RESILIENCE PLAN

Isle of Wight County, Virginia

October 2024

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With assistance from: ATCS PLC

ATCS

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Executive Summary

According to the Virginia Department of Conservation and Recreation (DCR), flooding in Virginia is expected to become more frequent and costly because of climate change, sea-level rise and storm surge. With the present and future natural hazard and water-related risk in the community, and a desire to apply resilience principles to the long-range mitigation of and response to this risk, Isle of Wight County Public Utilities Department initiated development of this Resilience Plan as a planning level document with funding from the Virginia Community Flood Preparedness Fund (CFPF) Grant Program. The CFPF was established to provide support for regions and localities across Virginia to reduce flood impacts, including flooding driven by climate change. The goal of this document is to outline measures to reduce flood impacts, review projected climate changes and associated risks, and to spotlight current, planned, and desired resilience projects.

For this plan "resilience" is defined as "the capability to anticipate, prepare for threats and hazards, adapt to changing conditions, and withstand and recover rapidly from disruptions"[1].

In the context of flooding, resilience focuses on minimizing impacts through mitigation actions and equipping a community to respond to and recover from impacts related to a specific flood event (damaged homes, businesses, culvert damage, polluted water systems), as well as the longer-term issues that flood risk can create in a community (damage to roadways, reduced drainage capacity, infrastructure damage, economic impacts). The contents of this Plan are based on five elements required for resiliency plans according to the Grant Manual for the 2021 Virginia Community Flood Preparedness Fund (dated November 5, 2021).

5 Elements Required for Resiliency Plans
2021 Virginia Community Flood Preparedness Fund Grant Manual (dated 11/5/21)

1. It is project-based with projects focused on flood control and resilience.
2. It incorporates nature-based infrastructure to the maximum extent possible.
3. It includes considerations of all parts of a local government regardless of socioeconomics or race.
4. It includes coordination with other local and inter-jurisdictional projects, plans, and activities and has a clearly articulated timeline or phasing for plan implementation.
5. It is based on the best available science and incorporates climate change, sea level rise, and storm surge (where appropriate), and current flood maps.

This Plan is focused on flood protection and mitigation and is part of ongoing community-wide efforts to identify physical, natural, and social vulnerabilities that put the community at risk for flooding, and document future opportunities to strengthen overall resilience. To assist in the development of this Plan, a document review process was undertaken to identify elements of existing plans or documents that could be combined to meet the requirements of a resilience plan. Citations to those reference plans and documents are in the footnotes and Appendix A.

[1] Page 1, Status of Flood Resilience Report, Virginia Department of Conservation and Recreation (DCR)

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1.0 Introduction

Isle of Wight County, Virginia, is located on the shore of the James River in the Hampton Roads region[2]. The County spans 316 square miles, is bordered to the north by the James River, and lies close to the Chesapeake Bay and Atlantic Ocean. The County's main transportation corridors include Route 460, Route 258, Route 17, Route 58, and Route 10 which link to interstate highways I-64, I-95, and I-85. The Norfolk Southern Corporation and CSX Transportation freight rail lines provide freight rail access. The area's average elevation is approximately 80 feet above sea level.

Isle of Wight has seen accelerated population growth in recent years. Between 2020 and 2023, the County saw a 5.4% increase in population, surpassing 40,000 residents for the first time, according to data from the U.S. Census Bureau. This comes on the heels of an 18.6% increase between 2000 and 2010, and a 9% increase between 2010 and 2020.

More intense and more frequent storms are projected to exacerbate flooding and sea level rise in Isle of Wight, affecting more areas of development in the coming years. The County has made efforts to control stormwater runoff through stormwater management facilities, spillways, and underground piping but these systems have proven adequate, leading to recurring flooding and public safety concerns.

This Plan identifies risks and vulnerabilities and provides information on current initiatives and future opportunities to mitigate stormwater flooding and reduce impacts to Isle of Wight County.



Figure 1: Flooding on Woodland Drive in Isle of Wight County (September 9, 2020)

[2] Isle of Wight County, VA. (2024). About IOW county. Isle of Wight, VA. https://www.co.isle-of-wight.va.us/our_community/about_iow_county/index.php

Plan Development and Key References

In addition to addressing the five requirements outlined in the 2021 Grant Manual for the Virginia Community Flood Preparedness Fund referenced above, this Plan leverages existing plan elements appropriate for inclusion as outlined in the CFPF Manual's Appendix G: Elements of Resilience Plans.

Isle of Wight Comprehensive Plan: Envisioning the Isle

The Isle of Wight community engaged in a deliberative comprehensive plan development process called *Envisioning the Isle,* which was finalized and adopted in January 2020. This plan is a general, long-range, dynamic policy and implementation guide for the County's overall growth and development[3].

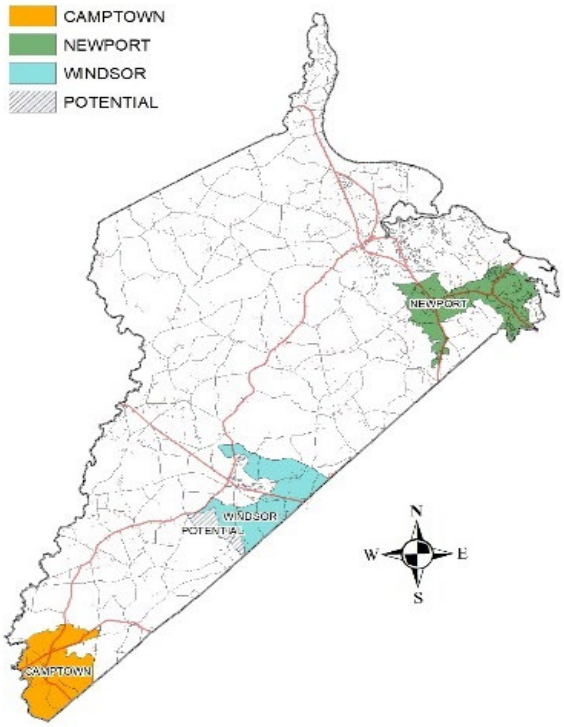


Figure 2: Development Service Districts

One section of the plan, "Preserving the Isle," is dedicated to projects and key actions to enhance resiliency. This segment of the comprehensive plan notes the County's use of key areas for development and public services, or Development Service Districts (DSDs), to guide future growth in the County. This approach helps target development to areas where public infrastructure, including public roads, water, and wastewater services, are currently available or planned in the future. The comprehensive plan includes policies and actions to protect and preserve agricultural areas and environmentally sensitive areas outside the DSDs and mitigate flooding within the three designated DSDs: Newport, Windsor, and Camptown (Figure 2). By concentrating development in specific areas, the County can better manage flood risks. Infrastructure planning within DSDs includes considerations for flood control, drainage, and emergency response. Additionally, preserving rural lands outside DSDs helps maintain natural buffers that can absorb floodwaters and reduce the impact of flooding events. DSDs in Isle of Wight County are a strategic tool for sustainable growth, flood resilience, preservation of the County's rural character, and environmental conservation.

[3] Isle of Wight County, Envisioning the Isle County Masterplan, 2020

Preserving the Isle, Isle of Wight Comprehensive Plan: Mechanisms to protect property values and environmentally sensitive areas.

- Local Chesapeake Bay Preservation Area (CBPA) Ordinance: Includes the development standards for sensitive areas in the Chesapeake Bay Watershed.
- Stormwater Management Program: Requires new development to store and treat runoff.
- Floodplain Management Ordinance: Guides new development in the County's floodplains
- Wetlands Ordinance: Limits development in tidal wetland areas.
- Coastal Primary Sand Dune Ordinance: Protects fragile shoreline features.
- Subdivision Ordinance: Sets standards for subdivision activity in environmentally sensitive areas.
- Zoning Ordinance: Includes development plan criteria for areas with natural resources.
- Natural buffers: Preserve and restore coastal features (such as wetlands and dunes) to absorb and dissipate surge impacts[4].

Hampton Roads Hazard Mitigation Plan

The Hampton Roads Planning District Commission has been a leader in coastal resilience initiatives. Isle of Wight representatives contributed to the development of the Hampton Roads Hazard Mitigation Plan (June 2022), a comprehensive strategy designed to reduce the vulnerability of the region to natural hazards, enhance safety for residents, and protect public and private property[5]. The plan's detailed assessment of risks identifies specific mitigation actions and integrates structural and non-structural mitigation techniques. The mitigation plan catalogs significant flood events from 1995 to 2021 across the region by County and documents County mitigation actions and potential funding sources. Several of the listed Isle of Wight mitigation action items focus on efforts to mitigate flood damage[6].

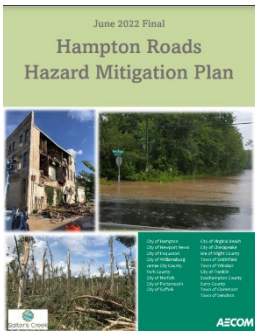


Figure 3: 2022 Hampton Roads Hazard Mitigation Plan

Isle of Wight County Public Utilities Emergency Response Plan

The Public Utility ERP has key information on Isle of Wight utilities, response resources in the event of natural disaster, and communication and coordination mechanisms to facilitate resilience to manmade or natural incidents and their resulting impacts.

Isle of Wight County Basic Emergency Operations Plan

The Basic Emergency Operations Plan (EOP) establishes the legal and organizational basis for operations in Isle of Wight County to effectively respond to and recover from all-hazards disasters and/or emergencies. The plan reflects how County departments/agencies are organized during response to an event, including command authorities.

[4] Wetlands, Isle of Wight County, VA
[5] 2022 Hampton Roads Hazard Mitigation Plan
[6] Pp. 201-211 2022 Hampton Roads Hazard Mitigation Plan

Isle of Wight Master Water and Sewer Plan

The purpose of the master plan is to identify and map public and private water and sewer systems currently known to be located within Isle of Wight County and also to determine the future needs (source, distribution, treatment, and storage).

Virginia Coastal Resilience Masterplan

The 2020 Virginia Coastal Resilience Master Planning Framework[7] lays out the core principles of the Commonwealth's approach to coastal adaptation and protection. The framework emphasizes proactive measures to address climate challenges, rising sea levels, and severe weather threats that endanger economic, cultural, and environmental resources along the coast. The 2021 Phase 1 Virginia Coastal Resilience Master Plan modeled current and future land exposure to coastal flood hazards, estimated the impacts of exposure on key assets, and identified areas with both high social vulnerability and coastal flood exposure; established an inventory of locally driven coastal resilience programs and established an inventory of grant and loan programs; and created an online coastal resilience database of funding sources and coastal resilience web explorer tool. Phase 2 of the Plan (planned for December 2024 release) will incorporate all major flood hazards, including precipitation-driven flooding, update the project inventory, and update the impacts of exposure.

Isle of Wight County participated in the DCR End-User Survey, which collected feedback to inform the development of Virginia CRMP Phase 2 as well as locality meetings organized by DCR where information about was shared about CRMP tools, activities, and flood resilience challenges and opportunities. Isle of Wight also contributed to the Resilience User Portal and Data Call, which is part of the CRMP's effort to collect data on projects and initiatives related to flood resilience. The feedback is being used to refine the content and approach of the final CRMP Phase 2 products.

