

Adapt Virginia: A New Web Portal about Climate Change Adaptations

www.adaptva.org

A new web portal has hit the internet – Adapt Virginia or AdaptVA for short. AdaptVA is a gateway to multiple sources of information for individuals, local programs, and agencies engaged in climate adaptation. AdaptVA was developed with start-up funding from the Virginia-based blue moon foundation, in response to a growing demand for planning and collaboration across multiple sectors and localities. The project team was led by the Center for Coastal Resources Management (CCRM) at the Virginia Institute of Marine Science. Other project partners include the Virginia Coastal Policy Center (VCPC) at the William and Mary Law School, the William and Mary Public Policy Program, and Wetlands Watch, a non-governmental organization.

The initial content of the new portal focuses on sea-level rise and flooding in the coastal region of Tidewater Virginia, a matter of pressing local concern. Several tools and datasets in the portal have extended coverage to assist with implementing adaptation actions in all regions of the Commonwealth.

A wide variety of information, data, analyses, and tools useful for risk assessment and adaptation

What is a Web Portal?






“A web portal is a specially designed website that often serves as the single point of access for information. It can allow users to voluntarily personalize the information presented in the portal.”

– www.techopedia.com

planning are in the portal to help many interests. This includes emergency managers responsible for natural disaster preparedness

and response, home and business owners seeking relief from rising flood insurance premiums, local government officials responsible for zoning and building regulations, and military installations wanting to improve readiness, and land use planning, just to name a few. Visitors to the new portal will find legal and policy resources, stories that explain adaptation through maps and pictures, a searchable data catalog, and mapping tools that address short and long-term predictions for rising water levels to help communities understand their vulnerability and reduce their risk.

AdaptVA is currently organized into 5 areas.
Each content area is described in more detail in this issue.

- 
Forecasts – information on water levels now and into the future with real-time data, near and long-term predictions, Tidewatch and a sea-level viewer
- 
Adaptations – case studies and story maps that illustrate how adaptation works and can be financed through zoning, construction, engineering, and policy
- 
Tools – flood risk maps, shoreline management recommendations and an interactive comprehensive map of adaptation strategies
- 
Maps & Data – a geoportal to search, browse, and download geospatial data
- 
Planning & Policy – management strategies such as comprehensive planning, zoning and building codes, insurance, and the Community Rating System

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Forecasts

Forecasting water levels helps to mitigate flood impacts in the short term (*What roads will be flooded today?*) and improves resiliency in the long term (*How long until an area is flooded daily?*).

Both types of forecasts can be accessed under **Water Levels**. Short term forecasts for the next 36 hrs can be viewed in *Tidewatch*, which uses tide gauge data combined with storm surge models to predict water levels.

Long term forecasts can be viewed on a graph in *About VA Sea Level* or on a map in the **Sea Level Viewer** (Figure 1). The graph shows historic data, trends based on the historic data, and sea level scenarios for Virginia. Both options display the Low, Intermediate and Extreme sea-level rise scenarios from 2017-2100. The projections for future sea level are based on National Oceanic and Atmospheric Administration (NOAA) data analysis published in January 2017. Link to the report, “Global and Regional Sea Level Rise Scenarios for the United States” in this tab.

