

Mapping of Air Pollution and Time-Series Analysis in Delhi NCR Region

TEAM: MAP MYSTICS

KHUSHI SAXENA

Student Id: 202151078

YASH KUMAR SINGH

Student Id: 202151181



Objective

Our project revolved around leveraging the capabilities of Google Earth Engine to comprehensively analyze and visualize air pollution dynamics within the Delhi National Capital Region (NCR).



Our objectives encompassed a multifaceted approach aimed at:

1. Data Collection and Preparation:

- Gathering satellite imagery datasets containing crucial air quality information.
- Undertaking meticulous data preprocessing tasks.

2. Quantification of Air Pollution Indices:

- Calculating and deriving air pollution indices, particularly emphasizing concentrations of particulate matter such as PM2.5 and PM10.

3. Spatial Mapping and Visualization:

- Visualizing the spatial distribution of air pollution levels across the Delhi NCR region. This involved generating maps and graphical representations to showcase the varying concentrations and hotspots of air pollutants, providing a clear and intuitive understanding of the geographical spread of pollution.

4. Temporal Analysis for Patterns and Trends:

- Conducting robust time-series analysis to identify temporal patterns, trends, and seasonality in air pollution levels.

5. Additional Analyses for Holistic Insight:

- Exploring further analyses beyond the primary objectives, such as evaluating the impact of air pollution on public health, correlating air pollution trends with meteorological data to understand influencing factors, and comparing pollution levels among various zones within the Delhi NCR region to identify localized sources and disparities.

Mapping Air Pollution Levels



Environmental impact of air pollution

Air pollution poses severe environmental impacts, harming ecosystems and biodiversity. It leads to soil and water contamination, damages vegetation, disrupts wildlife habitats, and negatively affects air quality, weather patterns, and overall environmental health.

Health risks of air pollution

Air pollution poses significant health risks, causing respiratory and cardiovascular issues. Fine particulate matter and pollutants like nitrogen dioxide can lead to asthma and lung diseases.

Four major causes of air pollution in Delhi NCR region

01

Vehicular Emissions

Delhi's dense traffic leads to extensive vehicle emissions, releasing pollutants like nitrogen oxides and particulate matter, contributing significantly to the city's air pollution.

02

Industrial Activities

Numerous industries in and around Delhi release pollutants, including gases and particulate matter, impacting air quality and posing health risks for residents.

03

Crop Residue Burning

Agricultural areas surrounding Delhi often resort to burning crop residues, releasing smoke and pollutants into the air, worsening air quality during specific seasons.

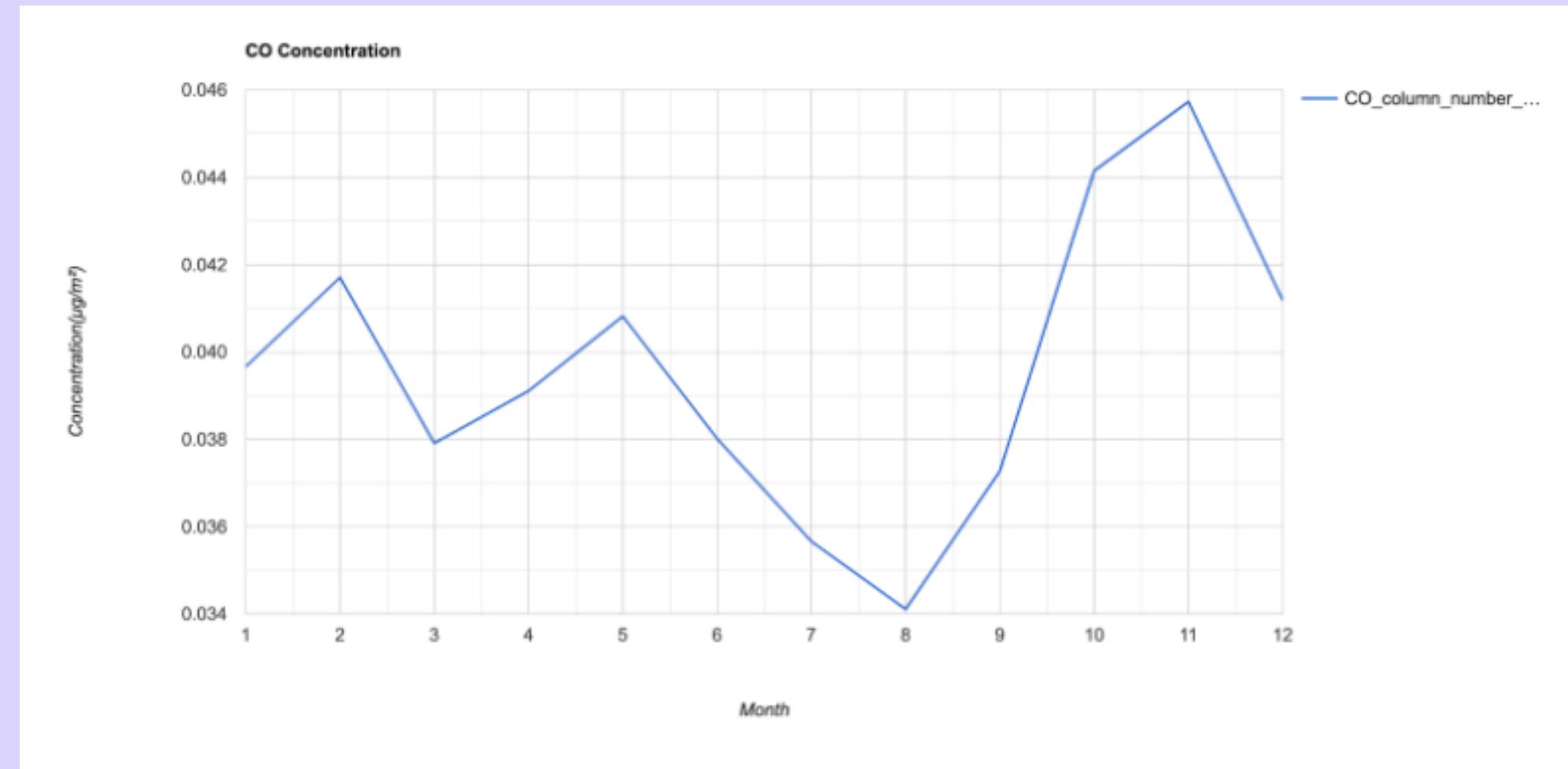
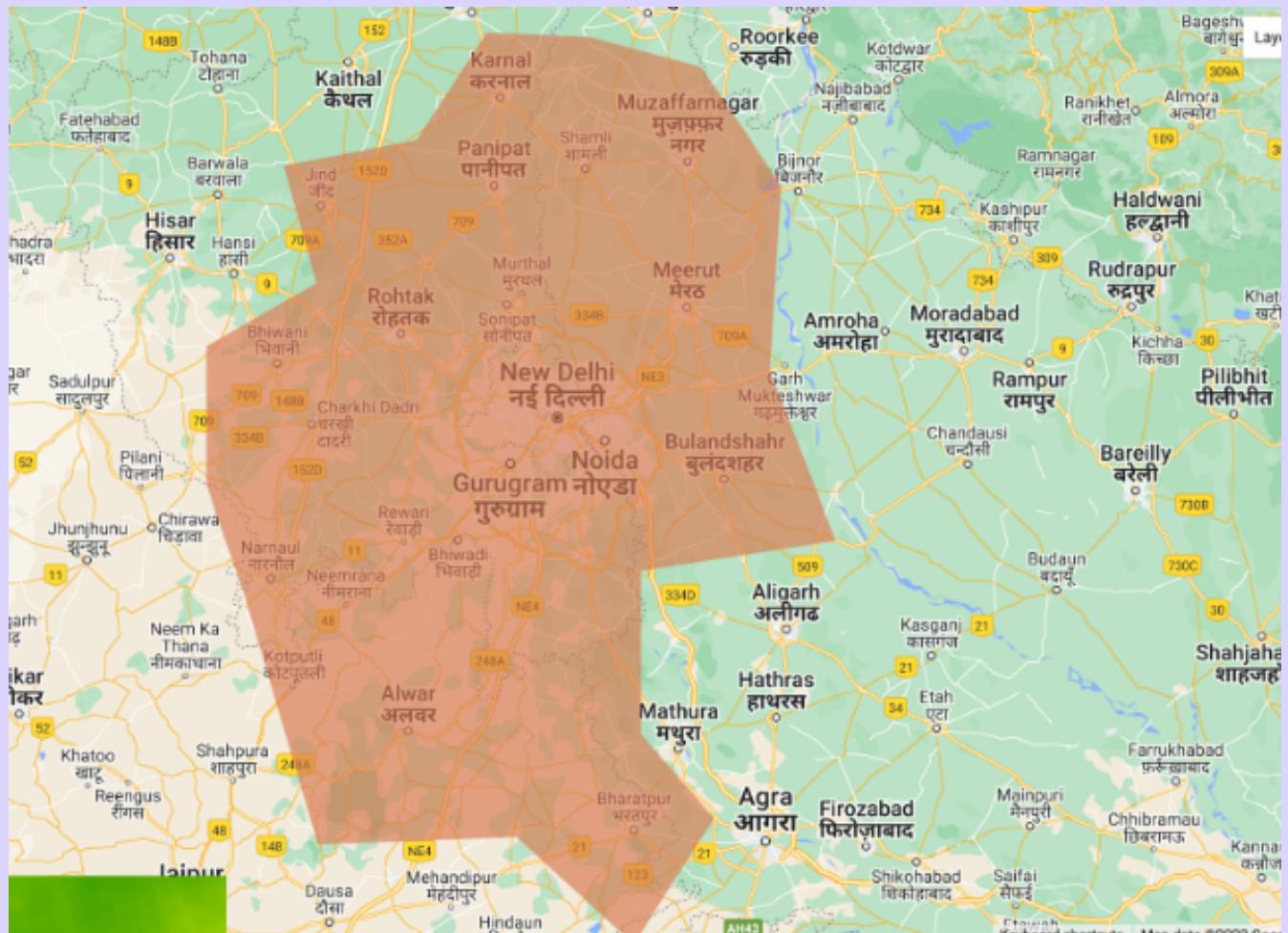
04

