

**Virginia Department of Conservation and Recreation Virginia
Community Flood Preparedness Fund – Round 3 Application
Flood Prevention and Protection Project**

**East River Boat Yard: Managing Flooding Impacts for a Publicly Owned
Working Waterfront and Building for the Future of Living with Flood
Waters**

**Virginia Department of Conservation and Recreation Virginia
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PROJECT TITLE: East River Boat Yard: Managing Flooding Impacts for a Publicly Owned Working Waterfront and Building for the Future of Living with Flood Waters

Name of Local Government: Middle Peninsula Planning District Commission

Category of Grant Being Applied for (check one):

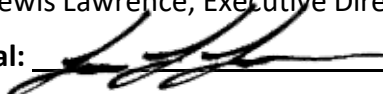
_____ Capacity Building/Planning Project _____ Study

NFIP/DCR Community Identification Number (CID): Mathews County (510096)

If a state or federally recognized Indian tribe, Name of tribe: NA

Name of Authorized Official: Lewis Lawrence, Executive Director

Signature of Authorized Official: _____



Mailing Address (1): PO Box 286

Mailing Address (2): 125 Bowden Street

City: Saluda **State:** VA **Zip:** 23149

Telephone Number: (804) 758-2311

Cell Phone Number: (____) _____

Email Address: llawrence@mppdc.com

Contact Person (if different from authorized official): Jackie Rickards

Mailing Address (1): PO Box 286

Mailing Address (2): 125 Bowden Street

City: Saluda **State:** VA **Zip:** 23149

Telephone Number: (804) 758-2311

Cell Phone Number: (215) 264-6451

Email Address: jrickards@mppdc.com

Is the proposal in this application intended to benefit a low-income geographic area as defined in the Part 1 Definitions? Yes ___ No X

Categories (select applicable project): Project Grants (Check All that Apply)

- Acquisition of property (or interests therein) and/or structures for purposes of allowing floodwater inundation, strategic retreat of existing land uses from areas vulnerable to flooding; the conservation or enhancement of natural flood resilience resources; or acquisition of structures, provided the acquired property will be protected in perpetuity from further development.
- Wetland restoration.
- Floodplain restoration.
- Construction of swales and settling ponds.
- Living shorelines and vegetated buffers.
- Structural floodwalls, levees, berms, flood gates, structural conveyances.
- Storm water system upgrades.
- Medium and large-scale Low Impact Development (LID) in urban areas.
- Permanent conservation of undeveloped lands identified as having flood resilience value by *ConserveVirginia* Floodplain and Flooding Resilience layer or a similar data driven analytic tool.
- Dam restoration or removal.
- Stream bank restoration or stabilization.
- Restoration of floodplains to natural and beneficial function.
- Developing flood warning and response systems, which may include gauge installation, to notify residents of potential emergency flooding events.

Location of Project (Include Maps): Mathews County, 502 Mill Lane Rd, Bohannon, VA 23021

NFIP Community Identification Number (CID#) (See appendix F): 510096

Is Project Located in an NFIP Participating Community? Yes

Is Project Located in a Special Flood Hazard Area? Yes

Flood Zone(s) (If Applicable): Zones AE and VE

Flood Insurance Rate Map Number(s) (If Applicable): 51115C0090E eff. 12/9/2014

Total Cost of Project: \$966,987

Total Amount Requested: \$580,192

SCOPE OF WORK NARRATIVE

INTRODUCTION

This proposal focuses on advancing a holistic approach to enhancing the current and future resilience and utility of the publicly owned East River Boat Yard site located on the East River and Mill Creek in Bohannon, Virginia (Mathews County). The site has served as a hub for commercial and recreational marine activity for Mathews County for centuries and is currently experiencing severe shoreline erosion and flooding issues, which are likely contributing to the shoaling and need for dredging of the mouth of Mill Creek. The proposed project will accomplish the following six unique tasks which holistically will transform the site in a manner which will allow for continued productivity from the site for decades to come:

1. Develop shovel ready resilient designs for a wharf or dock on the East River for commercial users to load/offload catch and gear,
2. Develop shovel ready designs for a resilient boat ramp and tending pier on Mill Creek that can withstand increased coastal flooding conditions and sea-level rise,
3. Shovel ready designs for improvements to an existing commercial building that has served the commercial seafood industry but is in need of repair due to recurrent flood damages,
4. Designs for improvements to the parking area which has been damaged from repeated flooding and is insufficiently designed to manage stormwater flooding issues,
5. Design for a living shoreline to protect the site from future erosion and to serve as best practice examples of E&S measures while also increasing overall resilience, and
6. to design and perform dredging of the mouth of Mill Creek and study beneficial reuse options for the material, whether for on-site fill or as living shoreline materials.

The East River Boat Yard is a key asset to Mathews County, for residents, visitors, and for commercial enterprise, and development of designs focused on resilience are vital to the site's success and long-term viability. The project represents an opportunity to advance and implement sitewide resilience for a publicly owned working waterfront which must be designed in a manner to remain resilient in the face of increased flooding and sea-level rise so that it may continue to serve the community and local economy. It is anticipated that the outcomes may serve as a model for the hundreds of similar working waterfronts which exist in locations vulnerable to flooding and sea-level rise throughout coastal Virginia.

The primary purpose of this project is to stabilize the property perimeter with several types of shoreline protection measures. Additional primary and secondary purposes include the development of public amenities in the form of a public boat ramp and public fishing pier.

FEMA, the Virginia General Assembly, DCR's Floodplain Management Program, and the Middle Peninsula Planning District Commission (MPPDC) all recognize that natural hazards pose a serious risk to all levels of government including states, localities, tribes and territories and the citizens which reside and work there. These hazards include flooding, drought, hurricanes,

landslides, wildfires and more. Because of climate change, many natural hazards are expected to become more frequent and more severe. Reducing the impacts these hazards have on lives, properties and the economy is a top priority for the Middle Peninsula PDC and the Middle Peninsula Fight the Flood (FTF) program (www.FightTheFloodVA.com). To that end, this proposal is a partnership between the MPPDC and Mathews County (see Community Support Letter, **Attachment 1**).

- A link or copy to the approved MPPDC resilience plan: https://fightthefloodva.com/wp-content/uploads/2021/08/Approved-8_19_DCR-packet_letterandplan.pdf
- Middle Peninsula All Hazards Mitigation Plan (2016): https://www.mppdc.com/articles/reports/AHMP_2016_FEMA_Approved_RED.pdf
- Mathews County Comprehensive Plan: <https://www.mathewscountyva.gov/196/Comprehensive-Plan>

This project is consistent with multiple objectives and strategies outlined within the Regional All-Hazards Mitigation Plan. Relevant strategies include the following:

- Objective 1.1: Provide protection for future development to the greatest extent possible.
 - Strategy 1.1.1: Reduce or eliminate flood damage to residential/business structures that are highly vulnerable for continual flood damage.
 - Strategy 1.1.3: Protect public buildings and public infrastructure from flood waters resulting from 100-year flood storm events.
 - Strategy 1.3.1: Mitigation projects that will result in protection of public or private property from natural hazards.

PROJECT INFORMATION

Project Description

The project site is the East River Boat Yard property, with waterfront access on the East River and Mill Creek in Mathews County, Virginia. The approximately one-acre property current includes a 1-story metal boathouse building and remnants of the former pier and dock structures. Given existing site conditions, including shoreline erosion, as well as the need to dredge the mouth of Mill Creek, the project involves a master redesign of the site, taking into account existing and proposed elements, and consideration of the site as a recreational and commercial asset.

The County is proposing to improve the existing property by first demolishing existing dilapidated structures that include old timber pilings and piers, bulkheading, and various mounds of rubble concrete and debris. The new improvements feature a concrete boat ramp (16 feet wide and 63 feet long), a tending pier (6 feet wide and 63 feet long), gravel parking, including an ADA parking stall, and five (5) trailered parking spaces. The

shoreline protection structures are comprised of two segments of riprap revetment (75 feet and 155 feet), two sill segments (220 feet and 50 feet), and wetland plantings (3,732 sq ft E2EM and 834 sq ft E2SS) at the waterfront park.

Nearly all of the site is a previously disturbed parcel that was associated with a small marine repair yard prior to the County obtaining the land. Most of the original structures have been demolished and the County has steadily been cleaning the property up. Impacts to onsite resources have been minimized by designing the smallest footprint possible for the boat ramp (14.3% slope approaching maximum) and shoreline stabilization measures, while maintaining green space within the interior (including planted wetlands and upland buffer areas)

The project also includes constructing an open-pile, fixed pier for the intent of providing public fishing access at the waterfront park. The fishing pier covers approximately 955 sq ft of subaqueous lands and extends out to depths of approximately 7 feet (MLW).

The revetment structures will be placed on a coarse aggregate bedding, while the sill will be placed directly upon filter fabric. Sand for planting medium will be imported from the dredged material from the mouth of Mill Creek adjacent to the site or from an approved supplier should it be needed, and filter fabric will also be used underneath the revetment. The boat ramp will be constructed of concrete over coarse aggregate and the tending pier will be constructed from treated wood suitable for the marine environment.

Specifically, this project proposes to:

1. Assess of site conditions;
2. Replace and establish shoreline protection in areas where there are currently dilapidated structures or no structures;
3. Demolish and remove existing concrete debris and foundations;
4. Add gravel substrate to create a turnaround and parking spaces for vehicles and trailers;
5. Enhance two wetlands areas that will be located behind proposed sills and planted with tidal wetland species;
6. Construct a new concrete boat ramp and tending pier;
7. Construct a new public fishing pier; and
8. Dredge Mill Creek and incorporate beneficial reuse to the greatest extent possible.

A conceptual site layout with project components is provided in **Figure 1** below, along with cost estimates for all project activities.

