

MADISON ELEMENTARY ORANGE COUNTY

INTERDISCIPLINARY ENVIRONMENTAL JUSTICE CASE STUDY
An Exploration of Environmental Governance Needs, Challenges and Opportunities

JULY 2024



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<https://disaster-sts-network.org/>

ABOUT




This case study report was developed by high school students at Madison Elementary for the 2024 Environmental Health and Justice Research Internship run by GREEN-MPNA in collaboration with the UCI EcoGovLab and APHEL.

INDIGENOUS LAND ACKNOWLEDGEMENT

The first people to live in Santa Ana were the Gabrieleno, also known as the Tongva, and the Acjachemen. There are about 1,700 remaining Tongva and 1,800 Acjachemen. Their land was taken in the 1700s when the Spanish arrived. Neither tribe is federally recognized, so they struggle to get the funding that other tribes get.

COVER PHOTO

Image description: Photo of a mural on McFadden Street in Santa Ana near Madison Elementary. Image source: [Cody Lusby](#)

<p style="text-align: center;">BIOGRAPHICAL STATEMENT</p>	<p style="text-align: center;">PHOTO</p>
<p>Ariana Duran is a upcoming sophomore attending Circulos High School at Advanced Learning Academy. Ariana is currently an Intern at GREEN MPNA. She likes biology and plans on attending a four-year university to pursue to become a doctor. Ariana sees herself becoming an environmental stakeholder by creating a voice to address the environmental issues throughout our community.</p>	
<p>Karen Montalvo is a upcoming sophomore attending Circulos High School at Advanced Learning Academy. Karen is currently an Intern at GREEN MPNA. Karen is a cheerleader at Circulos High School. She's interested in biology and plans to attend a four year university to pursue being a doctor. Karen sees herself becoming an Environmental Justice stakeholder to have the power to address Environmental health hazards and problems, as well as speaking up for those who can't.</p>	
<p>Valeria Orozco is an upcoming Junior attending Godinez Fundamental High School. Valeria is currently an intern at GREEN MPNA. Valeria is in Cross Country, Track, and ASB at her high school. She is interested in mathematics and plans to attend a four year university to pursue being a nurse. Valeria sees herself becoming an Environmental Justice Stakeholder to influence policies and practices that can lead to long term environmental improvements and justice for low income communities.</p>	

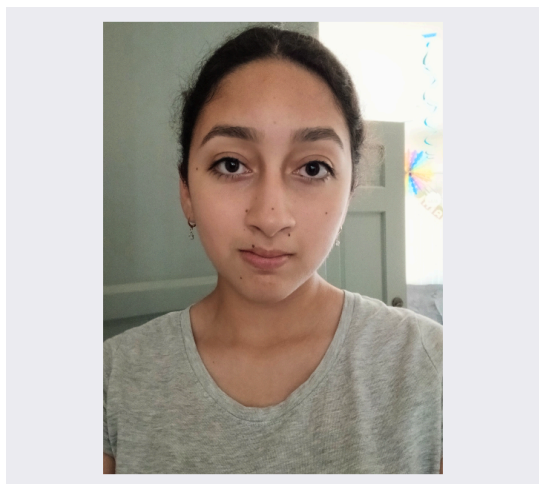
Allen Carbajal is a rising Sophomore at Circulos High School . Allen is currently an Intern at GREEN MPNA. Allen is in the Circulos basketball team. He’s interested in mathematics, chemistry and plans to attend a community college then transfer to a 4 year university. Allen sees himself becoming an Environmental Justice Stakeholder to address Environmental health hazards and problems, as well as speaking up for those who can't.



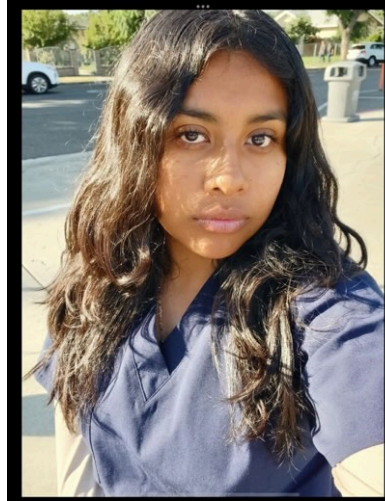
Bella Martinez is a rising senior at Saddleback High School. Bella is an intern at GREEN MPNA, member of CUAL, and student athlete. She likes chemistry and biology and plans on attending Stanford after graduating in hopes of entering the medical field. Her future plans are to become a pediatrician. Bella sees herself as an environmental justice stakeholder who has the ability to create solutions for the environmental issues affecting the community of Santa Ana.



Evelyn Muñiz Morfin is a rising junior at Circulos High School at Advanced Learning Academy. Evelyn is currently an intern at GREEN MPNA. She plans to attend a four year university and pursue a career as a veterinarian. She enjoys chemistry, biology, and art. Evelyn sees herself as an environmental justice stakeholder who has the power to address and contribute to the change of issues that impact our health and environment.



Briana Rendon is a rising junior at círculos high school. Briana is currently an Intern at GREEN MPNA. She likes chemistry and plans on attending a four-year university to pursue to become a nurse. Briana sees herself becoming an environmental stakeholder by creating a voice to address the environmental issues throughout our community with the new knowledge she has learned with the program.



Luis Ferrer Rodriguez is an upcoming Junior attending Century High School. Luis is currently an Intern at GREEN MPNA. He likes psychology and plans on attending a four year university to become a Therapist or social worker. Luis sees himself becoming an Environmental Justice stakeholder to create the chain in my community to start a change and to stand up for not just his communities rights but everyone's rights as well.



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

Name	Signature	Publish? (Y or N)
1. Valeria Orozco	<i>Valeria Orozco</i>	Y
2. Ariana Duran	<i>Ariana Duran</i>	Y
3. Karen Montalvo	<i>Karen Montalvo</i>	Y
4. Bella Martinez	<i>Bella Martinez</i>	Y
5. Evelyn Muñiz Morfin	<i>Evelyn Muñiz Morfin</i>	Y
6. Allen Carbajal	<i>Allen Carbajal</i>	Y
Luis Ferrer Rodriguez	<i>Luis Ferrer Rodriguez</i>	Y

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ABSTRACT

Problem statement: In the last few decades, a growing body of scientific research has shown that climate change is accelerating environmental injustice and causing cascading harms. In the Madison park area, for example, climate change has led to increasing extreme heat, drought, flooding, compounding existing environmental injustices like drinking contaminated water, traffic impacts, lead and toluene.

Climate change and environmental injustice hit poor and politically marginalized communities hardest in the United States and around the world. California communities are at the frontline of both environmental problems and environmental action. That's why we need to understand and address environmental injustice in California communities.

Aims: The aim of this case study is to characterize climate change and environmental hazards and the health effects that contribute to environmental injustice in Santa Ana. Because children and youth are especially vulnerable to the effects of climate change and combo disaster, we have centered the study on a particular school. Our focus is on Madison Elementary.

Methods: To conduct this research, we drew from data resources, information collection and analysis strategies focused on: 1) specific environmental hazards and their effects on different communities; 2) different stakeholders who play a role in environmental injustice and climate change in Santa Ana; 3) possibilities for action that would reduce the impacts of environmental injustice and climate change; and 4) toxicological data.

