-D/subject-group-ECFR031321e29ac5bbd/section-200.331>)
4. Requirements for pass-through entities (<https://www.ecfr.gov/current/title-2/subtitle-A/chapter-II/part-200/subpart-D/subject-group-ECFR031321e29ac5bbd/section-200.332>)
5. Procurement standards (<https://www.ecfr.gov/current/title-2/part-200/subject-group-ECFR45ddd4419ad436d>).
6. Audit findings: <https://www.ecfr.gov/current/title-2/subtitle-A/chapter-II/part-200/subpart-F/subject-group-ECFRa73e47c9a286e6/section-200.516>
7. Conflict of interest: <https://www.ecfr.gov/current/title-2/subtitle-A/chapter-II/part-200/subpart-B/section-200.112>
8. Equipment requirements: <https://www.ecfr.gov/current/title-2/subtitle-A/chapter-II/part-200/subpart-D/subject-group-ECFR8feb98c2e3e5ad2/section-200.313>
9. Supplies requirements: <https://www.ecfr.gov/current/title-2/subtitle-A/chapter-II/part-200/subpart-D/subject-group-ECFR8feb98c2e3e5ad2/section-200.314>
10. Mandatory disclosures: <https://www.ecfr.gov/current/title-2/subtitle-A/chapter-II/part-200/subpart-B/section-200.113>



Advanced Technology for
Nature-Based Restoration
and Resilience

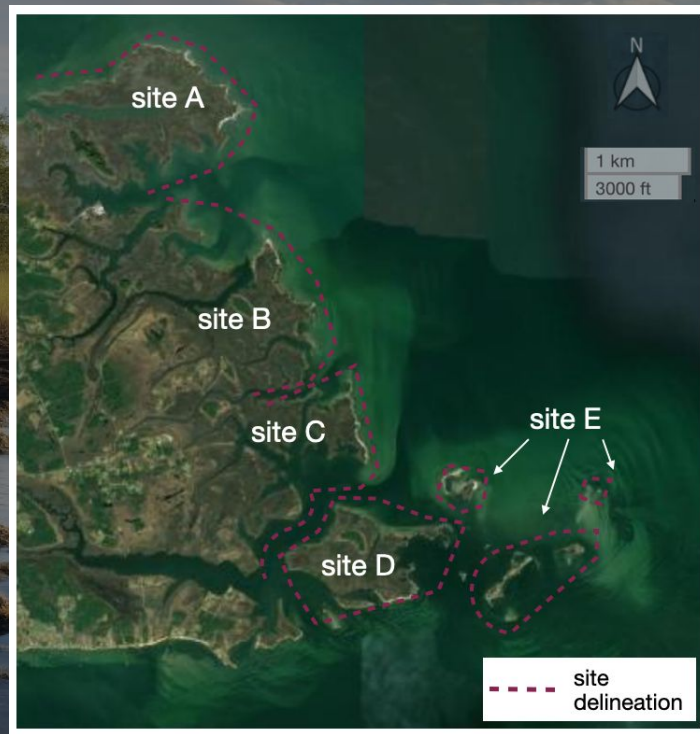
Mobjack Bay Project Concept: The Problem

- 98% of waterfront property in Virginia is privately owned, creating an inherent environmental justice challenge for participation in natural resources.
- The 2% of public waterfront is rapidly eroding away and experiencing one of the most rapid rates of relative sea level rise in the nation.
- **18,144 metric tons per year of sediment loading**, along with 21 metric tons of Nitrogen and 10 metric tons of phosphorus are currently being released into the bay in the proposed project area, severely impacting the resource.
- Degraded water quality and resilience risks are directly impacting housing values, property tax receipts, and putting pressure on public services.
- Current engagement with fisheries and marine resources at the neighborhood and housing tract level in disadvantaged areas is low.

