



DRAFT: Identifying Overburdened Communities Highly Impacted by Air Pollution

Technical Support Document

Air Quality Program

Washington State Department of Ecology
Olympia, Washington

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Department of Ecology's Regional Offices

Map of Counties Served



Southwest Region 360-407-6300	Northwest Region 206-594-0000	Central Region 509-575-2490	Eastern Region 509-329-3400
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Region	Counties served	Mailing Address	Phone
Southwest	Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Mason, Lewis, Pacific, Pierce, Skamania, Thurston, Wahkiakum	P.O. Box 47775 Olympia, WA 98504	360-407-6300
Northwest	Island, King, Kitsap, San Juan, Skagit, Snohomish, Whatcom	P.O. Box 330316 Shoreline, WA 98133	206-594-0000
Central	Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, Yakima	1250 West Alder Street Union Gap, WA 98903	509-575-2490
Eastern	Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman	4601 North Monroe Spokane, WA 99205	509-329-3400
Headquarters	Statewide	P.O. Box 46700 Olympia, WA 98504	360-407-6000

Washington Clean Air Agencies

Ecology works in partnership with local clean air agencies and tribes to make sure we all have clean, healthy air to breathe.² Local clean air agencies manage most of the air quality in Washington, within their jurisdictions. Tribal governments protect air quality within their tribal reservations, with technical assistance from EPA. Ecology is the primary air regulator in all other areas of Washington.

Map of Counties Served



- [Benton Clean Air Agency](#)³ – Benton County
- [Ecology Central Regional Office](#)⁴ – Chelan, Douglas, Kittitas, Klickitat, Okanogan Counties
- [Ecology Eastern Regional Office](#)⁵ – Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Stevens, Walla Walla, Whitman Counties
- [Ecology Industrial Section](#)⁶ – Pulp mills, aluminum smelters
- [Ecology Northwest Regional Office](#)⁷ – San Juan County
- [EPA Region 10](#)⁸ – Tribal lands

² <https://ecology.wa.gov/About-us/Accountability-transparency/Partnerships-committees/Clean-air-agencies>

³ <http://bentoncleanair.org/>

⁴ agburnteamcro@ecy.wa.gov

⁵ agburnteamero@ecy.wa.gov

⁶ <https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Industrial-facilities-permits>

⁷ sean.lundblad@ecy.wa.gov

⁸ <https://www.epa.gov/tribal-air>

- [Northwest Clean Air Agency](https://nwcleanairwa.gov/)⁹ – Island, Skagit, Whatcom Counties
- [Olympic Region Clean Air Agency](https://www.orcaa.org/)¹⁰ – Clallam, Grays Harbor, Jefferson, Mason, Pacific, Thurston Counties
- [Puget Sound Clean Air Agency](https://www.pscleanair.gov/)¹¹ – King, Kitsap, Pierce, Snohomish Counties
- [Southwest Clean Air Agency](https://www.swcleanair.gov/)¹² – Clark, Cowlitz, Lewis, Skamania, Wahkiakum Counties
- [Spokane Regional Clean Air Agency](https://www.spokanecleanair.org/)¹³ – Spokane County
- [Yakima Regional Clean Air Agency](https://www.yakimacleanair.org/)¹⁴ – Yakima County

⁹ <https://nwcleanairwa.gov/>

¹⁰ <https://www.orcaa.org/>

¹¹ <https://www.pscleanair.gov/>

¹² <https://www.swcleanair.gov/>

¹³ <https://www.spokanecleanair.org/>

¹⁴ <https://www.yakimacleanair.org/>

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DEPARTMENT OF
ECOLOGY
State of Washington

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Purpose of This Document

This document contains in-depth information about the technical aspects of the draft indicators to identify overburdened communities highly impacted by air pollution. Ecology provides this information for full transparency of our process, indicators, and sources of data. A general overview of the draft indicators is available on [our web page](#).¹⁵

Table 1. Acronyms used in this document

Acronym	Meaning
ACS	American Community Survey
AQI	Air Quality Index
CASAC	Clean Air Scientific Advisory Committee
CCA	Climate Commitment Act
CDC	Center for Disease Control
CEJST	Climate and Economic Justice Screening Tool
CO	Carbon Monoxide
COPD	Chronic Obstructive Pulmonary Disease
EHD Map	Washington Environmental Health Disparities Map
LCAA	Local Clean Air Agency
NAAQS	National Ambient Air Quality Standards
NEI	National Emissions Inventory
NO₂	Nitrogen Dioxide
O₃	Ozone
Pb	Lead
PM_{2.5}	Particulate matter smaller than 2.5 micrometers in diameter
PM₁₀	Particulate matter smaller than 10 micrometers in diameter
SO₂	Sulfur Dioxide
U.S. EPA	United States Environmental Protection Agency
VOCs	Volatile Organic Compounds
WTN	Washington Tracking Network

¹⁵ <https://ecology.wa.gov/Air-Climate/Climate-change/Reducing-greenhouse-gases/Climate-Commitment-Act/Overburdened-communities>

