



2016

South River Report Card



Acknowledgments

We would like to thank the following individuals and organizations for their support in furthering the mission of the South River Federation and this annual Report Card. Their continued contribution and support is greatly appreciated.

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South River Federation Staff & Board of Directors

and all of our generous donors

The South River Federation, Inc. is dedicated to protecting, preserving, restoring, and celebrating the South River and its interdependent living community.

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Jaclyn Fisher, Chesapeake Conservation Corps Volunteer, Monitoring the South River

HEALING THE SOUTH RIVER IN ONE GENERATION

South River Federation Scientific Monitoring Program



This report card is based on South River Federation's scientifically rigorous data collection and analysis, which also drives our restoration strategy for the river. The same data is integrated into the Chesapeake Bay Program and the State of Maryland databases to model Bay processes as well as to inform policy and restoration efforts. No other non-profit organization shares this distinction.

The Federation installed 16 restoration projects in 2016 and finally achieved its ten-year goal of restoring the Church Creek stream that runs behind the Annapolis Harbour Center, which has long been the most polluted stream segment in the South River.

In 2016, over 1,200 people (750 students) volunteered with the South River Federation to help heal the river within one generation through planting trees, installing living shorelines, restoring oyster reefs, cleaning up streams, and collecting data. In addition, the Federation managed 65 oyster growers and 370 oyster cages and helped Chesapeake Bay Foundation to plant over 5.5 million oyster spat on shell in the South River. The Federation also mobilized volunteers for 23 plantings at restoration sites and organized five stream clean-ups that involved 80 people. Over the summer, the Federation trained 24 students from the READY Program (Restoring the Environment and Developing Youth) weekly by engaging them in conservation landscaping.

If you or your organization is looking for volunteer or educational opportunities, please contact Nancy Merrill at 410-224-3802, ext. 205.

11th Annual Report Card On the State of the South River 2016



The South River Federation is pleased to present our 11th Annual South River Report Card. This year, we have changed our scoring system to one developed by the Mid-Atlantic Tributary Assessment Coalition (MTAC).

The MTAC system is based on biologically significant thresholds for Chesapeake Bay aquatic life, and is used by the majority of other Chesapeake WATERKEEPERS®, the University of Maryland Center for Environmental Science, and the James River Association for their report cards. Even though our new scoring system results in some higher-than-usual letter grades, the River's recovery is not on cruise control yet. In the face of the proposed federal budget cuts to the Chesapeake Bay clean-up effort, collection of scientific data by local watershed groups is more important than ever.

A Fishable and Swimmable River?