Mobjack Bay Project Concept: Analysis Area



Area



Section Groupings

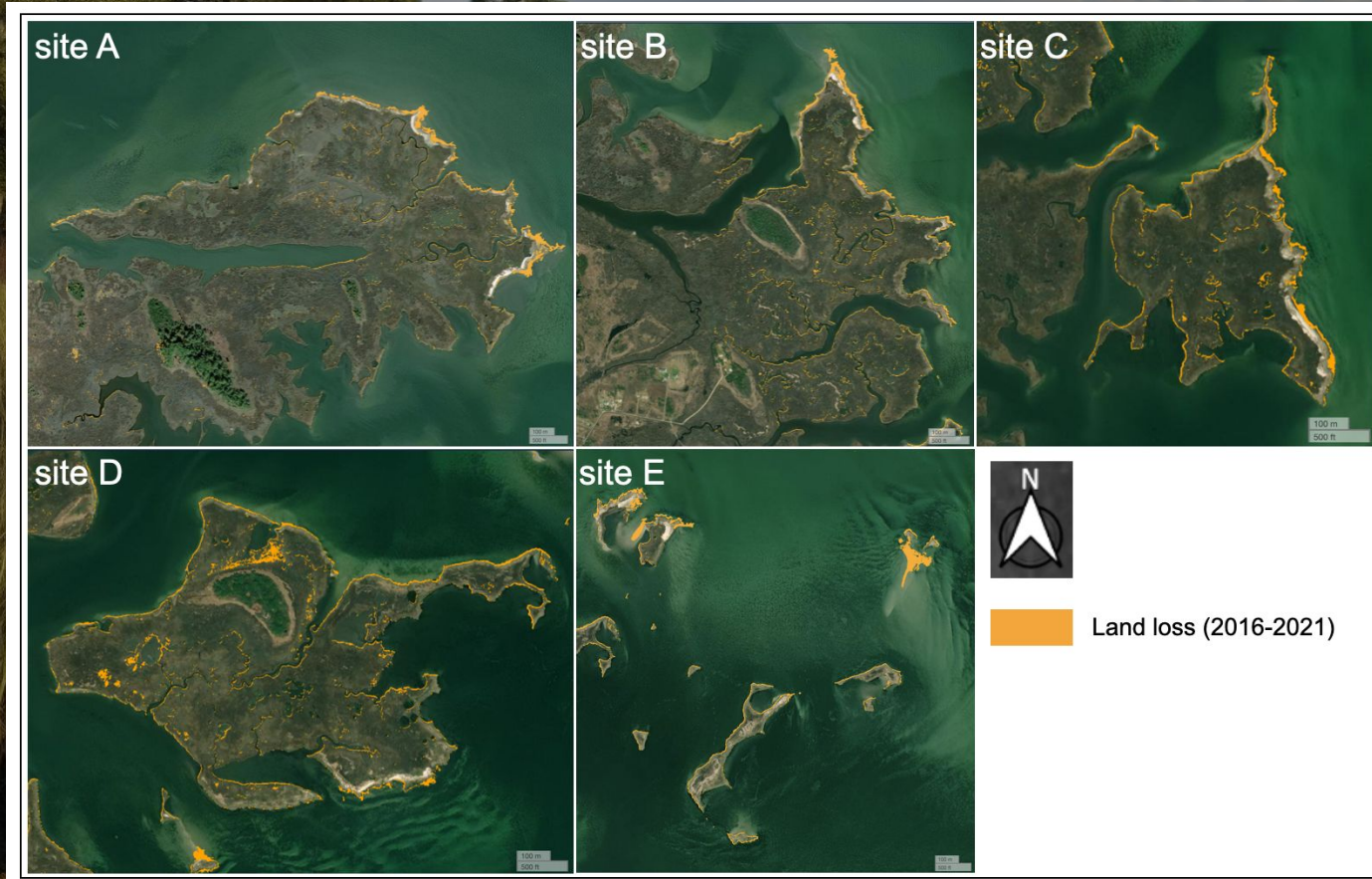
Mobjack Bay Project Concept: Status

1. Land Loss and Accretion Analysis (done)
2. Shoreline Profile Assessment from Available Bathymetric Data (done)
3. Categorization of Living Shoreline Proposals by Coastal Typology (done)
4. Nutrient, Sediment, and Carbon Loss Estimates with a Stop Loss Analysis (done)
5. Climate and Community Resilience Optimization (in progress)

