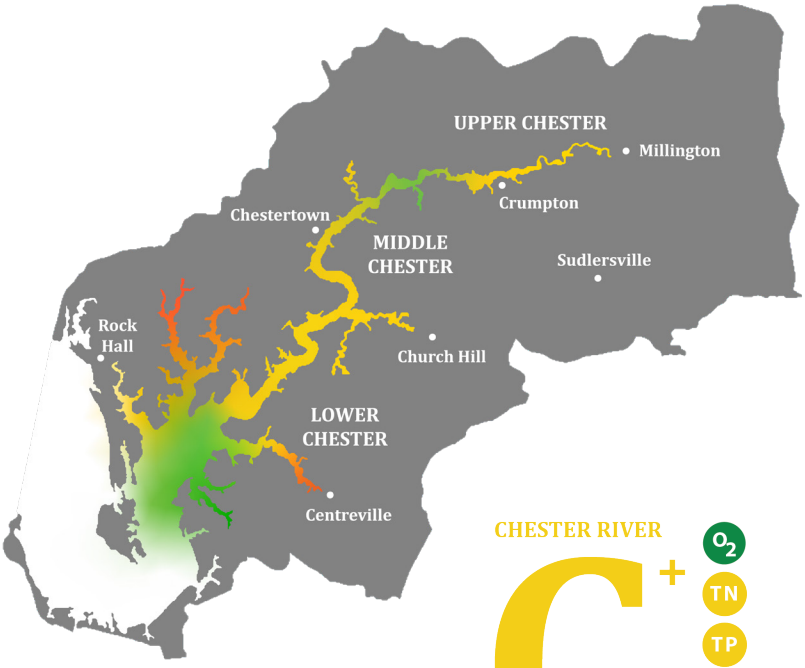
Chester River Report Card

2022

BAY HEALTH SCALE

Very good A B C D F Very poor

100% 80 60 40 20 0



CHESTER RIVER

C+

O2 TN TP

Our 2022 data shows that phosphorus, sediment, and chlorophyll *a* remain the Chester River's largest threat, with its main stem scoring between 44–55%, and each of its tributaries scoring between 20–45% for these parameters. Impacts from climate change will continue to augment these threats through increased rainfall and rising tides. Unfortunately, a decline in bay grass beds in the middle and upper Chester over the past two years has weakened our river's natural defense against nutrient and sediment loads.

In the face of these challenges, the Chester River Water Quality Index is consistent with last year's report, and the overall index for every tributary has improved by 6–8% except Southeast Creek, which remained consistent. As innovative restoration practices on land continue to reduce surface erosion into our waterways, and as upgrades are made to septic systems and wastewater facilities, we predict these scores will continue to improve.

Annie Richards, Chester Riverkeeper
arichards@shorerivers.org
410.810.7556 ext 282

SHORERIVERS

O2 DISSOLVED OXYGEN
TN TOTAL NITROGEN
TP TOTAL PHOSPHORUS
WATER CLARITY
CHLOROPHYLL *A*

ShoreRivers uses Mid-Atlantic Tributary Assessment Coalition scientific protocols to collect and evaluate water quality data. A numeric **Water Quality Index** is calculated using established thresholds for water quality parameters, then converted to a letter grade.

	DISSOLVED OXYGEN	TOTAL NITROGEN	TOTAL PHOSPHORUS	WATER CLARITY	CHLOROPHYLL *A*	WATER QUALITY INDEX	2022 GRADE
Chester	83%	60%	45%	44%	55%	57%	C+
Corsica	78%	34.2%	12.3%	28.7%	22.9%	35%	D+
Grays Inn	75%	67%	45%	36%	26%	50%	C
Langford	55%	52%	30%	29%	25%	38%	D+
Southeast Creek	100%	47%	22%	25%	40%	47%	C

BACTERIA MONITORING ON THE CHESTER | 2022

Site	Pass Rate	Average Failing CFU*
Millington Waterfront Park	40%	698
Crumpton Landing	63%	748
Fairview Park	87%	5292
Morgan Creek	40%	3049
High Street Dock	75%	2862
Quaker Neck Landing	69%	293
Conquest Preserve	87%	2973
Corsica River Yacht Club	94%	110
Centreville Wharf	75%	278
Broadneck Landing	33%	5357
Skinners Neck Landing	56%	2551
Bogles Wharf	87%	2610
Jackson Creek Landing	80%	444