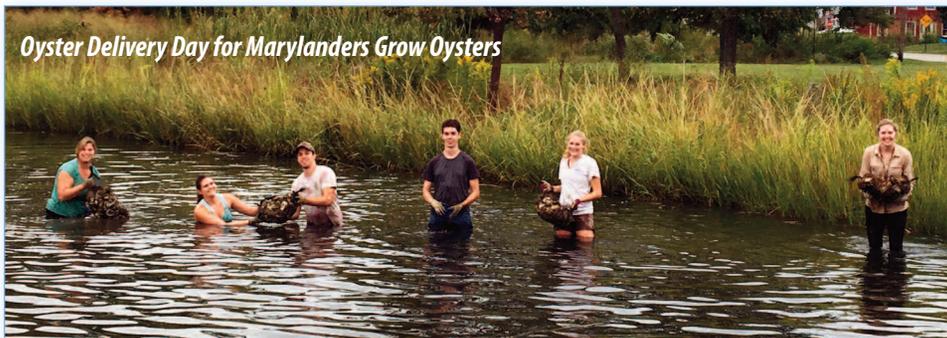
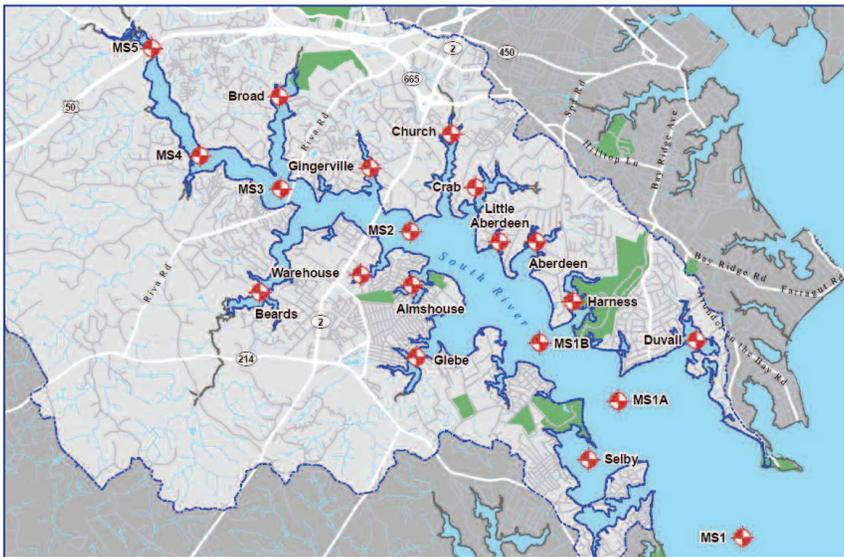
The data from 2016 shows that the South River remains stable and resilient, but there is still work to be done to make it fully fishable and swimmable. The worst pollutant for the river is sediment, or dirt, and the river scored a 62% for water clarity. While improving, nutrients (our second worst pollutant) continue to be excessive. The river bacteria levels improved by 10.5%, with the river's popular swimming beaches obtaining a healthy score 89% of the time.

With your support, we can continue to raise our voice for the South River, to keep our finger on its pulse, and monitor for sources of pollution. Together we are making progress, slowly, but as surely as the osprey find their way back to the River from South America each year, or the Rockfish return to their spawning creeks from the ocean. Thank you for helping us preserve, protect, restore and celebrate this amazing river.

About the Report Card

The **11th Annual South River Report Card** assesses the River's health based on eight water quality indicators: dissolved oxygen, pH, bacteria, water clarity, nutrients, temperature, chlorophyll a, and underwater grasses. Most of this data was collected by the South RIVERKEEPER® from 21 stations in the tidal portion of the South River. The nutrient information is provided by data from the Maryland Department of Natural Resources sampling station near the South River Rt. 2 Bridge. The South River Federation's tidal monitoring data is reviewed and verified by the Maryland Department of Natural Resources and independent third parties.

South River Watershed and Tidal Monitoring Stations



Report Card Grades 2016

Water Quality Indicators (n = # of samples)	2016 Score*	Grade	Change from 2015** (based on April-August)
Dissolved Oxygen (n=611)	88%	A	Worse (-1%)
pH (n=612)	99%	A	Same (+0.5%)
Bacteria (n=369) <i>(Federation & AA County data)</i>	89%	A	Better (+10.5%)
Water Clarity (n=684)	62%	B	Worse (-4.4%)
Nutrients (DNR data)			
Phosphorus (n=7)	63%	B	Better (+1.5%)
Nitrogen (n=7)	49%	C	Better (+4%)
Temperature (n=612)	54%	C	Better (+24%)
Chlorophyll (n=485)	37%	D	Worse (-2.5%)
Underwater Grasses	3%	F	Better (+1%)
OVERALL GRADE	60%	B-	Better (+4%)

* The South River's overall 2016 score was determined through analysis of all samples collected within the sampling seasons outlined by the Mid Atlantic Tributary Assessment Coalition (seasons vary for each parameter).

** Due to necessary equipment repair from August to October in 2015, "Change from 2015" was calculated using comparable time frames. 2015's score was also calculated using the new grading system.

What Do the Grades Mean?

