

How ERG is developing interactive apps (via Qlik Sense[®]) to facilitate air toxics data review

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EASTERN RESEARCH GROUP, INC.

AUGUST 24, 2022

NMP Program and Data Review

Eastern Research Group, Inc (ERG) is the contract laboratory for EPA's National Monitoring Programs (NMP)*, which includes the following programs:

- Urban Air Toxics Monitoring Program (UATMP),
- National Air Toxics Trends Stations (NATTS) network,
- Community-Scale Air Toxics Ambient Monitoring (CSATAM) program, and
- Photochemical Assessment Monitoring Stations (PAMS) program.

These programs have extensive data verification and validation requirements. ERG is developing interactive apps (via Qlik Sense®) to help facilitate air toxics data review for these programs.

*NHAPs = formerly NMP

What is Qlik Sense[®]?

Qlik Sense is a data analytics tool that allows for the development of app(s) that enable interactive data exploration by different users.

<https://www.qlik.com/us/products/qlik-sense>

EPA is using Qlik Sense as one means of inter-actively viewing data and thus, we at ERG are utilizing it as well.

Internal Data Visualization

The ERG lab's first development of a data visualization app was for internal data visualization.

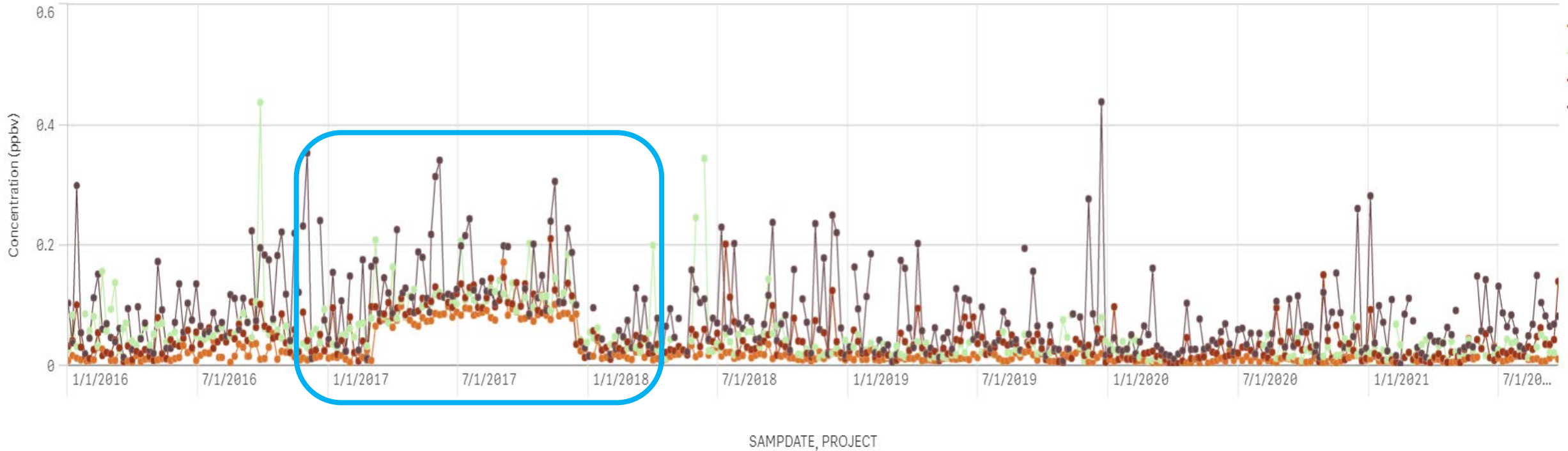
Essentially, the app allowed us to quickly review data to make sure everything looked as expected.

Doing this step in our QA has revealed to us, as a few examples,

- outliers at a given monitoring site
 - the identification of a sample line leak;
 - an unknown parking lot resurfacing operation;
 - impacts of nearby burning;
 - or the effects of extreme heat,
- an internal standard contamination issue at the lab
- changes in concentrations trends at a monitoring site.

