

Pellet Mill Community Impact Survey



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October 2024

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We dedicate this report to Debra Ann David. Debra was an outspoken advocate against industrial polluters around Dobbins Heights, North Carolina. Her passion for environmental justice inspired many. She worked in coalition to create this survey. She passed away July 11, 2024.



Debra Ann David
May 30, 1957 – July 11, 2024



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EXECUTIVE SUMMARY

Across the coastal plain of the southeastern United States, there are industrial wood pellet manufacturing facilities — also known as pellet mills — where local trees are chipped, dried, and pressed into small pellets and then shipped overseas to be burned for electricity. Pellet mills emit harmful pollutants, including particulate matter, greenhouse gases, and several toxic pollutants. They use trees taken from local, ecologically important forests. They inundate communities with 24-hours of operating noise and traffic. They are also often located in rural, low-wealth communities of color.

For over a decade, community members across the south have spoken out about the pollution, potential health impacts, and daily disturbances caused by pellet mills. Their countless, unanswered testimonies before local, state, federal, and international bodies demonstrated the need for measurable, comprehensive research into the impacts of living around these operations.

A coalition of local organizers and regional organizations began meeting in the spring of 2023 to design a survey to collect quantitative data on the impacts of living near pellet mills. While the pollution and environmental impacts from pellet mills are far reaching, due to resource constraints, we limited the survey to households within a 2-mile radius of selected pellet mills. The survey was conducted face-to-face in 5 communities across 4 states. This report provides the aggregated results from the 312 responses received from those communities.¹

As hypothesized, the survey found that pellet mills significantly impact people in their daily lives. Air pollution, dust, noise, and traffic — the most commonly reported concerns from survey participants — disrupt the daily lives of people nearby. The impacts from the pellet mill are more pronounced for people living closer to the pellet mill, however, they are still felt 2 miles away.

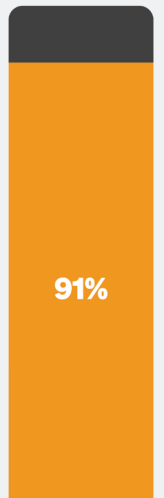
This survey is a first of its kind measure of quality-of-life impacts to people living around pellet mills. We intend to continue this research and conduct this study in additional southern communities with pellet mills. We also hope this research can act as a model and be replicated to measure impacts from other polluting industries.

This project was completed in coalition with the Southern Environmental Law Center, Environmental Justice Action Research Clinic at the University of North Carolina at Chapel Hill's Giling School of Public Health, Dogwood Alliance, the People's Justice Council, Greater Greener Gloster, Gaston Youth, and Organized Uplifting Resources & Strategies. Additional support was provided by the North Carolina Environmental Justice Network and Environmental Justice Community Action Network. It is our intent that this research be used to support the testimonies of the lived experience of community members in local, state, federal, and international advocacy.

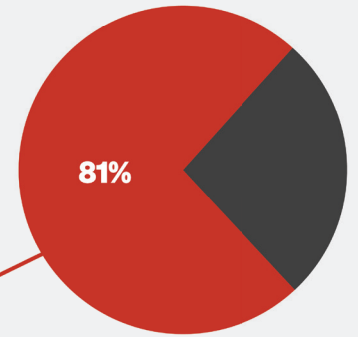
Overview of Survey Results

Dust, noise, air pollution and traffic are the most common concerns.

91% of households within ½ mile of a pellet mill experience dust, traffic, or noise at least weekly.



55% of households have concerns that prevent or disturb their regular outdoor activities like gardening, or grilling and eating outside.



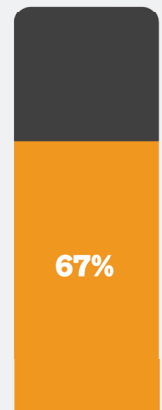
Of those with concerns about outdoor activities, 81% say the wood pellet mill is "always" or "very often" the cause.

AIR AND DUST

Dust is the most commonly reported negative impact of wood pellet mills.



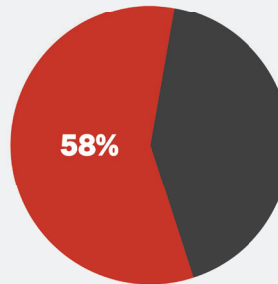
54% of households experience dust at least weekly.



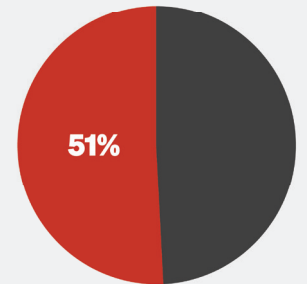
67% of households living **within ½ mile** of a pellet mill experience dust daily.

HEALTH

Respondents reported health concerns such as sinus or throat irritation.



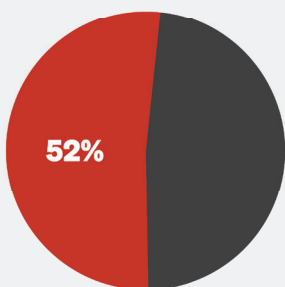
58% of households reported **one or more** health concerns.



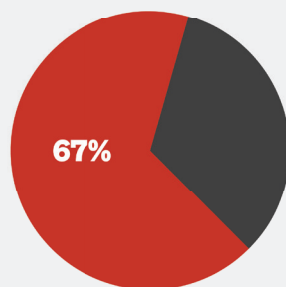
51% of households reported **two or more** health concerns.

TRAFFIC

People associated noise, poor road conditions, and roadside debris with pellet mill truck traffic.



52% of households experience traffic at least weekly.



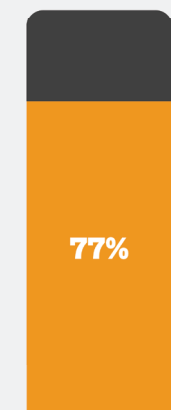
67% of households **within ½ mile** of a pellet mill experience traffic daily.

NOISE

Respondents described loud booms, banging, and grinding noises coming from the pellet mills.



56% of households experience noise at least weekly.



77% of households **within ½ mile** of a pellet mill experience noise daily.



History of Wood Pellet Biomass Industry

The wood pellet industry took off in the late 2000s after the European Union (“EU”) began to subsidize burning wood for energy generation.⁵ Within just a few years, the U.S. South became the largest source of wood pellets in the world.⁶ Data from the Energy Information Association shows that nearly 80% of U.S. biomass manufacturing capacity (both for pellet export and domestic use) is in the South.⁷

The EU began subsidizing the use of wood pellets for energy because of a mistaken belief that wood pellet biomass was a carbon neutral energy source. Wood pellet biomass has often been described as being a carbon neutral energy source because new trees can grow to replace the trees used to produce wood pellets.⁸ However, even if the trees are replanted or regrown, it is unlikely that the young trees will absorb as much carbon as the older trees that were cut down for wood pellet production.⁹ It will take decades, and up to a hundred years or more, for a newly planted forest to be able to absorb the amount of carbon that their predecessors absorbed.¹⁰ This is because a mature tree can absorb and store more carbon than can a newly planted sapling tree.¹¹ It takes several decades, or even centuries, for saplings to grow large enough to absorb the carbon released in the removal and burning of mature trees.¹² Moreover, wood pellet burning power plants emit more carbon dioxide per unit of energy produced than fossil fuel plants, including about 50% more carbon dioxide than a typical coal plant.¹³ Because of a loophole in EU regulations, neither the greenhouse gases emitted by burning the wood pellets, nor the lost carbon sequestration from the harvested trees, are accounted for in the calculations assessing biomass’s carbon emissions.¹⁴

