

IMPERIAL COUNTY

**SLOW DISASTER
CASE STUDY**



**ENVIRONMENTAL
INJUSTICE**

Summer 2021

GROUP NO. Interns

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

Landscape photo of Calipatria (a city in Imperial County, CA) taken by Amy C. Fredericks on 2017 from www.mapcarta.com

BIOGRAPHICAL STATEMENT	PHOTO
<p>Noelle Chin is a fourth year anthropology major at California State University, Long Beach. She is currently interested in the role of agri-food politics in human and environmental health.</p>	 A close-up portrait of a young woman with long, dark, wavy hair, smiling warmly. She is wearing a dark jacket. The background is slightly blurred, showing green foliage.
<p>Clara Carrabba is a senior at Memorial High School in Houston, Texas. After high school, she plans to attend a four year university and pursue a career in journalism.</p>	 A young woman with long, wavy blonde hair, smiling. She is wearing a white denim jacket over a light-colored top and a tan skirt. She is standing on a wooden walkway with a blue railing, overlooking a beach and the ocean under a sunset sky.

Brenda Vuong is a second year Environmental Science & Policy Major at the University of California, Irvine. Her current interests revolve around clean energy and global sustainability. She hopes to continue her environmental studies education in graduate school or enter the working field for sustainability.



June Su is a junior at University High School in Irvine, California. After high school, she plans on going to a four year college majoring in sociology or psychology with a minor in fine art, and then going to graduate school to further pursue a career in academics.



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Katherine Wu is a junior at University High School. After high school, she hopes to continue on to higher education and pursue her interest in medicine and health policy.



Diana Kou is a recent graduate from the University of California, Irvine, with a bachelor's degree in business economics and a minor in digital information systems, emphasis in human computer interaction. She's currently a product designer & user researcher hoping to work in the intersection of tech, accessibility, and sustainability.



Lena Fortun is a junior at University High School in Irvine, California. After graduating high school, she plans on attending a four year university and plans to focus on biology and health policy. She hopes to work abroad and work to improve health infrastructures around the world.



Yvonne Wen is a junior Environmental Engineering major at the University of California, Irvine. She is interested in just transitions and hopes to help with environmental injustices with her engineering skills in her future career.



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INTRODUCTION

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

Analyses of environmental injustice have been advanced with a number of critical concepts. The U.S. Government’s Healthy People program defines health disparities as “a particular type of health difference that is closely linked with social, economic, and/or environmental disadvantage”. Health disparities disproportionately affect people who have already been systematically discriminated against and are particularly apparent in low income communities whose population is mainly people of color. Understanding health disparities can lead to important evidence of environmental injustice.

Environmental injustice can also be seen in social determinants of health; social determinants of health include the conditions in the environments where people are born,

live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks. They can be grouped in 5 domains- economic stability, education access and quality, health care access and quality, neighborhood and built environment, and social and community context. Above all, it is important to understand systemic racism and how systemic racism has shaped many aspects of everyday life, many of which contribute to environmental injustice. Systemic racism is embedded into societal institutions, lawmaking, and political structure, causing unjust treatment, unequal opportunities, and stereotypes for people of color. In understanding some of the solutions proposed to ease environmental effects, green zones will be addressed. According to the California Environmental Justice Alliance, green zones are “a place-based strategy that uses community-led solutions to transform areas overburdened by pollution into healthy, thriving neighborhoods”. Since the residents of these polluted areas are more likely to be from low income or minority communities, the green zone initiative works to reflect the needs of the community through its core principles of being community-led, collaborative, solution-oriented, and comprehensive.

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.

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.

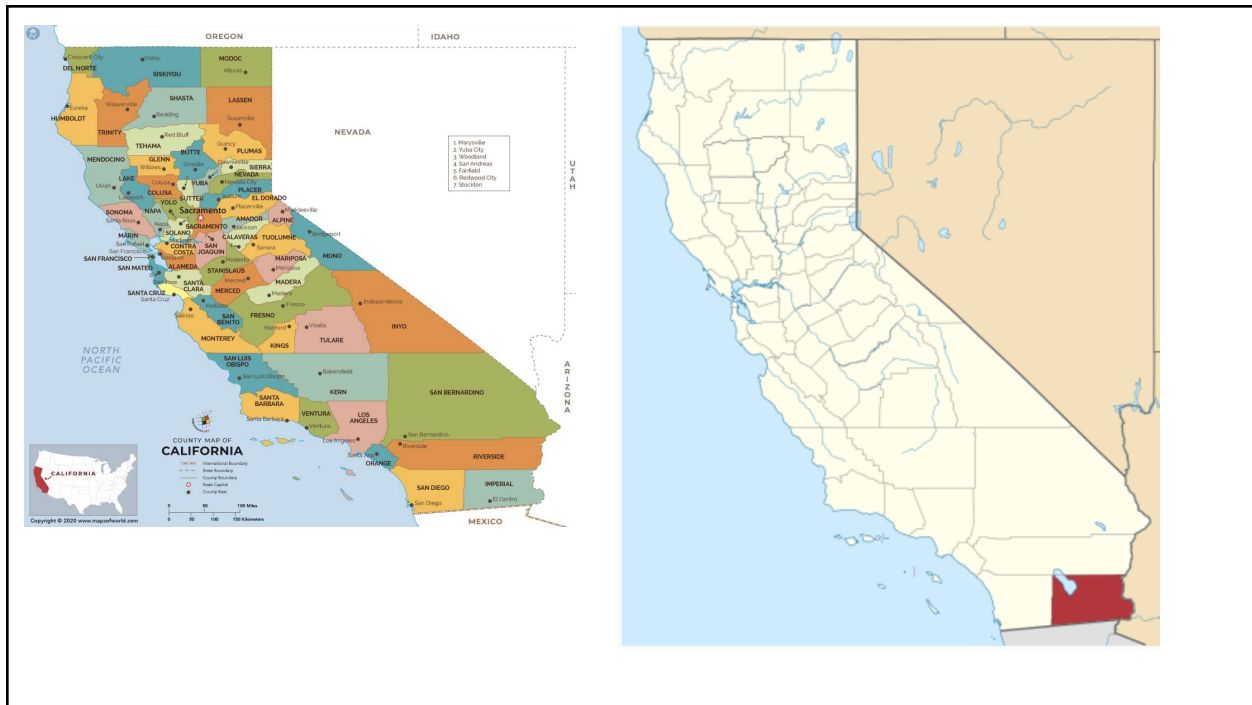


FIGURE 2: Imperial County is located in the very most southeastern region of California bordering Mexico and is known for its prosperous agricultural industry.

<https://www.mapsofworld.com/usa/states/california/california-county-map.html>

https://en.wikipedia.org/wiki/Imperial_County,_California

(Screenshots by Khira Pearlstein, June 29, 2021)

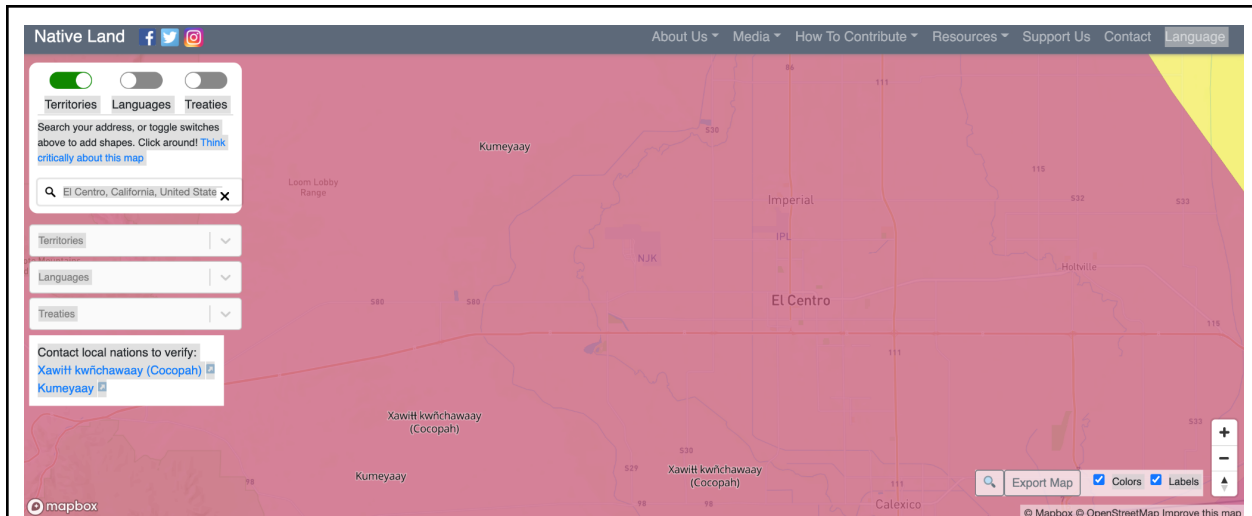


FIGURE 3: Native Land’s digital map shows Imperial County’s city of El Centro on Cocopah homelands. In 1985, the Cocopah Tribe gained an additional 4,200 acres, including the North Reservation, through the Cocopah Land Acquisition Bill. The reservation's unique geographical location borders the United States, Mexico, Arizona and California

<https://native-land.ca/> (Screenshot by Lena Fortun, June 19, 2021)

1. COMMUNITY ASSETS & SETTING

Living and Breathing in the Desert

Noelle Chin

This case study is focused on Imperial County, a rural southern California county bordering Mexico. Due to the mineral resources, climate, and geography, irrigation-dependent agriculture in Imperial County is a big contributor to both the economy and environmental hazards in the region. Agricultural practices such as clearing land through agricultural burnings, spraying pesticides, and exhaust from transporting vehicles produce high levels of particle pollution that get trapped by the region's geography and impact air quality (Corbett 2020). The high temperatures in Imperial County have made matters worse as the evaporation of the Salton Sea has resulted in years of its accumulated agricultural run-off becoming airborne in the form of toxic dust. The poor air quality in Imperial County has had a significant impact on resident health as even low-level exposure to particle pollution can increase the rates of childhood asthma and chronic respiratory illnesses (Bacon 2017).

Although the agricultural industry can be blamed for significant pollution in Imperial County, it is also the biggest industry; accounting for 48% of employment in the area and an annual crop production of over \$1 billion (El Centro Chamber of Commerce 2008). Agribusiness is the community's largest economic asset by far, with livestock feeding

operations and crop production relying on the location's connections to southwest markets, access to international ports, and a large base of migrant workers (Imperial Valley Economic Development Corporation 2013). Major crops include alfalfa and sugar beets but the area's weather allows for different crops to be grown year round. Imperial County also has one of the largest numbers of feedlot and fed-cattle capacity in California with over 300,000 head of cattle (University of California Agriculture and Natural Resources).

