

# DRAFT PRE-DECISIONAL DOCUMENT

## Virginia Coastal Resources Master Plan

### PROJECT IDENTIFICATION

### PROJECT CLASSIFICATION SCHEMA and PROJECT FIELDS

#### Draft Memorandum

Revised, June 2, 2021

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## Summary

This document provides a project classification schema, as well as initial definitions and database field descriptions for the Coastal Resources Master Plan (CRMP) Projects Database.

Key Sections for Reviewers:

- **Project Classification Schema** – this section presents an overview of the initial CRMP project classification schema.
- **Project Data Attributes** – this section presents the data fields needed to describe and evaluate projects for the purposes of the CRMP, including both required and optional fields.

## Project Classification Schema

The project classification schema was created based on an iteration of content provided by the CRMP Technical Advisory Committee (TAC), which was, in part, based on the Texas Coastal Master Plan. The schema has four levels of hierarchy 1) Project Category 1) Project Class, 2) Project Type, and 3) Project Subtype, as discussed below and shown in Table 1 and Table 2:

**Project Category** – the highest level of grouping projects defined as follows:

- **Physical Projects:** These projects involve assessing, designing, constructing, and maintaining a physical environment, including both natural and nature-based and structural approaches – as shown in Table 1.
- **Capacity Building:** These projects encompass initiatives at the locality, planning jurisdiction, or statewide level such as training, planning, and policymaking – as shown in Table 2.

**Project Class** – the second highest level of grouping projects defined as follows:

- **Natural and Nature-Based Approaches:** Natural features along waterways can reduce the impacts of erosion and flooding in inland areas, while also providing additional economic, environmental, and social benefits. Natural and Nature-Based Approaches projects focus on protecting or restoring features that occur naturally in the landscape, or engineering and constructing features to mimic natural conditions. Examples include beach and dune restoration, habitat creation and restoration, land acquisition, and nature-based shoreline stabilization.
- **Community Capacity Building:** Recognition of future hazards and resilience planning is a process in which all coastal communities should engage. While there are excellent examples in Virginia, many communities have not had the resources to understand and identify resilience needs. Capacity Building projects include financial programs, resilience planning activities, policies and standards, staffing, public education and outreach, training, data collection and management, studies, and grant application development.
- **Structural Approaches:** Engineered flood risk reduction strategies can include the protection of individual assets or the blocking of flood pathways, preventing coastal or riverine floodwaters from passing into inland areas. Structural Approaches include permanent or deployable flood defense systems, as well as retrofit or relocation strategies for built infrastructure for which protection is not practical.

**Project Type** and **Project Subtype** – see Table 1 and Table 2 for Project Type and Project Subtype groupings and definitions. Projects may have multiple applicable types and subtypes.

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## Project Data Attributes

This document provides initial data field definitions and descriptions for the CRMP Projects Database. The fields are presented in sub-sections, dividing the information into:

- **Required Fields** – project attributes the CRMP consultant team believes are essential to best achieve the objectives of the CRMP by November 2021.
- **Optional Fields** – project attributes the CRMP consultant team believes is desirable and would help achieve improved outcomes for the long-term objectives of the CRMP.
- **Populated Fields** – project attributes the CRMP can populated on the back end once all of the required and optional fields are collected. Data contributors need not provide these fields.

The list of required and optional fields below are grouped by Project Category.

### All Projects

#### Required Fields

**Project Name** – a short unique title for the project.

**Contributor Name, Contributor Email, Contributor Phone Number** – the Contributor is a person familiar with the project planning who can answer questions. Typically an employee of or agent for the project owner.

**Project Owner** - the locality, agency, entity, or person that will be responsible for implementing the project, regardless of land ownership. If a locality will implement the project, the owner is the locality. If a government agency will implement the project, it is the government agency. If a commercial business or private citizen will implement the project, the owner is the commercial business or private citizen.

**Project Description** – a brief description of the purpose, need, and/or benefits of the project.

**Project Class** – the most applicable class as defined above.

- *Community Capacity Building*
- *Natural and Nature-Based Approaches*
- *Structural Approaches*

**Project Type and Project Subtype** – defined in Table 1. The most appropriate type and subtype, although each project can have multiple types, and subtypes. The optional fields can hold additional types or subtypes.

**Funding Status** – the amount the owner has available for matching and application costs.

#### Optional Fields

**Project Owner Classification** – refer to the Project Owner definition above:

- *Commonwealth of Virginia*
- *Federal-Military*
- *Federal-Non-Military*
- *Industrial/Commercial*
- *Locality*
- *Non-Profit Organization/Non-Governmental Organization*
- *Private*
- *Tribal*
- *Trust*

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**Estimated Project Start Date** – the estimated start date for spending on this project, including planning, engineering, and permitting lead time.

**Estimated Project Completion Date** – the estimated completion date for the project (when the project will be implemented or constructed and is fully functional).

**Information Link** – an Internet URL (webpage address) where interested parties can read more online about the project. This link could lead to a webpage, PDF report, ArcGIS online story map, or similar resource.

**Special Consideration Notes** - clarifying information or context about the extent of project benefits. This field may be blank if there is no need for clarification. Examples of additional information or special considerations include:

- Has the community the project is located in had a major disaster under Stafford Act in the last seven years?
- What is the community's Creditworthiness?
- Is the project community or project owner considered a Disadvantaged Community or Applicant?
- Does the project involve beneficial use of dredged materials?
- Water quality benefits - 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?

## Populated Fields

**NFIP Community** – is the project is located within a National Flood Insurance Policy (NFIP) community?

- *Yes, the project is located within an NFIP community*
- *No, the project is not located within an NFIP community.*

**CRS Community** – is the project located within a FEMA Community Rating System (CRS) community?

- *Yes, the project is located within a CRS community.*
- *No, the project is not located within a CRS community.*

**SFHA Area** – is the project is located within a Special Flood Hazard Area (SFHA)?

- *Yes, the project is located within a SFHA*
- *No, the project is not located within a SFHA.*

**Baseline Screening (Primary)** – does the project pass the Primary Baseline Screening?

- *Yes, the project passes.*
- *No, the project does not pass.*

**Baseline Screening (Secondary)** – does the project pass the Secondary Baseline Screening?

- *Yes, the project passes.*
- *No, the project does not pass.*

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## Physical Projects

### Required Fields

**Project Footprint** – the geographic footprint of a project, in a polygon GIS shapefile format.

**Project Scale** – the scale of the project:

- *Large-Scale Project* – the project is located in more than one community, locality, more region.
- *Pilot or Demonstration Project* – the project is located in an individual community, locality, or region, but is needed demonstrate the innovative design approach for transferability to broader, large-scale implementation in the future.
- *Individual Project* – the project is located in an individual community, locality, or region.

**Project Status** – the current (2021) status of the project:

- *Proposed* – the project has been identified as a need through a planning process that address coastal resilience (e.g. Resilience Plan, Comprehensive Plan, Hazard Mitigation Plan), but has not yet been formally initiated.
- *Site Assessment and Preliminary Design* - Projects in this phase involve activities required to lay the groundwork for successful implementation. These activities may include evaluation of potential project sites, assessing alternatives, assessing project benefits/adverse impacts, identifying and addressing barriers to moving to the final design and implementation phases, gathering baseline data, conducting cost-benefit analyses, and selectin the most appropriate solution for a site, and preparing preliminary project designs that allow a community to make a “go/no-go” decision on the project.
- *Final Design and Permitting* - Projects in this phase involve advancing conceptual or preliminary designs into final designs and engineering plans, developing detailed cost estimates, engaging the community, preparing permitting applications, and other related tasks to position projects for implementation.
- *Construction* - Projects in this phase involve active implementation (e.g. construction).
- *Post-Construction Monitoring* – Projects in this phase have completed construction and involve monitoring efforts to track project success.

**Total Implementation Cost** – the total estimate of all planning, engineering, permitting, mitigation, and construction costs. This cost represents the total financial commitment by the Project Owner to proceed from initial project conception to ribbon cutting. The total implementation cost does not include estimated annual operations and maintenance costs. Additional cost breakdowns may be provided as optional fields.

**Design Life** – the expected design/service life of the project (in years from 2021):

- < 20 years (2021 - 2040)
- 20 – 40 years (2041 – 2060)
- > 40 years (2061 and beyond)
- Not applicable

**Resilience Considerations** – the standards account for future increases in flooding:

- *CRMP SLR Scenario standards (defined as the NOAA 2017 Intermediate-High sea level rise projection);*
- *Local Standards that are more conservative than CRMP SLR Scenario standards;*
- *Local Standards that are less conservative than CRMP SLR Scenario standards;* or
- *No consideration of conditions.*

### Optional Fields

**Planning, Engineering and Permitting Cost** – the estimated cost for planning, engineering, and permitting, in 2021 dollars. This value typically will be a fraction of the Total Implementation Cost. The Planning, Engineering, and Permitting Cost plus the Construction Implementation Cost plus the Easement Land Cost should not exceed the Total Implementation Cost.

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**Construction Implementation Cost** – the estimated cost of construction or implementation, in 2021 dollars. This value will typically be a fraction of the Total Implementation Cost. The Planning, Engineering, and Permitting Cost plus the Construction Implementation Cost plus the Easement Land Cost should not exceed the Total Implementation Cost.

**Average Annual O&M Cost** – the estimated average annual operations and maintenance cost for the project, in 2021 dollars. This value is separate from the other cost information presented above. It is NOT a portion of the Total Implementation Cost.

**Permitting Status** – the current (2021) status of required permitting:

- *Project does not require permits*
- *Permits Obtained*
- *Permit Applications Submitted*
- *Permitting Activities Underway*
- *Permitting Activities Have Not Started*

**Project Benefits (Shoreline Length)** – the estimated number of miles of shoreline that would benefit from the implemented project. Examples include:

- Beach and Dune Restoration – the number of miles of beach or dune restored.
- Hydrologic Connectivity - the number of stream miles opened or restored for reconnection.
- Seawall/Levee - the length of protected shoreline.

**Project Benefits (Area)** – the estimated total number of acres that would benefit from the project. Examples include:

- Habitat Creation and Restoration - the number of acres of habitat restored or created.
- Area protected by a seawall or levee

**Project Benefits (Population)** – the estimated total number of people who will benefit from the project. Examples include:

- Road Replacement - the estimated population who will benefit from the infrastructure improvement. For example, the number of residents who will benefit from improved annual average daily traffic of the new road.
- Flood/Shoreline Risk Reduction Structures - the estimated population within the geographic extent of benefits.

**Project Benefits (Critical Assets)** – the estimated number of critical facilities that are within the geographic extent of benefits. A critical facility is defined by the State Hazard Mitigation Plan as: "Any facility or building that (1) is essential to maintain emergency response actions, (2) provides lifeline services (e.g., shelters, potable water supplies, health facilities), (3) is essential to maintain public safety (e.g., police and fire stations), (4) may cause devastating financial or safety conditions if shut down for more than one week (e.g., an evacuation route), (5) houses irreplaceable items, records, equipment, or research, (6) houses a special population that requires particular social services on site not needed by the general public (e.g., prisons, nursing home, and advanced care facilities), or (7) has a special historic or other character."

## Populated Fields

**Evaluation Scoring Results (Criteria 1A)** – how many points did the project receive for evaluation Criterion 1.A: Resilient Design Criteria?

- *Lowest; 0 Points*
- *Medium; 5 Points*
- *High; 7 Points*
- *Highest; 10 Points*

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**Evaluation Scoring Results (Criteria 1B)** – how many points did the project receive for evaluation Criterion 1.B: Nature-Based Approaches)?

- *No; 0 points*
- *Yes; 10 Points*

**Evaluation Scoring Results (Criteria 1C)** – how many points did the project receive for evaluation Criterion 1.C: Flood Reduction Potential?

- *Lowest; 3 Points*
- *Medium; 5 Points*
- *High; 7 Points*
- *Highest; 10 Points*

**Evaluation Scoring Results (Criteria 2A)** – how many points did the project receive for evaluation Criterion 2.A: Project Scale?

- *Small-Scale; 1 Point*
- *Pilot or Demonstration; 5 Points*
- *Large-Scale; 10 Points*

**Evaluation Scoring Results (Criteria 2B)** – how many points did the project receive for evaluation Criterion 2.B: Adverse Impacts?

- *Unlikely; 10 Points*
- *Likely; 0 Points*

**Evaluation Scoring Results (Criteria 3A)** – how many points did the project receive for evaluation Criterion 3.A: Critical Infrastructure Co-Benefits?

- *None; 0 Points*
- *All; 10 Points*

**Evaluation Scoring Results (Criteria 3B)** – how many points did the project receive for evaluation Criterion 3.B: Social & Cultural Co-Benefits?

- *None; 0 Points*
- *All; 10 Points*

**Evaluation Scoring Results (Criteria 3C)** – how many points did the project receive for evaluation Criterion 3.C: Natural Infrastructure Co-Benefits?

- *No; 0 points*
- *Yes; 10 Points*



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## Capacity Building Projects

### Required Fields

**Geographic Location** – the Virginia locality or localities the project is expected to benefit, i.e., the counties, cities, and towns that comprise the eight coastal Planning District Commissions and Regional Commissions (PDCs/RCs). It can be assumed that Capacity Building would benefit the entire community (e.g. locality or localities) it is intended to serve.

**Project Status** – the current (2021) status of the project:

- *Proposed* – Projects in this phase have been identified as a need through planning process that address coastal resilience (e.g. Resilience Plan, Comprehensive Plan, Hazard Mitigation Plan), but have not yet been formally initiated.
- *Planning and Programming* - Projects in this phase involve development of plans and programs to identify specific efforts that, once implemented, will meet the needs of a community to increase resilience and reduce exposure to or risks from coastal storms and flooding. This includes collecting data, engaging stakeholders, and building the capacity to plan and execute future resilience strategies, projects, and other activities.
- *Project Implementation* - Projects in this phase involve active training, program implementation, adoption of plans, policies, and standards into local, region, and state resilience plans.

**Total Implementation Cost** – the total estimate of all planning, programming, and implementation costs.

**Project Objectives** – select all that apply:

- *Increase Asset Adaptive Capacity*
- *Increase Resilience*
- *Reduce Asset Sensitivity*
- *Reduce Flood Hazard Exposure*
- *Reduce Habitat Degradation*

**Resilience Considerations** – has the project been prioritized through planning processes that address coastal resilience (e.g. Resilience Plan, Comprehensive Plan, Hazard Mitigation Plan)?

