Virginia Coastal Resilience Technical Advisory Committee

Research, Data, and Innovation Quarterly Subcommittee Meeting

Date: Thursday, August 15th, 2024
Time: 01:00 pm

Location: Bank of America Building
3rd Floor Conference Room
1111 East Main St.
Richmond, VA 23219

Virtual Access:
Register at https://vcu.zoom.us/meeting/register/tZMscuioqjMtHtUUgiYfgvEkDiczo2-JB__9

Meeting Agenda

1) Call to Order, Roll Call, and Introductions
2) Adoption of Agenda
3) Adoption of 2024Q2 Subcommittee Meeting Minutes
4) Subcommittee Overview
5) Old Business
    a. Combined Flood Hazard Update
    b. Subcommittee Recommendations Development
6) New Business
    a. Subcommittee Discussion
7) Public Comment
8) Adjourn

-- **Public Comment**: If you seek to provide public comment, please sign up either in-person or virtually using the Chat window.

Research, Data, & Innovation Subcommittee Meeting

VIRGINIA COASTAL RESILIENCE TECHNICAL ADVISORY COMMITTEE

THURSDAY, AUGUST 15, 2024 | 1:00 PM

VIRGINIA COASTAL RESILIENCE MASTER PLAN

DCR Virginia Department of Conservation & Recreation

Meeting Agenda

- Call to Order, Roll Call
- Adoption of Agenda
- Adoption of Q2 2024 Meeting Minutes
- Subcommittee Overview
- Old Business
  - Flood Hazard Assessment Review
  - Recommendations Development
- *New Business*
  - *Subcommittee Discussion*
- Public Comment
- Action Items, Scheduling
- Adjourn

Name	Title	Organization
Alexander Samms (Chair)	Chief Deputy	Virginia Department of Environmental Quality
Dave Davis (Alternate Chair)	Manager of the Office of Wetlands and Stream Protection	
Whitney Katchmark	Principal Water Resources Engineer	Hampton Roads Planning District Commission
Ben McFarlane (A)	Chief Resilience Officer	
Norm Goulet	Director of NVRC's Environment and Resiliency Planning	Northern Virginia Regional Commission
Rebecca Murphy (A)	Coastal Zone Program Manager	
Dr. Jessica Whitehead	Director of the Institute for Coastal Adaptation and Resilience	Old Dominion University
Carol Considine (A)	Director of Applied Projects, CCRFR	
Dr. Karen McGlathery	Director of the Environmental Resilience Institute	University of Virginia
Dr. Mark Luckenbach	Associate Dean for Research and Advisory Services	Virginia Institute of Marine Science
Dr. Molly Mitchell (A)	Assistant Professor	
Dr. Troy Hartley	Director	Virginia Sea Grant
Dr. Wendy Stout	Director, Virginia Tech Coastal Collaborator Center	Virginia Tech
G. Michael Fitch, Ph.D.	Acting Director	Virginia Transportation Research Council
Mary-Cason Stiff	Executive Director	Wetlands Watch
Ian Blair	Policy Program Director	

Virginia Coastal Resilience Master Plan, Phase II

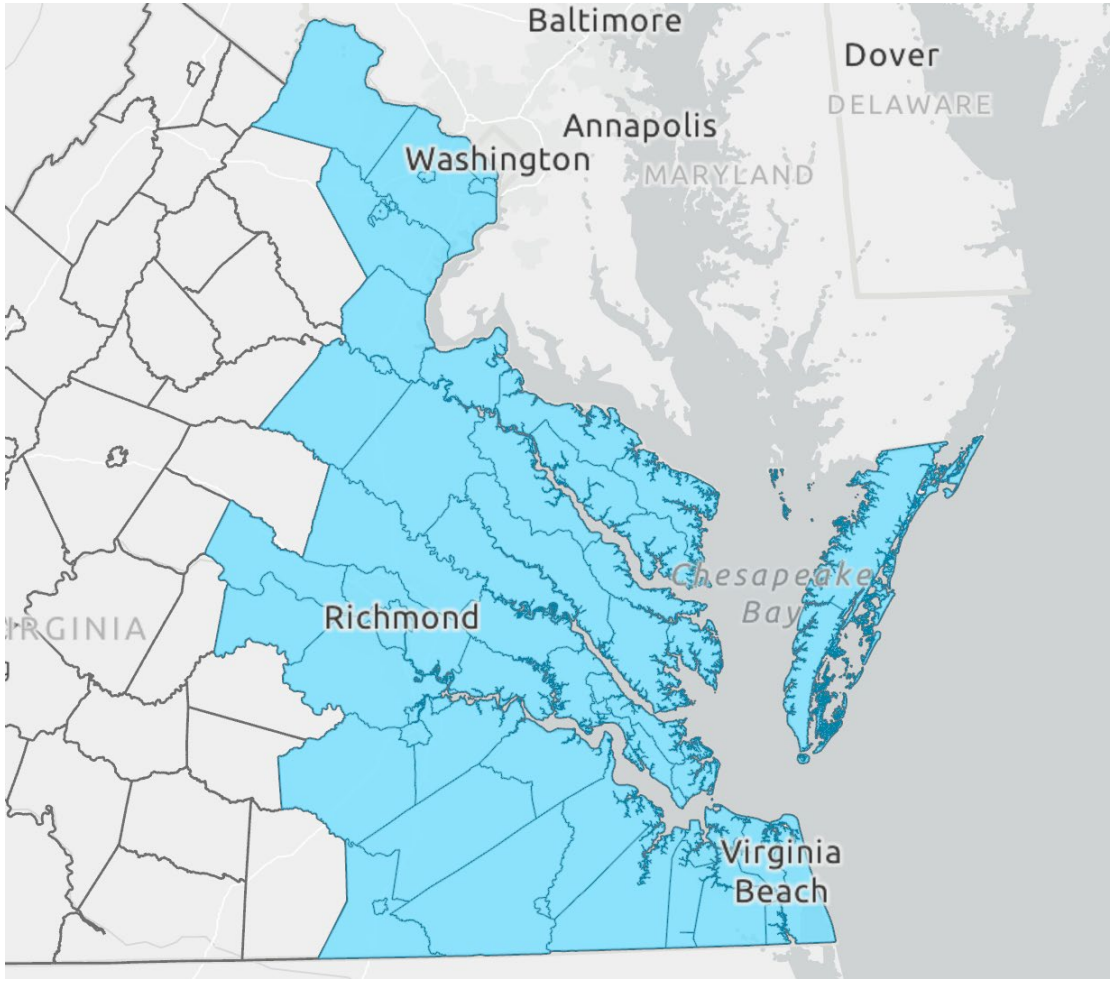
WHAT IS THE CRMP?