Virginia Flood Protection Masterplan

The DCR Virginia Flood Protection Masterplan is intended to complement the Virginia CRMP and inform local resilience planning efforts. The plan identifies a state strategy for floodplain management to allow for better use of local, state, federal, and private resources in the promotion of floodplain management issues. The anticipated release of the next edition is December 2025.

[7] Virginia Department of Conservation and Recreation, Virginia Coastal Resilience Master Plan

2.0 Current and Projected Flood Risks

Isle of Wight County has floodplains that include residential structures, croplands, and forests. Flooding poses significant challenges for coastal counties, amplifying existing hazards and vulnerabilities. The coastal areas are susceptible to tidal flooding caused by hurricanes and nor'easters, which generate strong winds pushing water toward the shore[8]. In Isle of Wight County, both precipitation-induced and tidal flooding occur, sometimes in combination. The impact of storms and flood events is intensifying due to climate change, including rising sea levels. Isle of Wight County boasts approximately 222 linear miles of tidal shoreline. The major watersheds (the Chesapeake Bay Watershed and the Blackwater River Watershed) in Isle of Wight encompass several water bodies, including the James River, Pagan River, and Chuckatuck Creek (Figure 4). The Pagan River plays a significant role in the County's history and geography. The colonial seaport town of Smithfield sits on its banks, and the river has witnessed centuries of human activity and environmental changes.

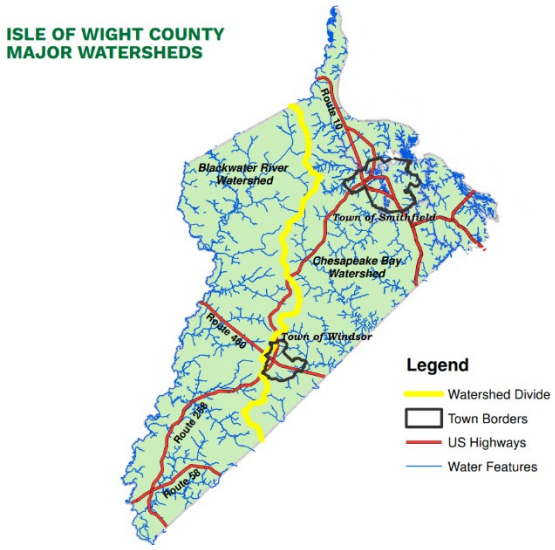


Figure 4: Isle of Wight Watersheds. Source: Preserve the Isle Comprehensive Plan

While the waterways provide essential transportation routes and recreational opportunities, they have also experienced flooding events over time. Understanding the dynamics of these waterways and their interactions with tides, precipitation, and land use is crucial for managing flood risk and ensuring the well-being of the community. Tidal and non-tidal wetlands also play a vital role in the watershed. They serve as natural buffers, absorb excess water, and provide habitat for diverse species. Tidal wetlands, subject to regular flooding by tides, occur in coastal areas but inland from the ocean. Non-tidal wetlands, on the other hand, are inland and not influenced by tides. These wetlands contribute to flood control, nutrient cycling, and overall ecosystem health within Isle of Wight County[9]. By studying the historical patterns of flooding and the ecological significance of these waterways, local authorities can make informed decisions to enhance resilience and protect the community from future flood events.

Recurring Flood Issues

Identifying areas that repetitively flood loss plays a crucial role in identifying areas in the County to focus actions to reduce flood risk. Some of these areas of recurrent flooding are part of current or future projects in Section 6.0 Resilience Projects.

[8] Page 15, Flood Risk Report: Isle of Wight County, Virginia, FEMA, 2015
[9] Isle of Wight County, Virginia, Wetlands

Example of recurrent flood issues in the County include:

- The emergency spillway of Ennis Pond has been breached several times over the last 10 years due to inadequate capacity for higher intensity events. The spillway was damaged by Hurricane Matthew in 2016 (Figure 5) and was repaired through funds from the Federal Emergency Management Agency (FEMA) later that year. A failure in the embankment could compromise the overland conveyance of the Lake Gaston water source, which is downstream of Ennis Pond and serves Norfolk and Virginia Beach.
- The Courthouse Pond also overtopped causing flooding in the Courthouse parking lot, which resulted in closure of the County complex.
- Camptown is a low-lying area just outside the City of Franklin, directly adjacent to Isle of Wight County, that is impacted frequently by recurrent flooding. This area is considered very highly vulnerable based on the ADAPT VA Social Vulnerability Index.
- There have been challenges with stormwater management in Windsor, which have led to recurrent flooding issues.



Figure 5: Damage to Ennis Pond Earthen Dam after Hurricane Matthew (2016)

Precipitation Flooding

Outdated or inadequate stormwater infrastructure significantly contributes to flood problems. The capacity of infrastructure to handle varying water volumes is a necessity for effective flood management. Stormwater management policies and regulations have evolved over time. Depending on when a neighborhood or development was established, its drainage system might be insufficient or outdated compared to current design standards.

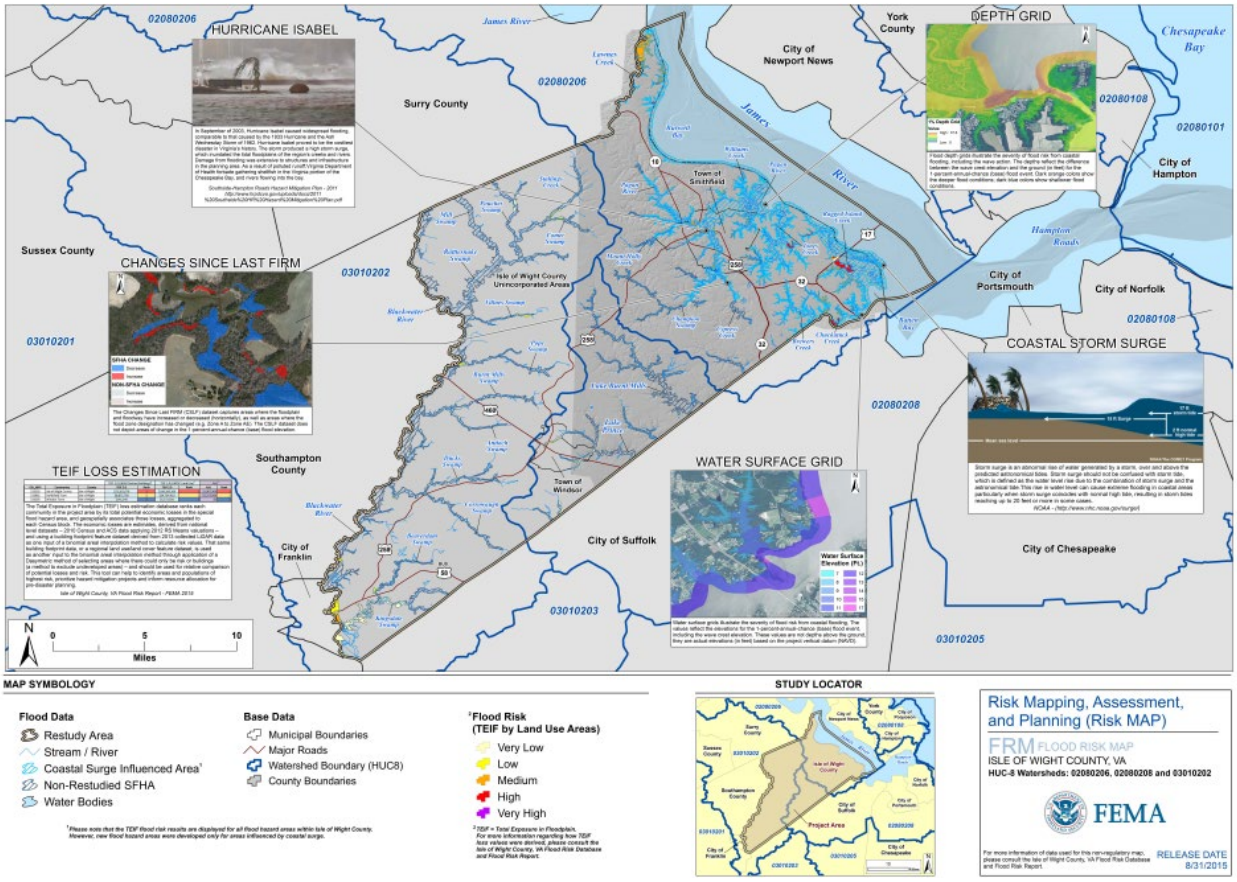


Figure 6: IOW FEMA Flood Risk Map[10]

Figure 6 displays base data reflecting community boundaries, major roads, and streams/rivers as well as Total Exposure in Floodplain (TEIF) flood risk identification. TEIF provides an approximate value of potential economic losses in the Special Flood Hazard Areas and a relative comparison of potential flood loss. Figure 7 on the following page shows the location of dams with an overlay of the 100-year flood zone data.

