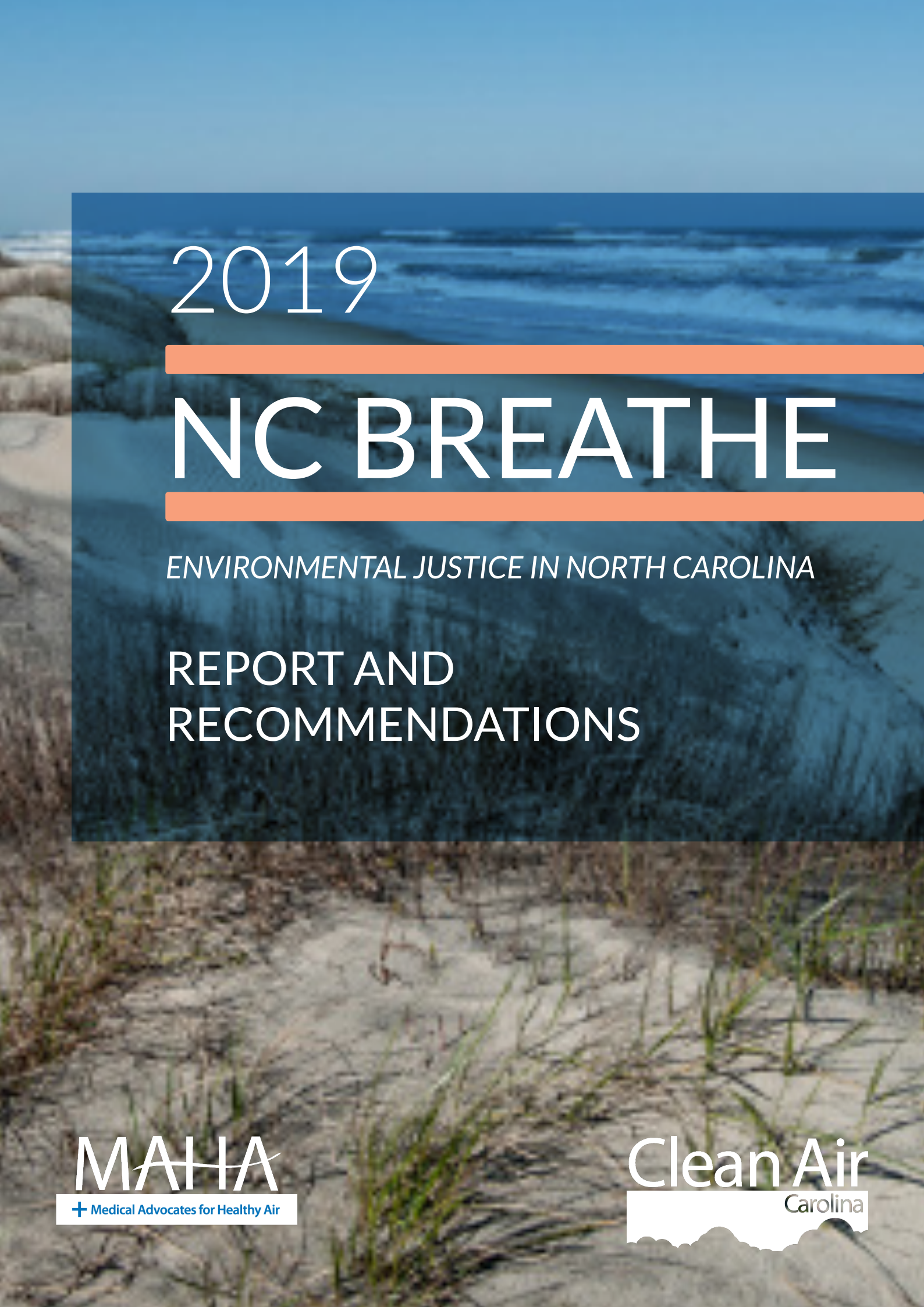

2019

NC BREATHE

ENVIRONMENTAL JUSTICE IN NORTH CAROLINA

REPORT AND RECOMMENDATIONS

MAHA
Medical Advocates for Healthy Air

Clean Air Carolina

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Executive Summary

The fifth annual NC BREATHE Conference was held on April 11, 2019 at Cape Fear Community College in Wilmington, North Carolina. This year's conference focused on environmental justice challenges in North Carolina, the birthplace of the environmental justice movement. Sponsored by Clean Air Carolina, Medical Advocates for Healthy Air, Fred and Alice Stanback, the Orton Foundation, and the National Institute of Environmental Health Sciences, the conference brought together health professionals, researchers, community leaders, policymakers, students, and clean air advocates to discuss environmental justice challenges in the state and to develop community-oriented environmental justice solutions.

