



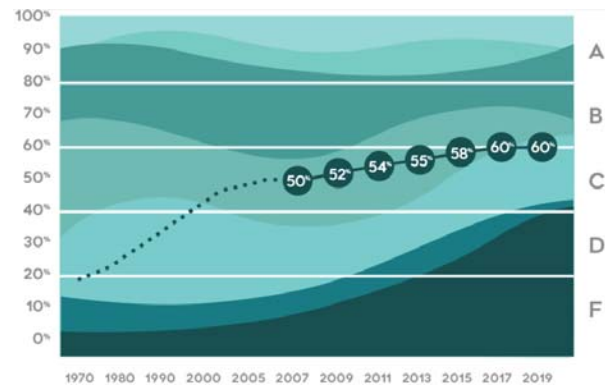
# STATE OF THE JAMES

## 2019

SCOPE   GRADE		
RIVER HEALTH	62%	B-
RIVER RESTORATION PROGRESS	58%	C+
OVERALL	60%	B-
GRADING SCALE: A: 80% - 100% B: 50% - 79% C: 40% - 49% D: 30% - 39% E: LESS THAN 20%		

### Key Conclusions:

- The overall score remained steady at 60% and a grade of B-minus, a positive sign for the resilience of the James River despite the record rains of 2018.
- The increased polluted runoff associated with heavier than normal downpours caused setbacks for a number of indicators, including sediment reductions, bacteria pollution, tidal water quality, and oysters.
- While bald eagles and smallmouth bass remained strong, American shad were the lowest scoring indicator, dropping to just 1%.
- We continue to see progress in areas where Virginia has made significant investments, particularly wastewater pollution controls.
- Virginia's newest Cleanup Plan provides a blueprint for achieving a Grade-A James River by 2025 and calls for more investment in agriculture and stormwater pollution controls.



STATE OF THE JAMES SHOWS  
AN IMPROVING TREND

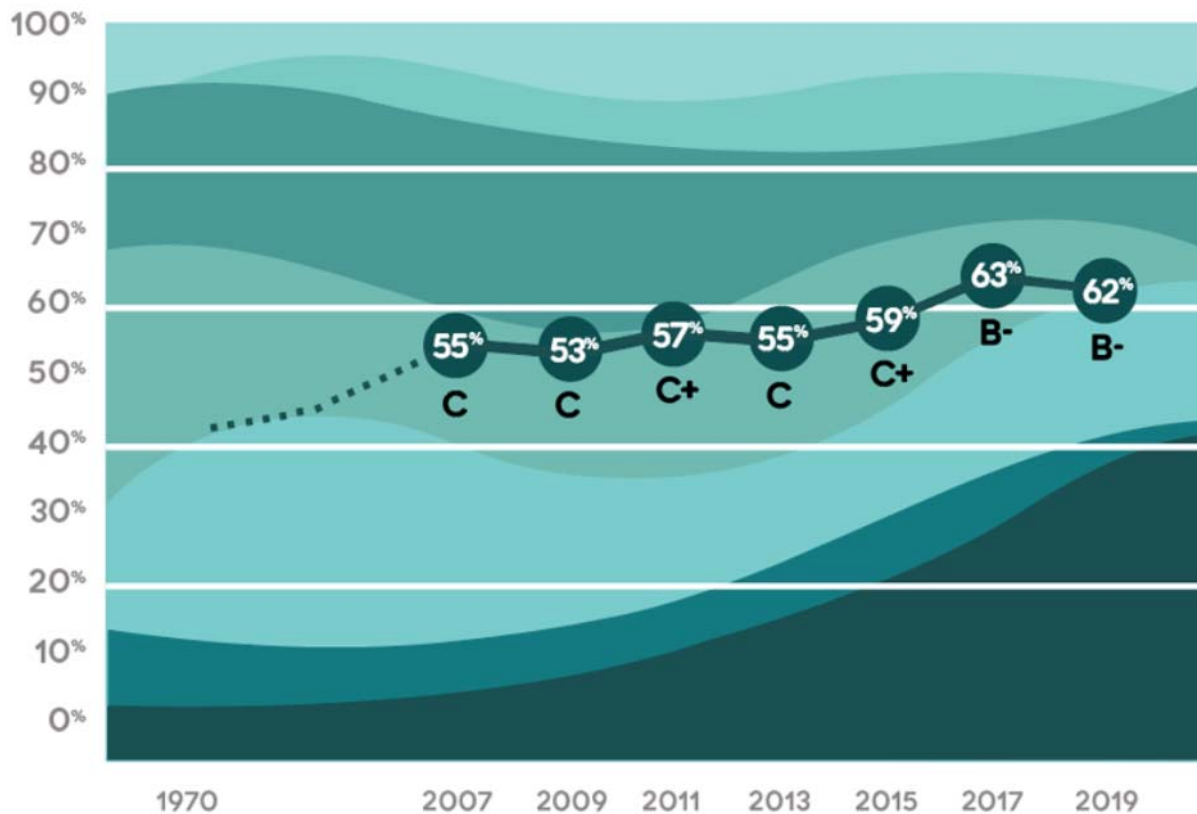
### Change the James and the James Will Change You:

One third of all Virginians live in the James River watershed and benefit from a healthy river. At the James River Association, we have many ways you can be a James Changer:

- Prevent pollution at home by becoming a [River Hero Home](#).
- Lend us your time and talent by [volunteering](#) for the James.
- Help be eyes and ears on the river by joining the [RiverRats](#) program.
- Remind your elected officials that a healthy, accessible James is a priority by becoming a [RiverRep](#).
- Get out and enjoy the river on a [James River Adventures](#) trip.
- Introduce someone to the river on a [Connect with the James](#) program.
- Strengthen our collective voice for the river by [becoming a member](#).

## River Health

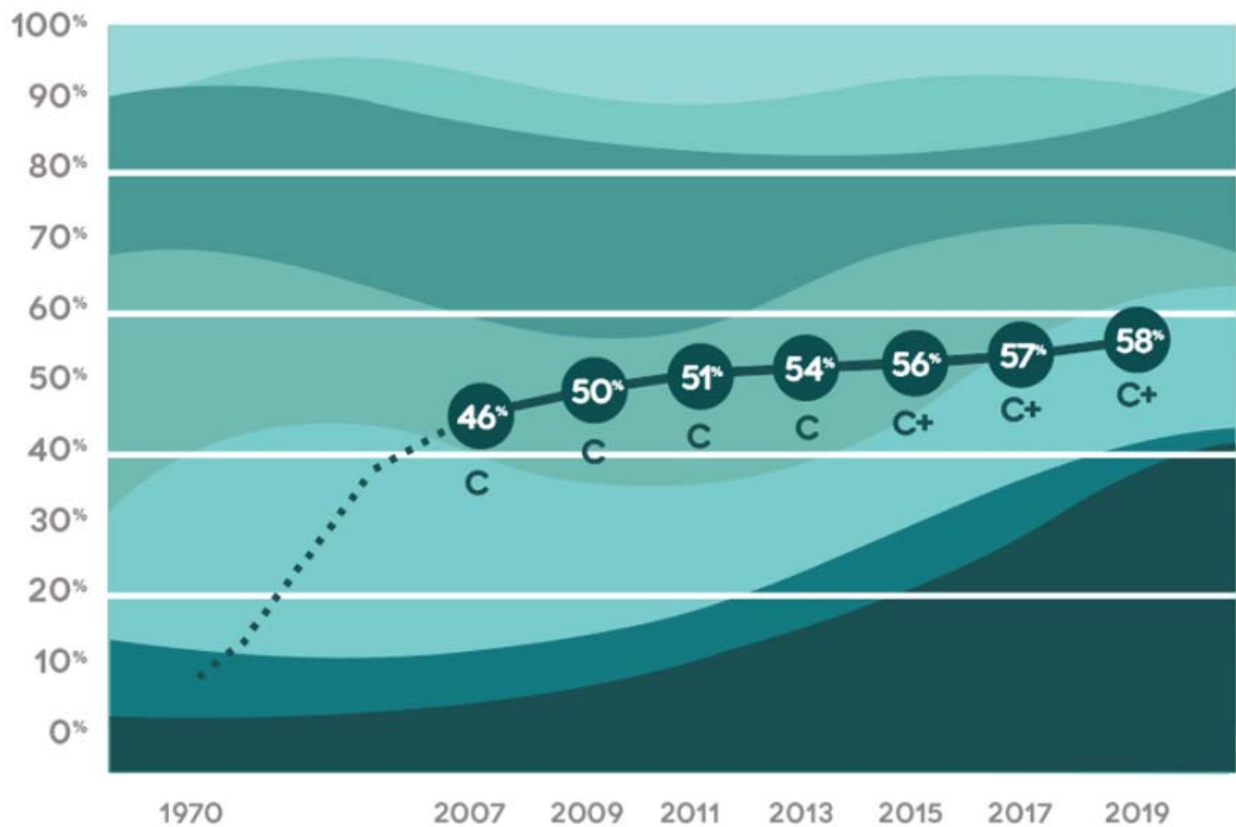
The River Health score is comprised of ten indicators, identified in blue, related to the ecological health of the James. They include fish and wildlife species native to the river as well as the habitat features that help these species thrive. Overall, the River Health score fell one point to 62%. Despite this small setback, the James showed remarkable resilience in the face of heavy downpours throughout the watershed during 2018, and we remain at a grade of B-, a full letter grade above where we were in the 1970s. However, there is troubling news for oysters and American shad, which both suffered heavy losses compared to 2017. Responsible management decisions will be critically important for restoring these celebrated species.