CFU = Coliform Forming Units

Pass/Fail Threshold = 104 CFU

***Indicates the average of all failing scores this season**

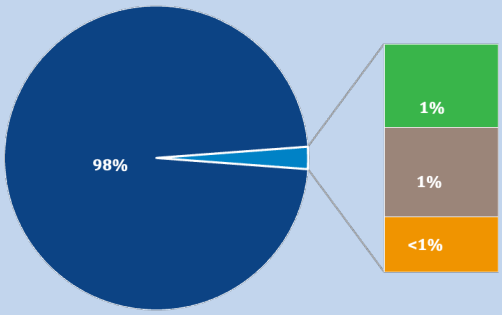
As part of the Swimmable ShoreRivers program, volunteer SwimTesters sample for bacteria at popular public access locations. Tests are conducted weekly from Memorial Day through Labor Day. The program follows the Environmental Protection Agency's standard protocols for collecting and analyzing samples and uses a pass/fail system to determine if bacteria levels are safe or unsafe for swimming.

Land use, tide, and temperature vary at each location, and major rain events are almost always connected to spikes in bacteria levels at any site.

Thank you to our sponsors and volunteers for making our bacteria testing program possible!

BACTERIA eDNA SOURCE TRACKING ANALYSIS

Copies per 100ml

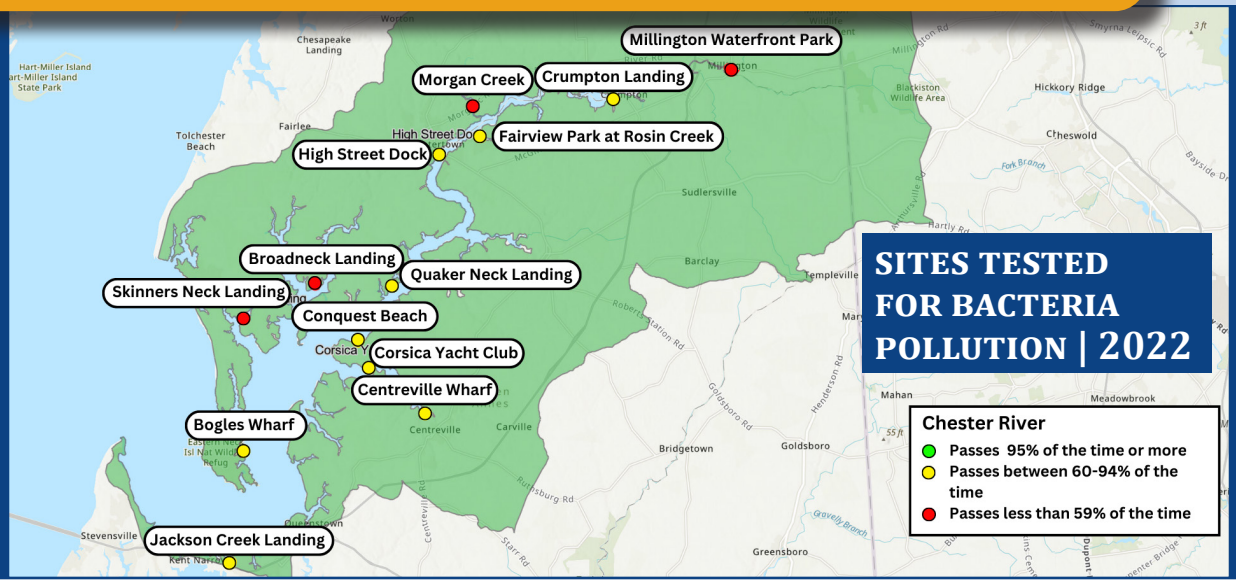


Human: 151,443 Poultry: 1,337 Swine: 1,443 Dog: 882

Thanks to generous funding from **our members** and the Cornell Douglas Foundation, ShoreRivers has begun tracking the sources of bacteria pollution **in our rivers using eDNA testing.** This new type of testing measures the number of eDNA copies (genetic material found in the environment) per 100ml of sample water and identifies the specific animal groups present.

