Environmental Justice in Southeast Louisiana

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There is no question that environmental justice (EJ) is a concern in large swaths of the Gulf Coast. All we need to do is begin to speak to local people in coastal counties and Parishes to discover the realities of pollution, redlining, poverty, wetlands destruction and systematic racial discrimination that have been present for decades and continue to impose disproportionate disadvantages to environmental injustice communities. EJ screening tools often reflect the reality that the Gulf Coast is a place of deep-rooted environmental injustice. Examining the Centers for Disease Control and Prevention's "Social Vulnerability Index" (SVI), we see that only one coastal county across the five Gulf states has an SVI category of "lowest" comparative SVI.[1] Texas and Louisiana have zero, and in fact most coastal counties and Parishes in these two states are in the top highest tiers (Fig. 1).
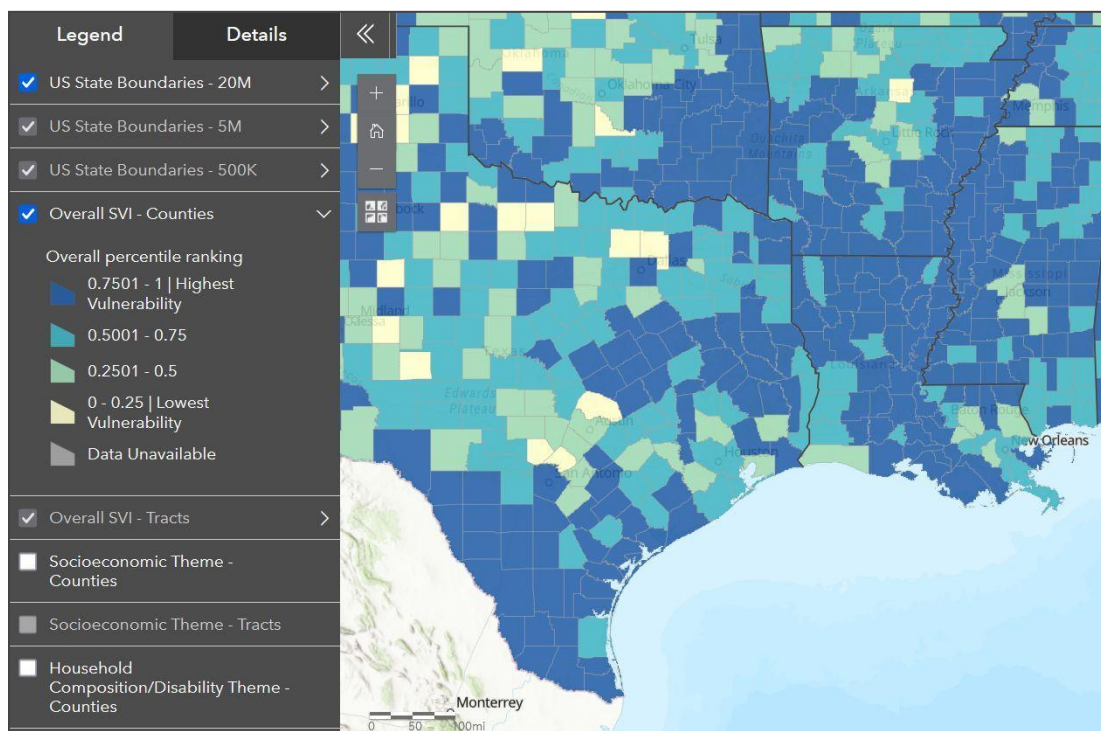
Figure 1. Not a single county/Parish in Texas and Louisiana are in the "lowest vulnerability" category for the CDC SVI rating. SVI analyses a combination of factors (socioeconomic, household diversity and disability, race and language access, and housing/transportation access) and scores each factor category and combines those categories into one overall SVI rating for each analysis unit.

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[1] CDC SVI 2018, overall counties interactive map:
https://cdcarcgis.maps.arcgis.com/apps/Embed/index.html?webmap=df36c227cc904bd38785ee6dd9b77922&extent=-129.9244,22.4914,-65.0171,54.2005&home=true&zoom=true&scale=true&search=true&searchextent=true&details=true&legendlayers=true&active_panel=details&basemap_gallery=true&disable_scroll=true&theme=dark

At a finer scale, some of the particular disparities become more clear. Using Census Block Groups and comparing those areas to Parish/county and state levels for race and income, we see that areas of historical fossil fuel development (industrial corridors) and future development (buildout) in Texas and Louisiana are environmental injustice areas already. Let's examine in detail the area in Southeast Louisiana, with a focus on point source pollution and land loss.

Southeast Louisiana Environmental Justice

Southeast Louisiana is home to polluting industry and high rates of poverty and illness, especially in the "River Parishes" or those Parishes along the Mississippi River between Baton Rouge and the birdfoot delta outlet[2]. For the purposes of this analysis, geographic scope will be limited to Plaquemines Parish with some mention of St. Bernard Parish.