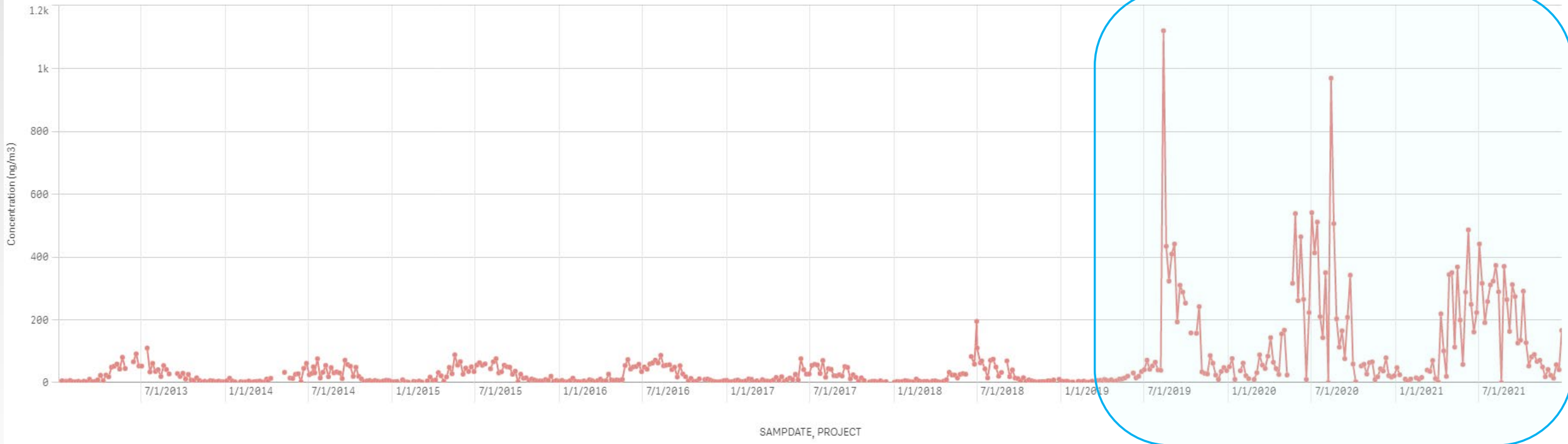
Internal Data Visualization

Time Series Plot for Ethylbenzene

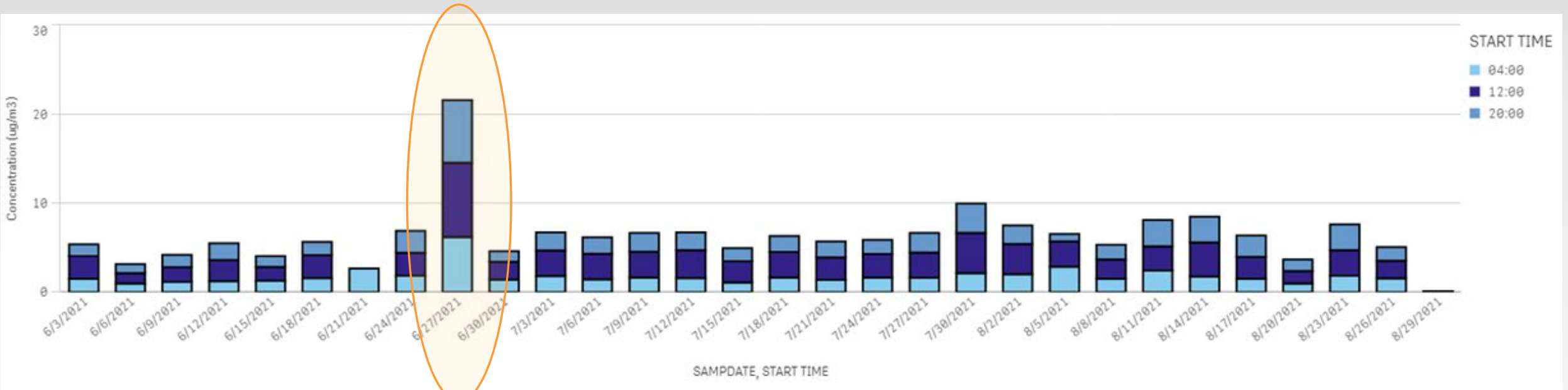


Internal Data Visualization

Time Series Plot for Phenanthrene



Internal Data Visualization



Allowing clients to see what we see

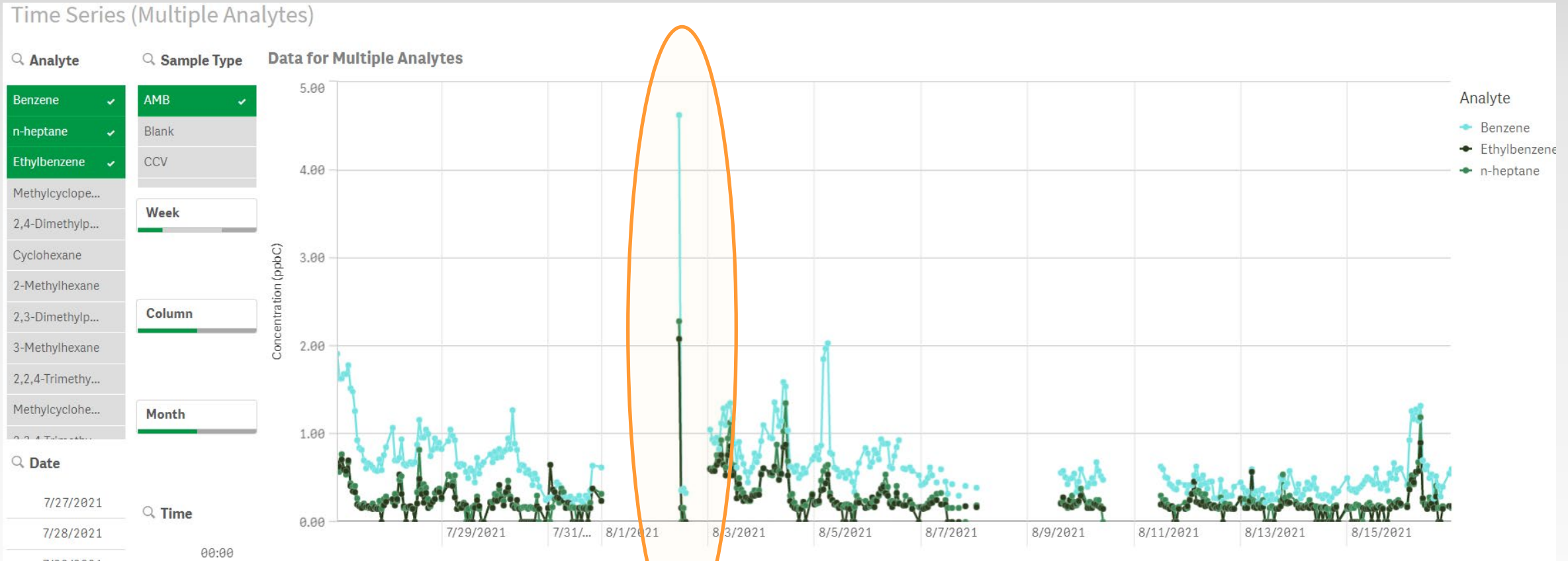
For the 2021 PAMS season, we developed site-specific apps to share with our individual clients to help them review AutoGC on their end while we were reviewing it on ours.

The app provided interactive:

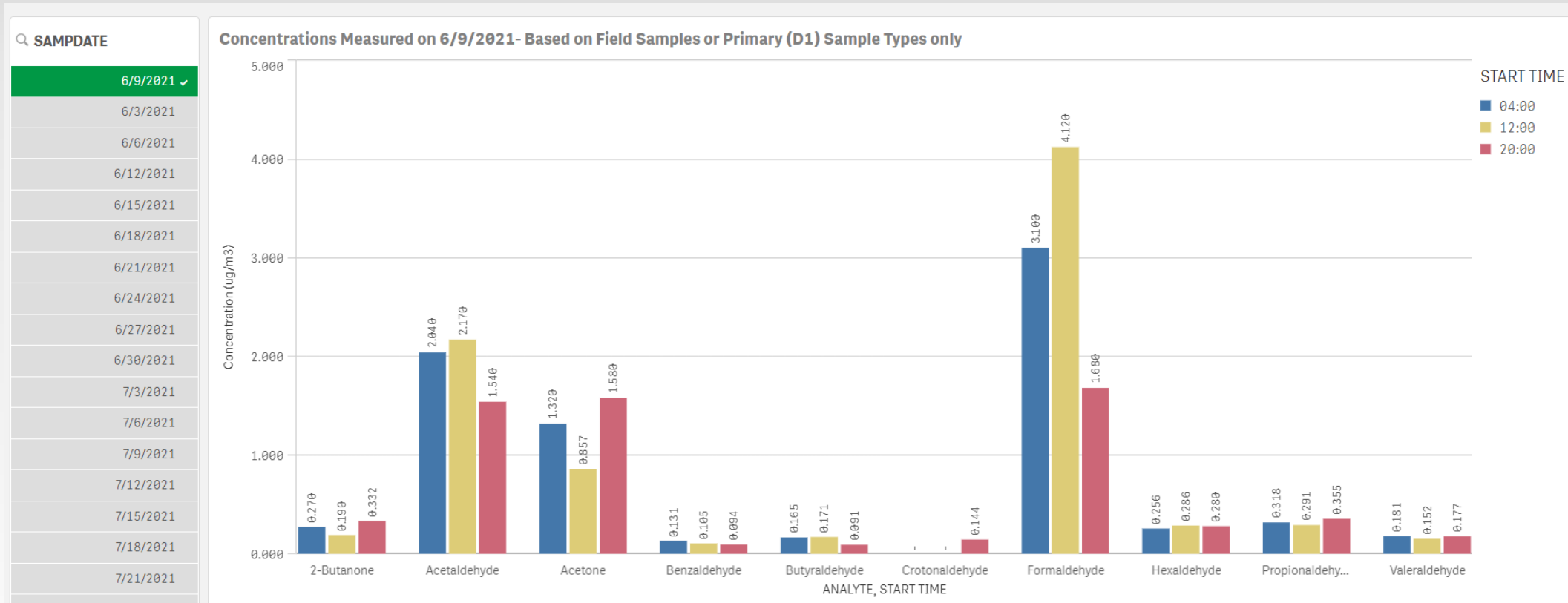
- time series plots
- statistical tables
- various bar charts
- AQS coding

