



# Researching the Causes of Air Pollution Across the U.S.

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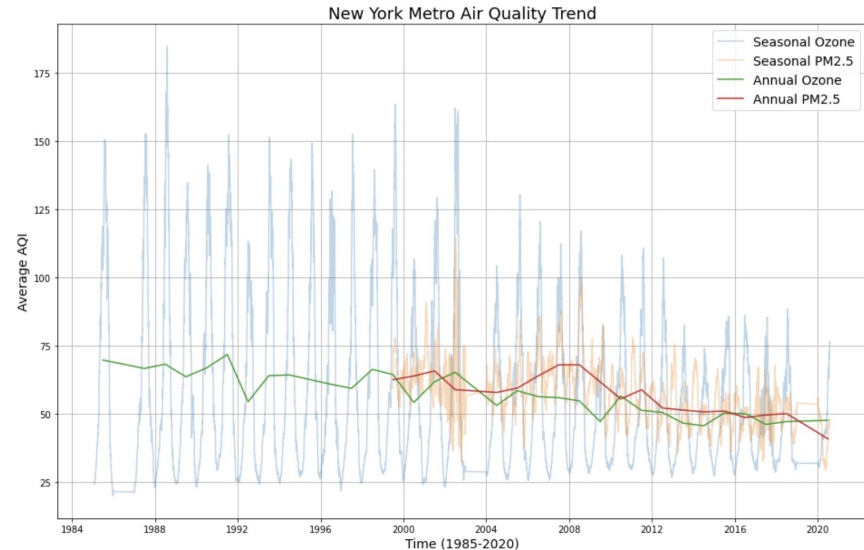
*August 2020*



# How is air quality measured?

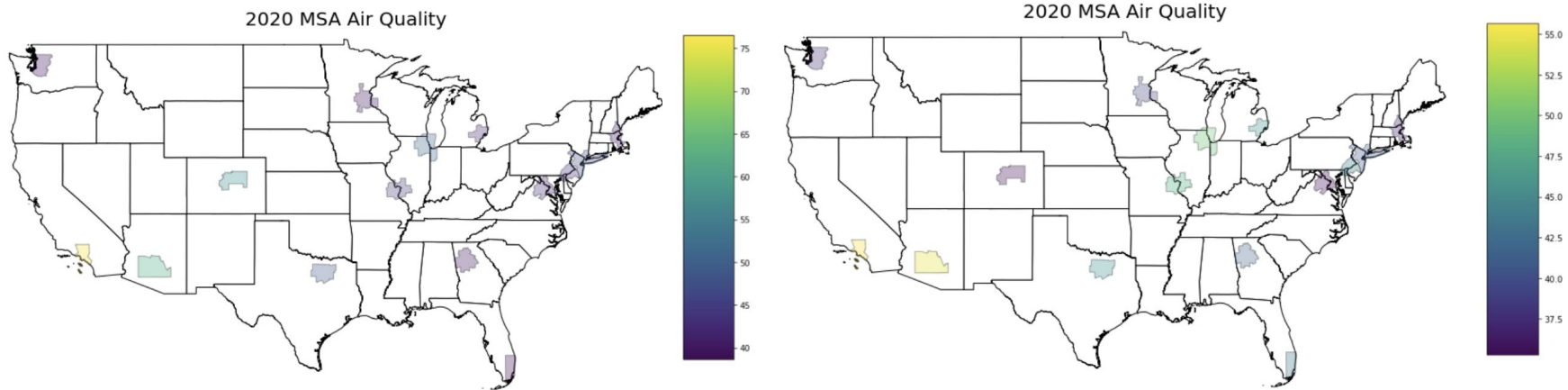
| AQI Basics for Ozone and Particle Pollution |                                |                 |   |
|---|--------------------------------|-----------------|---|
| Daily AQI Color                             | Levels of Concern              | Values of Index | Description of Air Quality  |
| Green                                       | Good                           | 0 to 50         | Air quality is satisfactory, and air pollution poses little or no risk.   |
| Yellow                                      | Moderate                       | 51 to 100       | Air quality is acceptable. However, there may be a risk for some people, particularly those who are unusually sensitive to air pollution. |
| Orange                                      | Unhealthy for Sensitive Groups | 101 to 150      | Members of sensitive groups may experience health effects. The general public is less likely to be affected.                              |
| Red   | Unhealthy                      | 151 to 200      | Some members of the general public may experience health effects; members of sensitive groups may experience more serious health effects. |
| Purple                                      | Very Unhealthy                 | 201 to 300      | Health alert: The risk of health effects is increased for everyone.   |
| Maroon                                      | Hazardous                      | 301 and higher  | Health warning of emergency conditions: everyone is more likely to be affected.   |

