Hampton Roads Planning District Commission
Meeting – January 16, 2025
The Regional Building
723 Woodlake Drive, Chesapeake, Virginia
Agenda

Lunch – Noon (757 Room)
Call to Order – 12:30 PM (Regional Board Room)

1. Call to Order
2. Approval/Modification of Agenda ***[Action Requested]***
3. Public Comments
   A. Submitted Public Comments
   B. Public Comment Period
4. Executive Director's Report
5. Employee Recognition
6. Community Advisory Committee (CAC) Report
7. Election of Officers ***[Action Requested]***
8. Consent Agenda ***[Action Requested]***
   A. Meeting Minutes – November 21, 2024 Commission Meeting
   B. Treasurer's Report – November 2024
   C. Fiscal Year 2025 Budget Amendment
   D. PROTECT Grant Application
   E. Calendar Year 2025 Regional Meetings Schedule
   F. Executive Director's Contract
   G. HRPDC Personnel Manual Update
9. Resilient Design Standards – Ben McFarlane, HRPDC ***[Action Requested]***
10. Hampton Roads 2025 Economic Forecast – Nikki Johnson, HRPDC
11. Regional Legislative Agenda – Bob Crum, HRPDC
12. Upcoming Meetings
13. Advisory Committee Meeting Minutes
14. Technical Committee Meeting Summaries
15. For Your Information
16. Old/New Business
17. Adjournment

HAMPTON ROADS
PLANNING DISTRICT COMMISSION
MEETING

Lunch will be available in the 757 Room at Noon
The meeting will begin at 12:30 PM in the Regional Board Room
723 Woodlake Drive, Chesapeake

1. Call to Order

2. Approval/Modification of Agenda *[Action Requested]*

3. Public Comments

A. Submitted Public Comments

There were no submitted public comments since the last HRPDC meeting. Any written public comments received after the preparation of this agenda will be announced at the meeting.

B. Public Comment Period

Members of the public are invited to address the Commission. Each speaker is limited to three minutes.

4. Executive Director's Report

The Executive Director's Report is included as Attachment 4.

5. Employee Recognition

The employees listed below are recognized for their outstanding service to the HRPDC and for reaching a milestone anniversary between January 1, 2024 and December 31, 2024.

Ten Years:
Jillian C. Sunderland, Senior Water Resources Planner

Five Years:
Andrew Margason, General Services Manager

6. Community Advisory Committee (CAC) Report

The HRPDC/HRTPO Community Advisory Committee (CAC) held a meeting on December 12, 2024, at the Norfolk International Airport (ORF). The agenda focused on a Recap of the August 14th meeting with the FHWA/FTA, the proposed Public Engagement Plan (PEP), a briefing on the state of ORF, and the nomination of officers. The CAC will meet next on February 13th.

7. Election of Officers *[Action Requested]*

The HRPDC Bylaws provide that, at its Annual Meeting in January, the Commission will elect a Chair, Vice-Chair, Secretary, and Treasurer to serve during the upcoming year. The Chair and Vice-Chair must come from separate localities and be elected officials. The offices of Secretary and Treasurer must be voted on an annual basis but need not be elected officials and may succeed themselves.

All officers shall be elected for a term of one year, until their successors are elected, or until they resign or are removed from office. The Chair and Vice-Chair may serve up to two consecutive one-year terms in succession.

During the November 21, 2024 meeting, Chair Douglas Pons requested that the Nominating Committee prepare recommendations of nominees for the officer positions for the upcoming year. A representative of the Nominating Committee will present recommendations to the Commission for consideration.

Further nominations may be made by any member at the meeting at which the election is held. The election of officers shall be by voice vote unless changed by a majority vote of those present.

Action Requested: The HRPDC should receive the Nominating Committee's recommendation and take action to elect a Chair, Vice-Chair, Secretary, and Treasurer to serve during the upcoming year.

8. Consent Agenda *[Action Requested]*

A. Meeting Minutes – November 21, 2024 Commission Meeting

The minutes from the November 21, 2024 Commission meeting are included as Attachment 8A.

B. Treasurer's Report – November 2024

The Statement of Revenues and Expenditures for the activities of November 2024 is included as Attachment 8B.

C. Fiscal Year 2025 Budget Amendment

The current Fiscal Year (FY) 2024 HRPDC/HRTPO Budget was approved on May 16, 2024. Subsequently, the HRPDC/HRTPO received new awards and adjustments to existing awards. This agenda note summarizes the changes to the approved budget through December 31, 2024.

The previously approved budget totaled **$44,750,415**. This budget amendment results in an increase of **$131,967,** bringing the total Operating and Pass-Through budget to **$44,882,382**. The additional **$131,967** is the result of the following changes:

+ $1,504,600	New federal awards received from the Department of Homeland Security (DHS) ($1,286,665 of which will **pass-through** to consultants).
+ $333,000	New federal award received from the Department of Environmental Quality (DEQ) ($300,001 of which will pass-through to consultants).
+ $44,532	New state award received from Wetlands Water/VOF (all of which will **pass-through** to consultants).
+ $83,956	FY 2024 funds carried forward for the HRTPO (all of which will **pass-through** to Hampton Roads Transit).
+ $19,086	HRPDC deferred revenue carried forward from previous years ($19,815 of which will **pass-through** to existing consultant contracts).
- ($1,850,207)	Various adjustments to previous awards; this increase mainly affected **pass-through** expenditures.
+ $131,967	**FY 2025 Budget Increase**

The FY 2025 Proposed Amended Budget is included as Attachment 8C.

D. PROTECT Grant Application

The Promoting Resilient Operations for Transformative, Efficient, and Cost-saving Transportation (PROTECT) Grant program, administered by the Federal Highway Administration (FHWA), is funded under the Bipartisan Infrastructure Law (BIL) to improve transportation resilience to natural hazards. The program provides funding to states, local governments, and others for planning, resilience improvements, community resilience and evacuation routes, and at-risk coastal infrastructure. Up to $576 million is available for FY 2024–2025. Proposals are due February 24, 2025. The HRPDC staff, through discussions with the Coastal Resiliency Committee and other locality stakeholders, has identified the regional roadway flooding sensor network as an ideal candidate for this program.

Staff recommends that the Commission authorize the Executive Director to submit a PROTECT Grant proposal based on the outcomes of discussions between HRPDC staff and local and regional stakeholders.

E. Calendar Year 2025 Regional Meetings Schedule

The regional meeting schedule for the 2025 Calendar Year is included as Attachment 8E for the Commission's approval.

F. Executive Director's Contract

The HRPDC/HRTPO Executive Director's contract expired June 30, 2024. Per the terms and conditions, the contract continues on a month-to-month basis until and unless another contract is put into place as approved by the HRTPO and HRPDC. At the request of the HRPDC/HRTPO Joint Personnel and Budget (P&B) Committee, the contract has been updated to reflect the current salary, terms, and conditions as follows:

- The effective date of the new contract shall be January 16, 2025
- The salary has been updated to reflect the current annual salary of $228,218
- The contract is extended an additional three (3) years to January 31, 2028
- The July 2022 action by the HRPDC and HRTPO Board of a cell phone allowance of $100 per month has been added to the contract
- All other provisions in the contract as approved by the HRPDC and HRTPO Board remain unchanged

G. HRPDC Personnel Manual Update

The Personnel Manual is a reference for employees of the HRPDC/HRTPO that provides information on current human resource policies, procedures, and benefits provided by the organization. The manual is regularly reviewed to ensure the most accurate and up-to-date information is provided to employees as it relates to their employment, and updated policies are communicated to staff once they are approved and incorporated as revised policies as appropriate. Recently, the Personnel Manual has undergone a full revision to reflect the current policies and practices of the HRPDC/HRTPO. The Personnel and Budget Committee met with the HRPDC/HRTPO Executive Director and Deputy Executive Director for Administration and Operations on November 21, 2024 and January 16, 2025 to review the updated manual, provide input, and ask questions.

The HRPDC/HRTPO Personnel and Budget Committee recommends approval of the Personnel Manual.

Action Requested: The HRPDC should consider action to approve the January 16, 2025 Consent Agenda.

9. Resilient Design Standards – Ben McFarlane, HRPDC *[Action Requested]*

The HRPDC staff has worked with the Coastal Resiliency Committee and other local, regional, state, and federal partners to develop recommendations for regional resilient design standards that are built on the Regional Sea Level Rise Planning Policy and Approach that the Commission adopted in October 2018. The proposed standards include updated sea level rise scenarios, future precipitation projections, rainfall design storms, tailwater elevations, and joint rainfall-tidal design storms.

A draft resolution and a copy of the proposed design standards are included as Attachments 9A and 9B for the Commission's consideration and approval.

Mr. Benjamin J. McFarlane, HRPDC Chief Resilience Officer, will brief the Commission on the proposed design standards, including updates made since the November 21 Commission meeting.

Action Requested: The HRPDC should consider approving proposed Resolution 2024-05 recommending that local governments in Hampton Roads incorporate resilient design standards into their local plans and policies.

10. Hampton Roads 2025 Economic Forecast – Nikki Johnson, HRPDC

Each January since 1990, HRPDC Economics Staff have delivered a regional economic forecast for the coming year. The forecast presentation includes a review of local and national trends and provides a forecast for gross regional product, employment, unemployment, and retail sales.

The Hampton Roads 2025 Economic Forecast is a review of current economic trends and a staff assessment of what the region can expect for the coming year. The HRPDC forecast is often used for planning purposes by staff from member jurisdictions as well as other regional organizations.

Ms. Nikki Johnson, HRPDC Regional Economist, will present the Hampton Roads 2025 Economic Forecast to the Commission.

11. Regional Legislative Agenda – Bob Crum, HRPDC

The HRPDC/HRTPO Regional Legislative Priorities brochure is available online at https://online.fliphtml5.com/ruevh/gobv/ and will be provided as a handout.

Mr. Robert A. Crum, Jr., HRPDC Executive Director, will provide an update on the HRPDC/HRTPO Regional Legislative Priorities, review coordination efforts that have occurred over the past few weeks with regional partners, and discuss the upcoming General Assembly session.

This item is presented for information and discussion by Commission members.

12. Upcoming Meetings

February 20, 2025
Climate Pollution Reduction Grant (CPRG) Update
Environmental Protection Agency (EPA) Grant Update
Regional Building Parking Lot Update
Regional Legislative Update
Water Supply Planning

March 2025
No HRPDC Meeting per Regional Meeting Schedule

April 17, 2025
- Chesapeake Bay 2025
- Regional Fiber Initiative
- Regional Housing Assessment Update
- Regional Legislative Update
- Roadway Flooding Sensor Network

May 15, 2025

- FY 2026 Budget
- FY 2026 Work Program
- Journey to Work Analysis

June 2025

No Meeting per Regional Meeting Schedule

13. Advisory Committee Meeting Minutes

Included below are links to the HRPDC Advisory Committee meeting minutes approved since the last Commission meeting.

Community Advisory Committee (CAC)

- Meeting Minutes – June 8, 2023
- Meeting Minutes – August 10, 2023
- Meeting Minutes – October 12, 2023
- Meeting Minutes – December 14, 2023
- Meeting Minutes – February 8, 2024
- Meeting Minutes – April 11, 2024
- Meeting Minutes – June 13, 2024
- Meeting Minutes – August 14, 2024
- Meeting Minutes – October 10, 2024

14. Technical Committee Meeting Summaries

Summaries of HRPDC Technical Committee meetings held since the last Commission meeting are included in Attachment 14.

15. For Your Information

- A letter dated December 10, 2024 from the City of Poquoson appointing David A. Hux and reappointing J. Randall Wheeler as a member of the HRPDC is included in Attachment 15.

- A letter dated January 8, 2025 from the City of Virginia Beach appointing Stacy Cummings as a member of the HRPDC is included in Attachment 15.

- A letter dated January 8, 2025 from the City of Virginia Beach appointing Robert W. "Worth" Remick as a member of the HRPDC is included in Attachment 15.

16. Old/New Business

17. Adjournment

HAMPTON ROADS PDC | HAMPTON ROADS TPO

Executive Director's Report
January 2025

HRPDC/HRTPO COMMUNITY ADVISORY COMMITTEE (CAC)

The CAC held its regular meeting on December 12 at Norfolk International Airport and received a briefing from Executive Director and CEO Mark Perryman on the current state of the Airport and its future capital improvement program. This interactive session provided the CAC members an opportunity to ask questions about trends at the Airport and to provide input on future plans.

WILLIAM AND MARY AND VIRGINIA INSTITUTE OF MARINE SCIENCE (VIMS)

On November 18, the HRPDC/HRTPO staff attended a tour of the William and Mary Campus and the VIMS facility. Our staff received briefings on the following areas:

- Welcome and Overview of current efforts and future plans by Dr. Katherine Rowe, President, William and Mary
- School of Computing, Data Sciences, and Physics
- Global Research Institute, Institute for Integrative Conservation, Whole of Government Center of Excellence
- Entrepreneurship Hub
- Tour of Batten School and VIMS
    - Acuff Center for Aquaculture
    - Multispecies Research Group
    - Environmental Chemistry and Marine Pollution Lab

The tour provided the HRPDC/HRTPO staff team with comprehensive information on efforts at the William and Mary Main Campus and VIMS facility that can be incorporated into our regional planning initiatives. We want to thank President Rowe and Monty Mason, Senior Director of Community Affairs and Partnerships, for their hospitality and efforts to arrange this visit and information briefing.

REGIONAL TRANSIT ADVISORY PANEL (RTAP)

The RTAP held its regularly scheduled meeting at the Regional Building on January 3. Approximately 40 RTAP members attended and participated in an engaged discussion on the following agenda topics:

- HRT briefing on legislative initiatives related to sustainable and predictable funding for the Tide Light Rail system and increased statewide operating and capital funding
- HRTPO/HRPDC Regional Legislative Agenda and the need for adequate funding to support Hampton Roads Transit, Williamsburg Area Transit Authority, and Suffolk Transit
- Overview of Paratransit Services and Coverage Zones
- Information sharing roundtable discussion by RTAP members

VIRGINIA OUTDOORS COALITION

On January 7, the Executive Director provided a presentation to the Virginia Outdoors Coalition on biking/walking trail plans and funding needs in the Hampton Roads region. This session included a discussion of the Great Outdoors Act legislation that is expected to be considered in the upcoming General Assembly session.

HOUSING PRESENTATION TO THE VIRGINIA CHAMBER OF COMMERCE

On December 9, the Executive Director was invited to provide a presentation to the Housing Executive Committee of the Virginia Chamber of Commerce. This Committee is in the process of collecting information on housing issues, challenges and needs that can be incorporated into Blueprint Virginia 2030. The Executive Director provided background information on housing trends and needs in Hampton Roads and discussed the regional housing assessment that will be advanced by the HRPDC.

OTHER MEETINGS AND EXECUTIVE DIRECTOR OUTREACH

- Met with a representative of the Future of Hampton Roads on November 29 to discuss HRPDC and HRTPO regional initiatives
- Attended the Hampton State of the City Address on December 3
- Attended a meeting of the Greater Norfolk Corporation and the Norfolk Innovation Corridor on December 5
- Participated in a meeting with the Virginia Association of Planning District Commissions on December 5 to discuss potential energy planning issues that are anticipated to be considered at the upcoming Virginia General Assembly session
- Attended the December 12 meeting of the Hampton Roads Military and Federal Facilities Alliance
- Provided staff support at the December 13 meeting of the Southside Network Authority
- Met with representatives of GO Virginia on December 17 to discuss potential broadband funding opportunities
- Participated in a meeting of the Elizabeth River Foundation on December 18

ADMINISTRATION/MANAGEMENT

- Year-end administrative tasks
- Project Management and oversight for the Regional Building parking lot project
- SNA Executive Director onboarding
- Preparation for the upcoming General Assembly session
- Oversight for Regional Building meeting support, maintenance, and repairs
- IT management
- GIS server project management
- Financial management, human resources, meeting and IT support for the HRPDC, HRTPO, HRTAC, HRMFFA, SNA, and visiting organizations and community groups

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Hampton Roads Planning District Commission
Minutes of November 21, 2024 Meeting

The November 21, 2024 meeting of the Hampton Roads Planning District Commission (HRPDC) was called to order by the Chair at 12:35 p.m. in the Regional Board Room located at 723 Woodlake Drive in Chesapeake, Virginia with the following in attendance:

Commissioners in Attendance:

Douglas Pons, Chair (WM)
Shannon Glover, Vice Chair (PO)
Randy Keaton, Treasurer (IW)*
Amanda Newins (CH)*
Christopher Price (CH)
Debbie Ritter (CH)
Ella Ward (CH)
Rosylen Oglesby (FR)
Carol Steele (GL)
Donnie Tuck (HA)
Scott Stevens (JC)
Alan Archer (NN)
Courtney Doyle (NO)
Patrick Roberts (NO)
David Hux (PQ)
Randy Wheeler (PQ)
Brian Thrower (SH)*
Leroy Bennett (SU)
Albert Moor (SU)*
Robert Dyer (VB)*
Amelia Ross-Hammond (VB)*
Patrick Duhaney (VB)*
Mark Bellamy (YK)
Sheila Noll (YK)

Commissioners Absent:

Brian Solis (CH)
Gregory McLemore (FR)
Christopher Hutson (GL)
Steven Brown (HA)
Mary Bunting (HA)
Joel Acree (IW)
Ruth Larson (JC)
Phillip Jones (NN)
Cleon Long (NN)
Kenneth Alexander (NO)
Andria McClellan (NO)
Danica Royster (NO)
Steven Carter (PO)
William Gillette (SH)
Steven Bowman (SM)
Michael Stallings (SM)
Walter Hardy (SY)
Melissa Rollins (SY)
Barbara Henley (VB)
Joash F. Schulman (VB)
Chris Taylor (VB
Sabrina Wooten (VB)
Andrew Trivette (WM)

Executive Director:

Robert A. Crum, Jr., Secretary

Other Participants:

Mark Geduldig-Yatrofsky (CAC)
Phillip Bazzani (GL)
Brian Deprofio (HA)
John McGlennon (JC)

**Late arrival or early departure*

Others Recorded Attending:
Bryan Pennington (NO); Rhonda Russell (PO); Andrew Damon and Brent McKenzie (VB); Greg Garrett and Joel Rubin (Future of Hampton Roads); Drew Lumpkin (Hampton Roads Executive Roundtable); Todd Nichols (HRMFFA); Otis Humphreys (Humphreys Home Team); Diane Kaufman (U.S. Senator Tim Kaine's Office); Angela Effah-Amponsah (VDOT); Katherine Hafner (WHRO); and Greg Grootendorst, Kelli Arledge, Shernita Bethea, Robert Cofield, Emma Corbitt, Katie Cullipher, Jeffrey DiScala, Simone Elmore, Markay Hall, Tealen Hansen, Nikki Johnson, Teresa Johnson, Whitney Katchmark, Sara Kidd, Ben McFarlane, Andrew Margason, Otesa Mitchell, Cynthia Mulkey, Ivy Ozmon, Pavithra Parthasarathi, Jill Sunderland, Jaquil Tatum, Joe Turner, Tho Tran, Quanda Tynes, Christopher Vaigneur, Eric Walberg, and Sheila Wilson (HRPDC/HRTPO Staff)

Chair Douglas Pons welcomed new Commission member Poquoson Mayor-Elect David Hux.

Approval/Modification of Agenda

Chair Pons called for a motion to approve the November 21, 2024 agenda as presented.

Motion: Commissioner Ella Ward Moved to approve the agenda as presented; seconded by Commissioner Donnie Tuck. The Motion Carried.

Public Comments

Mr. Crum stated that there were no submitted public comments. He invited members of the public to address the Commission. There were no requests to provide public comment.

**Commissioner Brian Thrower arrived*

Executive Director's Report

Mr. Crum announced that this Commission meeting would be Ms. Sheila Wilson's last as she was soon retiring. Ms. Wilson joined the HRPDC/HRTPO in 2001 and progressed upward through the organization. In 2018, Ms. Wilson was promoted to Chief Financial Officer (CFO). As CFO, Ms. Wilson managed the finances for the HRPDC, HRTPO HRTAC, HRMFFA, and SNA. For these five organizations, she has consistently produced clean audits. Mr. Crum stated that she is not only an incredible employee but an unbelievable person. Mr. Crum presented some tokens expressing the staff's appreciation and gratitude for her hard work.

Mr. Crum also recognized the outgoing Commission members Hampton Mayor Donnie Tuck, Norfolk Councilmembers Andria McClellan and Danica Royster, Poquoson Mayor Gordon Helsel, Virginia Beach Councilmember Chris Taylor, and Virginia Beach Councilmember Sabrina Wooten.

Mr. Crum arranged a photograph of Ms. Wilson with Chair Pons, Vice-Chair Shannon Glover, and the outgoing HRPDC Board members in attendance.

Ms. Wilson thanked the Commission members and stated that it has been a pleasure working for the HRPDC/HRTPO for the last 23 years. She thanked Mr. Crum for the opportunity to serve as CFO and recognized her staff for helping her succeed.

**Commissioner Amanda Newins departed*

Mr. Crum announced and welcomed new employees, Ms. Tealen Hansen as the organization's new CFO and Ms. Teresa Johnson as a temporary Administrative Assistant.

Mr. Crum introduced Ms. Sara J. Kidd, HRPDC GIS, Data, and Analytics Manager, to brief the Commission on two awards received by staff.

Ms. Kidd reported that a team of five HRPDC and HRTPO staff recently participated in the third annual Hampton Roads Datathon, sponsored by CivicLab Norfolk. The Datathon is a one-week challenge for teams to develop innovative solutions to issues related to the event theme using data. This year's theme was infrastructure, and the HRPDC/HRTPO staff project was called Shady Stops. The team analyzed all bus stops in Hampton Roads to discover how much tree canopy coverage each stop has and compared the information gathered to data about Urban Heat Island (UHI) severity to prioritize locations for improving shade. UHIs lead to hotter conditions at unshaded bus stops, causing potential health risks for passengers. In Hampton Roads, 85% of bus stops have zero tree canopy, and 25% are in high or severe UHI areas. The project earned first place.

Additionally, the updated FishSwimPlay website won the best web application award in the professional category at the Virginia Association for Mapping and Information Systems (VAMLIS) Virginia Geographic Information System (GIS) Conference. This resource for finding recreational sites in Hampton Roads was initially developed as part of a Virginia Coastal Zone Management Program grant several years ago. The latest version includes an updated inventory of recreation sites using mapping technology.

Ms. Kidd concluded her remarks by stating that GIS and data analysis are integral parts of the organization, and the staff is proud to be recognized for these efforts.

Ms. Kidd's presentation is available on the HRPDC website using the following link: https://www.hrpdcva.gov/DocumentCenter/View/13796/112124-PDC-04_Presentation-GIS-Awards-Brief?bidId=.

Chair Pons thanked Ms. Kidd for her presentation and congratulated the staff on the awards.

Commissioner Tuck asked the Commission to consider hosting a meeting on the Peninsula.

Chair Pons expressed his support.

Community Advisory Committee (CAC) Report

Mr. Mark Geduldig-Yatrofsky reported that the CAC had not met since October 10, 2024. The final meeting of the year will be held on December 12, 2024 and will focus on member recruitment, the nomination of officers, and providing an opportunity for members to engage with one another.

Consent Agenda

Chair Pons asked Mr. Crum to briefly describe the items on the Consent Agenda, which included the following:

- Meeting Minutes – October 17, 2024 Commission Meeting
- Treasurer's Report – October 2024
- Resolution 2024-04 Authorizing Tealen Hansen as Chief Financial Officer Effective December 1, 2024
- Community Advisory Committee Amended Bylaws 2024
- USACE Engineering with Nature Proving Ground

Motion: Commissioner Donnie Tuck Moved to approve the Consent Agenda as presented; seconded by Commissioner Amelia Ross-Hammond. The Motion Carried.

Appointment of Nominating Committee

The HRPDC Bylaws provide that, at its Annual Meeting in January, the Commission will elect a Chair, Vice-Chair, Secretary, and Treasurer to serve during the upcoming year. The Chair and Vice-Chair must come from separate localities and be elected officials. The offices of Secretary and Treasurer must be voted on an annual basis but need not be elected officials and may succeed themselves.

Chair Pons requested that the following Commissioners serve on the HRPDC Nominating Committee and provide a report to the Commission at its Annual Meeting.

Chesapeake – Ella Ward
Franklin – Gregory McLemore
Gloucester – Christopher Hutson
Hampton – Steven Brown
Isle of Wight – Joel Acree
James City – Ruth Larson
Newport News – Phillip Jones
Norfolk – Courtney Doyle
Poquoson – Gordon Helsel
Portsmouth – Shannon Glover
Smithfield – Steven Bowman
Southampton – William Gillette
Suffolk – Leroy Bennett
Surry – Walter Hardy
Virginia Beach – Robert Dyer
Williamsburg – Doug Pons
York – Sheila Noll

Mr. Crum reported that Mayor Shannon Glover, the current HRPDC Vice-Chair, expressed interest in being nominated as Chair. The Commission will need to appoint a Vice-Chair from

the Peninsula. Mr. Crum added that due to current HRPDC Treasurer Randy Keaton's upcoming retirement, the HRPDC will also need to elect a new Treasurer in January.

Resilient Design Standards

Chair Pons introduced Mr. Benjamin J. McFarlane, HRPDC Chief Resilience Officer, to brief the Commission on proposed regional resilient design guidelines for Hampton Roads.

Mr. McFarlane began his presentation with some background information. He stated that HRPDC staff has worked with the Coastal Resiliency Committee and other local, regional, state, and federal partners to develop recommendations for Regional Resilient Design Standards that are built on the Regional Sea Level Rise Planning Policy and Approach that was adopted by the Commission in October 2018.

Mr. McFarlane explained that design standards are fundamentally about protecting public health, safety, and welfare and are assigned based on the interpretation and tolerance of risk balanced with the cost of implementing these practices. The region is experiencing increasing rainfall and sea level rise, which are causing flooding in areas that have not flooded previously and more frequent flooding in areas where it used to happen on rare occasions. These events are starting to happen more often in the region, but the current infrastructure is not sufficient. Mr. McFarlane stated that a changing climate requires resilient design. Increases in sea level and rainfall have already been observed since the last updates to stormwater and flood design standards. To maintain the same level of protection, design standards need to be updated and applied to development decisions. Providing improved information to residents, designers, and decision-makers will enable them to make better decisions and make more sound public investments.

Resilient design guidelines should be scientifically based, appropriate, and implementable. Localities can amend ordinances, policies, and regulations to account for recent observations and future conditions under climate change. Although localities will still have to adopt the guidelines officially, the standards are intended to be used as a reference and suite of recommendations rather than requirements. Criticality and lifespan shape some of the recommendations with higher standards for more important or longer-lived projects. The proposed standards include updated sea level rise scenarios, future precipitation projections, tailwater elevations with sea level rise, and joint tidal/rainfall standards. Adopting higher standards will be more expensive, but keeping the same standards will increase risk. Either way, there is a cost.

Mr. McFarlane concluded his remarks by recommending that the HRPDC adopt a resolution encouraging Hampton Roads local governments to incorporate resilient design standards into their local plans and policies.

Mr. McFarlane's presentation is available on the HRPDC website using the following link: https://www.hrpdcva.gov/DocumentCenter/View/13797/112124-PDC-08_Presentation-HRPDC-Resilient-Design-Standards?bidId=.

Chair Pons announced that a quorum was no longer present.

Mr. Crum suggested that the recommended action be considered at the meeting in January.

Commissioner Robert Dyer thanked Mr. McFarlane for his presentation. He stated that a $567 million bond referendum in Virginia Beach to do the same projects now costs over $1 billion. He commented that finding a balance between growth and development, attainable and affordable housing, and infrastructure is going to be a challenge going forward.

**Commissioner Patrick Duhaney departed*

Commissioner Debbie Ritter thanked Mr. McFarlane for his report and commented that it will be interesting going forward with different approaches from all 17 jurisdictions. She also indicated that if the localities feel they have to raise fees or taxes to approach these issues, the details should be well-communicated to the public. She suggested better explaining that the definition of a 10-year or 100-year storm does not mean it should only happen once every 10 or 100 years.

Commissioner Amelia Ross-Hammond agreed with Commissioner Ritter that the layman's language is important. She asked Mr. McFarlane to elaborate about the elevated risk absent adequate funding.

Mr. McFarlane agreed that communicating clear terminology is something that staff who work with floodplain or stormwater management struggle with nationwide. He indicated that while the specific level of risk is relative to the increasing rainfall and sea level rise events, he could work to incorporate more specific examples into the recommendations.

Commissioner Randy Keaton asked if the design standards would be sent to all the local community development departments around the region for incorporation in local comprehensive plans.

Mr. McFarlane responded that the information has been shared with the Coastal Resiliency Committee and other stakeholders, and once finalized, it will be more widely distributed.

Commissioner Keaton added that localities are also struggling with the lack of wetland mitigation credits and banks. He commented that it would be beneficial if staff could do some mapping to show potential areas that could be converted into wetland mitigation banks because there is a lot of low property that holds water.

Mr. Crum responded that the staff would look into it. He asked the Chief Administrative Officers present to comment on bond rating agencies asking about resiliency preparation. He said that having these standards available to utilize could be helpful when funding these projects.

Commissioner Patrick Roberts indicated that approximately seven years ago, he started hearing questions from all three agencies on what the risk was to each of the individual areas of the city and what preparations were being made. He shared his thoughts that agencies have started to build some specific criteria into their metrics as they assign creditworthiness.

Commissioner Randy Wheeler concurred.

Commissioner Dyer announced he needed to leave the meeting and took a moment to recognize outgoing Commissioner Tuck for his leadership, friendship, and contributions to the region.

**Commissioner Robert Dyer departed*

Hampton Roads Regional Benchmarking Study

Chair Pons introduced Ms. Nikki Johnson, HRPDC Regional Economist, to brief the Commission on the Regional Benchmarking Study.

In the Regional Cooperation Act, the Code of Virginia calls for Planning District Commissions (PDCs) to collect and maintain demographic, economic, and other data concerning the region and member localities, and act as a State Data Center affiliate in cooperation with the Virginia Employment Commission (VEC). In keeping with this mandate, the HRPDC staff has completed the fifteenth annual Regional Benchmarking Study.

