

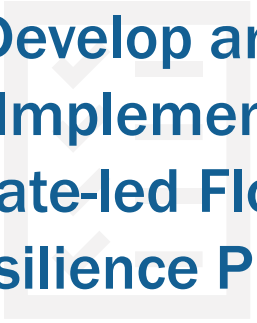
November 10, 2025

Leveraging DCR's Flood Hazard Data for CFPF Application Development



DCR Office of Resilience Planning

Planning for a flood-resilient future.



**Develop and
Implement
State-led Flood
Resilience Plans**



Coordinate Action



**Supply Data,
Information and
Resources**



**Conduct Outreach
and Engagement**

Virginia Flood Protection Master Plan

An actionable framework to align and enhance **the Commonwealth's policies and programs** that mitigate the impacts of flooding on people, the economy, and the environment.

Informed by:

- Current and future flood impacts across the state
- Identified gaps in state data, resources and capacity

The plan is currently under development. When released, it will establish flood resilience goals and metrics to track progress toward achieving them.



Learn more online:
dcr.virginia.gov/vfpmp



Mitigate current and future flood risks statewide.



Advance lasting and unified strategies to address flood risk.



Capture additional benefits through flood resilience.

Coastal Resilience Master Plan

More than six million people, or more than 70% of the state's population, call coastal Virginia home.



A place-specific, long-range plan guiding activities to mitigate severe and repetitive flooding in coastal Virginia.

- Provides a unified **analysis of the threats** of increasing flood exposure and impacts.
- Identifies **opportunities** to create impactful flood resilience solutions.

The Phase II plan, when released, will be the result of a major collaborative effort by stakeholders across Virginia's coastal region.



Lathan Goumas/Virginia Sea Grant



Learn more online:
dcr.virginia.gov/crmp



Today's Webinar

- Why use the data?
- Benefits, limitations and how to access:
 - VFPMP (Fathom) Data
 - CRMP Data
- Using the data for CFPF applications: justification and scoping
- Q&A

General CFPF Inquiries:

- Upcoming CFPF Office Hour Session 11/24 at 10am
- Email cfpf@dcr.virginia.gov or call (804) 371-6095.

We hope you'll leave understanding...

- The flood hazard data products available from DCR
- Opportunities to use the data to support your CFPF application and award.
- How to access the products you're interested in using.

The Community Flood Preparedness Fund

- **Purpose:** To provide support for regions and localities to reduce the impacts of flooding.
 - Focus on areas of recurrent *and future flooding*.
 - Priority for community-scale mitigation that uses nature-based solutions to reduce flood risk.
 - Priority for projects in concert with local, state & federal floodplain management standards, and local, regional and statewide resilience plans.
- **Fund categories:**
 - Capacity building and planning
 - Studies
 - Projects
- **Round 6: Open now until December 1, 2025**
 - \$50 million in grants (all categories)
 - \$25 million in long-term loans for projects
 - \$10 million in short-term loans for up-front costs
 - \$25 million for projects related to USACE
- **Note:** Applicants should thoroughly review the grant manual to understand the terms of the grant. Use of DCR's data in developing an application does not affect scoring.

The Community Flood Preparedness Fund

Things to Consider When...

Selecting and Scoping an Activity to Submit

- Resilience plans are required for project funding. (pg 20)
- Resilience plans must identify “all flooding occurring in all areas of the community, ***not just within the SFHAs***”. (Appendix F)
- Resilience plans must incorporate ***climate change, sea level rise, and storm surge*** (where appropriate). (Appendix F)
- Funded studies may not duplicate existing data or studies. (pg 18)

Writing Your CFPF Application

- All applications must include information about the specific problem being solved and factors which contribute to the identified problem. (pg 24)
- Project applications must include supporting documentation on flood risk of the project area. (pg 26)

We Recommend Using DCR's Data to...



Support Implementation of Your Funded Activity

- Use the data in resilience plans, studies and projects, where appropriate, to support decision making and initial design.
- In your application's work plan, state that you will leverage available products to support development of deliverables.

Using existing data can help you reduce costs & save time.



Develop Your Scope of Work Narrative

- In your Scope of Work Narrative, use the data to justify the need for your proposal.
- Provide map(s) in your application which demonstrate the extent of flooding in the area of interest (locality or project area).

Why Use the Data?

Rainfall-driven flooding is extensive and underrepresented in FEMA's flood maps.

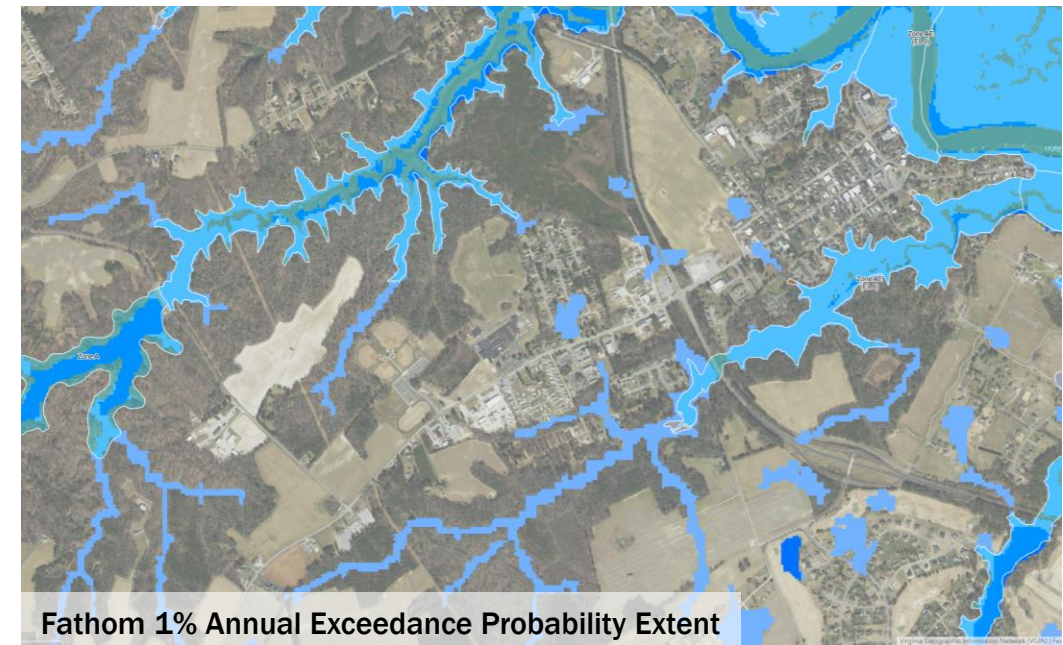
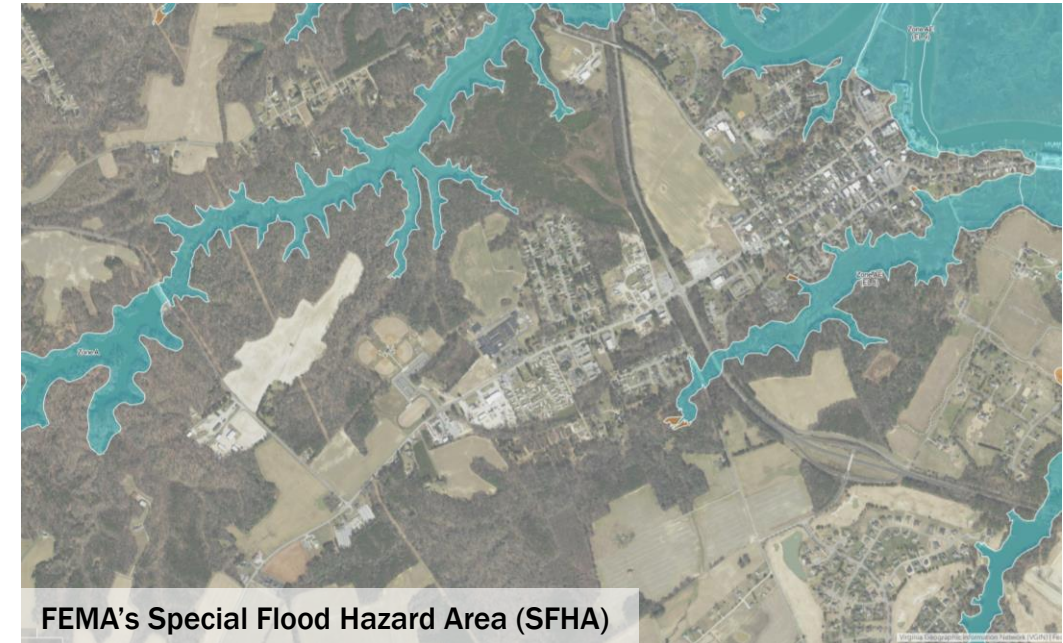
- **About three times more land** statewide may be at risk of flooding than has been shown by traditional flood hazard maps.
- An additional 5,700 square miles could be exposed to the 1% annual chance flood but does not currently show up in the SFHA.

