



Air Quality Data Analysis Tools Update

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U.S. Environmental Protection Agency

NAAMC Plenary Session
August 13th, 2024

Air Quality Data Analysis Tools Update

- AirData
- The Trends Report

Air Quality
Data



- Exceptional Events Design Value Tool
- Exceptional Events Analysis and Visualizations Tools
- PM_{2.5} Tiering Tool

Exceptional
Events



- PM_{2.5} Designations Mapping Tool
- Design Value Interactive Tool
- Network Assessment Tool
- Air Quality Overview Documents
- O₃ Watch

Regulatory



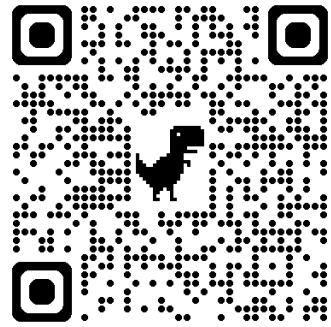
- 2020 AirToxScreen Mapping Tool
- Ambient Air Toxics Trends Tool

Air Toxics





Air Quality Data – AirData



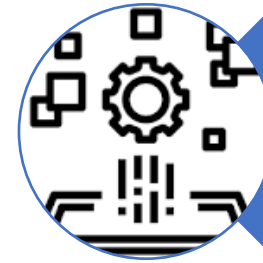
AirData provides "access to air quality data collected at outdoor monitors across the United States." ([Basic Information](#))



All available criteria air pollutant, air toxics, and meteorology data for 40+ years (1980-2024)



"concerned citizen[s], ... air quality analysts in the regulatory, academic, and health research communities..." ([Basic Information](#))



SAS, R Shiny, Qlik, ESRI ArcGIS GeoPlatform

1

2

3

Download Data

- [Pre-generated Data Files](#)
- [Download Daily Data](#)
- [Download Raw Data \(API\)](#)

Data Viz Tools

- [Daily Air Quality Tracker](#)
- [Tile Plot - Multiyear](#)
- [Tile Plot - Single Year](#)
- [AQI Plot](#)
- [Concentration Plot](#)
- [Concentration Map](#)
- [Ozone Exceedances](#)

Monitor Locations

- [Interactive Map of Air Quality Monitors](#)

Summary Reports

- [Air Quality Index Report](#)
- [Air Quality Statistics Report](#)
- [Monitor Values Report](#)
- [Monitor Values Report - Hazardous Air Pollutants](#)
- [Air Quality Index Daily Values Report](#)

About Air Data

- [Basic Information](#)
- [Frequent Questions](#)
- [Subscribe to RSS feed](#)

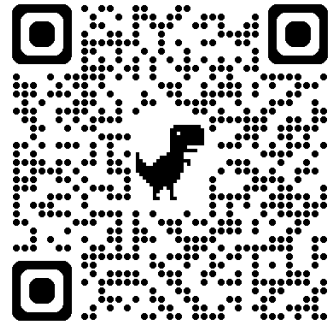
Technical Reports

- [Ozone Watch](#)
- [PM2.5 Continuous Monitor Comparability Assessments](#)
- [PM10 Continuous Monitor Comparability Assessments](#)
- [Single Point Precision and Bias Report](#)
- [Additional Air Monitoring Assessments](#)





Air Quality Data – The Trends Report



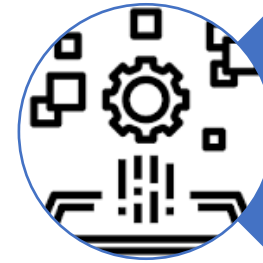
The Trends Report provides a high-level overview of nationwide air quality over the years through a series of interactive visualizations.



Criteria air pollutants and air toxics displaying information from 1970 through 2023



General public, community groups, academic researchers



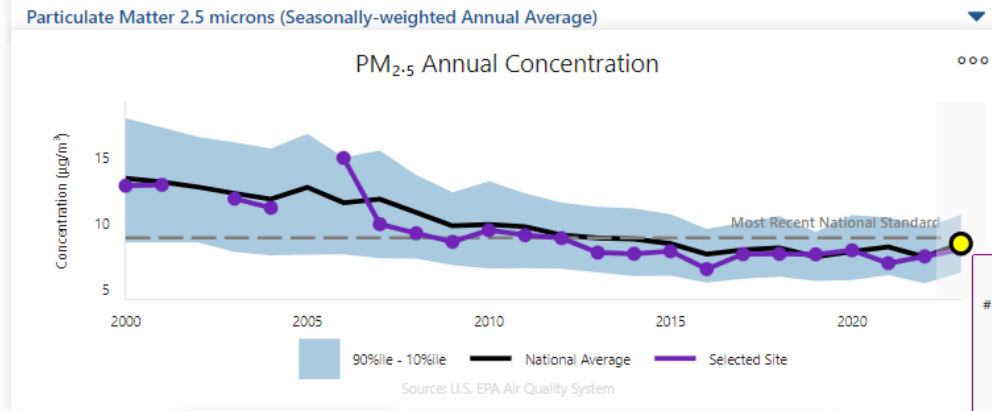
D3, R Shiny, ESRI ArcGIS

Criteria Pollutant Trends Show Clean Air Progress

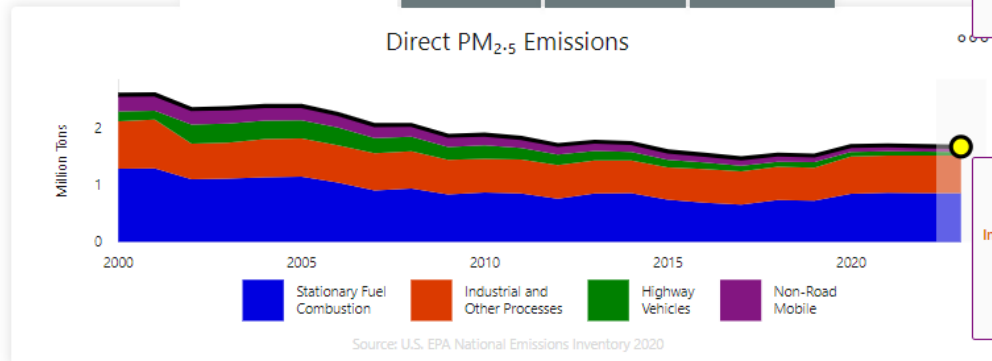
Select a [NAAQS](#) to view concentration and emission trends

[Understand health effects](#)

