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**ANTHRO 25A: Environmental Injustice**

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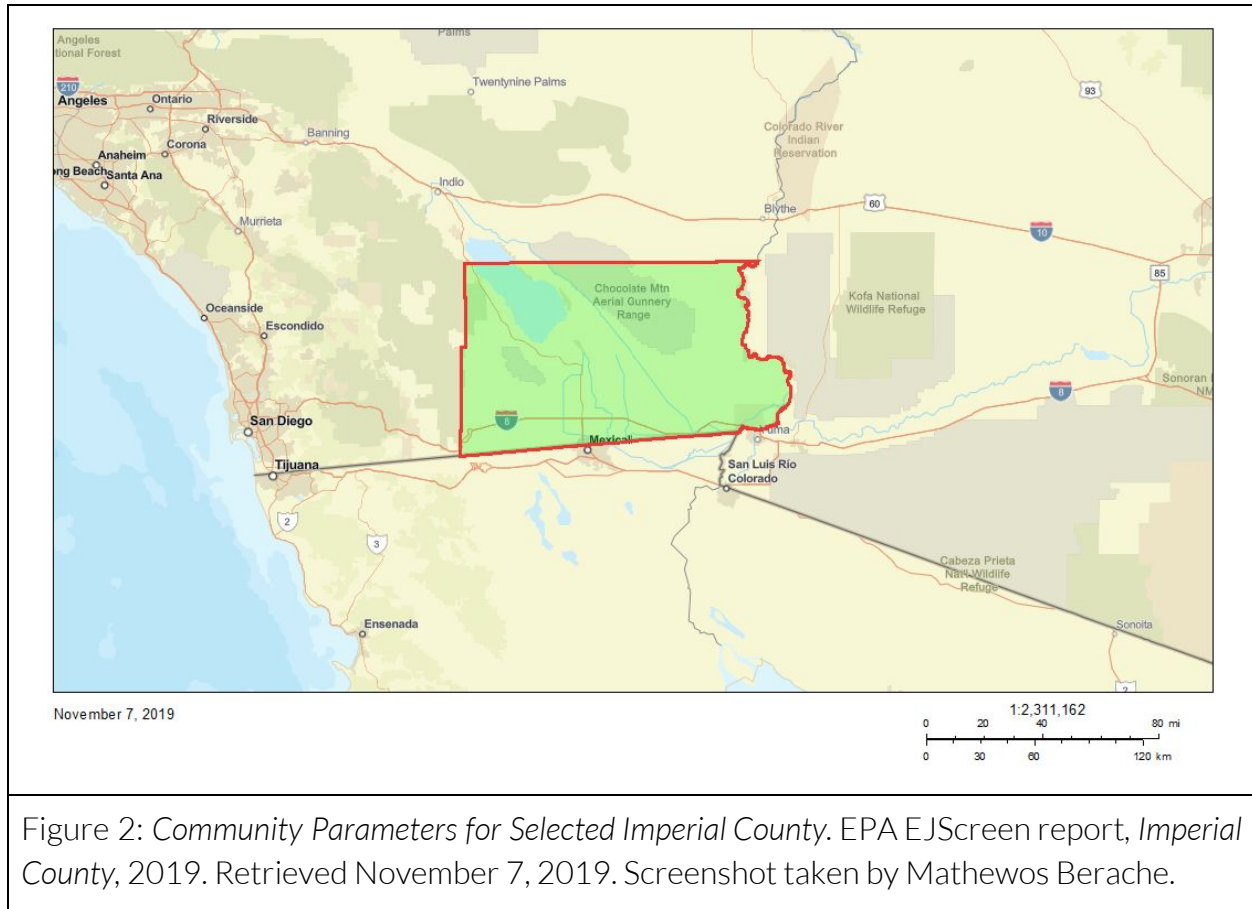
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Figure 1: Cover Image: Location map of Imperial County, Southern California, USA. “Map of California highlighting Imperial County . *Wikipedia*, November 25, 2016. [https://commons.wikimedia.org/wiki/File:Map\\_of\\_California\\_highlighting\\_Imperial\\_County.svg](https://commons.wikimedia.org/wiki/File:Map_of_California_highlighting_Imperial_County.svg)

## 1. What is the setting of this case? [Mathewos Berache]

The Salton Sea is a lake located in Salton City, Imperial Valley of Southern California (See fig 2), and it “is the largest lake in California, at some 375 square miles” (Davila Fragoso 2016). Also, the median household income in Salton City in 2016 was \$41,844 (Salton City 2019). Normally, in the past, the lake used to fluctuate between a state of a lake and just a dry lakebed due to weather fluctuations. However, in 1905, water from the Colorado River was diverted to irrigate farmlands in the Imperial County, and the gates broke due to a flood, leading to the filling up of the Salton Basin (Davila Fragoso 2016).



In terms of demographics, the population estimate of Imperial County, California from July 1 2018 is 181,287 people (US Census Bureau 2018). This population comprises mostly of Hispanic or Latino (84%), White (10%), followed by Black people(3.4%), and ultimately American Indian (2.5%)(US Census Bureau 2018).

Until the 1970's, the Salton Sea and the area around was thriving as a tourist attraction. It encompassed luxury resorts, piers, yachts and thousands of visitors (Davila Fragoso 2016). This had lead to a peak in the economy, as the tourism industry was the main flow of money and the main source of income for the area. However, with the increasing salinity of the lake and the threat of toxic dust being released into the air, the tourism in the area was detested and experienced an instant downfall. After the water gates had been repaired, the lake was literally replenished only through agricultural runoff, meaning that the sediments were purely toxic and could pollute the air if released as toxic dust. Bruce Wilcox, assistant secretary for Salton Sea policy, said "the air quality, of course, translates to human health, economic viability here in the valley, and agriculture" (Davila Fragoso 2016). Due to the toxic dust released into the air, children and the population in general have been immensely exposed to it, leading to soaring rates of asthma. As the

Salton Sea is disconnected from other bodies of water so the water only leaves through evaporation, which leaves behind all the salt; leading to the lake's extremely salty water. This extreme level of salinity has threatened the ecosystem in the area, such as the birds, which have largely depended on it as a sanctuary for many years. Ultimately, regarding the issue of the Salton Sea, there has been an involvement of "politics of inaction" (Davila Fragoso 2016), because several promises have been made by the state and have not been accomplished.

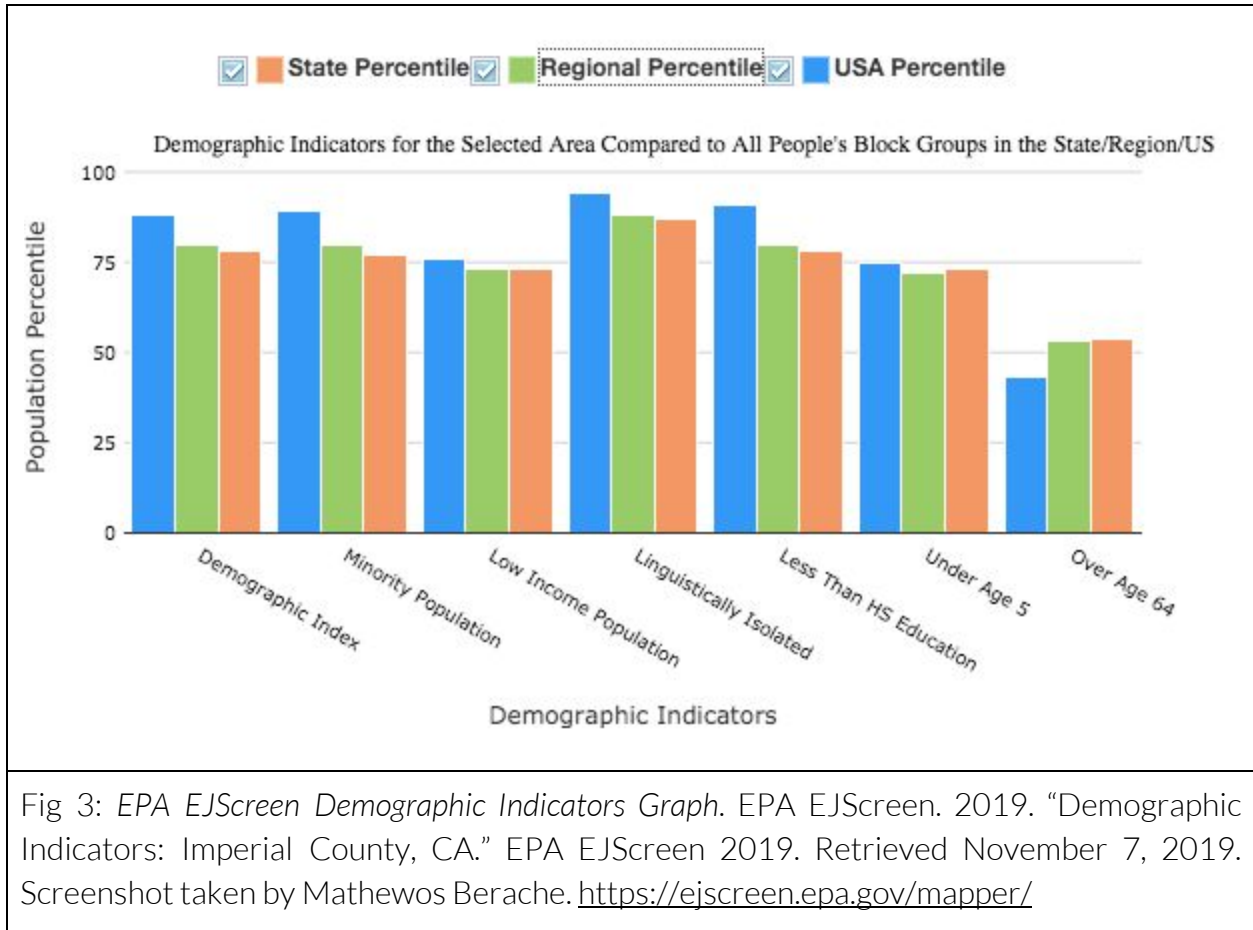


Fig 3: EPA EJScreen Demographic Indicators Graph. EPA EJScreen. 2019. "Demographic Indicators: Imperial County, CA." EPA EJScreen 2019. Retrieved November 7, 2019. Screenshot taken by Mathewos Berache. <https://ejscreen.epa.gov/mapper/>

According to the EPA EJScreen Report (2018), Imperial County as a whole ranks above the 50th percentile for all demographic indicators, and more specifically ranks above the 75th percentile for various indicators: demographic index, minority population, lower education, and linguistic isolation (See figure 3).

