



To invest carbon revenue in the communities that need it most, we need to know where they are.

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In [Washington](#) and [across the United States](#), communities of color and low-income neighborhoods are [more likely](#) to be exposed to air pollution and toxic chemicals. People of color and people with low incomes will also be disproportionately impacted by climate change. Exacerbating their vulnerability to pollution, low-income households and communities of color often have [fewer resources](#) available to respond to climate change and related health threats. A fair and equitable climate policy will ensure that Washington communities who have been and continue to be the most highly impacted by pollution have the opportunity to thrive.

Other states have recognized the imperative and the opportunity to stop pollution and invest in their most vulnerable communities. For example, California capped pollution and is directing [several hundred millions of dollars](#) per year to invest in clean energy, affordable housing, and public transit projects that will benefit highly-impacted communities. In order to direct investments to the communities who need it the most, California developed a screening tool for identifying the most deserving neighborhoods.

The Evergreen State could pass a similar policy, directing investments to support highly-impacted communities. To make sure the money goes to the right places, Washington would need to develop a statewide methodology to identify these communities.

It might seem relatively straightforward to identify the communities in Washington that have more pollution, more poverty, and more people of color than other parts of the state. Just look at census and pollution data, right? Or just ask around—community organizations know exactly where people are suffering. While it is widely understood that some communities face more social, economic, and health challenges than others, there is not a universal methodology for identifying these communities. To direct investments to the communities who need it most, Washington needs a statewide methodology for combining multiple data points related to pollution, socio-economic status, and racial, ethnic and cultural composition, along with local knowledge to identify highly-impacted communities.

Below, I outline different methods for identifying highly-impacted communities, what Washington has already done towards identifying them, and what Washington could do next.

What are these communities called?

Areas where there are more people of color, more people with lower incomes, and more exposure to pollution have been called disadvantaged communities, highly-impacted communities, environmental justice communities, over-burdened, and vulnerable communities. For example:

- ▶ Washington’s regional clean air agencies defines “[highly-impacted communities](#)” as “areas with poor air quality and residents who face financial or historic problems.” The agency gives an example of a neighborhood with a large number of people of color near a major road.
- ▶ California defines “[disadvantaged communities](#)” as those “disproportionately affected by environmental pollution” and “with concentrations of people that are of low income, high unemployment, low levels of homeownership, high rent burden, sensitive populations, or low levels of educational attainment.”
- ▶ The Environmental Protection Agency (EPA) defines “[environmental justice](#)” as “the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income.” The EPA aims for everyone to enjoy “the same degree of protection from environmental and health hazards and equal access to decision-making processes.”
- ▶ Academic researchers refer to areas that are “[over-burdened](#) with environmental hazards and are socially vulnerable.”
- ▶ Advocacy groups sometimes refer to “vulnerable” groups. For example, Green For All describes [vulnerable communities](#) as places where economic, environmental health, and quality of life realities are sub-par.

For purposes of this report, I will use the phrase “highly-impacted communities.”

What criteria identify these communities?

Highly-impacted communities generally have:

- ▶ **More poverty**—more low-income households and few employment opportunities.
- ▶ **More pollution**—more sources of pollution in the neighborhood such as freeways, factories, and landfills, and more health impacts related to pollution, such as asthma and cancer.
- ▶ **More people of color**—including racial, ethnic, and cultural minorities; immigrants; and people with [limited English fluency](#).

While some definitions say that any one of the above factors suffices to identify a community as highly impacted, the more accurate identifiers of highly impacted communities find those places that suffer from cumulative impacts. The residents aren’t just poor and they don’t just have a lot of pollution: they face socio-economic, cultural, environmental, *and* health barriers. Each factor layers on top of and often [exacerbates](#) the others. It turns out that these factors often go together: [incomes](#) of Black, Latino, and American Indian families languish far below those of white families in America, and neighborhoods with more people of color, more poverty, more unemployment, and less education also have more exposure to air pollution.