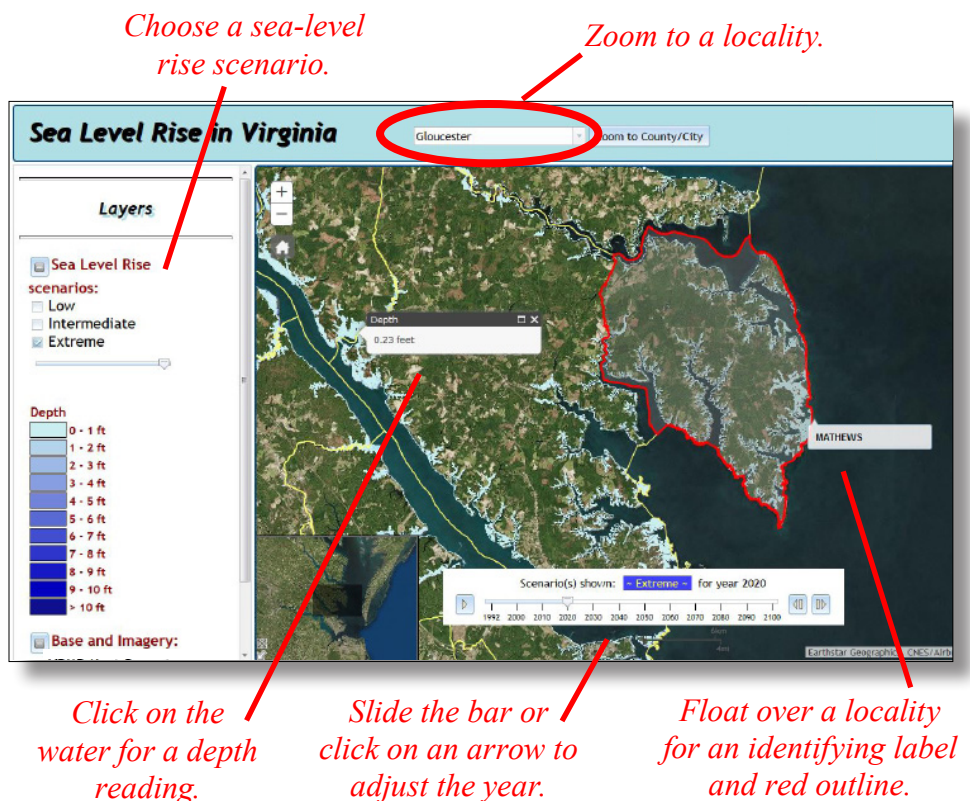


Figure 1. Virginia Sea-Level Rise Viewer

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SHORELINES



INFRASTRUCTURE



PLANNING



FUNDING

Adaptations

Story maps that combine authoritative or trusted maps with narrative text, images, and video content are used to tell sea-level rise and flooding adaptation stories. Common and creative adaptation efforts from Virginia, the United States and elsewhere in the world where communities are dealing with flooding are highlighted.

The story maps are organized in four topic areas:

Shorelines

The application of natural and nature-based features are covered in the *Living Shorelines* and *Gray Shorelines* story maps, including opportunities to increase ecosystem services in urban settings.

Infrastructure

Infrastructure stories include *Building Modifications*, such as floodproofing the VIMS Eastern Shore Seawater Lab (Figure 2), *Managed Retreat*, *Transportation Adaptation* and *Water Storage and Management*.

Planning

Setback and freeboard requirements, rolling easements and overlay districts are part of the *Zoning* story map. *Planning* stories cover comprehensive planning, climate smart and adaptation plans.

Funding

Financial Incentive stories include tax incentives, transfer of development rights, and fee simple acquisition.

Adaptation Stories: Building Modifications

- **New Building Floodproofing: VIMS Eastern Shore Seawater Lab, VA**
- Floodproofing Retrofit: Chrysler Museum, VA
- Elevating Home: Gloucester, VA
- Floodproofing Retrofit: Burnham Hall, VA
- Elevating Home Utilities: Soltate and Quincy, MA

New Building Floodproofing: VIMS Eastern Shore Seawater Lab, VA

The new VIMS Eastern Shore Seawater Lab is designed to withstand coastal flooding and sea-level rise. The new building, in FEMA Zone VE (Coastal High Hazard), is protected from waters reaching 14 feet above mean sea level (2 feet above the 100-year flood elevation).

Project Goals: Floodproof a new building

Techniques Used: Elevate structure, elevate utilities, construct a waterproof envelope around the base of the first floor

Project Size: 7,600 square foot building

Project Cost: ~\$2,800,000

Project Partners: Virginia Institute of Marine Science (VIMS), VIA design architects, pc; NASON Construction, Inc.