- *Yes*
- *No*

### Optional Fields

**Easement Land Cost** – The estimated cost for land and easement acquisition. Many Capacity Building activities do not require land.

### Populated Fields

**Evaluation Scoring Results (Criteria 1A)** – how many points did the project receive for evaluation Criterion 1.A: Contribution to Coastal Resilience?

- *No; 5 Points*
- *Yes; 10 Points*

**Evaluation Scoring Results (Criteria 2A)** – how many points did the project receive for evaluation Criterion 2.A: Impact Area?

- *Local; 2 Points*
- *Regional; 5 Points*
- *Cross-Regional; 7 Points*
- *Statewide; 10 Points*



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**Evaluation Scoring Results (Criteria 2B)** – how many points did the project receive for evaluation Criterion 2.B: Co-Benefits?

- *None; 0 Points*
- *All: 10 Points*

**Evaluation Scoring Results (Criteria 3A)** – how many points did the project receive for evaluation Criterion 3.A: Underserved Communities?

- *None; 0 Points*
- *All: 10 Points*

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Table 1: Project Class, Type, and Subtype for Physical Projects.

Category: Natural and Nature-Based Approaches	
<b>Project Type: Beach and Dune Restoration</b>	
Project Subtype	Subtype Definition
<b>Beach Nourishment</b>	Beach nourishment, or beach filling, is the addition of sand onto or directly adjacent to an eroding beach to combat erosion and increase beach width.
<b>Dune Creation/Restoration</b>	Dune restoration involves restoring dunes through the planting of native vegetation; dune creation involves creation of new dune systems that match the existing natural dune pattern and account for the natural processes that lead to dune establishment.
<b>Barrier Island Restoration</b>	This type of project may incorporate a variety of restoration techniques, such as the placement of dredged material to increase island height and width, the placement of structures to protect the island from erosive forces, and the placement of sand-trapping fences, which are used in conjunction with vegetation plantings, to build and stabilize dunes on barrier island beaches.
<b>Project Type: Habitat Creation and Restoration</b>	
Project Subtype	Subtype Definition
<b>Wetland Restoration</b>	Wetland restoration is the manipulation of a former or degraded wetland's physical, chemical, or biological characteristics to return its natural functions. Restoration practices include re-establishment (the rebuilding a former wetland); and/or rehabilitation (repairing the functions of a degraded wetland) (EPA).
<b>Wetland Creation</b>	Wetland creation is the construction of a wetland on a site that never was a wetland. This can be done only on a site where conditions exist that can produce and sustain a wetland.
<b>Oyster Reef Restoration</b>	Oyster reef restoration refers to the process of rebuilding or restoring of oyster reefs.
<b>Aquatic Vegetation Beds Restoration</b>	Underwater grass beds, known as Submerged Aquatic Vegetation (SAV), are comprised of rooted flowering plants that have colonized primarily soft sediment habitats in coastal, estuarine, or freshwater habitats (Chesapeake Bay Program). SAV restoration strategies involve making conditions more suitable for SAV survival or direct hands-on restoration such as seed dispersal or plantings.
<b>Hydrologic Connectivity</b>	Restoration of mimicking natural connections that have been broken or disrupted by infrastructure such as roads and levees. This often involves removing barriers to flow (e.g., old flood control structures) or installing structures like culverts to enable water to flow under or around an existing barrier.
<b>Project Type: Nature-Based Shoreline Stabilization</b>	
Project Subtype	Subtype Definition
<b>Living Shoreline</b>	A shoreline management practice that provides erosion control benefits; protects, restores, and enhances natural shoreline habitat; and maintains coastal processes through strategic placement of plants, stone, sand fill, and other structural organic materials.
<b>Project Type: Conservation</b>	
Project Subtype	Subtype Definition
<b>Conservation Easements</b>	A conservation easement is a voluntary, legal agreement that permanently limits the uses of the land in order to protect its conservation values.
<b>Land Acquisition</b>	Acquisition of land for conservation purposes and/or public access.

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## Category: Structural Approaches

### Project Type: Flood Risk Reduction Structures

Project Subtype	Subtype Definition
<b>Flood Walls</b>	Shore-parallel structures with vertical faces (seawalls, bulkheads, etc.). The principal function of a seawall is preventing overtopping by waves and flooding, and erosion associated with waves and storm surges.
<b>Levees</b>	A levee is a natural or artificial wall that blocks water from moving into the protected area behind.
<b>Tide Gate</b>	A tide gate is a structural intervention designed to prevent a storm surge or high tide from flooding the protected area behind the barrier. Tide gates can be closed or open depending on tidal elevation and anticipated storm conditions.
<b>Revetment</b>	Sloping structures placed on banks or bluffs in such a way as to absorb the energy of incoming water.

### Project Type: Community Infrastructure

Project Subtype	Subtype Definition
<b>Critical Facility and Infrastructure Retrofit/Upgrade</b>	<p>Retrofits/upgrades to critical facilities involve structural flood protection measures including elevation (if possible), in situ floodproofing, mitigation strategies for diverting floodwaters from all coastal hazard sources.</p> <p>A critical facility is defined by the State Hazard Mitigation Plan as: “Any facility or building that (1) is essential to maintain emergency response actions, (2) provides lifeline services (e.g., shelters, potable water supplies, health facilities), (3) is essential to maintain public safety (e.g., police and fire stations), (4) may cause devastating financial or safety conditions if shut down for more than one week (e.g., an evacuation route), (5) houses irreplaceable items, records, equipment, or research, (6) houses a special population that requires particular social services on-site not needed by the general public (e.g., prisons, nursing home, and advanced care facilities), or (7) has a special historic or other character.”</p>
<b>Drainage Improvement</b>	Drainage improvements are defined as retrofits/upgrades necessary to address the peak flow and volume requirements of drainage infrastructure (manholes, catch basins, outfalls, conduits, and stormwater controls) due to the individual or combined occurrence of coastal flooding (tailwater effects due to storm surge, waves, and tides), and precipitation events. The scale of the improvements can be site, reach, or corridor level. Improvement strategies include source control (infiltration), detention/retention, storage and controlled / regulated discharge. Examples of retrofits include re-routing overland flow through streets/ pipes, daylighting water bodies, regrading and storm sewer network reconfigurations. Groundwater considerations should be incorporated as necessary.
<b>Relocation</b>	Relocation involves the physical movement of a structure (e.g. critical facility, road, rail track, utility, etc.) outside of the flood hazard area.
<b>Road/Bridge Elevation</b>	Elevating roadways and bridges may be necessary to ensure continuity of access and transportation during flooding events due to multiple sources. In some situations, this will be necessary to avoid pressure flow and scour impacts to structures, which will challenge the long-term sustainability and performance of the structures and accessories associated with bridges. Strategies include pier additions, embankment reinforcement, low and high chords retrofits above HGL, and bridge replacement, if necessary.
<b>Utility Retrofit/Upgrades</b>	Above ground and subsurface utility infrastructure that need to be protected against the impacts of flooding. Measures include armoring, localized and corridor-wide measures, relocation, or improved installation.

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Table 2: Project Class, Type, and Subtype for Capacity Building Projects.

Category: Capacity Building Projects	
Project Type: Flood Risk Reduction Structures	
Project Subtype	Subtype Definition
<b>Buyout Program</b>	Acquisition of properties that have been damaged by or may be prone to incurring damage caused by storms or storm-related flooding or acquisition of land/property which may buffer or protect other lands from such damage.
<b>Financial Programs</b>	Programs to support the funding and financing of resilience projects. Program types may include bonds, taxes, fees, and revolving loan funds.
<b>Resilience Planning</b>	Efforts to create a resilience plan, or integrate coastal resilience and climate change planning considerations into existing plans, programs, and government functions. Planning efforts may include community and stakeholder engagement, intergovernmental coordination, best practice research, project design, and strategy development.
<b>Policies &amp; Standards</b>	Changes in land use codes, ordinances, zoning, development and design standards, incentive programs, or other local policy to better acknowledge the reality of climate change and/or advance coastal resilience objectives.
<b>Public Education &amp; Outreach</b>	Projects aimed at educating and empowering the public in relation to coastal hazards and resilience. Activities may include the development of educational materials, hosting public meetings and workshops, conducting surveys, building community partnerships, establishing community-based programs, and analyzing and incorporating findings into relevant planning efforts and programs.
<b>Training</b>	Efforts to institutionalize resilience within an organization by training staff and partners on the principles of climate change, coastal hazards, vulnerability, and/or resilience, and how to apply such principles in their professional roles.
<b>Data Collection &amp; Management</b>	Efforts to collect, process, manage, and/or publish data relating to coastal hazards and resilience in order to support the utilization of the best available data in research, planning, and design and/or increase public data accessibility.
<b>Staffing</b>	Hiring a full-time employee (such as a Chief Resilience Officer) or dedicating staff time to focus on advancing coastal resilience efforts, including project management and program coordination.
<b>Studies</b>	Structured research efforts that serve to enhance the understanding coastal hazards, vulnerabilities, risks, and/or effective resilience interventions.
<b>Grant Application Development</b>	Technical writing and application development to garner project funding from federal or non-profit grant programs.

# VIRGINIA COASTAL RESILIENCE MASTER PLAN

Task 5: Adaptation Strategies and Prioritization:  
Final Prioritization Approach

JUNE 2, 2021



FINAL WORKING DRAFT

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# 1. INTRODUCTION

## 1.1. BACKGROUND

The Virginia Coastal Resilience Master Planning Framework (hereinafter referred to as the “CRMP Framework”) lays out the guiding principles of the Commonwealth’s approach to coastal adaptation and protection, and the process by which the Commonwealth will develop and begin implementing Virginia’s first Coastal Resilience Master Plan (CRMP) by the end of 2021. The development of a prioritization approach is a key step to drive towards the first goal in the CRMP Framework: “Identification of priority projects for the Master Plan”. The document leverages lessons learned from the Louisiana and Texas Coastal Master plans to form the approach for a Virginia-specific prioritization approach.

This Technical Report presents a vision and objectives for the Prioritization Approach, and provides an overview of evaluation factors, criteria, and metrics to determine the relative priority of projects for funding and implementation across the State and by Master Planning Region. The Prioritization Approach will be refined in coordination with the Commonwealth leadership team; the Technical Advisory Committee (TAC); and the Dewberry Coastal Flood Hazard, Impact Assessment, and Project Inventory Tasks to understand potential data sources for evaluation factors. Specifically, the relevant tasks and associated objectives, activities, and deliverables are summarized in Table 1.

Table 1: Overview of relevant tasks and associated objectives, activities, and products.

Objective	Activities	Products
<b>Draft Prioritization Approach</b>		
<ul style="list-style-type: none"> <li>Establish a prioritization approach based on the CRMP Framework Document, Commonwealth, and TAC input.</li> </ul>	<ul style="list-style-type: none"> <li>Review the CRMP Framework and identify how values expressed in the guiding principles and desired outcomes shape the prioritization approach.</li> <li>Leverage lessons learned into a Virginia-specific framework from the Louisiana and Texas Coastal Master Plans to inform the approach.</li> <li>Coordinate with Coastal Flood Hazard, Risk Assessment, and Project Inventory Tasks to understand potential data sources for evaluation factors.</li> <li>Engage with the Commonwealth and TAC to gather perspective on approach and incorporate feedback.</li> </ul>	<ul style="list-style-type: none"> <li>Draft Technical Memorandum on Prioritization Approach</li> </ul>

Objective	Activities	Products
<b>Final Prioritization Approach</b>		
<ul style="list-style-type: none"> <li>Finalize approach for the prioritization framework.</li> </ul>	<ul style="list-style-type: none"> <li>Review feedback from Commonwealth and TAC.</li> <li>Discuss with Commonwealth and/or TAC to resolve outstanding issues.</li> <li>Update approach based on feedback and improved understanding of available data.</li> <li>Provide final draft for additional feedback, make final adjustments, and finalize approach.</li> </ul>	<ul style="list-style-type: none"> <li>Final Technical Memorandum on Prioritization Approach.</li> </ul>
<b>Initial Prioritization</b>		
<ul style="list-style-type: none"> <li>Provide an initial prioritized list of projects for the state and Master Planning Regions.</li> </ul>	<ul style="list-style-type: none"> <li>Coordinate with the Commonwealth and TAC to acquire all existing project databases.</li> <li>Evaluate databases, captured information, and CRMP Framework to establish schema for project evaluation in consultation with Commonwealth and TAC.</li> <li>Collect information from project owners to address key project attributes required for prioritization.</li> <li>Identify "New" projects based on a review of at-risk assets where an existing strategy is not in place.</li> <li>Organize projects in a database.</li> <li>Test prioritization approach to provide an initial list of prioritized projects and review results with Commonwealth and TAC. Adjust approach, as needed, based on feedback from initial testing.</li> </ul>	<ul style="list-style-type: none"> <li>Database populated with projects provided by the Commonwealth Stakeholders and identification of "New" projects.</li> <li>Initial prioritized list of projects (with evaluation scores)</li> </ul>
<b>Prioritized Project List</b>		
<ul style="list-style-type: none"> <li>Develop the final prioritized project list for the CRMP</li> </ul>	<ul style="list-style-type: none"> <li>Address outstanding data/process gaps/issues.</li> <li>Final application of prioritization criteria to projects.</li> <li>Provide draft final list for review and feedback to the Commonwealth and TAC.</li> <li>Integrate feedback and produce the final project list for the CRMP.</li> </ul>	<ul style="list-style-type: none"> <li>Final prioritized project list for the CRMP (with evaluation scores)</li> </ul>

## 1.2. PURPOSE

The purpose of the Prioritization Approach is to provide the Commonwealth with a mechanism to evaluate the relative importance of various coastal resilience projects in various stages of planning. The Prioritization Approach will enable the following actions:

- Identify and define overall goals to be accomplished by implementation of the CRMP. These shared goals will provide the foundation of the decision-making process and the scientific framework for metrics used in project evaluation.
- Screen the inventory of projects against baseline filters to identify those that align with the CRMP Framework.
- Rank projects against a standard set of streamlined evaluation criteria as part of the first version of the CRMP due in November, acknowledging that future CRMP versions could have updated evaluation processes.
- Provide a transparent, repeatable approach that can be leveraged by the Commonwealth's constituents to:
  - Advance projects that do not pass the baseline screening (e.g., defining additional planning and analysis needed to improve the characterization of these projects)
  - Formulate new project proposals that align with the CRMP evaluation criteria.
- Engage the Commonwealth, regional coastal planning district commissions, and TAC subcommittees to tailor the Prioritization Approach with local, regional, and Commonwealth adaptation priorities.