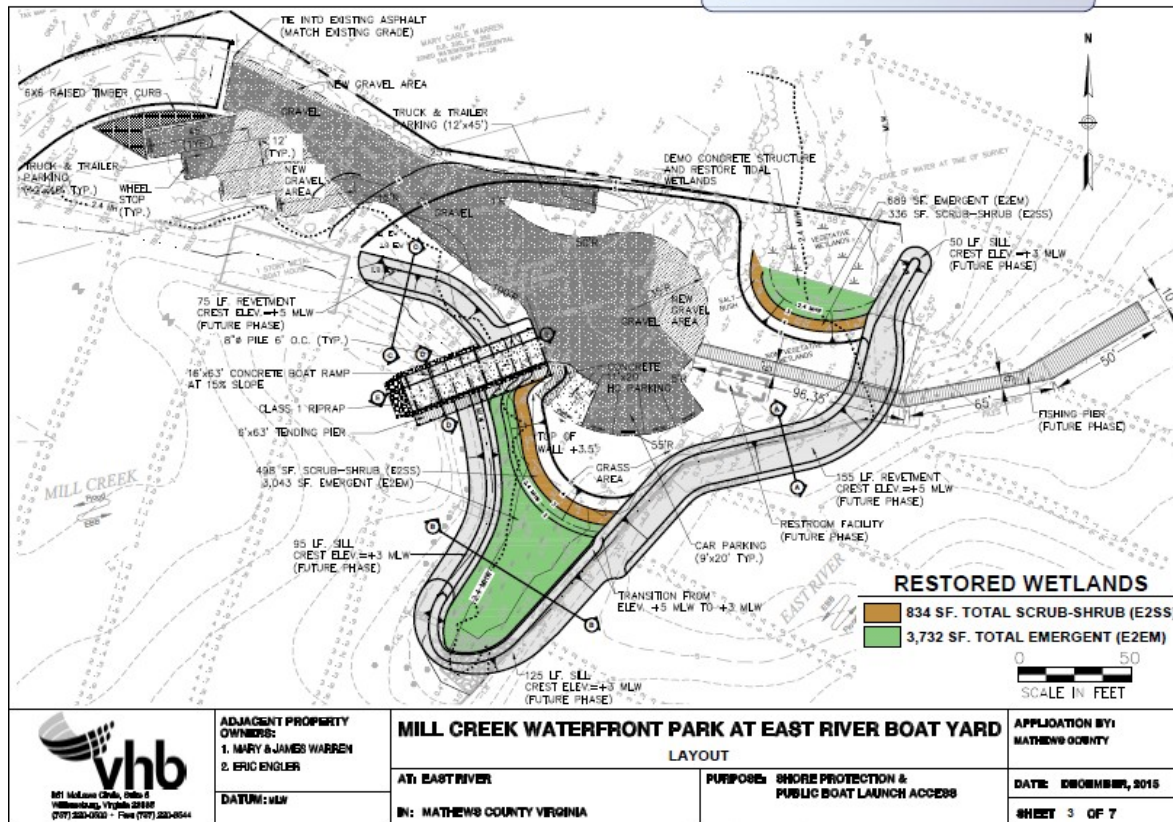


Figure 1. Site Layout and Cost Estimates

Mathews County - Mill Creek Park					
Waterfront Park					
Current Plans					
Date: June 23, 2016					
Item	Qty	Unit	Cost	Total	
Design					
Design Fishing Pier	1	ls	\$ 15,000	\$	15,000
Construction Admin	1	ls	\$ 15,000	\$	15,000
				DESIGN SUBTOTAL	\$ 30,000
Construction					
+5' Riprap Revetment (East River side)					
Armor Stone	648	ton	\$ 85	\$	55,080
Bedding #1	243	ton	\$ 55	\$	13,365
Geotextile	211	sy	\$ 3.50	\$	739
Piles thru Revetment for Future Pier	10	ea	\$ 700.00	\$	7,000
				Subtotal	\$ 76,184
+3' Riprap Sill (East River side)					
Armor Stone	102	ton	\$ 85	\$	8,670
Geotextile	35	sy	\$ 3.50	\$	123
				Subtotal	\$ 8,793
+3' Riprap Sill (East River to Mill Creek)					
Armor Stone	262	ton	\$ 85	\$	22,270
Geotextile	127	sy	\$ 3.50	\$	445
				Subtotal	\$ 22,715
+3' Riprap Sill (Mill Creek Side)					
Armor Stone	202	ton	\$ 85	\$	17,170
Geotextile	73	sy	\$ 3.50	\$	256
				Subtotal	\$ 17,426
+5' Riprap Revetment (Mill Creek side)					
Armor Stone	152	ton	\$ 85	\$	12,920
Bedding #1	13	ton	\$ 55	\$	711
Geotextile	55	sy	\$ 3.50	\$	193
				Subtotal	\$ 13,823
				Shoreline Subtotal	\$ 138,939
Boat Ramp (16' x 63')					
Riprap Toe along Ramp (both sides)	21	ton	\$ 85	\$	1,785
Marker piles	6	ea	\$ 700	\$	4,200
Concrete Panels (8" depth)	1008	sf	\$ 13	\$	13,104
Aggregate base (12" depth)	57	ton	\$ 50	\$	2,850
Riprap Apron (end of ramp)	8	ton	\$ 85	\$	680
Tending Pier @ Boat Ramp	552	sf	\$ 45	\$	24,840
				Ramp & Pier Subtotal	\$ 47,459

Mathews County - Mill Creek Park

Waterfront Park

Current Plans

Date: June 23, 2016

Item	Qty	Unit	Cost	Total
Landside Improvements				
Fishing Pier	1320	sf	\$ 50	\$ 66,000
Restroom Platform	1	ls	\$ 2,000	\$ 2,000
Concrete Sidewalk	30	sy	\$ 100	\$ 3,000
Gravel Parking Surface (4" Depth)	260	ton	\$ 50	\$ 13,000
Fill Below Gravel Parking Surface (8" Depth)	346	cy	\$ 12	\$ 4,152
Wetland Planting Area (8" depth clean sand)	100	cy	\$ 30	\$ 3,000
Emergent Wetland Planting Area (24" O.C. Plants)	925	ea	\$ 1.25	\$ 1,156
Scrub-Shrub Wetland Planting Area (5' O.C. plants)	170	ea	\$ 10.00	\$ 1,700
Handicap Wheelstop, Sign, Stripping	1	ls	\$ 1,000	\$ 1,000
Concrete Handicap Parking Space	50	sy	\$ 70	\$ 3,500
6x6 Timber Edging	127	lf	\$ 6	\$ 762
Wheel Stops	15	ea	\$ 250	\$ 3,750
Construction Entrance	1	ea	\$ 3,000	\$ 3,000
Signs	2	ea	\$ 500	\$ 1,000
Silt Fence	700	lf	\$ 2.50	\$ 1,750
Temporary & Permanent Seeding	1	ls	\$ 1,000.00	\$ 1,000
Mobilization	1	ls	\$ 15,000	\$ 15,000
Survey	1	ls	\$ 5,000	\$ 5,000
Demolition	1	ls	\$ 15,000	\$ 15,000
Landscaping	1	ls	\$ 500	\$ 500
			Landside Subtotal	\$ 145,270
			Shoreline, Ramp, and Landside Construction	\$ 331,668
			Design & Construction	\$ 361,668
			15% Contingency	\$ 54,250
			TOTAL COST	\$ 415,919

Table 43. Implementation Costs for Mill Creek 2

PHASE AND COST COMPONENT	COSTS FOR INITIAL PROJECT	COSTS FOR EACH SUBSEQUENT DREDGING CYCLE
PRE-CONSTRUCTION PHASE:		
Preliminary Engineering & Design for Dredging Activities (Including Joint Permit Application)	\$50,000	\$30,000
Preliminary Engineering & Design for Disposal Activities Not Included in Dredging Activities Above (Including Joint Permit Application)	\$50,000	\$30,000
Grant and Loan Applications	\$10,000	\$10,000
Community Engagement	\$6,000	\$3,000
Environmental Assessment	\$30,000	\$30,000
Federal, State, and Local Permits	\$25,000	\$25,000
Legal Coordination	\$10,000	\$0
Financial Coordination	\$25,000	\$10,000
Dredge Material Placement Site Acquisition ⁷⁶	\$0	\$0
Subtotal	\$206,000	\$138,000
Contingencies (10% of Pre-Construction Phase Costs)	\$20,600	\$13,800
TOTAL PRE-CONSTRUCTION PHASE COSTS	\$226,600	\$151,800
CONSTRUCTION PHASE:		
Final Engineering and Design/Plans and Specifications for Dredging Activities	\$25,000	\$15,000
Final Engineering and Design/Plans and Specifications for Disposal Activities Not Included in Dredging Activities Above	\$25,000	\$15,000
Bonds and Insurance	\$1,215	\$1,215
Mobilization/Demobilization	\$5,000	\$5,000
Dredge Material Placement Site Preparation	\$1,691	\$1,691
Dredging	\$33,810	\$33,810
Disposal (Placement) of Dredge Material	--	--
Supervision and Administration for Dredging Oversight	\$1,127	\$1,127
Supervision and Administration for Disposal (Placement) Oversight	\$1,127	\$1,127
Subtotal	\$93,970	\$73,970
Contingencies (25% of Construction Phase Costs)	\$23,492	\$18,492
TOTAL CONSTRUCTION PHASE COSTS	\$117,462	\$92,462
POST CONSTRUCTION PHASE:		
Monitoring and/or Mitigation	\$3,381	\$3,381
Project Condition Survey	\$25,000	\$25,000
Subtotal	\$28,381	\$28,381
Contingencies (25% of Post Construction Phase Costs)	\$7,095	\$7,095
TOTAL POST CONSTRUCTION PHASE COSTS	\$35,476	\$35,476
TOTAL COST ALL PHASES	\$379,538	\$279,738

Project Location Information

The Middle Peninsula is the second of three large peninsulas on the western shore of Chesapeake Bay in Virginia, as seen in **Figure 2**. It lies between the Northern Neck and the Virginia Peninsula. The region is predominantly rural, with large, scattered farms and forested tracts; close-knit waterfront communities; an active regional arts association; broad-based civic involvement; and an excellent transportation infrastructure that provides easy access to urban markets. The area contains 3.2% of Virginia's land mass but only 1.1% of the Commonwealth's total population of approximately 93,000 as seen in **Figure 3**.

Figure 2. Middle Peninsula Geographic Area

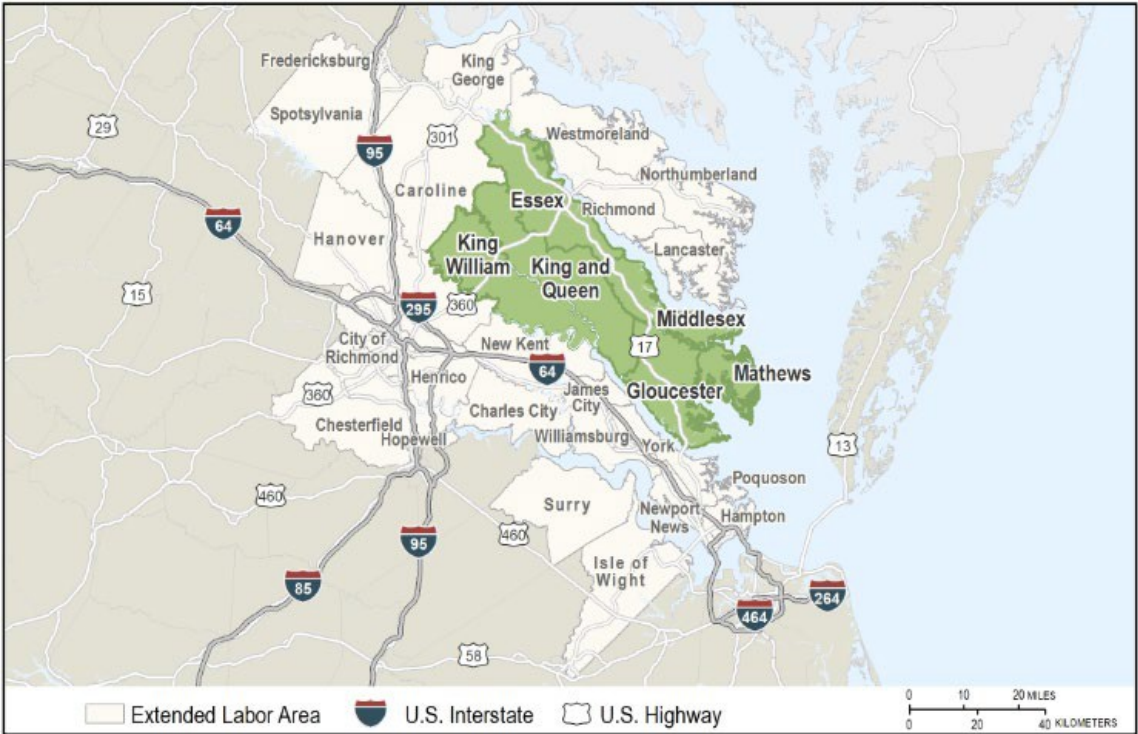


Figure 3. Middle Peninsula Population

CID #	US Census 2020 Population	2020 Total
510048 (Tapp 510049)	Essex (Includes Town of Tappahannock)	10,599
510071	Gloucester	38,711
510082	King and Queen	6,608
510304 (West Point 510083)	King William (Includes Town of West Point)	17,810
510096	Mathews	8,533
510098 (Urbanna 510292)	Middlesex (Includes Town of Urbanna)	10,625
	MPPDC Total	92,886

The project proposes to study and implement measures to enhance the resiliency of the East River Boat Yard site, an approximately 1-acre property located in Mathews County, along the East River and Mill Creek in Bohannon, Virginia. (Figures 4, 5, and 6).

