

# Riverside County

SLOW DISASTER  
CASE STUDY



ENVIRONMENTAL  
INJUSTICE

Fall 2021

## GROUP NO. 27

## AUTHORS

Conner Danskin, Kaitlynrose Kailonn, Juniper Yu, Angelique Lorenzo, Sean Lee, Carlos Daniel Perez Pacheco, Beatriz Leal, Joseph-Iann Wong, Cristopher Castillo, Gilberto Puga.

## CITE AS

Danskin, Conner. Kailonn, Kaitlynrose. Yu, Juniper. Lorenzo, Angelique. Lee, Sean. Perez Pacheco, Carlos Daniel. Leal, Beatriz. Wong, Joseph-Iann. Castillo, Cristopher. Puga, Gilberto. 2021. *Slow Disaster Case Study: Riverside County. Environmental Injustice, Disaster STS Research Network.*

## ABOUT

This case study report was developed by students at the University of California Irvine for the undergraduate class, “Environmental Injustice,” taught by Kim Fortun and Kaitlyn Rabach for the Department of Anthropology, Fall 2021. The University of California Irvine is on the ancestral homelands of the Tongva and Acjachemen nations.

## COVER PHOTO




The cover image depicts the entrance to one of the major freeways commonly used for commutes in Riverside County. Two of the cities in Riverside County were listed as top 10 worst commutes, this shows the breadth of pollution that comes from traffic on a daily basis, and the negative contribution this has towards air quality and the environment. (Screenshot by Conner Danskin, October 27, 2021.

<https://www.pe.com/2019/01/15/what-are-the-nations-10-worst-commutes-two-riverside-county-cities-made-the-list/>)

**PERMISSION TO PUBLISH @ <https://disaster-sts-network.org>**

**Do you consent to having your name listed as an author on the published case study?**

| <b>Name</b>                    | <b>Publish? (Y or N)</b> |
|--------------------------------|--------------------------|
| 1. Conner Danskin              | Y                        |
| 2. Kaitlynrose Kailonn         | Y                        |
| 3. Juniper Yu                  | Y                        |
| 4. Angelique Lorenzo           | Y                        |
| 5. Beatriz Leal                | Y                        |
| 6. Sean Lee                    | Y                        |
| 7. Joseph-Iann Wong            | Y                        |
| 8. Cristopher Castillo         | Y                        |
| 9. Carlos Daniel Perez Pacheco | Y                        |
| 10. Gilberto Puga              | Y                        |

| BIOGRAPHICAL STATEMENT   | PHOTO  |
|--|--|
| <p>Conner Danskin is a first year Business Administration student at the University of California, Irvine. He enjoys nature, reading, playing soccer, and spending time with his loved ones.</p> |    |
| <p>Kaitlynrose Kailonn is a first year Computer Science student at the University of California, Irvine. Her favorite things to do consist of playing video games and being active.</p>          |   |
| <p>Juniper Yu is an undergraduate Psychology major student at the University of California, Irvine. They hope to learn more about the injustices of local areas and how to resolve them.</p>     |  |

**Beatriz Leal is a first year Undeclared student with the intention of becoming a Chemistry student at the University of California, Irvine. They enjoy spending time with their family and painting.**



**Angelique Lorenzo is a first year Undeclared student at the University of California, Irvine, intending on switching to Psychological Sciences.**



**Joseph-lann Wong is a second year English student at the University of California, Irvine. In his free time he plays video games and writes short stories/books. He enrolled in EIJ for more ideas for his future short stories.**



**Cristopher Castillo is a first year undeclared student at the University of California, Irvine.**



**Gilberto Puga is a first year mathematics major at the University of California, Irvine.**



**Sean Lee is a fourth year Quantitative Economics major at the University of California, Irvine. Their favorite thing to do outside of school is powerlifting.**



**Carlos Perez is a third year Anthropology major at the University of California, Irvine.**



# TABLE OF CONTENTS

|  |    |
|--|----|
| INTRODUCTION   | 8  |
| 1. COMMUNITY ASSETS & SETTING                        | 13 |
| 2. SLOW DISASTER & OTHER ENVIRONMENTAL THREATS       | 23 |
| 3. COMPOUND VULNERABILITIES                          | 31 |
| 4. STAKEHOLDER ANALYSIS                              | 37 |
| 5. STAKEHOLDER ACTIONS                               | 39 |
| 6. ROLE OF MEDIA AND BIG ENVIRONMENTAL ORGANIZATIONS | 42 |
| 7. RECOMMENDED LOCAL ACTIONS                         | 45 |
| 8. RECOMMENDED EXTRA-LOCAL ACTIONS                   | 50 |
| 9. RECOMMENDATIONS FOR FUTURE RESEARCH               | 54 |
| 10. INJUSTICE ANALYSIS                               | 58 |
| BIBLIOGRAPHY   | 63 |
| FIGURES  | 70 |

# INTRODUCTION

This case study report focuses on routine, everyday air and water pollution in Riverside County.

We describe routine pollution as “slow disaster” because the impacts are drawn out and cumulative, causing harm slowly, increasing rates of asthma, cancer and heart disease. In many ways, slow pollution disasters are more difficult to deal with than fast, explosive disasters because people don’t pay attention to them or even think they are normal—especially in communities of color. Often, communities have to organize and fight to get their concerns about pollution heard and addressed by government officials. Often, particular people play important leadership roles. Sometimes, these people are residents impacted by a polluting facility. Sometimes, leading figures in fights for environmental justice are professionals—physicians who work in the community or engineers who work inside the polluting facilities. This case study describes many different stakeholders in routine pollution and the actions they have taken—and not taken—to improve environmental conditions.

The report addresses a series of ten questions (Fig. 2) that draw out local details in a manner that encourages comparison with other places. The research has been done quickly (within the constraints of a quarter-long undergraduate class) so is limited to and points to the need for further research and community engagement. The goal is to help build both a body of research on environmental injustice and a network of researchers ready to help conceptualize and implement next-generation environmental protections.

When addressing slow disasters in Riverside County, there are several key concepts that must be discussed and understood before diving into the causes and effects of such



environmental injustice. One of those key concepts is a **health disparity**, which is how all aspects of a person's life could influence a person's health specifically. Depending on their gender, race, socioeconomic status, where they live, and many other factors, a person's health status could vary extremely. By looking specifically at the aspects of life, one could find **social determinants of health**. When looking at someone's race or social status, it could help people gain information about that person's health conditions without even examining them in specifics because these determinants have very strong correlations with health. For example, there are many places that are deemed **green zones**, where the area has been so polluted, and yet there has been little to no action taken towards improving the conditions. In these **green zones**, most of the actions taken are community-led and community-driven. They focus on more than just ridding the community of pollution but also improving other intersecting factors of health, like access to fresh produce and more green parks. A lot of these issues and **health disparities** can be seen to stem from **systemic racism** specifically. This kind of racism is so deeply ingrained into the foundation of society that it is almost considered normal. It's considered normal that certain people are disadvantaged from the beginning even though it is fundamentally and morally wrong to be racist. Among many other key concepts, these are some of the biggest concepts that must be understood before diving into the slow disasters of Riverside County.

In previous environmental injustice case studies, many valid and quite relevant points have been made. One such point describes how "low-income individuals and people of color are exposed to much more dangerous air pollution than those in higher-income communities face" (Nguyen et. al. 2020). Pollution emitted from traffic in Riverside County is particularly pertinent when referring to the dangers surrounding the community. Large diesel trucks, for example, contribute a substantial amount of the pollution due to the nature of their operations. Another environmental threat in Riverside county, as identified by previous research, is water and soil contamination as well as toxic pollution released by chemicals (Ma et. al. 2019). Additionally, a prior case study argued

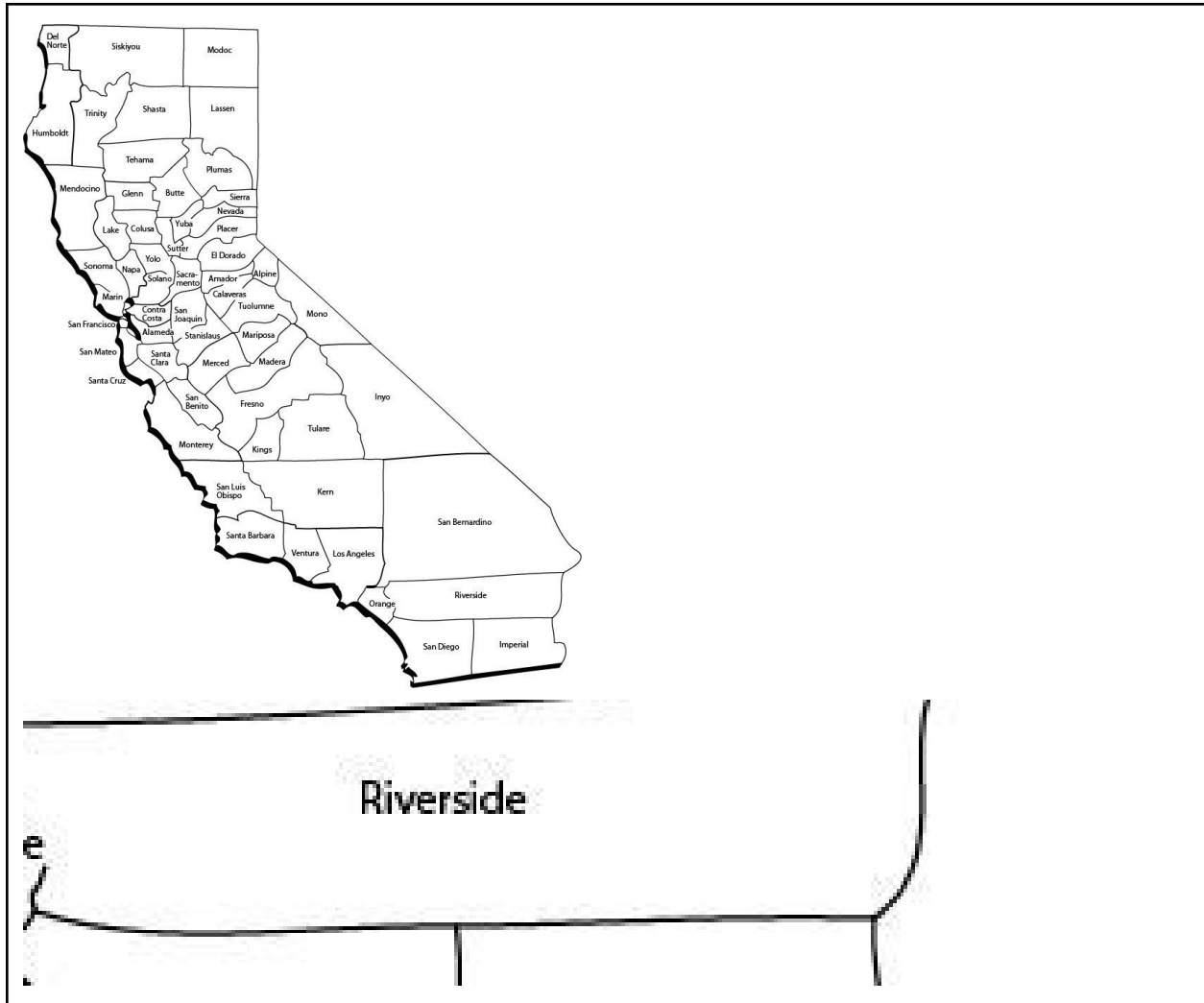
that it is extremely difficult to identify who is particularly to blame for the extremely poor air quality that exists in Riverside, but it is not difficult to tell that it was not done by only one sole contributor (Ma et. al. 2019).

There are twelve Sovereign Native American Tribes in Riverside County; nine being tribes. Some of the tribes that have historically been located in Riverside County include the Cahuilla, Gabrielino, Serrano, Luise-o, Chemehuevi, and Mojave tribes. These tribes have historically faced many struggles, and the increasing environmental injustice in Riverside County is not helping them.

## ENVIRONMENTAL INJUSTICE CASE STUDY FRAMEWORK

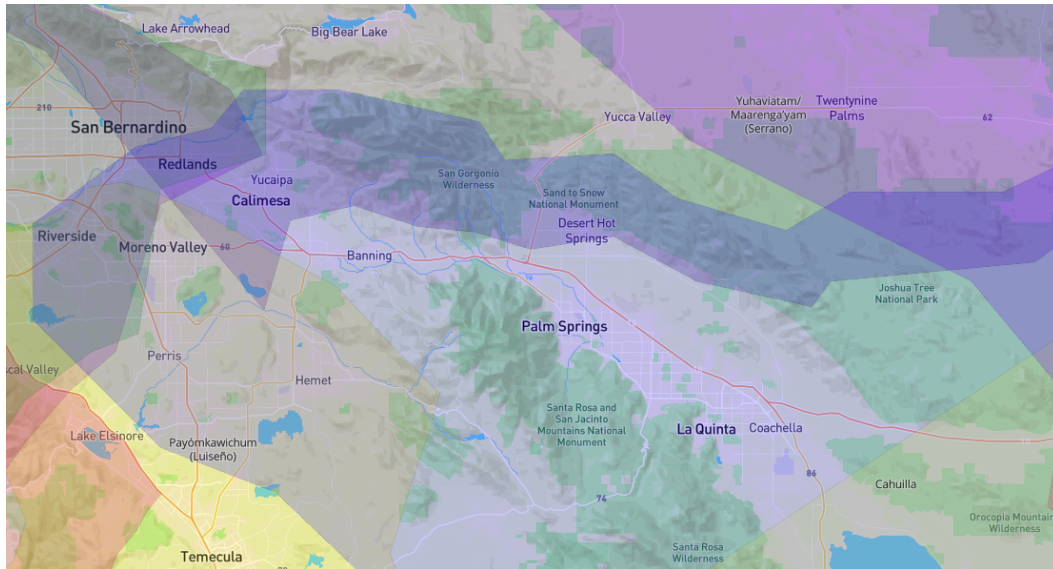
1. What is the setting of this case? What are its assets?
2. What environmental health threats (from explosions, everyday pollution, climate change, etc ) are there in this setting?
3. What intersecting factors -- social, cultural, political, technological, ecological -- contribute to environmental health vulnerability and injustice in this setting?
4. Who are stakeholders, what are their characteristics, and what are their perceptions of the problems?
5. What have different stakeholder groups done (or not done) in response to the problems in this case?
6. How have environmental problems in this setting been reported by media, environmental groups, companies and government agencies?
7. What local actions would reduce environmental vulnerability and injustice in this setting?
8. What extra-local actions (at state, national or international levels) would reduce environmental vulnerability and injustice in this setting and similar settings?
9. What kinds of data and research would be useful in efforts to characterize and address environmental threats in this setting and similar settings?
10. What intersecting injustices -- data, economic, epistemic, gender, health, infrastructure, intergenerational, media, procedural, racial, reproductive -- contribute to environmental injustice in this setting?

**FIGURE 1:** This is the analytic framework that guided research for this case study.



**FIGURE 2:** Riverside is a county located in southeast California. It is known for its high population density and for having many highly-technologically advanced companies. This, however, also leads to high air pollution.

(Screenshots by Joseph-Iann Wong, October 27th, 2021.  
<https://www.counties.org/general-information/california-county-map>)



**FIGURE 3:** Riverside County is mostly located in the Cahuilla lands and where the Yuhaaviatam clan reside. Unfortunately, these lands used to be extremely big, but now they have shrunk by a lot. These two groups have been trying their best to improve infrastructure in order to improve the quality of life of their residents and people.

