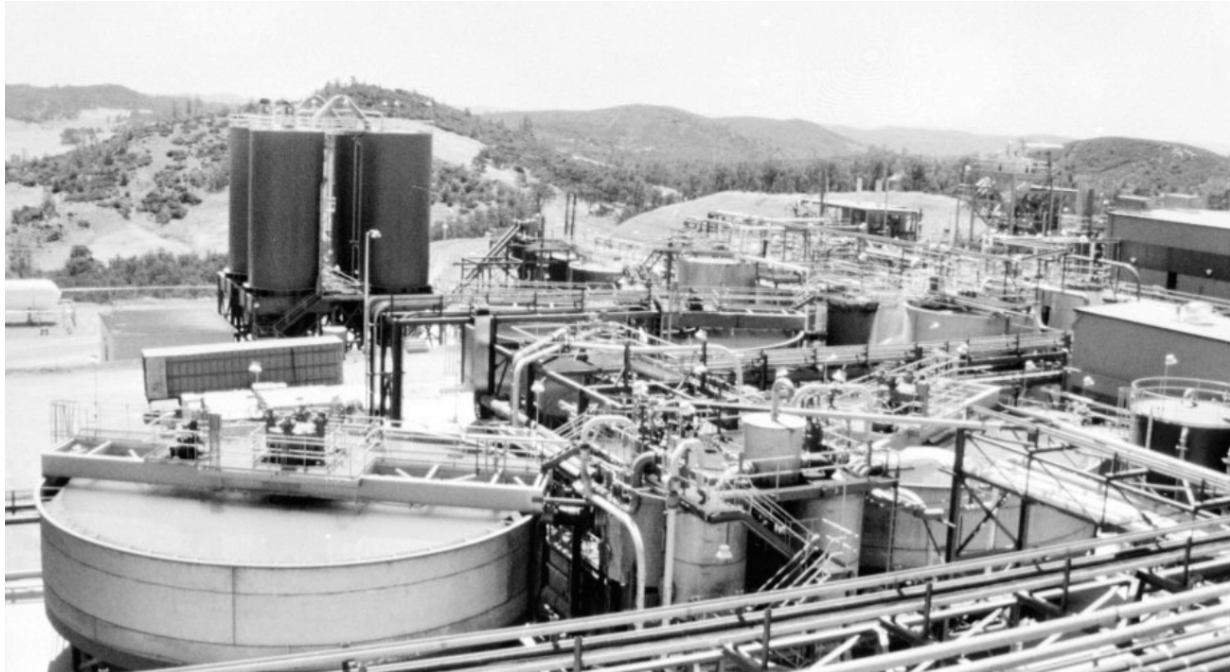


Yolo County

**SLOW DISASTER
CASE STUDY**



**ENVIRONMENTAL
INJUSTICE**

Fall 2021

GROUP NO. 3

AUTHORS

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ABOUT

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

COVER PHOTO

Photographed by Mike Silva in 1985, the mill at the Homestake McLaughlin Mine can be viewed here. This was a site for gold, silver, and mercury mining and is one of 27 mines in Yolo County (The Diggings, 2021). Thickener and acidifying tanks used for mineral processing and water treatment can be seen in the foreground (Process Corporation, 2021). (Screenshotted by Jenna Beining, November 1.2021

<https://thediggings.com/gallery/qyqdnhww?url=/usa/california/yolo-ca113.>)

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

Name	Publish? (Yes or No)
Beining, Jenna	Yes
Garcia, Giselle	Yes
Johnson, Anisa	Yes
Ogundiwin, Oluwadara	Yes
Orth, Emily	Yes
Smith, Gwen	Yes
Wojtowicz, Jessica	Yes
Zhong, Mei	Yes

BIOGRAPHICAL STATEMENT

Jenna Beining is a first year at the University of California, Irvine who is studying environmental science and policy. She took the Anthropology 25A class because it covers an environmental issue she wanted to learn more about. After taking the class, her approach to climate activism has completely changed and she wants to work to fight environmental injustice in the future. In her free time Jenna loves to spend time outdoors going on walks or playing games with family and friends.

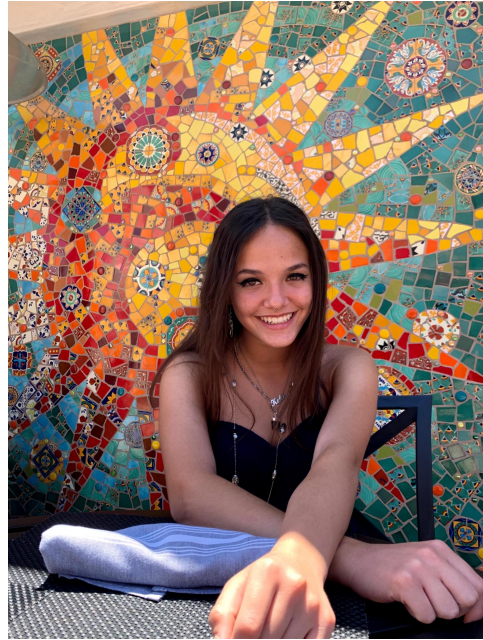
PHOTO



Giselle Garcia is a second year biological sciences major at the University of California. She took Anthro 25A because of her interest in anthropology and interest in environmental injustice issues to learn about the inequities that affect different demographics of people. She hopes to use this information to combat these inequities in the future. During her free time she enjoys painting and spending time with family and friends.



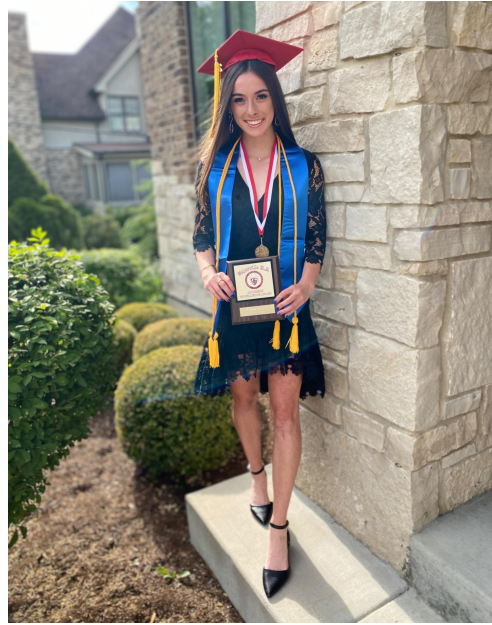
Anisa Johnson is a first year dance major, looking to obtain her bachelors of fine arts as well as a degree in business. Anisa has a passion for the environment and a drive for social equality, which inspired her to take the Environmental Injustice course. From this course, Anisa hopes to take her knowledge and spread awareness in order to improve the world around her and leave an impact that could preserve the human race and the environment that surrounds them.



Oluwadara Ogundiwin is receiving her education from the University California, Irvine as a first-year Biological Sciences major. Wanting to take more steps in combating medical racism- with hopes of becoming a medical practitioner in the future - learning about how these systemic issues are all intertwined with one another is why she took interest in the Environmental Injustice course. In her free time, Oluwadara loves to crochet, read, and watch cheesy TV shows.



Emily Orth is a first-year undeclared major at the University of California, Irvine. She initially took Anthro 25A to fulfill a GE requirement, but quickly realized she had an interest in environmental injustices in varying counties. Coming from out-of-state, she was not aware of the environmental issues in California counties and now has a passion to help correct these problems. In her free time, she cheers for UCI, rock climbs, participates in obstacle course races, and cheers for Paracheer Spirit: USA's first adaptive abilities cheerleading team.



Gwen Smith is a second year criminology major studying at the University of California, Irvine. She aims to become a forensic scientist, working with the FBI. She has taken Anthropologie 25A in hopes of gaining a better understanding of the world, what it is affected by and how it affects others. She hopes to be able to take the knowledge she has gained from this class and use it not only in her everyday life, but to make a change in the world.



Jessica Wojtowicz is a second year biomedical engineer at the University of California, Irvine. She has a strong passion for the environment which influenced her decision to take Anthro 25A. Previously, she did a research report which examined the water quality in multiple sources in Orange County. Jessica loves surfing, reading, drinking coffee, and going to Disneyland in her free time.



Mei Zhong is a second year at the University of California, Irvine who is currently undeclared but looking to study Business Economics with a minor in Environmental Science. She learned about the anthropogenic effects on the climate, and decided to take Anthro 25A to expand her knowledge on the effects that humans have on the environment as well as the injustices that come with it. In her free time, Mei likes to paint and listen to music.



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INTRODUCTION

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

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

The report addresses a series of ten questions (Fig. 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 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.

Previous environmental justice activists have found that Yolo County has many communities that face health hazards. By switching to alternative sources, the health vulnerability based on air quality will be greatly reduced. Additionally, Yolo County’s

water has many different pollutants in it that are not regulated. The Quality Report showed how far above regulation the pollutants in the water were. The pollutants in the water pose a health risk to the community. Pollution from fertilizer usage in the agricultural sector of Yolo County is a pressing issue because they account for almost half of this county's greenhouse emissions and can cause a plethora of problems within this sector (Atallah et al. 2020).

ENVIRONMENTAL INJUSTICE CASE STUDY FRAMEWORK

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

9. What kinds of data and research would be useful in efforts to characterize and address environmental threats in this setting and similar settings?

10. What intersecting injustices -- data, economic, epistemic, gender, health, infrastructure, intergenerational, media, procedural, racial, reproductive -- contribute to environmental injustice in this setting?

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

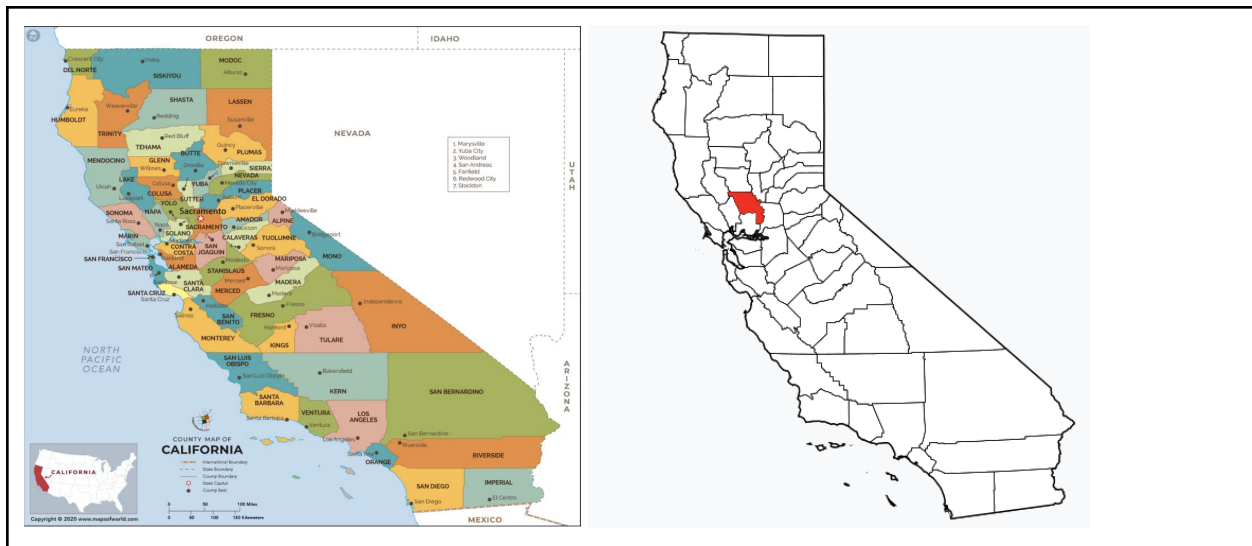


FIGURE 2: Yolo County is an inland province situated in Northern California known for its agriculture. The county is subject to great amounts of pollution that stem from water sources, motor vehicles, and farming. Yolo County is also known to be one of few Californian counties to create organic certification agencies for farmers in order to improve human health, animal health, and environmental health. (Screenshots by Emily Orth, October 14, 2021.