A **trusted resource** to assist government entities in making evidence-based decisions to mitigate severe and repetitive flooding.

- **Provides a unified baseline analysis** of the threat of increasing flood exposure and impacts in Virginia's coastal region due to sea level rise and changing precipitation patterns.
- **Identifies opportunities to prioritize impactful flood resilience solutions**, showcasing an inventory of government-led or supported projects and initiatives across the coastal region.

DELIVERY DETAILS

- Major plan elements: hazard exposure, impact assessment, planned resilience actions, financial needs, and subcommittee recommendations
- December 2024 timeline for delivery, updated every five years
- See Code of Virginia §10.1-658, 659



Research, Data, & Innovation Subcommittee Objectives

1. **Inform Development of Flood Hazard Exposure Model.**
   Using the best available data, provide recommendations to DCR and Dewberry to select pluvial modeling approach (including climate scenarios), advise on the selection of fluvial modeling data and scenarios, and advise on approach to compound flooding joint probability analysis.
2. **Inform Inputs to Flood Hazard Risk Assessment.**
   Based on the flood hazard exposure model developed, advise DCR and Dewberry on how to utilize the flood hazard model for conducting the flood hazard risk assessment.
3. **Develop recommendations for future planning.**
   This includes, but is not limited to:
   - Develop a data development plan to fill gaps in advance of future planning processes. **Consider research and data products that can meet the state's needs.**
   - **Advise on innovations suited to address flood risks and fill gaps in resilience action** for future planning efforts. Consider R&D, public-private partnerships, collaborative research.

Subcommittee Schedule

2023Q3	CRMP PII - Pluvial Modeling Pilot Study
2023Q4	CRMP PII - Flood Hazard Data Scenario Planning
	CRMP PII – Flood Hazard Data Reporting
2024Q1	CRMP PII – Flood Hazard Data Scenarios, Combined Flood Hazards
	Future Plans - Recommendations
2024Q2	CRMP PII – Flood Hazard Data Update
	Future Plans - Recommendations
2024Q3	CRMP PII – Flood Hazard Assessment Review
	Future Plans - Recommendations
2024Q4	Future Plans – Final Recommendations

CRMP2 Planning Scenarios and Flood Hazard Data

	Reference Scenario
Time Horizon	2000-2020
Coastal	2020 CRMP
Pluvial	Atlas14
Fluvial	FEMA

	Planning Scenarios			
Planning Horizon	Near Future ~2030-2060		Far Future ~2060-2100	
Risk Tolerance	Moderate	Low	Moderate	Low
Coastal	2040 CRMP	2060 CRMP	2060 CRMP	2080 CRMP
Pluvial	2020-2070 RCP 4.5 Median	2020-2070 RCP 4.5 90th %	2050-2100 RCP 4.5 Median	2050-2100 RCP 4.5 90th %
Fluvial	FEMA	FEMA	FEMA	FEMA

Notes:
Coastal: 2020 CRMP MSL adjusted based on tidal observations. 2040, 2060, & 2080 CRMP based on NOAA 2017 Intermediate-High Relative Sea Level Rise Projection
Pluvial: Precipitation values from Atlas14 and MARISA RCP 4.5 will be rounded to the nearest interval based pluvial model using conventional rounding.

Recommendations Development

OBJECTIVE

- Develop high priority recommendations to improve mitigation of severe and repetitive flooding in Virginia's coastal region.
- The recommendations should be:
  - An action to implement prior to the next planning phase (in the next 1-4 years) by appropriate responsible actors (ex., state agencies, PDCs, localities, legislators, federal government, etc.).
  - A process improvement for DCR when developing the next Coastal Resilience Master Plan (to be released in 2029).

OUTCOME

- The high priority recommendations that receive a passing vote from the full TAC per Section 2-3 of the TAC charter will be included as recommendations in the plan.
- Each recommendation will comprise an action-oriented statement, identified responsible actor(s), and a brief justification of the recommendation.
- The list of approximately 120 draft recommendations developed by the subcommittees at their Q2 2024 meetings will be included as an appendix to the plan.