The most sophisticated [cumulative impacts screen](#) in the United States uses 30 measures to score neighborhoods on three dimensions: (1) proximity to hazards, (2) exposure to air pollution, and (3) social and health vulnerability. There are many possible data points we could use to identify these characteristics. For example:

- ▶ Percentage of population living below poverty
- ▶ Unemployment rates
- ▶ Historical unemployment rates
- ▶ Rates of home ownership
- ▶ Educational levels
- ▶ Levels of particulate matter (PM) pollution
- ▶ Levels of nitrous oxide (NO_x)
- ▶ Levels of toxics in nearby air and water
- ▶ Rates of respiratory disease
- ▶ Rates of cancer
- ▶ Percentage of residents of color
- ▶ Percentage of immigrants and refugees
- ▶ Linguistic isolation (% residents above age 4 in households where no one over age 15 speaks English well)
- ▶ Lead paint indicator (% pre-1960)
- ▶ Distance from Superfund site
- ▶ Distance from treatment storage disposal facility
- ▶ Distance from major direct dischargers to water

What have other states done?

Several other states have attempted to identify highly-impacted communities (the following list is not exhaustive). There are a few important ways in which state tests differ:

- ▶ **How granular is the data?** Some use census block groups (250 to 500 households, or [600 to 3,000 people](#)) and some use census tracts ([1,200 to 8,000 people](#)). Census block data is usually sufficiently granular to identify a neighborhood, but census tract data often is not.
- ▶ **How many of the three dimensions described above does the test include?** Many include only income and race, no other identifiers of people of color and no pollution or health criteria. By ignoring pollution and health criteria, these states are undercounting a swath of highly-impacted communities with high pollution burden. By using only one measure of income, these tests may also be missing areas that have, for example, high unemployment and lower educational attainment.

- **Is the test single-factor or cumulative?** As explained above, highly-impacted communities usually face multiple challenges that layer on top of each other, so a single factor test is a blunt and overly broad instrument for identifying these communities. At the same time, it is difficult to decide how to weight multiple factors when combining them together, so most states use a single-factor test.
- **Is there a spectrum or is it a simple bimodal analysis?** Most states use a simple threshold—a yes-or-no test—to determine whether a criterion is present or not. Does the community qualify as poor or not? A more accurate screen uses a spectrum for each criterion—a community could be very poor, a little poor, not poor, or well-off.

California has conducted the most sophisticated and nuanced cumulative impacts analysis. Several professors created the [Environmental Justice Screening Method](#), and California used some of their methodology to create the [CalEnviroScreen](#). The professors used 23 indicator metrics in three categories: (1) hazard proximity and land use; (2) air pollution exposure and estimated health risk; and (3) social and health vulnerability. The [CalEnviroScreen](#) uses 12 pollution and environmental [metrics](#) and seven population and socioeconomic metrics and weights them according to distance and importance to create scores for each of the state’s 8,000 census tracts. The result is a statewide [map](#) with ten different color codes ranging from most highly-impacted (red) to least (green).

Other states all seem to use single-factor, simple threshold tests for income and minority status, with no other socio-economic criteria and no criteria for health or pollution exposure.

Massachusetts created a [map](#) showing “environmental justice” block groups using data from the US Census. Census block groups only need to meet one of the state’s criteria:

- 25 percent or more of the population is a minority; or
- Median household income is less than 75.5 percent of the statewide median; or
- 25 percent or more of households are English-isolated (no one in the household over 14 speaks English “very well”).

New York has county by county [maps](#) of “environmental justice” areas by block group. A block group only needs to meet one of the state’s criterion:

- At least 51.1 percent of the urban population is minority; or
- At least 33.8 percent of the rural population is minority; or
- At least 23.59 percent of the population had household incomes below the federal poverty line.