<https://www.mapsofworld.com/usa/states/california/california-county-map.html>,
https://en.wikipedia.org/wiki/Yolo_County,_California)

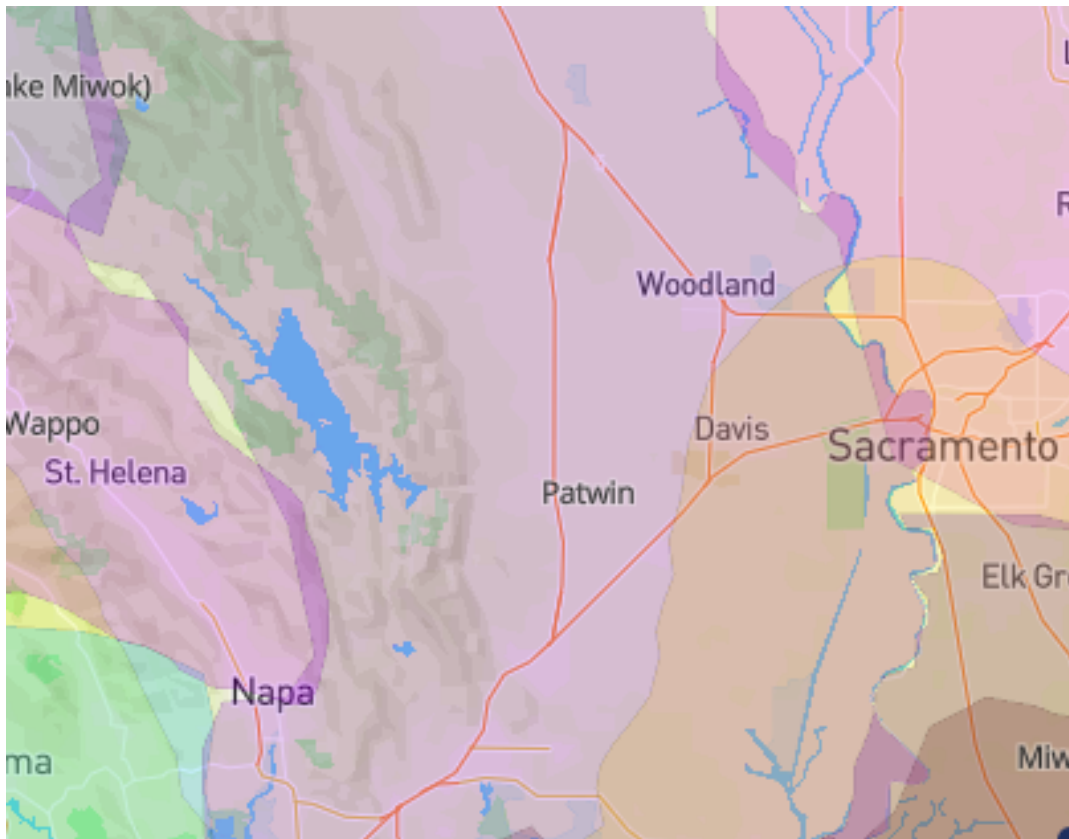


FIGURE 3: Yolo County is located on Patwin native land, also known as the Yocha Dehe Wintun Nation. This is a federally recognized tribe that is headquartered in California (The Free Encyclopedia, 2021). They support the “Change the Mascot” campaign to eliminate racist nicknames, imagery, and mascots” (Yocha Dehe Wintun Nation, 2021). (Screenshotted by Jenna Beining, November 1.2021. <https://native-land.ca>)

1. COMMUNITY ASSETS & SETTING

Prime Agricultural Farmland

Jessica Wojtowicz

Sprawling out across approximately 1,015 square miles of Northern California is Yolo County (U.S. Census Bureau 2019). The landscape of the region includes flat plains, basins, and numerous waterways (Vonk 2016). Additionally 216, 403 people reside in Yolo County, yet an astounding 16.9% of this community live in poverty (U.S. Census Bureau 2019). 46% of the population of Yolo is White, about 32% are Hispanic, 15% are Asian, and 3% are African American, this can visually be seen in Figure 7 (U.S. Census Bureau 2019).

Despite its proximity to California's capital city of Sacramento, Yolo County is heavily involved in agriculture (Jackson *et al.* 2011). In fact, just about 71% of land is occupied by farms. This land is mainly dedicated to cultivating crops rather than raising livestock, contributing to 1% of California's agricultural sales as seen in Figure 6 (USDA 2017). Yet while the total number of farms has witnessed a 6% decrease the average acres of land per farm has seen a 6% increase (USDA 2017). This shift is supported as a recent article on California's agriculture, published in the New Yorker, comments that "...federal farm policy tends to favor larger, industrial operations, many of them in the business of monocropping" (Wiener 2021). With a little over 328 million people residing in the United

States, the need for large farming operations is understandable (U.S. Census Bureau 2019).

Because farming operations are an integral part of Yolo County, a significant amount of labor is required to keep them running. Migrant farmers from Mexico are one way to keep operations running. One valuable community asset is “... seasonal housing for low-income migrant farm worker families” at two locations, one in Davis and the other in Madison (Yolo County Housing *n.d.*). This shows community support for these low-income families and ensures that they have a roof over their heads. Furthermore, Yolo County has shown how much they value their farm workers as Angel Barajas, a Yolo County Board Supervisor, reveals that “...[originally] farm workers were six to eight weeks away from receiving vaccines in Yolo County, but ‘we pushed to expedite the process’” (Bojorquez 2021). Proactive elected officials are a huge asset to Yolo as it shows a willingness to take the initiative to bring about change. Figure 8 depicts that the county is largely democratic, revealing the community’s mindset. This effort to protect a particularly vulnerable population highlights the fact Yolo County is concerned for the health and well-being of its residents, and will take action.

Despite the push to convert land for agriculture or commercial business, there are still plenty of natural spaces. Cache Creek Regional Park is an important natural asset that encompasses 600 acres and yields opportunities for fishing, hiking, kayaking, and even white water rafting (Yolo County *n.d.*). It ensures that despite the push for development, there is a place for the community to relax and experience the healing power of nature. Additionally the Yolo Basin foundation, “...founded in 1990 as a community based organization to assist in the establishment of the Yolo Bypass Wildlife Area,” is a significant resource which provides many opportunities to cultivate the nearby community’s appreciation for nature (Yolo Basin Foundation *n.d.*). Some activities include guided walks through the wetlands and summer camps for kids (Yolo Basin Foundation *n.d.*).



FIGURE 4: Cache Creek Regional Park is a valuable natural asset to Yolo County. It provides a space for individuals to gain a love for nature and escape from the bustle of developed areas of Yolo County. (Screenshot by Jessica Wojtowicz, November 3, 2021. <https://www.yolocounty.org/government/general-government-departments/parks/park-s-information/cache-creek-regional-park>)



FIGURE 5: The above image depicts farmland located in the western region of Yolo County. Large amounts of fertilizers and pesticides used to cultivate the crops can have severe consequences on individuals residing in Yolo County. (Screenshot by Jessica Wojtowicz, November 4, 2021. <http://theyololandtrust.org/easement/western-yolo/>)

2017 CENSUS of AGRICULTURE *County Profile*



**Yolo County
California**

Total and Per Farm Overview, 2017 and change since 2012

	2017	% change since 2012
Number of farms	949	-6
Land in farms (acres)	459,662	(Z)
Average size of farm (acres)	484	+6

1 Percent of state agriculture sales

Share of Sales by Type (%)

Crops	97
Livestock, poultry, and products	3

FIGURE 6: This figure highlights the importance of agriculture in Yolo County as they account for 1% of California’s agricultural sales. Yet the increased urbanization of the county is also revealed, as from 2012 to 2017 there was a 6% decrease in the number of farms. (Screenshot by Jessica Wojtowicz, October 30, 2021.

https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/California/cp06113.pdf)

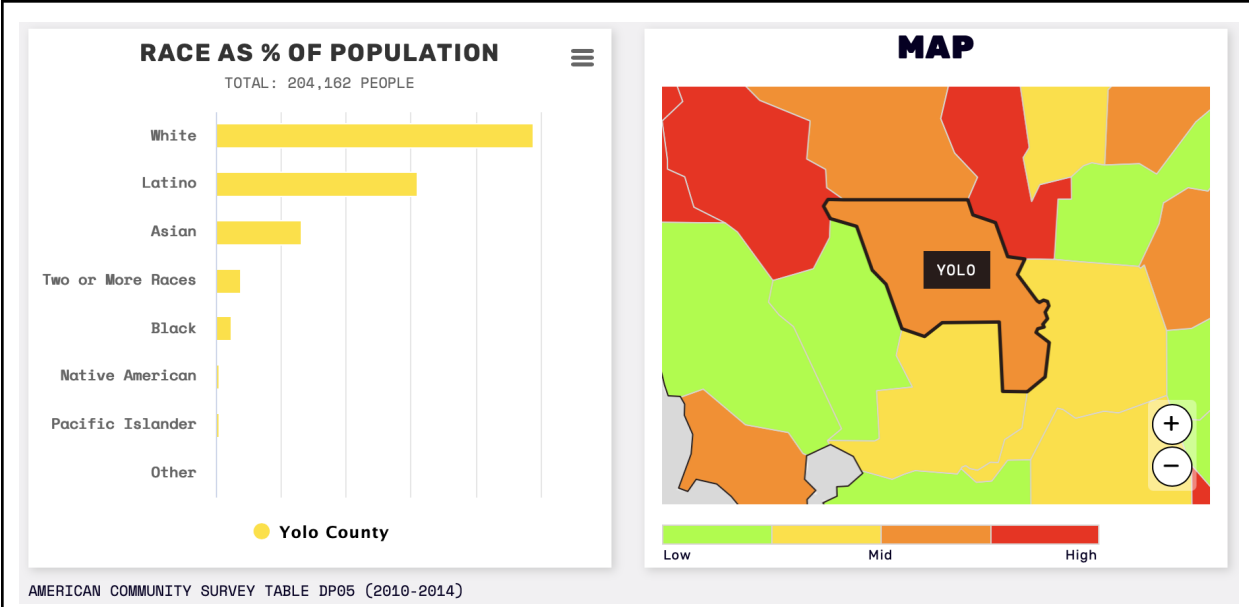


FIGURE 7: This figure reveals that a significant percentage of Yolo County’s population is white. The orange color of Yolo County on the map to the right is used to convey that the county has “high disparity & high performance.” (Screenshot by Jessica Wojtowicz, October 30, 2021. <https://www.racecounts.org/county/yolo/>)