Next Steps:

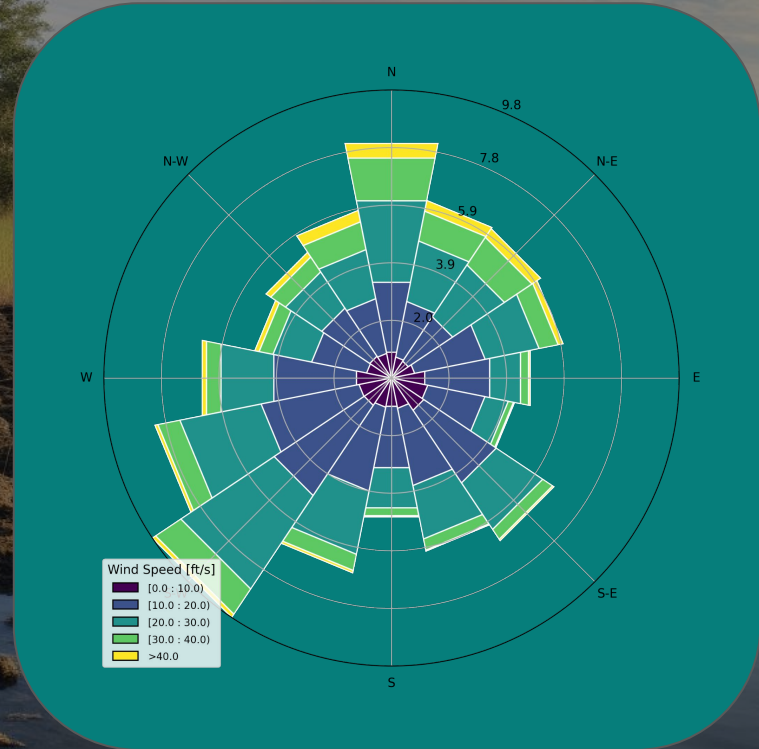
- Better define the project vision and tasks for fisheries and public engagement
- Develop final budget proposal with grant team members
- Convert the technical narrative (in progress) to full proposal content