- A** **80–100%** These regions of the South River are considered "healthy", demonstrating good water quality, capable of supporting a wide variety of fish and aquatic life
- B** **60–79%** These regions demonstrate "acceptable" water quality capable of supporting fish and aquatic life
- C** **40–59%** These regions demonstrate "fair" water quality and the ability to support some species of fish and aquatic life
- D** **20–39%** These regions demonstrate "poor" water quality with the reduced capability to support aquatic life
- F** **<20%** These regions demonstrate "very poor" water quality, exhibiting conditions capable of supporting very few aquatic species

Blue Crabs



IS IT FISHABLE?

Striped Bass



A thriving South River means more blue crabs for everyone to eat. Underwater grasses are a favorite habitat for crabs, but unfortunately, the South River has only met 3% of its 479 acre aquatic grass restoration goal (calculated based on historic levels).

Nonetheless, 2016 saw a big increase in the amount of underwater grass from 9.93 acres to 14.85 acres.

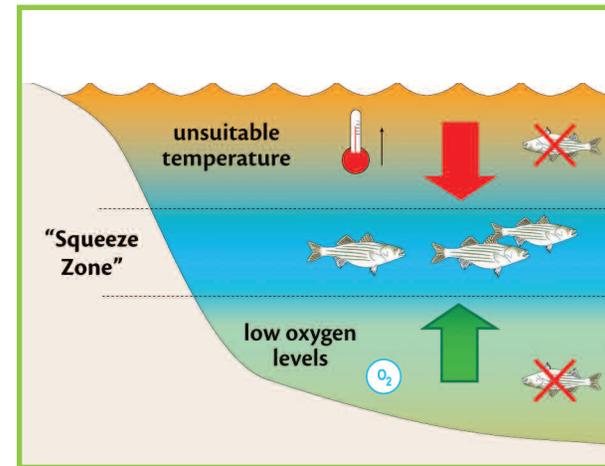
For the first time in recent history, summertime grasses were recorded in Glebe Bay via aerial photography.

The goal for the South River is to increase water clarity to an average of 1 meter during spring and summer so that sunlight can reach the underwater grasses. Despite a remarkably clear water clarity year for the larger Chesapeake in 2016, the average South River clarity is still below the 1 meter goal for the river. Clarity actually worsened, dropping from an average of 0.82 meters in 2015 to 0.72 meters in 2016,* even though 2016 was a slightly drier year.

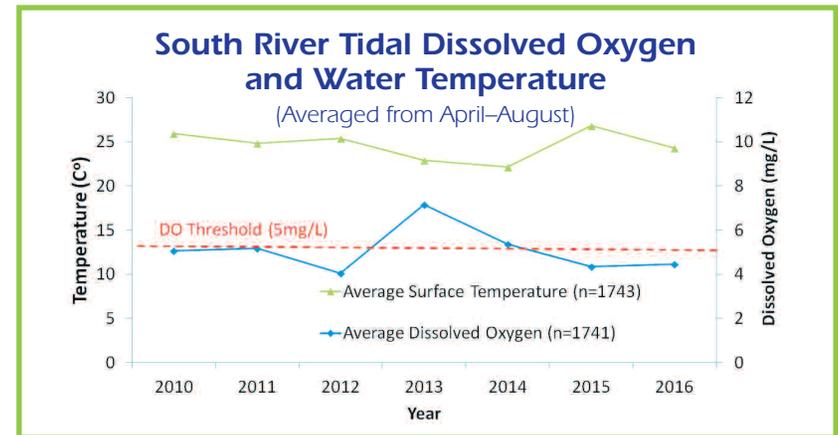
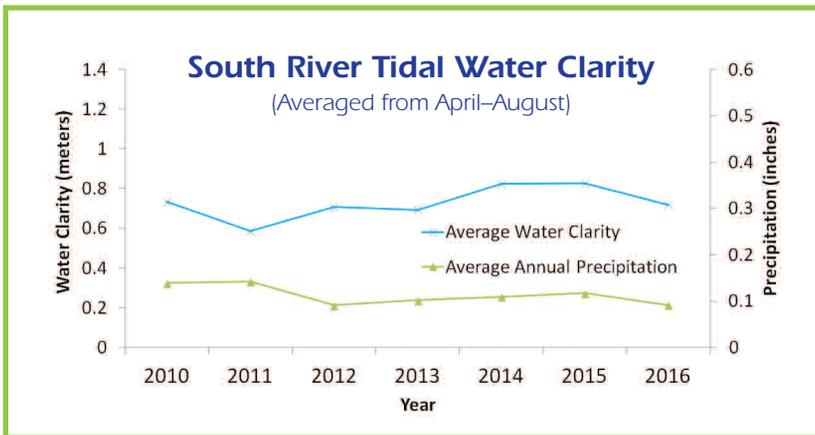
In May 2016, there was also a record amount of spring aquatic grass (mostly Horned Pondweed) that appeared in many of the creeks and along the shallows of the main stem. Citizens, many of whom stated they had not seen aquatic grasses in their creek in decades, helped us survey these spring grasses and found patches in 14 areas around the river!