Construction Dust

Ongoing construction projects generate substantial dust, containing particulate matter, contributing to Delhi's air pollution levels, especially in areas with extensive urban development.

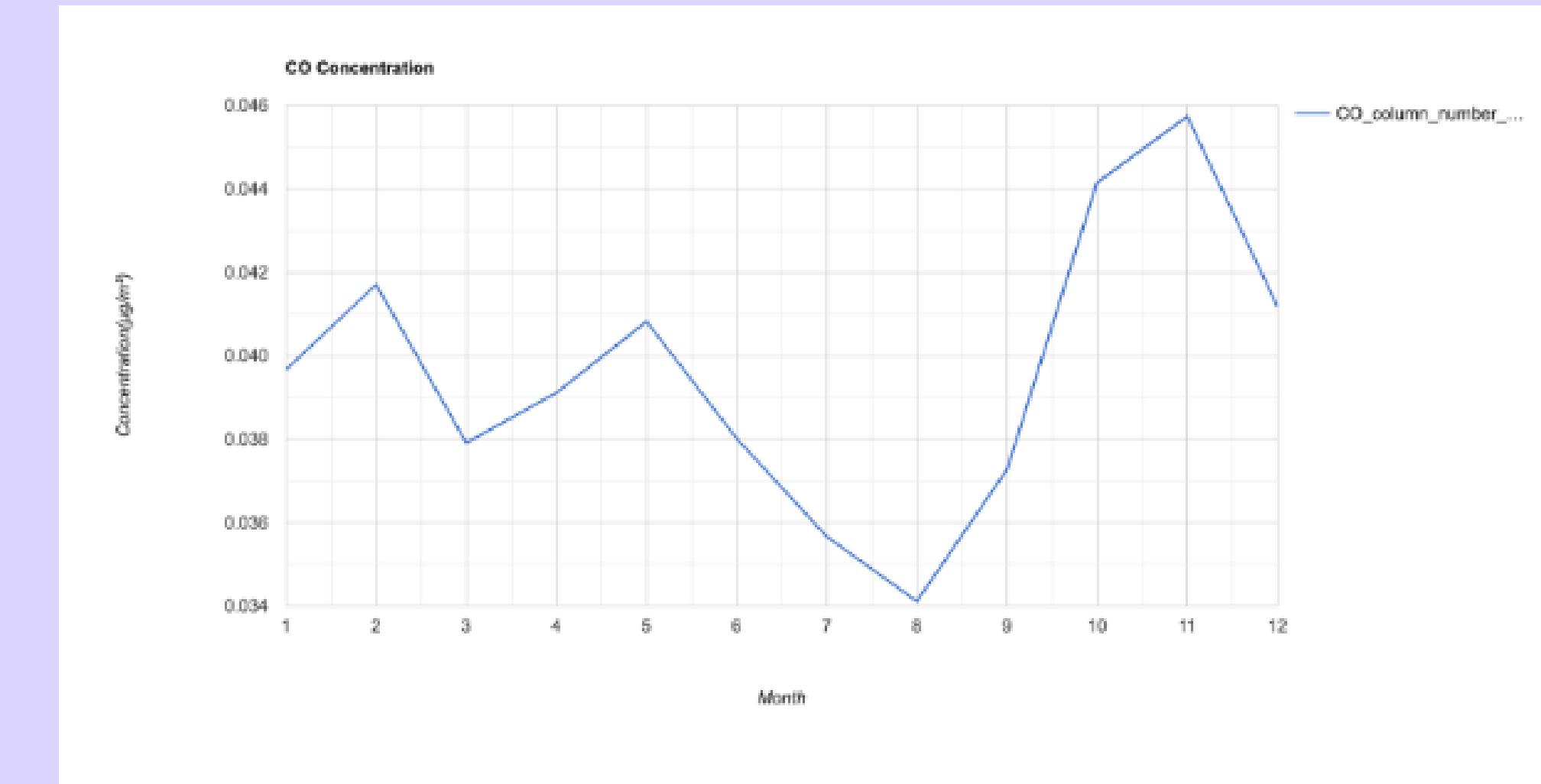
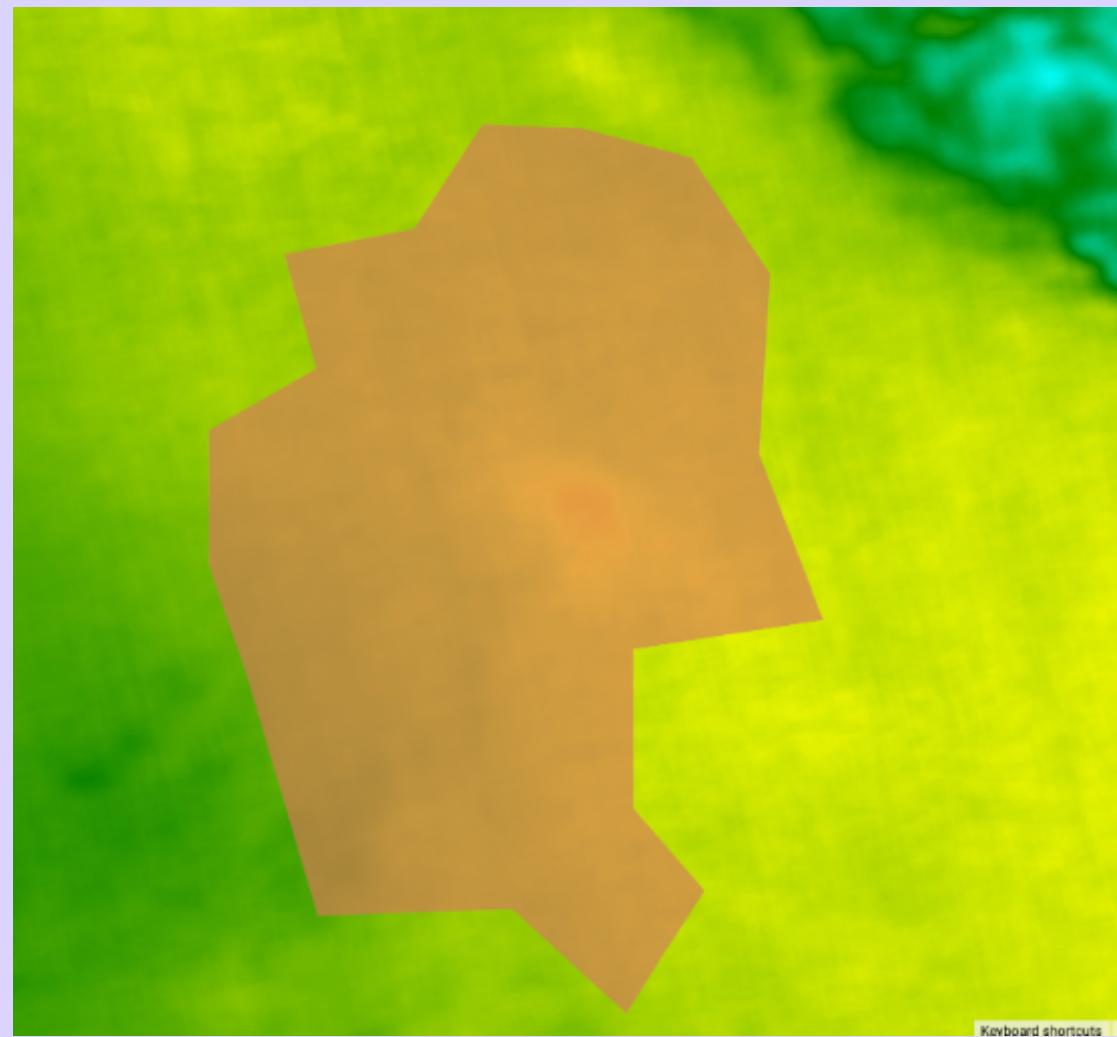
Graph for the concentration of CO(CARBON MONOXIDE).

MAP FOR 2019:

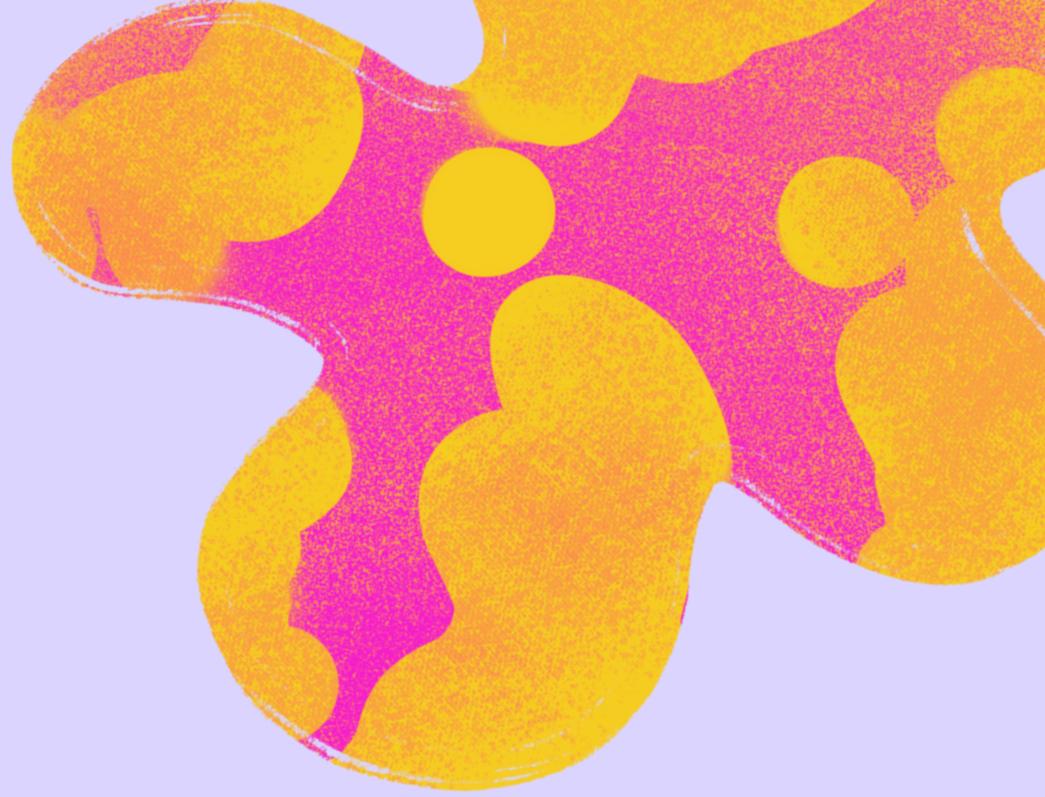


Graph for the concentration of CO(CARBON MONOXIDE).