Sites can provide us with feedback to help us enhance their app with requested formatting changes or additional data products.

Allowing clients to see what we see



Allowing clients to see what we see



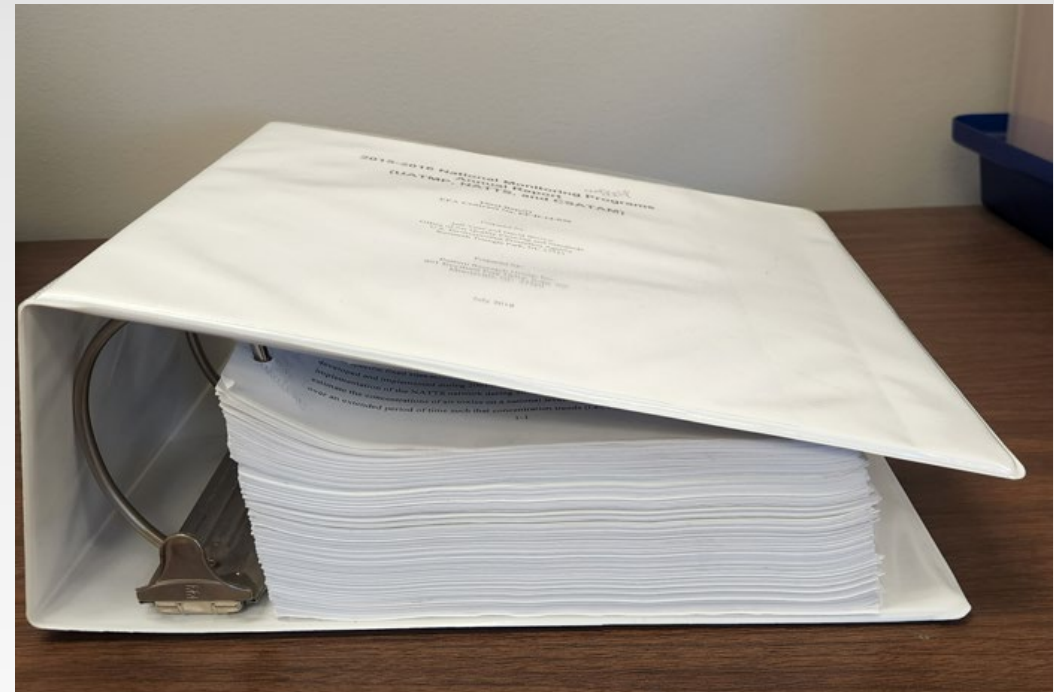
Modernizing Reports

2015-2016 National Monitoring Programs Annual Report (UATMP, NATTS, and CSATAM)

Final Report
EPA Contract No. EP-D-14-030

Prepared for:
Jeff Yane and David Shelow
Office of Air Quality Planning and Standards
U.S. Environmental Protection Agency
Research Triangle Park, NC 27711

Prepared by:
Eastern Research Group, Inc.
601 Keystone Park Drive, Suite 700
Morrisville, NC 27560



Modernizing Reports

The Qlik Sense Dashboard for EPA's National Monitoring Program's (NMP) data is intended to replace the annual NMP report. We are starting with 2017 data.

- ❑ The app was developed and designed to increase awareness of the data products and tools developed by the contract laboratory and allows users greater flexibility in exploring those products on their own.
- ❑ The app is comprised of a number of tabs which provide filters that allow the user to explore data based on analytical method, pollutant, and geographical location.
- ❑ The app essentially presents most of the same tables and graphs as the written report but allows the user to simply click on a site or state of interest and all the tables and graphs bend to the will of the user.

