Fathom Data Products for Public Planning in Virginia

Flooding impacts all parts of Virginia. Historically, 40% of flood insurance claims have come from outside of FEMA-mapped high risk flood areas. As sea levels rise and storm events become more intense and frequent, flood risks are continuing to change. Data predicting how flood depths and extents may change statewide are not currently available from federal government entities.

To ensure that Virginia has access to more up-to-date and forward-looking flood hazard data for the development of the Virginia Flood Protection Master Plan, DCR procured data in 2024. This data, provided by Fathom, offers information beyond the federally mapped regulatory floodplain. It can be used in tandem with regulatory data to support more informed flood resilience planning.

Fathom fluvial and pluvial flood areas (left) include smaller drainage areas not covered by available FEMA flood hazard maps (right).

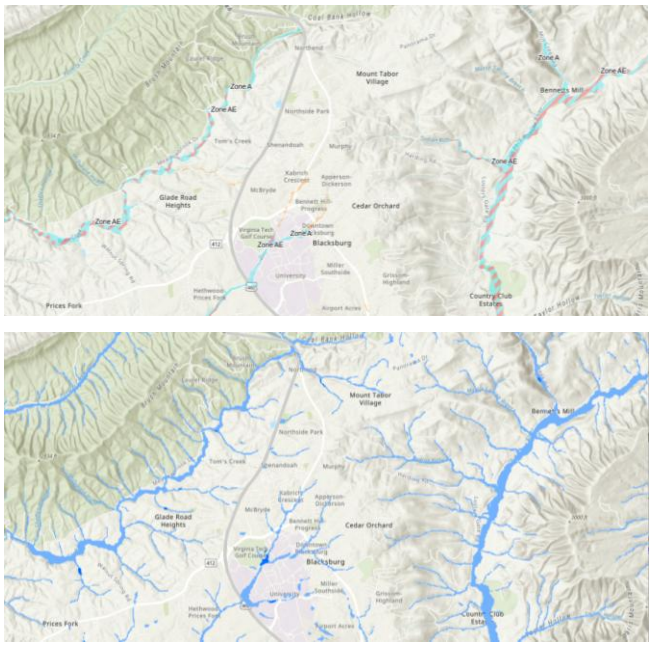
Data Description

- All datasets are available as **10-meter raster depth grids**, with depth values in centimeters.
- Separate datasets are available for **inland** (rainfall- driven/ pluvial and riverine/fluvial hazards), and **coastal** flood hazards. Several **merged** versions of the two datasets are also available.
- Flood hazard data is available for **five flood recurrence intervals**: 1 in 10, 25, 50, 100, and 500.
- Data is available for **baseline conditions** (2020) and **four future flood hazard scenarios**. This reflects uncertainty in the SSP2-4.5 climate scenario projection and provides options for use under different risk tolerances and planning horizons.

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

Fathom data product availability for baseline (2020) and future flood conditions by time horizon. Two percentile options represent uncertainty in the SSP2-4.5 climate scenario projection.

By including rainfall-driven flooding, the data provides flood risk mapping for lower order streams and areas of potential flash flooding often not mapped in FEMA's flood insurance studies. The value of this flood risk information is most pronounced in mountainous areas in the western part of Virginia.



Maps depicting the 1% AEP (1 in 100 year) recurrence interval flood event in the Blacksburg area. Top: FEMA's National Flood Hazard Layer. Bottom: the 2020 Fathom flood layer.

Data Access, License Terms, and Restrictions

Virginia government entities (defined as state agencies, political subdivisions, and public colleges or universities) and state-recognized Tribal governments may sub-license Fathom data from DCR for a 12-month renewable license term. The license agreement between DCR and Fathom includes limitations on the distribution and sharing of the complete dataset which extend to sub-license users. To inquire about a sub-license agreement for your organization please contact flood.resilience@dcr.virginia.gov.

Although Fathom data is available statewide, users planning for areas of coastal Virginia should consider instead using higher resolution coastal and rainfall-driven flood hazard data available from DCR, accessible via the Flood Resilience Open Data Portal.