In Plaquemines Parish in particular, the majority of Census Block Groups in rural southeast Louisiana in the lower Parish are of environmental justice concern (Fig. 2). All of the lower Parish is rural. Therefore, the Census Block Groups are rather large, and when this happens, EJ screening tools can sometimes mistakenly leave out a Block Group that has EJ issues. However, given the experience of local residents, even if EJ areas are left out mistakenly, there is a predominance of environmental injustice encompassing the lower Parish.
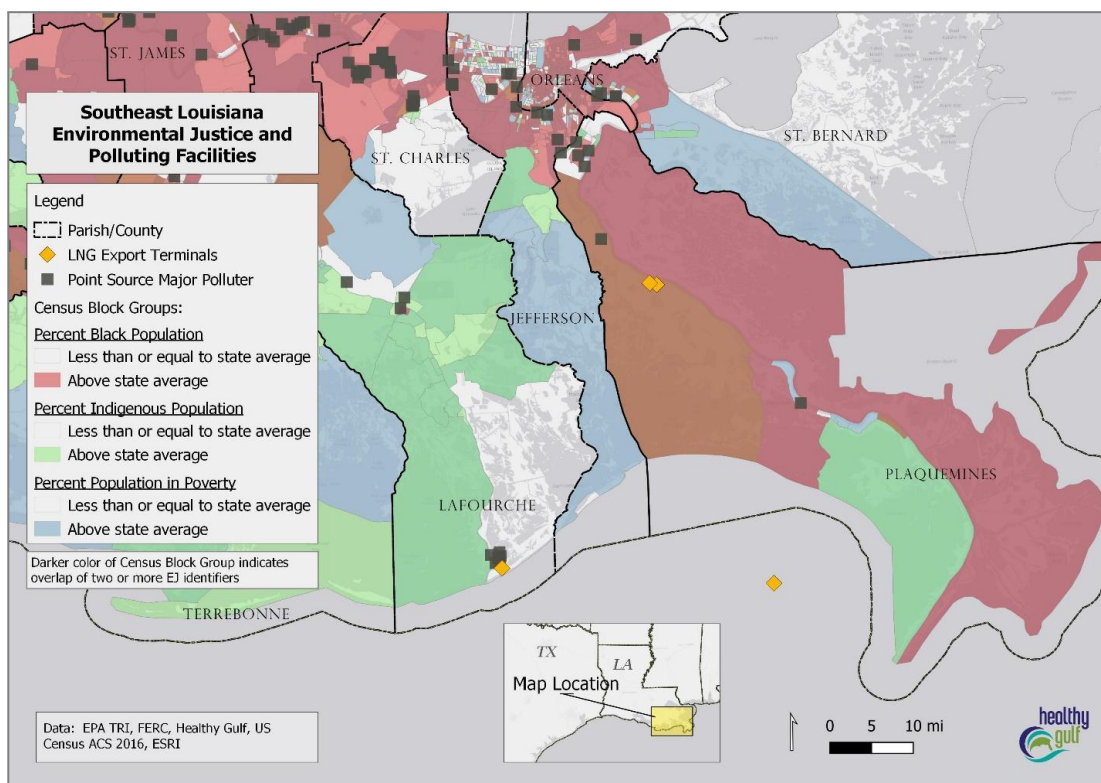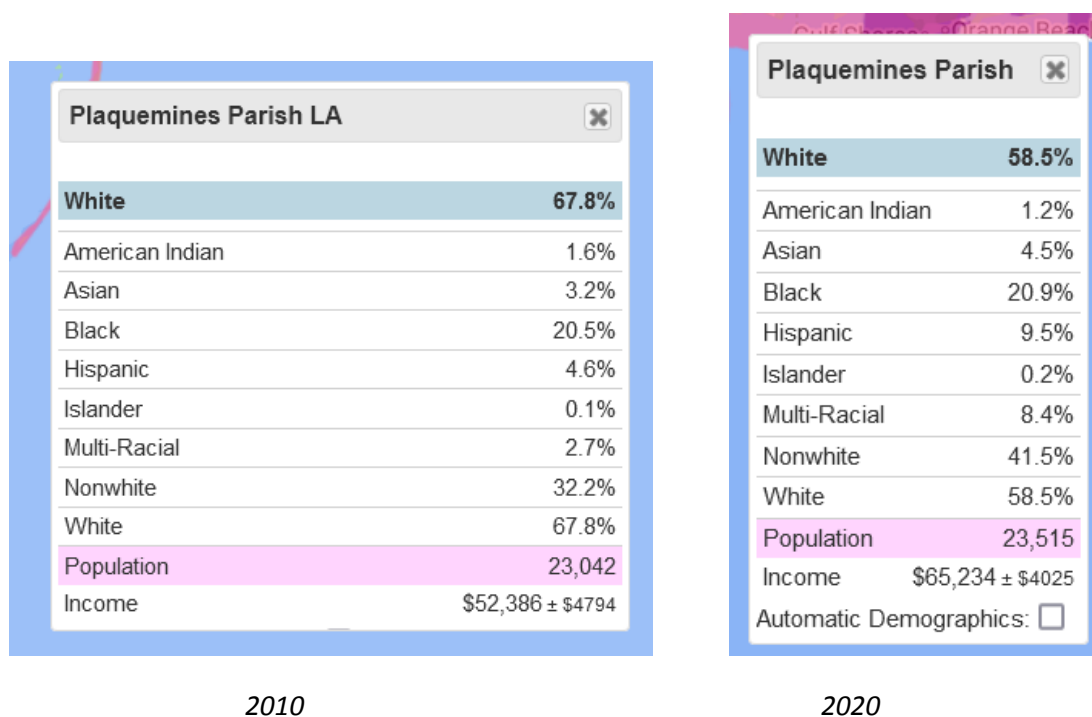

