

# Save *the* Bay

THE MAGAZINE OF THE CHESAPEAKE BAY FOUNDATION CBF.ORG



SPRING 2020



SPECIAL ISSUE

Climate Change:  
Its Effect on the  
Chesapeake Bay

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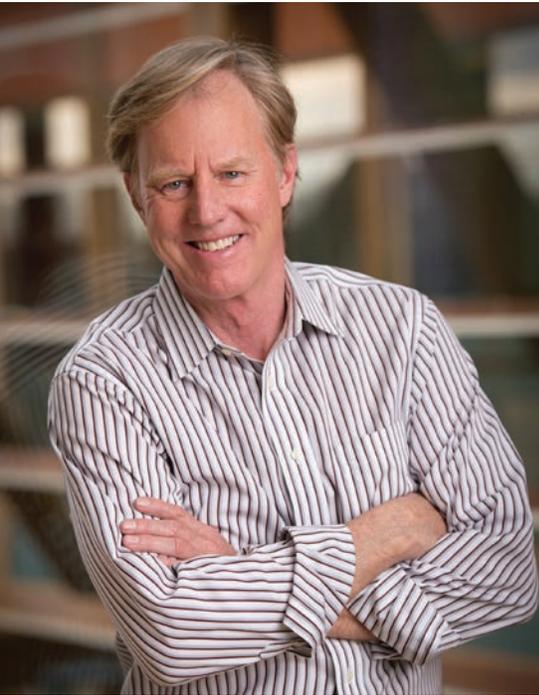
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*Saving a National Treasure*



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CBF President Will Baker

## A Powerful Lesson

The COVID-19 pandemic is the stuff of fiction writers. Sadly, it is all too real. The illness, death, and economic damage are nothing short of history in the making.

And yet, out of this tragedy, we see a glimmer of hope for our little Planet Earth.

In India, some have been able to see the Himalayas for the first time in decades. In England, nitrogen oxide pollution in cities fell by as much as 60 percent. And here in the U.S., air pollution has dropped 30 percent over large cities in the Northeast according to NASA.

These are not improvements to celebrate. The nexus is too painful. But there is a powerful lesson that we ignore at our peril. If we change our habits, we

can significantly improve the chances that our children and grandchildren will have a habitable planet. From the ashes of this crisis, a new beginning can arise. The horror of the pandemic can be a catalyst for change, a chance to overcome the existential threat of global climate change.

This special issue of *Save the Bay* has been planned for months. Now, it is more critical than ever to focus on the

**“Now, it is more critical than ever to focus on the intersection of climate change and Bay saving—two sides of the same coin.”**

intersection of climate change and Bay saving—two sides of the same coin. Climate change makes Bay saving more challenging, while Bay saving makes climate change less damaging.

We can save the Bay, fight climate change, and recover from the economic losses wrought by COVID-19. The solutions are quintessentially American: entrepreneurial, sometimes high-tech, sometimes elegantly simple.

What's more, they can be job creators. From rural nurseries growing and planting trees to the industrial expansion of wind energy to the farming of native Bay oysters, the economy and the environment can prosper together. Call it Sustainable Capitalism.

After the Great Depression came the New Deal. Can America do the same today to jump start Sustainable Capitalism?

Let's invest in jobs which begin the transition away from fossil fuels. Let's invest in jobs that restore nature's great filters. Let's invest in jobs that build commercial fisheries that will thrive for centuries. The triple bottom line benefits are worth it—a stronger

economy, cleaner water and air, and improved public health (as just one example: scientists recently learned that lungs damaged by air pollution make COVID-19 much more deadly).

It should be a slam dunk. Especially now with interest rates at record lows.

We WILL get through COVID-19. Let's make sure we don't just bounce back; let's make sure we bounce forward—stronger, more creative, and more resilient than before.

Save the Bay, Save the Planet,

William C. Baker



## CHESAPEAKE BAY FOUNDATION

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Philip Merrill  
Environmental Center  
6 Herndon Avenue  
Annapolis, MD 21403  
410-268-8816  
Eastern Shore  
114 South Washington Street  
Suite 103  
Easton, MD 21601  
410-543-1999

### Pennsylvania

1426 North Third Street  
Suite 220  
Harrisburg, PA 17102  
717-234-5550

### Virginia

1108 East Main Street  
Suite 1600  
Richmond, VA 23219  
804-780-1392  
Brock Environmental Center  
3663 Marlin Bay Drive  
Virginia Beach, VA 23455  
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# Save the Bay

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Loren Anne Barnett  
Editor | Director of Creative Services  
STBeditor@cbf.org

Jen Wallace  
Managing Editor

Lise Dykes  
Senior Graphic Designer

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### Editor's Note

Flatten the curve.

We've all seen the coronavirus graphs—the steep curve we'd see without preventive measures and the longer, flatter trajectory achieved with the aggressive actions that will help save lives.

Another crisis looms: climate change. Relabel that graph with 'business as usual' and 'climate mitigation.' Apply another lesson: Act fast. If you wait to see the impact, it's harder to get things back on track. We can't continue to kick the climate change can down the road.

While shuttered, we've had a taste of the benefits of reduced pollution, a glimmer of hope. But can we continue to step more lightly upon this Earth?

We must. It is the duty of governments and every citizen.

Before we barrel back to business as usual, what new behaviors can outlast the pandemic? What trends were already underway that we can now accelerate? Planting trees? Cutting carbon? Naturalizing shorelines?

How can we help flatten the climate change curve?

In this special issue of *Save the Bay* magazine, you'll read local accounts of the devastating effects climate change is already having on our Bay: more powerful storms increasing water pollution, higher temperatures putting our species at risk, and rising sea levels causing dangerous flooding. You'll learn about some of the work CBF is doing to mitigate these effects and what you can do to help. The actions we spell out can help save both the Bay and the planet.

Wash your hands and dig in.

*Loren*  
Loren Anne Barnett

### Environmental Awareness

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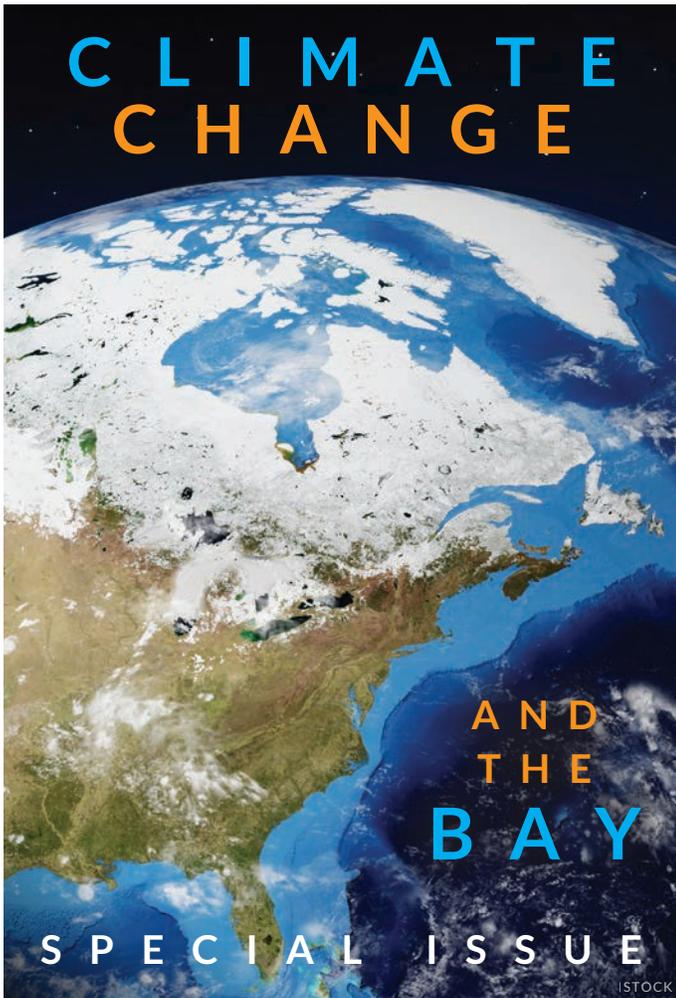


### On the Cover



Due to sea-level rise and erosion, this last house and what remained of Holland Island—a once most-populated Chesapeake Bay island community—now lie underwater.

JAY FLEMING



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CBF student leader Kallan Benson is helping grow an effective army to fight against climate change.



### CLIMATE CHANGE HITS HOME

The Chesapeake Bay is facing some negative impacts of climate change, but there's still time to save it.



### MORE STORMS

Better practices on land help protect our waters from polluted runoff from heavy rain events.



### HIGHER TEMPERATURES

Cleaner water would help protect Bay-area species that are vulnerable to higher temperatures.



### RISING SEA LEVELS

Trees, marshes, and softer shorelines will help protect our land from more-frequent flooding.



### HOW WE CAN HELP

CBF is working hard to reduce pollution and help mitigate climate change. You can help.

As climate change goes unabated, storms like this one over the Elizabeth River in Virginia will become more frequent and intense.

ANNETTE AVERITT

### Climate change impacts our environment.

### The impacts of climate change affect the Chesapeake Bay.

### CBF is working to mitigate the effects of climate change.

#### MORE STORMS

The number of intense rainfall events in the Northeast United States has nearly doubled over the past 60 years.

FOURTH NATIONAL CLIMATE ASSESSMENT

#### INCREASED WATER POLLUTION

Record rainfall and freshwater flows sent an assault of pollution into the Bay in 2019—a blow softened by restoration progress.

USGS

#### BETTER BUFFER PROGRAM

CBF and Pennsylvania farmers are using a new mobile tool to help meet the Blueprint's pollution-reduction goals.

PAGE 9

#### HIGHER TEMPERATURES

Average annual stream temperatures have increased by 1.1°F (.61°C) in the past six decades in the Chesapeake Bay watershed.