Mobjack Bay Project Concept: Land Loss Analysis

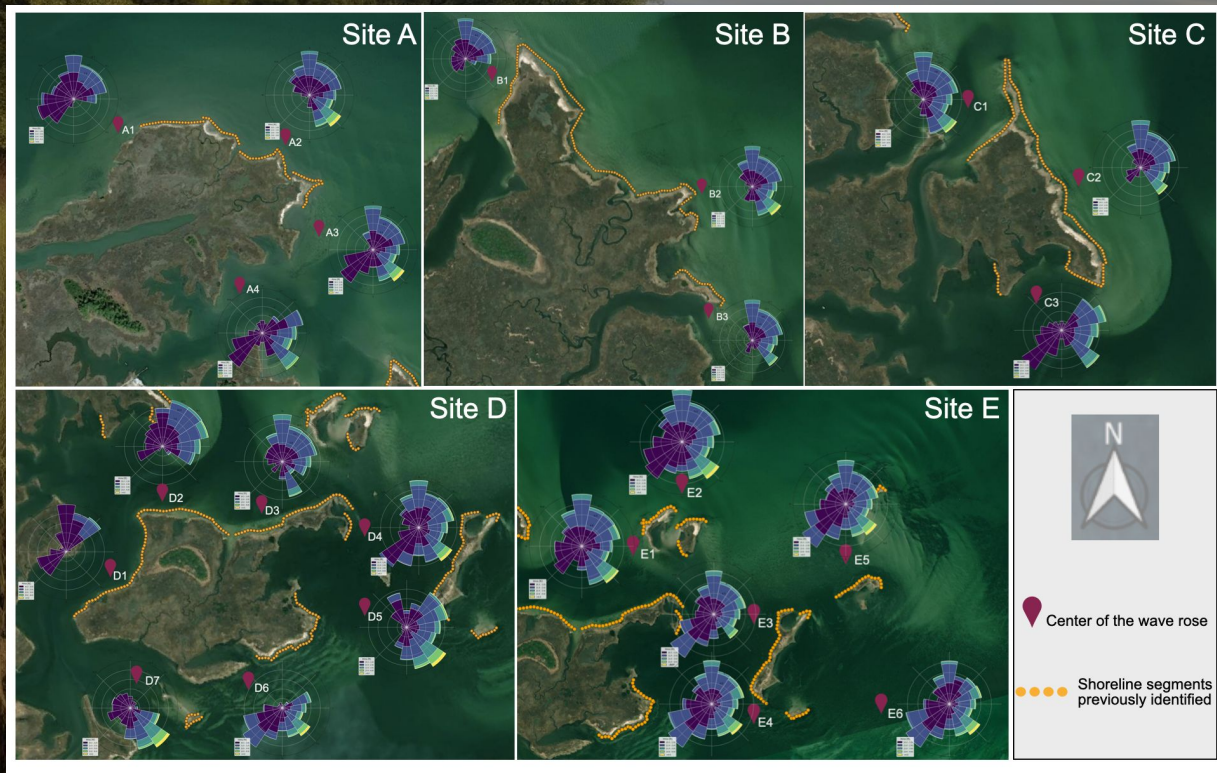


Mobjack Bay Project Concept: Wave Model

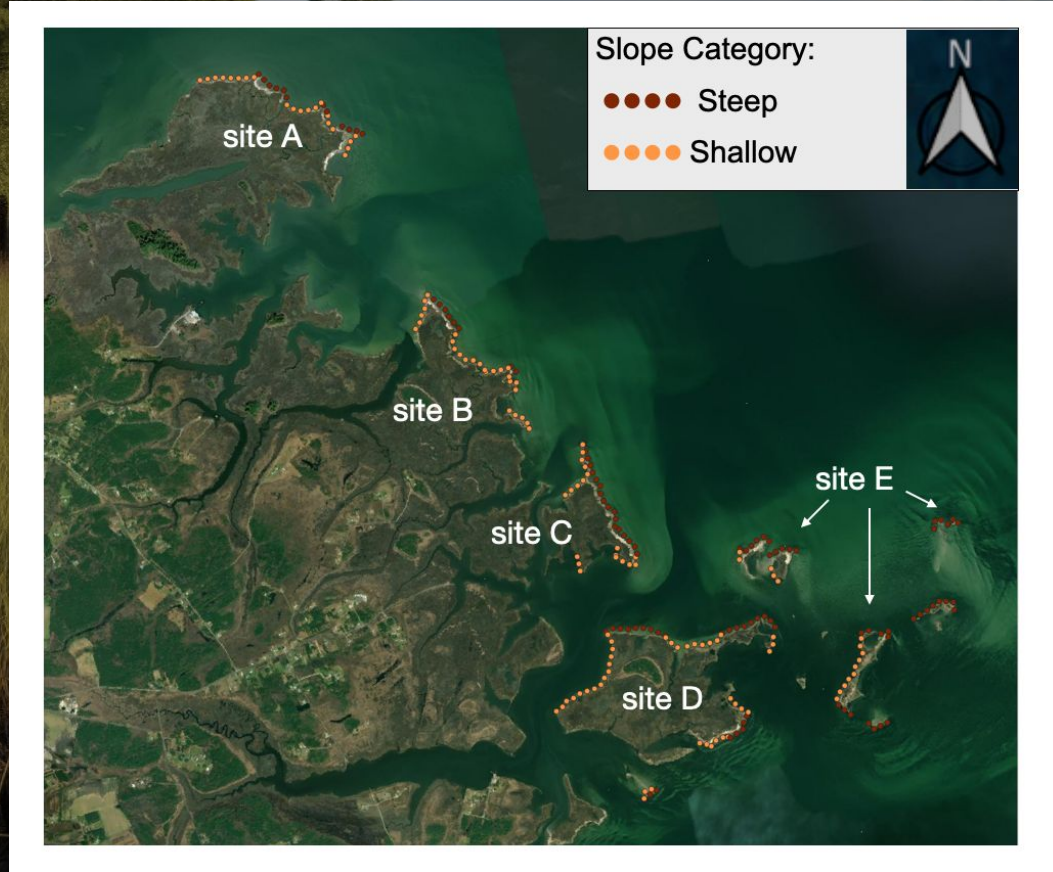
- Wave models derived from proximate NOAA wind stations to estimate wind & fetch driven stress on public lands in the project area.
- Example (right) shows intensity, frequency, and direction.



