Evaluating the impact of flooding on road network access in coastal Virginia

Final report (Year 1 of 2)

Submitted to the Virginia Coastal Zone Management Program,
Department of Environmental Quality

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Marcia Berman, Molly Mitchell, Dan Schatt, Jessica Hendricks
Center for Coastal Resources Management
Virginia Institute of Marine Science
William and Mary
Gloucester Point, Virginia 23061

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Introduction

The impacts of recurrent flooding on roadways present challenging social and economic considerations for all coastal jurisdictions. Maintenance, public and private accessibility, evacuation routes, emergency services are just a few of the common themes local governments are beginning to address for low-lying roadways currently known to flood. Continuation of these services allows a community to thrive, to maintain or increase its tax base, and to insure the safety and well-being of its citizenry.

In a 2013 report to the Virginia General Assembly, the Center for Coastal Resources Management (CCRM) highlighted the current flood frequency on state-maintained roadways using data only from the Virginia Department of Transportation (Mitchell et al 2013). Between August of 2008 and May of 2012 extreme weather events have resulted in road closures in every coastal locality in Virginia at least once. In some localities, single events have resulted in multiple road closures across the jurisdictions, and some localities have experienced this level of impact as many as 9 different times over this 4-year data collection period. Available data on current flood frequency of roads in coastal Virginia has limited value in a region where sea level rise predictions estimate water levels to be 1.5 feet (0.5m) higher by 2050 than today (Boon et al., 2017). In the low-lying coastal plain this means that roadways that do not currently flood today may flood by the year 2050, or sooner. To prioritize the task of making transportation networks more resilient it is critical to understand, not only which areas will flood, but which additional areas will be inaccessible during the time of the flooding because some portion of their road network is underwater.

A geospatial analysis, delivered through an easy access web portal and detailed road flooding summaries can bring communities new and critical data for planning, zoning, and protection consideration that will have great value of many years.

Approach

A traditional projection analysis would focus only on impacts within the actual zone of inundation. The protocol developed for use in this analysis also considers impacted inhabitants that may not be within the inundation zone but will lose their transportation corridor into or out of their downstream dwelling/service areas and other areas that may be impacted. This project implements a protocol developed by CCRM to analyze the service area(s) impacted by road flooding at periodic intervals through the year 2100 in coastal Virginia. A network analysis of roadways and the average annual duration in hours/year of flooding can be assessed using GIS, water level data, road centerline data and topographic lidar. Land use data at a variety of scales can be used to assess the pressure felt by development not only within but also “downstream” of roadway flooding.

There were two main parts to the analysis, 1) mapping current and future flood duration extents, and 2) determining road inaccessibility under different levels of flooding.

Localities included in the analysis are: York, James, Mathews, Gloucester, Middlesex, Northampton, Accomack, Fairfax, and the cities of Williamsburg, Poquoson, Hampton, Newport News, and Alexandria. This region incorporates the coastal localities of the Peninsula, the Middle Peninsula, the Eastern Shore, and a section of Northern Virginia. Localities are grouped by region into the Peninsula, the Middle Peninsula, the Eastern Shore, and a section of Northern Virginia.

Flood duration:

The purpose of this analysis was to map projected flooding duration extents based on a flood frequency analysis of current observed water levels and those combined with the NOAA intermediate sea level rise projections (NOAA 2017) for 2050 and 2100.

Table 1. Tide gauge stations used for each locality analysis

Tide Gauge	*Region*	*Localities*
Washington DC	Northern Virginia	Fairfax
		Alexandria
Kiptopeke	Eastern shore lower	Northampton
Windmill Pt	Eastern shore upper	Accomack
		Gloucester
		Middlesex
	Middle Peninsula	Mathews
Sewell's Pt	Peninsula	Newport News
		Hampton
		James City
		York Co
		City Williamsburg
		Poquoson

A 19-year record of hourly tide gauge records was downloaded from NOAA Tides & Currents. Tidal records from a 19-year period roughly represent tidal variability associated with one tidal epoch. Tide gauge stations were chosen for proximity to the locality, as shown in Table 1. Data were extracted and analyzed for the frequency of water levels at topographic elevation increments of one foot (NAVD88). Based on NOAA's intermediate sea level rise curve, an approximate 2050 mean sea level of +1.5 ft and an approximate 2100 mean sea level of +4.2 ft were added to the tide gauge record to model future flood frequencies. The modeled data was re-analyzed for the frequency of water levels at elevation intervals of one foot (NAVD88). The water level frequencies were used to delineate flooding zones from a lidar-derived elevation surface. Results were synthesized in a layer depicting four categories of flood durations: 1) 0-5 hours per year, 2) 5 -100 hours per year, 3) 100 - 200 hours per year, and 4) more than 200 hours per year.

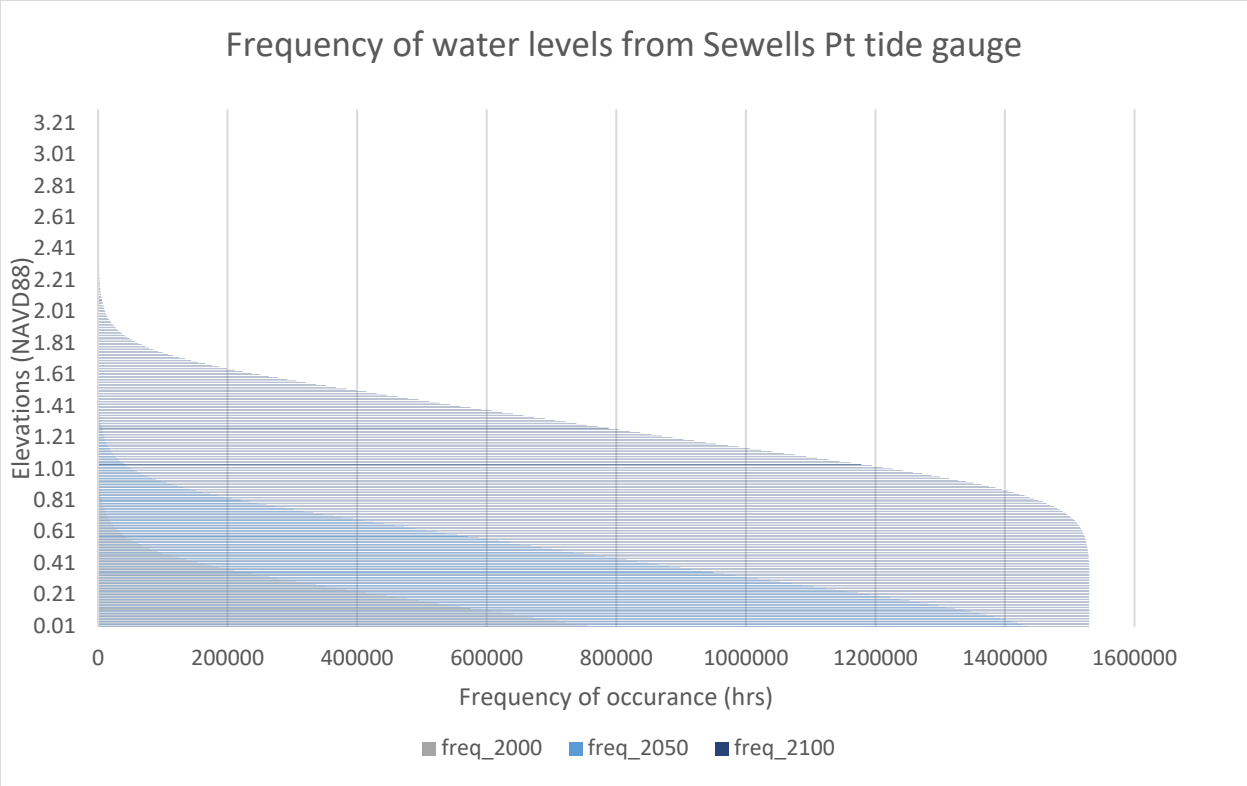

Figure 1. Water level frequency analysis for Sewell's Point tide gauge, assuming sea levels in 2050 and 2100 consistent with the NOAA intermediate scenario (NOAA 2017).

Inaccessible road analysis:

Inaccessible roads are portions of roads that experience flooding and/or experience disconnection due to flooding (i.e., the road portion itself is not flooded but access to that road section is blocked by flooding on adjacent road segment(s)). This analysis seeks to aid in planning by identifying those inaccessible roads. Since the information is given relative to water elevations, this analysis can aid in both sea level rise and storm surge planning efforts.

Road networks and road center line data were acquired from the Open Street Map database. Roads in Open Street Map have information already formatted in a way that makes network building more efficient. Elevations were mapped to the roads using high resolution land use and light detecting and radar (LiDAR) data available through the Virginia Geographic Information Network (VGIN).

The network analysis is run the using raster processing and network analysis tools in ArcGIS Desktop 8.0. Roadways and transportation pathways assess how traffic can move to and from a node if a barrier (i.e. a flooded road) is encountered. Nodes can represent critical infrastructure in a community such as fire and rescue stations, hospitals, military bases, and entrances to major arteries or evacuation routes. For this analysis, the node (point of origin) was always the locality seat. The network analysis was run regionally, to allow for the possibility that roads may transverse multiple localities and that flooding in one locality could affect access in another locality. Results of the network analysis were then clipped to the locality.

Constructing the road network analysis requires the delineation of a “service area” within which movement through the network can be assessed. The service area for the selected localities were initially constructed from a locality specific point of origin (county seat). Raw lidar elevation point clouds were downloaded for the localities of interest and elevation rasters were created from them. From the elevation rasters, the flooded areas were determined for varying flood levels derived from the tide gauge data. These flooding area polygons were used as polygon barrier inputs in the road network analysis. The use of the raw lidar data point clouds reconciled problems associated with overpasses and bridged yielding incorrect elevation profiles from data generated using bare earth raster data. The road network analysis was completed using road network datasets in the Open Street Map format as the source road data. First, the source point locations (county seats) were imported into the network analysis layer. Then, for each flood level, the flood area polygons were imported as a polygon barrier layer. Finally, the network analysis was solved to determine accessible and inaccessible roads for that flood level.

Roads accessibility was determined for 0.1 meter flood intervals from 0 up to 3.0 meters of flooding. Access is evaluated as the ability to travel from the locality's seat (e.g., the county courthouse) to each road in that locality. In some localities (e.g., Hampton City), roads to/from the county seat itself are flooded at a particular flooding level. In these cases, based on our definition of accessibility, the entire locality becomes inaccessible. For map display purposes and ease of use, inaccessible road segments were classified into 0.5 m elevation groups, according to the flood level the road segment first becomes inaccessible. This and other feedback was suggested by local government planners who reviewed and commented at various stages in the project (James City County). .

Web viewer development

The web viewer was developed to present the results of the analysis in the most intuitive way for use in comprehensive planning efforts. To ensure that this goal was met, the web viewer draft was presented to a group of stakeholders (James City County planners). Due to Covid-19 restrictions, the draft viewer was introduced to the stakeholders in a virtual meeting and all other discussion was conducted via email. The web viewer was updated following their feedback to include:

- Changes to the way that inaccessible roads were displayed to make the results more immediately interpretable
- Clicking on road segments to generate a table in the viewer with information about road flooding at each meter of flooding recorded
- Additional information was added that can help inform planning (social vulnerability data, infrastructure data including locality seats, building footprints and parcel data)
- A dashboard at the bottom of the map that clearly connects road flood impacts to sea level rise projections
- Additional basemaps were added to increase the amount of available information

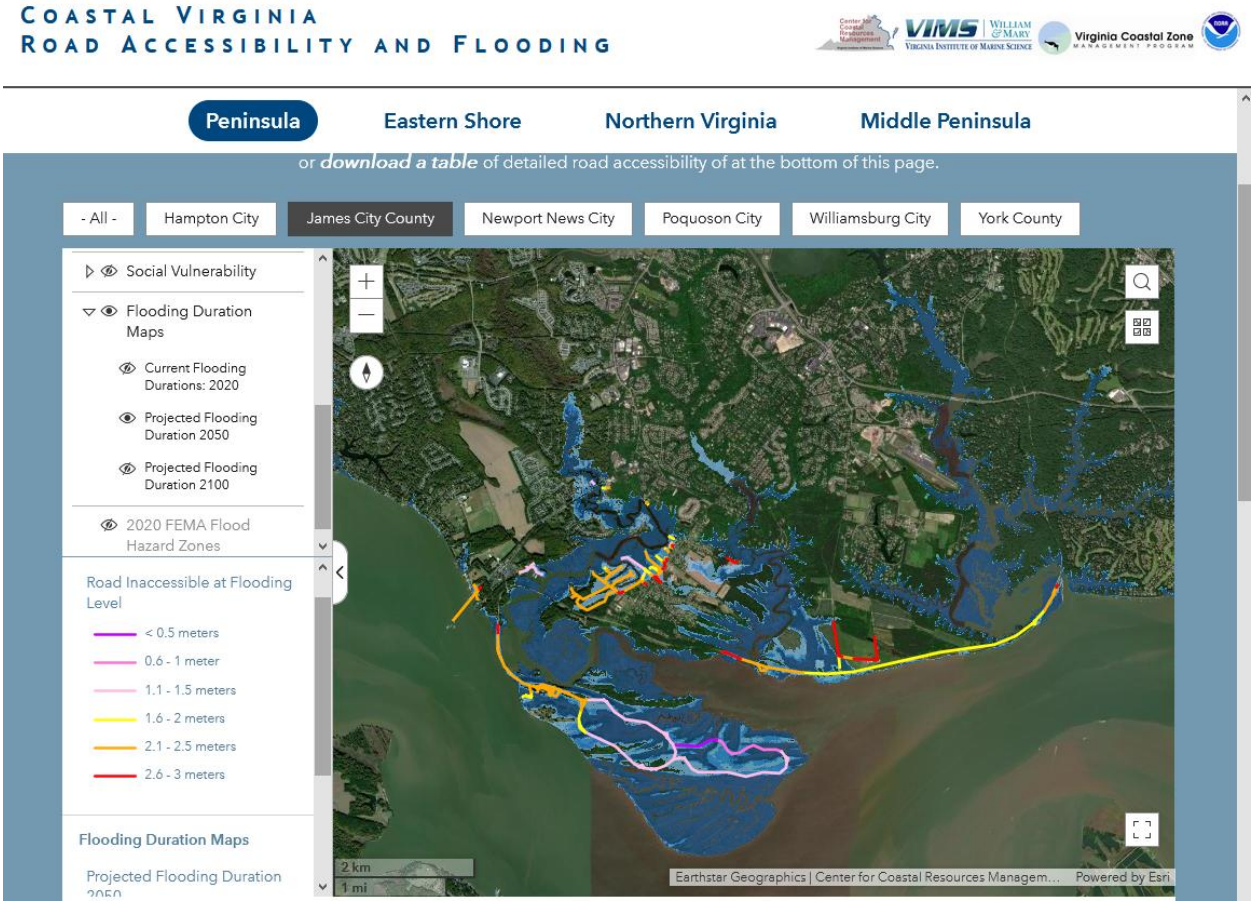

Figure 2. Example of information shown in the web viewer. The example shows inaccessible roads and 2050 flood duration for a section of James City County.

The stakeholders indicated that information from this analysis could inform multiple aspects of locality comprehensive planning, including:

- Land Use Planning (evaluation of land use designation changes and rezoning and SUP requests)
- Public Facilities Planning (consideration of future conditions for the location of public facilities and updates to Hazard Mitigation Plans)
- Transportation Planning (consideration of roadways projected to be impacted and determination of possible future road improvements).

In addition to the data in the map and dashboard, detailed summary tables of the miles of flooding for each locality can be accessed through links below the map.

Detailed Road Summary				
	When water rises this much:		*This length of road becomes inaccessible:*	
Road Name	Flooding Level (in meters)	Flooding Level (in feet)	Inaccessible (miles)	Inaccessible (feet)
Lake Powell Road	0.3	1.0	0	9
Lake Powell Road	0.4	1.3	0	13
	0.5	1.6	0	614
Island Drive	0.5	1.6	0	2,179
Lake Powell Road	0.5	1.6	0	13
South Riverside Drive	0.5	1.6	0	3
	0.6	2.0	0	682

Figure 3. Example of Downloadable Detailed Summary. Example is for a few roads in James City County.

