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ANTHRO 25A: Environmental Injustice

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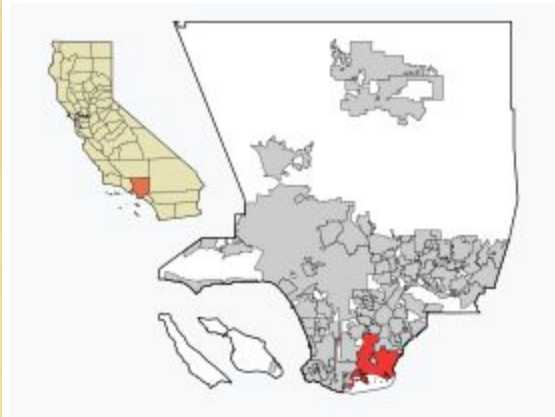


Fig 1: Vintage Map of Long Beach Area

1. What is the setting of this case?

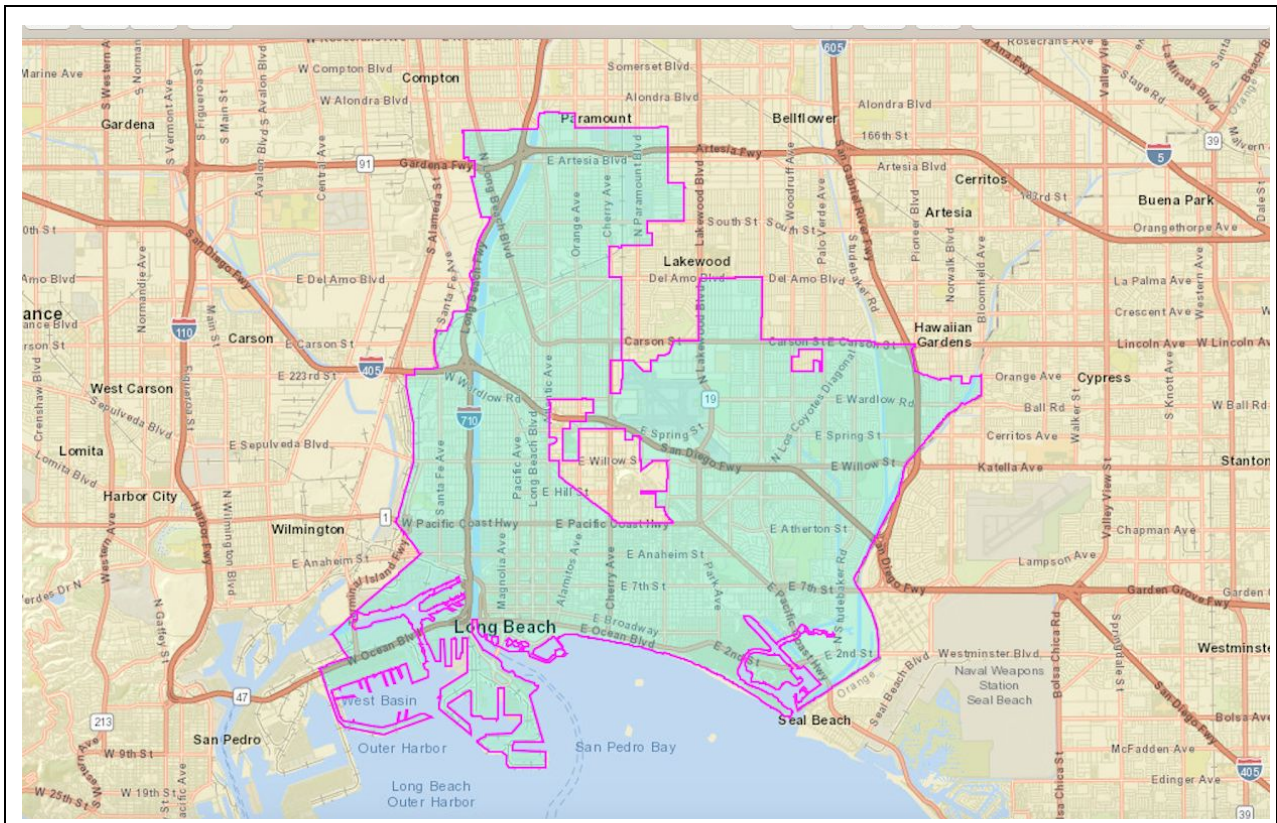


Fig. 1: Selected area for Long Beach, CA. EPA EJ Screen Report, Long Beach, CA, 2018.

Retrieved October 23, 2019. Screenshot taken by Nayelli Ascencio.

As displayed in Figure 1, Long Beach is a coastal city in Southern California nearby Wilmington and Lakewood. This city, on average, gets 14 inches of rain, 0 inches of snow with 287 sunny days per year (BestPlaces.net, 2018). This perfect weather makes it easy for the people to glorify the city for its beaches, proximity to Disneyland/ Knotts Berry Farm, the Aquarium of the Pacific and many more attractions; however, it's often forgotten that it, too, is surrounded by the Port of Long Beach, the Long Beach Cruise Terminal, the Long Beach Freeway (I-710) and many more busy corporations/ forms of transportation that exhaust numerous of fossil fuels. The other major pollutant in the Long Beach area is ozone pollution which is ranked one of the highest in the nation (CBS 2016). The city's top employers include Long Beach Memorial Medical Center, the City of Long Beach, Boeing, and California State University at Long Beach (Long Beach Population, 2019).

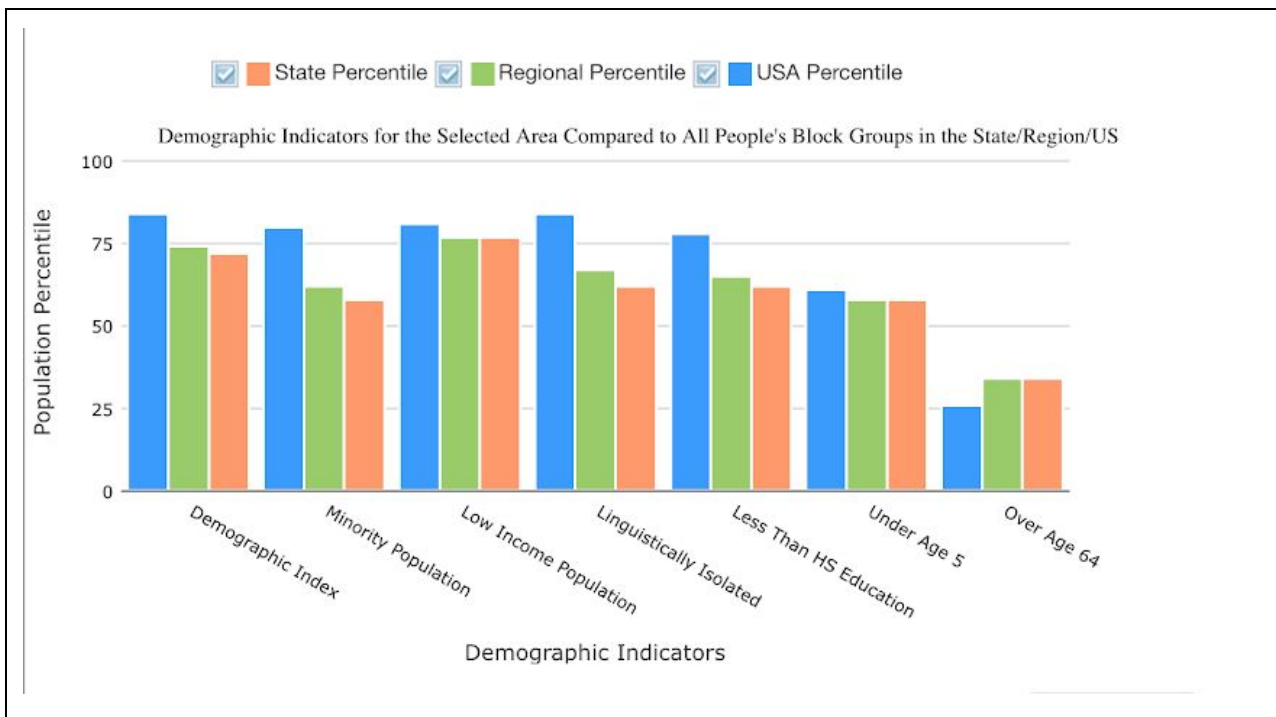


Fig. 2: Demographic indicators for Long Beach, CA. EPA EJ Screen Report, *Long Beach, CA*, 2018. Retrieved October 23, 2019. Screenshot taken by Nayelli Ascencio

The city is composed of 469,000 residents: 52.5% are Whites, 12.9% are African Americans, 42.8% are Hispanic or Latinos, and 13.2% are Asians. The EPA EJ Screen Report

above, portrays some demographic indicators in relation to the State, Regional and USA percentile. The city ranks below the 75th percentile in comparison to the rest of the state in regards to three indicators: percentage of minority population, its linguistic isolation and lower education (Fig. 2). In 2017, the median household income was \$58,314 and the total health care and social assistance revenue was about \$3,359,300 (US Census, 2017). This high median property value decreases the probability of low status families to find a home in a low risk health area. Many lower income houses are situated close to pollution sources causing higher rates of asthma, bronchitis, and cancer in these populations.

