

Swimming Safety in the James *Know Before You Go*



Bacteria Monitoring Results (2013-2017)



Updated June 1, 2018

Introduction

A jump in the James is a great way to beat the heat this summer, and as temperatures climb, throngs of Virginians will make their way to the cool waters of the James River to swim, boat, and fish. Across the state, Virginians have begun to realize the indispensable benefits of clean water. As the health of the James River has improved, the River has provided a boost to the tourism industry, outdoor recreation, rejuvenated fisheries, and ecosystem services.

For Virginians from the Blue Ridge to the Chesapeake Bay, the James River is a cherished resource and a vital opportunity for outdoor recreation. In 2016, more than 4 million people visited riverside parks in the James River watershed, the land area draining into the James River. But in the excitement surrounding the arrival of summer, remember this: rivers are dynamic, changing systems. They are quick to respond to varying weather conditions, from heat waves to thunderstorms, and these changing conditions have significant effects on bacteria levels, currents, and swimming safety in the River.

To communicate bacteria levels and river conditions in a clear, timely fashion, the James River Association (JRA) has created James River Watch, a program designed for outdoor recreators across the watershed. Weekly swimming, boating, and fishing conditions are made available at www.jamesriverwatch.org, so before you head down to the banks of the James and take the plunge, remember that it pays to *Know Before You Go!*

Why do Bacteria Levels Matter?

The answer is simple: human health. As Virginians spend more time in the water, the quality of that water becomes especially critical. For those recreating in the James, *E. coli* is a commonly tested indicator of other harmful bacteria, suggesting the water is likely contaminated from human and/or animal waste. *E. coli* and other pathogens at high levels can cause giardia and other illnesses resulting in cramps, nausea, and other symptoms that can be significantly more serious. Risk is based on exposure—boaters on the water are at less risk than swimmers in the water—but the impact of poor water quality extends beyond those who frequent the river. The James River provides drinking water for 2.7 million Virginians, and poorer water quality at the beginning of the treatment process raises costs. Further, poorer water quality inhibits the increased tourism revenue, community cohesion, and citizen health made possible by recent improvements in the health of the James River.