*Figure 1: Air Quality Index (EPA)*



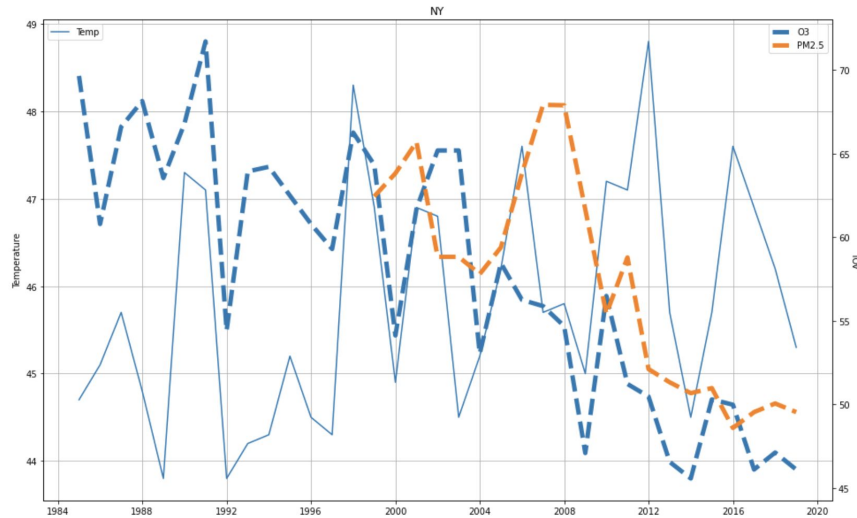
*Figure 2: New York MSA Air Quality Trend of O<sub>3</sub> and PM<sub>2.5</sub>, 1985-2020*

# Air quality across the U.S.

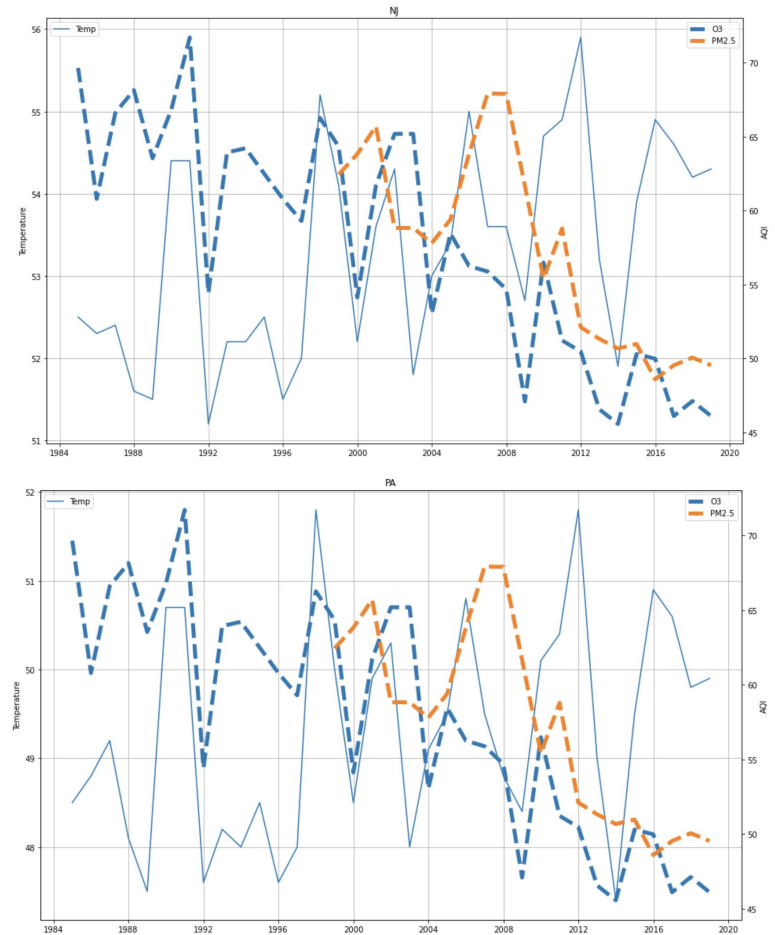


*Figure 3: Map visualizations of O<sub>3</sub> (left) and PM<sub>2.5</sub> (right) across the United States MSAs in 2020*