Findings: Through its focus on Madison Elementary in Santa Ana, this study points to aspects of climate change and environmental injustice that are often unrecognized or underappreciated. The case study highlights the following such aspects:

- The importance of addressing toluene and lead exposure and the diseases they cause
- The social disadvantage of Santa Ana
- Health and reproductive injustice in Santa Ana

Intellectual Significance: This study advances knowledge about climate change and environmental injustice by identifying multiple, often underappreciated factors that increase environmental health vulnerability. Environmental injustice is more than just activism, it is a lot more complex like the studies and research having to get done in order to find solutions for the problems that arise.

Practical Significance: This study points to the need for:

- Parents to understand that their child is in danger and they have the power to

stop/do something about it.

- People in the community to understand they affect that lead and toluene have a big affect on their lives whether it's short term or long term
- Using advocacy letters, murals, and stakeholder meetings to address these problems

INTRODUCTION

This case study report examines environmental health and governance challenges and opportunities near Madison Elementary, located in Orange County, California, USA.

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 in a short time-frame so is limited and points to the need for further research and community engagement. The goal is to help build both a body of research on radiation governance around the world and a network of researchers ready to help conceptualize and implement next-generation radiation protections.

Environmental Injustice Case Study Framework

1. What is the setting of this case? What are its assets? What opportunities and challenges will there be in this setting in coming years?
2. What environmental threats 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 environmental problems in this setting?
6. How have environmental problems in this setting been reported on by media, environmental groups, companies and government agencies?
7. What local actions would reduce environmental vulnerability and injustice in this setting?
8. What extra-local actions (at state, national or international levels) would reduce environmental vulnerability and injustice in this setting and similar settings?

9. What kinds of data and research would be useful in efforts to characterize and address environmental threats in this setting and similar settings?
10. What intersecting injustices -- data, economic, epistemic, gender, health, infrastructure, intergenerational, media, procedural, racial, reproductive -- contribute to environmental injustice in this setting?

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

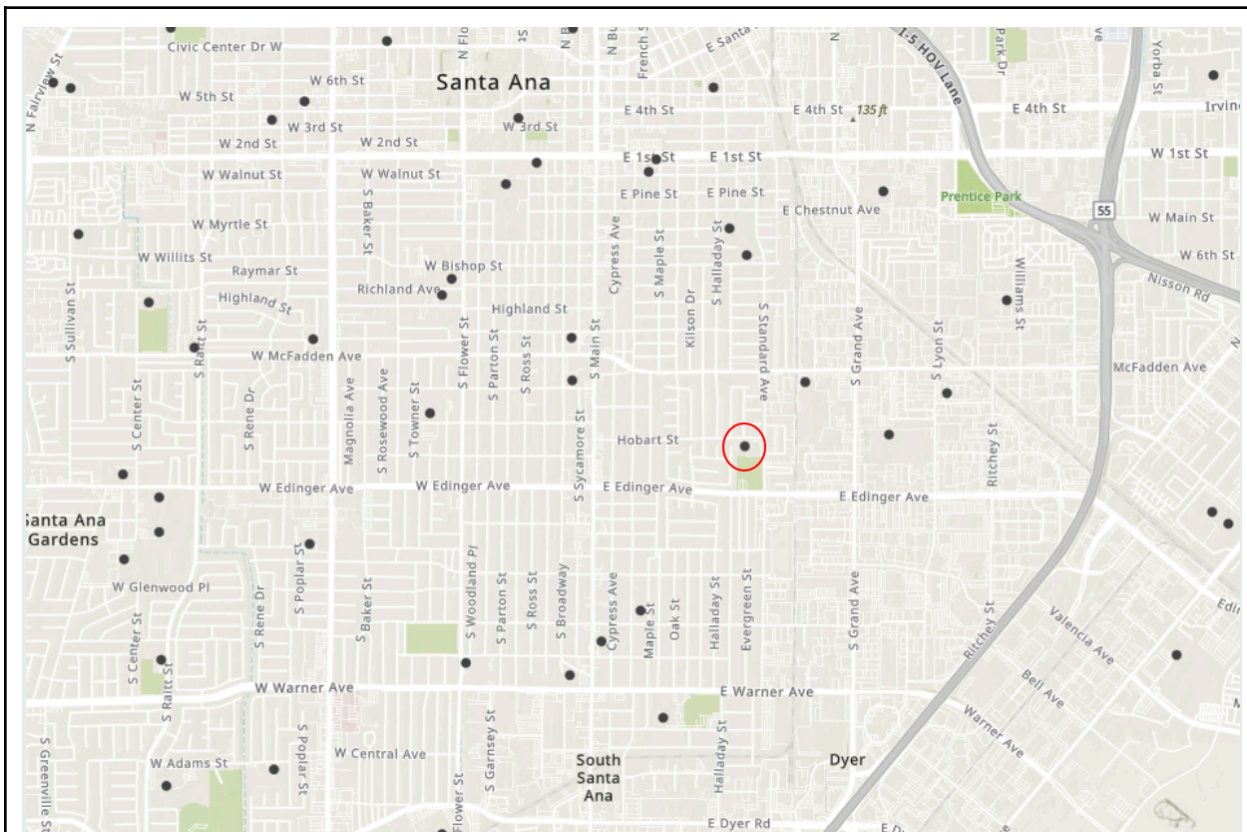


FIGURE 2: Our case study will focus on Madison Elementary, which is located in Santa Ana in Orange County. The school serves 989 students, 96% of whom are Latino/a. Source: <https://arcg.is/zzfrD>

1. MEDIA, SETTING, & ASSETS

Community Research

Most of the sources we have were credible and not just random talk, but it takes effort to find them. Even if you're seeing it on Tiktok, it could be credible—you need to do more research about the topic and the creator. Many of the data sources are spread out through the city and there aren't many that are specific to Madison Park. Other resources haven't been updated in a long time, like the emergency plan. Many sources just quote government information, they don't try to find it themselves. Some sources appear credible on the surface, but aren't when you look deeper into them. For example, the city says Santa Ana's water is the third best in the world, but only one of the authors of this report drinks tap water at home! Some sources are biased based on their opinions. Some sources have evidence to back up their claim and others don't, but just because they have evidence doesn't mean it's true.

There are 52 schools in Santa Ana and most students are Hispanic/Latino. In our experience, each school is missing some resources. For example, Circulos has a lot of academic resources (like AP classes and honors classes) but there aren't many sports and extracurricular opportunities. A lot of Saddleback HS students aren't motivated because the teachers don't support them. Godinez has some very good sports (like soccer) that get a lot of money, while others don't get any. Century has several academies that can help you succeed and some good sports. All of the schools have problems with gangs and drugs and

control access to the bathrooms. There are 32 colleges within 50 miles of Santa Ana.

Santa Ana is the fourth most densely populated city in the U.S., with about 310,000 residents. Only 8% of residents of Madison’s census tract have a college degree, and almost half are born outside of the United States. Most residents are Latino and many are undocumented. Some parts of the city are in poverty and others are not. California has designated 33 out of 64 of the city’s neighborhoods as disadvantaged.