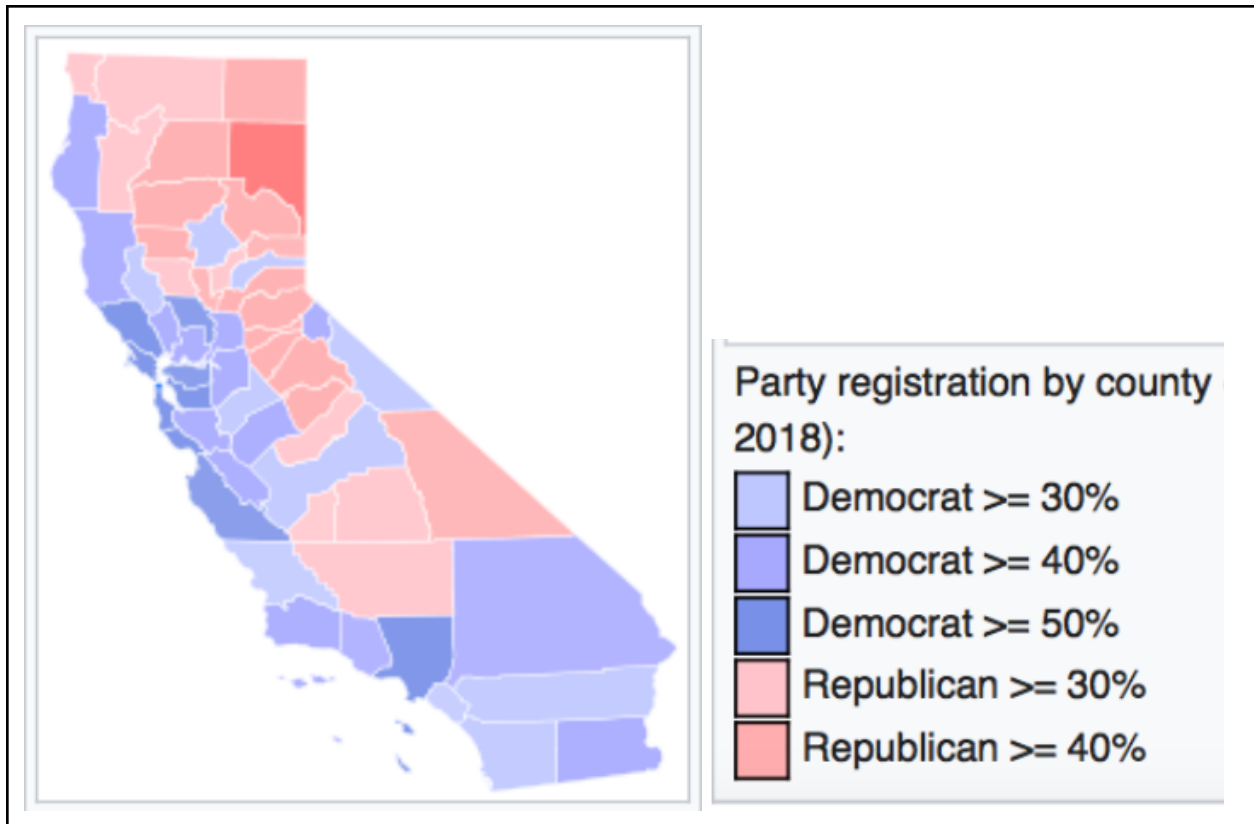


FIGURE 8: This Wikipedia map shows that Yolo County has a Democratic majority. Given the stance of many liberals, this suggests that citizens in Yolo County will be in support of regulatory policies that help reduce environmental hazards. (Screenshotted by Jenna Beining, November 1, 2021 https://en.wikipedia.org/wiki/California_locations_by_voter_registration)

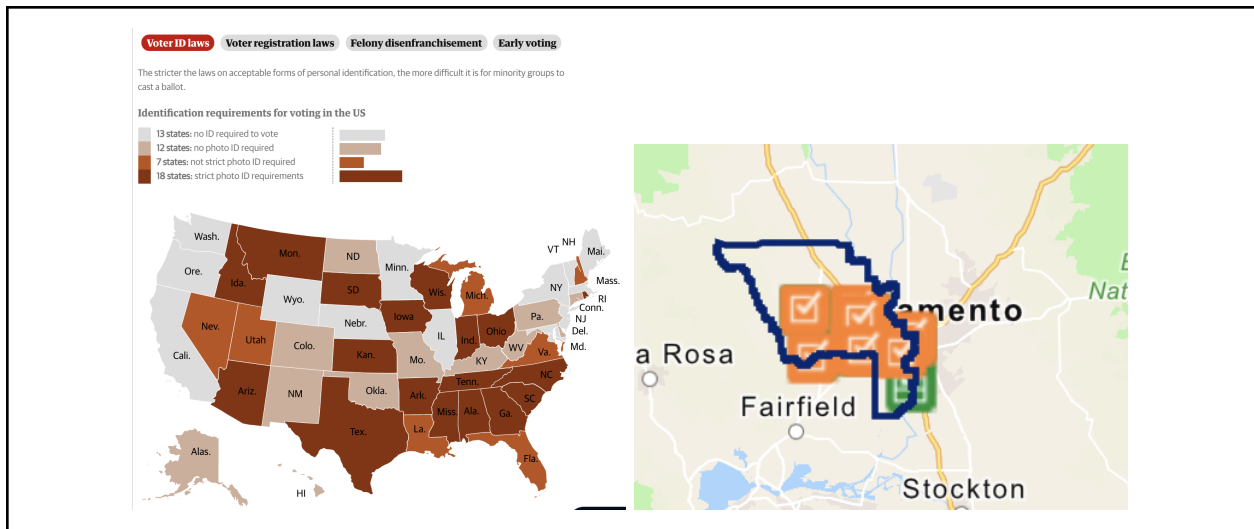


FIGURE 9:The state of California has laws that make it easier to vote than in many other US states. This strengthens democratic capacity across the state of California. There are still concerns, however. In Kern County, there have been calls for more voting options for rural residents, possibly through a mobile voting office (as has been used in Imperial County) (Morgan 2020). (Screenshot by Kim Fortun, October 17, 2020 <https://www.theguardian.com/us-news/ng-interactive/2019/nov/07/which-us-states-hardest-vote-suppression-election>)

Yolo provides voter assistance the 3 days prior to as well as the day of the election. There are centers located in Davis, Esparto, West Sacramento, Winters, and Woodland. For the actual ballot drop boxes, they are located in Clarksburg, Davis, Esparto, West Sacramento, Winters, and Woodland. Cities in Yolo without either of these include Knights Landing, Yolo, Dunnigan, Guinda, Madison, and Monument Hills. Additionally, Clarksburg lacks a voter assistance center, but they do have access to a ballot drop box. (Screenshot by Anisa Johnson, October 28, 2021 https://www.yoloelections.org/voting/polling_place).

2. SLOW DISASTER & OTHER ENVIRONMENTAL THREATS

“Mines, Landfills, Agriculture & More– the Least Anticipated Sources of Pollution”

Oluwadara Ogundiwin

In comparison to surrounding areas, Yolo County does not struggle as much with high levels of pollution. In accordance, this province has had an 87% reduction in days with harmful concentrations of ozone in the air since 2000, while also reducing its days with hazardous levels of particulate matter in the air by 100% since 2004 (Bellamy 2016). Even as shown in Figure 14, Yolo County’s average of PM2.5 in the air is around 50% lower than the state’s average. However, this does not negate the fact that levels of localized pollution– in any form– that is considered “small” or “negligible” can still pose massive health threats to Yolo County’s inhabitants (American Lung Association 2021). Therefore, this region’s dominant agricultural landscape along with the presence of certain polluting facilities, hazardous waste management sites, older infrastructure, and transportation pose great slow disaster environmental hazards– specific to air and water pollution.

Historical mines and the general topography surrounding Cache Creek and Putah Creek—two major bodies of water located within Yolo County—are highly troublesome due to the concerning levels of mercury pollution present. Rocks that contain significant amounts of this pollutant line the Inner Coast, eventually eroding into the water that flows towards Putah and Cache Creek. Furthermore, there are approximately 80 deserted mines along these creeks that catalyze mercury pollution as well. When this contaminant takes on the toxic form of methylmercury and is ingested by people—via fish consumption or from plants that have absorbed the toxin from the soil—it can negatively affect one’s nervous system and can cause major developmental issues in children (McCord 2016).

Though the risks of pollution stemming from waste decomposition is an afterthought for many, this can cause major health risks to county residents. The Yolo County Central Landfill recently installed an anaerobic composting facility within it to try and reduce air pollution. However, if any missteps or complications occur within its operations, ammonia and other volatile organic compounds can be released into the environment and stimulate the formation of ozone (Miranda 2021). If people breathe in this lethal substance, it can cause—or worsen—chronic respiratory or cardiovascular illnesses. For example, it can cause asthma and even permanently damage one’s lungs—which exacerbate cardiovascular issues. Furthermore, the ozone can derail a plant's photosynthetic processes, causing more carbon dioxide to be present in the atmosphere (Iowa Department of Natural Resources n.d.). As emulated in Figure 12, there have been zero days with ozone levels above regulatory standards. Yet, Yolo County recently received a “C” grade on their ozone pollution—shown in Figure 11. If there are any faults in how the Yolo County Central Landfill is regulated by the Yolo-Solano Air Quality Management District, then these levels of ozone will no longer be “low-risk” (Miranda 2021). Additionally, ozone pollution would heavily affect those located in the Central Valley, because of geographical factors causing it to travel eastwards and become trapped in the foothills (Bellamy 2016).

Due to Yolo County being widely known for its agriculture– especially since this makes up the bulk of its economy– the potential pollution that may arise from these operations can be hazardous. About 85% of this province’s land is utilized for agriculture; including livestock enterprises, small farming, and large-scale farming. Therefore, the majority of this region's inhabitants are situated near these agricultural endeavors (Yolo County n.d.). Furthermore, the use of fertilizers and pesticides is especially concerning because of their history of polluting the waterways (Stevenson 2006). This can eventually find its way into people’s drinking water, exposing them to high levels of coliform bacteria and nitrate. These toxins are attributed to causing bladder, kidney, colon, and ovarian cancers– which can exacerbate other health issues (Miller and Muren 2019).

As depicted in Figure 15, 6.2% of the Yolo County population is within a 150-meter radius of primary highways. This small percentage of the population is at risk for developing diabetes, asthma, and dementia. Additionally, they are at risk of dying earlier than usual (American Lung Association 2021).