### 1.3. VISION AND GUIDING PRINCIPLES

The following Vision Statement forms the basis upon which the Prioritization Approach was developed to drive towards the desired outcomes of the CRMP.

#### Vision

Virginia's Coastal Resilience Master Plan (CRMP) will protect and preserve Virginia's way of life, its economy, natural environment, cultural and historic assets in the face of a changing climate. It will enhance the resilience of its communities, regions and natural and built infrastructure to recurrent flooding and sea level rise. The CRMP will yield a resilient and thriving Virginia coast that is secure for current and future

The CRMP Framework recognizes the need for the alignment of community, regional, and statewide principles and goals. Such alignment should be informed by community, regional and statewide planning, capacity building, and project implementation. The spatial, temporal, capacity, funding, and project typology challenges inherent in developing the Prioritization Approach, across its four planning horizons (current conditions, 2040, 2060, and 2080) and its four distinct planning regions, must be explicitly acknowledged and addressed. The CRMP must offer actionable solutions for current and future generations, using the best available science, while accepting the uncertainties related to the rate of sea-level rise and environmental change and the extent of economic and community development across the Commonwealth. The CRMP must address today's hazards, as well as long-term resilience needs. The CRMP must acknowledge and balance resource constraints in funding, in natural system provisioning, in planning capacity, and across key regional and local priorities. The Prioritization Approach was developed in alignment with CRMP Framework guiding principles, and shall assess projects on how well they achieve the following outcomes, listed in no order:

- Reduce risk from storm surge, tidal, and recurrent flooding for communities, community lifelines, critical natural and built infrastructure, and historic and cultural assets.
- Adapt Virginia's coastal communities and infrastructure to the challenges of sea-level rise and environmental and socioeconomic impacts driven by climate change.
- Provide flood protection and climate adaptation through restoration and maintenance of coastal and estuarine ecosystems to support a thriving coast.
- Support the safety and prosperity of working and natural waterfronts that are keystones of Virginia's communities, economy, and the nation's defense.

- Equitably provide economic and social benefits to Virginia’s communities, with attention to the most chronically underserved communities facing increased flood risks.
- Support the preservation of Virginia’s cultural and historic resources, protecting resources in place where feasible.
- Improve regional coordination and region-wide risk reduction, across the four Coastal Master Planning Regions (Hampton Roads, Rural Coastal Virginia, Fall Line North, and Fall Line South), while acknowledging the unique characteristics of each region, distinctly local and regional hazards and risks, funding constraints, and planning capacities.

These objectives shall be vetted and made actionable with public, community, stakeholder, and TAC engagement during CRMP development. The objectives should be refined and adapted as needed in successive future CRMP iterations based on best-available science and stakeholder and other technical expert input. Such consensus will ensure that the CRMP is a living document, relevant to Virginia and its changing coast and that it enables the Commonwealth and its communities to achieve Virginia’s coastal resilience. The following section provides details on the proposed approach for baseline screening, evaluation, and prioritization of projects, in alignment with the above objectives.

## 2. APPROACH

The overall approach for the Prioritization Approach is illustrated in Figure 1, which demonstrates the processes, data inputs, and outputs required for prioritization. These elements are defined as follows, and further described in the following sections.

- **Processes:** the overarching analytical steps (e.g. Baseline Screening, Evaluation Scoring, and Implementation Screening) required for project prioritization. These are defined as:
  - **Baseline Screening (Section 2.1):** the process for screening projects for advancement to the project evaluation process. Projects will either pass or fail.
  - **Evaluation Scoring (Section 2.2):** the process for scoring projects that pass the baseline screening process against a standardized set of factors, criteria, and metrics. Projects will receive a total score.
  - **Implementation Screening (Section 2.3):** the process for reviewing projects that received high evaluation scores against a set of questions to gauge a project's readiness for implementation to prioritize funding resources, which will be defined during the CRMP Funding Analysis.
- **Data Inputs:** the key information required to accomplish the desired outcomes of the prioritization approach.
  - **Project Database:** The catalog of all projects assembled into the CRMP Project Database. The Project Database was designed in alignment with this Prioritization Approach to capture the key attributes required for each step of the prioritization process (Baseline Screening, Evaluation Scoring, and Implementation Screening) in a standardized and consistent way. The results of the Baseline Screening, Evaluation Scoring, and Implementation Screening will be captured within the Project Database for tracking and documentation purposes.
  - **Project Category:** The Project Classification Schema (Appendix Table 15 and Table 16) has four levels of hierarchy 1) Category, 2) Project Class, 2) Project Type, and 4) Project Subtype. For purposes of this Prioritization Approach, the Category is used as a way to prioritize projects with similar objectives. These include:
    - **Capacity Building:** These projects encompass initiatives at the locality, planning jurisdiction, or statewide level such as training,



planning, and policymaking – as shown in see Table 14 in the Appendix.

- **Physical Projects:** These projects deal with planning, designing, constructing, and maintaining a physical environment, including both natural and nature-based and structural approaches – as shown in Table 15 in the Appendix.
- **Baseline Screening Filters:** Binary (yes/no) filters intended to screen projects for advancement to the project evaluation process.
- **Evaluation Factors:** Categories that align CRMP guiding principles and desired outcomes, under which evaluation criteria are developed.
- **Evaluation Criteria:** A concise statement that summarizes what the project must achieve to be considered a priority.
- **Evaluation Metrics:** A qualitative statement or quantitative threshold to enable scoring of projects.
- **Funding Analysis Factors:** A set of standardized factors intended to screen projects for readiness for implementation.
- **Project Lists:** the inventory of projects in the CRMP Project Database. Each phase of the prioritization process will advance the level of screening of each project.
  - **Potential Projects:** list of projects that pass the baseline screening filters.
  - **Initial Prioritized Projects:** the initial prioritized list of projects for the CRMP.
  - **Final Prioritized Projects:** the final prioritized list of projects for the CRMP.
  - **Archived Projects:** list of projects that either 1) do not pass baseline screening or; 2) score low in the evaluation process, that will be archived for potential future reference or to be revisited in future iterations of the CRMP.

The Prioritization Approach is flexibly designed to accommodate changing data sources allowing metrics and methods for evaluating projects to be more refined as better data becomes available. The approach to evaluation and scoring includes a combination of quantitative and qualitative analyses, participatory scoring, and expert evaluation.

- **Quantitative Analysis:** Evaluation that leverages the CRMP study data, including outputs of the Coastal Flood Hazard Assessment and Impact Assessment; for example, the monetary value of flood damage avoided.
- **Qualitative Analysis:** Evaluation using non-numerical information about the proposed projects, such as the project type and description, overlaid on contextual community data.
- **Participatory Scoring:** Evaluation by a group from the leadership team, TAC, subcommittees, regional or local stakeholders, or members of the regional PDCs.
- **Expert Evaluation:** Evaluation by the CRMP consultant team aided by local, regional, and Commonwealth subject matter experts.
- **Project Owner Input:** Contribution from the project owner or a person who is the most familiar with the project, typically, an employee of or agent for the project owner. A data collection tool will support the collection of key project attributes that cannot be populated by one of the above-mentioned methods (e.g. quantitative/quantitative analysis participatory scoring, or expert evaluation).

The following sections present the three main prioritization processes (e.g. Baseline Screening, Evaluation Scoring, and Implementation Screening) in more detail.

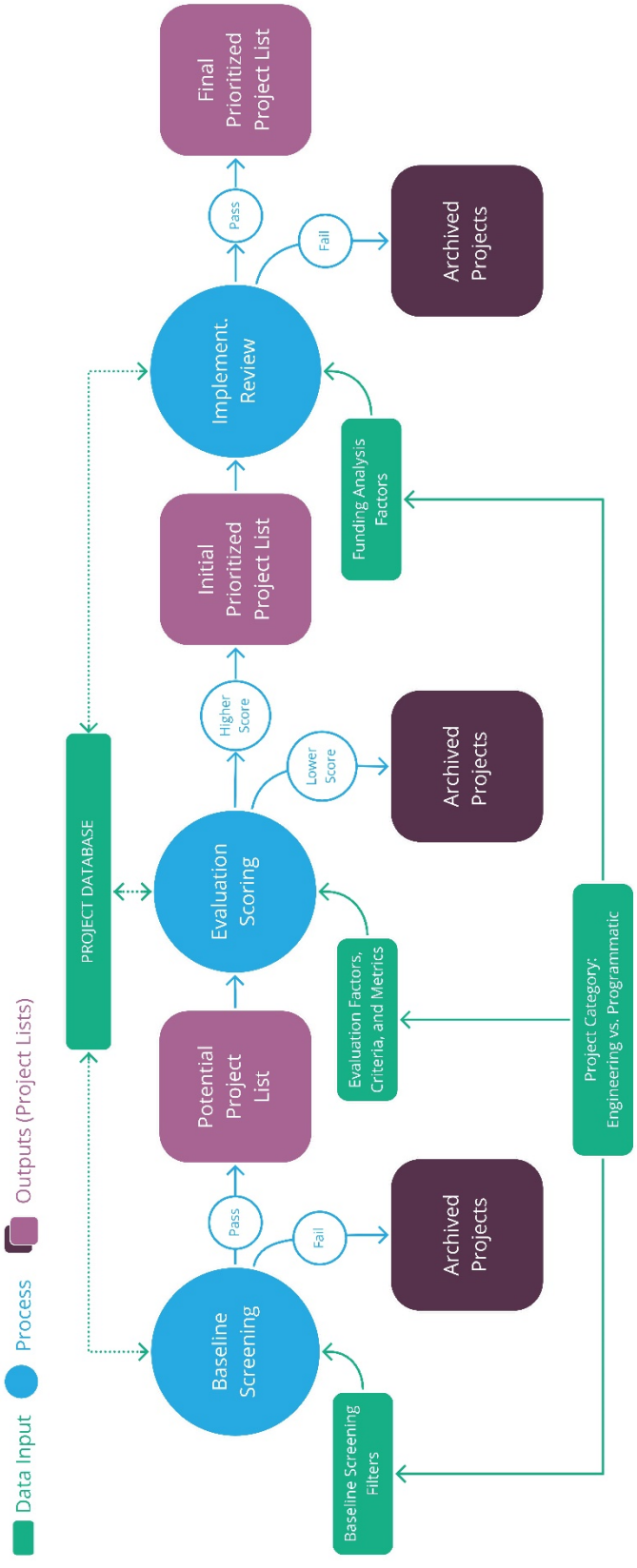


Figure 1: Overview of the Prioritization Approach.

## 2.1. BASELINE SCREENING

The Baseline Screening process begins with a review of the state-wide inventory of projects that will be assembled for the CRMP. The full set of projects within the Initial Project Database will then be reviewed against the Evaluation Screening Filters, which include:

1. **A Primary Screening Filter:** Removes projects lacking critical information.
2. **Secondary Screening Filters:** Removes projects that do not fall within the CRMP scope or are already being implemented.

The results of the Baseline Screening will be captured in the Project Database. Projects that do not pass the Baseline Screening Filters will be archived for potential future reference or additional analysis, whereas projects that pass will be compiled into a Potential Project List, as shown in Figure 2.

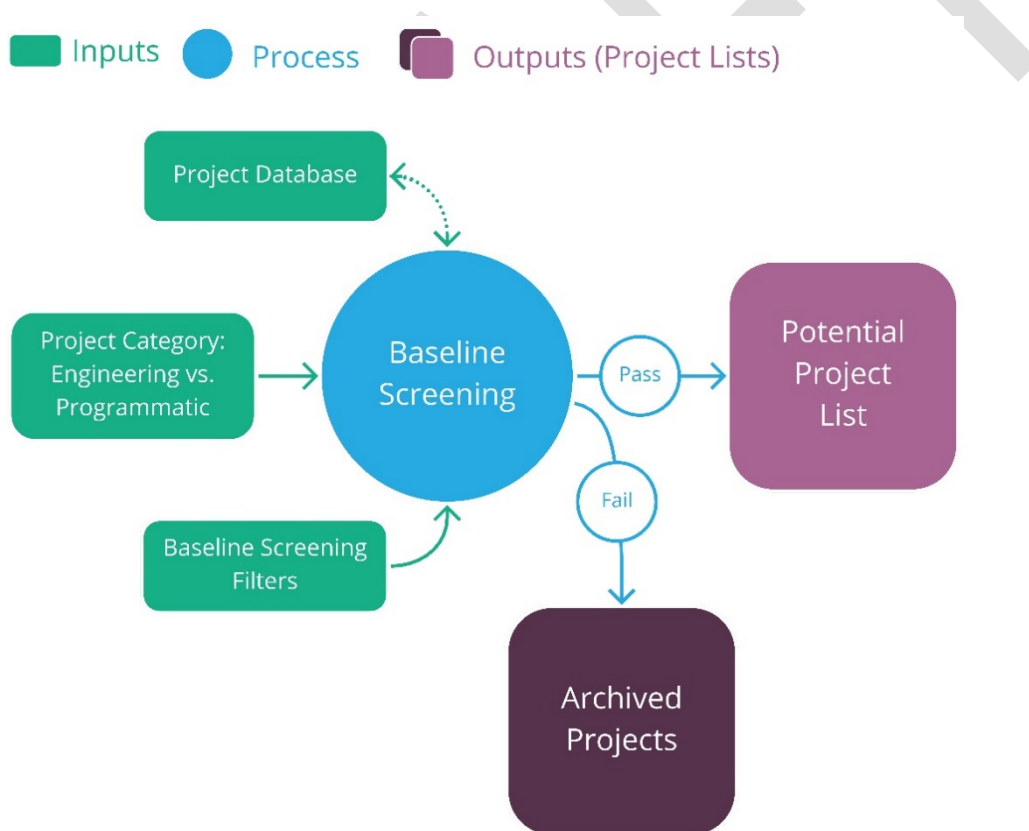


Figure 2: Baseline screening process.

