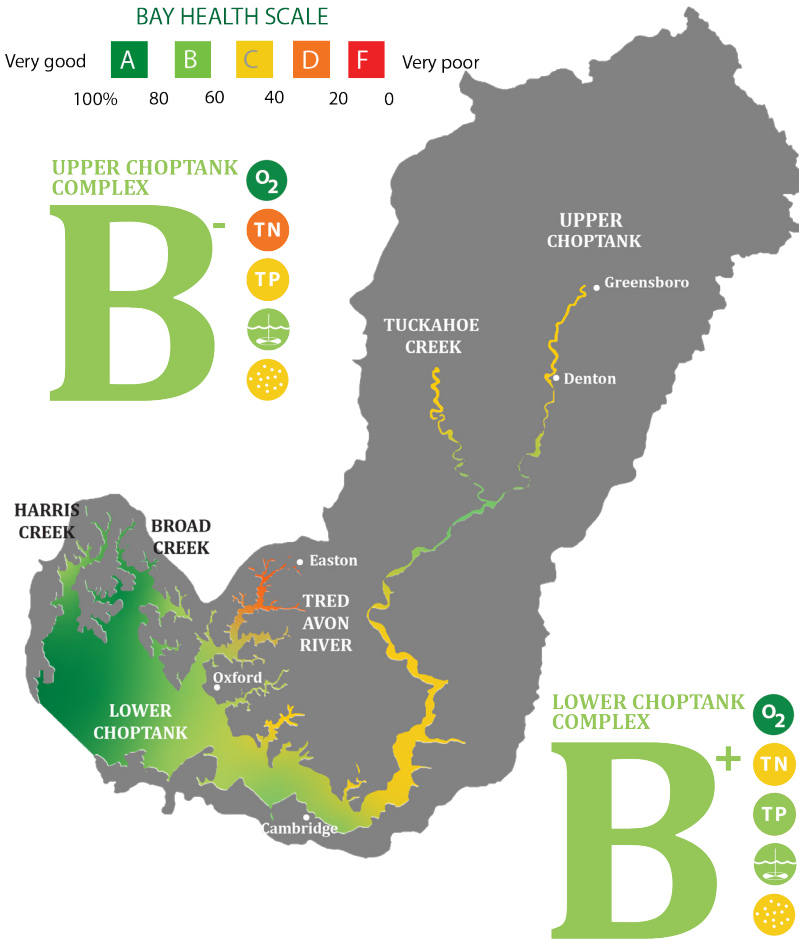
Choptank River Report Card

2023



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.

The highlight in water quality conditions in 2023 was, without a doubt, the increased salinity levels that soared 3–6 parts per thousand (ppt) above the 10-year average. It was a great case study to learn about the water quality benefits and costs in a year when we experienced less than normal precipitation resulting in higher than average salinity. Benefits include reduced nutrient inputs over land, greater oyster reproduction, healthier underwater grass beds, and smaller low-oxygenated areas (dead zones); costs include increased oyster diseases, poor reproduction of anadromous fish like striped bass, and increased sea nettles.

Looking at the full suite of parameters we monitor, we saw improvements in 2023 in dissolved oxygen, water clarity, chlorophyll *a*, and the lower Choptank River's total phosphorus. The biggest threat to the Choptank continues to be total nitrogen and, except for in Island and Tuckahoe creeks, we saw nitrogen levels greatly degrade. The majority of nitrogen enters our rivers from groundwater, and during drier years, groundwater inputs to rivers and creeks are less diluted and more impactful on water quality.

The fact that water quality in the rivers tend to improve in dry years means that improvements can continue during normal conditions if we can better capture and control runoff.

