

ASKING
QUESTIONS
ABOUT
AIR POLLUTION



WHAT IS AIR POLLUTION?



- According to the World Health Organization (WHO), air pollution is when chemical, physical, or biological particles contaminate the air.
- These particles affect the health of humans, plants, animals, and the planet.
- Industrial factories, cars, household appliances (such as gas ovens, space heaters, etc.), fire places, coal-burning, and forest fires are some common sources of air pollutants.
- Particulate matter, carbon monoxide, ozone, nitrogen dioxide, and sulfur dioxide are some of the pollutants that are seen as global public health concerns.

WHAT ARE THE HUMAN HEALTH EFFECTS OF AIR POLLUTION?

- Air pollution is linked to 6.7 million premature deaths each year across the world
- WHO data states that 99% of the global population is exposed to polluted air
 - People from low- and middle-income countries are particularly vulnerable and have increased exposure to these pollutants

HEALTH EFFECTS OF AIR POLLUTION



WHO IS MORE AFFECTED



PEOPLE WITH CHRONIC LUNG/HEART DISEASE, DIABETES



SENIORS



CHILDREN



PREGNANT WOMEN



PEOPLE WHO EXERCISE OUTDOORS

SHORT TERM EFFECTS



HEADACHE



NOSE, THROAT, EYES INFLAMMATION



COUGHING, PAINFUL BREATHING



PNEUMONIA, BRONCHITIS



SKIN IRRITATION

LONG TERM EFFECTS



AFFECTS CENTRAL NERVOUS SYSTEM (HEADACHE, ANXIETY)



CARDIOVASCULAR DISEASES



RESPIRATORY DISEASES (ASTHMA, CANCER)