Ms. Johnson began her presentation with an overview of the 2024 Hampton Roads Regional Benchmarking Study, which would be released at the end of November. Ms. Johnson explained that the benchmarking study is a comprehensive annual analysis of the region's economic performance across a variety of indicators for ten topics that shape the Hampton Roads region. The publication includes a profile for the 17 jurisdictions as well as graphical illustrations for a variety of regional benchmarks covering the economy, demographics, real estate, transportation, education, government finances, and various quality-of-life indicators. Each graph is accompanied by a brief explanation regarding the purpose of the benchmark and the current condition in Hampton Roads. The overall goal of the study is to help inform the Commission, the public, and policymakers and aid in the HRPDC's strategic planning efforts. In addition to the latest trends within the region, the study also compares the region's performance to 18 similar-sized Metropolitan Statistical Areas (MSAs).

**Commissioner Al Moor departed*

Ms. Johnson presented some highlights from the study. Within the economy section, the number of civilian jobs has made a full recovery from those lost during the pandemic. The level of jobs in the region has increased overall from 2019 to 2023, but the largest growth is occurring in MSAs in the South and West where the majority of population growth has been happening over the past few years. Within the demographic section, population growth in Hampton Roads rebounded in 2023 after decreasing in the prior year largely due to the surge

in COVID-related deaths and an increase of domestic out-migration during that period. Despite the rebound in 2023, the region remains below pre-pandemic levels.

A tight labor market in the aftermath of the pandemic increased wages for workers in the Leisure and Hospitality industry; although the region still ranks near the bottom of comparable MSAs, which is not conducive to remaining competitive in retaining and attracting residents. The housing section examines a variety of indicators from permits to prices to affordability. Housing affordability deteriorated during the pandemic with a surge in housing prices. The percentage of households spending 30% or more of their income on housing has increased dramatically since 2020, which is especially true among renters, where half of all renters in Hampton Roads are spending 30% or more of their income on housing. Although there was a slight improvement in 2023, the region is third from the bottom within reference MSAs. Housing affordability remains a significant issue within the region. A new section in the 2024 benchmarking study is inclusive growth and racial equity to determine how the region fared in terms of equitable growth across different social strata. The black unemployment gap is four percentage points higher in the region relative to the white unemployment rate.

In the transportation section, commuting patterns show that Hampton Roads has one of the highest rates of workers that travel outside of their city or county to go to work every day. There has not been much of a change in terms of the distribution of workers that work inside or outside their city or county of residence. However, these figures only include commuters. Should the figures include remote workers, those numbers may shift. Ms. Johnson concluded her presentation by stating that the study would be available on the HRPDC website at the end of the month and offered to provide a printed copy to Commission members upon request.

Ms. Johnson's presentation is available on the HRPDC website using the following link: https://www.hrpdcva.gov/DocumentCenter/View/13798/112124-PDC-09_Presentation-Hampton-Roads-Benchmarking-Study?bidId=.

The 2024 Hampton Roads Regional Benchmarking Study is available on the HRPDC website using the following link: https://www.hrpdcva.gov/DocumentCenter/View/13821/Benchmarking-2024-FULL-Report-PDF.

Chair Pons thanked Ms. Johnson for her presentation.

Commissioner Ella Ward requested a printed copy of the study. She also asked if the study included local statistics.

**Commissioner Randy Keaton departed*

Ms. Johnson responded that the last chapter includes various comparisons across all the localities within the region.

Strategic Plan for Hampton Roads

Mr. Crum introduced Mr. Eric Walberg, Principal for Planning and Economics, and Mr. Tho Tran, Senior Regional Planner, to provide an overview of the Strategic Plan initiative.

Mr. Walberg began the presentation with some background information. The Code of Virginia requires PDCs to create regional strategic plans for the regions they serve. The plans are to address issues that are of importance to multiple localities and should include goals, objectives, and strategies for topics included in the plan. The strategic plan will not impinge on local land use authority; will leverage, not replace, preexisting plans and initiatives; and will focus on areas where enhanced regional coordination, alignment, and effort are most needed.

Phase one of the plan development process will include an evaluation of the region's current status, which will include a compilation of regional statistics, analysis, and comparison of existing plans and initiatives; stakeholder engagement; and identification of regional metrics. The plan will focus on improving the quality of life for current residents as well as enhancing regional competitiveness. Phase two of the plan development process will include establishing goals linked to the regional metrics gathered in Phase one, and developing action plans for priority goals.

Mr. Tran continued the presentation by explaining the framework for the strategic plan. He described the approach as think globally, plan regionally, and act locally. The process includes reviewing and comparing existing plans, initiatives, and best practices; selecting metrics and identifying goals; and tracking progress toward those goals. Stakeholder engagement will be one of key aspects supporting the work program. Hampton Roads residents are placed at the center of the framework. Improving the quality of life for residents will not only help retain current residents but help attract more residents. In addition to residents, target groups will include visitors, investors, and talent.

The topics in the framework include economy, visitor appeal, settlement pattern, resident well-being, infrastructure, and natural environment. The economy topic will focus on federal spending, innovation, and workforce with references to the GO Virginia initiative, Comprehensive Economic Development Strategy (CEDS), Hampton Roads Investment Playbook, and 757 Recovery and Resilient Action Plan. Visitor appeal will focus on tourism and cultural capital with references to the Virginia Outdoor Plan, Virginia Wildlife Plan, and local plans. The settlement pattern topic will focus on land, placemaking, and housing with references to local comprehensive plans, while resident well-being will focus on health, education, resilience, and social equity and cohesion. The infrastructure topic will focus on transportation, energy, and broadband, and the natural environment topic will focus on sea level rise and flooding, environmental quality, and natural capital. These topics and subtopics are subject to be changed during the process of plan making and stakeholder engagement.

The framework is designed for three purposes. The first is to review and compare the existing plans and initiatives. The second is to select the metric and indicator for identifying the goals for the region. The third is to track the progress toward the established goals.

**Commissioner Amelia Ross-Hammond departed*

Mr. Walberg continued the presentation with a draft timeline for the strategic plan process. The evaluation synopsis, regional metrics, and resulting dashboard are scheduled for completion in the second quarter of 2025. Identifying regional goals and the development of action plans will be completed simultaneously for quality of life and regional competitiveness and are scheduled for completion in the fourth quarter of 2025. Mr. Walberg concluded the presentation by explaining that stakeholder engagement will focus on the professional level including HRPDC/HRTPO staff, the Commission, the HRTPO Board, the advisory committees, technical committees, and locality staff.

Mr. Walberg and Mr. Tran's presentation is available on the HRPDC website using the following link:
https://www.hrpdcva.gov/DocumentCenter/View/13799/112124-PDC-10_Presentation-Strategic-Plan-for-Hampton-Roads?bidId=

Chair Pons thanked Mr. Walberg and Mr. Tran for their presentation and stated that while it looks like an aggressive timeline, he looks forward to seeing it completed.

Upcoming Meetings

Mr. Crum noted that per the Regional Meetings Schedule, there will be no Commission meeting in December. The next regularly scheduled Commission meeting will be held on January 16, 2025.

Advisory Committee Meeting Summaries

Mr. Crum indicated the summary of the HRPDC Advisory Committee meeting held since the last Commission meeting was included in the agenda for information purposes.

Technical Advisory Committee Meeting Summaries

Mr. Crum stated that summaries of HRPDC Technical Advisory Committee meetings held since the last Commission meeting were included in the agenda for information purposes.

For Your Information

Mr. Crum mentioned the various correspondences of interest included in the agenda packet for Commission member information.

Old/New Business

Commissioner Glover congratulated his good friend Commissioner Tuck on his upcoming retirement. He stated that they traveled to many different places together all over the world as mayors and that Commissioner Tuck always demonstrated the highest level of integrity and professionalism. He thanked him for his leadership, guidance, love, care, and concern and wished him fair winds and following seas.

Commissioner Tuck thanked Commissioner Glover and expressed his gratitude and joy at being part of the Commission and HRTPO Board. He conveyed that he was proud of the work accomplished on behalf of the region and appreciative of the friendships and relationships established over the years.

Chair Pons thanked Mayor Tuck for being an example of how to conduct yourself as an elected official. He also expressed his gratitude and appreciation for everything Mayor Tuck has done for the City of Hampton and the region.

Adjournment

With no further business to come before the Commission, the meeting adjourned at 1:55 p.m.

Douglas G. Pons Chair	Robert A. Crum, Jr. Executive Director/ Secretary

FISCAL YEAR 2025
11/30/2024
STATEMENT OF REVENUES AND EXPENDITURES
42% OF FISCAL YEAR COMPLETE

REVENUES	Annual Budget	Previous YTD	Current Month	YTD	% Received /Expended
State PDC Revenue	$ 190,943	$ -	$ 95,471.00	$ 95,471	50%
DEQ	233,500	-	$ 67,645.11	67,645.11	29%
Environmental Protection Agency (EPA)	2,604,525	77,233.96		77,233.96	3%
Housing DHCD/ Portsmouth/ Chesapeake/IoW	909,214	-		-	0%
Virginia Housing VAPDC Grant	2,260,000	-		-	0%
Virginia Housing VHDA Spac Grant	5,000	-		-	0%
Natl Fish & Wildlife Foundation	474,152	-		-	0%
Water Quality Assessment	670,200	446,800.00	$ 223,400.00	670,200.00	100%
SCRC LDD	15,500	-		-	0%
VDEM	1,926,259	166,181.65		166,181.65	9%
Local Jurisdiction Membership Dues	1,753,239	1,065,399.25	$ 45,567.00	1,110,966.25	63%
Local Jurisdiction Programs	1,916,799	1,329,042.00	$ 90,013.75	1,419,055.75	74%
HRMFFA	55,000	-		-	0%
HR Economic Development Site Readiness	2,545,208	-	$ 3,201.55	3,201.55	0%
DCR Community Flood Preparedness Fund Grant	114,000	-		-	0%
Solid Waste Planning Unit	20,000	-		-	0%
Southside Network Authority	80,000	-		-	0%
VA Telecommunications	20,854,650	2,321,977.82		2,321,977.82	11%
Start Smart, Recycle Right Program	33,333	8,250.00		8,250.00	25%
SALES, INTEREST & MISC	287,815	110,350.33	$ 24,649.48	134,999.81	47%
VDOT-PL SEC 112	5,398,229	-	$ 484,496.36	484,496.36	9%
HRTAC	301,645	-	$ -	-	0%
VDRPT 5303/ Pass Through	1,208,508	-	$ 245,010.59	245,010.59	20%
SP&R	72,500	-	$ 16,699.42	16,699.42	23%
Special Contracts/Deferred/Pass Through	820,196	-	$ -	-	0%
Total Revenue	**44,750,415**	**5,525,235**	**1,296,154**	**6,821,389**	15%
EXPENDITURES					
PERSONNEL	$ 6,743,418	$ 1,697,089	$ 442,391	$ 2,139,480	32%
STANDARD CONTRACTS	275,935	770	$ -	770	0%
SPECIAL CONTRACTS/PASS THROUGH	36,707,170	1,677,290	$ 317,620	1,994,911	5%
OFFICE SERVICES	1,023,892	199,131	$ 25,258	224,389	22%
INDIRECT COSTS	-	620,945	161,865	782,810	0%
Total Expenses	**44,750,415**	**4,195,226**	**947,134**	**5,142,360**	11%
TOTALS	**$ -**	**$ 1,330,009**	**$ 349,020**	**$ 1,679,030** *	

***** HRTPO grants operate on a quarterly reimbursement basis; as such the total YTD does not reflect the commission's current financial position.

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HAMPTON ROADS PLANNING DISTRICT COMMISSION
HAMPTON ROADS TRANSPORTATION PLANNING ORGANIZATION
FY2025 SUMMARY DECEMBER 2024 BUDGET AMENDMENT

	TOTAL APPROVED BUDGET	Current 12/31/2024 AMEND	FY2025 PROPOSED AMENDED BUDGET				
			TOTAL BUDGET	TPO PASS-THRU	PDC PASS-THRU	TPO OPER BUDGET	PDC OPER BUDGET
REVENUES							
Local Contributions Member Dues (Note 1)	1,753,239	0	1,753,239	0	0	636,024	1,117,215
Local Program Contributions	1,073,815	0	1,073,815	0	0	0	1,073,815
Other Local Projects	20,832	527	21,359	0	0	0	21,359
Miscellaneous/Other	287,815	0	287,815	0	0	0	287,815
HRMFFA	55,000	0	55,000	0	0	0	55,000
SNA	80,000	0	80,000	0	0	0	80,000
HRTAC	301,645	0	301,645	0	0	301,645	0
HRTAC - HRCS	0	0	0	0	0	0	0
Federal & State Grants:	7,077,699	384,154	7,461,853	0	0	5,651,713	1,810,140
Transportation (Fed & State)	5,651,713	0	5,651,713	0	0	5,651,713	0
Planning District - Federal	1,130,543	334,848	1,465,390	0	0	0	1,465,390
Planning District - State	104,500	49,306	153,807	0	0	0	153,807
Planning District - State Allocation DHCD (Note 2)	190,943	0	190,943	0	0	0	190,943
TOTAL OPERATING REVENUE	**10,650,045**	**384,681**	**11,034,726**	**0**	**0**	**6,589,382**	**4,445,344**
Deferred	284,627	(729)	283,898	0	0	0	283,898
Pass-Thru Revenues	33,815,743	(251,985)	33,563,758	475,456	33,088,302	0	0
TOTAL REVENUE FOR FISCAL YEAR	**44,750,415**	**131,967**	**44,882,382**	**475,456**	**33,088,302**	**6,589,382**	**4,729,242**
	0						
EXPENDITURES							
Personnel (Note 3)	6,743,418	0	6,743,418	0	0	3,224,064	3,519,354
Standard Contracts (Note 4)	275,935	20,000	295,935	0	0	151,583	144,352
Special Contracts (Note 5)	505,438	61,902	567,340	0	0	392,519	174,821
Expenditures Schedules Operation (Note 6)	1,023,892	38,600	1,062,492	0	0	537,856	524,636
TOTAL OPERATING EXPENDITURES	**8,548,683**	120,502	**8,669,185**	**0**	**0**	**4,306,022**	**4,363,163**
Pass-Thru Expenditures	33,815,743	(251,985)	33,563,758	475,456	33,088,302	0	0
Deferred Contingencies (Note 7)	2,385,989	263,450	2,649,439	0	0	2,283,360	366,079
TOTAL EXPENDITURES FOR FISCAL YEAR	**44,750,415**	**131,967**	**44,882,382**	**475,456**	**33,088,302**	**6,589,382**	**4,729,242**

Note 1: Local Member Contributions were reduced by $0.02 in FY2013 to $0.80 per capita. Increase to $0.85 in FY22, $0.90 in FY23 & $1.00 in FY24

Note 2: State Allocation grant has been reduced from a high of $366,628 in FY2001 to $151,943. Increase to $165,943 in FY22, Increase to $190,943 in FY25

Note 3: Funding for 50 Full-Time positions.

Note 4: Standard Contracts include: Space, Insurance, Equipment Rental, Maintenance & Repairs, Legal, & Audit.

Note 5: Special Contracts include Internet/Web hosting, design, and maintenance; recycling; public involvement.

Note 6: Schedules: Includes hospitality for mtgs, consumables, equip, copy costs, telephone, memberships, travel.

Note 7: Contingencies consist of those revenues received in current fiscal year that it is anticipated won't be spent until a future fiscal year.

Attachment 8C

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CY 2025 Hampton Roads Regional Meetings
(January 2025 – December 2025)
HRPDC/HRTPO/HRTAC/HRMFFA

Date	HRTPO 10:30 AM	HRPDC 12:30 PM	HRMFFA 10:30 AM	HRTAC 12:30 PM
JANUARY 16, 2025	✓*	✓*		
FEBRUARY 20, 2025	✓	✓		
MARCH 20, 2025			✓	✓
APRIL 17, 2025	✓	✓		
MAY 15, 2025	✓	✓		
JUNE 12, 2025			✓*	✓*
JULY 17, 2025	✓	✓		
AUGUST 21, 2025	No Meetings Currently Scheduled			
SEPTEMBER 18, 2025			✓	✓
OCTOBER 16, 2025	✓	✓		
NOVEMBER 20, 2025	✓	✓		
DECEMBER 11, 2025			✓	✓

Annual Meeting

Please note modified meeting dates for June & December 2025

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HAMPTON ROADS PLANNING DISTRICT COMMISSION
RESOLUTION 2025-01

RESOLUTION OF THE HAMPTON ROADS PLANNING DISTRICT COMMISSION ENCOURAGING LOCAL GOVERNMENTS IN HAMPTON ROADS TO CONSIDER ADOPTING POLICIES TO IMPLEMENT REGIONAL RESILIENT DESIGN GUIDELINES

WHEREAS, the tide gauge at Sewell's Point in Norfolk has recorded approximately 1.5 feet of relative sea level rise since 1927, equivalent to a change of 1.57 feet per 100 years.

WHEREAS, reports by the Hampton Roads Planning District Commission and Hampton Roads local governments have found the Hampton Roads region and many of its localities to be vulnerable to flooding and sea level rise.

WHEREAS, the "Virginia Coastal Resilience Master Plan Phase I," completed in 2021 by the Virginia Department of Conservation and Recreation at the request of the General Assembly, found that sea level rise will have significant impacts on Coastal Virginia in the near-term and long-term.

WHEREAS, several federal agencies have found, as described in the technical report, "Global and Regional Sea Level Rise Scenarios for the United States," published in 2022, that "By 2050, the expected relative sea level (RSL) will cause tide and storm surge heights to increase and will lead to a shift in U.S. coastal flood regimes, with major and moderate high tide flood events occurring as frequently as moderate and minor high tide flood events occur today. Without additional risk-reduction measures, U.S. coastal infrastructure, communities, and ecosystems will face significant consequences."

WHEREAS, the Virginia Institute of Marine Science Sea-Level Report Card for Norfolk, Virginia, projects relative sea level rise of 1.5 feet of sea level rise between 1992 and 2050, with a 95% confidence that sea level will rise between 1.0 feet and 2.1 feet over the same interval.

WHEREAS, the City of Virginia Beach has adopted, based on locally and regionally specific analysis of sea level and precipitation trends and projections, resilient design standards related to stormwater management and climate adaptation as part of its "Public Works Design Standards Manual."

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WHEREAS, several Hampton Roads localities, including Chesapeake, Gloucester County, Hampton, Isle of Wight County, Newport News, Norfolk, Portsmouth, Suffolk, and Virginia Beach, have adopted or are developing plans and programs to address floodplains, coastal resiliency, or sea level rise.

WHEREAS, incorporating resilient design guidelines into local policies for stormwater management and other planning and engineering applications is sound public policy that will help mitigate current and long-term flood risk and help protect and promote the health, safety, and welfare of Hampton Roads communities and residents.

Now, therefore, be it resolved that the HRPDC hereby:

1. Encourages localities in Hampton Roads to consider amending their stormwater management and other policies to incorporate sea level rise and increased rainfall as described in the attached document, "Regional Resilient Design Guidelines for Hampton Roads," which has been developed by the HRPDC staff in concert with the HRPDC Coastal Resiliency Committee and other local, regional, state, and federal partners;

2. Recommends that the adopted policies include planning for 1.5 feet of relative sea level rise above the 1983-2001 National Tidal Datum Epoch by 2050, 3 feet of relative sea level rise by 2080, and 4.5 feet of sea level rise by 2100;

3. Recommends that the adopted policies include accounting for watershed-specific tailwater conditions that account for sea level rise in areas that drain to tidal waterbodies;

4. Recommends that the adopted policies include precipitation levels that account for projected climate change, with a minimum of a 10% increase above NOAA Atlas 14;

5. Recommends that the adopted policies include design storms that include both tidal elevations and rainfall, accounting for both sea level rise and increased rainfall due to climate change; and

6. Directs the HRPDC staff and Coastal Resiliency Committee to keep apprised of developments in the monitoring, research, and analysis of sea level and precipitation trends and projections and provide updated information and recommendations to the Commission and to its member localities as appropriate.

APPROVED and ADOPTED by the Hampton Roads Planning District Commission at its meeting on the 16th day of January 2025.

<<INSERT ELECTED OFFICER>>	Robert A. Crum, Jr.
Chair	Executive Director/Secretary

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Regional Resilient Design Guidelines for Hampton Roads

November 14, 2024

Contact:

Benjamin J. McFarlane

Chief Resilience Officer

Hampton Roads Planning District Commission

bmcfarlane@hrpdcva.gov

Regional Resilient Design Guidelines for Hampton Roads

Summary of Recommendations

- **Sea Level Rise**
  - Hampton Roads localities should incorporate the following sea level rise projections into their plans (comprehensive plans, hazard mitigation plans, etc.) and policies (public works standards, stormwater ordinances, zoning ordinances, etc.).
    - 1.5 feet of sea level rise by 2050 (relative to the 1983-2001 National Tidal Datum Epoch)
    - 3.0 feet of sea level rise by 2080
    - 4.5 feet of sea level rise by 2100
  - For projects with longer lifespans, Hampton Roads localities should calculate project-appropriate sea level rise projections based on the 2022 Global and Regional Sea Level Rise Scenarios for the United States[1] using a tool such as the U.S. Army Corps of Engineers Sea Level Analysis Tool (SLAT)[2] Or NOAA's Sea Level Calculator.[3]
- **Tailwater Elevations**
  - Hampton Roads localities should incorporate watershed-specific tailwater elevations into their stormwater design standards. These elevations should account for sea level rise based on projected project lifespan.
- **Precipitation**
  - Hampton Roads localities should adopt standards requiring the use of future precipitation levels that account for projected climate change. Hampton Roads localities should adopt a standard that increases NOAA Atlas 14 values by a minimum of 10%.
- **Joint Tidal/Rainfall Design Storms**
  - Hampton Roads localities should adopt design storm requirements that account for both tidal elevations and rainfall and incorporate projected future conditions from sea level rise and increased rainfall.

Introduction

Flooding is a significant concern for most Hampton Roads communities. Coastal areas are vulnerable to high tides and storm surge, upland areas in the western part of the region must plan for riverine flooding, and the entire region is susceptible to stormwater flooding from intense rainfall events. Observed changes to rainfall patterns and sea level rise have increased flood risk in

[1] https://sealevel.globalchange.gov/internal_resources/756/noaa-nos-techrpt01-global-regional-SLR-scenarios-US.pdf
[2] https://climate.sec.usace.army.mil/slat/
[3] https://coast.noaa.gov/sealevelcalculator

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Hampton Roads over the last several decades. In addition to permanently inundating some areas, future climate change is projected to further increase the region's vulnerability to flooding from high tides or storm surge or from stormwater due to reduced capacity.

An important strategy for addressing flood risk is the adoption of public policies that regulate the development of land and infrastructure. These include state regulations such as the Virginia Uniform Statewide Building Code and stormwater management regulations as well as local ordinances regulating floodplains. These policies are generally based on data from past observations, such as NOAA Atlas 14.[4] However, in a changing climate, relying on past data may underestimate current and future flood risk. Developing and implementing design standards based on expected future conditions is essential to protecting lives, property, and infrastructure now and into the future.

These guidelines are built on the HRPDC Sea Level Rise Planning Policy and Approach that was adopted by the Hampton Roads Planning Commission in October 2018. That policy recommended three regional sea level rise planning scenarios: 1.5' between 2020 and 2050, 3.0' between 2050 and 2080, and 4.5' between 2080 and 2100. It also recommended evaluating the scenarios when new information becomes available. Several recent developments, including the release of new sea level rise curves from NOAA, the development of future intensity-duration-frequency curves by MARISA, and the adoption of Virginia Beach's Public Works Design Standards Manual, drove the need to reevaluate the 2018 policy and to develop new policy recommendations, with a new emphasis on stormwater management. The rationale behind the recommendations remains largely the same:

- **Sea level rise will significantly affect Hampton Roads.** Climate modeling and science continue to advance. Recent projections from federal agencies and research institutions combine observed trends and scenario-based predictions that provide sound estimates of future sea level rise that are suitable for local decision-making.
- **More frequent and intense rainfall is already having an impact on Hampton Roads communities.** Academic and agency efforts to analyze recent trends in precipitation since the publication of authoritative references such as NOAA Atlas 14 combined with studies considering how projected climate change will affect future weather patterns have resulted in tools that can be used to project precipitation intensity, duration, and frequency at the local level.
- **State and federal efforts to increase precipitation standards are not keeping pace with observed impacts.** Although efforts are underway to develop and implement state and federal policies for sea level rise, efforts to develop updated precipitation projections and policies at the state and federal level are not scheduled to be completed before the end of 2025 at the earliest.
- **Adopting local policies will result in increased community resilience sooner than relying on state or federal mandates.** Factoring projections of sea level rise and precipitation change into planning, engineering, and design through local adopted policies and practices will reduce risk and damage from flooding and storm surge.

[4] https://www.weather.gov/media/owp/oh/hdsc/docs/Atlas14_Volume2.pdf

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- **A regional approach can reduce the costs of developing and implementing standards.** It can also provide a strong statement of support for state and federal action to support local resilience initiatives.

Related Efforts

Several efforts are currently underway at the local, state, and federal government levels to develop new models, tools, and policies that account for current and future flood risk. These guidelines are based in part on several of the efforts listed here. Examples of models and tools include the federal and state efforts such as the North Atlantic Coast Comprehensive Study[5] and Federal Emergency Management Agency Flood Insurance Studies and supporting products, state efforts such as the Virginia Coastal Resilience Master Plan[6] and Virginia Institute of Marine Science Sea Level Rise Report Cards,[7] local initiatives such as Sea Level Wise in Virginia Beach[8] and Resilient Hampton,[9] and research efforts such as the MARISA Projected Intensity-Duration-Frequency (IDF) Curve Data Tool for the Chesapeake Bay Watershed and Virginia.[10] Examples of policies that factor in future conditions such as sea level rise or increased rainfall include the Federal Flood Risk Management Standard,[11] Virginia Beach's Public Works Design Standards Manual,[12] and the Virginia Department of Transportation Structure and Bridge Division Design Guidelines.[13] Specific sources used for each recommendation are included in the relevant sections.

Project Lifespan and Criticality

Incorporating climate change impacts into project design and implementation requires both estimating what future conditions may apply and level of protection or performance should be required. Underestimating a project's lifespan by planning for a smaller amount of sea level rise may result in frequent flooding in the future, lessening the value that project provides or requiring costly maintenance. Similarly, lowering the level of protection required may cost less, but it will result in additional risk that the project may fail or otherwise be negatively affected by flooding or sea level rise. Conversely, overestimating a project's lifespan or criticality may add substantially to a project's costs without providing the benefits to justify such an expense. Localities should consider adopting specific standards for different categories of projects. Table 1 provides below provides some examples for project categories with lifespans that correspond to the HRPDC

[5] https://www.nad.usace.army.mil/CompStudy.aspx
[6] https://www.dcr.virginia.gov/crmp/plan
[7] https://www.vims.edu/research/products/slrc/
[8] https://pw.virginiabeach.gov/stormwater/sea-level-wise
[9] https://hampton.gov/3459/Resiliency
[10] https://midatlantic-idf.rcc-acis.org/
[11] https://floodstandard.climate.gov/
[12] https://s3.us-east-1.amazonaws.com/virginia-beach-departments-docs/pw/Bid-Opportunities/Contracts-Specifications/Public-Works-Design-Standards-Manual.pdf
[13] https://www.vdot.virginia.gov/media/vdotvirginiagov/doing-business/technical-guidance-and-support/technical-guidance-documents/structure-and-bridge/manuals-of-structure-and-bridge-acc/part2/Part2.pdf

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regional sea level rise planning scenarios. These are taken from the New York City Climate Resiliency Design Guidelines[14] and Climate Ready DC Resilient Design Guidelines.[15]

Table 1: Recommended Project Lifespan Categories

Timeframe *Description*	**Example Projects**
2020-2050 *Temporary or rapidly replaceable components and finishings*	- Interim and deployable flood protection measures - Asphalt pavement, pavers, and other right-of-way finishings - Green infrastructure - Street furniture - Temporary building structures - Storage facilities - Emergent or developing technology (e.g., telecommunications equipment, batteries, solar photovoltaics, fuel cells, etc.)
2050-2080 *Facility improvements and components on a regular replacement cycle*	- Electrical, HVAC, and mechanical components - Most building retrofits (substantial improvements) - Concrete paving - Infrastructure mechanical components (e.g., compressors, lifts, pumps) - Outdoor recreational facilities - On-site/at-site energy equipment (e.g., fuel tanks, conduit, emergency generators) - Stormwater detention systems
2080-2100 *Long-lifespan buildings and infrastructure*	- Most buildings (e.g., public facilities, office/commercial/residential buildings) - Piers, wharfs, and bulkheads - Plazas - Retaining walls - Culverts - On-site energy generation/co-generation plants
2100- *Infrastructure or assets that cannot be relocated*	- Major infrastructure projects (e.g., tunnels, bridges, water and wastewater treatment plants, etc.) - Monumental buildings - Road reconstruction - Subgrade sewer infrastructure (e.g., sewers, catch basins, outfalls)

In some cases, communities may wish to apply higher standards or requirements for critical or essential facilities. The 2022 Hampton Roads Hazard Mitigation Plan defines essential facilities and

[14] https://climate.cityofnewyork.us/initiatives/climate-resiliency-design-guidelines/

[15] https://doee.dc.gov/sites/default/files/dc/sites/ddoe/service_content/attachments/CRDC%20resilient%20design%20guidelines_FINALApproved.pdf

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infrastructure as "those facilities or systems whose incapacity or destruction would present an immediate threat to life, public health, and safety or have a debilitating effect on the economic security of the region."[16] In addition the regional hazard mitigation plan, several localities, including Chesapeake,[17] Gloucester County,[18] Norfolk,[19] and Virginia Beach,[20] have officially designated critical facilities in their floodplain ordinance or other policy with additional design and siting requirements. Examples of critical facilities include:

- Emergency management or operations centers
- Evacuation routes
- Governmental facilities, such as data and communication centers and key government complexes
- Hazardous material facilities
- Hospitals and other medical facilities
- Fire and rescue stations
- Police stations
- Prisons
- Retirement or nursing homes
- Schols
- Shelters
- Universities
- Utility systems such as water, wastewater, oil, natural gas, electricity, and telecommunications facilities
- Other high potential loss facilities

Climate Observations and Projections

Observational data forms the foundation for understanding the region's recent weather patterns and how those patterns are changing over time. Data from authoritative sources such as the National Oceanic and Atmospheric Administration, the Virginia Institute of Marine Science, and other federal and state entities provide both a record of what has already occurred and serve as inputs for climate models to project future conditions. Data for tides and sea level trends is

[16] https://www.hrpdcva.gov/DocumentCenter/View/3533/2022-Hampton-Roads-Hazard-Mitigation-Plan-PDF

[17] https://library.municode.com/va/chesapeake/codes/code_of_ordinances?nodeId=PTIICOOR_CH26EN_ARTIVFLMA_S26-88DE