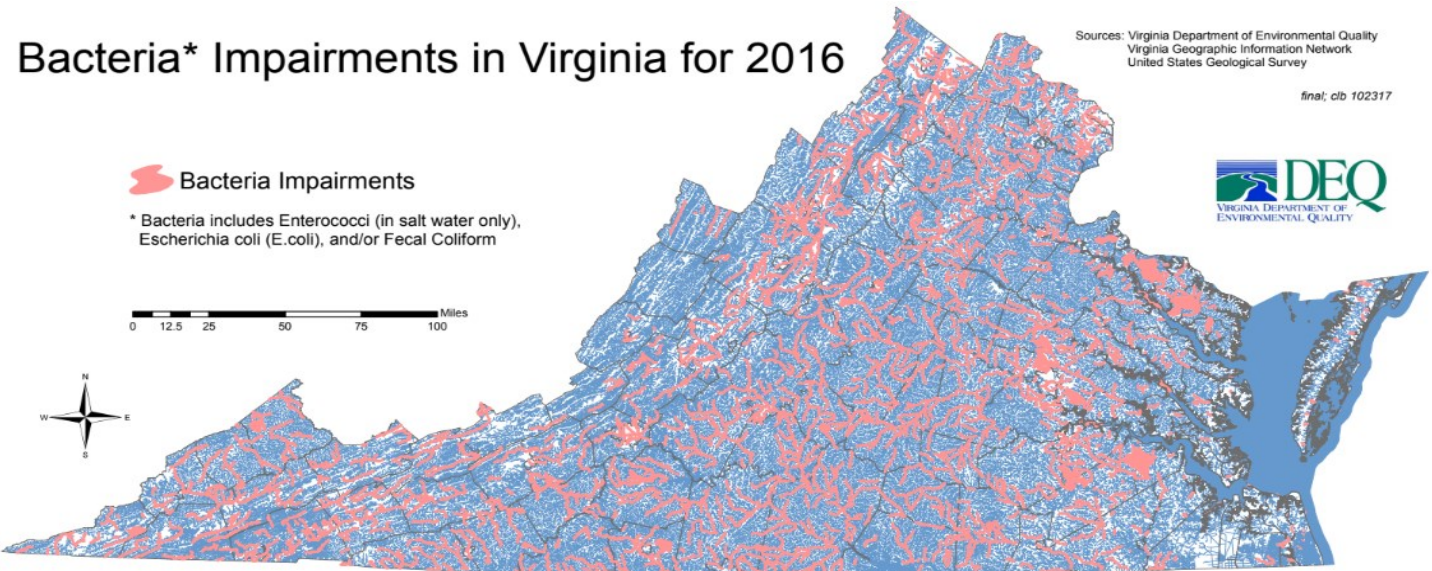


Figure 1: Virginia's rivers, streams and other bodies of water are shown in blue, with bacteria impairments displayed in pink. Figure from <http://deg.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/>

How are Bacteria Levels Monitored?

Thanks to the Clean Water Act, states like Virginia routinely assess the health of our water bodies to determine whether or not they meet certain designated uses, like drinking, swimming, or fishing. The Virginia Department of Environmental Quality (DEQ) collects and analyzes water samples from across the state and classifies water bodies as “impaired” when they fall short of water quality standards (see Figure 1). This type of monitoring offers a big picture view of sources and solutions pertaining to bacteria pollution—but doesn’t provide a real-time indication of swimming conditions for the public. River-goers typically recreate during the summer, on weekends, at river access points, and closer to the cities and towns where they live. To better understand levels of bacteria during seasons of high recreation, more frequent sampling is necessary in popular swimming locations. The Virginia Department of Health tracks bacteria at public beaches, issuing advisories when levels are elevated, but only has capacity to test at limited locations in Hampton Roads. JRA launched the James River Watch program in 2013 to educate the public about safe river conditions across the watershed.

What is James River Watch?

James River Watch is a program created to answer one of the most frequent and fundamental questions that we receive: *is it safe to swim in the James?* James River Watch is designed to communicate river conditions, including river levels, bacteria levels, and air and water temperatures, to an audience of river-goers at the time and place they want to recreate. The program is a collection of over 90 volunteers from across the watershed that team up to test 27 sites scattered from Buchanan and Lexington to the Chesapeake Bay. Through this program, we compile bacteria monitoring data generated by JRA and our partners, including Virginia Master Naturalists, the Rivanna Conservation Alliance, Appomattox River Company, Twin River Outfitters, the Virginia Department of Health, and more. We also include weather and river conditions from the National Oceanic and Atmospheric Administration (NOAA) and the US Geological Survey (USGS) at monitoring stations along the James River and its tributaries. These data, pictures, and other information are submitted, reviewed, and posted online every Friday afternoon, just in time for each weekend’s rush to the river. If you want to plan ahead for weekend activities, simply check the website on Friday night for a watershed-wide summary of river conditions and suitability for outdoor recreation over the weekend.

Visit www.jamesriverwatch.org to view real-time conditions across the watershed, browse each site’s historical data, subscribe for alerts when conditions are unsuitable for recreation, tab through layers of

