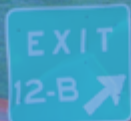




It Takes a Village — Advancing
Environmental Health
& Human Well-Being

REPORT & RECOMMENDATIONS



NC BREATHE 2024

Post-Conference Report & Recommendations



This report summarizes the key findings and recommendations from the 2024 NC BREATHE Conference, held on October 1 – 2, 2024, in Durham, North Carolina.

Published: January 28, 2025

Prepared by: Emily Wolfe and Andrew Whelan, CleanAIRE NC

Photographs: Clifford Mervil, <https://www.clifordmervil.com>

All rights reserved by CleanAIRE NC

PO Box 5311

Charlotte, NC 28299

TABLE OF CONTENTS

EXECUTIVE SUMMARY	2
INTRODUCTION	4
Day 1 Takeaways: The Enormity of the PFAS Crisis	5
Day 2 Takeaways: Environmental Health and Human Well-being	6
RECOMMENDATIONS	7
Increase Awareness of PFAS Exposure and its Dangers	7
Mitigate the Health Risks of Extreme Heat	9
Address the Mental Health Impacts of Environmental Stressors	10
CONCLUSION	13
ACKNOWLEDGEMENTS	13
REFERENCES	14
APPENDICES	19
Appendix I: 2024 NC BREATHE Planning Committee	19
Appendix II: 2024 NC BREATHE Day 1 Agenda	21
Appendix III: 2024 NC BREATHE Day 2 Agenda	22

EXECUTIVE SUMMARY

The 2024 NC BREATHE Conference brought together experts, community members, policymakers, and other stakeholders to address the critical intersection of environmental health and human well-being. Discussions highlighted the urgent need to address pressing environmental challenges, including PFAS contamination, climate change, and air pollution.

The event emphasized the power of collaborative action and community engagement in developing effective solutions and building a more resilient future. Three clear underlying themes and recommendations arose from the conference proceedings and participant discussions:

Increase Awareness of PFAS Exposure and its Dangers: While PFAS contamination severely endangers public health, limited public understanding of the crisis hinders effective prevention, mitigation, and treatment. Policymakers, health professionals, researchers, and advocacy groups should work to inform and support community-driven solutions.

An effective public education campaign will require clear and accessible information on PFAS delivered through highly visible communication channels. Researchers should collaborate with communities to build our understanding of PFAS contamination in North Carolina and inform public health policies. Healthcare providers should be equipped to screen and treat for PFAS exposure, and to discuss PFAS with their patients.

State and local governments must also implement comprehensive PFAS monitoring and mitigation strategies, including regulations on PFAS production, use, and disposal. Investing in both innovative cleanup technologies and community-led initiatives is essential for addressing PFAS contamination and protecting public health.

Mitigate the Health Risks of Extreme Heat: Climate-driven extreme heat events pose serious dangers, especially for vulnerable populations such as the elderly, children, low-income families, and outdoor workers. Rising energy costs and potential utility disconnections during heat waves further

compound these risks. To mitigate these impacts, we must prioritize public awareness, workplace protections, and support for vulnerable individuals.

CleanAIRE NC will partner with stakeholders to develop and share educational campaigns that effectively communicate heat risks and safety tips, working with community-based organizations to disseminate these resources through targeted outreach.

Strengthening OSHA standards for heat exposure is crucial for protecting workers. Employers should be required to assess, implement, and adhere to comprehensive heat stress prevention programs. Furthermore, policies restricting utility disconnections and expanding access to cooling centers during extreme heat are essential for safeguarding vulnerable populations.

Address the Mental Health Impacts of Environmental Stressors: Climate change, extreme weather events, and poor air quality can all contribute to anxiety, depression, PTSD, and even neurodegenerative disorders. To address these impacts, we must work to reduce air pollution exposure, mitigate climate change, and ensure equitable access to evidence-informed mental health services and supports.

Improving indoor air quality in schools is a key priority, as poor ventilation may negatively affect students' focus, learning, behavior, and overall health. CleanAIRE NC is pursuing research on HVAC retrofits in schools and encourages policymakers to prioritize legislation like the Indoor Air Quality and Healthy Schools Act.

Healthcare providers also need training to recognize and address mental health conditions linked to environmental stressors, requiring the development of educational resources for health professionals. Finally, raising public awareness of these connections and available resources for those seeking mental health support and services is crucial.

By implementing these recommendations, we can create healthier, more resilient communities and mitigate the harmful impacts of environmental stressors on human health and well-being.



Ken Cook, Environmental Working Group, addresses Day 1 attendees

INTRODUCTION

On October 1 – 2, 2024, CleanAIRE NC hosted the ninth annual NC BREATHE conference to foster conversations around the vital link between our health and the environment. Nearly 200 health professionals, community leaders, policymakers, and advocates gathered at the JB Duke Hotel in Durham to explore innovative solutions for a healthier and more sustainable future.