Introduction

The Climate Commitment Act¹⁶ requires Ecology to identify “overburdened communities highly impacted by air pollution” to ensure that the cap and invest program achieves reductions in criteria air pollutants, as well as greenhouse gas emissions, in these communities. Criteria air pollutants are six common air pollutants that can harm your health and the environment. The federal Clean Air Act requires setting National Ambient Air Quality Standards (NAAQS) for criteria air pollutants. Ecology, local clean air agencies, and Tribes monitor these pollutants across Washington and take action to control and reduce pollution. These criteria pollutants are:

- Carbon monoxide (CO)
- Lead (Pb)
- Ozone (O₃)
- Nitrogen dioxide (NO₂)
- Particulate matter:
 - Fine particulate matter (PM_{2.5})
 - Coarse particulate matter (PM₁₀)
- Sulfur dioxide (SO₂)

Once we have identified the overburdened communities highly impacted by air pollution, we will expand Ecology’s statewide air monitoring network within these identified communities as directed by RCW 70A.65.020. New emissions standards to improve air quality for overburdened communities will be developed through future processes.

Overview of the Draft Process to Identify Communities

In order to identify overburdened communities highly impacted by air pollution, we have evaluated several indicators that reflect where vulnerable populations face environmental harms or health impacts due to air pollution that result in unequal adverse health outcomes. To help guide this process, we held two tribal listening sessions, eight public and community group listening sessions, as well as a survey, and a comment map over a three-month period. We also consulted with the Washington State Department of Health and local clean air agencies. For more information about the public input from the first public comment period and how we used it, see [our web page](#).¹⁷

¹⁶ <https://apps.leg.wa.gov/rcw/default.aspx?cite=70A.45>

¹⁷ <https://ecology.wa.gov/Air-Climate/Climate-change/Reducing-greenhouse-gases/Climate-Commitment-Act/Overburdened-communities>

According to the draft process to identify overburdened communities highly impacted by air pollution (Figure 1), to be considered overburdened, an area must meet the following conditions, based on data available statewide:

- **Community Indicators:** Either have a 9 or 10 ranking on the Washington Environmental Health Disparities (EHD) map, be in the 90th percentile¹⁸ or higher of census block groups for the EJScreen Demographic Index, or be Tribal land; and
- **Air Pollution Indicators:**
 - Have an elevated level of one or multiple criteria air pollutants; and
 - Meet the threshold for one or more of the eight indicators related to air pollution exposure, health impacts, or vulnerability.

After these statewide indicators are applied, more specific, regional data will be applied to the screened areas to refine the boundaries of the overburdened communities (see “Draft Factors to Identify Community Boundaries” below).

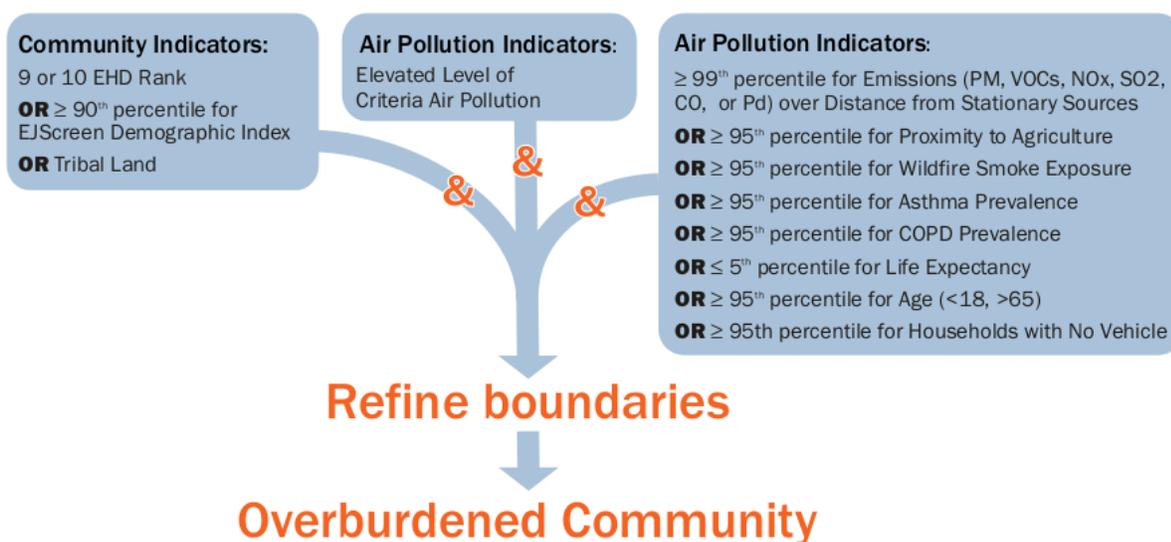


Figure 1. Flowchart of the draft process to identify overburdened communities highly impacted by air pollution.