USGS

#### DISPLACED BAY SPECIES

A 3.6°F (2°C) increase in temperature is projected to cause a 38 percent decline in eelgrass cover.

LEFCHECK ET AL.

#### CARBON REDUCTION FUND

CBF in partnership with WGL Energy is finding creative ways to reduce carbon pollution and improve air and water quality.

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#### RISING SEA LEVELS

Relative sea levels in the Chesapeake Bay region are rising two times as fast as the global average.

NOAA

#### DANGEROUS FLOODING

High tide floods in Norfolk, Virginia, are projected to occur 170 days per year by 2050.

NOAA

#### SHORELINE PROTECTION

CBF is helping a Baltimore-area neighborhood restore their shoreline with marshes that will help stop flooding.

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See pages 18–19 to find out how you can help.

# Climate Change Hits

# HOME

**The Chesapeake is changing. We can still save it—  
and help save the planet at the same time.**

Climate change is a reality in the Chesapeake Bay. There are nearly twice as many intense rainstorms in the region as there were six decades ago. More than half of the Chesapeake's streams have warmed significantly. And sea levels here are rising at some of the fastest rates in the nation; in Norfolk, Virginia, they're nearly a foot higher than in 1960.

The health of the Bay is inextricably linked. And the effects of climate change—more intense storms, higher temperatures, and sea-level rise—are causing more polluted runoff, species displacement, and flooding.

Controlling emissions of climate-warming greenhouse gases is urgent to slow climate change, but other measures—including work already being done to improve water quality—can help trap carbon and buffer the Chesapeake against its most harmful effects. 

MORE  
STORMS  
DEGRADE  
WATER  
QUALITY





# Weathering the STORM

## Protecting water quality in an era of extreme rainfall.

**David Salley was driving back home to Mount Joy, Pennsylvania, from Lancaster when the storm hit. He knew it was supposed to rain, but nothing like it did.**

“There was no anticipation,” he said. “It’s not like a hurricane where you might want to get out of town because you know it’s coming. This was more, ‘Oh, it’s raining.’ And then all of a sudden you can’t see out your windshield.”

State Route 283 flooded, stopping traffic in the middle of the highway. By the time Salley made it to Mount Joy, where he serves as the Stormwater Enforcement Officer for Public Works, the borough was in a state of emergency. Instead of flowing into stormwater catch basins, water was coming out. Below the town, water overflowed the storm pipes and pushed manhole covers off into the streets. The borough’s entire staff was out, blocking roads and directing people around the high water.

“There were several areas that got flooded that never had any water before,” Salley said.

“The storm pipes are really big, but to hold a storm like that is pretty much impossible.”

That was August 31, 2018. In just three hours, Mount Joy withstood 10 inches of rain. Over the ensuing months, an exceptionally wet year sent enough fresh water to fill one-and-a-half Olympic swimming pools into the Chesapeake Bay every second. It was the largest average annual flow since records began in 1937, according to the U.S. Geological Survey, beating out the previous record set in 1972 on the heels of Hurricane Agnes.

Scientists caution attributing any individual weather event to global climate change, but data consistently show an increase in the frequency of intense storms in the Chesapeake region. In the Northeast United States, the number of intense rainfall events has nearly doubled over the past six decades, and more of the region’s rainfall is concentrated into these extreme storms, according to the Fourth National Climate Assessment. The trend is expected to continue, with more than a three-fold increase in extreme storms projected by 2100 if carbon emissions continue unabated.

The storms not only pose an immediate risk to life and property, they threaten water quality and efforts to restore it. At the same time, progress must ramp up to achieve the pollution reductions

Heavy rains send polluted runoff down the Susquehanna and into the Chesapeake Bay as shown here in Havre de Grace, Maryland.

JERRY JACKSON/THE BALTIMORE SUN

necessary for a healthy Chesapeake watershed. The record flows in 2018 and 2019 washed large amounts of nitrogen and phosphorus downstream, resulting in an extensive oxygen-deprived dead zone. Researchers note it likely would have been much worse if not for the work communities have already done to cut pollution.

At the local level, extreme weather is yet another strain on municipalities that are contending with aging infrastructure, growing populations, and increasingly stringent requirements to reduce polluted urban runoff. In Mount Joy, just hours before the storm hit in 2018, construction workers completed a new bioswale meant to filter sediment and runoff from a 395-acre area. The green infrastructure project would have achieved all of the sediment reductions required by the town's state-issued stormwater permit, but the storm destroyed it.

"It's frustrating, especially when you work so hard for grant money, to all of a sudden see your project wash away," Salley said.

The borough is in the process of rebuilding the swale. This time, they're using heavy duty erosion matting and hydroseeding to give the vegetated channel a faster foothold, and they're completing the 1,200-foot long channel in 100-foot segments to avoid complete destruction if another storm hits.

In addition, Salley said the borough continues outreach efforts to educate residents and raise awareness about the importance of stormwater management to their property, clean creeks, and wildlife. The risks of extreme weather can be particularly tricky to communicate. Many people don't understand the idea of a 100-year storm, for example, which is used as a design benchmark for many

stormwater projects. Such storms have a one percent chance of happening in any given year, but they can still happen back to back—a situation that is increasingly likely as the climate warms.

"As we move forward with climate change or anything like that, those definitions aren't as relevant anymore," Salley said. "We can receive a 100-year storm and then a couple years down the road we may see another one."

Mount Joy Borough is also part of the Chiques Creek Watershed Alliance, a local group working to restore the 30-mile Susquehanna River tributary that runs through Lancaster County. In 2015, the alliance, local municipalities, farmers, non-profit organizations, universities, and other stakeholders came together to form the Chiques Creek Re-Envisioned Partnership to collectively work towards pollution reductions.

Virginia oyster farmer Taryn Brice-Rowland sustained huge inventory losses in 2018 from low salinity levels caused by record-setting rainfall.

## No Salt for Shellfish

**In 2018, oyster farmers Taryn Brice-Rowland and her husband, Aaron Rowland, watched more than half a million of their shellfish die.** The loss was 80 percent of their inventory. It was their second year of business.

Record-setting rainfall across northern Virginia had rushed from the Blue Ridge Mountains down the Rappahannock River, triggering a sharp drop in salinity at the Rowlands' farm, Rogue Oysters, near Lancaster. Oysters can tolerate a range of salt levels in the water, but only to a point.

"There's really no recourse. You're just out of luck," Taryn said.

Large amounts of freshwater flowing into the Bay from extreme weather events

kill oysters directly when salinity drops, hamper their reproduction, and flush more upstream pollution onto tidal reefs. It's detrimental to water quality and wildlife—oysters are natural filters and their reefs are home to a variety of fish and crabs—but it's personal, too.

"Last year we had hoped to bring on an employee but didn't have the revenue," Taryn said. "It's not just impacting oysters and companies, it's impacting people's ability to be economic drivers in their community."

With Rogue Oysters, the Rowlands hope to do their part to protect the Bay and the climate. They use solar-powered lights in their nursery and have plans to eventually reduce more carbon than they emit.

"Ultimately, there's not a lot we can do about rainfall," Taryn said. "But we can control how we interact with the environment around us to try to protect and maintain it."



Taking steps to reduce flood risks in the watershed has been important to partnership members from the start, said Kristen Koch, a program manager for the Penn State Agriculture and Environment Center and facilitator for Chiques Creek Re-Envisioned.

“There isn’t a magic project, not even one or two or three that can be put in place that will create a significant reduction in flooding,” she said. “We’re going to need to restore the watershed in the same way we would to restore water quality to fix the flooding issue.”

Extreme weather events can certainly complicate restoration projects, whether bioswales like the one damaged in Mount Joy or streamside tree plantings that are vulnerable to floodwaters. But Koch said the framework being used to identify, target, and prioritize projects across the Chiques Creek watershed can also serve well when planning for climate impacts.

“The benefit of working in partnerships is everyone who comes to the table has different priorities,” she said. “Those who don’t have climate change as a priority can be reminded that it should be, and how to deal with that as we make decisions. And the same is true for any of the other priorities—whether it’s wildlife habitat, water quality, or economic development. Having all of those voices at the table can help us achieve more.”

In the interim, Salley said the tight-knit community in Mount Joy and Lancaster County is key for getting through disasters like the 2018 floods. But he also noted the need for action on a global scale.

“It’s not just the United States’ problem, or Pennsylvania’s problem, or Mount Joy’s problem. It’s everyone’s problem,” Salley said. “I think doing things to help with climate change in a common-sense form would help everybody out.” 🐦



## CBF AT WORK

# Better buffers? There’s an app for that.

**CBF’s new mobile tool puts water-quality decisions in farmers’ hands.**

The Chesapeake Bay Watershed Agreement (Blueprint) requires the six watershed states and the District of Columbia to plant 900 miles of streamside forests each year through 2025. Acting as a natural barrier, so-called riparian buffers are one of the most effective ways to trap nutrient-laden water runoff on the land, and they are poised to play an increasingly important role as climate change triggers more severe storms.

But where do buffers work best? And how much are they worth? Those are the questions CBF’s GIS Program Manager Katie Leaverton and Pennsylvania Watershed Restoration Manager Molly Cheatum set out to answer.

This spring, as part of CBF’s Buffer Bonus program, they’re piloting a new mobile tool in Centre County, Pennsylvania, that will help farmers not only tailor buffers to best trap nutrients on their property, but also compensate them accordingly.

“On a particular piece of land, there are good places to put buffers and not as good places to put buffers,” said Leaverton. “Given the limited amount of money available, we want buffers to go into the right places to get the highest water-quality benefits.”

Currently, buffer designs generally adhere to a standard width—for example, a 30-foot-wide buffer or a 100-foot-wide buffer—and farmers are paid a standard amount per acre, regardless of the location on their property. But depending on how water flows across the landscape and how the land is farmed, certain parts of a stream may need more, or less, protection. And buffers in certain areas may trap more pollution than others, making them more or less valuable.

