



The “original sin” of air quality regulations is keeping communities polluted. But that’s changing.

DETROIT—Theresa Landrum still has an emergency kit the Wayne County Department of Homeland Security gave her years ago when she asked the agency to help her community, which is surrounded by heavy industry, create an evacuation plan in the event of a chemical emergency.

"They gave us a little can, the size that tennis balls come in, and we thought it was a joke," said Landrum at a recent meeting at Detroit's New Mount Hermon Missionary Baptist Church. "They gave us a whistle, a bottle of water and a Band-Aid and a tiny, little flashlight."

"County and city officials advised the community to 'stay in place, take duct tape and plastic, and cover up every opening,'" Landrum continued.

Landrum, a cancer survivor whose parents died of lung cancer, has cause for concern. More than two dozen major industrial facilities surround her neighborhood, known by its now infamous zip code 48217.

A sprawling oil refinery that processes dirty Canadian tar sands, two aging steel plants, a coke battery plant that converts coal into fuel for steel furnaces, and a coal burning power plant are among the facilities that belch a daily stew of toxic air pollutants into the air that Landrum's community breathes. Major chemical release incidents have already [occurred](#) and [continue to occur](#), yet the community still has no evacuation plan.

Pushing for that plan is one of many battles for residents of 48217. The community, in southwest Detroit, is 82 percent Black and has a

median household income of [\\$24,000](#), which is 35 percent lower than the state of Michigan's average. Roughly 44 percent of people live below the poverty line in 48217, according to the latest U.S. Census data, compared to 14 percent for the state of Michigan.

Residents suffer from high rates of [asthma](#), [cancer](#) and [respiratory illnesses](#), and a constant encroachment by industry that's left elementary schools and senior centers on the oil refinery's fence line. "Our health is being diminished; our property values are going down. We are casualties of America's greed," Landrum said.

Sulfur dioxide, benzene and chromium are among the contaminants spewed regularly in Landrum's neighborhood — and it's this toxic cocktail that's concerning. Scientists are still teasing out how these multiple exposures affect people's health; meanwhile most federal and state regulations fail communities of color like 48217 because they simply weren't designed to account for multiple pollutant exposures. However, some experts see signs of progress. States like California and Minnesota are beginning to tackle the challenge of cumulative exposure with screening tools and proactive regulations.

But when will these potentially lifesaving changes reach Landrum's neighborhood and others like it?

"Communities have been asking for this for the last four decades," Robert Bullard, professor of Urban Planning and Environmental Policy at Texas Southern University and a prolific author on environmental justice, told EHN.

"The more exposure the greater the risk"

Theresa Landrum (Credit: Rochelle Riley)

"One of the original sins of our air quality regulation is that it regulates pollutant by pollutant and facility by facility, and it rarely goes outside of those parameters," Nick Leonard, executive director of the Great Lakes Environmental Law Center, told EHN. "That doesn't adequately address these unique issues of having a cluster of major sources of pollution in a highly concentrated area."

Neither the federal Environmental Protection Agency (EPA), nor Michigan's Department of Environmental Quality (MDEQ) require cumulative assessment of exposures, even though experts agree that's exactly what's needed.

"Any one chemical can do multiple things and any two chemicals or any thousands of chemicals can interact in ways that make it very difficult to understand how you go from exposure to specific disease," David Carpenter, director of the Institute for Health and the Environment at the University of Albany, told EHN.

However, Carpenter's health studies of multiple exposures at hazardous waste sites have found significant increases in hospitalization rates for diseases including [strokes](#), [leukemia](#), [asthma](#) [and other respiratory diseases](#).

"People in these communities that have multiple exposures are going to have greater risk of multiple diseases, and the more exposure the greater the risk," he said.

Chemical by chemical vs. cumulative

Marathon Oil in 48217. (Credit: Rochelle Riley)

Southwest Detroit's billowing smokestacks, fiery-orange gas flares, petroleum coke piles and heavy truck traffic dominate the landscape and fill the air with an acrid stench. The 10 largest facilities within a three-mile radius of 48217 released a combined 1,353,532 pounds of air toxics in 2017, according to the EPA's Toxic Release Inventory (TRI).