# RIVER HEALTH

## River Restoration Progress

The River Restoration Progress score continued its slow but steady rise, increasing one point to 58%. The eight River Restoration indicators, identified in green, track our progress as a watershed to complete the restoration actions outlined in Virginia's Chesapeake Bay Cleanup Plan and reduce the amount of pollution entering the James River by 2025. We continue to see improvement where Virginia has made significant investments, particularly wastewater pollution controls. But 2018's record rainfall contributed to lower sediment and bacteria pollution scores, highlighting the need for more conservation practices like forested riparian buffers and urban stormwater treatment.



# RIVER RESTORATION PROGRESS

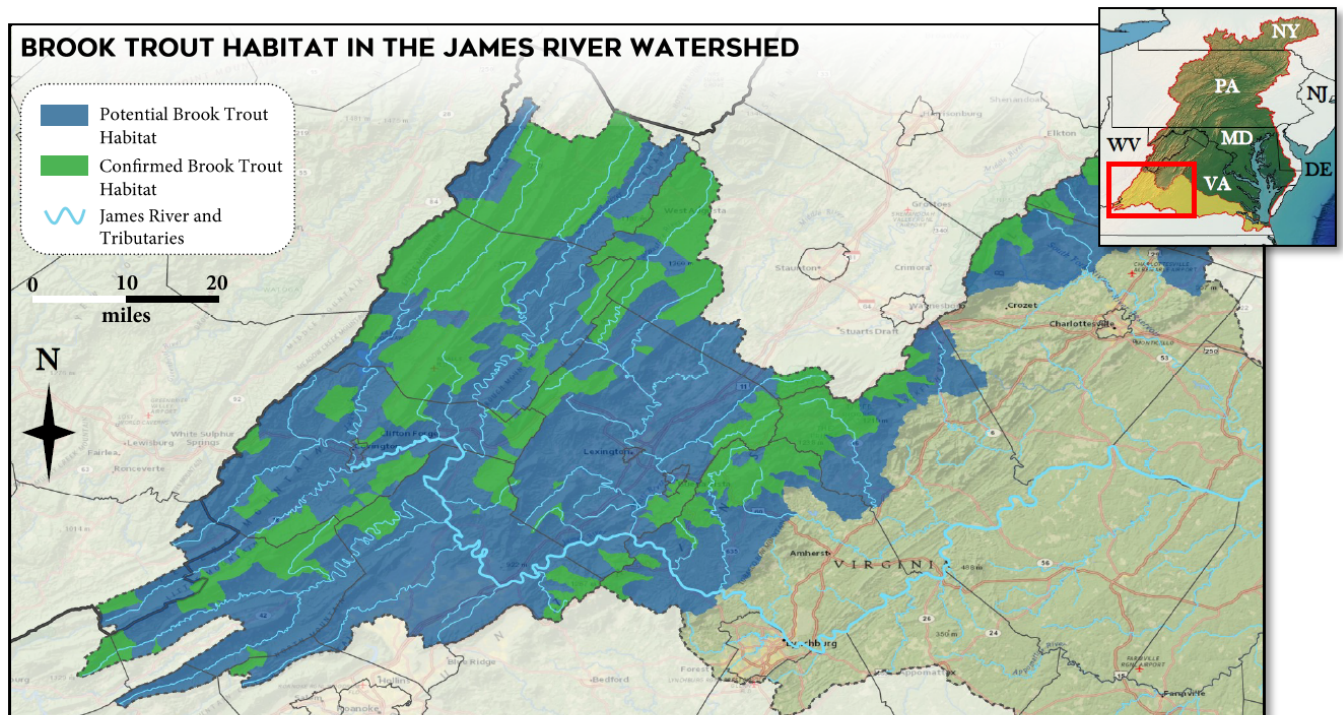
## River Health Indicators

### Brook Trout: 74% $\Rightarrow$ $\pm 0\%$

This vividly pigmented member of the salmon family is Virginia's official freshwater fish and once thrived in dozens of cold headwater streams in the watershed. Extremely sensitive to water quality and rising temperatures, the brook trout's range has been reduced due to changes in land use, competition with non-native fish species, warming streams, and acid rain. Brook trout currently occupy 74% of the desired habitat targeted by the Chesapeake Bay Program. In the face of future threats posed by climate change and land use disturbances, we must invest in riparian buffers to keep our streams cool, and advocate for sufficient state-level funding to build resiliency into remaining brook trout populations.

#### Be a James Changer:

- [Tell your elected representatives to make funding for natural resources a priority.](#)
- [Apply for a forested buffer on your property or volunteer to plant trees at \[JamesRiverBuffers.org\]\(http://JamesRiverBuffers.org\).](#)



Source: Eastern Brook Trout Joint Venture

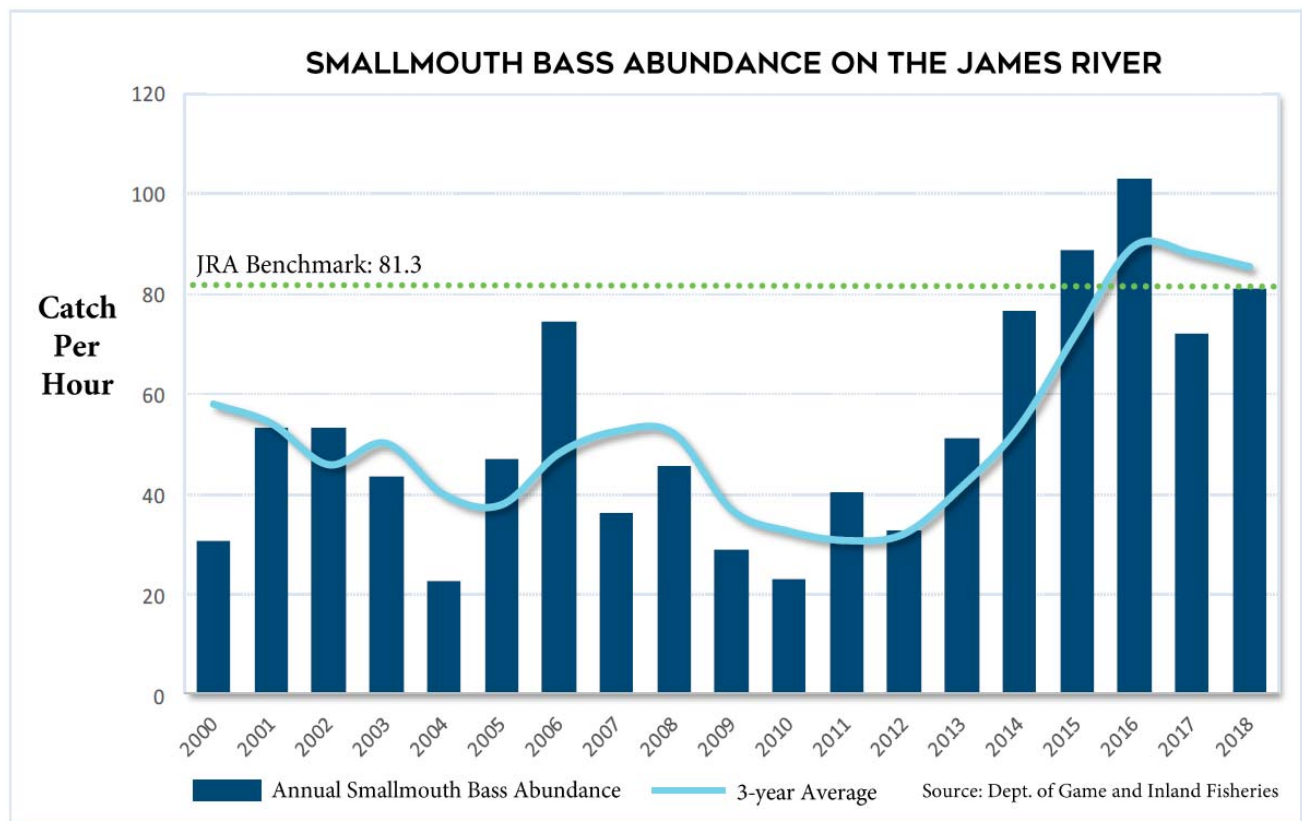


### Smallmouth Bass: 100% $\Rightarrow$ $\pm 0\%$

This lively sport fish entertains anglers across the Mountains and Piedmont, with the highest surveyed abundances on the Jackson and Maury Rivers. The most recent data indicate that the fishery is doing well - clocking in at 100% on the 2019 *State of the James*. But smallmouth bass aren't out of the woods. While some population fluctuations can be expected, we must invest in riparian buffers, agriculture best practices, and robust state-level funding to make sure that population numbers stay consistently high.