In 2019, Imperial County had an estimated population of 181,215 people. With over 85% of its population identifying as Hispanic or Latino and over 20% of everyone living under the poverty line, the increased exposure of these communities to environmental hazards has raised multiple concerns on the racial, economic, and health inequities in Imperial County. In May 2021, the unemployment in this region was reported to be three times the national rate with Imperial County having 15.9% of its population unemployed and over 20% living under the poverty line (California Employment Development Department 2021). The median household income in Imperial County varies greatly depending upon location as income in cities like Holtville and Imperial range from about \$30,000 to \$70,000 but communities like Bombay Beach earn around \$15,000 and are positioned closer to particle pollution sources like the Salton Sea (US Census 2014). A similar situation is happening in Niland where a high pressure geyser poses a great threat to key infrastructure like state Highway 111, railway tracks, a petrochemical pipe, and a fiber optic cable (Kirby 2020).

Since its founding in Imperial County in 1987, the environmental justice and public health organization known as Comico Civico del Valle (CCV) has been a great community asset in advocating for increased air quality regulation and access to health services. Most recently CCV sued the EPA over the federal and state governments' lack of enforcement of the Clean Air Act. After the lawsuit, the California Air Resource Board installed 40 new air monitors around schools and areas of interest like the Salton Sea that will send app

alerts to residents on particle pollution (Corbett 2020). Youth activists in Imperial County have also stepped up to voice their concerns through the organization of The Sierra Club's My Generation campaign that is focused on educating the public about the problems related to the Salton Sea as associated with systemic injustices like native land rights, habitat restoration, and public health.

Aside from environmental organizations, community assets in Imperial County also include local newspapers such as the Calexico Chronicle and the Imperial Valley Press. Reports from these papers on Imperial County have brought much needed awareness about air pollution and have informed further investigations from larger publications like the New York Times and the Los Angeles Times.

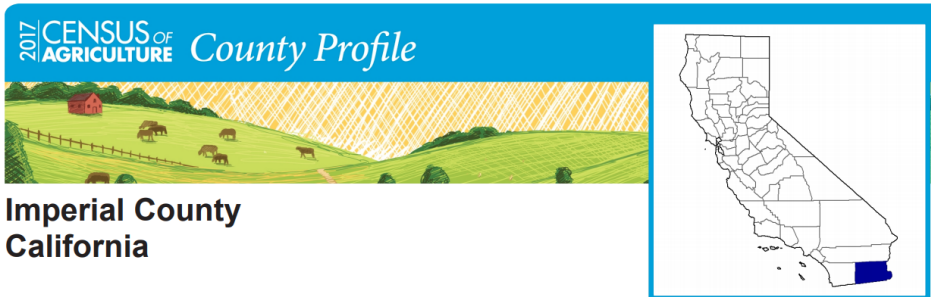


FIGURE 4: EL CENTRO, CALIFORNIA - JULY 23: A message is posted reading 'Stay Home' in Imperial County which has been hard-hit by the COVID-19 pandemic on July

23, 2020 in El Centro, California. At this time, Imperial County currently suffered from the highest death rate and near-highest infection rate from COVID-19 in California. Imperial County was already at a disadvantage when the pandemic hit. For years, the county led the state with the highest rates of diabetes, heart disease, asthma hospitalizations and obesity, high-risk factors that make people susceptible to catching COVID-19 and become severely ill or die.
Photo by Mario Tama/Getty Images



FIGURE 5: Imperial County farmers work year-round to produce crops for the United States and 94 other countries, according to the 2018 Imperial County Crop Report. The weather in Imperial County is unique because it allows farmers to yield different crops throughout the entire year, whereas most places are subject to shorter seasons.
Photo by Imperial County Film Commission



**Imperial County
California**

Total and Per Farm Overview, 2017 and change since 2012

	2017	% change since 2012
Number of farms	396	-6
Land in farms (acres)	521,729	+1
Average size of farm (acres)	1,317	+8
Total (\$)		
Market value of products sold	1,859,678,000	-2
Government payments	3,640,000	+31
Farm-related income	46,982,000	+126
Total farm production expenses	1,635,982,000	-1
Net cash farm income	274,318,000	+5
Per farm average (\$)		
Market value of products sold	4,696,156	+5

4 Percent of state agriculture sales

Share of Sales by Type (%)

Crops	66
Livestock, poultry, and products	34

Land in Farms by Use (%) ^a

Cropland	97
Pastureland	2
Woodland	-
Other	2

Acres irrigated: 456,089
87% of land in farms

FIGURE 6: This figure points to the change of agriculture in Imperial County, showing a 6% decrease in the number of farms since 2012 but a 8% increase in the average size of farms. 66% of the agricultural production is shown to be crops 34% is shown to be livestock, poultry, and related products.

https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/California/cp06025.pdf

(Screenshot by Lena Fortun, July 7, 2021)

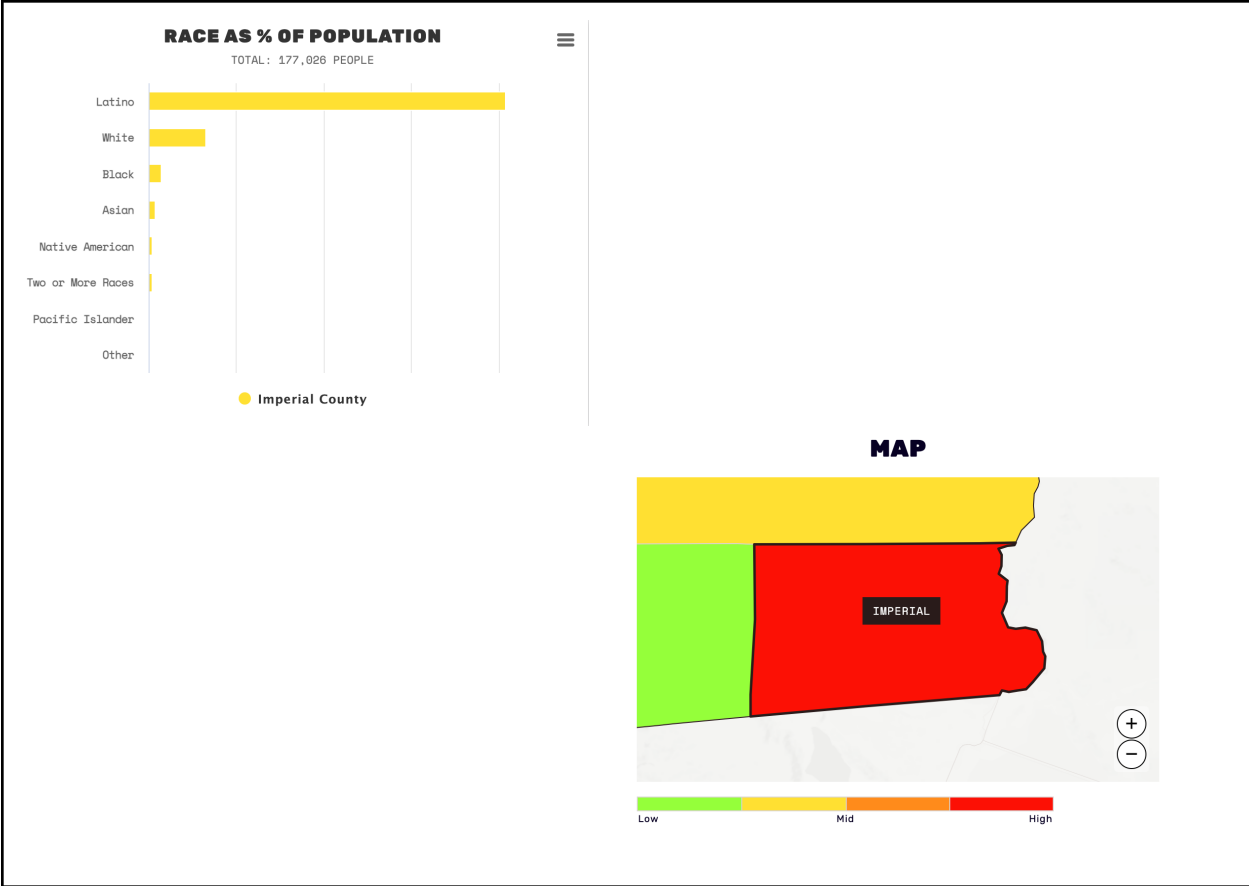
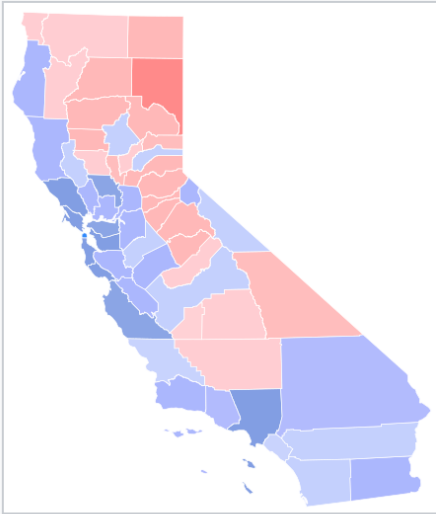


FIGURE 7: The Race Counts data project shows Imperial County to have a large Latino population. It describes Imperial County as “low performance, high disparity, less populous county”.

<https://www.racecounts.org/county/imperial/>

(Screenshot by Lena Fortun, July 7, 2021)



Party registration by county
(October 2018):

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

President and Vice President (Vote for 1)

Precincts Reported: 218 of 218 (100.00%)

	Election Day	VBM	Early Voting	Absentee	Total	
Times Cast	19,335	5,270	2,647	29,908	57,160 / 84,123	67.95%

Candidate	Party	Election Day	VBM	Early Voting	Absentee	Total	
JOSEPH R. BIDEN	DEM	10,095	2,832	1,602	20,087	34,616	61.22%
DONALD J. TRUMP	REP	8,544	2,283	959	8,921	20,707	36.62%
JO JORGENSEN	LIB	149	35	36	168	388	0.69%
ROQUE "ROCKY" DE LA FUENTE GUERRA	AI	112	21	10	148	291	0.51%
GLORIA LA RIVA	PF	112	22	6	138	278	0.49%
HOWIE HAWKINS	GRN	79	30	14	111	234	0.41%
Write-in		7	1	2	15	25	0.04%
Total Votes		19,098	5,224	2,629	29,588	56,539	

	Election Day	VBM	Early Voting	Absentee	Total		
Brian Carroll	WRITE-IN	7	1	2	15	25	0.04%
Mark Charles	WRITE-IN	0	0	0	0	0	0.00%
Joseph Kishore	WRITE-IN	0	0	0	0	0	0.00%
Brock Pierce	WRITE-IN	0	0	0	0	0	0.00%
Jesse Ventura	WRITE-IN	0	0	0	0	0	0.00%

U.S. Representative 51st District (Vote for 1)

Precincts Reported: 218 of 218 (100.00%)

	Election Day	VBM	Early Voting	Absentee	Total	
Times Cast	19,335	5,270	2,647	29,908	57,160 / 84,123	67.95%

Candidate	Party	Election Day	VBM	Early Voting	Absentee	Total	
JUAN C. VARGAS	DEM	10,288	2,788	1,557	20,173	34,806	63.57%
JUAN M HIDALGO, JR	REP	8,022	2,248	965	8,715	19,950	36.43%
Total Votes		18,310	5,036	2,522	28,888	54,756	