# Temperature Ozone ( $1/2$ )



*Figure 4: Line plots of NY-NJ-PA of temperature to air quality (1985-2020)*



# Temperature to Ozone (2/2)

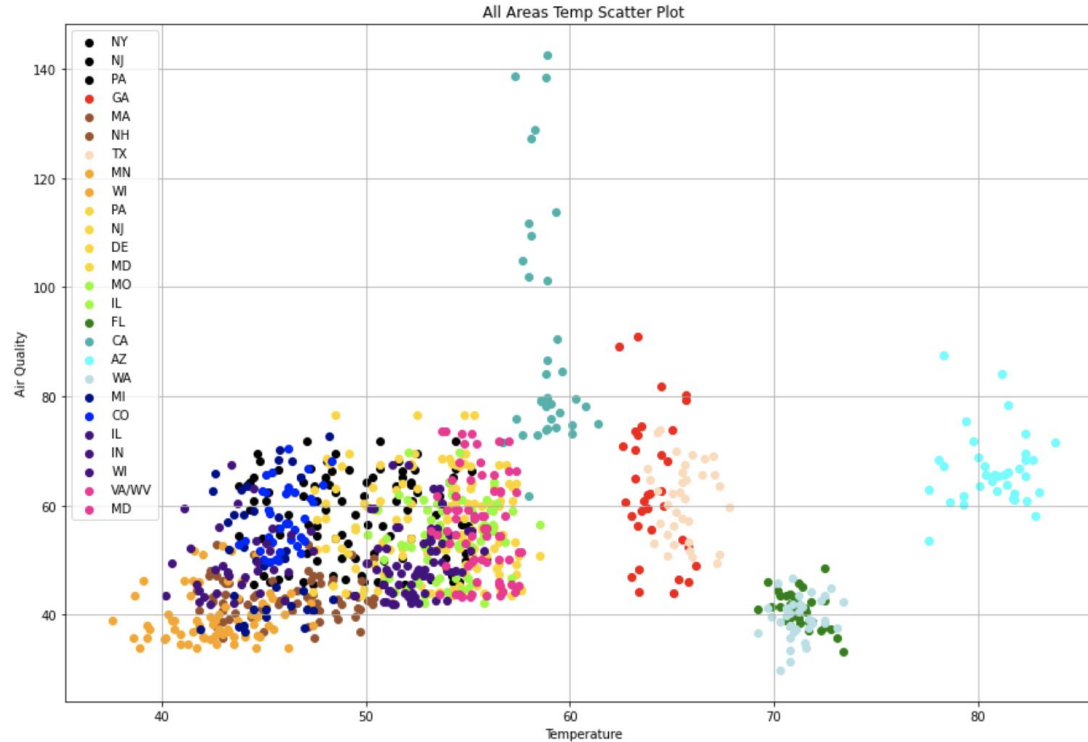


Figure 5: Scatter plot of states to metro ozone