This year's conference was spread over two days to highlight both the groundbreaking scientific research coming out on environmental health contaminants and the innovative collaborations and partnerships fighting air pollution to build healthier, more resilient communities.

Day 1 of the conference featured experts and cross-disciplinary researchers sharing their insights on the emerging environmental threat of PFAS, also known as “forever chemicals.” Panel discussions and presentations explored the threat PFAS exposure poses to community health and potential solutions for preventing PFAS contamination and cleaning up existing pollution.

Renowned environmental justice advocate Harold Mitchell Jr.'s keynote address set the tone for Day 2. Mitchell, and the panel discussions that followed, examined the challenges and opportunities facing communities

and individuals in the era of climate change while highlighting the value of collective action in addressing environmental and social injustices.

Day 1 Takeaways: The Enormity of the PFAS Crisis

Keynote Speakers: Ken Cook, *President of the Environmental Working Group*; Elizabeth Biser, *Former Secretary of the NC Department of Environmental Quality*
See Appendix II for the full list of speakers and panelists from Day 1

PFAS, a group of persistent chemicals found in a wide range of products, poses a significant threat to human health and the environment. These “forever chemicals” accumulate in the environment and the human body, leading to a variety of health problems including cancer, liver damage, and weakened immune systems.¹

Many communities are unknowingly exposed to dangerously high levels of PFAS.² The routes of exposure are both complex and varied, and may include contaminated drinking water, air, food, soil, or consumer products.³ And while the recently established federal PFAS standards⁴ are significant, they apply only to drinking water and cover a limited number of the myriad PFAS compounds that exist. Even these standards are being legally challenged by industry, utility companies, and politicians.

While tools are available to detect PFAS, the process can be lengthy and costly.⁵ Moreover, many communities may remain unaware of their exposure for years or even decades, leading to delayed action and increased health risks. Even after contamination is identified, implementing effective mitigation strategies can be challenging, requiring time, money, political will, and, most of all, public pressure.⁶

That is why **public awareness and community engagement are essential to addressing the PFAS crisis.** By educating the public about the risks of PFAS exposure and empowering communities to advocate for their health, we can drive policy change and accelerate the development of effective solutions. It is crucial to hold policymakers and regulatory agencies accountable and demand stronger regulations to protect public health and the environment.

Day 2 Takeaways: Environmental Health & Human Well-being

Keynote Speaker: Harold Mitchell Jr., *Founder & CEO of the ReGenesis Institute*
 See Appendix III for the full list of speakers and panelists from Day 2

Human health and well-being are deeply interconnected with our surrounding environments. Exposure to poor air quality can lead to a range of poor health outcomes including respiratory and cardiovascular diseases, cancer, increased risk of osteoporosis, and mental health challenges.^{7,8} Meanwhile, climate change acts as a “risk multiplier” that further exacerbates physical and psychological health issues.⁹

It is crucial to recognize that **these impacts are not evenly distributed, with marginalized or vulnerable populations disproportionately affected.** An ongoing, historic legacy of environmental injustice has led to heavy sources of pollution concentrated in or near disadvantaged communities.^{10,11} These multiple pollution sources do not impact communities in isolation—they compound on each other to produce “cumulative impacts.”¹²

Addressing these challenges will require an evidence-based and collaborative approach, involving scientists, researchers, community leaders, policymakers, government agencies at all levels, and health and medical professionals. One opportunity to more effectively identify and address environmental health and justice impacting communities is to include an Environmental Justice Chapter in all Community Health Assessments in North Carolina.¹³ By working together, we can implement effective solutions while building community resilience and protecting health.



Harold Mitchell Jr., the ReGenesis Institute

Community leaders and voices are integral to creating effective, sustainable, and collaborative partnerships. A community-informed process will better identify the environmental health issues impacting the community and ensure that any solutions and action plans accurately address and meet the needs and priorities of affected populations.¹⁴



(left to right): Crystal Dixon, Wake Forest University; Dr. Shree Dorestant, City of Greensboro; Daisha Wall, CleanAIRE NC; Neasha Graves, UNC–Chapel Hill; Dr. Virginia Guidry, NC DHHS

RECOMMENDATIONS

Three clear underlying themes and recommendations arose from the conference proceedings and participant discussions.

Increase Awareness of PFAS Exposure and its Dangers

Addressing PFAS contamination and exposure is crucial to protecting public health. Yet, while there is a growing awareness of PFAS contamination, there remains a significant gap in the public's understanding of its associated health risks.² This lack of awareness can hinder effective prevention, mitigation, and treatment.

