

Coastal Virginia CRS Workgroup July 2021 Meeting

COASTAL VIRGINIA COMMUNITY RATING SYSTEM WORKGROUP



WORKING TOGETHER FOR A STRONGER VIRGINIA



WETLANDS
WATCH



UPDATES / ANNOUNCEMENTS

WORKGROUP MEETING INTRODUCTIONS (in person)

Zoom manners

2021 Meeting Dates

Wednesday, September 29, 10AM-Noon (zoom only)

Wednesday, November 17, 10AM-Noon (in person & zoom - James Room)

Wednesday, January 26, 10AM-Noon (in person & zoom - James Room)

Wednesday, March 30, 10AM-Noon (in person & zoom - James Room)

Wednesday, May 25, 10AM-Noon (in person & zoom - James Room)

CFM CECs

July 2020 – 1 CEC

September 2020 – 1.5 CEC

November 2020 – 1.5 CEC

January 2021 – 1.5 CEC

March 2021 – 1.5 CEC



WETLANDS
WATCH

WWW.WETLANDSWATCH.ORG



POLL

CECs - POLL



WETLANDS
WATCH

WWW.WETLANDSWATCH.ORG



VA FLOODPLAIN MANAGEMENT ASSOCIATION - 2021 MEMBERSHIP CALL



Individual Memberships (\$25.00)

- Networking Opportunities
- Training and Workshops
- Membership Directory
- Quarterly Newsletters

Corporate Memberships (\$150.00)

- Same access as Individual Members
- Includes 7 members (1 membership free – \$25 discount)
- Company logo on the VFMA website

[Link to membership page](#)



WETLANDS
WATCH

WWW.WETLANDSWATCH.ORG



ISO VIRGINIA REPRESENTATIVE

Emily Schmidt

ISO/CRS Specialist

emily.schmidt@verisk.com



WETLANDS
WATCH

WWW.WETLANDSWATCH.ORG



VA DCR FLOODPLAIN STAFF

New Staff

Brandy Buford

brandy.buford@dcr.virginia.gov

Michael Barber

michael.barber@dcr.virginia.gov



WETLANDS
WATCH

WWW.WETLANDSWATCH.ORG



VA COASTAL RESILIENCE MASTER PLAN

The VA Coastal Resilience Master Plan [outreach](#) push is underway. The state is holding these meetings at the Coastal PDCs/RCs and created this [survey](#) for stakeholders to voice their concerns about coastal flooding.

[George Washington RC](#) - July 27th, 6:00 - 8:00 PM

[Richmond PlanRVA](#) - July 28th, 6:00 - 8:00 PM

[Crater PDC](#) - July 29th, 6:00 - 8:00 PM

[Middle Peninsula PDC](#) - August 3rd, 6:00 - 8:00 PM

[Northern Neck PDC](#) - August 4th, 6:00 - 8:00 PM

[Hampton Roads PDC](#) - August 5th, 6:00 - 8:00 PM

[Northern Virginia RC](#) - August 10th, 6:00 - 8:00 PM

[Accomack-Northampton PDC](#) - August 11th, 6:00-8:00 PM



WETLANDS
WATCH

WWW.WETLANDSWATCH.ORG



VA COMMUNITY FLOOD PREPAREDNESS FUND

Anyone planning to apply?

Status of local flood resilience plans?



WETLANDS
WATCH

WWW.WETLANDSWATCH.ORG



MISC. CRS/NFIP TRAINING

NFIP Risk Rating 2.0 Training - [July](#) & [August](#)

[BRIC & FMA Webinar Series](#)

[CRS Training Webinars](#)

EMI NFIP Classes Back in Person



WETLANDS
WATCH

WWW.WETLANDSWATCH.ORG



LOCAL CFM EXAM - SE VA

CFM Exam – Chesapeake, VA

Hosted by the HRPDC, coordinated and proctored by Ben McFarlane

Update on date?



WETLANDS
WATCH

WWW.WETLANDSWATCH.ORG



HAMPTON ROADS GET FLOOD FLUENT RACK CARD UPDATE

Ben McFarlane & Ashley Gordon: HRPDC



WETLANDS
WATCH

WWW.WETLANDSWATCH.ORG





GET FLOOD FLUENT

FLOOD INSURANCE OUTREACH UPDATES

COASTAL Virginia CRS Workgroup
July 28, 2021

HRSD BILL MESSAGES

Regional Message

Don't wait until a storm approaches. Fill up on the facts about the growing risk of flooding in Hampton Roads at www.getfloodfluent.org. Learn about flood insurance and important steps you can take to protect your property.

Want a unique message for your locality?

247 characters (including spaces)

Email to Ben McFarlane (bmcfarlane@hrpdcva.gov) by COB 7/30/21.

Existing Rack Card CRS Outreach Categories

- Know Your Flood Hazard
- Insure Your Property

- Revising Rack Card to Cover all 6 Categories

FILL UP ON FLOOD FACTS

Think you know your risks?
Think you're covered for flooding?
Be sure you know...

THE FACTS

/// **FLOODS ARE THE MOST COMMON NATURAL HAZARDS.**

Ninety percent of all natural disasters in the U.S. involve some type of flooding.

/// **ANYWHERE IT CAN RAIN, IT CAN FLOOD.**

It's true; rain causes flooding in Hampton Roads. Over the past 70 years, heavy rainfall events have become more intense and frequent in our area and will only continue to increase.

/// **HOMEOWNERS AND RENTERS INSURANCE POLICIES DO NOT COVER FLOOD DAMAGE.**

Damage resulting from flooding must typically be insured by a separate policy.

These are a few of the simple, indisputable facts about the growing chances for flooding and why you need to contact your insurance agent about flood insurance.

TIME TO ACT!

WHY DO I NEED FLOOD INSURANCE?

/// **ONE INCH OF FLOODING CAN COST MORE THAN \$25,000.**

One inch of water inside the home could cause over \$23,000 in damages and more than \$3,000 in personal property costs on average.

/// **LOW-RISK DOES NOT MEAN NO-RISK.**

More than one in five claims to the National Flood Insurance Program in South Hampton Roads have been for properties outside of high-risk flood zones. Flood insurance can offer you some peace of mind.

/// **YOU NEED TO PROTECT YOURSELF AS OUR FLOOD RISKS CONTINUE TO GROW.**

In Hampton Roads, uninsured residents impacted by Hurricane Matthew received around \$4,000 in assistance from FEMA whereas those with flood insurance received an average of \$35,000.



Get a quick estimate of what your flood insurance rate might be.

[GetFloodFluent.org/calculator](https://www.getfloodfluent.org/calculator)

GETFLOODFLUENT.ORG is a regional outreach campaign spearheaded by the 17 localities of the Hampton Roads Planning District Commission to encourage area residents to purchase flood insurance.

TO FIND OUT HOW TO GET COVERAGE, contact your insurance agent or the National Flood Insurance Program's Help Center at 1-800-427-4661.

GET
FLOOD
FLUENT.ORG

NEW CONTENT SIDE 1

Know Your Flood Hazard

For more information about the flood hazard for your property, visit <https://getfloodfluent.org/what-do-i-need-to-know-about-flood-insurance/#What-FloodRisk>.

Insure Your Property

TO FIND OUT HOW TO GET COVERAGE, contact your insurance agent or the FEMA Mapping and Insurance eXchange (FMIX) at 877-336-2627. There is typically a 30-day waiting period. TIME TO ACT!

NEW CONTENT SIDE 2

Build Responsibly

BUILD SMART. Always work with a licensed contractor and get the proper permits for your project. Elevate new or existing structures, and be sure your new structure does not impede the drainage flow of your property or increase flooding on neighboring properties

Protect Natural Floodplain Functions

Build outside the flood risk area if you can to protect your property and keep wetlands undisturbed – they protect natural floodplain functions and habitats.

NEW CONTENT SIDE 2

Protect Your Property from the Hazard

PLAN AHEAD. There are actions you can take now to protect from future flood events. Install flood vents and elevate critical systems, such as HVAC compressors. Store your valuables and documents in waterproof containers off the ground.

Protect People from the Hazard

TURN AROUND, DON'T DROWN. A mere 6 inches of fast-moving flood water can knock over an adult while just 12 inches of rushing water can carry away most cars. It is NEVER safe to walk or drive into flood waters.

QUESTIONS?

Ashley Gordon

agordon@hrpdcva.gov

Ben McFarlane

bmcfarlane@hrpdcva.gov

FILL UP ON FLOOD FACTS

Think you know your risks?