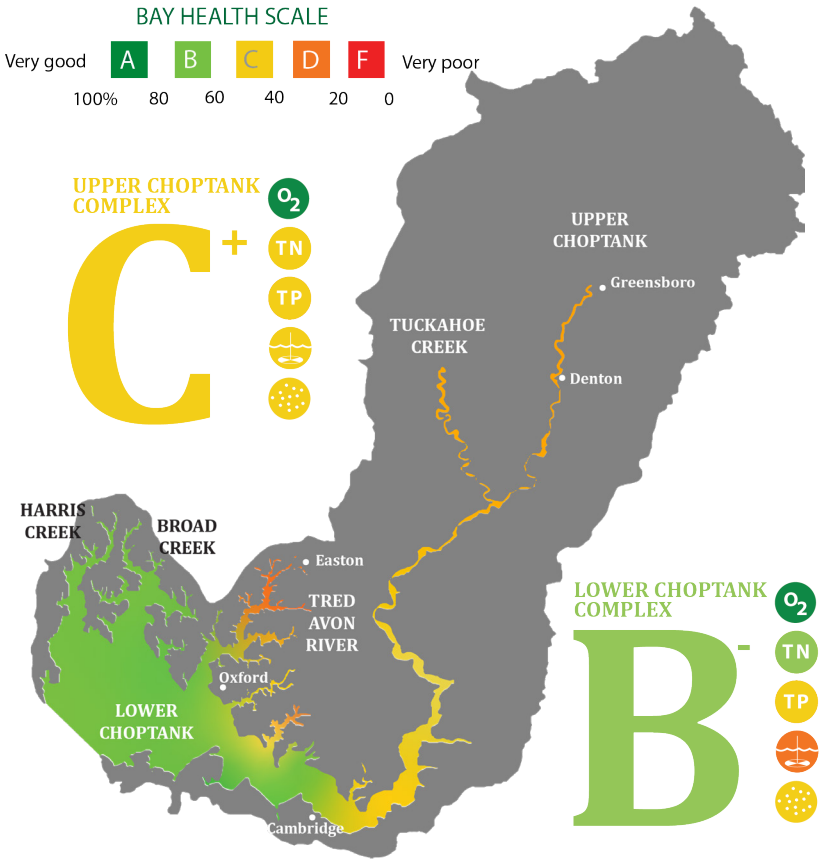
Results from 2022 testing indicate the overwhelming majority of eDNA present in our rivers is human, making shoreline septic systems, wastewater treatment outfalls, and illegal marine discharge key sources to monitor in the year ahead.

DID YOU KNOW that common practice is to pump out a septic system every three–five years? And if you're operating a Best Available Technology system, make sure that it's plugged in, turned on, and running properly. Failing or underperforming septic systems can cause bacteria and nutrient pollution to flow directly into our rivers, making them unsafe to swim in and to eat shellfish from.



Choptank River Report Card

2022



= see chart below for a list of what each complex includes

- DISSOLVED OXYGEN
- TOTAL NITROGEN
- TOTAL PHOSPHORUS
- WATER CLARITY
- CHLOROPHYLL *A*

ShoreRivers uses Mid-Atlantic Tributary Assessment Coalition scientific protocols to collect and evaluate water quality data. A numeric **Water Quality Index** is calculated using established thresholds for water quality parameters, then converted to a letter grade.

The 2022 water quality grades for the Choptank River show that **phosphorus, chlorophyll *a* and water clarity** remain the largest threats to water quality in the lower Choptank River complex, while **nitrogen** also threatens the upper Choptank River complex.

The **2022 overall grades** are consistent with the eight-year trend for these segments of the river, showing that water quality remains steady in the face of changing landuse, population growth, and variations in yearly weather patterns. **Dissolved oxygen** levels remained good to very good at almost all sampling locations, which represents conditions that support aquatic life. Results for **La Trappe Creek** were concerning, where scores for dissolved oxygen, total phosphorus, and chlorophyll *a* were among the lowest of all tributaries sampled. The **upper Tred Avon River** and the upper Choptank River mainstem also show indications of pollution hotspots with grades representing poor water clarity, phosphorus, and chlorophyll *a* scores.

