

Exploring the Correlation between Environmental & Demographic Indexes across the US

By Emily Yarvis





Roadmap

01

Introduction:

Environmental Justice? Whats that?

02

Discovery:

Initial findings and Data

03

Exploration

Who is truly most effected and why?

04

Conclusion:

Why do we care?



Introduction

Explaining Environmental Justice

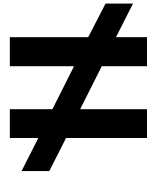
Environmental Discrimination

In 2019 **60 million** individuals died due to particulate matter in the air around the world



Environmental Discrimination

In 2019 **60 million** individuals died due to particulate matter in the air around the world



Research Question:

What is the correlation between environmental and demographic indicators across the US?

Environmental Indicators

| Factor # | Factor |
|----------|-------------------------------------|
| 1 | Particulate Matter |
| 2 | Ozone |
| 3 | Diesel |
| 4 | Air Toxics Cancer Risk |
| 5 | Air Toxics Respiratory Hazard Index |

| Factor # | Factor |
|----------|------------------------------|
| 6 | Toxic Releases to Air |
| 7 | Traffic Proximity and Volume |
| 8 | Lead paint indicator |
| 9 | Superfund proximity |
| 10 | RMP Proximity |

| Factor # | Factor |
|----------|------------------------------------|
| 11 | Hazardous Waste Proximity |
| 12 | Underground Storage Tank Indicator |
| 13 | Wastewater Discharge Indicator |

Demographic Indicators

| Factor # | Factor |
|----------|------------------------------------------|
| 1 | Demographic Index |
| 2 | Supplemental Demographic Index |
| 3 | BIPOC Pop. |
| 4 | Low Income Pop. |
| 5 | Unemployed Pop. |
| 6 | Limited English Speaking Households Pop. |
| 7 | Less Than High School Education Pop. |

Demographic Index- Factor 13

$$\frac{\% \text{ Low Income Pop.} + \% \text{ BIPOC Pop.}}{2}$$



Factor:

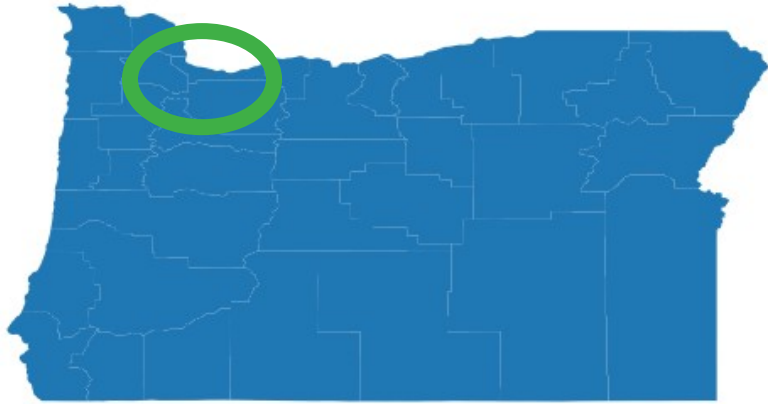
- 01 **Particulate Matter (pm 2.5)**
Annual average PM2.5 levels in air
- 02 **Ozone**
Average of the annual top ten daily maximum 8-hour ozone concentrations in air
- 03 **Diesel**
Diesel particulate matter level in air
- 04 **Air Toxics Cancer Risk**
Lifetime cancer risk from inhalation of air toxics
- 05 **Air Toxics Resp. Hazard Index**
Ratio of exposure concentration to health-based reference concentration



