

Kern County

**SLOW DISASTER
CASE STUDY**



**ENVIRONMENTAL
INJUSTICE**

Summer 2021

GROUP NO. 1

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, Summer 2021. The University of California Irvine is on the ancestral homelands of the Tongva and Acjachemen nations.

COVER PHOTO



Oil Fields in Kern county produce a little over 70,000 barrels of oil every day, making around 760,000 barrels of water that is sold to farmers for their farms daily. Although these mines produce valuable water in times where California needs it, they also release many harmful pollutants including nitrate which causes various respiratory diseases. (Screenshot by Hunter Walsh, July 6th, 2021)

<https://www.nytimes.com/2014/07/08/us/california-drought-chevron-oil-field-water-irrigation.html>

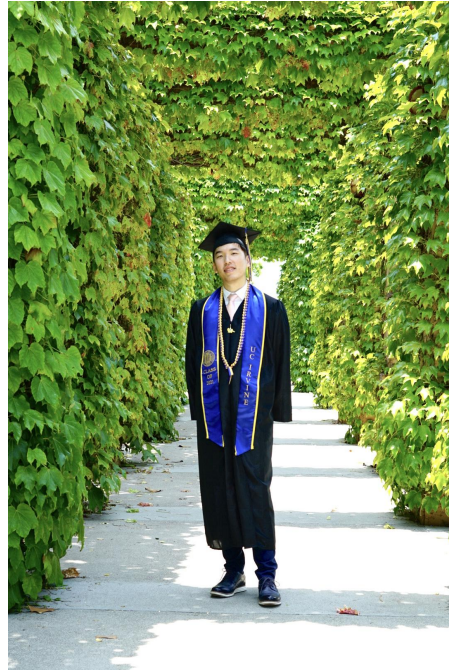
BIOGRAPHICAL STATEMENT

Hunter Walsh is a first year student at UCI majoring in mechanical Engineering. He is excited to be able to apply what he learns about environmental injustices to the field of engineering and possibly design products that produce less pollution than the products in circulation today.

PHOTO



Cyrus Lo is a senior Computer Science Student at University of California, Irvine. He was born in Hong Kong. He likes solving problems. For more information about him go to: <https://www.cyruslo.co>



Mona Gerami is a second year Psychological Science major at University of California, Irvine. She has taken two courses in climate change and air pollution her freshman year which began her interest in the environment. She values helping others' mental health as well as their physical health. She hopes to do her part in creating a healthier environment for future generations.



Shannen Duke is a second year business administration major at the University of California, Irvine. She has grown an interest in helping the environment after experiencing plastic pollution in the ocean where she lives and wanting to help solve this issue and many more. She is very excited to learn about ways she can help improve our environment and solve environmental injustice issues wherever she can.



Vivian Dinh is a fourth year biological sciences major at University of California, Irvine. She has taken interest in learning more about clean energy and ways to better help/improve the environment.



Negin Pourgholam is a first year Biology student at the University of California, Irvine. This is her first anthropology course, and with her background in biology, she hopes to use her learnings in this class to contribute to her development as a well rounded, aware citizen in hopes of making decisions better for the world around her.



Kasumi Kiriakidis is a second year mathematics major and ICS minor at the University of California, Irvine. She has been involved in some environmental activism events throughout high school, and has served a leadership position in an environmental club. She is very enthusiastic about environmental issues, especially topics on air pollution and plastic waste.



Gautam Chaudhri is a second year biological sciences major at the University of California, Irvine. He first took an interest in environmental activism when he volunteered in a cleanup with his friends at the San Joaquin Marsh & Wildlife Sanctuary in high school. Since then, his interest has grown and he hopes to use what he has learned so far to fight for the environment and make the world a better place for future generations.



Colin Donahue is a third year history major at University of California, Irvine. He has been interested in environmental injustice since taking environmental science in high school. Since he is a history major he is concerned about the future history and that history is happening right now.



Kelly Guan is a third year biological sciences major at the University of California, Irvine. She has been interested in environmental injustice and how to support environmental groups since high school. She is interested in learning about how the government and green organizations all over the world have created plans and programs in the interest of the current and future generations to create a healthier and greener planet.



Will Welker is an incoming freshman to University of California, Irvine. He plans to major in Environmental Science and Policy and minor in Economics. He is very interested in environmental science and the economic implications of climate change.



Seyedeh Saina Saifzadeh is a fourth year Biological Sciences major at the University of California, Irvine. She has been a part of the “green team” for over three years , working with other student’s to make their local community a more sustainable place. She has done over 500 hours of volunteer work cleaning beaches.



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INTRODUCTION

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

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

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

Native Land Mapping and Acknowledgments:

Negin Pourgholam

The goal of this section is to acknowledge the history of the ownership of Kern County and to acknowledge the Native American tribes which originated there.

Native Americans have been experiencing disregard from the government for decades as many members of different tribes all around the United States remain underprivileged and are living under poverty lines. Many of these tribes have been kicked out of their homes which have been replaced with private property, leaving them with no designated land or reservation to inhabit and form communities. California, being the state with the largest population of Native Americans within the United States is home to several of these tribes (Source 1). One of these tribes being the Tejon tribe, originating from Kern County, California. To this day Kern County is a home to a large population of the Tejon tribe, currently housing 1,111 members and is the only recognized tribe within Kern County.

After decades of petitioning to gain federal recognition, the Tejon tribe received “Tribal Re-affirmation” in 2012. This re-affirmation lists the Tejon tribe within the federal list of “Indian Entities Recognized and Eligible to Receive Service from the United States Bureau of Indian Affairs”. This recognition allows the tribe to expand healthcare opportunities as well as housing and economic growth opportunities. This further allowed for members of the tribe to create a committee with chairmen and tribal sovereignty which functions as a “government-to-government” system in which the United States federal government is trusted to protect tribal lands and rights. (Source 2)

Unfortunately, due to the fact that this federal recognition occurred historically late within the history of the Tejon tribe, many indigenous homelands are now privately

owned lands. To this day, the Tejon tribe has no recognized land or reservation. Because of the lack of designated land and reservation, the Tejon tribe has relocated several times throughout the decades. The most recent re-location occurred after the “White Wolf Earthquake” which occurred in 1952 within Kern County and led to the destruction of Tejon “adobe homes”. The Tejon Ranch owners who owned the land in which these homes were built refused to let members rebuild their houses. For this reason, the Tejon tribe was kicked out of their homes and members were forced to relocate to Bakersfield

For several centuries, the goal of the leaders of the Tribe have been to keep the bloodline connected. Today, the top priorities of the tribe is to ensure members have access to healthcare, housing and education and to do this, the Tejon tribe community has made available several assistance services and programs.

Sources:

Source 1:

1108. “Indigenous World 2020: United States of America.” IWGIA. IWGIA, May 2020. <https://www.iwgia.org/en/usa/3640-iw-2020-united-states-of-america.html>.

Source 2:

“Who We Are Today.” Tejon Indian Tribe. Tejon Indian Tribe. Accessed July 9, 2021. <https://www.tejonindiantribe.com/who-we-are-today/>.

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: Oil Fields in Kern county produce a little over 70,000 barrels of oil every day, making around 760,000 barrels of water daily that is often sold to farmers for their farms. Although these mines produce valuable water in times where California needs it, they also release many harmful pollutants including nitrate which causes various respiratory diseases. (Screenshot by Hunter Walsh, July 6th, 2021)

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9. What kinds of data and research would be useful in efforts to characterize and address environmental threats in this setting and similar settings?
10. What, in your view, is ethically wrong or unjust in this case?

FIGURE 3: Eij case study framework (Screenshot by Hunter Walsh, July 6th 2021)

1. COMMUNITY ASSETS & SETTING

Asthma County - Kern

Cyrus Lo

In 2016, the World Health Organisation (WHO) had identified San Joaquin Valley as having the country's worst air pollution ("Environmental Justice Education"). The air pollution problem in Kern County has been getting more serious over the past few decades. This caused some health issues to the people who live in Kern County. Maricruz Ramirez, a resident in Kern County, reported that everyone in her family diagnosed asthma or bronchitis due to the everyday air pollution in Kern County (Morgen, 2021). The air pollution problem in Kern County is causing the local residents to suffer from diseases like asthma and bronchitis. In 2017-2018, 14.8% of kids in Kern County were diagnosed with Asthma. In 2018, 12.1 in 100,000 kids ages 0-4 and 4.5 in 100,000 kids ages 5-17 were hospitalized due to asthma in Kern County (Summary: Asthma). The air pollution not only affects our generation but also our next generation.

The opportunity index in Kern County is 56.7 and has a grade of C- ("Opportunity Index"). It means that the people in Kern don't have much opportunity to improve their life quality

based on their community and their living environment. Also, Kern County lacks medical doctors. They only have 49.5 medical doctors per 100,000 population (“Opportunity Index”). Therefore, people in Kern County can not get enough medical support despite the fact that there are a lot of people suffering from asthma and bronchitis in Kern County. Also, their crime rate is pretty high as well. They have 545.3 violent crimes per 100,000 population (“Opportunity Index”). It harms the reputation of the County and makes it a not ideal County to live in.

The air pollution is not just harming the health of people who live in Kern County but all the people who live in the U.S.. There are 1731 farms in Kern County in 2017 (“2017 Census of Agriculture”). Most fruits, nuts, and vegetables that are provided in the U.S. are from the farm in Kern County(Rory, 2016). The pollutant will affect the products of the farm and the products will be delivered all over the U.S. . Therefore, this is not just the problem of the people who live in Kern County but also the problem that we need to deal with. The total market value of products sold in Kern County in 2017 is \$4,076,783,000 which has increased 2% since 2012 (“2017 Census of Agriculture”). The products produced from Kern County’s farms keep rising over the past decade. This is no doubt an urgent issue that we have to deal with.

There are also some assets in the community that help improve the environmental issue and the living environment of Kern County.

First, they have Kern Green which is an organization that works with the local residents, schools, business, and the community to protect the environment in Kern County through education(“Kern Green”). They will hold some community recycle drives to educate the local people about the environmental issue around them. Also, they will also email a monthly newsletter to over 3000 Kern County residents in order to educate them about the issue as well.

Also, they have the San Joaquin Valley Air Pollution Control District(“Air Monitoring”).

They help to monitor the pollutants in Kern County to see if the concentration of pollutants fit the U.S. EPA air quality standard. Therefore, they can make sure that the air pollution level will not reach the hazard level.

Furthermore, the Greater Bakersfield Legal Assistance Inc. has provided some legal services to Kern County's low income and elderly since 1968 ("Greater Bakersfield Legal Assistance, Inc"). The Community Health Initiative of Kern County also provides the uninsured individuals and families the access to comprehensive health insurance since 2004 ("About", The Community Health Initiative of Kern County). These assets can improve the living quality and help to ease the injustice problem in Kern County.



FIGURE 4: This photograph shows a farmer harvesting almonds. It represents the pollution that arises because of agriculture like overuse of fertilizers. Farmers are currently working on solutions and forming coalitions to efficiently use fertilizers.