Modernizing Reports

National Monitoring Programs Annual Report

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Q NMP Year

2017

Q State

AZ

CA

CO

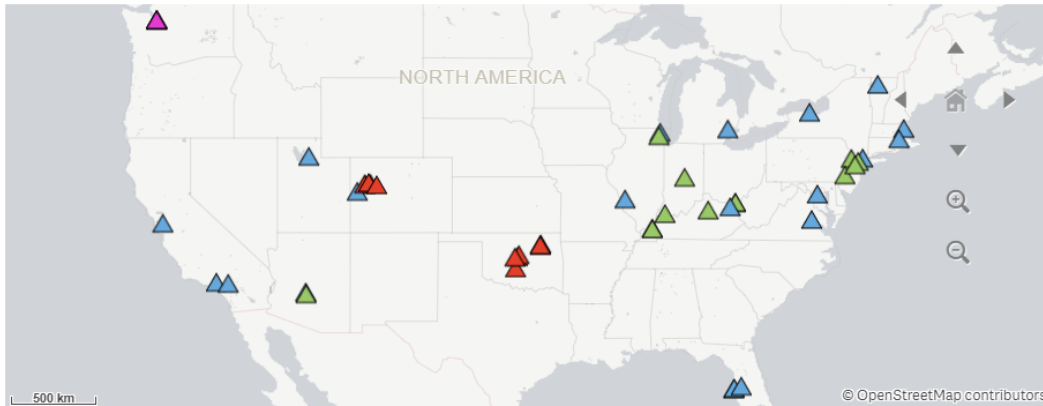
Q Region

1

2

3

2017 NMP Site Locations



Site Point layer

Program ■ CSATAM ■ NATTS ■ SLT ■ UATMP

2017 NMP Sites, Methods, and Date Range of Sampling

Site - Location Q	Method Q		Values	
	Metals Analysis		Methane	
	1st Date	Last Date	1st Date	Last Date
ASKY - Ashland, KY	-	-	-	-
ASKY-M - Ashland, KY	1/1/2017	12/27/2017	-	-
AZFL - St. Petersburg, FL	-	-	-	-
BAKY - Baskett, KY	1/1/2017	12/27/2017	-	-
BKWA - Seattle, WA	1/1/2017	9/28/2017	-	-
BLKY - Smithland, KY	1/1/2017	12/27/2017	-	-
BMCO - Battlement Mesa, CO	-	-	-	-
BOMA - Boston, MA	1/1/2017	12/27/2017	-	-
BRCO - Silt, CO	-	-	-	-
BROK - Bradley, OK	-	-	1/1/2017	6/30/2017
BTUT - Bountiful, UT	1/1/2017	12/27/2017	-	-
BXNY - New York, NY	-	-	-	-
CELA - Los Angeles, CA	-	-	-	-
CHNJ - Chester, NJ	-	-	-	-
CSNJ - Camden, NJ	-	-	-	-
DEMI - Dearborn, MI	-	-	-	-

Status of 2017 NMP app

Currently, the app is housed on EPA's server and awaiting approval to go public.

Acknowledgements

Special shout-out to Matthew Heyward with ERG for his superb Qlik/Java/Web skills!

Thanks to Julie Swift and other ERG lab folks for getting the NMP app where it is now.

Thanks to Doris Chen and other EPA folks for supporting these efforts.

Questions?

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NMP App Screenshots – About the Data

National Monitoring Programs Annual Report

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[NMP Dashboard User Guide](#)

[NMP Dashboard Data Treatment Memorandum](#)

[NATTS TAD](#)

This dashboard presents a summary of the NATTS, UATMP, and CSATAM monitoring data collected in 2017 from participating NMP sites and generated by the national contract laboratory, ERG. ERG operates under a yearly-approved U.S. EPA Level 1 QAPP. The dashboard presents the data at the time of publication and may not reflect any potential changes made to the data in AQS afterward.

Notable format changes for the 2017 dataset

- The use of Qlik Sense replaced a .pdf report summarizing the 2017 NMP monitoring effort.
- The risk screening process was revised slightly, with pollutants of interest identified where the pollutant-specific percentage of failed screens is greater than 10% (as opposed to contributing to at least 90% of total failed screens).
- Five times the MDL was used as minimum criteria for evaluating precision between paired concentrations.
- Collocated samples were not averaged together for the trends graphs (only the primary sample was used).

Site-specific items of note for the 2017 NMP

- Two sites from Puget Sound (TSWA and TTWA) collected carbonyl compound and VOC samples analyzed only for formaldehyde and acetaldehyde and benzene and 1,3-butadiene, respectively.

Laboratory-specific items of note for the 2017 NMP

- 2017 is the first full year of monitoring under the revised NATTS TAD.
- An internal standard used at the laboratory during the first quarter of 2017 had a low-level background that affected the data reported for some compounds. With the approval of EPA, ERG blank-subtracted the data for these compounds based on the average concentrations of blank data collected during this period. The compounds affected were bromochloromethane, chloroethane, chloromethane, dichlorodifluoromethane, dichlorotetrafluoroethane, propylene, trichlorofluoromethane, and vinyl chloride for samples collected through March 2, 2017.
- A second internal standard used at the laboratory had a low-level background of BTEX compounds, affecting ethylbenzene and o-xylene measurements from early March through mid-December, which have been flagged accordingly in AQS.
- An instrument malfunction at the laboratory resulted in a number of invalidated TO-13A/PAH samples collected between mid-October and mid-November.

NMP App Screenshots - Overview

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Q NMP Year

2017

Q State

AZ

CA

CO

Q Region

1

2

3

2017 NMP Site Locations

Site Point layer

Program ■ CSATAM ■ NATTS ■ SLT ■ UATMP

CSATAM = Community-Scale Air Toxics Ambient Monitoring sites; NATTS = National Air Toxics Trends Stations; SLT = State, Local, or Tribal program; UATMP = Urban Air Toxics Monitoring Program

2017 NMP Sites, Methods, and Date Range of Sampling

Site - Location Q	Method Q		Values	
	Metals Analysis		Methane	
	1st Date	Last Date	1st Date	Last Date
ASKY - Ashland, KY	-	-	-	-
ASKY-M - Ashland, KY	1/1/2017	12/27/2017	-	-
AZFL - St. Petersburg, FL	-	-	-	-
BAKY - Baskett, KY	1/1/2017	12/27/2017	-	-
BKWA - Seattle, WA	1/1/2017	9/28/2017	-	-
BLKY - Smithland, KY	1/1/2017	12/27/2017	-	-
BMCO - Battlement Mesa, CO	-	-	-	-
BOMA - Boston, MA	1/1/2017	12/27/2017	-	-
BRCO - Silt, CO	-	-	-	-
BROK - Bradley, OK	-	-	1/1/2017	6/30/2017
BTUT - Bountiful, UT	1/1/2017	12/27/2017	-	-
BXNY - New York, NY	-	-	-	-
CELA - Los Angeles, CA	-	-	-	-
CHNJ - Chester, NJ	-	-	-	-
CSNJ - Camden, NJ	-	-	-	-
DEMI - Dearborn, MI	-	-	-	-
ELNJ - Elizabeth, NJ	-	-	-	-
GLKY - Grayson Lake, KY	1/1/2017	12/27/2017	-	-
GPCO - Grand Junction, CO	1/1/2017	12/29/2017	-	-

NMP App Screenshots - Overview

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Q NMP Year

2017

Q State

NJ

NY

PA

Q Region

1

2

3

2017 NMP Site Locations

Site
Point layer
Program ■ NATTS ■ UATMP

2017 NMP Sites, Methods, and Date Range of Sampling

Site - Location Q	Method Q		Values	
	TO-11A		TO-13A	
	1st Date	Last Date	1st Date	Last Date
BXNY - New York, NY	-	-	1/1/2017	12/27/2017
CHNJ - Chester, NJ	1/1/2017	12/27/2017	-	-
CSNJ - Camden, NJ	1/1/2017	12/27/2017	-	-
ELNJ - Elizabeth, NJ	1/1/2017	12/27/2017	-	-
NRNJ - East Brunswick, NJ	1/1/2017	12/30/2017	-	-
ROCH - Rochester, NY	-	-	1/1/2017	12/27/2017

