

VIRGINIA COASTAL RESILIENCE MASTER PLAN

Task 6: Funding Analysis

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FINAL REPORT

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1. INTRODUCTION

1.1. OBJECTIVE

The purpose of this document is to provide an overview of the methods used to develop the Funding Database and Analysis (Task 6, Subtask 1) and the Funding Stream Alignment (Task 6, Subtask 2) for the Virginia Coastal Resilience Master Plan (CRMP). These subtasks identify, organize, and summarize potential funding streams for projects and initiatives that support coastal resilience in Virginia. These efforts serve as the foundation for CRMP implementation.

1.2. BACKGROUND

The Virginia CRMP Framework lays out the core principles of the Commonwealth's approach to coastal adaptation and protection. It outlines how the Commonwealth will develop Virginia's first CRMP by the end of 2021. The Study Conceptual Model, illustrated in Figure 1, was established to delineate the CRMP's analytical approach to realize the CRMP Framework goals.



Figure 1: Coastal Resilience Master Plan Conceptual Model

Executive Order 24 requires the CRMP to include a detailed funding analysis, needs assessment, and recommendations for potential funding sources. To that end, Subtask 1 identified and evaluated potential funding programs and financing mechanisms. Applicable strategies were compiled into an intermediate Airtable database, entitled the Funding and Financing Database (FFD), and accessed at [<https://airtable.com/shrkmQEepPDLJQQsc>]. The FFD was incorporated into the CRMP Database and Web Application to provide a public-facing resource.

The FFD leveraged previous efforts by the Virginia Coastal Zone Management (CZM) Program to identify and collect funding programs potentially available to Virginia stakeholders for coastal resilience. CZM previously funded Wetlands Watch to create a Funding Database and a Plans and Program Database along with portals for the public to submit funding ideas and plans / studies. Wetlands Watch developed an Airtable database of grant and loan programs that address coastal resilience. This database included 58 funding sources, including philanthropic, state, and federal programs. Wetlands Watch also created an Airtable database identifying 114 state, regional and local plans and studies which address a variety of topics including coastal resilience, hazard mitigation, coastal restoration, wildlife action, shoreline management, conservation, capital improvement and beachfront and storm protection. The FFD was developed by expanding and refining the CZM Program funding database via Wetlands Watch to align with CRMP goals and principles.

The FFD structure was designed to be consistent with the CRMP Project Database developed by the Project Evaluation and Identification Task. This coordination allowed the Funding Stream Alignment Subtask to leverage information in the CRMP Project Database, such as project and project owner characteristics, that indicate whether an initiative may be eligible for a specific funding program. The alignment of projects with funding programs will assist in implementing the CRMP and its associated projects.

2. ALIGNMENT WITH EXISTING EFFORTS

The Funding Database and Analysis and Funding Stream Alignment subtasks build upon efforts started by the CRMP Framework and the CRMP Technical Advisory Committee's Finance Subcommittee. To avoid duplication of work, this process began by assessing the scope and completion of those efforts, summarized in this section and illustrated in Figure 2. The Funding Stream Alignment Subtask also initiated collaboration with the internal Project Evaluation and Identification efforts (Task 5) to ensure consistency in the project and project owner attributes collected through the CRMP Project Database survey.

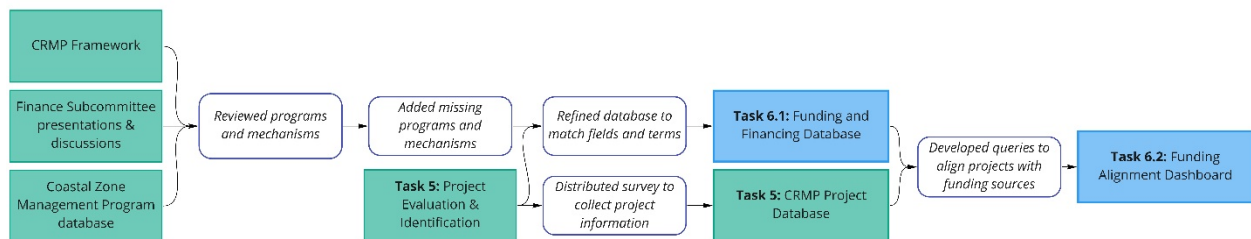


Figure 2: Funding Analysis Workflow

Chapter 7 of the Framework summarizes creative financing strategies that could be considered for use in Virginia. As part of the Funding Database and Analysis Subtask, these funding programs and financing mechanisms were reviewed for inclusion in the database and the gap analysis, discussed in more detail in Section 3.1.

Executive Order 71 established the Virginia Coastal Resilience Technical Advisory Committee (TAC) to support the coordination and later implementation and maintenance of the CRMP. The TAC consists of representatives of state agencies, coastal Planning Districts Commissions (PDCs) and Regional Commissions (RCs), academic advisors, and other subject matter experts. The TAC provides independent advice and recommendations to guide and advise the development of the CRMP. The TAC was supported by seven subcommittees that focus on more specific plan elements, including the Finance Subcommittee. The Finance Subcommittee developed recommendations on how to

leverage and align existing resilience revenue streams to maximize impact, overcome funding program challenges and how to create or access new revenue sources.

Starting in March 2021, the Finance Subcommittee conducted monthly meetings during which presenters led discussions on funding and financing strategies for resilience projects. The topics outlined in Table 1 covered several strategies from Chapters 5 and 7 of the CRMP Framework. These programs and mechanisms, where applicable, were reviewed for the funding database and gap analysis.