EJSCREEN Report (Version 2020)

County: Yolo
 CALIFORNIA, EPA Region 9
 Approximate Population: 214,977
 Input Area (sq. miles): 1023.56

Selected Variables	Percentile in State	Percentile in EPA Region	Percentile in USA
EJ Indexes			
EJ Index for Particulate Matter (PM 2.5)	51	55	76
EJ Index for Ozone	53	56	76
EJ Index for NATA* Diesel PM	49	53	71
EJ Index for NATA* Air Toxics Cancer Risk	54	58	76
EJ Index for NATA* Respiratory Hazard Index	56	60	78
EJ Index for Traffic Proximity and Volume	55	61	83
EJ Index for Lead Paint Indicator	60	65	79
EJ Index for Superfund Proximity	75	79	89
EJ Index for RMP Proximity	76	79	89
EJ Index for Hazardous Waste Proximity	57	62	85
EJ Index for Wastewater Discharge Indicator	79	80	86

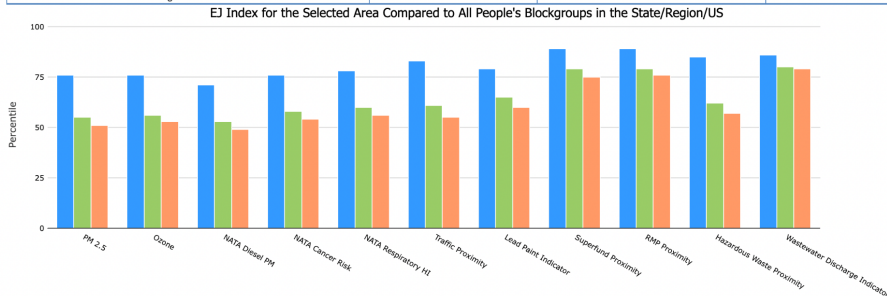


FIGURE 10: Yolo is in the top percentile for National Priorities list proximity, hazardous waste proximity, and for the wastewater discharge indicator. The National Priorities list proximity demonstrates how abundantly exist sites ranked as a national priority based on the amount of hazardous substances or pollutants given off. Furthermore, the hazardous waste proximity measures how many waste facilities there are within 5km and the wastewater discharge indicator demonstrates the concentration of toxic substances in stream segments. (Screenshotted by Anisa Johnson, October 28, 2021. https://ejscreen.epa.gov/mapper/ejscreen_SOE.aspx)

California: Yolo



Yolo County

Sacramento-Roseville, CA

If you live in Yolo County, the air you breathe needs your support.



FIGURE 11:Yolo county receives a c for both ozone and particle pollution 24-hour reports. Both of these low grades are likely due to the wildfires that often occur in the agricultural county that Yolo is. The carbon dioxide from the fires will affect the ozone layer while the soot from the smoke lowers the particle pollution grade. (Screenshot by Anisa Johnson, October 28, 2021.

<https://www.lung.org/research/sota/city-rankings/states/california/yolo>)

Days with Unhealthy Ozone Concentrations in Air

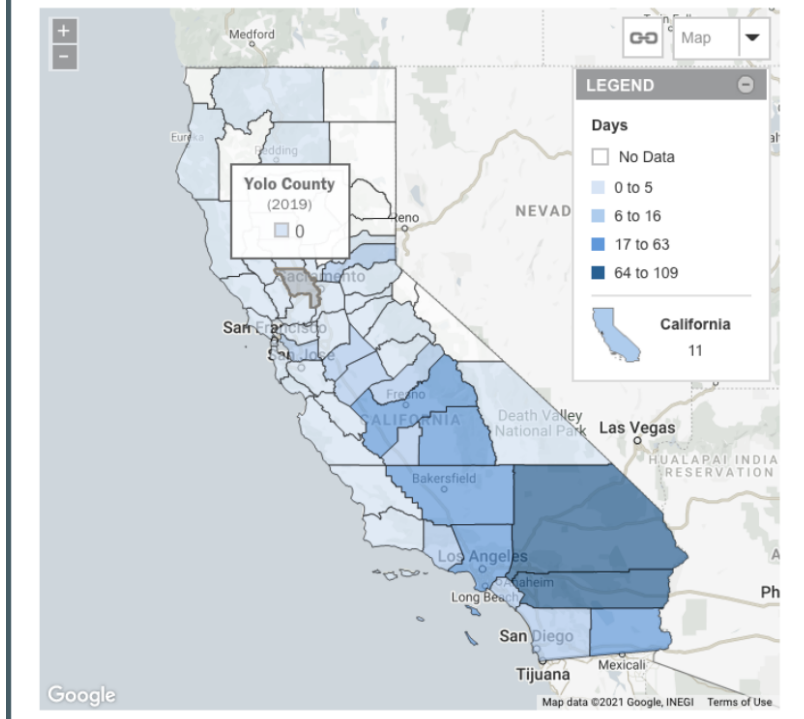


FIGURE 12: As of 2016, there have been zero days that were above the regulatory ozone standards in Yolo County. High levels of ozone pollution can cause birth defects and chronic illnesses such as: cardiovascular and respiratory diseases, cancer, obesity, and certain cognitive/behavioral development. (Screenshot by Oluwadara Ogundiwin, November 1, 2021.

<https://www.kidsdata.org/topic/525/air-ozone/map#loct=3&fmt=2750&loc=340&tf=124¢er=-13325098.893387,4509031.392449&zoom=1>)

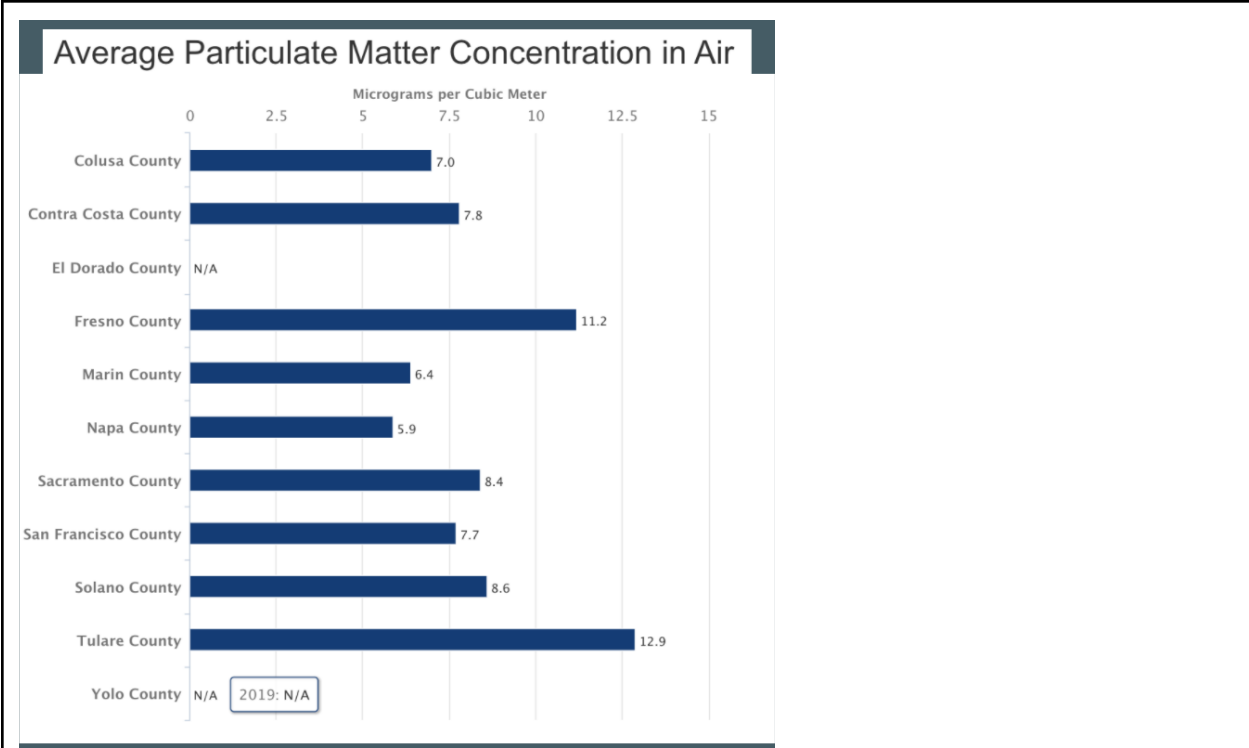


FIGURE 13: This image portrays the average particulate matter for Yolo County as “Not Applicable” in comparison to counties in proximity. Particulate matter is especially concerning due to the fineness of the air particles posing a great threat to human health– also being the cause of respiratory and cardiovascular illnesses, along with a plethora of other chronic conditions. (Screenshot by Oluwadara Ogundiwin, November 1, 2021.

<https://www.kidsdata.org/topic/524/air-particulate/bar#fmt=2751&loc=340,359,341,344,217,357,339,171,336,345,265&tf=124&sort=loc>)

Air Quality: Particulate Matter[†]

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

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

The national standard for annual PM_{2.5} levels is **12.0µg/m³**. When PM_{2.5} levels are above 12, this means that air quality is more likely to affect your health.

In 2016, the annual level of PM_{2.5} in **Yolo County** was **6.3µg/m³**. *

* Micrograms per cubic meter (µg/m³)

ANNUAL AMBIENT CONCENTRATION OF PM_{2.5}

6.3µg/m³*

Yolo County, California

12.0µg/m³*

Annual National Standard

*Micrograms Per Cubic Meter (µg/m³)

FIGURE 14: This figure relays that the annual ambient concentration of PM_{2.5} in Yolo County is under the national average by almost 50%. However, this does not downplay the effects that this concentration of particulate matter can have on the general population. (Screenshot by Oluwadara Ogundiwin, November 1, 2021. <https://ephtracking.cdc.gov/showInfoByLocationExt/?&FIPS=06113>)

Proximity To Highways[†]

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

In 2011, **6.2%** of the population of Yolo County lived within 150 meters* of a major highway.

In 2011, **0.0%** of Yolo County public schools (preK-4th grade) were sited within 150 meters* of a major highway.

* 150 meters is about 2 blocks.



6.2%



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

Discover the data | Learn more about this topic

† 2011 data from the National Environmental Public Health Tracking Network



FIGURE 15: This figure shows the percentage of the population and schools that are within 150 meters of a major highway. This number is low because Yolo county is a relatively rural agricultural area. Traffic related pollution has been linked to increased health problems. The 6.2% of Yolo residents who live within 150m away from a highway are most at risk for these traffic related health problems (Screenshot by Mei Zhong, November 3, 2021.

