

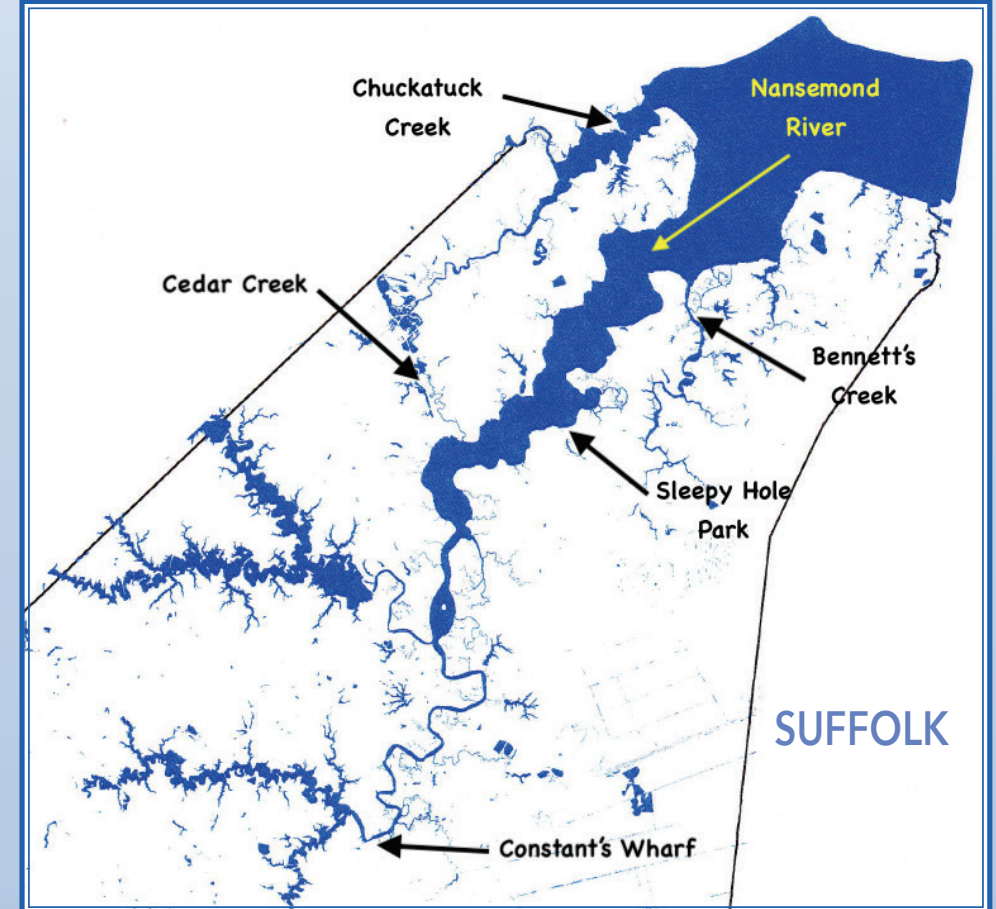


# About THE NANSEMOND RIVER

The Nansemond River was named for the Native American tribe that fished its waters for thousands of years before European settlers arrived. In 1608 Capt. John Smith sailed into the Nansemond River and in 1642, Anglican settlers formed a Parish near the shores of the Nansemond, known today as St. John's Church.

The Nansemond River originates in downtown Suffolk (upper Nansemond). Lakes Cahoon, Kilby and Meade were once streams which were the headwaters of the Nansemond. They have since been separated from the River by dams and are now owned by the City of Portsmouth. Lakes Burnt Mills and Prince were once streams which were the headwaters of the Western Branch but were also impounded by dams and are now owned by the City of Norfolk. Except for lake overflow, the River has no significant source of fresh water except for storm water runoff from rain events.

The Nansemond River runs more than 20 miles from downtown Suffolk to its confluence with the James River and is home to the Nansemond National Wildlife Refuge. Bennett's Creek, which feeds into the Nansemond downstream of the Rt. 17 Bridge, is a major tributary. The Nansemond Watershed drains 161,358 acres of land in Suffolk and Isle of Wight County. However, a significant portion of the rain water drains into the aforementioned lakes. Salinity at the mouth of the Nansemond averages 15 parts per thousand



(brackish) and due to tidal flow, decreases to nearly negligible salinity in downtown Suffolk. Much of the River, outside of the navigation channel, is of shoal depth and is bordered with numerous wetlands.

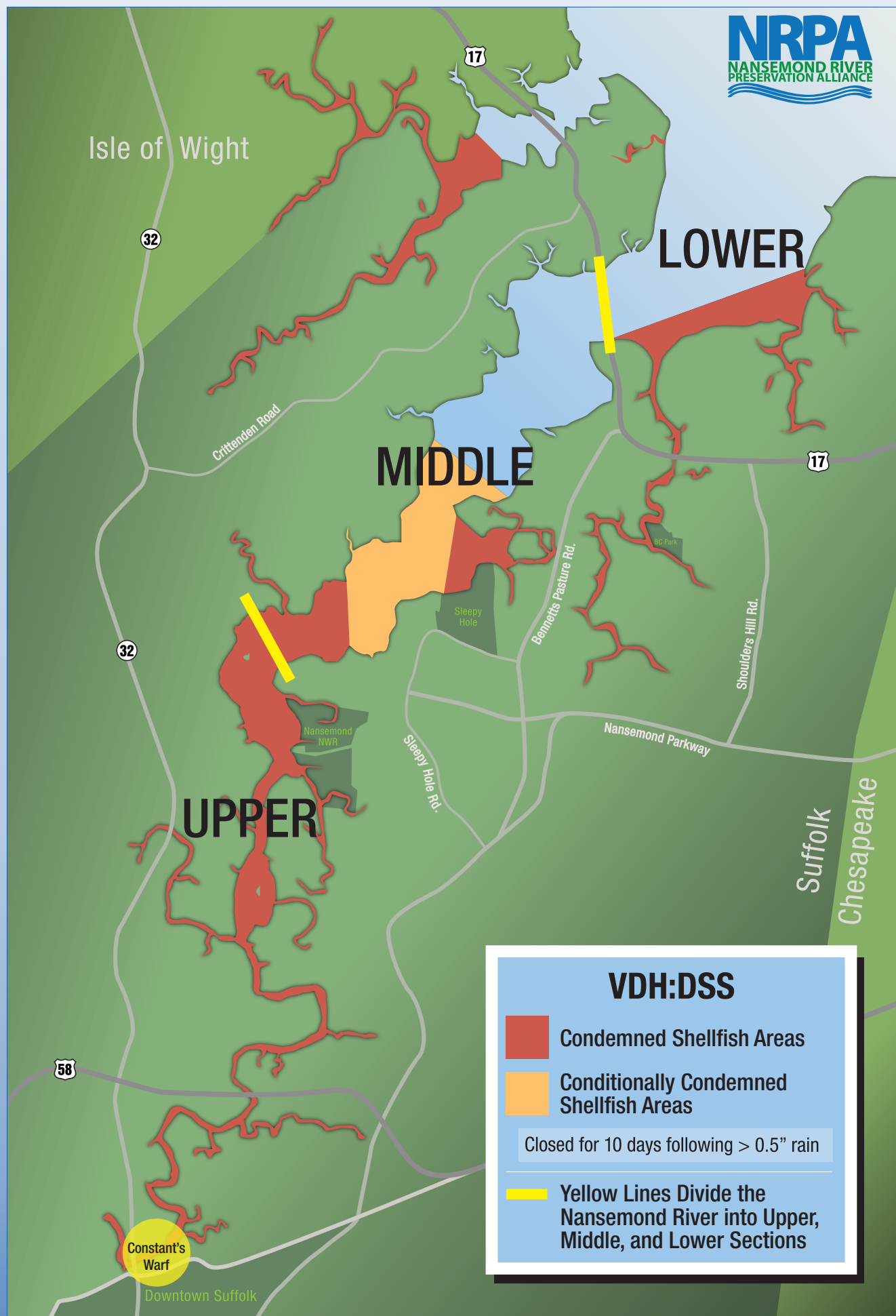
The Nansemond Watershed has a legacy of livestock and agriculture, from tobacco in the 18th century to peanuts, soybeans and cotton today. But the real legacy of the Nansemond stems from its once thriving oyster, crab and shad fisheries that are all but gone today as the result of pollution, impervious (hard) surfaces from development and loss of habitat.