Figure 4. County Map of Project Location

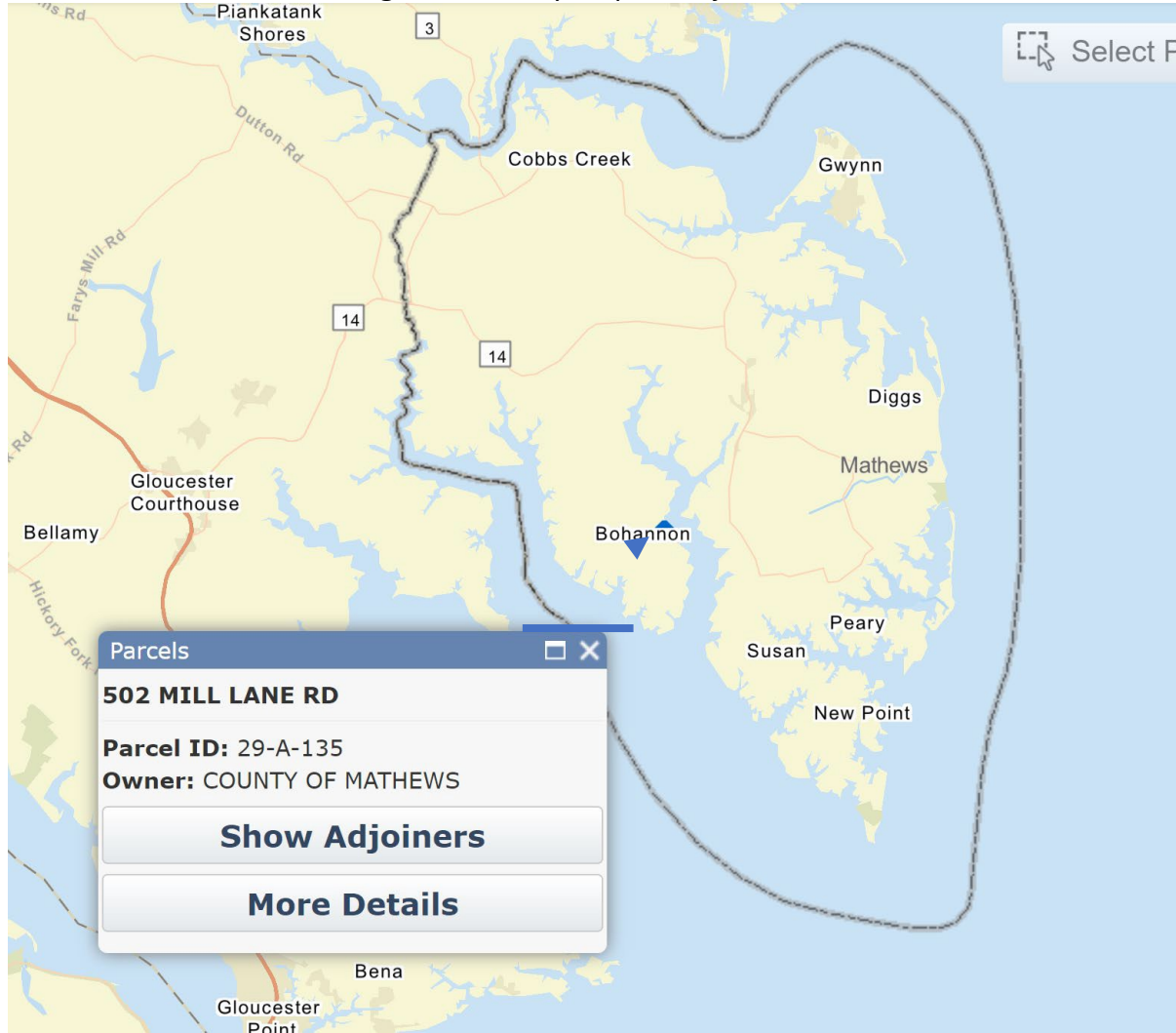


Figure 5. Parcel Map of Project Location; Survey and Onsite Photographs

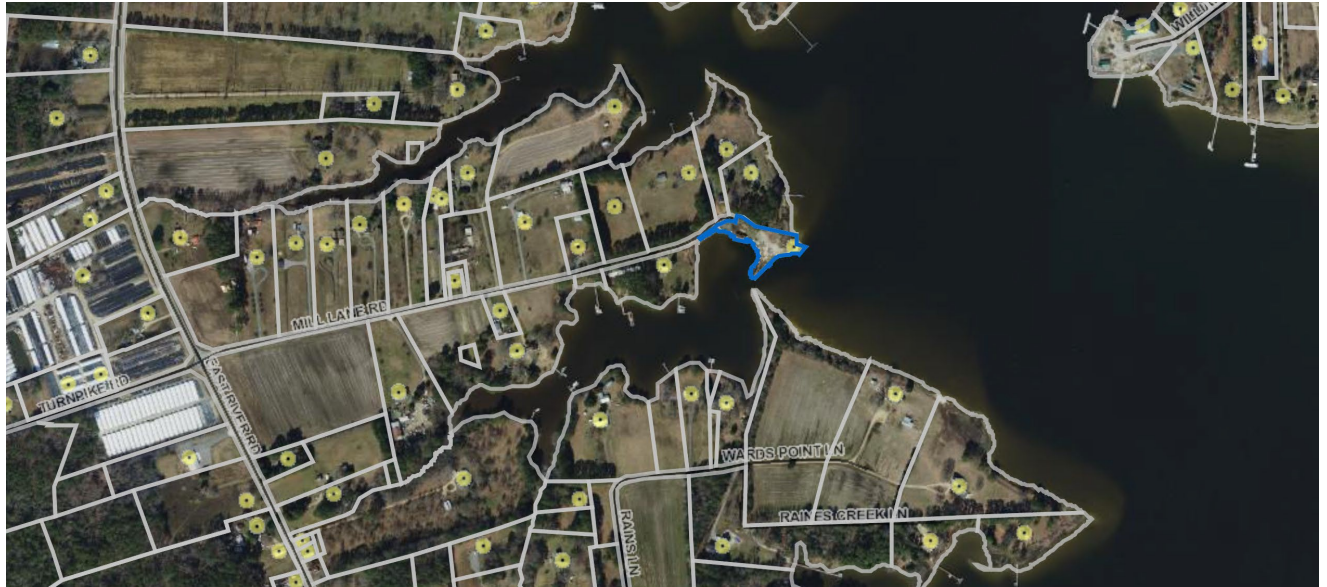


Figure 6. Site Survey

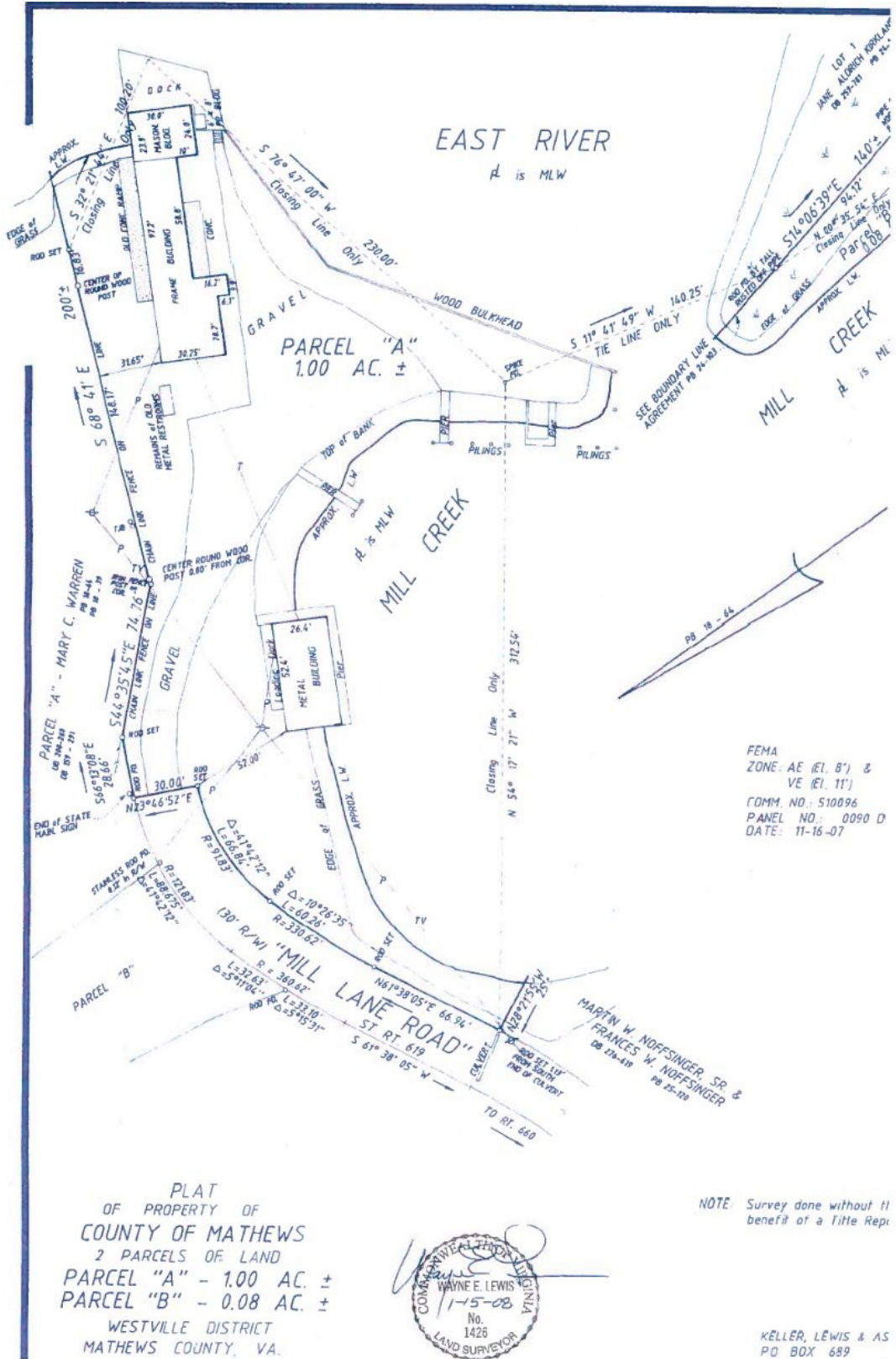


Figure 7. Site Photographs



The images of site damages are all a result of flooding and coastal weather events.

Figure 8. Rendering of Improved Site



Population Information

Mathews County is located on the easternmost portion of Virginia’s Middle Peninsula and is an agriculture, forestry and water-based economy. The County is a coastal community located between the Mobjack Bay, Piankatank River and the Chesapeake Bay. Mathews County has more than 200 miles of shoreline. Based on 2020 Census Data, Mathews County’s population totals 18,533 (**Figure 3**).

According to DCR guidelines, a portion of the County is considered a low-income geographic area. In **Figure 9**, the green areas depict qualified low-income “community” areas meeting the 80% Household limits based on US census household income data¹ or are qualified Opportunity Zones.

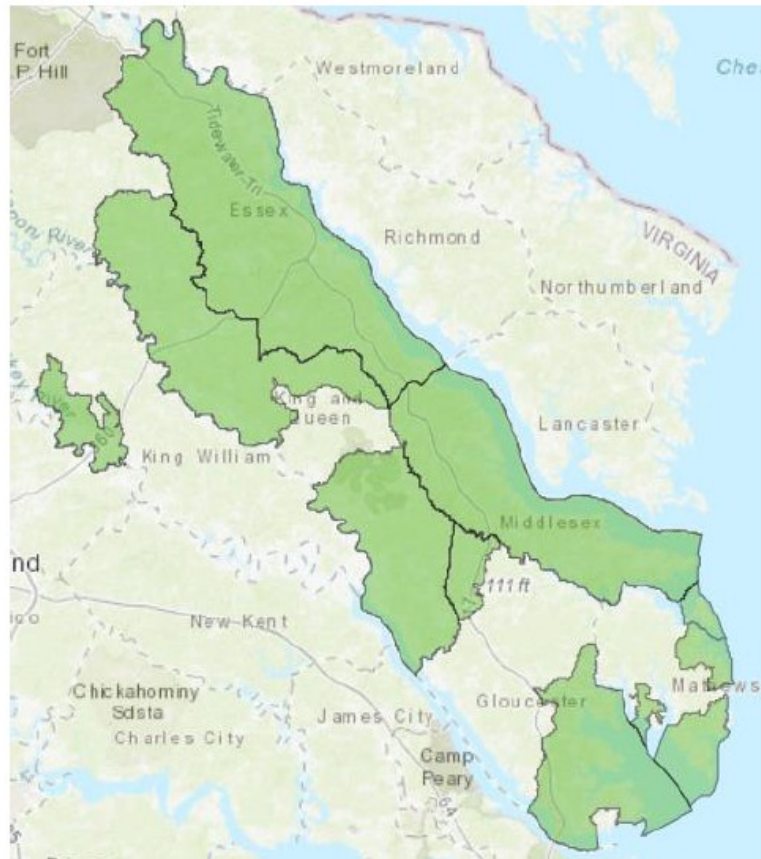
Figure 9. Map of Middle Peninsula Low Income Qualifying Geographic Areas

Each county had its 'Eligible Household income' calculated by multiplying the County's median Household income by .8. This resulted in the following numbers:

	Essex	Middlesex	Mathews	King William	King & Queen	Gloucester
Median household income (in 2019 dollars), 2015-2019	\$51,954	\$57,438	\$64,237	\$66,987	\$63,982	\$70,537
Eligible Household income	\$41,563	\$45,950	\$51,389	\$53,590	\$51,186	\$56,430

Note: Per 7/15/2021 DCR Webinar, comparing state Household income to locality is permissible to determine if the entire locality is LMI.