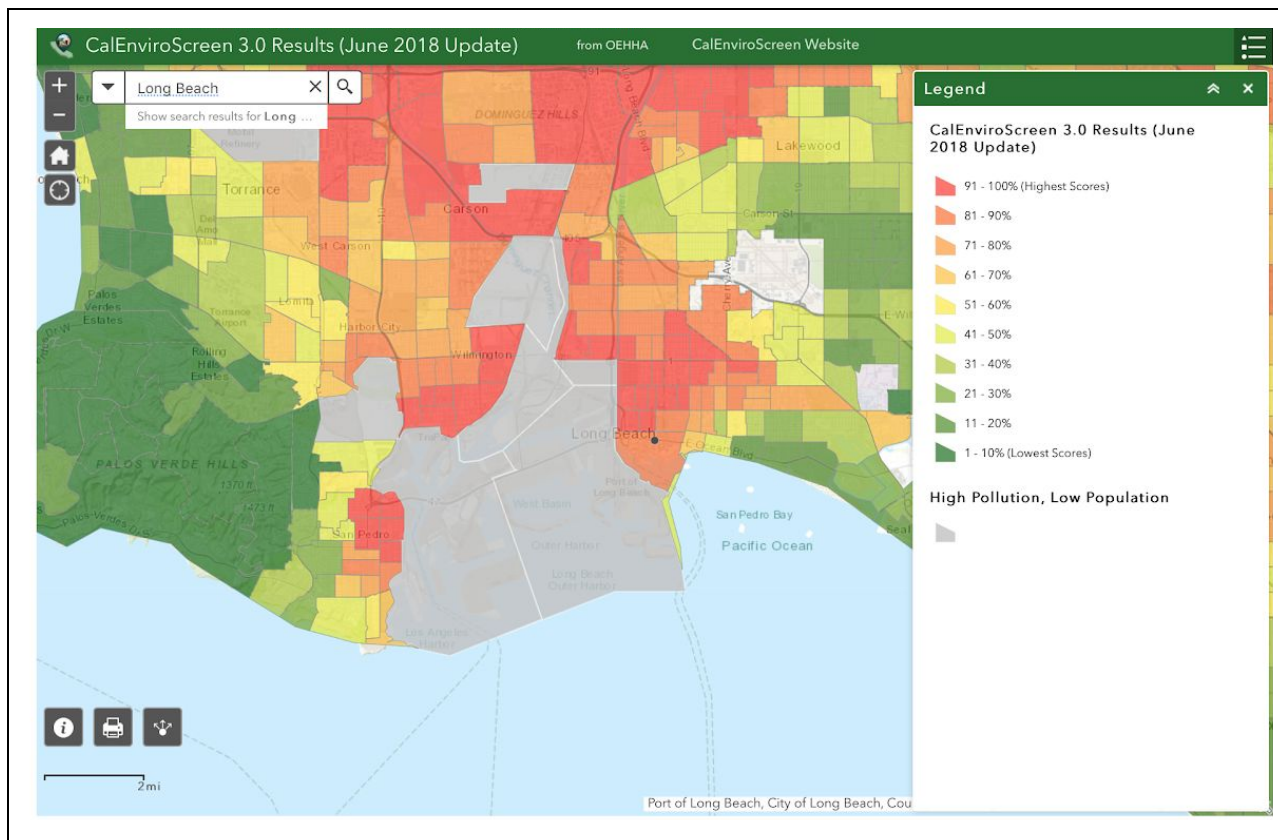


Fig. 3: Highest scoring census tracts in Long Beach, CalEnviro Screen 3.0, 2019. Retrieved October 23, 2019. Screenshot taken by Nayelli Ascencio.

The map above, (Fig. 3), shows the cases of Pollution Burden scores, Population Characteristic scores and the twenty indicators in CalEnviroScreen 3.0. This can be used to help identify California communities that are disproportionately burdened by multiple sources of pollution. Long beach is ranked among 71%-100% (the highest score).

Together the data indicates that there is a significant amount of environmental factors that

affect the health of those living in Long Beach. Its pollution disproportionately affects a large number of Hispanics/ Latinos and African Americans who live near the polluted areas.

2. What environmental threats from worse case scenarios are there in this setting? What data is available to characterize worse case scenario potential? What other environmental hazards are there in this setting?

Long Beach is known for its scenic beauty. However, due to Long Beach's increasing low air quality it is now being recognized as the most polluted city in the country (American Heart Association 2018). This pollution has caused serious health degradation driven by the poor air quality in the community. A major contributor to this result is due to the City of Long Beach existing between the Port of Los Angeles and the Port of Long Beach. It is clear that the city of Long Beach is in an area that plays an important role in the economic flow of the country with such ports. As a result, the emissions from the Port of Los Angeles and the Port of Long Beach have increased the possibility of major health risks, such as asthma, in the community. Especially for those who live in close proximity to the 710 freeway - an area tagged as "the death zone" or "asthma alley" (Jordan 2019). The health impacts created by such pollution brings concerning statistics, "14 percent of residents suffer from asthma, compared to 12.5 in Los Angeles and 8 percent in the U.S"(Portner 2016). In regards to vulnerability zones in Long Beach the city is "likely to be in at least one RMP facility's vulnerable zone" (EPA RMP Vulnerable Zone Report 2019). Facilities such as Pass Christian Treatment Plant, are found in close proximity to communities in Long Beach. This is important to note because a chemical spill by Pass Christian Treatment Plant would travel 2.20 miles and reach vulnerable populations as big as 3,974 (Who's In Danger? 2014).

Marchem Technologies, a company working with Ethylene Oxide has significantly bigger impact in regards to a worse case scenario. A Marchem Technologies chemical spill would travel 3.30 miles and impact a population of 227,959 (Who's In Danger? 2014). These facilities located in the city of Long Beach undoubtedly would be one of the most harmful worst case scenarios. By taking a look at the city of Long Beach's EPA EJ Screen Report (2018), the environmental stressors that goes over the state level is the hazardous waste proximity, traffic proximity, RMP proximity, and others.

These environmental stressors are well on their way to hitting the 75th percentile and or have already reached this percentile as visualized in (Fig 4). In addition to, "Diesel truck fumes... combined with truck corridors, rail yards, oil refineries, and the steady stream of exhaust from the 710 and 405 freeways, hike the region's ozone, smog and fine particulate matter to unacceptably high levels"(Portner 206), the plans that the ports have come to propose are criticized by many environmental groups. This is important because the

regulations followed by the ports and facilities shape the future quality of air in this community. Barboza (2017) quotes Morgan Wyenn, an attorney for the Natural Resource Defense Council, “It’s not a path to zero-emission trucks. It’s a natural gas plan...and it’s a very expensive distraction from where we need to go.” This is an environmental hazard in the city of Long Beach due to the huge amounts of profits these ports and facilities that are made on the expense of the people of Long Beach and their air quality. The plans that are coming forward allow these stakeholders to decide how and when they would like to comply.