Table 1: Topics covered by Finance Subcommittee (as of September 2021)

Month	Presentations	Organization	Presenter(s)
MARCH	VRA Overview: Waterway Maintenance Fund, C-PACE, and Suggested Resiliency Funding Improvements	Virginia Resources Authority	Peter D'Alema
	Dam Safety and Floodplains	VA Department of Conservation and Recreation	Russ Baxter
	Clean Water Financing Nonpoint Source Management Program	VA Department of Environmental Quality – Water Division	Mike Crocker & Kelly Meadows
APRIL	Outcome-Based Financing: Environmental Impact, Catastrophe and Resilience Bonds	Quantified Ventures	Eric Letsinger
	Blue Acres Buyout Program	NJ Department of Environmental Protection – State Land Acquisition Bureau	Fawn McGee & David Rosenblatt
MAY	FEMA Grants: BRIC, HMA, and FMA	VA Department of Emergency Management	Robert Coates
	HUD Grants: CDBG, Federal HOME, and National Housing Trust Fund and HIAA	VA Department of Housing and Community Development	Willie Fobbs & Lee Hutchinson
	Readiness and Environmental Protection Initiative Sentinel Landscape	US Department of Defense	Jaime Simon & Tom Crabbs
	USACE Studies and Programs	US Army Corps of Engineers – Norfolk District	Richard Kleine

Month	Presentations	Organization	Presenter(s)
JUNE	Remaining Questions from April Presentation	Quantified Ventures	Eric Letsinger
	PDC's Use of Revolving Loan Funds and Grants Lessons Learned	Middle Peninsula Planning District Commission	Lewie Lawrence
JULY	Project Funding Strategies Utilized in Virginia	VA Department of Planning & Budget	Michael Maul
	Hampton Roads Transportation Fund as a Model for Funding Resiliency Projects	Hampton Roads Planning District Commission	Robert Crum

The FFD leveraged the previous efforts of Virginia's CZM Program to develop a database for grant programs that support coastal resilience projects. The CZM Program database includes information on the types of projects supported, funding amounts, eligible applicants, and proposal deadlines. The CZM Program database was provided to the CRMP team to identify additional funding sources and align the categories with other CRMP efforts, primarily Project Evaluation and Identification. The CZM Program database served as the foundation for the FFD delivered with this report.

Subtask 1 initiated collaboration with the CRMP Project Evaluation and Identification Task, discussed in more detail in Section 6. This collaboration extended into Subtask 2 to align identified grants and programs in the FFD with projects collected in the CRMP Project Database. The CRMP Project Database was populated using an online survey distributed by the Project Evaluation and Identification Task. The survey asked questions and used language aligned with the FFD, so that identified projects could be compared to grants and programs to determine potential eligibility for funding. The coordination between the Funding Analysis (Task 6) and Project Evaluation and Identification (Task 5) teams is discussed in more detail in Section 3.4.

3. SUBTASK 1: FUNDING DATABASE AND ANALYSIS

The Funding Database and Analysis Subtask aimed to develop the FFD into a comprehensive resource of applicable programs and mechanisms that would support coastal resilience projects.

This subtask involves four core components: a gap analysis to assess previous efforts, refinements to the FFD to add additional resources and ensure consistency across CRMP efforts, an evaluation of whether programs specifically supported economically disadvantaged communities, and coordination with the internal Project Evaluation and Identification Task.

The following section summarizes these components and lays the foundation for the Funding Stream Alignment Subtask, detailed in Section 4.

3.1. GAP ANALYSIS

The gap analysis aimed to identify missing funding programs and financing mechanisms not captured in the efforts discussed in Section 2. The FFD was developed after these efforts had evolved, so a gap analysis was necessary to ensure that all topics covered by the CRMP Framework and Finance Subcommittee were captured.

After assessing the scopes and completion of those efforts, a review of other coastal plans, federal funding opportunities, state and local programs, and private market financing mechanisms was conducted. The plans and resources used for this review are described in this section. Programs and strategies identified by the gap analysis were then added to the FFD, a process described in Section 3.2.

3.1.1. COASTAL PLANS

Two coastal resilience plans were analyzed for funding and financing opportunities: Louisiana and Texas. While both of these states have similar issues to Virginia, their access to funding and financing opportunities are more extensive. Both state's resilience and flood mitigation efforts are heavily subsidized by the oil, gas, and extractive industries, including the utilization of taxes on this industry as revenue streams.

Due to the extensive destruction and subsequent lawsuits from the Deep Water Horizon Oil Spill, Louisiana has been allocating large portions of civil penalty funding to coastal resilience and flood mitigation. In addition, both Louisiana and Texas have been able to access historic amounts of federal funding in recent years due to catastrophic hurricanes and presidential disaster declarations.

Harris County, Texas, passed a historic resilience bond following Hurricane Harvey that has opened up new funding opportunities for coastal resilience projects. In addition, both states pursue support and funding from USACE, utilizing their deep expertise and resources to incorporate coastal resilience through comprehensive engineering solutions.

While Virginia's coast faces many of the same problems as Texas and Louisiana, the significant differences between the Gulf Coast and the East Coast make one-to-one financing and funding opportunities challenging to apply to Virginia. However, more broad lessons learned could be helpful as Virginia moves forward with coastal resilience planning.

3.1.2. FEDERAL FUNDING OPPORTUNITIES

To identify additional federal funding opportunities, a keyword search was conducted using Grants.gov. Grants.gov hosts a searchable database for federal financial assistance opportunities. For the Gap Analysis, Grants.gov was searched for all award types and three status types (forecasted, posted, closed). Three keywords were searched separately: coastal, flood, and resilience. No limits were placed on the funding instrument type, eligibility, category, or agency.

The search results were reviewed, excluding items not relevant to coastal resilience and those for which Virginia was ineligible. The remaining items were then reviewed with the CZM Program database to exclude results that were already captured. Because each keyword was searched separately, the results overlap. Items that appeared in other search results were marked, so they were not entered into the database more than once. Table 2 summarizes the Grants.gov search results and the number of programs added to the database.