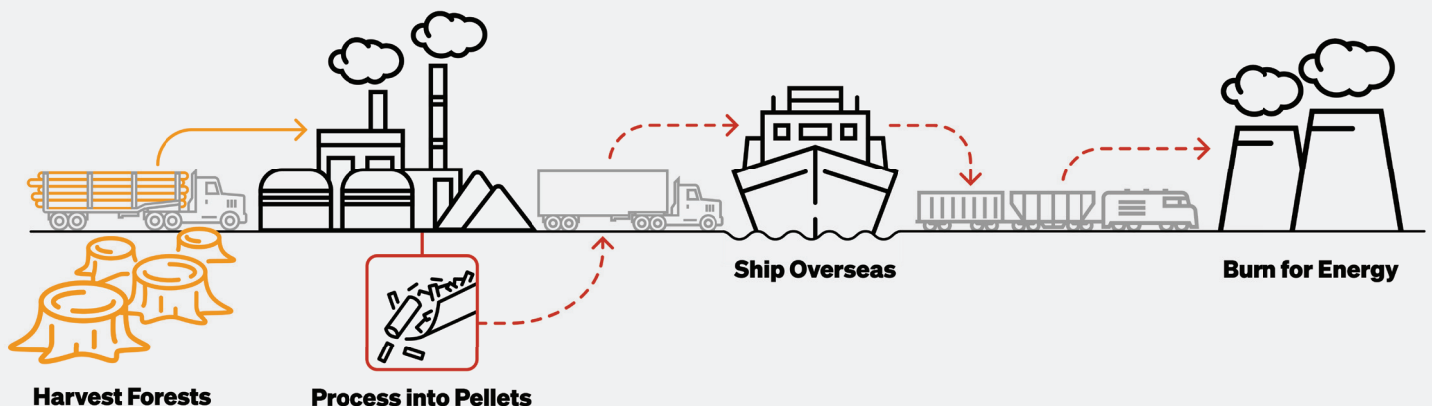
The consequences stemming from the high emissions released by the wood pellet sourcing, manufacturing, and combustion processes are further compounded by

BACKGROUND

Across the southeastern United States, there are 28 industrial-scale pellet mills.² These manufacturing facilities take trees and other woody material from nearby forests, then dry, grind, and press them into wood pellets. These wood pellets are then transported, by truck, train, or barge then cargo ship, to Europe or Asia where they are burned for electricity under the guise of “carbon neutrality.” In 2023, these pellets mills shipped over 9.5 million metric tons of wood pellets abroad to be burned for electricity.³

The majority of wood pellet mills are located in low-wealth communities and communities of color.⁴ There is little research into the impacts these facilities have on the surrounding community. Without quantitative data to support the lived experience of impacted community members, complaints have largely gone unaddressed.

The Cycle of Wood Pellets





the high greenhouse gas emissions released through transporting the wood pellets to Europe and Asia.¹⁵ Despite these harmful consequences, the demand for wood pellets is expected to continue growing globally, supplied in large part by wood pellet mills in the southeastern United States. The strain on U.S. forests has also recently increased because of Russia's invasion of Ukraine, which caused the EU to ban Russian wood pellet imports and limited the EU's ability to import wood pellets from Ukraine.¹⁶

In 2023, the United States exported 9.54 million metric tons of wood pellets, up from 9.01 in 2022.¹⁷ The United Kingdom is the largest importer of U.S. wood pellets, followed by Japan and the Netherlands.¹⁸

Pellet Mill Emissions and Human Health

Local air pollutants, which harm humans and the environment, are emitted throughout the entire wood pellet biomass supply chain. First, trees are harvested and processed, which involves cutting, debarking, and chipping the wood. The wood is then dried, crushed into smaller pieces, then compressed into wood pellets. These processes release volatile organic compounds ("VOCs"), particulates, nitrogen oxides, and hazardous air pollutants. Finally, the wood pellets are shipped overseas and burned for electricity, which emits carbon dioxide as well as additional harmful particulate matter.¹⁹

Manufacturing wood pellets can have significant consequences for human health. VOCs, nitrogen oxides, and particulate pollution cause serious health problems, including asthma, coughing, throat irritation, bronchitis, and even premature death.²⁰ Wood pellet manufacturing also emits significant levels of hazardous air pollutants, including carcinogens and pollutants capable of causing acute respiratory and neurological conditions.²¹

While pellet mills generally have to receive an air quality permit under the federal Clean Air Act and state air quality regulations, which prescribes limits on the amount of specific pollutants the mill is allowed to emit, historically pellet mills have underestimated emissions.²² Even still, pellet mills across the south frequently violate their air permit emissions limitations.²³

Wood pellets themselves have the potential to harm human health even when they are not being burned. Even several months after they have been produced, wood pellets continue to produce gases, such as carbon monoxide.²⁴ There have been several cases of carbon monoxide poisoning in wood pellet storage rooms, including several documented cases in Europe that resulted in the victim's death.²⁵

Forest degradation further compounds the negative health impacts of burning and manufacturing wood pellets because trees have the capacity to clean up air pollution.²⁶ The significant amount of pollution that trees have the capacity to clean from the air has tremendous benefits for human health.²⁷





CORNELL WATSON

Pellet Mills and Forest Loss

In addition to the wood pellet industry's significant effects on quality of life detailed in this report, the industry's reliance on trees, including from clearcutting,²⁸ also degrades forests, which harms the fight against climate change. Throughout their lifespan, trees absorb carbon dioxide, a potent greenhouse gas, and store it.²⁹ When a tree is cut down and burned, its stored carbon dioxide is released back into the atmosphere.³⁰ Therefore, not only does forest degradation eliminate forests' carbon storage capacity, but it also actively contributes to greenhouse gas emissions and a warming planet by releasing stored carbon.

Forest degradation also destroys natural barriers that mitigate the most severe consequences of weather events. Trees help to reduce the impacts of flooding from heavy rains by slowing rainwater, preventing sediment runoff, and holding soil.³¹ This is because tree canopies help absorb heavy rainfall, reducing the speed at which rain hits the soil and thereby allowing the soil more time to absorb the heavy rainfall.³² Allowing the soil to absorb more rainfall means that there is less of an urgent load on local drainage systems and a lowered risk of flooding.³³ Deep-rooted trees also support soil structure, reducing the chances of landslides during heavy rains.³⁴ Trees can also help protect against the damaging effects of fast hurricane

winds.³⁵ The indispensable role of trees in mitigating the harshest consequences of climate change is evidence of the urgent need to maintain and restore our natural forests.

The forest degradation caused by the wood pellet industry also impacts southern wildlife. Forests in the southeastern United States contain some of the most biologically important ecosystems on the continent³⁶ and act as key habitat for hundreds of at-risk species.³⁷ However, the wood pellet industry continues to disturb the wildlife in these important ecosystems by relying, in part, on trees taken from clearcutting natural and mature forests. Harvesting for the wood pellet industry is also concentrated throughout the North American Coastal Plain, an area recognized as a Global Biodiversity Hotspot because it is rich in species diversity while also being severely threatened.³⁸