FIGURE 8: This Wikipedia map shows that Imperial County has a substantial Democratic majority. Most Democrats are for more and stricter environmental regulation and policy. This may give the county an advantage in enforcing regulatory policy that can help reduce environmental hazards.

https://en.wikipedia.org/wiki/California_locations_by_voter_registration

(Screenshot by Lena Fortun, June 29, 2021)

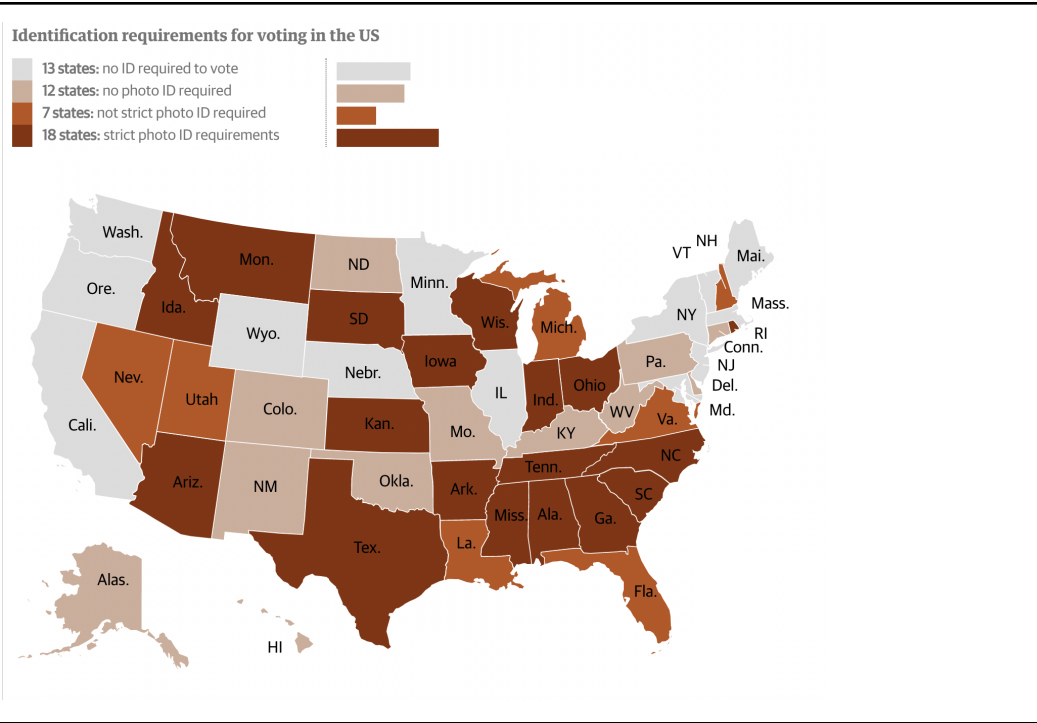


FIGURE 9: California is one of 13 states in the U.S. that does not require ID in order to vote and has both automatic voter registration and same day voting registration. The Imperial County Registrar of Voters holds early weekend voting for registered voters on the Saturday and Sunday before an election as well as utilizes a mobile office to make early voting a fast, accessible, and convenient option. In addition, Imperial County provides vote by mail ballots to those registered in the county approximately 35 to 40 days prior to an election.

<https://www.theguardian.com/us-news/ng-interactive/2019/nov/07/which-us-states-hardest-vote-suppression-election> , <https://elections.imperialcounty.org/>
 (Screenshot by Noelle Chin on July 7th, 2021)

2. ENVIRONMENTAL THREATS

Unchecked Agricultural Pollution on All Fronts

June Su

Imperial County experiences pollution from a variety of sources with air pollution most notably from agricultural practices, toxic dust, from facilities across the U.S.-Mexico border, and with water pollution in the New River and the Salton Sea from sewage and farm runoff.

Because the area is largely reliant on the agricultural and meat industry, farm waste, pesticide contamination, and various hazards from concentrated animal feeding operations (CAFOs) cause most of the environmental detriment in Imperial County. Ranking at “15 for high ozone days out of 226 metropolitan areas,” “22 for 24-hour particle pollution out of 216 metropolitan areas,” and “10 for annual particle pollution out of 199 metropolitan areas,” the air in most areas poses a major threat to its residents (American Lung Association). Agricultural practices “involving pesticide application techniques, agricultural burning, farming equipment, tractors, semi-trucks idling, and vehicles driving off-road” all contribute to air pollution in the county (Imperial County Community Air Monitoring Project). Soil sampling revealed that pesticides like Trifluralin, which has been listed as a carcinogen by the EPA, are “consistently present” in the area (Al-Delaimy 2008). Although the full effects of pesticide exposure are still unclear,

pesticide pollution is still an environmental hazard that is known to cause negative health effects in farmworkers and other populations who regularly are exposed.

While the exact amounts of pollution caused by “over 30 confined animal feeding operations” in Imperial County are unclear due to their lack of transparency, countless studies have shown that industrial meat production can negatively affect the environment in many different ways (Imperial County Air Pollution District). According to the United Nations Environmental Programme (UNEP), this industry can contaminate soil, create antimicrobial resistance, and cause massive amounts of air and water pollution that costs the environment trillions every year (UNEP).

The polluted New River in Imperial County is an extreme example of water pollution in the area. According to health guidelines, fecal coliform bacteria levels “should not exceed a value of 400 MPN per 100 milliliters “ but in the New River, fecal coliforms are in “the range of 5,000 to 12,000 MPN per 100 milliliters” (Mejia 2018). The chemicals released from the river into the air makes living around it extremely unpleasant as the stench permeates through neighboring communities. One of the chemicals causing this smell is hydrogen sulfide which can come from “decaying material like dead fish or decomposing algae in lakes and rivers, or from sewage or industrial processes” (James 2019). Another source of this chemical comes from across the border from the Cerro Prieto Geothermal Power Station. Because of Imperial County’s location next to the U.S-Mexico border, air and water pollution are also caused by polluting facilities in the southern nation.

The New River flows in from Mexico and empties into the Salton Sea which receives, in addition to sewage, millions of pounds of salt and hundreds of pounds of agricultural runoff in the form of chemicals like selenium. These untreated chemicals kill off animals living in the water and make the sea unsafe for swimming, fishing, and or any other use outside of waste drainage. Furthermore, as global warming continues and the contaminated Salton Sea continues to dry in the hotter temperatures, “toxic dust from the

lake bed [blows] into Imperial County,” further contributing to poor air quality (O’Dowd, McMahon 2021).

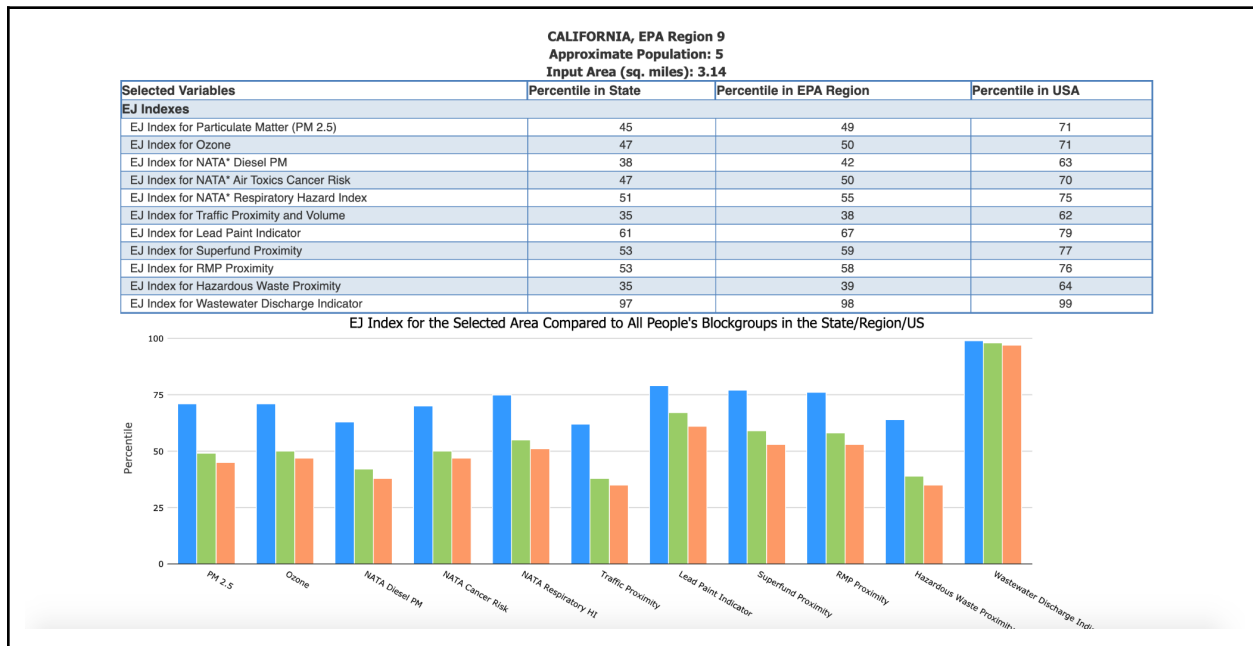


FIGURE 10: This compilation of environmental indicators (provided by the US EPA’s EJScreen tool) shows that Imperial County is in the 99th percentile nationwide for toxic wastewater discharge, the 79th percentile for lead paint, and the 77th percentile for superfund proximity.

https://ejscreen.epa.gov/mapper/ejscreen_SOE.aspx
 (Screenshot by Lena Fortun, July 7, 2021)

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

<p>Ozone</p>	<p>Particle Pollution 24-hour</p>	<p>Particle Pollution Annual</p>
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The air you breathe needs your support.
 You can make a difference in the air that you breathe.

FIGURE 11: The American Lung Association calculates a grade for ozone and particle pollution based on the number of days the daily 8-hour maximum concentration was considered to be hazardous. Imperial County received a failing grade for both ozone and particle pollution 24-hour based on exceeding the criteria of no more than 3.2 high pollution days with an average of 20.8 days of high ozone and 5.5 days of high particle pollution.