Results

Final products include:

1. The following layers for each locality, grouped by region:

   - Tidal flood duration time in hours, raster layers for 2020, 2050, 2100 (provided to CZM in the zipped folder "Final_FloodDuration_rasters")
     - These layers were developed using tide gauge data. Water level durations for the past 19-years were determined for the 2020 layers. The projected water level durations for the 2050 and 2100 layers were calculated by adjusting the 19-year record from the tide gauge using the NOAA intermediate projection for Sewell's Pt, Norfolk, VA. These water level durations were mapped onto a 1-m horizontal resolution digital elevation model.
   - Road inaccessibility classified by 0.1m increments (provided to CZM in the zipped folder "Road Accessibility Layers")
     - A shapefile layer with inaccessible roads used for the web viewer
     - An excel spreadsheet with inaccessible roads used for Detailed Road Flooding Summaries analyses available for download on the web viewer
     - This layer was developed using a road network analysis. Road networks were based on Open Street Map road centerline data and road elevations were extracted from a 1-m horizontal resolution digital elevation model. For each locality, the point of origin was the locality seat. Flood impacts were mapped from 0-3m of flooding at 0.1m increments to create possible service areas for each flood level. The road network analysis was run for each service area and results were compiled into a single file that codes road segments by the water elevation at which they become inaccessible from the county seat due to flooding.

2. Web viewer available at http://cmap2.vims.edu/VAroads/ with layers developed in this analysis (Inaccessible roads, Flooding duration maps), additional information layers (Infrastructure, Accessible

roads, Social Vulnerability, and 2020 FEMA flood hazard zones), dashboard of road impacts, and downloadable Detailed Road Flooding Summaries

- Each region is grouped on to a page and the locality information can be displayed individually or information for the entire region can be displayed, except in the Northern Virginia Region where both Fairfax and Alexandria are always displayed together
- The Detailed Road Flooding Summaries include the length of each road flooded at 0.1m increments.

The final map viewer is accessible on the AdaptVA.org tool tab and on the locality-specific Comprehensive Coastal Resource Management Portals (CCRMPs, `https://www.vims.edu/ccrm/ccrmp/index.php`).

Summary

The analysis conducted in this project shows that the current impact of flooding on road accessibility varies by locality; however, many localities are likely to see a significant increase in flood impact with sea level rise (Table 2).

*Table 2. Miles of road way inaccessible at each flood level. *Projected 2050 flood level. **Projected 2100 flood level.*

Region	*0.5m flood*	*1.0 m flood*	*1.5m flood**	*2m flood***	*2.5m flood*	*3m flood*
Peninsula	0.6 miles	43 miles	149 miles	1,230 miles	1,360 miles	1,411 miles
Middle Peninsula	17 miles	173 miles	380 miles	449 miles	572 miles	776 miles
Northern Virginia	1 mile	1 mile	3 miles	12 miles	25 miles	40 miles
Eastern Shore	8 miles	106 miles	228 miles	336 miles	440 miles	519 miles

The transportation network analysis of flood frequency over time will be delivered to stakeholders through the ADAPTVA Portal (`http://cmap2.vims.edu/AdaptVA/adaptVA_viewer.html`) and the locality-specific CCRMP to aid with Comprehensive planning efforts. These two locations were chosen to make the product visible both to end users interested in general planning and in climate change planning. Additional information has been added to the web viewer to help end users visually interpret and combine data output with other data resources to bolster their decision-making capacity. For example, the map contains information on social vulnerability. Therefore, if a community is particularly concerned with maintenance of public roadways to underserved neighborhoods, the new data delivered under this project could be viewed in conjunction with the present social vulnerability data to provide answers.

References

Boon, J. D., Mitchell, M., Loftis, J. D., & Malmquist, D. M. (2018) Anthropocene Sea Level Change: A History of Recent Trends Observed in the U.S. East, Gulf, and West Coast Regions. Special Report in Applied Marine Science and Ocean Engineering (SRAMSOE) No. 467. Virginia Institute of Marine Science, College of William and Mary. https://doi.org/10.21220/V5T17T

Mitchell, M., C. Hershner, J. Herman, D. Schatt, E. Eggington and S. Stiles. 2013. Recurrent flooding study for Tidewater Virginia. Virginia senate document no. 3. Richmond, Virginia. Report. http://ccrm.vims.edu/recurrent_flooding/recurrent_flooding_study_web.pdf.

NOAA. Sweet, W.W.V., Kopp, R., Weaver, C.P., Obeysekera, J.T.B., Horton, R.M., Thieler, E.R. and Zervas, C.E., 2017. Global and regional sea level rise scenarios for the United States. NOAA Technical Report

Appendix 1. Metadata

Eastern Shore Inaccessible Roads

Metadata also available as

Metadata:

Identification_Information:

Citation:

Citation_Information:

Publication_Date: 20201218

Title: Eastern Shore Inaccessible Roads
Geospatial_Data_Presentation_Form: vector digital data

Description:

Abstract:

Roads accessibility was determined for flooding intervals of 0.1 meters of flooding, up to 3.0 meters of flooding. Access is evaluated as the ability to travel from the locality's seat (e.g., the county courthouse) to each road in that locality. In some localities (e.g., Hampton City), roads to/from the county seat itself are flooded at a particular flooding level. In these cases, based on our definition of accessibility, the entire locality becomes inaccessible. Road segments overlap where flooding levels impact portions of the road. This layer is used primarily to generate statistics on the length of road segments that are flooded at different levels. This project, Task #92.01 was funded in part by the Virginia Coastal Zone Management Program at the Department of Environmental Quality through Grant FY2019 #NA19NOS4190163 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended. The views expressed herein are those of the authors and do not necessarily reflect the views of the U.S. Department of Commerce, NOAA, or any of its subagencies.

Purpose:

Inaccessible roads are portions of roads that experience flooding and/or experience disconnection due to flooding (i.e., the road portion itself is not flooded but access to that road section is blocked by flooding on adjacent road segment(s)). This analysis seeks to aid in planning by identifying those inaccessible roads.

Status:

Maintenance_and_Update_Frequency: None planned

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -76.034096

East_Bounding_Coordinate: -75.391666

North_Bounding_Coordinate: 38.010895

South_Bounding_Coordinate: 37.092044

Keywords:

Theme:

Theme_Keyword_Thesaurus: None

Theme_Keyword: road inaccessibility, flooding

Theme:

Theme_Keyword_Thesaurus: ISO 19115 Topic Categories

Theme_Keyword: transportation

Place:

Place_Keyword_Thesaurus: None

Place_Keyword: Accomack County, Northampton County

Access_Constraints: None
Use_Constraints: None
Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)
Contact_Person: Center for Coastal Resources Management

Contact_Address:

Address_Type: unknown
Address: PO Box 1346
Address: 1375 Greate Road
City: Gloucester Point
State_or_Province: Virginia
Postal_Code: 23062
Country: US

Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science
Contact_Person: Molly Mitchell

Contact_Position: Research Scientist

Contact_Address:

Address_Type: mailing and physical

Address: P.O. Box 1346
City: Gloucester Point
State_or_Province: VA
Postal_Code: 23062
Country: US

Contact_Voice_Telephone: 804-684-7188

Contact_Electronic_Mail_Address: molly@vims.edu

Data_Set_Credit:

VIMS Center for Coastal Resources Management (CCRM), OpenStreetMap
Native_Data_Set_Environment: Version 6.2 (Build 9200) ; Esri ArcGIS 10.6.1.9270

Data_Quality_Information:

Lineage:

Source_Information:

Type_of_Source_Media: None

Source_Contribution: Open Street Map

Process_Step:

Process_Description: Create network dataset.

Process_Date: 20200501

Process_Step:

Process_Description: Road network analysis and service areas generation.

Process_Date: 20200901

Process_Step:

Process_Description: Inaccessible roads identified and statistics generated.

Process_Date: 20211101

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Direct_Spatial_Reference_Method: Vector

Point_and_Vector_Object_Information:

SDTS_Terms_Description:

SDTS_Point_and_Vector_Object_Type: String

Point_and_Vector_Object_Count: 44999

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Horizontal_Coordinate_System_Definition:

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Map_Projection_Name: NAD 1983 UTM Zone 18N

Transverse_Mercator:

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Longitude_of_Central_Meridian: -75.0

Latitude_of_Projection_Origin: 0.0

False_Easting: 500000.0

False_Northing: 0.0

Planar_Coordinate_Information:

Planar_Coordinate_Encoding_Method: coordinate pair

Coordinate_Representation:

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Ordinate_Resolution: 0.0001

Planar_Distance_Units: meter

Geodetic_Model:

Horizontal_Datum_Name: D North American 1983

Ellipsoid_Name: GRS 1980

Semi-major_Axis: 6378137.0

Denominator_of_Flattening_Ratio: 298.257222101

Entity_and_Attribute_Information

: Detailed_Description:

Entity_Type:

Entity_Type_Label: EasternShore_Inaccessible

Attribute:

Attribute_Label: OBJECTID
Attribute_Definition: Internal feature number. *Attribute_Definition_Source:* Esri
Attribute_Domain_Values:

Unrepresentable_Domain:

Sequential unique whole numbers that are automatically generated.

Attribute:

Attribute_Label: Shape
Attribute_Definition: Feature geometry. *Attribute_Definition_Source:* Esri

Attribute_Domain_Values:

Unrepresentable_Domain: Coordinates defining the features.

Attribute:

Attribute_Label: level

Attribute_Definition:

Field captures the flooding level that the road segment becomes inaccessible at. Level is a text field, and represents flooding levels at 0.1 of the number in the field. For example, 06 means flooding level 0.6 meters.
Attribute_Definition_Source: CCRM

Attribute:

Attribute_Label: Network

Attribute_Definition:

Indicates that these road segments are inaccessible at flooding level indicated.
Attribute_Definition_Source: CCRM

Attribute:

Attribute_Label: name

Attribute_Definition:

Street name obtained from combination of Open Street Map street names and Virginia Geospatial Information Network (VGIN) names.

Attribute_Definition_Source: CCRM

Attribute:

Attribute_Label: NAMELSAD
Attribute_Definition: Locality name.
Attribute_Definition_Source: CCRM

Attribute:

Attribute_Label: miles

Attribute_Definition:

Length of inaccessible road segment in miles. Calculated from shape_length. (Shape_length is in meters.)

Attribute_Definition_Source: CCRM

Attribute:

Attribute_Label: Shape_Length

Attribute_Definition: Length of feature in internal units. *Attribute_Definition_Source:* Esri
Attribute_Domain_Values:

Unrepresentable_Domain: Positive real numbers that are automatically generated.

Metadata_Reference_Information

: Metadata_Date:

20210215

Metadata_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type: unknown
Address: PO Box 1346
Address: 1375 Greate Road
City: Gloucester Point
State_or_Province: Virginia
Postal_Code: 23062
Country: US

Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

Metadata_Standard_Version: FGDC-STD-001-1998

Metadata_Time_Convention: local time

Generated by mp version 2.9.12 on Mon Feb 15 12:48:24 2021

Eastern Shore Inaccessible Roads, Grouped into 0.5 meter Flooding Levels

Metadata also available as

Metadata:

Identification_Information:

Citation:

Citation_Information:

Publication_Date: 20201215

Title:

Eastern Shore Inaccessible Roads, Grouped into 0.5 meter Flooding Levels

Geospatial_Data_Presentation_Form: vector digital data

Description:

Abstract:

Roads accessibility was determined for flooding intervals of 0.1 meters of flooding, up to 3.0 meters of flooding. Access is evaluated as the ability to travel from the locality's seat (e.g., the county courthouse) to each road in that locality. In some localities (e.g., Hampton City), roads to/from the county seat itself are flooded at a particular flooding level. In these cases, based on our definition of accessibility, the entire locality becomes inaccessible. Inaccessible road segments were classified and coded into 0.5 meter elevation groups, according to what flooding level that road segment first becomes inaccessible. This differs from the Easter Shore Inaccessible Roads layer because overlaps were removed. This layer is used primarily for web display.This project, Task #92.01 was funded in part by the Virginia Coastal Zone Management Program at the Department of Environmental Quality through Grant FY2019 #NA19NOS4190163 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended. The views expressed herein are those of the authors and do not necessarily reflect the views of the U.S. Department of Commerce, NOAA, or any of its subagencies.

Purpose:

Inaccessible roads are portions of roads that experience flooding and/or experience disconnection due to flooding (i.e., the road portion itself is not flooded but access to that road section is blocked by flooding on adjacent road segment(s)). This analysis seeks to aid in planning by identifying those inaccessible roads.

Status:

Maintenance_and_Update_Frequency: None planned

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -76.034096

East_Bounding_Coordinate: -75.391666

North_Bounding_Coordinate: 38.010895

South_Bounding_Coordinate: 37.092044

Keywords:

Theme:

Theme_Keyword_Thesaurus: None

Theme_Keyword: road inaccessibility, flooding

Theme:

Theme_Keyword_Thesaurus: ISO 19115 Topic Categories

Theme_Keyword: transportation

Place:

Place_Keyword_Thesaurus: None

Place_Keyword: Accomack County, Northampton County

Access_Constraints: None
Use_Constraints: None
Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type: unknown
Address: PO Box 1346
Address: 1375 Greate Road
City: Gloucester Point
State_or_Province: Virginia
Postal_Code: 23062
Country: US

Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science
Contact_Person: Molly Mitchell

Contact_Position: Research Scientist

Contact_Address:

Address_Type: mailing and physical

Address: P.O. Box 1346
City: Gloucester Point
State_or_Province: VA
Postal_Code: 23062
Country: US

Contact_Voice_Telephone: 804-684-7188

Contact_Electronic_Mail_Address: molly@vims.edu

Data_Set_Credit:

VIMS Center for Coastal Resources Management (CCRM), OpenStreetMap
Native_Data_Set_Environment: Version 6.2 (Build 9200) ; Esri ArcGIS 10.6.1.9270

Data_Quality_Information:

Lineage:

Source_Information:

Type_of_Source_Media: None

Source_Contribution: Open Street Map

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Process_Description: Create network dataset.

Process_Date: 20200713

Process_Step:

Process_Description: Road network analysis and service areas generation.

Process_Date: 20200907

Process_Step:

Process_Description:

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Process_Date: 20201201

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Direct_Spatial_Reference_Method: Vector

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SDTS_Point_and_Vector_Object_Type: String

Point_and_Vector_Object_Count: 3855

Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:

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Map_Projection_Name: NAD 1983 UTM Zone 18N

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Latitude_of_Projection_Origin: 0.0

False_Easting: 500000.0

False_Northing: 0.0

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Planar_Coordinate_Encoding_Method: coordinate pair

Coordinate_Representation:

Abscissa_Resolution: 0.0001

Ordinate_Resolution: 0.0001

Planar_Distance_Units: meter

Geodetic_Model:

Horizontal_Datum_Name: D North American 1983

Ellipsoid_Name: GRS 1980

Semi-major_Axis: 6378137.0

Denominator_of_Flattening_Ratio: 298.257222101

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Attribute_Label: Shape
Attribute_Definition: Feature geometry. *Attribute_Definition_Source:* Esri *Attribute_Domain_Values:*

Unrepresentable_Domain: Coordinates defining the features.

Attribute:

Attribute_Label: name

Attribute_Definition:

Street name obtained from combination of Open Street Map street names and Virginia Geospatial Information Network (VGIN) names.

Attribute_Definition_Source: CCRM

Attribute:

Attribute_Label: NAMELSAD
Attribute_Definition: Locality name.
Attribute_Definition_Source: CCRM

Attribute:

Attribute_Label: fld_start

Attribute_Definition: Flooding level group(s) that the road segment is inaccessible.

Attribute_Definition_Source: CCRM

Attribute:

Attribute_Label: Shape_Length

Attribute_Definition: Length of feature in internal units. *Attribute_Definition_Source:* Esri *Attribute_Domain_Values:*

Unrepresentable_Domain: Positive real numbers that are automatically generated.

Attribute:

Attribute_Label: miles

Attribute_Definition:

Length of inaccessible road segment in miles. Calculated from shape_length. (Shape_length is in meters.)

Attribute_Definition_Source: CCRM

Metadata_Reference_Information

: Metadata_Date:

20210215

Metadata_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type: unknown
Address: PO Box 1346
Address: 1375 Greate Road
City: Gloucester Point
State_or_Province: Virginia
Postal_Code: 23062
Country: US

Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

Metadata_Standard_Version: FGDC-STD-001-1998

Metadata_Time_Convention: local time

Generated by mp version 2.9.12 on Mon Feb 15 12:48:24 2021

Eastern Shore Current Flooding Duration: 2020

Metadata also available as

Metadata:

Identification_Information:

Citation:

Citation_Information:

Publication_Date: 20201201

Title: Eastern Shore Current Flooding Duration: 2020
Geospatial_Data_Presentation_Form: raster digital data

Description:

Abstract:

This layer depicts four categories of flood durations: 1) 0-5 hours per year, 2) 5 -100 hours per year, 3) 100 - 200 hours per year, and 4) more than 200 hours per year. Using local Bay tide gauge records, a frequency analysis was done to determine the annual duration of flooding at various water levels. These water levels were used to delineate flooding zones from a lidar-derived elevation surface.This project, Task #92.01 was funded in part by the Virginia Coastal Zone Management Program at the Department of Environmental Quality through Grant FY2019 #NA19NOS4190163 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended. The views expressed herein are those of the authors and do not necessarily reflect the views of the U.S. Department of Commerce, NOAA, or any of its subagencies.