Funding Partners: College of William & Mary, Virginia College Building Authority

Public Demonstration: Yes, located at 40 Atlantic Avenue in Wachapreague.

A number of flood-resistant features were used in the design and construction of the new building:

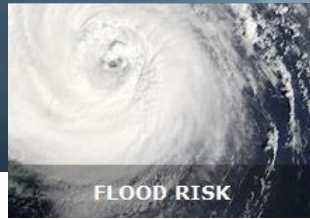
- The ground surface was graded to a height of 6 feet above mean sea level and the first floor was built 3 feet above that.
- The lowest 5 feet of the first floor are watertight; walls are constructed with 10-inch thick concrete.
- Doors can be sealed with a temporary watertight panel.
- Inside of the building, power outlets and light fixtures drop down from the ceiling, keeping them 14 feet above mean sea level.

Navigate through the story maps three different ways: click on an item from the front content page, scroll down, or use the bullet links on the far left of every screen.

Figure 2. AdaptVA Building Modifications story map, VIMS Eastern Shore Seawater Lab

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Tools

The Tools tab contains three areas:

- Flood Risk
- Shoreline Management
- AdaptVA Interactive Map.

Flood Risk includes impacts from storm surge, wave run-up and river flooding. The *Virginia Flood Risk Information System VFRIS* mapper helps to answer questions such as: *Which areas are currently at risk from flooding?* and *Does this property require flood insurance?*

VFRIS was developed in cooperation with the Virginia Department of Conservation and Recreation (DCR) and displays information on flood risk from the Federal Emergency Management Agency (FEMA) including Flood Insurance Rate Maps (FIRMs), Flood Hazard Zones, and Flood Depths (Figure 3). A DCR website link allows users to explore the floodplain management program.

