South DeKalb, GA NATTS Network Assessment Review

- Established 2003: Carbonyls, PM_{10} Metals, and VOCs
  - Chromium VI added in 2005; ended in in 2013
  - PAHs added in 2007
- For the NATTS Network Assessment (2003-2018):
  - 2 of 18 Method Quality Objective (MQO) Core HAPs were included in the national trends
    - Benzene, 1,3-Butadiene, Chloroform, and Vinyl Chloride: Data for 2013 invalidated.
    - Beryllium (PM_{10}), Cadmium (PM_{10}), Lead (PM_{10}), Manganese (PM_{10}), and Nickel (PM_{10}): Completeness less than 75% in 2013.
    - Acetaldehyde and Formaldehyde: Completeness less than 75% in 2016; invalidated data in 2013, 2014, and 2015.
    - Arsenic (PM_{10}): High MDLs in 2014 and 2016.
    - Carbon Tetrachloride: Data for 2013 invalidated and Proficiency Test percent difference results were ±35%.
    - Chromium VI: Completeness was less than 75% in 2007 and 2008.
    - Tetrachloroethylene and Trichloroethylene: Data for 2013 invalidated and analytical precision data missing in 2015 (tetrachlorethylene) and 2018 (trichloroethylene).
  - 202 of 270 pollutant datasets were suitable for trends analysis
  - Annual Average and 3-Year Rolling Average Concentrations were generally flat over time, with the exception of a few pollutants (benzene and naphthalene).
  - 100% Reporting of Datasets
- Method Quality Objectives (MQO): 2003-2018
  - Completeness: Met 85% completeness in 219 of 270 pollutant datasets
  - Method Detection Limits: Met MDL Target Ratio of 1.00 in 198 of 273 pollutant datasets
  - Bias: Met ±25% for 198 of 229 pollutant datasets
  - Overall Method Precision: Met ≤15% CV for 42 of 157 pollutant datasets
  - Analytical Method Precision: Met ≤15% CV for 26 of 124 pollutant datasets
- Analytical Laboratories for 2018

VOC	Carbonyl	PM_{10} Metals	Chromium VI	PAHs
GADNR	GADNR	GADNR	NA	GADNR

- Equipment Year Deployed

Equipment Type	VOC	Carbonyl	PM_{10} Metals	Chromium VI	PAHs
Sampler	2010	2010	2016	2008	2016
Analytical	2005	1993	2015	2001	2014
Preconcentrator	2016	NA	NA	NA	NA
Standards Preparation	2016	NA	NA	NA	NA
Canister Cleaning	2016	NA	NA	NA	NA
Extraction	NA	NA	2012	2011	2015

National Summary: NATTS data were collected at 27 locations across the United States, with sites beginning in 2003 or later (Figure 1) for 19 core HAPs. Over 528,000 concentrations (primary, secondary, and replicate) were generated and analyzed for this assessment. Pollutant datasets were scored to assess whether they were suitable for trends analysis. Each pollutant dataset was evaluated against four MQOs: Completeness; Sensitivity; Bias; and Precision. Datasets that were suitable (A- or B-rated) for six consecutive years were used for national trends analysis (Table 1).

National trends were determined by comparing the most recent 3-year blocked averages (e.g., 2013-2015 vs. 2016-2018) to determine if the NATTS Trends DQO was being met:

To be able to detect a a15 percent difference (trend) between the annual mean concentrations of successive 3-year periods within acceptable levels of decision error.

Of the 19 core HAPs. 18 were assessed for the NATTS Trends DQO. Due to sampling and analytical issues, acrolein was not considered for trends analysis (Table 2). This assessment showed that across the network, 15 of those 18 pollutants were decreasing between the 3-year blocks, while two of those pollutants were increasing between the 3-year blocks. One pollutant did not exhibit a trend.

Figure 1. NATTS Site and Year Established

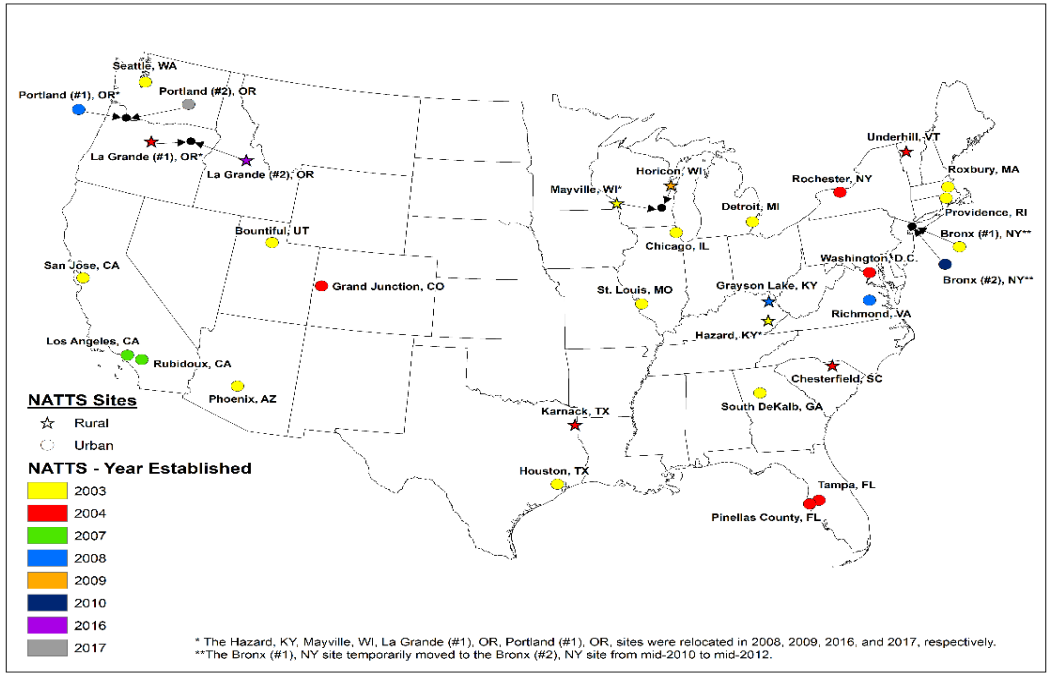


Table 1. NATTS Network Assessment: Count and Percentage of Suitable Datasets by Pollutant Group

Pollutant Group	A-rated		B-rated		Does Not Meet	
	#	%	#	%	#	%
VOCs	1,452	53%	737	27%	555	20%
Carbonyls	523	67%	193	25%	66	8%
PM_{10} Metals	1,418	61%	685	30%	213	9%
Chromium VI	159	74%	29	13%	27	13%
PAHs	410	74%	124	22%	18	3%
Total = 6,609	3,962	60%	1,768	27%	879	13%

Table 2. Three-Year Block Averages for National Trends

Pollutant	Units	# Sites	Block 1	Block 2	% Difference
Acetaldehyde	$\mu g/m^3$	19	1.51	1.39	-7.7%
Arsenic (PM_{10})	ng/m^3	21	0.71	0.68	-3.2%
Benzene	$\mu g/m^3$	19	0.65	0.59	-10.2%
Benzo(a)pyrene	ng/m^3	21	0.113	0.087	-23.2%
Beryllium (PM_{10})	ng/m^3	20	0.012	0.009	-26.4%
Butadiene, 1,3-	$\mu g/m^3$	19	0.071	0.063	-10.9%
Cadmium (PM_{10})	ng/m^3	21	0.170	0.097	-43.0%
Carbon Tetrachloride	$\mu g/m^3$	15	0.59	0.56	-4.7%
Chloroform	$\mu g/m^3$	20	0.256	0.255	-0.4%
Chromium VI	ng/m^3	18	0.029	0.026	-7.7%
Formaldehyde	$\mu g/m^3$	19	2.77	2.68	-3.3%
Lead (PM_{10})	ng/m^3	21	3.08	2.81	-8.9%
Manganese (PM_{10})	ng/m^3	20	8.06	7.93	-1.6%
Naphthalene	ng/m^3	20	66.70	51.08	-23.4%
Nickel (PM_{10})	ng/m^3	19	1.28	1.05	-18.0%
Tetrachloroethylene	$\mu g/m^3$	19	0.149	0.174	17.2%
Trichloroethylene	$\mu g/m^3$	19	0.020	0.022	10.7%
Vinyl Chloride	$\mu g/m^3$	17	0.0051	0.0048	-5.5%

NATTS Monitoring Site Report: South DeKalb, GA

Site Information

Region	4
NATTS Site Type	Urban
County	DeKalb
AQS Site Code	13-089-0002
NATTS Operating Agency	GA Dept. of Natural Resources
Latitude	33.688007
Longitude	-84.290325
AQS Land Use	Residential
AQS Location Setting	Suburban
10-Mile Population	713,340

Figure 2. NATTS Site Location

Pollutant Datasets Evaluation: Suitable for Trends (Y=yes; Y(T)=yes, and used for DQO Trends; N=No; "--"=not rated