Purpose:

To depict current flooding durations based on frequency of flooding.

Status:

Maintenance_and_Update_Frequency: None planned

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -76.058975

East_Bounding_Coordinate: -75.242672

North_Bounding_Coordinate: 38.031183

South_Bounding_Coordinate: 37.077880

Keywords:

Theme:

Theme_Keyword_Thesaurus: ISO 19115 Topic Categories

Theme_Keyword: elevation

Place:

Place_Keyword_Thesaurus: None

Place_Keyword: Northampton County, Accomack County

Access_Constraints: None
Use_Constraints: None
Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type: unknown
Address: PO Box 1346
Address: 1375 Greate Road
City: Gloucester Point
State_or_Province: Virginia
Postal_Code: 23062
Country: US

Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science
Contact_Person: Molly Mitchell

Contact_Position: Research Scientist

Contact_Address:

Address_Type: mailing and physical

Address: P.O. Box 1346
City: Gloucester Point
State_or_Province: VA
Postal_Code: 23062
Country: US

Contact_Voice_Telephone: 804-684-7188

Contact_Electronic_Mail_Address: molly@vims.edu

Data_Set_Credit:

VIMS CCRM, NOAA Tides and Currents, USGS Coastal National Elevation Database (CoNED)
Native_Data_Set_Environment: Version 6.2 (Build 9200) ; Esri ArcGIS 10.6.1.9270

Data_Quality_Information:

Lineage:

Source_Information:

Type_of_Source_Media: None

Source_Contribution:

Tidal gauge records. NOAA Tides and Currents: https://tidesandcurrents.noaa.gov/

Source_Information:

Type_of_Source_Media: None

Source_Contribution:

Lidar-derived surface elevations. USGS Coastal National Elevation Databased (CoNED) https://www.usgs.gov/core-science-systems/eros/coned

Process_Step:

Process_Description: Frequency analysis of Bay tidal gage records.

Process_Date: 20200811

Process_Step:

Process_Description:

Delineate flooding areas for each frequency step using lidar-elevation surface.
Process_Date: 20201005

Spatial_Data_Organization_Information:

Direct_Spatial_Reference_Method: Raster

Raster_Object_Information:

Raster_Object_Type: Grid Cell

Row_Count: 105280

Column_Count: 71374

Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:

Planar:

Map_Projection:

Map_Projection_Name: NAD 1983 UTM Zone 18N

Transverse_Mercator:

Scale_Factor_at_Central_Meridian: 0.9996

Longitude_of_Central_Meridian: -75.0

Latitude_of_Projection_Origin: 0.0

False_Easting: 500000.0

False_Northing: 0.0

Planar_Coordinate_Information:

Planar_Coordinate_Encoding_Method: coordinate pair

Coordinate_Representation:

Abscissa_Resolution: 0.00000000222000241645009560

Ordinate_Resolution: 0.00000000222000241645009560

Planar_Distance_Units: meter

Geodetic_Model:

Horizontal_Datum_Name: D North American 1983

Ellipsoid_Name: GRS 1980

Semi-major_Axis: 6378137.0

Denominator_of_Flattening_Ratio: 298.257222101

Entity_and_Attribute_Information

: Detailed_Description:

Entity_Type:

Entity_Type_Label: es_2020.vat

Attribute:

Attribute_Label: Rowid

Attribute_Definition: Internal feature number. *Attribute_Definition_Source:* Esri
Attribute_Domain_Values:

Unrepresentable_Domain:

Sequential unique whole numbers that are automatically generated.

Attribute:

Attribute_Label: VALUE

Attribute:

Attribute_Label: COUNT

Attribute:

Attribute_Label: DUR_LVL

Attribute_Definition:

Indicates the frequency flooding level: 2 = 0-5 hours/year 3 = 5-100 hours/year 4 = 100-200

hours/year 5 = >200 hours/year
Attribute_Definition_Source: CCRM

Metadata_Reference_Information

: Metadata_Date:

20210215

Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

Metadata_Standard_Version: FGDC-STD-001-1998

Metadata_Time_Convention: local time

Generated by mp version 2.9.12 on Mon Feb 15 12:48:24 2021

Eastern Shore Projected Flooding Duration: 2050

Metadata also available as

Metadata:

Identification_Information:

Citation:

Citation_Information:

Publication_Date: 20201208

Title: Eastern Shore Projected Flooding Duration: 2050
Geospatial_Data_Presentation_Form: raster digital data

Description:

Abstract:

This layer depicts four categories of flood durations: 1) 0-5 hours per year, 2) 5 -100 hours per year, 3) 100 - 200 hours per year, and 4) more than 200 hours per year. Using local Bay tide gauge records, a frequency analysis was done to determine the annual duration of current flooding at various water levels. NOAA sea level rise projections were added to these observed water levels, and were used to delineate flooding zones from a lidar-derived elevation surface.This project, Task #92.01 was funded in part by the Virginia Coastal Zone Management Program at the Department of Environmental Quality through Grant FY2019 #NA19NOS4190163 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended. The views expressed herein are those of the authors and do not necessarily reflect the views of the U.S. Department of Commerce, NOAA, or any of its subagencies.

Purpose:

To depict projected flooding duration extents based on a flood frequency analysis of current observed water levels combined with the NOAA intermediate sea level rise projections for 2050.

Status:

Maintenance_and_Update_Frequency: None planned

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -76.058975

East_Bounding_Coordinate: -75.242672

North_Bounding_Coordinate: 38.031183

South_Bounding_Coordinate: 37.077880

Keywords:

Theme:

Theme_Keyword_Thesaurus: ISO 19115 Topic Categories

Theme_Keyword: elevation

Place:

Place_Keyword_Thesaurus: None

Place_Keyword: Accomack County, Northampton County

Access_Constraints: None
Use_Constraints: None
Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type: unknown
Address: PO Box 1346
Address: 1375 Greate Road
City: Gloucester Point
State_or_Province: Virginia
Postal_Code: 23062
Country: US

Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science
Contact_Person: Molly Mitchell

Contact_Position: Research Scientist

Contact_Address:

Address_Type: mailing and physical

Address: P.O. Box 1346
City: Gloucester Point
State_or_Province: VA
Postal_Code: 23062
Country: US

Contact_Voice_Telephone: 804-684-7188

Contact_Electronic_Mail_Address: molly@vims.edu

Data_Set_Credit:

VIMS CCRM, NOAA Tides and Currents, USGS Coastal National Elevation Database (CoNED)
Native_Data_Set_Environment: Version 6.2 (Build 9200) ; Esri ArcGIS 10.6.1.9270

Data_Quality_Information:

Lineage:

Source_Information:

Type_of_Source_Media: None

Source_Contribution:

Tidal gauge records. NOAA Tides and Currents: https://tidesandcurrents.noaa.gov/

Source_Information:

Type_of_Source_Media: None

Source_Contribution:

Lidar-derived surface elevations. USGS Coastal National Elevation Databased (CoNED) https://www.usgs.gov/core-science-systems/eros/coned

Process_Step:

Process_Description:

Frequency analysis of Bay tidal gage records. Add projected sea level rise for 2050.
Process_Date: 20200914

Process_Step:

Process_Description:

Delineate flooding areas for each frequency step using lidar-elevation surface.
Process_Date: 20201109

Spatial_Data_Organization_Information:

Direct_Spatial_Reference_Method: Raster

Raster_Object_Information:

Raster_Object_Type: Grid Cell

Row_Count: 105280

Column_Count: 71374

Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:

Planar:

Map_Projection:

Map_Projection_Name: NAD 1983 UTM Zone 18N

Transverse_Mercator:

Scale_Factor_at_Central_Meridian: 0.9996

Longitude_of_Central_Meridian: -75.0

Latitude_of_Projection_Origin: 0.0

False_Easting: 500000.0

False_Northing: 0.0

Planar_Coordinate_Information:

Planar_Coordinate_Encoding_Method: coordinate pair

Coordinate_Representation:

Abscissa_Resolution: 0.00000000222000241645009560

Ordinate_Resolution: 0.00000000222000241645009560

Planar_Distance_Units: meter

Geodetic_Model:

Horizontal_Datum_Name: D North American 1983

Ellipsoid_Name: GRS 1980

Semi-major_Axis: 6378137.0

Denominator_of_Flattening_Ratio: 298.257222101

Entity_and_Attribute_Information

: Detailed_Description:

Entity_Type:

Entity_Type_Label: es_2050.vat

Attribute:

Attribute_Label: Rowid

Attribute_Definition: Internal feature number. *Attribute_Definition_Source:* Esri
Attribute_Domain_Values:

Unrepresentable_Domain:

Sequential unique whole numbers that are automatically generated.

Attribute:

Attribute_Label: VALUE

Attribute:

Attribute_Label: COUNT

Attribute:

Attribute_Label: DUR_LVL

Attribute_Definition:

Indicates the frequency flooding level: 2 = 0-5 hours/year 3 = 5-100 hours/year 4 = 100-200 hours/year 5 = >200 hours/year
Attribute_Definition_Source: CCRM

Metadata_Reference_Information

: Metadata_Date:

20210215

Metadata_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type: unknown
Address: PO Box 1346
Address: 1375 Greate Road
City: Gloucester Point
State_or_Province: Virginia
Postal_Code: 23062
Country: US

Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

Metadata_Standard_Version: FGDC-STD-001-1998

Metadata_Time_Convention: local time

Generated by mp version 2.9.12 on Mon Feb 15 12:48:24 2021

Eastern Shore Projected Flooding Duration: 2100

Metadata also available as

Metadata:

Identification_Information:

Citation:

Citation_Information:

Publication_Date: 20201210

Title: Eastern Shore Projected Flooding Duration: 2100
Geospatial_Data_Presentation_Form: raster digital data

Description:

Abstract:

This layer depicts four categories of flood durations: 1) 0-5 hours per year, 2) 5 -100 hours per year, 3) 100 - 200 hours per year, and 4) more than 200 hours per year. Using local Bay tide gauge records, a frequency analysis was done to determine the annual duration of current flooding at various water levels. NOAA sea level rise projections were added to these observed water levels, and were used to delineate flooding zones from a lidar-derived elevation surface.This project, Task #92.01 was funded in part by the Virginia Coastal Zone Management Program at the Department of Environmental Quality through Grant FY2019 #NA19NOS4190163 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended. The views expressed herein are those of the authors and do not necessarily reflect the views of the U.S. Department of Commerce, NOAA, or any of its subagencies.

Purpose:

To depict projected flooding duration extents based on a flood frequency analysis of current observed water levels combined with the NOAA intermediate sea level rise projections for 2100.

Status:

Maintenance_and_Update_Frequency: None planned

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -76.058975

East_Bounding_Coordinate: -75.242672

North_Bounding_Coordinate: 38.031183

South_Bounding_Coordinate: 37.077880

Keywords:

Theme:

Theme_Keyword_Thesaurus: ISO 19115 Topic Categories

Theme_Keyword: elevation

Place:

Place_Keyword_Thesaurus: None

Place_Keyword: Accomack County, Northampton County

Access_Constraints: None
Use_Constraints: None
Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type: unknown
Address: PO Box 1346
Address: 1375 Greate Road
City: Gloucester Point
State_or_Province: Virginia
Postal_Code: 23062
Country: US

Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science
Contact_Person: Molly Mitchell

Contact_Position: Research Scientist

Contact_Address:

Address_Type: mailing and physical

Address: P.O. Box 1346
City: Gloucester Point
State_or_Province: VA
Postal_Code: 23062
Country: US

Contact_Voice_Telephone: 804-684-7188

Contact_Electronic_Mail_Address: molly@vims.edu

Data_Set_Credit:

VIMS CCRM, NOAA Tides and Currents, USGS Coastal National Elevation Database (CoNED)
Native_Data_Set_Environment: Version 6.2 (Build 9200) ; Esri ArcGIS 10.6.1.9270

Data_Quality_Information:

Lineage:

Source_Information:

Type_of_Source_Media: None

Source_Contribution:

Tidal gauge records. NOAA Tides and Currents: https://tidesandcurrents.noaa.gov/

Source_Information:

Type_of_Source_Media: None

Source_Contribution:

Lidar-derived surface elevations. USGS Coastal National Elevation Databased (CoNED) https://www.usgs.gov/core-science-systems/eros/coned

Process_Step:

Process_Description:

Frequency analysis of Bay tidal gage records. Add projected sea level rise for 2100.
Process_Date: 20200914

Process_Step:

Process_Description:

Delineate flooding areas for each frequency step using lidar-elevation surface.
Process_Date: 20201109

Spatial_Data_Organization_Information:

Direct_Spatial_Reference_Method: Raster

Raster_Object_Information:

Raster_Object_Type: Grid Cell

Row_Count: 105280

Column_Count: 71374

Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:

Planar:

Map_Projection:

Map_Projection_Name: NAD 1983 UTM Zone 18N

Transverse_Mercator:

Scale_Factor_at_Central_Meridian: 0.9996

Longitude_of_Central_Meridian: -75.0

Latitude_of_Projection_Origin: 0.0

False_Easting: 500000.0

False_Northing: 0.0

Planar_Coordinate_Information:

Planar_Coordinate_Encoding_Method: coordinate pair

Coordinate_Representation:

Abscissa_Resolution: 0.00000000222000241645009560

Ordinate_Resolution: 0.00000000222000241645009560

Planar_Distance_Units: meter

Geodetic_Model:

Horizontal_Datum_Name: D North American 1983

Ellipsoid_Name: GRS 1980

Semi-major_Axis: 6378137.0

Denominator_of_Flattening_Ratio: 298.257222101

Entity_and_Attribute_Information

: Detailed_Description:

Entity_Type:

Entity_Type_Label: es_2100.vat

Attribute:

Attribute_Label: Rowid

Attribute_Definition: Internal feature number. *Attribute_Definition_Source:* Esri
Attribute_Domain_Values:

Unrepresentable_Domain:

Sequential unique whole numbers that are automatically generated.

Attribute:

Attribute_Label: VALUE

Attribute:

Attribute_Label: COUNT

Attribute:

Attribute_Label: DUR_LVL

Attribute_Definition:

Indicates the frequency flooding level: 2 = 0-5 hours/year 3 = 5-100 hours/year 4 = 100-200 hours/year 5 = >200 hours/year
Attribute_Definition_Source: CCRM

Metadata_Reference_Information

: Metadata_Date:

20210215

Metadata_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type: unknown
Address: PO Box 1346
Address: 1375 Greate Road
City: Gloucester Point
State_or_Province: Virginia
Postal_Code: 23062
Country: US

Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

Metadata_Standard_Version: FGDC-STD-001-1998

Metadata_Time_Convention: local time

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Middle Peninsula Inaccessible Roads

Metadata also available as

Metadata:

Identification_Information:

Citation:

Citation_Information:

Publication_Date: 20201218

Title: Middle Peninsula Inaccessible Roads
Geospatial_Data_Presentation_Form: vector digital data

Description:

Abstract:

Roads accessibility was determined for flooding intervals of 0.1 meters of flooding, up to 3.0 meters of flooding. Access is evaluated as the ability to travel from the locality's seat (e.g., the county courthouse) to each road in that locality. In some localities (e.g., Hampton City), roads to/from the county seat itself are flooded at a particular flooding level. In these cases, based on our definition of accessibility, the entire locality becomes inaccessible. Road segments overlap where flooding levels impact portions of the road. This layer is used primarily to generate statistics on the length of road segments that are flooded at different levels. This project, Task #92.01 was funded in part by the Virginia Coastal Zone Management Program at the Department of Environmental Quality through Grant FY2019 #NA19NOS4190163 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended. The views expressed herein are those of the authors and do not necessarily reflect the views of the U.S. Department of Commerce, NOAA, or any of its subagencies.

Purpose:

Inaccessible roads are portions of roads that experience flooding and/or experience disconnection due to flooding (i.e., the road portion itself is not flooded but access to that road section is blocked by flooding on adjacent road segment(s)). This analysis seeks to aid in planning by identifying those inaccessible roads.

Status:

Maintenance_and_Update_Frequency: None planned

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -76.706982

East_Bounding_Coordinate: -76.246949

North_Bounding_Coordinate: 37.773780

South_Bounding_Coordinate: 37.242787

Keywords:

Theme:

Theme_Keyword_Thesaurus: None

Theme_Keyword: road inaccessibility, flooding

Theme:

Theme_Keyword_Thesaurus: ISO 19115 Topic Categories

Theme_Keyword: transportation

Place:

Place_Keyword_Thesaurus: None

Place_Keyword: Gloucester County, Mathews County, Middlesex County

Access_Constraints: None
Use_Constraints: None
Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type: unknown
Address: PO Box 1346
Address: 1375 Greate Road
City: Gloucester Point
State_or_Province: Virginia
Postal_Code: 23062
Country: US

Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science
Contact_Person: Molly Mitchell

Contact_Position: Research Scientist

Contact_Address:

Address_Type: mailing and physical

Address: P.O. Box 1346
City: Gloucester Point
State_or_Province: VA
Postal_Code: 23062
Country: US

Contact_Voice_Telephone: 804-684-7188

Contact_Electronic_Mail_Address: molly@vims.edu

Data_Set_Credit:

VIMS Center for Coastal Resources Management (CCRM), OpenStreetMap
Native_Data_Set_Environment: Version 6.2 (Build 9200) ; Esri ArcGIS 10.6.1.9270

Data_Quality_Information:

Lineage:

Source_Information:

Type_of_Source_Media: None

Source_Contribution: Open Street Map road shapefile.