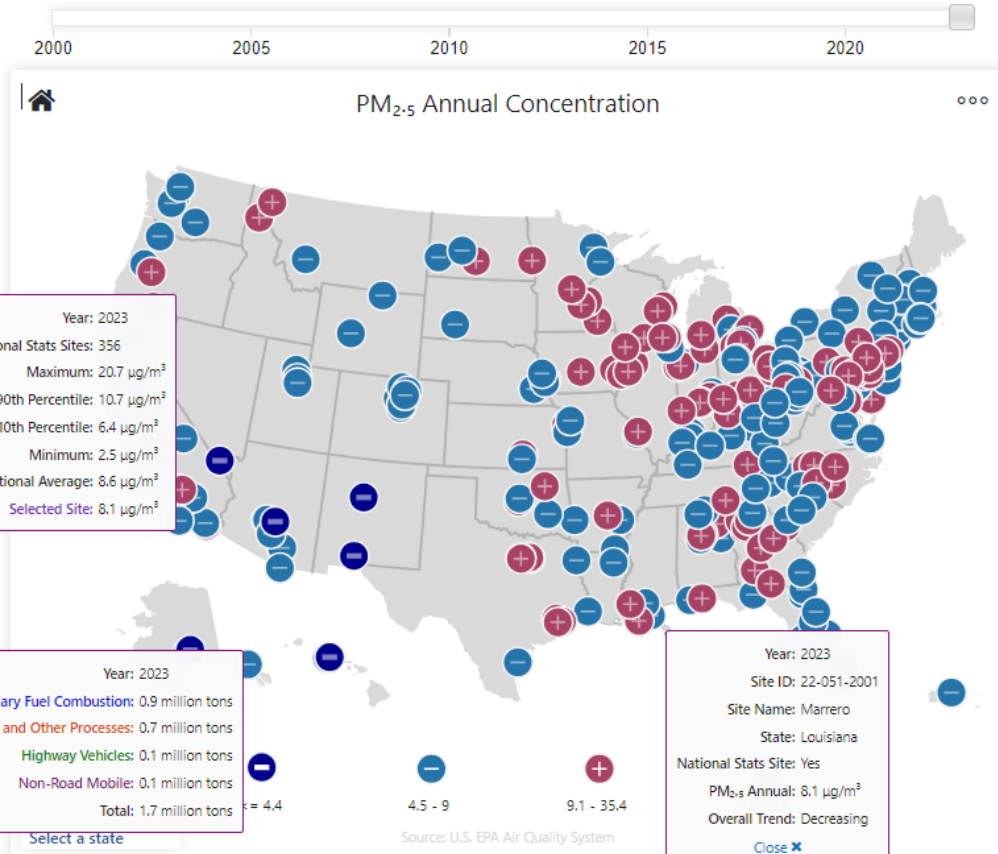
Year: 2023



Direct PM_{2.5} Emissions SO₂ Emissions NO_x Emissions VOC Emissions



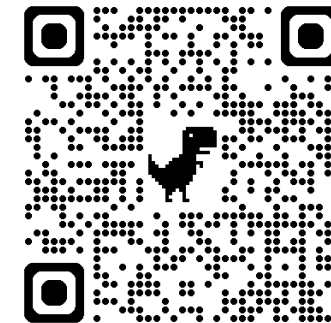
Charts Click emission tabs to change the emissions chart. The play/pause button controls animation, or manually change the year by dragging the yellow circle in the chart or the slider's gray square.



Map Symbols indicate values above or below the most recent standard. Click any point to display annual concentration data. Double click the map to zoom in and click the home button to reset. Please be patient with map exports.



Exceptional Events Design Value Tool



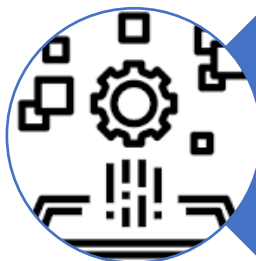
“This tool allows users to determine the regulatory significance of submitted or anticipated Exceptional Events demonstrations”



PM_{2.5}, O₃; 2019-2021 through 2021-2023 design values



State, Local, Tribal air agencies



R Shiny

Exceptional Events Design Value Tool

Select a Pollutant:
PM2.5

Select a NAAQS:
2024 Annual NAAQS (9 ug/m³)

Select an EPA Region:
National

Select a State:
22 - Louisiana

Select a County:
071 - Orleans

Select a Site:
0021 - I-610

Select a Design Value Period:
2021-2023

Selections include:
 Request Exclusion Flags
 Informational Flags
 NAAQS Exceedance Days

Get Selections Clear Selections

Download Site Design Value Data (xlsx)

2021-2023 Design Value: 7.8 ug/m³ 2021-2023 DV Validity: TRUE

2021 Annual Mean: 7.55 ug/m³ 2021 Complete Quarters: 4
2022 Annual Mean: 7.92 ug/m³ 2022 Complete Quarters: 4
2023 Annual Mean: 7.96 ug/m³ 2023 Complete Quarters: 4

2021 Q1 Mean: 7.20 ug/m³ 2021 Q1 Percent Complete: 97
2021 Q2 Mean: 6.83 ug/m³ 2021 Q2 Percent Complete: 97
2021 Q3 Mean: 8.82 ug/m³ 2021 Q3 Percent Complete: 83
2021 Q4 Mean: 7.36 ug/m³ 2021 Q4 Percent Complete: 94
2022 Q1 Mean: 7.22 ug/m³ 2022 Q1 Percent Complete: 100
2022 Q2 Mean: 9.67 ug/m³ 2022 Q2 Percent Complete: 100
2022 Q3 Mean: 7.08 ug/m³ 2022 Q3 Percent Complete: 100
2022 Q4 Mean: 7.71 ug/m³ 2022 Q4 Percent Complete: 97
2023 Q1 Mean: 7.30 ug/m³ 2023 Q1 Percent Complete: 100
2023 Q2 Mean: 8.29 ug/m³ 2023 Q2 Percent Complete: 100
2023 Q3 Mean: 8.92 ug/m³ 2023 Q3 Percent Complete: 100
2023 Q4 Mean: 7.32 ug/m³ 2023 Q4 Percent Complete: 100

Select days to exclude: Ctrl+click to select multiple

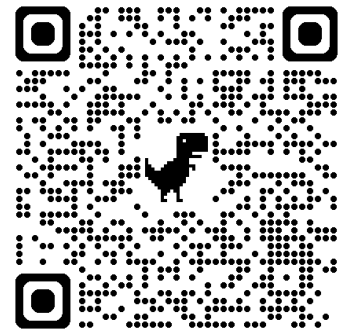
- date conc flag
- 2022-06-13 35.3 IA
- 2022-06-16 21.9 IA
- 2023-09-21 6.7 IT
- 2023-09-23 8.5 IT
- 2023-09-24 9.6 IT
- 2023-09-25 10.1 IT
- 2023-09-26 8.6 IT
- 2023-10-03 15.2 IT
- 2023-10-04 29.5 IT
- 2023-10-05 16.5 IT

Re-Calculate DV





Exceptional Events Analysis and Visualization Tools



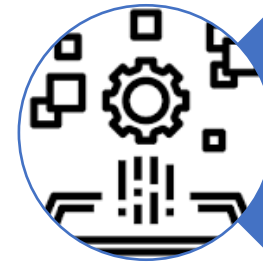
"The following tools can help with data screening and determining regulatory significance in support of exceptional events demonstration submissions"



CO, NO₂, O₃, PM₁₀, PM_{2.5}, SO₂, sulfate, nitrate, OC; User defined years



State, Local, Tribal air agencies



SAS, Qlik

Exceptional Events Analysis and Visualization Tools

The following tools can help with data screening and determining regulatory significance in support of exceptional events demonstration submissions.