## Energy consumption (1/2)

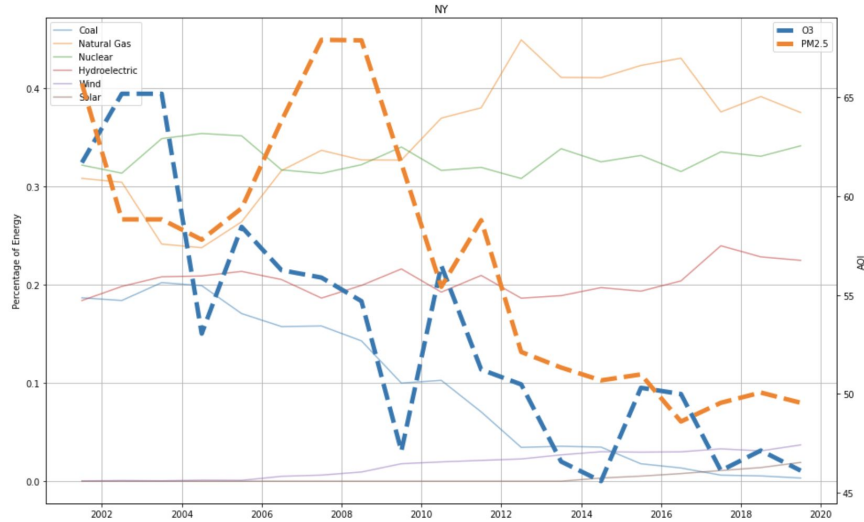
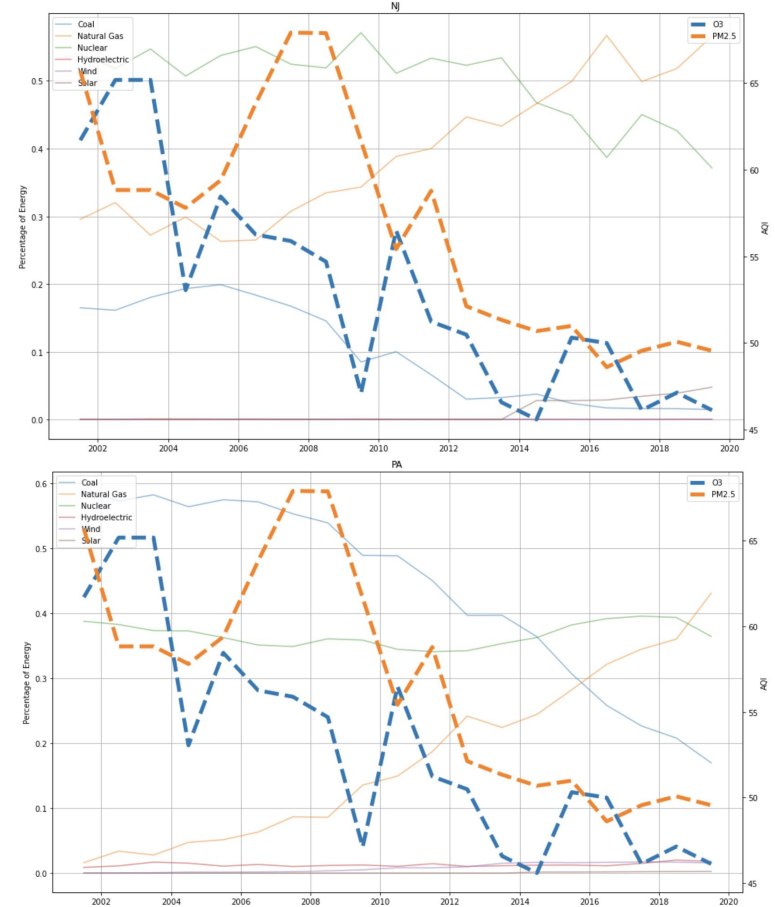
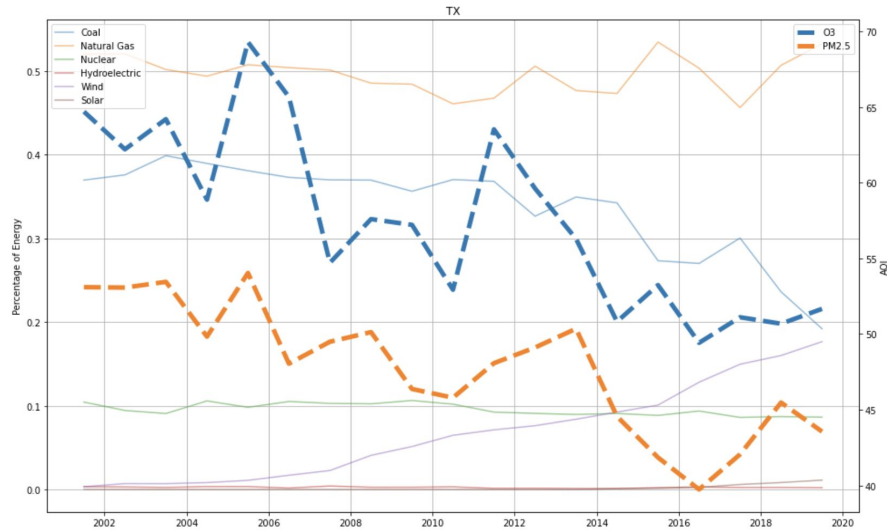


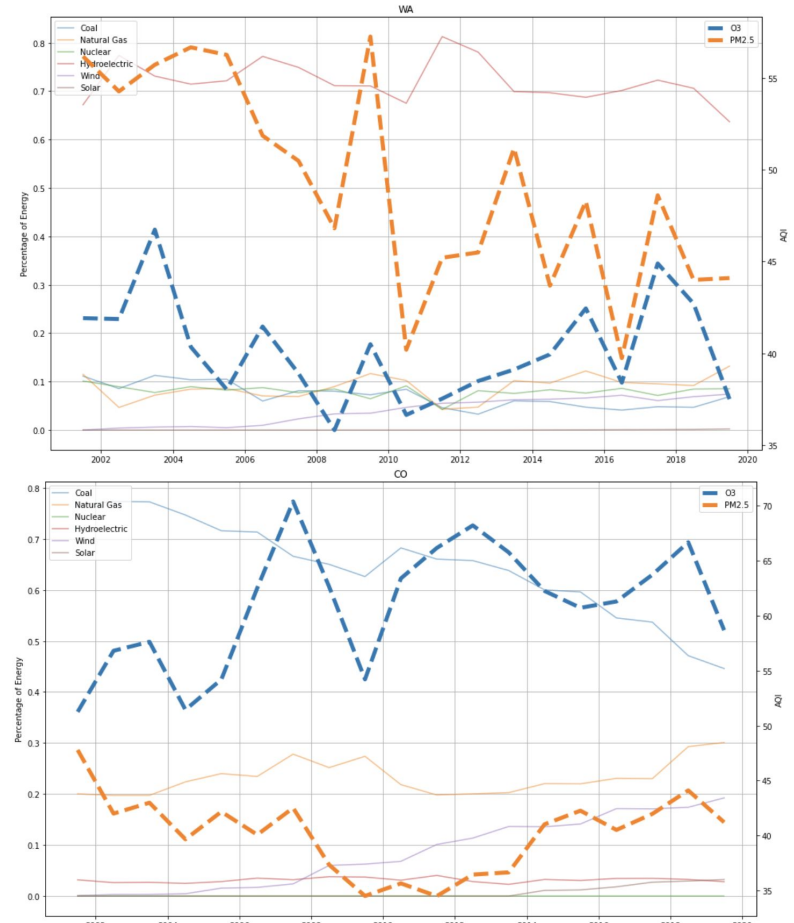
Figure 6: Energy consumption of the New York MSA (2001-2019)