∞ STATE OF THE  
2019 NANSEMOND RIVER  
REPORT & REPORT CARD



Turn the page!



Keep this fold-out map open while reading the report.

## THE NANSEMOND RIVER PRESERVATION ALLIANCE 2018 State of the Nansemond River Report Card

The Nansemond River continues to be impaired. Bacteria levels and sediment have risen steadily in recent years detracting from the value of the River's oyster industry and its recreational assets.

	PARAMETER	2014	2016	2018	AS OF DECEMBER 2018
VA Dept. of Health Data	Bacteria - Oyster				
	Lower Nansemond	A	A	B	Oyster harvesting unrestricted, but bacteria levels are increasing.
	Middle Nansemond	C	D	D	Portions are Conditionally Approved (Closed for 10 days after 0.5 inch of rain) or Restricted (Closed)
	Upper Nansemond	N/A	N/A	N/A	Not an oyster habitat - too low salinity.
City of Suffolk Data	Bacteria - Swimming				No requirement for City of Suffolk to post health warning. (Suffolk does not have public beaches)
	Lower Nansemond	No Data	B	A	Meets National Standards
	Middle Nansemond	No Data	F	D	No swimming 48 hours after major rainfall events.
	Upper Nansemond	No Data	F	F	National Standards warning advisory for swimming.
	EcoCheck - IAN	Grade	Grade	Grade	Grade Determined By Ecocheck Methodology
City of Suffolk Data	Total Nitrogen (All Nansemond River)	A	A	A	Total Nitrogen levels are low
	Phosphorous (All Nansemond River)	F	F	F	High levels may cause algae blooms. Fertilizer run off adds to problem.
	Turbidity-Suspended Solids (All Nansemond River) Average	27.4	28.2	35.8 (increase)	Impediment to aquatic plant growth. Suspended solids in the River have increased 25% over 3 years due to increasing run off which increases sediment levels.
NRPA Data	Dissolved Oxygen				Sampling Period: April - October
	Lower Nansemond	A	A	B	Good oxygen levels.
	Middle Nansemond	B	A	C	Acceptable oxygen levels.
	Upper Nansemond	F	F	D	Low oxygen levels at times.
Pollution Control	Storm Water and Runoff Control	C+	C+	D	Need proper compliance by developers, contractors, and homeowners of environmental regulations especially Chesapeake Bay Preservation Act and Stormwater regs.
	Sanitary Sewer Improvements	C+	C+	C+	Sewer or septic tank overflows during major rain events. Collaborative Bacterial Source Tracking Program in process. Aging pipe infrastructure and faulty septic systems are being identified and corrected.
	Clean Boating	B+	B+	B+	Constant's Wharf, Bennett's Creek Landing, Decoy's Marina have pump out. HRSD will pump out.

## EXECUTIVE SUMMARY

The NRPA Water Quality Committee is pleased to present the fifth edition of the State of the Nansemond River Report and Report Card. The Report examines the status of the River using five indicators. The findings are presented through a narrative format with supporting graphs. The Report Card provides a one-page illustration of the five indicators with a brief explanation.

As individuals and as a society we make choices that affect the River for better or worse. After decades of improvement following the removal of slaughterhouses and a decrease in the number of septic tanks in the watershed, we are now seeing the overall water quality deteriorating as population increases.

What will future generations say we did to protect and restore the Nansemond River? NRPA's goal is to educate citizens about the status of Suffolk's precious waterways and promote best practices that will reverse the declining waterway trends and reach our goal of a healthy and sustainable River, for ourselves and for future generations. The responsibility falls upon all citizens, businesses, elected officials and city department managers to do their part to *Make a Difference*.



### How is the Health of the Nansemond River?

The Nansemond River is a complex natural system, with many factors affecting its overall health and vitality.

**The River is classified as impaired** - Impaired, means that the River fails to meet state or federal standards for one or more pollutants. The source is considered **non-point source pollution**-not one source. Contributing factors include the accumulation of runoff from parking lots, homes and businesses. **People are the Solution.**

### Findings Include:

- The overall health of the waterway is declining.
- The River is impaired by excess bacteria which resulted in 60% of the Nansemond River being closed to shellfish harvesting. The VA Department of Health Division of Shellfish Safety issues the restrictions or conditional restrictions.
- According to state and national standards, swimming is not recommended in sections of the River due to high bacterial levels, especially after rainfall events.
- Suspended solids (sediment) are increasing rapidly due to increased run off which impacts water clarity.
- Phosphorus levels exceed the Virginia Department of Environmental Quality standards.
- The River meets standards for nitrates and dissolved oxygen. The implementation of best practices is required to ensure that changes do not occur with respect to nitrates and dissolved oxygen.

### Factors to be considered in order to fully understand the elements that can impact the health of the River:

- Unprecedented development, which results in an increase of impervious (hardened) surfaces, contributes to the increase of sediment in the waterways. Low water clarity prevents the growth of aquatic vegetation. There are no bottom grasses in the Nansemond.
- Increased design standards for run off catchment basins and protection of the 100-foot vegetated buffer along the River can reduce the flow of sediment and other elements.
- Environmental governmental regulations, such as the Chesapeake Bay Preservation Act (CBPA), need to be properly enforced. Scientific research supports the fundamental premise of the CBPA, the significance of the 100-foot buffer area as an important natural stormwater runoff filter. The state legislature agreed with the research by passing the CBPA.
- The benefits of a vegetated buffer should not be trivialized by citizens and developers.



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# About

## THE NANSEMOND RIVER PRESERVATION ALLIANCE

In 2009, 17 Suffolk citizens concerned with the continued degradation of the Nansemond River and its tributaries met to establish an environmental organization whose mission was to help reverse the trend by educating and encouraging all community residents to be environmental stewards. As a result of the efforts of this small group, the Nansemond River Preservation Alliance (NRPA) was founded, received its official non-profit status in August 2010, and enacted a fast-paced plan to achieve its mission. The NRPA organizational structure is minimal, yet very effective - led by a 22-member board, 4 operating committees - Water Quality, Environmental Education, Shoreline and Public Access. In addition to the committees, NRPA has a 2/3-time President/CEO and 1/4-time K-12

Education Manager and 150 volunteers. Funding is received through foundations, businesses, state and the generous 250 citizens who support NRPA's mission. Success is also based on collaborating with 28 non-profit, civic and community organizations, Homeowner Associations, city, regional and state agencies, and several universities including College of William & Mary Law School, Virginia Coastal Policy Center, Virginia Institute of Marine Sciences and Old Dominion University. NRPA provides the only comprehensive hands-on, environmental program in Suffolk that strives to educate all citizens to be environmental stewards and work to restore and protect Suffolk's natural resources. NRPA serves all of Suffolk's 93,000 citizens.