[10] Flood Risk Report: Isle of Wight County, Virginia, FEMA, 2015

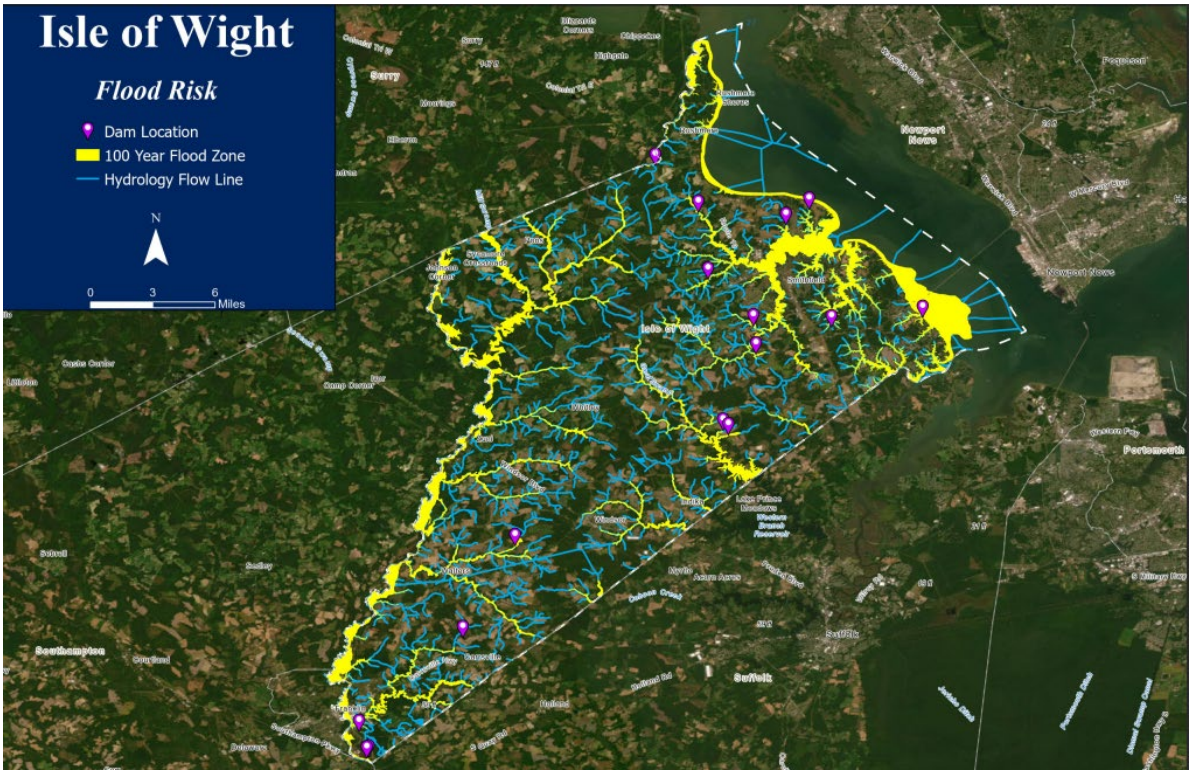


Figure 7: IOW 100 Year Flood Zone Map with Dam Locations

Riverine/Fluvial Flooding

Riverine flooding occurs when a river overflows its banks and inundates surrounding areas. The largest flooding event in Isle of Wight County, Virginia occurred in 2003 during Hurricane Isabel, which brought severe flooding and costly damage. Riverine flooding occurs during longer duration precipitation events that exceed the infiltration limits of the soils in the Chesapeake Bay Watershed and cause coastal flooding along the James River. Hurricane Isabel caused approximately $1.85 billion (2003 USD) in damage in Virginia[11]. A total of 36 deaths were reported across the state — 10 directly from the storm's effects and 22 indirectly related[12]. Isle of Wight County experienced riverine flooding due to the storm surge and heavy rainfall. The impact on homes and infrastructure was significant, emphasizing the need for effective flood management strategies during extreme weather events.

[11] National Weather Service, Isabel Anniversary
[12] Hurricane Isabel 20 years later: Virginia's costliest natural disaster, 2023

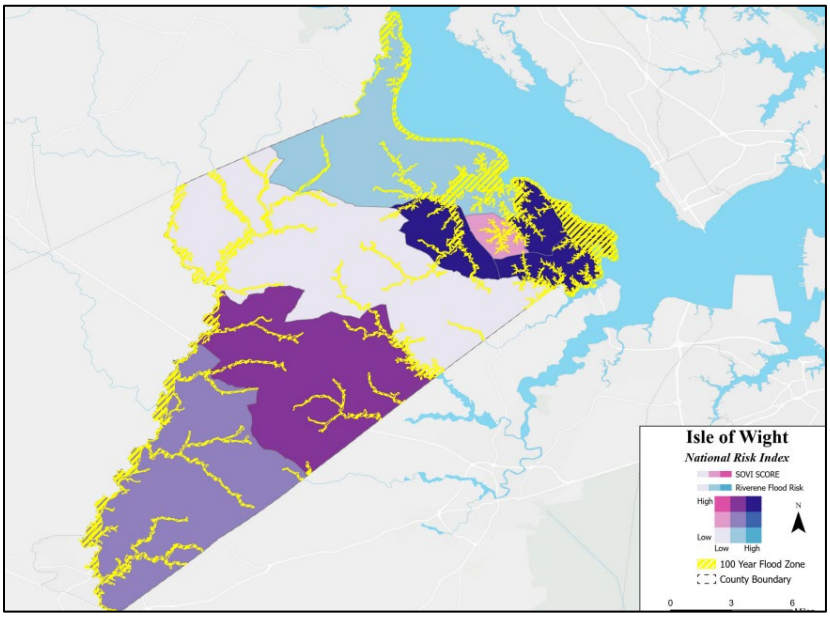


Figure 8: IOW 100 Year Riverine Flood Map Overlayed with Social Vulnerability

Pluvial Flooding

Pluvial flooding also known as surface water flooding or flash flooding occurs when heavy rainfall overwhelms drainage systems and natural water pathways. Pluvial flooding is caused by short-duration, intense bursts of rainfall and can occur in urban or rural areas. These localized downpours overwhelm storm drain systems and smaller tributaries. As an example, Isle of Wight County experienced significant pluvial flooding in September 2020 when roads were submerged, stranding some vehicles, and requiring emergency water rescues. The Moonefield area near Beale Park in Smithfield also saw flooded streets due to intense rainfall[13].



Figure 9: Image of 2020 Flooding in Smithfield, Virginia[14]

[13] Isle of Wight County roads flooding; about 15 people rescued from homes, 13 News Now, 2020
[14] Heavy rain floods local roads, Smithfield Times, 2020
Read more at: https://www.smithfieldtimes.com/2020/08/18/heavy-rain-floods-local-roads/

Future Flood Risks

According to the U.S. Geological Survey (USGS), average annual stream temperatures have increased by 1.1°F (.61°C) in the past six decades in the Chesapeake Bay Watershed[15].

In a study conducted by the Virginia Institute of Marine Science, the institute found temperatures are increasing by nearly 0.5°F per decade and rising nearly twice as fast as global surface ocean water temperatures, and the average annual surface water temperature in the Bay had warmed by 1.3°F since the late 1980s[16]. Within the next 50 years (by 2070), Isle of Wight County can expect a yearly average of 32 to 55 days above 95°F, with associated increases in cooling costs, reduced air quality, and heat-related illnesses[17]. These heightened temperatures will bring more frequent and intense rainfall events, which may cause more flooding in the County, including coastal and low-lying areas[18].

The Isle of Wight County Community Climate Outlook report explains heavy rainfall is increasing in frequency and intensity, causing property damage, septic backups, and impacts to water quality in wells, local streams, mold and indoor air quality issues, and the Chesapeake Bay[19]. Annual rainfall in Isle of Wight will likely increase by an average of 2 inches (2050-2079 average compared to the 1990-2019 average)[20]. There are 2,636 properties in Isle of Wight County at risk of flooding over the next 30 years. This represents 12.6 percent of all properties in Isle of Wight County.

FEMA Flood Insurance Rate Maps (FIRM)
Isle of Wight County participates in the National Flood Insurance Program (NFIP) and relies on FEMA FIRMs as the primary resource for assessing flood zones and determining flood elevations. These maps provide crucial information about flood risk areas and help guide development decisions. The FEMA Flood Map Service Center has flood hazard information for the County.

As a result, Virginia now mandates the use of living shorelines in place of hardened structures like riprap and bulkheads for shoreline management. A living shoreline is an erosion prevention tactic that could adapt to changing water levels and increased storm activity resulting from climate change[21].

The National Oceanographic and Atmospheric Administration's (NOAA) Mid-Atlantic Regional Integrated Sciences and Assessments (MARISA) Team has developed a tool to predict rainfall intensities of future storm events[22]. This tool can be used to project annual rainfall totals in the County.

[15] Chesapeake Bay Foundation, Climate Change - Chesapeake Bay Foundation (cbf.org)
[16] Chesapeake warming faster than ocean surface, study shows | Climate Change | bayjournal.com
[17] Page 2, Community Climate Outlook, Isle of Wight County, VA
[18] Page 98, Intergovernmental Panel on Climate Change (IPCC) 2023 Climate Change Synthesis report
[19] Page 2, Community Climate Outlook, Isle of Wight County, VA
[20] Page 2, Community Climate Outlook, Isle of Wight County, VA
[21] Chesapeake Bay Foundation
[22] NOAA Mid-Atlantic RISA Team

Sea Level Rise

The features that make shorelines attractive to residents and visitors also present risks due to sea level rise. The Hampton Roads region is vulnerable to flooding and sea level rise due to the combination of rising seas and subsidence (the sinking of land). Subsidence affects Isle of Wight County due to historic large withdrawals of groundwater by local industry. [23]

Approximately 13 of the 222 linear miles of Isle of Wight shoreline are defended by structural shoreline erosion control structures such as riprap, breakwaters, and bulkheads. [24] Areas in Isle of Wight County at risk of sea level rise between now and 2100 include the low-lying reaches of Lawnes Creek, James River, Jones Creek, Pagan River, Cypress Creek, and Chuckatuck Creek, and their tributaries (Figure 10). [25]

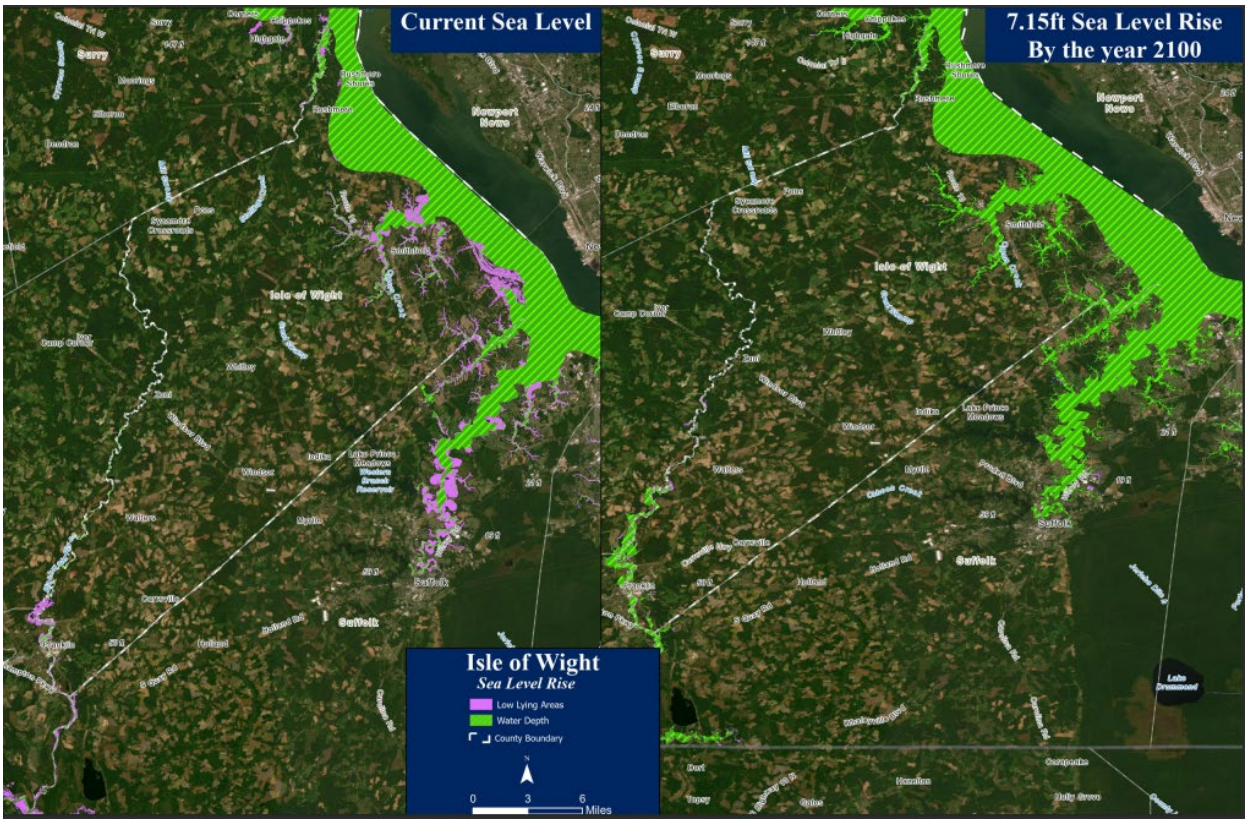


Figure 10: Isle of Wight County, Virginia Estimated Sea Level Rise by The Year 2100