Table 2: Grants.gov Keyword Search Results

Keyword	Number of Items	Relevant Items	Added to Database
Coastal	315	13	7
Flood	115	11	1
Resilience	312	9	1

In addition to the Grants.gov review, federal and state agency websites were reviewed for relevant grant opportunities that did not appear in the keyword search or the CZM Program database. Specifically, the following agency websites were examined: Federal Emergency Management Agency (FEMA); Environmental Protection Agency (EPA); U.S. Department of Housing and Urban Development (HUD); National Oceanic and Atmospheric Administration (NOAA); U.S. Department of Agriculture (USDA); U.S. Economic Development Administration; U.S. Department of Interior (DOI); U.S. Department of Transportation (DOT); and State-equivalent agencies. To supplement this review, general internet searches were conducted to find other funding programs specific to coastal resiliency that may not be captured on government websites.

3.1.3. STATE / LOCAL PROGRAMS AND FUNDING MECHANISMS

Chapters 5 and 7 of the CRMP Framework discussed existing state and local programs and financing mechanisms that could be leveraged to support coastal resilience. The CZM Program database included some of these funding programs but no financing mechanisms. The Framework chapters were reviewed to ensure that the FFD included these programs in addition to essential attributes, like eligibility, funding maximums, contact information, and funding fact sheets. Financing mechanisms covered by the Framework were added to the FFD under a new tab specifically for these types of strategies.

The Finance Subcommittee's monthly meetings featured presentations, captured in Table 1, on state and local programs and financing mechanisms relevant to coastal resilience. These topics were cross-walked with the FFD, and missing programs were added to the database.

3.1.4. WEB-BASED RESEARCH

As demonstrated in Section 2, this subtask leveraged significant previous research efforts by reviewing the CRMP Framework, Finance Subcommittee materials, the Grants.gov database, and other coastal resilience plans. To capture the full breadth of funding and financing opportunities, generalized web-based research was conducted. A few key resources discovered from this research are highlighted below.

The Georgetown Climate Center's Adaptation Clearinghouse was reviewed for coastal-related resilience projects and the funding and financing mechanisms utilized for those projects. In addition, any new grant programs were cross-referenced and noted in the FFD. The Adaptation Clearinghouse serves as a vital resource, and the funding and financing team will continue to monitor the website for new updates.

Beyond the Basics: Best Practices in Local Mitigation Planning is a website developed as part of a multi-year research study funded by the U.S. Department of Homeland Security, Coastal Resilience Center. The study was led by the Center for Sustainable Community Design within the Institute for the Environment at the University of North Carolina at Chapel Hill and the Institute for Sustainable Coastal Communities at Texas A&M University. The site has a section dedicated to funding and assistance for mitigation projects. This section was reviewed and cross-referenced with the FFD.

Mitigation Funding: A Resource for Funding Mitigation Projects, produced by FEMA, contains numerous links to private grant resources that were reviewed for potential applicability to the Commonwealth and addition to the FFD.

Mitigation Matters: Policy Solutions to Reduce Local Flood Risk is a study by Pew Charitable Trusts that was reviewed and analyzed to review and capture any details that might apply to Virginia.

The Delaware Database for Funding Resilient Communities was developed by the University of Delaware's Institute for Public Administration, with support from the Delaware Coastal Management Program. The online database is a searchable list of planning and technical assistance programs that support resiliency-building plans and projects. The Delaware Database allows for filtering by project type, funding amounts, match requirements, and the type of assistance provided. Many programs contained in this database leverage federal funding that may be available for Virginia.

The Dewberry Policy Database is a proprietary resource that has been created over the last three years and is continually updated with new details and interesting mitigation projects, policies, fees, taxes, and funding mechanisms. The database was reviewed for applicability and funding opportunities that may apply to Virginia.

3.2. DATABASE ENHANCEMENT

The CZM Program database was developed in Airtable and was delivered in a tabular format. The first step in enhancing the database was to refine and reorganize the content provided by the CZM Program. The FFD contains three tables (Grants and Programs, Financing Mechanisms, and Tax Options) that are structured differently and capture different revenue sources. This report focuses on the Grants and Programs tab because those data will provide critical inputs to later CRMP efforts, primarily the project alignment process.

The Grants and Programs tab contains the most records and includes funds distributed by entities based on applications for specific projects. The Financing Mechanisms and Tax Option tabs include innovative instruments that can generate revenues independently. The last two tabs are categorized by the type of instrument and provide broad descriptions and links to additional information.

The FFD's Grants and Programs tab is categorized based on each funding source's category, class, and project type. These categorizations are intended to provide ease of organization and identify project and funding matches with the highest degree of suitability. The enhancement process also included creating such variables as more detailed matching and cost-share information, sources, success stories, and if readily available, applicant types, project status, social vulnerability components, and notes.

Additionally, the enhanced database contains timing updates that automatically refresh for each funding source to show if a program cycle is accepting applications ("Active") or closed ("Inactive") under the Status variable. This variable contains a conditional formula

based on the entry for the Full Proposal Deadline. For example, if a user views the FFD on July 2, 2021, all entries with a Full Proposal Deadline of July 1, 2021, will have a Status of "Inactive;" whereas those with July 2, 2021, will be "Active." For programs without a date, the Status automatically populates as Not Applicable ("N/A"). Using the Airtable software, the FFD also can be viewed as a table or a calendar with dates populated by proposal deadline entries to provide a clear and visually accessible application timeline for users.