Matt Pluta, Choptank Riverkeeper
mpluta@shorerivers.org
443.385.0511 ext 203

SHORERIVERS

	DISSOLVED OXYGEN	TOTAL NITROGEN	TOTAL PHOSPHORUS	WATER CLARITY	CHLOROPHYLL *A*	WATER QUALITY INDEX	2022 GRADE
Lower Choptank River Mainstem	76%	75%	64%	42%	56%	63%	B-
Harris Creek	100%	91%	74%	40%	70%	75%	B+
Broad Creek	92%	81%	79%	44%	78%	75%	B+
Irish Creek	100%	83%	73%	38%	60%	71%	B
Tred Avon River	74%	70%	53%	36%	54%	57%	B-
Island Creek	92%	66%	50%	31%	43%	56%	C+
La Trappe Creek	50%	60%	42%	29%	27%	42%	C-
Bolingbroke Creek	92%	64%	48%	24%	40%	54%	C
Tuckahoe Creek	100%	24%	49%	52%	56%	56%	C+
Upper Choptank River Mainstem	88%	57%	58%	39%	46%	58%	C+

BACTERIA MONITORING ON THE CHOPTANK | 2022

Site	Pass Rate	Average Failing CFU*
Red Bridges	20%	213
Hillsboro Landing	25%	239
Denton, Crouse Park	53%	287
Choptank Marina Beach	47%	580
Bill Burton Beach	87%	705
Sailwinds Park Beach	60%	200
Willis St. Beach	27%	863
Gerry Boyle Park Beach	64%	354
Hambrooks Bay Beach	60%	255
Trappe Landing	43%	523
The Strand, Oxford	80%	1001
Bellevue Beach	53%	169

CFU = Coliform Forming Units

Pass/Fail Threshold = 104 CFU

***Indicates the average of all failing scores this season**

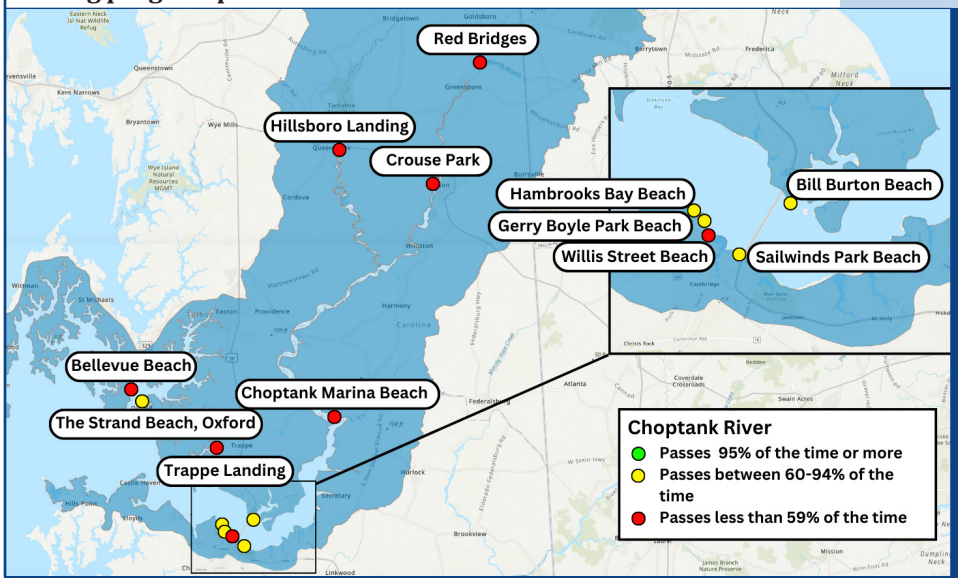
As part of the Swimmable ShoreRivers program, volunteer SwimTesters sample for bacteria at popular public access locations. Tests are conducted weekly from Memorial Day through Labor Day. The program follows the Environmental Protection Agency's standard protocols for collecting and analyzing samples and uses a pass/fail system to determine if bacteria levels are safe or unsafe for swimming.

In urban areas like Cambridge, sewage from outdated sewer lines mixes with stormwater during large rain events, delivering bacteria-latent water to the river. City leadership in Cambridge has prioritized upgrading the faulty waterfront sewer lines—a much needed upgrade that we're hopeful will reduce the amount of bacteria pollution washing into the Choptank. Septic systems around some more of our rural testing sites like Trappe and Hillsboro Landing, Red Bridges and Choptank Marina Beach are likely influences on bacteria at those beaches.

Bacteria is a localized source of pollution which explains why beaches located across a river from one another—like The Strand and Bellevue Beach, and Sailwinds Park and Bill Burton Beaches—can have different bacteria readings and rate of passing results.