<https://www.bakersfield.com/news/uc-davis-researchers-find-overuse-of-f>

[ertilizer-on-farms-a-key-source-of-air-pollution/article_97e8a656-086d-11e8-84fb-63653832500c.html](https://www.theguardian.com/us-news/2021/mar/12/kern-oil-field)

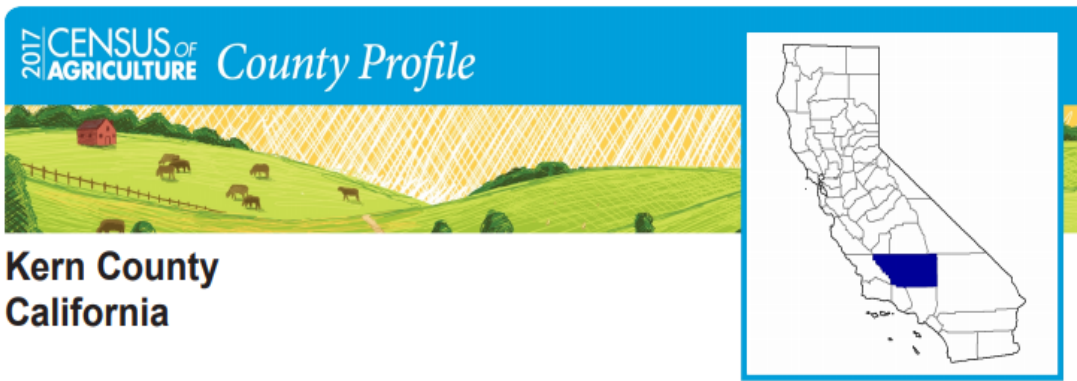
(Screenshot by Colin Donahue, July 7, 2021)



FIGURE 5: This is a photograph of an oilfield in Kern County. Kern County produce 70% of the state's oil and 90% of the state's natural gas. Moreover, according to a 2014 report from National Resources Defense Council, around 60% of people who live nearby these wells are people of color.

<https://www.theguardian.com/us-news/2021/mar/12/kern-oil-field>

(Screenshot by Cyrus Lo, July 6, 2021)



**Kern County
California**

Total and Per Farm Overview, 2017 and change since 2012

	2017	% change since 2012
Number of farms	1,731	-11
Land in farms (acres)	2,295,497	-1
Average size of farm (acres)	1,326	+10

9 Percent of state agriculture sales

Share of Sales by Type (%)

Crops	84
Livestock, poultry, and products	16

FIGURE 6: This figure shows how large agriculture is in Kern County. The number of farms and land in farms decreases, but the average farm size increases. Farms are producing more than they did in 2012. https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/California/cp06029.pdf (Screenshot by Colin Donahue, July 7, 2021)

County Overview

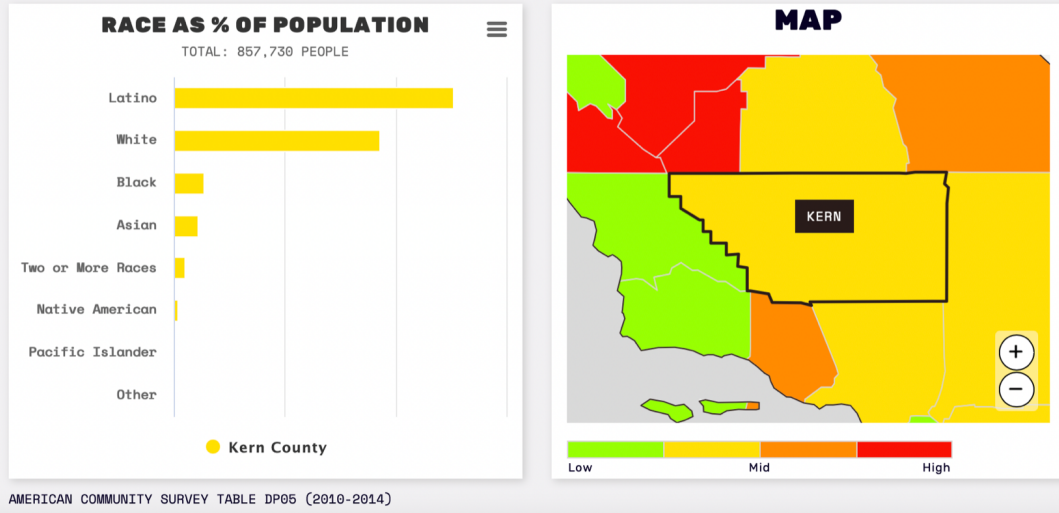
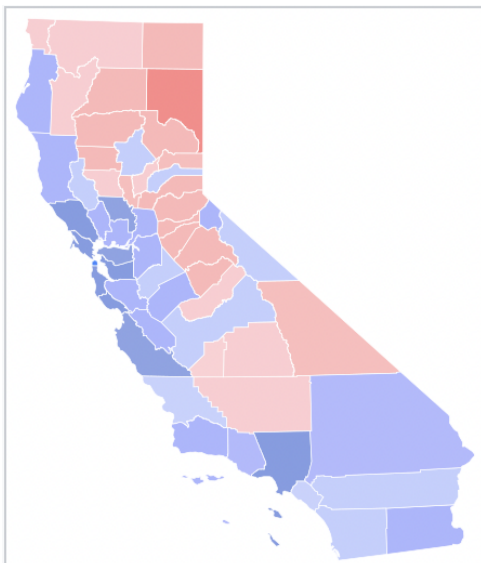


FIGURE 7: The Race Counts data for Kern County shows that Kern has a large Latinx population. The report states, “Kern is a low performance, low disparity, more populous county.”

<https://www.racecounts.org/county/kern/> (Screenshot by Will Welker, June 6, 2021)



Party registration by county (October 2018):

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

FIGURE 8: A wikipedia map of political party registration in California shows that Kern County has a slight Republican majority. Considering that many republicans have an anti-regulatory stance when it comes to high-polluting industries, Kern County may have an even harder time at legislating regulatory policies.

https://en.wikipedia.org/wiki/California_locations_by_voter_registration (Screenshot by Will Welker, June 6, 2021)

Choose a category:

Voter ID laws Voter registration laws Felony disenfranchisement Early voting

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

Identification requirements for voting in the US

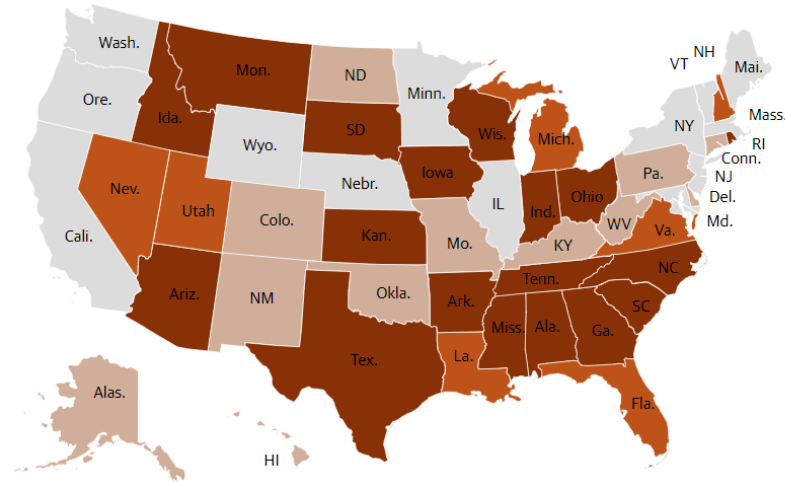
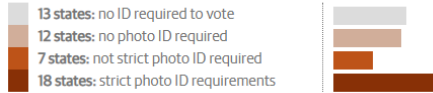


FIGURE 9:The state of California has laws that make it easier to vote than in many other US states. This strengthens democratic capacity across the state of California. There are still concerns, however. In Kern County, there have been calls for more voting options for rural residents, possibly through a mobile voting office (as has been used in Imperial County) (Morgan 2020). Grace Vallejo, Fourth District Supervisor candidate, wants more voting access for the rural parts of Kern County since the only place to vote early in person is the Kern County Elections Department in Bakersfield which is a far drive for some residents in Kern. Suggestions to improve this would to make places like fire stations early voting centers (Morgen 2018).

<https://www.theguardian.com/us-news/ng-interactive/2019/nov/07/which-us-states-hardest-vote-supression-election> (Screenshot by Colin Donahue, July 7, 2021)

https://www.bakersfield.com/news/grace-vallejo-asks-supervisors-for-greater-voting-access-for-county-residents/article_2ccd128a-cc0d-11e8-b797-e3aa9cbd97c6.html

2. FAST DISASTER & OTHER ENVIRONMENTAL THREATS

Industrial Agriculture and Oil Production: Economic Essentials but Environmental Destroyers

Will Welker

Air and water pollution is no stranger to those living in Kern county. Due to Kern being one of the top counties for oil production and agricultural output in the United States, pollution levels are through the roof. According to the American Lung Association's State of the Air 2016 report, Kern's air is the worst in the United States for short-term and year-round particle pollution, and the second worst for ozone pollution (Berg 2017). As for water pollution, a study conducted by Cal Water found that chemical levels in Kern's water were above health-guidelines for the following chemicals: 1,2,3-Trichloropropane, Arsenic, Bromodichloromethane, Chloroform, Chromium (hexavalent), Dibromochloromethane, Dichloroacetic Acid, Nitrate, Radiological Contaminants, Total

Trihalomethanes (TTHMs), and Trichloroacetic Acid. These pollutants can cause a wide array of health issues ranging from stomach irritation and nausea to liver & Kidney damage and cancers.

Oil industries, one of the two mass polluting industries in Kern, are very damaging to Kern's environment. The oil industries in Kern produce "70% of the state's oil" (Canon 2021). The large amount of oil production that occurs in Kern contributes to the County being in the 3rd percentile for water quality, 1st percentile for pm 2.5 concentration, and 3rd percentile for ozone concentration in California (Healthy Place Index).

Industrial Agriculture, the second most polluting industry in Kern, significantly contributes to air and water pollution; "The source of over half of the San Joaquin Valley's pollution is industrial agriculture, which contributes 170 tons of emissions per day" (Wilson 2007). Two of the primary environmentally hazardous industrial agriculture practices used in Kern are CAFOs and pesticide usage.

Due to Kern's high agricultural output, the county uses a large number of pesticides; "In 2016, Kern applied 28.9 million pounds of pesticides, making it second in the state for the most pesticides used" (Advancement Project 2019). While pesticide usage increases crop output, it also has significant environmental ramifications. "The use of pesticides degrades the quality of the air, water, and soil that people and animals rely on. Water discharged from agriculture farms through irrigation or storm runoff flushes pesticide residue into groundwater sources and rivers and lakes" (Advancement Project 2019). According to The National Water-Quality Assessment, this agricultural runoff is also the leading cause of water quality impacts to rivers and streams, the third leading source for lakes, and the second-largest source of impairments to wetlands. Both bacteria from livestock manure and pesticides constitute some of the primary stressors to water quality (EPA). Not only are pesticides polluting Kern's environment, but they're also very harmful to humans. According to The California Office of Environmental Health's list of harmful pesticides, chlorpyrifos, which is a commonly used insecticide in Kern, has been linked to cancer and birth defects. State data shows that in 2016 a highly toxic amount of chlorpyrifos was applied in Kern County (Advancement Project 2019).

