Regional Strategic Plan for Public Access to Waterways in Hampton Roads

HAMPTON ROADS PDC

February 2018

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REGIONAL STRATEGIC PLAN FOR PUBLIC ACCESS TO WATERWAYS IN HAMPTON ROADS

FINAL REPORT

This report was produced, in part, through financial assistance from the Virginia Coastal Zone Management Program in the Virginia Department of Environmental Quality through Grant No. NA16NOS4190171 from the National Oceanic and Atmospheric Administration. The views expressed herein are those of the authors and do not necessarily reflect the views of NOAA or any of its sub-agencies. Federal financial assistance to this project amounted to $19,994, or approximately fifty percent of the total project cost.

Preparation of this report was included in the HRPDC Unified Planning Work Program for FY2016-2017, approved by the Commission at its Executive Committee Meeting of June 16, 2016, and in the HRPDC Unified Planning Work Program for FY 2017-2018, approved by the Commission on May 18, 2017.

Prepared by the staff of the
Hampton Roads Planning District Commission

February 2018

Front cover: Back Bay National Wildlife Refuge in Virginia Beach.

REPORT DOCUMENTATION

TITLE
Regional Strategic Plan for Public Access to Waterways in Hampton Roads

REPORT DATE
February 2018

GRANT/SPONSORING AGENCY
DEQ/NOAA/Local Funds

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ABSTRACT

This report describes the process, research, and results produced to develop a Regional Strategic Plan for Public Access to Waterways in Hampton Roads. It includes an assessment of demand for public access (such as boat ramps, kayak launches, beaches, trails, etc.), an inventory of existing and planned public access locations and facilities, a gap analysis to identify opportunities for new public access sites, an assessment of funding opportunities, and descriptions of public outreach materials. The overall goal of this project is to use the research and tools discussed in this report to inform local, state, federal, and non-profit plans to improve public access to waterways in Hampton Roads.

ACKNOWLEDGEMENTS

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Virginia Coastal Zone
MANAGEMENT PROGRAM

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EXECUTIVE SUMMARY

The Regional Strategic Plan for Public Access to Waterways in Hampton Roads is the result of a cooperative effort between the HRPDC and stakeholders from state agencies, local governments, and non-governmental organizations. It documents the findings and results of four deliverables:

- An assessment of existing plans, policies, and locations for public access in Hampton Roads.
- An assessment of opportunities available for funding public access projects.
- An inventory of existing and planned public access locations and facilities.
- The development of public outreach materials for print and online to help members of the public identify and locate public access facilities.

The overall goal of this plan is to help develop a regional vision for providing and improving public access to waterways throughout Hampton Roads. Public access includes features such as beaches, boat ramps, kayak launches, trails, parks, and fishing piers.

This plan consists of five major sections. The first part consists of an assessment of the demand for public access in Hampton Roads based on surveys and data analysis from a variety of federal, state, and private sources. The second part is an inventory of existing and planned public access sites in the region. The third section is a series of analyses that aim to identify gaps in areas served by public access sites and to identify opportunities for adding or improving access. The fourth section describes several opportunities for funding new projects or planning. The final section describes the development of an online map/geo app and accompanying brochure that were developed to publicize public access infrastructure in the region.

DEMAND FOR PUBLIC ACCESS IN HAMPTON ROADS

Measuring demand for public access is important when considering how to prioritize expanding access relative to other local priorities. In Hampton Roads, public access is consistently considered to be a high priority based on residents' reported preferences and actual registrations for boats and fishing licenses. Several data sources were assessed in this section to provide a baseline of overall demand. These sources include surveys such as the Virginia Outdoors Demand Survey, active boat registrations, and sales of annual fishing licenses. Overall, these sources indicate a high demand for public access to waterways in Hampton Roads.

PUBLIC ACCESS INVENTORY

HRPDC staff produced an inventory of all public access sites in Hampton Roads. The primary sources of data were local parks and recreation departments and state agencies. The inventory

includes 192 public access sites in four categories: boating, fishing, swimming, and viewing. For each site HRPDC staff collected several pieces of information, including the site name, jurisdiction, waterbody accessed, and whether or not several access facilities (boat ramps, kayak launches, etc.) were present.

Identifying Opportunities for Public Access

One of the mains goals of this project is to help localities and state agencies strategically improve public access to waterways throughout the region. This part of the project used the inventory as a baseline to identify areas that did not have public access sites nearby, using a travel time analysis and a stream distance analysis. Most of the region is located within half an hour of a public facility. HRPDC staff also determined the population located within each watershed to determine whether or not those areas could use additional public access sites to support higher demand. The Elizabeth River, the Lynnhaven River, and the northern side of the James River are areas with high populations and relatively few public access sites. The report also includes an assessment of planned or proposed access sites, how these sites fill some accessibility gaps, and an analysis of the number and origins of visitors who are accessing each site.

Funding Opportunities for Public Access

Although local governments and state agencies primarily fund public access projects on their own, there are funding opportunities available to supplement those efforts. Most of these funding opportunities come from the federal government, but several state agencies and non-governmental organizations also provide grants to local governments for public access projects. This section summarizes several of these programs and includes information on eligibility of applicants and projects, match requirements, and where additional information or applications can be found.

Public Outreach

HRPDC developed two strategies to make the inventory available for use by local governments and the general public. The main focus of this component of the project was the development of a water access sites “geo app” or interactive mapping application. This app is an online, searchable map that can be accessed via URL on any device with a web-browser. Using FishSwimPlay.com, a user can browse a map of the region to find access sites, filter specific types of access sites, or search sites by name. HRPDC staff also developed a rack card brochure, which can be distributed at retailers, outfitters, parks and recreation offices, libraries, and other places where people interested in using public access sites might look for information.

Conclusions and Next Steps

The analyses and other work described in this report provide a solid foundation for improving local and regional public access planning in Hampton Roads. Currently there are many sites throughout the region, but there are also parts of the region that have relatively few facilities or no public access to the water or are underserved due to high demand. By analyzing the existing facilities and identifying gaps, this report can assist local and state planners and agencies in making funding decisions for additional access sites. In addition the HRPDC staff has identified several potential next steps, including surveys, additional analyses, new studies, and consideration of policy proposals that could further improve public access to waterways in the region.

I. Introduction

The Hampton Roads Planning District Commission (HRPDC) boundary encompasses the 17 local jurisdictions of southeastern Virginia with a total population of approximately 1.7 million. Ten independent cities, six counties, and one incorporated town comprise the membership of the HRPDC. Of the district's seventeen jurisdictions, all but two are located directly on or connected to tidal waters, and the remaining two, Franklin and Southampton County, are both located on significant inland rivers. As a result, Hampton Roads is culturally, environmentally, and economically tied to its coastal areas.

Figure 1. HRPDC member localities

Originally settled due to area's natural harbor, the region's economy has historically included substantial waterfront industries. In recent decades, as the economy has shifted to become more service-oriented, the region's waterfronts have experienced significant residential development. The area's considerable population growth since the middle of the 20th century has also increased the demand for recreational access to the water. However, providing public access in Hampton Roads is challenging for a number of reasons. Virginia law maintains that private property extends from the mean low water line landward, so there is no guaranteed right

for the public to use beaches or other waterfront lands.[1] Of the waterfront land in Hampton Roads that is publicly owned, a significant amount is owned by the federal government or state agencies, such as the Virginia Port Authority, further restricting the amount of land available for public access. As a result, a strategic approach to identifying and pursuing opportunities for increased and improved public access to the water is necessary for communities across the region.

Historically, the Virginia Coastal Zone Management Program (VCZMP) has strongly supported local, regional, and state efforts to improve public access to the water in Hampton Roads. Since the late 1980s, the VCZMP has provided funding for over a dozen local and state projects in eight different localities (Table 1). Past projects have included boat ramps and trails in Surry County and Virginia Beach, piers in Suffolk, Poquoson, and Norfolk, and a beach replenishment project in Newport News. More recently, in 2015 the VCZMP provided funding through the HRPDC for canoe/kayak launches in Isle of Wight County and Norfolk. This consistent funding over the last 30 years demonstrates the high priority that localities and the state have placed on improving public access in the region. Providing public access to the water is a major goal of many Hampton Roads localities. This is reflected in many of their local plans, capital improvement programs, and parks and recreation budgets.

Lavalette Kayak Launch and Fishing Pier in Norfolk on opening day in October 2017. Photo courtesy of City of Norfolk.

Although some communities in Hampton Roads have developed internal plans for building networks of public access sites, many projects at the local level and through the HRPDC are developed in an ad hoc and opportunistic manner. In 2015, VCZMP funding became available for public access projects. In response, the HRPDC solicited project ideas from its Regional Environmental Committee (REC), which is comprised of local government staff. The Committee recommended pursuing funding for two public access projects, one in Isle of Wight County and one in Norfolk. The quick response needed to submit the applications prompted the realization that a regional plan for public access would be beneficial for developing future proposals and for guiding local, regional, and state planning. Although VCZMP funding was used to build both of these projects, it is not consistently available.

[1] Code of Virginia § 28.2-1202

In 2016, HRPDC staff proposed the development of a regional strategic plan to REC to help guide decision-making and prioritization of public access improvements in Hampton Roads. This plan has been produced with the assistance of Hampton Roads localities, state agencies, and other regional stakeholders, including non-governmental organizations. The overall goal of this plan is to develop a vision for improving and maintaining public access to the water across Hampton Roads.

New kayak launch at Carrollton Nike Park in Isle of Wight County. Photo courtesy of Isle of Wight County.

The plan consists of five sections. The first is an assessment of existing federal, state, and local plans and policies related to public access. The second section is an assessment of the demand for public access in the region. The third is an inventory of existing and planned public access sites across the region and includes an online map showing public access sites across Hampton Roads for locality and public use. A brochure that can be distributed by localities, retailers, and others was created to publicize the map. The fourth section analyzes existing and planned inventories identify opportunities for new public access sites. The final section is a summary of funding opportunities for public access projects.

Table 1. Public Access Projects in Hampton Roads Funded by the Virginia Coastal Zone Management Program

Grant Year	Grantee	Project	Locality
1989	DCR	Chippokes Plantation State Park Access Trail	Surry County
1990	Suffolk	Bennett's Creek Crabbing Pier Extension	Suffolk
1991	Norfolk	Monkey Bottom Wetland Walkway	Norfolk
1992	Isle of Wight County	Jones Creek Boat Ramp	Isle of Wight County
1993	James City County	Powhatan Creek Canoe Launch	James City County
1993	Newport News	Riverview Farm Park Boardwalk	Newport News
1993	Virginia Beach	Elizabeth River Interpretive Path/Canoe Trail	Virginia Beach
1994	Virginia Beach	Alton's Creek Boardwalk Canoe Trail	Virginia Beach
1994	Newport News	King-Lincoln Park Beach Replenishment	Newport News
1996	Poquoson	White House Cove Pier Restoration	Poquoson
2005	DCR	First Landing State Park Walkway Renovations	Virginia Beach
2015	HRPDC	Carrollton Nike Park Canoe/Kayak Launch	Isle of Wight County
2015	HRPDC	Lavalette Kayak Launch and Fishing Pier	Norfolk

Background

Over the last three decades, many efforts have been made to plan for and implement public access projects in Hampton Roads. The region continues to benefit from federal and state planning efforts focused on the Chesapeake Bay, several of which included public access components. In addition to these plans, others have been developed at the local, regional, and state levels. This section provides an overview of relevant plans which laid the groundwork for this study. The plans described below provided additional public access sites for inclusion in the inventory and include policies adopted or recommended and other information, such as survey data, which can help guide current planning.

Federal

Chesapeake Bay Agreement (1987)

The Chesapeake Bay Agreement acknowledges the multi-faceted value of the Chesapeake Bay with the signatory states formally agreeing to work together to protect the Bay. It outlines objectives to guide the development of a framework for future cooperative efforts. One of the goals outlined in the Bay Agreement is to "promote increased opportunities for public appreciation and enjoyment of the bay and its tributaries" (Chesapeake Bay Commission, 1987). Access to the water allows the public to make personal connections with the environment while increasing the awareness of the issues affecting the Bay. In turn, this elicits support for protection efforts (Chesapeake Bay Commission, 1987).

Chesapeake Bay & Susquehanna River Public Access Guide (1989)

This *Guide* was the initial inventory of public access sites made in the Chesapeake Bay, conducted following the signing of the Chesapeake Bay Agreement in 1987. Intended as guide for public use, it revealed a lack of public access in the Bay at that time with less than one percent of the shoreline in public ownership (Public Access Task Force, 1989).

Chesapeake Bay Area Public Access Plan (1990)

The *Public Access Plan* goes a step further than the *Guide* to inventory all public and private access points in the Chesapeake Bay watershed as well as provide detailed information about the sites, such as the type of activities at each site and environmental conditions like shoreline erosion, cultural assets, wetlands, and natural heritage areas. The maps in the plan also depict these environmental conditions along with potential sites. The goal of the plan was for localities to incorporate potential access sites into their comprehensive planning efforts for new sites or maintenance/improvement of existing sites. It was the first effort to strategically look at the placement of public access (Chesapeake Executive Council, 1990).

CHESAPEAKE BAY WATERSHED PUBLIC ACCESS PLAN (2013)

The *Chesapeake Bay Watershed Public Access Plan* was born from the release of the *Strategy for Protecting and Restoring the Chesapeake Bay Watershed* in 2010, which was a response to Executive Order 13508: Chesapeake Bay Protection and Restoration. One of the goals of the *Strategy* is to increase public access across the Chesapeake Bay watershed and its tributaries by adding 300 new public access sites by 2025. The National Park Service was tasked with creating the *Public Access Plan*. In the *Plan*, the NPS described the demand for public access, conducted an updated inventory[2] identified potential new access sites, and identified strategies to assist planners in acquiring funding for new public access sites (National Park Service, 2013). As of 2016, 132 new public access sites became available bringing the total to 1,271. This represents 44% progress toward the original goal of 300 (ChesapeakeProgress, 2016).

CHESAPEAKE BAY WATERSHED AGREEMENT (2014)

The Chesapeake Bay Watershed Agreement was developed in the spirit of the original Bay Act Agreement from 1987. The goal new agreement is to "accelerate the pace of restoration" and continue to align state and local partners with federal goals for the benefit of a healthier Bay. The public access goal of 300 new sites by 2025 is reinforced in the updated agreement (Chesapeake Bay Program, 2014).

State

VIRGINIA OUTDOORS PLAN (2013)

The *Virginia Outdoors Plan* (VOP) is developed by the Virginia Department of Conservation and Recreation (DCR) as the state's comprehensive plan for land conservation, outdoor recreation, and open space planning. The VOP, which is updated approximately every five years, aims to identify the long-term recreation and conservation needs of the state by studying trends and engaging with local and regional stakeholders. The VOP provides support for local and regional outdoor recreation and conservation planning across the state. The Virginia Outdoors Demand Survey is an important component of the plan. The Survey asks Virginia's citizens about which outdoor activities they participate in and which activities there need more opportunities for participation. The VOP also inventories important state resources, including water access sites, and publishes it through the interactive VOP Mapper.[3]

The VOP includes a chapter summarizing programs and resources that can be utilized for planning blueways and water access sites across the state. The VOP also specifies certain focus areas for regions in the state. Both water access and trails are included as two of the five

[2] Available at https://www.findyourchesapeake.com
[3] Available at http://www.dcr.virginia.gov/recreational-planning/vopmapper

focus areas for Hampton Roads with specific recommendations given for each (Virginia Department of Conservation and Recreation, 2013).

Local & Regional

A comprehensive regional plan on public access for Hampton Roads has not been developed for Hampton Roads but there have been some related studies involving Hampton Roads localities.

Memorandum of Agreement to Improve Water Use Conflict Education for the North Landing River (2001)

This MOA was created from work on the Southern Watershed Area Management Plan (SWAMP), which involved a partnership between the Cities of Chesapeake and Virginia Beach, the HRPDC, the CZM program, and several federal and state agencies. It was developed to identify boating safety issues, reduce waterways conflicts, protect the natural resources along the North Landing River, and enhance the recreational experience for users. A component of the effort undertaken by the committee was to identify appropriate siting for boat ramps and marinas (Hampton Roads Planning District Commission, 2001).

The Green Sea Blueway and Greenway Management Plan (2015)

The *Green Sea Blueway and Greenway Management Plan* (GSMP) is a multi-jurisdictional plan developed by the City of Virginia Beach in collaboration with the City of Chesapeake and Currituck County, North Carolina, to protect and manage a system of delicate resources in the Green Sea area of south Hampton Roads. The Green Sea is comprised of the Northwest River, North Landing River, and Back Bay watersheds. The GSMP establishes a framework for creating a non-governmental entity to implement, manage, maintain, and promote the Green Sea area. The Green Sea area boasts some of the most pristine ecosystems in the state which is attractive to the public for passive recreational uses. One of the guiding principles for the plan that is critical to achieve its vision is “Additional Waterway Access” as this area is particularly lacking in easily accessible water access sites. It also encourages the development of connecting blueways between points of interest (City of Virginia Beach et. al., 2016).

Middle Peninsula Public Access Master Plan (2016)

The Middle Peninsula Public Access Master Plan (MPMP) was developed as a means for directing the development of public access in the Middle Peninsula region, which includes Gloucester County. Gloucester is a dual member of the HRPDC and Middle Peninsula Planning District Commission (MPPDC). The MPMP sets goals for policy and management of public access as well as infrastructure recommendations and recommendations for the acquisition of new assets (Middle Peninsula Planning District Commission, 2016).

II. Demand for Public Access in Hampton Roads

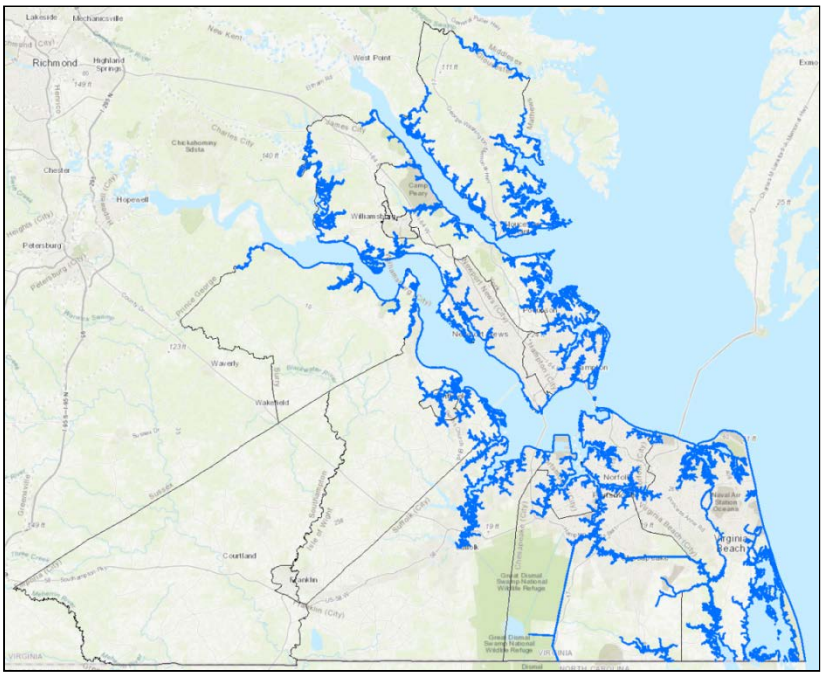


Figure 2. The shoreline of Hampton Roads.

As described in the previous section, public desire for greater access to the water is well-documented in several federal, state, and locals plans. Public access to waterways not only provides positive health and quality of life benefits to the public but also generates economic activity for localities and the state. The Virginia State Tourism Plan outlines several strategies for recreation encouraging the continued development of water trails and access sites and leveraging waterfront areas in developed and natural settings. A "primary theme focus" in the Hampton Roads Strategy section of the plan is nature and outdoor recreation (Virginia Tourism Corporation, 2013).

In order to add new public access to the waterways in Hampton Roads, planners first should consider how and where the public currently recreates as well as how and where they want to recreate. The region has approximately 3,900 miles of shoreline along the Chesapeake Bay, Atlantic Ocean, and connected tributaries (Figure 2). Its 1.7 million residents visit the water regularly to participate in a wide variety of activities. Quantifying the demand for public access at a regional scale is difficult without the benefit of site-level visitor counts and other local studies. However, a general picture of participation in water-related activities in the region can be obtained by evaluating data in the form of participant surveys and user registrations for popular activities such as fishing and boating. This chapter summarizes data from several sources to provide an overall picture of the public's current use and interest in water-related activities in Hampton Roads.

Survey Data

Surveys are one of the primary tools recreation planners use to determine which activities the public participates in and at what level. Surveys rely on public input to accurately report these activities—as such, they can only provide estimates. Still, the results are useful as they provide insight and guidance for planners in lieu of individual site studies.

Virginia Outdoors Demand Survey

The Virginia Outdoors Demand Survey (VODS) is conducted by the Virginia Department of Conservation and Recreation (DCR) in conjunction with each new Virginia Outdoors Plan update every five years.[4] The purpose of VODS is to estimate participation of Virginia residents in many different categories of recreational activities and to also ascertain their attitudes regarding outdoor recreation in the state. The VODS results are reported in regions as defined by Virginia's 21 planning districts. The Hampton Roads region had a 21% response rate for the 2017 VODS which provides representative data for the region. A data summary tool and the survey report are found on DCR's Virginia Outdoors Plan website (Virginia Department of Conservation and Recreation, 2013).[5]

According to the 2017 VODS, the most popular water-related activity in Hampton Roads was sunbathing or relaxing on the beach at 47%. Viewing the water was the second-most popular water-related activity in Hampton Roads at 43% participation. Swimming at the beach or lakes/rivers is next at 35% followed by fishing and boating. See Figure 3 for a comparison of all water-related activities collected in the survey in 2017 and 2011.

Compared to the 2011 VODS, there was a small increase in the sunbathing/relaxing at the beach category but a drop in reported swimming at the beach and other open water (lakes and rivers) (Virginia Department of Conservation and Recreation, 2011). Both fresh water and salt water fishing saw an increase in participation between 2017 and 2011 as did canoe/kayaking and power boating. Other water-based sports such as surfing and paddle boarding saw less than 10% participation in both years.

Out of the eight coastal planning district commissions (PDCs) in Virginia, five had sunbathing/relaxing on a beach as the highest participation category. Crater PDC had the top participation rate for freshwater fishing while the smaller and/or more rural regions (Accomack-Northampton, Middle Peninsula, and Northern Neck) had top participation rates for viewing the water. The smaller regions also had the highest rate of participation for both power boating and canoeing/kayaking. Surfing and paddle boarding are the only two activities where Hampton Roads had the highest rate of participation (Table 2).

[4] The VODS is conducted by the University of Virginia's Center for Survey Research.
[5] http://www.dcr.virginia.gov/recreational-planning/vop

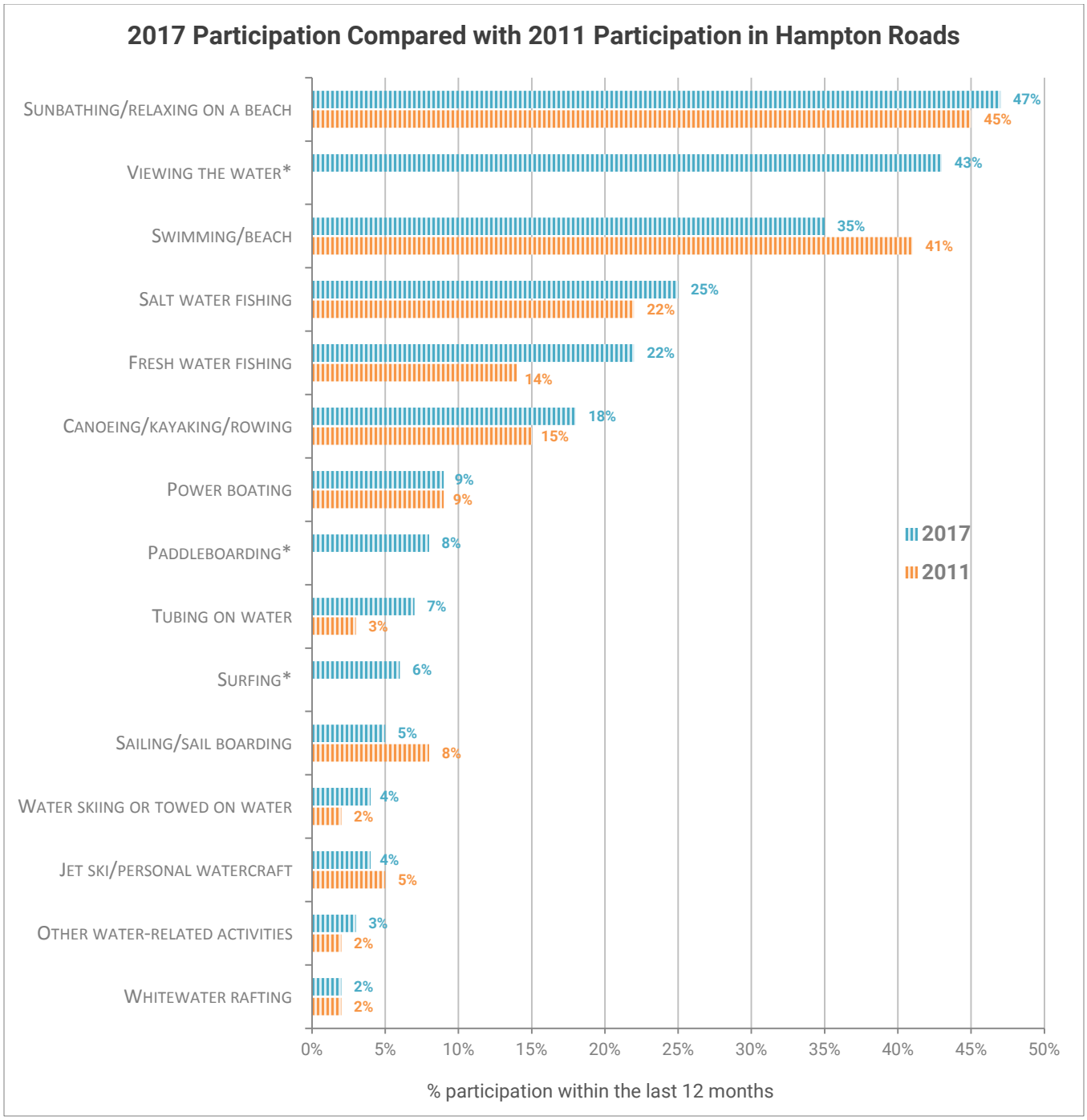


Figure 3. 2017 vs. 2011 Virginia Outdoors Demand Survey results for select water-related activities in Hampton Roads. Some categories (*) were new in the 2017 survey.

Table 2. Virginia Outdoors Demand Survey results for Hampton Roads compared to Coastal PDCs.[6]

Activity	HRPDC	AN/NN/MPPDC[7]	CPDC	GWRC	NVRC	RRPDC	State
Sunbathing/relaxing on a beach	47%	44%	35%	56%	47%	54%	47%
Viewing the water	43%	48%	28%	38%	42%	45%	38%
Swimming/beach/ lake/river	35%	42%	25%	41%	36%	39%	37%
Saltwater fishing	25%	42%	20%	14%	12%	19%	15%
Freshwater fishing	22%	33%	46%	36%	26%	26%	34%
Canoeing/kayaking	18%	32%	12%	23%	29%	21%	25%
Powerboating	10%	26%	10%	15%	14%	14%	14%
Paddle boarding	8%	5%	0%	8%	7%	6%	6%
Tubing on water	7%	7%	5%	13%	12%	8%	12%
Surfing	6%	2%	1%	0%	2%	2%	2%
Jet ski/personal watercraft	4%	9%	8%	9%	7%	5%	8%
Sailing	4%	7%	1%	3%	5%	2%	3%
Water-skiing or towed on water	4%	6%	2%	5%	6%	4%	6%
Other water-dependent activities	3%	6%	1%	0%	2%	1%	2%

When compared to the entire state, the Hampton Roads region exceeds the state average participation in only six categories: viewing the water, saltwater fishing, paddle boarding, surfing, sailing, and other activities. Most of these activities require access to the ocean which supports the higher participation rates. Hampton Roads participation was below the state average in the remaining categories except sunbathing/relaxing on the beach, which was the same. Many of the activities with lower demand in Hampton Roads may be more common on lakes or rivers, which may explain the difference in demand. In addition, nearly all of the tidal waters in Hampton Roads are considered to be saltwater by the Virginia Marine Resources Commission.[8] See Figure 4 for a comparison of water-related activities between Hampton Roads and Virginia.

[6] ANPDC = Accomack-Northampton PDC; NNPDC = Northern Neck PDC; MPPDC = Middle Peninsula PDC; CPDC = Crater PDC; GWRC = George Washington Regional Council; NVRC = Northern Virginia Regional Council; RRPDC = Richmond Regional PDC
[7] The VODS combines Accomack-Northampton PDC, Northern Neck PDC, and Middle Peninsula PDC into one group for statistical purposes.
[8] http://www.mrc.virginia.gov/mrc_license_boundaries.shtm

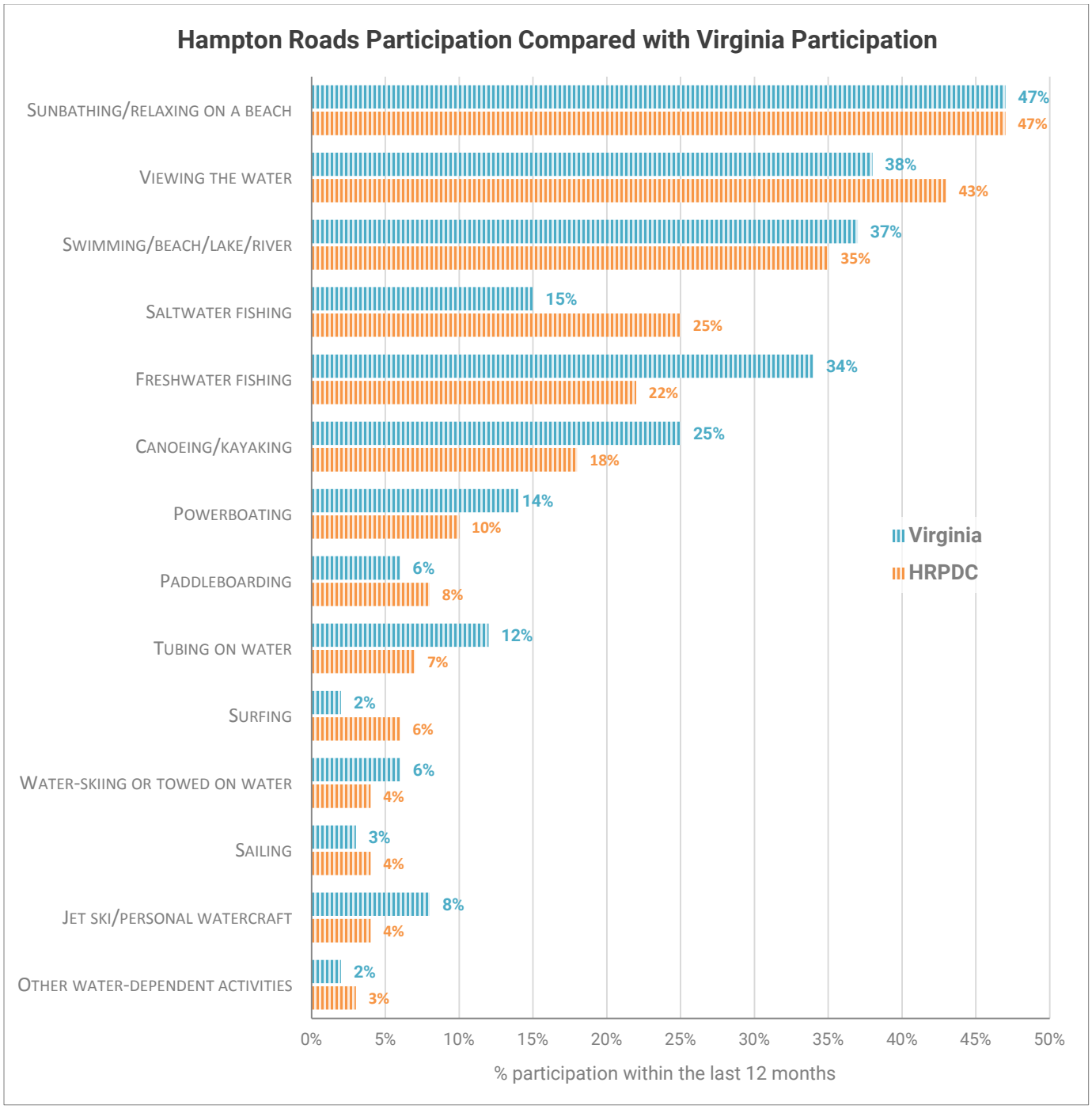


Figure 4. 2017 Virginia Outdoors Demand Survey results for Hampton Roads compared to Virginia.

Most Needed Outdoor Recreation Opportunities

The 2017 VODS also reported on what the public believes the needs are for particular outdoor recreation opportunities. Water access was the third most frequent answer with 43% of respondents agreeing in Hampton Roads (Figure 5).

The 2011 VODS categories were more specific with 59% of residents responding that more access to state waters was needed for fishing and swimming while 54% responded similarly for non-motorized boating, and 22% for motorized boating.

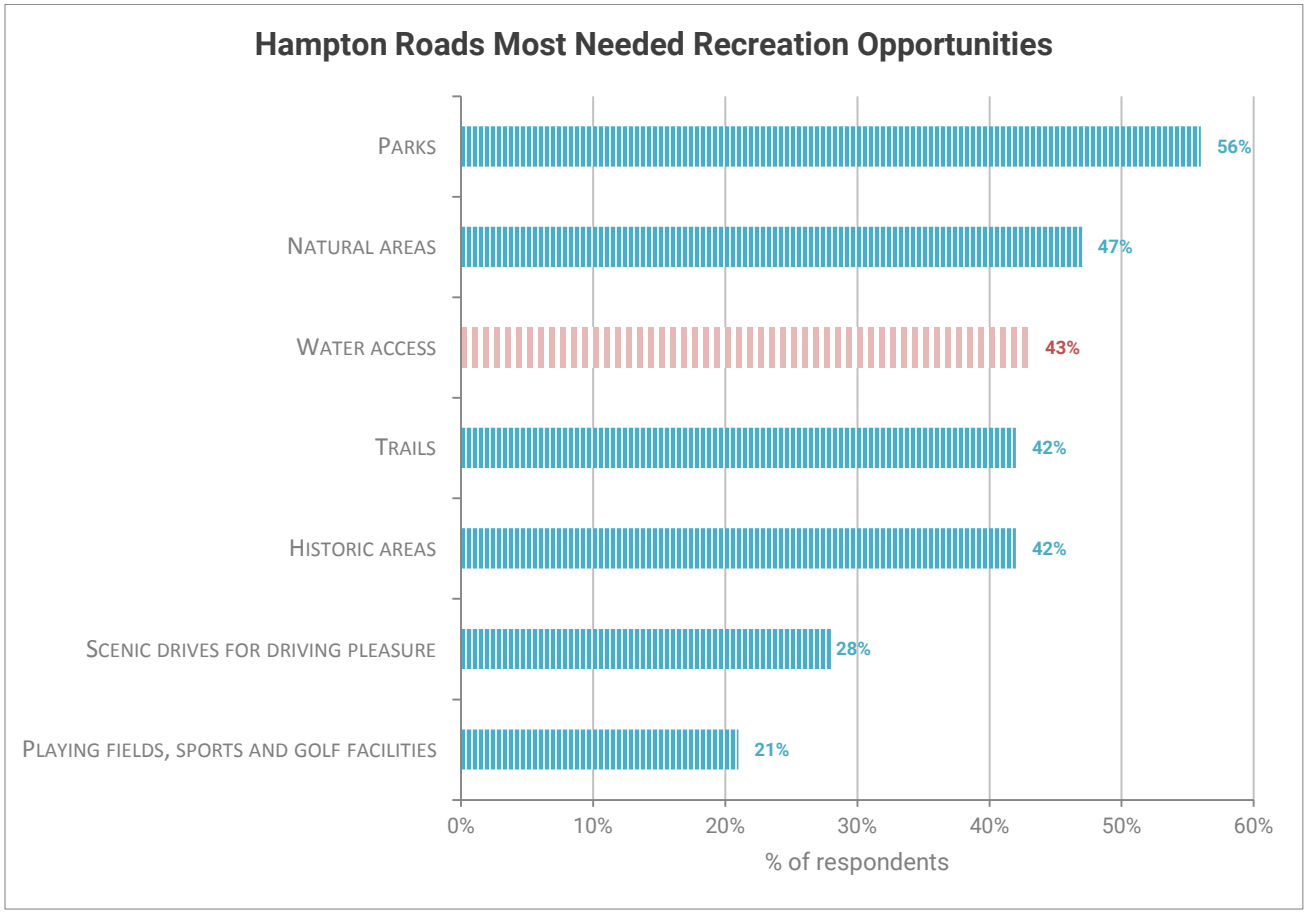


Figure 5. 2017 Virginia Outdoors Demand Survey results for most needed outdoor recreation opportunities in Hampton Roads.

Outdoor Participation Report

The Outdoor Foundation, a non-profit established by the Outdoor Industry Association, annually publishes the Outdoor Participation Report. This report analyzes the outdoor recreation behavior of Americans and identifies trends. The report tracks over 40 activities. For this project, the water-related activities similar to VODS categories were compared to the results of the VODS (Figure 6). Hampton Roads and Virginia residents participated in water-related activities at a higher rate than Americans as a whole in all compared categories (Outdoor Foundation, 2017).

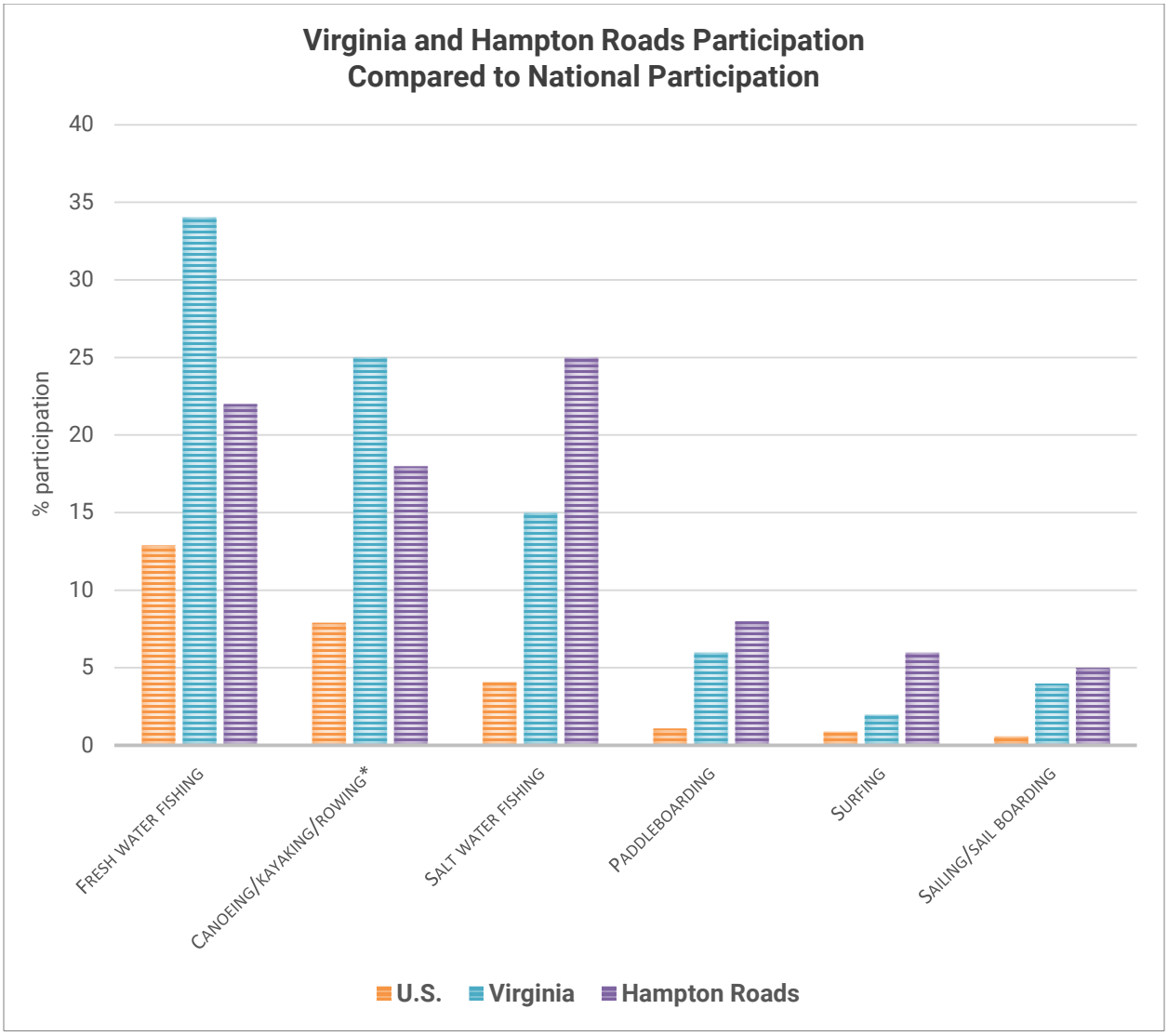


Figure 6. Outdoor recreation participation in Hampton Roads and Virginia compared to national estimates. Kayaking/canoeing and rowing were combined in the Outdoor Participation Report data.