Pellet Mills and Environmental Justice

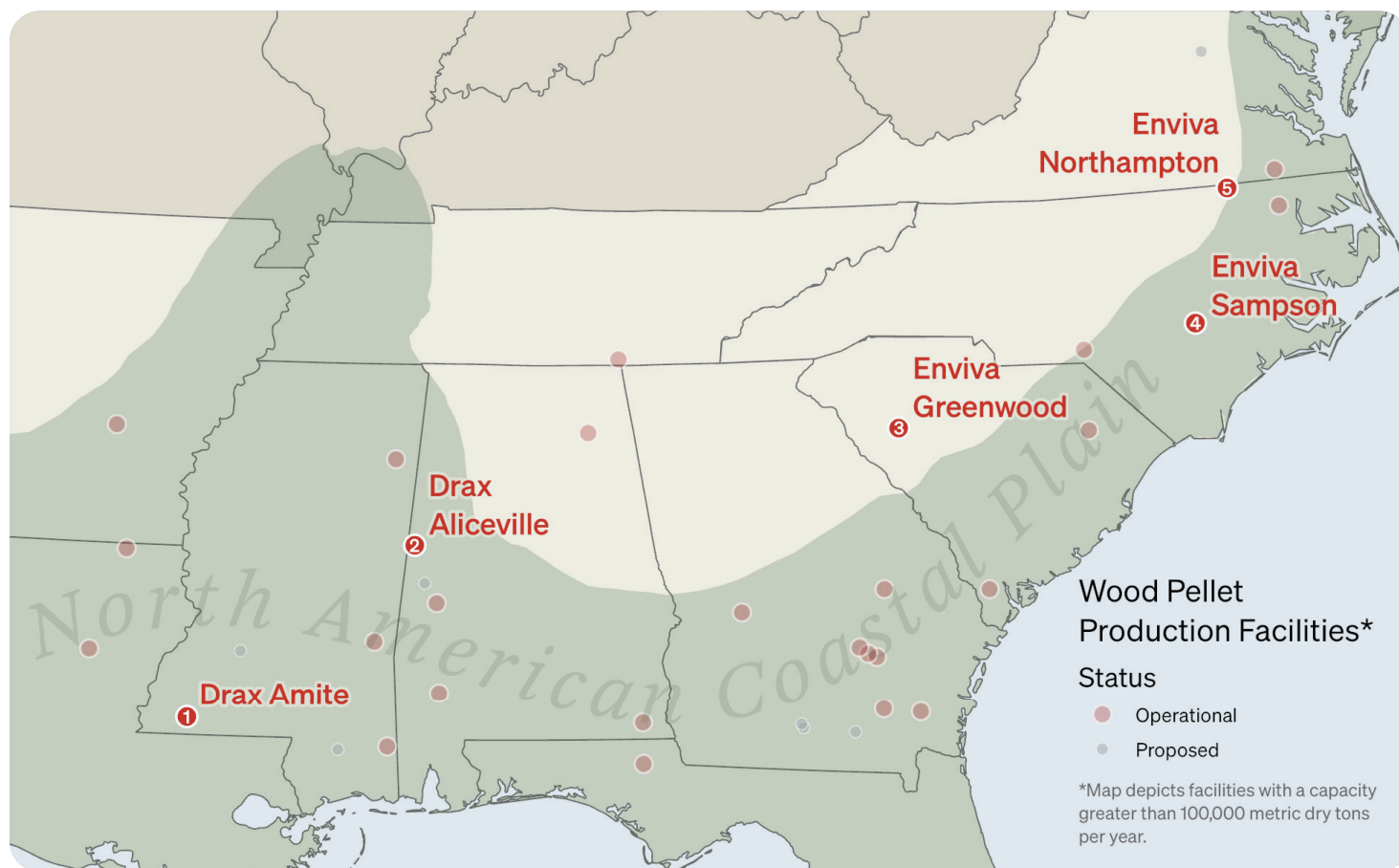
Wood pellet mills are disproportionately located near low-wealth communities with predominantly people of color populations.³⁹ In a recent study, researchers found that wood pellet mills were 50% more likely to be sited in environmental justice communities.⁴⁰ According to the White House Council on Environmental Quality's Economic Justice Screening Tool, 75% of pellet mills in the south are located in disadvantaged communities.⁴¹

This trend is exacerbated by historic disparities in wealth, in which systemic racism by U.S. governmental agencies prevented people of color from acquiring loans and other assistance needed to purchase land.⁴² Now, across the United States, 95% of forest land is owned by white people, while less than 1% of rural landowners are African American.⁴³ The disproportionate concentration of land in the hands of white people has created a severe imbalance of power in decisions over land use in rural areas. Because most rural land is owned by white people, the decisions on private forest logging are primarily made by white people.⁴⁴



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Surveyed Communities Impacted by Wood Pellet Mills



1 Drax Amite

Population within 2 miles: 1366
Number of households surveyed: 67

2 Drax Aliceville

Population within 2 miles: 22
Number of households surveyed: 7

3 Enviva Greenwood

Population within 2 miles: 3335
Number of households surveyed: 122

4 Enviva Sampson

Population within 2 miles: 656
Number of households surveyed: 33

5 Enviva Northampton

Population within 2 miles: 1983
Number of households surveyed: 83

COMMUNITIES AND ORGANIZERS

Nobody knows the big cities or remote pockets of the South better than the people who live there. And nobody fights harder for them.

When polluting industries that dominate decision making move in next door — or, in many cases, have operated there for decades — impacted communities have historically come together to protect their health and sacred places.

While lawyers and advocacy groups can take polluters to court and enforce the law, the big wins come from the wisdom of leaders who emerge on the ground and their special ability to unite the right people it takes to push back and win.

For this survey, the organizers profiled below led teams of impacted residents, environmental advocates, students, and attorneys as they went door to door to collect neighbors' concerns about living around so much wood pellet pollution. The data they recorded supports years of anecdotal evidence from nearby folks who have wound up sick and want real answers.

The movement to protect Southern people and places by stopping biomass production is still heating up. Meet some of the environmental justice leaders at the forefront.

ErNiko Brown

Greenwood, South Carolina



ERIC HILT

ENVIVA GREENWOOD

When you're raised in community, taking care of each other becomes second nature.

"I come from community, so I believe in community," says Commissioner ErNiko Brown, an equally simple and powerful way to describe how she arrived at organizing against pellet mills across the Southeast. But her collaborative spirit and attention to relationship building runs much deeper.

Commissioner Brown was raised by her grandmother — who birthed nine children and mothered so many others — in one of her family's most sacred places, their rural South Carolina homestead passed down through generations for more than 200 years. The land was a solid foundation for her family to thrive and enjoy the benefits of sharing time and space. It was a place to nurture and be nurtured in return.

"You can't overlook the essence of community Black women have built in these spaces," says Commissioner Brown, speaking from a life shaped by the intimate relationships her ancestors have historically cultivated with the land and between themselves. "Sustainability is just a 10 dollar word for survival that Black folks have been doing for over 400 years."

She's been front and center on building opposition to unjust pollution, from organizing on the ground in several Southern states to holding various leadership roles at multiple organizations, including founding and becoming CEO of Organized Uplifting Resources & Strategies, or



"When I think of myself as the little Black girl from South Carolina, I am truly amazed at all we've been able to accomplish so far. It's a true testament to the strength of a Black woman. And I thank God every day for being one."

— ERNIKO BROWN



OURS, a nonprofit focused on environmental justice for rural communities. Her grassroots organizing has spanned internationally and nationally including across 14 states and involved educating community members and identifying local leaders who have continued the fight today. This work has connected her with many other Black women building the movement against the toxic biomass industry.

She's touched by the way her elders carry on the spirit of her grandmother, who has passed away since Commissioner Brown started organizing.

"There's this beautiful thing about older women in the Black community," says Commissioner Brown. "They're not just the people leading the work, they're nurturers and wisdom holders. These are our elders who are nurturing our relationships and livelihoods in the process of passing the torch down."

Commissioner Brown is quick to praise Belinda Joyner of Northampton County, North Carolina.

"She has become this fixture in my life where I can't go too long without talking to her," Commissioner Brown says, drawing on a recent phone call where Joyner said, "I'm so proud of you, ErNiko. I know your grandma is up there in heaven shouting."