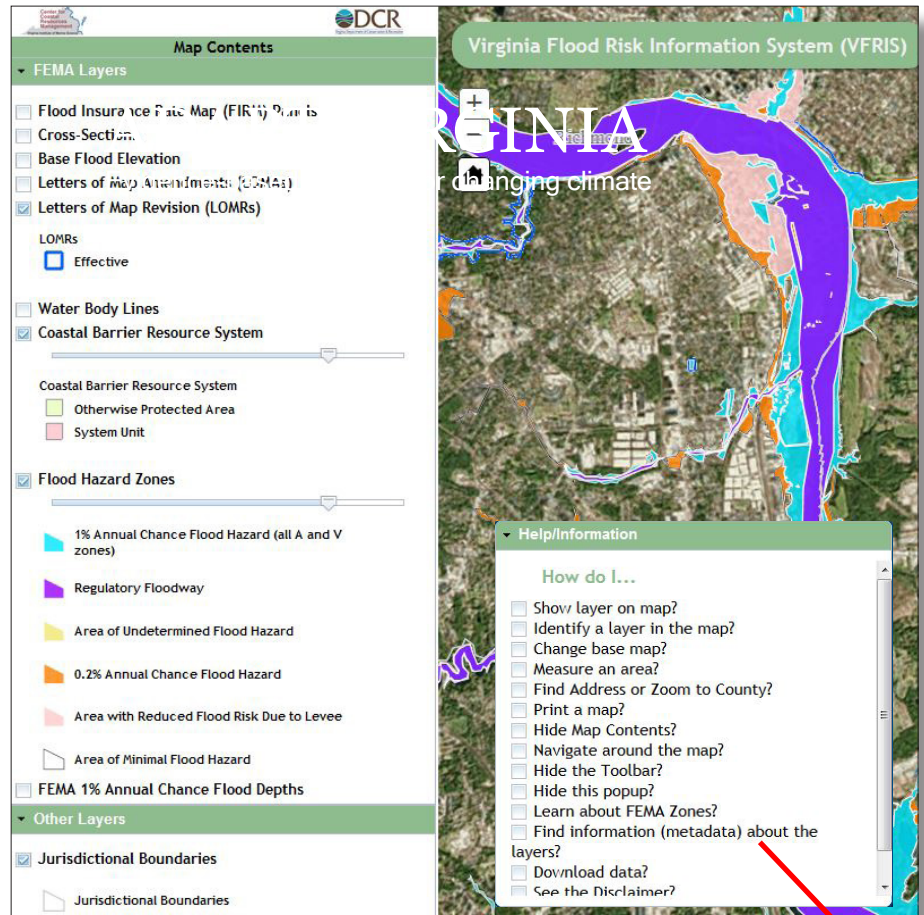
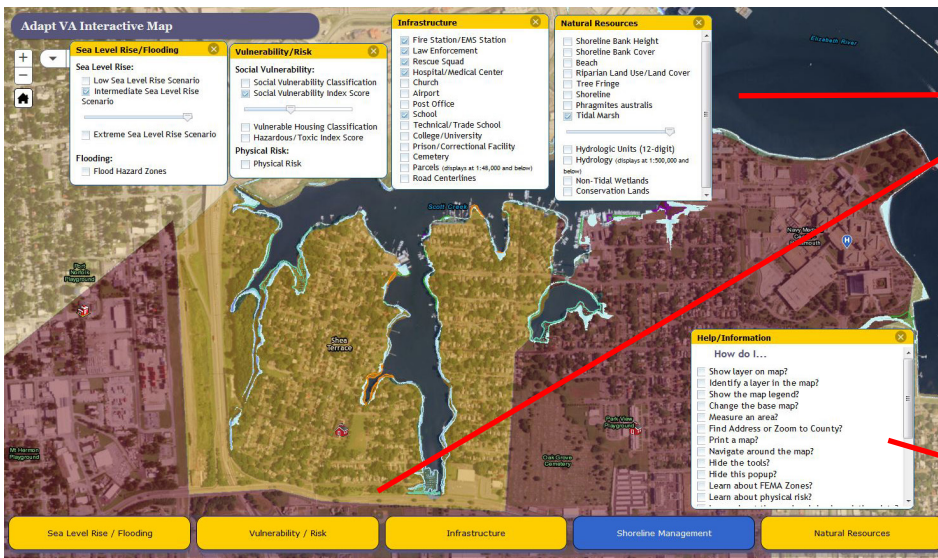


Figure 3. VFRIS 2.0 Mapper

A Help/Information dialog box automatically opens to answer common questions on how to use this map.

The **Shoreline Management** section connects the user to map viewers for Virginia localities created by CCRM for the Comprehensive Coastal Resource Management Portals (CCRMP's). It helps property owners and localities choose the best management strategy for shorelines based on site conditions. The CCRMP's address questions such as: *What are the existing conditions along a shoreline?* or *How can I optimally protect my shoreline from erosion?*

The Tools tab is also home to the **AdaptVA Interactive Map** (Page 5, Figure 4). This map viewer is a one-stop-shop for physical, ecological, social and management information. It integrates data from throughout the portal into a single mapper. The interactive map was designed to allow users to ask complicated questions and generate reports to answer them. For example, it could answer: *Which localities are most socially vulnerable and physically at risk from sea-level rise in the next 30 years?* *How many schools are in census tracts with high hazardous/toxic index scores?* or *What types of marshes are found near my house?*