Policymakers, health professionals, researchers, and advocacy groups must collaborate to raise awareness of PFAS as a health issue. By working together to educate the public about PFAS, we can empower communities to advocate for their health and implement effective mitigation strategies.

A comprehensive public education campaign requires clear and accessible



Elizabeth Biser, former Secretary of the North Carolina Department of Environmental Quality

information on PFAS, including its health impacts and its potential exposure routes, delivered through highly visible communication channels. These include social media, community workshops, or high-profile public health websites. Organizations such as [Clean Cape Fear](#) and the [Haw River Assembly](#) provide successful examples of effective community education and mobilization on PFAS. While these efforts have primarily been reactive and geographically targeted, we can build on them to conduct more proactive and widespread outreach across North Carolina.

We encourage scientists and researchers to collaborate directly with community organizations to ensure that their findings are communicated effectively and to understand the lived experiences of exposed individuals. By combining scientific data with community narratives, researchers can develop more effective prevention, mitigation, and treatment strategies.¹⁵

Health professionals should also be prepared to discuss PFAS exposure with patients and their families to support informed decision-making about their health. Medical providers must receive training about the health risks associated with PFAS and be equipped with the necessary resources (such as blood testing) to screen patients, particularly those living in areas with known or suspected contamination.

Finally, we must support both state- and community-based initiatives to monitor PFAS contamination while investing in innovative technologies for PFAS cleanup and remediation where we find it. At the state level, the [North Carolina Department of Environmental Quality](#) (DEQ) has developed

a PFAS Action Strategy¹⁶ that prioritizes research to understand the extent of PFAS contamination, mitigation efforts to clean up existing pollution, and regulation to prevent future contamination. The [North Carolina PFAS Testing Network](#) also provides valuable resources and expertise for communities seeking to test for PFAS. CleanAIRE NC is committed to partnering with the PFAS Testing Network to ensure all communities can access the necessary information and support.

Mitigate the Health Risks of Extreme Heat

Climate-driven extreme heat events are becoming more frequent and intense, posing significant risks to public health. Extreme heat exposure can trigger dehydration, heat stroke, impaired cognitive functioning, and even influence behavioral changes such as substance abuse or violence.^{17,18} Families and individuals must also bear higher energy costs to cool their homes during heat waves; those unable to cover these costs may have their utility services shut off at the worst possible time.¹⁹

These heat-related hazards are not shared equally. Vulnerable populations, including the elderly, children, pregnant people, low-income families, BIPOC (Black, Indigenous, and People of Color) communities, the unhoused, and individuals with chronic health conditions are particularly susceptible to heat exposure.^{20,21} Heat exposure also disproportionately impacts student-athletes, outdoor workers (e.g., agriculture, construction, first responders, etc.), and people working in unventilated and unairconditioned factories and warehouses.

To mitigate these risks, we must strengthen workplace protections, implement strategies to protect vulnerable populations,²² and increase public awareness of heat-related health issues.

CleanAIRE NC will partner with policymakers, healthcare providers, and other advocacy groups to develop and disseminate public education campaigns²³ on the dangers of extreme heat and provide practical tips²⁴ for staying safe. Community-based organizations can also play a vital role in

broadcasting educational resources and engaging underserved populations through targeted outreach.

The [Occupational Health and Safety Administration](#) (OSHA) is considering new rules to prevent heat-related injuries and illnesses in the workplace (including indoor and outdoor work settings).²⁵ CleanAIRE NC strongly encourages OSHA to require employers to implement comprehensive heat stress prevention programs, including training, engineering controls, and administrative controls. Upcoming OSHA heat regulations are a positive step in the right direction to protect the health of all workers.²⁶

Implementing policies restricting utility disconnections during extreme heat periods is crucial to safeguarding vulnerable populations. CleanAIRE NC will host a public webinar in 2025 to explore current utility disconnect policies²⁷ and the health implications of current policies and proposed changes. Expanding access to cooling centers (during the day and at night) and providing targeted educational outreach to vulnerable individuals is also essential to protecting health and safety.²⁸

Address the Mental Health Impacts of Environmental Stressors

The effects of climate change and poor air quality can significantly impact mental health.²⁹ Extreme weather events such as hurricanes, floods, or wildfires can lead to displacement, loss of income, food insecurity, and trauma, which in turn can trigger feelings of anxiety, depression, or post-traumatic stress disorder (PTSD) and increase the risk of other psychiatric disorders.³⁰

Research has also shown that acute and long-term exposure to air pollution negatively impacts our cognitive health and mental well-being,³¹ with increased rates of anxiety, depression, and neurodegenerative disorders like dementia and Alzheimer's disease.³² These effects can begin prenatally, as inhaled particulate matter is passed from mother to fetus.^{33,34}