Think you're covered for flooding?

Be sure you know...

THE FACTS

/// ANYWHERE IT CAN RAIN, IT CAN FLOOD.

It's true; rain causes flooding in Hampton Roads. Over the past 70 years, heavy rainfall events have become more intense and frequent in our area and will only continue to increase.

/// ONE INCH OF FLOODING CAN COST MORE THAN \$25,000.

One inch of water inside the home could cause over \$23,000 in damages and more than \$3,000 personal property costs on average.

/// HOMEOWNERS AND RENTERS INSURANCE POLICIES DO NOT COVER FLOOD DAMAGE.

Damage resulting from flooding must typically be insured by a separate policy.

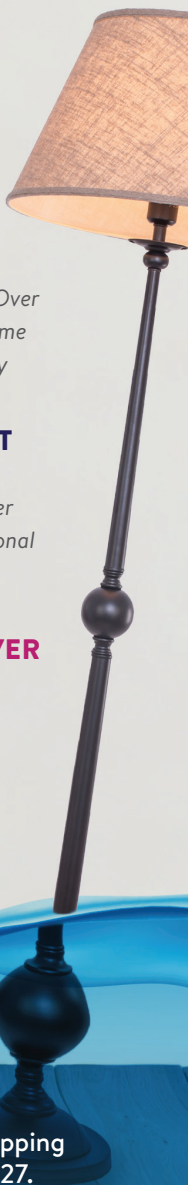
For more information about the flood hazard for your property, visit:

[GetFloodFluent.org/What-Flood-Risk](https://www.getfloodfluent.org/what-flood-risk)

TO FIND OUT HOW TO GET COVERAGE:

Contact your insurance agent or the FEMA Mapping and Insurance eXchange (FMIX) at 877-336-2627.

There is typically a 30-day waiting period. **TIME TO ACT!**



HOW DO I PROTECT MY HOME AND PROPERTY?

/// BUILD SMART.

Always work with a licensed contractor and get the proper permits for your project. Elevate new or existing structures, and be sure your new structure does not impede the drainage flow of your property or increase flooding on neighboring properties. Build outside the flood risk area if you can to protect your property and keep wetlands undisturbed – they protect natural floodplain functions and habitats.

/// PLAN AHEAD.

There are actions you can take now to protect from future flood events. Install flood vents and elevate critical systems, such as HVAC compressors. Store your valuables and documents in waterproof containers off the ground. And last but not least, get flood insurance!

HOW DO I STAY SAFE?


/// TURN AROUND, DON'T DROWN.

A mere 6 inches of fast-moving flood water can knock over an adult while just 12 inches of rushing water can carry away most cars. It is NEVER safe to walk or drive into flood waters.

For more flood preparedness tips, visit:

[GetFloodFluent.org/How-Do-I-Get-Flood-Insurance](https://www.getfloodfluent.org/How-Do-I-Get-Flood-Insurance)

GETFLOODFLUENT.ORG is a regional outreach campaign spearheaded by the 17 localities of the Hampton Roads Planning District Commission to encourage area residents to purchase flood insurance.



POLL

Get FloodFluent Rack Card Poll



WETLANDS
WATCH

WWW.WETLANDSWATCH.ORG



2018 USBC LOW FLOOR INSPECTIONS

2018 USBC added a low floor inspection/elevation documentation requirement for all buildings in SFHA (section 113.3.2 in VCC & [VRC](#))

- Inspection of foundation systems during phases of construction necessary to assure compliance with this code.

Activity 430 (RA3): Regulations Administration,
Detailed inspections (RA3): Credit is for conducting three detailed inspections for each new building in the regulatory floodplain. Figure 430-4 explains what is needed for this credit. There is no partial credit for two inspections or for doing less than what is listed

- Localities been doing this for a long time?
- Do we need to borrow documentation for others?



WETLANDS
WATCH

WWW.WETLANDSWATCH.ORG



PRESENTATION: VA INSTITUTE OF MARINE SCIENCE



Karen Duhring
Marine Scientist
Center for Coastal Resources Management

karend@vims.edu
(804) 684-7159



WWW.WETLANDSWATCH.ORG



Nature-Based Solutions for Tidal Flooding Mitigation

Virginia CRS Workgroup

July 28, 2021

Karen Duhring

Coastal Scientist

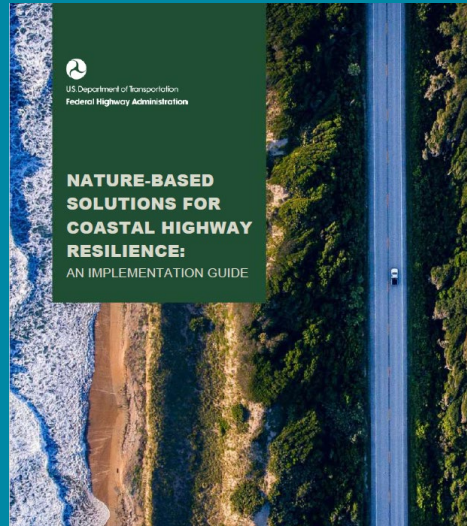
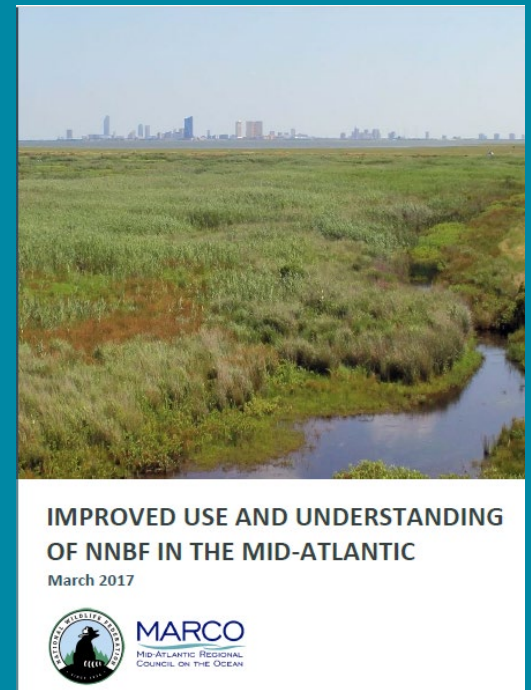
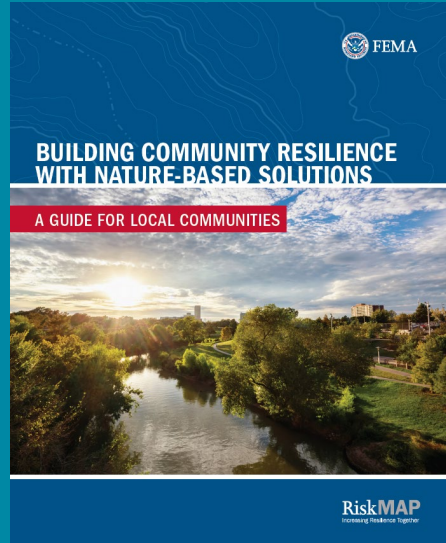




Nature-Based Solutions for Tidal Flooding Mitigation

1. Nature-Based Flood Mitigation
2. NNBF Project Summary
3. Products & Tools
 - AdaptVA map viewer
 - Fact Sheets
 - Locality Summaries

“Communities that invest in nature-based approaches to reducing disaster risk can save money, lives, and property in the long-term AND improve quality of life in the short term.” FEMA



Coming Soon - Summer
2021
International Guidelines
on Natural and Nature-
Based Features for
Flood Risk Management



Nature-Based Solutions

also known as Natural & Nature-Based Features
NNBFs

Natural Features evolve over time through processes operating in nature

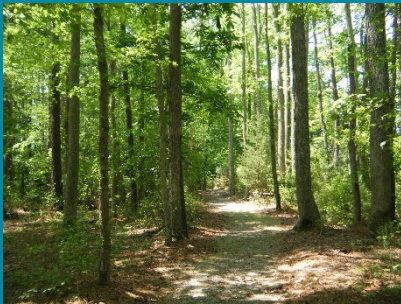
Nature-Based Features are created by human design, engineering and construction for specific services such as coastal hazard risk reduction

Natural Features

in coastal areas

UPLANDS

Forests & Trees



Scrub - Shrub



Beaches & Dunes



WETLANDS

Forested Wetlands



Scrub-Shrub Wetlands



Non-Tidal Marshes



Tidal Marshes



Various floodwater interactions and mitigation
based on elevations & vegetation types