Final Pollutant Name	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Acetaldehyde	Y	N[a]	N[a]	N[a]	Y	N[a]	N[a]	N[a]	N[b]	N[c]	N[c]	N[c]	N[c]	N[b]	Y	Y
Arsenic (PM_{10})	N[a]	Y	N[d]	Y	Y	Y	Y	Y	Y	Y	N[b]	N[a,e]	Y	Y	N[a,d]	Y
Benzene	Y	Y	Y	Y	Y	Y	Y	Y	N[b]	N[c]	N[c]	Y	Y	Y	Y	Y
Benzo(a)pyrene	--	--	--	--	--	Y	Y	Y	Y	Y	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)
Beryllium (PM_{10})	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N[b]	Y	Y	Y	Y	Y
Butadiene, 1,3-	N[a]	N[a]	Y	Y	Y	Y	Y	Y	N[b]	N[c]	N[c]	Y	Y	Y	Y	Y
Cadmium (PM_{10})	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N[b]	Y	Y	Y	Y	Y
Carbon tetrachloride	N[a]	N[a]	N[a]	Y	Y	Y	Y	Y	N[b]	N[c]	N[c]	Y	N[f]	N[f]	Y	Y
Chloroform	N[a]	N[a]	Y	Y	Y	Y	Y	Y	N[b]	N[c]	N[c]	Y	Y	Y	Y	Y
Chromium VI	--	--	Y	Y	N[b]	N[b]	Y	Y	Y	Y	--	--	--	--	--	--
Formaldehyde	Y	Y	Y	Y	Y	Y	Y	Y	N[b]	N[c]	N[c]	N[c]	N[c]	N[b]	Y	Y
Lead (PM_{10})	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N[b]	Y	Y	Y	Y	Y
Manganese (PM_{10})	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N[b]	Y	Y	Y	Y	Y
Naphthalene	--	--	--	--	--	Y	Y	Y	Y	Y	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)	Y(T)
Nickel (PM_{10})	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N[b]	Y	Y	Y	Y	Y
Tetrachloroethylene	N[a]	N[a]	Y	Y	Y	Y	Y	Y	N[b]	N[c]	N[c]	Y	N[g]	Y	Y	Y
Trichloroethylene	N[a]	N[a]	Y	Y	Y	Y	Y	Y	N[b]	N[c]	N[c]	Y	Y	Y	Y	N[g]
Vinyl chloride	N[a]	N[a]	Y	Y	Y	Y	Y	Y	N[b]	N[c]	N[c]	Y	Y	Y	Y	Y

[a]: Reported MDL to NATTS Target Ratio greater than 2.0

[b]: Completeness was less than 75% based on 1-in-6 day sampling.

[c]: Pollutant was expected, but were invalidated at this site for this year.

[d]: Bias % Difference was outside ± 35%.

[e]: Bias % Difference was outside ± 35%; Precision PCT CV was greater than 25%.

[f]: % Difference was outside ± 35%.

[g]: Analytical precision data (required since 2012) was not reported to EPA or AQS for this pollutant.

Table 3. NATTS Network Assessment Data (2003-2018) - National Distribution Statistics By Type[a]

Analyte	Units	Site Type	# Data Records	% Detections	Arithmetic Mean[b]	Percentile Value[c]						
						5th	10th	25th	50th	75th	90th	95th
Acetaldehyde	µg/m^3	Urban	15,704	100%	1.77 ± 0.02	0.50	0.66	0.97	1.45	2.19	3.24	4.04
	µg/m^3	Rural	4,930	100%	1.20 ± 0.04	0.36	0.46	0.65	0.93	1.38	2.02	2.76
	µg/m^3	All Sites	20,634	100%	1.63 ± 0.02	0.44	0.58	0.86	1.31	2.00	3.02	3.86
Arsenic (PM_{10})	ng/m^3	Urban	14,968	97%	0.89 ± 0.04	0.10	0.19	0.34	0.58	0.99	1.70	2.41
	ng/m^3	Rural	4,622	96%	0.49 ± 0.02	0.04	0.08	0.17	0.35	0.59	0.94	1.28
	ng/m^3	All Sites	19,590	97%	0.79 ± 0.03	0.06	0.14	0.29	0.52	0.89	1.54	2.19
Benzene	µg/m^3	Urban	15,984	99%	0.86 ± 0.01	0.25	0.30	0.43	0.66	1.05	1.64	2.21
	µg/m^3	Rural	2,494	95%	0.43 ± 0.02	0.04	0.13	0.21	0.33	0.52	0.78	1.01
	µg/m^3	All Sites	18,478	99%	0.81 ± 0.01	0.19	0.26	0.39	0.61	0.98	1.55	2.09
Benzo(a)pyrene	ng/m^3	Urban	12,336	70%	0.096 ± 0.004	ND	ND	ND	0.04	0.11	0.24	0.37
	ng/m^3	Rural	3,179	36%	0.067 ± 0.009	ND	ND	ND	ND	0.02	0.13	0.37
	ng/m^3	All Sites	15,515	63%	0.090 ± 0.004	ND	ND	ND	0.03	0.10	0.23	0.37
Beryllium (PM_{10})	ng/m^3	Urban	15,783	75%	0.051 ± 0.006	ND	ND	0.00003	0.005	0.018	0.050	0.101
	ng/m^3	Rural	4,687	49%	0.023 ± 0.003	ND	ND	ND	ND	0.005	0.017	0.072
	ng/m^3	All Sites	20,470	69%	0.045 ± 0.005	ND	ND	ND	0.003	0.012	0.049	0.100
Butadiene, 1,3-	µg/m^3	Urban	15,388	81%	0.092 ± 0.002	ND	ND	0.025	0.058	0.114	0.215	0.302
	µg/m^3	Rural	2,185	29%	0.012 ± 0.001	ND	ND	ND	ND	0.017	0.046	0.059
	µg/m^3	All Sites	17,573	75%	0.082 ± 0.002	ND	ND	ND	0.049	0.104	0.199	0.287
Cadmium (PM_{10})	ng/m^3	Urban	16,360	92%	0.21 ± 0.02	ND	0.01	0.05	0.09	0.17	0.42	0.63
	ng/m^3	Rural	4,684	87%	0.10 ± 0.01	ND	ND	0.03	0.06	0.11	0.20	0.29
	ng/m^3	All Sites	21,044	91%	0.18 ± 0.01	ND	0.01	0.04	0.08	0.16	0.35	0.56
Carbon Tetrachloride	µg/m^3	Urban	14,713	99%	0.569 ± 0.003	0.361	0.433	0.496	0.562	0.651	0.737	0.798
	µg/m^3	Rural	2,189	92%	0.534 ± 0.016	ND	0.180	0.402	0.537	0.633	0.727	0.798
	µg/m^3	All Sites	16,902	98%	0.565 ± 0.003	0.304	0.408	0.490	0.559	0.649	0.736	0.798
Chloroform	µg/m^3	Urban	16,068	87%	0.265 ± 0.022	ND	ND	0.093	0.132	0.217	0.420	0.668
	µg/m^3	Rural	3,802	43%	0.052 ± 0.003	ND	ND	ND	ND	0.095	0.144	0.230
	µg/m^3	All Sites	19,870	79%	0.224 ± 0.018	ND	ND	0.064	0.113	0.196	0.364	0.586
Chromium VI	ng/m^3	Urban	8,414	74%	0.036 ± 0.002	ND	ND	ND	0.020	0.042	0.081	0.120
	ng/m^3	Rural	2,586	41%	0.018 ± 0.004	ND	ND	ND	ND	0.017	0.031	0.051
	ng/m^3	All Sites	11,000	66%	0.032 ± 0.001	ND	ND	ND	0.016	0.036	0.073	0.114

Table 3. NATTS Network Assessment Data (2003-2018) - National Distribution Statistics By Type[a]

Analyte	Units	Site Type	# Data Records	% Detections	Arithmetic Mean[b]	Percentile Value[c]						
						5th	10th	25th	50th	75th	90th	95th
Formaldehyde	µg/m^3	Urban	16,118	100%	3.11 ± 0.04	0.66	0.99	1.60	2.47	3.84	5.63	7.25
	µg/m^3	Rural	5,002	100%	2.22 ± 0.05	0.53	0.68	1.06	1.69	2.74	4.19	5.45
	µg/m^3	All Sites	21,120	100%	2.90 ± 0.04	0.61	0.86	1.43	2.29	3.59	5.38	6.96
Lead (PM_{10})	ng/m^3	Urban	16,366	100%	4.21 ± 0.13	0.72	0.98	1.55	2.64	4.56	8.35	11.90
	ng/m^3	Rural	4,680	99%	2.10 ± 0.16	0.37	0.50	0.84	1.41	2.37	3.91	5.36
	ng/m^3	All Sites	21,046	99%	3.74 ± 0.11	0.55	0.80	1.31	2.31	4.04	7.41	10.56
Manganese (PM_{10})	ng/m^3	Urban	16,141	100%	9.80 ± 0.32	1.09	1.51	2.52	4.92	10.21	20.10	30.08
	ng/m^3	Rural	4,627	99%	3.96 ± 0.14	0.46	0.73	1.36	2.57	4.75	8.54	12.13
	ng/m^3	All Sites	20,768	100%	8.50 ± 0.25	0.85	1.23	2.15	4.18	8.89	17.98	26.70
Naphthalene	ng/m^3	Urban	12,332	100%	74.63 ± 1.14	15.62	21.27	33.55	55.89	94.64	150.05	196.16
	ng/m^3	Rural	3,301	100%	24.47 ± 1.38	3.74	4.73	7.74	13.86	26.25	50.88	79.17
	ng/m^3	All Sites	15,633	100%	64.04 ± 1.00	6.58	10.92	23.37	45.59	83.31	137.54	181.75
Nickel (PM_{10})	ng/m^3	Urban	16,125	97%	1.85 ± 0.05	0.25	0.41	0.67	1.11	2.00	3.52	5.27
	ng/m^3	Rural	4,623	85%	0.65 ± 0.08	ND	ND	0.10	0.28	0.64	1.15	1.89
	ng/m^3	All Sites	20,748	94%	1.58 ± 0.04	ND	0.15	0.47	0.92	1.73	3.14	4.74
Tetrachloroethylene	µg/m^3	Urban	15,612	86%	0.25 ± 0.01	ND	ND	0.06	0.13	0.25	0.48	0.74
	µg/m^3	Rural	2,272	36%	0.09 ± 0.04	ND	ND	ND	ND	0.04	0.08	0.16
	µg/m^3	All Sites	17,884	79%	0.23 ± 0.01	ND	ND	0.04	0.11	0.22	0.44	0.70
Trichloroethylene	µg/m^3	Urban	15,843	41%	0.040 ± 0.002	ND	ND	ND	ND	0.051	0.107	0.164
	µg/m^3	Rural	3,388	13%	0.021 ± 0.003	ND	ND	ND	ND	ND	0.017	0.250
	µg/m^3	All Sites	19,231	36%	0.037 ± 0.002	ND	ND	ND	ND	0.041	0.105	0.167
Vinyl Chloride	µg/m^3	Urban	14,778	19%	0.0044 ± 0.0003	ND	ND	ND	ND	ND	0.0137	0.0257
	µg/m^3	Rural	2,444	8%	0.0040 ± 0.0009	ND	ND	ND	ND	ND	ND	0.0156
	µg/m^3	All Sites	17,222	17%	0.0043 ± 0.0003	ND	ND	ND	ND	ND	0.0126	0.0254

[a] Statistics presented are from pollutant datasets which were suitable for trends.