CAFOs, which are another damaging practice of industrial agriculture, are a large contributor to Kern's water and air pollution levels. Harris Ranch is one of the largest Concentrated Animal Feeding Operations in Kern. "At Harris Ranch, 100,000 head of cattle stand shoulder to shoulder under metal awnings on 800 barren acres surrounded by a chain-link fence topped with razor wire. Meanwhile, Harris Ranch trucks drive, collectively, 6,000 miles a day to haul upwards of 60 loads of feed to the cattle lots. Along their route through the valley, the trucks release nitrogen oxides (NOx) from their tailpipes, which react in the air to form nitric acid. Once in the air, molecules of nitric acid combine with molecules of ammonia gas rising from cow manure and urine on the feedlot to create ammonium nitrate. Ammonium nitrate, according to the California Air Resources Board, accounts for more than half of the region's PM2.5 on the area's most polluted days" (Price and Borrell 2018). Particulate pollution levels in Kern are in the unhealthy range for about 40 days a year and this number is steadily increasing, according to the American Lung Association's (ALA) 2018 State of the Air Report. When PM 2.5 enters the lungs, it can cause respiratory issues, strokes, and heart disease. (Price and Borrell 2018). In addition to this, CAFOs can pollute local water sources on a massive scale. According to The Californian, "The drinking water of millions of Americans living in or near farming communities across the country is contaminated by dangerous amounts of nitrates and coliform bacteria from fertilizer and manure widely used in agriculture" (Wang, Tyau and Ybanez 2017).

EJSCREEN Report (Version 2020)

County: Kern
 CALIFORNIA, EPA Region 9
 Approximate Population: 883,053
 Input Area (sq. miles): 8162.63

Selected Variables	Percentile in State	Percentile in EPA Region	Percentile in USA
EJ Indexes			
EJ Index for Particulate Matter (PM 2.5)	78	81	93
EJ Index for Ozone	81	82	93
EJ Index for NATA* Diesel PM	65	67	80
EJ Index for NATA* Air Toxics Cancer Risk	74	76	88
EJ Index for NATA* Respiratory Hazard Index	82	83	93
EJ Index for Traffic Proximity and Volume	62	67	87
EJ Index for Lead Paint Indicator	69	74	84
EJ Index for Superfund Proximity	70	74	86
EJ Index for RMP Proximity	82	85	93
EJ Index for Hazardous Waste Proximity	60	66	87
EJ Index for Wastewater Discharge Indicator	8	9	20

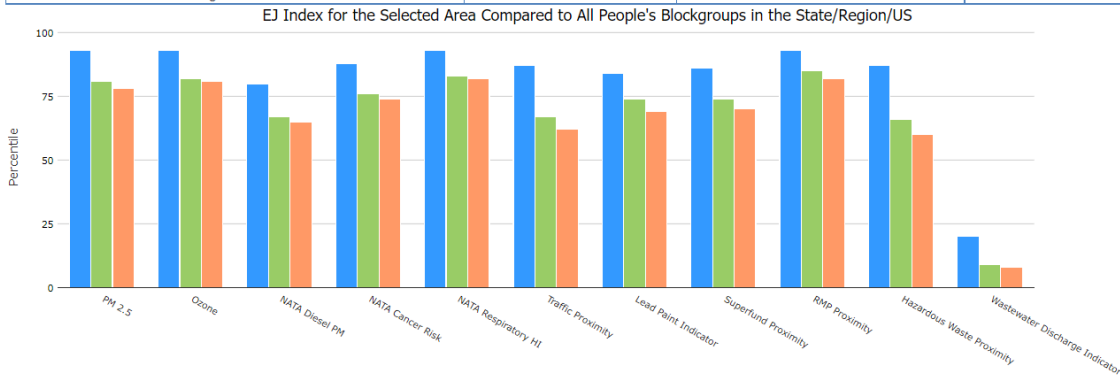


FIGURE 10: This compilation of environmental indicators (provided by the US EPA's EJScreen tool) shows that Kern County is in the 93rd percentile nationwide for Particulate Matter, Ozone, Respiratory Hazard, and proximity to RMP facilities. The Ozone indicator is based on summer seasonal avg. of daily maximum 8-hour concentration in air in parts per billion.

<https://www.epa.gov/ejscreen/overview-environmental-indicators-ejscreen>
 (Screenshot by Mona Gerami, July 7, 2021).

American Lung Association
 Kern County | Bakersfield, CA

If you live in Kern County, the air you breathe may put your health at risk.

- Ozone: **F**
- Particle Pollution 24-hour: **F**
- Particle Pollution Annual: **FAIL**

FIGURE 11: The American Lung Association (ALA) gave Kern County (California) an “F”

for ozone levels. This may be explained by high levels of facility pollution. Kern County is in close proximity to many RMP Facilities and home to a city with the biggest oil refinery in the world, Bakersfield. <https://www.stateoftheair.org/> (Screenshot by Mona Gerami, July 7, 2021).

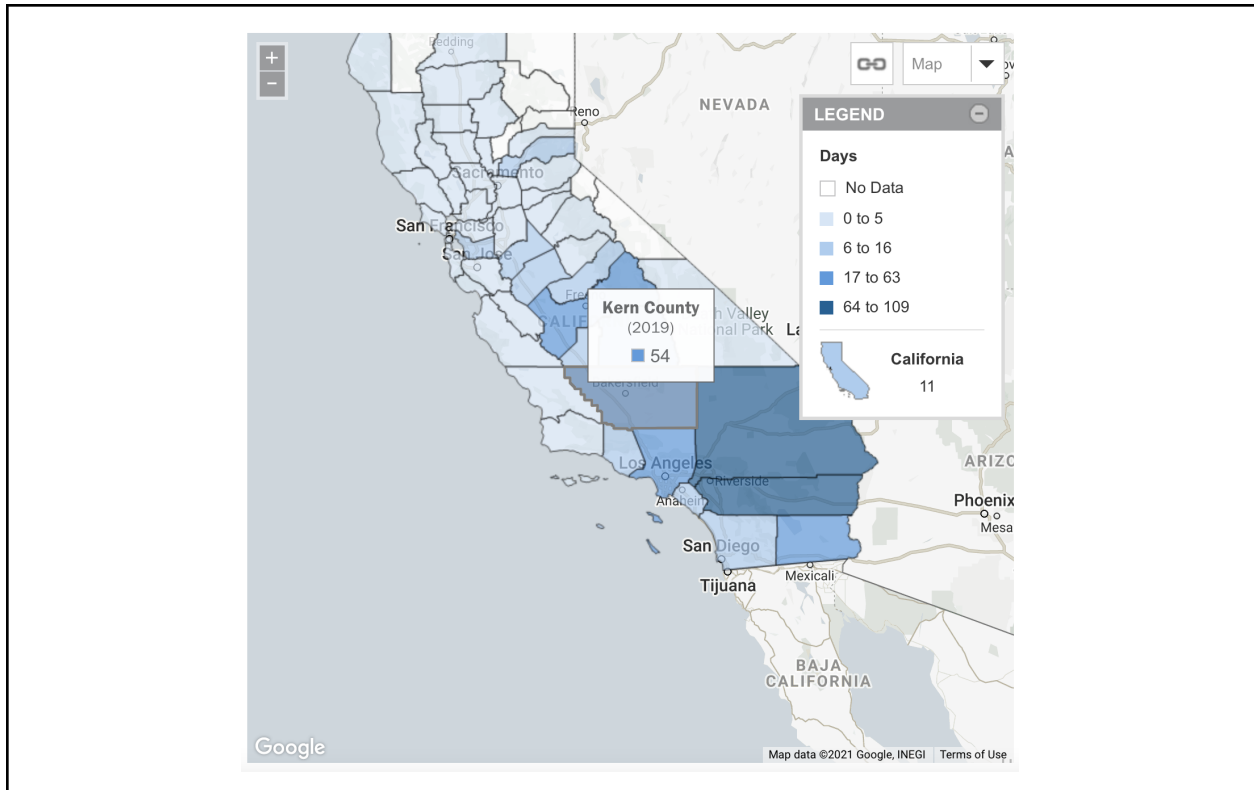


FIGURE 12: According to 2019 data, Kern County had 54 days when the ozone concentrations in the air were unhealthy. This number is significantly greater than the average number of days where the ozone concentrations in the air were above the regulatory standard for California (11). High ozone levels are linked to multiple respiratory diseases, cancer, and birth defects and this type of pollution can affect people negatively indoors and outdoors. Additionally, air pollution can significantly impact children more than adults because children have weaker immune systems and do activities such as playing outside more, which causes them to be more at risk of having their health affected by the poor air quality.

<https://www.kidsdata.org/topic/525/air-ozone/map#loct=3&fmt=2750&loc=362&tf=124¢er=-13236463.265591,4204168.1001617&zoom=1> (Screenshot by Kelly Guan, July 7, 2021)