Santa Ana has a unique climate phenomenon called “Santa Ana winds,” which are downslope winds that originate inland. The city’s climate change action plan and safety protocol (for fires and earthquakes) haven’t been updated since 2014. The majority of the city’s resources are in the northern part of the city and there are few in the Madison Park area. There are six city council members and a mayor, and Madison’s city council member is David Peñalosa. The city can make its own laws independently from the state of California.

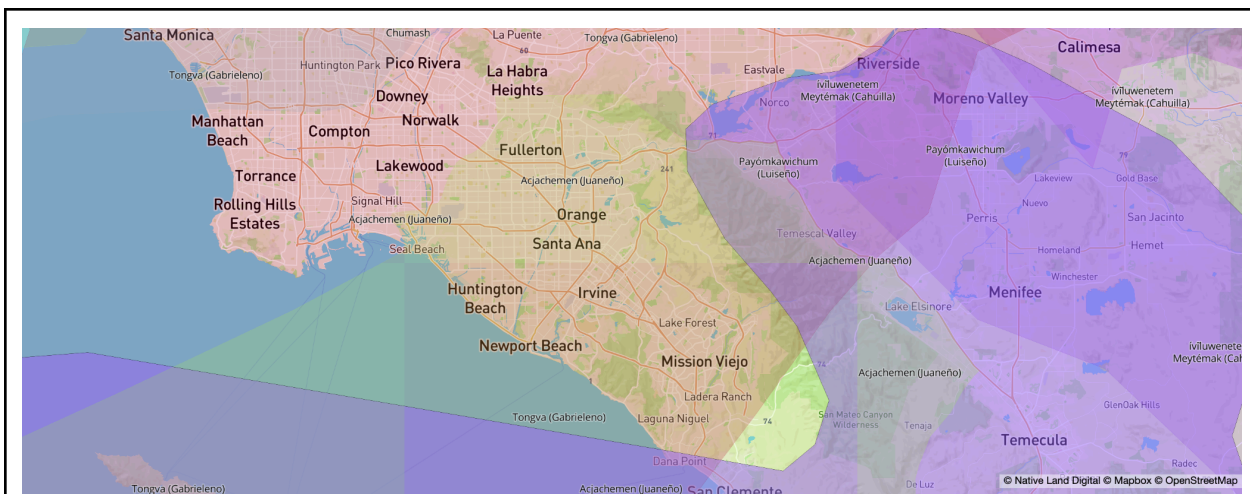


FIGURE 3 Native Land Acknowledgement- Luis F : This figure shows unceded land belonging to the Tongva and the Acjachemen Tribes in Orange County. It’s important to note their presence because Native American tribes like the Tongva and Acjachemen, are environmental stakeholders in our community and they don’t have federal recognition which is important. Source: <https://native-land.ca/>



FIGURE 4 Setting Photography - Evelyn: Madison Park is right next to Madison Elementary, our school of interest. It's a popular park for people in the area. The Madison Park neighborhood is within the Industrial Corridor which has a lot of air pollution and contact with harmful substances.

Source: <https://web.archive.org/web/20161029095039/http://www.panoramio.com/photo/109612366>

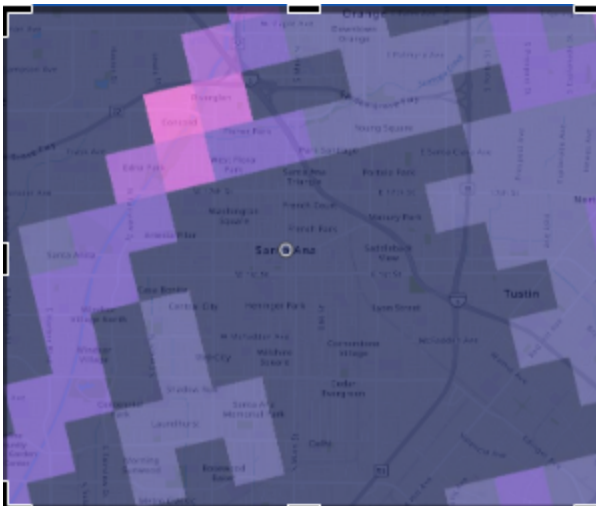


FIGURE 5 Biodiversity map -Valeria

The species on the map shows how many different kinds of plants and animals live in each area. Higher numbers mean more rare or endangered species are likely to be found there. Which Santa Ana has a high number compared to other cities

Source: <https://ucirvine.maps.arcgis.com/apps/instant/imageryviewer/index.html?appid=02f8371dd63146b8b390c11757c60b74&primaryLayerId=18a4339b168-1>

[ayer-2&primaryLayerRenderer=SR_ALL¢er=-117.8999;33.8341&level=9](#)

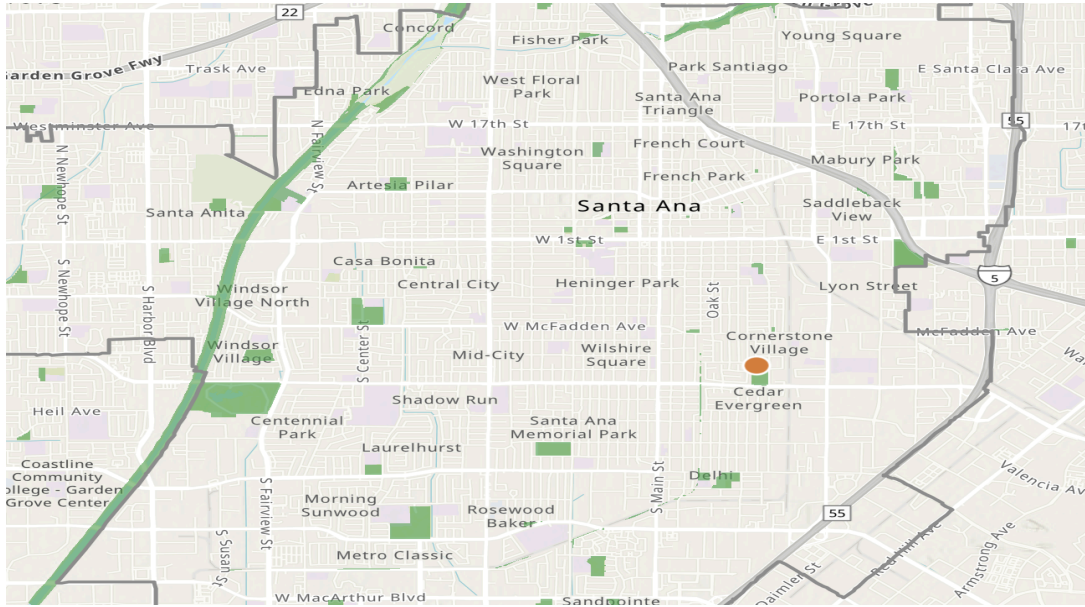


FIGURE 6: playgrounds Map- Ariana

This Map it showcases that there is some greenland near Madison Elementary School named, “Madison Park.”

