

AirExplorer

Web-Based Air Quality Data Visualization & Access Tool

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AirExplorer

<http://epa.gov/airexplorer>

Outline

- Quick comparison of AirExplorer to other publicly available EPA data visualization / data access tools
- Descriptions of the AirExplorer menu options and example outputs
- FYI – Things you should know
- Feedback

AirExplorer

When you want to 'see' air pollution data, you have choices!

AQS

AirNow

AirData

AirExplorer

AirExplorer

When you want to 'see' air pollution data, you have choices!

AQS

Action Help Session Admin Retrieval Maintenance Critical Rev Certification Batch Correct

Standard Report Criteria Selection (Read Only)

Criteria Set Monitor Selection Area Selection Sort Order Report Options Retrieve Report

Criteria Set Desc

Owner STEPHEN SCHMIDT Type PRIVATE

Report Code Report Name

Report Outputs

Run Online

Send via Email

Send to CDX

Report Selection Mode

Monitor Selection(detail)

Area Selection

Generate Report CDX to Retrieve Batch Reports

AQS

- The AQS client is the alpha source for ambient data
- It has a powerful query facility (standard reports & 'design your own')
- But ... An account is required; there are no graphics / maps; and no 'processed' data

Each choice has advantages & disadvantages!

AirExplorer

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AIRNow

- AIRNow is the media favorite pollution data dissemination tool
- It shows the most current monitoring data in map form
- But ... It only contains ozone and PM2.5 data; the data are not 'certified'; the PM2.5 data aren't FRM/FEM; and there is no public access data extraction utility

AIRNOW Quality of Air Means Quality of Life

Home National Forecast Local Forecasts & Conditions Partners

National Overview October 30th, 2006

National Outlook for 10/30/06-10/31/06
Unhealthy for Sensitive Groups AQI levels in Southern California: ==
[More](#)

[National Outlook](#) [Today's Forecast](#) [Ozone Now](#) [Particles Now](#)

Today's Action Days
No cities have declared Action Days for today.
[see Action Days map](#)

Today's Highest AQI Forecasts

Riverside Co. Metro, CA	PM2.5
Ann Arbor, MI	PM2.5
Atlanta, GA	PM2.5
Bakersfield, CA	PM2.5
Benton Harbor, MI	PM2.5

Local Resources
[EnviroFlash](#) E-mail Notif
Sign-up for e-mail, cell ph
pager air quality notificatio

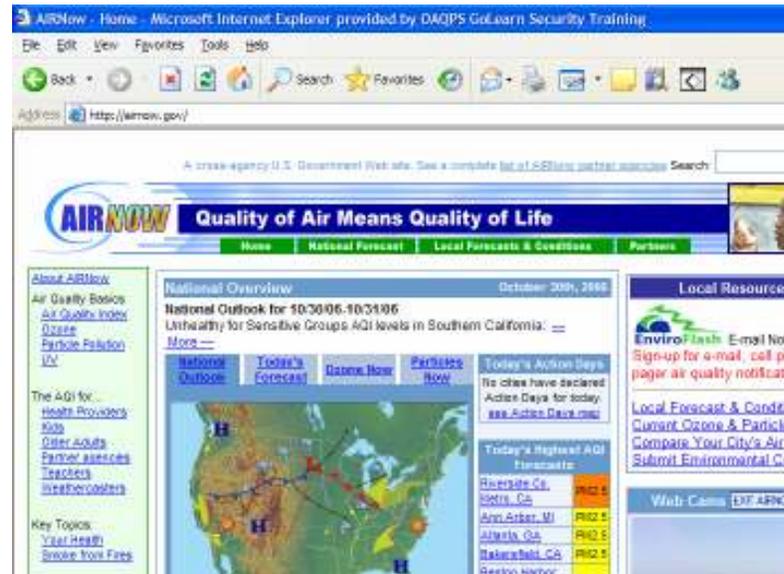
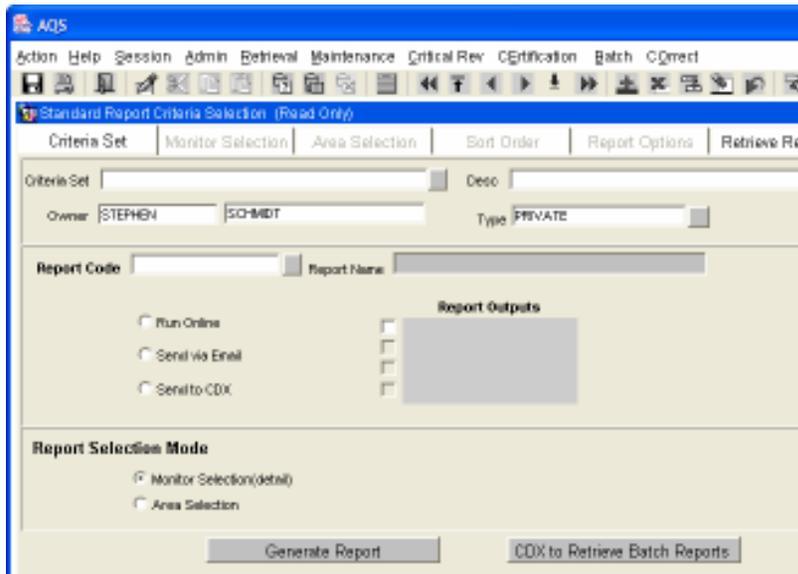
Local Forecast & Conditio
[Current Ozone & Particle](#)
[Compare Your City's Air C](#)
[Submit Environmental Co](#)

Web Cams [EXIT AIRNOW](#)

Each choice has advantages & disadvantages!