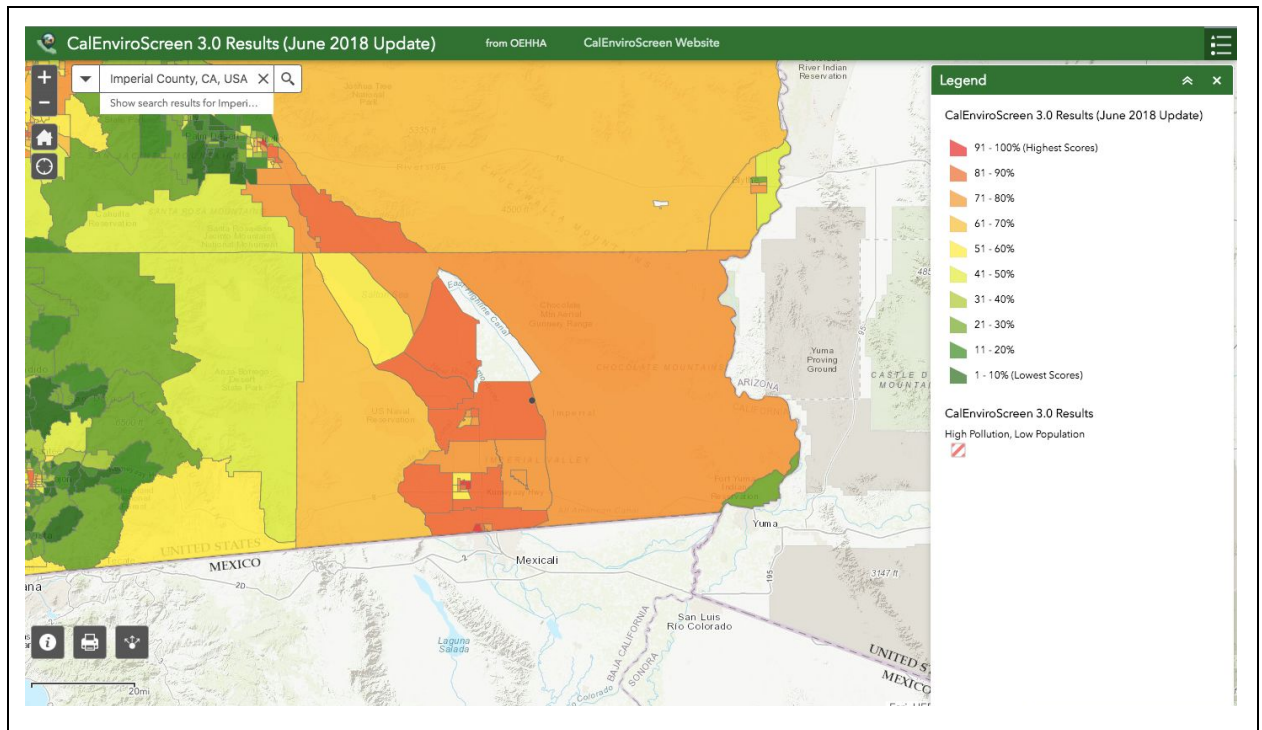


Fig 4: *High Scoring Census Tracts in Imperial County, CA.* CalEnviroScreen 3.0. 2018. “CalEnviroScreen 3.0 Results: Imperial County, CA, USA.” *CalEnviroScreen*, June 2018. Screenshot taken on November 7, 2019. <https://oehha.maps.arcgis.com/apps/webappviewer/index.html?id=4560cfbce7c745c299b2d0cbb07044f5>

This map (Fig 3), created by CalEnviroScreen 3.0, demonstrates which areas in Imperial County have pollution burden and displays the stressors across the map. In this case, the indicators demonstrate that most of Imperial County ranks between 75-80%; as three small areas found on the south side of Imperial County rank between 90-100%(See figure 4).

**2. What environmental threats contribute to slow disasters in this setting? What data is available to characterize these threats posed by slow disasters in the community? [Hannah Dayrit]**

Various environmental threats contribute to the declining condition of the Salton Sea: the absence of water source, toxic dust storms, high levels of salinity, and presence of agricultural runoff.

Although the Salton Sea is the biggest lake in California, it is also located in one of the driest places in the nation. The history of the Salton Sea shows that this lake is technically

not even supposed to be there; it was created in 1905 by massive flooding from the Colorado River when an irrigation canal broke through and water flowed into the Salton Basin for 18 months (Polakovic 2015). This technically “man-made” lake was originally an accident, and now has no source of water inflow, leaving the lake to evaporate.

According to a report written by Gary Polakovic for the Press-Enterprise, the Salton Sea mud contains “enough arsenic and selenium to qualify for disposal in a dump reserved for the most toxic of society’s trash (Polakovic 2019)”; yet there are still people and children breathing this in everyday, creating a huge health hazard for the neighboring communities of Salton City.

Because of rapid evaporation, the shoreline of the Salton Sea is receding— leaving at least 21,120 acres of sediments to hot and dry winds (Polakovic 2015). Given the conditions of the Salton Sea and there is an obvious threat for people living and breathing in this toxic dust that was once the sea bed of Salton Sea. This environmental threat is considered a slow disaster case because although most people will remain unaffected in the current and gradually declining state of Salton Sea upon a short visit, residents that live and breathe in this air unfortunately have to pay with their own health. It is even known that asthma runs rampant in the Imperial County. As reported by Michael Zelenko in the Verge, “more children are admitted to the emergency room here for asthma-related cases than anywhere else in the state; almost 1 in 5 children suffer from the condition (Zelenko 2018)”. This is a staggering and unfortunate number, seeing how this affects the growing children of the population.

Yet the damage doesn’t just stop at humans— large amounts of runoff chemicals in the form of fertilizers or pesticides from nearby agriculture leak into the sea as well, rapidly creating a layer of microbial that suffocates most organisms in the water itself. Masses of dead organisms litter the landscape, to the point where in the span of one day in 1999, “almost 8 million tilapia died in a single day, their silvery corpses spread along the shore” (Zelenko 2018). Salton Sea’s high level of salinity and contaminants kill many species of fish and migratory birds in large masses.

With a number of problems surrounding the Salton Sea— high salinity levels, harmful dust emitted in the air, high levels of asthma and respiratory disease and imbalanced ecosystem— the once popular tourist hotspot is now considered a health and ecological disaster.



Fig 5: The Salton Sea in the 50s and 60s had a reputation of beautiful desert oasis. "THE SALTON SEA - The Valley'S Great Challenge | Coachella Valley Weekly". 2013. Coachella Valley Weekly. <http://coachellavalleyweekly.com/the-salton-sea-the-valleys-great-challenge/>.





Fig 6: The once popular tourist destination now a ghost town. Diamond, Krista. 2017. "Why The Salton Sea Is The Most Important Lake You've Never Visited". Rootsrated. <https://rootsrated.com/stories/why-the-salton-sea-is-the-most-important-lake-you-ve-never-visited>.

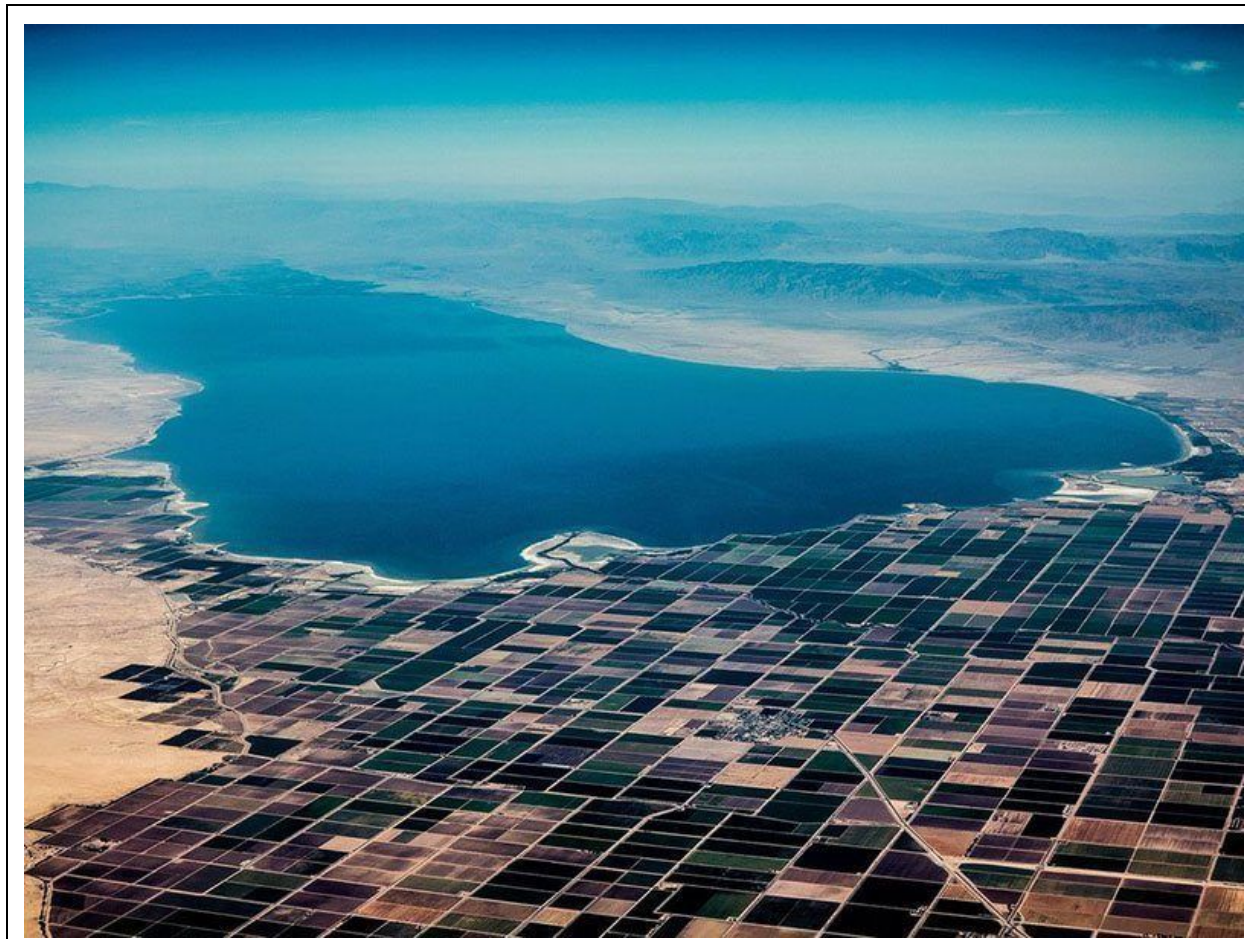


Fig 7: *The Salton Sea and nearby agricultural fields.* Photograph by Ker Than, for National Geographic "Can California Farmers Save Water And The Dying Salton Sea?". 2014. *Nationalgeographic.Com*.  
<https://www.nationalgeographic.com/news/2014/2/140218-salton-sea-imperial-valley-qa-water-conservation/#close>.