Identify days potentially impacted by exceptional events

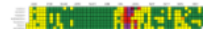
- [Multi-year Tile Plot](#)

Plots daily AQI values across multiple years. Each tile represents one day of the year and is color-coded based on the highest daily AQI value, helping identify days potentially impacted by exceptional events.



- [Single-year Tile Plot](#)

Plots daily AQI values for a single year. Each tile represents one day of the year and is color-coded based on the highest daily AQI value, helping identify days potentially impacted by exceptional events.



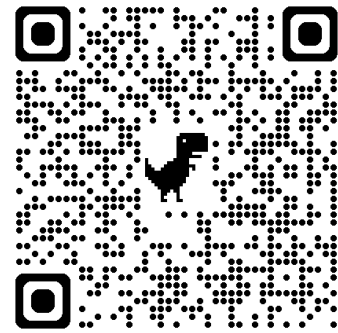
- [Concentration Map](#)

Maps daily concentrations over several days which can help identify areas potentially impacted by exceptional events.





PM_{2.5} Tiering Tool



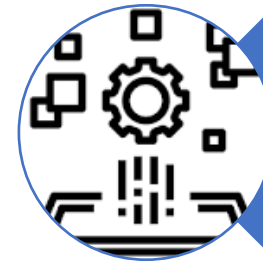
"This tool displays daily PM_{2.5} concentrations, along with tier levels based on the methodology described in the PM_{2.5} Wildland Fire Exceptional Events Tiering Document"



PM_{2.5}; 2019-2024



State, Local, Tribal air agencies



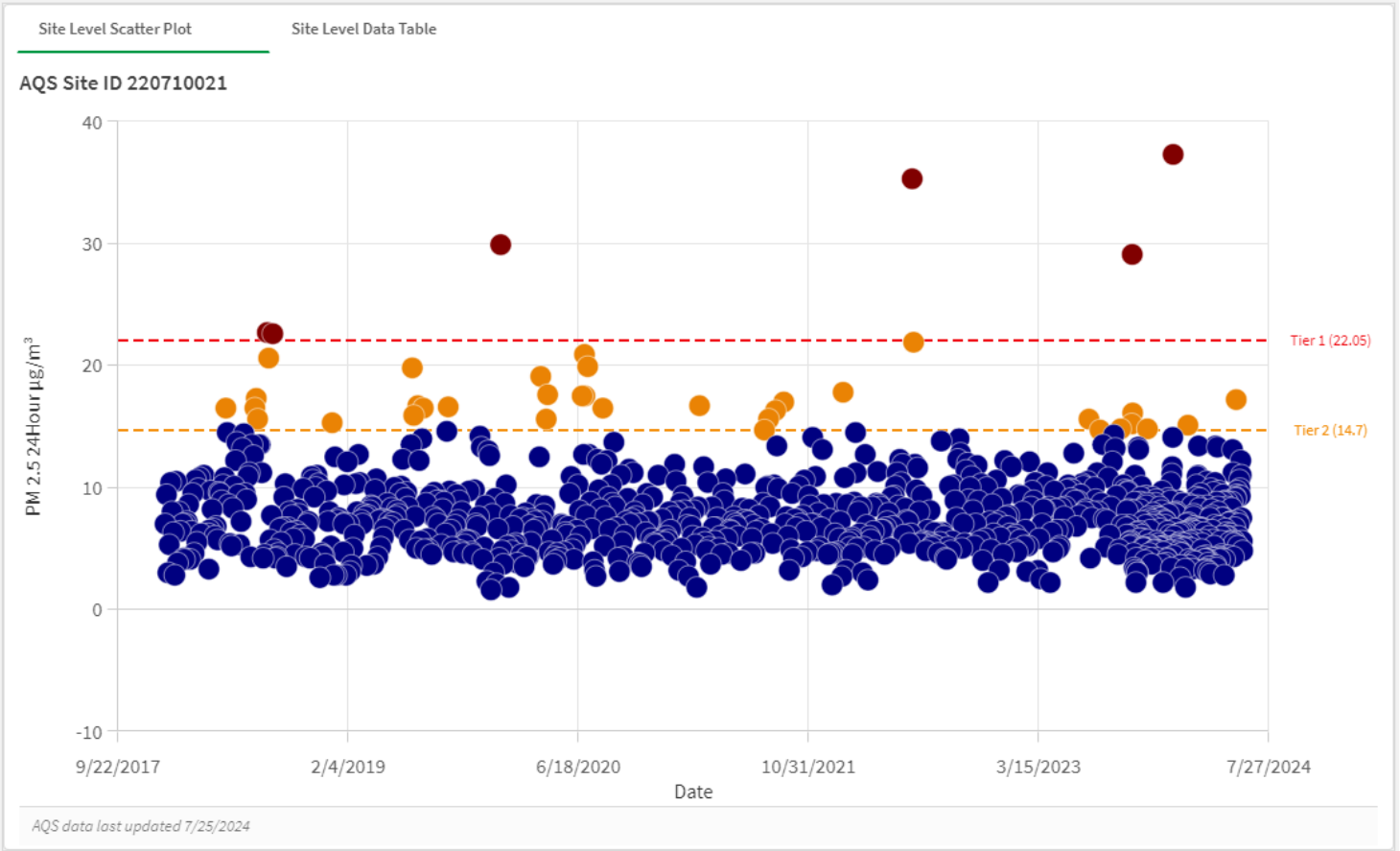
Qlik, Python

AQS Site ID	Excluded Flag	Tier 1 22.05	Tier 2 14.7	5 year month-specific 98th percentile 16.3	minimum annual 98th percentile 14.70	Year of 98th minimum 2023
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Month of EE

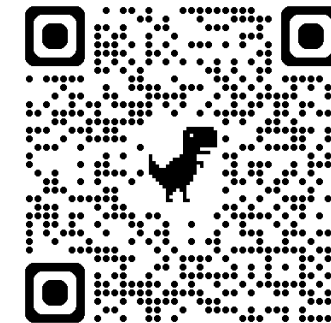
- Exclude Tier 1 from DV
- Exclude Tier 2 from DV
- Exclude Selected Days from DV
- Days Excluded from DV:
- Reset DV Calculations