Without multifrequency flood hazard data, it is more difficult to quantify risks.

- In one pilot study, **nearly 50% of buildings** located in FEMA's riverine SFHA were found to have a 10% annual chance of riverine flooding.

Flooding is becoming more frequent and severe.

- **54,000 additional buildings** statewide could be exposed to the 1% annual chance flood by 2060 compared to baseline conditions.
- This is a **20% increase** over current building exposure levels.

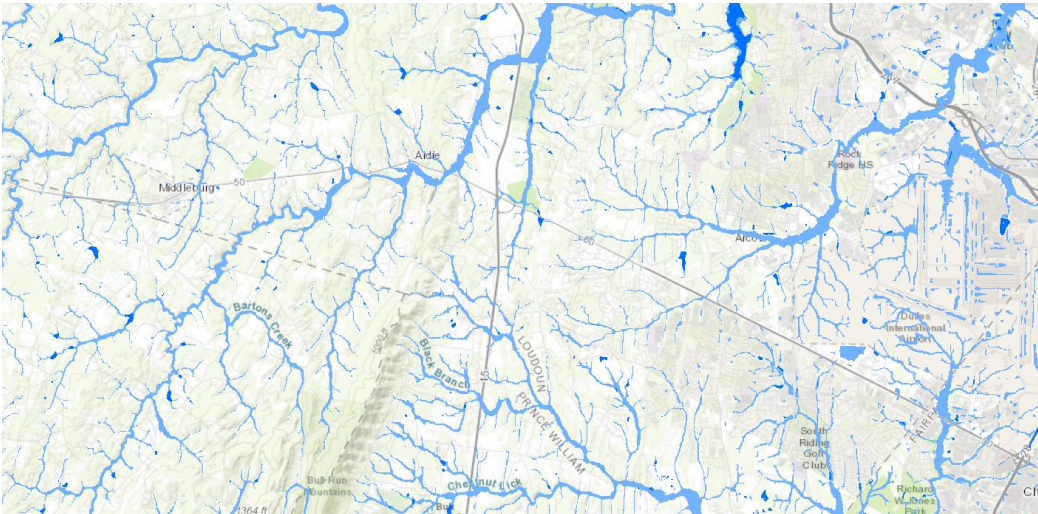


Virginia Flood Protection Master Plan: Flood Hazard Data Available to You

- **Inland** (rainfall-driven/pluvial and riverine/fluviol hazards) and **coastal** flood hazards are available as separate datasets.
 - Several merged versions of the datasets are also available.
- **Five flood recurrence intervals:** 1 in 10, 25, 50, 100, and 500.
- **Baseline conditions** (2020) and **four future scenarios**, reflecting uncertainty in projections and providing options for varying risk tolerances and planning horizons.*
- **10-meter raster depth grids.**
- **Data is licensed from Fathom**, a third-party provider.
- **Publicly available** data includes the 1 in 100 and 500-year recurrence intervals for baseline conditions.
- **Virginia government entities** and Tribal governments may sub-license data from DCR for a 12-month renewable license term.
 - Limitations on distribution and sharing of the dataset exist.

Flood Hazard	Time Horizon		
	2020	2060	2100
Inland (Pluvial + Fluviol)	50 th	50 th	50 th
	Percentile	83 rd	83 rd
Coastal	50 th	50 th	50 th
	Percentile	83 rd	83 rd

50th percentile: “moderate” scenario
83rd percentile: “high” scenario



2020 Combined Flood Extent, 1% AEP

*Data is for the SSP2-4.5 greenhouse gas emissions scenario.

Limitations of the Flood Hazard Data

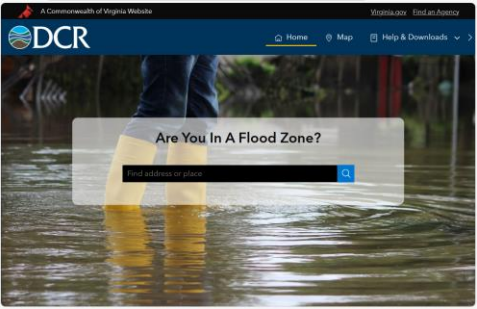
VFPMP Data Limitations and Notes:

- Tools and methods are not publicly available.
- The models do not include factors that may be necessary for some resilience applications.
- The following factors were not included:
 - stormwater infrastructure
 - compound flooding

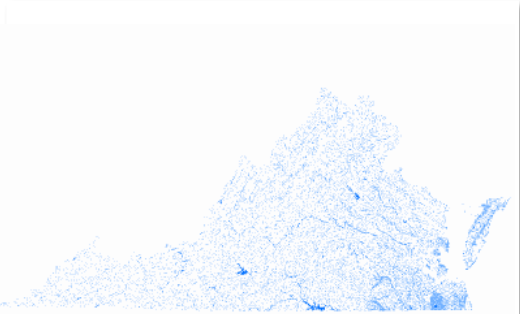
The models are based on desktop analysis utilizing remotely sensed data. These datasets have not undergone field verification. As such, local site conditions may differ significantly from modeled assumptions, and results should be interpreted with caution. Ground-truthing is recommended to validate findings before making site-specific decisions.

Access the VFPMP Data

Interested in a sublicense? Email us!
Flood.resilience@dcr.Virginia.gov



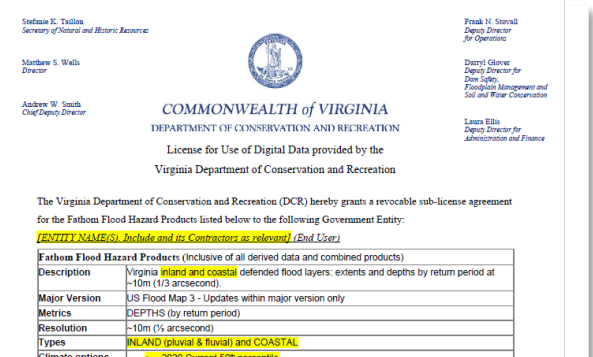
Virginia Flood Risk information System



Flood Resilience Open Data Portal Web Maps



ArcGIS REST Services Directory



Sublicense & Download Data*

Ease of Use

Simple and Quick to Use

Flexibility in Application

Limited Data and Formats Available

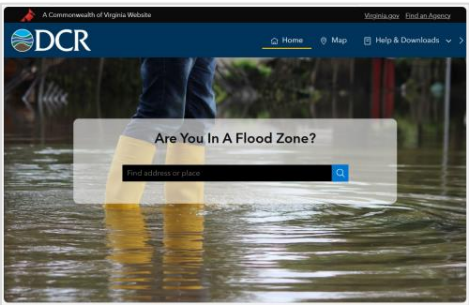
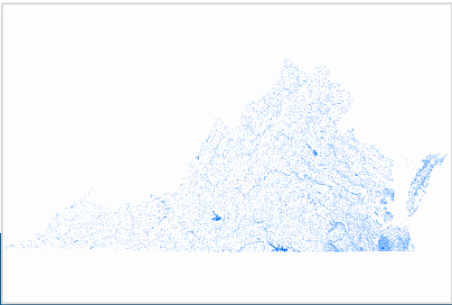
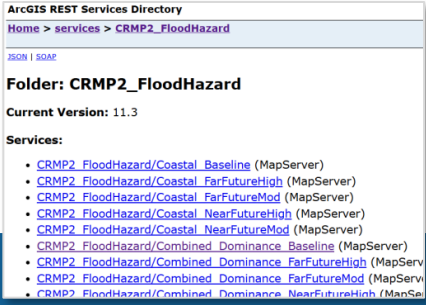
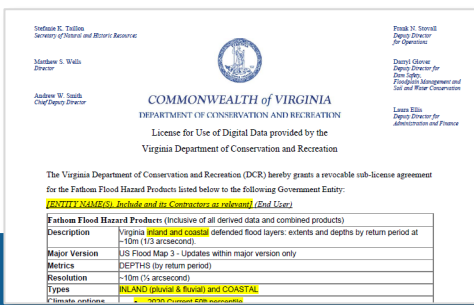
Requires Knowledge and Tools

Advanced Applications Enabled

Access Web Maps and REST Services via the Flood Resilience Open Data Portal:
floodplan-vdcr.hub.arcgis.com

*Available only to certain users. See slide 9.