(screenshot by Juniper Yu, October 27th, 2021. <https://native-land.ca/>)

“About our Tribe.” San Manuel Band of Mission Indians.  
<https://sanmanuel-nsn.gov/culture/about-smbmi>

# 1. COMMUNITY ASSETS & SETTING

## Diversity Rich, Yet Quality Poor

*Juniper Yu*

Considering that Riverside County is a well-known and well-populated area, it must have many resources for the community members to take advantage of. Being a community made up of about fifty percent Latino and Hispanic people, Riverside County is filled with people-of-color and low-income families (“Riverside County: California” (CA) 2021). Like many places in the world, **health disparities** are evident when looking at the difference in quality of life between neighborhoods. Unfortunately, different environmental injustice tends to affect people differently, usually affecting people-of-color and people stemming from lower incomes in a harsher manner. These people who are from low-income families are the most affected by slow disasters; however they are also the people who have the least amount of time to address the issues because they are just trying to get through each day. While the resources are there, certain people just aren’t able to access them at the same capacity and are treated differently at a fundamental level, and that is because of **systemic racism**. Even if everyone is given the same opportunity theoretically, not everyone can evenly apply it into their lives because of other circumstances that could be holding them back. If they only focus on each passing day, they won’t notice the long impacts of slow disasters because it’s part of the bigger picture of community health and

these people simply do not have the time to participate in community programs to educate themselves and advocate for themselves. This is especially true when the population sums up to be about 2.5 million people, creating a population density of about 340 people per square mile (National Association of Counties 2018). A density this high would require a lot of infrastructure in order to flourish, but a lot of people in Riverside County are not supported, which is evident by the very low HPI score of being in the 20.4 percentile compared to the entire state (The California Healthy Places Index 2021). While this is not good for fast disasters, this is also horrible for slow disasters because HPI calculates many different aspects of the community. Riverside County specifically has a very low quality of health care. This means that if many people are developing the same diseases in the same area, people may not connect the two dots. This would make them realize that it might be more than the lifestyles of the patients and actually have to do with the environment.

Even though there are very high rates of asthma and heart disease in Riverside County, there are many assets that the community can use in order to protect themselves and work towards healing the area. There are environmental organizations that formed with specific purposes, all striving to improve their community by addressing a specific issue. For example, the California Air Resources Board (CARB) is an organization “committed to racial equity and environmental justice as a fundamental part of all it does, including programs that reduce exposure to pollutants and improve the quality of life in California communities facing environmental and economic challenges”(California Air Resources Board 2021). While this organization is statewide, it works with Riverside in many different programs pertaining to all sorts of tests from air pollution to chemical exposure to the impacts of climate heat on the community. CARB works directly with another asset of the community, University of California: Riverside, one of the many colleges in the community. In addition to being a great resource of education in the community, UCR also gives Riverside County a solid connection between the community and higher authority. In addition to being able to conduct their own research on the community and how the air

quality affects quality of life (among other things), UCR is able to connect with high school students in programs that allow the youth to take part in improving the community and also be educated on the status of their home. Specifically, UCR did a project where students from J.W. North High School did a study on the air quality in their neighborhood, paying special attention because their “proximity to the intersections of SR60/I-215 on-ramp” increases the air pollution (Community Air Quality Project n.d.). The more aware and active the youth are in the community, the more promising future amendments will be because the youth today will control future regulations and laws. Including community members in these sorts of projects brings a sense of solidarity to the residents because they feel like they can actually participate and make a difference in their home. Even people outside of school can take action and improve their environment. People can volunteer or donate to Riverside County Parks Foundation, for example, in order to maintain and improve the state of the county’s local parks. A foundation like this one “raises funds and recruits volunteers for important RivCoParks projects, such as playground cleanups, trail maintenance, and historic preservation” in addition to educating the community in general (Welcome to RivCoParks 2021). This is yet another way residents are able to be active in the community while also being informed of different issues possibly arising in the area as well.

Furthermore, Riverside County has a lot of resources that help support people in slightly more direct ways other than giving opportunities to be active in the community. As stated previously, Riverside County is made up of a large percentage of people-of-color, meaning there are definitely many people who speak English as a second language. Unfortunately, a lot of these people are taken advantage of in different ways because of their lesser understanding of the language. For instance, these same people are more likely to be sold houses in polluted and lesser quality areas simply because they aren’t as fluent. Thankfully, there are centers like the TODEC (Training Occupational Development Educating Communities) Legal Center that support people who have trouble communicating properly in English by “ensur[ing] equitable access to information and

services for limited and non-English speaking people” (TODEC Legal Center 2019). When information is spread in multiple different languages, it allows more people to fully understand the information that they have the right to know. Resources like this center encourage residents to seek external support if they need it because it is available to them.

A lot of people in general, including people from Riverside County, are hesitant in reaching out for help and support with resources—specifically because of the fear of costs. Riverside County specifically has a relatively low median in household income, so it is difficult for many families to spare money in order to use the resources around them. Fortunately, certain assets have programs designed especially for people who have these concerns. Specifically, the Riverside University Health System has a sliding fee discount program where, depending on the household income and family size a person might have, they can cut down the prices they have to pay by up to eighty percent (Sliding Fee Discount Program 2019). This way, more people can actually afford going to the doctor with issues without needing to worry too much about how a single visit could severely affect their amount of income. Without a program like this, a lot of people could live their lives unknowingly affected by their environment, developing asthma or heart disease and not understanding why. By having programs like this, maintaining health is more encouraged, and it also creates a sense of communication between the patients, the medical professionals, and the environment. Lastly, one other set asset among many others left undiscussed is the unwavering support of local organizations. A big portion of local organizations in general include churches of all kinds, and in Riverside County, there are very many different kinds of churches, but most of them are extremely inclusive and support social reform and justice. One of these many churches is the First Congregational Church of Riverside, whose mission statement includes the fact that they are “called together to comfort and challenge one another, educate and empower one another, inspire and respect one another and in all things to love one another, so that [they] might be bearers of God’s image in this world” (First Congregational Church of Riverside 2021).



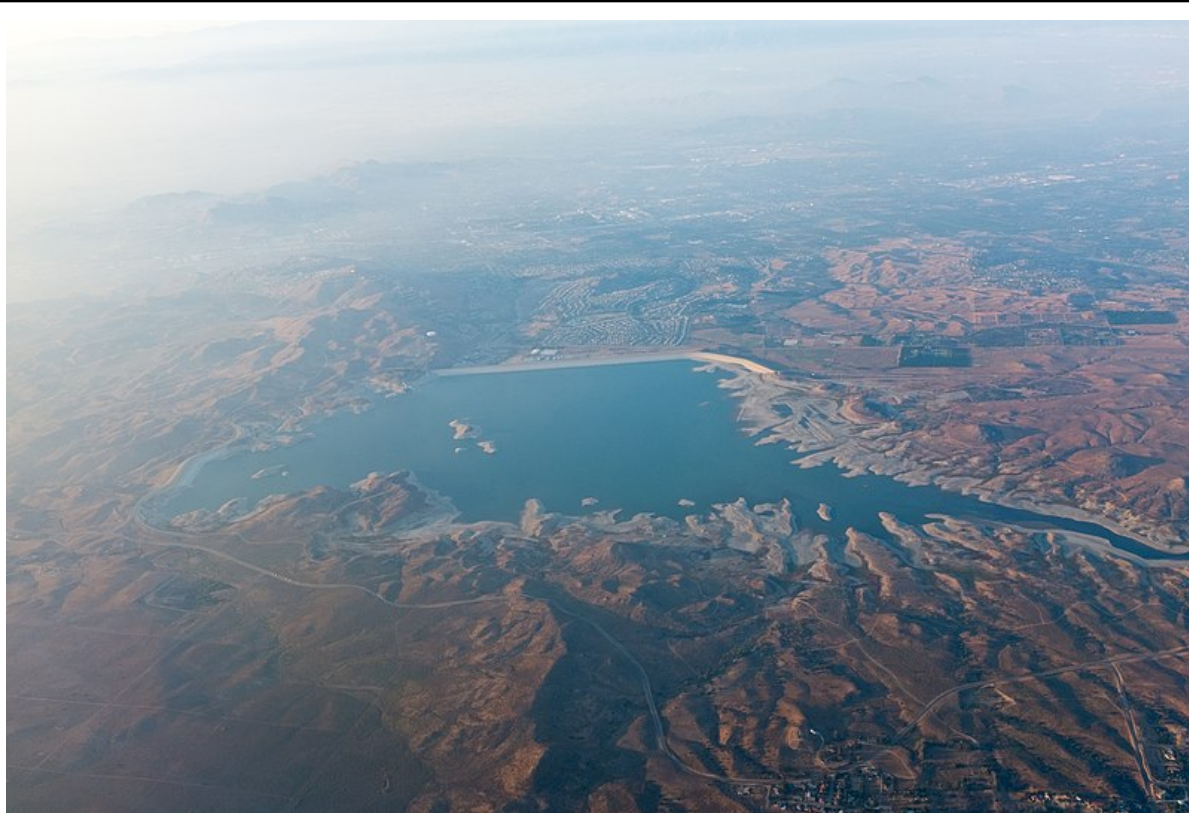
No matter the religion one believes in, there is almost always a place where a person can go to seek emotional and physical shelter, which can really support the emotional toll that slow disasters can have on people. The more supportive community is, the more power they hold in fighting back and seeking reforms in their environment. Using these resources, Riverside County residents have many opportunities to make themselves heard and make change in the community.



**FIGURE 4:** This photo is a visual of how smog has affected even the plants in the Riverside area. The fact that this has been a prominent issue even since the 1970s is evidence that people were extremely aware of the effects of poor air quality on plants and yet they didn't connect the effects to humans. This has been a problem for decades, and it's still an issue, meaning it's not the lack of awareness but the lack of action pulling us back.

(screenshot by Juniper Yu, October 29th 2021.

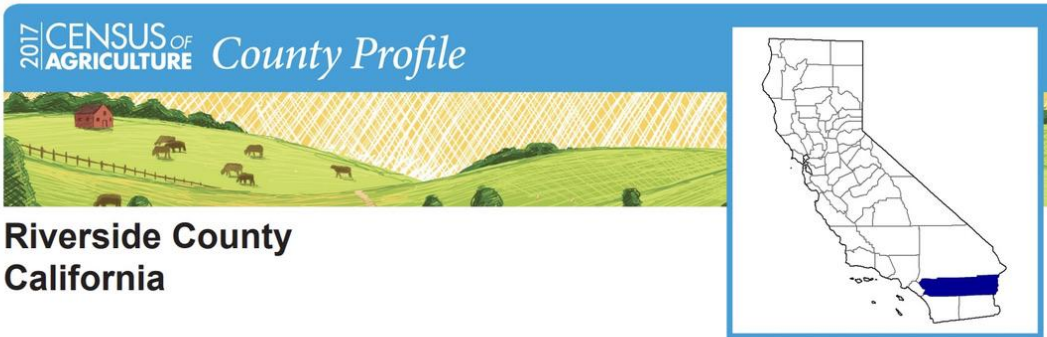
[https://commons.wikimedia.org/wiki/File:SMOG-DAMAGED PLANT AT THE STATE WIDE AIR POLLUTION RESEARCH CENTER, UNIVERSITY OF CALIFORNIA. PLANT - NARA - 542686.jpg](https://commons.wikimedia.org/wiki/File:SMOG-DAMAGED_PLANT_AT_THE_STATE_WIDE_AIR_POLLUTION_RESEARCH_CENTER,_UNIVERSITY_OF_CALIFORNIA._PLANT_-_NARA_-_542686.jpg))



**FIGURE 5:** This photo shows the receded water line of Lake Mathews in Riverside County during a drought. A lack of water in general in an area densely populated is concerning already, but in many cases, people tend to not stray from their ways of water usage even when informed of the fact that there is not enough water. Sometimes residents even use more water during droughts, which could be an indication that people are unaware of the severity and consequences of droughts.

(screenshot by Juniper Yu, October 29th, 2021.

[https://commons.wikimedia.org/wiki/File:Lake\\_Mathews\\_Drought\\_Riverside\\_County\\_California\\_from\\_the\\_Air.jpg](https://commons.wikimedia.org/wiki/File:Lake_Mathews_Drought_Riverside_County_California_from_the_Air.jpg))



**Riverside County  
California**

**Total and Per Farm Overview, 2017 and change since 2012**

|                              | 2017    | % change<br>since 2012 |
|------------------------------|---------|------------------------|
| Number of farms              | 2,667   | -10                    |
| Land in farms (acres)        | 263,796 | -23                    |
| Average size of farm (acres) | 99      | -15                    |

**2** Percent of state agriculture sales

**Share of Sales by Type (%)**

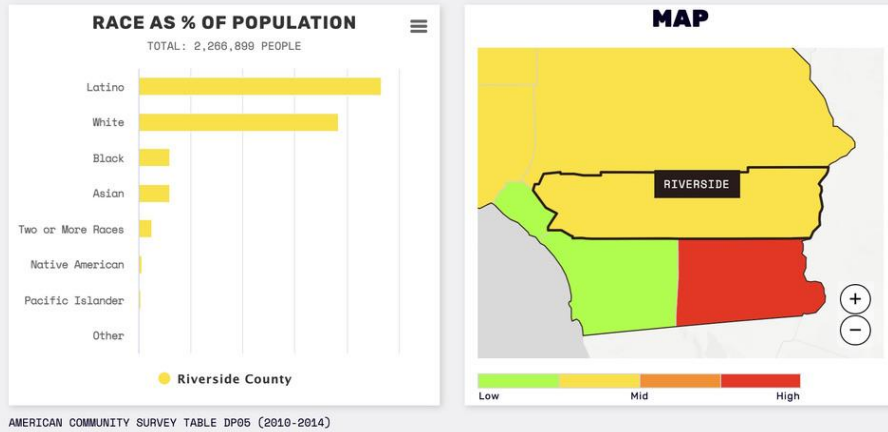
|                                  |    |
|----------------------------------|----|
| Crops                            | 76 |
| Livestock, poultry, and products | 24 |

**FIGURE 6:** This figure shows the lack of importance of agriculture in Riverside County with a 10% decrease in the number of farms since 2012. The lack of agriculture indicates that there is a growing warehousing industry in this county.

(Screenshot by Cristopher Castillo, October 29th 2021.

[https://www.nass.usda.gov/Publications/AgCensus/2017/Online\\_Resources/County\\_Profiles/California/cp06065.pdf](https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/California/cp06065.pdf) )

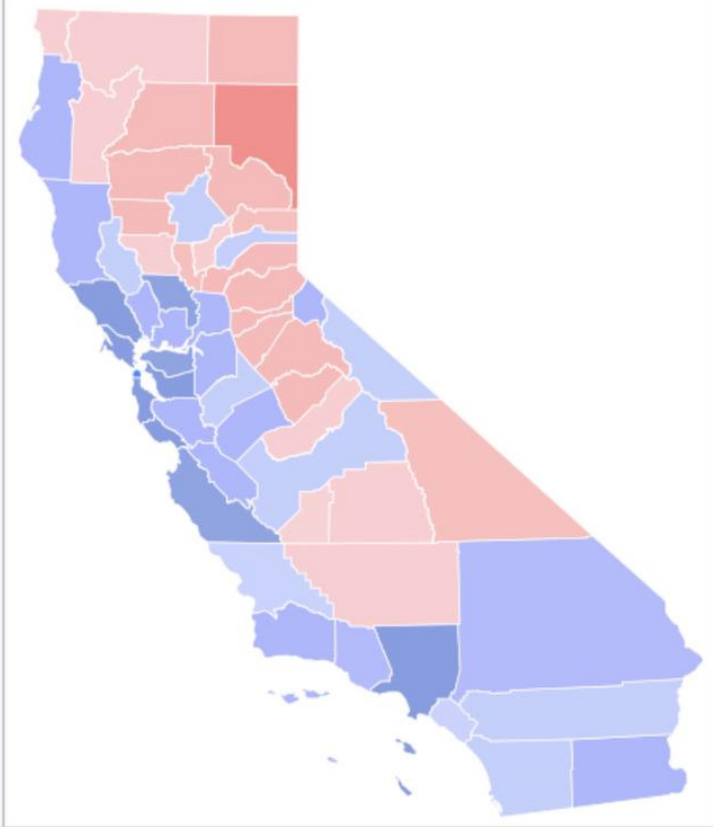
## County Overview



**FIGURE 7:** According to Race Counts, Riverside County has a large Latino community, with about 46.5% of people in the county being Latinx. Additionally, Riverside County is described as a “low performance, low disparity, more populous county.”

(screenshot by Cristopher Castillo, October 29th 2021.

<https://www.racecounts.org/county/riverside/> )



Party registration by county



(October 2018):

- Democrat  $\geq$  30%
- Democrat  $\geq$  40%
- Democrat  $\geq$  50%
- Republican  $\geq$  30%
- Republican  $\geq$  40%

**FIGURE 8:** This Wikipedia map reveals that Riverside County has a slight Democratic majority. Since Democrats usually take an environmentally friendly and pro-regulatory stance, it would be easier to pass regulations against the polluters in the area. However, given that it is a slight majority, there may still be resistance from the Republicans in the county.

(screenshot by Cristopher Castillo, October 29th 2021.