Recommendations by the Finance Subcommittee and the Commonwealth and the project data request for the Project Evaluation and Identification Task informed other changes to the FFD language and structure. Revised variables based on guidance from the Finance Subcommittee include the Administering Office, Funding Source, Applicable Project Phase, Applicant Match / Cost-Share, and Matching Requirements. During the Finance Subcommittee monthly meetings, discussions identified that matching requirements and the ability to stack different funding sources are essential factors for applicants when deciding which grant program to pursue. Property ownership requirements were not identified as an explicit parameter for the database. Property ownership is discussed where intrinsic in the grant application criteria in the purpose, funding notes, or eligible applicants fields.

Variables aligned for the Project Evaluation and Identification Task include Category, Class, Project Type, Applicant Type, and Applicable Project Phase. The alignment of these variables specifically aimed to ensure language continuity and facilitate efforts to match prioritized projects with potential suitable funding sources. These variables have been adjusted following the submission of this report based on feedback and revisions to the Project Evaluation and Identification Task online survey for the CRMP Project Database.

Table 3: Database Enhancement Variable Definitions

Variable	Definition
Name	Title of grant or program.
Purpose	Detailed description of the types of project(s) supported by the grant or program.
Administering Office	Entity administering funding program.
Funding Type	What organization type does funding source originate from: <ul style="list-style-type: none"> • Federal • State • Federal to State • Private Foundation • Locality
Funding Source	Specific origin of funds for grants or programs.
Website*	An active link to further information on the grant or program.

Variable	Definition
Category*	Differentiation between whether a grant or program supports physical projects or capacity-building initiatives.
Class*	Further differentiation between whether a grant or program supports: <ul style="list-style-type: none"> • Natural & Nature-Based Approaches • Community Capacity Building • Structural Approaches
Project Type*	Identification of whether a grant or program supports: <ul style="list-style-type: none"> • Beach and Dune Restoration • Habitat Creation and Restoration • Nature-Based Shoreline Restoration • Conservation • Flood Risk Reduction Structures • Community Infrastructure • Community Capacity Building
Applicant Type*	Differentiation between applicant categories including: <ul style="list-style-type: none"> • Commonwealth of Virginia • Federal and / or State Recognized Tribe • Locality • Federal – Department of Defense • Federal – Non-Department of Defense • Non-profit organization / Non-governmental organization • Trust • Other
Eligible Applicant Details	Description of the eligible applicant, if further clarification is warranted.
Underserved Communities Component*	A yes or no answer as to whether or not the grant or program has a component to aid underserved communities.
RFPs & Fact Sheets	An inserted file referencing each grant or program's request for proposals and / or fact sheet.
Program Notes*	A consolidated location for miscellaneous yet important information: can explain multiple programs within a grant or program (i.e. national, state, or incubator funding out of a single grant office, etc.); can provide outreach notes if needed to find the latest information which may not yet be available via online sources; or can outline future timelines for each grant or program.

Variable	Definition
Funding Maximum (Per Project)	Quantity of maximum financial disbursement by grant or program.
Funding Notes	Provides additional information regarding program funding including: funding limitations for different project categories; available explanation if no funding maximum is provided; or key information which may influence whether to apply for funding or not.
Applicant Match / Cost-Share*	Quantity of funding match or cost-share required by the grant or program.
Match Requirements	Helpful information on in-kind or financial match or cost-share required, if any.
Pre-Proposal Deadline	Date which preliminary materials must be submitted.
Full Proposal Deadline	Final date that application materials may be submitted.
Status*	Automatically updating status of grant or program using data in Full Proposal Deadline column which identifies whether or not the funding cycle is active.
Applicable Project Phase for Funding Source*	Identification of where in the project phase the grant or program aims; aligns with Project Team terminology.
Contact	Contact information for grant or funding program administrator or coordinator.
Success Stories	Examples or case studies of successful grant or funding program recipients' work.

* Denotes new variable added during the database enhancement process.

3.3. EQUITY CONSIDERATIONS AND EVALUATIONS

The CRMP Framework recognizes that Virginia's coastal communities face socioeconomic inequities and regional differences that influence the scale of their available resources and capacities. These variations may present obstacles to secure funding for resilience projects. The Funding Database and Analysis subtask identified programs that specifically support economically disadvantaged communities.

The Framework was developed before the transition in federal administrations in January 2021. The new federal administration has proposed actions and re-centered

existing programs to focus more on environmental justice and racial and economic inequalities, which can expand opportunities for coastal resilience.

Subtask 1 aimed to incorporate these new programs and provisions in the FFD by including a field ("Underserved Communities Component") to identify programs that support economically disadvantaged communities. The programs included in the FFD, which address underserved communities, define and assist them in unique ways. This effort reviewed relevant documentation and sources to recognize these variations and determine if the program addressed communities that have been historically underrepresented or underserved or low-income communities through preferential ranking or scoring, reduced matching or cost-share requirements, or other means. This attribute will allow the database to be filtered for programs potentially suitable for coastal communities with limited capacity and resources and historically underserved or underrepresented populations.

3.4. COORDINATION WITH PROJECT EVALUATION AND IDENTIFICATION TASK

The Funding Database and Analysis Subtask serves as the foundation for the Funding Stream Alignment, which matches projects with potential funding sources. This subtask focused on the collection, refinement, and organization of grants and programs to build the FFD but also worked to streamline the subsequent subtask to identify potentially suitable funding sources for a project by initiating coordination with the internal Project Evaluation and Identification Task.

The Project Evaluation and Identification Task developed and distributed an online survey to resilience project owners, such as the state's regional planning commissions and coastal localities, to identify ongoing and proposed coastal resilience projects. These projects were compiled into the CRMP Project.

