

Environmental Justice Inventory – Linn-Benton County, Oregon

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Introduction

The purpose of this inventory is to detail the state of environmental justice in the Mid-Willamette Valley in an up-to-date, centralized format. The inventory is based on information from various government sources, and a survey to gather first-person perspective to take a pulse of the wellbeing of our community. The Environmental Climate Justice committee of the Linn-Benton County NAACP commissioned this project to gather this information in order to make informed policy solutions to environmental justice issues experienced here in the Mid-Willamette Valley. This report will detail the methodology, findings from the survey and secondary sources, and some policy suggestions.

Environmental Justice Framework

The Environmental Protection Agency describes environmental justice as “the fair and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.”

The history of Environmental Justice in Oregon begins with the people native to this land being forcibly removed from their traditional homelands. The Kalapuyan tribes, of which there are nineteen, have lived across the Willamette and Umpqua Valleys over the last 14,000 years, tending to the earth via traditional land management and horticultural practices in that time. However, the advent of European colonization caused diseases like Smallpox and Malaria to spread, bringing the Kalapuyan population from over 200,000 to less than 1000 by 1850. Within that decade, tribes of the Willamette Valley signed treaties which allowed for the creation of permanent reservations on their homelands, which forced them to leave their lands and be removed to the Grand Rhonde Indian Reservation. By only 1851, no land in the Willamette Valley remained unclaimed by European settlers ([Lewis, 2021](#)). The forced removal, genocide, and assimilation of Kalapuyans (and all other tribes native to this land) remains to be not only one of the biggest miscarriages of racial justice in Oregon, but also one of the biggest ecological disasters the likes of which we are only beginning to understand.

When the State Constitution was first signed in 1857, Article 1, Sections 35 and 36 declared that free Black and mixed-race people were not allowed to move to Oregon, sign contracts, or vote

in Oregon. It took 70 years for these sections to be repealed. Many Oregon townships also sported “sundown laws”, which excluded certain minority groups (usually African Americans and/or Latinos and Asians) from entering and living there ([Oregon Secretary of State, n.d.](#)).

After these laws began to be repealed, BIPOC Oregonians were still segregated and confined to certain undesirable regions of a city with a practice called redlining. Mortgage brokers would deny Black, Brown, Indigenous, and Asian borrowers from buying homes in some neighborhoods due to their race or ethnicity. This practice created regions like Albina, Portland. Albina was home to 39% of Portland’s minority population in the early 1920s as well as 500 hazardous waste (brownfield) sites, which endangered the wellbeing of the people who lived there. This example shows the necessity of Environmental Justice research and monitoring; housing discrimination facilitates environmental policy and siting decisions that hurt minority residents the most ([Ackerman, 2016](#)). While redlining maps do not appear to exist for Corvallis or Albany from the 1930s, restrictive covenants in deeds appear in the Mid-Willamette Valley, prohibiting homeowners from selling a property to people of specified race, ethnicity, religion, or other characteristics ([City of Corvallis, n.d.](#)). While restrictive covenants have been unenforceable since 1948 and the Oregon legislature has made it easier for homeowners to remove such language from their deeds today, public and private housing policy has been deployed to segregate or exclude racial minorities from owning homes and building legacy in the Mid-Willamette Valley.

Environmental justice also includes a component of intergenerational equity. Each generation will feel increasing extreme adverse effects of climate change compared to the generation before ([Tyson, Kennedy, & Funk, Pew Research Center, 2021](#)). Because of changing demographics, younger generations in Oregon (and across the United States) have a higher proportion of BIPOC people. This may be more pronounced in our area of study because a higher proportion OSU and LBCC students are drawn to the area. According to College Factual, 27% of [OSU students](#) and 37.6% of [LBCC students](#) are non-white and/or multi-ethnic, which stands out in sharp contrast to the fact that Linn-Benton County has only 16% BIPOC population in 2020.

Given the historical and institutional foundations for environmental injustice, changing demographics, and a changing climate, minorities communities more often contain sources of pollution and environmental damage today, while climate change manifests stronger negative consequences now and in the future. Environmental racism, or the unequal access to a clean environment and basic environmental resources due to racial prejudice, continue to be experienced in the Mid-Willamette Valley today ([Patnick et al., 2020](#)).

For the purposes of this inventory, we will be taking a primary focus on the intersections of race and environmental policy, understanding the intersectional effects of low income, LGBTQIA+ communities, immigration status or language, and other sources of oppression compound the experiences of individuals in the Mid-Willamette Valley community.

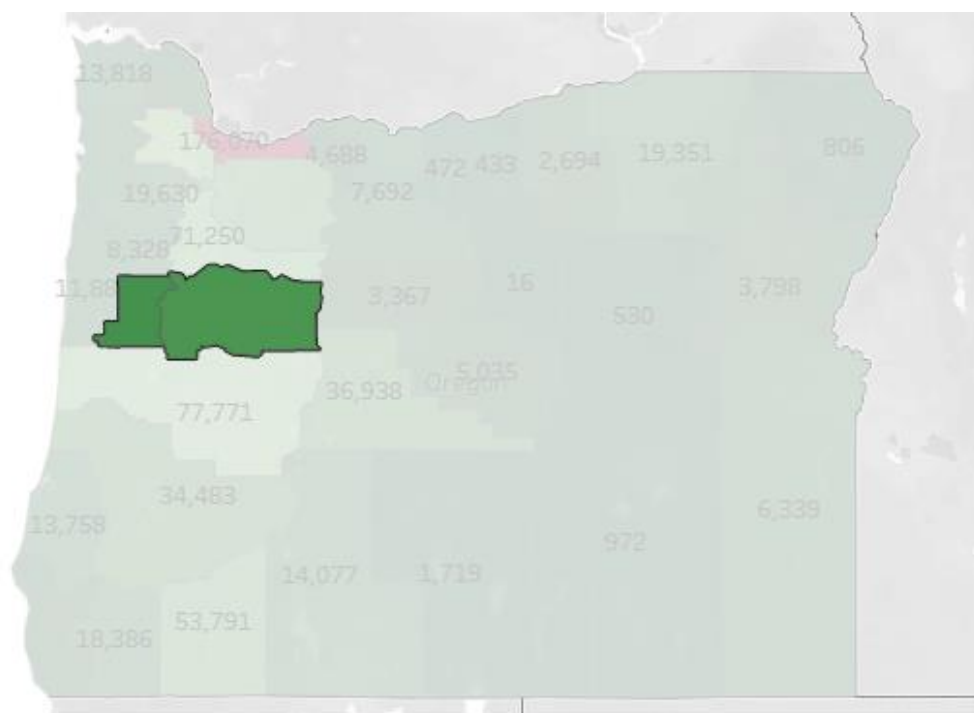
Methodology

This research is based on anonymous public surveys and a compilation of secondary research. The public survey gathered demographic and environmental inventory data administered online via the Qualtrics survey platform. The survey was reviewed by the Linn-Benton NAACP ECJ committee. The Linn-Benton NAACP branch in Corvallis and Albany shared the questionnaire in their monthly newsletter and social media. Responses to the survey were analyzed and reported using accepted statistical methods.

Secondary research data consists of demographic census data for the year 2020. All data used are taken from government websites including, but not limited to, the EPA's EJScreen tool, relevant data from the US Census Bureau, and Oregon Department of Environmental Quality.

Findings

Regional Demographics – Linn and Benton Counties, Oregon



DEMOGRAPHICS (2020)	LINN-BENTON COUNTIES	OSU-CORVALLIS STUDENTS	LBCC STUDENTS	OREGON	US
POPULATION	223,794	23,266	4,956	3,831,074	331,499,281
DEMOGRAPHIC INDEX*	24%	-	-	28%	36%
PEOPLE OF COLOR**	18.54%	27%	37.6%	24%	40%
LOW INCOME***	33%	-	-	31%	31%
UNEMPLOYMENT RATE	7%	-	-	5%	5%

LINGUISTICALLY ISOLATED	0%	-	-	2%	5%
LESS THAN HIGH SCHOOL	13%	-	-	9%	12%
EDUCATION					
OVER THE AGE OF 64	8%	-	-	6%	6%
UNDER THE AGE OF 5	16%	-	-	16%	16%

*Demographic index" is equal to the average of people of color and low-income earners in an area [%BIPOC+%Low Income]/2.)

** People of Color is defined as persons of any race/ethnicity aside from White, Non-Hispanic alone.

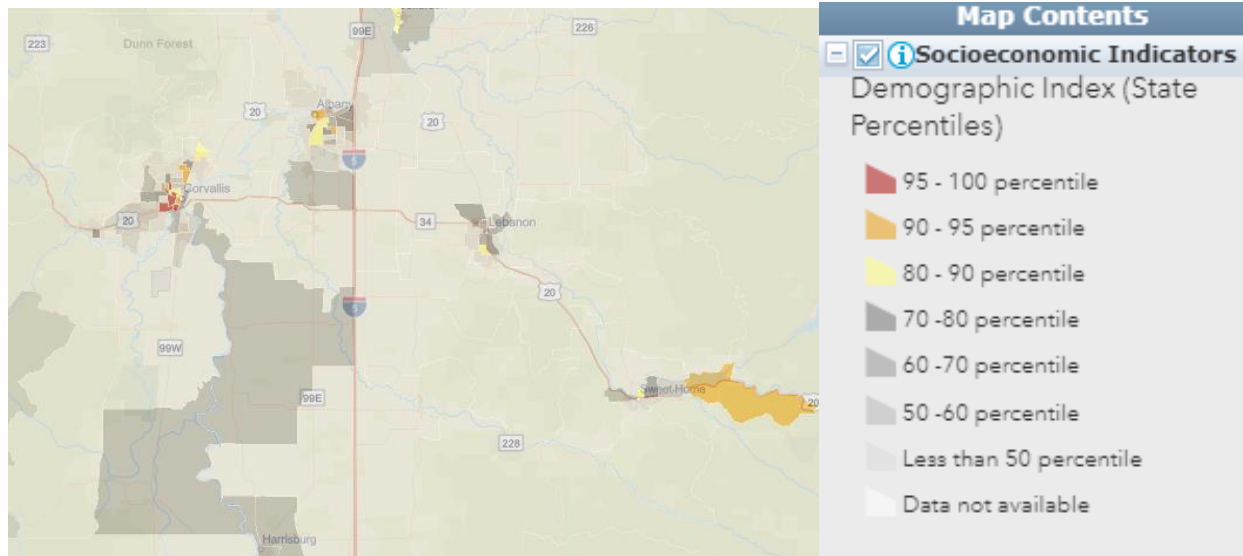
***Low-income is defined as the number or percent of a census block's population where household income is less than or equal to twice the federal poverty level ([US EPA, 2022](#)).

Source: [Census data](#), [Nealon, 2020](#); [UnivStats, 2021](#))

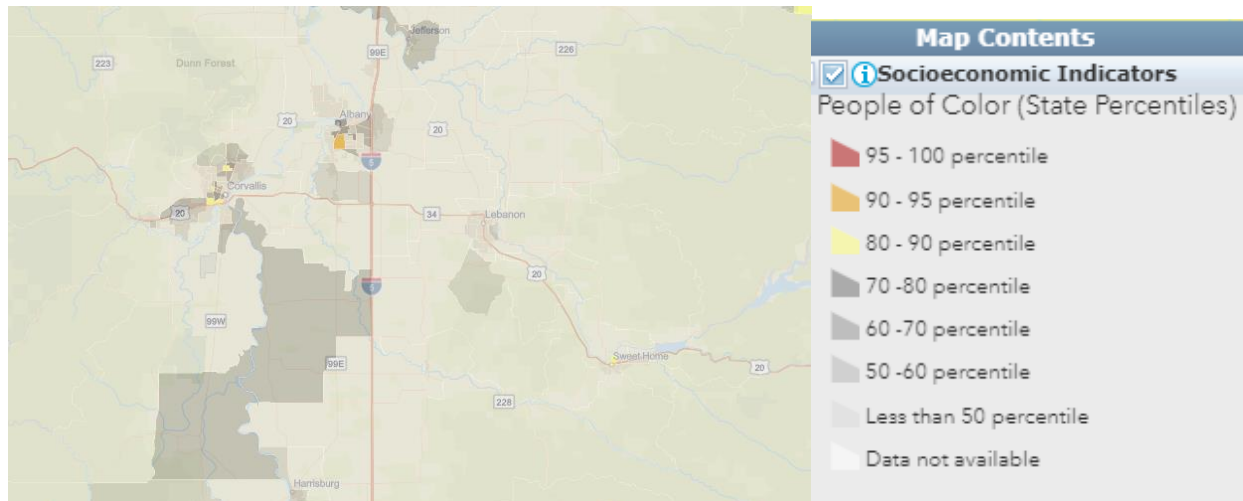
Recent Census data shows that Linn and Benton counties have a lower-than-average BIPOC population, both for the state and country, while Oregon State University and Linn-Benton County students have a much higher BIPOC population. Linn-Benton Counties have a higher proportion of low-income households and unemployment than the Oregon and US average, possibly attributable to the high student population.

Given that the 2020 US Census occurred during the Coronavirus pandemic, the Census undercounted Black, Hispanic, and "some other race" populations, children, and renters while it overcounted the Non-Hispanic White population and the Asian population. There was inconclusive data about the accuracy of the count of the college-aged population (age 18-29), as fewer college students lived on-campus during the pandemic. The importance of Oregon State University and Linn-Benton Community College to the population and economy of the Mid-Willamette Valley, with on-campus student enrollment accounting for 12.6% of the population (compared to 5.7% of the US population enrolled in college in 2020), may explain why the local demographic breakdowns are different from the overall state or national figures ([US Census Bureau, 2022](#); [Statistica, 2022](#) (total US college enrollment 18.99 million in 2020)).

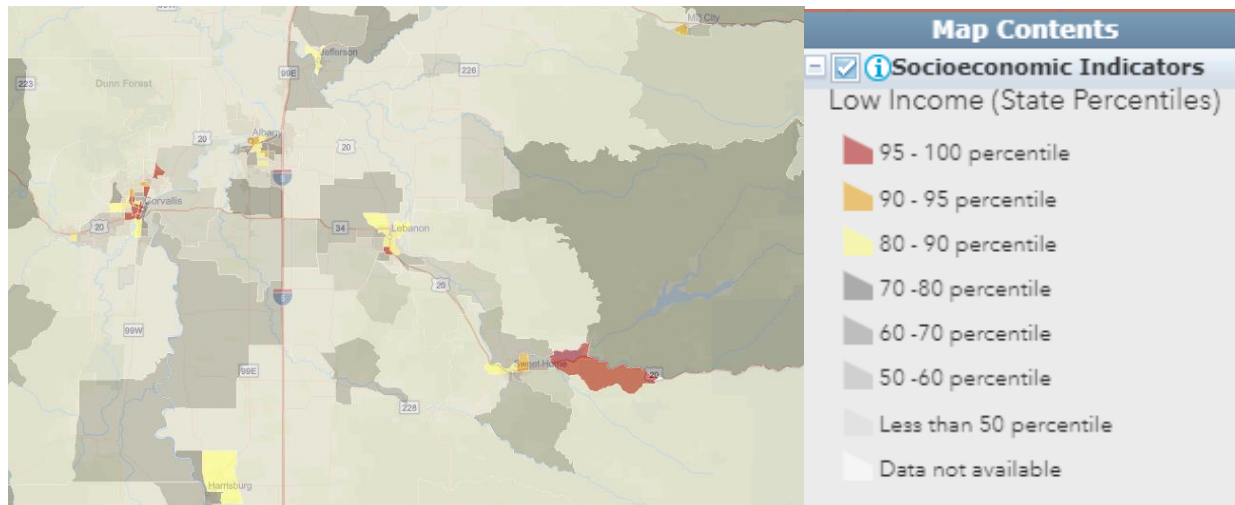
Because of the history of housing discrimination discussed above, the spatial distribution of BIPOC and low-income communities is essential to an EJ analysis. In our analysis of secondary data, we use the US EPA's EJScreen tool.



¹Linn-Benton County Demographic Index map covering Corvallis, Albany, and surrounding area.



²Linn-Benton County People of Color map covering Corvallis, Albany, and surrounding area.



³Linn-Benton County Low Income map covering Corvallis, Albany, and surrounding area.