2021 Annual DV 7.7	2021 24hr DV 17
2022 Annual DV 7.7	2022 24hr DV 17
2023 Annual DV 7.6	2023 24hr DV 16





PM_{2.5} Designations Mapping Tool



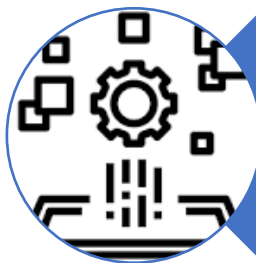
"The PM_{2.5} Mapping Tool provides air agencies access to air quality data, emissions data, jurisdictional boundaries, and other important information to assist in designations for the 2024 Revised Primary Annual Fine Particle NAAQS"



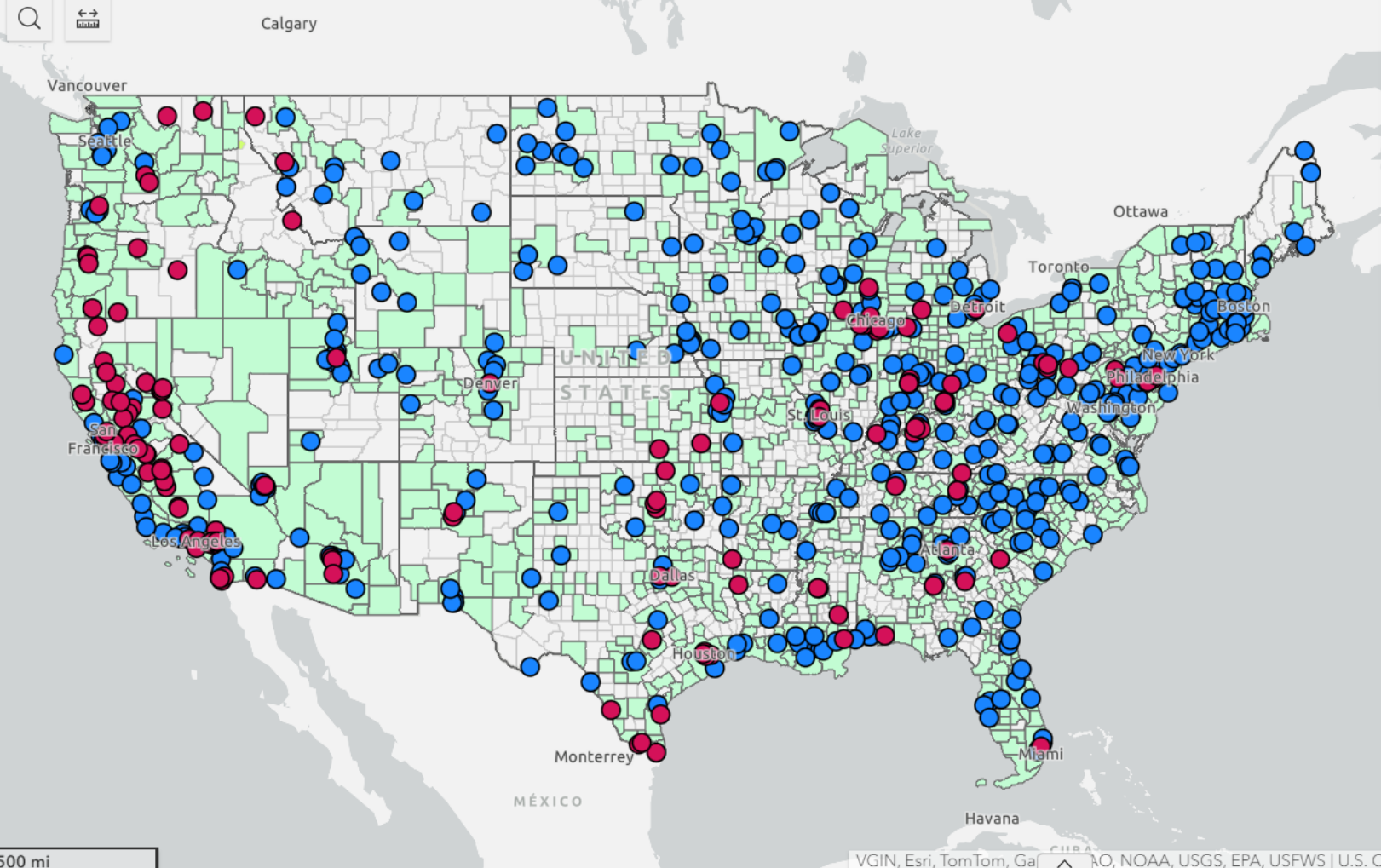
PM_{2.5}, sulfate, nitrate, OC, EC, crustal, sea-salt; 2020-2023



State, Local, Tribal air agencies



ESRI ArcGIS GeoPlatform



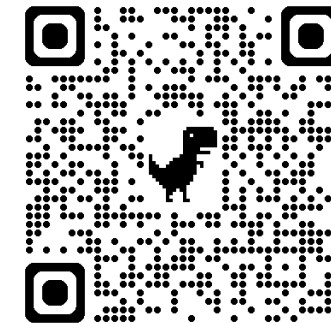
Map Layers

- PM2.5 Nonattainment Areas and Designations
- Tribal Boundaries
- Disadvantaged Communities per CEJST v1.0 (as of 11/22/2022)





Design Value Interactive Tool



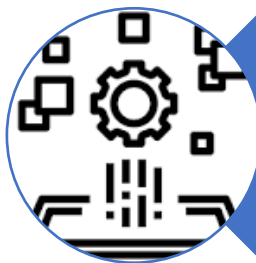
“A design value is a statistic that describes the air quality status of a given location relative to the level of the National Ambient Air Quality Standards (NAAQS)...This interactive Design Value Tool allows you to filter on geographic areas and pollutants - and download data as well.”