Debra David of Richmond County, North Carolina, was another person to love on Brown from the beginning. This staunch community organizer with nonprofit Dogwood

Alliance was known for her loving and humble spirit and world-class cakes and pies. Some say her banana pudding is the best they've ever eaten.

David participated in the survey project and passed away from cancer July 10, 2024, before the findings could be published. She was on the frontline of the fight against wood pellet pollution for many years and is personally responsible for hooking Commissioner Brown deeper into the work by laying out the ways the industry was harming Commissioner Brown personally.

"When she was out in the field doing this work, even when she was sick, she would give 110 percent," Commissioner Brown remembers. "She was a humble giant and any time someone needed to speak out about biomass or how her community was impacted, she was definitely there."

This survey project is a way to honor the many environmental justice champions who lead the way for today's emerging leaders, including David and Joyner.

"Being able to produce these survey results is a tangible way to pay homage to the many people who have taken on this fight," Commissioner Brown concludes.

"Now these people's daughters and granddaughters are taking over. When I think of myself as the little Black girl from South Carolina, I am truly amazed at all we've been able to accomplish so far. It's a true testament to the strength of a Black woman. And I thank God every day for being one."

Ruby Bell

Faison, North Carolina



ENVIVA SAMPSON

“Relentless,” is the word Dr. Ruby Bell uses to describe the fight for clean air in her rural North Carolina community.

Her home is less than five miles away from the Enviva Sampson pellet mill, and conveniently situated down the road from her husband’s barber shop. Forty years ago, her decision to settle here in his hometown of Sampson County was to benefit his small business.

As an associate professor at The University of Mt. Olive, the now-retired educator would pass the plumes of smoke billowing from the facility’s stacks on her drive to and from campus. At first, she didn’t consider how that pollution might affect people’s health or the environment.

But clean air and water are critical for this farming community of Faison, where if you can name a type of produce, Dr. Bell says, “We probably grow it.”

Sitting in a driveway across the street from one of the many facilities where Enviva operates across the Southeast, Dr. Bell talked with a Sampson County homeowner who worried pollution from the pellet mill was seeping into his well. Until this point, the amount of time she was spending on gathering information and addressing community concerns was strictly voluntary.

CORNELIUS LEWIS





“There’s a job out there and somebody’s got to do it,” Dr. Bell says. “I believe Black women stand up because we’re nurturers...but it’s not a fight that we can win all by ourselves.”

Twenty minutes of breathing in the nearby dust and particles was all it took for her to step into an official community organizing role with the nonprofit Dogwood Alliance.

“My eyes and nose started running and burning. I was sniffing and coughing,” Dr. Bell remembers after the interaction. “If I experienced that after just 20 minutes, think about what it’s like if your home is in the area. You can’t get in your car and drive away from it as I did.”

Subsidization at all levels of government has helped companies like Enviva keep their lights on, so a major goal for clean air advocates is putting an end to all subsidies. Representing Dogwood Alliance, Dr. Bell was among a group of concerned citizens who dropped by North Carolina’s most recent legislative session to make their request face to face.

“Enviva is not sustainable without those handouts,” she says. And in the spirit of relentlessness, she adds, “We just had to make sure they heard us.”

“My eyes and nose started running and burning. I was sniffing and coughing. If I experienced that after just 20 minutes, think about what it’s like if your home is in the area. You can’t get in your car and drive away from it as I did.”

— RUBY BELL



Krystal Nicole Martin

Gloster, Mississippi



PHOTOS BY NICO HOPKINS

DRAX AMITE

Folks who are familiar with Dr. Krystal Nicole Martin will tell you that helping others is her passion and priority. But in a recent moment of clarity, she reveals beginning to recognize it as something even bigger: her purpose.

She spun growing up in southwest Mississippi without access to supplemental resources into starting a nonprofit, KMartin Group, through which she dedicates her personal time, talent, and resources to making sure today's young people are able to explore new opportunities. She's also the type of person who didn't hesitate to pack up her professional life as a college administrator and move home to assist her mom and community.

Multiple hospital visits to treat her mom's unfounded respiratory issues would prompt the mother and daughter duo to do their own digging for insight. This search eventually turned up local newspaper coverage on harmful impacts of living near wood pellet facilities.

"Had it not been for my mom reading the article and sharing it with me in that moment, we wouldn't have known," Dr. Martin says, "And we probably wouldn't be where we are today."

Her contributions to the community prove repeatedly that the accumulation of small steps forward is what makes big



“It’s disheartening to see that in a small community like mine, we have so many people experiencing health issues with no explanation. And it’s been hard to convey to people that their illnesses could be from air pollution since it’s something you can’t even see.”

— KRYSTAL MARTIN



change. Like a magnet drawn to metal, her instinct and dedication to helping is what pulled her into the pellet mill community survey project.

“It’s disheartening to see that in a small community like mine, we have so many people experiencing health issues with no explanation,” she says. “And it’s been hard to convey to people that their illnesses could be from air pollution since it’s something you can’t even see.”

There are so many better things Dr. Martin envisions for her community than being Drax Amite’s dumping ground — and so many better ways she could spend her time as a public servant than fighting for something as simple as clean air.

“My wish is for a greater, greener Gloster to include clean air and water, but also a public school, a state-of-the-art library, a multi-purpose facility with indoor walking trail and basketball, better housing, a local dentist and medical doctor, community garden, food-pantry and after-school programs,” she says, sharing only a few of the ways she has identified improving her hometown where almost 40 percent of the population lives under the poverty line.

Gloster also needs new or remodeled places for people to put their minds together to solve the local environmental issues playing out now, Dr. Martin adds.

Also high on her list? A fun and safe place to play when her three granddaughters visit from Alabama. But it’s not lost on Dr. Martin that getting outside to enjoy nature with family should not be a privilege.



“I’m doing this work because of my mom, my son, the children, and the many people who call Gloster home,” she says. “We deserve the right to know the air we’re breathing in Gloster is as safe as the air in Madison, and other parts of the country. We can’t let southwest Mississippi stay forgotten.”

Richie Harding

Pleasant Hill, North Carolina



PHOTOS BY CORNELL WATSON

ENVIVA NORTHAMPTON

A midwife delivered Richie Harding in his childhood home in Pleasant Hill, North Carolina. Probably best known for coaching the town's kids in recreational sports over the past decade, this community pillar is now front and center on fighting the unjust wood pellet pollution that many suspect is making the community sick, or at least accelerating their symptoms.

"Most of our older people came up in an era where they really couldn't speak up. That's how I started speaking up for people on different issues, and that responsibility continues to grow," says Harding. "Before you know it, you're in a position where people are looking to you for a lot of different things."

When an environmental attorney called Richie Harding to ask what he knew about the pellet mill in his neighborhood, Harding answered. And after a trip to the county commissioner's office to find out more, he hasn't stopped spreading the word about the dangerous impacts these facilities are known to have on communities and the environment.

"It's challenging because there are a lot of people who don't want the harms of wood pellet pollution to be true," he says. "A prior county commissioner drove through town and was relieved not to see it. Well, most air pollution is invisible."





Breathing issues and other respiratory illnesses are prevalent near the Enviva Northampton facility in Garysburg. Living just a few miles away, Harding says he enjoys the slower pace that comes along with country life but not being a target for various polluting industries.

“There are a lot of people that really enjoy being here, but it’s like we have allowed industry to determine who lives where,” he adds. “That’s not okay.”

Most environmental injustices happen in Black, Latino, or Indigenous communities, or places where the median income is below the poverty line. The biggest polluters often claim they will give back to the communities they harm with their projects.

“I’ve seen their names on our sports team t-shirts as being a sponsor, but they don’t have a presence in our community,” says Harding. “They have no consideration for the people who live nearby.”