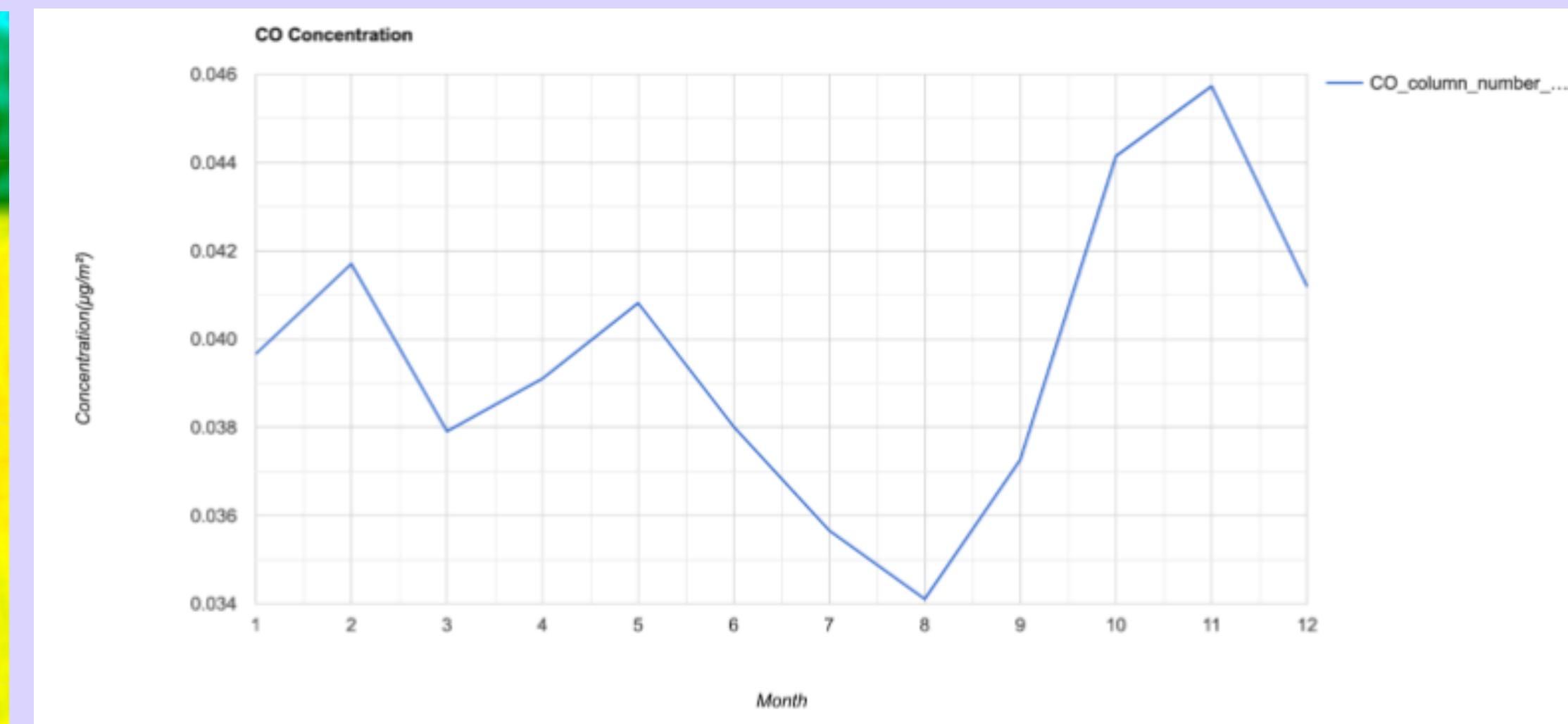
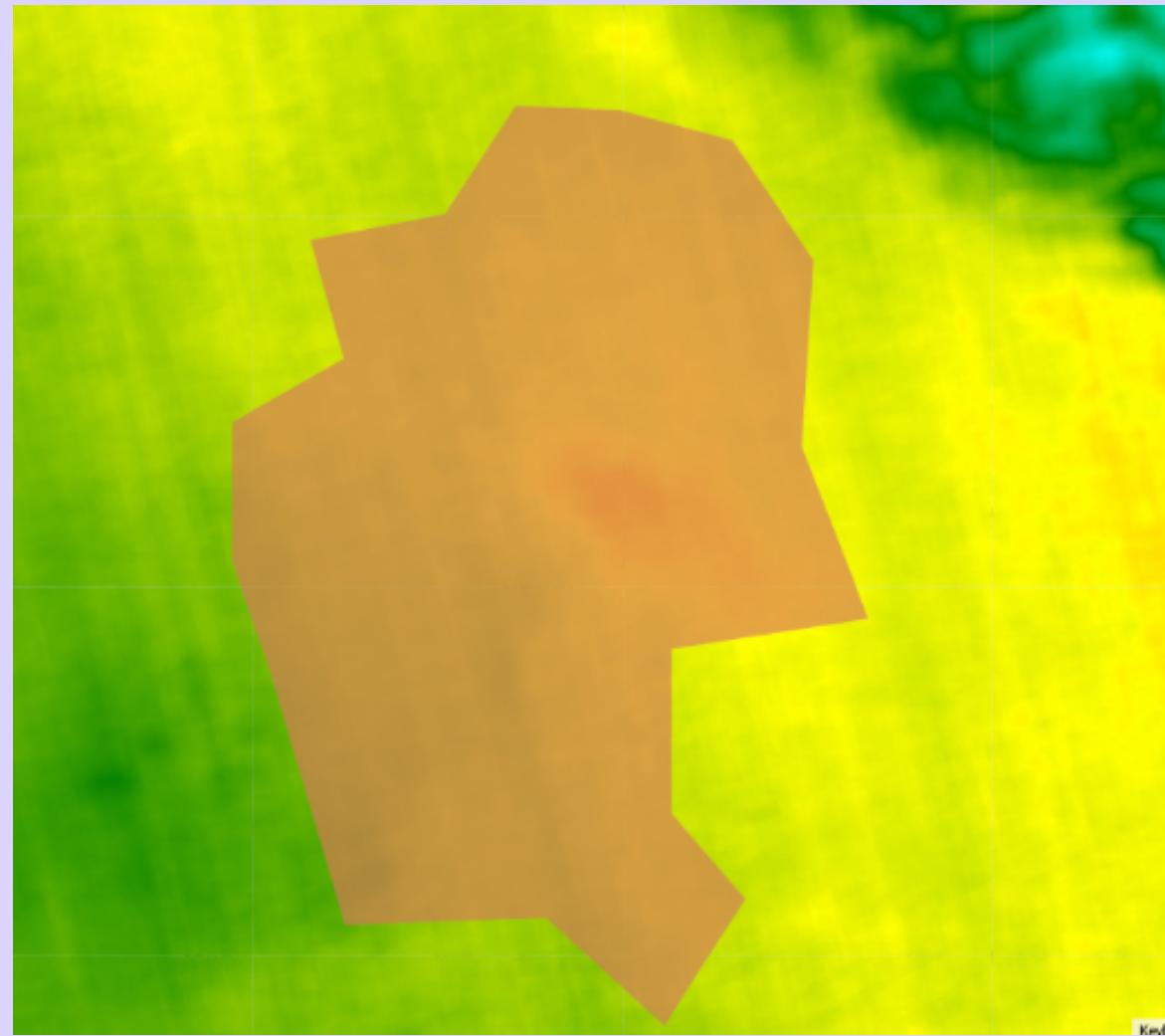
MAP FOR 2020:



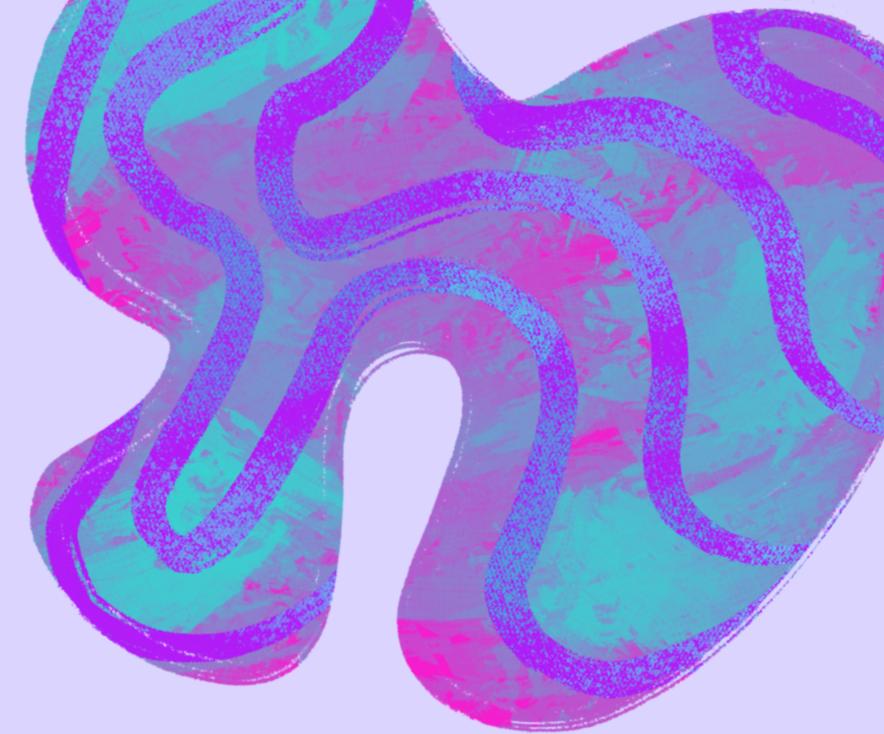
Graph for the concentration of CO(CARBON MONOXIDE).



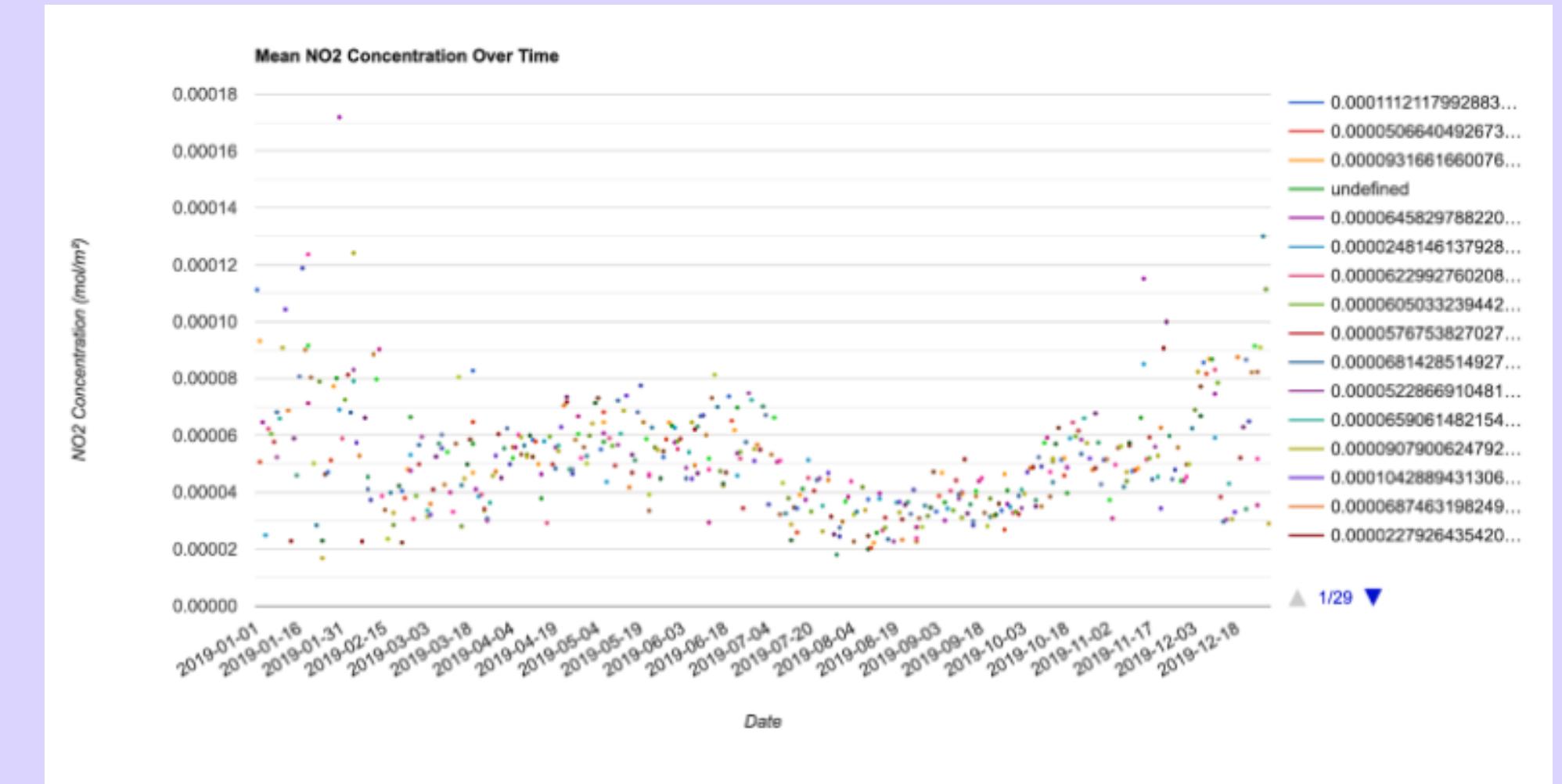
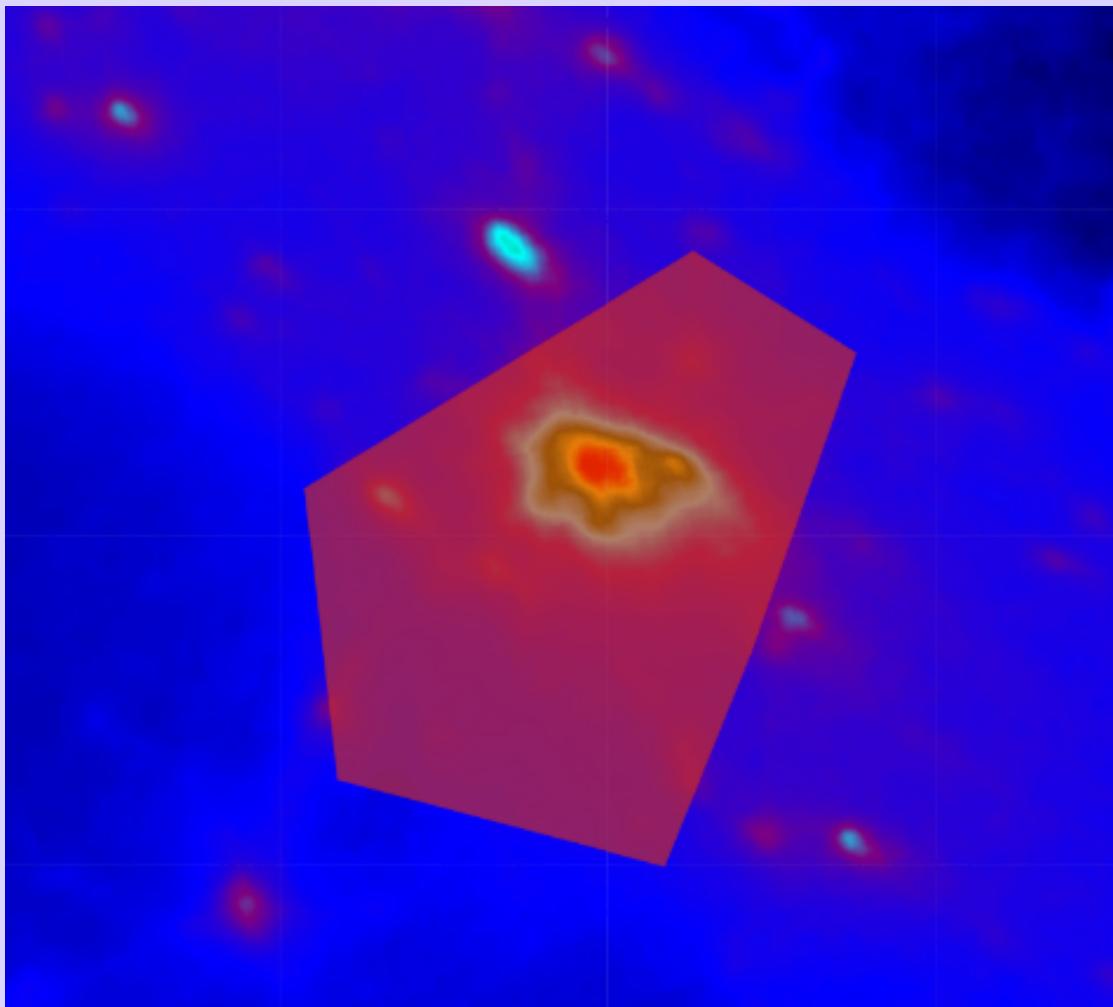
MAP FOR 2021:



Graph for the concentration of NO₂(NITROGEN DIOXIDE)

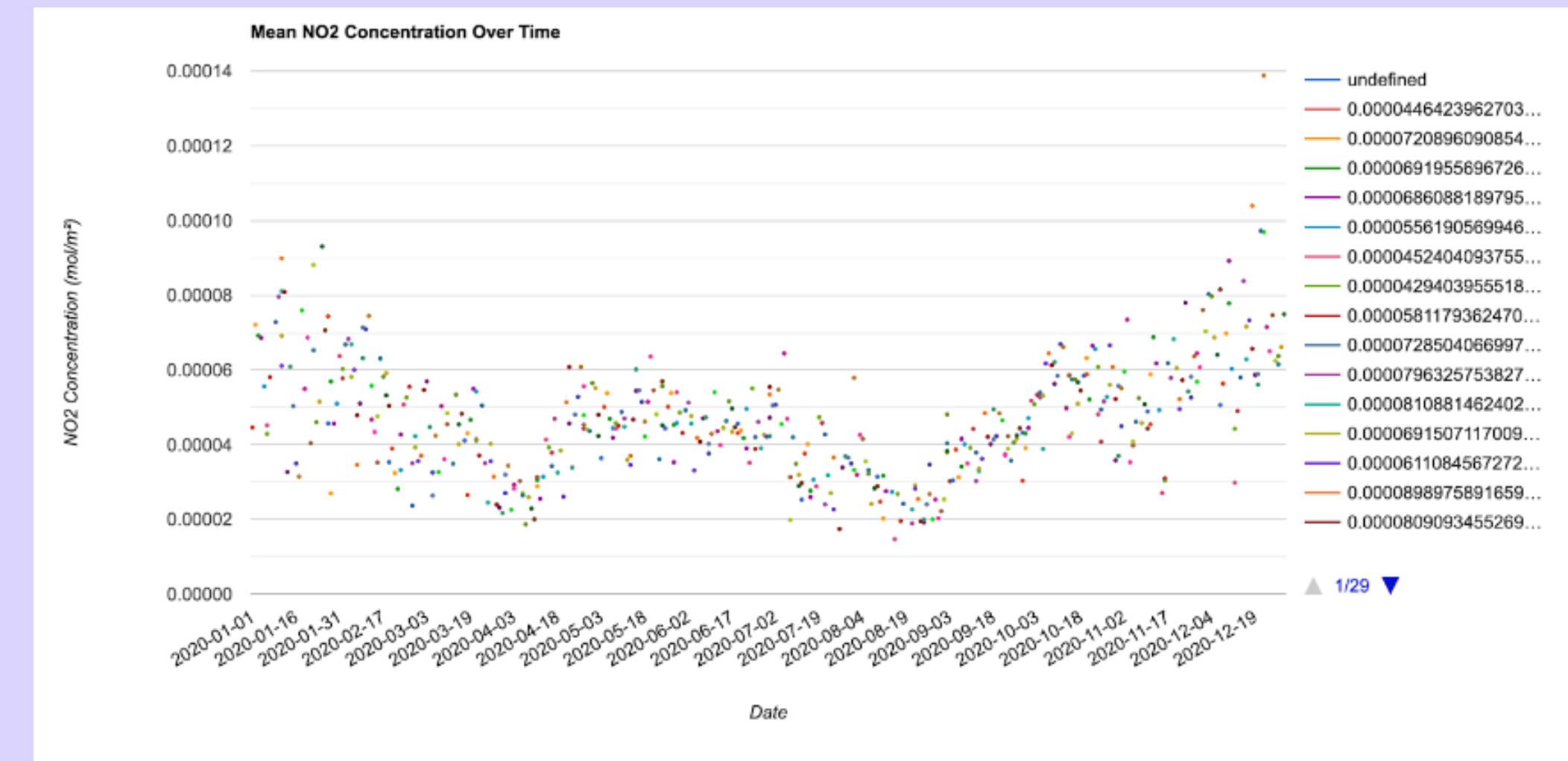
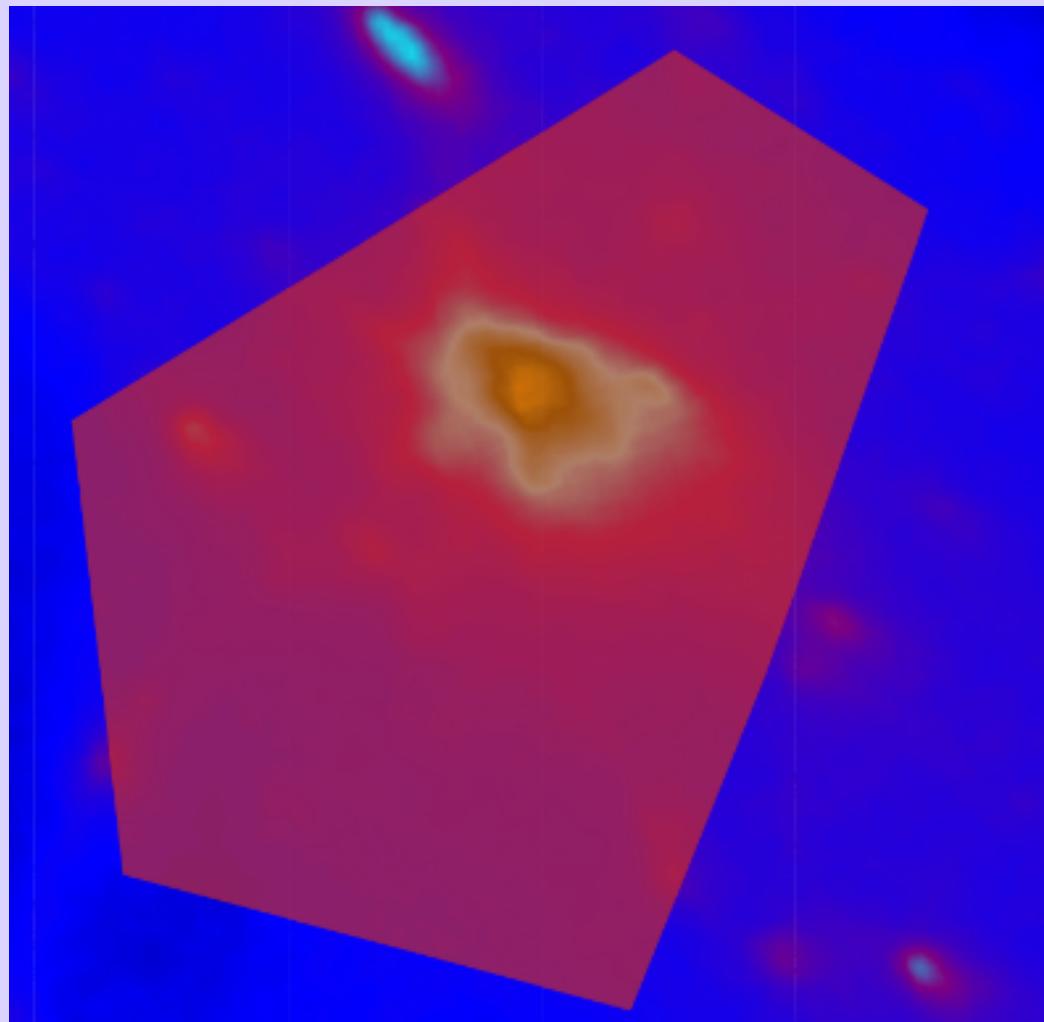


