RIVERSIDE COUNTY

SLOW DISASTER
CASE STUDY

ENVIRONMENTAL
INJUSTICE

FALL 2020

GROUP NO. 15

AUTHORS

Ryan Nguyen, Ethan Lee, Faith Berger, Julie Cao, Luis Cuevas, Emily Davis, Katherine Thomas, Marcelo Castaneda, Elijah Pineda, Nolan Mahaney, Aram Alajajian, Michael Gonzalez

CITE AS

Nguyen, Ryan. Lee, Ethan. Berger, Faith. Cao, Julie. Cuevas, Luis. Davis, Emily. Thomas, Katherine. Castaneda, Marcelo. Pineda, Elijah. Mahaney, Nolan. Alajajian, Aram. Gonzalez, Michael. 2020. 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, Tim Schütz, Kaitlyn Rabach, Prerna Srigyan and Maggie Woodruff for the Department of Anthropology, Fall 2020. The University of California Irvine is on the ancestral homelands of the Tongya and Acjachemen nations.

COVER PHOTO

The cover photo is a photograph of traffic heading towards Riverside on the 91 freeway between Fullerton and Corona. Automobile pollution is one of the main factors of Slow Disaster in Riverside COunty *Photo taken by Allen J. Schaben and shared by the New York Times.* (Screenshot by Faith Berger, November 3rd. 2020.

https://www.latimes.com/local/california/la-me-california-commute-20150804-story.html).

PERMISSION TO PUBLISH @ https://disaster-sts-network.org **Do you consent to having your name listed as an author on the published case study?**	
Name	**Publish? (Y or N)**
1. Katherine Thomas	**Y**
2. Emily Davis	**Y**
3. Ryan Nguyen	**Y**
4. Luis Cuevas	**Y**
5. Elijah Pineda	**Y**
6. Marcelo Castaneda	**Y**
7. Faith Berger	**Y**
8. Nolan Mahaney	**Y**
9. Aram Alajajian	**Y**
10. Julie Cao	**Y**
11. Ethan Lee	**Y**
12. Michael Gonzalez	**Y**

BIOGRAPHICAL STATEMENT PHOTO

Katherine Thomas is a second year undergraduate student at University of California, Irvine. She is an Earth Systems Science major and hopes that researching more about environmental injustice issues will allow her to incorporate and help solve those problems in her future career.

Aram Alajajian is a first year undergraduate student at the University of California Irvine. He is a biological sciences major on the pre-med track and chose to partake in EiJ case studies to get to know the environmental health hazards within the communities he will serve in the future.

Ryan Nguyen is a second-year undeclared student at University of California, Irvine. He is interested in learning about environmental issues in his California communities and wants to take steps in improving environmental injustice in his own community.

Ethan Lee is an undergraduate sophomore at the University of California, Irvine majoring in mechanical engineering. For his career as well as his duty as a citizen in his community, he believes it is of paramount importance to educate himself in environmental injustice in communities everywhere, and do his part to resolve these issues wherever he can.

Nolan Mahaney is a second year undergraduate student at the University of California Irvine. He is a mechanical engineering major enrolled in EiJ in hopes to learn more about what emissions do to the environment around us to work towards designing more environmental friendly gas engines in the future.

Luis Cuevas is first-year transfer student at the University of California, Irvine. He is working to complete his B.S. in Biochemistry or Genetics. Luis is enrolled in EiJ in hopes to learn as much as he can about Environmental Injustices and become an active member in society to fight against this.

Elijah Pineda is a second year undergraduate student currently attending the University of California, Irvine. He is a Biomedical Engineering major currently enrolled in EiJ in order to learn more about the environmental injustices plaguing local communities.

Marcelo Castaneda is a second year undergraduate student at UC Irvine. He is undeclared but is planning to declare mechanical engineering as his major. Through taking the environmental injustice course at UCI, he hopes to gain more knowledge on the positive and negative effects that we as people have on the environment and be able to become more involved in politics regarding protecting Earth.

Faith Berger is an undergraduate first-year at the University of California Irvine. She is currently a dance major but intends to double major in exercise science. She wants to continue to learn more about how she can help the current environmental state and how she can inform others about these issues as well.

Julie Cao is an undergraduate freshman at University of California, Irvine, majoring in Biological Sciences and striving for Biochemistry in the following years. After taking Public Health 2 during the past summer, she has learned the importance of environmental health issues that are prevalent in communities. She wants to learn what strategies or potential actions to take in bettering the issues of environmental injustices today.

Emily Davis is a first- year undergraduate student at the University of California, Irvine. She is currently majoring in Biological Sciences and has a passion for nature and animals. She hopes that learning about environmental injustice will help her in learning how to do her part to protect the wilderness and habitats of the wildlife around her and beyond .

Michael Gonzalez is a fourth year undergraduate student attending the University of California, Irvine. He is a political science major who learned about environmental injustices within his own community through one of his major courses. He is currently enrolled in EiJ to learn more about how different forms of injustice can impact different communities.

TABLE OF CONTENTS

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 asthma, cancer, and heart disease rates. In many ways, slow pollution disasters are more challenging to deal with than fast, explosive disasters. People do not 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 essential 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. 1) 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 it 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.

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, in your view, is ethically wrong or unjust in this case?

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

Description: Map locating all 58 counties in California.

Disclaimer

FIGURE 2: Riverside County is one of the larger counties in Southern California which borders Arizona. It is known for its large warehouse infrastructure and high pollution levels throughout the county. (Screenshots by Aram Alajajian, November 4, 2020. https://www.mapsofworld.com/usa/states/california/california-county-map.html, https://en.wikipedia.org/wiki/Riverside_County,_California#/media/File:Map_of_California_highlighting_Riverside_County.svg)

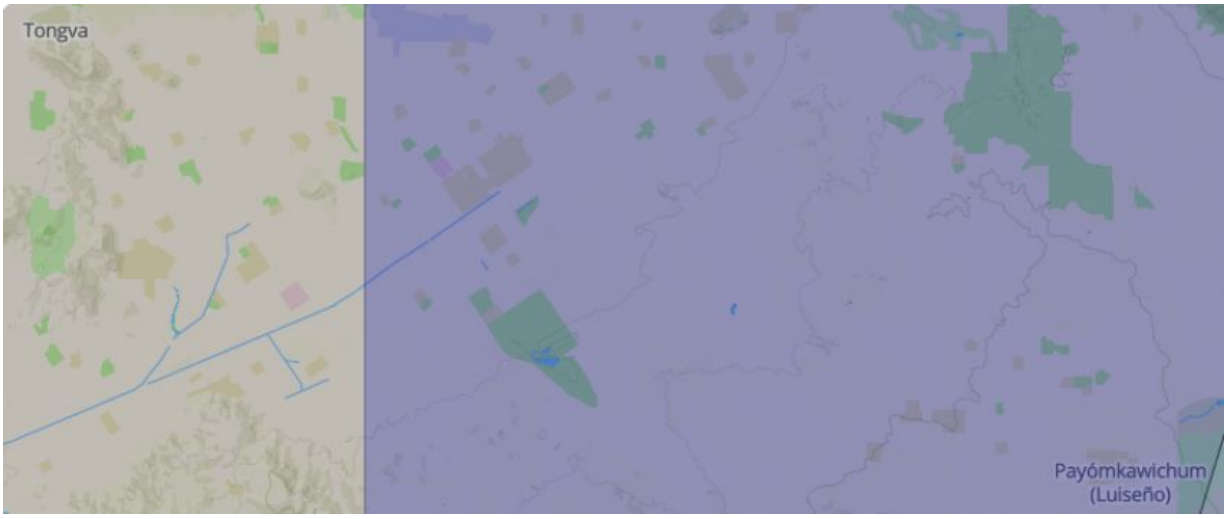


FIGURE 3: Due to its size, Riverside County is located on both the Tongva and Payómkawichum (Luiseño) native lands. Riverside County has recently been in contact with the tribes through the Riverside County Tribal Unit, ran through the county's District Attorney Office, aiming to build "... a strong commitment to ensuring that justice is served on tribal land and reinforces that commitment by maintaining strong relationships with the Riverside County Indian Tribes and staying up-to-date with the law through relevant training." (Riverside County District Attorney's office 2020). (Screenshot by Emily Davis, November 3, 2020. https://rivcoda.org/the-office/special-prosecutions/tribal-unit)

1. COMMUNITY ASSETS & SETTING

What Riverside has to offer

Aram Alajajian

Riverside County, which is the fourth largest county within California, reaches 7206 square miles (Counties.org) and houses a population of about 2,470,546 people (U.S Census 2019). The county is home to "718, 349 households with an average of 3.27 people per house" (U.S Census 2019). On top of the statistics regarding housing, the median household income is $63,948 with a 12.7% poverty rate within the country (U.S Census 2019). Riverside County sits in a California region where deserts and mountains meet together, which often means the climate is on the warmer side (see Fig 2). Asset-wise, the county holds important landmarks known statewide, such as one of the 9 UC's the University of California Riverside (see Fig 4), and the infamous vacation retreat Desert Hot Springs (see Fig 5). According to the U.S. News, UCR is ranked number 88 in the top national universities and stands with the prestige of being known as a University of California (U.S. News). The university has an average "in-state tuition fee of $13,859 and an out-of-state tuition fee of $43,613" (U.S News). The city's hot springs are "naturally heated to temperatures as high as 180 degrees" (City of DHS) and provide spa-like retreats. On top of those two landmarks, the county also has many libraries, and public schools diversified throughout the region. An interesting organization that caught our attention was the *GreenRiverside* movement, which is responsible for promoting environmental sustainability "to make Riverside a greener place" (GreenRiverside). Green

Riverside does its part by giving the people of Riverside a voice by pushing environmental issues so that policies are passed to acknowledge problems such as pollution within the county. Touching back to the statistics aspect of Riverside County's setting, the county has a higher than the national average sales tax of 8.2% compared to the average of 7.3% (Best Places). Riverside County also has a higher unemployment rate of 4.8% compared to 3.7% national average (Best Places), which makes sense because of the county's 12.7% poverty rate (U.S Census 2019). The county also has another environmental organization called *Keep Riverside Clean & Beautiful*, whose goal is to "build a sense of community pride with 29,913 volunteer hours organizing community beautification projects within the City of Riverside" (Keep Riverside Clean & Beautiful). These community-based organizations do their part to sustain their neighborhoods and provide a cleaner and healthier place for people to live. Moreover, a health-promoting asset that Riverside County has is the Joshua Tree National Park. Parks like these promote wellness and health due to outdoor activities, sports, and nature-oriented activities. What is special about this park is that it is a vast protected area that has a desert ecosystem. It allows communities to have a preserved, small, designated piece of nature/wilderness to admire. In 2015, 48% of people living in the county lived within half a mile of a park (National Environmental Public Health Tracking Network 2018). Riverside County has numerous, beautiful assets that it offers, but it also has environmental threats that come along with these community resources.

FIGURE 4: Established in 1907, UCR is one of 9 University of California campuses located in the heart of Riverside County. The school has an average acceptance rate of 51% and offers 57 majors. (Screenshot by Aram Alajajian, November 5, 2020. https://www.businesswire.com/news/home/20191007005795/en/University-of-California-Riverside-and-American-Campus-Communities-Break-Ground-on-First-Phase-of-North-District-Project)

FIGURE 5: Desert Hot Springs is a renown vacation getaway located in the Coachella Valley region of Riverside County. It is known for its naturally occurring hot springs formed from underground aquifers which are enjoyed by those looking for a spa remedy or for mere relaxation. (Screenshot by Aram Alajajian, November 5, 2020. https://www.tripadvisor.com/Tourism-g32293-Desert_Hot_Springs_Greater_Palm_Springs_California-Vacations.html)

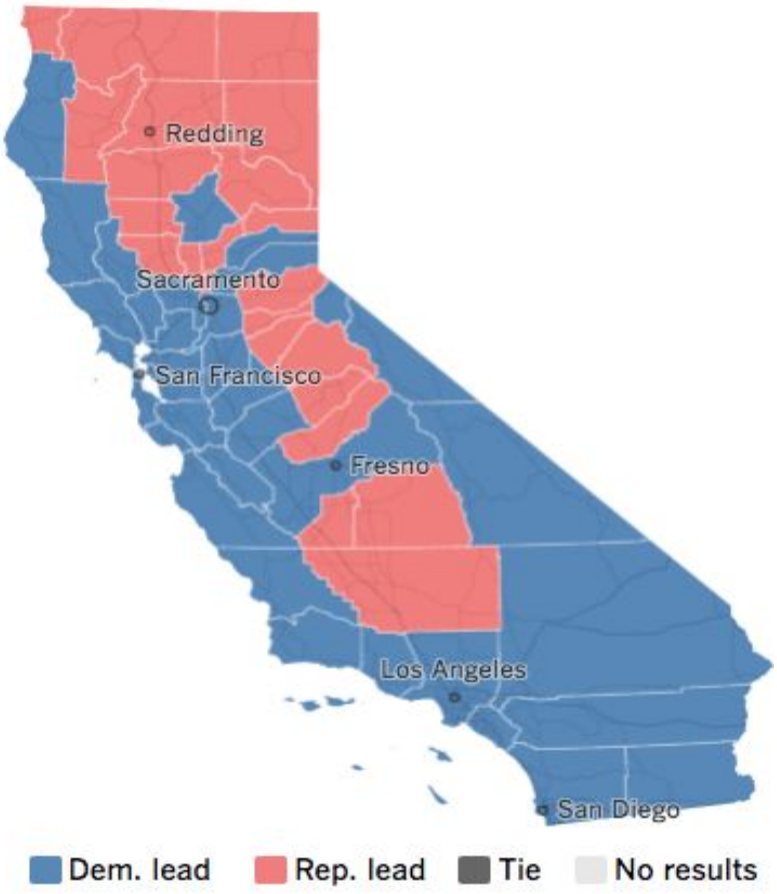


FIGURE 6: This LA Times map shows that in the November 2020 election, Riverside county ended with a Democratic majority. The environmental regulatory stance, a popular Democratic value, likely means that environmental protection policies will be easier to pass in Riverside County as opposed to Republican- leading counties, such as Kern County (Screenshot by Emily Davis, November 5, 2020. https://www.latimes.com/projects/2020-california-election-live-results/)