Pennsylvania defines “environmental justice” areas as any census tract (much larger than a census block group) where:

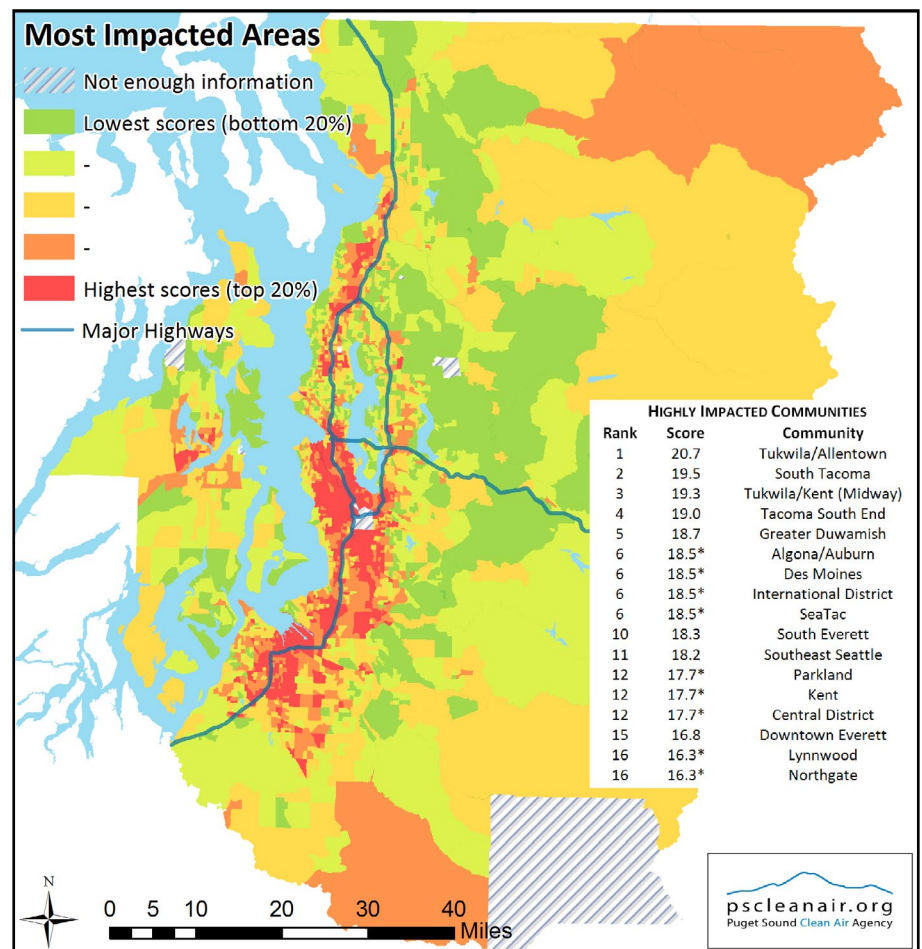
- 20 percent or more of individuals live in poverty, and/or
- 30 percent or more of the population is minority.