IMPACTS ON LIVER, SPLEEN, BLOOD



IMPACTS ON REPRODUCTIVE SYSTEM



HOW TO PROTECT YOURSELF



CHECK AIR QUALITY INDEX IN YOUR AREA



USE A FACE MASK

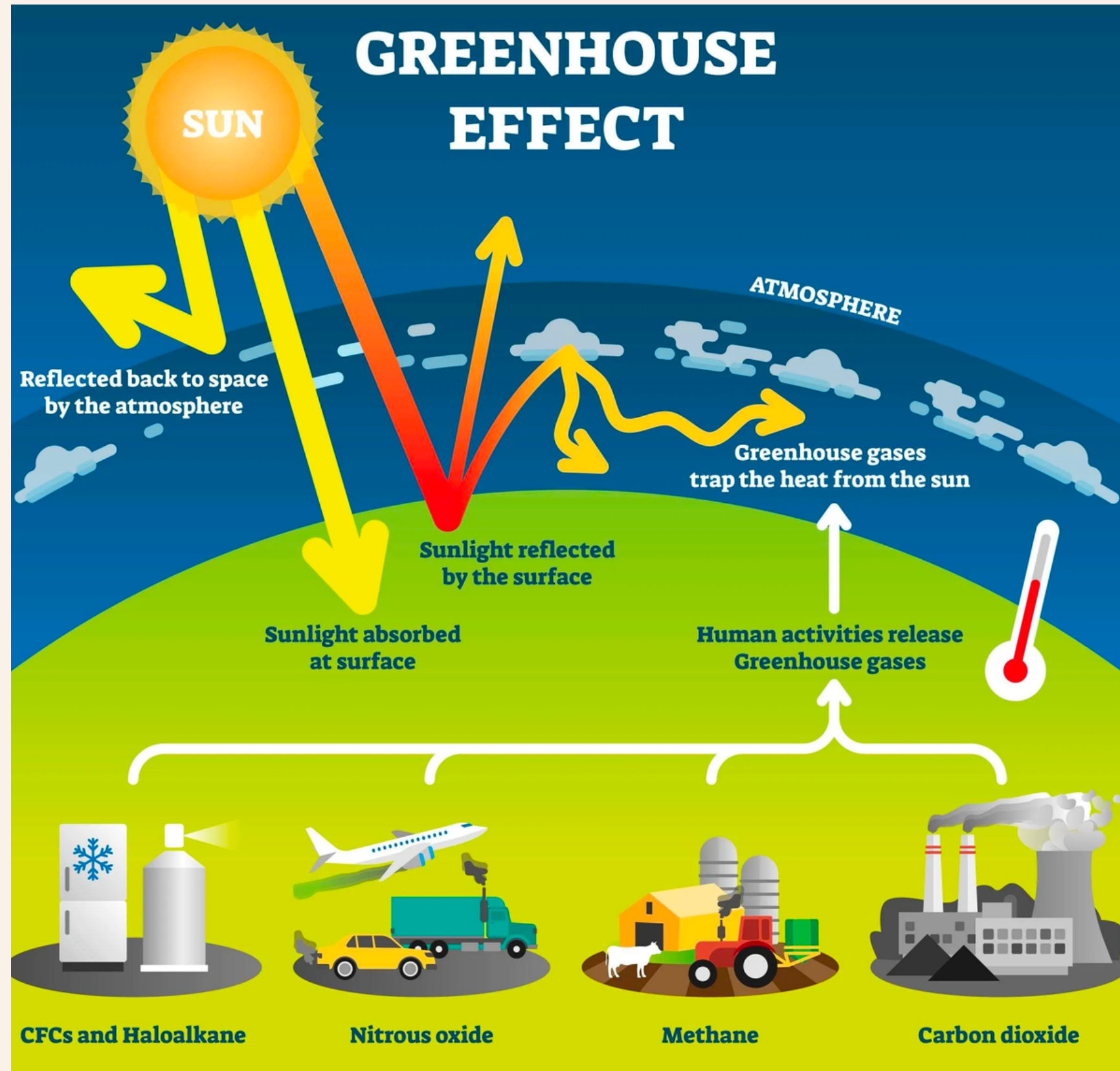


KEEP WINDOWS AND DOORS CLOSED





AVOID CONGESTED AREAS

WHAT ARE ENVIRONMENTAL CONSEQUENCES OF AIR POLLUTION?



- Creates haze/smog which can harm plants, animals, and humans
- Leads to acid rain which:
 - contaminates bodies of water, hurting marine wildlife and impacting clean water sources
 - contaminates soil, killing plant life and reducing food crop yields
- Worsens/speeds up global warming and climate change by trapping heat energy in the Earth's atmosphere
 - resulting in higher air and ocean temperatures
- Thins the ozone layer
 - causing increased UV radiation on Earth

AIR POLLUTION DATASETS

- [Daily Outdoor Air Quality Data](#) 
- [Air Data - Concentration Plot](#) 



- [WHO Ambient Air Quality Database](#) 



- [National Environmental Health Tracking Network](#) 



EXAMPLE RESEARCH QUESTION

How has the daily average concentration of ozone in the air changed over the last year in California?



How to Use:

1. Beneath the “Download Daily Data” header, fill out your pollutant of interest, year, geographic area, and monitoring site (you can select “All Sites” if you are looking for average data for an entire State)
2. Click “Get Data” to generate the data files which can be exported by clicking the download link: [Download CSV \(spreadsheet\)](#).
3. From the datasheet, you can calculate averages using the concentration column to see the average daily concentration throughout the State

1. Pollutant

2. Year

3. Geographic Area

-- or --

-- or --

4. Monitor Site

Date	Source	Daily Max 8-hour Ozone Concentration	UNITS
01/01/2022	AQS	0.032	ppm
01/02/2022	AQS	0.02	ppm
01/03/2022	AQS	0.033	ppm
01/04/2022	AQS	0.032	ppm
01/05/2022	AQS	0.029	ppm
01/06/2022	AQS	0.019	ppm
01/07/2022	AQS	0.031	ppm
01/08/2022	AQS	0.027	ppm
01/09/2022	AQS	0.022	ppm
01/10/2022	AQS	0.024	ppm
01/11/2022	AQS	0.027	ppm
01/12/2022	AQS	0.019	ppm
01/13/2022	AQS	0.013	ppm
01/14/2022	AQS	0.031	ppm
01/15/2022	AQS	0.027	ppm
01/16/2022	AQS	0.032	ppm

EXAMPLE RESEARCH QUESTION

Has ozone pollution been higher in rural or urban areas of Western Pennsylvania over the past 5 years?