PROCESS

July 15-19: **Prioritization Survey**	Subcommittee members vote on their top 10 recommendations per subcommittee.
August 7-15: **Q3 Subcommittee Meetings**	Subcommittees review survey results, identify and refine the top 5 recommendations, and assign responsible parties.
September 18: **Q3 TAC Meeting**	The Full TAC reviews and refines each subcommittee's top 5 recommendations.
October 3-10: **Q4 Subcommittee Meetings**	Subcommittee members finalize and vote on up to 5 recommendations.
November 13: **Q4 TAC Meeting**	The Full TAC votes on all subcommittee recommendations.

Recommendations Development

PRIORITIZATION CRITERIA

DCR encourages TAC members to prioritize recommendations using the following three criteria:

1. Alignment with the purpose of the Coastal Resilience Master Plan
2. Alignment with the Coastal Resilience Master Planning principles
3. The impact, urgency, and feasibility of the recommendation.

ADDITIONAL CONTEXT

- The Virginia Flood Protection Master Plan, due December 2025, will include stakeholder engagement to develop a policy and program strategy for state agencies to increase flood resilience across Virginia.

CODIFIED COASTAL RESILIENCE MASTER PLANNING PRINCIPLES

- Acknowledge climate change and its consequences, and base decision-making on the best available science.
- Identify and address socioeconomic inequities and work to enhance equity through coastal adaptation and protection efforts.
- Recognize the importance of protecting and enhancing green infrastructure like natural coastal barriers and fish and wildlife habitat by prioritizing nature-based solutions.
- Utilize community and regional scale planning to the maximum extent possible, seeking region specific approaches tailored to the needs of individual communities.
- Understand fiscal realities and focus on the most cost-effective solutions for protection and adaptation of our communities, businesses, and critical infrastructure.

Recommendations Development

New Business

SUBCOMMITEE DISCUSSION

Public Comment

IF YOU SEEK TO PROVIDE PUBLIC COMMENT, PLEASE SIGN UP EITHER IN-PERSON OR VIRTUALLY USING THE CHAT WINDOW.

Action Item Review

Upcoming Schedule

- Full TAC Meeting: September 18, 2024, 10am-1pm
  - Review plan updates and all subcommittee recommendations
- Research, Data, & Innovation Subcommittee Meeting: October 10, 2024, 1pm-3pm
  - Finalize and vote on subcommittee recommendations
- Full TAC Meeting: November 13, 2024, 10am-1pm
  - Vote on all subcommittees' recommendations
- Plan Released by December 31, 2024

CRMP, Phase II: Coastal Resilience TAC Recommendations

Research, Data, and Innovation Subcommittee | Survey Results

The four subcommittees of the Coastal Resilience Technical Advisory Committee (TAC) are tasked with developing recommendations to appear in the Coastal Resilience Master Plan (CRMP), Phase II. The TAC subcommittees drafted recommendations in their 2024 Q2 meetings. Between the Q2 and Q3 meetings, a survey was distributed to the subcommittees to identify the top 10 recommendations from each subcommittee. The draft recommendations used in the survey were taken directly from the Q2 subcommittee meetings. This memo presents the resulting top 10 recommendations from the survey.

Recommendations for Q3 Discussion

This section presents the top 10 recommendations as they will be presented to the subcommittee for discussion at the Q3 meeting.

The recommendations have been grouped based on similarity, with their ranking score result from the survey noted in parentheses. Additional bullets under each recommendation identify any related or similar recommendations, as well as a suggested primary responsible party for implementation.

Grouping 1:

- A.1.1.b.: Support research to evaluate flood reduction metrics of natural and nature-based solutions. Establish topic-specific, standing, and ad hoc sub-working groups to track research progress on needed research and data gaps, identify research priorities regularly, and catalyze teams to secure funding from applicable RFPs. (#1)
    - Related to A.1.1.a: Support research on economic valuation of nature-based infrastructure that includes blue carbon and other ecosystem services, including agricultural, wildlife, and other relevant values that have been difficult to measure.
    - Responsible Party: Commonwealth's research university collaborative[1]
- A.1.4.a: Develop measures and methods to monitor performance of resilience projects (dashboards including ecological, infrastructure, social, economic, cultural, and justice indicators), including sensor, drone, and other smart-tech data gathering and analysis methodologies. (#2)
    - Responsible Party: Commonwealth's research university collaborative

Grouping 2:

- A.2.6.a: Identify critical data needs for resilience planning and develop a plan for regular funding for acquisition, processing, and analysis. (#3)
    - Responsible Party: DCR ORP

[1] See Code of Virginia § 10.1-660.

- A.3.2.a: Develop statewide strategy to support co-production of initiatives/products/future research needs with stakeholders, including mechanisms to engage and incorporate community and stakeholder input into research, data visualization, and project implementation. (#6)
    - Responsible Party: State Agencies

Grouping 3:

- A.1.2.a: Research (planning, design, regulatory, legal, financial) obstacles that exist at the local scale, and what innovations are required at the state level to meet local needs innovatively and effectively. (#4)
    - Responsible Party: DCR ORP
- A.3.1.b: Conduct use-inspired collaborative R&D between public and private partners on adaptation solutions, including: nature-based solutions that simultaneously meet water quality and water quantity standards; enhance marsh plant production; alternative septic; wells – saltwater intrusion; beneficial dredge use; property scale monitoring technologies (sensors, drones). (#5)
    - Related to Funding (#3) C.2.2.c: Ensure businesses, government officials, citizens and other stakeholders are aware of the financial opportunity from economic development potential of innovative resilience and adaptation technologies, products, services and designs created in Virginia and sold to an emerging global market.
    - Responsible Party: Commonwealth's research university collaborative