<https://ephtracking.cdc.gov/showInfoByLocationExt/?&FIPS=06113>)

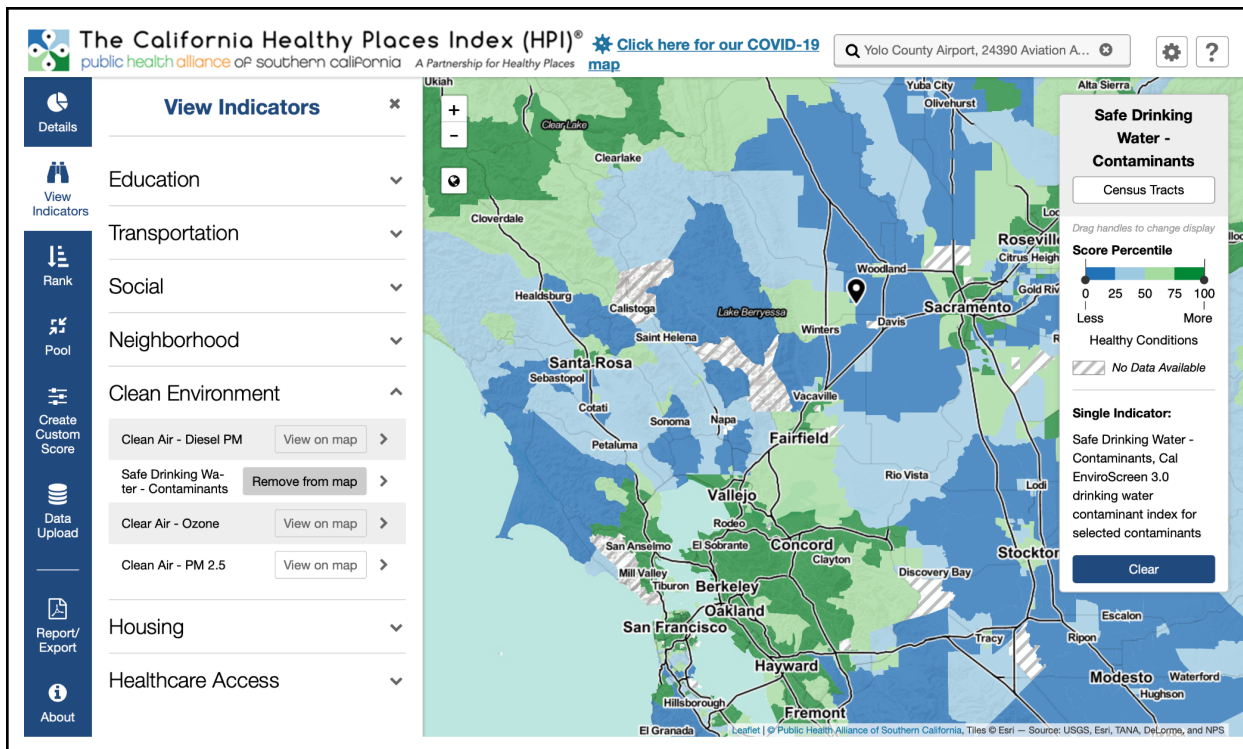


FIGURE 16: In this map of the California Healthy Places Index, Yolo county is on the lower end of the percentile index of the state for healthy drinking water. This is an indicator of unhealthy water in Yolo county, and this fact is supported by Yolo County's state and federal required Water Quality Report made in 2013, which states that “drinking water, including bottled water, may reasonably contain small amounts of some contaminants.” (Screenshot by Mei Zhong, November 2.2021. <https://www.yolocounty.org/home/showdocument?id=25616> and <https://map.healthyplacesindex.org>)

3. COMPOUND VULNERABILITIES

Piled Up Injustice

Giselle Garcia

Yolo County, CA hosts several intersecting factors that contribute to environmental health vulnerability and injustice. These factors work together creating complex issues that compound the environmental issues people in Yolo County face. Intersecting factors that are most relevant to slow disaster in Yolo County are social, health, economic, and ecological factors.

The recent COVID-19 pandemic exemplifies how ecological factors contribute to environmental health injustice. Air pollution impacts people with pre-existing health issues (Kurt et al., 2016). The quality of the air can negatively impact the population in an area, increasing the effects of, “asthma, lung cancer, respiratory infections, cardiovascular complications, and COPD,”(Kurt et al., 2016). A recent example of this would be how in areas of high pollution there has been a higher COVID-19 mortality rate. This suggests that pollution can increase respiratory issues, causing those who live in areas of high pollution to be more susceptible to severe reactions to COVID-19 or even death. In Yolo County, the mortality rate of those who contracted COVID-19 is significantly higher than other counties with less pollution (okreighb 2020). This injustice causes people who live in Yolo County to be more vulnerable to respiratory illness, most notably COVID-19.

On the topic of air pollution, people who are considered “low income” are harmed by air pollution at a disproportionate amount compared to those in higher income brackets (Yap, Gilbreath, Garcia 2008). People working in Yolo County as manual laborers such as farmers and crop workers are outside for large amounts of time, making them more vulnerable to negative effects of air pollutants (Miranda 2021). For example, the Yolo County Central Landfill has potentially negative effects on the ozone layer, putting outdoor workers in a position in which they are more prone to facing them. The landfill’s potential ozone layer threatens not only the human population, but the nature in the area as well, reducing photosynthesis rates and contributing to the possible extinction of plants in the area (Miranda 2021). This situation affects the human population as well by not having oxygen be produced at a normal rate during photosynthesis and by lowering the plant diversity through extinction.

Where the county’s population stands economically affects where they are ecologically and socially. Each injustice overlaps, causing those who are economically disadvantaged to be ecologically disadvantaged, and thus socially they are put in situations where they face more risk for harm (Miranda 2021). They pile up on each other, creating a heavier burden on each person’s shoulders, and furthering the need to seek environmental justice.



FIGURE 17: Yolo County has a 59.3 opportunity index score. The state of California ranks 16 (out of 51) among US States for opportunity. The opportunity index provides data on several aspects that comprise opportunity: economics, education, community and health. The score for each is based on multiple indicators. The score for health, for example, is based on developmental risk, overall health outcome, access to healthcare, personal health complications, and mental health. An interesting indicator for Yolo County is that the economy score is the only score lower than the score for the United States as a whole, every other factor is rated higher. The Opportunity Index draws various US government data sets, including the US Census. The Opportunity Index is by Opportunity Nation: The Forum for Youth Investment. (Screenshot by Giselle Garcia, 11/3/2021. <https://opportunitynation.org/>).



EJSCREEN ACS Summary Report



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

	2014 - 2018 ACS Estimates	Percent	MOE (±)
Population 25+ by Educational Attainment			
Total	126,055	100%	117
Less than 9th Grade	9,026	7%	683
9th - 12th Grade, No Diploma	8,154	6%	677
High School Graduate	23,271	18%	955
Some College, No Degree	33,180	26%	1,175
Associate Degree	8,553	7%	613
Bachelor's Degree or more	52,424	42%	1,346
Population Age 5+ Years by Ability to Speak English			
Total	202,510	100%	134
Speak only English	125,841	62%	1,775
Non-English at Home ¹⁻²⁺³⁺⁴	76,669	38%	1,859
¹ Speak English "very well"	49,818	25%	1,706
² Speak English "well"	14,475	7%	940
³ Speak English "not well"	8,298	4%	724
⁴ Speak English "not at all"	4,078	2%	567
³⁺⁴ Speak English "less than well"	12,376	6%	919
²⁺³⁺⁴ Speak English "less than very well"	26,851	13%	1,315
Linguistically Isolated Households*			
Total	4,968	100%	470
Speak Spanish	2,566	52%	367
Speak Other Indo-European Languages	1,001	20%	192
Speak Asian-Pacific Island Languages	1,315	26%	215

FIGURE 18: Educational attainment impacts environmental hazards exposure and management in Yolo County. With education and language barriers there will be information that won't reach people with low educational attainment and they will not be as well informed, prepared, or knowledgeable about the environmental slow disasters they are facing. Without this information they don't have the opportunity to have a say in the environmental hazards they face. (Screenshot by Giselle Garcia, 11/3/2021. <https://ejscreen.epa.gov/mapper/demogreportpdf.aspx?report=acs2017>).

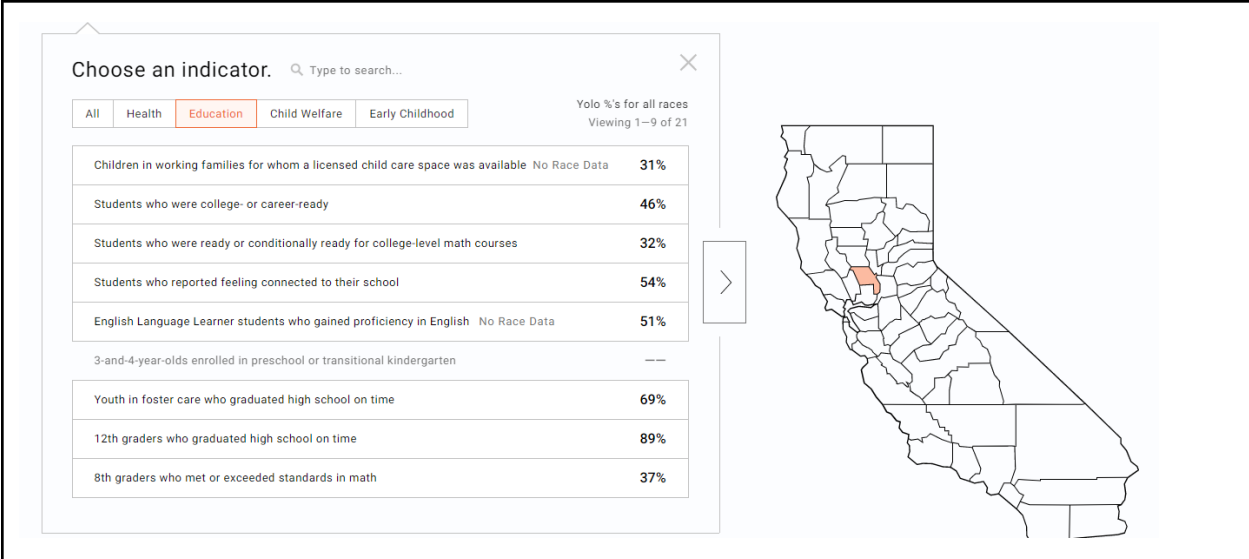


FIGURE 19: Data visualization drawn from the “Children Now 2018-19 County Scorecard of Children’s Well-Being.” Education indicators point to about half or less than half of students being college and career ready, and struggle with math. This suggests that information about environmental hazards that are made available in this county may be difficult for some people to understand or to know how to react. Education indicators also indicate that 54% of students feel a connection to their schools. This suggests that schools are failing to establish a learning environment that makes all of their students feel like they are involved in something meaningful. (Screenshot by Giselle Garcia, 11/3/2021 <https://www.childrenow.org/portfolio-posts/2018scorecard/>).