Recreational Boating Survey

In 2013, Monmouth University's Urban Coast Institute and the Mid-Atlantic Regional Council on the Ocean (MARCO) initiated a six-month Mid-Atlantic Recreational Boater Survey. The goal of this survey was to gather information on patterns of recreational boating in the ocean and coastal areas of the Mid-Atlantic region. Survey participants were asked to map in an online form the routes they take on the water for pleasure trips. Survey participants were chosen from a sample of registered boaters in Virginia (Monmouth University Urban Coast Institute, 2016).

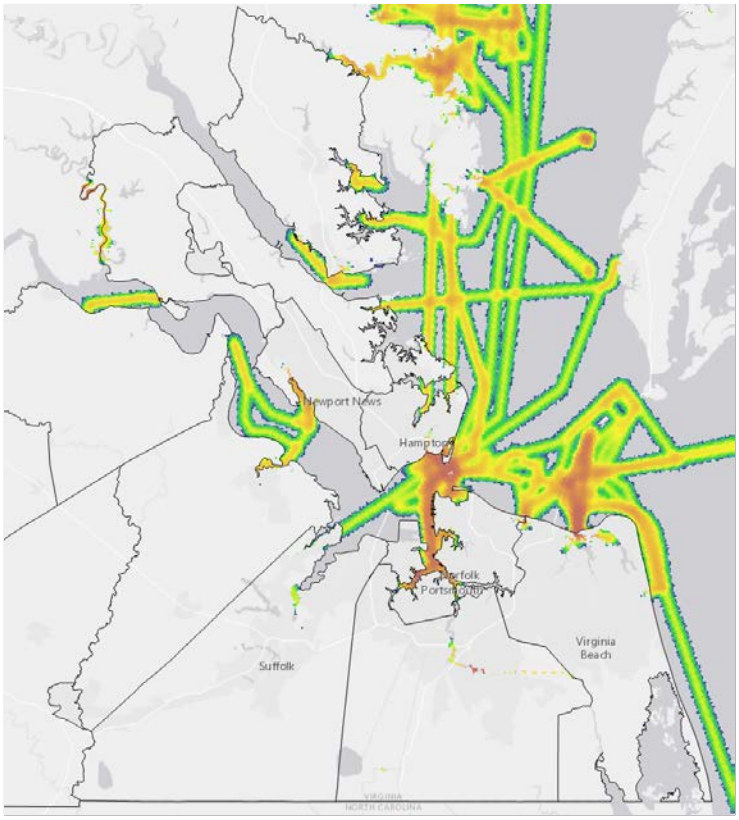


Figure 7. Mapped results of the Recreational Boaters Survey. Darker orange color indicates higher frequency of user-drawn boating routes.

The results show a concentration of activity between distinct locations. The densest corridors of activity are the Elizabeth River (Western, Eastern and main branch), the Hampton Roads harbor area near the Hampton Roads Bridge-Tunnel, and the area between the Lynnhaven River and the Chesapeake Bay Bridge-Tunnel. Fishing was the primary activity reported by the participants traveling in these corridors which appears to occur most frequently near the bridge-tunnels (Figure 7).

Access points that appeared to show the most activity based on visual interpretation include Lynnhaven Boat Ramp (Virginia Beach), Great Bridge Lock Park (Chesapeake), Sunset Creek Boat Ramp (Hampton), Willoughby Boat Ramp (Norfolk), and City Park Boat Ramp (Portsmouth).

Market Potential Index

Esri Demographics produces U.S. Market Potential data to provide insight into the minds of consumers. Esri's Market Potential Index (MPI) measures likely demand for a product or service in a given area after comparison against the national demand. The MPI is derived from several national surveys and Esri's proprietary Tapestry Segmentation data (Esri, 2017). The data was obtained through a subscription to Esri's Business Analyst Online.

Several categories relating to water access are included in the 2017 Market Potential Data. The data reports how many consumers said they participated in the given activity within the last 12 months. The results show that more consumers in all Hampton Roads localities visited the beach than participated in the other water-based activities in the survey. Other activities measured were fresh water fishing, salt water fishing, power boating, and canoe/kayaking. The popularity of each of the other activities varied between localities is shown in Table 3.

The Esri data report lower rates of participation in water-related activities compared to the VODS data. The reason for this is unknown. However, both datasets identified visiting the beach as the most popular water-based activity in Hampton Roads.

Table 3. Participation in water-related activities within the last 12 months. From 2017 Esri Market Potential Index data.

Locality	Went to Beach	Fresh Water Fishing	Power Boating	Canoeing or Kayaking	Salt Water Fishing
Chesapeake	29.9%	11.8%	5.4%	6.7%	4.4%
Franklin	16.9%	11.7%	3.8%	3.5%	4.1%
Gloucester	25.9%	14.9%	6.3%	7.3%	4.6%
Hampton	25.4%	11.8%	4.8%	5.6%	4.1%
Isle of Wight	25.1%	15.5%	6.2%	6.7%	3.9%
James City	30.7%	11.9%	6.0%	7.3%	4.6%
Newport News	25.9%	11.3%	4.8%	6.2%	4.4%
Norfolk	25.3%	10.6%	4.6%	6.8%	3.9%
Poquoson	31.5%	13.0%	6.1%	7.5%	4.4%
Portsmouth	22.5%	11.1%	4.5%	5.2%	4.2%
Southampton	16.8%	16.9%	5.3%	5.1%	3.8%
Suffolk	26.9%	11.6%	5.4%	6.2%	3.9%
Surry	17.6%	18.5%	6.2%	5.1%	4.2%
Virginia Beach	30.3%	10.9%	5.2%	6.7%	4.5%
Williamsburg	30.7%	10.7%	5.8%	9.0%	3.6%
York	32.0%	11.6%	5.7%	7.2%	4.3%

Discussion

Results from recreation surveys point to significant interest and participation in water-related activities in Hampton Roads. The proximity to the Chesapeake Bay and Atlantic Ocean results in beach-going as the top water-related activity in the region. Other passive activities are also popular, such as fishing and kayaking and even just viewing the water. Hampton Roads leads in ocean-dependent activities, such as surfing. However, comparisons between other coastal planning districts suggest that Hampton Roads residents are not participating in some water-related activities at a higher rate than other regions, and in some cases, have lower participation rates (e.g. fishing and boating). Whether or not this is related to lack of water access, demographics, or other factors would require further study. However, the participation rates are most likely affected by the urban nature and size of the region as well as a lack of freshwater lakes and rivers. Residents of the smaller and/or rural localities in Hampton Roads and the coastal zone may also have cultural attachments to the water resulting in higher participation rates when their smaller populations are taken into account.

With a population of 1.7 million in Hampton Roads, there are still a significant number of people participating in water-related activities and survey trends indicate the number is increasing, particularly for activities such as kayaking. Planners should follow these trends to inform decision-making about future water access sites.

Lynnhaven Boat and Beach Facility in Virginia Beach. Photo by HRPDC/Kidd.

Participant Data

Quantifying actual public participation in recreation is a difficult task. On-the-ground counts of visitors to each water access site in Hampton Roads are an ideal way to collect this data but are not practical on a regional scale. Proxy data was obtained to give a snapshot of how many Hampton Roads residents recreate in or near the water. Fishing licenses and boat registrations provide insight on how many people actually participate in these activities.

Active Boat Registrations

The number of active boat registrations in the Commonwealth gives a more nuanced look at power-boating activity in the region. This data was obtained from the Virginia Department of Games and Inland Fisheries (DGIF). Non-motorized boats are not included as they are not required to be registered in Virginia. The numbers presented include all types of motorized boats registered in the state but were filtered by primary owner to avoid duplication. Multiple boats registered by one owner are included in the summary data.

The total number of active boat registrations in the Hampton Roads region through Fiscal Year (FY) 2016 was 48,305, which is 21% of the total number of boat registrations in the state. This also represents 36% of boat registrations in the coastal zone. The entire coastal zone contains 57% of all boat registrations in the state. The Hampton Roads region has the highest number of boat registrations compared with the other coastal regions; however the per capita number is lower than the smaller and/or more rural regions such as the Northern Neck, Middle Peninsula, and Eastern Shore (Table 4).

Within Hampton Roads, the top locality for boat registrations is Virginia Beach which at 25.3% has over twice the number of registrations as the next locality, Chesapeake, with 12.2% of registrations in the region. The number of registrations for both cities is commensurate with their share of the regional population -- Virginia Beach has 25.3% of registrations and 26.2% of the regional population, while Chesapeake has 12.2% of registrations and 13.9% of the regional population. Gloucester County is third with 8.7% of total registrations but only 2.3% of the total regional population. Other coastal localities with smaller populations, such as Poquoson and Surry County, also have significantly higher shares of boat registrations than population (Table 5).

Table 4. Comparison of FY16 active boat registrations among coastal planning districts

Rank	Region (by Coastal PDC)[9]	Boat Registrations (2016)[10]	% of State Total	% of CZ Total[11]	Per Capita[12]
1	Hampton Roads	46,783	20%	36%	0.03
2	Richmond Region	22,242	10%	17%	0.02
3	Middle Peninsula	15,650	7%	12%	0.16
4	Northern Virginia	15,301	7%	12%	0.01
5	Crater	12,945	6%	10%	0.03
6	George Washington	12,940	6%	10%	0.04
7	Northern Neck	12,824	6%	10%	0.24
8	Accomack-Northampton	5,555	2%	4%	0.12
	Coastal Zone Total	**130,143**	**57%**	--	**0.02**
	State Total	**229,158**	--	--	**0.03**

Northwest River Park in Chesapeake. Photo by HRPDC/Kidd.

[9] Localities within a coastal PDC but not within the Virginia CZM program boundary were not counted (this includes Southampton and Franklin in Hampton Roads).
[10] Gloucester, Surry, and Chesterfield have dual membership in two PDCs. The regional totals account for this and the overall total does not include duplicates.
[11] The percentages do not add up to 100%. See previous footnote.
[12] Based on Esri Demographics 2016 Population Estimates

Table 5. FY16 active boat registrations for each Hampton Roads locality

Rank	Locality	Boat Registrations (2016)	% of Total Regional Registrations	% of Regional Population	Per Capita[13]
1	Virginia Beach	12,210	25.3%	26.2%	0.03
2	Chesapeake	5,898	12.2%	13.9%	0.02
3	Gloucester	4,198	8.7%	2.3%	0.11
4	Hampton	3,633	7.5%	7.9%	0.03
5	Norfolk	3,478	7.2%	14.2%	0.01
6	Suffolk	3,121	6.5%	5.2%	0.03
7	York	2,789	5.8%	3.9%	0.04
8	Newport News	2,585	5.4%	10.7%	0.01
9	Isle of Wight	2,280	4.7%	2.2%	0.06
10	James City	2,185	4.5%	4.3%	0.03
11	Portsmouth	1,970	4.1%	5.6%	0.02
12	Poquoson	1,544	3.2%	0.7%	0.13
13	Southampton	1,326	2.7%	1.1%	0.07
14	Surry	612	1.3%	0.4%	0.09
15	Williamsburg	280	0.6%	0.9%	0.02
16	Franklin	196	0.4%	0.5%	0.02
	Regional Total	**48,305**	**--**	**--**	**0.03**

TRENDS

Historic boat registration data for the period of 1998-2016 shows that Hampton Roads has seen an overall decline in registrations of about 9.5%. However, the largest decline occurred following the Great Recession when registrations dropped 13.1% from their peak in 2007 through 2016. This trend is mirrored at the state level which has seen a 9.7% decline since 2007. The decline since 1998 is only 2.8% for the entire state (Figure 8 and Figure 9).

[13] Based on Esri Demographics 2016 Population Estimates

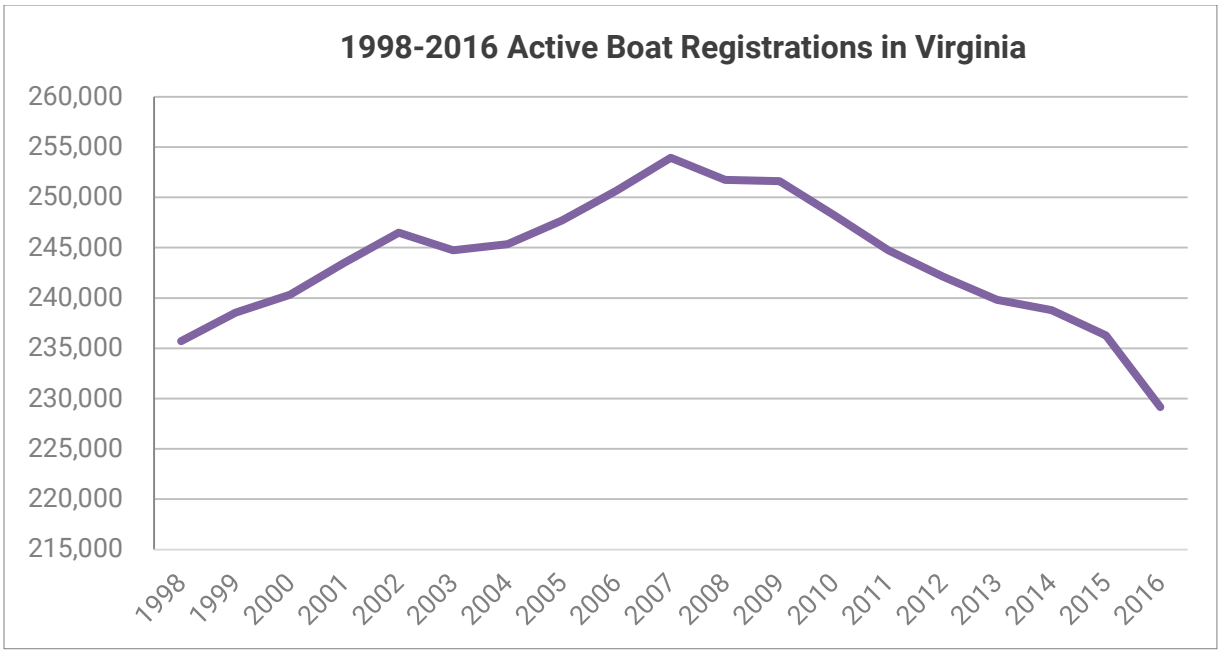


Figure 8. Active boat registrations in Virginia from 1998-2016

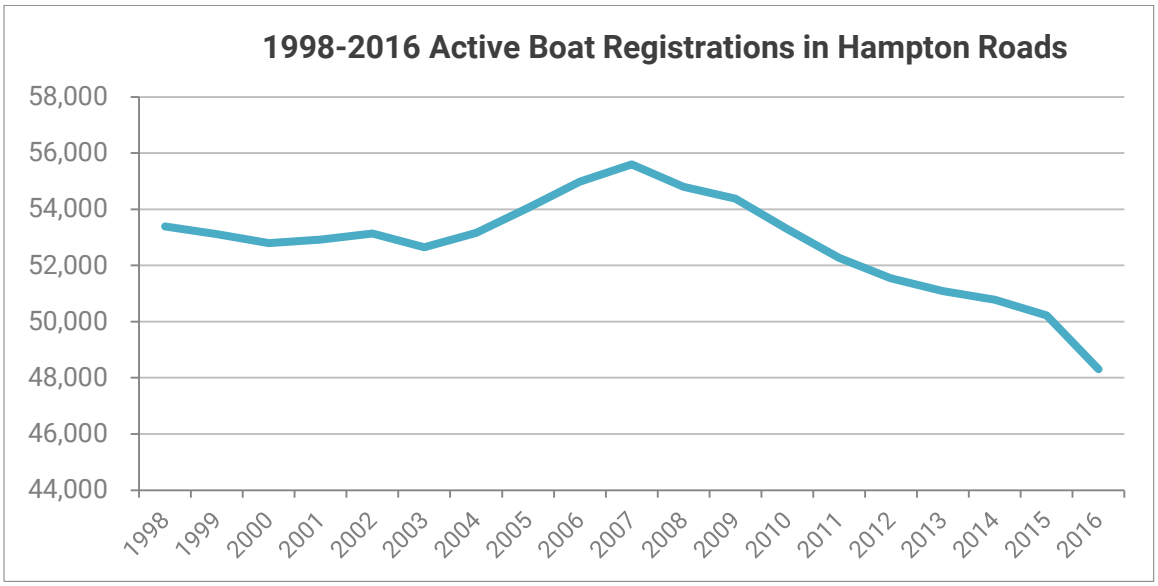


Figure 9: Active boat registrations in Hampton Roads from 1998-2016

Distribution of Boat Owners

Understanding demand at the locality level can help in setting overall community priorities, but having a more geographically precise understanding of where boat owners live can help in siting infrastructure and improvements. For this project, the home addresses of the primary boat owners from FY17 boat registrations were geocoded using geographic information systems (GIS) software to show a spatial distribution across the region. Multiple boats owned by one individual were discounted in order to identify unique boat owners and where they live.

The resulting map shows a significant concentration of power-boat owners in several areas across Hampton Roads, although boat owners are spread across every jurisdiction. The neighborhoods densest with boat owners at the regional level are those around the Lynnhaven Bay in Virginia Beach and the Poquoson River in Poquoson. Other highly concentrated areas are Little Creek area in Norfolk, Western Branch of the Elizabeth River in Portsmouth, Great Bridge area in Chesapeake, and Fox Hill area in Hampton (Figure 10).

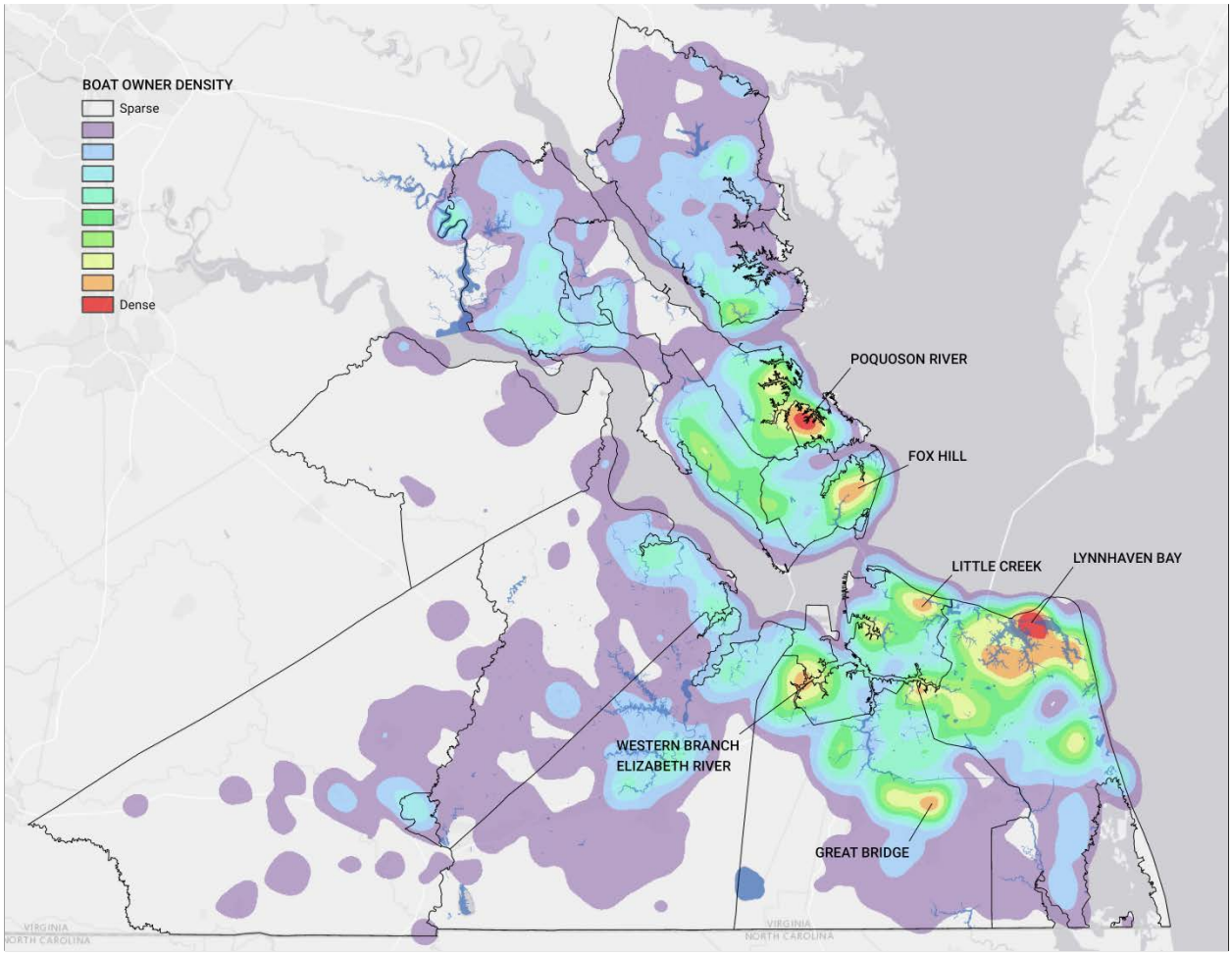


Figure 10. Density of unique boat owners in Hampton Roads based on FY17 boat registrations

Annual Fishing Licenses

The number of fishing licenses sold in Hampton Roads provides insight into fishing activity in region. This data is also maintained by DGIF. The data analyzed for this section represents several different types of fishing licenses sold annually and does not include lifetime licenses, which can also be purchased. The available types of fishing licenses encompass saltwater, freshwater, trout, and nets as well as resident and non-resident, veteran, and senior. There are also hunting and fishing combination licenses. For the purpose of this study, combination licenses were omitted to exclusively capture fishing activity.

When compared to the other coastal regions in Virginia, Hampton Roads leads with the highest number of fishing licenses sold in FY 2016, with the other urban areas of Northern Virginia and Richmond in second and third. However, the smaller and/or more rural regions lead in per capita fishing licenses. The Middle Peninsula has the highest number of fishing licenses per capita.

The license data does not capture all anglers as many groups are exempt from purchasing a license. Exempt anglers include children under 16 year old, seniors over 65 years old, anglers who fish from a registered boat which covers everyone on the boat, and those who fish from commercial piers or private property. Some of these anglers are counted by the Virginia Fisherman Identification Program (see next section).

Table 6. Comparison of FY16 annual fishing licenses purchased among coastal planning districts

Rank	Region (by Coastal PDC)[14]	Annual Fishing Licenses (2016)[15]	% of State Total	% of CZ[16] Total	Per Capita[17]
1	Hampton Roads	69,539	12.6%	33.6%	0.04
2	Northern Virginia	52,365	9.5%	25.3%	0.03
3	Richmond Regional	46,426	8.4%	22.5%	0.05
4	Crater	26,276	4.8%	12.7%	0.06
5	George Washington	24,539	4.4%	11.9%	0.07
6	Middle Peninsula	9,537	1.7%	4.6%	0.10
7	Northern Neck	3,654	0.7%	1.8%	0.07
8	Accomack-Northampton	3,214	0.6%	1.6%	0.07
	Coastal Zone Total	**206,722**	**37.4%**	--	**0.04**
	State Total	**552,279**	--	--	**0.07**

[14] Localities within a coastal PDC but not within the Virginia CZM program boundary were not counted.
[15] Gloucester, Surry, and Chesterfield have dual membership in two PDCs. The regional totals account for this but the overall total does not duplicate the count.
[16] The percentages do not add up to 100%. See Footnote 14.
[17] Based on Esri Demographics 2016 Population Estimates

Within Hampton Roads, the type of fishing licenses sold is nearly even between saltwater and freshwater with both categories close to 40%. The combination license is apparently less popular (Table 7).

Virginia Beach tops other Hampton Roads localities in the number of fishing licenses sold, comprising over 25% of the regional total followed by Chesapeake and Newport News. As is the case with boat registrations, the smaller and/or rural localities have higher per capita of fishing licenses purchases than the more urban localities. Franklin has the highest per capita value with Surry and Gloucester tied for second and Isle of Wight and Poquoson tied for third (

Table 8).

Table 7. Types of annual fishing licenses sold in Hampton Roads during FY16

License Type	Annual Fishing Licenses (2016)[18]	% of Total
Saltwater	29,868	41.7%
Freshwater	28,465	39.7%
Saltwater/Freshwater Combo	13,286	18.6%
Regional Total	**71,619**	--

Lavalette Kayak Launch & Fishing Pier in Norfolk. Photo courtesy of City of Norfolk.

[18] Includes Southampton and Franklin, which are not in the coastal zone.

Table 8. FY16 annual fishing licenses purchased in Hampton Roads localities

Rank	Locality	Annual Fishing Licenses (2016)	% of Total Regional Licenses	% of Regional Population	Per Capita[19]
1	Virginia Beach	18,162	25.4%	26.2%	0.04
2	Chesapeake	10,106	14.1%	13.9%	0.04
3	Newport News	7,399	10.3%	10.7%	0.04
4	Norfolk	6,179	8.6%	14.2%	0.03
5	Hampton	5,055	7.1%	7.9%	0.04
6	Suffolk	4,385	6.1%	5.2%	0.05
7	James City	4,380	6.1%	4.3%	0.06
8	Gloucester	3,609	5.0%	2.3%	0.09
9	York	3,007	4.2%	3.9%	0.04
10	Isle of Wight	2,837	4.0%	2.2%	0.08
11	Portsmouth	2,803	3.9%	5.6%	0.03
12	Southampton	1,245	1.7%	1.1%	0.07
13	Poquoson	970	1.4%	0.7%	0.08
14	Franklin	835	1.2%	0.5%	0.10
15	Surry	630	0.9%	0.4%	0.09
16	Williamsburg	17	0.0%	0.9%	0.00
	Regional Total	**71,619**	--	--	**0.04**

Virginia Fisherman Identification Program

The Virginia Fisherman Identification Program (FIP) requires that those who do not have to purchase a saltwater fishing license in Virginia to register with the Virginia Marine Resources Commission (VMRC) annually, primarily for statistical tracking purposes (Virginia Marine Resources Commission, 2017). Those who fish for anadromous species in freshwater must also register. The program, which began in 2011, allows exempt saltwater anglers to register with the state rather than with the National Saltwater Angler Registry which has an annual federal registration fee (Virginia Marine Resources Commission, 2017).

[19] Based on Esri Demographics 2016 Population Estimates

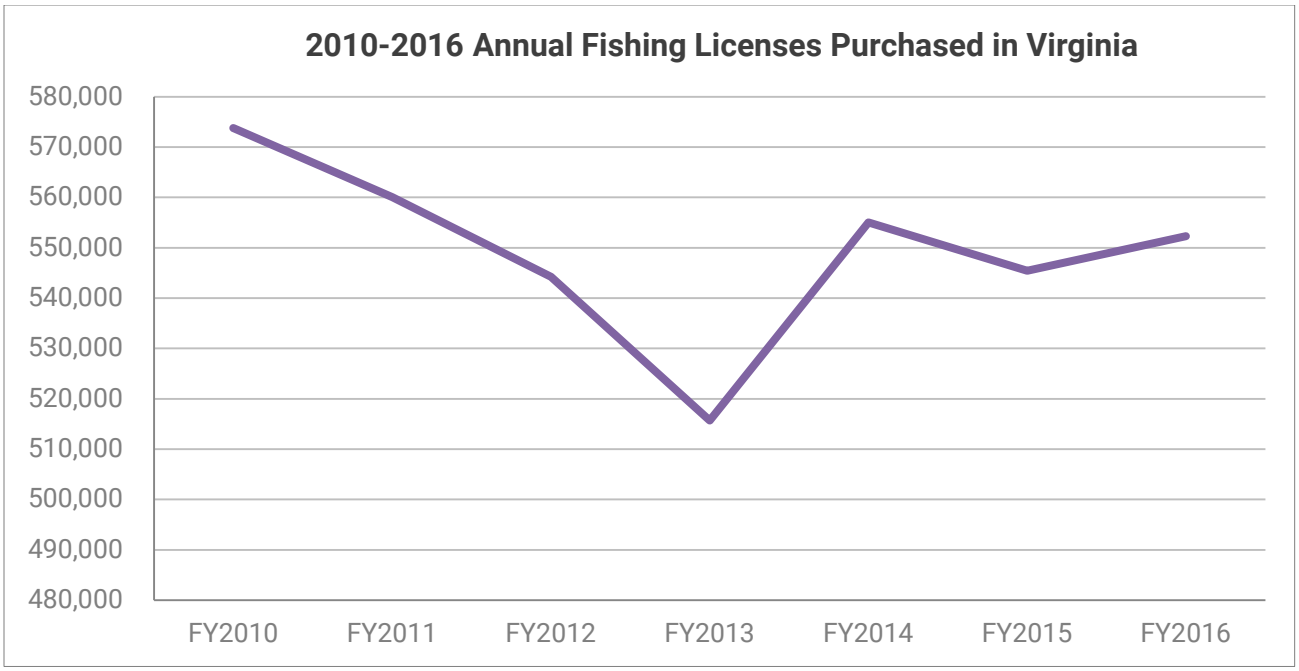


Figure 11. Annual fishing licenses purchased in all of Virginia from 2010-2016

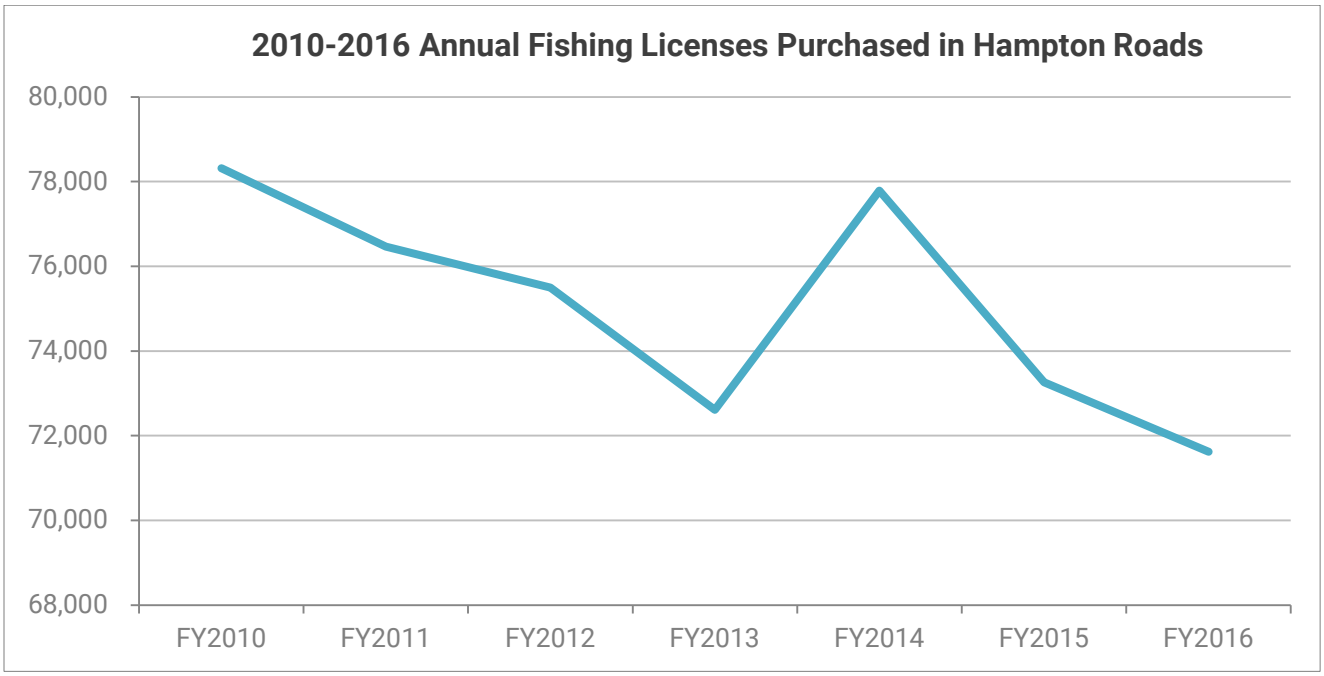


Figure 12. Annual fishing licenses purchased in Hampton Roads from 2010-2016

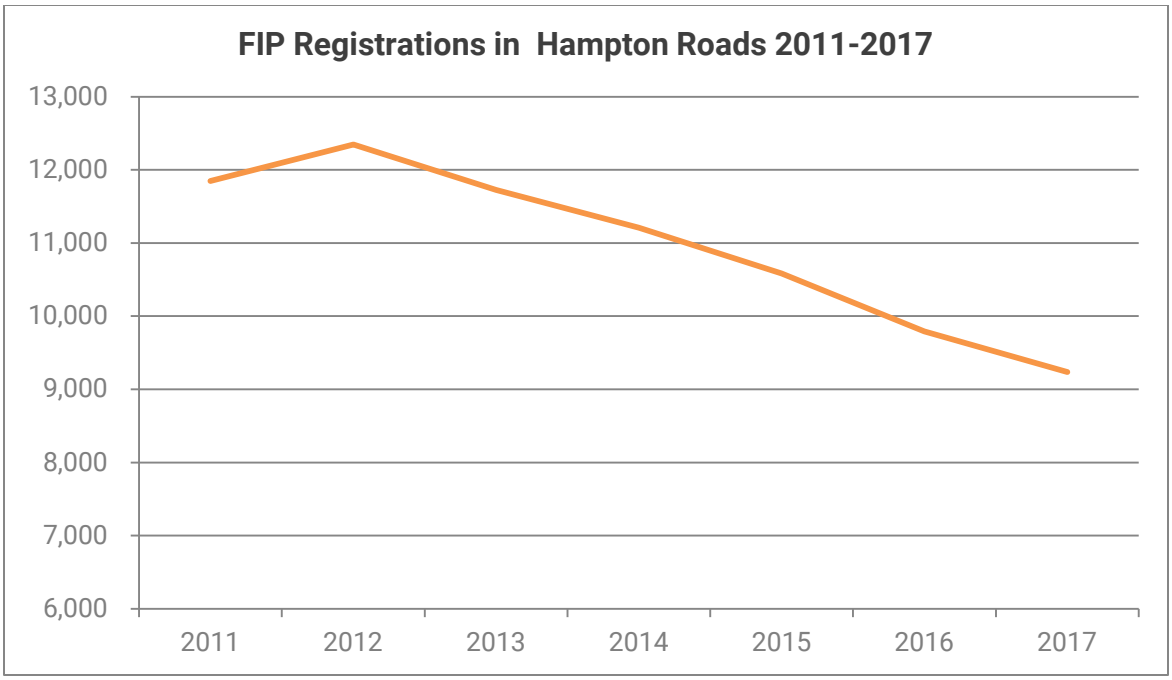


Figure 13. Number of Virginia Fisherman Identification Program (FIP) registrations in Hampton Roads between 2011 and 2017

TRENDS

Historic fishing license data shows a decline of 7.2% between FY10 and FY13 in Hampton Roads and 10.1% in Virginia, as shown in Figure 11. Sales appear to have rebounded in FY14 but continued to decline in Hampton Roads while remaining steady in Virginia as a whole. Since FY10, Hampton Roads has seen an overall decline of 8.6% while Virginia has seen a decline of 3.7% (Figure 11 and Figure 12).

The number of FIP registrations peaked in 2012 at 12,347, one year after the program started in Virginia. The number of registrations has declined each year with 9,235 reported for 2017 (Figure 13).[20]

[20] FIP data obtained from the Virginia Marine Resources Commission for 2011 through 2017

DISTRIBUTION OF ANGLERS

As with the boat registration data, the home addresses of local anglers who purchased annual licenses in FY 2017 were geocoded in GIS to show their spatial distribution across the region.[21] An analysis was completed in GIS to find areas with a greater density of anglers. The resulting map shows large concentrations of anglers in several distinct areas in Hampton Roads, although licenses were purchased by residents across every jurisdiction.

The highest densities of anglers are found in the Salem area of Virginia Beach, western Little Creek area in Norfolk, and the Fox Hill area in Hampton. Other areas with high densities are the Denbigh area in Newport News, Great Bridge area in Chesapeake, Big Bethel area in Hampton, Tabb area in York County, and the Kempsville, Strawbridge, and the Little Creek areas in Virginia Beach. Figure 14 represents residents who purchased saltwater and freshwater licenses (including trout) but does not include combination hunting/fishing licenses.

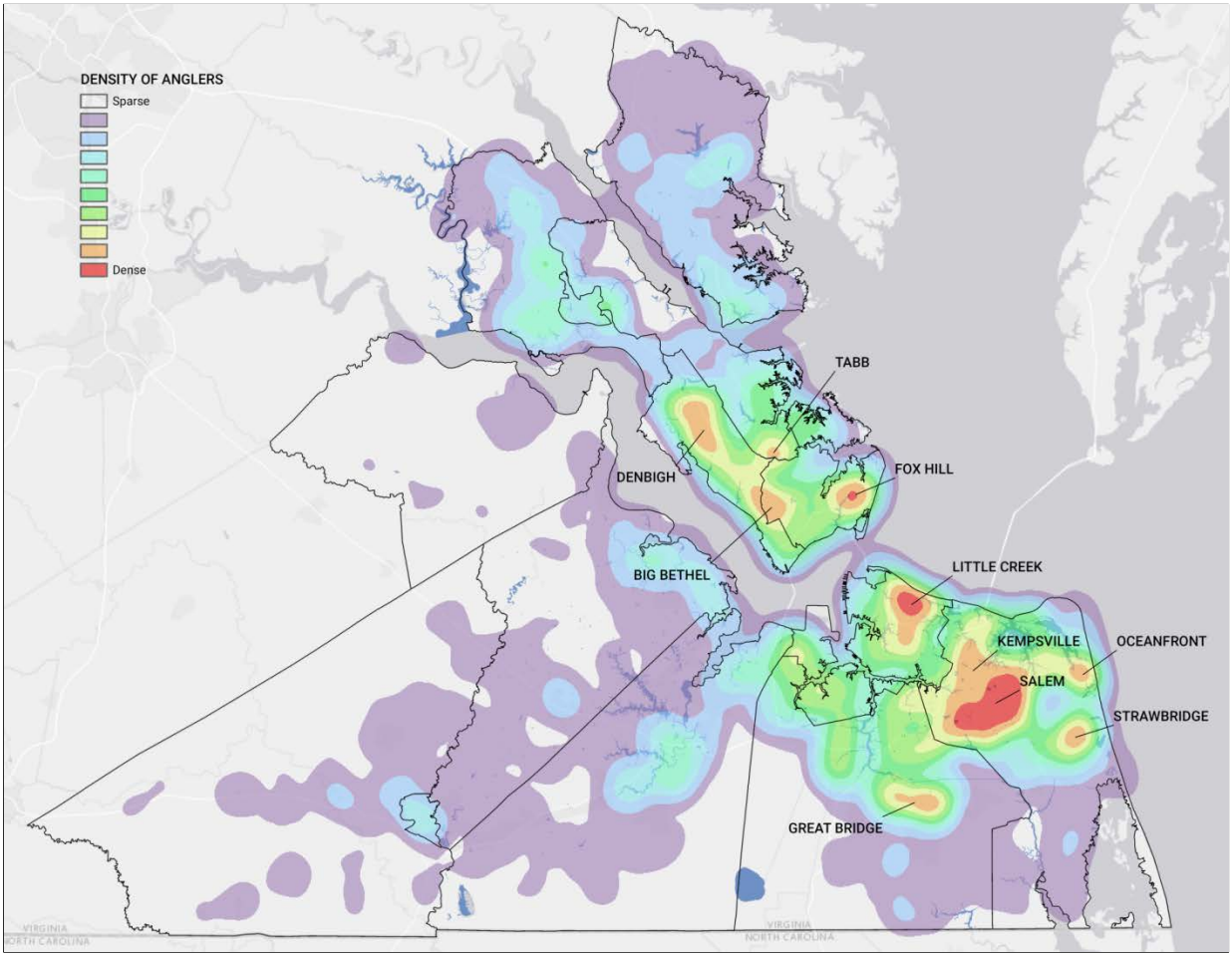


Figure 14. Density of unique anglers in Hampton Roads based on FY 2017 annual fishing license purchases

[21] Lifetime fishing licenses and FY 2017 annual licenses purchased were used. Multiple licenses purchased by the same individual are not included in the density.

