



INTRODUCTION

Rockaway, a peninsula located in Queens, New York, is an area with a growing society. As the area continues to prosper, it becomes difficult to keep a stable and safe level of air quality due to many contributing factors.

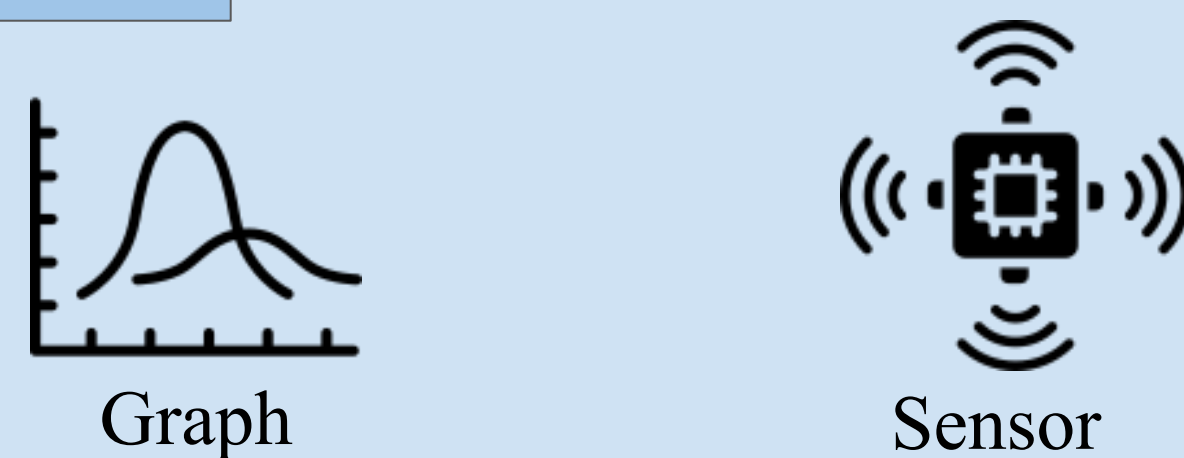
Major Air Quality Concerns:



Forest Fires

Pollution

METHODS



Graph

Sensor

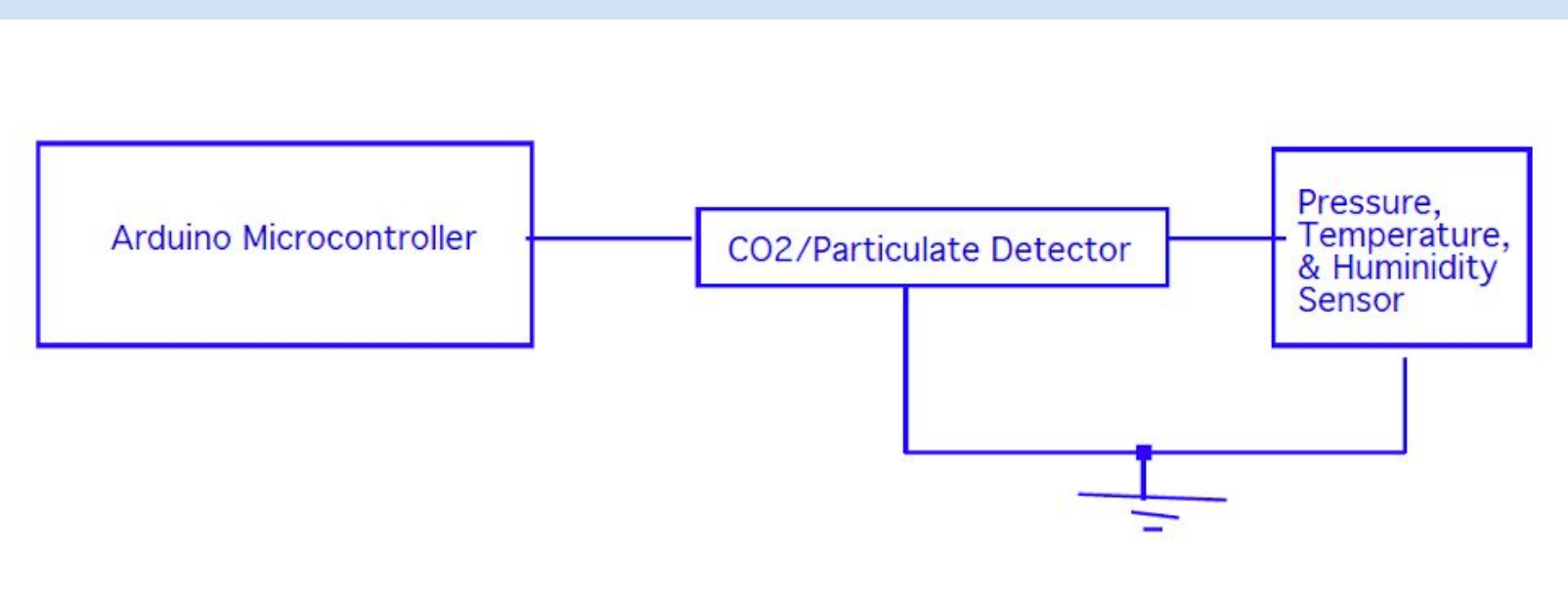


Figure 1. Diagram of air quality sensor. Figure made using LTspice.

(CO2/Particulate Detector operates through the absorption of infrared light at a specific wavelength. Pressure, Temperature & Humidity Sensor works by measuring the capacitance or resistance of air samples.)

PROCEDURE

As a way to better understand the engineering behind the PurpleAir sensor, we built a low cost air quality sensor of our own. This sensor measured CO₂, temperature, relative humidity and pressure.

However, for the purpose of being able to monitor the air over a longer period of time, the PurpleAir sensor at the RISE building was used in our research.

Therefore, we were able to create graphs and spreadsheets of data from this past year based off of the PurpleAir website.