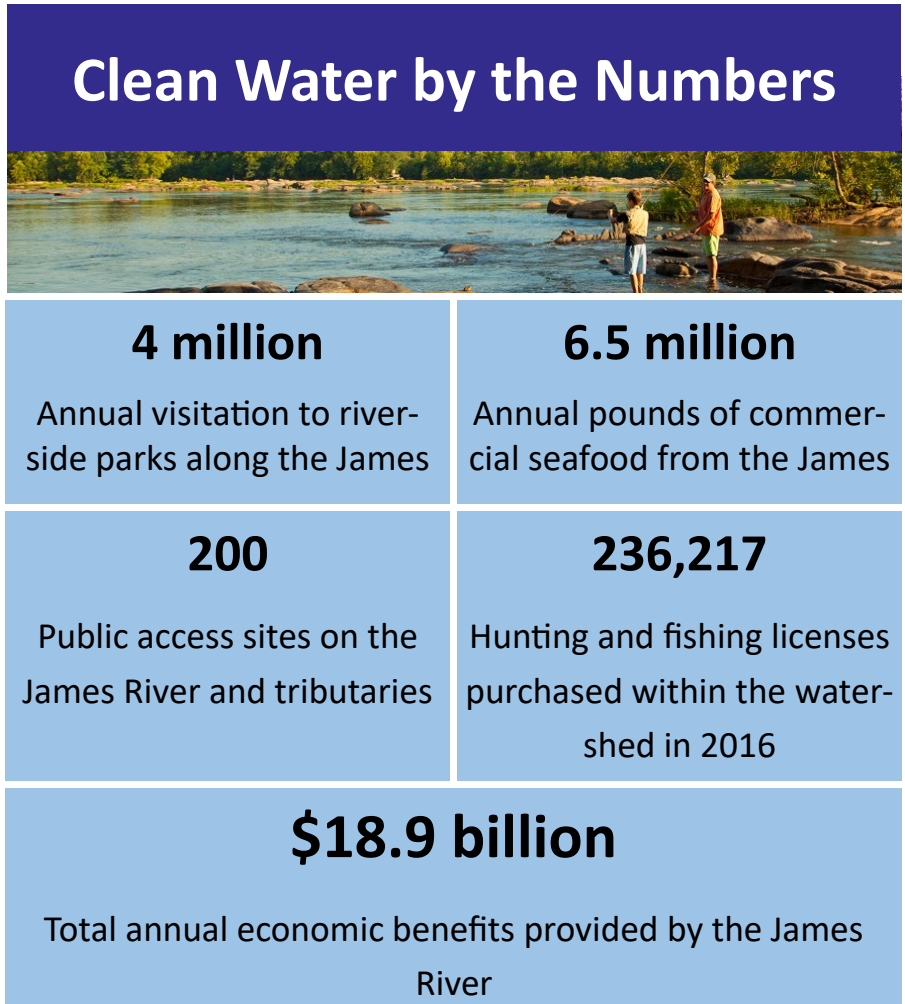


Figure 2: Selected benefits provided by the James River. See www.stateofthejames.org for more information.

information to see conditions for boating, fishing, or swimming, and more. We encourage you to explore the river this summer, but remember to check that conditions are safe so that you *know before you go*.

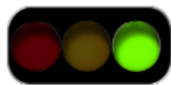
What do the James River Watch data show?

Much more often than not, the river is safe for swimming. Although many miles of the James River and its tributaries are impaired for bacteria pollution, that does not mean that it is always unsafe to swim. Bacteria levels vary through the year based on place, river conditions, and many other factors, making it especially important to check the latest river conditions for your specific location. There is much local variation, and across all 27 sites passing rates range from 63% to 100%, with an overall average of 85%. Reassuringly, over two-thirds of sites pass >80% of the time. For those who want to explore the data (see Figure 4), a closer look reveals additional patterns.

Pattern 1—bacteria levels vary by place. Among James River Watch sites, average passing rates appear slightly lower for sites located near urban areas such as downtown Richmond. There is a clear progression of increasing failure rates as one moves downstream from the Huguenot Flatwater area just above Richmond, toward and past downtown. There is also a concentration of well performing testing sites along the mainstem of the Lower James River. Here, the river widens, deepens, and mixes, somewhat reducing bacteria concentrations from land-based sources. This does not preclude the possibility of higher bacteria concentrations on some testing days, particularly near the urban centers of Hampton Roads and after storm events. A key takeaway is that if you are closer to bacteria sources, you face a higher risk of bacterial exposure, particularly if you are swimming or recreating *in* rather than *on* the water.

Swimming Conditions at: Buchanan public boat landing (Botetourt County)(J40)

May 24, 2018, 6:00 pm



Condition: Enjoy the river and please swim safely.

Status:

River Level*: 5.2 ft.