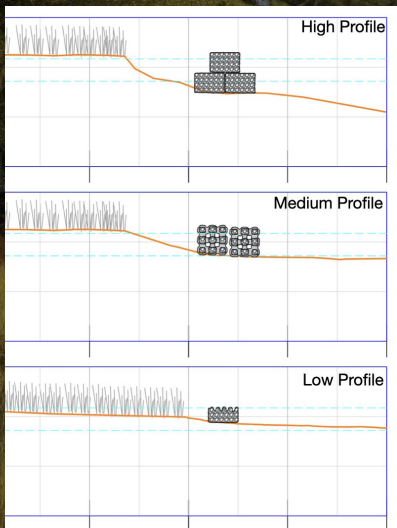
Mobjack Bay Project Concept: Guinea Marsh Analysis



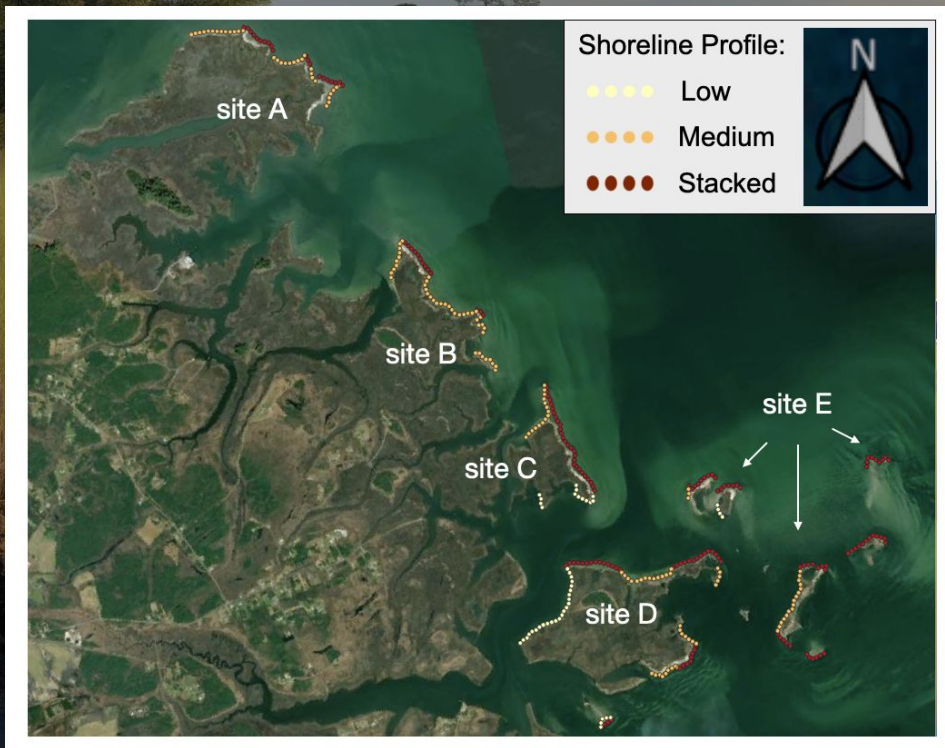
Mobjack Bay Project Concept: Slope Profile



Mobjack Bay Project Concept: Coastal Protection Typologies



Shoreline Profile	Total length (m)	Number of ExoForms	Total benthic surface Area (m ²)
Low	1373.59	1245	2739
Med	4170.13	7575	52,267.5
Stacked	4626.79	12,608	64,300.8
Grand Total	10,171	21,428	119,307