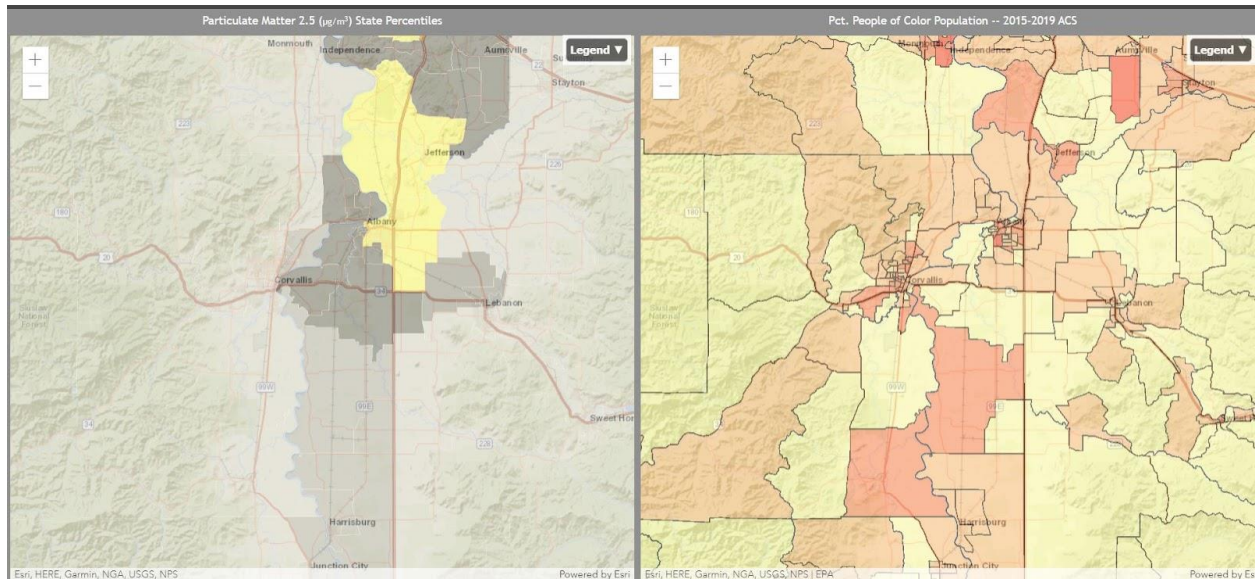
Environmental Harms

Climate change has already begun to create environmental harms on our planet, and Linn-Benton County is no exception. The following section will describe these harms as shown by our survey and secondary research.

Air Pollution

There are two kinds of air pollution that we will discuss in this report: particulate matter emissions and air toxins. Particulate matter can come from industrial or natural sources, which can vary by season depending on the sources. Greenhouse gas emissions are another type of air pollution that do not directly cause detrimental health effects for humans; however, they cause significant environmental degradation which hurts human and ecosystem health in the long run through changing temperature and precipitation patterns along with more extreme weather events. Greenhouse gases that cause climate change can exacerbate some natural sources of air pollution, such as pollen or wildfires. Climate change also causes water and soil acidification (which contaminates our water supply), increased infection rates of vector pathogens, and increase cardiovascular and respiratory issues ([EPA](#)).

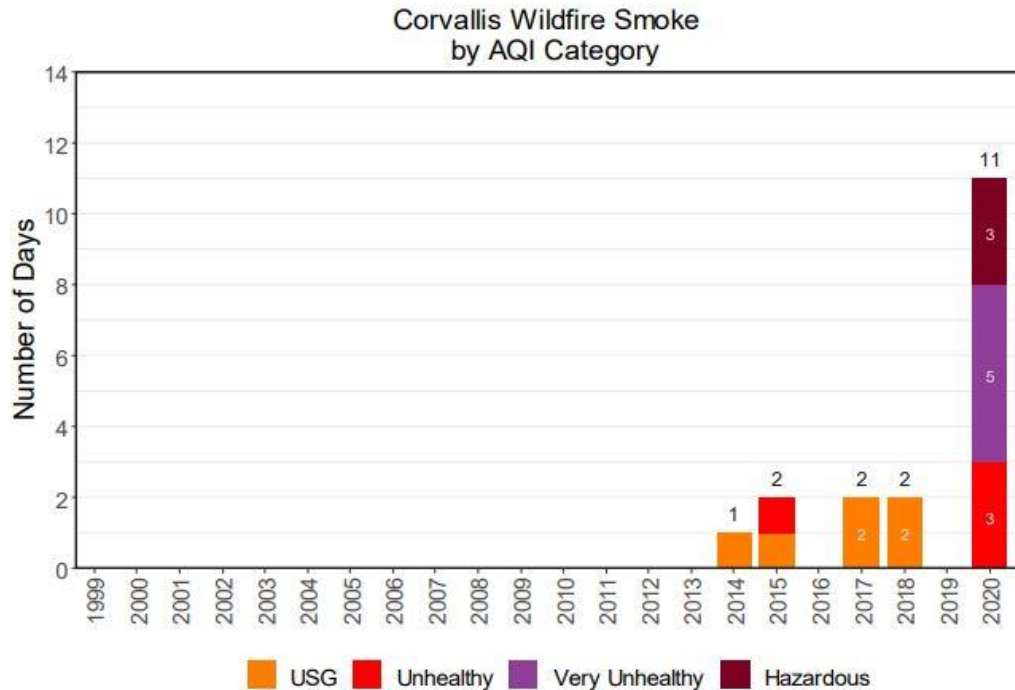
Particulate matter can include soot, smoke, pollen, and aerosol chemicals. The smaller the particles are, the more likely they are to make their way deep into a person's lungs or even their bloodstream. Exposure to particulate matter is linked to premature death for people with pre-existing lung or heart conditions, nonfatal heart attacks, irregular heartbeat, decreased lung functionality, worsened asthma, and increased respiratory symptoms according to the [EPA](#).



⁴EJScreen: Particulate matter (left) vs. BIPOC population (right) in Linn-Benton County

From this particulate matter map compared to the people of color population we can see that around Albany, the yellow block in the left map shows a moderate amount of particulate matter, and on the right map we can see that some of that area has higher BIPOC community members living around that space. However, there are other areas with high concentrations of BIPOC community members that are not in the high particulate matter area, and Corvallis does not have a strong correlation between particulate matter and BIPOC communities.

Another source of particulate matter pollution comes from wildfire, which is an acute threat that is not well demonstrated on the EJScreen mapping tool. In 2020, the Labor Day wildfires caused significantly more air pollution than in previous years, a total of eleven days with a poor air quality index: 3 days of unhealthy air quality period, five days of very unhealthy air quality, and finally three days of hazardous air quality index.

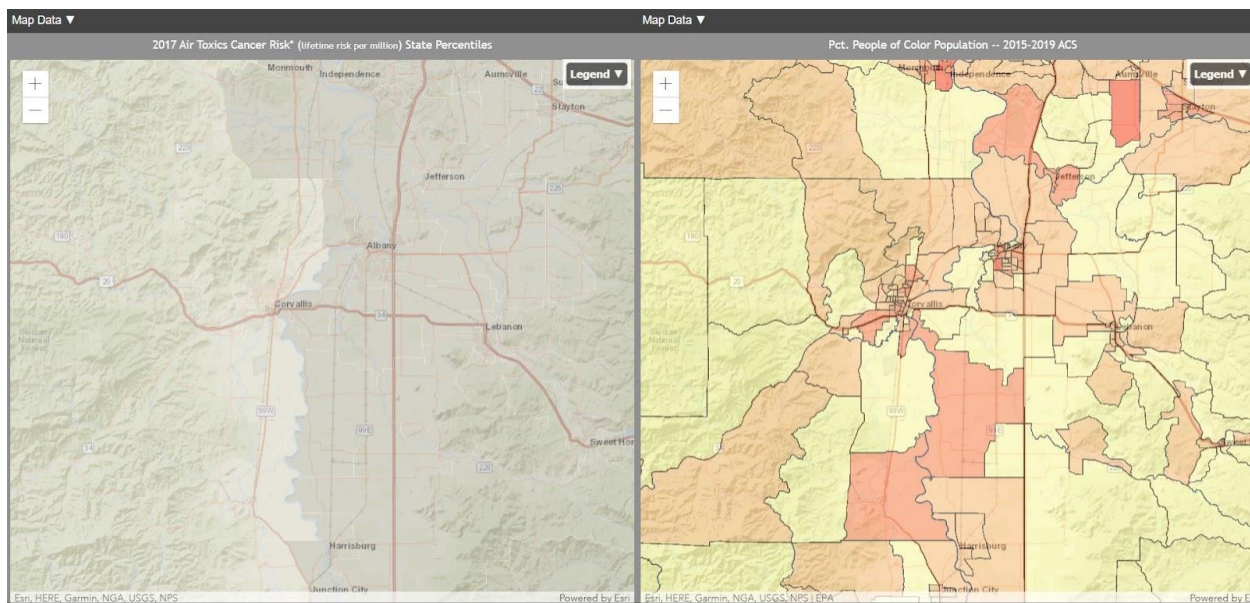


⁵ DEQ: Corvallis wildfire smoke

Corvallis wildfire >= USG AQI wildfire smoke trends. Taken from the Wildfire Smoke Trends and the Air Quality Index reported by DEQ, July 2021) ([Wildfire Smoke Trends and the Air Quality Index July 2021](#)).

Air Toxics Cancer Risk

The US EPA estimates the risk of cancer and other serious health effects from breathing (inhaling) air toxins outdoors. Air toxins (also called toxic air pollutants or hazardous air pollutants) are chemicals that are released into the air from human activity, usually industrial sources. Air toxins can cause serious health problems such as cancer, reproductive problems or birth defects in humans, along with harmful environmental and ecological effects. EJScreen shows a measure of lifetime cancer risk from inhalation of air toxins in a local area to give communities information about air quality and assist communities in addressing environmental justice concerns ([US EPA, Air Toxics Screening Assessment - FAQs](#)).



⁶ EJScreen: 2017 Air Toxics Cancer Risk (left) vs. BIPOC population (right) in Linn-Benton County

Here is a side-by-side comparison of 2017 Air Toxic Cancer Risk state percentile compared to the percentage of People of Color population from 2016 to 2019. We can see that there is no discernable correlation between air toxics cancer risk and race or ethnicity.

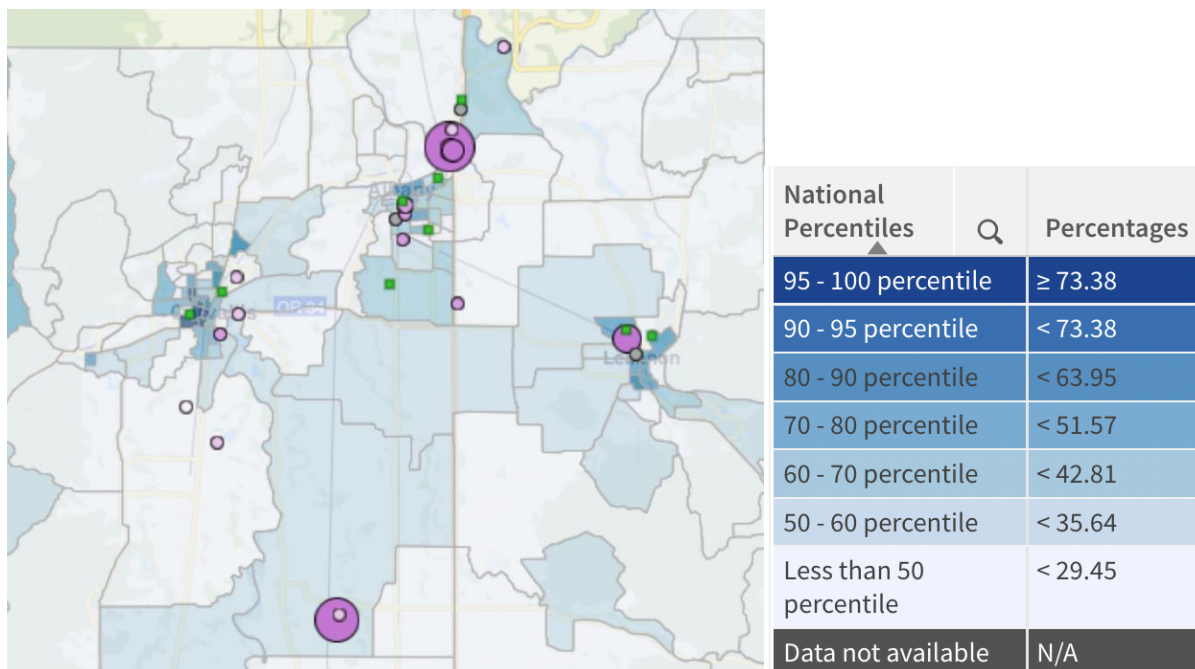
To summarize, particulate matter and air toxins do not have as strong correlation to the distribution of BIPOC communities in the Mid-Willamette Valley. However, seasonal spikes in particulate matter due to wildfires and other causes, and the ability to adapt when pollution levels are high, are issues discussed later in this report.

Toxic Waste and Contamination

Data from the [EPA TRI Toxics Tracker](#) shows facilities in some industrial sectors that use or hold certain toxic chemicals that may pose a threat to human health and the environment. The regulated facilities report how much of each chemical is released to the air, water, or land and/or is managed through recycling, energy recovery and treatment annually. Toxic waste types include computers and electronic products, chemicals, non-metallic mineral products, primary metals, and wood products. In Linn and Benton Counties, most of these sites are in Corvallis and Albany, with a couple in Halsey and Lebanon. Major concentrations of these sites are in less populated regions, like Old Salem Road NE in Albany, where these industrial centers are located. This EJScreen report covers toxic waste from 2018-2020.

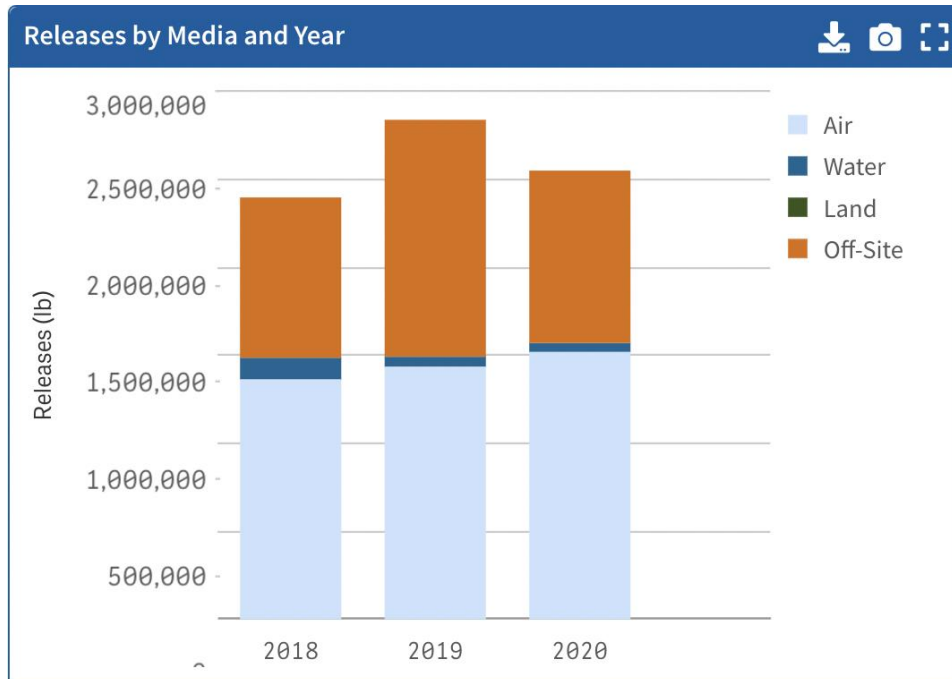
Note that the TRI map below is based on different data than EJ Screen provides in other maps in this report. The demographic data is based on the national percentiles, the low-income percentiles are displayed on the map below (Linn and Benton County BIPOC populations are much lower than national percentiles and do not show significant variation in the maps). The size of the purple dots represents the “Potential Risk Score” associated with the 21 facilities

reporting from 2018-2020, an estimate of potential human health risk based on quantity, toxicity, and potential human exposure to a chemical. The green dots represent facilities that have hazardous material on site but are not required to submit TRI reports.

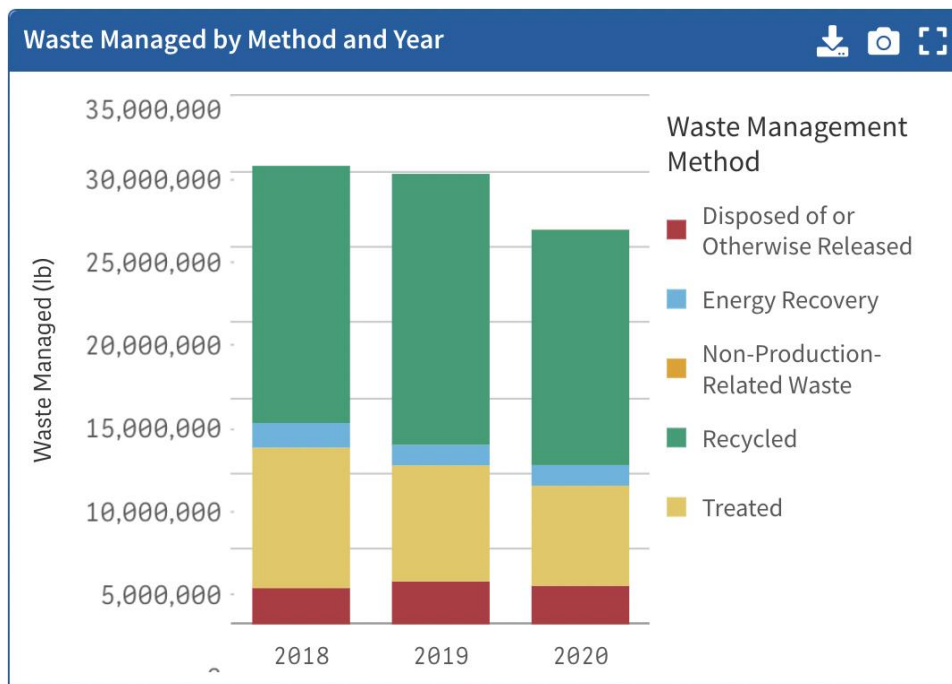


⁷ [EPA TRI Toxics Tracker](#) map for Linn-Benton County, showing low-income populations relative to US National percentiles.