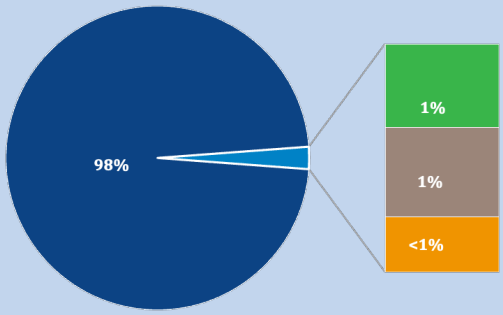
We're especially thankful for strong community support for this program from watershed residents—our Trappe Landing, Choptank Marina Beach, Bellevue, Crouse Park, and Red Bridges sites are all paid for by residents of those neighborhoods!

Thank you to our sponsors and volunteers for making our bacteria testing program possible!



BACTERIA EDNA SOURCE TRACKING ANALYSIS

Copies per 100ml



Human: 151,443 Poultry: 1,337 Swine: 1,443 Dog: 882

Thanks to generous funding from **our members** and the Cornell Douglas Foundation, ShoreRivers has begun tracking the sources of bacteria pollution **in our rivers using eDNA testing.** This new type of testing measures the number of eDNA copies (genetic material found in the environment) per 100ml of sample water and identifies the specific animal groups present.

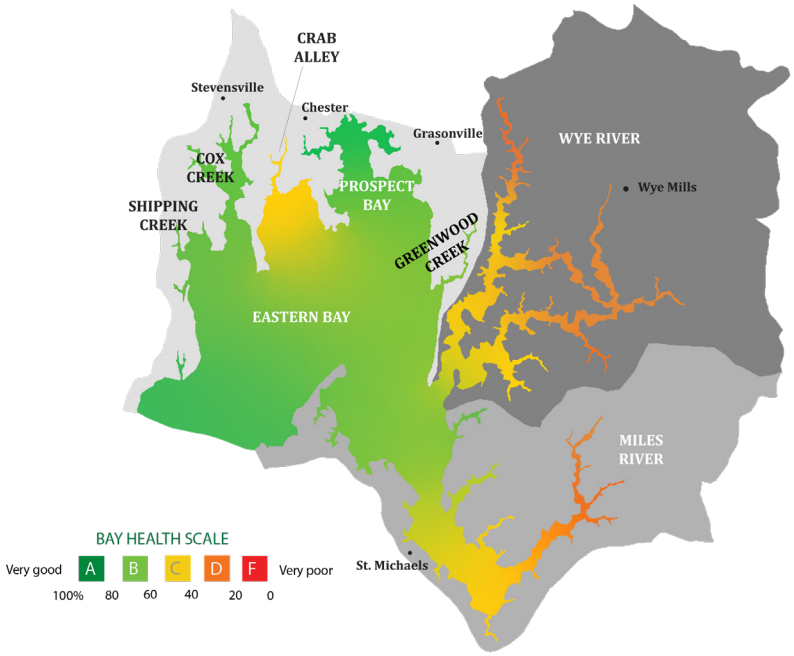
Results from 2022 testing indicate the overwhelming majority of eDNA present in our rivers is human, making shoreline septic systems, wastewater treatment outfalls, and illegal marine discharge key sources to monitor in the year ahead.

DID YOU KNOW that common practice is to pump out a septic system every three–five years? And if you're operating a Best Available Technology system, make sure that it's plugged in, turned on, and running properly. Failing or underperforming septic systems can cause bacteria and nutrient pollution to flow directly into our rivers, making them unsafe to swim in and to eat shellfish from.

SITES TESTED FOR BACTERIA POLLUTION | 2022

MILES, WYE, & EASTERN BAY REPORT CARD

2022



The 2022 Water Quality Index scores for the Miles River, Wye River Complex, and Eastern Bay Complex show that poor water clarity, likely due to algae and sediment particles in the water column, is a major threat to these waterways. All of the major tributaries showed declining conditions in 2022 compared to the long term average for these sampling stations.

The Wye River Complex scored a D+ in 2022, showing impairments from phosphorus and chlorophyll *a*, declining water clarity scores, and moderate nitrogen scores. The Miles River scored a C+, with poor water clarity and moderate levels of nutrients, and chlorophyll *a*. Eastern Bay had the best score of any tributary in the complex, which is expected given its low land to water ratio. However, it also had poor water clarity scores and moderate scores for chlorophyll *a*. Crab Alley and Greenwood Creek showed moderate scores with a declining trend.