Mobjack Bay Project Concept: Treatment & Co-Benefits Calculations by Sub-Segment

ID	Eroded Distance (m)	Profile_type	seg_len_m	eroded_area_m2	erosion_rate_m2/yr	erosion_depth	erosion_vol_rate_m3/yr	Exoforms_in_x_section	Exoforms_in_seg	Surface_area_exoform_m2	Benthic_surface_area_bulk_density_g_cm3	sediments_kg/ly	N_min_kg/ly	N_max_kg/ly	N_mean_kg/ly	N_median_kg/ly	P_min_kg/ly	P_max_kg/ly	P_mean_kg/ly	P_median_kg/ly	C_min_kg/ly	C_max_kg/ly
1	4	Stacked	111.35	445	92.075	1.5	138.1125	3	303	1545.3	1.36	187833	75	404	218	214	38	178	104	100	582	17788
2	10	Low	130.33	1303	269.605	0.5	134.8025	1	118	259.6	1.36	183331	73	394	213	209	37	174	102	97	568	17361
3	4	Med	81.13	325	67.246	1	67.246	2	147	1014.3	1.36	91455	37	197	106	104	18	87	51	48	284	8661
4	5	Med	164.48	822	170.081	1	170.081	2	299	2031.0	1.36	213110	93	497	269	264	46	220	129	123	717	21905
5	4	Stacked	238.52	954	197.393	1.5	296.0895	3	650	3315	1.36	402882	161	866	468	458	81	383	224	213	1248	38134
6	2	Med	187.65	375	77.592	1	77.592	2	341	2352.9	1.36	105525	42	227	123	120	21	100	59	56	327	9993
7	1	Med	151.35	151	31.244	1	31.244	2	275	1897.5	1.36	42492	17	91	49	48	8	40	24	23	132	4024
8	3	Stacked	408.98	1227	253.88	1.5	380.82	3	1115	5686.5	1.36	517915	207	1114	602	590	104	492	288	274	1606	49047
9	5	Med	283.66	1418	293.4	1	293.4	2	515	3553.5	1.36	399024	160	858	464	455	80	379	222	211	1237	37788
10	5	Stacked	427.2	2136	441.962	1.5	662.943	3	1165	5941.5	1.31	868455	347	1867	1010	990	174	825	483	460	2692	82243
11	2	Med	107.47	215	44.486	1	44.486	2	195	1345.5	1.31	58277	23	125	68	66	12	55	32	31	181	5519
12	2	Low	723.21	1446	299.193	0.5	149.5965	1	657	222.2	1.31	195971	78	421	228	223	39	186	109	104	608	18558
13	3	Stacked	176.24	529	109.456	1.5	164.184	3	480	2448	1.31	215081	86	462	250	243	43	204	120	114	667	20368
14	3	Stacked	139.49	418	86.489	1.5	129.7335	3	380	176438	1.36	176438	71	379	205	201	35	168	98	94	547	16709
15	3	Med	486.45	1459	301.883	1	301.883	2	894	6099.6	1.36	410561	164	883	477	468	82	390	228	218	1273	38880
16	3	Stacked	98.83	296	61.246	1.5	91.869	3	269	1371.9	1.36	124942	50	269	145	142	25	119	69	66	387	11832
17	6	Stacked	114.74	688	142.355	1.5	213.5325	3	312	1591.2	1.36	290404	116	624	338	331	58	276	161	154	900	27501
18	2	Stacked	369.08	738	152.7	1.5	229.05	3	1006	5130.6	1.36	311508	125	670	362	355	62	296	173	165	966	29500
19	8	Stacked	265.14	2121	438.858	1.5	658.287	3	723	3687.3	1.36	895270	358	1925	1041	1021	179	851	498	474	2775	84782
20	10	Stacked	257.35	2574	532.588	1.5	798.882	3	701	3575.1	1.31	1046535	419	2250	1217	1193	209	994	582	555	3244	99107
21	4	Stacked	22.97	92	19.036	1.5	28.554	3	82	316.2	1.31	37406	15	80	44	43	7	36	21	20	116	3542