### NRPA WATER QUALITY COMMITTEE

- |                                    |                             |
|------------------------------------|-----------------------------|
| Geoff Payne, Chair                 | Leora Porter                |
| Captain Steve Barnum, NOAA (Ret'd) | William Old, MD             |
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| Captain Bob Crocker                | Cindy Pinell                |
| Barbara Cummings                   | Boo Van Straten             |
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| Paul Fisher                        | Joseph Verdirame, MD        |
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| Philip Ford                        | A. Scott Wilson             |
| Kelly Hengler                      | Jim Winters                 |
| Steven Kirkpatrick                 | Elizabeth Taraski, PhD      |
| Brian Martin                       | <b>Technology Advisors:</b> |
| Wayne Martin                       | Adam Pinell                 |
| Don Porter                         | Russ Richards               |

## REPORT'S PURPOSE

An important tenet of the NRPA philosophy is to educate citizens about the current status of our waterways and encourage them to be environmental stewards. The NRPA Water Quality Committee biannually releases the

State of the Nansemond River Report and Report Card to inform residents, businesses, government agencies and elected officials about the status of our River. Reports were released in 2011, 2013, 2015 and 2017.

### METHODOLOGY

#### SAMPLING DATA

The Report reflects an analysis of sampling data collected by NRPA, Suffolk Public Works and the Virginia Department of Health: Division of Shellfish Safety.

#### ANALYSIS AND GRADING

The NRPA Water Quality Committee's goal is to ensure that their assessment and grades reflect best practices in the field. Beginning with the 2019 released Report, NRPA is now using the EcoCheck methodology. The Chesapeake Bay Foundation, Elizabeth River Project and other environmental organizations use the EcoCheck methodology. EcoCheck is part of the University of Maryland Center for Environmental Science Integration and Application Network, with a focus on ecosystem health reporting. EcoCheck's primary mission is to enhance and support the science, management, and restoration of the Chesapeake Bay.

#### VIRGINIA DEPARTMENT OF HEALTH: DIVISION OF SHELLFISH SAFETY PROTOCOL

Virginia Department of Health: Division of Shellfish Safety (VDH:DSS) relies on water quality monitoring data in accordance with guidance from the Food and Drug Administration's National Shellfish Sanitation Program (NSSP). The VDH:DSS conducts sampling in which fixed stations within shellfish growing areas are monitored on dates randomly selected with regard

to weather, generally sampling one time per calendar month. At least once per year, the VDH:DSS calculates Geomean and 90th percentile results of the most current 30 data points. The results are compared with the NSSP standards regarding the classification of shellfish growing areas. Restrictions and Conditional Restrictions are made based on this data.

#### SUFFOLK PUBLIC WORKS PROTOCOL

Suffolk's Comprehensive Plan states: "A Total Maximum Daily Load (TMDL) Implementation Plan is developed after a TMDL is approved by the United States Environmental Protection Agency (EPA). Once fully completed, a TMDL Implementation Plan is intended to restore the designated uses of an impaired water body and maintain its water quality into the future." The City tests the water to meet their Municipal Separate Storm Sewer Systems (MS4) Permit. The City's protocol is certified by the Virginia Department of Environmental Quality.

<https://www.suffolkva.us/DocumentCenter/View/214/Action-Plan-for-Bacteria-Reduction-PDF>

#### NANSEMOND RIVER PRESERVATION ALLIANCE PROTOCOL

Nansemond River Preservation Alliance collects sampling data monthly at sites that were designated by the Virginia Department of Environmental Quality. NRPA's sampling protocol is certified by the Virginia Department of Environmental Quality.



# Supporting DATA & GRAPHS

## BACTERIAL IMPAIRMENT

### THE SHELLFISH HARVESTING INDUSTRY AND THE NANSEMOND RIVER

**Fecal Coliform:** The Virginia Department of Health, Division of Shellfish Safety's (VDH:DSS) sampling data is used for the report because of the highly sophisticated random sampling and analysis process. NRPA and Suffolk Public Works' sampling supplements the VDH:DSS data by providing a more comprehensive picture of the condition of the waterways.

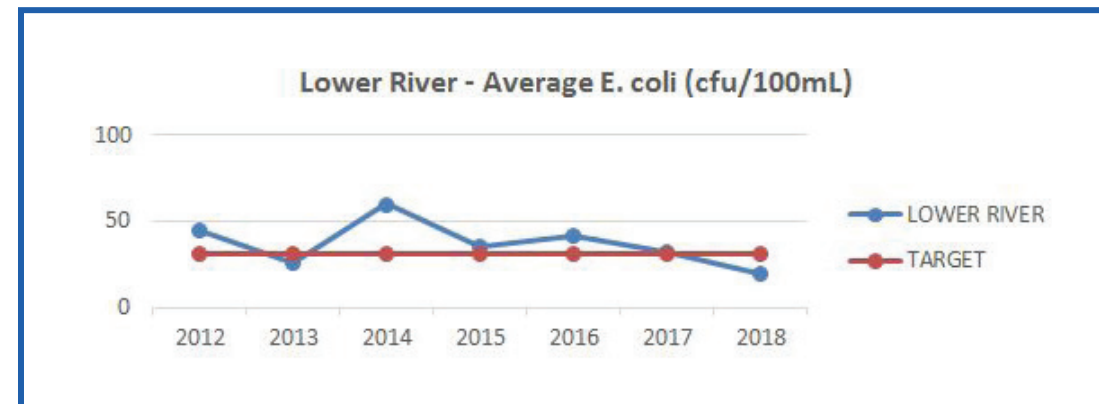
VDH:DSS relies on water quality monitoring data in accordance with guidance from the Food and Drug Administration's National Shellfish Sanitation Program (NSSP). In order for the area to be approved for the unrestricted harvesting of shellfish, the fecal coliform (measured via mTEC method) values shall not exceed a geometric mean of 14 colony forming units (CFU) per 100mL or 90th percentile of 31 CFU per 100 mL.