**Averaged across all 21 stations from April through July*

The 2016 grade for the South River's dissolved oxygen was an A under the new grading system since, on average, the river can support fish. However, a closer look at the data reveals that the bottom of the river is still experiencing dead zones, especially in late summer. Which means fish habitat, like that of Striped Bass (Rockfish), is being "squeezed" because the surface water temperature is too high and dissolved oxygen levels on the river's bottom are too low.



At least two small-scale fish kills did occur in 2016 on the South River, although nothing like the more significant fish kills experienced on the Middle River and elsewhere in the Bay. We also noticed a greater presence of apex predators such as Dolphins and Bald Eagles in 2016, indicating a strong aquatic food base.



Improving the South River for Yellow Perch

Yellow perch live in partial saltwater rivers and spawn in the early spring in small, shallow freshwater streams that have sand and gravel bottoms. The female lays long strands of eggs which stick to underwater vegetation, tree branches and other debris. Our RIVERKEEPER® spotted eggs in North River!



Importance of Underwater Grasses

Underwater grass beds provide food and shelter for yellow perch. In fact, their most distinguishing feature is the dark vertical bands across their back and sides, which help camouflage them among the grasses. Underwater grasses, vital for their survival, are down to 3% of their historic levels due to poor water clarity. In 2016, the Federation, with the help of local residents, found spring aquatic grasses in 14 regions around the River and the amount of summertime grasses leaped from 9 to 14 acres—a record increase!

Putting the River on a Sediment Diet



Photo credit Jay Fleming photography

Too much sediment flowing into the headwaters can reduce perch populations by covering good spawning habitat and suffocating incubating eggs. The

Bay Program calculated in 2016 that the South River Watershed should not release more than 1,546 tons of sediment per year, recommending a 22% decrease in its current sediment load. The Federation believes that this sediment diet will help aquatic species like the perch thrive again.

Breathable Water

Juvenile perch stay in freshwater tributaries, that provide a nourishing and safe nursery habitat, until they are large enough to move to more brackish near-shore waters. With 21 tidal and 22 non-tidal monitoring stations, the South River Federation monitors the water quality of the many potential habitats of yellow perch, from Bacon Ridge to Broad Creek. Currently, the bottom of the river from Riva Bridge upriver is not breathable for yellow perch at the end of summer.



Oyster Advocacy and Restoration

In 2016, a proposal to open over one thousand acres of oyster sanctuaries to commercial harvest was blocked, partially due to the advocacy effort led by the Federation and its partners. The South RIVERKEEPER® attended many Oyster Advisory Commission (OAC) meetings and testified on behalf of a successfully passed bill to prevent any opening of the sanctuaries until the completion of a robust, scientifically-derived stock assessment of the oyster population in December 2018.