Water Temperature: 72 °F

Air Temp: 80 °F

Air temp + Water temp should ideally be no

less than: 100°F

Turbidity: 7.12 NTU

Bacteria: 167

* James River At Buchanan, Va



Sampled by:



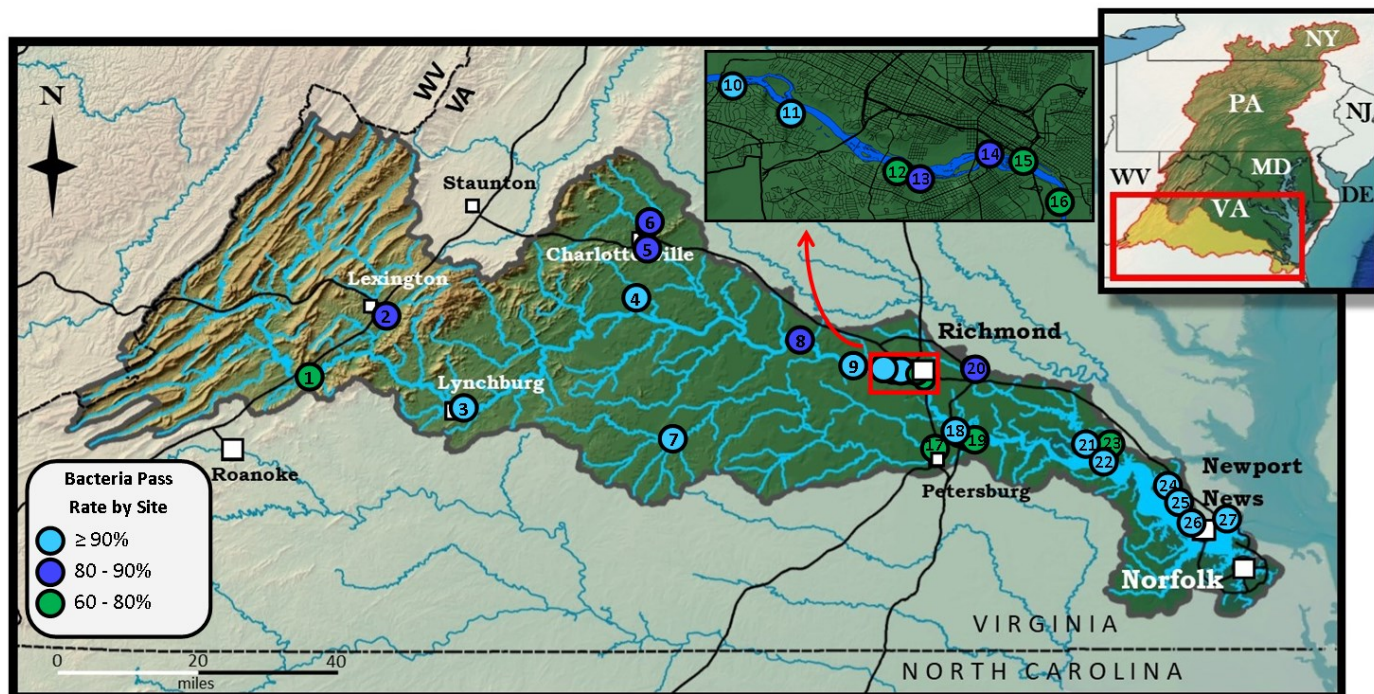
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Pattern 2—bacteria levels vary through time. In the short term, bacteria levels are tremendously subject to weather conditions. Runoff from heavy rainfall is known for carrying nutrients, sediment, and litter into our streams and rivers, but it can also carry bacteria from agricultural land and city streets. Bacteria levels tend to be higher when river levels are higher, but even on days when the river is low, a quick pulse of bacteria can enter the water from very localized heavy rains, and the Virginia Department of Health states that it is best to avoid swimming for “a few days after heavy rainfall.” For a complete list of VDH swimming recommendations, see VDH’s Beach Monitoring webpage.

Figure 3. A screenshot of river conditions on the James River at Buchanan, VA, courtesy of Twin River Outfitters. Data made available on www.jamesriverwatch.org.

Where Do Bacteria Come From?