As outlined in Section 3.2, the FFD aligned with the CRMP Project Database for the following variables: Category, Class, Project Type, Applicant Type, and Applicable Project Phase. Many funding programs determine eligibility by the applicant, type of project, and current project phase seeking support. The FFD compiled this information for each funding program, and the online survey issued to populate the CRMP Project Database required respondents to provide this information for each initiative.

The internal teams conducting the Funding Analysis (Task 6) and the Project Evaluation and Identification (Task 5) initiated early coordination to ensure that the same terminology was used in the FFD and the CRMP Project Database. Table 4: Descriptions of Aligned Variables in the Funding & Financing Database and CRMP Project Database summarizes the alignment between these variables.

Table 4: Descriptions of Aligned Variables in the Funding & Financing Database and CRMP Project Database

Funding & Financing Database Variable		CRMP Project Database Variable	
	Definition		Definition
Applicant Type	Eligible applicant type, such as locality, federal- or state-recognized tribe, non-profit organization, etc.	Owner Classification*	Locality, agency, entity, sponsor, or person that will be responsible for implementing the project, regardless of land ownership.
Category	Type of project that a grant or program supports, such as structural or nature-based projects.	Project Subtype**	Type of project proposed or implemented, such as a living shoreline, revetment, buyout program, etc.
Class			
Project Type			
Applicable Project Phase	Eligible project phases to receive funding, such as proposed, site assessment and preliminary design, under construction, etc.	Project Status	Project status as of August 2021.

*Owner classification determined through respondents answering an optional question, or through post-processing of online survey results to assign all projects an owner classification type.

** Project Subtypes were summarized into Project Types, Class, and Category through post-processing of the online survey results to ensure consistency.

The online survey included two optional questions about project owners' funding capacities, outlined in Table 5. These questions aimed to gather information about project owners that was not captured directly by the survey but could potentially indicate the applicant's eligibility or ability to apply for funding.

Table 5: Optional Funding Questions in the CRMP Project Database Survey

Variable	Survey Question	Possible Responses
Funding Cost-Share Requirements	Does the submitting organization have the ability to raise or collect funding to pay for any cost-share requirements?	Yes / No
Funding Application Costs	Does the submitting organization have the resources to complete funding applications (e.g., grant applications, etc.)?	Yes / No

The joining of the FFD and CRMP Project databases facilitated the alignment of prioritized projects with potentially eligible grants and programs. This process is described in more detail in Section 4.

4. SUBTASK 2: FUNDING STREAM ALIGNMENT

The Funding Stream Alignment Subtask leverages the Funding Database and Analysis work to align coastal resilience projects with potential funding sources. This subtask aims to analyze the suitability of funding sources for projects based on attributes contained within the FFD and collaboration with the Project Team.

This effort consisted of two main components: developing queries to align grants and programs in the FFD with projects in the CRMP Project Database and creating a Funding Alignment Dashboard to visualize and access the results.

The following section summarizes these components, provides an overview of how to access and use the Funding Alignment Dashboard, and discusses limitations to this process.

4.1. FUNDING ALIGNMENT QUERIES

As detailed in Section 3.4, the coordination of the Funding Analysis (Task 6) and Project Evaluation and Identification (Task 5) efforts establishes consistent variables in both the FFD and the CRMP Project Database. These variables were selected for coordination to determine whether a project may be potentially eligible for a funding source. A project's alignment to a funding source should be considered a foundational step to identifying a suitable grant or program but will not guarantee a project is eligible or will secure funding. These limitations are discussed in more detail in Section 4.2.

Before executing alignment queries, the FFD Airtable database was downloaded as a comma-separated list file. This file was cleaned (e.g., removing unnecessary spaces and converting comma-separated values into a form readable by Postgres) and then uploaded to the CRMP PostgreSQL database. The CRMP Project Database was previously processed and uploaded to the CRMP PostgreSQL database. The transfer of the FFD from Airtable to the CRMP PostgreSQL allowed the joining and aligning of grants and programs to projects in the CRMP Project Database. Future updates and additional entries to the table can be easily made by the database administrator.

The Funding Stream Alignment Subtask identified potential grants and programs using two sets of queries applied to the FFD and the CRMP Project Database: the Eligibility Filter and the Suitability Score.

The Eligibility Filter screens out funding sources for which the specific project and the project owner are not eligible to apply. The Eligibility Filter determines if a project in the CRMP Project Database shares particular characteristics with grants and programs in the

FFD. As discussed previously, the CRMP Project Database was populated using an online survey, but not all questions were required. The Eligibility Filter only leverages responses from this survey that were required, so that the filter could be applied to all projects. The output from this query is a list of funding sources that pass the eligibility queries, as discussed in Section 4.1.1.

The Suitability Score was developed to highlight which funding sources may be better suited or more relevant for a specific project compared to other eligible sources. This query was created in recognition that funding programs often have additional requirements that influence whether a project or an applicant can or will apply. The Suitability Score does not screen out any funding programs. Instead, it produces a score from zero (insufficient information) to eight (most feasible to be eligible) for each alignment of a project and potentially eligible funding source. The Suitability Score components are discussed in more detail in Section 4.1.2.

4.1.1. ELIGIBILITY FILTER

The purpose of the Eligibility Filter is to eliminate funding sources for which a project would not be eligible, based on the information available through the FFD and CRMP Project Database. The Eligibility Filter uses required questions from the online survey that was distributed to populate the CRMP Project Database and can be applied to every project.

The Eligibility Filter is based on three queries: Applicant Type Filter, Project Classification Filter, and Project Status Filter. To pass the Eligibility Filter (received "true"), all three queries must be true.