### FINDINGS:

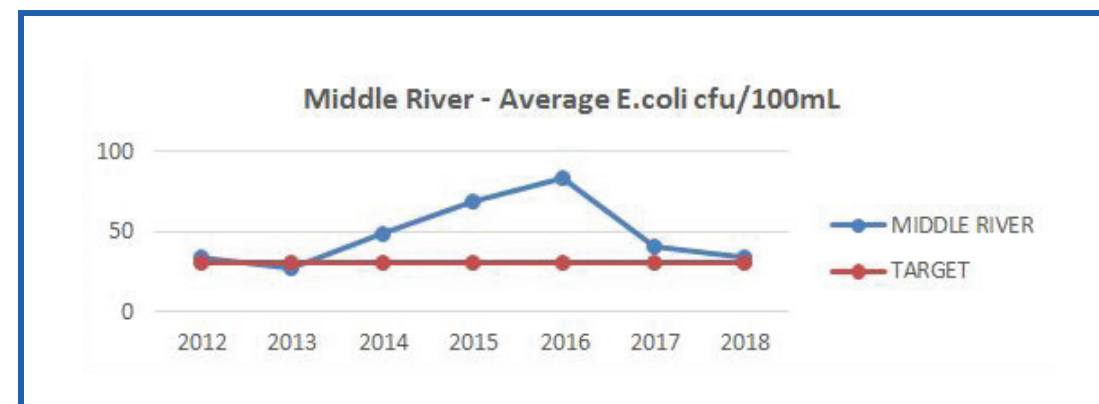
The Nansemond River is divided into three segments for this Report.\*

- (a) The Lower River meets acceptable standards.
- (b) The Middle River most southern section is Restricted. The next section proceeding north is conditionally closed (Closed for 10 days after 0.5 inch of rain). The next section is open to shellfish harvesting.
- (c) The Upper River does not support oyster growth due to low salinity. However, bacterial levels exceeded acceptable standards.

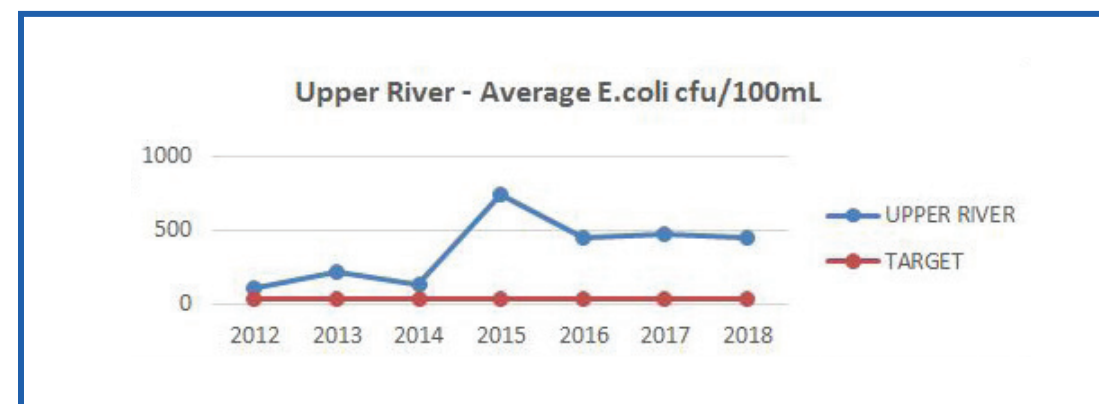
\*See fold-out map



EcoCheck Grade **B**



EcoCheck Grade **D**



Salinity is too low to support oysters. Bacteria levels are **VERY** high.



## RECREATIONAL

### CAN I SWIM IN THE RIVER?

Recreational standards are based on the Virginia Water Quality Standard 9 VAC 25-260-170 standard which states no single sample shall exceed 104 CFU/100 mL. Enterococcus (Bacteria) levels above Enterococci 104 CFU/100 mL are deemed impaired.

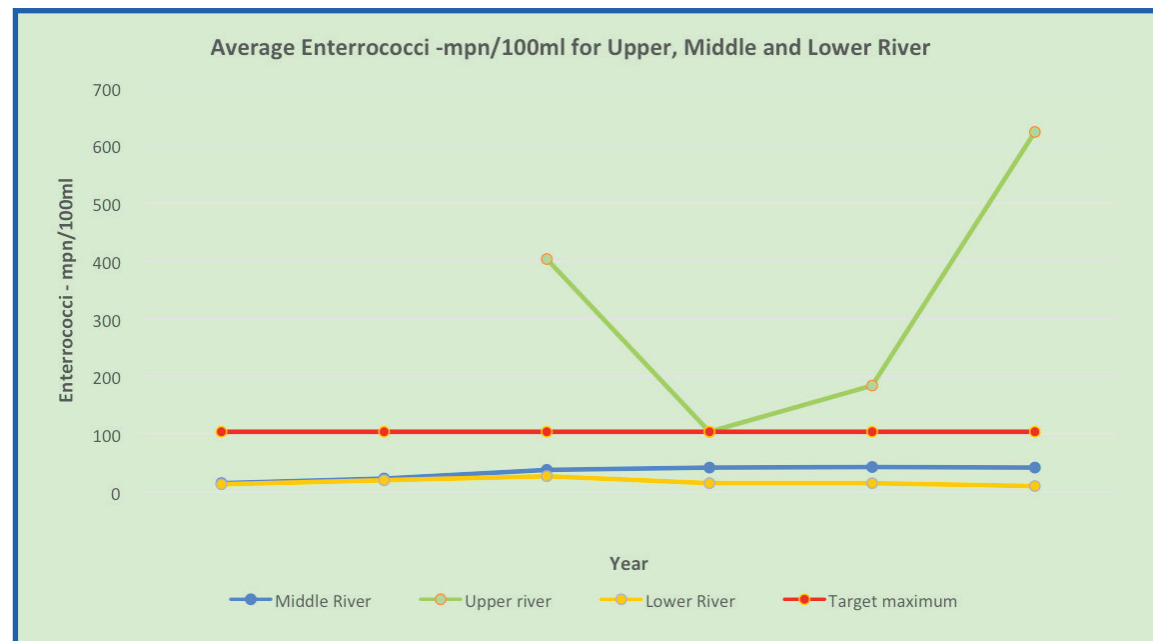
Samples analyzed for enterococcus bacteria levels are collected by the City at sites along the Nansemond River are used for this Report. The Hampton Roads Sanitation District conducts the analysis of the City's samples. The graph shows an increase from the mouth (Lower River) of the Nansemond to downtown (Upper River) Suffolk.

### FINDINGS:

Samples exceed the acceptable standard. Suffolk does not have any public beaches therefore the Suffolk Department of Health does not issue any warnings related to recreational waterway activities. The Virginia Department of Health provides the following recommendations to prevent illness and injury when swimming in natural waters by following these steps:

- Avoid swimming in natural waters for a few days after a heavy rain event.
- Avoid swallowing water when swimming.
- Avoid getting water shot up your nose when swimming, especially in warm shallow water.
- Avoid swimming or wading in with open wounds or cuts.