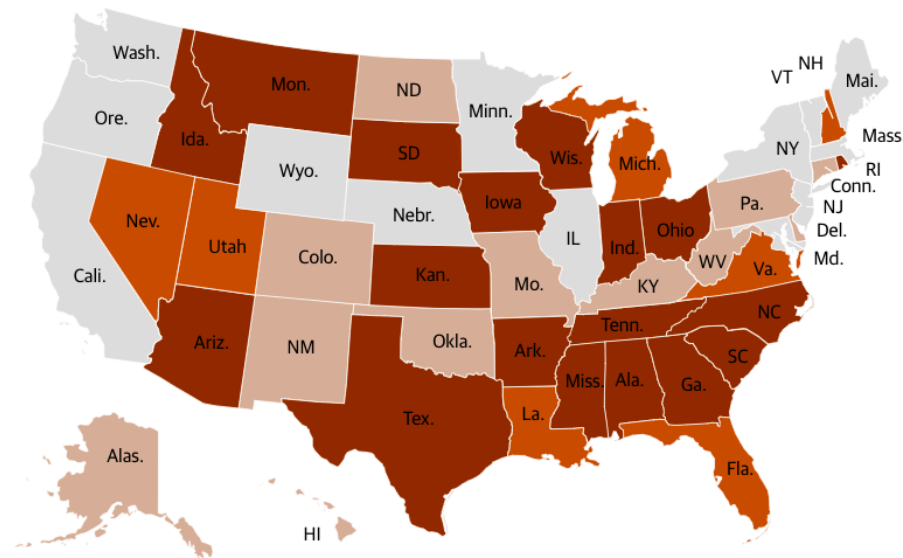
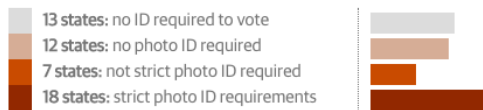
[https://en.wikipedia.org/wiki/California\\_locations\\_by\\_voter\\_registration](https://en.wikipedia.org/wiki/California_locations_by_voter_registration))

## Choose a category:

**Voter ID laws** Voter registration laws Felony disenfranchisement Early voting

The stricter the laws on acceptable forms of personal identification, the more difficult it is for minority groups to cast a ballot.

### Identification requirements for voting in the US



**FIGURE 9:** The state of California has laws that make it easier to vote than in many other US states. This strengthens democratic capacity across the state of California. Despite this, there are still some concerns in Riverside County specifically. In this county, there are only five ballot drop-off locations despite being a very large and spread out county. Because of this, a lot of people who do not live near these areas will have less options to turn in their votes and have their voices heard.

(screenshot by: Juniper Yu, November 3rd, 2021.

<https://www.theguardian.com/us-news/ng-interactive/2019/nov/07/which-us-states-hardest-vote-suppression-election> )

## **2. SLOW DISASTER & OTHER ENVIRONMENTAL THREATS**

### **The Cost of Living**

#### ***Beatriz Leal***

Riverside as a whole has been characterized for its hazardous air quality, resulting in the overall environmental issues. Therefore, it isn't unusual to notice the alarming rates of children developing asthma and bronchitis. Not only are children affected by this but air pollution has been linked to heart attacks, premature deaths and respiratory issues each year.

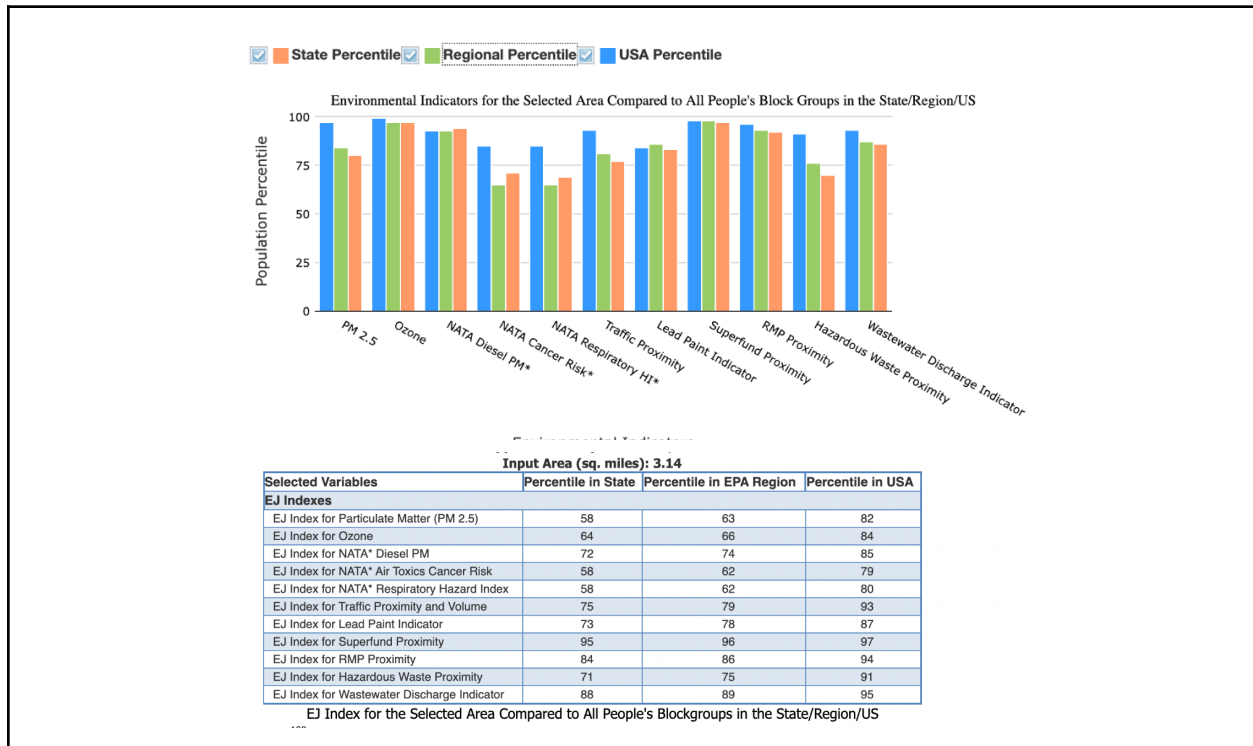
Riverside has been one of the counties that has been graded an "F" for air quality, according to the 2019 American Lung associations (NBClosangeles 2019). In addition,

according to Kidsdata from 2019, Riverside County had sixty-four days that were above the regulatory standard for ozone. In the county of Riverside, oil and gas facilities, ozone smog, and air toxins have fallen into threat radii of schools, daycares, homes and medical facilities. So much so that there have been high concentrations of elemental particles found in the classrooms of many students, thus children becoming vulnerable to the pollution. The large amounts of warehouses contributes to this, as in Moreno Valley and Riverside County has increased the air pollution and decreased the quality of air. The majority of warehouses in Southern California in general are not environmentally friendly, constantly pumping out "greenhouse pollution at horrific levels" (Olalde 2021). In addition to the local emission pollution, "the prevailing wind pattern [. . .] blow[s] east bring[ing] emissions from cars, trucks, ports, and construction equipment" ("City of Jurupa Valley; Environmental Justice Element" 2014). Riverside stands in the 96th percentile for proximity to RMP facilities, with 93rd percentile of hazardous wastewater indicators and the 84th percentile for lead paint, which indicates the exposure to lead paint in homes. Another contributing factor is the neighboring freeways that advocate the emissions pollution that resides near residential areas. Also the "I-15 freeway is adjacent to about 200 acres between 68th Street and Bellegrave Avenue that are zoned for residential use" (Jurupa Area plan, 2014). The motor vehicles emissions generate carbon monoxide, nitrogen oxides, particle matter and hydrocarbons that react to form ozone, all near neighboring homes. Because of the large release of pollution, respiratory diseases and other health effects have severely increased and still continue to. Residents have been warned to stay indoors and keep windows/doors closed, which also affects locals as they lack physical exercises which result in other health effects. Because of the close presence of industrialism, it becomes difficult for locals to avoid health issues that are caused by the pollution.

As a result of the hazardous air condition, extreme heat waves have become "one of the deadliest consequences of climate change", according to a news article, *The Los Angeles Times*. Many of the companies and industrialism are settled in low-income communities;



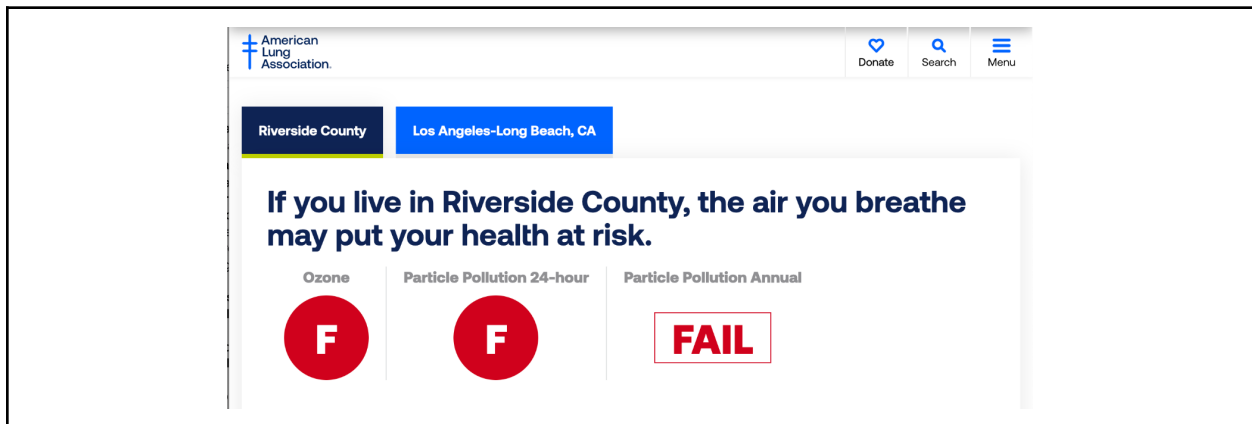
minorities that have higher rates of poverty, lower housing income, and lower education levels. Therefore, they are more exposed and helpless to the extreme heat waves. The majority of minorities tend to be Black and LatinX, thus the majority are affected by not only the drastic climate change, but also the terrible air quality. According to the South Coast Air Quality Management District, moderating the use of air conditioning contributes to reducing the pollution, but it contradicts the wellbeing of locals as protection against the extreme heat waves would require cooling down (air conditioning). According to the *Los Angeles Times*, “extreme heat kills more Americans than any other climate-fueled hazard, including hurricanes, floods and wildfires”(L.A. Times 2021) each year. Minorities tend to obtain jobs that spend hours working in the sun, affecting their health as they tend to collapse due to the extreme heat. People also die from the extreme heat as they don’t have the correct equipment to shy away from the fever in their own homes. All in all, air pollution and drastic climate change is evident as it causes many health threats such as asthma, heart attacks, respiratory issues and even death.



**FIGURE 10:** These figures help emphasize where the county stands in percentile of environmental indicators throughout the state, region, and nation. The highest being

the ozone as it stands in the 99th percentile throughout the nation with a 98th percentile in superfund proximity and 96th percentile in RMP proximity, that contribute to this.

(screenshot by Beatriz Leal, November 3rd, 2021)  
[https://ejscreen.epa.gov/mapper/ejscreen\\_SOE.aspx](https://ejscreen.epa.gov/mapper/ejscreen_SOE.aspx)



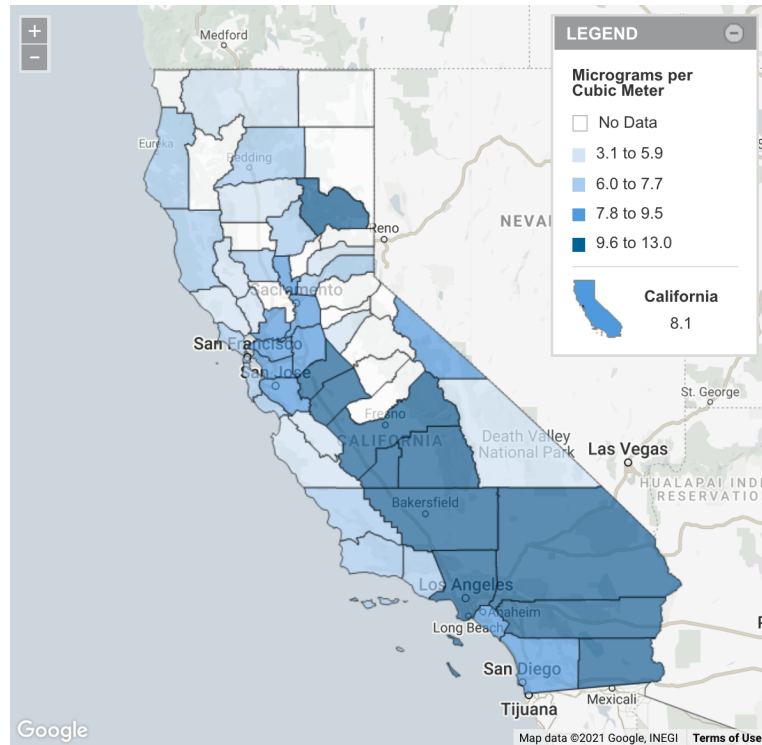
**FIGURE 11:.** The American Lung Association (ALA) gave Riverside county an “F” for ozone levels and annual particle pollution. Riverside has been one of the counties in the nation who has been graded a fail because of the high levels of vehicle pollution in industrial facilities that reside in residential areas. ALA also advocates that such hazardous ozone levels will put your health at risk, thus the hazard with living in the county.

(screenshot by Beatriz Leal, November 3rd, 2021)  
<https://www.lung.org/research/sota/city-rankings/states/california/riverside>



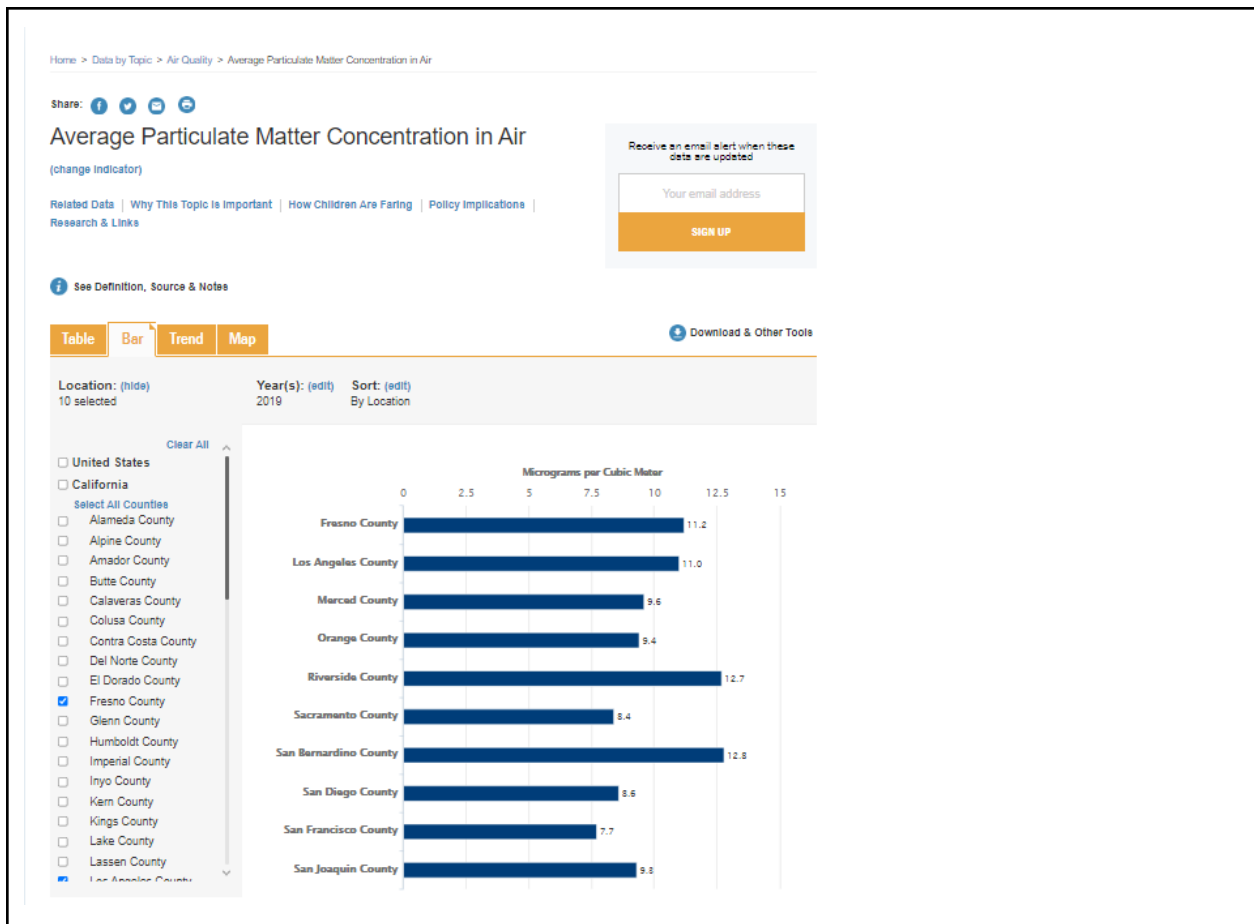
### Average Particulate Matter Concentration in Air

Year(s): 2019



**FIGURE 12:** According to the data provided from 2019, Riverside County had 64 days that were above the regulatory standard for ozone. These high levels of ozone are correlated with cognitive and developmental issues for especially young children, as they are being exposed to air particulate matter in greater quantities relative to their body weight. Not only this, but their organs are still developing, and these harsh toxins in the air may affect the rate and extent to which they develop, rendering them physically impaired.