Leaverton, working with partners at the Chesapeake Conservancy, used detailed maps of landcover, water flowpaths, and other data to build a mobile tool that calculates the value of a forested buffer on any given acre in the county. In practice, the tool will allow restoration specialists and farmers to meet in the field, draw various potential buffer designs on a tablet, and immediately see the worth of those buffers in terms of water quality and financial compensation for the farmer.

“I think it’s really important for farmers to understand why they’re making a decision,” said Cheatum. “Farmers may not be looking just at the conservation side of things, but they’re very economically minded, so this tool brings that conversation to them in economic terms.”

Cheatum and Leaverton hope to eventually expand the tool to other counties in Pennsylvania to help the Commonwealth reduce pollution locally and downstream in the Bay.

“When you make better decisions on your land, the public benefits from that,” Cheatum said. “This tool starts a conversation that normally doesn’t happen from that perspective.”



An underwater photograph showing a dense field of green seagrass in the foreground. Sunlight rays penetrate the clear blue water from the top right, creating a shimmering effect. The background is a deep, clear blue.

HIGHER  
TEMPS  
DISPLACE  
SPECIES

# In HOT WATER

Underwater grasses mitigate climate change by storing carbon and protecting shorelines, but species like eelgrass are also extremely vulnerable to its effects.

ISTOCK.COM/INUSUKE

## The world's oceans have absorbed over 90 percent of the warming generated by climate change. The Bay is feeling the heat.

### When Charles Bangley and his colleagues started looking at gillnet survey results for Pamlico Sound, North Carolina, they didn't expect to see juvenile bull sharks.

The sharks are a large coastal species capable of living in both salt and freshwater environments. But though the adults migrate up and down the East Coast—including into the Chesapeake Bay—their young are born and raised in warmer waters.

These nursery habitats were originally confined to the Gulf Coast and Florida, but the Pamlico Sound data showed something strange. Between 2011 and 2016, researchers caught 64 young bull sharks—seven times the number earlier studies had documented over the preceding four and a half decades.

“Since 2012, there’s been a real upsurge in juveniles, which previously were never in the

area,” said Bangley, a postdoctoral fellow who researches marine ecology and migrations at the Smithsonian Environmental Research Center (SERC) in Edgewater, Maryland. “Now there are little sharks, which are an indication that these bull sharks have stopped just occasionally entering Pamlico Sound and have started breeding there.”

That hasn’t happened in the Chesapeake Bay. Yet. But warming water temperatures in the Bay and the rivers and streams that feed it are already having profound effects on its fish, as well as the underwater grass beds that provide critical habitat and water-quality benefits.

Researchers at the University of Maryland have documented warming trends in 92 percent of the Bay’s surface waters. River herring are migrating earlier into the Bay’s streams to spawn. Cobia, a fish that traditionally spent more time off the Carolinas, is reliably caught in the Potomac River. Shrimp are now the focus of an experimental fishery in Virginia after commercial fishermen began seeing the southerly crustaceans turn up near the mouth of the Bay.

“You have these more traditional warm-water species showing up increasingly often in the Bay

and points even further north,” Bangley said. “At the same time, you have slower species—things like crabs and bottom-oriented fish, or oysters that don’t move on their own once they’re adults—that are not going to shift as fast.”

For the fish, that could mean new interactions between different species, with uncertain outcomes. For anglers and commercial fishermen, it could mean potential mismatches between the species they’re allowed to fish for and the species that actually exist in the area at a given time. It’s a scenario already playing out for black seabass, which has been shifting north from the Mid-Atlantic to New England. The Atlantic States Marine Fisheries Commission, the interstate body that manages sea bass coastwide, is re-evaluating its commercial fishery allocations for each state, in part due to the bass’s changing distribution.

“We may already be in a situation where we have to adapt certain fisheries,” Bangley said. “Some of these species have already shifted their range or are in the process of shifting, but the more we can do to mitigate the effects of climate change, the more stable things are going to be for these coastal economies.”

### What happens to species that can’t migrate?

Underwater grass beds form one of the most important habitats in the Chesapeake, providing refuge for juvenile fish and crabs and food for migrating waterfowl. And while they can mitigate climate change by storing carbon and protecting shorelines, they are also extremely vulnerable to its effects.

Eelgrass, one of only two species that dominate the Bay’s lower reaches, is at particular risk.

“For eelgrass, climate change is going to be a big issue, to the point where we may not have the beds of eelgrass that even existed in the 1960s or 70s,” said Robert Orth, Professor and Director of the Submerged Aquatic Vegetation Program at the Virginia Institute of Marine Science (VIMS).

Eelgrass in the Bay is already near the southern end of its range. It doesn’t mind cold temperatures—and can even grow and survive under ice—but it has a hard time with heat, Orth said. Essentially, high temperatures knock its metabolism out of whack, causing it to lose tissue faster than it can gain.

Sediment pollution complicates the matter. Like other species of underwater grasses, eelgrass requires light. Sediment clouds the water, reducing the depth light can penetrate. As a result,



Washington, D.C., residents seek relief from a summer heat wave.

## Sweltering Cities

Rising temperatures could cause thousands to tens of thousands of additional premature deaths in the United States each year by century’s end, making heat one of the deadliest impacts of climate change. But not everyone will feel the effects equally.

Cities are often warmer than surrounding rural areas due to the high density of roads, buildings, and hard surfaces, a phenomenon called the urban heat island effect. Even within the same city, certain neighborhoods are hotter—as much as 16 degrees Fahrenheit hotter, according to a 2019 study that looked at heat variations in Richmond, Baltimore, and Washington, D.C.

“You already have a heat event, then add on top of that you might live in part of the city that further amplifies that extreme heat event,” said Jeremy Hoffman, Chief

Scientist at the Science Museum of Virginia and one of the study’s authors. “It becomes extremely dangerous.”

Moreover, Hoffman’s research found the hottest neighborhoods today are the same neighborhoods once redlined under racially discriminatory home lending practices in the mid-1900s. These neighborhoods often remain lower income and communities of color, with fewer trees and open spaces, exposing residents who need to walk or use public transportation to dangerous heat.

The future doesn’t have to be so hot. Planting urban trees and reducing hard surfaces not only cools city streets, it helps slow and filter the polluted stormwater runoff that impairs streams and the Bay.

“We really get a win-win-win by designing [cities] for heat amelioration,” Hoffman said. “You can flip it and say, let’s design for stormwater mitigation. It’s the same practices, and we get potentially huge, generational benefits by doing this.”

eelgrass can't grow in deep areas it once could, when the water was clearer.

“The plants are essentially dying in these deeper areas and moving toward shallower areas where it gets hotter,” Orth said. “They’re being squeezed between the shallow area, where it’s hot and they don’t do well, and the deeper area where it’s turbid.”

There are signs that improving water quality in the Bay is helping grass beds recover from historic declines suffered in the second half of the 20th century. In 2017, the extent of underwater grasses in the Bay exceeded 100,000 acres for the first time since monitoring began in the 1980s. But recent diebacks, most notably in 2005 and 2018, suggest that increasingly hot temperatures are putting that progress at risk. Of particular concern are back-to-back hot years that could wipe out eelgrass seedlings before they can reproduce, said Orth.

If climate change continues unabated, consecutive hot years are more likely to occur. The world’s five warmest years have happened since 2015, and nine of the 10 warmest years on record happened since 2005 and 2018, according to the National Oceanic and Atmospheric Administration. The amount of heat stored in the ocean also reached a record high last year.

Reducing the emissions that drive climate change and warming temperatures is critical for saving species like eelgrass in the Bay, Orth said. But we can give it a fighting chance by improving water quality.

“The only way to offset the higher temperatures is to get the water clearer than what it is today,” he said. And, of course, this is the focus of the Chesapeake Bay Program, to improve water quality and clarity in the Bay and its tributaries. 🌊



WGL Energy’s Carbon Reduction Fund, managed by CBF, finances projects—like forested buffers—that improve both air and water quality.

## CBF AT WORK

# Safekeeping Carbon

**It’s not just trains, planes, and automobiles. A healthy watershed can reduce emissions, too.**

Climate change is a global problem playing out at a global scale. But at its root, it’s a matter of molecules—in particular, carbon dioxide (CO<sub>2</sub>) molecules that trap heat from the sun and raise the Earth’s temperature.

Levels of CO<sub>2</sub> in the atmosphere have surpassed 400 parts per million and are now higher than at any time in the last 800,000 years, according to the National Oceanic and Atmospheric Administration (NOAA). And, driven by the burning of coal, oil, and natural gas for energy and transportation, they’re rising at a rate nearly 100 times faster than observed under natural conditions.

One part of the solution is directly reducing the fossil fuel emissions we pump into the air, which also reduces nitrogen oxides that pollute local streams and the Bay. Stricter fuel-efficiency standards started before the Obama administration. The United States began implementing regulations to impose stricter fuel-efficiency standards for cars and trucks, cut emissions from power plants, and consider climate change impacts when issuing permits for large infrastructure projects. Many of those initiatives have now been repealed or are being significantly curtailed by the Trump administration, rollbacks that CBF continues to fight (see page 26) by filing comments on regulatory changes and, if necessary, pursuing legal challenges.

Just as key, on-the-ground projects in cities, farms, and forests can help fashion an environment that traps carbon for us. Many of them are the same practices that help improve water quality. The Keystone 10 Million Trees Partnership, launched by CBF to help Pennsylvania reduce pollution flowing into its streams and the Bay, will help plant enough trees to capture an amount of carbon equivalent to the emissions of 47,000 cars each year. And farming practices that improve soil health, such as rotationally grazing livestock and reducing tillage, can substantially reduce nitrogen, phosphorus, and sediment pollution as well as climate-warming emissions.