The South River is also on the short list to become one of the targeted tributaries to receive federal funding for oyster restoration. The Federation appreciates all the letters that people sent in to their representatives in support of South River oyster restoration.

The number of oysters on the sanctuary reefs in the South River increased during 2016. In collaboration with the Chesapeake Bay Foundation, SRF planted over 5 million spat-on-shell and 272,400 one-year old oysters at six locations in the River.

Annually, the 65 South River participants in the Marylanders Grow Oyster program add almost 50,000 oysters to the sanctuary reef.

If you own waterfront property and want to see more oysters in the River, ask us how you can get involved in the Marylanders Grow Oysters program. The program provides cages of oyster spat for homeowners to raise for a year to be planted on our sanctuary reef in Glebe Bay.



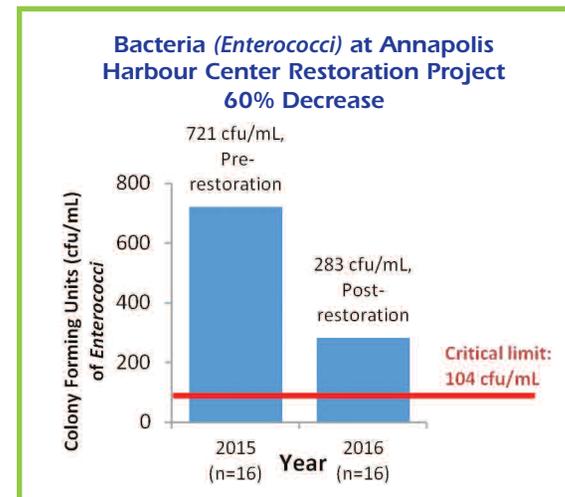
Is it Swimmable?



The Federation collects water samples and tests for bacteria at South River swimming areas every week of the summer as part of "Operation Clearwater." In 2016, popular swimming areas around the River had healthy scores 89% of the time, a 10.5 % improvement over last year.

Elevated levels of *Enterococci* bacteria indicate the presence of harmful bacteria that can cause ear, eye, and skin infections as well as gastro-intestinal symptoms. The Environmental Protection Agency (EPA) sets a limit of 104 colony forming units (CFU) per 100 mL of water for recreational contact. It is not advised to swim within 48 hours of a rain event due to predicted high bacteria levels.

What Can You Do To Help?—Residents can help reduce bacteria by picking up pet waste, keeping Canada Geese off shorelines/beaches and maintaining septic systems. This helps keep the bacteria out of the river, especially after a rainstorm.



Restoration Success Story— In 2016, the Federation finally tackled the most polluted stream segment on the river, which is a portion of Church Creek that runs behind Annapolis Harbour Center. Within a year of restoration, mean bacteria levels improved by 60%, making progress towards meeting EPA's bacteria limit!

How to Receive the Bacteria Information

SwimGuide:
www.swimguide.org *There is also an app!*

Website:
www.southernriverfederation.net

Facebook:
www.facebook.com/SouthRiverFederation

Operation Clearwater

To sign up to have your waterfront community's recreational area tested, please contact our office at **410-224-3802**.

A group of 25 eagles, or a "Convocation," was spotted January 20th on the South River. Bald Eagles require a strong food base, perching areas, and nesting sites and the South River is providing just that.

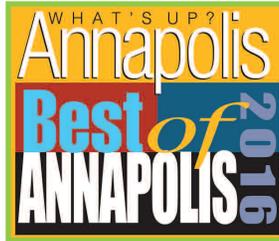


Photo by Donna Cole



Dolphins made quite a splash in the South River last summer, being caught on film in many areas around the River.

Photo by Patrick Snapp



The Federation was voted best Local Non-profit by *WhatsUp? Magazine* for 2016.



