

## SPOTLIGHT FROM THE FIELD:

# Durham Public School District

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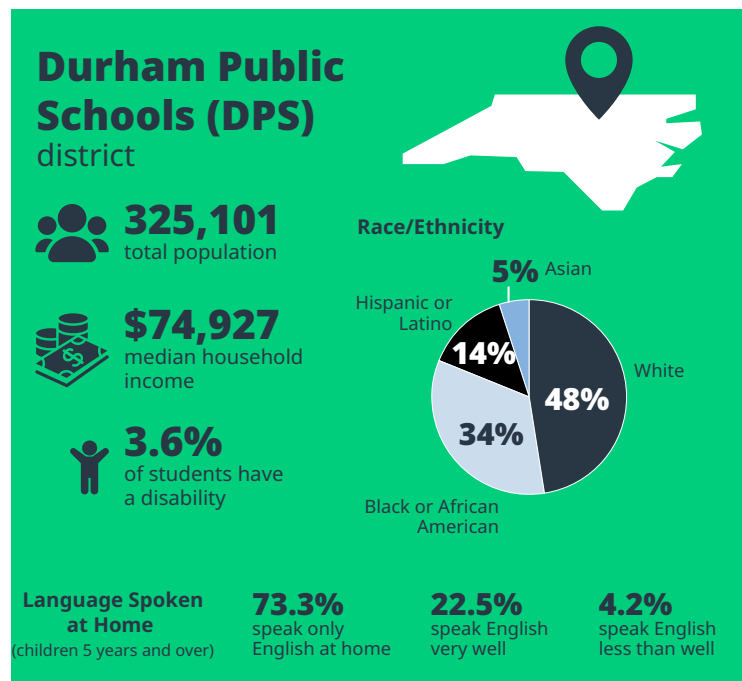
**Education systems must equip young people with the knowledge and skills they need to address the long-term effects of climate change, which they will feel for the rest of their lives.**

To advance climate change education in the United States, FHI 360 proposed four research-based strategic recommendations:

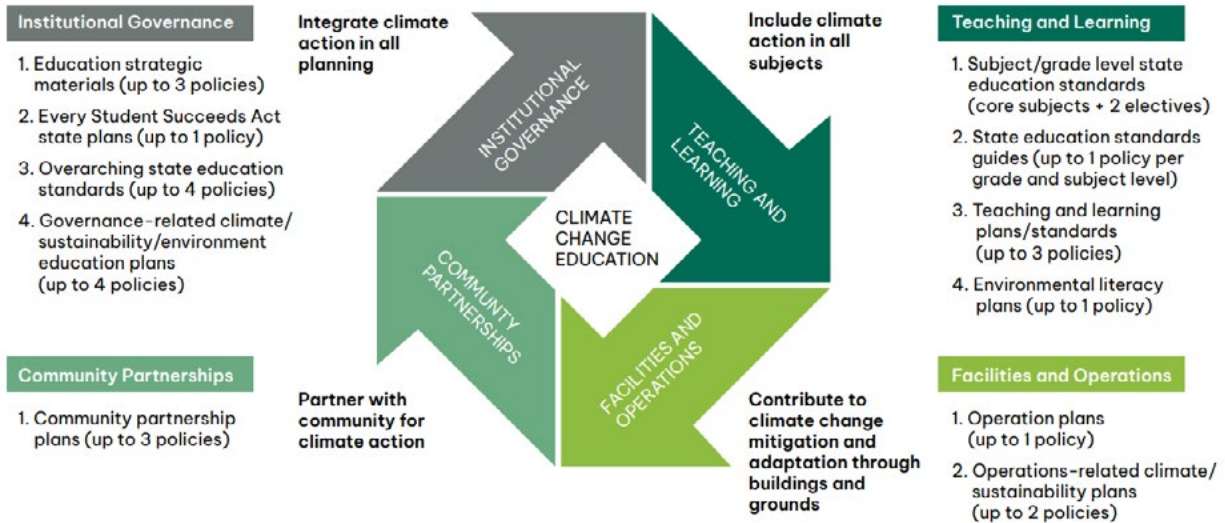
- Enact policy to support climate change education at national, state, district, and school levels
- Provide access to high-quality curricula and materials that are grounded in scientific evidence.
- Support educators with training and professional development.
- Scale up out-of-school time and work-based learning models.