Source:<https://parkserve.tpl.org/mapping/index.html>

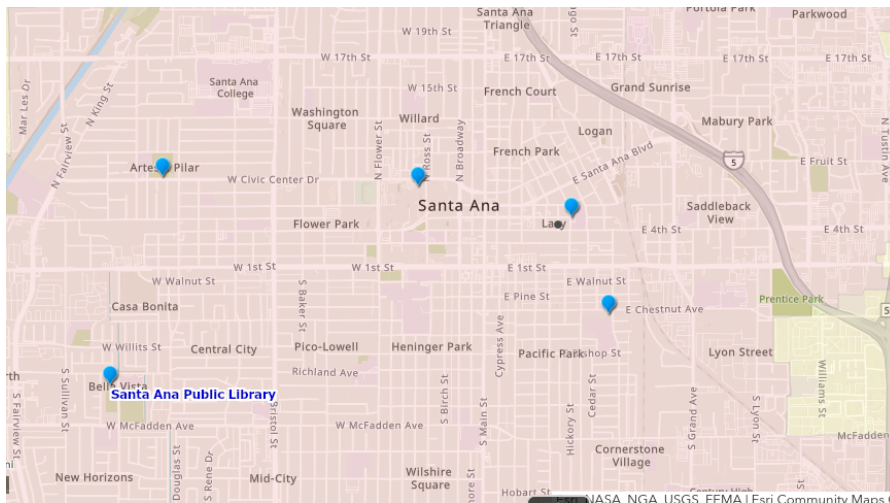


FIGURE 7: Libraries Map - Karen

This Map show all the 6 different types of libraries spread around Santa Ana. Starting off with Santa Anas Public library, Garfield Community Center, Roosevelt-Walker

Community Center, El Salvador Community Center, Jerome Teenspace And newhope Library Learning Center. Based on this map it is show that there are no nearby libraries in the further south of Santa Ana making libraries not accessible to nearby neighborhoods in the further south area.

Source:

<https://castatelibrary.maps.arcgis.com/apps/webappviewer/index.html?id=0cb00b3ff0774122969f3b3b1cbcbef4>

2. ENVIRONMENTAL HAZARDS

Risk Assessment

We identified several of the most important hazards in the Madison Park neighborhood: PM2.5, drinking water contamination, drought, hazardous waste, propane, hazardous facilities like Gallade, and, most importantly, lead and toluene.

PM2.5 travels through the air and can enter lungs and cause lung problems and heart problems. Children, the elderly, and people with asthma are most vulnerable. Madison is in the 95th percentile for PM2.5 exposure. PM2.5 comes from emissions from combustion of gas or diesel or can form from chemical reactions in the atmosphere.

Madison's drinking water has hexavalent chromium, nitrate, and perchlorate. Hexavalent chromium exposure can cause respiratory irritation, kidney damage, and cancer. Welders are at risk. Nitrate can cause nausea, headache, colon cancer, and blue baby syndrome.

Perchlorate can affect the thyroid gland. Infants and expecting mothers are most vulnerable to nitrate and perchlorate. Contamination can come from sewage, chemicals applied near water, and metal plating.

Drought can damage crops and lead to shortages of food and drinking water and conflict over remaining water. It can damage vegetation, animals, and people, especially infants and people with chronic medical conditions. Orange County is in the 85th percentile for drought risk. 77% of Santa Ana's drinking water comes from groundwater, which would be threatened by drought.

Hazardous waste can cause abnormal behavior, cancer, kidney failure, and many other health effects. Madison is in the 95th percentile for exposure to hazardous waste. There are many sources of hazardous waste in Santa Ana, including metal plating facilities.

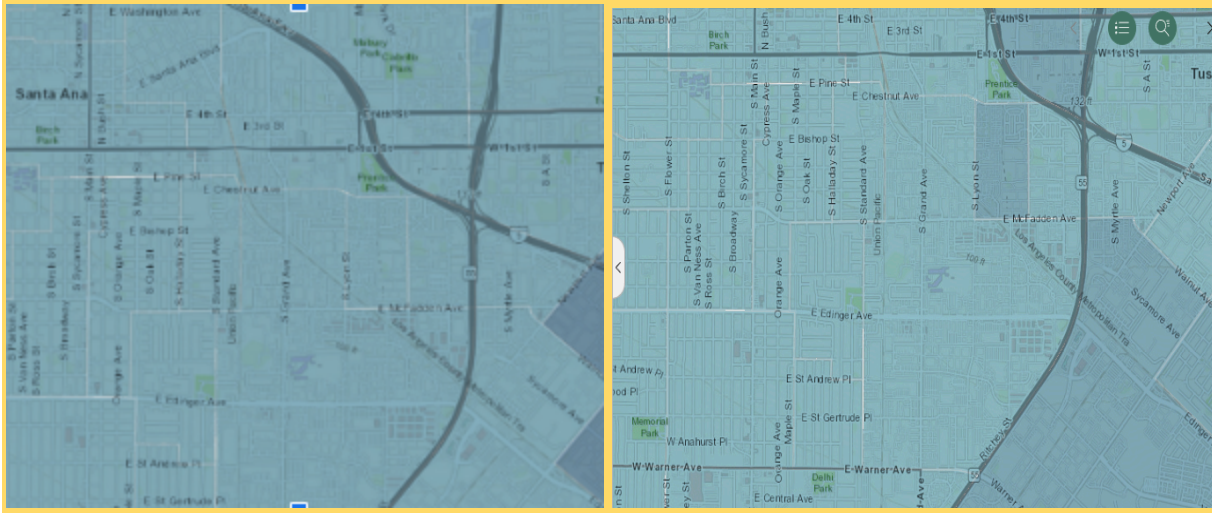
Propane can displace oxygen in your lungs, making it difficult to breathe. It can come from transportation and truck accidents. Propane is a greenhouse gas, so it contributes to climate change.

Gallade Inc. is a company that buys and supplies chemicals to laboratories and other companies. There are several facilities right next to each other, and a leak or explosion at one facility could cause many serious health effects. Most people aren't aware that this could happen. It is about 1,000 feet from Madison

Lead: Based on the data that we have compiled in the risk assessment the uses of lead are in the productions of batteries, radiation shielding, and alloying elements that are in many materials to facilitate free cutting properties. Lead adheres to soil particles which don't break down in the environment. Both soil and dust contain lead which can be transported to nearby properties by every day human activities and by wind/rain. We also found out that lead exposures can lead to anemia, renal impairment, toxicity to the reproductive

organs , and low IQ which can not be reversed. Also if you're exposed to it at a very young age symptoms might not be showcased till an older age and there's no way to find out if you have lead in your bloodstream if no symptoms occur. Furthermore in our research we discovered that the environmental dose limit for lead is 0.15 ug. The occupational health dose limit will be 50ug and lastly the public dose limit will be 50 micrograms of lead per cubic meter . In our community working in construction, painting, battery manufacturing , recycling, and children are most likely to be at risk for lead. You can reduce your exposure to lead by cleaning around areas that generate dust, such as doors, windows, and drawers. By wiping these areas with a wet sponge or rag to remove paint or dust.

