

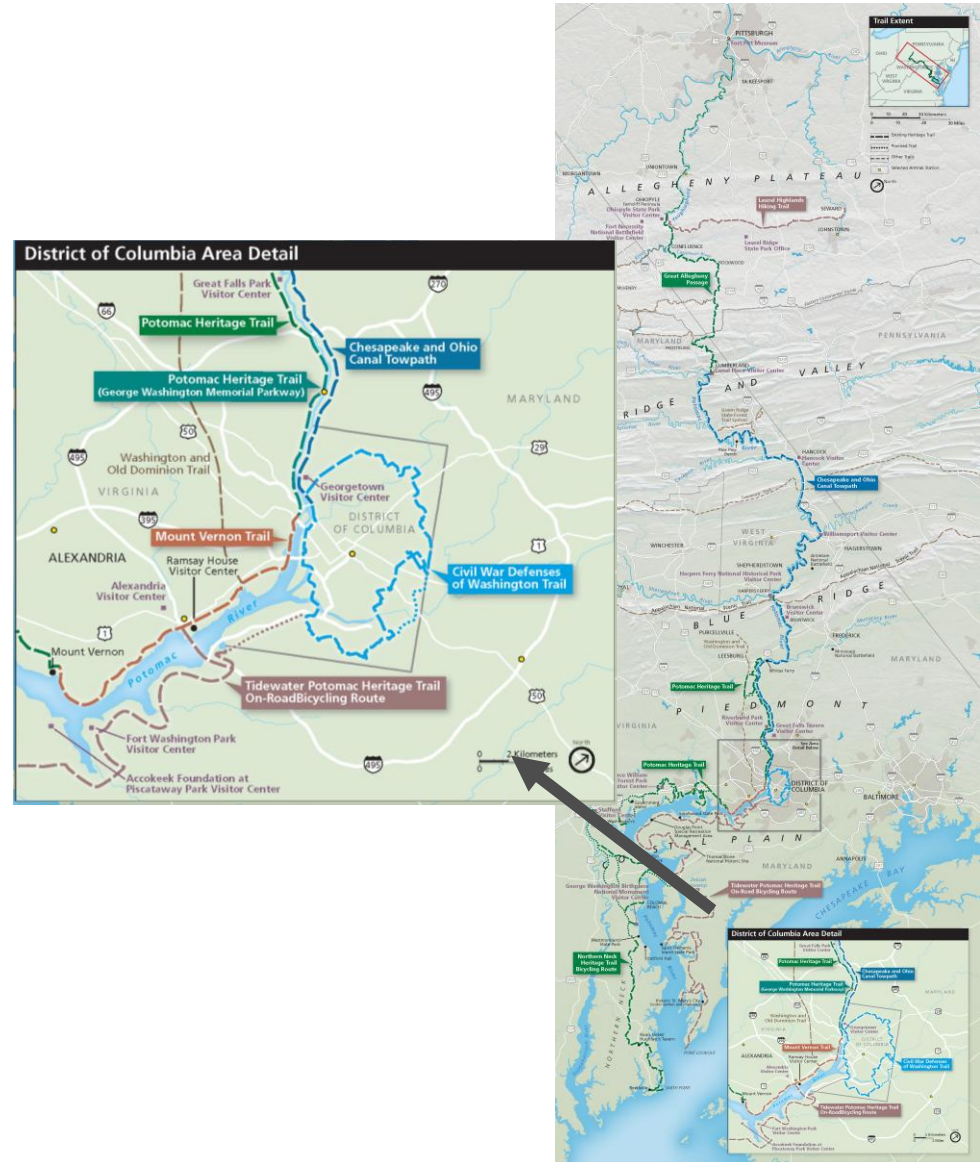


Potomac Heritage National Scenic Trail Climate Resilience Assessment Phase I

Northern Virginia Regional Commission
October 1, 2026

NVRC and the Potomac Heritage National Scenic Trail

- A 1983 amendment to the National Trail System Act of 1968 designated the Potomac Heritage National Scenic Trail ("the Trail" or PHNST) as a component of the National Trails System
- Spans over 900 miles as a braided trail network from the Laurel Hills Highlands Trail in western Pennsylvania to the mouth of the Potomac River in Maryland and Virginia
 - Currently, 138 miles in Northern Virginia with a combination of paths for pedestrian, bike, and equestrian users.
- NVRC has been designated by NPS through cooperative agreements to coordinate the Northern Virginia section of the PHNST since the 1980s.