To mitigate these mental health impacts, we must pursue strategies



(left to right): Emily Wolfe, CleanAIRE NC; Justin Cook, Journalist and Photographer; Dr. Robert Tighe, Duke University School of Medicine; Dr. Rajendra Morey, Duke University School of Medicine

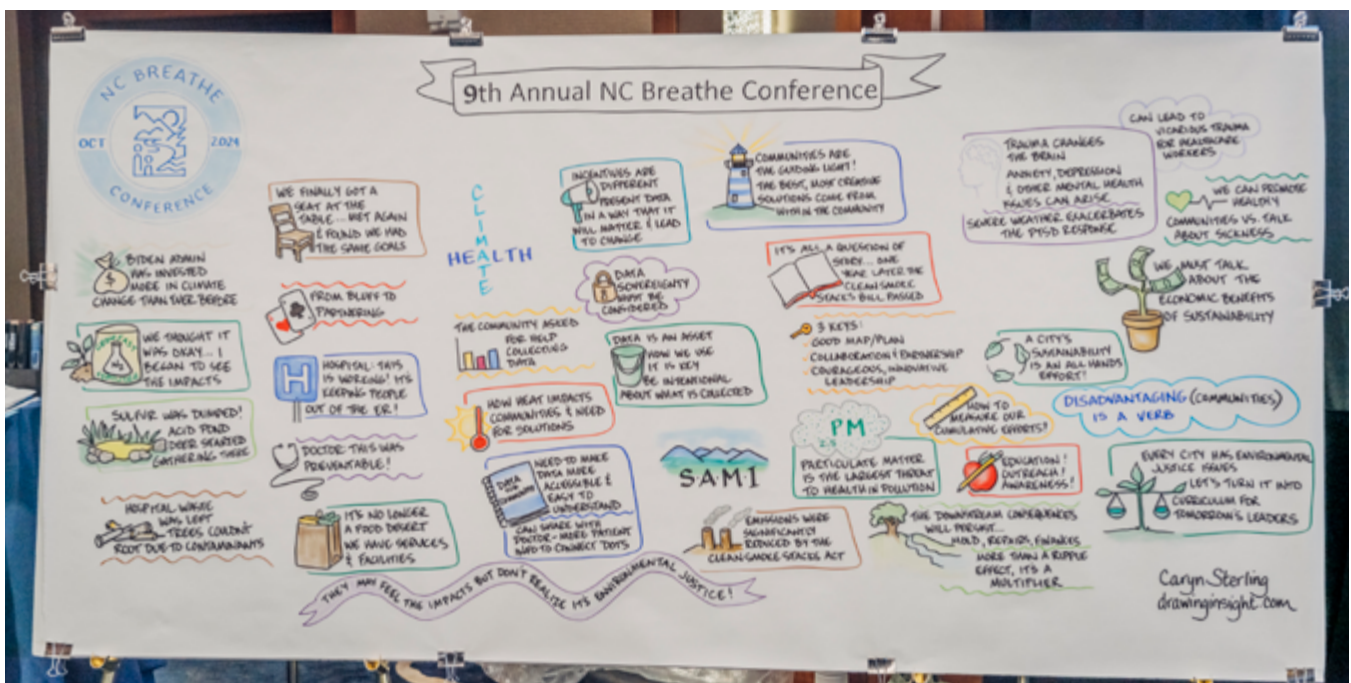
that reduce air pollution exposure while supporting affected individuals and communities. This includes improving air quality through stricter regulations and cleaner technologies and investing in mental health services and support programs for those impacted by extreme weather events and other climate-related stressors.^{35,36}

Improving air quality in schools should be an immediate priority, given the long-term impacts of pollution on children's developing minds and the availability of effective, practical solutions.³⁷ Poor indoor air quality, often caused by inadequate ventilation, can disrupt students' ability to focus, learn, and participate in classroom activities.³⁸ Investing in HVAC retrofits in our schools can create healthier learning environments in the short term while promoting long-term cognitive health for children.

CleanAIRE NC is currently pursuing a grant to investigate the impact of HVAC retrofits on indoor air quality in schools, providing valuable data that will inform policy decisions. We strongly encourage policymakers to prioritize legislation like the Indoor Air Quality and Healthy Schools Act³⁹ to ensure that all schools have the necessary resources to improve their air quality.

Healthcare providers must also be prepared to provide appropriate care and support to help their patients cope with the psychological effects of climate change and air quality. CleanAIRE NC offers various educational resources and programs for health professionals, highlighting the connections between environmental factors and mental health. In 2025, we will host a new CleanAIRE NC Health Webinar Series to explore the impacts of air quality on mental well-being, along with opportunities for policy support and change. We will also launch the CleanAIRE Academy, an online, self-paced learning platform focused on the science, policy, and societal impacts of air pollution and climate change.