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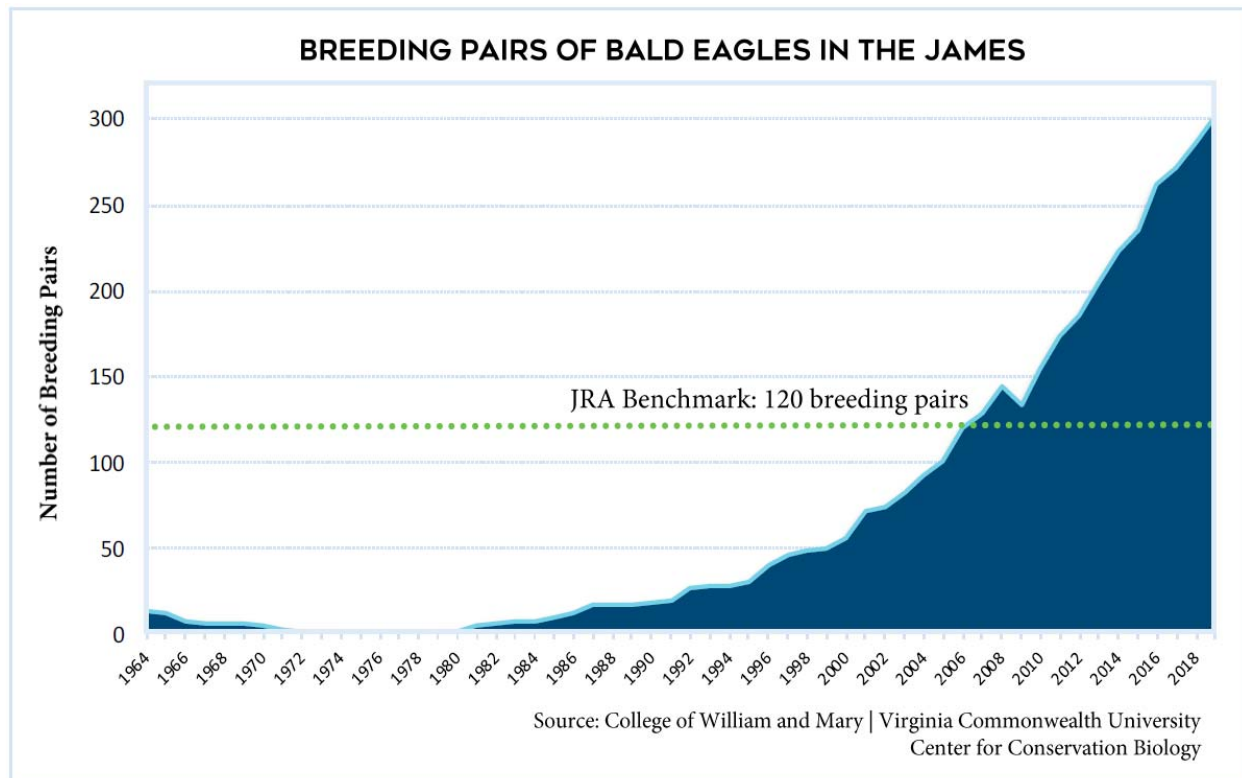


### Bald Eagle: 100% $\Rightarrow$ $\pm 0\%$

Since the ban of the pesticide DDT and the passage of the Endangered Species Act in the 1970s, bald eagles have made a dramatic comeback. The number of breeding pairs in the James River watershed rose to 302 in 2019 - up 11% points from 2017 and surpassing 300 for the first time since surveys began more than 50 years ago. The James River eagle population is one of the densest in North America today. Protecting riparian buffers and planting new riverside forests is an essential action to aid in the continued eagle resurgence.

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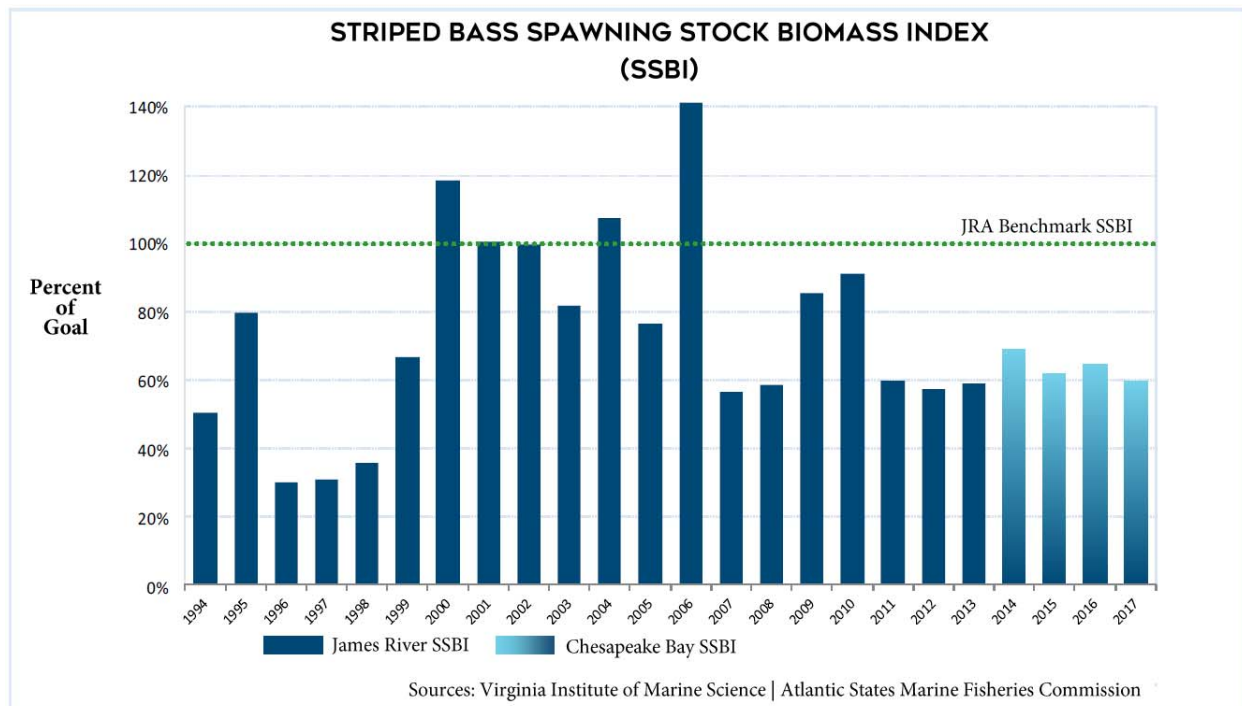


**Striped Bass: 60%  $\Rightarrow$   $\pm 10\%$** 

Striped bass are a favorite recreational sportfish and one of the most valuable commercial fisheries in the Chesapeake Bay. Overfishing, habitat loss and pollution caused a significant population decrease during the 1970s and 1980s, but a fishing moratorium helped the population rebound by 1995 and in the following decade. Today the spawning stock has once again declined and is being overfished according to the latest coast-wide stock assessment. Careful management is necessary to protect striped bass and ensure populations have the opportunity to recover again. Forage fish like menhaden are an essential food source for striped bass, but Virginia needs strong limits in place for the commercial menhaden fishery to preserve a balanced food chain and healthy striped bass population.

**Be a James Changer:**

- [Support responsible wildlife management by purchasing a license or membership through the Department of Game and Inland Fisheries.](#)

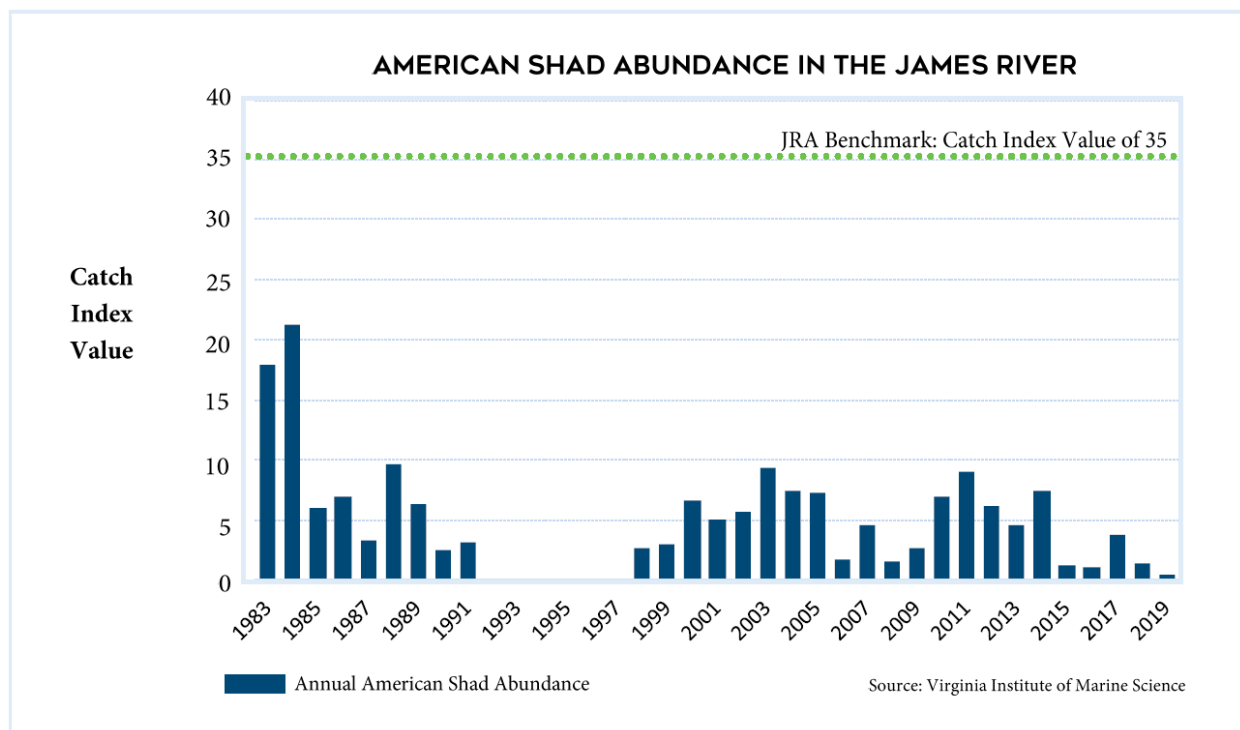


## American Shad: 1% ↓ -10%

American shad was once one of the most abundant and important fish species in the James River. Shad are anadromous fish that migrate into freshwater to spawn during the spring, however, decades of overfishing, pollution, and construction of dams that block migrations have severely hurt shad. From 1992 to 2017 Virginia stocked nearly 126 million hatchery shad to give the species a leg up. A fishing moratorium has been in place in Virginia since 1994, and significant work has taken place to provide fish passage at existing dams, or to remove dams entirely. Despite these efforts, the James River shad population reached an all-time low of 1% in 2019. Virginia needs a solid plan and a renewed commitment to restoration efforts for American shad to mount a recovery.