What Washington knows from Puget Sound Clean Air

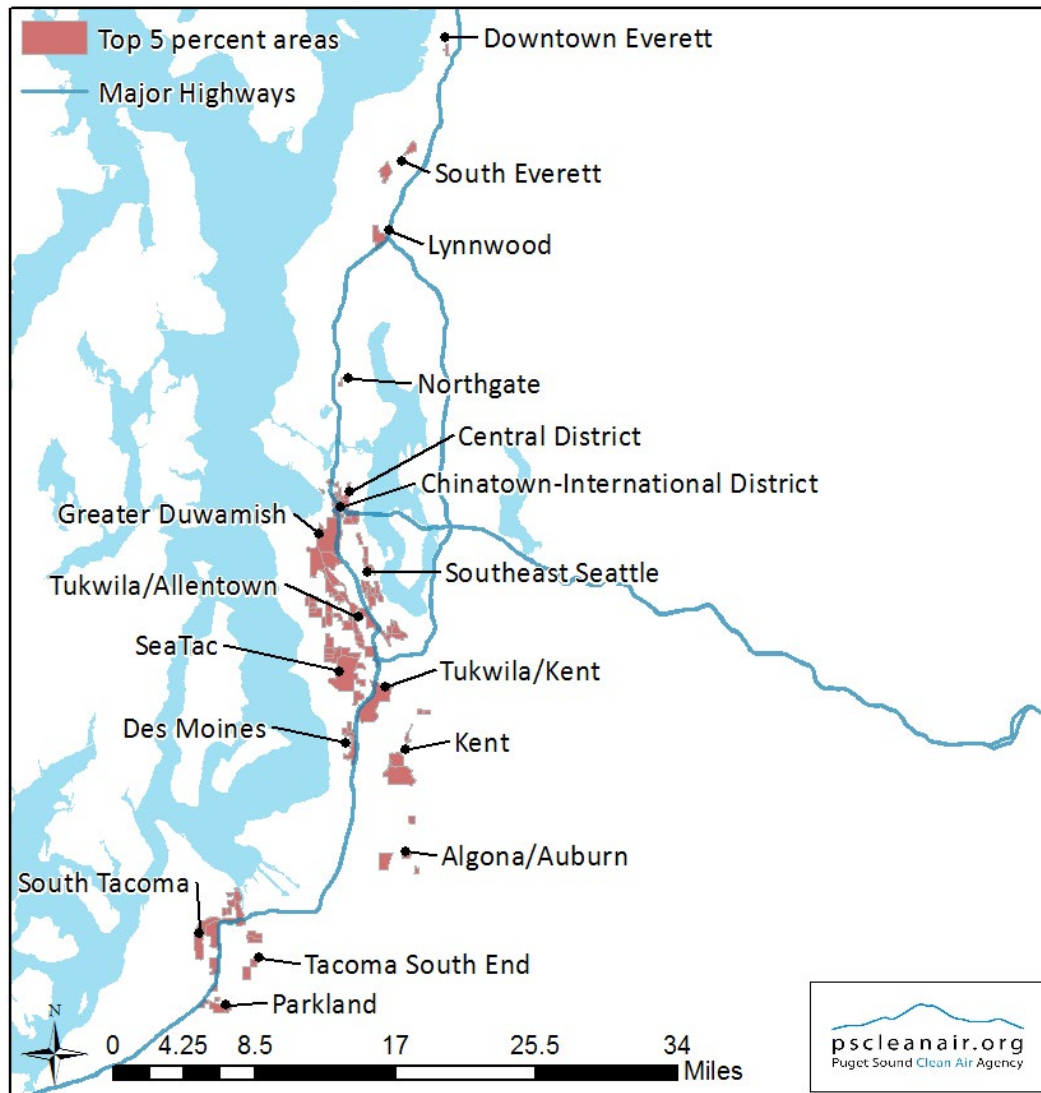
Puget Sound Clean Air Agency's region includes King, Kitsap, Pierce, and Snohomish counties—over half of Washington's population. Puget Sound Clean Air's vision is for everyone in the region to be able to breathe clean air, and one of its strategic objectives is to reduce inequities in air pollution exposure. Towards that goal, the agency set out to identify “highly impacted communities,” defined as locations with poor air quality whose residents also face economic or historic barriers to participation in clean air decisions and solutions. The agency devised a screening tool to identify highly-impacted communities based on criteria relevant to air quality, health, and demographic markers. Based on in-depth discussion around the Agency's mandate as well as known risks and health impacts, they selected the following factors:

- ▶ Diesel pollution (onroad and nonroad)
- ▶ Household income
- ▶ Health sensitivity—i.e. individuals who suffer from asthma, chronic pulmonary obstructive disease (COPD), or cardiac illness
- ▶ Industrial density – large and small air pollution sources
- ▶ Race
- ▶ Limited English proficiency
- ▶ Primary wood burning households

The agency examined each census block group and gave it a score of 0 (for the least highly-impacted 25 percent of block groups) through 3 (for the most impacted 25 percent of block groups) for each of the factors above. By weighting each factor equally and adding all the numbers up, the agency came up with a single number for each block group. It mapped them (below), with the top 20 percent most impacted block groups shown in red and the least impacted in green. It also identified the 20 most highly-impacted communities in the region (listed on the side of the map).