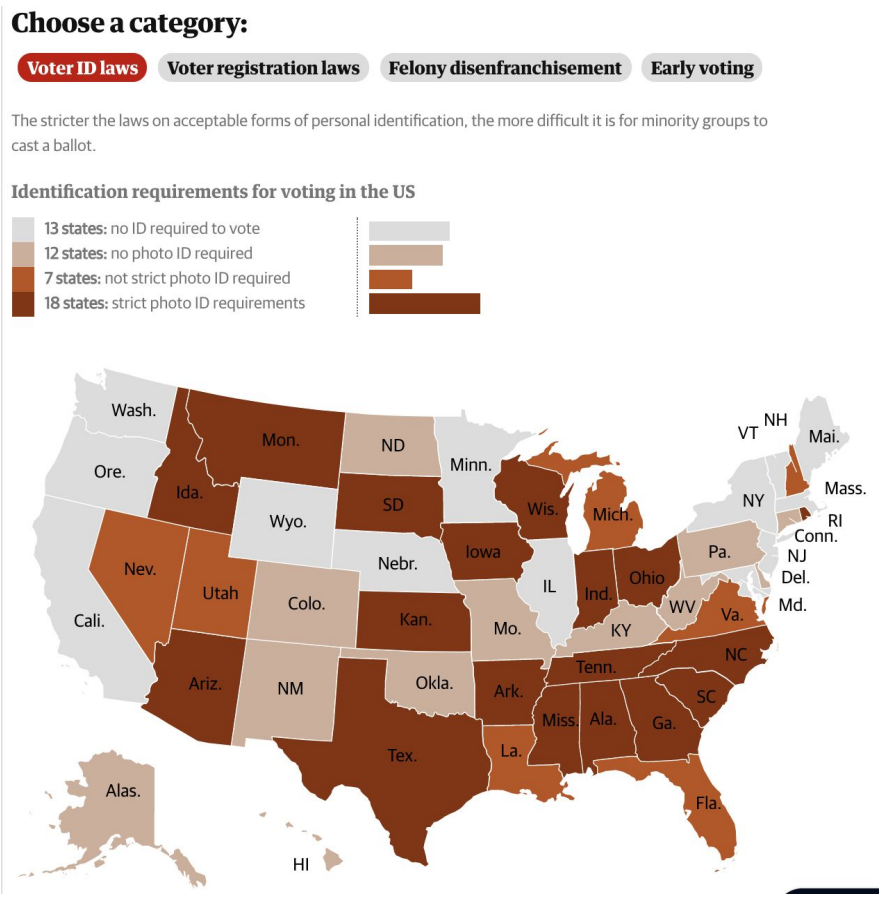


FIGURE 7: The state of California has laws that make it easier to vote than in many other US states. This strengthens democratic capacity across the state of California. There are still concerns, however. In parts Riverside County, such as Palm Desert for example began early voting so that it gives everyone voting flexibility. This flexibility allows people to vote during days that suit them just in case they are busy on election day (Desert Sun Staff 2020). (Screenshot by Kim Fortun, October 17, 2020. https://www.theguardian.com/us-news/ng-interactive/2019/nov/07/which-us-states-hardest-vote-supression-election)

2. FAST DISASTER & OTHER ENVIRONMENTAL THREATS

Soil and water contamination, air pollution, and hazardous chemicals threaten California's Inland Empire metropolitan area

Julie Cao

Part of Riverside County is located within the Inland Empire, a region known for its failing air quality. This majorly affects the entire region due to a result of many environmental factors.

EJSCREEN Report (Version 2019)

County: Riverside
CALIFORNIA, EPA Region 9
Approximate Population: 2,355,002
Input Area (sq. miles): 7303.13

(The study area contains 2 blockgroup(s) with zero population.)

Selected Variables	Percentile in State	Percentile in EPA Region	Percentile in USA
EJ Indexes			
EJ Index for Particulate Matter (PM 2.5)	67	71	86
EJ Index for Ozone	73	75	89
EJ Index for NATA* Diesel PM	65	67	81
EJ Index for NATA* Air Toxics Cancer Risk	65	68	83
EJ Index for NATA* Respiratory Hazard Index	62	66	83
EJ Index for Traffic Proximity and Volume	60	66	86
EJ Index for Lead Paint Indicator	58	63	77
EJ Index for Superfund Proximity	69	74	86
EJ Index for RMP Proximity	69	73	86
EJ Index for Hazardous Waste Proximity	60	65	84
EJ Index for Wastewater Discharge Indicator	91	92	97

EJ Index for the Selected Area Compared to All People's Blockgroups in the State/Region/US

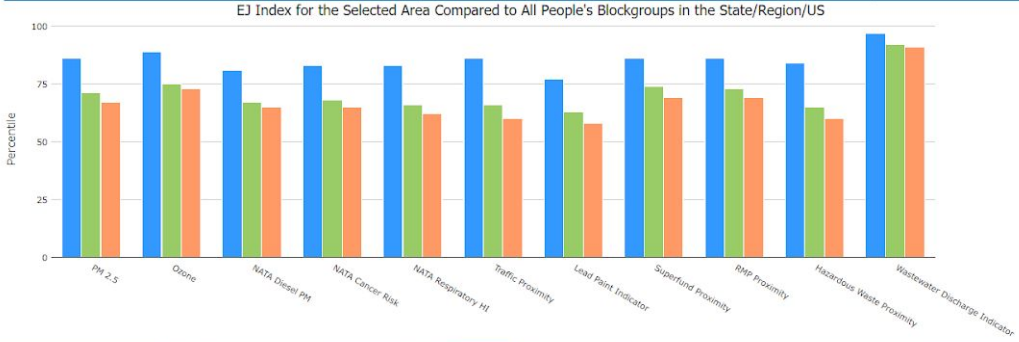


FIGURE 8: This compilation of environmental indicators (provided by the US EPA's EJScreen tool) shows that Riverside County is in the 97th percentile nationwide for toxic wastewater discharge to streams, in the 77th percentile for lead paint, and in the 86th percentile for proximity to RMP facilities. The lead paint indicator is based on the percent of homes built pre-1960s, as an indicator of possible lead paint exposure. (Screenshot by Julie Cao, October 28, 2020. https://ejscreen.epa.gov/mapper/ejscreen_SOE.aspx, https://www.epa.gov/ejscreen/overview-environmental-indicators-ejscreen)

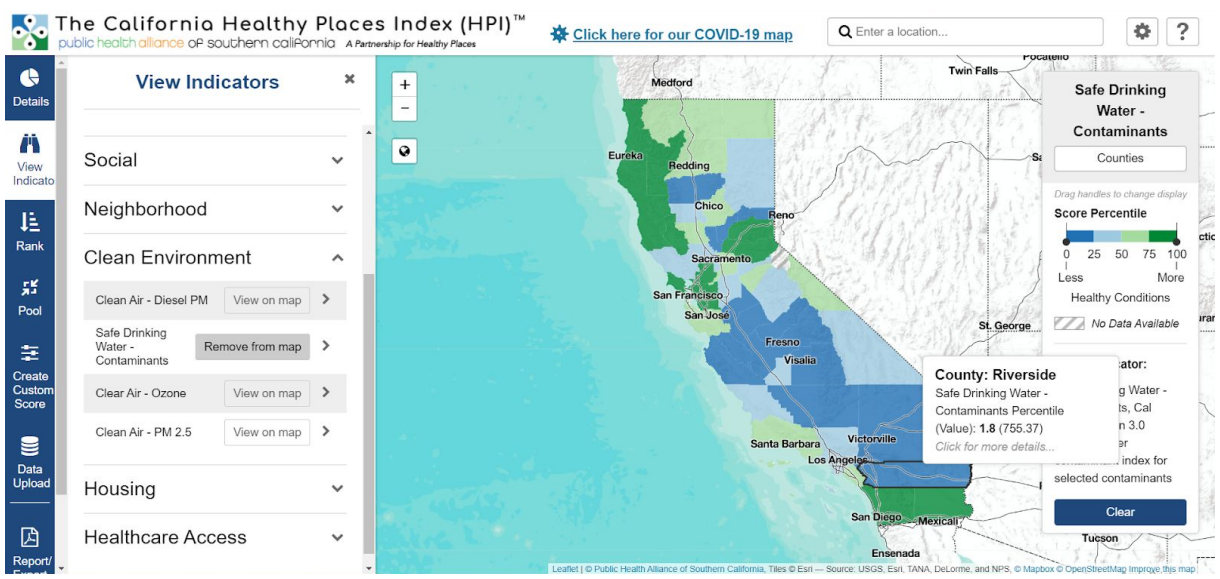


FIGURE 9: In maps provided by the California Health Places Index, Riverside County appears to be in the lowest percentile of the state for healthy drinking water. The Liberty database (provided by the Environmental Working Group) highlights that "there were 22 chemicals detected, with tetrachloroethylene exceeding legal health standards." This means that this map for Riverside County is deemed clear and correct. (Screenshot by Julie Cao, October 29, 2020. https://map.healthyplacesindex.org/)

An environmental threat in Riverside County is soil and water contamination (Fig. 8). One in particular called Stringfellow site is a hazardous waste facility that produces contaminated groundwater due to "Improper disposal practices contaminated soil, surface water, and groundwater with volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides and metals, among other contaminants" (EPA). These contaminants contribute to adverse health impacts like cancer, and unfortunately, the county is ranked fifth for most water-contaminated in California. According to the report released by Wall Street in 2014, it is stated that the county's water contained 22 chemicals, which surpassed the recommended health guidelines and legal health standards (Liberty 2020). As a consequence, the county's drinking water is considered unhealthy (Fig. 9). These health threats are highlighted in several media sites; however, there is not much action to fight against Riverside communities' injustice. The booming population resulted in many environmental health threats like widespread air pollution, and the county is yet to have an independent solution to it.

Another threat are the RMPs that are located near communities. According to figure 8, 72% of the population in the county are in close proximity to RMP facilities. There are worse case potential scenarios in Riverside County that can be worsened by slow disaster effects, such as the three power plants located near the west and nine generators located throughout the county to deliver energy to residents. These supply up to a total of 268 megawatts in emergencies during the hottest days in the summer (City of Riverside). Consequently, this may cause cancer-causing toxins like benzene and mercury in residents who live near these polluting facilities.

The hazardous waste management sites are also an issue that affect both the environment and the Riverside residents. There are six landfills in the county, and it is no surprise that these sites have a close proximity to 64% of the population (Fig. 8). The county officials have plans to layer six inches of dirt or spread "processed greenwaste" on garbage piles that contain toxic exposure risks (City News Service 2016). It is important to mention that garbage that is buried may release toxic chemicals or hazardous materials into the earth and the environment in general. With the organic materials decompose underground, they release methane, which is a potent greenhouse gas that contributes to global warming.