Process Development and Considerations

Through this process, we are striving to identify the communities across Washington that are most impacted by air pollution, and have the greatest need for air quality monitoring and pollution reduction. We designed the draft community indicators to be consistent with the

¹⁸ Percentiles reflect the distribution of a variable and run from the 0th percentile, meaning the lowest score on a given scale, to the 100th percentile, meaning the highest score on a given scale. For example, if an area is in the 95th percentile for demographic index, it has a demographic index higher than 95% of all areas measured.

definition of overburdened communities described in the CCA (see Appendix A). The EHD ranking, EJScreen Demographic Index, and Tribal land indicators help to identify areas where “vulnerable populations face combined, multiple environmental harms.” To identify those communities most impacted by air pollution, the eight indicators related to air pollution exposure, health impacts, or vulnerability distinguishes where vulnerable communities face exposure to air pollutants “through multiple pathways, which may result in significant disparate adverse health outcomes or effects.” Additionally, the CCA directs us to monitor and reduce criteria air pollution in overburdened communities. The “elevated level of criteria air pollution” indicator identifies areas where this type of pollution is likely to be the highest.

In some cases, we were not able to find data and develop indicators that reflect important air pollution impacts that we heard in the initial engagement period. That includes vulnerable populations like outdoor workers and unhoused people, as well as health impacts like general wellness and quality of life. We welcome suggestions about how these and other important experiences with air quality can be represented comparatively across Washington.

Aside from identifying indicators, we also considered the different ways these indicators can be combined to identify communities. Many environmental justice tools combine different environmental indicators into a single rank or index. Others, like the [Climate and Economic Justice Screening Tool \(CEJST\)](#),¹⁹ use thresholds for each indicator and require that a combination of indicator thresholds be met to be considered disadvantaged or overburdened. We decided to use thresholds for our indicators because it allowed us flexibility to use and combine different types and scales of data. As stated in the CEJST technical documentation, “Given the available datasets, however, it was determined that a thresholds approach would better enable the tool to identify disadvantaged communities in rural and urban areas...The thresholds approach addressed concerns that certain areas of the nation and territories would be penalized in an index simply because they had less available data.”

Furthermore, the thresholds approach better reflected the different experiences that people have with air pollution across Washington. Urban and rural communities as well as communities in different regions of the state are exposed to different types and sources of air pollution. For example, a rural or inland community may be more impacted by wildfire smoke and agriculture whereas an urban or coastal community may be more impacted by transportation and industry. Different communities may also have unique vulnerabilities or health impacts from air pollution. That is why only one of the eight indicators related to air pollution exposure, health impacts, or vulnerability must be met. These indicators are evaluated independently and do not compete with one other. The threshold for each indicator in this category is the 95th percentile,²⁰ which results in the selection of the top 5% of either

¹⁹ <https://screeningtool.geoplatform.gov/en/#9.89/47.4526/-122.3349>

²⁰ Percentile is based either on area or on population depending on the data available. Two indicators are exceptions to this threshold: (a) Life Expectancy is an inversely related health impact, so the bottom 5th percentile is selected, and (b) Emissions over Distance from

census tracts or grid cells, depending on the indicator, to represent the most highly impacted communities for each individual indicator.

Unlike CEJST or the EHD map, which are tools and can be used for a variety of purposes, we are developing a process that is informed by, or in some cases uses those tools, but is intended to identify communities for this specific initiative. We are proposing using the indicator data that is available statewide first as a screening step to identify general areas for further consideration. Using data available statewide avoids leaving out areas that have less data availability, or less spatially detailed data. However, Ecology is tasked with identifying specific communities overburdened by air pollution, which requires further refinement. Applying localized data, in addition to the statewide indicators, will help us ensure we are identifying overburdened communities accurately. That is why after the statewide indicators are applied, we are proposing the use of additional local and regional data, where available and applicable, to inform the identification of boundaries for overburdened communities.

Draft Indicators

This section is a full technical breakdown of each of the draft indicators proposed by Ecology for identifying overburdened communities highly impacted by air pollution. Included for each draft indicator is a short description, the method for how the data was collected and/or put together, important caveats to consider when using these data, and the data source(s). For a general overview of the draft indicators, see the General Overview document available on [our web page](#).²¹

Community Indicators

Environmental Health Disparities Map Rank – The EHD Map is an interactive mapping tool that compares communities across our state for environmental health disparities. The following indicators are included in the EHD map (version 2.0):

- Environmental Exposures (diesel particle emissions; ozone concentration; PM_{2.5} concentration; proximity to heavy traffic roadways; toxic release from facilities (RSEI model))
- Environmental Effects (lead risk from housing; proximity to hazardous waste treatment, storage, and disposal facilities (TSDFs); proximity to National Priorities List sites (Superfund sites); proximity to Risk Management Plan (RMP) facilities; wastewater discharge)
- Sensitive Populations (death from cardiovascular disease; low birth weight)

Stationary Sources is a combination of six separate map layers, and the 99th percentile from each was combined into a single map (see draft indicator information below for more detail).

²¹ <https://ecology.wa.gov/Air-Climate/Climate-Commitment-Act/Overburdened-communities>

- Socioeconomic Factors (limited English; no high school diploma; poverty; race - people of color; transportation expense; unaffordable housing; unemployed)

A rank of 9 or 10 is designated as the threshold for this indicator. This is consistent with what the Department of Health includes in the definition of a “highly impacted community,” developed for the Clean Energy Transformation Act (CETA) for communities highly impacted by climate change and fossil fuel pollution.