The Agency parsed the data further to identify the top 5 percent most impacted communities, shown below:



What King County knows from Communities of Opportunity

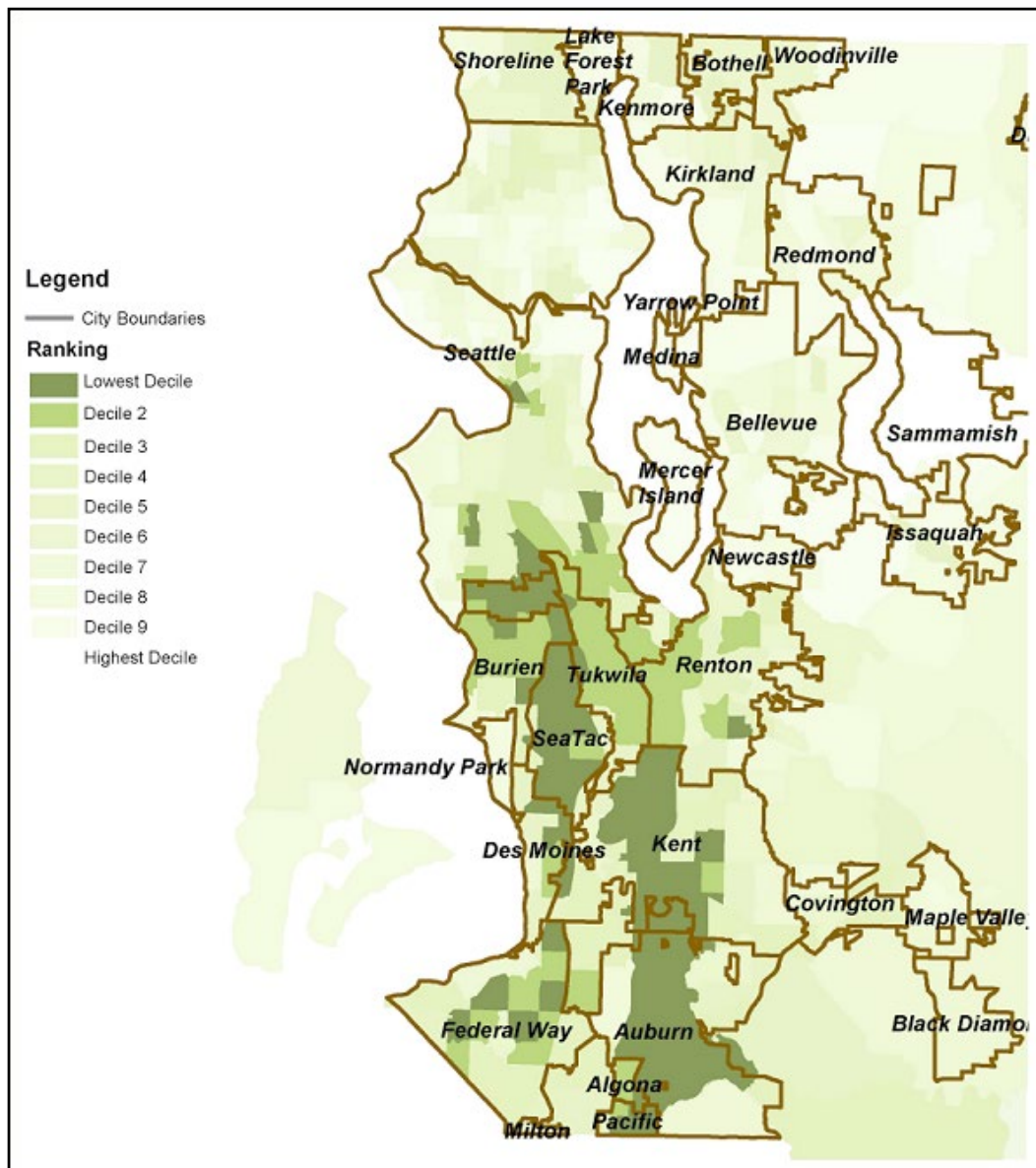
King County and The Seattle Foundation recently launched an effort called [Communities of Opportunity](#) to improve health, social, racial, and economic outcomes in communities in King County. They used data at the census tract level to rank tracts into deciles based on the following health, housing, and economic criteria:

- ▶ Life expectancy
- ▶ Adverse childhood experiences
- ▶ Frequent mental distress
- ▶ Smoking

- Obesity
- Diabetes
- Preventable hospitalizations
- Poor housing conditions
- Low-income, below 200% poverty
- Unemployment

These factors corroborate Puget Sound Clean Air's maps showing a pattern of worse health and lower economic opportunity in certain communities, particularly along freeway corridors and in southern King County.