[18] https://library.municode.com/va/gloucester_county/codes/code_of_ordinances?nodeId=CH8.5FLMA_ARTIINGE

[19] https://www.norfolkva.gov/norfolkzoningordinance/#Norfolk-ZO/8_3_Definitions_and_Rules_of_Measurement.htm#_Toc502655915?TocPath=Article%25208%253A%2520Definitions%2520and%2520Rules%2520of%2520Measurement%257C8.3%2520Definitions%2520and%2520Rules%2520of%2520Measurement%257C_____0

[20] https://s3.us-east-1.amazonaws.com/virginia-beach-departments-docs/pw/Bid-Opportunities/Contracts-Specifications/Public-Works-Design-Standards-Manual.pdf

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available from NOAA's Center for Operational Oceanographic Products and Services (CO-OPS).[21] Precipitation data is available from NIAA's National Centers for Environmental Information (NCEI).[22]

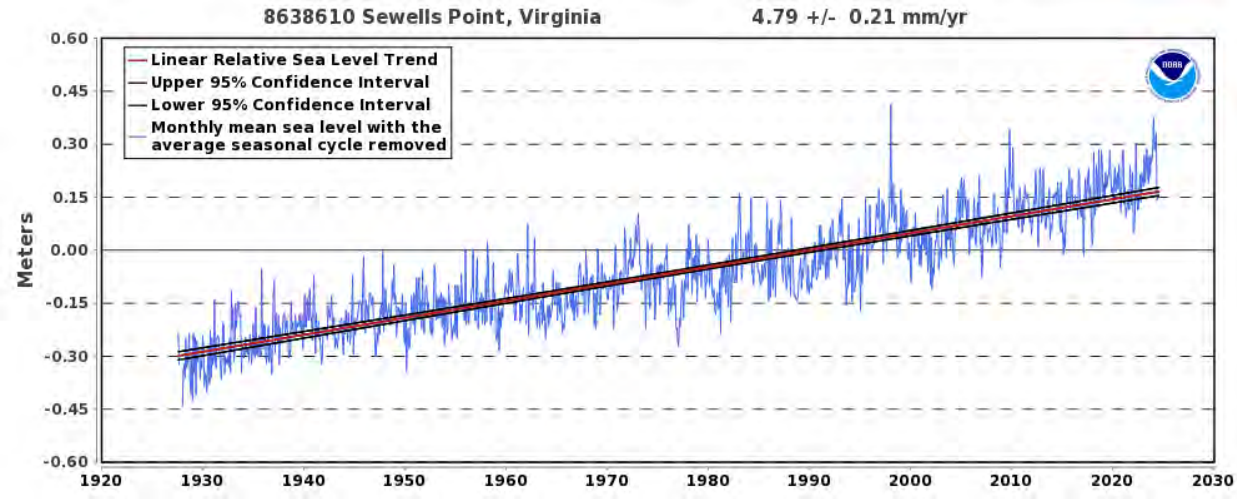
Sea Level Rise

Sea level rise is already having significant impacts on Hampton Roads communities, and these impacts are expected to increase in the future due to further sea level rise resulting from climate change. Ongoing and future impacts from sea level rise include loss of tidal wetlands and other shoreline areas due to permanent inundation, more frequent tidal flooding of riparian areas, increased extent of flooding from high tides and storm surge, and more frequent and wider spread inland flooding in some areas. According to the U.S. Interagency Sea Level Task Force[23], between 1970 and the present mean sea level increased by approximately 12 inches at the Sewell's Point tide gauge in Norfolk, Virginia, and it is projected to increase by a further 12 inches between 2020 and 2050 under the 2022 Intermediate Sea Level Rise Scenario.[24]

The HRPDC regional sea level rise planning scenarios originally adopted in 2018[25] and recommended again in these guidelines are based on observations at the Sewell's Point tide gauge, near-term projections based on statistical analysis of the observation record, and regional sea level rise projections based on global climate scenarios. The continuous long-term record at the Sewell's Point gauge extends from 1928 to the present and shows an annual average rate of sea level rise of 4.79 millimeters per year, or approximately 1.57 feet per hundred years, as shown in the chart below.[26]

[21] https://tidesandcurrents.noaa.gov/
[22] https://www.ncei.noaa.gov/
[23] The U.S. Interagency Task Force includes the U.S. Environmental Protection Agency, the U.S. Department of Homeland Security, the Federal Emergency Management Agency, NASA, NOAA, the U.S. Army Corps of Engineers, the U.S. Department of Defense, and the U.S. Geological Survey. Information on the Task Force is available at https://sealevel.globalchange.gov/about/interagency-sea-level-task-force/.
[24] https://sealevel.globalchange.gov/national-sea-level-explorer/?psmsl_id=299&scope=section_1
[25] https://hrpdcva.gov/674/Policy-Guidance
[26] https://tidesandcurrents.noaa.gov/sltrends/sltrends_station.shtml?id=8638610

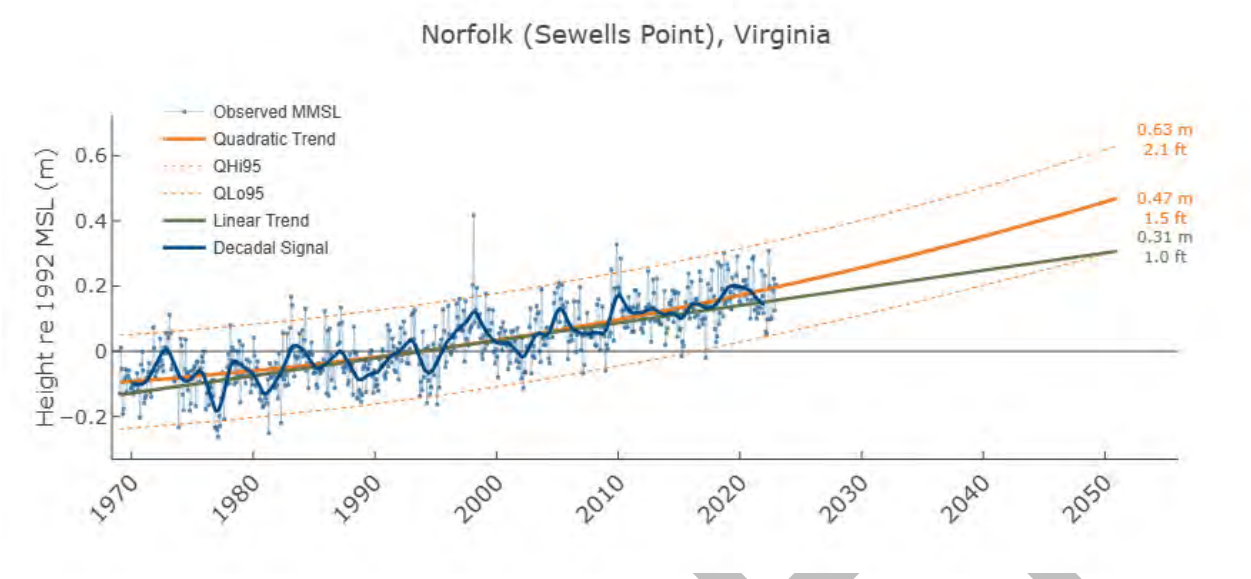
Figure 1: Relative Sea Level Trend for Sewell's Point Tide Gauge, Norfolk, Virginia



The long-term record is a critical tool, but, depending on the length of the record, it can downplay changes to the average trend. Recent research from the Virginia Institute of Marine Science has found evidence of accelerating sea level rise beginning in 1987.[27] Additional research published in 2018 reinforced this finding.[28] Based on this work, VIMS publishes Sea Level Rise Report Cards for thirty-two locations along the U.S. East, Gulf, West, and Alaskan coasts, including Norfolk.[29] These report cards include recent observational data, projections of future sea level in 2050, and a summary of how different drivers are affecting sea level trends for each location. For example, sea level rise in the Norfolk area is significantly affected by changing ocean dynamics and glacial ice melt, but less affected by groundwater withdrawals.[30] The VIMS Sea Level Rise Report Card for Norfolk projects that sea level will rise 0.47 meters or 1.5 feet above 1992 mean sea level, with a 95% chance that mean sea level in 2050 will be between 0.31 and 0.63 meters (1.0 feet to 2.1 feet). This confidence interval accounts for interannual and decadal variations in mean sea level. 1992 is used as the benchmark because it is the midpoint of the current 1983-2001 National Tidal Datum Epoch.[31]

[27] https://bioone.org/journals/journal-of-coastal-research/volume-28/issue-6/JCOASTRES-D-12-00102.1/Evidence-of-Sea-Level-Acceleration-at-US-and-Canadian-Tide/10.2112/JCOASTRES-D-12-00102.1.short
[28] https://scholarworks.wm.edu/reports/1111/
[29] https://www.vims.edu/research/products/slrc/
[30] https://www.vims.edu/research/products/slrc/localities/nova/
[31] https://www.tidesandcurrents.noaa.gov/datum-updates/ntde/

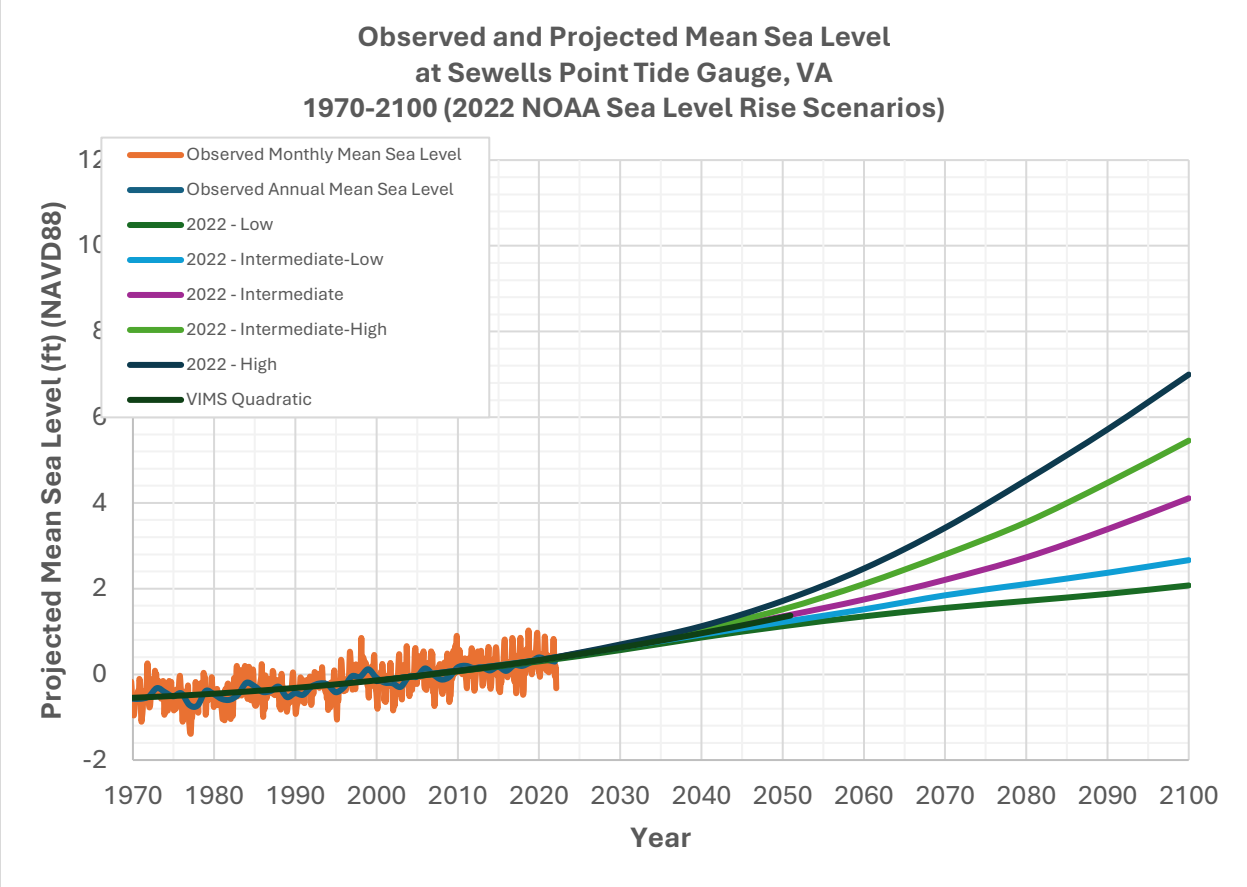
Figure 2: VIMS 2050 Sea Level Rise Projection for Norfolk, Virginia



The VIMS projections end in 2050 because uncertainty grows significantly beyond that timeframe using a statistical analysis approach. For longer-term projections, a scenario-based approach that uses various sets of socio-economic conditions is used to develop a range of possible outcomes. This is the approach used by both the Intergovernmental Panel on Climate and the U.S. Interagency Sea Level Task Force. In 2022, the National Oceanic and Atmospheric Agency, in partnership with the U.S. Interagency Sea Level Task Force, Rutgers University, and the Florida International University Institute of Environment, published *Global and Regional Sea Level Rise Scenarios for the United States: Updated Mean Projections and Extreme Water Level Probabilities Along U.S. Coastlines*.[32] This report incorporates updated science, including the statistical approach used by VIMS, and additional observations of sea level change and various drivers to produce five sea level rise scenarios that have been downscaled to develop regional estimates. These estimates account for global sea level rise drivers, such as ocean thermal expansion, glacial ice melt, ice sheet instability, and changes in the Earth's gravitational field, along with regional and local drivers such as vertical land movement (e.g., land subsidence caused groundwater withdrawals) and changes in ocean currents. This new analysis projects between 2.2 feet of sea level rise in Hampton Roads between 2000 and 2100 under the low scenario and 7.2 feet of sea level rise by 2100 under the high scenario. The intermediate scenario, which the observational trend and most closely follows, projects 4.3 feet of sea level rise between 2000 and 2100.

[32] https://sealevel.globalchange.gov/internal_resources/756/noaa-nos-techrpt01-global-regional-SLR-scenarios-US.pdf

Figure 3: Observed and Project Mean Sea Level Change in Norfolk, Virginia

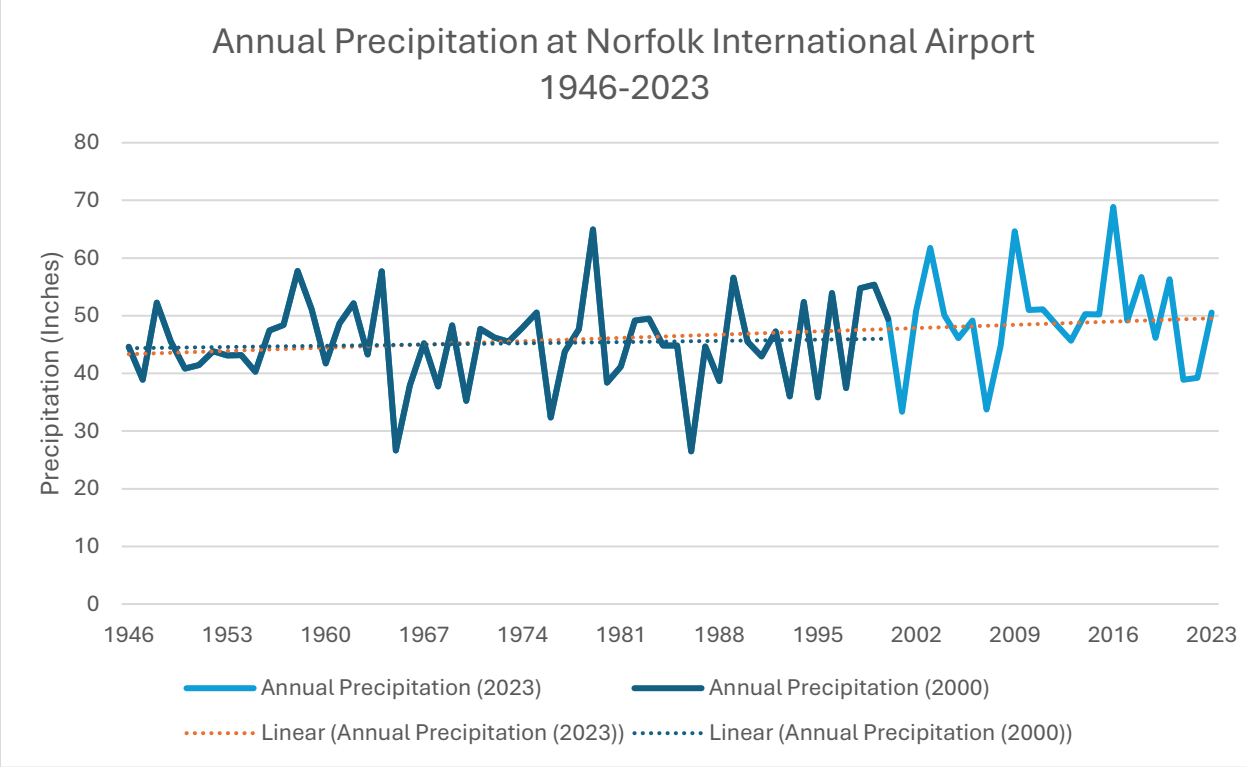


Precipitation

Increasing rainfall will have a significant impact on community infrastructure. Stormwater flooding is becoming more of a concern as rainfall intensifies and as sea level rise reduces stormwater system capacity during high tides. Generally, stormwater management facilities in Hampton Roads have been constructed based on design depths from NOAA Atlas 14, Volume 2, which is the most recent precipitation atlas for Virginia.[33] However, this atlas only includes data through December 2000, and analyses of recent data by Virginia Beach and others suggest that rainfall has continued to increase at an accelerated rate. Between 1946 and 2000, annual precipitation at the rain located at Norfolk International Airport increased approximately 3.7%, from 44.3 inches in 1946 to 45.9 inches in 2000, based on the linear trend. Including data from 2000 to 2023 results in a much larger increase of approximately 10.1% between 1946 to 2000 and 14.3% from 1946 to 2023. This trend is shown in Figure 5.

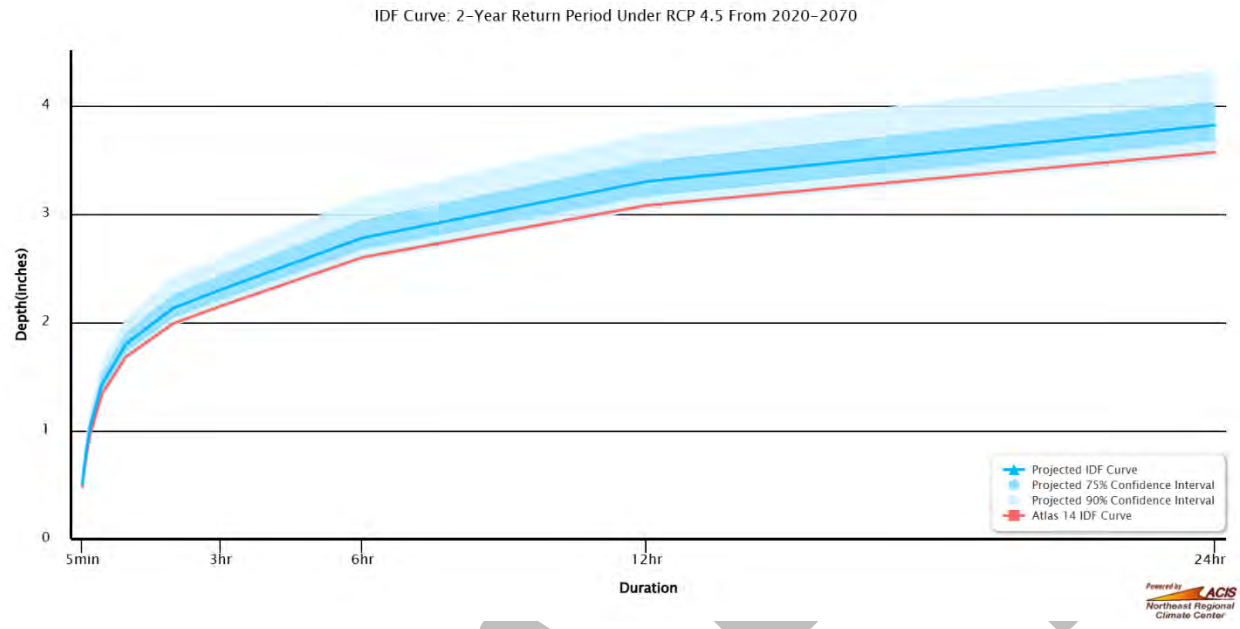
[33] Precipitation-Frequency Atlas of the United States" NOAA Atlas 14, Volume 2, Version 3.0, G. M. Bonnin, D. Martin, B. Lin, T. Parzybok, M. Yekta, and D. Riley, NOAA, National Weather Service, Silver Spring, Maryland, 2006

Figure 4: Annual Precipitation in Norfolk, Virginia - 1946-2023



While updating the dataset to include observations since 2000 is important for understanding current rainfall patterns, it is also important to take into account projected changes in precipitation due to climate change. Recent projects completed separately by the City of Virginia Beach and the Mid-Atlantic Regional Integrated Sciences and Assessments (MARISA) program have shown that rainfall will increase significantly in future years as a result of climate change. The MARISA project, completed in partnership with RAND and the Chesapeake Bay Program, used available precipitation data and downscaled climate models to project future precipitation levels and intensity-duration-frequency (IDF) curves for various combinations of climate scenarios, time periods, and recurrence intervals. For example, Figure 5 below shows the adjusted IDF curve for the 2-year storm under Representative Concentration Pathway 4.5 for 2020-2070 at Norfolk International Airport. Averaging both climate scenarios and all return periods for the 2020-2070 time period resulted in median projected increases between 4% and 13% above Atlas 14 for Hampton Roads localities, while using the 75th percentile resulted in median projected increases between 13% and 22%. More information on this analysis is available in Appendix C.

Figure 5: Project IDF Curve for Norfolk International Airport



Recommended Design Guidelines

Sea Level Rise

Given the uncertainty in how much sea level rise will occur over the 21st century, it is important for localities to use robust planning values that are relevant across multiple scenarios. Regional sea level rise planning values for Hampton Roads should be based on a combination of the observational record, near-term projections based on observed trends, and long-term climate scenarios. Based on the regional tide gauge record, VIMS projections, and 2022 NOAA sea level rise report, the HRPDC recommends that Hampton Roads localities use the following scenarios for sea level rise planning at the local and regional level:

- 1.5' of sea level rise between 1992 and 2050
- 3.0' of sea level rise between 1992 and 2080
- 4.5' of sea level rise between 1992 and 2100

For projects with longer lifespans, Hampton Roads localities should calculate project-appropriate sea level rise projections based on the 2022 Global and Regional Sea Level Rise Scenarios for the United States[34] using a tool such as the U.S. Army Corps of Engineers Sea Level Analysis Tool (SLAT)[35] Or NOAA's Sea Level Calculator.[36] These scenarios should be incorporated into local plans (e.g., comprehensive plans, hazard mitigation plans, etc.) and policies (e.g., stormwater

[34] https://sealevel.globalchange.gov/internal_resources/756/noaa-nos-techrpt01-global-regional-SLR-scenarios-US.pdf
[35] https://climate.sec.usace.army.mil/slat/
[36] https://coast.noaa.gov/sealevelcalculator

ordinances, public works/facilities manuals, etc.) as well as regional plans (e.g., the regional hazard mitigation plan or regional long-range transportation plan).

Design Tidal Elevations

Tailwater elevations are used as boundary conditions for stormwater management calculations based on specified design storms or other standards. The VDOT Drainage Manual requires the use of actual water elevations corresponding to either the specified design storm or to mean high water if those values are known; if not, the standard is to use an elevation equal to 0.8 times the diameter of the outlet pipe.[37] Several localities, including Chesapeake, Norfolk, and Virginia Beach, have specific elevations in their ordinances. Other communities in Hampton Roads currently rely on the VDOT Drainage Manual. Since stormwater infrastructure is generally intended to be long-lived, it is important that the design criteria used should account for expected future conditions, including sea level rise. The HRPDC recommends that Hampton Roads localities should incorporate watershed-specific tailwater elevations into their stormwater design standards. These elevations should account for sea level rise based on projected project lifespan. A proposed methodology for calculating these values is included in Appendix A. Design tidal elevations based on this methodology for each Hampton Roads locality are included in Appendix B.

Design Rainfall Depths

Rainfall depths are key inputs into stormwater management calculations, with different design storms used for different regulatory or other requirements. Virginia's current stormwater management regulations reference NOAA Atlas 14. Updated and new NOAA precipitation products are anticipated to be available in 2025 or 2026. However, the delivery timeline for these products is uncertain. The HRPDC recommends that Hampton Roads localities should adopt standards requiring the use of future precipitation levels that account for projected climate change. Hampton Roads localities should consider adopting a standard that increases NOAA Atlas 14 values by a minimum of 10%. A proposed methodology for determining design rainfall depths is included in Appendix C. Recommended design rainfall depths for each Hampton Roads locality are included in Appendix D.

Joint Probability Events

As part of its broader sea level rise planning program, in 2017 the City of Virginia Beach and Dewberry completed a report assessing the interaction between tidal and rainfall events. The report, "Joint Occurrence and Probabilities of Tides and Rainfall," documents correlation and joint probability analyses used to develop coastal tailwater conditions for tidal waterbodies in Virginia Beach and accompanying rainfall depths to be used together in implementing the city's stormwater

[37] https://www.vdot.virginia.gov/doing-business/technical-guidance-and-support/technical-guidance-documents/drainage-manual/

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management program in coastal areas. The design storm pairs listed in Table 2 are based on the joint probability pairs included in the City of Virginia Beach's Public Works Design Standards Manual. Accounting for both conditions will enable the design of more robust stormwater systems in areas where capacity may be limited during high tides or storm tides. The HRPDC recommends that Hampton Roads localities should adopt design storm requirements that account for both tidal elevations and rainfall and incorporate projected future conditions from sea level rise and increased rainfall.

Table 2: Recommended Joint Tidal/Rainfall Design Storms

Design Storm	Tidal Elevation	Rainfall
1-Year	**10-Year**	**1-Year**
2-Year	**5-Year**	**2-Year**
10-Year	**1-Year**	**10-Year**
25-Year	**2-Year**	**25-Year**
50-Year	**2-Year**	**50-Year**
100-Year	**3-Year**	**100-Year**

Future Policy Recommendations

Climate trends are continuously being monitored and updated by both federal (NOAA, USGS) and state (VIMS) entities. In addition, research and analysis into how climate change will alter sea level rise dynamics and precipitation patterns continues to progress. Several efforts underway, including updates to NOAA Atlas 14, the development of NOAA Atlas 15, regional Coastal Storm Risk Management Plans, Phase 2 of the Virginia Coastal Resilience Master Plan, and the Virginia Flood Protection Master Plan, will have direct relevance to the policies recommended in this document. The HRPDC recommends that the HRPDC staff and Hampton Roads local governments evaluate and update these guidelines as appropriate based on new information as it becomes available.

Appendix A – Design Tidal Elevations Methodology

The goal of this effort is to develop design tidal elevations for communities in Hampton Roads that incorporate future sea level rise. These design tidal elevations are intended for use as input tailwater conditions for stormwater management calculations using design storms based on specific recurrence intervals for individual tidal subwatersheds (12-digit Hydrologic Unit Code) throughout Hampton Roads.[38] This analysis builds on two previous studies conducted by the U.S. Army Corps of Engineers: the FEMA Region III Storm Surge Study[39] and the North Atlantic Coast Comprehensive Study.[40] The FEMA Region III Storm Surge Study (FEMA Study) was used in the development of the most recent flood insurance studies and corresponding flood insurance rate maps for coastal Hampton Roads localities. As part of the FEMA Study, the Advanced Circulation Model for Oceanic, Coastal and Estuarine Waters (ADCIRC) model was used to develop a two-dimensional, unstructured grid of storm surge stillwater (not including waves) elevations for six return periods: 10-year, 25-year, 50-year, 100-year, 500-year, and 1000-year (Figure 1). This dataset provided the baseline storm surge values used for the analysis.

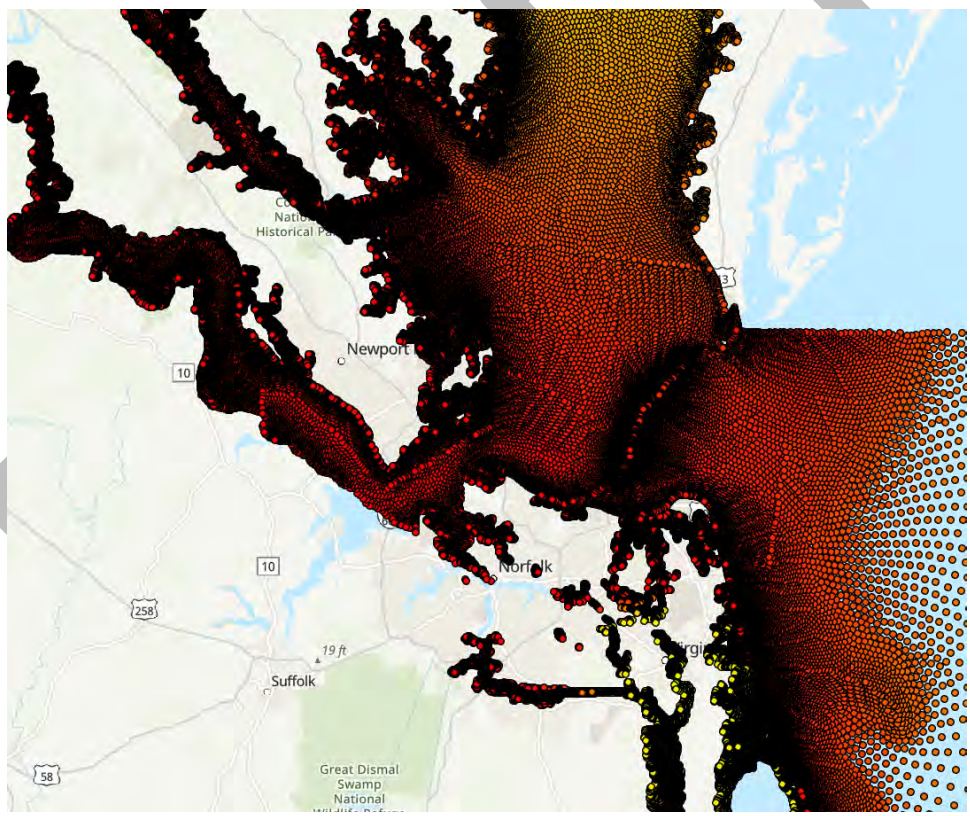

Figure 6: ADCIRC Grid from FEMA Region III Storm Surge Study

[38] Subwatersheds are 12-digit Hydrologic Unit Code (HUC-12) watersheds.
[39] Hanson, Jeffrey L., Michael F. Forte, Brian Blanton, Mark Gravens, and Peter Vickery. FEMA Region III Storm Surge Study Coastal Storm Surge Analysis: Storm Surge Results. US. Army Corps of Engineers Engineer Research and Development Center. November 2013.
[40] U.S. Army Corps of Engineers. North Atlantic Coast Comprehensive Study: Resilient Adaptation to Increasing Risk. U.S. Army Corps of Engineers. January 2015. https://www.nad.usace.army.mil/CompStudy/

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HRPDC staff developed representative tidal elevations for individual watersheds by calculating the 95th- percentile for each HUC-12 geography. A log-linear analysis was run on these values to calculated values for the 1-year, 2-year, 3-year, and 5-year return periods for each watershed. Figure 2 shows an example of this approach. Blue dots represent the 95th-percentile values calculated from the original dataset. Orange dots represent the values calculated using the log-linear analysis.