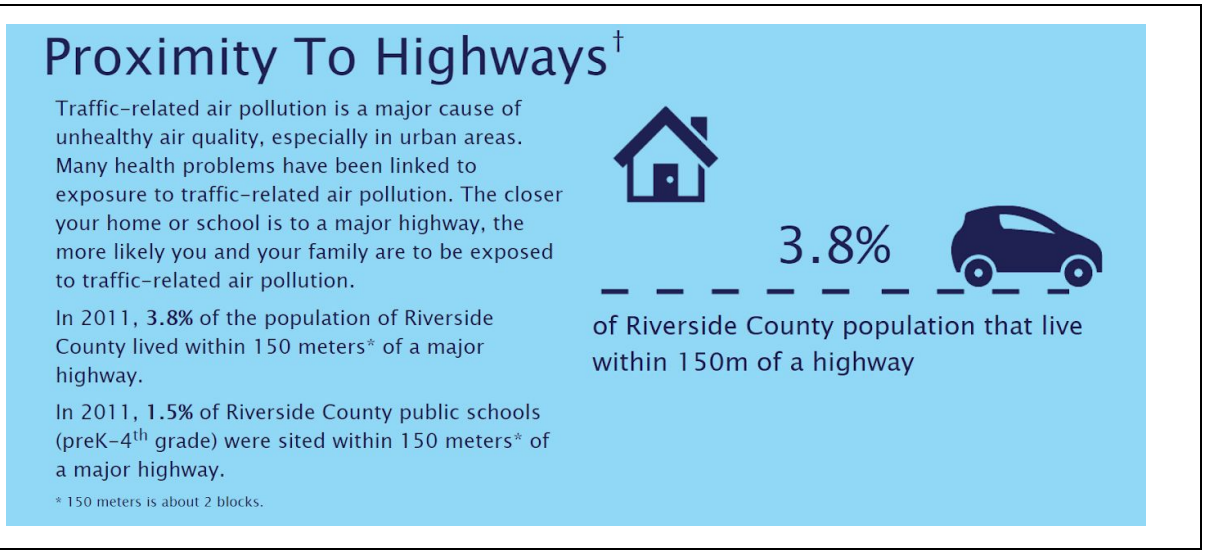


FIGURE 10: This figure shows the schools and percentage of the population of Riverside County that are near a major highway. The US Center for Disease Control reports that traffic pollution has been linked to increased asthma, childhood cancer and cardiovascular disease. (Screenshot by Julie Cao, October 29, 2020. https://ephtracking.cdc.gov/showInfoByLocationExt?&FIPS=06065)

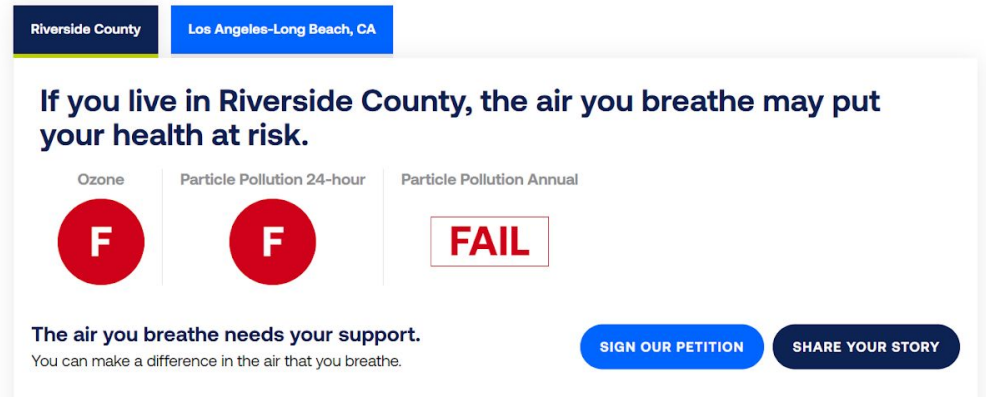


FIGURE 11: The American Lung Association gave Riverside County a "F" for ozone levels. This may be explained by high levels of vehicle pollution from warehouses like Amazon and Walmart. (Screenshot by Julie Cao, October 28, 2020. https://www.stateoftheair.org/city-rankings/states/california/riverside.html)

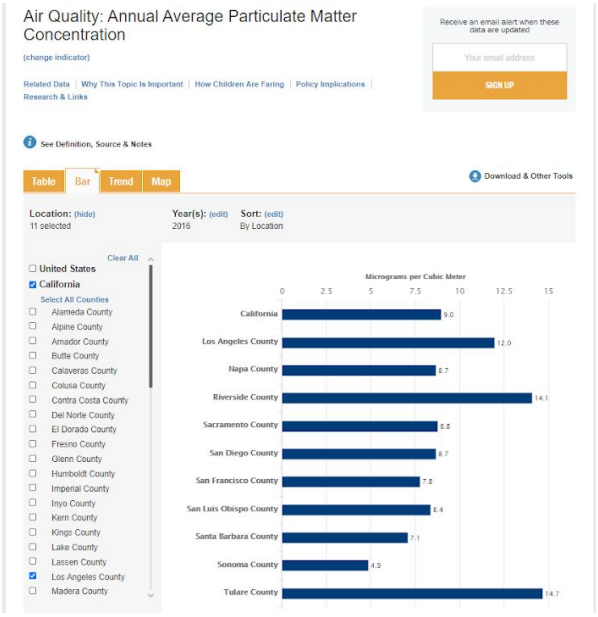


FIGURE 12: Kids Data presents the air quality in counties like Los Angeles County,

Riverside County, and Tulare County where there are high annual average concentrations of fine particulate matter in the air with Riverside County having 14.1 micrograms per cubic meter. "Fine particulate matter" or PM 2.5 is an air pollutant commonly found in diesel exhaust. Concentrations at or above 12 micrograms per cubic meter are considered potentially harmful to health, especially for sensitive groups such as young children and those with asthma. (Screenshot by Julie Cao, October 29, 2020. https://www.kidsdata.org/topic/524/environment-airquality/bar#fmt=2525&loc=2,367,368,265,361,273,338,359,339,344,364&tf=88&sort=loc)

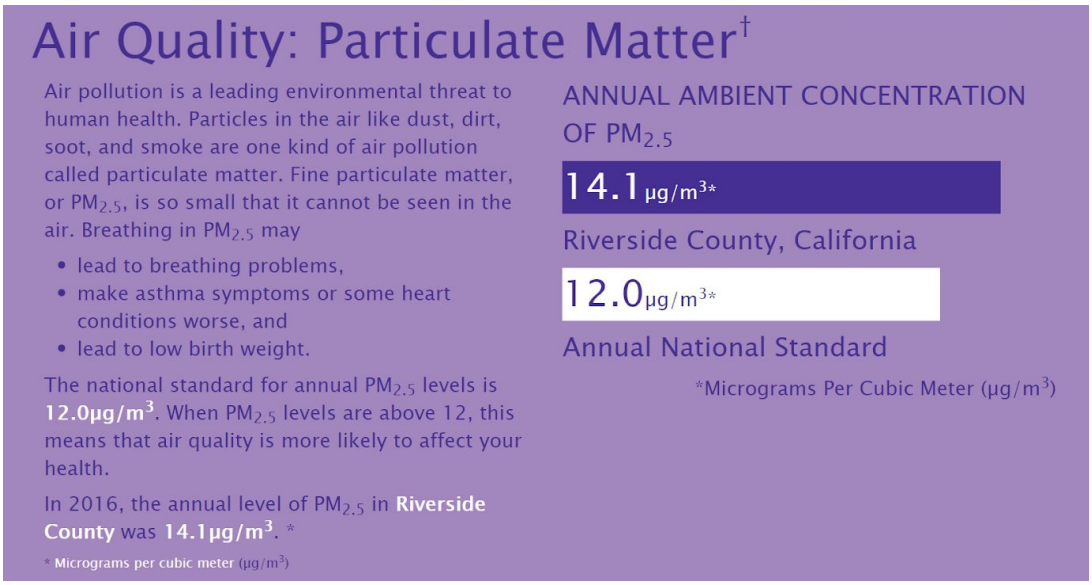


FIGURE 13: This figure shows annual ambient concentration of PM 2.5 in Riverside County to be below the US national standard. This means that the air in the county is not safe. PM 2.5 is one of many air pollutants. (Screenshot by Julie Cao, October 29, 2020. https://ephtracking.cdc.gov/showInfoByLocationExt?&FIPS=06065)

A significant contributor to poor air quality is smog emissions from vehicles. With the increasing number of automobiles on highways and other roads, it contributes to more air pollution and traffic. Thus, if one's home or school is close to certain roads, there are major health consequences as a result (Fig. 10). San Bernardino and Riverside counties were given the name "smog belt" due to the brown haze over the areas. Smart Cities Dive explains that smog is formed when the by-produce of combustion, nitrous oxide, reacts with the air and light chemicals that allow it to produce ozone (Global Site Plans 2019). These gas emissions stem from diesel trucks and personal means of gas-emitting

transportation. However, it is mainly due to big cities like Los Angeles and counties like Orange County, San Bernardino County, and Riverside County. These counties do e-commerce, which has become popular over the past years. One of the core causes of this is due to COVID-19. According to The New York Times, Riverside County set a new record of 974 cases in one day in July (Cowan 2020). The spikes continue to go up as individuals rely on large e-commerce companies to deliver their necessities during the pandemic. In this case, these corporations have a high demand for workers to sort, package, and deliver goods and products, including more warehouses where these types of work can be done. Riverside County includes a large number of warehouses used by major corporations like Amazon and Walmart for product deliveries and distribution that amount to the worsening of air pollution and carbon emissions caused by diesel trucks traveling to and from warehouses (Fig. 11 & 12). Consequently, air pollution is one of the most harmful environmental threats to the county due to the growing population, leading to increasing numbers of businesses and transportation means (Fig. 13).

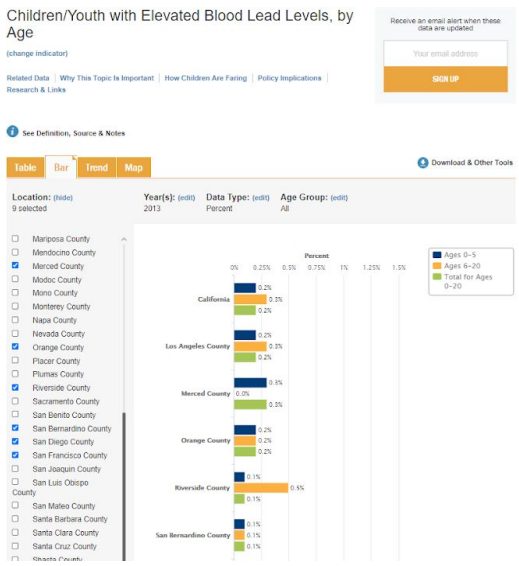


FIGURE 14: Kids Data presents elevated blood levels in children and the youth. It is clear that in the age range between 6-20 is affected in Riverside County, just as in Los Angeles County. This may be due to workplace and household exposure and the environment residents live in that contain lead in old buildings and products. (Screenshot by Julie Cao, November 3, 2020.

https://www.kidsdata.org/topic/529/environment-lead/bar#fmt=706&loc=2,364,354,365,367,366,368,265,359&tf=73&pdist=7&ch=484,1029,1030&sort=loc)

Lead poisoning is another issue Riverside County faces. Lead can be found in products like paint in older buildings, manufacturing factories, auto repair shops, and contaminated air, water, and soil. These are the most common sources of lead poisoning that affect mostly children because they can "absorb 4-5 times as much ingested lead as adults" (WHO 2019) (Fig 14). The Riverside University Health System Public Health reported that 296 children in the county were identified with lead poisoning (Mack 2016). A particular case involved a Riverside resident who was informed that her 18-month-old baby, including her other two children, was exposed to high levels of lead in his blood system due to his chewing on a windowsill. The Riverside County Department of Environmental Health investigated their home and found that the old interior paint and soil surrounding the house were contaminated with lead. Since lead had been frequently used in paint, household lead exposure will impede children's and adults' long-term development. It is important to mention that adults are also at risk, especially those who work. From the California Occupational Blood Lead Registry, it states that "from 2012 to 2014, 38,440 workers had their blood tested for lead, and 6,051 workers were identified with an elevated level of 5 or more micrograms of lead per deciliter (about 3.3 ounces) of blood" (Press Enterprise 2017). These workers were in the age range between 20 and 59, in which many lived in Southern California counties of Los Angeles, Riverside, and San Bernardino. With the rise in the number of warehouses and manufacturers, these statistics are most likely to increase over the years. Moreover, regarding the Riverside County area's ethnicities, less than half of the population are Hispanic (CDC 2011). This means that the mentioned slow-disaster environmental threats disproportionately affect communities of color. Overall, lead is prevalent in both homes and workplaces.

Moreover, the fundamental issue that contributed to a negative health impact on families by lead exposure was due to Riverside’s history in the 1990s when many people moved to

the county because of its massive housing units being sold at a relatively inexpensive price. Thus, families struggle to recover from financial ruin and rising costs of rent as Wall Street firms place profits first on at least 3,000 single-family homes. Although struggling in financial ruins, the county is ranked sixth for strongest housing markets in the nation. About 30% of renters spend more than half of their annual income on rent, and as a result, rent rose to 3.8% and annual median income decreased by 7.2% (Takano 2019). With LA in close proximity, commuter rates increase with "more than 7 percent of workers are now classified as super-commuters" (Chiland 2019). The number of residents in Riverside County with commutes over 90 minutes increased by 31%. With the neighboring counties like San Bernardino, Orange, and Los Angeles, traffic congestion and, unfortunately, air pollution rates spike up, contributing to global warming.