Other Natural Features *in coastal areas*

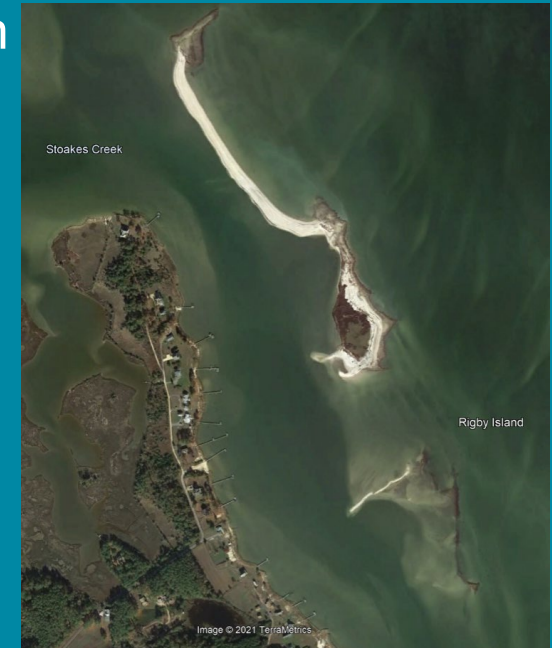
Oyster Reefs



Submerged Aquatic Vegetation



Barrier Islands



Provide multiple benefits
Less opportunity to mitigate flooding due to location

Nature-Based Features

in coastal areas

Engineered features that mimic & restore coastal habitats

Living Shorelines

Non-Structural



Hybrid with structures



Stream & Wetland Restoration



NNBF Flood Mitigation Services

Intercept & slowly release rainfall

Floodwater storage

Pervious soils for infiltration

Storm surge barriers

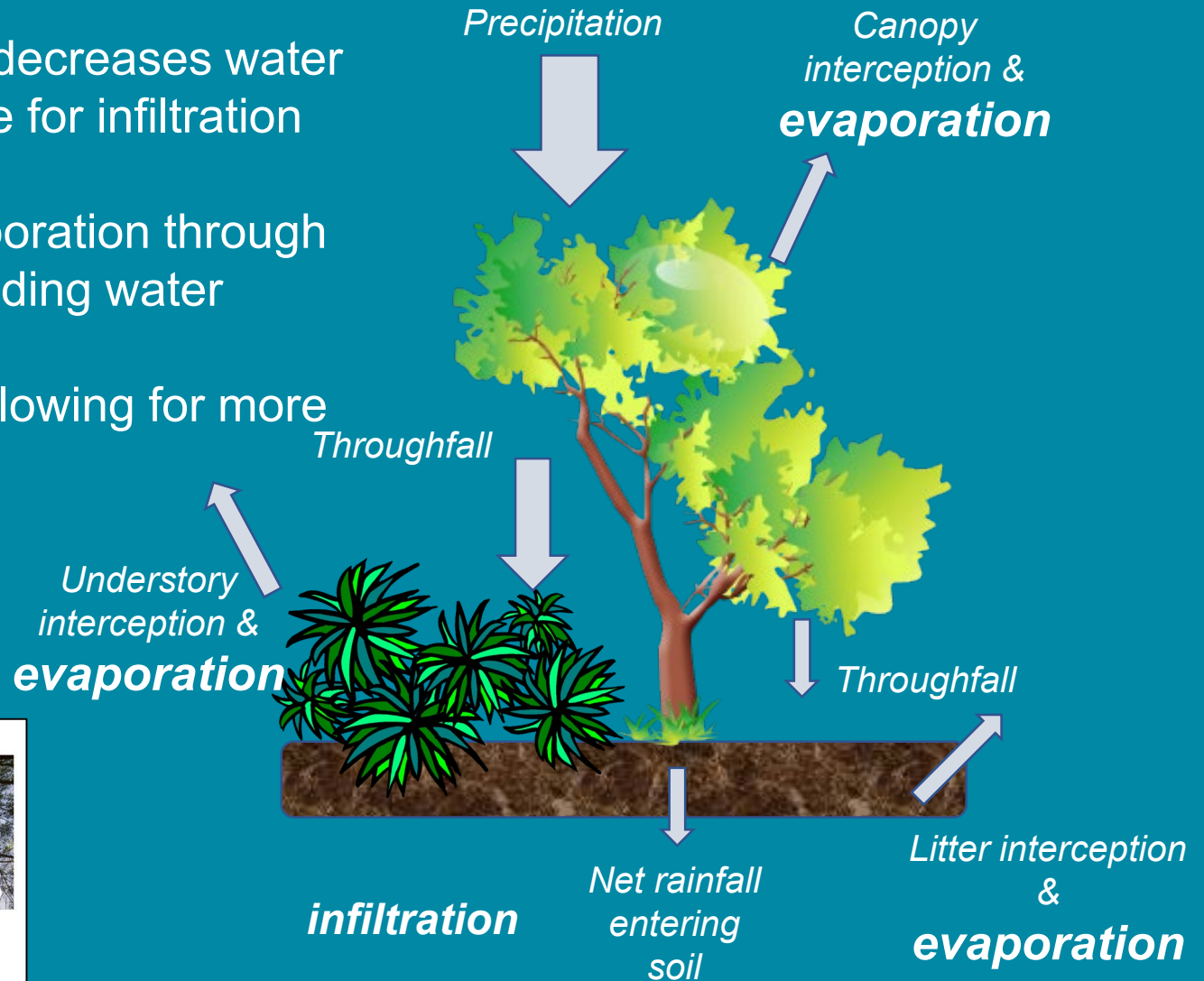
Rough surfaces - stem density *decreases flow rate & energy*