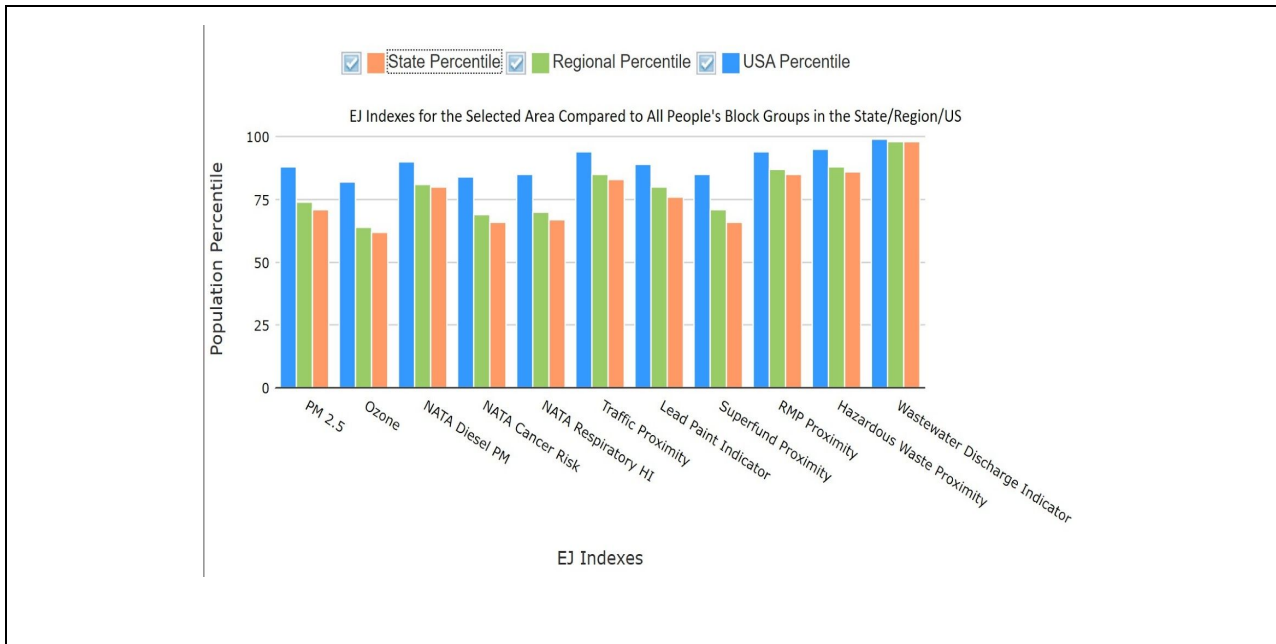


Fig. 4: EJ Indexes for Long Beach. EPA EJ Screen Report, City of Long Beach, 2018. Retrieved October 24, 2019. Screenshot taken by Dinorah Hernandez.

3. What factors -- social, cultural, political, technological, ecological -- contribute to environmental health vulnerability and injustice in this setting? Identify the census tract that scores the highest according to CalEnviroScreen’s index. Identify at least three sources of vulnerability.

Long Beach has a 91 percent pollution burden, meaning that there is a 90 to 100 percent of “potential exposures to pollutants [in this case, PM 2.5, diesel particulate matter, and toxic release] and the adverse pollutants caused by the pollutants (CalEnviroScreen).” These specific pollutants come from the ports and the oil refineries that are behind the homes of the estimated 469,450 people residing in Long Beach. A factor that contributes to

environmental vulnerability is the harbor port in Long Beach, which is one of the busiest ports in America and is a major gateway for trade with Asia. Long Beach Port generates billions of dollars in economic activity each year by being the “shipping hubs that bring our TVs, iPhones, and sneakers to our doorsteps,” but it also generates billions of pollution (Binns, 2018). Another source of pollution is the freeways that surround Long Beach, such as the I-710, I-91, I-605, I-405 and the I-103, all which are used by the “trucks going to and from the harbor fueled by diesel (Binns, 2018).” And it is the disadvantaged minority groups, mainly Hispanic and Black communities, who live near the interstates and who are disproportionately affected by the pollution and are at higher risk of receiving respiratory issues such as asthma (Schmidt 2019). In addition, communities of color and of low-income also live near to cleanup sites. According to CalEnviroScreen, there are more than 30 cleanup sites in Long Beach. These cleanup sites contain hazardous chemicals that require cleanup and that can travel through air and groundwater. And majority of those cleanup sites are in low-income neighborhoods, exposing them to toxic pollutants even more. This exposes them to have a higher risk of getting asthma, premature death, and cancer. For instance, 87 percent of asthma, 90 percent low birth weights, and 66 percent cardiovascular rate of cases in the Long Beach communities (CalEnviroScreen).

Based on the indicator maps in CalEnviroScreen, three vulnerabilities that are seen in Long Beach communities are poverty, linguistic isolation, and housing burden. There is a 30 percent of poverty, a 41 percent linguistic isolation, and a 62 percent in housing burden (CalEnviroScreen). Due to these vulnerabilities, these communities in Long Beach don't have the resources and the finances to move to a community where there aren't as many toxic air pollutants. For example, linguistic isolation creates a barrier for those who live there to educate themselves about environmental injustice and to raise their voice against such injustice. Moreover, poverty and housing burden correlate in that the 62 percent of those with housing burden, pay more than 30 percent of their income for housing, which causes them to have difficulty to pay for necessities, and takes away the possibility

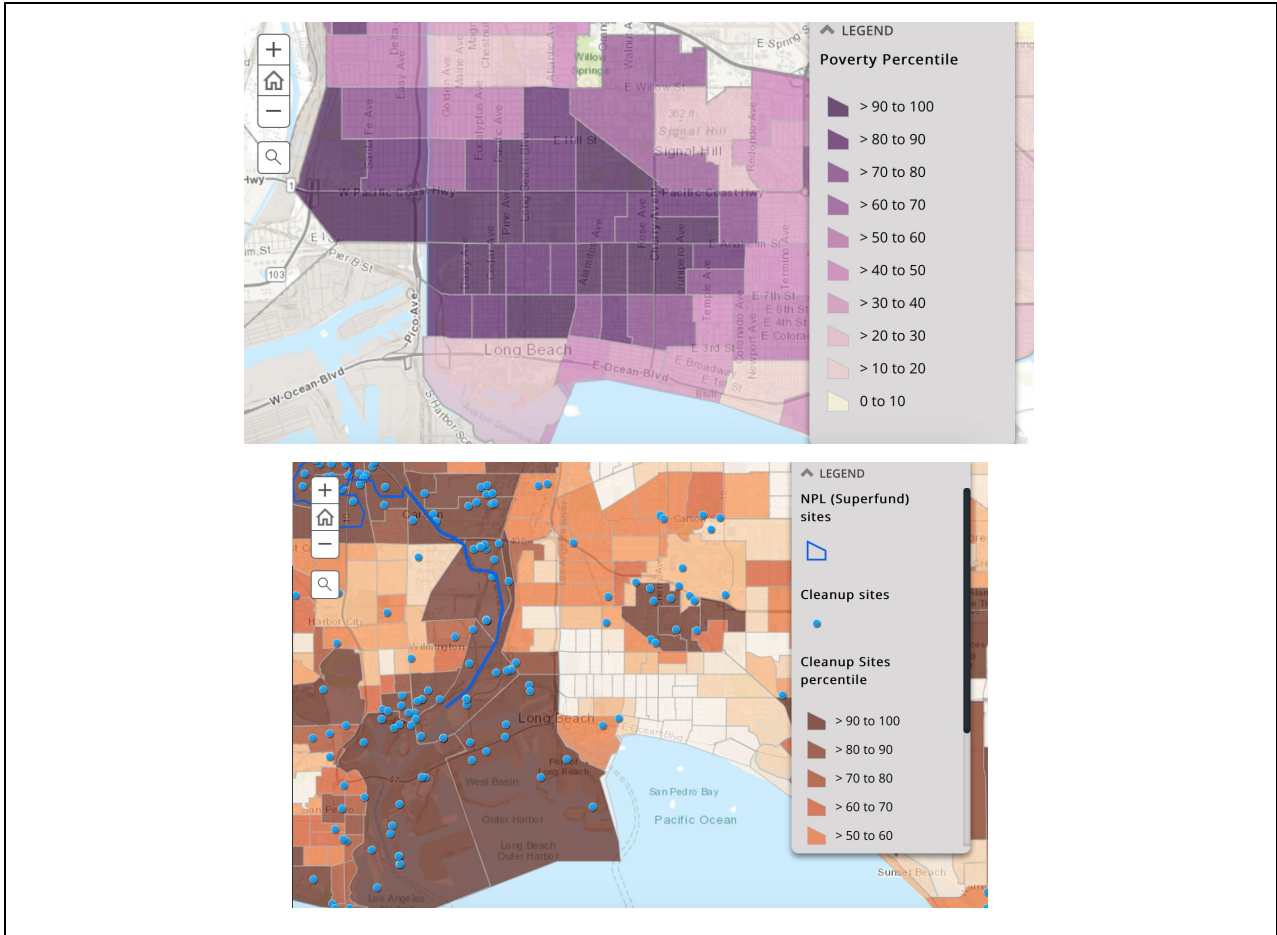


Fig. 5: Indicator maps of Long Beach, demonstrating how the poorer areas is where there are more cleanup sites, CalEnviroScreen 3.0, 2019. Retrieved October 25, 2019. Screenshot taken by Yara Higuera.