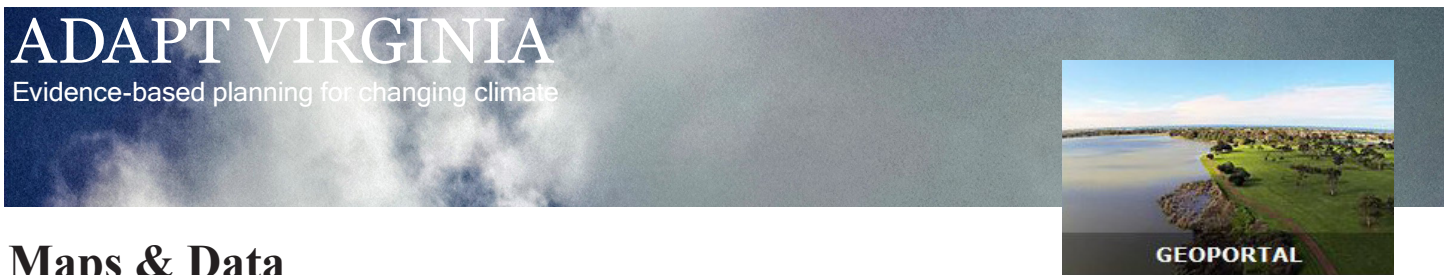


Users may enable or disable one or more map elements at the bottom and make data selections from the pop-up box for each chosen element.

The Sea Level Rise/Flooding element can be used to find the water level depth over land by clicking on the map in any area shown to be flooded.

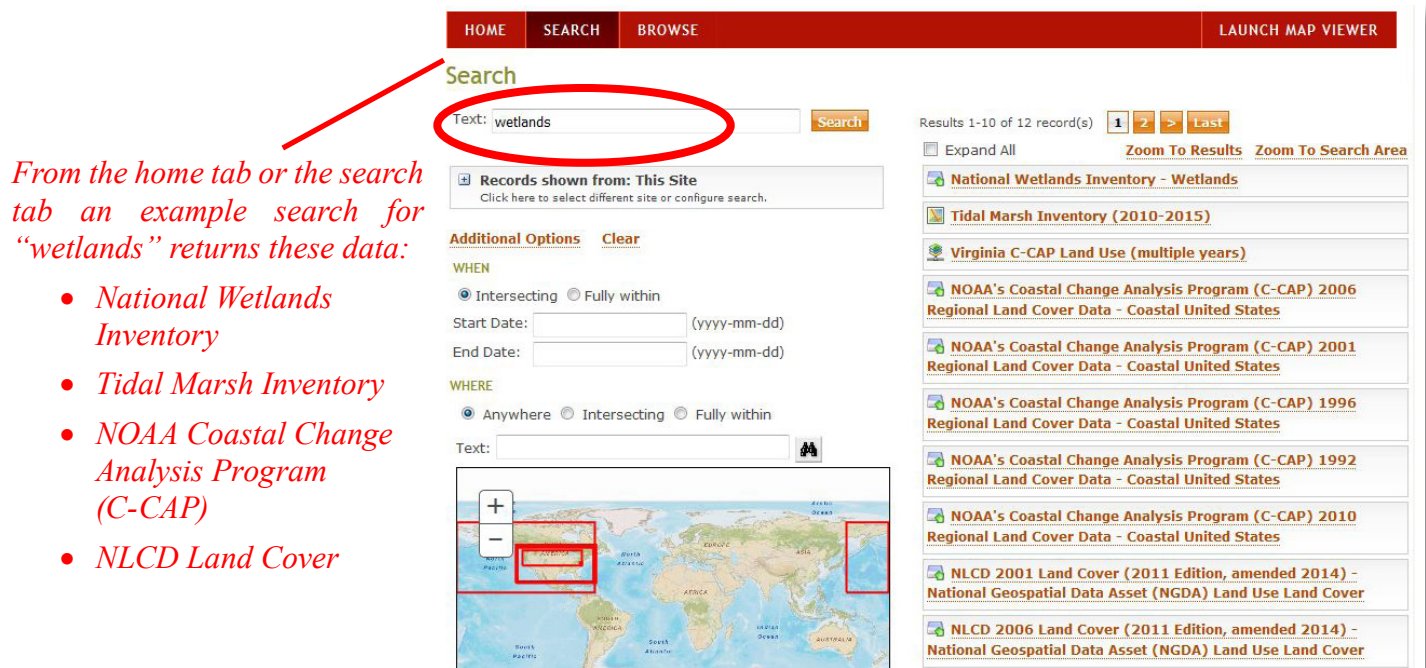
A Help/Information window directs users how to use the tool, and find information (metadata) on the map.