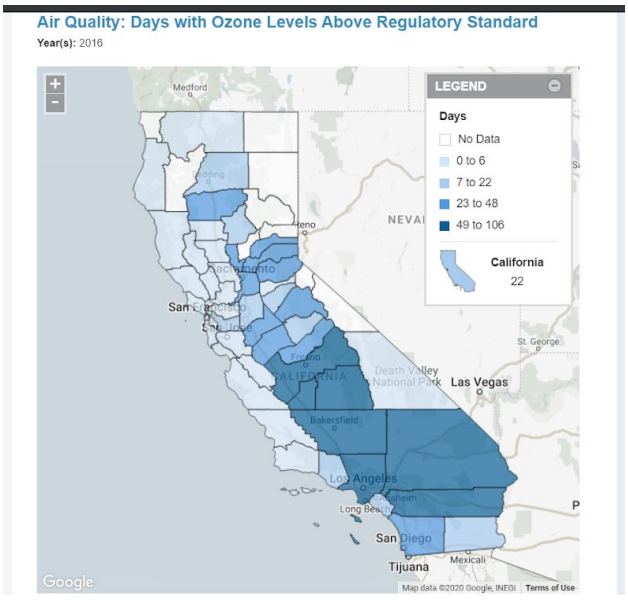


FIGURE 15: According to 2016 data, Riverside County had 69 days that were above the regulatory standard for ozone. High ozone levels are linked to asthma. (Screenshot by Julie Cao, October 28, 2020. https://www.kidsdata.org/topic/80/air-quality/summary, https://www.kidsdata.org/topic/525/environment-airquality-ozone/table#fmt=2527&loc=2,127,347,1763,331,348,336,171,321,345,357,332,324,369,358,362,360,337,327,364,356,217,353,328,354,323,352,320,339,334,365,343,330,367,344,355,366,368,265,349,361,4,273,59,370,326,333,322,341,338,350,342,329,325,359,351,363,340,33

5&tf=88)

The environmental dangers and the effects of these issues in Riverside County and the neighboring counties can stem from the overall international environmental threat of climate change. From the KVCR News, reporter Ken Vincent explains that "climate change and wildfire are cited as key causes" of air deterioration in Southern California (Vincent 2019). Over the years, climate change is negatively impacting both human individuals, other species, and the environment. With the air pollution worsening and the hot climate rising, ozone production increases (Fig. 15). With this cycle of horrible, failing conditions, the Riverside County region's temperatures will continue to rise. The hot weather and drought go hand in hand, leading to a rise in the number of wildfires. Wildfires have become a recent major issue today, endangering people who live in hazardous areas and contributing to air pollution in the surrounding places. If climate change is accelerating as it is currently, environmental issues like these will not improve. To slow this environmental threat, actions must be taken to better people's lives and the environment each and every one resides in.

3. COMPOUND VULNERABILITIES

Social and community factors contributing to environmental health vulnerability and injustice.

Faith Berger

Riverside County faces many intersecting factors contributing to the immense environmental health vulnerability and injustice in this setting. Some include poverty, the wage-gap, violence, weather, political corruption, low access to public transportation, covid-19, homelessness, and education attainment. This portion of the case study will examine how these factors intersect with each other and slow disasters in the county.

The first factor we are going to approach is poverty. In Riverside County in 2018, it was reported that 12.7% of the population was in poverty (U.S. Census 2018). Compared to the 12.8% poverty rate in California as a whole (Public Policy Institute of California 2018), what is more concerning is the percentage of women and minorities that fall below the poverty line. The largest demographic groups of people in poverty in Riverside are women ages 25-34 making up 7.67% of those in poverty by gender ratios, and Hispanics making up 37.7% of those in poverty by race ratios (DataUSA 2018). This economic inequality directly contributes to environmental injustice in this setting because people in poverty are far more likely to live near slow disaster threats, like air and water pollution, than those who can afford to move into cleaner neighborhoods. Those in poverty also cannot afford to purchase organic health foods and likely do not have access to them in their areas, contributing to overall worse health. Women and minorities are the most at risk for environmental health vulnerability because they are more likely to be in poverty. This factor shows a clear presence of environmental racism and sexism in Riverside County.

Poverty is a huge contributor to other factors, as well as being a factor in and of itself. Low access to public transportation in Riverside County is affected by poverty and disabilities. 65% of senior citizens do not have access to public transportation, and adults with disabilities are two times as likely to have low access than able people (Takano 2015). Seniors and people with disabling conditions are most likely on a fixed income, disability, and social security, from the government and do not always have the means to afford their own transportation that accommodates their needs. These people rely on public

transportation to buy essential items, food, healthcare, and socialize. Without proper access, these people may not make doctor appointments, get medication, get to stores with healthy options, and see their family and friends. All these factors contribute to a person's health, and without them, they are increasingly more vulnerable to health issues and the effects of a slow disaster. Families in Riverside city spend 60% of their income alone on housing and transportation costs; families in Perris spend 58% (Takano 2015). To reduce this cost, many families will move far away from urban areas where health services and healthy food choices are available and will no longer have close access to these essential services or public transportation. As shown in figure 15, poverty rates are very high in the rural areas of Riverside County. These people most likely do not have access to public transportation to get to cities and may not be able to afford transportation of their own. These people are left to the options available to them, which are likely unhealthy and of worse quality (see fig.15).

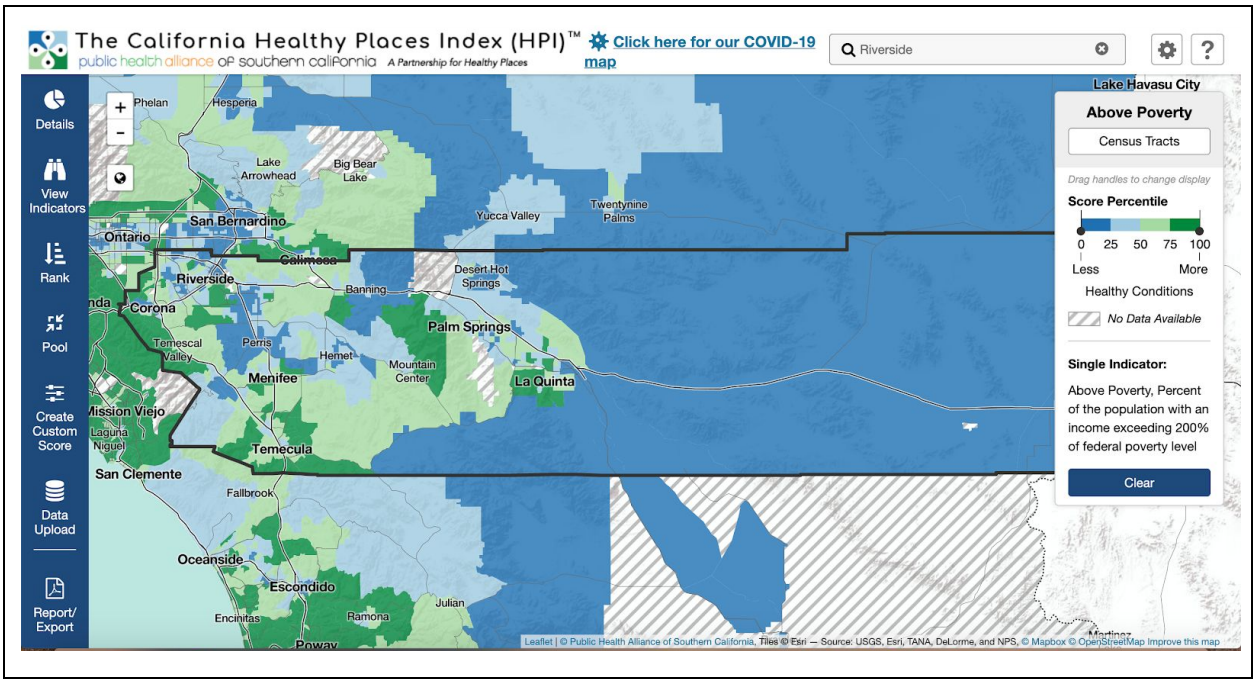
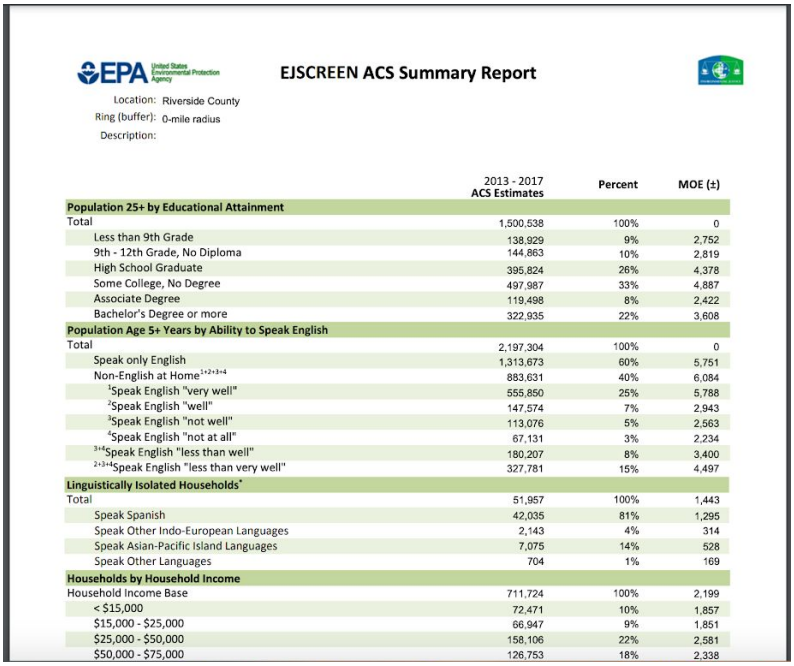


FIGURE 16: This map shows the areas in Riverside County that are in poverty. The rural areas of the county are colored dark blue, showing they are in the highest percentile of poverty. Impoverished areas are also shown close to Perris, Hemet, Riverside, and Banning. (Screenshot by Faith Berger, November 3, 2020. https://map.healthyplacesindex.org/)

Another factor contributing to the environmental health vulnerability in Riverside County is education. With only 26% of the population over twenty-five years old (see fig. .16), many may not have enough education to get high paying jobs or may not be able to understand the health threats slow disasters cause them entirely. This problem is also apparent in youth. Only 30% of eighth-graders in 2017 met or exceeded grade-level math standards (see fig.17). 39% of young adults felt prepared for college or their career after high school, and 26% of young adults felt prepared for their college-level math courses (California County Scorecard of Children's Well-being 2018-19). With such low math understanding levels, many children will have a hard time graduating high school, finding a career, and understanding the complex data released about slow disasters, air and water pollution, and proximity to hazardous waste. These data sets can be challenging to interpret and understand. Without proper education, many may misunderstand important information about hazards in their communities. As shown in figure four, only 36% of students feel like what they are doing in school is making a difference, and only 52% feel connected to their school. These factors can contribute to dropouts, higher poverty levels, and students not becoming involved with issues that matter in their communities.



EJSCREEN ACS Summary Report

Location: Riverside County
Ring (buffer): 0-mile radius
Description:

	2013 - 2017 ACS Estimates	Percent	MOE (±)
Population 25+ by Educational Attainment			
Total	1,500,538	100%	0
Less than 9th Grade	138,929	9%	2,752
9th - 12th Grade, No Diploma	144,863	10%	2,819
High School Graduate	395,824	26%	4,378
Some College, No Degree	497,987	33%	4,887
Associate Degree	119,498	8%	2,422
Bachelor's Degree or more	322,935	22%	3,608
Population Age 5+ Years by Ability to Speak English			
Total	2,197,304	100%	0
Speak only English	1,313,673	60%	5,751
Non-English at Home[1+2+3+4]	883,631	40%	6,084
[1]Speak English "very well"	555,850	25%	5,788
[2]Speak English "well"	147,574	7%	2,943
[3]Speak English "not well"	113,076	5%	2,563
[4]Speak English "not at all"	67,131	3%	2,234
[3+4]Speak English "less than well"	180,207	8%	3,400
[2+3+4]Speak English "less than very well"	327,781	15%	4,497
Linguistically Isolated Households*			
Total	51,957	100%	1,443
Speak Spanish	42,035	81%	1,295
Speak Other Indo-European Languages	2,143	4%	314
Speak Asian-Pacific Island Languages	7,075	14%	528
Speak Other Languages	704	1%	169
Households by Household Income			
Household Income Base	711,724	100%	2,199
< $15,000	72,471	10%	1,857
$15,000 - $25,000	66,947	9%	1,851
$25,000 - $50,000	158,106	22%	2,581
$50,000 - $75,000	126,753	18%	2,338

FIGURE 17: This data from the EPA shows the percentage of the population of twenty-five years old who have different levels of education. The highest percentage is some college, no degree at 33%, followed by high school graduate at only 26%. (Screenshot by Faith Berger, November 3, 2020. https://ejscreen.epa.gov/mapper/demogreportpdf.aspx?report=acs2017)

