

# *Environment and Social Inequalities around California*

*Discussing what really matters and promoting inclusivity*



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# Table of Content

Introduction

Map Structure

Dataset Used

Data Analysis & Result

Geoprocessing Tools for Editing

Time table

Time & Labour Requirement

Hardware and Software





# Introduction

In the United States of America, the facilities and industries that tend to process and release dangerous gases; discharge these gases effluent into streams and dispose of refuse tends to be in poor and minority communities. The people in such communities have little or no protection from the industries around them. This situation can be found in virtually all states across the country. With the current pandemic, so many underlying uglinesses has come to light, which we would like to take advantage of by buttressing this environmental injustice. The City of Los Angeles is our main area of interest, as the city has its own life and affluence, which can be pivotal to starting this new movement to serve as a great example to the rest of the country. This project aims to analyse the relationship of race, income, and national origin to VARIABLE I across Los Angeles County to visualise this toxic relationship to acquire enough signature from all constituent to start the process of proper litigation and to add much strict environmental protection laws that put the people first.

## Client

National Resources Defence Council Los Angeles  
SAN FRANCISCO  
111 Sutter Street,  
21st floor,  
San Francisco, CA 94104.

## Contractor

GeoEnvision  
2282 Oak Street,  
13420, Old Forge  
New York, USA.





# MAP STRUCTURE

## I. MAP TITLE

"Geospatial Analysis of Water Pollutants and Social Minorities in Los Angeles County."

## II. MAP SCALE AND FUNCTIONS

The scale of the map for the poster will be 1:1,000,000 and presented in a comprehensive overview of the relationship between the location of racial minorities, income (disease prevalence), ground water threats and hazardous waste release.

## III. MAP PROJECTION

The map will use the "NAD 1983 California (Teale) Albers (Meters)"– projection Transverse Mercator. This type of map projection was chosen since this projection allows an accurate working on small locations as the Los Angeles county.