Toluene: Based on our research that we have compiled in the risk assessment, we found that Toluene is commonly found/used in making paints, paint thinners, fingernail polish, rubber, and in some printing and leather tanning processes. It is also added to gasoline to increase Octane rating. Toluene may be associated with thyroid cancer. In addition, people have also gotten nerve damage, abnormal heartbeats, and brain disorders that involve a reduction in memory. Furthermore in our research, we found that the dose limit for Toluene is 60 mL. In our community, elders, pregnant women, children, asthmatic people, and people with cardiovascular diseases are being affected the most by Toluene. If you are being exposed or want to decrease the chances of being affected, ventilating houses as much as possible, unless you live in an area with a lot of car traffic. We can also use air purifiers or cover up our skin as much as possible, which can also help if we're ever in direct contact with it.



1st Picture - Ozone Exposure

2nd Picture - Drinking Water Contaminants

FIGURE 8:

Ozone Exposure -Valeria

Madison Elementary is in an area that ranks around the middle (58th percentile) in California for how much ozone is in the air . Which means it is not too high or low we are just in the middle which is decent.

Drinking Water Contaminants - Allen

The drinking water contaminant percentile is 46, meaning it is higher than 46% of the census tracts in California. In other words, it means it is not too high or low. It could be better.

Source: <https://experience.arcgis.com/experience/ed5953d89038431dbf4f22ab9abfe40d/>

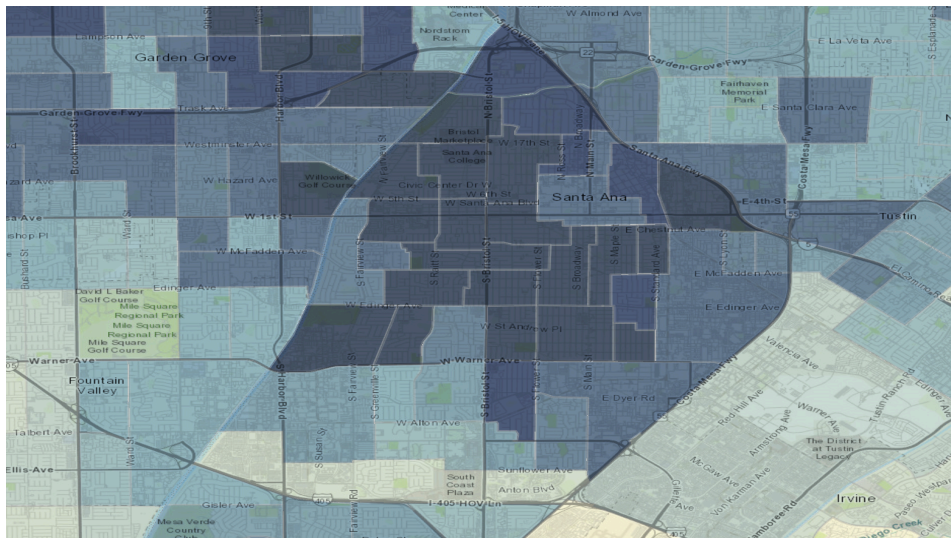


FIGURE 9: Childhood lead exposure- Ariana

This map shows us the amount of lead being exposed in Madison Elementary which is about 87 percentile.

Source: <https://experience.arcgis.com/experience/ed5953d89038431dbf4f22ab9abfe40d/>

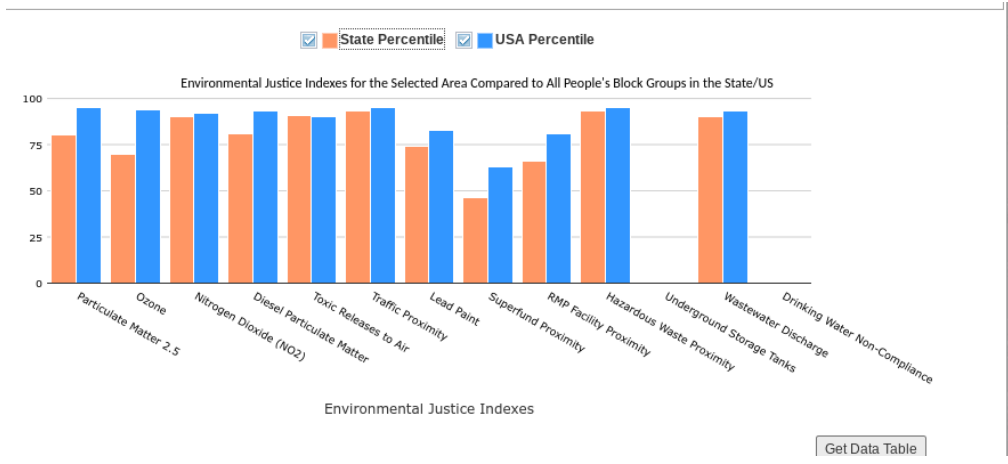


FIGURE 10: EJSscreen Indexes - Karen

Santa Ana residents have extremely high exposure to many hazards such as hazardous waste being in a 95th percentile. Water Waste discharge in a 93th percentile. And PM 2.5 also in a 95th percentile compared to the rest of the country Santa Ana is one of the cities with high hazard levels.

Sources: <https://ejsscreen.epa.gov/mapper/>

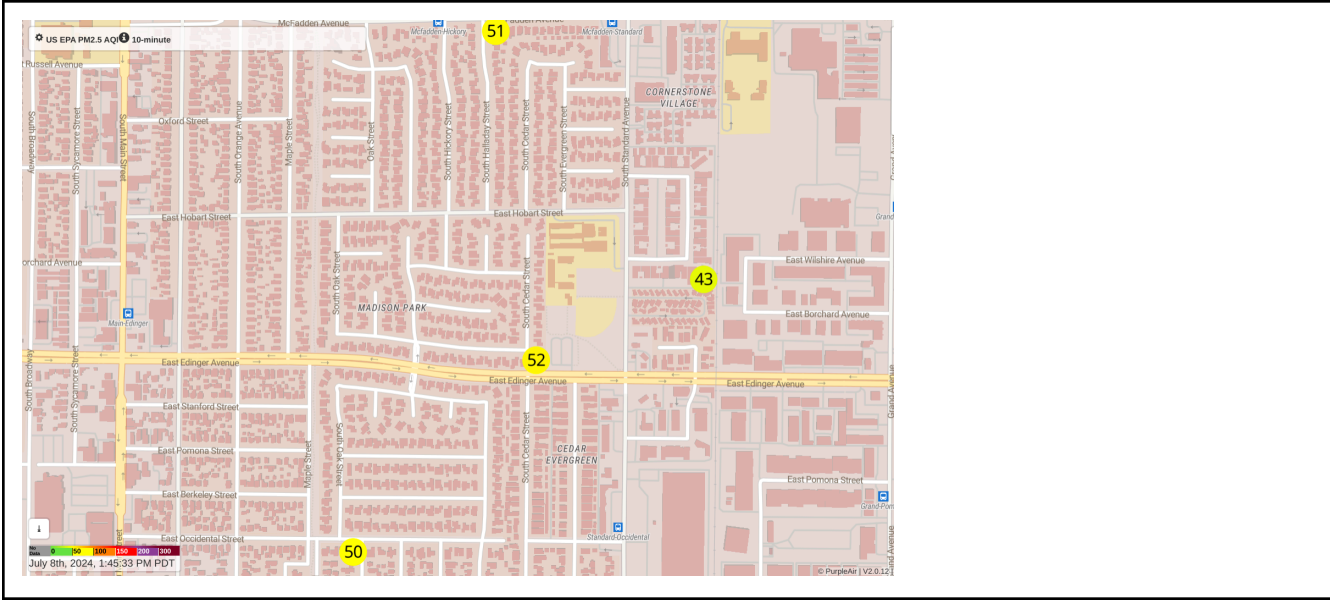


FIGURE 11: Purple Air Quality Monitors - Evelyn

There are four purple air monitors close to Madison Elementary. They show that the air quality is currently acceptable with most being in the 40's and low 50's on July 8, 2024. Although it's acceptable, it still means that people who are very sensitive to air pollution are at risk if exposed for 24 hours or more.