[b] The arithmetic mean is the average of all samples results which include actual measured values. If no chemical was registered, then a value of zero is used when calculating the mean.

[c] ND: No results of this chemical were registered by the laboratory analytical equipment.

Table 4. Summary Statistics for South DeKalb, GA

Analyte	Units	# Data Records	% Detection	Arithmetic Mean[a]	Percentile Value[b]						
					5th	10th	25th	50th	75th	90th	95th
Acetaldehyde	µg/m^3	619	93%	2.64 ± 0.16	ND	0.62	1.37	2.27	3.47	5.08	6.07
Arsenic (PM_{10})	ng/m^3	885	73%	0.55 ± 0.04	ND	ND	ND	0.50	0.82	1.13	1.44
Benzene	µg/m^3	800	88%	0.71 ± 0.05	ND	ND	0.32	0.54	0.88	1.45	1.94
Benzo(a)pyrene	ng/m^3	685	34%	0.04 ± 0.01	ND	ND	ND	ND	0.04	0.15	0.24
Beryllium (PM_{10})	ng/m^3	886	5%	0.004 ± 0.003	ND	ND	ND	ND	ND	ND	ND
Butadiene, 1,3-	µg/m^3	774	5%	0.018 ± 0.010	ND	ND	ND	ND	ND	ND	0.073
Cadmium (PM_{10})	ng/m^3	886	75%	0.08 ± 0.01	ND	ND	ND	0.05	0.10	0.16	0.21
Carbon Tetrachloride	µg/m^3	767	83%	0.40 ± 0.01	ND	ND	0.34	0.45	0.53	0.59	0.64
Chloroform	µg/m^3	770	31%	0.057 ± 0.008	ND	ND	ND	ND	0.098	0.190	0.256
Chromium VI	ng/m^3	439	66%	0.019 ± 0.003	ND	ND	ND	0.014	0.027	0.046	0.056
Formaldehyde	µg/m^3	614	100%	6.20 ± 0.37	1.32	1.90	3.26	5.36	7.53	11.04	15.01
Lead (PM_{10})	ng/m^3	889	100%	1.95 ± 0.17	0.63	0.79	1.05	1.56	2.23	3.14	3.92
Manganese (PM_{10})	ng/m^3	887	100%	3.44 ± 0.21	0.96	1.24	1.84	2.81	4.09	5.90	7.42
Naphthalene	ng/m^3	682	100%	70.82 ± 4.43	11.29	18.20	30.76	52.80	95.16	143.64	182.80
Nickel (PM_{10})	ng/m^3	886	90%	1.22 ± 0.17	ND	0.19	0.59	0.81	1.13	1.69	2.60
Tetrachloroethylene	µg/m^3	775	30%	0.074 ± 0.011	ND	ND	ND	ND	0.123	0.226	0.343
Trichloroethylene	µg/m^3	773	7%	0.006 ± 0.002	ND	ND	ND	ND	ND	ND	0.067
Vinyl Chloride	µg/m^3	771	9%	0.0054 ± 0.0013	ND	ND	ND	ND	ND	ND	0.0548

[a] :The arithmetic mean is the average of all samples results which included actual measured values. If no chemical was registered, then a value of zero is used.

[b] ND: No results of this chemical were registered by the laboratory analytical equipment.

Table 5. Analytical Labs Supporting this Site

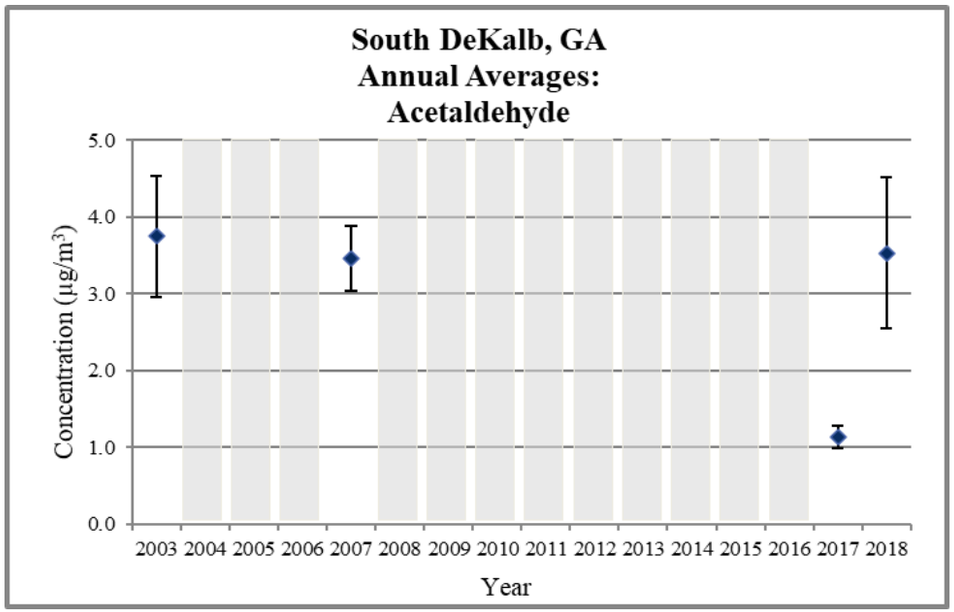
Pollutant Group	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
VOCs	GADNR	GADNR	GADNR	GADNR	GADNR	GADNR	GADNR	GADNR	GADNR	GADNR	GADNR	GADNR	GADNR	GADNR	GADNR	GADNR
Carbonyls	GADNR	GADNR	GADNR	GADNR	GADNR	GADNR	GADNR	GADNR	GADNR	GADNR	GADNR	GADNR	GADNR	GADNR	GADNR	GADNR
PM_{10} Metals	GADNR	GADNR	GADNR	GADNR	GADNR	GADNR	GADNR	GADNR	GADNR	GADNR	GADNR	GADNR	GADNR	GADNR	GADNR	GADNR
Chromium VI	--	--	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	ERG	--	--	--	--	--
PAHs	--	--	--	--	--	ERG	ERG	ERG	ERG	GADNR	GADNR	GADNR	GADNR	GADNR	GADNR	GADNR

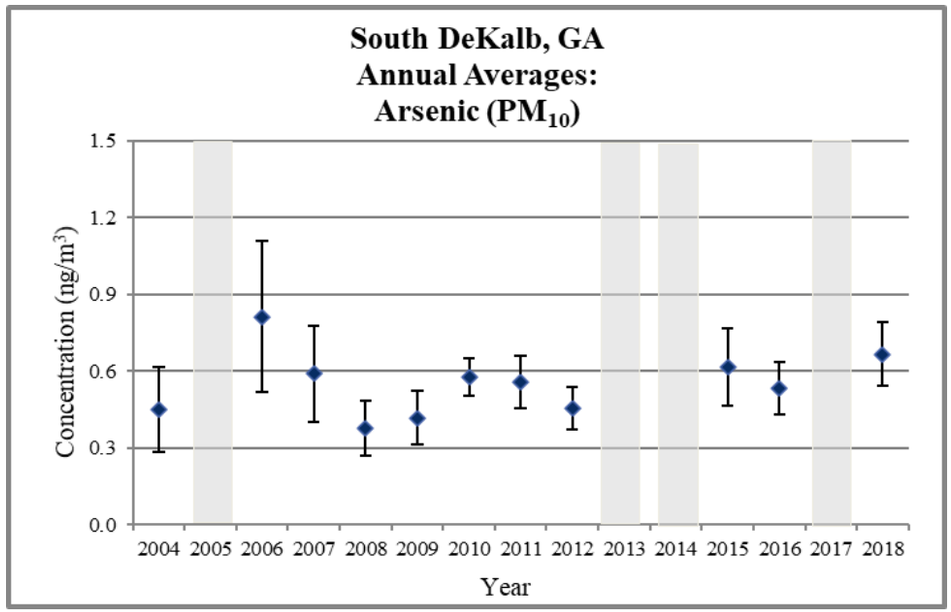
--: Not Applicable

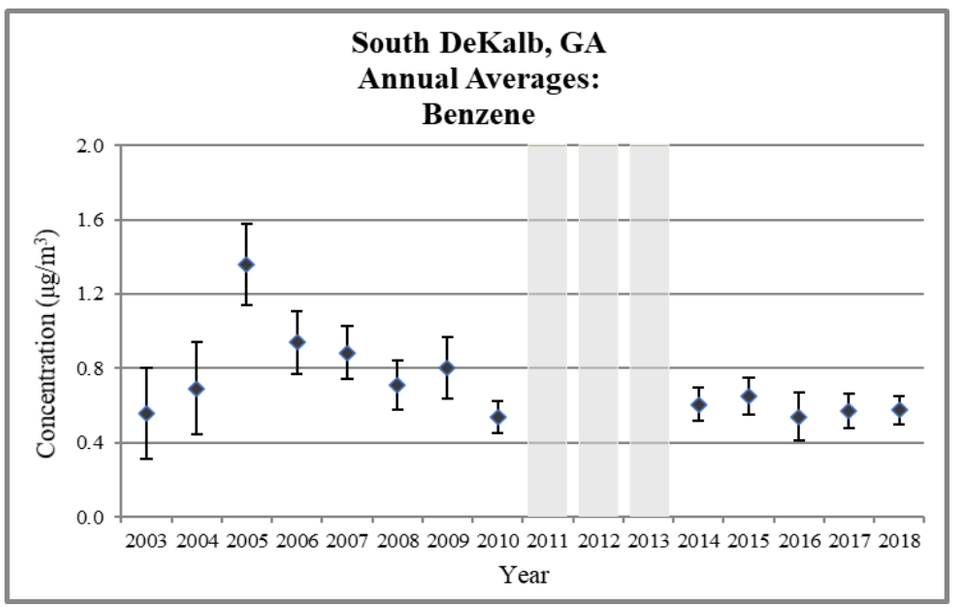
GADNR: Georgia Department of Natural Resources

ERG: Eastern Research Group, Inc.