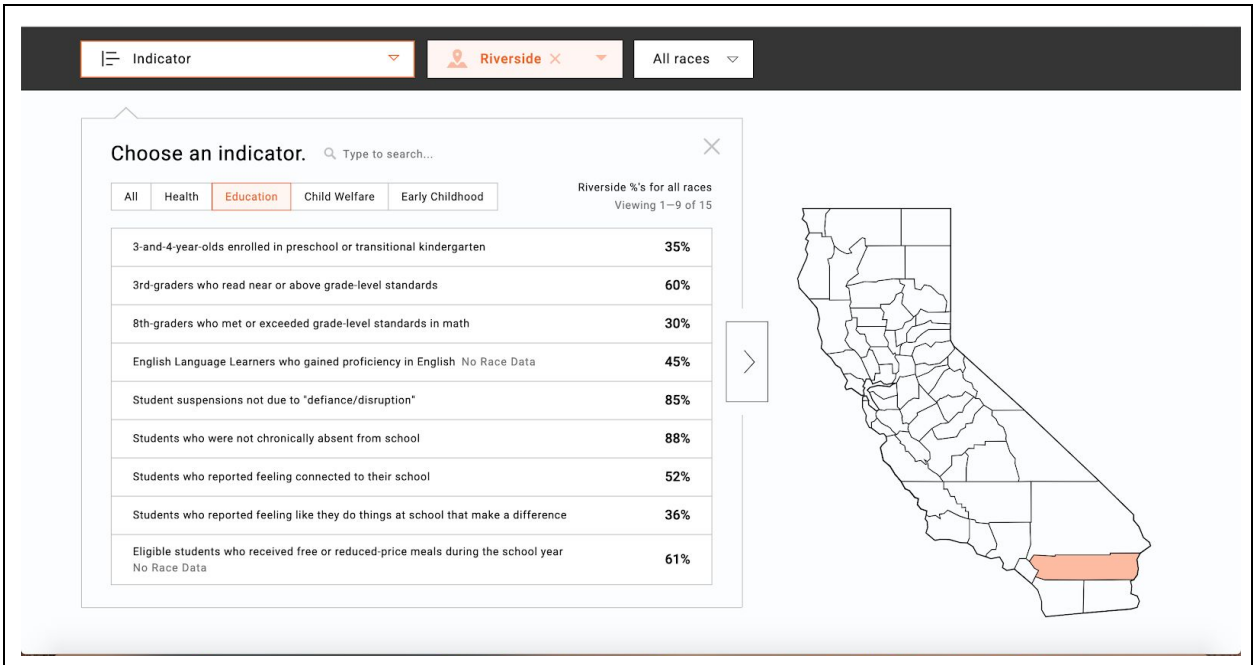


FIGURE 18: This data shows education statistics in Riverside County. Low rates of english and math understanding can be seen, along with low levels of connection to schools. The level of education children in riverside are receiving is not up to societal. (Screenshot by Faith Berger, November 3, 2020. https://www.childrennow.org/portfolio-posts/2018scorecard/)

Riverside County has a history of violence. Riverside County crimes are 38% higher than the national average, and violent crimes are 33% higher (FBI 2020). An average person in Riverside County has a one in thirty chance of becoming a victim of crime based on these statistics. Violence and lousy behavior start at a young age. 85% of students suspended from school were suspended on the grounds of defiance and disruptive behavior (see fig.17). This behavior continues into childhood and leaves Riverside County with an F rating for crime. Riverside also has an extensive history involving drug trafficking. Just the other day, on September eighth, 2020, an article was released speaking to how seven people were fatally shot in a rural Riverside County area home to a large-scale illegal marijuana growing operation (New York Times 2020). County sheriff Chad Bianco has said publicly that "the illegal marijuana trade remains a constant and deadly menace" and that just this year alone, there have been fourteen murders leading back to marijuana (New York Times 2020). These levels of violence and continued history of drug trafficking

leave Riverside County with a community score of 37.5 from the Opportunity Index (see fig.18). This number is much lower than California at 46.9, and areas with a similar opportunity to Riverside County at 51.6 (see fig.18). This community score assesses factors that contribute to community health and civic life. Factors included are the percentage of teens not working or in school, community safety, access to health care, incarceration, and access to healthy foods (Opportunity Index 2019). Violence contributes to this score because of community safety and incarceration and violence. These contribute to environmental health vulnerability and injustice in this setting because many Riverside neighborhoods are dangerous. People living in them may not have the same access to health services, food, and other needs as those in safe neighborhoods.

FIGURE 19: This index is showing Riverside Counties ratings for five different aspects of the county and an overall rating. Very low community scores can be noted along with education, opportunity, and economy also being slightly low. (Screenshot by Faith Berger, November 3, 2020. https://opportunitynation.org/)

The factors we have discussed in this section, poverty, low access to public transportation, education, and violence all contribute to environmental injustice and compounding health vulnerabilities in this county.

4. STAKEHOLDER ANALYSIS

Amazon’s Personal Trash Can

Marcelo Castaneda

Seeing as Riverside County has some of the worst air pollution that America has to offer, and Amazon warehouses infest the Inland Empire neighborhoods, several stakeholders would like to see change in the community. Many of these stakeholders include people who are immediately affected by this slow disaster, the workers of the warehouses, people living in these neighborhoods, and most importantly, young students and elderly people who live and attend schools in the Inland Empire.

With coronavirus being somewhat recent and online shopping being more prevalent as people are ordered to stay indoors, many of these stakeholders in Riverside County have become worried that their terribly polluted communities are about to become even worse off with production increasing. One worker that works in one of Amazon's many centralized locations in Riverside County shares that "nearby residents regularly choke on the thick, black smoke of diesel emissions wafting from the industry's army of idling trucks. They are kept awake at night from the constant low rumble of giant semis barreling along the interstate and the high-pitched whir of cargo planes flying overhead. Inside the warehouses, the morale stinks as bad as the air pollution. [the worker], who uses they/them pronouns, has been reprimanded for helping other workers while taking a

bathroom break. Furthermore, many of the people [the worker] started with a few months back are gone — having already quit or been fired" (Knoblauch 2020). With the Amazon warehouses already seeming like a toxic environment regarding not treating its workers well, the amount of carbon emissions that the workers and the residents of the communities around these warehouses have to endure seems to be inhumane. In this same article that focuses on the harmful effects of the warehouses in the Inland Empire, an interview is done with a resident of the area. This resident claims to have contracted all sorts of respiratory issues, with extreme difficulty breathing being part of the problem. "The Inland Empire has some of the worst ozone and soot pollution in the country. San Bernardino and Riverside counties, which encompass the region, have asthma rates twice as high as the national average" (Knoblauch 2020). Amazon warehouses have occupied a large portion in Riverside County, and workers and residents see it as a substantial, slow disaster threat.

The threat of air pollution is also feared mainly by people of younger and older ages, and "According to U.S. Environmental Protection Agency data, children under 18 and adults over 65 are most vulnerable to poor air quality, suffering from illnesses including asthma, cardiovascular disease, and diabetes. New studies show that elderly women breathing unsafe levels of fine-particle pollution are twice as likely to develop dementia and Alzheimer's disease" (Warren 2019). With Amazon having a massive impact on the community's welfare in terms of respiratory health, many workers and local residents, along with people seeking to protect kids and the elderly, would like to see Amazon become greener and tremendously reduce their carbon footprint.

5. STAKEHOLDER ACTIONS

Corporate Interests and Government Entanglement

Elijah Pineda

Part of the reason for the poor air quality in Riverside County can be attributed to the excessive land development put in place by corporations. One such example is that of the Villages of Lakeview project which has been an ongoing development for quite some time. Certain environmental groups, such as the "Center for Biological Diversity sued, along with the Sierra Club and San Bernardino Valley Audubon Society," in the hopes that the project would be halted (Downey 2018). The aforementioned information was taken from an article written in 2018 that also projected that the project would "draw about 28,000 people to the Lakeview/Nuevo area who...will drive 450 million miles a year and consume 1.5 billion gallons of water per year," thus attributing to the poor air quality of the county-which currently has an 'F' for its air quality grading from the American Lung Association (Downey 2018; City News Service 2019). The Riverside County Board of Supervisors, in spite of the information regarding the environmental ramifications of the project, "voted 3-1, with one member absent, to approve plans and related documents for the 2,800-acre Villages of Lakeview" (Downey 2018). The land developments are not only restricted to residential projects, but corporate warehouses as well.

Warehouses began to appear more following the economic recession about a decade ago, with "the expansion of the logistics industry [seeming] like a lifeline to many residents"

(Zilliac 2020). Since then "over 150 million square feet...of industrial space, mostly warehouses, has been built in the Inland Empire"; from these warehouses "thousands of diesel trucks...come and go...[which] are certainly adding to what has become an intractable problem" (Zilliac 2020). Because local governments promised these expansions as a way to recover from the economic downturn many were eager to allow corporations use of land. Although, the county and communities within are facing the environmental consequences of all the land developments.

Yet, there are still branches and individuals within the government and community that have taken steps towards opposing corporate interests. Riverside County Supervisor Kevin Jeffries led the efforts to pass a policy that would create a "1,000-foot-buffer between large warehouse projects and residential homes in Riverside County," yet the proposal had to be cut down to a 300 foot buffer before local officials accepted the proposal (Zilliac 2020). Despite this setback, there are also state level policies that are currently being written by the Southern California Air Quality Management District that intend to "combat air pollution from warehouses, distribution centers, and railyards" (Zilliac 2020). With the implementation of more environmentally conscious policies from different members of local and state government, the harm done by corporations can be mitigated.

6. ROLE OF MEDIA AND BIG ENVIRONMENTAL ORGANIZATIONS

Broadcasting Environmental Health Hazards About Air and Water

Katherine Thomas

From organizations and news sites, it seems as if Riverside's poor air quality is the main problem reported. For instance, the American Lung Association ranked Riverside as "Failed" for ozone and particle pollution ("Riverside" 2018). Additionally, a common local news source called "Patch" has multiple articles about Riverside County's air quality, such as an article from August 2020 titled "Hard To Breathe? Unhealthy Air Plagues Riverside County" (McAllister 2020). Another article from May 2020 that is also from this website and is written by the same author is titled "Heatwave Causing Poor Air Quality Across Riverside County" (McAllister 2020). Since this air quality and pollution issue is very recognizable from the smog that residents of the county can see, and by local news sources and a health organization pointing out the problem, the county of Riverside has most likely addressed this problem. Consequently, the county has responded by providing ways that residents of Riverside county can contribute to improving the air quality and by providing data on the current air quality to warn the more sensitive groups that could be

affected. One of the resources found on the government website for Riverside County is what the residents in the county can do in order to stay safe during periods of harmful air, as well as some smaller actions that can be done by each person to reduce pollution ("Air Quality"). The County Website has also provided quick links, such as a PDF titled "50 Ways to Clean the Air", which lists ways on how people can reduce the amount of pollution in their immediate area to ideas of how people would be able to get their voice heard about this air quality problem (City of Riverside). These actions taken by the county are very informative to the community, but it seems that these actions are on a smaller scale and that the county should address larger problems coming from the sources of air pollution. In addition to the county's websites, the Wikipedia page for Riverside county unfortunately does not mention anything about the environment or any pollution hazards in the county (Wikipedia 2020). This lack of coverage could be alarming considering that the county has such a poor rating for its air quality because Wikipedia might be the first article that shows up on a Google search of the county.

Along with air quality, Riverside County's water quality is reported and addressed through media, Riverside County Agencies, and State Agencies as well. A website that gives details on the contaminants found in drinking water states that the tap water from a utility in the city of Riverside that comes from the groundwater source contains 17 contaminants but "was in compliance with federal health-based drinking water standards" (Environmental Working Group). As mentioned on this page, even though the water quality passed the federal government's regulations, this does not mean that the drinking water is entirely safe. In the latest water quality report done in 2019 by the City of Riverside Public Utilities, which is required by the EPA, the report states that the primary groundwater sources that the city of Riverside gets its water from "are considered most vulnerable to historical contamination from industrial and agricultural operations" (Riverside Public Utilities 2020). This report is also sent to customers each year, which could be beneficial for people to know if they wanted to avoid drinking the tap water by switching to bottled water or using filters. Overall, the problems faced in Riverside

county, such as poor air and water quality, are well known from the media, and the county and its cities address these problems by providing and warning the residents with ways they can protect their health when air and water quality is poor.

7. RECOMMENDED LOCAL ACTIONS

Local Actions Go a Long Way

Luis Cuevas & Michael Gonzalez

Actions that would reduce environmental vulnerability and injustice in Perris, Riverside on a local level would be to create group initiatives to clean the streets and illegal dumpsites, monitor our water and air, and promote movement in the community. To begin with, there is a ton of trash in Riverside County. I drive through the streets and freeways often, and to be quite honest, I am often embarrassed about all the littering. Many other cities in Riverside County struggle to keep up with it. For example, the city of Perris said, "The most common items that are dumped include construction and demolition wastes, including waste paint, used tires, and old furniture, mattresses or appliances" (Waste &

Recycling). These plastics and appliances contain lots of contaminants that can harm the environment. Forming groups regarding this issue, whether in person or on social media, would be a great way to start. We can take initiatives to find/report illegal dumpsites and commit our time to cleaning the streets anyway we can.

Another problem that we face is the persistent water contaminants and air pollution found in Riverside County. According to Journalist Renee Schiavone's article, "*Local Drinking Water Named Among the Worst in Nation*," "The water in Riverside County contained 13 chemicals that exceeded recommended health guidelines over the four tested years and one that exceeded legal limits (Schiavone 2014). Schiavone says that the Eastern Municipal Water District removed the links and claimed its false information. It is not uncommon that companies cover up their actions to avoid lawsuits and public scrutiny, so this is something we should hold them accountable for if there are alarming amounts of contaminants. Also, Riverside County has horrible air quality, mostly due to heavy-duty diesel trucks shipping things to local factories. Environmentalists fought to help regulate pollution from the trucks while "Republicans and representatives of the Inland Empire fiercely opposed the proposal" (Guerin 2018). On a local level, it would be a great idea to form community groups in person and on social media to help monitor water contaminants and air pollution in different areas of the county. We could work together to figure out different water and air quality analysis methods and hold agencies and companies accountable for false information. An example of what this could look like is if the community decides to "integrate environmental monitoring with existing research and community engagement mechanisms… to help build local capacity" (London pg. 10). Execution of such an idea can be found in the IVAN system in Coachella Valley, an online environmental reporting system. The reporting system allows the community to participate in self-reporting and spotlight the hidden dangers that may not be clearly present through general research.