O₃, PM_{2.5}, SO₂, PM₁₀, Pb, NO₂, CO; 2021-2023 DVs



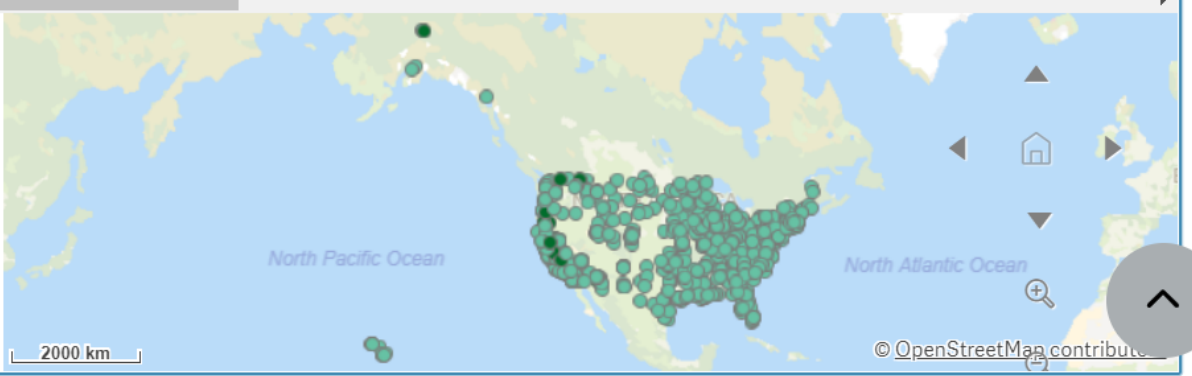
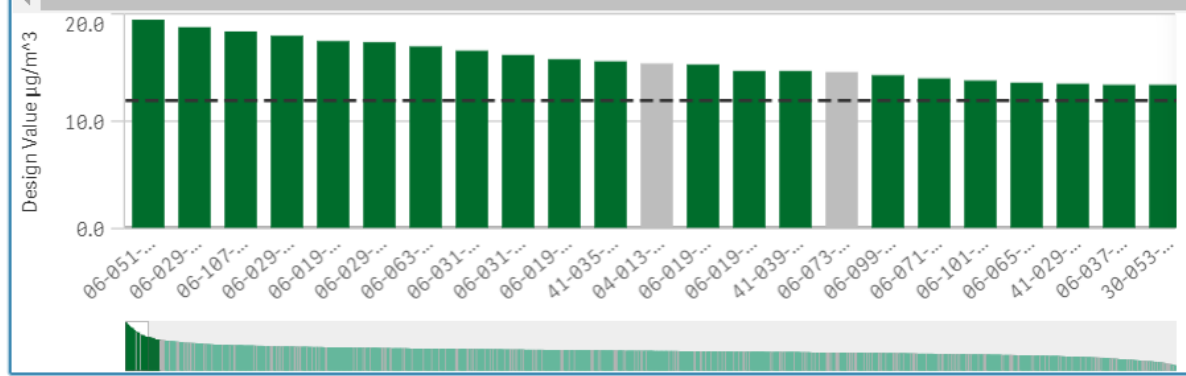
State, Local, Tribal air agencies



Qlik

PM2.5 Annual Design Values

Site Details			Site Trends		NAA Trends		Violating Not In NAA	
State Name	County Name	CBSA	Designated Area	EPA Region	AQS Site ID	Local Site Name	Street Address	
Alabama	Baldwin	Daphne-Fairhope-Foley, AL	-	4	01-003-0010	FAIRHOPE, Alabama	FAIRHOP FAIRHOP	
Alabama	Clay		-	4	01-027-0001	ASHLAND	ASHLAND	
Alabama	DeKalb	Fort Payne, AL	-	4	01-049-1003	CROSSVILLE	13112 HW	
Alabama	Etowah	Gadsden, AL	-	4	01-055-0010	GADSDEN C. COLLEGE	1001 WA	
Alabama	Jefferson	Birmingham-Hoover, AL	-	4	01-073-0023	North Birmingham	NO. B'HA	
Alabama	Jefferson	Birmingham-Hoover, AL	-	4	01-073-1005	McAdory	ROUTE 8	
Alabama	Jefferson	Birmingham-Hoover, AL	-	4	01-073-1010	Leeds	201 ASH	
Alabama	Jefferson	Birmingham-Hoover, AL	-	4	01-073-2003	Wylam	1242 JER	
Alabama	Jefferson	Birmingham-Hoover, AL	-	4	01-073-2059	Arkadelphia/Near Road	1110 5th	





Network Assessment Tool



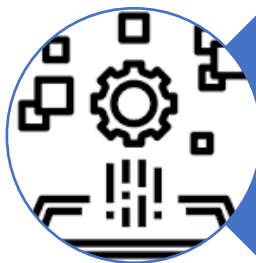
"This tool is meant to assist with 5-year Network Assessments as required by 40 CFR §58.10(d)."



CO, Pb, NO₂, O₃, PM₁₀, PM_{2.5}



State, Local, Tribal air agencies, EPA






Javascript, R Shiny

Area of Interest

Draw an Area of Interest


Use the buttons below to define your own area of interest:







Select Predefined Area

Select an area type, then select a specific area from the dropdown menu:


Area Type: State CBSA CSA

New Orleans-Metairie, LA 

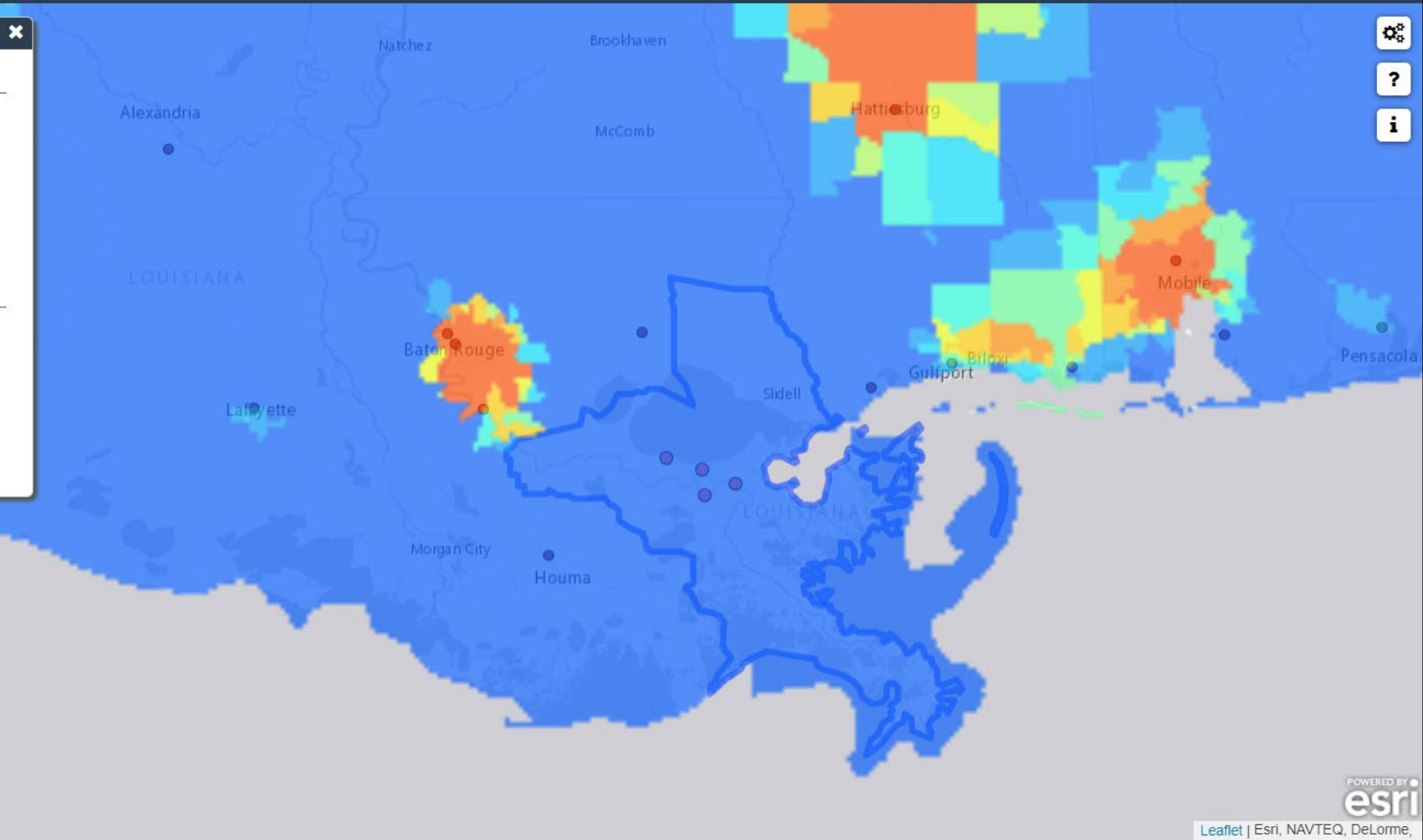
Legend

-  Existing Site
-  Existing Site (selected)
-  New Site
-  New Site (selected)
-  Area of Interest
-  Area Served Polygon