4. Who are the stakeholders, what are their characteristics, and what are their perceptions of the problems? Include the “Stakeholder Sketch” in the appendix.

In regards to the pollution of Long Beach, two significant stakeholders include industry workers and the Port of Long Beach Executive Director, Mario Cordero. Each year, the Port of Long Beach handles “more than 7.5 million 20-foot container units (TEUs), with the cargo being valued at \$194 billion” (Port of Long Beach, 2019). This much responsibility requires a lot of manpower. The Port offers “51,000 jobs in Long Beach (2019);” however, “2.6 million jobs throughout the U.S. are related to Long Beach-generated trade” (2019). Whether the jobs range from clerical to dock workers, the Port is putting a majority of the service

workers at a high health risk. For example, in 2017, there was a chemical leakage at the Port of Long Beach. “Workers who were exposed to the leaking chemical, identified as propyl acetate, experienced shortness of breath” (Curwen, 2017). This spill could’ve been more disastrous, but thankfully it wasn’t. The spill put the Port under a close public eye and it raised awareness on the weaknesses of the company and the dangers it creates for its workers and the people surrounding the location of the Port. Most of the workers can only maintain a living by working their jobs at the Port so this accident led to informing officials of the lives they were putting in danger. In terms of gains, Executive Director Mario Cordero has recently been trying to change the Port for the better. He was the one who “pushed the port to go green at a time when it was controversial and took a leadership role to the chagrin of others in the industry... he stood up for Long Beach. He said communities must have clean air and clean trucks” (Uranga, 2017). He fought and is still fighting for his community because if things go wrong, the pressure to correct the tragedies fall into his hands.

Another one of the stakeholders involved in the Port of Long Beach is the Long Beach Board of Harbor Commissioners. The Long Beach Board of Harbor Commissioners is responsible for setting policies for the Port and to manage the Harbor Department. This is important to note because if a fast disaster were to occur, this commission would become responsible for not enforcing their policies strictly upon the Port. The Long Beach Board of Harbor Commissioners' perspective on the problems of pollution in the City of Long Beach is to better regulate the Port in the City of Long Beach.

Our fifth stakeholder is the nonlocal truck drivers that travel distances to the Port of Long Beach. These nonlocal stakeholders are the millions of national workers of jobs that are generated through the Port of Long Beach trade. They are impacted by the Port because a slash in trades or removal of trade through this port would cause a disturbance in their job stability. As seen in the Figure below, there are plenty of trucks bringing cargo to the Port, meaning that outside truck drivers are taking those cargos there and facing the pollution and poor air quality of the Port. A change in the operations of the Port of Long Beach, POLB workers would have to learn to adapt. On the Port of Long Beach’s website, Green Port, it stated: “In 2012, the CTP permanently banned the last remaining older, more polluting trucks from Port terminals” (“Clean Trucks”). This is important to note because a significant change in the operations of the Port includes adaption to these changes by its workers. This can also include things such as budget cuts. The perspective of the workers is to comply with these changes in order to continue having their job secured.

In addition to the other stakeholders mentioned above, another stakeholder is the residents of Long Beach, including the children living in Long Beach. In the article “Breathing Air into

Asthma Prevention in Long Beach” it states: “Diesel truck fumes from the Port of Long Beach—one of the busiest shipping ports in the nation—combined with truck corridors, rail yards, oil refineries, and the steady stream of exhaust from the 710 and 405 freeways, hike the region’s ozone, smog and fine particulate matter to unacceptably high levels”(Jessica Portner 2016). This is important to note because this negatively impacts the health of Long Beach residents, including children, with an asthma diagnosis.

There are many people being overall impacted and these stakeholders are facing the effects of pollution. In Appendix B, there is the “Stakeholder’s Sketch” that has more stakeholders listed down along with reasons why their voice is valuable and has worth but also with reasons why their fight to end the issue with pollution in the City of Long Beach will not be strong enough.

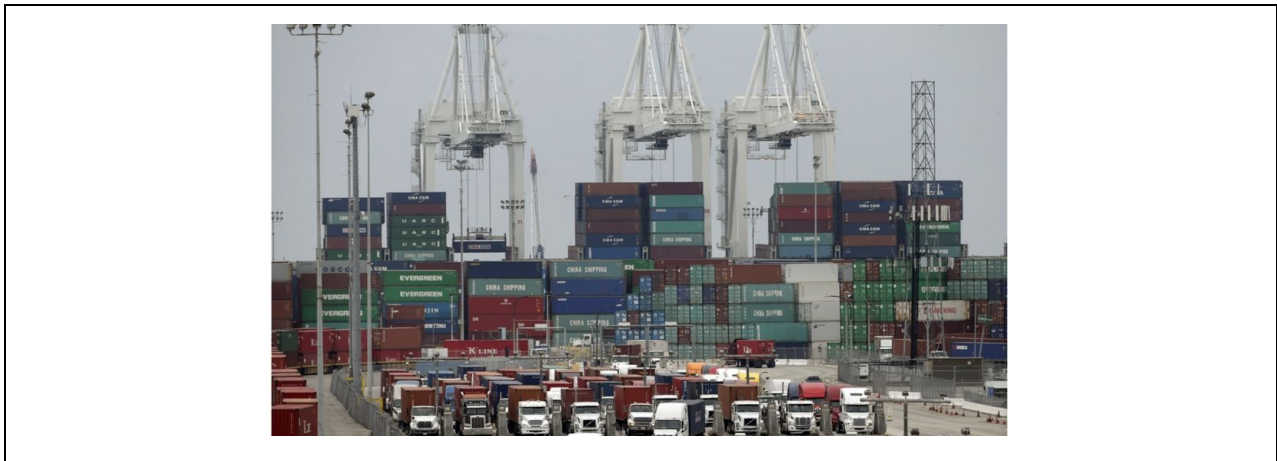


Fig 6: A quick shot of the Port of Long Beach showing plenty of the cargo and the truck drivers that come to the Port of Long Beach, and not all those truck drivers are locally from Long Beach but drive to the Port to deliver for the trade. Screenshot taken by Shirley Rose Manalang from the article: “L.A. and Long Beach Port Truck Drivers, Warehouse Workers Plan to Strike Monday.” Supply & Demand Chain Executive. Los Angeles Times, June 16, 2017. <https://www.sdexec.com/warehousing/news/12344671/la-and-long-beach-port-truck-drivers-warehouse-workers-plan-to-strike-monday>.

5. What have different stakeholder groups done (or not done) in response to the problems in this case?

Some stakeholders in the Long Beach area have made significant progress regarding ozone and diesel pollution particularly local government office holders. California politicians are supporting the federal Clean Air Act enacted in 1963 still to this day, and the results are

significant with a 30 percent reduction in ozone and more than an 80 percent drop in particle pollution in the past 19 years. (Daily News 18). These achievements however are at risk due to the Trump’s administration's efforts to roll back progress in reducing air pollution in California. Another stakeholder in the Long Beach air pollution problem is the port of Los Angeles itself. The port of Los Angeles has been secretly been violating agreements they made to reduce their environmental impact in the area. The port was granted the ability to expand its china shipping area as long as they use the granted money to reduce port emissions. Although the port full filled some of the required environmental regulations some still are not in effect. For example the port ignored environmental regulations instead giving China Shipping North America a waiver “that lets ships ignore an agreement requiring ships to plug into on-shore electrical outlets instead of belching out pollutants while their diesel-engines idle”(Universal Cargo 15). The voices of Stakeholders whose interests lie in the area of profit maximizations and shipping efficiency are unfortunately still heard better than those communities who are hurt by the air pollution from the port.