The four major sources of bacteria pollution are livestock, humans, pets, and wildlife. DNA testing of bacteria samples shows that the relative contributions of each of these sources change throughout the watershed. In the Warwick River near Newport News, livestock account for 23% of *E. coli*, humans 35%, pets 24%, and wildlife 18%. In Lynchburg, livestock contribute 33%, humans account for 24%, pets make up 10%, and wildlife account for roughly 33%. These exact percentages are subject to change, but generally speaking, pets and human sources are larger contributors to bacterial problems in urban areas, while wildlife and livestock are larger components of bacterial pollution in rural areas.



SITE NUMBER	SITE NAME	LOCATION	PASS RATE (2013 – '17)	LENGTH OF RECORD (YRS)
1	Buchanan Boat Ramp	Buchanan	72%	5
2	Maury at Ben Salem	Rockbridge	86%	4
3	Riveredge Park	Lynchburg	95%	5
4	Scottsville Boat Ramp	Scottsville	93%	5
5	Rivanna at Riverview	Charlottesville	83%	3
6	Rivanna at Darden Towe	Charlottesville	85%	2
7	Main St. Bridge	Farmville	93%	1
8	Tucker Park/Maidens	Goochland	88%	5
9	Robious	Chesterfield	93%	2
10	Huguenot	Richmond	93%	3
11	Pony Pasture	Richmond	91%	3
12	42nd Street	Richmond	77%	3
13	Reedy Creek	Richmond	84%	3
14	Tredegar	Richmond	82%	5
15	14th Street	Richmond	71%	5
16	Rockett's Landing	Richmond	63%	4
17	Harvell Dam	Petersburg	79%	4
18	Hopewell (Rt. 10)	Hopewell	94%	2
19	City Point	Hopewell	73%	5
20	Grapevine Bridge	Henrico	82%	4
21	Chickahominy Riverfront Park	James City	100%	2
22	Jamestown Beach	James City	96%	5
23	Powhatan Creek	James City	71%	3
24	Denbigh Boat Ramp	Newport News	91%	4
25	Riverside Beach	Newport News	98%	4
26	James River Fishing Pier	Newport News	100%	2
27	Hampton River	Hampton	90%	3

Figure 4. James River Watch test sites across the watershed. Numbers on the map correspond with the Site Numbers column in the accompanying table, and coloration on the map indicates the passing rate of bacteria samples from each site. For more information about a specific site, visit www.jamesriverwatch.org.

These categories can be subdivided further. Common culprits within the wildlife category are deer and particularly geese, which border on becoming a nuisance species in some parts of the watershed. Cattle are the most common variety of livestock contributing to bacteria pollution, particularly those that have direct, unfenced access to the river, though agricultural runoff can carry waste from a number of other livestock species as well.

In urban areas, common sources include pet waste and combined sewer overflow events, or CSOs. Lynchburg and Richmond have CSO systems that mix stormwater runoff from our streets with sewage from our homes and businesses. These systems are vulnerable to localized downpours that can overwhelm water treatment systems, sending pulses of untreated sewage into the James. Additional components of human-sourced bacterial pollution include leaking or broken sewage lines, particularly in areas of aging infrastructure, failed septic systems in areas without municipal sewage treatment, and illegal straight pipes discharging directly into waterways.

What Needs to be Done?

Bacteria clean-up plans have been developed for many localities along the James River and tributaries to bring impaired sections of the River into compliance with state and federal standards. These plans identify best management practices (BMPs) necessary to reduce bacteria loads and concentrations to acceptable levels, and these plans can only be successful with buy-in from citizens and local governments.

There is additional work that can be accomplished on local scales in cities with combined sewer systems, like Richmond and Lynchburg. These communities have agreements with the State of Virginia and EPA to reduce combined sewer overflows through a legally binding Long Term Control Plan. By implementing stormwater projects that reduce the amount of water entering the CSO system and by advocating for additional funds that can be allocated towards wastewater and stormwater projects, we can help our communities reach the goals of these Long Term Control Plans faster and more efficiently.

