NVRC Rain Gauge Platform and Flood Risk Tracking

Tuesday, February 25, 2025



@novaregic

Regional Transportation
Resilience
Subcommittee-

Subcommittee-Addressing the nexus of climate resilience, adaptation and public transit







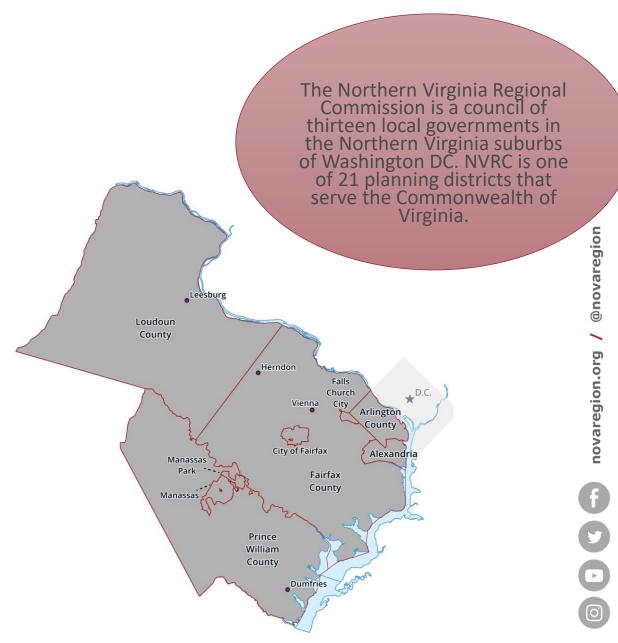


What: Ad hoc group of individuals interested in navigating increasingly complex flooding patterns and to find ways to deal with a rising level of rain-related property damage.

Purpose: Identify common trends/issues related to current and future flood risk and damages. Discuss potential solutions and strategies for implementation.

Who: Northern Virginia City, Town, County floodplain administrators and other staff involved in stormwater or floodplain management; state and academic partners

Northern Virginia Regional Commission



Climate Hazards



Climate change risks overwhelming infrastructure





One year ago, big time rains flooded streets, caused a commuting nightmare and damage across the D.C. region.