Method: The overall EHD rank is calculated with the following equation:

$$\frac{(\text{Average Environmental Exposures Percentile} + 0.5 \times \text{Average Environmental Effects Percentile})}{2} \times \frac{(\text{Average Sensitive Populations Percentile} + \text{Average Socioeconomic Factors Percentile})}{2} = \text{Overall EHD Risk}$$

For full methods, limitations, and caveats, see UW’s Environmental and Occupational Health Sciences’ [web page for the EHD Map Project](#).²²

Data source: [WA Environmental Health Disparities Map](#), Version 2.0²³

EJScreen Demographic Index – An average of the percent of low-income populations and people of color, used in the Environmental Justice Screening Tool (EJScreen), calculated at the census block group level.

Race and income are both included in the EHD map, however they are included separately in this indicator to account for communities that may experience elevated levels of criteria air pollution and greater vulnerability to pollution based to socioeconomic factors, but are not highly impacted by other types of pollution or environmental exposures that may result and an EHD ranking less than 9 or 10.

Method: The demographic index calculated using the following equation:

$$\frac{(\% \text{ people of color} + \% \text{ low income})}{2} = \text{Demographic Index}$$

We selected the “compare by state” data option to ensure that the percentiles reflect Washington, rather than national demographics.

For more information on the methods, limitations, and caveats, see the [EJScreen Technical Documentation](#).²⁴

²² <https://deohs.washington.edu/washington-environmental-health-disparities-map-project>

²³ <https://doh.wa.gov/data-statistical-reports/washington-tracking-network-wtn/washington-environmental-health-disparities-map>

²⁴ <https://www.epa.gov/ejscreen/technical-documentation-ejscreen>

Data source: [EJScreen Version 2.0](#)²⁵

Tribal Land – Tribal lands in Washington, including:

- Reservation land – Federally recognized tribal reservation lands
- Disputed land – Lands designated as being part of a reservation but title is disputed by other parties
- Off-reservation tribal land – lands outside of a reservation acquired by or held in trust for tribal use

We are inviting government-to-government consultation with Tribal nations and organizations affiliated with Washington Tribes on the areas included in “Tribal land.” Tribal land is not limited to the listed bullets and we look forward to input from Tribal nations. For more information, see the “Tribal Consultation” section below.

Data source: [Tribal Lands of Washington](#),²⁶ WA Department of Ecology

Air Pollution Indicators

Elevated Level of Criteria Air Pollution – Areas with an elevated level of a one or more criteria pollutants and/or the highest cumulative level of criteria pollutants, based on a combination of monitoring, modeling, and/or emissions data. For this indicator, the following thresholds are considered elevated levels of criteria air pollution:

Table 2. Criteria Pollutant Thresholds

Pollutant	Threshold	Rationale
PM _{2.5}	PM _{2.5} 24-hour design value > 20.4 ug/m ³	Ecology’s healthy air goal (used to identify areas of concern for PM_{2.5}) ²⁷
	PM _{2.5} annual design value > 8 ug/m ³	Lower end of Clean Air Scientific Advisory Committee (CASAC) ²⁸ recommendation for the PM _{2.5} NAAQS reconsideration

²⁵ <https://www.epa.gov/ejscreen>

²⁶ <https://ecology.wa.gov/Research-Data/Data-resources/Geographic-Information-Systems-GIS/Data>

²⁷ <https://ecology.wa.gov/Air-Climate/Air-quality/Air-quality-targets/Air-quality-standards/Particle-pollution>

²⁸ <https://casac.epa.gov/ords/sab/f?p=113:1:4048948258280>

Pollutant	Threshold	Rationale
PM₁₀	At least one recent exceedance of the federal 24-hour PM ₁₀ standard of 150 µg/m ³ not attributable to natural events such as wildfires or high-wind dust events	Lower exceedance frequency than NAAQS ²⁹ (not to be exceeded more than once a year on average over 3 years)
O₃	O ₃ design value > 65 ppb	Lower end of EPA's proposal for most recent O₃ NAAQS revision ³⁰
NO₂	NO ₂ 1-hour design value > 54 ppb	Lower end of moderate Air Quality Index ³¹ (AQI) range
CO	8-hour design value > 4.5 ppm	Lower end of moderate AQI ³² range
SO₂	SO ₂ 1-hour design value > 36 ppm	Lower end of moderate AQI ³³ range
Lead	Proximity to any lead source emitting more than 0.5 ton per year	Lowest threshold for EPA's monitoring network design criteria for lead monitoring, 40 CFR Part 58 , ³⁴ Appendix D
Combined	98th percentile or above for the AQI sum of all statewide interpolated criteria pollutants combined (PM _{2.5} 24-hour, O ₃ , NO ₂ , SO ₂ , CO)	Cumulative impact from criteria air pollution

Method: PM_{2.5}, O₃, NO₂, SO₂, CO: Modeled and monitored concentration data from July 2014 through June 2017 were used to interpolate criteria pollutant design values at 4 km x 4 km grid cell resolution across Washington.