November 19th, the Federation celebrated the completion of our Church Creek Headwaters Project with a ribbon cutting ceremony. Volunteers helped plant 19,000 plants, including 2,000 trees!



In November and December, the Federation had multiple groups out to help with the reforestation of Homeport Farm Park, a reopened County Park and kayak launch. In total, over 700 trees were planted.



December 1st, RIVERKEEPER® Jesse Iliff was certified to operate this little yellow submarine and hopes to use it to monitor the oyster sanctuary reef.

How Did the River

JANUARY

Do in 2016?

On January 28th, over 300 gallons of oil spilled into a tributary of Crab Creek due to a leak in Annapolis Middle School's boiler room.



After decades of absence from Church Creek, the chain pickerel returned! In July and August, 11 individuals were found at Wilelinor, one of South River's oldest and most mature restoration sites.

DECEMBER



Despite the millions of oyster spat dumped into the river with our partner Chesapeake Bay Foundation, their survival was threatened this year as plans to open sanctuaries to commercial harvest were announced.

At the end of the year, a sediment Total Maximum Daily Load (TMDL —or dirt diet!) was announced for the South River. This would reduce the input of sediment to the river by 22%, from 1,982 tons/yr to 1,546 tons/yr.

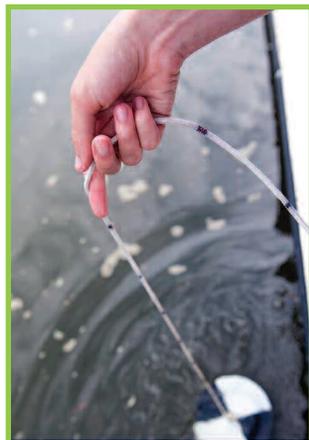


Data Collection Methodology

The data collected for the 2016 report card was derived from weekly sampling at 21 tidal sites throughout the river using a Hydrolab DS5 (see bottom photo), a device that records seven water quality parameters at quarter meter measurements through the water column. Water clarity is measured using a Secchi Disk. Precipitation data was collected at the U.S. Naval Academy.

This year the Federation shifted to an improved standardized grading system established by the Mid-Atlantic Tributary Assessment Coalition (MTAC) to more consistently assess the South River in relation to other Bay tributaries. In past years, the Federation has evaluated the river's health based on one threshold for each water quality indicator, with a simple pass/fail percentage forming the basis for the grades.

This new method, however, considers multiple thresholds to more precisely gauge the river's ability to support fish and shellfish populations. It assigns numeric scores of 1–5 for very poor, poor, fair, good, or very good. Then the scores are averaged across the sampling season for all stations to better evaluate and understand the quality of the water in the South River.



The Secchi disk— as created in 1865 by Angelo Secchi—is a circular disk 12 inches in diameter used to measure water transparency in bodies of water.



How Well is Anne Arundel County Enforcing Environmental Laws?

During 2016, the South Riverkeeper conducted a review of Anne Arundel County's enforcement of its environmental code. The audit examined every environmental complaint from 2014–2016 and the County's response.

The effort developed some interesting information—for instance, on average over two thirds of complaints are dismissed. Of the remaining 32% of cases which spur action by the County, ¾ of the cases are resolved without assessment of a monetary penalty, or other material consequence (such as required tree replanting) beyond responding to the County's deadlines for corrective action.

Although only 18% of the County is in the Critical Area, 47% of the Department's caseload involves Critical Area violations. This indicates an appropriate focus on our most vulnerable areas. Overall, the County's enforcement program could stand to increase the number of strong enforcement actions to send a message that breaking environmental laws carries real consequences.



So far, as funding to the Department of Inspections and Permits increases, so too does the percentage of strong enforcement actions. The launch of new case-tracking software also holds potential to ensure that outstanding violations are resolved and to prevent repeat violators from receiving additional permits. The Federation looks forward to working with the County to improve their tracking and enforcement of wrongful actions that harm the South River.