On a broader scale, the Chesapeake Bay Cleanup Plan was initiated in 2010 by the EPA, six Bay states and the District of Columbia to tackle pollution plaguing the 64,000mi² Bay watershed. Now eight years into the cleanup effort, the Cleanup Plan has achieved significant pollution reductions across jurisdictions, including the James River watershed. The Cleanup Plan is critical to the restoration of the James River watershed, and continued commitment is necessary from Virginia to reach pollution reduction commitments by the 2025 deadline.



Figure 5. Sources of bacteria pollution in the James River. Clockwise from upper left, they are CSOs, broken sewer pipes, unfenced cattle, CAFOs, deer, geese, failed septic systems, and pets.

DEQ, EPA and other agencies are currently engaged in a midpoint assessment to update the Chesapeake Bay Cleanup Plan to ensure that commitments are met by 2025. This process represents the third phase of actions under the Chesapeake's Watershed Implementation Plan, frequently referred to as "WIP III." These groups realize the importance of planning and engaging at the local level, and are working with communities and municipalities to target and tailor environmental protections in ways that are appropriate for each locality.

We are entering a critical period to address bacteria issues and Chesapeake Bay issues together. We can only address these issues if we work together on multiple levels. Regionally, JRA and partners are tackling these pollution issues by actively participating in new and improved management plans with federal, state, and local governments. It is paramount that localities throughout the watershed also participate in the WIP III process and take advantage of the opportunity to provide needed and requested input. It is additionally critical that local clean up plans stemming from the WIP III planning process are implemented, and that adequate local and state funding is set aside for their successful completion.

What You Can Do

Big picture success stories are the sum of many small actions—actions that we all can take. Here are some small, simple steps to help you save the James:

Pick up after your pet. In some parts of the watershed pet waste accounts for as much as 40% of *E. coli* bacteria present in the water. A simple and considerate solution is to scoop the poop! Many parks have bag kiosks for this purpose, but just in case, pack a few of your own next time you and your dog go on a walk.

Become a River Hero Home. In most cases bacteria but is carried to a creek or river by runoff. You can decrease runoff (and thus bacteria pollution) by increasing infiltration on your property. Rain barrels, permeable pavement, and other stormwater management practices go a long way to stopping runoff on site, before it reaches the nearest creek or stream. To learn more or sign up, visit www.jamesriverhero.org.

Plant trees and buffers near streams. Vegetation beside a stream behaves much like a sponge, absorbing many pollutants before they have a chance to enter our waterways. If you have a stream on your property, be aware of the vital purpose that streamside vegetation serves. Protect vegetation, or restore it further!

Let your elected officials know clean water is important. Numerous environmental protections at the federal level have been recently threatened, making it especially important for our states and local governments to stand up for Virginia's environment. There are many important decisions being made at the state and local level at various points during the year where citizen voices are crucial. Particularly over the next several months, support needs to be given for local Watershed Implementation Plans to be sure plans are adopted that effectively improve water quality and that adequate funding is in place for the plans to be successful. Help strengthen our voice for the river by joining **JRA's Action Network**. We'll keep you updated on the latest river policy issues and connect you to your elected officials so you can tell them that water quality is important to you!



Figure 6. Reduce runoff and help the James by becoming a River Hero Home!

Today, a healthy James River is a chief catalyst driving the economic revitalization of the Richmond and Virginia economies. Clean water and strong economies boost local businesses and create vibrant, thriving communities. The River is the backbone of a growing outdoor recreation industry, and a culture of outdoor appreciation promotes health, wellness, and quality of life. Safe recreation in the James River is not only required by the Clean Water Act—it is paramount to continued regional growth.



ABOUT THE JAMES RIVER ASSOCIATION:

The James River Association is a member-supported nonprofit organization founded in 1976 to serve as a guardian and voice for the James River. Throughout the James River's 10,000-square mile watershed, the James River Association works toward its vision of a fully healthy James River supporting thriving communities. With offices in Lynchburg, Richmond and Williamsburg, the James River Association is committed to protecting the James River and connecting people to it. For more information visit www.jamesriverassociation.org.