Grouping 4:

- A.1.3.a: Support research to evaluate the benefits and costs of resilience action and of failing to take resilience actions. (#7)
    - Responsible Party: Commonwealth's research university collaborative
- A.4.2.a: Define what resilience success looks like. (#10)
    - Similar to: C.1.3.a: Determine future efforts to set metrics for flood resilience.
    - Responsible Party: Flood Resilience Advisory Committee[2]

Grouping 5:

- A.1.1.e: Support research on next generation Social Vulnerability Indices (SVI) and understanding of climate justice, cultural and historic resources, including a Virginia flood-centric SVI dataset to inform project prioritization. (#8)
    - Similar to A.1.1.d: Consider researching a Virginia flood-centric Social Vulnerability Index (SVI) dataset to inform project prioritization.
    - Responsible Party: Commonwealth's research university collaborative
- A.2.1.a: Support multi-institutional efforts to collate quantitative AND qualitative data on modeling, risk assessment, and planning decisions in Virginia. (#9)
    - Responsible Party: TBD [need to define “support”]

[2] See Code of Virginia § 10.1-659, subpart D.

Survey Results

Prioritization Process

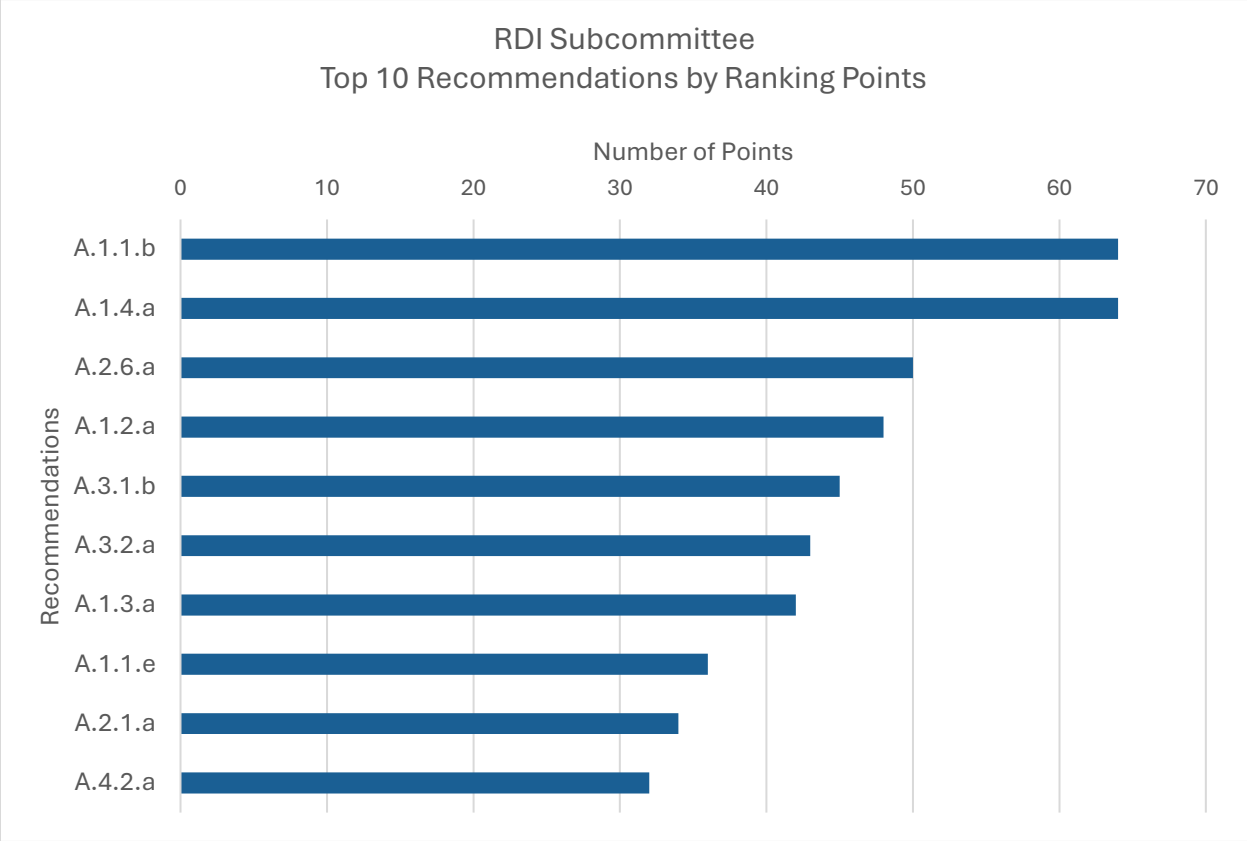
The Research, Data, and Innovation Subcommittee drafted 29 recommendations during its 2024 Q2 meeting. Survey respondents categorized each draft recommendation as first, second, or third priority. Respondents could categorize up to 12 recommendations as first-priority. Survey respondents then ranked their first-priority recommendations from 1 through 12.

Results were evaluated using a point system. Point values were assigned to each draft recommendation according to the ranking results. Each time a recommendation received a ranking in first position it received 12 points, the second position received 11 points, the third position received 10 points, and so on down to the twelfth (last) position that received 1 point. The list and chart show the top 10 recommendations in order from highest to lowest point values received.