Finally, we must empower individuals and communities to take steps to protect their mental health and better understand the connections between climate change-related issues and air quality.⁴⁰ By raising public awareness about both the issues and currently available support resources,⁴¹ we can encourage people to seek help, adopt healthy coping strategies, and continue advocating for policies that protect mental health and well-being. [Mental Health America](#) and the [North Carolina Psychological Association](#) maintain an inventory of local resources for people seeking mental health care. We also strongly urge state and federal lawmakers to support mental wellness resources for communities hit by extreme weather events.



CONCLUSION

The information and connections fostered during the 2024 NC BREATHE conference will undoubtedly fuel future initiatives and collaborations.

As we move forward, it is crucial to maintain momentum and build upon the progress made. Above all, this means harnessing the power of collective action. We must continue to foster partnerships between scientists, healthcare providers, policymakers, community leaders, and individuals. By sharing expertise, resources, and ideas, we can develop innovative solutions and drive meaningful change.

We encourage all NC BREATHE attendees to stay connected and continue to advocate for environmental health. Let's work together towards a healthier and more sustainable future for all.

ACKNOWLEDGMENTS

CleanAIRE NC would like to thank this year's conference planning committee and the speakers, panelists, participants, and staff who made the 2024 NC BREATHE conference such a success. Special thanks to the JB Duke Hotel, Duke University, and the City of Durham for hosting and supporting this year's conference.

The conference organizers would also like to thank our NC BREATHE sponsors and co-organizers, Duke University's Nicholas School of the Environment, the Duke University School of Medicine, the Duke University Environmental Health Scholars Program, Rural Beacon Initiative, the North Carolina PFAS Testing Network, AirBox, the U.S. Environmental Protection Agency, Environmental Defense Fund, WUNC, Climate Power, Southern Environmental Law Center, the North Carolina Black Alliance, the Environmental Justice Community Action Network, Self-Help Credit Union, Piercing Sun Consulting, and Fred and Alice Stanback, for their ongoing commitment to public health and the environment.

REFERENCES

1. Fenton SE, Ducatman A, Boobis A, et al. (2021). Per- and Polyfluoroalkyl Substance Toxicity and Human Health Review: Current State of Knowledge and Strategies for Informing Future Research. *Environmental Toxicology and Chemistry* 40(3), 606 – 630. doi.org/10.1002/etc.4890
2. Berthold TA, McCrary A, deVilleneuve S, and Schramm M. (2023). Let's talk about PFAS: Inconsistent public awareness about PFAS and its sources in the United States. *PLOS One* 18(11), e0294134. doi.org/10.1371/journal.pone.0294134
3. Our Current Understanding of the Human Health and Environmental Risks of PFAS. *United States Environmental Protection Agency*. Accessed December 3, 2024. epa.gov/pfas/our-current-understanding-human-health-and-environmental-risks-pfas
4. Per- and Polyfluoroalkyl Substances (PFAS): Final PFAS National Primary Drinking Water Regulation. *United States Environmental Protection Agency*. Accessed November 26, 2024. epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas
5. PFAS Detection: Methods And Challenges. *Hepure*. Accessed December 3, 2024. hepure.com/pfas-detection-methods-and-challenges
6. Brennan NM, Evans AT, Fritz MK, et al. (2021). Trends in the Regulation of Per- and Polyfluoroalkyl Substances (PFAS): A Scoping Review. *International Journal of Environmental Research and Public Health* 18(20), 10900. doi.org/10.3390/ijerph182010900
7. Air Pollution and Your Health. *National Institute of Environmental Health Sciences*. Accessed November 25, 2024. niehs.nih.gov/health/topics/agents/air-pollution