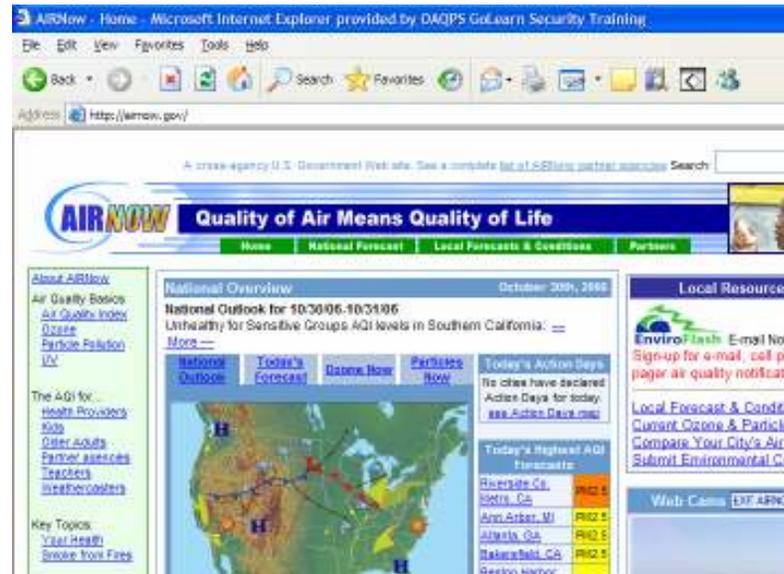
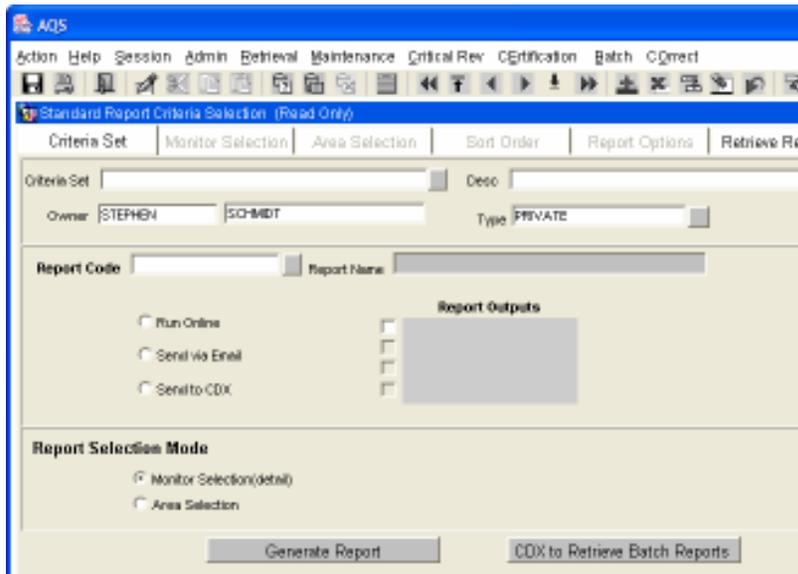
AirExplorer

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Each choice has advantages & disadvantages!

AirExplorer

- Designed primarily to help data analysts access / visualize / explore air quality data to answer routine questions.
- It generates unique interactive/portable maps and graphs.
- It allows quick-n-easy download of popular air pollution data sets ... including 'processed' PM2.5 speciation data.
- But, the data are not 'real-time' and not all ambient data are available.

AIR Explorer - Microsoft Internet Explorer provided by QADPS GoLearn Security Training

U.S. Environmental Protection Agency

AIR Explorer

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EPA Home > AIR Explorer

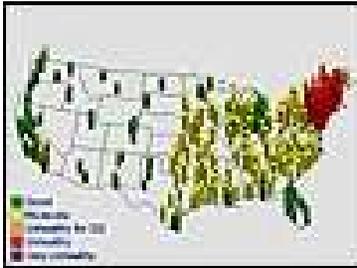
AIR Explorer is a collection of user-friendly visualization tools for air quality analysts. The tools generate maps, graphs, and data tables dynamically. Currently, the tools use ambient concentration data from EPA's Air Quality System (AQS). The criteria pollutant data were updated on March 2, 2006. The PM2.5 speciation data were updated in 2006. The benzene data were updated on February 25, 2005. This is a developmental site. We are continually designing and implementing innovative tools for analyzing and communicating air quality information.

UPDATE (3/8/2006) The PM2.5 speciation data were updated.
UPDATE (3/2/2006) The criteria pollutant data were updated.

MAPS	GRAPHS	DATA
Map One Day Generate a three-dimensional, interactive map of daily pollutant concentrations.	Plot Concentrations Generate a line series plot for a specific location and time period.	Query Concentrations View or download daily pollutant concentrations for a specific location and time period.
Map Several Days Generate an animated series of daily concentration maps for a specific time period.	Plot AQI Values Plot PM2.5 and Ozone AQI values for a specific location and time period.	Query Speciation Data View or download daily PM2.5 speciation data for a specific location and time period.
Tile AQI Values Plot daily AQI values for a specific location and time period.	Plot Speciation Data Plot daily PM2.5 speciation data for a specific location and time period.	Query Benzene Data View or download benzene data for a specific location and time period.
	Plot Benzene Data Generate a line series plot or download data for all monitoring sites for a specific state.	

AirExplorer

Descriptions of the menu options: Maps – Map One Day



Map One Day
Generate a three-dimensional, interactive map of daily pollutant concentrations

Map One Day

Step 1: Select Pollutant
Select Pollutant

Step 2: Select Date
JAN 01 2005

Step 3: Select Options
Include Exceptional Events? Yes No
Interactive Graph? Yes No

[Install the plug-in](#) to view interactive graphics on this site.

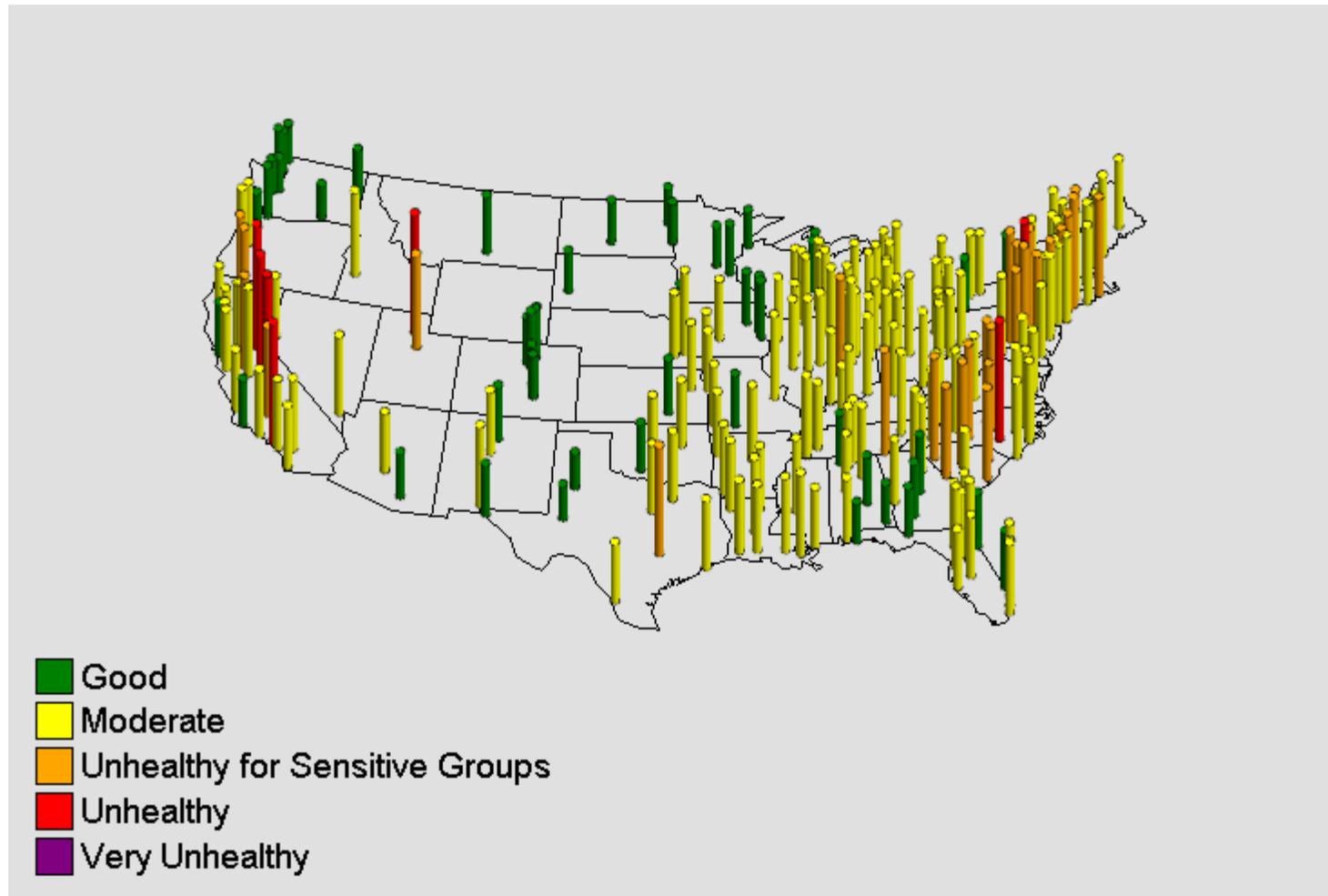
Step 4: Submit Selections
After map is generated, right-click to display interactive controls and help options.