EcoCheck Grade	
Lower River	A
Middle River	D
Upper River	F

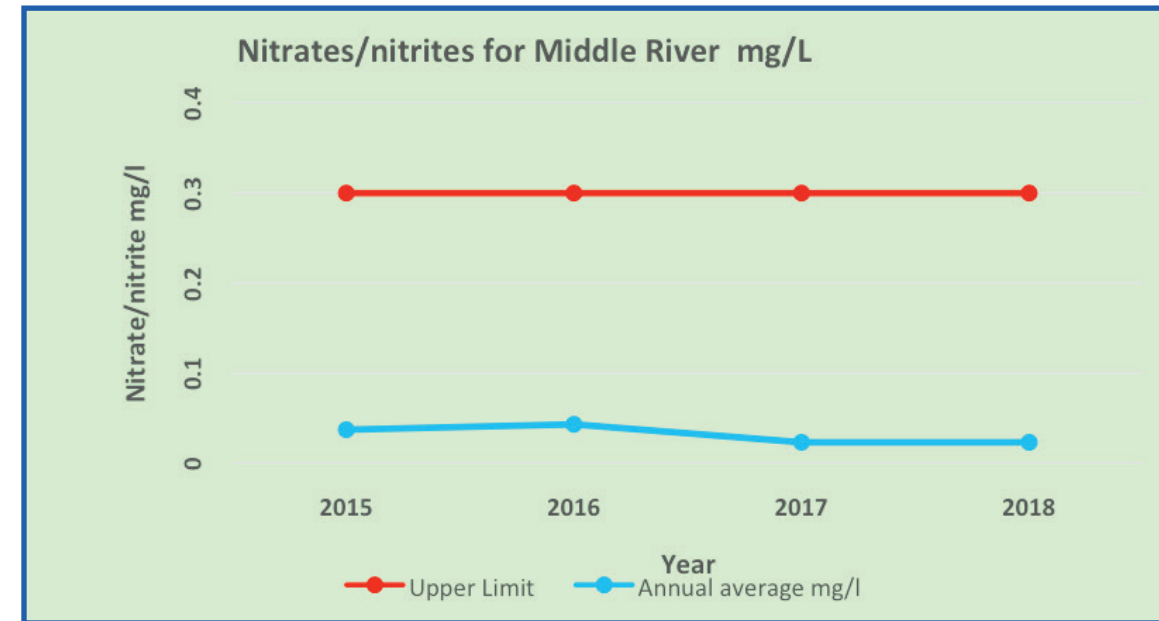


## NITRATES AND PHOSPHORUS

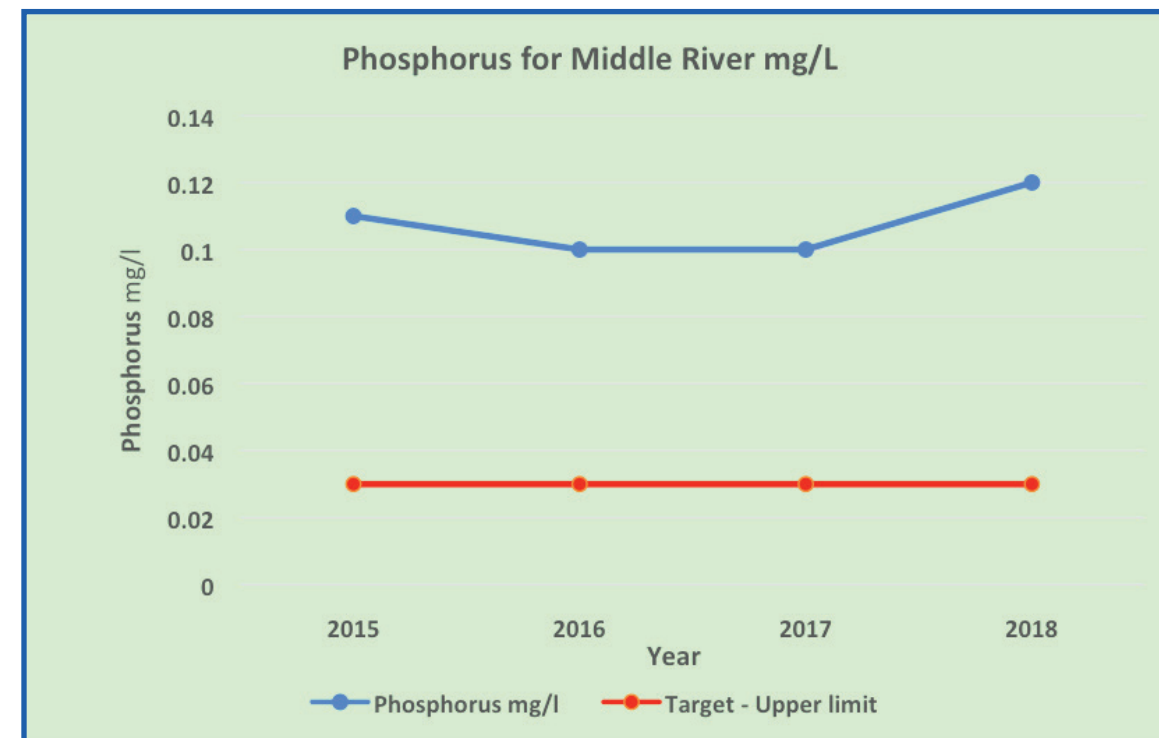
Nitrates and phosphorus pollution result primarily from use of fertilizers on agricultural and suburban lands. Runoff during rains carries pollution-bearing sediment into the River, either directly or via the stormwater system. These nutrients promote the growth of algae that consume the dissolved oxygen necessary to support marine life and reduce water clarity. The Suffolk Public Works data is used.

### FINDINGS:

- Nitrates levels meet standards.
- Phosphorus levels exceed algae bloom threshold levels for all of the River.



EcoCheck Grade **A**



EcoCheck Grade **F**

## TURBIDITY/WATER CLARITY- SEDIMENT (SUSPENDED SOLIDS)

Turbidity is the measure of suspended particles in the water. Several types of material cause water turbidity, including silt or soil particles, tiny floating organisms, and fragments of dead plants. Human activities can be the cause of turbidity as well. Runoff from farm fields, stormwater from construction sites and urban areas, shoreline erosion and heavy boat traffic all contribute to high levels in natural waters. Excess sediment makes the water murky, harming aquatic plants and habitat for

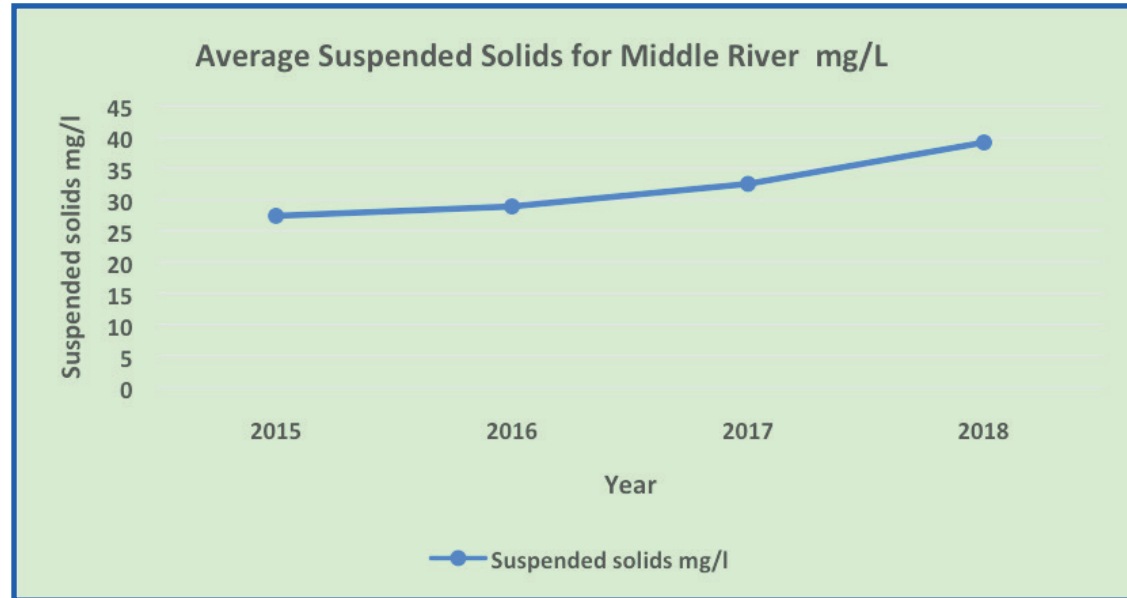
fish and other wildlife. In addition, other pollutants can attach to the sediment and be carried downstream.

