
Pathways to Climate Justice – A Roadmap to Confront Race, Equity, and Justice for Addressing Climate Change

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The following summarizes a panel discussion addressing climate change, health, and environmental justice during the AAAS Science & Technology Policy Fellows symposium, [From Concept to Action: A Pathway to Climate Justice \(https://sites.google.com/view/climate-justice-symposium\)](https://sites.google.com/view/climate-justice-symposium). The full

discussion including panelist remarks is available [here \(https://youtu.be/G11g_wTSI7E\)](https://youtu.be/G11g_wTSI7E).

In the winter of 2019, before the world knew about COVID-19 and before global protests centered on police brutality highlighted racial injustices present throughout America, we along with the American Association for the Advancement of Science's (AAAS) Energy and Climate Affinity group started planning for a symposium focused on climate justice and unequal health outcomes in Black, Indigenous, and other People of Color (BIPOC) communities.

We wanted to use our background and scientific networks to highlight the intersection of health and climate change—which continues to be a pressing and underemphasized topic. Our vision was to use our collective knowledge of air pollution and environmental health outcomes to describe how climate change will disproportionately affect marginalized communities, and how climate solutions could reduce environmental harms in these communities. We sought to illuminate this issue and attracted renowned experts in the field to discuss *pathways to climate justice* for frontline and fenceline communities.

To that end, we gathered panelists from academia, the private sector, government, and nonprofits to generate a discussion around climate justice solutions necessary for equitable health outcomes to be realized. We envisioned a cordial conversation between public and private sector organizations addressing the intersection between climate change and health, but also sought out leaders in the environmental and climate justice movement who had experience working with scientists and frontline and fenceline communities.

In March 2020, the COVID-19 pandemic altered all of our lives forever. We felt a responsibility to shift our conversation to address the disturbingly disproportionate infection and mortality rates among Black, Latinx, and Indigenous communities. The pandemic made clear that the American public health system was woefully underprepared for dealing with a global health crisis and that historical environmental and social inequalities would engender the worst health outcomes in frontline communities. Similarly, we expect climate change to drive differential health outcomes in frontline and fenceline communities.

As we finalized preparations for the (now virtual) symposium, the Black Lives Matter protests around police brutality and racial inequalities pushed us to address the equality, equity, and justice themes that had been underlying our intended discussion. Catalyzed by current events, both the panelists and the organizers felt a shared interest in acknowledging the deficiencies of the scientific community and using this panel to highlight how environmental and climate justice issues reverberate across the larger conversations around systemic racism.

As a result of the passionate discussion and engagement from our panelists, our audience and the AAAS fellows were inspired by the conversation. We acknowledge this conversation is only a beginning and describe our vision for what actions should be taken, below. The themes discussed during our panel spanned key conversations around basic science, sociology, and community engagement. Overall, it was clear that the panelists urged current and aspiring scientists to advocate for and support efforts to fix environmental and racial injustices that have existed for too long and will continue to exist without a unified response. The following areas of focus emerged in the discussion:

Support Frontline Communities

Comprehensive climate policies that transform industries and economies as well as proactively address the long-standing and future health impacts in Black, Indigenous, and people of color (BIPOC) and frontline communities must be developed and implemented. These communities have

historically been dehumanized and treated as environmental sinks, where pollution, waste, and other undesirable products of the economy are dumped. In the US, Black and Latinx communities [bear a “pollution burden”](https://www.pnas.org/content/116/13/6001) (https://www.pnas.org/content/116/13/6001) of 56% and 63%, respectively, in excess air pollution exposure relative to their consumption. These communities bear the environmental and health burdens of society because policies have been crafted to offload these environmental externalities onto frontline and fenceline communities. Policymakers and regulators must recognize that historical and present inequalities have been institutionalized by government policies when trying to address climate change. These same frontline communities are also likely to be the most impacted by climate change (see [NAACP](https://www.naacp.org/latest/mothering-justice-environmental-justice/) (https://www.naacp.org/latest/mothering-justice-environmental-justice/); [Bullard et al. 2016](https://lib.dr.iastate.edu/jctp/vol5/iss2/3/) (https://lib.dr.iastate.edu/jctp/vol5/iss2/3/)). Students of color are [disproportionately impacted by hot school days](https://www.aeaweb.org/articles?id=10.1257/pol.20180612) (https://www.aeaweb.org/articles?id=10.1257/pol.20180612), approximately 7% of the racial achievement gap may be attributed to excess heat exposure. Additionally, recent natural disasters such as Hurricane Katrina, Hurricane Harvey, and the COVID-19 pandemic have illustrated that underlying health risks and inadequate public health/physical infrastructure will exacerbate adverse health outcomes in these communities. For example, Black individuals account for [13.4%](https://www.census.gov/quickfacts/fact/table/US/RH1125219) (https://www.census.gov/quickfacts/fact/table/US/RH1125219) of the US population, yet they (as of Aug 2020) account for [22.4 % of COVID-19 deaths](https://covid.cdc.gov/covid-data-tracker/#demographics) (https://covid.cdc.gov/covid-data-tracker/#demographics).