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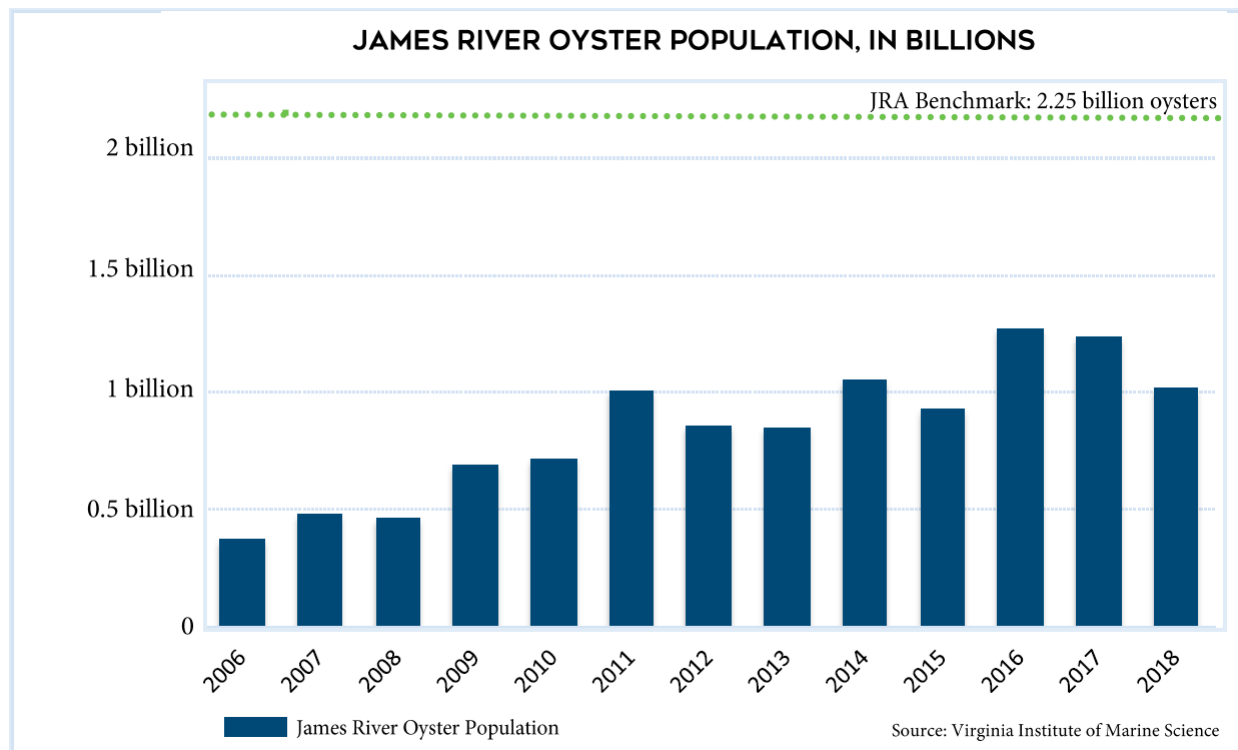


**Oysters: 45% ↓ -12%**

Oyster reefs provide valuable structure and habitat for a wide variety of aquatic organisms, and an adult oyster can filter 50 gallons of water per day. Oyster populations have been decimated by overharvest, pollution and disease, but the James River saw marked population increases from 2006-2017. Careful fishery management, including the establishment of a 585-acre oyster sanctuary in 2009, has helped buffer the James River from some of the dramatic population losses seen elsewhere in the Chesapeake Bay. However, record setting rains in 2018 caused a surge in freshwater entering the river and ultimately significant oyster die-offs. Restoring a fully healthy oyster population will benefit overall water quality and enhance the resiliency of oyster reefs in the face of future climate driven challenges.

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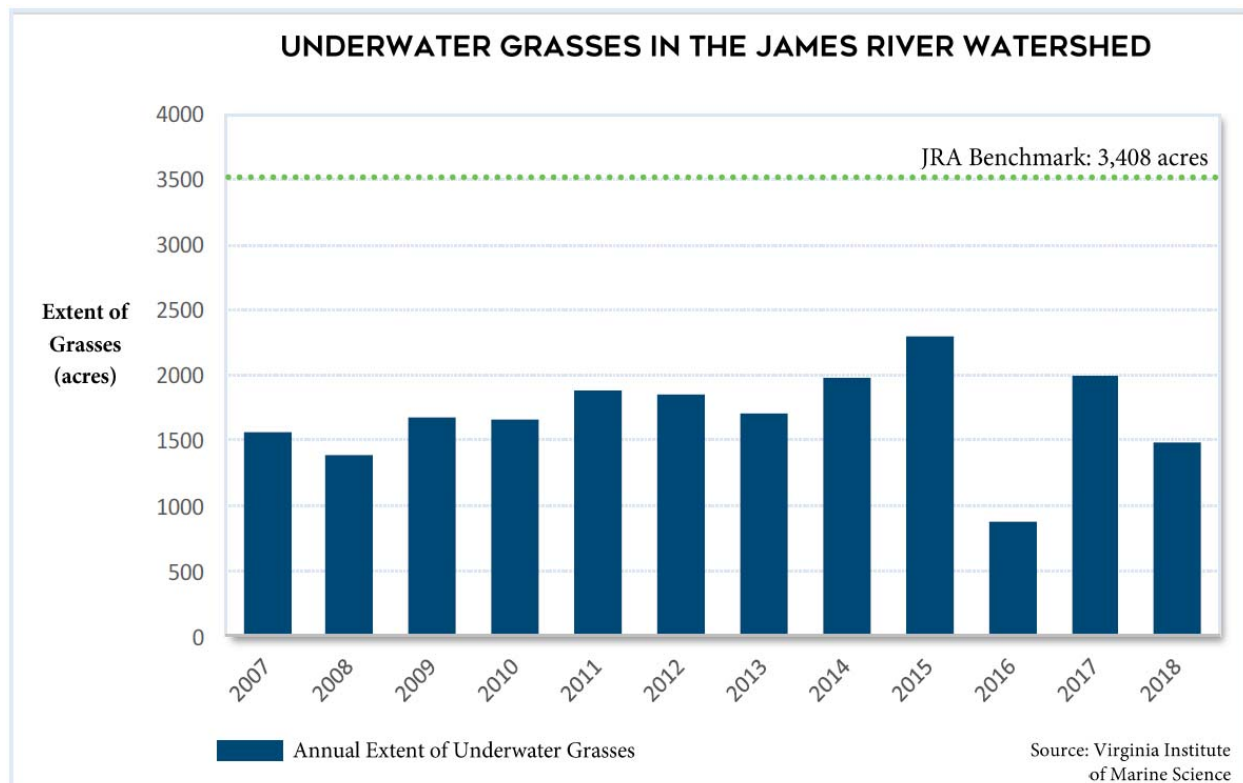


## Underwater Grasses: 43% ↑ +16%

Underwater grasses have increased in parts of the James River, now covering 43% of the goal set for the James. The presence of these grasses, which provide essential habitat for juvenile fish, crabs and waterfowl, is a positive sign that water quality is improving. Because sunlight is the most important factor in the growth of underwater grasses, improving water clarity is a key step in reaching the goal of 3,408 acres of underwater grasses in the James River. Continued restoration of streamside buffers and reductions in sediment and nutrient runoff from agriculture and development are needed in order to meet this goal.

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- [Apply for a forested buffer on your property or volunteer to plant trees at \[JamesRiverBuffers.org\]\(#\).](#)
- [Help us monitor underwater grasses in the James.](#)