How to Use:

1. Using the drop down menus, select your pollutant, time period, and geographic region(s) of interest
2. When you click "Plot Data," the concentration plots as seen to the right will be generated on the page
3. To export the raw data for all time points across the time period selected, click the "Download CSV (spreadsheet)" link at the bottom of the page
4. Please note, the download link expires 10 minutes after generating the concentration plots



1. Pollutant

2. Period from to

3. Geographic Area

-- or --

All Sites

420030008

420030067

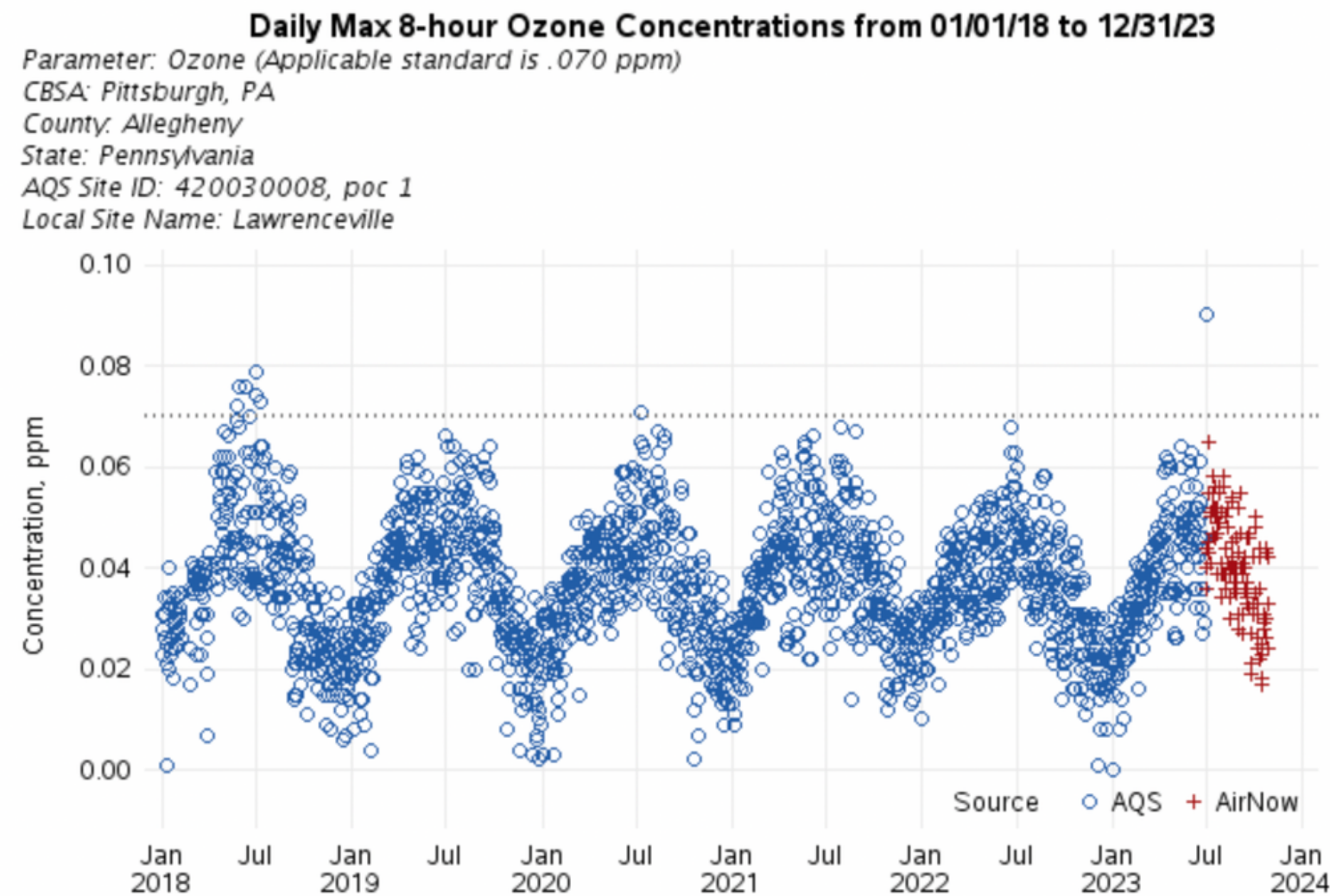
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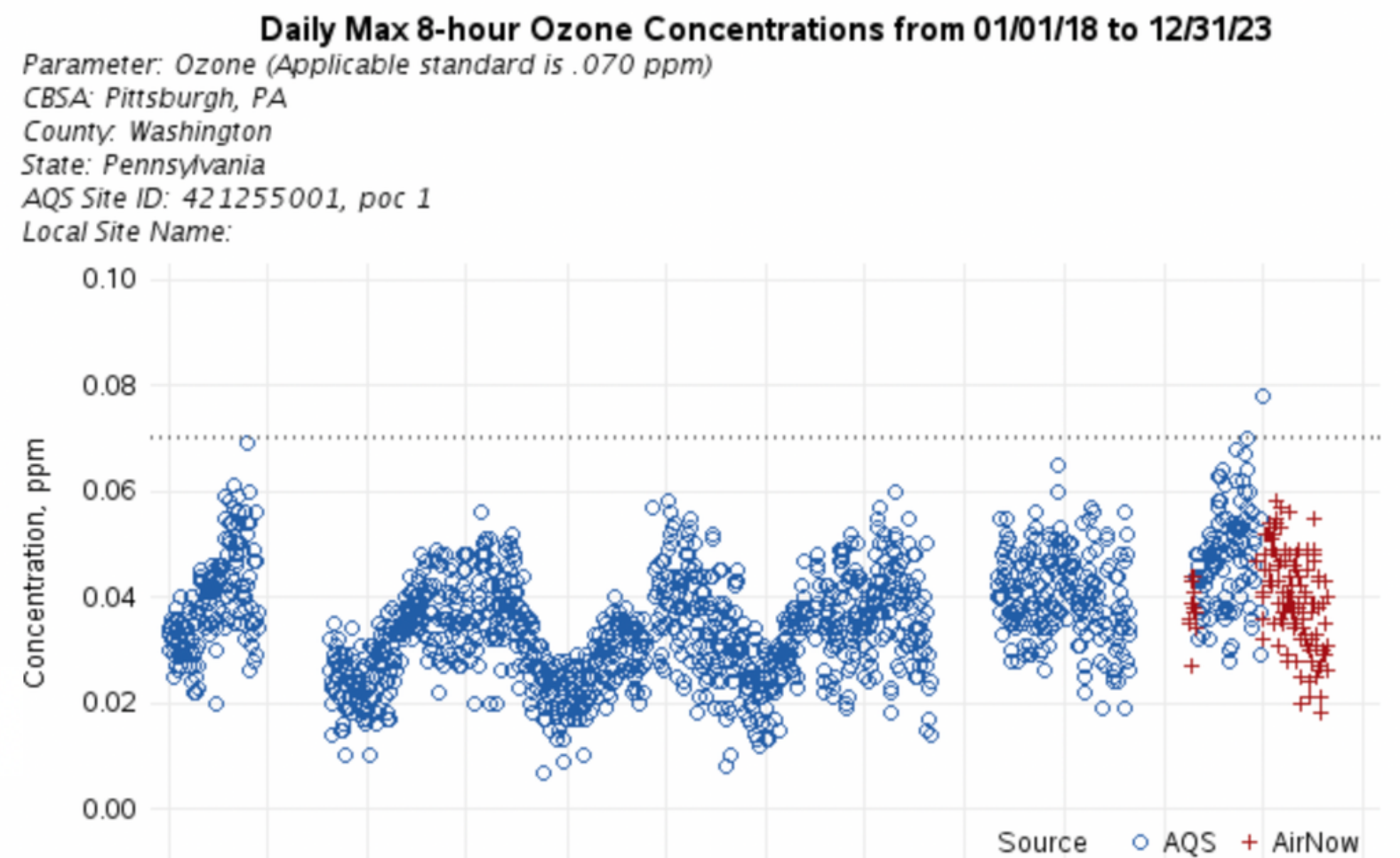
420070002