Figure 3. South DeKalb, GA Annual Average Concentrations







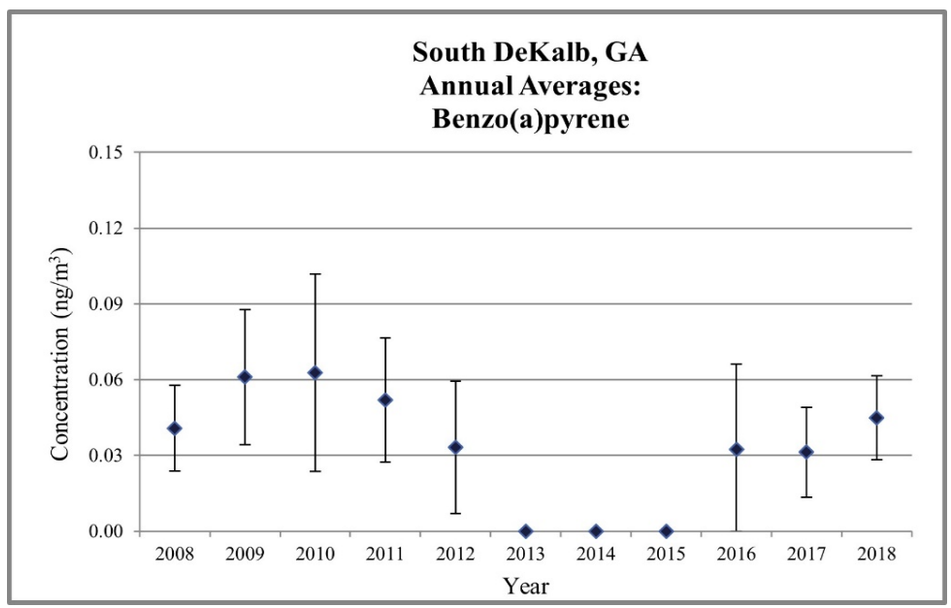
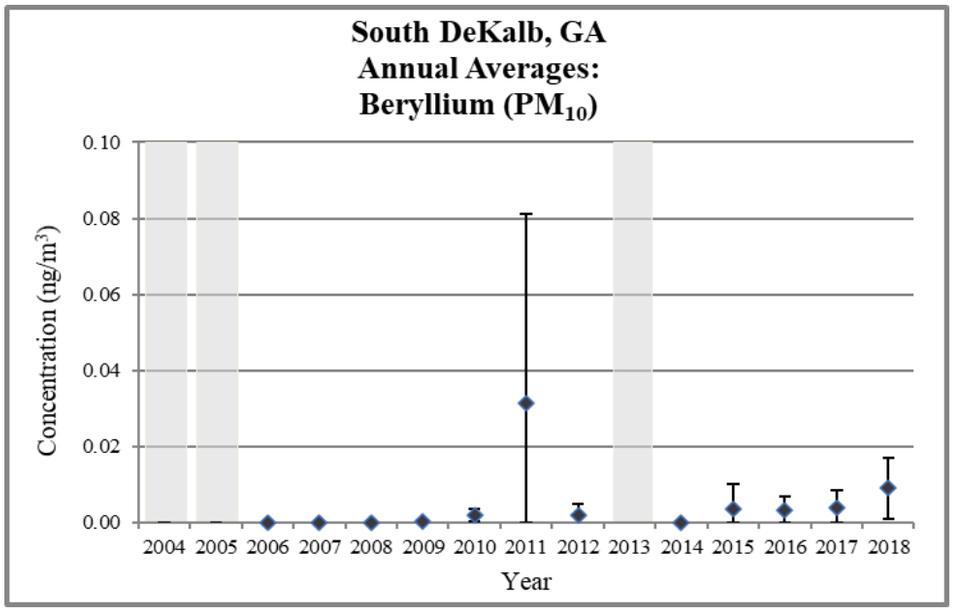
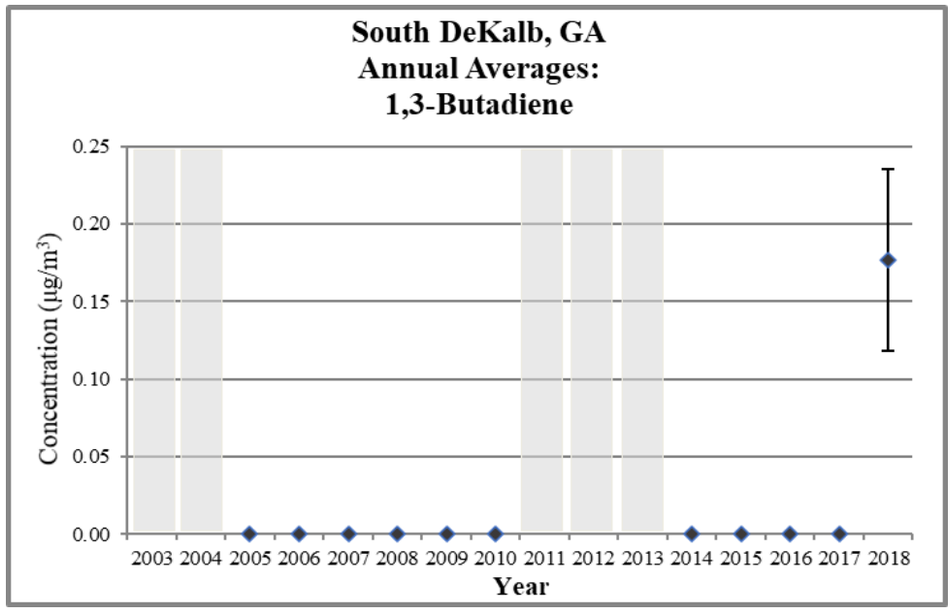
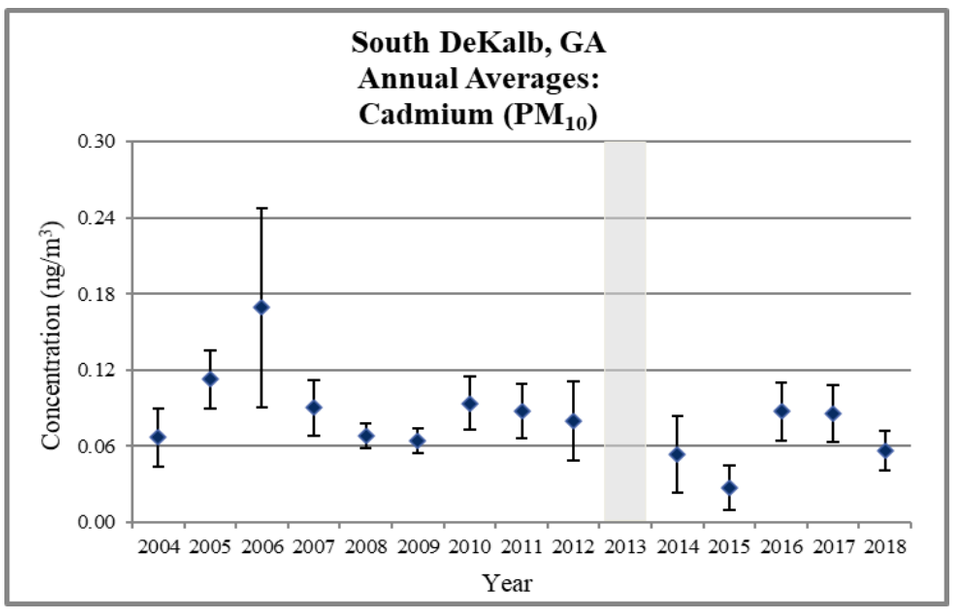