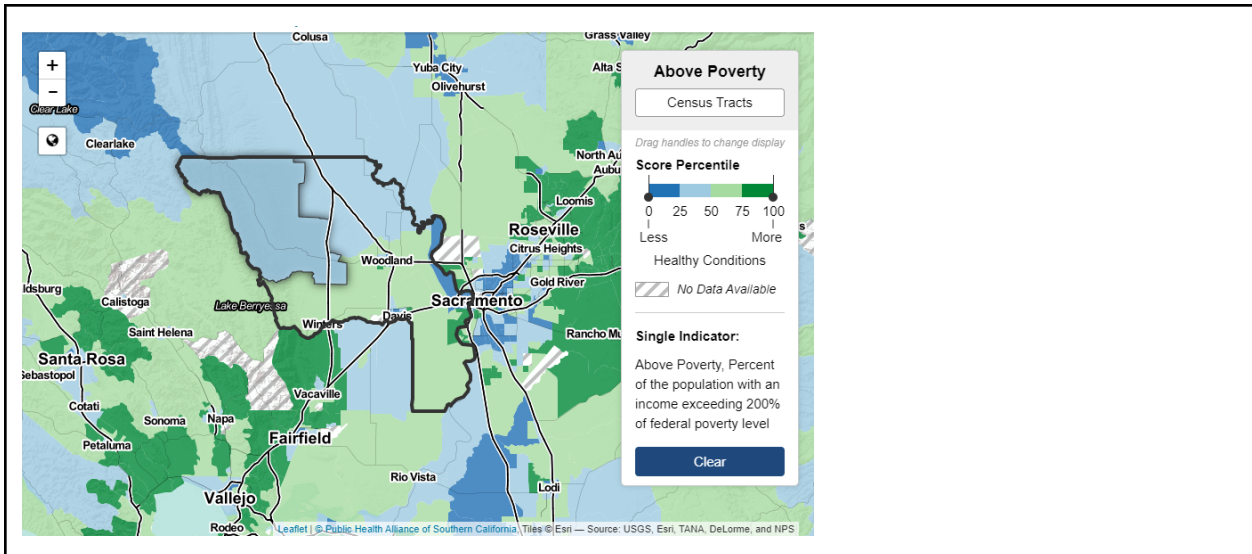


FIGURE 20: This California Health Places Index (HPI) map compares poverty levels in different counties in California. Dark blue indicates the highest poverty level. A county-scale view can easily obscure poverty and income inequality *within* a county because it just gives a general idea of the poverty levels without giving a deeper than surface level picture.
 (Screenshot by Giselle Garcia, November 3, 2021. <https://map.healthyplacesindex.org/>)

4. STAKEHOLDER ANALYSIS

Pollute, Harm, Respond

Jenna Beining

In Yolo County, opposing groups of people are affected by slow disasters, create slow disasters, and work to fight slow disasters. Each stakeholder in the county has a unique perspective on environmental issues which creates complexities. The people who are harmed by these disasters are the members of the community. Focusing in on vulnerable groups that reside in Yolo County, children ages 1-10, the elderly, and people with pre-existing health issues are the highest at risk. According to research from Human Biology Students, “poor air quality and increased air pollutants can increase the effects of asthma, lung cancer, respiratory infections, cardiovascular complications, and COPD” to these groups (Okreighb 2020). In Yolo County, there has been a dramatic increase in senior citizens during the last 10 years (Area 4 Agency on Aging, 2009), about 10% of the population is under 10 years of age, and 6% of the population under 65 years of age has a disability (United States Census Bureau, 2019). Not only are these groups more at risk of being negatively affected by slow disaster, their ability to receive health care is undermined by low economic status. The per capita income in the county is \$34,515 and 16.9% of the population is living in poverty (United States Census Bureau, 2019). These are all factors that undermine the stakeholders’ ability.

A common contributor to slow disasters in the county is pollution from farming. This presents a complex issue because many people depend on agriculture for financial stability and see it as a way of life. However, farming practices can cause groundwater pollution from nutrients, animal waste, and pesticides/herbicides/insecticides (California Water Boards, 2021). This is especially harmful to agriculture workers who are exposed to these pollutants everyday. Programs have been established to support ranchers and promote environmental equality (California Water Boards, 2021), however, these stakeholders are often more concerned with practical problems relating to water usage, rather than conservation, meaning that they often oppose suggested solutions to environmental injustice.

A catalyst that has contributed to groups promoting environmental regulation in the county is the amount of research that has been done in the area. Having a government funded, public research university located in the county is a main reason for this. A group of researchers, some from the California Water Science Center, and others from University of California, Davis, were the first to study mercury and toxic chemicals in the Cache Creek and Putah Creek watersheds (Hothem, Bergen, Bauer, Crayon, and Mechstroth, 2007). Another example of research being completed is a 2020 UC Davis study that showed a link between traffic related air pollution and neurodevelopmental disorders (Wood, 2020). These researchers are given a platform and means necessary to collect data and information through the university. Actions and resources like these enable groups to make changes and fight for environmental injustice.

5. STAKEHOLDER ACTIONS

Time to Take Action

Gwen Smith

Yolo County is a small town that suffers from many slow disasters, but luckily many of those residing in it take action to try and make it a safer place.

One group of stakeholders to consider is UC Davis, their students, and their work to try and respond to the environmental problems surrounding the county and the school. One major problem that the students are facing is a rise in air pollution. How may they be fighting against this one may ask? They are putting into effect the idea of Lower Impact Modes (LIM). LIM includes “biking, busing, carpooling, taking a train, walking, telecommuting, and any combination of these” (Congleton, 2007), aiming to lessen congestion, parking stress, and most importantly, air pollution. Although it has been reported that almost 50 percent of the UC Davis students use bikes (UC Davis, 2017), there has sadly been a decline in biking and walking over the last decade. This decline is expected to keep going down as it is projected for many of the students to be commuting from outside of Davis. Luckily, they are implementing the UC Policy on Sustainable Practices, which is “policies to pursue more sustainable transportation” (Congleton, 2007). Many students are beginning to follow in line with more of these sustainable practices, especially the environmental club that “encourages volunteer work in aiding local conservation service projects” (Clayton, 2020) that will help to inform them on the issues

of environmental justice.

Another important stakeholder in Yolo County is the farmers, not only are they helping contribute to the pollution problems, but they are also aiming to try and stop it. Sadly, during the development of the Climate Action Plan in Yolo County, it was demonstrated that nitrous oxide, stemming from nitrogen fertilizers, caused 40 percent of the agricultural emissions. These emissions from the croplands and farms have demonstrated to be more impactful than the urbanized land. Many farmers in the County use the Water Evaluation and Planning Model in order to provide a “water-efficient cropping pattern combined with improved irrigation technology, reduce[ing] demand to 12 percent below” (Pier Program, 2012), as well as adopting voluntary greenhouse gas (GHG) mitigation practices.

Lastly, it is important to mention not only what the California government is doing to help reduce emissions and climate change, but also the local governments. In the year 2006, California passed the Global Warming Solutions Act, aiming to reduce greenhouse gas emissions, hopefully reducing it down to 80 percent by 2050 (Haden 2012). A key aspect to this reduction is land use, thus the Senate passed a bill in 2008 requiring “regional administrative bodies to develop sustainable land-use plans” (Haden 2012). The Yolo County Local government is one of the first in California to address climate change mitigation and adapt their action plans. Many of this relates back to the previous section of the farmers, a goal of reducing the nitrous oxide and implementing a better and more well regulated irrigation system. Through the Environmental Protection Agency they are able to provide information regarding the “air quality, water pollution, and emission rate within any given area” (Clayton, 2020). The report given to the county helps give the members an idea of what conditions they are living in.

6. ROLE OF MEDIA AND BIG ENVIRONMENTAL ORGANIZATIONS

Behind The Scenes

Anisa Johnson

Yolo County is one with lots of potential. Potential for environmental health hazards that is. Much of the threat found in Yolo County can be attributed to slow disasters, such as agricultural runoff, mercury pollution in the water, and agricultural air pollution. Because these disasters are not immediate and do not kill a lot of people all at once, it can be more difficult for the press and organizations to recognize exactly how much damage is resulting. Many environmental organizations help in raising the awareness of issues present, but reaching resources for applicable recognition is more of a challenge.

Organizations that work to gain justice for environmental issues provide the primary force towards environmental equality. Due to the Yolo Bypass, this county is a prime example for wildlife conservation. Such recognition is granted to them by Earth Island Journal in an article discussing the effects of human made infrastructure on the survival of a specific fish species. They refer that "In Central Valley's 60,000-acre Yolo Bypass. . . scientists from UC Davis and the nonprofit Cal Trout are working with farmers to help

restore salmon populations by reintroducing them during winter to floodplains that are farmed with rice during summer" (Mitra 2018). By drawing attention to the county's efforts, more focus can be guided to the needs of their environment as well. Fulfillment of such a task is done by the Center for Environmental Health with their confrontation of the EPA. Specifically, their article addressing the EPA's involvement with regulation states, "[the] EPA has missed statutory deadlines to promulgate a federal implementation plan (FIP) for Yolo-Solano Air Quality Management District. . ." (Inside EPA 2019). The Center for Environmental Health gives some voice to the county in relation to this big governmental affiliation. The ignorance seen in this situation highlights the continued lack of attention Yolo county experiences from the EPA. According to their research, "EPA failed to take final action either approving or disapproving the "contingency measures" incorporated in the Portola PM2.5 attainment SIP submitted by California for the Portola region of Plumas County" (Inside EPA 2019). Monitoring contingency measures is vital for regulation of the levels of PM2.5, affecting the breathing conditions of the residents in Yolo County. Similar ignorance from government agencies can be seen in air quality reports. Found in the emergency preparedness resources in the government section of Yolo County's official website, are two sources for current air quality reports; one of which does not even include Yolo's report. Spare The Air reports a very restricted section of California which borders, but does not include Yolo County. This becomes very misleading for anyone looking for a current update that comes from the official website. It should be assumed that sites provided by the county include information on the county itself. Even in areas where the EPA is present with their work, it falls short. The Pesticide Action Network, in an article highlighting pesticide risk, they reveal, "EPA's pesticide use reports are few and far between, and don't give details on which crops they're used on" (Marquez 2021). The specifications here can be good information for the residents to be aware of. When buying food grown within the county as well as when living near these crops, residents should be informed of what is being sprayed on the crops and in their air, as well as seeping into surrounding soils. Extra-local recognition appears to be difficult for Yolo to obtain, and that is not only with governmental business.

Media coverage for Yolo county is either outdated or slim as seen when looking at Wikipedia, as well as LA times. Some of the most known outlets in California both fail Yolo when it comes to accurate reports. If one is curious about Yolo County and gives the county a search, one of the first sites to pop up is wikipedia. However, Wikipedia's information is very dry and lacks detail that tells the real situation of the county. While facts such as geographical components are listed, there is no mention of the environment-- a prevalent subject in Yolo-- on their page. Likewise, the talk section contains no conversation causing the question of accessibility within the county to come up. A pattern reveals itself when looking at the dating of LA Times articles covering any slow pollution for Yolo County. The only coverage they receive are articles from the late 80's and one from 2004. This means, the most recent news Yolo County has on the status of pollution is from seventeen years ago. Therefore, although little bit of coverage exists, it does not provide accurate information due to lack of details and outdated information.