### 2.1.1. PRIMARY SCREENING FILTER: EXTENT OF INFORMATION PROVIDED

The project must pass (i.e., answer “Yes”) this primary screening filter first before being evaluated against the secondary screening filters. This primary filter removes projects from consideration that do not have sufficient information to enable prioritization.

**Screening Criteria (Yes/No):** Does the project have the minimum information required to enable prioritization? This includes:

1. **Project Name** - a short, unique title for the project.
2. **Project Description** - a brief description of the purpose, need, and/or benefits of the project.
3. **Project Owner** - the locality, agency, entity, or person that will be responsible for implementing the project, regardless of land ownership.
4. **Project Classification, Type, and Subtype** —as defined in (see Appendix).
5. **Total Implementation Cost** - the total estimate of the project.
6. **Funding Status** - the amount the owner has available for matching and application costs.
7. **Geographic Location** - the approximate geographic extent of the project, dependent on the Project Category:
  - a. *Physical Projects* - a project footprint, in a polygon GIS shapefile format.
  - b. *Capacity Building* - the localities, Planning District Commissions (PDCs), or Regional Commissions (RCs), or Master Plan Region that the project is intended to serve. The project could also cover the entire Commonwealth.
8. **Resilience Considerations** - the capacity of the project to address future increases in flooding, dependent on the Project Category.
  - a. *Physical Projects* - the design standards used to account for future increases in coastal flooding (described in Section 2.2.3.1)
  - b. *Capacity Building* - whether or not the project has been prioritized through planning processes that address coastal resilience (described in Section 2.2.4.1).
9. **Project Scale/Impact Area** - the area predicted to benefit from an implemented project, dependent on the Project Category.

- a. *Physical Projects* – individual project, pilot or demonstration project, or large-scale project (described in Section 2.2.3.2).
- b. *Capacity Building Projects* – calculated by the project team based on the geographic location selected by the project owner (described in Section 2.2.4.2).

10. **Project Status** – the current (2021) status of the project, dependent on the Project Category:

- a. *Physical Projects* – Proposed, Site Assessment and Preliminary Design, Final Design and Permitting, Construction, or Post-Construction Monitoring.
- b. *Capacity Building Projects* – Proposed, Planning, Implementation

**Screening Approach:** The CRMP consultant team will review existing project databases along with additional information requested from project owners. Once all this information is collected and organized in the Project Database, the team will perform a data gap analysis to determine if projects contain the attributes listed above.

### 2.1.2. SECONDARY SCREENING FILTERS

The project must pass (i.e., answer “yes”) to all the secondary filters to advance to the Evaluation Scoring process.

#### 2.1.2.1. Filter 1: Project Location within VA Coastal PDCs/RCs

This secondary screening filter removes projects from consideration that are not located within the boundaries of the CRMP region.

**Screening Criteria (Yes/No):** The project is located within the CRMP region, which includes the following eight coastal Planning District Commissions (PDC) and Regional Commissions (RCs):

1. Accomack-Northampton PDC (A-NPDC)
2. Crater PDC
3. George Washington Regional Commission (GWRC)
4. Hampton Roads PDC (HRPDC)
5. Middle Peninsula PDC (MPPDC)
6. Northern Neck PDC (NNPDC)

7. Northern Virginia Regional Commission (NVRC)
8. PlanRVA (formerly Richmond Regional Planning District)

**Screening Approach:** The CRMP consultant team will perform a spatial analysis of the geographic location of the project, provided by the project owner, in relation to the eight coastal planning commission boundaries.

#### 2.1.2.2. Filter 2: Project Status

This secondary screening filter removes projects that are already complete.

**Screening Criteria (Yes/No):** Is the project complete? This depends on the Project Category:

1. *Physical Projects* – projects considered already complete include those that are within the Post-Construction Monitoring phase.
2. *Capacity Building Projects* – projects considered already complete include those within the Project Implementation phase.

**Screening Approach:** The CRMP consultant team will evaluate this screening criterion based on the project status provided by the project owner.

#### 2.1.2.3. Filter 3: Project Contribution to Coastal Resilience

In the Coastal Resilience Planning Framework, coastal resilience projects are defined as those that would “improve the Commonwealth’s resilience and ability to adapt to rising seas, increased nuisance flooding, and more frequent and intense storms that result from climate change and threaten our coastal communities”. This secondary screening filter removes projects that are not consistent with or intended to achieve this definition.

**Screening Criteria (Yes/No):** The project contributes to coastal resilience.

**Screening Approach:** The CRMP consultant team will evaluate this screening criterion based on the project classification provided by the owner. If the project falls under the three main classes, it is considered to contribute to coastal resilience:

1. **Capacity Building:** Recognition of future hazards and resilience planning is a process in which all coastal communities should engage. While there are excellent examples in Virginia, many communities have not had the resources to understand and identify resilience needs. Capacity Building projects include financial programs, resilience planning activities, policies and standards, staffing, public education and outreach, training, data collection and management, studies, and grant application development— as defined in Table 16 (see Appendix).



2. **Natural and Nature-Based Approaches:** Natural features along waterways can reduce the impacts of erosion and flooding in inland areas, while also providing additional economic, environmental, and social benefits. Natural and Nature-Based Approaches projects focus on protecting or restoring features that occur naturally in the landscape, or engineering and constructing features to mimic natural conditions. Examples include beach and dune restoration, habitat creation and restoration, land acquisition, and nature-based shoreline stabilization — as defined in Table 15 (see Appendix).
3. **Structural Approaches:** Engineered flood risk reduction strategies can include the protection of individual assets or the blocking of flood pathways, preventing coastal or riverine floodwaters from passing into inland areas. Structural Approaches include permanent or deployable flood defense systems, as well as retrofit or relocation strategies for built infrastructure for which protection is not practical — as defined in Table 15 (see Appendix).

#### 2.1.2.4. Filter 4: Project Redundancy

This screening filter removes projects that are either precisely the same or have significant overlapping goals and scopes.

**Secondary Criteria (Yes/No):** The project is unique, i.e., it is not duplicative of an existing or proposed project.

**Screening Approach:** The CRMP consultant team will evaluate this screening criterion based on a review of locations of projects within the Project Database based on the Project Category.

1. *Physical Projects* – unique projects would not significantly overlap with the footprint of other existing or proposed projects.
2. *Capacity Building Projects* – unique projects may occur in the same geography but must have significantly different goals and scopes. The consultant team will review the project description, type, and subtypes to evaluate this criterion.

## 2.2. EVALUATION SCORING

In the Evaluation Scoring process, the Potential Project List will be appraised against a standard set of Evaluation Factors, Criteria, and Metrics, which are presented in Section 2.2.1. The outcome of the Evaluation Scoring process will be an Initial Prioritized Project List where each project is assigned a total numerical score. A tiering approach is recommended to group projects by level of priority (e.g. high, medium, and low-priority projects) at the state and planning jurisdiction, as discussed in more detail in Section 2.2.2. The Evaluation Factors, Criteria, and Metrics could be further refined by establishing factor weights that would capture local, regional, and Commonwealth priorities, which is further described in Section 2.2.1.

There may also be an opportunity at this stage to develop “project packages” that represent complementary efforts that yield regional benefits rather than individual projects that may not rank high when evaluated in isolation. However, project packages that combine multiple, small-scale projects, must be re-evaluated through this process to assess potential unintentional upstream or downstream impacts on each other that would reduce their collective impact.

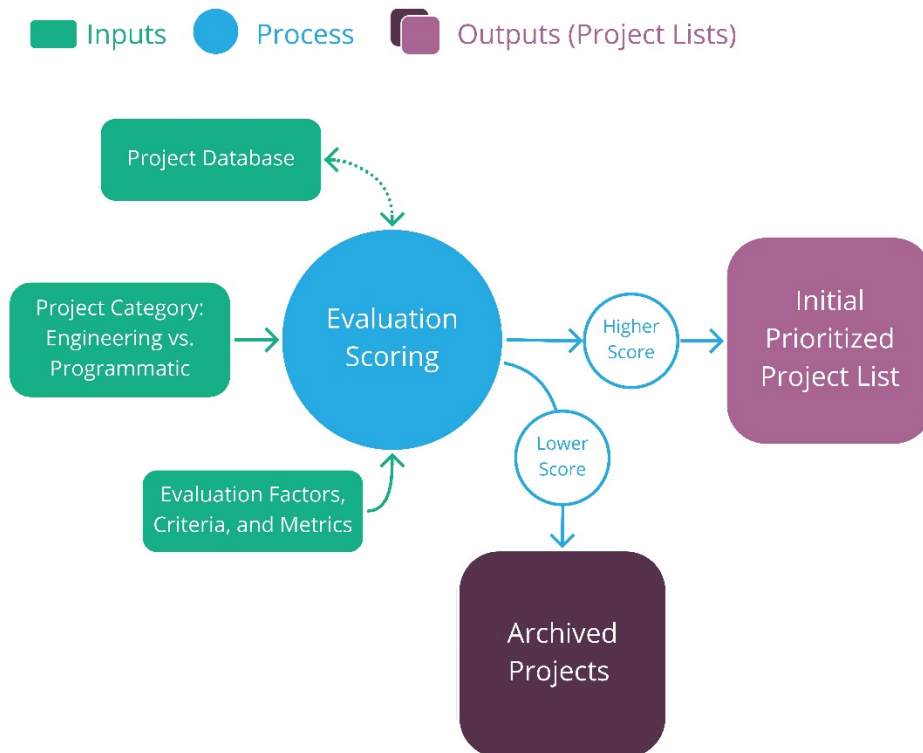


Figure 3: Evaluation scoring process.

### 2.2.1. EVALUATION FACTORS CRITERIA, & METRICS

The Evaluation Scoring process begins with the establishment of the standard set of Factors, Criteria, and Metrics – one set for Physical Projects and one set for Capacity Building Projects. The CRMP Framework guiding principles and desired outcomes were distilled into the three core evaluation factors for each Project Category:

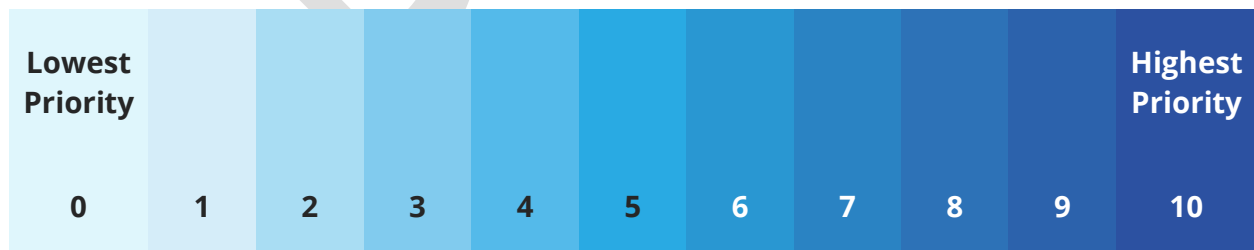
- Physical Projects:
  - **Factor 1:** System Performance & Design
  - **Factor 2:** Extent of Benefits & Impacts
  - **Factor 3:** Co-Benefits
- Capacity Building Projects:
  - **Factor 1:** Resilience Considerations
  - **Factor 2:** Extent of Benefits
  - **Factor 3:** Equity Considerations

The criteria and metrics for these factors are presented in Sections 2.2.2 and 2.2.3.

### 2.2.2. SCORING RUBRIC

To enable ranking of projects, each metric is assigned a numerical point score from one (lowest score) to ten (highest score). The maximum score for each criterion is ten (10) points. For some criteria, the project will be assigned a single score, whereas other criteria use an additive approach, where projects can receive a cumulative score for that criterion.

**Project scores should only be compared for projects within the same Project Category** since they use different Factors; Physical Projects should only be compared to other Physical Projects, and Capacity Building Projects should only be compared to other Capacity Building Projects.



## 2.2.3. PHYSICAL PROJECTS

The Factors, Criteria, and Metrics, and associated point scores, for Physical Projects, are summarized in Figure 4, and further described in the following sections.

0 1 2 3 4 5 6 7 8 9 10 SCORING RUBRIC									
Factors	Criteria	Metrics & Scores							
<b>Factor 1: System Performance &amp; Design</b> Incorporates forward-looking and adaptive design principles.	<b>1.A. Resilient Design Criteria:</b> The project incorporates resilient design standards (e.g. Sea Level Rise scenarios).	<ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #003366; margin-right: 5px;"></span> Standards more conservative than CRMP standards</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #0070C0; margin-right: 5px;"></span> CRMP standards</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #00B0F0; margin-right: 5px;"></span> Standards less conservative than CRMP standards</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #E0F0FF; margin-right: 5px;"></span> No considerations of future conditions.</li> </ul>							
	<b>1.B. Nature-Based Approaches:</b> The project incorporates nature-based design elements.	<ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #003366; margin-right: 5px;"></span> Incorporates nature-based design elements.</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #E0F0FF; margin-right: 5px;"></span> Does not incorporate nature-based design elements.</li> </ul>							
	<b>1.C. Flood Reduction Potential:</b> The project is expected to reduce economic flood risks today, and in the future.	<ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #003366; margin-right: 5px;"></span> Expected to reduce existing flood risks.</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #0070C0; margin-right: 5px;"></span> Expected to reduce near-term flood risks.</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #00B0F0; margin-right: 5px;"></span> Expected to reduce mid-term flood risks.</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #E0F0FF; margin-right: 5px;"></span> Expected to reduce long-term flood risks.</li> </ul>							
<b>Factor 2: Extent of Benefits &amp; Impacts</b> Maximizes positive impacts and minimizes adverse impacts.	<b>2.A. Project Scale:</b> The project is part of a larger, more comprehensive effort designed for greater impact while minimizing adverse impacts	<ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #003366; margin-right: 5px;"></span> Large-scale project</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #00B0F0; margin-right: 5px;"></span> Pilot or demonstration project.</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #E0F0FF; margin-right: 5px;"></span> Small-scale project.</li> </ul>							
	<b>2.B. Adverse Impacts:</b> The project is not anticipated to result in adverse impacts beyond the project area.	<ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #003366; margin-right: 5px;"></span> Unlikely to result in adverse impacts.</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #E0F0FF; margin-right: 5px;"></span> Likely to result in adverse impacts.</li> </ul>							
<b>Factor 3: Co-Benefits</b> Provides multiple co-benefits to the social, built, and natural environment.	<b>3.A. Critical Infrastructure Co-Benefits:</b> The project protects infrastructure critical for national security, public health and safety, or the economy.	<ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #00B0F0; margin-right: 5px;"></span> Benefits transportation systems.</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #00B0F0; margin-right: 5px;"></span> Benefits public health and safety assets.</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #00B0F0; margin-right: 5px;"></span> Benefits energy and communication assets.</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #E0F0FF; margin-right: 5px;"></span> Benefits agricultural lands.</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #E0F0FF; margin-right: 5px;"></span> Benefits other critical facilities.</li> </ul>							
	<b>3.A. Social and Cultural Co-Benefits:</b> The project protects exposed populated areas, and historic, cultural, & tribal resources.	<ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #00B0F0; margin-right: 5px;"></span> Benefits chronically underserved communities.</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #00B0F0; margin-right: 5px;"></span> Benefits communities with high social vulnerability.</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #00B0F0; margin-right: 5px;"></span> Benefits one or more cultural resources.</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #00B0F0; margin-right: 5px;"></span> Benefits one or more tribal resources.</li> </ul>							
	<b>3.C. Natural Infrastructure Co-Benefits:</b> The project protects or enhances the Commonwealth's natural infrastructure conservation priorities.	<ul style="list-style-type: none"> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #003366; margin-right: 5px;"></span> Benefits the critical natural infrastructure.</li> <li><span style="display: inline-block; width: 15px; height: 15px; background-color: #E0F0FF; margin-right: 5px;"></span> Does not benefit critical natural infrastructure.</li> </ul>							

Figure 4: Summary of Evaluation Factors, Metrics, and Criteria for Physical Projects.

