

“Resiliency Planning for Northern Virginia: Developing a Roadmap for Critical Infrastructure”

Northern Virginia Regional Commission

July 18, 2019

BEEAC



Northern Virginia Regional Commission

Related NVRC-Led Resiliency Work 2008 to Present

NOAA-Funded Flood Management Study



Convening the Team - 2016



Critical Climate-Driven Environmental Stressors Affecting Northern Virginia Identified by “Team”

- **1) Heat** – Urban heat island effect
- **2) Extreme Precipitation** – flash flooding, increased pollution from stormwater runoff
- **3) Sea Level Rise and Storm Surge** – along tidal areas of the Potomac River and tributaries

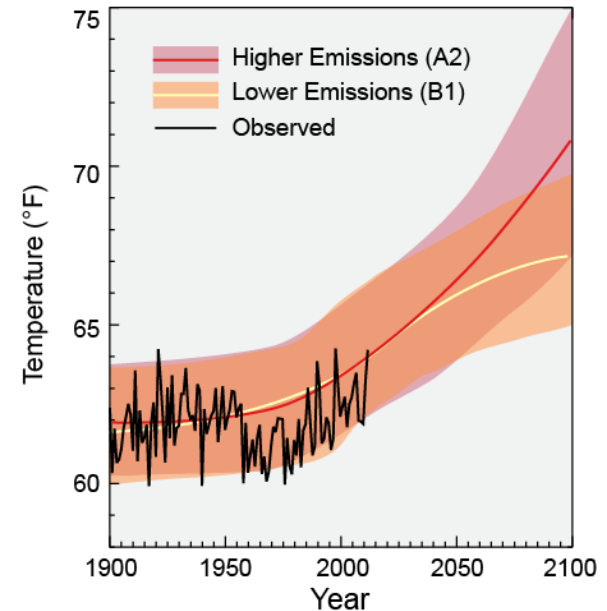
1) Temperature

Temperature and Urban Heat Island Effect

- Days with heat index $>95F$ could rise from 29 days to 70 days by 2080
- Children, elderly, homeless, outdoor laborers at highest risk of heat related illness and death



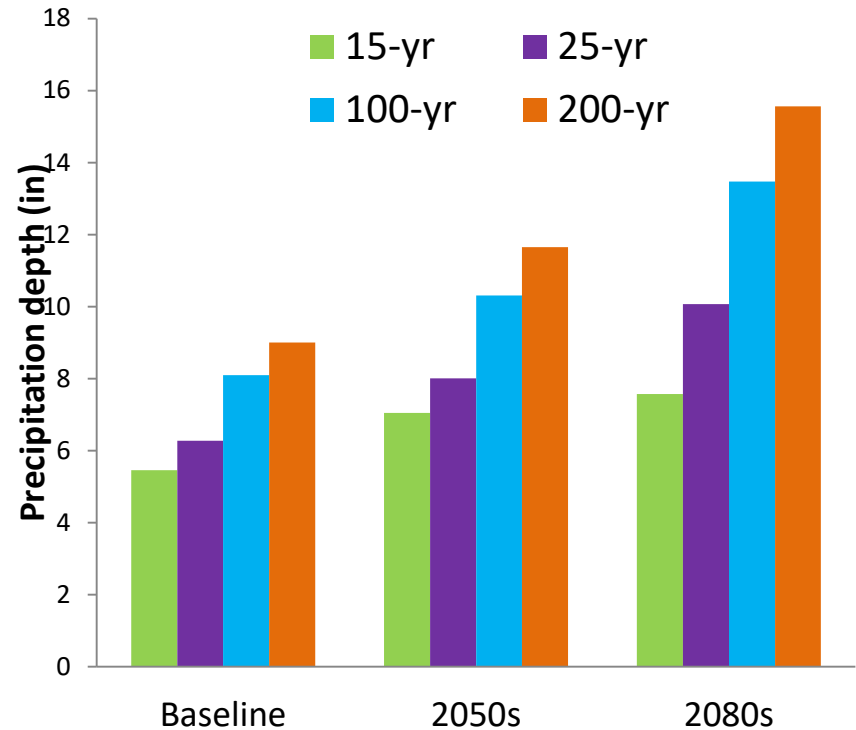
Southeast Temperature: Observed and Projected