Initiatives like the Carbon Reduction Fund combine both approaches. Managed by CBF in partnership with WGL Energy Services (WGL Energy) and Sterling Planet, the fund uses proceeds from carbon offsets sold to WGL Energy’s customers in order to finance projects that improve both air and water quality. This spring, the fund leveraged contributions from the University of Maryland, along with additional fund donations, to match a grant from the National Fish and Wildlife Foundation designed to promote rotational grazing and the planting of forested buffers. The \$1.6 million project aims to ultimately convert 1,700 acres of land in the watershed to rotational grazing, as well as implement related practices such as fencing livestock away from streams and providing alternative watering systems.



SEA-LEVEL  
RISE  
INCREASES  
FLOODING

# Borrowed

# LAND

## **The Bay's coastal communities face some of the fastest rates of sea-level rise in the nation. They're not giving up.**

**In late October, a dozen middle and high school students took a boat from Crisfield, Maryland, to Fox Island.**

Like generations of students before them, they watched the island's old hunting lodge materialize on the Bay's horizon, its gray docks strung over blue water and green marsh as if distilled from the air. They would be the last to stay there.

The lodge was converted into CBF's first residential education center more than four decades ago and quickly became the centerpiece of our award-winning environmental education programs on the Bay. Words painted over the screened kitchen door read, "Practice what we preach—get outside to reach and teach," a mantra shared with tens of thousands of the watershed's educators and students.

But in the last 50 years, Fox Island lost more than 70 percent of its land area to rising sea levels and erosion. Salt marshes that once protected the lodge are a fraction of their former size, leaving the building vulnerable to waves and prompting the closure of the education program last fall.

"Taking the boat in and seeing how small the island has become, I had the thought—is this really an island anymore? Because the house is basically on top of water and there's only a few patches of land left now," said Lenka Platt, a senior at Halifax High School in Pennsylvania who was among the last group of students to stay on Fox Island. "It's really a bit disheartening. But it gives us a purpose."

Platt is the president of CBF's Student Leadership Council in Pennsylvania. She and her classmates spent three days on Fox Island. They compiled a list of dozens of species they encountered mucking in the nearby marshes and pulling seine nets through the shallow waters. They set crab pots with CBF's Captain Larry Laird, a Smith Island native, and one night raced from dinner to watch the harvest moon rise over the Bay. By the final morning, Platt sat on the lodge's porch and remarked that she could live out at Fox Island, if climate change and erosion weren't washing it away.

"We need to think about the fact that this island is being closed down after so many years, and the reason is not because the building is run down or anything like that, it's being closed down because the actions of humans created this," she said. "We need our actions as humans to help this instead. We can't be going in a negative direction. We need to start making positive differences."

The Bay is particularly vulnerable to rising sea levels from climate change because, at the same time, the region's land has

CBF's Fox Island Environmental Education Center, which offered magical teaching moments for 40 years—is now unsafe for student experiences due to sea-level rise and erosion.

BILL PORTLOCK/CBF STAFF

been slowly sinking since the last ice age—a natural phenomenon known as subsidence. As a result, the relative sea level in the Chesapeake Bay is increasing at approximately 3.4 millimeters per year, according to the National Oceanic and Atmospheric Administration (NOAA). That's twice the average rate globally, and parts of the Bay have seen sea level rise total more than 10 inches since 1960.

By mid-century, the Bay region is looking at another 1.5 to 2 feet of sea-level rise, said Molly Mitchell, a marine scientist at the Virginia Institute of Marine Science's Center for Coastal Resources Management. The higher seas will create bigger storm surges during bad weather, but also an increase in more regular flooding at high tide.

These so-called "sunny day" floods already happen with increasing

frequency in many of the Bay's coastal cities. In 2018, several Chesapeake cities experienced a record number of days with sunny day floods, including Washington, D.C. and Baltimore and Annapolis, Maryland.

"The tides are high enough now that they're coming up onto where we've built our roads and people have put their houses," Mitchell said. "In a lot of cases, they're coming up through the storm sewers, and the flooding is not even happening on the waterfront—it's a little bit inland where people are not expecting it."

In Annapolis, the floods already close parking areas and disrupt businesses in the downtown shopping district near the city's dock, but the future could be much worse. Speaking to Congress in October, U.S. Senator Ben Cardin (D-Maryland) noted the closure of CBF's

Fox Island Education Center and the important role marshes play in the fight against climate change.

"The marshes and wetlands the foundation is dedicated to protecting are among Maryland's best natural defenses at mitigating the effects of climate-related impacts, like more frequent storms and rising sea levels," he said.

Marshes help in two ways, Mitchell explained. If they're big enough, they can break the wave energy from storm surges. And though they don't stop flooding outright, they do move the shoreline away from houses, reducing the risk to coastal properties.

"But this is the caveat with marshes," Mitchell said. "Because sea-level rise is threatening them, if we don't leave places for them to go on the land, then it's going to be a short-term solution."

The Smithsonian's Global Change Research Wetland in Maryland is the world's longest-running field experiment collecting data on the effects of sea-level rise on tidal wetlands.

## Wetlands on the Move

Coastal marshes in the Chesapeake Bay provide refuge for wildlife, buffer shorelines against storms, and filter pollution from the water. Another skill? Engineering.

By trapping sediment and growing roots, marsh plants can raise the soil level and alter their environment. This ability for thousands of years helped marshes adapt to slowly rising water levels. But the Bay's rapid sea-level rise is putting them to the test.

"Marshes, just like people, can drown," said Patrick Megonigal, Principal Investigator at the Smithsonian Global Change Research Wetland in Edgewater, Maryland. "As long as their shoots are out of the water, they act like snorkels transporting oxygen from the atmosphere, through the plant, down to the roots. But once they're underwater, most of these plants tend to die."

There are promising signs the Chesapeake's marshes may be able to keep up with rising seas and climate change. High carbon dioxide (CO<sub>2</sub>) levels and longer, warmer growing seasons help plants grow, build up the soil, and escape rising water—to a degree.

"Elevated CO<sub>2</sub> helps the marshes keep pace, but even a benefit like that will eventually come up short when rates of sea-level rise accelerate past a certain point," Megonigal said.

His team is working to identify where that tipping point occurs. In the meantime, giving marshes the space to migrate—to engineer themselves out of the problem—could be key.

"Because there are already things there, like homes and agricultural fields, just thinking about how to back up off the edge of the water is a big policy change," he said. "But one that, if we were to tackle it, could be very positive for these systems."

Cities are starting to find innovative fixes. Hampton, Virginia, is undertaking a citywide effort, called Resilient Hampton, to tackle recurrent flooding from rising seas and storms. The city's plan notes that nearby Sewell's Point, in Norfolk, experienced nearly one and a half feet of sea level rise in the past century, and that eight of the eleven highest storm surges over 80 years of records occurred in the last two decades.

At the end of 2018, the city, through a partnership with CBF and Quantified Ventures, began considering the use of environmental impact bonds to help finance some of the work. The bonds use a pay-for-success model in which private investors share the financial risk with the city if projects don't perform as well as expected, but earn increased returns if they succeed beyond expectations. In Hampton, the bonds could help fund green infrastructure like bioswales and permeable pavement to help reduce flooding problems and polluted stormwater runoff.

The simplest way to reduce risk in the future is to take sea level rise into account when planning new developments, Mitchell said.

"We have a pretty good idea of where we're heading in 20 to 30 years, which really gives us an opportunity for this to not be a disaster," she said. "We can be ready for this."

As part of the generation set to be most impacted by climate change, Platt said solutions need to come from all sides.

"We're going to need to live in this world that has been created," she said. "It's now been put upon us to make a difference and start protecting our land. Whether it's planting trees and small things like that, or talking to your legislators, everyone needs to start making a difference and realize that if they don't, it's just going to get worse." 🐦



## CBF AT WORK

# Communities Rise to the Climate Challenge

**In Baltimore Harbor's toxic legacy, Turner Station sees a solution for rising seas.**

The sediments dredged from the bottom of Baltimore Harbor are a dark, soupy slurry that resembles black mayonnaise. Pollutants from the city's industrial past long prevented the material's use, but a growing scientific understanding of its toxicity—coupled with the gradual accumulation of cleaner sediments in the harbor—is generating new ideas to repurpose it for good.

In at least one case, it may help Baltimore County adapt to rising sea levels. The Fleming Park project, located in the historic Black community of Turner Station near the harbor's mouth, proposes using dredged sediments to rebuild marshes and upland areas along the park's shoreline.

The project aims to both protect the park from increasingly frequent tidal flooding and reconnect the community with its waterfront.

"The area once thrived with stores, churches, beach life, and high-paying jobs fueled by the nearby Bethlehem Steel mill," said Carmera Thomas-Wilhite, CBF's Baltimore Program Manager. "But as the mill declined and finally closed in 2012, many residents lost their jobs. They're on the front lines not only of the city's economic challenges, but also at the front lines of sea-level rise and flooding because of where they sit in the harbor."



(left to right) CBF Maryland Senior Scientist Doug Myers, Turner Station Conservation Team members Larry Bannerman and Gloria Nelson, and Isaac Hametz of the landscape design firm Mahan Rykiel Associates review plans to protect Fleming Park in Baltimore County's Turner Station from rising sea levels.

Turner Station Conservation Teams, the local nonprofit spearheading the project, has been examining the possible use of dredge material for shoreline revitalization for more than a decade. The group approached CBF for technical assistance to help get the Fleming Park project off the ground, and last November it earned a \$500,000 grant from the Department of Transportation to conduct a feasibility study. The study, which is contingent on county approval, would include soil testing to make sure the sediments are safe, as well as engineering assessments to determine how much dredged material would be needed.

Eventually, the park could serve as a green jobs incubator, a jumping off point for environmental outreach and education programs, and an example for shoreline revitalization projects in other areas.