Process_Step:

Process_Description: Create network dataset.

Process_Date: 20200803

Process_Step:

Process_Description: Road network analysis and service areas generation.

Process_Date: 20200902

Process_Step:

Process_Description: Inaccessible roads identified and statistics generated.

Process_Date: 20201109

Spatial_Data_Organization_Information:

Direct_Spatial_Reference_Method: Vector

Point_and_Vector_Object_Information:

SDTS_Terms_Description:

SDTS_Point_and_Vector_Object_Type: String

Point_and_Vector_Object_Count: 81253

Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:

Planar:

Map_Projection:

Map_Projection_Name: NAD 1983 UTM Zone 18N

Transverse_Mercator:

Scale_Factor_at_Central_Meridian: 0.9996

Longitude_of_Central_Meridian: -75.0

Latitude_of_Projection_Origin: 0.0

False_Easting: 500000.0

False_Northing: 0.0

Planar_Coordinate_Information:

Planar_Coordinate_Encoding_Method: coordinate pair

Coordinate_Representation:

Abscissa_Resolution: 0.0001

Ordinate_Resolution: 0.0001

Planar_Distance_Units: meter

Geodetic_Model:

Horizontal_Datum_Name: D North American 1983

Ellipsoid_Name: GRS 1980

Semi-major_Axis: 6378137.0

Denominator_of_Flattening_Ratio: 298.257222101

Entity_and_Attribute_Information

: Detailed_Description:

Entity_Type:

Entity_Type_Label: MidPen_Inaccessible

Attribute:

Attribute_Label: OBJECTID
Attribute_Definition: Internal feature number. *Attribute_Definition_Source:* Esri
Attribute_Domain_Values:

Unrepresentable_Domain:

Sequential unique whole numbers that are automatically generated.

Attribute:

Attribute_Label: Shape
Attribute_Definition: Feature geometry. *Attribute_Definition_Source:* Esri *Attribute_Domain_Values:*

Unrepresentable_Domain: Coordinates defining the features.

Attribute:

Attribute_Label: Network

Attribute_Definition:

Indicates that these road segments are inaccessible at flooding level indicated.

Attribute:

Attribute_Label: level

Attribute_Definition:

Field captures the flooding level that the road segment becomes inaccessible at. Level is a text field, and represents flooding levels at 0.1 of the number in the field. For example, 06 means flooding level 0.6 meters.
Attribute_Definition_Source: CCRM

Attribute:

Attribute_Label: name

Attribute:

Attribute_Label: NAMELSAD
Attribute_Definition: Locality name.
Attribute_Definition_Source: CCRM

Attribute:

Attribute_Label: miles

Attribute_Definition:

Length of inaccessible road segment in miles. Calculated from shape_length. (Shape_length is in meters.)

Attribute_Definition_Source: CCRM

Attribute:

Attribute_Label: Shape_Length

Attribute_Definition: Length of feature in internal units. *Attribute_Definition_Source:* Esri
Attribute_Domain_Values:

Unrepresentable_Domain: Positive real numbers that are automatically generated.

Metadata_Reference_Information

: Metadata_Date:

20210215

Metadata_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type: unknown
Address: PO Box 1346
Address: 1375 Greate Road
City: Gloucester Point
State_or_Province: Virginia
Postal_Code: 23062
Country: US

Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

Metadata_Standard_Version: FGDC-STD-001-1998

Metadata_Time_Convention: local time

Generated by mp version 2.9.12 on Mon Feb 15 12:48:25 2021

Middle Peninsula Inaccessible Roads, Grouped into 0,5 meter Flooding Levels

Metadata also available as

Metadata:

Identification_Information:

Citation:

Citation_Information:

Publication_Date: 20201215

Title:

Middle Peninsula Inaccessible Roads, Grouped into 0,5 meter Flooding Levels

Geospatial_Data_Presentation_Form: vector digital data

Description:

Abstract:

Roads accessibility was determined for flooding intervals of 0.1 meters of flooding, up to 3.0 meters of flooding. Access is evaluated as the ability to travel from the locality's seat (e.g., the county courthouse) to each road in that locality. In some localities (e.g., Hampton City), roads to/from the county seat itself are flooded at a particular flooding level. In these cases, based on our definition of accessibility, the entire locality becomes inaccessible. Inaccessible road segments were classified and coded into 0.5 meter elevation groups, according to what flooding level that road segment first becomes inaccessible. This differs from the Easter Shore Inaccessible Roads layer because overlaps were removed. This layer is used primarily for web display.This project, Task #92.01 was funded in part by the Virginia Coastal Zone Management Program at the Department of Environmental Quality through Grant FY2019 #NA19NOS4190163 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended. The views expressed herein are those of the authors and do not necessarily reflect the views of the U.S. Department of Commerce, NOAA, or any of its subagencies.

Purpose:

Inaccessible roads are portions of roads that experience flooding and/or experience disconnection due to flooding (i.e., the road portion itself is not flooded but access to that road section is blocked by flooding on adjacent road segment(s)). This analysis seeks to aid in planning by identifying those inaccessible roads.

Status:

Maintenance_and_Update_Frequency: None planned

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -76.706982

East_Bounding_Coordinate: -76.246949

North_Bounding_Coordinate: 37.773780

South_Bounding_Coordinate: 37.242787

Keywords:

Theme:

Theme_Keyword_Thesaurus: None

Theme_Keyword: road inaccessibility, flooding

Theme:

Theme_Keyword_Thesaurus: ISO 19115 Topic Categories

Theme_Keyword: transportation

Place:

Place_Keyword_Thesaurus: None

Place_Keyword: Gloucester County, Mathews County, Middlesex County

Access_Constraints: None
Use_Constraints: None
Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type: unknown
Address: PO Box 1346
Address: 1375 Greate Road
City: Gloucester Point
State_or_Province: Virginia
Postal_Code: 23062
Country: US

Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science
Contact_Person: Molly Mitchell

Contact_Position: Research Scientist

Contact_Address:

Address_Type: mailing and physical

Address: P.O. Box 1346
City: Gloucester Point
State_or_Province: VA
Postal_Code: 23062
Country: US

Contact_Voice_Telephone: 804-684-7188

Contact_Electronic_Mail_Address: molly@vims.edu

Data_Set_Credit:

VIMS Center for Coastal Resources Management (CCRM), OpenStreetMap
Native_Data_Set_Environment: Version 6.2 (Build 9200) ; Esri ArcGIS 10.6.1.9270

Data_Quality_Information:

Lineage:

Source_Information:

Type_of_Source_Media: None

Source_Contribution: Open Street Map road layers.

Process_Step:

Process_Description: Create network dataset.

Process_Date: 20200810

Process_Step:

Process_Description: Road network analysis and service areas generation.

Process_Date: 20201012

Process_Step:

Process_Description:

Inaccessible roads identified and grouped into 0.5 meter intervals corresponding to the flooding level that the road is inaccessible at.

Process_Date: 20201120

Spatial_Data_Organization_Information:

Direct_Spatial_Reference_Method: Vector

Point_and_Vector_Object_Information:

SDTS_Terms_Description:

SDTS_Point_and_Vector_Object_Type: String

Point_and_Vector_Object_Count: 6854

Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:

Planar:

Map_Projection:

Map_Projection_Name: NAD 1983 UTM Zone 18N

Transverse_Mercator:

Scale_Factor_at_Central_Meridian: 0.9996

Longitude_of_Central_Meridian: -75.0

Latitude_of_Projection_Origin: 0.0

False_Easting: 500000.0

False_Northing: 0.0

Planar_Coordinate_Information:

Planar_Coordinate_Encoding_Method: coordinate pair

Coordinate_Representation:

Abscissa_Resolution: 0.0001

Ordinate_Resolution: 0.0001

Planar_Distance_Units: meter

Geodetic_Model:

Horizontal_Datum_Name: D North American 1983

Ellipsoid_Name: GRS 1980

Semi-major_Axis: 6378137.0

Denominator_of_Flattening_Ratio: 298.257222101

Entity_and_Attribute_Information

: Detailed_Description:

Entity_Type:

Entity_Type_Label: MidPen_Inaccessible_GrpLev

Attribute:

Attribute_Label: OBJECTID
Attribute_Definition: Internal feature number. *Attribute_Definition_Source:* Esri
Attribute_Domain_Values:

Unrepresentable_Domain:

Sequential unique whole numbers that are automatically generated.

Attribute:

Attribute_Label: Shape
Attribute_Definition: Feature geometry. *Attribute_Definition_Source:* Esri *Attribute_Domain_Values:*

Unrepresentable_Domain: Coordinates defining the features.

Attribute:

Attribute_Label: name

Attribute_Definition:

Street name obtained from combination of Open Street Map street names and Virginia Geospatial Information Network (VGIN) names.
Attribute_Definition_Source: CCRM

Attribute:

Attribute_Label: NAMELSAD
Attribute_Definition: Locality name.
Attribute_Definition_Source: CCRM

Attribute:

Attribute_Label: fld_start

Attribute_Definition: Flooding level group(s) that the road segment is inaccessible.

Attribute_Definition_Source: CCRM

Attribute:

Attribute_Label: Shape_Length

Attribute_Definition: Length of feature in internal units. *Attribute_Definition_Source:* Esri
Attribute_Domain_Values:

Unrepresentable_Domain: Positive real numbers that are automatically generated.

Attribute:

Attribute_Label: miles

Attribute_Definition:

Length of inaccessible road segment in miles. Calculated from shape_length. (Shape_length is in meters.)
Attribute_Definition_Source: CCRM

Metadata_Reference_Information

: Metadata_Date:

20210215

Metadata_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type: unknown
Address: PO Box 1346

Address: 1375 Greate Road
City: Gloucester Point
State_or_Province: Virginia
Postal_Code: 23062
Country: US

Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

Metadata_Standard_Version: FGDC-STD-001-1998

Metadata_Time_Convention: local time

Generated by mp version 2.9.12 on Mon Feb 15 12:48:25 2021

Middle Peninsula Current Flooding Duration: 2020

Metadata also available as

Metadata:

Identification_Information:

Citation:

Citation_Information:

Publication_Date: 20201208

Title: Middle Peninsula Current Flooding Duration: 2020
Geospatial_Data_Presentation_Form: raster digital data

Description:

Abstract:

This layer depicts four categories of flood durations: 1) 0-5 hours per year, 2) 5 -100 hours per year, 3) 100 - 200 hours per year, and 4) more than 200 hours per year. Using local Bay tide gauge records, a frequency analysis was done to determine the annual duration of flooding at various water levels. These water levels were used to delineate flooding zones from a lidar-derived elevation surface.This project, Task #92.01 was funded in part by the Virginia Coastal Zone Management Program at the Department of Environmental Quality through Grant FY2019 #NA19NOS4190163 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended. The views expressed herein are those of the authors and do not necessarily reflect the views of the U.S. Department of Commerce, NOAA, or any of its subagencies.

Purpose:

To depict current flooding durations based on frequency of flooding.

Status:

Maintenance_and_Update_Frequency: None planned

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -76.710828

East_Bounding_Coordinate: -76.244737

North_Bounding_Coordinate: 37.775603

South_Bounding_Coordinate: 37.242632

Keywords:

Theme:

Theme_Keyword_Thesaurus: ISO 19115 Topic Categories

Theme_Keyword: elevation

Place:

Place_Keyword_Thesaurus: None

Place_Keyword: Gloucester County, Mathews County, Middlesex County

Access_Constraints: None
Use_Constraints: None
Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science
Contact_Person: Molly Mitchell

Contact_Position: Research Scientist

Contact_Address:

Address_Type: mailing and physical

Address: P.O. Box 1346
City: Gloucester Point
State_or_Province: VA
Postal_Code: 23062
Country: US

Contact_Voice_Telephone: 804-684-7188

Contact_Electronic_Mail_Address: molly@vims.edu

Data_Set_Credit:

VIMS CCRM, NOAA Tides and Currents, USGS Coastal National Elevation Database (CoNED)
Native_Data_Set_Environment: Version 6.2 (Build 9200) ; Esri ArcGIS 10.6.1.9270

Data_Quality_Information:

Lineage:

Source_Information:

Type_of_Source_Media: None

Source_Contribution:

Tidal gauge records. NOAA Tides and Currents: https://tidesandcurrents.noaa.gov/

Source_Information:

Type_of_Source_Media: None

Source_Contribution:

Lidar-derived surface elevations. USGS Coastal National Elevation Databased (CoNED) https://www.usgs.gov/core-science-systems/eros/coned

Process_Step:

Process_Description: Frequency analysis of Bay tidal gage records.

Process_Date: 20200914

Process_Step:

Process_Description:

Delineate flooding areas for each frequency step using lidar-elevation surface.

Process_Date: 20201014

Spatial_Data_Organization_Information:

Direct_Spatial_Reference_Method: Raster

Raster_Object_Information:

Raster_Object_Type: Grid Cell

Row_Count: 58517

Column_Count: 40287

Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:

Planar:

Map_Projection:

Map_Projection_Name: NAD 1983 UTM Zone 18N

Transverse_Mercator:

Scale_Factor_at_Central_Meridian: 0.9996

Longitude_of_Central_Meridian: -75.0

Latitude_of_Projection_Origin: 0.0

False_Easting: 500000.0

False_Northing: 0.0

Planar_Coordinate_Information:

Planar_Coordinate_Encoding_Method: coordinate pair

Coordinate_Representation:

Abscissa_Resolution: 0.00000000222000241645009 56

Ordinate_Resolution: 0.00000000222000241645009 56

Planar_Distance_Units: meter

Geodetic_Model:

Horizontal_Datum_Name: D North American 1983

Ellipsoid_Name: GRS 1980

Semi-major_Axis: 6378137.0

Denominator_of_Flattening_Ratio: 298.257222101

Entity_and_Attribute_Information

: Detailed_Description:

Entity_Type:

Entity_Type_Label: mp_2020.vat

Attribute:

Attribute_Label: Rowid

Attribute_Definition: Internal feature number. *Attribute_Definition_Source:* Esri
Attribute_Domain_Values:

Unrepresentable_Domain:

Sequential unique whole numbers that are automatically generated.

Attribute:

Attribute_Label: VALUE

Attribute:

Attribute_Label: COUNT

Attribute:

Attribute_Label: DUR_LVL

Attribute_Definition:

Indicates the frequency flooding level: 2 = 0-5 hours/year 3 = 5-100 hours/year 4 = 100-200 hours/year 5 = >200 hours/year

Attribute_Definition_Source: CCRM

Metadata_Reference_Information

: Metadata_Date:

20210215

Metadata_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type: unknown

Address: PO Box 1346
Address: 1375 Greate Road
City: Gloucester Point
State_or_Province: Virginia
Postal_Code: 23062
Country: US

Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

Metadata_Standard_Version: FGDC-STD-001-1998

Metadata_Time_Convention: local time

Generated by mp version 2.9.12 on Mon Feb 15 12:48:25 2021

Middle Peninsula Projected Flooding Duration: 2050

Metadata also available as

Metadata:

Identification_Information:

Citation:

Citation_Information:

Publication_Date: 20201207

Title: Middle Peninsula Projected Flooding Duration: 2050
Geospatial_Data_Presentation_Form: raster digital data

Description:

Abstract:

This layer depicts four categories of flood durations: 1) 0-5 hours per year, 2) 5 -100 hours per year, 3) 100 - 200 hours per year, and 4) more than 200 hours per year. Using local Bay tide gauge records, a frequency analysis was done to determine the annual duration of current flooding at various water levels. NOAA sea level rise projections were added to these observed water levels, and were used to delineate flooding zones from a lidar-derived elevation surface.This project, Task #92.01 was funded in part by the Virginia Coastal Zone Management Program at the Department of Environmental Quality through Grant FY2019 #NA19NOS4190163 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended. The views expressed herein are those of the authors and do not necessarily reflect the views of the U.S. Department of Commerce, NOAA, or any of its subagencies.

Purpose:

To depict projected flooding duration extents based on a flood frequency analysis of current observed water levels combined with the NOAA intermediate sea level rise projections for 2050.