Source: [Map | PurpleAir](#)

3. STAKEHOLDERS & VULNERABILITIES

Stakeholder and Vulnerability Info:

There are many different stakeholders in Santa Ana. People are stakeholders when they have power to make a change, when they need something to change because they're impacted by it, or when they're affected by a problem. Just because a stakeholder has a lot of power, it doesn't mean they can accomplish all of their goals. For example, police officers have power over residents but they still have obstacles like funding or connections.

Students are stakeholders because they want to see change in their community and take action when no one else is taking action. Students are prevented from taking action by a lack of opportunity or resources, or because they don't know about the problems. Students have different priorities that occupy their minds.

Social media users have the opportunity to share awareness about environmental issues if it's done right, but not everyone does their research, so people don't take it as seriously. Sometimes social media can spread disinformation. Some people don't know who to believe or where to get information. Sometimes this is for religious reasons, just because they believe Facebook is reliable, because there's conflicting information, because schools don't teach it (because it's not in the curriculum or they don't have the resources), or because they aren't given the information in a way they can understand.

Even though some people see environmental problems (like air pollution), a lot of people don't see them because they think it's normal. This is why some people don't contribute to environmental justice. Others think that it's not that bad because it's worse in other places—like Los Angeles and Mexico.

Clean Up Kingspan is one example of a stakeholder group of factory workers that stood up for their right to have a safe work environment.

Stakeholder Power Grid

What empowers this stakeholder?	Stakeholder	What disempowers this stakeholder?
Donations Recognition for their actions can also help motivate them.	Fire districts: They want to ensure safety to their community and prevent fires	Limited funding Local tax may not be enough to cover enough costs in smaller communities.
Support from teachers and family members. Attaining a certification or degree. Working or developing on their hard and soft skills.	Students: a secure job, to succeed in school, a	Lack of opportunities and experience. A competitive job market. They might not have a strong professional network.
Having access to nutritious meals, a safe house, supporting children with homework and encouragement. Be available to support them emotionally, academically, and overall in every aspect of life.	Parents: A safer environment, a good life for their children	Lack of resources, mental health issues, and high levels of stress can prevent them from supporting their children. Parents who work long hours or multiple jobs are less likely to have time to provide and be there for their children.
Following accounts that meet their interests. Sharing contacts that generally reflect who they are and what they care about.	Social media users: entertainment and to connect with others	Cyberbullying Spread of false information that creates confusion or mistrust Constant comparison of themselves to influencers
They hold power and authority over residents which allows a stakeholder group to accomplish their goals faster and more efficiently. They are also funded by taxes which means they get good pay.	Police work to ensure a safe and healthy environment for their community.	They are busy with their job where they may need to deal with other issues. They also may not have enough funds or connections.

<p>They are informed of the environmental problems in their community. They attend meetings on the problems going on as they try to make a change.</p>	<p>Madison Park residents work with programs to stay informed about the environmental dangers in their community.</p>	<p>The information they get might not be in the language they understand. They might not be informed of the problems going on. They also might be too busy to attend meetings about the environmental problems in their community.</p>
<p>They have a good reputation and are well informed about environmental injustice. They have people that are experts in the subjects and may have connections that will help push them further.</p>	<p>CalEPA works to restore, protect, and enhance the environment to ensure a safe environment.</p>	<p>Communities thinking that there are no environmental dangers may slow them down as well as uninformed people. Not having enough funds. Polluters and corporations may push them back.</p>
<p>They inform the communities about environmental problems and get people together to fight and make a change. They're well-known and have a lot of information, which helps them get resources and communicate with people.</p>	<p>CUAL - "They want and need safe and clear air, a healthy environment, and more open green spaces for all living beings"</p>	<p>Government ignorance, the government providing poor performance or communication with the people or disregarding the people's voice</p>
<p>They provide multiple programs and workshops to help provide better health and education to both the children and adults. They create these programs to help diminish the barrier or missed opportunities when it comes to learning about STEM. They have connections and resources</p>	<p>GREEN-MPNA - Wants to improve health through wellness programs and environmental justice policy work.</p>	<p>Getting kids and adults engaged and showing that what they are spending their time with is worth it and will benefit them and their communities as well as children that live in those areas too.</p>
<p>Since they are starting out,</p>	<p>Small business owners -</p>	<p>Since they are small and not</p>

<p>more people are willing to help out small businesses and provide some resources.</p>	<p>They want to expand and make profit on any specific business they are running</p>	<p>well known, they need to find specific person/place to get required needs to continue</p>
<p>They have been promoting a safer environment. For example they are adding books on environmental injustice. They have also been recycling.</p>	<p>Santa Ana libraries: They want to have a safer community for example cleaner air, a cleaner community, and etc.</p>	<p>The things that prevent this group getting what they want would be the factories polluting the air, the people leaving trash, and the very old buildings that libraries are located in.</p>
<p>Achieve these by talking to people, working with others, making deals, and listening to what the public thinks.</p>	<p>Elected officials (aim to represent people, pass laws they support, and achieve their political goals)</p>	<p>Opposition, different opinions, budget limits, rules, not enough time, or personal issues in general.</p>
<p>Achieve their goals by managing well, improving how things are made, following rules</p>	<p>Factory owners (want to make money, run their factories well, produce good product)</p>	<p>Economic downturns, supply issues, equipment breakdowns, unexpected expenses and health violations considering their spreading chemicals all around them.</p>
<p>They can achieve these goals by working with unions for better pay and conditions. They can also communicate their needs to management.</p>	<p>Bus drivers: Bus drivers want fair wages, reasonable working hours, safe working conditions, and many more.</p>	<p>Bus drivers sometimes can't do anything because they have rules, union agreements, budget constraints, and many more.</p>

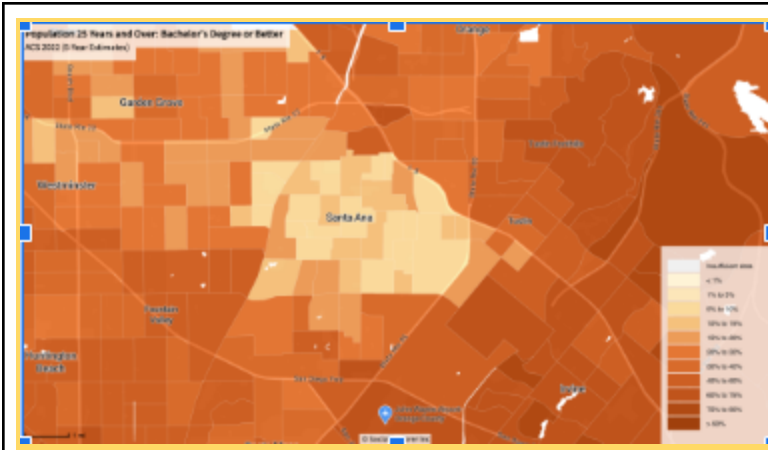


FIGURE 12: Educational Attainment -Valeria

Santa Ana overall has 8% of the population that has graduated with a bachelor’s or higher. Which means that Santa Ana has areas with fewer people who have gone to college compared to other places in the Los Angeles region.