The conference opened with a series of keynotes that took an in-depth look at three key environmental justice challenges facing North Carolina: the health impacts of living near hog farms; the vulnerability of North Carolina to climate change; and the implications of GenX as an emerging contaminant. Afternoon breakout sessions examined the potential for citizen science, science communication, and data to address environmental injustice.

Four clear underlying themes and recommendations arose from the conference proceedings and participant discussions:

- **Working with communities:** Environmental justice researchers must collaborate with and solicit input from impacted communities to ensure their work is solutions-oriented and designed with the best interests of the community in mind.
- **Communicating science and data:** Scientists must improve how they communicate their research to non-scientific audiences in order to inspire environmental justice solutions.
- **Valuing quality-of-life:** Everyday quality-of-life outcomes significantly impact community livelihoods and wellbeing, and deserve to be taken seriously. Mortality cannot be the only indicator that an environmental justice problem requires action.
- **Preparing for disparate climate change impacts:** Climate change will exacerbate the health, social, and economic disparities in communities that already face poorer outcomes. When preparing for climate change impacts, policymakers must focus on safeguarding the most vulnerable populations through a lens of equity and environmental justice.

All of these recommendations relate to one another, and are broadly applicable to environmental justice challenges faced in both North Carolina and around the country. Researchers, policymakers, and communities should develop strategies that holistically implement these recommendations in pursuit of environmental equity and community health.

Introduction

Since 2015, Clean Air Carolina has sponsored the annual NC BREATHE Conference. Each year we bring together health professionals, researchers, community leaders, policymakers, students, and clean air advocates to share the latest research on the health, environmental, and economic impacts of air pollution and climate change. Previous conferences featured discussions ranging from the health benefits of clean air policymaking, engaging vulnerable communities in air quality research, and the connection between wildfires, climate change, and health.

This year's conference focused more broadly on environmental justice issues in North Carolina. Keynote speakers took an in-depth look at three key environmental justice challenges facing our state: the health impacts of living near hog farms; the vulnerability of North Carolina to climate change; and the implications of GenX as an emerging contaminant. Afternoon breakout sessions examined the potential for citizen science, science communication, and data to address environmental justice.

North Carolina is the birthplace of the environmental justice movement. The fifth annual NC BREATHE Conference brought together esteemed researchers, policymakers, community leaders and government officials to continue prioritizing environmental justice in our state.

Keynote Presentations

- *Environmental Justice in North Carolina*, Naeema Muhammad, Co-director, NC Environmental Justice Network
- *Health and Cost-of-Living Impacts of Living Near Hog Farms (CAFOs)*, Christopher Heaney, Ph.D., Associate Professor, Johns Hopkins University
- *Vulnerability of North Carolina to Climate Change*, Chris Weaver, Ph.D., U.S. Environmental Protection Agency
- *Health Impacts of Emerging Contaminants: A Look at GenX*, Jane Hoppin, Sc.D., Deputy Director, Center for Human Health and the Environment, NC State University

Recommendations

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

Working with Communities

Communities facing environmental injustices are often frustrated by research projects that never seem to result in action[1,2]. Conference participants emphasized that environmental justice research should be designed with the best interests of the community in mind. It's therefore

essential that researchers work closely with impacted communities to ensure their work is solutions-oriented.

Investing in long-term relationships and building trust with community members can take a long time, but ultimately results in higher quality, more practical research[3]. Impacted communities typically have greater insight into environmental justice issues than outside researchers or policymakers can ever hope to achieve. Researchers are more likely to get at the true nature of the problem if they actively listen to local residents and solicit their input and feedback when designing the study.

Residents also have skills and local knowledge that could be invaluable to environmental justice research. Employing community participants as citizen scientists can amplify data collection, and provide a more detailed picture of local on-the-ground environmental conditions that are not captured by official monitoring stations located miles away.

Several conference attendees lamented that impacted communities can feel excluded from environmental justice discussions, including events like NC BREATHE. Researchers actively seeking participation and feedback from community members are building capacity within the community. This empowers residents with the tools and training they need to engage with academics and policymakers, and steer the broader environmental justice conversation towards community-oriented policy solutions.