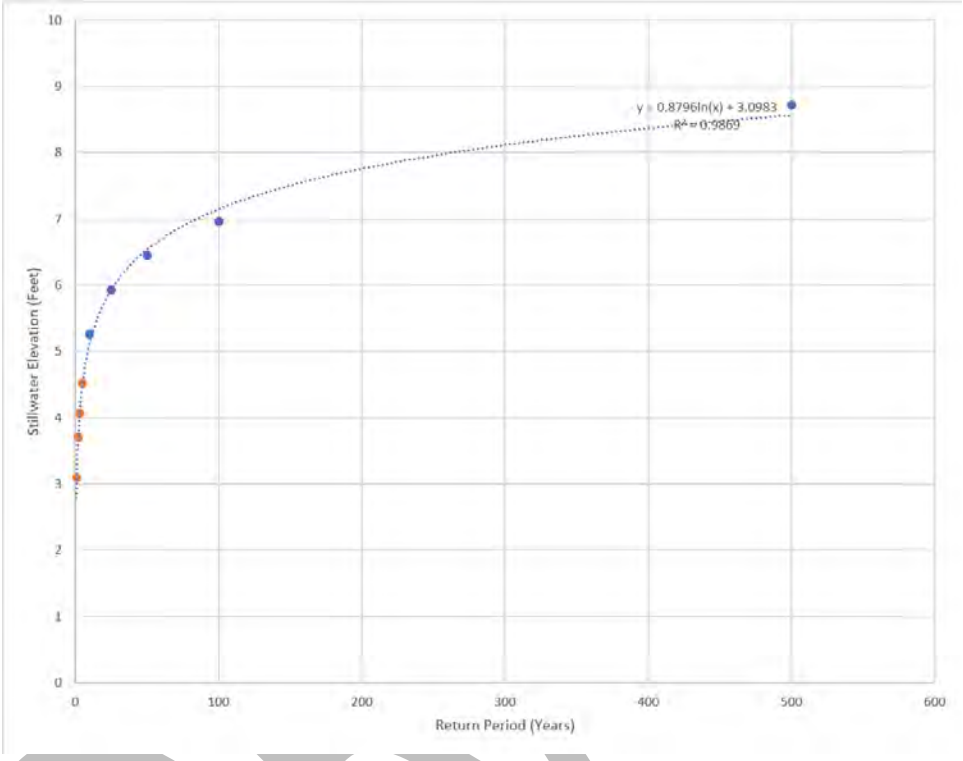

Figure 7: Chart Showing Results of Log-Linear Analysis of 1-, 2-, 3-, and 5-Year Return Periods

Separately, estimates of non-linear effects of sea level rise were calculated by comparing storm surge elevations from the North Atlantic Coast Comprehensive Study (NACCS) with and without sea level rise (Figure 3). This approach described here for calculating non-linearity factors is based on the methodology used by the City of Virginia Beach and Dewberry to develop design tidal elevations for the city's Public Works Design Standards Manual (June 2020). As part of the NACCS, the US. Army Corps of Engineers modeled storm surge under present conditions and with one meter of sea level rise. The results showed that storm surge in many areas was higher than simply adding one meter to the baseline value. This difference can be accounted for by using non-linearity factors, which are multipliers used to convert baseline values to future values.

For this analysis, non-linearity factors for all HUC-10 and HUC-12 watersheds in Hampton Roads were calculated by averaging factors for each NACCS grid point and return period (10-year, 20-year, 50-year, 100-year, and 500-year). HUC-10 watershed values were calculated for use when the NACCS did not include points within a given HUC-10. Design tidal elevations with sea level rise were then calculated by adding the three regional sea level rise scenarios (1.5', 3', and 4.5') to the

calculated elevations. The non-linearity factors derived from the NACCS were then used to develop design tidal elevations for the 3' and 4.5' sea level rise scenarios. The Virginia Beach study found that non-linearity did not occur with 1.5' of sea level rise, so for that scenario the amount of sea level rise was just added to the baseline tidal elevation. Non-linearity factors for all watersheds included in this analysis are listed in Table 1.

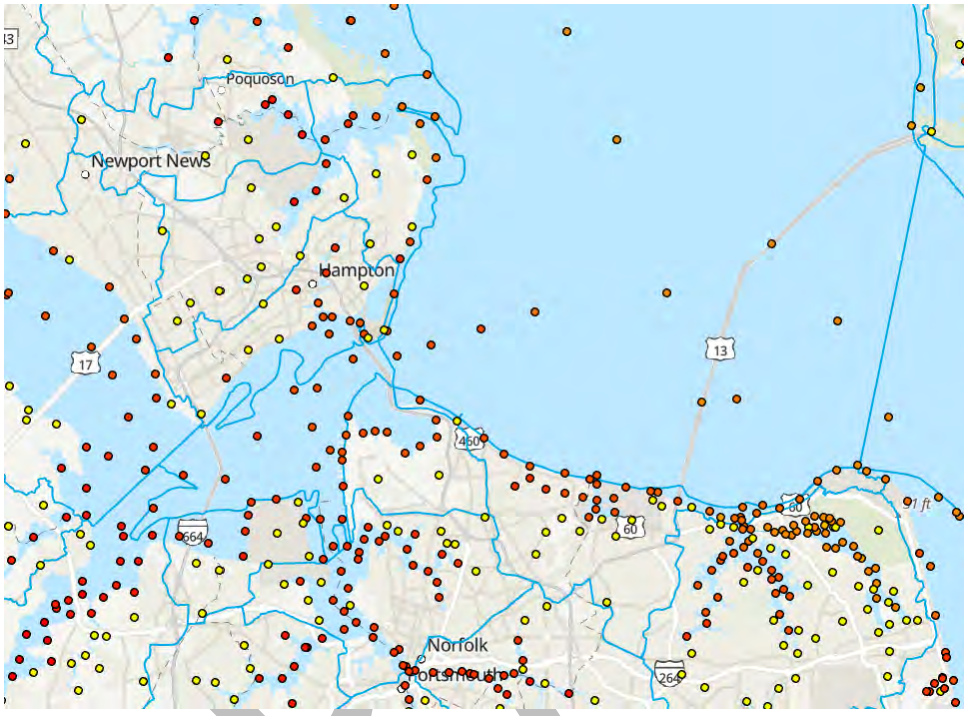

Figure 8: NACCS Storm Surge and Sea Level Rise Analysis Grid Points

Methodology for Design Tidal Elevations:

1. Spatially join Region III Storm Surge points to HUC-12 watersheds (Figure 4)
2. Export spatially joined table and convert to Excel format
3. Calculate 95th-percentile for 10-year, 25-year, 50-year, 100-year, 500-year, and 1000-year return periods for each HUC-12 watershed
4. Calculate SLOPE and INTERCEPT values for each watershed
5. Calculate values for 1-year, 2-year, 3-year, and 5-year return periods using log-linear model
6. (For 1.5' SLR) Add 1.5' to each baseline return period value
7. (For 3' and 4.5' SLR):

$$\textit{Future Design Tidal Elevation} = \textit{(Baseline Tidal Elevation + SLR Scenario) x Non-Linearity Factor}$$

Calculation of Non-Linearity Factors

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$$\text{Non-Linearity Factor} = \frac{\text{(USACE Modeled Storm Surge Elevation with SLR)}}{\text{(USACE Baseline Storm Surge Elevation + SLR)}}$$

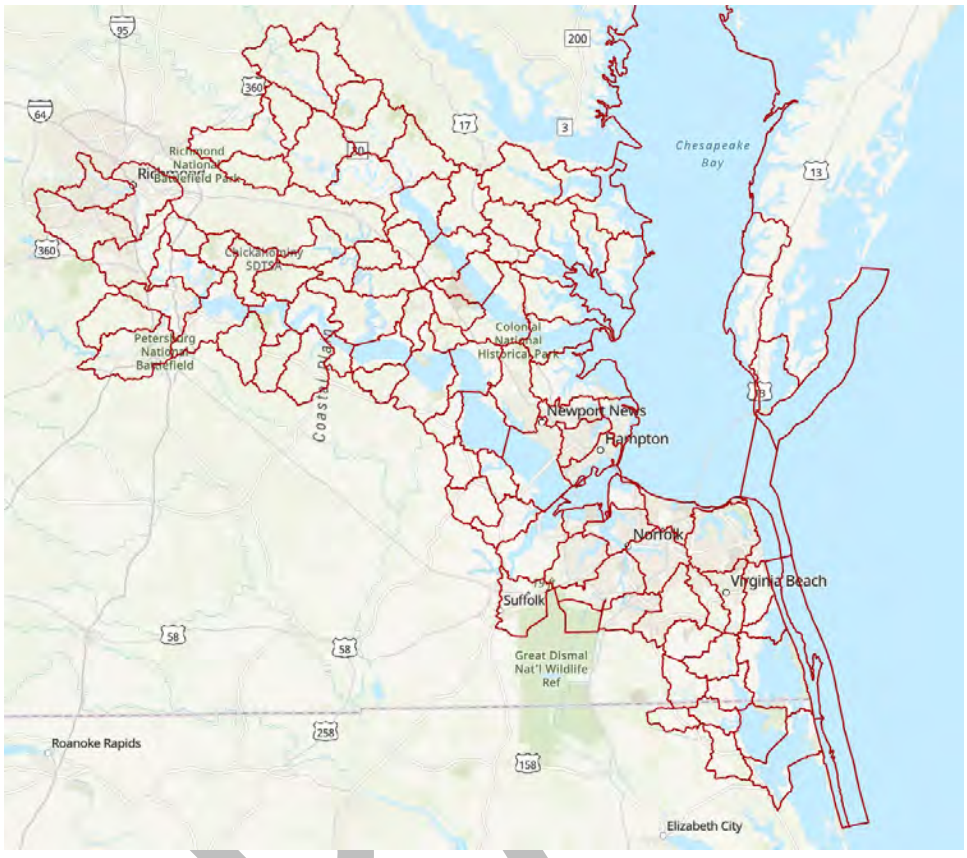


Figure 9: HUC-12 Watersheds Used for Tidal Elevation Analysis

Table 3: Non-Linearity Factors for Hampton Roads Tidal Watersheds

HUC12	Name	Non-Linearity Factor
020403040304	Smith Island Inlet-The Thorofare	1.07
020403040404	Lower Eastern Shore-Atlantic Ocean	1.09
020403040501	Rudee Inlet-Atlantic Ocean	1.07
020403040502	020403040502-Atlantic Ocean	1.08
020801010000	Lower Chesapeake Bay	1.03
020801020301	Carvers Creek-Piankatank River	1.00
020801020302	Hills Bay-Piankatank River	1.03
020801020303	Milford Haven-Lower Chesapeake Bay	1.01
020801020401	Beaverdam Swamp	1.03*
020801020402	Crany Creek-Fox Mill Run	1.01
020801020403	Ware River	1.02
020801020404	North River	1.03
020801020405	East River	1.04
020801020406	Winter Harbor-Lower Chesapeake Bay	1.02
020801020407	Severn River	1.02
020801020408	Monday Creek-Mobjack Bay	1.03
020801050504	Aylett Creek-Mattaponi River	1.03
020801050601	Garnetts Creek	1.04*
020801050602	Courthouse Creek-Mattaponi River	1.05
020801050603	Heartquake Creek-Mattaponi River	1.04
020801050604	Cabin Creek-Mattaponi River	1.04
020801061003	Black Creek	1.10*
020801061004	Montague Creek-Pamunkey River	1.10
020801061005	Jacks Creek	1.10*
020801061101	Cohoke Mill Creek-Pamunkey River	1.11
020801061102	Mill Creek-Pamunkey River	1.04
020801070101	Ware Creek	1.04*
020801070102	Philbates Creek-York River	1.03
020801070103	Poropotank River	1.09
020801070104	Skimino Creek-York River	1.05
020801070201	Jones Creek-York River	1.03
020801070202	Queen Creek	1.03
020801070203	Carter Creek-York River	1.03
020801070204	Sarah Creek-York River	1.02
020801080101	Poquoson River-Lower Chesapeake Bay	1.02
020801080102	Northwest Branch Back River	1.02
020801080103	Southwest Branch Back River	1.01
020801080104	Back River-Lower Chesapeake Bay	1.03
020801080201	Lynnhaven River	1.03
020801080202	Little Creek-Lower Chesapeake Bay	1.03
020801110901	Hungars Creek-Lower Chesapeake Bay	1.03
020801110902	Cherrystone Inlet-Lower Chesapeake Bay	1.04

HUC12	Name	Non-Linearity Factor
020802050607	Little Westham Creek-James River	2.73
020802060101	Almond Creek-James River	2.54
020802060102	Falling Creek	1.85*
020802060103	Proctors Creek-James River	2.09
020802060104	Fourmile Creek	1.85*
020802060105	Turkey Island Creek	1.85*
020802060106	Curles Creek-James River	1.48
020802060201	Bailey Creek-James River	1.12
020802060202	Powell Creek	1.11
020802060203	Herring Creek	1.12*
020802060204	Courthouse Creek-Queens Creek	1.12*
020802060205	Flowerdew Hundred Creek-James River	1.09
020802060301	Wards Creek	1.07*
020802060302	Kittewan Creek-James River	1.07
020802060303	Upper Chippokes Creek	1.10
020802060304	Sunken Meadow Pond-James River	1.06
020802060506	Big Swamp-Chickahominy River	1.04
020802060601	Barrows Creek-Chickahominy River	1.04
020802060603	Mill Creek-Diascund Creek	1.05*
020802060604	Yarmouth Creek-Chickahominy River	1.05
020802060605	Morris Creek-Chickahominy River	1.05
020802060701	Broad Swamp-James River	1.05
020802060702	Powhatan Creek	1.05
020802060703	Grays Creek	1.05
020802060704	Lower Chippokes Creek-James River	1.04
020802060801	College Creek	1.04*
020802060802	Skiffes Creek-James River	1.04
020802060803	Lawnes Creek	1.04*
020802060804	Morrisons Creek-James River	1.04
020802060901	Warwick River	1.07
020802060902	Warren Creek-Pagan River	1.03*
020802060903	Cypress Creek	1.03*
020802060904	Jones Creek-Pagan River	1.02
020802060905	Chuckatuck Creek	1.01
020802060906	Cooper Creek-James River	1.03
020802070904	Franks Branch-Swift Creek	1.15
020802071001	Oldtown Creek-Appomattox River	1.14
020802071002	Ashton Creek-Appomattox River	1.14
020802080105	Cedar Lake-Nansemond River	1.05
020802080106	Bennett Creek-Nansemond River	1.02
020802080201	New Mill Creek-Southern Branch Elizabeth River	0.99
020802080202	Big Entry Ditch-Dismal Swamp	1.01*
020802080203	Deep Creek-Southern Branch Elizabeth River	1.00
020802080204	Eastern Branch Elizabeth River	1.02

HUC12	Name	Non-Linearity Factor
020802080205	Western Branch Elizabeth River	1.02
020802080206	Elizabeth River	1.02
020802080301	Streeter Creek-Hampton Roads	1.03
020802080302	Willoughby Bay	1.02
020802080303	Hampton River-Hampton Roads	1.03
020802080304	Hampton Roads Channel	1.03
030102051104	Indian Creek-Northwest River	1.04
030102051105	Moyock Run	1.04*
030102051107	Tull Creek	1.04*
030102051108	Tull Bay-Northwest River	1.04
030102051201	Chesapeake Canal	1.00
030102051202	West Neck Creek	1.04*
030102051203	Upper North Landing River	1.04
030102051204	Pocaty River	1.04*
030102051205	Blackwater Creek-North Landing River	1.03
030102051206	Milldam Creek-North Landing River	1.03
030102051207	Town of Currituck-North Landing River	1.06
030102051301	Ashville Bridge Creek	1.07*
030102051302	North Bay-Shipps Bay	1.08
030102051303	Back Bay	1.09
030102051304	Coinjock Bay-Currituck Sound	1.05
030102051701	Sand Ridge-Atlantic Ocean	1.09
030102051702	Town of Corolla-Oceanside Seashore	1.12
030102051706	030102051706-Atlantic Ocean	1.10

* Non-Linearity Factor for corresponding HUC-10 watershed

Appendix B – Design Tidal Elevations for Hampton Roads Localities

Notes:

1. Sea level rise scenarios are based on HRPDC Sea Level Rise Planning Policy and Approach (2018) and HRPDC Regional Resilient Design Guidelines (2024).
2. Except where noted, all elevations sourced from statistical analysis of the distribution of water elevations in each watershed from the FEMA Region III Storm Surge Study conducted by the U.S. Army Corps of Engineers Engineer Research and Development Center (2013).
3. Conditions related to the 3-ft sea level rise design level include non-linear increases derived from numerical modeling completed by the U.S. Army Corps of Engineers as part of the North Atlantic Coast Comprehensive Study.
4. Non-linearity factors for HUC-10 watersheds used in cases where HUC-12 watersheds had no data points to calculate non-linearity factors.

Design Tidal Elevations – Chesapeake

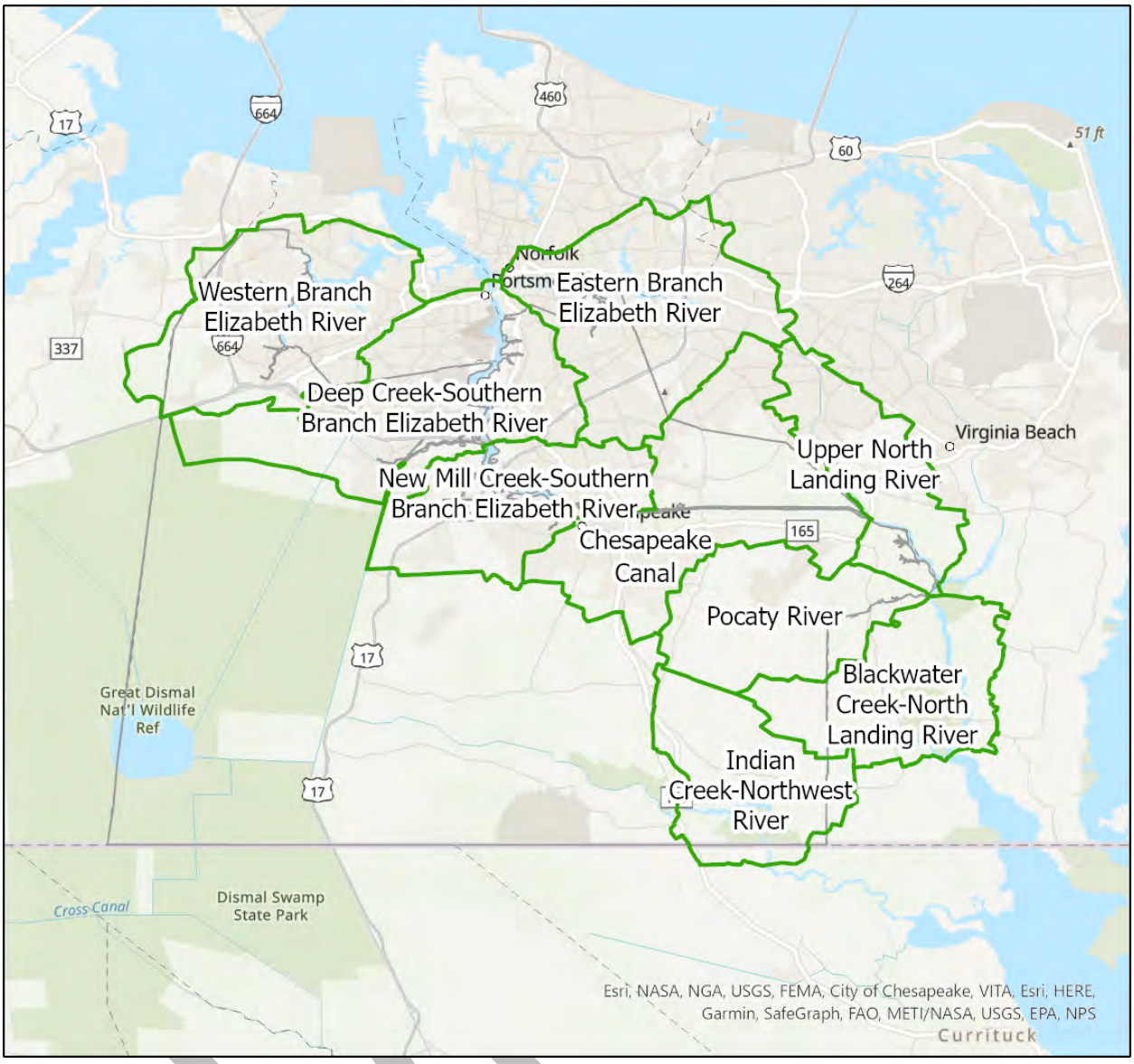
Note: All elevations in feet relative to the North American Vertical Datum (NAVD) of 1988

HUC12	Watershed	Design Level	1-Year	2-Year	3-Year	5-Year	10-Year	25-Year	50-Year	100-Year	500-Year
020802080201	New Mill Creek-Southern Branch Elizabeth River	Current	3.9	4.5	4.8	5.2	5.8	6.6	7.2	7.8	9.2
		1.5 ft SLR	5.4	6.0	6.3	6.7	7.3	8.1	8.7	9.3	10.7
		3.0 ft SLR	6.9	7.5	7.8	8.2	8.8	9.6	10.2	10.8	12.2
020802080203	Deep Creek-Southern Branch Elizabeth River	Current	3.4	4.1	4.5	5.1	5.9	6.7	7.3	8.0	10.0
		1.5 ft SLR	4.9	5.6	6.0	6.6	7.4	8.2	8.8	9.5	11.5
		3.0 ft SLR	6.4	7.1	7.5	8.1	8.9	9.7	10.3	11.0	13.0
020802080204	Eastern Branch Elizabeth River	Current	2.9	3.7	4.2	4.8	5.9	6.6	7.3	8.0	10.4
		1.5 ft SLR	4.4	5.2	5.7	6.3	7.4	8.1	8.8	9.5	11.9
		3.0 ft SLR	6.0	6.8	7.3	7.9	9.1	9.8	10.5	11.2	13.6
020802080205	Western Branch Elizabeth River	Current	3.7	4.5	4.9	5.4	6.1	7.0	7.9	8.6	10.3
		1.5 ft SLR	5.2	6.0	6.4	6.9	7.6	8.5	9.4	10.1	11.8
		3.0 ft SLR	6.9	7.7	8.1	8.6	9.3	10.2	11.2	11.9	13.6
030102051104	Indian Creek-Northwest River	Current	-	-	-	-	-	2.0	2.4	2.8	3.8
		1.5 ft SLR	-	-	-	-	-	3.5	3.9	4.3	5.3
		3.0 ft SLR	-	-	-	-	-	5.2	5.6	6.0	7.1
030102051201	Chesapeake Canal	Current	3.0	3.6	4.0	4.4	5.0	5.8	6.4	7.0	8.4
		1.5 ft SLR	4.5	5.1	5.5	5.9	6.5	7.3	7.9	8.5	9.9
		3.0 ft SLR	6.0	6.6	7.0	7.4	8.0	8.8	9.4	10.0	11.4
030102051203 030102051204 030102051205	North Landing River	Current	-	-	-	-	-	2.8	3.4	3.9	4.9
		1.5 ft SLR	-	-	-	-	-	4.3	4.9	5.4	6.4
		3.0 ft SLR	-	-	-	-	-	6.3	6.9	7.5	8.5

Notes:

1. North Landing River watershed includes Upper North Landing River, Pocaty River, and Blackwater Creek-North Landing River watersheds. Sourced from Virginia Beach Public Works Design Standards Manual, June 2020.
2. Due to recurring wind tides, it is recommended to use the 25-year design tidal elevations for 1-year to 10-year return periods for the Indian Creek-Northwest River and North Landing River watersheds.

Figure 10: Watershed Boundaries for Design Tidal Elevations – Chesapeake


Western Branch
Elizabeth River
Eastern Branch
Elizabeth River
Deep Creek-Southern
Branch Elizabeth River
New Mill Creek-Southern
Branch Elizabeth River
Chesapeake
Canal
Upper North
Landing River
Pocaty River
Blackwater
Creek-North
Landing River
Indian
Creek-Northwest
River
Great Dismal
Nat'l Wildlife
Ref
Dismal Swamp
State Park
Cross Canal
Virginia Beach
Norfolk
Portsm
Currituck
Esri, NASA, NGA, USGS, FEMA, City of Chesapeake, VITA, Esri, HERE,
Garmin, SafeGraph, FAO, METI/NASA, USGS, EPA, NPS
51 ft
17
664
460
60
264
337
165

Design Tidal Elevations – Gloucester County

Note: All elevations in feet relative to the North American Vertical Datum (NAVD) of 1988

HUC12	Watershed	Design Level	1-Year	2-Year	3-Year	5-Year	10-Year	25-Year	50-Year	100-Year	500-Year
020801020301	Carvers Creek-Piankatank River	Current	1.8	2.5	2.9	3.4	4.2	5.0	5.3	5.9	7.8
		1.5 ft SLR	3.3	4.0	4.4	4.9	5.7	6.5	6.8	7.4	9.3
		3.0 ft SLR	4.8	5.5	5.9	6.4	7.2	8.0	8.3	8.9	10.8
020801020401	Beaverdam Swamp	Current	1.2	2.2	2.7	3.4	4.9	5.6	6.1	6.9	10.0
		1.5 ft SLR	2.7	3.7	4.2	4.9	6.4	7.1	7.6	8.4	11.5
		3.0 ft SLR	4.3	5.4	5.9	6.6	8.1	8.9	9.4	10.2	13.4
020801020402	Crany Creek-Fox Mill Run	Current	1.6	2.5	3.0	3.6	4.9	5.6	6.1	6.8	9.6
		1.5 ft SLR	3.1	4.0	4.5	5.1	6.4	7.1	7.6	8.3	11.1
		3.0 ft SLR	4.7	5.6	6.1	6.7	8.0	8.7	9.2	9.9	12.8
020801020403	Ware River	Current	1.8	2.6	3.1	3.7	4.9	5.6	6.0	6.6	9.3
		1.5 ft SLR	3.3	4.1	4.6	5.2	6.4	7.1	7.5	8.1	10.8
		3.0 ft SLR	4.9	5.7	6.2	6.8	8.1	8.8	9.2	9.8	12.5
020801020404	North River	Current	1.5	2.3	2.8	3.5	4.8	5.4	5.9	6.6	9.4
		1.5 ft SLR	3.0	3.8	4.3	5.0	6.3	6.9	7.4	8.1	10.9
		3.0 ft SLR	4.6	5.5	6.0	6.7	8.1	8.7	9.2	9.9	12.8
020801020407	Severn River	Current	2.6	3.2	3.6	4.1	4.9	5.7	6.0	6.5	8.5
		1.5 ft SLR	4.1	4.7	5.1	5.6	6.4	7.2	7.5	8.0	10.0
		3.0 ft SLR	5.7	6.3	6.8	7.3	8.1	8.9	9.2	9.7	11.8
020801070103	Poropotank River	Current	2.7	3.4	3.9	4.4	5.4	6.1	6.5	6.9	9.2
		1.5 ft SLR	4.2	4.9	5.4	5.9	6.9	7.6	8.0	8.4	10.7
		3.0 ft SLR	6.2	7.0	7.5	8.0	9.1	9.9	10.3	10.8	13.3
020801070104	Skimino Creek-York River	Current	3.0	3.6	4.0	4.5	5.3	6.1	6.4	6.9	8.8
		1.5 ft SLR	4.5	5.1	5.5	6.0	6.8	7.6	7.9	8.4	10.3
		3.0 ft SLR	6.3	6.9	7.3	7.9	8.7	9.5	9.8	10.4	12.4
020801070201	Jones Creek-York River	Current	3.2	3.8	4.1	4.6	5.2	6.0	6.4	6.8	8.5
		1.5 ft SLR	4.7	5.3	5.6	6.1	6.7	7.5	7.9	8.3	10.0
		3.0 ft SLR	6.4	7.0	7.3	7.8	8.5	9.3	9.7	10.1	11.9
020801070203	Carter Creek-York River	Current	3.1	3.7	4.0	4.5	5.1	5.8	6.3	6.8	8.3
		1.5 ft SLR	4.6	5.2	5.5	6.0	6.6	7.3	7.8	8.3	9.8
		3.0 ft SLR	6.3	6.9	7.2	7.7	8.3	9.1	9.6	10.1	11.6
020801070204	Sarah Creek-York River	Current	3.0	3.6	3.9	4.3	4.9	5.5	6.1	6.6	7.9
		1.5 ft SLR	4.5	5.1	5.4	5.8	6.4	7.0	7.6	8.1	9.4
		3.0 ft SLR	6.1	6.7	7.1	7.5	8.1	8.7	9.3	9.8	11.1