For a more in-depth explanation of the methods, caveats, and limitations of the interpolation for each individual pollutant, see [NW-AIRQUEST Regional Background Design Values, 2014-2017](#).³⁵

PM₁₀: Due to the absence of reliable modeled or interpolated PM₁₀ concentrations, we used monitoring data from sites in the Washington Ambient Air Monitoring Network.

²⁹ <https://www.epa.gov/criteria-air-pollutants/naaqs-table>

³⁰ <https://www.epa.gov/naaqs/ozone-o3-air-quality-standards-documents-review-completed-2015>

³¹ <https://ecology.wa.gov/Research-Data/Monitoring-assessment/Air-Quality-Index>

³² <https://ecology.wa.gov/Research-Data/Monitoring-assessment/Air-Quality-Index>

³³ <https://ecology.wa.gov/Research-Data/Monitoring-assessment/Air-Quality-Index>

³⁴ <https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-58>

³⁵ <https://idahodeq.maps.arcgis.com/apps/MapSeries/index.html?appid=0c8a006e11fe4ec5939804b873098dfe>

Lead: We used the most recent state air emissions inventory and the most recent national emissions inventory (NEI) to identify sources that emit greater than 0.5 tons of lead per year.

Data source: [NW-AIRQUEST Regional Background Design Values, 2014-2017](#)³⁶ (hosted on Idaho Department of Environmental Quality's web site); [Washington Ambient Air Monitoring Network](#),³⁷ Department of Ecology; [Air Emissions Inventory](#), Department of Ecology; [National Emissions Inventory](#),³⁸ EPA

Emissions over Distance from Stationary Sources – Emissions quantity divided by distance from major stationary sources of pollution, including airports and railyards for: PM_{2.5}, SO₂, CO, Pb, nitrogen oxides (NO_x), or Volatile Organic Compounds (VOCs). VOCs are not considered criteria pollutants; however, they are precursors to the formation of O₃, which is a criteria pollutant. This indicator represents which areas are nearby to one or multiple stationary sources of criteria pollutants and criteria pollutant precursors.

Method: We used the AIRPACT 1.33 km gridded domain, major source emissions from the 2019 point-source [stationary] emissions database, airport emissions from the 2017 NEI, and railyard emissions from the 2017 NEI. We created individual layers for each pollutant were by: (1) calculating the distance of each source to each grid-cell and used a minimum distance of 1 km for calculations; (2) dividing the emissions for each pollutant by the distance to each grid-cell; and (3) summing the Emissions/Distance from all sources (by pollutant) for each grid-cell.

Caveats: The 99th percentile for each pollutant was selected for this indicator because it is made up of a combination of six separate map layers for each of the six pollutants included. The combined map of the six pollutants with the higher threshold for each had roughly the same weight as the other indicators with a 95th percentile threshold.

PM₁₀ is not included here because >80% of PM₁₀ emissions are included in the PM_{2.5} emissions data.

Data source: [Air Emissions Inventory](#),³⁹ WA Department of Ecology, 2019; [National Emissions Inventory](#),⁴⁰ EPA, 2017; [AIRPACT](#)⁴¹ grid-cells (1.33 km), University of Washington Weather Research and Forecasting (WRF) Model/Washington State University

³⁶ <https://idahodeq.maps.arcgis.com/apps/MapSeries/index.html?appid=0c8a006e11fe4ec5939804b873098dfe>

³⁷ <https://enviwa.ecology.wa.gov/home/map>

³⁸ <https://www.epa.gov/air-emissions-inventories/national-emissions-inventory-nei>

³⁹ <https://ecology.wa.gov/Air-Climate/Air-quality/Air-quality-targets/Air-emissions-inventory>

⁴⁰ <https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data>

⁴¹ <http://lar.wsu.edu/airpact/>

Proximity to Agriculture – Average of proximity to land designated for cultivating crops and proximity to dairies adjusted for range of mature animals.

Method: We calculated separate scores for agricultural intensity and proximity to dairies. For agricultural intensity, each 1.33 km grid cell was assigned a score for the percent of agricultural land in a 15 km buffer, normalized to a scale of 0-1. Agricultural land was identified using the Washington State Department of Agriculture’s [2017 Agricultural Land Use Dataset](#).⁴² For proximity to dairies, each 1.33 km grid cell was assigned a score for the total number of mature cattle at dairies within a 15 km buffer, normalized to a scale of 0-1. Dairy locations and number of mature cattle were extracted from a [2017 WSDA Dairy Map](#).⁴³ In accordance with RCW 42.56.610 and 90.64.190, animal counts were generalized to the ranges listed in WAC 16-06-210 and each dairy assigned the midpoint of its corresponding range. The final proximity to agriculture score was calculated as the mean of the normalized agricultural intensity score and proximity to dairies score.

Caveats: The methods for quantifying agricultural intensity do not distinguish among different crop types, which may pose different environmental impacts to people living nearby. Furthermore, other types of animal feeding operations (aside from dairies) are currently not included, but may be added in the future depending on data availability.