The following is an overview of the Regional Eligibility map. Green areas are qualified low-income "community" areas meeting the 80% Household limits based on US census household income data or are qualified Opportunity Zones.



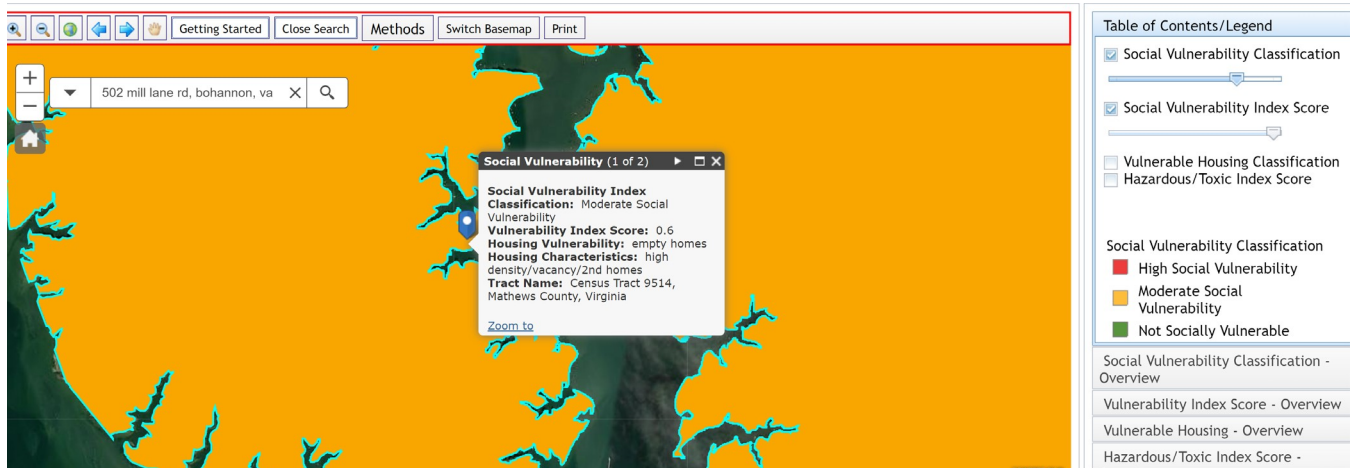
Please see **Figure 10** for a detailed map of the project location and the green low- income area overlay. This shows that the project location is not within the low-income area.

Figure 10. Map of the Project Location within the Green Low-Income Area



With respect to social vulnerability, according to [ADAPTVA](#)'s Social Vulnerability Index Score, this project location has a Social Vulnerability Index Score of 0.6, classified as Moderate Social Vulnerability (**Figure 11**)

Figure 11. ADAPTVA Social Vulnerability Index Score Viewer



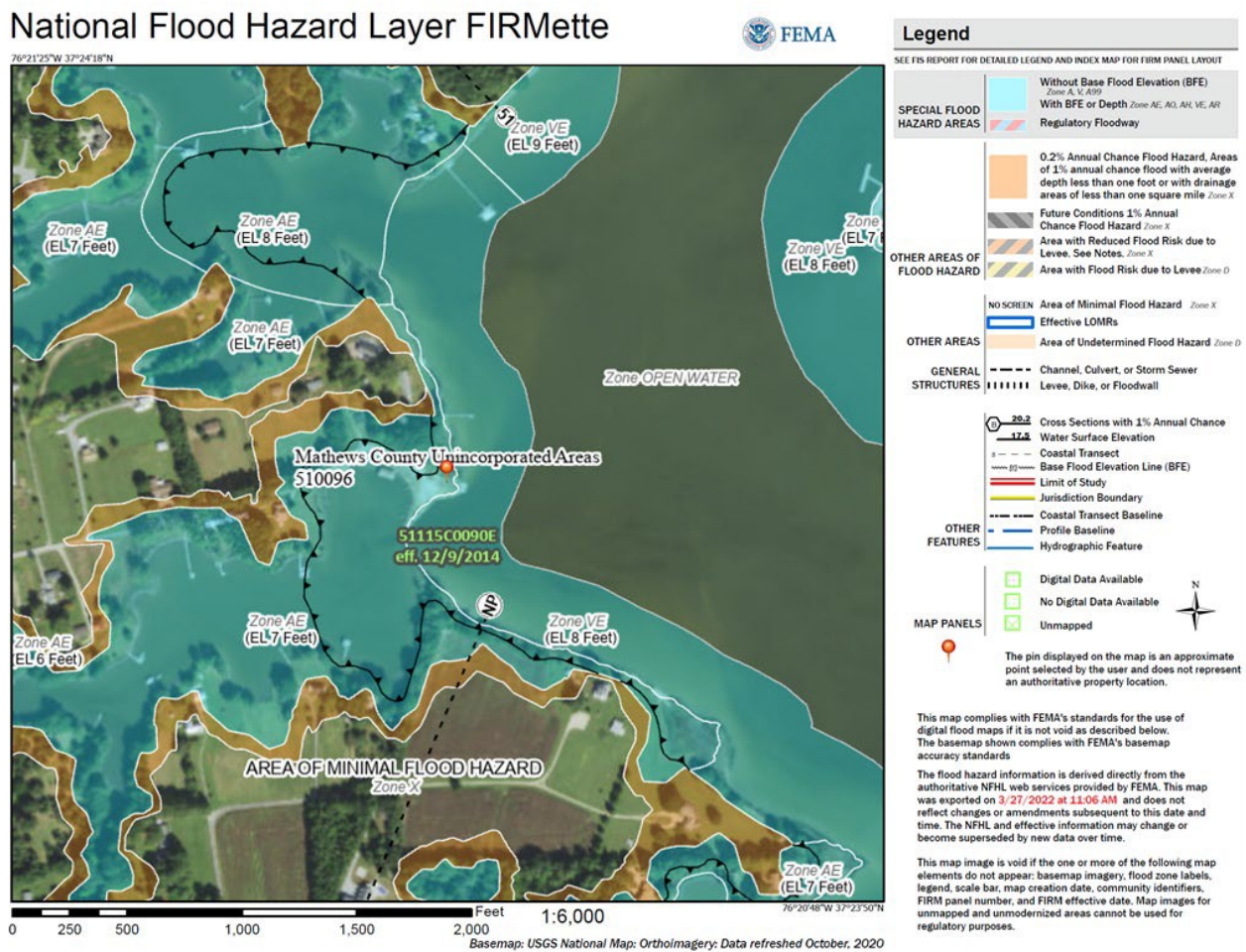
¹ Based upon 2015-2019 U.S. Census American Community Survey data available on January 4, 2022, when CFPP Round 3 opened; 2016-2020 ACS data was not released until March 17, 2022.

Flood Risk Information

The entirety of the site (502 Mill Lane Rd, Bohannon, Virginia, 37.4013787568471, -76.35289892950684) is located within a mapped floodplain, with portions located within FEMA Flood Zones AE and VE (**Figure 12**). Mathews County's Planning and Zoning Department administers the requirements of the NFIP program, and the County's Floodplain Management Ordinance may be accessed at the following link:

<https://www.co.Mathews.va.us/DocumentCenter/View/422/Floodplain-Management-PDF?bidId=>

Figure 12. Map of FEMA Flood Zones



Due to the project site's proximity to the water and low elevation, the site has an extensive history of being subject to extreme weather events that have resulted in significant impacts to infrastructure and the environment. For example, the project location has long been, and continues to be, impacted by tropical, sub-tropical, and Nor'easter events (**Attachment 3**). According to NOAA's Coastal Flood Mapper, this project location is at the higher range for risk of coastal flooding (**Figure 13**). Collectively, these reoccurring and storm-related events have contributed to shoreline loss at site. **Figure 14** depicts the shoreline in 1937 and the 2017,

based on historical shoreline data from the Virginia Institute of Marine Science Shoreline Studies Program; illustrated is an approximate loss of 12,000 square feet of site area at the project location over an eighty-year period.

Figure 13. Map of Project Location and Risk of Coastal Flooding (NOAA, 2021)



Figure 14. Project Location and Map of Associated Shoreline Change Between 1937 (purple) and 2017 (red)



NEED FOR ASSISTANCE

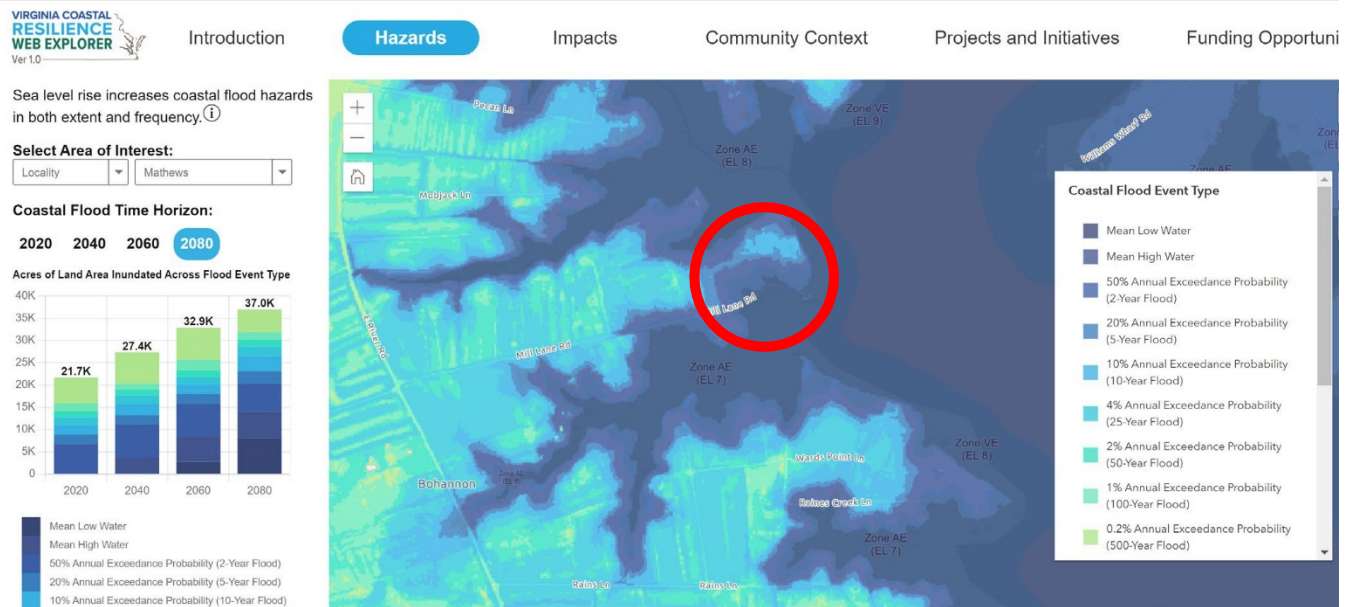
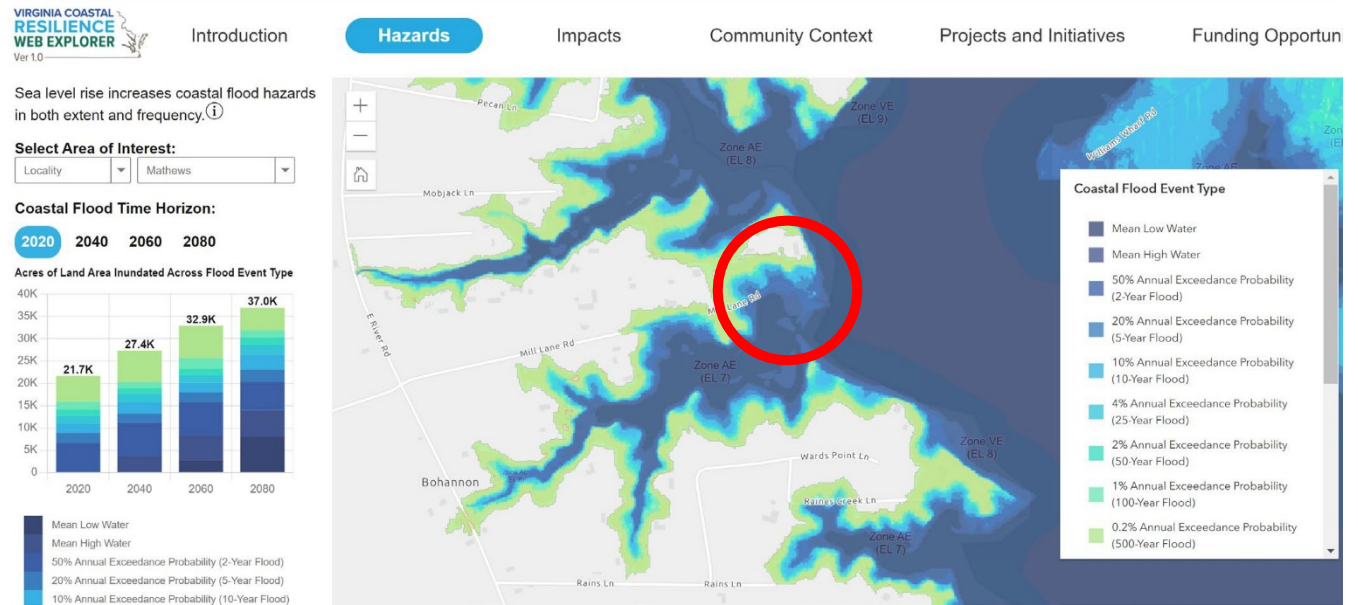
The Middle Peninsula Planning District Commission (MPPDC) is a political subdivision of the Commonwealth of Virginia formed under VA Code §15.2-4203 to provide solutions to problems of greater than local significance and cost-savings through economies of scale. The MPPDC serves nine localities of the Middle Peninsula including Essex, Gloucester, King & Queen, King William, Mathews, and Middlesex counties, as well as the Towns of Tappahannock, West Point, and Urbanna.