Figure 11: Watershed Boundaries for Design Tidal Elevations – Gloucester County

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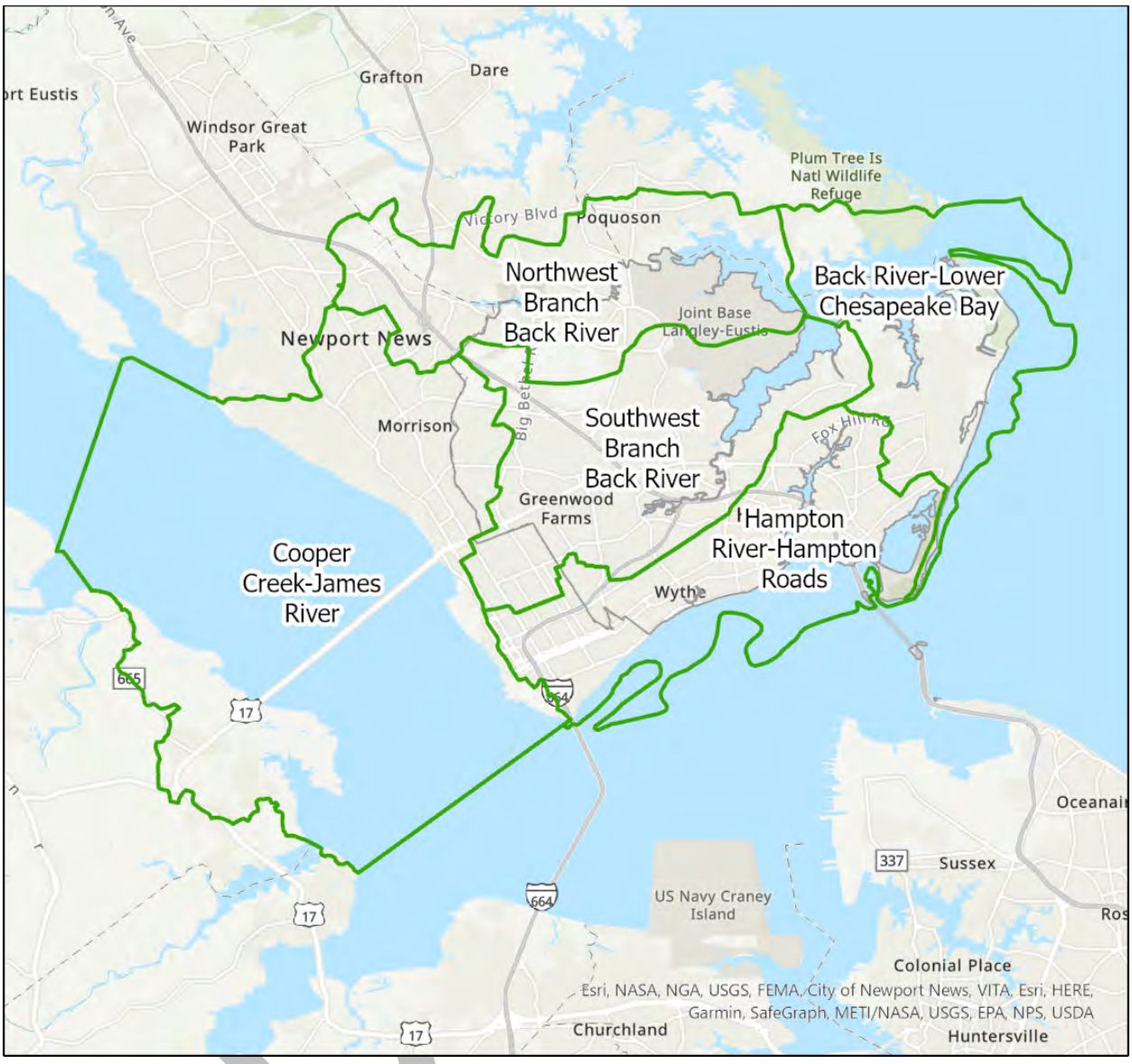
Design Tidal Elevations – Hampton

Note: All elevations in feet relative to the North American Vertical Datum (NAVD) of 1988

HUC12	Watershed	Design Level	1-Year	2-Year	3-Year	5-Year	10-Year	25-Year	50-Year	100-Year	500-Year
020801080102	Northwest Branch Back River	Current	3.2	3.9	4.3	4.9	5.6	6.4	7.2	7.9	9.6
		1.5 ft SLR	4.7	5.4	5.8	6.4	7.1	7.9	8.7	9.4	11.1
		3.0 ft SLR	6.4	7.1	7.5	8.1	8.8	9.6	10.5	11.2	12.9
020801080103	Southwest Branch Back River	Current	3.3	4.0	4.4	5.0	5.6	6.5	7.4	8.1	9.7
		1.5 ft SLR	4.8	5.5	5.9	6.5	7.1	8.0	8.9	9.6	11.2
		3.0 ft SLR	6.4	7.1	7.5	8.1	8.7	9.6	10.5	11.3	12.9
020801080104	Back River-Lower Chesapeake Bay	Current	3.2	3.9	4.3	4.7	5.4	6.1	6.8	7.5	9.0
		1.5 ft SLR	4.7	5.4	5.8	6.2	6.9	7.6	8.3	9.0	10.5
		3.0 ft SLR	6.4	7.1	7.5	7.9	8.6	9.3	10.1	10.8	12.3
020802060906	Cooper Creek-James River	Current	3.7	4.4	4.8	5.2	5.8	6.7	7.5	8.1	9.6
		1.5 ft SLR	5.2	5.9	6.3	6.7	7.3	8.2	9.0	9.6	11.1
		3.0 ft SLR	6.9	7.6	8.0	8.4	9.1	10.0	10.8	11.4	13.0
020802080303	Hampton River-Hampton Roads	Current	3.5	4.1	4.4	4.9	5.4	6.2	7.0	7.6	8.9
		1.5 ft SLR	5.0	5.6	5.9	6.4	6.9	7.7	8.5	9.1	10.4
		3.0 ft SLR	6.7	7.3	7.6	8.1	8.6	9.5	10.3	10.9	12.2

Figure 12: Watershed Boundaries for Design Tidal Elevations - Hampton

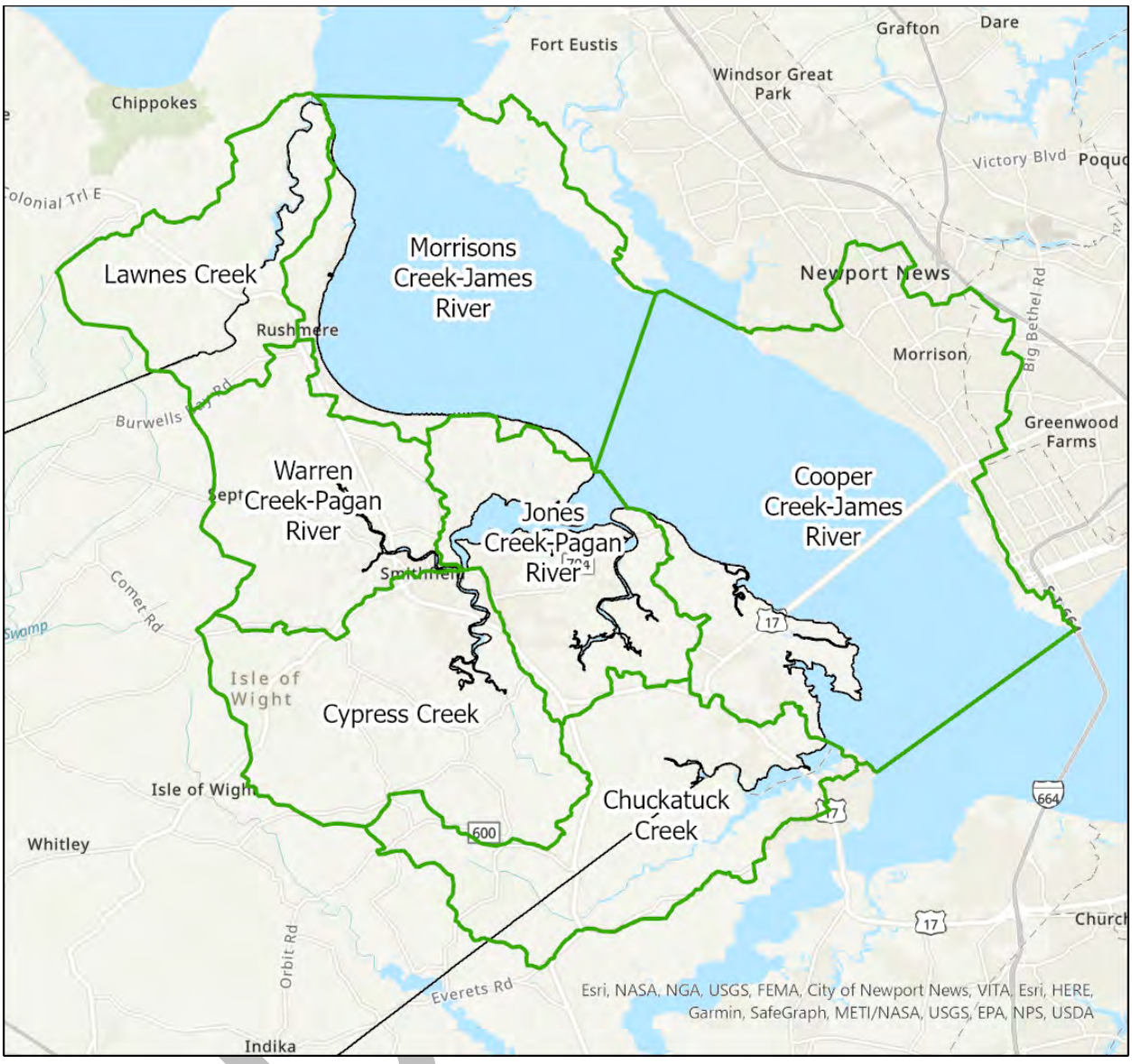


Design Tidal Elevations – Isle of Wight County

Note: All elevations in feet relative to the North American Vertical Datum (NAVD) of 1988

HUC12	Watershed	Design Level	1-Year	2-Year	3-Year	5-Year	10-Year	25-Year	50-Year	100-Year	500-Year
		Current	4.0	4.5	4.8	5.2	5.6	6.4	6.8	7.3	8.4
		1.5 ft SLR	5.5	6.0	6.3	6.7	7.1	7.9	8.3	8.8	9.9
020802060803	Lawnes Creek	3.0 ft SLR	7.3	7.8	8.1	8.5	8.9	9.8	10.2	10.7	11.9
	Morrisons	Current	4.0	4.6	4.9	5.3	5.7	6.5	7.1	7.6	8.7
	Creek-James	1.5 ft SLR	5.5	6.1	6.4	6.8	7.2	8.0	8.6	9.1	10.2
020802060804	River	3.0 ft SLR	7.2	7.9	8.2	8.6	9.0	9.8	10.5	11.0	12.1
		Current	4.0	4.6	5.0	5.5	6.0	6.9	7.8	8.4	9.7
	Warren Creek-	1.5 ft SLR	5.5	6.1	6.5	7.0	7.5	8.4	9.3	9.9	11.2
020802060902	Pagan River	3.0 ft SLR	7.2	7.8	8.2	8.8	9.3	10.2	11.1	11.7	13.1
		Current	3.9	4.6	5.0	5.5	6.0	6.9	7.8	8.5	9.8
		1.5 ft SLR	5.4	6.1	6.5	7.0	7.5	8.4	9.3	10.0	11.3
020802060903	Cypress Creek	3.0 ft SLR	7.1	7.8	8.2	8.8	9.3	10.2	11.1	11.8	13.2
		Current	3.9	4.6	5.0	5.4	5.9	6.8	7.6	8.3	9.5
	Jones Creek-	1.5 ft SLR	5.4	6.1	6.5	6.9	7.4	8.3	9.1	9.8	11.0
020802060904	Pagan River	3.0 ft SLR	7.0	7.8	8.2	8.6	9.1	10.0	10.8	11.5	12.8
		Current	4.0	4.7	5.1	5.7	6.2	7.3	8.2	8.9	10.4
	Chuckatuck	1.5 ft SLR	5.5	6.2	6.6	7.2	7.7	8.8	9.7	10.4	11.9
020802060905	Creek	3.0 ft SLR	7.1	7.8	8.2	8.8	9.3	10.5	11.4	12.1	13.6
		Current	3.7	4.4	4.8	5.2	5.8	6.7	7.5	8.1	9.6
	Cooper Creek-	1.5 ft SLR	5.2	5.9	6.3	6.7	7.3	8.2	9.0	9.6	11.1
020802060906	James River	3.0 ft SLR	6.9	7.6	8.0	8.4	9.1	10.0	10.8	11.4	13.0

Figure 13: Watershed Boundaries for Design Tidal Elevations – Isle of Wight County



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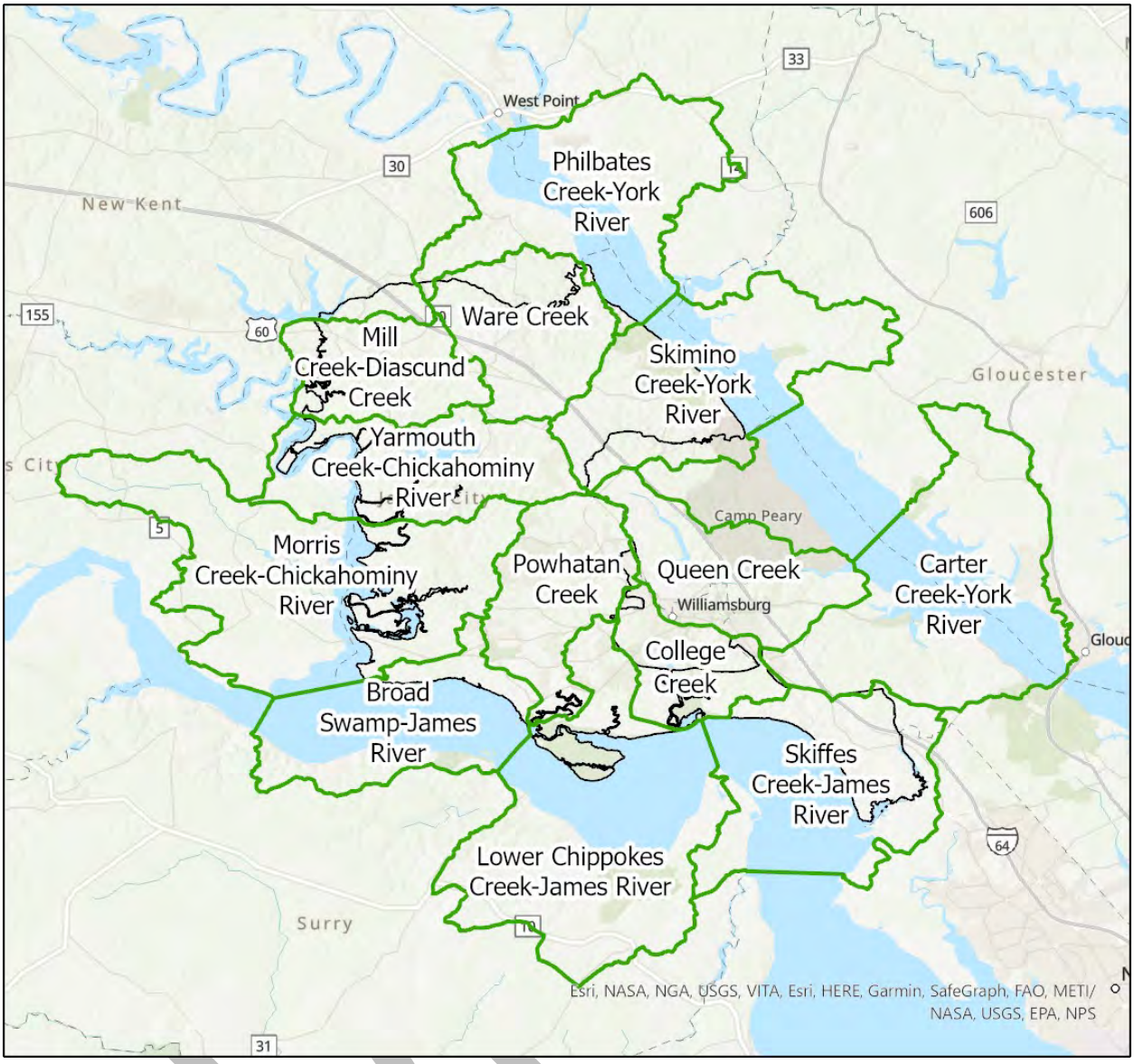
Design Tidal Elevations – James City County

Note: All elevations in feet relative to the North American Vertical Datum (NAVD) of 1988

HUC12	Watershed	Design Level	1-Year	2-Year	3-Year	5-Year	10-Year	25-Year	50-Year	100-Year	500-Year
		Current	2.8	3.5	3.9	4.5	5.5	6.2	6.6	7.1	9.3
		1.5 ft SLR	4.3	5.0	5.4	6.0	7.0	7.7	8.1	8.6	10.8
020801070101	Ware Creek	3.0 ft SLR	6.0	6.8	7.2	7.8	8.8	9.6	10.0	10.5	12.8
		Current	2.1	3.0	3.5	4.2	5.5	6.3	6.6	7.2	10.2
	Philbates Creek-	1.5 ft SLR	3.6	4.5	5.0	5.7	7.0	7.8	8.1	8.7	11.7
020801070102	York River	3.0 ft SLR	5.3	6.2	6.7	7.4	8.8	9.6	9.9	10.6	13.7
		Current	3.0	3.6	4.0	4.5	5.3	6.1	6.4	6.9	8.8
	Skimino Creek-	1.5 ft SLR	4.5	5.1	5.5	6.0	6.8	7.6	7.9	8.4	10.3
020801070104	York River	3.0 ft SLR	6.3	6.9	7.3	7.9	8.7	9.5	9.8	10.4	12.4
		Current	2.9	3.5	3.9	4.4	5.1	5.9	6.3	6.8	8.6
		1.5 ft SLR	4.4	5.0	5.4	5.9	6.6	7.4	7.8	8.3	10.1
020801070202	Queen Creek	3.0 ft SLR	6.1	6.7	7.1	7.6	8.4	9.2	9.6	10.1	12.0
		Current	3.1	3.7	4.0	4.5	5.1	5.8	6.3	6.8	8.3
	Carter Creek-	1.5 ft SLR	4.6	5.2	5.5	6.0	6.6	7.3	7.8	8.3	9.8
020801070203	York River	3.0 ft SLR	6.3	6.9	7.2	7.7	8.3	9.1	9.6	10.1	11.6
		Current	4.0	4.6	4.9	5.3	5.9	6.6	7.0	7.3	8.7
	Mill Creek-	1.5 ft SLR	5.5	6.1	6.4	6.8	7.4	8.1	8.5	8.8	10.2
020802060603	Descend Creek	3.0 ft SLR	7.4	8.0	8.3	8.7	9.3	10.1	10.5	10.8	12.3
	Yarmouth Creek-	Current	3.8	4.4	4.7	5.2	5.9	6.6	7.0	7.3	8.9
	Chickahominy	1.5 ft SLR	5.3	5.9	6.2	6.7	7.4	8.1	8.5	8.8	10.4
020802060604	River	3.0 ft SLR	7.1	7.7	8.1	8.6	9.3	10.1	10.5	10.8	12.5
	Morris Creek-	Current	3.8	4.4	4.7	5.2	5.9	6.7	7.0	7.4	9.0
	Chickahominy	1.5 ft SLR	5.3	5.9	6.2	6.7	7.4	8.2	8.5	8.9	10.5
020802060605	River	3.0 ft SLR	7.2	7.8	8.1	8.6	9.4	10.2	10.5	11.0	12.6
		Current	4.0	4.6	4.9	5.3	5.8	6.7	7.1	7.4	8.8
	Broad Swamp-	1.5 ft SLR	5.5	6.1	6.4	6.8	7.3	8.2	8.6	8.9	10.3
020802060701	James River	3.0 ft SLR	7.3	8.0	8.3	8.7	9.2	10.2	10.6	10.9	12.4
		Current	3.7	4.3	4.6	5.0	5.6	6.3	6.7	7.0	8.5
		1.5 ft SLR	5.2	5.8	6.1	6.5	7.1	7.8	8.2	8.5	10.0
020802060702	Powhatan Creek	3.0 ft SLR	7.0	7.6	8.0	8.4	9.0	9.7	10.2	10.5	12.0
	Lower Chippokes	Current	3.9	4.5	4.8	5.2	5.7	6.5	6.9	7.3	8.6
	Creek-James	1.5 ft SLR	5.4	6.0	6.3	6.7	7.2	8.0	8.4	8.8	10.1
020802060704	River	3.0 ft SLR	7.2	7.8	8.1	8.5	9.1	9.9	10.3	10.7	12.1
		Current	3.3	3.9	4.3	4.8	5.6	6.3	6.7	7.1	9.0
		1.5 ft SLR	4.8	5.4	5.8	6.3	7.1	7.8	8.2	8.6	10.5
020802060801	College Creek	3.0 ft SLR	6.6	7.2	7.6	8.1	8.9	9.7	10.1	10.5	12.5
		Current	3.6	4.2	4.5	4.9	5.6	6.3	6.7	7.1	8.6
	Skiffes Creek-	1.5 ft SLR	5.1	5.7	6.0	6.4	7.1	7.8	8.2	8.6	10.1
020802060802	James River	3.0 ft SLR	6.9	7.5	7.8	8.2	8.9	9.7	10.1	10.5	12.1

Figure 14: Watershed Boundaries for Design Tidal Elevations – James City County

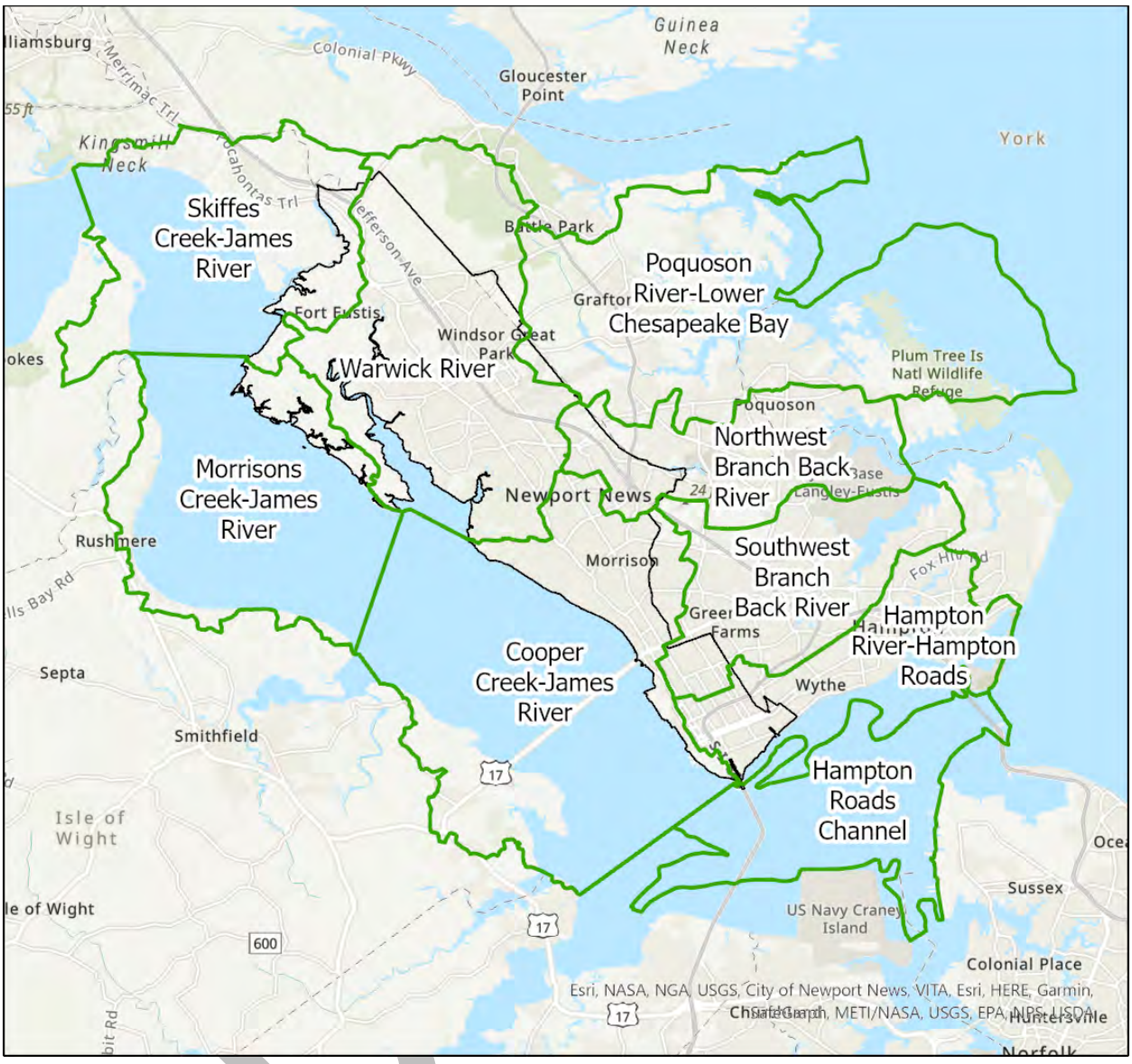

West Point
33
30
New Kent
Philbates Creek-York River
606
155
60
Ware Creek
Mill Creek-Diascund Creek
Skimino Creek-York River
Gloucester
Yarmouth Creek-Chickahominy River
Camp Peary
5
Morris Creek-Chickahominy River
Powhatan Creek
Queen Creek
Williamsburg
Carter Creek-York River
College Creek
Broad Swamp-James River
Skiffes Creek-James River
64
Lower Chippokes Creek-James River
Surry
Esri, NASA, NGA, USGS, VITA, Esri, HERE, Garmin, SafeGraph, FAO, METI/ NASA, USGS, EPA, NPS
31

Design Tidal Elevations – Newport News

Note: All elevations in feet relative to the North American Vertical Datum (NAVD) of 1988

HUC12	Watershed	Design Level	1-Year	2-Year	3-Year	5-Year	10-Year	25-Year	50-Year	100-Year	500-Year
020801080101	Poquoson River-Lower Chesapeake Bay	Current	2.8	3.5	3.9	4.4	5.1	5.9	6.8	7.4	9.0
		1.5 ft SLR	4.3	5.0	5.4	5.9	6.6	7.4	8.3	8.9	10.5
		3.0 ft SLR	5.9	6.6	7.0	7.5	8.3	9.1	10.0	10.6	12.2
020801080102	Northwest Branch Back River	Current	3.2	3.9	4.3	4.9	5.6	6.4	7.2	7.9	9.6
		1.5 ft SLR	4.7	5.4	5.8	6.4	7.1	7.9	8.7	9.4	11.1
		3.0 ft SLR	6.4	7.1	7.5	8.1	8.8	9.6	10.5	11.2	12.9
020801080103	Southwest Branch Back River	Current	3.3	4.0	4.4	5.0	5.6	6.5	7.4	8.1	9.7
		1.5 ft SLR	4.8	5.5	5.9	6.5	7.1	8.0	8.9	9.6	11.2
		3.0 ft SLR	6.4	7.1	7.5	8.1	8.7	9.6	10.5	11.3	12.9
020802060802	Skiffes Creek-James River	Current	3.6	4.2	4.5	4.9	5.6	6.3	6.7	7.1	8.6
		1.5 ft SLR	5.1	5.7	6.0	6.4	7.1	7.8	8.2	8.6	10.1
		3.0 ft SLR	6.9	7.5	7.8	8.2	8.9	9.7	10.1	10.5	12.1
020802060804	Morrisons Creek-James River	Current	4.0	4.6	4.9	5.3	5.7	6.5	7.1	7.6	8.7
		1.5 ft SLR	5.5	6.1	6.4	6.8	7.2	8.0	8.6	9.1	10.2
		3.0 ft SLR	7.2	7.9	8.2	8.6	9.0	9.8	10.5	11.0	12.1
020802060901	Warwick River	Current	3.7	4.2	4.6	5.0	5.6	6.3	6.8	7.2	8.7
		1.5 ft SLR	5.2	5.7	6.1	6.5	7.1	7.8	8.3	8.7	10.2
		3.0 ft SLR	7.1	7.7	8.1	8.5	9.2	9.9	10.4	10.9	12.5
020802060906	Cooper Creek-James River	Current	3.7	4.4	4.8	5.2	5.8	6.7	7.5	8.1	9.6
		1.5 ft SLR	5.2	5.9	6.3	6.7	7.3	8.2	9.0	9.6	11.1
		3.0 ft SLR	6.9	7.6	8.0	8.4	9.1	10.0	10.8	11.4	13.0
020802080303	Hampton River-Hampton Roads	Current	3.5	4.1	4.4	4.9	5.4	6.2	7.0	7.6	8.9
		1.5 ft SLR	5.0	5.6	5.9	6.4	6.9	7.7	8.5	9.1	10.4
		3.0 ft SLR	6.7	7.3	7.6	8.1	8.6	9.5	10.3	10.9	12.2
020802080304	Hampton Roads Channel	Current	3.3	4.0	4.4	4.9	5.5	6.4	7.1	7.8	9.4
		1.5 ft SLR	4.8	5.5	5.9	6.4	7.0	7.9	8.6	9.3	10.9
		3.0 ft SLR	6.5	7.2	7.6	8.1	8.7	9.6	10.4	11.1	12.7

Figure 15: Watershed Boundaries for Design Tidal Elevations – Newport News

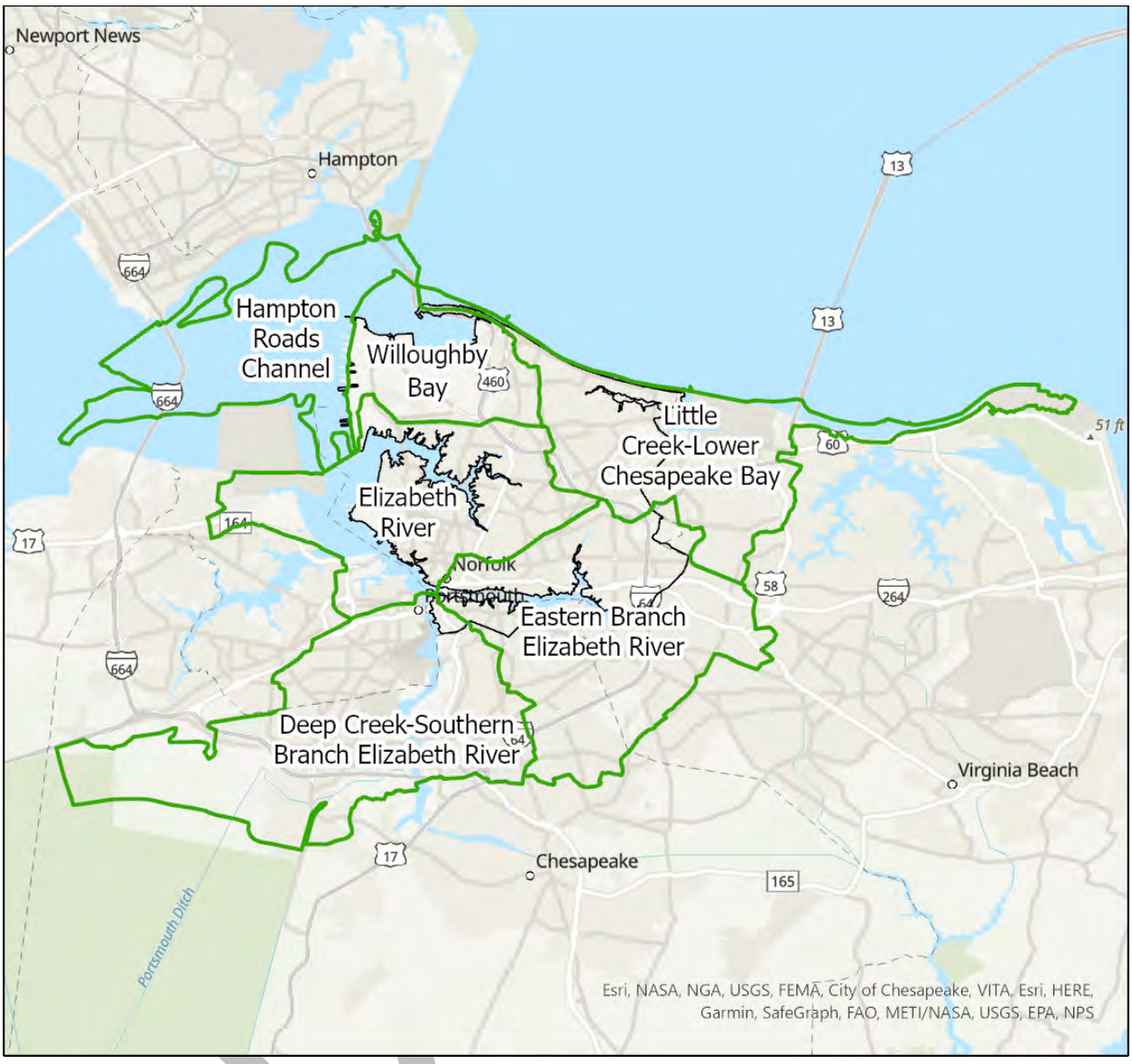


Design Tidal Elevations – Norfolk

Note: All elevations in feet relative to the North American Vertical Datum (NAVD) of 1988