### 2.2.3.1. Factor 1: System Performance & Design

This factor is intended to evaluate if the project considers future flood risk and sea level rise impacts and is adaptable to future conditions through integration of nature-based design elements.

#### Criterion 1a: Resilient Design Criteria

**Evaluation Criteria:** Projects that incorporate the CRMP Standards (2017 NOAA Intermediate-High Curve), or a more conservative local standard, will rank highest in this criterion.

**Evaluation Metrics:** The evaluation metrics for this criterion are presented in Table 2.

Table 2: Metrics and basis for ranking for Criterion 1a: Resilient Design Criteria.

Metric	Basis for Metric Ranking	Score (Single Choice)
Highest	The project uses local standards that are more conservative than the CRMP standards, relative to the project design life.	10 Points
High	The project uses the CRMP standards, relative to the project design life.	7 Points
Medium	The project uses local standards that are less conservative than the CRMP standards.	5 Points
Lowest	The project has no considerations of future conditions	0 Points

**Evaluation Approach:** The basis for ranking will be determined by input from the project owner. The project owner will explicitly be asked to select from the above options to self-assess their project against this criterion.

Future iterations of the CRMP could incorporate the ability of projects to account for social and environmental stressors that exacerbate coastal flood hazard impacts on development, including:

- Habitat loss
- Land-use changes
- Climate change effects on rainfall patterns and coastal storms
- Change in frequency and duration of tidal flooding

## Criterion 1b: Nature-Based Approaches

**Evaluation Criteria:** Projects that support the Commonwealth’s priorities for coastal resilience (e.g., flood mitigation) and natural resource enhancement by protecting or enhancing natural systems will rank highest in this category.

**Evaluation Metrics:** The evaluation metrics for this criterion are presented in Table 3.

Table 3: Metrics and basis for ranking for Criterion 1b: Nature-Based Approaches.

Metric	Basis for Metric Ranking	Score (Single Choice)
Yes	The project incorporates nature-based design elements (e.g. beach/dune, marsh, oyster reef, aquatic vegetation, etc. restoration/creation).	10 Points
No	The project does not incorporate nature-based design elements (e.g. beach/dune, marsh, oyster reef, aquatic vegetation, etc. restoration/creation).	0 Points

**Evaluation Approach:** The basis for ranking will be determined by expert evaluation based on the project classification schema (see Appendix), and project description. Specifically, any project that is classified as a Natural and Nature-Based Approach within the project classification schema will automatically score High. Projects classified as Capacity Building or Structural Approaches will score Low unless the project description or owner input provides sufficient evidence that it should score High.

## Criterion 1c: Flood Reduction Potential

**Evaluation Criteria:** Projects that are needed to address existing flood risks will rank highest in this criterion. Existing flood impacts are defined as the area around the project that is expected to withstand economic flood damages under baseline conditions (e.g. within the next 5 years) across the range of events, from daily tidal flooding minor to major storm surge.

**Evaluation Metrics:** The evaluation metrics for this criterion are presented in Table 4.

Table 4: Metrics and basis for ranking for Criterion 1b: Nature-Based Approaches.

Metric	Basis for Metric Ranking	Score (Single Choice)
Highest	Project area is expected to reduce economic flood risks today.	10 Points
High	Project area is expected to reduce near-term (e.g. 2040) economic flood risks.	7 Points

Metric	Basis for Metric Ranking	Score (Single Choice)
Medium	Project area is expected to reduce mid-term (e.g. 2060) economic flood risks.	5 Points
Lowest	Project area is expected to reduce long-term (e.g. 2080) economic flood risks.	3 Points

**Evaluation Approach:** The basis for ranking will be determined by quantitative analysis based on the intersection of the project impact area (see Section 2.2.2.3 for more information on how “extent of benefit” polygons will be generated) with the economic Impact Assessment loss analysis results to evaluate if the project has potential to reduce losses in a flood-affected area.

### 2.2.3.2. Factor 2: Extent of Benefits & Impacts

This factor is intended to evaluate the potential of the project to maximize benefits to the social, built, and natural environment, while minimizing adverse impacts.

## Criterion 2a: Project Scale

**Evaluation Criteria:** Proposals for larger, more comprehensive projects that are designed for greater impact (e.g. across more than one community, locality, or region) will rank highest in this criterion. “Demonstration” or “pilot” projects will rank second-highest, as long as they demonstrate an innovative design approach required for transferability to broader, large-scale implementation in the future. Projects that are only located within an individual community, locality, or region will rank lowest in this criterion.

This criterion provides an incentive for coordination of activities among local, regional, state, and federal partners to develop strategic coastal adaptation and protection solutions. If a project scores low, it provides an opportunity to align the project with region-specific approaches.

**Evaluation Metrics:** The evaluation metrics for this criterion are presented in Table 5.

Table 5: Metrics and basis for ranking for Criterion 2a: Extent of Benefits.

Metric	Basis for Metric Ranking	Score (Single Choice)
Large-Scale	The project is considered large-scale as it is located in more than one community, locality, or region.	10 Points



Metric	Basis for Metric Ranking	Score (Single Choice)
<b>Pilot or Demonstration</b>	The project is located in an individual community, locality, or region, but is needed to demonstrate an innovative design approach for transferability to broader, large-scale implementation in the future.	5 Points
<b>Small-Scale</b>	The project is located within an individual community, locality, or region.	1 Point

**Evaluation Approach:** The basis for ranking will be determined based on input from the project owner. The project owner will explicitly be asked to select from the above options to self-asses their project against this criterion.

## Criterion 2b: Adverse Impacts

**Evaluation Criteria:** The project is complementary to other projects and will not result in adverse impacts on upstream or downstream projects or communities. Adverse impacts are defined as impairing the functions of natural systems, such as coastal wetlands, oyster reefs, aquatic vegetation, and beaches and dunes.

Future iterations of the CRMP could capture additional adverse impacts that would likely require more in-depth analysis and numerical modeling to characterize and quantify impacts, such as:

- Increase socioeconomic inequities within chronically underserved communities already facing increased flood risk
- Increase in flood elevations outside of the project area.

**Evaluation Metrics:** The evaluation metrics for this criterion are presented in Table 6.

Table 6: Metrics and basis for ranking for Criterion 2b: Adverse Impacts.

Metric	Basis for Metric Ranking	Score (Single Choice)
<b>Unlikely</b>	The implemented project is not anticipated to result in adverse impacts beyond the project area.	10 Points
<b>Likely</b>	The implemented project is anticipated to result in adverse impacts beyond the project area.	0 Points

**Evaluation Approach:** The basis for ranking will be determined using expert assessment based on one of two approaches, depending on the project classification.

- Natural and Nature-Based Approaches: projects in this classification will automatically score 10 points (e.g., Unlikely).
- Structural Approaches: projects in this classification will be evaluated through a qualitative spatial analysis where the project footprint is overlaid on top of ecosystem data. If the project footprint infringes on coastal habitat, it will score “Likely” (e.g., 0 points), whereas if it does not, it will score “Unlikely” (e.g., 10 points).

### 2.2.3.3. Factor 3: Co-Benefits

The exact area of benefit/impact of projects will likely not be readily available but will be generated through the automated creation of polygons that represent the anticipated *extent of benefits*, which the National Fish and Wildlife Foundation (NFWF) defines as “the area predicted to benefit from an implemented project”.

The basis for production of these *extent of benefits* polygons will be based on the project footprint provided by the project owner and the project type, as shown in Table 7. This would provide a mechanism to provide a transparent, standard, and impartial method for evaluating the extent of benefits across Physical Projects of the same project subtype.

Table 7: Standardized buffer distances to determine the extent of benefits based on project subtypes.

Buffer Distance	Relevant Project Subtypes
10 miles	Flood Walls, Levees, Tide Gate, Revetment
5 miles	Community Infrastructure
5 miles	Living Shoreline
3 miles	Habitat Creation

This approach could be improved upon during later iterations of the CRMP as benefits estimation is improved.

## Criterion 3a: Critical Infrastructure Co-Benefits

**Evaluation Criteria:** Projects that have the potential to protect critical infrastructure identified by the Impact Assessment as critical for national security, public health and safety, or the economy, will rank highest in this category. This exact list of assets will depend on data availability, which is still being evaluated as part of the forthcoming Impact Assessment. An initial list of critical infrastructure assets includes:

- Transportation Systems: roads, railroads, ports, airports, mass transit stations, bridges, and culverts
- Public Health & Safety: medical facilities, emergency services, fire and police stations
- Food & Agriculture: agricultural land
- Water Resources & Management: water management facilities, stormwater infrastructure, dams, and levees
- Energy & Communications: power plants and other energy and communication assets.
- Other Critical Facilities: critical commercial facilities.

**Evaluation Metrics:** The evaluation metrics for this criterion are presented in Table 8. The scoring is additive to enable projects to receive additional points for multiple benefits.

Table 8: Metrics and basis for ranking for Criterion 3a: Critical Infrastructure Co-Benefits.

Metric	Basis for Metric Ranking	Score (Additive)
<b>Transportation Systems</b>	The project benefits transportation systems.	2 Points
<b>Public Health &amp; Safety</b>	The project benefits public health and safety assets.	2 Points
<b>Energy &amp; Communication Assets</b>	The project benefits energy and communications assets	2 Points
<b>Water Resources</b>	The project benefits water resources and management assets.	2 Points
<b>Agricultural Lands</b>	The project benefits food and agricultural assets.	1 Point
<b>Other Critical Facilities</b>	The project benefits other critical facilities.	1 Point

**Evaluation Approach:** The basis for ranking will be determined by a quantitative assessment that involves intersecting the extent of benefits polygon with the critical infrastructure layers produced as part of the Impact Assessment.

## Criterion 3b: Social & Cultural Co-Benefits

**Evaluation Criteria:** Projects that have the potential to benefit underserved communities, historic and cultural resources, and tribal resources, will rank highest in this

criterion. This exact list of targeted communities and cultural assets is still being evaluated as part of the Impact Assessment. An initial list, developed in alignment with the draft Impact Assessment approach, includes:

- **Equity Considerations:** Populations sharing a particular characteristic—either demographic or geographic—that have suffered from a systematic lack of social opportunity, civic life, and economic investment. Underserved communities can be defined using two main factors: *Community Resources & Capacity* (geographic/jurisdictional elements) and *Social Vulnerability* (demographic elements) – described in more detail in Section 2.2.3.3. Demographic and statistical factors used to identify underserved communities will be clarified in the forthcoming Impact Assessment.
- **Historical & Cultural Resources:** Historic places, architectural resources, and historic districts as defined in the Impact Assessment.
- **Tribal Resources:** Tribal reservations and Native American heritage sites as defined in the Impact Assessment.

**Evaluation Metrics:** The evaluation metrics for this criterion are presented in Table 9.. The scoring is additive to enable projects to receive additional points for multiple benefits.

Table 9: Metrics and basis for ranking for Criterion 3b: Social & Cultural Co-Benefits

Metric	Basis for Metric Ranking	Score (Additive)
<b>Community Resources &amp; Capacity</b>	The project provides benefits to chronically underserved communities facing a lack of community resources and capacity to address current and future increases in flooding.	3 Points
<b>Social Vulnerability</b>	The project provides benefits to communities with a high social vulnerability rating.	3 Points
<b>Historic &amp; Cultural Resources</b>	The project provides benefits to one or more historic/cultural resources	2 Points
<b>Tribal Resources</b>	The project provides benefits to one or more tribal resources	2 Points

**Evaluation Approach:** The basis for ranking will be determined by an expert quantitative assessment that involves intersecting the extent of benefits polygon with the social and cultural layers produced as part of the Impact Assessment.

## Criterion 3c: Natural Infrastructure Co-Benefits

**Evaluation Criteria:** Projects that have the potential to enhance the Commonwealth’s natural infrastructure conservation priorities, will rank highest in this category. These systems provide environmental co-benefits including improved water quality, habitat, ecosystem health, and other human social and health benefits. The exact approach for the identification of these priorities is still being evaluated as part of the Impact Assessment.

**Evaluation Metrics:** The evaluation metrics for this criterion are presented in Table 10. The scoring is additive to enable projects to receive additional points for multiple benefits.