Figure 2. Environmental justice (EJ) in southeast Louisiana. EJ identification is comparing Census Block Groups to the state average levels. Census data is from 2016 ACS. Poverty is measured by comparing median income for the Block Group to the median income for the state.
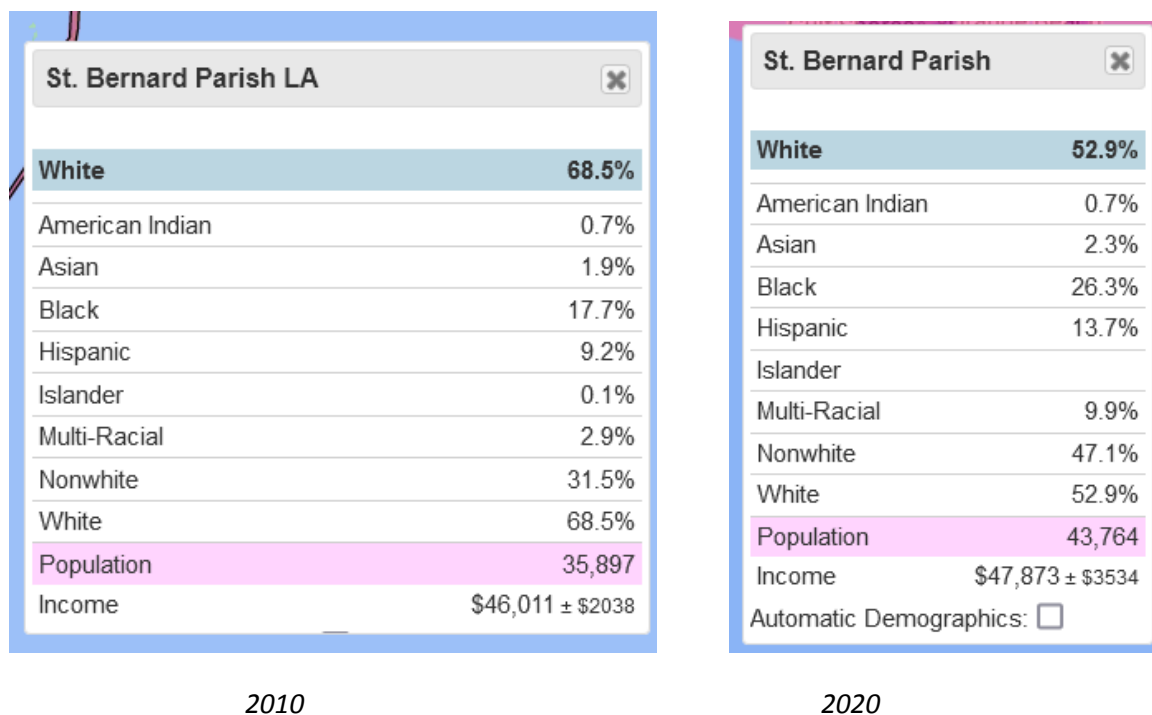
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[2] Terrell, K.A. and G. St Julien (2022). Air pollution is linked to higher cancer rates among black or impoverished communities in Louisiana. ERL, January 2022. https://doi.org/10.1088/1748-9326/ac4360

Looking at the 2016 ACS Census survey, we see that all EPA Toxics Release Inventory (TRI) facilities (i.e., major point-source polluters) in lower Plaquemines Parish are within Block Groups of environmental justice concern (see Fig. 2). In this case, "environmental justice concern" is defined using the "threshold" method, where an EJ Block Group is one where the percentage of Black or Indigenous residents is larger than the percentage of the respective racial group in the state, or a Block Group's median income is smaller than the state average. There is no mistaking the high ranking of lower Plaquemines Parish as an EJ area of concern.

Both Plaquemines Parish and St. Bernard Parish are getting less white and more populated (Figs. 3, 4). Between 2010 and 2020, the white population of Plaquemines Parish decreased by about 10 percentage points. The largest jumps in non-white population during that time in Plaquemines Parish was an increase of Asian, Hispanic, and Multi-Racial people. There was a slight increase in population overall, but only by about 500 people across the Parish of over 23,000 people.

Plaquemines Parish LA	
White	67.8%
American Indian	1.6%
Asian	3.2%
Black	20.5%
Hispanic	4.6%
Islander	0.1%
Multi-Racial	2.7%
Nonwhite	32.2%
White	67.8%
Population	23,042
Income	$52,386 ± $4794

2010

Plaquemines Parish	
White	58.5%
American Indian	1.2%
Asian	4.5%
Black	20.9%
Hispanic	9.5%
Islander	0.2%
Multi-Racial	8.4%
Nonwhite	41.5%
White	58.5%
Population	23,515
Income	$65,234 ± $4025
Automatic Demographics: ☐	

2020

Figure 3. Plaquemines Parish environmental justice metrics from JusticeMap. Since 2010, the Parish has become less white, has had a minor population increase, and has had a big income increase.