8. Air Pollution's Impact on Mental Health. *American Psychiatry Association*, April 12, 2023. [psychiatry.org/news-room/apa-blogs/air-pollutions-impact-on-mental-health](https://www.psychiatry.org/news-room/apa-blogs/air-pollutions-impact-on-mental-health)
9. Human Health Impacts of Climate Change. *National Institute of Environmental Health Sciences*. Accessed November 25, 2024. niehs.nih.gov/research/programs/climatechange/health_impacts
10. EPA Research: Environmental Justice and Air Pollution. *United States Environmental Protection Agency*. Accessed December 2, 2024. [epa.gov/ej-research/epa-research-environmental-justice-and-air-pollution](https://www.epa.gov/ej-research/epa-research-environmental-justice-and-air-pollution)
11. Cushing LJ, Li S, Steiger BB, and Casey JA. (2023). Historical red-lining is associated with fossil fuel power plant siting and present-day inequalities in air pollutant emissions. *Nature Energy* 8, 52 – 61. doi.org/10.1038/s41560-022-01162-y
12. Cumulative Impacts. *National Caucus of Environmental Legislators*. Accessed December 3, 2024. [ncelenviro.org/issue/cumulative-impacts](https://www.ncelenviro.org/issue/cumulative-impacts)
13. Environmental Justice Agency Goals. (2024). *North Carolina Department of Health and Human Services*. <https://www.ejhub.nc.gov/documents/nc-department-health-human-services-environmental-justice-goals>
14. Ward F, Lowther-Payne HJ, Halliday EC, et al. (2022). Engaging communities in addressing air quality: a scoping review. *Environmental Health* 21(1), 89. doi.org/10.1186/s12940-022-00896-2
15. Mishra AP, Singh S, Sarkar MS, et al. (2024). Integrating community perceptions, scientific data and geospatial tools for sustainable water quality management. *Results in Engineering* 23, 102563. doi.org/10.1016/j.rineng.2024.102563
16. North Carolina DEQ Action Strategy for PFAS. *North Carolina Department of Environmental Quality*, June 7, 2022. [deq.nc.gov/genx/nc-deq-action-strategy-pfas/open](https://www.deq.nc.gov/genx/nc-deq-action-strategy-pfas/open)

17. Dehydration and Heat Stroke. *Johns Hopkins Medicine*. Accessed December 12, 2024. hopkinsmedicine.org/health/conditions-and-diseases/dehydration-and-heat-stroke
18. 4 effects of heat on mental health (and how to protect yourself). *UCLA Health*, September 26, 2023. uclahealth.org/news/article/4-effects-heat-mental-health-and-how-protect-yourself-2
19. Moore H. Can an NC utility company turn off your power in a heat wave? What you need to know. *The News & Observer*, June 20, 2024. newsobserver.com/news/state/north-carolina/article276825236.html
20. Who Is Most At Risk To Extreme Heat? *National Integrated Heat Health Information System*. Accessed December 4, 2024. heat.gov/pages/who-is-at-risk-to-extreme-heat
21. Hsu A, Sheriff G, Chakraborty T, and Manya D. (2021). Disproportionate exposure to urban heat island intensity across major US cities. *Nature Communications* 12, 2721. doi.org/10.1038/s41467-021-22799-5
22. EPA's Programs and Actions to Address Extreme Heat. *United States Environmental Protection Agency*. Accessed December 5, 2024. epa.gov/climate-adaptation/epas-programs-and-actions-address-extreme-heat
23. Heat Policy Innovation Hub. *Duke University – Nicholas Institute for Energy, Environment & Sustainability*. Accessed December 4, 2024. nicholasinstitute.duke.edu/project/heat-policy-innovation-hub
24. Protect Yourself From the Dangers of Extreme Heat. *Center for Disease Control*, June 25, 2024. cdc.gov/climate-health/php/resources/protect-yourself-from-the-dangers-of-extreme-heat.html
25. Heat Injury and Illness Prevention in Outdoor and Indoor Work Settings. *Federal Register*. Accessed December 8, 2024. federalregister.gov/documents/2024/08/30/2024-14824/heat-injury-and-illness-prevention-in-outdoor-and-indoor-work-settings

26. What Are the New OSHA Heat Regulations? + How to Prepare. *Alert Media*, July 19, 2024. alertmedia.com/blog/osha-heat-regulations
27. Hot Weather Disconnect Policies. *Low Income Home Energy Assistance Clearing Program*. Accessed November 26, 2024. liheapch.acf.hhs.gov/Disconnect/hot-weather.htm
28. Bedi NS, Adams QH, Hess JJ, and Wellenius GA. (2022). The Role of Cooling Centers in Protecting Vulnerable Individuals from Extreme Heat. *Epidemiology* 33(5), 611 – 615. doi.org/10.1097/EDE.0000000000001503
29. Hough E and Counts N. How Climate Change Affects Our Mental Health, and What We Can Do About It. *The Commonwealth Fund*, March 29, 2023. commonwealthfund.org/publications/explainer/2023/mar/how-climate-change-affects-mental-health
30. Newbury JB, Stewart R, Fisher HL, et al. (2021). Association between air pollution exposure and mental health service use among individuals with first presentations of psychotic and mood disorders: retrospective cohort study. *The British Journal of Psychiatry* 219(6), 678 – 685. doi.org/10.1192/bjp.2021.119
31. Zundel CG, Ryan P, Brokamp C, et al. (2022). Air pollution, depressive and anxiety disorders, and brain effects: A systematic review. *Neurotoxicology* 93, 272 – 300. doi.org/10.1016/j.neuro.2022.10.011
32. Shaw J. How Air Pollution Affects Our Brains. *Harvard Magazine*, February 28, 2024. harvardmagazine.com/2024/02/harvard-panel-air-pollution
33. Bas B, Barratt B, Batalle D, et al. (2023). Prenatal exposure to air pollution is associated with structural changes in the neonatal brain. *Environment International* 174, 107921. doi.org/10.1016/j.envint.2023.107921