Source

https://codap.concord.org/releases/latest/static/dg/en/cert/index.html*shared=https://*c/fm-shared.concord.org/cUfwRpfOE3EjPJPJSdla/file.json

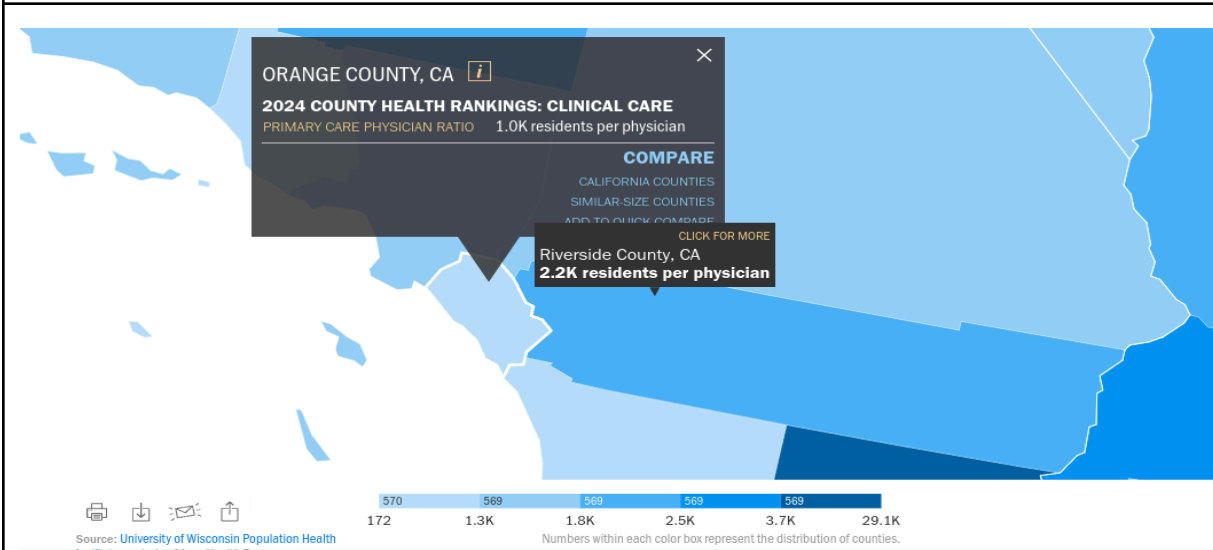


FIGURE 13: Physician to Patient Ratio- Ariana

This map showcases that in 2024, Orange County’s primary care physician Ratio is about 1.0K residents per physician.

source:<https://ce.naco.org/?dset=County%20Health%20Rankings%3A%20Clinical%20Care&ind=Primary%20Care%20Physician%20Ratio>



FIGURE 14: Native Peoples - Karen

These images were taken in an event the native acjachemen hosted to honor their ancestors. This event was made to support mother earth and all life as they create a large scale “huma” artwork with hundreds of like-hearted people. This event was to unite indigenous elders from the Acjachemen Nation and various other California tribes in a act of love and reverence for our planet.

Sources: <https://www.jbmian.com/past-events.html#/>

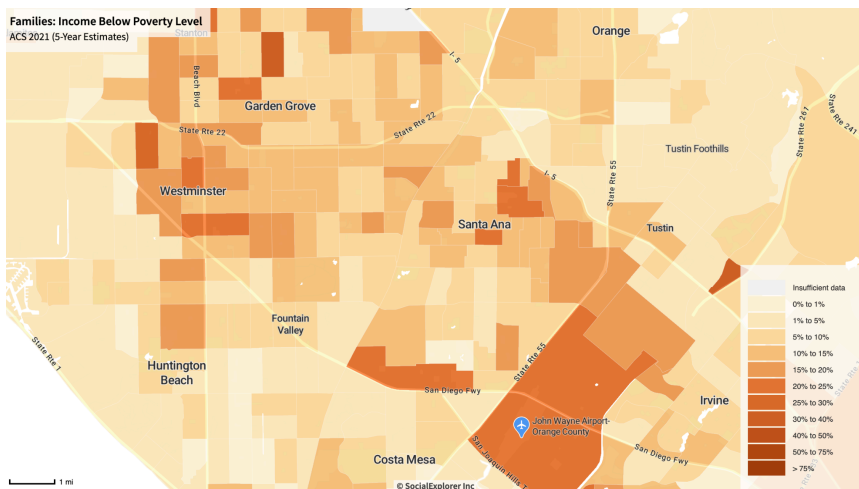


FIGURE 15: Poverty - Evelyn

This figure shows that in the Madison Park area, 12% of the population is considered living in poverty. To be considered living in poverty a person must earn less than \$15,060 annually. However this map might not include everyone such as undocumented individuals or people who choose to not report they're status.

Source:

https://codap.concord.org/releases/latest/static/dg/en/cert/index.html*shared=https://cfm-shared.concord.org/cUfwRpfOE3EjPJPJSdla/file.json

4. INTERSECTING INJUSTICES

Injustices contributing to hazards:

77% of people in Madison Park live below twice the poverty level. This worsens environmental justice because people are forced to live in polluted areas. Not everyone in the city has a voice in decision making processes, which is procedural injustice. The city listens less to people living in poverty and people of color, and mostly listens to the whiter and richer areas of the city. Low income communities also have less access to public transportation, which limits their social and economic opportunities, causing more stress. Older public transportation systems also use vehicles that put out more pollution, impacting nearby communities.

According to a 2016 report, most of the people who live close to hazardous facilities are people of color. This causes a lot of health hazards. Similarly, communities with low income and education are impacted by air and water pollution and climate change more often than richer communities.

Gender injustice is a problem in Santa Ana because women are discriminated against, which makes them feel like they don't have any power. It intersects with racism because 17% of Latinx women don't have healthcare.

Intergenerational injustice is a problem in Santa Ana because lead contamination happened a long time ago (before leaded gasoline was banned), but it's still impacting adults and children today. Some parents worry about their children being exposed to lead and don't let them go outside.

Not many people have access to healthy food so they eat junk food, which is bad because it promotes plastic waste. Also, only 100,000 out of 300,000 residents have access to healthcare. Only 6,000 residents use MediCal out of the 100,000 eligible people. 14.6% of people don't have health insurance, which makes people less likely to seek medical attention. This means that medical problems become more severe because they wait until it's urgent to go to the doctor. The UCI Family Health Centers in Santa Ana are recognized for quality care.