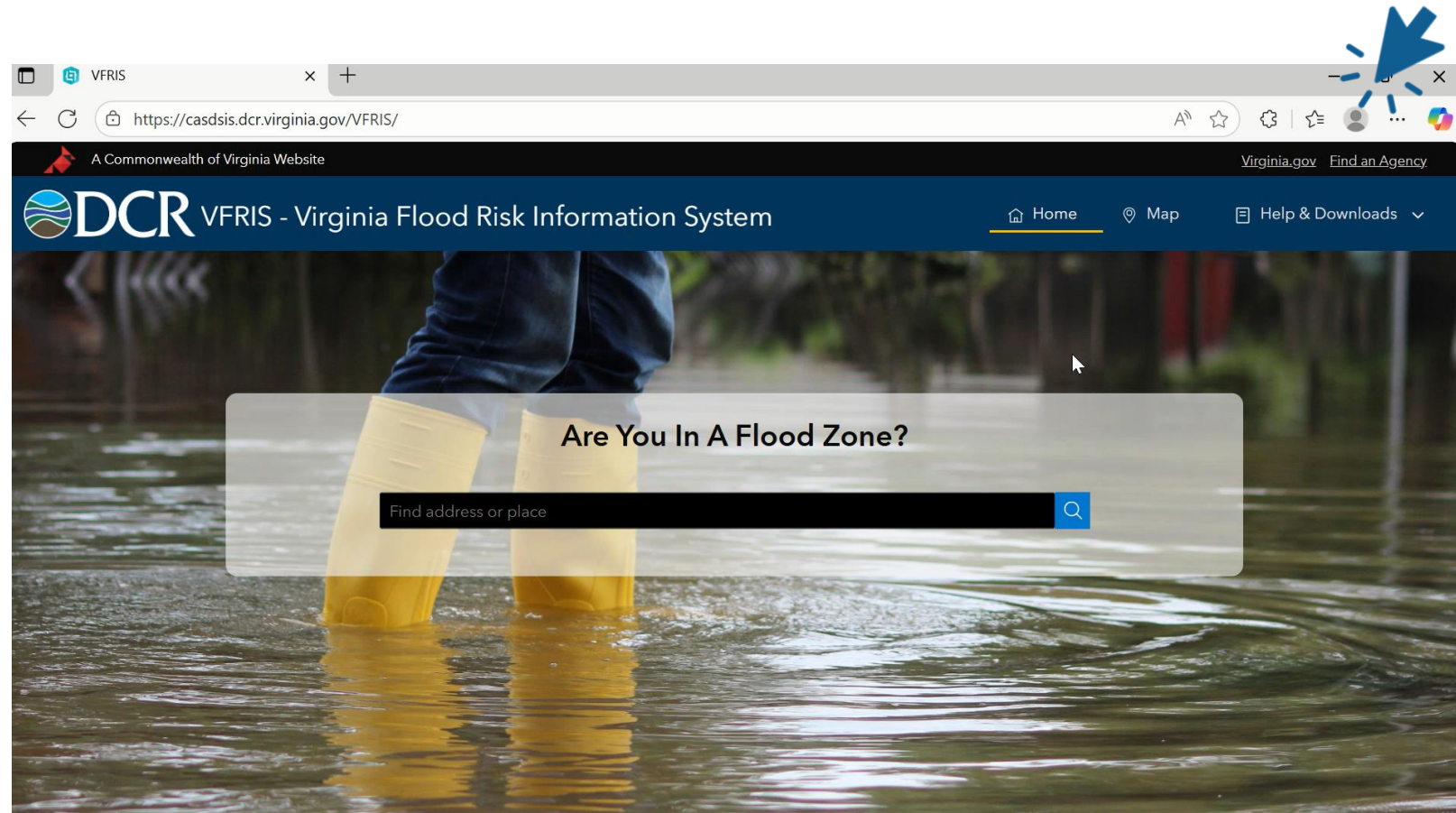
Summary Comparison of Data Resources

				
	Virginia Flood Risk Information System★	Flood Resilience Open Data Portal Web Maps	ArcGIS REST Services Directory★	Sublicense & Download Data
Use	View public hazard data together with other flood related data	View public hazard data in streamlined web maps	View maps or connect files to GIS apps to make limited-feature maps	Download data to drive custom analysis and mapping
Data Available	Baseline combined flood extent for 1 in 100 and 500 year conditions (public data)	Baseline combined flood extent for 1 in 100 and 500 year conditions (public data)	Baseline combined flood extent for 1 in 100 year condition	All available flood hazard data layers and combined layers
Intended Users	All audiences	All audiences	Users with some GIS experience	Experienced GIS users
Notes			Cannot customize map layers, but can clip map to desired geography	Available only to eligible entities under sub-license agreement

VFPMP data in the Virginia Flood Risk Information System

1. Go to the Virginia Flood Risk Management System
2. Open the “Map” view
3. Open the “Layers” tab
4. Toggle on the “Fathom Flood Hazard (1% AEP)” and/or “Fathom Flood Hazard (0.2% AEP) layers from the data list
5. Toggle on other data layers of interest
6. Screenshot page

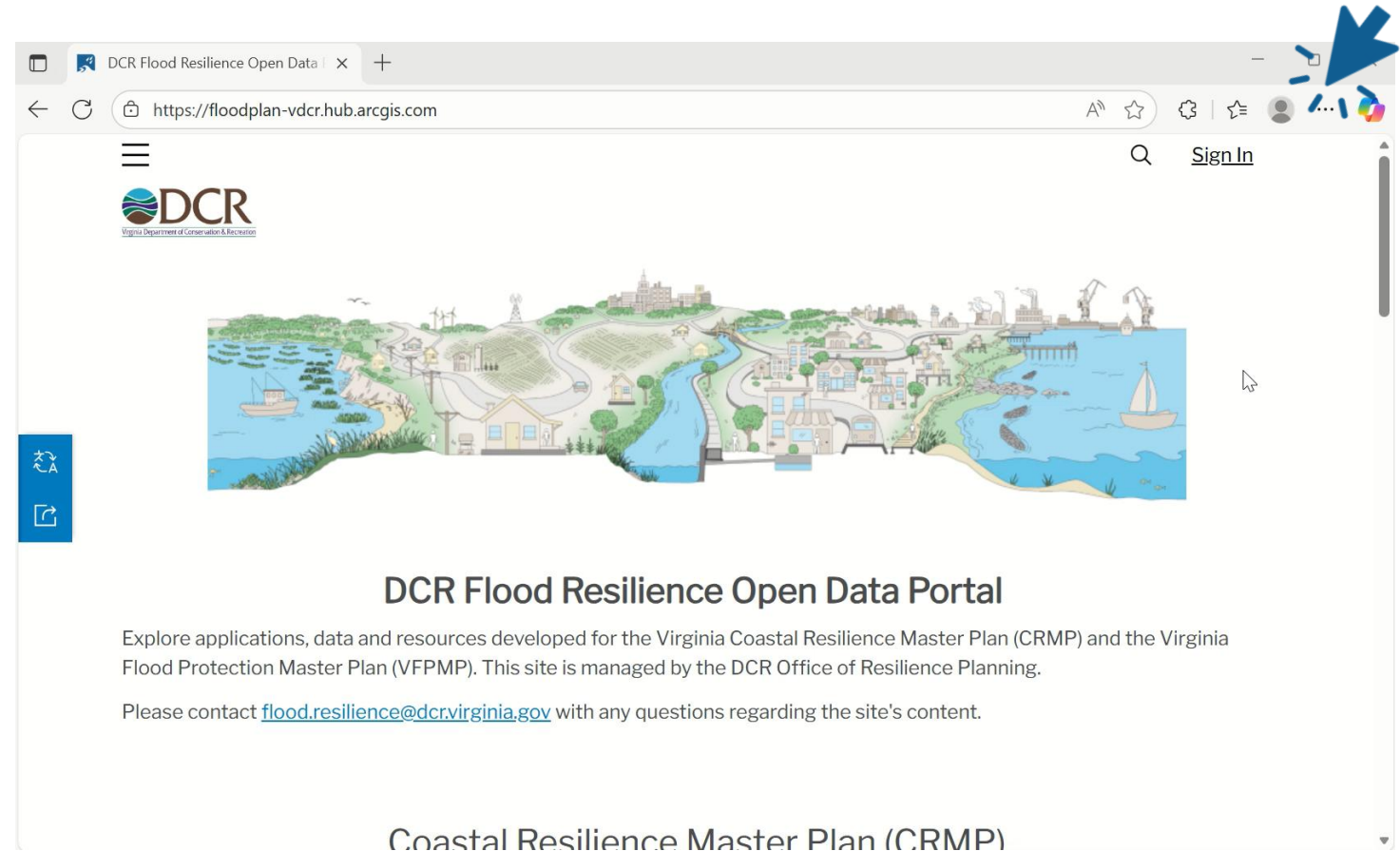
Find VFRIS online at:
www.virginia.dcr.gov/vfris



Develop your CFPF Scope of Work Narrative: Take screenshots to illustrate the specific flood problem that will be addressed.