Fig 7: This image illustrates a source of diesel exhaust in the Port of Los Angeles from a container ship moving about in the port.

6. How have big media outlets and environmental organizations covered environmental problems related to worse case scenarios in this setting?

Long Beach has had issues with declining air quality and general pollution for roughly two decades. The area off the interstate 710 has been labeled as "the death zone" or "asthma alley." Through media platforms, the coverage of the current state of pollution in the area is updated as things get better or worse. Media outlets provide residents of the area with information regarding the environmental conditions and possible hazards from increase in pollution or contamination. In an article from 2014 by Aaron Orlowski of the Orange County Register, he writes about how Long Beach and Los Angeles were both getting ready for a worse case scenario of an oil spill. Local media outlets tend to escalate or completely dismiss various ongoing environmental problems based on their beliefs. In this article, we get a sense of urgency from a local marine biologist "We have a much higher risk of getting a spill in and around our water than other areas of the country"(Orlowski 2014).

Other newspaper outlets, such as the LA Times, provide numerous articles on the ongoing political battles involving environmental activists. They've been publicizing these events for years now and one article stood out called "Environmental groups threaten to sue Port of Long Beach over air pollution" where an environmental group was suing the Long Beach port and created a plan "which was designed to protect the public from harm by sites contaminated with hazardous waste" (Sahagun 2009). Los Angeles neighbors Long Beach, meaning that the LA Times are slightly obligated to report the ongoing events, and as of now, environmental articles provide them with a steady audience. Long Beach environmental groups and national groups seem to recruit individuals of various age groups to their functions as long as they believe in the cause for a better environment to live in. One environmental group that stands out is the Long Beach Environmental Alliance. This organization also uses media platforms such as Facebook and Twitter to spread awareness about coinciding in a green friendly environment as well as to reach a broader audience to inform them about upcoming events such as neighborhood cleanups and opportunities to give back to the community.

The Sierra Club is a national environmental group that has its own chapter set up in Long beach. There they organize "cleanups and plantings and meet with community groups"(Sierra Club 2019). They also do a great job of communicating with local

governments to attempt to strengthen local action plans and regulations. Additionally, Long Beach is home to Cal State Long Beach, a great institute for higher education. There are on campus organizations full of student activists attempting to make a change for the better in their community. The Long Beach Environmental Alliance is dedicated to addressing the detrimental impacts of pollution, climate change, and coastal issues. The organization's utilization of media platforms allow them to spread the word about hosting cleanups, council meetings, and organizational meetings (Barba 2018). By addressing the environmental issues of the community, they are able to recruit many individuals who are adamant about change for the better. Overall, the media does report on environmental problems. The only thing is whether or not they justifiably do so.



Fig. 8 : The Long Beach Environmental Alliance is shown here in one of their many yearly clean ups. They attempt to host and participate in various environmental community activities.

7. What local actions would reduce environmental vulnerability and injustice related to fast disaster in this setting?

When addressing an issue as significant as the ozone levels in Long Beach, it is essential to inform the local community on ways to decrease their pollution production. In 2010, the Long Beach City Council constructed a Sustainable City Action Plan, which focuses on methods for citizens to produce less waste and air contaminants in order to protect and restore their environment (SCAP 2010). Specifically, this plan concentrates on seven different life aspects that one may come across during their daily routine: buildings and neighborhoods, energy, green economy and lifestyle, transportation, urban nature, waste

reduction, and water. Recommendations among these categories include implementing solar panels for homes as well as bus stops and pay stations and encouraging the use of energy-efficient products for large industries and local homes (Action Plan 2010).

Transportation, however, is one of the most vital categories to make improvements for since Long Beach is home to Interstate 710, or, also commonly referred to as, “Asthma Alley” (Zart 2018). Interstate 710 frequents approximately 600 diesel trucks daily, which contaminates more than domestic vehicles due to the more sulfur-rich particulates in diesel fuel, along with individuals who commute to places such as work or school (Zart 2018). It is near various schools and neighborhoods, therefore, increasing their susceptibility to the hazardous air particulates and respiratory issues such as asthma (Zart 2018). The Long Beach City Council, however, targets transportation in their Sustainable City Action Plan by introducing the Clean Trucks Program, which requires trucks to be EPA-certified and manufactured after 2007, along with recommending ways for citizens to utilize different transportation methods (Action Plan 2010). One example of this is to “encourage local car-pool programs to reduce the number of single-occupancy commute trips” and promote the public’s use of public transit and low emission vehicles (Action Plan 2010). In conclusion, there are several ways for locals to reduce environmental vulnerability and injustice by making minor changes to their lifestyles. In doing so, the city will continue to decrease pollution and hazardous air particles, therefore, moving closer towards its sustainability goals.

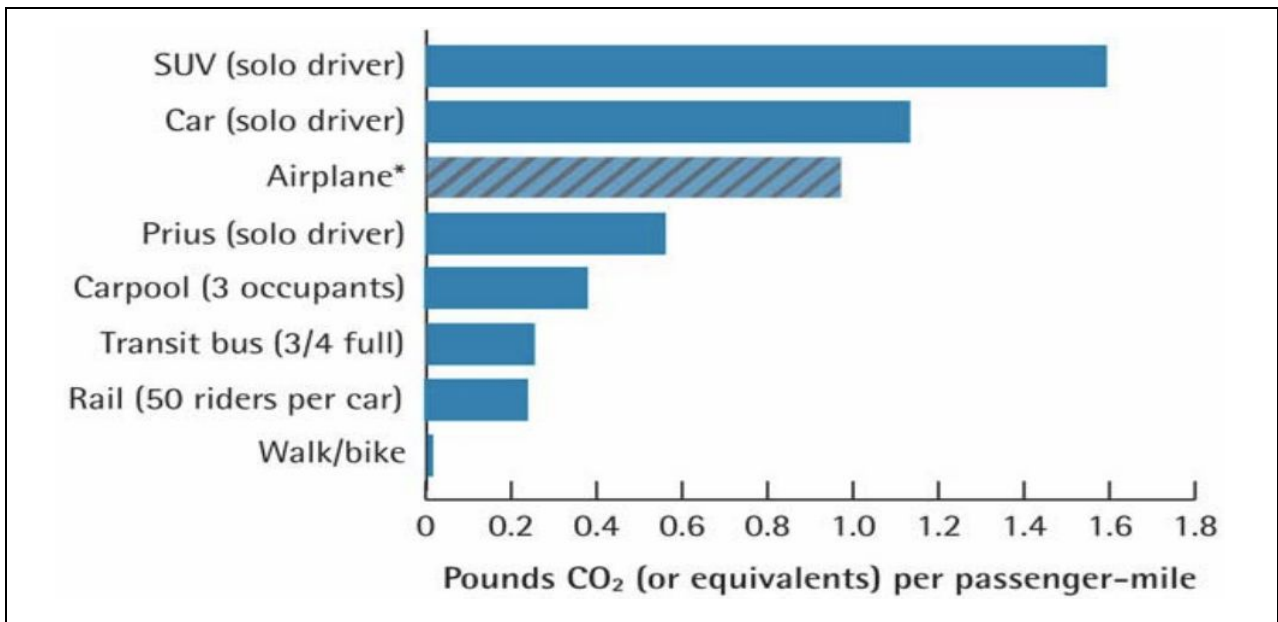


Fig 9: Average amount of Carbon Dioxide emitted by specified vehicles per passenger-mile.

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?