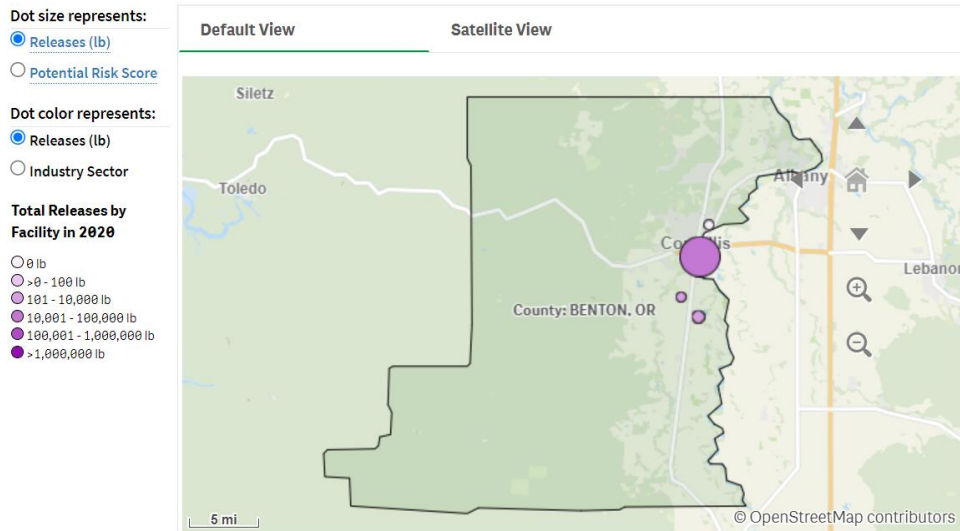
The TRI reports for Linn and Benton Counties are combined to show that most releases of hazardous materials are into the air, with a small amount to the water. Most are transferred offsite, to an unspecified location. The Waste Management Method graph shows that most waste in the facilities is recycled or treated.



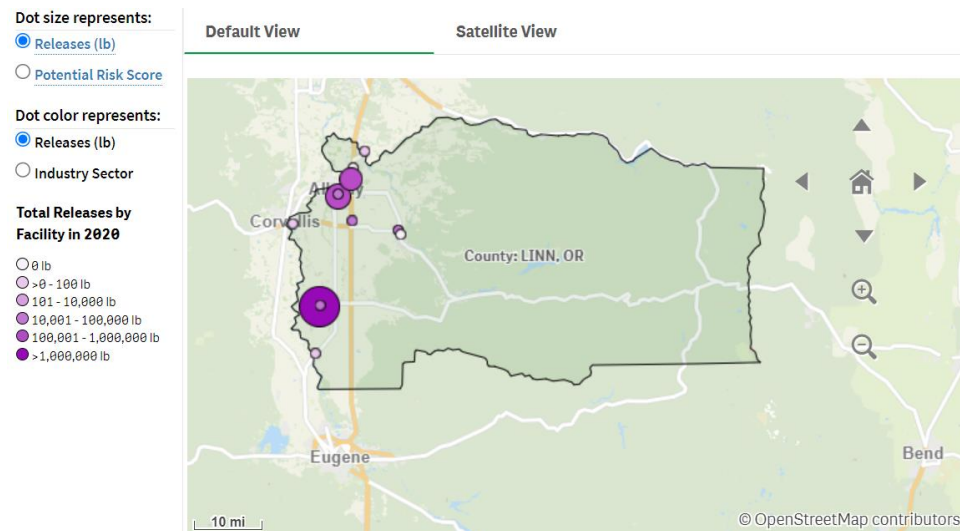
⁸ [EPA TRI Toxics Tracker](#) summary report, Releases by Media and Year, for Linn-Benton County



⁹ [EPA TRI Toxics Tracker](#) summary report, Waste Managed by Method and Year, for Linn-Benton County



¹⁰ [EPA TRI Toxics Tracker](#) map of TRI Facilities for Linn-Benton County – Reporting Year 2020



¹¹ [EPA TRI Toxics Tracker](#) map of TRI Facilities for Linn County – Reporting Year 2020

TRI Sites – Overview		
	Benton County	Linn County
Number of TRI Facilities	4	17
Total Production-Related Waste Managed	31,939 lb	26,102,388 lb
Total Disposals or Other Releases	16,742 lb	2,534,993 lb
Total On-Site	2,075 lb	1,569,396 lb
• Air	419 lb	1,520,755 lb
• Water	35 lb	48,623 lb
• Land	1,621 lb	17 lb
Total Off-Site	14,667 lb	965,597 lb

For the table below, we gathered data on local TRI sites from the [TRI Tracker map](#), then plugged in the addresses for each into [EJScreen](#) to access the most recent demographic data in that Census Block. Below are the results.

Note: BIPOC population is 18.54% in Linn-Benton County and 28% in Oregon while Low-Income population is 33% in Linn-Benton and 31% in Oregon.

	Facility	Address	Amount (total lbs.)	Type	POC	Low Income
Corvallis	HP INC	1070 NE Circle Blvd	134	Computers and Electronics Products	21%	23%
	Oregon Rubber Mills Co.	1985 SW Airport Ave	406	Chemicals	6%	7%
	Green & White	28054 Payne Rd	4424	Non- metallic mineral products	6%	7%
	Hollingswo rth & Vose Fiber Co.	1551 SE Crystal Lake Dr.	42,649	Non- metallic mineral products	25%	30%
	MDU Corvallis Asphalt	28602 Hwy 34	3	Non- metallic mineral products & Petroleum	4%	29%
Albany	ATI Albany Operations Facility	530 34th Ave SW	276,334	Primary Metals	20%	33%
	Pacific Cast Technologi es	150 Queen Ave SW	2,230,352	Primary Metals	49%	36%
	WR Grace & Co.	1290 Industrial Way SW	30,349	Chemicals	31%	51%
	Selmet Inc.	33992 Seven Mile Ln SE	83,388	Primary Metals	17%	25%
	TDY Industries Inc.	1600 Old Salem Rd. NE	1,739,644	Primary Metals	13%	17%
	Georgia Pacific Chemicals	2190 Old Salem Rd. NE	34,186	Chemicals	13%	17%

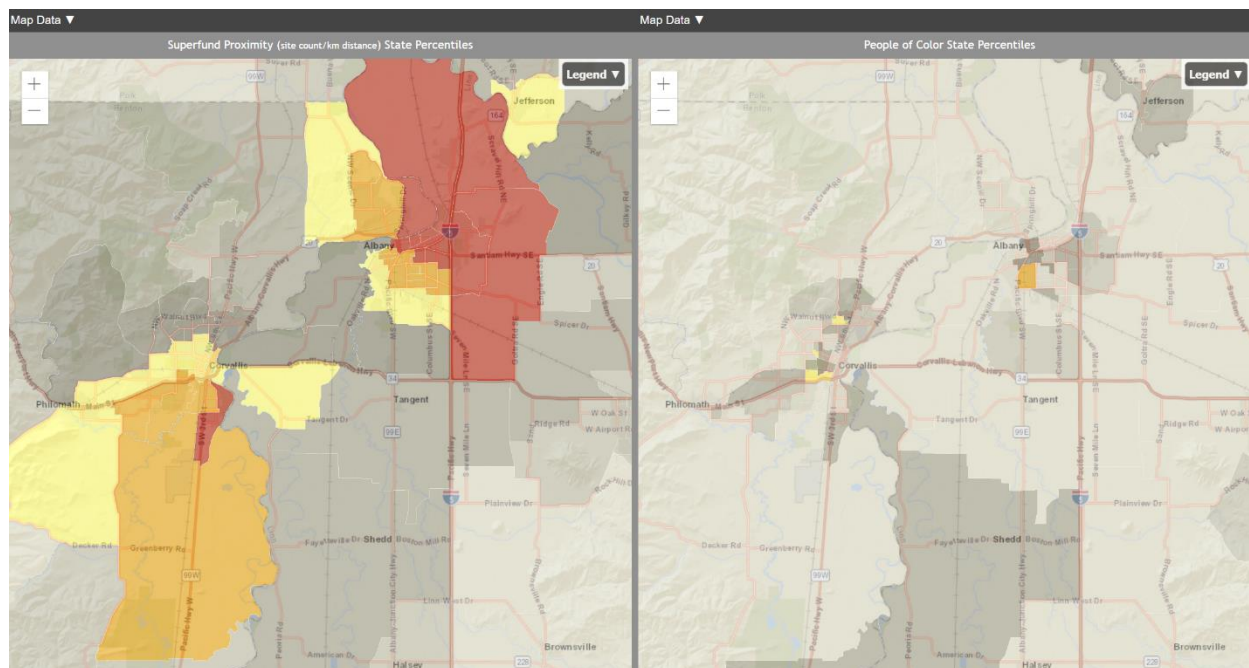
	Arauco NA Inc.	2550 Old Salem Rd. NE	353,366	Wood Products	13%	17%
	Highline Warren - Albany	3075 Arnold Rd. NE	3575	Chemicals	13%	17%
Halsey	Cascade Pacific Pulp	30480 American Dr, Halsey	3,123,772	Wood Products	35%	35%
	Georgia Pacific Consumer Operations	30470 American Dr., Halsey	88,616	Wood Products	35%	35%
Lebanon	Entek International LLC	250 N Hansard Ave., Lebanon	130,101	Plastics and Rubber	20%	52%
Harrisburg	Harrisburg PS	23505 Peoria Rd., Harrisburg	207	Non-metallic Mineral Product	15%	47

¹² TRI Tracker Map: Toxic waste sites in Linn-Benton County

Listed above are 17 of the 22 TRI sites. The other four remain unlisted because they produced 0 pounds (lbs.) of reported waste in 2020.

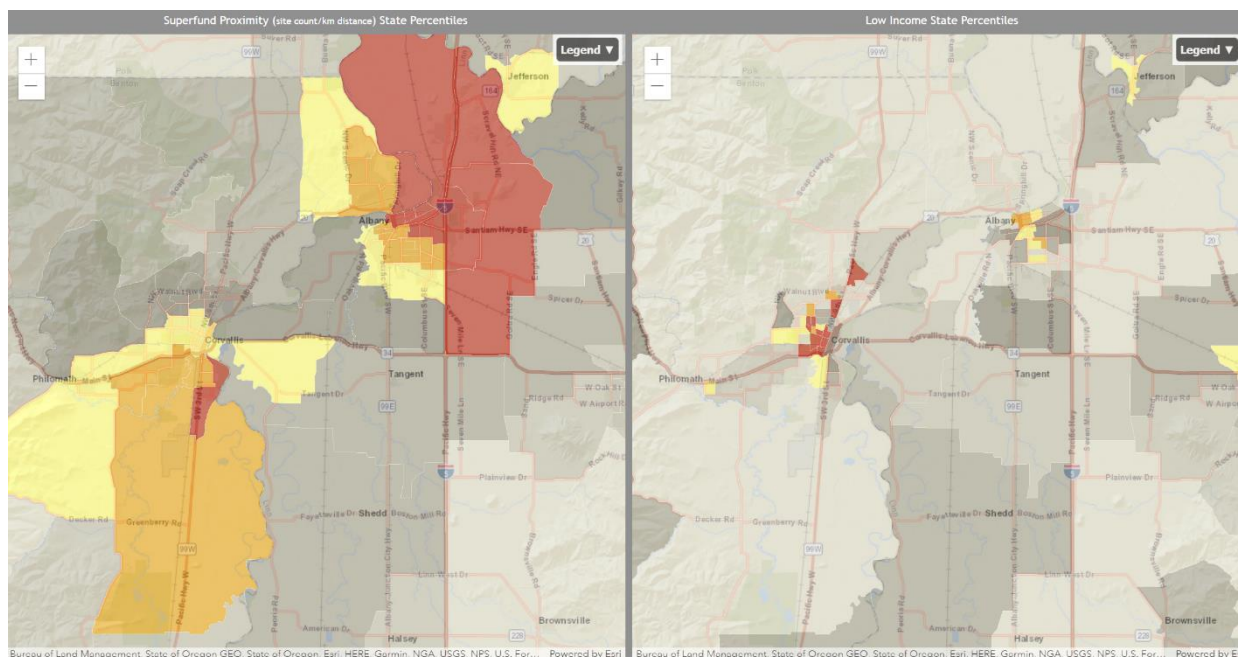
Of the 22 TRI sites in Linn-Benton, 7 are in census blocks with a higher-than-average population of low-income earners and 8 are in blocks with a higher-than-average BIPOC population compared to the average population density in the counties. **TRI sites occur in BIPOC census blocks 47% of the time, and in Low-Income blocks about 41% of the time in Linn-Benton County, which indicates a positive correlation between the two.**

[Superfund](#) sites are areas where toxic waste has been dumped, left out in the open, or otherwise mismanaged. These often occur at manufacturing centers, processing plants, landfills, or mining sites.



¹³ EJScreen: Proximity to superfund sites (left) vs. BIPOC (right) in Linn-Benton County

Here is the superfund proximity map in the Mid-Willamette valley compared to the percentage of BIPOC population. It is difficult to determine correlations between the data shown in these maps, but where there are higher concentrations of BIPOC people, there appears to be at least moderate proximity (50-60th percentile or higher, or the medium grey color) to superfund sites.

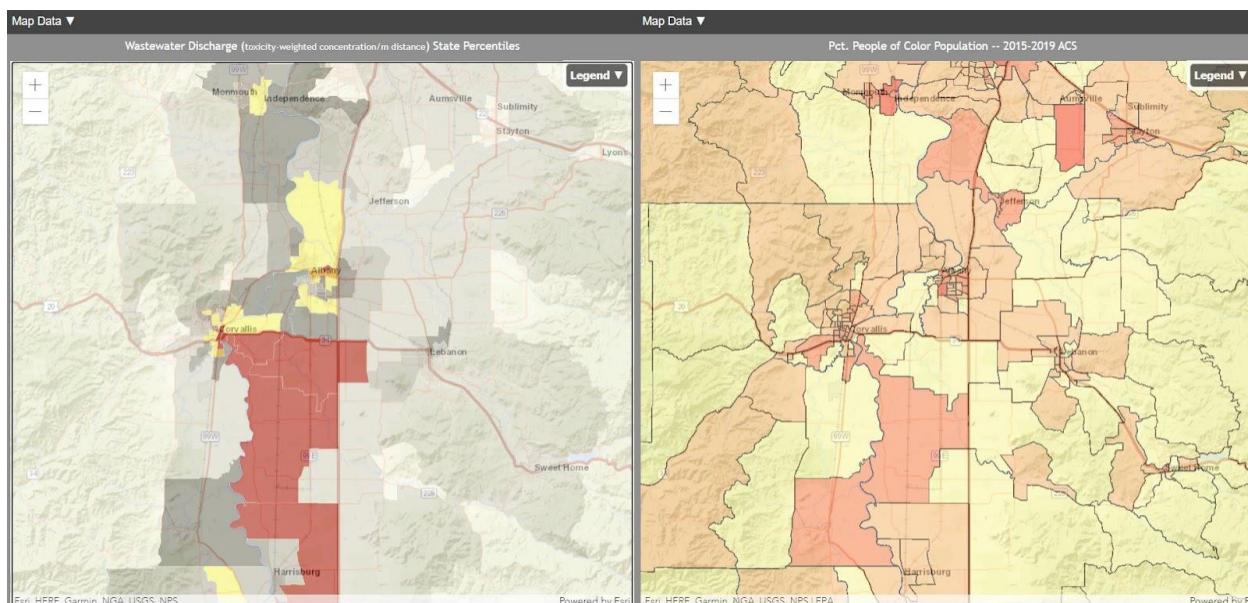


¹⁴ EJScreen: Proximity to superfund sites (left) vs. low-income population (right) in Linn-Benton County

There also seems to be a moderate correlation between low-income regions and proximity to superfund sites.

Wastewater Discharge

EJScreen maps proximity to EPA's Risk-Screening Environmental Indicators (RSEI) for wastewater discharge, looking for toxic concentrations of water pollutants at stream segments. It is an estimate based on the quantity, toxicity, and chemical transport and fate in the environment along with potential for human exposure, including population in an area. RSEI Scores do not describe a level of risk and can only be evaluated relative to other scores, for example, comparing risk over different spatial areas or how it changes over time. RSEI Scores point to chemical releases that the community can respond to ([US EPA, Understanding RSEI Results](#)).



¹⁵ EJScreen: Water Discharge (left) and BIPOC population (right) in Linn-Benton County

Above is a map contrasting the BIPOC community with the risk associated with wastewater discharge. **We can see that more than 50% of the community living around the area with high wastewater discharge have a higher proportion of people of color than surrounding areas.** If we investigate the gray shaded areas of wastewater discharge, we can see that there are less people of color living around there.

Pollution Survey Results

A total of 158 respondents gave their input on the question “Do you experience significant pollution such as industrial (smog, fumes, contaminated water), natural (smoke and pollens), noise pollution (trains, vehicles, construction equipment), or light pollution (bright security lights, etc.)?” Respondents rated their pollution exposure from 0-5, where 0 means never and 5 means all the time.