Data source: [Agricultural Land Use Map](#),⁴⁴ WSDA, 2017; [WA Dairy Map](#),⁴⁵ WSDA, 2017; [AIRPACT](#)⁴⁶ grid-cells (1.33 km), University of Washington Weather Research and Forecasting (WRF) Model/Washington State University

Wildfire Smoke Exposure – Estimated exposure to particulate matter pollution from wildfire smoke over a 4-year average.

Method: Daily interpolated PM_{2.5} concentrations from 2015-2018 at census tract centroids were downloaded from EPA’s Fused Air Quality Surfaces Using Downscaling Tool (FAQSD) available in EPA’s Remote Sensing Information Gateway. For each census tract centroid, summer (June – Sept) 98th percentile concentrations and number of days over 20 µg/m³ were calculated. Both summary measures were normalized to a scale of 0-1 and summed into a final “smoke score,” expressed as a percentile.

Caveats: Wildfire smoke exposure can vary significantly year to year. Interpolated concentrations from EPA’s FAQSD tool have associated model uncertainty, and standard errors are likely greater in rural areas without proximate monitoring sites. As the FAQSD is a national

⁴² <https://agr.wa.gov/departments/land-and-water/natural-resources/agricultural-land-use>

⁴³ https://geo.wa.gov/datasets/26add7da921d4aa68ccb50ce191c6182_0/about

⁴⁴ <https://agr.wa.gov/departments/land-and-water/natural-resources/agricultural-land-use>

⁴⁵ https://geo.wa.gov/datasets/26add7da921d4aa68ccb50ce191c6182_0/about

⁴⁶ <http://lar.wsu.edu/airpact/>

tool, its model and interpolation parameters are not necessarily optimized for air quality conditions in the Pacific Northwest.

Data source: [Remote Sensing Information Gateway](#),⁴⁷ EPA, 2015-2018

Asthma Prevalence – Asthma prevalence among adults age 18 years or over.

Method: Weighted percentage of people age ≥ 18 years who answer “yes” to both of the following questions: (a) have you ever been told by a doctor, nurse, or other health professional that you have asthma?, and (b) do you still have asthma? The weighted percentage ensures that survey responses match the population characteristics of each census tract.

Caveats: Physician-diagnosed asthma is self-reported and requires a doctor diagnosis of asthma, which may not include all persons with asthma. This measure does not include prevalence of asthma among children (under age 18). It also does not represent asthma severity.

Data source: [PLACES: Local Data for Better Health](#),⁴⁸ CDC, 2016-2019

COPD Prevalence – Chronic obstructive pulmonary disease prevalence among adults age 18 years or older.

Method: Percentage of people age ≥ 18 years who report ever having been told by a doctor, nurse, or other health professional that they had chronic obstructive pulmonary disease (COPD), emphysema, or chronic bronchitis.

Caveats: The percentage is based on being diagnosed by a physician and respondent recall of the diagnosis and might underestimate the true prevalence. This measure also does not represent COPD severity.

Data source: [PLACES: Local Data for Better Health](#),⁴⁹ CDC, 2016-2019

Life Expectancy – The number of years a newborn can expect to live if the current age-specific death rate remains constant.

Method: The Washington Department of Health collects information about deaths in Washington from death certificates. Health collects and presents these data in data tables.

Caveats: Life expectancy calculations can fluctuate considerably in smaller populations or populations experiencing low or no deaths for the year(s) being calculated. Because of these issues, the life expectancy at birth calculation for the Census Tract geographies was suppressed

⁴⁷ <https://www.epa.gov/hesc/remote-sensing-information-gateway>

⁴⁸ <https://www.cdc.gov/places/>

⁴⁹ <https://www.cdc.gov/places/>

for Census Tracts with a population (for the 5 years combined) of <5000 or a result with a Standard Error >2 or a record of <50 deaths for the time period.

Data source: [Washington Tracking Network \(WTN\)](#),⁵⁰ 2015-2019

Age – Percent of individuals under age 18 and over age 65, as a fraction of the population

Method: The number of individuals under the age of 18 and over the age of 65 were added together and divided by the total population in each census tract.

Data source: [American Communities Survey \(ACS\)](#),⁵¹ U.S. Census, 2015-2019

Households with No Vehicle – Percent of household units with no vehicle

Method: The number of household units that report having no vehicle available divided by the number of households in each census tract.

Caveats: Households with no vehicle is used as proxy for areas where individuals may be more likely to get around by walking, biking, or public transit, and therefore face greater exposure to outdoor air pollution during transit; however, it does not represent that exposure directly.

Data source: [American Communities Survey \(ACS\)](#),⁵² U.S. Census, 2015-2019

Draft Factors to Identify Community Boundaries

After statewide indicators are applied to screen for areas overburdened by air pollution, Ecology proposes using the following additional factors, including regional- and local-level data to identify the boundaries of the overburdened communities highly impacted by air pollution.

Existing community boundaries – Geographic boundaries used to distinguish communities (i.e., city limits, neighborhoods, etc.)