Discovery

Initial Research and Findings

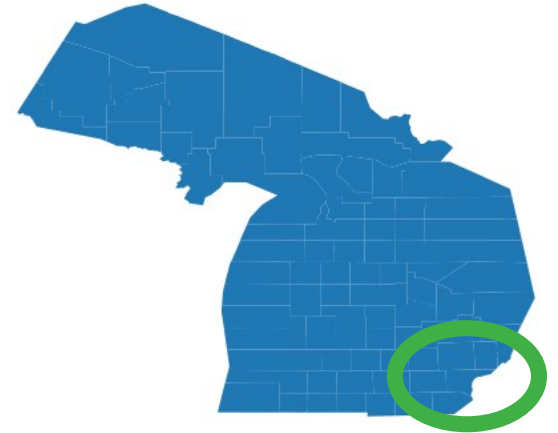
Initial Chosen States



**Portland,
Oregon**

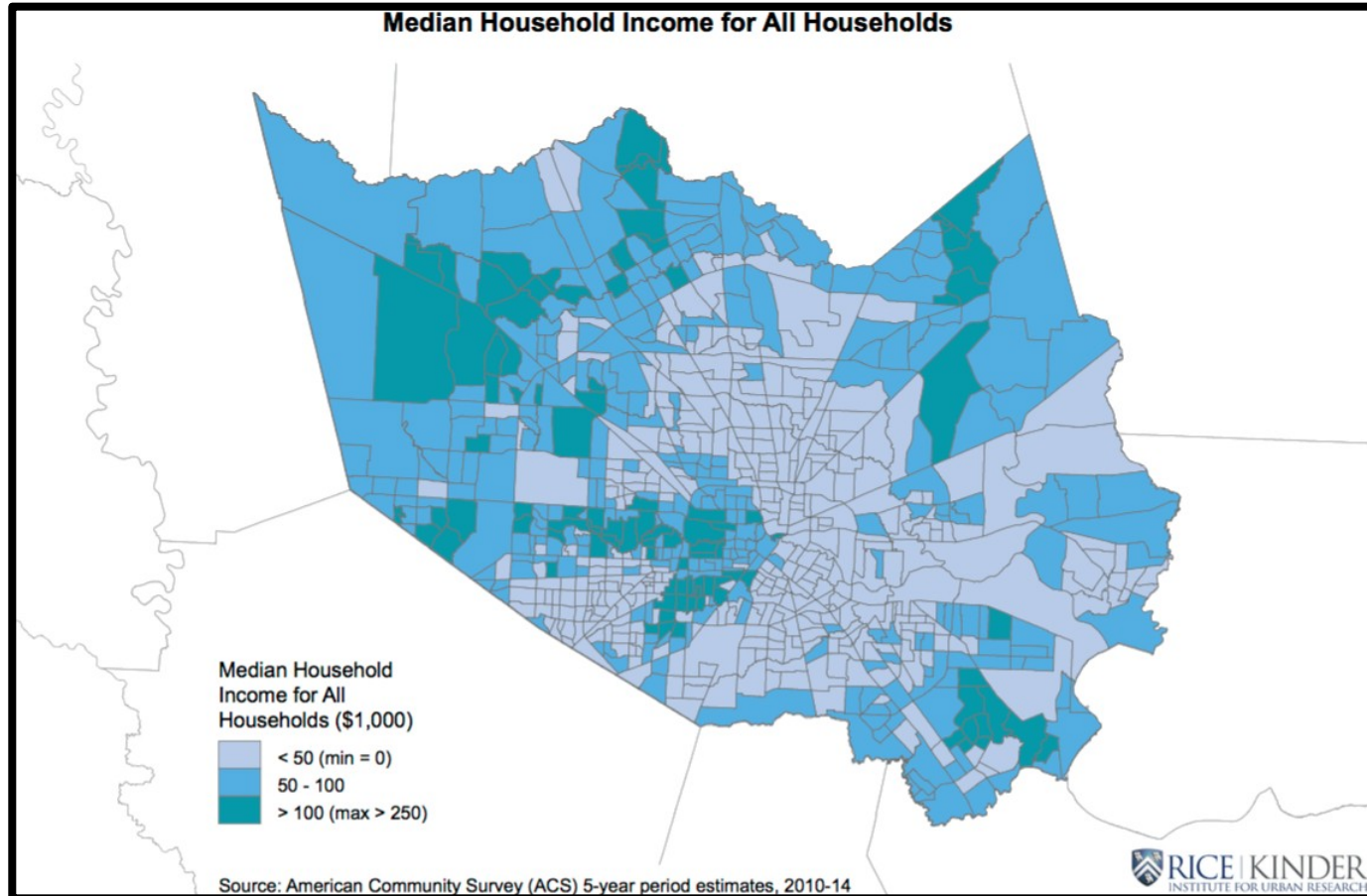


**Houston,
Texas**

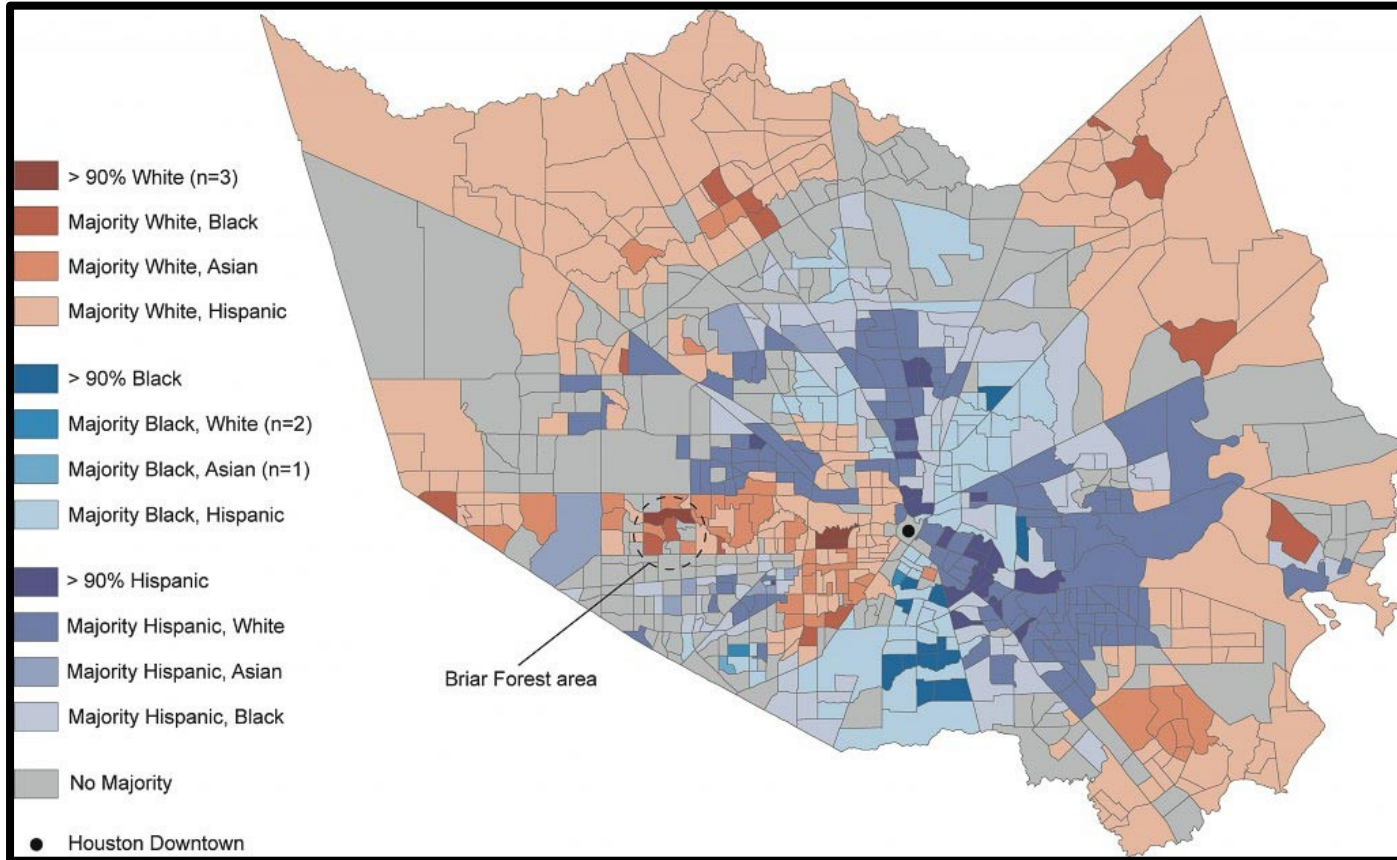


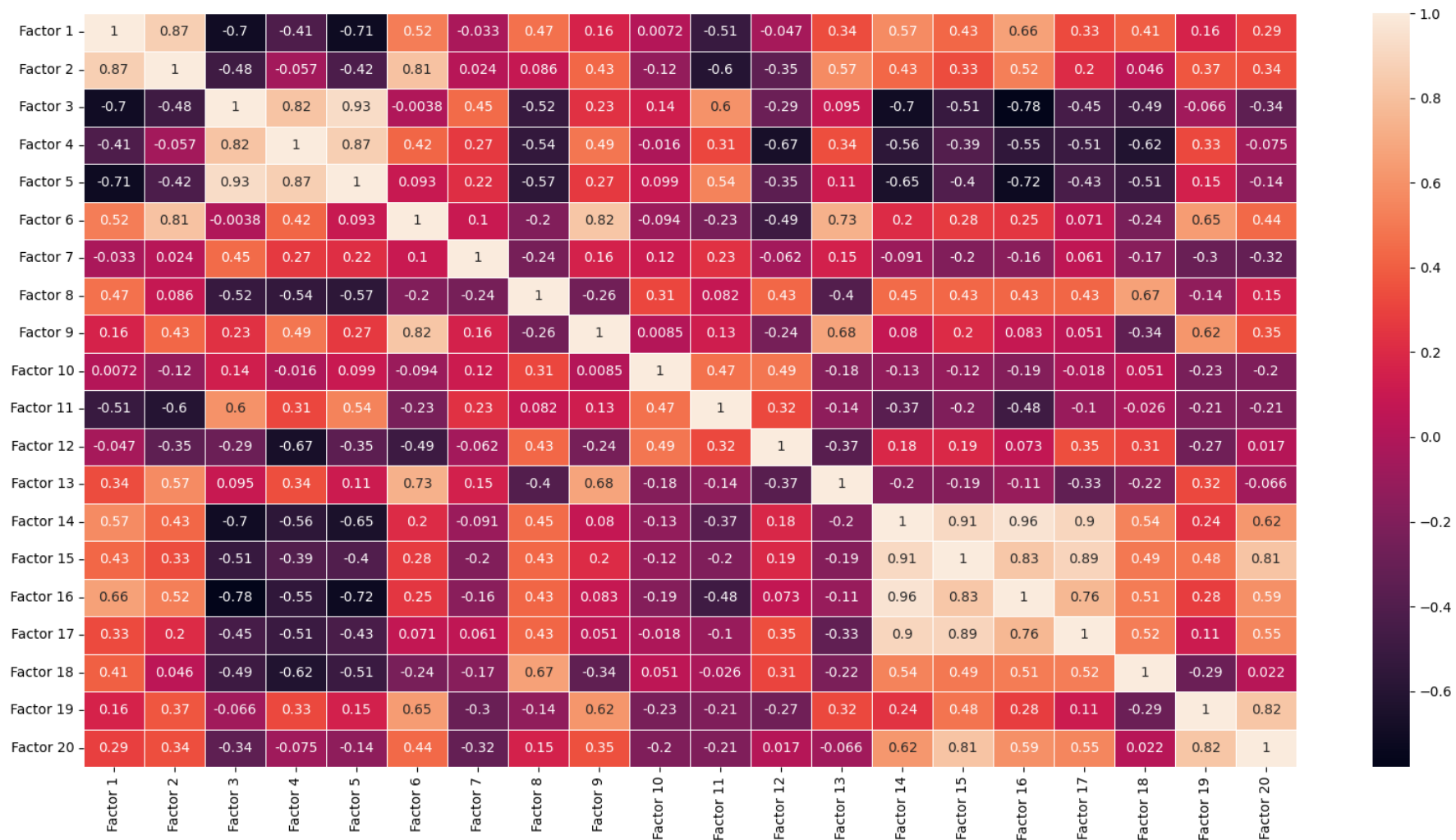