CSATAM = Community-Scale Air Toxics Ambient Monitoring sites; NATTS = National Air Toxics Trends Stations; SLT = State, Local, or Tribal program; UATMP = Urban Air Toxics Monitoring Program

NMP App Screenshots - Completeness

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Q NMP Year

2017

Completeness

Site Q	Method Q		Values		Metals Analysis			Methane			SNMOC			TO-11A			TO-13A			TO-15		
	Valid # of Samples	Expected # of Samples	% Complete	Valid # of Samples	Expected # of Samples	% Complete	Valid # of Samples	Expected # of Samples	% Complete	Valid # of Samples	Expected # of Samples	% Complete	Valid # of Samples	Expected # of Samples	% Complete	Valid # of Samples	Expected # of Samples	% Complete	Valid # of Samples	Expected # of Samples	% Complete	
	ASKY	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	58	61	95.08
ASKY-M	57	61	93.44	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
AZFL	-	-	-	-	-	-	-	-	-	26	31	83.87	-	-	-	-	-	-	-	-	-	
BAKY	60	61	98.36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BKWA	45	46	97.83	-	-	-	-	-	-	46	46	100.00	47	46	102.17	46	46	100.00	-	-	-	
BLKY	59	61	96.72	-	-	-	-	-	-	-	-	-	-	-	-	55	61	90.16	-	-	-	
BMCO	-	-	-	-	-	-	56	61	91.80	30	31	96.77	-	-	-	-	-	-	-	-	-	
BOMA	59	61	96.72	-	-	-	-	-	-	-	-	-	57	61	93.44	-	-	-	-	-	-	
BRCO	-	-	-	-	-	-	60	61	98.36	29	31	93.55	-	-	-	-	-	-	-	-	-	
BROK	-	-	-	30	31	96.77	30	31	96.77	31	31	100.00	-	-	-	-	-	-	30	31	96.77	
BTUT	58	61	95.08	-	-	-	58	61	95.08	61	61	100.00	57	61	93.44	58	61	95.08	-	-	-	
BXNY	-	-	-	-	-	-	-	-	-	-	-	-	54	61	88.52	-	-	-	-	-	-	
CELA	-	-	-	-	-	-	-	-	-	-	-	-	58	61	95.08	-	-	-	-	-	-	
CHNJ	-	-	-	-	-	-	-	-	-	54	61	88.52	-	-	-	56	61	91.80	-	-	-	
CSNJ	-	-	-	-	-	-	-	-	-	59	61	96.72	-	-	-	54	61	88.52	-	-	-	
DEMI	-	-	-	-	-	-	-	-	-	59	61	96.72	59	61	96.72	60	61	98.36	-	-	-	
ELNJ	-	-	-	-	-	-	-	-	-	61	61	100.00	-	-	-	61	61	100.00	-	-	-	
GLKY	56	61	91.80	-	-	-	-	-	-	60	61	98.36	56	61	91.80	60	61	98.36	-	-	-	
GPCO	60	61	98.36	-	-	-	-	-	-	59	61	96.72	57	61	93.44	60	61	98.36	-	-	-	
LEKY	59	61	96.72	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
NBIL	60	61	98.36	-	-	-	59	61	96.72	61	61	100.00	60	61	98.36	59	61	96.72	-	-	-	
NRNJ	-	-	-	-	-	-	-	-	-	60	61	98.36	-	-	-	60	61	98.36	-	-	-	

Yellow indicates Completeness < 85%

NMP App Screenshots - Stats

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Q NMP Year: 2017
 Q Region: 1
 Q State: AZ
 Q Site: ASKY
 Q Method: Metals Analysis

Q Region: 2
 Q State: CA
 Q Site: ASKY-M
 Q Method: Methane

Q Region: 3
 Q State: CO
 Q Site: A7FI
 Q Method: SNMOC

Statistical Summaries (ug/m3)

Method	ANALYTE	PM TYPE	# of Measurements	# of Detects	Min Conc (ug/m3)	Max Conc (ug/m3)	Avg Conc (ug/m3)	Median Conc (ug/m3)	StDev
Totals			171,817	114,631	-	-	-	-	-
SNMOC	1-Butene	NA	2	2	0.0471	0.11	0.079	0.079	0.044
SNMOC	1-Decene	NA	427	1	0	0.301	0.001	0.000	0.015
SNMOC	1-Dodecene	NA	427	5	0	0.655	0.003	0.000	0.037
SNMOC	1-Heptene	NA	427	29	0	0.609	0.013	0.000	0.060
SNMOC	1-Hexene	NA	474	304	0	0.374	0.043	0.039	0.046
SNMOC	1-Nonene	NA	427	316	0	12.5	0.130	0.074	0.642
SNMOC	1-Octene	NA	427	356	0	0.581	0.134	0.117	0.103
SNMOC	1-Pentene	NA	474	444	0	0.575	0.111	0.099	0.077
SNMOC	1-Tridecene	NA	427	0	0	0	0.000	0.000	0.000
SNMOC	1-Undecene	NA	427	14	0	0.319	0.003	0.000	0.021
TO-15	1,1-Dichloroethane	NA	1,407	158	0	0.758	0.009	0.000	0.049
TO-15	1,1-Dichloroethene	NA	1,407	157	0	0.123	0.004	0.000	0.011
TO-15	1,1,1-Trichloroethane	NA	1,407	646	0	7.65	0.023	0.000	0.206
TO-15	1,1,2-Trichloroethane	NA	1,407	44	0	2.35	0.005	0.000	0.068
TO-15	1,1,2,2-Tetrachloroethane	NA	1,407	115	0	0.138	0.005	0.000	0.016
TO-15	1,2-Dibromoethane	NA	1,407	58	0	0.115	0.003	0.000	0.016
TO-15	1,2-Dichloroethane	NA	1,407	1,338	0	107	0.342	0.077	3.523
TO-15	1,2-Dichloropropane	NA	1,407	59	0	0.176	0.003	0.000	0.013
SNMOC	1,2,3-Trimethylbenzene	NA	474	223	0	13.5	0.094	0.000	0.626
TO-15	1,2,4-Trichlorobenzene	NA	1,407	0	0	0.000	0.000	0.000	0.000

Zeros have been substituted for non-detects and are included in the statistical calculations. In the case of co-elution, no value is reported.