Figure 4. AdaptVA Interactive Map



Maps & Data

Adapt Virginia’s comprehensive Geoportal can be found in the Maps and Data tab. A geoportal is a gateway to web-based geographic data and informational resources served by a variety of providers. This new geoportal provides an easy and convenient way to access and download geospatial data specifically related to sea-level rise, flooding, and other climate change effects. A data catalog in this Geoportal can be accessed via a search tool (Figure 5) or by launching the map viewer to see all the data available for a particular map extent.



From the home tab or the search tab an example search for “wetlands” returns these data:

- National Wetlands Inventory
- Tidal Marsh Inventory
- NOAA Coastal Change Analysis Program (C-CAP)
- NLCD Land Cover

Figure 5. Maps & Data search tool

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Planning & Policy

The content in this section is broad and covers:

- Social Vulnerability
- Community Rating System
- Legal Authorities and Analyses

Social Vulnerability is the characteristics of an individual or group that influences their capacity to prepare for and recover from a natural or man-made hazard. Studies have shown that the poor, elderly, and disabled are at much greater risk to natural disasters such as flooding and hurricanes than the general public. Other things that can affect resilience include housing conditions, toxic environments, business characteristics and government structure. After hurricane Katrina, federal law requires equitable treatment on the basis of race, sex, age, disability, and economic status when federal resources are used to respond to disasters; making it important for planners to understand where the socially vulnerable communities are in their jurisdiction.

There are two social vulnerability measures in the portal, the Social Vulnerability Cluster Analysis and the Social Vulnerability Index. These two measures are based on similar census data, but the Social

Vulnerability Index measures overall vulnerability, while the Social Vulnerability Cluster Analysis details which factors make a given area vulnerable.

The Hazardous/Toxic Index characterizes the environment within a census tract, including: air pollution, water pollution, leaking underground storage tanks and facilities that handle hazardous waste. The Housing Vulnerability Cluster Analysis identifies areas where the housing stock may be vulnerable. Areas with many mobile homes, many houses lacking full plumbing or many empty homes may have difficulty preparing for and recovering from an unexpected natural hazard.

The National Flood Insurance Program's **Community Rating System** (CRS) is a voluntary incentive based program that rewards localities with flood insurance premium discounts for floodplain management efforts, like green infrastructure. The CRS has provided credit for many existing programs in Virginia localities, such as stormwater regulations and system maintenance, building code enforcement and stringent floodplain ordinances, and open space preservation.

The *Coastal Virginia CRS Workgroup* is an active community that promotes education and cultivation of strong floodplain management programs. The workgroup's web site has links to guidance documents on CRS, forms, worksheets, checklists, applications, and financing.

Also find a link to the *CRS Guide*, "Flood Protection Pay-Offs: A Local Government Guide to the Community Rating System".

Legal Authorities and Analyses

This area has information on state legislation and local ordinances addressing flooding from a policy and legal perspective.

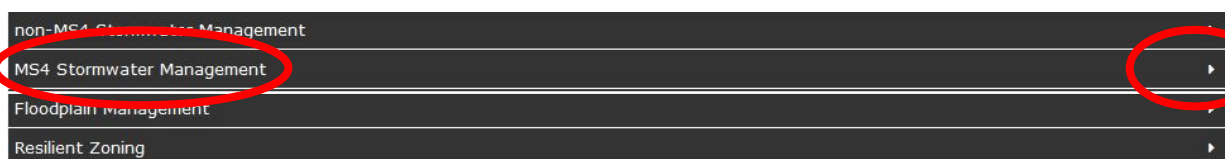
Users can click on the *Search Local Ordinances* button to access a searchable database of links for 58 counties, cities and towns ordinances on:

- Chesapeake Bay Preservation
- Erosion and Sediment Control
- Floodplain Management
- Freeboard Requirement
- Stormwater Management
- Subdivision
- Wetlands Management
- Zoning

The *State Legislation and Provisions* button opens a table full of information on Virginia enabling legislation for coastal resilience and adaptation. Clicking on the subject headings will open related web pages from the Wetlands Watch Adaptation Guide. This Guide identifies and analyzes common tools, authorized by Virginia Code, that localities can use to adapt to recurrent flooding and sea level rise. Each topic area can also be expanded by clicking on the arrows to reveal additional information, web site links to the Virginia Legislative Information System (LIS), and story maps about how the provisions are used in Virginia. An example of this table is illustrated in Figure 6.

The *Virginia Coastal Policy Center Reports* button takes you to reports served by the Coastal Policy Center at the College of William and Mary. Topic categories include:

- Strategic Planning for Sea Level Rise and Recurrent Flooding
- Potential Liability of State and Local Government
- The Dillon Rule
- Social Vulnerability and Environmental Justice
- National Flood Insurance Program and Community Rating System



1. Clicking on the topic header will connect you to more information in the Wetlands Watch Adaptation Guide.

2. AND - Click on the arrow to expand the view. (see below)



All tidewater localities and localities with Municipal Separate Storm Sewer System (MS4) permits must regulate and administer stormwater management (runoff volume and water quality) for new development and redevelopment according to the Virginia Stormwater Management Program (VSMP). See a storymap to learn more

Va Code §§ 15.2-51-2114; 62.1-44.15:33;
Amended: 2016; 2016

15.2-2114: "Any locality, by ordinance, may establish a utility or enact a system of service charges to support a local stormwater management program..."; 62.1-44.15:33: MS4 localities "are authorized to adopt more stringent stormwater management ordinances than those necessary to ensure compliance with the Board's minimum regulations."

Links to AdaptVA story maps are included when available.

The code citations link to the Virginia Legislative Information System.

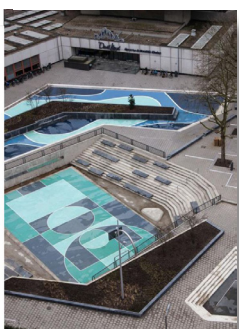
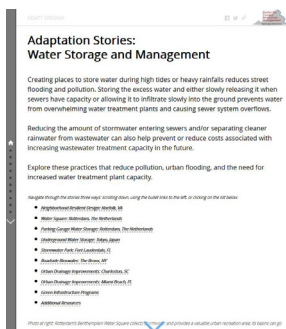


Figure 6. The State Legislation and Provisions Table links to external and internal pages with more information


Adapt Virginia's Future

The Adapt Virginia portal is designed to facilitate more robust decision-making about climate change adaptation. Portal users across the Commonwealth of Virginia now have easy access to integrated information based on the best available science, legal guidance, and planning strategies to address both short and long-term climate change issues like sea-level rise and recurrent flooding. Adapt Virginia's tools, information, and analyses are presented in a variety of ways to effectively communicate complex topics.

The current portal design and content is only the first step to building and maintaining a dynamic gateway for information and resources. There are plans for continued and expanded collaboration to add client-driven products, new data, new topic areas and additional technical analyses. Future subject areas to be added and expanded include storms, precipitation, and temperature, plus analyses on how these events affect local economies, natural resources and opportunities to integrate multiple benefits into adaptation strategies.

Adapt Virginia Project Team

User feedback and suggestions about the utility and applications of the Adapt Virginia portal are appreciated. Contact one or more of the project partners to ask questions and/or share your experiences.



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About Adapt Virginia's Maps & Data

Every attempt has been made to ensure that data and documentation used in the portal are reliable and accurate. Information is provided with the understanding that the records are not guaranteed to be correct or complete, and conclusions drawn from the data are the sole responsibility of the user.

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