<https://www.kidsdata.org/topic/80/air-quality/summary>. (Screenshot by Gilberto Puga, October 29, 2021).



**FIGURE 13:** This figure consists of a bar graph of the Average Particulate Matter Concentration in Air for eleven different counties in California. Riverside County is one of the main leaders in having the most micrograms per Cubic Meter (12.7%). This graph supports the idea that Riverside's population is more vulnerable to particulate matter that can harm one's health due to the heavy air pollution.

(Screenshot by Kaitlynrose Kailonn, October 29th, 2021.

<https://www.kidsdata.org/topic/524/air-particulate/bar#fmt=2751&loc=367,364,354,357,344,366,368,349,365,265&tf=124&sort=loc>

## Air Quality: Particulate Matter<sup>†</sup>

Air pollution is a leading environmental threat to human health. Particles in the air like dust, dirt, soot, and smoke are one kind of air pollution called particulate matter. Fine particulate matter, or PM<sub>2.5</sub>, is so small that it cannot be seen in the air. Breathing in PM<sub>2.5</sub> may

- lead to breathing problems,
- make asthma symptoms or some heart conditions worse, and
- lead to low birth weight.

The national standard for annual PM<sub>2.5</sub> levels is 12.0µg/m<sup>3</sup>. When PM<sub>2.5</sub> levels are above 12, this means that air quality is more likely to affect your health.

In 2016, the annual level of PM<sub>2.5</sub> in **Riverside County** was 14.1 µg/m<sup>3</sup>. \*

\* Micrograms per cubic meter (µg/m<sup>3</sup>)

ANNUAL AMBIENT CONCENTRATION OF PM<sub>2.5</sub>

14.1 µg/m<sup>3</sup>\*

Riverside County, California

12.0 µg/m<sup>3</sup>\*

Annual National Standard

\*Micrograms Per Cubic Meter (µg/m<sup>3</sup>)

**FIGURE 14:** This figure shows that Riverside County's annual ambient concentration of PM<sub>2.5</sub> is above the national standard by about 2.1 micrograms per cubic. Not only is this unusually high for average annual ambient concentration, PM<sub>2.5</sub> is only one of the many air pollutants in Riverside County.

(Screenshot by Joseph-Iann Wong, October 27th 2021.

<https://ephtracking.cdc.gov/showInfoByLocationExt/?&FIPS=06065>)

## Proximity To Highways<sup>†</sup>

Traffic-related air pollution is a major cause of unhealthy air quality, especially in urban areas. Many health problems have been linked to exposure to traffic-related air pollution. The closer your home or school is to a major highway, the more likely you and your family are to be exposed to traffic-related air pollution.

In 2011, 3.8% of the population of Riverside County lived within 150 meters\* of a major highway.

In 2011, 1.5% of Riverside County public schools (preK-4<sup>th</sup> grade) were sited within 150 meters\* of a major highway.

\* 150 meters is about 2 blocks.



3.8%



of Riverside County population that live within 150m of a highway

Discover the data | Learn more about this topic

† 2011 data from the National Environmental Public Health Tracking Network

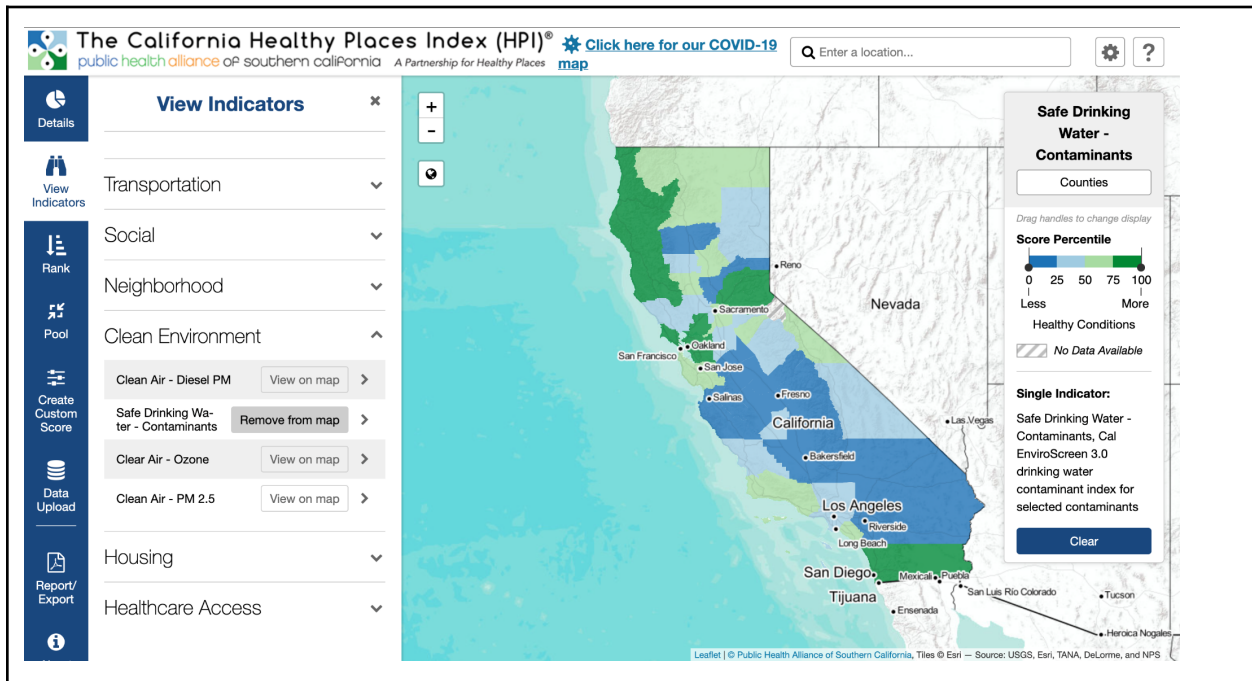


**FIGURE 15:** This figure displays the percentage of the population of Riverside County that lives within about 2 blocks, or 150 meters, of a highway. In addition to this 3.8% living with close proximity to a highway, 1.5% of the public schools in Riverside County are located within 150 meters of a highway. This means that about 3.8% of the population here is exposed to great amounts of air pollution, and 1.5% of children in grades preK-4<sup>th</sup> even more so, as there is greater air pollution in areas with major

traffic due to highways.

(Screenshot by Gilberto Puga, October 29th, 2021.

<https://ephtracking.cdc.gov/showInfoByLocationExt/?&FIPS=06065>)



**FIGURE 16:** Caption: In maps provided by the California Healthy Places Index, Riverside County appears to be in the lowest percentile of the state for healthy drinking water. This contaminated water disproportionately affects low-income communities, communities of color, and rural areas. This lack of safe drinking water creates environmental vulnerability, because residents do not have access to clean water for sanitation/cleaning and maintaining their environment clean; nor can they have reliable source of access to clean water.

(Screenshot by Gilberto Puga, October 29th, 2021. <https://map.healthyplacesindex.org> )

# 3. COMPOUND VULNERABILITIES

## Intersecting factors contributing to environmental vulnerability and injustice

*Gilberto Puga*

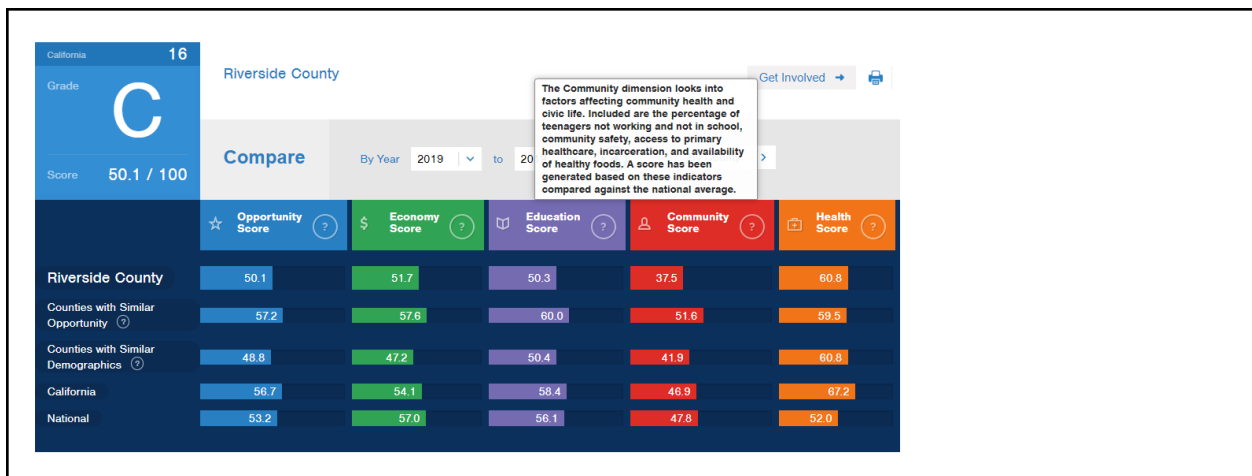
Riverside County deals with various forms of injustice that makes the county's health vulnerable and contributes to the injustice in the area. To begin with, residents are victims of redlining and other discriminatory land use policies. This means that Riverside county consists largely of minorities and other people of color who could not afford to live in those communities that they had once lived in; because over the decades, the population of Riverside county slowly tipped from majority white to majority POC while the quality of life simultaneously decreased. This slow decrease in the quality of life while the population simultaneously tips from majority white to POC is a huge indicator of just how vulnerable the county is. It has become a target for major companies, such as Amazon, because of the fact that a large number of residents are suffering from poverty and the potential that the company has for creating jobs creates economic opportunity at a huge cost for the residents, rendering the economic opportunities redundant, due to the fact that these residents will develop an illness and have to address it. Many residents that come from poverty show support for the warehouse growth because of false illusions of prosperity (The Magazine of the Sierra Club n.d.).

In terms of health, “More than 40% of Americans – more than 135 million people – are living in places with unhealthy levels of ozone or particle pollution,” (American Lung Association n.d.). It is also a well established fact that communities that consist of low-income people-of-color are affected more significantly by various forms of pollution, when compared to higher-income or white people. The median household income in Riverside County was \$56,592 (RaceCounts) between the years 2010–2014. This qualifies the majority of the residents of Riverside County as low-income. A very large number of them may find it difficult to finance a doctor's appointment or treatment for a medical condition, as the insured adults percentile is 19.6 (The California Healthy Places Index n.d.) and their low-income status. The air district also found that more than 2.4 million people live within half a mile of at least one large warehouse, that those areas have higher rates of asthma, heart attacks and poverty and are disproportionately Black and Latino. The medical conditions that residents develop are a direct result of these large warehouses surrounding the residents. They cannot afford to suffer, yet they must learn to deal with these consequences because of large corporations and the greed for economic gain at the sacrifice of the quality of life of the residents, thus also contributing to epistemic injustice.

Furthermore, in terms of ecological injustice, the county seems to be facing various hardships. The county is prone to droughts, which have the same potential as a very hazardous disaster: "as a 'slow' disaster that, while less dramatic in its onset, might have equally potent effects on population health. It represents a critically important but understudied form of disaster." (EurekAlert n.d.). A drought can affect just about every aspect of a resident's life, including their quality of life. A drought means more regulations for residents on things like watering their lawn, showering, etc. It also poses the question of whether the members of the community will have clean drinking water, or even any water at all for sanitation and other vital aspects of life. This issue is worsened by the fact that the county is a logistics hub.



All of these factors and injustices also contribute greatly to intergenerational injustice in Riverside County. Residents who happen to be pregnant are exposed to harsh chemicals in the environment around them, and this means that the offspring may have health problems that stem from this exposure. Not only this, but they have to also grow up with worsening effects from environmental injustice in the county if nothing is done soon to protect the well-being of future generations, as well as the future of our planet. It is not worth compromising our health, our future generation's health, and the health of the planet. Corporations need to be more cautious and considerate with what they are releasing into the air that those individuals in fence line communities.



**FIGURE 17:** Riverside County has a 50.1 opportunity index score. The opportunity index provides a multidimensional view of opportunity by combining data on economics, education, community and health. The score for each of these is based on multiple indicators. For example, The Community dimension looks into factors affecting community health and civic life. Included are the percentage of teenagers not working and not in school, community safety, access to primary healthcare, incarceration, and availability of healthy foods. Riverside County has 15.1 % of youth (16-24) not in school and not working. Violent Crime happens 291.2 times per 100,000 population. There are also only 1.5 grocery stores and produce vendors per 10,000 population.

(Screenshot by Sean Lee, October 29th, 2021.  
<https://opportunityindex.org/detail/06065>)



## EJSCREEN ACS Summary Report



Location: Riverside County

Ring (buffer): 0-mile radius

Description:

|  | 2014 - 2018<br>ACS Estimates | Percent | MOE (±) |
|--|------------------------------|---------|---------|
| <b>Population 25+ by Educational Attainment</b>            |                              |         |         |
| Total  | 1,530,229                    | 100%    | 0       |
| Less than 9th Grade  | 139,524                      | 9%      | 3,002   |
| 9th - 12th Grade, No Diploma                               | 140,771                      | 9%      | 2,727   |
| High School Graduate                                       | 411,949                      | 27%     | 4,391   |
| Some College, No Degree                                    | 504,267                      | 33%     | 5,020   |
| Associate Degree   | 122,746                      | 8%      | 2,388   |
| Bachelor's Degree or more                                  | 333,718                      | 22%     | 3,702   |
| <b>Population Age 5+ Years by Ability to Speak English</b> |                              |         |         |
| Total  | 2,225,278                    | 100%    | 0       |
| Speak only English   | 1,321,481                    | 59%     | 5,830   |
| Non-English at Home <sup>1+2+3+4</sup>                     | 903,797                      | 41%     | 6,199   |
| <sup>1</sup> Speak English "very well"                     | 569,223                      | 26%     | 5,840   |
| <sup>2</sup> Speak English "well"                          | 153,500                      | 7%      | 3,062   |
| <sup>3</sup> Speak English "not well"                      | 112,077                      | 5%      | 2,697   |
| <sup>4</sup> Speak English "not at all"                    | 68,997                       | 3%      | 2,291   |
| <sup>3+4</sup> Speak English "less than well"              | 181,074                      | 8%      | 3,539   |
| <sup>2+3+4</sup> Speak English "less than very well"       | 334,574                      | 15%     | 4,680   |
| <b>Linguistically Isolated Households*</b>                 |                              |         |         |
| Total  | 57,022                       | 100%    | 1,793   |
| Speak Spanish  | 47,221                       | 83%     | 1,676   |
| Speak Other Indo-European Languages                        | 1,939                        | 3%      | 318     |
| Speak Asian-Pacific Island Languages                       | 7,170                        | 13%     | 524     |
| Speak Other Languages                                      | 692                          | 1%      | 170     |
| <b>Households by Household Income</b>                      |                              |         |         |
| Household Income Base                                      | 718,349                      | 100%    | 2,722   |
| < \$15,000   | 69,743                       | 10%     | 1,793   |
| \$15,000 - \$25,000  | 64,175                       | 9%      | 1,811   |
| \$25,000 - \$50,000  | 152,409                      | 21%     | 2,585   |
| \$50,000 - \$75,000  | 124,931                      | 17%     | 2,333   |
| \$75,000 +   | 307,091                      | 43%     | 3,720   |
| <b>Occupied Housing Units by Tenure</b>                    |                              |         |         |
| Total  | 718,349                      | 100%    | 2,722   |
| Owner Occupied   | 472,401                      | 66%     | 3,912   |
| Renter Occupied  | 245,948                      | 34%     | 2,861   |
| <b>Employed Population Age 16+ Years</b>                   |                              |         |         |
| Total  | 1,842,591                    | 100%    | 1,312   |
| In Labor Force   | 1,106,781                    | 60%     | 4,521   |
| Civilian Unemployed in Labor Force                         | 94,709                       | 5%      | 2,055   |
| Not in Labor Force   | 735,810                      | 40%     | 4,740   |

Data Note: Detail may not sum to totals due to rounding. Hispanic population can be of anyrace.