EASTERN BAY COMPLEX **B-**

MILES RIVER **C+**

WYE RIVER COMPLEX **D+**

= see chart below for a list of what each complex includes

- O_2 DISSOLVED OXYGEN
- TN TOTAL NITROGEN
- TP TOTAL PHOSPHORUS
- WATER CLARITY
- CHLOROPHYLL *A*

ShoreRivers uses Mid-Atlantic Tributary Assessment Coalition scientific protocols to collect and evaluate water quality data. A numeric **Water Quality Index** is calculated using established thresholds for water quality parameters, then converted to a letter grade.

Ben Ford, Miles-Wye Riverkeeper
bford@shorerivers.org
443.385.0511 ext 213

SHORERIVERS

	DISSOLVED OXYGEN	TOTAL NITROGEN	TOTAL PHOSPHORUS	WATER CLARITY	CHLOROPHYLL *A*	WATER QUALITY INDEX	2022 GRADE
Eastern Bay	57%	73%	78%	67%	66%	68%	B
Shipping Creek	100%	71%	58%	33%	60%	64%	B-
Cox Creek	100%	76%	69%	38%	60%	68%	B
Crab Alley	92%	51%	47%	24%	40%	51%	C
Prospect Bay	93%	78%	73%	42%	60%	69%	B
Greenwood Creek	93%	67%	56%	22%	37%	55%	C
Wye Narrows	63%	43%	22%	22%	24%	35%	D
Wye River	67%	52%	29%	31%	39%	44%	C-
Wye East	72%	40%	20%	29%	30%	38%	D+
Miles River	78%	59%	42%	34%	41%	51%	C

BACTERIA MONITORING ON THE MILES, WYE, & EASTERN BAY | 2022

Site	Pass Rate	Average Failing CFU*
Drum Point Beach	60%	257
Broad Cove Claiborne	33%	250
Claiborne Beach	67%	885
Tunis Mills Bridge	60%	4958
Miles River Yacht Club	73%	6203
Matapeake Beach	67%	426

***Indicates the average of all failing scores this season**

CFU = Coliform Forming Units

Pass/Fail Threshold = 104 CFU

As part of the Swimmable ShoreRivers program, volunteer SwimTesters sample for bacteria at popular public access locations. Tests are conducted weekly from Memorial Day through Labor Day. The program follows the Environmental Protection Agency's standard protocols for collecting and analyzing samples and uses a pass/fail system to determine if bacteria levels are safe or unsafe for swimming.

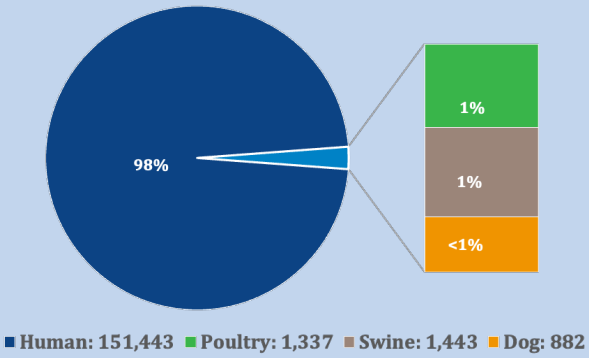
The tide, recent rain fall, water temperature, and distance from bacteria source all play a major role in how often a site might experience high levels of bacteria pollution.

Thank you to our sponsors and volunteers for making our bacteria testing program possible—and to those using our pumpout boat to help keep marine waste out of the Miles & Wye rivers!

DID YOU KNOW that common practice is to pump out a septic system every three–five years? And if you're operating a Best Available Technology system, make sure that it's plugged in, turned on, and running properly. Failing or underperforming septic systems can cause bacteria and nutrient pollution to flow directly into our rivers, making them unsafe to swim in and to eat shellfish from.