MAP FOR 2019:

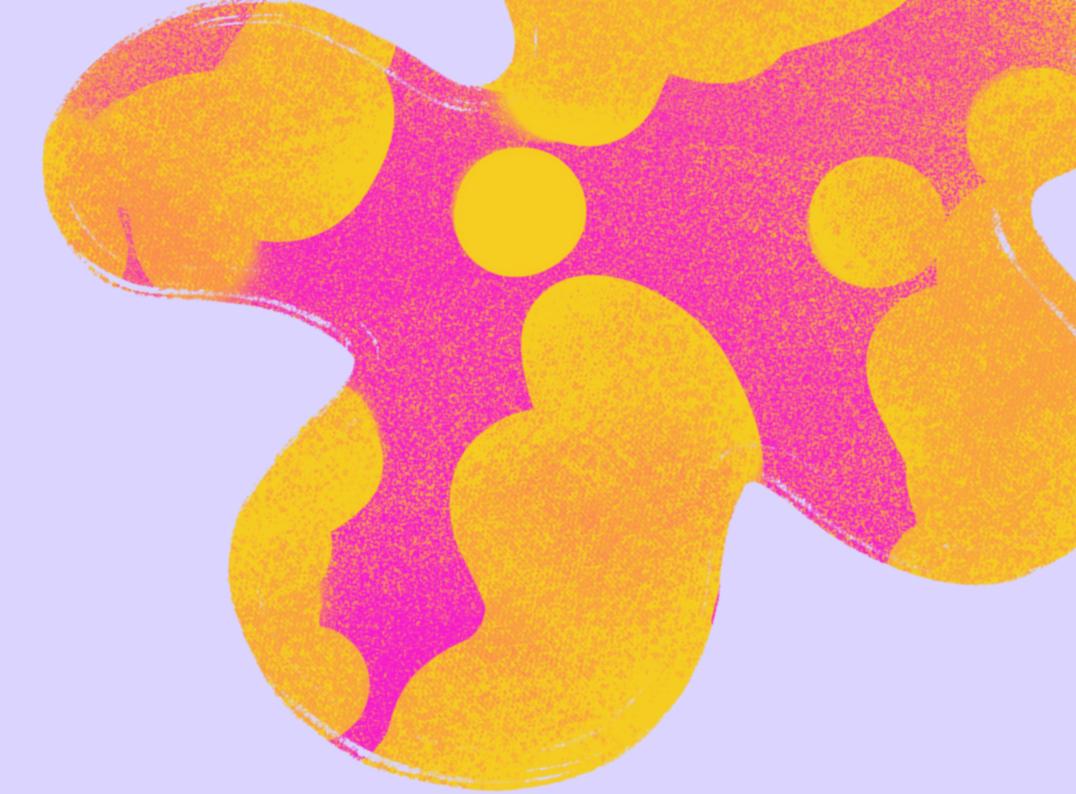


Graph for the concentration of NO₂(NITROGEN DIOXIDE)