**Detroit,
Michigan**

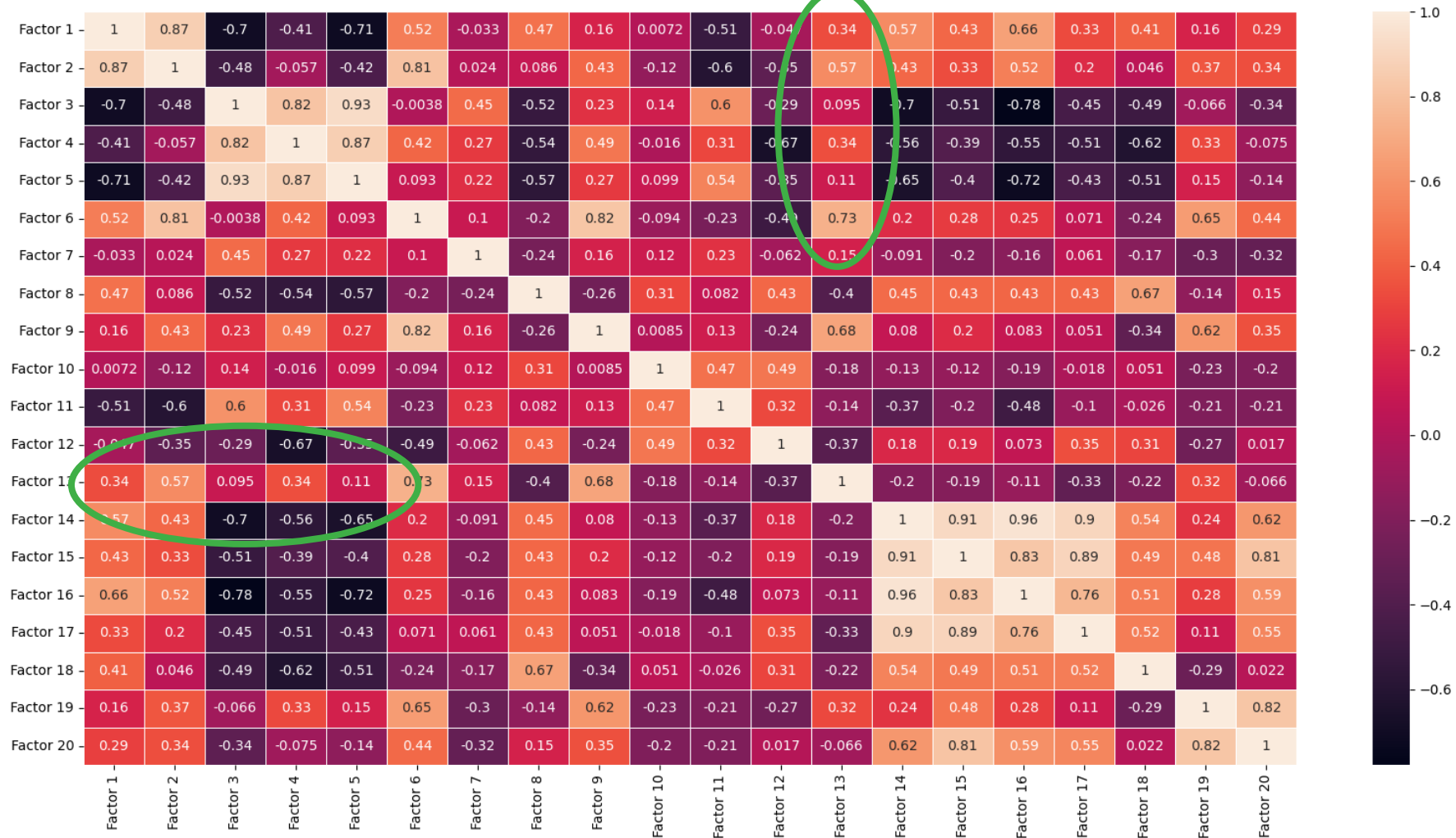
The Arrow



The Arrow





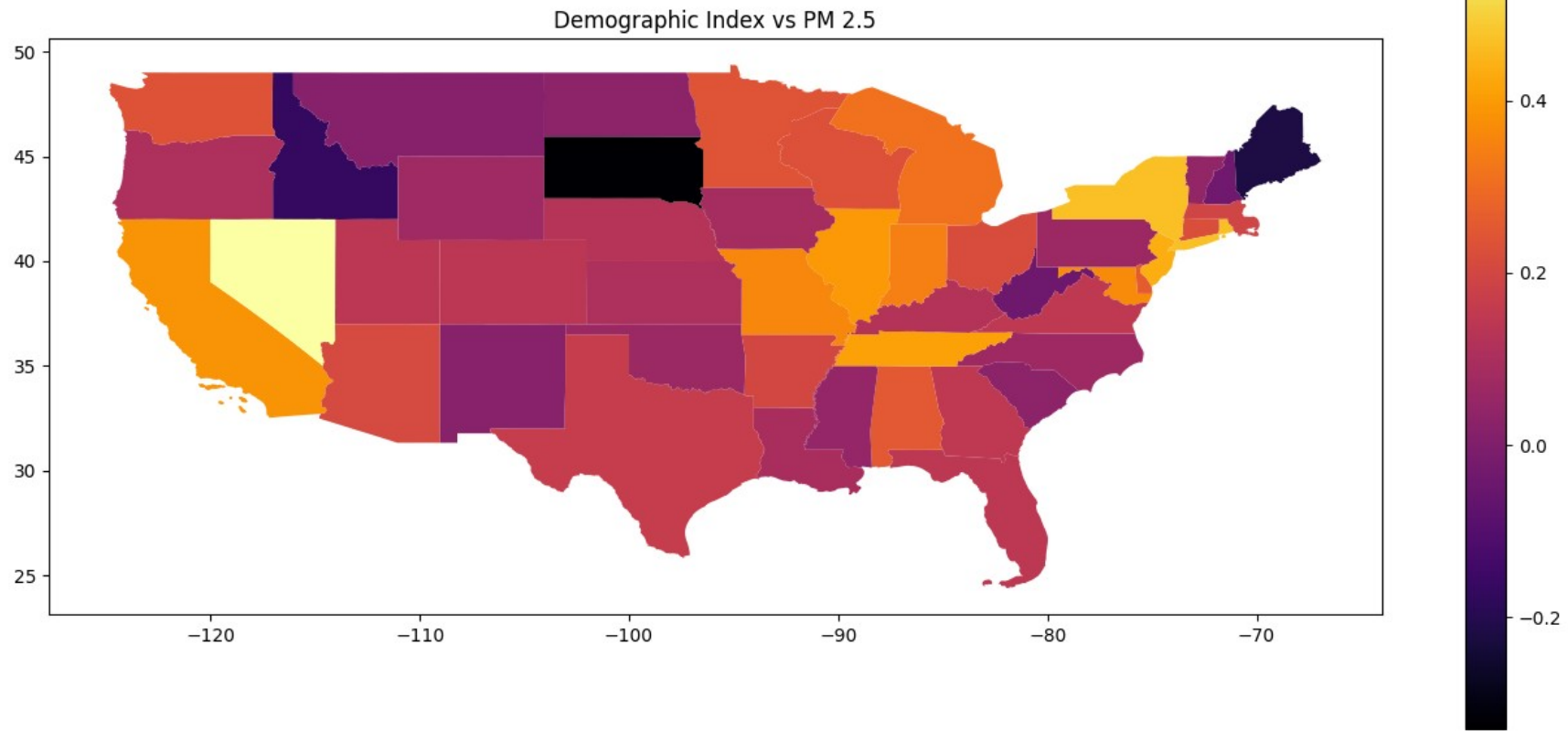