But determining air quality depends on whether you take a chemical-by-chemical or a cumulative approach.

Susan Kilmer, environmental manager at MDEQ's Air Monitoring Division, told EHN that air pollution in 48217 is "fairly typical for urban ambient air pretty much throughout southeast Michigan."

The neighborhood falls within a non-attainment area for both sulfur dioxide and ozone, Kilmer said, meaning that air pollution levels exceed the national standard and the state must get the area back into attainment—which it's doing.

Both pollutants are associated with asthma and other respiratory and cardiac diseases, which are [huge concerns in the community](#).

"Some families have four or five children born with asthma," Landrum said. [Asthma prevalence](#) among Detroit children was 11.3 percent, or 14 percent higher than in Michigan as a whole from 2012 to 2014.

A [2010 risk assessment](#) of air toxics found nine pollutants and diesel particulates in the Detroit area exceeding the state's health-based cancer risk of one in one million. Cancer risk reached as high as 10 to 100 in one million for benzene and formaldehyde during 2006 and 2007.

An [evaluation in 2017](#) with a new community air monitoring station in 48217 confirmed exceedances of sulfur dioxide and also found naphthalene, arsenic and hexavalent chromium at levels of concern for cancer risk, though lower than previously measured in the 2000s.

Despite these findings, progress has been slow. But if 48217 was in California it would be immediately targeted for pollution reduction.

California's environmental justice screening tool, [CalEnviroScreen](#), considers 20 indicators of pollution burden, population characteristics (e.g., poverty level, income, education level), and health conditions, like low-birth weight, that increase a population's vulnerability to pollution. Its model derives a single score by census tract, ranking overall pollution burden and vulnerability for that land tract. The higher the score, the higher the burden.

Shankar Prasad, toxicologist at CalEPA's Office of Environmental Health Hazard Assessment, used CalEnviroScreen to rank all of Michigan's census tracts, using EPA data. Prasad told EHN that the 13 census tracts within 48217 scored in the 87th percentile for overall pollution burden and vulnerability, meaning that the cumulative exposure for 48217 was 87 percent higher than the rest of Michigan's communities.

In California, scoring above the 75th percentile marks a community for investments to reduce pollution —such as public transit, renewable energy and clean vehicle initiatives—with funding from [California Climate Investments](#).

CalEnviroScreen was developed in response to a law passed in 2012 (Senate Bill 535), directing 25 percent of the funds collected through the state's [Cap-and-Trade program](#) to be invested in disadvantaged communities to reduce their pollution burden.

Screening tools as solutions?

(Credit: Adam Reinhardt)

California isn't alone. Minnesota also has an environmental justice screening tool, as does the EPA. But California's is considered the gold standard by Bullard and others because it's geared toward pollution reduction and financed with money from the Cap-and-Trade Program.

California's [AB 617](#) law, for example, requires reductions in air pollution in disadvantaged communities and sets up a process whereby community organizations work with the state's air districts to create plans for monitoring and reducing air pollution that go beyond existing programs. Those plans are due next year.

Another law, the [Transformative Climate Communities \(TCC\) Act](#), combines greenhouse gas reductions with public health improvements and economic development in disadvantaged communities. "No one experiences pollution or poverty in one single way. It all intersects," Tiffany Eng, program manager at California Environmental Justice Alliance, told EHN, explaining the law's significance.

Map created by 48217 activists marking the industrial facilities surrounding their community. 48217 is outlined in red. (Credit: Meg Wilcox)

Cities scoring high on CalEnviroScreen are eligible for TCC funds to create community development plans to reduce pollution and boost economic opportunity. Fresno, for example, [received \\$70 million](#) for a plan focused on issues such as workforce training; affordable, energy efficient housing; food deserts and access to public transportation.

Then there's AB 673 law, which requires the state to look at cumulative impact and factor in the CalEnviroScreen score when

permitting hazardous waste facilities. "It's a major, fundamental change in the permitting process," Bonnie A. Holmes-Gen, a senior environmental scientist at California's Department of Toxic Substances, told EHN.