"The harbor's resiliency plan is addressing stormwater and the way it's moving through different properties, but it's not always reimagining the harbor with a softer edge," said Thomas-Wilhite.

Instead of armoring shorelines with hard materials like riprap that do little to stop flooding from sea-level rise—which often comes up through storm drains—the Fleming Park project would create a "soft" edge with marshes that help soak up water.

Thomas-Wilhite continued, "That is something we're hoping to do with this project that would be a model for projects going forward."



Restoring the Bay and fighting climate change go hand in hand. Through advocacy and restoration, CBF is putting practices on the ground that reduce pollution to the Bay and help communities mitigate and adapt to climate change. **You can help.**

## OYSTERS



Oysters filter the water, their reefs can buffer coastlines from storms, and as a food source, they have a relatively small carbon footprint. Protecting oysters and improving water quality will better enable populations to withstand the effects of climate change.

### What CBF is doing:

CBF launched the **Chesapeake Oyster Alliance** to accelerate ongoing restoration efforts in the Chesapeake Bay by restoring oysters in sanctuaries, improving science-based fishery management, and increasing oyster aquaculture.

### What you can do:

- ✓ Ask for farmed oysters at restaurants or buy directly from oyster farmers at farmers' markets.
- ✓ Visit [chesapeakeoysteralliance.org](https://chesapeakeoysteralliance.org) to find where you can recycle oyster shells and which restaurants recycle their shells.
- ✓ Volunteer at CBF's Oyster Restoration Centers in Maryland and Virginia, or join our Oyster Gardening programs to raise oysters for restoration.

## FARMS

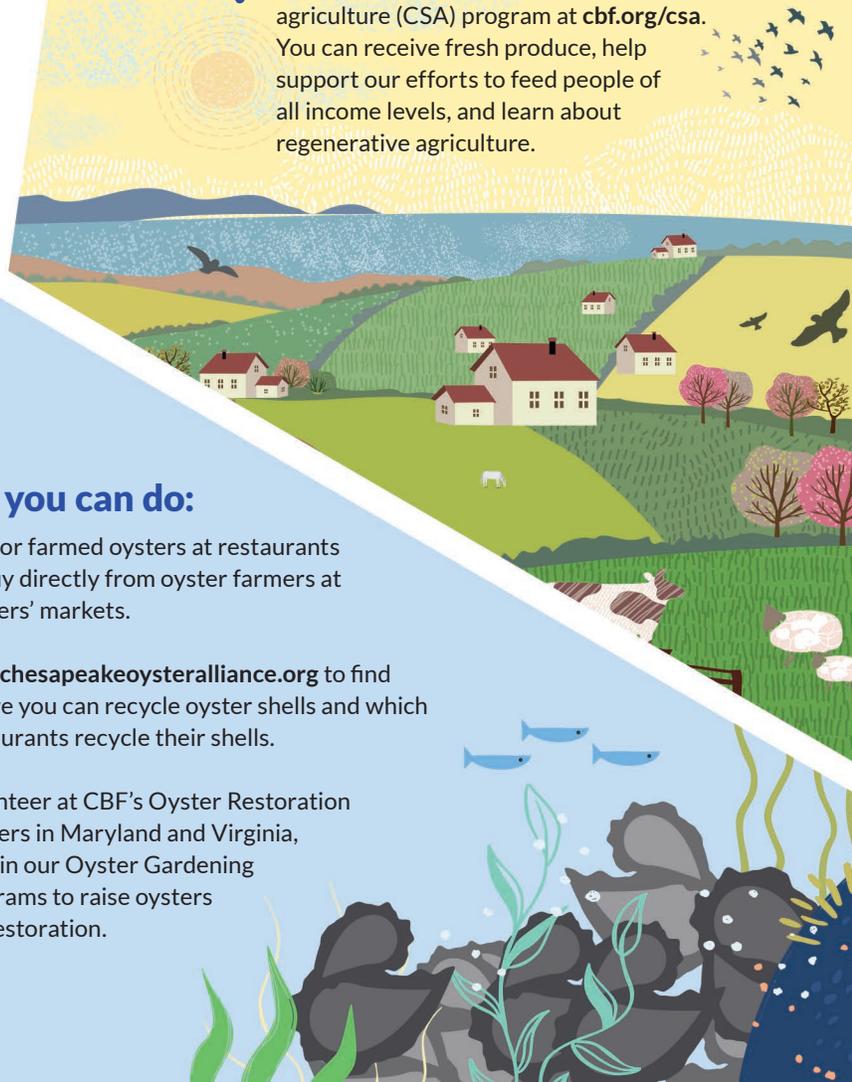
Farming practices like rotational grazing, cover crops, and no-till planting trap more carbon in the soil and reduce polluted runoff.

### What CBF is doing:

CBF is working with farmers and public and private partners across the watershed to implement farming practices that benefit water quality, improve soil health, and boost farm economies. The **Mountains-to-Bay Grazing Alliance** and the **Million Acre Challenge** are two key initiatives.

### What you can do:

- ✓ Support farmers who use best practices. Check out the "Amazing Grazing" directory at [futureharvestcasa.org](https://futureharvestcasa.org), and find guides to locally sourced and sustainably grown foods at [buylocalchesapeake.org](https://buylocalchesapeake.org).
- ✓ Buy organic dairy products, which require the majority of the cow's diet to come from grass.
- ✓ Buy a share in CBF's community supported agriculture (CSA) program at [cbf.org/csa](https://cbf.org/csa). You can receive fresh produce, help support our efforts to feed people of all income levels, and learn about regenerative agriculture.



# CITIES

Green infrastructure such as rain gardens, street trees, constructed wetlands, and other green spaces can help reduce polluted runoff and flooding and provide relief from extreme heat.

## What CBF is doing:

CBF is working with cities and community groups to place more trees in urban areas, such as our **Hopewell Restoration Project** in Virginia. We're also working with Baltimore, Maryland, and Hampton, Virginia, to utilize innovative **environmental impact bonds (EIBs)** to finance green infrastructure projects.

## What you can do:

- ✓ Install rain barrels to collect water from your downspouts, use native plants for landscaping, and replace hard surfaces with pervious pavement.
- ✓ Get involved with local planning initiatives by attending city council meetings and letting your local elected officials know that water quality and climate change are important to you.



# FORESTS

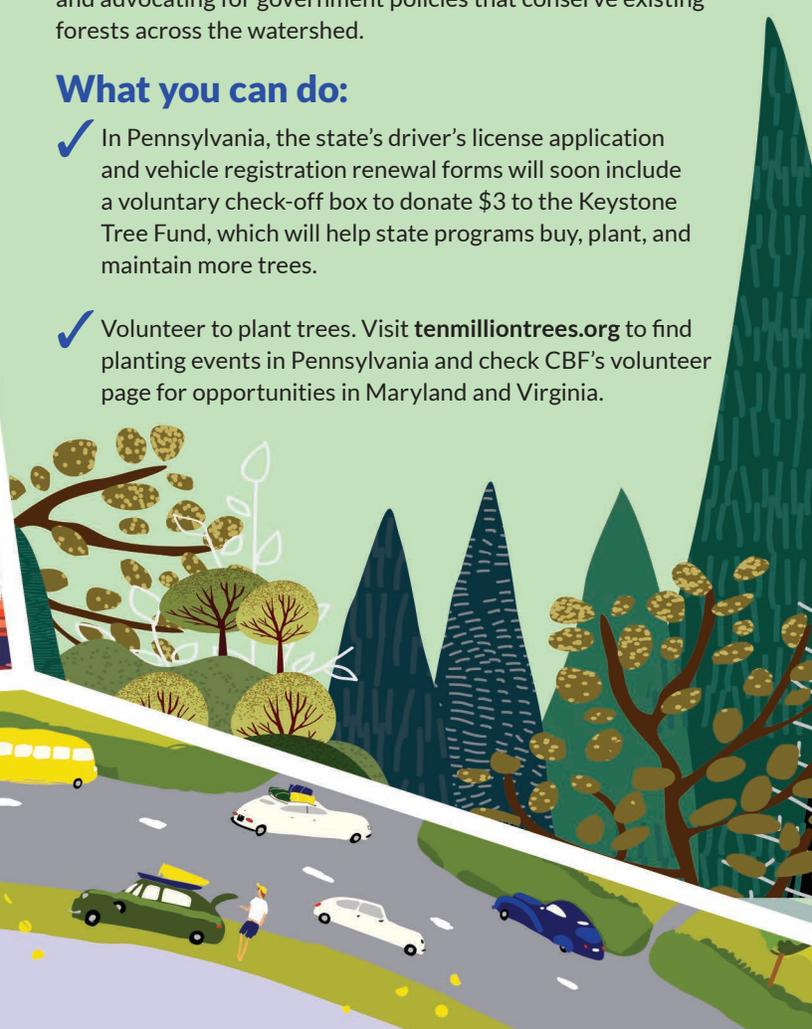
Planting forest buffers along streams is one of the most cost-effective ways to reduce polluted runoff, cool city streets and waterways, and trap climate-warming carbon.

## What CBF is doing:

The **Keystone 10 Million Trees Partnership** will help accelerate the planting of trees in Pennsylvania by the end of 2025. We're also planting streamside trees on farms and in cities and advocating for government policies that conserve existing forests across the watershed.

## What you can do:

- ✓ In Pennsylvania, the state's driver's license application and vehicle registration renewal forms will soon include a voluntary check-off box to donate \$3 to the Keystone Tree Fund, which will help state programs buy, plant, and maintain more trees.
- ✓ Volunteer to plant trees. Visit [tenmilliontrees.org](https://tenmilliontrees.org) to find planting events in Pennsylvania and check CBF's volunteer page for opportunities in Maryland and Virginia.



# EMISSIONS

One-third of the Bay's nitrogen pollution comes from the air. Reducing emissions of carbon dioxide, nitrogen oxides, and methane is essential to curb climate change and improve water quality.