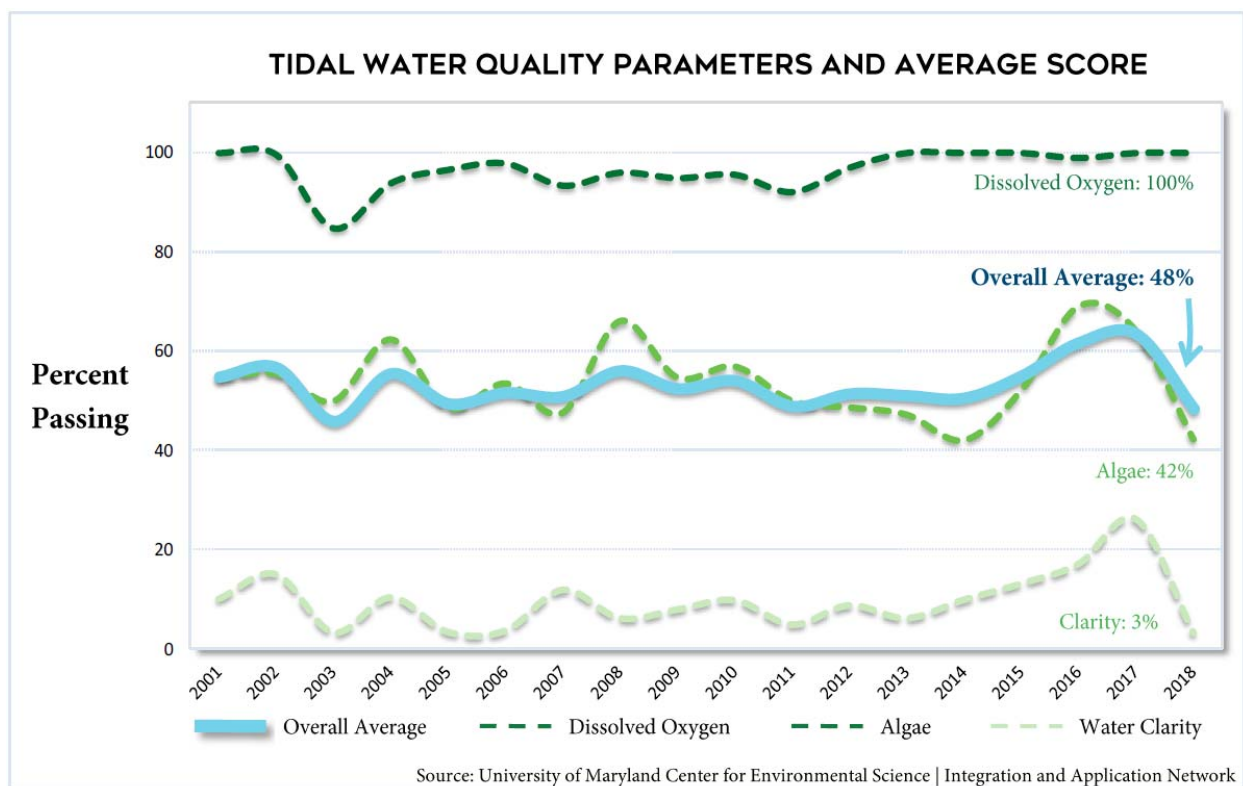


## Tidal Water Quality: 48% ↓ -14%

Dissolved oxygen, algae levels and water clarity are important indicators that each tell an important story about tidal water quality. Dissolved oxygen is essential for the survival of fish and other aquatic organisms and is typically at a healthy level in the James. However, algae growth and water clarity remain problematic within much of the tidal James. Both algae growth and poor water clarity are the result of excessive nutrient and sediment pollution in the water, which the James River experienced a surge of in 2018 due to record precipitation. As a result, overall tidal water quality scores declined in 2018; however, the long term outlook shows an improving trend.

### Be a James Changer:

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- [Help us monitor underwater grasses in the James.](#)
- [Check the water quality conditions at JamesRiversWatch.org](#)



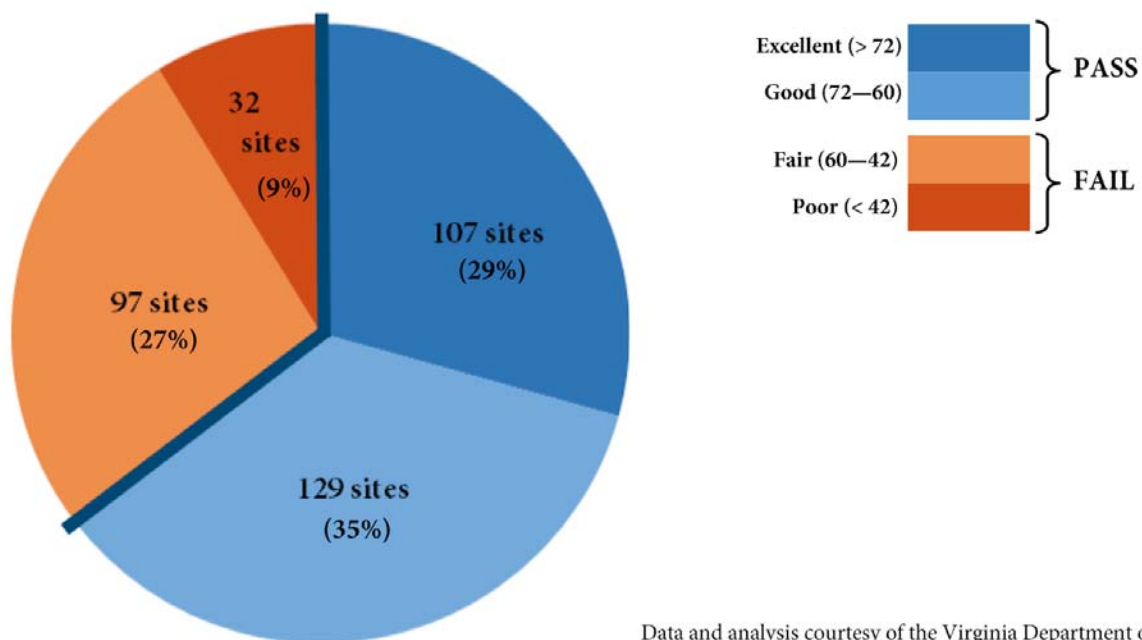
## Stream Health: 65% ↑ +6%

Across the watershed, 65% of the surveyed streams and creeks in the watershed were classified as being in good or excellent condition - a 6% improvement from the 2017 Report. You can't protect a river without protecting its tributaries, and the health of the James depends directly on the health of the 25,000 miles of streams that flow into it. The Clean Water Act has been vital in protecting these creek and streams. To return all the James River's tributaries to good health, we need increased restoration efforts, more extensive riparian buffers, intelligent land-use planning, strong stormwater pollution controls, and better stewardship of our natural resources - as well as funding to support these many efforts.

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### STREAM HEALTH SCORES IN THE JAMES RIVER WATERSHED



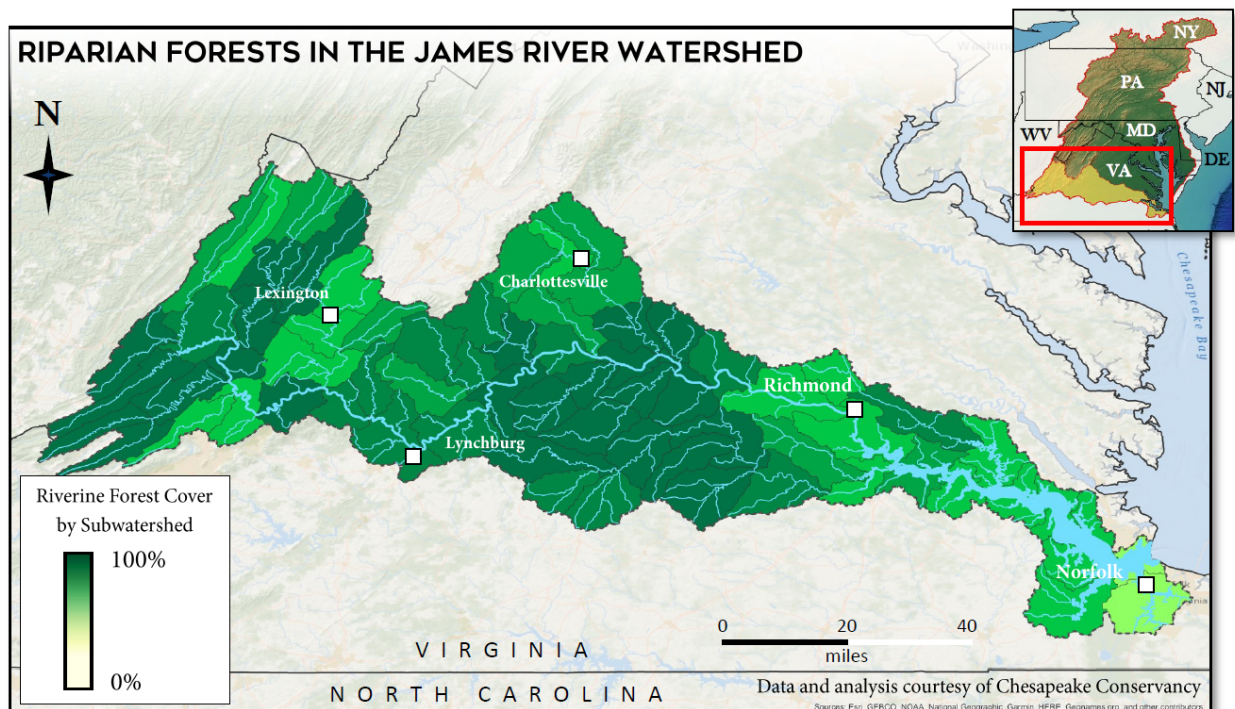


## Riparian Forests: 84% $\Rightarrow$ $\pm$ 0%

Riparian forests are forested areas within 100 feet of the James River and its tributaries. These areas provide habitat for wildlife and play an important role in streambank stabilization, erosion control, and pollution reduction. An analysis of high-resolution land cover data conducted by the Chesapeake Conservancy in 2017 indicates that 84% of riparian areas in the watershed are forested. Virginia's Cleanup Plan calls for an additional 26,496 documented acres of forested riparian buffers across our watershed by 2025. Through targeted agricultural best management practices that exclude livestock from the James River and its tributaries and revegetate riparian buffers, the James River Association and its partners across the watershed are working together to help reach this goal.