The least common type of pollution was industrial (1.28), then light (1.78), noise (2.11), and the most common was natural pollution (2.49). This is largely consistent with the secondary data on

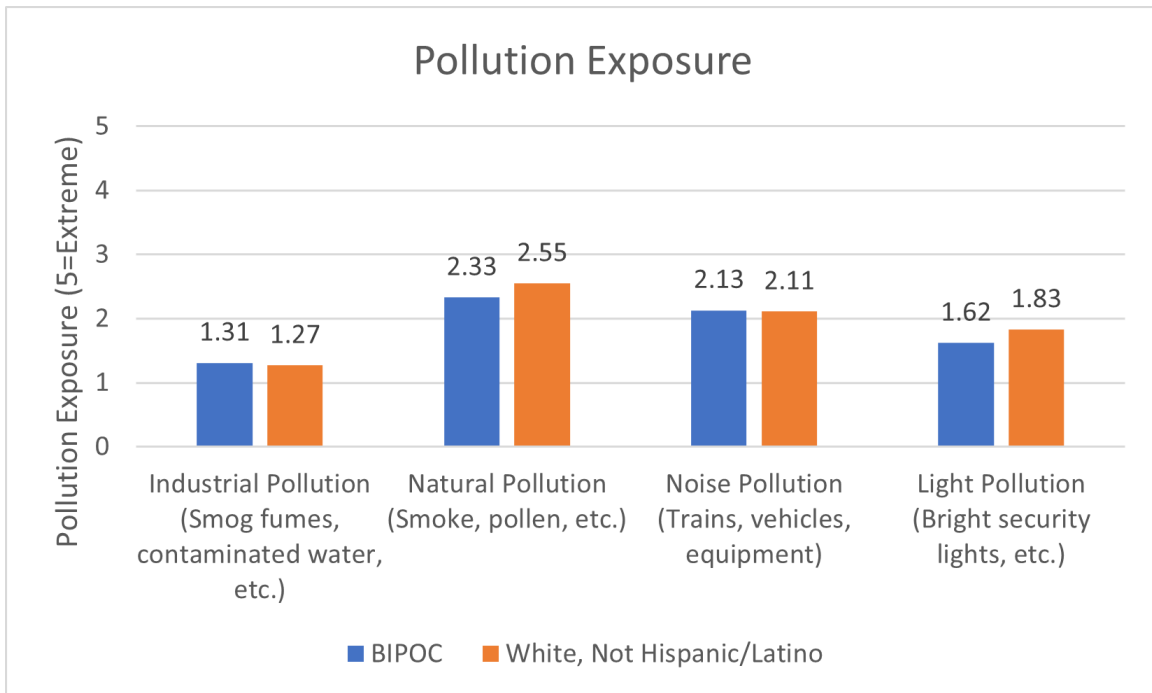
particulate matter and air toxins. Secondary data on noise and light pollution is not readily available.

TYPE OF POLLUTANT	AVERAGE (OUT OF 5)
INDUSTRIAL POLLUTION (SMOG, FUMES, CONTAMINATED WATER)	1.28
NATURAL POLLUTION (SMOKE, POLLEN)	2.49
NOISE POLLUTION (TRAINS, VEHICLES, TRANSPORTATION)	2.11
LIGHT POLLUTION (BRIGHT SECURITY LIGHTS, ETC.)	1.78

Respondents most often experience “natural” pollution, which includes particulate matter such as smoke, pollen, etc. While these are naturally occurring pollutants, they can be exacerbated by human activity. Heightened exposure can lead to cardiovascular and respiratory health risks previously mentioned.

Heightened exposure to smoke is likely in part due to recent changes in wildfire trends in Oregon. While wildfires aren’t becoming more frequent, they are becoming larger and more intense ([Bennett, Fitzgerald, Leavell, & Berger, 2018](#)). Climate projections conclude that these trends are likely to accelerate in the near future as Oregon's climate becomes hotter and drier. The long-term health impacts of wildfire smoke inhalation include higher risk for respiratory complications, lung cancer (if susceptible), and premature death as well as mental health issues and higher rates of interpersonal violence ([Grant & Runkle, 2022](#)), though more research is needed on this issue. Another possible cause of the increased severity of wildfires in Oregon comes from Euro-centric forest management practices.

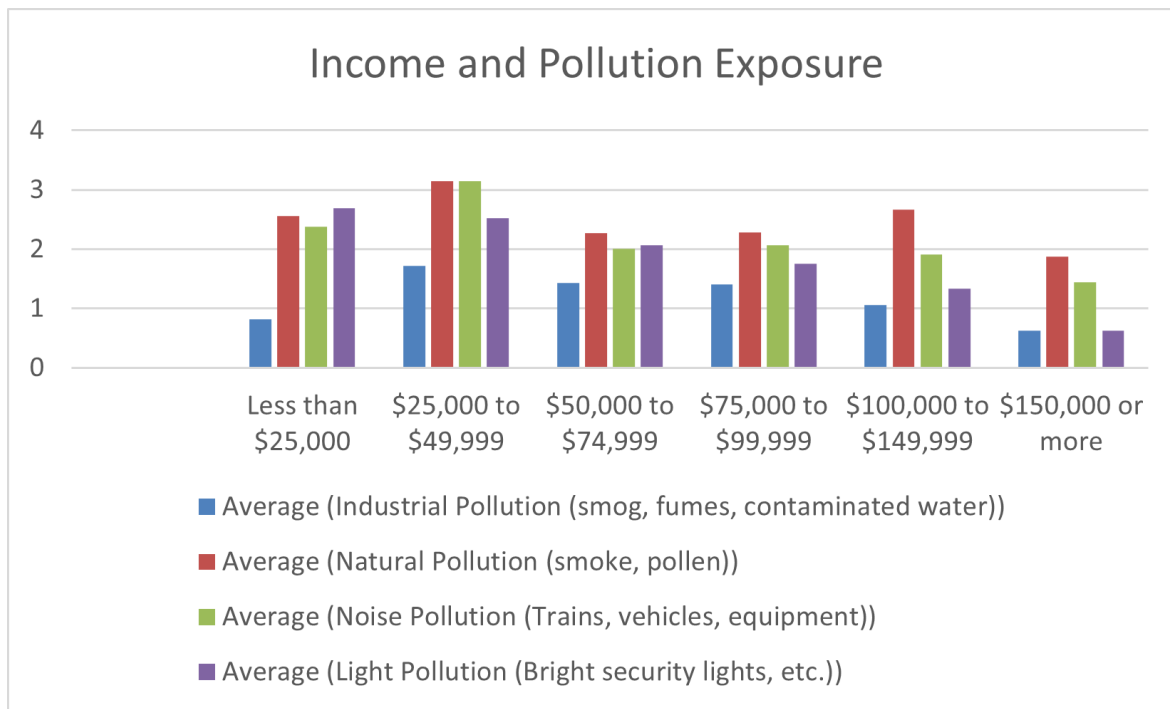
Climate change is also increasing pollen counts around the world, and the Willamette Valley (home to Linn County – the grass seed capital of the world) is no exception. Although gaps in the literature exist, allergy specialists and other healthcare professionals agree that pollen counts are increasing over time, making seasonal allergies steadily worse ([Schmidt, 2016](#)). As carbon dioxide levels rise, plants consume more of it (sometimes called the carbon dioxide fertilization effect) to reproduce which makes more pollen. Another potential cause of increasing pollen counts could be due to the phenomenon related to urban planning. The lack of planning in city spaces prompts lower biodiversity, introduced exotic and invasive species, botanical sexism (or when city planners plant more male trees than female ones ([Hirschlag, 2020](#))), poor management and neglect, and many more factors have a significant role in aggravating pollen allergies ([Cariñanos & Casares-Porcel, 2011](#) and [Agache et. al. 2018](#)). However, this is merely speculation since no data on horticulture in urban planning in the Willamette Valley currently exists.



¹⁶ Survey: Pollution exposure between BIPOC and White only respondents

Questions: How do you and your family identify racially/ethnically? Do you experience significant pollution such as industrial, natural, noise, or light pollution?

Generally consistent with EJScreen, our survey showed a negligible difference in pollution exposure between White-only and BIPOC respondents, which is good news. However, communities may have inequitable access to air conditioning, air filtration, or other means of dealing with their pollution exposure, which we explore in later survey questions. Someone who is exposed to much of it may not know until their health begins to decline after [long-term exposure](#).



¹⁷ Survey: Pollution exposure by income

Questions: How much is your household's income? Do you experience significant pollution such as industrial, natural, noise, or light pollution?

Comparing income and response averages shows that lower-income earners experience higher rates of pollution than high-income earners. Something interesting to note — households making less than \$25,000 a year tend to experience less pollution than those who make \$25,000-\$49,999 a year. This may be because more of the lowest-income people are full- or part-time students, and have less experience, time, or qualifications to take higher paying jobs. In this case, students may spend much or all their time on campus (which is typically cleaner than the rest of the community), which may account for the reduced exposures.

Transportation

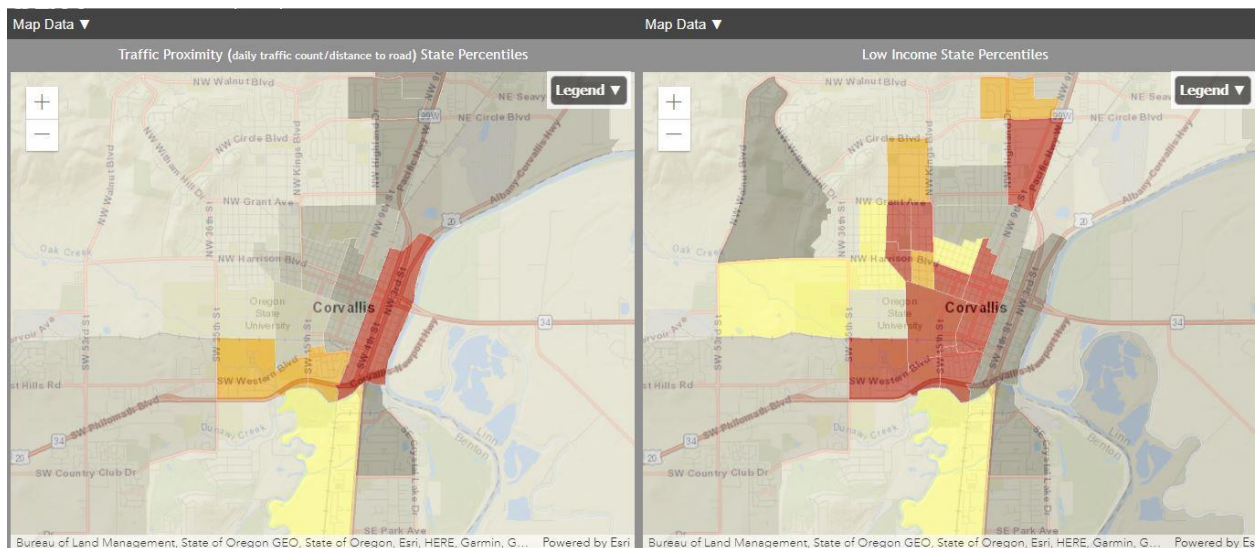
According to the Oregon Department of Transportation (ODOT), the number of vehicle crashes went down by 23.91% in 2020, although fatal crashes increased by 0.88%, and the number of non-fatal injury crashes decreased by 28.44%. This may be due to the overall national trend of a decrease in traffic during the pandemic, while reckless driving behavior increased along with more severe accidents ([NHTSA, 2021](#)).

The Oregon State Highway Vehicle Miles of Travel by County stated that the number of vehicle miles of travel (VMT) decreased by 11.43% in 2020 compared to 2019, from 262 million miles in 2019 to 232 million miles in 2020. In general, the trend of VMT in Benton County showed a steady increase between the years 2013 (238.5 million miles) to 2018 (263.2 million miles), while Linn County VMT has decreased by 13.62%. This might be because of the COVID-19 pandemic case that made people stay at home and did less traveling.

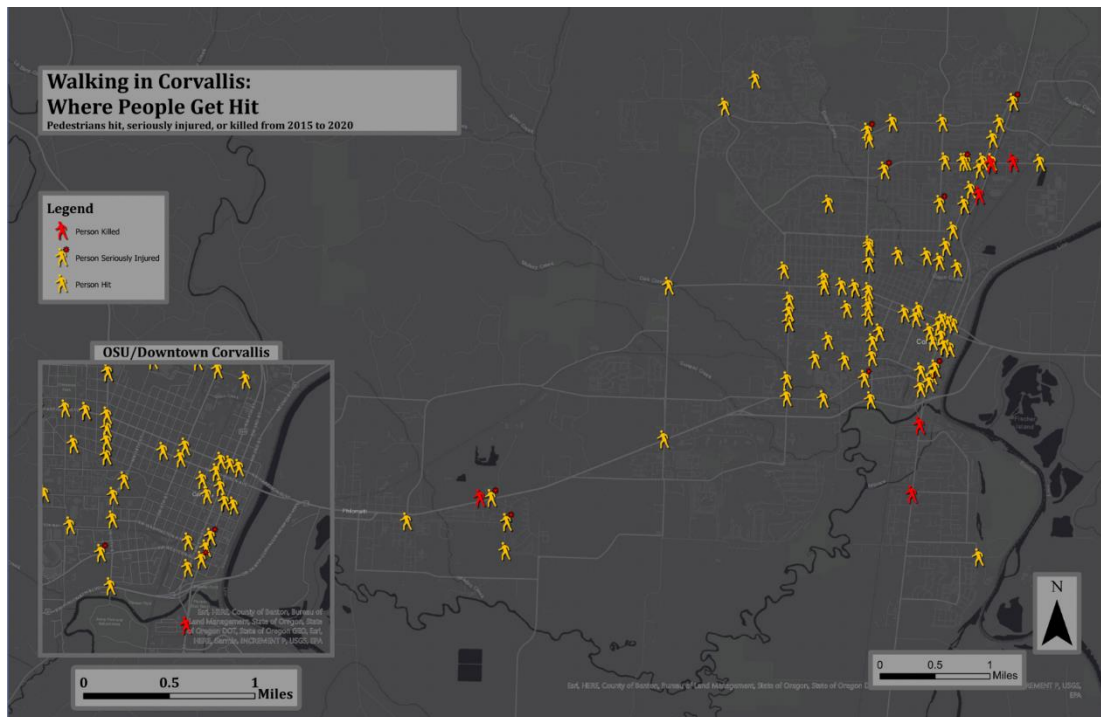
In addition to injuries or fatalities from vehicles, people living near high concentrations of motor vehicles traffic are exposed to air pollution. The burning of gasoline emits carbon monoxide, particulate matter, and nitrogen dioxide, both of which cause global warming (CO and NO₂).

Both Corvallis and Albany have transportation system plans for coordinating all modes of local transportation. Both have public transit systems that are currently free to the public, and a Linn-Benton Loop bus service that serves the Linn-Benton Community College campuses in both cities, plus other stops. Both have networks of bike lanes and pedestrian trails or sidewalks, and active citizen advocates and city government offices or advisory boards for active transportation such as biking and walking.

Corvallis is known as an active transportation city—11% of Corvallis residents commute by bicycle and 12% commute by walking to their destination. Since 2003, Corvallis achieved a Gold-level Bicycle Friendly Community award by the League of American Bicyclists; since 2011 has been Gold-level certified by Walk Friendly Communities, and achieved designation from PeopleForBikes in 2019 celebrating city bicycling conditions ([City of Corvallis Public Works, n.d.](#)).

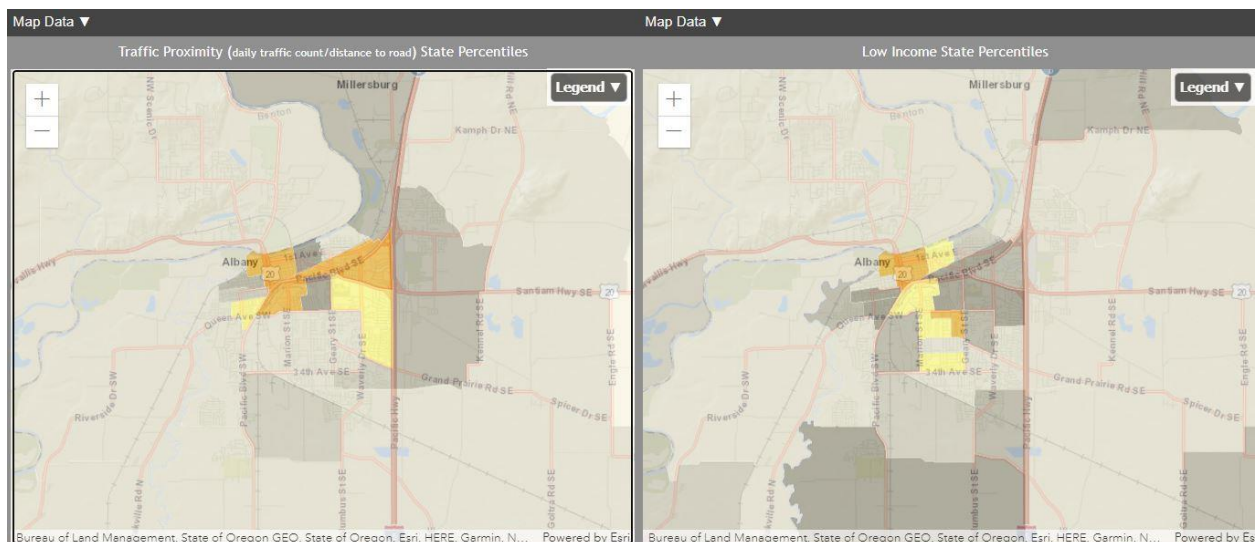


¹⁸Traffic Proximity (left) and Low-Income population (right) in Corvallis, Oregon



¹⁹ Location of pedestrians hit, seriously injured, or killed in Corvallis, 2015-2020 (Fryback, 2022).