Environmental justice research represents a moral partnership fundamentally different from most academic research[1]. Because of the powerful and immediate implications their work has for vulnerable communities, environmental justice researchers cannot afford to be dispassionate about their research topics; they have a responsibility to promote the welfare of the communities they study. NC BREATHE participants recommended that researchers help the communities they work with find resources to address their environmental justice problems. This could include helping individuals suffering from serious health issues find medical care, or translating environmental permits to help communities understand the implications of public policy decisions. Again and again, attendees and speakers emphasized that researchers cannot wait to publish their study results before sharing valuable insights into the problem with the community.

Communicating Science and Data

Between the three afternoon breakout sessions, conference participants identified science communication as the most important issue influencing environmental justice policy. Unfortunately (or perhaps relatedly), participants perceived a communications barrier that inhibits engagement between researchers, policymakers, and impacted communities. Scientists must learn to communicate effectively with a variety of audiences if they want their research to inspire environmental justice solutions.

The issue may be inherent in how scientists are trained to communicate amongst themselves. Within the scientific community, researchers are expected to present background information and their data in comprehensive detail before they reveal the main takeaways of their work[4]. This

is radically different from the way the general public communicates. Non-technical audiences typically comprehend scientific information better when the bottom line is presented upfront, and then backed up by key supporting details.

Many scientists also have a tendency to employ overly technical or jargon-laden language when discussing their work, but this only causes non-technical audiences to tune out[5]. Instead, researchers must learn to focus on just a few key points they want to come across to their audience, and use language that is simple, direct, and focused on potential actions the audience can take.

Conference participants identified several strategies and resources available to help scientists bridge the communication gap. As a starting point, participants recommended that scientists simply practice talking about their work with people outside their specialized fields. Social media allows researchers to target their message directly to their intended audience. Researchers should also develop relationships with journalists who can help the public understand the environmental justice components of an issue. In addition, participants encouraged researchers to enroll in university science communication courses or work with communication specialists to learn how they can engage their target audience.

For environmental justice research to truly resonate, scientists must work with effective messengers within the community. Research can be a powerful tool, but it cannot produce real-world actions if nobody listens to or understands it. Storytelling can change hearts and minds, but it is far more impactful when grounded in salient facts. Environmental justice researchers must learn to bring both together, so their data is telling a coherent story. Finding the right messenger is a fundamental ingredient to effective storytelling, and nobody can tell a community's story better than members of the community. NC BREATHE participants recommended that researchers invest in building relationships with potential community messengers. In particular, they identified churches and other houses of worship as among the best avenues for building relationships within a community.

Valuing Quality-of-Life

It is imperative that researchers, policymakers, and others understand that mortality is not the only indicator that should prompt action. During his keynote, Dr. Chris Heaney noted that when policymakers are presented with quality-of-life concerns for people living near concentrated animal feeding operations (CAFOs), a common response is: "Where are the body bags?"[6]. Outside observers may dismiss environmental problems that are not immediately life-threatening, but everyday quality-of-life outcomes significantly impact community livelihoods and wellbeing, and deserve to be taken seriously.

Studies have examined the mental health and quality-of-life costs for people living near CAFOs[7]. The odor, hydrogen sulfide, and ammonia produced by CAFOS have been associated with increased stress levels, irritability, and anxiety[8–10]. In one study, residents reported that the odor from a nearby CAFO caused them to reduce their time spent outside[11]. These symptoms are less

likely to be prioritized for research and policy solutions because the do not directly result in mortality, even though they drastically impact how people live their lives.

While North Carolina residents living near CAFOs can file nuisance complaints for odor issues, this process is arduous and fickle. The North Carolina Department of Environmental Quality (NC DEQ) has 30 days to respond to a nuisance complaint and must investigate the complaint "as expeditiously as possible"[12]. Unfortunately, the potency of odors emanating from CAFOs can rise and fall; if the smell is not as strong when investigators arrive, the complaint may be dismissed.

In the past year, there have actually been a few nuisance lawsuits from communities near CAFOs that have resulted in settlements[13]. These outcomes appeared to demonstrate progress in how we value quality-of-life, but North Carolina's laws have since been altered to reduce the size of future settlements[14].

Quality-of-life issues in vulnerable communities are clearly still under-prioritized in North Carolina. CAFOs are just one example of this; other environmental justice problems, such as climate change, can also significantly degrade quality-of-life. NC BREATHE participants recommended that future research studies and policy solutions aimed at addressing environmental justice must account for quality-of-life impacts to ensure affected individuals can live an equitable and healthy life.

Preparing for Disparate Climate Change Impacts

Climate change is a risk "multiplier" and the ultimate social determinant of health. In North Carolina climate change is expected to continue to cause increases in temperature, precipitation extremes, flooding events, wildfires, sea level, and ocean warming and acidification, according to the U.S. Fourth National Climate Assessment (NCA4) released last November[15].