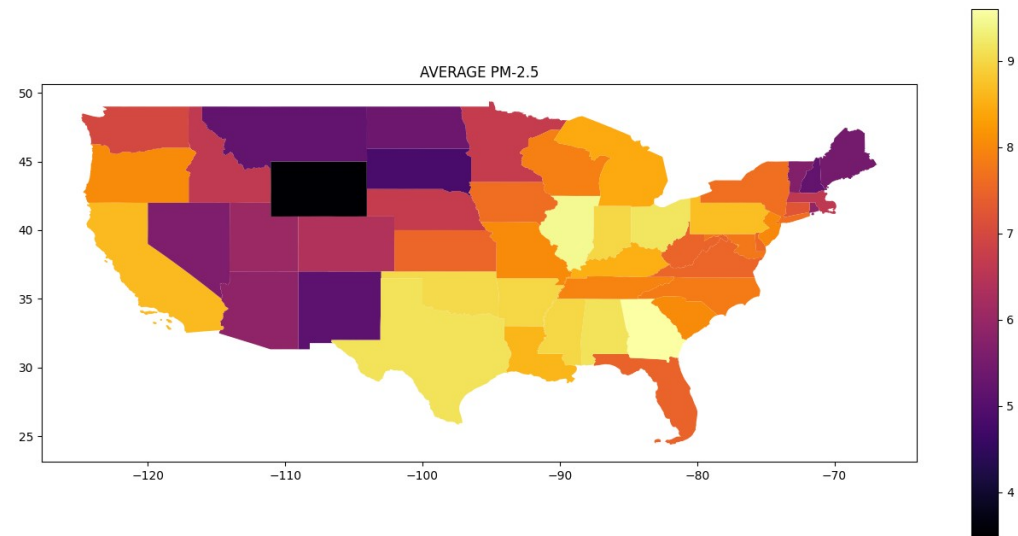
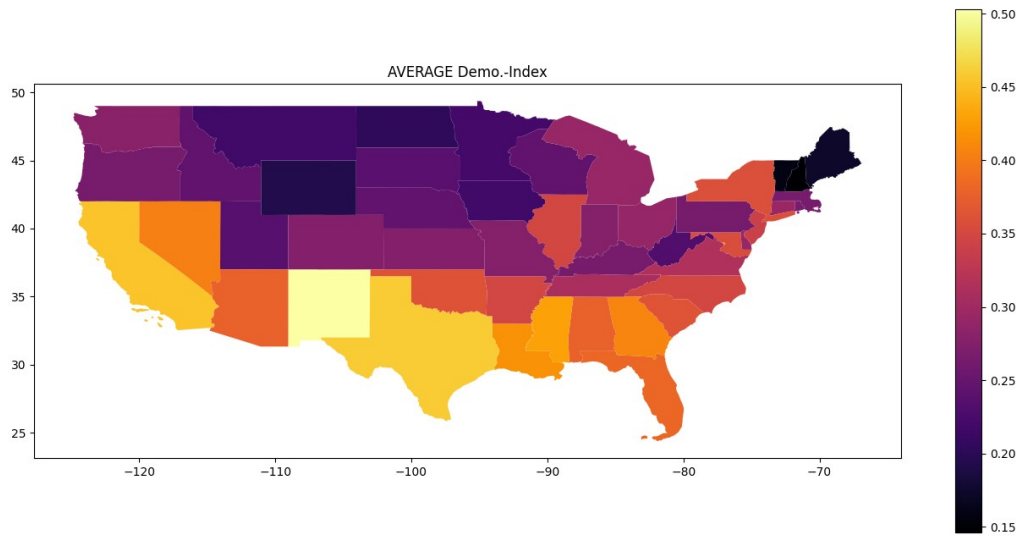
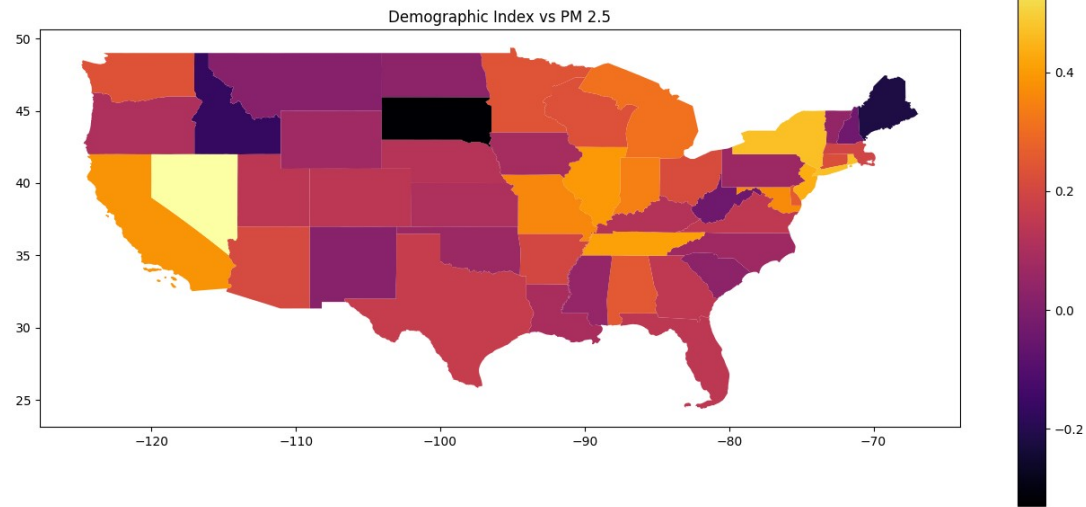