Climate Risks & Trail Impacts in Northern Virginia

The Northern Virginia portion of the PHNST faces threats to long-term safety, sustainability, and accessibility due to climate hazards, including sea level rise, flooding, and rising temperatures

Extreme weather from these hazards has resulted in increasing erosion, amenity/signage deterioration, and washouts, making parts of the trail unusable for portions of the year

In the future, parts of the trail may be unsuitable for recreation without strategic planning and intervention



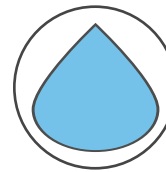
PHNST Climate Resilience Assessment

Two-Phase Assessment Study

Purpose is to identify and address areas most vulnerable to climate change along the trail corridor

- **Phase I:** preliminary exposure assessment
 - Completed in early 2026
- **Phase II:** vulnerability study and response strategy development
 - Contingent upon future funding

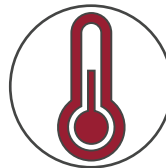
Climate Hazards Addressed



Flooding (FEMA National Flood Hazard Layer)



Sea level rise



Heat island effect

Phase I Assessment Data

Assessed climate exposure by analyzing map overlays of key trail assets (e.g., access points, visitor centers, cultural/historic sites) and wayfinding with three climate hazards:

- 100-year flood hazard
- 5-foot sea level rise
- Heat island effect

Identified surrounding context of assets to inform future vulnerability study, including:

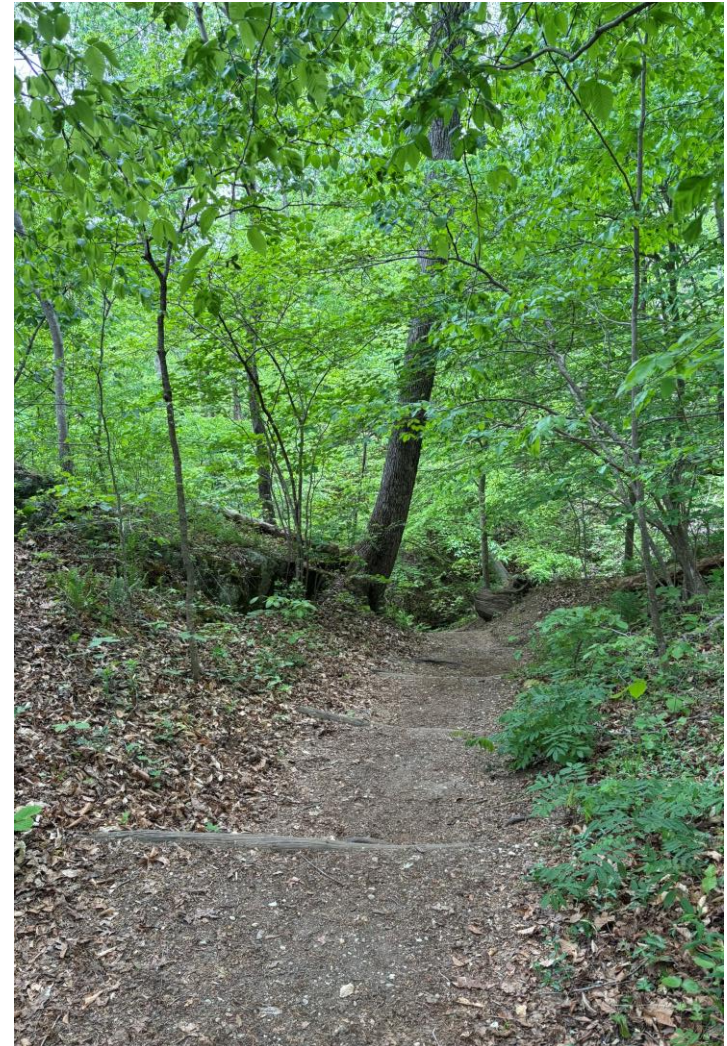
- High Ecological Value Areas
- Disadvantaged Communities
- Land Cover



Stakeholder Engagement

Trail managers and local jurisdiction representatives were engaged throughout the project

- **Stakeholder Meeting #1** – October 22, 2025
 - Consultant gathered input on the assets and criteria considered for the methodology on climate exposure and the surrounding context
- **Stakeholder Meeting #2** – November 18, 2025
 - Consultant shared the results of the climate exposure analysis and surrounding context analysis and received feedback from stakeholders



Exposure GIS Spatial Analysis

Buffering Assets and Dividing Corridor

- Generated buffers around PHNST assets
 - 500 feet for amenity/access points
 - 100 feet for trail alignment
- Divided trail alignment into 1-mile sections for more granular analysis