Status:

Maintenance_and_Update_Frequency: None planned

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -76.710828

East_Bounding_Coordinate: -76.244737

North_Bounding_Coordinate: 37.775603

South_Bounding_Coordinate: 37.242632

Keywords:

Theme:

Theme_Keyword_Thesaurus: ISO 19115 Topic Categories

Theme_Keyword: environment

Place:

Place_Keyword_Thesaurus: None

Place_Keyword: Gloucester County, Mathews County, Middlesex County

Access_Constraints: None
Use_Constraints: None
Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type: unknown
Address: PO Box 1346
Address: 1375 Greate Road
City: Gloucester Point
State_or_Province: Virginia
Postal_Code: 23062
Country: US

Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science
Contact_Person: Molly Mitchell

Contact_Position: Research Scientist

Contact_Address:

Address_Type: mailing and physical

Address: P.O. Box 1346
City: Gloucester Point
State_or_Province: VA
Postal_Code: 23062
Country: US

Contact_Voice_Telephone: 804-684-7188

Contact_Electronic_Mail_Address: molly@vims.edu

Data_Set_Credit:

VIMS CCRM, NOAA Tides and Currents, USGS Coastal National Elevation Database (CoNED)
Native_Data_Set_Environment: Version 6.2 (Build 9200) ; Esri ArcGIS 10.6.1.9270

Data_Quality_Information:

Lineage:

Source_Information:

Type_of_Source_Media: None

Source_Contribution:

Tidal gauge records. NOAA Tides and Currents: https://tidesandcurrents.noaa.gov/

Source_Information:

Type_of_Source_Media: None

Source_Contribution:

Lidar-derived surface elevations. USGS Coastal National Elevation Databased (CoNED) https://www.usgs.gov/core-science-systems/eros/coned

Process_Step:

Process_Description:

Frequency analysis of Bay tidal gage records. Add projected sea level rise for 2050.
Process_Date: 20200810

Process_Step:

Process_Description:

Delineate flooding areas for each frequency step using lidar-elevation surface.
Process_Date: 20201116

Spatial_Data_Organization_Information:

Direct_Spatial_Reference_Method: Raster

Raster_Object_Information:

Raster_Object_Type: Grid Cell

Row_Count: 58517

Column_Count: 40287

Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:

Planar:

Map_Projection:

Map_Projection_Name: NAD 1983 UTM Zone 18N

Transverse_Mercator:

Scale_Factor_at_Central_Meridian: 0.9996

Longitude_of_Central_Meridian: -75.0

Latitude_of_Projection_Origin: 0.0

False_Easting: 500000.0

False_Northing: 0.0

Planar_Coordinate_Information:

Planar_Coordinate_Encoding_Method: coordinate pair

Coordinate_Representation:

Abscissa_Resolution: 0.00000000222000241645009560

Ordinate_Resolution: 0.00000000222000241645009560

Planar_Distance_Units: meter

Geodetic_Model:

Horizontal_Datum_Name: D North American 1983

Ellipsoid_Name: GRS 1980

Semi-major_Axis: 6378137.0

Denominator_of_Flattening_Ratio: 298.257222101

Entity_and_Attribute_Information

: Detailed_Description:

Entity_Type:

Entity_Type_Label: mp_2050.vat

Attribute:

Attribute_Label: Rowid

Attribute_Definition: Internal feature number. *Attribute_Definition_Source:* Esri
Attribute_Domain_Values:

Unrepresentable_Domain:

Sequential unique whole numbers that are automatically generated.

Attribute:

Attribute_Label: VALUE

Attribute:

Attribute_Label: COUNT

Attribute:

Attribute_Label: DUR_LVL

Attribute_Definition:

Indicates the frequency flooding level: 2 = 0-5 hours/year 3 = 5-100 hours/year 4 = 100-200 hours/year 5 = >200 hours/year
Attribute_Definition_Source: CCRM

Metadata_Reference_Information

: Metadata_Date:

20210215

Metadata_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type: unknown
Address: PO Box 1346
Address: 1375 Greate Road
City: Gloucester Point
State_or_Province: Virginia
Postal_Code: 23062
Country: US

Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

Metadata_Standard_Version: FGDC-STD-001-1998

Metadata_Time_Convention: local time

Generated by mp version 2.9.12 on Mon Feb 15 12:48:25 2021

Middle Peninsula Projected Flooding Duration: 2100

Metadata also available as

Metadata:

Identification_Information:

Citation:

Citation_Information:

Publication_Date: 20201120

Title: Middle Peninsula Projected Flooding Duration: 2100
Geospatial_Data_Presentation_Form: raster digital data

Description:

Abstract:

This layer depicts four categories of flood durations: 1) 0-5 hours per year, 2) 5 -100 hours per year, 3) 100 - 200 hours per year, and 4) more than 200 hours per year. Using local Bay tide gauge records, a frequency analysis was done to determine the annual duration of current flooding at various water levels. NOAA sea level rise projections were added to these observed water levels, and were used to delineate flooding zones from a lidar-derived elevation surface.This project, Task #92.01 was funded in part by the Virginia Coastal Zone Management Program at the Department of Environmental Quality through Grant FY2019 #NA19NOS4190163 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended. The views expressed herein are those of the authors and do not necessarily reflect the views of the U.S. Department of Commerce, NOAA, or any of its subagencies.

Purpose:

To depict projected flooding duration extents based on a flood frequency analysis of current observed water levels combined with the NOAA intermediate sea level rise projections for 2100.

Status:

Maintenance_and_Update_Frequency: None planned

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -76.710828

East_Bounding_Coordinate: -76.244737

North_Bounding_Coordinate: 37.775603

South_Bounding_Coordinate: 37.242632

Keywords:

Theme:

Theme_Keyword_Thesaurus: ISO 19115 Topic Categories

Theme_Keyword: elevation

Place:

Place_Keyword_Thesaurus: None

Place_Keyword: Gloucester County, Mathews County, Middlesex County

Access_Constraints: None
Use_Constraints: None
Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type: unknown
Address: PO Box 1346
Address: 1375 Greate Road
City: Gloucester Point
State_or_Province: Virginia
Postal_Code: 23062
Country: US

Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science
Contact_Person: Molly Mitchell

Contact_Position: Research Scientist

Contact_Address:

Address_Type: mailing and physical

Address: P.O. Box 1346
City: Gloucester Point
State_or_Province: VA
Postal_Code: 23062
Country: US

Contact_Voice_Telephone: 804-684-7188

Contact_Electronic_Mail_Address: molly@vims.edu

Data_Set_Credit:

VIMS CCRM, NOAA Tides and Currents, USGS Coastal National Elevation Database (CoNED)
Native_Data_Set_Environment: Version 6.2 (Build 9200) ; Esri ArcGIS 10.6.1.9270

Data_Quality_Information:

Lineage:

Source_Information:

Type_of_Source_Media: None

Source_Contribution:

Tidal gauge records. NOAA Tides and Currents: https://tidesandcurrents.noaa.gov/

Source_Information:

Type_of_Source_Media: None

Source_Contribution:

Lidar-derived surface elevations. USGS Coastal National Elevation Databased (CoNED) https://www.usgs.gov/core-science-systems/eros/coned

Process_Step:

Process_Description:

Frequency analysis of Bay tidal gage records. Add projected sea level rise for 2100.
Process_Date: 20200921

Process_Step:

Process_Description:

Delineate flooding areas for each frequency step using lidar-elevation surface.
Process_Date: 20200925

Spatial_Data_Organization_Information:

Direct_Spatial_Reference_Method: Raster

Raster_Object_Information:

Raster_Object_Type: Grid Cell

Row_Count: 58517

Column_Count: 40287

Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:

Planar:

Map_Projection:

Map_Projection_Name: NAD 1983 UTM Zone 18N

Transverse_Mercator:

Scale_Factor_at_Central_Meridian: 0.9996

Longitude_of_Central_Meridian: -75.0

Latitude_of_Projection_Origin: 0.0

False_Easting: 500000.0

False_Northing: 0.0

Planar_Coordinate_Information:

Planar_Coordinate_Encoding_Method: coordinate pair

Coordinate_Representation:

Abscissa_Resolution: 0.00000000222000241645009560

Ordinate_Resolution: 0.00000000222000241645009560

Planar_Distance_Units: meter

Geodetic_Model:

Horizontal_Datum_Name: D North American 1983

Ellipsoid_Name: GRS 1980

Semi-major_Axis: 6378137.0

Denominator_of_Flattening_Ratio: 298.257222101

Entity_and_Attribute_Information

: Detailed_Description:

Entity_Type:

Entity_Type_Label: mp_2100.vat

Attribute:

Attribute_Label: Rowid

Attribute_Definition: Internal feature number. *Attribute_Definition_Source:* Esri
Attribute_Domain_Values:

Unrepresentable_Domain:

Sequential unique whole numbers that are automatically generated.

Attribute:

Attribute_Label: VALUE

Attribute:

Attribute_Label: COUNT

Attribute:

Attribute_Label: DUR_LVL

Attribute_Definition:

Indicates the frequency flooding level: 2 = 0-5 hours/year 3 = 5-100 hours/year 4 = 100-200 hours/year 5 = >200 hours/year
Attribute_Definition_Source: CCRM

Metadata_Reference_Information

: Metadata_Date:

20210215

Metadata_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type: unknown
Address: PO Box 1346
Address: 1375 Greate Road
City: Gloucester Point
State_or_Province: Virginia
Postal_Code: 23062
Country: US

Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

Metadata_Standard_Version: FGDC-STD-001-1998

Metadata_Time_Convention: local time

Generated by mp version 2.9.12 on Mon Feb 15 12:48:25 2021

Northern Virginia Current Flooding Duration: 2020

Metadata also available as

Metadata:

Identification_Information:

Citation:

Citation_Information:

Publication_Date: 20201208

Title: Northern Virginia Current Flooding Duration: 2020
Geospatial_Data_Presentation_Form: raster digital data

Description:

Abstract:

This layer depicts four categories of flood durations: 1) 0-5 hours per year, 2) 5 -100 hours per year, 3) 100 - 200 hours per year, and 4) more than 200 hours per year. Using local Bay tide gauge records, a frequency analysis was done to determine the annual duration of flooding at various water levels. These water levels were used to delineate flooding zones from a lidar-derived elevation surface.This project, Task #92.01 was funded in part by the Virginia Coastal Zone Management Program at the Department of Environmental Quality through Grant FY2019 #NA19NOS4190163 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended. The views expressed herein are those of the authors and do not necessarily reflect the views of the U.S. Department of Commerce, NOAA, or any of its subagencies.

Purpose:

To depict current flooding durations based on frequency of flooding.

Status:

Maintenance_and_Update_Frequency: None planned

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -77.277148

East_Bounding_Coordinate: -77.031874

North_Bounding_Coordinate: 38.845053

South_Bounding_Coordinate: 38.616457

Keywords:

Theme:

Theme_Keyword_Thesaurus: ISO 19115 Topic Categories

Theme_Keyword: elevation

Place:

Place_Keyword_Thesaurus: None

Place_Keyword: Alexandria City, Fairfax County

Access_Constraints: None
Use_Constraints: None
Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type: unknown
Address: PO Box 1346
Address: 1375 Greate Road
City: Gloucester Point
State_or_Province: Virginia
Postal_Code: 23062
Country: US

Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science
Contact_Person: Molly Mitchell

Contact_Position: Research Scientist

Contact_Address:

Address_Type: mailing and physical

Address: P.O. Box 1346
City: Gloucester Point
State_or_Province: VA
Postal_Code: 23062
Country: US

Contact_Voice_Telephone: 804-684-7188

Contact_Electronic_Mail_Address: molly@vims.edu

Data_Set_Credit:

VIMS CCRM, NOAA Tides and Currents, USGS Coastal National Elevation Database (CoNED)
Native_Data_Set_Environment: Version 6.2 (Build 9200) ; Esri ArcGIS 10.6.1.9270

Data_Quality_Information:

Lineage:

Source_Information:

Type_of_Source_Media: None

Source_Contribution:

Tidal gauge records. NOAA Tides and Currents: https://tidesandcurrents.noaa.gov/

Source_Information:

Type_of_Source_Media: None

Source_Contribution:

Lidar-derived surface elevations. USGS Coastal National Elevation Databased (CoNED) https://www.usgs.gov/core-science-systems/eros/coned

Process_Step:

Process_Description: Frequency analysis of Bay tidal gage records.

Process_Date: 20200608

Process_Step:

Process_Description:

Delineate flooding areas for each frequency step using lidar-elevation surface.
Process_Date: 20200914

Spatial_Data_Organization_Information:

Direct_Spatial_Reference_Method: Raster

Raster_Object_Information:

Raster_Object_Type: Grid Cell

Row_Count: 24896

Column_Count: 20748

Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:

Planar:

Map_Projection:

Map_Projection_Name: NAD 1983 UTM Zone 18N

Transverse_Mercator:

Scale_Factor_at_Central_Meridian: 0.9996

Longitude_of_Central_Meridian: -75.0

Latitude_of_Projection_Origin: 0.0

False_Easting: 500000.0

False_Northing: 0.0

Planar_Coordinate_Information:

Planar_Coordinate_Encoding_Method: coordinate pair

Coordinate_Representation:

Abscissa_Resolution: 0.00000000222000241645009560

Ordinate_Resolution: 0.00000000222000241645009560

Planar_Distance_Units: meter

Geodetic_Model:

Horizontal_Datum_Name: D North American 1983

Ellipsoid_Name: GRS 1980

Semi-major_Axis: 6378137.0

Denominator_of_Flattening_Ratio: 298.257222101

Entity_and_Attribute_Information

: Detailed_Description:

Entity_Type:

Entity_Type_Label: nova_2020.vat

Attribute:

Attribute_Label: Rowid

Attribute_Definition: Internal feature number. *Attribute_Definition_Source:* Esri
Attribute_Domain_Values:

Unrepresentable_Domain:

Sequential unique whole numbers that are automatically generated.

Attribute:

Attribute_Label: VALUE

Attribute:

Attribute_Label: COUNT

Attribute:

Attribute_Label: DUR_LVL

Attribute_Definition:

Indicates the frequency flooding level: 2 = 0-5 hours/year 3 = 5-100 hours/year 4 = 100-200 hours/year 5 = >200 hours/year
Attribute_Definition_Source: CCRM

Metadata_Reference_Information

: Metadata_Date:

20210215

Metadata_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type: unknown
Address: PO Box 1346
Address: 1375 Greate Road
City: Gloucester Point
State_or_Province: Virginia
Postal_Code: 23062
Country: US

Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

Metadata_Standard_Version: FGDC-STD-001-1998

Metadata_Time_Convention: local time

Generated by mp version 2.9.12 on Mon Feb 15 12:48:25 2021

Northern Virginia Projected Flooding Duration: 2050

Metadata also available as

Metadata:

Identification_Information:

Citation:

Citation_Information:

Publication_Date: 20201215

Title: Northern Virginia Projected Flooding Duration: 2050
Geospatial_Data_Presentation_Form: raster digital data

Description:

Abstract:

This layer depicts four categories of flood durations: 1) 0-5 hours per year, 2) 5 -100 hours per year, 3) 100 - 200 hours per year, and 4) more than 200 hours per year. Using local Bay tide gauge records, a frequency analysis was done to determine the annual duration of current flooding at various water levels. NOAA sea level rise projections were added to these observed water levels, and were used to delineate flooding zones from a lidar-derived elevation surface.This project, Task #92.01 was funded in part by the Virginia Coastal Zone Management Program at the Department of Environmental Quality through Grant FY2019 #NA19NOS4190163 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended. The views expressed herein are those of the authors and do not necessarily reflect the views of the U.S. Department of Commerce, NOAA, or any of its subagencies.

Purpose:

To depict projected flooding duration extents based on a flood frequency analysis of current observed water levels combined with the NOAA intermediate sea level rise projections for 2050.