VFPMP Data in ArcGIS REST Services

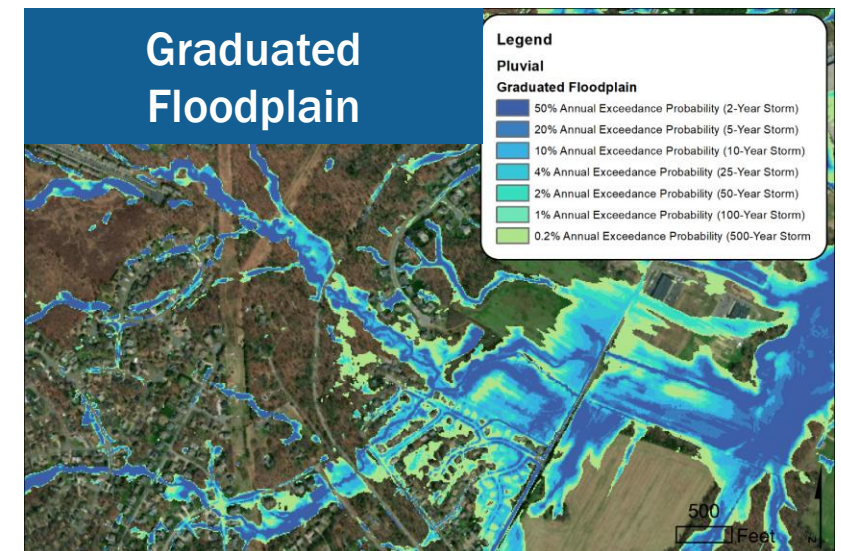
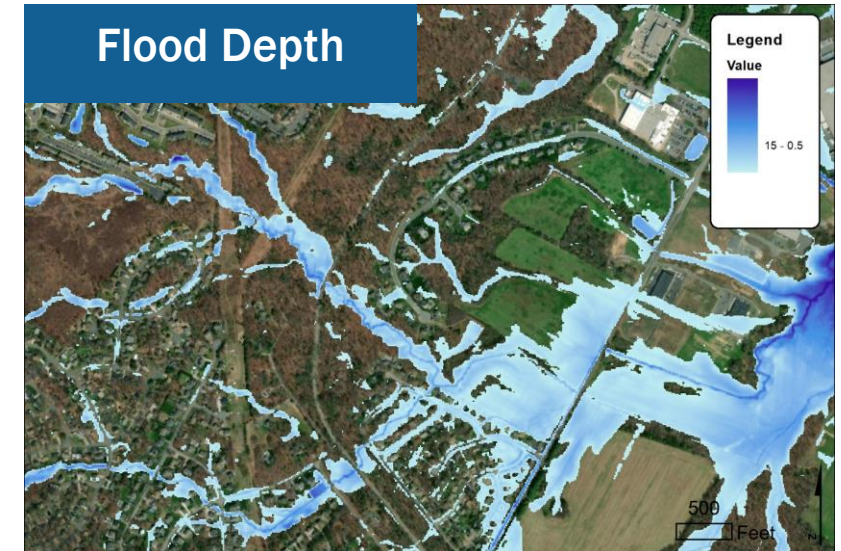
1. Go to the Flood Resilience Open Data Portal
2. Scroll to bottom of page, click “REST Services”
3. Navigate to VAFathom_Public folder
4. Select the data layer
5. Choose desired viewing application and make map or take screenshot



Develop your CFPF Scope of Work Narrative:
Layer flood hazards with asset data in simple maps to illustrate the specific flood problem.

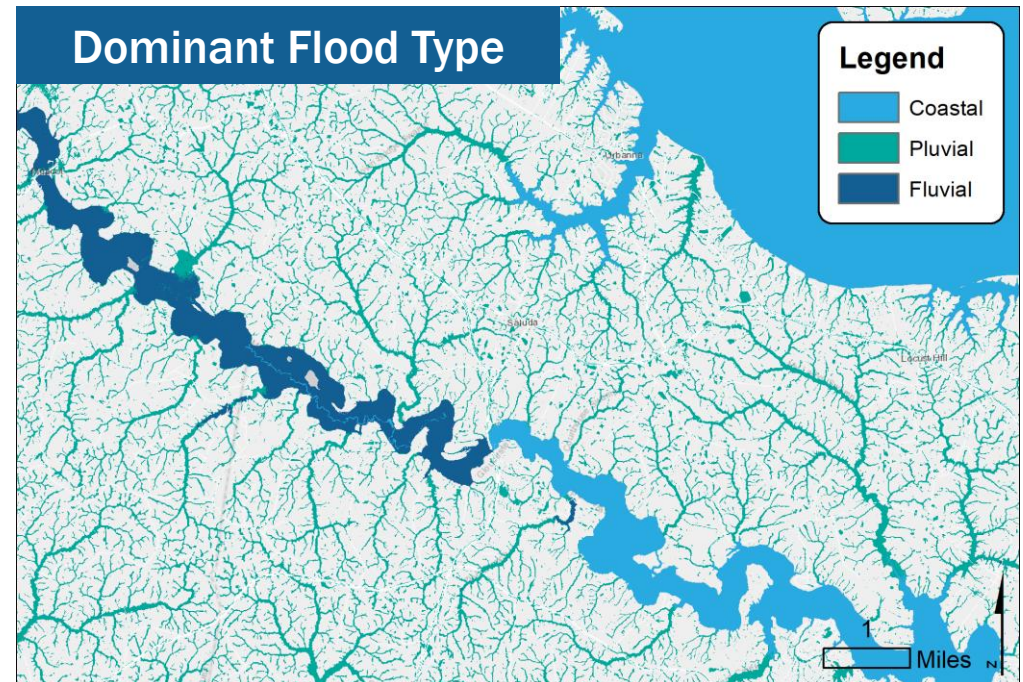
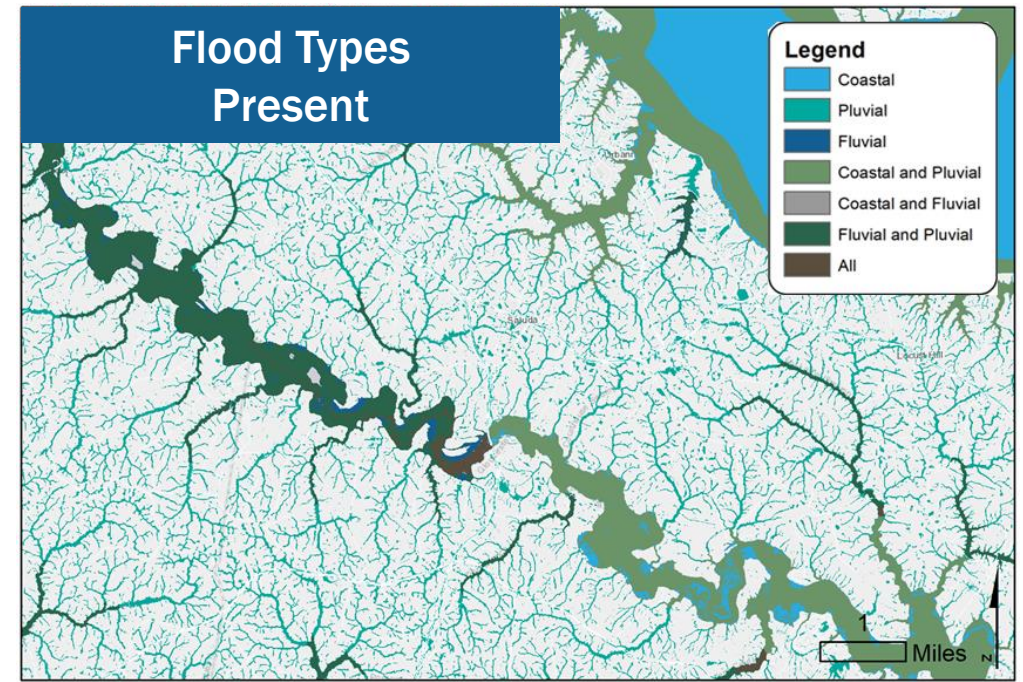
Coastal Resilience Master Plan: Flood Hazard Data Available to You

- **Coastal and rainfall-driven (pluvial) hazards.** Some combined hazard products include riverine flooding (next slide).
- **Multiple flood recurrence intervals:**
 - 1 in 2, 5, 10, 25, 50, 100 and 500 year return frequencies.
 - Coastal flooding is also available for mean low water and mean high water.
- **Five planning scenarios:**
 - baseline conditions (2020).
 - near future (2030-2060) and far future (2060-2100) scenarios in both “moderate” and “high” options.
 - Future scenarios for rainfall-driven hazards include relevant tidal tailwater elevations.
- **10-foot resolution raster data** covering the entire coastal Virginia region.
- **Free and open to access** for direct download or ArcGIS REST services.
- **Fully public documented methodology** regarding the data’s development.