VOC, NO₂ and PM_{2.5}

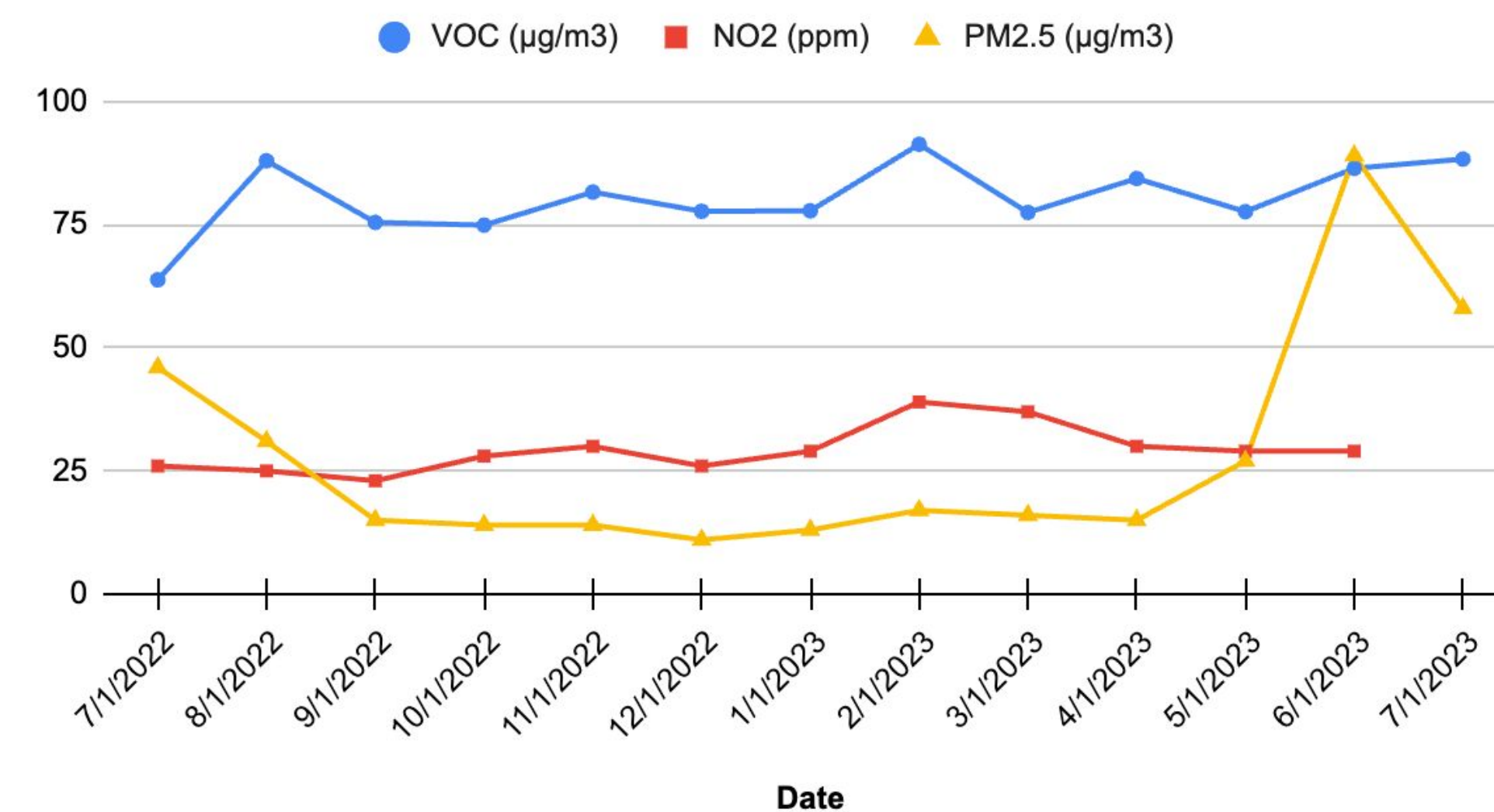


Figure 2. Graph of VOC, NO₂ & PM_{2.5} levels over 1 year. (A healthy level of... VOC: 0-400 µg/m³, PM_{2.5}: 0-12 µg/m³, NO₂: 0-50 ppm)

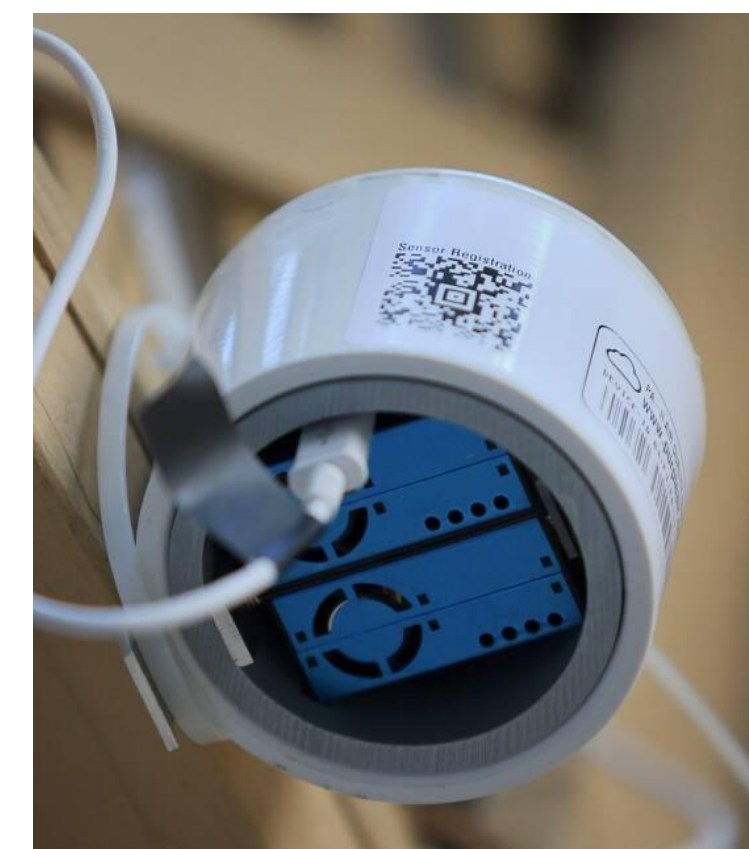


Figure 3. PurpleAir Monitor - Christopher Chung/ The Press Democrat

RESULTS

We found a connection between recent events in Rockaway and spikes in the levels of air pollution that has traveled indoors.

- As Rockaway advances, it continues to have **major construction projects** that emit high levels of VOC.
- Another reason levels are not stable is the nearby **JFK airport**, which releases NO₂ into the air through the burning of fossil fuels.
- A significant cause of the spike in levels of PM_{2.5} during the month of June is the spread of smoke from recent **wildfires in Canada**.

As the levels of pollution are closer to 0, the air becomes safer. However, we can see that each of the pollutants are at a high level.



Figure 4. Contributing factors of high levels of pollution in the Rockaways: construction, airports, wildfires.

ACKNOWLEDGEMENTS

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REFERENCES

- <https://www.lung.org/clean-air/at-home/indoor-air-pollutants/volatile-organic-compounds>
- https://www.cdc.gov/air/particulate_matter.html
- <https://www.epa.gov/outdoor-air-quality-data/download-daily-data>