MPPDC is staffed using multiple methods including co-operative procurement, hourly, and burdened FTE staff. MPPDC staff consists of an Executive Director, Deputy Director, Chief Financial Officer, Senior Project Planner, and clerical support staff; a Director of Planning, General Planner, Certified Flood Plain Manager, Transportation Planner, and Emergency Planner are co-operative procured; Housing, Community Development Planner and Public Relations staff are hourly.

The Planning District staffing team assists localities with long-term and/or regional planning efforts. The MPPDC Executive Director, Deputy Director, and Chief Financial Officer have decades of experience in managing and administering project grants at multiple scales - from grants in excess of \$1,000,000 to small grants. MPPDC is an entrepreneurial-based government agency with an annual operating budget ranging from \$750,000 to more than \$1,000,000. Annually, the MPPDC manages 25-30 concurrent federal and state grants utilizing industry standard Grants Management Software and other software (e.g., GIS, Microsoft Office) as required and/or necessitated by different grants. The MPPDC operates service centers in the topical areas of: coastal zone management, emergency planning, housing, transportation planning and transportation demand management, economic development, social assistance, small business development, general planning and technical assistance, as well as other areas determined by the Commission. MPPDC has more than 25 years of experience managing multiple revolving loan programs. In the 25 years that the Executive Director has been employed by the Commission, no audit findings have occurred.

As noted, the East River Boat Yard site is compromised by shoreline erosion issues, which likely contributes to the need to dredge the mouth of Mill Creek. Further, the site needs to be comprehensively reviewed to identify measures to increase overall resilience, but to also ensure that the site serves as an asset for recreational and commercial users. **Figure 15**, from the Virginia Coastal Resilience Master Plan - Virginia Coastal Resilience Web Explorer, illustrates flood levels combined with sea-level rise and their effects on the site. Notably, sea-level rise combined with flooding over the next 60 years is expected to pose an issue to the site, resulting in inundation and increased flooding risk; key construction techniques will need to be employed to increase overall resilience in order to mitigate the effects of exceptional floods and sea level rise 60 years and out.

Figure 15. Sea Level and Flooding, 2020 - 2080



The need for assistance is two-fold. First, Mathews County is along the Chesapeake Bay and numerous tidal rivers that contribute to the area’s high risk to coastal flooding, sea-level rise, and storm surge. Based on tidal gauge data from the Virginia Institute of Marine Science (VIMS), relative sea-level rise rates ranging from 0.11-0.23 in./yr. (2.9-5.8 mm/yr.; period: 1976-2007; 10 stations) within the Chesapeake Bay region, which are the highest rates reported

along the U.S. Atlantic coast (Boon et. al., 2010). In addition to sea-level rise, Mathews County has a history of being impacted by hurricanes and tropical storms. As storms pass over or near the coast, the atmospheric pressure drops, causing a large volume of sea water to build up, eventually being pushed ashore by the storm's winds as storm surge. When a storm makes landfall at high tide, the storm surge and the added water from the tidal fluctuation combine to create a "storm tide".

Nor'easters, like hurricanes and tropical storms, can dump heavy amounts of rain and sediment, and produce hurricane-force winds that push large amounts of seawater inland. A strong indicator that Mathews County is experiencing the impact of coastal hazards (i.e., flooding, hurricanes, sea-level rise, and storm surge) is the number of repetitive loss and severe repetitive loss claims submitted by residents and businesses to FEMA. As of 2015, Mathews County had over 1,000 NFIP claims with claims topping \$20.5 Million. The County has implemented several preventative measures, property protection policies, public information activities, and emergency service measures to decrease impacts on its communities. This project will therefore build on local efforts moving toward a more resilient community.

Second, this project location is primed for co-benefits derived from shoreline erosion mitigation efforts. The proposed application of shoreline protection features, boat launch improvements, and increased public access that provides strategic protection of the infrastructure and landscape at this point of interest. For example, the proposed improvements will facilitate multiple, simultaneous activities that will contribute to economic growth in the area while fostering innovation.

Business Development

The potential of increased community interest drawn to the site is significant. Visitors seeking access to local waterways could be drawn to activities available at the East River Boat Yard, supporting the local economy with outside revenue in their pursuits. Additionally, the site has the unique opportunity to support and serve as an incubator for commercial seafood or other ecotourism or water management-related businesses. The provision of a public access site with enhanced amenities thus has the potential to drive continued economic growth through business development.

Community Scale Benefits

Due to the multitude of public investment for shoreline protection and flood research and innovation, we believe this site meets the test of "Priority shall be given to projects that implement community-scale hazard mitigation activities that use nature-based solutions to reduce flood risk." The East River Boat Yard site serves as one of the Commonwealth's best chances to innovate shoreline resilience projects in "live time" so that all of coastal Virginia can benefit. This public working waterfront has provided critical community scale benefits for generations, and it is essential that action be taken now to ensure that the site can continue to provide similar benefit to the citizens, businesses, and visitors of Mathews County and the Commonwealth.

Benefit of and Suitability for Natural Based Solutions

Adapt VA contains a data layer illustrating areas of less than ten feet in elevation that show locations in the Middle Peninsula offering benefits of NNBF to coastal buildings, habitat, and community protection; additionally, the platform contains a layer identifying areas suitable for living shorelines given the presence of marsh, ranked for co-benefits (see **Figure 16**). The project site offers multiple community protection benefits which include combinations of mitigating coastal flooding, protecting buildings/community facilities and CRS credit. Additionally, shoreline is identified as suitable for living shorelines resulting in co-benefits.

Figure 16. Natural and Nature-Based Features at the Project Site



ALTERNATIVES

The submission of alternatives is not applicable in this application. Nature-based and hybrid solutions are anticipated, and the project cost is less than \$3 million.

GOALS AND OBJECTIVES

This proposal will develop a comprehensive strategy to increase resilience of the site against multiple shoreline erosion inputs while providing co-benefits that foster resilience. The focused goals and objectives of the project are as follows:

Goal 1: Improve public access to local coastal waterways.

- Objective A: Increase public access to the Chesapeake Bay with improved conditions and mitigation of recurrent and repetitive flooding and erosion using a nature-based approach on site.
- Objective B: Enhance quality of life for local residents and visitors alike through recreation, educational and cultural opportunities, and commercial fishing at the point of interest.
- Objective C: Leverage improved public access and coastal resiliency for economic growth within Mathews County.

Goal 2: Improve coastal resiliency within the community and the Commonwealth.

- Objective A: Mitigate recurrent and repetitive flooding and erosion alongside storm surge and sea level rise using natural and nature-based solutions that benefit people and the economy as well as the environment.
- Objective B: Prevent loss of life and reduce property damage by mitigating for recurrent, repetitive, and future flooding within the project area using a nature-based design approach.
- Objective C: Enhance the resilience of public infrastructure, ensuring longer-term viability.

Goal 3: Transferability to other communities.

- Objective A: Model natural and nature-based solutions for coastal sites exploring development potential.
- Objective B: Foster innovative research and solutions-oriented studies on site focused on coastal adaptation and mitigation for external transfer.
- Objective C: Improve the implementation of Fight the Flood as a model program to be replicated in other communities within the region and/or Commonwealth.

The MPPDC expects the following results and benefits of the completed project:

1. **Foster economic growth in the area over the useful life of site infrastructure and most likely, beyond.** Enabling public access to this county asset while ensuring its sustainability will protect and enhance the area's recreational economies and has the potential to positively impact related commercial endeavors.
2. **Prevent loss of property without cementing an alternative.** Building resilient structures and facilities at the project site as outlined will help prevent loss of property and property value, while capitalizing on the useful life of the site as much as possible.

The proposed project was confirmed for the MPPDC by Matthew C. Burnette PG, PH, CFM or Holly White AICP, CFM.

3. **Provide ecosystem services to the community toward increased quality of life.** Increased public access to recreational, educational, and cultural opportunities leverage the provisioning and cultural services associated with the site's natural resources, services that provide benefits to safety, health, and well-being for all visitors.

APPROACH, MILESTONES, AND DELIVERABLES

As noted, the intent of this project is to focus on shoreline erosion, dredging with beneficial reuse, and overall site planning with resilient designs for the East River Boat Yard site. This project will utilize and incorporate sustainable planning, design, environmental management, and engineering practices, coupled with a focus on programs and services to support recreation and commercial development, to promote overall adaptation and resilience of the site.

The principal tasks and milestones are as follows:

- Assessment of site conditions;
- Replacing and establishing shoreline protection in areas where there are currently dilapidated structures or no structures
- Demolishing and removing existing concrete debris and foundations
- Adding gravel substrate to create a turnaround and parking spaces for vehicles and trailers
- Enhancing two wetlands areas that will be located behind proposed sills and planted with tidal wetland species
- Constructing a new concrete boat ramp and tending pier
- Constructing a new public fishing pier
- Dredging of Mill Creek and beneficial reuse options for the material, whether on-site fill or as living shoreline materials (not included in estimate)

Concerning Adverse Impacts

Additionally, the applicant and the property owner recognize the importance to do no harm to land owned by the Commonwealth nor the adjacent property owners as result of the construction elements of this project. The design for the proposed project will be developed and constructed under the auspices of experienced contractors who understand that adverse impacts must be avoided and considered in the design and implementation of the project. The proposed project will work with the permitting agency, designers, and contractors to ensure that the project is built to and functions at the level of the design specifications to ensure that no adverse impacts will occur.