34. Newbury JB, Heron J, Kirkbride JB, et al. (2024). Air and Noise Pollution Exposure in Early Life and Mental Health From Adolescence to Young Adulthood. *JAMA Network Open* 7(5), e2412169. doi.org/10.1001/jamanetworkopen.2024.12169
35. Hurricane Helene Disaster Resources and Mental Health Support. *North Carolina Psychological Association*. Accessed December 11, 2024. ncpsychology.org/hurricane-helene-disaster-resources
36. Mental Health and Stress-Related Disorders. *Center for Disease Control*, March 2, 2024. cdc.gov/climate-health/php/effects/mental-health-disorders.html
37. Creating Healthy Indoor Air Quality in Schools. *United States Environmental Protection Agency*. Accessed December 3, 2024. epa.gov/iaq-schools
38. Schools – Healthy Buildings. *Harvard T.H. Chan School of Public Health*. Accessed December 3, 2024. healthybuildings.hsph.harvard.edu/research/schools
39. Burns J. Bipartisan bill would strengthen EPA’s indoor air quality oversight. *Facilities Dive*, July 31, 2024. facilitiesdive.com/news/indoor-air-quality-healthy-schools-act-proposed-strengthening-EPA-enforcement/722932
40. Climate Change and Mental Health Connections. *American Psychiatric Association*. Accessed December 3, 2024. psychiatry.org/patients-families/climate-change-and-mental-health-connections
41. Disaster and Behavioral Health Resources Communications Toolkit. *North Carolina Department of Health and Human Services*. Accessed November 21, 2024. ncdhhs.gov/divisions/mental-health-developmental-disabilities-and-substance-use-services/mental-health-disaster-preparedness/disaster-and-behavioral-health-resources-communications-toolkit



APPENDIX I: PLANNING COMMITTEE

GERALD BABAO

Deputy Director
CleanAIRE NC

JEFFREY ROBBINS, MBA

Executive Director
CleanAIRE NC

CRYSTAL DIXON, MPH, MA

*Assistant Professor of Health and
Exercise Science*
Wake Forest University

WILLIAM ROSS JR., JD

Attorney of Council
Brooks Pierce

MADISON FRAGNITO

Partnership Manager
CleanAIRE NC

ANGIE SHATAS, MS

Environmental Scientist
**US EPA, Office of Research and
Development**

**KAY JOWERS, PhD, JD, MA,
MSPH**

Just Environments Program Director
Duke University

**SHERRI WHITE-WILLIAMSON,
JD, MS**

Environmental Justice Director
NC Conservation Network

KIM LYERLY, MD

*George Barth Geller Professor in
Cancer Research, Professor of Surgery*
Duke University