[23] Isle of Wight County, Virginia, Preserve The Isle
[24] Virginia Institute of Marine Science, 2017 Survey of upland tidal shorelines in the County (Source: IOW Envision Plan)
[25] Page 7, IOW Envisioning the Isle: Preserving the Isle

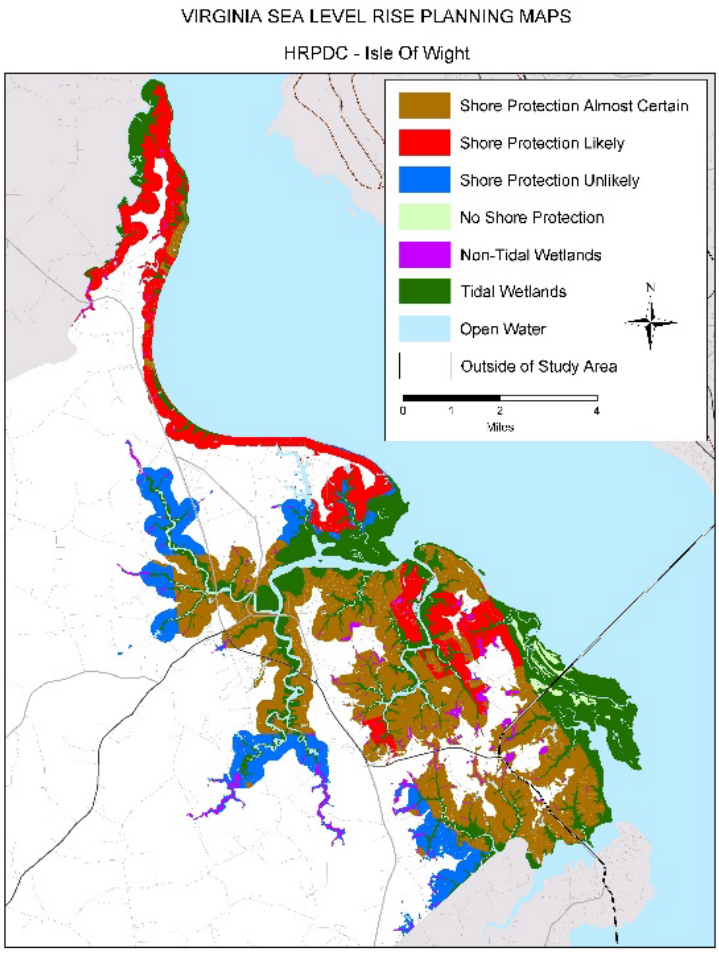


Figure 11: IOW County Sea Level Rise Planning Map

Floodplains and wetlands function as filters for runoff and storage for stormwater, help protect water quality and help protect property from damage caused by flooding and erosion. Additionally, as saltwater from rising sea levels infiltrates groundwater, it poses a threat to drinking water and agriculture. Isle of Wight County is actively monitoring and managing saltwater intrusion to safeguard water resources. This includes measures to prevent farmland abandonment due to salinity and investments in desalination treatments[26]. With sea levels rising and land continuing to subside, there is an increasing threat of septic system failure. The County is looking to update data and maps on the number and location of septic systems to better plan for potential environmental and public health impacts of system failures. Currently, the Chesapeake Bay septic tank pump-out program, which began in 2008, requires routine pump-outs for septic tanks located in designated CBPAs at least once every five years[27]. Approximately 25 percent of homes nationwide rely on on-site septic systems, and most septic system failures are related to inappropriate design and poor

[26] Page 1, Community Climate Outlook, Isle of Wight County, VA
[27] Isle of Wight County, VA, Septic Tank Pump Out Program

maintenance[28]. Proper maintenance, including regular pump-outs, can significantly extend the useful life of on-site septic systems[29].

Marsh migration is a process of non-wetland coastal plants, like pine trees, dying due to storms and saline soils at the marsh border, then marsh plants growing in their place. This is a natural process that has always taken place a bit at a time but has escalated with sea-level rise. When marshes move inland, they can also transform or destroy other ecosystems, such as forested areas or arable agricultural land. Man-made barriers like roads, canals, and seawalls can prevent marshes from migrating inland.

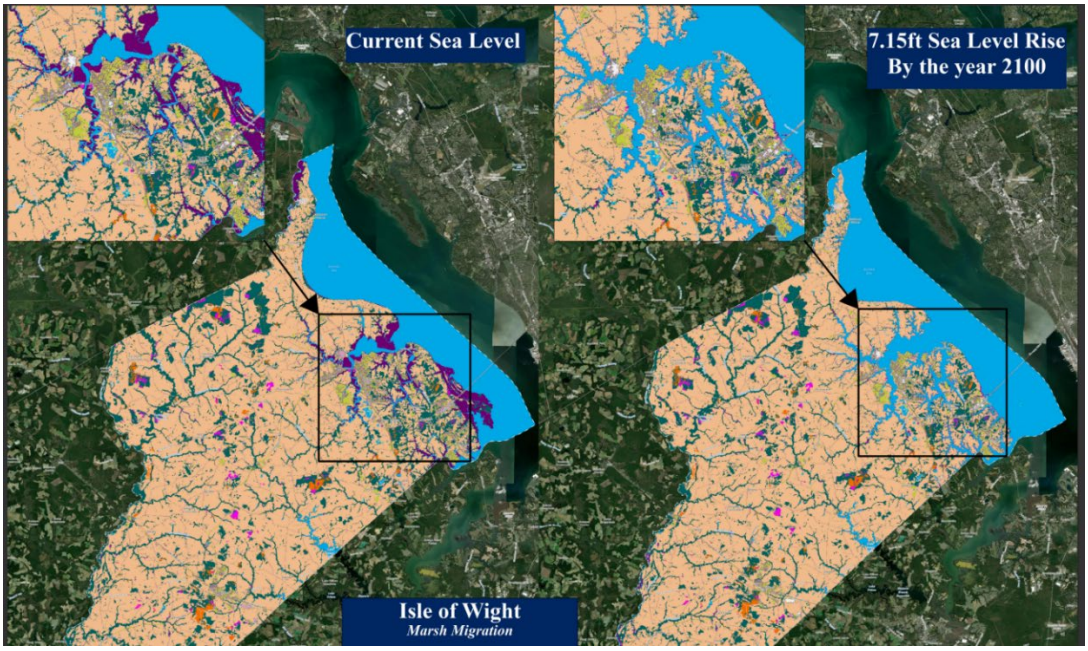


Figure 12: Isle of Wight Marsh Migration by The Year 2100

Land Cover Type	Current Sea Level Percent	7ft Sea Level Rise Percent	Percent Change
High Intensity Development	0.19	0.19	0
Medium Intensity Development	0.86	0.86	0
Low Intensity Development	2.65	2.65	0
Developed Open Space	1.49	1.49	0
Upland	62.70	62.14	-0.56
Freshwater Forested Wetland	14.95	13.68	-1.27
Freshwater Scrub Wetland	1.16	1.11	-0.05
Freshwater Emergent Wetland	0.67	0.92	+0.25
Brackish/Transitional Marsh	2.19	0.29	-1.9
Unconsolidated Shore	0.04	0.24	+0.20
Water	13.10	16.42	+3.32

Figure 13: Marsh Migration Percent Change Over Time

[28] Isle of Wight County, VA, Septic Tank Pump Out Program
[29] Septic Tank Hotline, Isle of Wight County, VA, Septic Tank Cleaning and Pumping

Storm Surge

While the total annual rainfall is increasing, the greatest impact to flood resilience is the flooding and excess water brought by increasingly intense storm and rainfall events. The County's coastline is susceptible to storm surges caused by hurricanes and tropical storms. These surges result from strong winds pushing seawater onto land, leading to rapid coastal inundation. According to a report, Recurrent Flooding Study for Tidewater Virginia submitted to the Virginia General Assembly, Isle of Wight County's predicted vulnerability to sea level rise and storm surge involves 204,515 acres of land, 0.04 percent of the area potentially flooded, 0.02 percent of that area developed, and five road miles potentially flooded in these events.

Presidential Disaster Declarations from 1972 to 2020: Isle of Wight County, Virginia

Year	Disaster #	Event
1972	339	Tropical Storm Agnes
1996	1086	Blizzard of 1996
1996	1135	Hurricane Fran
1999	1293	Hurricane Floyd
2000	1318	Severe Winter Storms
2003	1491	Hurricane Isabel
2005	3240	Hurricane Katrina Evacuation
2006	1661	Tropical Depression Ernesto
2009	1862	Tropical Depression Ida and a Nor'easter
2011	4024	Hurricane Irene
2016	4291	Hurricane Matthew
2018	4401	Hurricane Florence
2020	4512	COVID-19 Pandemic

In late August 2011, Hurricane Irene, a tropical cyclone, had significant impacts on Isle of Wight County, Virginia. Hurricane Irene brought torrential rains to the region, leading to flash flooding. The relentless rainfall caused widespread property damage and the storm surge increased water levels in Isle of Wight Bay. Throughout the Eastern Seaboard, Irene delivered substantial rainfall (more than 7 inches in many locations), exacerbating existing saturation from summer rains.

In recent storm events, such as during Tropical Storm Ophelia, Isle of Wight County was under tropical storm and storm surge warnings. The National Weather Service (NWS) forecasted wind speeds of 20 to 30 mph with gusts up to 45 mph. The storm surge warning indicated potential for life-threatening flooding, reaching 2 to 4 feet above ground level as water moved inland from the coastline.

The approximate storm surge levels for Isle of Wight County have been mapped based on different hurricane categories (1, 2, 3, and 4) as determined by the U.S. Army Corps of Engineers. Surge levels vary based on the severity of the storm (Figure 14).