Yolo County experiences much of it's difficulty behind the scenes. Environmental Organizations have to pull the majority of the weight in receiving any recognition or in getting help with movements from anyone outside of the county. Governmental agencies turn a shoulder when faced with tasks relevant for this county and major news outlets let Yolo down with little to no useful information being put out. This lacking coverage can provide major difficulty in battling issues related to the environment, considering the amount of collaboration with surrounding areas this task involves. However, Yolo is holding strong for what they are provided, and have plans to continue improvements with whatever help they can get.

7. RECOMMENDED LOCAL ACTIONS

Clear Lake's not so clear lake

Mei Zhong

Clearlake is one of Yolo counties main water supplies. 2/3rds of the district's surface water comes from Clearlake. The water in Clearlake is “eutrophic” because of fertilizer runoff from nearby farming and agricultural operations and discharges, which causes waste water in waterways as well as algae blooms that destroy the quality of the water. In addition to eutrophic waters caused by fertilizer runoff, the salinity of surface and groundwater also contributes to the deterioration of Yolo county’s water quality. As droughts are causing surface and groundwater to become scarcer, salinity concentrations of the water are increasing. It is more important to first address Clearlakes risk of algae blooms before addressing the salinity of surface and groundwater, because it’s easier to control fertilizer runoff than water salinity. Thus, the first most important local action to increase water quality would be to implement restrictive conditional waivers, such as “Ag waiver programs [that]... require the owners of irrigated farmland to control discharges (irrigation and stormwater runoff) from their property to protect surface and groundwater” (Newman 2010) to limit the amount of discharge from irrigated agricultural practices into waterways. This will result in less eutrophic waterways and reduce the risk of algae blooms. The second most important local action to prevent water contamination that we can take is to collect data about the effects of these water contaminants before using that data to spread awareness and push for action. Collecting data and the effects of these water contaminants can be used to encourage communication between local water

resource management residents and the Regional Board to help create a “appropriate analysis of Clearlake nutrient TMDL data, as it relates to source water quality issues in Yolo County” (Stevenson 2006) and improve water quality. We can then use this data to spread more awareness about this issue through social media or by word of mouth. This way, the community can gather and maybe write to the government for another restrictive wastewater dump program to really limit the unnecessary releasing of waste water into waterways. The third most important local action that we can take to decontaminate water relates to Salinity: local salinity reports, such as “Salinity in the Central Valley: an Overview” (Cismowski et al. 2006), should be made to collect data, which we can then use to help highlight the urgency for a better system to manage water Salinity in Central Valley. We can do this by spreading awareness again by word of mouth or social media to spread awareness and encourage statewide efforts to have a management plan for Central Valleys long term water salinity. The fourth most important local action that we can take to increase water quality also relates to water salinity: we can use previously collected data to make projections of predicted water salinity, which we can then share with the residents in Yolo county, resulting in a greater understanding of salinization of groundwater as an initiative to start addressing this issue.

In addition to using previously collected data to make predictions on water salinity, Jenna Beining, Giselle Garcia, Anisa Johnson, Oluwadara Ogundiwin, Emily Orth, Gwen Smith, Jessica Wojtowicz, and Mei Zhong came up with the idea of a high school program that will get students interested in environmental hazards and advocacy; this program is called Learn Up. The three main goals of Learn Up are to help more students become educated about potential major pollutants in the county (like mercury pollution from the mines along Cache Creek), to help students become aware of actions being taken to combat this (like the Climate Action Committee of UCD reducing carbon emissions), and to educate students about ways to reduce pollution in the community (through encouraging riding bikes, carpooling, , public transportation, and conversions to electric or hybrid cars). To let students know about the program, we can talk to science teachers at high schools who will

agree with the actions you would like to take and ask them if we can present about it in the classes. In addition to that, we can also contact schools who care about these environmental concerns and ask them if we can present during assembly or pass flyers around campus. Activities that we can do at Learn Up include group walks through the cache creek recreational park, safe protests on environmental issues that student's find important, and group meets with UC Davis students to learn about potential agricultural runoff in the creek and instances of mercury pollution. We can share what students do by making an Instagram and Facebook account to post videos and a synopsis of the activities that the students did (we can ask willing students to share our posts through their personal accounts as well), ask students to present what they learned in the class and make Youtube videos about it to share with others, and spread flyers to advertise and demonstrate the work done to the highschool they come from which will also provide incentives for recruitment.

8. RECOMMENDED EXTRA-LOCAL ACTIONS

Require Requirements

Emily Orth

Yolo County, California is home to farmers, teachers, parents, children, and many others. Every resident in the community deals with many different types of hazards and injustices in their daily life. Some of the harder-to-see disasters are called slow disasters because their impacts are drawn out which causes harm slowly (Fortun 2021). The most prominent of these disasters deal with some sort of pollution, thus creating a high health risk for the community members. Extra-local actions need to be taken in order to help correct these issues and provide a safer environment for Yolo County residents along with bettering the environment itself.

The first and most important action that needs to be taken regards putting regulations on water pollution. Yolo County gets some of its water and fish from Cache Creek. Recent research has looked at the “mean MeHg concentrations in crayfish” from Cache Creek and has discovered that the averages for mercury pollution “were higher than the average reported in crayfish for the January 2005 Cache Creek health advisory for fish consumption” (Hothem et al. 2007). Yolo County is providing its people with an unsafe amount of contaminated water and fish. By exceeding the amount of safe consumable

pollution, the citizens are at risk of health vulnerabilities such as peripheral vision loss, lack of coordination, neurological impairment, and more (United States Environmental Protection Agency 2021). There needs to be a change in state laws that require all bodies of water near communities to be measured for possible toxins. The health risks mercury pollution pose are too great to only be researched and not regulated. While California's Office of Environmental Health Hazards has performed assessments on mercury and warned citizens about its danger, it is not yet accurately regulated and still poses a major threat to the people who are constantly exposed to it (Domagalski et al. 2021). Yolo County needs better state regulation of pollution to help decrease health vulnerabilities.

The second most important action that needs to be taken involves receiving increased funding from the government to go towards environmental health research, especially dealing with air pollution. Once again, mercury endangers Yolo County. Mercury pollution can be found in water, fish, and the air. This becomes a major hazard as mercury pollution transported through the air cannot be counted (Domagalski et al. 2021). As previously mentioned, the health risks that come from mercury exposure can be detrimental if inhaled over long periods of time. Yolo County needs government funding in order to start researching ways to assess and prevent mercury transportation in the air. This research is vital to preserve health and address the generational and data injustices brought on by mercury mining. The article "Summary and Synthesis of Mercury Studies in the Cache Creek Watershed, California, 2000-01" mentions that "Very few, if any, environmental constraints were placed on the mercury mines and mineral-processing facilities in those times" (Domagalski et al. 2021). Because this process has been going on for generations without adequate research, the citizens who are living in the county have very few ways to correct the consequences of past practices. This being said, government funding for health research can help correct these issues.

The third vital extra-local action that needs to be taken is mandating farming permits at the state level. Yolo County is a huge agricultural community: farming is very prominent in

the community. Elizabeth Gribkoff's "Environmental Groups Petition EPA to Rescind Factory Farms' 'Free Pass to Pollute'" article mentions some of the problems stemming from a lack of farming permits. She claims, "Rather than require that owners of factory farms apply for permits under the Clean Air Act, the EPA under the Bush Administration instead reached a deal with pork, egg, and other livestock industry representatives... The agreement, signed by the owners of more than 90% of the largest animal feeding operations in the country, said that the agency would not enforce air pollution regulations provided that factory farm owners pay for a national livestock and poultry air pollution study" (Gribkoff 2021). In addition to already dealing with mercury toxins, Yolo County now has to deal with air toxication coming from large animal feeding operations. Inhalation of toxic fumes is detrimental to health, and the Environmental Protection Agency is avoiding this fact. Instead of helping to purify the air, the EPA is making deals with factory owners to avoid regulations on their farms if owners pay a certain price. For this reason, mandating permits is necessary. Factory farm owners need to be required to show valid permits in order to actually follow the goals of the Clean Air Act which aims to control pollution.

The last extra-local action that needs to be taken involves the California State Department of Education. This agency needs to update aspects of public education in California; all of the schools need to be required to teach children about environmental hazards, mainly pollution. Many current environmental injustices and hazards fall into the hands of America's youth. This next generation will be responsible for addressing, or ignoring, the situations at hand. If the youth are required to learn about environmental injustices and hazards, these issues can be resolved and not ignored. Without requiring schools to teach these subjects, the problems will continue to increase and be more difficult to overcome.

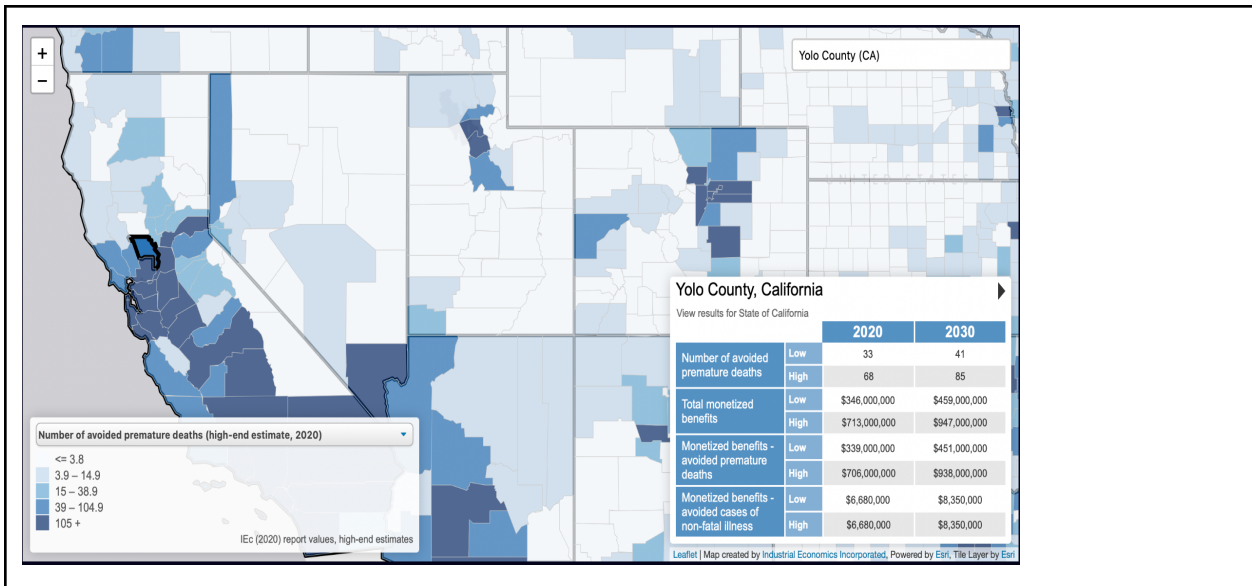


FIGURE 21:

The figure above shows data based on The Clean Air Act; this act helps protect Yolo County through its classification on nonattainment areas, auto emission standards, reformulated/alternate fuel in polluted areas requirement, addressing of released air toxins, acid rain control programs, state-run permit program to operate with major sources of air pollution, Montreal Protocol which phases out most ozone-depleting chemicals, and updated enforcements for pollution control acts. The Act also makes states adopt the State Implementation Plan and submit their results to the EPA which ensures each area meets statutory requirements; an action that works to improve the community’s health and living standards.