These changes will amplify associated health problems such as heat stress, vector-borne infectious diseases, mental health stress, and triggers for vulnerable populations (such as people with heart disease or asthma). While these effects will be felt statewide, they will exacerbate the health, social, and economic disparities in communities that already face poorer outcomes[15], making climate change an environmental justice crisis in North Carolina.

Low-income communities, older adults, children, and some communities of color are disproportionately affected by a "cumulative exposure" to climate health risks[15]. Rural populations in eastern North Carolina have a higher population of older adults and generally have lower education levels, poorer health outcomes, and reduced access to medical care than populations in urban areas[16]. They are also at a higher risk for many climate change impacts, including three of the four key messages from the NCA4: 1) increasing flood risks in coastal and low-lying regions; 2) transformed natural ecosystems; and 3) economic and health risks for rural communities[15]. North Carolina also has the highest heat-related death rate in the US, with particularly high rates in Eastern and rural North Carolina[17,18]. This all poses a serious challenge to rural populations that already have limited access to public health services[16].

In addition to health costs, the Southeastern US can expect higher economic costs associated with climate mitigation than most other regions of the United States due to projected increases in wildfires, inland flooding, coastal property damage, vector-borne infectious diseases, and reduced outdoor labor hours[19].

Climate change will also amplify other environmental justice challenges in North Carolina. For example, the majority of hog CAFOs in North Carolina are located in the eastern part of the state, which is more susceptible to climate change risks and already has underlying health disparities[7]. Climate change will feed into and exacerbate the quality-of-life problems faced by communities living near CAFOs.

North Carolina must take action to mitigate and prepare for climate change impacts to protect the health and well-being of all residents, with a focus on safeguarding the most vulnerable populations through a lens of equity and environmental justice.

Conclusion

The four recommendations outlined in this report are broadly applicable to environmental justice challenges faced in both North Carolina and around the country. All four relate to one another and cannot be considered in isolation. For example, effective science communication is essential for inspiring community-oriented policy solutions, while climate change exacerbates existing quality-of-life problems. Researchers, policymakers, and communities should develop strategies that holistically implement these recommendations in pursuit of environmental equity and community health.

Future Direction for NC BREATHE

Building on these recommendations, the 2020 NC BREATHE Conference will focus on the theme of "Health, Equity and the Climate Crisis in North Carolina." The conference will provide a forum for speakers, panelists, and attendees to explore the intersection between our health and our changing climate, and how environmental justice communities are being disproportionately impacted by climate change and will need more support. The conference will be held in Charlotte, North Carolina in early April.

Acknowledgements

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Appendix I - 2019 NC BREATHE Planning Committee

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Appendix II - 2019 NC BREATHE Agenda

AGENDA

8:00 AM — BREAKFAST & REGISTRATION

8:30 AM — WELCOME AND OPENING REMARKS
- June Blotnick, M.Ed., *Clean Air Carolina*

8:45 AM — ENVIRONMENTAL JUSTICE IN NORTH CAROLINA
- Naeema Muhammad, *N.C. Environmental Justice Network*

9:30 AM — HEALTH AND COST-OF-LIVING IMPACTS NEAR HOG FARMS
- Chris Heaney, Ph.D., *Johns Hopkins University*

10:15 AM — BREAK, VISIT POSTERS AND EXHIBITS

10:45 AM — VULNERABILITY OF N.C. TO CLIMATE CHANGE
- Chris Weaver, Ph.D., *U.S. Environmental Protection Agency*

11:30 AM — HEALTH IMPACTS OF EMERGING CONTAMINANTS: A LOOK AT GENX
- Jane Hoppin, Sc.D., *N.C. State University*

12:15 PM — LUNCH, VISIT POSTERS AND EXHIBITS

1:15 PM — STUDENT LIGHTENING TALKS

1:45 PM — BREAK, VISIT POSTERS AND EXHIBITS

2:00 PM — BREAKOUT SESSIONS
- Using Citizen Science to Address Environmental Justice (Room 512)
- Using Science Communication to Address Environmental Justice (Room 527)
- Using Data to Address Environmental Justice (Room 528)

3:00 PM — OUTCOMES OF BREAKOUT SESSIONS

3:50 PM — POSTER AWARDS

4:00 PM — CLOSING SESSION
- Leoneda Inge, M.A., *N.C. Public Radio, WUNC 91.5FM*

4:30 PM — ADJOURN