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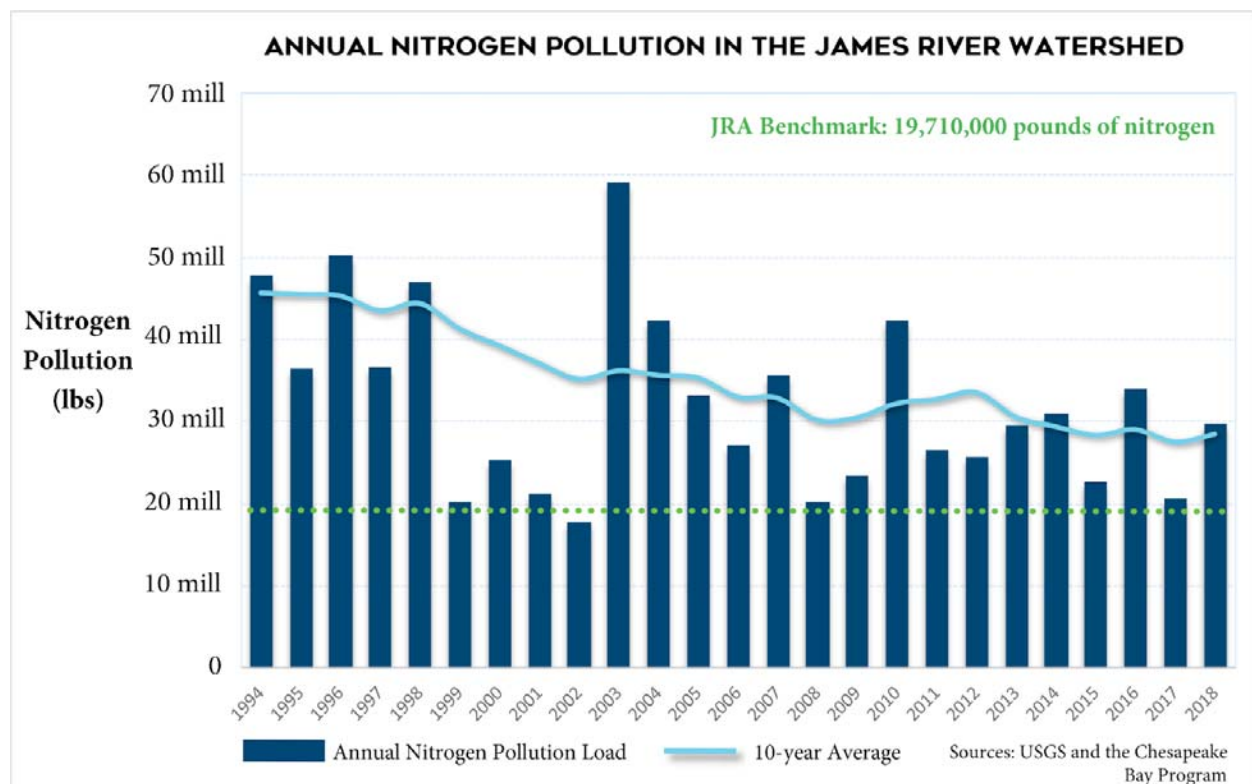
## River Restoration Progress Indicators

### Nitrogen Reductions: 53% ↑ +7%

Major sources of nitrogen include wastewater, agricultural runoff, and urban stormwater. Excess nitrogen and phosphorus in the water can lead to algal growth, which decreases water clarity, lowers dissolved oxygen, and harms critical habitats for fish and aquatic life. The good news is that long term levels of nitrogen are decreasing, helping us get closer to our pollution reduction goals in the James River. Wastewater treatment plant upgrades have benefited the James, but more work remains. Moving forward we need to make sure our wastewater treatment plants are using the latest technology, and we need to secure additional funding for the implementation of agricultural BMPs and stormwater infrastructure -- particularly as our watershed population grows. Thanks to the investments that have been made so far, we are currently at 53% of Virginia's Draft Cleanup Plan nitrogen loading target of 19,700,000 pounds.

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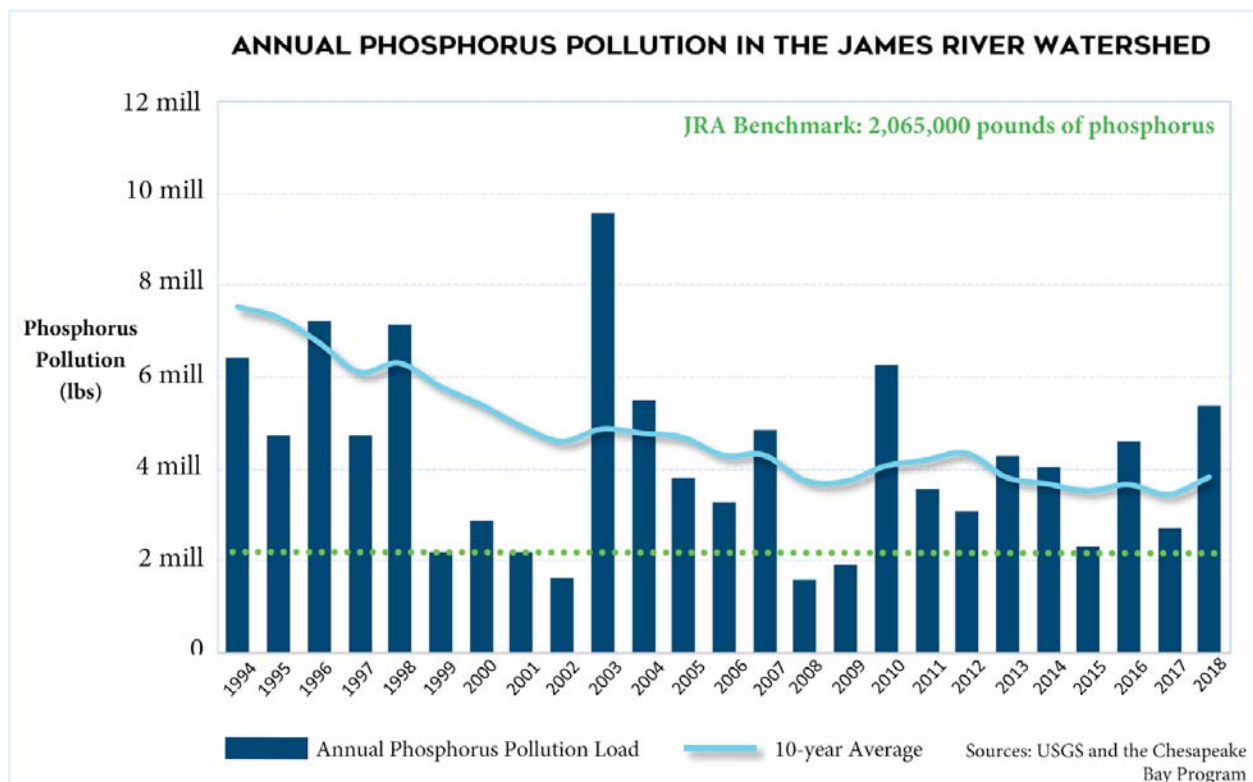


## Phosphorus Reductions: 68% ↓ -1%

Phosphorus levels in the James River have fallen since the 1980s due to wastewater treatment plant upgrades, fertilizer management plans, and bans on phosphates in detergents and other products. Similar to nitrogen, elevated phosphorus levels can lead to algae blooms which cause poor water clarity, fish kills, and habitat reductions for many aquatic organisms. Rapid phosphorus reductions were seen in the late 1990s and early 2000s, though reductions have slowed since. Pound-for-pound, phosphorus is the most impactful source of nutrient pollution, and it is critical that the James River and other Virginia waterways reach the targets identified in the Chesapeake Bay Cleanup Plan. To reach these goals, we must plant more riparian buffers and implement more best management practices on agricultural and developed land.

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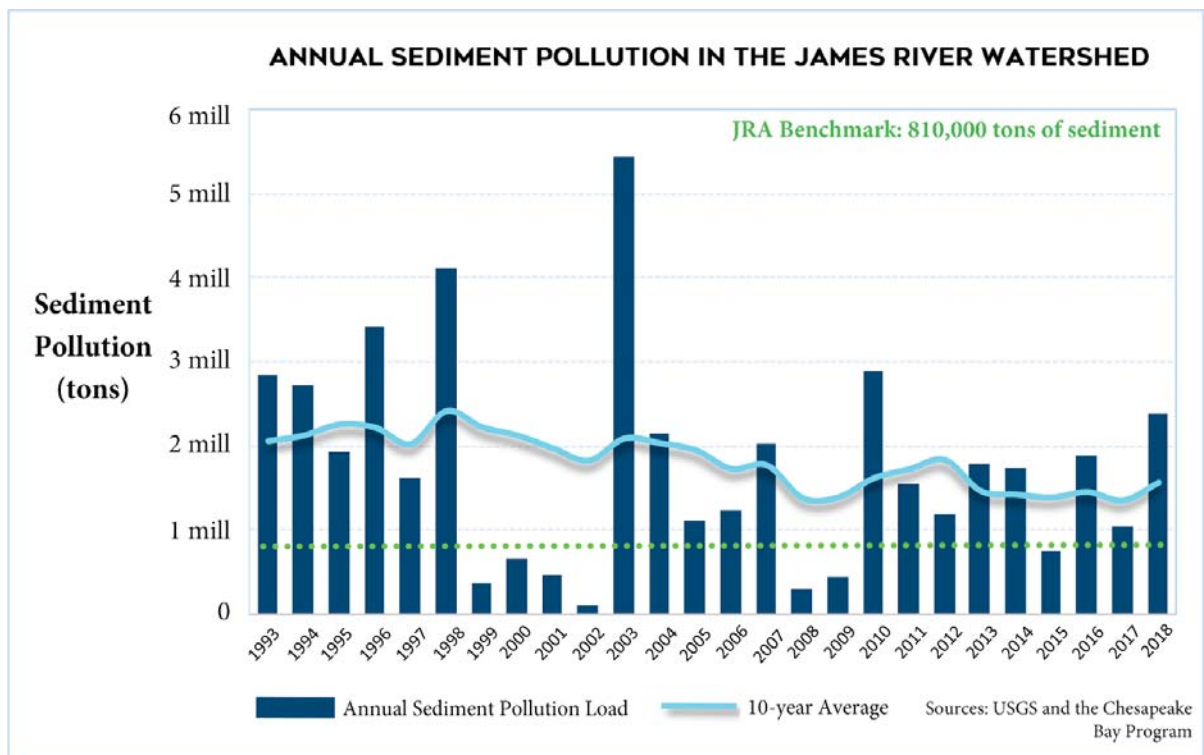


## Sediment Reductions: 43% ↓ -7%

Sediment poses a significant and long-term threat to water quality on the James River. Agricultural practices and land development are the two main sources of sediment in the James. Regulations for development and construction and agricultural best management practices have helped to address sediment issues, however sediment remains the greatest ongoing pollution problem in the James. The lack of overall improvement in sediment pollution indicates that more investments must be made and stronger measures taken to target the primary sources of sediment. And these measures serve the additional purpose of reducing nutrient and bacterial pollution, creating a healthier, more diverse James River.