Discussion

Hampton Roads has the highest number of boat registrations and fishing license purchases in the state due to the large population in the region. These numbers represent a portion of the total number of people (residents and tourists) who visit public access sites of all types, confirming high demand for access to the water. The higher per capita numbers of the smaller or more rural localities indicates demand for access even in areas with lower populations. As stated previously, residents of smaller localities in Hampton Roads and the coastal zone may have a stronger preference for recreating on or near the water resulting in higher participation rates when their smaller populations are taken into account. The higher overall numbers in the more populous localities and the higher participation rates in the smaller communities suggest that public access improvements should be considered top priorities for both groups.

The number of boat registrations has declined in Hampton Roads and Virginia since 1998 with a significant decline since the Great Recession even though the participation in power boating reported in the VODS increased one percent since 2011. This may indicate fewer people own power boats in favor of non-motorized boats, such as kayaks, and/or participate in power boating with friends or family who own boats. The expense of boat ownership is likely a contributing factor to this decline. Non-motorized boating participation increased three points since 2011 reflecting this potential shift. Increased participation in kayaking or canoeing may lead to increased demand for more launch sites.

Dismal Swamp Canal Trail in Chesapeake. Photo by HRPDC/Kidd.

The number of fishing licenses purchased has been trending downward which contradicts the participation data measured in the VODS. Saltwater and freshwater fishing participation has increased three and eight points respectively since 2011, according to the VODS. The reason for the decline in license purchases is unclear but it may be related to the Virginia Fisherman Identification Program (FIP) which became effective January 1, 2011. There may be some confusion among anglers on whether or not a license must be purchased or if registration is required. Further study is needed to identify the cause in the decline of license sales and FIP registrations.

Freshwater fishing does not appear to have higher participation rates in coastal waters in Virginia as there are more opportunities for freshwater fishing in other parts of the state. Hampton Roads does not stand out in terms of fishing activity overall; however there are still a significant number of anglers who live in the region that require access in order to participate in this popular activity.

The areas of high density of participants are markedly different between boat owners and anglers as shown in Figure 10 and Figure 14. Only Fox Hill and Great Bridge have high density for both activities. In general, the analysis shows people who own boats tend to live closer to the water than those who have fishing licenses but not all neighborhoods near the water have high concentrations of boaters or anglers. There is likely a relationship to demographics (e.g. income) that can explain these patterns but would require additional study to uncover. Density analysis could also be performed at the locality level as well to further refine the more active neighborhoods.

III. Public Access Inventory

An updated inventory was produced for both access sites and trails to establish a current picture of existing public water access availability in Hampton Roads. Public access was defined as sites that are controlled or managed by federal, state, or local governments. A few private sites open to the public were included but an inventory of private sites was not conducted. The inventory contains water access sites from four major categories: boating, fishing, swimming, and viewing, which is modeled after the 2013 Chesapeake Bay Watershed Public Access Plan inventory (National Park Service, 2013). These categories were further refined to reflect specific activities. The information collected about each site includes the following:

- Site Name
- Jurisdiction
- Waterbody accessed
- Boat Ramp (Y/N)
- Kayak/Canoe Launch (Y/N)
- Fishing Pier (Y/N)
- Bank Fishing (Y/N)
- Observation Deck (Y/N)
- Boardwalk (Y/N)
- Beach Swimming (Y/N)
- Nature Trails (Y/N)
- Latitude
- Longitude
- Website URL

A total of 192 sites were identified. Beaches were identified using main access points. Some beaches may not have been included if a distinct access could not be found. Virginia Beach has the highest number of access points in the region with 41 while the locality with the lowest number is Franklin with one access point (Figure 15).

Virginia Beach oceanfront. Photo courtesy of Shutterstock.

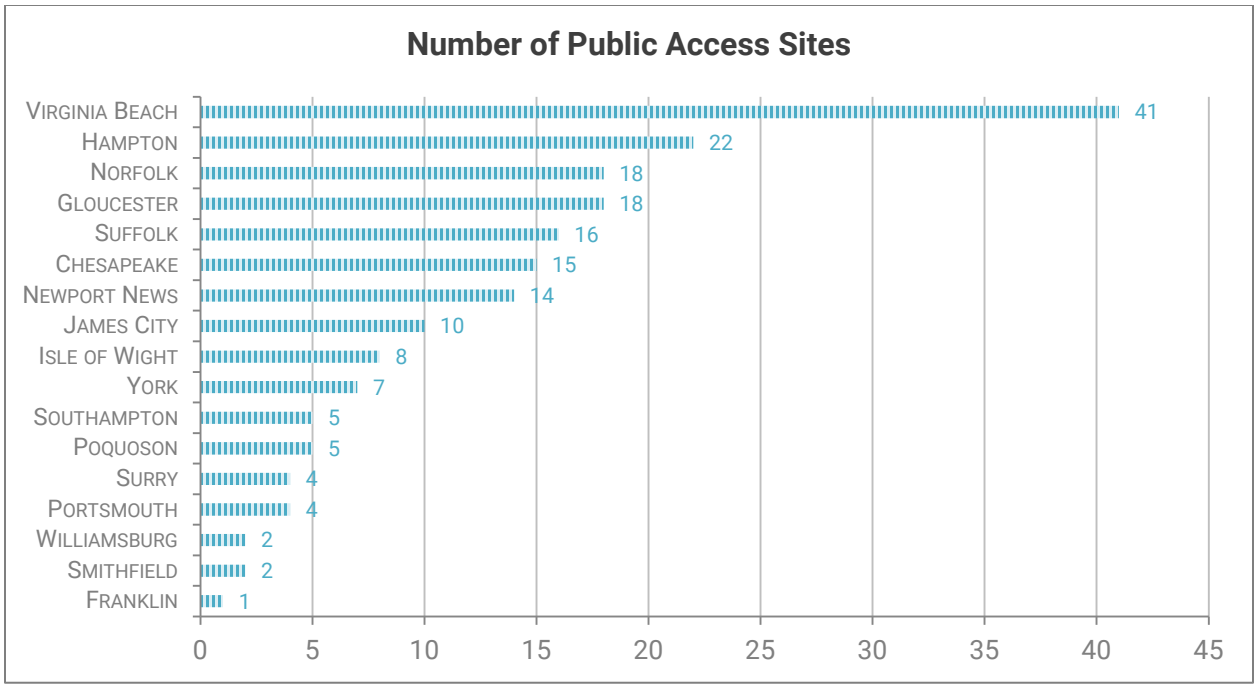


Figure 15. Total number of public access sites by locality

Table 9. Types of water access sites by locality. Many access sites provide more than one water-related activity.

Locality	Boat Ramps	Kayak/Canoe Launches	Fishing Piers	Bank Fishing	Beach Swimming	Observation Decks	Board-walks	Nature Trails
Chesapeake	4	12	2	5	0	5	1	10
Franklin	1	0	1	0	0	1	1	0
Gloucester	9	18	3	11	2	0	0	2
Hampton	6	9	4	4	4	6	4	6
Isle of Wight	3	1	2	2	2	3	1	5
James City	6	7	7	4	0	2	1	6
Newport News	5	5	7	5	3	3	3	6
Norfolk	4	11	4	5	4	3	0	4
Poquoson	5	5	2	1	0	0	0	0
Portsmouth	1	2	1	0	0	2	1	2
Smithfield	0	1	2	0	0	0	1	1
Southampton	4	2	0	0	0	0	0	1
Suffolk	13	5	6	3	0	0	2	8
Surry	2	2	0	2	0	1	0	2
Virginia Beach	10	26	4	11	6	4	3	13
Williamsburg	1	2	2	1	0	2	0	1
York	3	5	3	2	1	0	0	2
TOTAL	**77**	**113**	**50**	**56**	**22**	**32**	**18**	**69**

Some access points have multiple functions, such as a boat ramp and fishing pier. A matrix of access types for each locality is found in Table 9.

Kayak/canoe launches make up the largest proportion of access sites (26%) with boat ramps (18%) and natural trails (16%) the second and third most prevalent, as shown in Figure 16. A map of the existing water access sites inventory is available in Figure 17. The complete inventory can be found in Appendix A.

A web mapping application was created to allow the public to search existing water access sites in the region. A detailed description of this product is found in the Public Outreach chapter of this plan.

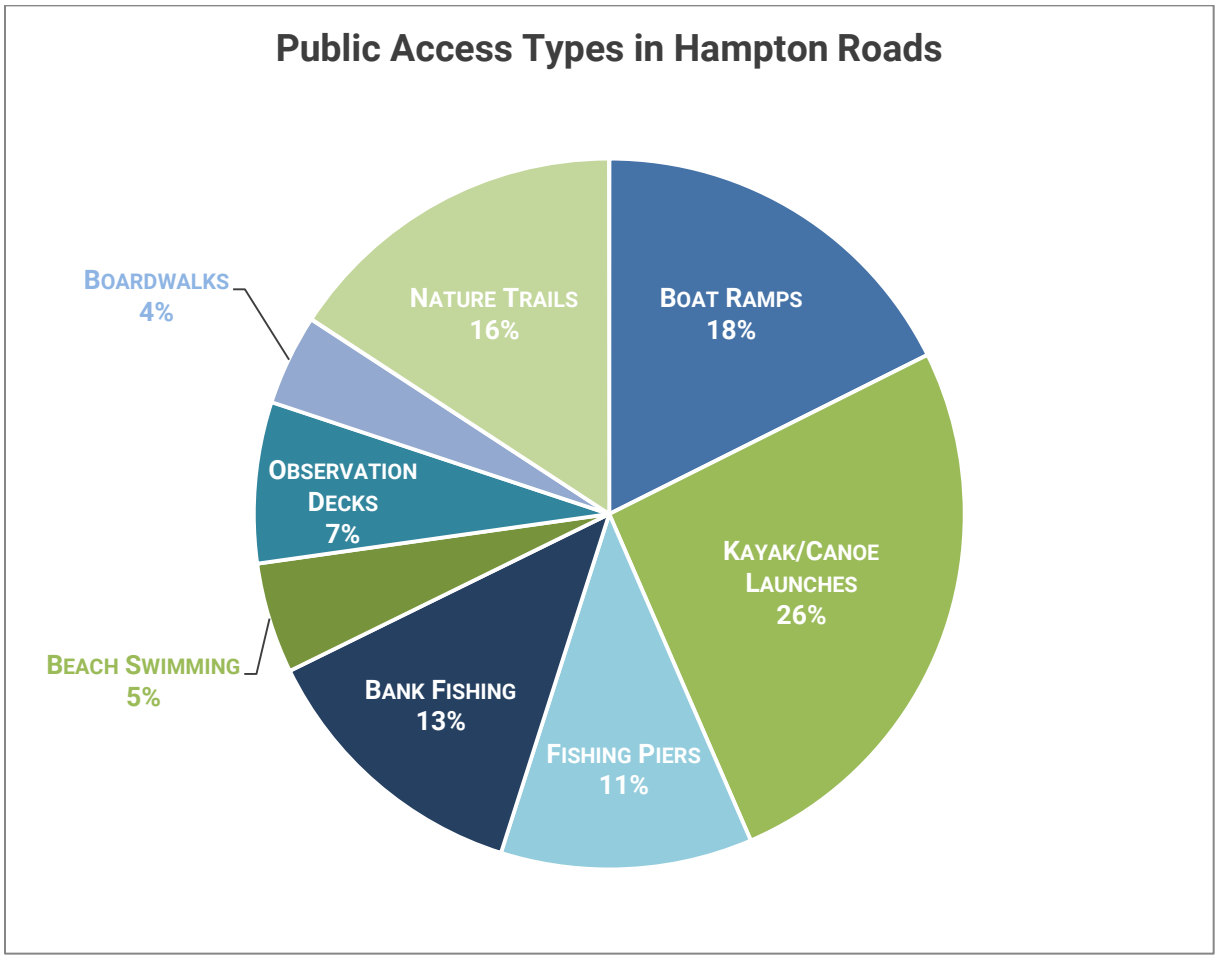


Figure 16. Proportion of all existing water access sites in Hampton Roads

Trails

Existing blueways (paddling trails) and major regional multi-use trails passing through Hampton Roads were also updated as a part of this inventory. Trails provide connectivity between water access locations for the public and are an important consideration when planning for new water access. Local-level multi-use trails were not identified for this project but could be added as a future improvement to the inventory.

The major trails that were identified in Hampton Roads are listed in Table 10. Maps of the existing blueways and trails are shown in Figure 18 and Figure 19.

Table 10. Major blueways and trails in Hampton Roads

National/Interstate	Virginia	Regional/Local
Captain John Smith National Historic Trail	James River Heritage Trail	Gloucester County Blueways
Intracoastal Waterway	Beaches to Bluegrass Trail	York County Blueways
Southeast Coast Saltwater Paddling Trail	James River Water Trail	South Hampton Roads Trail
East Coast Greenway	Virginia Capital Trail	Chickahominy Water Trail
	Colonial Parkway	Dismal Swamp Canal Trail
	Virginia Birding & Wildlife Trail	Eastern Branch Elizabeth River Water Trail
	Virginia Scenic Rivers	Elizabeth River Trail

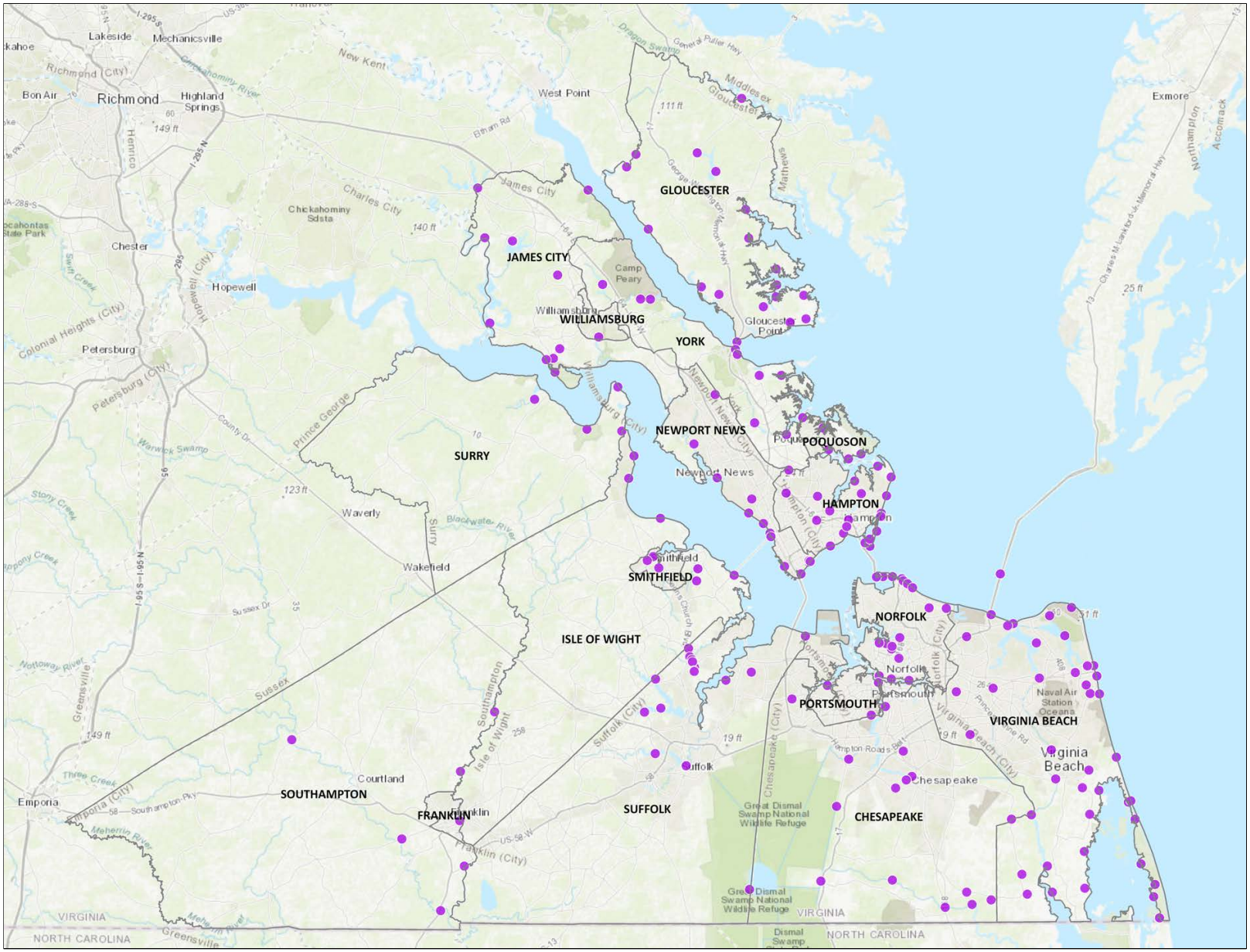


Figure 17. Map of existing public access sites in Hampton Roads

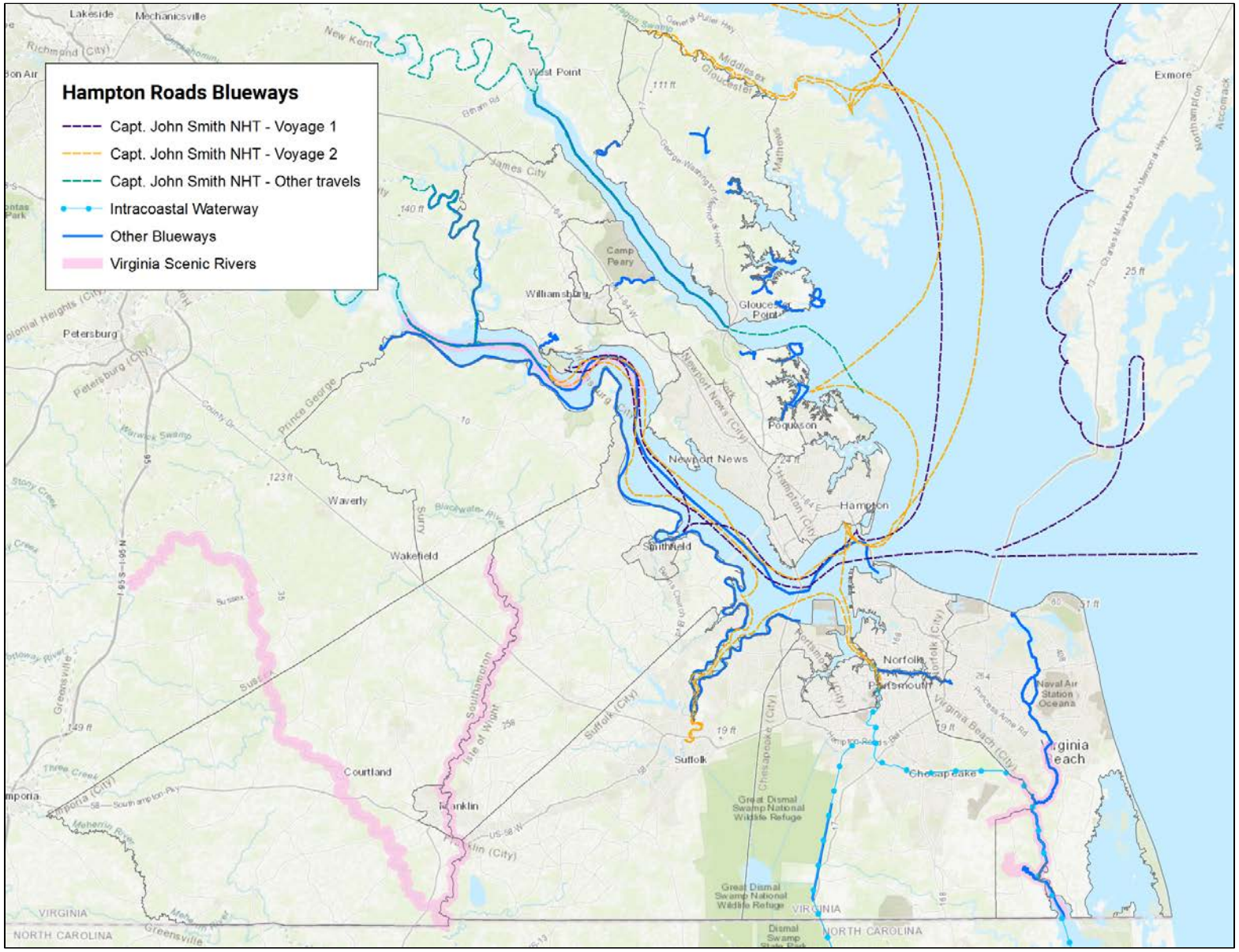


Figure 18. Map of existing blueways in Hampton Roads

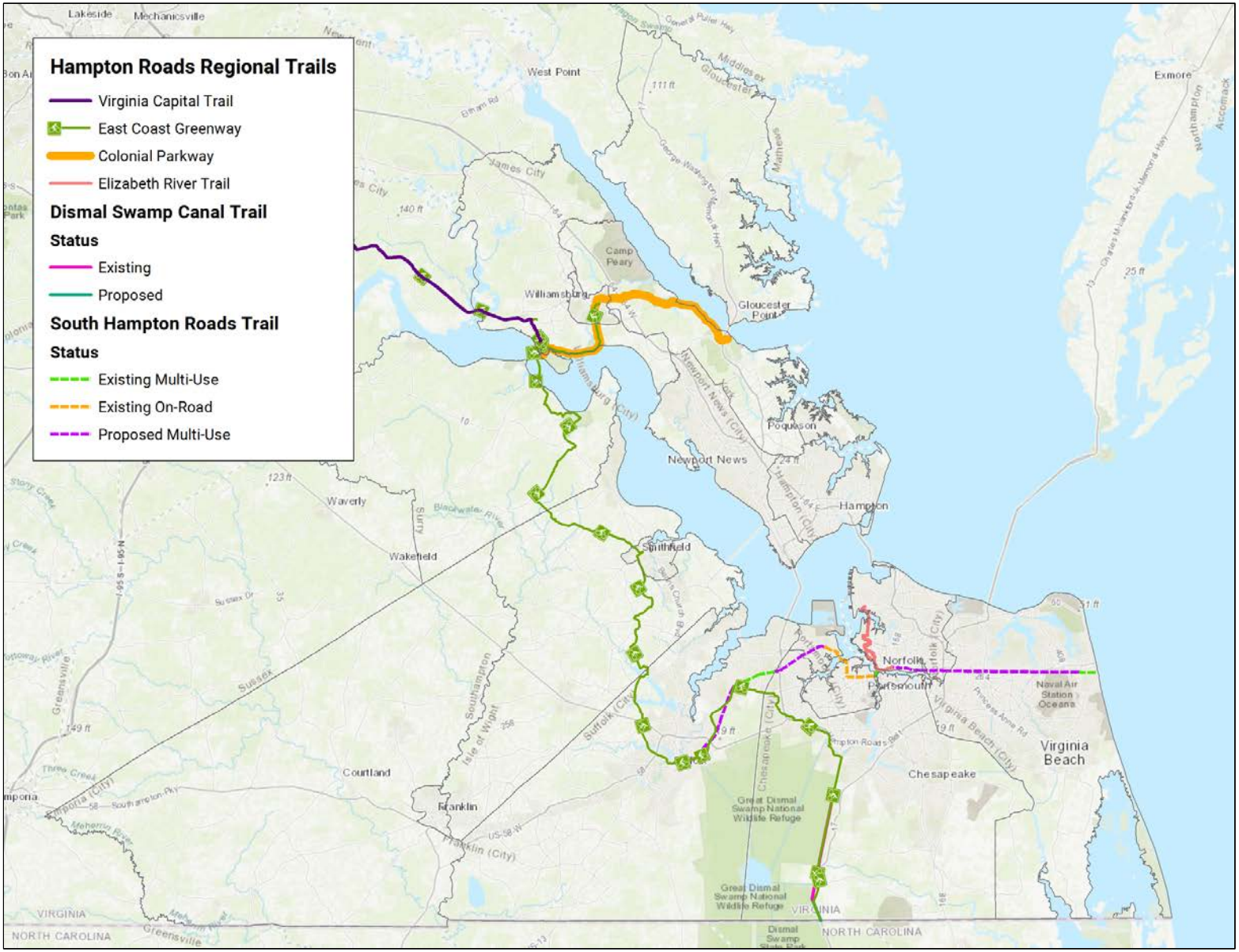


Figure 19. Map of existing multi-use trails in Hampton Roads

IV. Identifying Opportunities For Public Access

Existing demand for public access to water is already strong and interest in improving public water access within the region is increasing. Although there are already 192 existing public access sites in Hampton Roads, there are still opportunities to increase access to create a more connected and cohesive network for the region. An analysis of the distribution of existing public access sites identified potential gaps in the regional network of public access. Knowing where these gaps are will help decision-makers act strategically when selecting public access sites to support or fund in the future.

This analysis is intended to provide a general overview of these access gaps. At a regional level, there are essentially two types of gaps to consider: 1) a lack of access points in a given area and 2) areas that have existing access but may be underserved due to high demand. Several metrics were chosen to identify potential opportunities at the regional level: population distribution, driving time to public access sites, stream distance between public access sites, and an analysis of travel data, which captures visitor behaviors and volumes.

Travel Time Analysis

One of the challenges in public access planning is the lack of established metrics and guidance for determining need. However, research shows that the public is likely to visit water access sites more frequently if the sites are closer to where they live. As part of their human health priority, the Chesapeake Conservation Partnership (CCP) established a goal of ensuring nearly all residents of the Chesapeake Bay watershed are able to visit a public access site within a 30-minute drive (LandScope America, 2017).[22] This metric was applied to the Hampton Roads region to identify areas that may not be within 30 minutes of a public access site.

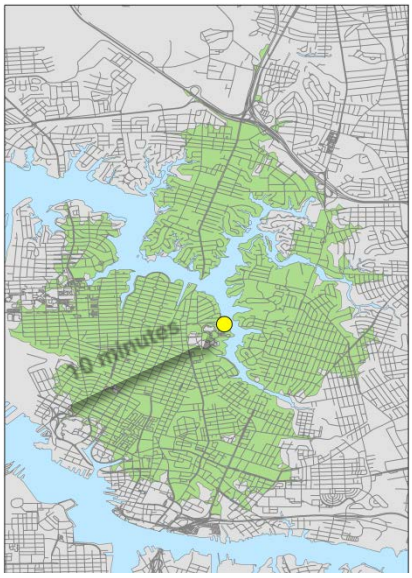


Figure 20. Example 10-minute DTA

Drive-time areas (DTAs) for each existing public access location were calculated using GIS. The boundaries of the DTA polygon represent the furthest distance from which one can travel along the road network and reach the public access site within the given time (Figure 20). As illustrated in Figure 21, nearly the entire Hampton Roads region is within a 30-minute drive of existing access

[22] The CCP coalition brings together several organizations and governmental agencies who are engaged in land conservation and related activities in the Chesapeake Bay. The group is convened by the National Park Service and Chesapeake Conservancy and provided support for the 2013 NPS Chesapeake Bay Watershed Public Access Plan.

locations. Drive time areas for 20- and 10-minute travel times were also calculated to identify gaps in access at a more local scale.

The population within each DTA polygon was calculated to quantify the number of residents within the DTAs. Nearly the entire population of Hampton Roads (98%) is located within a 30-minute drive of a public access location. Even with a lower threshold of 10 minutes, approximately 78% of the region can visit some type of public access site in a relatively short time.

The western localities in the region have fewer public access locations and a much lower population density than the cities of Hampton Roads. Therefore, the percent population calculations in Table 11 do not reflect an equal distribution of access sites across the region. The western localities have fewer 10-minute DTAs which means the residents in those areas must travel further to reach a public access site.

Table 11. Estimates of the population located within a 10-, 20-, and 30-minute drive time of water access sites.

Drive Time	Population within DTA	Percent of Total Population[23]
10-minute	1,353,378	78.1%
20-minute	1,675,036	96.6%
30-minute	1,691,422	97.6%

The DTAs are also not equal for all the different types of public access. Ten-minute DTAs and the associated population estimates were also calculated for each major use-type category: 1) swimming beaches, 2) boat ramps, 3) fishing locations, 4) observation decks, boardwalks, and trails, and 5) paddling launches (Table 12). When comparing DTAs by water access type, boating, paddling, and viewing access sites have the widest regional distribution. The DTAs for these three use-types extend from the oceanfront to the western and northern most localities. The DTAs of fishing locations encompass the third highest percent of the population (59.1%). Swimming beaches have a narrow distribution, focused on the oceanfront, Chesapeake Bay, and James River. Although beach access is the type of access that is furthest away for most residents, people are willing to drive to visit a beach as it was the most popular water-based activity in the Virginia Outdoors Demand Survey in 2011 and 2017. Maps displaying DTA for each use type are located in Appendix C.

[23] Based on 2016 Esri Demographics Population Estimates

Table 12. Estimates of the population living within a 10-minute drive of water access sites by use type.

Water Access Type	Population within 10-minute DTA	Percent of Total Population
Swimming Beaches	274,103	15.8%
Boat Ramps	808,291	46.6%
Fishing Locations	1,024,990	59.1%
Observation Decks, Boardwalks, and Trails	1,144,895	66.0%
Paddling Launches	1,154,148	66.6%

Carolanne Farm Park in Virginia Beach. Photo by HRPDC/Kidd.

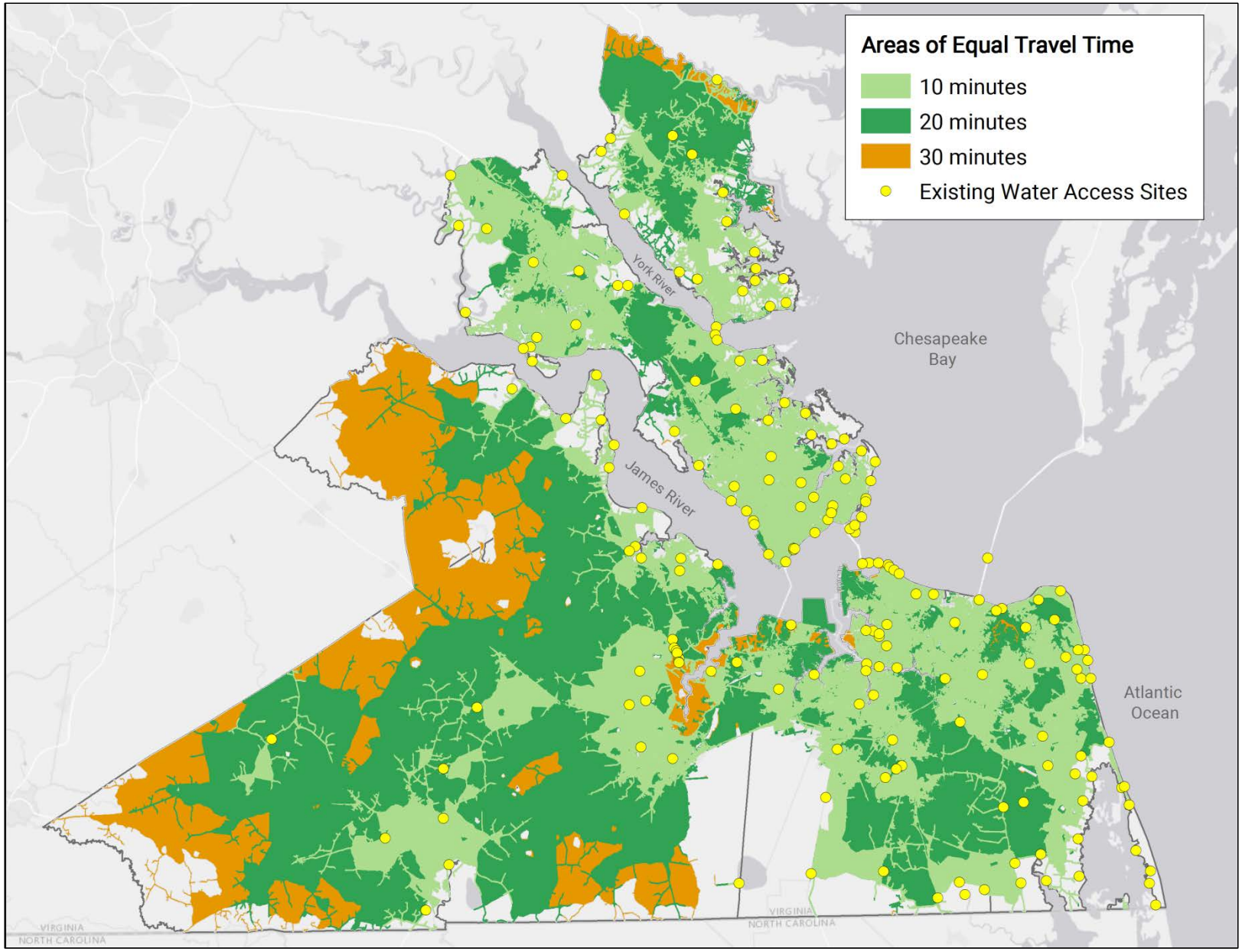


Figure 21: Areas within a 10-, 20-, and 30-minute drive time of a waterway public access location in the Hampton Roads region. DTA's were constructed using the Network Analyst extension of ArcMap.

Stream Distance Analysis

Paddling and boating opportunities are the most frequent access types in the region at 44% (Figure 16). The previous analysis does not account for gaps that may exist between sites along a waterway. Large gaps, especially for paddlers, diminish the outdoor experience and may deter them from paddling in waterways that would otherwise be ideal. Connectivity and reasonable distances between boat ramps and paddling launches are critical considerations for water trail planning.

The distribution of boating and paddling public access points along specific waterways of regional importance was analyzed in GIS. To determine travel distance, the center of the waterway, rather than the shoreline, was used and the distance between each pair of adjacent access points of the same type (canoe/kayak or boat ramp) was calculated.

A five-mile distance between consecutive access points was selected as a threshold to identify broad gaps in access along waterways; however, given that paddlers generally travel between 1 and 5 miles per hour, a smaller threshold (e.g. 2 miles) may be desirable for official blueway trail planning (Cayuga Lake Blueway Trail Plan Committee, 2013). Applying a similar standard, the City of Suffolk identified a goal of 3 to 5 miles between canoe/kayak launches along the Nansemond River in their Green Infrastructure plan (City of Suffolk, 2017). The average travel distance between adjacent access points ranges from approximately one-half mile to 14 miles for kayak launches and one-half mile to 16 miles for boat ramps. Although the Nansemond River currently has two designated canoe/kayak access locations, these points are 12.5 miles apart (Table 13). By adding additional access points, the travel distance between the existing two points would be reduced and could contribute to the establishment of a paddling trail.

The Northwest River, North Landing River, and Western Branch of the Elizabeth River currently only have one public boat ramp, whereas the Eastern Branch of the Elizabeth River and Nansemond River lack public boat ramps entirely (Table 13). Bennett's Creek, a tributary to the Nansemond River, however, does have a boat ramp. The Western Branch of the Elizabeth River, Blackwater River, and Nottoway River each has only one paddling access point. The Southern and Western Branches of the Elizabeth River, the Nansemond River, the upper James River, the Chickahominy River, Blackwater River, and Nottoway River could be considered priority waterways for increasing paddling and boating access. Figure 22 and Figure 23 chart the distance ranges between consecutive boat ramps and kayak/canoe launches respectively. Distances greater than 20 miles along a river which lack boating or paddling access are highlighted in dark purple. Portions of the rivers that are not shaded in purple represent distances of less than five miles.

Table 13. Summary of travel distance between paddling and boating access points by waterway. Distances are represented in stream miles. Waterways contained in the black box have greater than a 5-mile distance between consecutive kayak or boat ramps.

Waterway	Number of Paddling Access Points	Average Distance to Consecutive Kayak Launch (miles)[24]	Number of Boat Access Points	Average Distance to Consecutive Boat Ramp (miles)[24,25]	Total Number of Paddling and Boating Access Points along Waterway
Hampton River	2	0.52	2	0.46	4
Lafayette River*	3	0.66	3	0.66	3
Northwest River*	3	4.61	1	0	3
North Landing River*	2	4.66	1	0	2
York River*	6	3.93	4	6.52	6
E Branch Elizabeth River	3	3.10	0	NA	3
S Branch Elizabeth River*	2	9.67	2	9.67	2
W Branch Elizabeth River*	1	0	1	0	1
Nansemond River	2	12.50	0	NA	2
James River*	3	14.43	3	6.95	4
Chickahominy River*	2	8.49	2	8.49	2
Blackwater River	1	0	3	9.01	4
Nottoway River*	1	0	3	15.90	3

* Waterways contain individual access locations with both paddling and boating uses.

[24] Zero indicates only one public access point of that use type currently exists along the waterway.
[25] NA indicates no public boat ramps.

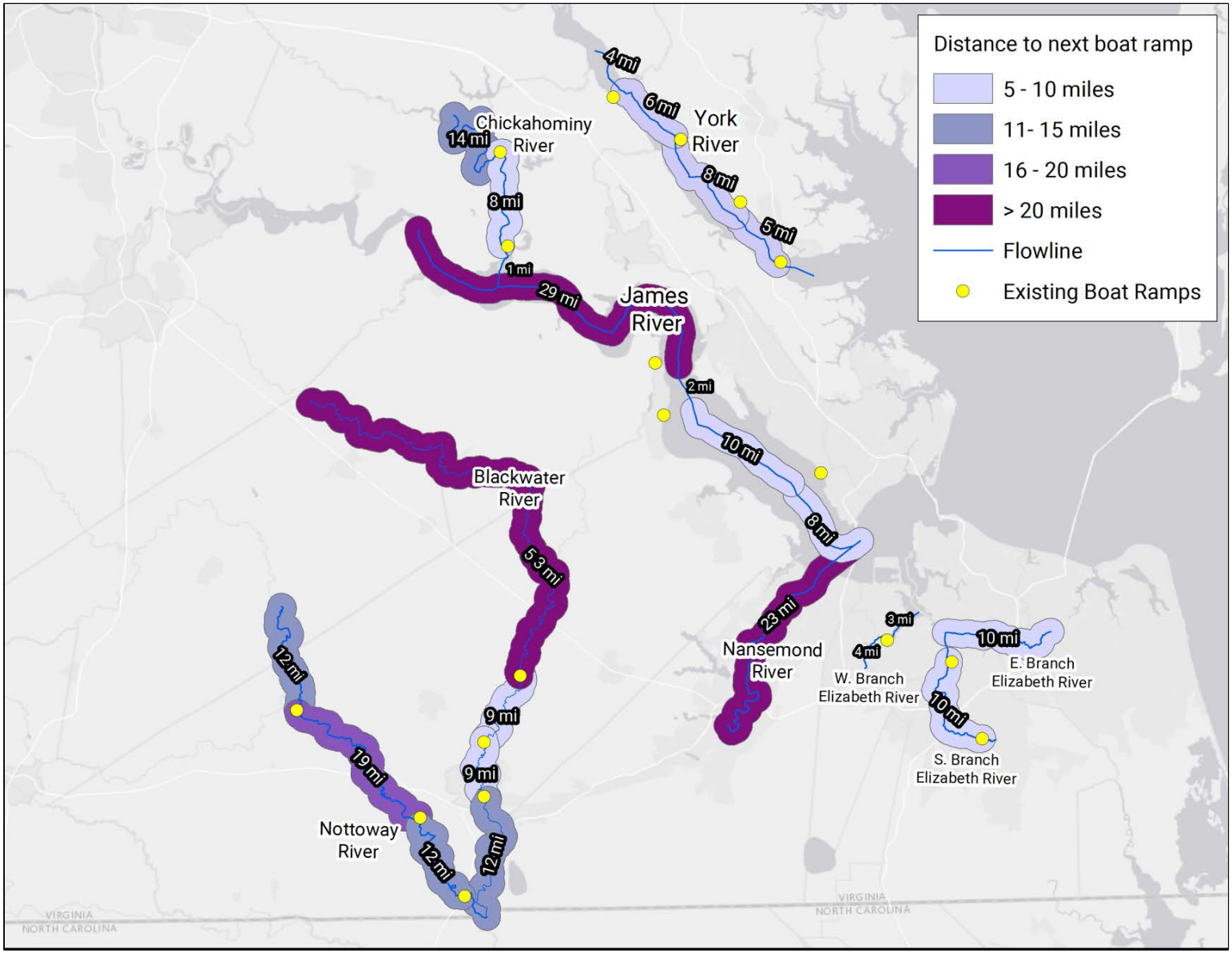


Figure 22: Rivers with 5 miles or greater distance between existing boat ramps. Distances between boat access points are labeled in miles and rounded to the nearest whole number. Segments of rivers greater than 20 miles that lack boating or paddling access are highlighted in dark purple. Portions of rivers not shaded in purple on the map are less than 5 miles in length. Only existing boat ramps which correspond with the labeled waterways are displayed on the map.