Exceedence Probability (2018-2020)

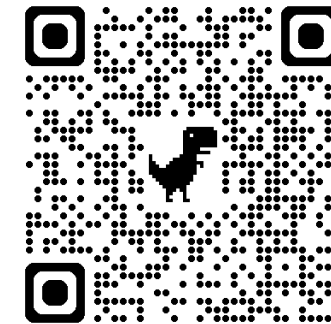


0% 20% 40% 60% 80% 100%





Air Quality Overview Documents



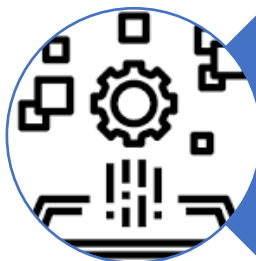
"The documents in this section present an overview of the current state of [NAAQS pollutant] air quality in the U.S. based on recent air pollutant emissions and air quality monitoring data"



CO, Pb, NO₂, O₃, PM, SO₂; 2021, 2022, 2023 (soon)



EPA-ORD, EPA-OAQPS



R Markdown

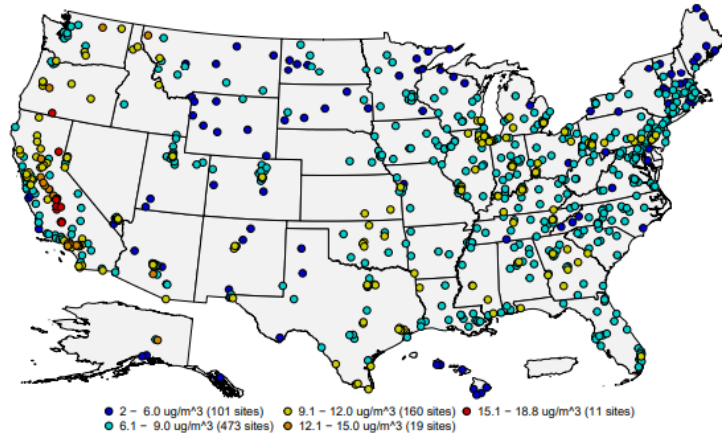


Figure 13: Annual $PM_{2.5}$ design values in $\mu g/m^3$ for the 2020-2022 period. Source: AQS.

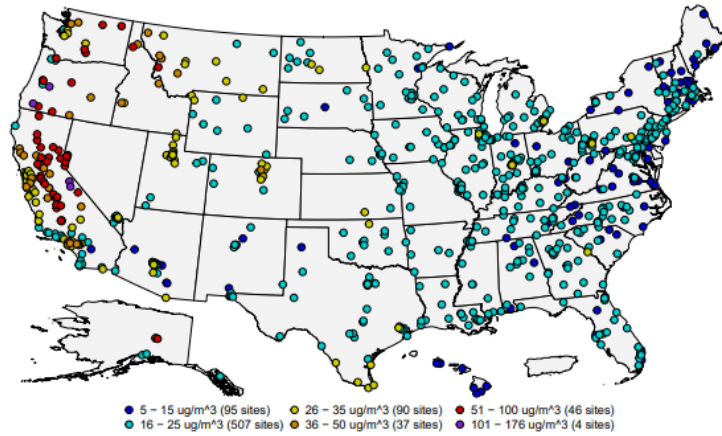


Figure 14: 24-hour $PM_{2.5}$ design values in $\mu g/m^3$ for the 2020-2022 period. Source: AQS.

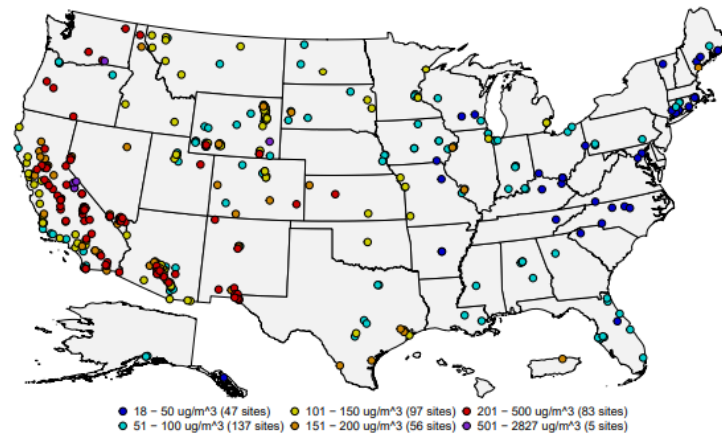


Figure 15: 24-hour PM_{10} design concentrations in $\mu g/m^3$ for the 2020-2022 period. Source: AQS.

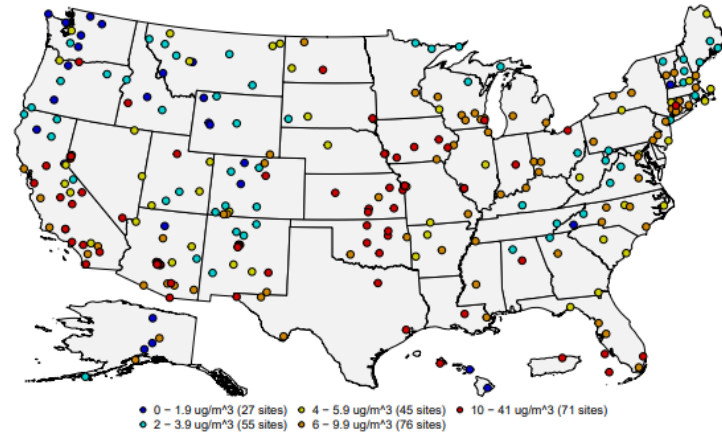
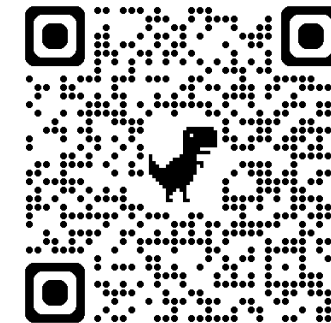


Figure 16: Average annual $PM_{10,2.5}$ concentrations in $\mu g/m^3$ for the 2020-2022 period. Source: AQS.