NMP App Screenshots - Risk

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Q Risk Year

2017

Results of the Program-Wide Risk-based Screening Process

Target Analyte	Risk Screening Value (ug/m3)	# Failed Screens	Total # of Detects	# of Valid Samples	Detection Rate %	% of Failed Screens
Benzene	0.13	1,764	1,764	1,764	100.00	100.00
Formaldehyde	0.077	1,629	1,629	1,629	100.00	100.00
Carbon Tetrachloride	0.17	1,406	1,407	1,407	100.00	99.93
Acetaldehyde	0.45	1,580	1,629	1,629	100.00	96.99
1,2-Dichloroethane	0.038	1,336	1,338	1,407	95.10	94.95
Arsenic	0.00023	996	1,137	1,137	100.00	87.60
1,3-Butadiene	0.03	1,210	1,395	1,764	79.08	68.59
Naphthalene	0.029	734	1,134	1,134	100.00	64.73
Ethylbenzene	0.4	1,013	1,668	1,674	99.64	60.51
Hexachloro-1,3-butadiene	0.045	252	257	1,407	18.27	17.91
p-Dichlorobenzene	0.091	157	431	1,407	30.63	11.16
Nickel	0.0021	101	1,137	1,137	100.00	8.88
Benzo(a)pyrene	0.0002	71	1,059	1,134	93.39	6.26
Manganese	0.03	57	1,137	1,137	100.00	5.01
Vinyl chloride	0.11	60	398	1,377	28.90	4.36
1,2-Dibromoethane	0.0017	58	58	1,407	4.12	4.12
Acenaphthene	0.021	29	1,084	1,134	95.59	2.56
Chloroprene	0.0021	35	35	1,407	2.49	2.49
1,1,2-Trichloroethane	0.0625	29	44	1,407	3.13	2.06
Propionaldehyde	0.8	29	1,535	1,536	99.93	1.89
Fluorene	0.021	21	1,108	1,131	97.97	1.86
Trichloroethylene	0.2	25	309	1,407	21.96	1.78
Cadmium	0.00056	16	1,137	1,137	100.00	1.41
Lead	0.015	12	1,137	1,137	100.00	1.06
Tetrachloroethylene	3.8	10	1,220	1,407	86.71	0.71

Concentrations of the pollutants shaded in gray failed screens for at least 10% of the total valid measurements collected and are deemed "Pollutants of Interest". Risk screening values represent the cancer risk in 1 million or the noncancer HQ=0.1. Acrolein, acetonitrile, acrylonitrile, and carbon disulfide were excluded from the risk-based screening process due to sampling difficulties outlined in the User Guide.

NMP App Screenshots - POI

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NMP Year: 2017
 Pollutant of Interest: **Acetaldehyde** ✓
 1,2-Dichloroethane
 1,3-Butadiene
 ArsenicPM10
 ArsenicTSP
 State: AZ, CO, FL, IL, TN, RI, OK
 Site: AZFL, BKWA, BMCO, BRCO, BROK

Number of Sites
31

of Samples vs # of Detects
1,629 vs 1,629

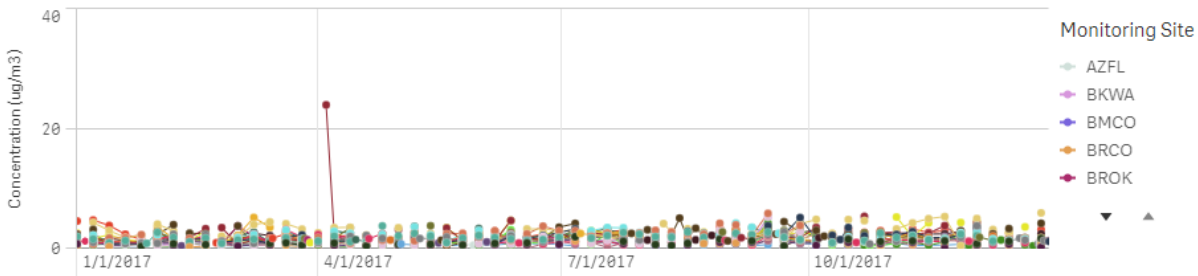
% Detects
100.0%

Concentration Range
0.0632-24

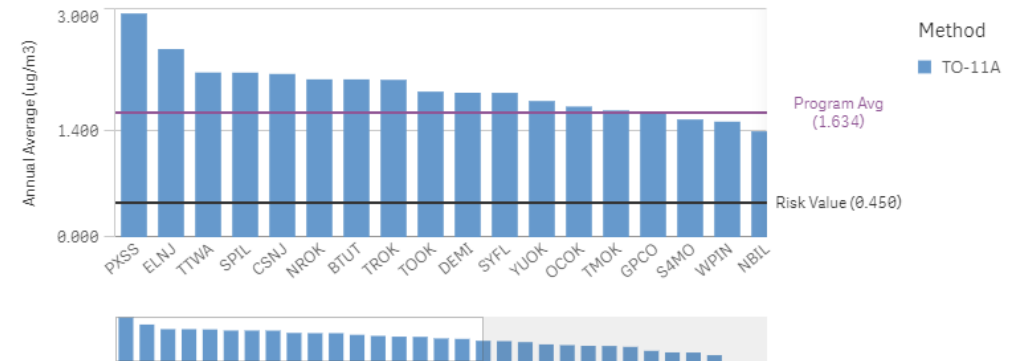
Avg Concentration
1.634

Median Concentration
1.440

Time Series Plot of Acetaldehyde Concentrations (ug/m3)

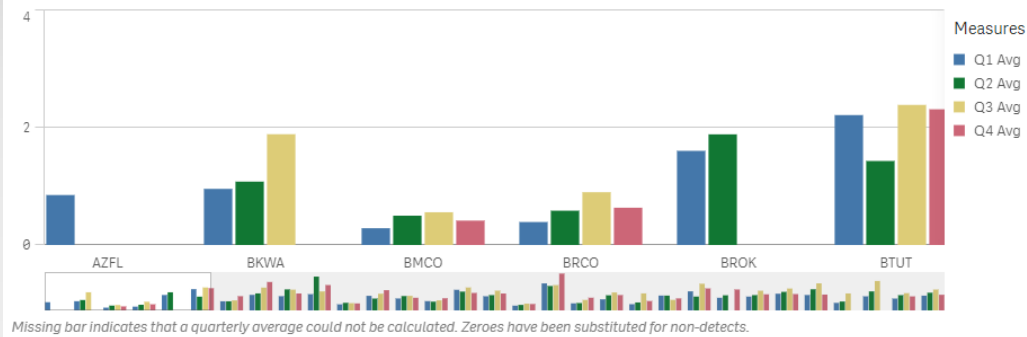


Annual Average Concentration Comparison for Acetaldehyde (ug/m3)



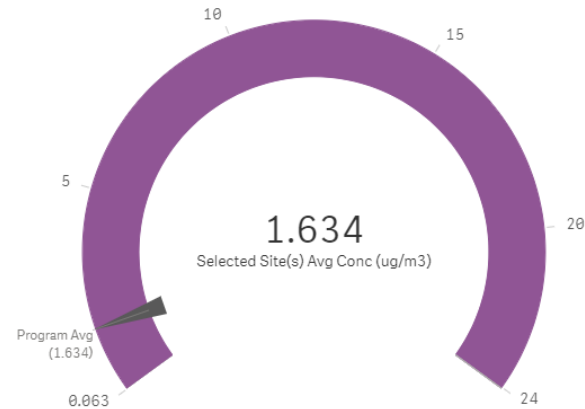
NMP App Screenshots - POI

Quarterly Average Concentration Comparison for Acetaldehyde (ug/m3)



Site-Specific vs Program Acetaldehyde Concentrations (ug/m3)

Site data in purple, NMP program data in gray.