St. Bernard Parish LA	
White	68.5%
American Indian	0.7%
Asian	1.9%
Black	17.7%
Hispanic	9.2%
Islander	0.1%
Multi-Racial	2.9%
Nonwhite	31.5%
White	68.5%
Population	35,897
Income	$46,011 ± $2038

St. Bernard Parish	
White	52.9%
American Indian	0.7%
Asian	2.3%
Black	26.3%
Hispanic	13.7%
Islander	
Multi-Racial	9.9%
Nonwhite	47.1%
White	52.9%
Population	43,764
Income	$47,873 ± $3534
Automatic Demographics: ☐	

2010   *2020*

Figure 4. St. Bernard Parish environmental justice metrics from JusticeMap. Since 2010, the Parish has become less white, has had a large population increase, and has had a small income increase.
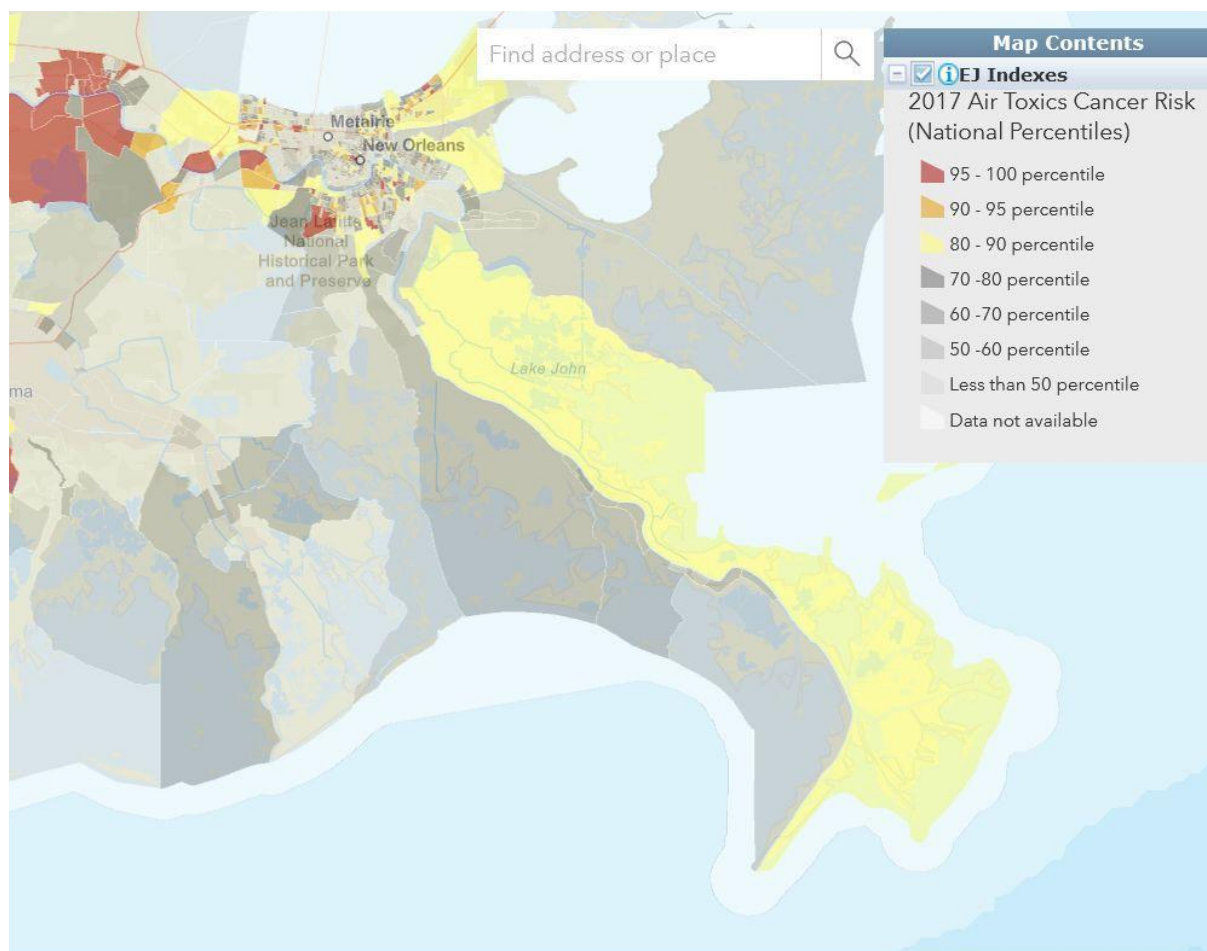
a. **NATA**

Lower Plaquemines Parish is already a polluted area. All Census Block Groups in lower Plaquemines Parish rate above the 50th percentile for Air Toxics Cancer Risk nationally according to the EPA's National Air Toxics Assessment (NATA, see Fig. 5). Already, without any other information, we can conclude that the areas of lower Plaquemines Parish with industrial facilities planned, are more at risk than 70% of the rest of the nation.

b. **SVI**

The Social Vulnerability Index is a tool designed by the Centers for Disease Control and Prevention (CDC) based on Census data. It puts a number score on "overall vulnerability" by looking at four broad markers in each census tract:

- Socioeconomic status (including income, employment, and education),
- Household composition and disability (including age and marital status of household members),
- Minority status and language,
- Housing and transportation (including type and make-up of home and vehicle ownership).