Expected outcomes include the development of plans to allow for the redevelopment of the site for overall resilience, including with living shoreline treatments to reduce erosion and exposure to sea-level rise and flooding, and dredging of Mill Creek to improve access and navigability.

The expected timeline for the project milestones, and deliverables, is as follows. All activities are contingent upon approval of the relevant permitting authorities, and as such, the schedule and milestones should be considered estimates at best. The ultimate project schedule will be dictated predominantly by the permitting process; however, the proposed activities are not anticipated to exceed the 3 years allowed per the DCR Grant Manual:

Year 1/Months 1-6 - Site Evaluation

- Months 1-6: Assessment of site conditions

Year 1/Months 7-9 - Development of Design Plans

- Months 7-9: Replacing and establishing shoreline protection in areas where there are currently dilapidated structures or no structures, demolishing and removing existing concrete debris and foundations, and adding gravel substrate to create a turnaround and parking spaces for vehicles and trailers.

Year 1/Months 10-18 – Construction and Dredging

- Months 10-18: Enhancing two wetlands areas that will be located behind proposed sills and planted with tidal wetland species, constructing a new concrete boat ramp and tending pier, constructing a new public fishing pier, and dredging of Mill Creek. Dredging Mill Creek will ensure key waterfront access while using materials for beneficial reuse such as living shoreline materials.

RELATIONSHIP TO OTHER PROJECTS

While the specific proposed project bears no direct relationship to specific past, future, or future resilience projects, the project does relate to larger regional resilience efforts. For more than 40 years, the Middle Peninsula Planning District Commission (MPPDC) and its participating localities have worked diligently on topics associated with the land water interface, including coastal use conflicts and policies, sea level rise, stormwater flooding, roadside ditch flooding, erosion, living shorelines, coastal storm hazards (e.g., hurricanes, tropical storms), riverine and coastal flooding, and coastal resiliency.

The proposed project is a priority project generated from the Middle Peninsula Regional Flood Resilience Plan, which was approved by DCR in August of 2021. This Flood Resiliency Plan serves as the MPPDC's guiding document for its flood resiliency programs and is comprised of two primary MPPDC-approved policy documents. These documents frame the foundation and implementation of the Middle Peninsula flood protection approach, and are indirectly and directly supported by specific regional planning documents each approved by federal, regional, and/or local partners as required by statute.

Other plans and resources integral to the implementation of the Flood Resiliency Plan include:

Long Term Planning

- Middle Peninsula All Hazard Mitigation Plan - FEMA and Middle Peninsula locality, approved 2016 (MPPDC Website)
 - This overarching project provides updates every five years on the hazards within the region; it identifies the top hazards within the region and provides a HAZUS assessment that analyzes flooding (riverine and coastal), sea-level rise and hurricane storm surge impacts in the region. Additionally, this plan lists strategies and objectives that guide member localities to mitigate for these strategies.
- Middle Peninsula Comprehensive Economic Development Strategy – MPPDC, approved March 2021
- Middle Peninsula VDOT Rural Long Range Transportation Plan – MPPDC, approved annually

Short Term Implementation

- Middle Peninsula Planning District Commission Fight the Flood Program Design - MPPDC Commission, approved June 2020; Chairman approved update 8/6/21
- Middle Peninsula Planning District Commission Living Shoreline Resiliency Incentive Funding

Program - Virginia Revolving Loan Fund Program Design and Guidelines, approved 2015

The MPPDC has a history of continuous work on flooding and coastal resiliency topics, as described in **Attachment 5**. These projects have built upon each other to establish within the MPPDC a solid foundation of regional expertise in flooding and coastal resiliency. Now, given this history of accumulated information and knowledge, the MPPDC can move beyond research and studies to begin implementing projects on the ground. One such effort, launched in 2020 following the Commission's authorization, was developed in response to emerging flood challenges. This effort, the **Middle Peninsula Fight the Flood (FTF) Program**, leverages state and federal funding to deliver flood mitigation solutions directly to constituents, for both the built and natural environments with an emphasis on nature-based flood mitigation solutions. The Middle Peninsula **FTF** program helps property owners gain access to programs and services to better manage challenges posed by flood water. MPPDC staff have partnered with private property owners registered for the FTF program to assist them in finding funding for their shoreline.

Finally, the Flood Resiliency Plan and associated programs strive to carry out the guiding principles and goals set forth in the Virginia Coastal Resilience Master Planning Framework established in 2020. The proposed activities are proposed in accordance with the guiding principles and with the intent that their outcomes will help the Commonwealth meet the goals set forth in the planning framework.

MAINTENANCE PLAN

It is important to ensure that the public investment of DCR CFPF funding be protected should the project not withstand future conditions. As such, MPPDC staff will work with legal counsel to develop an agreement to be signed by each party which outlines the terms necessary to ensure the public investment is maintained over the duration of the project.

CRITERIA

*Describe how the project meets each of the applicable scoring criteria contained in **Appendix B** and provide the required documentation where necessary. Documentation can be incorporated into the Scope of Work Narrative or included as attachments to the application. **Appendix B** must be completed and submitted with the application.*

For local governments that are not towns, cities, or counties, the documentation provided for the criteria below should be based on the local government or local governments in which the project is located and/or directly impacts.

1. Is the applicant a local government (including counties, cities, towns, municipal corporations, authorities, districts, commissions, or political subdivisions created by the General Assembly or pursuant to the Constitution or laws of the Commonwealth, or any combination of these or a recognized state or federal Indian tribe?

- Yes; the applicant is a regional planning district commission.

2. **Does the local government have an approved resilience plan meeting the criteria as established by this grant manual? Has it been attached or a link provided?**
 - Yes; the MPPDC's DCR-approved resilience plan may be accessed at the following link: https://fightthefloodva.com/wp-content/uploads/2021/08/Approved-8_19_DCR-packet_letterandplan.pdf
3. **For local governments that are not towns, cities, or counties, have letters of support been provided from affected local governments?**
 - Yes; please see **Attachment 1**
4. **Has the applicant provided evidence of an ability to provide the required match funds?**
 - Yes; please see the match commitment letter in **Attachment 1**
5. **Has the applicant demonstrated to the extent possible, the positive impacts of the project or study on prevention of flooding?**
 - Yes

BUDGET NARRATIVE

ESTIMATED TOTAL PROJECT COST

Based upon the identified scope of work, the estimated total project cost is \$966,987. This estimate is based on previously furnished costs estimates for project components, provided in **Figure 1**.

MPPDC staff will manage and administer this project. Thus, personnel time is needed to ensure that project deliverables are completed within the project timeline. Along with personnel expenses, MPPDC fringe is needed. This includes health insurance, retirement, group life insurance, workman's comp, and unemployment insurance. MPPDC fringe rate for FY23 is 26.21% and comprised of: Health Insurance – 48.58%, Retirement – 18.06%, Workers Comp – 0.28%, Social Security – 28.55%, Life Insurance – 4.39%, Unemployment – 0.14%. Direct charges are costs associated with overall projects costs consistent with general accounting principles. MPPDC also prepares an indirect cost (IDC) plan annually per 2 CFR 200 Appendix VII. Following annual audit, the plan is submitted to NOAA for acceptance. MPPDC's IDC rate has a basis of Modified Total Direct Costs (MTDC), with a planned rate of 27.92%. IDC is only applied to the first \$25,000 of each contract. IDC calculated on MTDC (modified total direct cost)-Personnel, supplies, travel, and first \$25,000 of each subcontract, etc.; excludes equipment.

East River Boat Yard Public Working Waterfront Resilience Enhancements						
Personnel Salaries/Wages	DCR %	Match %	Annual Salary	DCR	Owner	Total
<i>Staff</i>	0.00%	0.00%	\$0	\$57,437	\$38,291	\$95,728
Personnel	<i>Lewis's Cheat Sheet</i>			\$57,437	\$38,291	\$95,728
		Total		60%	40%	
FT Fringe, 26.21% salaries;		\$805,457	\$805,457	483,274.20	322,182.80	\$805,457
	15%	120,818.55	120,818.55	72,491.13	48,327.42	120,818.55
Total Personnel		926,275.55	926,275.55	555,765.33	370,510.22	926,275.55
SubAward/SubContract Agreements				60%	40%	
<i>East River Boat Yard Final Design, Demolition and Construction</i>				\$415,919	\$249,551	\$665,470
<i>Dredging and Beneficial Reuse</i>				\$379,538	\$227,723	\$607,261
<i>Legal Bid Documents and Procurement Preparation</i>				\$10,000	\$6,000	\$16,000
				\$805,457	\$582,274	\$1,387,731
SUBTOTAL: Direct Costs				\$555,765	\$370,510	\$926,275
Indirect/IDC/Facilities & Administrative Costs			27.92%	\$40,712	\$24,427	\$65,139
Total				\$580,192	\$386,795	\$966,987
Other Match:						
<i>Source of Match</i>				\$0	\$0	\$0
GRAND TOTAL				\$580,192	\$386,795	\$966,987

AMOUNT OF FUNDS REQUESTED

The total amount of requested grant assistance is \$580,192 or 60% of total project costs, as the project is located outside of a low-income geographic area and the project results in hybrid solutions. These funds, combined with local match, would be used for the services identified above.

AMOUNT OF CASH FUNDS AVAILABLE

Mathews County will appropriate the requisite 40% or \$386,795 in required local cash match funds, to be combined with the \$580,192 in grant assistance to equal the total estimated project cost. The County's match commitment letter is included as **Attachment 1**.

AUTHORIZATION TO REQUEST FUNDING

The authorization to request funding is included as **Attachment 1**.

Appendix B: Scoring Criteria for Flood Prevention and Protection Projects

Virginia Department of Conservation and Recreation
Virginia Community Flood Preparedness Fund Grant Program

Applicant Name:	Middle Peninsula Planning District Commission	
Eligibility Information		
Criterion	Description	Check One
1. Is the applicant a local government (including counties, cities, towns, municipal corporations, authorities, districts, commissions, or political subdivisions created by the General Assembly or pursuant to the Constitution or laws of the Commonwealth, or any combination of these)?		
Yes	Eligible for consideration	X
No	Not eligible for consideration	
2. Does the local government have an approved resilience plan and has provided a copy or link to the plan with this application?		
Yes	Eligible for consideration under all categories	X
No	Eligible for consideration for studies, capacity building, and planning only	
3. If the applicant is <u>not a town, city, or county</u>, are letters of support from all affected local governments included in this application?		
Yes	Eligible for consideration	X
No	Not eligible for consideration	
4. Has this or any portion of this project been included in any application or program previously funded by the Department?		
Yes	Not eligible for consideration	
No	Eligible for consideration	X
5. Has the applicant provided evidence of an ability to provide the required matching funds?		
Yes	Eligible for consideration	X
No	Not eligible for consideration	
N/A	Match not required	

Project Eligible for Consideration		<input checked="" type="checkbox"/> Yes
		<input type="checkbox"/> No
Applicant Name:	Middle Peninsula Planning District Commission	
Scoring Information		
Criterion	Point Value	Points Awarded
6. Eligible Projects (Select all that apply)		
Projects may have components of both 1.a. and 1.b. below; however, only one category may be chosen. The category chosen must be the primary project in the application.		
1.a. Acquisition of property consistent with an overall comprehensive local or regional plan for purposes of allowing inundation, retreat, or acquisition of structures.	50	
<input checked="" type="checkbox"/> Wetland restoration, floodplain restoration <input checked="" type="checkbox"/> Living shorelines and vegetated buffers. <input type="checkbox"/> Permanent conservation of undeveloped lands identified as having flood resilience value by <i>ConserveVirginia</i> Floodplain and Flooding Resilience layer or a similar data driven analytic tool <input type="checkbox"/> Dam removal <input checked="" type="checkbox"/> Stream bank restoration or stabilization. <input checked="" type="checkbox"/> Restoration of floodplains to natural and beneficial function. <input type="checkbox"/> Developing flood warning and response systems, which may include gauge installation, to notify residents of potential emergency flooding events.	45	45
1.b. any other nature-based approach	40	
All hybrid approaches whose end result is a nature-based solution	35	
All other projects	25	
7. Is the project area socially vulnerable? (Based on ADAPT VA's Social Vulnerability Index Score.)		
Very High Social Vulnerability (More than 1.5)	15	
High Social Vulnerability (1.0 to 1.5)	12	
Moderate Social Vulnerability (0.0 to 1.0)	8	8
Low Social Vulnerability (-1.0 to 0.0)	0	
Very Low Social Vulnerability (Less than -1.0)	0	