Fig 8: *Piles of dead fish seen on the bank of the Salton Sea.* Photograph by Xinhua/Yang Lei via Getty Images. "Can A New Salton Sea Plan Fend Off Ecological And Health Disasters?". 2019. Water.

[https://www.newsdeeply.com/water/articles/2017/11/10/can-a-new-salton-sea-plan-fend-off-ecological-and-health-disasters.](https://www.newsdeeply.com/water/articles/2017/11/10/can-a-new-salton-sea-plan-fend-off-ecological-and-health-disasters)

**3. What factors -- social, cultural, political, technological, ecological -- contribute to environmental health vulnerability and injustice in this setting? [Ali Amiri]**

Salton Sea Located in Imperial County, which is located in the dry Southern California Desert as seen is Figure 8 the Sea is very easy to notice as well.

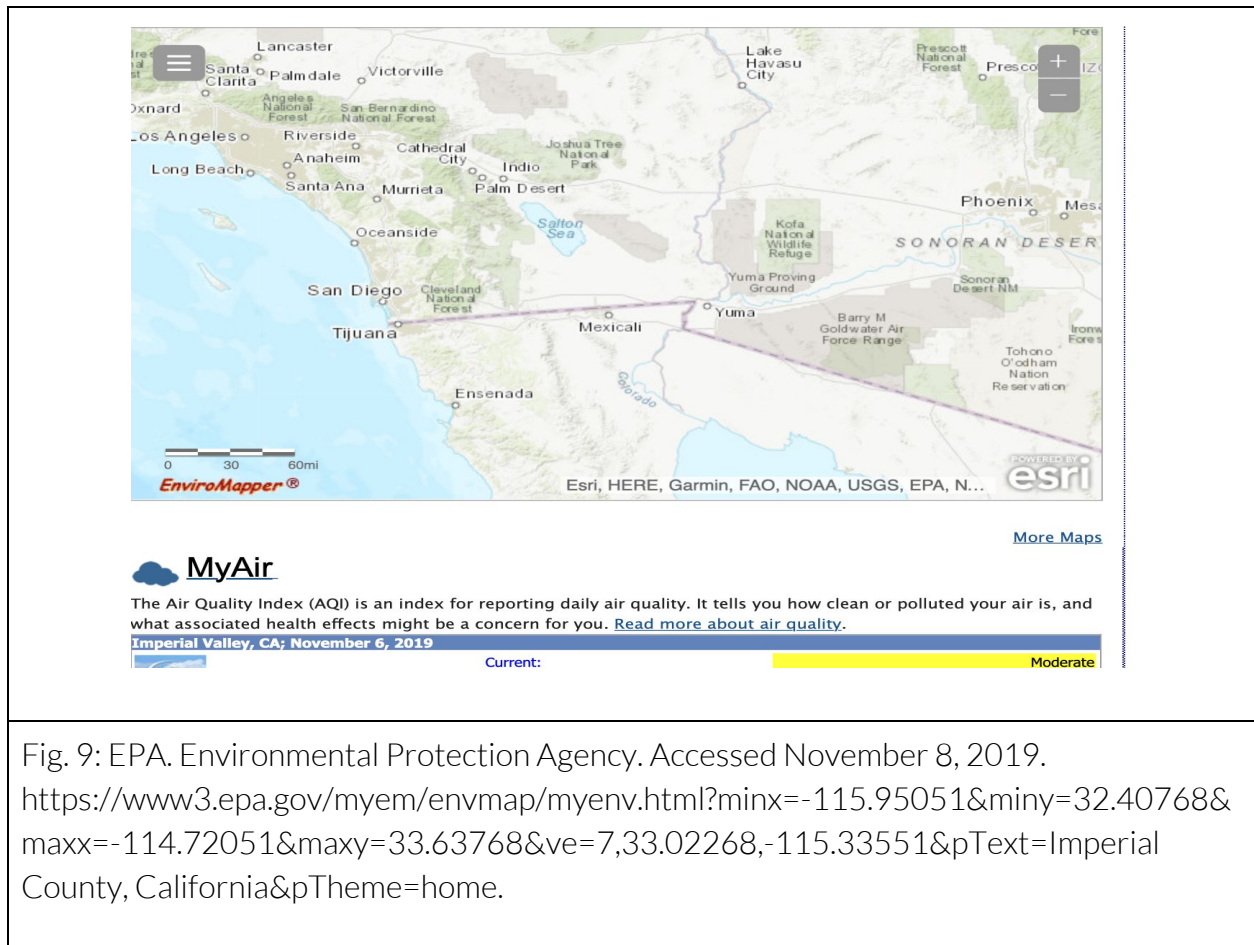


Fig. 9: EPA. Environmental Protection Agency. Accessed November 8, 2019.  
[https://www3.epa.gov/myem/envmap/myenv.html?minx=-115.95051&miny=32.40768&maxx=-114.72051&maxy=33.63768&ve=7,33.02268,-115.33551&pText=Imperial County, California&pTheme=home](https://www3.epa.gov/myem/envmap/myenv.html?minx=-115.95051&miny=32.40768&maxx=-114.72051&maxy=33.63768&ve=7,33.02268,-115.33551&pText=Imperial%20County,%20California&pTheme=home).

The County of Imperial County most known for its Agriculture which is the “backbone for its main economy in the area.” As seen in figure 10 the Agriculture brings in revenue and creates jobs for the county but it also brings in toxic chemicals which then mix in with the air and dust and then cause Toxic Dust which is harmful to the living things in the area. As seen in figure 10 the air quality has just been getting worse and worse every year.

## Economic Contributions of Imperial County Agriculture

### For 2016, Imperial County Agriculture:

#### **...contributed a total of \$4.50 billion to the local economy, including:**

- \$2.94 billion in direct economic output, representing 25.9% of the county's total economic output.
- \$1.56 billion in additional economic output in the form of expenditures by agriculture companies and their employees.
- This equates to over half a million dollars per hour and \$12.3 million per day.

#### **...provided 24,429 jobs, including:**

- 12,916 direct employees, or about one out of every six jobs in the county.
- 11,513 additional jobs attributable to expenditures by agriculture companies and their employees.

#### **...maintained exceptional diversity of agricultural commodities, providing stability within the agricultural and broader county economy.**

- The Shannon-Weaver Diversity Index measures economic diversity. Imperial County agriculture's score for 2016 is 3.23.

Fig. 10: Crops Report Plus, December 2017. Screenshoted by Ali Amiri on November 7, 2019

[https://www.co.imperial.ca.us/ag/docs/spc/2016\\_Imperial\\_County\\_Crop\\_Report\\_Plus.pdf](https://www.co.imperial.ca.us/ag/docs/spc/2016_Imperial_County_Crop_Report_Plus.pdf)

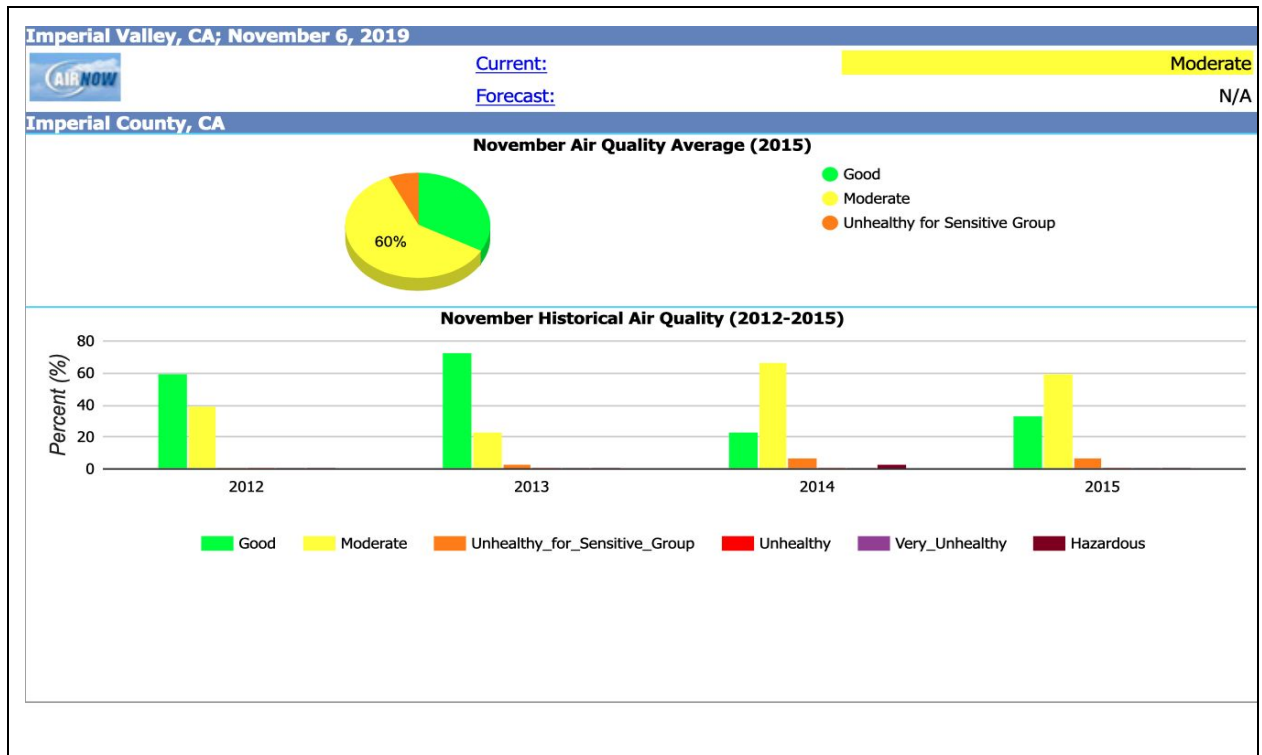


Fig. 11: EPA. Environmental Protection Agency. Accessed November 8, 2019.  
[https://www3.epa.gov/myem/envmap/myenv.html?minx=-115.95051&miny=32.40768&maxx=-114.72051&maxy=33.63768&ve=7,33.02268,-115.33551&pText=Imperial County, California&pTheme=home](https://www3.epa.gov/myem/envmap/myenv.html?minx=-115.95051&miny=32.40768&maxx=-114.72051&maxy=33.63768&ve=7,33.02268,-115.33551&pText=Imperial%20County,%20California&pTheme=home).

According to “bestplaces.net as seen in figure 21” the areas unemployment stands at 20 percent, and the average household income comes in at 34,280 compared to the average household income in the United States which is 57,652. The Family Median income is at 46,486 compared to 70,850 on the national scale. The local income compared to the national average shows that the people in the area make a lot much less than most places around the United States (bestplaces.net 2019).