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

(Screenshot by Noelle Chin on July 7th, 2021)

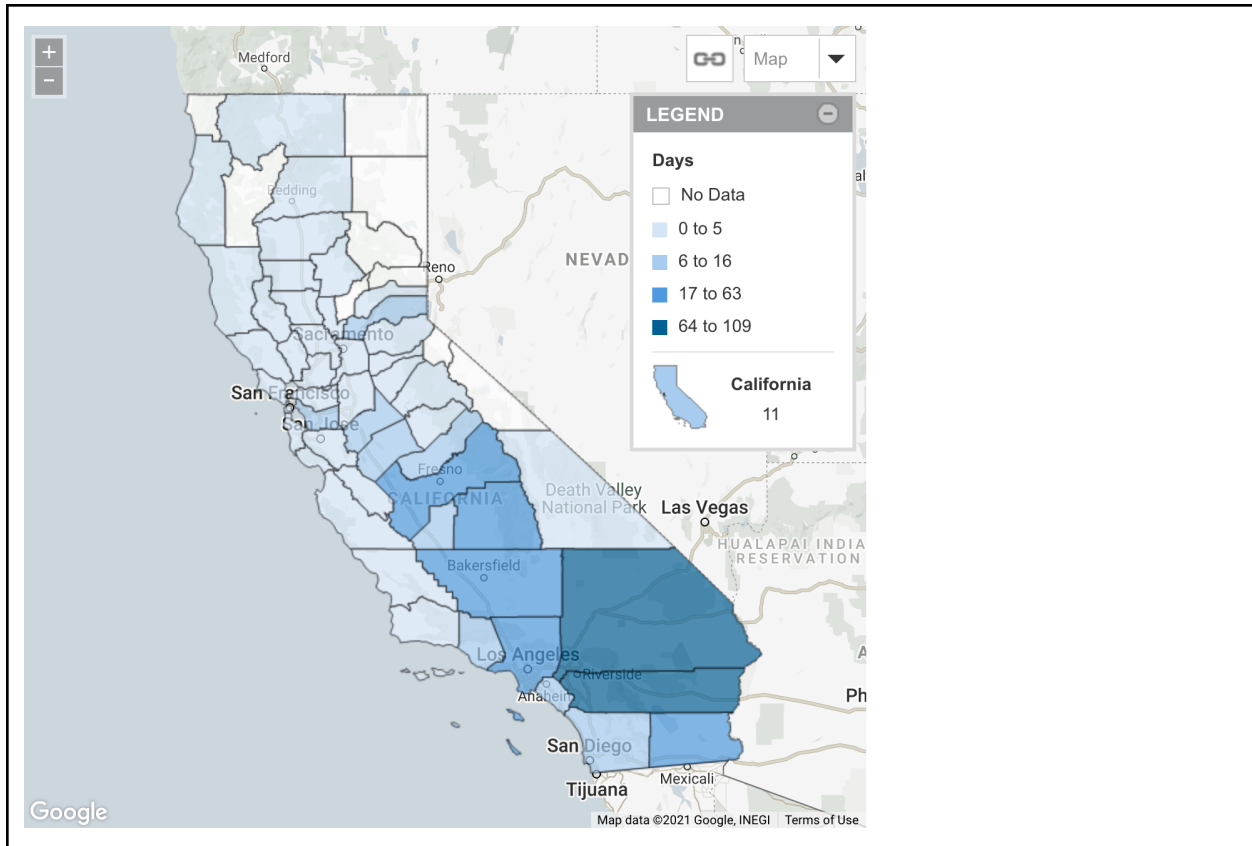


FIGURE 12: According to 2019 data, Imperial County had 17 days that had unhealthy ozone concentrations in the air. Exposure to unhealthy ozone concentrations is linked to adverse birth outcomes, obesity, cardiovascular and respiratory diseases, and cancer. Children are especially more vulnerable to air pollution since their bodies and organs are less fully developed and since they breathe more air relative to their size.

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

(Screenshot by Lena Fortun, July 7, 2021)

Average Particulate Matter Concentration in Air

(change indicator)

[Related Data](#) | [Why This Topic Is Important](#) | [How Children Are Faring](#) | [Policy Implications](#) | [Research & Links](#)

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Table Bar Trend Map

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Location: (hide) 12 selected Year(s): (edit) 2019 Sort: (edit) By Location

Select All Counties

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- Glenn County
- Humboldt County
- Imperial County
- Inyo County
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- Lassen County
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- Modoc County

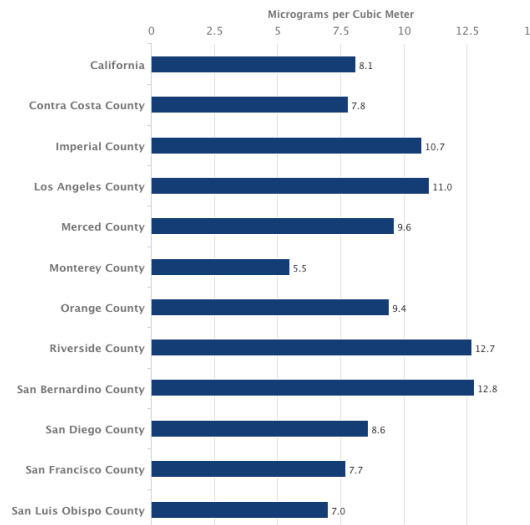


FIGURE 13: According to the above graph, California's average PM_{2.5} concentration is about 8. Imperial County lies at almost 11, meaning it has quite hazardous levels of PM_{2.5}. This can cause a large set of issues such as obesity, cardiovascular and respiratory disease, and cognitive and behavioral problems, to which children are much more vulnerable to.

<https://www.kidsdata.org/topic/80/air-quality/summary>

(Screenshot by Khira Pearlstein, 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 **Imperial County** was **12.5µg/m³**. *

* Micrograms per cubic meter (µg/m³)

ANNUAL AMBIENT CONCENTRATION OF PM_{2.5}

12.5µg/m³*

Imperial County, California

12.0µg/m³*

Annual National Standard

*Micrograms Per Cubic Meter (µg/m³)

FIGURE 14: According to CDC data from 2016, the annual ambient concentration of PM 2.5 was slightly above the national standard. While the annual PM 2.5 concentration is not especially concerning, the American Lung Association gave Imperial County's 24-hour particle pollution an F grade.

<https://ephtracking.cdc.gov/showInfoByLocationExt?&FIPS=06025>

(Screenshot by Noelle Chin on July 7th, 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, **3.7%** of the population of Imperial County lived within 150 meters* of a major highway.

In 2011, **1.4%** of Imperial County public schools (preK-4th grade) were sited within 150 meters* of a major highway.

* 150 meters is about 2 blocks.



3.7%



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

FIGURE 15: The CDC reported that in 2011, only 3.7% of Imperial County’s population lived within 2 blocks of a major highway. This data is a decade old and does not account for the traffic-related air pollution produced by the large number of shipping trucks used by Imperial County’s agricultural industries.

<https://ephtracking.cdc.gov/showInfoByLocationExt?&FIPS=06025>

(Screenshot by Noelle Chin on July 7th, 2021)

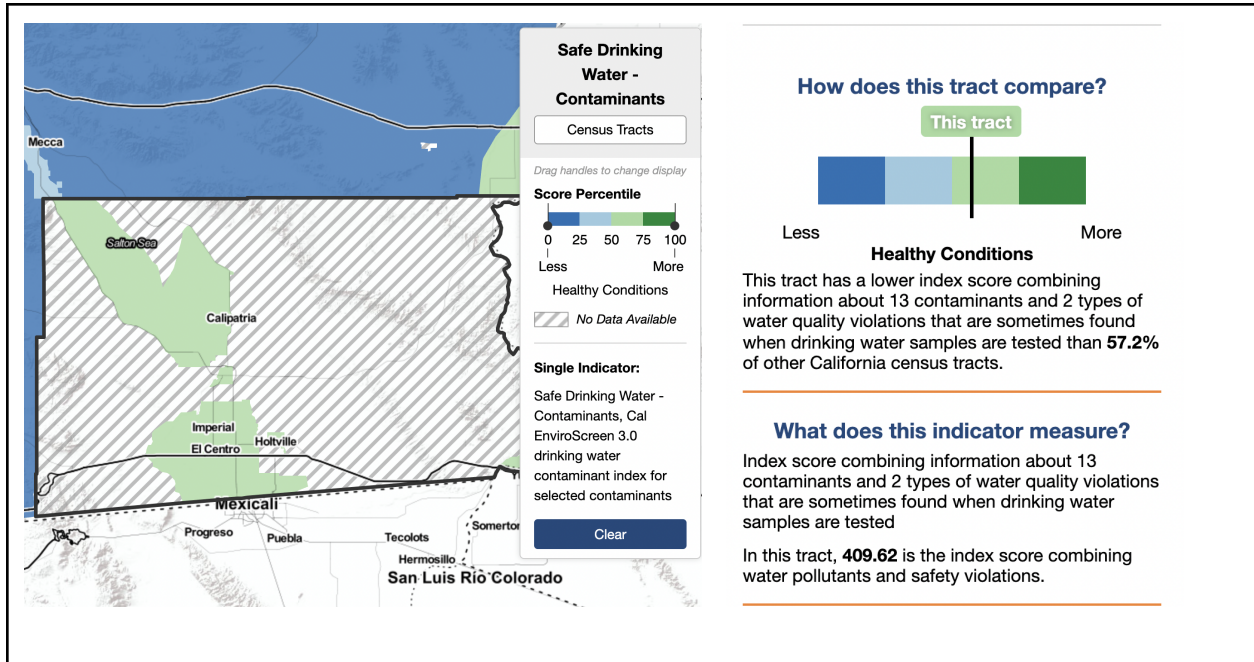


FIGURE 16: According to data from CalEnviroScreen 3.0, Imperial County scored an water contaminant index that was 57.2% lower than other California census tracts, meaning that the drinking water in this region is considered safe to drink.

<https://map.healthyplacesindex.org/>

(Screenshot by Noelle Chin on July 7th, 2021)

3. COMPOUND VULNERABILITIES

County in Crisis

Clara Carrabba

A combination of factors including racial disparities, income levels, and representation make up a community's vulnerability status. In Imperial County, a Latinx agricultural community, vulnerabilities are high and residents face a multitude of environmental and health hazards.

One of the most significant stressors Imperial County residents face is poverty, which is both caused by and leads to several other stressors. With a staggering 23.4 percent of the population below the poverty line, the community is often overlooked by governmental bodies and many residents face unemployment or criminally low wages. According to the California Healthy Places Index, 58.71 percent of people aged 25-64 are unemployed (California Healthy Places Index 2019). This can be connected to the low educational attainment rates, as only 20 percent of people have some sort of college degree (California Healthy Places Index 2019). Without stable employment and little economic opportunity, residents do not have access to necessary essentials, including health care, fresh food products, higher education, or decent housing. Living in an impoverished community not only diminishes economic wellness for residents but also increases health vulnerabilities and lowers life expectancy because of its relation to higher crime rates,

poor nutrition, lack of healthcare, and inadequate housing.

The low educational attainment rates greatly contribute to Imperial County's vulnerability, as education is essential in attaining jobs, and therefore being eligible for healthcare or quality housing. This lack of education also creates a linguistic barrier between non-English speaking residents and the media. Only 36 percent of students gained proficiency in the English language (Children Now 2018-19 County Scorecard of Children's Well-Being), and these residents could be completely unaware of the environmental hazards they are up against. Also, research shows that only 26% of students were proficient in math. As much of the information released about certain environmental risks, such as air pollution, is done so in statistics and analytical data, a lack of math proficiency could disrupt their understanding of major risks.

Another stressor, not necessarily caused by poverty but certainly persisting because of the community's vulnerability, is air pollution. The toxic dust-emitting Salton Sea, transportation pollution, and agricultural pollution all contribute to Imperial County having the highest asthma hospitalization rates among children and a 15.1 percent asthma prevalence rate (Office of Statewide Health Planning and Development 2021). Asthma and other respiratory diseases will only be exacerbated by climate change-induced increased temperatures, and can be fatal. These conditions prove to be especially dangerous because the majority of employed Imperial County residents are farmworkers, making heat strokes and asthma attacks occur more frequently.