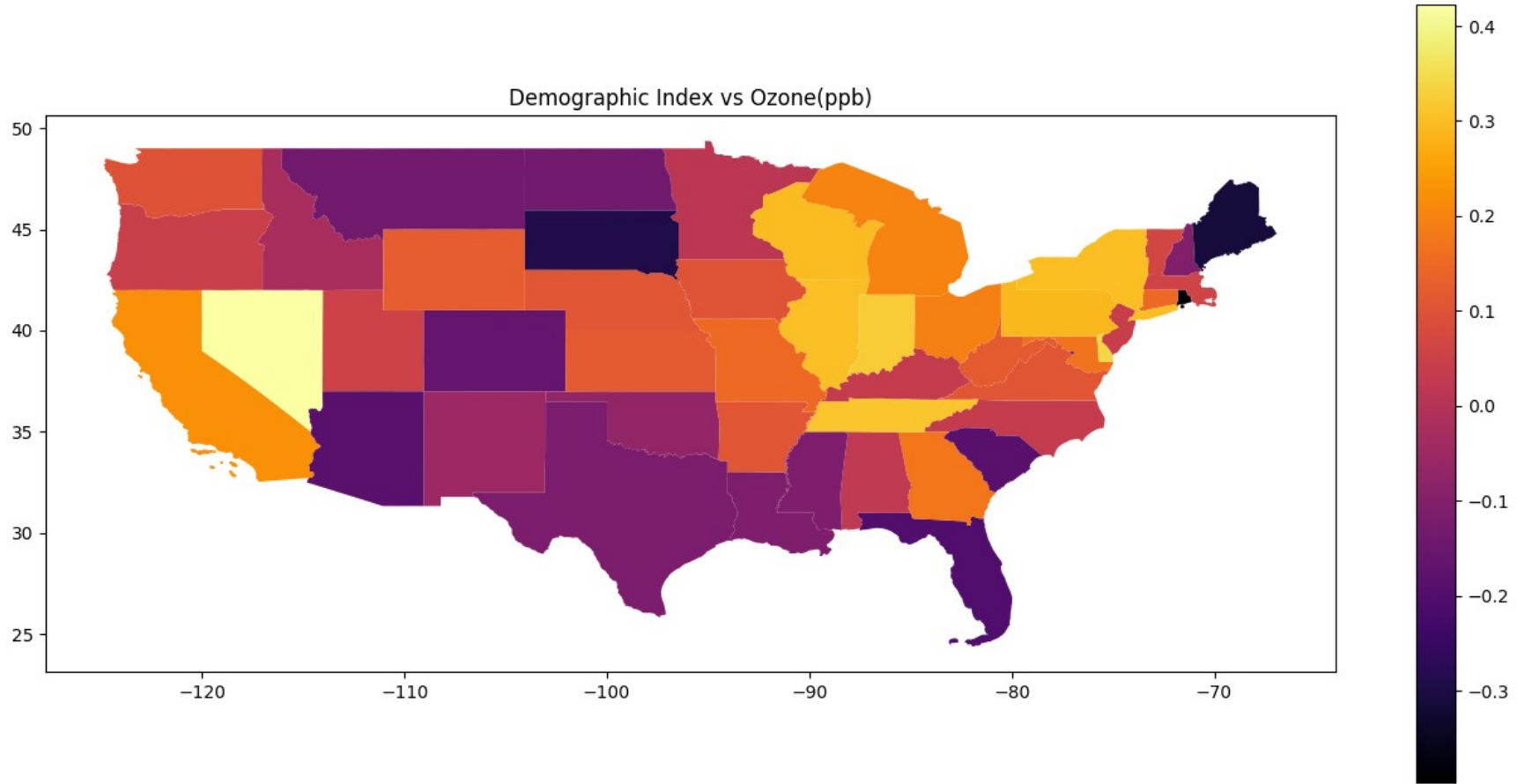
Exploration

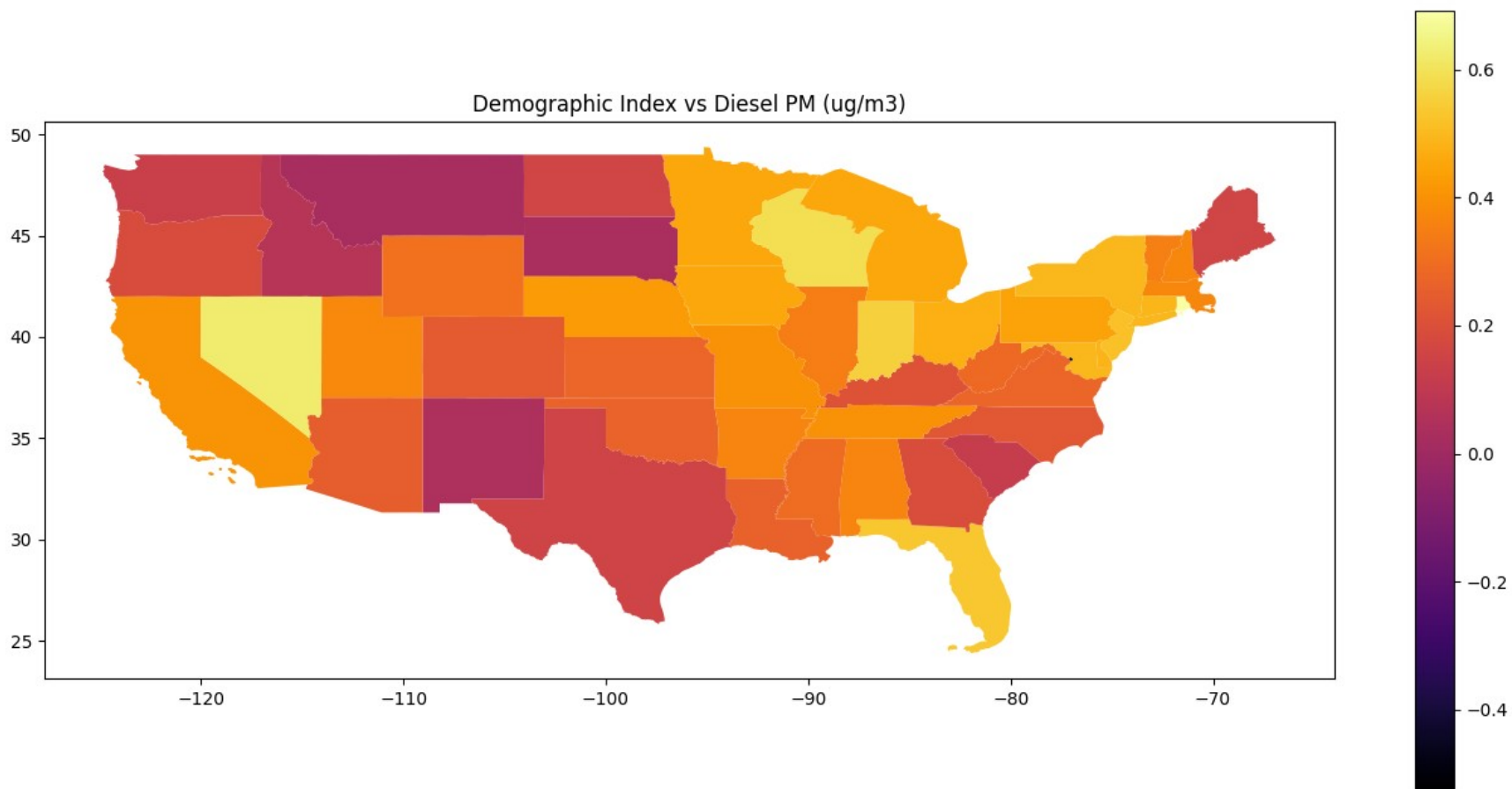