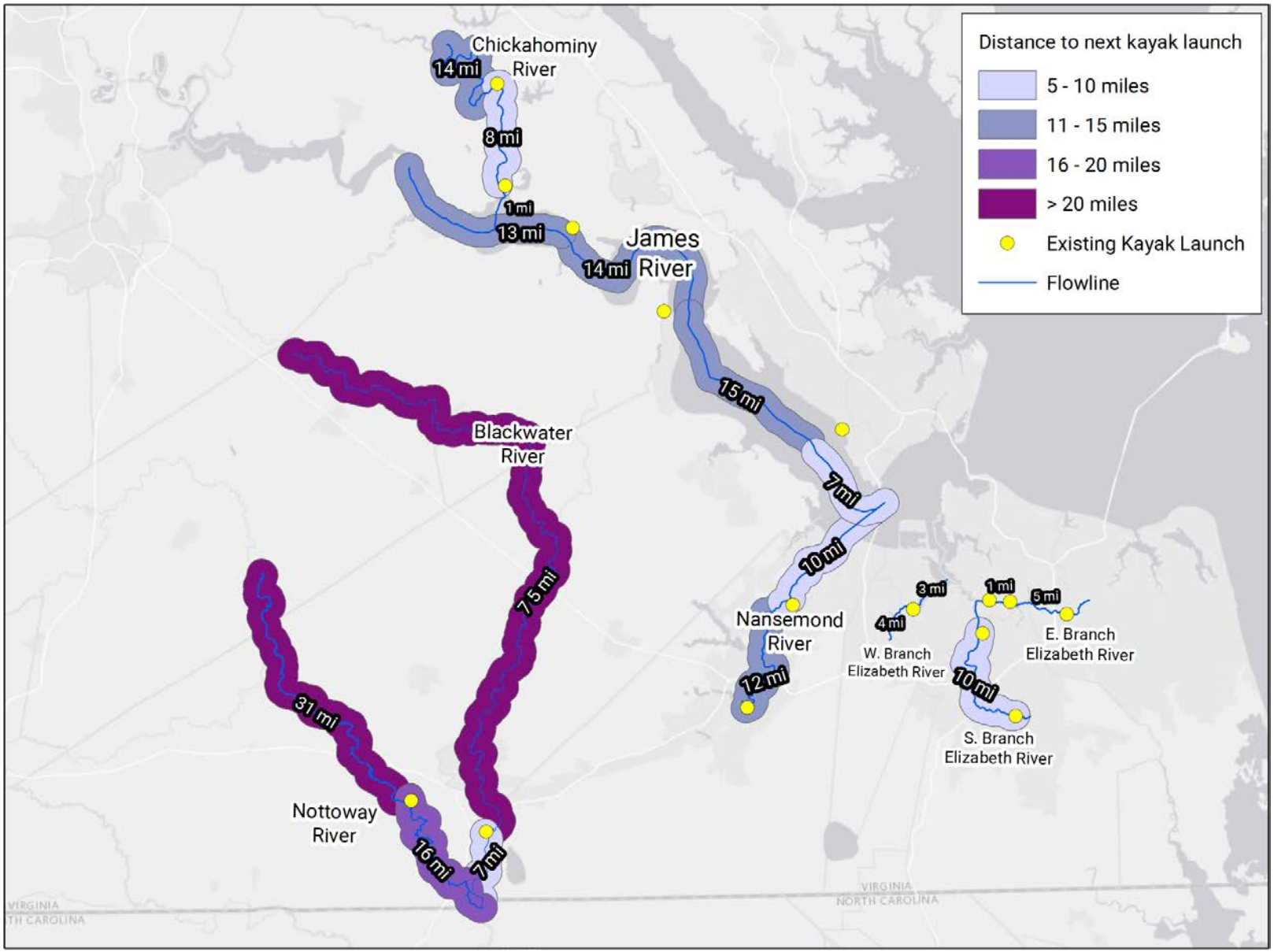


Figure 23: Rivers with 5 miles or greater distance between existing kayak and canoe launches. Distances between kayak access points are labeled in miles and rounded to the nearest whole number. Segments of rivers greater than 20 miles that lack boating or paddling access are highlighted in dark purple. Portions of rivers not shaded in purple on the map are less than 5 miles in length. Only existing kayak launches which correspond with the labeled waterways are displayed on the map.

Population by Watershed Analysis

A simple analysis of the number of access sites in a watershed compared to the population of the watershed can provide insight into the distribution of sites and the potential demand. Figure 24 shows the estimated population of each watershed divided by the number of access points of all use types within the watershed. For example, each access point of the Elizabeth River watershed serves a relatively large population. The Elizabeth River watershed has an estimated population of approximately 467,000 with 20 existing access points; therefore, each access point is associated with over 23,000 people, assuming all access points receive equal usage.

The population serviced by each access site by use type was also calculated by watershed. For the Elizabeth River and Lynnhaven River watersheds, the population serviced per boat ramp is higher than for any other use types (Table 14). This indicates a single boat ramp must serve more visitors compared to the other use types and highlights a potential opportunity for improved water access. Opportunities to increase the number of boat ramps, fishing docks, and viewing opportunities (i.e. observation decks or nature trails) along the North Landing River are also evident given the relatively high population per access site (54,958) for these specific use types (Table 14). Maps depicting the population per access type by watershed are found in Appendix C.

The number of boat registrations and annual fishing licenses were summarized by watershed (Table 15). The Elizabeth River watershed currently has the highest count of boat owners, 6,553, and annual fishing licenses, 11,557. Although the percent of the watershed population owning a boat or fishing license is low (<5%), four boat ramps and one fishing pier are likely insufficient to accommodate the level of demand for these activities in the watershed.

Portions of the James River watershed located along the Peninsula (Skiffes Creek and Warwick River) are associated with greater than 10,000 people per access site. Given there are over 3,000 boat owners and 7,000 licensed anglers within the Peninsula portions of the James River watershed, there is substantial demand for recreational water activities along the James River to support increasing public access.

There are over 2,000 boat owners in the Nansemond River watershed (Table 15). Although the Nansemond River watershed has a relatively high number of boat ramps relative to other use types, the Nansemond River itself does not have any boat ramps (the watershed includes Lone Star Lakes Park with several access sites). Establishing public boat ramps along the Nansemond River would enhance recreational opportunities for the boating community in Suffolk.

The northern portions of the Blackwater River watershed lack access entirely (Figure 24). While there are a lower number of boat owners and licensed anglers in these watersheds relative to urban watersheds, the proportion of the watershed population that owns a boat or fishing license is still high relative to more urban watersheds (Table 15).

Carrying capacity studies could be conducted at individual boat ramps within a watershed to determine the amount of use each site receives and the overall impact on the particular body of water to assist in deciding where to add new ramps or improve existing ramps.

Table 14. Summary of population per access site for each water use type. A higher population number indicates a lower number of access points. Populations were calculated by dividing the watershed population by the number of access points per use type. For the James River, York River, and Blackwater River, values of all watersheds associated with the same waterway were combined. Note that the Lafayette River was excluded from the table because it falls within the Elizabeth River watershed.

Watershed	Watershed Population	Population per Boat Ramp	Population per Kayak Launch	Population per Fishing Locations	Population per Viewing Location	Population per Swimming Location
Elizabeth River	467,434	77,906	38,953	58,429	35,956	---
Lynnhaven River-Lower Chesapeake Bay	277,704	92,568	34,713	27,770	27,770	55,541
James River (Peninsula)	220,038	55,010	31,434	20,003	18,337	110,019
Back River-Lower Chesapeake Bay	165,350	15,032	11,811	13,779	20,669	41,338
North Landing River	164,874	54,958	20,609	54,958	54,958	---
Nansemond River	75,960	10,851	18,990	15,192	12,660	---
Hampton River-Hampton Roads	68,778	17,195	17,195	13,756	13,756	68,778
Willoughby Bay	55,845	55,845	27,923	27,923	---	55,845
York River	48,795	6,099	4,066	3,753	12,199	16,265
Currituck Sound	35,469	11,823	2,956	11,823	7,094	17,735
James River (Southside)	30,165	3,464	7,793	2,834	2,834	15,586
Blackwater River	23,913	7,971	23,913	23,913	23,913	---
Rudee Inlet-Atlantic Ocean	17,390	17,390	17,390	8,695	8,695	8,695
Mobjack Bay-Lower Chesapeake Bay	17,311	5,770	1,731	2,885	8,656	---
Streeter Creek-Hampton Roads	15,277	---	15,277	---	15,277	---
Northwest River	11,794	11,794	1,966	3,931	5,897	---
Lower Chickahominy River	10,645	2,661	3,548	2,661	5,323	---
Mill Creek-Nottoway River	8,417	2,806	8,417	---	8,417	---
Dismal Swamp Canal-Lake Drummond	3,279	1,640	1,640	3,279	1,640	---
Piankatank River-Lower Chesapeake Bay	2,218	2,218	2,218	2,218	---	---

Table 15. Summary of boat registrations and fishing licenses by watershed. For the James River, York River, and Blackwater River, values of all watersheds associated with the same waterway were combined. Note that the Lafayette River was excluded from the table because it falls within the Elizabeth River watershed. Watersheds highlighted in gray lack access.

Watershed	Watershed Population	Count of Boat Registrations[26]	% of Watershed Population	Count of Annual Fishing Licenses[27]	% of Watershed Population
Elizabeth River	467,434	6,553	1.40%	11,557	2.47%
Lynnhaven River-Lower Chesapeake Bay	277,704	6,315	2.27%	9,105	3.28%
James River (Peninsula)	220,038	3,370	1.53%	7,196	3.27%
Back River-Lower Chesapeake Bay	165,350	4,502	2.72%	6,198	3.75%
North Landing River	164,874	3,119	1.89%	5,924	3.59%
Nansemond River	75,960	2,122	2.79%	3,039	4.00%
Hampton River-Hampton Roads	68,778	826	1.20%	1,867	2.71%
Willoughby Bay	55,845	321	0.57%	1,046	1.87%
York River	48,795	2,179	4.47%	2,770	5.68%
Currituck Sound	35,469	1,157	3.26%	1,610	4.54%
James River (Southside)	31,173	1,598	5.13%	1,909	6.12%
Blackwater River	23,913	1,025	4.29%	1,549	6.48%
Rudee Inlet-Atlantic Ocean	17,390	428	2.46%	669	3.85%
Mobjack Bay-Lower Chesapeake Bay	17,311	1,228	7.09%	1,384	7.99%
Streeter Creek-Hampton Roads	15,277	164	1.07%	430	2.81%
Northwest River	11,794	495	4.20%	611	5.18%
Lower Chickahominy River	10,645	567	5.33%	568	5.34%
Mill Creek-Nottoway River	8,417	501	5.95%	662	7.87%
Somerton Creek	4,070	197	4.84%	225	5.53%
Dismal Swamp Canal-Lake Drummond	3,279	181	5.52%	187	5.70%
Three Creek	2,666	73	2.74%	105	3.94%
Piankatank River-Lower Chesapeake Bay	2,218	206	9.29%	232	10.46%
Tarrara Creek-Meherrin River	2,141	98	4.58%	153	7.15%
Seacock Swamp	1,793	118	6.58%	145	8.09%
Assamoosick Swamp	444	25	5.63%	44	9.91%
Dragon Swamp	322	14	4.35%	19	5.90%
Raccoon Creek-Nottoway River	95	13	13.68%	17	17.89%

[26] Based on unique names in FY 2017 boat registration data
[27] Based on unique names in FY 2017 annual fishing licenses data

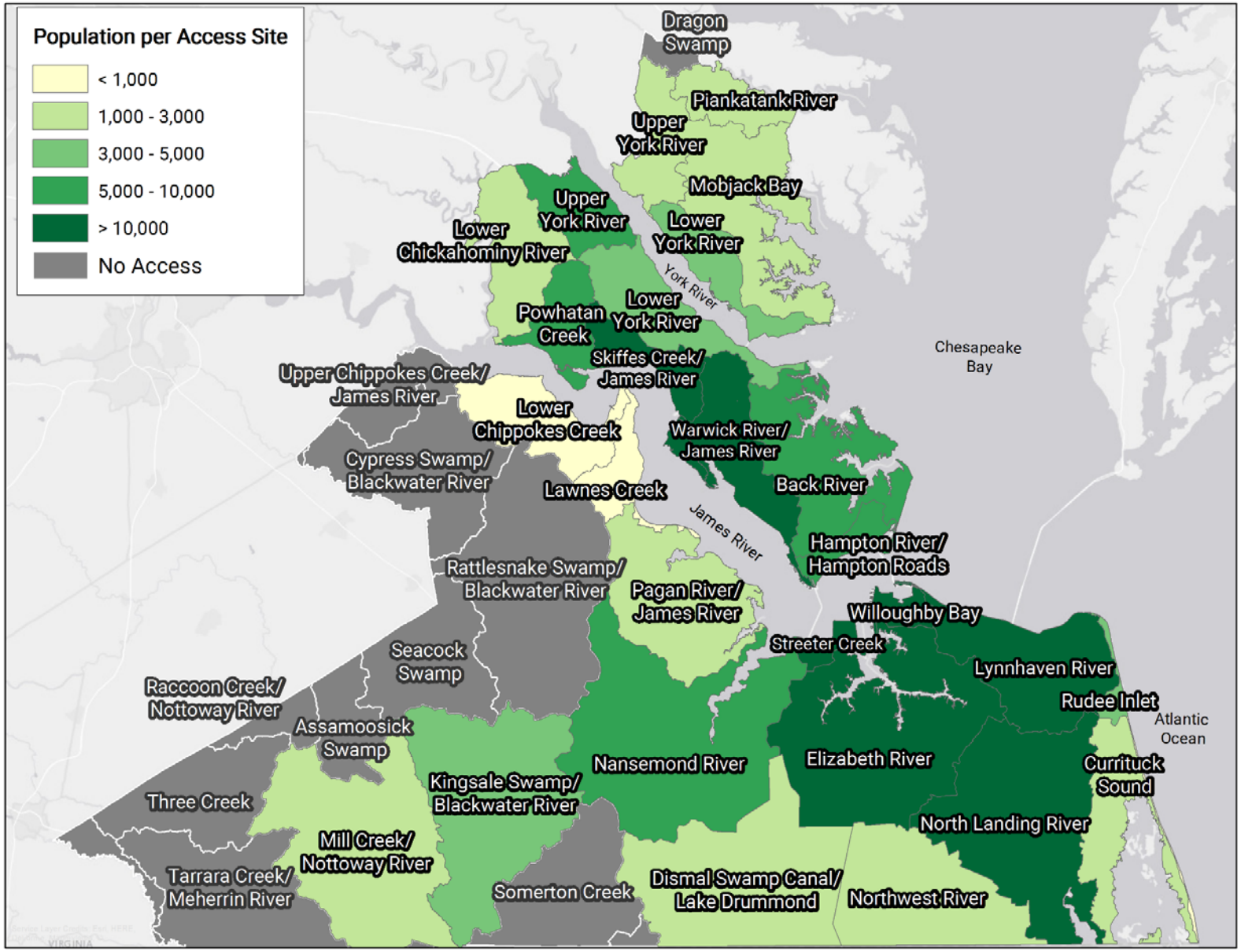


Figure 24. Estimated population served by each access point at the watershed scale. Values calculated by dividing the estimated population of the watershed by the count of access points of all use types.

Comparing Future Sites to Identified Access Gaps

Existing local government recreational master plans were reviewed to determine if locality plans align with the identified access gaps. Sites were sorted into three categories based on level of completeness to distinguish access points that were under construction from preliminary ideas (Table 16). "Planned" sites are those currently under construction or nearing development with a source of funding secured or likely to be secured. "Proposed" sites are those recognized in a plan, but have no timeline for development. "Potential" sites represent locations collected informally through public comments or conversation with locality staff. Of the 91 future sites identified 61 had sufficient spatial information to be mapped (Figure 25). Table 17 provides a summary of all local plans reviewed for future public water access projects. The attributes associated with future sites are provided in Appendix B. In addition to the local and multijurisdictional plans, Appendix B of the 2013 National Park Service's Chesapeake Bay Watershed Public Access Plan includes a table of potential access sites (National Park Service, 2013).

Table 16. Count of future access sites by locality. Note that not all sites included in this table are recommended in locality plans, but also include those suggested through public comments.

Jurisdiction	Planned Access Sites	Proposed Access Sites	Potential Access Sites
Chesapeake	1	---	3
Franklin	---	---	---
Gloucester	---	1	2
Hampton	1	7	1
Isle of Wight	---	---	2[28]
James City	---	---	4[28]
Newport News	---	---	---
Norfolk	---	17	1
Poquoson	---	---	---
Portsmouth	---	20[28]	---
Southampton	---	---	---
Suffolk	1	2	6[28]
Surry	---	---	3[28]
Virginia Beach	4	4	10
Williamsburg	---	---	---
York	---	---	1[28]
Total	**7**	**51**	**33**

[28] Some or all of the sites included in the count lacked sufficient information to map.

Table 17. Summary of local and multijurisdictional plans within the Hampton Roads region that document future access locations.

Localities Included	Date	Plan	Description
Cities of Chesapeake and Virginia Beach	1994	North Landing River Watershed Public Access and Visual Assessment	Provides information about existing and proposed water access sites (pg. 33-53).
Cities of Chesapeake, Norfolk, Virginia Beach	2014	Elizabeth River Eastern Branch Restoration Plan	Indicates the location of potential launch sites (pg. 9); published by the Elizabeth River Project.
City of Chesapeake	2017	Parks, Recreation, and Tourism Department Report (May/June)	Identifies location of future Indian River access site (pg. 49).
City of Hampton	2007	North King St Master Plan	Proposed increased access to Newmarket Creek (pg. 2).
City of Hampton	2013	Phoebus Master Plan	Provides concept for waterfront park (pg. 21).
City of Hampton	2015	Coliseum Central Master Plan	Proposed waterfront park along Newmarket Creek (pg. 31).
City of Hampton	2017	Downtown Hampton Master Plan	Provides plan for network of landings along the water (pg. 54).
City of Norfolk	2012	Recreation Master Plan	Identifies potential water access locations in Section 4.6; uses 2-mile threshold for gap analysis.
City of Portsmouth	2012	Parks, Recreation, and Leisure Services Master Plan	Provides recommendations for waterfront access (pg. 38-41).
City of Suffolk	2015	Parks and Recreation Trails and Water Access Study Appendix in Master Plan	Includes recommendations for water access (p. 145).
City of Virginia Beach	2015	Alternative Transportation Study: Back Bay National Wildlife Refuge	Provides water access information in Chapter 8.
City of Virginia Beach	2016	Outdoors Plan	Illustrates the location of future sites (pg. 38).

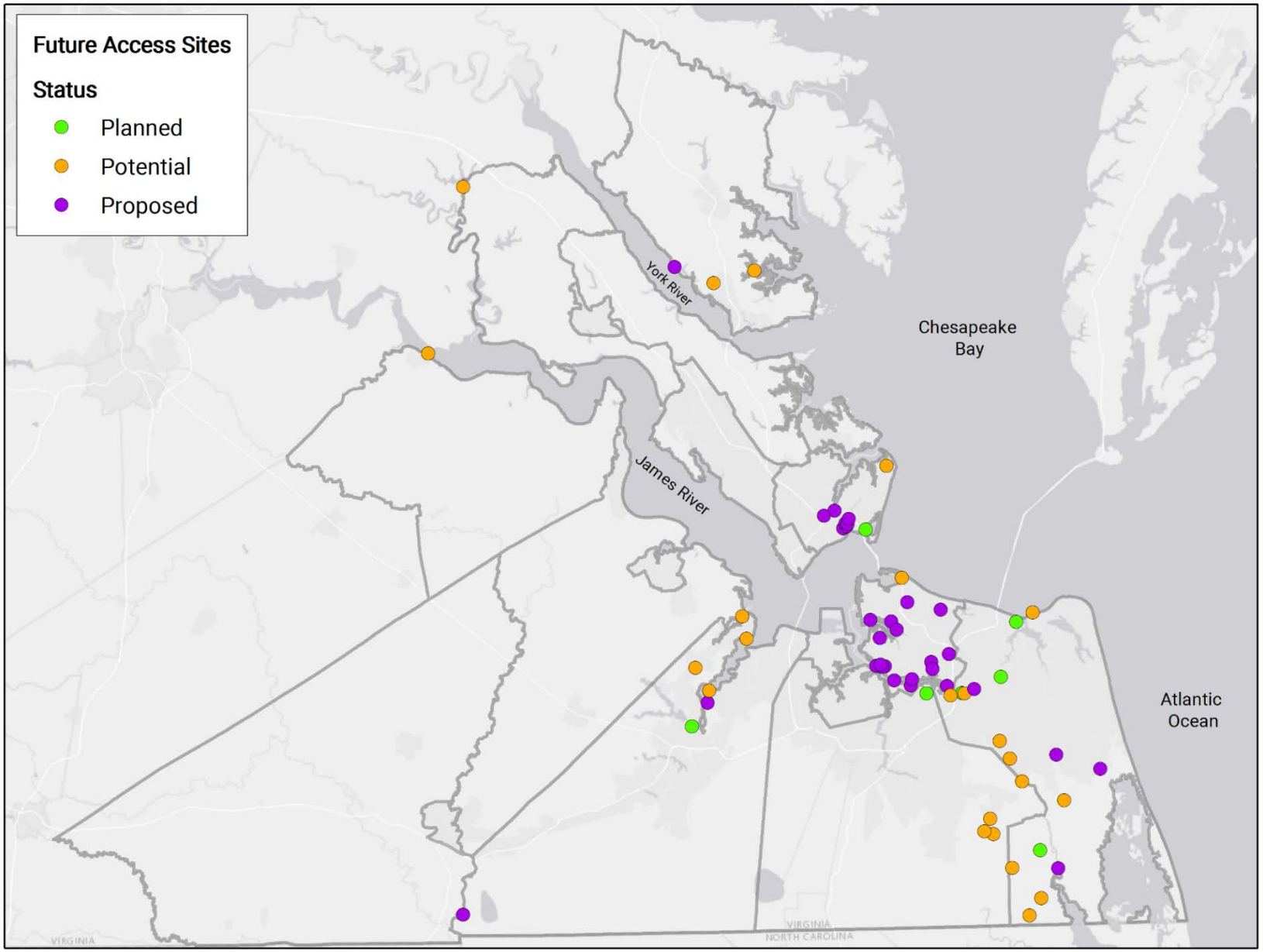


Figure 25. Identified future access sites in Hampton Roads categorized by status of implementation.

Of the 61 future access sites that could be mapped, 13 are outside of the current 10-minute DTA for all water access types (Figure 26). Localities may consider prioritizing these projects, which address an existing access gap.

Population density may also be an important criterion when deciding upon new public access locations. Of the identified future site locations, 10 sites would fill existing gaps in the 10-minute DTA. The estimated additional population that would be served if these sites were constructed is shown in Table 18. Maps for each locality comparing the inventory of future sites to 10-minute DTAs and the associated population are presented in Appendix C.

Table 18. Summary of the estimated number of additional people who would be able to visit a public water access site in 10 minutes. Only the 13 future sites located outside of an existing 10-minute drive-time area are included. The estimated population excludes people who currently live within a 10-minute drive of a water access site of any use type. Therefore, a value of 0 indicates that the population living within a 10 minute driving distance of the proposed site is already serviced by an existing water access site.

Locality	Future Water Access Site	Status	Waterbody	Additional Population within 10 minutes of Water Access if Site is Developed
Virginia Beach	Woodstock Cove Park	Potential	Elizabeth River	26,300
Virginia Beach	Normandy Ave	Planned	Elizabeth River	18,800
Virginia Beach	Fairfield Forest Park	Potential	Elizabeth River	18,000
Chesapeake	Fentress Airfield Rd	Potential	Pocaty River	2,600
Norfolk	Rivers Edge Rd	Proposed	Broad Creek	2,500
Suffolk	Brady's Marina	Planned	Nansemond River	<1,000
Gloucester	Middle Peninsula State Park	Proposed	York River	<1,000
Chesapeake	Long Ridge Rd	Potential	Pocaty River	<1,000
Surry	Claremont	Potential	James River	<1,000
Suffolk	Driver Sports Complex	Proposed	Nansemond River	<1,000
Suffolk	Eclipse	Potential	Chuckatuck Creek	0
Suffolk	South Quay Sandhills Natural Area	Proposed	Blackwater River	0
Virginia Beach	North Landing River Preserve	Planned	North Landing River	0

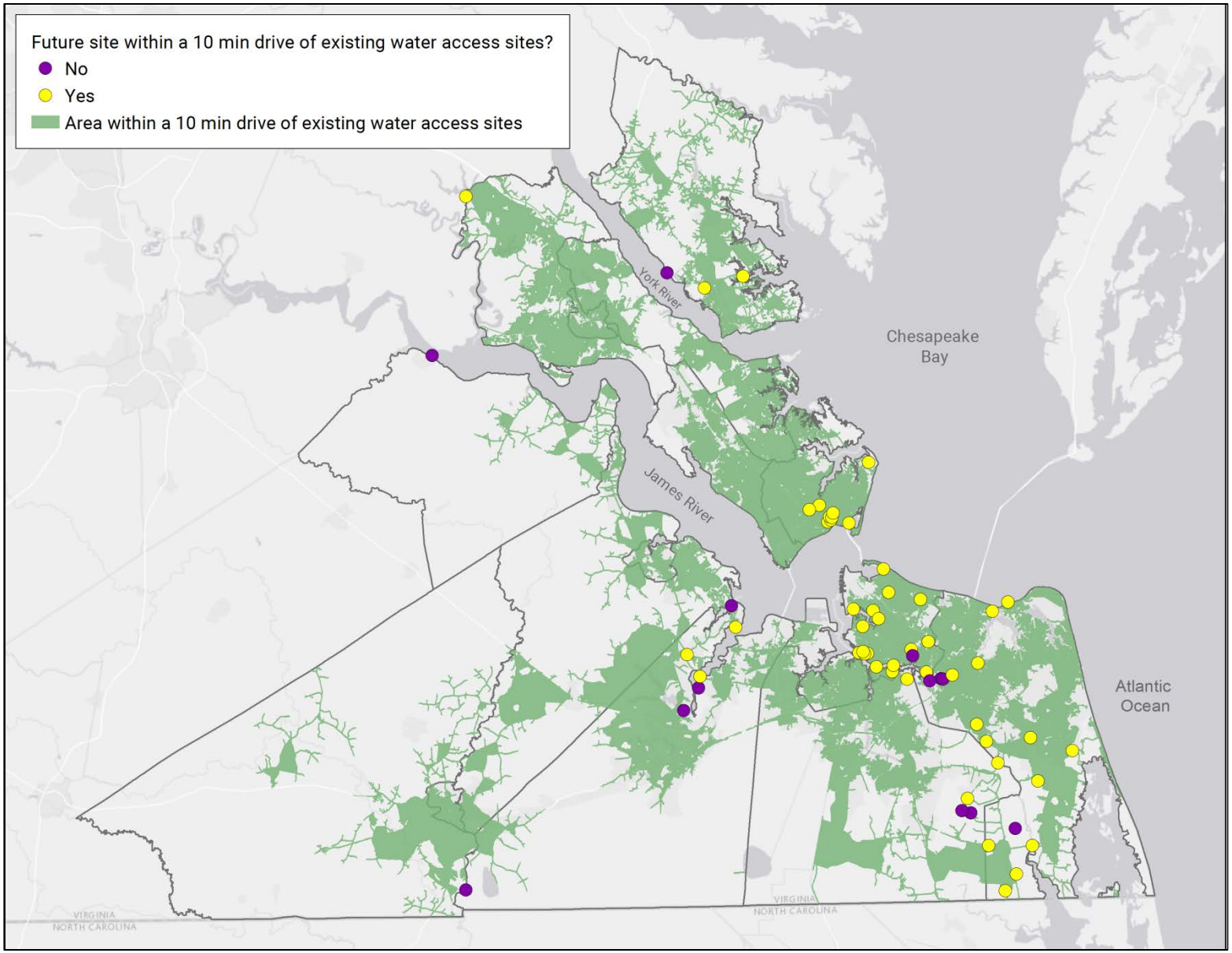


Figure 26. Distribution of future public access locations, including planned, proposed, and potential, relative to the 10-minute DTA of existing access sites. The 13 sites displayed in purple are located outside of the existing 10-minute DTA.

Visitor Analysis

Travel data is usually not collected with recreational planning as a specific focus; however, it does offer potentially relevant information. Travel data can provide an overview of recreational activity across a region or a locality by identifying which sites are being visited, the volume of visitors, distance traveled from home, and other demographics about the visitors. Knowing where people live who visit water access sites, how far they are willing to travel to a site, and where they choose to go can help identify potential gaps for water access sites in the region. A detailed visitor analysis of each water access site was not done for this study but regional-level analyses were performed to demonstrate the usefulness of travel data for water access planning purposes, particularly when combined with the travel time analysis previously discussed.

STREETLIGHT INSIGHT

Streetlight Data, Inc. provided access to the travel data through an account held by the Virginia Department of Transportation (VDOT).[29] The travel data analysis was conducted as a "Visitor Home-Work Analysis" project using *Streetlight InSight*, an online "software as a service" or SaaS application. Each public water access site identified in the existing inventory was converted into a "zone" for analysis. The results produced by the analysis include the Visitor Activity Index, demographics, and a GIS layer of one square kilometer grids depicting the home and work locations of people who visited any of the water access sites. The location data for this particular type of project is generated by Streetlight through the analysis of anonymous and aggregated Location-Based Services (LBS) cell phone data.[30] Locations from Global Positioning Systems (GPS) data are also available in *Streetlight InSight* but not with this particular type of analysis.

[29] See https://www.streetlightdata.com
[30] Location-Based Services (LBS) are data acquired through smart-phone applications that collect location information while delivering various services (such as weather). This data typically represents "user activity" at a given location.

Visitor Activity Index

Streetlight reports a Visitor Activity Index (VAI) for each zone which represents a relative volume of visitors to the location based on LBS data. The index is not an actual count of visitors but can be used to compare relative visitation between sites.[31] The top 20 most visited public access sites in the region are outlined in Figure 27 and Table 18 below. Figure 28 is a map showing the visitor activity index for all existing sites in the inventory that had enough travel data to be analyzed.[32] The Virginia Beach oceanfront in the resort area claims the top position. Large municipal parks such as Sandy Bottom Nature Park in Hampton and Mount Trashmore in Virginia Beach comprise the majority of the remainder of the list. This is not surprising given the large number of water-related and non-water-related activities available at these popular locations.

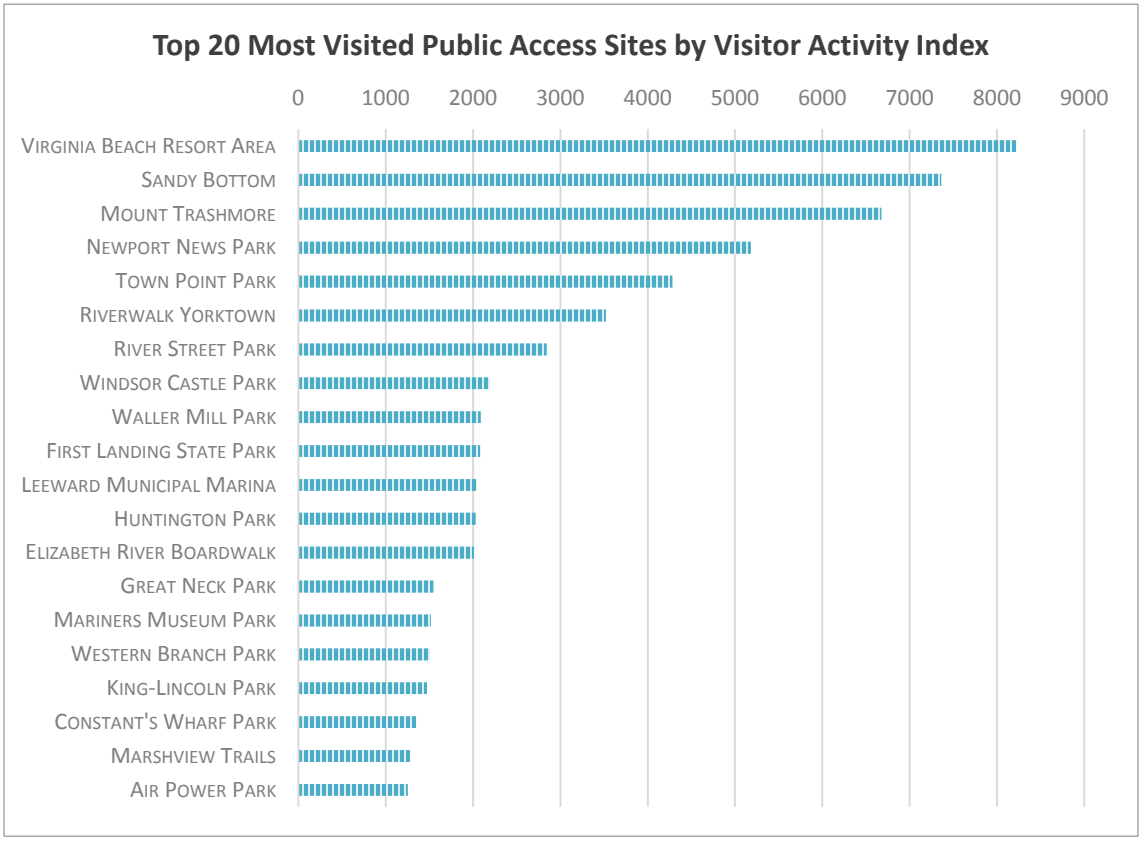


Figure 27. Visitor Activity Index (VAI) for the top 20 most visited water-access sites in Hampton Roads, based on Streetlight data analysis (see discussion on limitations later in the report). The VAI compares the relative volume of visitors; it does not represent an actual count of visitors.

[31] The analysis was run using an average from all days and times of the week with data from October 2016, January 2017, April 2017, and July 2017 to represent an entire year.
[32] Eighty-six out of 192 public access sites did not generate any travel data because of low volume (either low visitation or out of cell phone range).

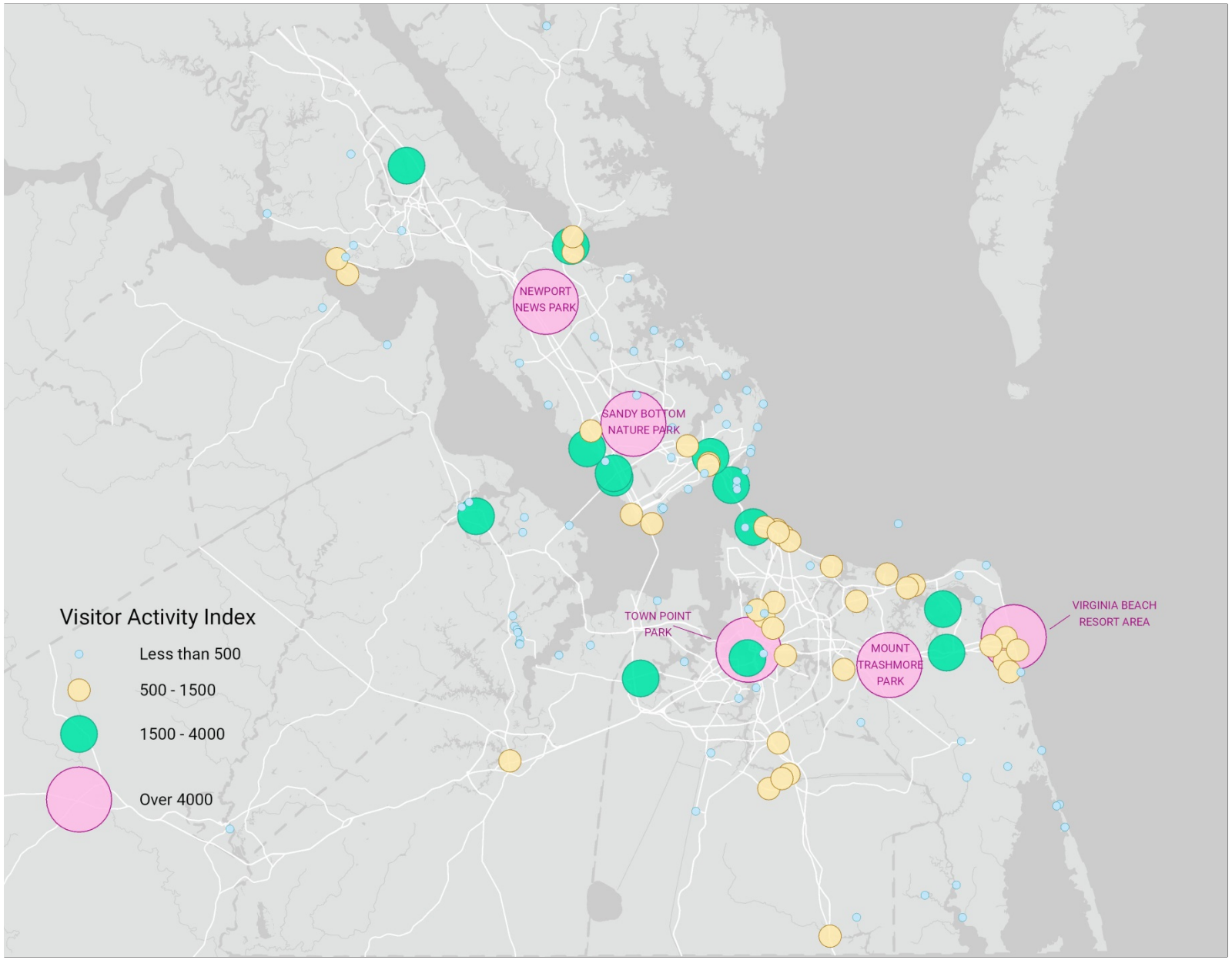


Figure 28. Visitor activity index for all existing public access sites in Hampton Roads.

Table 19. Visitor Activity Index (VAI) for the top 20 most visited water access sites in Hampton Roads by jurisdiction.

Rank	Site Name	Jurisdiction	VAI
1	Virginia Beach Resort Area	Virginia Beach	8223
2	Sandy Bottom	Hampton	7361
3	Mount Trashmore	Virginia Beach	6676
4	Newport News Park	Newport News	5182
5	Town Point Park	Norfolk	4282
6	Riverwalk Yorktown	York	3522
7	River Street Park	Hampton	2842
8	Windsor Castle Park	Smithfield	2191
9	Waller Mill Park	Williamsburg	2088
10	First Landing State Park	Virginia Beach	2082
11	Leeward Municipal Marina	Newport News	2043
12	Huntington Park	Newport News	2032
13	Elizabeth River Boardwalk	Portsmouth	2011
14	Great Neck Park	Virginia Beach	1545
15	Mariners Museum Park	Newport News	1517
16	Western Branch Park	Chesapeake	1501
17	King-Lincoln Park	Newport News	1474
18	Constant's Wharf Park	Suffolk	1348
19	Marshview Trails	Virginia Beach	1278
20	Air Power Park	Hampton	1253

Home Locations of Visitors

An innovative feature of the Streetlight travel data is the ability to determine the “home” and “work” locations for each visitor by analyzing where their cell phone spends the daytime and evening hours. All the LBS data is anonymous and aggregated before Streetlight analyzes it and converts it into one square kilometer grids. Each of the public access sites was analyzed in *Streetlight InSight* to determine the home grid for people who visited each particular public access site with the given parameters. Data samples from each quarter of the year were used to represent an average.[33]

Figure 29 shows the aggregation of all the home locations for visitors to all public access sites in the existing inventory for Hampton Roads in the timeframe chosen. Visitors to Hampton Roads water access sites came from nearly every state in the country. However, Virginia

[33] The analysis was run using an average from all days and times of the week with data from October 2016, January 2017, April 2017, and July 2017.

residents comprise an average of 85% of the visitors for all sites, followed by North Carolina at 4%, and Maryland at 2%.