Figure 3. South DeKalb, GA Annual Average Concentrations







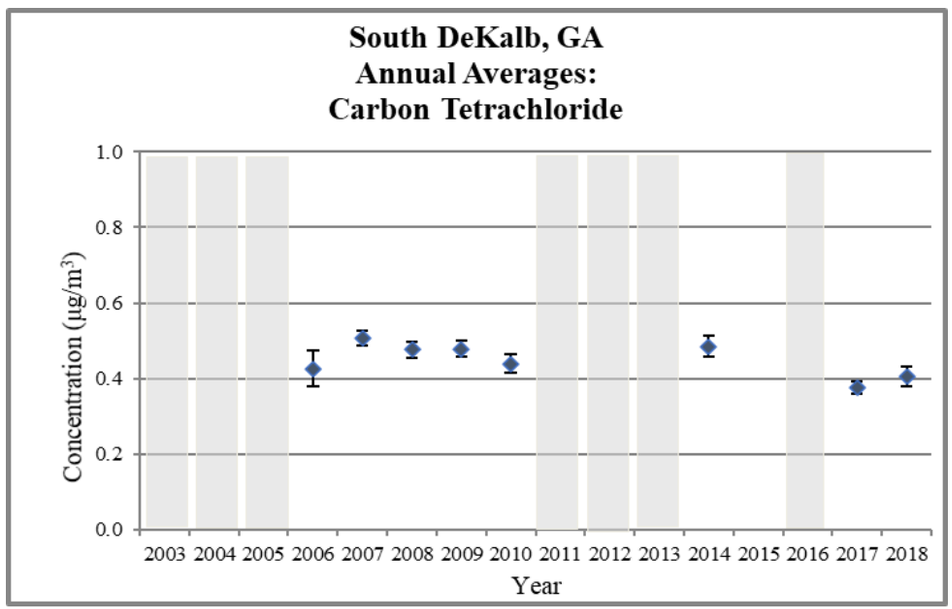
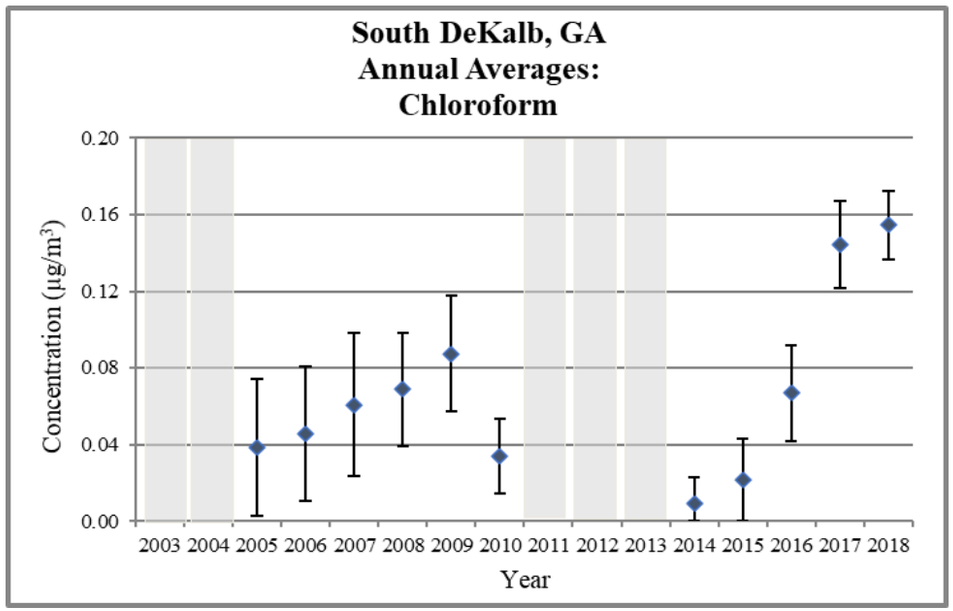
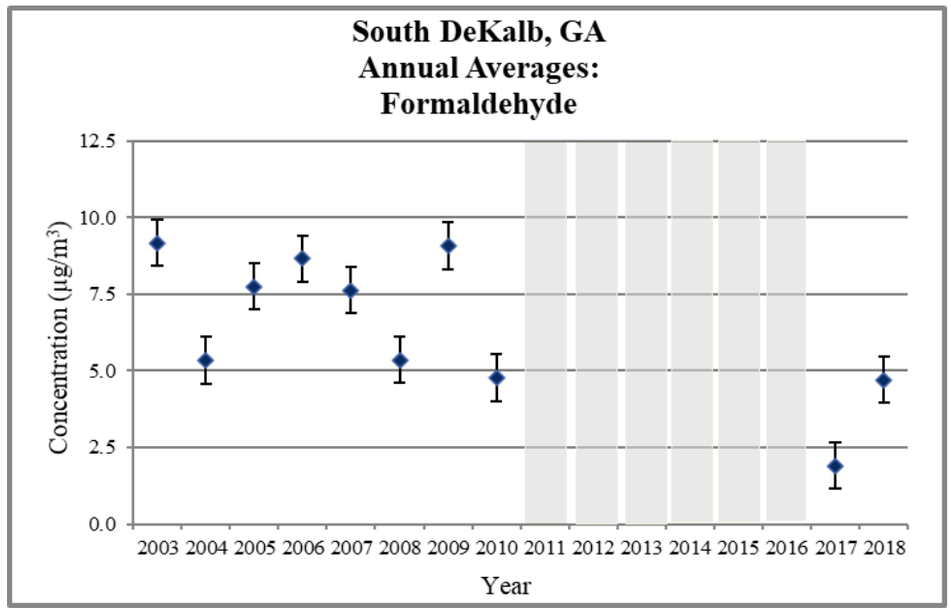
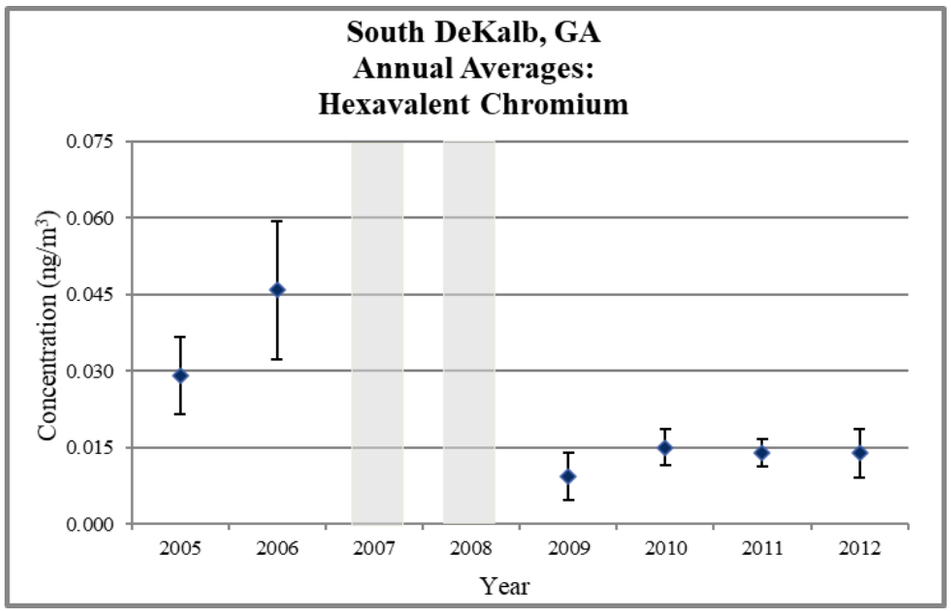