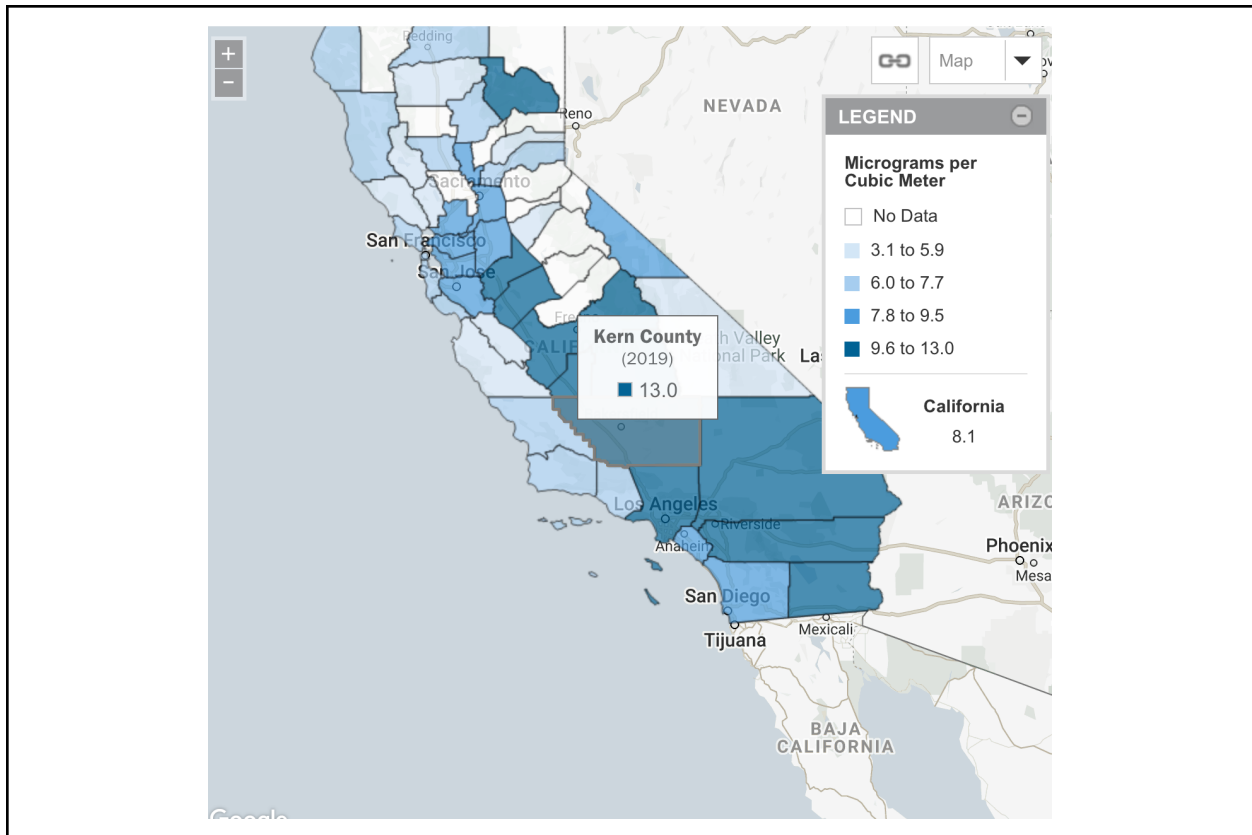


FIGURE 13: This figure shows the average particulate matter concentration in the air in Kern County. The bar only allows for the selection of one county, in this case (Kern County) which has a matter concentration of 13. However, looking at the key on the right, we can use the color indicator to determine the micrograms per cubic meter in any of the counties based on the color shown on the map. Air pollution is attributed to many diseases including respiratory issues, cardiovascular issues, and obesity. Sources for these pollutants can be vehicles and industrial facilities (ground level ozone).

<https://www.kidsdata.org/topic/524/air-particulate/Map#loc=3&fmt=2751&loc=362&tf=124¢er=-13236463.265591,4204168.1001617&zoom=1>

(Screenshot by Negin Pourgholam, July 7, 2021)

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 **Kern County** was **16.0µg/m³**.*

* Micrograms per cubic meter (µg/m³)

ANNUAL AMBIENT CONCENTRATION OF PM_{2.5}

16.0µg/m³*

Kern County, California

12.0µg/m³*

Annual National Standard

*Micrograms Per Cubic Meter (µg/m³)

Discover the data | Learn more about this topic

† 2016 data from the National Environmental Public Health Tracking Network



FIGURE 14: This figure compares the annual particulate matter of Kern County with the national standard and shows that the air quality is at unsafe levels. PM 2.5 is just one of many types of air pollutants but can still lead to many health problems, especially respiratory problems.

[National Environmental Public Health Tracking Network - CDC - Info By Location External](#)
(Screenshot by Gautam Chaudhri, July 7, 2021)

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, 2.7% of the population of Kern County lived within 150 meters* of a major highway.

In 2011, 1.1% of Kern County public schools (preK-4th grade) were sited within 150 meters* of a major highway.

* 150 meters is about 2 blocks.



2.7%



of Kern 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 how much of the population in Kern County lives in close proximity to a major highway. The number is relatively low since the county is fairly rural,

which is good because traffic pollution has been linked to respiratory and other health problems.

[National Environmental Public Health Tracking Network - CDC - Info By Location External](#)
(Screenshot by Gautam Chaudhri, July 7, 2021)

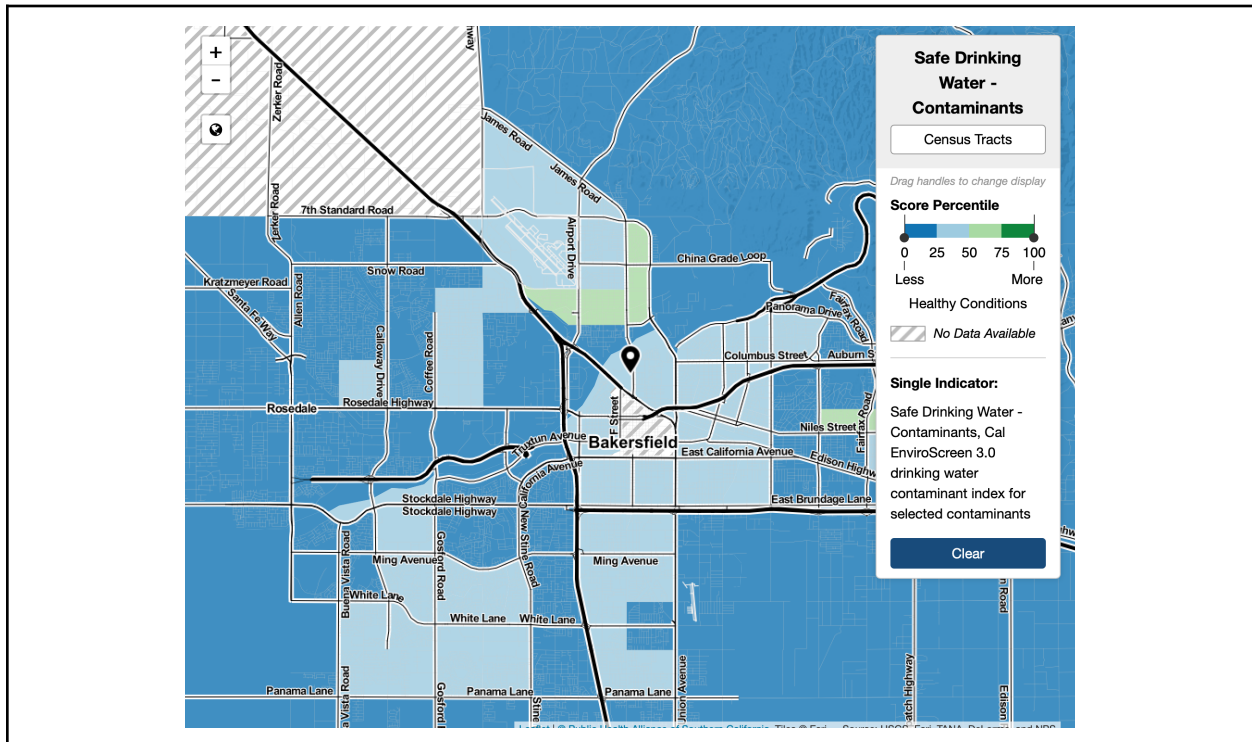


FIGURE 16: Shown here is the score percentile for the safe drinking water in Kern County. As seen on the map and the score percentile color indicator, we can see that most of Kern County falls into the 50% or lower score percentile which indicates that there is a significant water contamination issue present within the county. High water contamination is linked to health issues such as transmission of bacterial diseases

<https://map.healthyplacesindex.org> (Screenshot by Negin Pourgholam, July 7, 2021)

3. COMPOUND VULNERABILITIES

Disparate

Mona Gerami

Health access in Kern County is a big stressor. Access is limited in many aspects. Life expectancy is currently at 77.5 years in Kern which is 7 years lower than the country average. On top of that, 9% of the population in Kern is uninsured which is 3.7% lower than the country average (“Kern County,” Race Counts, October 1, 2020, 1). These statistics place Kern County at a low performing area as far as health care. Citizens are at risk of a lower life expectancy than the average US citizen and on top of that lack health insurance. This puts residents of Kern at a major disadvantage.

Ozone levels, another major stress indicator in Kern County, and water contaminants are in the third percentile compared to other California counties. That means that 97% of California has better ozone levels and water contamination than Kern County (“California Healthy Places Index Map,” California Healthy Places Index Map, accessed July 6, 2021, 1). High ozone levels in the county can lead to toxic air. Residents will have respiratory issues due to unhealthy air. The water in the county is also very contaminated which could cause residents to be poisoned. This would lead to health issues which 9% of the population could not afford and contribute to the low life expectancy.

Particulate Matter in the air on average is 13.0 micrograms per cubic meter in Kern County and only 8.1 in California. (“Kern County Summary,” Kidsdata.org, accessed July 7, 2021, 1). This contributes to the chemicals of the air in Kern County being much more toxic than the average California air conditions. The air pollution in Kern County is much higher than the state average. The residents are breathing in toxic air and are disproportionately impacted. This is likely tied to the high ozone levels as well.

As far as accessibility to healthy food and/or healthcare, Kern County is low performing. Kern County has a community score of 36 which is lower than the national average of 47.8. (“Map,” Opportunity Index, accessed July 7, 2021, 1). The community score means availability of healthy foods and access to healthcare. Residents of Kern have less of this than the average citizen so they are at higher risk of not receiving care for health

conditions and respiratory issues. Not having access to enough healthy foods could lead to obesity and other conditions.

Overall, high levels of air pollution and low levels of health access make Kern County an area of high disparity and low performance.

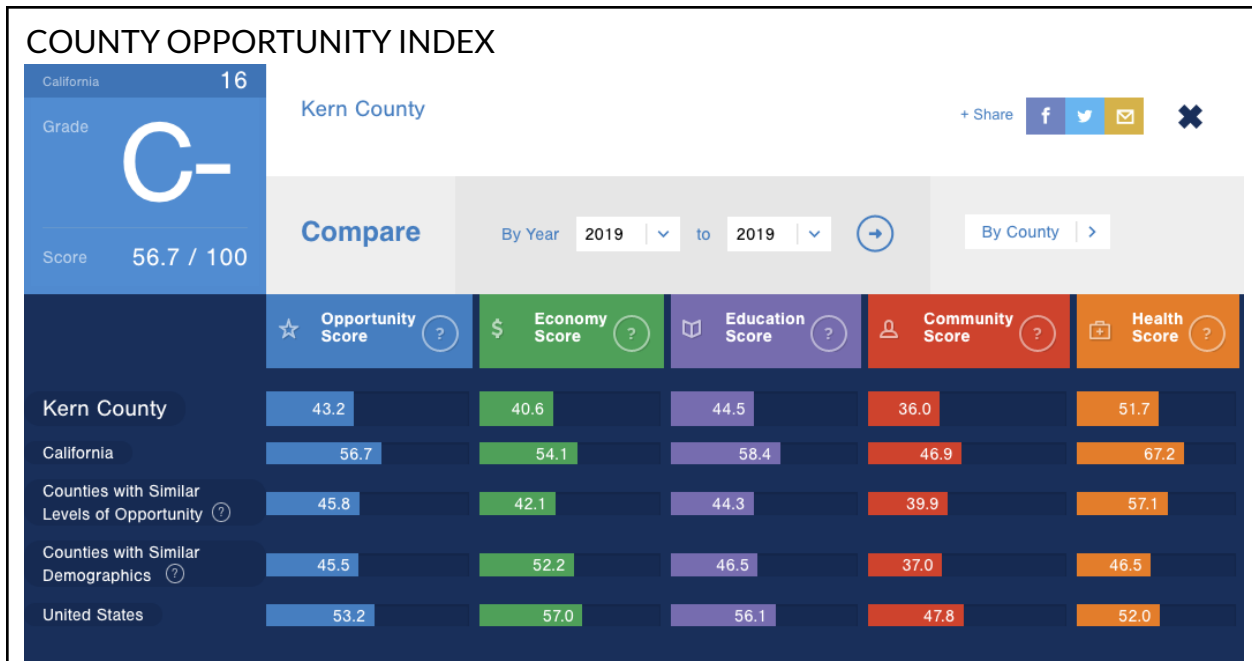


FIGURE 17: Kern County has a 56.7 opportunity index score. The opportunity index reflect if the resident in the community feel they have the opportunity to improve their life based on different factors. The number of medical doctors in Kern County is very low. They have 49.5 medical doctors per 100,000 population. Also, the violent crime is very high. They have 545.3 crime per 100,000 population.