Water Storage & Flooding Moderation

Surface roughness decreases water velocity to allow time for infiltration

Plant uptake & evaporation through leaves reduces standing water

Plants loosen soil allowing for more infiltration

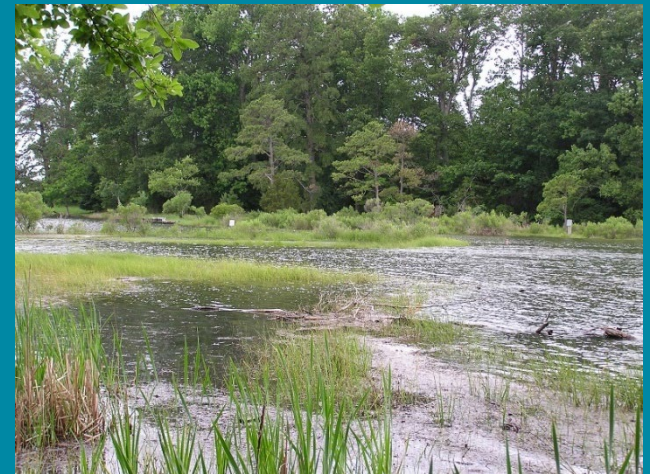


Floodwater & Wave Energy Reduction

Rough surfaces slow down velocity & reduce wave height

Plant stem density provides rough surfaces

Sand & soil provide physical barriers



NNBF Connections & Corridors

Elevation Gradient



Beach – Wetland – Forest
Combinations

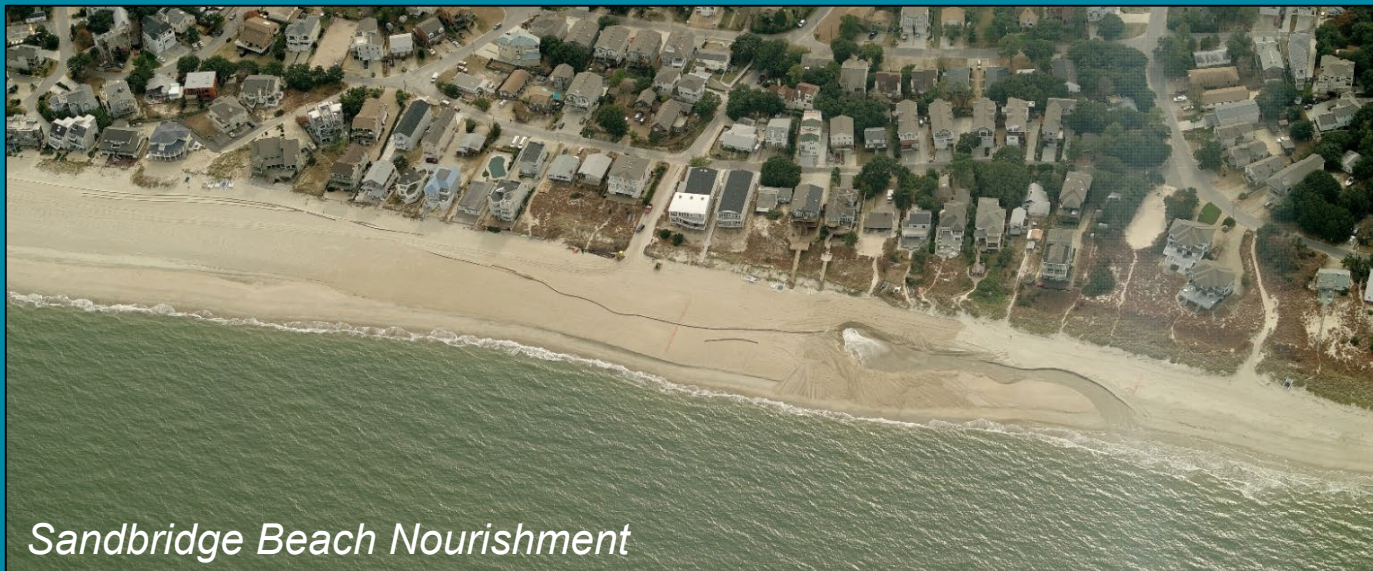
Integrated Vegetation

More opportunity
for flood mitigation



NNBF Connections & Corridors

Across Landscape



Natural & Nature-Based Features Project

NOAA Coastal Resilience grant project

Map existing natural and nature-based features and buildings

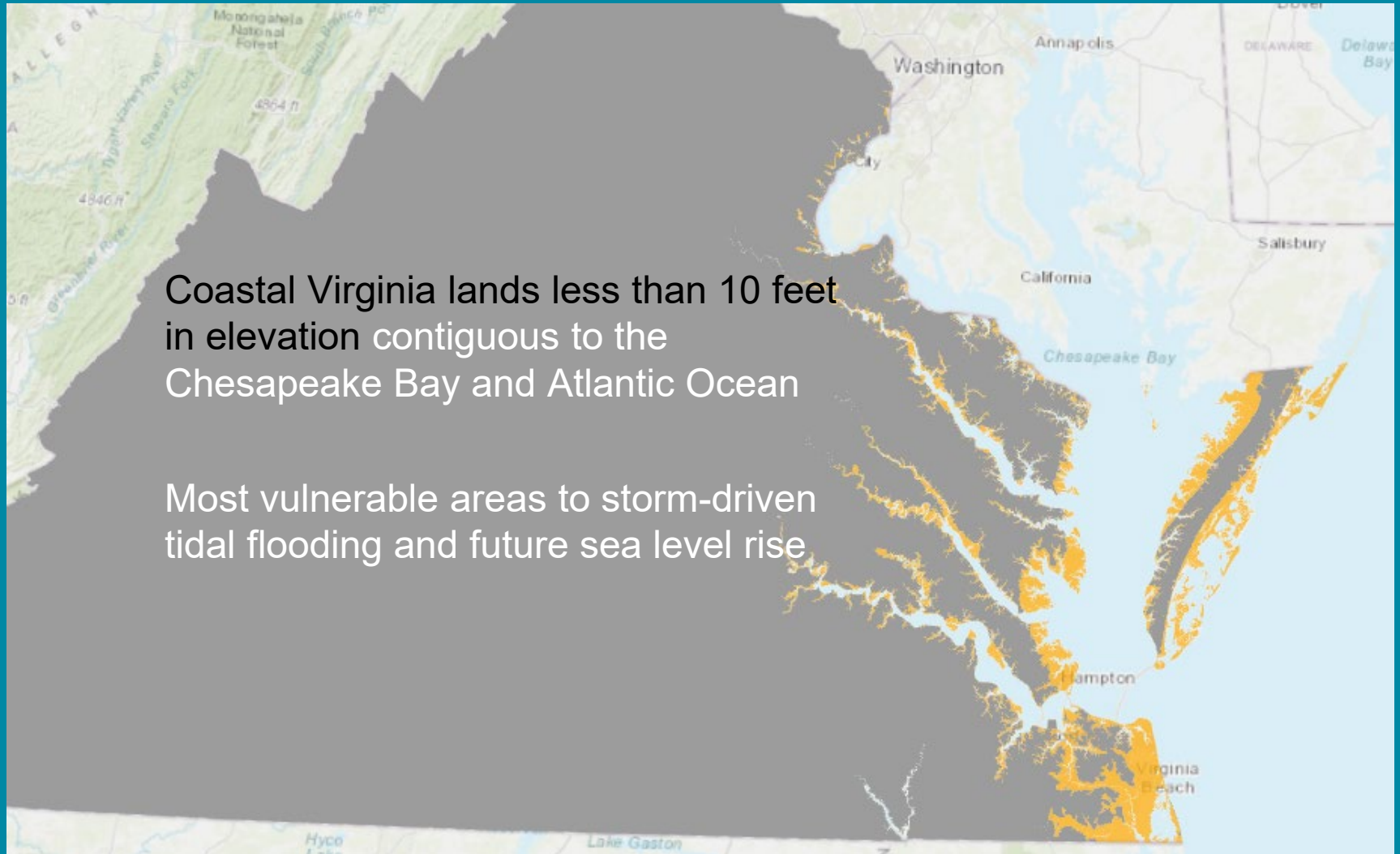
less than 10 feet elevation in the coastal zone

Identify and rank existing NNBFs with multiple benefits

Identify NNBF target areas to improve tidal flooding resilience



Project Study Area



Map Existing Building Locations less than 10 feet land elevation

Coastal Buildings



~170,000

primary buildings

Virginia Buildings Footprint
(2017)




USGS National Structures
(2018)

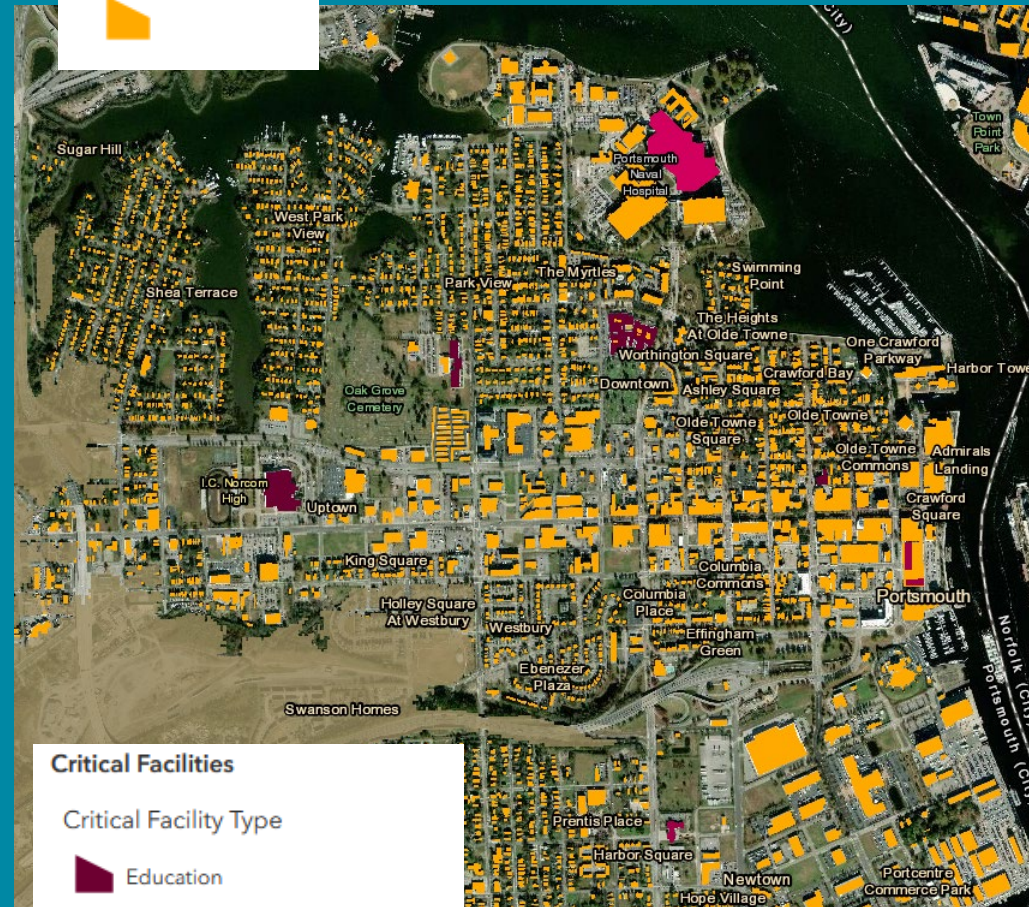
Footprints > 870 square feet

Lowest floor elevation may be > 10 ft

Critical Facilities

Critical Facility Type

-  Education
-  Emergency Response and Law Enforcement
-  Health and Medical



Map Existing NNBFs

▼ Natural Features



Forests & Trees – Upland areas covered by trees greater than 20 feet tall



Scrub-Shrub – Upland areas covered by woody vegetation less than 20 feet tall



Beaches & Dunes – Sandy areas next to tidal waters



Forested Wetlands – Tidal and non-tidal wetlands covered by trees greater than 20 feet tall