# Energy consumption (2/2)



*Figure 7: Energy consumption of the Dallas, Seattle, and Denver MSAs (2001-2019)*



# GDP and production by industry (1/3 )

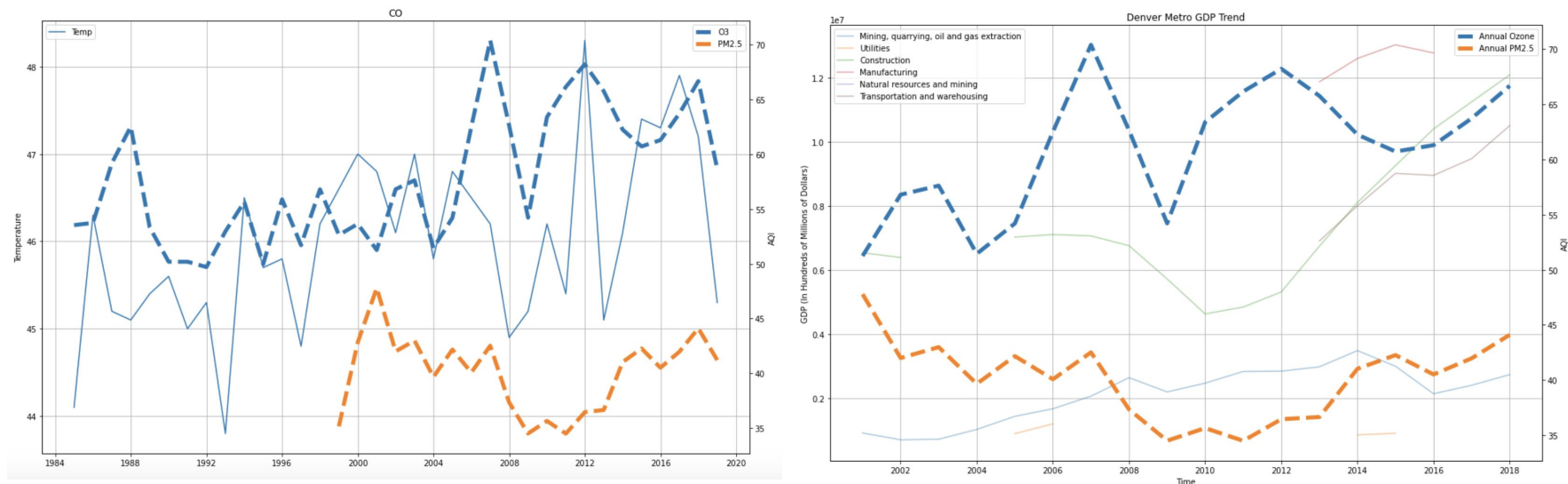