The three queries include the following:

- **Applicant Type:** *Is the applicant eligible for this funding source?*
 - To pass, the project owner type(s) (Commonwealth of Virginia, Locality, Federal- or State-Recognized Tribe, etc.) in the CRMP Project Database must match at least one of the eligible applicants in the FFD.
 - To not pass, the project owner type is not found in the funding source's list of eligible applicants.
- **Project Classification:** *Is the project eligible for this funding source?*
 - To pass, the project subtype(s) in the CRMP Project Database must match at least one of the eligible project types in the FFD.
 - To not pass, the project subtype is not found in the funding source's list of eligible project types.

- **Project Status:** *Is the project phase / status eligible for this funding source?*
 - To pass, the project status in the CRMP Project Database must match at least one of the eligible project phases in the FFD.
 - To not pass, the project status is not found in the funding source's list of eligible applicants.

4.1.2. SUITABILITY SCORE

The purpose of the Suitability Score is to highlight funding sources for which a project and project owner may be an appropriate applicant. The Suitability Score leverages optional responses from the CRMP Project Database online survey. Not every respondent answered these questions, so the Suitability Score is not used to eliminate funding sources. Instead, these queries determine which funding programs may be a better fit for a specific project relative to other programs in the FFD.

The Suitability Score is the sum of four queries: Cost-Share Score, Applicant Capacity Score, Project Costs Score, and Permitting Status Score. The Cost-Share Score and Applicant Capacity Score are determined by the responses to the questions developed by the Funding Analysis Task for inclusion in the CRMP Project Database online survey. These questions are outlined in Table 5 in Section 3.4.

A Suitability Score is produced for each project-funding alignment and ranges from zero (insufficient information) to eight (most feasible to be eligible). The scoring system is designed so that respondents that did not answer any of the optional questions will be segmented into a category indicating insufficient information.

The four queries consist of the following:

- **Cost-Share Score:** *If the funding source requires cost-share, can the applicant raise cost-share funds?*
 - 2 Points: Project Owner / Applicant can raise funds for cost-share requirement, and funding source requires, prefers, or has no matching funds.
 - 1 Point: Project Owner / Applicant cannot raise funds for cost-share requirement, and the funding source prefers but does not require matching funds.
 - 0 Points: Insufficient information. Project Owner did not respond to the question.

- **Applicant Capacity Score:** *Does the applicant have the capacity to pay for application costs?*
 - 2 Point: Project Owner / Applicant has the resources to pay for applicant costs.
 - 1 Points: Project Owner does not have the resources to pay for applicant costs.
 - 0 Points: Insufficient information. Project Owner did not respond to the question.

- **Project Costs Score:** *Does the maximum funding amount for this funding source cover costs for the applicant project phase?*
 - 2 Point: The costs associated with the applicable project phase (i.e., planning, construction, or operation and maintenance) equal or are less than the funding source's maximum grant amount.
 - 1 Point: The costs associated with the applicable project phase exceed the funding source's maximum grant amount.
 - 0 Points: Insufficient information. Project Owner did not provide a breakdown of costs.

- **Permitting Status Score:** *If required, are the necessary permits obtained or in the process of being obtained?*
 - 2 Point: Project Owner has obtained or started obtaining the necessary permits, or permits are not required for this project.
 - 1 Point: Project Owner has not started the process of obtaining the necessary permits for this project.
 - 0 Points: Insufficient information. Project Owner did not respond to the question.

4.1.3. SUMMARY OF ALIGNMENT RESULTS

The Eligibility Filter and Suitability Score queries were applied to the projects in the CRMP Project Database. These projects were previously reviewed for alignment with the CRMP goals and principles for the Prioritization Approach. For the CRMP, a "project" is defined as any activity that would lead to the implementation of on-the-ground treatments, installations, or land use controls that reduce flood impacts and associated hazards in Virginia's coastal communities. The alignment process identified at least one funding

source for over 99% of the projects. Those projects that did not align with the CRMP initiatives or the Commonwealth's project definition were removed.

Alignment metrics can be applied to all projects in the database. However, the results for projects that are not aligned with the CRMP principles should be considered preliminary. Alignment metrics cannot be applied to capacity-building initiatives that were screened out from the project inventory at this time due to data limitations. The FFD identifies whether a funding source supports capacity building using the category and class attributes. The capacity-building initiatives collected through the data call would need categories, like the project data call, to more effectively align these efforts to potential funding sources.

The FFD included a wide range of potential grants and programs, some of which have unique eligibility and funding requirements that are not captured through the Eligibility Filter or Suitability Score. Due to these unique requirements, these programs may not be viable funding opportunities for many projects or project owners, but appear eligible for the majority of projects in the CRMP Project Database. The Funding Stream Alignment subtask reviewed the preliminary alignment results and opted to remove the five programs administered by the U.S. Army Corps of Engineers. The specific programs and the justification for exclusion are summarized in Table 6.

Table 6: Funding Sources Excluded from Alignment Queries

Source Name	Administering Office	Exclusion Justification
Continuing Authorities Program Section 510 Chesapeake Bay	U.S. Army Corps of Engineers	The process to obtain these funds requires substantial state involvement and is timely and unlikely for many.
Continuing Authorities Program Section 206 Aquatic Ecosystem Restoration		
Continuing Authorities Program Section 204 Beneficial Use of Dredged Material		
Continuing Authorities Program Section 103 Hurricane and Storm Damage Reduction		
Continuing Authorities Program Section 205 Flood Control		

With the exclusion of five programs, a project could have no more than 91 potential eligible funding sources. The maximum potential sources identified for a project were 36, and the minimum (excluding the one project for which no sources were identified) was five. On average, projects were aligned with 24 potential eligible funding sources.