Most importantly, we could promote this movement online or by going to schools, grocery stores, parks, and other public places. Social media platforms are the easiest way to spread information and are essential for communication on a large scale since Riverside County is extensive. A great example of social media and community reporting is found with the concerns from community group ECV No Se Vende and their disapproval of building a luxury resort in the Thermal community. Through their voice, they were able to push back the vote, and the developer agreed to fund more community benefits in response to community concerns (Reyes par. 9). Individually, we can only cover so much ground, but together it would not be an issue. We need people who can volunteer their time to serve their community by creating incentives for people like food, gifts, raffles, or other events. We need people to not only report local issues but also to help with the cleaning and maintenance of our environment. If people are willing to donate money to the cause and communicate with our city representatives, then we can continue to fuel the movement. We should integrate this type of culture into our society at a young age so that they pass on the baton to their children eventually as well. Teaching the youth about the environment with presentations and activities is a great way to learn and entertain.

This engagement must successfully be maintained, which is why there needs to be sufficient encouragement and development of leadership and civic engagement of the youth, immigrants, and residents of unincorporated regions within these communities. Such actions could prevent what could be called "brain drain," where young upwardly mobile individuals go to college and seek work in cities with better opportunities (Lopez and Wilson par. 7). Such a reversal of "brain drain" allows individuals with greater knowledge and a personal stake within communities to effectively speak out and represent these at-risk areas.

Last but not least, communities need to take steps to combat the data desert in regions such as Coachella Valley (Aliferis par. 3) and provide the data needed for researchers and community members to understand the community's issues correctly. While this may

sound like an extra local decision, the action being taken is making the data available, so when extra local decisions are made, it is easier to have a sense of what change is needed. For members of the community, it can be easy to identify some hazards such as lack of transportation or strange smells due to hazardous waste sites, but air quality, social capital, and resources become much more challenging to understand. If this data is made readily available and easily understood, it can make all the difference.

8. RECOMMENDED EXTRA-LOCAL ACTIONS

How Actions on the State, National, and International Level Could Shape Riverside for the Better

Ethan Lee

In the last few years, there have been several decisions on the state and national levels that have negatively impacted the progress made towards environmental health and safety in this community, mainly due to the Trump Administration. Even just a few malicious legislations can cause a cascade of harmful effects down the line. On September 18, 2019 President Trump announced that he was revoking California's Federal Waiver on emissions from 2013, which "under the Clean Air Act allowed [California] to set standards tighter than the federal standards" on vehicle emissions ("Trump Revokes Waiver for California to Set Higher Auto Emissions Standards," para. 4). Due to its vast amounts of resources and industrial beginnings, California has long had air pollution problems, but it "has been regulating emissions since before the EPA existed" and has repeatedly been granted federal waivers to allow it to create "its own, generally stricter, air quality and auto emissions rules" ("California's Mandate to Sell Only Zero-Emissions Vehicles by 2035 Isn't as Crazy as Critics Think", para. 9). As outlined by comments from public officials such as California governor Gavin Newsom and Environmental Protection Network member Jeff Alson, there is no reason to revoke the waiver other than for a political agenda like buying favors from his buddies in the oil and gas industries. California's tighter rules are justified by its higher levels of air pollution, and removing them will only slow down the state's progress to decrease emissions to a healthy level. This will not increase jobs as Trump says it will, because lowering emission standards does not affect the job market. It just allows auto-makers to cut corners on making their products more efficient and environmentally friendly. Riverside may be significantly affected by this, with its air quality among the worst of the Californian counties and being

one of its most significant environmental hazards to the county residents. In addition to this, another repealing of legislation will come into effect soon that will have great effects on not just Riverside, but the whole U.S. In 2017, Trump announced that he would be pulling the U.S. out of the Paris Climate Agreement, and on November 4, 2020, the U.S. completed its withdrawal. This is not only a major hit to our environment now and in the future, but this could also be a huge hit to Trump's all-important economy. According to a 2016 report from the International Finance Corporation of the World Bank Group, the Paris goals "would open up an estimated $23 trillion in investment opportunities in developing markets through 2030", which would clearly be a boost to the economy ("U.S. Begins Formal Withdrawal from Paris Climate Accord," para. 12). The renewable energy industry is one of the fastest growing industries on the job market right now and stripping away the possibilities of more research and jobs speaks to the poor quality in judgement that the administration has in respect to environmental issues. The future is not completely bleak, however. This section will focus on actions that are being taken or could be implemented at the state, national, or international level to help Riverside County out in combating slow disaster hazards.

At the forefront of statewide legislation in combating the slow but harmful effects of poor air quality is California Governor Gavin Newsom's mandate that "all new passenger cars and trucks sold in the state must be emission-free by 2035" ("California's Mandate to Sell Only Zero-Emissions Vehicles by 2035 Isn't as Crazy as Critics Think", para. 1). Of course, this is a massive leap forward in terms of helping the quality of air in California. Having the state sell only "zero emissions vehicles" (ZEVs) utilizing electric or hydrogen fuel cell vehicles seems too ambitious, but this "will likely see Newsom's goal softened or the deadline extended" as the article from CNN mentions ("California's Mandate to Sell Only Zero-Emissions Vehicles by 2035 Isn't as Crazy as Critics Think", para. 6). Currently electric vehicles only make up a small percentage of the market and are costly to purchase. However, with more electric fueling stations and decreasing costs, availability for these types of vehicles is sure to widen and the market will continue to pick up speed.

Similarly, hydrogen fuel cell vehicles are great in concept but the logistics of using hydrogen, which is flammable and combustible, to power such an efficient vehicle are difficult. Research and development around the world are being poured in this technology, however because the only waste produced by the chemical reactions in the hydrogen fuel cell engine would be regular, old water. Whatever the case this may be, this movement towards ZEVs will most certainly help Riverside County, where the main source of air pollution results from vehicle fumes.

Newsom's mandate directly targeting vehicle emissions is certainly a move towards improving air quality in the state, but adopting a strategy being implemented in Helsinki, Finland may be just as helpful. Finland has actually been named the country with the best air quality numerous times over the past few years thanks to a few different programs. Helsinki's goal for the past few years has been to make the city's public transport so good that no one would want to use a car. They have in part done this by investing "in better public transport, imposing higher parking fees, encouraging bikes and walking and converting inner city ring roads into residential and walking areas" ("How Are Cities around the World Tackling Air Pollution?"). This alone discourages driving around the city, but their personalized public transport system Kutsuplus is the last straw. Similar to Uber or Lyft, people can "digitally summon Kutsuplus minibuses to any of more than 1,000 local bus stops" to deliver them to their desired location by means of an app that can be used on their smartphones or computers ("The 14 Countries Doing the Most to Protect the Environment"). With the large amount of traffic that goes through and around Riverside County implementing any of these measures would be a step in the right direction for improving the county's air quality. For instance, most streets should have bike lanes already, but it would be a simple task to ensure that they are abundant enough that those who could use them will have that ability. The Kutsuplus minibuses are a combination of public transportation along with personalized destination routing, and given that almost everyone has a smart phone already state or local government could create an app similar to this. Public transportation has always been around in the U.S. but it is not nearly as

popular or accessible as it is in other countries, but this may be in part why the country struggles with vehicle emissions. Although public transportation may not be as popular or safe in the time of the coronavirus, it would still be good foresight to plan for something like this now so that it can be used as soon as possible.

Government regulation is always helpful in being the hand that ensures there is change, but outside sources also play a role. The American Lung Association for example, is an independent organization that delivers an annual report on air quality in the nation. In a recent article, NBC Los Angeles reported on the "American Lung Association's 2019 'State of the Air' report card," which graded Riverside County an "F" for air quality ("Riverside County Receives' F' for Air Quality," para 1). This news is not new or useful for the county as they have been dealing with air pollution for several years now resulting from several refineries and factories, as well as high amounts of vehicle fumes. Nonetheless, the ALA's report card is a consistent and reputable source of data regarding air quality in the county.

There is legislation at the state and national levels to combat this, however. Although the EPA has had much of its power stripped by the Trump Administration, many of its older regulations are still active and in effect. The National Ambient Air Quality Standards (NAAQS) as seen below in Figure 20 for example, were created under the Clean Air Act and have been the national standard for emissions ever since. Within the last several years, the EPA has revised the national air quality standards for fine particles, ground-level ozone, sulfur dioxide, nitrogen dioxide, and lead based on concurrent scientific evidence. In a section of their Clean Air Act overview, they mention how if areas do not meet air quality standards, "states are required to adopt state implementation plan revisions containing measures needed to meet the standards as expeditiously as practicable and within time periods specified in the Clean Air Act" ("Air Pollution: Current and Future Challenges"). County researchers, activists, and community members should regularly check up on the city's plan as a grade of "F" from the ALA means that the

situation has not been in a good state for a long time. If the plan is incomplete or action and deadlines are not being met, these stakeholders should be raising the alarm and pressing hard for change because their community depends on it.

Pollutant [links to historical tables of NAAQS reviews]		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO)		primary	8 hours	9 ppm	Not to be exceeded more than once per year
			1 hour	35 ppm	
Lead (Pb)		primary and secondary	Rolling 3 month average	0.15 µg/m^3 (1)	Not to be exceeded
Nitrogen Dioxide (NO_2)		primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		primary and secondary	1 year	53 ppb (2)	Annual Mean
Ozone (O_3)		primary and secondary	8 hours	0.070 ppm (3)	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Pollution (PM)	$PM_{2.5}$	primary	1 year	12.0 µg/m^3	annual mean, averaged over 3 years
		secondary	1 year	15.0 µg/m^3	annual mean, averaged over 3 years
		primary and secondary	24 hours	35 µg/m^3	98th percentile, averaged over 3 years
	PM_{10}	primary and secondary	24 hours	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO_2)		primary	1 hour	75 ppb (4)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

FIGURE 20: The National Ambient Air Quality Standards (NAAQS) Table from the EPA website. The EPA has revised these standards multiple times in accordance with scientific studies. Changes such as fine particles in 2006 and 2012, sulfur dioxide in

2010, and ground level ozone in 2008 and 2015 have all been implemented and updated under the NAAQS. (Screenshot by Ethan Lee, November 3, 2020. https://www.epa.gov/criteria-air-pollutants/naaqs-table)

One final ray of hope rests in the results of the presidential election. With Joe Biden winning the election, among other new initiatives he can bring to the country, he can reenter the U.S. into the Paris Climate Agreement with the necessary commitments. With action like this, it will press areas across the country like Riverside to keep up with their action plan and perhaps surpass expectations if possible. By taking action through government action now, we can see benefits months, years, and decades down the road for the wellbeing of the environment and safety of the people that live in it.

9. RECOMMENDATIONS FOR FUTURE RESEARCH

The Necessity for Community Specific Data

Emily Davis

To see most clearly the research that would be most useful to tackle the environmental issues in Riverside County, it is first imperative to acknowledge the research and data that has already been collected on the threats that permeate the lands and people, of and surrounding Riverside county. It does not take much time in research to discover that the primary environmental threat reported in Riverside is the extreme air pollution that occurs every day, as a result of the growing population equating to increasing transportation fumes, as well as an influx of industry throughout the county. As it has in the past, it is predicted that this will only continue to worsen in Riverside County. With each year, the compounding air pollution is only built upon.

According to NBCLA, Riverside County scored an "F" for air quality in the 2019 American Lung Association's 2019 "State of the Air" report (City News Service 2019). Another salient example of this type of data gathered is done daily by IQAir, which displays the extent of air pollution in the area on any given day, as well as listing the major pollutants that are present in the air (IQAir 2020). Data of this category is displayed over a wide range of media sources and variations of information outlets. However, in order to enact change there must be specific research done on the residents of Riverside county themselves. A research example that would help address and raise awareness of the

environmental damage caused by air pollution in Riverside County is a survey on what exactly Riverside residents know about the air pollution that directly affects them, done anonymously (to take the attention off the participant themselves, as well as protect their privacy) through social media, as a large number of residents can easily access this format. How severe do they perceive it to be? Do they believe that this is affecting their health? If so, how severely, and in what ways? This way, researchers will know the extent to which residents are informed about air pollution, and will be able to publish detailed and digestible information based on that, to grow the concern and awareness in members of the community specifically. After all, how can you expect change from a community that may be ignorant of the specific situation that needs changing? An excellent example of research conducted in this way is the "Second Minnesota Report Card on Environmental Literacy," published by Hamline University and in partnership with the Minnesota Office of Environmental Assistance, an extensive paper filled with data collected by surveys in Minnesota, detailing the knowledge of residents on the environment and the hazards that threaten it (Murphy 2004). Once this data is collected, the next logical step to accurately characterizing and addressing the environmental dangers in Riverside county would be a research study taking members of Riverside County and determining how exactly the air pollution in their county is affecting their health, as opposed to a group of people living in an area with much cleaner air quality levels. While a much broader and unfocused approach, the Environmental Defense Fund's article "Health Impacts of Air Pollution" is an excellent blueprint for this category of research, as it displays the many diverse types of air pollutants, and highlights the shocking fact that "Air pollution is now the biggest environmental risk for early death, responsible for as many as 5 million premature deaths each year…" (EDF 2020).