Adapted from: Regional Climate Trends and Scenarios for the U.S.
National Climate Assessment: Part 2. Climate of the Southeast U.S.
NOAA Technical Report 142-2

2) Extreme Precipitation

- Trend towards increased heavy precipitation events will continue
- Warming will cause tropical storms to be fewer in number globally, but stronger in force
- Design storms should look to the future



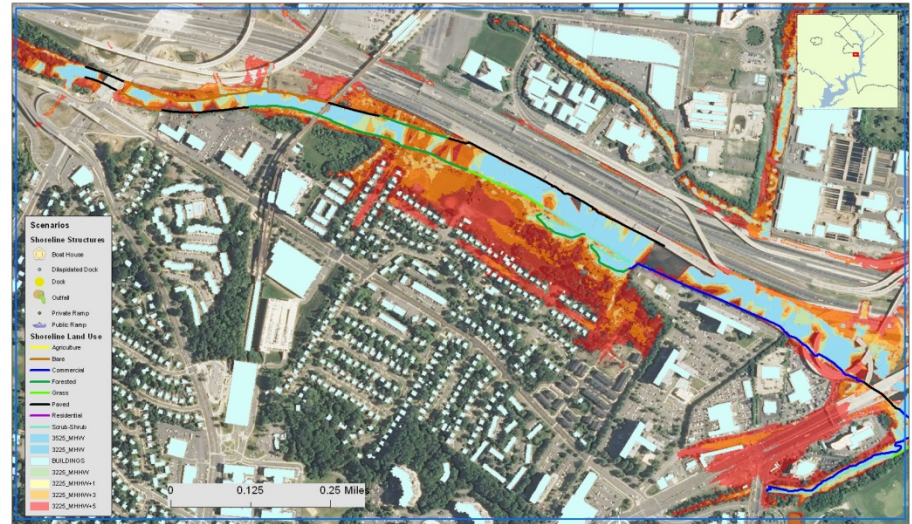
Reference: Climate Ready DC

https://doee.dc.gov/sites/default/files/dc/sites/ddoe/publication/attachments/150828_AREA_Research_Report_Small.pdf

3) Sea Level Rise and Storm Surge

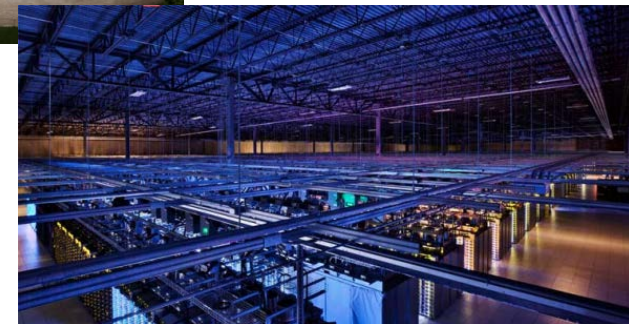
- VIMS asserts that sea level rise as underlying and persistent cause of shoreline change
- Erosion
- Combined with land subsidence (RSLR)
- More frequent inundation of low lying areas (larger range projected is 1-4 feet by 2080)

Fairfax County - Huntington
Shoreline Land Use and Shoreline Structures



Critical Infrastructure

- Airports: National & Dulles
- Rail lines: DC Metro & VRE
- Interstate Highways: I-66, I-95, I-495, and I-395
- Cultural Heritage & Landmarks: Mount Vernon and Arlington National Cemetery
- Commerce: Data Centers (70 percent of global Internet traffic flows through NOVA)