- Generates a 3-D interactive map of daily pollutant-specific AQI values.
- Aggregates by MSA – highest concentration in area used.
- Available pollutants: CO, SO₂, Ozone (max 8-hr), PM₁₀, PM_{2.5}
- Ten years of available data (currently, 1996 – 2005).
- Include or exclude exceptional event data.
- Interactive option.

AirExplorer

Examples outputs: Maps – Map One Day

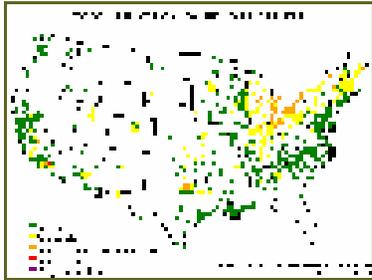
PM2.5 AQI Values by MSA on 01/01/2000



- Bar (column) color and height correspond to AQI level
- Interactive / portable features include: cursor over for ID info, rotate, move, zoom, subset, and reset

AirExplorer

Descriptions of the menu options: Maps – Map Several Days



Map Several Days

Generate an animated series of daily concentration maps for a specific time period

Map Several Days

Step 1: Select Pollutant
CO

Step 2: Select Dates
From
JAN 01 2005
To
JAN 01 2005

Step 3: Select Options
Include
Exceptional Events? Yes No

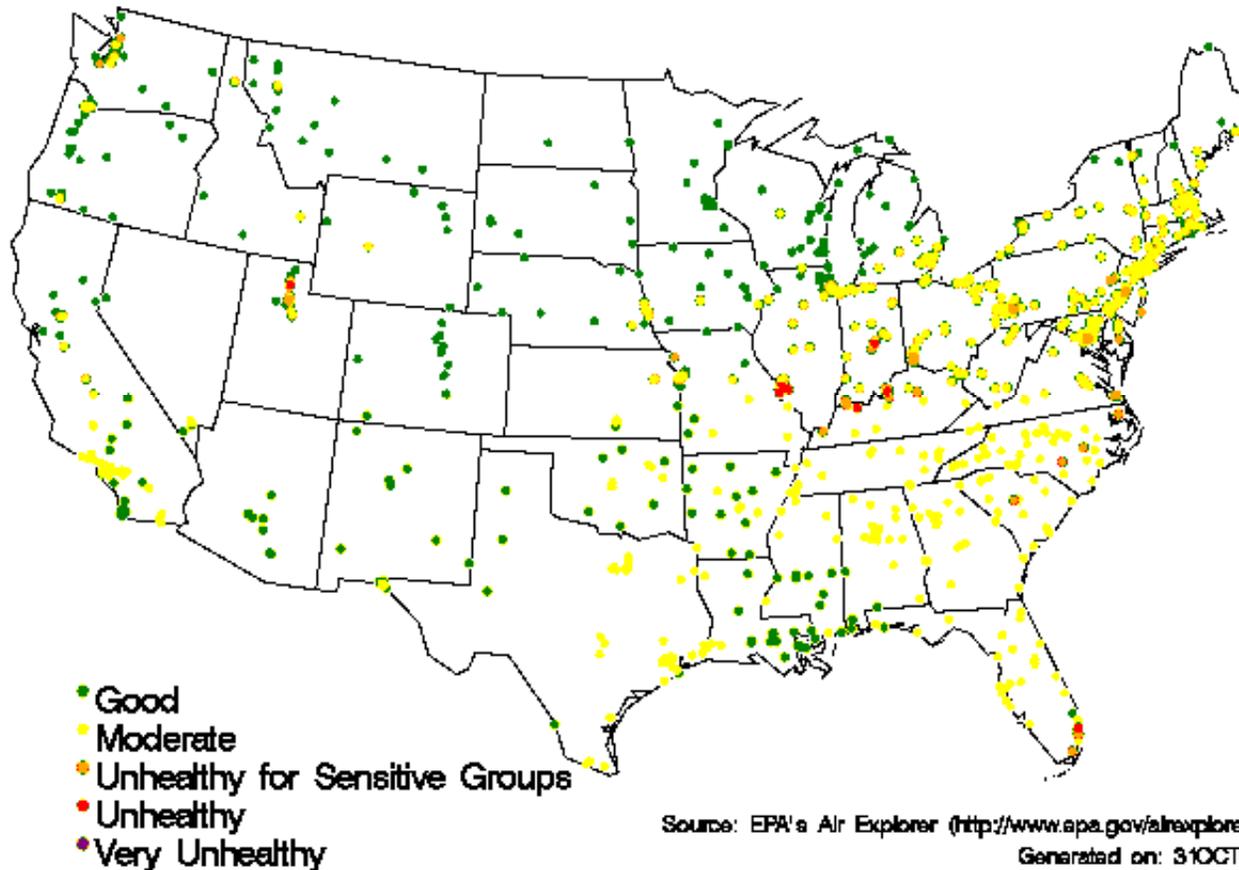
Step 4: Submit Selections
Larger data sets take longer to process.
Submit

- Generates an animated series of daily site-level, pollutant-specific AQI values (for criteria pollutants) or concentration ranges (for key PM_{2.5} species)
- Available pollutants: CO, SO₂, Ozone (max 8-hr), PM₁₀, PM_{2.5}, carbon, nitrate, sulfate
- Ten years of available data (currently, 1996 – 2005)
- Include or exclude exceptional event data

AirExplorer

Example outputs: Maps – Map Several Days (Example 1)