HUC12	Watershed	Design Level	1-Year	2-Year	3-Year	5-Year	10-Year	25-Year	50-Year	100-Year	500-Year
020801080202	Little Creek-Lower Chesapeake Bay	Current	3.2	3.8	4.2	4.7	5.3	6.1	6.8	7.4	8.9
		1.5 ft SLR	4.7	5.3	5.7	6.2	6.8	7.6	8.3	8.9	10.4
		3.0 ft SLR	6.4	7.0	7.4	8.0	8.6	9.4	10.1	10.7	12.3
020802080203	Deep Creek-Southern Branch Elizabeth River	Current	3.4	4.1	4.5	5.1	5.9	6.7	7.3	8.0	10.0
		1.5 ft SLR	4.9	5.6	6.0	6.6	7.4	8.2	8.8	9.5	11.5
		3.0 ft SLR	6.4	7.1	7.5	8.1	8.9	9.7	10.3	11.0	13.0
020802080204	Eastern Branch Elizabeth River	Current	2.9	3.7	4.2	4.8	5.9	6.6	7.3	8.0	10.4
		1.5 ft SLR	4.4	5.2	5.7	6.3	7.4	8.1	8.8	9.5	11.9
		3.0 ft SLR	6.0	6.8	7.3	7.9	9.1	9.8	10.5	11.2	13.6
020802080206	Elizabeth River	Current	3.2	3.9	4.4	4.9	5.8	6.5	7.3	7.9	9.9
		1.5 ft SLR	4.7	5.4	5.9	6.4	7.3	8.0	8.8	9.4	11.4
		3.0 ft SLR	6.3	7.1	7.6	8.1	9.0	9.7	10.5	11.2	13.2
020802080302	Willoughby Bay	Current	3.2	3.8	4.2	4.7	5.4	6.2	6.9	7.6	9.2
		1.5 ft SLR	4.7	5.3	5.7	6.2	6.9	7.7	8.4	9.1	10.7
		3.0 ft SLR	6.3	6.9	7.3	7.8	8.6	9.4	10.1	10.8	12.4
020802080304	Hampton Roads Channel	Current	3.3	4.0	4.4	4.9	5.5	6.4	7.1	7.8	9.4
		1.5 ft SLR	4.8	5.5	5.9	6.4	7.0	7.9	8.6	9.3	10.9
		3.0 ft SLR	6.5	7.2	7.6	8.1	8.7	9.6	10.4	11.1	12.7

Figure 16: Watershed Boundaries for Design Tidal Elevations – Norfolk

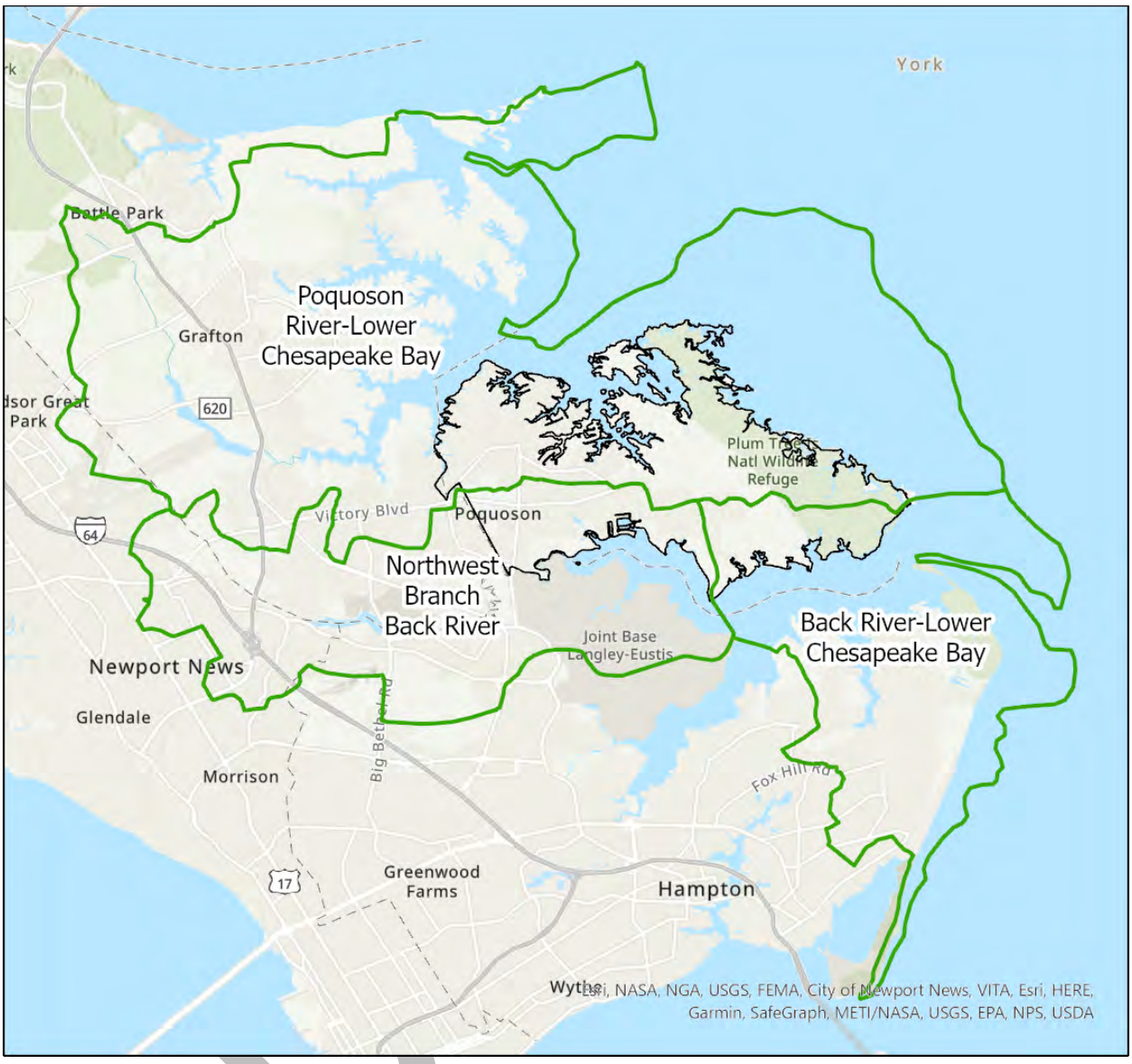


Design Tidal Elevations – Poquoson

Note: All elevations in feet relative to the North American Vertical Datum (NAVD) of 1988

HUC12	Watershed	Design Level	1-Year	2-Year	3-Year	5-Year	10-Year	25-Year	50-Year	100-Year	500-Year
020801080101	Poquoson River-Lower Chesapeake Bay	Current	2.8	3.5	3.9	4.4	5.1	5.9	6.8	7.4	9.0
		1.5 ft SLR	4.3	5.0	5.4	5.9	6.6	7.4	8.3	8.9	10.5
		3.0 ft SLR	5.9	6.6	7.0	7.5	8.3	9.1	10.0	10.6	12.2
020801080102	Northwest Branch Back River	Current	3.2	3.9	4.3	4.9	5.6	6.4	7.2	7.9	9.6
		1.5 ft SLR	4.7	5.4	5.8	6.4	7.1	7.9	8.7	9.4	11.1
		3.0 ft SLR	6.4	7.1	7.5	8.1	8.8	9.6	10.5	11.2	12.9
020801080104	Back River-Lower Chesapeake Bay	Current	3.2	3.9	4.3	4.7	5.4	6.1	6.8	7.5	9.0
		1.5 ft SLR	4.7	5.4	5.8	6.2	6.9	7.6	8.3	9.0	10.5
		3.0 ft SLR	6.4	7.1	7.5	7.9	8.6	9.3	10.1	10.8	12.3

Figure 17: Watershed Boundaries for Design Tidal Elevations - Poquoson

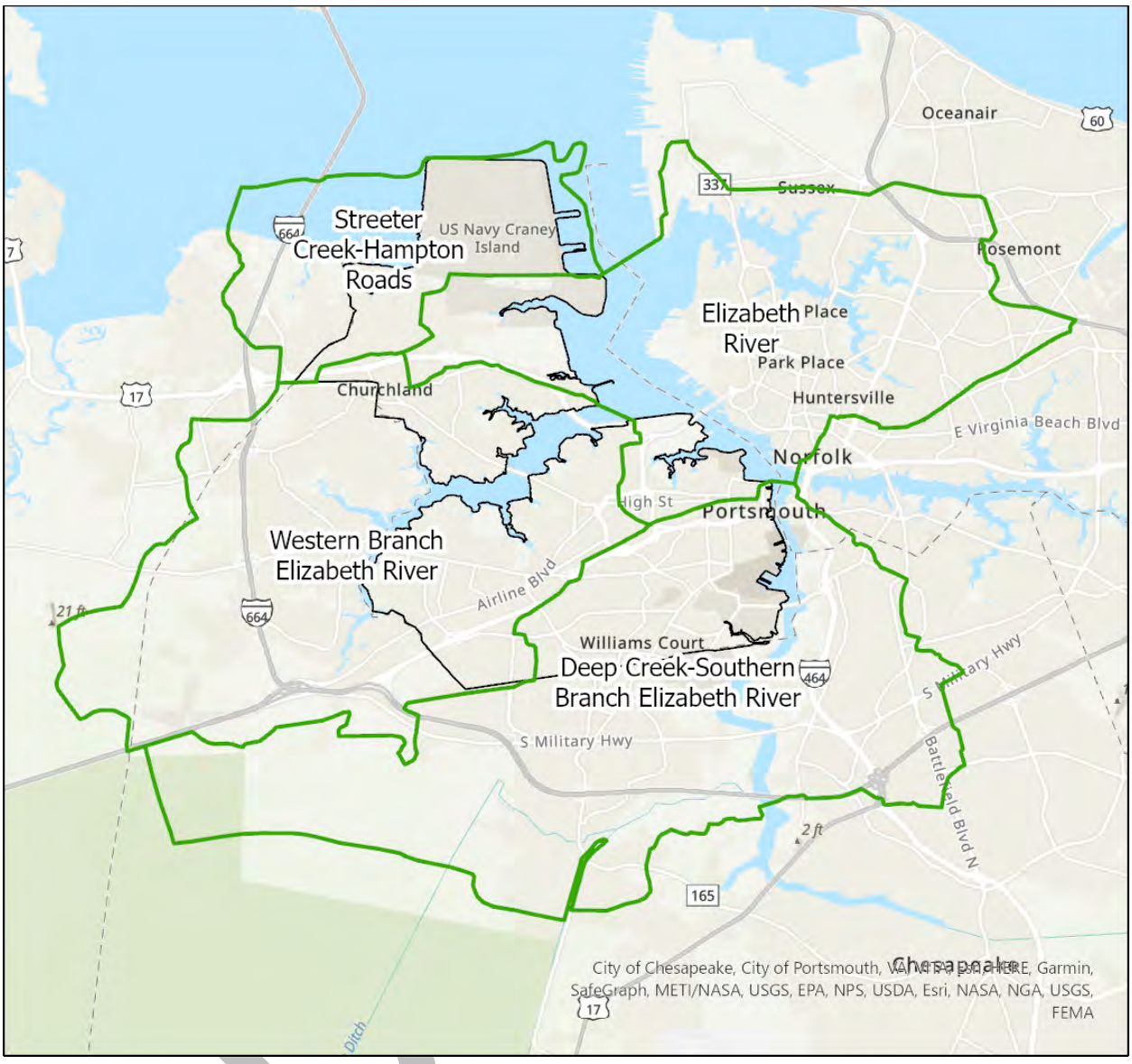


Design Tidal Elevations – Portsmouth

Note: All elevations in feet relative to the North American Vertical Datum (NAVD) of 1988

HUC12	Watershed	Design Level	1-Year	2-Year	3-Year	5-Year	10-Year	25-Year	50-Year	100-Year	500-Year
020802080203	Deep Creek-Southern Branch Elizabeth River	Current	3.4	4.1	4.5	5.1	5.9	6.7	7.3	8.0	10.0
		1.5 ft SLR	4.9	5.6	6.0	6.6	7.4	8.2	8.8	9.5	11.5
		3.0 ft SLR	6.4	7.1	7.5	8.1	8.9	9.7	10.3	11.0	13.0
020802080205	Western Branch Elizabeth River	Current	3.7	4.5	4.9	5.4	6.1	7.0	7.9	8.6	10.3
		1.5 ft SLR	5.2	6.0	6.4	6.9	7.6	8.5	9.4	10.1	11.8
		3.0 ft SLR	6.9	7.7	8.1	8.6	9.3	10.2	11.2	11.9	13.6
020802080206	Elizabeth River	Current	3.2	3.9	4.4	4.9	5.8	6.5	7.3	7.9	9.9
		1.5 ft SLR	4.7	5.4	5.9	6.4	7.3	8.0	8.8	9.4	11.4
		3.0 ft SLR	6.3	7.1	7.6	8.1	9.0	9.7	10.5	11.2	13.2
020802080301	Streeter Creek-Hampton Roads	Current	3.3	4.0	4.5	5.0	5.7	6.6	7.4	8.1	9.9
		1.5 ft SLR	4.8	5.5	6.0	6.5	7.2	8.1	8.9	9.6	11.4
		3.0 ft SLR	6.5	7.2	7.7	8.2	8.9	9.9	10.7	11.4	13.2

Figure 18: Watershed Boundaries for Design Tidal Elevations – Portsmouth



Design Tidal Elevations – Smithfield

Note: All elevations in feet relative to the North American Vertical Datum (NAVD) of 1988

HUC12	Watershed	Design Level	1-Year	2-Year	3-Year	5-Year	10-Year	25-Year	50-Year	100-Year	500-Year
020802060902	Warren Creek-Pagan River	Current	4.0	4.6	5.0	5.5	6.0	6.9	7.8	8.4	9.7
		1.5 ft SLR	5.5	6.1	6.5	7.0	7.5	8.4	9.3	9.9	11.2
		3.0 ft SLR	7.2	7.8	8.2	8.8	9.3	10.2	11.1	11.7	13.1
020802060903	Cypress Creek	Current	3.9	4.6	5.0	5.5	6.0	6.9	7.8	8.5	9.8
		1.5 ft SLR	5.4	6.1	6.5	7.0	7.5	8.4	9.3	10.0	11.3
		3.0 ft SLR	7.1	7.8	8.2	8.8	9.3	10.2	11.1	11.8	13.2
020802060904	Jones Creek-Pagan River	Current	3.9	4.6	5.0	5.4	5.9	6.8	7.6	8.3	9.5
		1.5 ft SLR	5.4	6.1	6.5	6.9	7.4	8.3	9.1	9.8	11.0
		3.0 ft SLR	7.0	7.8	8.2	8.6	9.1	10.0	10.8	11.5	12.8

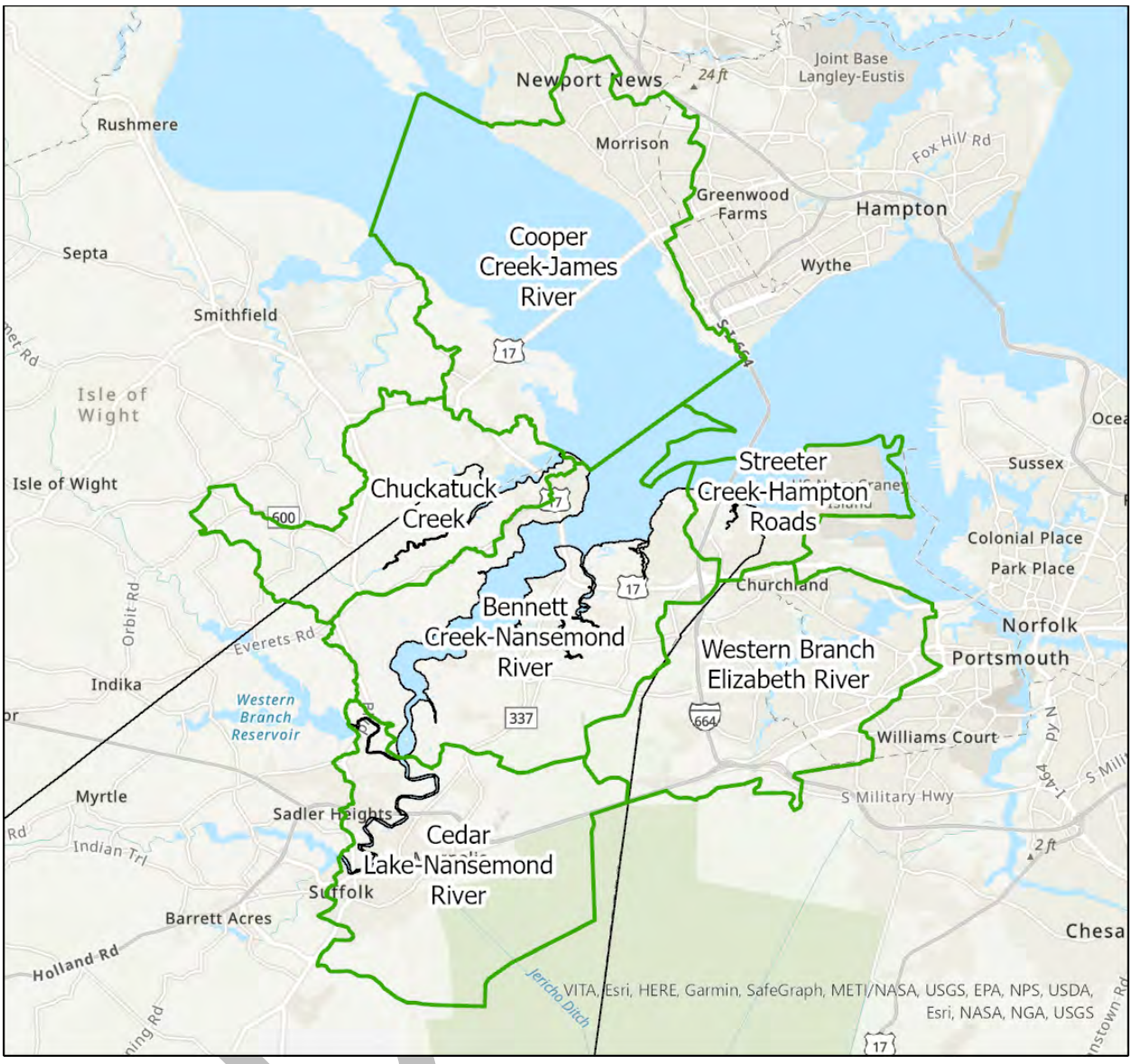
Figure 19: Watershed Boundaries for Design Tidal Elevations - Smithfield

Design Tidal Elevations – Suffolk

Note: All elevations in feet relative to the North American Vertical Datum (NAVD) of 1988

HUC12	Watershed	Design Level	1-Year	2-Year	3-Year	5-Year	10-Year	25-Year	50-Year	100-Year	500-Year
020802060905	Chuckatuck Creek	Current	4.0	4.7	5.1	5.7	6.2	7.3	8.2	8.9	10.4
		1.5 ft SLR	5.5	6.2	6.6	7.2	7.7	8.8	9.7	10.4	11.9
		3.0 ft SLR	7.1	7.8	8.2	8.8	9.3	10.5	11.4	12.1	13.6
020802060906	Cooper Creek-James River	Current	3.7	4.4	4.8	5.2	5.8	6.7	7.5	8.1	9.6
		1.5 ft SLR	5.2	5.9	6.3	6.7	7.3	8.2	9.0	9.6	11.1
		3.0 ft SLR	6.9	7.6	8.0	8.4	9.1	10.0	10.8	11.4	13.0
020802080105	Cedar Lake-Nansemond River	Current	4.0	4.9	5.4	6.1	6.9	8.0	9.1	9.9	12.0
		1.5 ft SLR	5.5	6.4	6.9	7.6	8.4	9.5	10.6	11.4	13.5
		3.0 ft SLR	7.4	8.3	8.8	9.6	10.4	11.6	12.7	13.6	15.8
020802080106	Bennett Creek-Nansemond River	Current	4.0	4.9	5.4	6.0	6.8	7.9	8.9	9.8	11.7
		1.5 ft SLR	5.5	6.4	6.9	7.5	8.3	9.4	10.4	11.3	13.2
		3.0 ft SLR	7.1	8.1	8.6	9.2	10.0	11.1	12.2	13.1	15.0
020802080205	Western Branch Elizabeth River	Current	3.7	4.5	4.9	5.4	6.1	7.0	7.9	8.6	10.3
		1.5 ft SLR	5.2	6.0	6.4	6.9	7.6	8.5	9.4	10.1	11.8
		3.0 ft SLR	6.9	7.7	8.1	8.6	9.3	10.2	11.2	11.9	13.6
020802080301	Streeter Creek-Hampton Roads	Current	3.3	4.0	4.5	5.0	5.7	6.6	7.4	8.1	9.9
		1.5 ft SLR	4.8	5.5	6.0	6.5	7.2	8.1	8.9	9.6	11.4
		3.0 ft SLR	6.5	7.2	7.7	8.2	8.9	9.9	10.7	11.4	13.2

Figure 20: Watershed Boundaries for Design Tidal Elevations - Suffolk

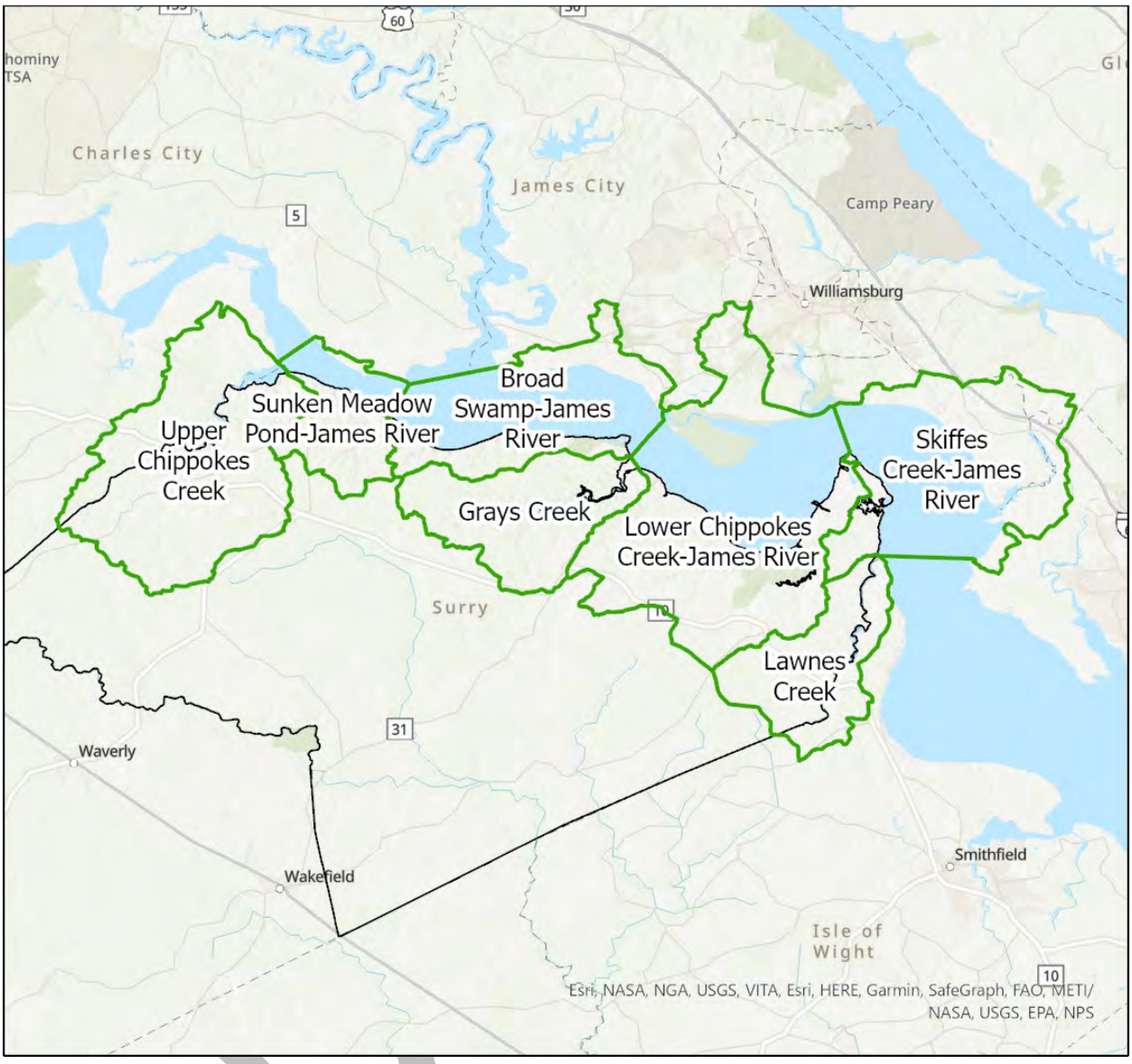


Design Tidal Elevations – Surry County

Note: All elevations in feet relative to the North American Vertical Datum (NAVD) of 1988

HUC12	Watershed	Design Level	1-Year	2-Year	3-Year	5-Year	10-Year	25-Year	50-Year	100-Year	500-Year
020802060303	Upper Chippokes Creek	Current	4.2	4.8	5.1	5.5	6.0	7.0	7.3	7.6	9.0
		1.5 ft SLR	5.7	6.3	6.6	7.0	7.5	8.5	8.8	9.1	10.5
		3.0 ft SLR	7.9	8.6	8.9	9.4	9.9	11.0	11.4	11.7	13.2
020802060304	Sunken Meadow Pond-James River	Current	4.0	4.5	4.9	5.3	5.9	6.8	7.2	7.5	9.0
		1.5 ft SLR	5.5	6.0	6.4	6.8	7.4	8.3	8.7	9.0	10.5
		3.0 ft SLR	7.4	7.9	8.4	8.8	9.4	10.4	10.8	11.1	12.7
020802060701	Broad Swamp-James River	Current	4.0	4.6	4.9	5.3	5.8	6.7	7.1	7.4	8.8
		1.5 ft SLR	5.5	6.1	6.4	6.8	7.3	8.2	8.6	8.9	10.3
		3.0 ft SLR	7.3	8.0	8.3	8.7	9.2	10.2	10.6	10.9	12.4
020802060703	Grays Creek	Current	4.1	4.6	4.9	5.3	5.7	6.6	7.0	7.3	8.5
		1.5 ft SLR	5.6	6.1	6.4	6.8	7.2	8.1	8.5	8.8	10.0
		3.0 ft SLR	7.5	8.0	8.3	8.7	9.2	10.1	10.5	10.8	12.1
020802060704	Lower Chippokes Creek-James River	Current	3.9	4.5	4.8	5.2	5.7	6.5	6.9	7.3	8.6
		1.5 ft SLR	5.4	6.0	6.3	6.7	7.2	8.0	8.4	8.8	10.1
		3.0 ft SLR	7.2	7.8	8.1	8.5	9.1	9.9	10.3	10.7	12.1
020802060802	Skiffes Creek-James River	Current	3.6	4.2	4.5	4.9	5.6	6.3	6.7	7.1	8.6
		1.5 ft SLR	5.1	5.7	6.0	6.4	7.1	7.8	8.2	8.6	10.1
		3.0 ft SLR	6.9	7.5	7.8	8.2	8.9	9.7	10.1	10.5	12.1
020802060803	Lawnes Creek	Current	4.0	4.5	4.8	5.2	5.6	6.4	6.8	7.3	8.4
		1.5 ft SLR	5.5	6.0	6.3	6.7	7.1	7.9	8.3	8.8	9.9
		3.0 ft SLR	7.3	7.8	8.1	8.5	8.9	9.8	10.2	10.7	11.9