N/A means not available. Source: U.S. Census Bureau, American Community Survey (ACS)

\*Households in which no one 14 and over speaks English "very well" or speaks English only.

October 29, 2021

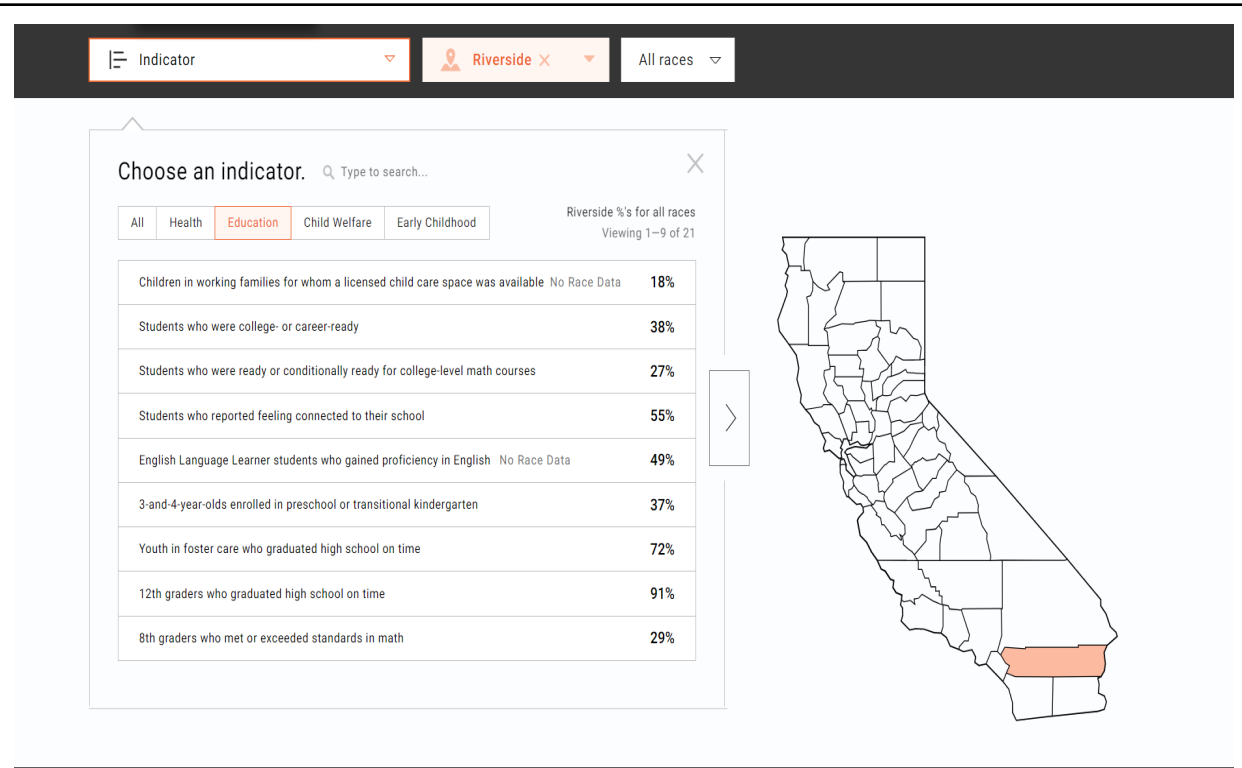
2/3

**FIGURE 18:** This report showcases the level of education people aged 25 and above have and how it connects to their income, job, and ability to speak English. Almost half of the population that are aged 16 and above are unemployed (40%). This statistic may

contribute to the fact that 50% of the population (aged 25 and above) don't have a bachelor's degree and above. This lack of education could be a reason that half of the population are not currently in the workforce.

(Screenshot by Kaitlynrose Kailonn, October 29th, 2021.

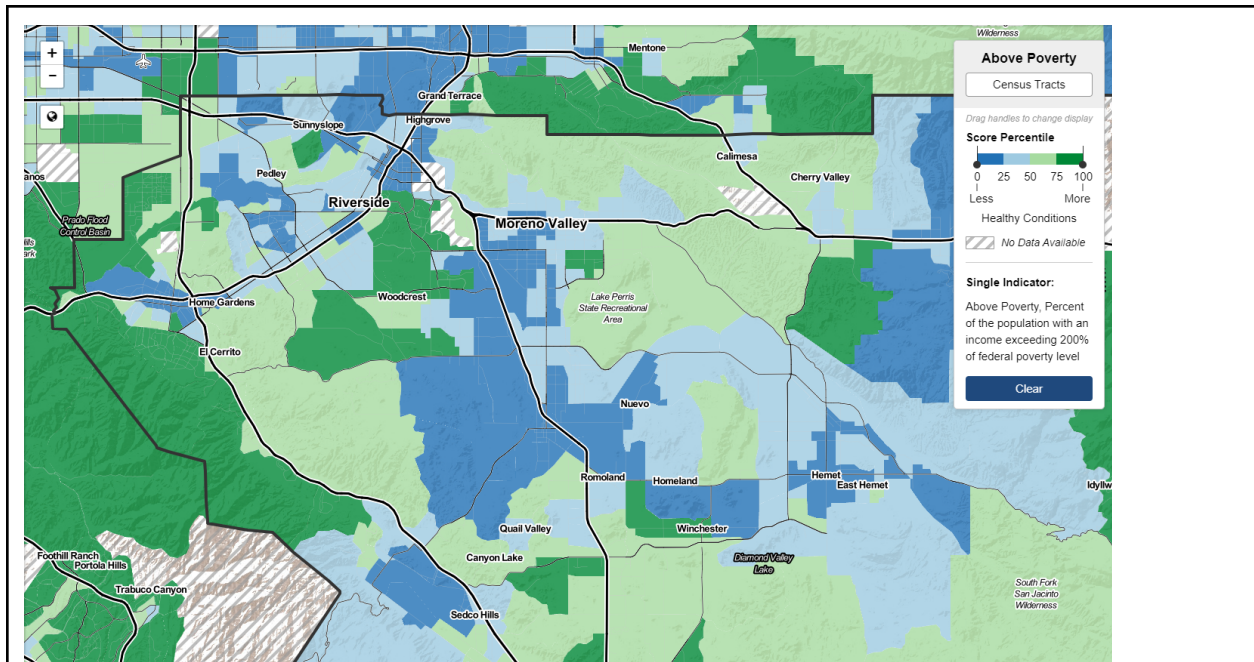
<https://ejscreen.epa.gov/mapper/demogreportpdf.aspx?report=acs2018>)



**FIGURE 19:** Image of generalized statistics in regards to Riverside County's education level. Education rates show that many of the students from 8th–12th grade weren't meeting math standards on a college/high school level. The lack of math preparedness may contribute to the underwhelming amount of budget for schools or the lack of teacher readiness. In addition, the average graduation rate for high school students is 91%, meaning that the majority of students are passing classes.

(Screenshot by Kaitlynrose Kailonn, October 29th, 2021.

<https://scorecard.childrenow.org/?cty=riverside&yr=3>)



**FIGURE 20:** This California Health Places Index (HPI) map compares poverty levels in California counties, with dark blue indicating the highest poverty level. A county-scale view easily obscures poverty and income inequality *within* a county.

(Screenshot by Sean Lee, November 1st, 2021. <https://map.healthylacesindex.org>)

# 4. STAKEHOLDER ANALYSIS

## The Mission to stop Emissions

### *Angelique Lorenzo*

In Riverside county there are many stakeholders that are involved in the active fight for environmental injustice. Living in the county itself the **demographic of the residents** are quite diverse but with about fifty percent of the population being Latino or Hispanic, and black communities. These groups of people are normally the target for environmental injustice which most of the time are **low-income families and poorly supported communities** that aren't given the resources and they need when exposed to environmental vulnerabilities. Within these groups are also "**sensitive receptors**" (children, pregnant women, the sick and elderly), (Jurupa Area Plan, Civic Solution Inc. 2014) which are people who are particularly susceptible to illnesses and diseases. Sadly these residents' pollution burdens are measured by the proximity of which they live to an environmental threat; and in Riverside County's case, there are many schools, hospitals, and residential neighborhoods within 1-3 miles distance to industrial routes or zones (ex. Mira Loma). Driven by the economy **industrial companies such as: Saudi Aramco, Chevron, Amazon and Gazprom**; they work very closely in the surrounding towns with industrial plants and passing through routes leaving behind a trail of pollutants that these residents are trapped by.

There has been a significant increase in the amount of diesel truck activity due to the high production of industrial company plants. With this increase comes the frequent emission of the nitrous oxide (N<sub>2</sub>O) which has made a big impact on the Inland Empires “Smog Belt” with noticeable disadvantages. The **American Lung Association** has explained that Riverside county has failed their air quality analysis and that, “the levels and in the average daily presence of particle pollution, which the U.S. The Environmental Protection Agency defines it as dirt, dust, soot and other ‘inhalable coarse particles’ larger than 2.5 micrometers” (City News Service, 2019). Although big companies like **Walmart and Amazon** are increasing productivity and find that they are helping the community by supplying jobs there is no doubt that it comes with the sacrifice of the community and the slow disaster pollution is one that does take time to show its effects but within the last decade there has been an increase in respiratory illnesses and diseases. These cases that are widely subjective to **young children** are showing up in kids that have no respiratory disease history in their families at all, so **pediatric doctors** have directly linked these cases to local air pollution.

Agencies such as **South Coast Air Quality Management**, have been working towards reducing emissions and are seeing minor improvements. However, with an elongated slow disaster such as air pollution over the years, it will definitely take much longer to see complete results in the air quality and a recovery of the surrounding community from respiratory problems. Currently in this day in age there is much more attention on environmental injustice so there are more regulations, plans, and programs that are geared in aiding these troubled communities.

# 5. STAKEHOLDER ACTIONS

## The Fight Against Polluters and Enablers

*Cristopher Castillo*

Riverside County contains a variety of different stakeholders ranging from local residents and communities to an epidemiologist looking to solve the county's issues. Despite this wide range of stakeholders, everyone is taking varying degrees of action.

To begin, the residents of Riverside County are beginning to take a stand against the corporations and industries polluting their communities. In the Inland Empire, there is increasing pushback against warehouses and trucks from "the semi-rural communities of color to the upper-income White residents" (Scauzillo 2021). This is due, in part, by the citizens' realization of the environmental issues in their towns. Riverside County residents are beginning to speak out about their health concerns over the warehouses and truck-traffic close to their homes and some towns have even begun sending out surveys to gather these concerns. Additionally, Cesunica Ivey, an expert in air quality modeling, and Susan Anenberg, an epidemiologist, have been working collaboratively with local community activists in order to use air quality management technology to gather information on air pollution in these communities and connect it to the **health disparities** the people are facing. They then want to give this information to the residents so they can begin to "advocate for targeted pollution mitigation efforts." (Bourzac 2021). However, even though there is increasing information on the pollution affecting the residents, there

is still not enough data or media coverage. This leads to the inaction of many residents because they are simply unaware of how much their surroundings are affecting their lives. Plus, a lot of residents are either not able to take action because of insufficient means or are employed by the industries, forcing them to stay compliant in order to survive.

Another stakeholder group involved in this county are the industries and corporations which create the warehouses and truck-traffic. Some of these corporations include Amazon, Walmart, Costco as well as real estate development companies specializing in large scale industrial developments, like Highland Fairview. These stakeholders continue to propose new projects for warehouses and other industrial projects with little to no regard for the harm they may cause with the reasoning that they generate jobs and money for the economy. Even so, these industries and corporations only share part of the blame as it is local governments and industry-supporting politicians which enable them to continue with their projects. According to the former California Attorney General, Xavier Becerra, the Moreno Valley City Council allegedly ignored California policy in order to approve a massive Highland Fairview project, one that would increase the amount of emissions in Moreno Valley. Moreno Valley City Councilwoman Victoria Baca and the rest of the city council denied his allegations, causing Becerra to file an amicus brief. Without the local government to regulate these industries, it is up to other organizations to take action. For instance, the South Coast Air Quality Management District has already passed regulation on diesel trucks making them change to "electric-powered trucks, install solar panels and use electric vans to deliver packages, among many clean-energy or zero-emission options." (Scauzillo 2021). Now they are looking to regulate warehouses in an effort to lower emissions.

Other stakeholders that are helping are the American Lung Association and Riverside County. The American Lung Association reports on air quality in certain states as well as the demographics affected by the quality in an effort to "[urge] federal officials to adopt a stricter standard for ground-level ozone pollution under the Clean Air Act." (James 2014). Riverside County as a whole has adopted the "good neighbor policy," a policy which sets a



300-foot minimum buffer zone between warehouse loading docks and schools/homes.

Riverside County is full of various different stakeholders, but it is also home to different environmental issues. In the end it is up to the residents and those willing to help to take actions against the corporations and their enablers.

# 6. ROLE OF MEDIA AND BIG ENVIRONMENTAL ORGANIZATIONS

## Poor Air Quality and the News

*Carlos Perez Pacheco*

Information on slow disasters affecting Riverside county might be difficult to find considering the complex interaction between residents of Riverside county and the air they breathe. For starters, a simple search and one single article on slow disaster might not provide a full picture of the driving forces of slow disaster like the cause and effects of air pollution. Therefore, an array of research articles discussing the nature of air pollution, its effect on health and ways to improve air quality are good segments to work with and find information on. In addition to that, it is also of great importance to consider the political, economic and social forces that might perpetuate a cycle of poor air quality in Riverside County. These issues do not readily show up in a single article or encyclopedia. In Wikipedia, for example, entries on environmental challenges or hazards are absent. The only information provided concerning the environment is a temperature graph, which is peculiar since Riverside, as a part of the Inland Empire (Riverside-San Bernardino-Ontario metropolitan area), experiences a significant portion of the year with bad air quality due to

smog and soot, according to the *Environment America Research and Policy Center* (Morgan 2020). Reports from reputable organizations such as the *EARPC* which publishes yearly reports on air quality data on counties across the country indicate that the Inland Empire consistently has poor air quality and ranks in the top 3 of counties with worst air quality (Folger 20, 2020). In *Environment America's* 2018 report on ozone and PM 2.5 emissions, the Inland Empire scored the most days in 2018 in which half or more monitoring locations reported elevated ozone and/or PM 2.5 out of all studied metropolitan areas in the United States, with 227 days or more than 60% of the year (Folger 20, 2020). PM 2.5 and ozone are the main ingredients in air pollution, and they cause adverse health effects on the body. They were responsible for dozens of thousands of premature deaths around the world in 2018; people exposed to PM 2.5 were at higher risk of developing emphysema and stroke according to *Journal of the American Medical Association*; and people exposed to PM 2.5 were at high risk of developing cancer, according to the *International Agency for Research on Cancer (IARC)* (Folger 10). Although these findings are unsettling, they provide quantitative data on health complications attributed to bad air quality that should be discussed and reported by the media.