From the maps above, we can see that the traffic proximity is higher in lower-income areas, corresponding to the campus area and downtown. Cyclists and pedestrians, likely to be younger and lower-income populations, are at higher risk of injury in a vehicle crash. Corvallis active transportation advocates generated the second map above showing where vehicles hit pedestrians and those that resulted in injury or death, using publicly available data (Ben Fryback, 2022, on file with author). Again, we see the injuries and fatalities clustered downtown, campus, and along high-transportation corridors where lower income community members reside.



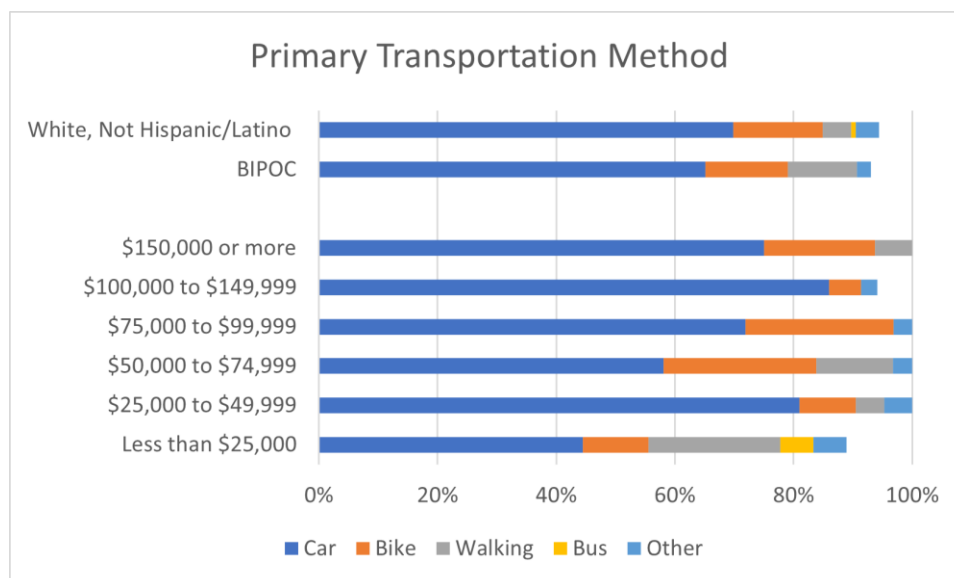
²⁰ Traffic Proximity (left) and Low-Income population (right) in Albany, Oregon

The trend is similar in Albany, where traffic proximity corresponds to low-income neighborhoods. Data on traffic fatalities in vehicle crashes or for pedestrian injuries are not readily available for Albany.

Survey Results

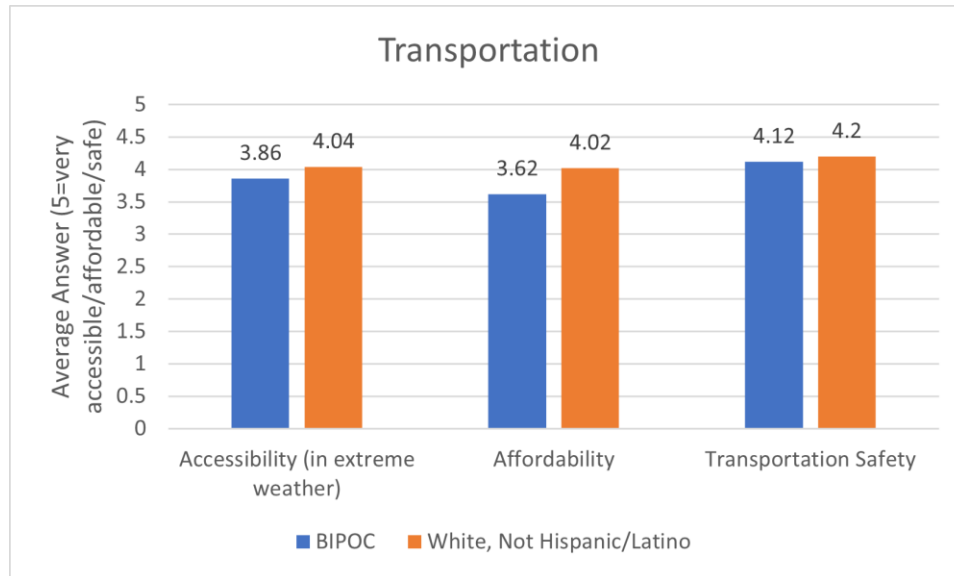
We asked several questions related to transportation, including “What is your primary mode of transportation?”, “How affordable is your method of transportation?”, “How accessible is your method of transportation in extreme weather?”, and “How safe is your method of transportation?”

FROM A RATE OF 0 TO 5 (VERY AFFORDABLE AND ACCESSIBLE)	AVERAGE SCORE
HOW AFFORDABLE IS YOUR METHOD OF TRANSPORTATION?	3.94
HOW ACCESSIBLE IS YOUR METHOD OF TRANSPORTATION IN EXTREME WEATHER CONDITIONS (HEAT, COLD, SNOW, ETC.)?	4.02
HOW SAFE IS YOUR TRANSPORTATION METHOD?	4.20



²¹ Survey: Primary transportation method by income and between BIPOC and White only respondents
 Questions: How much is your household's income? What type of transportation do you use the most?

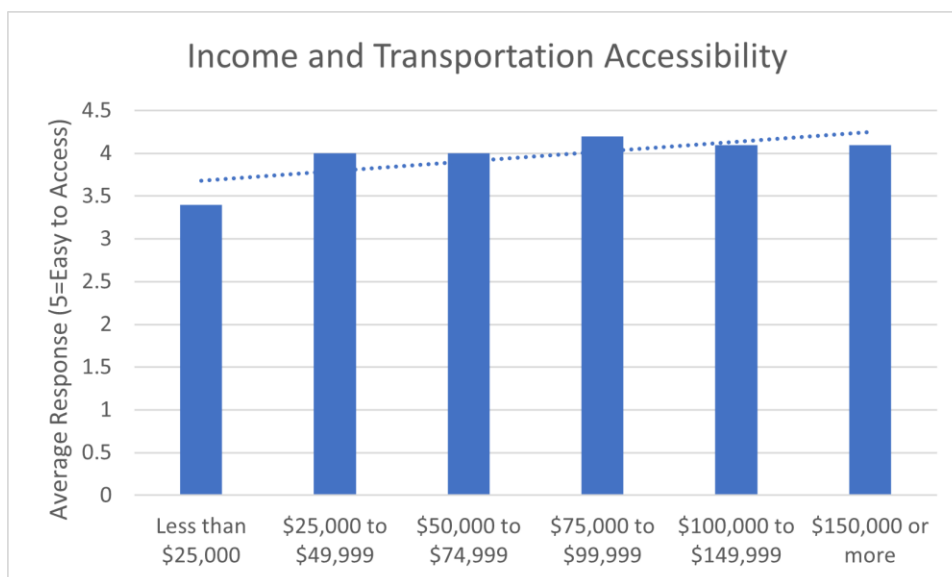
Generally, **more BIPOC and lower-income respondents used non-vehicle methods of transportation**, most notably a higher proportion of BIPOC respondents reported walking as a primary mode of transportation. Households earning under \$25,000 reported using the bus service more than any other group.



²² Survey: Transportation accessibility in extreme weather/temperature conditions (left), affordability (center), and safety (right) between BIPOC and White only respondents
 Questions: How do you and your family identify racially/ethnically? How accessible is your method of transportation in extreme weather? How affordable is your method of transportation?

BIPOC respondents reported that their mode of transportation was less accessible in extreme weather, and BIPOC respondents find their transportation far less affordable. Lack of access to transportation can create additional barriers for BIPOC Americans to go to work, care for their children and families, access community services, etc. This, including several other possible consequences, may perpetuate the BIPOC wage gap over time. According to [Income Inequalities in America](#), a 2021 report by United Way, the racial pay disparity in Oregon State was 13.44%

The average answers in transportation safety only differ slightly between BIPOC and White only respondents. For some background, from January 1, 2020 to May 30, 2022 (the most recent data), there were 1,789 DUI arrests, 1,087 motor vehicle theft arrests, and 4,386 traffic citations given in Linn-Benton County according to [Oregon State Police](#). In 2019, Benton County was 20th of Oregon counties in terms of drunken driving crashes with 10.6 crashes per 100,000 citizens and Linn County was 17th with 14.2 per 100,000 ([OregonLive, 2019](#)) The small difference between average answers in the survey could be due to several factors. Public transportation (specifically buses) is free in Corvallis, where many respondents to this survey are from. The Corvallis Transit System specifically offers the [Nite Owl routes](#) which allows for safe, late-night transportation until 11:45pm. Another free transit option in Corvallis includes [ASOSU's SafeRide](#), which provides OSU students with free, individual transportation from 8:00pm to 1:00am during the academic year.



²³Survey: Transportation accessibility in extreme weather/temperature conditions by income
 Questions: How much is your household's income? How accessible is your method of transportation in extreme weather?

Responses show that lower-income communities have lower transportation accessibility in extreme weather conditions. This could be explained by the fact that more low-income respondents use non-car transportation methods, like bikes, buses, or walking. All of these can be harder to access in extreme heat/cold, rain, or snow.

Our survey results also showed that the average response of BIPOC community members on their transportation safety was quite safe, ranking it as 4.2 out of 5; however, their rating of transportation safety was lower than White-only respondents.

Indoor Climate Controls

Environmental justice includes the ability to control your personal living environment. This is assuming first that people have adequate shelter and appropriate heating and cooling systems, insulation, and other amenities that make a living space habitable. The unhoused community in Linn and Benton counties experience environmental injustice daily. Linn and Benton counties, and cities within the counties, have several initiatives and organizations that focus on the unhoused community in the area (for example, [Linn-Benton Housing Authority](#), [Home, Opportunity, Planning and Equity \(HOPE\) Advisory Board](#), [Community Services Consortium](#)).

For community members that own or rent a house, the ability to control the indoor temperature depends on having the necessary appliances and infrastructure, along with the ability to afford the energy required to run the appliances. On average, it costs around \$2,000 per year for electricity and natural gas in Linn and Benton counties. A household is considered energy burdened if they spend 6% or more of their income on energy costs. The Oregon Department of Energy also calculates the Annual Energy Burden Gap in each county, which is the amount needed to reduce energy costs to 6% of household income for households at 200%

federal poverty level—this is the average gap in household income required to overcome a household’s energy burden ([Oregon Department of Energy, Benton County, 2020](#); [Oregon Department of Energy, Linn County, 2020](#)). If a household cannot afford their energy bills, they may not turn the heat up to a comfortable temperature in the winter, or they may not use air conditioners to stay cool on the hottest summer days. Cold or heat exposure can lead to health impacts.

Energy burden depends on household income, the cost of energy, and how much energy is required based on the size and type of housing, appliances, and level of maintenance. Inadequate insulation, windows, or inefficient appliances can make the cost higher per square foot of living space, and many homes in the region do not have air conditioning because of historically mild summers. As climate change increases average temperatures and makes weather events and wildfire more extreme, households need air conditioning and forced-air climate controls that provide air filtration for a healthy and comfortable indoor environment. The 2020 wildfires and 2021 heat dome show that people need help adapting to the changing, more extreme climate conditions to protect their health and safety ([The Weather Channel, 2021](#); [Samayoa, 2021](#)).

In addition, policies to reduce greenhouse gases will make energy more expensive over the next decade, but natural gas is expected to become much more expensive and scarcer than it is today and outpace the cost of electricity. Upgrading to efficient electric heat pumps that provide efficient heating, cooling, and air filtration is a solution to many of these problems for households, but can be expensive for those with lower incomes, and may be impossible for renters who cannot upgrade appliances in their living space ([Oregon CUB, July 14, 2022](#); [Oregon CUB, May 10, 2022](#)).

A snapshot of the energy burden in Benton and Linn Counties is provided by the Oregon Department of Energy ([Oregon Department of Energy, Benton County, 2020](#); [Oregon Department of Energy, Linn County, 2020](#)). A substantial number of households in our community struggle to pay their energy bills, and likely do not have the financial resources to upgrade their appliances or housing to reduce their bills—a vicious cycle that perpetuates poverty.

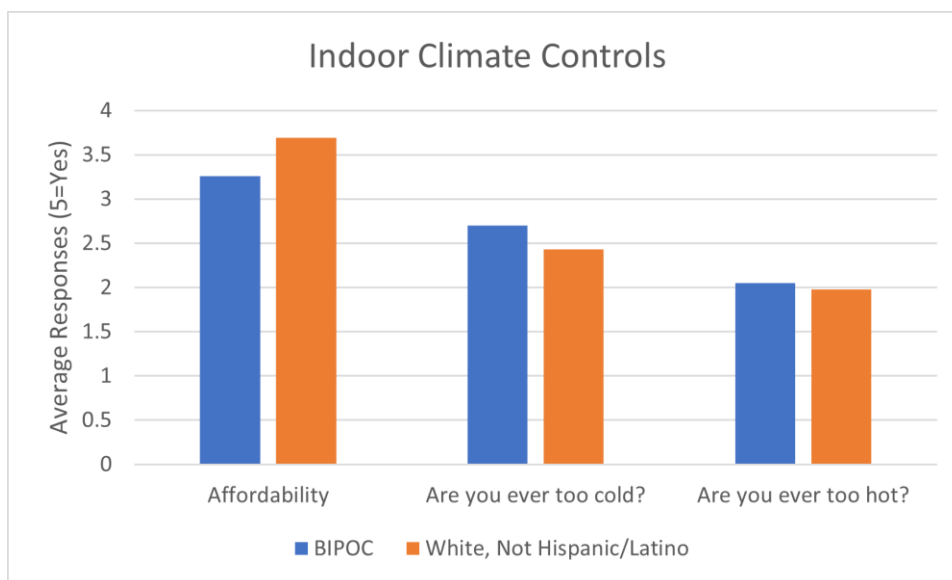
	Benton County	Linn County
% Energy Burdened	28%	26%
Annual Energy Burden Gap	\$725	\$586
Homes Built Before 1990	65%	67%
Owner-occupied Homes	58%	64%
Renter-occupied Homes	42%	36%
Electricity	51%	50%
Natural Gas	40%	37%

²⁴ Households that do not heat with electricity or natural gas use either wood or propane.

Survey Results

Indoor climate control is still a problem faced by people living in Linn and Benton Counties, as survey respondents on average say that they are sometimes too hot or too cold indoors, and many report that their energy costs are unaffordable. This is consistent with the secondary data from the Oregon Department of Energy that shows a sizable portion of the population is energy burdened. In addition, around 40% of households heat with natural gas, which is a large number that would benefit from switching to efficient electric heat pumps.

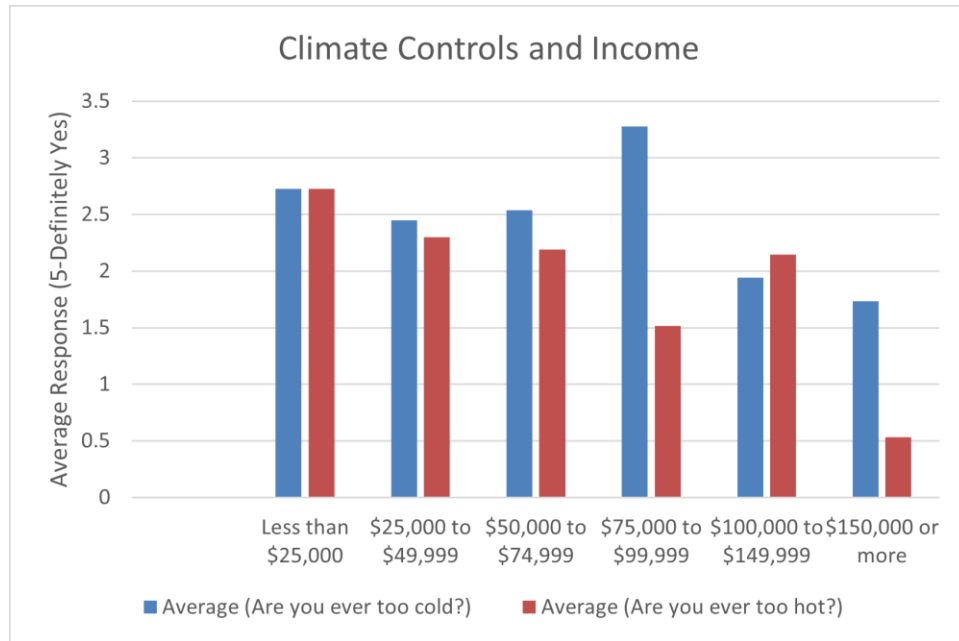
FROM A RATE OF 0 TO 5 (5 INDICATES HIGH CONFIDENCE)	AVERAGE (OUT OF 5)
ARE YOU EVER TOO COLD?	2.51
ARE YOU EVER TOO HOT?	2.01
HOW AFFORDABLE IS YOUR HEATING OR COOLING IN YOUR LIVING SPACE?	3.60



²⁵ Survey: Indoor climate controls accessibility and affordability between BIPOC and White only respondents

Questions: How do you and your family identify racially/ethnically? How affordable is your heating or cooling in your living space? Are you able to keep your living space at a comfortable temperature (Are you ever too hot/cold)?