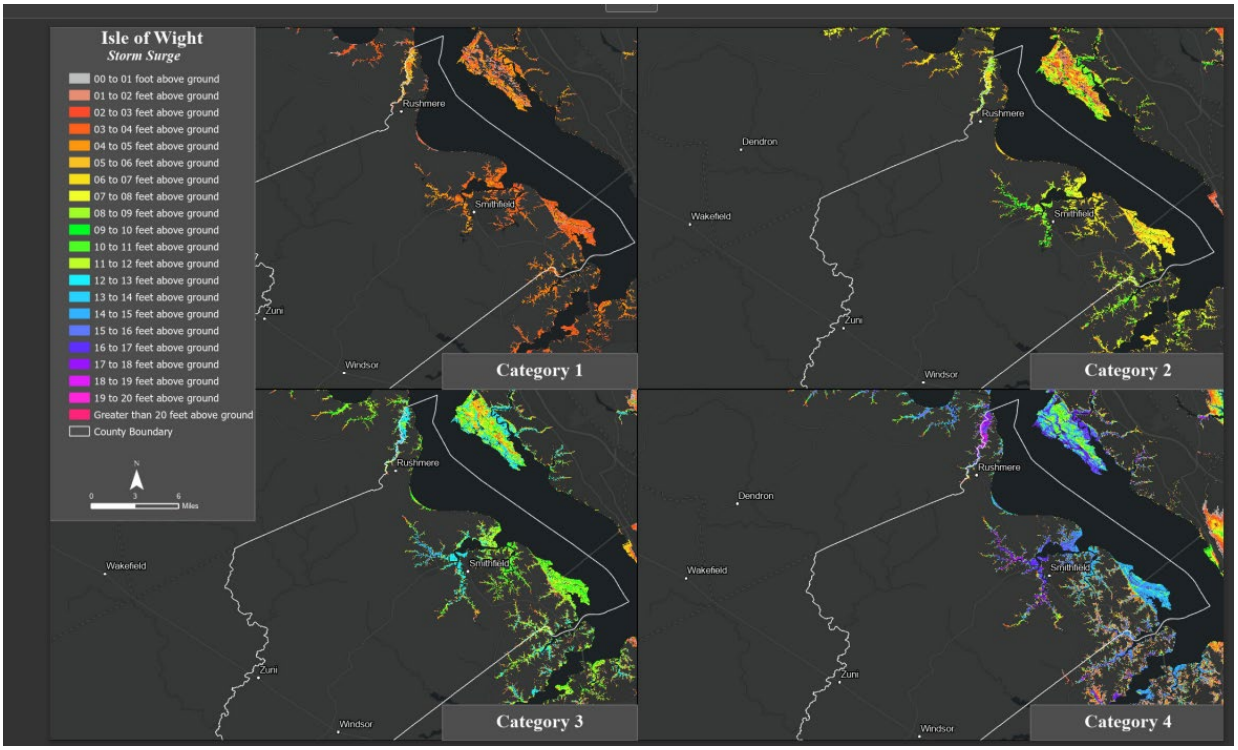


Figure 14: Isle of Wight Coastal Area Storm Surge Map Based on Hurricane Category

Critical Facilities

Pinpointing critical infrastructure supports communities in developing protective measures, reducing the risk of system failures, and minimizing flood-related consequences. The Isle of Wight County Department of Utility Services owns and maintains the County owned water systems. There are 17 independent water systems that fall under the maintenance and control of the County (Figure 15).

- Three of the water systems (the Newport Development Service District, the Windsor Development Service District, and the Camptown Development Service District) purchase water from the adjacent municipalities (the City of Suffolk, the Town of Windsor, and the City of Franklin, respectively) and distribute the water to the customers.
- There is an elevated water storage tank located in each of these development service districts. The Newport Development Service District (NDSD) has 3 MGD available to it through a long-term purchase agreement with the City of Suffolk; with a current average daily demand of 0.7 MGD.
- Gatling Point is a local community distribution system where water is purchased from the Town of Smithfield. Water is distributed through a County owned distribution system.
- The remaining thirteen water systems consist of a local well system with storage tanks, a pump station and local distribution piping. There is an elevated water storage tank at the Courthouse system.

In the event of a disaster, the *Public Utilities Emergency Response Plan* has core response procedures for sampling and testing water and providing alternate water supplies along with information on primary utility components and key points of contact for addressing issues such as debris clearing, which would be critical in addressing drainage issues. The Isle of Wight Emergency Operations Plan designates lines of authority for addressing the key functions of Isle of Wight Utility Services to include Public Utilities and Storm Water.

> Critical Infrastructure – Systems and assets, whether physical or virtual, so vital to the community, the Commonwealth, or the nation that the incapacity or destruction of such systems and assets would have a debilitating impact on security, economic security, public health or safety, or any combination of those matters.

Approximately 80 percent of the drinking water systems in the County rely on groundwater. The primary water systems in both Windsor and Smithfield are also groundwater wells. To address increased demand, the County is planning a new water line extension from the City of Suffolk.

In addition to concerns about diminished supply of groundwater and water supply costs, the County also has planned initiatives to mitigate against the increased maintenance and repair costs associated with more frequent and severe weather events.

By identifying and safeguarding critical water facilities, communities can ensure uninterrupted access to safe water, mitigating health risks associated with floods. Additionally, water and wastewater services are lifelines for businesses and the overall economy.

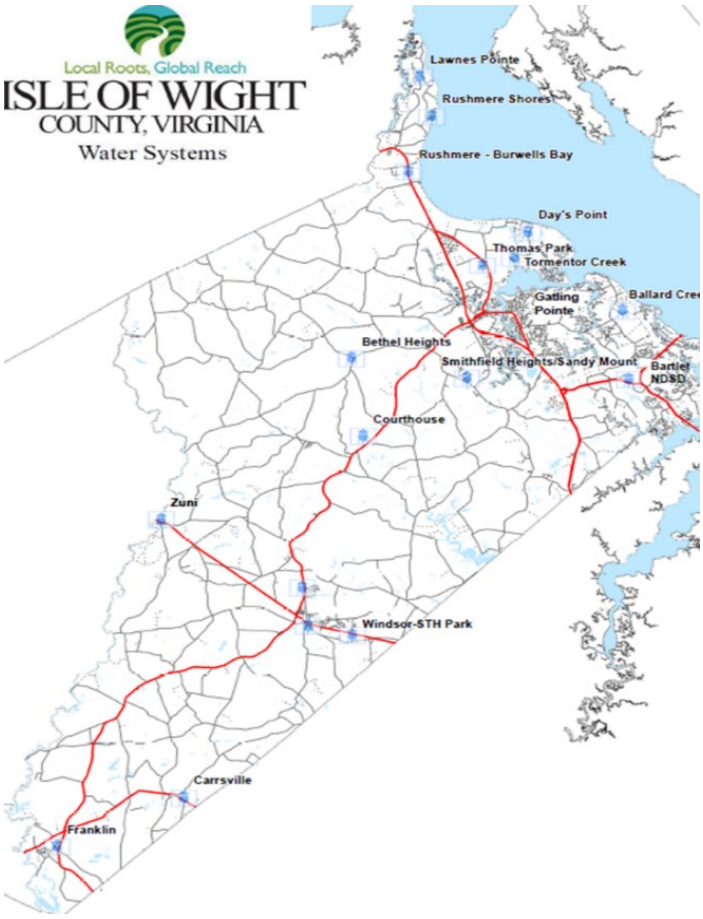


Figure 15: IOW County Water Systems Map

The County does not own any wastewater treatment plants; however, it does own a public sewer service system comprising of gravity sewer, force mains, and pump stations in each of the three DSDs. The County owns 32 pump stations providing services to approximately 2,850 customers. Figure 16 overlays areas of flood risk (100 year floodplain) and areas outside the public sewer system.

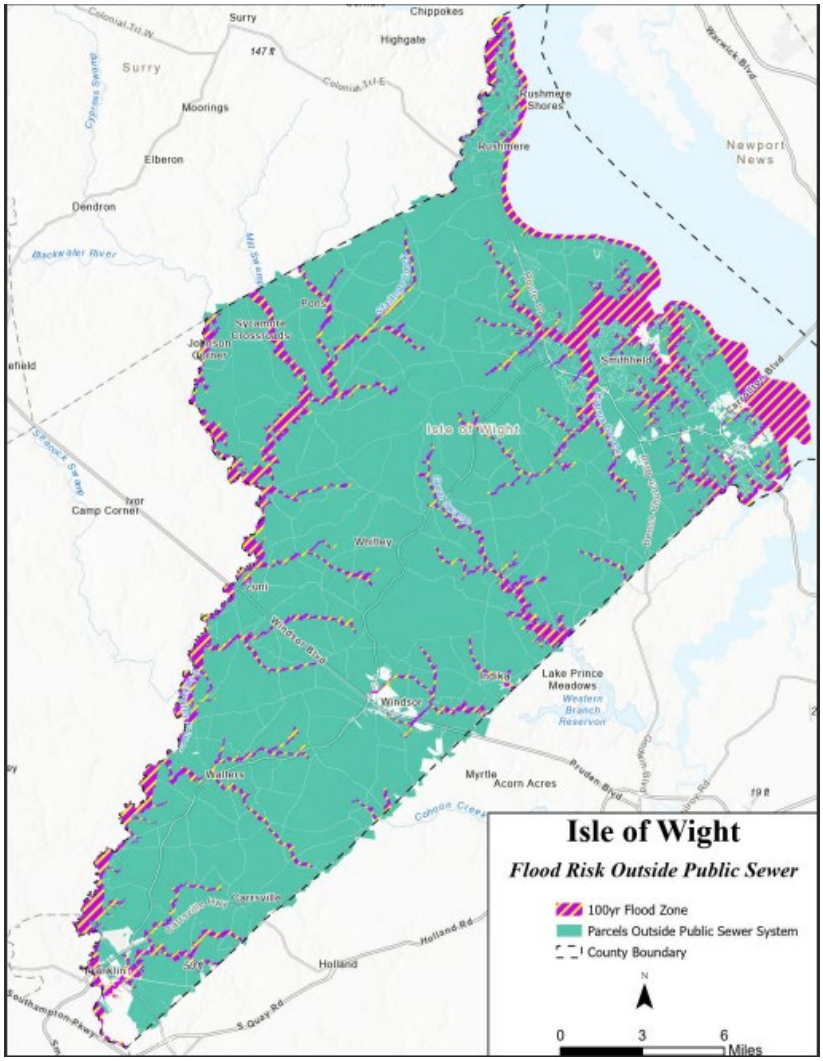


Figure 16: Isle of Wight Flood Risk Outside of Public Sewer

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3.0 Social Vulnerability and Equity

Social vulnerability refers to the characteristics of an individual or group that impacts their ability to anticipate, cope with, resist and recover from a physical hazard. As social vulnerability in a population increases, their resiliency to natural hazards decreases[30]. Socially vulnerable populations may be identified based on age, income, race/ethnicity, gender, education, disability, health status, and other factors. These individuals and communities may face higher risks than others due to their having less capacity to anticipate, respond to, recover from, and adapt to climate and weather-related events. Disadvantaged groups, particularly those with lower incomes, endure the brunt of the physical and economic consequences of such disasters, exacerbating the challenges of recovery. Proactive public outreach and awareness campaigns to engage and empower these communities can significantly contribute to enhancing flood resiliency.

Isle of Wight Demographics

Per Capita Income

$45,230

Mean income for 20% of households with lowest income is **$19,988**

19.3 %

of residents are 65 years and older

7.6%

of residents are over the age of 75

~8.50%

Families below the poverty threshold.

Poverty rate among those who worked:

- Full-time for the past 12 months - 2.28%
- Part-time for the past 12 months - 11.18%,
- Those who did not work - 14.74%.

14.7 %

Individuals who are disabled

Hearing Difficulty	4.3%
Vision Difficulty	2.2%
Cognitive Difficulty	5.2%
Ambulatory Difficulty	8.2%
Self-Care Difficulty	2.8%
Independent Living Difficulty	6.4%

4.7%

Individuals who speak a language other than English at home

Racial Demographics

72.7% - Caucasian
22.7% - Black or African American
1.1 % - Asian
4.6% -Hispanic or Latino

Figure 17: Isle of Wight Demographics

Sources:

U.S. Census Bureau, QuickFacts: Isle of Wight County, Virginia, 2023
U.S. Census Bureau, Older Population by Age, Isle of Wight County, Virginia, 2022
U.S. Census Bureau, Disability, Isle of Wight County, Virginia, 2022
Neilsberg, 2024, Isle of Wight County, VA Median Household Income: Trends, Analysis, and Key Findings

[30] ADAPTVA, Evidence based planning for changing climate.