4. Monitor Site

[Download CSV \(spreadsheet\)](#)



Source: U.S. EPA AirData <<https://www.epa.gov/air-data>>



EXAMPLE RESEARCH QUESTION

How does average air quality compare between Europe and the United States?



How to Use:

1. To download the dataset, click “Excel version of the database - Ambient (outdoor) quality database, by country and city” link on the webpage
2. Data is organized alphabetically first by country and city, then by year
3. To view all air quality/air pollutant measurements scroll from side to side on the datasheet (the example to the right only shows a small sample of the total data in the spreadsheet)

WHO Region	ISO3	WHO Country Name	City or Locality	Measurement Year	PM _{2.5} (µg/m ³)	PM ₁₀ (µg/m ³)
Eastern Mediterranean Region	AFG	Afghanistan	Kabul	2019	119.77	
European Region	ALB	Albania	Durres	2015		17.65
European Region	ALB	Albania	Durres	2016	14.32	24.56
European Region	ALB	Albania	Elbasan	2015		
European Region	ALB	Albania	Elbasan	2016		
European Region	ALB	Albania	Elbasan	2017		
European Region	ALB	Albania	Korce	2015	30.34	45.31
European Region	ALB	Albania	Korce	2016	28.64	40.21
European Region	ALB	Albania	Vlore	2014		15.25
European Region	ALB	Albania	Vlore	2015		19.39
European Region	ALB	Albania	Vlore	2016		22.71
European Region	ALB	Albania	Vlore	2019	10.32	
European Region	ALB	Albania	Vrith	2015	13.24	19.52
European Region	AND	Andorra	Escaldes-Eng	2012		27.5
European Region	AND	Andorra	Escaldes-Eng	2014		25.03
European Region	AND	Andorra	Escaldes-Eng	2015		27.04
European Region	AND	Andorra	Escaldes-Eng	2016		26.26
European Region	AND	Andorra	Escaldes-Eng	2017		26.3
European Region	AND	Andorra	Escaldes-Eng	2018		23.2
European Region	AND	Andorra	Escaldes-Eng	2019		24.58
Eastern Mediterranean Region	ARE	United Arab	Abu Dhabi	2011		158.18
Eastern Mediterranean Region	ARE	United Arab	Abu Dhabi	2012		165.3
Eastern Mediterranean Region	ARE	United Arab	Abu Dhabi	2013		143.75
Eastern Mediterranean Region	ARE	United Arab	Abu Dhabi	2014		108.6
Eastern Mediterranean Region	ARE	United Arab	Abu Dhabi	2015		149.75
Eastern Mediterranean Region	ARE	United Arab	Abu Dhabi	2017	32.79	122.17
Eastern Mediterranean Region	ARE	United Arab	Abu Dhabi	2018	49.13	134.29

EXAMPLE RESEARCH QUESTION

Is race/ethnicity related to air pollution in the United States?



How to Use:

1. To view the air quality data map, select your pollutant of interest, geographic regions, and time period in the drop down menu
2. In the side-by-side comparison map on the screen, you can select demographic markers (in the example of the map on the right, “All Non-White Races Included” is the selected demographic feature)
3. You can hover over each separate color to see the individual data point averages for air pollution in the year
4. The colors correspond to the figure legends in the bottom left corner of each map