This spotlight shows one school district's actions in these areas, exploring first steps, successes, and challenges. We hope this example helps other districts and states develop their own vision for advancing climate change education and prepare their students for a more sustainable future.

Durham Public Schools District (DPS) sits at the intersection of urban and rural areas, a setting that provides robust educational opportunities for students to explore the impact of climate change in their daily lives—such as the methane and nitrous oxide emissions caused by the area's large hog farming industry and urban heat islands. To ensure climate change education remains a priority, DPS developed a structured, multifaceted strategy that draws on in-house and external resources to mobilize a team of action-oriented individuals committed to equipping the next generation of students with the knowledge and skills to address climate change. The district implemented system-wide structural changes to enhance climate change education by engaging local partners, supporting teachers through training and resources, and providing students workforce opportunities.



[ACS-ED District Demographic Dashboard 2018–22, Durham Public Schools, North Carolina](#). Institute of Education Sciences (IES) National Center for Education Statistics (NCES).



FHI 360's definition of climate change education aligns with the Monitoring and Evaluating Climate Communication and Education Project's framework as outlined in their report, [Mapping the Landscape of K-12 Climate Change Education Policy in the United States](#).

## Systemic and Strategic Approaches at State and District Levels

### Strategic recommendation: Policy to support climate change education at multiple levels

While North Carolina does not have statewide policy requirements for climate change education, we do see two examples of systemic approaches: statewide professional development for teachers and the adoption of new science standards. In response to the U.S. Environmental Protection Agency's 2019 "Endangerment Finding" showing that greenhouse gas pollution contributes to climate change and threatens the health and welfare of future generations, the North Carolina Department of Environmental Quality launched a statewide professional development program to support educators in teaching climate-related topics such as atmospheric chemistry, air pollution, combustion, clean energy solutions, and more. The department continues to offer a range of capacity-building supports, including an [online hub](#) that provides evidence-based environmental education resources such as curricula, lesson plans, and student materials.

North Carolina's newly updated 2024–25 science standards explicitly address climate change. While climate change is currently embedded only within science standards, DPS's district-wide design incorporates research findings that show the power of providing students with a comprehensive climate change education that extends beyond the science classroom. Incorporating climate

change education across different classes and content areas helps students experience the issues from different perspectives and disciplines, giving them a holistic understanding of the problems and solutions. Two key aspects of DPS's approach are its Career and Technical Education (CTE) Department and its partnership with a municipal agency:



All photos by Jessica Scranton for FHI 360 of students and staff of Durham Public Schools in September 2022.

- DPS's CTE Department offers tailored pathways of study, including several career clusters that prepare students for green jobs—jobs that benefit the environment or conserve natural resources—in agriculture; food and natural resources; architecture and construction; and science, technology, engineering and mathematics (STEM).
- As part of its mission to provide technical assistance and environmental education to county citizens, the Durham County Soil and Water Conservation District provides environmental resources, teacher newsletters, field days, classroom presentations, an environmental education learning library, and conservation contests.

DPS staff note that an important ingredient in their climate change education work is the support of district leadership, also key to a successful district-wide approach. The executive director of elementary curriculum and instruction, Linda Tugurian, Ph.D., is a former science specialist with a passion for climate change education. Having a content expert on senior leadership supports informed and strategic decisions that lead to effective and multifaceted implementation.

Additionally, to sustain a focus on climate change education, DPS created two dedicated district positions: an outdoor learning specialist who provides environmental and climate change education supports to teachers, and an energy manager, who helps identify district-level energy savings. The district recently hired a second energy manager after they saw how much money this role could save the district long-term). By establishing these two positions, the district helps ensure that climate change education and climate-friendly infrastructure improvements can happen simultaneously. In this way, the district is implementing good environmental practices while also giving students the knowledge and skills to be good climate stewards today and in the future.