NOVA Resilient Roadmap Goals

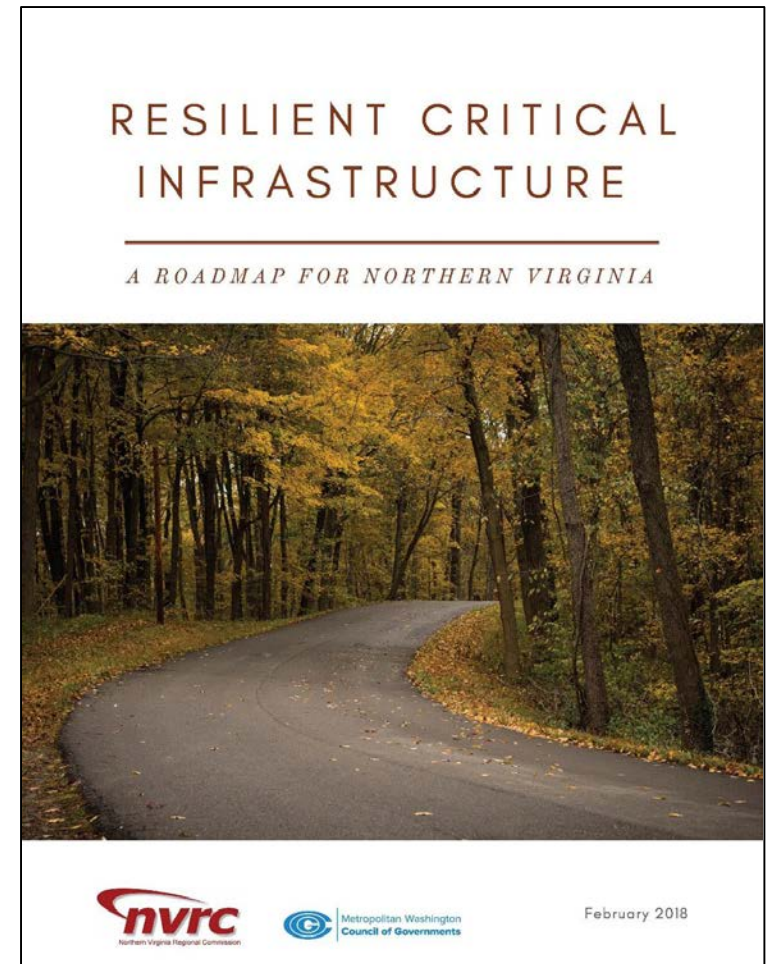
1. **Who**- Identify community stakeholders
2. **What** – Understand risks and future scenarios
3. **Where** – Critical infrastructure in region
4. **Why** – Understand vulnerabilities to infrastructure and people
5. **How**- Integrate responsive actions into planning and policy development



Outcomes

The “Resilient Critical Infrastructure Roadmap for Northern Virginia”

- Planning framework
- Identify actions to be take now
- Ameliorate consequences emanating from future climate changes and extreme weather.



Notional Strategies for Improving Resilience of Critical Infrastructure



Back to Extreme Precipitation



A Special Resiliency Project: Thriving Earth Exchange

- NVRC/AGU/GMU Partnership
- Multi-disciplinary team of Mason-based meteorologists, engineers, hydrologists and geographers
- Mason team gathering spatial- and temporal-scale data for 3 NOVA watersheds (Four Mile Run, Occoquan and Cameron Run)
- Narrow/ downscale granularity of spatial analysis of precipitation from global to regional to local
- Use models to simulate impacts of projected precipitation scenarios on 3 NOVA watersheds
- Assess future stormwater and climate conditions to improve long-term infrastructure planning
- Envisioned Scenarios: 1971–1998 (historical baseline) and 2041–2068 (assess future scenarios and conditions – under a medium to high greenhouse gas emissions assumption. Interpret modeled future precipitation trends to improve understanding of flood risks and gray-green infrastructure fusion

Looking Ahead

- 1) This is a 2-3 year process
- 2) Involvement and participation of localities such as Fairfax County is critical and NVRC greatly appreciates the involvement and participation of Fairfax County staff
- 3) The next steps concerning goal refinement and attainment will rely heavily on the contributions of bodies such as the EQAC

Thank You!

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