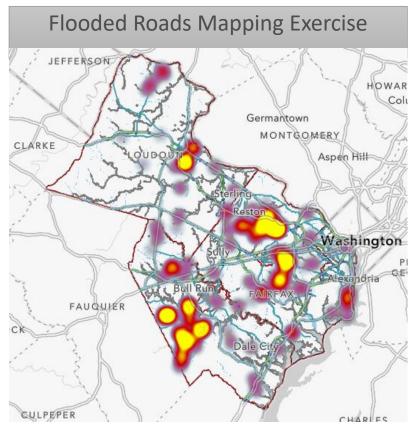




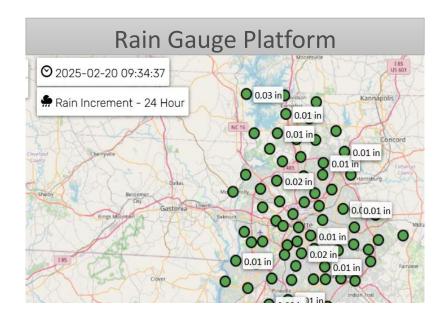




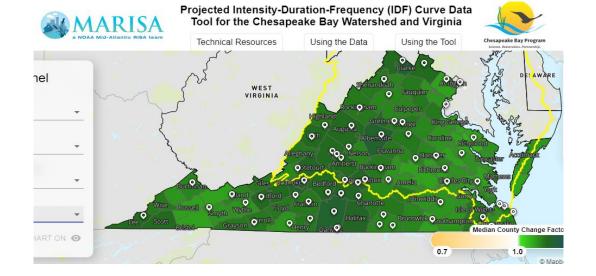
NVRC Resiliency Projects







Resilient Design Guidelines







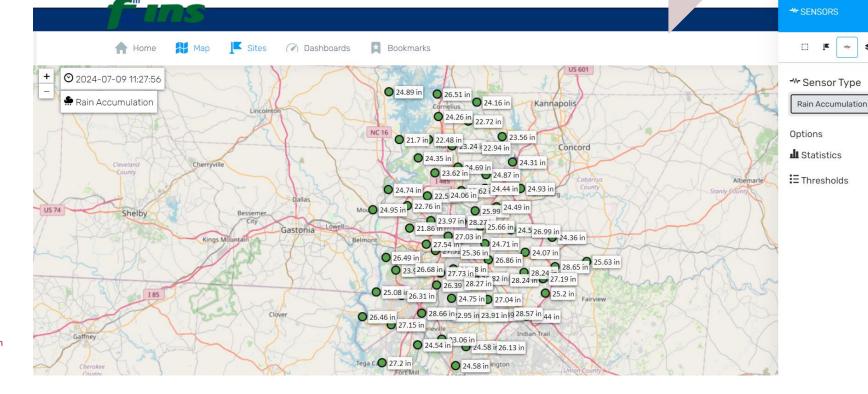
Aug 2021- established workgroup

Fall 2021- applied for CFPF funding to integrate the existing network

March 2022 – received CFPF funds, less than requested April 2022- applied for additional funding to build platform

February 2023- develop scope of work

recent additions to the monitoring networks in NOVA













Rain Gauge Platform

Summer 2023- worked on the audit

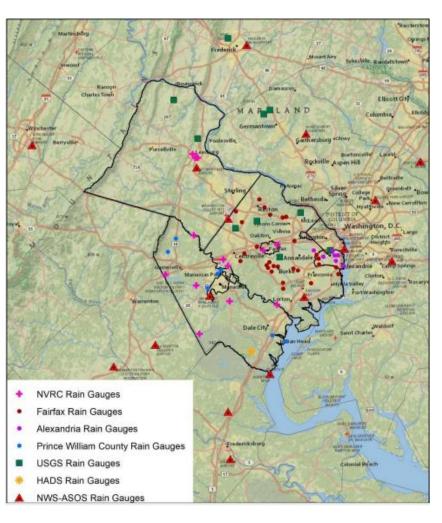


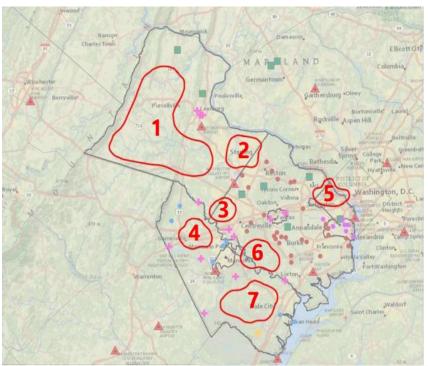
April 2024- audit completed. worked with jurisdictions to determine use of CDS money