<https://opportunityindex.org/detail/06029>

(Screenshot by Cyrus Lo, July 6, 2021)

EDUCATIONAL ATTAINMENT



EJSCREEN ACS Summary Report



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

	2014 - 2018 ACS Estimates	Percent	MOE (±)
Population 25+ by Educational Attainment			
Total	532,100	100%	57
Less than 9th Grade	72,415	14%	1,994
9th - 12th Grade, No Diploma	67,169	13%	2,021
High School Graduate	147,239	28%	2,561
Some College, No Degree	159,525	30%	2,814
Associate Degree	38,465	7%	1,326
Bachelor's Degree or more	85,752	16%	2,080
Population Age 5+ Years by Ability to Speak English			
Total	811,880	100%	92
Speak only English	454,012	56%	3,612
Non-English at Home ^{1,2,3,4}	357,868	44%	3,983
¹ Speak English "very well"	210,943	26%	3,497
² Speak English "well"	62,190	8%	2,120
³ Speak English "not well"	53,422	7%	1,887
⁴ Speak English "not at all"	31,313	4%	1,502
^{3,4} Speak English "less than well"	84,735	10%	2,411
^{2,3,4} Speak English "less than very well"	146,925	18%	3,211
Linguistically Isolated Households*			
Total	24,246	100%	1,082
Speak Spanish	21,403	88%	996
Speak Other Indo-European Languages	892	4%	234
Speak Asian-Pacific Island Languages	1,607	7%	310
Speak Other Languages	344	1%	164
Households by Household Income			
Household Income Base	267,913	100%	1,297
< \$15,000	33,314	12%	1,452
\$15,000 - \$25,000	30,030	11%	1,460
\$25,000 - \$50,000	65,367	24%	1,941
\$50,000 - \$75,000	47,612	18%	1,623
\$75,000 +	91,590	34%	2,180

FIGURE 18: As shown in the figure, a fourth of the population over the age of 25 did not get a high school diploma, and almost half of the population speak English “less than very well” to “not well.” This may raise a problem in the community in which the environmental issues are not accurately communicated to those with lower levels of education, or none at all are communicated to non-English speakers.
<https://ejscreen.epa.gov/mapper/demogreportpdf.aspx?report=acs2018> (Screenshot by Kasumi Kiriakidis, July 7, 2021)

K-12 EDUCATION INDICATORS

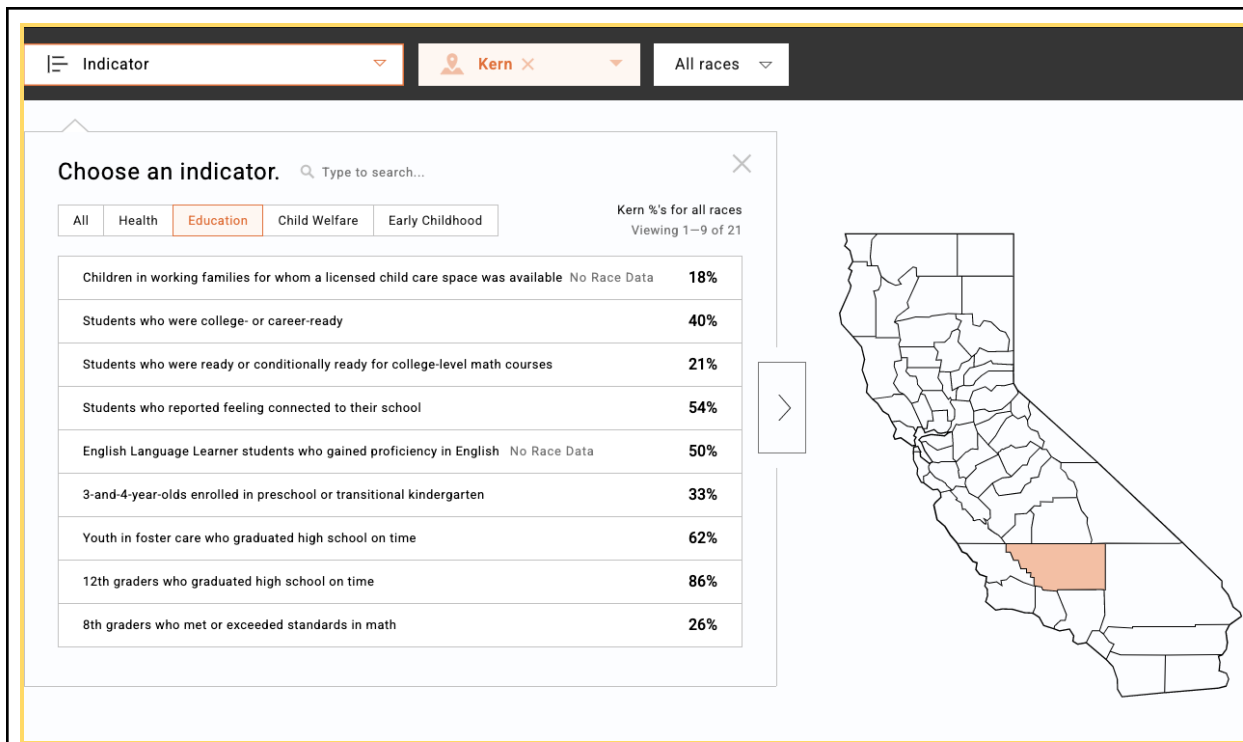


FIGURE 19: This is the data from the “Children Now 2018-19 County Scorecard of Children’s Well-Being.”The indicator point out that only 50% of the English Learner gained proficiency in English. Also, there are 377,000 children/youth in Kern County where 60% of them are Latino. They may not able to understand the information about the environment injustice near them.

<https://scorecard.childrennow.org/?ind=englishLearners&cty=kern&yr=3>

(Screenshot by Cyrus Lo, July 6, 2021)

CALIFORNIA HEALTHY PLACES INDEX ON POVERTY LEVELS

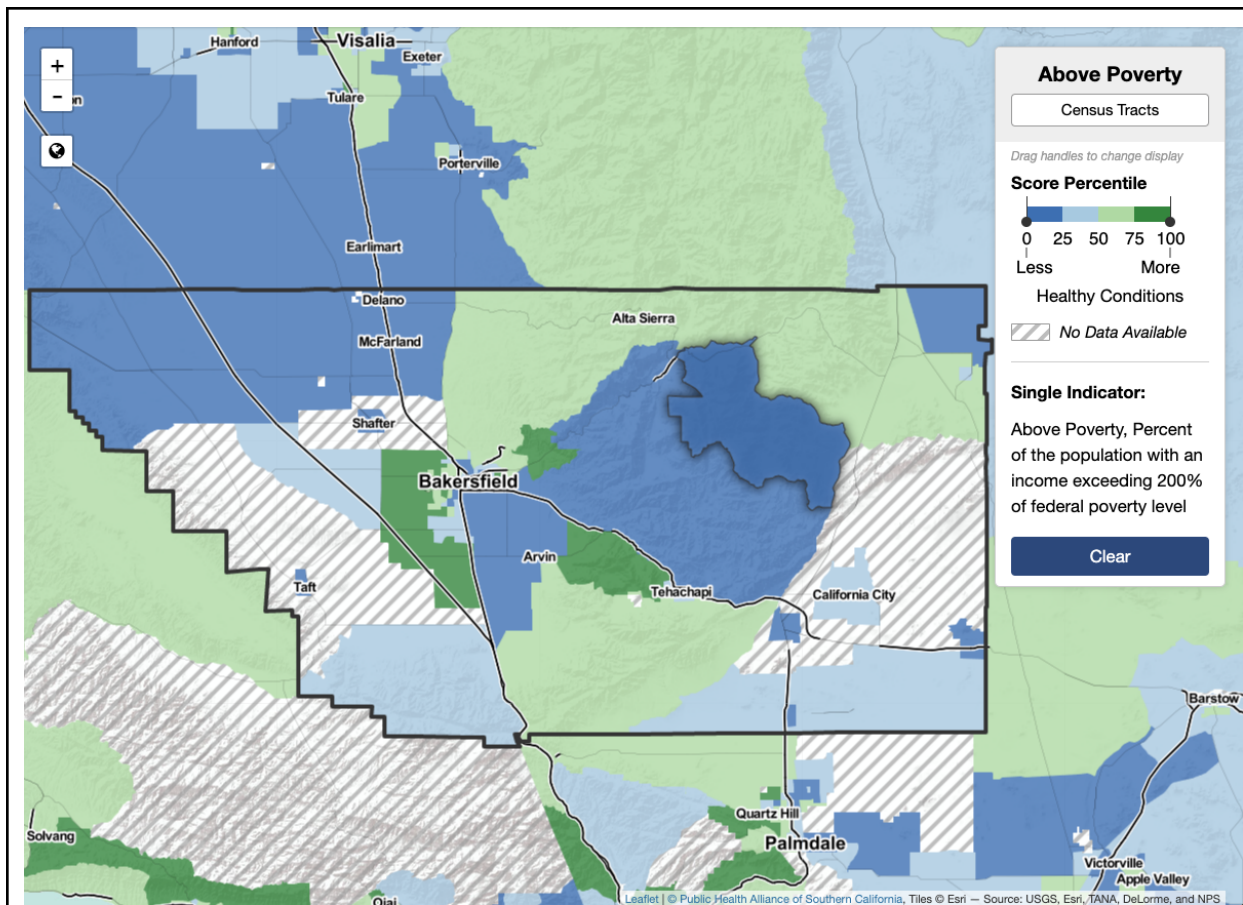


FIGURE 20: This data shows the poverty level of Kern County based on the different areas. The dark blue shows indicate the highest poverty level where the green indicate the lowest poverty level. Based one the data, most people are poor in Kern County. Moreover, it also shows some income inequality within Kern County.
<https://map.healthyplacesindex.org/>
 (Screenshot by Cyrus Lo, July 6, 2021)

4. STAKEHOLDER ANALYSIS

Water, Air, Fire, And Ground: There's no escaping the pollution in Kern County

Hunter Walsh

Residents in Kern County are currently battling against pollution threats from 2 fronts, the agriculture and oil industry.

Residents face the effects from the pollution first hand, but often don't have the means or power to go up against big corporations.

Oil company Ceo's and executive board members try to silence the opinion of these residents in order to keep the highest profit margin possible. Since they don't feel the effects of the pollution first hand, the pollution isn't a priority or concern for them.

Supplying 1/7 of total jobs in Kern county and millions of money in donations to the city, these companies have tremendous power over the citizens and Kern County's economy.