PM2.5 AQI Values by site on 07/04/2002

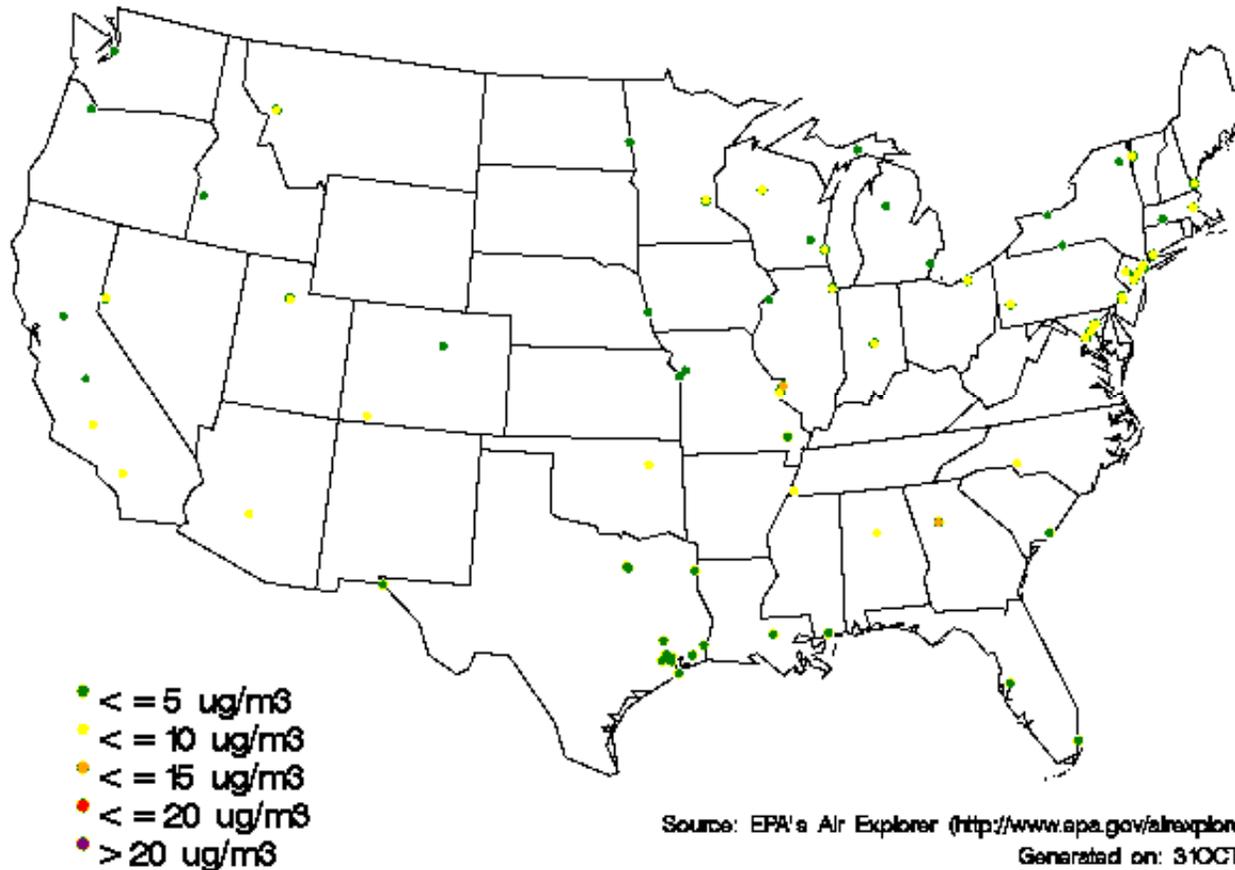


- For criteria pollutants, dot color corresponds to AQI level
- Animation is portable.
- Useful for identifying episodes and associated scales

AirExplorer

Example outputs: Maps – Map Several Days (Example 2)

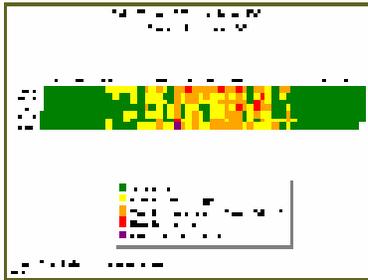
Carbon Concentrations by site on 07/04/2002



- For PM_{2.5} species (e.g., carbon), dot color corresponds to concentration range.
- Animation is portable.
- Useful for identifying episodes and associated scales

AirExplorer

Descriptions of the menu options: Maps – Tile AQI Values



Tile AQI Values

Plot daily AQI values for a specific location and time period

Tile AQI Values

Step 1: Select Pollutant
Select Pollutant

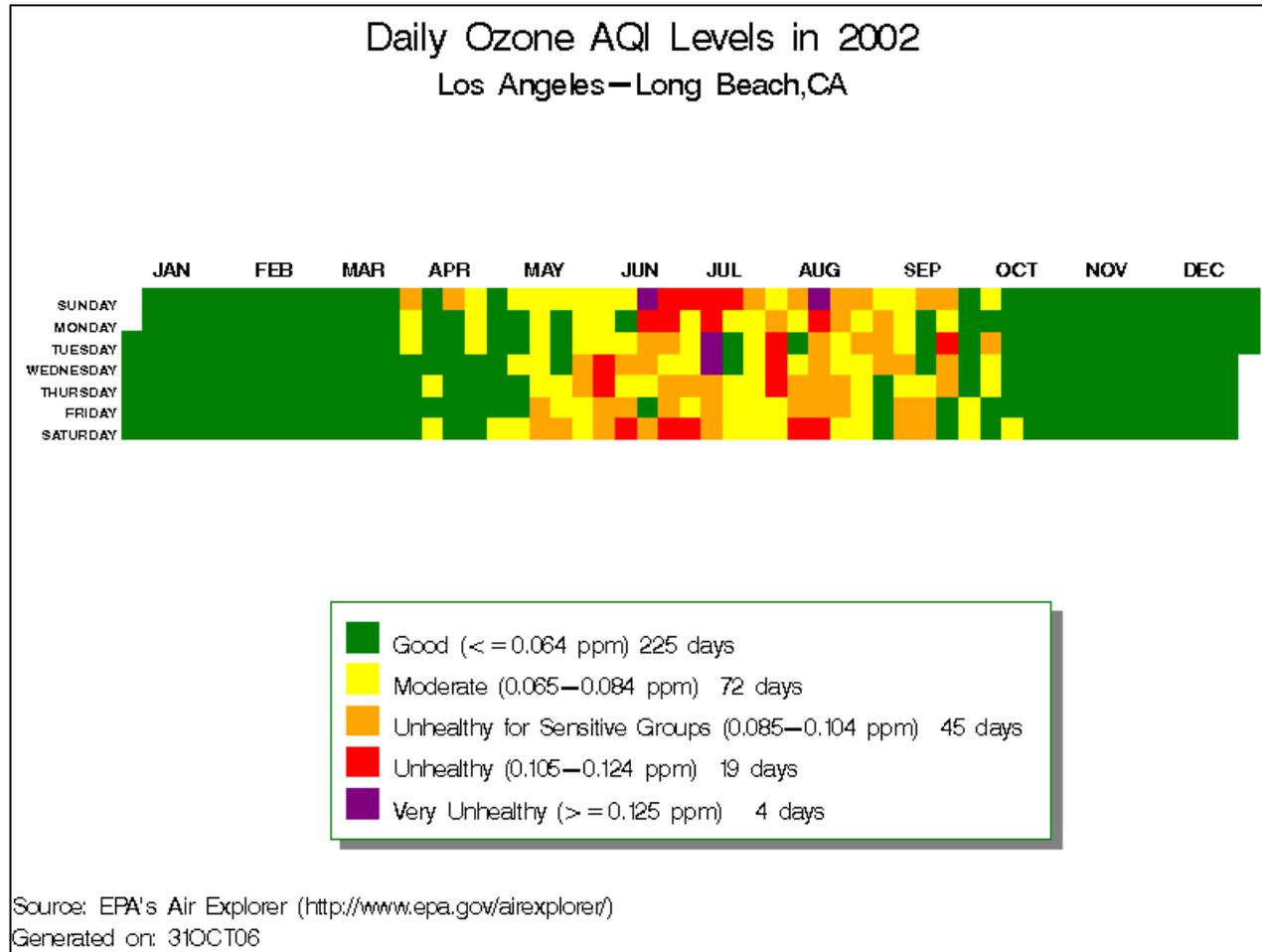
Step 2: Select a County or MSA
County:
MSA:

Step 3: Select Year
2005

Step 4: Select Options
Include Exceptional Events? Yes No

Step 5: Submit Selections

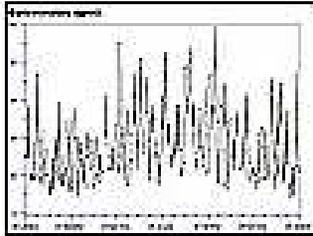
- Plots daily AQI values for a specific location (county or MSA) and time period (year)
- Available pollutants: CO, SO₂, Ozone (max 8-hr), PM₁₀, PM_{2.5}.
- Ten years of available data (currently, 1996 – 2005)
- Include or exclude exceptional event data



- Shows pollutant-specific AQI value ranges (highest in area) for each day of a year. Each day is represented by a color tile.
- Rows are day-of-week (7); columns are weeks (52 or 53)
- Useful for identifying seasonal and day-of-week patterns

AirExplorer

Descriptions of the menu options: Graphs – Plot Concentrations



Plot Concentrations
Generate a time series plot for a specific location and time period

Plot Concentrations

Step 1: Select Pollutant
CO

Step 2: Select a County or MSA
County: Select a County
MSA: Select an MSA

Step 3: Select a Site
All Sites
010730005
010730009
010730012

Step 4: Select Dates
From: JAN 01 2005
To: JAN 01 2005

Step 5: Select Options
Include Exceptional Events? Yes No
Interactive Graph? Yes No
[Install the plug-in](#) to view interactive graphics on this site.

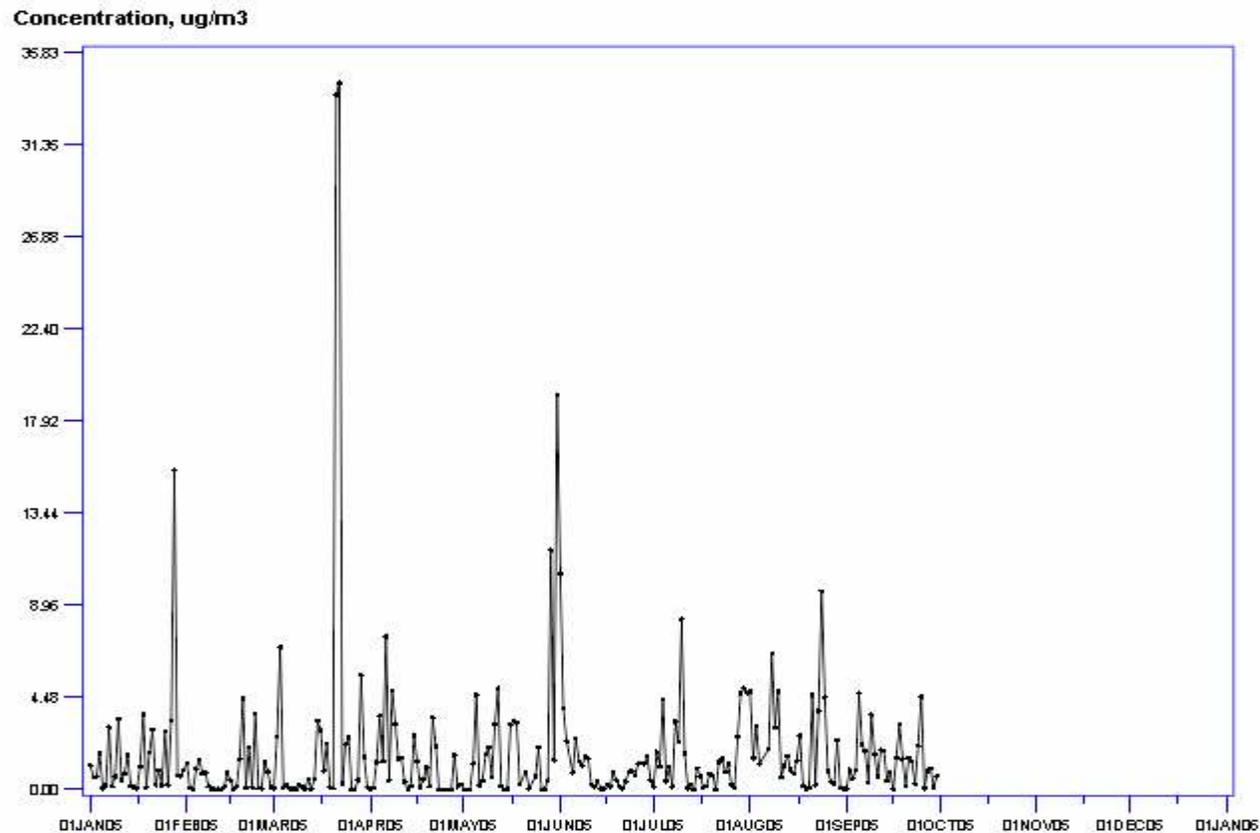
Step 6: Submit Selections
After map is generated, right-click to display interactive controls and help options.
Submit

- Generates a time series plot for a specific location (one or more sites) and time period.
- Available pollutants: Pb, CO, SO₂, NO₂, Ozone (max 8-hr), PM₁₀, PM_{2.5}.
- Tool shows available sites by county or MSA. Pick one, multiple, or 'all' sites.
- Ten years of available data (currently, 1996 – 2005)
- Include or exclude exceptional event data
- Interactive option