On average, projects received an average Suitability Score of 4.3. Many projects with higher suitability scores originated from the same localities, likely due to differences in

respondents' answers to the online survey. Some localities entered relatively large batches of projects previously identified through other resilience efforts. These entries tended to be more consistent in the amount of information provided by project owners. For example, the City of Virginia Beach submitted 53 projects, and the project owners answered "Yes" for 49 of these for all questions about Application Costs and Applicant Capacity. Hampton submitted 136 projects, and the project owners answer "Yes" for all questions about Application Costs and Applicant Capacity. Many other jurisdictions submitted fewer projects, and many did not answer these questions. Additionally, many jurisdictions did not submit information about projects costs or permitting status. These attributes contribute to the project-funding alignment Suitability Score. The Suitability Score was developed in acknowledgement that these entries were not required and adds context to whether or not a project may be ready to apply for funding. Future project and capacity building collection efforts should seek to gather as much information from project owners as possible to mitigate this challenge.

4.2. LIMITATIONS

The alignment queries allow for a foundational and high-level filtering of funding programs to determine potential revenue sources. The Eligibility Filter and Suitability Score results are based on available variables and data in the FFD and CRMP Project Database. The alignment process does not consider how project owners could "stack" funds or leverage financing mechanisms, like bonds or taxes to fill funding gaps. However, the alignment results can be a starting place for project owners to review potential funding opportunities rather than sifting through the entire FFD.

The FFD contains documents and grant manuals that may become outdated with the next grant cycle, which varies by program. The FFD should be updated annually to include new deadlines for proposals and applications, as well as update relevant grant manuals and documents to support the application process. The number of awards, maximum distributed, and application deadlines may change every year depending on the source. For example, some FEMA grant programs are attached to disaster declarations, which will change annually. Data for some grant programs are incomplete, examples include missing documentation, program websites, contact information, or a recent grant cycle deadline. Additionally, some programs did not state explicitly whether matching funds were required, and these are noted as "unclear" in the database.

Further, the CRMP Project Database contains details about ongoing and proposed projects, including implementation costs. However, the online survey to populate this database did not request respondents to provide a dollar amount of how much funding is still needed to complete the project's implementation. This information could help determine whether the maximum award amount of a grant or program applies to a project's scale. Refined alignment and funding prioritization will require a more detailed understanding of each program's requirements and each project's specific needs.

5. INCORPORATION INTO WEB APPLICATION

The Funding Analysis Task outputs were incorporated into the CRMP Web Application to provide a publicly-available resource to Virginia coastal resilience project stakeholders.

5.1. FUNDING AND FINANCING DATABASE

The FFD was integrated as a feature element on the Web Application. The FFD is accessed by visiting the Web Application and selecting the “Funding Coastal Resilience” button at the top right-hand side (Figure 3). A pared-down version of the FFD is returned, limited to essential attributes including:

- Administering Office;
- Funding Source;
- Funding Type;
- Purpose;
- Eligible Applicants;
- Funding Maximum (Per Project);
- Applicant Match / Cost-Share;
- Source; and,
- Contact.

The screenshot shows a web application interface with a navigation bar at the top containing: Introduction, Hazards, Impacts, Community Context, Building Coastal Resilience, and Funding Coastal Resilience (highlighted in blue). Below the navigation bar is a text block: "The Master Plan expanded and enhanced a funding database established by the Virginia Coastal Zone Management Program. This database is intended to provide a comprehensive resource of applicable programs and mechanisms that would support coastal resilience projects in Virginia." Below this is a sub-header: "VA Funding for Projects (Features: 96, Selected: 0)". The main content is a table with the following columns: Administering Office, Funding Source, Funding Type, Purpose, Eligible Applicants, Funding Maximum (Per Project), and Applicant Match/Cost-Share. The table contains four rows of data.

Administering Office	Funding Source	Funding Type	Purpose	Eligible Applicants	Funding Maximum (Per Project)	Applicant Match/Cost-Share
Chesapeake Bay Restoration Fund via Virginia General Assembly	Chesapeake Bay Restoration Fund via Virginia General Assembly	State	Supports: environmental education and restoration projects relating to Chesapeake Bay and its tributaries. Revenues from the sale of Friend of the Chesapeake license plates have gone into Chesapeake Bay Restoration Fund.	State/local governments; non-profit organizations	15,000	None
Chesapeake Bay Trust	EPA, Chesapeake Bay Trust, Maryland Department of Natural Resources	Private Foundation, Federal, State	Supports: design, financing strategies and/or implementation of green street projects. Chesapeake Bay G3 Grant Program goal: to help communities develop and implement plans that reduce stormwater runoff, increase the number and amount of green spaces in urban areas, improve the health of local streams and the Chesapeake Bay and enhance quality of life and community livability.	Local government; non-profit organizations, and neighborhood/community associations in the Chesapeake Bay watershed portion of EPA Region 3	100,000	Preferred
Chesapeake Research Consortium	Chesapeake Research Consortium & the National Oceanic and Atmospheric Administration (NOAA)	Federal	Supports: nearshore habitat restoration project(s) in the Middle Peninsula areas of Virginia. Goal of program: to develop a shorewide nearshore habitat restoration project design and monitoring protocols to remove barriers to project implementation and increase the capacity of planners to conduct nearshore habitat restoration. Project design should be appropriate for grant opportunities that can provide funding for project implementation such as National Fish and Wildlife Foundation (NFWF) Coastal Resilience Funding and the NFWF Chesapeake Stewardship Fund.	State/local/tribal governments; regional planning district commissions; institutions of higher education; non-profit/non-profit organizations	40,000	None
Climate Resilience Fund	Climate Resilience Fund, NOAA and Doris Duke Charitable Foundation	Private Foundation, Federal	Supports: integrating diversity, equity and inclusion into climate resilience planning; integrating nature-based solutions with resilience planning; defining characteristics for finance-ready resilience plans and projects; measuring success: tracking performance and results of climate resilience plans and projects. Funding priorities are focused on planning components and tracking of plans. Supports: cost-share of assessments in land from willing sellers to preserve land uses for military missions and natural habitats near military installations to sustain	Non-profit organizations		None

Figure 3. Screenshot of the FFD aspect on the CRMP Web Application "Funding Coastal Resilience" element. Note: screenshot is from draft website and final version may vary.