Scrub-Shrub Wetlands – Non-tidal wetland areas covered by woody vegetation less than 20 feet tall



Non-Tidal Marsh – Non-tidal wetland area covered by herbaceous plants



Tidal Marsh – Wetland area in tidal waters covered by herbaceous plants or shrubs

Map Existing NNBFs

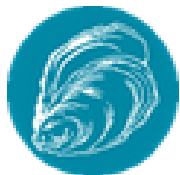
▼ Nature-Based Features: Hybrid Living Shorelines



Marsh Sills – Low-profile stone structures to maintain tidal marshes



Offshore Breakwaters – Large gapped structures offshore to maintain beaches & dunes



Oyster Sills – Low-profile reef structures for wave attenuation

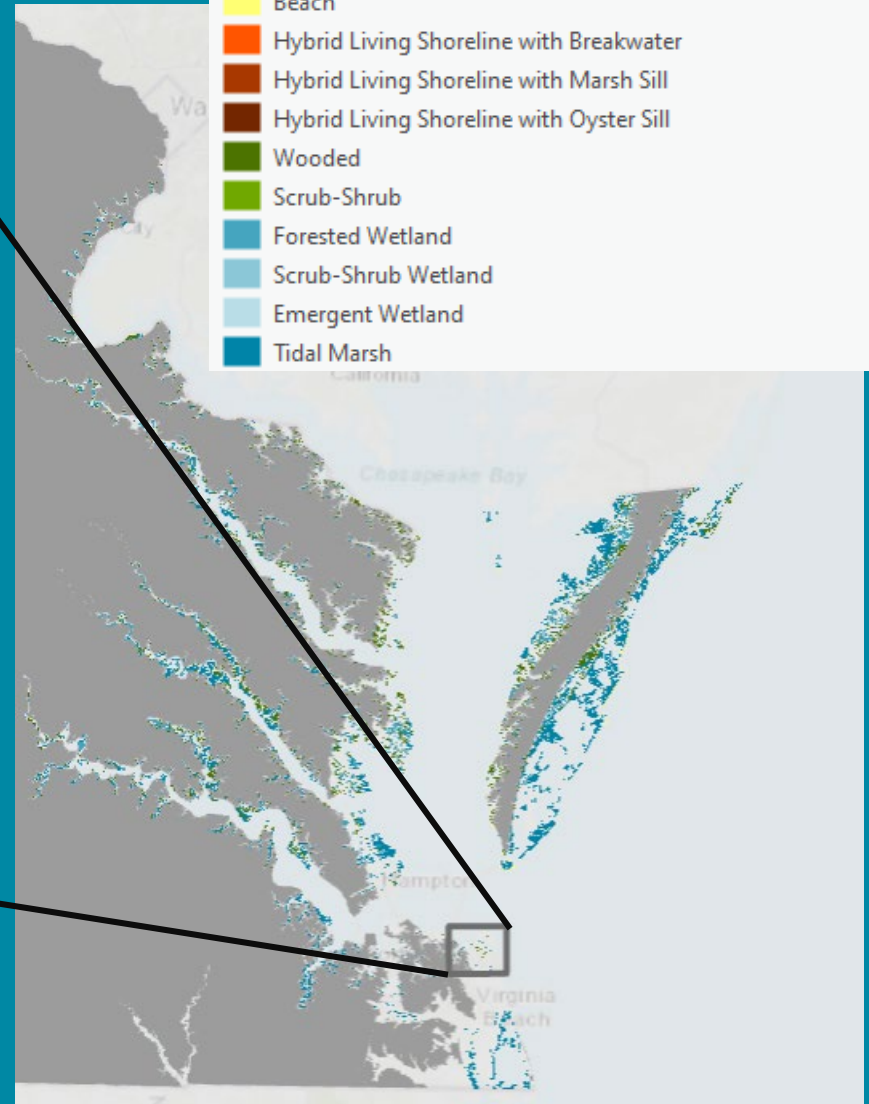
Map Existing NNBFs

~ 350,000 NNBFs
in study area



Natural and Nature-Based Features at less than 10 feet in elevation

- Dune
- Beach
- Hybrid Living Shoreline with Breakwater
- Hybrid Living Shoreline with Marsh Sill
- Hybrid Living Shoreline with Oyster Sill
- Wooded
- Scrub-Shrub
- Forested Wetland
- Scrub-Shrub Wetland
- Emergent Wetland
- Tidal Marsh





NNBF Ranking

How many benefits?

1. Tidal flooding mitigation potential
2. Number of buildings the NNBF benefits
3. Critical facilities that benefit from the NNBF
4. Can the NNBF be used to take advantage of existing programmatic incentives?

Each NNBF ranked high, medium, or low for each of these 4 components

Programmatic Incentives

FEMA Community Rating System (CRS) credits

Located in Special Flood Hazard Area + some type of protection

Particularly 100-ft RPA Buffer under local Chesapeake Bay Preservation Act ordinances

Water quality/TMDL credit potential

Nitrogen, Phosphorus, Total Suspended Sediment reductions from vegetation

Turf & agriculture conversion to NNBF

FEMA Community Rating System (CRS) Credit Potential

Any existing NNBF without impervious cover not already conserved in public lands or conservation easement

+




Overlaps both FEMA zones A or V & 100-foot RPA buffer

+

Wetlands within FEMA flood zones A or V

NNBF Ranking

Ranking of Benefits Provided




-  Most Benefits
-  Many Benefits
-  Some Benefits

Highest ranking NNBFs provide more flooding mitigation to more buildings AND potentially used for incentive programs



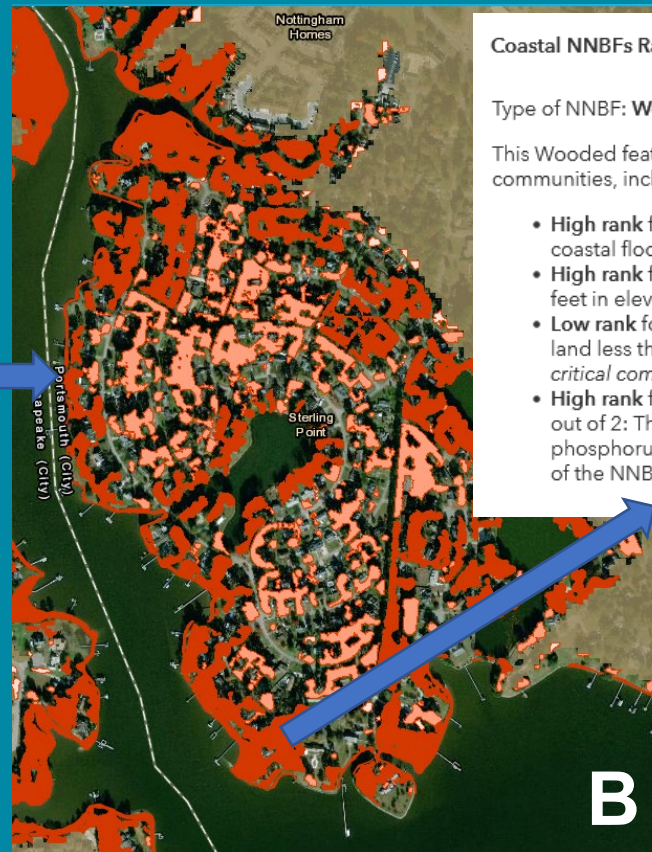
NNBF Ranking

Ranking of Benefits Provided

-  Most Benefits
-  Many Benefits
-  Some Benefits

A. NNBF features by type

B. NNBF features by ranking



Coastal NNBFs Ranked: Benefits to Coastal Buildings

Type of NNBF: **Wooded** [Fact Sheet](#) (opens in a new tab)