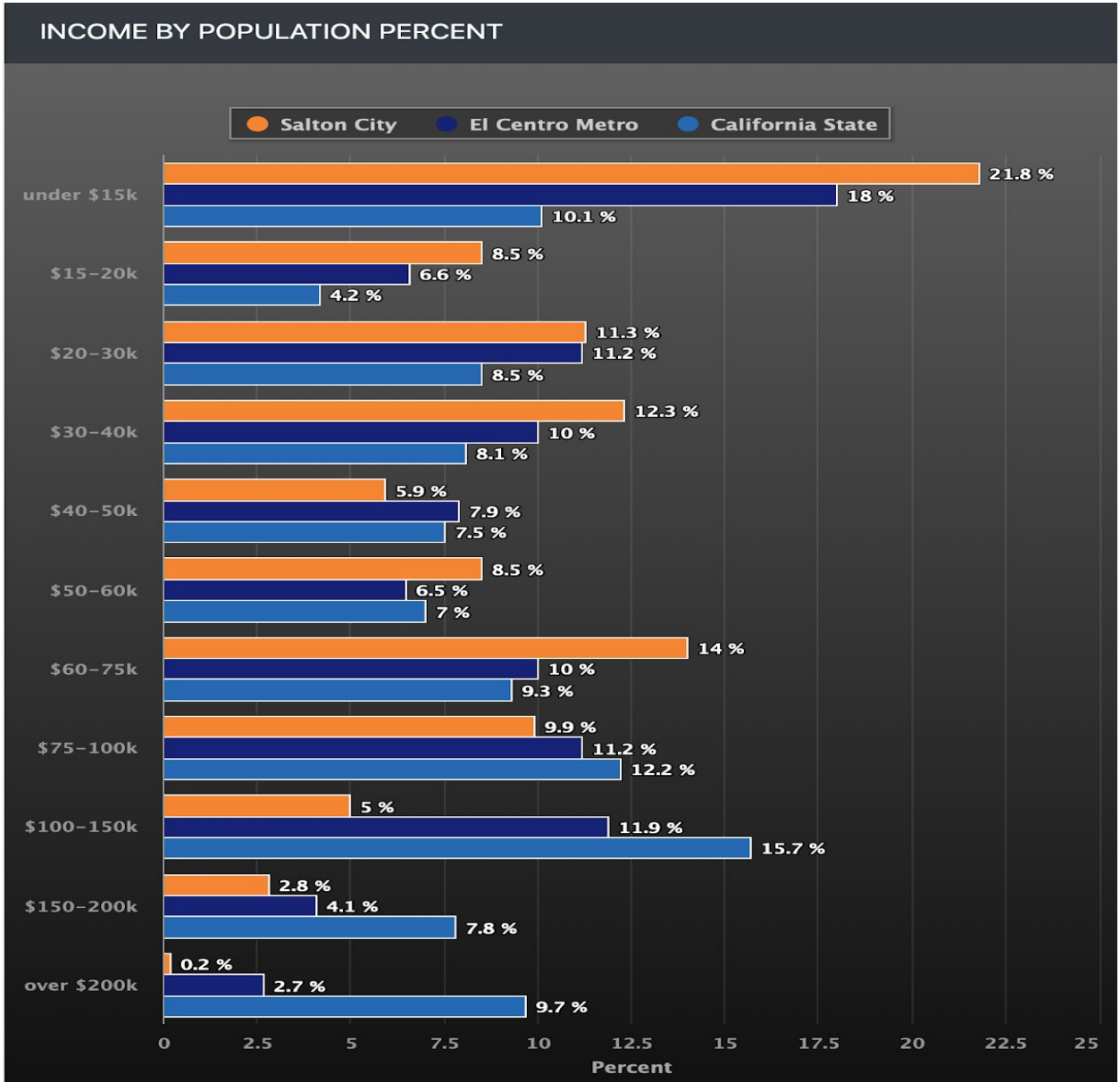
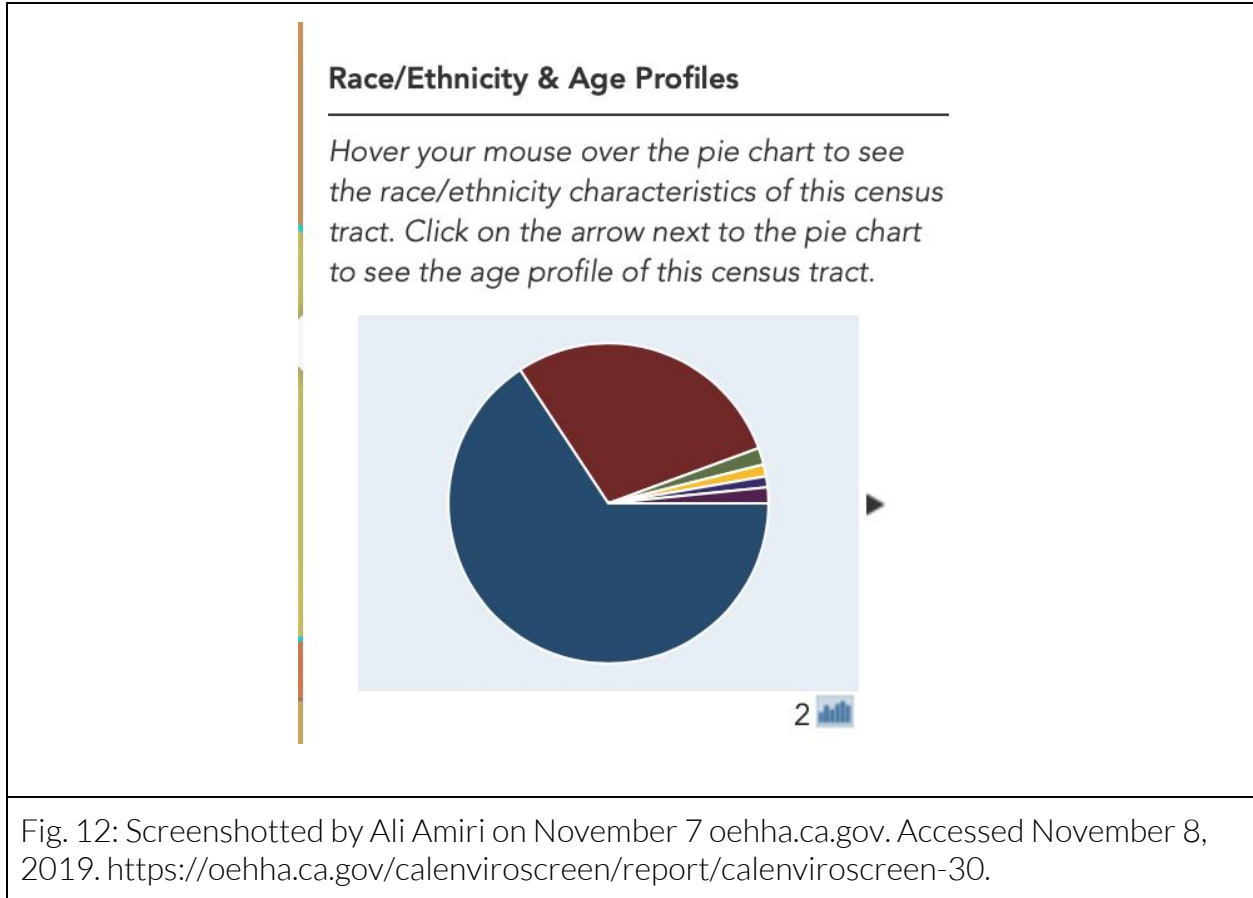


Fig: 21 Income by Population percentage, screenshotted by Ali Amiri on November 11, 2019.

Salton City, California Economy. Accessed November 11, 2019. [https://www.bestplaces.net/economy/city/california/salton\\_city](https://www.bestplaces.net/economy/city/california/salton_city).

“According to CalEnviroScreen 3.0 and figure 12” sixty six percent of the population is made up of Hispanics and twenty nine percent of the population are white while African Americans and Native Americans make up three percent of the population (CalEnviroScreen 2018).



According to “Town Charts figure 12” the dropout rate of school in Salton City is thirty three percent which is higher than the national average of thirteen percent and higher than the California average of eighteen percent. Thirty Six percent of the population has high school degree or GED, thirty percent has less than a high school degree, nineteen percent has some college exposure and ten percent have at least a bachelor's degree (TownCharts 2013).



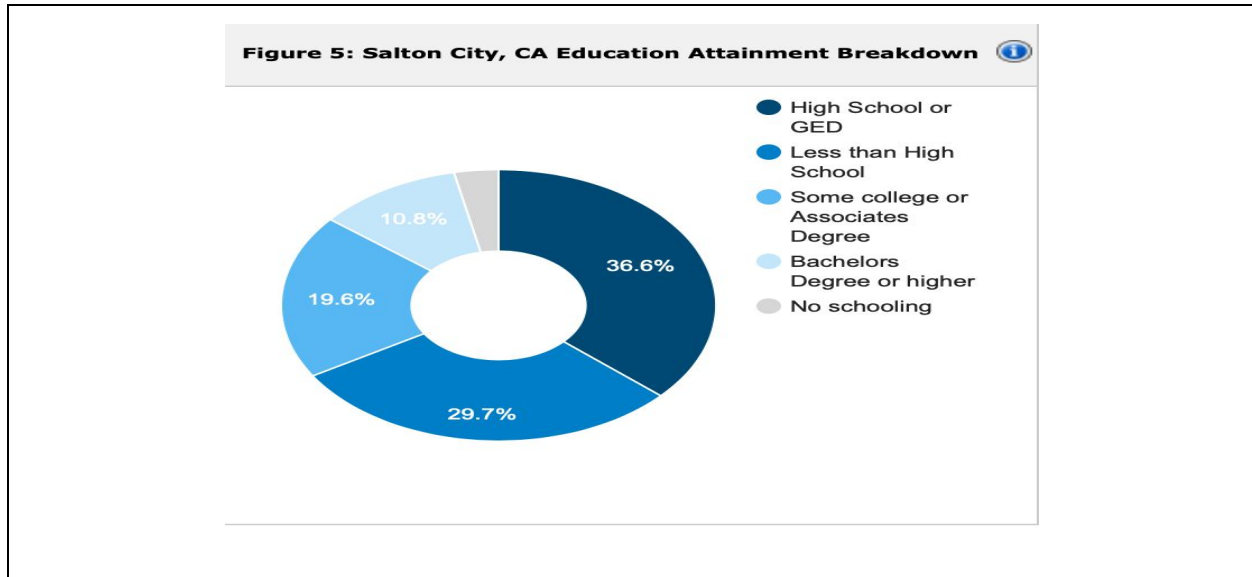


Fig. 13: Town Charts, Screenshotted by Ali Amiri on November 17  
 "Salton City CA Education Data." Salton City CA Education data. Accessed November 8, 2019.  
<http://www.towncharts.com/California/Education/Salton-City-CDP-CA-Education-data.html>.