Further Findings

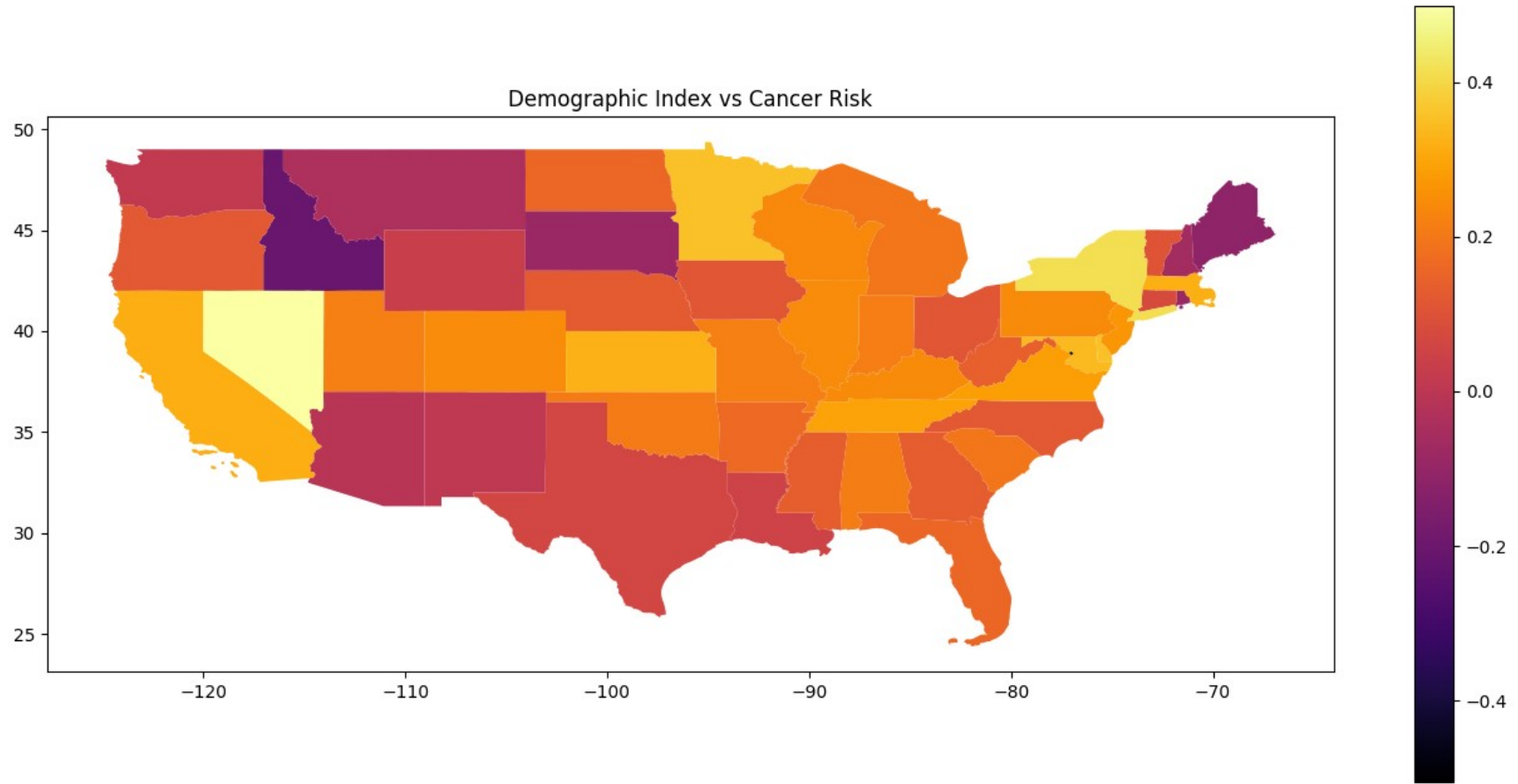
Total Tracts



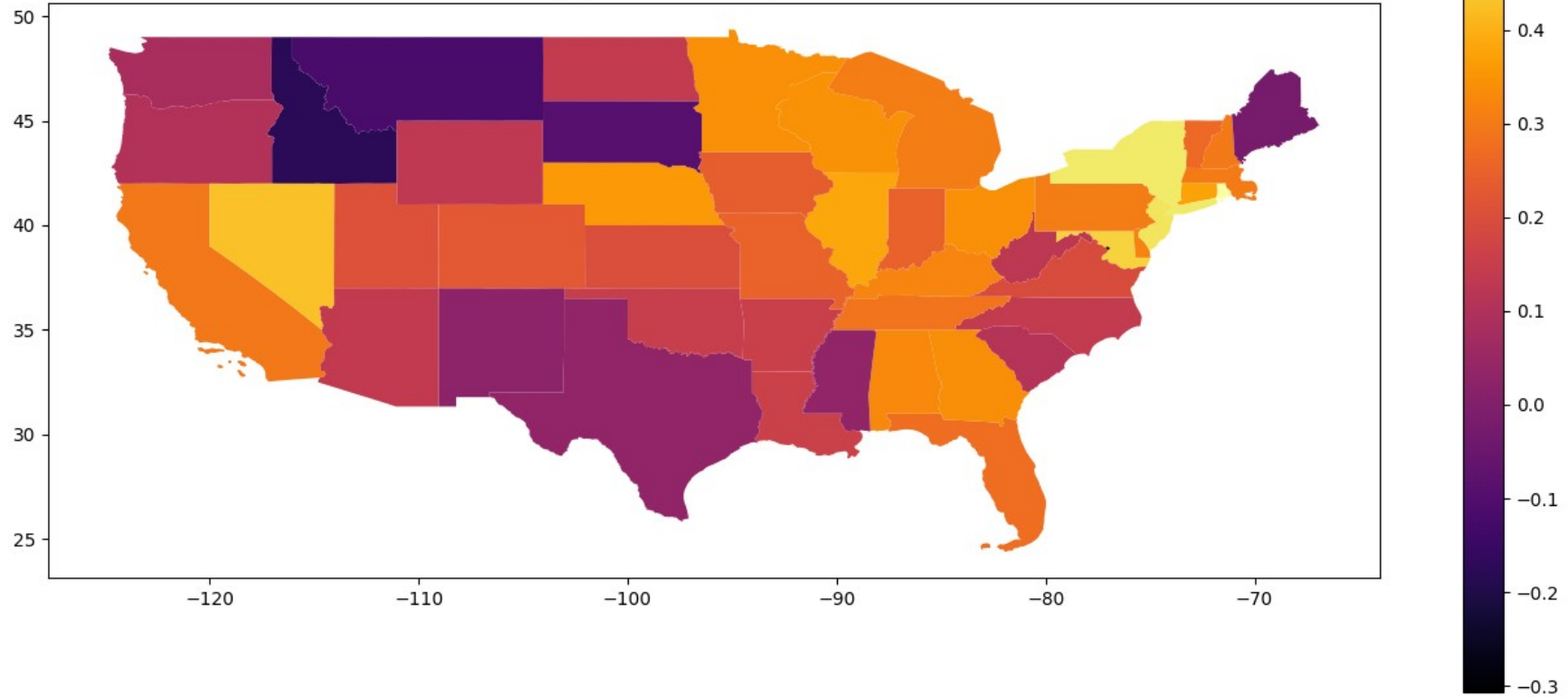








Demographic Index vs Resp. Hazard Index





Conclusion

Why Do We Care