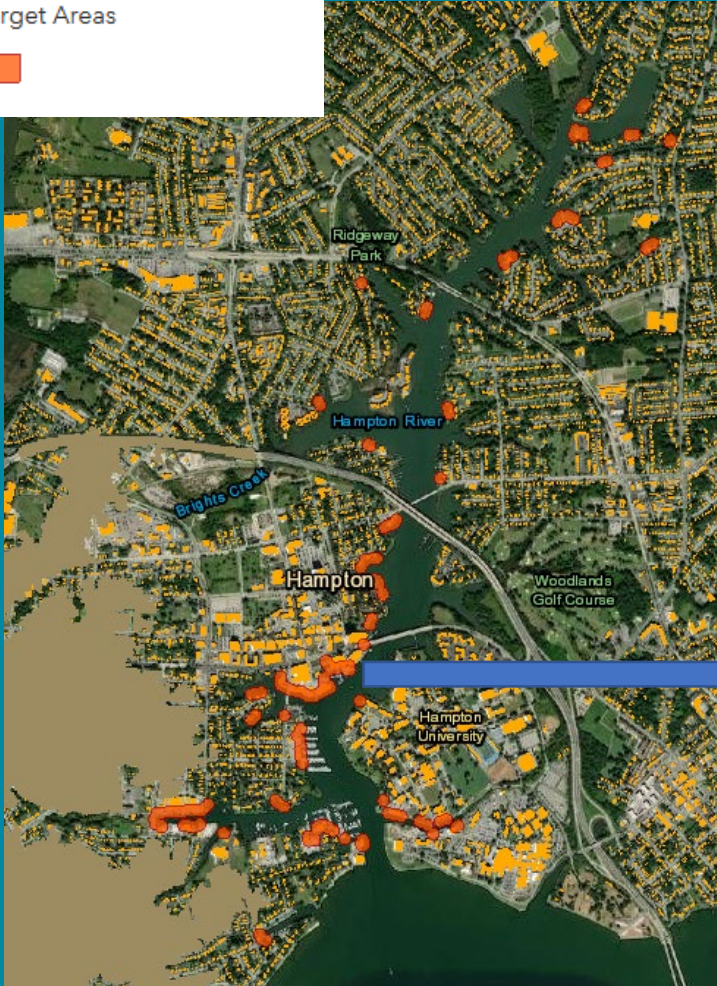
This Wooded feature provides the **Most Benefits** to buildings and communities, including:

- **High rank** for the natural capacity of NNBF to mitigate coastal flooding
- **High rank** for the number of buildings on land less than 10 feet in elevation that the NNBF benefits (*10 buildings*)
- **Low rank** for the number of critical community facilities on land less than 10 feet in elevation that the NNBF benefits (*0 critical community facilities*)
- **High rank** for the NNBF to be used for incentive programs (2 out of 2: The NNBF has water quality benefit of nitrogen, phosphorus, and/or sediment reduction, and all or a portion of the NNBF has potential to earn credit in the CRS Program.)


Identify Target Areas for NNBF Improvements

Target Areas: Create/Restore shoreline NNBFs to benefit coastal buildings

Target Areas



Shoreline areas where NNBF benefits are absent for vulnerable buildings

Target Areas: Create/Restore shoreline NNBFs to benefit coastal buildings 

Total 208 building(s) will benefit
Including 78 building(s) with no other benefit from NNBFs

Potential NNBF Restoration Options

Convert Existing Land Cover:

Impervious
Turf Grass

Expand Adjacent Existing NNBFs:

[Tidal Marsh](#), [Wooded](#)
(pdf links open in a new tab)

NNBF Erosion Control Recommendation (SMM v. 5.1)

Highly Modified Area. Seek expert advice.
[Click here for more information](#)

Shoreline Structure Enhancements

Add natural features to existing structures: Bulkhead, Marina, Unconventional, Wharf.

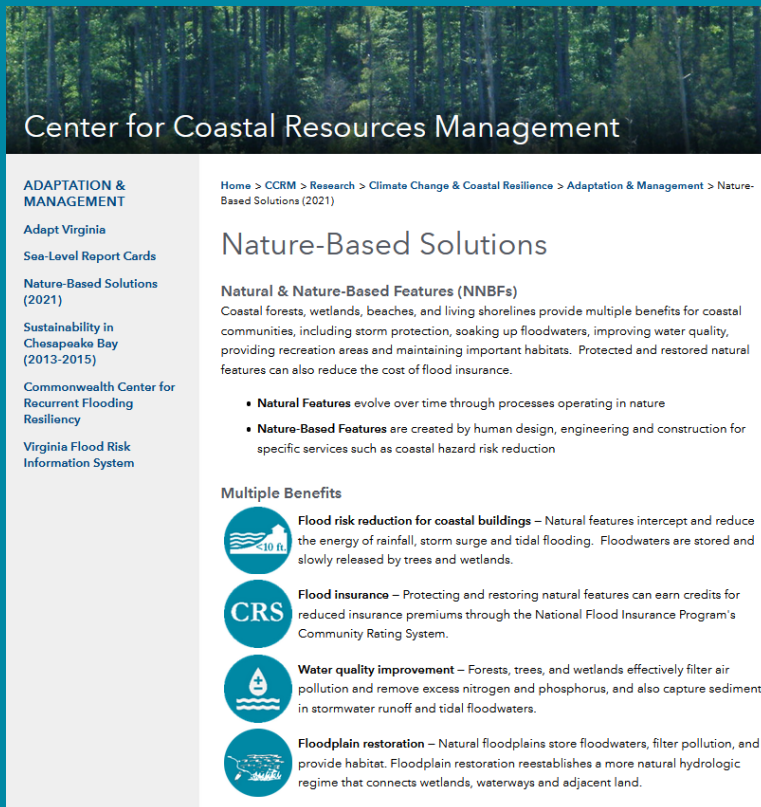
NNBF Project Products & Tools

New Web Site

www.vims.edu/ccrm/nbf

New AdaptVA Maps

Adaptva.org



Center for Coastal Resources Management

ADAPTATION & MANAGEMENT

Adapt Virginia

Sea-Level Report Cards

Nature-Based Solutions (2021)

Sustainability in Chesapeake Bay (2013-2015)

Commonwealth Center for Recurrent Flooding Resiliency

Virginia Flood Risk Information System





Home > CCRM > Research > Climate Change & Coastal Resilience > Adaptation & Management > Nature-Based Solutions (2021)

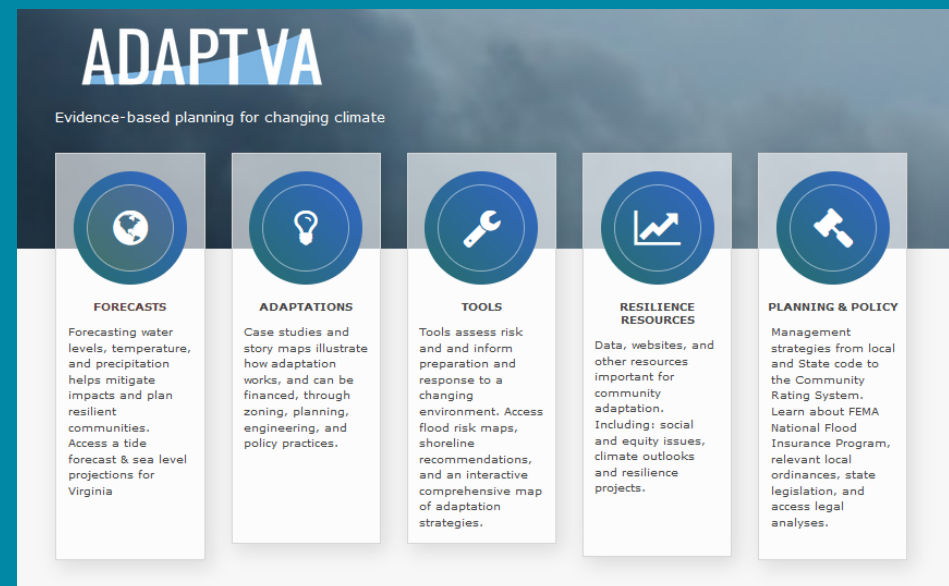
Nature-Based Solutions

Natural & Nature-Based Features (NNBFs)
Coastal forests, wetlands, beaches, and living shorelines provide multiple benefits for coastal communities, including storm protection, soaking up floodwaters, improving water quality, providing recreation areas and maintaining important habitats. Protected and restored natural features can also reduce the cost of flood insurance.