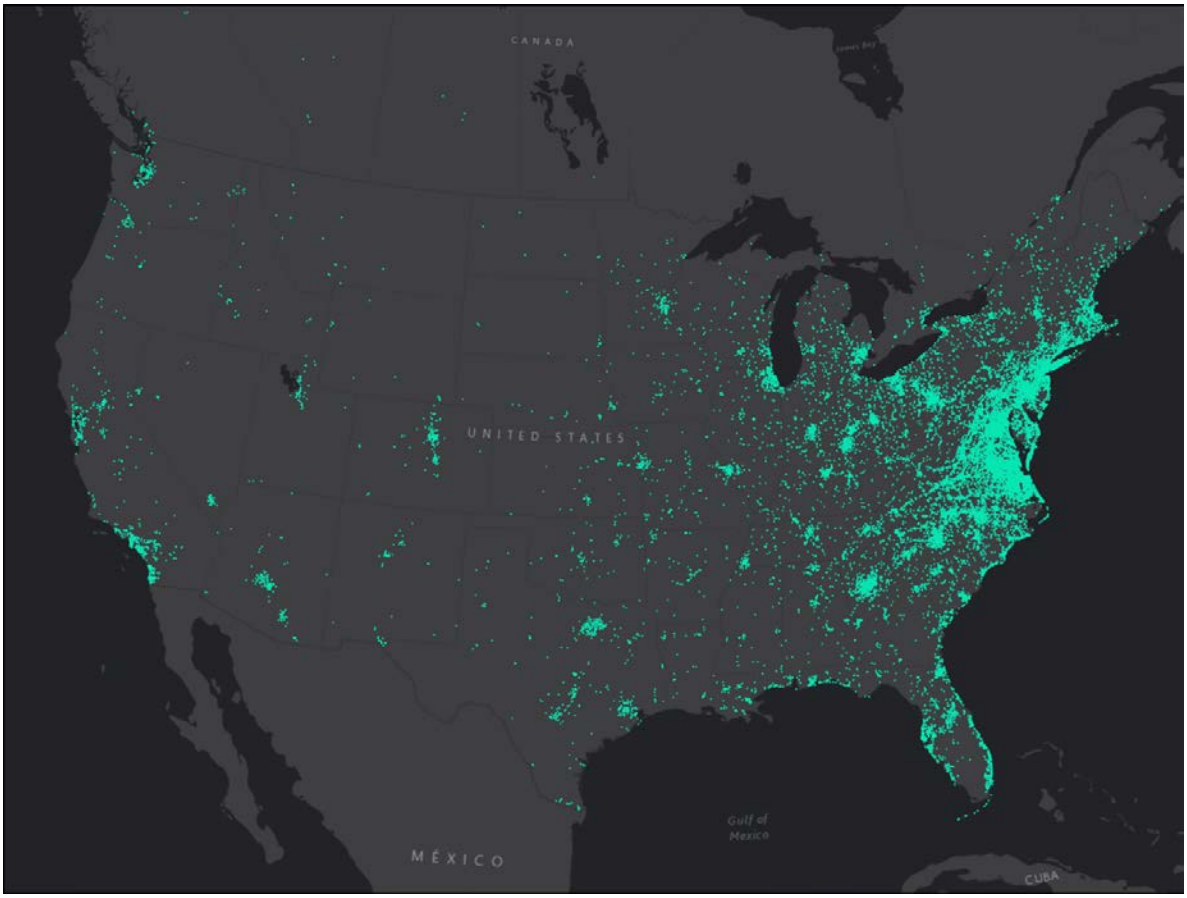


Figure 29. Map depicting the home locations of visitors to Hampton Roads water access sites

When looking at Hampton Roads as a whole, the analysis reveals several pockets in the region where higher concentrations of visitors to public water access sites live. The proportion of VAI for each access site that was visited by residents in the grid was combined into one value. The grids which have higher percentages of residents who visited any public access site in Hampton Roads are shown in red in Figure 30 and summarized below:

- **Virginia Beach**
  - Oceanfront area
  - Chic's Beach area
  - Salem area
- **Norfolk**
  - Oceanview area
  - Ghent/Colonial Place neighborhood
  - Downtown area
- **Hampton**
  - Fox Hill area

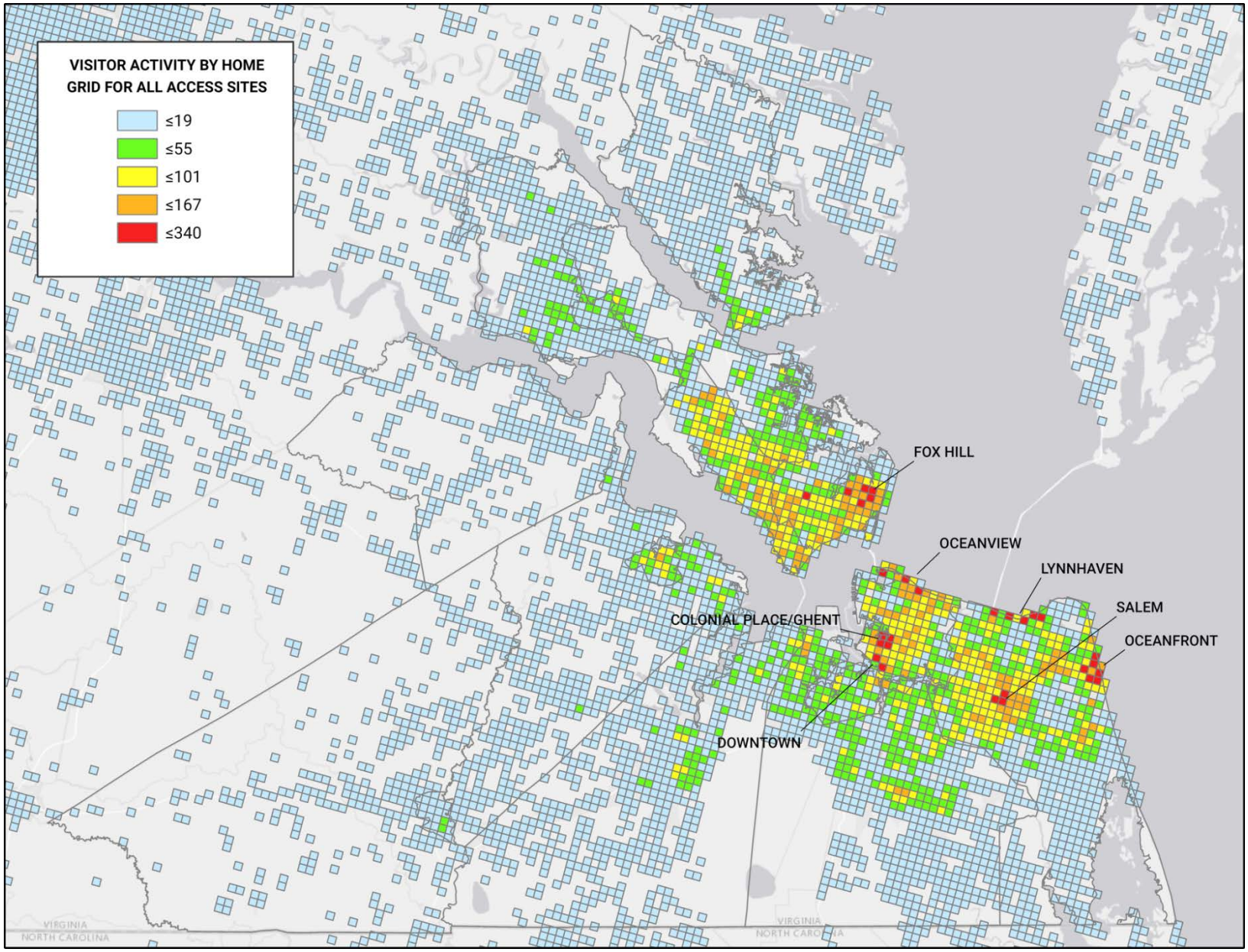


Figure 30. Sum of visitor activity by home grid for all water access sites in Hampton Roads

The regional visitor activity map shows an interesting pattern which can be compared to the maps of the density of boaters and anglers to see if there is any overlap. For example, Colonial Place and Ghent neighborhoods in Norfolk and the oceanfront neighborhoods in Virginia Beach have a high number of residents that have visited public access sites, but those areas do not have high densities of boaters or anglers. Conversely, the Lynnhaven, Little Creek, Salem and Fox Hill neighborhoods have both a high density of anglers and high visitation rates to all types of public access sites. Further studies can be done to determine which public access sites residents in a particular neighborhood are visiting.

The visitor activity was also analyzed by watershed to determine which catchments contain the most visitors to water access sites in Hampton Roads. Higher numbers indicate a larger number of people who live in that watershed visited water access sites in Hampton Roads. The top five watersheds by Visitor Activity are: the Elizabeth River, Lynnhaven River, Back River, Warwick/James River, and North Landing River, as shown on Figure 31.

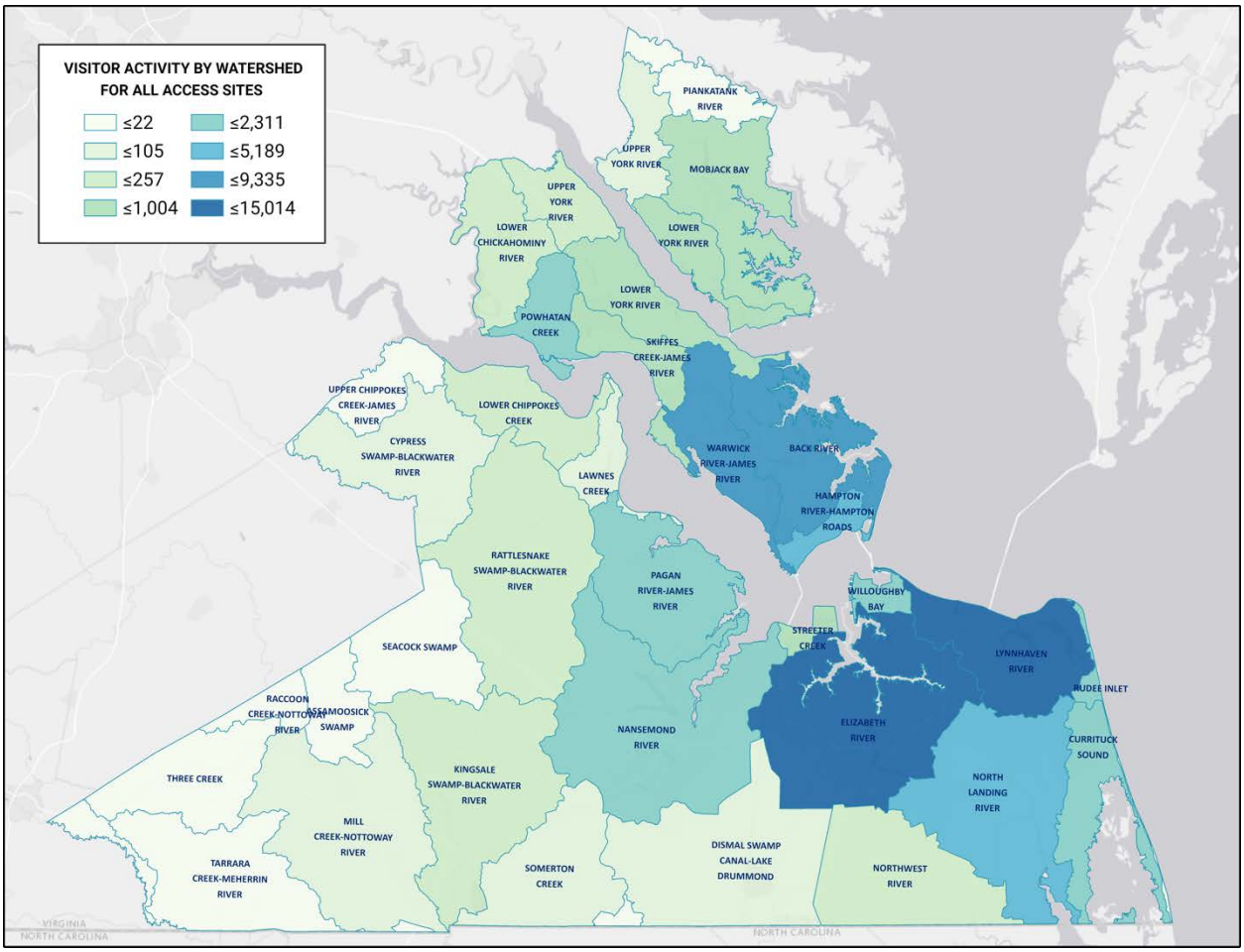


Figure 31. Visitor activity from all home grids aggregated by watershed.

Average Distance Traveled to Sites

The Streetlight LBS data also includes demographic information. This data is useful for broadly studying the characteristics of people who visit water access sites. One of the available metrics is the distance traveled by visitors to each site, broken out into categories by mileage. This information can reveal from how far away people are traveling to visit a particular site or learn which access sites people in a certain neighborhood are visiting. Combined with the results of the drive-time analysis, planners can identify potential gaps in access.

The average distance traveled was calculated for all water access sites as a whole. The LBS data reveals that on average, 75% of visitors to all of the region's water access sites lived closer than 25 miles. The largest percentage of visitors (23%) lives on average between 10 and 25 miles from the access sites. Only 35% of visitors live less than 5 miles away from sites they have previously visited (Table 19).

Table 19. Average distance visitors to water access sites in Hampton Roads traveled

Distance from Home of Visitors	Average for All Access Sites
Less than 1 mile	10%
1 to 3 miles	15%
3 to 5 miles	10%
5 to 10 miles	18%
10 to 25 miles	23%
25 to 50 miles	6%
50 to 100 miles	4%
Over 100 miles	15%

EXAMPLE CASE STUDY

Different patterns emerge based on the size and type of water access site. A comparison was done between three sample sites of varying size to investigate the differences between the Visitor Activity (VAI), home locations, and distance traveled.[34] The sites chosen were the Virginia Beach oceanfront, Gloucester Point Beach Park, and Sleepy Hole Park in Suffolk to represent large, medium, and small water access sites in different areas of the region.

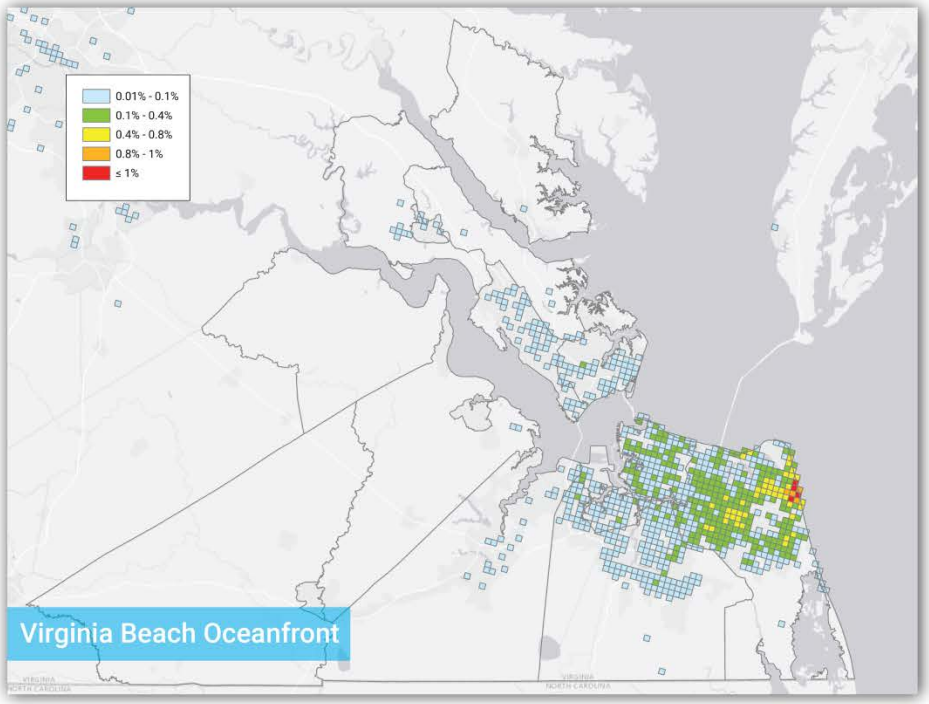
As shown in Figure 32, the oceanfront has a very large VAI compared to the other two locations.[35] The oceanfront primarily attracts visitors from across the Southside while Gloucester Point Beach primarily attracts visitors from the Peninsula and Middle Peninsula. A majority of Sleepy Hole Park visitors are from Suffolk and western Chesapeake. There is some cross over between the Peninsula and Southside but in general, it appears most visitors are not traveling to visit the sites on the opposite side of the water.

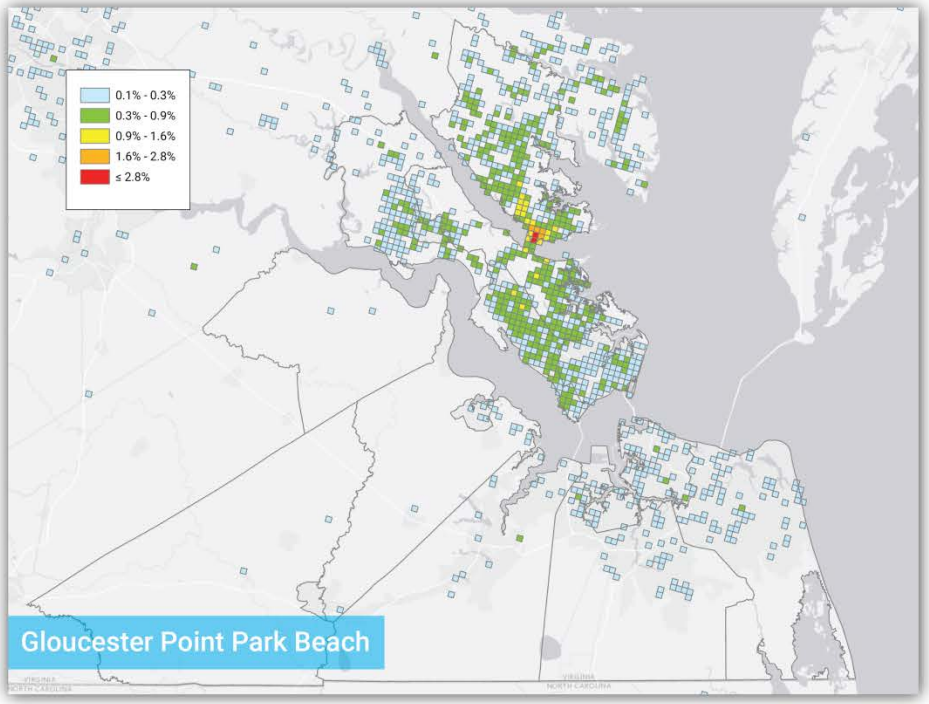
Because the oceanfront appeals to a wide range of people, particularly tourists, the home grids of visitors are not concentrated near the beach. Only 4% of visitors to the oceanfront live less than a mile away. At Gloucester Point Beach, about 6% of the visitors live less than a mile away but Sleepy Hole Park attracts 27% of its visitors from less than one mile away and nearly 50% live within five miles. In contrast, 45% of the visitors to the oceanfront live over 100 miles away whereas only 14% of Gloucester Point Beach Park and visitors 7% of Sleepy Hole Park live over 100 miles away.

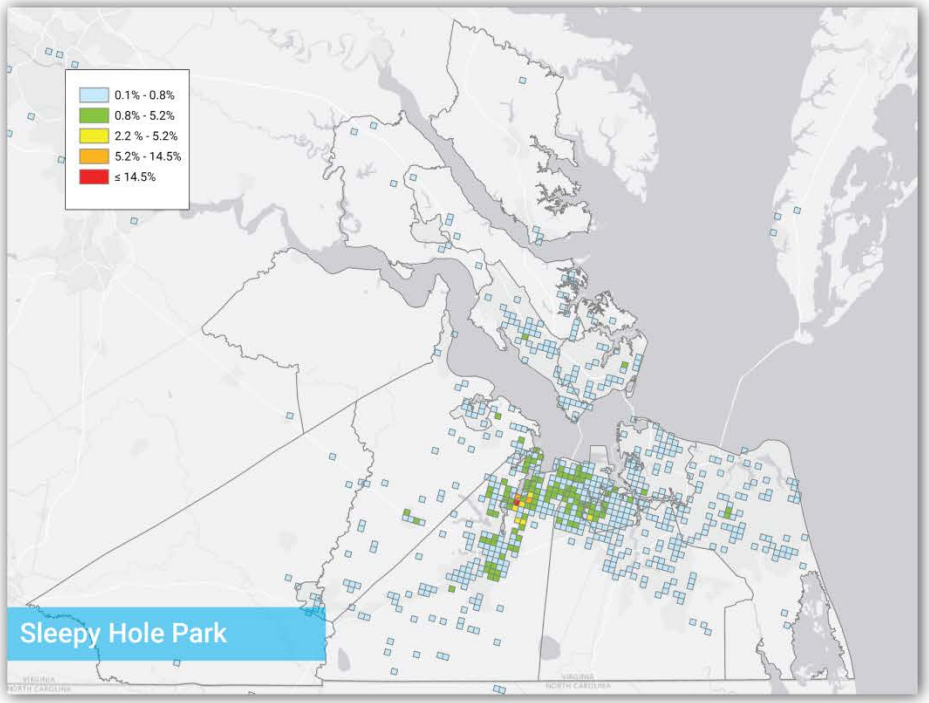
The Streetlight data has potential to inform not only recreational planners but also tourism officials with this type of analysis.

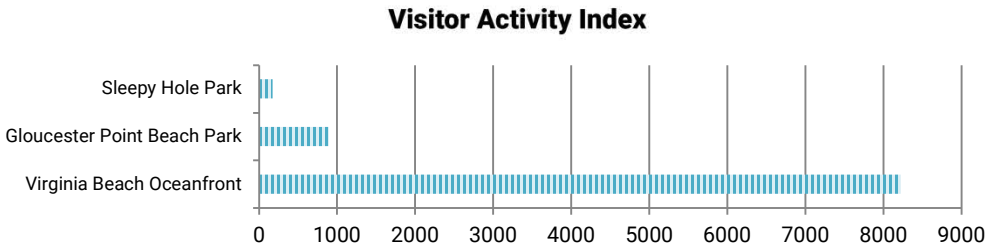
[34] The same Streetlight data criteria were used as the previous analysis.
[35] The analysis zone encompasses the area from approximately 21st St to 31st St between Atlantic Ave. and the beach.

Percent of Visitors to Access Site by Home Grid









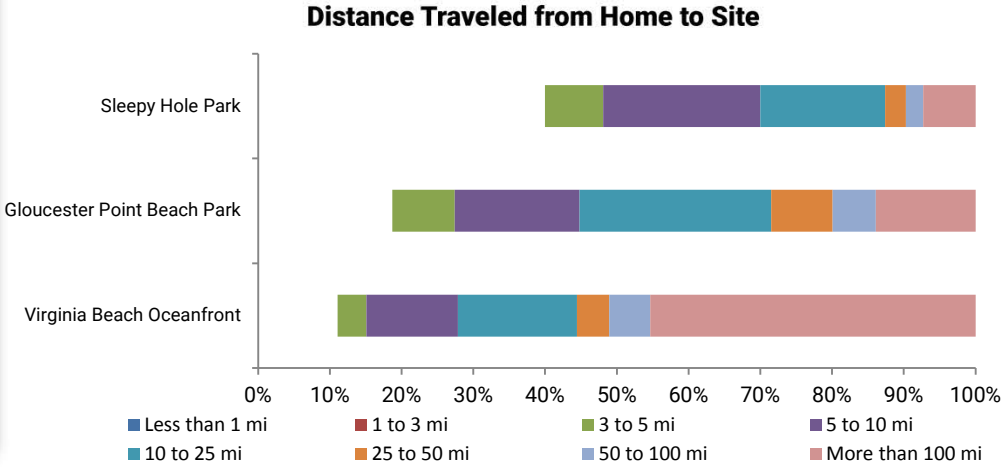


Figure 32. Case study results.

LIMITATIONS OF TRAVEL DATA

While very useful for planning, there are some limitations to be aware of when using the LBS data via *Streetlight InSight*. Projects should be planned accordingly.

Size of analysis zones allowed in Streetlight

The application limits the size of the zone to four square kilometers. Zones were created to capture data at and near the main entrance to a facility if it was larger than allowed. Large access sites may need to have more than one zone.

Inability to distinguish types of use by visitors

The LBS data cannot determine which activities a visitor engaged in at a particular site. While all sites in the existing inventory have water-related activities available, not all activities (such as ball parks) are related to the water. The Home-Work Analysis is best for providing broad pictures of visitation to a specific site to compare to others in the area. It is useful for tourism studies and providing general information on level of activity. There are other more specific traffic studies that can be conducted in *Streetlight InSight* which can potentially provide more detailed information about a specific water access site.

Low or no travel data

If there are not enough visitors to a particular site, or the site is out of cell phone range, then no travel data can be generated. Similarly, if there is no access by car to the site, then the analysis most likely will not generate travel data.

LBS data accuracy

The LBS data is not as precise as GPS positions so there may be some influence from nearby major roads which inflate the visitor index for some smaller sites. The influence on each zone can occur within a 250-meter buffer however, cell phone data that are triangulated more closely to the zone are weighted higher by Streetlight. For this project, zones were created to try and avoid major highways if possible, but many sites are near or adjacent to busy roads.

Discussion

While nearly 98% of the population of Hampton Roads lives within a 30-minute drive of a public water access location, opportunities to enhance public access exist in both rural and urban settings. Within the western portion of Hampton Roads, the northern stretches of the Blackwater River currently lack any form of public access. The Nottoway River, also located in Southampton County, currently has one kayak launch and nearly 19 miles between consecutive boat access points. A more detailed assessment of the Blackwater River and Nottoway River conditions would inform whether development of a paddling trail is feasible, although both are already designated as a Virginia Scenic Rivers. Along the portion of the James River spanning James City County and the City of Newport News, there is over a 20-mile stretch of the river that lacks paddling and boating access along the northern/eastern bank which also represents an opportunity to provide public water access.

The eastern, southern, and western branches of the Elizabeth River currently contain kayak and boat access points; however, they are likely insufficient to meet the demand of the densely populated area given that the Elizabeth River watershed has the greatest number of boat owners and licensed anglers in the region. Although there are over 2,000 boat owners in the Nansemond River watershed, the Nansemond River proper currently lacks public boat ramps. While local master plans addressed gaps along the Nansemond River and eastern branch of the Elizabeth River, the plans reviewed for this study did not provide detailed suggestions for improving access along the Blackwater River, Nottoway River, and northern banks for the James River. Increasing access along these waterways would enhance the blueways network of the region.

The visitor analysis reveals that visitors to each site tend to live closer to the site but the percentage varies based on the type and size of the site. Streetlight data analysis combined with the watershed analysis should be explored in more depth to inform the planning process by painting a picture of the recreational behavior of residents in specific areas.

To help prioritize future public access site development, factors such as community population and distance to existing sites should be considered. For example, the planned Normandy Avenue site in Virginia Beach was identified as a priority future site in this analysis and would reduce travel time to a water access location for nearly 19,000 residents. The Virginia Beach City Council recently approved acquisition of the Normandy Avenue property for creation of a public park in November 2017 (City of Virginia Beach, 2017). The development of this park is a collaborative effort involving the City of Virginia Beach, Living River Restoration Trust (including the Elizabeth River Project), the Virginia Outdoor Foundation, and Virginia Department of Conservation and Recreation.

Given the diversity of opportunities and limited funding, it is important to recognize tradeoffs when prioritizing public access projects. While population, travel time, stream distance, and travel data were addressed in this analysis, other factors such as cost, availability of parking,

and level of post-construction maintenance required should also be considered. A future direction for this analysis may involve collaborating with local planners to develop a formal potential project scoring index to help prioritize projects for the benefit of the region.

Noland Trail at Mariners' Museum Park in Newport News. Photo by HRPDC/Gordon.

V. Funding Opportunities for Public Access

Although many, if not most, public access projects are funded through locality funds, grants from non-governmental organizations, state agencies, or the federal government can provide significant boosts to help local projects get built or improved. There are a variety of sources for funding or other assistance that are available to local governments in Hampton Roads. Some of these sources are summarized below.

Boating Infrastructure Grant (BIG) Program, Tier 1

Source: U.S. Fish and Wildlife Service, U.S. Department of the Interior (Federal)

State Agency: Virginia Department of Health

Regularly Available: Yes (annually)

Eligible Applicants: State Agencies

Amount Available: $4-$5 million for FY2018 total $200,000 per state maximum

Match Required: 25% of project costs (minimum)

Eligible Activities: Construction, renovation, and maintenance of publicly or privately-owned boating infrastructure facilities for transient recreational vessels at least 26 feet long that are operated, leased, rented, or chartered primarily for pleasure.

More information: http://www.vdh.virginia.gov/environmental-health/marina-program/big-program-marinas/

Funding Announcement: http://www.vdh.virginia.gov/content/uploads/sites/20/2016/07/FY-2018-BIG-Tier-1-Notice-of-Funding-Opportunity-NOFO-F17AS00214.pdf

Boating Infrastructure Grant (BIG) Program, Tier 2

Source: U.S. Fish and Wildlife Service, U.S. Department of the Interior (Federal)

State Agency: Virginia Department of Health

Regularly Available: Yes (annually)

Eligible Applicants: State Agencies

Amount Available: $8 million for FY2018 total; $1.5 million per application maximum

Match Required: 25% of project costs (minimum)

Eligible Activities: Construction, renovation, and maintenance of publicly or privately-owned boating infrastructure facilities for transient recreational vessels at least 26 feet long that are operated, leased, rented, or chartered primarily for pleasure.

More information: http://www.vdh.virginia.gov/environmental-health/marina-program/big-program-marinas/

Funding Announcement: http://www.vdh.virginia.gov/content/uploads/sites/20/2016/07/FY-2018-BIG-Tier-2-Notice-of-Funding-Opportunity-NOFO-F17AS00215.pdf

Clean Vessel Act Program

Source: U.S. Fish and Wildlife Service, U.S. Department of the Interior (Federal)

State Agency: Virginia Department of Health

Regularly Available: Yes (annually)

Eligible Applicants: State Agencies

Amount Available: Unknown

Match Required: 25% of project costs (minimum)

Eligible Activities: Construction, renovation, operation, and maintenance of sewage pump-out stations and sanitary waste reception facilities.

More information: http://www.vdh.virginia.gov/environmental-health/marina-program/cva-grant-marinas/

Funding Announcement: Not available

Coastal Zone Management Program Section 306a

Source: National Oceanic and Atmospheric Administration, U.S. Department of Commerce (Federal)

State Agency: Virginia Coastal Zone Management Program, Virginia Department of Environmental Quality

Regularly Available: No (depends on annual program priorities)

Eligible Applicants: Varies (Coastal Planning District Commissions and state agencies, historically)

Amount Available: Varies

Match Required: 50% of project costs (minimum)

Eligible Activities: acquisition of fee simple and other interests in land, low-cost construction projects, and habitat restoration projects

More information: http://www.deq.virginia.gov/Programs/CoastalZoneManagement/Funds,Initiatives,Projects.aspx

Funding Announcement: Not available

Coastal and Estuarine Land Conservation Program (CELCP)

Source: National Oceanic and Atmospheric Administration, U.S. Department of Commerce (Federal)

State Agency: Virginia Coastal Zone Management Program, Virginia Department of Environmental Quality

Regularly Available: No (depends on congressional appropriation)

Eligible Applicants: States (local governments or other public entities may submit project proposals to their states for inclusion in the state application)

Amount Available: Varies

Match Required: 50% of project costs (minimum)

Eligible Activities: acquisition of fee simple and other interests in coastal and estuarine lands as defined by approved state coastal and estuarine land conservation plans

More information: https://coast.noaa.gov/czm/landconservation/

Funding Announcement: Not available

Land and Water Conservation Fund

Source: National Park Service, U.S. Department of the Interior (Federal)

State Agency: Virginia Department of Conservation and Recreation

Regularly Available: Yes (annually, but depends on congressional appropriation)

Eligible Applicants: State and local governments, park and recreation authorities, tribal governments

Amount Available: approximately $2.6 million for FY18 total; $250,000 to $500,000 per project

Match Required: 50% of project costs (minimum)

Eligible Activities: acquisition, development, and planning of public outdoor recreation areas and facilities.

More information: http://www.dcr.virginia.gov/recreational-planning/lwcf

Funding Announcement: Not available

Virginia Recreational Access Program

Source: Commonwealth Transportation Board

State Agency: Virginia Department of Transportation

Regularly Available: Yes (annually)

Eligible Applicants: counties, cities, and designated towns

Amount Available: varies

Match Required: program includes both unmatched allocations and funds that require a match

Eligible Activities: construction of access roads or bikeways to or within public recreational areas

More information: http://www.virginiadot.org/business/local-assistance-access-programs.asp

Funding Announcement: Not available

Open-Space Lands Preservation Trust Fund

Source: Virginia Outdoors Foundation

State Agency: N/A

Regularly Available: Yes (annually)

Eligible Applicants: landowners, localities

Amount Available: $600,000 for FY18 total

Match Required: 50%

Eligible Activities: Open-space easements that result in new outdoor recreation and education opportunities for the public

More information: http://www.virginiaoutdoorsfoundation.org/protect/open-space-lands-preservation-trust-fund/

Funding Announcement: http://www.virginiaoutdoorsfoundation.org/2017/11/vof-announces-grant-opportunity-easements-include-public-access/

Virginia Saltwater Recreational Fishing Development Fund

Source: Virginia Marine Resources Commission

State Agency: Virginia Marine Resources Commission

Regularly Available: Yes (annually)

Eligible Applicants: counties, cities, and designated towns

Amount Available: varies

Match Required: 25% match in cash or land

Eligible Activities: conserving and enhancing finish species taken by recreational anglers, enforcing certain provisions of state law and associated regulations, improving recreational fishing opportunities (including facilities or other access projects), administrating the Virginia Saltwater Sport Fishing Tournament certificates program, obtaining necessary data and research

More information: http://www.mrc.virginia.gov/vsrfdf/index.shtm

Funding Announcement: http://www.mrc.virginia.gov/vsrfdf/application.shtm

Recreational Trails Program

Source: Federal Highway Administration
State Agency: Virginia Department of Conservation and Recreation

Regularly Available: Yes (annually)

Eligible Applicants: localities, public bodies, and registered (tax-exempt) nonprofit organizations partnering with governmental bodies

Amount Available: approximately $1.5 million FY17 total; $100,000 minimum request per project; $300,000 maximum request per project

Match Required: 20%

Eligible Activities: building and rehabilitation of trails and trail-related facilities

More information: http://www.dcr.virginia.gov/recreational-planning/trailfnd

Funding Announcement: Not available

Virginia Land Conservation Fund

Source: Virginia Land Conservation Foundation

State Agency: Virginia Department of Conservation and Recreation

Regularly Available: Yes (annually)

Eligible Applicants: state agencies, localities, public bodies, and registered (tax-exempt) nonprofit organizations

Amount Available: $900,000 for natural area preservation FY18 total; $900,000 for open space and parks FY18 total; $900,000 for historic area preservation FY18 total; $10,000 minimum total project cost

Match Required: 50% match for non-state agency applicants

Eligible Activities: acquisition of land or easements on land for development of public recreational and/or open space purposes, to protect habitats of rare, threatened, or endangered plant or animal species or state-significant natural communities or natural areas, or for protection or preservation of historic, archaeological, cultural, or historic landscape resources

More information: http://www.dcr.virginia.gov/virginia-land-conservation-foundation/

Funding Announcement: Not available

Public Access Authorities

In addition to grant programs, local governments may have other authorities or powers available to them to assist in promoting public access. One example of this in Virginia is a public access authority. Public access authorities are specially created organizations charged with obtaining and holding land for public access and other purposes as determined by law. There are two public access authorities in Virginia, the Middle Peninsula Public Access Authority[36] and the Northern Neck Chesapeake Bay Public Access Authority,[37] each authorized by enabling legislation from the General Assembly.[38] [39] The General Assembly has also authorized a public access authority for the Eastern Shore.[40] Although authorized by the General Assembly for the entire planning district, participation by local governments is voluntary.

The main purpose of public access authorities is to improve public access to the water within its region. Public access authorities can acquire or otherwise establish and operate public access sites, including the construction of facilities on those sites. They can also charge for the use of the facilities. Public access authorities can be funded through public bodies or private donations and can own land in fee simple. Lands donated to public access authorities can provide donors with state and federal tax credits.

Although many if not all of the tasks that public access authorities are authorized to do can be performed by individual local governments or land trusts, the authorities have three primary benefits that may make a public access authority worth considering in Hampton Roads. First, as a specially created body, the board of a public access authority is equipped and empowered to act quickly, which can be important when considering donations of land. Second, a public access authority is solely focused on a single mission, which makes public access a higher priority than it is for a local government which must attend to many different issues. Third, compared to land trusts or other conservation easement-based organizations, public access authorities do not have to place any restrictions on the lands they acquire. Authority-owned land can be sold to help fund improvements on other properties or to acquire other land. These benefits can make public access authorities a powerful tool for regions looking to increase public access to the water. The Middle Peninsula Public Access Authority has had particular success in the years since it was created and now owns more than a dozen sites and easements.[41]

[36] http://www.virginiacoastalaccess.net/MPPAA_authority.html
[37] http://www.northernneck.us/public-access-authority/
[38] § 15.2-6600
[39] § 15.2-6626
[40] Code of Virginia § 15.2-7400
[41] http://www.virginiacoastalaccess.net/MPPAA_sites.html

VI. Public Outreach

Traditionally, information about public access sites has been distributed via paper maps, books, or even on static web sites. The public is generally comfortable with accessing information this way, but printed materials cannot be updated on a regular basis and are expensive to reproduce. Static web sites can be updated but are not the practical to access a large inventory on-the-go, particularly if there are only descriptions without maps. Instead of developing a large folded static map, HRPDC staff chose to produce the existing inventory of public access sites via an interactive, dynamic web mapping application (or geo app) and advertise the availability of the geo app with printed materials. The type of printed material was selected based on a survey of outdoor recreation outfitters and related businesses.

Water Access Sites Geo App

The geo app was created using Esri's WebApp Builder, available in ArcGIS Online. The application is accessed via a URL and does not need to be downloaded to a device. An easy-to-remember URL was chosen to market the geo app to the public: FishSwimPlay.com. A logo was also developed to help brand the site:

FISHSWIMPLAY.COM

FIND WATER ACCESS SITES IN HAMPTON ROADS

The geo app contains several layers for regional blueways and multi-use trails in addition to the public access inventory. The geo app is configured with several out-of-the-box widgets which allow the user to search the existing inventory on a map of Hampton Roads. Users can explore the inventory by clicking on the map or search for sites in numerous ways. The interface is quite simple yet powerful in ways that static formats cannot compete with.

A detailed description of each of the tools is available in the geo app by clicking on the information "i" button in the tool bar. A view of the geo app is shown in Figure 33.

The HRPDC plans to maintain the public access sites inventory and the geo app in the future with updates added as needed.