Table 10: Metrics and basis for ranking for Criterion 2c: Natural Infrastructure Co-Benefits

Metric	Basis for Metric Ranking	Score (Single Choice)
Yes	The project benefits the Commonwealth’s natural system conservation priorities.	10 Points
No	The project does not benefit the Commonwealth’s natural system conservation priorities.	0 Points

**Evaluation Approach:** The basis for ranking will be determined by a quantitative assessment that involves intersecting the extent of benefits polygon with the natural infrastructure layers produced as part of the Impact Assessment.

## 2.2.4. CAPACITY BUILDING PROJECTS

The Factors, Criteria, and Metrics, and associated point scores, for Capacity Building Projects are summarized in Figure 5 and further described in the following sections.

SCORING RUBRIC										
0	1	2	3	4	5	6	7	8	9	10
Factors		Criteria				Metrics & Scores				
<b>Factor 1: Resilience Considerations</b> Developed through planning processes that address coastal resilience.		<b>1.A. Contribution to Coastal Resilience:</b> The project has already been identified through planning processes that address coastal resilience.				Yes, already identified as coastal resilience need. No, not already identified as coastal resilience need.				
<b>Factor 2: Extent of Benefits &amp; Impacts</b> Maximizes benefits and co-benefits to the Commonwealth's coastal residents.		<b>2.A. Project Scale:</b> The project is part of a larger, more comprehensive effort designed for greater impact while minimizing adverse impacts				Statewide benefits. Cross-regional benefits. Regional benefits. Local benefits.				
		<b>2.B. Co-Benefits:</b> The project leads to improved outcomes for the built and natural environment.				Leads to flood hazard exposure. Leads to increased resilience. Leads to reduced asset sensitivity. Increases adaptive capacity. Leads to improved outcomes for habitat.				
<b>Factor 3: Equity Considerations</b> Addresses underserved community's capacity for resilience planning and project implementation.		<b>3.A. Community Resources &amp; Capacity:</b> The project provides benefits to socially vulnerable communities and chronically underserved communities facing lack of community resources and capacity to address current and future increases in flooding.				Benefits chronically underserved communities. Benefits communities with high social vulnerability.				

Figure 5: Summary of Evaluation Factors, Metrics, and Criteria for Capacity Building Projects.

### 2.2.4.1. Factor 1: Resilience Considerations

For Capacity Building Projects, consideration of future conditions reflects whether the project has been prioritized through planning processes that address coastal resilience.

#### Criterion 1a: Contribution to Coastal Resilience

**Evaluation Criteria:** Projects that were developed through planning processes that address coastal resilience will rank highest in this criterion. Examples of planning process include:

- Comprehensive Plan
- Hazard Mitigation Plan
- Resilience Plan
- Stakeholder Engagement

**Evaluation Metrics:** The evaluation metrics for this criterion are presented in Table 11.

Table 11: Metrics and basis for ranking for Criterion 1a: Contribution to Coastal Resilience.

Metric	Basis for Metric Ranking	Score (Single Choice)
Yes	The project has already been identified through planning processes that address coastal resilience.	10 Points
No	The project has not already been identified through planning processes that address coastal resilience.	5 Points

**Evaluation Approach:** The basis for ranking will be determined by input from the project owner. The project owner will explicitly be asked to select from the above options to self-assess their project against this criterion.

### 2.2.4.2. Factor 2: Extent of Benefits & Co-Benefits

This factor is intended to evaluate the potential to provide to maximize benefits to the Commonwealth's CRMP region and provide community co-benefits.

#### Criterion 2a: Impact Area

**Evaluation Criteria:** Capacity Building Projects that advance resilience initiatives across all eight coastal planning commissions will rank highest in this criterion. This criterion assumes that any Capacity Building Project would benefit the entire community it is

intended to serve. For example, a large-scale project meeting state or master planning needs scores high.

This criterion provides an incentive for coordination of activities among local, regional, state, and federal partners to develop strategic programs. If a project scores low, it provides an opportunity to align the project with regional and Commonwealth objectives.

**Evaluation Metrics:** The evaluation metrics for this criterion are presented in Table 12.

Table 12: Metrics and basis for ranking for Criterion 2a: Impact Area.

Metric	Basis for Metric Ranking	Score (Single Choice)
<b>Statewide</b>	Statewide: the project is considered statewide (e.g., meets Commonwealth and Statewide Master Planning needs).	10 Points
<b>Cross-Regional</b>	Cross-regional: the project spans across two (2) or more coastal planning commissions	7 Points
<b>Regional</b>	Regional: the project spans across two or more counties or localities within a single coastal planning commission or	5 Points
<b>Local</b>	Local: The project is located within a single county or locality.	2 Points

**Evaluation Approach:** The basis for ranking will be determined by a combination of owner input, and back-end calculation to derive the total population of the project’s impact area. Owners will be able to select multiple counties that compose the eight coastal planning commissions or select all to indicate that their project is a statewide initiative.

## Criterion 2b: Co-Benefits

**Evaluation Criteria:** Capacity Building Projects that would lead to improved outcomes for the built and natural environment will rank highest in this criterion.

**Evaluation Metrics:** The evaluation metrics for this criterion are presented in Table 13. The scoring is additive to enable projects to receive additional points for multiple benefits.

Table 13: Metrics and basis for ranking for Criterion 2b: Co-Benefits.

Metric	Basis for Metric Ranking	Score (Additive)
<b>Reduce Flood Risk Exposure</b>	The project would lead to a reduction in flood hazard exposure.	2 Points
<b>Increase Resilience</b>	The project would lead to increased resilience.	2 Points
<b>Reduce Asset Capacity</b>	The project would lead to a reduction in asset sensitivity.	2 Points



Metric	Basis for Metric Ranking	Score (Additive)
<b>Increase Adaptive Capacity</b>	The project would lead to increased adaptive capacity.	2 Points
<b>Improve Habitat Outcomes</b>	The project would lead to improved outcomes for habitat.	2 Points

**Evaluation Approach:** The basis for ranking will be determined based on input from the project owner on project objectives.

#### 2.2.4.3. Factor 3: Equity Considerations

In the context of challenges with coastal flooding, the CRMP Framework acknowledges “challenges differ by region, locality, neighborhood, and individual, as does capacity to address them.” The Equity criterion aims to capture discrepancies relating to financial resources and technical capacity across Virginia’s coastal jurisdictional areas (cities, towns, tribes, and unincorporated communities). It is assumed that these cross-jurisdictional inequities are largely a result of historic and present disadvantages that reduce a community’s capacity for resilience planning and project implementation.

For the purposes of the CRMP, “underserved communities” are defined as populations sharing a particular characteristic – either demographic or geographic – that have suffered from a systematic lack of social opportunity, civic life, and economic investment.<sup>1</sup> The Commonwealth recognizes that these existing inequities of resources across communities necessitate a higher prioritization of projects and actions that serve these groups. Underserved communities can be defined using two main factors: **Community Resources & Capacity** (geographic/jurisdictional elements) and **Social Vulnerability** (demographic elements). Demographic and statistical factors used to identify underserved communities will be clarified in the forthcoming Impact Assessment.

### Criterion 3a: Underserved Communities

**Evaluation Criteria:** Projects that have the potential to provide benefits to chronically underserved communities—communities containing high concentrations of socially vulnerable populations and facing lack of community resources and capacity to address current and future increases in flooding—will rank highest in this category.

**Evaluation Metrics:** The evaluation metrics for this criterion are presented in Table 14.

<sup>1</sup> Adapted from EO 13985. Available here: <https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/20/executive-order-advancing-racial-equity-and-support-for-underserved-communities-through-the-federal-government/>

Table 14: Metrics and basis for ranking for Criterion 3a: Underserved Communities.

Metric	Basis for Metric Ranking	Score (Additive)
<b>Community Resources &amp; Capacity</b>	The project provides benefits to communities identified as lacking resources and capacity to address current and future increases in flooding.	5 Points
<b>Social Vulnerability</b>	The project provides benefits to communities with a high social vulnerability rating.	5 Points

**Evaluation Approach:** The basis for ranking could be determined through a combination of expert evaluation, participatory scoring, community self-assessments, as well as a qualitative evaluation of community capacity indicators. The approach to identify underserved communities will be developed as part of the Impact Assessment and may include using a semi-quantitative approach that considers the following metrics:

- Quantitative Metrics (public datasets):
  - Demographic factors, leveraging a Social Vulnerability Index methodology
  - County/Locality gross domestic product (GDP) per Capita
  - Gini Index for Income Inequality
  - Community Rating System (CRS) Participation and Score
- Semi-Quantitative Metrics (stakeholder survey data)
  - Resilience Planning History
  - Funding and Financing Experience
  - Self-assessment of resilience planning capacity
  - Locality-identified vulnerable populations

### 2.2.5. FACTOR WEIGHTING

The relative importance of the Evaluation Factors and Criteria will vary across the CRMP region based on local, regional, and Commonwealth priorities as well as the extent and magnitude of social, economic, and environmental impacts. This variance can be addressed by assigning weights to various criteria as a mechanism to capture regional stakeholder input and special circumstances. The weights provide an opportunity for participatory refinement of the Prioritization Approach, to be agreed upon with the Commonwealth leadership team and the TAC.

An example of a factor weighting approach that addresses geographic diversity is the Commonwealth Transportation Board’s (CTB) SMART SCALE, which uses weights to acknowledge the diversity of transportation needs in different areas of the Commonwealth. Based on a robust public involvement process, the CTB decided to create four weighting typologies based on PDC/RC and metropolitan planning organization (MPO) boundaries, as shown in Figure 6. This approach could be tailored for purposes of the CRMP, based on Master Planning Region, PDC/RCs, and/or regional typologies that characterize coastal flood risks.

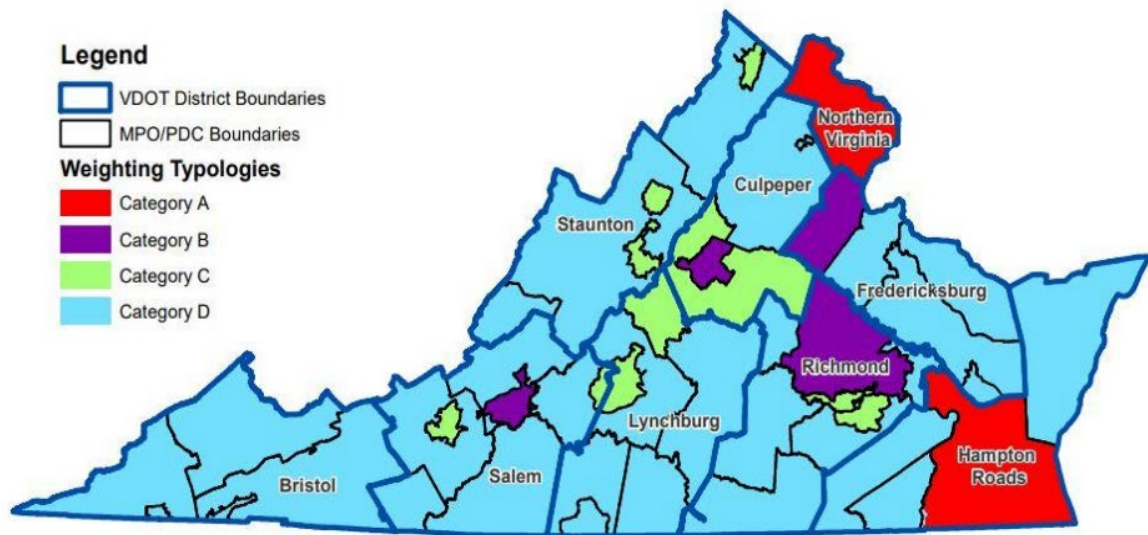


Figure 6: PDC and MPO factor weighting typology map developed for the CTB SMART SCALE.

For the November iteration of the CRMP, participatory weighting may or may not be possible within the available time frame. A suggestion is to set default weights informed by the results of the Coastal Flood Hazard and Impact Assessment, and planned design charettes, which could be further refined in future CRMP updates, based on additional public and regional stakeholder engagement.

## 2.2.6. PROJECT TIERING

The outcome of the Evaluation Scoring process will be a list of raw and weighted scores for all the potential projects. A tiered approach could be established to group projects into priority bins, such as high-, medium-, low-priority. The tiering system would be established after a review of the initial scoring results.

Examples from established prioritization methodologies will be reviewed to determine the best tiering schema for the CRMP, such as:

- The Texas Coastal Resilience Master Plan grouped projects into three tiers, based on a set of benefit and feasibility criteria:
  - Tier 1 Projects:
    - 123 projects, approximately 50 percent of those evaluated
    - High TAC approval ratings (typically over 80 percent)
    - High feasibility
    - Benefits mitigate Issues of Concern in project's subregion
    - Most resilient and actionable project solutions recommended for the state
  - Tier 2 Projects:
    - Moderate TAC approval ratings (between 60 percent and 80 percent)
    - Moderate feasibility projections
    - Benefits address Issues of Concern in project's subregion
    - May still effectively contribute to resiliency and viability of coastal zone
  - Tier 3 Projects:
    - Need further research and development in future iterations of the Resiliency Plan or already captured under another, separate project
- The Virginia Beach Policy Response Report used qualitative scores across nine weighted feasibility criteria to evaluate and tier over 180 resilience action items. Scoring was completed by different City departments and summed to calculate a cumulative point score for each action item. Those point scores facilitated a numerical ranking of action items, which was ultimately kept internal. Point scores were also used to group action items into prioritization buckets, which were used for public presentation and communication:
  - High Priority: 51 actions (28%)
  - Med-High Priority: 54 actions (30%)

- Med Priority: 35 actions (19%)
  - Med-Low Priority: 40 actions (22%)
  - Low Priority: 2 actions (1%)
- Raw scores can also be converted into tiers using a statistically driven approach such as quantile buckets, or k-means clusters (i.e., natural breaks). K-means clustering is a data classification method that sorts data into a set of natural classes based on one or more quantitative metrics. It optimizes classification ranges to reduce the variance within classes and maximizes the variance between classes.

A tiering approach like the examples above could be applied to summarize priority projects statewide, by Master Planning Region, by project type, or by implementation timeframe. For example, to ensure project distribution across Master Planning Regions, Tier 1 projects may be comprised of projects scoring within the top 20% of all projects evaluated within each Master planning region. The ultimate tiering method will be developed with input from the project management team, TAC, and design charettes and as part of subtask 5, Prioritized Project List.

