

MICHIGAN STATE

U N I V E R S I T Y

Alpha Presentation

Health Outcomes Forecasting Tool

The Capstone Experience

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*From Students...
...to Professionals*

Project Overview

- There is a lack of precise data about air pollution and health effects on the individual.
- Poor air quality can result in an increase in lung disease and other health complications.
- Keep consumers, researchers, and politicians informed about air quality in their area
- Designing a web app that uses machine learning to predict air quality and health information in each area, and displays that with a map overlay



System Architecture



Map Page

Map

Not secure | 206.189.205.73:5000

Apps Archive Classes CS D&D Discord Bot Pixel Art Research RPI SpartaHack Textbooks Thrift Club Web D2L EGR Remote ASL Discord Embeds Reading list

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Predicted PM2.5 Value: 15.142766

Selection

- Home
- Compare
- Health Predictions
- Resource
- Quiz

Map Satellite 415 Pacific Avenue, Venice, CA, USA

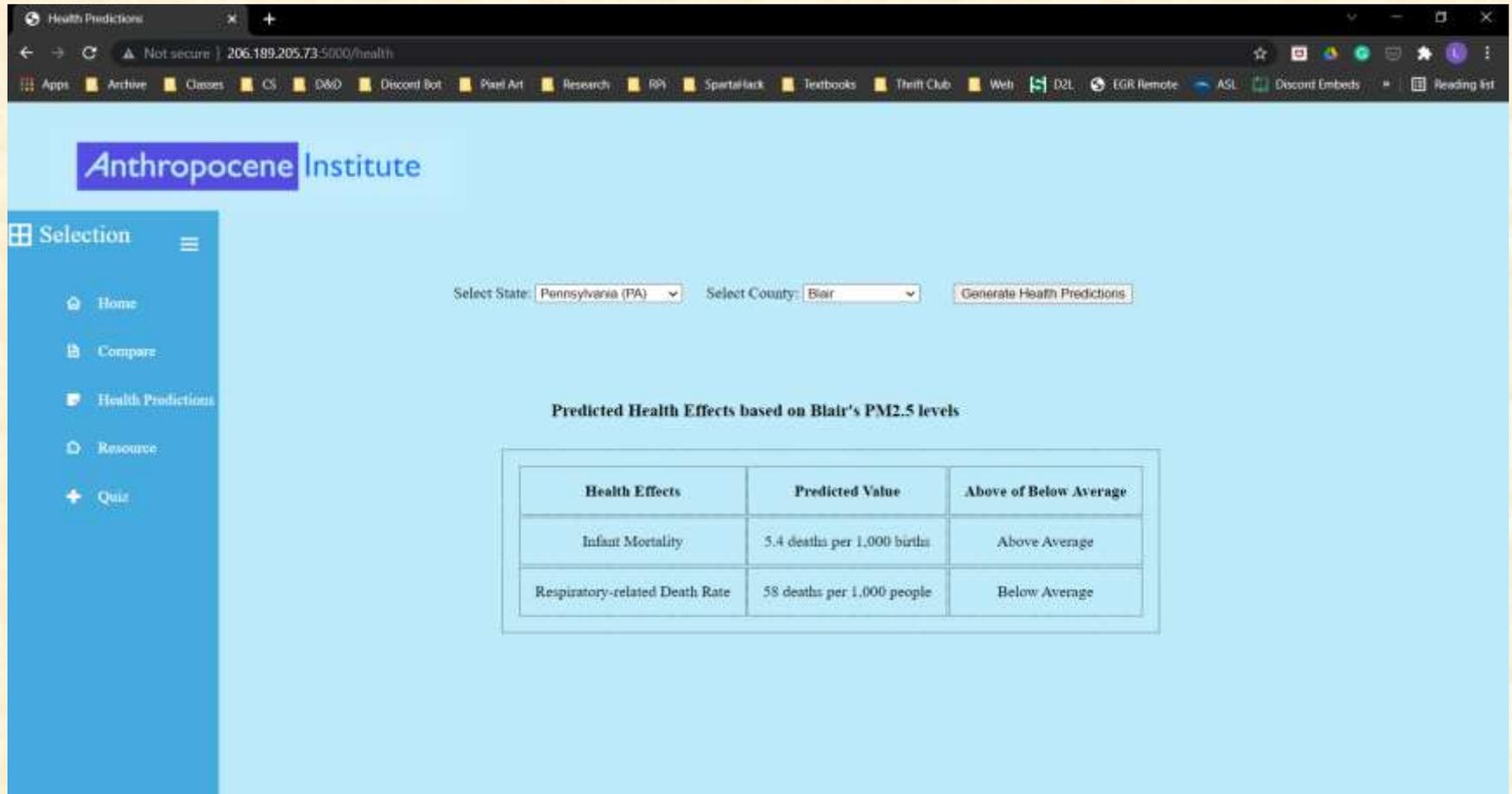
Toggle Heatmap
Change gradient
Change radius
Change opacity