The people in the area are obviously uneducated compared to other cities across California and even the nation, this creates conflict because the people do not have much of an idea of what is going on to their health and environment. The State of California obviously does not seem to care about the area because they know not all the people in the area know a lot about the issues that they could help with and use their money to help.

The Social Determinant in this case is that the housing is very affordable and much cheaper than most other cities in Southern California so for the people that move here they are not having to worry about paying a lot much more for their rent or mortgage compared to other cities which is a major reason as to why we see people living in this area that are poor. The other factor is that the people do not have much money so they are not going to their doctor regularly and do not get the best Treatment possible as early as possible.

The Senses Tract Score from CalEnviroScreen is as follows, Ozone=74, PM 2.5=11, Diesel=4, Pesticides=85, Toxic Releases=6, Traffic=13, Drinking Water=32, Cleanups=43, Groundwater Threats 14, Hazardous Waste=43, Impaired Water= 81, Solid Waste= 0, Asthma= 39, Low Birth Weight= 46, Cardiovascular Rate= 55, Education= 86, Linguistic Isolation= 68, Poverty= 97, Unemployment= 98, Housing Burden=

#### **4. Who are the stakeholders, what are their characteristics, and what are their perceptions of the problems? [Nelva Perales]**

It is important to realize that the environmental problems facing the Salton Sea is not just a local issue, they go beyond the Imperial County. Local stakeholders are residents of Imperial County, residents of Mexicali, and farmers. Other non-local stakeholders include tourists and the California's 51<sup>st</sup> congressional district representative Juan Vargas.

The first and most affected stakeholders are the residents of Imperial County. These are the individuals that are at the forefront of the issue. They breathe the polluted air and are they are the ones suffering the consequences of asthma. Most of the residents in the Salton Sea and the Imperial County vicinity are below the national income median and typically have a low level of education. Imperial County is composed by a majority of Latino and Caucasian. Their perceptions in regard to the problem is simple yet complicated; they feel left behind, underrepresented, unimportant. A resident express, "families should not have to worry that if their kids go outside and play baseball or soccer... they might get sick" (Aguilera 2019). Although many feels like this, they believe that they should live with the problem because they cannot afford to relocate.

The second and most affected by the threats are residents of Mexicali, on the other side of the United States border with Mexico. Mexicali is the capital of Baja California, a large urban city with a lot of manufacturing companies and farmlands as well. Their contamination also adds to the ongoing air pollution problem. The residents of Mexicali do not have a perception of the problem simply because they might not realize or know the problem in the United States. According to Professor Nieblas in the Autonomous University of Baja California (UABC), "Salton Sea es un riesgo del que los mexicalenses no nos hemos percatado" (La Voz de la Frontera 2019). Professor Nieblas states that people are unaware of the issue, but residents must know the information since Imperial Valley and Mexicali share the same valley and breathe the same air.

The third stakeholders are farmers working the land. They are people of low socioeconomic status that believe they must endure the harsh environmental conditions or be jobless. They feel like this is a tradeoff. Yet, they are the most affected since they expose themselves to the outdoors more.

The fourth and non-local stakeholders are tourists. Older generations remember that the Salton Sea was going to be the new and better Palm Springs, the riviera in the desert. Many of them had weddings and family trips to the lake so the current state of the lake brings them nostalgia and wish the lake gets saved.

The fifth, non-local stakeholder is and should be United States Congressman Juan Vargas who represents California's 51<sup>st</sup> district (where Imperial County is included). He is the person that can make the most noise in the state capital that can help mobilize actions to resolve this crisis. In September 2019, Juan Vargas called for hearing on the Salton Sea crisis, "I am committed to improving the Salton Sea and protecting the public from this environmental hazard" ("Rep. Vargas Calls for Hearing on Salton Sea Crisis" 2019).

It is crucial that all stakeholders get together to make a change and improve the environmental and health qualities in the area.



Fig 14: Member Nelva Perales exploring the remnants of the once thriving Salton Sea. 2019.

## **5. What have different stakeholder groups done (or not done) in response to the problems in this case? [Zizheng Jin]**

The three stakeholders are 1) Imperial County 2) Public health Organization 3) The local residents.

According to the latest report, Imperial County, where the Salton Sea is located, its government has claimed the situation of the Salton Sea to be a public health emergency, and the County “aiming to force Gov. Gavin Newsom and federal officials to free up emergency funds and take immediate action to tamp down dangerous dust” (Wilson 2019). The contaminated water caused by agricultural dumping and military testing is evaporating and causing air pollution. Since the environmental damage has been out of control that Imperial County can no longer afford to reverse, they thus must seek for more funds, which led the local government to strongly ask the state governor and the federal officials. The fund and related actions were never done in the past 14 years even if that issue has been reported multiple times, and this time is different. The local government is fighting until the problem gets done.

Because of the air pollution, the local residents are getting asthma. The Respira Sano program, which is developed by CCV and San Diego State University, helps the residents to get possible protection. To be specific, they sent health workers to consult with families and teach them with adequate protections. For families who lived within the danger, their top concerns would be their children. The nonprofit’s School Flag Program that helps the children stay away from asthma has also been operational. The program established a network that monitored the air quality so that educators could react immediately to what’s coming to their students. However, according to the article, the author admits “the educational programs like these are stopgap solutions because knowing the risks doesn’t protect you” (Zelenko 2018).

As for the local residents, most of them are doomed, literally, because only a few people who could afford moving. Although the “demand for housing in California continues to outstrip supply, low-income families are forced to leave the precarious area” (Zelenko 2018), most of them didn’t move, even if they all claimed such desire to leave the city. The reason is obvious because they just couldn’t afford. Take an example from Villa, an asthma patient in the valley, stated that “leaving behind your community is so hard, so we do what the chameleons do, to adapt it” (Zelenko 2018). Of course, what hindered those residents

was the reality, the poverty. As a result, most of them chose to stay and go with the disaster with knowing the terrible fact that they had to live with disaster.

Above information contains three stakeholders and actions they did.



Fig 15 Patients receive nebulizer treatments in the ER of Pioneers Memorial Hospital in Brawley.

[https://cdn.vox-cdn.com/thumbor/NJA--mGTA\\_X\\_Q0bINEDWFhdlqNg=/0x0:1800x2700/1720x0/filters:focal\(0x0:1800x2700\):no\\_upscale\(\)/cdn.vox-cdn.com/uploads/chorus\\_asset/file/11489013/06.04.18\\_The\\_Verge\\_Salton\\_Sea\\_0089\\_2.jpg](https://cdn.vox-cdn.com/thumbor/NJA--mGTA_X_Q0bINEDWFhdlqNg=/0x0:1800x2700/1720x0/filters:focal(0x0:1800x2700):no_upscale()/cdn.vox-cdn.com/uploads/chorus_asset/file/11489013/06.04.18_The_Verge_Salton_Sea_0089_2.jpg)

## **6. How have big media outlets and environmental organizations covered environmental problems related to worse case scenarios in this setting? [Takumi Jeff Okamoto]**

News surrounding the Salton Sea and the whole of Imperial County commonly note a set of themes. Many news articles, for example, *The Atlantic*, center around the rapid receding of the shoreline since the 1990's, and how it is exposing unhealthy amounts of dust into the surrounding communities (Iovenko 2015). Articles that make mention of the rapidly evaporating water body may also state the history of the Salton Sea, from its formation as

overflow of the Colorado River in 1905, to its continued sustenance via agricultural runoff, to its rise and fall as a tourist attraction in the mid-20th century, similar to the article on the topic by *GreenWire* (Jacobs 2016). One article from *The Verge* also took interviews from affected residents, detailing their failing health, the increased respiratory illnesses in the region, and the increasing salinity killing large amounts of fish (Zelenko 2018). Some articles also detail local and state government efforts to curb the ongoing issues, such as a plan to create wetlands that is both behind schedule and slow to approve (James 2018). Likewise, this frustrates local organizations such as the Imperial Irrigation District and the California Natural Resources Agency, whose goals are to mitigate the many problems of Salton Sea. In addition, it appears there is little attention from groups outside California, most proposals and enacted plans originating from state government or local groups. On these topics, a lot of the information comes from *The Desert Sun*, which can be considered their local newspaper, as well as an editorial by the *Los Angeles Times*. Lastly, when talking about the plans the government attempts to put into action, one conspicuous detail is the cost. The plan to create wetlands around the Salton Sea to minimize dust costs \$383 million, risen to \$410 million (James 2018). Another proposal by the state back in 2007 has a potential cost of \$9 billion, which failed to gain traction (Iovenko 2015). The high cost of these plans, and the relatively poor region of Imperial County, are noted to be the reason they fail to gain traction or slow processing. Of particular note is one common figure to appear when addressing government plans, budget, and action; the recently appointed state secretary Bruce Wilcox, responding to a state petition by the Imperial Irrigation District (Jacobs 2016). Many articles will quote his words on the situation at Salton Sea and his plans to mitigate the many problems of Imperial County.



Fig 16: Exposed lake-bed of Salton Sea, a commonly discussed topic  
<https://www.desertsun.com/story/salton-sea/2018/03/21/salton-sea-crisis-fixes-still-lagging-far-behind-and-cost-growing/444109002/>

## **7. What local actions would reduce environmental vulnerability and injustice related to slow disaster in this setting? [Collective]**

To reduce environmental vulnerability and injustice in these cases, local authorities should take it upon themselves to not only educate nearby residents of the health hazards, but to also take immediate action to prevent long term cases and impacts.

1. (Highest Priority Action) Money is the fundamental factor for all other solutions. The fund is required immediately, or should it be restated like such protective action should've been done when the disaster was first spotted. Frankly, appropriate budget could solve anything, but it also was the biggest problem. The Congress has signed to the Reclamation Act in 2003, but there was no fund. In 2007, there was a sum of money for the project, "Later in 2007, Sen. Barbara Boxer

authorized the Army Corps of Engineers to spend up to \$30 million on Salton Sea projects”, however, “the money was never usable until 2015” (Parker 2015). Unfortunately, the money couldn’t help the environment because it’s too late and little. In other words, if the local government had strived harder to attain enough money for the plan and cared more about the Salton Sea area, the environmental disaster would’ve been recovered today.