### 2.3. IMPLEMENTATION SCREENING

Under the Implementation Screening process, the Initial Prioritized Project List will be evaluated against the Implementation Screening questions to reveal projects that are ready for implementation for the first iteration of the CRMP, as illustrated in Figure 7. This process will be iteratively refined in coordination with the forthcoming Funding Analysis

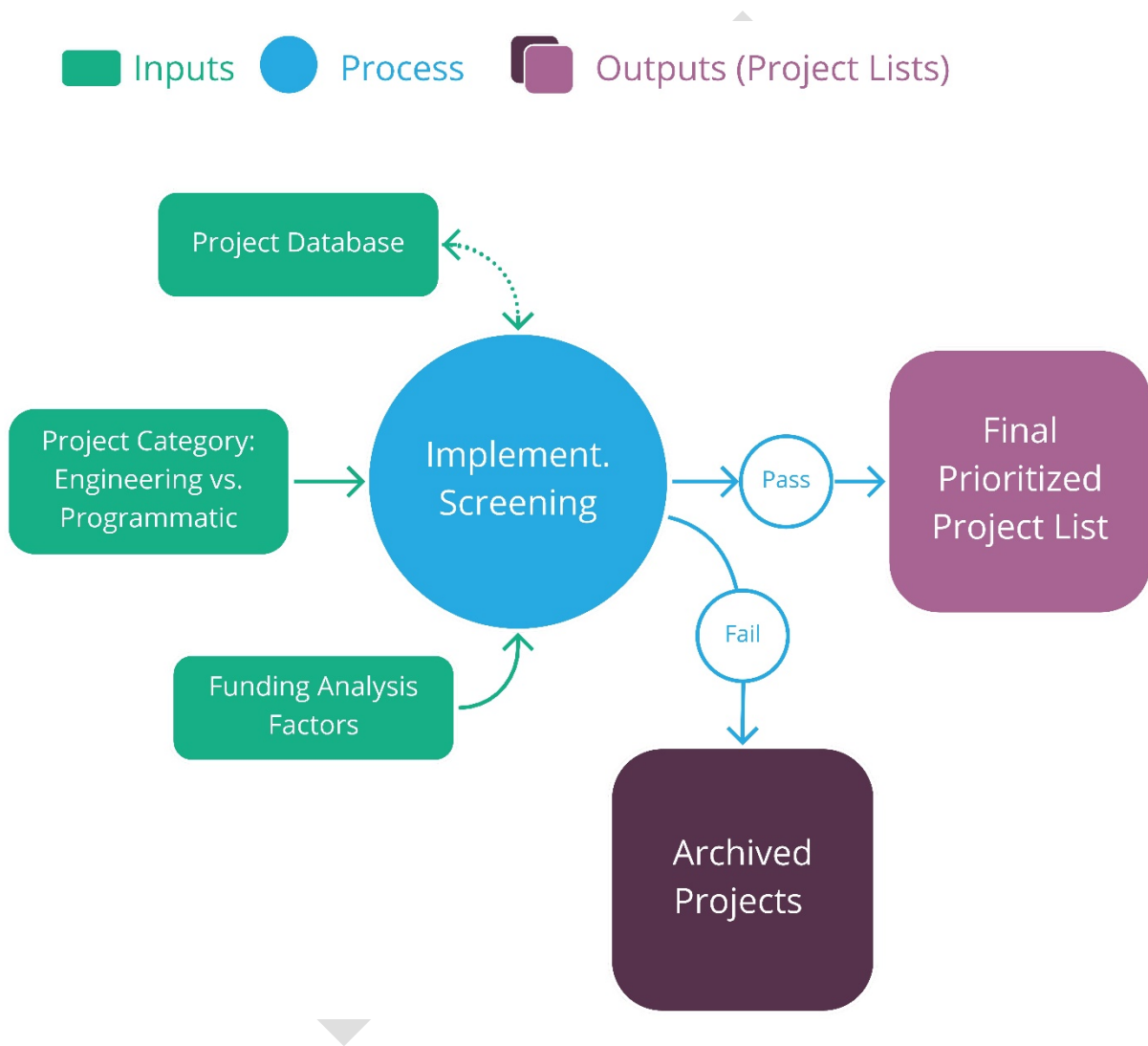


Figure 7: Implementation Screening process.

Similar to the Baseline Screening process, the Implementation Screening process could establish primary and secondary filters. A primary filter could help determine the relative timeframe of implementation. The Environmental Defense Fund (EDF) recommends sorting projects into three categories defined as:

- High Urgency: the project is needed within 5 years

- Medium Urgency: the project is needed within 10 years
- Low Urgency: the project is not needed for more than 10 years

This primary screening filter will avoid important projects that are less urgent for implementation from being listed as low-priority projects in the Final Prioritized Project List. Projects identified as High and Medium Urgency projects could then undergo secondary screening. The following are examples of secondary screening filters, to be refined in coordination with the Funding Analysis:

1. Are there funding sources align with the proposed project?
2. Does the project meet the eligibility requirements of available funding sources?
3. Does the project have sufficient funding to meet cost-share requirements?
4. Does the project already have the necessary permits and environmental compliance?
5. Does the project have a reasonable implementation timeframe for being implemented within the relevant planning horizon (i.e., 2040, 2060, 2080)? Each project will have a different timeline, depending on the Project Category and complexity.
  - a. Physical Projects – a reasonable implementation timeframe is five to ten years based on the following assumptions:
    - i. Six months to contract the design work
    - ii. Two-year design period
    - iii. An environmental impact assessment; one to two years for an Environmental Assessment (EA); two to five years for an Environmental Impact Statement (EIS), if required
    - iv. One year to solicit contractors
    - v. Permitting (one to two years), but could be achieved in parallel with the environmental assessment process
    - vi. Two to five-year construction timeframe
  - b. Capacity Building Projects – dependent on project subtype.

6. Does the owner, or region have the capacity (i.e., staffing, expertise, and resources) to implement the project? This could include support from other local, regional, or Commonwealth resources.

### 3. NEXT STEPS

The next step for the Prioritization Approach is to refine and finalize the approach. Specifically, the study team will:

- Apply the Baseline Screening and Evaluation Scoring criteria to a range of projects to evaluate the functionality and make necessary adjustments based on results.
- Review feedback from the Commonwealth and TAC.
- Discuss with Commonwealth and TAC to resolve outstanding issues
- Update the approach based on feedback and improved understanding of available data.
- Provide final draft for additional feedback, make final adjustments, and finalize approach.



# 4. APPENDIX – PROJECT CLASSIFICATION SCHEMA

Table 15: Project Class, Type, and Subtype for Physical Projects.

Category: Natural and Nature-Based Approaches	
Project Type: Beach and Dune Restoration	
Project Subtype	Subtype Definition
<b>Beach Nourishment</b>	Beach nourishment, or beach filling, is the addition of sand onto or directly adjacent to an eroding beach to combat erosion and increase beach width.
<b>Dune Creation/Restoration</b>	Dune restoration involves restoring dunes through the planting of native vegetation; dune creation involves creation of new dune systems that match the existing natural dune pattern and account for the natural processes that lead to dune establishment.
<b>Barrier Island Restoration</b>	This type of project may incorporate a variety of restoration techniques, such as the placement of dredged material to increase island height and width, the placement of structures to protect the island from erosive forces, and the placement of sand-trapping fences, which are used in conjunction with vegetation plantings, to build and stabilize dunes on barrier island beaches.
Project Type: Habitat Creation and Restoration	
Project Subtype	Subtype Definition
<b>Wetland Restoration</b>	Wetland restoration is the manipulation of a former or degraded wetland's physical, chemical, or biological characteristics to return its natural functions. Restoration practices include re-establishment (the rebuilding a former wetland); and/or rehabilitation (repairing the functions of a degraded wetland) (EPA).
<b>Wetland Creation</b>	Wetland creation is the construction of a wetland on a site that never was a wetland. This can be done only on a site where conditions exist that can produce and sustain a wetland.
<b>Oyster Reef Restoration</b>	Oyster reef restoration refers to the process of rebuilding or restoring of oyster reefs.
<b>Aquatic Vegetation Beds Restoration</b>	Underwater grass beds, known as Submerged Aquatic Vegetation (SAV), are comprised of rooted flowering plants that have colonized primarily soft sediment habitats in coastal, estuarine, or freshwater habitats (Chesapeake Bay Program). SAV restoration strategies involve making conditions more suitable for SAV survival or direct hands-on restoration such as seed dispersal or plantings.

<b>Hydrologic Connectivity</b>	Restoration of mimicking natural connections that have been broken or disrupted by infrastructure such as roads and levees. This often involves removing barriers to flow (e.g., old flood control structures) or installing structures like culverts to enable water to flow under or around an existing barrier.
<b>Project Type: Nature-Based Shoreline Stabilization</b>	
<b>Project Subtype</b>	<b>Subtype Definition</b>
<b>Living Shoreline</b>	A shoreline management practice that provides erosion control benefits; protects, restores, and enhances natural shoreline habitat; and maintains coastal processes through strategic placement of plants, stone, sand fill, and other structural organic materials.
<b>Project Type: Conservation</b>	
<b>Project Subtype</b>	<b>Subtype Definition</b>
<b>Conservation Easements</b>	A conservation easement is a voluntary, legal agreement that permanently limits the uses of the land in order to protect its conservation values.
<b>Land Acquisition</b>	Acquisition of land for conservation purposes and/or public access.
<b>Category: Structural Approaches</b>	
<b>Project Type: Flood Risk Reduction Structures</b>	
<b>Project Subtype</b>	<b>Subtype Definition</b>
<b>Flood Walls</b>	Shore-parallel structures with vertical faces (seawalls, bulkheads, etc.). The principal function of a seawall is preventing overtopping by waves and flooding, and erosion associated with waves and storm surges.
<b>Levees</b>	A levee is a natural or artificial wall that blocks water from moving into the protected area behind.
<b>Tide Gate</b>	A tide gate is a structural intervention designed to prevent a storm surge or high tide from flooding the protected area behind the barrier. Tide gates can be closed or open depending on tidal elevation and anticipated storm conditions.
<b>Revetment</b>	Sloping structures placed on banks or bluffs in such a way as to absorb the energy of incoming water.

**Project Type: Community Infrastructure**

<b>Project Subtype</b>	<b>Subtype Definition</b>
<b>Critical Facility and Infrastructure Retrofit/Upgrade</b>	<p>Retrofits/upgrades to critical facilities involve structural flood protection measures including elevation (if possible), in situ floodproofing, mitigation strategies for diverting floodwaters from all coastal hazard sources.</p> <p>A critical facility is defined by the State Hazard Mitigation Plan as: "Any facility or building that (1) is essential to maintain emergency response actions, (2) provides lifeline services (e.g., shelters, potable water supplies, health facilities), (3) is essential to maintain public safety (e.g., police and fire stations), (4) may cause devastating financial or safety conditions if shut down for more than one week (e.g., an evacuation route), (5) houses irreplaceable items, records, equipment, or research, (6) houses a special population that requires particular social services on-site not needed by the general public (e.g., prisons, nursing home, and advanced care facilities), or (7) has a special historic or other character."</p>
<b>Drainage Improvement</b>	<p>Drainage improvements are defined as retrofits/upgrades necessary to address the peak flow and volume requirements of drainage infrastructure (manholes, catch basins, outfalls, conduits, and stormwater controls) due to the individual or combined occurrence of coastal flooding (tailwater effects due to storm surge, waves, and tides), and precipitation events. The scale of the improvements can be site, reach, or corridor level. Improvement strategies include source control (infiltration), detention/retention, storage and controlled / regulated discharge. Examples of retrofits include re-routing overland flow through streets/ pipes, daylighting water bodies, regrading and storm sewer network reconfigurations. Groundwater considerations should be incorporated as necessary.</p>
<b>Relocation</b>	<p>Relocation involves the physical movement of a structure (e.g. critical facility, road, rail track, utility, etc.) outside of the flood hazard area.</p>
<b>Road/Bridge Elevation</b>	<p>Elevating roadways and bridges may be necessary to ensure continuity of access and transportation during flooding events due to multiple sources. In some situations, this will be necessary to avoid pressure flow and scour impacts to structures, which will challenge the long-term sustainability and performance of the structures and accessories associated with bridges. Strategies include pier additions, embankment reinforcement, low and high chords retrofits above HGL, and bridge replacement, if necessary.</p>
<b>Utility Retrofit/Upgrades</b>	<p>Above ground and subsurface utility infrastructure that need to be protected against the impacts of flooding. Measures include armoring, localized and corridor-wide measures, relocation, or improved installation.</p>

Table 16: Project Class, Type, and Subtype for Capacity Building Projects.

<b>Category: Capacity Building Projects</b>	
<b>Project Type: Flood Risk Reduction Structures</b>	
Project Subtype	Subtype Definition
<b>Buyout Program</b>	Acquisition of properties that have been damaged by or may be prone to incurring damage caused by storms or storm-related flooding or acquisition of land/property which may buffer or protect other lands from such damage.
<b>Financial Programs</b>	Programs to support the funding and financing of resilience projects. Program types may include bonds, taxes, fees, and revolving loan funds.
<b>Resilience Planning</b>	Efforts to create a resilience plan, or integrate coastal resilience and climate change planning considerations into existing plans, programs, and government functions. Planning efforts may include community and stakeholder engagement, intergovernmental coordination, best practice research, project design, and strategy development.
<b>Policies &amp; Standards</b>	Changes in land use codes, ordinances, zoning, development and design standards, incentive programs, or other local policy to better acknowledge the reality of climate change and/or advance coastal resilience objectives.
<b>Public Education &amp; Outreach</b>	Projects aimed at educating and empowering the public in relation to coastal hazards and resilience. Activities may include the development of educational materials, hosting public meetings and workshops, conducting surveys, building community partnerships, establishing community-based programs, and analyzing and incorporating findings into relevant planning efforts and programs.
<b>Training</b>	Efforts to institutionalize resilience within an organization by training staff and partners on the principles of climate change, coastal hazards, vulnerability, and/or resilience, and how to apply such principles in their professional roles.
<b>Data Collection &amp; Management</b>	Efforts to collect, process, manage, and/or publish data relating to coastal hazards and resilience in order to support the utilization of the best available data in research, planning, and design and/or increase public data accessibility.
<b>Staffing</b>	Hiring a full-time employee (such as a Chief Resilience Officer) or dedicating staff time to focus on advancing coastal resilience efforts, including project management and program coordination.
<b>Studies</b>	Structured research efforts that serve to enhance the understanding coastal hazards, vulnerabilities, risks, and/or effective resilience interventions.
<b>Grant Application Development</b>	Technical writing and application development to garner project funding from federal or non-profit grant programs.