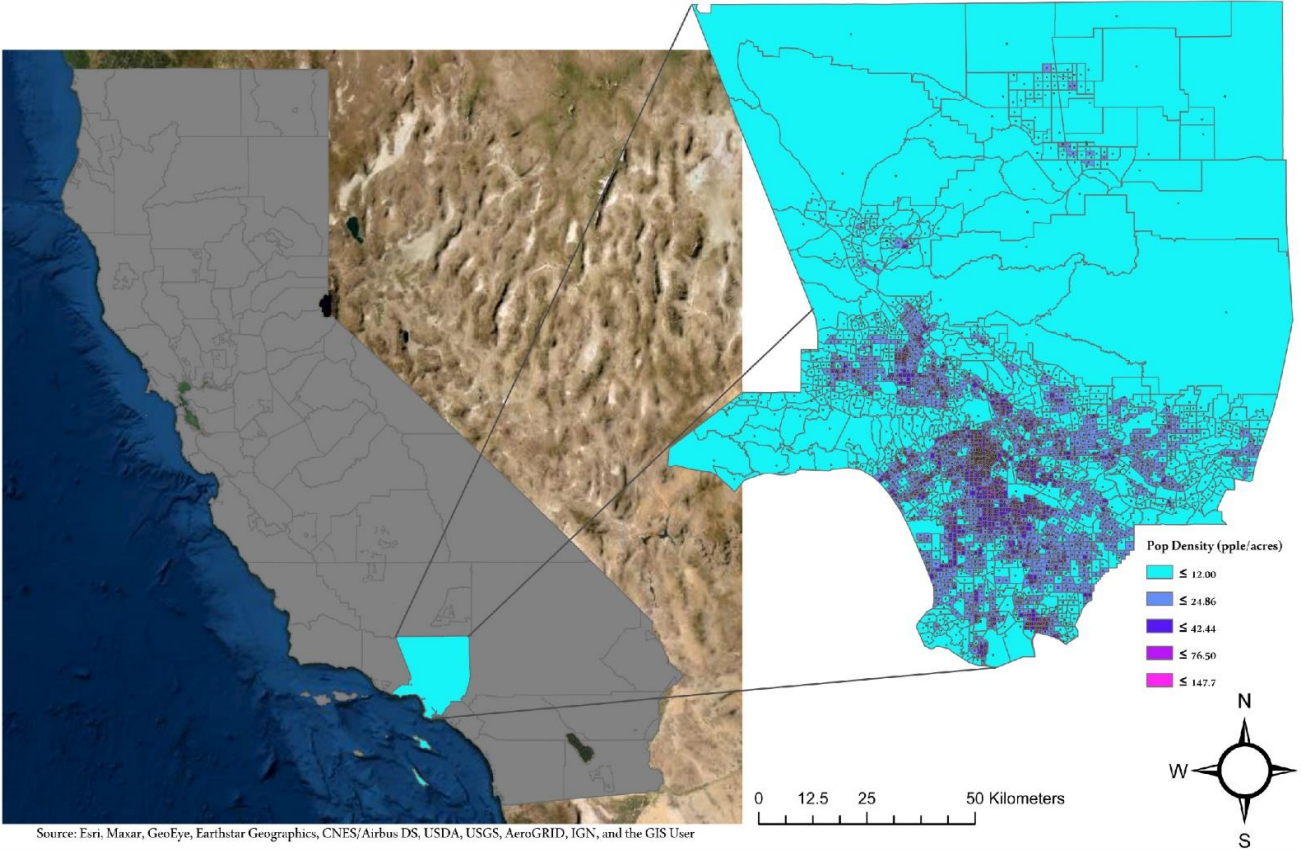
## IV. MAP FORMAT

The final map will be a POSTER displaying the different results (Cluster Analysis and Hotspot) and highlighting important information in the form of discussion.

## V. MAP FUNCTION

The final map will detect patterns in the above stated variables identifying statistical significant clusters and outliers in the Los Angeles County to solidify the theme of the project.

Sample of Map Layout of Pollutants and Racial  
Minority and Income by Tract in Los Angeles County



This is a sample of the map format used for the poster  
(A0 Landscape size).

DATASET USED

The data sources and materials for California necessary for the creation of the map were available on the California Office of Environmental Health Hazard Assessment website (CalEnviroScreen) as Open Data [<https://oehha.ca.gov/calenviroscreen/maps-data>]

The Tract Income dataset was retrieved from the ArcGIS Living Atlas via the GeoEnvirons organisation account with ESRI. All this data was obtained and pre-processed into feature classes for further mapping and analysis.

Other additional data that will form part of our content, which will be inferred from literature, and will be included in the poster. Base maps will be directly sourced from ArcGIS.



# Data Analysis

## Data Processing

The boundary of the California and all associated tract was downloaded in the form of a single shapefile. To acquire the boundaries of Los Angeles County, a combination of definition query (Selection by attribute) and Selection by location. The filter will be done to abstract all tracts in Los Angeles.

## Data Analysis

This will then be used to create a new feature. It should be noted that all the variables of interest are all attributes in the feature class except the tract's income per capital shapefile.

This process will be repeated for the tract's income per capital as well. Next, local Moran cluster and outlier analysis and the Optimized Hotspot will be applied to Racial minority, household income per capita, and Water pollutants. For each of the variables, this analysis will be obtained and then combined.

# Data Results

The result was investigated through correlation with other research and visualized to help gain insight and promote informed decisions.