2. If the situation within Imperial County is to be solved in a prudent manner, a push for government response is absolutely necessary. Therefore, the people should organize protests to call attention to the many problems caused by the neglect of the Salton Sea and the slow response by the government to address the air pollution and stop the accumulation of poisonous dusts.
3. . From our point of view, the species that depended on the Salton Sea basin as a haven have been particularly affected extremely. One of the solutions that the local government could do would be to create a new sustainable habitat for the endangered animals and relocate them there. This would provide the species with a safer new refuge compared to the Salton Sea, where some were on the brink of extinction.
4. An additional local action that can be done is to install free air filtration systems in schools, homes, and businesses in Imperial County to minimize dust pollution in these infrastructures. (California Air Resources Board 2018) (See Figure 17) There have been proposals in the past, but none of them have gone to fruition.

Ultimately, local actions are vital, money being the most important in this case, in terms of reducing the environmental vulnerability and injustices that are present, because the local people, government, or organizations have firsthand engagement with the issue in comparison to extra-local or international bodies.





Fig 17: Local Residents and Tracking California set up an air monitoring project to help reduce air pollution in the community.

<https://trackingcalifornia.org/imperial-air-project/imperial-air-project-landing>

### **8. What extra-local actions (at state, national or international levels) would reduce environmental vulnerability and injustice related to fast disaster in this setting and similar settings? [Declan Hayworth]**

Extra local actions that would reduce the environmental vulnerability and injustice of the Salton Sea and its nearby residents would be funding for massive engineering projects and legislation to end current and prevent future pollution

The highest priority and most obvious course of action would be obtaining state and federal funding to develop a system capable of siphoning water from the Pacific Ocean into the Salton Sea in order to dilute all of the agricultural runoff and decrease the incredibly high levels of salinity. This would restore the size of the Salton Sea to what it previously was back in 1907 making it more resistant to disturbances such as pollutants and rapid evaporation due to its location. Toxic dust and sulfur bubbles would also no longer escape or blow off the surface of the sea as they would be trapped within the much larger body of water. It is also highly feasible as the Salton Sea is “236 feet below sea level,” meaning that the siphon would require little energy outside the force of gravity to move such an enormous amount of water to restore the sea (Gomes 2018).

Another extra-local action would be developing a salt extraction system to help keep the salinity of the ocean down as it evaporates faster than other bodies of water with the high heat and sun exposure of the local environment. This would make the water healthier and allow it to better sustain life within it rather than killing the majority of its fish and other wildlife populations and having them wash up on the shores as rotting carcasses.

Finally to prevent further contamination and pollution of the sea, the agricultural runoff needs to be prevented from reaching the waters. Even if the sea is restored to its original size and salt is filtered out of the sea to reduce its salinity, it will only become more and more toxic until it reaches the same hazardous levels as it is now but with larger area. This is because there is such heavy amounts of agricultural industry surrounding the sea at higher elevation levels allowing the farmers to flood their fields and let the runoff of excess fertilizers, pesticides, insecticides, herbicides, and salt drain into the sea with ease and no cost to them. The state and federal government needs to create legislation making it illegal to dump their agricultural waste into the Salton Sea and other environments that would only be ruined and create disastrous health hazards for local residents and those even further away.

The federal and state government of California needs to siphon water from the ocean to restore its size, create a salt extraction system to remove its main pollutant of excess salt, and then create legislation preventing further runoff from bringing the sea back to its current state or making it even worse. With these actions, the sea can be restored to its once healthy and thriving state and end the lung related diseases of the locals and sustain its originally vast populations of birds, fish, and other wildlife.



Fig 18: Farmland is flooded to remove excess chemicals and salt, making it flow down into the Salton Sea.

<http://www.sci.sdsu.edu/salton/FarmRunoff.html>

**9. What kinds of data and research would be useful in efforts to characterize and address environmental threats (related to slow disaster, pollution and climate change) in this setting and similar settings? [Jaqueline Perez]**

There are several types of data and research that would be very helpful to address the environmental threats that are present in Imperial County due to the toxic dust that has been released into the air because of the drying sea. It is important to collect data on how much the asthma rates have been increasing among the residents to demonstrate the impact of the problem. The most constructive data to gather would be qualitative, observational, epidemiological and statistical. Research on the exposures and projects to start addressing would also be useful in this setting.

One of the main ones that would help bring awareness about the environmental issues in this setting would be qualitative and observational data. It is crucial to see what many of the residents actually go through and find out what is affecting their daily lives and health. Being able to take testimonies from them and collect data would be one of the most credible data to rely on. A 9 year old said that when she would be playing outside and the sky started to turn hazy from the toxic dust, her chest would tighten and she would struggle to breath ( James 2017). Details like these serve as crucial analysis to characterize the environmental threats that are occurring in the community. (See Figure, left)

Projects to help educate the public and research on how to lower the pollution exposures would be a great way to address the dangers the residents live in. For instance, local residents and a California Environmental Health program have joined together to create an air monitoring project to reduce air pollution exposures in Imperial County (Tracking California 2018). Research and actions like these are useful to collect data and start minimizing the threats people face.

Collecting and analyzing epidemiologic data would also play an important role in identifying environmental threats. This can lead to findings of the health of the people and the causes/risks of them. (See Figure, right) Epidemiological data can support and call for decisions to be made ( Fann 2011). Figuring out the problem that is hurting the health of many demanding policies to be done is a step for the people to be able to fight for environmental justice.

Overall, research on toxins and environmental exposures can help educate the residents about the health risks and make them start taking actions to prevent them from being affected even more. Any statistical data about health diseases that allows them to see the impact of the problem would also be useful to begin addressing the serious chaos pollution is causing in their setting.

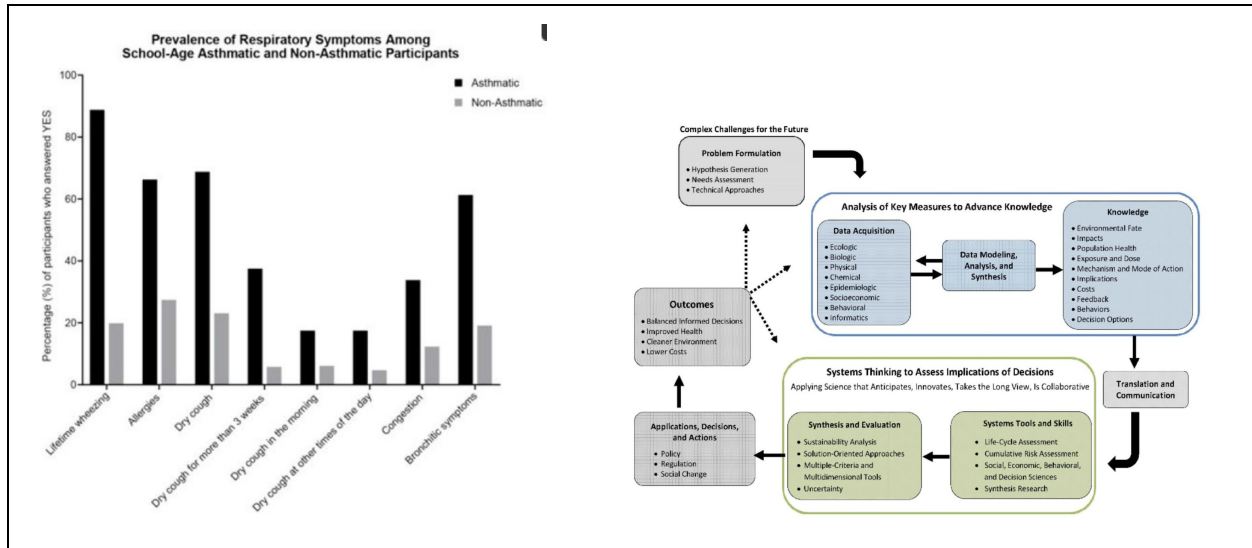


Fig 19: Symptoms and problems residents with asthma face. (left)  
<https://www.mdpi.com/1660-4601/16/20/3828/htm>  
 Types of data and analysis that can lead to better health of the people. (right)  
[https://www.epa.gov/sites/production/files/2016-10/documents/environmental\\_justice\\_research\\_roadmap\\_final\\_10132016.pdf](https://www.epa.gov/sites/production/files/2016-10/documents/environmental_justice_research_roadmap_final_10132016.pdf)

## 10. What, in your view, is ethically wrong or unjust in this case? [Vivian Chu]

There are many ways in which the Salton Sea slow disaster can be considered an act of injustice, however, the four main injustices portrayed in this case are: procedural, economic, intergenerational, and racial.

The Salton Sea has been an issue since the 1900s, however, only recently has this issue been properly addressed by government officials. In 2003, the Imperial Irrigation District countered the evaporation using mitigation water and allowed a 15-year grace period for lawmakers to create and act upon a long-term plan - they did not. Procedural injustice is exemplified in the lateness of California's actions regarding the Salton Sea. The stakeholders of this slow disaster have yet to receive sufficient governmental support which results in even longer lasting effects and impacts of the polluted air. These are consequences the stakeholders must face, rather than the lawmakers who worsened this case.

Imperial County is an agricultural leader in California, and much of its economy relies on

farming (Abrams 2017). As a result, many of the families in the county are financially dependent on this industry and are unable to move away. To contribute to the odds stacked against Imperial County residents, is estimated that “one in four live in poverty” (Zelenko 2018). Due to the numerous financial factors that prevent families from moving away from the polluted area, it is evident that economic injustice takes place in the county. It is unjust that residents who did not partake in the building of this slow disaster must face several health risks because they cannot financially afford to live elsewhere.

The receding lake of Salton Sea leaves behind toxins and chemicals in the air as the water evaporates. This polluted air puts a detrimental impact on the residents of Imperial County, especially on young children. The intergenerational injustice shows in the data regarding the health of children today. For instance, the county is ranked first in California for asthma and respiratory problems emergency room visits for children (Abrams 2017). Though the Salton Sea flooding happened before many of these children were born, they must now face the consequences of irresponsible environmental actions of others.

Imperial County consists of primarily poor and Latino residents, with advocates believing that the ethnicity of the county is the main reason for the neglect. As shown in the procedural injustice, California lawmakers consistently delayed any action towards cleansing the area surrounding Salton City. Plans were implemented to address the ecological issues, but the health of the residents were not prioritized nearly as much (Abrams 2017). If Imperial County were an affluent, white-dominated county, then possibly the issue may have been resolved already. Based on the demographics and negligence from California lawmakers, signs of racial injustice show in this slow disaster case.



Fig 20: Welsh, Alex. 2018. *Benito Rodriguez, age 6, gets a check-up after being hospitalized for several days at El Centro Regional Medical with a virus that triggered his asthma.* Photograph. *The Verge*, June 6 2018.

<https://www.theverge.com/2018/6/6/17433294/salton-sea-crisis-drying-up-asthma-toxic-dust-pictures>

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## FIGURES

Figure 1: Cover Image: Location map of Imperial County, Southern California, USA. "Map of California highlighting Imperial County . Wikipedia, November 25, 2016. [https://commons.wikimedia.org/wiki/File:Map\\_of\\_California\\_highlighting\\_Imperial\\_County.svg](https://commons.wikimedia.org/wiki/File:Map_of_California_highlighting_Imperial_County.svg)

Figure 2: Community Parameters for Selected Imperial County. EPA EJScreen report, Imperial County, 2019. Retrieved November 7, 2019. Screenshot taken by Mathewos Berache.