Figure 3. South DeKalb, GA Annual Average Concentrations







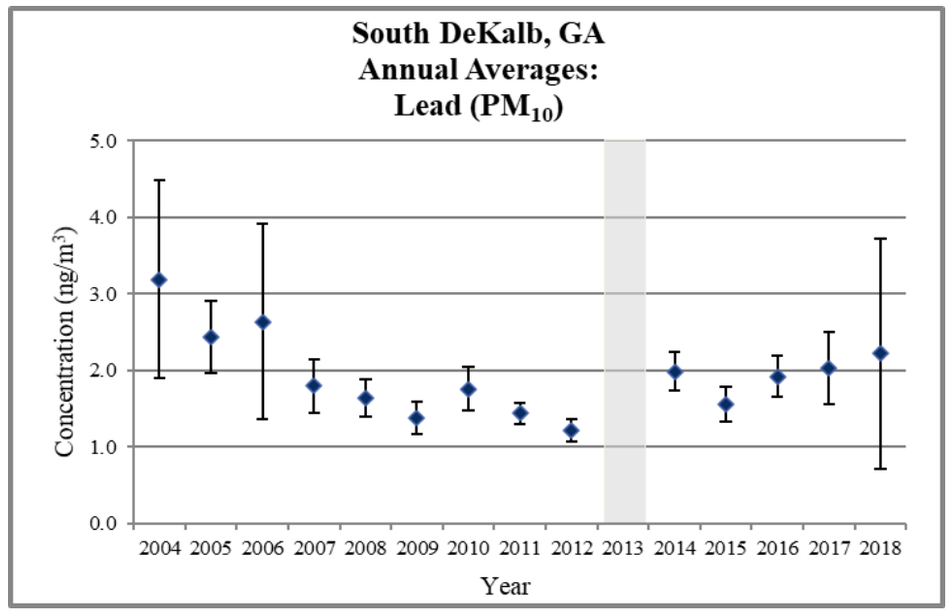
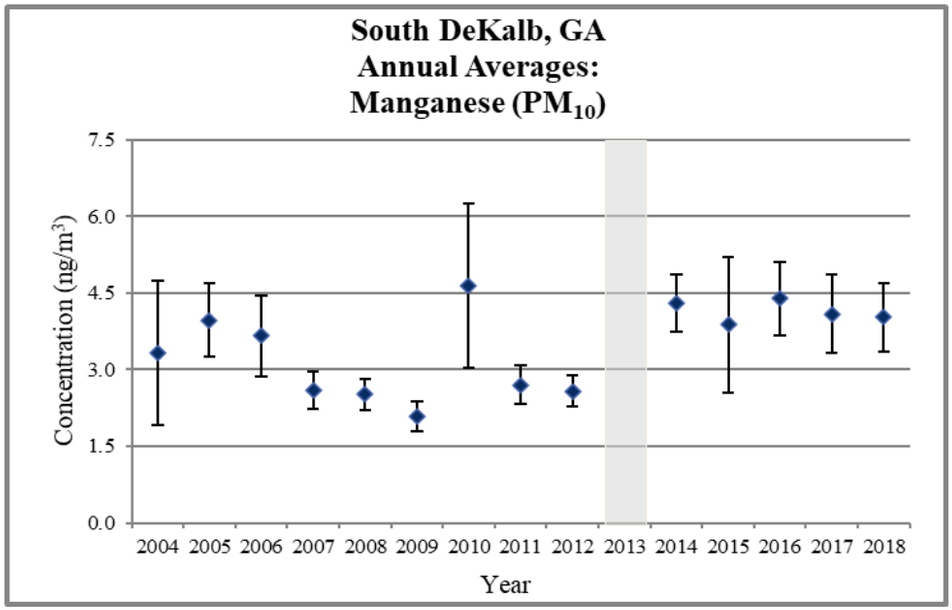
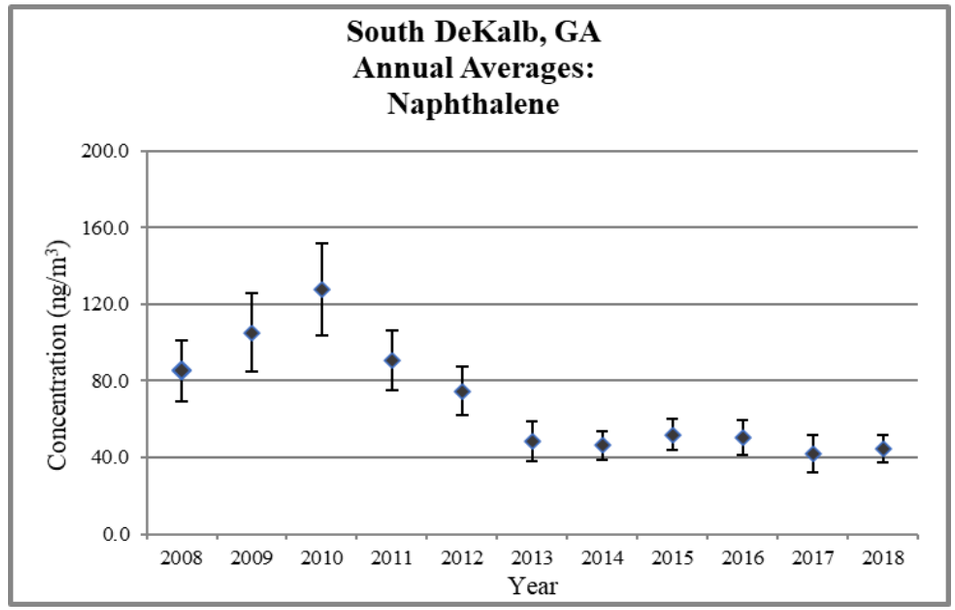
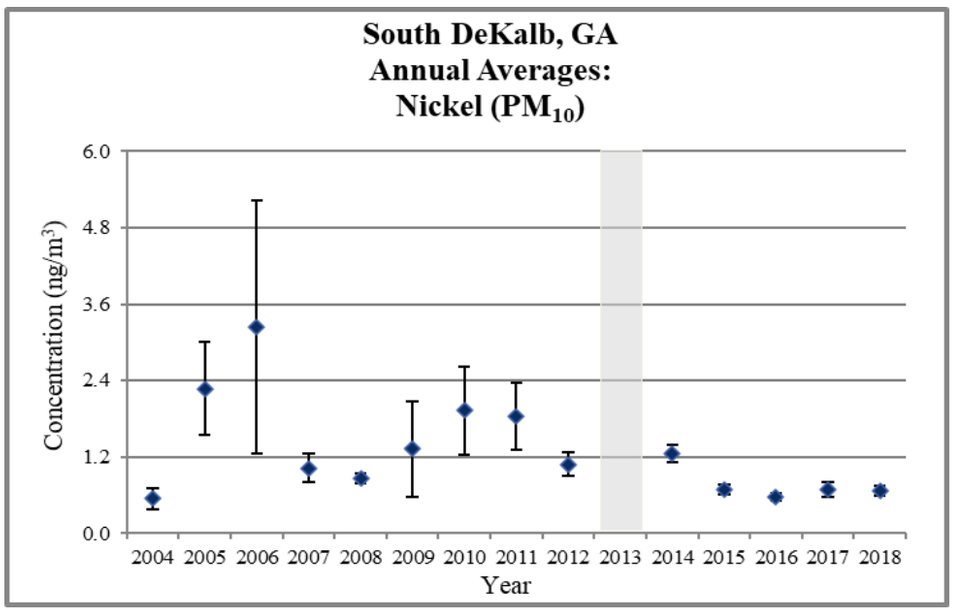
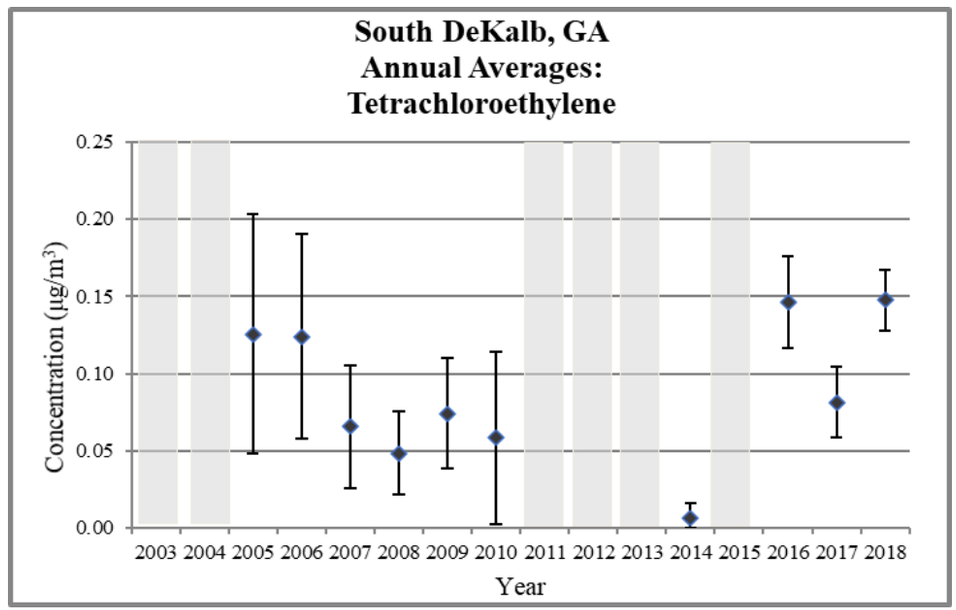