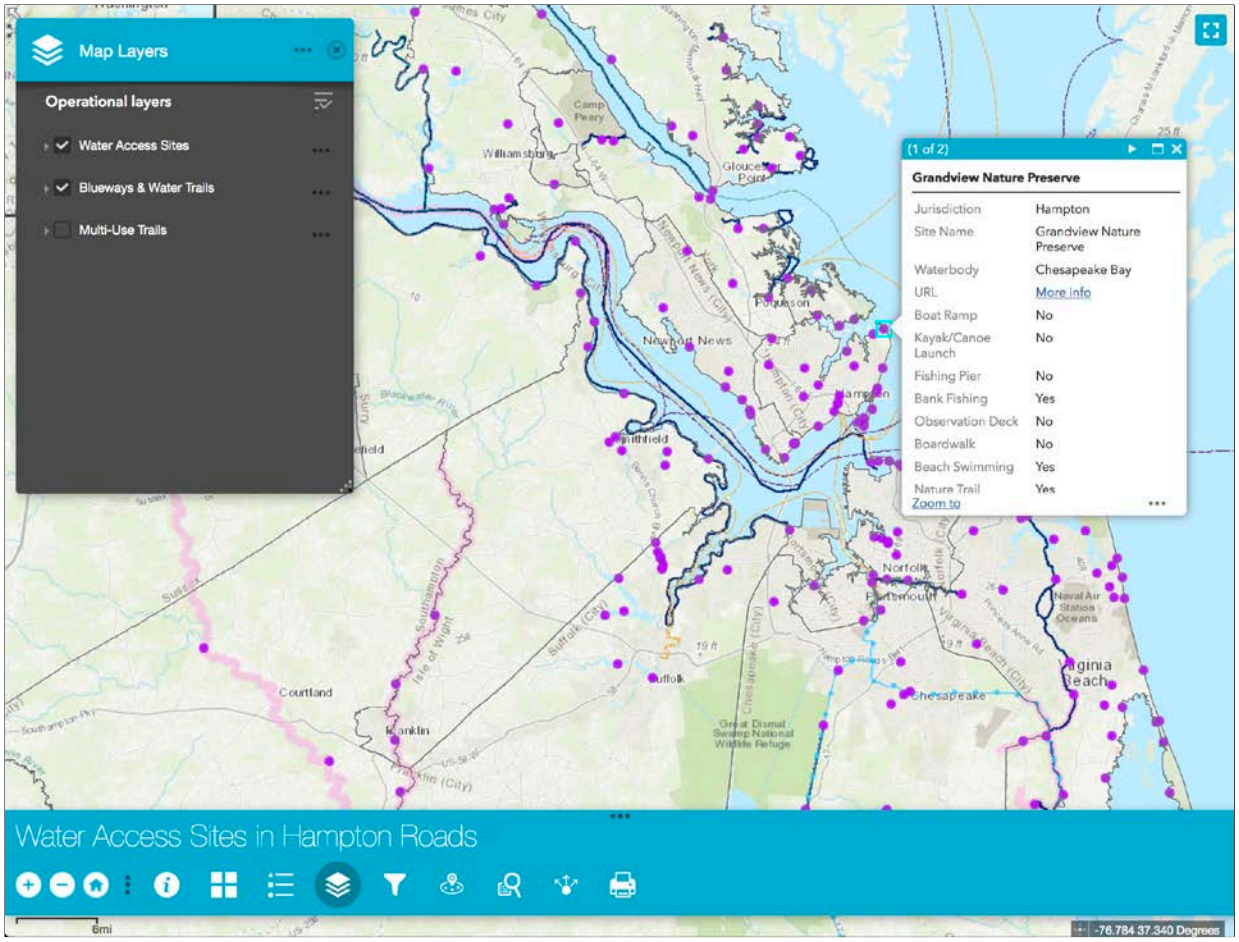


Figure 33. Screenshot of the Water Access Geo App

Survey of Businesses

To assess methods of public outreach regarding the interactive online map, outfitters and related businesses within the Hampton Roads region were contacted to complete an online survey. The survey asked business managers to identify the types of water-related recreational information that their customers request and to select their preferred outreach method to promote the geo app. Representatives from 10 outfitter locations completed the survey and answered the question: "What would be the best way to advertise the link to the online map?" Half of the respondents chose a single rack card or a tri-fold brochure. Other choices included fold-up maps or business cards. One respondent suggested promoting the link via social media sites.

A single rack card format was identified as the preferred outreach material since this type of brochure received the most responses. While tri-fold pamphlets, fold-up maps, and business cards received an equal number of replies, business cards were selected as a secondary outreach method because this format is economical to produce in large quantities and can be easily distributed to a large number of people. One respondent who chose business cards as a

preferred method stated, “We could hand them out easily, keep them at the register, or place one in every bag for every transaction.”

Brochure

The goal of the brochure design was to capture the reader’s attention and quickly convey the availability of the geo app. The front of the rack card introduces the web address FishSwimPlay.com and briefly describes the available content. The back of the card provides more details about the tools available in the application. A business card was also designed, which is a condensed version of the rack card meant to provide basic information on how to access the geo app.

The rack cards and business cards will be made available to localities, businesses, or other interested agencies for distribution to the public.

VII. Conclusions and Next Steps

Hampton Roads boasts numerous public access opportunities for its 1.7 million residents. From the Virginia Beach oceanfront to small kayak launches and nature trails, there are public access sites across the region that appeal to a wide audience. Nearly 98% of residents are within a 30-minute drive of a site. However, there are still opportunities to fill in access gaps to create a more connected and cohesive network for Hampton Roads which can be promoted locally and across the state and the nation. These gaps reflect both a sheer lack of access in some areas but also gaps created in underserved areas where there is higher demand.

Gaps created by a lack of access are primarily in rural Hampton Roads localities. Several watersheds have no access at all. This also creates an issue when looking at connectivity between sites for boaters. For example, some river segments along the James, Blackwater, Nansemond, and Nottoway Rivers have gaps of 15 to 20 miles between boat ramps or kayak launches. With the Nottoway and Blackwater designated as Scenic Waterways, there may be an opportunity to create a new blueway.

In more developed areas, the major impediments are geographic gaps and an overall lack of capacity. Larger population areas in the region have a higher overall demand for access, which requires more access points. For example, the Elizabeth River watershed has the highest overall amount of participation in boating and fishing as well as the highest visitor activity in the region. However, the challenge for reducing gaps or increasing capacity in developed areas is not necessarily funding—it can also be limited availability of public land.

This plan builds on previous efforts by the HRPDC and its member localities to promote public access and is the first step in taking a comprehensive, regional view on public access planning in Hampton Roads. Through this process, the HRPDC has analyzed the current state of access to the water in the region and started to identify opportunities for improving access. This project has also resulted in an online, interactive map that will make information on public access widely available to the general public and to local planners. This project has also helped identify future work for the state, regional and local planners when considering the expansion of public access in the future. Examples of potential next steps include:

- Conducting additional local surveys to better determine how residents participate in water-based activities at the community and sub-community scales
- Conducting additional analysis of travel time and other data to refine gap analyses
- Developing metrics and conducting additional analysis to evaluate and rank potential projects
- Exploring Streetlight data in greater depth to identify how access points vary in terms of who they serve (local audiences, statewide, national, etc.)

- Inventory of public versus private land ownership
- Special studies for specific watersheds or waterbodies
- Considering the creation of a public access authority in Hampton Roads to coordinate and assist localities with acquiring land for new projects

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IX. Appendices

Appendix A: Existing Water Access Sites Inventory

Newport News Park in Newport News. Photo courtesy of Shutterstock.

Jurisdiction	Access Site Name	Waterbody	Access Control	Boat Ramp	Kayak/Canoe Launch	Fishing Pier	Bank Fishing	Observation Deck	Boardwalk	Beach Swimming	Nature Trail	Latitude	Longitude
Chesapeake	A Place for Girls Nellie Hayse Site	Belles Mill Creek	Private/Public Access	No	Yes	No	No	Yes	Yes	No	Yes	36.7116541	-76.2710758
Chesapeake	Baum Rd	Smith Creek	Locality	No	Yes	No	No	No	No	No	No	36.5773	-76.1308
Chesapeake	Bells Mill Park	Elizabeth River	Locality	No	No	No	No	No	No	No	Yes	36.7212695	-76.2551954
Chesapeake	Bob's Fishing Hole	Northwest River	Private/Public Access	Yes	Yes	No	Yes	No	No	No	No	36.568833	-76.1988661
Chesapeake	Bunch Walnuts Bridge	Northwest River	Locality	No	Yes	No	No	No	No	No	No	36.6017824	-76.2767259
Chesapeake	Deep Creek Lock Park	Deep Creek	Locality	No	Yes	No	Yes	Yes	No	No	Yes	36.7464829	-76.3403572
Chesapeake	Dismal Swamp Canal Trail North	Dismal Swamp Canal	Locality	No	Yes	No	Yes	No	No	No	Yes	36.6902018	-76.3587426
Chesapeake	Dismal Swamp Canal Trail South	Dismal Swamp Canal	Locality	Yes	Yes	No	No	No	No	No	Yes	36.601056	-76.382606
Chesapeake	Elizabeth River Park	Elizabeth River	Locality	Yes	Yes	Yes	No	No	No	No	Yes	36.8090853	-76.2855536
Chesapeake	Great Bridge Lock Park	Elizabeth River	Locality	Yes	Yes	No	Yes	No	No	No	Yes	36.7254423	-76.2468756
Chesapeake	Indian Creek Launch	Indian Creek	Locality	No	Yes	No	No	No	No	No	No	36.5868211	-76.166893
Chesapeake	Northwest River Park	Northwest River	Locality	No	Yes	Yes	No	Yes	No	No	Yes	36.5721124	-76.1590817
Chesapeake	Oak Grove Lake Park	Oak Grove Lake	Locality	No	No	No	Yes	Yes	No	No	Yes	36.7556832	-76.2593891
Chesapeake	TNC Observation Deck (Only accessible via water)	North Landing River	Nature Conservancy	No	Yes	No	No	Yes	No	No	No	36.6785992	-76.0702131
Chesapeake	Western Branch Park	Elizabeth River	Locality	No	No	No	No	No	No	No	Yes	36.8187004	-76.4240473
Franklin	Blackwater Landing	Blackwater River	DGIF	Yes	No	No	No	No	No	No	No	36.6741164	-76.9170014
Gloucester	Beaverdam Park Fary's Mill Entrance	Beaverdam Lake	Locality	Yes	Yes	No	Yes	No	No	No	Yes	37.4712763	-76.5621945
Gloucester	Beaverdam Park Main Entrance	Beaverdam Lake	Locality	Yes	Yes	No	Yes	No	No	No	Yes	37.4489921	-76.5344016
Gloucester	Cappahosic Landing	York River	VDOT	Yes	Yes	No	Yes	No	No	Yes	No	37.3803229	-76.6356586
Gloucester	Cedar Bush Oliver's Landing	York River	VDOT	Yes	Yes	No	Yes	No	No	No	No	37.3112157	-76.5566306
Gloucester	Cherry Point Landing	Severn River	VDOT	No	Yes	No	Yes	No	No	No	No	37.2872702	-76.4641237
Gloucester	Deep Point Landing	Piankatank River	DGIF	Yes	Yes	No	Yes	No	No	No	No	37.5361229	-76.4953889
Gloucester	Field's Landing	York River	VDOT	No	Yes	No	Yes	No	No	No	No	37.3022112	-76.5303269
Gloucester	Glass Point Landing	Severn River	Locality	No	Yes	No	No	No	No	No	No	37.313674	-76.443963
Gloucester	Gloucester Point Beach Park	York River	DGIF	Yes	Yes	Yes	No	No	No	Yes	No	37.2453998	-76.5037657
Gloucester	Guinea Landing	Mobjack Bay	VDOT	No	Yes	No	No	No	No	No	No	37.3006699	-76.4037306
Gloucester	John's Point Landing	Severn River	VDOT	No	Yes	No	Yes	No	No	No	No	37.3323148	-76.4448432

Jurisdiction	Access Site Name	Waterbody	Access Control	Boat Ramp	Kayak/Canoe Launch	Fishing Pier	Bank Fishing	Observation Deck	Boardwalk	Beach Swimming	Nature Trail	Latitude	Longitude
Gloucester	Maundy Creek	Maundy Creek	Locality	No	Yes	No	No	No	No	No	No	37.2812578	-76.3902102
Gloucester	Miller's Landing	Poropotank River	VDOT	No	Yes	No	Yes	No	No	No	No	37.469692	-76.6538602
Gloucester	Payne's Landing	Ware River	Locality	No	Yes	No	No	No	No	No	No	37.3691531	-76.4855368
Gloucester	Perrin Wharf	Perrin River	Locality	Yes	Yes	Yes	No	No	No	No	No	37.2677915	-76.4263175
Gloucester	Severn Landing	Mobjack Bay	VDOT	No	Yes	No	No	No	No	No	No	37.2990521	-76.4452136
Gloucester	Tanyard Landing	Porpoptank River	DGIF	Yes	Yes	No	Yes	No	No	No	No	37.4547034	-76.6676189
Gloucester	Warehouse Landing	Ware River	DGIF	Yes	Yes	No	Yes	No	No	No	No	37.403433	-76.4898212
Hampton	Air Power Park	Newmarket Creek	Locality	No	Yes	No	No	No	No	No	No	37.0430722	-76.3665483
Hampton	Armistead Point Park	Armistead Pointe Pond	Locality	No	No	No	Yes	No	No	No	No	37.0605843	-76.3835376
Hampton	Bethel Park	Bethel Reservoir	Private/Public Access	Yes	Yes	Yes	No	No	No	No	Yes	37.0921167	-76.4273596
Hampton	Bluebird Gap Farm	Newmarket Creek	Locality	No	Yes	No	No	No	No	No	Yes	37.0318699	-76.3861334
Hampton	Buckroe Beach Park	Hampton Roads	Locality	No	Yes	No	No	Yes	No	Yes	No	37.039857	-76.2898667
Hampton	Chesapeake Avenue - Hampton Roads Harbor Overlook	Hampton Roads	Locality	No	No	No	No	Yes	No	No	No	37.0011745	-76.3658953
Hampton	Dandy Point/Fox Hill Landing	Back River	DGIF	Yes	No	No	Yes	No	No	No	No	37.096216	-76.2946605
Hampton	Downtown Marina	Hampton River	Locality	Yes	No	No	No	Yes	Yes	No	No	37.0242286	-76.3414826
Hampton	Engineer Wharf Fishing Pier	Chesapeake Bay	Private/Public Access	No	No	Yes	No	No	No	No	No	37.00064	-76.3070692
Hampton	Fort Monroe Launch	Mill Creek	Private/Public Access	No	Yes	No	No	No	No	No	No	37.0091693	-76.3072855
Hampton	Fort Monroe National Monument	Hampton Roads	NPS	No	No	No	No	Yes	Yes	No	Yes	37.0035714	-76.3076795
Hampton	Fort Worth Overlook	Harris Creek	Locality	No	No	No	No	Yes	No	No	No	37.0635116	-76.3194064
Hampton	Gosnold's Hope Park	Back River	Locality	Yes	Yes	No	No	No	Yes	No	Yes	37.0786276	-76.3292478
Hampton	Grandview Nature Preserve	Chesapeake Bay	Locality	No	No	No	Yes	No	No	Yes	Yes	37.101065	-76.280922
Hampton	James T. Wilson Fishing Pier	Hampton Roads	Locality	No	No	Yes	No	No	No	No	No	37.0363142	-76.2905509
Hampton	Mill Point Park	Hampton River	Locality	No	Yes	No	No	Yes	Yes	No	No	37.0262795	-76.3407778
Hampton	Old Point Comfort Marina	Chesapeake Bay	Private/Public Access	Yes	No	No	No	No	No	No	No	37.0048159	-76.3142293
Hampton	Outlook Beach	Chesapeake Bay	Private/Public Access	No	No	No	No	No	No	Yes	No	37.0184951	-76.2967694
Hampton	River Street Park	Hampton River	Locality	No	Yes	No	No	No	No	No	No	37.0323611	-76.3385936
Hampton	Salt Ponds Beach	Chesapeake Bay	Locality	No	No	No	Yes	No	No	Yes	No	37.060707	-76.2819536

Jurisdiction	Access Site Name	Waterbody	Access Control	Boat Ramp	Kayak/Canoe Launch	Fishing Pier	Bank Fishing	Observation Deck	Boardwalk	Beach Swimming	Nature Trail	Latitude	Longitude
Hampton	Sandy Bottom	Sandy Bottom Lake	Locality	No	Yes	Yes	No	No	No	No	Yes	37.0645834	-76.4314451
Hampton	Sunset Creek Boat Ramp	Hampton River	Locality	Yes	No	No	No	No	No	No	No	37.0163329	-76.3461901
Isle of Wight	Fort Boykin Historic Park	James River	Locality	No	No	No	Yes	Yes	No	Yes	Yes	37.0350019	-76.6186559
Isle of Wight	Fort Huger Historic Park	James River	Locality	No	No	No	No	Yes	No	No	Yes	37.1095689	-76.6577543
Isle of Wight	Jones Creek Boat Ramp	Jones Creek	DGIF	Yes	No	Yes	No	No	No	No	No	36.9746126	-76.5630984
Isle of Wight	Joyner's Bridge	Blackwater River	DGIF	Yes	No	No	No	No	No	No	No	36.7328759	-76.9159442
Isle of Wight	Nike Park	Jones Creek	Locality	No	Yes	Yes	No	Yes	No	No	Yes	36.9601866	-76.5650652
Isle of Wight	Ragged Island WMA	James River	DGIF	No	No	No	Yes	No	Yes	No	Yes	36.96675	-76.509227
Isle of Wight	Riverview Park	Cypress River	Locality	No	No	No	No	No	No	No	Yes	36.9840226	-76.6386967
Isle of Wight	Tyler's Beach	James River	Locality	Yes	No	No	No	No	No	Yes	No	37.0827748	-76.6657333
James City	Brickyard Landing	Chickahominy River	Locality	Yes	Yes	Yes	No	No	No	No	No	37.3702607	-76.8801266
James City	Chickahominy Riverfront Park	Chickahominy River	Locality	Yes	Yes	Yes	No	No	No	No	Yes	37.2682941	-76.8725656
James City	Colonial National Historic Park	James River	NPS	No	No	No	Yes	No	Yes	No	Yes	37.2096676	-76.7754111
James City	Diascund Landing	Diascund Creek Reservior	DGIF	Yes	Yes	Yes	Yes	No	No	No	No	37.4296781	-76.8908009
James City	James City County Marina	Powhatan Creek	Locality	Yes	Yes	No	Yes	No	No	No	No	37.2261731	-76.7778269
James City	Jamestown Beach Event Park	James River	Locality	No	Yes	Yes	No	Yes	No	No	No	37.2246469	-76.7884605
James City	Little Creek Reservoir	Little Creek Reservoir	Locality	Yes	No	Yes	No	No	No	No	Yes	37.3678775	-76.8374379
James City	Powhatan Creek Park	Powhatan Creek	Locality	No	Yes	Yes	No	Yes	No	No	Yes	37.2376862	-76.7682864
James City	Warhill Sports Complex	Warhill Ponds	Locality	No	No	No	Yes	No	No	No	Yes	37.3136425	-76.7699569
James City	York River State Park - Croaker Landing	York River	DCR	Yes	Yes	Yes	No	No	No	No	Yes	37.4271739	-76.72563
Newport News	Anderson Park	Hampton Roads	Locality	No	No	No	Yes	No	No	No	Yes	36.9816943	-76.3978204
Newport News	Harwood's Mill	Harwood's Mill Reservoir	Locality	Yes	Yes	Yes	Yes	No	No	No	Yes	37.148656	-76.477923
Newport News	Hilton Pier	James River	Locality	No	No	Yes	No	No	No	Yes	No	37.0283664	-76.4654129
Newport News	Hoopes Landing/Denbigh Park	Warwick River	Locality	Yes	Yes	Yes	No	Yes	No	No	No	37.1236672	-76.5683891
Newport News	Huntington Park	James River	Locality	Yes	Yes	Yes	No	No	No	Yes	No	37.0168645	-76.4556009
Newport News	King-Lincoln Park	Hampton Roads	Locality	No	No	Yes	No	No	No	Yes	No	36.9680336	-76.4097984
Newport News	Lake Maury Natural Area	Lake Maury	Locality	No	No	No	Yes	No	No	No	Yes	37.0577638	-76.4825879

Jurisdiction	Access Site Name	Waterbody	Access Control	Boat Ramp	Kayak/Canoe Launch	Fishing Pier	Bank Fishing	Observation Deck	Boardwalk	Beach Swimming	Nature Trail	Latitude	Longitude
Newport News	Leeward Municipal Marina	James River	Locality	No	No	No	No	No	Yes	No	No	37.0126679	-76.4542581
Newport News	Mariners Museum Park	James River	Locality	No	No	No	No	No	No	No	Yes	37.0409509	-76.4872609
Newport News	Monitor - Merrimac Overlook Park	Hampton Roads	Locality	No	No	Yes	No	No	No	No	No	36.9828671	-76.3959859
Newport News	Newport News Park	Lee Hall Reservoir	Locality	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	37.1826197	-76.5365188
Newport News	Peterson Yacht Basin	Hampton Roads	DGIF	Yes	Yes	No	Yes	No	No	No	No	36.9836622	-76.3976838
Newport News	Riverview Farm Park	James River	Locality	No	No	No	No	Yes	No	No	Yes	37.0831034	-76.5339444
Newport News	Victory Landing/Christopher Newport Park	James River	Locality	No	No	No	No	No	Yes	No	No	36.9770728	-76.4342772
Norfolk	45th Street	Lafayette River	Locality	Yes	Yes	No	No	No	No	No	No	36.885089	-76.2941
Norfolk	Barraud Park	Lafayette River	Locality	No	No	No	Yes	No	No	No	Yes	36.8665541	-76.2650438
Norfolk	Captain's Quarters Park	Willoughby Bay	Locality	No	Yes	No	Yes	No	No	Yes	No	36.9641584	-76.2737882
Norfolk	Community Beach Park	Chesapeake Bay	Locality	No	Yes	No	No	No	No	Yes	No	36.9507633	-76.2440312
Norfolk	East Ocean View Park	Pretty Lake	Locality	No	No	Yes	No	No	No	No	No	36.9258166	-76.1941158
Norfolk	Grandy Village Community Center	Elizabeth River	Locality	No	Yes	No	No	Yes	No	No	No	36.8400894	-76.2501808
Norfolk	Harbor Park Launch	Elizabeth River	Locality	No	Yes	No	No	No	No	No	No	36.8419544	-76.276476
Norfolk	Haven Creek Boat Ramp	Lafayette River	Locality	Yes	Yes	No	No	No	No	No	No	36.8842	-76.2838
Norfolk	Lavalette Boat Ramp and Fishing Pier	Lafayette River	Locality	Yes	Yes	Yes	Yes	No	No	No	No	36.8808535	-76.2751084
Norfolk	Lafayette Park/Virginia Zoo	Lafayette River	Locality	No	No	No	No	Yes	No	No	Yes	36.8792867	-76.2749705
Norfolk	Lakewood Park	Wayne Creek	Locality	No	Yes	No	Yes	No	No	No	No	36.8912995	-76.2635277
Norfolk	Ocean View Beach Park	Chesapeake Bay	Locality	No	Yes	No	No	No	No	Yes	No	36.9555212	-76.2515181
Norfolk	Ocean View Fishing Pier	Chesapeake Bay	Private/Public Access	No	No	Yes	No	No	No	No	No	36.9615764	-76.2598334
Norfolk	Sarah Constant Beach Park	Chesapeake Bay	Locality	No	Yes	No	Yes	No	No	Yes	No	36.9591126	-76.2578287
Norfolk	Tarrallton Park	Little Creek	Locality	No	No	No	No	No	No	No	Yes	36.9265924	-76.2196481
Norfolk	Town Point Park	Elizabeth River	Locality	No	No	No	No	Yes	No	No	Yes	36.8458115	-76.2944575
Norfolk	Willoughby Boat Ramp	Willoughby Bay	Locality	Yes	Yes	No	No	No	No	No	No	36.964248	-76.2879
Norfolk	Willoughby Fishing Pier	Willoughby Bay	Locality	No	No	Yes	No	No	No	No	No	36.9638778	-76.2975951
Poquoson	Armory's Wharf Landing	Back River	Locality	Yes	Yes	No	Yes	No	No	No	No	37.105112	-76.3382708
Poquoson	Cedar Road Landing	Back River	Locality	Yes	Yes	No	No	No	No	No	No	37.116264	-76.3677914

Jurisdiction	Access Site Name	Waterbody	Access Control	Boat Ramp	Kayak/Canoe Launch	Fishing Pier	Bank Fishing	Observation Deck	Boardwalk	Beach Swimming	Nature Trail	Latitude	Longitude
Poquoson	Hunt's Neck Landing	Poquoson River	Locality	Yes	Yes	No	No	No	No	No	No	37.1546211	-76.4061508
Poquoson	Messick Point Landing	Back River	DGIF	Yes	Yes	Yes	No	No	No	No	No	37.110864	-76.319553
Poquoson	Ren's Road Landing	Whitehouse Cove	Locality	Yes	Yes	Yes	No	No	No	No	No	37.1419809	-76.3759249
Portsmouth	City Park	Elizabeth River	Locality	Yes	Yes	Yes	No	No	No	No	No	36.8346187	-76.3715461
Portsmouth	Elizabeth River Boardwalk	Elizabeth River	Locality	No	No	No	No	No	Yes	No	No	36.837848	-76.2956883
Portsmouth	Hoffler Creek Wildlife Preserve	Hoffler Creek	Private/Public Access	No	Yes	No	No	Yes	No	No	Yes	36.8936761	-76.4037051
Portsmouth	Paradise Creek Nature Park	Elizabeth River	Locality	No	No	No	No	Yes	No	No	Yes	36.798957	-76.3065875
Smithfield	Clontz Park	Pagan River	Locality	No	No	Yes	No	No	Yes	No	No	36.989396	-76.6294391
Smithfield	Windsor Castle Park	Pagan River	Locality	No	Yes	Yes	No	No	No	No	Yes	36.9757981	-76.6211809
Southampton	Blackwater Bridge	Blackwater River	DGIF	Yes	No	No	No	No	No	No	No	36.8041024	-76.8653925
Southampton	Carey's Bridge	Nottoway River	DGIF	Yes	No	No	No	No	No	No	No	36.7703978	-77.1661913
Southampton	General Vaughan Bridge	Nottoway River	DGIF	Yes	No	No	No	No	No	No	Yes	36.5666556	-76.9451632
Southampton	Hercules Landing	Nottoway River	DGIF	Yes	Yes	No	No	No	No	No	No	36.6522358	-77.0027257
Southampton	South Quay Rd	Blackwater River	Locality	No	Yes	No	No	No	No	No	No	36.6199	-76.9102
Suffolk	Bennetts Creek Park	Bennetts Creek	Locality	Yes	Yes	Yes	No	No	No	No	Yes	36.850937	-76.484234
Suffolk	Constant's Wharf Park	Nansemond River	Locality	No	Yes	No	No	No	Yes	No	No	36.7395231	-76.5813394
Suffolk	Great Dismal Swamp	Lake Drummond	FWS	Yes	Yes	Yes	No	No	Yes	No	Yes	36.5914887	-76.488168
Suffolk	Lake Burnt Mills	Lake Burnt Mills	Locality	Yes	No	No	No	No	No	No	Yes	36.8430283	-76.626467
Suffolk	Lake Meade and Cahoon Bait and Tackle	Lake Meade and Lake Cahoon	Locality	Yes	No	No	No	No	No	No	No	36.7540648	-76.62719
Suffolk	Lake Prince Boat Ramp	Lake Prince	Locality	Yes	No	No	No	No	No	No	No	36.8035759	-76.6430143
Suffolk	Lone Star Lakes Park	Butler Tract Lake	DGIF	Yes	No	Yes	No	No	No	No	Yes	36.8695489	-76.5755191
Suffolk	Lone Star Lakes Park	Crane Lake	DGIF	Yes	No	No	Yes	No	No	No	Yes	36.8661895	-76.5724299
Suffolk	Lone Star Lakes Park	Cedar Creek	Locality	No	Yes	Yes	No	No	No	No	No	36.8569454	-76.5686834
Suffolk	Lone Star Lakes Park	Crystal Lake	Locality	Yes	No	Yes	No	No	No	No	No	36.8636589	-76.5711346
Suffolk	Lone Star Lakes Park	Lake Annette	Locality	Yes	No	No	No	No	No	No	No	36.8635663	-76.5715486
Suffolk	Lone Star Lakes Park	Lake Wahoo	Locality	Yes	No	No	Yes	No	No	No	Yes	36.8528138	-76.5696335
Suffolk	Lone Star Lakes Park	Southern Lakes	Locality	Yes	No	No	Yes	No	No	No	Yes	36.8520915	-76.569157

Jurisdiction	Access Site Name	Waterbody	Access Control	Boat Ramp	Kayak/Canoe Launch	Fishing Pier	Bank Fishing	Observation Deck	Boardwalk	Beach Swimming	Nature Trail	Latitude	Longitude
Suffolk	Lone Star Lakes Park	Fingers Lake	Locality	Yes	No	No	No	No	No	No	No	36.8795776	-76.5774365
Suffolk	Sleepy Hole Park	Nansemond River	Locality	No	Yes	Yes	No	No	No	No	Yes	36.8414342	-76.5220639
Suffolk	Western Branch Boat Ramp	Western Branch Reservoir	DGIF	Yes	No	No	No	No	No	No	No	36.8083139	-76.6187311
Surry	Chippokes State Park	James River	DCR	No	No	No	Yes	No	No	No	Yes	37.1460849	-76.7322876
Surry	Gray's Creek Marina	Gray's Creek	Locality	Yes	Yes	No	No	No	No	No	No	37.1773062	-76.8058549
Surry	Hog Island WMA	James River	DGIF	No	No	No	Yes	Yes	No	No	Yes	37.1919277	-76.6816496
Surry	Lawnes Creek	James River	DGIF	Yes	Yes	No	No	No	No	No	No	37.1392047	-76.6758977
Virginia Beach	Back Bay NWR Visitor's Station	Back Bay	FWS	No	Yes	No	Yes	No	No	No	Yes	36.6721709	-75.9165952
Virginia Beach	Barbour Hill	Back Bay	DCR	No	Yes	No	No	No	No	No	Yes	36.6187346	-75.9085001
Virginia Beach	Beach Garden Park Trails	Little Neck Creek	Locality	No	No	No	No	No	Yes	No	Yes	36.8558253	-75.985147
Virginia Beach	Birdneck Launch	Linkhorn Bay	Locality	No	Yes	No	No	No	No	No	No	36.8479904	-76.0032574
Virginia Beach	Blackwater Trading Post	Blackwater Creek	Private/Public Access	Yes	Yes	No	No	No	No	No	No	36.6075746	-76.0850124
Virginia Beach	Cape Henry Lighthouse	Atlantic Ocean	Private/Public Access	No	No	No	No	Yes	No	No	No	36.9257328	-76.0080705
Virginia Beach	Carolanne Farm Park	E. Branch Elizabeth River	Locality	No	Yes	No	No	No	No	No	No	36.8262	-76.1801
Virginia Beach	Chic's Beach	Chesapeake Bay	Locality	No	No	No	No	No	No	Yes	No	36.917997	-76.1275352
Virginia Beach	Croatan Beach	Atlantic Ocean	Locality	No	No	No	No	No	No	Yes	No	36.8221491	-75.9676442
Virginia Beach	Dozier Bridge	West Neck Creek	Locality	No	Yes	No	No	No	No	No	No	36.75579	-76.0398
Virginia Beach	Dudley Island	Back Bay	DCR	No	Yes	No	No	No	No	No	No	36.5540904	-75.8820027
Virginia Beach	False Cape Landing	Back Bay	DCR	No	Yes	No	Yes	No	No	No	Yes	36.5940172	-75.8880584
Virginia Beach	First Landing State Park	Broad Bay	DCR	Yes	No	No	Yes	No	No	Yes	Yes	36.8920904	-76.0183335
Virginia Beach	First Landing State Park	Chesapeake Bay	DCR	No	Yes	No	Yes	No	No	No	Yes	36.9183608	-76.0555242
Virginia Beach	Great Neck Park	Lynnhaven River	Locality	No	No	No	No	Yes	No	No	No	36.8837743	-76.0606197
Virginia Beach	Horn Point	Back Bay	FWS	Yes	Yes	No	No	No	No	No	No	36.7078849	-75.970257
Virginia Beach	Hutton Circle	Lynnhaven River	Locality	No	Yes	No	No	No	No	No	No	36.8417	-76.05667
Virginia Beach	Indian River Road	West Neck Creek	Locality	No	Yes	No	No	No	No	No	No	36.7211299	-76.0337775
Virginia Beach	Lake Lawson/Lake Smith Natural Area	Lake Smith	Locality	Yes	Yes	Yes	No	No	No	No	Yes	36.8919171	-76.1642452
Virginia Beach	Little Island	Back Bay	FWS	No	Yes	No	No	No	No	No	No	36.6926715	-75.9263722

Jurisdiction	Access Site Name	Waterbody	Access Control	Boat Ramp	Kayak/Canoe Launch	Fishing Pier	Bank Fishing	Observation Deck	Boardwalk	Beach Swimming	Nature Trail	Latitude	Longitude
Virginia Beach	Little Island District Park	Atlantic Ocean	Locality	No	No	Yes	No	No	No	Yes	No	36.6941174	-75.9227204
Virginia Beach	Lotus Garden Park	Back Bay	Locality	No	Yes	No	No	No	No	No	No	36.73147	-75.9845
Virginia Beach	Lovitts Landing	Back Bay	FWS	No	Yes	No	No	No	No	No	No	36.6785848	-75.9838421
Virginia Beach	Lynnhaven Boat and Beach Facility	Lynnhaven Bay	Locality	Yes	Yes	No	Yes	No	No	No	No	36.9070033	-76.0949159
Virginia Beach	Marshview Park Trails	Lake Rudee	Locality	No	No	No	No	No	No	No	Yes	36.8333113	-75.9865638
Virginia Beach	Mill Landing	Back Bay	DGIF	Yes	Yes	No	No	No	No	No	No	36.6342264	-75.9923166
Virginia Beach	Milldam Creek Boardwalk	North Landing River	Nature Conservancy	No	No	No	No	Yes	Yes	No	No	36.5838176	-76.0772178
Virginia Beach	Mount Trashmore Park	Lake Trashmore	Locality	No	No	No	Yes	No	No	No	Yes	36.8300912	-76.1254388
Virginia Beach	Muddy Creek Road	Muddy Creek	Locality	No	Yes	No	No	No	No	No	No	36.7102567	-75.994364
Virginia Beach	Munden Point Park	Northlanding River	Locality	Yes	Yes	No	Yes	No	No	No	No	36.5859	-76.0402
Virginia Beach	Owls Creek Municipal	Rudee Inlet	DGIF	Yes	Yes	No	Yes	No	No	No	No	36.8227483	-75.9814569
Virginia Beach	Pleasure House Point Natural Area	Lynnhaven River	Locality	No	No	No	Yes	No	No	No	Yes	36.9047319	-76.1027497
Virginia Beach	Pocaty River Boat Launch	Pocaty River	Private/Public Access	No	Yes	No	Yes	No	No	No	No	36.6733309	-76.0997189
Virginia Beach	Princess Anne WMA	Back Bay	DGIF	Yes	Yes	No	No	No	No	No	Yes	36.5903043	-75.9920682
Virginia Beach	Pungo Ferry Landing Park	North Landing River	Locality	Yes	Yes	No	Yes	No	No	No	No	36.6172226	-76.0471723
Virginia Beach	Resort Area Beach	Atlantic Ocean	Locality	No	No	No	No	No	Yes	Yes	No	36.8636833	-75.9780073
Virginia Beach	Sandbridge Beach	Atlantic Ocean	Locality	No	No	No	No	No	No	Yes	No	36.7464788	-75.9435706
Virginia Beach	Sea Gull Pier (Temporarily closed)	Chesapeake Bay	Private/Public Access	No	No	Yes	No	Yes	No	No	No	36.9665258	-76.1134037
Virginia Beach	Stumpy Lake	Stumpy Lake	Locality	No	Yes	No	No	No	No	No	Yes	36.7749361	-76.1601051
Virginia Beach	Virginia Beach Fishing Pier	Atlantic Ocean	Private/Public Access	No	No	Yes	No	No	No	No	No	36.8435492	-75.971293
Virginia Beach	Wash Woods	Back Bay	DCR	No	Yes	No	No	No	No	No	Yes	36.5794151	-75.8902856
Williamsburg	College Landing Park	College Creek	Locality	No	Yes	Yes	Yes	Yes	No	No	No	37.2516562	-76.7101102
Williamsburg	Waller Mill Park	Waller Mill Reservoir	Locality	Yes	Yes	Yes	No	Yes	No	No	Yes	37.3144408	-76.7041872
York	Back Creek Park	Back Creek	Locality	Yes	Yes	No	No	No	No	No	No	37.2052138	-76.437701
York	Colonial National Historic Park	York River	NPS	No	No	No	Yes	No	No	No	Yes	37.2387858	-76.5207669
York	New Quarter Park Fishing Pier	Queen's Creek	Locality	No	No	Yes	No	No	No	No	No	37.2968325	-76.6475195
York	New Quarter Park Kayak Launch	Queens Creek	Locality	No	Yes	No	No	No	No	No	No	37.2966196	-76.6328017

Jurisdiction	Access Site Name	Waterbody	Access Control	Boat Ramp	Kayak/Canoe Launch	Fishing Pier	Bank Fishing	Observation Deck	Boardwalk	Beach Swimming	Nature Trail	Latitude	Longitude
York	Old Wormley Creek Landing	Wormley Creek	Locality	Yes	Yes	No	Yes	No	No	No	No	37.205227	-76.4706672
York	Riverwalk Landing and Fishing Pier	York River	Locality	No	Yes	Yes	No	No	No	Yes	Yes	37.2364145	-76.5060381
York	Smith Landing and Fishing Pier	Poquoson River	Locality	Yes	Yes	Yes	No	No	No	No	No	37.1345342	-76.4305525

Appendix B: Future Water Access Sites Inventory

Buckroe Beach in Hampton. Photo courtesy of Shutterstock.