This work is ongoing, and Harding pledges to keep his foot on the pedal.

“It may not change for me, but I got kids and grandkids, and I want them to have a comfortable life,” he says. “Everyone’s life deserves the same consideration.”

“It may not change for me, but I got kids and grandkids, and I want them to have a comfortable life. Everyone deserves the same consideration.”

— RICHIE HARDING





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SURVEY METHODOLOGY

Household health surveys can be particularly challenging in small rural towns, as concerns about privacy and confidentiality become more acute with smaller populations. To ensure the broadest possible distribution of the survey, it was imperative for our team to have pre-existing relationships of trust with community members who lived in those towns. Our team administered the survey in phases, as determined by the communities where we had built the strongest relationships. This process is consistent with other more recent rural health surveys, such as a 2023 survey of sanitation infrastructure access in Lowndes County, Alabama.⁴⁵

We developed the survey in the span of three months, between June and September 2023, with technical support from the Environmental Justice Action Research Clinic at The University of North Carolina at Chapel Hill's Gillings School of Public Health. Community leaders from each of the surveyed towns were involved in the process, particularly to advise about the overall accessibility of the survey—reading levels, language access, length, appropriateness—for their particular communities. The final survey was 20 questions and was available both online and on paper, and in English and Spanish. This collaborative method of developing the survey instrument is at the heart of citizen science, now more regularly called participatory science. Participatory science begins from the premise that communities possess local knowledge that can facilitate successful scientific inquiry by identifying

scientific problems, developing informed research questions, and co-creating the methods and relationships necessary for the broader community to participate in the research process.⁴⁶

Due to population size and resource limitations, the scope of the survey was restricted to households located within a 2-mile radius of the pellet mill. Using GIS technology, census information, and parcel records, we identified each of the recorded households within the prescribed radius of each town. The survey was administered face-to-face, either via door-to-door canvassing or at local health fairs, by community members in each of the towns, all of whom were compensated for their time. We determined the face-to-face survey format was the most appropriate, as it ensured greater fidelity in survey results, gave the surveyor an opportunity to explain the survey, and offered the respondents a chance to ask questions. We used a GIS locator application to determine whether respondents lived within $\frac{1}{2}$, 1, or 2 miles of a pellet mill.

Survey questions were largely multiple choice, with spaces allowed for explanation as respondents desired. The respondents were asked to articulate specific impacts on their wellbeing and enjoyment of their homes and larger communities since the establishment of the wood pellet mill in their communities, and to indicate any relevant health conditions. Survey responses showed that nearly all respondents lived in their current households prior to the construction of the pellet mills.

We received a total of 312 valid responses from 5 communities. This equates to over 10% of all households within a 2-mile radius of the selected pellet mills. Those communities were: Gloster, Mississippi, around Drax Amite; Faison, North Carolina, around Enviva Sampson; Garysburg, North Carolina, around Enviva Northampton; Greenwood, South Carolina, around Enviva Greenwood; and Aliceville, Alabama, around Drax Aliceville. Our sample corresponds well with the overall racial makeup of the 5 communities surveyed. We estimated, using U.S. census data, that the 2-mile radius around the 5 surveyed communities would be majority Black or African American, and 70% of our respondents identified themselves as “Black or African American.”



RESULTS

Responses to the pellet mill community impact survey show that pellet mills impact people in their daily lives. Air pollution, dust, noise, and traffic were the most common reported concerns from survey participants. The impacts

“[It’s] very noisy and stuff constantly flying in the air, it’s hard for my grandkids to play outside.”

— GREENWOOD, SC RESIDENT

from the pellet mill are more pronounced for people living closer to the pellet mill, however, even as far as 2 miles away, respondents are still affected.

Air pollution and dust concerns, the two most commonly identified concerns, prevent over half of all survey respondents, regardless of proximity to the plant, from engaging in regular outdoor activities. For those living within ½ mile of the plant, that number rises to 79%. Noise was the third most commonly identified barrier to outdoor activities, affecting 36% of participants.

“I’m not able to go outside because of the dust [or] sleep because of the noise.”

— GARYSBURG, NC RESIDENT

The majority of households surveyed reported dust, noise, or traffic weekly or more frequently. People living closer to pellet mills bear the greatest burden. 91% of those surveyed who live within ½ mile of a pellet mill said they experience dust, noise, or traffic weekly or more frequently. Environmental conditions such as dust, noise, and truck traffic are so severe and so frequent that a majority of respondents reported that they had concerns that kept them from going outside their homes. While dust, noise, and air pollution are the most common complaints, respondents also noted that foul odors and health concerns kept them inside.

Over 80% of respondents who reported that the above-noted environmental conditions prevented them from going outside reported that the pellet mill “always” or

“I’m not outside a lot. I used to walk around a lot but stopped once the mill came down. I was recently given an asthma pump for breathing problems.”

— GLOSTER, MS RESIDENT

“very often” contributes to their concerns. The majority of respondents were not aware of any other industries contributing to their concerns.

Several participants were concerned for wildlife. Some expressed concern that local clear cutting which may feed the local pellet mill, is destroying animal habitat. Many observed increased wildlife in their yard throughout the day.

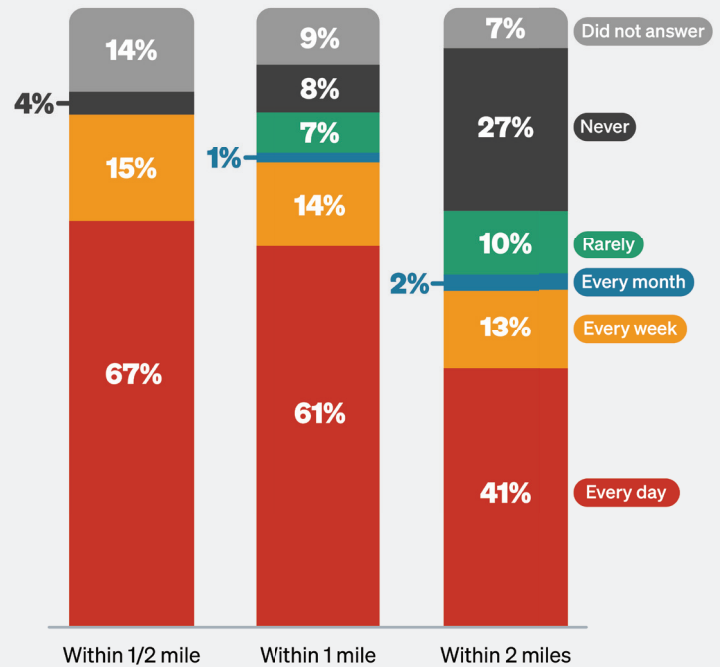
Air and Dust

Dust was the most commonly reported concern for respondents. 54% of respondents experience dust at least weekly. Closer to the pellet mills dust is an even greater concern: 67% of respondents living within a ½-mile radius experience dust “every day.”

Dust and air pollution interfere with people’s daily lives. People reported irritated throats and sinuses due to the constant dust. Several parents and grandparents stated that dust prevents their children from playing outside. One survey respondent, who lives within 1 mile of Enviva Northampton, stated, “the pollution caused my children to stay inside because they had problems breathing when outside. Doctor stated that the asthma was attributed to the outside air pollution.”

Over a dozen respondents stated that their car is always dusty, despite weekly, or twice weekly, washing. A resident of Faison, NC, living within ½-mile of Enviva Sampson, stated that “dust and air pollution causes me not to be able to sit outside, I don’t hang clothes on the line, my car is always dusty.”