8. Is the proposed project part of an effort to join or remedy the community's probation or suspension from the NFIP?		
Yes	10	
No	0	0
9. Is the proposed project in a low-income geographic area as defined in this manual?		
Yes	10	10
No	0	
10. Projects eligible for funding may also reduce nutrient and sediment pollution to local waters and the Chesapeake Bay and assist the Commonwealth in achieving local and/or Chesapeake Bay TMDLs. Does the proposed project include implementation of one or more best management practices with a nitrogen, phosphorus, or sediment reduction efficiency established by the Virginia Department of Environmental Quality or the Chesapeake Bay Program Partnership in support of the Chesapeake Bay TMDL Phase III Watershed Implementation Plan?		
Yes	5	5
No	0	
11. Does this project provide "community scale" benefits?		
Yes	20	20
No	0	
Total Points		88

Appendix D: Checklist All Categories

Virginia Department of Conservation and Recreation
Virginia Community Flood Preparedness Fund Grant Program

Scope of Work Narrative	
Supporting Documentation	Included
Detailed map of the project area(s) (Projects/Studies)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
FIRMette of the project area(s) (Projects/Studies)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Historic flood damage data and/or images (Projects/Studies)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
A link to or a copy of the current floodplain ordinance	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Non-Fund financed maintenance and management plan for project extending a minimum of 5 years from project close	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
A link to or a copy of the current hazard mitigation plan	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
A link to or a copy of the current comprehensive plan	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Social vulnerability index score(s) for the project area from ADAPT VA's Virginia Vulnerability Viewer	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
If applicant is not a town, city, or county, letters of support from affected communities	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Completed Scoring Criteria Sheet in Appendix B, C, or D	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Budget Narrative	
Supporting Documentation	Included
Authorization to request funding from the Fund from governing body or chief executive of the local government	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
Signed pledge agreement from each contributing organization	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A

Attachment 1: Community Support/Match Commitment/Authorization Letter

County Administration



March 21, 2022

Lewie Lawrence, Executive Director
Middle Peninsula Planning District Commission
P.O. Box 286
Saluda, VA 23149

RE: Support Letter for Whites Creek Landing, East River Boat Yard, and Davis Creek Dredging Proposals

Dear Mr. Lawrence,

Mathews County supports the three proposals for Whites Creek landing resilience, East River Boat Yard resilience, and Davis Creek dredging for VDCR Community Flood Preparedness Funding.

If any or all of the projects are funded by the VDCR, the County plans to provide the required matching funds.

Should you have any questions concerning our support for this project, please contact the County Administration office at (804) 725-7172

Respectfully,

A handwritten signature in black ink that reads "Paul Hudgins".

Paul Hudgins,

Chairman, Mathews County Board of Supervisors

804.725.7172 office
804.725.7805 fax
mathewscountyva.gov

50 Brickbat Road | P.O. Box 839 | Mathews, VA 23109



Attachment 2: Project Location FIRMette

National Flood Hazard Layer FIRMette



76°21'25"W 37°24'18"N



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

- SPECIAL FLOOD HAZARD AREAS**
 - Without Base Flood Elevation (BFE) Zone A, V, A99
 - With BFE or Depth Zone AE, AO, AH, VE, AR
 - Regulatory Floodway
 - OTHER AREAS OF FLOOD HAZARD**
 - 0.2% Annual Chance Flood Hazard. Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile. Zone X
 - Future Conditions 1% Annual Chance Flood Hazard. Zone X
 - Area with Reduced Flood Risk due to Levee. See Notes. Zone X
 - Area with Flood Risk due to Levee. Zone D
 - OTHER AREAS**
 - NO SCREEN Area of Minimal Flood Hazard. Zone X
 - Effective LOMRs
 - Area of Undetermined Flood Hazard. Zone D
 - GENERAL STRUCTURES**
 - Channel, Culvert, or Storm Sewer
 - Levee, Dike, or Floodwall
 - OTHER FEATURES**
 - 20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
 - 17.6 Coastal Transect
 - Base Flood Elevation Line (BFE)
 - Limit of Study
 - Jurisdiction Boundary
 - Coastal Transect Baseline
 - Profile Baseline
 - Hydrographic Feature
 - MAP PANELS**
 - Digital Data Available
 - No Digital Data Available
 - Unmapped
- The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards.

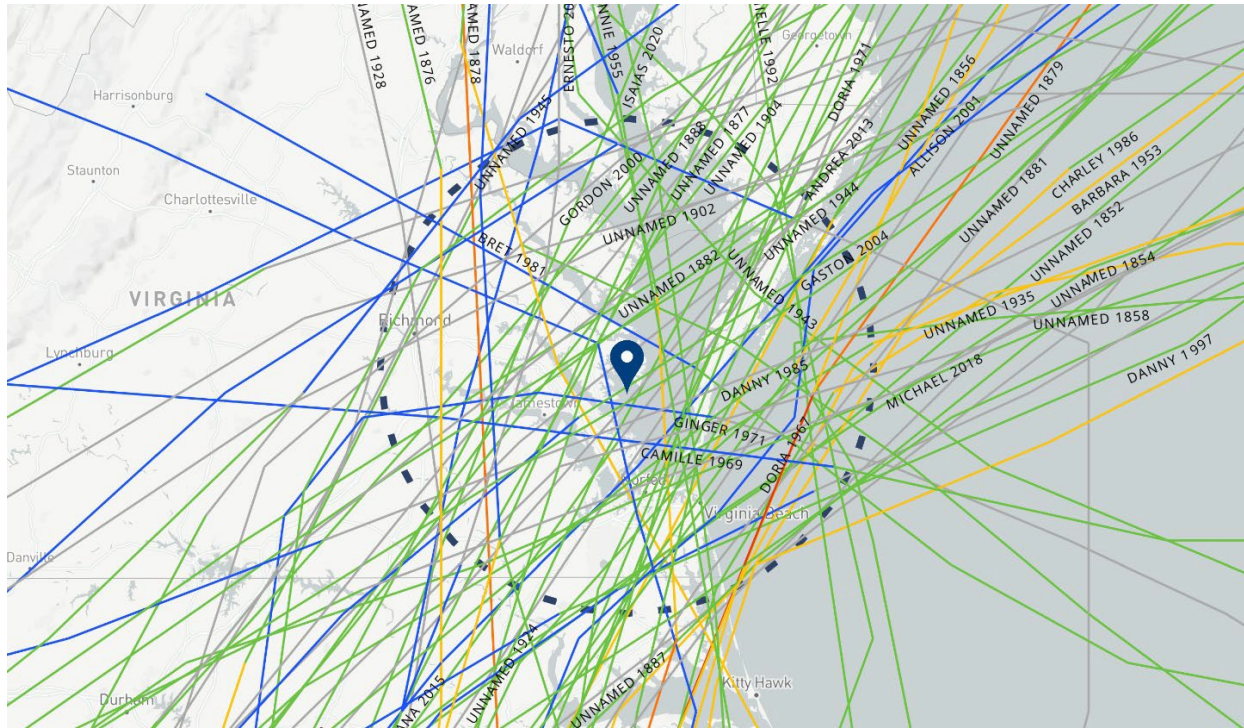
The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 3/27/2022 at 11:06 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

0 250 500 1,000 1,500 2,000 Feet 1:6,000
 Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020
 76°20'48"W 37°23'50"N

Attachment 3: List of historic hurricanes impacting the project area 1851 to present per NOAA.

Hurricane List



Search Filter Criteria

Location: 37.4013787568471, -76.35289892950684 Categories: H5, H4, H3, H2, H1, TS, TD, ET
 Months: ALL Years: ALL
 El Niño-Southern Oscillation (ENSO): ALL Minimum Pressure (mb) below: 1150 Include Unknown
 Pressure Rating: TRUE Buffer Distance: 60
 Buffer Unit: Nautical Miles

STORM NAME	DATE RANGE	MAX WIND SPEED	MIN PRESSURE	MAX CATEGORY
ZETA 2020	Oct 24, 2020 to Oct 30, 2020	100	970	H3

STORM NAME	DATE RANGE	MAX WIND SPEED	MIN PRESSURE	MAX CATEGORY
ISAIAS 2020	Jul 28, 2020 to Aug 05, 2020	80	986	H1
NESTOR 2019	Oct 17, 2019 to Oct 21, 2019	50	996	TS
MICHAEL 2018	Oct 06, 2018 to Oct 15, 2018	140	919	H5
ANA 2015	May 06, 2015 to May 12, 2015	50	998	TS
ANDREA 2013	Jun 05, 2013 to Jun 08, 2013	55	992	TS
IRENE 2011	Aug 21, 2011 to Aug 30, 2011	105	942	H3
HANNA 2008	Aug 28, 2008 to Sep 08, 2008	75	977	H1
ERNESTO 2006	Aug 24, 2006 to Sep 04, 2006	65	985	H1
JEANNE 2004	Sep 13, 2004 to Sep 29, 2004	105	950	H3
IVAN 2004	Sep 02, 2004 to Sep 24, 2004	145	910	H5
GASTON 2004	Aug 27, 2004 to Sep 03, 2004	65	985	H1
CHARLEY 2004	Aug 09, 2004 to Aug 15, 2004	130	941	H4
ALLISON 2001	Jun 05, 2001 to Jun 19, 2001	50	1000	TS
HELENE 2000	Sep 15, 2000 to Sep 25, 2000	60	986	TS
GORDON 2000	Sep 14, 2000 to Sep 21, 2000	70	981	H1
FLOYD 1999	Sep 07, 1999 to Sep 19, 1999	135	921	H4
DANNY 1997	Jul 16, 1997 to Jul 27, 1997	70	984	H1
BERTHA 1996	Jul 05, 1996 to Jul 17, 1996	100	960	H3
DANIELLE 1992	Sep 22, 1992 to Sep 26, 1992	55	1001	TS
CHARLEY 1986	Aug 13, 1986 to Aug 30, 1986	70	980	H1
DANNY 1985	Aug 12, 1985 to Aug 20, 1985	80	987	H1
DEAN 1983	Sep 26, 1983 to Sep 30, 1983	55	999	TS

STORM NAME	DATE RANGE	MAX WIND SPEED	MIN PRESSURE	MAX CATEGORY
BRET 1981	Jun 29, 1981 to Jul 01, 1981	60	996	TS
BOB 1979	Jul 09, 1979 to Jul 16, 1979	65	986	H1
GINGER 1971	Sep 06, 1971 to Oct 05, 1971	95	959	H2
DORIA 1971	Aug 20, 1971 to Aug 29, 1971	55	989	TS
CAMILLE 1969	Aug 14, 1969 to Aug 22, 1969	150	900	H5
DORIA 1967	Sep 04, 1967 to Sep 21, 1967	85	973	H2
UNNAMED 1967	Jun 15, 1967 to Jun 22, 1967	35	1006	TS
UNNAMED 1963	Jun 01, 1963 to Jun 04, 1963	50	1000	TS
UNNAMED 1961	Sep 12, 1961 to Sep 15, 1961	55	995	TS
BRENDA 1960	Jul 27, 1960 to Aug 07, 1960	60	976	TS
CINDY 1959	Jul 04, 1959 to Jul 12, 1959	65	995	H1
UNNAMED 1956	Oct 14, 1956 to Oct 19, 1956	55	996	TS
IONE 1955	Sep 10, 1955 to Sep 27, 1955	120	938	H4
CONNIE 1955	Aug 03, 1955 to Aug 15, 1955	120	944	H4
BARBARA 1953	Aug 11, 1953 to Aug 16, 1953	80	973	H1
UNNAMED 1945	Sep 12, 1945 to Sep 20, 1945	115	949	H4
UNNAMED 1944	Oct 12, 1944 to Oct 24, 1944	125	937	H4
UNNAMED 1944	Jul 30, 1944 to Aug 04, 1944	70	985	H1
UNNAMED 1943	Sep 28, 1943 to Oct 02, 1943	55	997	TS
UNNAMED 1935	Aug 29, 1935 to Sep 10, 1935	160	892	H5
UNNAMED 1934	Sep 01, 1934 to Sep 04, 1934	45	-1	TS
UNNAMED 1933	Aug 13, 1933 to Aug 28, 1933	120	948	H4