AirExplorer Example outputs: Graphs – Plot Concentrations

Daily Pb Concentrations from 01/01/05 to 12/31/05

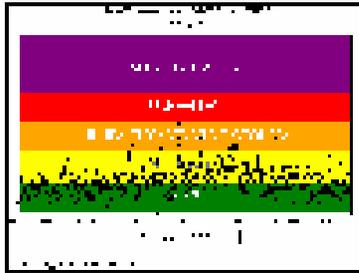
STATE_NAME=Missouri COUNTY_NAME=Jefferson MSA_NAME=St, Louis,MO-IL SITE=290990016 POC=1



- Plots daily concentration levels for specified time period.
- Multiple sites are plotted separately
- Uses same y-scale for multiple site plots.
- Interactive / portable features include: cursor over for ID info, move, zoom, subset, and reset

AirExplorer

Descriptions of the menu options: Graphs – Plot AQI Values



Plot AQI Values
Plot PM2.5 and Ozone
AQI values for a specific
location and time period

Plot Ozone and PM2.5 AQI Values

Step 1: Select an MSA
Select an MSA

Step 2: Select Dates
From
JAN 01 2005
To
JAN 01 2005

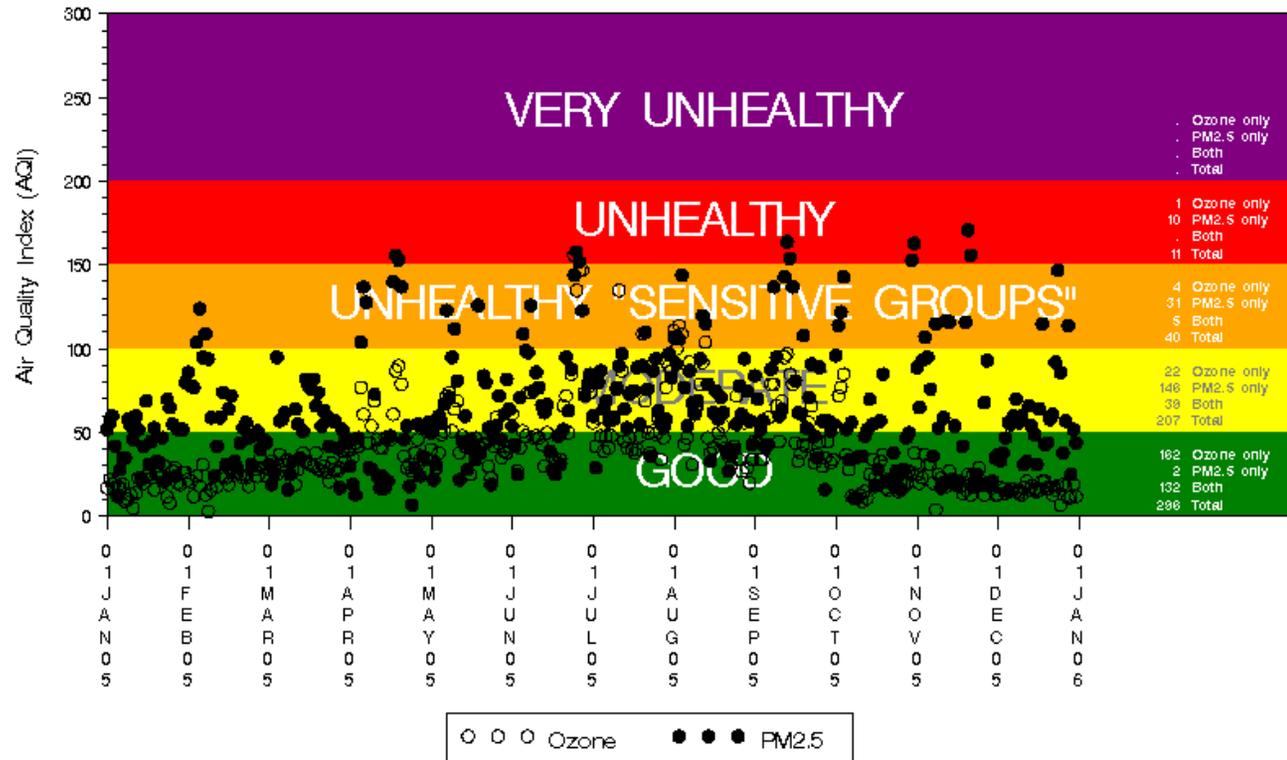
Step 3: Select Options
Include
Exceptional Events? Yes No
Omit Y-axis Values? Yes No

Step 4: Submit Selections
Larger data sets take longer to process.

- Plots PM2.5 and ozone AQI values for a specific location (MSA) and time period.
- Aggregates by MSA – highest concentrations (for PM2.5 & O3) in area for each day.
- Ten years of available data (currently, 1996 – 2005)
- Include or exclude exceptional event data
- Include/exclude y-axis labels and category counts

AirExplorer Example outputs: Graphs – Plot AQI Values

Daily Ozone and PM2.5 AQI Values from 01/01/05 to 12/31/05
Pittsburgh,PA

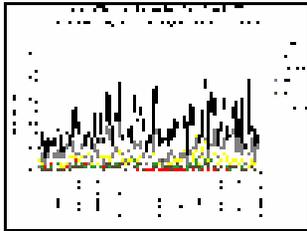


Source: EPA's Air Explorer (<http://www.epa.gov/airexplorer/>)
Generated on: 31/0CT06

- Ozone plotted as circles, PM2.5 as dots
- Same y-scale used for all plots

AirExplorer

Descriptions of the menu options: Graphs – Plot Speciation Data



Plot Speciation Data

Plot daily PM2.5
speciation data for a
specific location and
time period

Plot Speciation Data

Step 1: Select a County or MSA

County:

MSA:

Step 2: Select Dates

From

To

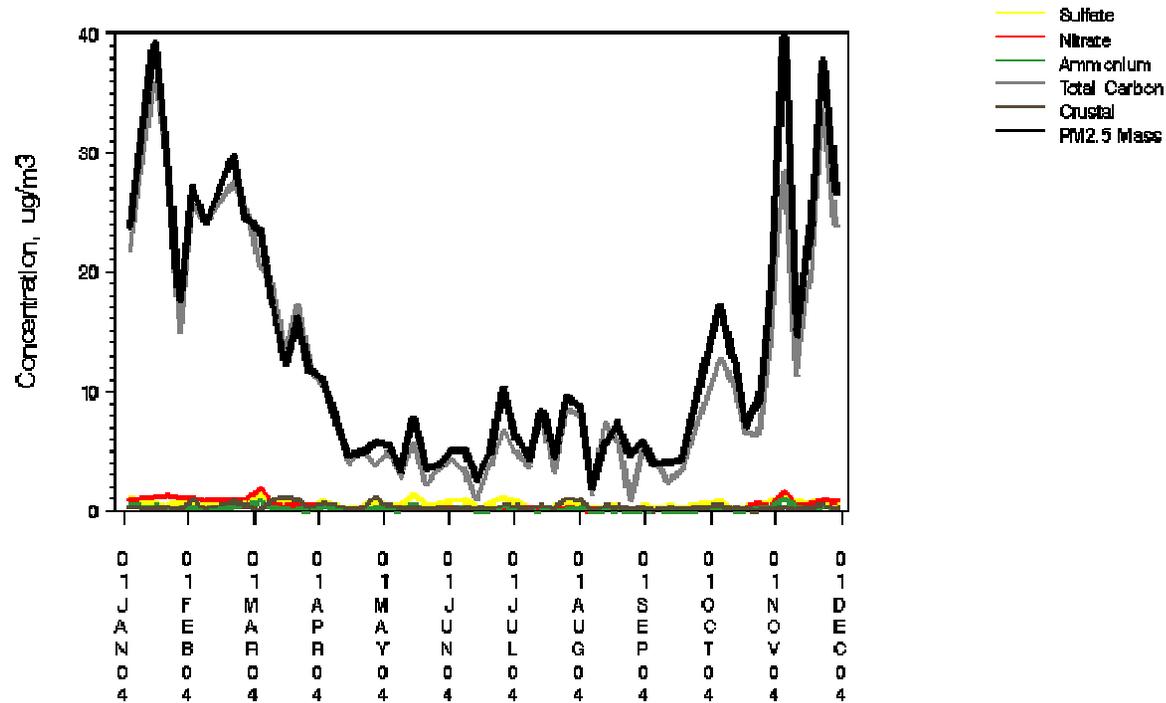
Step 3: Submit Selections

- Plots daily PM2.5 speciation data (key components) for a specific location (MSA or County) and time period.
- Include or exclude exceptional event data.
- Multiple sites in an area are plotted separately.
- All STN data (2001 ->) available.

AirExplorer Example outputs: Graphs – Plot Speciation Data

Daily PM2.5 Concentrations from 01/01/04 to 12/31/04

STATE_NAME= Montana COUNTY_NAME= Lincoln MSA_NAME= Not in a MSA SITE= 300530018 POC= 5

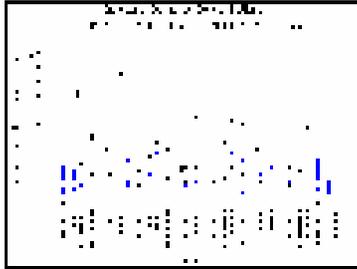


Source: EPA's Air Explorer (<http://www.epa.gov/airexplorer/>)
Generated on: 01NOV06

- Plots: Total PM2.5 mass (black); sulfate (yellow); nitrate (red), ammonium (green); total carbon (grey); crustal (brown)

AirExplorer

Descriptions of the menu options: Graphs – Plot Benzene Data



Plot Benzene Data

Generate a time series plot or download data for all monitoring sites for a specific state

Plot Benzene Data

Sites with Valid Quarterly Means



Sites with Valid Annual Means



Step 1: Select Summary Period

- Quarterly
 Annual

Step 2: Select State

California

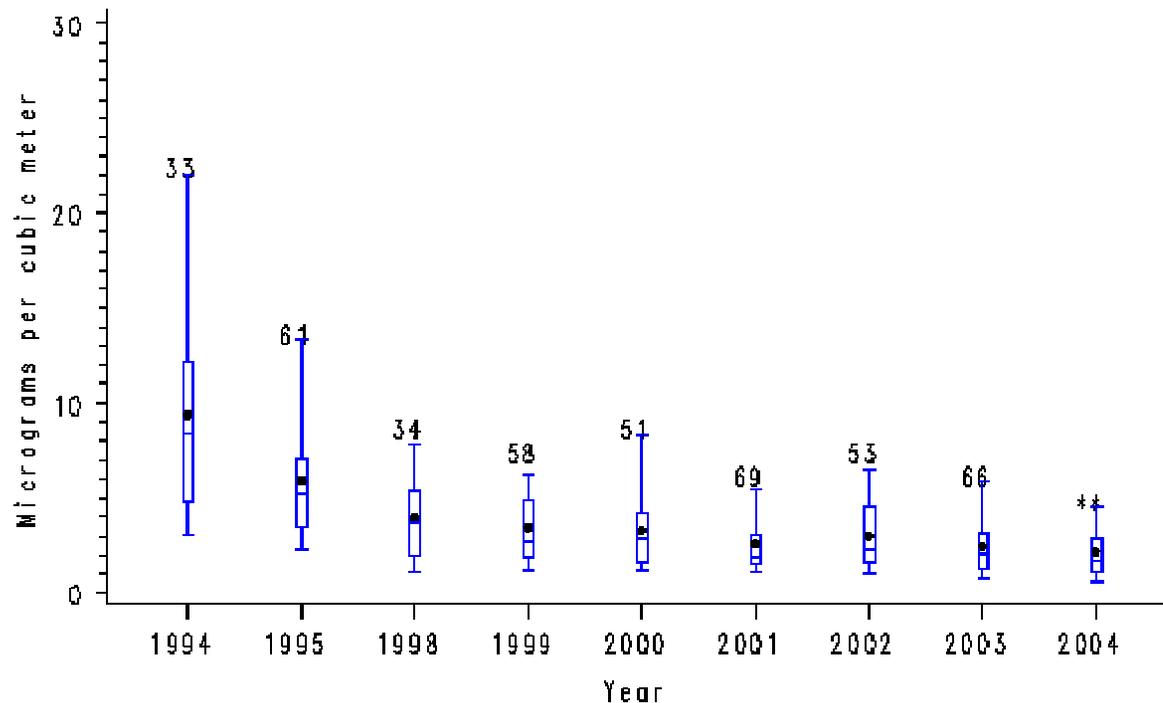
Step 3: Submit Selections

- Option produces boxplot time series.
- Maps show location of sites with valid data.
- Plot annual or quarterly averages.
- Uses all available 24-hr benzene data from 1999 >
- Select by State; all sites in State plotted (separately).

AirExplorer Example outputs: Graphs – Plot Benzene Data

Annual Benzene Concentrations

SITE=060371601 PQC=2 CITY_NAME=Pico Rivera MSA_NAME=Los Angeles-Long Beach,CA

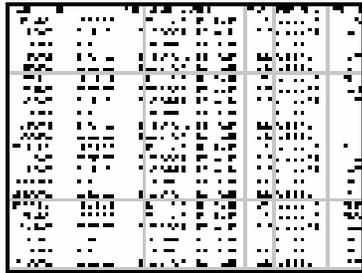


Source: EPA's Air Explorer (<http://www.epa.gov/airexplorer/>)
Generated on: 01NOV08

- Box depicts interquartile range and median; whiskers depict 5th and 95th percentiles; dots identify averages (annual or quarterly); number of observations shown on top.