Suffolk's Public Works data is used.

### FINDINGS:

Suspended solids have increased 25% over the last three years.

Suspended solids have increased 25% over the last 3 years.



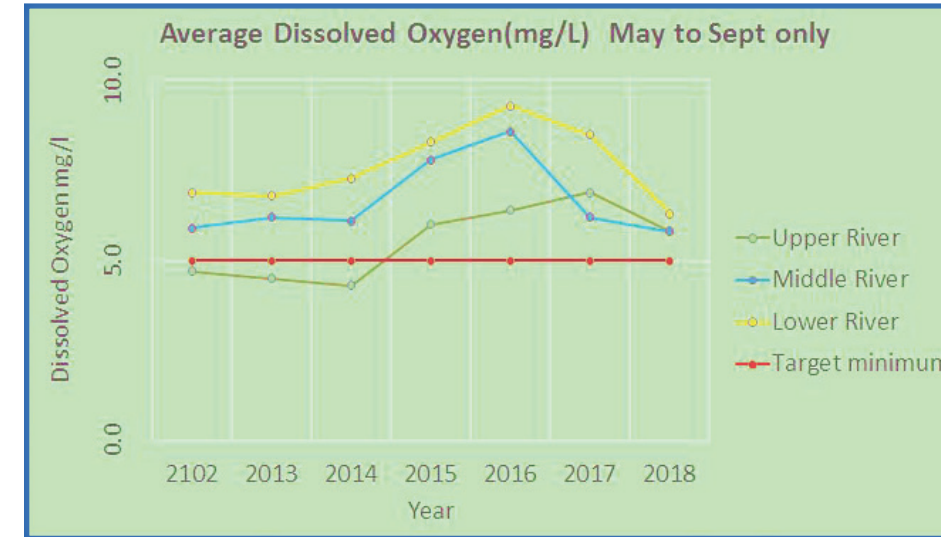
## DISSOLVED OXYGEN

Dissolved oxygen levels below 5 mg/L stress fish and other marine life. Minimally impaired streams have significant higher levels of dissolved oxygen.

Marine animals suffocate without sufficient levels of dissolved oxygen. Dissolved oxygen is enhanced by underwater plants through photosynthesis. However, the Nansemond River has no aquatic vegetation. Reducing nutrients will increase dissolved oxygen levels. NRPA's data is used.

### FINDINGS:

The average dissolved oxygen levels in the Nansemond River were sufficient to support marine life, but during the summer months when algae thrive, dissolved oxygen levels fall below acceptable standard levels.



### EcoCheck Grade

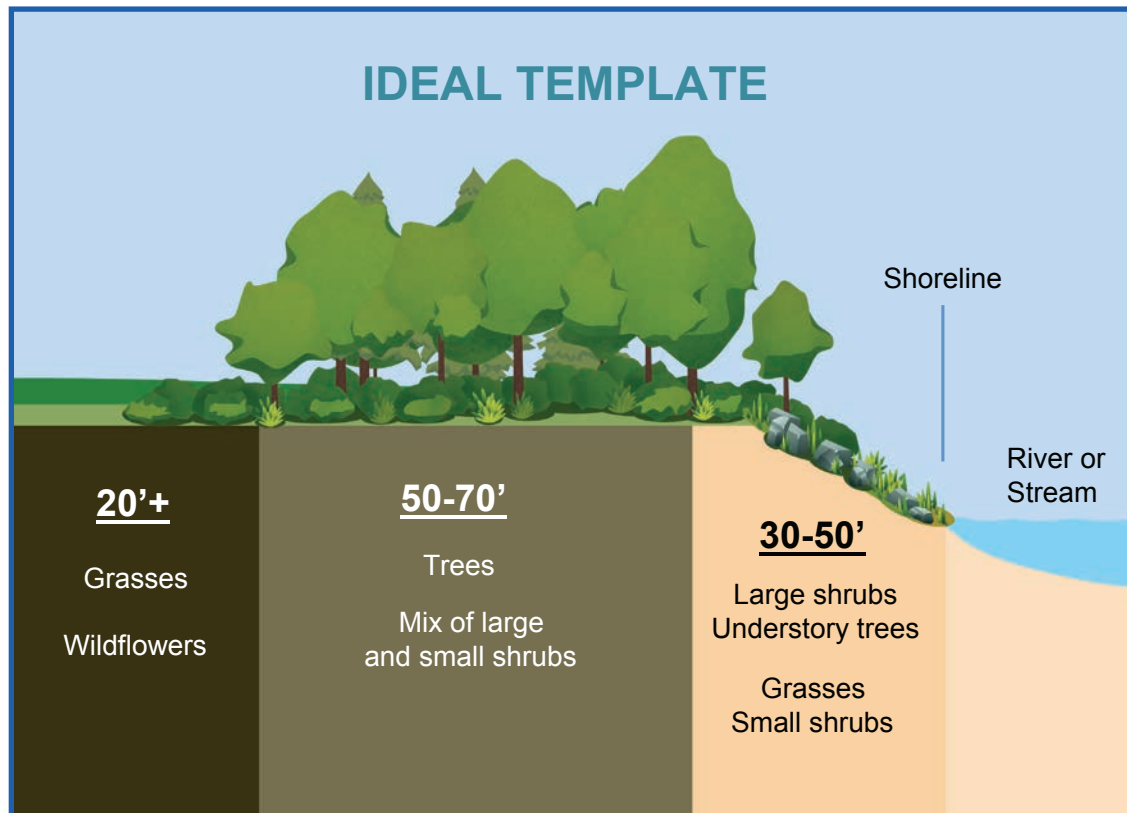
Lower River **B**

Middle River **C**

Upper River **D**

### Native Trees and Shrubs Vegetated Buffer

A natural filter to help reduce stormwater runoff which will decrease sediment, nitrates, and phosphorus from flowing into the River.



## POLLUTION CONTROL

### STORMWATER AND RUNOFF CONTROL

The Chesapeake Bay Preservation Act, adopted by the Virginia General Assembly in 1989, focuses on local land use planning and land management to effect a positive impact on water quality. The first sentence sets the tone for the rest of the statute: Healthy state and local economies and a healthy Chesapeake Bay are integrally related; balanced economic development and water quality protection are not mutually exclusive.

Every Tidewater locality is required to have (and other localities may adopt) a local CBPA ordinance, which includes: a map of Chesapeake Bay Preservation Areas, land use ordinance, building permit requirements, and the incorporation of CBPA protections within the Comprehensive Plan, Zoning Ordinance, and Subdivision Ordinance. Every five years, localities are required to conduct a review to ensure compliance with the Bay Act regulations.

EcoCheck Grade **D**



### FINDINGS:

- Notice of Act Violations have been issued to citizens and developers.
- Proper enforcement of Environmental Acts and Regulations by the city is required.