Figure 21: Watershed Boundaries for Design Tidal Elevations – Surry County

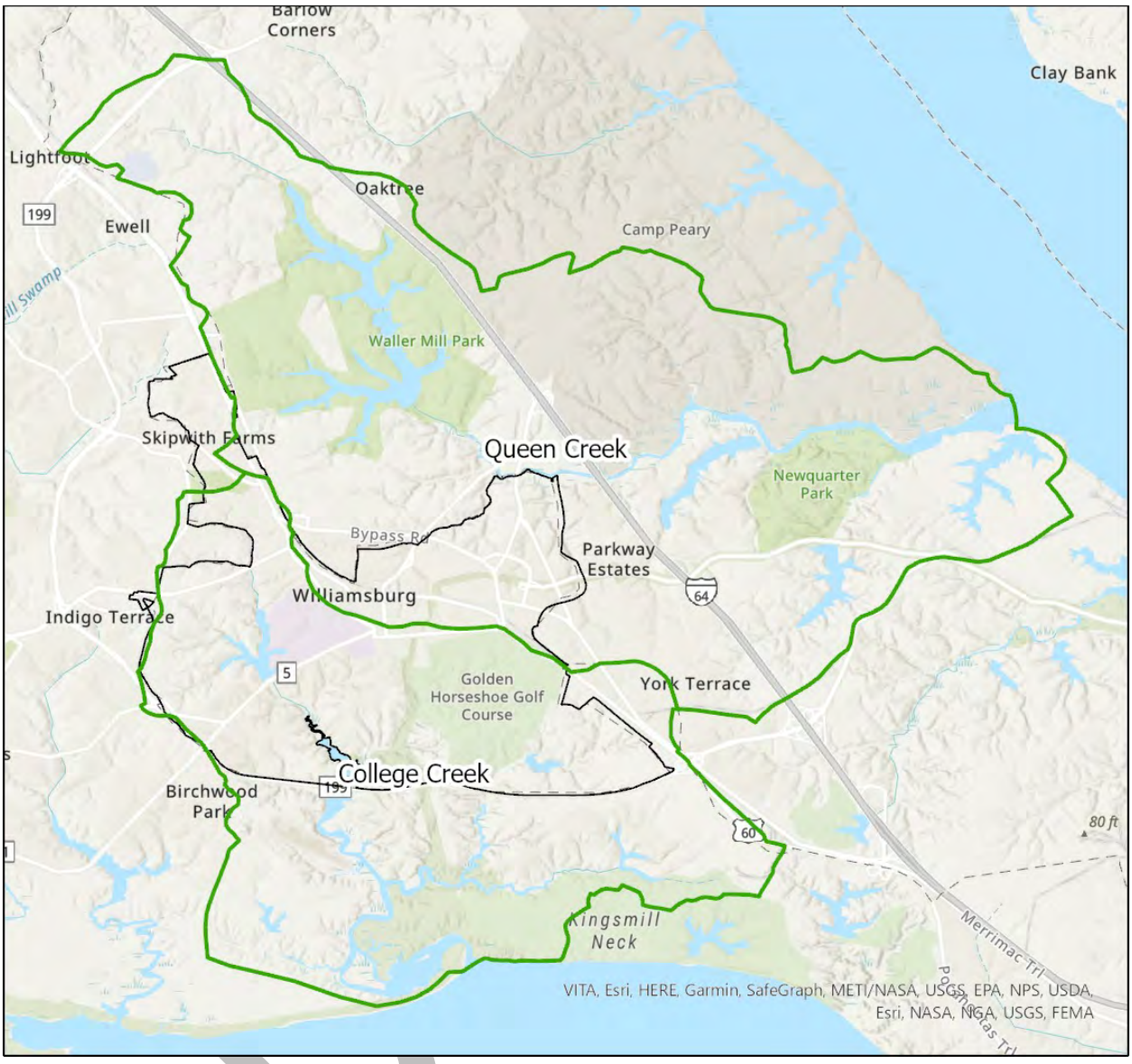


Design Tidal Elevations – Williamsburg

Note: All elevations in feet relative to the North American Vertical Datum (NAVD) of 1988

HUC12	Watershed	Design Level	1-Year	2-Year	3-Year	5-Year	10-Year	25-Year	50-Year	100-Year	500-Year
020801070202	Queen Creek	Current	2.9	3.5	3.9	4.4	5.1	5.9	6.3	6.8	8.6
		1.5 ft SLR	4.4	5.0	5.4	5.9	6.6	7.4	7.8	8.3	10.1
		3.0 ft SLR	6.1	6.7	7.1	7.6	8.4	9.2	9.6	10.1	12.0
020802060801	College Creek	Current	3.3	3.9	4.3	4.8	5.6	6.3	6.7	7.1	9.0
		1.5 ft SLR	4.8	5.4	5.8	6.3	7.1	7.8	8.2	8.6	10.5
		3.0 ft SLR	6.6	7.2	7.6	8.1	8.9	9.7	10.1	10.5	12.5

Figure 22: Watershed Boundaries for Design Tidal Elevations - Williamsburg

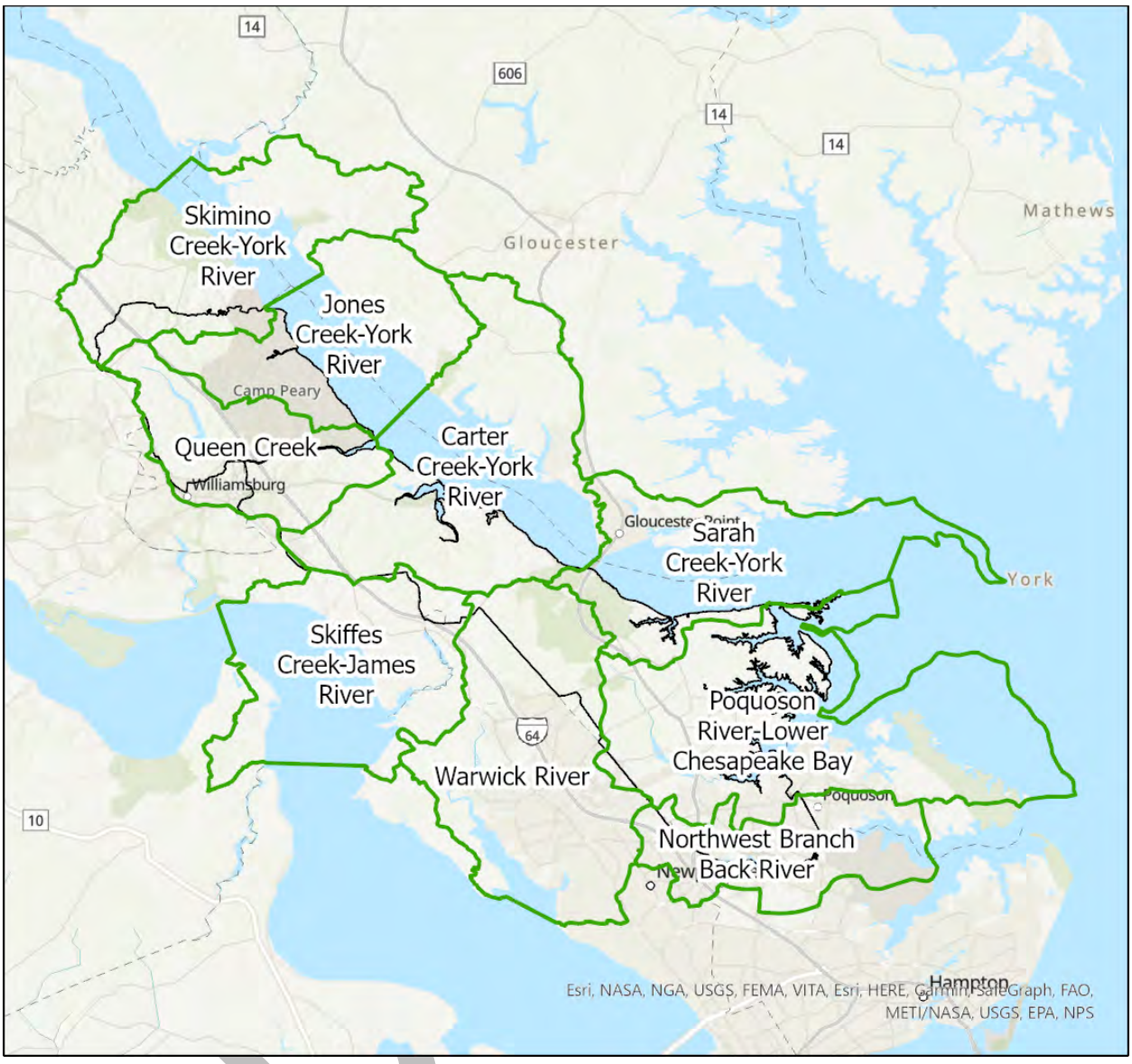


Design Tidal Elevations – York County

Note: All elevations in feet relative to the North American Vertical Datum (NAVD) of 1988

HUC12	Watershed	Design Level	1-Year	2-Year	3-Year	5-Year	10-Year	25-Year	50-Year	100-Year	500-Year
020801070104	Skimino Creek-York River	Current	3.0	3.6	4.0	4.5	5.3	6.1	6.4	6.9	8.8
		1.5 ft SLR	4.5	5.1	5.5	6.0	6.8	7.6	7.9	8.4	10.3
		3.0 ft SLR	6.3	6.9	7.3	7.9	8.7	9.5	9.8	10.4	12.4
020801070201	Jones Creek-York River	Current	3.2	3.8	4.1	4.6	5.2	6.0	6.4	6.8	8.5
		1.5 ft SLR	4.7	5.3	5.6	6.1	6.7	7.5	7.9	8.3	10.0
		3.0 ft SLR	6.4	7.0	7.3	7.8	8.5	9.3	9.7	10.1	11.9
020801070202	Queen Creek	Current	2.9	3.5	3.9	4.4	5.1	5.9	6.3	6.8	8.6
		1.5 ft SLR	4.4	5.0	5.4	5.9	6.6	7.4	7.8	8.3	10.1
		3.0 ft SLR	6.1	6.7	7.1	7.6	8.4	9.2	9.6	10.1	12.0
020801070203	Carter Creek-York River	Current	3.1	3.7	4.0	4.5	5.1	5.8	6.3	6.8	8.3
		1.5 ft SLR	4.6	5.2	5.5	6.0	6.6	7.3	7.8	8.3	9.8
		3.0 ft SLR	6.3	6.9	7.2	7.7	8.3	9.1	9.6	10.1	11.6
020801070204	Sarah Creek-York River	Current	3.0	3.6	3.9	4.3	4.9	5.5	6.1	6.6	7.9
		1.5 ft SLR	4.5	5.1	5.4	5.8	6.4	7.0	7.6	8.1	9.4
		3.0 ft SLR	6.1	6.7	7.1	7.5	8.1	8.7	9.3	9.8	11.1
020801080101	Poquoson River-Lower Chesapeake Bay	Current	2.8	3.5	3.9	4.4	5.1	5.9	6.8	7.4	9.0
		1.5 ft SLR	4.3	5.0	5.4	5.9	6.6	7.4	8.3	8.9	10.5
		3.0 ft SLR	5.9	6.6	7.0	7.5	8.3	9.1	10.0	10.6	12.2
020801080102	Northwest Branch Back River	Current	3.2	3.9	4.3	4.9	5.6	6.4	7.2	7.9	9.6
		1.5 ft SLR	4.7	5.4	5.8	6.4	7.1	7.9	8.7	9.4	11.1
		3.0 ft SLR	6.4	7.1	7.5	8.1	8.8	9.6	10.5	11.2	12.9
020802060802	Skiffes Creek-James River	Current	3.6	4.2	4.5	4.9	5.6	6.3	6.7	7.1	8.6
		1.5 ft SLR	5.1	5.7	6.0	6.4	7.1	7.8	8.2	8.6	10.1
		3.0 ft SLR	6.9	7.5	7.8	8.2	8.9	9.7	10.1	10.5	12.1
020802060901	Warwick River	Current	3.7	4.2	4.6	5.0	5.6	6.3	6.8	7.2	8.7
		1.5 ft SLR	5.2	5.7	6.1	6.5	7.1	7.8	8.3	8.7	10.2
		3.0 ft SLR	7.1	7.7	8.1	8.5	9.2	9.9	10.4	10.9	12.5

Figure 23: Watershed Boundaries for Design Tidal Elevations – York County



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Appendix C – Design Rainfall Depths – Methodology

The goal of this effort is to develop design rainfall depths for communities in Hampton Roads that account for project climate change for use as inputs for stormwater management calculations. Design rainfall depths are commonly based on the NOAA Atlas 14 Precipitation-Frequency Atlas for the United States. Virginia is included in Volume 2, which covers the states in and around the Ohio River basin. Volume 2 was last published in 2004 and revised in 2006. It only includes data through 2000, so does not account for observed changes in precipitation patterns since then, nor does it account for future climate change.

This analysis is based on two previous projects. The first was conducted by the City of Virginia Beach to help inform the development of the city's revised public facilities manual. The second was completed by RAND and the Mid-Atlantic Regional Integrated Sciences and Assessments (MARISA) program to develop a Chesapeake Bay watershed-wide tool for the Chesapeake Bay Program. Both efforts use NOAA's Atlas 14[41] precipitation data as a starting point along with multiple downscaled climate projections to generate future precipitation values.

The primary deliverable from the RAND study was the development of change factors for individual counties and county-equivalent units (e.g., independent cities in Virginia) in the Chesapeake Bay watershed and all of Virginia (Figure 5). Change factors are multipliers applied to values from the current NOAA Atlas 14 volume to generate estimates that correspond to future climate conditions.

$$\textit{Future Precipitation} = \textit{NOAA Atlas 14 Precipitation} \times \textit{Change Factor}$$

Change factors were developed for different combinations of climate scenarios, time periods, and recurrence intervals. For example, a change factor would be calculated for the 2-year recurrence interval for 2020-2069 under representative concentration pathway 4.5.

- Climate scenarios: representative concentration pathways (RCPs) 4.5 and 8.5[42]
- Time periods: 2020-2069 and 2050-2099 (baseline time period is 1950-2000)
- Recurrence intervals: 2-year, 5-year, 10-year, 25-year, 50-year, and 100-year

In order to account for uncertainty, the RAND/MARISA team calculated multiple values for each factor, including the 10th-percentile, 25th-percentile, 50th-percentile, 75th-percentile, and 90th-percentile, in addition to minimum and maximum values.

[41] NOAA Atlas 14 Precipitation-Frequency Atlas of the United States, Volume 2 (2006) https://www.weather.gov/media/owp/oh/hdsc/docs/Atlas14_Volume2.pdf

[42] Representative concentration pathways (RCPs) are greenhouse gas emissions scenarios based on different assumptions about energy usage and economic activity in the future. RCP 4.5 represents a decline in emissions around 2045. RCP 8.5 represents increasing emissions through the 21st century.

The Virginia Beach study[43] included both a statistical analysis of rainfall data after the cutoff for NOAA Atlas 14 and projections of future rainfall with climate change. The analysis found that the current 10-year event was approximately 10% larger in the Hampton Roads region than what is in NOAA Atlas 14. The climate analysis also considered both climate scenarios RCP 4.5 and RCP 8.5. The Virginia Beach study included mid-term (2045) and long-term (2075) estimates for the 24-hour rainfall duration for the 1-year, 2-year, 5-year, 10-year, 20-year, 50-year, and 100-year return periods. The study also modeled historical values to compare with NOAA Atlas 14. The change between the modeled historical value and the future projected value ranged from 11% to 23% for the mid-term and from 19% to 36% for the long-term. Although the Virginia Beach study provided both mid-term and long-term estimates of future rainfall depths for each return period, the final recommendation was for the city to apply a 20% increase above NOAA Atlas 14 values for all return periods instead of using the individual calculated values.

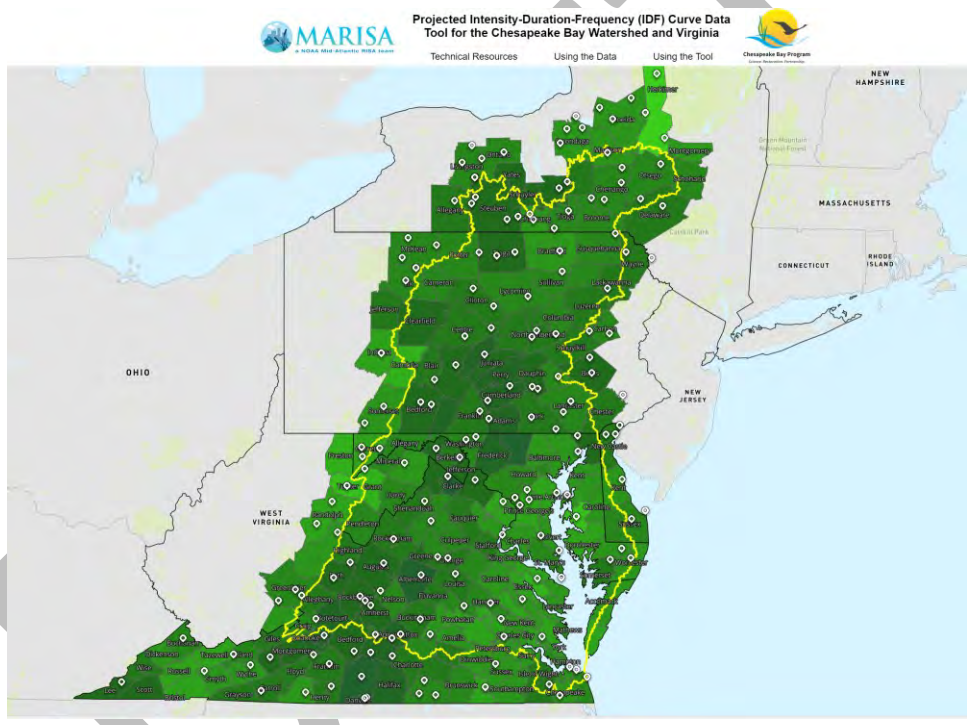

Figure 24: Screenshot of MARISA IDF Curve Data Tool Showing Median County Change Factors[44]

For these guidelines, the results of the MARISA tool were used in conjunction with the approach used by Virginia Beach to calculate an average multiplier for each locality. For each locality, all median values for all 2020-2070 scenarios (2-year through 100-year storm events, RCP 4.5 and RCP 8.5) were averaged to calculate a single median multiplier. The same was done for all 75th percentile values for each locality. The average median and 75th percentile change factors for each locality are

[43] "Analysis of Historical and Future Heavy Precipitation," March 26, 2018 (CIP 7-030, PWCN-15-0014, Work Order 9A) https://www.vbgov.com/government/departments/public-works/comp-sea-level-rise/Documents/anaylsis-hist-and-future-hvy-precip-4-2-18.pdf

[44] Projected Intensity-Duration-Frequency (IDF) Curve Data Tool for the Chesapeake Bay Watershed and Virginia (https://midatlantic-idf.rcc-acis.org/)

listed below. The final recommended multiplier for each locality was then selected from either the average of the median values or the average of the 75th percentile values based on existing impervious cover. The methodology for calculating impervious cover is described below.

Table 4: Average Median and 75th Percentile Change Factors for Hampton Roads Localities

Locality	Median	75th Percentile
Chesapeake	1.10	1.21
Franklin	1.12	1.21
Gloucester County	1.06	1.14
Hampton	1.08	1.18
Isle of Wight County	1.12	1.20
James City County	1.05	1.13
Newport News	1.08	1.17
Norfolk	1.09	1.22
Poquoson	1.07	1.18
Portsmouth	1.09	1.21
Southampton County	1.09	1.19
Suffolk	1.13	1.21
Surry County	1.08	1.16
Virginia Beach	1.10	1.20
Williamsburg	1.04	1.13
York County	1.06	1.14

Impervious Cover Calculations

Impervious cover for each locality was calculated using the best available one-meter resolution land cover data. For Franklin, Smithfield, and Southampton County, the source of the data was the 2013-2014 land cover data developed by Worldview Solutions and the Virginia Geographic Information Network. For all other localities, draft data from the 2018 Chesapeake Bay High Resolution Land Cover was acquired from the Chesapeake Conservancy and used instead. Data from the 2013-2014 is available online at the Chesapeake Conservancy website.[45] Data from the 2018 update is expected to be available for download through the same website in early 2022.

To calculate the percentage of impervious cover using the 2013-2014 data, locality boundaries for all seventeen jurisdictions were clipped using a shoreline file to remove major tidal water bodies. Federal properties such as Department of Defense installations and Department of the Interior facilities were then removed to identify those areas within each locality that are under local authority. The 2013-2014 land cover data is divided into twelve classifications.[46] For the 2013-2014 data, the percentage of impervious cover was calculated using the following function.

[45] https://www.chesapeakeconservancy.org/conservation-innovation-center/high-resolution-data/land-cover-data-project/

[46] Hydro, Impervious (extracted), Impervious (local), Barren, Forest, Tree, Scrub/Shrub, Harvested/Disturbed, Turf Grass, Pasture, Cropland, Woody Wetlands

$$\textit{Impervious Cover Percentage} = \frac{\textit{(Impervious (Extracted) + Impervious (Local))}}{\textit{(All Land Cover Classifications minus Hydro)}}$$

The 2018 data was only provided in tabular format. The 2018 land cover data is divided into eleven classifications.[47] For the 2018 data, the percentage of impervious cover was calculated using the following function.

$$\textit{Impervious Cover Percentage} = \frac{\textit{(Impervious Structures + Other Impervious + Impervious Roads)}}{\textit{(All Land Cover Classifications minus Water)}}$$

Impervious cover percentages for Hampton Roads localities range from less than two percent in Southampton County and Surry County to over fifty percent in Norfolk. The results of this analysis are listed below.

Table 5: Impervious Cover Percentages for Hampton Roads Localities

Locality	2013-2014	2018
Chesapeake	11.78%	10.82%
Franklin	14.89%	N/A*
Gloucester County	3.23%	4.33%
Hampton	36.89%	40.07%
Isle of Wight County	3.93%	4.28%
James City County	9.71%	10.37%
Newport News	38.98%	38.49%
Norfolk	48.59%	52.07%
Poquoson	14.91%	12.21%
Portsmouth	44.13%	41.40%
Smithfield	17.72%	N/A**
Southampton County	1.42%	N/A*
Suffolk	6.40%	5.70%
Surry County	1.41%	1.82%
Virginia Beach	22.54%	19.41%
Williamsburg	19.98%	24.16%
York County	14.91%	14.06%

* 2018 land cover data for Franklin and Southampton County is not expected to be developed, since both localities are outside of the Chesapeake Bay watershed.
** 2018 land cover data for Smithfield is expected to become available once the data is released in raster format.

[47] Water, Tree Canopy, Scrub/Shrub, Herbaceous, Barren, Impervious Structures, Other Impervious, Impervious Roads, Tree Canopy over Impervious Structures, Tree Canopy over Other Impervious, Tree Canopy over Impervious Roads

Development of Recommended Multipliers

Recommended multipliers for each locality were calculated based on either the average median or average 75th percentile for 2020-2070. For localities with less than 10% impervious cover, the average median value was used, while the average 75th percentile value was used for localities with greater than 10% impervious cover. For ease of use, these average multipliers were rounded to the nearest 0.05, with a minimum multiplier of 1.10 (10% increase above NOAA Atlas 14). The recommended multipliers Hampton Roads localities are listed below. Recommended precipitation values for each locality are included in the individual locality summaries.

Table 6: Recommended Multipliers for Hampton Roads Localities

Locality	Recommended Multiplier
Chesapeake	1.2
Franklin	1.2
Gloucester County	1.1
Hampton	1.2
Isle of Wight County	1.1
James City County	1.15
Newport News	1.15
Norfolk	1.2
Poquoson	1.2
Portsmouth	1.2
Smithfield*	1.2
Southampton County	1.1
Suffolk	1.15
Surry County	1.1
Virginia Beach	1.2
Williamsburg	1.15
York County	1.15

* The recommended multiplier for Smithfield is based on the 75th percentile value for Isle of Wight County due to the town's impervious cover percentage.

Methodology for Design Rainfall Depths[48]

1. Calculate centroid of locality in ArcGIS using Convert Feature To Point
2. Use Extract Multi Values to Points to append NOAA Atlas 14 rainfall depths[49] to Locality Centroid Feature
3. Export Feature and convert to Excel format
4. Multiply NOAA Atlas 14 rainfall depths for locality centroids by recommended change factor to calculate future rainfall depths for 2020-2070

[48] This methodology is used for all localities except for Virginia Beach, which establish a separate representative point as part of adopting the city's Public Works Design Standards Manual in June 2020.
[49] NOAA Atlas 14 GIS data was obtained from NOAA's Precipitation Frequency Data Server (PF Data Server-PFDS/HDSC/OWP (noaa.gov))

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Attachment 9B

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Appendix D – Design Rainfall Depths for Hampton Roads Localities

Notes:

1. All values are in inches.
2. All values are for the 24-hour duration event.
3. Atlas 14 values are for the centroid of each locality unless otherwise noted.

Recommended Design Rainfall Depths - Chesapeake

Table 7: NOAA Atlas 14 (Vol. 2) Precipitation Values for Chesapeake, Virginia

Design Storm	Minimum	Maximum	Mean	Median	90th Percentile	Centroid
1-Year	2.95	3.08	3.03	3.03	3.07	3.04
2-Year	3.59	3.75	3.69	3.69	3.74	3.70
5-Year	4.64	4.84	4.76	4.76	4.82	4.78
10-Year	5.53	5.76	5.67	5.67	5.74	5.69
25-Year	6.85	7.12	7.01	7.01	7.10	7.04
50-Year	7.98	8.29	8.17	8.17	8.26	8.19
100-Year	9.23	9.58	9.44	9.44	9.54	9.47

Table 8: Recommended Design Rainfall Depths for Chesapeake, Virginia

Design Storm Frequency	NOAA Atlas 14 Rainfall (24-Hour Duration)	Design Rainfall (NOAA Atlas 14 * Multiplier)	CBP Median Rainfall Depth (RCP 4.5)	CBP Median Rainfall Depth (RCP 8.5)
1-Year	3.04	**3.65**	-	-
2-Year	3.70	**4.44**	3.96	4.11
5-Year	4.78	**5.73**	5.20	5.25
10-Year	5.69	**6.83**	6.20	6.31
25-Year	7.04	**8.44**	7.67	7.81
50-Year	8.19	**9.83**	8.93	9.26
100-Year	9.47	**11.36**	10.51	10.70

Notes:

1. All values are in inches.
2. All values are for the 24-hour duration event.
3. NOAA Atlas 14 rainfall values for Recommended Design Rainfall Depths are based on the centroid of the city (latitude 36.6793761, longitude -76.3017883).
4. CBP Median Rainfall Depths are not available for the 1-Year event.

Recommended Design Rainfall Depths - Franklin

Table 9: NOAA Atlas 14 (Vol. 2) Precipitation Values for Franklin, Virginia

Design Storm	Minimum	Maximum	Mean	Median	90th Percentile	Centroid
1-Year	2.94	2.96	2.95	2.95	2.96	2.95
2-Year	3.57	3.60	3.59	3.59	3.59	3.59
5-Year	4.61	4.64	4.62	4.62	4.64	4.63
10-Year	5.48	5.52	5.50	5.50	5.52	5.50
25-Year	6.76	6.81	6.79	6.79	6.81	6.79
50-Year	7.86	7.92	7.89	7.90	7.92	7.90
100-Year	9.07	9.13	9.10	9.11	9.13	9.11

Table 10: Recommended Design Rainfall Depths for Franklin, Virginia

Design Storm Frequency	NOAA Atlas 14 Rainfall (24-Hour Duration)	Design Rainfall (NOAA Atlas 14 * Multiplier)	CBP Median Rainfall Depth (RCP 4.5)	CBP Median Rainfall Depth (RCP 8.5)
1-Year	2.95	**3.54**	-	-
2-Year	3.59	**4.31**	3.88	3.98
5-Year	4.63	**5.55**	5.09	5.09
10-Year	5.50	**6.6**	6.05	6.05
25-Year	6.79	**8.15**	7.67	7.61
50-Year	7.90	**9.48**	9.00	8.92
100-Year	9.11	**10.93**	10.48	10.29

Notes:

1. All values are in inches.
2. All values are for the 24-hour duration event.
3. NOAA Atlas 14 rainfall values for Recommended Design Rainfall Depths are based on the centroid of the city (latitude 36.6840142, longitude -76.9413955).
4. CBP Median Rainfall Depths are not available for the 1-Year event.

Recommended Design Rainfall Depths – Gloucester County

Table 11: NOAA Atlas 14 (Vol. 2) Precipitation Values for Gloucester County, Virginia

Design Storm	Minimum	Maximum	Mean	Median	90th Percentile	Centroid
1-Year	2.78	2.92	2.86	2.86	2.91	2.87
2-Year	3.38	3.55	3.48	3.48	3.53	3.49
5-Year	4.38	4.60	4.51	4.52	4.58	4.52
10-Year	5.24	5.49	5.39	5.40	5.47	5.41
25-Year	6.54	6.83	6.72	6.73	6.81	6.74
50-Year	7.67	7.99	7.88	7.89	7.97	7.90
100-Year	8.93	9.28	9.17	9.18	9.26	9.19

Table 12: Recommended Design Rainfall Depths for Gloucester County, Virginia

Design Storm Frequency	NOAA Atlas 14 Rainfall (24-Hour Duration)	Design Rainfall (NOAA Atlas 14 * Multiplier)	CBP Median Rainfall Depth (RCP 4.5)	CBP Median Rainfall Depth (RCP 8.5)
1-Year	2.87	**3.15**	-	-
2-Year	3.49	**3.84**	3.70	3.80
5-Year	4.52	**4.97**	4.79	4.97
10-Year	5.41	**5.95**	5.68	5.89
25-Year	6.74	**7.41**	6.94	7.27
50-Year	7.90	**8.69**	7.98	8.53
100-Year	9.19	**10.11**	9.10	9.93

Notes:

1. All values are in inches.
2. All values are for the 24-hour duration event.
3. NOAA Atlas 14 rainfall values for Recommended Design Rainfall Depths are based on the centroid of the county (latitude 37.4035413, longitude -76.523505).
4. CBP Median Rainfall Depths are not available for the 1-Year event.

Recommended Design Rainfall Depths - Hampton

Table 13: NOAA Atlas 14 (Vol. 2) Precipitation Values for Hampton, Virginia

Design Storm	Minimum	Maximum	Mean	Median	90th Percentile	Centroid
1-Year	2.92	2.95	2.94	2.94	2.94	2.94
2-Year	3.56	3.59	3.57	3.57	3.58	3.58
5-Year	4.61	4.64	4.63	4.63	4.64	4.63
10-Year	5.50	5.54	5.53	5.53	5.54	5.53
25-Year	6.82	6.89	6.87	6.87	6.88	6.88
50-Year	7.97	8.07	8.04	8.04	8.06	8.05
100-Year	9.23	9.38	9.33	9.33	9.36	9.35

Table 14: Recommended Design Rainfall Depths for Hampton, Virginia

Design Storm Frequency	NOAA Atlas 14 Rainfall (24-Hour Duration)	Design Rainfall (NOAA Atlas 14 * Multiplier)	CBP Median Rainfall Depth (RCP 4.5)	CBP Median Rainfall Depth (RCP 8.5)
1-Year	2.94	**3.52**	-	-
2-Year	3.58	**4.29**	3.86	3.90
5-Year	4.63	**5.56**	4.91	5.05
10-Year	5.53	**6.64**	5.81	6.09
25-Year	6.88	**8.26**	7.22	7.57
50-Year	8.05	**9.66**	8.54	8.94
100-Year	9.35	**11.22**	9.91	10.47

Notes:

1. All values are in inches.
2. All values are for the 24-hour duration event.
3. NOAA Atlas 14 rainfall values for Recommended Design Rainfall Depths are based on the centroid of the city (latitude 37.0480302, longitude -76.2971486).
4. CBP Median Rainfall Depths are not available for the 1-Year event.