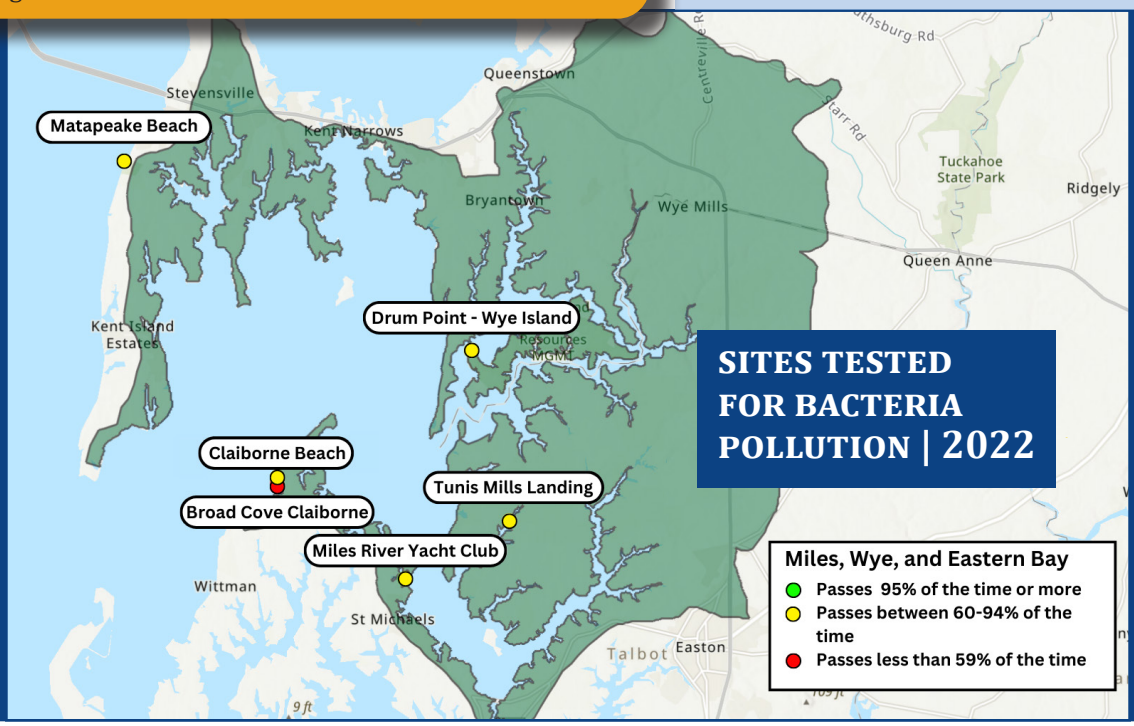
BACTERIA EDNA SOURCE TRACKING ANALYSIS

Copies per 100ml



Thanks to generous funding from **our members** and the Cornell Douglas Foundation, ShoreRivers has begun tracking the sources of bacteria pollution **in our rivers using eDNA testing.** This new type of testing measures the number of eDNA copies (genetic material found in the environment) per 100ml of sample water and identifies the specific animal groups present.

Results from 2022 testing indicate the overwhelming majority of eDNA present in our rivers is human, making shoreline septic systems, wastewater treatment outfalls, and illegal marine discharge key sources to monitor in the year ahead.



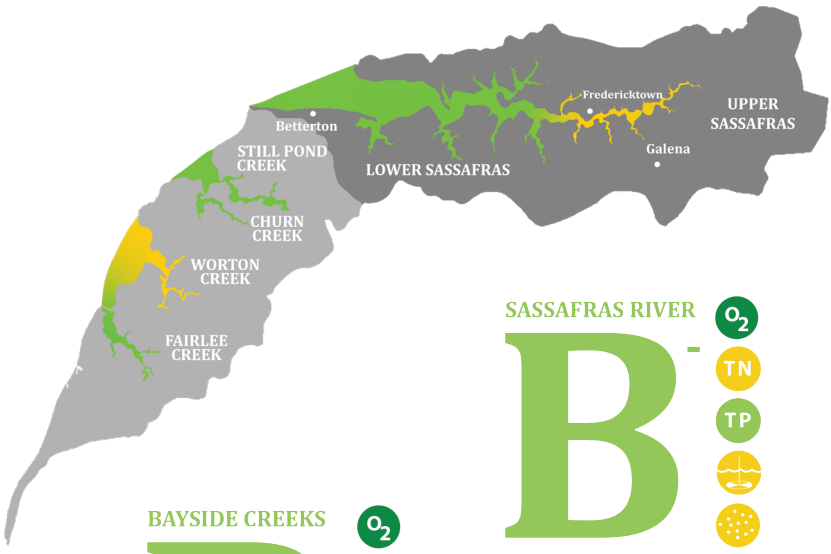
SASSAFRAS RIVER & BAYSIDE CREEKS REPORT CARD

2022

BAY HEALTH SCALE

Very good A B C D F Very poor

100% 80 60 40 20 0



SASSAFRAS RIVER **B-**

BAYSIDE CREEKS **B-**

O_2 DISSOLVED OXYGEN

TN TOTAL NITROGEN

TP TOTAL PHOSPHORUS

WATER CLARITY

CHLOROPHYLL *A*

ShoreRivers uses Mid-Atlantic Tributary Assessment Coalition scientific protocols to collect and evaluate water quality data. A numeric **Water Quality Index** is calculated using established thresholds for water quality parameters, then converted to a letter grade.