Functionality for the Funding Coastal Resilience webpage includes the ability to view the FFD, and the presented columns by alphabetic or numeric order. Also, an overview of financing

5.2. FINANCE MECHANISMS

The Web Application also incorporates a high-level overview of finance mechanisms. Users can select a mechanism, including Bonds, Loans, Taxes and Fees, and Transfer of Development Rights. Once selected, the web application provides examples with descriptive text. If a user mouse-hovers over the example, a “Success Story” on the finance mechanism appears (e.g., Figure 4).

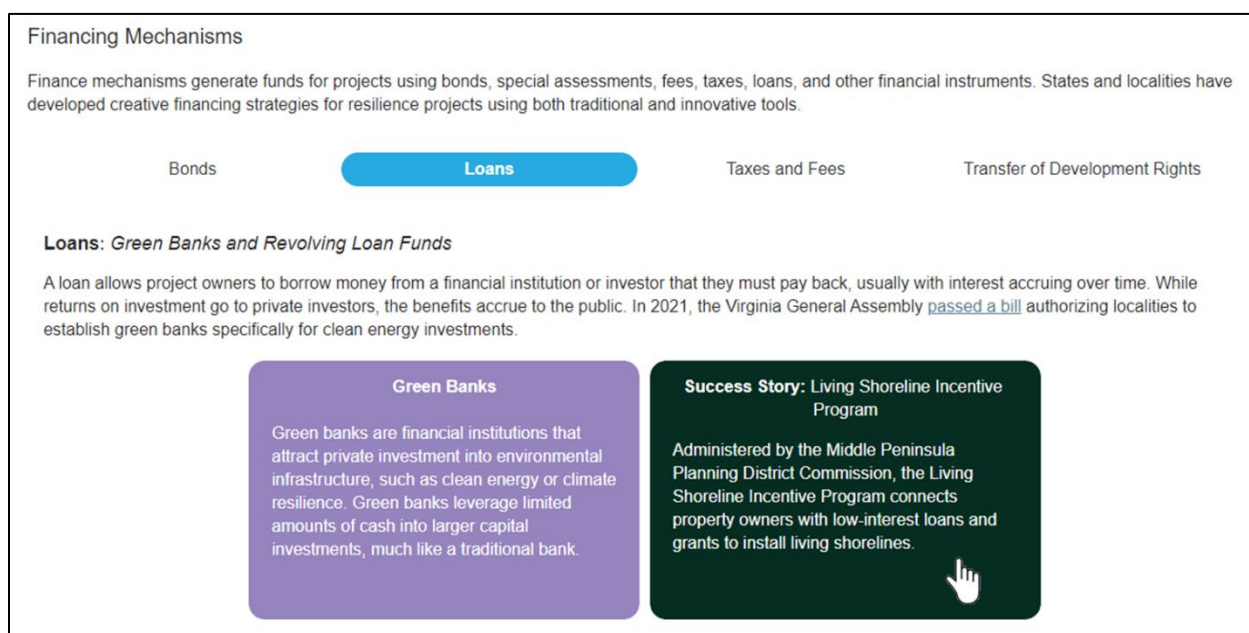


Figure 4. Screenshot of the financing mechanism aspect of the “Funding Coastal Resilience” element. Note: screenshot is from draft website and final version may vary.

5.3. FUNDING STREAM ALIGNMENT

The Funding Stream Alignment product was integrated into the “Building Coastal Resilience” element of the Web Application, which allows users to interact with the resilience project and capacity building efforts cataloged under the first iteration of the CRMP. Once a user selects an individual project in either the table or map viewer, a list of funding sources for the specific project is returned on the bottom-section of the Building Coastal Resilience element (Figure 5). The list reflect the Eligibility Filter and the Suitability Score applications for the specific project. While the actual Suitability Scores are not shown, the list is ordered from highest to lowest score (top to bottom).

Funding Sources
 Funding programs provide money to pay for specific project operating and/or capital costs. These programs can include grants and loans from federal and state agencies and private philanthropies.

VA Projects & Fundings (Features: 19, Selected: 0) ...

Funding Source Name ▲ ...	Administering Office ⚙ ...	Cost Share ⚙ ...	Award Max ⚙ ...	Purpose ⚙
Chesapeake Bay Restoration Fund via Virginia General Assembly	Chesapeake Bay Restoration Fund Advisory Committee	None	15,000	Supports: environmental education and restoration projects relating to Chesapeake Bay and its tributaries. Revenues from the sale of Friend o Chesapeake license plates have gone into Chesapeake Bay Restoration Fund.
Chesapeake Research Consortium & the National Oceanic and Atmospheric Administration (NOAA)	Chesapeake Research Consortium	None	40,000	Supports: nearshore habitat restoration project(s) in the Middle Peninsl areas of Virginia. Goal of program: to develop a shovel-ready nearshor habitat restoration project design and monitoring protocols to remove barriers to project implementation and increase the capacity of planne conduct nearshore habitat restoration. Project design should be appropriate for grant opportunities that can provide funding for projec implementation such as National Fish and Wildlife Foundation (NFWF) Coastal Resilience Funding and the NFWF Chesapeake Stewardship Fu
				Supports: the FCC definition of locations as sentinel landscapes and th subsequent connection of private landowners with government assista

Figure 5. Screen capture of the Funding Sources (Funding stream alignment) element of the CRMP Web Application. Note: screenshot is from draft website and final version may vary.