Each of the four marker categories receive a vulnerability score. Then the final score for overall vulnerability is calculated. The scores are expressed as decimal numbers, with "1" being the most vulnerable and "0" being the least.

Figure 3. 2017 Air Toxics Cancer Risk as seen in EJSCREEN in southeast Louisiana. All Census Block Groups in Lower Plaquemines Parish are above the 50th percentile nationwide for Air Toxics Cancer Risk. The west bank of lower Plaquemines Parish is all one Block Group, and that area is above the 80th percentile nationwide for Air Toxics Cancer Risk.

In 2020, Plaquemines Parish received an overall score of 0.6604, or a score of "more vulnerable" than the Parish's 2016 score of 0.5852. The 2020 score represents a "moderate to high level of vulnerability." This number was impacted most by minority status and language, indicating that Parish residents are made more vulnerable because of their racial or ethnic minority status and use of languages other than English — factors which correspond to "vulnerability" only because of the racism entrenched in planning and permitting processes as well as disaster response (Fig. 4, 5).

St. Bernard Parish is even more vulnerable overall than Plaquemines Parish. St. Bernard Parish received a 2020 SVI score of 0.8549, up from 0.7049 in 2016, indicating a "high level of vulnerability." The strongest contributors to this score were socioeconomic factors, followed closely by minority status and language.[3]
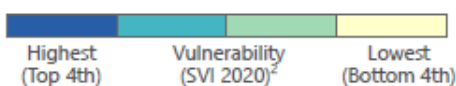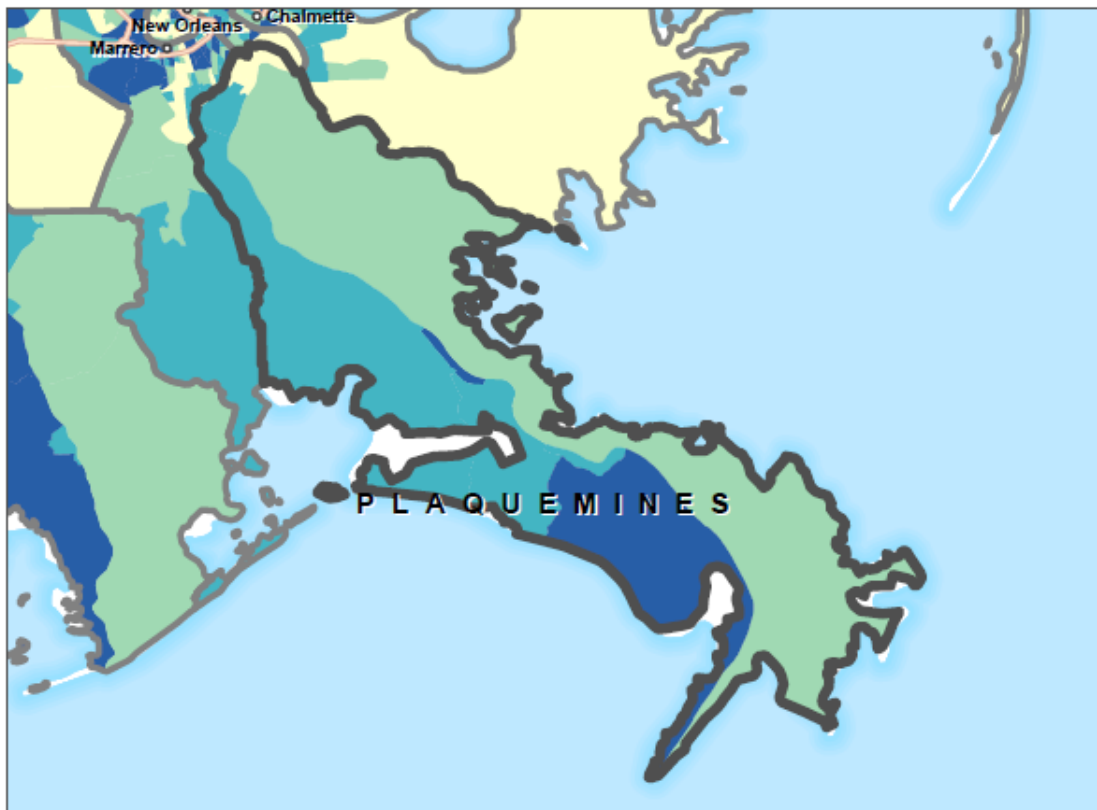
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[3] https://www.atsdr.cdc.gov/placeandhealth/svi/interactive_map.html

CDC/ATSDR Social Vulnerability Index 2020

PLAQUEMINES PARISH, LOUISIANA

Overall Social Vulnerability[1]

Highest (Top 4th) — **Vulnerability (SVI 2020)[2]** — **Lowest (Bottom 4th)**

Data Unavailable[3]