Jurisdiction	Access Site Name	Waterbody	Status	Boat Ramp	Kayak/Canoe Launch	Fishing Pier	Bank Fishing	Observation Deck	Boardwalk	Beach Swimming	Nature Trail	Latitude	Longitude	Source
Chesapeake	Fentress Airfield Rd	Pocaty River	Potential	No	Yes	No	No	No	No	No	No	36.6610166	-76.15586847	North Landing River Watershed Public Access and Visual Assessment
Chesapeake	Fentress Airfield Rd at Pocaty Rd	Pocaty River	Potential	No	Yes	No	No	No	No	No	No	36.675374	-76.14682765	North Landing River Watershed Public Access and Visual Assessment
Chesapeake	Indian River Watershed Area	Indian River	Planned	No	Yes	No	No	No	No	No	No	36.8232347	-76.2346161	Chesapeake PR Division Report
Chesapeake	Long Ridge Rd	Pocaty River	Potential	No	Yes	No	No	No	No	No	No	36.6577237	-76.14275274	North Landing River Watershed Public Access and Visual Assessment
Gloucester	Brays Landing	Severn River	Potential	No	Yes	No	No	No	No	No	No	37.3202645	-76.4710793	
Gloucester	Middle Peninsula State Park	York River	Proposed	Yes	No	Yes	No	No	No	Yes	Yes	37.3263	-76.58730194	2013 NPS Public Access Plan
Gloucester	Timberneck Rd	Timberneck Creek	Potential	No	Yes	No	Yes	Yes	No	No	No	37.3067478	-76.53054083	2013 NPS Public Access Plan
Hampton	Armistead Avenue Landing	Hampton River	Proposed	No	No	No	No	Yes	Yes	No	No	37.0178475	-76.34982006	2017 Downtown Hampton Master Plan
Hampton	Central Park	Newmarket Creek	Proposed	No	Yes	No	No	No	Yes	No	Yes	37.0330394	-76.37737349	2015 Coliseum Central Master Plan
Hampton	Grundland Creek Park	Grundland Creek	Potential	No	Yes	No	No	No	No	No	No	37.0893565	-76.28525346	Communication with City of Hampton staff.
Hampton	King Street Landing	Hampton River	Proposed	No	No	No	No	Yes	Yes	No	No	37.0229456	-76.34341963	2017 Downtown Hampton Master Plan
Hampton	Lincoln Street Landing	Hampton River	Proposed	No	No	No	No	Yes	Yes	No	No	37.0285571	-76.34130766	2017 Downtown Hampton Master Plan
Hampton	Phoebus Dinghy Dock	Mill Creek	Planned	No	Yes	No	No	No	Yes	No	No	37.0156297	-76.3174711	2013 Phoebus Master Plan
Hampton	Salters Creek Landing	Hampton River	Proposed	No	No	No	No	Yes	Yes	No	No	37.0238418	-76.34656387	2017 Downtown Hampton Master Plan
Hampton	Victoria Blvd. Landing	Hampton River	Proposed	No	No	No	No	Yes	Yes	No	No	37.0198958	-76.34498997	2017 Downtown Hampton Master Plan
Hampton	YH Thomas	Newmarket Creek	Proposed	No	Yes	No	No	No	No	No	No	37.0385151	-76.36188145	2007 North King St Master Plan
James City	Liberty Baptist Church	Diascund Creek	Potential	No	Yes	No	Yes	Yes	No	No	No	37.4243843	-76.8935524	2013 NPS Public Access Plan
Norfolk	Azalea Little League Fields	Broad Creek	Proposed	No	No	No	No	No	No	No	No	36.8596279	-76.22699223	2012 City of Norfolk Recreation Master Plan
Norfolk	Beverly Avenue	Lafayette River	Proposed	No	No	No	No	No	No	No	No	36.8981097	-76.27568124	2012 City of Norfolk Recreation Master Plan
Norfolk	Chesterfield	Elizabeth River	Proposed	No	No	No	No	No	No	No	No	36.8403926	-76.25499595	2012 City of Norfolk Recreation Master Plan
Norfolk	Chrysler Museum	The Hague	Proposed	No	No	No	No	No	No	No	No	36.8559504	-76.29384371	2012 City of Norfolk Recreation Master Plan
Norfolk	Crab Creek | Granby Elementary School	Lafayette River	Proposed	No	No	No	No	No	No	No	No	36.9081418	-76.28356391	2012 City of Norfolk Recreation Master Plan
Norfolk	Dundaff	The Hague	Proposed	No	No	No	No	No	No	No	No	36.8581812	-76.30044642	2012 City of Norfolk Recreation Master Plan
Norfolk	Fort Norfolk	Elizabeth River	Proposed	Yes	No	No	No	No	No	No	No	36.85667	-76.3065724	2012 City of Norfolk Recreation Master Plan
Norfolk	Hermitage Park	Lafayette River	Proposed	No	No	No	No	No	No	No	No	36.9103412	-76.31346661	2012 City of Norfolk Recreation Master Plan
Norfolk	Indian River Rd	Elizabeth River	Proposed	No	No	No	No	No	No	No	No	36.8392862	-76.28100901	2012 City of Norfolk Recreation Master Plan
Norfolk	Lake Taylor High School	Lake Taylor	Proposed	No	No	No	No	No	No	No	Yes	36.8685182	-76.20089652	2012 City of Norfolk Recreation Master Plan
Norfolk	McGinnis	Elizabeth River	Proposed	No	No	No	No	No	No	No	No	36.8314294	-76.20475754	2012 City of Norfolk Recreation Master Plan

Jurisdiction	Access Site Name	Waterbody	Status	Boat Ramp	Kayak/Canoe Launch	Fishing Pier	Bank Fishing	Observation Deck	Boardwalk	Beach Swimming	Nature Trail	Latitude	Longitude	Source
Norfolk	Mona Avenue Park	Little Creek	Proposed	No	No	No	No	No	No	No	No	36.9203481	-76.2112732	2012 City of Norfolk Recreation Master Plan
Norfolk	Monkey Bottom Wetland Walkway	Willoughby Bay	Potential	No	No	No	No	Yes	No	No	No	36.9584666	-76.26632987	VIMS
Norfolk	Mowbray Arch	The Hague	Proposed	No	No	No	No	Yes	No	No	No	36.8554236	-76.29821223	2012 City of Norfolk Recreation Master Plan
Norfolk	Northside Park	Mason Creek	Proposed	No	Yes	Yes	No	No	Yes	No	No	36.9299625	-76.25923671	2012 City of Norfolk Recreation Master Plan
Norfolk	ODU | Larchmont Recreation Center	Lafayette River	Proposed	No	No	No	No	No	No	No	No	36.8890188	-76.30036092	2012 City of Norfolk Recreation Master Plan
Norfolk	Rivers Edge Road	Broad Creek	Proposed	No	No	No	No	No	No	No	No	36.8515311	-76.2253039	2012 City of Norfolk Recreation Master Plan
Norfolk	Steamboat Creek	Steamboat Creek	Proposed	No	No	No	No	No	No	No	No	36.8328909	-76.25690903	2012 City of Norfolk Recreation Master Plan
Suffolk	Brady's Marina	Nansemond River	Planned	Yes	No	No	No	No	No	No	No	36.7909883	-76.57535843	2013 NPS Public Access Plan
Suffolk	Driver Sports Complex	Nansemond River	Proposed	No	Yes	No	No	Yes	No	No	Yes	36.817939	-76.55192495	2015 Suffolk Parks and Rec Trails and Water Access Study
Suffolk	Eclipse	Chuckatuck Creek	Potential	No	No	No	No	Yes	No	No	No	36.9179166	-76.49913895	2013 NPS Public Access Plan
Suffolk	King's Hwy	Nansemond River	Potential	Yes	No	No	Yes	Yes	No	No	No	36.8321765	-76.54943966	2013 NPS Public Access Plan
Suffolk	Lone Star Lakes Lodge	Cedar Creek / Chuckatuck Creek	Potential	No	Yes	No	No	Yes	No	No	No	36.8592383	-76.56842298	2013 NPS Public Access Plan
Suffolk	Route 17 bridge	Nansemond River	Potential	Yes	No	Yes	No	Yes	No	No	No	36.8915847	-76.49349327	2013 NPS Public Access Plan
Suffolk	South Quay Sandhills Natural Area	Blackwater River	Proposed	No	No	No	No	No	No	No	No	36.5764764	-76.9114913	2015 Suffolk Parks and Rec Trails and Water Access Study
Surry	Claremont	James River	Potential	Yes	No	No	Yes	Yes	No	No	No	37.230767	-76.94878048	2013 NPS Public Access Plan
Virginia Beach	Craigs Causeway Rd	Northwest River	Potential	No	Yes	No	No	No	No	No	No	36.5617427	-76.09341186	North Landing River Watershed Public Access and Visual Assessment
Virginia Beach	Elbow Rd Bridge	North Landing River	Potential	No	Yes	No	No	No	No	No	No	36.766086	-76.13025011	North Landing River Watershed Public Access and Visual Assessment
Virginia Beach	Fairfield Forest Park	Elizabeth River	Potential	No	Yes	No	No	Yes	No	No	No	36.8223215	-76.17998989	2016 Virginia Beach Outdoors Plan
Virginia Beach	Future Back Bay Contact Station	Back Bay	Proposed	No	Yes	No	No	No	No	No	No	36.7305509	-75.9859685	2015 Back Bay NWR Alternative Transportation Study
Virginia Beach	Gum Swamp Bridge	North Landing River	Potential	No	Yes	No	No	No	No	No	No	36.7447552	-76.11637954	North Landing River Watershed Public Access and Visual Assessment
Virginia Beach	Head of River Rd Bridge	Blackwater Creek	Potential	No	Yes	No	No	No	No	No	No	36.6174581	-76.11674586	North Landing River Watershed Public Access and Visual Assessment
Virginia Beach	Kemps Landing Park	Elizabeth River	Proposed	No	No	No	No	No	No	No	No	36.8271294	-76.16575839	2016 Virginia Beach Outdoors Plan
Virginia Beach	Lynnhaven Fishing Pier	Chesapeake Bay	Potential	No	No	Yes	No	No	No	No	No	36.9145459	-76.07805801	Visit Virginia Beach Website
Virginia Beach	Milldam Creek	Milldam Creek	Potential	No	Yes	No	No	No	No	No	No	36.58166	-76.0759	North Landing River Watershed Public Access and Visual Assessment
Virginia Beach	Normandy Ave	Elizabeth River	Planned	No	Yes	No	No	No	No	No	No	36.8228171	-76.18315322	Elizabeth River Project
Virginia Beach	North Landing	North Landing River	Potential	No	Yes	No	No	No	No	No	No	36.718	-76.09965	North Landing River Watershed Public Access and Visual Assessment
Virginia Beach	North Landing River Preserve	North Landing River	Planned	No	Yes	No	No	Yes	Yes	No	No	36.6374507	-76.0759398	Virginia Department of Conservation and Recreation
Virginia Beach	Old Railroad Bed	West Neck Creek	Proposed	No	Yes	No	No	No	No	No	Yes	36.7481065	-76.0492044	North Landing River Watershed Public Access and Visual Assessment

Jurisdiction	Access Site Name	Waterbody	Status	Boat Ramp	Kayak/Canoe Launch	Fishing Pier	Bank Fishing	Observation Deck	Boardwalk	Beach Swimming	Nature Trail	Latitude	Longitude	Source
Virginia Beach	Pleasure House Point Kayak Launch	Lynnhaven River	Planned	No	Yes	No	No	No	No	No	No	36.9038407	-76.10204818	Virginia Beach Parks and Recreation
Virginia Beach	Pungo Ferry Bridge	North Landing River	Proposed	Yes	Yes	No	No	No	No	No	Yes	36.6159853	-76.05055311	North Landing River Watershed Public Access and Visual Assessment
Virginia Beach	Thalia Creek	Thalia Creek	Planned	No	Yes	No	No	No	No	No	Yes	36.8404581	-76.12624479	2016 Virginia Beach Outdoors Plan
Virginia Beach	Tributary off West Neck Creek Rd	West Neck Creek	Potential	No	Yes	No	Yes	No	No	No	No	36.6949033	-76.03923194	North Landing River Watershed Public Access and Visual Assessment
Virginia Beach	Woodstock Cove Park	Elizabeth River	Potential	No	No	No	No	No	No	No	No	36.8204605	-76.19991958	2016 Virginia Beach Outdoors Plan

Appendix C: Analysis Maps

Three sets of maps were generated during the analysis in Chapter 4. This appendix contains maps for:

1. Drive Time Areas by Access Type
2. Watershed Population by Access Type
3. Population by Drive Time Areas with Future Sites by Jurisdiction

Drive Time Areas by Access Type

Ten, twenty, and thirty minute drive time areas (DTAs) were generated for each of the following water access types: (1) boat ramps, (2) paddling launches, (3) fishing locations, (4) viewing locations, (5) swimming beaches.

DTAs were calculated using Esri's ArcGIS Network Analyst Extension with the direction of travel specified as towards the water access site. Network Analyst uses a road network to construct DTAs so some water access sites may not have an associated DTA because they are not accessible via automobile (e.g. locations in False Cape State Park). For each water access type map, only sites containing the specific feature of interest are displayed.

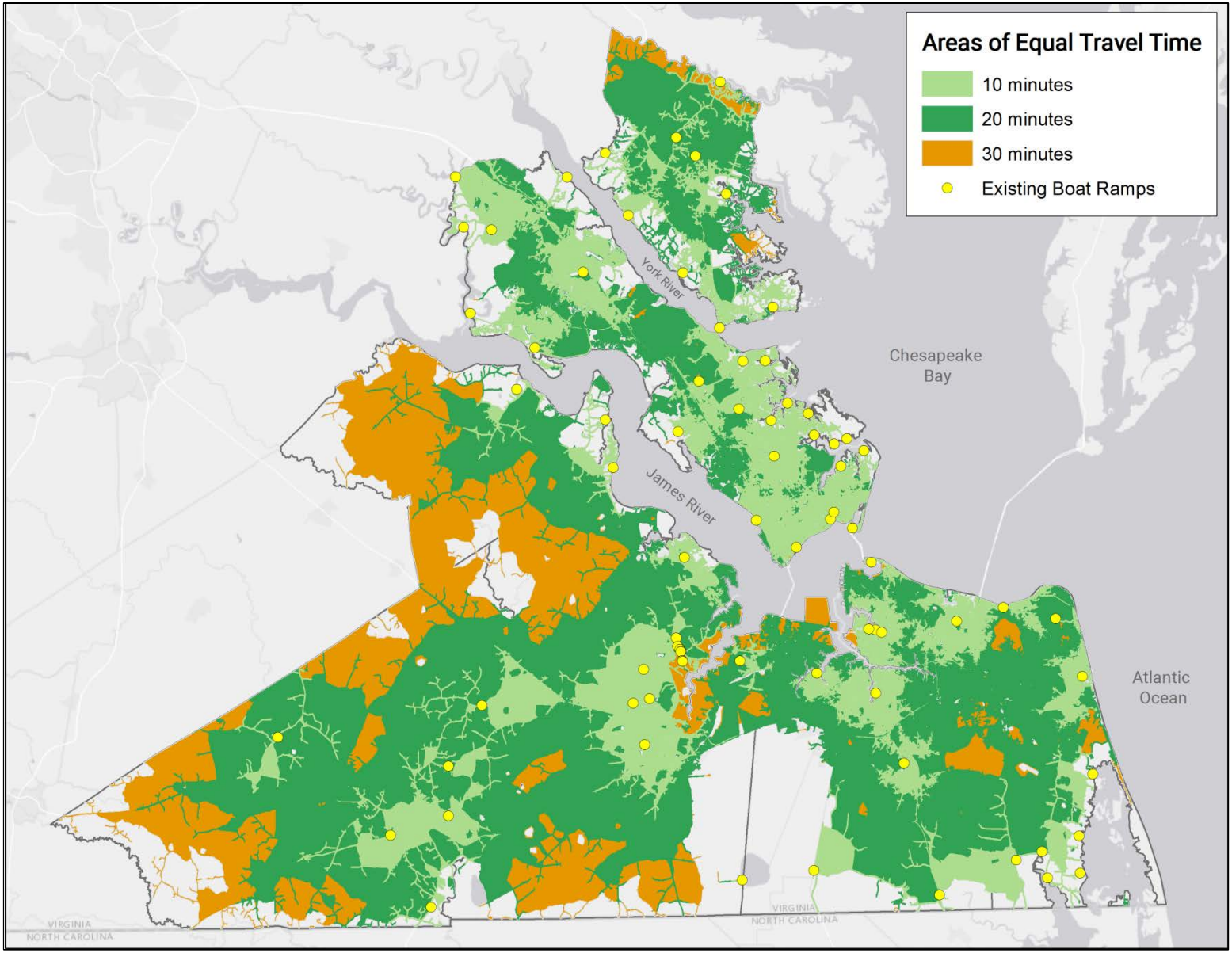

Figure 34. Ten, twenty, and thirty minute drive-time areas for existing boat ramps.

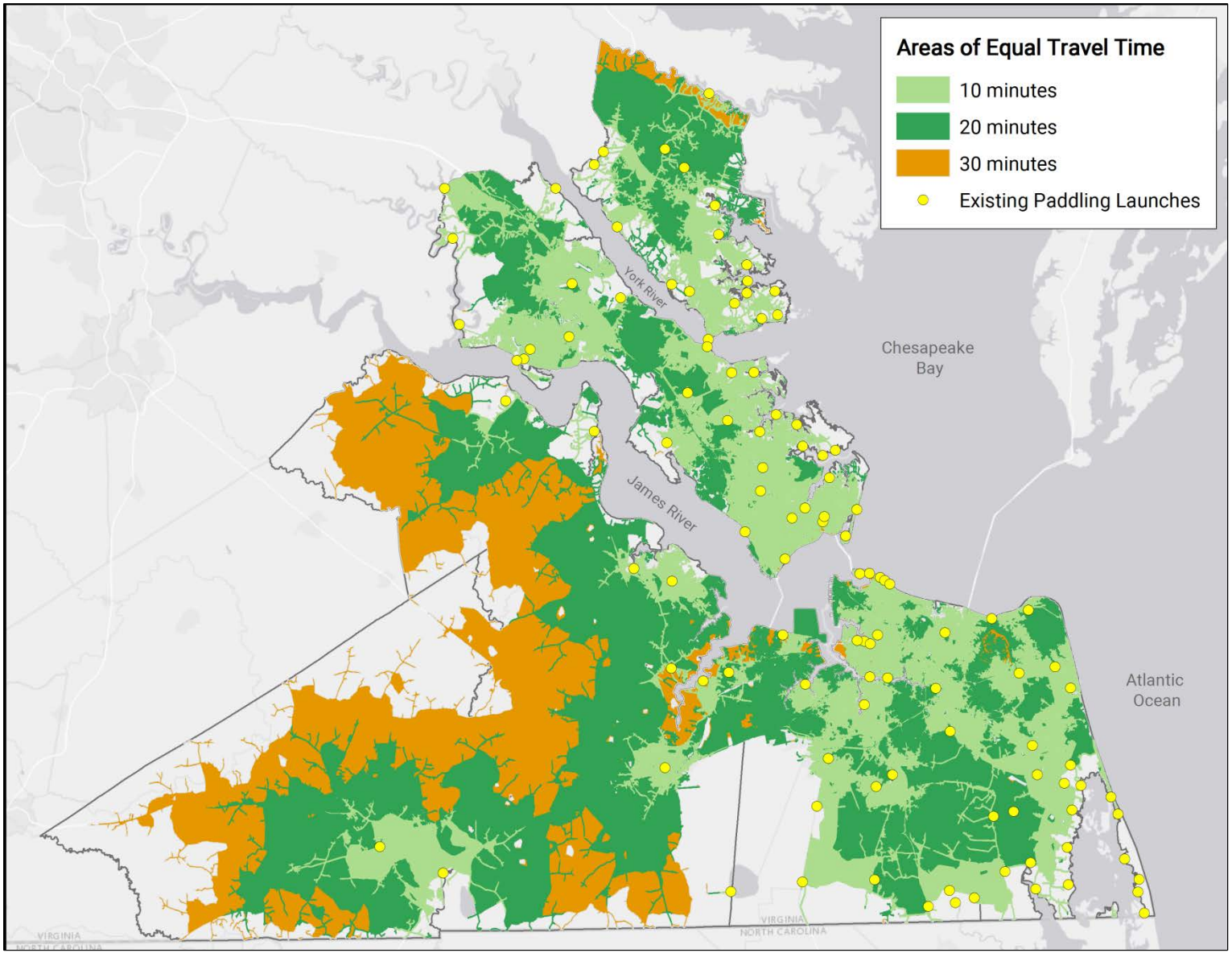

Figure 35. Ten, twenty, and thirty minute drive-time areas for existing paddling launches.

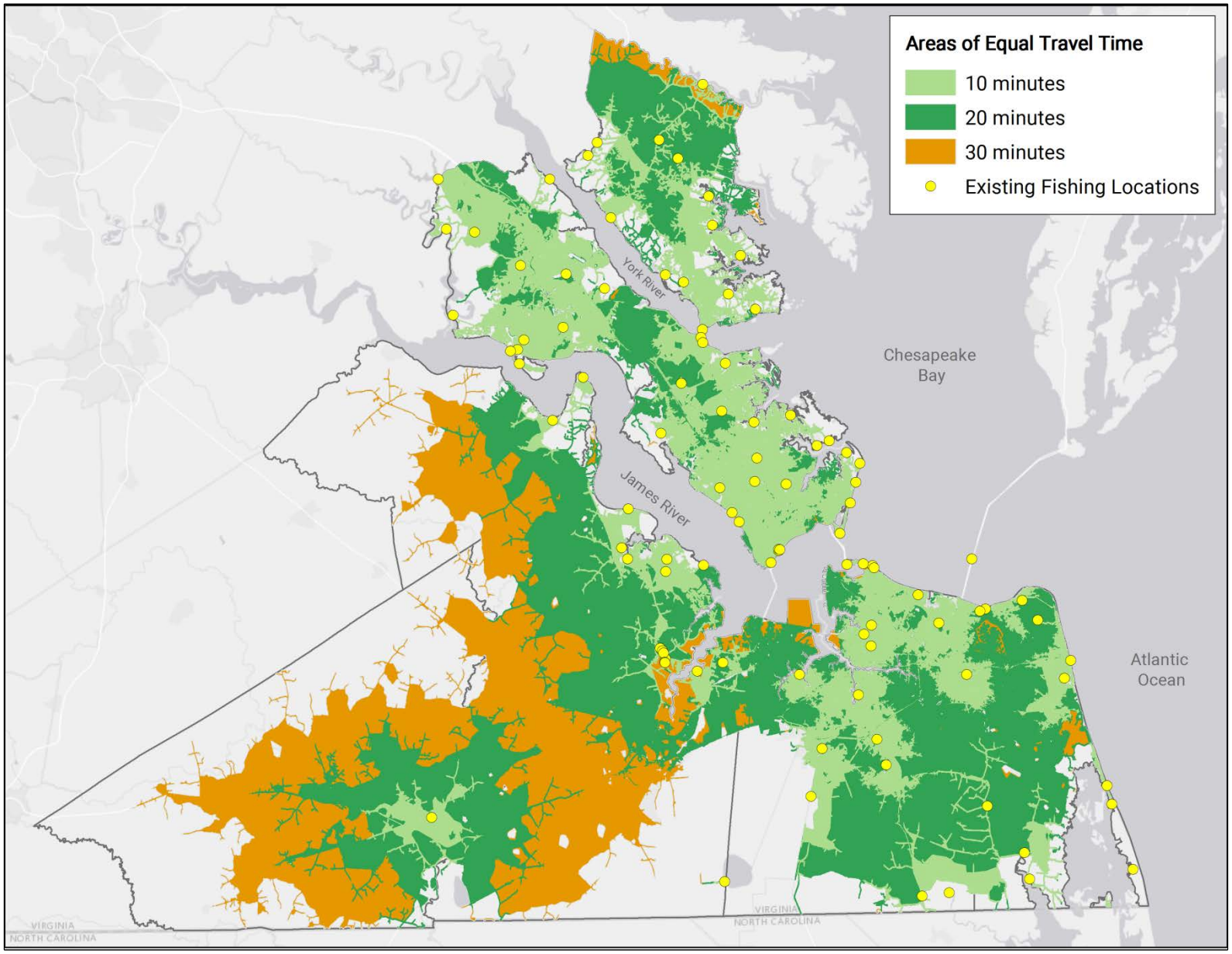

Figure 36. Ten, twenty, and thirty minute drive-time areas for existing fishing locations. This includes both fishing piers and bank fishing.

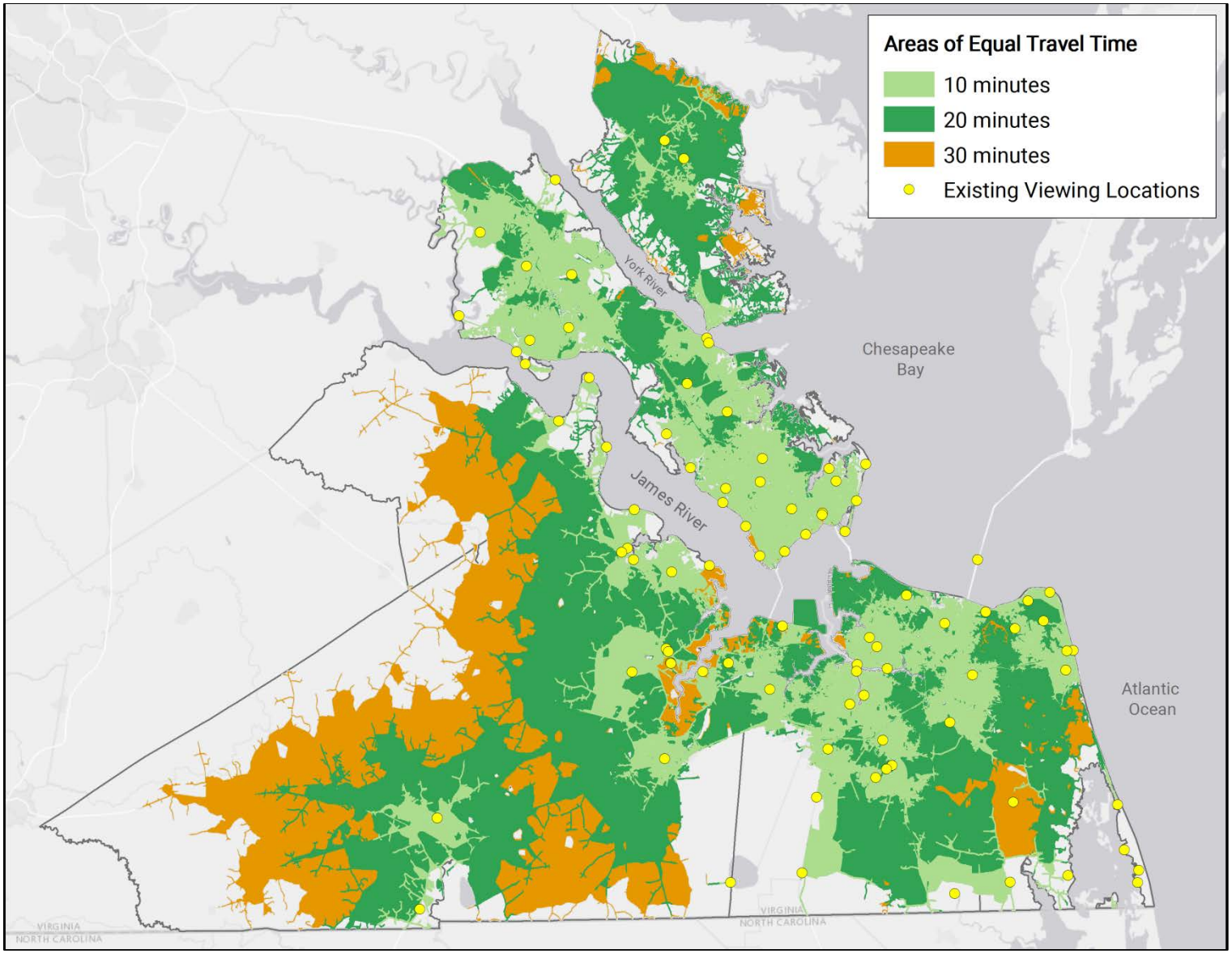

Figure 37. Ten, twenty, and thirty minute drive-time areas for existing viewing locations. This includes observation decks, boardwalks, and nature trails.

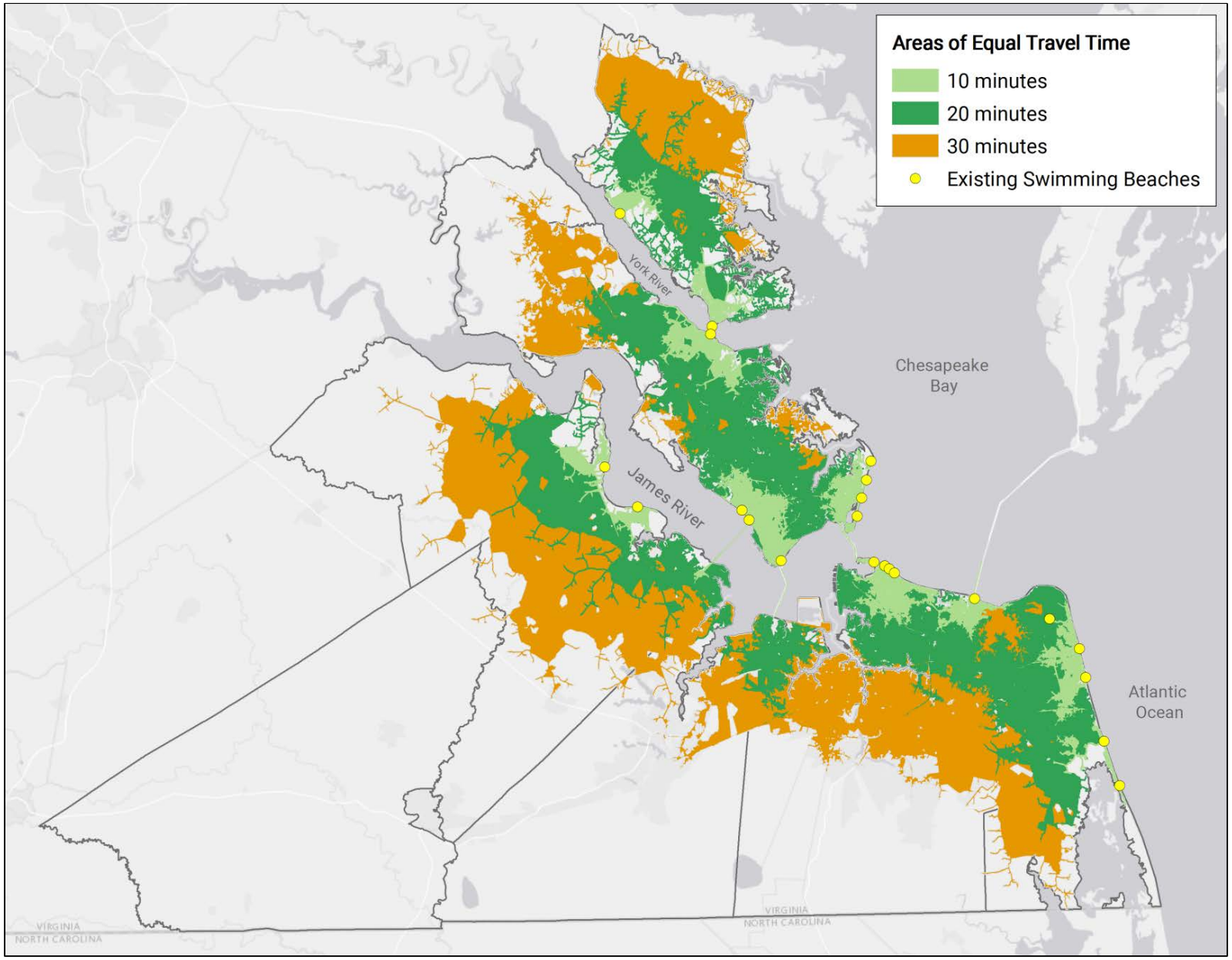

Figure 38. Ten, twenty, and thirty minute drive-time areas for existing swimming beaches.

Watershed Population by Access Type

The population per access site in each watershed was calculated by dividing the estimated watershed population by the number of water access points of a specific recreational type. For example, the Elizabeth River watershed has an estimated population of 467,434 people and 6 public boat ramps. Thus the watershed has 77,905 people per boat ramp, assuming equal usage of all boat ramps.

Populations for each watershed were estimated using the Spatial Overlay tool in the ArcGIS Business Analyst extension with ESRI 2016 Demographics Total Population Estimates. For each water access type map, only sites containing the specific feature of interest are displayed.