Climate Hazards

1. 100-year flood hazard

- Intersect with asset buffers to determine if each asset is exposed to 100-year flood (Yes/No)

2. 5-foot sea level rise

- Intersect with asset buffers to determine if each asset is exposed to 5-foot sea level rise (Yes/No)

3. Heat Islands

- Used Zonal Statistics tool to calculate the average heat island value within each asset's buffer
- Calculated the 75th percentile from average heat island values across all asset buffers within each type
- Assets that have an average heat map value in the 75th percentile or above are considered exposed to the heat island effect and were identified as such

Exposure Classification

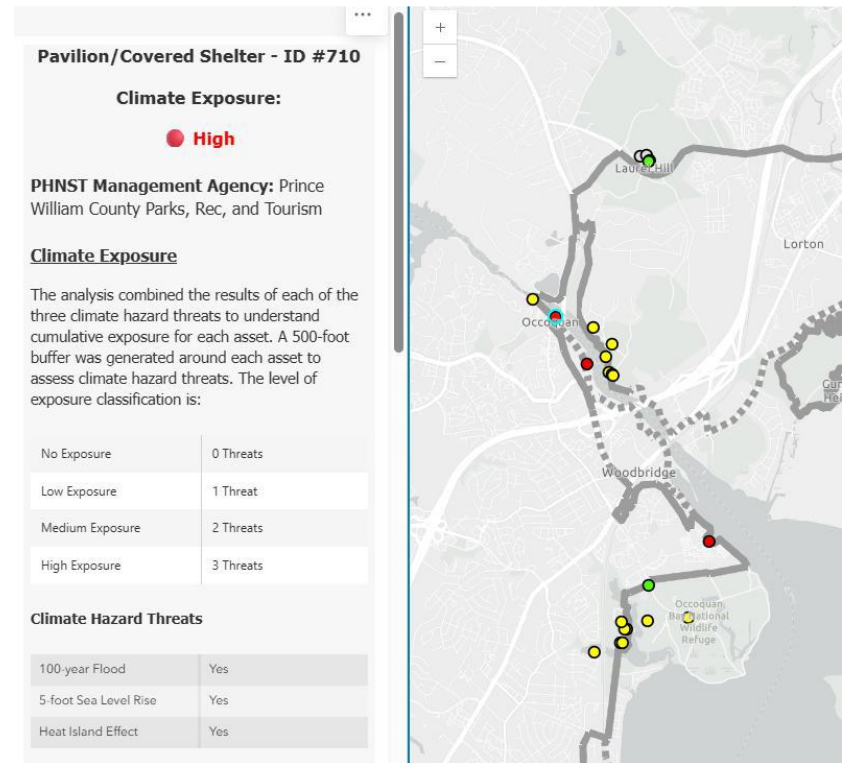
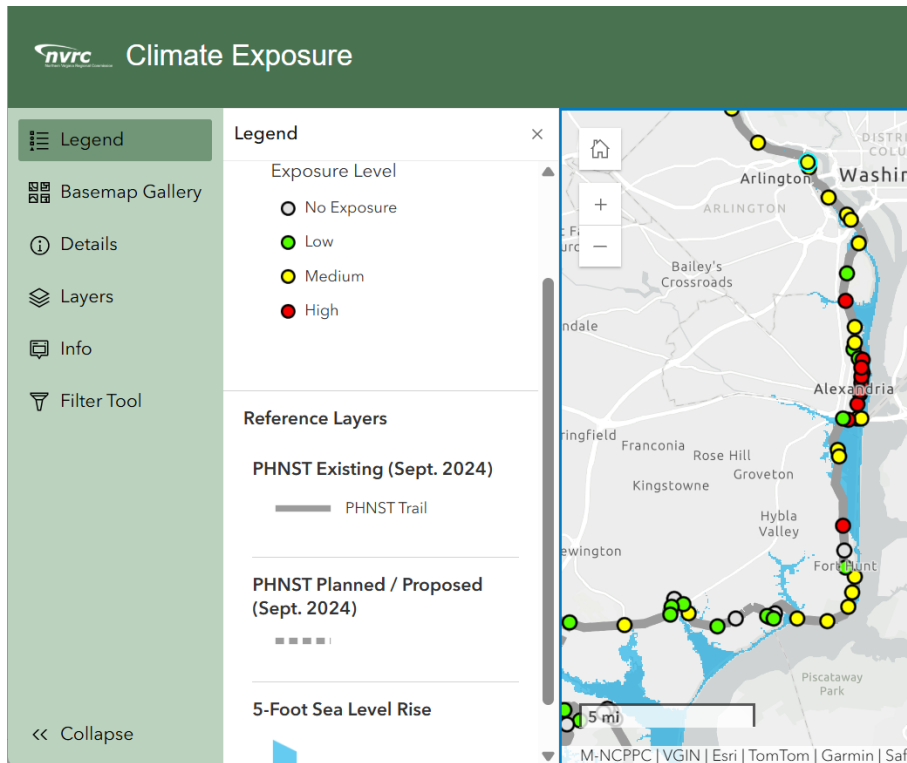
Analysis combined the results of each of the three climate hazards to understand cumulative exposure for each asset