Figure 3: EPA EJScreen Demographic Indicators Graph. EPA EJScreen. 2019. "Demographic Indicators: Imperial County, CA." EPA EJScreen 2019. Retrieved November 7, 2019. Screenshot taken by Mathewos Berache. <https://ejscreen.epa.gov/mapper/>

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Figure 10: Crops Report Plus, December 2017. Screenshotted by Ali Amiri on November 7, 2019

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Figure 12: Race/Ethnicity & Age Profiles oehha.ca.gov. Accessed November 8, 2019. <https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-30>.

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Figure 16: Exposed lake-bed of Salton Sea, a commonly discussed topic <https://www.desertsun.com/story/salton-sea/2018/03/21/salton-sea-crisis-fixes-still-lagging-far-behind-and-cost-growing/444109002/>

Figure 17: Local Residents and Tracking California set up an air monitoring project to help reduce air pollution in the community. <https://trackingcalifornia.org/imperial-air-project/imperial-air-project-landing>

Figure 18: Farmland is flooded to remove excess chemicals and salt, making it flow down into the Salton Sea. <http://www.sci.sdsu.edu/salton/FarmRunoff.html>

Figure 19: Symptoms and problems residents with asthma face (left) <https://www.mdpi.com/1660-4601/16/20/3828/htm> Types of data and analysis that can lead to better health of the people. (right) [https://www.epa.gov/sites/production/files/2016-10/documents/environmental\\_justice\\_research\\_roadmap\\_final\\_10132016.pdf](https://www.epa.gov/sites/production/files/2016-10/documents/environmental_justice_research_roadmap_final_10132016.pdf)

Figure 20: Welsh, Alex. 2018. Benito Rodriguez, age 6, gets a check-up after being hospitalized for several days at El Centro Regional Medical with a virus that triggered his asthma. The Verge, June 6 2018. <https://www.theverge.com/2018/6/6/17433294/salton-sea-crisis-drying-up-asthma-toxi>

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## APPENDIX

Choosing a Community:

CHOOSING A SLOW DISASTER COMMUNITY SKETCH		
<p>Resources:</p> <ul style="list-style-type: none"><li>● Search community name and “pollution” or “disparities” or “environmental injustice” or “just transition” or “racism”</li><li>● <a href="#">US EPA My Environment</a></li><li>● <a href="#">CalEnviroScreen 3.0</a></li><li>● <a href="#">Value of Lead Prevention</a> (California) – Overall cost of lead prevention and cost calculator</li><li>● <a href="#">Bombs in Your Backyard</a> (USA) – Pollution caused by military operations</li><li>● <a href="#">Coal Ash Ponds</a> (USA)</li><li>● <a href="#">World's Air Pollution: Real-time Air Quality Index</a> (Worldwide)</li><li>● <a href="#">U.S. Government Accountability Office</a> (USA) – Disposal of High-Level Nuclear Waste</li><li>● <a href="#">Nuclear Regulatory Commission Map</a> (USA) – Nuclear facilities undergoing decommission</li><li>● <a href="#">California Open Data Portal</a> (California)</li><li>● <a href="#">EdSource: Chronic School Absenteeism</a> (California)</li><li>● <a href="#">California Healthy Places Index</a> (California)</li><li>● <a href="#">Lung.org Most Polluted Cities</a> (USA)</li><li>● <a href="#">Mapping LA</a> (Los Angeles) – Crime, Education, Income by neighborhood)</li><li>● <a href="#">RWJ Resources for Cultures of Health</a></li><li>● <a href="#">California Poverty Facts</a></li></ul>		
Questions to Consider:	Community 1: Salton City (Imperial County)	Community 2: South Los Angeles
<i>Does the community's Wikipedia page give any</i>	There aren't many Hazardous industries but there are a lot of	There are not many clues to worse case scenarios, but

<p>clues to worse case scenarios? Are there hazardous industries? (Look in the economy section)</p>	<p>farms and they use a lot of pesticides which go into the air. The other issue in the area is that the Salton Sea is drying up because there is no inflow of water, and there is a lot of toxic dust coming up into the air.</p>	<p>this is concluded based of solely the Wikipedia page Research from other page show that South L.A ha heavily polluted air.</p>
<p>Are there local environmental groups in this community? (Possible search term: environmental justice)</p>	<p>1.IVAN (Identifying Violations Affecting Neighborhoods) is an environmental monitoring system that connects the community with real people that can help solve local environmental problems. 2.A collaboration involving a community organization, a state agency, and academic institutions, has created a community-owned and maintained a network of low-cost air monitors in Imperial County. Communities will use data from these monitors to develop strategies to improve public health.</p>	<p>1. Transformative Climate Communities is dedicated to improving public transportation so that residents can reduce their pollution from their individual commutes.</p>
<p>According to the <u>EPA</u>, is this location likely to be in at least 1 RMP vulnerability zone?</p>	<p>Has to be found through epa request- need 24 hours</p>	<p>Has to be found through epa request- need 24 hours</p>
<p>What is the RMP potential in EPA EJ Screen?</p>	<p>84 (regional)</p>	<p>97</p>
<p>Is the community listed in either of these resources? <u>Who's in Danger?</u> (starting on page 59) /// <u>California Fact Sheet</u></p>	<p>The county in which Salton City is located (Imperial County) does appear in <i>Who's in Danger?</i></p>	<p>Los Angeles County is listed</p>
<p>According to the American Lung Association, is the community's <u>state of air</u></p>	<p>According to the American Lung Association, Imperial County has an F as air rating.</p>	<p>According to the American Lung Association, Los Angeles has an F as air</p>

rating?		rating.
<i>Is there adequate news coverage of the environmental hazards in the setting? Does news convey the perspectives and vulnerabilities of all stakeholders?</i>	There is rather low news coverage detailing the region around the Salton Sea, apart from the concern of slow increasing toxic dusts and evaporation of the water. General non-urgency.	There is an adequate amount of news coverage as South Los Angeles is a popular location. The news covers a variety of perspectives.

Community Fast Facts:

COMMUNITY FAST FACTS SKETCH	
Slow Disaster Community: Salton City	
Conduct a “quick” Google search for fast facts about your community: What is the landscape? How densely populated? Main industries? Overall wealth of the region? Brief history? Find quick resources/articles about the community: Recent news? What are the environmental groups? Environmental News? Community vulnerabilities?	
Google Search	News Resources
A Shrinking Sea Mean Toxic Dust The Dying Salton Sea USA Today	<a href="https://news.usc.edu/159380/salton-sea-shrinking-asthma-respiratory-health-air-quality/">https://news.usc.edu/159380/salton-sea-shrinking-asthma-respiratory-health-air-quality/</a>
Landscape Shallow, saline, endorheic (limited drainage basin) rift lake directly on the San Andreas fault. In the Imperial and Coachella valleys.	<a href="http://www.sci.sdsu.edu/salton/ShrinkingSeaToxicDust.html">http://www.sci.sdsu.edu/salton/ShrinkingSeaToxicDust.html</a> <a href="https://www.usatoday.com/pages/interactive/salton-sea/the-dying-salton-sea/">https://www.usatoday.com/pages/interactive/salton-sea/the-dying-salton-sea/</a>
Population Salton City, CA has a population of 5,217; population density is 243 per sq mi	<a href="https://www.areavibes.com/salton+city-ca/mographics/">https://www.areavibes.com/salton+city-ca/mographics/</a>
Main Industries Fishing Industry - popular fishing location Tourist Industry - attracted many tourists; yacht clubs, resorts, and marinas were made in the 1960s	<a href="https://ca.water.usgs.gov/projects/PFRG/SaltonSea.html">https://ca.water.usgs.gov/projects/PFRG/SaltonSea.html</a> <a href="https://ivanonline.org/about">https://ivanonline.org/about</a> <a href="https://www.desertsun.com/story/news/20">https://www.desertsun.com/story/news/20</a>

### Overall Wealth

For Imperial County: median household income of \$44,779, median property value is \$167,700

### Brief History

The Salton Sea is the largest lake in California, at some 375 square miles (970 square km). Thing is, it didn't use to be there. Throughout geologic history, the basin has alternated between being a lake and a dry lakebed as the climate fluctuated over long time periods. Through modern history, it was bone dry. Now the lake gets replenished by irrigation runoff and "municipal and industrial drainage," according to the U.S. Geological Survey. Today, this man-made disaster of a lake has gotten so salty that scientists say it now threatens some of the birds that rely on it.

### Environmental Groups

1.IVAN (Identifying Violations Affecting Neighborhoods) is an environmental monitoring system that connects the community with real people that can help solve local environmental problems.

2.A collaboration involving a community organization, a state agency, and academic institutions, has created a community-owned and maintained a network of low-cost air monitors in Imperial County. Communities will use data from these monitors to develop strategies to improve public health.

### Community Vulnerabilities

Vulnerabilities include toxic dust that occasionally escapes the large body of water consistently killing local wildlife, littering the shore areas with bones and corpses and triggering many lung related

[/03/20/residents-see-zero-progress-salton-a-but-new-officials-say-its-time-turn-page/23485002/](#)

[https://datausa.io/profile/geo/imperial-county-ca](#)

[https://www.niehs.nih.gov/research/supported/translational/community/imperial/index.c](#)

[https://www.desertsun.com/story/news/environment/2019/05/07/salton-sea-deal-reach-cas-largest-water-body-may-finally-get-help/132443001/](#)

[https://phys.org/news/2019-04-editorial-salton-sea-disaster-california.htm](#)

[http://www.nbcnews.com/id/43641145/ns/technology\\_and\\_science-science/t/how-was-salton-sea-created/#.Xbt\\_PC2ZOqA](#)

[https://www.theverge.com/2018/6/6/174394/salton-sea-crisis-drying-up-asthma-toxic-dust-pictures](#)