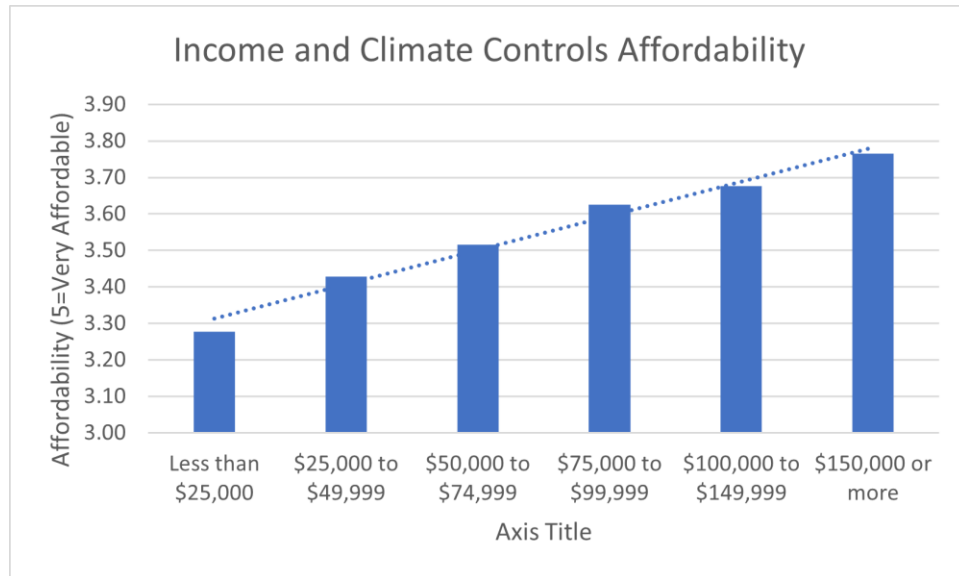
The survey showed that on average, BIPOC respondents found indoor climate control less affordable than White respondents. Additionally, they reported that they more frequently found their living conditions too cold or too hot.



²⁶ Survey: Indoor climate controls accessibility by income

Questions: How much is your household's total income? Are you able to keep your living space at a comfortable temperature (Are you ever too hot/cold)?

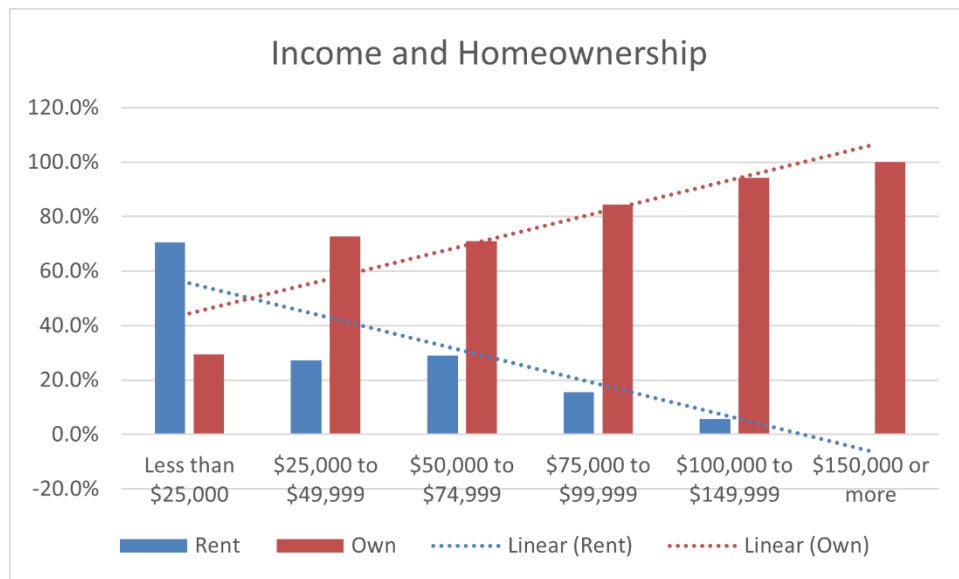
Survey results show that on average people with lower incomes tend to feel too hot in the summer or too cold during the winter. In general people of all incomes tend to report feeling too cold more often than too hot, likely because Oregon's climate has been cool in the summer and there are fewer days of extreme heat. However, lower income households report equal exposure to cold and heat. Higher income people likely have more access to climate controls that lower temperatures during the summertime, while lower income people do not have access to air conditioning. **In summary, higher income earners tend to have more access to indoor climate controls, and lower income earners feel the consequences of their inaccessibility.**



²⁷ Survey: Climate controls affordability by income

Questions: How much is your household's total income? How affordable is your heating or cooling in your living space?

Lower income people report that they struggle to afford energy to heat and cool their homes; the graph's trendline is very clear that affordability of indoor temperature comfort increases as income grows. However, even the highest income households in our survey reported some struggles to pay for energy.

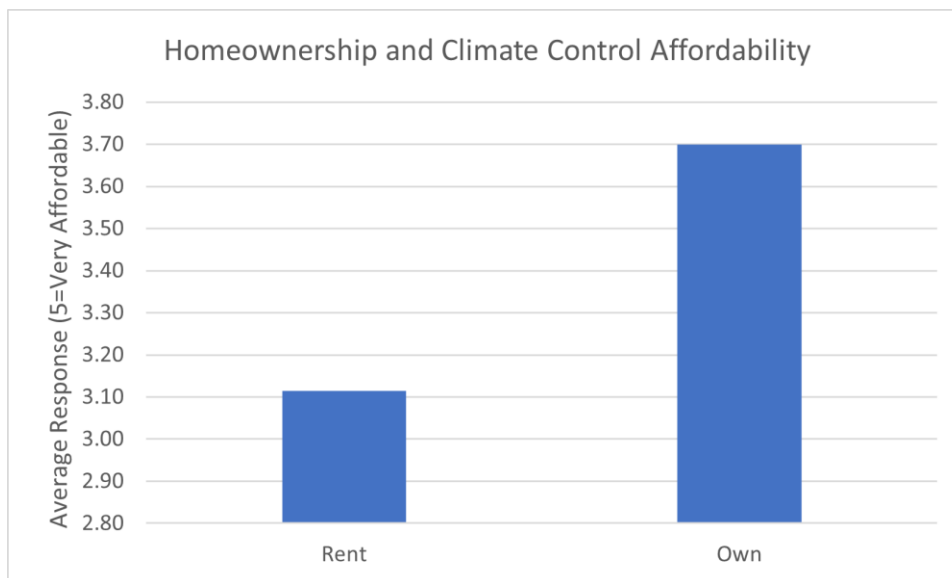


²⁸ Survey: Homeownership by income

Questions: How much is your household's total income? Do you rent or own your home?

Energy affordability and the ability to adapt by upgrading living spaces and appliances is directly related to whether someone rents or owns their own home. There is a clear relationship between income and home ownership, as expected. **On average, respondents who earned less**

money were more likely to rent; those with higher incomes were more likely to own their homes.



²⁹ Survey: Climate control affordability by income

Questions: Do you rent or own your home? How affordable is your heating or cooling in your living space?

It is no surprise that the survey results also show that renters found indoor climate control less affordable than homeowners. Renters often must pay their energy bills but have no control over whether their living space is adequately insulated or uses a high-efficiency furnace or heat pump. Landlords have control over infrastructure upgrades to rental units but may not have an incentive to invest in energy efficiency, leaving renters with a high energy burden.

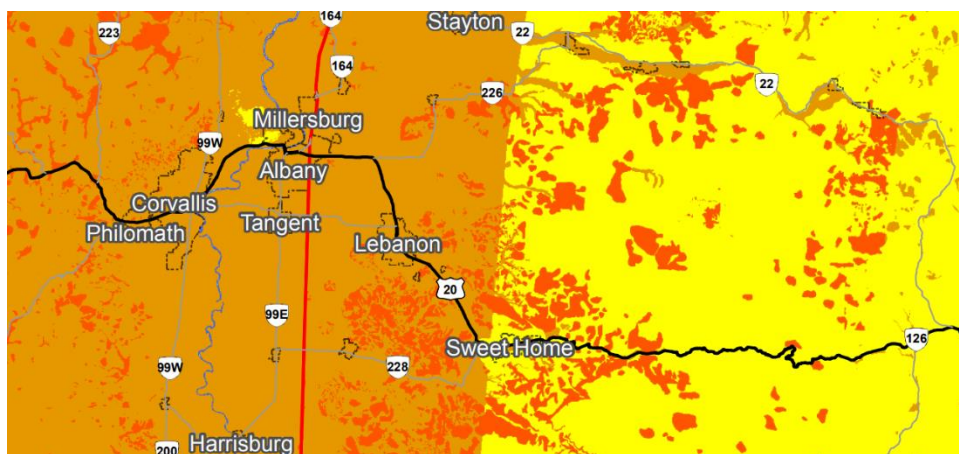
Natural Disaster Anxiety and Preparedness

Need a discussion of the natural disasters likely to occur in Linn-Benton counties for context for these questions.

Some natural disasters that are likely to occur in Linn-Benton County include wildfires, winter storms, windstorms, and drought. The severity of each of these events may increase as climate change worsens the health of our atmosphere. The [Oregon Department of Land Conservation and Development](#) has an extensive arsenal of climate change resources related to estimating vulnerability and preparing local communities.

One potentially impending natural disaster, unrelated to climate change, is an earthquake along the Cascadia Subduction Zone. In 1700, the Cascadia earthquake occurred with an estimated magnitude of 8.7-9.2 on the Richter scale. According to the [Oregon Department of Emergency Management](#), 41 earthquakes have occurred along this fault line over the past 10,000 years, between 190 and 1200 years apart. Since 1700, the Strait of Juan de Fuca tectonic plate has subducted and gradually been building pressure. Scientists currently predict a 37% chance of a

megathrust earthquake, ranking above 7.1 occurring in this area within the next 50 years. This will likely cause a major tsunami following the initial shaking, which will hit the major coastal areas, but not Linn-Benton.



³⁰Oregon Department of Geology and Mineral Industries: Map of Earthquake and Tsunami Damage Potential for a Simulated Magnitude 9 Cascadia Earthquake, [2013](#)

LEGEND

Cities

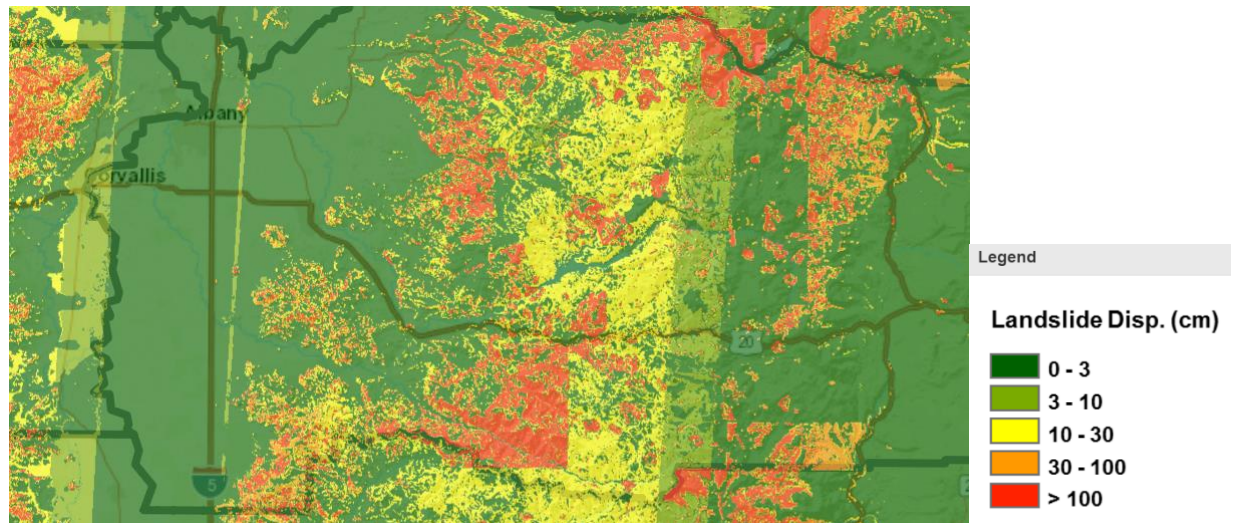
Simulated Magnitude 9 Cascadia Earthquake Modified Mercalli Intensity Scale / Damage Potential

IV	None: Felt indoors by many, outdoors by few, some awakened at night, Dishes, windows, doors, rattle and move, stationary cars rock.
V	Very Light: felt outdoors, sleepers wakened; liquids disturbed or spilled; small unstable objects upset; doors swing, pictures move.
VI	Light: felt by all; windows crack; dishes, glassware, books fall off shelves; pictures fall off walls; furniture moved; weak plaster, adobe buildings and poorly built masonry cracked.
VII	Moderate: difficult to stand or walk; furniture broken; damage to poorly built masonry buildings; weak chimneys break; plaster, loose bricks, cornices, unbraced parapets and porches fall; some cracks in better masonry buildings.
VIII	Moderate/Heavy: steering of cars affected; extensive damage to unreinforced masonry buildings, including partial collapse; fall of some masonry walls; twisting and falling of
IX	Heavy: general panic; serious damage to collapse in old masonry buildings; wood frame structures rack and shift off foundations if unsecured; underground pipes broken.
X	Very Heavy (Includes Tsunami Inundation Zone): poorly built structures destroyed with their foundations; bridges and well-built wooden structures heavily damaged and in need of replacement.

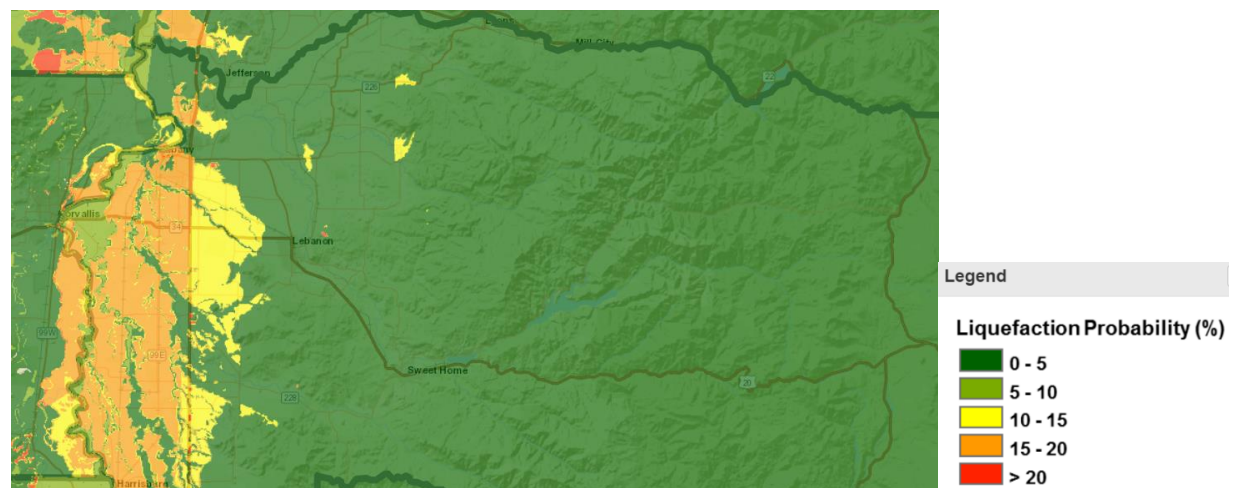
³¹ Map Legend

However, the initial shaking is not the foremost concern in Linn-Benton County when it comes to an earthquake of this magnitude. Below are maps generated by Oregon State University's O-HELP (Oregon

Hazard Explorer for Lifelines Program) tool, which shows which parts of Oregon are at risk for different impacts of a 9.0 earthquake along the Cascadia fault line.



³² [O-HELP](#): Landslide Displacement Danger



³³ [O-HELP](#): Liquefaction Triggering Probability

As the earlier maps show, central and eastern Linn County is at a higher risk for landslides upon a Cascadia event, in the Cascade mountains area. Benton County and western Linn County are at higher risk of liquefaction, which causes the ground to lose strength as the ground shakes ([USGS, n.d.](#)). Areas with water-logged sediment, which occur around the Willamette River are ripe for liquefaction.

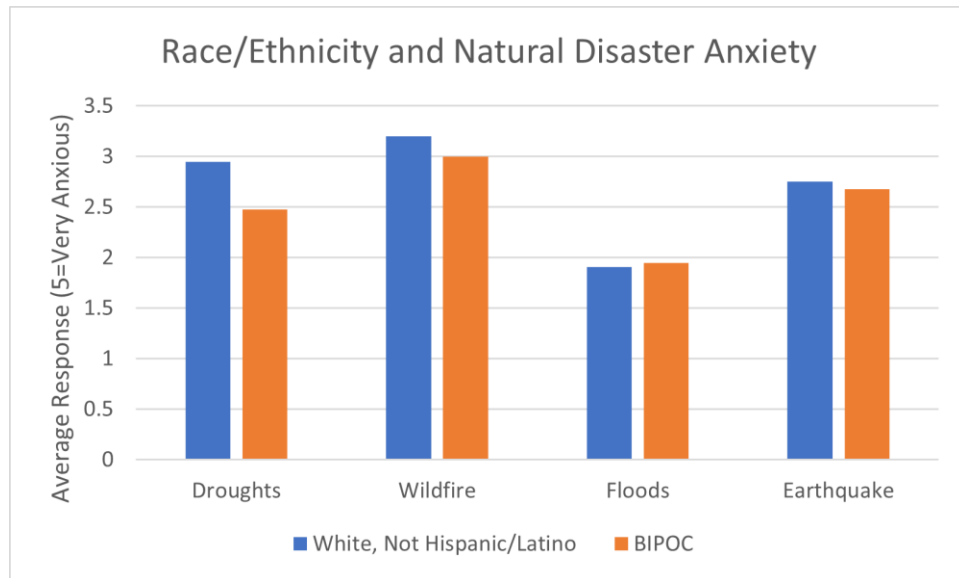
Survey Results

HOW <u>ANXIOUS</u> DO YOU FEEL ABOUT THE POSSIBILITY OF NATURAL DISASTERS?	AVERAGE SCORE (FROM 0 TO 5)
DROUGHTS	2.85
WILDFIRE	3.17
FLOODS	1.93

EARTHQUAKES

2.75

Generally, wildfire is the natural disaster respondents are most anxious about. In 2020, the Beechie Creek Fire destroyed over 1,500 structures and took 5 lives in northeastern Linn County along Highway 20. The Holiday Farm Fire, which occurred at the same time on the border of Linn and Lane Counties, also destroyed local communities in the Blue River area. These two fires consumed about 367,000 acres, damage which is still being cleaned up to this day. The smoke from these (and other co-occurring) fires caused smoke to spread as far as New York State, but nowhere as thick as here in Western Oregon. As such, wildfire is a prominent natural event and the increasing prevalence of wildfire smoke year after year is likely a factor in respondents' anxiety.