EMILY WOLFE, MSW, LCSW

Health Manager
CleanAIRE NC



APPENDIX II: DAY 1 AGENDA

- 8:00 AM ● REGISTRATION CHECK-IN
- 9:00 AM ● WELCOME & INTRODUCTION
Dr. Kim Lyerly, *Duke University*, and Dr. Robert Tighe, *Duke University*
- 9:15 AM ● PFAS AND HUMAN HEALTH
Keynote Speaker: Ken Cook, *Environmental Working Group*
- 9:45 AM ● ASSESSING THE TOXICITY OF PFAS
Moderator: Dr. Jamie C. DeWitt, *Oregon State University*
Panelist: Dr. Elaina Kenyon, *US Environmental Protection Agency*
Panelist: Dr. PingPing Meng, *East Carolina University*
Panelist: Dr. Justin Conley, *US Environmental Protection Agency*
Panelist: Sue Fenton, *North Carolina State University*
- 10:45 AM ● PFAS EXPOSURE: SOURCES, VARIABILITY, AND CLINICAL GUIDANCE
Moderator: Dr. Heather Stapleton, *Duke University*
Panelist: Dr. Jane Hoppin, *North Carolina State University*
Panelist: Dr. Virginia Guidry, *NC Department of Health and Human Services*
- 11:30 AM ● PFAS IN FISH
Presenter: Dr. Frannie Nilsen, *NC Department of Environmental Quality*
Presenter: Kennedy Holt, *NC Department of Health and Human Services*
- 12:00 PM ● LUNCH & STUDENT POSTER RECOGNITION
- 12:45 PM ● THE IMPACT OF PFAS ON COMMUNITIES
Moderator: Sherri White-Williamson, *Environmental Justice Community Action Network*
Panelist: Emily Donovan, *Clean Cape Fear*
Panelist: Emily Sutton, *Haw River Assembly*
Panelist: Dr. Courtney Woods, *University of North Carolina at Chapel Hill*
- 1:30 PM ● PFAS AND HUMAN HEALTH IN NORTH CAROLINA
Keynote Speaker: Fmr. Sec. Elizabeth Biser, *NC Department of Environmental Quality*
- 2:05 PM ● PFAS MEASUREMENT AND ANALYSIS
Presenter: Dr. Mark Strynar, *US Environmental Protection Agency*
- 2:25 PM ● PFAS IN THE AIR
Moderator: Dr. Viney P. Aneja, *North Carolina State University*
Panelist: Dr. Amy Delinsky, *NC Department of Environmental Quality*
Panelist: Ralph Mead, *University of North Carolina at Wilmington*
Panelist: Michael Davern, *University of North Carolina at Chapel Hill*
Panelist: Gary Saunders, *NC Department of Environmental Quality*
- 3:25 PM ● PFAS IN DRINKING WATER AND GROUNDWATER
Moderator: Sushma Masemore, *NC Department of Environmental Quality*
Panelist: Kenneth Waldroup, *Cape Fear Public Utilities Authority*
Panelist: Jared Wilson, *NC Department of Environmental Quality*
Panelist: Andy Neal, *NC Department of Environmental Quality*
Panelist: Eric Hudson, *NC Department of Environmental Quality*
- 4:15 PM ● PFAS LEVELS AND HEALTH OUTCOMES IN NORTH CAROLINA
Presenter: Dr. Julia Kravchenko, *Duke University*
- 4:45 PM ● CLOSING REMARKS & NEXT STEPS
Jeffrey Robbins, *CleanAIRE NC*
- 5:00 PM ● ADJOURN



APPENDIX III: DAY 2 AGENDA

- 7:30 AM ● REGISTRATION & BREAKFAST
- 8:30 AM ● WELCOME & LAND ACKNOWLEDGEMENT
- 8:45 AM ● RENEW, REFRESH, RECHARGE: REVOLUTIONIZING TOMORROW'S SUSTAINABILITY LANDSCAPE
Keynote Speaker: Harold Mitchell Jr., *The ReGenesis Institute*
- 9:30 AM ● BREAK
- 9:45 AM ● CONNECTING THE DOTS: HOW ECO-FACTORS IMPACT HUMAN HEALTH & WELL-BEING
Moderator: Sherri White-Williamson, *NC Conservation Network*
Panelist: Dr. Ashley Ward, *Nicholas Institute, Duke University*
Panelist: Dr. Jennifer Richmond-Bryant, *North Carolina State University*
Panelist: Dr. Robert Tighe, *Duke University School of Medicine*
Panelist: Sydney Warner, *Wake Forest University School of Medicine*
- 10:45 AM ● BREAK
- 11:00 AM ● SUCCESSFUL ENVIRONMENTAL POLICY FOR CLEANER AIR AND IMPROVED HEALTH
Presenter: William Ross Jr., *NC Department of Environment and Natural Resources*
Presenter: Dr. Kim Lyerly, *Duke University*
Presenter: Randy Strait, *NC Department of Environmental Quality*
- 11:45 AM ● NETWORKING LUNCH
- 12:45 PM ● YES, AND...GOING BEYOND ECO-ANXIETY TO UNDERSTAND THE IMPACTS OF CLIMATE CHANGE AND ENVIRONMENTAL ISSUES ON MENTAL HEALTH
Moderator: Emily Wolfe, *CleanAIRE NC*
Panelist: Dr. Jennifer Runkle, *NC Institute for Climate Studies, NC State University*
Panelist: Justin Cook, *Journalist and Photographer*
Panelist: Dr. Rajendra Morey, *Duke University School of Medicine*
Panelist: Johnette Walser, *University of North Carolina at Greensboro*
- 1:45 PM ● BREAK
- 2:00 PM ● CREATING MEANINGFUL CHANGE THROUGH COLLABORATION
Moderator: Crystal Dixon, *Wake Forest University*
Panelist: Dr. Virginia Guidry, *NC Department of Health and Human Services*
Panelist: Neasha Graves, *UNC Institute for the Environment*
Panelist: Daisha Wall, *CleanAIRE NC*
Panelist: Dr. Shree Dorestant, *City of Greensboro*
- 3:00 PM ● BREAK
- 3:10 PM ● COLLABORATIVE LEARNING
- 3:50 PM ● REFLECTIONS & CLOSING REMARKS
- 4:00 PM ● NETWORKING & HAPPY HOUR



clean
AIRE
nc

Protecting what connects us.

www.cleanairenc.org
704-307-9528

Contact us at
Connect@CleanAIREnc.org
to discuss how you can get involved.