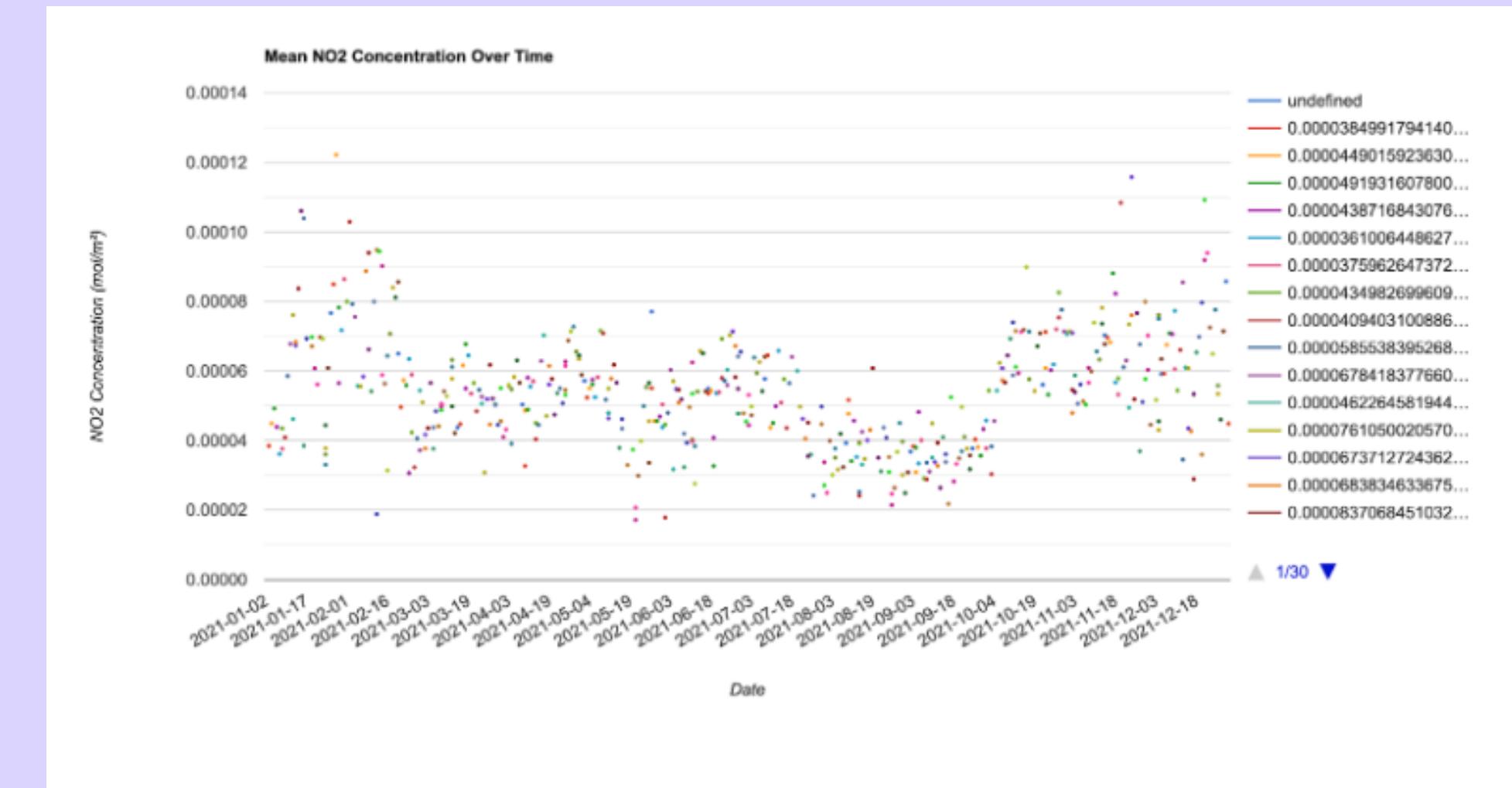
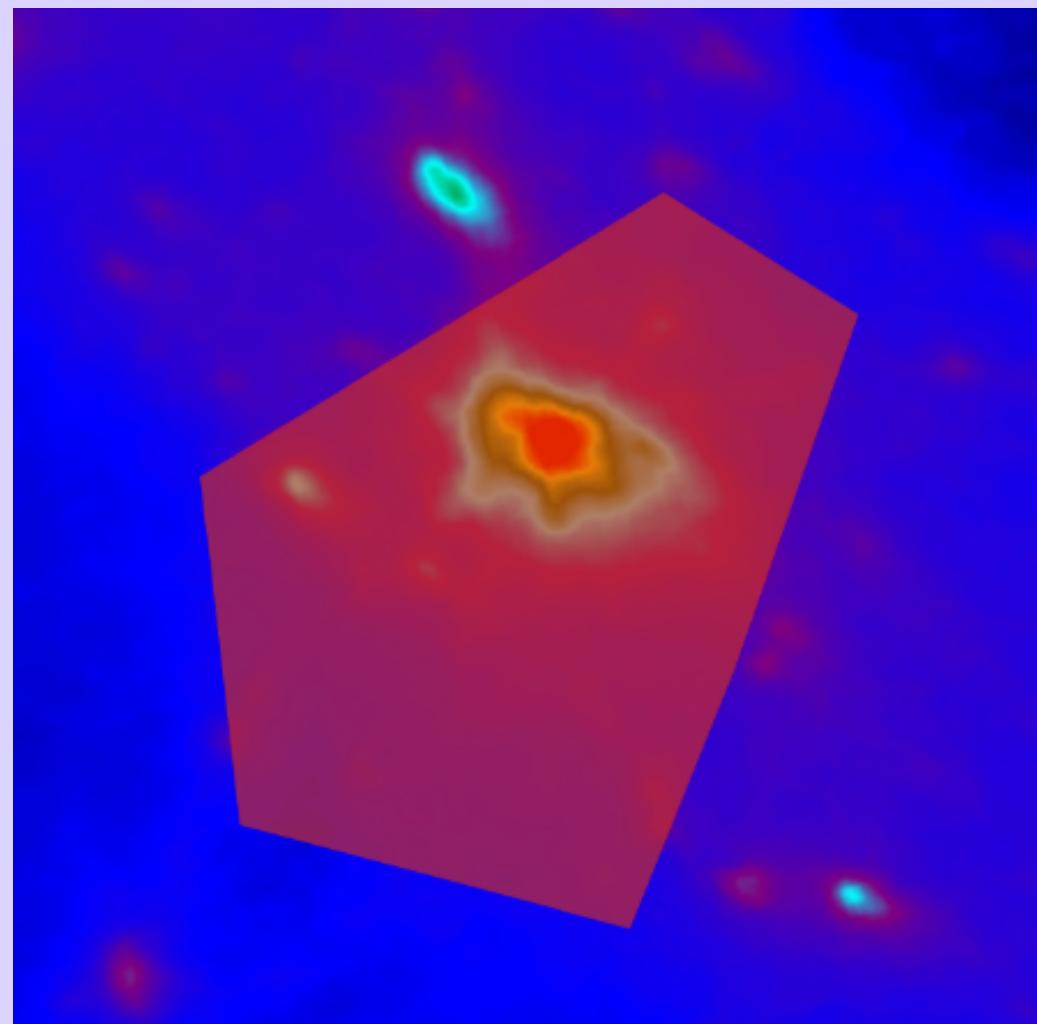
MAP FOR 2020:



Graph for the concentration of NO₂(NITROGEN DIOXIDE)



MAP FOR 2021:



CONCLUSION

In conclusion, our project effectively utilized Google Earth Engine to Analyze Air Pollution Dynamics in the Delhi NCR region. Through data collection, preprocessing, and analysis, we identified temporal trends, spatial disparities, and correlations with meteorological factors.

The project's findings extend to public health and policy considerations. Overcoming challenges in data processing, the work provides valuable insights for environmental monitoring. Future recommendations include advanced machine learning models, intervention efficacy assessments, and holistic integration of Earth Engine datasets for a comprehensive understanding of environmental complexities.

Thank You!