Recent victories in California include a groundbreaking [local ordinance](#) passed in the City of Arvin requiring a 300 foot buffer between oil and gas drilling operations and sensitive places like homes, schools and senior centers. Activists also convinced the Fresno City Council to require a meat-rendering plant that emitted a stench and spilled foul liquids and animal wastes from trucks [to relocate](#) to an area that would not harm the public's health.

"The [CalEnviroScreen] tool has been really instrumental in these local groups being able to advocate for their needs on the ground," Eng said.

Minnesota's [screening tool](#) is based on race and income because the state has found those two indicators often predict pollution burdens throughout the state, Ned Brooks, environmental justice coordinator at the Minnesota Pollution Control Agency (MPCA), told EHN. MPCA uses a [separate tool](#) to evaluate pollution burden in a community

once it's identified as an environmental justice priority, and it proceeds more cautiously with permitting or compliance matters in those communities.

Recently, for example, MPCA settled a compliance issue in a way to benefit an impacted community. The company, Northern Metal Recycling, [agreed to relocate](#) to another area and pay \$600,000 to support community lead reduction programs.

Minnesota also [mandates the assessment of cumulative exposure](#) at sites with high environmental justice scores, but only in one part of Minneapolis. Facilities seeking permits there are required to model not only their own emissions, but the emissions of surrounding facilities, Brooks said.

EPA's [EJSCREEN](#), in contrast, doesn't have regulatory teeth behind it. The tool combines environmental data (e.g. traffic proximity, criteria air pollutant data, cancer risk assessment) with population characteristics (e.g. race, ethnicity, income) and produces individual scores for 11 environmental indicators at the census tract level. There's no cumulative score.

EJSCREEN was intended to provide information to communities about their pollution burden, and it does that well, Bullard, of Texas Southern University, said. In fact, arming communities with the data they need to convince policy makers to respond to their demands, is one of the most powerful aspects of environmental justice screening tools.

Not waiting for regulations

Delores Leonard holding up the analysis the community did with the TRI data and community monitoring station. (Credit: Adam Reinhardt)

Earlier this year, Michigan Governor Rick Snyder's environmental justice task force [issued 33 recommendations](#), including the development of a state environmental justice screen, cumulative exposure assessment and community air monitoring. Since then it's acted on two of those recommendations, establishing a state ombudsman and an environmental justice interagency working group. The recently sworn-in Governor Gretchen Whitmer is expected to keep the ball moving forward.

Developing an environmental justice screen shouldn't be all that hard for Michigan or other states, Paul Mohai, professor at the University of Michigan School of Natural Resources and Environment, told EHN. "California put in so much time and effort; they subsidized the work for us," he said. Of course, there are many design questions to consider, and data quality, particularly at the community level, is an issue any state must grapple with.

But the thorniest challenges are political.

Ultimately states need to decide: What levels of pollution trigger action? What regulatory or rule changes are needed to ensure action?

And how will pollution reduction efforts be funded?

Residents of 48217 aren't holding their breath.

Rhonda Anderson of the Sierra Club. (Credit: Meg Wilcox)

Already they fought long and hard to get the community air monitoring station set up at the New Mount Hermon Baptist Church. Now they're leading efforts to develop their own emergency evacuation plan that they'll submit to the state for funding, according to Landrum. And they're also evaluating their cumulative exposure, using data from the EPA's TRI database.

Working with Mohai, community activist Delores Leonard and Rhonda Anderson of the Sierra Club took TRI data from the facilities in their neighborhood and compiled it by chemical to get the sum of their exposure. While the group is not ready to release the data, Landrum said, "We feel that the data does show we've been overexposed, and it's a serious health risk for vulnerable populations who've been living here for 30, 40, 60, 70 years."

Mohai agrees. "In my opinion, if you look at a community and there's a lot of pollution there, and you do a health survey and see respiratory and cardiovascular disease and cancer, and you have information that identifies things in the environment that cause those conditions,

prudence should be: what can we do to minimize those exposures, not that you have to prove cause and effect."

Environmental justice screening tools take that progressive approach. That's why Mohai, Bullard and others view them as a positive advancement, a starting point for communities and a means to begin transforming the regulatory process.

"If we took a commonsense approach, used the precautionary principle, we would flip the dominant environmental protection paradigm on its head," Bullard said.

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