While the issue of air pollution will likely be present for many years ahead (especially in such high- risk environments such as Riverside County), these first steps toward research to inform the community of the true nature of these community-specific hazards are essential to kickstarting change that could inspire many more across the state, country,

and globe to participate in addressing the environmental issues that is air pollution in their communities, therefore disallowing the buildup of air pollution to continue to damage the health of community members.

10. INJUSTICE ANALYSIS

Racial Injustice and Reproductive Injustice

Ryan Nguyen & Nolan Mahaney

One of the main things that are ethically wrong in Riverside County is the lack of response and lack of effort from the county government in addressing the environmental problems to the community. On the City of Riverside website, when addressing the county's issue of pollutants, the website did not address the problem within the county. Instead, it blamed the pollutants on the results of other surrounding cities. The website says, "Such is the case in Riverside and other Inland communities where due to geographic location we endure more pollutants than what we generate. Pollution from the greater Los Angeles area funnels into the Inland region via air currents through passes in the natural barrier of

the mountain range between the greater Los Angeles area and the Inland Empire" (City of Riverside). Along with environmental problems, there is prevalent evidence of racial injustice within Riverside county, especially with recent events of the Black Lives Matter Movement as well as the upcoming election. According to an article by the Press Enterprise, "the city of Riverside has declared racism a public health crisis. Members of the public who addressed the council were split in their opinions, with many saying that there was little evidence of racism in Riverside. Others worried about possible legal liability if, for instance, a police officer shot a person of color and the victim's attorney now had evidence that the city itself saw a problem with racism" (Hagen 2020). Riverside County needs to improve in easing racial tension in order to help improve other injustices, including environmental problems.

Reproductive injustice in Riverside County is prevalent with the environmental hazards that residents report on in their communities. Coachella Valley, for example, is the easternmost city in Riverside County and while it is in a desert area, the amount of agriculture and irrigation has helped the land in Coachella Valley prosper. While the land may be achieving success, Coachella Valley residents are failing to experience that same prosperity. According to an article written by Lisa Aliferis, gathering data for an area is a difficult task. The article says, "For years, this desert valley has also been known as another kind of desert: a data desert. Though many here know the area is rife with environmental hazards and social vulnerabilities like poverty and limited English-proficiency, there has not been plentiful information about environmental risks, air quality, or residents' social capital and resources. Without data identifying problems, it is difficult to make a case for improvements" (Aliferis 2013). After a team from U.C. Davis collaborated with a community from Eastern Coachella Valley to create a data report for the environmental problems for the valley, they were able to designate several problems that had a notable impact on the reproductive injustice that was occurring in the areas of data collection. According to Karen Borja, a community organizer with Inland Congregations United for Change, "She says residents in the historically isolated

community of North Shore suspected that lack of public transportation was a major barrier to health, income, and education" (Aliferis 2013). Borja follows this up by stating more information on the things that residents experience every day and the extra efforts they have to put in to live in Coachella Valley. "Data showed people traveled 20 miles each way to work every day, and were paying neighbors or family members up to $285 a week to get to work, the grocer, the doctor. Some college students said they could not get to their institutions of higher learning because they did not have reliable transportation" (Aliferis 2013). This is a crucial example of Reproductive Injustice in Riverside county because a lack of transportation for residents causes them to spend extra time and money on getting to work, school, and other locations every day that could have been used on other necessities like childcare, groceries, and things that would make life easier for residents of the community. Lead exposure is another problem that residents of Riverside face and are fearful of because of the possibility of it affecting their children, who are more likely to be exposed to lead and lead poisoning. According to a Riverside University Health System report, Griselda Jimenez, a mother of three, had to deal with lead exposure that was affecting her 18-month-old toddler. The report says, "Jimenez, 32, was shocked to learn that Miguel's blood tested "ridiculously high" for lead. A flurry of tests ensued, resulting in a week-long hospital stay for Miguel. There were also follow-ups with her older children, Ezekiel, 3, and Gracie, 13, whose levels lead also were elevated" (Overton 2016). Lead exposure levels have steadily increased from the collected data from 2013, seen in Figure 20. Lead can be found in several different places, including the air you breathe, the water you drink, and in the case of Driselda's son Miguel, through the lead found in paint. "Miguel was chewing on the windowsill and we believe that this is what contributed to the especially high lead levels in his blood" (Overton 2016). This is an issue that can be solved by taking simple steps in preventing your child from increasing their lead exposure. Keeping children away from dirt and paint as well as washing the toys that they play with regularly. Other things that help, according to the report, include, "Wash their hands often; especially before eating and sleeping. Feed your child healthy meals and snacks every day" (Overton 2016). An important thing that the City of Riverside should do

is be more proactive in stopping lead incidents from happening. Whether it is educating the public or promoting non-toxic alternatives to paint and other materials that use lead, being more knowledgeable on the topic is the key to prevention.

Riverside County is not particularly known for having a shockingly high poverty rate. However, there is still poverty that can not be ignored, and certain low-income communities that are affected unfairly by environmental issues. Don Howard writes, "More than half of Inland Empire residents (51 percent) are working but struggling with poverty (compared to 47 percent of Californians overall)" (Howard 2018). Riverside County is included in the Inland Empire, and this shows that there is a very prevalent struggle with poverty in the county's population. With this struggle, many in poverty are fighting against environmental issues that middle and high-income citizens don't generally have to face. The Mira Loma Village is an excellent example of economic injustice in Riverside County. Grist Creative writes, "Starting in the 1990s, a 15-square-mile warehouse district was steadily built around the mostly low-income Hispanic community. Thousands of diesel delivery trucks followed." (Creative 2020). This shows how the economic injustice developed. A once peaceful and healthy community is now being exposed to harmful diesel exhaust. There are many health effects of these gases diesel trucks emit, and the warehouse was built around this low-income town. We must work to relocate warehouses like these that emit harmful exhaust fumes to local communities. It is unfair that their poverty has affected their life in this way because it is a position they were forced into.

Health is a vital part of life and is more critical than ever as the Covid-19 pandemic is still raging across the United States. Low-income families and people of color have a much more difficult time getting the health care they need to fight Covid-19. Ryan Hagen tells us in an article, "The coronavirus has also infected and killed people of color at disproportionate rates, including locally, said Councilwoman Erin Edwards." (Hagen 2020) This is an example of health injustice. This is linked to the fact that people of color are

generally part of low-income communities. They cannot get the help they need and do not have the same resources that white people have available to them because they are unable to afford health care. People of color and those in low-income communities also are exposed to dangerous air pollution more often than higher-income communities. For example, in the Mira Loma Village, Grist Creative tells us, "Diesel exhaust contains nearly four dozen toxic air contaminants, a class of pollutants so noxious that even low levels of exposure are linked to serious health issues and premature death." (Creative 2020) This is another example of health injustice. These people being exposed to diesel gases are now suffering from health effects, often being respiratory-related. Those with damaged respiratory systems and illnesses are going to be hit harder by Covid-19. The symptoms of the virus will be much more severe, and they will have a more difficult battle. This is unfair that these low-income communities and people of color are more heavily affected by the virus and also can't get the health care that they need to stay healthy during this pandemic. We must bring equality and care for the communities that are affected by air pollution most and who are not fit to fight Covid-19.

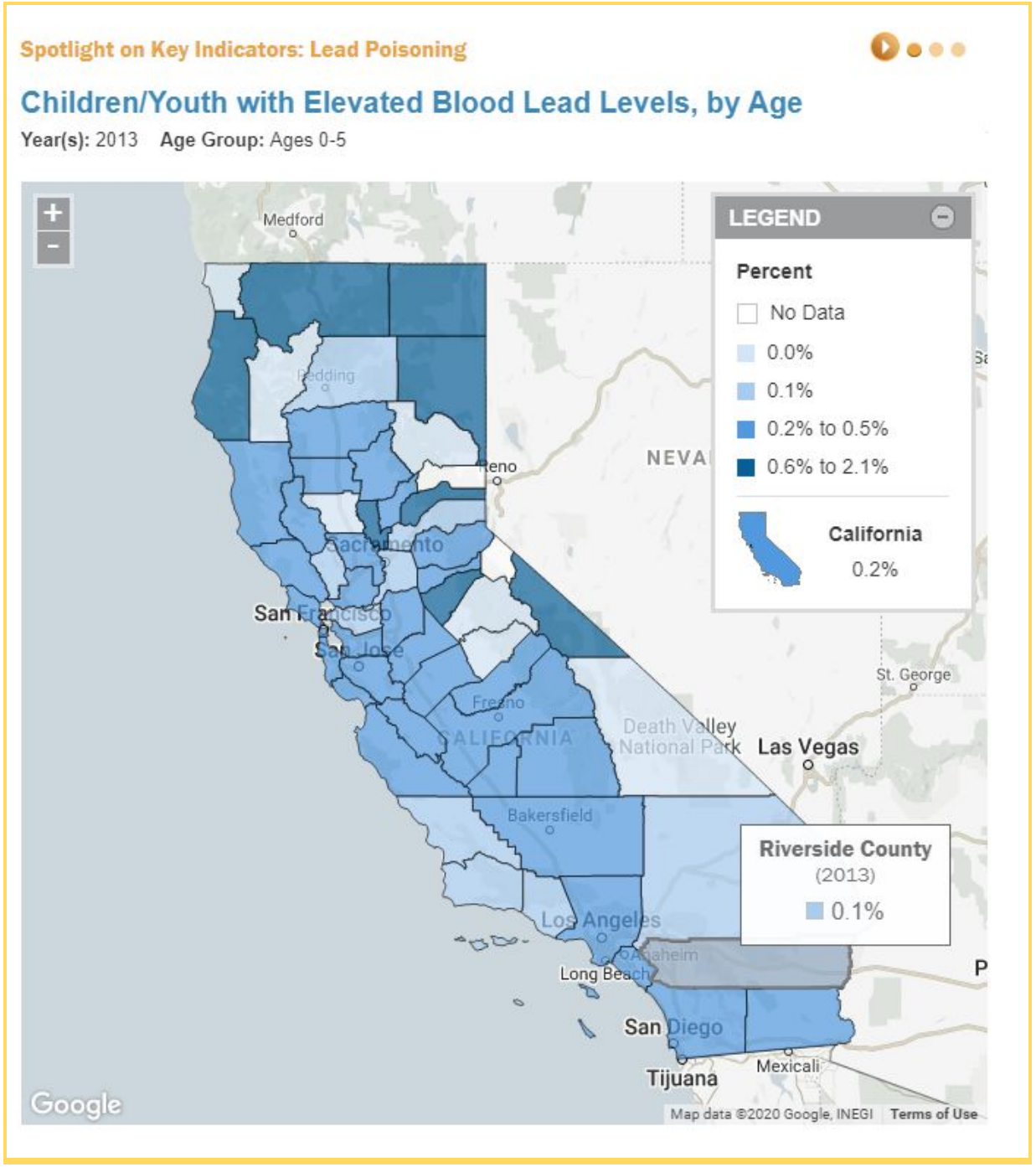


FIGURE 21: According to 2013 data, 1% of children ages 0-5 in Riverside County have elevated blood lead levels. The elevated lead levels may be due to lead found in contaminated water, exposed from paint, or even through the air. (Screenshot by Ryan Nguyen, November 4, 2020. https://m.kidsdata.org/table/367/riverside-county/529/environment-lead)

BIBLIOGRAPHY

"Air Pollution: Current and Future Challenges." EPA. Environmental Protection Agency, September 17, 2019. https://www.epa.gov/clean-air-act-overview/air-pollution-current-and-future-challenges.

"Air Quality." Air Quality | Ready Riverside. Accessed October 30, 2020. https://www.riversideca.gov/readyriverside/be-informed/hazards/air-quality.

Aliferis, Lisa. 2013. "In Impoverished Eastern Coachella Valley, Data Brings Change." KQED. June 12, 2013. https://www.kqed.org/stateofhealth/13182/in-impoverished-eastern-coachella-valley-data-brings-change.

"BestPlaces." Riverside County, California Economy. Accessed October 29, 2020. https://www.bestplaces.net/economy/county/california/riverside.

Bogle, Jeff. "The 14 Countries Doing the Most to Protect the Environment." Reader's Digest. Reader's Digest, March 16, 2020. https://www.rd.com/list/countries-doing-the-most-to-protect-the-environment/.

"California Healthy Places Index Map." n.d. Accessed November 3, 2020. https://map.healthyplacesindex.org/.

Chiland, Elijah. 2019. "Number of LA Residents Dealing with Commute Times over 90 Minutes Surges." *Curbed LA*. https://la.curbed.com/2019/8/15/20807275/los-angeles-commute-times-traffic.

"Children Now Scorecard." n.d. Accessed November 3, 2020. https://scorecard.childrennow.org/?cty=riverside.

City News Service. "Riverside County Receives 'F' for Air Quality." NBC Los Angeles (blog), April 24, 2019. https://www.nbclosangeles.com/news/riverside-county-receives-f-for-air-quality/

163975/.