## SANITARY SEWER IMPROVEMENTS

EcoCheck  
Grade **C+**

### FINDINGS:

Suspended solids have increased 25% over the last three years.

- Suffolk Public Works Department created and periodically revises the City's Total Maximum Daily Load Program (TMDL) to reduce storm water runoff and plan to address the 'impaired' status of the Nansemond River and creeks. Sewer systems are replacing septic systems in communities located near the waterways. Installing sewer systems is costly and takes time.
- Properly enforcing the Chesapeake Bay Preservation Act, which means maintaining the 100 ft. vegetated buffer, is a scientifically proven method to reduce storm water runoff.
- The City of Suffolk produced its fifth comprehensive annual report for Virginia Stormwater Management Plan (VSMP) with regards to the City's General Permit for Municipal Separate Storm Sewer Systems; Permit

#VAR040029. These reports are required under The Clean Water Act and Virginia Law. The reports can be found at:

- <http://www.suffolkva.us/265/MS4-Program-Overview>
- In 2017, NRPA, Virginia Department of Health: Division of Health Department of Shellfish Safety, Suffolk Public Works and Hampton Roads Sanitation District formed a Collaborative Bacterial Source Tracking Program. As part of the program the four organizations developed a strategic plan to investigate the potential human sources of high bacterial levels found in the River. Through an investigative process using a wet-weather and dry-weather approach faulty septic systems and aging pipe infrastructure were identified. Homeowners were contacted to take corrective actions to repair their septic system. The City replaced the aging pipe infrastructure.

## CLEAN BOATING

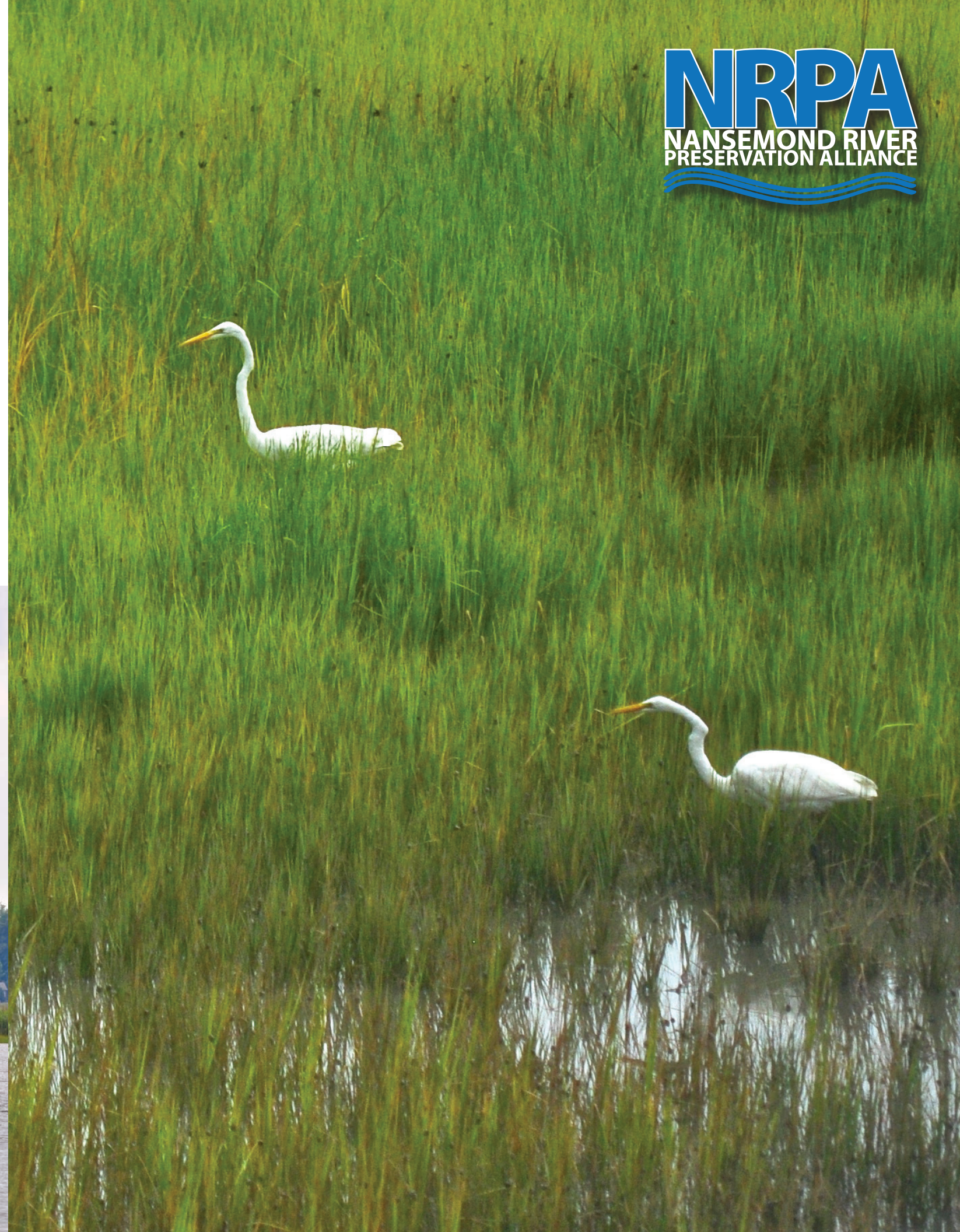
EcoCheck  
Grade **B+**

The majority of boating activity on the Nansemond River and its tributaries is recreational boating.

### FINDINGS:

Currently boaters have four options within the city limits to comply with pump-out regulations:

- Public pump-out station located at Constant's Wharf
- Pump-out station at Decoy's Restaurant on Bennett's Creek
- A less visible pump-out station located at Bennett's Creek Landing
- The Hampton Roads Sanitation District (HRSD) has a pump-out program for boaters where HRSD staff will travel to your dock and pump-out your boat.



**NRPA**  
NANSEMOND RIVER  
PRESERVATION ALLIANCE



# People


## ARE THE SOLUTION

### TEAM BUILDING


Coordination and Synchronization

The **Critical** first step is to form the team that will execute the environmental activity. The primary contributors are:


**GOVERNMENT**




**ACADEMIA**




**COMMERCIAL**



**MEDIA**



**VOLUNTEER ORGANIZATIONS**



- Learn about activities that you can do daily to protect the waterways by joining your neighbors and participate in the Water Wise Homes Program. The Water Wise Program was developed in partnership with the Nansemond River Garden Club and provides a list of actions that all citizens can do daily to protect and restore Suffolk's River and creeks.
- Support Suffolk's Green Initiative and encourage the City and their elected representatives to adhere to the recommendations in the City's Green Initiative Report and Comprehensive Plan.
- Attend River Talk Programs with your neighbors and learn about best practices that you can do every day to be an environmental steward.
- Participate in the monthly Water Sampling and Monitoring sessions.
- Participate in Clean the River Days.
- Reduce stormwater runoff into stormwater outlets and the waterways by:
  - Enhancing the 100 foot Vegetated Buffer Area along your shorelines
  - Establishing a living shoreline
  - Creating a rain garden on your property
  - Learning about native plants, shrubs and trees that you can plant on your property by visiting the NRPA Outdoor Classroom - Riparian Buffer Conservation Demonstration Site at Sleepy Hole Park.