King County, Washington Census Tracts Ranked by an Index of Health, Housing, and Economic Opportunity Measures:



What we know from the Environmental Protection Agency

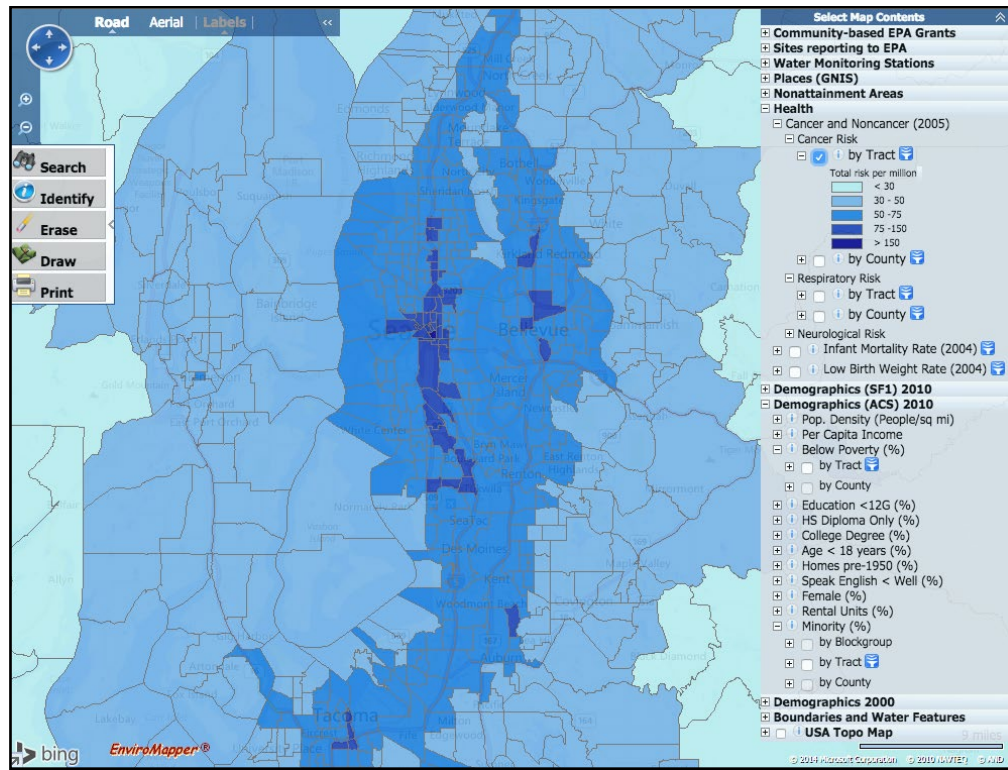
The Environmental Protection Agency (EPA) has been developing a tool called EJSCREEN that will provide nationally consistent data sets about exposure to pollution and socioeconomic factors. EPA warns that EJSCREEN should not be used for identifying an area as an Environmental Justice community because it provides each data set independently, and is not a cumulative impacts screen. In addition, EPA warns that any data set should be backed up with local, community-sourced data such as community based participatory research.

EJSCREEN includes the following data for each census block group:

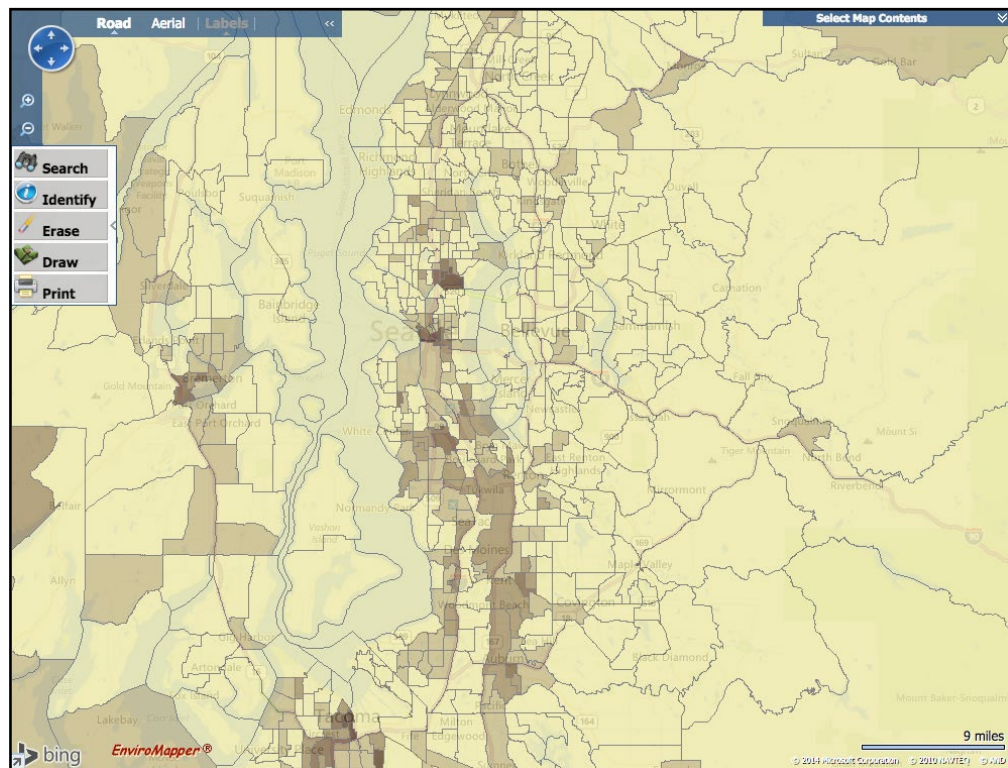
- ▶ PM 2.5 level in air
- ▶ Ozone level in air
- ▶ Diesel particulate matter level in air
- ▶ Air toxics cancer risk
- ▶ Air toxics neurological hazard index
- ▶ Air toxics respiratory hazard index
- ▶ Traffic proximity and volume
- ▶ Lead paint indicator (% pre-1960)
- ▶ Risk management plan facility proximity
- ▶ Superfund site proximity
- ▶ Treatment storage disposal facility proximity
- ▶ Major direct dischargers to water proximity
- ▶ Percentage of the population that is minority
- ▶ Percentage of population that is low-income
- ▶ Linguistic isolation
- ▶ Population over age 64
- ▶ Population under age 5
- ▶ Population with less than a high school education

EPA is currently rolling out EJSCREEN for public use, conducting a series of workshops with stakeholders. A simpler version, called [EJ View](#), is already available for public use. Looking at single factors in EJ View corroborates what Puget Sound Clean Air found.

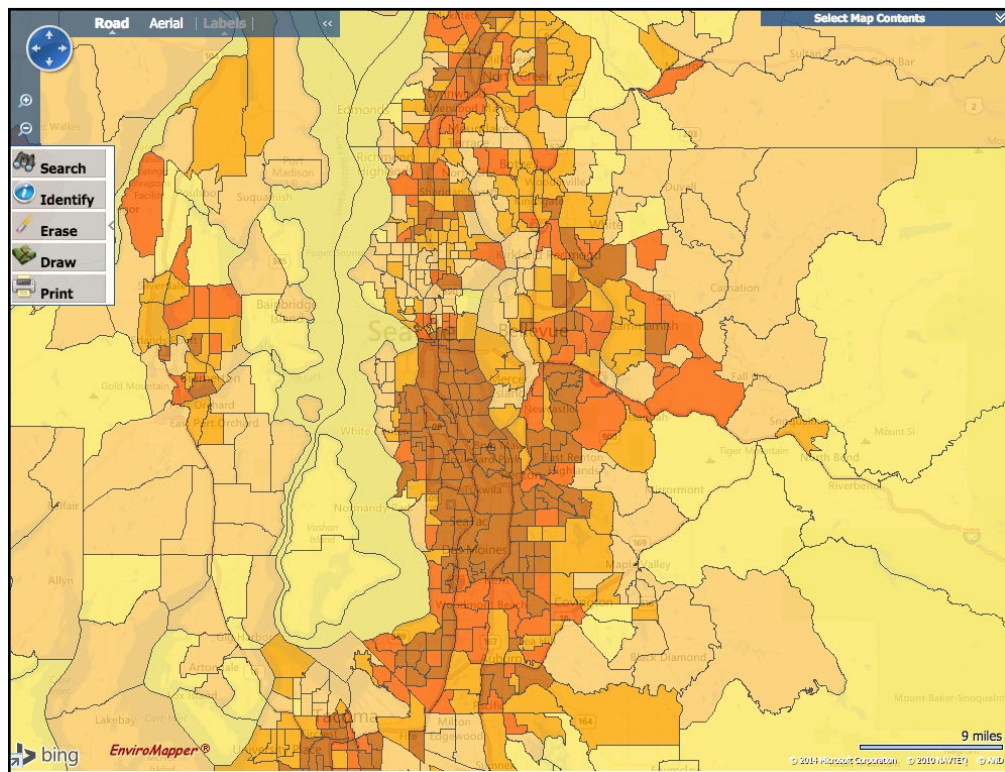
Health impacts such as cancer risks are concentrated along freeway corridors in the Puget Sound area (the darkest blue has the highest cancer risk).