CRMP Combined Floodplain Data

- “**Combined floodplains**” are based on combinations of coastal, rainfall, and riverine flood hazard data into single products.
- Only the **1% AEP (1 in 100 year) recurrence interval** is available.
- **All five planning scenarios** are available; however, riverine flood conditions remain constant in each scenario.
- **Combined Flood Presence** data identifies all possible combinations of flood sources at a given location.
- **Combined Flood Dominance** data identifies the deepest flood hazard at a given location.
- This data **does not represent compound flooding**, which occurs when multiple sources of flooding co-occur at the same time and location.



CRMP: Forward-Looking Data



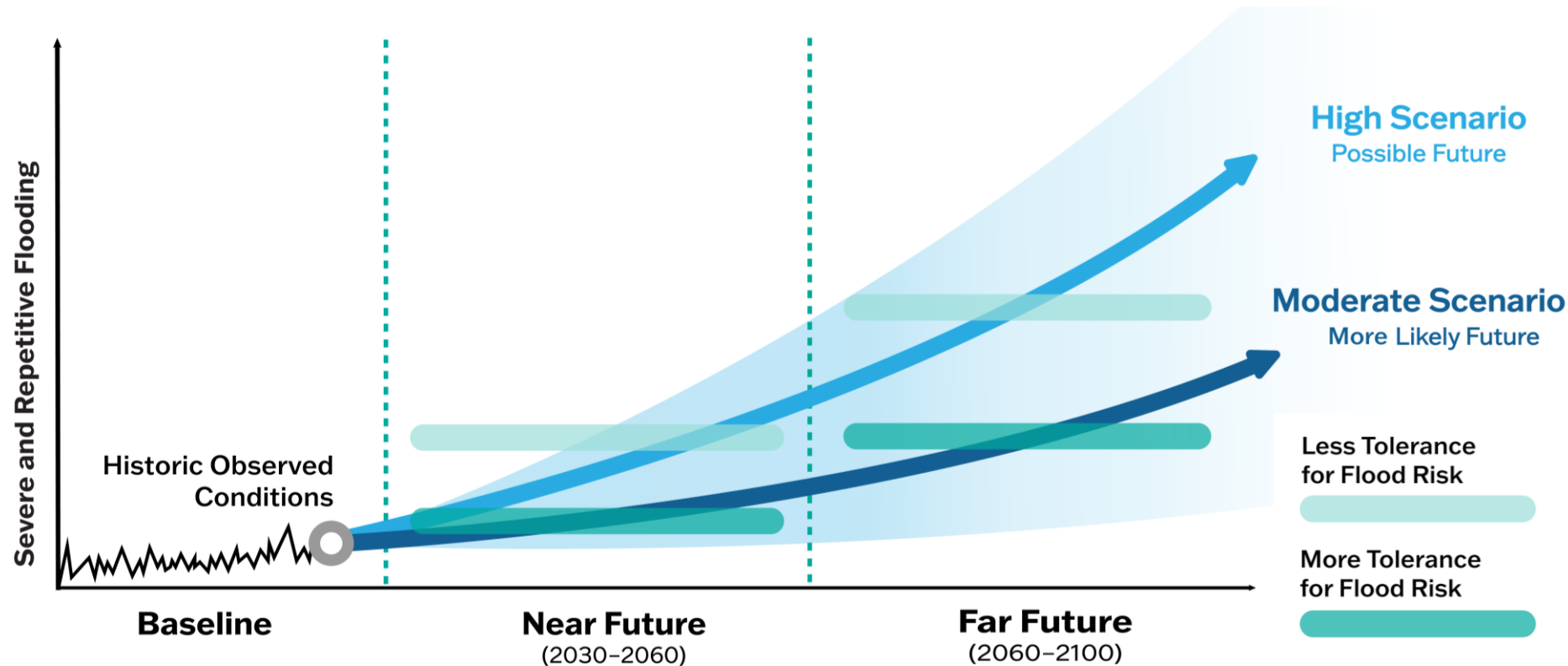
Coastal: Model inputs for future scenarios leveraged NOAA's relative sea level rise projections.



Rainfall-Driven: Model inputs for future scenarios leveraged MARISA's intensity-duration-frequency precipitation estimates.



Riverine: FEMA National Flood Hazard Layer filtered to only riverine flooding. Future scenarios are not available.



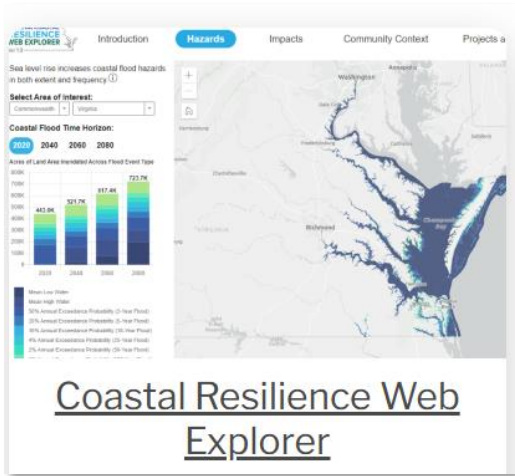
Limitations of the Flood Hazard Data

CRMP Data Limitations:

- The models do not include factors that may be necessary for some resilience applications.
- The following factors were not included:
 - stormwater infrastructure
 - compound flooding
 - flood velocities and durations
 - erosion
 - groundwater levels
 - marsh accretion

The models are based on desktop analysis utilizing remotely sensed data. These datasets have not undergone field verification. As such, local site conditions may differ significantly from modeled assumptions, and results should be interpreted with caution. Ground-truthing is recommended to validate findings before making site-specific decisions.

Access the CRMP Data



ArcGIS REST Services Directory

Home > services > CRMP2_FloodHazard

JSON | SOAP

Folder: CRMP2_FloodHazard

Current Version: 11.3

Services:

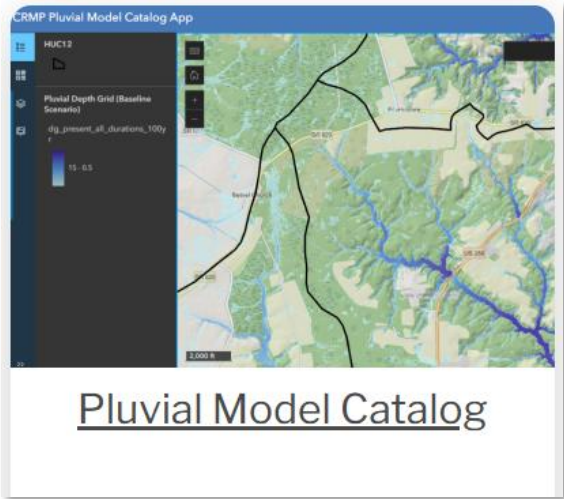
- [CRMP2_FloodHazard/Coastal_Baseline](#) (MapServer)
- [CRMP2_FloodHazard/Coastal_FarFutureHigh](#) (MapServer)
- [CRMP2_FloodHazard/Coastal_FarFutureMod](#) (MapServer)
- [CRMP2_FloodHazard/Coastal_NearFutureHigh](#) (MapServer)
- [CRMP2_FloodHazard/Coastal_NearFutureMod](#) (MapServer)
- [CRMP2_FloodHazard/Combined_Dominance_Baseline](#) (MapServer)
- [CRMP2_FloodHazard/Combined_Dominance_FarFutureHigh](#) (MapServer)
- [CRMP2_FloodHazard/Combined_Dominance_FarFutureMod](#) (MapServer)
- [CRMP2_FloodHazard/Combined_Dominance_NearFutureHigh](#) (MapServer)

AWS S3 Explorer

vdcr-fip / Coastal / rasters / GRAD / 2040

how: 50 entries Search:

Object	Last Modified	Timestamp	Size
GRAD_2040_1.tif	10 months ago	2023-07-20 08:58:35	102 KB
GRAD_2040_10.tif	10 months ago	2023-07-20 08:58:35	102 KB
GRAD_2040_100.tif	10 months ago	2023-07-20 08:58:35	102 KB
GRAD_2040_101.tif	10 months ago	2023-07-20 08:58:35	102 KB
GRAD_2040_102.tif	10 months ago	2023-07-20 08:58:35	107 KB
GRAD_2040_103.tif	10 months ago	2023-07-20 08:58:35	299 KB
GRAD_2040_104.tif	10 months ago	2023-07-20 08:58:35	103 KB