The 2022 water quality scores for the Sassafras River and Bayside Creeks show that while almost all parameters are trending in a positive direction, excess nitrogen, low water clarity, and high levels of chlorophyll *a* continue to be detrimental to the health of these waterways.

Water clarity is the only measured parameter that hasn't shown much sign of improvement over the past several years. The overall Water Quality Index shows that the Upper Sassafras only meets acceptable water quality standards 58% of the time, while the Lower Sassafras meets these standards 72% of the time, and the Bayside Creeks meet these standards 63% of the time.

Zack Kelleher, Sassafras Riverkeeper

zkelleher@shorerivers.org

410.810.7556 ext. 281

SHORERIVERS

	DISSOLVED OXYGEN	TOTAL NITROGEN	TOTAL PHOSPHORUS	WATER CLARITY	CHLOROPHYLL *A*	WATER QUALITY INDEX	2022 GRADE
Sassafras River	97%	59%	66%	41%	58%	64%	B-
Still Pond Creek	100%	51%	76%	43%	57%	65%	B
Churn Creek	100%	51%	81%	47%	61%	68%	B
Worton Creek	100%	51%	54%	35%	46%	57%	C+
Fairlee Creek	100%	52%	65%	37%	61%	63%	B-

BACTERIA MONITORING ON THE SASSAFRAS & BAYSIDE CREEKS | 2022

Site Name	Pass Rate	Average Failing CFU*
Fox Hole Landing	75%	162
Budds Landing	100%	Never Failed
Shorewood Estates	75%	277
Georgetown Bridge	100%	Never Failed
Indian Acres	92%	341
Kentmore Park	92%	318
Turner's Creek	75%	304
Cheshaven	100%	Never Failed
Betterton Beach	75%	324
Still Pond Creek	100%	Never Failed
Churn Creek	75%	199
Worton Creek	67%	2191
Fairlee Creek	83%	254

CFU = Coliform Forming Units

Pass/Fail Threshold = 104 CFU

***Indicates the average of all failing scores this season**

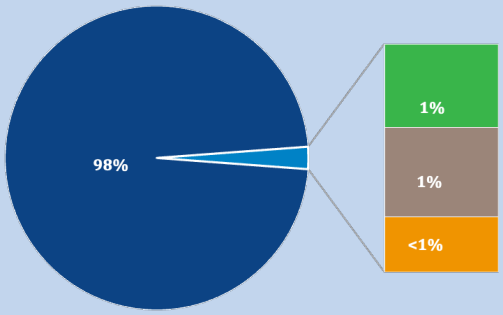
As part of the Swimmable ShoreRivers program, volunteer SwimTesters sample for bacteria at popular public access locations. Tests are conducted weekly from Memorial Day through Labor Day. The program follows the Environmental Protection Agency's standard protocols for collecting and analyzing samples and uses a pass/fail system to determine if bacteria levels are safe or unsafe for swimming.

We're especially thankful for this watershed's strong community support for this program—our Fox Hole Landing, Budds Landing, Shorewood Estates, Kentmore Park, and Cheshaven sites are all paid for by residents of those neighborhoods! Tidal flow, temperature, and rainfall vary at each site and can cause bacteria levels to spike at various rates, contributing to failing results.

Thank you to our sponsors and volunteers for making our bacteria testing program possible!

BACTERIA eDNA SOURCE TRACKING ANALYSIS

Copies per 100ml



Human: 151,443 Poultry: 1,337 Swine: 1,443 Dog: 882

Thanks to generous funding from **our members** and the Cornell Douglas Foundation, ShoreRivers has begun tracking the sources of bacteria pollution **in our rivers using eDNA testing.** This new type of testing measures the number of eDNA copies (genetic material found in the environment) per 100ml of sample water and identifies the specific animal groups present.

Results from 2022 testing indicate the overwhelming majority of eDNA present in our rivers is human, making shoreline septic systems, wastewater treatment outfalls, and illegal marine discharge key sources to monitor in the year ahead.

DID YOU KNOW that common practice is to pump out a septic system every three–five years? And if you're operating a Best Available Technology system, make sure that it's plugged in, turned on, and running properly. Failing or underperforming septic systems can cause bacteria and nutrient pollution to flow directly into our rivers, making them unsafe to swim in and to eat shellfish from.