### Be a James Changer:

- [Tell your elected representatives to make funding for natural resources a priority.](#)
- [Check the water quality conditions at JamesRiverWatch.org](#)
- [Patrol the river with our RiverRats program.](#)
- [Prevent stormwater pollution at home with our River Hero Home program.](#)



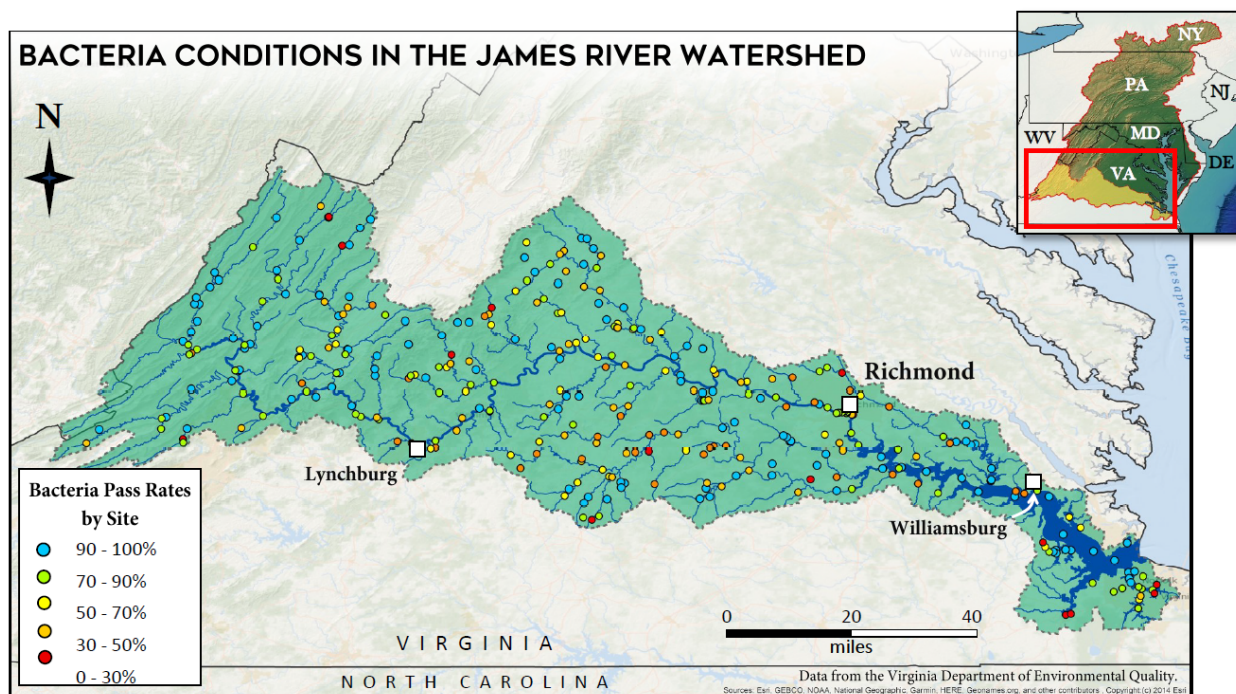


## Bacteria Reductions: 45% ↓ -4%

Bacteria levels in the James River can fluctuate quickly, but they are consistently highest during and just after heavy rain, when *E. coli* and other fecal bacteria can pose a significant health risk to swimmers. Major sources of bacteria include unfenced livestock, combined sewer overflows, and pet waste. Heavy rainfall throughout 2018 resulted in higher than average bacteria levels, lowering our bacteria score to 45%. To raise this score, work must be done on many levels. This includes major actions, such as additional funding for livestock fencing and increased investments in our sewer and stormwater infrastructure, as well as individual actions, like regular septic inspections and picking up after your pet.

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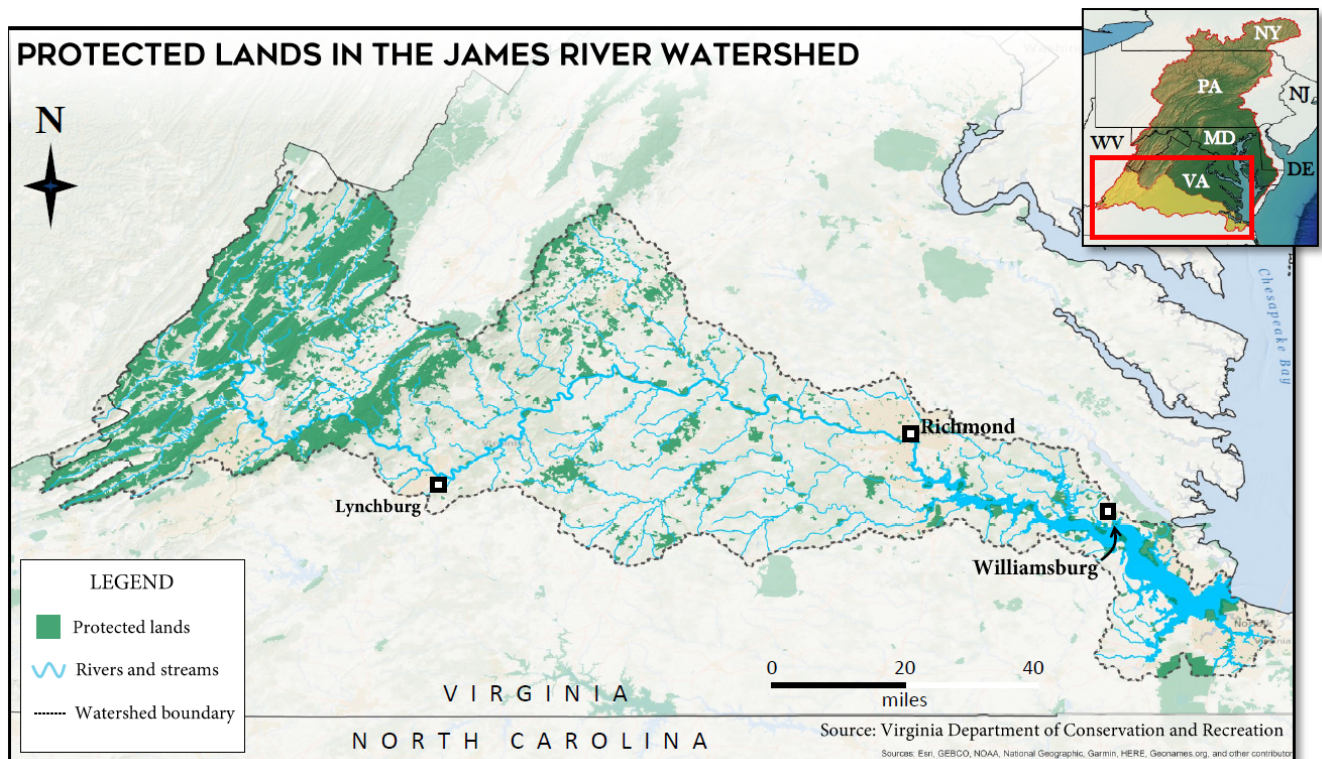


## Land Protection: 89% ↑ +1%

As part of the Chesapeake Bay 2000 Agreement, the Commonwealth of Virginia set a goal of protecting 20% of the land in the James River watershed. Governor Kaine, Governor McDonnell and a Presidential Executive Order all established additional goals bringing the total preservation goal to 1.65 million acres. As of 2019, 1,476,398.84 acres of 6,569,707.53 acres in the watershed are protected. This is 89% of the 1.65 million acre benchmark for land protection.

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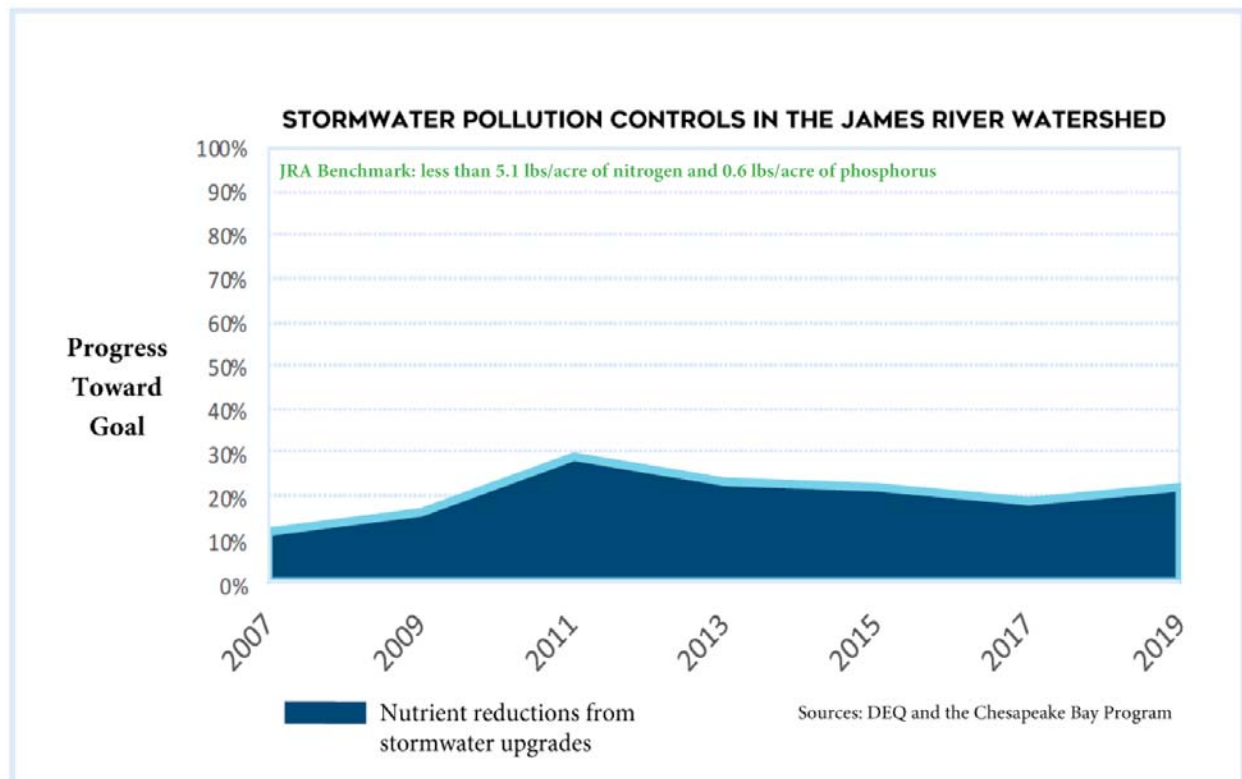
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## Stormwater Pollution Controls: 22% ↑ +3%