Figure 3. South DeKalb, GA Annual Average Concentrations









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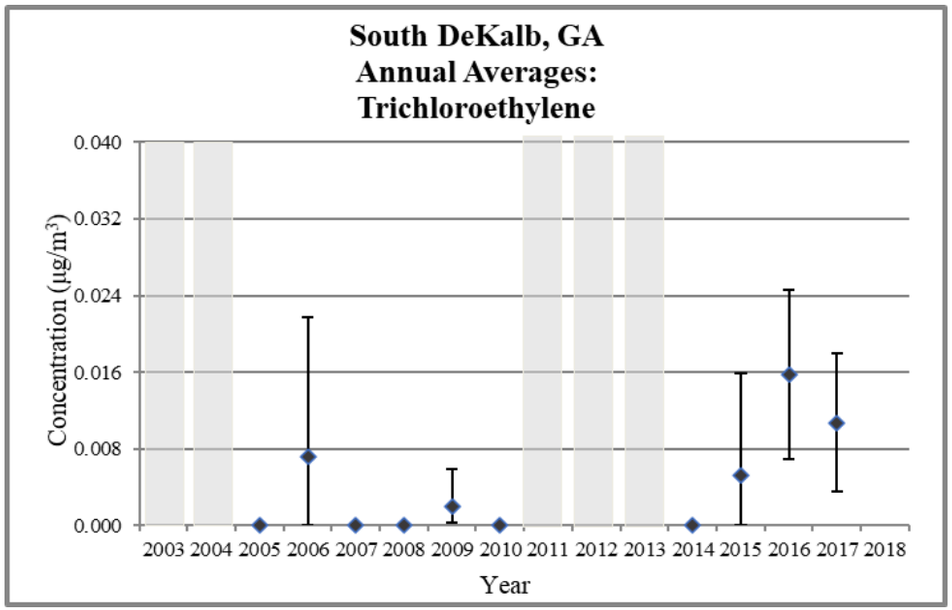
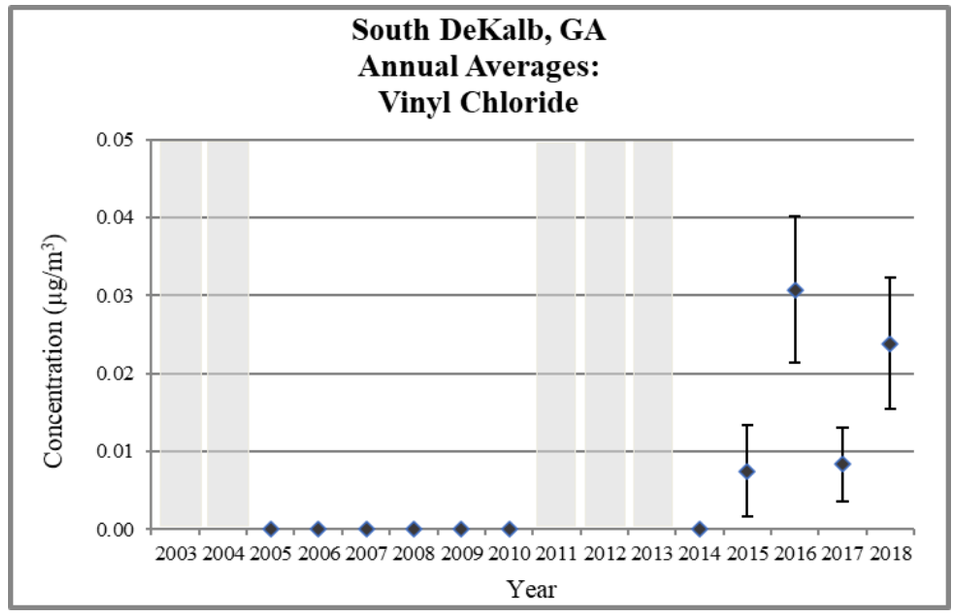
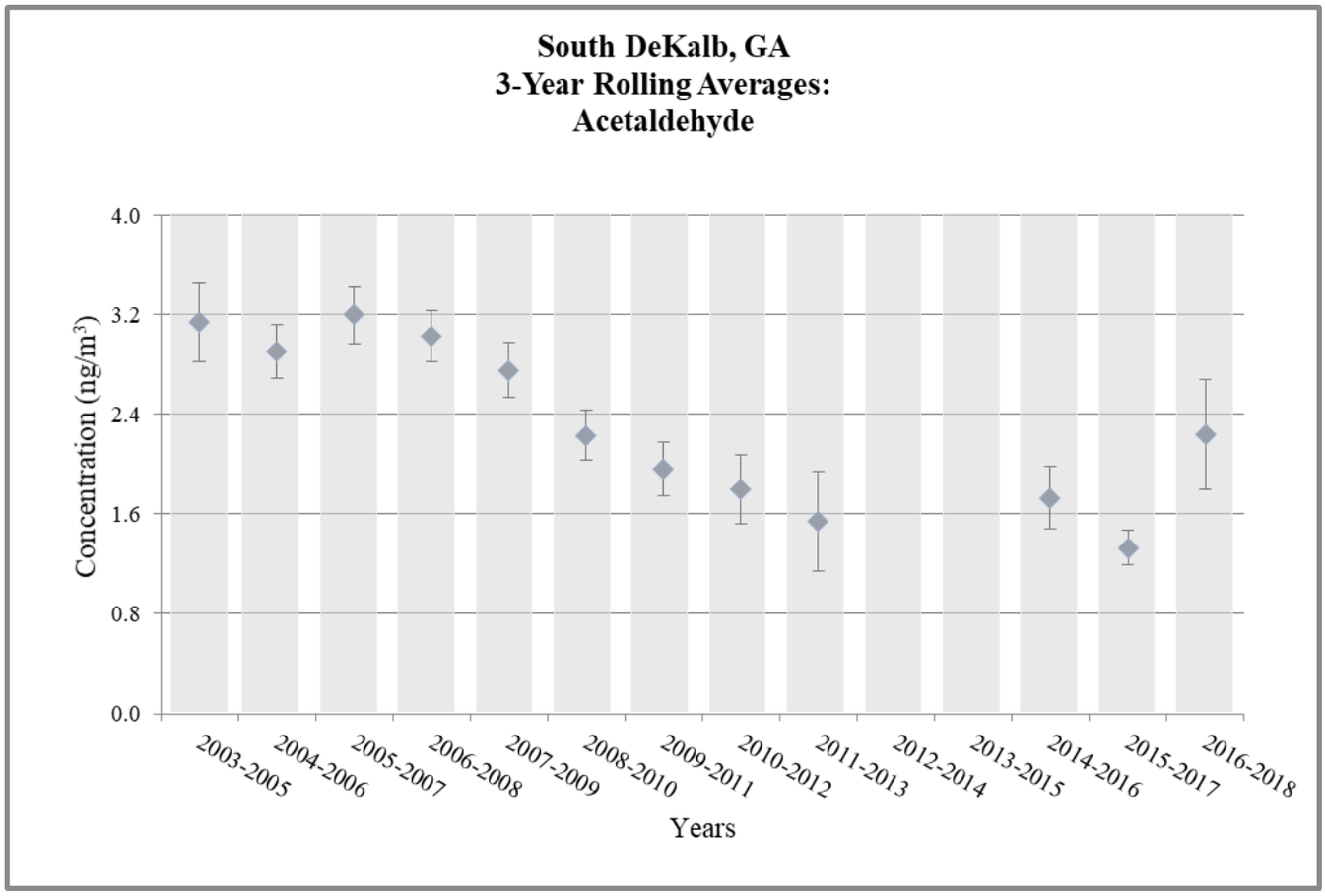
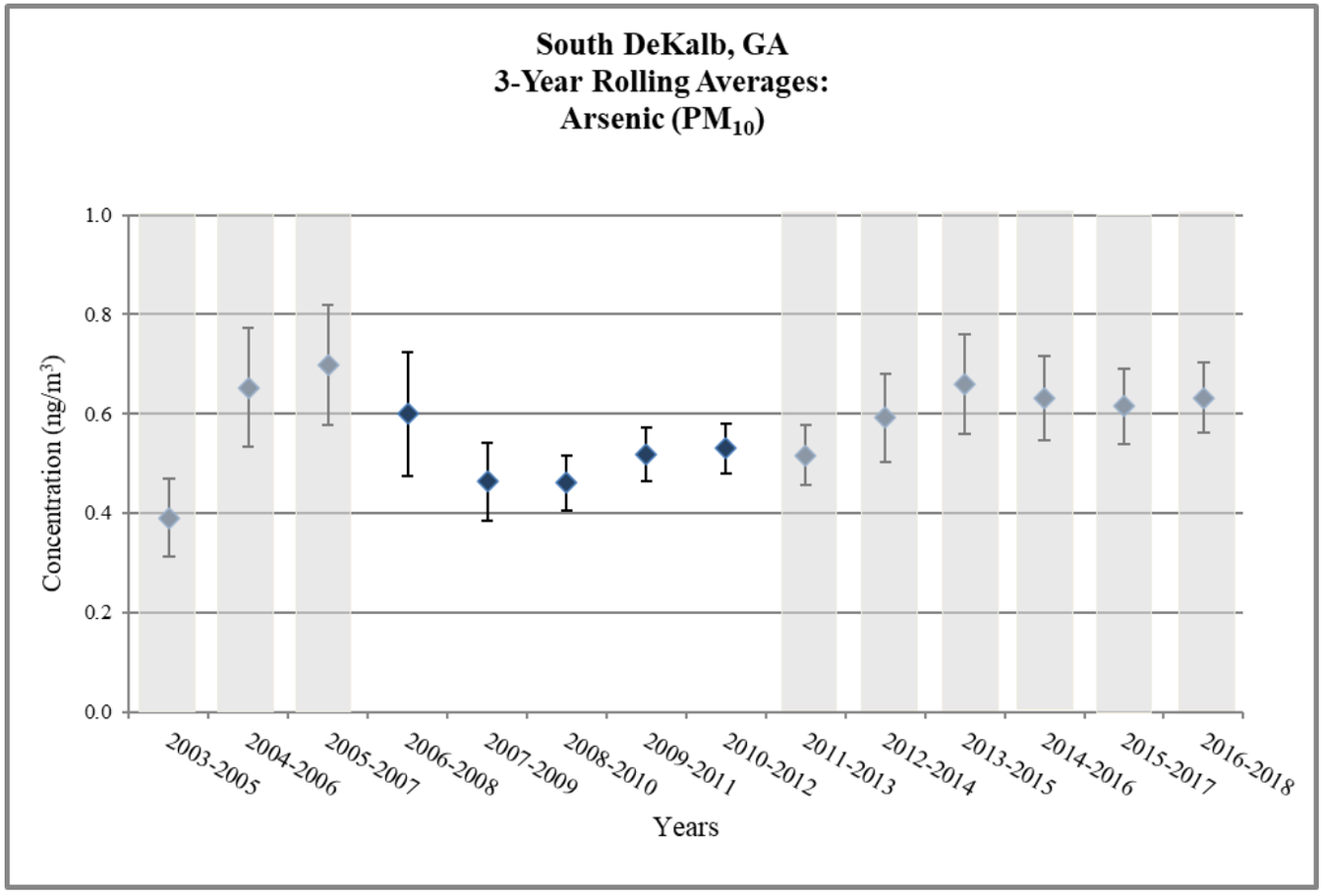