Summer 2024- scope of work, data sharing addendum to COG's existing agreement





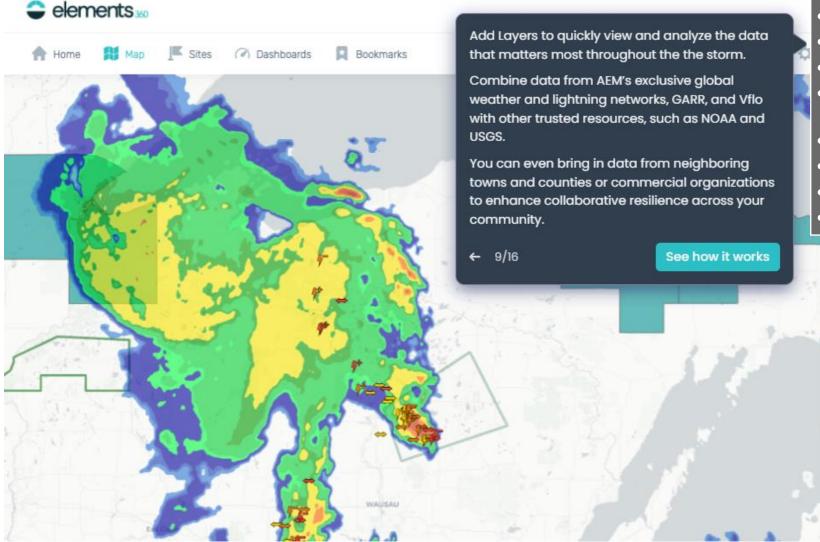


- NVRC Rain Gauges
- Fairfax Rain Gauges
- Alexandria Rain Gauges
- Prince William County Rain Gauges
- USGS Rain Gauges
- * HADS Rain Gauges
- ▲ NWS-ASOS Rain Gauges

Table 2. Proposed Rain Gauge Summary

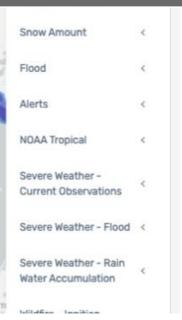
Figure 5 Location	Number of Additional Rain Gauges	Prioritization
Area1	5-6	1
Area 2	1	4
Area 3	1	6
Area 4	1	3
Area 5	1	5
Area 6	1	7
Area 7	1-2	2

Public Rain Gauge Platform



5-year pilot to look at:

- Cost savings
- Data sharing
- Sensor management and reporting
- GARR production
- Multi-tenant options to support different departments and sub-clients
- Post-event analysis
- Model calibration
- Long term network planning
- Maintenance (training, coordination, funding)



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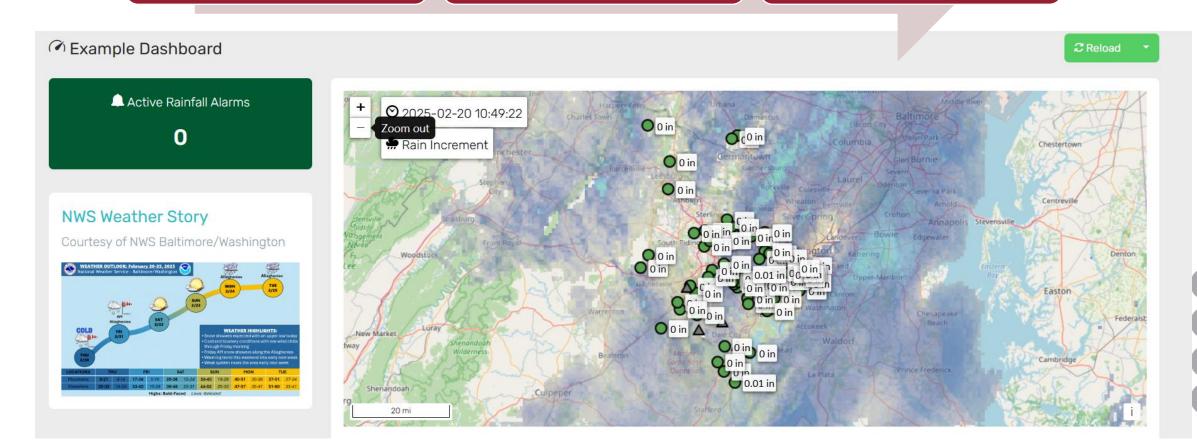




Fall/Winter 2024- contrail starts building the platform

February 2025- administrator training and dashboard design

March 2025- release "publicly" for Flood Awareness Week



Wherever it rains, it can flood.

to use public transportation, people still need to be able to access pickup locations/stations

We were selected as one of the partners for the pilot of the <u>Virginia Climate Center</u> at GMU- climate data extension services for Virginia.











