

# BREAKING Systemic Barriers

BEING BLACK IN THE AQUATIC SCIENCES AND RELATED FIELDS

BY LAUREN D. PHARR



*Kayelyn Simmons, winner of a prestigious John A. Knauss Marine Policy Fellowship from Sea Grant*



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**D**iversity fuels innovation and performance, according to a study from *Harvard Business Review*. It allows us to experience different perspectives and incorporate various ideas, which, in turn, ultimately helps broaden the array of available options and opportunities.

Yet, communities of Black, Indigenous, and People of Color (BIPOC) are underrepresented in science. Pew Research Center reports that African American scientists, in particular, make up only 9% of the STEM workforce.

When we look at the aquatic sciences and related disciplines, from marine biology to wetland ecology to coastal resilience, we can see how Black scientists are persisting and breaking barriers in white-dominated fields. While these scientists conduct the work they love, they also encounter hardships in both academic and research settings.

Here are four stories from Black scientists about their first-hand experiences with systemic obstacles, their resilience, and their advice about how to move forward.

## A Black Woman in Marine Biology

Kayelyn Simmons, a 2021 recipient of Sea Grant's prestigious John A. Knauss Marine Policy Fellowship, is no stranger to the ocean.

"As a kid, I grew up spending most of my time outside," says Simmons, who became open water S.C.U.B.A.-certified in 2009. "I was definitely a 'wild child.' My earliest memories are of taking family vacations to Hilton Head and Myrtle Beach. This is what got me interested in marine biology."

Simmons, now a Ph.D. candidate in the Marine, Earth and Atmospheric Sciences program at NC State University, originally had wanted to become a veterinarian for marine

animals. However, over time she sought out another career path that would fulfill her love for the ocean and the outdoors. She attended Hampton University, an HBCU (Historically Black College or University) in Hampton, Virginia, where she received her bachelor of science degree in marine and environmental science.

While at Hampton, one of her professors, Deidre Gibson, saw Simmons's potential and mentored her, even speaking to her mother so she could pursue an undergraduate internship funded by the NOAA Living Marine Resources Cooperative Science Center.

Simmons soon began her first internship at the Monterey Bay Aquarium Research Institute in Moss Landing, California. She conducted research studying deep-sea marine worms and recalls getting to eat her lunch on the beach while viewing seals and dolphins. The internship also provided her the opportunity to become

S.C.U.B.A.-certified.

"Once I became S.C.U.B.A.-certified and completed my internship, that's when I officially decided no more vet school," she says. "I wanted to do marine biology."

The years ahead would bring Simmons great successes but also moments of struggle. Being Black in marine science is one thing, but being a Black *woman* in marine science presented other challenges during her fieldwork.

"As a Black woman, I feel like sometimes when I come off as a strong person, people think that I'm not being considerate," she says. "However, it seems like that kind of initiative is acceptable for anyone else. Even when trying to make a connection and collaborate with other agencies, I found my thoughts and ideas being conveyed and taken by someone else."

She also notes another added layer of concern to Black women that our counterparts might



*At Hampton, Deidre Gibson (right) mentored Kayelyn Simmons (left), even speaking to Simmons's mother so she could pursue an undergraduate internship funded by the NOAA Living Marine Resources Cooperative Science Center.*





*Prior to graduating from The Citadel, Austin Gray (above and left) initially thought he would practice medicine or serve in the Air Force. Instead, the former North Carolina Sea Grant and Water Resources Research Institute Fellow earned his Ph.D. and now works in environmental toxicology.*



not face, particularly out in the field: our hair.

"I was in the car with one of my colleagues on the way back from fieldwork," Simmons recalls. "As I went to fix my hair, I noticed that she made the effort to adjust her rear-view mirror to look at me in amazement. I thought, 'Am I her first Black friend?' I had not experienced that since childhood, and oddly enough it made me feel slightly uncomfortable."

From then on, planning how she would fix her hair and dress before going out into the field became a whole new task for Simmons. She now

gets easy-to-manage braids in all kinds of colors: blonde, red, even blue and black. (She also buys very fashionable underwater leggings.)

In academic settings, Simmons also has noticed incidences as a Black marine biology student that have led her to feel strongly that we need to change how we think about progress when it comes to diversity.

"I wish we not only focused on diversity with regard to inclusion but also diversity as an *investment*, where we do not only value meeting simple requirements," she says. "Just how advisors or mentors see and cultivate their students' strengths — I know not every African American student who successfully enters college gets the chance to have someone see and invest in them. It will take more work beyond diversity and inclusion to achieve diversity investment."