Backing these oil companies are the farmers of Kern County, who are supplied with a little over 760,000 thousand barrels of water daily in order to continue to farm crops in times of widespread droughts in California (Onishi 2014, 15) Oil companies sell these barrels

for below market price in order to keep the support of the farmers, who also wish to retain as high of a profit margin as possible.

Agriculture in Kern county is the #1 polluter in the area, spewing nitrate and toxic pesticides into the air. Farmers continue to use these pesticides as they give them a higher crop yield allowing them to maximize their profits.

Pesticide companies, also eager to maintain a high profit margin, also have no incentive to make their products safer as long as farmers continue to purchase their pesticides that pollute the air.

Farmworkers, forced to breathe in these toxic pesticides every day at work, have little power to fight against these big corporations who have all teamed up against them. These replaceable workers often face the worst effects of the pollution, ending up with cardiovascular conditions, reproductive defects, respiratory issues, cancer, nervous system problems, and many other effects(Srebotnjak and Rotkin-Ellam, 2014,16)

Newsom, attempting to defend the residents and farm workers of Kern county, has placed multiple laws in attempts to curb the pollution taking place. Newsom allocated 200 million dollars to clean up oil wells that were leaking contaminants, such as the radioactive element Radium, that was leaking into local water sources, causing residents who drank the water to get sick. (Kretzmann 2019, 17)He also banned the burning of crops in farms at the end of the season to reduce the amount of pollutants in the air after the farming season ends. As much as Newsom has done to protect residents of Kern County, he can't stop all pollution in a primarily republican county who relies on the pollution for their economy. The interwebbed complexity of Kern county's various stakeholders makes it hard to solve the pollution crisis the county faces.

5. STAKEHOLDER ACTIONS

A Fighting County

Shannen Duke

Kern County faces hardships as the result of a multitude of slow disasters. From air pollution to chemical gas exposure, environmental injustice is present all throughout the county and affects many different kinds of people. With so many different stakeholders involved in the environmental injustice in Kern County comes many different forms of action being taken (or not taken) to fight this issue.

One of the main sources of environmental injustice in Kern County result from the actions of oil companies, a major slow disaster stakeholder. Oil companies have done work both for and against environmental injustice in Kern County. For instance, Ex. chevron CEO Michael Wirth has taken a stand for environmental justice when he claimed that “Chevron will continue to explore new technologies in furtherance of environmental, social, and corporate governance investment” (Caufield 2021). Wirth claims that Chevron will be more open with the public about exactly what chemicals and products they will use and will fight for environmental justice. However, it ultimately is hard for oil plant companies to fight for environmental justice, especially since “Kern County, in the south Central Valley, produces 80 percent of California’s onshore oil and gas; it’s currently home to 78,000 operating oil and gas wells” (Herr 2021). It is important for these oil companies to

continue to operate in order for them to make a profit and keep Kern County as a top supplier of the state's oil. In order to do so, most companies will not stop using the harmful chemicals and means of handling these chemicals, putting those in Kern County at risk of pollution and oil spills.

Another stakeholder working both for and against environmental justice are farm workers and farm owners. Agriculture is a large factor in Kern County's economy and lifestyle. For instance, "Kern County ... is part of a major agricultural region, nicknamed the "salad bowl" of the United States" (Fassler 2021). With such a large use of agriculture comes an equally large amount of pesticides and chemicals being released into the atmosphere. Farm owners are well aware of the harmful chemicals and pesticides they are using, however they fail to inform their farm workers and provide the proper training and background information on how to deal with these pesticides to remain safe. For instance, "while pests and weeds are front of mind for farm owners, everyday farmworkers too often are caught in the crossfire" (Fassler 2017). Farm owners should be doing more to fight against the effects of their harmful pesticides by informing their workers, however they are not taking action by staying silent. Farm workers, on the other hand, are getting together to fight for their jobs and farms. For instance, "farmworkers and local groups rallied Thursday at the Kern County Ag Commissioner's office to demand that commissioners post information about when, when and where hazardous pesticides will be applied" (KGET 2021).

In addition to farm owners not taking action on their pesticide use, pesticide companies themselves play a role in environmental injustice in Kern County, as well. A harmful chemical, known as chlorpyrifos, is continually used by pesticide companies today even though they are aware of its harmful effects. For instance, "the EPA banned chlorpyrifos in household products in 2000. However, its use in agriculture was allowed to continue" (Roost 2019). If the chemical is harmful enough to be banned from households, it should not be used in an agricultural setting either, however pesticide companies continue to use it anyway. By not taking any action and restricting or at least reducing the use of this

chemical, pesticide companies are putting Kern County residents at risk of being exposed to this harmful chemical and others like it.

Another major stakeholder in slow disasters in Kern County is none other than the Governor of California, Governor Newsom. Governor of California Gavin Newsom has taken steps backwards in the wrong direction when it comes to addressing environmental injustice. For starters, Governor Newsome “failed to direct his administration to take swift action on public health protections for communities living near drilling” (Leonard 2021). Governor Newsom, along with other California Government officials should be stepping up and taking legal action considering these oil companies and harmful pesticide use in agriculture by placing bans, restrictions, rules, and regulations. However, overall in his time in office, “Newsom’s administration has sided with fossil fuel interests over protecting the public health of Californians” (Leonard 2021).

One of the main stakeholders in slow disasters in Kern County are none other than the Kern County residents themselves, who are involuntarily being affected by these harmful chemicals and pesticides every day. Thankfully, Kern County residents are stepping up and taking action by having a voice in their government and standing up for what is right. For instance, “Kern residents and allies will continue to rise up to call on state decision makers, namely state legislators and CalGEM, to right this wrong by passing and enacting policies to protect our communities and environments now and for the years to come” (Doherty 2021). Along with residents of Kern County are the residents of Arvin, a small farming community in Kern County. Residents in Arvin, California have formed a group known as the Committee for a Better Arvin, where they are dedicated to “to press California to create a statewide setback rule. Their slogan: “No drilling where we are living.”” (Kane 2020). Overall, although some people and groups are doing their best to address environmental injustice, it is clear that everyone in Kern County can be doing more to step up and take action in the fight for environmental justice.

6. ROLE OF MEDIA AND BIG ENVIRONMENTAL ORGANIZATIONS

Bringing Attention to Injustice in Kern

Colin Donahue

Kern County has a variety of environmental problems that are regularly reported on by big media outlets, local media outlets, and environmental organizations.

The local paper, Bakersfield Californian, reports on the poor air quality of Kern and how there are more significant causes but also minor ones that can be prevented. For example, there was an article about incentives for residents in the community to trade in their gas lawn mowers for electric ones. Gas lawn mowers add to the already poor air quality in Kern and electric ones with zero emissions would help that air quality even if it is just a little bit. The incentive is, "Participants receive up to \$250 when trading in a gas mower in favor of electric, and up to \$50 when making a straight purchase (no trade-in) of electric mowers and other electric yard care equipment" (Bakersfield Californian, 2021). In

addition to this incentive, "residents of Shafter can be eligible for a 100 percent rebate on electric mowers, up to \$500, when trading in a gas mower and purchasing electric" (Bakersfield Californian, 2021). This is a small step, but still a helpful one. This initiative saves people money and helps the air quality, so it doesn't hurt. Big media outlets report less on these local initiatives and more on the significant causes of pollution in the area like the presence of the petroleum industry.

The LA Times reports on things happening on the state level. For example, there is an article about Gavin Newsom banning new fracking permits starting in 2024 (Willon, Luna, 2021). While it is unfortunate that these restrictions do not start for another few years, it is still a good step in the right direction to limit fracking. The petroleum industry is one of the main causes of the poor air quality not only in Kern County, but in most of the counties in the San Joaquin Valley.

The Natural Resources Defense Council (NRDC) is an environmental organization and they report on the risks of fracking to the communities in Kern. The NRDC reports that, "One in three residents lives within one mile of an oil or gas well" (NRDC, 2014). Living that close to an oil or gas well is extremely dangerous and leads to many health problems, which is why the NRDC is working to change this and stop dangerous oil extraction methods.

The Wikipedia page for Kern County scarcely mentions the environmental problems in Kern. Poor air quality and water supply issues are mentioned, but the causes of these problems nor are the actions done to improve them. The consequences of these issues are also not described. There is no mention of any of the environmental problems on the talk page.

These media outlets, with the exclusion of Wikipedia, bring light to the pollution in Kern and some provide solutions like the local paper. Some are like the NRDC and are

attempting to stop environmental injustices that are happening as well as bringing attention to it by filing lawsuits and holding the petroleum industry accountable. The media lets everyone who does not live in Kern County know about these issues and what is being done to solve the issues.

7. RECOMMENDED LOCAL ACTIONS

How to address some problems in Kern County at the local level.

Gautam Chaudhri

Many of Kern County's socio economic problems stem from the multitude of oil refineries across the region which the county has come to be known for. While these oil refineries may be vital to the county due to the amount of money they bring in and the amount of people they employ, they are actively harming the cities they are located in as they are left unchecked and are free to pollute as they please. This pollution spreads into the neighborhoods and cul de sacs that are located next to these refineries. As a result, many residents have complained about the pollution that they must live in. They complain about the hazy skies and the "Oil fields [which] make up most of the view from the top of the bluffs, and the scent of petroleum is often detectable around the city" (Guardian News and Media 2017). They also complain about the high rates of sickness and various health problems that are directly the result of air pollution. This is an issue that must be addressed and can be addressed through local actions. In Fall of 2019, a lawsuit was carried out at the state-level against Kern Oil, one of the refineries spreading pollution through these neighborhoods. The lawsuit aimed to close a certain loophole in the air district rules but failed. However, a similar lawsuit is being carried out currently but at the local level. Earthjustice, a non-profit public interest organization that specializes in

litigating environmental issues, is carrying out the same lawsuit against Kern Oil. To improve the situation, the judge can rule in favor of Earthjustice and close the loophole. This would in turn reduce pollution in the neighborhoods and make life easier for the residents. This solution should be priority ranked first because it must be solved first before the second problem can be addressed.

One of the consequences of constant pollution into these neighborhoods over the years is the fact that the residents feel forgotten. The neighborhoods that live close to oil refineries and have high pollution are predominantly Latino and a large number of them are below the poverty line. The high pollution rates have left the residents distrustful of the local government.

As a result, people in those neighborhoods “tend to steer clear of politics and activism” (Jacobs 2020), with only 25% of eligible Latino voters showing up to the polls during the 2016 presidential election. To increase the turnout, faith needs to be restored to these residents and the county must demonstrate that their problems are heard and being actively fixed.

The refineries located near them could be fined and assets forfeited for breaking pollution laws.

The county could also hire a company to clean up these neighborhoods.

Once faith is restored, the residents need to be encouraged to vote. Advocates can go door-to-door explaining why it is important to vote. Residents must be taught that they can gain representation and be remembered by voting in local, state, and federal elections or by running government positions themselves. Getting people to the polls will get them representation. This solution should be priority ranked second because it stems from the first and also partially fixes the third problem.