Top 10 Recommendations Ranked

1. A.1.1.b: Support research to evaluate flood reduction metrics of natural and nature-based solutions. Establish topic-specific, standing, and ad hoc sub-working groups to track research progress on needed research and data gaps, identify research priorities regularly, and catalyze teams to secure funding from applicable RFPs.
2. A.1.4.a: Develop measures and methods to monitor performance of resilience projects (dashboards including ecological, infrastructure, social, economic, cultural, and justice indicators), including sensor, drone, and other smart-tech data gathering and analysis methodologies.
3. A.2.6.a: Identify critical data needs for resilience planning and develop a plan for regular funding for acquisition, processing, and analysis.
4. A.1.2.a: Research (planning, design, regulatory, legal, financial) obstacles that exist at the local scale, and what innovations are required at the state level to meet local needs innovatively and effectively.
5. A.3.1.b: Conduct use-inspired collaborative R&D between public and private partners on adaptation solutions, including: nature-based solutions that simultaneously meet water quality and water quantity standards; enhance marsh plant production; alternative septic; wells – saltwater intrusion; beneficial dredge use; property scale monitoring technologies (sensors, drones).
6. A.3.2.a: Develop statewide strategy to support co-production of initiatives/products/future research needs with stakeholders, including mechanisms to engage and incorporate community and stakeholder input into research, data visualization, and project implementation.
7. A.1.3.a: Support research to evaluate the benefits and costs of resilience action and of failing to take resilience actions.
8. A.1.1.e: Support research on next generation Social Vulnerability Indices (SVI) and understanding of climate justice, cultural and historic resources, including a Virginia flood-centric SVI dataset to inform project prioritization.

9. A.2.1.a: Support multi-institutional efforts to collate quantitative AND qualitative data on modeling, risk assessment, and planning decisions in Virginia.
10. A.4.2.a: Define what resilience success looks like.



Coastal Resilience Technical Advisory Committee

Initial Subcommittee Recommendations from Q2 Meetings

Grouped by Subcommittee, Themes, and Common Topic Areas

Contents

A. Research, Data, and Innovation Subcommittee

A.1 Research: Applying Research to CRMP Flood Resilience Planning, Processes, and Implementation.

A.1.1 Support Research on Nature-Based Solutions, Modeling, and Other Topics (Alignment w/Funding & PP)

a) Support research on economic valuation of nature-based infrastructure that includes blue carbon and other ecosystem services, including agricultural, wildlife, and other relevant values that have been difficult to measure.
b) Support research to evaluate flood reduction metrics of natural and nature-based solutions. Establish topic-specific, standing, and ad hoc sub-working groups to track research progress on needed research and data gaps, identify research priorities regularly, and catalyze teams to secure funding from applicable RFPs.
    - Compound flood modeling,
    - Human dimensions of adaptation behavior,
    - Socio-Economic impacts,
    - Emerging best practices from other states addressing flooding
c) Support research, monitoring, and modeling of groundwater levels and saltwater intrusion.
d) Consider researching a Virginia flood-centric SVI dataset to inform project prioritization.
e) Support research on next generation Social Vulnerability Indices (SVI) and understanding of climate justice, cultural and historic resources, including a Virginia flood-centric SVI dataset to inform project prioritization.

A.1.2 Research Local Challenges and Lessons Learned from Other States

a) Research [planning?, design?, regulatory?, legal, financial?] obstacles that exist at the local scale, and what innovations are required at the state level to meet local needs innovatively and effectively. (Overlap w/O&C)
b) Conduct a synthesis fully analyzing how other states are addressing the issue of coastal flooding to provide context to the approach we are using thus far and in the future.

A.1.3 Support Research on Benefits/Costs of Resilience Action and Human Adaptative Behavior

a) Support research to evaluate the benefits and costs of resilience action and of failing to take resilience actions.
b) Conduct research to generate a better understanding of human adaptive behavior (e.g., tipping or trigger points for choices, incremental adaptive behavior At the individual, organizational and community scales)

A.1.4 Monitor Performance of Resilience Projects and Assessments

a) Develop measures and methods to monitor performance of resilience projects (dashboards including ecological, infrastructure, social, economic, cultural, and justice indicators), including sensor, drone, and other smart-tech data gathering and analysis methodologies.

A.2 Data: Sourcing, Using, And Managing High-Quality Data to Improve Models, Risk Assessment, and Planning Approaches.

A.2.1 Support Multi-Institutional Data Efforts (Alignment w/PP)

a) Support multi-institutional efforts to collate quantitative AND qualitative data on modeling, risk assessment, and planning decisions in Virginia.

A.2.2 Integrate a Variety of Data Sources and Types

a) Integrate groundwater data with existing flooding and infrastructure risk datasets. (inter-agency and centralized)
b) Develop comprehensive bridge deck elevation data.
c) Consider drone usage for collecting data.
d) Consider modeling flood loss estimates that consider agricultural and wildlife habitat value in BC A tools for considering new projects and studies.

A.2.3 Provide Data-Related Training and Incorporate Customer Feedback (Overlap w/O&C)

a) Provide training opportunities at the local scale to utilize and apply new data and identify additional gaps in data needed for flood resiliency planning at the local scale.
b) Identify ways to learn how useful and successful the data is for localities to use. Collect customer feedback, follow up, and iterate.