An Orange County news report on air pollution written by environmental reporter Martin Wisckol and published by *The Orange County Register* summarizes air pollution quality in Southern California, its adverse health effects, and ways to reduce pollution by citing a couple of environmental reports, one very similar to *Environment America*. The news article mentions that according to the *Environment California-CALPIRG* study conducted in 2020, the Inland Empire placed third in terms of worst air quality in the country. Wisckol cites from the 2020 *Environment California* report: "The Inland Empire ranked as having the nation's worst smog in 2020." Smog, also known as ground-level ozone, is attributed to "nitrogen oxide emissions from transportation-related fossil fuels." Fossil fuel emissions from transportation are one of the leading sources of nitrogen oxide emissions according to *Environment California*, an affiliated organization to *Environment America*. The news article does provide, however, helpful suggestions on reducing air pollution. Individual

choices like biking, taking public transportation, "combining online purchase into one shipment," reducing meat consumption, and moving to renewable energy sources (solar panels, electricity) reduces an individual's ozone and PM 2.5 footprint (Wisckol 2021). Nevertheless, extra-local policy initiatives such as enforcing and expanding the Clean Air Act, incentivizing renewable energy such as wind and solar, directing funds to establishing better transit, and promoting using public transportation, biking and walking can be synergistic strategies to promote a cleaner environment at the community and state level. Suggestions on improving environmental problems in news articles should be more prominent in local newspapers so its readership stays informed on the sources of air pollution, how they can make changes at the personal level and make change at the neighborhood, community, and state level, and know the quality of the air they are breathing.

One significant piece of information at the heart of the air pollution in Riverside county is the big picture of consumerism. Part of the increase in pollution by trucks carrying goods to storage facilities such as Amazon work in a cycle of making sure that imported or local shipments arrive on time. Given that some customers expect same-day delivery the stakes run high to ensure the customer receives their package in the interest of productivity at the cost of burning diesel fuel, expanding a storage monopoly upon recreational areas, homes, and schools, and continuing a deteriorating cycle of poor health attributed to air pollution. The Amazon company, for example, plays an important economic role; it is the second biggest employer in Riverside County, in which Black or Hispanic comprise more than half of the population, according to 2019 census numbers (Horseman 2021). Being a key employer in the county, Amazon's employees may feel intimidated to fight back against an employer like Amazon and risk working in unhealthy conditions (Horseman 2021). Amazon has a major influence in the labor market and so does the Logistics industry, the umbrella of the storage and transportation industry in the Inland Empire, with its complex driving forces: high demand of online goods, excess of imported goods, limited storage space in LA facilities, and the urgency to deliver same day deliveries. This information

helps understand the complexity of stakeholders, market forces, and the hegemonic presence of big companies profiting off of a low-skilled labor force and exacerbating poor air quality.

## **7. RECOMMENDED LOCAL ACTIONS**

### **Long-term Actions for Long-time pollution**

*Kaitlynrose Kailonn*

Often, society has taken our environmental sources for granted. For example, we have consistently burned coal and oil, chopped trees for resources and even used animals as a source of food and entertainment for generations. As a result, our environment has been placed in a bad condition; increasing temperatures, animal extinction, and mass wildfires are signs of environmental retaliation. With these signs, there has been an increase of initiatives to fight against climate change, specifically air pollution in Riverside County. From updating policies to holding lawsuits against those causing environmental vulnerability, Riverside County residents hope to rid of the long-term pollution that has been allowed in their community. In order to fight off the long-term pollution, Riverside County itself must attempt multiple solutions to ensure a safer future for their community. In the next few paragraphs, we will be discussing which actions Riverside County should consider or move forward with when attempting to solve their long-term pollution.

One of the main solutions Riverside County constituents are currently working on and should continue to push is changing diesel from electric-powered trucks and using electric vans to deliver packages. According to the EPA, “Greenhouse gas (GHG) emissions from transportation account for about 29 percent of total U.S. greenhouse gas emissions, making it the largest contributor of U.S. GHG emissions.” (Carbon Pollution from Transportation n.d.). Considering Riverside has a considerable amount of warehouses in its vicinity, trucks and vans are constantly transporting objects through Riverside which can accumulate a lot of air pollution. If Riverside were to switch to electric transportation for goods, it would reduce the amount of pollution by transportation by a significant amount. According to the South Coast Air Quality Management District, “The district estimates its rule will cut nitrogen oxide emissions by 1½ to 3 tons a day, or 10% to 15% by 2031” (Scauzillo 2021). In addition to reducing the amount of pollution, it would also help the people. The switch to electric trucks and vans “could lead to 150 to 300 fewer deaths, 2,500 to 5,800 fewer asthma attacks, and 9,000 to 20,000 fewer lost workdays” as well as reduce the amount of bills spent going to the hospital for air issues “ between \$1.2 billion to \$2.7 billion. . .” (Scauzillo 2021). By switching to electric transportation rather than using diesel transportation, Riverside Community would be positively affected by the changes and reduce the amount of air pollution in Riverside.

Another solution that community members could implement individually or community-wise would be air purifiers in households and public buildings. Riverside County’s air quality is ranked F and is considered one of the worst counties for air quality. Since the air quality is not in the best state, people living in Riverside County have a higher chance to encounter health issues pertaining to air pollution such as lung cancer. Although there are many movements attempting to reduce the amount of pollution in the air, the air pollution will not go away in an instant. In order to negate the negative impacts of bad air quality, people can resist the pollutants in the air by buying air purifiers. Air purifiers’ purpose is to rid of airborne pollutants that cause sickness and allergies. By investing in an air purifier for their household, a person is able to have a safe space where they are less vulnerable to

pollutants that cause sickness. Evidence from the CDC shows the use of air purifiers specifically HEPA filters reduces exposure to aerosols by up to 65% (“Efficacy of Portable Air Cleaners and Masking for Reducing Indoor Exposure to Simulated Exhaled SARS-CoV-2 Aerosols – United States, 2021” 2021). Therefore, a person’s living atmosphere can be significantly cleaner with an investment for an air purifier. In relation to public buildings, the combination of masks and air purifiers can make it nearly impossible for pollutants to be in your environment’s vicinity. According to the CDC, “the HEPA air cleaners and masks reduced exposure to respiratory aerosols by up to 90%” (“Efficacy of Portable Air Cleaners and Masking for Reducing Indoor Exposure to Simulated Exhaled SARS-CoV-2 Aerosols – United States, 2021” 2021).

Wearing a mask is often a requirement in any space outside of your home whereas air purifiers aren’t necessarily required in any building. However, with the addition of an air purifier in public buildings such as schools, people, especially students would be able to remain safe from the toxic pollutants during classroom learning. Local government and community can enforce this action by having a specific regulation limiting the amount of aerosol particles in the air for schools. This initiative would encourage administrators to purchase air purifiers for classrooms and overall contribute to a healthier campus for students.

One problem in Riverside that is also causing long-term pollution would be water pollution. According to the Environmental Working Group’s data, in the city of Murrieta (a city in Riverside County), “17 contaminants in the water supply, and 6 that they believe are above the EWG’s own recommended health guidelines. . .” (“Riverside County: Is our water safe to drink?” 2019). In the same article, it was revealed that the EPA has been very behind in regards to updating water records. This can prove quite dangerous because people could be consuming water with high amounts of contaminants and were unaware about how harmful the water could be. Therefore, a solution for this would be community involvement in reporting. To ensure that the water is safe to drink and not highly detrimental to your health at times, community members can sample an amount of

drinking water every month to review the contaminants with it. If the contaminants seem to be highly above the average, the people can bring attention to the harmful effects of the water and local government officials assess the importance of the issue. Although it may not be an occasional response, showing urgency to the idea as well as expressing information and media is important when it comes to health pertaining issues.

Last but not least, one of the main priorities would be to create awareness to younger generations. Younger generations will be our future leaders, and they will have to deal with whatever mess the prior generations left for them to clean up such as climate change and environmental injustice. If the younger generations remain unaware about the importance of stopping climate change and uninformed about how to advocate in their community, they will be unable to fight for their ideals through the legal process.

Therefore, my solution to bring more awareness is to create a high school program or club that engages high school students into finding solutions for environmental issues in their community. During high school, many students want to engage in activities that will look good on their college applications to make them competitive. Fighting for environmental justice would be considered one of those activities that students are going to be an asset to their school. Even though they may be doing it for visual outlook, being in the program would help educate as many students as possible to learn about how they can advocate in their communities for environmental justice and plausibly apply it to real life situations. In addition, fighting for their passions or what they believe in could spark an interest in political science or environmental justice.

In relation to spreading awareness , we decided to brainstorm a high school organization connected to environmental awareness and action. This high school organization would be called “Changing our Lifestyle through Environmental Action” also known as CLEA. Our main goals for the program would be to educate students on how to spread environmental awareness in their community, explaining how to get involved in environmental activism through organization actions, and to get students to remain



involved with the program or other types of activism after they complete the program. Our activities to meet our goals would include inviting organizations that talk about their method of activism, explaining how to lobby government officials, and different careers that fit in the environmental justice field. For interactive activities, we would host two projects: individual projects explaining a particular subject they are passionate about and a group project pertaining to industrial agriculture issues. These projects would be focusing on researching the issue, finding solutions and advocating for their project. Overall, we hope that students would get motivated to make a difference in their community.

In regards to our solutions, we would suggest that their first priority solution would be to change diesel fueled trucks and vans to electric vehicles. Since Riverside County is already working on the initiative and has a large amount of support, we believe it should be their first priority to win the initiative. The solution we decided would be the second utmost priority is getting the air purification system in public schools and households. It would guarantee less health issues in the community as well as economically it would lower the cost of hospital bills for low-income families. The solution we suggest to focus on third would be to spread awareness to younger generations. Climate change is rapidly harming the environment we live in. We must inform the younger generations so we can have more support in fighting climate change. The community mapping for water contamination was ranked lower because technically the EPA is getting information about the water; the information is just arriving slower.

Overall, Riverside County has taken amazing initiative to combat climate change in their community. From having a reliable water partnership to prepare for drought as well as having one of the main cities leading in solar panels ("Why are People Investing in Solar Installation in Riverside?" 2020), Riverside County's community members are doing as much as they can to reduce the amount of air pollution. In regards to our solutions, we would suggest that their first priority solution would be to change diesel fueled trucks and

vans to electric vehicles. In order to guarantee a better environment in the future, Riverside County must continuously find local-government solutions to fight against the pollution in their community.

## **8. RECOMMENDED EXTRA-LOCAL ACTIONS**

### **What the Extra-Locals Gave Done and What Can be Improved/Added**

*Joseph-Iann Wong*

As a group, we have collaborated and discussed the various extra-local actions that could be done: Following this discussion, we have decided to make a ranked list dedicated to which ones we believe is best for Riverside county. The first problem we identified was the way in which hazardous materials were being disposed of. While Riverside has their own way of handling a situation like this, "funding their waste minimization and household hazardous waste collection program through a 25 cent surcharge on the sold waste tipping fee at landfills" (Hanlon 1990), there should be ways Riverside could work on solutions towards this issue more. Ranked number 4 on our list, our group has agreed that the government should look for **a way to promote the use of less hazardous materials and find better, more eco-friendly alternatives.** For example they could raise taxes on the

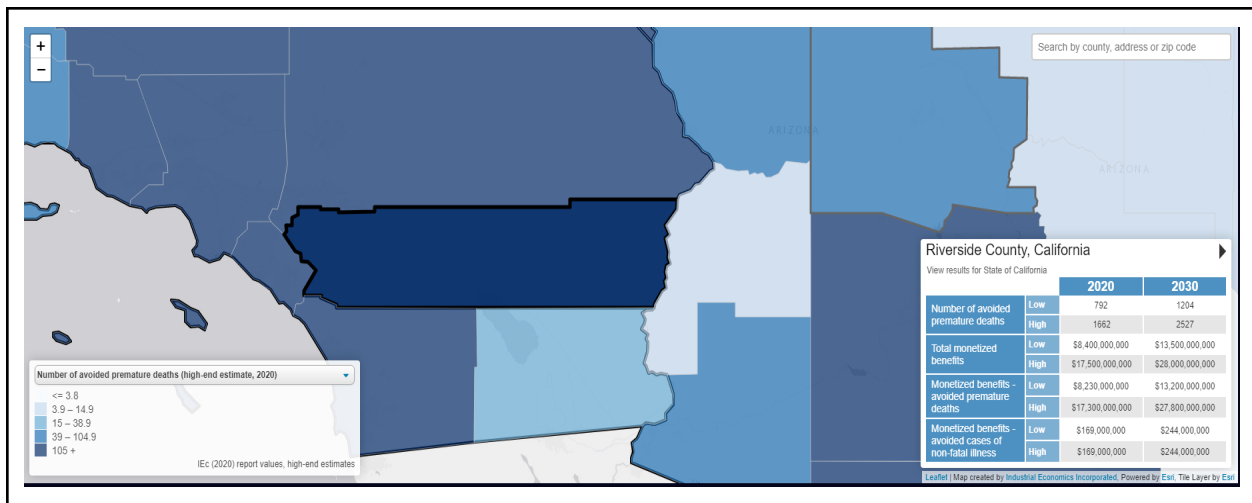
usage of the various hazmats used, thus forcing companies to look for better alternatives. The reason for this being the lowest on the list is because, this isn't the main issue that Riverside has a particular problem with. This solution, while incredibly helpful for the environment, isn't always possible and not as helpful towards Riverside specifically.

The next issue that came up in our discussion was the water pollution affecting Riverside County. In the Riverside Addendum, there are various solutions to various other pollution such as air pollution, but there was relatively little said about water pollution: "improving water quality inputs adjacent to the river course. . ." (Riverside County 2009). While there are some solutions as to how they plan to improve the water quality, there is little said about what they plan to do when it comes to helping with the various risks associated with poor water quality. Therefore, ranked number three on our list, **Riverside County should add funding to the various schools in order to invest in water filters.** Rather than forcing the community to raise up their own money for the filters, the government can step in to provide extra funding or even raise taxes to invest in these filters. As a reactive measure, this will help prevent (or at the very least delay) the side effects of poor water quality control. By having these filters in all schools, that would at the very least help the first eighteen years of a child's life from being at high risk to these side effects.

As we discussed and researched further into the various solutions, we entered a topic that none of us have really heard before: Light pollution. An issue that has spawned due to the air pollution or at very least, related to it. According to Cameran Hooshang Ashraf: "Light pollution costs taxpayers millions of dollars, decreases the visibility of the night sky, affects human health. . ." (Ashraf 2008). It is quite interesting that as university students, we have really never heard of this kind of problem, especially one of this magnitude. While Riverside has a regulation policy, it still interests our group how this is seemingly swept under the rug relative to the other slow disasters. In turn, this leads to our number 2 extra-local action which is **adding new (state-minimum) required disaster courses for high school students.** By adding these new GE course(s), it will teach the students more about the various disasters that potentially affect them. Giving these students more

resources to learn is what helps cultivate the next generation of environmental activism. Without these classes, most students wouldn't really give a second thought as to what disasters are slowly killing them since the effects aren't instantly affecting them.

Many of the recommended extra-local actions discussed so far have been very reactive actions that could be done as soon as possible. Many of the actions will definitely help with the side effects of the biggest problem of climate change. Due to the excessive pollution (not just Riverside County), we are constantly contributing to the ever-growing problem in climate change. As a group we concluded that number 1 on our list would be an extra-local action that would help combat this issue, even if it doesn't entirely solve it. Our rank one recommended local action was to **standardize the uses of electric buses in place of a standard gas-fueled one. And, in combination with this, we recommend that the government promote offline shopping and less driving.** The federal governments are the ones in control of manufacturing buses. So, rather than making buses that feed into the carbon emission problem, the federal government should start manufacturing electric buses. By switching to electric buses, carbon emissions will reduce drastically. Also, if the government promotes driving less by doing something like restricting what can be bought online or by promoting group delivery (by giving rewards for waiting the extra day to have all items delivered all at once), that would help in reducing carbon emissions since the amount of transportation for delivering and buying products would be cut down significantly.



**FIGURE 21:** According to the figure, Riverside County has one of the highest avoided premature deaths thanks to the Clean Air Act. The Clean Air Act prevented hundreds of deaths with a projected 1000+ more in the coming 10 years.

(Screenshot by Joseph-Iann Wong, October 27th, 2021.

<https://www.nrdc.org/resources/clean-air-acts-benefits-map> )

# 9. RECOMMENDATIONS FOR FUTURE RESEARCH

## The Voice of the People is the Solution

*Sean Lee*

One of the biggest factors of environmental injustice in Riverside County is the air pollution. This isn't surprising as Riverside is the hotspot for warehouses such as those belonging to Amazon. These warehouses have been growing at a rapid pace and the fumes they release intoxicate the air. "Riverside County was one of a number of counties in California graded 'F' for air quality on the American Lung Association's 2019 'State of the Air' report card" and "According to the 20th annual analysis, Riverside County scored failing grades in smog -- or ozone -- levels and in the average daily presence of particle pollution" (City News Service).