<p>diseases and illnesses such as asthma. Bubbles of sulfur have also popped out creating pollution that could be smelled as far as Los Angeles.</p> <p><b>Recent News</b>          Around May of this year, the Imperial Irrigation District board of directors votes to allow access across lands for the much needed state wetlands projects, a plan designed to reduce the danger of dust storms and help threatened wildlife. The state of California will be responsible for the maintenance and operation of the project, while if a problem were to arise the cost of any lawsuits or regulatory penalties will be covered by taxpayers. This agreement marks a very important step in the right direction to alleviate problems for the habitat and communities around the Salton Sea.</p> <p><b>Environmental News</b>          Salton Sea, California’s largest body of water, is drying up and leaving an exposed lake bed. This brings a large threat to the surrounding habitat and community— and adds onto the already high levels of asthma and respiratory disease in Southern California. The once popular tourist hotspot is now considered a health and ecological disaster.</p>	<p><a href="https://www.desertsun.com/story/news/environment/2019/05/07/salton-sea-deal-reach-cas-largest-water-body-may-finally-get-help/132443001/">https://www.desertsun.com/story/news/environment/2019/05/07/salton-sea-deal-reach-cas-largest-water-body-may-finally-get-help/132443001/</a></p> <p><a href="https://www.latimes.com/opinion/editorials-ed-salton-sea-failure-20190329-story.html">https://www.latimes.com/opinion/editorials-ed-salton-sea-failure-20190329-story.htm</a></p>
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Stakeholders:

STAKEHOLDER SKETCH			
catalysts	“stakeholders”		corrosions
Money	Residents of Riverside/ Imperial Counties		Lack of awareness



reputation	Residents of Mexico (very close to the US-MEX border)	Low- income status
ethnicity	US Fish and Wildlife Service	Most residents uneducated
Decreasing lake's salinity levels	U.S. Environmental Protection Agency	Lack of urgency
Reducing toxic dust	Regional Water Quality Control Board	Lack of media coverage big city so no one really
Revitalizing tourist sector	Agricultural Farmers from Imperial County	Decaying city infrastructure)
Decreasing asthma rates in the region	IVAN group (identifying Violations Affecting Neighborhoods)	Involves community/ and has their support
Making air quality in the region better	local departments of public health	Decreasing population
Policy	City Government and communities nearby	Corruption and distribution manipulation
Increasing Tourism	Visitors and relative industries	Requires investment lower valued region
Reducing pesticide-related illnesses		
Creating a cleaner/ more sustainable home	The State, Farmers, and Residents	The farmers continue their pesticides and continue to go into the Sea level drops. continues to contain toxic dust and gets we wait and do nothing
Gender	Women are more vulnerable once they are pregnant	
Situated in the Pacific Flyway, so there are many bird species (almost bird sanctuary)		

Responsibility as a public agency to maintain system reliability for the environment and community of Imperial Valley	Imperial Irrigation District	Lack of funds and lawsuits by farmers
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Many Forms of Injustice:

"Many Forms of Injustice" Sketch		
Types of Environmental Injustice	Example of type of justice listed that you've learned about through the course and your research. Try to use course concepts (example: "health disparities").	Data collection/research needed to respond to this type of environmental injustice.
1. DATA INJUSTICE: Do stakeholders have the data they need to understand and respond to environmental hazards in this setting?	A recently released report on Aliso Canyon Natural Gas Storage Facility noted that SoCalGas had 60 previous minor gas leaks before the massive pipe rupture in 2015, which they failed to properly analyze.	For outsiders, e.g., citizens and activist organizations, the need for information on the existence, cause, and context of the hazards are vital. For insiders, e.g., government and company, it is properly regarding the information provided by research and the necessary steps to maintain public safety.
2. ECONOMIC INJUSTICE: Does poverty or uneven wealth exacerbate environmental hazards in this setting?	Yes in this case the people are living in poverty and unable to move to another city, even in their own county. Most of the people that live here are people of color. The people in Richmond California have a higher rate of getting Asthma, having a heart attack, and cancer in the future.	Collect data from the people in Richmond and others in their county and compare. Analyze data to see what chemicals are causing the health hazards.
3. EPISTEMIC JUSTICE: Are	This exists through	Obtaining information from the companies about their

<p>some ways of understanding environmental hazards and harms discounted or silenced?</p>	<p>companies not revealing the potential fast disasters that could occur from an industrial accident out of worry from potential public panic.</p>	<p>potential fast disasters and emergency safety plans.</p>
<p>4. GENDER JUSTICE: How do gender hierarchies shape both exposure to environmental hazards and capacity to address them?</p>	<p>women disproportionately suffer the impacts of disasters, severe weather events, and climate change because of cultural norms and the inequitable distribution of roles, resources, and power, especially in developing countries.</p>	<p>Collect information from different places around the world through survey, NGC enlisting and factsheets about women's specific roles in society in comparison to men along with women's exposure to environmental hazards a last. Then, analyze these numbers and deduce the source of issue and the unequal capacity to address them, with examples and facts backing it up.</p>
<p>5. HEALTH JUSTICE: Are there health disparities or uneven access to health care in this setting?</p>	<p>Example of health injustice: Kids around the Salton Sea have a higher incidence of asthma than other kids in the state due to the sea drying up and releasing toxic dust into the air</p>	<p>Collect data from the components in the soil in hopes to find and reduce asthma triggers</p> <p>Data of kids with asthma in the vicinity of the Salton Sea compared to kids from other countries</p>
<p>6. INTERGENERATIONAL INJUSTICE: Will future generations be impacted by environmental hazards in this setting today?</p>	<p>Yes, current and future generations growing up in poor communities that do not have the wealth for decent grocery stores or schools or proper infrastructure will not have the same opportunities or good health as wealthier communities.</p>	<p>Investing more money into poor communities: infrastructure to make them environmentally healthier and ensure they have decent schools and access to healthy foods and activities.</p>

<p>7. <b>MEDIA JUSTICE:</b> Is there adequate news coverage of the environmental hazards in the setting? Does news convey the perspectives and vulnerabilities of all stakeholders?</p>	<p>After the Bhopal Disaster, the people that lived around the industry, or the residents in general, none of the environmental hazards nor any protective measures were made public.</p>	<p>Collect information on the connections between media companies and large industries or governments in order to deduce what needs to change to get news coverage of the environmental hazards.</p>
<p>8. <b>PROCEDURAL JUSTICE:</b> Have all stakeholders had fair access to government support and law to address environmental hazards in this setting?</p>	<p>The California government took two months to declare a state of emergency and aid the residents of Porter Ranch after the Aliso Canyon gas leak. That is, people were left exposed in these two months.</p>	<p>This sort of information is most likely obtainable through news articles, for the government may not be able to immediately respond in any visible manner.</p>
<p>9. <b>RACIAL JUSTICE:</b> Do environmental hazards in this setting disproportionately impact particular social groups, especially communities of color?</p>	<p>According to LA Times, “a relatively high ratio of Asian and white people in the neighborhood. The figures for 2000 were 60.9% White, 26.8% Asian, 7.5% Latino, 1.8% black and 3.0% other races. So no racial injustice found.</p>	<p>Such information is easy to access. Only need to disclose residents and their identities from the city hall.</p>
<p>10. <b>REPRODUCTIVE JUSTICE:</b> Do environmental hazards in this setting undermine rights to safely parent children?</p>	<p>In Richmond, California exposure to benzene and other fumes released by the oil companies have caused women to give birth to low-weight/ premature babies</p>	<p>Data of babies’ weights in Richmond vs cities in other vicinities.</p>

-Nelva Perales-

Nelva Perales is a fourth-year Biological Sciences student at UC Irvine. She is originally from a low-income community called City Heights in San Diego, California. Nelva will be graduating June 2020 from college and plans to continue her studies pursuing a master's program in Infectious Diseases or Microbiology and Immunology. Nelva aspires to attend medical school one day and become an OB/GYN.



-Vivian Chu-

Vivian Chu is a second-year studying mathematics at the University of California, Irvine. She is interested in exploring the field of applied and computational mathematics. Vivian hopes to go into a career centered around research. Aside from focusing on her academics, she enjoys playing with her dogs when she is back home in the Bay Area.



-Zizheng Jin-

Zizheng Jin is a third-year student studies in FMS. He pursues high GPA overall, so every course he takes matters. Absorbing knowledge is quite an exciting thing to complete. He likes it and glad to try. His favorite food is pizza. Sandwiches are also great choices. One day he will become a necessary man, who is important to live in this world, and finally, he dies with people knowing that he's died. The most unfortunate thing to him is his ever existence would only be a short memory to himself.



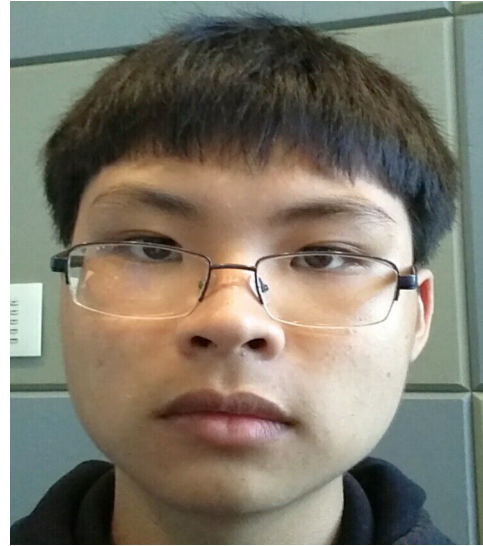
-Jaqueline Perez-

Jaqueline Perez is a second-year student at the University of California, Irvine majoring in Biological Sciences. She is from the small town of Santa Maria, California. Jaqueline plans to graduate in June 2022 with a bachelor's degree in Human Biology and then attend medical school where she will pursue her dream of becoming a pediatrician.



-Takumi Jeff Okamoto-

Takumi Jeff Okamoto is a fourth-year Computer Engineering major studying at the University of California, Irvine. He will graduate June 2020. He is interested in circuit design and wishes to pursue a career in Information Technology. He also has aspirations toward programming and computer repair/troubleshooting, and engages in such as a hobby.



-Mathewos Berache-

Mathewos Berache is a first-year Civil Engineering Student at the University of California, Irvine. He is originally from Eritrea, East Africa. He is Interested in marine science and the effects of pollution and global warming on the oceans, as he is a licensed Scuba Diver. Besides, he also loves playing soccer and is a motorbike rider. Ultimately, he wants to become a construction manager and seeks to build his own construction company back in his home country.



-Hannah Dayrit-

Hannah Dayrit is a second year Biological Sciences student at the University of California, Irvine. She is from Northern California, born and raised in the Sacramento area. She is currently working towards the goal of graduating with her bachelor's degree in the year 2022. Her aspirations are to attend a nursing graduate program within the state of California, in order to help serve the marginalized communities that suffer from inadequate health care and services.



-Declan Hayworth-

Declan Hayworth is a second year Environmental Engineering student at the University of California, Irvine. He is from Southern California and is aiming to graduate by 2022 with a bachelor's and then apply for graduate school. He wants to work on research with biofuels and the recycling and use of bio waste to create a more sustainable society.





-Ali Amiri-

Ali Amiri is a first year undergraduate undeclared student currently studying at the University of California, Irvine. He is from Irvine, California and is currently exploring his options on what to major in. He is currently on the Men's Tennis team is aiming to be a professional tennis player in the near future.