0 3.5 7 14 21 Miles

Social vulnerability refers to a community's capacity to prepare for and respond to the stress of hazardous events ranging from natural disasters, such as tornadoes or disease outbreaks, to human-caused threats, such as toxic chemical spills. The **CDC/ATSDR Social Vulnerability Index (CDC/ATSDR SVI 2020)[4] County Map** depicts the social vulnerability of communities, at census tract level, within a specified county. CDC/ATSDR SVI 2020 groups **sixteen census-derived factors** into **four themes** that summarize the extent to which the area is socially vulnerable to disaster. The factors include economic data as well as data regarding education, family characteristics, housing, language ability, ethnicity, and vehicle access. Overall Social Vulnerability combines all the variables to provide a comprehensive assessment.
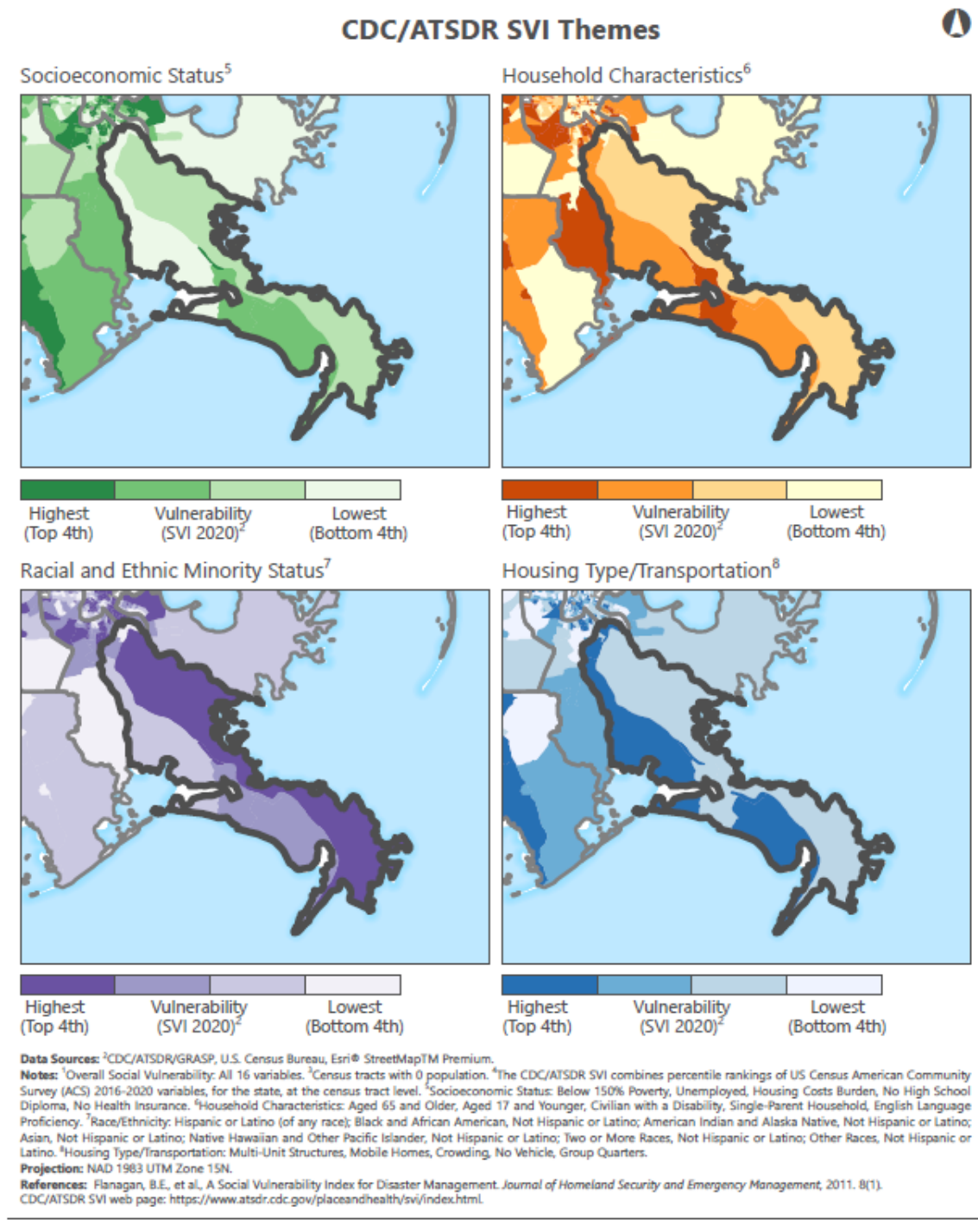
ATSDR Agency for Toxic Substances and Disease Registry

GRASP Geospatial Research, Analysis, and Services Program

Figure 4. Centers for Disease Control and Prevention, Social Vulnerability Index (Agency for Toxic Substances and Disease Registry) data for Plaquemines Parish, 2020.

Figure 5. CDC, Social Vulnerability Index (Agency for Toxic Substances and Disease Registry) data for Plaquemines Parish, 2020, broken out by vulnerability theme.

    c. EJScreen

The EPA's EJ identification tool, EJScreen, bears out similar results to the other measures outlined above. The EJScreen results show that a 3-mile radius from Deer Range, LA is home to percentiles of over 75% for either state or national rankings, for the following factors:

- EJ Index for Ozone (state)
- EJ Index for Air Toxics Cancer Risk (national)
- EJ Index for Wastewater Discharge (both)
- Demographic Index (both)
- People of Color (both)
- Low Income (national)
- Less than High School Education (national)

(see Appendix A)

Wetlands & Land Loss

The amount of land Louisiana has lost in the past century equals the total land area of the state of Delaware. All of this land loss is coastal, and coastal lands in Louisiana are wetlands. There are several causes of this, but the root of the problem is lack of sediment delivery from the Mississippi River, and climate change. The Mississippi River historically built land throughout southeast Louisiana by flooding on a regular basis. When a river overtops its banks (floods) at a delta area, the water fans out across the land and whatever sediment was in the river becomes deposited there. We no longer let the river flood regularly, since we live and work along the river and flooding all the time would be dangerous. The cost of prohibiting the river from flooding is that new sediment is not delivered regularly either, and thus neither is new land built.