Ozone Watch



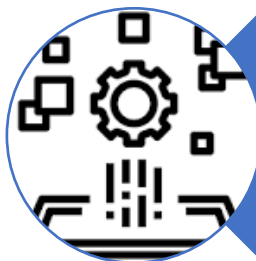
"Ozone Watch is designed to help users keep track of ozone concentrations reported during the current ozone season and understand the possible implications for attainment of the National Ambient Air Quality Standards (NAAQS) for ozone during the current 3-year design value period"



O₃; 2022-2024 (2012-2021 data also available)



State, Local, Tribal air agencies



R Shiny

Ozone Watch

Last Updated: July 10, 2024

Select an Application:

Design Value Tables

Select a Data Type:

Area-level Design Values

Site-level Design Values

Select an Ozone NAAQS:

2015 8-hour (70 ppb)

Select a Geographic Area Type:

State/County

Select an EPA Region:

EPA Region 6

Select a State:

Louisiana

Select Years:

2022 - 2024

Area 4th Highest Values based on:

Site with Highest Design Value

Site with Highest Annual Value

Go!

View Intro

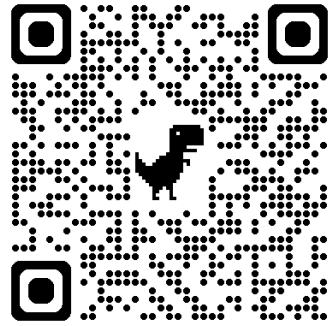
Download this Table (CSV)

State	County	Core Based Statistical Area (CBSA)	Preliminary 2022 - 2024 Design Value (ppb)	Meets 2015 NAAQS? (70 ppb)	2022 4th Max Value (ppb)	2023 4th Max Value (ppb)	2024 4th Max Value (ppb)	2024 Critical Value (ppb)	2025 Critical Value (ppb)
Louisiana	Ascension	Baton Rouge, LA	65	Yes	65	70	61	78	82
Louisiana	Bossier	Shreveport-Bossier City, LA	59	Yes	59	60	60	94	93
Louisiana	Caddo	Shreveport-Bossier City, LA	64	Yes	65	66	61	82	86
Louisiana	Calcasieu	Lake Charles, LA	65	Yes	65	70	62	78	81
Louisiana	East Baton Rouge	Baton Rouge, LA	69	Yes	63	74	71	76	68
Louisiana	Iberville	Baton Rouge, LA	71	No	70	77	68	66	68
Louisiana	Jefferson	New Orleans-Metairie, LA	64	Yes	62	69	62	82	82
Louisiana	Lafayette	Lafayette, LA	65	Yes	65	68	62	80	83
Louisiana	Lafourche	Houma-Thibodaux, LA	60	Yes	59	64	58	90	91
Louisiana	Livingston	Baton Rouge, LA	67	Yes	65	72	64	76	77
Louisiana	Ouachita	Monroe, LA	61	Yes	60	65	60	88	88
Louisiana	Pointe Coupee	Baton Rouge, LA	66	Yes	63	68	67	82	78
Louisiana	St. Bernard	New Orleans-Metairie, LA	62	Yes	60	67	61	86	85
Louisiana	St. James	New Orleans-Metairie, LA	64	Yes	63	65	65	85	83
Louisiana	St. John the Baptist	New Orleans-Metairie, LA	66	Yes	59	71	69	83	73





2020 AirToxScreen Mapping Tool



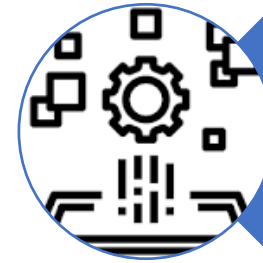
"The AirToxScreen Mapping Tool displays cancer risks, emissions data, and other AirToxScreen data on a map" at the census block level.



AirToxScreen models 180 air toxics modeled and diesel PM; 138 cancer and non-cancer hazard; Year available: 2017-2020



General public and concerned citizens, state, local, and tribal air agencies, regional offices, EPA headquarters.



ESRI ArcGIS Experience Builder



AirToxScreen Mapping Tool

(based on 2020 emissions)

Legend

Risk Changes (click block for more info)



Cancer Risk (2020)

Total Risk (in a million)

- Zero Population Blocks
- 6 - 25
- >25 - 50
- >50 - 75
- >75 - 100
- > 100

Facility Level Emissions (2020)



Ambient Monitors (2020)



State/County/Block ID Search

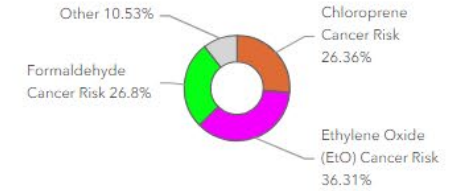
Facility Search

Filter by Total Risk



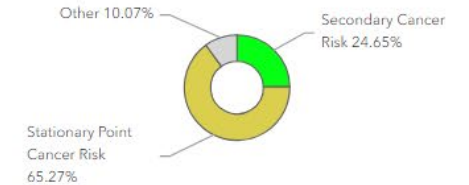
Risk by Air Toxic

Select census block(s) to display pie chart



Risk by Source Type

Select census block(s) to display pie chart



Census Block Data Facility Emissions Data

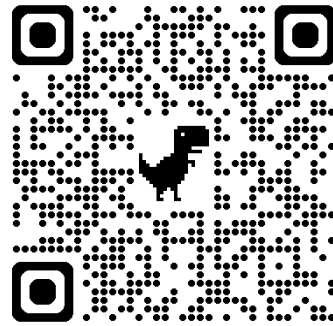
Block ID	Total Cancer Ris...	County Name	County FIPS Code	State	EPA Region	Population
220890601001028	80	St. Charles Parish	22089	LA	EPA Region 6	10
220890601001029	80	St. Charles Parish	22089	LA	EPA Region 6	5
220890601001030	90	St. Charles Parish	22089	LA	EPA Region 6	12

Total: 531 | Selection: 531





Ambient Air Toxics Trends Tool



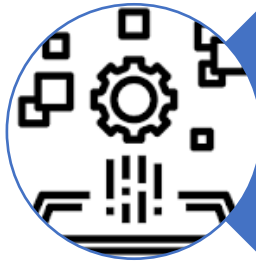
“This tool displays site-level and national-level trends for all available annual ambient monitoring data for air toxics since 2010” through a map, time series, and tables.