The County is classified as moderately socially vulnerable based on the ADAPT VA Social Vulnerability Index. Figure 18 shows Smithfield in Sile of Wight County, which has moderately high social vulnerability according to the AdaptVA Vulnerability Viewer.



Figure 18: AdaptVa Social Vulnerability Map Highlighting Smithfield

The City of Franklin is located adjacent to the County and contains projects that are related to the Isle of Wight County. The City of Franklin is classified as very highly socially vulnerable based on the ADAPT VA Social Vulnerability Index (Figure 19).

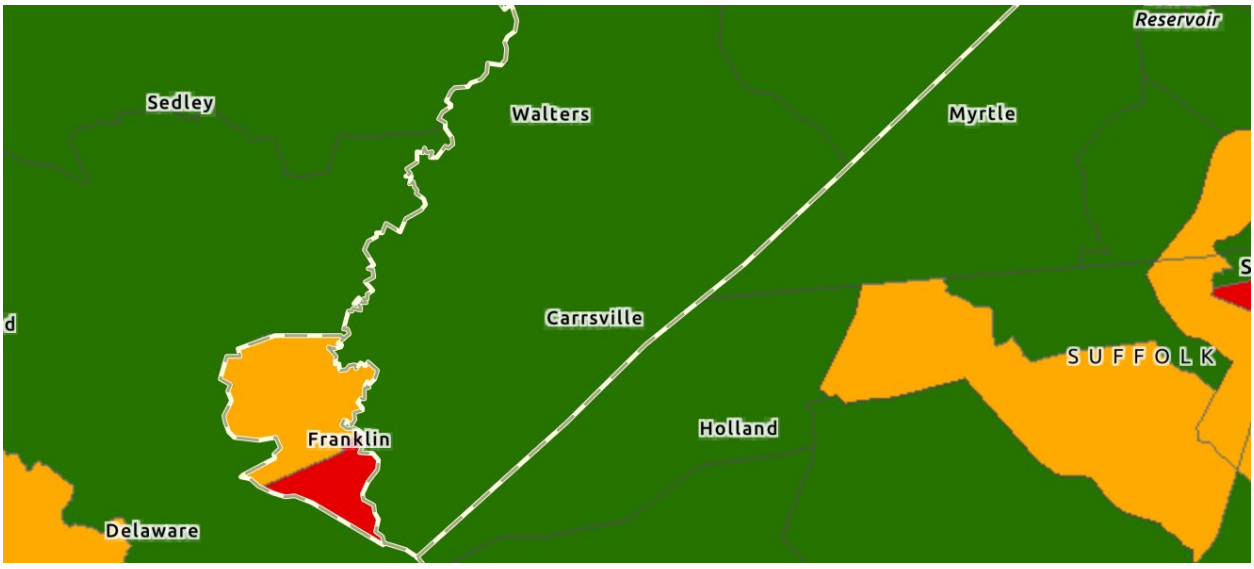


Figure 19: AdaptVa Social Vulnerability Map Highlighting City of Franklin

Figure 20 shows social vulnerability based on the Center for Disease Control's (CDC's) Social Vulnerability Index (SVI). Darker blue areas have higher rates of social vulnerability. This map is overlaid with 100-year flood zone data to show areas of flood risk with populations that may have more severe impacts from disaster events.

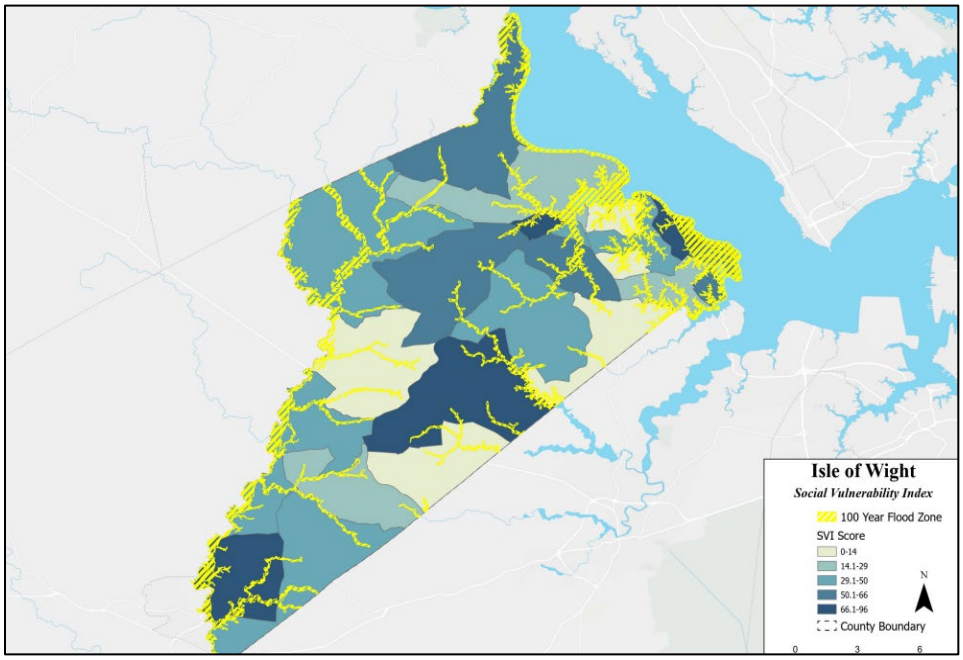


Figure 20: CDC Social Vulnerability Index (SVI), Isle of Wight County

Some of the socioeconomic factors contributing to vulnerability in the County in select spots include a moderately high elderly population, moderately high dependency on social security, high nursing home population, moderately high poverty levels, and lower levels of education.

Isle of Wight County has incorporated consideration of vulnerable population in its comprehensive planning process. The County is focused on mitigating flood impacts for all residents and providing quality water and wastewater services to all customers. The Isle of Wight Public Utilities Department is committed to meeting the present and future water needs of all their customers, and to meeting or exceeding federal, state, and local regulatory requirements.

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4.0 Natural Resource Flood Protection

Ecosystems play a large role in flood reduction and water management. Riparian buffers and bottomland areas along riverbanks and floodplains act as natural sponges, absorbing excess water during heavy rainfall or flooding events[31]. The dense root systems of trees like bald cypress and oak help stabilize soil and prevent erosion.

Riparian Buffer Protection

According to the Virginia Department of Forestry, the Chesapeake Bay Preservation Act and regulations require that a 100-foot-wide vegetated buffer be located adjacent to and landward of all tidal shores, wetlands, non-tidal wetlands connected to tidal wetlands, or along water bodies with perennial flow. These features comprise the Resource Protection Area (RPA). The buffer must be 35 to 300 feet wide and be intact for 15 years[32].



Figure 21: Example of riparian buffers along the James River. Source: Bay Journal, James River grants to pay for riparian buffers, precision ag techniques, 2020

Riparian buffers, which are vegetated areas along water bodies, serve as protective zones. They filter pollutants, slow down floodwaters, and provide habitat for wildlife. By retaining vegetation along stream channels, landowners can contribute to flood reduction efforts. Trees such as bald cypress play a vital role in floodplain ecosystems[33]. Additionally, properly managed longleaf pine forests contribute to flood reduction. These slow-growing pine trees have extensive root systems that stabilize soil and enhance water infiltration. Longleaf forests also support a diverse

[31] Virginia Department of Conservancy and Recreation, Riparian Buffers Modification & Mitigation Guidance Manual, 2006
[32] Virginia Department of Forestry, Riparian Forest Buffers
[33] Virginia Department of Forestry, Field Notes: A Tale of Cypress Trees and Floods, 2018

groundcover of up to 300 species of plants per acre, further aiding in water retention and flood mitigation[34].

In the short term, the County aims to develop a riparian buffer protection strategy to safeguard sensitive natural resources and property values[35]. The strategy will focus on establishing protective measures for soil capacity and water features, including tidal and non-tidal wetlands, floodplains, and coastal areas. The strategy will involve developing a specific plan for the Blackwater River Watershed to maintain riparian buffers, which are vegetated areas along water bodies that help filter pollutants, prevent erosion, and support aquatic ecosystems. This approach is part of a broader effort to enforce local stormwater management programs and collaborate with the Virginia Department of Transportation to maintain roadside ditches, ultimately preventing flooding and protecting water quality.

Developing a riparian buffer protection strategy for the Blackwater River Watershed will help enhance water quality by limiting sedimentation and pollutants carried by runoff. This will ensure environmental preservation and manage growth sustainably within the County. According to the Virginia Department of Forestry, to implement riparian buffers, landowners can follow steps such as land preparation, tree planting, and maintenance[36]. Various cost-share programs are available to support buffer establishment[37]. Additionally, protecting natively vegetated riparian buffers of at least 100 feet on both sides of perennial tributaries or 200 feet on both sides of designated waters is recommended to minimize impacts. This strategy is a useful alternative to flood mitigation as riparian forest buffers filter pollutants, reduce flood volume, and provide habitat for wildlife. These buffers contribute to overall water quality improvement and flood risk reduction.

Wetlands

Coastal wetlands, including salt marshes and freshwater marshes, act as natural buffers against storm surges and flooding. Their vegetation absorbs excess water, dissipates wave energy, and provides habitat for various species. In the context of rising sea levels, preserving and restoring these wetland ecosystems becomes crucial. They reduce flood risk and support biodiversity and water quality. Overall, Isle of Wight County benefits from a combination of natural ecosystems that work together to manage floodwaters, protect water quality, and enhance resilience against climate-related challenges. These ecosystems play a vital role in maintaining a balance between human development and environmental conservation.

Wetlands, which are found throughout the Commonwealth, serve as diverse ecological habitats for various plant and animal species. Beyond their ecological importance, wetlands also play a role in flood reduction by protecting downstream properties from flood damage. Their effectiveness in

[34] USDA, Longleaf Pine Initiative Virginia
[35] P. 29, Isle of Wight County, Envisioning the Isle County Masterplan, 2020
[36] Virginia Department of Forestry, Plant Riparian Buffers
[37] Virginia Department of Forestry, Plant Riparian Buffers

mitigating floods depends on several factors, including the wetland's size, its proximity to floodways, the type of vegetation it contains, and the condition of soil before flooding occurs.

The wetland geographic information system (GIS) data in Isle of Wight County incorporates information from the National Wetland Inventory and wetlands that have been delineated and confirmed by the U.S. Department of Fish and Wildlife[38]. According to this data, wetland systems are more present on the coastal side of the County. Notably, some of the larger wetland systems are found along the James River and in the eastern portion of the County. The majority of these wetlands are classified as palustrine scrub-shrub (PSS) and palustrine forested (PFO) as they are non-tidal wetlands dominated by wood trees and shrubs[39]. The County is taking the initiative to preserve and enhance wetland systems to safeguard their natural resources and maintain the valuable flood abatement services that wetlands provide to surrounding properties. To ensure long-term resilience in the face of climate change, Isle of Wight County will continue pursuing natural and nature-based resiliency projects, such as stream restoration and floodplain reconnection.