## What CBF is doing:

CBF's **Federal Affairs Office** is responding to attacks on important federal regulations that protect our air, water, and climate. When necessary, our **litigation department** takes legal action to hold the government accountable. For example, we challenged the repeal of the federal Clean Power Plan and its inadequate replacement with the Affordable Clean Energy (ACE) Rule. We also challenged EPA's move to block state-level greenhouse gas standards for car tailpipes and zero-emission vehicle programs.

## What you can do:

- ✓ Carpool, use public transportation, and ask your energy provider about options to get your electricity from renewable sources.
- ✓ Stay connected to our emissions work by visiting CBF's regulatory web page, where you'll find information on key regulatory priorities, and visit our online Action Center at [cbf.org/takeaction](https://cbf.org/takeaction).



# CBF Board Elects New Officers



**Elizabeth Oliver-Farrow** (*Chevy Chase and Drum Point, Maryland*) owns The Oliver Group, Inc., a public policy and relations firm in Washington, D.C. She previously owned and was CEO of another public relations, management consulting, and community outreach company in Washington that had federal government and private sector clients. She is Vice Chair of the Hispanic Scholarship Fund, Inc. and the Latino Corporate Directors Association. Mrs. Oliver-

Farrow formerly chaired the Boards of the National Education Association Foundation, the U.S. Hispanic Chamber of Commerce, and the DC Chamber of Commerce and served on the Board of CareFirst, Inc.; Group Hospitalization and Medical Services, Inc; and the Advisory Board of Comcast. In addition, she was appointed to the U.S. Small Business Administration's National Advisory Council and its National Women's Business Council. She is a member of the International Women's Forum, Leadership Washington, the Solomons Island Yacht Club, and the Drum Point Club.

We also welcome new Vice Chairs. **Otis S. Jones** (*Richmond, Virginia*) joined CBF's Board in 2018 and is the Director, U.S. Financial Services Market, Mid-Atlantic with IBM. He comes from a long line of Rappahannock River oystermen and fishermen.



**Robert A. Kinsley II** (*York, Pennsylvania*) also joined CBF's Board in 2018 and is a registered architect, CEO of Kinsley Enterprises, and Chairman of the Board of Warehaus. He served on the Advisory Council of CBF's Brock Environmental Center, and lives on a farm in York County.



# CBF Thanks Outgoing Chair



**Harry T. Lester** (*Virginia Beach, Virginia*) served as a member of CBF's Board of Trustees from 2004 through 2009, rejoined the Board in 2013, and was appointed Chair in 2016. He served on CBF's Executive, Litigation, and Nominating Committees. Mr. Lester is the retired President of Eastern Virginia Medical School and co-founder of Lynnhaven River Now. Mr. Lester brought unmatched passion, enthusiasm, and dedication to protecting the waters and wildlife of his

local community and the Bay. We are most grateful for his tireless service. Mr. Lester will now be an Honorary CBF Trustee.

# CBF Thanks Outgoing Vice Chairs and Trustees



**Jane P. Batten** (*Virginia Beach, Virginia*) is an active community volunteer and philanthropist. She serves

on the boards of E3: Elevate Early Education, Slover Library Foundation, the Hampton Roads Community Foundation, and St. Patrick Catholic School in Norfolk, and is co-chair of Focused Ultrasound Foundation Council. She formerly sat on the boards of the George Washington Foundation and Smart Beginnings of South Hampton Roads. Ms. Batten was a CBF Trustee since 2010, Co-Chair of the Hampton Roads Campaign Committee, Vice Chair of the Board, and a member of the Executive Committee. Ms. Batten's steadfast interest in environmental education inspired CBF to broaden the reach of our programs. Her commitment and generosity made her an invaluable leader to CBF.



**Arnold I. Richman** (*Baltimore, Maryland*) serves as Partner and Chairman of Brightview Senior Living, serves

on the boards of Johns Hopkins Medicine and The Baltimore Equitable Society, and is an Emeritus Trustee of the Institute for Christian and Jewish Studies. He formerly served as President of the Board of The Park School and Vice Chairman and Campaign Chair of The Associated-Jewish Community Federation of Baltimore. Mr. Richman served as a member of CBF's Board from 2000 through 2008, rejoined the Board in 2011, and was Vice Chair of the Board and a member of the Executive Committee. He is a passionate ambassador for CBF and will now be an Honorary CBF Trustee.



**Mark J. Hourigan** (*Richmond, Virginia*) is the Owner and CEO of Hourigan Construction, a full-service general

contracting firm that has built hundreds of projects, including CBF's award-winning Brock Environmental Center in Virginia Beach. At the Virginia Tech School of Building Construction,

Mr. Hourigan serves as Chairman of the Myers Lawson School of Construction Board and serves or has served on the boards of Management Round Table, Go Virginia, Lansing Building Products, Frank L. Blum Construction, Leukemia & Lymphoma Society, The Richmond Forum, and Chamber RVA. Mr. Hourigan was a member of CBF's Board since 2017.



**Mark S. Ordan** (*Bethesda, Maryland*) has successfully led several public corporations over the course of his career, chiefly as a turnaround specialist. He has served as CEO of Quality Care Properties, Washington Prime Group, Sunrise Senior Living, The Mills Corporation, Balducci's, and Fresh Fields Markets. Mr. Ordan cares deeply about the communities in which he lives and works and is involved in numerous philanthropic organizations. Mr. Ordan was a member of CBF's Board of Trustees since 2016, and served on the Executive Committee and as Chair of the Governance Committee.



**Susan P. Wilmerding** (*Haverford, Pennsylvania*) is an environmentalist and serves as an advisor and former Chair of the Conservation Committee of the Garden Club of America. She serves on the Board of the Friends of the Wissahickon, the Advisory Board of the Audubon/Outward Bound Discovery Center, and the President's Council of Natural Lands. Ms. Wilmerding was a member of CBF's Board of Trustees since 2011, was a member of the Litigation Committee, serves on CBF's Pennsylvania Advisory Council, and graciously works to open doors and make new connections for CBF in the Philadelphia region.

## CBF Welcomes Incoming Trustees



**Dara C. Bachman, Esq.** (*Lancaster, Pennsylvania*), is a Senior Director, Legal Strategist with Sageworth Trust Company. A licensed attorney with a masters in taxation, Ms. Bachman began her legal career as an associate attorney in a national law firm based in Philadelphia

in the Corporate Practice Group. Immediately prior to joining Sageworth, she was a member of the business and tax practices at Barley Snyder, LLP. Ms. Bachman currently serves as a director on the Hospice & Community Care Board. She previously sat on the Board of Trustees of the Lancaster Farm Trust, serving as treasurer for two years, and on the Board of Directors of the Lancaster Family YMCA.



**Joan Brock** (*Virginia Beach, Virginia*), a native of Norfolk, graduated from Longwood University with a Bachelor of Arts degree and a minor in Mathematics and earned a Master of Arts in Humanities from Old Dominion University. She has chaired the boards of the Access College Foundation, Virginia Wesleyan University, and she was the first woman to chair the Chrysler Museum Board. She has also served on the boards of Sentara Healthcare, Virginia Museum of Fine Arts, Hampton Roads Community Foundation, and the National Board of Women United of the United Way. In 2019, Joan was selected First Citizen of Norfolk by the Cosmopolitan Club of Norfolk, while the Urban League of Hampton Roads honored her with the Edward L. Hamm Award for Philanthropy. She and her husband, Macon, were recognized by the National Board of American Fundraising Professionals as Outstanding Philanthropists for 2015.



**Margaret (Meg) Freeman** (*Newtown Square, Pennsylvania*) is the owner of Heywood Financial, LLC, assisting individuals and families with day-to-day finances and life matters in the Greater Philadelphia area. Ms. Freeman serves as a board member or volunteer for several non-profit organizations. Originally from Richmond, Virginia, Ms. Freeman attended Hollins University and graduated with Bachelor of Arts in Psychology and Education. More recently she earned her Master of Science in Organizational Development and Leadership. Ms. Freeman has special training in family systems and is a Certified Trainer in Family

Philanthropy. She is a board member for the Chester County Community Foundation, Help Hope Live, and The Freeman Foundation.



**Jennifer E. Green** (*Annapolis, Maryland*) is the co-founder and former CEO of Urban Teachers, a non-profit that has placed more than 1,000 teachers in Baltimore; Washington, D.C.; and Dallas schools. A veteran urban educator, Ms. Green has served as a high school teacher, a district administrator, and a non-profit leader. In 2004, she was named by the Baltimore Business Journal as one of Baltimore City's "Top 40 under 40."



**Mamie A. Parker Ph.D.** (*Dulles, Virginia*) is a fish and wildlife biologist and principal consultant at Ecologix Group and M. A. Parker & Associates, a management consulting firm, and holds degrees in limnology and aquatic ecosystem management. She served on the Chesapeake Conservation Partnership Steering Committee and was U. S. Fish and Wildlife Service (FWS) Head of Fisheries and Habitat Conservation. A Presidential Rank Awardee, Dr. Parker made history when appointed the first female and African American FWS Regional Director of the 13 Northeastern states. She is the Chair of the Board of Commissioners of the Virginia Game and Inland Fisheries, appointed by Governor McAuliffe in 2017. A motivational speaker, she serves on several boards including The Nature Conservancy-Virginia Chapter and Duke University's Nicholas School of the Environment.



**Crystal Patterson** (*Washington, D.C.*) has more than 15 years of experience in campaigns, communications, and policy. Ms. Patterson leads Facebook's global civic partnerships team, with a focus on civic participation and elections integrity. Ms. Patterson has been with Facebook's Public Policy team since 2014, working with candidates, campaigns, and advocacy organizations to use Facebook effectively. 🌟



Together, the Arbor Day Foundation and the Chesapeake Bay Foundation are planting trees alongside streams and streets and other priority places to clean the air and water and combat climate change. CBF Director of Corporate, Foundation, and Grant Relations Laura Wood and ADF Manager of Forest Restoration Programs Bradley Brandt prepare to plant a trees at Susquehanna Township Veterans Park in Harrisburg, Pennsylvania.