A.2.4 Publish Data in Way that Protects Privacy

a) Disseminate / visualize data to preserve privacy of individuals, and develop protocols for identifying sensitive data, ensuring ethical research methods and conduct (e.g., supporting research that undergoes Institutional Review Board procedures).

A.2.5 Update Data Regularly

a) Develop a mechanism to update data over 4-year time horizon.

A.2.6 Identify Critical Data Needs and Plan for Funding (Overlap w/PP)

a) Identify critical data needs for resilience planning and develop a plan for regular funding for acquisition, processing, and analysis.

A.3 Innovation: Identifying Innovations Suitable to Address Flood Risks and Fill Gaps in Resilience Action.

A.3.1 Expand Support for Innovation Programs and Research Development

a) Expand the support for innovation ecosystem programs to support emerging resilience and adaptation innovations.
b) Conduct use-inspired collaborative R&D between public and private partners on adaptation solutions including:
    i. NBS that simultaneously meet water quality and water quantity standards
    ii. Enhance marsh plant production
    iii. Alternative septic

iv. Wells – saltwater intrusion.
v. Beneficial dredge use
vi. Property scale monitoring technologies (sensors, drones)

c) Develop policy innovation tools to allow responsible, rapid policy adaptation and experimentation e.g., establish experimental zones – R&D, but also Policy Zones, with Resilience principles, goals that must be met – to receive tax incentives, regulatory discretion, permit integration and coordination (see the integration team efforts of the SF Bay restoration program, Green Tape Cutting Initiative).
d) Identify regulatory barriers to testing out innovative resilience practices.

A.3.2 Engage Stakeholders in Knowledge Creation (Overlap w/O&C)

a) Develop statewide strategy to support co-production of initiatives/products/future research needs with stakeholders, including mechanisms to engage and incorporate community and stakeholder input into research, data visualization, and project implementation.
b) Create environments that help move from information sharing to creation of knowledge.

A.4 Other

A.4.1 Determine How to Support Local Resilience Champions (Overlap w/O&C)

a) What is the role of local/regional/state agencies in supporting local/regional resilience champions?

A.4.2 Define Resilience Success (Overlap w/PP)

a) Define what resilience success looks like.

A.4.3 Identify Mechanisms for Future Collaboration Amongst Stakeholders (Overlap w/O&C)

a) Identify mechanisms for future collaboration amongst diverse stakeholders.

B. Project Prioritization Subcommittee

B.1 Driving Toward Outcomes: Develop a Clear Purpose, Goals, Implementation Strategy, and Measures of Success for Future Iterations of the CRMP.

B.1.1 Develop an Implementation Plan Focused on Funding and Policy

a) Use the CFPF to implement the CRMP. (Overlap w/Funding)
b) It's still problematic that the CRMP and the Community Flood Preparedness Fund are not directly connected. Using the CFPF to implement the CRMP or the VFPMP would go a long way towards getting buy-in.(Overlap w/Funding)
c) The scale of the CRMP is too large to have a useful implementation plan, unless that plan is focused on policy or programmatic changes. The level of geography at which on-the-ground implementation will be done is mostly within individual jurisdictions. It's unclear how the CRMP supports that work.

B.1.2 Address Long-Term Planning Challenges

a) Take temporal aspects into account when developing clear plan purpose and goals. Clarify what the timespan is, expected to help short-term, mid-term, long-term? And what does that do to our costs and investments long-term?
b) Include mention of path-dependency as an issue that can cause future challenges in adaptation due to actions taken right now to address current problems. As an example, think of the so called "levee effect" whereby research has demonstrated that in many instances, development of structural protections has often led to greater future losses in "protected" areas when the infrastructure is overwhelmed. This results because the perceived safety offered by infrastructure increases development and investment, all of which suffers when the infrastructure is overwhelmed. And infrastructure is often overwhelmed as we typically build, at most, to a 1% annual chance event, which itself is an arbitrary standard, not a safety standard.

B.1.3 Identify Project Options

a) Have a few detailed project alternatives, possibly a low-cost, med-cost, and high-cost alternative so localities aren't being bombarded with expensive and intensive projects that they need to do without the capacity and funding to do them. Recognizing that even a small step is a step makes seeking outcomes a lot less overwhelming for our more stressed localities.

B.1.4 Develop Metrics to Determine Outcomes

a) Balance PROCESS metrics with OUTCOME metrics – Design outcomes and how they are determined.
b) Frequency, magnitude – Strategize with tracking.

B.2 Supplying Actionable Impact Data: Effectively Assess the Potential Impacts of Flooding to Support Decision Making.

B.2.1 Identify Additional Data Sources to Fill Gaps

a) Survey stakeholders to learn what they consider critical data to inform decision-making, and what data is missing.

b) Utilize/survey flood management practice data to supplement flood hazard data for a full picture of flood risk and vulnerability.
c) Map data needs across the entire "supply chain", (i.e. program-wide KPIs to vulnerability assessment data to project scoring criteria) and come up with plan to fill any gaps.

B.2.2 Coordinate and Improve Inter-Agency Data Management, Accessibility, and Integration

a) Continue state inter-agency coordination efforts aimed at the development, maintenance, and enhancement of accessible region-wide asset datasets for non-sensitive data, and to ensure that agencies aren't duplicating efforts.
b) Establish programs to encourage coordination and cost savings for data collection. Ex. real-time flood data from sensors. Create an intuitive system to index, document, search, and analyze data using FAIR (Findable, accessible, interoperable, reusable) principles across agencies (https://internetofwater.org/valuing-data/making-public-data-fair/).
c) Create a standard going forward that is interoperable to ensure high-quality data that can be used by various agencies in the future. Potentially rework older data that is less usable.
d) Create a one-stop-shop platform to host data for all state agencies, starting with coastal resilience data.
e) Have a standard to ensure all ingested data has a process for curation, de-identification, de-duplication, and a safe and secure way to identify characteristics about all data elements. This will allow everyone to know that data has been contributed and available.

B.2.3 Utilize Historic, Real-Time and Future Conditions Flood Data

a) Expand availability and use of real-time data (e.g. real-time flooding) to assist in response. Increase use of real data instead of projections and historic data.
b) Consider forward-looking/future-conditions data for all components of flood risk (hazard, exposure, vulnerability). Examples include SLR, precipitation frequency (Atlas 15, MARISA), projected growth, demographic changes, etc.
c) Analyze historic trends of flooding to look for recent increases in flooding events and damage. This will help to identify what areas are more likely to have more immediate increased impacts with climate change.

B.3 Identifying Flood Resilience Needs: Establish Criteria to Define where the Greatest Need for Flood Resilience Actions Exist.

B.3.1 Ensure Criteria are Multi-faceted and Consider Future Conditions

a) Integrate criteria for weighting of actions that balances need/desire for action on today's impacts with evaluation of the feasibility of long-term viability of an area. Determining "long-term viability" is clearly not an objective process, but the difficulty of engaging in such a discussion is to engage community and thus provide learning opportunities.
b) Consider compounding hazards like SLR and coastal surge to project and estimate future conditions to identify flood resilience needs.
c) Establish criteria that is multi-faceted and addresses both vulnerability and solutions that identify the greatest needs.

B.3.2 Develop a Needs Assessment

a) Develop an initial needs assessment for coastal flood resilience, like exists for wastewater or Ag, and a process to update it as an element of the plan.

B.3.3 Engage and Support Localities to Identify Needs (Overlap w/O&C)

a) Provide support to localities on developing locally specific weighting for prioritization of projects utilizing CRMP data.
b) If there are no planned actions, establish state staff/consultant team program to reach out to local government to identify if they are not interested in actions or what factors (staff, funding) would support developing actions.
c) Coordinate with local governments to ID flood prone areas. Talk to residents and other stakeholders and work to address their concerns.

B.3.4 Identify Outlier Data

a) Include section in final report(s) discussing outliers in responses (disproportionately high or low) and plans to address in subsequent iterations.

C. Funding Subcommittee

C.1 Building the Financial Baseline: Using Financial Data to Guide the Development of Flood Resilience Metrics.

C.1.1 Track Real Estate Value Data

a) Track the data on real estate analysis and recognize the detrimental impacts of water in relation to the tax base.
b) Existing real estate land value and building values should be tracked annually to report when local tax revenue slippage is occurring in areas at risk to flooding, sea level rise, saltwater intrusion, marsh migration, or other related environmental changes.

C.1.2 Track and Leverage Financial Data from Impacts and Projects

a) Identify specific financial needs for private and public projects.
b) Ensure matching funds are tracked to identify or validate contributor expectations. Determine a justifiable financial report that portrays flood damage trends.

C.1.3 Establish Flood Resilience Metrics (Overlap w/PP)

a) Determine future efforts to set metrics for flood resilience.

C.2 Making the Financial Case: Providing Financial Information to Motivate and Enable Action.

C.2.1 Develop Tools to Track Flood Impacts and Financial Needs

a) Develop financial tools and reports to more clearly explain the immediate and mid-term cost of doing nothing at the local level.
b) Develop and promote tool for localities to track flood damages, especially minor flood events where FEMA doesn't get involved in reporting.

C.2.2 Engage with Legislators and Special Interest Groups (Overlap w/O&C)

a) Engage with special interest groups to determine what is important to adapt the messaging and data to fit their interests and motivate potential investments.
b) Make the case to state legislators using project prioritization and project readiness.
c) Ensure businesses, government officials, citizens and other stakeholders are aware of the financial opportunity from economic development potential of innovative resilience and adaptation technologies, products, services and designs created in Virginia and sold to an emerging global market.

C.2.3 Consider Complex Metrics and Data

a) Consider complexity of metrics and various types of stakeholders.
b) Connect economic benefits and other benefits outside of resilience improvements to resilience-focused projects.

C.2.4 Consider Impacts to Private and Public Property

a) Consider recommendations for private properties and for public properties.
b) Ensure that all businesses are aware of financial impacts that may threaten their businesses associated with water.

C.3 Documenting Opportunities for State Support to Reduce Barriers and Increase Access to Financial Tools for Flood Resilience

C.3.1 Identify and Evaluate Funding Sources

a) Determine what the existing and available funding resources are.
b) Evaluate existing state grant funds such as the Flood Fund which primarily supports short term projects and maybe should be looking longer-term. Consider additional funding mechanisms that may be needed for longer-term challenges, e.g., strategic relocation, saltwater intrusion into public drinking water systems, infrastructure abandonment, etc.
c) Identify opportunities for inter-regional revenue and cost-sharing methods and programs, e.g., if one community provides a resilience benefit that supports other communities within the region, then there may be a means of providing revenues to maintain and enhance that resilience benefits; similar to the Catskill Watershed Corporation, or other governance tools (wetlands banks, nutrient trading, transferable development rights, conservation easements).

C.3.2 Consider Additional Methods for State Support Based on Current Needs and Opportunities

a) Consider fight the flood initiatives as a framework for additional state support.
b) Establish state program for non-federal match with multi-year projections and eligibility criteria so localities can plan for state or federal funds on a timeline.
c) Identifying revenue sources for projects that don't receive grant funding, including loan options.
d) Consider impact bonds/type of performance metrics.
e) Simplify the process to connect the flood resilience need to the pursuit of funding.

C.3.3 Address Challenges with Reimbursement-Based Grants

a) Review reimbursable grants and management of cash flow.
b) State agencies develop new mechanisms to allow for more flexibility with funding grant reimbursement.

C.3.4 Identify Opportunities for Public-Private Partnerships

a) Identify opportunities for public private partnerships in pursuing prioritized resilience projects.

C.4 Providing Guidance and Information to Government for Funding and Financing Flood Resilience Activities

C.4.1 Provide Clear, Consistent Funding Guidance

a) Define & outline who the funding is for (public vs. private).
b) Provide clear rules and concise guidance for obtaining and using funding to ensure consistency and predictability.
c) Ensure funding prioritization is politically agnostic.

C.4.2 Research Long-Term Funding Resources for Future Adaptation Measures

a) Consider how to secure resources for the future beyond M&O costs, e.g., strategic relocation of key public assets, iterative adaptation measures to update existing resilience projects, etc.
b) Research resources for future, or iterative adaptation measures.

C.4.3 Enhance Evaluation Metrics and Methods to Increase Impact (Overlap w/PP)

a) Determine what we are trying to accomplish and where we can make the largest impact. Review return on investment calculations for pursuing federal dollars.
b) Identify crossover benefits of prioritized resilience projects at the local, regional and Commonwealth level as a starting point for potential pooling of resources to get projects completed.
c) Enhance the state's ability to further evaluate local flood resilience needs.

D. Outreach and Coordination Subcommittee

D.1 Encouraging Plan Uptake: Identify Sustainable Outreach and Engagement Strategies to Support the use of the Planning Products.

D.1.1 Demonstrate the Value of Plan to Stakeholders

a) Encourage state agencies to leverage the plan through representation on the TAC.
b) Show value of the plan to stakeholders by increasing coordination with local government departments to pinpoint areas of flooding complaints, then target those areas with increased coordination (by getting into the communities with informative town hall meetings, etc.)
c) Determine a strategy for how to get local governments and stakeholders interested.
d) Periodically review and assess plan uptake progress and pivot strategies.

D.1.2 Identify Funding Opportunities (Overlap w/Funding)

a) Given budget constraints, identify a comprehensive list of available funding (state, federal) opportunities to support plan initiatives.

D.1.3 Identify Capacity Constraints and Build Support

a) Recognize capacity constraints that prevent plan uptake and try to find ways to bridge those gaps.
b) In assessing partner capabilities/constraints, think about ways to build support network for grant writing. (Overlap w/ Funding)
c) Define issues and explain how they impact underserved communities.

D.1.4 Provide Education and Training to Stakeholders

a) Hold webinars/demonstrations of tools available with interested local governments and stakeholders to increase visibility of what we have that others can use. Make simplified and short tutorials for people to learn in their free time.
b) Provide education to community groups.
c) Conduct trainings/workshops on materials/tools.

D.2 Enhancing Coordination: Strengthen Relationships with Key Stakeholders.

D.2.1 Coordinate Interagency Activities

a) Coordinate activities among agencies to minimize participant fatigue and show that participants' input is utilized.
b) Capture data via coordination with other agencies.

D.2.2 Increase Awareness of CRMP Products

a) Increase awareness of online tools available to local stakeholders.
b) Increase outreach efforts via social media.
c) Utilize state office that can help with language of the messages.

D.2.3 Conduct Meaningful Engagement to Improve Knowledge Sharing

a) Go to a community before and after a flooding event and capture metrics to see if plans are working.
b) Coordinate with community groups who must react to resilience events to understand how they typically respond.
c) Eliminate barriers to attend meetings and do what is possible to go to people/meet people where they are.

D.3 Understanding our Stakeholders: Improve our Understanding of Key Stakeholders, including their Capacities and Needs.

D.3.1 Build Trusting Relationships

a) Listening to groups and understand and respect word choice/approach to establishing relationships.
b) Develop a strategy to take action to work with different groups to obtain trust.
c) Incorporate stakeholder suggestions and feedback into future actions taken related to the plan.

D.3.2 Design Initiatives to Reach More Vulnerable Populations

a) Partner with localities to investigate best cultural format for distributing information.
b) Identify highest at-risk populations specifically for Virginia and curate outreach initiatives for those needs (e.g., elderly in retirement, men aged 15-30, etc., whoever is assessed to be at the most risk for flood hazard).
c) Engage with non-English media outlets on outreach efforts to raise awareness of issues and resources available – TV, radio, print, etc.
d) Engage with media outlets in languages other than English.

D.3.3 Consider Additional Outlets to Increase Stakeholder Engagement

a) Provide interactive community events that encourage engagement and provides education.
b) Join Community Action Groups to present information on flood resilience.
c) Identify outlets and see if they overlap with those who haven't been participants.

D.3.4 Use Clear, Consistent Messaging

a) Commit to plain English to translate/describe/explain flood mitigation activities and challenges throughout the full process.
b) Provide a consistent message.