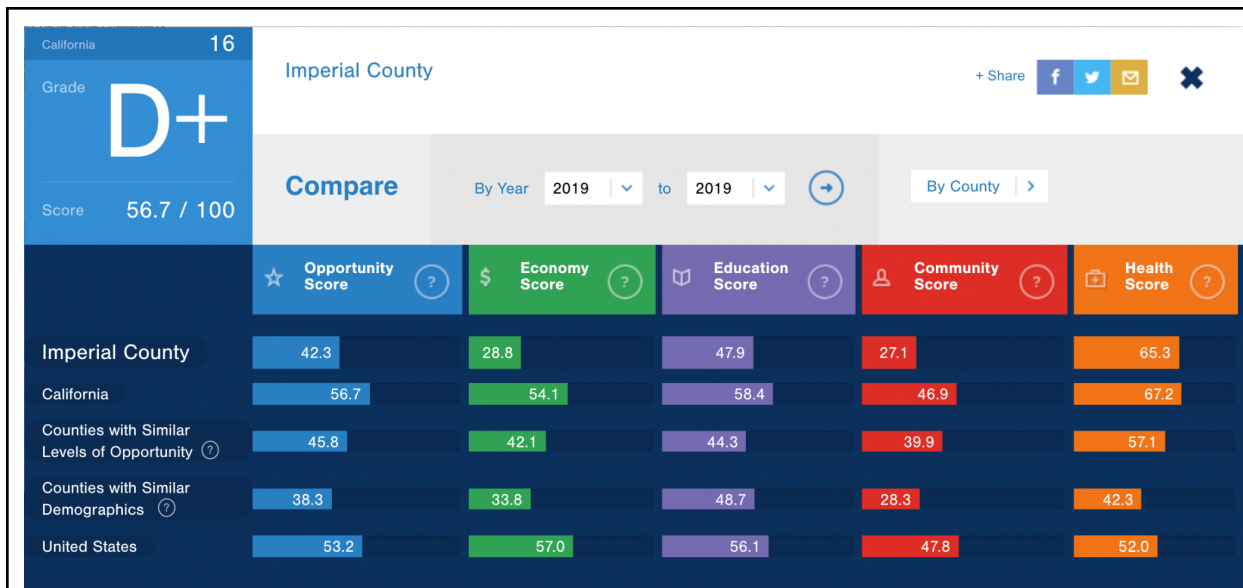


FIGURE 17: The Opportunity Index for Imperial County reflects below-average data that greatly differs from other California counties, more specifically wealthier areas. The county demonstrates low income levels, education, economic opportunities, and greater health disparities. (Screenshot by Noelle Chin, July 6, 2021) <https://opportunityindex.org/detail/06025>

	2014 - 2018 ACS Estimates	Percent	MOE (±)
Population 25+ by Educational Attainment			
Total	109,338	100%	135
Less than 9th Grade	18,440	17%	1,099
9th - 12th Grade, No Diploma	15,488	14%	950
High School Graduate	26,758	24%	1,175
Some College, No Degree	32,850	30%	1,336
Associate Degree	6,870	6%	596
Bachelor's Degree or more	15,802	14%	927
Population Age 5+ Years by Ability to Speak English			
Total	165,124	100%	48
Speak only English	39,692	24%	1,336
Non-English at Home ^{1,2,3,4}	125,432	76%	1,336
¹ Speak English "very well"	70,228	43%	1,787
² Speak English "well"	20,941	13%	1,234
³ Speak English "not well"	17,791	11%	926
⁴ Speak English "not at all"	16,472	10%	1,026
^{3,4} Speak English "less than well"	34,263	21%	1,382
^{2,3,4} Speak English "less than very well"	55,204	33%	1,853
Linguistically Isolated Households*			
Total	10,151	100%	627
Speak Spanish	9,854	97%	613
Speak Other Indo-European Languages	31	0%	47
Speak Asian-Pacific Island Languages	233	2%	122
Speak Other Languages	33	0%	23
Households by Household Income			
Household Income Base	44,057	100%	845

FIGURE 18: This summary report by the EPA demonstrates the distinct lack of education in Imperial County, with only 20% of residents having acquired some kind of

college degree. Lower education levels directly relate to lower economic status and opportunities, making unemployment and poverty a high stressor for residents of Imperial County. (Screenshot by Clara Carrabba, July 7, 2021)

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

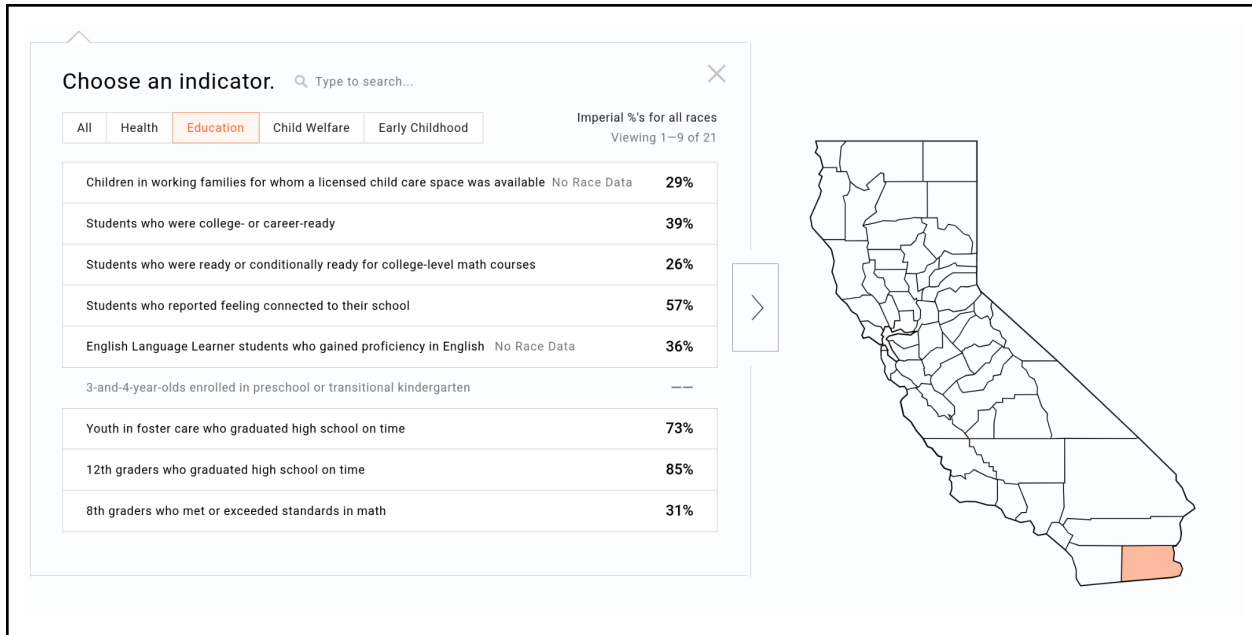


FIGURE 19: This data drawn from “Children Now 2018-19 County Scorecard of Children’s Well-Being” demonstrates the educational inadequacies among Imperial County residents. There is a distinct linguistic barrier, as shown in the low percentage of students proficient in English. The low percentage of math readiness also proves as a barrier that could disrupt residents’ understanding of environmental and health hazards, such as air pollution, because they might not understand the statistics or even media releases written or spoken in English. (Screenshot by Clara Carrabba, July 7, 2021) <https://scorecard.childrenow.org/?cty=imperial&yr=3>

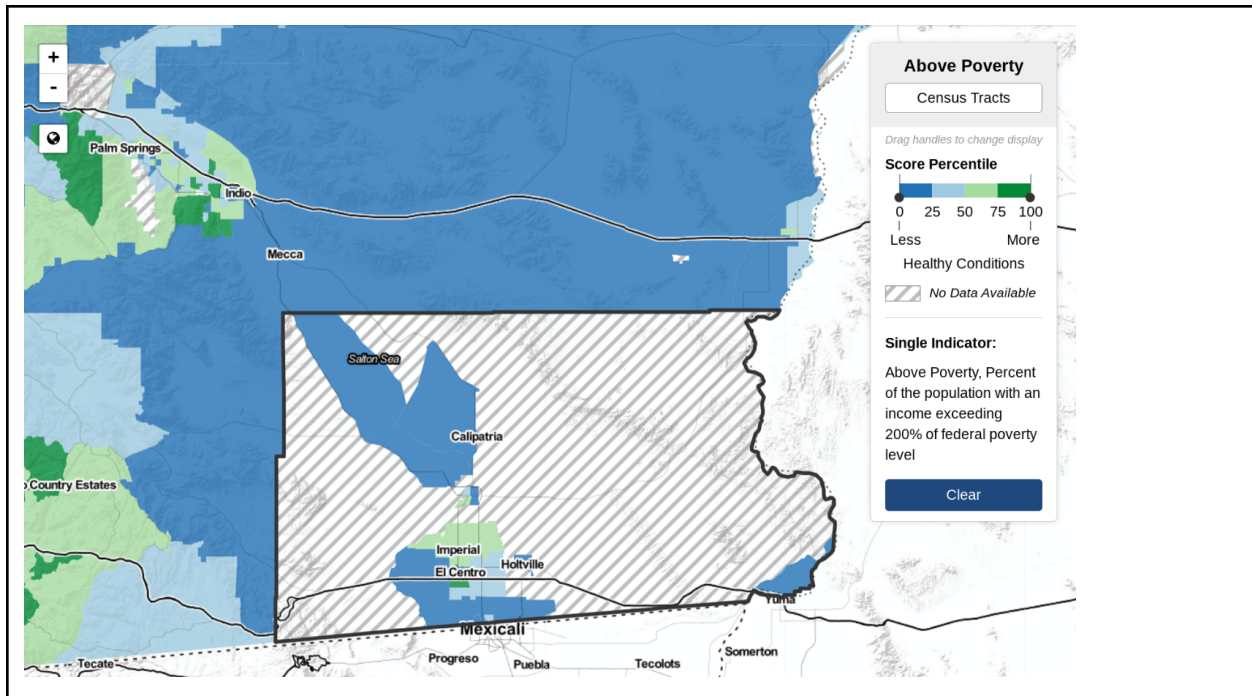


FIGURE 20:The California Healthy Places Index for Imperial County reflects the high levels of residents below the poverty line. While much of the county does not have adequate data on this factor, the available data clearly states the economic struggles community members face. The dark blue areas represent the highest poverty levels, and includes a large sector of the county. The small green areas that show low poverty levels surround the biggest city in the county, El Centro, because there are more economic opportunity for residents. However, it can be assumed that most of the county suffers from poverty, given low education and employment rates. This amount of poverty makes Imperial County more vulnerable to health issues and environmental threats because of a lack of political power and economic well-being. (Screenshot by Clara Carrabba, July 7, 2021) <https://map.healthyplacesindex.org/>

4. STAKEHOLDER ANALYSIS

The Power Imbalance Between Stakeholders

Diana Kou

Important stakeholders of Imperial County, when it comes to environmental slow disasters, include residents like farmers, parents, children, and those who live nearby environmental hazards. Other influential stakeholders are environmental groups, polluting companies, and government institutions.