Figure 8: Temperature (left) and GDP (right) trends of Denver MSA



# GDP and production by industry (2/3 )

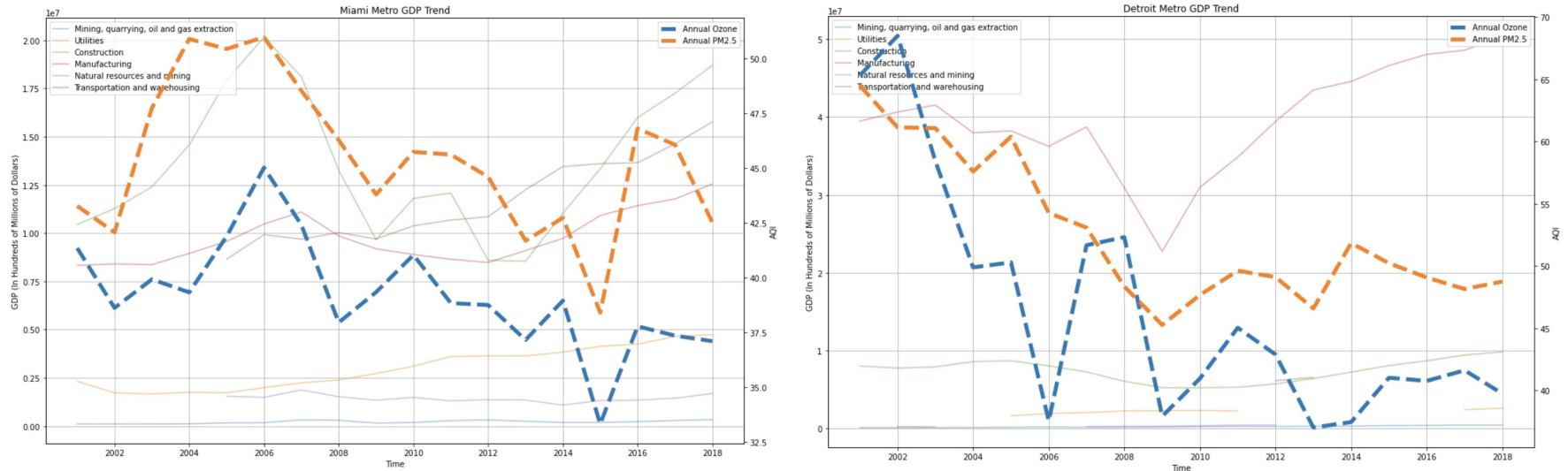
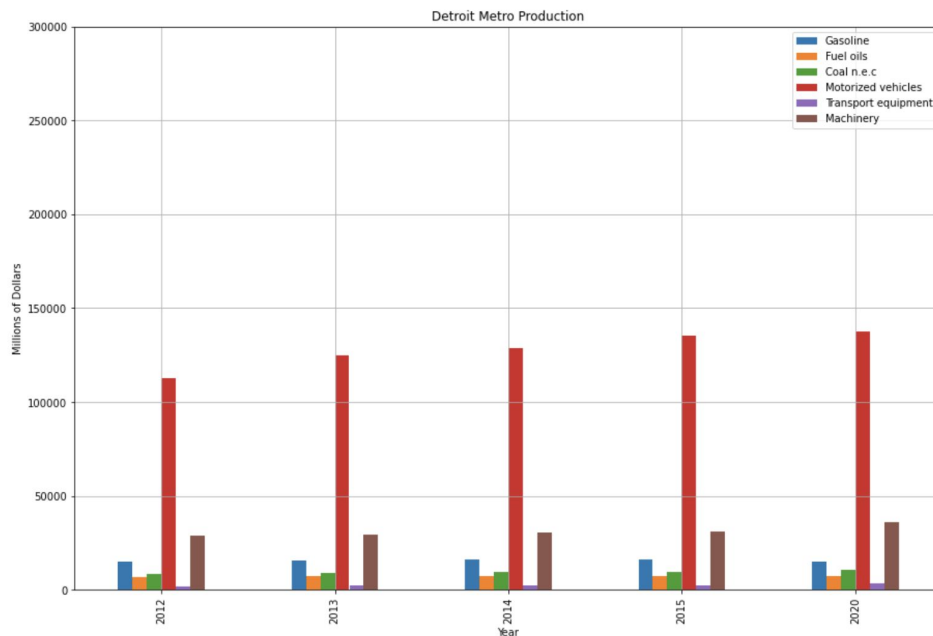