Status:

Maintenance_and_Update_Frequency: None planned

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -77.271264

East_Bounding_Coordinate: -77.031874

North_Bounding_Coordinate: 38.845053

South_Bounding_Coordinate: 38.616571

Keywords:

Theme:

Theme_Keyword_Thesaurus: ISO 19115 Topic Categories

Theme_Keyword: elevation

Place:

Place_Keyword_Thesaurus: None

Place_Keyword: Alexandria City, Fairfax County

Access_Constraints: None
Use_Constraints: None
Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type: unknown
Address: PO Box 1346
Address: 1375 Greate Road
City: Gloucester Point
State_or_Province: Virginia
Postal_Code: 23062
Country: US

Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science
Contact_Person: Molly Mitchell

Contact_Position: Research Scientist

Contact_Address:

Address_Type: mailing and physical

Address: P.O. Box 1346
City: Gloucester Point
State_or_Province: VA
Postal_Code: 23062
Country: US

Contact_Voice_Telephone: 804-684-7188

Contact_Electronic_Mail_Address: molly@vims.edu

Data_Set_Credit:

VIMS CCRM, NOAA Tides and Currents, USGS Coastal National Elevation Database (CoNED)
Native_Data_Set_Environment: Version 6.2 (Build 9200) ; Esri ArcGIS 10.6.1.9270

Data_Quality_Information:

Lineage:

Source_Information:

Type_of_Source_Media: None

Source_Contribution:

Tidal gauge records. NOAA Tides and Currents: https://tidesandcurrents.noaa.gov/

Source_Information:

Type_of_Source_Media: None

Source_Contribution:

Lidar-derived surface elevations. USGS Coastal National Elevation Databased (CoNED) https://www.usgs.gov/core-science-systems/eros/coned

Process_Step:

Process_Description:

Frequency analysis of Bay tidal gage records. Add projected sea level rise for 2050.
Process_Date: 20200915

Process_Step:

Process_Description:

Delineate flooding areas for each frequency step using lidar-elevation surface.
Process_Date: 20201116

Spatial_Data_Organization_Information:

Direct_Spatial_Reference_Method: Raster

Raster_Object_Information:

Raster_Object_Type: Grid Cell

Row_Count: 24896

Column_Count: 20237

Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:

Planar:

Map_Projection:

Map_Projection_Name: NAD 1983 UTM Zone 18N

Transverse_Mercator:

Scale_Factor_at_Central_Meridian: 0.9996

Longitude_of_Central_Meridian: -75.0

Latitude_of_Projection_Origin: 0.0

False_Easting: 500000.0

False_Northing: 0.0

Planar_Coordinate_Information:

Planar_Coordinate_Encoding_Method: coordinate pair

Coordinate_Representation:

Abscissa_Resolution: 0.00000000222000241645009560

Ordinate_Resolution: 0.00000000222000241645009560

Planar_Distance_Units: meter

Geodetic_Model:

Horizontal_Datum_Name: D North American 1983

Ellipsoid_Name: GRS 1980

Semi-major_Axis: 6378137.0

Denominator_of_Flattening_Ratio: 298.257222101

Entity_and_Attribute_Information

: Detailed_Description:

Entity_Type:

Entity_Type_Label: nova_2050.vat

Attribute:

Attribute_Label: Rowid

Attribute_Definition: Internal feature number. *Attribute_Definition_Source:* Esri
Attribute_Domain_Values:

Unrepresentable_Domain:

Sequential unique whole numbers that are automatically generated.

Attribute:

Attribute_Label: VALUE

Attribute:

Attribute_Label: COUNT

Attribute:

Attribute_Label: DUR_LVL

Attribute_Definition:

Indicates the frequency flooding level: 2 = 0-5 hours/year 3 = 5-100 hours/year 4 = 100-200 hours/year 5 = >200 hours/year
Attribute_Definition_Source: CCRM

Metadata_Reference_Information

: Metadata_Date:

20210215

Metadata_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type: unknown
Address: PO Box 1346
Address: 1375 Greate Road
City: Gloucester Point
State_or_Province: Virginia
Postal_Code: 23062
Country: US

Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

Metadata_Standard_Version: FGDC-STD-001-1998

Metadata_Time_Convention: local time

Generated by mp version 2.9.12 on Mon Feb 15 12:48:25 2021

Northern Virginia Projected Flooding Duration: 2100

Metadata also available as

Metadata:

Identification_Information:

Citation:

Citation_Information:

Title: Northern Virginia Projected Flooding Duration: 2100
Geospatial_Data_Presentation_Form: raster digital data

Description:

Abstract:

This layer depicts four categories of flood durations: 1) 0-5 hours per year, 2) 5 -100 hours per year, 3) 100 - 200 hours per year, and 4) more than 200 hours per year. Using local Bay tide gauge records, a frequency analysis was done to determine the annual duration of current flooding at various water levels. NOAA sea level rise projections were added to these observed water levels, and were used to delineate flooding zones from a lidar-derived elevation surface. This project, Task #92.01 was funded in part by the Virginia Coastal Zone Management Program at the Department of Environmental Quality through Grant FY2019 #NA19NOS4190163 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended. The views expressed herein are those of the authors and do not necessarily reflect the views of the U.S. Department of Commerce, NOAA, or any of its subagencies.

Purpose:

To depict projected flooding duration extents based on a flood frequency analysis of current observed water levels combined with the NOAA intermediate sea level rise projections for 2100.

Status:

Maintenance_and_Update_Frequency: None planned

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -77.271921

East_Bounding_Coordinate: -77.031874

North_Bounding_Coordinate: 38.845053

South_Bounding_Coordinate: 38.616558

Keywords:

Theme:

Theme_Keyword_Thesaurus: ISO 19115 Topic Categories

Theme_Keyword: elevation

Place:

Place_Keyword_Thesaurus: None

Place_Keyword: Alexandria City, Fairfax County

Access_Constraints: None
Use_Constraints: None
Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type: unknown
Address: PO Box 1346
Address: 1375 Greate Road
City: Gloucester Point
State_or_Province: Virginia
Postal_Code: 23062
Country: US

Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science
Contact_Person: Molly Mitchell

Contact_Position: Research Scientist

Contact_Address:

Address_Type: mailing and physical

Address: P.O. Box 1346
City: Gloucester Point
State_or_Province: VA
Postal_Code: 23062
Country: US

Contact_Voice_Telephone: 804-684-7188

Contact_Electronic_Mail_Address: molly@vims.edu

Data_Set_Credit:

VIMS CCRM, NOAA Tides and Currents, USGS Coastal National Elevation Database (CoNED)
Native_Data_Set_Environment: Version 6.2 (Build 9200) ; Esri ArcGIS 10.6.1.9270

Data_Quality_Information:

Lineage:

Source_Information:

Type_of_Source_Media: None

Source_Contribution:

Tidal gauge records. NOAA Tides and Currents: https://tidesandcurrents.noaa.gov/

Source_Information:

Type_of_Source_Media: None

Source_Contribution:

Lidar-derived surface elevations. USGS Coastal National Elevation Databased (CoNED) https://www.usgs.gov/core-science-systems/eros/coned

Process_Step:

Process_Description:

Frequency analysis of Bay tidal gage records. Add projected sea level rise for 2100.
Process_Date: 20200810

Process_Step:

Process_Description:

Delineate flooding areas for each frequency step using lidar-elevation surface.
Process_Date: 20201109

Spatial_Data_Organization_Information:

Direct_Spatial_Reference_Method: Raster

Raster_Object_Information:

Raster_Object_Type: Grid Cell

Row_Count: 24896

Column_Count: 20294

Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:

Planar:

Map_Projection:

Map_Projection_Name: NAD 1983 UTM Zone 18N

Transverse_Mercator:

Scale_Factor_at_Central_Meridian: 0.9996

Longitude_of_Central_Meridian: -75.0

Latitude_of_Projection_Origin: 0.0

False_Easting: 500000.0

False_Northing: 0.0

Planar_Coordinate_Information:

Planar_Coordinate_Encoding_Method: coordinate pair

Coordinate_Representation:

Abscissa_Resolution: 0.00000000222020024164500956

Ordinate_Resolution: 0.00000000222020024164500956

Planar_Distance_Units: meter

Geodetic_Model:

Horizontal_Datum_Name: D North American 1983

Ellipsoid_Name: GRS 1980

Semi-major_Axis: 6378137.0

Denominator_of_Flattening_Ratio: 298.257222101

Entity_and_Attribute_Information

: Detailed_Description:

Entity_Type:

Entity_Type_Label: nova_2100.vat

Attribute:

Attribute_Label: Rowid

Attribute_Definition: Internal feature number. *Attribute_Definition_Source:* Esri
Attribute_Domain_Values:

Unrepresentable_Domain:

Sequential unique whole numbers that are automatically generated.

Attribute:

Attribute_Label: VALUE

Attribute:

Attribute_Label: COUNT

Attribute:

Attribute_Label: DUR_LVL

Attribute_Definition:

Indicates the frequency flooding level: 2 = 0-5 hours/year 3 = 5-100 hours/year 4 = 100-200 hours/year 5 = >200 hours/year
Attribute_Definition_Source: CCRM

Metadata_Reference_Information

: Metadata_Date:

20210215

Metadata_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type: unknown
Address: PO Box 1346
Address: 1375 Greate Road
City: Gloucester Point
State_or_Province: Virginia
Postal_Code: 23062
Country: US

Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

Metadata_Standard_Version: FGDC-STD-001-1998

Metadata_Time_Convention: local time

Generated by mp version 2.9.12 on Mon Feb 15 12:48:26 2021

Northern Virginia Inaccessible Roads

Metadata also available as

Metadata:

Identification_Information:

Citation:

Citation_Information:

Publication_Date: 20201217

Title: Northern Virginia Inaccessible Roads
Geospatial_Data_Presentation_Form: vector digital data

Description:

Abstract:

Roads accessibility was determined for flooding intervals of 0.1 meters of flooding, up to 3.0 meters of flooding. Access is evaluated as the ability to travel from the locality's seat (e.g., the county courthouse) to each road in that locality. In some localities (e.g., Hampton City), roads to/from the county seat itself are flooded at a particular flooding level. In these cases, based on our definition of accessibility, the entire locality becomes inaccessible. Road segments overlap where flooding levels impact portions of the road. This layer is used primarily to generate statistics on the length of road segments that are flooded at different levels. This project, Task #92.01 was funded in part by the Virginia Coastal Zone Management Program at the Department of Environmental Quality through Grant FY2019 #NA19NOS4190163 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended. The views expressed herein are those of the authors and do not necessarily reflect the views of the U.S. Department of Commerce, NOAA, or any of its subagencies.

Purpose:

Inaccessible roads are portions of roads that experience flooding and/or experience disconnection due to flooding (i.e., the road portion itself is not flooded but access to that road section is blocked by flooding on adjacent road segment(s)). This analysis seeks to aid in planning by identifying those inaccessible roads.

Status:

Maintenance_and_Update_Frequency: None planned

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -77.257832

East_Bounding_Coordinate: -77.033260

North_Bounding_Coordinate: 38.845129

South_Bounding_Coordinate: 38.633459

Keywords:

Theme:

Theme_Keyword_Thesaurus: None

Theme_Keyword: road inaccessibility, flooding

Theme:

Theme_Keyword_Thesaurus: ISO 19115 Topic Categories

Theme_Keyword: transportation

Place:

Place_Keyword_Thesaurus: None

Place_Keyword: Alexandria City, Fairfax County

Access_Constraints: None
Use_Constraints: None
Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type: unknown
Address: PO Box 1346
Address: 1375 Greate Road
City: Gloucester Point
State_or_Province: Virginia
Postal_Code: 23062
Country: US

Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science
Contact_Person: Molly Mitchell

Contact_Position: Research Scientist

Contact_Address:

Address_Type: mailing and physical

Address: P.O. Box 1346
City: Gloucester Point
State_or_Province: VA
Postal_Code: 23062
Country: US

Contact_Voice_Telephone: 804-684-7188

Contact_Electronic_Mail_Address: molly@vims.edu

Data_Set_Credit:

VIMS Center for Coastal Resources Management (CCRM), OpenStreetMap
Native_Data_Set_Environment: Version 6.2 (Build 9200) ; Esri ArcGIS 10.6.1.9270

Data_Quality_Information:

Lineage:

Source_Information:

Type_of_Source_Media: None

Source_Contribution: Open Street Map

Process_Step:

Process_Description: Create network dataset.

Process_Date: 20200708

Process_Step:

Process_Description: Road network analysis and service areas generation.

Process_Date: 20201006

Process_Step:

Process_Description: Inaccessible roads identified and statistics generated.

Process_Date: 20201117

Spatial_Data_Organization_Information:

Direct_Spatial_Reference_Method: Vector

Point_and_Vector_Object_Information:

SDTS_Terms_Description:

SDTS_Point_and_Vector_Object_Type: String

Point_and_Vector_Object_Count: 5605

Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:

Planar:

Map_Projection:

Map_Projection_Name: NAD 1983 UTM Zone 18N

Transverse_Mercator:

Scale_Factor_at_Central_Meridian: 0.9996

Longitude_of_Central_Meridian: -75.0

Latitude_of_Projection_Origin: 0.0

False_Easting: 500000.0

False_Northing: 0.0

Planar_Coordinate_Information:

Planar_Coordinate_Encoding_Method: coordinate pair

Coordinate_Representation:

Abscissa_Resolution: 0.0001

Ordinate_Resolution: 0.0001

Planar_Distance_Units: meter

Geodetic_Model:

Horizontal_Datum_Name: D North American 1983

Ellipsoid_Name: GRS 1980

Semi-major_Axis: 6378137.0

Denominator_of_Flattening_Ratio: 298.257222101

Entity_and_Attribute_Information

: Detailed_Description:

Entity_Type:

Entity_Type_Label: NoVA_Inaccessible

Attribute:

Attribute_Label: OBJECTID
Attribute_Definition: Internal feature number. *Attribute_Definition_Source:* Esri
Attribute_Domain_Values:

Unrepresentable_Domain:

Sequential unique whole numbers that are automatically generated.

Attribute:

Attribute_Label: Shape
Attribute_Definition: Feature geometry. *Attribute_Definition_Source:* Esri *Attribute_Domain_Values:*

Unrepresentable_Domain: Coordinates defining the features.

Attribute:

Attribute_Label: level

Attribute_Definition:

Field captures the flooding level that the road segment becomes inaccessible at. Level is a text field, and represents flooding levels at 0.1 of the number in the field. For example, 06 means flooding level 0.6 meters.
Attribute_Definition_Source: CCRM

Attribute:

Attribute_Label: Network

Attribute_Definition:

Indicates that these road segments are inaccessible at flooding level indicated.
Attribute_Definition_Source: CCRM

Attribute:

Attribute_Label: name

Attribute_Definition:

Street name obtained from combination of Open Street Map street names and Virginia Geospatial Information Network (VGIN) names.

Attribute_Definition_Source: CCRM

Attribute:

Attribute_Label: NAMELSAD
Attribute_Definition: Locality name.
Attribute_Definition_Source: CCRM

Attribute:

Attribute_Label: miles

Attribute_Definition:

Length of inaccessible road segment in miles. Calculated from shape_length. (Shape_length is in meters.)

Attribute_Definition_Source: CCRM

Attribute:

Attribute_Label: Shape_Length

Attribute_Definition: Length of feature in internal units. *Attribute_Definition_Source:* Esri
Attribute_Domain_Values:

Unrepresentable_Domain: Positive real numbers that are automatically generated.

Metadata_Reference_Information

: Metadata_Date:

20210217

Metadata_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type: unknown
Address: PO Box 1346
Address: 1375 Greate Road
City: Gloucester Point
State_or_Province: Virginia
Postal_Code: 23062
Country: US

Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

Metadata_Standard_Version: FGDC-STD-001-1998

Metadata_Time_Convention: local time

Generated by mp version 2.9.12 on Wed Feb 17 13:13:16 2021

Northern Virginia Inaccessible Roads, Grouped into 0.5 meter Flooding Levels

Metadata also available as

Metadata:

Identification_Information:

Citation:

Citation_Information:

Publication_Date: 20201214

Title:

Northern Virginia Inaccessible Roads, Grouped into 0.5 meter Flooding Levels

Geospatial_Data_Presentation_Form: vector digital data

Description:

Abstract:

Roads accessibility was determined for flooding intervals of 0.1 meters of flooding, up to 3.0 meters of flooding. Access is evaluated as the ability to travel from the locality's seat (e.g., the county courthouse) to each road in that locality. In some localities (e.g., Hampton City), roads to/from the county seat itself are flooded at a particular flooding level. In these cases, based on our definition of accessibility, the entire locality becomes inaccessible. Inaccessible road segments were classified and coded into 0.5 meter elevation groups, according to what flooding level that road segment first becomes inaccessible. This differs from the Easter Shore Inaccessible Roads layer because overlaps were removed. This layer is used primarily for web display.This project, Task #92.01 was funded in part by the Virginia Coastal Zone Management Program at the Department of Environmental Quality through Grant FY2019 #NA19NOS4190163 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended. The views expressed herein are those of the authors and do not necessarily reflect the views of the U.S. Department of Commerce, NOAA, or any of its subagencies.

Purpose:

Inaccessible roads are portions of roads that experience flooding and/or experience disconnection due to flooding (i.e., the road portion itself is not flooded but access to that road section is blocked by flooding on adjacent road segment(s)). This analysis seeks to aid in planning by identifying those inaccessible roads.