Google

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Health Predictions Page



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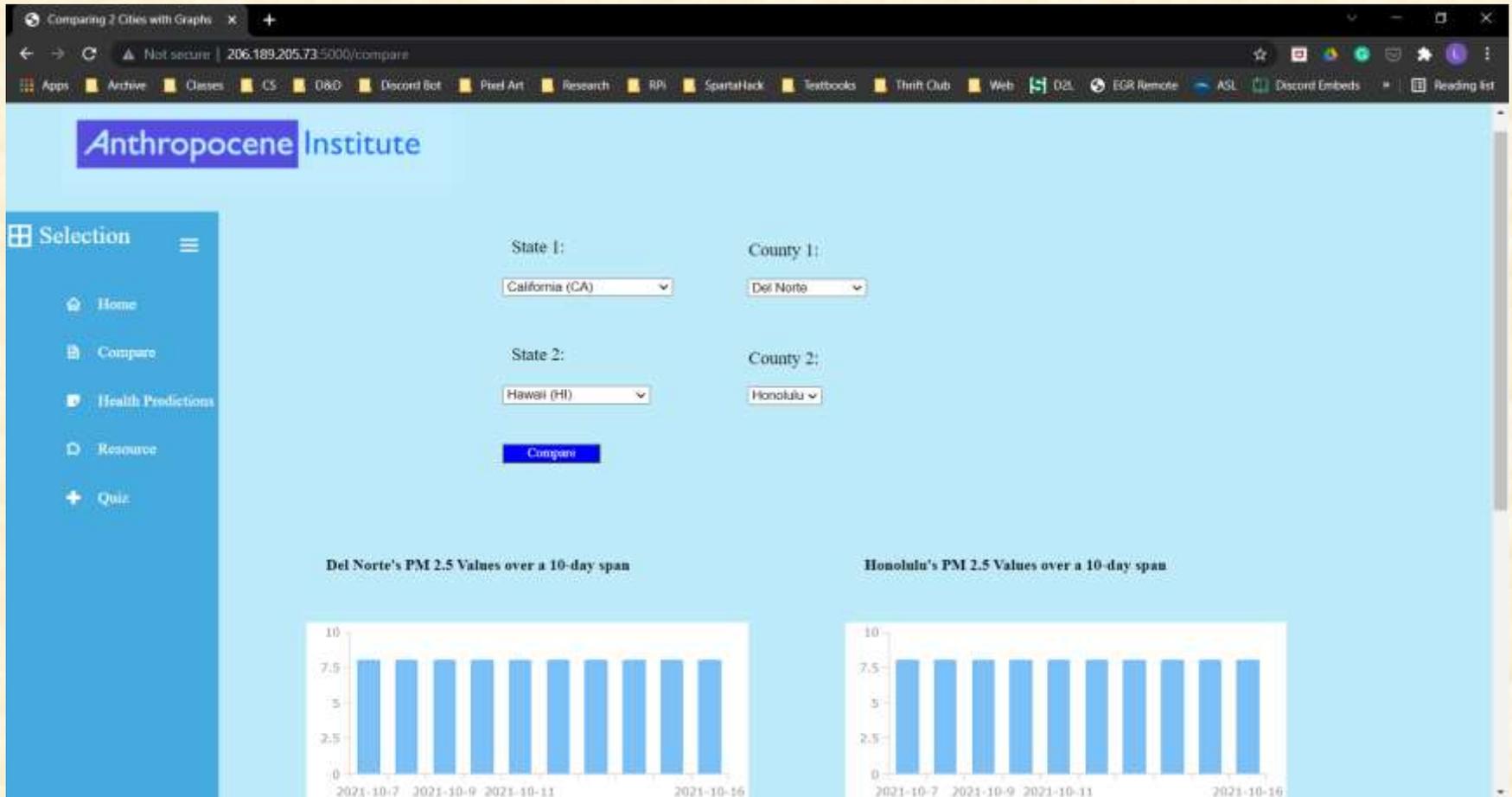
Select State: Pennsylvania (PA) Select County: Blair