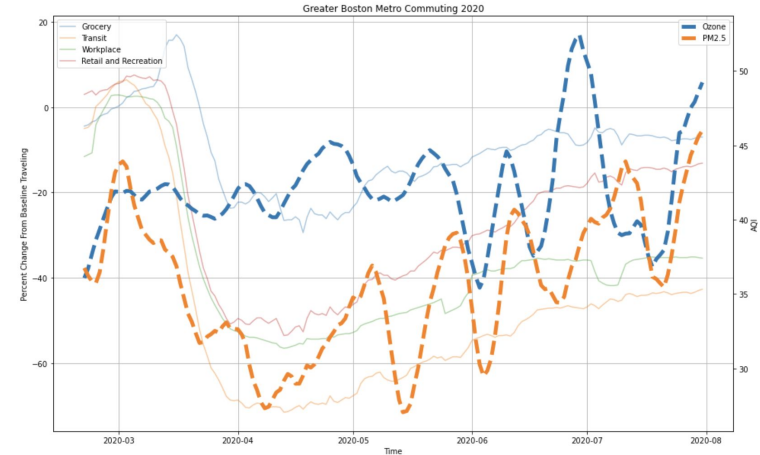
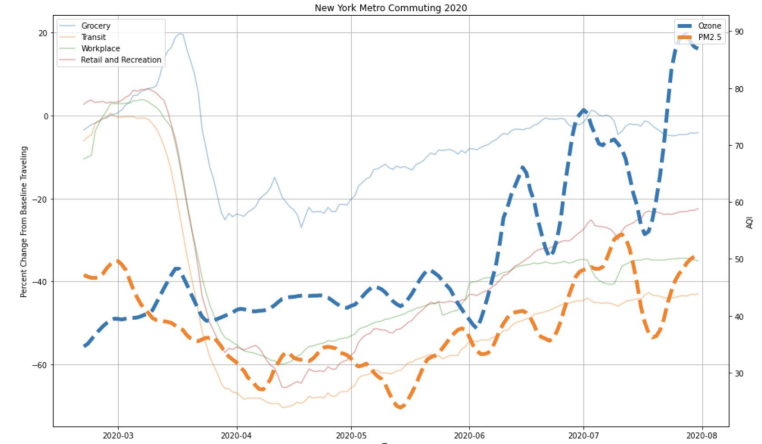
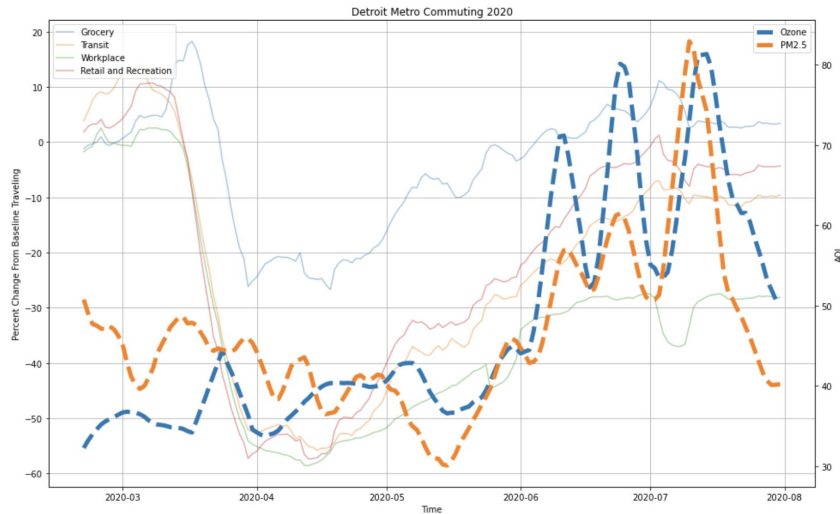
Figure 9: Miami (left) and Detroit (right) MSA GDP trends (2001-2019)

# GDP and production by industry (3/3 )



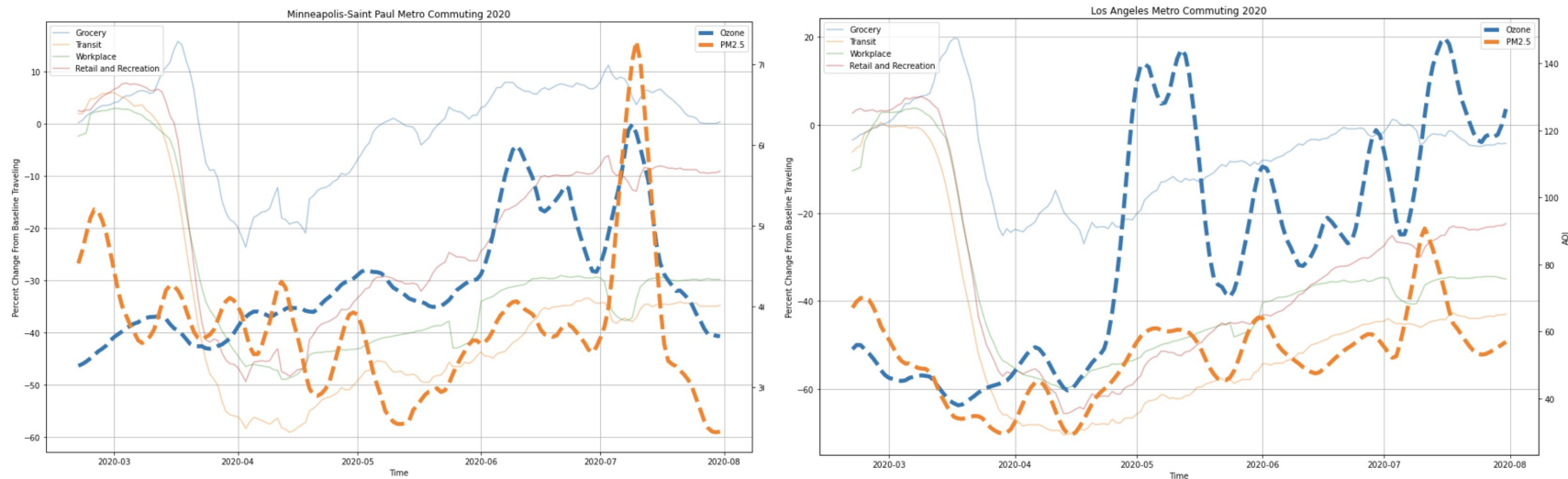
*Figure 10: Detroit MSA production (2012-2015, 2020)*