Poverty also seems to cling to highway corridors.



Communities with more people of color are a bit more scattered.



What we know from peer-reviewed research

Professor [Troy Abel](#) at Western Washington University studies the intersection of environmental injustice and gentrification. He [examined](#) air toxic pollution data and socioeconomic factors in Seattle from 1990 to 2007 and concluded that air toxic exposure and socioeconomic inequality converge in south central Seattle.

Summary of what we know in Washington

We can draw a few conclusions from the data collected so far:

- ▶ Highway corridors are the most significant sources of pollution in Washington.
- ▶ Some of the most highly-impacted communities are almost certainly in the places where highways meet other significant sources of pollution—such as the port, train yards, and landfills—in south central Seattle and communities to the south.

What Washington could do next

In order to ensure carbon revenue is helping highly-impacted communities thrive, Washington needs a uniform, statewide methodology for identifying those communities. To accurately identify communities that face a host of barriers rather than just one, Washington will need to use a cumulative impacts screen that:

- ▶ includes pollution and health factors, as well as identifiers of communities of color beyond just race
- ▶ takes into account more than one factor at a time
- ▶ uses census block group data to identify neighborhoods
- ▶ uses a spectrum of numbers to code severity of each category
- ▶ uses community-based participatory research to understand the experiences of people living in highly impacted communities

By doing these five things, Washington would create a much more sophisticated and nuanced tool than any other state except California.

Community-based participatory research empowers communities to illuminate which criteria to use, rather than leaving it entirely to researchers to choose the criteria. Armed with information from communities, researchers could select data sets within EPA's EJSCREEN tool to create a statewide cumulative impacts screen that uses socio-economic, racial, health, and pollution metrics at the block group level. Researchers could use a methodology similar to Puget Sound Clean Air Agency's: select around 10 relevant factors and weigh them equally to come up with a single number used to rank communities on how severely impacted they are. Or they could use the information gathered through community-based participatory research to assign different weights to factors that are more significant for Washington communities.

Alternatively, Washington could pursue a more complicated cumulative impacts screen similar to California's—using several dozen data sets beyond what EJSCREEN provides, some of which may need to be collected by researchers—and develop algorithms for properly weighting the different metrics.

Before pursuing the more complicated and more expensive methodology, Washington may want to evaluate whether a California-like screen is better at identifying communities than a community-informed Puget Sound Clean Air-like screen. The data so far collected suggests that using a Washington-grown methodology may be just as accurate—but faster and cheaper—than developing a new, California-like methodology.

The Evergreen State should pass a polluters-pay policy that directs investments to the Washington communities that have borne the brunt of racism, poverty, and environmental health impacts for many years. Washington has the beginnings of a first-class methodology combining community-based participatory research with multiple data sets to accurately identify communities that face cumulative impacts. By bringing such a methodology to fruition, Washington would be ready to direct polluters-pay revenue to the communities that need it the most.

Sightline Institute is a think tank providing leading original analysis of energy, economic, and environmental policy in the Pacific Northwest.

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