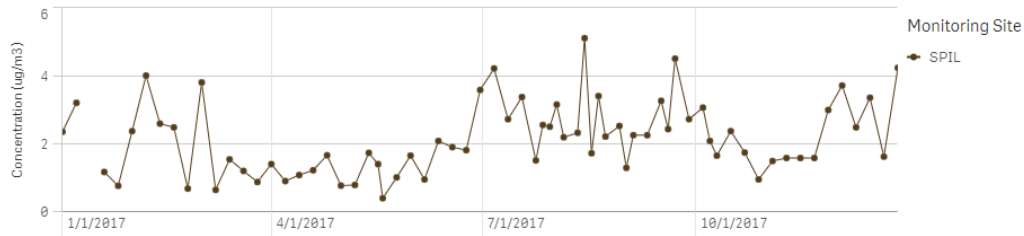
Program Range: 0.0632 - 24 ug/m3; Program Avg: 1.634 ug/m3; Annual average criteria not applied to sub-program averages.

Quarterly and Annual Average Concentrations of Acetaldehyde (ug/m3)

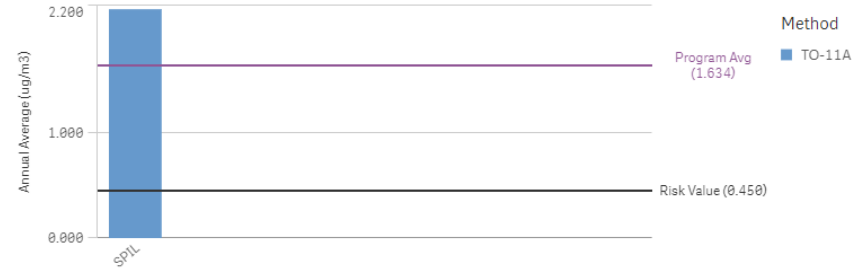
Site	Q1 Avg	Q2 Avg	Q3 Avg	Q4 Avg	Annl Avg
AZFL	0.852	-	-	-	-
BKWA	0.957	1.081	1.889	-	1.304
BMCO	0.286	0.500	0.559	0.416	0.437
BRCO	0.392	0.585	0.900	0.636	0.620

NMP App Screenshots - POI

Time Series Plot of Acetaldehyde Concentrations (ug/m3)

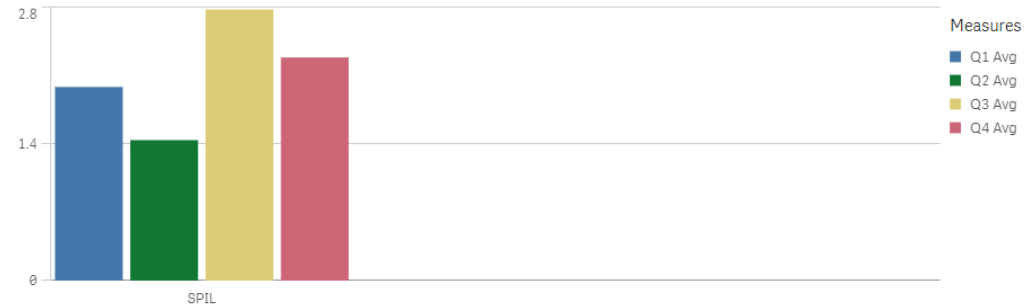


Annual Average Concentration Comparison for Acetaldehyde (ug/m3)



Missing bar indicates that an annual average could not be calculated. Zeroes have been substituted for non-detects.

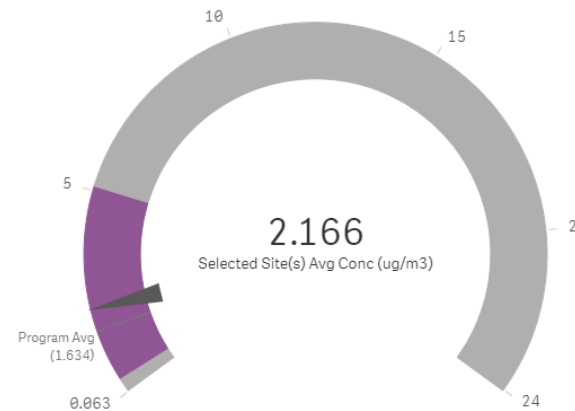
Quarterly Average Concentration Comparison for Acetaldehyde (ug/m3)