³⁴Anxiety regarding natural disasters between White only and BIPOC respondents

Questions: How do you and your family identify racially/ethnically? How anxious do you feel about the possibility of natural disasters (droughts, wildfire, floods, earthquake)?

The survey shows that respondents had roughly the same levels of anxiety surrounding natural disasters, with BIPOC respondents showing slightly less on average.

DO YOU FEEL ABLE TO PREPARE YOUR HOUSEHOLD FOR NATURAL DISASTERS?

AVERAGE SCORE (FROM 0 TO 5)

DROUGHTS

2.97

WILDFIRE

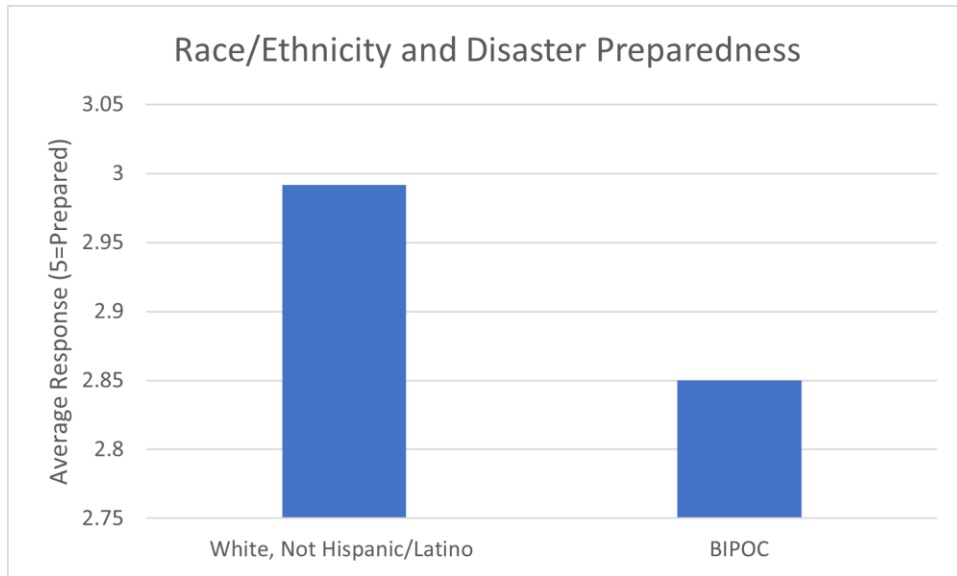
2.62

FLOODS

3.00

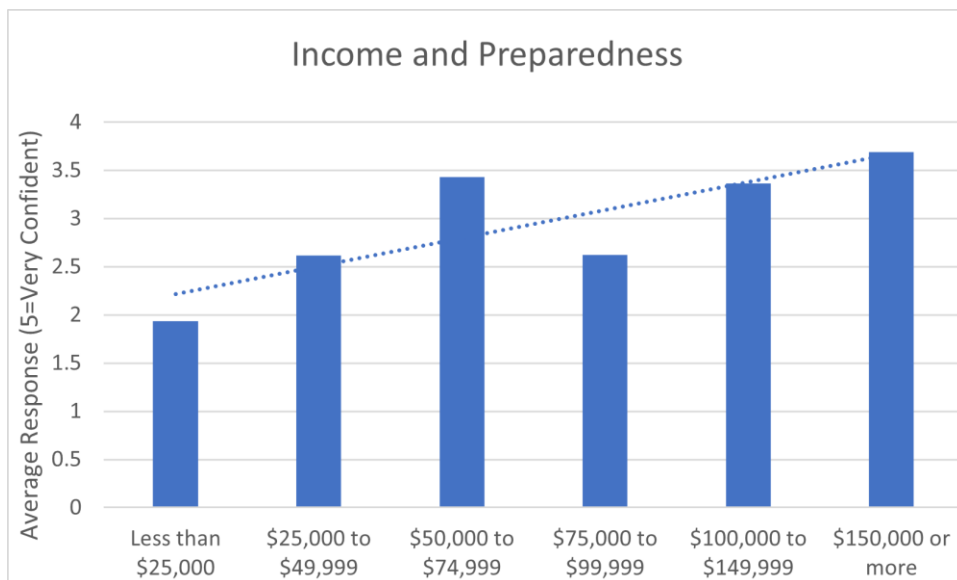
EARTHQUAKES

2.34



³⁵ Survey: Ability to prepare for natural disasters between White only and BIPOC respondents
 Questions: How do you and your family identify racially/ethnically? Do you feel able to prepare your household for natural disasters?

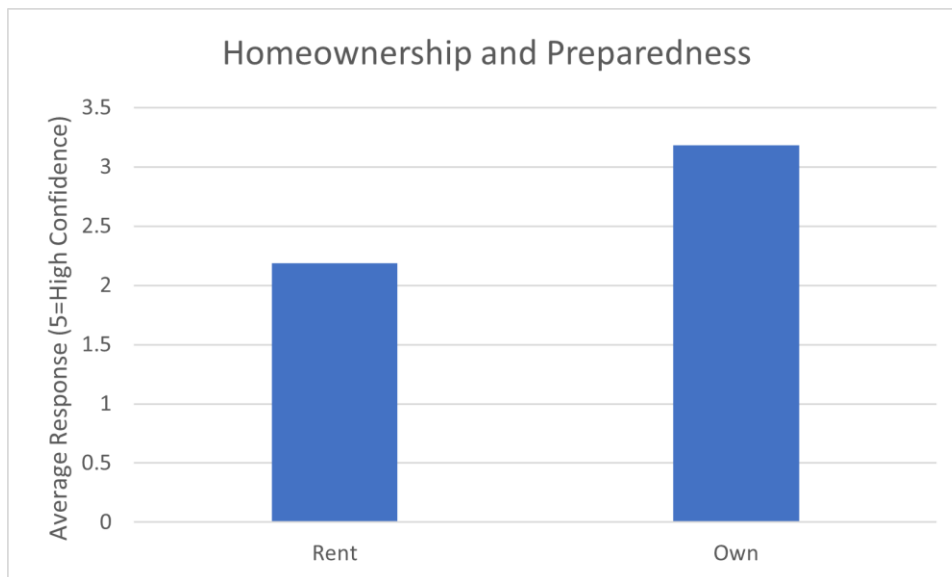
BIPOC respondents felt on average slightly less able to prepare their households for natural disasters. There could be a discrepancy between the amount of information that different community members receive about potential natural disasters, with higher awareness of risk and how to prepare leading to higher anxiety, but that is merely speculation.



³⁶ Survey: Ability to prepare for natural disasters by income
 Questions: How much is your household's income? Do you feel able to prepare your household for natural disasters?

We found a strong correlation between income and confidence to prepare one's living space for natural disasters. This is likely because households with higher incomes are more likely to be able to afford

goods/services that aid in disaster mitigation such as insurance or investment in foundation/structure resiliency as well as emergency funds in case such disaster strikes.



³⁷ Survey: Ability to prepare for natural disasters by homeownership

Questions: Do you rent or own your home? Do you feel able to prepare your household for natural disasters?

Finally, the average renter felt significantly less able to prepare their households for natural disasters compared to homeowners likely due to the limited agency to alter the space when renting.

To summarize, while all populations feel somewhat unprepared for natural disasters, **BIPOC respondents, lower-income respondents and renters feel less able to prepare their living space for natural disasters**, which could reflect a lack of information about what they can do to prepare, or an inability to take those steps because of barriers to information or resources.

Public Safety and Discrimination

Environmental justice also includes the social environment of the community. Community members experience unsafe or unjust actions from institutional actors such as police or government officials, or from other private community members. The institutional and community response to biased, discriminatory, or violent acts is a measure of environmental justice.

Police and emergency services are provided by a variety of agencies, including the sheriffs' offices in Linn and Benton Counties, Corvallis and Albany police departments, or other local governments in the counties (Philomath, Lebanon, Sweet Home, etc.). According to the Oregon Department of Public Safety, 81 police or corrections officers and emergency dispatchers in Oregon State have had their Department of Public Safety Standards and Training (DPSST) certification revoked within the past five years. Of those from 2020-2022, only two were from Linn or Benton counties ([DUII conviction](#), [sexual harassment of crime victim](#)), and one was from Oregon State Police ([biased statements against LGBTQIA+ community](#)). Other bias incidents

may be handled by agencies and do not lead to revocation of certifications and employment as police officers.

The most recent crime data includes victim's race and whether bias as a motivating factor in a crime.

2021 Uniform Crime Reporting Data

	BENTON COUNTY	LINN COUNTY
TOTAL OFFENSES	25,370	28,564
TOTAL VICTIMS	22,490	26,192
MALE	53.15%	53.49%
FEMALE	46.1%	46.35%
WHITE	68.61%	87.21%
HISPANIC/LATINX	3.29%	4.3%
BLACK OR AFRICAN AMERICAN	1.54%	1.22%
ASIAN	2.53%	0.52%
ALASKAN NATIVE/AMERICAN INDIAN	0.3%	0.2%
NATIVE HAWAIIAN OR PACIFIC ISLANDER	0.21%	0.2%
UNKNOWN RACE/ETHNICITY	23.52%	6.35%
65+	4.06%	4.79%

([Oregon State Police, 2022](#))

Bias Involved Offenses in 2021 with Reported Victims

	BENTON COUNTY	LINN COUNTY
NO BIAS	22,470	26,072
UNKNOWN BIAS	-	96
ANTI-OTHER ETHNICITY/NATIONAL ORIGIN	4	-
ANTI-HISPANIC	3	3
ANTI-BLACK	3	16
ANTI-ARAB	3	-
ANTI-ASIAN	2	1
POLITICAL AFFILIATION	1	-
ANTI-WHITE	1	1
ANTI-MULTI-RACIAL GROUP	1	2
ANTI-PHYSICAL DISABILITY	1	-
ANTI-FEMALE	1	-
ANTI-LGBT+	2	3
ANTI-GAY	1	2

([Oregon State Police, 2022](#))

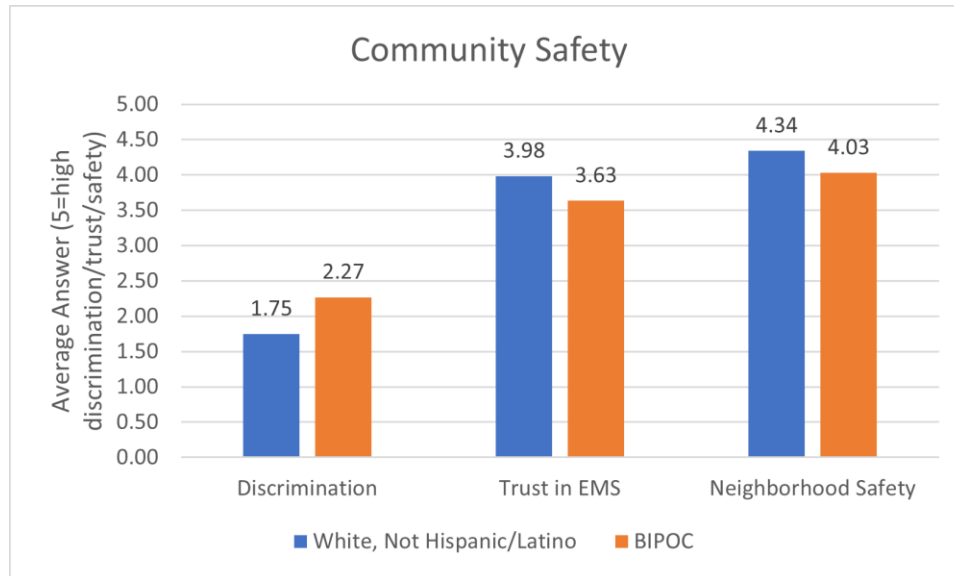
Benton County's BIPOC community (all except White, Non-Hispanic) is 21.6% of the population according to the 2020 Census but may be up to 31.39% of the crime victims (including the large category of unknown race/ethnicity). This data shows that there is a gap in reporting the race of crime victims, making bias crimes more difficult to identify. If the "unknown race/ethnicity" category does include members of the BIPOC community, they are experiencing a higher rate of crime than their population share.

Linn County's BIPOC community (all except White, Non-Hispanic) is 19.1% of the population according to the 2020 Census but may be only 12.8% of the crime victims (including the large category of unknown race/ethnicity). The crime rate for BIPOC communities is less than their total share of the population. Linn County has a much smaller share categorized as "unknown race/ethnicity," which may help in identifying bias crimes; however, Linn County categorizes many bias crimes as "unknown bias," which makes it difficult to take institutional action to correct.

Survey Results

Our survey results show that when asked about how safe they feel to live in the community, 43.3% of the population feel very safe and 42.8% of them feel safe. Only 0.6% of the population feels extremely unsafe and 3.9% feel somewhat unsafe. The rest of the population feels safe about the area (rated 3).

WHERE 0 IS UNSAFE AND 5 IS VERY SAFE	AVERAGE SCORE
HOW SAFE IS YOUR TRANSPORTATION METHOD?	4.20
HOW SAFE IS THE AREA WHERE YOU LIVE?	4.30
WHERE 0 IS NEVER AND 5 IS FREQUENTLY	AVERAGE SCORE
DO YOU FREQUENTLY FACE LANGUAGE BARRIERS IN YOUR COMMUNITY? - LINGUAL BARRIERS	0.56
DO YOU FREQUENTLY EXPERIENCE OR WITNESS DISCRIMINATORY OR HOSTILE ACTS, WORDS, OR SYMBOLS IN YOUR COMMUNITY? - DISCRIMINATION	1.89
WHERE 0 IS NOT AT ALL AND 5 IS FULLY	AVERAGE SCORE
DO YOU HAVE TRUST IN YOUR LOCAL EMERGENCY RESPONDERS (INCLUDING POLICE, FIRE, OR AMBULANCE SERVICES)? - EMS	3.92



³⁸ Survey: Discrimination, trust in emergency services, and perceived safety between White only and BIPOC respondents

Questions: How do you and your family identify racially/ethnically? Do you frequently experience or witness discriminatory or hostile acts, words, or symbols in your community? Do you have trust in your local emergency responders (including police, fire, or ambulance services)? How safe is the area where you live?

The survey results show that BIPOC respondents, on average, witnessed 30% more discrimination in Linn-Benton, had 9% less trust in emergency services, and felt 7% less safe in their neighborhoods. As previously noted, there were about 35 documented hate-motivated crimes against BIPOC residents in Linn-Benton County last year, which could partially fuel this finding. The recent national coverage of police brutality cases against Black Americans like George Floyd and Breonna Taylor (to name two of [many](#)) has lowered the general trust in police integrity/accountability, and likely still lingers in public consciousness.

Environmental Amenities

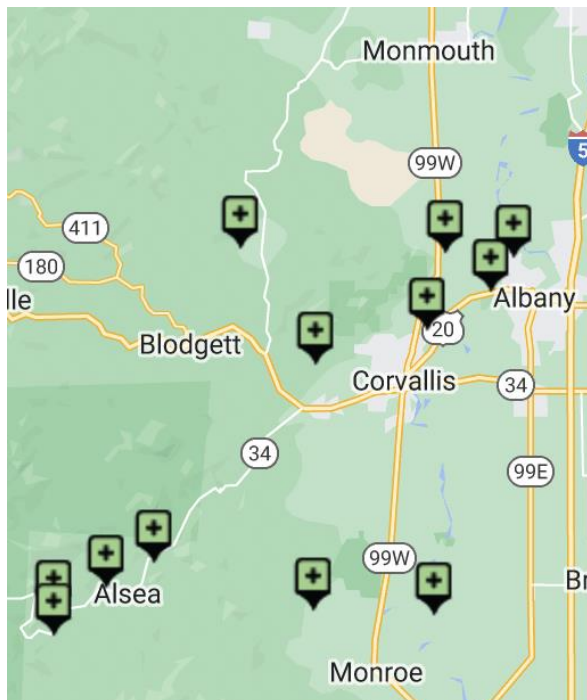
Environmental amenities include resources that provide health and wellbeing to members of our community. They may also ease the harms of climate change and will become scarcer as our environment degrades. This research analyzes access to natural spaces and outdoors, the ability to keep a pet at home, government and community resources, and public participation in political or community decisions.