### A Black Aquatic Ecologist Sampling Streams and Wells

Prior to graduating from The Citadel in 2013, Austin Gray initially thought he would

practice medicine or serve in the Air Force. Instead, the former joint North Carolina Sea Grant and Water Resources Research Institute Fellow earned his Ph.D. and now works in environmental toxicology.

Originally from North Charleston, South Carolina, Gray is the youngest of five boys. He says he found his voice early on and always made it a point to state his opinion. He remembers he also developed an early affinity for science.

"You could say it all started from watching Bill Nye the Science Guy," he says. "When I was young, I wanted to be an M.D., but I didn't really know what that truly entailed. After my first year of college, I landed a work study job in an aquatic toxicology lab with John Weinstein, cleaning glassware. As time went on, I found myself beginning to listen more about the research that was taking place."

Weinstein's research, at the time Gray started working in his lab, focused on personal care products, specifically "green products"

*Continued*





Adam Rosso

*Alex Troutman (above and right) conducts research on the diets of seaside sparrows, a species endemic to marshes and wetlands. With sea levels continuing to rise and continuous coastal development, these sparrows are losing their habitat.*

that were marketed as environmentally friendly. “Our research, however, found that some of these products were either more toxic or equally toxic to the environment.”

Becoming more intrigued, Gray began to work his way into the field to help with the project alongside graduate student Jonte Miller. By the end of the summer, his interest had been sparked. He wanted to understand how emerging contaminants can impact aquatic habitats, and by the beginning of his junior year, he began his own independent research project.

He went on to get his master’s in biology at The Citadel, investigating microplastics. After a subsequent year with the Medical University of South Carolina in the NIH’s Post-baccalaureate Research Education Program, he entered the University of North Carolina at Greensboro’s Environmental Health Science program. There, he earned his Ph.D., studying antibiotics in rural and urban streams in the Piedmont of North Carolina.

“A typical day would vary between doing lab work and fieldwork,” he says. “The lab work would involve me getting up early and working through my research protocol, thinking about what I wanted to accomplish that day, as well as performing extractions on water, sediment, or aquatic invertebrates I had collected. Collecting samples can make up about a 6-to-8-hour day. Fieldwork requires a lot of time prior in

preparation, to ensure all needed supplies are sorted and organized.”

Fieldwork also brings opportunities for Gray to share his passion for what he does with people who inquire, creating many positive educational experiences. However, sometimes conducting fieldwork also brings challenges.

“I enjoy interacting with the public,” he says. “There’s always someone around who is curious about what I am doing. This is a chance for me to relay my research and to make that connection. Yet, you can imagine being Black in science comes with a lot of hazards, warnings, and issues of safety.”

In the field, Gray can recall being approached by a group of men, and being singled out amongst his research group and addressed as “homie.” Luckily, his advisor intervened to remove him from the situation. During his dissertation work, when he studied antibiotic pollution in rural drinking wells, after successfully recruiting study participants to allow him to sample water on their property, it became a different story once they found out he was Black.

While out in certain parts of North Carolina, Gray has also found himself being followed by trucks with Confederate flags.

“Now when I go out, I call or message my mom and wife to update them on my progress and where I am, he says. “This is not something that certain groups of people would probably have

to think about when they’re doing their fieldwork.”

Even in academic settings, Gray has felt isolated. Being an “A” student in graduate school, though, and receiving presentation awards, grants, and fellowships, won him a belated sense of respect from peers and faculty.

“I found that after I performed above their expectations, or received an award, then people would interact with me more,” he says. “It showed me they didn’t think I was capable, until I proved to them I was.”

With the University of Cincinnati’s Latonya Jackson in 2018, Gray co-founded a diversity committee within the globally-recognized Society of Environmental Toxicology and Chemistry. They had realized that institutions (and society as a whole) were not dedicating or promoting many resources to support the careers of Black scientists and other scientists from groups historically excluded.

For Gray, it was important they founded that committee, despite many barriers, at a time when people often were more hesitant to focus on diversity in science.

“With everything that was highlighted with the tragedies of George Floyd and Breonna Taylor in 2020, I think it took this for institutions to begin to realize how our institutions are lacking diversity, and in turn lacking understanding into the needs and worries of people from underrepresented and exploited groups in science,” he says. “Now that





we have been 'seen,' I wish they would have seen us earlier, along with the countless others."

### A Black Wetland Ecologist in the Marsh

Alex Troutman, a graduate student at Georgia Southern University and recent recipient of the Bill Terrell Graduate Research Grant from the Georgia Ornithological Society, has always loved being in natural settings.

Troutman grew up about 20 minutes from Atlanta in Austell, Georgia, and he credits fishing with his family, visiting state parks, and the creek in his own backyard for inspiring him to pursue a career in ecology.

"I had a friend who would always come over, and we would go out and try to find salamanders," says Troutman. "We would also have competitions every summer to see who could catch the most fish."

In college, Troutman wavered about what he wanted to do for his career, jumping between becoming a veterinarian and studying middle

school education. However, a mammalogy and ornithology course inspired him, and he found an opportunity to pursue his passion for the outdoors.

After graduating with a degree in biology from Georgia Southern, Troutman worked for a few years as a professional biologist with multiple agencies and various wildlife species, including the endangered Kemps Ridley sea turtle and Karner blue butterflies. He now pursues a master's in conservation biology at Georgia Southern.

His research involves investigating the diets of nestling seaside sparrows, a species endemic to marshes and wetlands. With sea levels continuing to rise and continuous coastal development, these sparrows are losing their habitat for nesting, along with their primary source of food: insects.

Being out in the marsh can be fun; every day brings something different. Working with the tide is key, or else you can get flooded out. It can also be a challenge walking through the terrain.

"One wrong step, and you may have found yourself 5 feet deep in mud," Troutman jokingly says.

As a Black man in a white-dominated field, Troutman says he has been fortunate in his many professional positions, but he also says that carrying out fieldwork near the place of a tragic act of racist violence can leave him uneasy.

"Both of my field sites are within a 7-mile radius of where Ahmaud Arbery was murdered," Troutman says. "I have to pass his neighborhood every time I go to the field site; it is challenging and heartbreaking. I usually walk slower to the truck or add another task to do while in the field, until people leave. Other times, it's hearing yelling from a passing truck. Most of the time it's something related to my university." Georgia Southern's logo is on the field truck. "But other times it's the N-word or something else obscene."

Troutman says that the murder of Arbery, an unarmed 25-year-old Black man who was pursued and fatally shot while jogging near Brunswick, Georgia, resonates with him for many reasons. As a seasonal wildlife biologist, Troutman's work often takes him into predominantly white neighborhoods, where he too goes out to exercise or look for wildlife.

"We have to make ourselves less threatening just to enjoy the outdoors like our white counterparts," Troutman says. "If we want to go for a run, then instead of a hoodie, maybe we should wear a sweatshirt and a ball cap or beanie instead. We can be warm but still not look threatening. Or maybe it's smiling and waving at people that pass you by, so you look friendly."

### An Afro-Latina Social Scientist Researching Disasters and Climate Change

Michelle Dovel's Afro-Latina roots are strong. Born in Miami to African American and Dominican parents, she describes herself as having been a very quiet, shy, and reserved kid. However, as she reached her teen years, she broke out of her shell and eventually became more vocal and outgoing. Moreover, she has always been naturally observant and fascinated by both the natural and social sciences.

Dovel says the events leading up to Hurricane Katrina, as well as the aftermath, prompted her interest in disaster and climate change research. At 17, she remembers watching images on television of people treading through the chest-high floodwaters and climbing onto their rooftops to cry for help. The catastrophic event devastated the Gulf Coast, displacing hundreds of thousands of residents, leaving areas of Alabama, Louisiana, and Mississippi utterly destroyed. *Continued*



She also remembers what people had to say about the hurricane's victims: "They're stupid. They should have left."

At the time, she says, she didn't have the language or tools to really deconstruct what was happening. But a few years later she would.

While at the University of Florida, Dovel was assigned a reading from Michael Eric Dyson's *Come Hell or High Water* that answered her questions and provoked new curiosities regarding disasters and social inequalities. She went on to complete both her master's and Ph.D. in sociology at Howard University, studying disaster research and climate change. She focused on answering some of the same questions Katrina and other disasters had raised for her and many others: "Why didn't residents evacuate before the hurricane? Why do people often decide to return to high-risk, vulnerable areas?"

As a former graduate research fellow with both NOAA and the Bill Anderson Fund, and now as a visiting assistant professor and researcher at Howard, Dovel continues to break barriers as an Afro-Latina social scientist.

"Growing up, I thought that people like me don't get Ph.D.s," she says. "But as an Afro-Latina and social scientist, I have received three research grants: two from the Department of Homeland Security and another from the National Science Foundation."

Such success is rare so early in any young researcher's career, but Dovel doesn't care about accolades; she cares about her students and loves to use her teaching and research as an avenue to train them, as she puts it, "to be amazing." North Carolina Sea Grant hosted Dovel and two undergraduates from Florida A&M during the summer of 2019, for instance, while she gave them hands-on experience conducting research in coastal communities.

Dovel also has experienced daily moments of struggle and uncertainty.

"As a Black and Latina woman I live in a world that constantly tells me that I'm not good enough and reminds me every day that I don't deserve to be in certain spaces," she says. "There are certain things that I have to do to make sure I am not a threat to anyone, and I know that my professional and academic success does not shield me or any other BIPOC from racism or sexism. When I walk outside, no one knows I'm a professor at one of the most prestigious HBCUs with an NSF-funded project, and I can't walk

around with a sign on my back that says, 'I'm not a threat. Don't shoot me.'"

Once, after she received a travel grant to a conference, tired from walking and wanting a drink and a snack, she headed to the refreshment table, where a conference employee stopped her.

"That's not for you," said the employee. "That's for people who are here for the conference."

Dovel found herself upset by having to reassure the employee that she was a part of the conference.

"It's instances like these where you feel like you have to make sure your nametag is visible," she says, "just so you won't be singled out because you are Black."

## Listening and Learning

These experiences are all too real for Black scientists, but they have informed the perspectives of Kayelyn Simmons, Austin Gray, Alex Troutman, and Michelle Dovel about how institutions and organizations can better raise awareness and promote diversity, equity, and inclusion.

Simmons suggests publicizing resources

and recognizing faculty, staff, and researchers who actively are working for diversity. Dave Eggleston, for instance, her advisor at NC State, is trying to establish partnerships with HBCUs in North Carolina for internships through their lab.

"If there were more professors, mentors, or science leaders that focused on investing in students from diverse backgrounds or even partnering with minority-serving institutions, then diversity and inclusion would be an everyday endeavor," she says. "Instead, the focus would be on promoting professional growth and development for life after college."

Gray wants to contribute to permanent change within academia. He will be an assistant professor in the department of biological science at Virginia Tech beginning in August and plans to start his own laboratory, with training dedicated to inspiring a new, more diverse generation of scientists from a wide range of backgrounds.

Gray says it means a lot for students to see a young Black professional who looks like them.

"For institutions working towards diversity or changing their demographics, it has to be done in a genuine effort, rather than just an effort to







*Even with her early career successes, including two grants from the Department of Homeland Security and another from the National Science Foundation, Michelle Dovil most enjoys mentoring her students. In 2019, North Carolina Sea Grant hosted Dovil (middle, above) and Florida A&M undergraduates Tia Maxwell (left) and Tenesha Washington (right), while they conducted research in coastal North Carolina communities.*

appease people,” he says. “If it’s done genuinely and it’s done where the voices of those that are marginalized or hurt are valued, then you will see a change.”

When it comes to diversity and inclusion, Troutman is no stranger to the cause. He co-organized *Black in Marine Science Week*, a social media campaign that celebrated minority peoples who work in the marine sciences and other related fields. He says he hoped the campaign would amplify and encourage minorities to pursue a career in the marine science field.

Troutman also is devoted to encouraging people of all ages to learn about nature and enjoy the outdoors. He hopes to create a foundation that brings Black, Brown, and students of lower socioeconomic status into a natural resource field.

“So many people highlight the ‘glamour jobs’ like engineering or being a doctor, but they rarely highlight the outdoor and natural resource jobs,” says Troutman. “Although they may not be six-figure positions, we still need people to do these jobs.”

Dovil says that she has seen many statements on diversity, equity, and inclusion from

D.E.I. committees, and she has attended many meetings. But she has not yet witnessed a lot of structural changes to enhance recruitment, retention, and promotion.

She recommends that institutions and organizations do more than put out D.E.I. statements and actually work on tackling these structural problems. Most of these institutions and organizations are aware of their issues regarding a lack of diversity, equity, and inclusion, she says. They have the data — such as how many white, Black, Latino and Latina people they hire, retain, and promote.

Dovil says you can look around your meetings and lunchrooms and see some of these issues. “Just hiring more women is not sufficient when it comes to diversity and inclusion.”

It also is not enough to try to be diverse and inclusive, she explains.

“Institutions and organizations must also acknowledge all forms of racism that take place and actively work to be antiracist,” she says. “I just find it interesting how some people can manage to do quantum physics and get men on the moon, but they just can’t understand basic race relations in America.” 🌐

- Watch a video about the innovative research that Michelle Dovil and her students conducted at the North Carolina coast  
[go.ncsu.edu/Dovil](https://go.ncsu.edu/Dovil)
- The Society of Environmental Toxicology and Chemistry, where Austin Gray co-founded a diversity committee  
[globe.setac.org](https://globe.setac.org)
- “Citadel Study Casts Doubt on ‘Green’ Product Claims,” the research that drew Austin Gray to the field  
[go.ncsu.edu/not-green](https://go.ncsu.edu/not-green)
- The NOAA Living Marine Resources Cooperative Science Center, which supported an internship for Kayelyn Simmons  
[umes.edu/lmrccsc/](https://umes.edu/lmrccsc/)
- North Carolina Sea Grant’s commitment to diversity, equity, and inclusion  
[go.ncsu.edu/DEI](https://go.ncsu.edu/DEI)