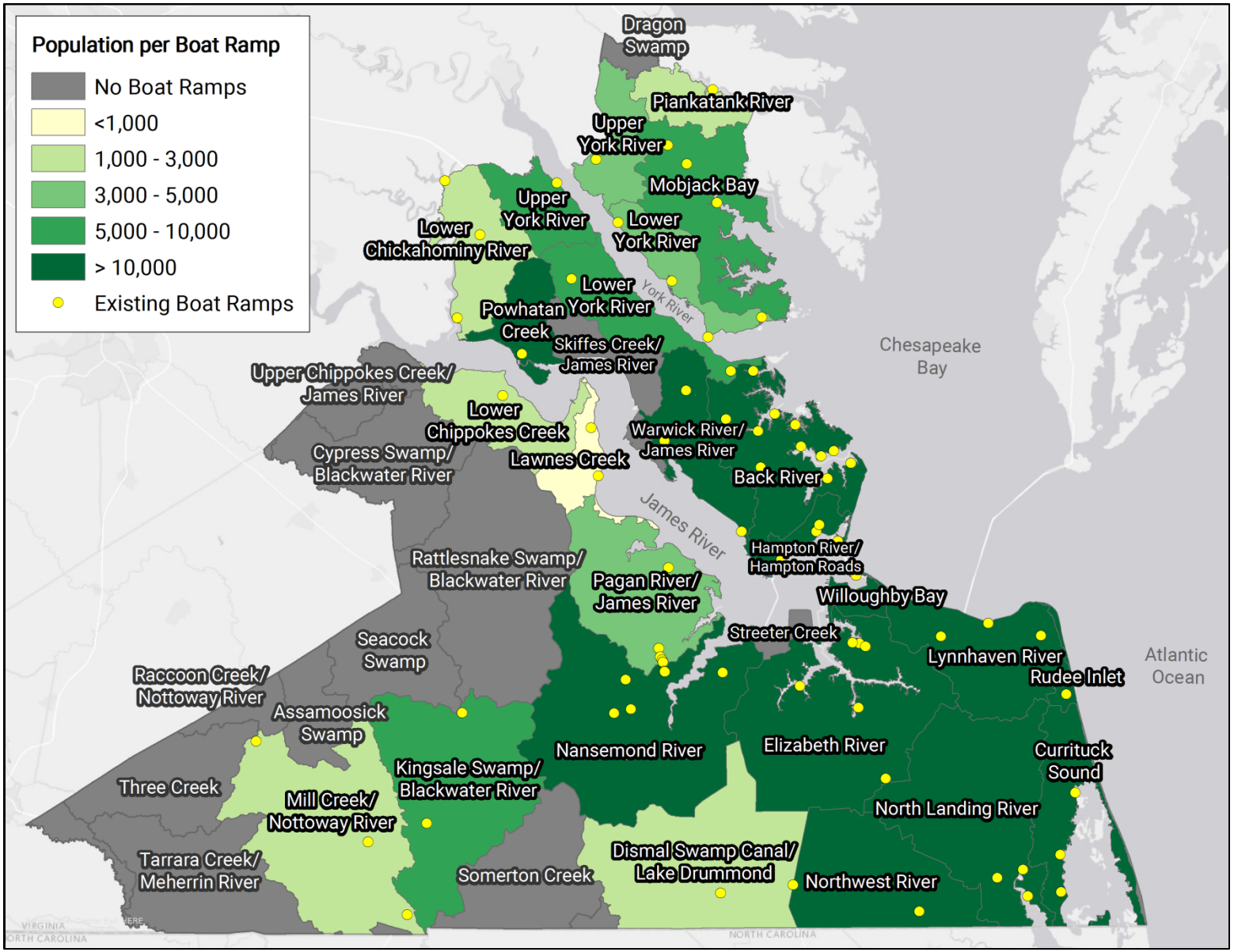

Figure 39. Population served per boat ramp by watershed

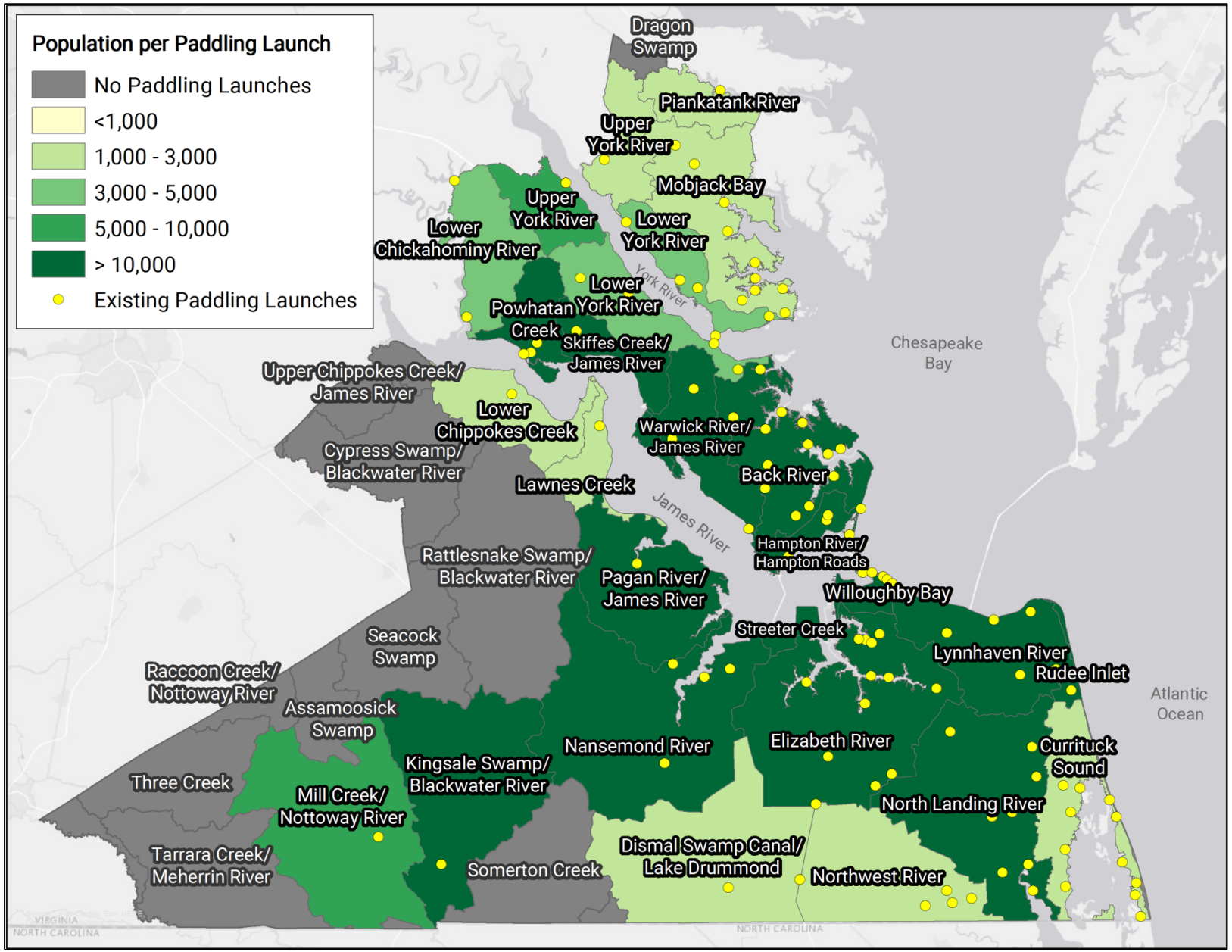

Figure 40. Population served per paddling launch by watershed

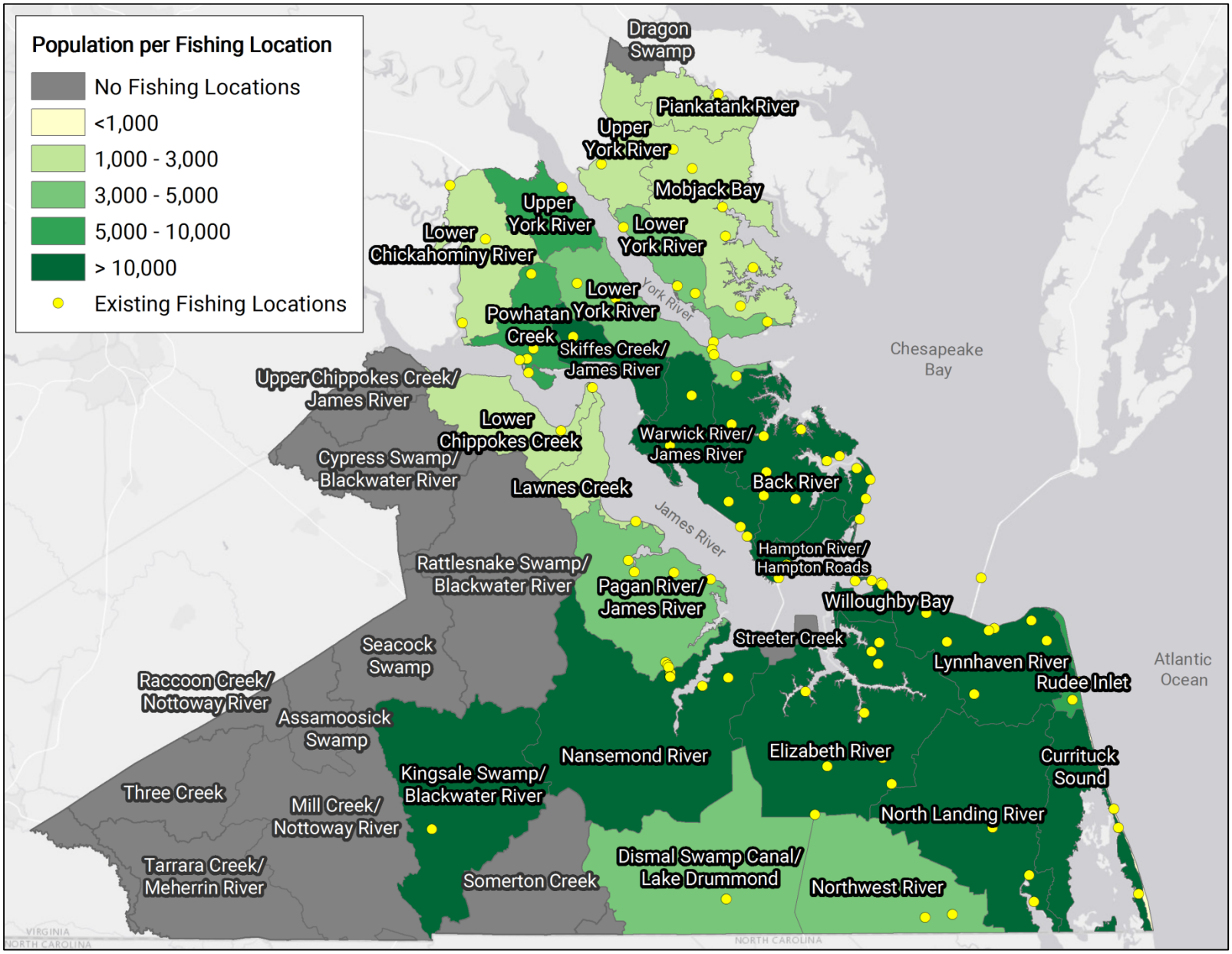

Figure 41. Population served per fishing location by watershed

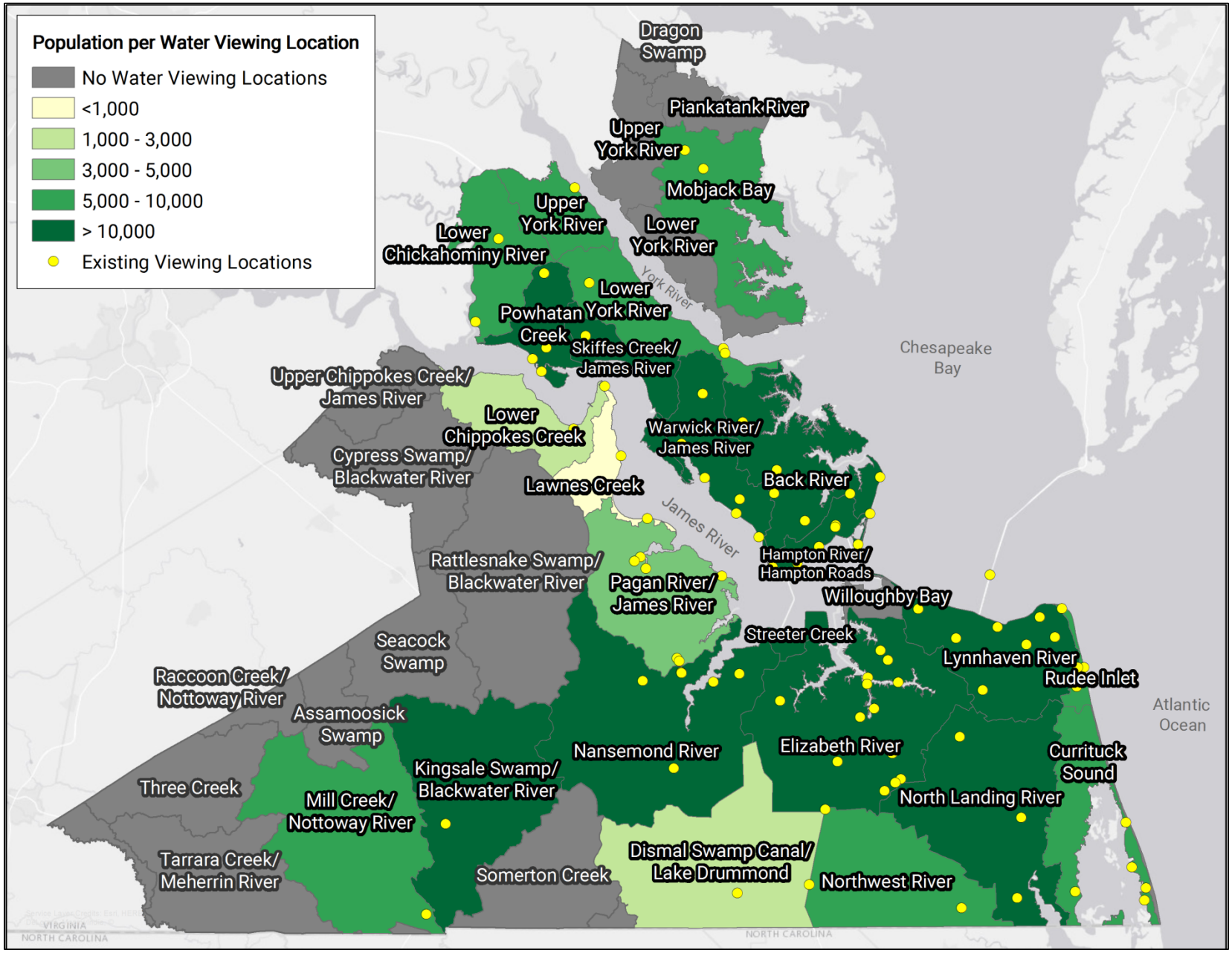

Figure 42. Population served per viewing location by watershed

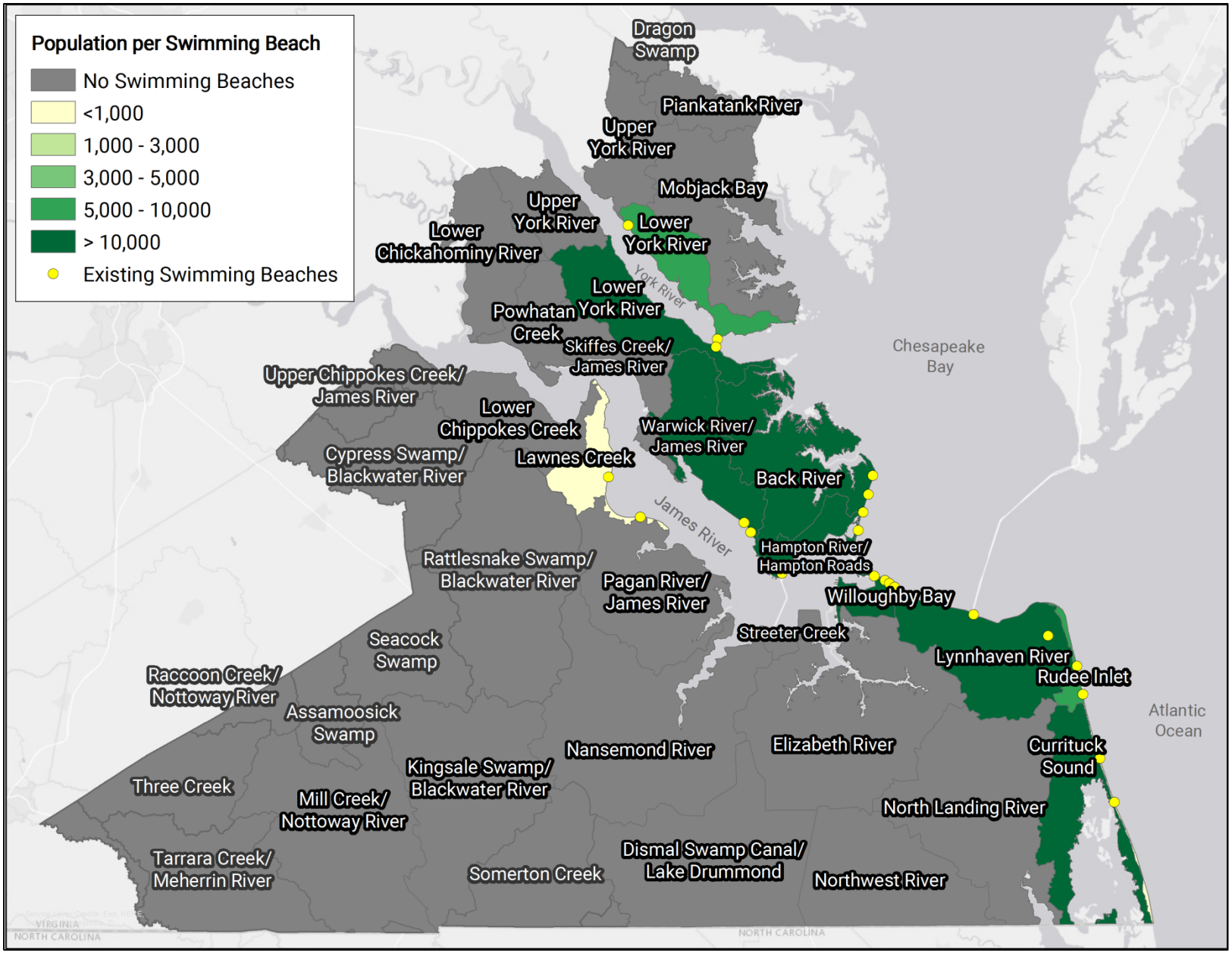

Figure 43. Population served per swimming beach by watershed

Population by Drive Time Areas with Future Sites by Jurisdiction

Comparisons of future sites to 10-minute drive time areas (DTA) and population estimates are presented for each locality. Planned, proposed, and potential sites are represented collectively as “future sites.” The purpose of the locality maps is to provide information for prioritizing future projects based on proximity to existing access locations and the surrounding population.

The future sites are symbolized by whether they fall within or outside of the 10-minute drive time area for existing public water access sites. The drive time polygon indicates the current area within a 10-minute drive of an existing water access location of any type. The drive time area is shaded by population estimates at the census block group level. Therefore, only block groups, or portions of block groups, which fall within the boundaries of the 10-minute DTA are displayed. Future sites outside of this drive time area, marked in purple, may be considered a priority because they would address a gap in service.

The following localities were selected because there was sufficient information to map future access points:

Locality	Count of Future Sites (Mapped)
City of Chesapeake	4
Gloucester County	3
City of Hampton	9
James City County	1
City of Norfolk	18
City of Suffolk	7
Surry County	1
City of Virginia Beach	18
Total	**61**

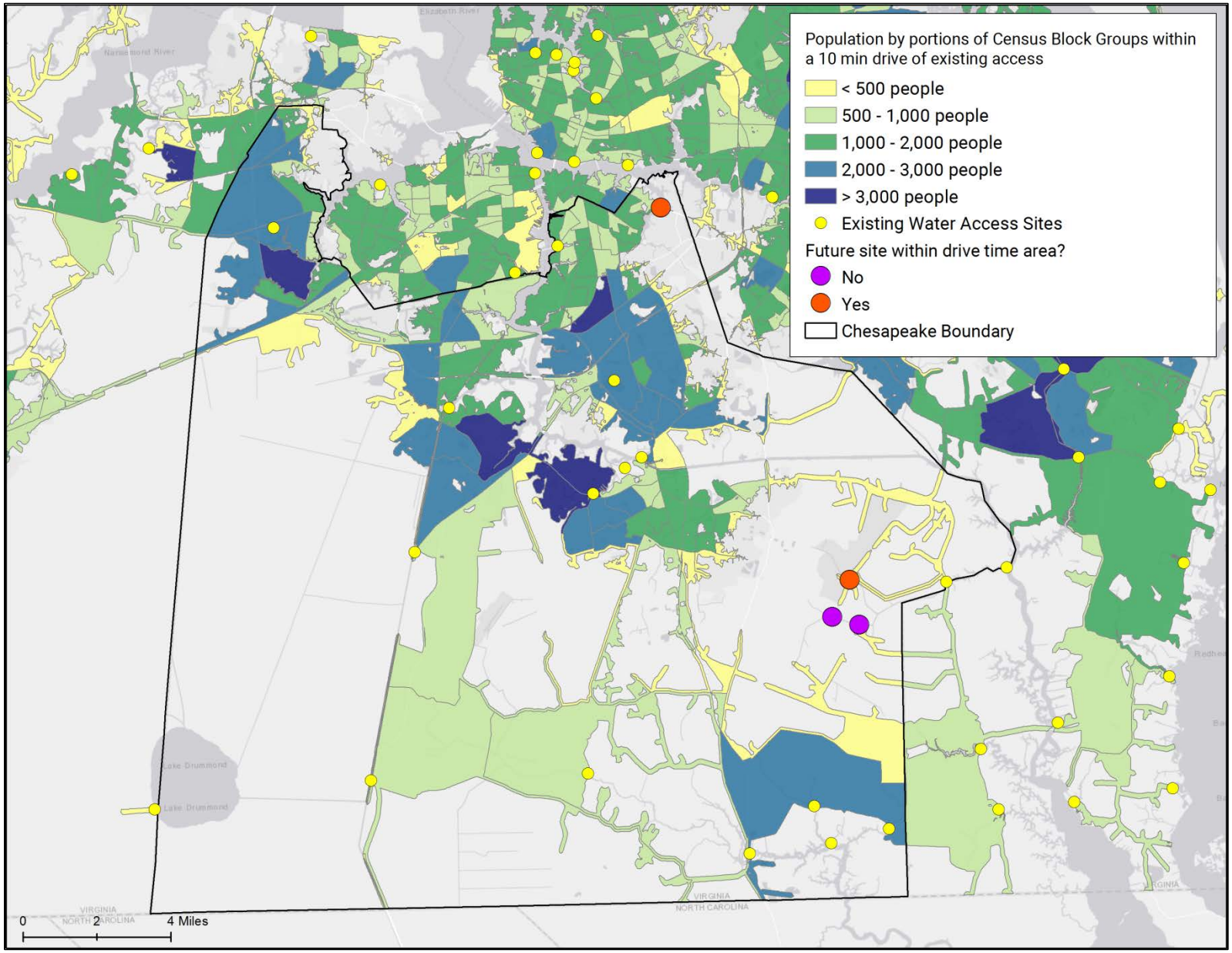

Figure 44. Comparison of 10-minute drive time areas and Census block population to future public access sites for the City of Chesapeake.

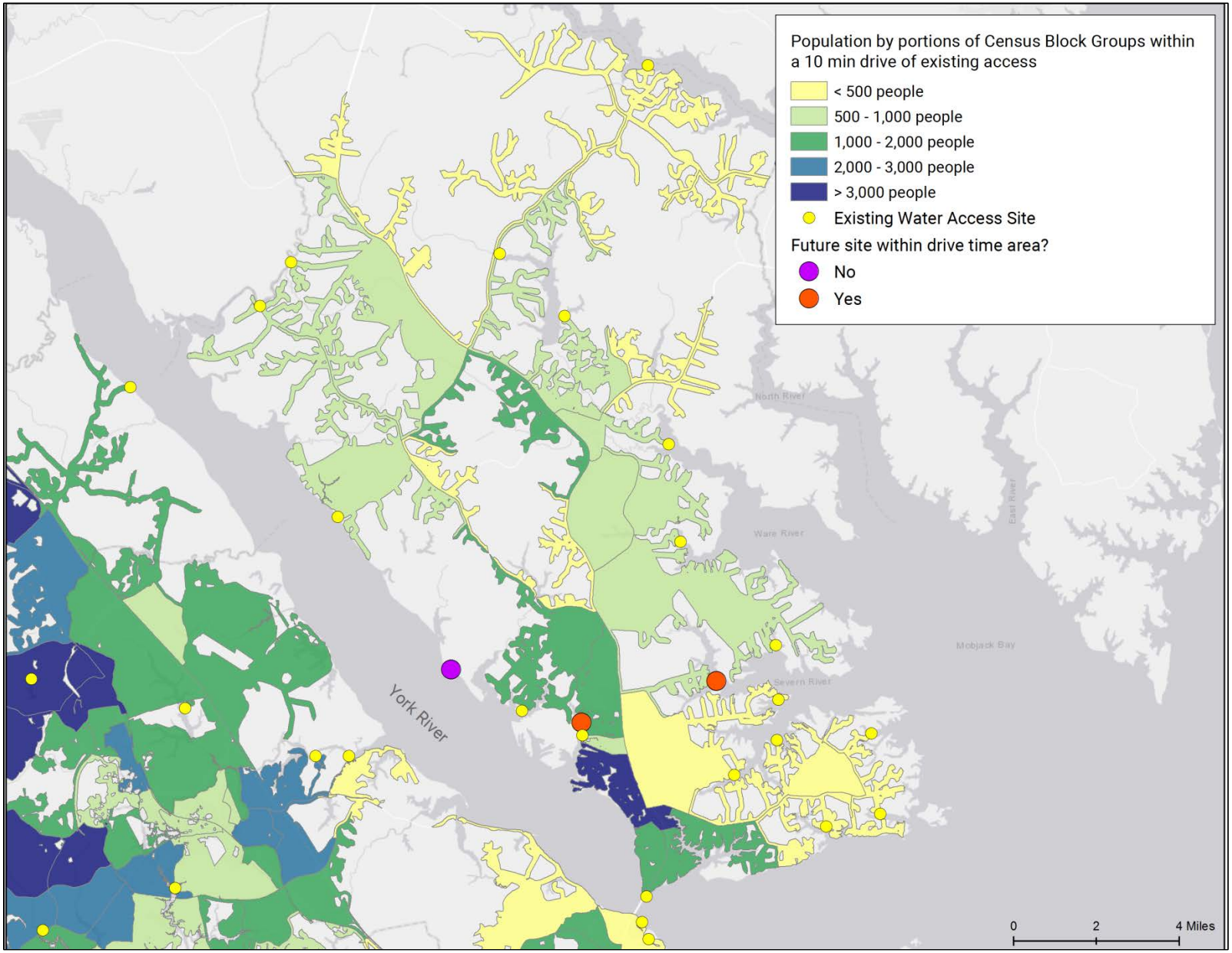

Figure 45. Comparison of 10-minute drive time areas and Census block population to future public access sites for Gloucester County.

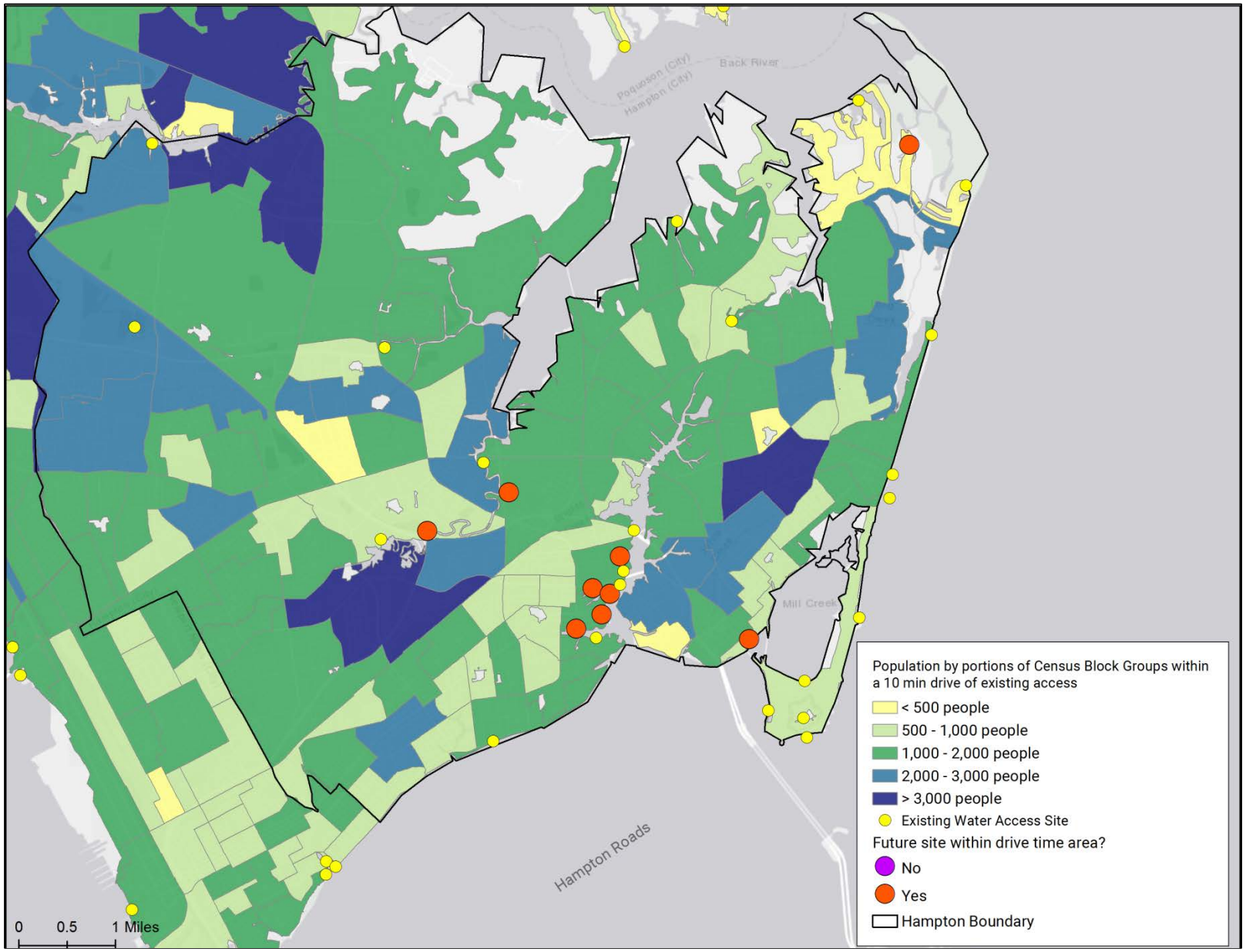

Figure 46. Comparison of 10-minute drive time areas and Census block population to future public access sites for the City of Hampton.

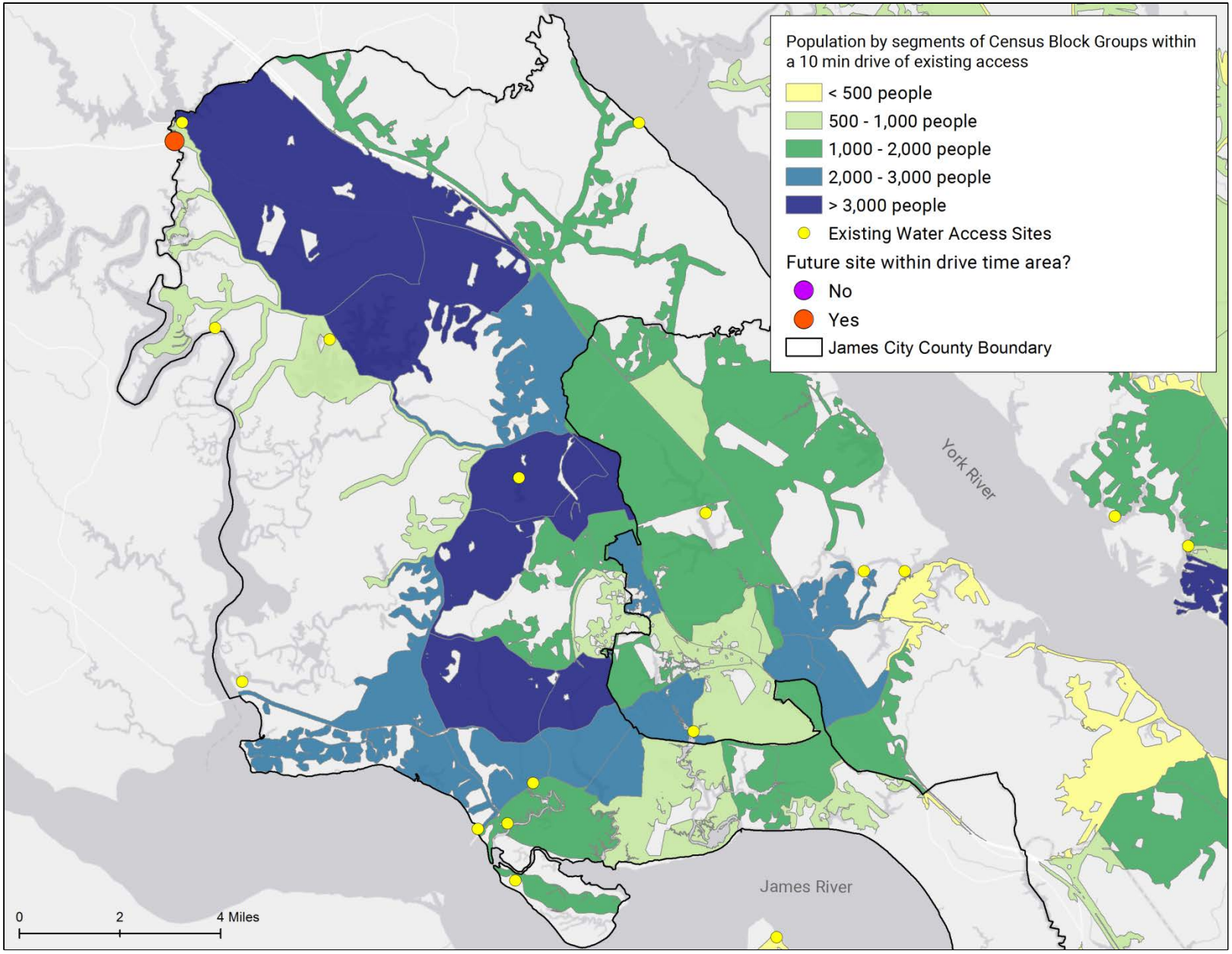

Figure 47. Comparison of 10-minute drive time areas and Census block population to future public access sites for James City County.

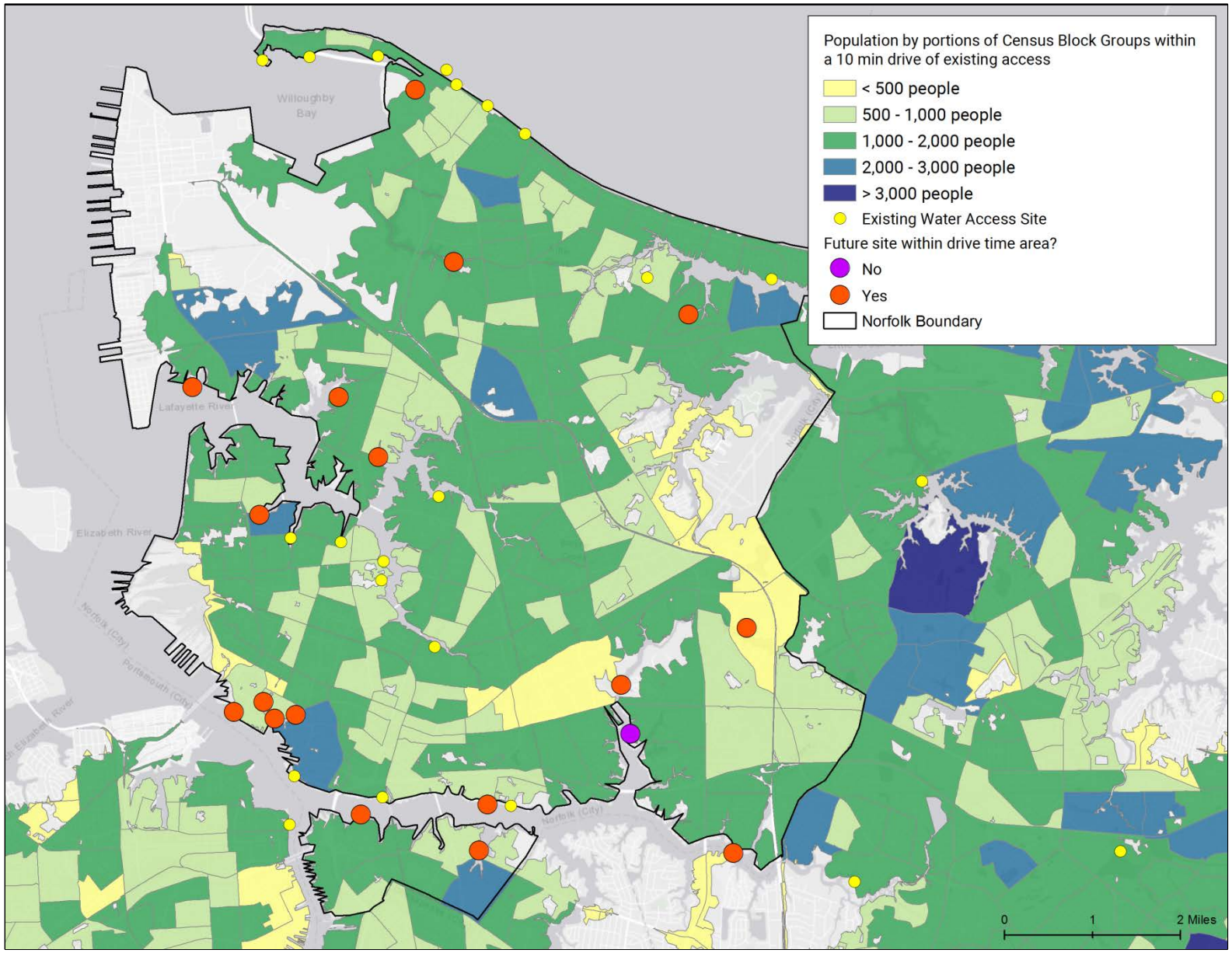

Figure 48. Comparison of 10-minute drive time areas and Census block population to future public access sites for the City of Norfolk.

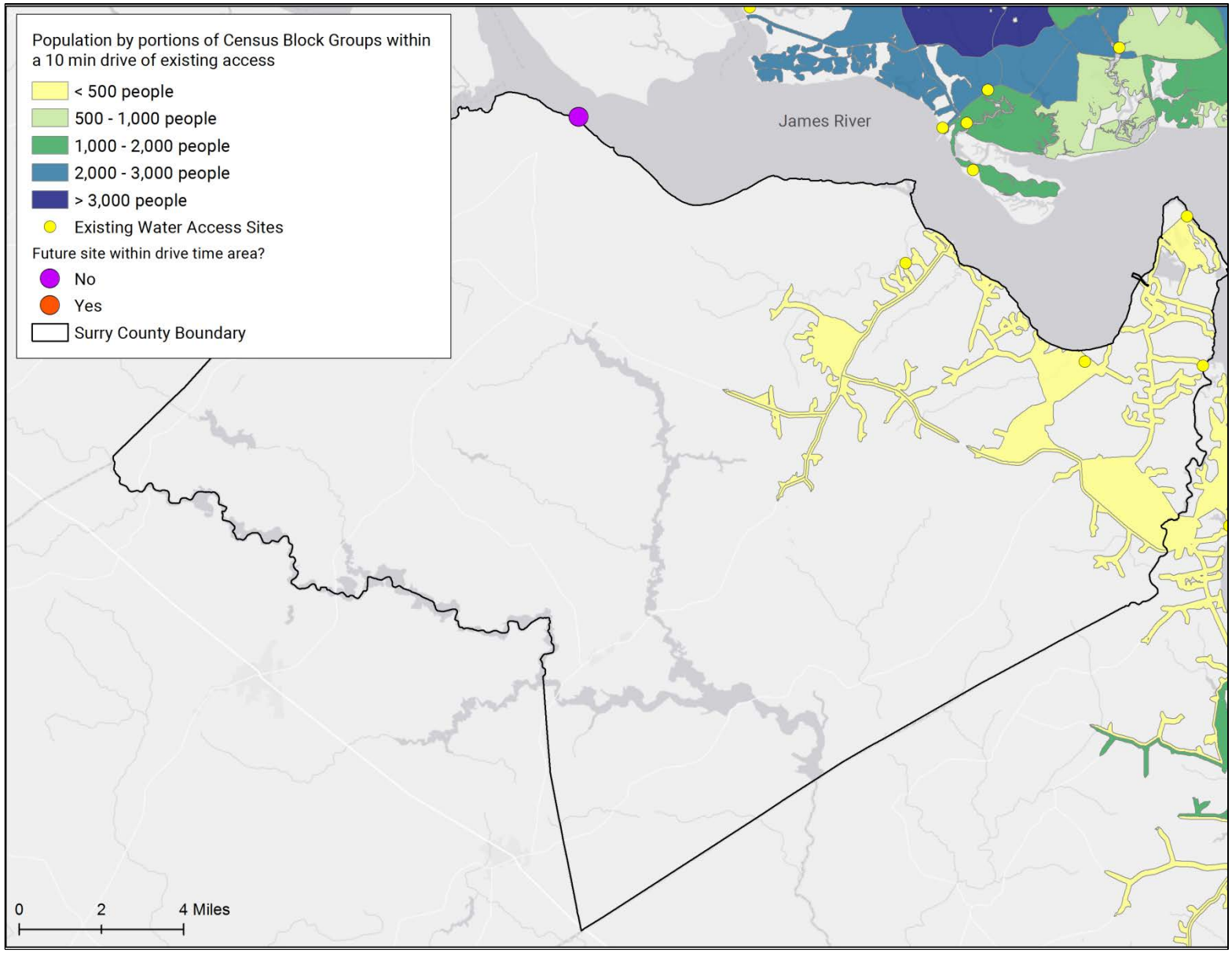

Figure 49. Comparison of 10-minute drive time areas and Census block population to future public access sites for Surry County.

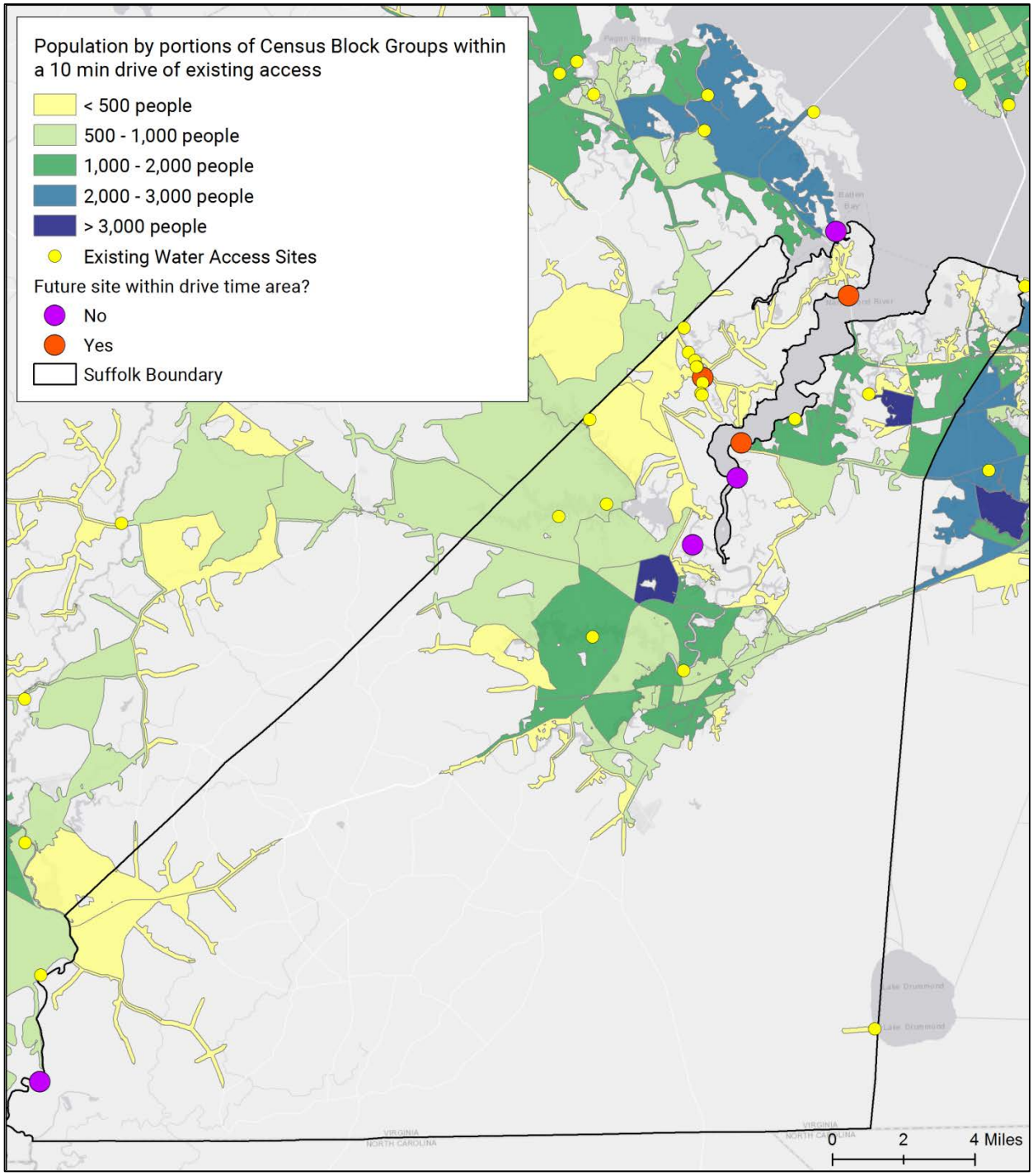

Figure 50. Comparison of 10-minute drive time areas and Census block population to future public access sites for the City of Suffolk.

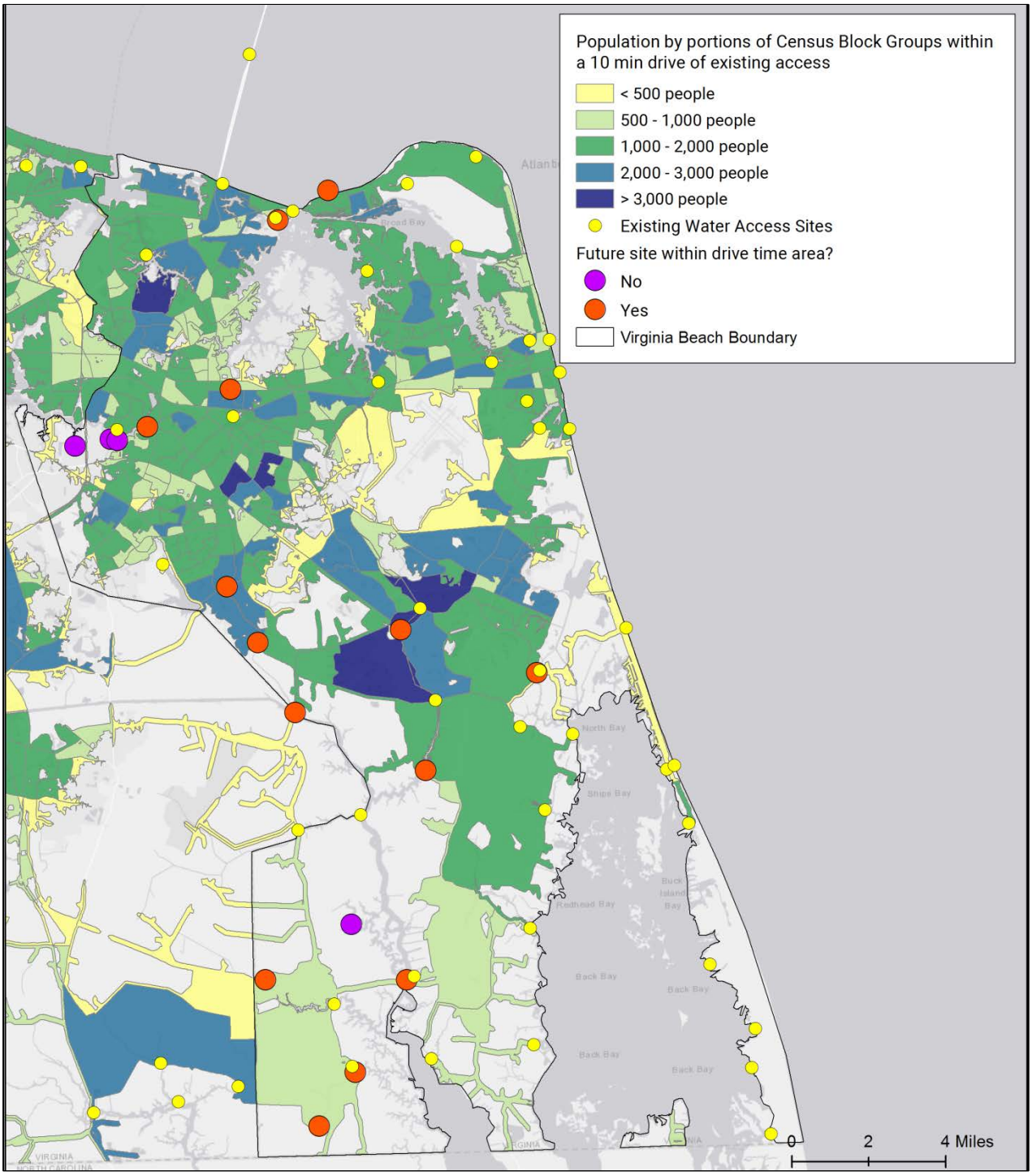

Figure 51. Comparison of 10-minute drive time areas and Census block population to future public access sites for the City of Virginia Beach.