Status:

Maintenance_and_Update_Frequency: None planned

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -77.257832

East_Bounding_Coordinate: -77.033260

North_Bounding_Coordinate: 38.845129

South_Bounding_Coordinate: 38.633459

Keywords:

Theme:

Theme_Keyword_Thesaurus: None

Theme_Keyword: road inaccessibility, road flooding

Theme:

Theme_Keyword_Thesaurus: ISO 19115 Topic Categories

Theme_Keyword: transportation

Place:

Place_Keyword_Thesaurus: None

Place_Keyword: Fairfax County, Alexandria City

Access_Constraints: None
Use_Constraints: None
Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type: unknown
Address: PO Box 1346
Address: 1375 Greate Road
City: Gloucester Point
State_or_Province: Virginia
Postal_Code: 23062
Country: US

Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science
Contact_Person: Molly Mitchell

Contact_Position: Research Scientist

Contact_Address:

Address_Type: mailing and physical

Address: P.O. Box 1346
City: Gloucester Point
State_or_Province: VA
Postal_Code: 23062
Country: US

Contact_Voice_Telephone: 804-684-7188

Contact_Electronic_Mail_Address: molly@vims.edu

Data_Set_Credit:

VIMS Center for Coastal Resources Management (CCRM), OpenStreetMap
Native_Data_Set_Environment: Version 6.2 (Build 9200) ; Esri ArcGIS 10.6.1.9270

Data_Quality_Information:

Lineage:

Source_Information:

Type_of_Source_Media: None

Source_Contribution: Open Street Map road layer.

Process_Step:

Process_Description: Create network dataset.

Process_Date: 20200720

Process_Step:

Process_Description: Road network analysis and service areas generation.

Process_Date: 20200914

Process_Step:

Process_Description:

Inaccessible roads identified and grouped into 0.5 meter intervals corresponding to the flooding level that the road is inaccessible at.

Process_Date: 20201109

Spatial_Data_Organization_Information:

Direct_Spatial_Reference_Method: Vector

Point_and_Vector_Object_Information:

SDTS_Terms_Description:

SDTS_Point_and_Vector_Object_Type: String

Point_and_Vector_Object_Count: 1994

Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:

Planar:

Map_Projection:

Map_Projection_Name: NAD 1983 UTM Zone 18N

Transverse_Mercator:

Scale_Factor_at_Central_Meridian: 0.9996

Longitude_of_Central_Meridian: -75.0

Latitude_of_Projection_Origin: 0.0

False_Easting: 500000.0

False_Northing: 0.0

Planar_Coordinate_Information:

Planar_Coordinate_Encoding_Method: coordinate pair

Coordinate_Representation:

Abscissa_Resolution: 0.0001

Ordinate_Resolution: 0.0001

Planar_Distance_Units: meter

Geodetic_Model:

Horizontal_Datum_Name: D North American 1983

Ellipsoid_Name: GRS 1980

Semi-major_Axis: 6378137.0

Denominator_of_Flattening_Ratio: 298.257222101

Entity_and_Attribute_Information

: Detailed_Description:

Entity_Type:

Entity_Type_Label: NoVA_Inaccessible_GrpLev

Attribute:

Attribute_Label: OBJECTID
Attribute_Definition: Internal feature number. *Attribute_Definition_Source:* Esri
Attribute_Domain_Values:

Unrepresentable_Domain:

Sequential unique whole numbers that are automatically generated.

Attribute:

Attribute_Label: Shape
Attribute_Definition: Feature geometry. *Attribute_Definition_Source:* Esri *Attribute_Domain_Values:*

Unrepresentable_Domain: Coordinates defining the features.

Attribute:

Attribute_Label: name

Attribute_Definition:

Street name obtained from combination of Open Street Map street names and Virginia Geospatial Information Network (VGIN) names.
Attribute_Definition_Source: CCRM

Attribute:

Attribute_Label: NAMELSAD
Attribute_Definition: Locality name.
Attribute_Definition_Source: CCRM

Attribute:

Attribute_Label: miles

Attribute:

Attribute_Label: fld_start

Attribute_Definition: Flooding level group(s) that the road segment is inaccessible.

Attribute_Definition_Source: CCRM

Attribute:

Attribute_Label: Shape_Length

Attribute_Definition: Length of feature in internal units. *Attribute_Definition_Source:* Esri
Attribute_Domain_Values:

Unrepresentable_Domain: Positive real numbers that are automatically generated.

Metadata_Reference_Information

: Metadata_Date:

20210217

Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

Metadata_Standard_Version: FGDC-STD-001-1998

Metadata_Time_Convention: local time

Generated by mp version 2.9.12 on Wed Feb 17 13:13:16 2021

Peninsula Current Flooding Duration: 2020

Metadata also available as

Metadata:

Identification_Information:

Citation:

Citation_Information:

Publication_Date: 20201207

Title: Peninsula Current Flooding Duration: 2020
Geospatial_Data_Presentation_Form: raster digital data

Description:

Abstract:

This layer depicts four categories of flood durations: 1) 0-5 hours per year, 2) 5 -100 hours per year, 3) 100 - 200 hours per year, and 4) more than 200 hours per year. Using local Bay tide gauge records, a frequency analysis was done to determine the annual duration of flooding at various water levels. These water levels were used to delineate flooding zones from a lidar-derived elevation surface.This project, Task #92.01 was funded in part by the Virginia Coastal Zone Management Program at the Department of Environmental Quality through Grant FY2019 #NA19NOS4190163 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended. The views expressed herein are those of the authors and do not necessarily reflect the views of the U.S. Department of Commerce, NOAA, or any of its subagencies.

Purpose:

To depict current flooding durations based on frequency of flooding.

Status:

Maintenance_and_Update_Frequency: None planned

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -76.930652

East_Bounding_Coordinate: -76.259000

North_Bounding_Coordinate: 37.473523

South_Bounding_Coordinate: 36.943250

Keywords:

Theme:

Theme_Keyword_Thesaurus: ISO 19115 Topic Categories

Theme_Keyword: elevation

Place:

Place_Keyword_Thesaurus: None

Place_Keyword:

James City County, Newport News City, Hampton City, Poquoson City, Williamsburg City, York County

Access_Constraints: None
Use_Constraints: None
Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type: unknown
Address: PO Box 1346
Address: 1375 Greate Road
City: Gloucester Point
State_or_Province: Virginia
Postal_Code: 23062
Country: US

Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science
Contact_Person: Molly Mitchell

Contact_Position: Research Scientist

Contact_Address:

Address_Type: mailing and physical

Address: P.O. Box 1346
City: Gloucester Point
State_or_Province: VA
Postal_Code: 23062
Country: US

Contact_Voice_Telephone: 804-684-7188

Contact_Electronic_Mail_Address: molly@vims.edu

Data_Set_Credit:

VIMS CCRM, NOAA Tides and Currents, USGS Coastal National Elevation Database (CoNED)
Native_Data_Set_Environment: Version 6.2 (Build 9200) ; Esri ArcGIS 10.6.1.9270

Data_Quality_Information:

Lineage:

Source_Information:

Type_of_Source_Media: None

Source_Contribution:

Tidal gauge records. NOAA Tides and Currents: https://tidesandcurrents.noaa.gov/

Source_Information:

Type_of_Source_Media: None

Source_Contribution:

Lidar-derived surface elevations. USGS Coastal National Elevation Databased (CoNED) https://www.usgs.gov/core-science-systems/eros/coned

Process_Step:

Process_Description: Frequency analysis of Bay tidal gage records.

Process_Date: 20200811

Process_Step:

Process_Description:

Delineate flooding areas for each frequency step using lidar-elevation surface.
Process_Date: 20200921

Spatial_Data_Organization_Information:

Direct_Spatial_Reference_Method: Raster

Raster_Object_Information:

Raster_Object_Type: Grid Cell

Row_Count: 57864

Column_Count: 58646

Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:

Planar:

Map_Projection:

Map_Projection_Name: NAD 1983 UTM Zone 18N

Transverse_Mercator:

Scale_Factor_at_Central_Meridian: 0.9996

Longitude_of_Central_Meridian: -75.0

Latitude_of_Projection_Origin: 0.0

False_Easting: 500000.0

False_Northing: 0.0

Planar_Coordinate_Information:

Planar_Coordinate_Encoding_Method: coordinate pair

Coordinate_Representation:

Abscissa_Resolution: 0.00000000222000241645009560

Ordinate_Resolution: 0.00000000222000241645009560

Planar_Distance_Units: meter

Geodetic_Model:

Horizontal_Datum_Name: D North American 1983

Ellipsoid_Name: GRS 1980

Semi-major_Axis: 6378137.0

Denominator_of_Flattening_Ratio: 298.257222101

Entity_and_Attribute_Information

: Detailed_Description:

Entity_Type:

Entity_Type_Label: pen_2020.vat

Attribute:

Attribute_Label: Rowid

Attribute_Definition: Internal feature number. *Attribute_Definition_Source:* Esri
Attribute_Domain_Values:

Unrepresentable_Domain:

Sequential unique whole numbers that are automatically generated.

Attribute:

Attribute_Label: VALUE

Attribute:

Attribute_Label: COUNT

Attribute:

Attribute_Label: DUR_LVL

Attribute_Definition:

Indicates the frequency flooding level: 2 = 0-5 hours/year 3 = 5-100 hours/year 4 = 100-200 hours/year 5 = >200 hours/year
Attribute_Definition_Source: CCRM

Metadata_Reference_Information

: Metadata_Date:

20210215

Metadata_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type: unknown
Address: PO Box 1346
Address: 1375 Greate Road
City: Gloucester Point
State_or_Province: Virginia
Postal_Code: 23062
Country: US

Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

Metadata_Standard_Version: FGDC-STD-001-1998

Metadata_Time_Convention: local time

Generated by mp version 2.9.12 on Mon Feb 15 12:48:26 2021

Peninsula Projected Flooding Duration: 2050

Metadata also available as

Metadata:

Identification_Information:

Citation:

Citation_Information:

Publication_Date: 20201119

Title: Peninsula Projected Flooding Duration: 2050
Geospatial_Data_Presentation_Form: raster digital data

Description:

Abstract:

This layer depicts four categories of flood durations: 1) 0-5 hours per year, 2) 5 -100 hours per year, 3) 100 - 200 hours per year, and 4) more than 200 hours per year. Using local Bay tide gauge records, a frequency analysis was done to determine the annual duration of current flooding at various water levels. NOAA sea level rise projections were added to these observed water levels, and were used to delineate flooding zones from a lidar-derived elevation surface.This project, Task #92.01 was funded in part by the Virginia Coastal Zone Management Program at the Department of Environmental Quality through Grant FY2019 #NA19NOS4190163 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended. The views expressed herein are those of the authors and do not necessarily reflect the views of the U.S. Department of Commerce, NOAA, or any of its subagencies.

Purpose:

To depict projected flooding duration extents based on a flood frequency analysis of current observed water levels combined with the NOAA intermediate sea level rise projections for 2050.

Status:

Maintenance_and_Update_Frequency: None planned

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -76.930652

East_Bounding_Coordinate: -76.259000

Keywords:

North_Bounding_Coordinate: 37.473523

South_Bounding_Coordinate: 36.943250

Theme:

Theme_Keyword_Thesaurus: ISO 19115 Topic Categories

Theme_Keyword: elevation

Place:

Place_Keyword_Thesaurus: None

Place_Keyword:

James City County, Newport News City, Hampton City, Poquoson City, Williamsburg City, York County

Access_Constraints: None
Use_Constraints: None
Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type: unknown
Address: PO Box 1346
Address: 1375 Greate Road
City: Gloucester Point
State_or_Province: Virginia
Postal_Code: 23062
Country: US

Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science
Contact_Person: Molly Mitchell

Contact_Position: Research Scientist

Contact_Address:

Address_Type: mailing and physical

Address: P.O. Box 1346
City: Gloucester Point
State_or_Province: VA
Postal_Code: 23062

Country: US

Contact_Voice_Telephone: 804-684-7188

Contact_Electronic_Mail_Address: molly@vims.edu

Data_Set_Credit:

VIMS CCRM, NOAA Tides and Currents, USGS Coastal National Elevation Database (CoNED)
Native_Data_Set_Environment: Version 6.2 (Build 9200) ; Esri ArcGIS 10.6.1.9270

Data_Quality_Information:

Lineage:

Source_Information:

Type_of_Source_Media: None

Source_Contribution:

Tidal gauge records. NOAA Tides and Currents: https://tidesandcurrents.noaa.gov/

Source_Information:

Type_of_Source_Media: None

Source_Contribution:

Lidar-derived surface elevations. USGS Coastal National Elevation Databased (CoNED) https://www.usgs.gov/core-science-systems/eros/coned

Process_Step:

Process_Description:

Frequency analysis of Bay tidal gage records. Add projected sea level rise for 2050.
Process_Date: 20201012

Process_Step:

Process_Description:

Delineate flooding areas for each frequency step using lidar-elevation surface.
Process_Date: 20201119

Spatial_Data_Organization_Information:

Direct_Spatial_Reference_Method: Raster

Raster_Object_Information:

Raster_Object_Type: Grid Cell

Row_Count: 57864

Column_Count: 58646

Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:

Planar:

Map_Projection:

Map_Projection_Name: NAD 1983 UTM Zone 18N

Transverse_Mercator:

Scale_Factor_at_Central_Meridian: 0.9996

Longitude_of_Central_Meridian: -75.0

Latitude_of_Projection_Origin: 0.0

False_Easting: 500000.0

False_Northing: 0.0

Planar_Coordinate_Information:

Planar_Coordinate_Encoding_Method: coordinate pair

Coordinate_Representation:

Abscissa_Resolution: 0.00000000222000241645009560

Ordinate_Resolution: 0.00000000222000241645009560

Planar_Distance_Units: meter

Geodetic_Model:

Horizontal_Datum_Name: D North American 1983

Ellipsoid_Name: GRS 1980

Semi-major_Axis: 6378137.0

Denominator_of_Flattening_Ratio: 298.257222101

Entity_and_Attribute_Information

: Detailed_Description:

Entity_Type:

Entity_Type_Label: pen_2050.vat

Attribute:

Attribute_Label: Rowid

Attribute_Definition: Internal feature number. *Attribute_Definition_Source:* Esri
Attribute_Domain_Values:

Unrepresentable_Domain:

Sequential unique whole numbers that are automatically generated.

Attribute:

Attribute_Label: VALUE

Attribute:

Attribute_Label: COUNT

Attribute:

Attribute_Label: DUR_LVL

Attribute_Definition:

Indicates the frequency flooding level: 2 = 0-5 hours/year 3 = 5-100 hours/year 4 = 100-200 hours/year 5 = >200 hours/year
Attribute_Definition_Source: CCRM

Metadata_Reference_Information

: Metadata_Date:

20210215

Metadata_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type: unknown
Address: PO Box 1346
Address: 1375 Greate Road
City: Gloucester Point
State_or_Province: Virginia
Postal_Code: 23062
Country: US

Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

Metadata_Standard_Version: FGDC-STD-001-1998

Metadata_Time_Convention: local time

Generated by mp version 2.9.12 on Mon Feb 15 12:48:27 2021

Peninsula Projected Flooding Duration: 2100

Metadata also available as

Metadata:

Identification_Information:

Citation:

Citation_Information:

Publication_Date: 20201221

Title: Peninsula Projected Flooding Duration: 2100
Geospatial_Data_Presentation_Form: raster digital data

Description:

Abstract:

This layer depicts four categories of flood durations: 1) 0-5 hours per year, 2) 5 -100 hours per year, 3) 100 - 200 hours per year, and 4) more than 200 hours per year. Using local Bay tide gauge records, a frequency analysis was done to determine the annual duration of current flooding at various water levels. NOAA sea level rise projections were added to these observed water levels, and were used to delineate flooding zones from a lidar-derived elevation surface.This project, Task #92.01 was funded in part by the Virginia Coastal Zone Management Program at the Department of Environmental Quality through Grant FY2019 #NA19NOS4190163 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended. The views expressed herein are those of the authors and do not necessarily reflect the views of the U.S. Department of Commerce, NOAA, or any of its subagencies.

Purpose:

To depict projected flooding duration extents based on a flood frequency analysis of current observed water levels combined with the NOAA intermediate sea level rise projections for 2100.