Ease of Use



Simple and Quick to Use

Flexibility in Application



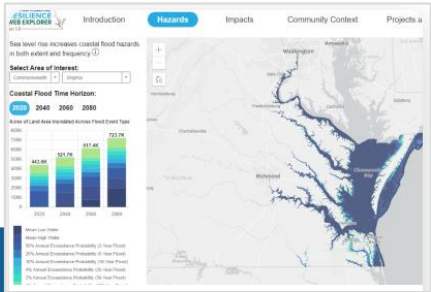
Limited Data and Formats Available

Requires Advanced Knowledge and Tools

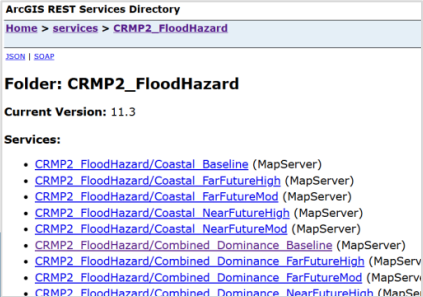
Advanced Technical Applications Enabled

All options are available via the Flood Resilience Open Data Portal:
floodplan-vdcr.hub.arcgis.com

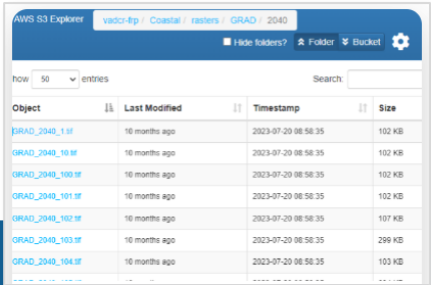
Summary Comparison of CRMP Data Resources



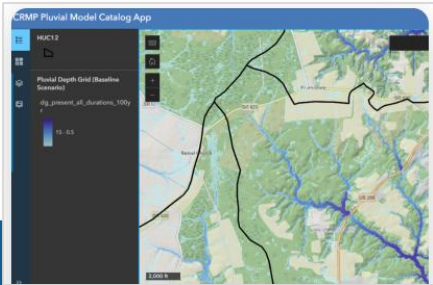
Coastal Resilience Web Explorer



ArcGIS REST Services Directory



DCR ORP Public File Repository



Pluvial Model Catalog

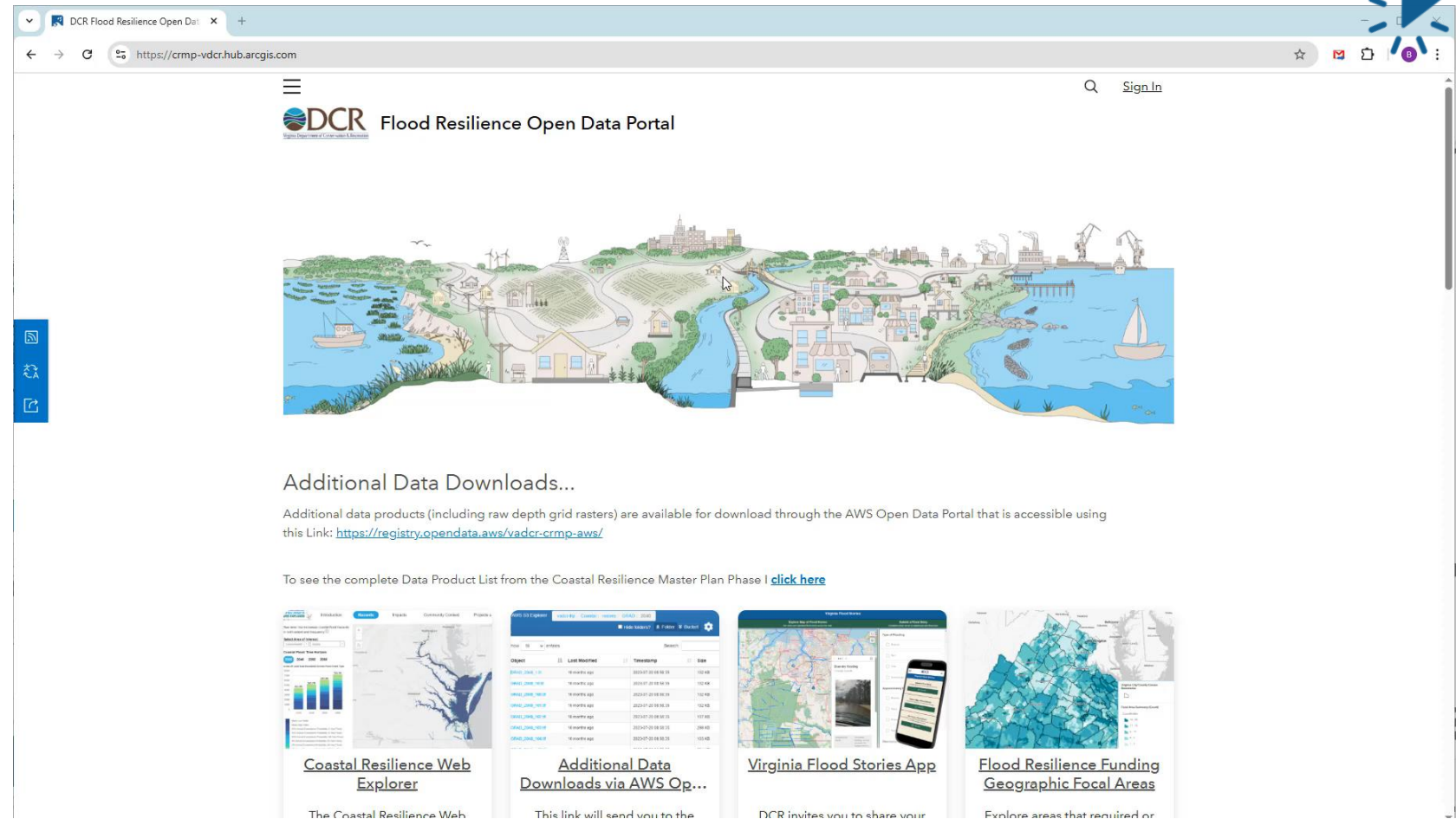


Use	View hazard and risk maps or charts and download tabular data	View maps or connect files to GIS apps to make limited-feature maps	Download data to drive custom analysis and mapping	Access watershed-scale pluvial modeling data for advanced analysis
Data Available	Coastal flooding, impacts, and community context	Coastal, pluvial, fluvial, and combined flooding	Coastal, pluvial, fluvial, and combined flooding spatial data	Pluvial flood models
Intended Users	All audiences	Users with some GIS experience	Experienced GIS users	Users with modeling experience
Notes	Data summaries available by county and PDC. Only provides coastal data	Cannot customize map layers, but can clip map to desired geography	Contact DCR for more information on finding data of interest in this repository	Only applicable for rainfall interval-based products

Pluvial Model Catalog

1. Go to the Flood Resilience Open Data Portal
2. Click on “Pluvial Model Catalog”
3. Search for desired subbasin, and where relevant, select tidal boundary condition of interest
4. Browse rainfall simulations by duration, select desired data to download
5. Access depth grid viewer at bottom if desired

*See the [pluvial model use case guide](#) for more details on the pluvial data.



DCR Flood Resilience Open Data Portal

Additional Data Downloads...

Additional data products (including raw depth grid rasters) are available for download through the AWS Open Data Portal that is accessible using this Link: <https://registry.opendata.aws/vadcr-crmv-aws/>

To see the complete Data Product List from the Coastal Resilience Master Plan Phase I [click here](#)

[Coastal Resilience Web Explorer](#)
The Coastal Resilience Web

[Additional Data Downloads via AWS Op...](#)
This link will send you to the

[Virginia Flood Stories App](#)
DCR invites you to share your

[Flood Resilience Funding Geographic Focal Areas](#)
Explore areas that required or



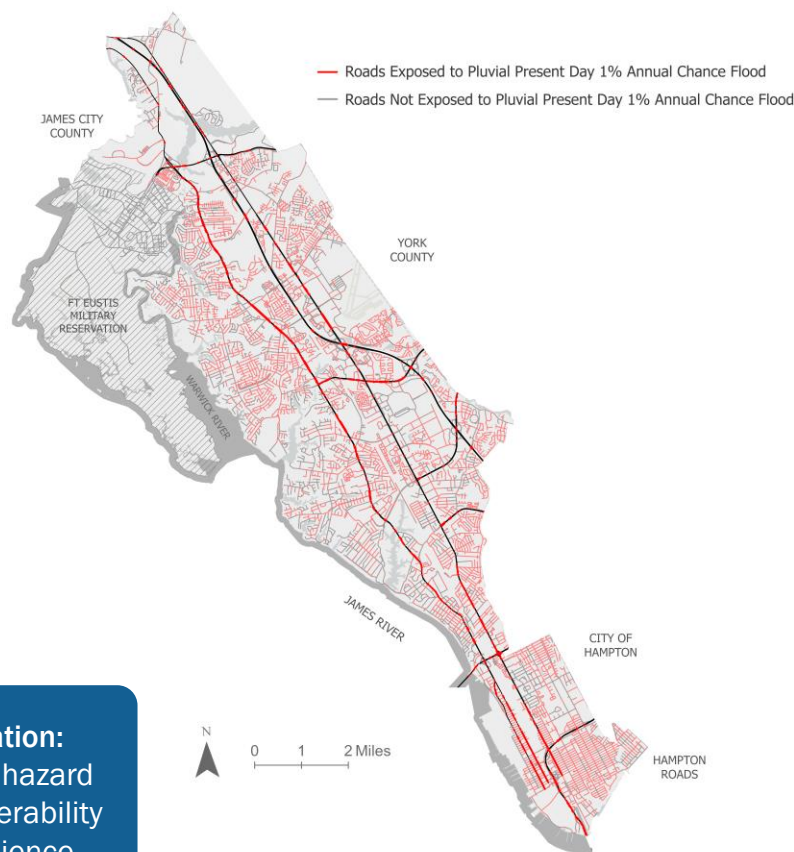
Support Implementation:

Use the HEC-RAS 2D models to support CFPF-funded study development or initial project design.