To create change, we need to focus our research on those affected by air pollution. So why not focus on the people who live in these warehouse populated areas. Due to a large growth of warehouses in the area, a lot of peoples home's are very close to these warehouse zones. According to NBC, "The growth also brought warehouse development projects closer to people's homes, in some cases right up against their backyards, despite warnings from state air quality regulators to keep homes more than 1,000 feet from distribution centers because of truck traffic" (Olivia Solon n.d.). Our research should try to

help address and raise awareness of the health issues that have been developed by locals due to the air pollution in Riverside County. Our research would be survey based and we would ask residents of Riverside County if they know how air pollution is affecting their health.

#### QUALITATIVE STUDY: *The Voice of the Affected*

How do residents of Riverside County perceive the air pollution in the area? Do they understand what the air pollution in the area can do to their health? Has it affected their health? These questions will help us collect data about how the residents perceive and have dealt with the air pollution in the area. If given the opportunity to study Riverside County, we would study the residents who live around these warehouse populated areas and residents of Riverside in general. To gain access to all these individuals, we would conduct a random survey online through social media as that will be easier and more convenient for most people. We want to make sure the survey is anonymous to protect individuals' identities so there isn't any attention drawn towards them in the future by these companies. These surveys will all be participant based but will have individuals answer a series of in-depth interview questions. Questions we would ask in the survey are:

How bad do you think the air pollution is in Riverside County?

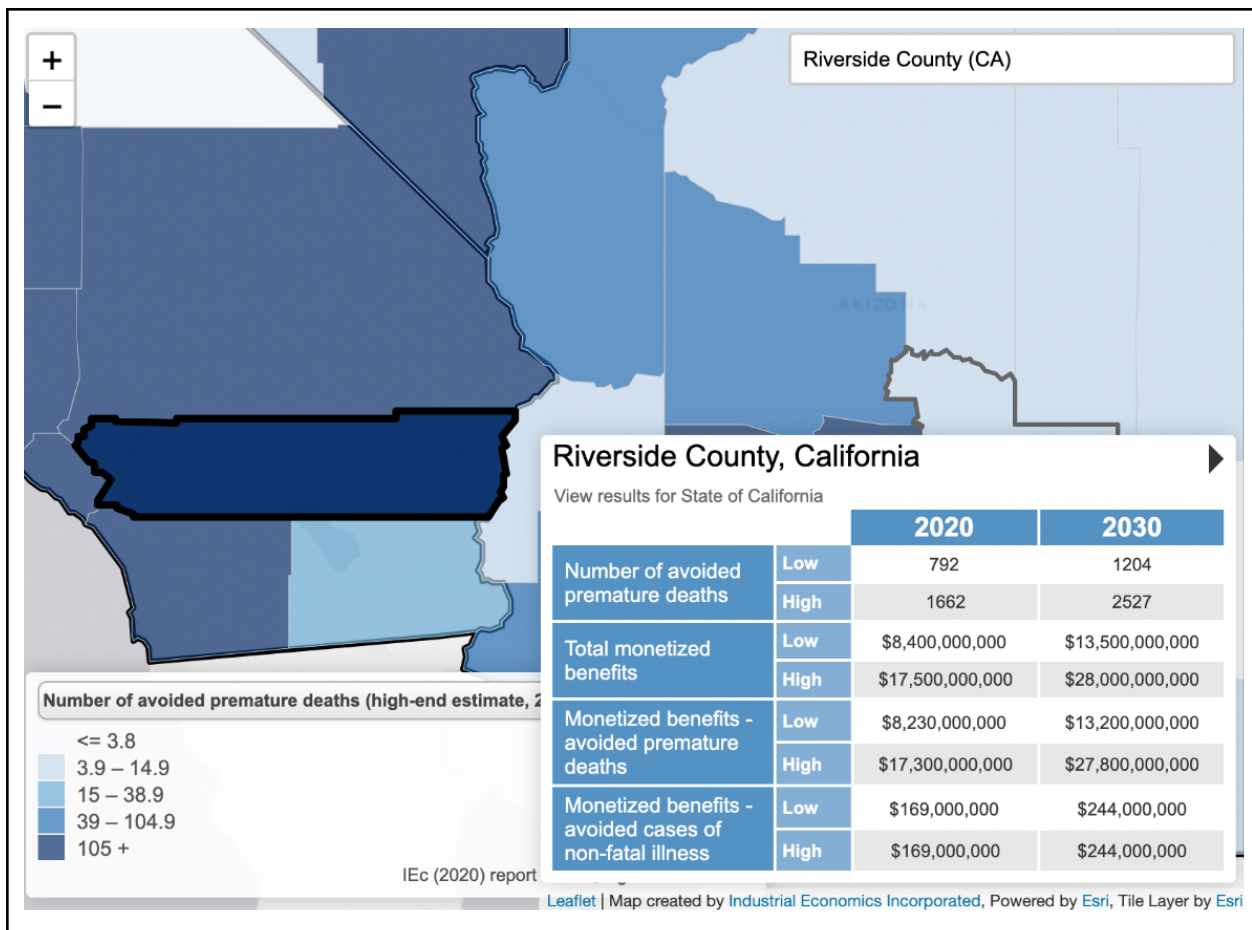
Do you believe it is affecting your health? If so, in what ways has it affected you?

Do you know what health issues can be caused by the air pollution surrounding you?

By asking these questions, we can get a general idea of what local residents believe is happening, and it lets those affected speak out about the problems they have faced. It lets us raise more awareness about health issues that may go unspoken that the air pollution is causing. We could use focus groups such as focusing on residents that live in these

warehouse populated areas specifically to get a better idea of how much worse their health is compared to those who may live further away.

Everyone would find this research useful, especially the residents of Riverside County. By doing this extensive research we can start raising awareness of health issues caused by air pollution. By raising awareness, we can have people act upon it to try to get change within the area and battle the companies that have tarnished the air. The more people that know about the issues, the more likely something will get done to help prevent them. Hopefully by doing this research it helps the residents and government of Riverside County focus on reducing the air pollution and making sure that the warehouses follow health guidelines for the sake of the community.



**FIGURE 22:** This is an image of the map that indicated the premature deaths that were



avoided and the monetized benefits gained from air pollutant effects in 2020 and the predicted next decade. Though they present the data for avoiding premature deaths, the numbers are alarmingly high and only increase in the foreseeing decade. Because of the heavily polluted environment, the total monetized benefits are way over \$17 billion, which again increases to \$28 billion in the next decade.

(screenshot by Beatriz Leal, October 29, 2021.

<https://www.nrdc.org/resources/clean-air-acts-benefits-map>)

# 10. INJUSTICE ANALYSIS

## The Perpetual Cycle and Repetition of Interconnected Injustices

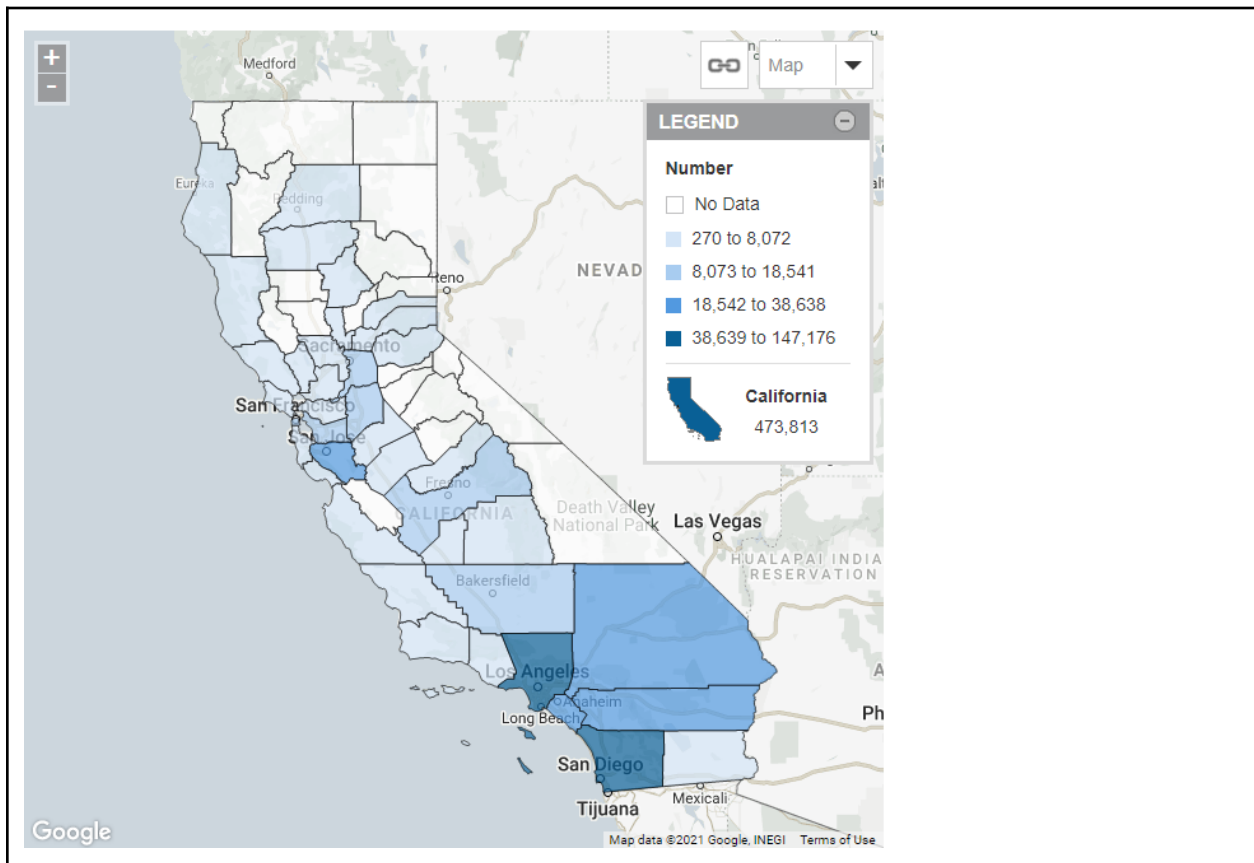
*Conner Danskin*

There are many instances of different injustices that are present in Riverside County for the topic of slow disasters, many of which are interconnected and compound upon one another. One important topic of injustice in Riverside is that of water pollution. It is essential that a community is aware of risks that potentially awaits them, however Riverside suffers from **epistemic injustice** where misinformation is spread across the county. A prime example of this is seen by how reports of water quality are not completely accurate, or in some cases just false. This intersects with **data injustice** that is present in the county as there is often a serious lack of awareness about complex systemic risks, such as droughts. This creates a lot of obvious danger for residents in their respective communities because they could be subjected to risks that they are unintentionally unaware of (“Drought Report Calls for New Management Approach” 2021). Additionally, **media injustice** plays a crucial role in the perpetuation and compounding of injustices because of how there is such a lack of attention being given to said injustices by media sources to begin with. For example, it is very difficult to find news coverage on the everyday pollution that occurs from large factories, traffic, and similar contributors, at both the local and extralocal levels, mainly because such issues are not even considered to be important enough to be covered.

Systemic injustices that prevent community members from having an equal opportunity to communicate beliefs or feelings towards particular subjects are also present in Riverside County. For instance, only one out of five of the Board of Supervisors in Riverside County is female. This is an obvious **gender injustice** that is present in the county as women, a group representing about half of the population, are only represented as twenty percent of the top county officials. Similarly, there is **procedural injustice** as residents of the county do not have that great of an ability to make their voices heard regarding slow disaster issues such as everyday pollution caused by traffic and facilities. This is especially dangerous for the wellbeing of the county as those who are affected by the issues the most are not given a voice from which to be heard. It is very likely that, given the chance, community members would be more than willing to be engaged with the discussion of their quality of life and the health of their environment. Additionally, there is a large amount of **infrastructure injustice** present in the county as the infrastructure does not support a way for large trucking companies and facilities to exist without bothering the communities. Due to this fact, lower income communities tend to face higher risks to these polluters which relates to the disproportionate effects of environmental injustice to specific groups and communities. As said commonly by environmental activists, an important and easy indicator that can be used when describing a community's health is their zip code (Service, C. N. 2019). This goes to show the importance of recognizing these issues rather than avoiding them and leaving them to compound as an issue for the future.

More focused on the residents of Riverside County, they face many individual injustices that are compounded with each other in addition to the other injustices previously mentioned. Many residents have to face consistent **economic injustice** where poverty and economic disparities create a greater hazard for those that reside in lower income areas. Redlining, for instance, has gravely affected the lives of the people in this setting. Lower income individuals were essentially given only the option to live in these communities with terrible air quality and no promising hope for resolution of the issue at hand. Large industrial operations, like warehouses and trucking companies, contribute substantially to

the reduction of air quality in the environment (Global Site Plans - The Grid n.d.). This is especially true for lower income communities that reside near large freeways that are frequently full of traffic, including large trucks, that consistently release a lot of pollution. **Racial injustice**, similarly to **systemic racism**, is relevant in this case as some social groups are disproportionately affected by hazards induced in Riverside. Approximately two thirds of the population in Riverside County are people of color, so it is obvious that they make up a large portion of those affected by air quality. People of color and people from low-income families are especially affected because they do not have the necessary resources and ability to move to better areas that have fresh food, tools, etc., which substantially decreases their standard of living (“Report: Heart Disease Devastating to Riverside County Residents.” 2013). These disproportionate effects can be seen across multiple cities in the county, and naturally those that are living in these areas are suffering more health consequences without much choice for an alternative.



**FIGURE 23:** According to 2018 data, 0.1% of children that are ages 0–5 in Riverside County have elevated blood lead levels. Lead exposure can take place at home (by air, soil or ingestion of old paint) or even in daycare facilities. Starting in 2020, California daycares are now required by law to test their drinking water for lead (Savidge 2018). This goes to show both the intergenerational and reproductive injustices occurring in Riverside even in the places where children should feel the most safe.

(Screenshot by Conner Danskin, October 25th, 2021.

<https://www.kidsdata.org/topic/529/blood-lead-level/table?print=true#fmt=706&loc=367&tf=108&ch=484,1029,1030,1472,1473,1474&sortColumnId=0&sortType=asc> )

**Health injustice** is also pertinent in this case as it is the resulting health effects that come from everyday pollution. Not only are those living in Riverside county exposed to the pollution from within their own communities, but are also facing health detriments from pollution occurring in other counties, such as Los Angeles county (Global Site Plans – The Grid n.d.). In a report detailing groups considered at greater risk due to air pollution in Riverside, there are “an estimated 54,000 children suffering from asthma and 145,000 adults with asthma in a total population of about 2.3 million” (James 2014). This shows a concerning amount of the population that have adverse health effects from their communities that they likely have no choice but to live in and suffer from. State officials have also identified areas such as Coachella Valley and Imperial Valley as disproportionately burdened by pollution (James 2014). The Environmental Protection Agency has even “linked year-round exposure with increased hospital visits and slowed lung growth in children and teenagers. New studies found elderly women breathing unsafe levels of fine-particle pollution were twice as likely to develop dementia and Alzheimer’s disease.” (Scauzillo 2018). These are only some of the major **health disparities** that occur due to everyday pollution that is emitted into the environment on an ever-growing massive scale. This also contributes to **intergenerational injustice** from which future generations are impacted by the decisions made by the people living today. A prime example of this is that those who are commuting to their jobs everyday, in their own car, are contributing heavy amounts of pollution into the environment that affect future generations due to traffic and other factors. Also, the lack of action taken by those

residing in the communities now also is setting a precedent for a perpetual cycle of established ignorance. Similarly to intergenerational injustice, **reproductive injustice** is also present as many communities have schools and housing very close to freeways with high pollution contribution. This causes kids who grow up in these areas to be substantially more exposed to the poor air quality that results from this resulting in the aforementioned health effects.

As described in this case study, there are many different types of injustices that are affecting Riverside County, as has been for decades. These injustices can be as narrow as individual households, while also having the possibility to broaden affecting other counties. Many of these injustices compound with one another and build up to a point where there is seemingly no way to reverse it. Too much time has been wasted avoiding these issues, and they do not only impact the environment, but also the people who reside there. Action needs to be taken to work towards a better future for the environment, those currently living in Riverside County, and the future generations that are to come.