Starting small, at a local level, the use of reusable bags instead of plastic bags could be very beneficial to the community environment of Long Beach, as plastic bags tend to find their way drifting at the mercy of the wind. Plastic bags tend to disrupt our ecosystem due to the toxins and harmful particles in their material. When plastic bags are burnt, it releases lethal fumes in the air, producing an air pollutant in our atmosphere. Plastic bags also locate themselves in our natural soils, leaving a death sentence to any wild animal who comes into their way. Animals confuse the plastic material with food, causing these wildlife creatures to choke to death. With reusable bags, we are using an environmentally-friendly product that can help reduce the harm in our wildlife and, most importantly reduce any harmful pollutants in the environment. Other actions taken to reduce environmental vulnerability include the conservation of resources and community participation for change. The use of electricity is the most efficient and the biggest action that can be taken to reduce environmental vulnerability. As an advocate for recycled energy - waste heat to power - as it utilizes discharged heat to produce a surge of power enough to start motors or power a building. The switch to improve a community environment may vary, as each community will have different situations corresponding to many factors such as area, surroundings, and hazards. Regardless of the issue, I believe one of the biggest actions that will reduce environmental vulnerability is to utilize the giant celestial body comprised of energy. Solar power is only improving as technological innovations continue to advance, and the use of solar energy is all-natural through the photoelectric effect. Solar energy can be one of the biggest answers to the air pollution situation in Long Beach as it reduces air pollution by creating clean energy that does not contribute to air pollution. Additionally, solar power reduces dependency on nonrenewable energy sources that are the cause of pollutants in the air (Perez 2014). Switching to solar energy is not only beneficial to those who can afford it, but to all as it will increase air quality to the area. Certain areas that use solar power, such as parts of the Silicon Valley, are green and seem much nicer to be around. The community is clean and the environment feels warm and embracing instead of toxic and hazardous.

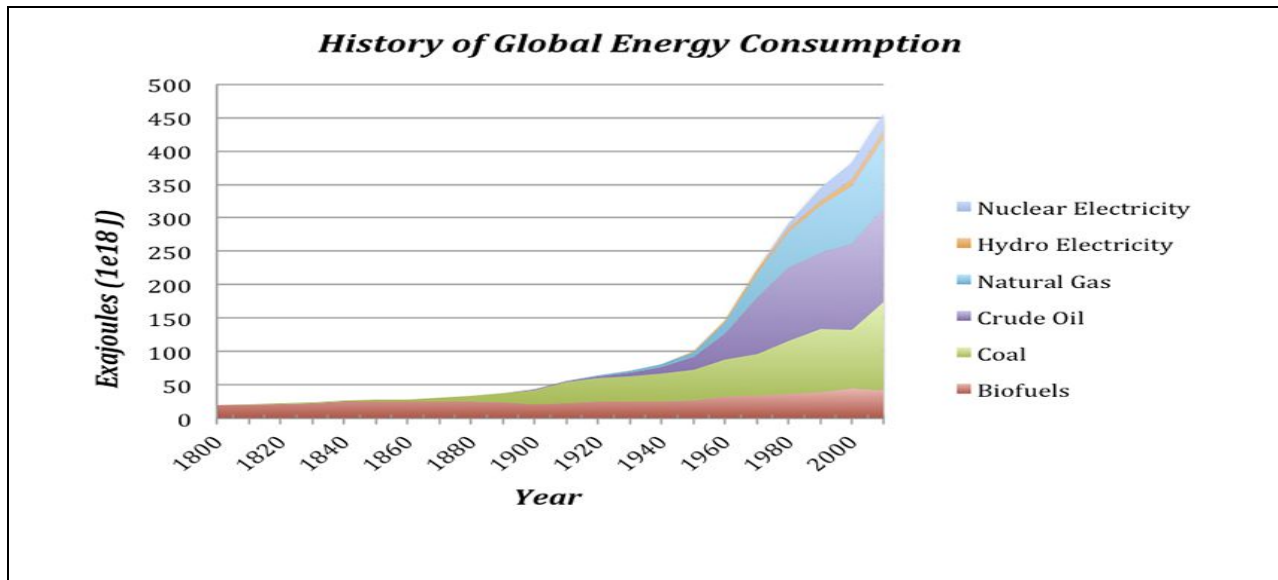


Fig 10: The History of Global Energy Use: It shows the audience specific types of energy consumption we use on a global scale for the past years.

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

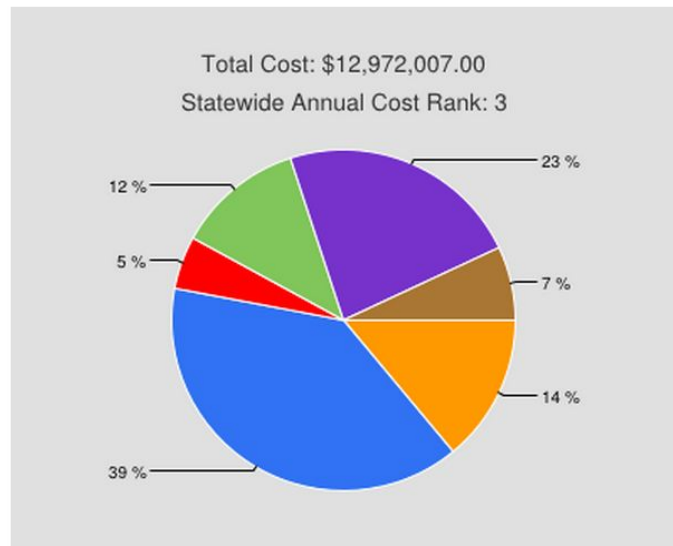
Graphs, charts, and numeric data such as statistics and skew would be resourceful in addressing environmental threats such as pollution of air quality or change in rate of pollution in a well known polluted area. I believe if we were able to show the change of air quality in an area over the past decades, it would appeal to the general public and project a message about the situation of the environmental situation and the possible growth of hazards how bad our air quality has worsened over the past years. The importance of this data to the community is to bring to their attention the threat levels and the concentration of harmful pollution within the area they reside. Regardless of the magnitude of data – be it data concerning pollution from big corporate facilities or data addressing local littering – all data is important in order to bring the issue to the attention of the general public. The article *Near-Road Air Pollution Impacts of Goods Movement in Communities Adjacent to the Ports of Los Angeles and Long Beach* exhibits the general public that was affected by the infamous pollution that occurs near the 710-freeway in an area dubbed as “asthma alley” (Kozawa 2009). She uses meteorological images to show readers where the freeway is located relative to the geographical mapping of Long Beach and which neighborhoods are

severely affected by the widespread pollution.

A geographical plot of data is significantly important to show readers which communities and cities have the worst air quality and how our environment is being polluted more and more as the days pass. Additionally, geographical plot of data also emphasizes the situation in the area, therefore leading to an in-out improvement, where focus in improving begins from the area and spreads outwards in an effect similar to a seismic wave. Other types of data that would be useful are statistics and graphical representation of the population number that is at risk of lung diseases and other health problems due to heavy ozone pollution. A piece of statistic I believe that should be an important eye opener to the community is the fact that Long Beach has held the ranking for LA's most polluted beach for consecutive years (Chiland 2019). This is a shame since Long Beach used to be one of the most grandiose sceneries of the west coast. Other sources of information include American Lung Association's website which displays the groups at risk due to the negative impact of the hazardous pollution. Some of the negative results from exposure to heavy pollution include adult asthma, cardiovascular diseases, and lung diseases. Of course, there are other detrimental health effects due to the air quality, but they are not as common as breathing issues and development of breathing disabilities. Displaying this data, the public will not only be able to understand the magnitude of the environmental threat we are dealing with, but will also show the various ways such biohazards could affect our lives as well as the lives of others as it spreads. Such small solutions the public has reached included subjecting small fees on vehicles of large emission output such as trucks (Ruiz 2018). Simple awareness of issues typically leads to improvement of the issues due to the involvement of the public knowing what is at risk. Although there is never an immediate to solutions concerning years of damage due to environmental negligence, there is a gradual build towards a green solution to reach a greener environment as communities band together in order to contribute to the improvement of living quality by reducing hazardous outputs into the air and around their communities while making changes to make sure such hazards do not happen in the future (Herranz 2017).

Presentation of data is only the first step in realizing that change is to come. The next few steps from the presentation of data is action towards the data: will they change for the better with respect to current conditions or will things worsen? Typically, statistics provided will appeal to the community, turning them towards the best for the condition of their communities, thus leading to the improvement of environmental quality. Although the presentation of data is mostly beneficial, its effects are slow, gradual, and consistent.