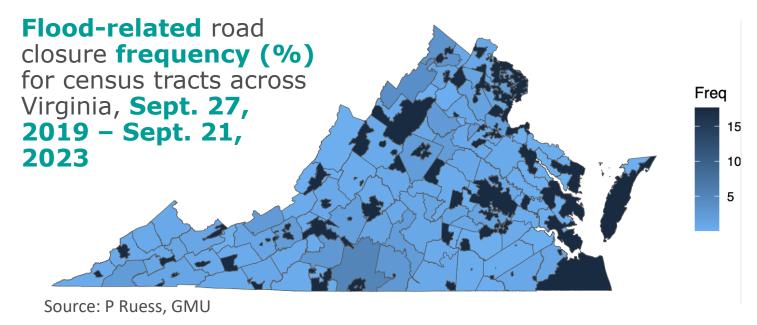




Virginia Department of Transportation (VDOT):

Smarter Roads Data

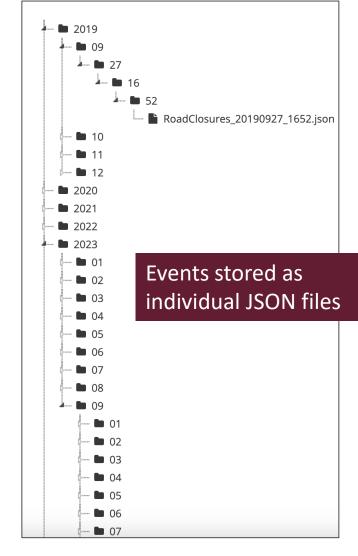
Data download, processing and meta-analysis











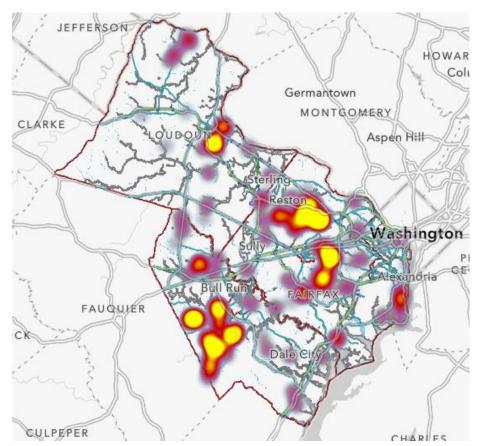








Cumulative Flooded Road Closures, Oct 2019-Aug 2023





How many were inside the FEMA special flood hazard area (regulatory floodplain)?



Photo by Celso Ferreira, captured during July 5, 2023. Numerous swift water rescues were later reported in the area. 37 of 287.