- **Natural Features** evolve over time through processes operating in nature
- **Nature-Based Features** are created by human design, engineering and construction for specific services such as coastal hazard risk reduction



Multiple Benefits

-  **Flood risk reduction for coastal buildings** – Natural features intercept and reduce the energy of rainfall, storm surge and tidal flooding. Floodwaters are stored and slowly released by trees and wetlands.
-  **Flood insurance** – Protecting and restoring natural features can earn credits for reduced insurance premiums through the National Flood Insurance Program's Community Rating System.
-  **Water quality improvement** – Forests, trees, and wetlands effectively filter air pollution and remove excess nitrogen and phosphorus, and also capture sediment in stormwater runoff and tidal floodwaters.
-  **Floodplain restoration** – Natural floodplains store floodwaters, filter pollution, and provide habitat. Floodplain restoration reestablishes a more natural hydrologic regime that connects wetlands, waterways and adjacent land.




ADAPTVA

Evidence-based planning for changing climate

- **FORECASTS**
Forecasting water levels, temperature, and precipitation helps mitigate impacts and plan resilient communities. Access a tide forecast & sea level projections for Virginia
- **ADAPTATIONS**
Case studies and story maps illustrate how adaptation works, and can be financed, through zoning, planning, engineering, and policy practices.
- **TOOLS**
Tools assess risk and inform preparation and response to a changing environment. Access flood risk maps, shoreline recommendations, and an interactive comprehensive map of adaptation strategies.
- **RESILIENCE RESOURCES**
Data, websites, and other resources important for community adaptation. Including: social and equity issues, climate outlooks and resilience projects.
- **PLANNING & POLICY**
Management strategies from local and State code to the Community Rating System. Learn about FEMA National Flood Insurance Program, relevant local ordinances, state legislation, and access legal analyses.

Nature-Based Solutions Web Site NNBF Fact Sheets

Natural & Nature-Based Features Forests & Woodlands



Description

Forests and wooded areas are covered by upland trees more than 20 feet tall. Most coastal plain upland forests are heavily altered with a mix of native and introduced tree species. Large intact forests are generally limited to conservation lands and military installations in coastal Virginia. Forests and woodlands provide storm and flood mitigation, cleaner water, economic gains, and cultural traditions as ecosystem service benefits.

Multiple Benefits

- Intercept & slowly release rainfall
- Absorb & store floodwaters
- Reduce bank erosion
- Intercept air pollution
- Regulate stream & air temperatures
- Carbon storage
- Recreation & tourism


Forest Restoration Tips

- Protect intact forests & connect forest patches
- Convert riparian buffer turf & impervious areas to forest
- Choose native trees similar to local forests
- Provide layers of plant height between tree canopy & ground
- Allow leaves & sticks to remain for healthy soil & infiltration
- Remove & control invasive plants
- Consult with arborist about tree health & care


Resources

[A Guide for Forestry Practices in the Chesapeake TMDL](#)
[VA Cooperatives Extension Buffers Fact Sheet](#)

Learn More www.vims.edu/ccm/nnbf



Natural & Nature-Based Features Living Shorelines: Oyster Sills



Description

Hybrid living shorelines combine organic features with structures to support wide tidal marshes and beaches. Oyster sills combine natural and planted tidal marshes with low elevation reef structures that support the growth of shellfish and filter-feeders. Oyster sills are suitable where natural oyster productivity is high, existing marshes have eroding edges, and where minor natural bank erosion is present despite marsh vegetation. Research has shown that hybrid living shorelines and the habitats they support provide cleaner water, economic gains, and cultural traditions as ecosystem service benefits.

Multiple Benefits

- Increase tidal habitat diversity
- Dissipate energy of incoming waves
- Flood storage
- Nitrogen, phosphorus & sediment capture
- Seafood production


Oyster Sill Restoration Tips

- Average salinity should always be above 10 ppt
- Locate normal & extreme tide elevations on land, present & future scenarios
- Make sure construction & future maintenance access is feasible
- Choose wetland plants based on local salinity average
- Plant low & high marsh, expect plant changes over time
- Reserve adjacent land slope for future tidal marsh location
- Perform periodic inspections & maintenance, like remove trash
- Add thin-layer fill over time to maintain marsh elevations

Resources

[Living Shoreline Shellfish Beds](#)
[Living Shorelines: Marshes and Oysters Story Map](#)

Learn More www.vims.edu/ccm/nnbf



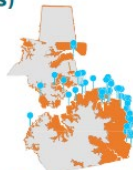
Description of natural feature
Benefits provided by it
Restoration tips
Links to additional resources
Potential CRS & water quality credit information

Nature-Based Solutions Web Site Locality Summary Reports *in progress*

COASTAL RESILIENCE SUMMARY CITY OF PORTSMOUTH, VIRGINIA

Natural and Nature-Based Features (NNBFs)

Forests, trees, wetlands, beaches, and living shorelines benefit communities by reducing storm wave energy, soaking up floodwaters, improving water quality, providing areas for recreation, creating habitats for important plants and animals, and even lowering flood insurance costs. These Natural and Nature-Based Features (NNBFs) have been mapped for areas that are less than 10-feet in elevation, experience tidal and storm flooding, and include buildings at risk. *(All numbers are approximate.)*



MAP: City of Portsmouth coastal areas less than 10-ft elevation, with targets for new NNBFs

NNBFs in City of Portsmouth Coastal Areas

1,664 acres All Coastal NNBFs, including:

	1,054 acres	Wooded
	464 acres	Tidal Marsh
	52 acres	Forested Wetland
	42 acres	Emergent Wetland
	>1 miles	Hybrid Living Shorelines

Visit www.AdaptVA.org to view all coastal NNBFs

Coastal Area Facts

for areas less than 10-ft elevation

37% of locality area (8,005 acres)

10,651 coastal buildings

10 critical facilities

431 coastal buildings without NNBF benefits

49 targets for new NNBFs

Benefits of NNBFs in City of Portsmouth

	1,055 acres	of NNBFs that decrease flooding risks for buildings
	1,596 acres	of NNBFs that improve water quality by reducing sediment, nitrogen, and phosphorus
	294 acres	of NNBFs potentially eligible for FEMA Community Rating System credits (100-ft RPA buffers and wetlands located within 100-year flood zones)

Chesapeake Bay RPA 100-ft Buffer Overview

across all of City of Portsmouth

878 acres of RPA buffer

209 acres of RPA buffer currently turfgrass that is potentially eligible for water quality credits if converted into NNBF



To learn more: www.vims.edu/ccrm/nbf

NNBFs identified below 10-foot land elevation

Benefits of protecting and increasing NNBFs

Information about what's at risk

AdaptVA Portal & Map Viewer

ADAPTVA

Evidence-based planning for changing climate



FORECASTS

Forecasting water levels, temperature, and precipitation helps mitigate impacts and plan resilient communities. Access a tide forecast & sea level projections for Virginia



ADAPTATIONS

Case studies and story maps illustrate how adaptation works, and can be financed, through zoning, planning, engineering, and policy practices.



TOOLS

Tools assess risk and inform preparation and response to a changing environment. Access flood risk maps, shoreline recommendations, and an interactive comprehensive map of adaptation strategies.



RESILIENCE RESOURCES

Data, websites, and other resources important for community adaptation. Including: social and equity issues, climate outlooks and resilience projects.



PLANNING & POLICY

Management strategies from local and State code to the Community Rating System. Learn about FEMA National Flood Insurance Program, relevant local ordinances, state legislation, and access legal analyses.

AdaptVA.org > Tools > AdaptVA Interactive Map

The screenshot shows the 'Tools' page on AdaptVA.org. At the top, there is a navigation bar with links for FORECASTS, ADAPTATIONS, TOOLS, RESILIENCE RESOURCES, and PLANNING & POLICY. The main heading is 'Tools' with the subtitle 'Evidence-based planning for changing climate'. Below this, there are five tool cards:

- TOOLS** (wrench icon): TOOLS are available to help assess risk and vulnerability to climate impacts, build community resiliency against extreme events, and provide guidance to prepare and respond to a changing environment.
- FLOOD RISK** (hurricane icon): Floods are among the most frequent and costly natural disasters in terms of human hardship and economic loss. Learn more about flooding and floodplains in maps, models, documents and websites. Includes buttons for 'Virginia's Flood Risk Information System' and 'Locality Road Flood Tool'.
- SHORELINE MANAGEMENT** (waves icon): What is the best management strategy for your shoreline? Includes a 'Learn more' button.
- ADAPTVA INTERACTIVE MAP** (map icon): View water levels, social vulnerability, infrastructure and natural capital in one viewer. Includes a 'Launch Viewer' button, which is highlighted with a red box in the screenshot.