Data injustice is a problem because people don't have access to good data, sometimes because it hasn't been updated in a long time, and sometimes because it isn't available. For example, we couldn't find information on the health effects of hazardous waste.

Orange County used 34% of its total funding for the criminal/legal system, which means that there's less money available for environmental issues and to make people's lives better.

5. RECOMMENDED ACTIONS

Addressing Injustice

Even though protests can be very effective, they won't always be successful the first time. There will always be trial and error and we need to learn from our initial attempts by analyzing weaknesses. For example, if the protest was too small, wait until you have enough people committed next time. Consistency is key, and the campaign will encounter lots of setbacks (from the government, from other people) and everyone won't be on the same page at the start. For example, the first bill trying to get buffer zones between oil and gas wells and homes failed, but activists began another bill that passed. Buffer zones are a really important issue for many cities.

When we organize tactics, we should be specific about what exactly we're going to do. For example, protestors trying to get PacifiCorp to remove dams on the Klamath river dressed up as PacifiCorp employees and brought dead fish, acting out what was happening so people who had never been would know. This communicated their message really clearly.

Another good tactic is building strategic alliances between different groups of people that either have similar beliefs or could benefit from the same thing. This will make the cause stronger even if the groups are living in very different areas. For example, activists on the Klamath river formed alliances with salmon fishermen who were also being harmed. This could be done between Madison Park residents and business owners in Santa Ana.

It's important to step out of your comfort zone and do what you think is right. There will always be obstacles to what you want, but we have to act anyway. For example, farm workers stepped out of their comfort zone to march from Delano to Sacramento. It's important to talk about these issues with people in power, not just other residents, so they know it's a problem.

Proposed Action Strategy
PROJECT TITLE:
<p>ISSUE Toluene exposure</p> <p>GOAL Mandating use of safer alternatives to toluene by industries</p> <p>TARGET The mayor; CalEPA; OEHHA; David Penaloza (city councilmember)</p> <p>TACTIC #1 Artivism project - mural</p> <p>TACTIC #2 Advocacy letter to Yana Garcia, CalEPA Secretary</p> <p>TACTIC #3 Stakeholder meeting</p>

Proposed Artivism Project
PROJECT TITLE:
<p>PROJECT DESIGN</p> <ul style="list-style-type: none"> ● It's going to be a mural ● Have a brain where it's half dead which would be in gray, meanwhile the other half will be blooming with flowers to indicate the heath effect Toluene would have on your brain ● In the mural the half flower brain stands for the environment while the other half

gray brain stands for what the environment is doing to you.

- On the ridges of the brain would be outlined in the words, “effects of toluene”
- Have a quote that states, “When things change inside you, things change around you.”
- This means : That when you ingest toluene something inside of you changes in this case it would be your brain .
- Which then can also impact how you see the world around and the health impacts that toluene has on us.
- We could add a definition of what is Toluene on the bottom corner

PROJECT OUTREACH

We would display somewhere near chestnut and grand Ave because the factories found with these chemicals are around this area, Which affects the people nearby.

PROJECT GOALS

Our goal is to raise awareness, inspire action, and empower communities.

PROJECT MOTIVATION

Our motivation is desire for social justice and equality because it could impact the community in a positive way. This could also be a better way to understand the health effects of it. The purpose towards this mural would be the potential to empower and uplift communities through art.

PROJECT EVALUATION

This would be successful because there would be people and car’s passing by it. Which could be a 50% chance that they would stop to look at it and realize that they have empathy for others and desire to make the environment a better place.

Proposed Advocacy Letter

ADDRESSEE: Yana Garcia

Our letter will begin by saying that we are students in Santa Ana. We’ll talk about how Yana grew up in Oakland, which faces similar issues. We are asking her to research if proposed alternatives to toluene like Polychem 36 and ethyl lactate are actually safe.

Toluene is used in gasoline, paint, and many other products. This is important to know because the the health impacts it can have in the community. Some health effects that can be noticed in later in there life would be cancer, cardiovascular disease, neurological disorders like lower IQ.

If toluene is banned, there will be less health problems and people will live in better environments.

People who can support us would be community members/people who have been exposed, Green MPNA, Ecogovlab, and scientists. People who might oppose would be industries, customers, investors, people who are not affected by toluene.

Stakeholder Meeting Plan

GOALS

Spread awareness for Toluene

Inspire the community to cause a change in regards to Toluene

Get more information from the representatives to get a better understanding

RESEARCH AND PLANNING

We need to know:

- I need to know the age of the people attending
- Whether they speak Spanish or english
- Their farthest level of education
- The race of the people
- What do people use to get their information?
- Where they live and whether they have transportation
- Whether they have any sickness that can be related
- Whether they have children
- We need to know any actions these stakeholders have taken regarding toluene to prevent us from seeming uninformed or telling them to do something they've already done.
- We need to know all of the stakeholders' knowledge about toluene to make sure everyone has enough knowledge about what's going on, the importance, and to not waste time.
- We need to research what other agencies or people in other places have done regarding toluene to present them to stakeholders who can take higher action and sort of pressure them to take action.
- What are some known safe substitutions to toluene? (we know some but it's unsure whether they're safe or not)

OUTREACH

- We can make flyers and spread them around the neighborhoods that are affected by Toluene

- The flyers will have information in regards to the component
- We can have a in person or zoom opinions to make it more flexible for the people
- We will use social media outlets to get more attention
- What places are usually popular within the public so we know where to give the flyers

PLAN

1. Introduction: Introduce the organization/people involved, the topic, and goals.
2. Input: Have time to debate or talk with stakeholders who can make change and ask them questions or convince them to make change. We can also let the community make comments or voice their opinions.
3. Conclusion: Establish what the stakeholders will do to address the problem, what we can investigate further, and how everyone will stay updated on the situation.

QUESTIONS & ATTENDEES

- Community:
 - Do you know if you've been exposed to toluene and if so have you experienced any side effects?
 - Do you know how you could be exposed to toluene?
- The mayor
 - How does it feel that your community is at risk of cancer and cardiovascular diseases due to Toluene?
- CalEPA
 - What will you be doing to protect the environment and the people of Santa Ana from Toluene?
 - What solutions can be done to decrease the exposure to Toluene?
- OEHHA
 - Knowing and researching the health effects of toluene, have you proposed any actions towards removing or substituting toluene?
 - What do you recommend people do to stay safe from the effects of toluene?
- David Penaloza
 - Having lived in Santa Ana your whole life how does it feel to know you've been exposed to a toxic chemical your whole life?
 - What are your thoughts on Toluene and the effects it has?

FOLLOW UP

- We can have a social media page dedicated to the stakeholder meetings and the updates happening
- Have a sign up sheet at the meetings where they put their phone numbers or emails and that way we can reach back to them via phone # or email

CONCLUSION

BIBLIOGRAPHY

FIGURES

COVER IMAGE

FIGURE 1: ENVIRONMENTAL INJUSTICE CASE STUDY FRAMEWORK

FIGURE 2: GEOGRAPHIC CONTEXT

FIGURE 3:

FIGURE 4:

FIGURE 5:

FIGURE 6:

FIGURE 7:

FIGURE 8:

FIGURE 9:

FIGURE 10:

FIGURE 11:

FIGURE 12: