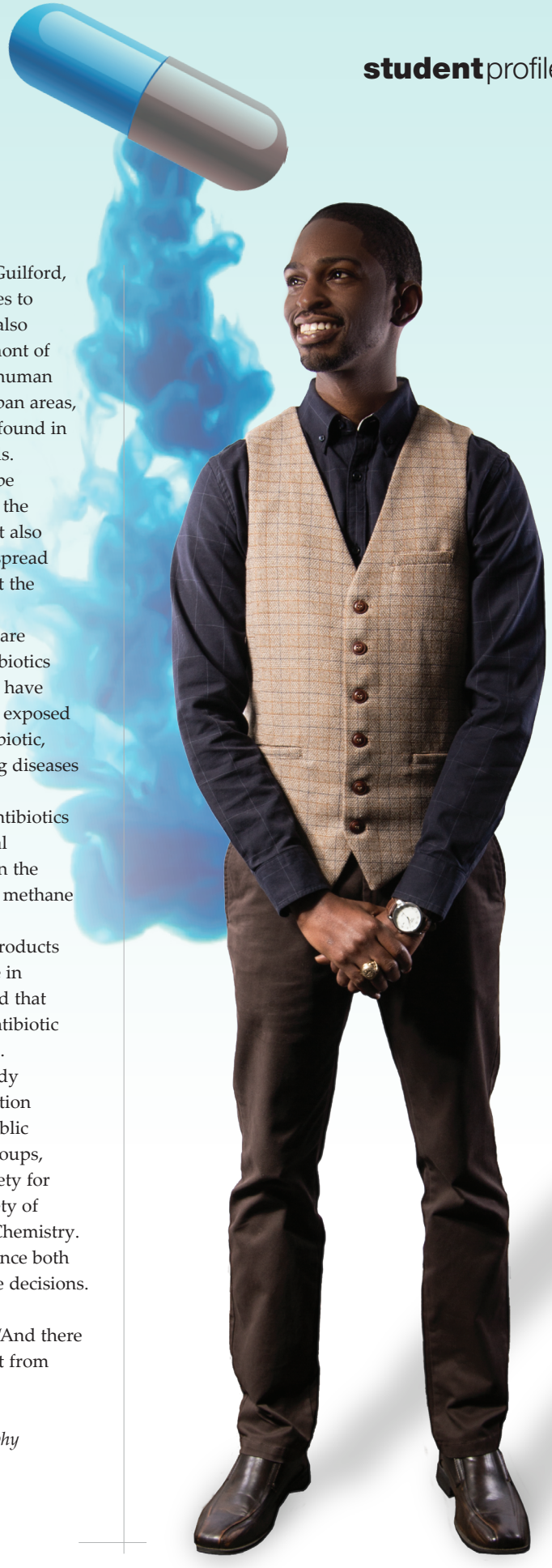
Water, water everywhere

Austin Gray, graduate researcher



Environmental Health Sciences PhD student Austin Gray hails from Charleston, South Carolina, a harbor city nestled among three rivers. Considering his hometown's relationship with water, it's no coincidence it became his academic focus.

Gray started as pre-med at The Citadel, but when a work-study position put him in an aquatic toxicology lab, he was hooked.

"I saw that environmental health and human health are intertwined," he says. "The importance of water quality amazed me."

In Charleston, where seafood is central to the culture and floods are often possible, it was easy for him see the health consequences of contaminated water or a compromised aquatic environment.

While a master's student at The Citadel, Gray researched aquatic estuarine areas, green products, and microplastics — tiny plastic pieces that can threaten aquatic life. His lab's research, shared through town meetings, even led to the banning of plastic bags by several South Carolina towns and beaches.

Gray came to UNCG to work with Morton Distinguished Professor Anne Hershey, whose scholarship on urban streams caught his interest. He wanted to design a project that examined stream ecology and pharmaceuticals.

"It was aquatic research, but with a completely different focus. I knew working with her would add to my skill set and allow me to become a better scientist."

During his first year as a doctoral student, Gray received a UNCG O'Brien Award for Ecological Field Research to investigate antibiotics in urban streams of Greensboro. With a biology department grant, he also initiated work in North Buffalo Creek, near campus.

Subsequently, through Hershey's lab and a fellowship from NC Sea Grant and the Water Resources Research Institute of the UNC System, Gray has conducted research investigating antibiotic pollution in North Carolina rural streams and drinking wells in three counties.

Gray contacted residents of Guilford, Randolph, and Alamance counties to sample their drinking wells. He also sampled 17 streams in the Piedmont of North Carolina, looking at both human antibiotics, typically found in urban areas, and veterinary antibiotics, often found in rural areas and close to farmlands.

The project's findings could be crucial, not only for determining the health of water environments but also in demonstrating just how widespread antibiotic pollution is throughout the Piedmont.

As Gray explains, if humans are exposed to trace amounts of antibiotics through drinking water, that can have adverse effects. One is that those exposed may become resistant to the antibiotic, rendering it ineffective in treating diseases and infections.

"There is also concern that antibiotics in the water can change microbial functions, which play key roles in the nitrogen cycle, carbon cycle, and methane cycle," Gray says.

Improper disposal of these products is what leads to their appearance in our water, and Gray has observed that instructions about responsible antibiotic disposal are not widely available.

He has been seeking to remedy that problem by sharing information at local community meetings, public schools, universities, outreach groups, and conferences such as the Society for Freshwater Science and the Society of Environmental Toxicology and Chemistry. He hopes his research will influence both individual behavior and land use decisions.

"We do play a role in our environment's health," he says. "And there are steps we can take to protect it from antibiotic pollution."

By Susan Kirby-Smith • Photography by Mike Dickens • Learn more at https://biology.uncg.edu