# Commuting trends of COVID-19 (1/3)



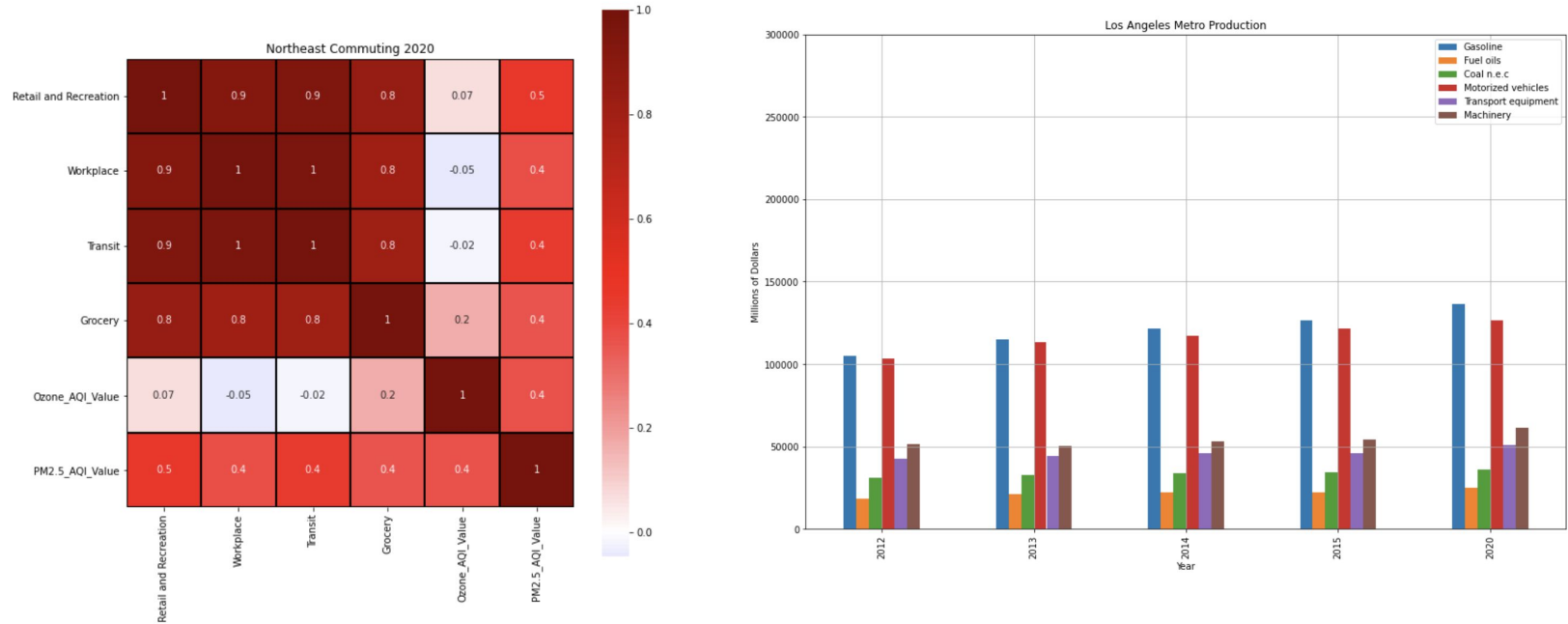
*Figure 11: Commuting trends for Detroit, New York, and Greater Boston MSAs (February 15-July 31st, 2020)*

# Commuting trends of COVID-19 (2/3)



*Figure 12: Commuting trends for Minneapolis (left) and Los Angeles (right) MSAs (February 15-July 31st, 2020)*

# Commuting trends of COVID-19 (3/3)



*Figure 13: Northeast commuting correlation matrix (left) and Los Angeles MSA production (right)*

A huge thank you to Jon Stelman, the LSI Team, the other interns, as well as the entirety of Renaissance Learning.