# BIBLIOGRAPHY

- Adolphe, Juweek, Ankita Rao and Erum Salam. 2020. "Which US States Make It Hardest to Vote?" *The Guardian*. Accessed October 28, 2021.  
<http://www.theguardian.com/us-news/ng-interactive/2019/nov/07/which-us-states-hardest-vote-suppression-election>.
- American Lung Association. n.d. "Riverside." *American Lung Association*. Accessed October 26, 2021.  
<https://www.lung.org/research/sota/city-rankings/states/california/riverside>.
- Barboza, Tony. 2021. "Southern California Warehouse Boom a Huge Source of Pollution. Regulators Are Fighting Back." *Los Angeles Times*, May 5, 2021.  
<https://www.latimes.com/california/story/2021-05-05/air-quality-officials-target-warehouses-bid-to-curb-health-damaging-truck-pollution>.
- Bourzac, Katherine. 2021. "A local look at air pollution highlights inequalities within cities." *Chemical and Engineering News*. Accessed October 28, 2021.  
<https://cen.acs.org/environment/pollution/local-air-quality-monitoring-inequalities/99/i23>.
- California Air Resources Board. n.d. "Environmental Justice | California Air Resources Board." Accessed November 2, 2021.  
<https://ww2.arb.ca.gov/our-work/topics/environmental-justice>.
- California Healthy Places. n.d. "California Healthy Places Index Map." Accessed November 2, 2021. <https://map.healthyplacesindex.org/>.
- Chan, Jacqueline, et al. 2027. "Climate Change and Health Profile Report Riverside County." *California Department of Public Health*.  
[https://scag.ca.gov/sites/main/files/file-attachments/chpr065riverside\\_county2-23-17.pdf](https://scag.ca.gov/sites/main/files/file-attachments/chpr065riverside_county2-23-17.pdf)
- Chariot Energy. "Natural Gas or Solar Energy: Which Should You Choose?" Accessed November 2, 2021.  
<https://chariotenergy.com/chariot-university/natural-gas-vs-solar-energy/>.
- Cherry, Brett. "Children's Asthma and Allergies - RMC," January 12, 2015.

<https://www.riversidemedicalclinic.com/news-item-1-2-2/>.

City-Data. n.d. "Riverside County, California Detailed Profile - Houses, Real Estate, Cost of Living, Wages, Work, Agriculture, Ancestries, and More." Accessed November 1, 2021. [http://www.city-data.com/county/Riverside\\_County-CA.html](http://www.city-data.com/county/Riverside_County-CA.html).

City News Service. 2019. "Riverside County Receives 'F' for Air Quality." *NBC Los Angeles*. Accessed October 27, 2021. <https://www.nbclosangeles.com/news/riverside-county-receives-f-for-air-quality/163975/>.

County Explorer. "How Much Do You Know about Your County?" Accessed November 1, 2021. <https://explorer.naco.org>.

County of Riverside. n.d. "ArcGIS Web Application." Accessed November 3, 2021. <https://countyofriverside.maps.arcgis.com/apps/webappviewer/index.html?id=eb00468fde9d49bab315800650b0e768>.

County of Riverside. n.d. "Health and Hospital Services." Accessed November 2, 2021. <https://rivco.org/services/health-and-hospital-services>.

Drought. n.d. "Riverside County Conditions." *National Integrated Drought Information System*. Accessed October 28, 2021. <https://www.drought.gov/states/california/county/riverside>.

"EIJ FALL 2019: SLOW CASE STUDY RIVERSIDE (GROUP 16) | Disaster STS Network." Accessed November 3, 2021. <https://disaster-sts-network.org/content/eij-fall-2019-slow-case-study-riverside-group-16>.

"EIJ Fall 2020: Slow Disaster Case Study Riverside County (Group 15) | Disaster STS Network." Accessed November 3, 2021. <http://www.disaster-sts-network.org/content/eij-fall-2020-slow-disaster-case-study-riverside-county-group-15>.

EurekaAlert! n.d. "UC Riverside Researchers to Study Health Impacts of Drought." Accessed October 28, 2021. <https://www.eurekaalert.org/news-releases/848892>.

Fairweather, John H. 1962. "A Practical Air Pollution Control District Approach." *Journal of the Air Pollution Control Association* 12, no. 8 (August 1962): 384–87. <https://doi.org/10/gm8nxh>.

First Congregational Church of Riverside. n.d. "First Congregational Church of Riverside – A Voice of Progressive Christianity in the Inland Empire." Accessed



- November 2, 2021. <https://www.fccriverside.org/>.
- Folger, Morgan et al. 2020 "Trouble in the Air Millions of Americans Breathed Polluted Air in 2018." Environment America Research & Policy Center. [https://environmentamericacenter.org/sites/environment/files/reports/Trouble-In-The-Air/EnvironmentAmerica\\_TroubleintheAir\\_scrn.pdf](https://environmentamericacenter.org/sites/environment/files/reports/Trouble-In-The-Air/EnvironmentAmerica_TroubleintheAir_scrn.pdf)
- Glaser, April, Olivia Solon. 2021. "Amazon's Neighbors near Its California Warehouses Battle Toxic Fumes." *NBC News*. Accessed October 27, 2021. <https://www.nbcnews.com/tech/tech-news/treated-sacrifices-families-breathe-toxic-fumes-california-s-warehouse-hub-n1265420>.
- Group, Environmental Working. "EWG's Tap Water Database: What's in Your Drinking Water?" Accessed October 27, 2021. <https://www.ewg.org/tapwater/system.php?pws=NY5105655?pws=NY510565>.
- Hagen, Ryan Press. 2019. "What Are the Nation's 10 Worst Commutes? Two Riverside County Cities Made the List." *Press Enterprise*, January 15, 2019. <https://www.pe.com/what-are-the-nations-10-worst-commutes-two-riverside-county-cities-made-the-list>.
- Hanlon, Deborah. 1990. "OPPORTUNITIES FOR LOCAL GOVERNMENTS TO PROMOTE POLLUTION PREVENTION." Washington D. C.: U.S. Environmental Protection Agency, March 19, 1990.
- Herrington, A.J. 2021. "California Destroys 1M Plants in Marijuana Eradication Campaign." *High Times*, October 25, 2021. <https://hightimes.com/news/california-destroys-1m-plants-in-marijuana-eradication-campaign/>.
- Horseman, Jeff (2021). "Inland Empire is warehouse central, but how did it happen?" *Press- Enterprise*. <https://www.pe.com/2021/09/29/inland-empire-is-warehouse-central-but-how-did-it-happen/>
- James, Ian. 2014. "Riverside County air quality ranked among worst." *The Desert Sun*. Accessed October 25, 2021. <https://www.desertsun.com/story/news/environment/2014/04/30/american-lung-association-riverside-county-worst-us/8500589/>.
- James, Ian. 2016. "Seeking to Block Sprawl, Activists Sue Riverside County." *The Desert Sun*. Accessed October 28, 2021.

<https://www.desertsun.com/story/news/environment/2016/01/16/seeking-block-sprawl-activists-sue-riverside-county/78870766/>.

Knoblauch, Jessica A. 2021. "What It's Like to Be Boxed In By Amazon." *Earthjustice*, May 24, 2021.

<https://earthjustice.org/blog/2020-april/amazon-inland-empire-workers-covid-19>.

LawHelpCA. n.d. "TODEC Legal Center." Accessed November 2, 2021.

<https://www.lawhelpca.org/org/todec-legal-center>.

Liberty Plumbing Heating Air Conditioning. 2020 "Riverside County: Is Our Water Safe to Drink?" January 27, 2020.

<https://www.libertyplumbingheatingandair.com/blog/riverside-county-is-our-water-safe-to-drink/>.

Lindsey, Rebecca. "Climate Change: Global Sea Level." Government. Climate, October 7, 2021.

<https://www.climate.gov/news-features/understanding-climate/climate-change-global-sea-level>.

Lindsley, William G. "Efficacy of Portable Air Cleaners and Masking for Reducing Indoor Exposure to Simulated Exhaled SARS-CoV-2 Aerosols – United States, 2021." *MMWR. Morbidity and Mortality Weekly Report* 70 (2021).

<https://doi.org/10.15585/mmwr.mm7027e1>.

Mackenzie, Jillian and Jeff Turrentine. 2021. "Air Pollution: Everything You Need to Know." NRDC. Accessed October 26, 2021.

<https://www.nrdc.org/stories/air-pollution-everything-you-need-know>.

Milford, Jana B., Armistead G. Russell, and Gregory J. McRae. "A New Approach to Photochemical Pollution Control: Implications of Spatial Patterns in Pollutant Responses to Reductions in Nitrogen Oxides and Reactive Organic Gas Emissions." *Environmental Science & Technology* 23, no. 10 (October 1989): 1290–1301. <https://doi.org/10/b6gz5r>.

Murrieta, CA Patch. "Report: Heart Disease Devastating to Riverside County Residents," April 1, 2013.

<https://patch.com/california/murrieta/report-heart-disease-devastating-to-riverside-county-residents>.

Ober, Holly. 2021. "Poor Air Quality and Warehouses Linked to Inland Empire

- Covid-19 Inequities.” *Inside UCR*. Accessed October 28, 2021.  
<https://insideucr.ucr.edu/stories/2021/06/02/poor-air-quality-and-warehouses-linked-inland-empire-covid-19-inequities>.
- Patch. n.d. “Riverside County’s Air Quality Among Worst in Nation, Report Finds | Temecula, CA Patch.” Accessed October 27, 2021.  
<https://patch.com/california/temecula/riverside-countys-air-quality-among-worst-nation-report-finds-0>.
- Riverside. “Riverside Addendum.” Riverside, November 2009.
- Riverside County Community Health. n.d. “Sliding Fee Scale Program.” Accessed November 2, 2021.  
<https://www.rivco-familycarecenters.org/SlidingFeeScaleProgram.aspx>.
- Riverside County Parks. “HOME.” Accessed November 2, 2021.  
<https://www.rivcoparks.org>.
- Savidge, Nico. “New California Law Requires Day Care Centers to Test for Lead in Water.” EdSource. Accessed October 25, 2021.  
<https://edsource.org/2018/new-california-law-requires-day-care-centers-to-test-for-lead-in-water/603156>.
- Scauzillo, Steve. 2021. “Pushback against Warehouses in the Inland Empire Gains Momentum.” *Press Enterprise*, October 7, 2021.  
<https://www.pe.com/2021/10/07/pushback-against-warehouses-in-the-inland-empire-gains-momentum>.
- Scauzillo, Steve. 2018. “Southern California Still Has Some of the Worst Air Pollution in the Country, Report Finds.” *Daily News*, April 18, 2018.  
<https://www.dailynews.com/southern-california-has-some-of-the-worst-air-pollution-in-the-country-report-finds>.
- Service • •, City News. “FEMA Ranks Riverside County Among Riskiest in U.S. For Natural Disasters.” *NBC Los Angeles* (blog). Accessed October 27, 2021.  
<https://www.nbclosangeles.com/news/local/fema-ranks-riverside-county-among-riskiest-in-u-s-for-natural-disasters/2497527/>.
- Siewert, Shereen. “Contamination Detected in Riverside Park Soil Tests.” *Wausau Pilot & Review*, June 9, 2020.  
<http://wausaupilotandreview.com/2020/06/08/contamination-detected-in-riverside-park-soil-tests/>.

- Smart Cities Dive. n.d. "Is Riverside County to Blame for Its 'Smog Belt' and Failing Air Quality? | Smart Cities Dive." Accessed October 27, 2021.  
<https://www.smartcitiesdive.com/ex/sustainablecitiescollective/riverside-county-blame-its-smog-belt-failing-air-quality/1021866/>.
- Solar Optimum. 2020. "Why Are People Investing in Solar Installation in Riverside?" . Accessed November 3, 2021.  
<https://www.solaroptimum.com/blog/2020/6/18/why-are-people-investing-in-solar-installation-in-riverside>.
- Unbound Solar. "Solar Incentives by State." Accessed November 2, 2021.  
<https://unboundsolar.com/solar-information/state-solar-incentives>.
- University of California, Riverside. "Community Air Quality Project." School of Medicine Center for Healthy Communities. Accessed November 2, 2021.  
<https://healthycommunities.ucr.edu/community-air-quality-project>.
- University of California, Riverside. "University of California, Riverside." Accessed November 2, 2021. <https://www.ucr.edu/>.
- U.S. Census. "U.S. Census Bureau QuickFacts: Riverside County, California." Accessed November 3, 2021.  
<https://www.census.gov/quickfacts/fact/table/riversidecountycalifornia/PST045219>.
- US EPA, OAR. "Carbon Pollution from Transportation." Overviews and Factsheets, September 10, 2015.  
<https://www.epa.gov/transportation-air-pollution-and-climate-change/carbon-pollution-transportation>.
- WalletHub. 2021. "Greenest States." Accessed November 2, 2021.  
<https://wallethub.com/edu/greenest-states/11987>.
- Weber, Scott. "Riverside Tap Water Rated 2nd Worst in Nation." *NBC Los Angeles* (blog). Accessed October 28, 2021.  
<https://www.nbclosangeles.com/news/local/riverside-tap-water-rated-2nd-worst-in-nation/1888684/>.
- Wikipedia. n.d. "California Locations by Voter Registration." Last modified February 2018.  
[https://en.wikipedia.org/w/index.php?title=California\\_locations\\_by\\_voter\\_registration&oldid=1042775741](https://en.wikipedia.org/w/index.php?title=California_locations_by_voter_registration&oldid=1042775741).

- Wisckol, Martin. 2021. "San Bernardino, Riverside, Los Angeles Counties Rank as Smoggiest in U.S." *Orange County Register*, April 21, 2021.  
<https://www.ocregister.com/2021/04/21/san-bernardino-riverside-and-los-angeles-counties-rank-as-top-three-for-bad-air-in-the-united-states>.
- Wisckol, Martin. 2021. "'Vicious Cycle' Fuels Southern California Air Pollution, the Worst in the U.S." *Orange County Register*, October 5, 2021.  
<https://www.ocregister.com/2021/10/05/vicious-cycle-fuels-southern-california-air-pollution-the-worst-in-the-u-s>.
- World Meteorological Organization. 2021. "Drought Report Calls for New Management Approach." June 17, 2021.  
<https://public.wmo.int/en/media/news/drought-report-calls-new-management-approach>.
- Yarbrough, Beau. 2020. "Moreno Valley Ignored Environmental Law When It OK'd World Logistics Center, California Attorney General Says." *Press Enterprise*, January 10, 2020.  
<https://www.pe.com/2020/01/10/moreno-valley-ignored-environmental-law-when-it-okd-world-logistics-center-california-attorney-general-says>.
- Zilliac, Chloe. 2020. "Are Warehouses in the Inland Empire a Blessing or a Curse?" *Sierra Club*, January 17, 2020.  
<https://www.sierraclub.org/sierra/are-warehouses-inland-empire-blessing-or-curse>.

# FIGURES

## COVER IMAGE

- FIGURE 1: ENVIRONMENTAL INJUSTICE CASE STUDY FRAMEWORK
- FIGURE 2: MAP OF CALIFORNIA'S COUNTIES
- FIGURE 3: MAP SHOWING NATIVE LANDS OF THE COUNTY
- FIGURE 4: SETTING PHOTOGRAPH
- FIGURE 5: SETTING PHOTOGRAPH
- FIGURE 6: DEPT OF AG PROFILE
- FIGURE 7: RACE COUNTS IN RIVERSIDE COUNTY
- FIGURE 8: MAP SHOWING POLITICAL PARTY REGISTRATION IN CALIFORNIA
- FIGURE 9: US MAP OF VOTING ACCESS
- FIGURE 10: US EPA EJSCREEN CHART SHOWING ENVIRONMENTAL INDICATORS
- FIGURE 11: AMERICAN LUNG ASSOCIATION COUNTY REPORT CARD
- FIGURE 12: BAD OZONE DAYS
- FIGURE 13: ANNUAL PM2.5 LEVELS
- FIGURE 14: US EPA EJSCREEN
- FIGURE 15: PROXIMITY TO HIGHWAYS
- FIGURE 16: SAFE DRINKING WATER CONTAMINANTS
- FIGURE 17: COUNTY OPPORTUNITY INDEX
- FIGURE 18: EDUCATIONAL ATTAINMENT
- FIGURE 19: K-12 EDUCATION INDICATORS
- FIGURE 20: CALIFORNIA HEALTHY PLACES INDEX ON POVERTY LEVELS
- FIGURE 21: BENEFITS OF CLEAN AIR ACT
- FIGURE 22: CAFO DATA TRANSPARENCY PROBLEMS
- FIGURE 23: CHILDHOOD BLOOD LEAD LEVELS