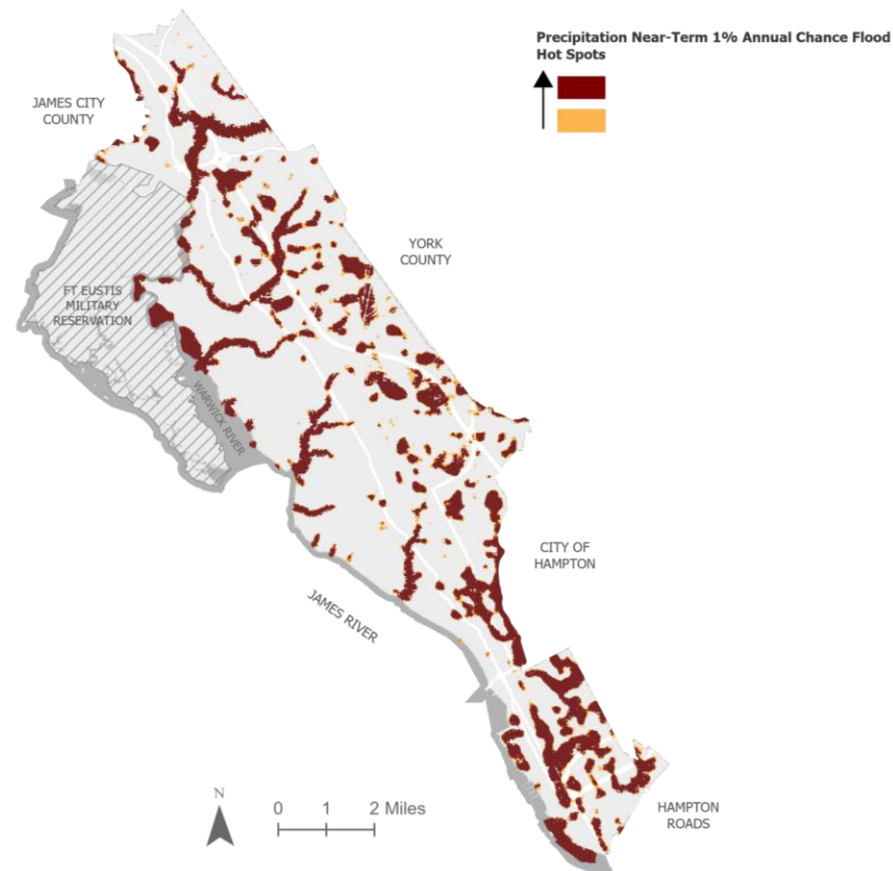
Example: City of Newport News Resilience Plan and Floodplain Management Plan

Pluvial Flood Depth Rasters

Used to assess miles of roadway exposed to flooding during the present-day 1% annual chance flood event and potential flood hotspots



Used to identify precipitation flooding hotspots throughout the City for present-day and future (2040-2050) 1% annual chance flood event



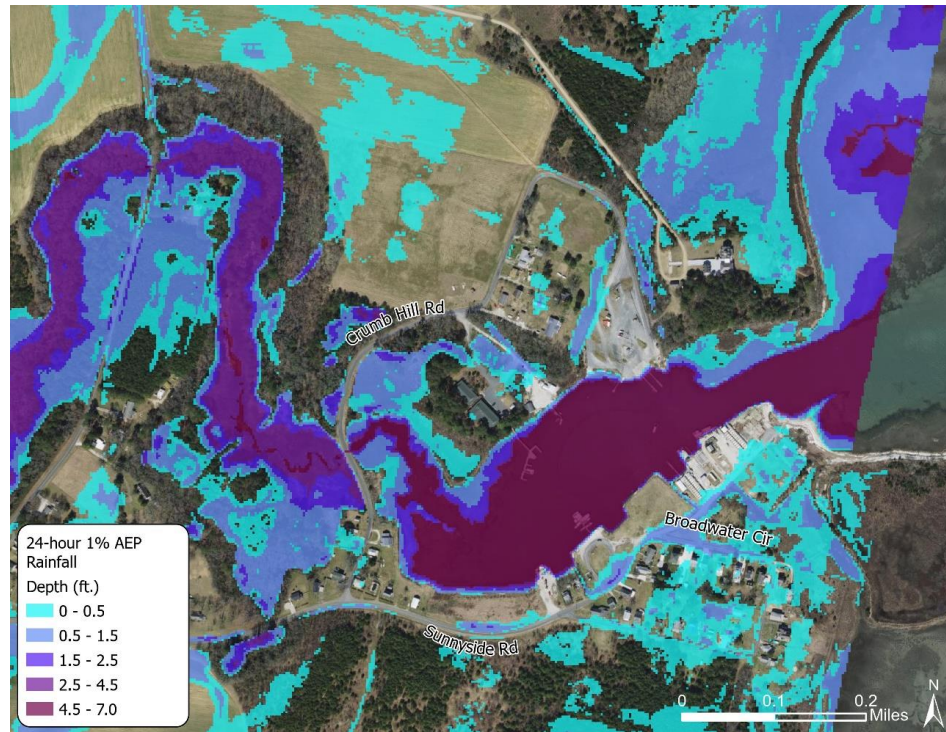


Support Implementation:
Use the pluvial flood hazard data to conduct vulnerability analyses in your resilience plan.

Example: Oyster Village Coastal Adaptation and Resilience Plan

Coastal and Pluvial Flood Depth Rasters

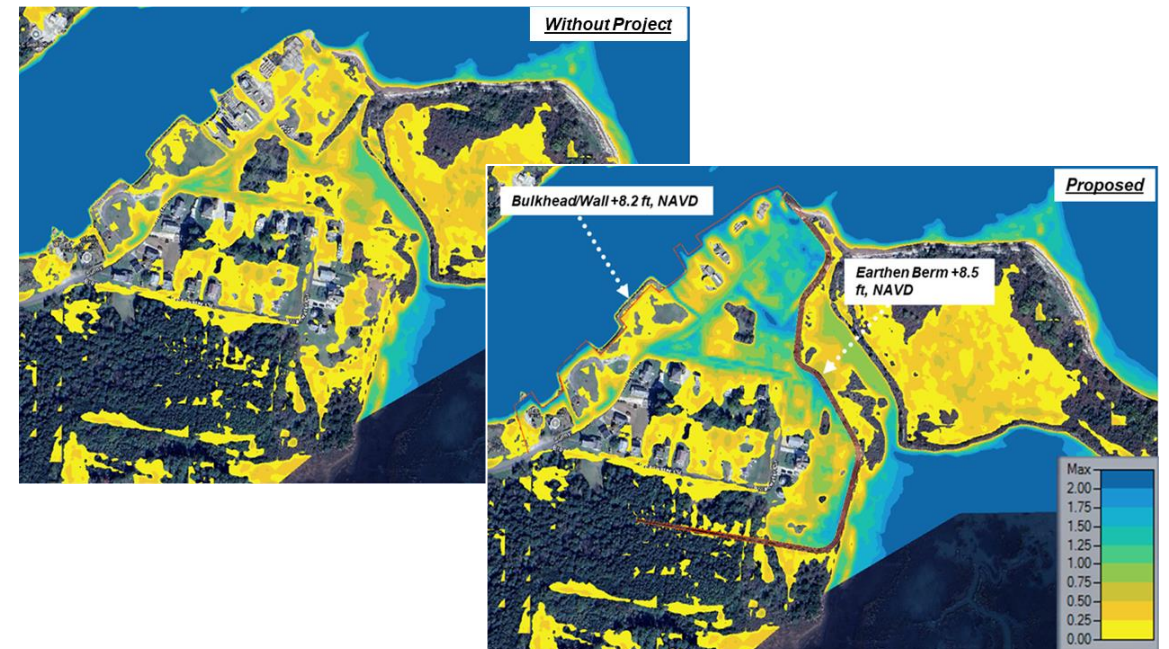
Used to identify areas subject to rainfall-driven flooding during the 24-hour, 1% annual chance flood event.