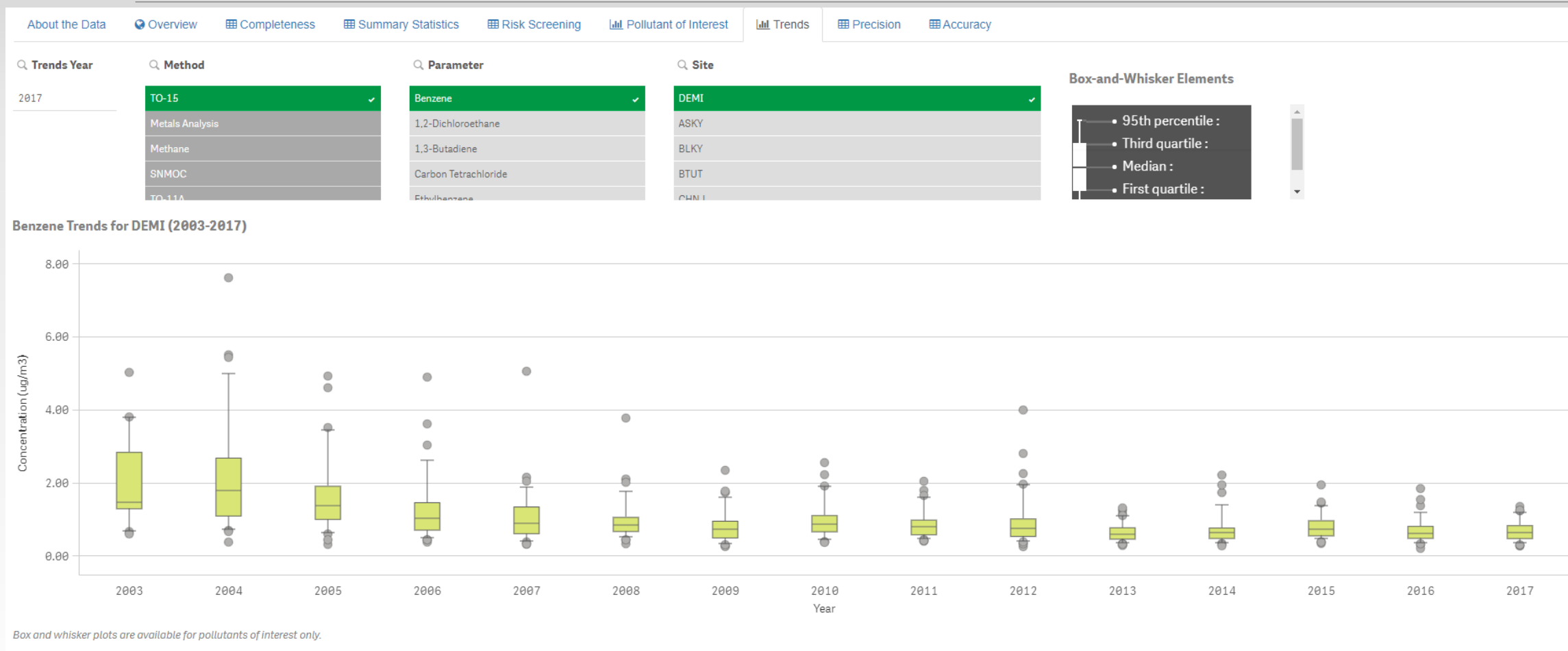
Missing bar indicates that a quarterly average could not be calculated. Zeroes have been substituted for non-detects.

Site-Specific vs Program Acetaldehyde Concentrations (ug/m3)

Site data in purple, NMP program data in gray.



NMP App Screenshots - Trends



NMP App Screenshots - Precision

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Q Precision Year: 2017
 Q Precision Type: Method
 Analytical
 Q Method: TO-11A
 Metals Analysis
 Methane
 SNMOC
 TO-13A

Precision as % Coefficient of Variation (CV)

Method precision is based on concentrations from duplicate and/or collocated pairs; analytical precision is based on concentrations from analytical replicates.

Pollutant	Site																					
	Avg(CV) by Pollutant	AZFL	BKWA	BROK	BTUT	CHNJ	CSNJ	DEMI	ELNJ	GLKY	GPCO	NBIL	NRNJ	NROK	OCOK	PXSS	S4MO	SEWA	SKFL	SPIL	SYFL	TMOK
Avg(CV) by Site	4.78	5.29	4.19	2.79	2.25	8.24	5.14	14.86	5.87	2.80	3.08	5.15	4.55	2.44	2.82	10.25	3.83	4.51	7.38	4.37	6.97	2.86
2-Butanone	6.10	8.61	4.07	3.06	1.46	14.07	12.34	6.09	10.13	2.56	3.52	5.92	14.04	2.73	2.51	9.97	3.73	3.70	17.51	4.32	6.84	3.90
Acetaldehyde	2.94	0.65	3.24	0.94	0.89	1.97	2.89	14.93	3.47	1.03	1.27	5.01	1.43	1.63	1.63	6.85	1.64	1.85	6.82	4.09	7.48	1.82
Acetone	3.10	1.24	1.55	0.57	2.25	14.99	4.73	3.41	13.00	1.82	1.52	1.73	1.54	2.19	1.31	1.72	1.21	2.10	2.53	3.87	8.47	0.71
Benzaldehyde	5.39	2.48	8.73	5.56	2.59	4.76	2.19	6.75	5.97	1.90	5.61	5.11	5.10	2.89	3.47	17.43	4.75	7.10	5.23	4.20	4.66	6.34
Butyraldehyde	5.43	11.38	4.29	4.01	1.08	13.48	2.38	31.62	4.36	2.01	3.13	5.36	2.94	2.32	2.61	11.13	1.52	2.68	4.05	4.12	7.42	2.95
Crotonaldehyde	6.12	9.79	5.18	0.97	2.20	14.90	7.75	19.98	6.90	4.13	1.59	7.74	6.98	1.79	1.02	8.02	6.56	4.73	7.52	6.41	15.92	2.68
Formaldehyde	3.30	2.96	4.53	1.48	1.07	4.83	1.15	9.74	2.16	1.20	3.35	5.11	1.49	1.46	1.43	10.22	1.39	2.21	8.24	3.44	3.73	1.14
Hexaldehyde	6.23	6.82	3.55	6.33	4.74	4.74	3.53	29.59	5.40	6.89	3.63	4.31	4.56	3.68	7.09	8.90	3.73	7.19	7.12	5.88	3.16	5.67
Propionaldehyde	3.86	3.71	4.04	0.89	1.85	5.54	4.76	11.62	1.56	1.41	4.13	5.92	3.55	2.58	2.17	7.58	3.26	3.86	7.78	4.03	6.00	1.84
Tolualdehydes	9.33	-	-	-	-	-	-	-	-	-	-	-	-	-	2.67	15.99	-	-	-	-	-	-
Valeraldehyde	5.22	-	2.76	4.12	4.39	3.14	9.63	-	5.78	5.05	3.04	5.33	3.82	2.92	5.00	14.96	10.48	9.69	7.03	3.30	6.00	1.55

Precision calculations are based on concentration pairs where both measurements are at least five times the MDL. Thus, pollutants without precision measurements at least five times the MDL do not appear in this table. Additionally, acrolein, acetoneitrile, acrylonitrile, and carbon disulfide have been presented is the average of the individual site- and pollutant- specific CVs. CVs greater than 15% are highlighted in blue.

NMP App Screenshots - Accuracy

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PT Year 2017
 Audit Type PT
 Method TO-13A

Accuracy, as indicated by Percent Difference (from mean of Participating NATTS Labs)

Pollutant	Month Performed	Media Type	Percent Difference
	May	December	
	TO-13A	TO-13A	
Acenaphthene			8.0
Anthracene			-2.7
Benzo(a)pyrene			-6.7
Fluoranthene			-2.9
Fluorene			6.2
Naphthalene			-
Phenanthrene			-18.6
Pyrene			-6.3