Status:

Maintenance_and_Update_Frequency: None planned

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -76.930652

East_Bounding_Coordinate: -76.259000

Keywords:

North_Bounding_Coordinate: 37.473523

South_Bounding_Coordinate: 36.943250

Theme:

Theme_Keyword_Thesaurus: ISO 19115 Topic Categories

Theme_Keyword: elevation

Place:

Place_Keyword_Thesaurus: None

Place_Keyword:

Hampton City, James City County, Newport News City, Poquoson City, Williamsburg City, York County

Access_Constraints: None
Use_Constraints: None
Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type: unknown
Address: PO Box 1346
Address: 1375 Greate Road
City: Gloucester Point
State_or_Province: Virginia
Postal_Code: 23062
Country: US

Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science
Contact_Person: Molly Mitchell

Contact_Position: Research Scientist

Contact_Address:

Address_Type: mailing and physical

Address: P.O. Box 1346
City: Gloucester Point
State_or_Province: VA
Postal_Code: 23062

Country: US

Contact_Voice_Telephone: 804-684-7188

Contact_Electronic_Mail_Address: molly@vims.edu

Data_Set_Credit:

VIMS CCRM, NOAA Tides and Currents, USGS Coastal National Elevation Database (CoNED)
Native_Data_Set_Environment: Version 6.2 (Build 9200) ; Esri ArcGIS 10.6.1.9270

Data_Quality_Information:

Lineage:

Source_Information:

Type_of_Source_Media: None

Source_Contribution:

Tidal gauge records. NOAA Tides and Currents: https://tidesandcurrents.noaa.gov/

Source_Information:

Type_of_Source_Media: None

Source_Contribution:

Lidar-derived surface elevations. USGS Coastal National Elevation Databased (CoNED) https://www.usgs.gov/core-science-systems/eros/coned

Process_Step:

Process_Description:

Frequency analysis of Bay tidal gage records. Add projected sea level rise for 2100.
Process_Date: 20200622

Process_Step:

Process_Description:

Delineate flooding areas for each frequency step using lidar-elevation surface.
Process_Date: 20201013

Spatial_Data_Organization_Information:

Direct_Spatial_Reference_Method: Raster

Raster_Object_Information:

Raster_Object_Type: Grid Cell

Row_Count: 57864

Column_Count: 58646

Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:

Planar:

Map_Projection:

Map_Projection_Name: NAD 1983 UTM Zone 18N

Transverse_Mercator:

Scale_Factor_at_Central_Meridian: 0.9996

Longitude_of_Central_Meridian: -75.0

Latitude_of_Projection_Origin: 0.0

False_Easting: 500000.0

False_Northing: 0.0

Planar_Coordinate_Information:

Planar_Coordinate_Encoding_Method: coordinate pair

Coordinate_Representation:

Abscissa_Resolution: 0.00000000222020024164500956

Ordinate_Resolution: 0.00000000222020024164500956

Planar_Distance_Units: meter

Geodetic_Model:

Horizontal_Datum_Name: D North American 1983

Ellipsoid_Name: GRS 1980

Semi-major_Axis: 6378137.0

Denominator_of_Flattening_Ratio: 298.257222101

Entity_and_Attribute_Information

: Detailed_Description:

Entity_Type:

Entity_Type_Label: pen_2100.vat

Attribute:

Attribute_Label: Rowid

Attribute_Definition: Internal feature number. *Attribute_Definition_Source:* Esri
Attribute_Domain_Values:

Unrepresentable_Domain:

Sequential unique whole numbers that are automatically generated.

Attribute:

Attribute_Label: VALUE

Attribute:

Attribute_Label: COUNT

Attribute:

Attribute_Label: DUR_LVL

Attribute_Definition:

Indicates the frequency flooding level: 2 = 0-5 hours/year 3 = 5-100 hours/year 4 = 100-200 hours/year 5 = >200 hours/year
Attribute_Definition_Source: CCRM

Metadata_Reference_Information

: Metadata_Date:

20210215

Metadata_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type: unknown
Address: PO Box 1346
Address: 1375 Greate Road
City: Gloucester Point
State_or_Province: Virginia
Postal_Code: 23062
Country: US

Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

Metadata_Standard_Version: FGDC-STD-001-1998

Metadata_Time_Convention: local time

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Peninsula Inaccessible Roads

Metadata also available as

Metadata:

Identification_Information:

Citation:

Citation_Information:

Publication_Date: 20201214

Title: Peninsula Inaccessible Roads
Geospatial_Data_Presentation_Form: vector digital data

Description:

Abstract:

Roads accessibility was determined for flooding intervals of 0.1 meters of flooding, up to 3.0 meters of flooding. Access is evaluated as the ability to travel from the locality's seat (e.g., the county courthouse) to each road in that locality. In some localities (e.g., Hampton City), roads to/from the county seat itself are flooded at a particular flooding level. In these cases, based on our definition of accessibility, the entire locality becomes inaccessible. Road segments overlap where flooding levels impact portions of the road. This layer is used primarily to generate statistics on the length of road segments that are flooded at different levels. This project, Task #92.01 was funded in part by the Virginia Coastal Zone Management Program at the Department of Environmental Quality through Grant FY2019 #NA19NOS4190163 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended. The views expressed herein are those of the authors and do not necessarily reflect the views of the U.S. Department of Commerce, NOAA, or any of its subagencies.

Purpose:

Inaccessible roads are portions of roads that experience flooding and/or experience disconnection due to flooding (i.e., the road portion itself is not flooded but access to that road section is blocked by flooding on adjacent road segment(s)). This analysis seeks to aid in planning by identifying those inaccessible roads.

Status:

Maintenance_and_Update_Frequency: None planned

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -76.907193

East_Bounding_Coordinate: -76.272276

North_Bounding_Coordinate: 37.448947

South_Bounding_Coordinate: 36.952053

Keywords:

Theme:

Theme_Keyword_Thesaurus: None

Theme_Keyword: road inaccessibility, flooding

Theme:

Theme_Keyword_Thesaurus: ISO 19115 Topic Categories

Theme_Keyword: transportation

Place:

Place_Keyword_Thesaurus: None

Place_Keyword:

James City County, Hampton City, Newport News City, Poquoson City, Williamsburg City, and York County.

Access_Constraints: None
Use_Constraints: None
Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type: unknown
Address: PO Box 1346
Address: 1375 Greate Road
City: Gloucester Point
State_or_Province: Virginia
Postal_Code: 23062
Country: US

Point_of_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science
Contact_Person: Molly Mitchell

Contact_Position: Research Scientist

Contact_Address:

Address_Type: mailing and physical

Address: P.O. Box 1346
City: Gloucester Point
State_or_Province: VA
Postal_Code: 23062
Country: US

Contact_Voice_Telephone: 804-684-7188

Contact_Electronic_Mail_Address: molly@vims.edu

Data_Set_Credit:

VIMS Center for Coastal Resources Management (CCRM), OpenStreetMap
Native_Data_Set_Environment: Version 6.2 (Build 9200) ; Esri ArcGIS 10.6.1.9270

Data_Quality_Information:

Lineage:

Source_Information:

Type_of_Source_Media: None

Source_Contribution: Open Street Map road layer

Process_Step:

Process_Description: Create network dataset.

Process_Date: 20200908

Process_Step:

Process_Description: Road network analysis and service areas generation.

Process_Date: 20201102

Process_Step:

Process_Description: Inaccessible roads identified and statistics generated.

Process_Date: 20201214

Spatial_Data_Organization_Information:

Direct_Spatial_Reference_Method: Vector

Point_and_Vector_Object_Information:

SDTS_Terms_Description:

SDTS_Point_and_Vector_Object_Type: String

Point_and_Vector_Object_Count: 81823

Spatial_Reference_Information:

Horizontal_Coordinate_System_Definition:

Planar:

Map_Projection:

Map_Projection_Name: NAD 1983 UTM Zone 18N

Transverse_Mercator:

Scale_Factor_at_Central_Meridian: 0.9996

Longitude_of_Central_Meridian: -75.0

Latitude_of_Projection_Origin: 0.0

False_Easting: 500000.0

False_Northing: 0.0

Planar_Coordinate_Information:

Planar_Coordinate_Encoding_Method: coordinate pair

Coordinate_Representation:

Abscissa_Resolution: 0.0001

Ordinate_Resolution: 0.0001

Planar_Distance_Units: meter

Geodetic_Model:

Horizontal_Datum_Name: D North American 1983

Ellipsoid_Name: GRS 1980

Semi-major_Axis: 6378137.0

Denominator_of_Flattening_Ratio: 298.257222101

Entity_and_Attribute_Information

: Detailed_Description:

Entity_Type:

Entity_Type_Label: Peninsula_Inaccessible

Attribute:

Attribute_Label: OBJECTID
Attribute_Definition: Internal feature number. *Attribute_Definition_Source:* Esri
Attribute_Domain_Values:

Unrepresentable_Domain:

Sequential unique whole numbers that are automatically generated.

Attribute:

Attribute_Label: Shape

Attribute_Definition: Feature geometry.

Attribute_Definition_Source: Esri

Attribute_Domain_Values:

Unrepresentable_Domain: Coordinates defining the features.

Attribute:

Attribute_Label: level

Attribute_Definition:

Field captures the flooding level that the road segment becomes inaccessible at. Level is a text field, and represents flooding levels at 0.1 of the number in the field. For example, 06 means flooding level 0.6 meters.
Attribute_Definition_Source: CCRM

Attribute:

Attribute_Label: Network

Attribute_Definition:

Indicates that these road segments are inaccessible at flooding level indicated.
Attribute_Definition_Source: CCRM

Attribute:

Attribute_Label: name

Attribute_Definition:

Street name obtained from combination of Open Street Map street names and Virginia Geospatial Information Network (VGIN) names.

Attribute_Definition_Source: CCRM

Attribute:

Attribute_Label: NAMELSAD
Attribute_Definition: Locality name.
Attribute_Definition_Source: CCRM

Attribute:

Attribute_Label: miles

Attribute_Definition:

Length of inaccessible road segment in miles. Calculated from shape_length. (Shape_length is in meters.)

Attribute:

Attribute_Label: Shape_Length

Attribute_Definition: Length of feature in internal units. *Attribute_Definition_Source:* Esri
Attribute_Domain_Values:

Unrepresentable_Domain: Positive real numbers that are automatically generated.

Metadata_Reference_Information

: Metadata_Date:

20210215

Metadata_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type: unknown
Address: PO Box 1346
Address: 1375 Greate Road
City: Gloucester Point
State_or_Province: Virginia
Postal_Code: 23062
Country: US

Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

Metadata_Standard_Version: FGDC-STD-001-1998

Metadata_Time_Convention: local time

Generated by mp version 2.9.12 on Mon Feb 15 12:48:26 2021

Peninsula Inaccessible Roads, Grouped into 0.5 meter Flooding Levels

Metadata also available as

Metadata:

Identification_Information:

Citation:

Citation_Information:

Publication_Date: 20201207

Title:

Peninsula Inaccessible Roads, Grouped into 0.5 meter Flooding Levels

Geospatial_Data_Presentation_Form: vector digital data

Description:

Abstract:

Roads accessibility was determined for flooding intervals of 0.1 meters of flooding, up to 3.0 meters of flooding. Access is evaluated as the ability to travel from the locality's seat (e.g., the county courthouse) to each road in that locality. In some localities (e.g., Hampton City), roads to/from the county seat itself are flooded at a particular flooding level. In these cases, based on our definition of accessibility, the entire locality becomes inaccessible. Inaccessible road segments were classified and coded into 0.5 meter elevation groups, according to what flooding level that road segment first becomes inaccessible. This differs from the Easter Shore Inaccessible Roads layer because overlaps were removed. This layer is used primarily for web display.This project, Task #92.01 was funded in part by the Virginia Coastal Zone Management Program at the Department of Environmental Quality through Grant FY2019 #NA19NOS4190163 of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, under the Coastal Zone Management Act of 1972, as amended. The views expressed herein are those of the authors and do not necessarily reflect the views of the U.S. Department of Commerce, NOAA, or any of its subagencies.

Purpose:

Inaccessible roads are portions of roads that experience flooding and/or experience

disconnection due to flooding (i.e., the road portion itself is not flooded but access to that road section is blocked by flooding on adjacent road segment(s)). This analysis seeks to aid in planning by identifying those inaccessible roads.

Status:

Maintenance_and_Update_Frequency: None planned

Spatial_Domain:

Bounding_Coordinates:

West_Bounding_Coordinate: -

76.907193

East_Bounding_Coordinate: -76.272276

North_Bounding_Coordinate: 37.448947

South_Bounding_Coordinate: 36.952053

Keywords:

Theme:

Theme_Keyword_Thesaurus: None

Theme_Keyword: road inaccessibility, flooding

Theme:

Theme_Keyword_Thesaurus: ISO 19115 Topic Categories

Theme_Keyword: transportation

Place:

Place_Keyword_Thesaurus: None

Place_Keyword:

James City County, Hampton City, Newport News City, Poquoson City, Williamsburg City, and York County

Access_Constraints: None
Use_Constraints: None
Point_of_Contact:

Contact_Information:

Contact_Organization

_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type:
unknown
Address: PO Box
1346 *Address:*
1375 Greate
Road *City:*
Gloucester Point
State_or_Provinc
e: Virginia
Postal_Code:
23062 *Country:*
US

Point_of_Contact:

Contact_Information:

Contact_Organization

_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science
Contact_Person: Molly Mitchell

Contact_Position: Research Scientist

Contact_Address:

Address_Type: mailing and physical

Address: P.O.
Box 1346
City:
Gloucester

Point
State_or_Province: VA
Postal_Code: 23062
Country: US

Contact_Voice_Telephone: 804-684-7188

Contact_Electronic_Mail_Address: molly@vims.edu

Data_Set_Credit:

VIMS Center for Coastal Resources Management (CCRM), OpenStreetMap
Native_Data_Set_Environment: Version 6.2 (Build 9200) ; Esri ArcGIS 10.6.1.9270

Data_Quality_Information:

Lineage:

Source_Information:

Type_of_Source_Media: None

Source_Contribution: Open Street Map road data.

Process_Step:

Process_Description: Create network dataset.

Process_Date: 20200907

Process_Step:

Process_Description: Road network analysis and service areas generation.

Process_Date: 20201102

Process_Step:

Process_Description:

Inaccessible roads identified and grouped into 0.5 meter intervals corresponding to the flooding level that the road is inaccessible at.
Process_Date: 20201202

Spatial_Data_Organization_Informati

on:

Direct_Spatial_Reference_Meth

od: Vector

Point_and_Vector_Object_In

formation:

SDTS_Terms_Descripti

on:

SDTS_Point_and_Vector_Object_Type: String

Point_and_Vector_Object_Count: 6337

Spatial_Reference_Information:

*Horizontal_Coordinate_System_*

Definition:

Planar:

Map_Projection:

Map_Projection_Name: NAD 1983 UTM Zone 18N

Transverse_Mercator:

Scale_Factor_at_Central_Meridian: 0.9996

Longitude_of_Central_Meridian: -75.0

Latitude_of_Projection_Origin: 0.0

False_Easting: 500000.0

False_Northing: 0.0

Planar_Coordinate_Information:

Planar_Coordinate_Encoding_Method:

coordinate pair

Coordinate_Representation:

Abscissa_Resolution: 0.0001

Ordinate_Resolution: 0.0001

Planar_Distance_Units: meter

Geodetic_Model:

Horizontal_Datum_Name: D North American 1983

Ellipsoid_Name: GRS 1980

Semi-major_Axis: 6378137.0

Denominator_of_Flattening_Ratio: 298.257222101

Entity_and_Attribute_In

formation:

Detailed_Descript

ion:

Entity_Type:

Entity_Type_Label: Peninsula_Inaccessible_forWeb_GrpLyrs

Attribute:

Attribute_Label: OBJECTID
Attribute_Definition: Internal feature number.
Attribute_Definition_Source: Esri
Attribute_Domain_Values:

Unrepresentable_Domain:

Sequential unique whole numbers that are automatically generated.

Attribute:

Attribute_Label: Shape
Attribute_Definition: Feature geometry.
Attribute_Definition_Source:

Esri
Attribute_Domain_Values:

Unrepresentable_Domain: Coordinates defining the features.

Attribute:

Attribute_Label: name

Attribute_Definition:

Street name obtained from combination of Open Street Map street names and Virginia Geospatial Information Network (VGIN) names.
Attribute_Definition_Source: CCRM

Attribute:

Attribute_Label:
NAMELSAD
Attribute_Definition:
Locality name
Attribute_Definition_Sour
ce: CCRM

Attribute:

Attribute_Label: fld_start

Attribute_Definition: Flooding level group(s) that the road segment is inaccessible.

Attribute_Definition_Source: CCRM

Attribute:

Attribute_Label: miles

Attribute_Definition:

Length of inaccessible road segment in miles. Calculated from shape_length. (Shape_length is in meters.)
Attribute_Definition_Source: CCRM

Attribute:

Attribute_Label: Shape_Length

Attribute_Definition: Length of feature in
internal units. *Attribute_Definition_Source:*
Esri *Attribute_Domain_Values:*

Unrepresentable_Domain: Positive real numbers that are automatically generated.

Metadata_Reference_I

nformation:

Metadata_Date:

20210215

Metadata_Contact:

Contact_Information:

Contact_Organization_Primary:

Contact_Organization:

Center for Coastal Resources Management, Virginia Institute of Marine Science (VIMS)

Contact_Address:

Address_Type:
unknown
Address: PO Box
1346 *Address:*
1375 Greate
Road *City:*
Gloucester Point
State_or_Provinc
e: Virginia
Postal_Code:
23062 *Country:*
US

Metadata_Standard_Name: FGDC Content Standard for Digital Geospatial Metadata

Metadata_Standard_Version: FGDC-STD-001-1998

Metadata_Time_Convention: local time

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