Residents

Agriculture is the biggest industry in Imperial County, and yet, farm laborers are impoverished, extremely underserved, and neglected by the government and the farms they work for. Low pay, long hours, and constant proximity to harmful pesticides or PM10 emissions burden these workers. PM10 emissions are fine inhalable particles that can cause serious health issues when they get deep into an individual's lungs or bloodstream. It is also pertinent to note that many of these farm workers are Hispanic or Latino. Even throughout the pandemic, they've been working nonstop in rough conditions, and they still struggle to afford housing (Bowman 2021). Women farm workers avoid drinking water even in extreme heat because of the lack of restrooms. They are supported by Ureña, the city councilman, who has been a vocal supporter of farmworker camps, but many believe they must endure these harsh conditions or be jobless.

Families in Imperial County are important stakeholders that are negatively affected by environmental issues, yet tethered to their homes. Low-income families are unable to move to areas with better air quality, education, and resources. Children are particularly hard hit because the largest demographic living in poverty in Imperial County are 6-11 year old females, followed by 6-11 year old males. Asthma is common among children. Mirroring the rest of the United States, low-income communities of color here are exposed to toxic pollutants at significantly higher levels than upper-income whites.

High schoolers, like those from Brawley Union High School, are able to learn about the environmental injustices in their community through classes and programs, and from local environmental groups. Comite Civico (CCV) holds conferences, like the Environmental Health Leadership Summit, at Brawley Union High School. The summits feature discussions on such topics as pollution, tools for environmental justice, air quality programs, pesticide exposure's health effects, and tools for families living with asthma. Simultaneous sessions in Spanish are also offered, catering to other community members, like these students' parents.

Higher education also plays a role in Imperial County, despite the low rates of students who pursue it. Jill Johnston, an assistant professor of preventive medicine with the Keck School of Medicine of USC, along with fellow preventive medicine researcher Shohreh Farzan, have collaborated with CCV on a long-term study into the receding Salton Sea shoreline and the effect on air quality in the region.

Residents living near New River are affected by environmental hazards everyday. "The river is so foul that rumors swirl about two-headed turtles and three-eyed fish. If you fall in, locals joke, you might sprout a third arm" (Mejia 2018). The smell permeates through the air, alarming residents as the smell is so concerning, yet there is little being done about it. They lack hope that the river will ever be cleaned up, and are exposed to dangerous air

pollution which causes respiratory issues. This river flows from Mexicali and empties into the Salton Sea, an important part of Imperial County's agricultural system (James 2018).

Community Assets

The Imperial County Public Health Department is a major stakeholder to the community. As the core of the health of Imperial County, they serve to heal the community from disease, illnesses, and injuries, but a lack of sufficient doctors and ICU beds in proportion to the number of residents in Imperial County is a hurdle that proved deadly during the COVID-19 pandemic.

Vital transportation infrastructure near Niland Geyser is also threatened because of the rate of movement and proximity of the Geyser. The geyser is approximately 210 feet away from Highway 111, the Kinder Morgan pressurized petroleum pipeline, and important utilities including fiber optic cables. Fire Chief Alfredo Estrada has pointed out concerns for Caltrans and the Union Pacific Railroad (Kirby 2021).

Environmental Advocators

Environmental groups play an important role as stakeholders with both influence and investment in Imperial County. Comite Civico is one of these local organizations that brings together diverse experts, community stakeholders, youth leadership, environmental justice organizations, academia, scientists and researchers to collectively focus on improving air quality, utilizing advocacy and education.

The Sierra Club helps grassroots organizations to protect marginalized communities in Imperial County and areas surrounding the Salton Sea. Christian Garza was born with asthma and as a child, hid his frequent and intense asthma attacks in an effort to alleviate the financial burden on his mother, who worked hard but struggled to put food on the table (Bacon 2017). Community members with respiratory illnesses, like asthma, are given a voice through these organizations.

State & Federal Government

As a representative of California's state government, Governor Gavin Newsom has attempted to raise funds to address pollution in the New River, despite then-President Trump threatening to cut off these funds in the future. Newsom's advocacy for farm workers and residents affected by environmental justice in Imperial County has not taken full advantage of his political power. Housing programs are still underutilized due to farm workers' concerns about deportation, job loss, and isolation.

Outside Institutions

Manufacturing centers and polluting industries contribute to environmental injustice along with various other intersecting injustices in Imperial County. One World Beef, for example, is a national cow slaughterhouse company. After already closing down a different slaughterhouse amid accusations of large amounts of polluted wastewater in 2014, One World Beef was allowed by the Colorado River Basin Water Board to take over the facilities and resume operations (Espino-Padron 2016). With little regard for worker safety, proven by its treatment of workers during the COVID-19 pandemic (Tuiránon 2020), water that the community is dependent on, and the prevalent water shortage in California, One World Beef single-handedly adds to environmental, health, procedural, economic, and racial injustices in Imperial County.

5. STAKEHOLDER ACTIONS

Taking Action: Tackling Imperial County Vulnerabilities

Lena Fortun

In order to combat community vulnerabilities, residents of Imperial County, outside environmental organizations and government institutions have taken an array of actions.

The Niland Geyser for example, has become an expanding “geyser of bubbling mud” that releases carbon dioxide gas and is expanding to such an extent that it now threatens local railroad tracks and highways. In response, the Union Pacific Railroad has already built an alternate track for its trains to travel along, despite this alteration causing them to travel at a slower pace than they used to on the now compromised tracks. If the mud from the geyser continues to creep outward, a more permanent solution, such as a bridge, may need to be implemented. The California Department of Transportation might also have to close state route 111 if the mudpot advances further. The possible causes of this “unstoppable geyser” have yet to be thoroughly explored, hence further solutions beyond working around it have also not yet been researched either (Starr 2018).

The ongoing Covid-19 pandemic - exacerbated by the low income of much of the population of Imperial County causing people to continue working -- has also increased

the vulnerability of many community members. The California State Government, along with Governor Gavin Newsom, have implemented the Housing for Harvest Program which offers paid hotel rooms for farm workers who have Covid-19 or have been exposed (California All 2021). Since originally the Housing for Harvest Program did not provide funding for transportation or staff, among other things, Governor Newsom signed a legislative package that gave more funding to the program. A spokesperson at the California Department of Food and Agriculture said “the extra funding will help pay for services that local administrators have been covering and provide financial assistance for farmworkers” (Bowman 2021).

The Covid-19 pandemic has also made working conditions more unpredictable and only exacerbated the county’s “insufficient housing options, low wages, and barriers to healthcare”. Subsequently, agricultural workers in Imperial County have created camp communities near the farms they work at. Community members have also begun donating foods and books to support these pop-up communities. This land, owned by the city of Calexico, which was once to be sold to the federal government for a secondary border wall, has now been housing workers, “some of them homeless or who want to avoid the long border crossing wait before their next shift” (Bowman 2021).

Sierra Club, a long-running environmental organization that works to protect the Earth’s ecosystems, promote responsible use of resources, and educate, has started the My Generation campaign. This campaign works to protect marginalized communities, including communities in Imperial County and around the Salton Sea. The goal of the program is to educate residents on environmental and health hazards that they may have been oblivious to beforehand. In Imperial County, the Salton Sea, a significant resource in the county’s agricultural sector, is at risk of drying up and in the process is allowing substantial amounts of dust to add to the county’s air pollution levels. Imperial County residents, and activists, share their stories; Ruben Garza comments on how her mother shouldn’t have to worry everytime she goes outside, Christian Garza tells of the asthma

attacks he's been having since he was a kid, and Marina Barragán shares stories of the many people in her life who have had health complications. The My Generation campaign is supposed to give community members voice and work to restore the sea (Bacon 2017).

Under the Clean Air Act, the US EPA has the power to regulate industrial outputs and protect communities from harmful pollutants that are known to cause health effects. Imperial County's proximity to the U.S.-Mexico border complicates the matter; the California Resource Board claimed that they could not enforce the Clean Air Act because some/many of the pollutants were coming from across the border, and therefore couldn't be regulated under the Clean Air Act. The Center for Biological Diversity and the Center for Environmental Health sued the California Resource Board for their inaction in enforcing the Clean Air Act in Imperial County. This lawsuit has been unsuccessful due to the claims that they cannot regulate emission from neighboring Mexico, but has still brought attention to the fact that Imperial County "has failed for more than a decade to attain federal standards for ozone pollutants" (Corbett 2020).

To combat air pollution levels in Imperial County and give residents more information, community members, working with local organizations, Comite Civico del Valle, the University of Washington, the California Department of Public Health, and the Public Health Institute of Oakland, have installed 40 air quality monitors around Imperial County to assess particle pollution. Collectively they have also set up an interactive app, using IVAN (Identifying Violations Affecting Neighborhoods) air monitoring, where community members can check the quality of the air wherever they are and input environmental factors that they see (Times of San Diego, 2019). Edmund Seto, an associate professor at the University of Washington Department of Environmental and Occupational Health Services, says, "The goal is less about seeing if communities meet those EPA standards and rather understanding where the hot spots are for pollution in the community". Community members have not reached out to many government organizations to propose regulations, using their data as evidence of environmental injustice; instead, they want to

use this data for themselves, as a way to stay updated on air pollution in certain areas and put the data/power in their own hands (Phelps 2017).

There is also important inaction to address environmental hazards and community vulnerability in Imperial County. Despite action from the Mexican government to cover the toxic New River in Mexicali, no such actions have been made in Imperial County. The hazardous river still runs through much of Imperial County, exposing its residents and eventually dumping into the already struggling Salton Sea. The Salton Sea has also become a major air pollution contributor in the county, releasing mass amounts of dust into the air and prompting asthma attacks and other health issues, yet the fate of it is not truly discussed. While there are people talking about the changes the Salton Sea has undergone and the effects it is having on local residents, no real solutions have yet to be implemented. No actions have been taken to improve other air and water pollutants, like the agricultural industry in Imperial County, either.

6. ROLE OF MEDIA AND BIG ENVIRONMENTAL ORGANIZATIONS

Extra! Extra! (You Won't Read All About It)

Khira Pearlstein

The role of media in Imperial County is quite scarce, especially regarding slow disasters. The population is heavily made up of minorities, Latino and Hispanic, which could account for the lack of media coverage. It might also create a language barrier that makes it difficult for the majority of people to be informed about the array of issues present. While browsing the internet for information on Imperial County, you'll find several articles about fast disasters, primarily earthquakes, from sources like the LA Times. However, hardly anything about the poor air quality from the drying Salton Sea or the ammonium nitrate shortage will appear. There are some local news outlets, such as the Imperial Valley Press, that are trying to spread information to the community, but they still fail to address the extent of the environmental issues.