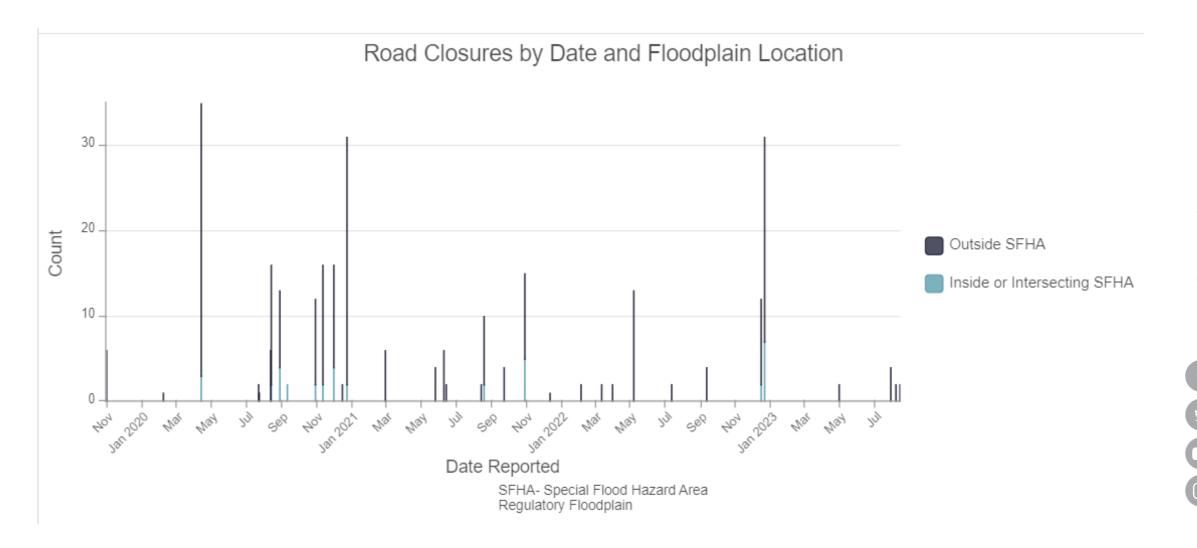




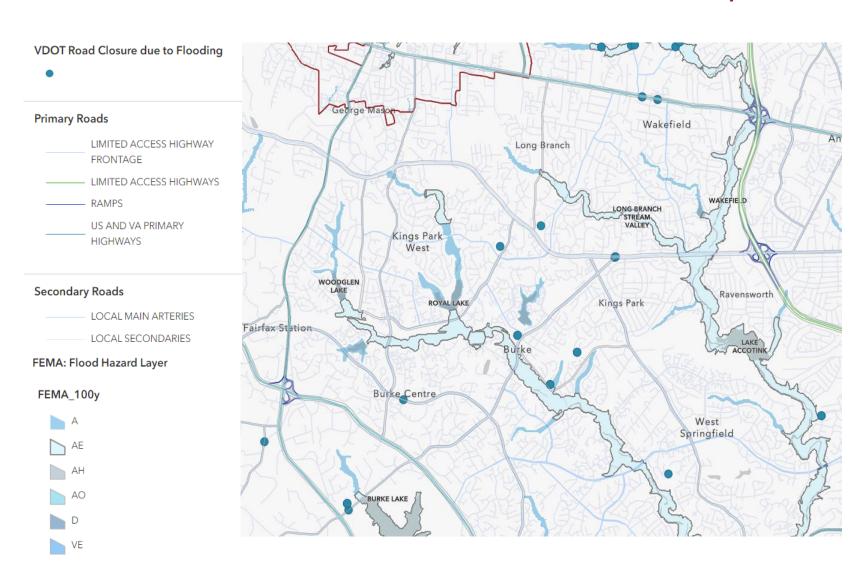




Cumulative Flooded Road Closures, Oct 2019-Aug 2023



Cumulative Flooded Road Closures, Oct 2019-Aug 2023



Dense stream network

Demonstrates how flooding is happening outside of the regulatory floodplain

The FEMA flood hazard layer is the only available data for regional or multigovernmental scales









Translating Research to Practice to Create Climate Ready Communities



Pilot different types of road sensors and ground truth reports



Launch a data collection campaign to include citizen reported events, photos, details



Prioritize projects in repeat areas with high social vulnerability



Utilize in conjunction with a flood hazard public awareness campaign



Document the need for complete overland flow modeling



Support real-time flood forecasting





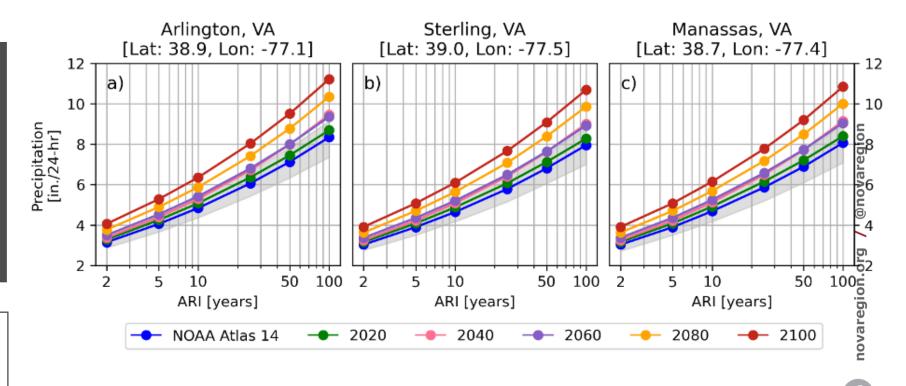




Resilient Design Guidelines

"develop and coordinate a regional approach that addresses the development of potential regional Intensity, Duration, Frequency (IDF) Curves to assist localities in stormwater planning in the context of climate change"