The last problem that can be improved through local actions are working conditions. Many workers who are employed stress about the dangerous working conditions where they are exposed to various chemicals and pollution. Some of these workers would like to move to another industry but are not financially stable or educated enough to do so. They are stuck with their current employment situations. These working conditions can be improved by creating a workers union or forming their own. A union is designed to protect workers and give them better working conditions. If a union is formed, these workers can be given resources and be able to bargain with their employers for better working conditions through them. This solution should be priority ranked third as it can be partially fixed by addressing the first and second problems. These are just some of the problems that Kern County faces but they can all be addressed or fixed through various local actions.

8. RECOMMENDED EXTRA-LOCAL ACTIONS

What must be done at the state/national level?

Vivian Dinh, Kasumi Kiriakidis

Vivian Dinh

With the presented issues found in Kern County, there have been extra-local actions that took place to start improving the environment. According to an article by Quinn Wilson, the chief communications officer, Jaime Holt, from the San Joaquin Valley Air Pollution Control District stated, “there are some indications that harmful oxide nitrogen emissions have dropped since Gov. Gavin Newsom’s stay-at-home order issued in March... there needs to be federal and state funding mandating the replacement of equipment on the vehicles such as cars, commercial trucks and trains” (Wilson, 2020). The issue of pollution from commercial vehicles has seen to be reduced after citizens were ordered to stay in lock down. The result of this stay-at-home order is an example of what might happen if California’s economy becomes carbon-neutral. In 2018, Gov. Jerry Brown “issued an executive order during the Climate Action Summit in San Francisco...calling for the entire California economy to become carbon-neutral by 2045.” (Science, 2018). In addition, Gov. Gavin Newsom “allocates \$200 million for oil and gas well remediation.” According to Veronica Wilson from the Labor Network for Sustainability states, “plugging and remediating oil wells is a critical next step to meet California’s climate goals” (Cox,

2021). If Kern Country transitions to greener energy, this can reduce the amount of emission that comes from the oil drills and lower ozone levels even more without a stay-at-home order.

Another issue that has been addressed is the issue of water pollution from slaughterhouses. An extra-local action that has been placed was the Clean Water Act, it “prohibits the discharge of any pollutant without a permit that incorporates limits required by federal regulation and additional restrictions may be needed to protect water quality.” (Burkhart et al., 2018, pg 9). Although there are limits in place, “74 of 98 of the plants violated at least one of the pollution limits.” (Burkhart et al., 2018, pg 2). Although this action has been placed, there seems to be little to no reinforcement of these permits. If Kern county enforces these permits, the pollutant coming from the slaughterhouses can greatly decrease.

Kasumi Kiriakidis

The COVID-19 pandemic took the lives of many people - however, certain areas were more affected than others. A study from Harvard University found that long-term exposure to air pollution increases the risk of death from COVID-19. As we should now know, some areas are more prone to air pollution than others - Kern County being one of them. As one of the areas in the country with the worst air quality, Kern County has been affected by COVID-19 much more than other states with better air quality, for example, the case rate for Kern County was about 12% (“Kern County, California Covid Case and Risk Tracker”, 2021), whereas the case rate for the state of Maine was about 5% (“COVID-19: Maine Data”, 2021). Then, what measures need to be taken to decrease this risk? Even when COVID-19 won't be much of a threat to us anymore, this study is a great indication that actions need to be taken to reduce the contamination of the air. “The study underscores the importance of continuing to enforce existing air pollution regulations to protect human health both during and after th COVID-19 crisis.” (“Air Pollution Linked with Higher COVID-19 Death Rates”, 2020) The air contamination does not get any better

because these laws and regulations are not enforced as strictly as they should be. Many large corporations are able to find a loophole to these regulations, which should not be happening, especially considering the rapidly declining health of many residents in areas where the air is much more contaminated than others.

Furthermore, communities of color are being disproportionately affected by COVID-19. “As a civil society we should not be willing to tolerate disproportionate suffering by any segment of our population.” (“Younger Blacks and Latinos Are Dying of COVID-19 at Higher Rates in California”, 2020) Better healthcare should be insured to all Americans, regardless of their race, ethnicity, or economic position. With more equal opportunities for colored people, these racial injustices should be decreased to a minimum. Current President Joe Biden does have a healthcare plan announced: “Biden has said that his plan will insure more than 97% of Americans by introducing a Medicare-like public option for Individuals and Families.” (Porretta, 2021) If this plan goes through, many people who had lots of health issues that couldn’t be treated due to economic hardships will be able to receive medical attention, as they should. This will also help the many people unfortunate to live near oil refineries, who are greatly affected by the heavily contaminated air in the area. “‘At least help me with my medical expenses,’ Brand said, calling out local, state and federal agencies responsible for monitoring public health. ‘Because I know that they know that a lot of this is due to the factories.’” (Reilly, 2020) Currently, there are so many people that require medical attention that cannot afford it due to the lack of sufficient healthcare that could benefit so much from Biden’s new healthcare plan.

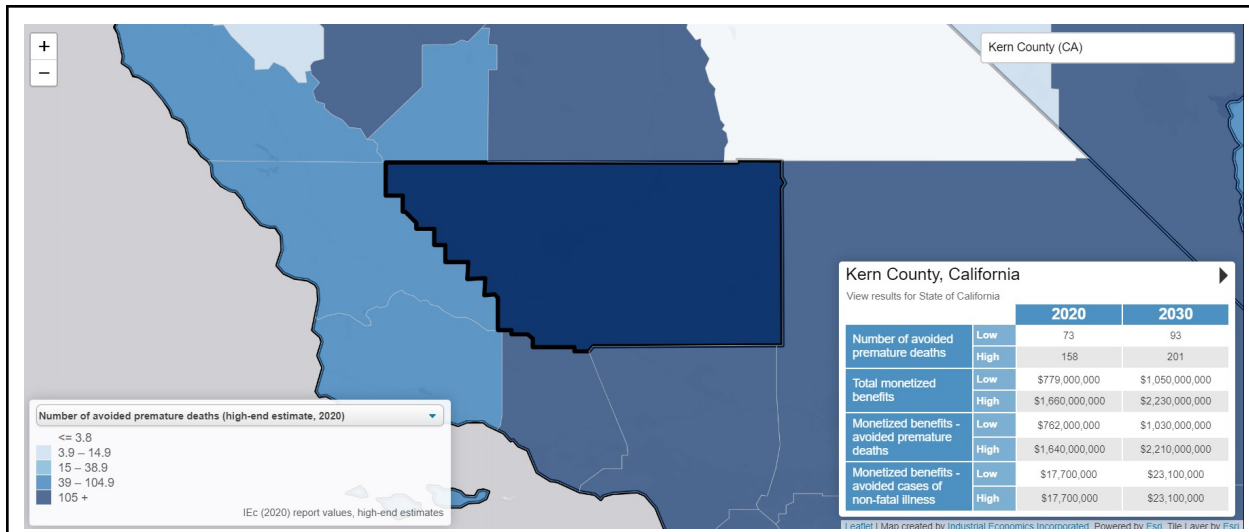


FIGURE 21: In Kern County under the Clean Air Act, “both EPA and the district inspect facilities to ensure compliance with permit limits, and take enforcement actions when appropriate” (EPA 2021). The EPA has addressed many different companies in Kern County and their violations of the Clean Air Act and has required them to pay back for their wrongdoings in various ways.

<https://www.epa.gov/sanjoaquinvalley/epa-activities-cleaner-air>

(Screenshot by Shannen Duke, July 7, 2021).

9. RECOMMENDATIONS FOR FUTURE RESEARCH

What else can be done?

Vivian Dinh, Kasumi Kiriakidis, Negin Pourgholam

Quantitative Research

<Pollution Research> [Negin Pourgholam]

Pollution research contributed to the Casino Project which is a project in which indigenous land from the Tejon tribe located in Kern County was used for the construction of Casinos. Furthermore, the effects of this construction on the health and well being of the members of the Tejon tribe.

<Health Research> [Kasumi Kiriakidis]

Although it is pretty clear that exposure to air pollution causes many health issues such as asthma and cancer, most of the data focuses on a larger view. It would be beneficial to see detailed data - for example, individual data on rates of different health issues near a certain oil refinery. This would help see how bad each refinery (or other industries which cause a lot of contamination) is affecting the air quality, and determine what regulations need to be put in place. However, this data may not be so accurate in informing researchers of the causation of different health issues, as it will only show correlation, and there may be other factors which contribute to bad air quality and high

health issues in the area that we should take into account.

<Quantitative Social Survey> [Kasumi Kiriakidis]

A survey asking residents near oil refineries in Kern County of their experiences with different health concerns and if they do, asking them if they think it's related to the quality of air in their area may be helpful in seeing a sample on how many people's healths are being affected by the contamination and what they think the causes may be.

Qualitative Research Design Proposal [Vivian Dinh]

According to the Natural Resource Defense Council in 2018, the transparency of concentrated animal feeding operations is at a low rank for all of California. This means that the information pertaining to permit status, location, manure storage, type of animal, count of animal, and owner information is not easily accessible to the public. To address this issue, a qualitative study can be performed to get a better understanding of how much residents and consumers know about the issues that come with these animal feeding operations.

This proposed research will answer the question: "How do the residents of Kern county feel about the lack of transparency when it comes to concentrated animal feeding operations (CAFO)? Are they aware of the adverse effects of these animal facilities?" The social group that this study will interact with will mostly be residents of Kern county, of all groups because food has a hand in all aspects of the community. However there can be special attention to lower income residents as they might not have much access to cleaner food. To gain access to these social groups, just focusing on regions of residential areas or even near grocery stores. Participant observation on how the community reacts to the issues of animal feeding operations will give insight on how much the residents really know. The in-depth interviews would not only get some insight on the standpoint of the consumers, but it would also be an opportunity to educate consumers on the pollution that comes from these facilities.

Some example questions would be:

1. As a consumer, are you aware of the costs that come with purchasing farm products, such as meat, eggs, and dairy? These costs include “environmental and human health costs...which can threaten neighboring communities, pollute waterways, and exacerbate antibiotic resistance.” (Miller, 2019, pg 7) How does learning about this information make you feel about concentrated animal feeding productions?
2. According to the Natural Resource Defense Council, most of California’s information on these concentration animal feeding operations is very low in transparency. Would you say that this type of information has been purposefully hidden from consumers such as yourself? Or do you believe that there is just a lack of interest for research and this data?
3. Now being aware of these adverse effects, are you more curious or more inclined to learn more about these facilities?

This research will be useful to activist groups who are trying to make the concentrated animal facility operations issues known and aware. This research will also be useful to the focus groups as they will also be educated on the pollution created by these animal facilities that will inevitably affect the environment.