STORM NAME	DATE RANGE	MAX WIND SPEED	MIN PRESSURE	MAX CATEGORY
UNNAMED 1929	Sep 19, 1929 to Oct 05, 1929	135	924	H4
UNNAMED 1928	Sep 06, 1928 to Sep 21, 1928	140	929	H5
UNNAMED 1928	Aug 03, 1928 to Aug 13, 1928	90	971	H2
UNNAMED 1924	Sep 27, 1924 to Oct 01, 1924	55	999	TS
UNNAMED 1916	May 13, 1916 to May 18, 1916	40	990	TS
UNNAMED 1907	Jun 24, 1907 to Jun 30, 1907	55	-1	TS
UNNAMED 1904	Sep 08, 1904 to Sep 15, 1904	70	-1	H1
UNNAMED 1902	Oct 03, 1902 to Oct 13, 1902	90	970	H2
UNNAMED 1902	Jun 12, 1902 to Jun 17, 1902	50	-1	TS
UNNAMED 1899	Oct 26, 1899 to Nov 04, 1899	95	-1	H2
UNNAMED 1894	Oct 01, 1894 to Oct 12, 1894	105	-1	H3
UNNAMED 1893	Oct 20, 1893 to Oct 23, 1893	50	-1	TS
UNNAMED 1893	Jun 12, 1893 to Jun 20, 1893	65	-1	H1
UNNAMED 1889	Sep 12, 1889 to Sep 26, 1889	95	-1	H2
UNNAMED 1888	Sep 06, 1888 to Sep 13, 1888	50	999	TS
UNNAMED 1887	Oct 09, 1887 to Oct 22, 1887	75	-1	H1
UNNAMED 1886	Jun 27, 1886 to Jul 02, 1886	85	-1	H2
UNNAMED 1886	Jun 17, 1886 to Jun 24, 1886	85	-1	H2
UNNAMED 1882	Sep 21, 1882 to Sep 24, 1882	50	1005	TS
UNNAMED 1882	Sep 02, 1882 to Sep 13, 1882	110	949	H3
UNNAMED 1881	Sep 07, 1881 to Sep 11, 1881	90	975	H2
UNNAMED 1879	Aug 13, 1879 to Aug 20, 1879	100	971	H3

STORM NAME	DATE RANGE	MAX WIND SPEED	MIN PRESSURE	MAX CATEGORY
UNNAMED 1878	Oct 18, 1878 to Oct 25, 1878	90	963	H2
UNNAMED 1877	Sep 21, 1877 to Oct 05, 1877	100	-1	H3
UNNAMED 1876	Sep 12, 1876 to Sep 19, 1876	100	980	H3
UNNAMED 1874	Sep 25, 1874 to Oct 01, 1874	80	980	H1
UNNAMED 1872	Oct 22, 1872 to Oct 28, 1872	70	-1	H1
UNNAMED 1867	Aug 10, 1867 to Aug 18, 1867	45	-1	TS
UNNAMED 1864	Jul 23, 1864 to Jul 26, 1864	35	-1	TS
UNNAMED 1863	Sep 16, 1863 to Sep 19, 1863	60	-1	TS
UNNAMED 1861	Oct 31, 1861 to Nov 03, 1861	60	992	TS
UNNAMED 1861	Sep 27, 1861 to Sep 28, 1861	70	-1	H1
UNNAMED 1859	Sep 15, 1859 to Sep 18, 1859	70	-1	H1
UNNAMED 1858	Aug 11, 1858 to Aug 20, 1858	45	994	TS
UNNAMED 1856	Aug 19, 1856 to Aug 21, 1856	50	-1	TS
UNNAMED 1854	Sep 10, 1854 to Sep 14, 1854	65	-1	H1
UNNAMED 1854	Sep 07, 1854 to Sep 12, 1854	110	938	H3
UNNAMED 1852	Aug 28, 1852 to Aug 31, 1852	50	-1	TS

Attachment 4: Flood Prevention Project and its Relevance to Other Projects

MPPDC staff have worked throughout the years to understand the policy, research and impacts of flooding (i.e., stormwater, coastal, riverine, sea level rise) and coastal resiliency to the region. Below is a list of projects that have built upon each other over the year that have contributed to our understanding.

Climate Change & Sea Level Rise (2009 to 2012): The MPPDC was funded for a 3 Phase project through the Virginia Coastal Zone Management Program to assess the impacts of climate and sea level rise throughout the region. With over 1,000 miles of linear shoreline, the Middle Peninsula has a substantial amount of coast under direct threat of accelerated climate change and more specifically sea-level. In Phase 1, MPPDC staff assessed the potential anthropogenic and ecological impacts of climate change. Phase 2 focused on the facilitating presentations and develop educational materials about sea level rise and climate change for the public and local elected officials. Finally Phase 3 focused on developing adaptation public policies in response to the assessments.

Phase 1: Middle Peninsula Climate Change Adaptation: Facilitation of Presentations and Discussions of Climate Change Issues with Local Elected Officials and the General Public

Phase 2: Climate Change III: Initiating Adaptation Public Policy Development

Phase 3: Phase 3 Climate Change: Initiating Adaptation Public Policy Development

Emergency Management - Hazard Mitigation Planning (2009 to Present): Since 2009, the Middle Peninsula Planning District Commission has assisted regional localities in meeting the federal mandate to have an adopted local hazard plan. *The Regional All Hazards Mitigation Plan addresses the natural hazards prone to the region, including hurricanes, winter storms, tornadoes, coastal flooding, coastal/shoreline erosion, sea level rise, winter storms, wildfire, riverine flooding, wind, dam failures, drought, lightning, and earthquakes. This plan also consists of a HAZUS assessment of hurricane wind, sea level rise (i.e., Mean High Higher Water and the NOAA 2060 intermediate-high scenario), and flooding (coastal and riverine flooding) that estimates losses from each hazard.* The Middle Peninsula All-Hazard Mitigation Plan Update 2021 is currently being updated. The 2021 All Hazards Mitigation Plan builds off and updates previous mitigation plans.

Land and Water Quality Protection (2014): In light of changing Federal and State regulations associated with Bay clean up-nutrient loading, nutrient goals, clean water, OSDS management, storm water management, TMDLs, etc., staff from the Middle Peninsula Planning District Commission (MPPDC) will develop a rural pilot project which aims to identify pressing coastal issue(s) of local concern related to Bay clean up and new federal and state legislation which ultimately will necessitate local action and local policy development. Staff has identified many cumulative and secondary impacts that have not been researched or discussed within a local public policy venue. Year 1-3 will include the identification of key concerns related to coastal

land use management/water quality and Onsite Sewage Disposal System (OSDS) and community system deployment. Staff will focus on solution based approaches, such as the establishment of a regional sanitary sewer district to manage the temporal deployment of nutrient replacement technology for installed OSDS systems, assessment of land use classifications and taxation implications associated with new state regulations which make all coastal lands developable regardless of environmental conditions; use of aquaculture and other innovative approaches such as nutrient loading offset strategies and economic development drivers.

Department of Conservation and Recreation Stormwater Management (2014): The Virginia General Assembly created a statewide, comprehensive stormwater management program related to construction and post-construction activities (HB1065 - Stormwater Integration). The Virginia Department of Conservation and Recreation requires stormwater management for projects with land disturbances of one acre or more. This new state mandate requires all Virginia communities to adopt and implement stormwater management programs by July 1, 2014, in conjunction with existing erosion and sediment control programs.

Additionally, the communities within the MPPDC are required to address stormwater quality as stipulated by the Chesapeake Bay TMDL Phase II Watershed Implementation Plan and the Virginia Stormwater Regulations. The MPPDC Stormwater Program helped localities develop tools specific to the region necessary to respond to the state mandate requirement for the development of successful stormwater programs.

Stormwater Management-Phase II (2014): MPPDC staff and Draper Aden Associates worked with localities (i.e., Middlesex, King William, and Mathews Counties and the Town of West Point) interested in participating in a Regional Stormwater Management Program. While each locality sought different services from the regional program, this project coordinated efforts, developed regional policies and procedures, and the proper tools to implement a regional VSMP.

Mathews County Rural Ditch Enhancement Study (2015): In contract with Draper Aden Associates, a comprehensive engineering study was developed to provide recommendations and conceptual opinions of probable costs to improve the conveyance of stormwater and water quality through the ditches in Mathews County.

Drainage and Roadside Ditching Authority (2015): This report explored the enabling mechanism in which a Regional Drainage and Roadside Ditching Authority could be developed. An Authority would be responsible for prioritizing ditch improvement needs, partnering with Virginia Department of Transportation (VDOT) to leverage available funding, and ultimately working toward improving the functionality of the region's stormwater conveyance system.

Living Shoreline Incentive Program (2016 to present): In 2011 Virginia legislation was passed designating living shorelines as the preferred alternative for stabilizing Virginia tidal floodplain shorelines. The Virginia Marine Resources Commission, in cooperation with the Virginia

Department of Conservation and Recreation and with technical assistance from the Virginia Institute of Marine Science (VIMS), established and implemented a general permit regulation that authorizes and encourages the use of living shorelines however, no financial incentives were put in place to encourage consumers to choose living shorelines over traditional hardening projects in the Commonwealth. To fill this, need the MPPDC developed the MPPDC Living Shoreline Incentives Program to offer loans and/or grants to private property owners interested in installing living shorelines to stabilize their shoreline.

Currently, loans are available to assist homeowners to install living shorelines on suitable properties. Loans up to \$10,000 can be financed for up to 5 years (60 months). Loans over \$10,000 can be financed for up to 10 years (120 months). Interest is at the published Wall Street Journal Prime rate on the date of loan closing - currently at 5.25% (11/29/18). Minimum loan amount is \$1,000. Maximum determined by income and ability to repay the loan. Finally, there are currently no grants available in this program. Since 2016 under the MPPDC Living Shoreline Revolving Loan program, 8 living shorelines have been financed and built to date encumbering ~\$500,000 in VRA loan funding and ~\$400,000 in NFWF grant funding. Living Shoreline construction cost to date range per job \$14,000- \$180,000. MPPDC oversees all aspects (planning, financing, construction, and loan servicing) of these projects from cradle to grave.

Mathews County Ditch Project - VCPC White Papers (2017): This report investigated the challenges presented by the current issues surrounding the drainage ditch network of Mathews County. The study summarized research conducted in the field; examined the law and problems surrounding the drainage ditches; and proposed some next steps and possible solutions.

Mathews County Ditch Mapping and Database Final Report (2017): This project investigated roadside ditch issues in Mathews County through mapping and research of property deeds to document ownership of ditches and outfalls. This aided in understanding the needed maintenance of failing ditches and the design of a framework for a database to house information on failing ditches to assist in the prioritization of maintenance needs.

Virginia Stormwater Nuisance Law Guidance (2018): This report was developed by the Virginia Coastal Policy Center to understand the ability of a downstream recipient of stormwater flooding to bring a claim under Virginia law against an upstream party, particularly a nuisance claim. The report summarizes how Virginia courts determine stormwater flooding liability between two private parties.

Oyster Bag Sill Construction and Monitoring at Two Sites in Chesapeake Bay (2018): VIMS Shoreline Studies Program worked with the PAA to (1) install oyster bag sills as shore protection at two PAA sites with the goal of determining effective construction techniques and placement guidelines for Chesapeake Bay shorelines and (2) assess the effectiveness for shore protection with oyster bags on private property through time.

Fight the Flood Program (2020): The Fight the Flood was launched in 2020 to connect property

owners to contractors who can help them protect their property from rising flood waters. FTF also offers a variety of financial tools to fund these projects including but limited to the Septic Repair revolving loan program, Living Shoreline incentives revolving loan fund program, and plant insurance for living shorelines.