Community-Driven Science

Research and scientific discovery should be done *by* the community, *for* the community, and *with* the community. We need to ensure that trained scientists represent a broad array of all communities, so that research studying frontline communities can involve scientists who understand and are from those same communities. In many BIPOC communities, there’s a distrust of scientists due to a history of grossly unethical studies-- the [Tuskegee](https://www.cdc.gov/tuskegee/index.html) (https://www.cdc.gov/tuskegee/index.html) Experiment, where researchers withheld the standardized treatment, penicillin, from a group of poor, Black men who had syphilis, and the proliferated use of [HeLa cells](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5072843/) (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5072843/) without informed consent from Henrietta Lacks, are prime examples. Frontline and fenceline communities may also [distrust government and academic experts](https://www.usdn.org/uploads/cms/documents/usdn_guide_to_equitable_community-driven_climate_preparedness_high_res.pdf) (https://www.usdn.org/uploads/cms/documents/usdn_guide_to_equitable_community-driven_climate_preparedness_high_res.pdf) that have solicited community input, but have not utilized this input to implement effective policy or build scientific research and evidence for improving outcomes. Science that solves problems and provides multiple benefits to the community is needed. To achieve this, scientists and researchers must build relationships with the community and build capacity within the community to support and further the research. There is a need for frontline communities to define the research agenda and assist with components of the discovery process; previous [citizen science](https://doi.org/10.1007/s13412-018-0521-6) (https://doi.org/10.1007/s13412-018-0521-6), [community based participatory research](https://doi.org/10.1007/s10661-017-6063-7) (https://doi.org/10.1007/s10661-017-6063-7), and [community-owned and -managed research models](https://pubmed.ncbi.nlm.nih.gov/20208213/) (https://pubmed.ncbi.nlm.nih.gov/20208213/) provide evidence for how this can work in practice. Another example is the [Robert Wood Johnson Foundation’s recent funding](https://www.google.com/url?q=https%3A//www.rwjf.org/en/blog/2019/09/how-communities-are-promoting-health-and-responding-to-climate-change.html&sa=D&ust=1595955878331000&usg=AFQjCNGBELE_tIMw4VEYrYZnN-KA2naMw) (https://www.google.com/url?q=https%3A//www.rwjf.org/en/blog/2019/09/how-communities-are-promoting-health-and-responding-to-climate-change.html&sa=D&ust=1595955878331000&usg=AFQjCNGBELE_tIMw4VEYrYZnN-KA2naMw) effort to learn from the most impactful ideas from across the globe to stimulate action in U.S. cities to address the intertwined issues of health, equity and climate change. To meet this demand, diversity among scientists in academia, government, and industry is necessary. BIPOC advocates play a critical role in illuminating research needs in communities of color and showing funders where resources are needed to drive change. The democratization of research—where access to software, data, journals is open—can bolster the ability for citizens to participate in the research process and

elevate the baseline understanding of scientific topics in the community. Organizations have started to generate public-facing data and platforms to help communities learn about their impacts. For example, in its servicing of the Bay Area and San Diego, [Aclima \(https://aclima.io/\)](https://aclima.io/) provides a [public portal \(https://insights.aclima.io/\)](https://insights.aclima.io/) for community members to access information about hyperlocal air quality by address. This work is being done in partnership with both local regulators and community members to support implementation of California's Community Air Protection Program, which prioritizes emissions reductions in frontline communities.

Science Integration with Other Tools

Science is a tool, but it's just one tool in the toolbox. Science can be used in support of political change and racial justice, but it is guided by the agendas and principles of the people doing the research (including the public and private donors and academic institutions supporting the research). There is a need for training and guidance that fosters the ubiquitous presence of justice, equity, diversity and inclusion (JEDI) within these research institutions, so that researchers understand what is necessary to support social and cultural change. Scientific research can help identify risks and vulnerabilities, generate evidence, and develop solutions in support of meaningful change to improve unequal environmental-health outcomes. The science on identifying who is at most risk from climate, environmental, and health hazards has recently been summarized (see Ch. 14 [4th National Climate Assessment \(https://nca2018.globalchange.gov/chapter/14/\)](https://nca2018.globalchange.gov/chapter/14/)). While these groups have been identified, more research is needed to document the increased risks experienced by certain groups (disaggregated by gender, race, income, etc.), so that targeted solutions addressing equity can be developed. The scientific and donor community must develop solution-oriented science that not only uncovers inequalities, but also mitigates unequal health outcomes in frontline communities. These community-based solutions will be inherently multi-sectoral, addressing health, environment, and equity outcomes, which makes these solutions challenging.

Make Equity Central to Sustainability and Resilience

Without equity, you cannot have sustainable or resilient communities. We need to address questions such as, "Who is at the table when climate solutions are developed?" So that we can assess for whom climate solutions are developed and which communities will see improved health and well-being outcomes. These solutions need to be community-driven. Top-down solutions are unlikely to address justice or equity. Climate solutions need to acknowledge the frontline and fenceline communities that will suffer the most from climate change and develop community-driven interventions that optimize health, well-being and climate benefits.

In conclusion, in developing a pathway to *climate justice*, it is important to acknowledge the social, health, and environmental inequalities that predispose frontline and fenceline communities to climate risks. To address these risks, community-driven solutions need to be developed with frontline and fenceline communities. These solutions will require diversity in representation among trained scientists who understand these communities and emphasis on the value of solution-oriented science. To ensure a just and sustainable transition, climate advocates must develop mitigation and adaptation measures that address disproportionate harm and disparities (social, economic, and health) in frontline and fenceline communities.

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