129 AQS parameter codes (51 air toxics) from 2010 through 2021



General public, state, local, and tribal air agencies, EPA



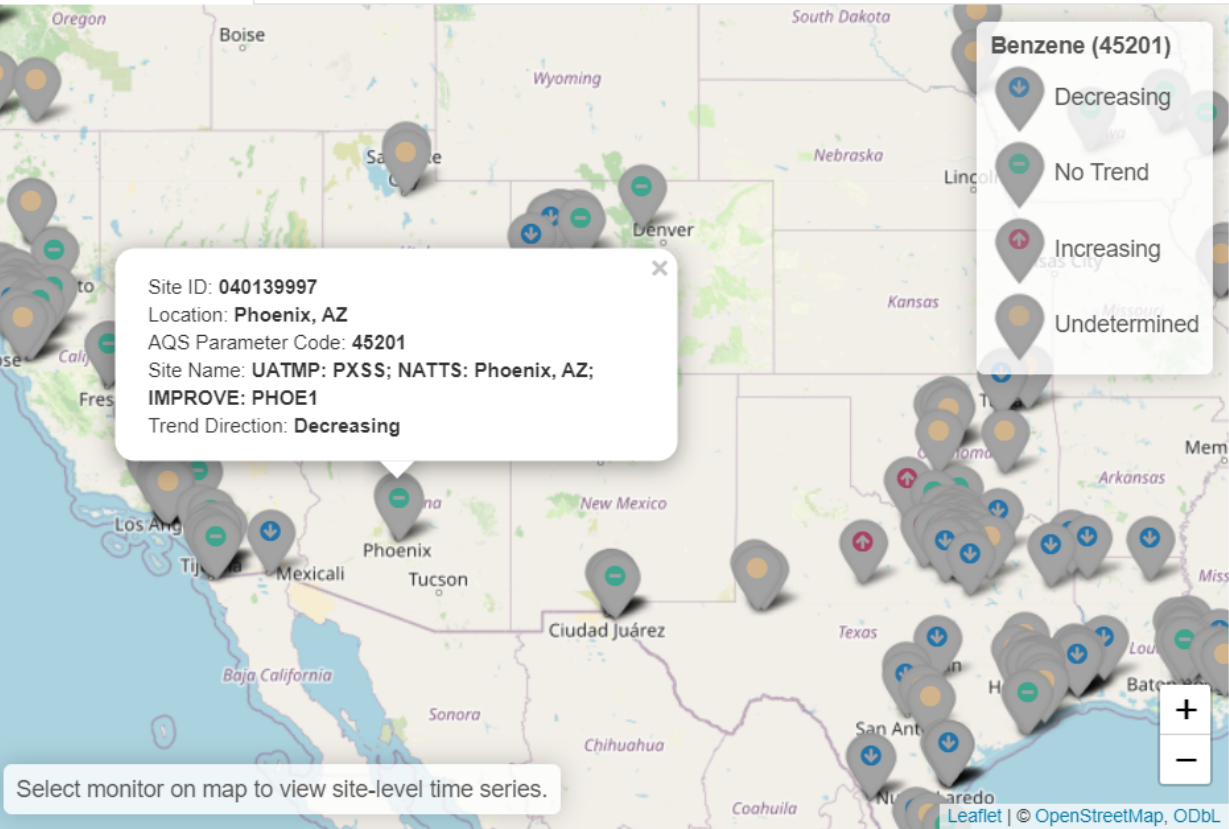
R Shiny

Select an air toxic

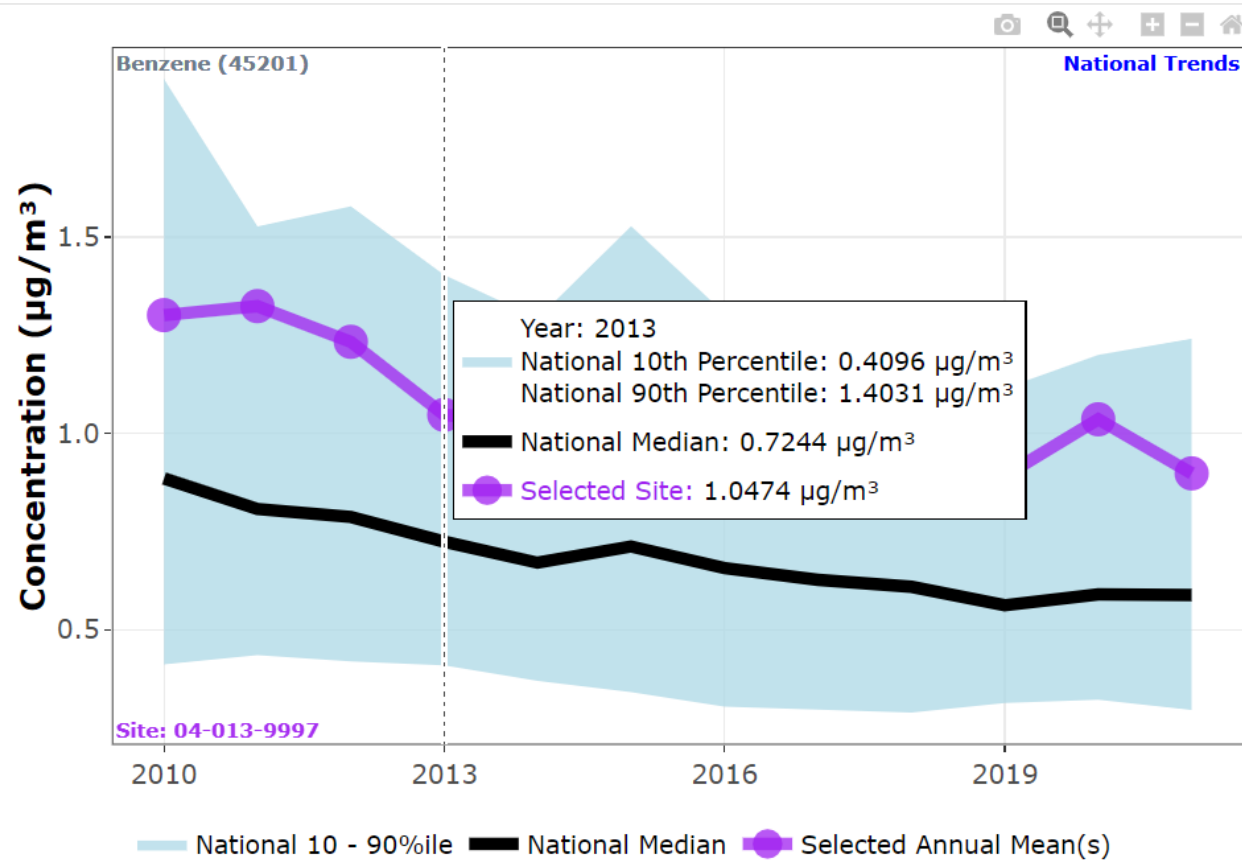
Benzene (45201)

Clear Selected Site

Map and Time Series Table(s) Read Me



Download Map



Contact

- Jeanette Reyes (RTP, NC)
 - OAR/OAQPS/AQAD/AQAG
 - reyes.jeanette@epa.gov
- Brett Gantt (RTP, NC)
 - OAR/OAQPS/AQAD/AQAG
 - gantt.brett@epa.gov