AdaptVA Interactive Map

Sea Level Rise / Flooding / Storm Surge

Infrastructure

Natural Resources

Sea Level Rise/Flooding/Storm Surge [Close]

- ▶ Sea Level Rise (mean high water) ...
- ▼ Flooding ⓘ
 - Limit of Moderate Wave Action (LiMWA) ⓘ
 - Flood Hazard Zones (FHZ) ...
 - ⓘ Layer information
 - ^ Increase opacity
 - v Decrease opacity
- Coastal Barrier Resource System ⓘ
- ▶ Storm Surge ...

Infrastructure [Close]

- ▶ General Infrastructure ⓘ
- ▼ Infrastructure at less than 10 feet land elevation
 - Critical Facilities ⓘ
 - Coastal Buildings ⓘ

Natural Resources [Close]

- ▼ Natural and Nature-Based Features (NNBFs) less than 10 feet land elevation
- ▼ Existing Living Shoreline Projects (all types) ⓘ
 - Beach Nourishment ...
 - Hybrid: Breakwater ⓘ
 - Hybrid: Marsh Sill ⓘ
 - Hybrid: Oyster Sill ⓘ
 - Marsh Plantings ...
- Dunes ⓘ
- Beaches ...
- Tidal Marshes ...
- ▶ Wetlands (less than 10 feet land elevation) ⓘ
 - Upland Wooded Areas ...
 - Upland Scrub-shrub ...

AdaptVA Interactive Map

Shoreline Management

Shoreline Management

- Shoreline Management Model
- Existing Structures
- Resource Protection Area (RPA) 100-foot Buffer for Chesapeake Bay
 - Pervious SFHA Area in 100-ft Buffer
 - Pervious Area in RPA 100-ft Buffer
 - All Buffer

Legend

Resource Protection Area (RPA)
100-foot Buffer for Chesapeake
Bay

Pervious SFHA Area in 100-ft
Buffer

- Open Space
- Turfgrass
- Agriculture

Pervious SFHA Area in 100-ft Buffer

This layer does not represent a jurisdictional boundary and should not be used for legal purposes.

This layer depicts pervious land cover (all natural cover, turfgrass, and agricultural lands) within both the FEMA Special Hazard Flood Area (SFHA) and the Chesapeake Bay Resource Protection Area (RPA) 100-ft buffer for coastal Virginia localities.

Data Sources: FEMA; VGIN Land Cover Dataset (2016); Individual Localities; for localities without existing GIS data: CCRM Tidal Marsh Inventory, National Wetlands Inventory, National Hydrography Dataset

AdaptVA Interactive Map

Protection / Restoration Opportunities

Protection/Restoration

- Restoration Opportunities
- Lands for Protection
 - Coastal NNBFs Ranked: Benefits to Coastal Buildings

Legend

Lands for Protection

Coastal NNBFs Ranked: Benefits to Coastal Buildings

NNBF Ranked

- Most Benefits
- Many Benefits
- Some Benefits

Layer Information

Coastal NNBFs Ranked: Benefits to Coastal Buildings

The layer displays Natural and Nature-Based Features (NNBFs) located on lands that are generally less than 10 feet in elevation in the coastal zone ranked by their benefits provided to buildings and localities.

NNBFs were categorized into three groups: Some Benefits, Many Benefits, and the Most Benefits provided. Rankings are based on a characterization of four components: tidal flooding mitigation, how many buildings the NNBF benefits, if there are any critical facilities that the NNBF benefits, and if the NNBF can be used to take advantage of existing programmatic incentives (e.g., FEMA CRS Open Space credits).

AdaptVA Interactive Map

Protection / Restoration Opportunities

Protection/Restoration

- Restoration Opportunities
 - Target Areas: Create/Restore shoreline NNBFs to benefit coastal buildings
 - Living Shorelines: Suitable Areas for Marsh Ranked for Co-Benefits

Target Areas: Create/Restore shoreline NNBFs to benefit coastal buildings

Target Areas



Layer Information

Target Areas: Create/Restore shoreline NNBFs to benefit coastal buildings

This layer consists of target areas where the future creation or enhancement of NNBFs could add benefits to vulnerable buildings. Target areas were identified along shoreline locations where buildings with no other NNBF benefits are located.

Data Source: CCRM

Restoration Opportunities

Living Shorelines: Suitable Areas for Marsh Ranked for Co-Benefits

Rank of Benefits Provided



Most Benefits Provided



Many Benefits Provided



Some Benefits Provided

Layer Information

Living Shorelines: Suitable Areas for Marsh Ranked for Co-Benefits

This layer contains only those areas determined to be suitable for non-structural plant marsh or plant marsh with sill recommendations (determined by the Shoreline Management Model (SMM)). These areas are ranked for potential co-benefits provided using a scoring method that considers nutrient removal potential, benefits provided to coastal buildings, the potential for the project to provide habitat continuity and enhancement, and the potential for the project to add resilience for socially vulnerable communities.

Data Source: CCRM

AdaptVA Interactive Map

Protection / Restoration Opportunities

Protection/Restoration

Restoration Opportunities

Target Areas: Create/Restore shoreline NNBFs to benefit coastal buildings

Target Areas: Create/Restore shoreline NNBFs to benefit coastal buildings

Total 24 building(s) will benefit
Including 12 building(s) with no other benefit from NNBFs

Potential NNBF Restoration Options

Convert Existing Land Cover:

Impervious
Turf Grass

Expand Adjacent Existing NNBFs:

Wooded

(pdf link opens in a new tab)

Natural & Nature-Based Features Forests & Woodlands



Description

Forests and wooded areas are covered by upland trees more than 20 feet tall. Most coastal plain upland forests are heavily altered with a mix of native and introduced tree species. Large intact forests are generally limited to conservation lands and military installations in coastal Virginia. Forests and woodlands provide storm and flood mitigation, cleaner water, economic gains, and cultural traditions as ecosystem service benefits.

Multiple Benefits

- * Intercept & slowly release rainfall
- * Absorb & store floodwaters
- * Reduce bank erosion
- * Intercept air pollution
- * Regulate stream & air temperatures
- * Carbon storage
- * Recreation & tourism

Forest Restoration Tips

- * Protect intact forests & connect forest patches
- * Convert riparian buffer turf & impervious areas to forest
- * Choose native trees similar to local forests
- * Provide layers of plant height between tree canopy & ground
- * Allow leaves & sticks to remain for healthy soil & infiltration
- * Remove & control invasive plants
- * Consult with arborist about tree health & care

Resources

- [A Guide for Forestry Practices in the Chesapeake TMDL](#)
- [VA Cooperative Extension Buffers Fact Sheet](#)



Water Quality BMPs

Ag Forest Buffers
Ag Forest Buffers w/ Exclusion Fencing
Ag Tree Planting
Urban Tree Planting
Urban Forest Buffers
Tree Planting - Canopy
Urban Forest Planting
Forest Conservation
Dry Swale



CRS Community Rating System Credit Potential

Wooded Areas in Special Flood Hazard Areas

Wooded areas do not typically earn credit in the CRS Program, unless the area shares space with features that could earn CRS credit.

For example, if the wooded area is located within a tidal marsh, then it could potentially earn credits under **Activity 420: Open Space Preservation, Natural Functions Open Space, & Natural Shoreline Protection**.

Learn More www.vims.edu/ccrm/nnbf





CRS Open Space Preservation Applications

- Locate beneficial NNBF features & corridors for multiple buildings
- Locate Natural Functions Open Space parcels within corridors
- Identify open space areas subject to regulations
- Gather supporting information
 - Submit to FEMA & DCR
 - Limit development encroachment into open spaces
- Update local flood resilience plans, natural areas inventory, green infrastructure plans, open space corridor plans
- Programs for Public Information outreach materials

Questions?

Contact Info
Karen Duhring
karend@vims.edu



Acknowledgements:
Pam Mason & Jess Hendricks,
CCRM

VIMS PRESENTATION POLL

POLL!



WETLANDS
WATCH

WWW.WETLANDSWATCH.ORG



WORKGROUP MEMBER/ATTENDEE REPORT OUTS

Time for Workgroup members/attendees to bring up any news, questions, or future meeting topics to the group.



WETLANDS
WATCH

WWW.WETLANDSWATCH.ORG



THANKS!

Ross Weaver
Mary-Carson Stiff

Wetlands Watch
ross.weaver@wetlandswatch.org
mc.stiff@wetlandswatch.org



WETLANDS
WATCH

WWW.WETLANDSWATCH.ORG