The district's outdoor learning specialist, Erin Carroll, takes pride in being the first person hired in this role for DPS. She was hired after the school board, responding to a post-pandemic decline in students' engagement with the outdoors and nature, allocated funds for a district-level staff member to support environmental and outdoor learning initiatives. Environmental education prepares students to understand environmental issues and make informed and responsible decisions related to climate change and other urgent issues. To support this process, Carroll provides professional development for teachers in both formal and informal settings and works directly with teachers and students in the field, helping to foster a love for the outdoors.

While conducting her signature "walk around the school," Carroll tours a school campus with teachers and asks reflective questions such as "How do you use this outdoor space?" "How could this space be used for learning?" and "Can you think of any standards that connect to this outdoor space?" This hands-on approach helps teachers discover how to engage students in authentic outdoor learning right outside their buildings. She also sends monthly newsletters to teachers and administrators, sharing district-specific outdoor learning initiatives, grant opportunities, field trips, nonprofit conservation programs, lesson ideas, and local resources. Additionally, Carroll collaborates closely with the district's science specialist to integrate outdoor learning into ongoing district efforts, ensuring it aligns with broader educational initiatives.



While the outdoor learning specialist focuses on education, the energy manager primarily focuses on establishing a green district infrastructure and sound energy management (e.g., lights, charging stations) that save energy and money and support the district's commitment to sustainability. While not directly focused on climate change education, energy management and sustainability work support instruction in important ways. [According to David Schuler, executive director of AASA, the School Superintendents Association](#), green solutions serve as an educational tool and inspiration, showing students that "innovation is not limited to products or technologies but is a mindset, a way of engaging with the world. By integrating energy-efficient technologies and renewable energy sources, we show students that innovation applies to every aspect of life, including their learning environments." One example of this in DPS is when energy managers Aaron Hope and Chelsea Simmons presented

to teachers at the summer professional learning academy on how schools and classrooms can support energy conservation efforts. Hope and Simmons also created the 2024–25 Energy Champions program, where multiple schools commit to making sustainable school-based changes to reduce energy consumption.

## Curriculum Maps and Resources for Hands-On Learning

One way DPS is working to expand climate change education beyond the supports the outdoor learning specialist and energy managers provide is through evidence-based materials. In addition to the CTE curriculum and resources from state and local environmental agencies, Emma Refvem, the current science specialist, and her team have developed curriculum maps that outline each science unit, detailing the standards covered and providing information to enhance students' understanding. For example, [this 8th grade curriculum map](#) includes lessons on how greenhouse gases affect climate and how human activities (fossil fuels, agricultural practices, and refrigerants) contribute to greenhouse gases. Additionally, to offer hands-on experiences, Refvem and her team can supply teachers with instruments and learning kits, such as temperature sensors for lessons on extreme heat and investigation kits, for elementary and middle school students. High-quality, hands-on learning activities are not only engaging for students but also [have been shown](#) to strengthen student academic outcomes.

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**Strategic recommendation:  
High-quality curricula and materials**

## Teacher Passion and Partnerships for Equipping Educators

While professional development for climate change education for all teachers is not a district requirement, Refvem, DPS's science specialist, works with local organizations to ensure interested teachers receive quality support beyond the resources offered by state and local environmental agencies. Located within North Carolina's "research triangle" (made up of Raleigh, Durham, and Chapel Hill), DPS has a wealth of universities, research organizations, museums, and nonprofits that can provide professional development to DPS teachers on a variety of climate-specific topics, and many organizations seek partnerships with teachers as part of their mission or grant requirements.

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**Strategic recommendation:  
Training and professional development**





While they are building systems and structures for climate change education, DPS focuses on supporting early adopters and passionate educators open to leading the way. For instance, one environmental science teacher subscribes to multiple listservs about local opportunities, attends conference sessions on climate change education, became a local leader for the Climate Reality Project, serves on a local climate education task force—and shares resources and what she learns with fellow teachers. “If you take the time to look at the things that are offered to us, they’re there,” she explains. “I just think it’s a matter of priority for each teacher.” With support from the district and school leadership, she is creating a professional learning community (PLC) structure with other science teachers in her school to share best practices. She plans to regularly incorporate climate change and culturally relevant, place-based learning into the PLC.