AirExplorer

Descriptions of the menu options: Data – Query Concentrations



Date	Location	Concentration
01/01/2005	010730005	12.5
01/02/2005	010730005	13.2
01/03/2005	010730005	11.8
01/04/2005	010730005	14.1
01/05/2005	010730005	12.9

Query Concentrations
View or download daily concentrations for a specific location and time period

Query Concentrations

Step 1: Select Pollutant
CO

Step 2: Select a County or MSA
County: Select a County
MSA: Select an MSA

Step 3: Select a Site
All Sites
010730005
010730009
010730012

Step 4: Select Dates
From: JAN 01 2005
To: JAN 01 2005

Step 5: Select Options
Include Exceptional Events? Yes No
Download or View Online? Download View Online

Step 6: Submit Selections
Submit

- View 24-hr criteria pollutant data online or download in .csv format.
- Available pollutants: Pb, CO, SO₂, NO₂, Ozone (max 8-hr), PM₁₀, PM_{2.5}.
- Tool shows available sites by county or MSA. Pick one, multiple, or 'all' sites.
- Ten years of available data (currently, 1996 – 2005)
- Include or exclude exceptional event data

AirExplorer Example outputs: Data – Query Concentrations



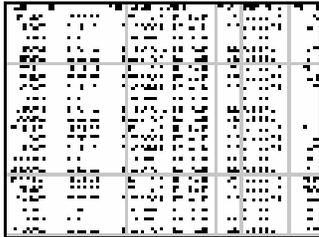
Date	SITE	POC	Concentration	FLAG	NOBS	PCTOBS	STATE_NAME	COUNTY_NAME	CITY	CITY_NAME
01/01/2005	010730023	1	0.03200	0	24	100.0000	Alabama	Jefferson	07000	Birmingham
01/02/2005	010730023	1	0.03100	0	24	100.0000	Alabama	Jefferson	07000	Birmingham
01/03/2005	010730023	1	0.02400	0	24	100.0000	Alabama	Jefferson	07000	Birmingham
01/04/2005	010730023	1	0.02100	0	24	100.0000	Alabama	Jefferson	07000	Birmingham

Done

- Fields: Date, SITE, POC, Concentration, FLAG, NOBS, PCTOBS, STATE_NAME, COUNTY_NAME, CITY, CITY_NAME, ADDRESS, AQCR, AQCR_NAME, UAR, UAR_NAME, LAND_USE, LOCATION, LATITUDE, LONGITUDE, UTM_ZONE, UTM_NORTHING, UTM_EASTING, ELEVATION, REGION, MSA, POP, MSA_NAME

AirExplorer

Descriptions of the menu options: Data – Query Speciation Data



Query Speciation Data

View or download daily PM2.5 speciation data for a specific location and time period

New!
SANDWICH'ed speciation data now available!

Query Speciation Data

Step 1: Select a Data Set

Ambient PM2.5 Speciation Data (All measured and computed components)

OR

SANDWICH modeled PM2.5 FRM Components

The SANDWICH technique uses the speciation data to provide estimates of PM2.5 components Method. For more information, link to SANDWICH [description](#) or [data dictionary](#).

Major PM2.5 FRM Components

All Raw Data Components

Step 2: Select an Area or All Sites

Area

County:

MSA:

Region:

OR

All Sites

Step 3: Select Dates

From:

To:

Step 4: Select Options

Download Spreadsheet

View Online

Step 5: Submit Selections

- View speciation data online or download in .csv format.
- Choose 'traditional' processed ambient data or SANDWICH estimates.
- All STN data (2001 ->) available in traditional format; subset available as SANDWICH estimates.
- Select 'all sites' in the country or pick by county, MSA, or EPA Region.

The SANDWICH technique uses the speciation data to provide estimates of the PM2.5 components as they might be measured by the PM2.5 reference method. [In general,

AirExplorer Example outputs: Data – Query Speciation Data

‘Traditional’ processed data ...“Ambient PM2.5 Speciation Data (All measured and computed components)”



im	silicon	silver	zinc	strontium	sulfur	tantalum	terbium	rubidium	potassium	yttrium	sodium	zirconium	wolfram	AMMONIUM	Sodium Ion	potassium Ion	Organic Carbon as measured (NIOSH)	Organic Carbon Blank Adjusted
0	0.05500	0.00420	0.07810	0.01660	0.76000	0.00385	0.00700	0.00070	0.68800	0.00110	0.08400	0.00140	0.00305	0.48400	0.14000	0.73900	4.07000	2.54
0	0.04300	0.00420	0.00930	0.00085	1.13000	0.00385	0.00220	0.00070	0.09600	0.00110	0.14300	0.00140	0.00305	1.24000	0.16000	0.09300	4.62000	3.09
0	0.09900	0.00420	0.08320	0.00085	0.80100	0.00380	0.00215	0.00070	0.05800	0.00110	0.14400	0.00135	0.00305	0.78100	0.99000	0.12400	3.38000	1.85

- Fields: DATE, SITE, POC, STATE_NAME, COUNTY_NAME, CITY, CITY_NAME, ADDRESS, AQCR, AQCR_NAME,, UAR, UAR_NAME, LAND_USE, LOCATION, LATITUDE, LONGITUDE, UTM_ZONE, UTM_NORTHING, UTM_EASTING, UNITS, UNIT_DESC, TYPE, REGION, MSA, MSA_NAME, stype, FLAG, Min Amb Temp, Max Amb Temp, Avg Amb Temp, Min BP, Max BP, Avg BP, PM2.5 Mass Collocated FRM, PM2.5 Mass, Antimony, arsenic, aluminum, barium, bromine, cadmium, calcium, chromium, cobalt, copper, chlorine, cerium, cesium, europium, gallium, iron, hafnium, lead, indium, manganese, iridium, molybdenum, nickel, magnesium, mercury, gold, lanthanum, niobium, phosphorus, selenium, tin, titanium, samarium, scandium, vanadium, silicon, silver, zinc, strontium, sulfur, tantalum, terbium, rubidium, potassium, yttrium, sodium, zirconium, wolfram, AMMONIUM, Sodium Ion, potassium Ion, Organic Carbon as measured (NIOSH), Organic Carbon Blank Adjusted, Organic Carbon Mass (k=1.4), NITRATE, Elemental Carbon, Carbonate Carbon, Volatile Nitrate, Non Volatile nitrate, SULFATE, Total Carbonaceous Mass, CRUSTAL, RCFM_urban, FN_ammsulfate_sulfate, FN_ammnitrate (NO3*1.29), heiregion, dayofweek

AirExplorer - FYI

Remember: <http://epa.gov/airexplorer>

- Criteria pollutant and speciation data were updated last week!
- In the future, plan to link directly to the source data (e.g., AQS), eliminating the need to update manually. Also, plan to provide access to other data sets (e.g., design values, emissions inventories).
- Need to hear status updates for AQS Data Mart & AirQuest!
- Contacts:
 - David Mintz: mintz.david@epa.gov (919) 541-5224.
 - Mark Schmidt: schmidt.mark@epa.gov (919) 541-2416.

AirExplorer - Feedback

- Comments?
- Suggestions?
- Betting tips?