22	8	Med	66.07	529	109.456	1	109.456	2	120	828	1.31	143387	57	308	167	163	29	136	80	76	445	13579
23	7	Stacked	212.22	1486	307.469	1.5	461.2035	3	578	2947.8	1.31	604177	242	1299	703	689	121	574	336	320	1873	57216
24	3	Low	120.19	361	74.895	0.5	37.3475	1	109	239.8	1.31	48925	20	105	57	56	10	46	27	26	152	4633
25	3	Low	120.84	363	75.109	0.5	37.5545	1	109	239.8	1.31	49196	20	106	57	56	10	47	27	26	153	4659
26	3	Low	61.37	184	38.072	0.5	19.036	1	55	121	1.31	24937	10	54	29	28	5	24	14	13	77	2362
27	2	Low	217.65	435	90.006	0.5	45.003	1	197	433.4	1.31	58954	24	127	69	67	12	56	31	31	183	5583
28	8	Stacked	232.18	1857	384.233	1.5	576.3495	3	633	3228.9	1.36	783835	314	1685	912	157	894	745	415	408	2430	74229
29	4	Stacked	615.01	2460	509.001	1.5	763.5015	3	1677	8552.7	1.36	1038362	415	2232	1208	1184	208	986	577	550	3219	98333
30	3	Med	433.12	1299	268.777	1	268.777	2	787	5430.3	1.36	365537	146	786	425	417	73	347	203	194	1133	34616
31	6	Med	231.34	1388	287.192	1	287.192	2	420	2898	1.36	390581	156	840	454	445	78	371	217	207	1211	36988
32	4	Med	122.42	490	101.386	1	101.386	2	222	1531.8	1.36	137885	55	296	160	157	28	131	77	73	427	13058
33	4	Med	45.78	183	37.865	1	37.865	2	83	572.7	1.36	51496	21	111	60	59	10	49	29	27	160	4877
34	9	Stacked	65.22	587	121.457	1.5	182.1855	3	177	1462.7	1.36	247772	99	533	288	282	50	235	139	131	768	22464
35	7	Med	152.46	1067	220.774	1	220.774	2	277	1911.3	1.36	300253	120	646	349	342	60	285	167	159	931	28434
36	8	Med	390.74	3126	646.803	1	646.803	2	710	4899	1.36	878562	352	1991	1023	1003	176	836	489	466	2727	83303
39	12	Stacked	297.43	3569	738.465	1.5	1107.6975	3	811	4136.1	1.31	1451084	580	3120	1688	1654	290	1379	807	769	4498	137418
40	7	Med	302.08	2115	437.616	1	437.616	2	549	3788.1	1.36	595158	238	1280	692	678	119	565	331	315	1845	56361
41	3	Med	191.68	575	118.974	1	118.974	2	348	2401.2	1.36	161805	65	348	188	184	32	154	90	86	502	15323
42	13	Stacked	197.49	2567	531.14	1.5	796.71	3	538	2743.8	1.36	1083526	433	2330	1260	1235	217	1029	602	574	3359	102610
43	3	Med	116.52	356	73.66	1	73.66	2	215	1483.5	1.36	100178	49	215	117	114	20	95	56	53	311	9497
44	6	Stacked	80.2	481	99.524	1.5	148.286	3	218	1111.8	1.36	203029	81	437	236	231	41	193	113	108	629	19227
46	4	Med	263.08	1052	217.67	1	217.67	2	478	3298.2	1.36	296031	118	636	344	337	59	281	165	157	918	28034
47	16	Stacked	297.15	4754	983.654	1.5	1475.481	3	810	4131	1.36	2006654	803	4314	2334	2288	401	1906	1116	1064	6221	190030
48	3	Med	390.65	1172	242.499	1	242.499	2	710	4899	1.36	329799	132	709	384	376	66	313	183	175	1022	31232

Total sediment, nitrogen, phosphorus, and carbon 'stop loss' project co-benefits based on available soil data near project area and geospatial soil flux analysis.