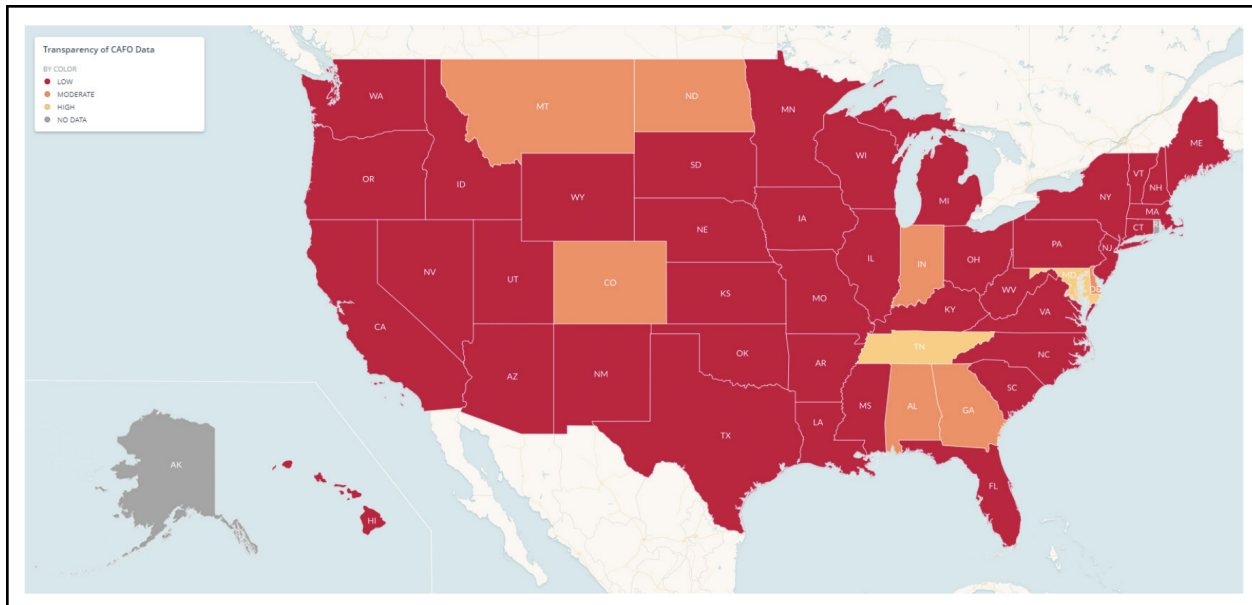


FIGURE 22: This figure provided by the Natural Resource Defense Council in 2019 depicts the transparency on concentrated animal feeding operations in America. In California the transparency of permit status, location, manure storage, type of animal, count of animal, and owner information is all low. This makes it difficult to find research on the basic standards of these feeding operations to “clean up industrial animal operations and hold them accountable for their pollution.” (D.Lee Miller, 2019, pg 14). (Screenshot by Vivian Dinh, July 7, 2021). <https://www.nrdc.org/sites/default/files/cafos-dont-know-hurting-us-report.pdf>

10. INJUSTICE ANALYSIS

How are the environmental injustices affecting Kern County?

Seyedeh Saina Saifzadeh and Kelly Guan

The lack of government control on industrial drilling in Kern county results in racial, intergenerational, and reproductive injustices amongst frontline communities.

Kern county is made up of mainly farmers and low income families that rely heavily on oil company jobs to make a living. At the same time, over 40% of Kern County's population is made up of only spanish speaking people. However, "all communications from Kern County and CalGem have been posted solely in English" (Ferrar, 2020). This has created major linguistic isolation between different groups of people that reside in the county. The exclusion of Spanish-speaking residents from notifications and information on decisions that affect their health is "... a condemnation of the systematic and outright racism of Kern County's permitting approach" (Manduffie, 2021). This is a major issue that needs to be addressed by the local government as soon as possible.

Media and other major governmental agencies should deliver notices and information in non-English languages, especially in Spanish because every community member has a right to receive information about what could be possibly detrimental to their health. Furthermore, constant drilling releases so many toxins in the air that preventing health issues has become nearly impossible. Environmental monitoring has shown time and time again that emissions from oil and gas wells include air toxics and carcinogens. Their data has also shown "that living near oil and gas activity [is] associated with numerous health

impacts such as low birth weight, cancer, skin problems, asthma, and depression” (Manduffie, 2021). Hence, the lack of control on oil drilling is detrimental to the future generation’s health and wellbeing as well as to those who currently live in the county. In case local agencies decide to not place restrictions on oil and gas drilling, families should be informed of the fact that their future children will definitely get impacted by the exposure to such environmental hazards and should be given enough resources to help them move to a safer location. Lastly, as of May 18, 2020, Kern County approved “1,310 new drilling permits, putting Kern County on track to meet or exceed 2015 permit numbers”. The constant increase in government approved drilling not only increases air toxins and negatively impacts the lives of those living in the nearby communities, but it also makes controlling the increase of such hazards harder and harder day after day. These environmental hazards will ultimately prevent parents from not exposing their children to these dangers as they will eventually hover over every individual’s life in Kern County (Ferrar, 2020). Agencies should recognize these facts and place immediate restrictions on the increase of drilling permits to keep local families safe.

Adding on, environmental injustice in Kern County has shown to bring even more injustices for the people that live there including farmworkers and oil workers. Examples of these include economic and epistemic injustices. Most of the residents living in Kern County are minorities or low income people. They have been put in an unfair position because they do not have enough resources or money to move to a new area. They rely on work in the oil industry or agriculture to make a living, yet the harmful chemicals and pollution released by those industries tend to cause environmental problems such as water contamination and soil degradation. Additionally, they haven’t been able to change their economic statuses because the wages they make are unreasonably low and hopefully new policies can be implemented to change this. For example, the government can increase protections for farmworkers and oil workers because they are the people that are most affected by these industries, yet their pay and wages are things that can be cut or decreased out of nowhere. Another thing could be to provide more funding for communities of Kern County to provide support for residents and families who are

struggling, due to the low wages or increase in harmful health conditions such as “as many as 1,300 premature deaths each year to the noxious air here – alongside countless emergency room visits, lost days of school and work, and other public health impacts that cost the San Joaquin Valley as much as \$11 billion each year,” showing concern that medical conditions have cost significance amounts of money for people living in the county, and making it difficult for them to ever earn enough to leave (Price and Borell 2018).

An epistemic injustice is that representatives for oil companies and corporations tend to discount the hazards caused by the polluting contaminants and manipulate the data from the monitoring of the air quality in Kern County. Also, advocates for environmental justice in Kern County describe their struggles in making their voice heard by officials that may have been supported by funds from local oil refineries. To change this, Kern County could have more health officials increase the regulations for the oil refineries because the air quality in Kern County is very bad compared to other counties around it or have local community members be more wary of who they elect because officials that tend to have connections with oil refineries may not want to put the interest of the general public before interests of the oil refineries. An example is described by the lawsuit by Gardiner Farms who claims, “the board ignored overwhelming opposition in order to rubber stamp the new permitting process and didn’t demand a comprehensive environmental review to determine its impacts,” showing one way that officials that have been supported by these oil refineries disregard parts of the procedure to approve ordinances for the oil refineries and contributing to allowing these refineries to create even more pollution (Manduffie 2021). These injustices indicate the effects of these types of injustices, one can see how injustices in Kern County have been unfairly dealt with and how agricultural, oil workers, and their families have had to suffer as a result.

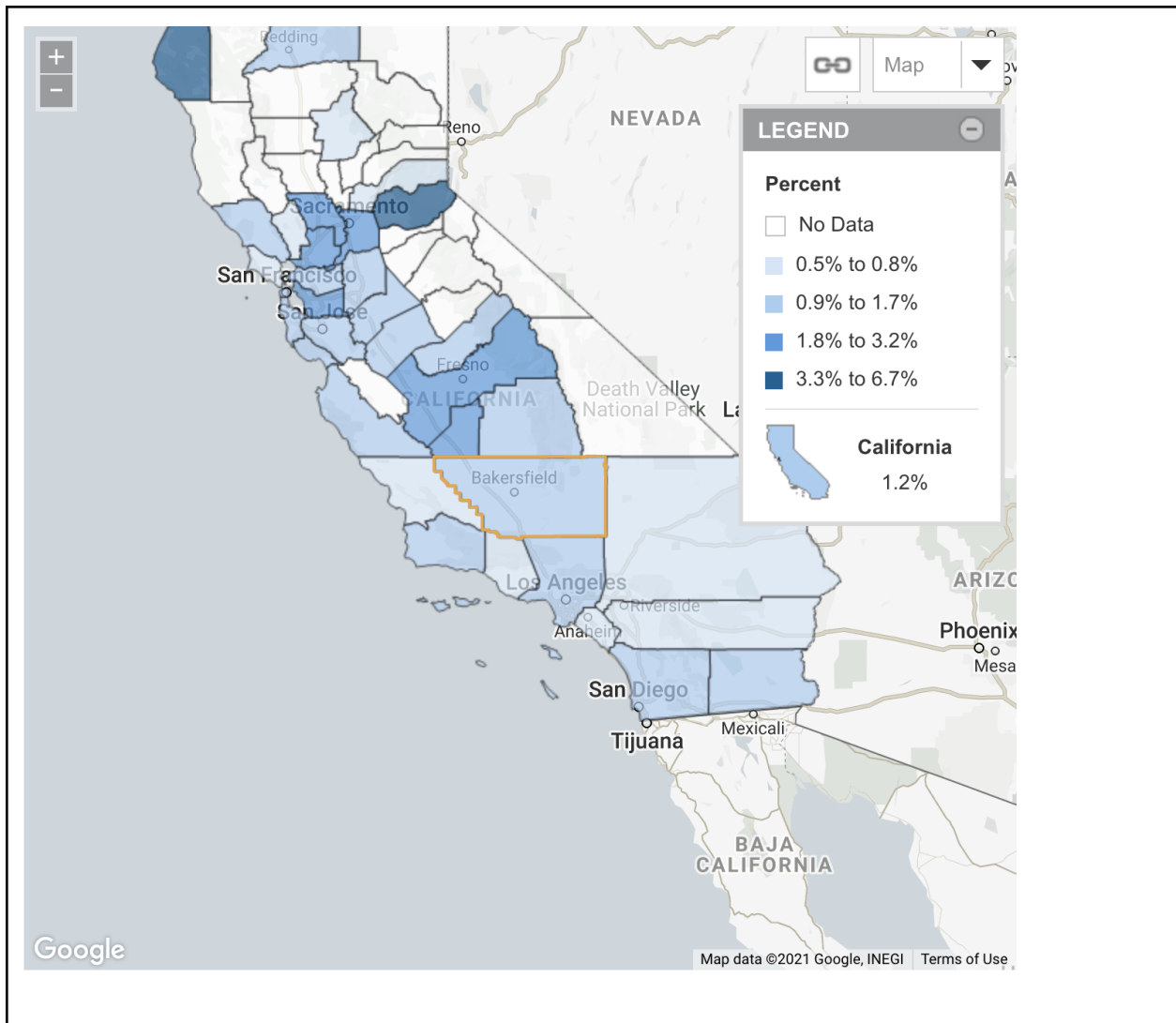


FIGURE 23: In Kern County, the percentage of kids from ages 0-5 that have been diagnosed with elevated blood levels is about 1.8% with blood lead levels ranging from 4.5 to 9.5 $\mu\text{g}/\text{dL}$ or higher. According to an article by the World Health Organization, exposure of lead to children can “suffer profound permanent adverse health effects, particularly affecting the development of the brain and the nervous system.” (World Health Organization, 2019). [Screenshot by Vivian Dinh, July 7, 2021].

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