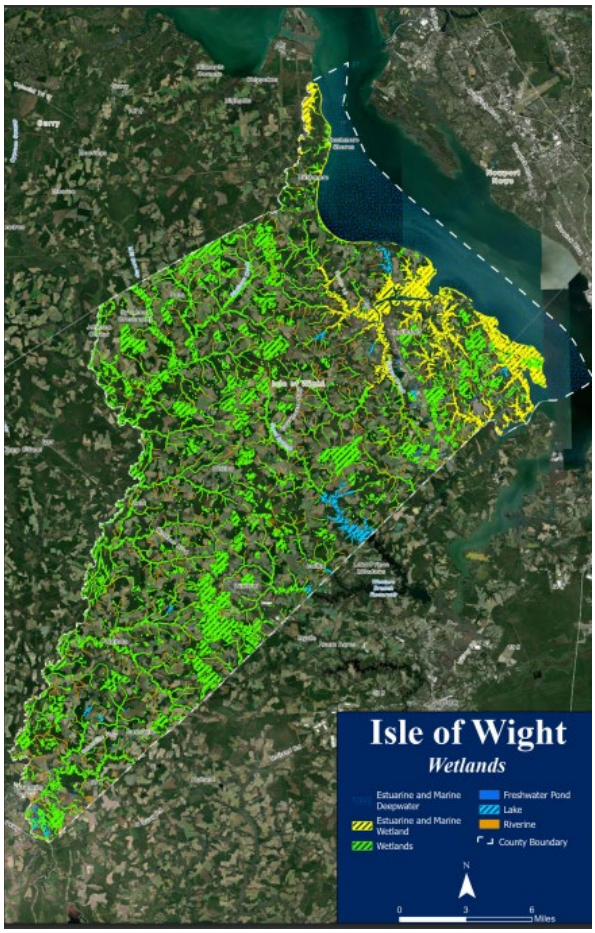


Figure 22: Isle of Wight Wetlands

[38] U.S. Department of Fish and Wildlife, National Wetlands Inventory
[39] Isle of Wight County, Virginia, Wetlands

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5.0 Planning and Regulatory Flood Mitigation Measures

In Isle of Wight County, well-defined protocols and programs play a crucial role in shaping flood prevention and mitigation efforts. These structured guidelines provide a roadmap for County staff, ensuring effective implementation of strategies to combat flooding and associated hazards. When flood events impact the community, these protocols offer valuable guidance. Isle of Wight remains committed to advancing flood resilience by consistently issuing a variety of procedures, protocols, and policies. Notably, the County's development procedures and flood-related protocols contribute to this ongoing process. As the landscape evolves, stormwater management and flood prevention remain top priorities for Isle of Wight.

Floodplain Ordinances, Regulations, and Municipal Codes

Flood Insurance

After a flood, federal flood relief support for the County has been established through the County's participation in the NFIP and Community Rating System (CRS) Program administered through FEMA[40]. The NFIP is a voluntary initiative that communities can join to enhance flood resilience. To participate, a community like Isle of Wight County, Virginia, must complete an application, adopt a resolution expressing intent to cooperate with FEMA, and submit a floodplain management ordinance that meets or exceeds the minimum NFIP criteria. By participating, the community gains access to federally-backed flood insurance for its residents. Additionally, the NFIP status has implications for disaster assistance to both the community and its citizens. The NFIP acts as a risk management tool for property owners in floodplains through flood insurance and has significant cost-saving associated benefits in that the insurance is federally-backed and receives CRS discounts.

Since the County participates in the NFIP, the County uses the FEMA FIRMs as the primary tool for assessing flood zones and elevations[41]. The NFIP regulations impose minimum standards for development within flood zones, including requirements related to building elevation and flood-proofing. It's important to note that the Uniform Statewide Building Code mandates construction consistent with FEMA standards. DCR oversees FEMA regulations at the state level. The County's Zoning Ordinance (Appendix B) addresses floodplain management at the local level through the Floodplain Overlay District[42].

[40] Floodplain Management, Isle of Wight County, VA
[41] FEMA, Map Service Center
[42] Isle of Wight County, Virginia, Code of Ordinances, Appendix B- Zoning

Stormwater Management Ordinances and Laws

Isle of Wight County has established a Virginia Stormwater Management Program (VSMP) for land-disturbing activities and adopted state regulations for stormwater management[43]. The program is administered by the director of utility services or a designated official. The ordinance sets utility fees to fund the County's stormwater assets and outlines requirements to regulate stormwater runoff from developments to mitigate flooding, erosion, and pollution. The ordinance specifies that all land development projects disturbing an acre or more, or 2500 square feet within the Chesapeake Bay Watershed, must comply with the chapter's requirements, except for certain exemptions like single-family residences not part of a larger plan[44]. Maintenance and inspection procedures are used to ensure facilities meet water quality standards. Finally, the ordinance includes provisions for emergency land-disturbing activities, requiring notification of the VSMP authority within seven days.



Figure 23 Chuckatuck Creek, Isle of Wight County

Additionally, the Clean Water Act (CWA) is a federal law aimed at restoring and maintaining the chemical, physical, and biological integrity of the nation's waters[45]. While the CWA primarily applies at the federal level, it sets guidelines and standards that states and localities must follow. Isle of Wight County's stormwater management program aligns with the CWA's goals by addressing water quality and runoff control.

Floodplain Management Overlay District

Local floodplains are managed by the Floodplain Management Overlay (FPMO) District found under Article VI of the Isle of Wight County Zoning Ordinance. The ordinance delineates flood zones based on relevant FIRMs, specifying the frequency and type of flooding that may occur in a given area and the associated extent. The purpose of the FPMO District is to limit certain types of development within the 100-year floodplain to protect life and property. The 100-year floodplain refers to land that, on an annual basis, stands a one percent chance of flooding.

[43] Isle of Wight County, Virginia, Code of Ordinances, Chapter 14A. Stormwater Management
[44] Isle of Wight County, Virginia, Code of Ordinances, Chapter 14A. Stormwater Management
[45] Wetlands Watch, Federal Laws and Regulations

The FPMO District regulations cover various criteria, including[46]:

- Location within the floodplain: The 100-year floodplain represents areas that have a one percent chance of flooding in any given year. Properties falling within this floodplain are subject to specific regulations to enhance flood resilience.
- Residential development and construction: Limiting construction in flood-prone areas. Structures built within the FPMO District must adhere to flood-resistant construction standards.
- Hazardous materials: The FPMO District addresses the handling and storage of hazardous materials near floodplains. Proper management of hazardous substances is essential to prevent contamination during floods.
- Filling in the floodplain: Regulating land alterations. These restrictions include limitations on residential construction, filling, and alterations to land. The goal is to prevent development that could exacerbate flood risks or endanger life and property.
- Non-structural development: Addressing other flood-related issues.
- Flood insurance eligibility: Communities with effective floodplain management programs qualify for flood insurance through the NFIP.

To qualify for flood insurance, communities must have a floodplain management program. The official FIRMs, published by FEMA, show the 100-year floodplain and other flood classifications. For development purposes, new structures are typically located outside the 100-year floodplain (in Zone X), where the annual chance of flooding is lower (0.2 percent). Some parts of the 100-year floodplains have determined Base Flood Elevations (BFEs) based on hydrologic studies, while other areas have estimated floodplain elevations using topographic maps[47].

[46] ELaws.US, Article VI. Overlay Districts, 2024.
[47] Floodplain Management, Isle of Wight County, VA

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6.0 Resilience Projects

Isle of Wight has been actively working with local, state, federal, and nongovernmental partners to support resilience initiatives. Isle of Wight County has initiated a number of flood and stormwater management projects to increase the County's resilience. These projects focus on stream and floodplain restoration, addressing failing septic systems, retrofitting stormwater facilities, and implementing Best Management Practices (BMPs). The James and Chowan Watersheds, which historically experience significant flooding, are key geographic areas of focus.

> Per the Nov. 5, 2021, grant manual for the Virginia Community Flood Preparedness Fund, "Project" means activities that include the development of flood protection facilities, acquisition of land, restoration of natural features or other activities that involve design, construction or installation of facilities. Activities such as design necessary to ensure projects meet their intended purpose will be considered part of the project.

Some of the projects are conceptual, and further engineering assessments are necessary to determine their feasibility and cost-effectiveness. Potential sources of funding include USDA Rural Development (RD) Community Development Block Grant (CDBG), Virginia Department of Health (VDH), Virginia Department of Environmental Quality (DEQ), and the Virginia Resource Authority (VRA).

The County recognizes the importance of incorporating nature-based solutions, and to identify and address social inequities in project development and implementation. The projects are outlined on the following pages with information provided, as available, for each of the following topics:

1. Project Description
2. Existing/Proposed Project
3. Addresses Recurrent/Repetitive Flooding (Y/N)
4. Nature based Solution (Y/N)
5. Existing Local Plan(s) that Include Project (if applicable)
6. Interjurisdictional/Regional Project (Y/N)
7. Implementation Timeframe
8. Projected Cost
9. Anticipated/Potential Funding Source(s)

1. Project Name: Clyde's Dale Mobile Community Septic Sewer Conversion

1. Project Description	Clyde's Dale Mobile Community is a low-income community that has a septic tank and field that is located in a low-lying and flood-prone area of the County. The project will convert the community from septic to sanitary by connecting the septic system by pump station to prevent the risk of the septic system from being inundated by flood waters.
2. Existing/Proposed Project	Proposed
3. Addresses Recurrent/ Repetitive Flooding (Y/N)	Y
4. Nature based Solution (Y/N)	N
5. Existing Local Plan(s) that Include Project (if applicable)	Envisioning The Isle Comprehensive Plan
6. Interjurisdictional/ Regional Project (Y/N)	Y (HRSD)
7. Implementation Timeframe Short Term - 0-5 yrs.; Mid Term - 6-10 yrs. Long Term - 10+ yrs.; Ongoing	Short-Term
8. Projected Cost	$858,000
9. Anticipated/Potential Funding Source(s)	Unknown

2. Project Name: Thomas Park Septic Sewer Conversion

1. Project Description	Thomas Park is a low-income community that has a septic tank and field that is located in a low-lying and flood-prone area of the County. The project will convert the community from septic to sanitary by connecting the septic system by pump station to prevent the risk of the septic system from being inundated by flood waters.
2. Existing/Proposed Project	Proposed
3. Addresses Recurrent/ Repetitive Flooding (Y/N)	Yes
4. Nature based Solution (Y/N)	No
5. Existing Local Plan(s) that Include Project (if applicable)	Envisioning the Isle Comprehensive Plan
6. Interjurisdictional/Regional Project (Y/N)	Y (HRSD)
7. Implementation Timeframe Short Term - 0-5 yrs.; Mid Term - 6-10 yrs. Long Term - 10+ yrs.; Ongoing	Short-Term
8. Projected Cost	$1,000,000
9. Anticipated/Potential Funding Source(s)	Unknown