Contracted to Dewberry.
Kickoff in January 2025,
estimated completion in
December 2026



Source: Coelho, Ferreira and Kinter (2022) "Potential Impacts of Future Extreme Precipitation Changes on Flood Engineering Design across the Contiguous United States" *Water Resources Research*

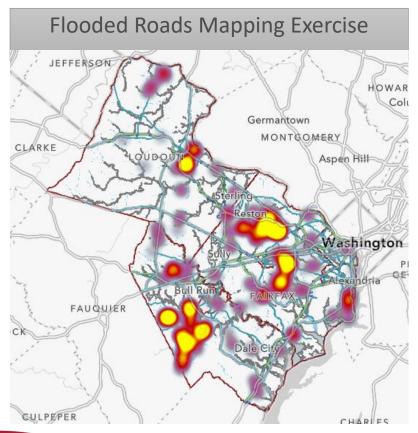




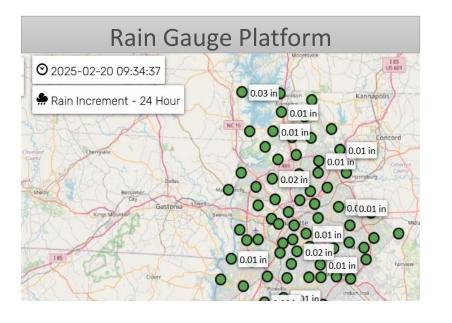
Funding Source: Community Flood Preparedness Fund



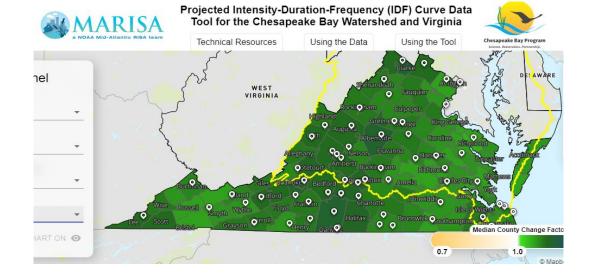
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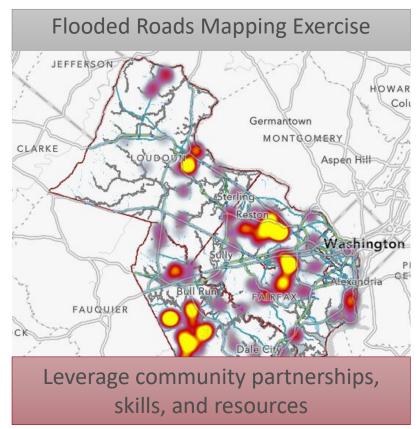
Resilient Design Guidelines



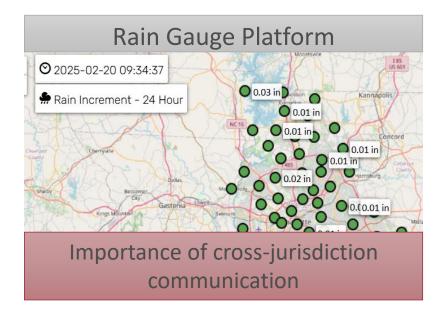




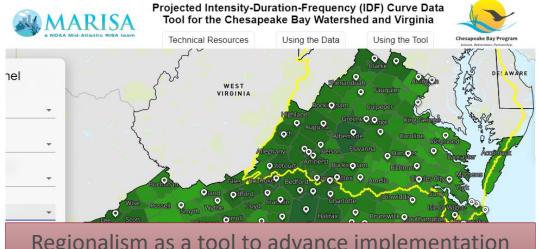
Key Takeaways







Resilient Design Guidelines



Regionalism as a tool to advance implementation











Thank you!

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