Despite the lack of action from the media, Imperial's issues are being addressed by some large environmental organizations such as the Sierra Club and Earthjustice. The Sierra Club has been invested in Imperial county for years. Posted in 1998, was an article

explaining how Imperial was the heart of environmental issues for all of its bordering counties (Barry 1998). More recently, they have been reporting on the severity of the Salton Sea and the Clean Air Acts. They even partnered with a local environmental activist group, Comite Civico del Valle, to set up about 40 air monitors among the community so people can be aware of the air quality daily (Nicklen 2016). Another organization, Earthjustice, was extremely concerned about Imperial County's well-being in the early 2000s. Posting several articles about them fighting for clean air acts and even suing the EPA for waiving such air quality requirements. Their support eventually fizzled out, and nowadays they have been mostly inactive on issues involving Imperial County.

Even the Wikipedia page for Imperial County contains almost no information about their environmental hazards. It describes Imperial's setting, geography, sites of interest, history, etc. but does not mention one of its great hallmarks, environmental issues. It does mention the Salton Sea, but not how detrimental its drying is to the community. It also mentions a little about earthquakes, but nothing about air quality, water quality, or the many other issues found in Imperial. On the talk page, yet again, the environmental issues are ignored. It only talks about Imperial County's economic standing, the county flag, and more history. It is clear to see why some of the environmental issues in Imperial have gotten so dire, it's because they have been simply cast aside and not given a moment's notice by the average person.

7. RECOMMENDED LOCAL ACTIONS

Taking Baby Steps

Katherine Wu

While many efforts have been made by local environmental groups, much more can be done to help community members face slow disaster hazards and the consequent vulnerabilities. Local actions which should be prioritized for Imperial County should address the spread of information regarding RMP and other highly polluting facilities, the extreme housing crisis, as well access to healthcare. Because of the compound vulnerabilities which affect Imperial Valley residents, immediate action should be taken in order to minimize risk.

Many workers of the polluting manufacturing industry as well as residents of fenceline communities are unaware of the vulnerabilities they are exposed to by local RMP facilities. In order to effectively disperse valuable information, Imperial Valley workers unions should prioritize increasing membership and promoting media campaigns. This could include social media posts in multiple languages to serve the large Hispanic/Latinx community, as well as physical flyers posted around the community as well as in manufacturing centers. In addition, local workplaces should develop health initiatives which inform employees of the risks they may face and steps for preventative care. Many workplaces have begun offering health checkups for employees since the turn of the Industrial Revolution due to the new risks workers face. These checkups have been shown to “prevent the working, hiring, and risk of interpersonal diseases, injury, and chronic

diseases of unhealthy employees” (Hakro, 2019). Providing workers in Imperial County with semi-annual or annual health checkups focusing on respiratory health would be a huge step in informing employees of associated health risks posed by local environmental disasters. Following the World Health Organization’s framework for protecting workers’ health would be extremely beneficial and entails establishing occupational healthcare and connections to primary care providers. In addition, air quality data collected by the Comité Cívico del Valle’s IVAN Air Monitoring Network, a valuable asset to the community, should be made widely accessible through social media in various languages, and could also be presented at union meetings or on workplace bulletins. In addition, improving environmental education in Imperial County would allow younger generations to become established in the world of environmental justice and become aware of the vulnerabilities they face.

The housing crisis in Imperial County has left many families living in dangerous proximity to polluting facilities or unable to find housing at all, putting many at higher risk of respiratory illness and other health issues. Local residents can increase their land use activism and utilize community-led decision making, which has shown in other areas to have offered “an improved approach to environmental and land use planning that prioritizes the people who experience disproportionate pollution burdens” (California Environmental Justice Alliance, 2020). Imperial County could collaborate with the California Environmental Justice Alliance (CEJA) to reduce industry-related harm through the Green Zones Initiative, which utilizes community action and close collaboration with local government and businesses to transform communities. While the Imperial Valley Housing Authority (IVHA) has some established housing programs for low income families as well as farmworkers, their housing units are not sufficient and there is a waiting list. Local authorities should take more action in maintaining and utilizing older buildings and creating more government-subsidized housing. In addition, workforce housing could be built at safe distances from RMP facilities offering bus transportation taking workers to and from the workplace. Banks and other financial workers in the Imperial Valley should

work towards creative finance and help low income families build credit in order to become homeowners, rather than living in the uncertainty of being a tenant. This has been done before by groups like NeighborWorks America, which makes loans to empower families to stay in their housing.

While faulty health coverage is mainly indicative of gaps in federal policy, local action can be taken in order to alleviate Imperial County's health injustice. A crucial factor in preventing local workers and residents from visiting hospitals is the language barrier. Because the Imperial Valley houses a large Hispanic/Latinx community, providing language services with interpreters, translators, and telecommunication devices would bridge a huge gap in local health services. El Centro has already taken a step in this direction, offering Spanish oral interpretation as well as over-the-phone interpretation services. Another barrier in preventing people from receiving medical care is the distrust of doctors due to valid concerns of discrimination. Imperial County employers should strive to integrate occupational health services and connect workers to primary care providers for easy access to reliable care. Because occupational risks play a huge role in chronic illnesses, it is crucial for health services to be established at this level. Introducing workplace health initiatives has actually proven to be beneficial for both the employee and the employer, "reducing sick leave absenteeism by 27% and health-care costs for companies by 26%" (World Health Organization, 2017).

Taking small steps toward a healthier community through these local actions could play a huge role in combating the vulnerabilities of slow disaster hazards. Imperial County should prioritize community-led action and provide more resources for burdened residents and workers. Implementing these initiatives addressing awareness of RMP facilities and associated health hazards, the housing crisis, as well as gaps in health services would minimize the effect of compound vulnerabilities.

8. RECOMMENDED EXTRA-LOCAL ACTIONS

Federal Inaction Proves Fatal

Diana Kou, Brenda Vuong

Low income residents are more likely to experience health impacts and deal with medical bills due to increased exposure to air pollution. 15.9% of Imperial County's population is unemployed and over 20% is living under the poverty line (California Employment Development Department 2021). The lowest earning town is located on Salton Sea with an average annual income of around \$11,000. Poverty is correlated with pollution when these residents don't have funds to move away, but they also can't afford health care to deal with health disparity. Our recommended extra-local actions include raising minimum wage to a livable wage, increasing taxes on high income brackets, demanding higher wages from farms, and protection for undocumented immigrants.

In order to address the low ratio of doctors/ICU beds to people in the county, stronger and more incentives for healthcare workers to work in underprivileged areas should be given by the state of California to healthcare workers looking to gain experience, pay off student loans, or receive extra benefits.

Over 85% of the population identifies as Hispanic or Latino, meaning language barriers can make it difficult for many residents to easily understand health implications of pollutants or testing processes for diseases. When COVID-19 first broke out in California,

Imperial County was one of the worst hit. As farms and meat processing facilities like One World Beef ramped up production to turn profits as America went through a food shortage, the health and safety of workers was put at risk. When workers finally demanded COVID testing and better safety precautions, One World Beef executed a grossly inefficient testing regime by sending its workers to get tested for antibodies instead of live cases. Insufficient language translators left workers extremely confused when they received X-rays and blood prick tests instead of nasal swabs, and added to the confusion amidst the pandemic, delaying important safety precautions and endangering worker lives. Our recommendations to address language barriers would be to mandate language translators at hospitals and doctor offices, respective to the residential and employed demographics.

Not only does requiring language translators in healthcare serve as an important safety precaution, it also ensures that the residents of Imperial County, as well as other counties with language barriers are sufficiently informed on updates on COVID-19 and other state-wide healthcare news. Often, at clinics or hospitals, pamphlets especially on asthma rates and precautions should be updated to include Spanish translations.

Undocumented workers and workers in general are sometimes unwilling to go to hospitals or receive government help out of fear of job loss or getting deported. Universal healthcare and reformation of immigration laws are humane extra-local actions the government should take.

Low income families “stuck” working in low income jobs like farming, make it difficult to move away from environmental hazards, affecting future generations. The poverty cycles within Imperial County allow for residents to be routinely affected by air pollution without enough financial mobility to find housing elsewhere. More funding for educational programs, student loans for students to get higher levels of education for higher paying

jobs, and funding for remote learning and internet access so that children can attend school more often is an investment into the future of America.

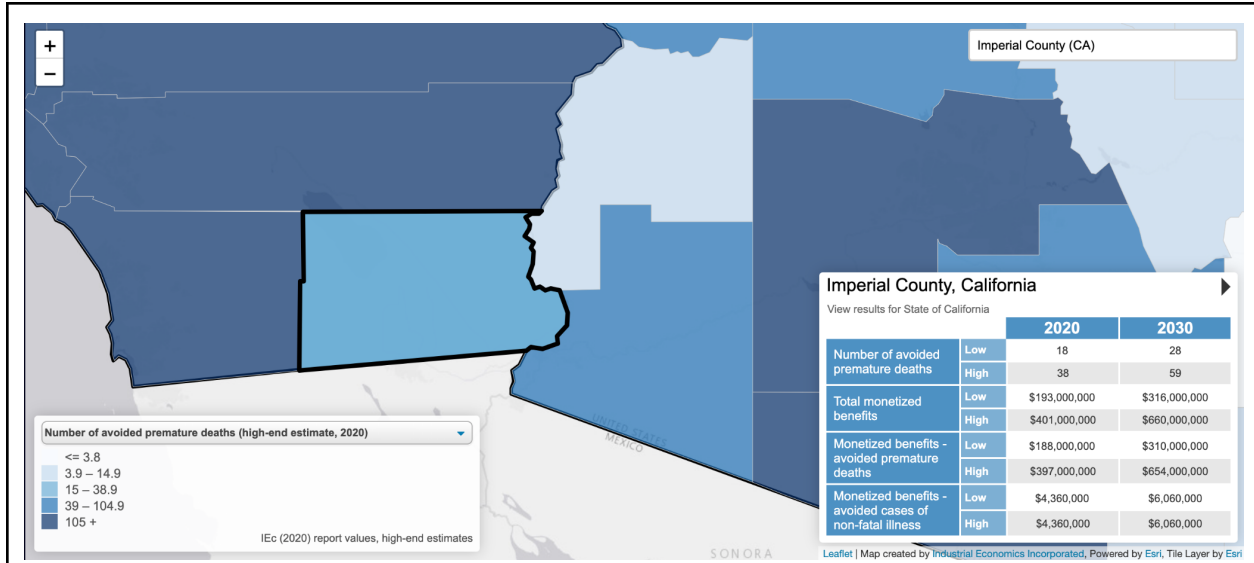


FIGURE 21: The Clean Air Act protects Imperial County by allowing environmental organizations in the county to use the precedent to take legal action and get stronger regulation on ozone pollution. The act also plays a significant role in regulating the amount of air pollution; mainly caused by the agriculture and meat industries in the area along with other sources like diesel fumes and automobile exhaust. (Screenshot by June Su, July 8, 2021)

9. RECOMMENDATIONS FOR FUTURE RESEARCH

Defying the Limitations

Noelle Chin

The agricultural industry emits multiple sources of pollution that contribute to the poor air quality and community vulnerability in Imperial County. Agricultural burning to clear the land, tilling of land, spraying of pesticides, and vehicle transport of agricultural products all emit particulate matter and toxic chemicals that increase the ozone concentration in the area. In addition to air pollution, the agricultural runoff and slaughterhouse wastewater dumping into the evaporating Salton Sea has been linked to farmworkers and residents experiencing nosebleeds, chronic coughs, and high rates of childhood asthma.