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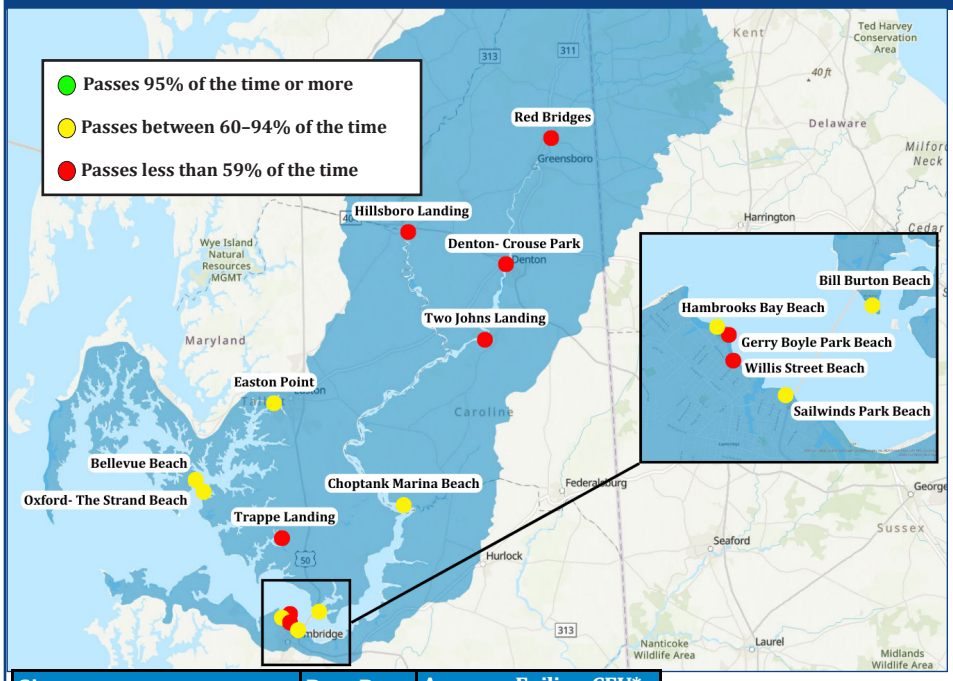
		DISSOLVED OXYGEN	TOTAL NITROGEN	TOTAL PHOSPHORUS	WATER CLARITY	CHLOROPHYLL *A*	WATER QUALITY INDEX	2023 GRADE
	Lower Choptank River Mainstem	96%	50%	77%	67%	57%	69%	B
	Harris Creek	100%	58%	82%	84%	72%	79%	B+
	Broad Creek	100%	52%	89%	83%	71%	79%	B+
	Irish Creek	100%	52%	86%	82%	69%	78%	B+
	Tred Avon River	76%	45%	75%	60%	55%	62%	B-
	Island Creek	100%	35%	75%	65%	53%	66%	B
	La Trappe Creek	80%	28%	58%	43%	37%	49%	C
B+	Bolingbroke Creek	100%	45%	63%	45%	43%	55%	C+
B-	Tuckahoe Creek	100%	52%	27%	60%	66%	61%	B-
	Upper Choptank River Mainstem	98%	31%	51%	67%	51%	60%	B-

BACTERIA MONITORING ON THE CHOPTANK | 2023



Site	Pass Rate	Average Failing CFU*
Red Bridges	29%	247
Hillsboro Landing	36%	537
Denton, Crouse Park	46%	321
Two Johns Landing	29%	215
Choptank Marina Beach	71%	319
Bill Burton Beach	92%	134
Sailwinds Park Beach**	64%	381
Willis St. Beach	14%	660
Gerry Boyle Park Beach	36%	293
Hambrooks Bay Beach	79%	223
Trappe Landing	43%	459
Easton Point	86%	1277
The Strand, Oxford	93%	383
Bellevue Beach	86%	122

CFU =
Colony Forming Units

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

****Readings above 104 CFU are considered failing, except at Sailwinds Park Beach, which uses a more rigorous testing method and a geometric mean of 35 CFU to be considered failing.**

Each season our volunteer SwimTesters, as a part of the Swimmable ShoreRivers program, test for bacteria pollution at shoreline sites along our rivers, including popular public access locations, marinas, yacht clubs, and town piers. These 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 the level of risk that bacteria levels pose for water contact activities.

Bacteria monitoring data for the Choptank showed that 67% of the sites passed more often in 2023 than they did in 2022. However, half of the sites still passed less than 60% of the time, while the rest passed between 60–94% of the time. We also brought on two new sites: Easton Point and Two Johns Landing. Easton Point is surrounded by predominantly urban landuse, so it was a pleasant surprise to see an 86% pass rate, however, this site had the highest average failing results, meaning that even though it doesn't fail often, when it does, it fails because of a lot of bacteria in the water.

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

Bacteria Monitoring Study Supports Tips for Safe Swimming

Thanks to funding from the Chesapeake Bay Trust, Morgan Buchanan, ShoreRivers' Education Programs Coordinator, conducted a continuous bacteria monitoring study at Morgan Creek Landing on the Chester River to better understand the relationship between tidal cycles and bacteria pollution in our waterways.

Results support our understanding that outgoing tides bring the highest bacteria levels of each tidal cycle. This can be seen in the figure to the right, showing results for the tidal cycle sampled on July 11, 2023, which saw no rain in the 24 hours prior to sampling. The highest bacteria level that day occurred one hour prior to low tide and with a reading of 471 CFU, whereas the average bacteria level that day was 124 CFU.