## The Power of Trees

### The Arbor Day Foundation joins forces with CBF and the Keystone 10 Million Trees Partnership.

**When it comes to cleaning the air and water, and providing oxygen and shade for all of us, no one knows more about the power of trees than the Arbor Day Foundation (ADF).** Founded in 1972 by John Rosenow to mark the 100th anniversary of Arbor Day, the Arbor Day Foundation plants trees for a greener, healthier planet. By working together, CBF and the Arbor Day Foundation are collectively driving positive environmental change through the simple act of planting trees.

“Through our Time for Trees initiative, the Arbor Day Foundation set the ambitious goal of planting 100 million trees worldwide by 2022,” said Bradley Brandt, Manager of Reforestation Programs, Arbor Day Foundation. “Working alongside CBF and the Keystone 10 Million Trees



Partnership will leverage our efforts to improve air and water quality and create healthier communities for generations to come.”

By the time the 10 million trees planted under the Keystone 10 Million Trees Partnership reach maturity, they could offset nearly 900 million tons of carbon in a single year. When we add the benefits of cleaner water to the equation, it’s clear that trees really are marvelous green machines and one of our best and most cost-effective tools for fighting climate change and saving the Bay.

Together, since the launch of the partnership, we have supported the planting of over 1 million trees in Pennsylvania. We could not have achieved this milestone without the support of the Arbor Day Foundation and donors—and tree planters like you. Thanks to all for fueling the power of trees. ✨

# THE STORY MUST GO ON

**In recent years, an increasing number of CBF members like you have included CBF in their charitable or estate plan. Why?**

They know the greatest story of environmental recovery ever cannot be told in one generation, and the Bay’s restoration is a story that must go on.

Anyone can establish a planned gift—and a creative plan often allows individuals to give more than they think possible. Planned gifts provide vital resources for our future work. One person really can have a lasting impact.



PATRICK HOLLIDAY

**Ready to learn more and increase your impact?**

**Request a planned giving booklet today.**

**CBF.ORG/PLANNEDGIVING  
LWHansen@cbf.org  
443-482-2102**

“We saw this as an opportunity to teach our kids how to participate in understanding the value of helping to clean our local waterways.”

—Natalie Biggie  
CBF Oyster Gardener



The Biggie family enjoys growing oysters and doing their part to restore and protect the Chesapeake Bay. Their participation in CBF’s Oyster Gardening Program is supported, in part, by a grant from the Arthur Vining Davis Foundations.

## Encouraging Bay Stewardship

**Arthur Vining Davis Foundations funding helps turn awareness into action.**

The Arthur Vining Davis Foundations (AVDF) are continuing the legacy of leadership and vision of their benefactor to strengthen America’s “religious, charitable, scientific, literacy, and educational purposes” through philanthropy. AVDF has selected CBF as a designated partner to implement “Environmental Education, Engagement, and Solutions” in the Chesapeake Bay. As just one of a few partners across the country, AVDF has provided CBF with catalytic funding to address the Bay’s environmental challenges by educating and engaging the public in stewardship activities.

Thanks to AVDF, we have created more opportunities for citizens to assist in rebuilding the oyster population in Maryland and Virginia and planting trees in Pennsylvania. We have scaled up our coordination capacity in both our Chesapeake Oyster Alliance and our Keystone 10 Million Trees Partnership programs. We have raised public awareness, generating wider support to help us tackle the large-scale Chesapeake Bay restoration effort through more robust citizen education and engagement events. CBF’s Oyster Gardening Program is one of many such donor-funded connections.

Oyster Gardeners Natalie Biggie and her husband Jeramy are deepening family ties and purifying their own Virginia Beach backyard. “We saw this as an opportunity to teach our kids how to participate in understanding the value of helping to clean our local waterways.” Seeing physical growth in their oysters, watching animals attracted to their spat (baby oysters), and focusing on the idea that an adult oyster can filter up to 50 gallons of water in a day are the primary motivators for this family. Jameson (9) and Evangeline (7) help tend the family oyster cage by washing, turning, and keeping their new friends clean. Natalie said, “You don’t have to be a scientist, an expert in waterways, or know anything about oysters to do this, just take the [CBF Oyster Gardening] class and try it!”

We celebrate our teamwork with AVDF, and the lasting impact their support will have by inspiring stewardship actions among Bay residents. 🌊



PENNSYLVANIA

**Optimistic Budget Proposal**

CBF is encouraged by some aspects of Pennsylvania Governor Tom Wolf's \$36 billion General Fund budget proposal for fiscal year 2020-21. The governor proposes to increase funding for the Department of Environmental Protection, restoring it to above 1994-95 levels for the first time in a decade.

CBF is also pleased that funds within the Environmental Stewardship Fund (ESF) would no longer be used to pay debt service on the Growing Greener Fund. Extra ESF dollars can be spent to plant more trees, address acid mine drainage, and protect additional acres of productive farmland.

Still, with this budget, it remains unclear how the state will close the over \$320 million annual shortfall in investments needed to meet Pennsylvania's Clean Water Blueprint by 2025. Ultimately, it's up to state legislators to ensure funding so Pennsylvania's farms, families, and

*Progress in the Keystone State takes more money, trees, and regulated use of turf fertilizer.*

communities can restore and protect the land, water, and air.

**Year-Three Kick Off for Trees**

The Keystone 10 Million Trees Partnership's third season is underway on a limited basis based on the goal of adhering to all CDC and state guidelines designed to reduce the spread of COVID-19 during the coronavirus pandemic.

Small partner groups that have taken direct delivery of some trees from nurseries and growers, have worked to plant those trees.

Spring is also an opportune time to revisit buffers already planted and

perform maintenance. As with any outdoor activity, it is important to maintain social distancing.

**Fertilizer Standards for Turf**

A new fertilizer bill (SB 915) sets standards for turf application, labeling, and professional fertilizer applicator certification, and provides for an education program. The provisions of the bill, would help reduce nitrogen and phosphorus pollution entering Pennsylvania's rivers and streams. "This legislation will reduce the environmental impact of fertilizer applied to turf areas, such as lawns, golf courses, and athletic fields," says bill sponsor Senator Gene Yaw, R-Lycoming. Similar legislation has been enacted in Maryland and Virginia.

► To learn more about the 10 Million Trees Partnership, visit [tenmilliontrees.org](http://tenmilliontrees.org).

► To learn more about CBF's priorities in Pennsylvania, visit [cbf.org/Pennsylvania](http://cbf.org/Pennsylvania).



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A bill in the Pennsylvania Senate is designed to reduce the environmental impact of fertilizer applied to turf areas, such as lawns, golf courses, and athletic fields.



## Support for Good Farming Practices

Maryland lawmakers left Annapolis three weeks early due to the coronavirus, but during a flurry of activity on the final day they passed a CBF-supported bill aimed at increasing natural filters on farm lands.

The legislation, if signed by the governor, will update Maryland's agricultural cost-share program. The bill defines fixed natural filters in Maryland law to ensure farmers are fully eligible for state funds to restore wetlands; convert crop land to grass pastures; and plant trees next to field edges and streams or other waterways. The legislation also focuses funding on reducing pollution on existing farms rather than assisting with start-up or expansion projects at large animal farming operations.

The natural filters promoted in this legislation limit Bay pollutants including nitrogen, phosphorus, and sediment from running off farm fields during and after rain events. The filters also help build healthy soils by keeping the plant nutrients on the land, rather than allowing them to flow into the Bay. Once in the Bay, nitrogen and phosphorus fuel harmful algal blooms that create dead

*Some good news for farmers and clean water from Maryland's shortened General Assembly session.*

zones devoid of oxygen in the water that are uninhabitable for marine life.

Once in effect, CBF believes this new policy will help Maryland meet its 2025 Chesapeake Bay clean-up goals by having more farmers add these natural filters to their land, which will reduce Bay pollutants over time.

## Other Priorities Fail to Pass

While the cost-share bill passing was good news, the shortened session resulted in other environmental priorities not being addressed. Bills that would have decreased plastic ban usage, removed incineration from the renewable energy list in the state, and required net-zero greenhouse gas emissions by 2045 failed to pass before the session wrapped up March 18.

Legislators also ran out of time to fully restore about \$440,000 in state education funding that CBF previously

received to help fund the Maryland outdoor education program. The funding was cut by Maryland Governor Larry Hogan in his fiscal 2021 budget. The funds were only used to help CBF take students and teachers out on the Bay to teach them about state history and estuary science. The state funding made up about a quarter of CBF's Maryland education budget. We're working to get the funding restored either in a special session later this year or next year. It's also possible, but unlikely, that Hogan could restore the funds sooner by reprioritizing other education funding.

## New Oyster Management Law in Place

Earlier in this year's session, progress was made to protect oysters. In February, the legislature overrode Governor Larry Hogan's veto of a bill the General Assembly passed last year that will create a consensus-based process to draft a new oyster fishery management plan. The new law will bring together environmental advocates, academics, watermen, and seafood sellers to create a new plan to end oyster overfishing and increase oysters' overall population in Maryland. Under the law, the group is scheduled to send its fishery management plan recommendations to the state's Department of Natural Resources for implementation by August 2021.

Oyster advocates hope the new group can use the latest science and newly available population modeling technology to develop management strategies that end the long-term decline of oysters in the state. Since 1999, Maryland's oyster population has dropped from about 600 million adult oysters to 300 million in 2018. In the Bay, oysters are valuable as water filters and their reefs provide habitat to fish and crabs.

► For more information on CBF's efforts in Maryland, visit [cbf.org/Maryland](http://cbf.org/Maryland).