Natural Spaces and the Outdoors

Spending time in outdoor spaces has numerous proven benefits to individuals' health. Physical health benefits include better respiration (when in green spaces, due to less air pollution), resetting the natural circadian rhythm, providing more motivation to exercise, boosting immunity function and mitigating risk for airborne viruses like COVID-19, and higher Vitamin D exposure. Mental health benefits include heightened concentration, boosted mood, and

reduced symptoms of depression including seasonal affective disorder and major depressive disorder ([Healthline, n.d.](#)) and ([Harvard Health Publishing, 2010](#)).

Climate change is likely to cause additional harm to human health from events like air pollution, to food and water insecurity, to vector-borne pathogens. Specific concerns for the Pacific Northwest include temperature-related deaths and illnesses (much like the 2021 heatwave that killed 19 people in Portland, OR), air quality impacts from wildfire and pollen, increase in infectious diseases, and higher frequency of water contamination events in extreme heat ([CDC, n.d.](#)). Climate change will also threaten the availability and ecological wellbeing of natural spaces, prompting the need for heightened monitoring and conservation of these areas.



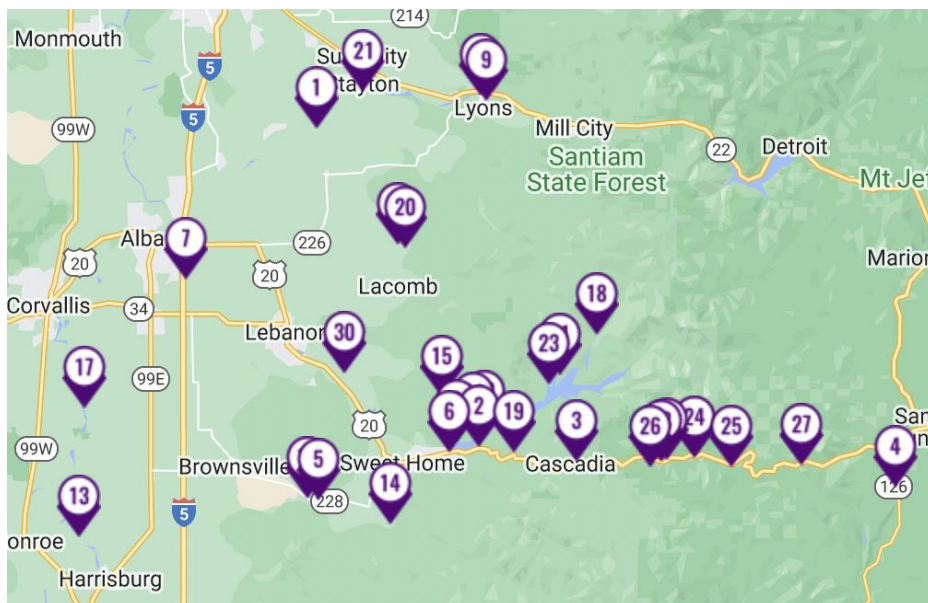
Benton County manages 12 natural or parks areas covering 2000 acres of hiking trails, campgrounds, natural areas and habitat, public gathering spaces, or other uses ([Benton County, n.d.](#)).

The City of Corvallis also manages over 2,000 acres of parks, playgrounds, playing fields, trails, open spaces, dog parks, rental facilities, the Majestic Theater, the C3 community center, and other natural areas that are open to the public. The city also maintains a pollinator program and urban forestry department to keep the city landscape green, which provides shade and cooling ([City of Corvallis, n.d.](#)). Of note, Corvallis is embarking on a new master plan for Dr. Martin Luther King, Jr. Park to bring people

together and honor the legacy of Dr. Martin Luther King, Jr.

³⁹ Map of Benton County parks.

Linn County has 33 parks with hiking trails, waterfalls, covered bridges, and swimming areas ([Linn County Parks, Find a Location, n.d.](#)) The City of Albany also has an extensive park and



outdoor recreation system with playgrounds, playing fields, dog parks, and other recreational facilities.

⁴⁰ Map of Linn County parks.

In addition to the city and county park system, the Mid-Willamette Valley benefits from state and federal lands that

are managed for recreation and ecosystem services. Oregon State University maintains state forests in the area that are popular for hiking, camping, and other outdoor recreation.

Survey Results

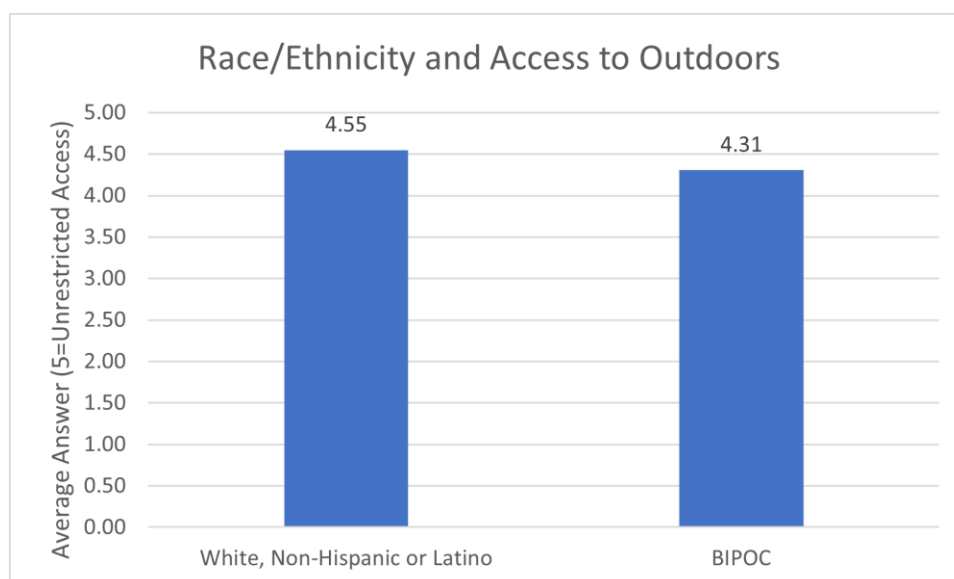
While Linn and Benton Counties have excellent outdoor recreation opportunities, not all communities may feel welcome or able to use those resources. Our survey asked people to rate their access to clean outdoor spaces.

FROM A RATE OF 0 TO 5 WHERE 5 MEANS COMPLETE ACCESS

**AVERAGE
SCORE**

DO YOU HAVE ACCESS TO CLEAN, LITTER-FREE OUTDOOR SPACES (I.E., PARKS, NATURE, COMMUNITY GARDENS, ETC.)? - OUTDOORS

4.52



⁴¹ Survey: Access to parks and outdoor recreation between White only and BIPOC respondents
Questions: How do you and your family identify racially/ethnically? Do you have access to clean, litter-free outdoors?

The survey results conveyed that there was a slight decrease in the accessibility of outdoor recreational areas for BIPOC communities.

Ability to Keep a Pet

https://search.library.oregonstate.edu/discovery/fulldisplay?docid=cdi_proquest_journals_892704129&context=PC&vid=01ALLIANCE_OSU:OSU&lang=en&search_scope=OSU_Everything_Profile&adaptor=Primo%20Central&tab=Everything&query=any,contains,pets%20human%20health&offset=0

While it is helpful to have outdoor spaces to connect with the natural world, many people also value the companionship of an animal at home. Renters or low-income community members may not be able to keep a pet because it is not allowed in their lease, or they cannot afford to have a pet. Studies indicate that pets cause generally positive health impacts, including (but not limited to) improved social skills, decreased stress, better focus in kids with ADD/ADHD, reassurance to veterans with PTSD or complex trauma, calmness to autistic students, etc. ([News Health Institute, 2018](#)).

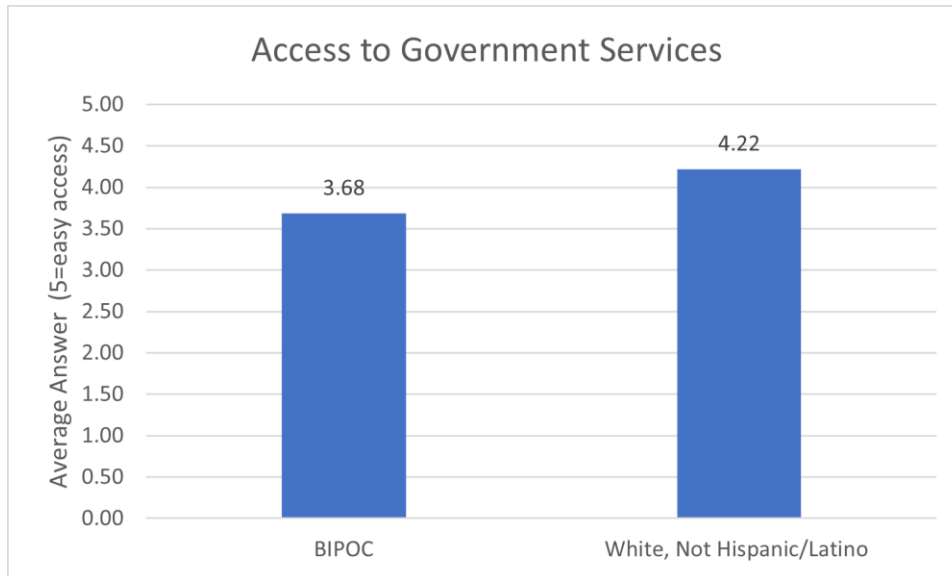
Our survey respondents indicated that they could keep a pet at home if they choose to, with an average score of 4.45 out of 5.

FROM 0 TO 5 WHERE 5 MEANS COMPLETELY ABLE TO KEEP A PET	AVERAGE SCORE
DO YOU HAVE THE ABILITY TO KEEP A PET? - PETS	4.45

Government Services and Community Resources

Another question we asked in the survey regards the ability to access government services and resources necessary to promote health.

FROM A RANGE OF 0 TO 5 WHERE 5 MEANS	AVERAGE SCORE
DO YOU HAVE THE RESOURCES NECESSARY TO PROMOTE YOUR HEALTH (HEALTH CARE, DENTAL CARE, ACCESS TO HEALTHY FOOD AND EXERCISE)?	4.43
DO YOU HAVE ACCESS TO GOVERNMENT SERVICES IF YOU NEED THEM (FOOD STAMPS, SOCIAL SECURITY, MEDICARE)?	4.11



⁴² Survey: Access to government services between BIPOC and White only respondents

Question: Do you have access to government services if you need them (food stamps, Social Security, Medicare)? - Government Services

The survey shows a 15% difference between the average answers of BIPOC and White only respondents. This difference could be due to any number of factors, from the documented discrepancies in BIPOC Americans' access to healthcare ([Brookings, 2020](#)), to housing proximity to government offices. A whole study could be done analyzing this issue in the Linn-Benton area alone due to the breadth of potential causes and implications. However, one issue that could factor into this data that would be more relevant to Linn-Benton is unequal distribution of federal research grants to BIPOC researchers/innovators ([Americanprogress.org, 2020](#)), due to the proximity of Oregon State University.

Public Participation

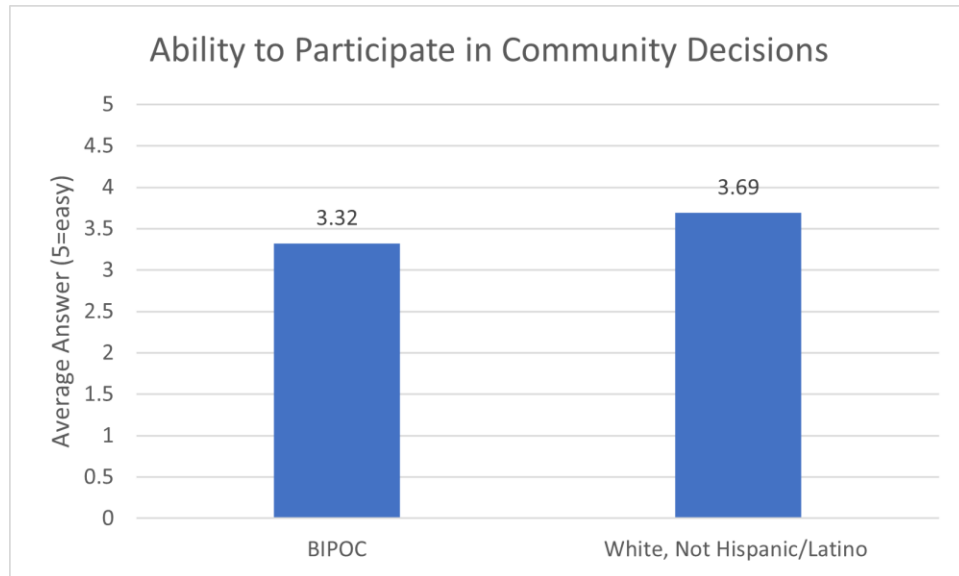
Participation in public decision-making is a cornerstone of environmental justice. One cause of environmental injustice is that communities of color, low-income communities, or people without property have been deprived of political power, so that their voices are not present when decisions are made that will affect their community.

FROM A RATE OF 0 TO 5 WHERE 5 MEANS COMPLETE ACCESS

**AVERAGE
SCORE**

DO YOU FEEL ABLE TO PARTICIPATE IN DECISIONS MADE BY YOUR COMMUNITY (CITY COUNCIL, COUNTY COMMISSION, CIVIC GROUPS, ETC.)? - ABLE TO PARTICIPATE	3.62
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Please add a graph about this—BIPOC vs White at least, Low income if the data looks interesting



⁴³ Survey: Ability to participate in community decisions between White only and BIPOC respondents
 Questions: How do you and your family identify racially/ethnically? Do you feel able to participate in decisions made by your community (city council, county commission, civic groups, etc.)?

Our survey shows that BIPOC respondents feel on average 10.6% less able to participate in community decisions.

Additional Concerns

At the end of the survey, we asked our respondents if they had any additional concerns regarding environmental justice that were not covered by the survey that they wished to convey. Here are the topics of feedback:

- Housing for farm workers (seasonal and full-time)
- Exposure to pesticides
- Low accessibility to recycling centers
- Career opportunities for BIPOC candidates in the timber industry
- Dairy barn emissions
- Local land access as a long-term lease land trust from Black and Indigenous farmers, gatherers, and horticulturalists
- Stagnation of local and state-level policies regarding climate change
- Unhoused people's exposure to weather, traffic, and environmental stresses
- Logging within the Corvallis watershed and related soil erosion
- Coffin Butte Landfill expansion
- Waste management in homeless communities
- Accessibility to improving/retrofitting one's home for energy efficiency, temperature management, and to limit environmental harms (I.e., lead pipes and insulation)
- Lack of accessibility for non-car transportation in certain parts of Corvallis

- Decline of pollinators
- Lack of protection for people living and building on floodplains

Proposed Action

The purpose of this survey is to inform the Environmental and Climate Justice Committee of the deficits of environmental justice in our region. This portion of the report includes policy suggestions that the researchers propose.

1. Unaffordable indoor climate controls and natural disaster preparedness stand out as disproportionate problems for BIPOC, low-income, and renter communities in Linn-Benton Counties, based on our survey data. These problems will only grow more dire in the future as climate change exacerbates more extreme temperatures and natural disasters. Linn-Benton NAACP ECJ Committee programs and public policy advocacy could address these environmental injustices in the community.
2. Public participation is a cornerstone of environmental justice and will facilitate the community's ability to address the disproportionate burdens that exist for BIPOC and other marginalized communities now and in the future. Create mechanisms to increase public reporting and participation in local, state, and federal policy decisions. Create a virtual reporting forum — the ECJ could create a Community Environmental Reporting page that allows community members to submit concerns and comments. Partnering with other environmental community groups (potentially including the OSU Extension Service) could help spread the reach of this forum.
3. The NAACP ECJ Committee could work to advocate for local policies that support environmental wellness, climate adaptation, and preparedness, such as home energy efficiency upgrade programs and natural disaster preparedness for BIPOC, low income, or renters in the community.
4. Increasing educational outreach to minority groups — The National American Association for Environmental Education ([NAAEE](#)) suggests several methods of spreading environmental education in a community, which marries social community gathering and environmental education. For example, the Austin Water Watcher's program allows school-aged children to test local water supplies, then meet back at the program's headquarters for food and socialization. Another example from OSU is the Organic Grower's Club, in which volunteers can help work at the student farm then participate in a potluck.
5. Facilitate individual environmentally-friendly practices — As climate change continues to cause environmental damage in our communities, the NAACP could help our community by making environmental practices more accessible. These could include establishing community gardens, hosting speakers to discuss energy conservation and waste mitigation, boosting outreach for local agriculture programs, etc.

Conclusion

Our research has shown some environmental justice concerns in the Mid-Willamette Valley, particularly access to energy efficiency, energy affordability, and natural disaster preparedness. BIPOC community members may also experience greater environmental harms such as particulate matter exposure and transportation safety and accessibility. Community engagement and political participation to redress environmental injustices is essential for racial and economic justice in our community. Continued monitoring of environmental justice in this region and action on these findings is vital to the wellbeing of our most vulnerable neighbors.

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Acknowledgements

We would like to acknowledge the Linn-Benton County NAACP for commissioning this report and funding the research that went into the project, specifically Sara Lovtang and the ECJ Committee. Thank you to the OSU College of Agricultural Sciences and URSA for funding the project and providing resources that facilitated our research.

Special thanks to faculty advisor Christy Anderson Brekken for guiding us and serving as our mentor throughout this process, none of this would have been possible without your guidance. Additionally, thank you to Dr. Yong Chen for guiding us through Census data analysis.

Finally, thank you to every one of the 201 respondents to our survey.