Reported Frequency of Dust



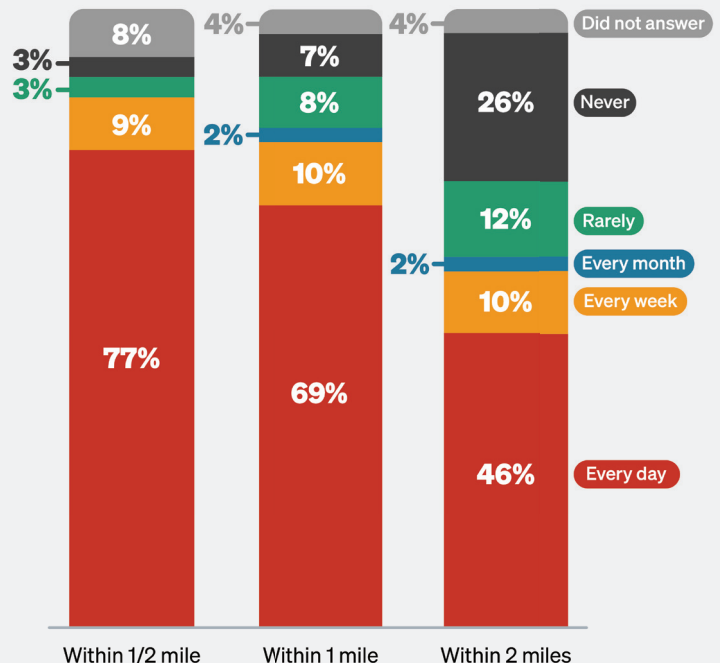
Noise

People living around pellet mills experience constant noise that many attribute to the pellet mill. Noise was the third most frequently identified concern. People described the noise as “loud booms,” “grinding noise,” and “banging” that “sounds like thunder.”

Most respondents living within a ½-mile radius of a pellet mill experience noise at least weekly. 77% of residents within a ½-mile experience noise every day. Even at up to 2 miles away, nearly half of all respondents experience noise every day.

The levels of noise experienced by people living around pellet mills disturbs their daily, and nightly, lives and interferes with sleep. One Gloster, MS, resident stated that “it’s not worth it to go outside and sit” because of the noise. Some people stay inside and bear the noise, while others report leaving their home or community for relief. A respondent from near Enviva Northampton expressed, the “noise is all day long. . . . I leave home and go to my friends cause I won’t hear it there. I changed bedrooms in my house and moved to the back of the house so there would be less noise.”

Reported Frequency of Noise



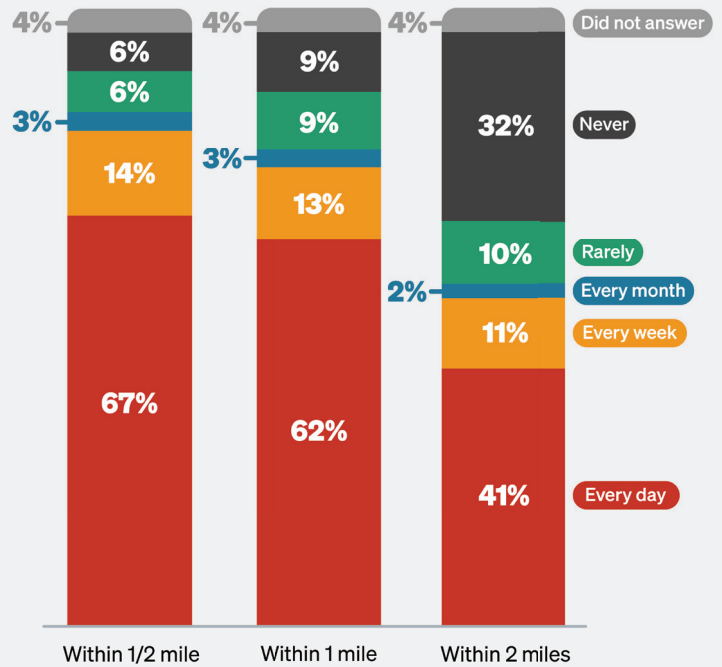


JULIE DERMANSKY

Traffic

Over half of all respondents experience traffic from the pellet mill at least weekly. 67% of people within a 1/2-mile of a pellet mill reported daily traffic. People also associated noise, poor road conditions, and frequent roadside woody debris with truck traffic.

Reported Frequency of Traffic



Economics

Out of 312 total respondents, only three people stated that a member of their household worked at their local pellet mill. When asked to describe the “economic advantages or disadvantages” arising from their local pellet mill, only 16 respondents identified economic benefits such as jobs and corporate donations to local initiatives, like parks.

However, 71 respondents stated that they saw no economic advantages from the pellet mill. Moreover, several people that identified economic benefits also questioned whether the benefits outweighed the potential environmental and health burdens.



Health

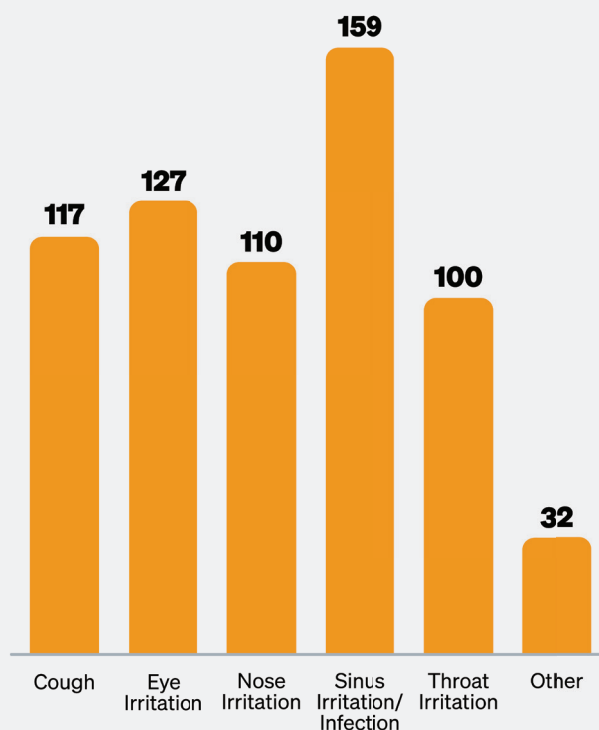
The majority of households surveyed reported moderate to extreme health challenges that they attribute to the wood pellet mill. 58% of respondents reported at least one health condition such as cough or eye irritation. The majority of surveyed households reported at least one family member diagnosed with one or more of the thirteen diseases associated with wood pellet mill pollution. In four out of five communities,⁴⁷ 86% of households reported at least one family member diagnosed with one or more of the thirteen diseases associated with pellet mill pollution.

These statistics represent self-reported health data. People are often not forthcoming with their personal health information. Moreover, these numbers do not include undiagnosed medical illnesses or people who selected not to respond to these questions. Therefore, the rates of these medical diagnoses and health conditions is likely higher than reported here.

“My eyes burn. I also have mucus in my throat every morning when I wake up started about 5 or 6 years ago. Dry throat is a constant.”

— FAISON, NC RESIDENT

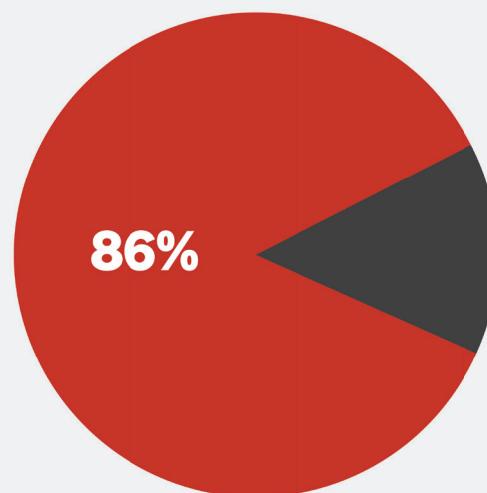
Health Conditions Reported by Survey Respondents



Self-Reported Medical Diagnoses*

*Excluding Greenwood, SC

Diagnosis	Total Reported Number of Household Members with Diagnosis
High Blood Pressure	165
Asthma	121
High Cholesterol	113
COVID-19	99
Poor Mental Health	80
Diabetes	67
Immunocompromised	40
Heart Disease	35
Lung Disease	32
Dementia	27
Cancer	24
Kidney Disease	21
Hepatitis	12



86% of households reported at least one diagnosis.