Predicted Health Effects based on Blair's PM2.5 levels

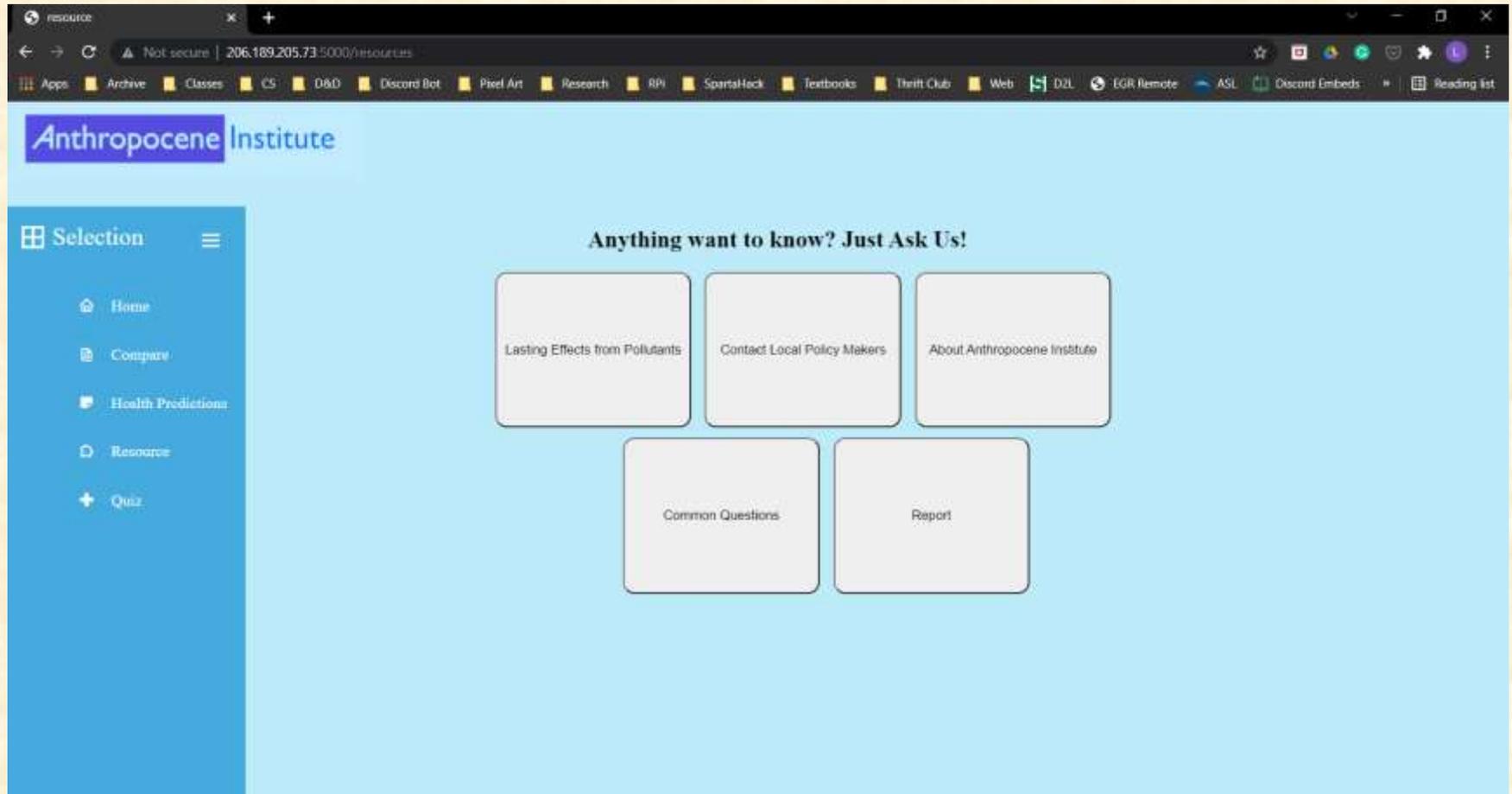
Health Effects	Predicted Value	Above of Below Average
Infant Mortality	5.4 deaths per 1,000 births	Above Average
Respiratory-related Death Rate	58 deaths per 1,000 people	Below Average



Compare Page



Resources Page



Quiz Page

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Good Luck!

[Start quiz!](#)

What is the average PM2.5 value in Los Angeles?

- 10.1
- 21.2
- 14.8
- 6.4

How much has the average PM2.5 value in Los Angeles changed over the last 10 years?