# Explore THE RIVERS & CREEKS

## SUFFOLK PARKS & RECREATION

The number of public access sites to the River for kayaking and canoeing has increased and more sites are in the planning phase. Two additional sites were opened over the past three years which reflects the

Suffolk Parks & Recreation Department's commitment to ensuring that all citizens have access to Suffolk's River and creeks and have the opportunity to enjoy our wonderful natural assets.

# Suffolk Can Be a Leader in Balancing Economic Development with Environmental Sustainability

## NRPA'S RECOMMENDATIONS

### THE CITY OF SUFFOLK CAN PROVIDE CRITICAL SUPPORT

- As part of the City's Vision, establish a water quality goal and contributing objectives that will inform and encourage citizens to act. The City must lead!
- Provide sufficient positions for properly educated (environmental science/engineering) inspectors to ensure strict enforcement of the Chesapeake Bay Preservation Act and its' implementing City Ordinance.
- Establish a process to horizontally integrate all clean water actions across the City's Departments

### SHORT TERM (1-5 YEARS)

- Adopt a City goal for clean water. Establish objectives to reach that goal each year. Update and revise objectives as they are met or circumstances change.
- Designate a champion for clean water on the City staff. Make them responsible for the coordination and synchronization of environmental responsibilities.
- Formalize all staff procedures dealing with clean water. Require mandatory coordination meetings for any land disturbance activity. Ensure all decisions are made in writing and as a matter of public record.
- Provide in-service environmental training to all personnel who deal with any area affected by the Chesapeake Bay Preservation Act. Develop the expertise to properly implement requirements.
- Vigorously enforce the City clean water component of the Unified Development Ordinance - Article 4ZO 31-415.

### LONG TERM (5-10 YEARS):

- Establish an Office of Environmental Quality on the City Staff:
- Staff with trained personnel who have degrees in environmental science and/or environmental engineering.
- Consolidate all environmental related activities in this Office.

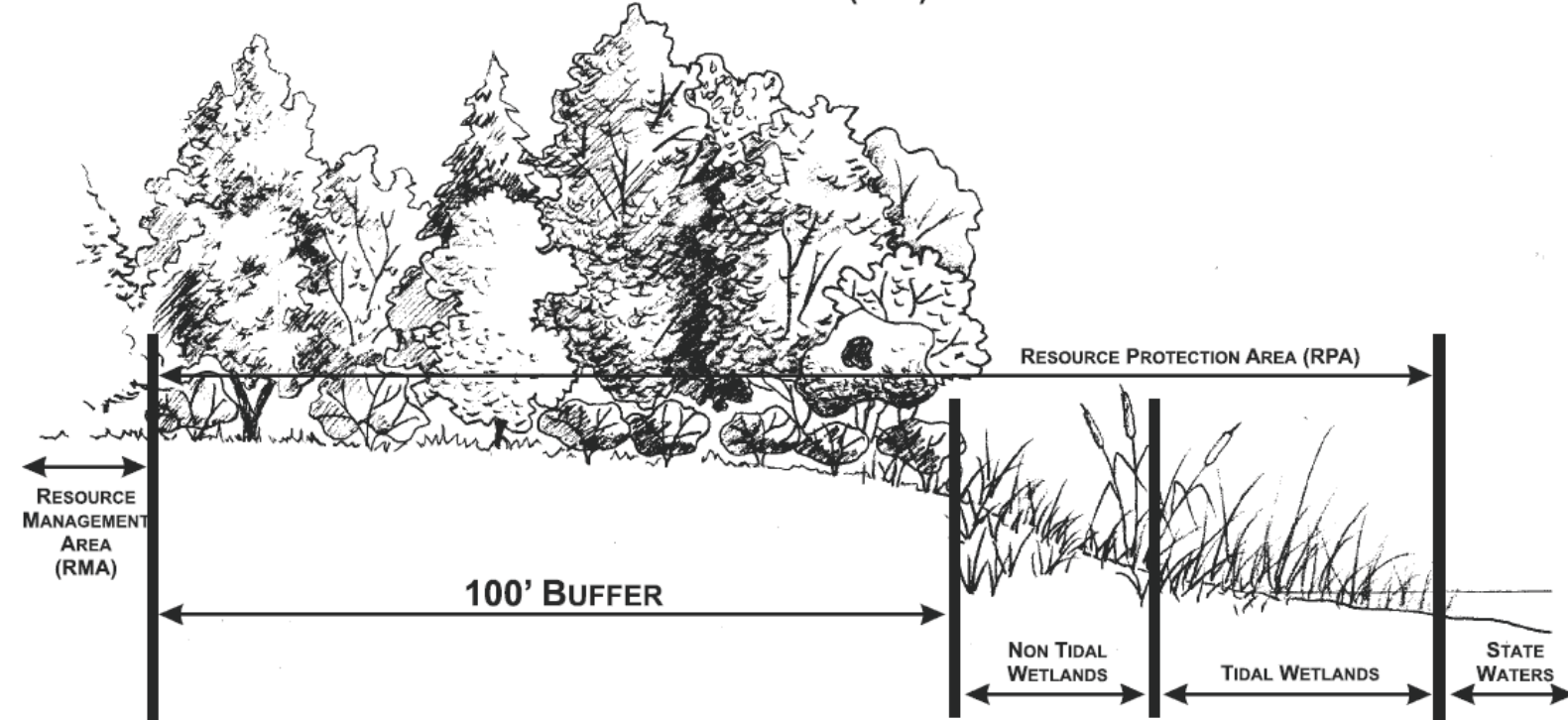
and Offices. Work towards the establishment of an Office of Environmental Quality on the City Staff.

- Document all water quality actions in writing filed by lot/plat. Provide citizens a report each year summarizing the decisions made, the current status of water quality compliance, and planned future efforts.

- Require trained inspectors who establish a baseline before land disturbance begins and check periodically for any violations.
- On the construction site, mark the required 100 foot buffer before and during construction. Periodically check for encroachment into the Chesapeake Bay Preservation Act designated protected area.
- Provide a summary of enforcement actions on a yearly basis to the citizens. Show actions taken to prevent a recurrence of violations.
- Establish a public process to show the status of the City's clean water efforts. Monitor the status of all Best Management Practices (BMPs) in the relevant Total Maximum Daily Load (TMDL) plans. Monitor the status of BMPs in the Municipal Separate Storm Sewer Systems (MS4) Permit. Report the status of these BMPs to the citizens of Suffolk on a yearly basis, to include remedial action where required.

- Provide a report on the Environmental Status of the City to the citizens each year.
- Add a chapter on Environmental Planning to the City's Future Development Plan.
- Make the entire River safe for recreational use and shellfish harvesting.

CHESAPEAKE BAY PRESERVATION AREA  
RESOURCE PROTECTION AREA (RPA) CROSS SECTION



*NRPA is grateful for the grant provided by the Birdsong Trust's Board of Directors to fund the printing of the Report.*

*Thank you to the Virginia Department of Environmental Quality for the Citizen Water Quality Monitoring grant to support NRPA's monthly sampling and monitoring of the Nansemond River*

*Thank you to John Wass, photographer, for the use of his images for the report.*



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