Agriculture has a significant influence on both poor air quality and economic life in the county. In order for researchers to understand how Imperial County residents are impacted by agriculture, it is important to work with the community to obtain accurate health and demographic data as well as conduct qualitative surveys to understand the complicated relationship that residents may have with the agricultural industry.

The questions that future studies could focus on are:

1. What are residents' opinions/perceptions on the agricultural industry's role as both a contributor to poor air quality and influence on the region's economy?
2. How large is the undocumented community? How is employer treatment of undocumented workers? What information is needed for researchers to address the vulnerabilities in this community?
3. What are the experiences or associations that people have with pollution in Imperial County? To what effect has pollution in Imperial County had an impact on residents' health?

Because undocumented individuals may be hesitant to directly participate in initiatives that could reveal their status, a possible method of reaching this community is through distributing anonymous surveys during community resource meetings. The surveys could ask questions such as:

Health

- Do you believe that your health has been affected by the environmental conditions in the county?
- Do you have any specific concerns about your health? If yes, have you addressed these concerns with a physician?

Employment

- Do you feel that your health has been impacted by your working conditions?
- How do you think your employer could support worker safety?

Environment

- What do you believe affects the air quality of this region?
- Do you think that air quality can be improved? If yes, then how?

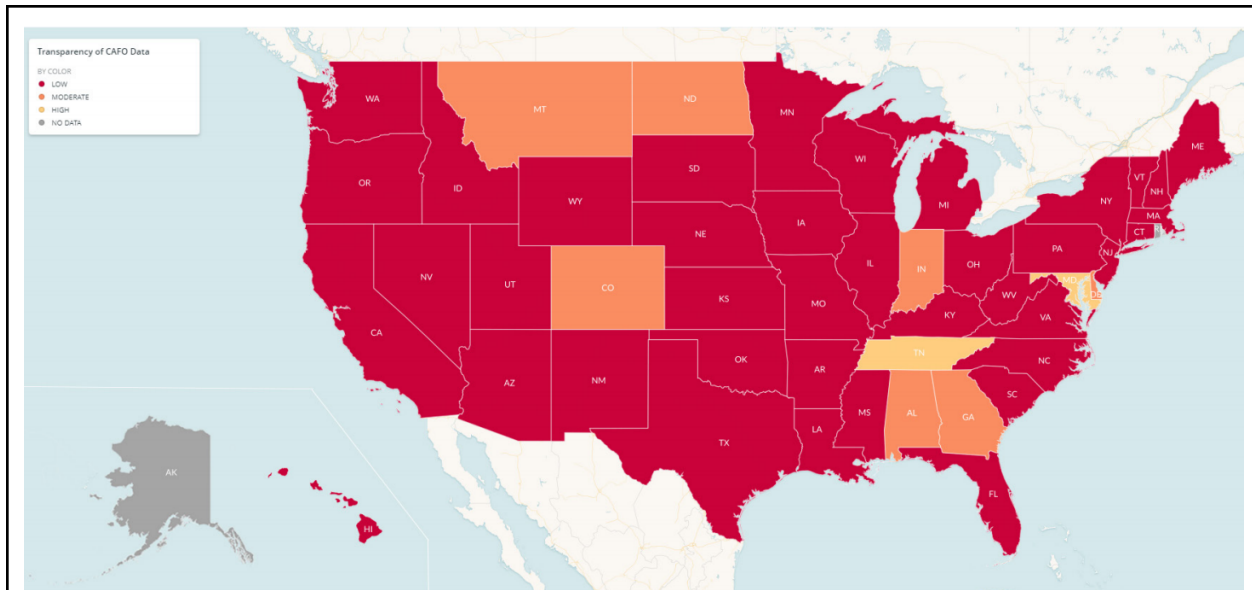


FIGURE 22: Based on our research, there is extremely limited information available to the public on concentrated animal feeding operations (CAFOs). Crop reports on the number of cattle in Imperial County are available but the amount of air and water pollution and more specific effects on the community meat facilities cause is nowhere to be found. (Screenshot by June Su, July 8, 2021).

10. INJUSTICE ANALYSIS

Just Transition is Needed Everywhere

Yvonne Wen

Different hidden disasters in several sites in Imperial County have been slowly expanding and threatening the environmental rights of the residents in the County.

An expanding mud puddle in Imperial County due to underground mining has been so troublesome that The Union Pacific Railroad had to build an alternative track for the train, and the California Department of Transportation had to relocate the route 111 (Starr 2018). Although the puddle does not pose a health hazard from a distance, it has been a threat for vehicles' safety. "It's a slow-moving disaster," Alfredo Estrada, Imperial County's fire chief and emergency services coordinator, told the Los Angeles Times (Starr 2018). What's more, scientists and constructors have been attempting to stop the expansion by building a wall, or dumping soft stones in it (Starr 2018). However, "Nothing has stopped it, not even the wall. In October, the mud just seeped underneath it and kept sludging on towards the tracks" (Starr 2018). These efforts were in vain, which created data injustice for the Imperial County residents since they do not have the data to understand and respond, which is concerning.

The New River, which flows directly into Salton Sea, is severely polluted due to the discharge of raw sewage and other pollutants that cause "extreme peril to the health, safety, and welfare of people and properties near and around the river" (Wilson 2019). People who grew up near the river stated that "That's what our moms tell us: Don't go down to the river bottom, don't play near the river" (Wilson 2019). Failed to properly address the environmental hazards directly deprive health justices and epistemic justices

which enable people to have a clean environment and an understanding of the environmental harms. Awareness of those environmental injustices is raised. Imperial County and the governor Gavin Newsom have been actively seeking solutions. However, lack of extra-local actions and national support contributed to the environmental vulnerability of the setting. Governor Gavin Newsom quickly won federal emergency funds, though President Donald Trump has threatened to cut off such funding in the future (Wilson 2019).

On top of which, the New River is one of the most polluted river in the county, which locates in the city of Brawley, where is one of the most overburdened communities of color in California, specifically 80 percent of the populations are Latinos (Espino-Patron 2016). In an area which is in need of the most attention, more damage was done. The Colorado River Basin Water Board has approved the company One World Beef to discharge the wastewater, which contains a numerous amount of pollutants to Salton sea despite the efforts from the community members and Earthjustice on opposing the decision with the excuse of providing job opportunities for the community (Espino-Patron 2016). It violated the principles of just transition, which prioritize the health of the environment.

Due to the nature of the agricultural setting in Imperial County, Pollution from transportation, field burning and pesticide use, along with dust from the evaporating Salton Sea, has resulted in poor air quality, making Brawley a city where the asthma rate is the highest in the state (Espino-Patron 2016). Gilbert Rebollar, a board member of the Brawley Elementary School District, to the north of Calexico, said students regularly cannot go outside because the air quality is too dangerous. About 20 percent of children in Imperial County have asthma, according to a 2016 California Health Interview Survey, roughly twice the state average (Real 2019). Efforts against the environmental injustices in this setting are much needed.

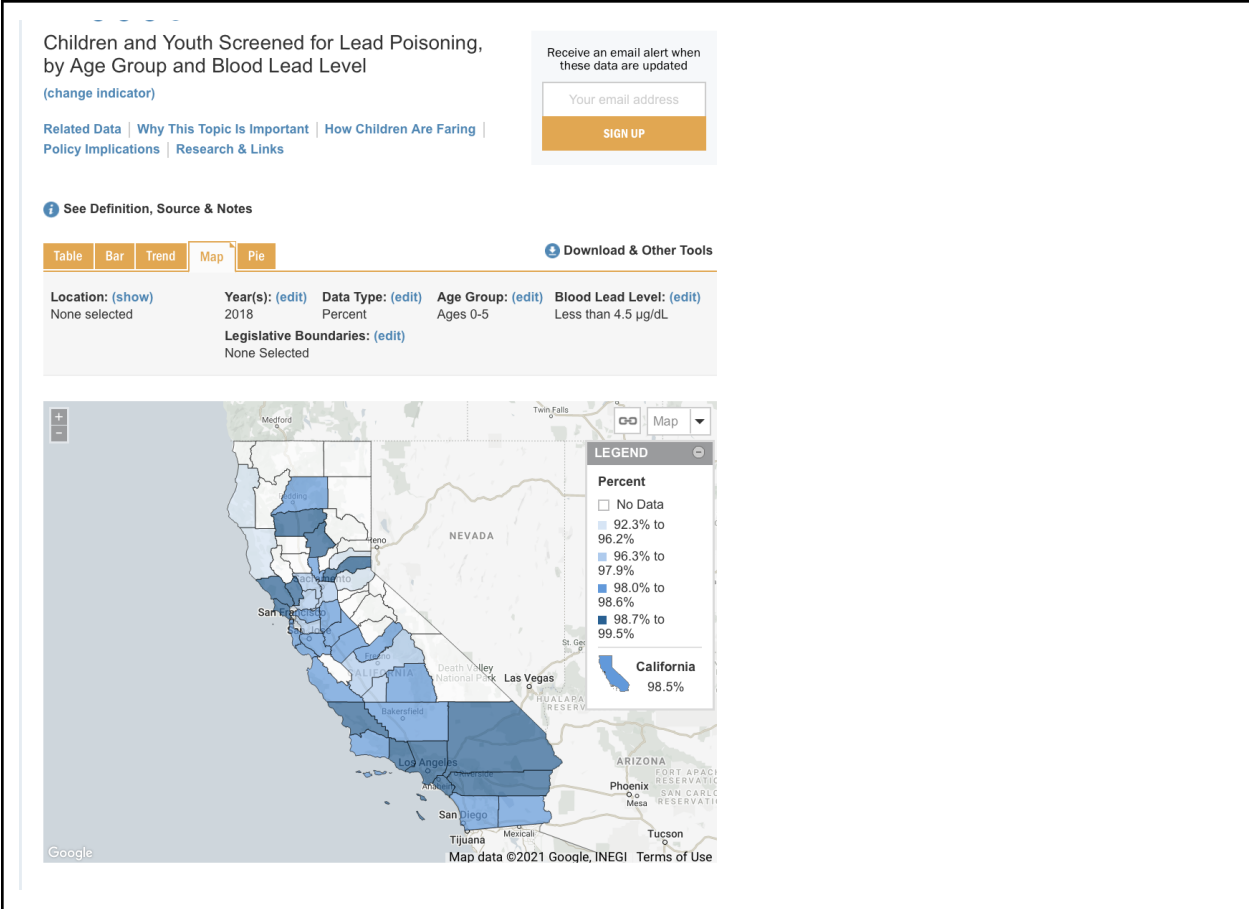


FIGURE 23: According to 2018 data, 1.7% of children ages 0-5 in Imperial County have elevated blood lead levels. Lead exposure could be occurring at home (though air, soil or ingestion of old paint) or in daycare facilities.

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(Screenshot by Khira Pearlstein, July 7, 2021)).

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