Long Beach



- **Beach / Waterway Cleanup:** \$1,837,398.00
- **Street Sweeping:** \$5,054,886.00
- **Stormwater Drain Cleaning & Maintenance:** \$700,000.00
- **Stormwater Capture Devices:** \$1,494,679.00
- **Manual Cleanup:** \$3,002,002.00
- **Public Education:** \$883,042.00

Fig 11: Costs of community maintenance in Long Beach Shows more is spent on cleanup than on Education

10. What, in your view, is ethically wrong or unjust in this case?

Long Beach is already known to be one of the most dangerous cities with its gang and crime related activities, but what I think is much more dangerous is how little awareness there is about the pollution affecting the residents each and every day. People are living their lives while they are unknowingly being harmed by things like high ozone levels from diesel emissions and volatile organic compounds in the air from the oil industry in the area. What's even worse is that the children are one probably being the most affected by the pollution as they are more vulnerable and are going to be more exposed to the pollutants longer. Some areas in Long Beach are ranked some of the worst with a "low birth weight percentile 84.24 and asthma percentile of 96.68." where the bigger the number the less desirable

(Abendschein 2013). Also, there is a higher rate of lung based diseases and cancers in the Long Beach area especially in the areas closer in proximity to the sources of pollution. A huge factor to the higher rates of health issues stem from the very high poverty rate in the Long Beach area. Many households cannot afford to have good healthcare and also they tend to be the ones located closer to the sources of pollution. Most of the people in the area don't even know what they are breathing in since health risks or exposures were never disclosed by the companies running the area. Another thing that is frustrating is that many of these big corporations in the area are not willing to change their ways of doing things to make it more eco-friendly as they are more prioritized on business and making more money. Because in their heads, the more eco-friendly the less money they will be making and also the amount of money that will cost them to change everything. In general, the main thing that is preventing change is that the city is more focused on making business since the big corporations have a big representation in the city whilst people who are the most affected by the pollution, such as low-income communities, don't have much of a say since their words are drowned out by the big money-making corporations.

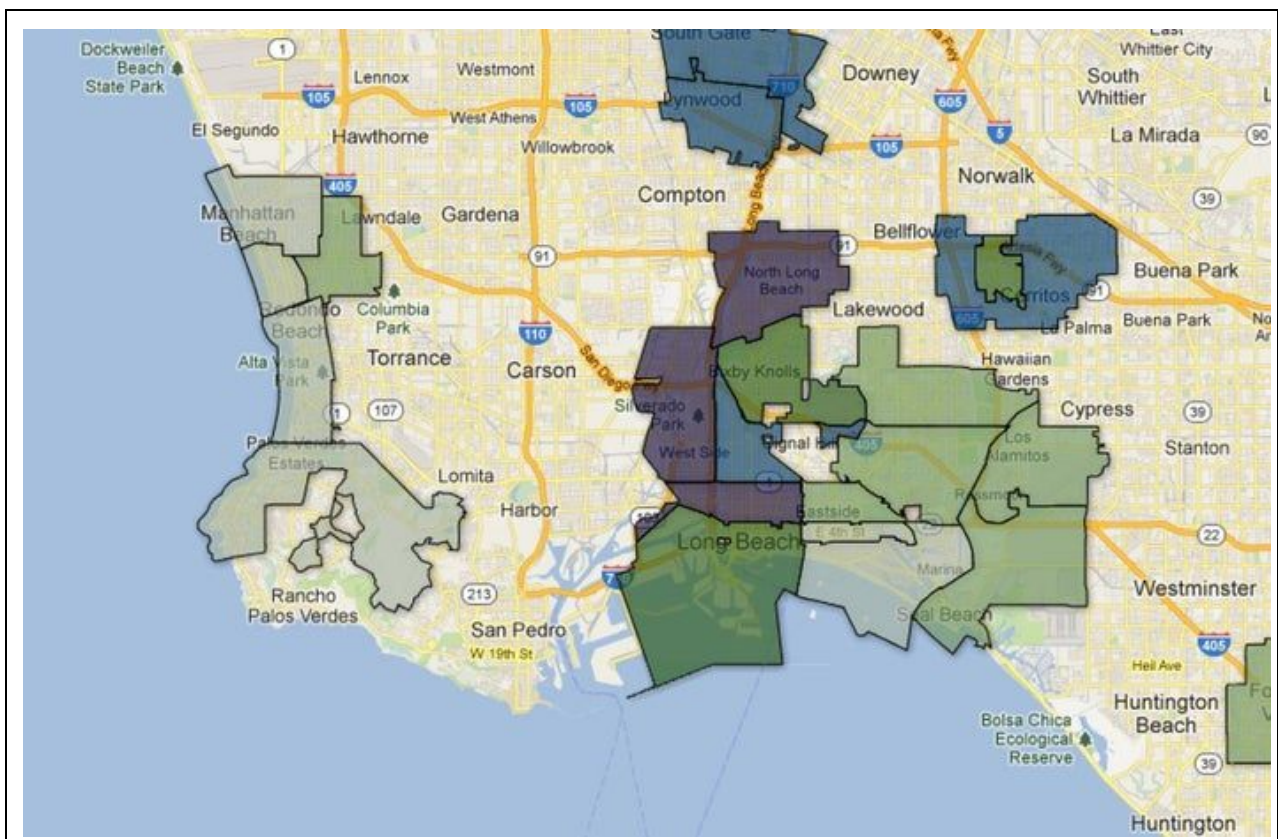


Fig 12: Zip code areas In or near the Long Beach area showing “pollution burden score” with a color representation of severity

REFERENCES

- American Heart Association. n.d. "Most Polluted Cities."
<https://www.lung.org/our-initiatives/healthy-air/sota/city-rankings/most-polluted-cities.html>.
- "'Asthma Alley': Long Beach Ranks Worst in U.S. for Air Quality." 2019. *Cronkite News - Arizona PBS* (blog). October 1, 2019.
<https://cronkitenews.azpbs.org/2019/10/01/long-beach-air-quality-problems/>.
- Barboza, Tony. n.d. "L.A., Long Beach Ports Adopt Plan to Slash Air Pollution and Go to Zero-Emissions."
<https://www.latimes.com/local/lanow/la-me-ports-air-quality-20171102-story.html>.
- Chiland, Elijah. "Long Beach Named LA County's Most Polluted Beach." *Curbed LA*. Curbed LA, June 26, 2019.
https://la.curbed.com/2019/6/26/18758922/long-beach-swimming-polluted-safe?fbclid=IwAR3AOYpDyOrNINCYNPLOCSjx4BN04e1HpafwdtANcNsc9KZerTN1H_HBbyY.
- City New Service. n.d. "LA-Long Beach Area Ranked as Nation's Worst for Ozone Pollution." *Long Beach Post News*. [LA-Long Beach area ranked as nation's worst for ozone pollution](#).
- "Climate in Long Beach, CA." n.d. *BestPlaces.Net*.
https://www.bestplaces.net/climate/city/california/long_beach.
- Corey, Binns. 2018. "In Long Beach, Touring a Toxic Neighborhood on Bike." *NRDC*, October 24, 2018. <https://www.nrdc.org/story/western-dispatch>.
- "Costs of Childhood Asthma Due to Traffic-Related Pollution in Two California Communities." n.d. <https://erj.ersjournals.com/content/40/2/363>.
- "Demographic Indicators." n.d. https://ejscreen.epa.gov/mapper/ejscreen_SOE.aspx.
- "Environmental Justice and Health Alliance for Chemical Policy Reform Who's In Danger? Race Poverty and Chemical Disasters." n.d.
<https://comingcleaninc.org/assets/media/images/Reports/Who's%20in%20Danger%20Report%20and%20Table%20FINAL.pdf>.
- EPA EJ Screen. n.d. "EJSCREEN Report (Version 2018) City: Long Beach." Accessed October 23, 2019.

Herranz, Arantxa. "Big Data and How It Will Help Pollution Control in Your City." Ferrovial Blog, April 12, 2017.
<https://blog.ferrovial.com/en/2017/04/big-data-pollution-control-in-cities/?fbclid=IwAR3D8DHPVMn-B9gBYXE3OtesFBWeL4iskGl6aKPtWz0Tq0jy13cQKADGAeQ>.

"Long Beach Activists Want Cleaner Air. What About The Beach?" n.d.

"Long Beach, California Population 2019." n.d.

<http://worldpopulationreview.com/us-cities/long-beach-population/>.

"Long Beach Named LA County's Most Polluted Beach." 2019, June.

<https://la.curbed.com/2019/6/26/18758922/long-beach-swimming-polluted-safe>.

"Long Beach Pollution Sources." n.d.

"Long Beach-Route 710 Near Road, Los Angeles, California, California Air Pollution: Real-Time Air Quality Index." n.d. Accessed October 20, 2019.