# Geoprocessing Tools for Editing

01 Selection By Attribute

02 Selection by Location

03 Creation of Feature Class

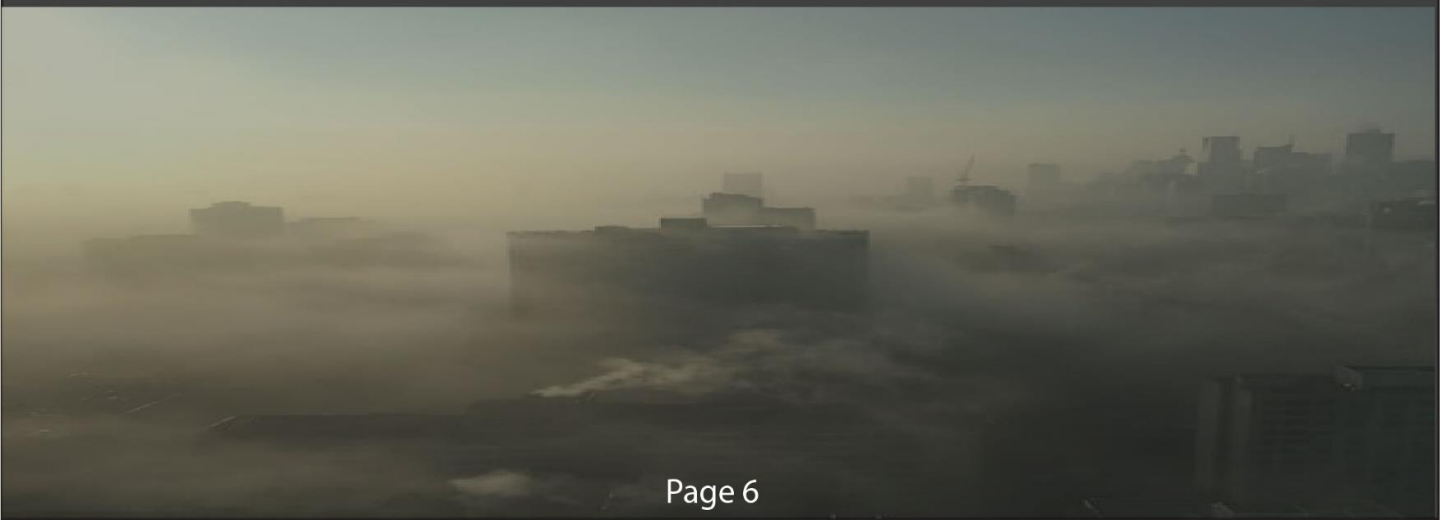
04 Local Moran I

05 Getis Ord Hotspot  
Analysis

06 Combination of LM  
& HOA

07 Poster Map

08 Documentation



# Time-table

The schedule for completing the exercise is as follows

29th June – 04th July	Research and understanding the theme.	6
07th July – 16th July	Data Sourcing, Data Processing, and production of Editorial plan.	10
18th July – 20th July	Geoprocessing Pt 1	3
21st July – 24th July	Geoprocessing Pt 2	4
25th July – 27th July	Geovisualisation via Posters Production	3
28th July – 30th July	Review and final vetting of results and Editorial plan	4
31st July	Finalisation and Submission	1





# Time and Labour Requirement

The project took off on 29th June 2020, and the final submission will be on 31st July 2020. The Task will be executed by three personnel, as described above. The total staff-hours to be involved in the work is about 90 hours, which will span 32 days. The editorial plan took about half a day. The actual implementation is categorized into three gradual stages.

In the first stage, more research will be carried out, and the data will be sourced from the CalEnviron website and the ArcGIS platform. This data will be pre-processed and thoroughly vetted for issues and errors to make it suitable for the analysis that will be carried out. In the second stage, we will execute feature engineering, which will involve abstraction of the Los Angeles county and manipulation of the different variables of interest. Next, the data will undergo spatial statistics analysis to identify local clusters and spatial outliers at a statistically significant threshold.

In the final stage, the poster will portray the whole achieved results above to allow proper dissemination of information to the communities in line with the aim of the project. This Task will take about 12 hours spaced into three days. Finally, reporting and updating the editorial plan is planned for about two days (3 hours) each.



# Hardware and Software

The Hardware to be used are Asus TUF Gaming FX505DY  
Asus X560UD  
HP Pavilion x360

The leading software used is the ArcGIS Pro, Microsoft Office, and ArcGIS Online. ArcGIS Pro will be our main platform to facilitate the initial creation of feature classes and achieving the result of all spatial statistics and analysis. Microsoft office will aid the nature of the editorial plan content as well as the compilation and formulation of relevant literature documentation to purport our findings. ArcGIS Online will provide for the storage of data for future reference and visualization when needed.



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