No Exposure	0 threats
Low Exposure	1 threat
Medium Exposure	2 threats
High Exposure	3 threats

Key Finding

Exposure is highest across assets in the Arlington and Alexandria areas, reflecting a combination of sea level rise and flood risk from the Potomac River and heat island effect from surrounding dense urban development.

PHNST Climate Resilience Assessment Phase I: Exposure Results Highlights



Surrounding Context of Assets and Results Highlights

Context Criteria

- **High Ecological Value Areas** – Conserve Virginia 3.0
 - Spatial intersect with asset buffers (Yes/No)
- **Disadvantaged Communities** – Social Vulnerability Index (SVI) 2022, census tracts above the 75th percentile
 - Spatial intersect with asset buffers (Yes/No)
- **Land Cover** – National Land Cover Dataset (NLCD) 2024
 - Used GIS Tabulate Area tool to summarize geometric area of each land cover type within each buffer and then divided by total buffer area to determine percent of area covered by each land cover type

Spatial Analysis

- Same buffers as the hazard analysis: 500 feet around asset points

Results

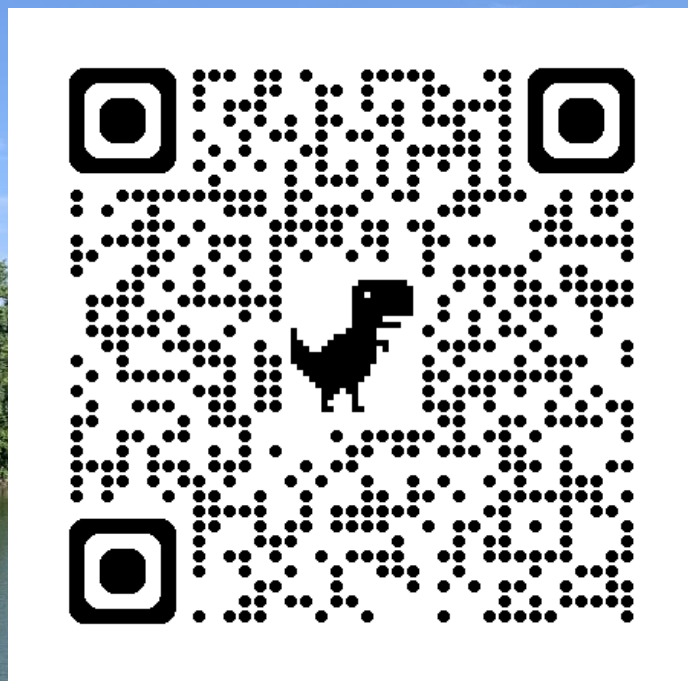
- Results documented in each asset's online mapping information table for future analyses by NVRC and trail managers

Non-Land Cover

Ecological Value Area	No
Disadvantaged Community	No

Land Cover Distribution (%)

Development - High	4.8
Development - Medium	53.0
Development - Low	28.9
Open - Developable	4.8
Open - Water	8.4
Wetland - Woody	0.0



**Read the Report and Explore the
Interactive Maps:**

<https://www.potomacheritagenva.com/climate-assessment>

Next Steps: Phase II & Additional Analyses

The second phase of the project will consist of a comprehensive vulnerability analysis using exposure findings and surrounding context layers, including:

- More specific analyses of vulnerability per trail section (i.e., 500 ft versus 1 mile)
- Asset materials and how they may respond to climate threats such as extreme heat or moisture
- Age and condition of assets and how vulnerable they may be to climate threats
- Estimated costs of damage to assets
- Anticipated impact on users
- Difference of impact in areas of rural and urban context
- Multiple thresholds of severity per hazard to assess higher-consequence scenarios

Phase II is contingent upon the identification of future funding!





Thank You!

NVRC Points of Contact:

Rebecca Murphy: General Programming (rmurphy@novaregion.org)

Jill Kaneff: GIS, Mapping, Data, Research and Analysis (jkaneff@novaregion.org)