<http://aqicn.org/city/california/los-angeles/long-beach-route-710-near-road/>.

"LONG BEACH STATE ALUMNA STRIVES FOR ENVIRONMENTAL STEWARDSHIP & PROTECTION." n.d.

Martin Wisckol. 2019. "Long Beach Is Home to the 4th Worst California Beach, According to Heal the Bay 2019 Report." *Press-Telegram*, June 26, 2019.

<https://www.presstelegram.com/2019/06/26/highs-lows-of-long-beachs-ocean-water-quality-detailed-in-heal-the-bay-2019-report/>.

"Near-Road Air Pollution Impacts of Goods Movement in Communities Adjacent to the Ports of Los Angeles and Long Beach." 2009. *Atmospheric Environment* 43 (18): 2960-70. <https://doi.org/10.1016/j.atmosenv.2009.02.042>.

Port Of Long Beach: The Green Port. n.d. "Facts at a Glance."

<http://www.polb.com/about/facts.asp>.

Ruiz, Jason. "Report Shows Pollution Is Dropping at the Port of Long Beach • Long Beach Post News." News, August 30, 2018.

https://lbpost.com/news/trade-transportation/report-shows-pollution-is-dropping-at-the-port-of-long-beach/?fbclid=IwAR0O-Pgq-GOVu7w10rUNacnx_YjmkPYY7VjPU39vQCXGKmlxAZ-W4KbwqD4.

APPENDIX

APPENDIX A.

U.S. Environmental Protection Agency
Chemical Emergency Preparedness and Prevention Office
RMP Vulnerable Zone Report

PLEASE DO NOT REPLY

You asked us if the address or location referenced below is likely to be in a vulnerable zone of a potential accidental release based on reports filed by a facility under the Environmental Protection Agency's Risk Management Program. Here is your reply.

You Submitted

Address:
2805 E. Arroyo Blvd.
Long Beach, California 90713

Important Information on Latitude/Longitude

Latitude is the distance of a facility north or south of the equator measured in degrees. Longitude is the distance of a facility east or west of the prime meridian measured in degrees.

The facility latitude and longitude values were obtained from EPA's Facility Registry and may reflect corrections to the latitude and longitude submitted by the facility.

Facility latitude and longitude used by VZIS may not duplicate the latitude and longitude used by the facility during the preparation of their Off-site Consequence Analysis. Some facilities may have used points that reflect the chemical storage area of their facility. EPA used the latitude/longitude points in EPA's Facility Registry to standardize VZIS operation.

RMP facility information used for this search was last updated in September 2019.

Because websites use various methods and data sources to determine latitude/longitude values, values may differ among websites.

Latitude: 33.873691
Longitude: -118.152181

Results: The EPA's Vulnerable Zone Indicator System shows that the location you submitted is **likely to be** in at least one RMP facility's vulnerable zone.

Local Emergency Planning Committees (LEPCs) are your community's chemical safety experts!

LEPCs develop and review your community's chemical emergency response plan and collect annual chemical inventory reports from facilities. Work with your LEPC to learn more about chemicals in your community! To find out which RMP facilities may affect the above location, you can:

Note: Due to formatting differences in some web based Internet E-mail accounts (such as Hotmail) you may not be able to access the hyper linked websites below by clicking on them directly. If you first experience problems with the hyperlinks when you click on them, try cutting and pasting the full hyperlink (URL) into the "address" field of your web browser and press "enter", which should take you directly to the website.

Contact your Local Emergency Planning Committee (LEPC) <https://www.epa.gov/epaosqa/local-emergency-planning-committees>

View the Concerned Citizen page on EPA's Chemical Emergency Preparedness and Prevention Office website: <https://www.epa.gov/epaosqa/citizen>

Read Chemicals in Your Community, a publication that tells you how to obtain helpful information that can help you build a snapshot of chemicals stored and released in your community: <https://www.epa.gov/epaosqa/chemicals-your-community>. A facility's vulnerable zone is based on one or more "Off-site consequence analyses" (OSCA) submitted to EPA as part of their Risk Management Plan. To learn how you can access Off-Site Consequence Analyses (OSCA), visit: <https://www.epa.gov/epaosqa/federal-reading-rooms-risk-management-plans-epa>

APPENDIX B.

"Stakeholders' Sketch"		
catalysts	"stakeholders"	corrosions
Cargo valued at \$194 billion	Long Beach Community	Undermined voices
Listed under Los Angeles County	Executive Director of the Port of Long Beach	Low social standing
Honorable reputation, highly-respected university	Cal State Long Beach students	Under age of importance
Second busiest port in the U.S	Fenceline residents	Reputation to have lack of care
Located at a well-known site	Port of Long Beach workers	No voice that is being listened to
Ability to post public opinion and review of Long Beach	Tourists coming to visit Long Beach	Lack of knowledge of Long Beach
Community voice and strike	2.6 billion jobs generated	Lack of money and resource

	through Port	
The future of the city	Children of Long Beach	Underage. No voice or representation in huge decisions

ABOUT THE AUTHORS

BIOGRAPHICAL STATEMENTS

Alexander Myers is a second year Earth System Science Major at The University of California Irvine. He is interested in ocean conservation research and human impact on the environment. He is mainly interested in the ocean and how it affects the Earth's climate and ecosystems. Alex plans to conduct field research in areas involving ocean conservation as well ways to reduce our negative impact on our oceans. In his major Alex looks at the bigger picture of how all of earth's systems, the biosphere, the hydrosphere, the atmosphere, and the lithosphere all work together to make earth habitable for life.

PHOTOS



Dinorah Hernandez is a second year environmental science and policy major at the University of California, Irvine. Through her studies she has developed an interest in community outreach and global sustainability. After university, Dinorah wants to attend graduate school and pursue research. She aspires to work for the Environmental Protection Agency and create policies that challenge environmental injustices in her community of Compton.



James Tsien is a third year Electrical Engineering and Computer Science major at the University of California: Irvine. He has developed an interest in electronics, circuit design, cybersecurity, and development through work experience and proposed projects. After finishing his undergraduate education, James plans to go to graduate school in order to gain more experience in circuit design and program developments. Some projects that James has worked on include VR therapy and software development for cybersecurity. He aspires to create technology that will be beneficial to all in the future, especially in cybersecurity and the development of a perfectly efficient electric circuit configuration.



Kenneth Ramirez is a second year Business Economics Major at the University of California, Irvine. He's acquired interest in statics, and accounting. He wants to transfer to the school of engineering in order to obtain a major in Biomedical engineering. With this he plans to do his research with stem cells and attempt to cure numerous conditions.



Lilian Reddivalam is a fourth-year Public Health Science major at the University of California, Irvine. Currently, Lilian is a research assistant at the BRoAD research lab and an intern for the Patient Experience department at UCI Health. After obtaining her B.S., she plans on attending medical school in order to become a Perinatologist.



Nayelli Lisbeth Ascencio is a second-year Psychology and Social Behavior & Criminology, Law and Society double-major at the University of California, Irvine. After obtaining her B.A., she plans on furthering her education at the University of Delaware in hopes of receiving a Master's Degree in Forensics Psychology. She hopes to become a forensic psychologist in the near future. Her job would include offering psychotherapy services, investigating reports of child abuse, performing child custody evaluations, and conducting visitation risk assessments. Aside from all



of this, she is interested in land conservation, community organizing and wildlife preservation.

Lily Reddivalam is a fourth year Public Health Science major and Medical Anthropology minor at the University of California, Irvine. Her research interests include brain behavior and how this impacts lifestyle choices.

Prescilla Gisella Rios is currently a second year, undeclared student. However, she is planning to double major in Psychology and Social Behavior and Criminology at the University of California, Irvine. She is interested in studying human behavior and characteristics, personality disorders, and mental disorders, specifically in the criminology field, to understand why criminals or serial killers behave the way they do. After obtaining her Bachelor's degree, she plans to obtain her Master's at a graduate school in order to attain more information about our criminal and judicial system and how are some ways to improve it.



Quinn Vuong is a second-year Civil Engineering major at the University of California, Irvine. His interests include environmental sciences, Urban cityscapes, and geology.

Yara Higuera is a fourth year Public Health Science Major at the University of California, Irvine. After obtaining her degree, she intends on taking one year off before going back to school at University of California, Los Angeles and obtain a Masters degree in Community Health Sciences.