Many people identify their community by geography, such as the town or the neighborhood(s) in which they live, work, and play. Where applicable, we can use these existing geographic boundaries to inform the boundaries of the identified overburdened communities.

Data source: Varies

⁵⁰ <https://doh.wa.gov/data-statistical-reports/washington-tracking-network-wtn>

⁵¹ <https://www.census.gov/programs-surveys/acs>

⁵² <https://www.census.gov/programs-surveys/acs>

Locations of sensitive receptors – Locations where occupants are more susceptible to the adverse effects of exposure to air pollution, including:

- K-12 schools
- Childcare facilities
- Hospitals and health clinics (e.g., assisted living facilities, nursing homes, etc.)
- Long-term care facilities
- Prisons, jails, and detention centers

Data source: [Washington Geospatial Open Data](#)⁵³

Regional data – Many studies or additional data on pollution, health, or environmental justice are available at the regional scale that can further refine the statewide draft indicator data. This includes pollution studies, health impact assessments, survey data, and more.

Local clean air agencies also may have additional air quality data available to help identify overburdened communities, or they may be doing work to address environmental justice within their own jurisdictions. For example, Puget Sound Clean Air Agency has a process to identify “[focus areas](#),”⁵⁴ or geographic locations with degraded air quality, whose residents face economic or historic barriers to participation in clean air decisions and solutions within Puget Sound. The data and insights from that process can also be used to help inform overburdened community boundaries within that region.

Data source: Varies

Size – Large populated areas may be broken up into several adjacent overburdened communities.

Public input – Input from public comment periods will inform how we consider and apply the draft factors to determine overburdened community boundaries.

Indicators under Exploration

Several indicators were not included in the draft indicators due to data limitations. The following indicators are still under exploration, and may be added in the future if the limitations with the data are resolved:

- **Outdoor workers** – People who work primarily outdoors (agricultural workers, construction workers, postal delivery workers, etc.) have higher exposure to outdoor air pollution than people who primarily work indoors. We have not yet been able to

⁵³ <https://geo.wa.gov/>

⁵⁴ <https://www.pscleanair.gov/372/Community-Equity-Access>

identify or produce a dataset that captures the many different types of outdoor workers and where they are located across Washington.

- **Homelessness** – Outdoor air pollution disproportionately affects unhoused people. Statewide data on homeless populations is available through the [Point in Time Count](#);⁵⁵ however, the data is only available at the county level, which does not provide enough resolution to determine where unhoused populations are located for community identification.
- **Childhood asthma** – While prevalence of asthma is included in the draft indicators above, specifically childhood asthma was frequently brought up in the first public comment period. We have not been able to identify an adequate dataset where data on childhood asthma is collected and reported consistently across Washington.
- **Proximity to CAFOs** – Currently the “proximity to agriculture” indicator includes cultivated crops and dairies, but not other types of concentrated animal feeding operations (CAFOs) such as beef feedlots and poultry farms. These facilities are not uniformly permitted, so we do not yet have a comprehensive source of data on different CAFO types in the state, or their relative sizes.

Tribal Consultation

We are inviting government-to-government consultation with Tribal nations throughout the entire process. We invited government-to-government consultation in December 2021 and conducted two Tribal meetings in January 2022, the week prior to the public listening sessions. We will continue to consult with Tribal nations and organizations affiliated with Washington Tribes on the process to identify overburdened communities highly impacted by air pollution.

Opportunities to Provide Feedback

Soliciting feedback from partner agencies, stakeholders, and the broader community is important to help ensure that the process to identify overburdened communities highly impacted by air quality is reflective of the concerns from communities across Washington. Specifically, Ecology would like feedback on:

- Draft indicators to identify overburdened communities highly impacted by air pollution
- Draft factors for boundaries
- Data sources

You can provide feedback about any of these topics in multiple ways during our fall public comment period **September 19, 2022 – November 4, 2022**:

⁵⁵ <https://www.commerce.wa.gov/serving-communities/homelessness/annual-point-time-count/>

- Online public hearings (interpretation available)
- Submit comments:
 - [Online](#)⁵⁶
 - Mail to:
Erin Torrone
Washington Department of Ecology
Air Quality Program
P.O. Box 47600
Olympia, WA 98504-7600

Next Steps

We will consider all the input received from the Environmental Justice Council, Tribal consultation, and the public before finalizing the indicators used for identifying overburdened communities highly impacted by air pollution. We will release a final version of the process, an updated technical support document, and a final list and map of overburdened communities the following winter.

Once overburdened communities are identified, we will begin the process of placing air monitors in the identified communities, as well as providing additional public outreach to provide information about monitoring.