Pluvial HEC-RAS Models for Drainage Evaluation

Hydraulic analysis was performed using the open-source pluvial HEC-RAS model to evaluate the impact of earthen berm and bulkhead/stem wall alignment on rainfall depths in Oyster Village.

The simulated water surface elevation and flood depth were analyzed for conditions without and with the project to improve understanding of needed drainage improvements.



Support Implementation:

Use the flood hazard data to conduct vulnerability assessments, and the pluvial models for project alternatives evaluation.

Example: James City County Application for Resilience Plan

Flood Impact Narrative

Used CRMP data to develop narrative of coastal flood exposure and impacts in broader region, including impacts on people, environment, and structures

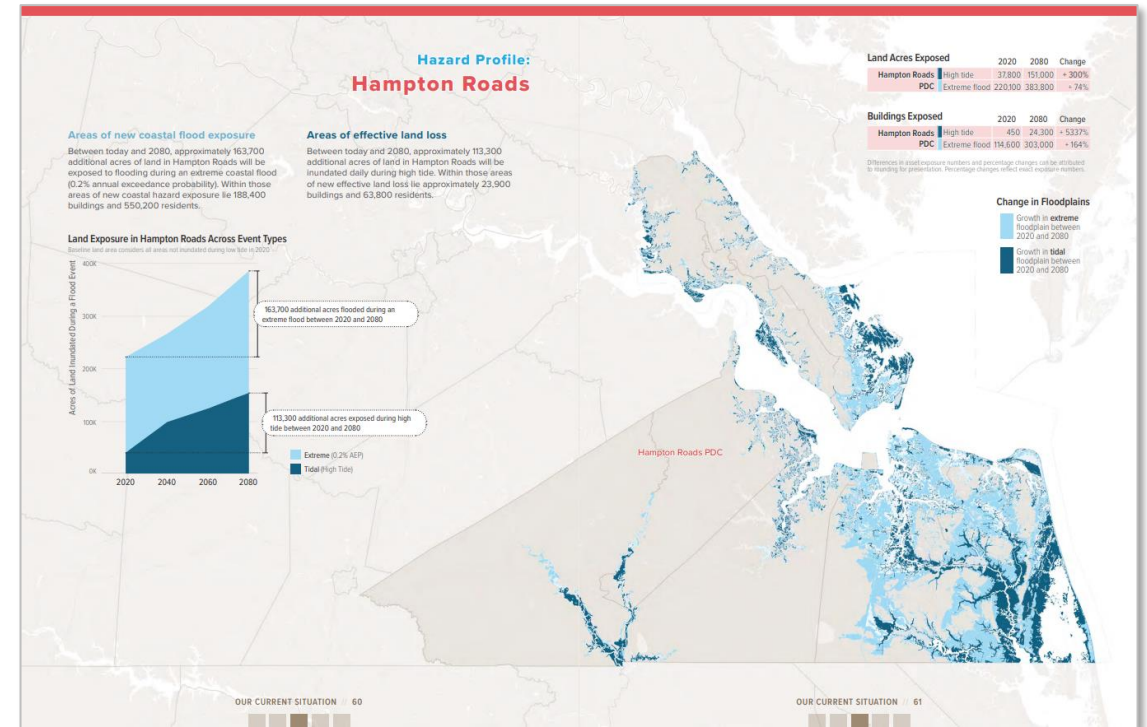


Develop your Scope of Work Narrative:
Use the flood hazard data to illustrate the flood challenges you will address.

Flood Exposure and Impacts from the Virginia Coastal Resilience Master Plan

The following data from the 2021 Virginia Coastal Resilience Master Plan paints a picture of what flood exposure currently looks like in the Hampton Roads region and how climate change impacts and land subsidence will influence exposure in the future. This type of data is not yet available for James City County, but it is anticipated that regional trends are mirrored at the county level. Based on the Virginia Coastal Resilience Master Plan (2021), data indicates the following risks and impacts for the Hampton Roads region which includes JCC.

- **Structures at Risk:** As of 2022, research shows that 560,000 structures in the Hampton Roads region, valued at \$204 billion, are at risk due to flooding.
- **Future Projections:** By 2080, approximately 113,300 additional acres of land will be inundated daily during high tide.
- **Extreme Coastal Flooding:** The number of buildings exposed to extreme coastal floods (0.2% annual exceedance probability) is expected to increase by nearly 150% by 2080.
- **Flood Damages:** Annualized flood damages are projected to rise by more than 930% by 2080, potentially reaching \$5.7 billion in cumulative damages.
- **Population Impact:** Between 2020 and 2080, the residential population exposed to high tide flooding in the Hampton Roads region will increase by 6,485%, and those exposed to extreme flooding will increase by 172%.
- **Structure Losses:** Annualized structure losses for residential properties are expected to increase by over 1,200%, totaling \$3.1 billion by 2080.
- **Marsh Vulnerability:** By 2080, 171,000 acres of tidal wetland habitat in the Hampton Roads region are expected to become open water. This loss will expose inland areas to even more severe flooding impacts, unchecked by coastal marshes.



For coastal hazards, locality-specific statistics and tabular data are in the **Costal Resilience Web Explorer**

Uploading Awards to the Projects & Initiatives Inventory (Coastal Virginia)

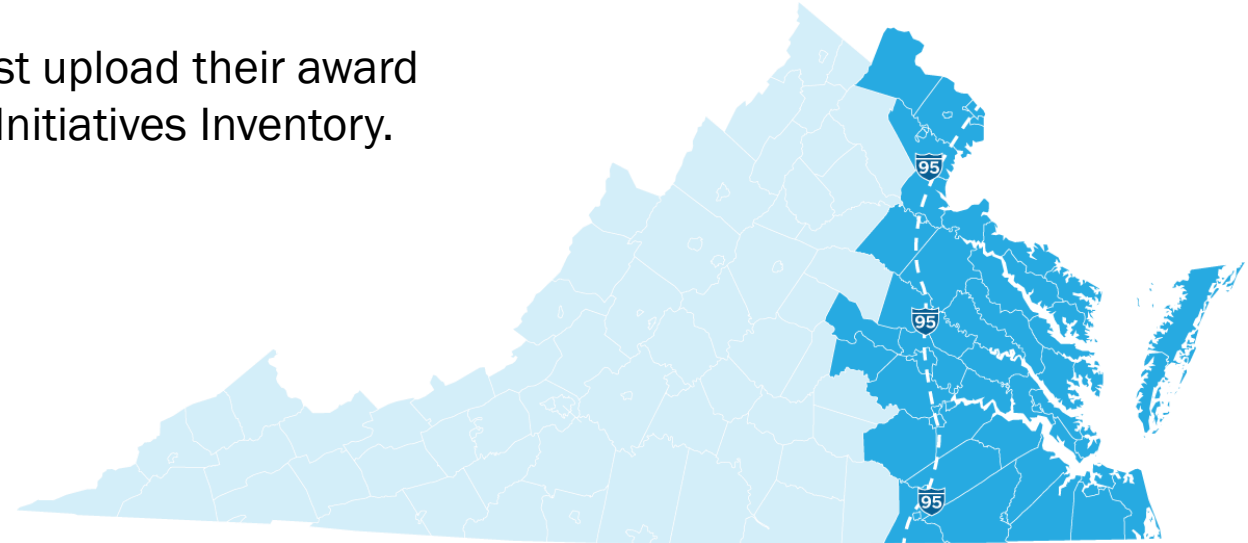
New requirement for Round 6: successful applicants must upload their award data to the Coastal Resilience Web Explorer's Projects & Initiatives Inventory.

What is the Coastal Resilience Web Explorer Projects & initiatives Inventory?

- The Web Explorer is an online tool to present findings from the Coastal Resilience Master Plan in an interactive format.
- The Web Explorer includes access to an inventory of planned, ongoing and completed flood resilience projects and initiatives.
- This inventory is a “living” resource. It is updated independently from the plan to provide timely information on opportunities for building flood resilience.
- Visit the Web Explorer: dcr.virginia.gov/crmp/ResilienceExplorer

How do I upload an award to the inventory?

- Submit key information about your project or initiative through an online user portal: floodplan.dcr.virginia.gov/userportal.
- Information submitted through the User Portal is automatically incorporated into the Web Explorer once approved by DCR staff.
- Contact the DCR Office of Resilience Planning with questions or to request assistance: resilience.explorer@dcr.virginia.gov.



- Relevant only for awards located in any of the eight easternmost planning district commissions.
- Relevant to all award types except staff capacity building projects.
- Awardees are encouraged to upload their data as soon as possible following execution of the grant agreement.
- Awardees must upload their data to the inventory to be eligible to receive reimbursements.

Thank you!



Sign up for our Newsletter

dcr.virginia.gov/signup

Visit us Online

dcr.virginia.gov/resilience-planning

Send us an Email

flood.resilience@dcr.virginia.gov