# Virginia Coastal Resilience Master Plan

Projects Database Gap Analysis | 5/25/2021



# Topics

- **CRMP Database Design**
  - Project Data Attributes
  - Project Classification Schema
- **Existing Project Database Gap Analysis**
  - Wetlands Watch Coastal Zone Management Database
  - Hampton Roads Planning District Commission Resilience Projects Dashboard
- **Data Call Ideas & Options**
  - Excel Spreadsheet
  - Online Tool

# CRMP Database Design

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# Project Data Attributes (Required Fields)

- **Required Fields** – project attributes that were identified as essential to best achieve the objectives of the CRMP by November 2021.

General	Project Characteristics	Project Location	Project Status	Project Benefits
Project Name	Classification	Latitude	Implementation Status	Impact Area
Contributor Contact	Type	Longitude	Implementation Cost	Resilience Considerations
Project Owner	Subtype		Funding Status	
Project Description			Permitting Status	

- Note – these fields were identified in coordination with the draft Prioritization Approach.

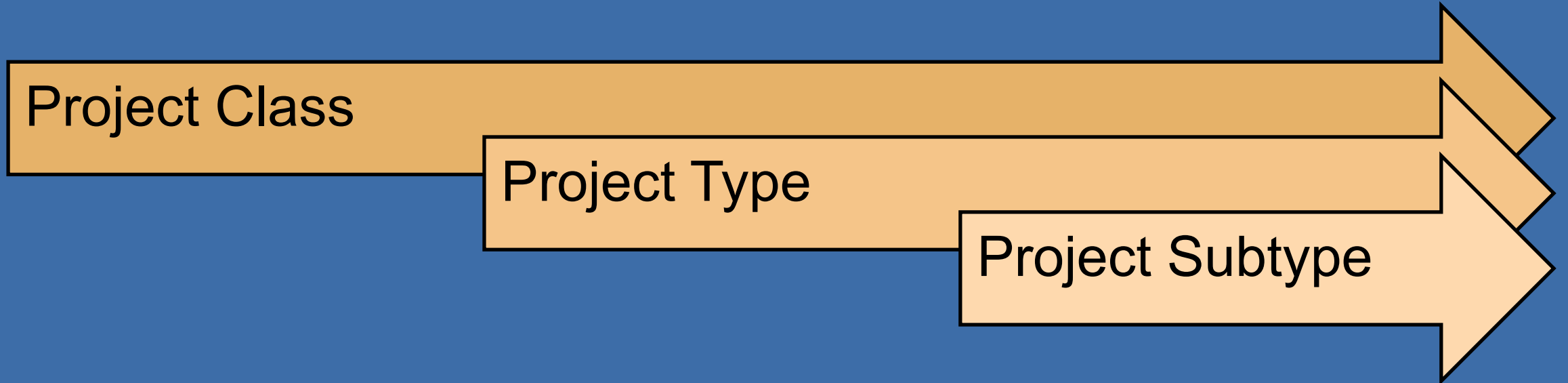


# Project Data Attributes (Optional Fields)

- **Optional Fields** – project attributes that would help achieve improved outcomes for the long-term objectives of the CRMP

General	Project Characteristics	Project Location	Project Status	Project Benefits
Locality	Project Start Date	Street Address	Engineering Cost	Benefits Length
PDC Jurisdiction	Project Completion Date	Lot/Block/Parcel#	Permitting Cost	Benefits Area
Project Owner Classification	Information Link		Construction Cost	Benefits Population
Notes from Contributor			Easement Land Cost	Benefits Critical Assets
			Average Annual O&M	

# Project Classification Schema



# Project Classification Schema

Project Class	Project Type	Project Subtype
Community Capacity Building	Plans and Programs	Financial Programs
		Policies & Standards
		Resilience Planning
		Staffing
	Technical Assistance	Data Collection & Management
		Grant Application Development
		Public Education & Outreach
		Studies
		Training

# Project Classification Schema

Project Class	Project Type	Project Subtype
Natural and Nature-Based Approaches	Beach and Dune Restoration	Beach Nourishment
		Dune Creation/Restoration
	Habitat Creation and Restoration	Aquatic Vegetation Restoration
		Barrier Island Restoration
		Hydrologic Connectivity
		Oyster Reef Restoration
		Wetland Creation/Restoration
	Conservation	Acquisition Program
		Buyout Program
		Conservation Easement
	Nature-Based Shoreline Stabilization	Living Shoreline

# Project Classification Schema

Project Class	Project Type	Project Subtype
Structural Approaches	Community Infrastructure	Critical Facility Retrofit/Upgrade
		Drainage Improvement
		Road/Bridge Elevation
		Utility Retrofit/Upgrade
	Flood/Shoreline Risk Reduction Structures	Floodwall
		Levee
		Revetment
		Tide Gate

# Gap Analysis

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# Gap Analysis – Objectives & Caveats



- **Objective** - Review existing databases (HRPDC and Wetlands Watch) against the initial CRMP database schema
  - What information is available to populate CRMP fields?
  - Where are the data gaps?
  - What information is still missing?
- **Caveat** - Both HRPDC and Wetlands Watch have done a good job collecting and cataloging available resilience project information. Their data population efforts predate any schema that has been considered or approved for the CRMP projects.

# Gap Analysis Summary

- Duplicate Projects
- Partially Missing Data
  - Latitude Longitude – missing for 4% of projects
  - Total Implementation Cost – missing for 12% of projects
- Missing (Required Fields)
  - Project Description
  - Project Owner
  - Permitting Status
  - Funding Status
  - Impact Area
  - Resilience Considerations

Destination Field	HRPDC		Wetlands Watch	
	Source Field	Non-Null Records	Source Field	Non-Null Records
average_annual_o_m_cost	Cost_OM	46	-	-
benefit_cost_ratio	-	-	-	-
construction_implementation_cost	Cost_CN	331	-	-
easement_land_cost	-	-	-	-
est_completion_date	-	-	-	-
est_project_start_date	-	-	-	-
implementation_phase	-	-	Implementation Phase	221
improved_shoreline_length	-	-	-	-
information_link	-	-	Additional Documents	106
information_source	Source	448	Planning Document, Additional Information	218
latitude	Lat	443	Lat/Long	198
locality	Locality	450	Locality	209
longitude	Lon	443	Lat/Long	198
notes_from_contributor	Notes	66	-	-
notes_re_costal_resiliency	-	-	-	-
owner	-	-	-	-
owner_classification	-	-	-	-
owner_project_number_or_identifier	OBJECTID	450	Object ID	221
pdc_jurisdiction	"HRPDC"	450	PDC	221
permitting_status	-	-	-	-
planning_engineering_permitting_cost	Cost_PL	317	-	-
project_applies_to_coastal_resiliency	-	450	-	221
project_description	-	-	-	-
proj_eval_type_id	estimated from source field [Category]	370	estimated from source field [Project Type]	190
project_name	Project_Name	450	Project Name	221
project_number	-	450	-	221
project_status	Status	450	-	-
projscreen_already_funded	-	-	-	-
projscreen_category	-	-	-	-
projscreen_crmp_region	-	-	-	-
total_implementation_cost	Cost_Total	424	Estimated Cost	169
watershed_area_served	-	-	-	-
Out of 450 Total Records			Out of 221 Total Records	



# Data Call Ideas & Options

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# Data Call Ideas

- A data call issued to contributors (i.e., those most familiar with the project plans, typically the project owner) is the most efficient way to collect accurate project information.
- A spreadsheet or online tool could be produced to capture required and optional fields, with short, clear, easy-to-follow instructions should produce the best results in a timely manner.
- Although CRMP can move forward with only a few required fields of information, contributors could be incentivized to fill out as many optional fields as possible to help their project rankings—as would be stated in the instructions.
- The completed data call could be returned to a single point of contact who could then upload the projects into the database.

# Data Call Spreadsheet

- Pros

- Contributors can fill out one spreadsheet for all projects
- Can set dependencies based on user selection (e.g. project class, type and subtype)
- Would require separate form/email to contribute project footprint

- Cons

- Burdensome to select additional project types
- Some folks not as comfortable with Excel

Number	Check	Project Name (Start entering data here.)	Contributor			Project Owner	Project Description	Latitude	Longitude	Project Status	Total Implementation Cost	Prior Funded Amount
			Name	Email	Phone Number							
1	ok	Sample Dune Restoration on Mount Everest	Jane Smith	<a href="mailto:jsmith@notarealemail.com">jsmith@notarealemail.com</a>	555-555-1234	County of Anywhere	This project will consist of rebuilding the extensive network of sand dunes on Mount Everest for the benefit of future mountain climbers.	37.010101	-75.501234	Planning	\$ 1,000,000.00	\$ 10.00
2	ok	Sample Living Shoreline Project in Everest Park	Jane Smith	<a href="mailto:jsmith@notarealemail.com">jsmith@notarealemail.com</a>	555-555-1234	Mount Everest Park Foundation	Installing living shoreline practices in Everest Park to protect and enhance the natural shoreline habitat in that area.	37.212121	-75.598760	Project Implementation	\$ 150,000.00	\$ 145,000.00
3	ok	Jamestown Beach Shoreline Restoration, Phase IV	Hayden Paine	<a href="mailto:hpaine@notarealaddress.gov">hpaine@notarealaddress.gov</a>	757.123.4567	James City County	This project will complete the restoration of the Jamestown shoreline west of the ferry pier, connecting 1,300 linear feet of the the unfinished gap between Phases III and V. This area has experience moderate to severe erosion.	37.228768	-76.791874	Final Design and Permitting	\$ 1,180,000.00	\$ -
4	15 fields still need to be filled out.	Marsh Terrace Design										

Number	Project Name	Owner Project Number or Identifier	Locality	PDC Jurisdiction	Project Owner					Division of Costs				
					Project Owner	Street Address	Zipcode	Subdivision	Lot/Block/Parcel #	Owner Classification	Planning Engineering Permitting Cost	Construction Implementation Cost	Easement Land Cost	Imple
1	Sample Dune Restoration on Mount Everest				County of Anywhere	123 Main St.				Locality	\$ 250,000.00	\$ 500,000.00	\$ 250,000.00	\$ 1.0
2	Sample Living Shoreline Project in Everest Park				Mount Everest Park Foundation					Private				\$ :
3	Jamestown Beach Shoreline Restoration, Phase IV	JSSA-2017-1147-Ph. IV	James City County	NVRC, HRPDC	James City County					Locality	\$ 85,000.00	\$ 1,010,580.00	\$ 25,000.00	\$ 1.1
4	Marsh Terrace Design					0								\$

# Data Call Online Form

- Pros

- One long scrolling form rather than multiple tabs
- Can capture project footprint in easy-to-use map-based tool
- Can easily select multiple project subtypes

- Cons

- Burdensome to complete individual form for each project

### VA Coastal Resilience Master Plan Data Call

The purpose of this form is to capture information from project contributors to assist with project evaluation and prioritization for the VA Coastal Resilience Master Plan (CRMP).

**Required (Project Information)**

**Contributor Name\***  
Please provide the name of the person familiar with the project planning who can answer questions; typically, an employee of—or agent for—the project owner. The contributor should be the contact person providing the project information for this data call.

**Contributor Phone Number\***

**Contributor Email\***

**Project Location\***  
Use the map below to draw the footprint of your project. The footprint will depend on the type and scale of your project. Some examples include:

- A project footprint for a structural or natural infrastructure project should represent the estimated extent of the project, once it has been implemented.
- A project footprint for a land-based strategy (e.g. acquisition or conservation easement) would represent the area of land (e.g. parcel)
- A project footprint for a capacity-building project (e.g. resilience plan, financial programs, design standards, etc.) would represent the entire community it is intended to serve, such as a locality, county, watershed, or region.

Before you upload the shapefile, you must save the shapefile (.shp, .dbf, .prj, .shx) in a compressed (zipped) folder. Note that the shapefile must NOT exceed 10 MB.

Esri, HERE, Garmin, FAO, NOAA, USGS, EPA, NPS  
Powered by Esri

No geometry captured yet.

**Project Subtype\***  
Please see Table 1 for Project Type and Project Subtype groupings and definitions.

<input type="checkbox"/> Acquisition Program	<input type="checkbox"/> Beach Nourishment	
<input type="checkbox"/> Barrier Island Restoration	<input type="checkbox"/> Buyout Program	
<input type="checkbox"/> Conservation Easement	<input type="checkbox"/> Drainage Improvement	
<input type="checkbox"/> Dune Creation/Restoration	<input type="checkbox"/> Financial Program	
<input type="checkbox"/> Flood Walls	<input type="checkbox"/> Hydrologic Connectivity	<input type="checkbox"/> Levees
<input type="checkbox"/> Living Shoreline	<input type="checkbox"/> Oyster Reef Restoration	

**Optional**

**Planning Engineering Permitting Cost**  
Provide the estimated cost for planning, engineering, and permitting, in 2021 dollars. This number will typically be a portion of the Total Implementation Cost on the Required Tab. The Planning, Engineering, and Permitting Cost plus the Construction Implementation Cost plus the Easement Land Cost should not exceed the Total Implementation Cost.

**Permitting Status**  
Select the current (2021) status of required permits.

**Project Benefits (Shoreline Length)**  
Enter the number of miles of shoreline that would benefit from the implemented project:

Examples include:

- Beach and Dune Restoration - number of miles of beach or dune restored
- Hydrologic Connectivity - the number of stream miles opened or restored for reconnection
- Seawall/Levee - the length of shoreline that the structural intervention spans

**Project Benefits (Area)**  
Enter the total number of acres that would benefit from the project.

Examples include:

- Habitat Creation and Restoration - the number of acres of habitat restored or created.
- Land Acquisition: the number of acres of land acquisition planned.

# Discussion

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