More Information

Please visit [our web page](#)⁵⁷ for more information about this initiative, a draft map of areas that meet the initial draft indicator thresholds, up-to date-information about public input opportunities, as well as translated materials available in Spanish, Chinese, Korean, Vietnamese, and Russian: <https://ecology.wa.gov/Air-Climate/Climate-change/Reducing-greenhouse-gases/Climate-Commitment-Act/Overburdened-communities>

For questions regarding this document, contact:

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⁵⁶ <https://aq.ecology.commentinput.com/?id=MaBWc>

⁵⁷ <https://ecology.wa.gov/Air-Climate/Climate-change/Reducing-greenhouse-gases/Climate-Commitment-Act/Overburdened-communities>

Appendix A. Climate Commitment Act Legal Code

This focus of this initiative is on overburdened communities highly impacted by criteria air pollution, as directed by RCW 70A.65.020 (1). For the purposes of the Climate Commitment Act, overburdened communities, are defined in RCW 70A.65.010 (54):

(54) "Overburdened community" means a geographic area where vulnerable populations face combined, multiple environmental harms and health impacts or risks due to exposure to environmental pollutants or contaminants through multiple pathways, which may result in significant disparate adverse health outcomes or effects.

(a) "Overburdened community" includes, but is not limited to: (a) "Overburdened community" includes, but is not limited to:

(i) Highly impacted communities as defined in RCW 19.405.020;

(ii) Communities located in census tracts that are fully or partially on "Indian country" as defined in 18 U.S.C. Sec. 1151; and

(iii) Populations, including Native Americans or immigrant populations, who may be exposed to environmental contaminants and pollutants outside of the geographic area in which they reside based on the populations' use of traditional or cultural foods and practices, such as the use of resources, access to which is protected under treaty rights in ceded areas, when those exposures in conjunction with other exposures may result in disproportionately greater risks, including risks of certain cancers or other adverse health effects and outcomes.

(b) Overburdened communities identified by the department may include the same communities as those identified by the department through its process for identifying overburdened communities under RCW 70A.02.010.

RCW 70A.65.020, titled "Environmental Justice Review" is the portion of the Climate Commitment Act that directs the formation and implementation of this initiative:

(1) To ensure that the program created in RCW 70A.65.060 through 70A.65.210 achieves reductions in criteria pollutants as well as greenhouse gas emissions in overburdened communities highly impacted by air pollution, the department must:

(a) Identify overburdened communities, which may be accomplished through the department's process to identify overburdened communities under chapter 70A.02 RCW;

(b) Deploy an air monitoring network in overburdened communities to collect sufficient air quality data for the 2023 review and subsequent reviews of criteria pollutant reductions conducted under subsection (2) of this section; and

(c)(i) Within the identified overburdened communities, analyze and determine which sources are the greatest contributors of criteria pollutants and develop a high priority list of significant emitters.

(ii) Prior to listing any entity as a high priority emitter, the department must notify that entity and share the data used to rank that entity as a high priority emitter, and provide a period of not less than 60 days for the covered entity to submit more recent data or other information relevant to the designation of that entity as a high priority emitter.

(2)(a) Beginning in 2023, and every two years thereafter, the department must conduct a review to determine levels of criteria pollutants, as well as greenhouse gas emissions, in the overburdened communities identified under subsection (1) of this section. This review must also include an evaluation of initial and subsequent health impacts related to criteria pollution in overburdened communities. The department may conduct this evaluation jointly with the department of health.

(b) Once this review determines the levels of criteria pollutants in an identified overburdened community, then the department, in consultation with local air pollution control authorities, must:

(i) Establish air quality targets to achieve air quality consistent with whichever is more protective for human health:

(A) National ambient air quality standards established by the United States environmental protection agency; or

(B) The air quality experienced in neighboring communities that are not identified as overburdened;

(ii) Identify the stationary and mobile sources that are the greatest contributors of those emissions that are either increasing or not decreasing;

(iii) Achieve the reduction targets through adoption of emission control strategies or other methods;

(iv) Adopt, along with local air pollution control authorities, stricter air quality standards, emission standards, or emissions limitations on criteria pollutants, consistent with the authority of the department provided under RCW 70A.15.3000, and may consider alternative mitigation actions that would reduce criteria pollution by similar amounts; and

(v) After adoption of the stricter air quality standards, emission standards, or emissions limitations on criteria pollutants under (b)(iv) of this subsection, issue an enforceable order or the local air authority must issue an enforceable order, as authorized under RCW 70A.15.1100, as necessary to comply with the stricter standards or limitations and the requirements of this section. The department or local air authority must initiate the process, including provision of notice to all relevant affected permittees or registered sources and to the public, to adopt and implement an enforceable order required under this subsection within six months of the adoption of standards or limitations under (b)(iv) of this subsection.

(c) Actions imposed under this section may not impose requirements on a permitted stationary source that are disproportionate to the permitted stationary source's contribution to air pollution compared to other permitted stationary sources and other sources of criteria pollutants in the overburdened community.

(3) An eligible facility sited after July 25, 2021, that receives allowances under RCW 70A.65.110 must mitigate increases in particulate matter in overburdened communities due to its emissions.

(4)(a) The department must create and adopt a supplement to the department's community engagement plan developed pursuant to chapter 70A.02 RCW. The supplement must describe how the department will engage with overburdened communities and vulnerable populations in:

(i) Identifying emitters in overburdened communities; and

(ii) Monitoring and evaluating criteria pollutant emissions in those areas.

(b) The community engagement plan must include methods for outreach and communication with those who face barriers, language or otherwise, to participation.