Recommended Design Rainfall Depths – Isle of Wight County

Table 15: Atlas 14 (Vol. 2) Precipitation Values for Isle of Wight County, Virginia

Design Storm	Minimum	Maximum	Mean	Median	90th Percentile	Centroid
1-Year	2.92	2.98	2.95	2.96	2.97	2.96
2-Year	3.56	3.62	3.59	3.60	3.61	3.60
5-Year	4.59	4.68	4.64	4.64	4.66	4.65
10-Year	5.47	5.57	5.53	5.53	5.55	5.53
25-Year	6.75	6.88	6.83	6.84	6.87	6.83
50-Year	7.85	8.02	7.95	7.96	8.00	7.95
100-Year	9.06	9.27	9.19	9.19	9.25	9.18

Table 16: Recommended Design Rainfall Depths for Isle of Wight County, Virginia

Design Storm Frequency	NOAA Atlas 14 Rainfall (24-Hour Duration)	Design Rainfall (NOAA Atlas 14 * Multiplier)	CBP Median Rainfall Depth (RCP 4.5)	CBP Median Rainfall Depth (RCP 8.5)
1-Year	2.96	**3.26**	-	-
2-Year	3.60	**3.96**	3.92	4.00
5-Year	4.65	**5.11**	5.06	5.20
10-Year	5.53	**6.08**	6.03	6.19
25-Year	6.83	**7.52**	7.65	7.72
50-Year	7.95	**8.75**	9.07	9.07
100-Year	9.18	**10.1**	10.56	10.47

Notes:

1. All values are in inches.
2. All values are for the 24-hour duration event.
3. NOAA Atlas 14 rainfall values for Recommended Design Rainfall Depths are based on the centroid of the county (latitude 36.9014184, longitude -76.7075687).
4. CBP Median Rainfall Depths are not available for the 1-Year event.

Recommended Design Rainfall Depths – James City County

Table 17: Atlas 14 (Vol. 2) Precipitation Values for James City County, Virginia

Design Storm	Minimum	Maximum	Mean	Median	90th Percentile	Centroid
1-Year	2.83	2.94	2.90	2.90	2.94	2.92
2-Year	3.44	3.58	3.52	3.53	3.57	3.55
5-Year	4.44	4.63	4.56	4.56	4.62	4.59
10-Year	5.30	5.52	5.44	5.44	5.51	5.47
25-Year	6.59	6.85	6.74	6.75	6.83	6.78
50-Year	7.71	8.00	7.88	7.89	7.98	7.91
100-Year	8.95	9.29	9.14	9.14	9.24	9.17

Table 18: Recommended Design Rainfall Depths for James City County, Virginia

Design Storm Frequency	NOAA Atlas 14 Rainfall (24-Hour Duration)	Design Rainfall (NOAA Atlas 14 * Multiplier)	CBP Median Rainfall Depth (RCP 4.5)	CBP Median Rainfall Depth (RCP 8.5)
1-Year	2.92	**3.35**	-	-
2-Year	3.55	**4.08**	3.76	3.79
5-Year	4.59	**5.27**	4.81	4.95
10-Year	5.47	**6.29**	5.69	5.90
25-Year	6.78	**7.79**	6.98	7.18
50-Year	7.91	**9.1**	7.99	8.39
100-Year	9.17	**10.55**	9.17	9.63

Notes:

1. All values are in inches.
2. All values are for the 24-hour duration event.
3. NOAA Atlas 14 rainfall values for Recommended Design Rainfall Depths are based on the centroid of the county (latitude 37.3244273, longitude -76.7783194).
4. CBP Median Rainfall Depths are not available for the 1-Year event.

Recommended Design Rainfall Depths – Newport News

Table 19: Atlas 14 (Vol. 2) Precipitation Values for Newport News, Virginia

Design Storm	Minimum	Maximum	Mean	Median	90th Percentile	Centroid
1-Year	2.93	2.95	2.94	2.94	2.95	2.94
2-Year	3.57	3.59	3.58	3.58	3.59	3.58
5-Year	4.62	4.65	4.63	4.63	4.64	4.63
10-Year	5.51	5.54	5.53	5.52	5.54	5.53
25-Year	6.84	6.87	6.86	6.86	6.87	6.86
50-Year	7.99	8.04	8.01	8.01	8.02	8.01
100-Year	9.26	9.33	9.29	9.29	9.31	9.30

Table 20: Recommended Design Rainfall Depths for Newport News, Virginia

Design Storm Frequency	NOAA Atlas 14 Rainfall (24-Hour Duration)	Design Rainfall (NOAA Atlas 14 * Multiplier)	CBP Median Rainfall Depth (RCP 4.5)	CBP Median Rainfall Depth (RCP 8.5)
1-Year	2.94	**3.38**	-	-
2-Year	3.58	**4.11**	3.86	3.93
5-Year	4.63	**5.32**	4.95	5.14
10-Year	5.53	**6.35**	5.86	6.13
25-Year	6.86	**7.89**	7.20	7.61
50-Year	8.01	**9.22**	8.33	8.90
100-Year	9.30	**10.69**	9.76	10.32

Notes:

1. All values are in inches.
2. All values are for the 24-hour duration event.
3. NOAA Atlas 14 rainfall values for Recommended Design Rainfall Depths are based on the centroid of the city (latitude 37.0759783, longitude -76.5217186).
4. CBP Median Rainfall Depths are not available for the 1-Year event.

Recommended Design Rainfall Depths - Norfolk

Table 21: Atlas 14 (Vol. 2) Precipitation Values for Norfolk, Virginia

Design Storm	Minimum	Maximum	Mean	Median	90th Percentile	Centroid
1-Year	2.92	2.96	2.94	2.93	2.95	2.93
2-Year	3.55	3.60	3.57	3.57	3.59	3.56
5-Year	4.59	4.65	4.62	4.61	4.64	4.60
10-Year	5.47	5.55	5.50	5.50	5.53	5.49
25-Year	6.78	6.87	6.82	6.82	6.85	6.80
50-Year	7.91	8.01	7.95	7.95	7.98	7.93
100-Year	9.16	9.27	9.20	9.20	9.23	9.18

Table 22: Recommended Design Rainfall Depths for Norfolk, Virginia

Design Storm Frequency	NOAA Atlas 14 Rainfall (24-Hour Duration)	Design Rainfall (NOAA Atlas 14 * Multiplier)	CBP Median Rainfall Depth (RCP 4.5)	CBP Median Rainfall Depth (RCP 8.5)
1-Year	2.93	**3.51**	-	-
2-Year	3.56	**4.28**	3.81	3.88
5-Year	4.60	**5.52**	4.88	5.06
10-Year	5.49	**6.59**	5.82	6.04
25-Year	6.80	**8.16**	7.21	7.55
50-Year	7.93	**9.51**	8.48	8.88
100-Year	9.18	**11.01**	9.91	10.28

Notes:

1. All values are in inches.
2. All values are for the 24-hour duration event.
3. NOAA Atlas 14 rainfall values for Recommended Design Rainfall Depths are based on the centroid of the city (latitude 36.9230148, longitude -76.2446413).
4. CBP Median Rainfall Depths are not available for the 1-Year event.

Recommended Design Rainfall Depths - Poquoson

Table 23: Atlas 14 (Vol. 2) Precipitation Values for Poquoson, Virginia

Design Storm	Minimum	Maximum	Mean	Median	90th Percentile	Centroid
1-Year	2.92	2.93	2.93	2.93	2.93	2.93
2-Year	3.55	3.57	3.56	3.56	3.57	3.56
5-Year	4.60	4.62	4.61	4.62	4.62	4.62
10-Year	5.50	5.53	5.52	5.52	5.53	5.52
25-Year	6.85	6.88	6.87	6.87	6.88	6.87
50-Year	8.03	8.06	8.05	8.05	8.06	8.05
100-Year	9.33	9.37	9.35	9.36	9.37	9.36

Table 24: Recommended Design Rainfall Depths for Poquoson, Virginia

Design Storm Frequency	NOAA Atlas 14 Rainfall (24-Hour Duration)	Design Rainfall (NOAA Atlas 14 * Multiplier)	CBP Median Rainfall Depth (RCP 4.5)	CBP Median Rainfall Depth (RCP 8.5)
1-Year	2.93	**3.51**	-	-
2-Year	3.56	**4.27**	3.81	3.88
5-Year	4.62	**5.54**	4.89	5.03
10-Year	5.52	**6.63**	5.80	6.07
25-Year	6.87	**8.25**	7.15	7.49
50-Year	8.05	**9.66**	8.29	8.86
100-Year	9.36	**11.23**	9.64	10.39

Notes:

1. All values are in inches.
2. All values are for the 24-hour duration event.
3. NOAA Atlas 14 rainfall values for Recommended Design Rainfall Depths are based on the centroid of the city (latitude 37.1283599, longitude -76.3035337).
4. CBP Median Rainfall Depths are not available for the 1-Year event.

Recommended Design Rainfall Depths - Portsmouth

Table 25: Atlas 14 (Vol. 2) Precipitation Values for Portsmouth, Virginia

Design Storm	Minimum	Maximum	Mean	Median	90th Percentile	Centroid
1-Year	2.95	2.99	2.97	2.97	2.98	2.97
2-Year	3.59	3.63	3.61	3.61	3.63	3.61
5-Year	4.64	4.69	4.66	4.66	4.68	4.66
10-Year	5.53	5.59	5.56	5.56	5.58	5.55
25-Year	6.85	6.91	6.88	6.88	6.90	6.88
50-Year	7.99	8.06	8.02	8.02	8.04	8.01
100-Year	9.24	9.31	9.27	9.27	9.30	9.27

Table 26: Recommended Design Rainfall Depths for Portsmouth, Virginia

Design Storm Frequency	NOAA Atlas 14 Rainfall (24-Hour Duration)	Design Rainfall (NOAA Atlas 14 * Multiplier)	CBP Median Rainfall Depth (RCP 4.5)	CBP Median Rainfall Depth (RCP 8.5)
1-Year	2.97	**3.56**	-	-
2-Year	3.61	**4.33**	3.90	4.00
5-Year	4.66	**5.59**	4.94	5.08
10-Year	5.55	**6.66**	5.83	6.05
25-Year	6.88	**8.25**	7.22	7.63
50-Year	8.01	**9.62**	8.49	9.06
100-Year	9.27	**11.12**	10.10	10.56

Notes:

1. All values are in inches.
2. All values are for the 24-hour duration event.
3. NOAA Atlas 14 rainfall values for Recommended Design Rainfall Depths are based on the centroid of the city (latitude 36.8594298, longitude -76.3562686).
4. CBP Median Rainfall Depths are not available for the 1-Year event.

Recommended Design Rainfall Depths – Smithfield

Table 27: Atlas 14 (Vol. 2) Precipitation Values for Smithfield, Virginia

Design Storm	Minimum	Maximum	Mean	Median	90th Percentile	Centroid
1-Year	2.95	2.96	2.95	2.95	2.96	2.95
2-Year	3.59	3.60	3.59	3.59	3.60	3.59
5-Year	4.63	4.65	4.64	4.64	4.65	4.64
10-Year	5.52	5.54	5.53	5.53	5.54	5.53
25-Year	6.84	6.86	6.85	6.85	6.86	6.85
50-Year	7.97	8.00	7.99	7.99	8.00	7.98
100-Year	9.21	9.25	9.24	9.24	9.25	9.24

Table 28: Recommended Design Rainfall Depths for Smithfield, Virginia

Design Storm Frequency	NOAA Atlas 14 Rainfall (24-Hour Duration)	Design Rainfall (NOAA Atlas 14 * Multiplier)	CBP Median Rainfall Depth (RCP 4.5)	CBP Median Rainfall Depth (RCP 8.5)
1-Year	2.95	**3.54**	-	-
2-Year	3.59	**4.31**	3.92	4.00
5-Year	4.64	**5.57**	5.06	5.20
10-Year	5.53	**6.64**	6.03	6.19
25-Year	6.85	**8.22**	7.65	7.72
50-Year	7.98	**9.58**	9.07	9.07
100-Year	9.24	**11.08**	10.56	10.47

Notes:

1. All values are in inches.
2. All values are for the 24-hour duration event.
3. NOAA Atlas 14 rainfall values for Recommended Design Rainfall Depths are based on the centroid of the town (latitude 36.9718727, longitude -76.612997).
4. CBP Median Rainfall Depths are not available for the 1-Year event.
5. CBP Median Values are for Isle of Wight County

Recommended Design Rainfall Depths – Southampton County

Table 29: Atlas 14 (Vol. 2) Precipitation Values for Southampton County, Virginia

Design Storm	Minimum	Maximum	Mean	Median	90th Percentile	Centroid
1-Year	2.70	2.97	2.87	2.88	2.94	2.87
2-Year	3.28	3.61	3.49	3.50	3.57	3.49
5-Year	4.22	4.65	4.50	4.51	4.61	4.50
10-Year	5.01	5.53	5.34	5.36	5.48	5.34
25-Year	6.16	6.83	6.59	6.60	6.76	6.58
50-Year	7.13	7.94	7.66	7.67	7.86	7.64
100-Year	8.18	9.16	8.82	8.84	9.06	8.79

Table 30: Recommended Design Rainfall Depths for Southampton County, Virginia

Design Storm Frequency	NOAA Atlas 14 Rainfall (24-Hour Duration)	Design Rainfall (NOAA Atlas 14 * Multiplier)	CBP Median Rainfall Depth (RCP 4.5)	CBP Median Rainfall Depth (RCP 8.5)
1-Year	2.87	**3.16**	-	-
2-Year	3.49	**3.84**	3.73	3.80
5-Year	4.50	**4.95**	4.77	4.95
10-Year	5.34	**5.88**	5.71	5.88
25-Year	6.58	**7.24**	7.11	7.24
50-Year	7.64	**8.4**	8.32	8.55
100-Year	8.79	**9.67**	9.49	10.02

Notes:

1. All values are in inches.
2. All values are for the 24-hour duration event.
3. NOAA Atlas 14 rainfall values for Recommended Design Rainfall Depths are based on the centroid of the county (latitude 36.7201725, longitude -77.1038556).
4. CBP Median Rainfall Depths are not available for the 1-Year event.

Recommended Design Rainfall Depths - Suffolk

Table 31: Atlas 14 (Vol. 2) Precipitation Values for Suffolk, Virginia

Design Storm	Minimum	Maximum	Mean	Median	90th Percentile	Centroid
1-Year	2.96	3.07	2.99	2.99	3.03	2.99
2-Year	3.60	3.73	3.64	3.63	3.68	3.64
5-Year	4.63	4.81	4.70	4.69	4.75	4.69
10-Year	5.51	5.72	5.59	5.58	5.65	5.59
25-Year	6.80	7.07	6.91	6.89	6.98	6.90
50-Year	7.91	8.23	8.04	8.03	8.13	8.04
100-Year	9.13	9.50	9.28	9.27	9.38	9.28

Table 32: Recommended Design Rainfall Depths for Suffolk, Virginia

Design Storm Frequency	NOAA Atlas 14 Rainfall (24-Hour Duration)	Design Rainfall (NOAA Atlas 14 * Multiplier)	CBP Median Rainfall Depth (RCP 4.5)	CBP Median Rainfall Depth (RCP 8.5)
1-Year	2.99	**3.44**	-	-
2-Year	3.64	**4.18**	3.97	4.04
5-Year	4.69	**5.4**	5.16	5.26
10-Year	5.59	**6.43**	6.20	6.37
25-Year	6.90	**7.94**	7.73	7.94
50-Year	8.04	**9.24**	9.16	9.40
100-Year	9.28	**10.67**	10.76	10.94

Notes:

1. All values are in inches.
2. All values are for the 24-hour duration event.
3. NOAA Atlas 14 rainfall values for Recommended Design Rainfall Depths are based on the centroid of the city (latitude 36.6971573, longitude -76.6347807).
4. CBP Median Rainfall Depths are not available for the 1-Year event.

Recommended Design Rainfall Depths – Surry County

Table 33: Atlas 14 (Vol. 2) Precipitation Values for Surry County, Virginia

Design Storm	Minimum	Maximum	Mean	Median	90th Percentile	Centroid
1-Year	2.83	2.93	2.90	2.90	2.93	2.90
2-Year	3.43	3.57	3.52	3.53	3.56	3.52
5-Year	4.42	4.62	4.55	4.56	4.60	4.55
10-Year	5.26	5.51	5.41	5.42	5.49	5.42
25-Year	6.47	6.83	6.69	6.70	6.79	6.70
50-Year	7.51	7.97	7.79	7.80	7.92	7.80
100-Year	8.63	9.24	9.00	9.01	9.16	9.01

Table 34: Recommended Design Rainfall Depths for Surry County, Virginia

Design Storm Frequency	NOAA Atlas 14 Rainfall (24-Hour Duration)	Design Rainfall (NOAA Atlas 14 * Multiplier)	CBP Median Rainfall Depth (RCP 4.5)	CBP Median Rainfall Depth (RCP 8.5)
1-Year	2.90	**3.19**	-	-
2-Year	3.52	**3.87**	3.77	3.87
5-Year	4.55	**5.00**	4.87	5.00
10-Year	5.42	**5.96**	5.79	5.90
25-Year	6.70	**7.37**	7.03	7.23
50-Year	7.80	**8.58**	8.34	8.34
100-Year	9.01	**9.91**	9.73	9.73

Notes:

1. All values are in inches.
2. All values are for the 24-hour duration event.
3. NOAA Atlas 14 rainfall values for Recommended Design Rainfall Depths are based on the centroid of the county (latitude 37.119761, longitude -76.8801717).
4. CBP Median Rainfall Depths are not available for the 1-Year event.

Recommended Design Rainfall Depths – Virginia Beach

Table 35: Atlas 14 (Vol. 2) Precipitation Values for Virginia Beach, Virginia

Design Storm	Minimum	Maximum	Mean	Median	90th Percentile	Centroid
1-Year	2.93	3.06	3.01	3.01	3.04	3.01
2-Year	3.57	3.72	3.66	3.66	3.70	3.66
5-Year	4.61	4.81	4.73	4.73	4.77	4.73
10-Year	5.50	5.72	5.64	5.64	5.68	5.64
25-Year	6.82	7.08	6.98	6.99	7.02	6.98
50-Year	7.95	8.24	8.14	8.15	8.18	8.13
100-Year	9.21	9.52	9.42	9.43	9.46	9.40

Table 36: Recommended Design Rainfall Depths for Virginia Beach, Virginia

Design Storm Frequency	NOAA Atlas 14 Rainfall (24-Hour Duration)	Design Rainfall (NOAA Atlas 14 * Multiplier)	CBP Median Rainfall Depth (RCP 4.5)	CBP Median Rainfall Depth (RCP 8.5)
1-Year	3.00	**3.60**	-	-
2-Year	3.65	**4.38**	3.95	4.06
5-Year	4.73	**5.68**	5.11	5.25
10-Year	5.64	**6.77**	6.14	6.26
25-Year	6.99	**8.39**	7.60	7.81
50-Year	8.16	**9.79**	8.94	9.11
100-Year	9.45	**11.34**	10.34	10.53

Notes:

1. All values are in inches.
2. All values are for the 24-hour duration event.
3. NOAA Atlas 14 rainfall values for Recommended Design Rainfall Depths are based on latitude 36.8201, longitude -76.0756, as incorporated in the city's Public Works Design Standards Manual, adopted June 2020.
4. CBP Median Rainfall Depths are not available for the 1-Year event.

Recommended Design Rainfall Depths - Williamsburg

Table 37: Atlas 14 (Vol. 2) Precipitation Values for Williamsburg, Virginia

Design Storm	Minimum	Maximum	Mean	Median	90th Percentile	Centroid
1-Year	2.93	2.94	2.94	2.94	2.94	2.94
2-Year	3.57	3.58	3.57	3.58	3.58	3.58
5-Year	4.61	4.63	4.62	4.62	4.63	4.62
10-Year	5.50	5.52	5.51	5.51	5.52	5.51
25-Year	6.82	6.84	6.83	6.83	6.84	6.83
50-Year	7.95	7.99	7.97	7.97	7.98	7.97
100-Year	9.22	9.26	9.24	9.24	9.25	9.24

Table 38: Recommended Design Rainfall Depths for Williamsburg, Virginia

Design Storm Frequency	NOAA Atlas 14 Rainfall (24-Hour Duration)	Design Rainfall (NOAA Atlas 14 * Multiplier)	CBP Median Rainfall Depth (RCP 4.5)	CBP Median Rainfall Depth (RCP 8.5)
1-Year	2.94	**3.38**	-	-
2-Year	3.58	**4.11**	3.72	3.79
5-Year	4.62	**5.32**	4.81	4.99
10-Year	5.51	**6.34**	5.68	5.90
25-Year	6.83	**7.85**	6.97	7.17
50-Year	7.97	**9.17**	7.97	8.37
100-Year	9.24	**10.62**	9.05	9.61

Notes:

1. All values are in inches.
2. All values are for the 24-hour duration event.
3. NOAA Atlas 14 rainfall values for Recommended Design Rainfall Depths are based on the centroid of the city (latitude 37.2692929, longitude -76.7067172).
4. CBP Median Rainfall Depths are not available for the 1-Year event.

Recommended Design Rainfall Depths – York County

Table 39: Atlas 14 (Vol. 2) Precipitation Values for York County, Virginia

Design Storm	Minimum	Maximum	Mean	Median	90th Percentile	Centroid
1-Year	2.91	2.94	2.93	2.93	2.94	2.93
2-Year	3.54	3.58	3.56	3.57	3.57	3.57
5-Year	4.58	4.63	4.61	4.62	4.62	4.61
10-Year	5.46	5.53	5.51	5.51	5.52	5.51
25-Year	6.78	6.88	6.84	6.84	6.86	6.84
50-Year	7.92	8.06	8.00	8.00	8.03	8.00
100-Year	9.19	9.36	9.28	9.29	9.32	9.29

Table 40: Recommended Design Rainfall Depths for York County, Virginia

Design Storm Frequency	NOAA Atlas 14 Rainfall (24-Hour Duration)	Design Rainfall (NOAA Atlas 14 * Multiplier)	CBP Median Rainfall Depth (RCP 4.5)	CBP Median Rainfall Depth (RCP 8.5)
1-Year	2.93	**3.37**	-	-
2-Year	3.57	**4.1**	3.81	3.89
5-Year	4.61	**5.31**	4.84	5.03
10-Year	5.51	**6.34**	5.73	6.01
25-Year	6.84	**7.87**	7.05	7.46
50-Year	8.00	**9.2**	8.24	8.64
100-Year	9.29	**10.68**	9.47	9.94

Notes:

1. All values are in inches.
2. All values are for the 24-hour duration event.
3. NOAA Atlas 14 rainfall values for Recommended Design Rainfall Depths are based on the centroid of the county (latitude 37.2209138, longitude -76.3955329).
4. CBP Median Rainfall Depths are not available for the 1-Year event.

MEETING SUMMARY
askHRgreen.org Environmental Education Committees

The askHRgreen.org Environmental Education Committees met in November/December to discuss the following ongoing programs and initiatives. All Committees met individually in November with representatives from Davis Advertising Agency for onboarding of the new marketing services contract.

askHRgreen.org Recycling & Beautification Committee – November 12, December 10

- The Committee is implementing a three-year EPA Recycling Education and Outreach Grant (REO). During this reporting period the Committee finalized the web-based recycling education tools, began development of a locally-funded recycling confidence survey, and planned for route-level recycling audits and cart-tagging in spring 2025.

- The Committee is planning for the 2025 Great American Cleanup scheduled for March 28-29, 2025. Cleanup and beautification projects will happen across the region this weekend with the help of thousands of local volunteers. Localities are encouraged to participate by planning community cleanup and beautification projects.

askHRgreen.org Fats, Oils, & Grease Education Committee – November 19

- The new HRFOG.com training website for the HRFOG Food Service Employee and Grease Hauler certifications is now fully implemented. The Committee is exploring options to expand training resources for populations with limited English proficiency.

- The Committee will be promoting the "Grease Grinch" campaign encouraging residents to keep fats, oil, grease, and food scraps out of household drains during the holiday season.

askHRgreen.org Stormwater Education Committee – November 15

- The Committee is planning for special promotions and giveaways for Chesapeake Bay Awareness Week in June 2025.

- The Committee is promoting the regional pet waste station grant program to local neighborhoods and civic leagues and looking into rebranding the Bay Star Homes and Bay Star Business programs for 2025.

askHRgreen.org Water Awareness Committee – November 25

- The Committee launched a new "Adopt a Drop" fundraising campaign for the Hampton Roads Help 2 Others program. The program provides water bill payment assistance for Hampton Roads residents experiencing financial hardship. New resources include rack cards, posters, donation displays, and a social media toolkit.

- The Committee discussed public communication efforts under the new Lead and Copper Rule requirements.

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MEETING SUMMARY
COASTAL RESILIENCY COMMITTEE

The HRPDC Coastal Resiliency Committee met on December 13, 2024. The following items were discussed.

- Mr. Ben McFarlane, HRPDC, briefed the Committee on the HRPDC's Regional Legislative Priorities and on the status of proposed legislation regarding flood risk disclosure.

- Mr. McFarlane and locality staff updated the Committee on the status of Coastal Storm Risk Management Studies and Projects underway in the region.

- Ms. Emma Corbitt, HRPDC, briefed the Committee on the outcomes of a project funded by the Community Flood Preparedness Fund to identify potential regional initiatives to support locality participation in the National Flood Insurance Program's Community Rating System.

- Mr. McFarlane updated the Committee on the status of the Community Flood Preparedness Fund, including Grant Round 5.

- Ms. Whitney Katchmark, HRPDC, briefed the Committee on the final recommendations of the Virginia Coastal Resilience Master Plan Technical Advisory Committee and the status of Phase II of the Virginia Coastal Resilience Master Plan.

- Mr. McFarlane updated the Committee on the status of the regional resilient design standards.

- Ms. Katchmark updated the Committee on the regional roadway flooding sensors effort.

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MEETING SUMMARY
DIRECTORS OF UTILITIES COMMITTEE

The Directors of Utilities Committee and the Health Directors met in Chesapeake and via Teams on December 4, 2024. The following items were discussed:

- Directors shared details on recent scam activities reported by utility customers.
- The Chief Technology Officer for HRSD provided a brief on the agency's partnership with Waste Management for leachate treatment and PFAS waste destruction testing.
- Mr. Dan Horne, Virginia Department of Health, updated the committee on the Lead and Copper Rules Revisions (LCRR) and Lead and Copper Rule Improvements (LCRI) program requirements.
- HRPDC staff reviewed recent updates to the Hampton Roads Fats, Oils, and Grease (HR FOG) online training programs.
- HRPDC staff shared updates on the Adopt a Drop fundraising campaign for the Help 2 Others program.
- HRPDC staff announced a Locality user survey to inform upgrades to the regional Sanitary Sewer Overflow Reporting System (SSORS).

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MEETING SUMMARY
REGIONAL ENVIRONMENTAL COMMITTEE

The Regional Environmental Committee met on December 5, 2024. The following items were discussed.

- Mr. Jay Ford, Chesapeake Bay Foundation, briefed the Committee on the CBF's legislative agenda for the 2025 General Assembly, including priorities on renewable energy and resiliency.

- Mr. Mitchell Smiley, Virginia Municipal League, briefed the Committee on VML's legislative agenda for the 2025 General Assembly session, including priorities on local land use control and funding for the Stormwater Local Assistance Fund and Water Quality Improvement Fund.

- Ms. Grace Holmes, DEQ, briefed the Committee on recent activities at the Department of Environmental Quality's Tidewater Regional Office.

- Ms. Sara Kidd, Ms. Emma, Corbitt, and Mr. Tho Tran, HRPDC, gave a presentation to the Committee on the HRPDC's winning project for the 2024 Hampton Roads Datathon. The project looked at tree canopy and urban heat island effects near bus stops.

- Mr. Ben McFarlane, HRPDC, briefed the Committee on several new tools and resources developed by NOAA and other federal agencies to support local and regional resiliency planning.

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CITY OF POQUOSON
OFFICE OF THE CITY MANAGER

500 CITY HALL AVENUE
POQUOSON, VA 23662
(757) 868-3000 *TELEPHONE*
(757) 868-3101 *FAX*

December 10, 2024

Mr. Robert A. Crum
Executive Director
Hampton Roads PDC
The Regional Building
723 Wood lake Drive
Chesapeake, VA 23320

Dear Mr. Crum:

At its meeting on December 9, 2024, Poquoson City Council appointed David A. Hux to the Hampton Roads Planning District Commission (HRPDC) and J. Randall Wheeler as Ex Officio member of the Hampton Roads Planning District Commission (HRPDC).

If you have any questions, please do not hesitate to call.

Sincerely,

Christy Snapp
Deputy City Clerk

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City of Virginia Beach

ROBERT M. "BOBBY" DYER
MAYOR

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January 8, 2025

Council Member Stacy Cummings
2401 Courthouse Drive #2111
Virginia Beach, VA 23456

Dear Council Member Cummings,

Congratulations!

The Virginia Beach City Council, at its Formal Session on January 7, 2025, appointed you to the ***Hampton Roads Planning District Commission*** *as a representative of the Virginia Beach City Council effective January 7, 2025.*

On behalf of the Members of City Council, please accept our gratitude for accepting this volunteer responsibility. The City Attorney will forward you a copy of the Freedom of Information Act. The Commonwealth's Attorney will send you a copy of the State Conflict of Interest Act.

The City Clerk is responsible for the Council Appointive Agencies. If she can assist you in any way, you have only to make it known to her by calling 385-4036 or accessing the web site: https://clerk.virginiabeach.gov/appointed-agencies

Sincerely,

Robert M. Dyer
Mayor

RMD/tc
Enclosure
Cc: City Attorney
Commonwealth Attorney

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ROBERT M. "BOBBY" DYER
MAYOR

City of Virginia Beach

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2401 COURTHOUSE DRIVE
VIRGINIA BEACH, VA 23456-9000
(757) 385-4581
CELL (757) 749-4659
BDYER@VBGOV.COM

January 8, 2025

Council Member Robert W. "Worth" Remick
2401 Courthouse Drive #2111
Virginia Beach, VA 23456

Dear Council Member Remick,

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Sincerely,

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