REBECCA LONG/CBF STAFF

CBF volunteers plant trees at a farm in St. Mary's County in 2019. New legislation passed in the 2020 General Assembly session will help farmers add more natural filters such as trees, wetlands, and grass pasture to their land.



D.C. & FEDERAL AFFAIRS

**COVID-19**

CBF has objected forcefully to EPA pursuing its regulatory rollback agenda despite the upheaval caused by the COVID-19 pandemic. To safeguard citizens' right to comment on regulations affecting the Chesapeake Bay and its waterways, CBF urged the Trump administration in a March 23 letter to extend the comment period for all federal regulations not related to COVID-19 until the president lifts the emergency declaration he issued on March 13. EPA hasn't relented so CBF continues to file comments and engage members to make their voices heard.

In a separate letter to EPA dated March 31, CBF expressed deep concern about the environmental and public health risks of the agency's decision not to pursue enforcement against permit-holders that claim they cannot comply with their legal obligations because of the COVID-19 emergency especially when there is potential harm to human health. CBF specifically noted the danger of not requiring permit-holders to notify

*Ignoring climate change isn't an option.*

the public when they fail to meet their permit requirements.

**Standing up for Clean Air**

The Trump administration dramatically weakened federal efforts to cut nitrogen oxide and greenhouse gas (GHG) emissions fouling the Bay when it released revised rules governing fuel economy and GHG emissions from cars, SUVs, and pickup trucks on March 31. In place of the Obama-era Clean Cars Rule, which required automakers to improve vehicles' fuel economy and lower their GHG emissions five percent annually through 2026, the new rule requires standards to tighten by just 1.5 percent a year.

CBF is weighing all options to oppose this rule, which threatens to accelerate the damaging effects of climate change

on the Bay region and derail states' progress towards meeting their 2025 goals for reducing nitrogen pollution under the Bay clean-up plan.

**Climate Change and the Permitting Process**

Equally dangerous is the White House's proposal to eliminate climate change from the environmental impacts government agencies must consider when issuing permits for large-scale federal infrastructure projects, like building a pipeline or expanding a highway.

The National Environmental Policy Act requires all federal agencies to evaluate how major projects would affect the surrounding environment, consider less harmful alternatives, make this information public, and get citizens' input before proceeding.

The White House in January proposed limiting the influence of local communities (and organizations like CBF) on permitting decisions, narrowing the possible alternatives agencies can consider and excluding climate change impacts from the environmental consequences agencies must weigh.

Ignoring climate change isn't an option when the Bay's 64,000-square-mile watershed is already grappling with its effects. Sea-level rise is claiming Bay islands. More frequent, intense storms regularly flood low-lying coastal cities like Annapolis and Norfolk. CBF submitted comments objecting to this dangerous proposal on March 10.

▶ To learn more about CBF's federal efforts, visit [cbf.org/federal](http://cbf.org/federal).

▶ For more information on air pollution and the Bay, visit [cbf.org/issues/air-pollution](http://cbf.org/issues/air-pollution).

▶ For more on climate change, visit [cbf.org/issues/climate-change](http://cbf.org/issues/climate-change).

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By repealing the Clean Power Plan, the administration is allowing power plants that run on fossil fuels to continue spewing carbon pollution into the Bay airshed.

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The administration's proposal to weaken tailpipe and fuel economy standards for cars, pickup trucks, and SUVs will worsen greenhouse gas emissions and nitrogen pollution in the Bay.



## VIRGINIA

### Virginia Wraps Up Remarkable Session for Clean Water

Legislators wrapped up an exciting legislative session in March that ranks among Virginia's strongest for clean water. Policy proposals defeated in previous years finally passed, while legislators also adopted many important new initiatives on environmental and water-quality issues.

One of the biggest victories revolved around a small fish—the menhaden. Legislators voted to transfer management of Virginia's menhaden fisheries from the General Assembly to the Virginia Marine Resources Commission, which manages every other saltwater fishery in the Commonwealth. This comes after almost two decades of advocacy by CBF, our members, partners, and other stakeholders, including anglers.

In a major step toward combatting climate change, the General Assembly authorized Virginia to join the Regional Greenhouse Gas Initiative, a cap-and-trade program for power plants that will reduce emissions. Forty-five percent of the funds generated will go to the Virginia Community Flood Preparedness Fund. In reducing pollution from air emissions, the program will also decrease pollution to the Chesapeake Bay, and funding from the program will help Virginia prepare for sea-level rise and extreme weather.

*Your voices for clean water are leading to a better future.*

Legislation passed this session will accelerate efforts by farmers to fence cattle out of streams and implement nutrient management plans to reduce fertilizer runoff from cropland. These are among the most cost-effective ways to reduce pollution to waterways.

Legislators also voted to prohibit oil and gas drilling and related infrastructure in Virginia waters up to three miles off the coast just as the Trump administration has proposed opening the Atlantic Coast to risky drilling. The General Assembly also established milestones and a 2035 deadline for Richmond to eliminate sewage overflows into the James River.

In March, legislators also approved and sent to the governor for his signature a two-year state budget that included an unprecedented level of investment in the Bay and its rivers and streams, showing clean water remains a priority for Virginians.

The lawmakers proposed record investments in both oyster restoration and reducing polluted runoff from developed areas. The Stormwater Local

Assistance Fund, which provides matching grants to localities to reduce stormwater pollution, would receive an additional \$50 million over the two-year period—up from \$10 million the previous year.

Oyster restoration and replenishment efforts in Virginia would receive \$8 million over the two-year period, plus \$10 million in innovative bond financing to construct sanctuary reefs. This investment would boost sanctuary oyster reef construction and support goals to fully restore 10 Bay tributaries for oyster habitat. Last year legislators appropriated \$4 million for replenishment and restoration.

Virginia legislators also renewed financial support at \$50 million for sewage treatment plant upgrades, an effort that leads to dramatic improvements in reducing pollution to rivers.

Investments in Virginia's agricultural cost-share program were approved at \$95.7 million over the next two years. Many of the practices supported by the program also address climate change and trap carbon through trees, grasses, and healthier soil.

Unfortunately, one of the many casualties of COVID-19 has been the budget, which could will be significantly affected. Governor Northam has proposed several related budget amendments and measures given the anticipated economic downturn.

This session's progress is a testament to the commitment of Virginia legislators and Governor Northam. But it wouldn't have been possible without the advocacy and action of the many CBF members who wrote, called, and met with legislators. Your voices for clean water will lead to a better future for our children and grandchildren.

► To learn more about what is happening in Virginia, visit [cbf.org/Virginia](http://cbf.org/Virginia).



In February, CBF held an oyster roast on the capital grounds to educate legislators about the importance of the mighty oyster. Seen here are Virginia Senior Fisheries Scientist Chris Moore and Zack Greenberg, Officer, Conserving Marine Life in the U.S. at The Pew Charitable Trusts.

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MEGAN FINK/CBF STAFF

# KALLAN BENSON

Kallan Benson joined the CBF Student Leadership Program in 2018 after meeting CBF Student Leaders at Maryland's annual Environmental Legislative Summit.

## Bringing the Planet to a Safe Place

**Kallan Benson grew up along Maryland's Severn River, fishing, swimming, kayaking, and sailing.** Her connection to the Bay runs deep and her passion is clear: Create a lasting, positive impact on her local community, the Chesapeake Bay watershed, and ultimately, the planet we live on. Whether she's engaging representatives or captivating the public with painted images on parachutes, she is asking for people to get involved.

Kallan and her fellow student leaders have travelled across the Bay watershed to meet scientists, watermen, and elected officials. Gathering evidence from all perspectives to answer one question: How do we work together to save the Bay? For Kallan, this means we must address climate change.

Kallan created Parachutes for the Planet, a campaign designed to raise awareness about the people, places, plants, and animals that will be negatively impacted by climate change. It has inspired art from 72 countries and 43 U.S. states. Kallan's work on this campaign and in the Fridays For Future (FFF) movement earned her

Amnesty International's 2019 Ambassador of Conscience Award alongside climate activist Greta Thunberg. Kallan also received (and returned on behalf of FFF) the United Nations Environment Programme's Champions of the Earth Award. She stood before a room full of world leaders and said, "We understand the Champions of the Earth award is a great honor, but we cannot accept it. Instead, we offer to hold it for you to earn."

Kallan's spirit and determination gives us hope that the Bay will be cared for and appreciated by future generations. Not only will her efforts help save the Bay, her work will help restore and protect our planet. Kallan and our CBF student leaders view addressing the Climate Crisis as part of their mission to help save the Bay. We are proud to stand with them. ✨

**LEARN MORE:** Listen to Kallan discuss Parachutes for the Planet in this 2018 podcast with Will Baker: [cbf.org/parachutes](https://cbf.org/parachutes).

# Together, we are one voice for clean water.

CBF's founders started with a simple concept: create an organized voice for citizens to combat the pollution and development affecting the Chesapeake Bay. What began as a staff of three and 2,000 members working to save the Bay has, over fifty years later, engaged hundreds of thousands of advocates in the fight for clean water.

CBF aims to significantly increase, diversify, and intensify the voices demanding clean water in congressional offices, the courts, and our communities. CBF will mobilize this powerful network of engaged individuals to ensure the successful implementation of pollution-reduction commitments by 2025. Together, our collective voices will help save the Bay.

Please join us at [cbf.org/takeaction](https://cbf.org/takeaction).





# Bands *in the* Sand

2020 Bands in the Sand has been cancelled due to COVID-19.

**THANK YOU**  
to all our supporters  
and sponsors.



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**SEE YOU NEXT YEAR!**

Bands in the Sand will be held Saturday, June 12, 2021.

Connect with us!

Chesapeake Bay Foundation

✉ 6 Herndon Avenue, Annapolis, MD 21403

☎ 410-268-8816  chesapeakebay

@ stbeditor@cbf.org  chesapeakebay

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