DPS’s partnership with Durham’s Museum of Life and Science also plays a significant role in integrating climate change education across the district. One of the many valuable supports the museum provides is Step Outside, a program that offers professional development to teachers on how to establish outdoor classrooms for environmental education. The partnership with the museum also includes hands-on field trips, curriculum materials aligned to North Carolina’s K–12 science standards, an annual youth climate symposium, weekly visits to participating elementary classrooms, and an after-school program grounded in social justice. The museum has benefited from the partnership as well. Tomara Gee, the museum’s director of STEM learning, credits much of the museum’s success to the relationship it has built with DPS over the years.

## The Power of Field Trips, Summer Camp, and Workforce Experience

Out-of-school time learning or workforce development programs and internships are a powerful way for students to learn about climate change. For example, Durham Public Schools’ [Hub Farm](#)—a 30-acre farm, forest, and aquatic outdoor learning center that features gardens, a forest trail, livestock, a creek, and a pond—offers students valuable place-based environmental education opportunities through both in-school and out-of-school time learning experiences that include a summer camp, field trips, and an internship program for high school students.

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**Strategic recommendation:**  
**Out-of-school time and  
work-based learning models**

The summer camp, a two-week program for rising first through fifth graders, currently focuses on general environmental education and literacy. The school field trips offer a tailored approach that allows teachers to select the experience that best aligns with their goals, including meeting the new climate change standards. For example, teachers can select a self-guided tour of Hub Farm for their class; a content-specific trip where Hub Farm staff provide a hands-on outdoor lesson aligned with Common Core and the state's standards; or a collaborative approach where teachers and Hub Farm staff tailor the trip to what is being taught in the classroom.

The Hub Farm's internships are part of DPS's commitment to providing industry-specific training and work-based learning to empower students as effective citizens. The internships, which currently pay \$15 an hour, are available to high school students. Interns gain hands-on experience in areas such as agriculture, landscaping, media, marketing, land stewardship, business development, sales, and animal science. Students enjoy the opportunity to explore outdoor careers they might not have otherwise considered; many enjoy the experience so much that they reapply.

Students have access to other internship opportunities through DPS's CTE Department. One popular internship related to climate change is the Rain Garden Internship offered by the Bionomic Educational Training Center. This three-week program aims to enhance students' STEM and environmental literacy through in-person and virtual learning. Students receive a \$220 stipend for completing the internship. Rachel Owens, a science teacher in the program, highlights the hands-on experience it provides, as it often inspires students to pursue green jobs. Reflecting on the value of experiential learning, she shares, "In a dream world, we'd be outside more, traveling to see the effects of climate change firsthand — whether that's at the beach, in the mountains, or on farms. That's where real learning happens." These opportunities are not only essential to providing students with high-quality, hands-on education, but in many cases, students rely on summer jobs and would not be able to participate without compensation.



With many of these opportunities taking place away from school campuses, additional challenges arise. Students need transportation to and from the site, students need access to meals, and teachers need substitute teachers. All

of these needs require additional funding and resources that a district may not have. To meet this need in DPS, many teachers and district staff write grants to support field trips and internships. Ultimately, more and consistent funding is needed to ensure that access to the program is equitable and sustainable.

## Key Takeaways



DPS offers important insights that districts can use to further their own climate change education efforts. Specifically, district staff and educators can consider the following recommendations:

1. For districts that do not have the support of leadership (e.g., superintendent, science specialist, director of education), build coalitions and generate momentum through student, family, and community engagement.
2. Partner with organizations that have high-quality materials and professional development to support teachers' instruction and students' workforce opportunities.
3. Encourage community members to advocate for funding positions such as the outdoor learning specialist and the energy manager to help sustain their climate change actions.
4. Consider racial and income inequality when providing students with educational opportunities.