Climate change (and the elements leading to that) adds another set of factors that exacerbate land loss in Louisiana. The very fossil fuel exploration and then extraction, plus maintenance and repair of the facilities has dug channels and drilled wells across Louisiana's coastal wetlands. This carving up of the land is physically land loss and sinking of spongy wetlands, but then the greenhouse gases emitted from burning the fossil fuels is the cause of the climate change crisis in the first place. One of the consequences of climate change is sea-level rise, and this combination of sea-level rise plus carved up land equals disaster for Louisiana's wetlands.

Southeast Louisiana is especially affected by land loss. St. Bernard and Plaquemines Parishes are ranked first and second, respectively, for the percentage of land projected to be underwater over the next fifty years in the state, by the Coastal Protection and Restoration Authority (CPRA).

2017 CPRA Plaquemines Fact Sheet: "Plaquemines Parish faces extensive wetland loss over the next 50 years under the medium environmental scenario. With no further coastal protection or restoration actions, the parish could lose an additional 296 square miles, or 55% of the parish land area. Plaquemines Parish faces the second highest percent of land area loss over the next 50 years (behind St. Bernard). Additionally, with no further action, most areas of the parish outside the levee system face severe future storm surge based flood risk. Over the next 50 years (under the medium environmental scenario), 100-year flood depths increase to 13-15 feet or above in most locations except for Belle Chasse."

2017 CPRA St. Bernard Fact Sheet: "St. Bernard Parish may incur some of the highest wetland loss as a percentage of total parish land area over the next 50 years (under the medium environmental scenario) of any coastal parish. With no further coastal protection or restoration actions, the parish could lose an additional 237 square miles, or 72% of the parish land area. Additionally, with no further action, most areas of the parish outside the levee system face severe future storm surge based flood risk. Over the next 50 years (under the medium environmental scenario), 100-year flood depths increase to over 15 feet in Delacroix and Yscloskey. Chalmette and some other areas within the levee system may experience 1-6 feet flood depths."

Appendix A - EJScreen Report

⊕EPA United States Environmental Protection Agency

EJScreen Report (Version 2.1)

3 miles Ring Centered at 29.617069,-89.915720, LOUISIANA, EPA Region 6

Approximate Population: 356

Input Area (sq. miles): 28.27

Deer Range, Plaquemines Parish

Selected Variables	State Percentile	USA Percentile
Environmental Justice Indexes		
EJ Index for Particulate Matter 2.5	0	56
EJ Index for Ozone	91	62
EJ Index for Diesel Particulate Matter*	38	48
EJ Index for Air Toxics Cancer Risk*	68	88
EJ Index for Air Toxics Respiratory HI*	8	72
EJ Index for Traffic Proximity	5	5
EJ Index for Lead Paint	61	64
EJ Index for Superfund Proximity	64	54
EJ Index for RMP Facility Proximity	38	42
EJ Index for Hazardous Waste Proximity	44	47
EJ Index for Underground Storage Tanks	38	56
EJ Index for Wastewater Discharge	89	91

EJ Index for the Selected Area Compared to All People's Blockgroups in the State/US
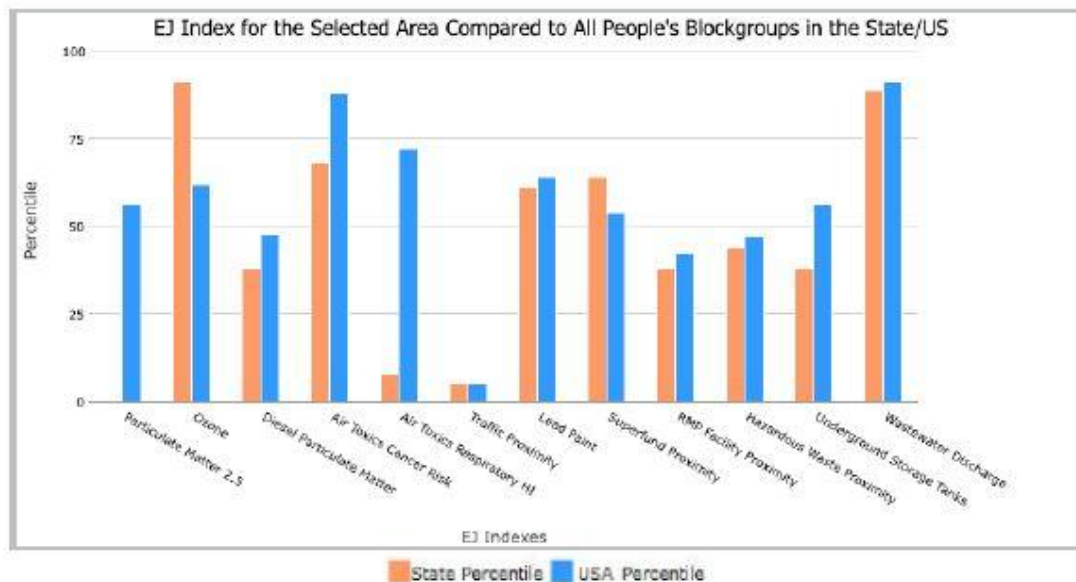
This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