(Screenshot by Emily Orth, October 29, 2021.

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

9. RECOMMENDATIONS FOR FUTURE RESEARCH

Quality Air for a Quality Life

Jessica Wojtowicz

In order to guard against potential slow disaster threats, it is essential that more research is done into the air quality and water quality of Yolo County. There was extremely limited information our research group could find regarding air and water pollution in Yolo County. Thus it is important to conduct research in order to remedy this data injustice. Air quality monitors should be set up near roadways, industrial areas, and large farm operations to collect data. This data will yield valuable insight into the overall air quality, as well as the most significant contributors to poor quality air. Air pollution contributes to lung issues such as asthma, and an analysis has revealed that rates of asthma diagnosis in Yolo County are 2% above the state average (Yolo County Health Department 2014). Collecting more current data on asthma rates in the county would also be valuable. Actions can then be taken to mitigate the impacts of these large polluters. Additionally, it is critical to research to make sure water sources are not polluted. As agriculture is a large part of Yolo County, fertilizer and pesticides can be carried into waterways through runoff.

Fertilizer can disrupt natural ecosystems by producing algal blooms and pesticides can have negative effects on wildlife (Healthy Food Playbook *n.d.*). These contaminants are also dangerous for human consumption. Pesticide ingestion can lead to various forms of cancer and reproductive issues (Healthy Food Playbook *n.d.*). It is essential that further health research is done into the impacts of pesticides on reproductive health. Nitrates pose a threat as “...they inhibit oxygen transport in the blood” (Healthy Food Playbook *n.d.*). Therefore it is extremely important to conduct research to make sure the community’s drinking water is not contaminated.

Community views on these issues are also important to understand. A potential study could ultimately aim to answer the question: How do citizens of Yolo County understand causes and potential threats from air pollution? Participants in the study should include farmers, college students, parents, and regional industry executives. Potential ways to gain access to these groups are through organizations in Yolo County such as the Yolo County Farm Bureau, Yolo Basin Foundation, and on the UC Davis campus. There is the possibility that some participants may want to be anonymous, this should be allowed as it is most important to gain insight into community views. One way to gather data to answer the research question is to use participant observation. A potential design could be to set up tables in populated areas offering pamphlets about air pollution. The amount of people that take the time to stop and pick up the resources would show how concerned the community is. A sign up sheet for an informational session at a local library could also yield insight. Utilizing in-depth interviews is another component necessary to answer the proposed research question. With in-depth interviews, a few individuals from each social group could be asked about their history with lung issues, if they feel air pollution is a significant issue in Yolo, what they feel contributes the most to air pollution, and what they would like to see happen in regards to improving air quality. This would provide more detailed information into the community’s disposition towards air pollution. A third component of the study would be to conduct focus groups. This is an additional critical piece of a study as individuals within social groups are likely to have differing opinions.

This brings those perspectives into the conversation and allows for kind debate. In a focus group with farmers, a potential question could be: Do you feel that farms contribute to poor air quality? The information gathered through this study would ultimately be of value to environmental scholars wanting information on how farms impact air quality and would also be important to organizations advocating for stricter air regulations.

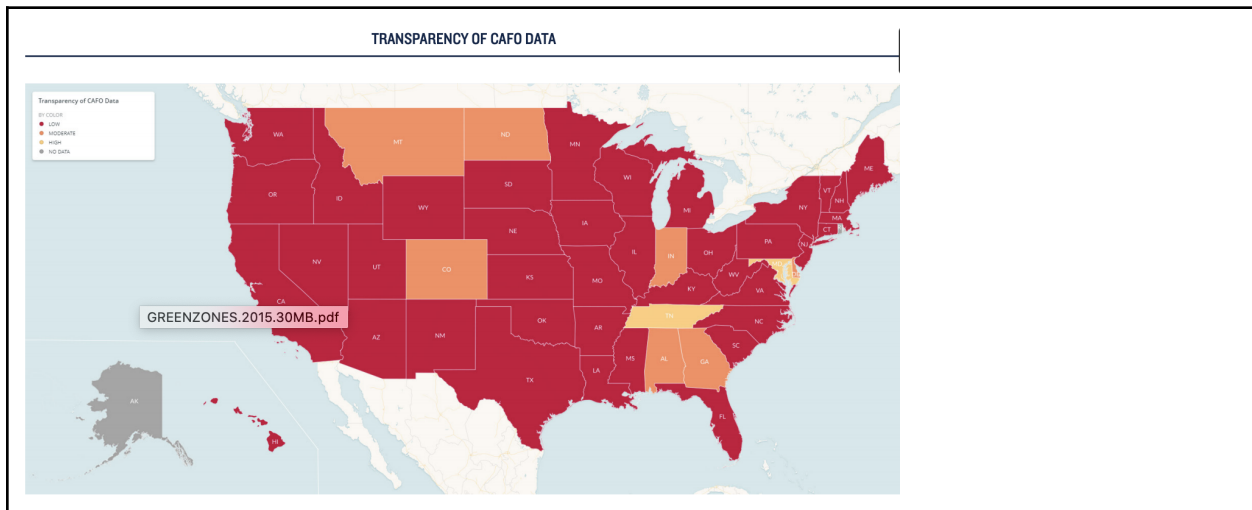


FIGURE 22:

Natural Resource Defense Council's 2019 report, *CAFOs: What We Don't Know is Hurting US*, documents the unavailability of publicly accessible data about concentrated animal feeding operations. The report gave each state a rating regarding transparency; California, the state where Yolo County is, scored a "Low Transparency" rating meaning 60% or fewer of all CAFO sites had readily available data which confirms the lack of transparency. For example, report authors searched and were unable to find data about type of manure storage, animal count, and a current permit status.

(Screenshot by Emily Orth, October 29, 2021.

<https://www.nrdc.org/sites/default/files/cafos-dont-know-hurting-us-report.pdf>)

10. INJUSTICE ANALYSIS

No Justice, No Peace

Jenna Beining, Jessica Wojtowicz

Various types of injustice occur across Yolo County that compound and contribute to slow disasters. A critical topic, and one form of injustice that often directly explains health disparities, is economics. According to an online document, 19% (36,993 people) live in households with income below the Federal Poverty Level (Yolo County Health Department 2014). Racial injustice also plays a major role in this situation. Asians, African Americans, and American Indians had the highest number of people living in poverty at 34%, 31%, and 22% respectively. The ethnicity with the least amount of people in poverty was white at 14% (Yolo County Health Department 2014). With this many minorities having a low socioeconomic status, they often live in cheaper housing closer to freeways and are more likely to drink polluted water from pesticides and mercury--all health threats and causes of slow disasters in Yolo County.

This brings us to injustice number three: health. In 2009, Yolo County's percent of the population with asthma was 5% higher than the statewide average. While this number dropped to 2% in 2012, Yolo County is still showing significantly greater health issues than the rest of the state (Yolo County Health Department 2014). Important to note is that asthma, bronchitis, and pneumonia are the 2nd leading causes of hospitalizations in

the county proving that asthma is an issue in Yolo that needs to be addressed. An additional part of health injustice that makes this situation much worse is that 20% of Yolo County adults did not have health insurance in 2011 (Yolo County Health Department 2014). Not only does the county have more asthma problems than the rest of the state, they also have less ways to get the help and care that they need.

The last major form of injustice caused by slow disasters in Yolo County, and one that can be truly devastating is reproductive injustice. A study that examined Rhesus Monkeys after wildfire exposure proved that air pollution can have negative impacts on children before they are born (Miller 2019). A second, and predominant way unborn children can be harmed is from their mother's exposure to pesticides, a common form of pollution from the agriculture industry in Yolo County. "Pesticide exposure is associated with increased risk of certain cancers and disorders of the nervous, endocrine, immune, and reproductive systems" (Health Care Without Harm 2018). The pain of struggling to bare a child, or the difficulties of raising a child with disorders are tremendous challenges, and it's an injustice that women in Yolo County have to unfairly bare this burden.

EJSCREEN Report (Version 2020)

County: Yolo, Nevada
 CALIFORNIA, EPA Region 9
 Approximate Population: 314,069
 Input Area (sq. miles): 1997.35

Selected Variables	Percentile in State	Percentile in EPA Region	Percentile in USA
EJ Indexes			
EJ Index for Particulate Matter (PM 2.5)	42	46	68
EJ Index for Ozone	40	43	66
EJ Index for NATA* Diesel PM	43	47	67
EJ Index for NATA* Air Toxics Cancer Risk	42	45	67
EJ Index for NATA* Respiratory Hazard Index	42	46	68
EJ Index for Traffic Proximity and Volume	51	57	80
EJ Index for Lead Paint Indicator	53	58	73
EJ Index for Superfund Proximity	66	70	84
EJ Index for RMP Proximity	69	73	85
EJ Index for Hazardous Waste Proximity	52	57	82
EJ Index for Wastewater Discharge Indicator	5	5	9

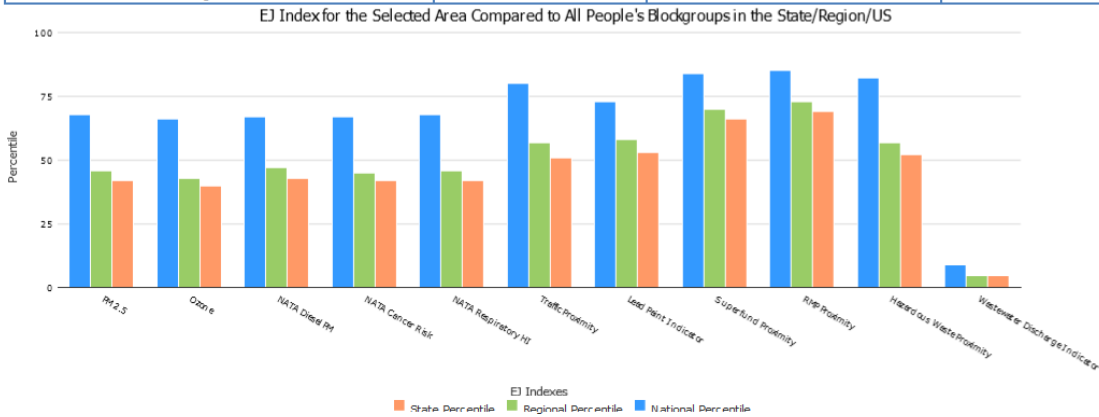


FIGURE 23: This compilation of environmental indicators (provided by the US EPA's EJScreen tool) shows that Yolo County is in the 85th percentile nationwide for proximity to RMP's, in the 84th percentile in proximity to superfunds, and 82nd in proximity to hazardous waste. The superfund sites, also known as National Priorities List (NPL), is sites within 5 km (or the closest one), each one divided by distance in kilometers, calculated in the year 2020. (Screenshot by Gwen Smith, November 1, 2021, <https://www.epa.gov/ejscreen>, <https://www.epa.gov/ejscreen/overview-environmental-indicators-ejscreen>)

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