



# Northern Virginia Flood and Education Outreach Framework

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Prepared by:

**Northern Virginia Regional Commission**

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## Introduction

As record-breaking storms and extreme weather events increase in Northern Virginia, so are the resulting floods that threaten the safety and integrity of the region, its communities, and its infrastructure. With a high vulnerability to flood hazards, it is more crucial than ever to prepare the region for sea level rise and changing precipitation patterns and the impacts that both have on our communities. Since flooding is a community scale problem, it should be addressed with a community scale approach. Effective management of flood risks requires the support and engagement of private citizens, businesses, and other organizations in addition to government agencies. Since flood hazards do not stop at political boundaries, a whole community approach can provide a more effective communication plan, and a well-informed community can make better decisions to protect themselves and their property from flooding.

This Education and Outreach Framework was developed to provide a regional approach in flood hazard awareness outreach and messaging for Northern Virginia. Most current flood education activities emanate from individual jurisdictions and are usually driven by their own ordinances and regulatory requirements. By using consistent messages delivered by a regional authority, we hope to foster credibility, decrease confusion, and provide support to our member jurisdictions looking to advance flood resilience in their community. This framework identifies key topics, goals and strategies for coordinated public education about flood risk specific to Northern Virginia.



*North Dickerson Street in Arlington in July 2019. Photo credit Arlington DES*

## Methodology

Components of the NOVA Flood Education and Outreach Framework were determined based on information and feedback from Northern Virginia jurisdictions and other regional resiliency stakeholders. During the development and draft phases of the framework, NVRC engaged representatives from local jurisdictions to understand each locality's current flood education and outreach strategies and priorities, as well as to identify gaps in flood-related messaging and content at the local and regional scale. Interview questions are included in Appendix A. NVRC also received input and feedback on the framework's goals and content during the Commission's quarterly flood mitigation and resilience workgroup meetings, which includes representatives from local jurisdictions, state agencies, and non-profit organizations, as well as other technical and policy experts from across the region.

This document begins with an overview of flood hazards in Northern Virginia, including key issues and impacts to address at the regional scale, followed by an outline of audience types that can be targeted with tailored messaging and engagement activities. After a review of each audience, the document highlights the primary topics and goals that the framework aims to accomplish through specific strategies and methods for future outreach and education programming. In particular, while strategies represent specific types of messaging that can be used to accomplish each goal, the identified methods serve as forms of delivery for each strategy, including community engagement activities and products to share with the public.

Two matrices are provided in the following sections to highlight the range of associated strategies and methods for future engagement. Moreover, components of these matrices are used to determine next steps for implementation, including mechanisms to assess the framework's short and long-term effectiveness.

Notably, the NOVA Flood Education and Outreach Framework serves as a living document as flood hazard conditions and community needs continually evolve throughout Northern Virginia. As such, the components of this framework are subject to change and will be updated as new information and local, state, and regional priorities are identified.



## Objectives

The ultimate objective of this framework is to enhance public safety and reduce vulnerability to flood damage by improving the effectiveness of public information programs. NVRC aims to establish and advance the whole community's understanding of current flood hazards and support for climate resilient planning at a regional level by delivering tailored messages meaningful to Northern Virginia. This framework intends to:

- Build community capacity to prepare, adapt, and respond to flooding events,
- Foster support for climate-informed decision making that prioritizes the health and safety of the community,
- Increase public understanding of climate change and its impact on flooding,
- Promote public safety by encouraging risk reduction actions before, during, and after flood events

NVRC will use the framework to develop an outreach campaign with region-specific approaches tailored to the individual needs of the community.

## Flood Hazards in Northern Virginia

As a part of the coastal zone of Virginia, the region is exposed to flood hazards from both sea level rise and intense, localized precipitation. The Potomac River and its tributaries are responsible for the storm surge and tidal flooding issues in the region's waterfront communities, while stormwater runoff routinely compounds these issues by exceeding the design capacity of drainage systems resulting in flash floods, the most common type of flooding in the region. Flash floods can occur quickly outside of identified flood-hazard areas and are frequently related to intense rainfall events that exceed the capacity of existing stormwater management practices. The impacts can close and damage infrastructure such as roads and culverts in addition to buildings and other personal property.

The severity of flood events is determined by many factors, including stream and river basin topography and physiography, degree of vegetative clearing, and precipitation and weather patterns. Northern Virginia may still be home to a vast network of rivers and streams, but swift development in the early to mid-20<sup>th</sup> century filled in, paved, or piped most of the natural drainage features in the region. As the hydrology of the region shifted with urbanization and



*Surface damage on 18<sup>th</sup> Street North following July 2019 floods in Arlington. Photo credit Arlington DES.*

climate change, the community began to experience more frequent flash floods and property loss outside of designated floodplains. While most development in Northern Virginia occurred before planners and regulators recognized and protected floodplain functions, the extent of impervious surface cover also contributes greatly to the increased risk of flooding in the region. This combination of climate change and extensive urbanization, coupled with proximity to the coast, requires a shift in the public's awareness and understanding of flooding issues in order to address immediate and long-term threats posed by flood hazards.

## Topics



### **WATER CYCLE 101**



### **WEATHER AWARENESS**



### **FINANCIAL IMPACTS**

These three core outreach topics were determined based on jurisdiction interviews and feedback on current gaps in outreach efforts. Associated goals are described under each topic to highlight desired outcomes from education and outreach implementation.

### **Water Cycle 101**

With climate change bringing more intense weather to Northern Virginia, helping the public understand their relationship to the changing flooding patterns in the region is an important component of helping them understand their risk. An accurate understanding of flood risk is critical in effectively managing and reducing that risk. The messages developed for this topic will introduce basic flooding concepts, explain how climate change impacts risk, and encourage the recognition of essential stormwater infrastructure in the community, such as



drainage easements. Through this topic, we aim to improve general flood knowledge, increase the understanding of climate change impacts on flooding and inform how individual choices influence flooding patterns and public risk.

### **Weather Awareness**

Although government agencies and other organizations disseminate flood warnings and assist with emergency management tasks like road closings and evacuations, individuals are ultimately responsible for their own safety. This requires that the general public know what to do before, during, and after a flood to protect themselves and their property, as well as other impacts floods have on their daily lives and routines. In recent years, there has been an increase in the number of flooded roads and swift water rescues. By promoting a culture of preparedness around storm events, we aim to decrease the risk exposure for drivers, first responders and other emergency personnel. The messages developed for the topic of weather awareness aim to improve driver safety, reduce flood damage to structures, and decrease damage/disruption to critical infrastructure or public services.

### **Financial Impacts**

Flood insurance costs are changing as FEMA transitions to a new rating system for the National Flood Insurance Program (NFIP). As the NFIP shifts, the insurance industry is also beginning to respond to the rising costs of insuring high-risk property. Existing outreach programs, such as Virginia Flood Awareness Week, focus on educating the public about flood risk and promoting the need for flood insurance. However, it is also important to provide a clear and accurate understanding of other influencing factors on flood risk and recovery costs such as the Community Rating System (CRS) and flood risk disclosure laws. By focusing on the financial benefits of flood resiliency activities in a community, the messages for this topic will aim to increase the general understanding of flood liability and recovery costs, advance political and industry support for resilient design standards, and advance jurisdiction rating and participation in the CRS program.

# Target Audience

In order to address the various impacts of flooding in Northern Virginia, it is important to tailor messages to specific audiences based on their role in the community and the desired outcome and understanding. Some messages may be appropriate for all audiences while others may only be relevant for one audience type.

## Residents

People who live in the community are one of the broadest audience types. Messages intended for the public should be designed to explain technical concepts in broad and simple terms. This includes language with actions that individuals can take to protect themselves, or information to improve understanding and decision-making around different forms of flood risk. Accordingly, this audience also contains several subsets to appropriately address specific flood issues and impacts:

### Homeowners or Tenants

Residents that own, rent, or otherwise use property that are located both within and outside flood-prone areas. Messaging can vary depending on whether the land is within or outside of the floodplain, as well as the type of home, e.g., multifamily and condominium units versus single family homes.

### Neighborhood and Community Organizations

Groups that represent specific interests or neighborhoods in Northern Virginia, such as Homeowner Associations and civic associations. Messaging can help to influence larger groups of residents that reside in the same area and may face similar types of flood risk.

### Drivers

Residents that own, lease, or regularly operate a vehicle. Language focuses on education around preparation and safety practices when driving or parking in a flooded area.



## **Decision Makers**

Elected or appointed individuals as well as government agencies with decision-making power at the city, county, or regional level. This includes local officials, emergency management, building inspection, economic development and other jurisdictional departments. This audience subset has the ability to influence public policy and perception around flood risk and protection measures, and as such, messaging focuses on education that supports informed policy actions and generation of community buy-in.

## **Business and Professional Community**

Individuals or groups whose professions impact flood-related decision-making in the community or result in the implementation of practices that influence flood safety. This encompasses the region's development industry, including construction, landscaping and design, and real estate professionals, as well as the finance industry, e.g., insurance companies and mortgage lenders. Messaging to this audience aims to provide up-to-date, accurate information and resources to build consensus around flood hazard issues and support best practices for implementation activities.

# Strategy Matrix

All outreach messages should be developed using the CRS manual to ensure maximum credit availability from the 300: Public Information series. Outreach activities should be reviewed by local CRS coordinators and the region's ISO specialist and must be thoroughly documented to be credited. The messages displayed here are examples of existing strategies implemented by NOVA jurisdictions and are intended to be representative of the type of content to be developed by NVRC staff and a marketing consultant.

Goal (Desired Outcome)	Audience	Message/Strategy	Method
<b>Topic 1: Water Cycle 101</b>			
1. Understand climate change impacts on flooding	All	Flooding is the <a href="#">most common and costly natural disaster</a> in the United States, and it is becoming more frequent with climate change. <a href="#">Arlington</a>	1a, 1b, 1c, 3a, 3c, 3d
		The warming climate has brought more frequent and severe storms to the city. <a href="#">Alexandria</a>	
2. Improve general flood knowledge	All	A floodplain is any area of land that is susceptible to being inundated by unusual and rapid accumulation of water from any source. <a href="#">Arlington</a>	1a, 1b, 2b, 2c, 3d
		Flash floods develop quickly during periods of heavy rainfall, sometimes in just a few minutes. <a href="#">Alexandria</a>	1a, 1b, 1c, 2b, 2c, 2d, 3a, 3b, 3c, 3d

Goal (Desired Outcome)	Audience	Message/Strategy	Method
3. Understand impacts of individual choices	Residents	Make room for the runoff by keeping flow paths clear of fences, planting beds, sheds, and other obstructions that could block the stormwater and cause ponding or flooding. <a href="#">Fairfax</a>	1a, 1b, 1c 2a, 2b, 2c, 2d, 3d
<b>Topic 2: Weather Awareness</b>			
1. Prevent drivers from being stranded in floodwaters	Residents	Do not drive through a flooded area; the road surface or bridge may be washed out. Just 12 inches of water is enough to float a small car. Remember: turn around; don't drown! <a href="#">Prince William</a>	1a, 1b, 1c 2a, 2b, 2c, 2d
2. Decrease flood damage to structures	Residents, Business/ Professional Community	Make sure landscaping slopes away from the foundation to keep water from getting in when it rains. <a href="#">Arlington</a>	1a, 1b, 1c, 2b, 2c, 3a, 3d
		One way to keep water away is to regrade your lot, build a small floodwall or earthen berm, or sandbag. Another practical step is to raise the house above the flood levels. <a href="#">Prince William</a>	

Goal (Desired Outcome)	Audience	Message/Strategy	Method
3. Decrease flood damage and disruption to critical infrastructure and public services	Business/Professional Community, Decision Makers	Arlington has revised development requirements for single family home projects to require additional stormwater detention. <a href="#">Arlington</a>	1a, 1b, 1c, 2b, 3a, 3d
		While the City’s design standard is consistent with or more protective than some of the City’s neighboring jurisdictions, the July 8, 2019, and the July 23, 2020, storms were more intense than this design standard, with the July 23 event about 30 times more intense. <a href="#">Alexandria</a>	1a, 1b, 2c
Topic 3: Financial Impacts			
1. Increase understanding of flood liability and recovery costs	Residents, Business/ Professional Community	Flooding can occur not only in identified high-risk areas, but may also occur in areas that may not have been identified as high risk <a href="#">Arlington</a>	1a, 1b, 1c
		Just one inch of water can cause thousands of dollars' worth of damage. Whether you own your home or are renting, you can get flood insurance for the property and contents, even if you’re not in a designated floodplain. <a href="#">Fairfax</a>	1a, 1b, 1c 2a, 2b, 2c, 2d 3a, 3d

Goal (Desired Outcome)	Audience	Message/Strategy	Method
2. Advance political and industry support for resilient design standards	Decision Makers; Business/ Professional community	The increasing frequency of more intense storm events has created more frequent flooding and drainage issues. <a href="#">Alexandria</a>	2b, 2c, 3a, 3d
		This intense rain causes flooding because our infrastructure and natural systems are not designed to handle such high volumes all at once. <a href="#">Fairfax</a>	
		Recent localized flooding from intense short periods of rainfall now challenges parts of our stormwater system due to issues of capacity and limited overland relief. <a href="#">Arlington</a>	
3. Advance jurisdiction rating and participation in the Community Rating System (CRS)	Decision Makers	The objective of the CRS is to reward those communities that are exceeding the minimum NFIP requirements in order to help their citizens prevent or reduce flood losses. <a href="#">Prince William</a>	1a, 1b, 2b, 2c, 3b,

## Methods

The following methods represent just a snapshot of opportunities for NVRC to deliver flood-related messaging to the public as forms of community engagement and communication will continue to evolve in future years. In general, NVRC will plan to procure social marketing services to develop the described web-based activities as well as certain non-web based activities. This may include services to produce graphics and other content to include on physical materials and other forms of advertising.

Method Type	Summary	NVRC Forms of Delivery
Web Based	Information sharing and engagement over the internet	1.a Social media content and advertisements over platforms such as Facebook, Twitter/X, and Instagram
		1.b Hosting of information and resources over NVRC's resilience dashboard or similar website
		1.c Animated videos to share over the TV, social media platforms, and relevant websites.
Non-Web Based	Information sharing and engagement using print and non-internet media	2.a Radio advertisements
		2.b Newspaper submissions, including press releases, articles, and interviews with local experts
		2.c Physical materials, e.g., fact sheets, brochures, door hangers, and other handouts, to share in-person and online
		2.d Traditional advertising in public spaces, e.g., messaging on billboards, buses, seating, etc.



		2.e Personal interviews and oral histories, i.e., opportunities for residents to share their experiences and perspectives
Community Engagement Activities	Active in-person or virtual engagement within the community	3.a In-person presentations or seminars to community-based organizations, professional associations, or neighborhood groups
		3.b Tabling at community events
		3.c Volunteer-based education, such as watershed steward or community leadership programs
		3.d Special interest webinars or virtual workshop series

## Additional Activities

### Virginia Flood Awareness Week

Virginia Flood Awareness Week is an annual, weeklong event that aims to educate residents on their flood risk and promote the purchasing of flood insurance to protect property. Activities during the week include webinars on ways to prepare for floods, the National Flood Insurance Program (NFIP) basics, and other useful safety measures, as well as posts on social media platforms to highlight flood protection resources. In particular, the Virginia Department of Conservation and Recreation (DCR), who hosts the week, provides social media templates as well as links to FEMA and NFIP toolkits and other resources that stakeholders can use to promote the week and share messaging.

As a participant in the week, NVRC will utilize the methods of delivery described above to share DCR's resources as well as coordinate with localities and other stakeholders to promote regional collaboration on flood awareness week activities and messaging. This could include development of regional webinars, social media content that targets Northern Virginia residents, and hosting of Flood Awareness Week resources on NVRC's resilience dashboard.



# Implementation

## Next Steps & Updates

NVRC will utilize the strategy matrix as a tool to regularly identify opportunities for the implementation of described messaging and engagement. In particular, NVRC will collaborate with other regional flood hazard stakeholders to develop new projects or activities through the various methods of delivery, as well as to support ongoing programming that is already taking place across the region. Notably, completion of these activities will be dependent on staff capacity and funding availability, so it is likely that certain strategies may be implemented in phases or in partnership with other stakeholders in the future.

## Program Evaluation

In order to ensure the success and advancement of the NOVA Education and Outreach Framework, NVRC will regularly assess the effectiveness of the framework and its implementation through periodic review of the framework components and tracking of activities through a number of evaluation metrics. Because the framework serves as a living document, NVRC expects to update and adapt the document's strategies and methods of delivery as the needs and priorities of Northern Virginia stakeholders and communities evolve.

Outreach evaluation metrics may include, but are not limited to:

1. Web Based Activities:
  - a. Number of impressions, engagements, and "clicks" on websites and social media platforms
  - b. Number of social media posts, advertisements, and post sharing produced
  - c. Number of social media followers per platform
2. Non-Web Based Activities:
  - a. Number and frequency of radio advertisements
  - b. Number and frequency of physical materials distributed
  - c. Number and frequency of traditional advertisements produced (i.e., messages on billboards, buses, etc.)
3. Community-Engagement Activities:
  - a. Number and frequency of events
  - b. Number of individuals per event
  - c. Demographic distribution of participants

d. Activity feedback forms

While these evaluation metrics serve to track progress on outreach and engagement activities, NVRC also recognizes that additional assessments are necessary to gauge changes in residents' attitudes and behaviors towards flood issues. As such, NVRC will identify potential funding sources for community surveys to comprehensively track the long-term impact of the framework.

## References

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2. The Status of Flood Resilience in The Commonwealth. <https://www.dcr.virginia.gov/dam-safety-and-floodplains/document/2024-Status-of-Flood-Resilience-in-the-Commonwealth%E2%80%93December-2023.pdf>
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4. Strategy for a Flood Resistant Southern Tier Central Region Flood Education Plan. [https://www.stcplanning.org/wp-content/uploads/2020/09/FloodEducationPlan\\_2014.pdf](https://www.stcplanning.org/wp-content/uploads/2020/09/FloodEducationPlan_2014.pdf)
5. [NOVA Hazard Mitigation Plan](#).
6. Outreach Projects for Credit under the Community Rating System of the National Flood Insurance Program. [https://crsresources.org/files/300/outreach\\_projects\\_for\\_credit\\_under\\_the\\_crs\\_2017.pdf](https://crsresources.org/files/300/outreach_projects_for_credit_under_the_crs_2017.pdf)
7. Virginia Flood Awareness Week. <https://www.dcr.virginia.gov/floodawarenessweek/>

## Appendix: Education and Outreach Framework Interview Questions

- 1) What are the primary topics and issues that your jurisdiction or organization currently focuses on relating to stormwater management and flooding-related education and outreach? E.g., flood insurance, flood proofing, issue reporting, etc.
  - a) Is there any specific language or messaging that you frequently use to address these topics? E.g., Turn around, don't drown
- 2) What methods of delivery do you frequently use to engage residents? E.g., direct mail, webinars, social media, newsletters, community events/meetings, brochures, video ads, print ads
- 3) Do you have target audiences for engagement? E.g., homeowners, residents in floodplains, etc.
  - a) Does any of your messaging focus on underrepresented or marginalized communities?
- 4) Do you have multilingual options for your materials? If so, what languages options do you provide?
- 5) Do you have any technology or systems (e.g., 311, capitalalert.gov) for residents to receive alerts and/or report flooding or stormwater management issues?
  - a) If yes, please describe the system. What information can they share and report?
- 6) How do you measure and assess outreach and education effectiveness?
- 7) Do you have projects, programs, or resources that you want NVRC to highlight or promote?  
Are any of the activities tracked as credit for the CRS program?

- 8) Are there any non-profits or community-based organizations that you engage with on this topic?
- a) If yes, describe how they are engaged in planning processes. If not, what are your barriers to doing so?