3. Project Name: Orchard Lane Conversion to Sanitary Sewer

1. Project Description	Orchard Lane is a low-income community that has a septic tank and field that is located in a low-lying and flood-prone area of the County. The project will convert the community from septic to sanitary by connecting the septic system by pump station to prevent the risk of the septic system from being inundated by flood waters.
2. Existing/Proposed Project	Proposed
3. Addresses Recurrent/ Repetitive Flooding (Y/N)	Yes
4. Nature based Solution (Y/N)	No
5. Existing Local Plan(s) that Include Project (if applicable)	Envisioning The Isle Comprehensive Plan
6. Interjurisdictional/ Regional Project (Y/N)	Yes (HRSD)
7. Timeframe Short Term - 0-5 yrs.; Mid Term - 6-10 yrs. Long Term - 10+ yrs.; Ongoing	Short-Term
8. Projected Cost	$1,000,000
9. Anticipated/Potential Funding Source(s)	Unknown

4. Project Name: Carisbrooke by Ragged Island Creek Pump Station Relocation

1. Project Description	Modify/relocate the existing pump station located in a flood-prone area to increase resilience of the County's sanitary sewer system.
2. Existing/Proposed Project	Proposed
3. Addresses Recurrent/ Repetitive Flooding (Y/N)	Y
4. Nature based Solution (Y/N)	N
5. Existing Local Plan(s) that Include Project (if applicable)	NA
6. Interjurisdictional/Regional Project (Y/N)	N
7. Timeframe Short Term – 0-5 yrs.; Mid Term – 6-10 yrs. Long Term – 10+ yrs.; Ongoing	Mid-Term
8. Projected Cost	Unknown
9. Anticipated/Potential Funding Source(s)	Unknown

5. Project Name: Windsor High School Outfall Drainage Study

1. Project Description	Perform a study to determine the improvements needed to the outfall drainage system of the existing pond at Windsor High School, which experiences localized flooding due to downstream maintenance and capacity issues.
2. Existing/Proposed Project	Proposed
3. Addresses Recurrent/ Repetitive Flooding (Y/N)	Yes
4. Nature based Solution (Y/N)	No
5. Existing Local Plan(s) that Include Project (if applicable)	NA
6. Interjurisdictional/Regional Project (Y/N)	No
7. Implementation Timeframe Short Term – 0-5 yrs.; Mid Term – 6-10 yrs. Long Term – 10+ yrs.; Ongoing	Mid-Term
8. Projected Cost	$500,000
9. Anticipated/Potential Funding Source(s)	Unknown

6. Project Name: Windsor Ditch Vacuum Sewer Conversion

1. Project Description	Perform an engineering study to replace existing sewer vacuum systems throughout the County, focusing on systems in flood inundated areas to increase the flood resilience of the County's sewer system.
2. Existing/Proposed Project	Proposed
3. Addresses Recurrent/ Repetitive Flooding (Y/N)	Yes
4. Nature based Solution (Y/N)	No
5. Existing Local Plan(s) that Include Project (if applicable)	NA
6. Interjurisdictional/Regional Project (Y/N)	Y
7. Implementation Timeframe Short Term - 0-5 yrs.; Mid Term - 6-10 yrs. Long Term - 10+ yrs.; Ongoing	Long-Term
8. Projected Cost	Unknown
9. Anticipated/Potential Funding Source(s)	Unknown

7. Project Name: Ennis Pond Retrofit

1. Project Description	Retrofit Ennis Pond to address flooding issues. The emergency spillway of Ennis Pond has been breached several times over the last 10 years due to inadequate capacity for higher intensity events. The spillway was damaged by Hurricane Matthew in 2016 and was repaired by the County using FEMA funds later that year (Source).
2. Existing/Proposed Project	Proposed
3. Addresses Recurrent/ Repetitive Flooding (Y/N)	Yes
4. Nature based Solution (Y/N)	No
5. Existing Local Plan(s) that Include Project (if applicable)	NA
6. Interjurisdictional/Regional Project (Y/N)	No
7. Implementation Timeframe Short Term - 0-5 yrs.; Mid Term - 6-10 yrs. Long Term - 10+ yrs.; Ongoing	Mid-Term
8. Projected Cost	$1,000,000
9. Anticipated/Potential Funding Source(s)	Unknown

8. Project Name: County-Wide Stream Investigation

1. Project Description	County to perform preliminary investigations to assess stream restoration opportunities throughout the County.
2. Existing/Proposed Project	Proposed
3. Addresses Recurrent/ Repetitive Flooding (Y/N)	Y
4. Nature based Solution (Y/N)	Y
5. Existing Local Plan(s) that Include Project (if applicable)	NA
6. Interjurisdictional/Regional Project (Y/N)	N
7. Implementation Timeframe Short Term - 0-5 yrs.; Mid Term - 6-10 yrs. Long Term - 10+ yrs.; Ongoing	Long Term
8. Projected Cost	Unknown
9. Anticipated/Potential Funding Source(s)	Unknown

9. Project Name: Jamestown Community Flood Studies

1. Project Description	The Jamestown community dates back to the old Union Camp papermill in the early-mid 1900s. As the community has grown, localized flooding has become an issue. Studies are recommended to identify ways to provide relief. Natural and man-made solutions would benefit the community, as well as prevent sanitary sewer inflows.
2. Existing/Proposed Project	Proposed
3. Addresses Recurrent/ Repetitive Flooding (Y/N)	Y
4. Nature based Solution (Y/N)	N
5. Existing Local Plan(s) that Include Project (if applicable)	NA
6. Interjurisdictional/Regional Project (Y/N)	N
7. Implementation Timeframe Short Term - 0-5 yrs.; Mid Term - 6-10 yrs. Long Term - 10+ yrs.; Ongoing	Mid-Term
8. Projected Cost	Unknown
9. Anticipated/Potential Funding Source(s)	Unknown

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Appendix B: Isle of Wight Floodplain Management Regulations/Ordinances

Topic	Regulation/ Ordinance	Description
Floodplain Management	Article VI, Floodplain Management Overlay (FPMO) District	This district limits development in the 100-year floodplain to protect life and property. Regulations cover residential development, hazardous materials, floodplain filling, construction standards, and non-structural development. The goal of this program is to keep new structures out of the 100-year floodplain. Most new developments are encouraged to be located in Zone X, which lies outside the 100-year floodplain. Zone X represents an area with a 0.2 percent annual chance of flooding[48].
	Virginia Floodplain Management Standards	The Virginia Floodplain Management Standards are a set of regulations designed to ensure state agency compliance with floodplain management when undertaking development activities. These standards aim to save lives, protect property, and promote a comprehensive approach to managing floodplains without prohibiting development. They require local ordinances to be legally enforceable, uniformly applied, and periodically updated to align with NFIP guidance and policies[49]. Localities have the authority to manage development in floodplains, and the DCR provides a model ordinance to assist communities in drafting their own regulations[50].
	44 CFR 60.3 Flood Plain Management Criteria for Flood-Prone Areas	The Flood Plain Management Criteria for Flood-Prone Areas serve as a foundation for communities to create legally enforceable regulations that manage flood plain areas effectively[51]. The criteria first outlines permit requirements and how communities must require permits for all proposed construction or development in flood-prone areas. When using data, regulations should be based on data provided by the Federal Insurance Administrator, or from other reliable sources if federal data is not available. New constructions and substantial improvements must be designed to minimize flood damage and ensure safety from flooding. In certain zones, structures must be elevated to or above the base flood level, with specific standards for residential and non-residential buildings.
	Article 6. Comprehensive Flood Control Program	Article 6 of the Comprehensive Flood Control Program describes the state's commitment to flood

[48] Floodplain Management, Isle of Wight County, VA
[49] Virginia Department of Conservation and Recreation (DCR), 2024
[50] Virginia Department of Conservation and Recreation (DCR), 2024
[51] U.S. National Archives, Code of Federal Regulations, 2024

Topic	Regulation/ Ordinance	Description
		resilience and control[52]. It declares the General Assembly's recognition of the dangers posed by recurrent flooding and supports measures to mitigate and alleviate the effects of sea level rise and stormwater surges. The article emphasizes the importance of community-scale and regional-scale planning, the enhancement of natural and nature-based approaches, and the prioritization of socioeconomic equity in flood resilience efforts. It assigns the Department the responsibility for implementing the Virginia Coastal Resilience Master Plan and the Virginia Flood Protection Master Plan, which are to be updated regularly with a focus on cost-effective solutions and the best-available science. Coordination with various state, local, and federal programs is mandated to minimize loss of life, property damage, and environmental impacts. Additionally, the article establishes the Virginia Coastal Resilience Technical Advisory Committee to assist with the development and implementation of the master plans, ensuring that they are informed by the latest scientific data and address statewide and regional needs.
Zoning	Isle of Wight Zoning Ordinance	The Isle of Wight County Zoning Ordinance includes regulations related to land use, development, and zoning within the county. It covers various aspects, including floodplain management, land subdivision, and wetlands zoning[53].
Stormwater Management	Stormwater Management Ordinance	Regulates land-disturbing activities and protects water resources from the adverse effects of development. The ordinance sets forth requirements for stormwater plans, outlines procedures for their submission and approval, and designates the director of utility services as the program administrator. It aims to safeguard public health, safety, and welfare by managing stormwater runoff and preserving water quality. The ordinance applies to all land development projects disturbing one acre or more, with certain exemptions. It also mandates routine maintenance of stormwater facilities and establishes a utility fee system to fund the program's operations and maintenance[54].
Preservation of the Chesapeake Bay Area	Chesapeake Bay Preservation Area Ordinance	The Chesapeake Bay Preservation Area (CBPA) Ordinance in Isle of Wight County, Virginia, aims to protect the Chesapeake Bay and its tributaries from pollution, particularly nonpoint source pollution from

[52] Commonwealth of Virginia Law, Article 6. Comprehensive Flood Control Program, 2024
[53] Floodplain, Isle of Wight County, VA
[54] Isle of Wight County, Virginia, Code of Ordinances, Chapter 14A. Stormwater Management

Topic	Regulation/ Ordinance	Description
		land development[55]. It enforces specific regulations within designated CBPAs to maintain water quality and manage development activities. The ordinance includes provisions for permitted uses, special requirements, and lot size compliance. It also outlines the process for delineating Resource Protection Areas (RPAs) and Resource Management Areas (RMAs), with a focus on protecting water quality through buffer areas and performance standards. Additionally, it addresses exemptions, enforcement, penalties, and appeals related to the ordinance.
	Coastal Primary Sand Dune Ordinance	Regulates the use and development of coastal primary sand dunes. This ordinance aims to preserve and protect primary sand dunes and beaches within the county[56]. These dunes play a crucial role in maintaining coastal resilience and safeguarding natural resources. Refer to the Isle of Wight County Code of Ordinances for more information.

[55] Isle of Wight County, Virginia, Code of Ordinances, Appendix B-1- Chesapeake Bay Preservation Area Ordinance

[56] Code of Virginia, Article 2. Coastal Primary Sand Dune Ordinance and Boards