City News Service. 2016. “Why Riverside County Is Covering Trash at Landfills.” *Press Enterprise (blog)*. https://www.pe.com/articles/tarps-818062-county-waste.html.

City of Riverside. “Air.” Riverside, California | City of Arts & Innovation | Air. Accessed October 29, 2020. https://riversideca.gov/publicworks/air/air-quality.asp.

Cowan, Jill. 2020. “Warehouse Workers in a Bind as Virus Spikes in Southern California.” *The New York Times*. Accessed November 3, 2020. https://www.nytimes.com/2020/07/09/us/coronavirus-ca-warehouse-workers.html.

Downey, David. “Environmental Groups Sue Riverside County over Villages of Lakeview Project.” Press Enterprise (blog), January 10, 2018. https://www.pe.com/2018/01/10/environmental-groups-sue-riverside-county-over-villages-of-lakeview-project/.

“EJSCREEN Map Comparisons.” n.d. Accessed November 3, 2020. https://ejscreen.epa.gov/mapper/comparemapper.html.

Environmental Defense Fund. “Health Impacts of Air Pollution.” Environmental Defense Fund, 2020. https://www.edf.org/health/health-impacts-air-pollution.

Environmental Working Group. “EWG's Tap Water Database: What's in Your Drinking Water? - City of Riverside” EWG Tap Water Database. Accessed November 3, 2020. https://www.ewg.org/tapwater/system.php?pws=CA3310031.

EPA. EJSCREEN ACS Summary Report. Pdf. EPA, 2018. https://ejscreen.epa.gov/mapper/demogreportpdf.aspx?report=acs2017.

EPA. n.d. “STRINGFELLOW Site Profile.” Overviews and Factsheets. Accessed October 31,

2020. https://cumulis.epa.gov/supercpad/CurSites/srchsites.cfm.

Global Sites Plan. 2019. “Is Riverside County to Blame for Its ‘Smog Belt’ and Failing Air Quality?.” *Smart Cities Dive*. Accessed November 3, 2020. https://www.smartcitiesdive.com/ex/sustainablecitiescollective/riverside-county-blame-its-smog-belt-failing-air-quality/1021866/.

"Green Riverside | Riverside Sustainability Coalition." n.d. Www.Greenriverside.Com. Accessed November 1, 2020. http://www.greenriverside.com/about-us/riversidesustainabilitycoalition.asp.

Guerin, Emily. "Cracking down on Warehouses to Stem Pollution from Trucks." Southern California Public Radio, 59:00 700. https://www.scpr.org/news/2018/05/04/82129/truck-pollution-is-harming-californians-is-crackin/.

Hagen, Ryan. 2020. "Riverside Declares Racism a Public Health Crisis." *Press Enterprise* (blog). July 1, 2020. https://www.pe.com/riverside-declares-racism-a-public-health-crisis.

"How Does University of California--Riverside Rank Among America's Best Colleges?" U.S. News & World Report. U.S. News & World Report. Accessed November 4, 2020. https://www.usnews.com/best-colleges/university-of-california-riverside-1316.

Kann, Drew. "US Begins Formal Withdrawal from Paris Climate Accord." CNN. Cable News Network, November 4, 2019. https://www.cnn.com/2019/11/04/politics/trump-formal-withdrawal-paris-climate-agreement/index.html.

"Keep Riverside Clean and Beautiful." JQuery Cycle Plugin - Basic Demo. Accessed October 29, 2020. http://www.krcb.com/.

Knoblauch, Jessica A. "What It's Like to Be Boxed In By Amazon Warehouses." Earthjustice, October 20, 2020. https://earthjustice.org/blog/2020-april/amazon-inland-empire-workers-covid-19.

"Lead Poisoning and Health." 2019. *World Health Organization.* Accessed November 3, 2020. https://www.who.int/news-room/fact-sheets/detail/lead-poisoning-and-health.

Liptak, Kevin, and Gregory Wallace. "Trump Revokes Waiver for California to Set Higher Auto Emissions Standards." CNN. Cable News Network, September 18, 2019.

https://www.cnn.com/2019/09/18/politics/epa-trump-california/index.html.

London Jonathan, Ph.D., Teri Greenfield, M.Ed., Tara Zagofsky, M.S. 2013. *Revealing the Coachella Valley*. UC Davis Center for Regional Change. https://regionalchange.ucdavis.edu/sites/g/files/dgvnsk986/files/inline-files/English%20Coachella%20Valley%20Report%20-%20Print%20version.pdf.

Mack, Sarah. 2016. "Riverside family, county health officials warn of the dangers of childhood lead poisoning." *Riverside University Health System Public Health.* Accessed November 3, 2020. https://www.rivcoph.org/Portals/0/Childhood%20Lead%20Poisoing%20Prevention%20program%20PR%202016.pdf?ver=2016-10-24-160352-650.

McAllister, Toni. "Hard To Breathe? Unhealthy Air Plagues Riverside County." Lake Elsinore-Wildomar, CA Patch. Patch, August 20, 2020. Accessed 30, 2020. https://patch.com/california/lakeelsinore-wildomar/hard-breathe-unhealthy-air-quality-plagues-riverside-county.

McAllister, Toni. "Heatwave Causing Poor Air Quality Across Riverside County." Lake Elsinore-Wildomar, CA Patch. Patch, May 26, 2020. Accessed October 30, 2020. https://patch.com/california/lakeelsinore-wildomar/heatwave-causing-poor-air-quality-across-riverside-county.

Murphy, Dr. Tony P. "The Second Minnesota Report Card on Environmental Literacy ." Hamline University, Minnesota Office of Environmental Assistance , August 2004. https://www.pca.state.mn.us/sites/default/files/p-ee5-06.pdf.

"NAAQS Table." EPA. Environmental Protection Agency, December 20, 2016. https://www.epa.gov/criteria-air-pollutants/naaqs-table.

"National Environmental Public Health Tracking Network - Info By Location." 2011. *Centers for Disease Control and Prevention.* Accessed November 3, 2020. http://ephtracking.cdc.gov/InfoByLocation/.

Olalde, Mark. 2020. "Proposed Western Riverside County Development Headed Back to Court." Desert Sun. Accessed November 3, 2020. https://www.desertsun.com/story/news/environment/2020/05/13/proposed-wes

tern-riverside-county-development-headed-back-court/3121848001/.

"Opportunity Index - Map." n.d. Opportunity Index. Accessed November 3, 2020. https://opportunityindex.org/.

Overton, Linda. 2016. "Childhood Lead Poisoning Prevention Program PR 2016.Pdf." October 24, 2016. https://www.rivcoph.org/Portals/0/Childhood%20Lead%20Poisoing%20Prevention%20program%20PR%202016.pdf?ver=2016-10-24-160352-650.

Paybarah, Azi, and Allyson Waller. 2020. "7 Fatally Shot at California House Where 1,000 Pounds of Marijuana Is Found." The New York Times, September 8, 2020, sec. U.S. https://www.nytimes.com/2020/09/08/us/aguanga-shooting-marijuana.html.

"Poverty in California." n.d. Public Policy Institute of California (blog). Accessed November 3, 2020. https://www.ppic.org/publication/poverty-in-california/.

Press Enterprise. 2017. "Thousands of Workers in California Exposed to Elevated Lead Levels." *Press Enterprise.* Accessed November 3, 2020. https://www.pe.com/2017/02/12/thousands-of-workers-in-california-exposed-to-elevated-lead-levels/.

"Public Transportation In Riverside County | U.S. Congressman Mark Takano of California's 41st District." n.d. Accessed November 3, 2020. https://takano.house.gov/public-transportation-in-riverside-county.

"QuickFacts: Riverside County, California." 2018. Census Bureau QuickFacts. United States Census Bureau. 2018. https://www.census.gov/quickfacts/riversidecountycalifornia.

Reyes, Jesus. 2020. "Supervisors Approve Thermal Beach Club Luxury Development." *KESQ* (blog). October 28, 2020. https://kesq.com/news/2020/10/27/supervisors-approve-thermal-beach-club-luxury-development/.

"Riverside Air Quality Index (AQI) and California Air Pollution: AirVisual." Riverside Air Quality Index (AQI) and California Air Pollution | AirVisual, November 3, 2020. https://www.iqair.com/us/usa/california/riverside.

"Riverside." American Lung Association, 2018. Accessed October 30, 2020.

https://www.stateoftheair.org/city-rankings/states/california/riverside.html.

"Riverside, CA Crime Rates & Map." n.d. Accessed November 3, 2020. https://www.areavibes.com/riverside-ca/crime/.

"Riverside, California | City of Arts & Innovation | Air." n.d. Accessed October 29, 2020. https://riversideca.gov/publicworks/air/air-quality.asp.

"Riverside County, CA." Data USA. 2018. Accessed October 29, 2020. https://datausa.io/profile/geo/riverside-county-ca#economy.

"Riverside County: Is Our Water Safe to Drink?." *Liberty*. 2020. https://www.libertyplumbingheatingandair.com/blog/riverside-county-is-our-water-safe-to-drink/.

Riverside Public Utilities. "Water Quality Report 2019." Riverside Public Utilities | Water & Energy, June 2020. Accessed November 3, 2020. https://riversideca.gov/utilities/businesses/your-water.asp.

"Riverside Public Utilities | Power Resources." *City of Riverside*. Accessed November 7, 2020. https://www.riversideca.gov/utilities/about-rpu/rpu-power-resources.asp.

Schiavone, Renee. "Local Drinking Water Named Among the Worst in Nation," February 14, 2014. https://patch.com/california/murrieta/local-drinking-water-named-among-the-worst-in-nation.

"Seeking Environmental Justice in California's 'Diesel Death Zones.'" 2020. Grist (blog). January 10, 2020. https://grist.org/sponsored/seeking-environmental-justice-in-californias-diesel-death-zones/.

Service, City News. "Riverside County Receives 'F' for Air Quality." NBC Los Angeles. NBC Southern California, April 24, 2019. https://www.nbclosangeles.com/news/riverside-county-receives-f-for-air-quality/163975/.

"Solving the Inland Empire's Poverty Problem – Press Enterprise." n.d. Accessed November 3, 2020.

https://www.pe.com/2018/09/29/solving-the-inland-empires-poverty-problem/.

Springs, City of Desert Hot. n.d. “Award-Winning Water | City of Desert Hot Springs.” www.Cityofdhs.Org. Accessed November 1, 2020. https://www.cityofdhs.org/award-winning-water?__hstc=116968025.a37349f1037b6b347c8f61465b993a20.1604003528003.1604003528003.1604003528003.1&__hssc=116968025.12.1604003528004&__hsfp=2416737960.

Staff, Desert Sun. “Early Voting Begins This Weekend at Westfield Palm Desert, Other Sites.” The Desert Sun. Palm Springs Desert Sun, October 24, 2020. https://www.desertsun.com/story/news/politics/elections/2020/10/24/early-voting-begins-westfield-palm-desert-across-riverside-county/6016824002/.

Takano, Mark. 2019. “The Heavy Burden of Rent in Riverside County.” *Press Enterprise (blog)*. https://www.pe.com/the-heavy-burden-of-rent-in-riverside-county-mark-takano.

“Uniform Crime Reporting (UCR) Program.” n.d. Folder. Federal Bureau of Investigation. Accessed November 3, 2020. https://www.fbi.gov/services/cjis/ucr.

“U.S. Census Bureau QuickFacts: Riverside County, California.” n.d. Accessed November 3, 2020. https://www.census.gov/quickfacts/fact/table/riversidecountycalifornia/IPE120219#IPE120219.

Valdes-Dapena, Peter. “California's Mandate to Sell Only Zero-Emissions Vehicles by 2035 Isn't as Crazy as Critics Think.” CNN. Cable News Network, October 3, 2020. https://www.cnn.com/2020/10/03/cars/california-2035-zev-mandate/index.html.

Vidal, John. “How Are Cities around the World Tackling Air Pollution?” The Guardian. Guardian News and Media, May 17, 2016. https://www.theguardian.com/environment/2016/may/17/how-are-cities-around-the-world-tackling-air-pollution.

Vincent, Ken. 2019. “Report: Inland Empire Has The Worst Air Pollution In The Nation...

Even Worse Than LA." *Empire KVCR*. Accessed November 3, 2020. https://www.kvcrnews.org/post/report-inland-empire-has-worst-air-pollution-nation-even-worse-la.

Warren, J.D. "UCR, Riverside Schools Push Back against Pollution." News, May 13, 2019. https://news.ucr.edu/articles/2019/05/13/ucr-riverside-schools-push-back-against-pollution.

"Waste & Recycling | City of Perris, CA." Accessed November 3, 2020. https://www.cityofperris.org/our-city/city-services/waste-recycling.

Wikipedia. "Riverside County, California." Wikimedia Foundation, October 15, 2020. Accessed November 7, 2020. https://en.wikipedia.org/wiki/Riverside_County,_California.

Wilson, Ricardo Lopez and Janet. n.d. "Many Eastern Coachella Valley Natives Are Returning. Their Mission? To Advocate for Their Community." The Desert Sun. Accessed November 4, 2020. https://www.desertsun.com/story/news/local/2019/06/28/eastern-coachella-valley-natives-returning-home-personal/1304993001/.

Zilliac, Chloe. "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