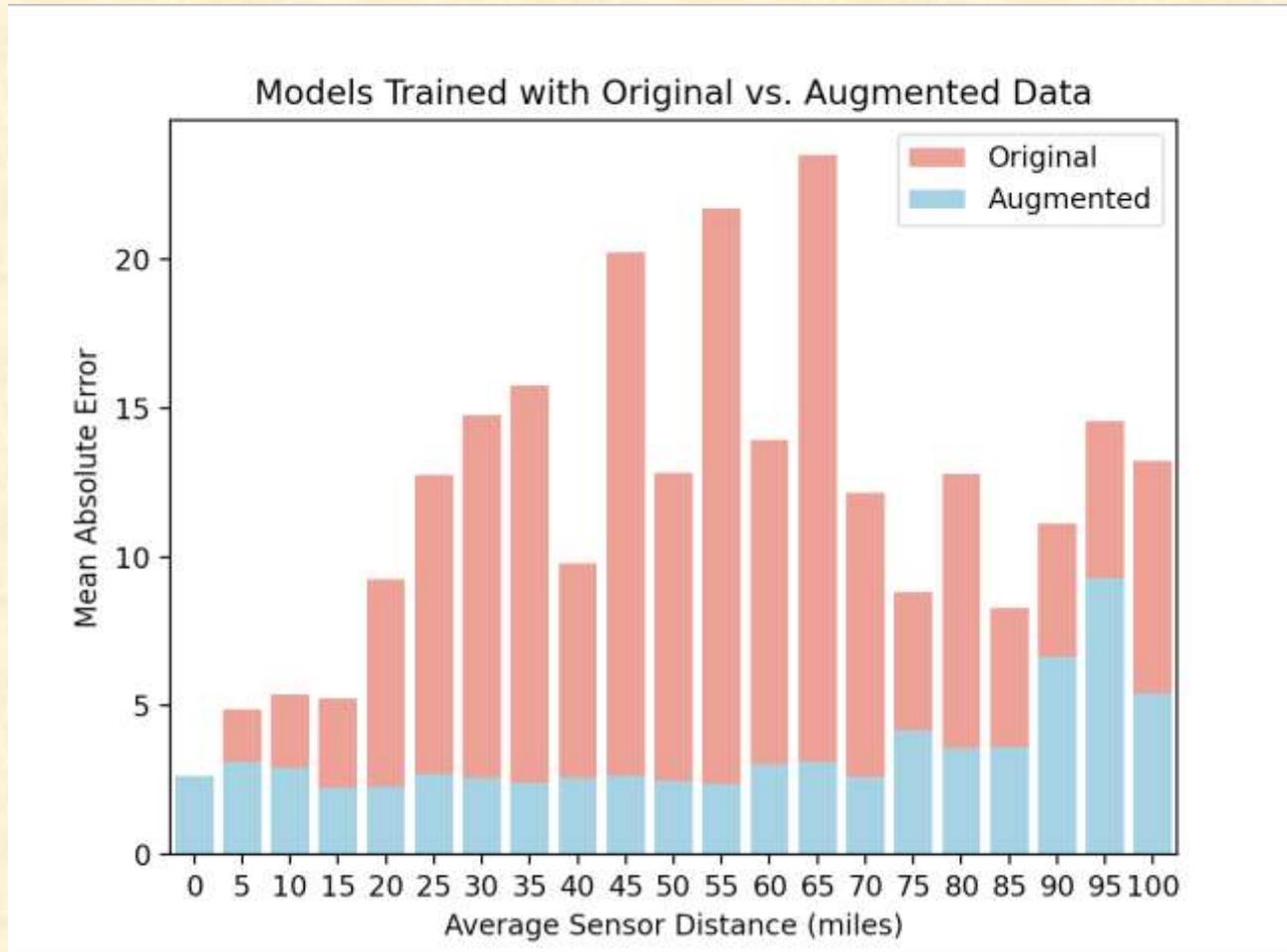
- 4.1
- +2.4
- 1.6
- +6.8

What is the largest contributor to pollution in the United States?

- Industrial Processes (i.e. metal smelters, petroleum refineries, cement kilns and dry cleaners)
- Stationary Fuel Combustion (i.e. electric utilities and industrial boilers)
- Highway Vehicles
- Non-road Mobile sources (i.e. recreational and construction equipment, utility vehicles, aircraft and locomotives)



Sensor Accuracy with Sparse Data



What's left to do?

- Create models for other health parameters, like respiratory cancer and asthma rates, and increase the accuracy of those models.
- Expand the air quality prediction model to the rest of the country.
- Format pages to look aesthetically pleasing.
- Implement full functionality of each page.
- Fully integrate our models with the front end.



Questions?

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