CONCLUSION

This research shows that pellet mills have a measurable impact on the quality-of-life for those living nearby. Pellet mills impact people living nearby in their daily lives. Air pollution, dust, noise, and traffic were the most common concerns for survey participants. While the impacts from pellet mills are more pronounced for people living closer to the pellet mill, the impacts are still felt by people living as far as 2 miles away.

Additional research is needed in communities with pellet mills in order to measure the full scope of impacts from the industry. We limited the scope of this survey to focus on households within a 2-mile radius of selected pellet mills. However, the health and quality-of-life impacts of living near one of these facilities is felt beyond 2 miles. Moreover, many survey respondents identified other polluting industries that contribute to the cumulative environmental burden. The particular impacts of those industries were not measured in this survey.

To limit the number of questions in the survey, thereby encouraging higher participation, there are several environmental concerns that we chose not to measure. We limited inquiry into the impacts of forest destruction, contact with wildlife, and cultural site identification. In addition, we chose not to identify or target households based on their proximity to clear-cut forest, highways, or wood pellet storage facilities. These are all important areas that need additional research.

Lastly, additional surveys need to be done in other communities close to pellet mills. We adopted a phased approach to this region-wide survey. There are 28 pellet mills in the southeastern United States. The five communities discussed in this report were considered Phase I of the region-wide survey. We will conduct surveys in communities identified for Phase II.

The successful deployment of the survey in 5 communities across 4 states demonstrates the importance of having impacted community members in coalition at every stage of project development and deployment. Creation and deployment of this survey in communities with different geographies and demographics would not have been possible without local organizers from those communities. We intend to continue to build coalition with impacted community members to carry out this survey in other communities with pellet mills.

Dust, noise, and traffic from pellet mills affect the daily lives of people living nearby. Those effects are felt disproportionately in low-wealth, communities of color. The results from this survey support the stories, told countless times by community members, about the quality-of-life impacts of living around pellet mills.

ENDNOTES

¹All percentages in this report are out of total respondents, which includes respondents who selected “prefer not to answer” or skipped individual questions.

² *Southeast U.S. Wood Pellet Plants Exporting to Europe and Asia*, S. ENV'T L. CTR., (Apr. 2023), <https://www.southernenvironment.org/wp-content/uploads/2023/12/Screen-Shot-2024-01-03-at-12.34.48-PM.png>.

³ Erin Voegelé, *USDA: US Wood Pellet Exports Reach 9.54 Million Metric Tons in 2023*, BIOMASS MAGAZINE (Feb. 8, 2024), <https://biomassmagazine.com/articles/usda-us-wood-pellet-exports-reach-954-million-metric-tons-in-2023>.

⁴ *Climate and Economic Justice Screening Tool*, COUNCIL ON ENV'T QUALITY, <https://screeningtool.geoplatform.gov/en/#3/33.47/-97.5> (showing that 75% of the 28 pellet mills in the South are located in “disadvantaged communities”); see also Stefan Koester & Sam Davis, *Siting of Wood Pellet Production Facilities in Environmental Justice Communities in the Southeastern United States*, 11 ENV'T J. 66 (2018), <https://www.liebertpub.com/doi/10.1089/env.2017.0025> (finding that pellet mills in the southeastern United States are 50% more likely to be located in an environmental justice community, defined as “a county where the poverty level is above the state median and at least 25% of the population is nonwhite”).

⁵ Majlie de Puy Kamp, *How Marginalized Communities in the South are Paying the Price for ‘Green Energy’ in Europe*, CNN (July 9, 2021), <https://www.cnn.com/interactive/2021/07/us/american-south-biomass-energy-invs/>; see *Wood Pellet Production Capacity in the U.S. South*, FORISK CONSULTING (2019), <https://forisk.com/blog/2019/09/05/wood-pellet-production-capacity-in-the-u-s-south/> (showing the increase in U.S. wood pellet capacity from 2009-2019).

⁶ *Export Volume of Wood Pellets Worldwide in 2022, by Major Country*, STATISTA.COM, <https://www.statista.com/statistics/477086/exports-of-wood-pellets-volume-by-key-country/#:~:text=The%20United%20States%20was%20the,under%203.5%20million%20metric%20tons> (last visited Aug. 30, 2024).

⁷ U.S. Energy Information Administration, *Monthly Densified Biomass Fuel Report* (May 2024), <https://www.eia.gov/biofuels/biomass/> (showing a total densified biomass fuel capacity in the US of 13,414,999 tons, with 10,694,811 tons of that from the South).

⁸ Joe Crowley & Tim Robinson, *Drax: UK Power Station Owner Cuts Down Primary Forests in Canada*, BBC (Oct. 2, 2022), <https://www.bbc.com/news/science-environment-63089348>.

⁹ See Niclas Scott Bentsen, *Carbon Debt and Payback Time—Lost in the Forest?*, 73 RENEWABLE & SUSTAINABLE ENERGY REVS. 1211, 1215 (2017), <https://doi.org/10.1016/j.rser.2017.02.004>.

¹⁰ See *id.*; Thomas Buchholz et al., *A Global Meta-Analysis of Forest Bioenergy Greenhouse Gas Emission Accounting Studies*, 8 GCB BIOENERGY 281, 281–89 (2016), <https://onlinelibrary.wiley.com/doi/epdf/10.1111/gcbb.12245>.

¹¹ See William R. Moomaw et al., *Intact Forests in the United States: Proforestation Mitigates Climate Change and Serves the Greatest Good*, FRONTIERS IN FORESTS & GLOBAL CHANGE (2019), <https://doi.org/10.3389/ffgc.2019.00027>.

¹² See Bentsen, *supra* note 9, at 1215; Buchholz et al., *supra* note 10, at 287.

¹³ LONGWEN OU & HAO CAI, ENERGY SYSTEMS DIV., ARGONNE NAT'L LAB'Y, UPDATE OF EMISSION FACTORS OF GREENHOUSE GASES AND CRITERIA AIR POLLUTANTS, AND GENERATION EFFICIENCIES OF THE U.S. ELECTRICITY GENERATION SECTOR 23 (2020), <https://publications.anl.gov/anlpubs/2020/09/162084.pdf> (identifying CO₂ emissions factors for coal as ranging from 987 to 1,012 g/kWh and for biomass as ranging from 1,456 to 1,523 g/kWh).

¹⁴ ENV'T INTEGRITY PROJECT, DIRTY DECEPTION: HOW THE WOOD BIOMASS INDUSTRY SKIRTS THE CLEAN AIR ACT 4 (2017), <https://www.environmentalintegrity.org/wp-content/uploads/2017/02/Biomass-Report.pdf>.

¹⁵ See Koester & Davis, *supra* note 4, at 65.

¹⁶ BOB FLACH & SOPHIE BOLLA, U.S. FOREIGN AGRIC. SERV., EU WOOD PELLET ANNUAL 10–11 (2022), <https://fas.usda.gov/data/european-union-eu-wood-pellet-annual>.

¹⁷ Voegelé, *supra* note 3.