Stormwater runoff from construction sites, city scapes, and streets can carry substantial amounts of pollution to our rivers and streams. That includes contaminants like bacteria, sediment, oil, pesticides, fertilizer, and other chemicals. Communities can and should install management practices that temporarily store the stormwater and let it soak into the ground, reducing pollution and the risk of flooding. We are 22% of the way to meeting our pollution diet for stormwater, which we measure as the amount of pollution reaching the river from each acre of developed land. Unfortunately, new development is outpacing the installation of stormwater management practices. As a consequence, stormwater is the only major source of pollution to our watershed that is not consistently improving. Bold investments in stormwater treatment, like those that we have secured for wastewater, can help boost our score, improve water quality, and mitigate flooding.

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- [Prevent stormwater pollution at home with our River Hero Home program.](#)

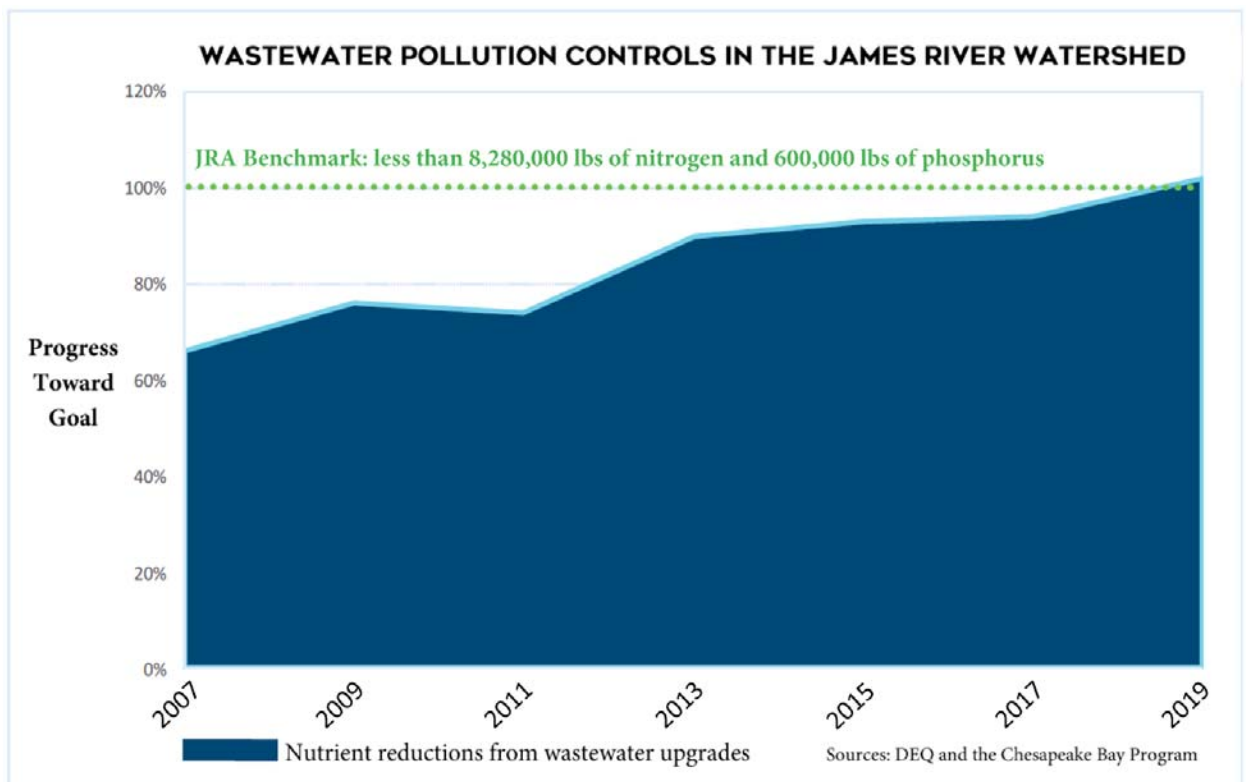


## Wastewater Pollution Controls: 102% ↑ +8%

Since 1985, wastewater treatment plants have cut their nitrogen pollution by almost two-thirds thanks to some significant investments by the state, the industry, and rate-payers. But to keep pace with our growing population and prevent harmful algal blooms in the James River, we need to make sure our wastewater treatment plants are using the latest technology. On average, each liter of wastewater released into the James River carries more nitrogen pollution than wastewater entering Virginia's other Chesapeake Bay tributaries. With additional investments in plant upgrades, the James River can be well on its way to meeting its pollution reduction goals by 2025.

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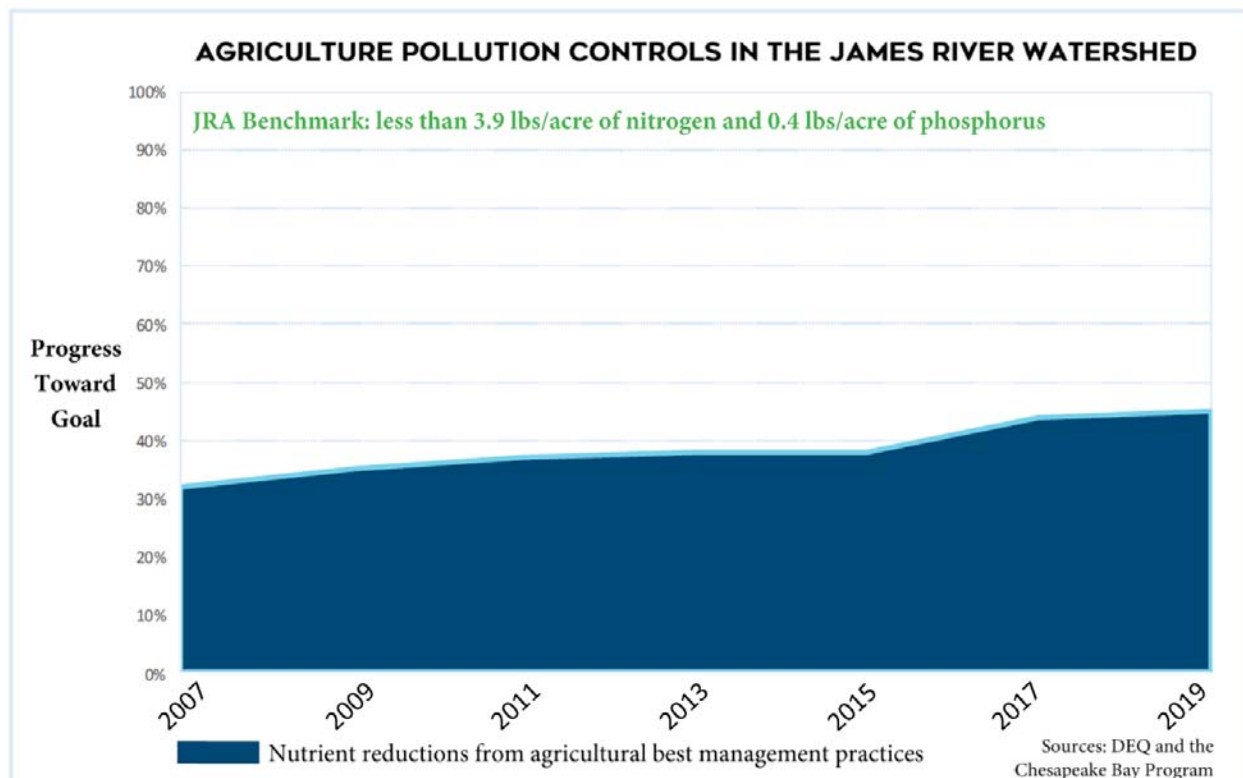


## Agricultural Pollution Controls: 45% ↑ +1%

Farmland covers almost 12% of the James River watershed and is one of the largest sources of pollution runoff. Fortunately, agricultural pollution controls are among the most impactful and cost-effective improvements available. Virginia's farmers have made substantial progress installing conservation practices and reducing agricultural runoff to the James River, but historically, they have not had the reliable financial and technical assistance they need. To help, the James River Association has worked with farmers to protect their livestock and their water by installing stream exclusion fences on their property. Our current James River Buffer Program helps interested landowners install and monitor forested buffers to slow agricultural runoff and take up excess nutrient pollution. Time is of the essence. Virginia's Cleanup Plan calls for almost 70,000 buffer acres within the James River watershed by 2025, and we have just under 8,000 acres to date.

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To ensure that trends for indicators are equal comparisons across time, JRA utilizes the best, most recent data set and benchmark available for each indicator and when needed recalculates previous year scores. The following indicators had previous year scores recalculated based on improved information.

Riparian Forests

Smallmouth Bass

Agriculture, Wastewater, and Stormwater Pollution controls

Phosphorus, Sediment and Nitrogen Reductions

Vegetated Buffer Restoration - Removed from report, but now reflected in Agriculture and Stormwater Pollution Controls.