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Appendix A - EJScreen Report

EPA United States Environmental Protection Agency
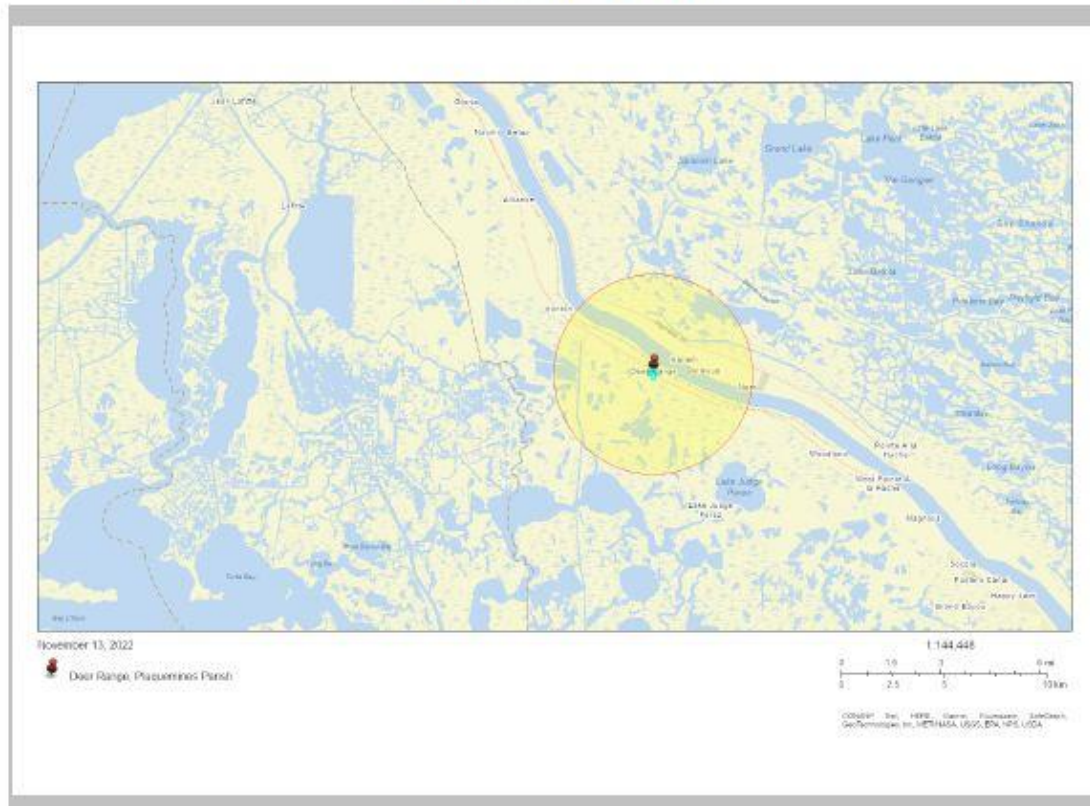
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Approximate Population: 356
Input Area (sq. miles): 28.27
Deer Range, Plaquemines Parish

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Deer Range, Plaquemines Parish

1:144,448

Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	0

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Appendix A - EJScreen Report

&EPA United States Environmental Protection Agency

EJScreen Report (Version 2.1)

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Approximate Population: 356

Input Area (sq. miles): 28.27

Deer Range, Plaquemines Parish

Selected Variables	Value	State Avg.	%ile in State	USA Avg.	%ile in USA
Pollution and Sources					
Particulate Matter 2.5 ($\mu g/m^3$)	7.52	9.2	0	8.67	22
Ozone (ppb)	38.5	37	78	42.5	23
Diesel Particulate Matter* ($\mu g/m^3$)	0.113	0.297	15	0.294	<50th
Air Toxics Cancer Risk* (lifetime risk per million)	30	40	52	28	80-90th
Air Toxics Respiratory HI*	0.3	0.45	6	0.36	<50th
Traffic Proximity (daily traffic count/distance to road)	1.2	640	3	760	2
Lead Paint (% Pre-1960 Housing)	0.05	0.2	29	0.27	26
Superfund Proximity (site count/km distance)	0.021	0.076	32	0.13	19
RMP Facility Proximity (facility count/km distance)	0.095	0.96	15	0.77	15
Hazardous Waste Proximity (facility count/km distance)	0.095	1.4	19	2.2	18
Underground Storage Tanks (count/km²)	0.011	2.2	14	3.9	22
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.0096	0.37	75	12	69
Socioeconomic Indicators					
Demographic Index	67%	41%	80	35%	88
People of Color	81%	42%	81	40%	84
Low Income	53%	38%	69	30%	82
Unemployment Rate	1%	7%	31	5%	22
Limited English Speaking Households	0%	2%	0	5%	0
Less Than High School Education	18%	14%	66	12%	77
Under Age 5	2%	7%	28	6%	22
Over Age 64	16%	15%	59	16%	54

*Diesel particular matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

For additional information, see: www.epa.gov/environmentaljustice

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