¹⁸ See Erin Voegelé, *USDA: US Wood Pellet Exports Top 926,024 Metric Tons in May*, BIOMASS MAGAZINE (July 8, 2024), <https://biomassmagazine.com/articles/usda-us-wood-pellet-exports-top-926024-metric-tons-in-may> (reporting on monthly exports for May 2024).

¹⁹ ENV'T INTEGRITY PROJECT, *supra* note 14, at 5–6.

²⁰ Pablo Orellano et al., *Short-Term Exposure to Particulate Matter (PM10 and PM2.5), Nitrogen Dioxide (NO₂), and Ozone (O₃) and All-Cause and Cause-Specific Mortality: Systematic Review and Meta-Analysis*, 142 ENV'T INT'L 11 (2020), <https://doi.org/10.1016/j.envint.2020.105876>; Xihe Zhou et al., *Environmental and Human Health Impacts of Volatile Organic Compounds: A Perspective Review*, 313 CHEMOSPHERE, Feb. 2023, at 6–7, <https://www.sciencedirect.com/science/article/abs/pii/S0045653522039820>; *Basic Information About NO₂*, EPA, <https://www.epa.gov/no2-pollution/basic-information-about-no2> (last updated July 16, 2024); *Health and Environmental Effects of Particulate Matter (PM)*, EPA, <https://www.epa.gov/pm-pollution/health-and-environmental-effects-particulate-matter-pm> (last updated July 16, 2024).

²¹ See ENV'T INTEGRITY PROJECT, *supra* note 14, at 6; Carl Dimitri, *A Looming Health Crisis Shadows the South's Wood Pellet Boom*, BROWN UNIV. SCH. PUB. HEALTH (2024), <https://sph.brown.edu/news/2024-04-29/mississippi-wood-pellets#:~:text=Wood%20pellet%20manufacturing%20involves%20processing,formation%2C%20posing%20severe%20health%20risks>.

²² See generally ENV'T INTEGRITY PROJECT, *supra* note 14.

²³ *Table of Clean Air Act Permit Violations by Wood Pellet Manufacturers in the Southern United States*, S. ENV'T L. CTR.,

<https://www.southernenvironment.org/wp-content/uploads/2024/06/Pellet-Mill-Violations-in-the-South-updated-2024-06-05.pdf> (last updated June 5, 2024); see generally ENV'T INTEGRITY PROJECT, *supra* note 14.

²⁴ *Avoiding Toxic Gases from the Pellet Bunker*, GERMAN FEDERAL INSTITUTE FOR RISK ASSESSMENT (2014), https://www.bfr.bund.de/en/press_information/2014/19/avoiding_toxic_gases_from_the_pellet_bunker-191181.html.

²⁵ See *id.*; Saskia Gauthier et al., *Lethal Carbon Monoxide Poisoning in Wood Pellet Storerooms—Two Cases and a Review of the Literature*, 56 ANNALS OF WORK EXPOSURE & HEALTH 755–63 (2012), <https://doi.org/10.1093/annhyg/mes047>; Wolfgang Stelte, *Guideline: Storage and Handling of Wood Pellets*, DANISH INST. TECH. (2012), https://www.teknologisk.dk/_/media/52682_RK%20report%20storage%20and%20handling%20of%20pellets.pdf.

²⁶ David J. Nowak et al., *Tree and Forest Effects on Air Quality and Human Health in the United States*, 193 ENV'T POLLUTION 119, 123–24 (2014), <https://www.sciencedirect.com/science/article/abs/pii/S0269749114002395> (stating that in the contiguous United States, trees clean up to 23.2 million tons of air pollution annually).

²⁷ *Id.* at 124 (finding pollution removal effect of trees led to hundreds of fewer deaths and hundreds of thousands of fewer occurrences of respiratory health incidents).

²⁸ DOGWOOD ALLIANCE ET AL., GLOBAL MARKETS FOR BIOMASS ENERGY ARE DEVASTATING U.S. FORESTS, <https://www.cutcarbonnotforests.org/wp-content/uploads/2023/12/global-markets-biomass-energy-devastating-us-forests-202312.pdf> (last updated 2023).

²⁹ Jillian Fink, *Deforestation and Endangered Species' Habitats in the U.S.* (2023), <https://storymaps.arcgis.com/stories/608e57dd2e864804a0f7fc5ed1797a3f>.

³⁰ *Id.*

³¹ *Storm Preparation and Tree Resiliency*, VA. DEP'T FORESTRY, <https://dof.virginia.gov/urban-community-forestry/storm-planning-and-recovery/storm-preparation-and-tree-resiliency/> (last visited July 26, 2024).

³² *The Role of Forests in Protecting Against Natural Disasters*, COILLE ALBA, <https://coillealba.org.uk/blog/the-role-of-forests-in-protecting-against-natural-disasters/> (last visited July 26, 2024).

³³ *Id.*

³⁴ *Id.*

³⁵ *Storm Preparation and Tree Resiliency*, VA. DEP'T OF FORESTRY, *supra* note 31.

³⁶ NAT. RES. DEFENSE COUNCIL, IN THE U.S. SOUTHEAST, NATURAL FORESTS ARE BEING FELLED TO SEND FUEL OVERSEAS 4 (2015), <https://nrdc.org/sites/default/files/southeast-biomass-exports-report.pdf>.

³⁷ S. ENV'T L. CTR., BURNING TREES FOR POWER: THE TRUTH ABOUT WOODY BIOMASS, ENERGY & WILDLIFE 6–7 (2018), https://www.southernenvironment.org/wp-content/uploads/2021/08/Biomass_Biodiversity_white_paper.pdf.

³⁸ *Id.*

³⁹ Koester & Davis, *supra* note 4, at 68.

⁴⁰ *Id.* at 66, 68 (defining “environmental justice communities” as “a county where the poverty level is above the state median and at least 25% of the population is nonwhite”); see also Council on Env't Quality, *supra* note 4.

⁴¹ See Council on Env't Quality, *supra* note 4; *Southeast U.S. Wood Pellet Plants Exporting to Europe and Asia*, *supra* note 2.

⁴² See generally PETE DANIEL, DISPOSSESSION: DISCRIMINATION AGAINST AFRICAN AMERICAN FARMERS IN THE AGE OF CIVIL RIGHTS (2015).

⁴³ Leah Douglas, *African Americans Have Lost Untold Acres of Land Over the Last Century*, THE NATION (June 26, 2018), <https://www.thenation.com/article/archive/african-americans-have-lost-acres/>.

⁴⁴ See *id.*

⁴⁵ See Elizabeth A. Albright et al., *Failing Septic Systems in Lowndes County, Alabama: Citizen Participation, Science, and Community Knowledge*, 29 LOCAL ENV'T 135, 137–38 (2024), <https://doi.org/10.1080/13549839.2023.2267066>.

⁴⁶ See *About CitizenScience.gov*, U.S. GEN. SERVS. ADMIN., <https://www.citizenscience.gov/about/#> (last visited Aug. 29, 2024); JASON CORBURN, STREET SCIENCE: COMMUNITY KNOWLEDGE AND ENVIRONMENTAL HEALTH JUSTICE 47–77 (2005).

⁴⁷ The rates of reported health diagnosis around Enviva Greenwood were statistically improbable. As expected in public health surveys, survey respondents were likely hesitant to provide their private health information. Many responded “no” to every health condition instead of “prefer not to answer.” When results from 2 days of survey showed unrealistically low rates of health diagnosis, we notified surveyors to expressly tell respondents that they did not have to answer. After that conversation, the rates for “prefer not to answer” rose significantly. The health-related responses around Enviva Greenwood were out of line with city, county, state, and national rates. This outlier represents the challenges in community participatory studies, particularly health surveys.