Does not meet MQO

Figure 4. South DeKalb, GA - 3-Year Rolling Average Concentrations





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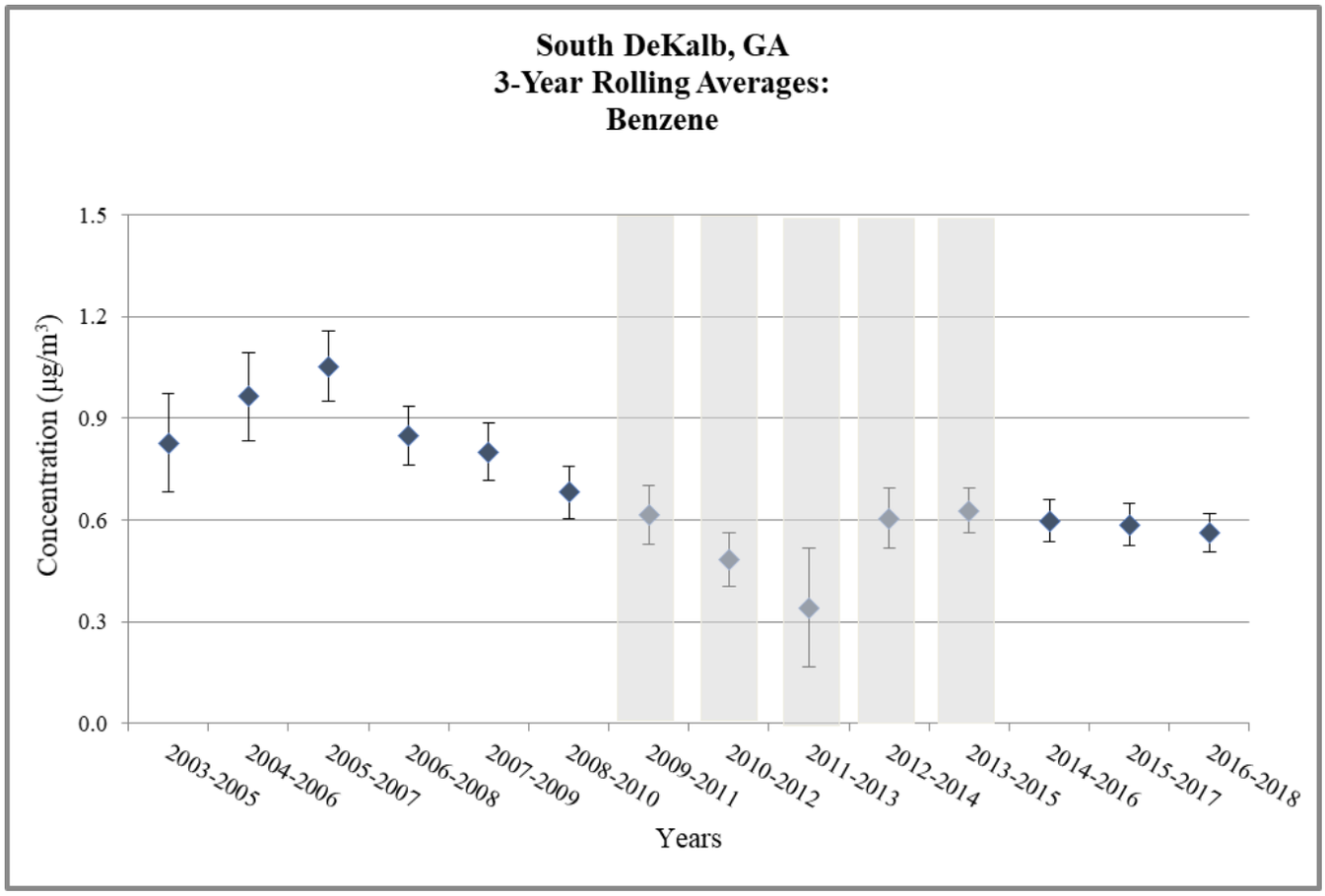

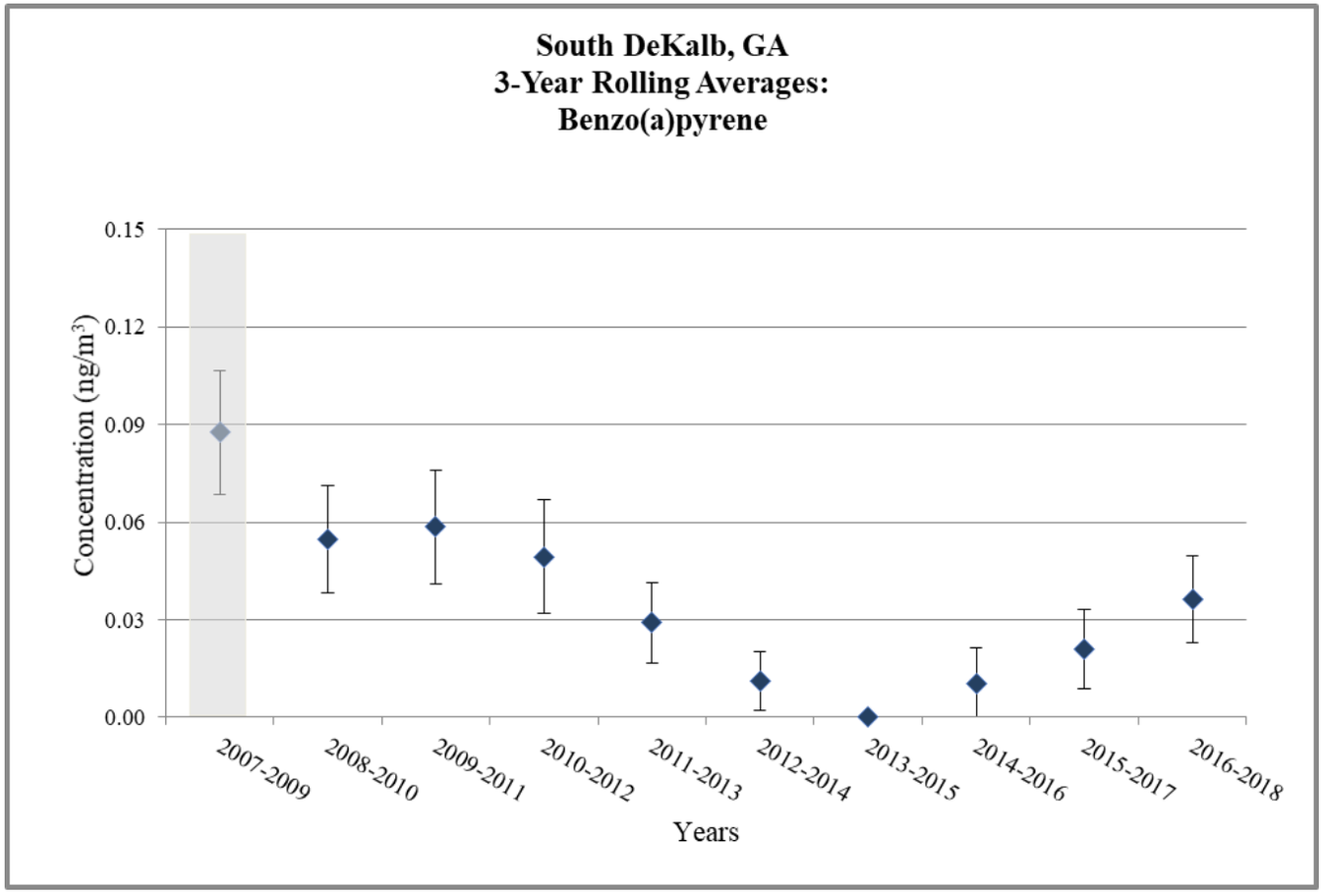

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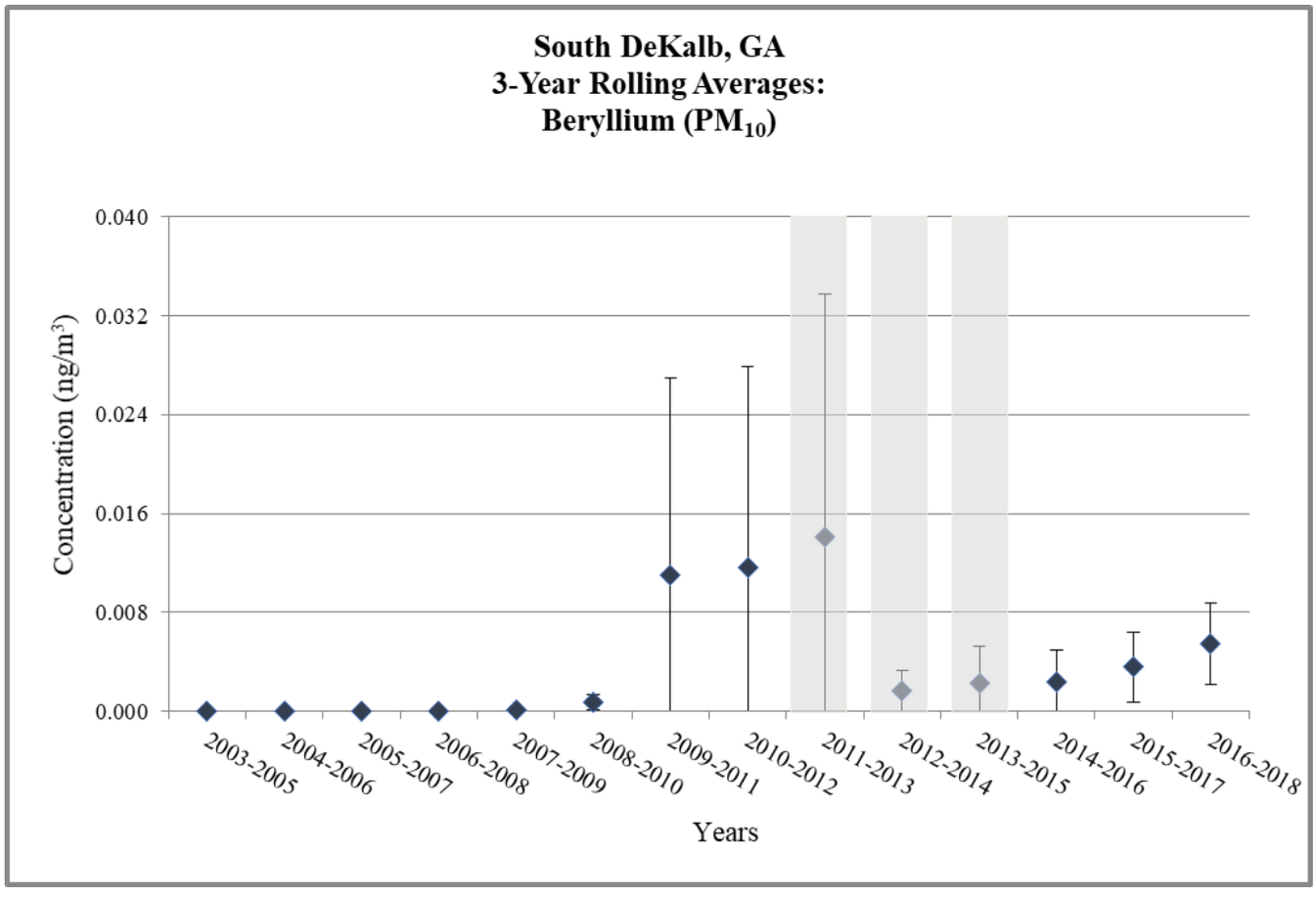

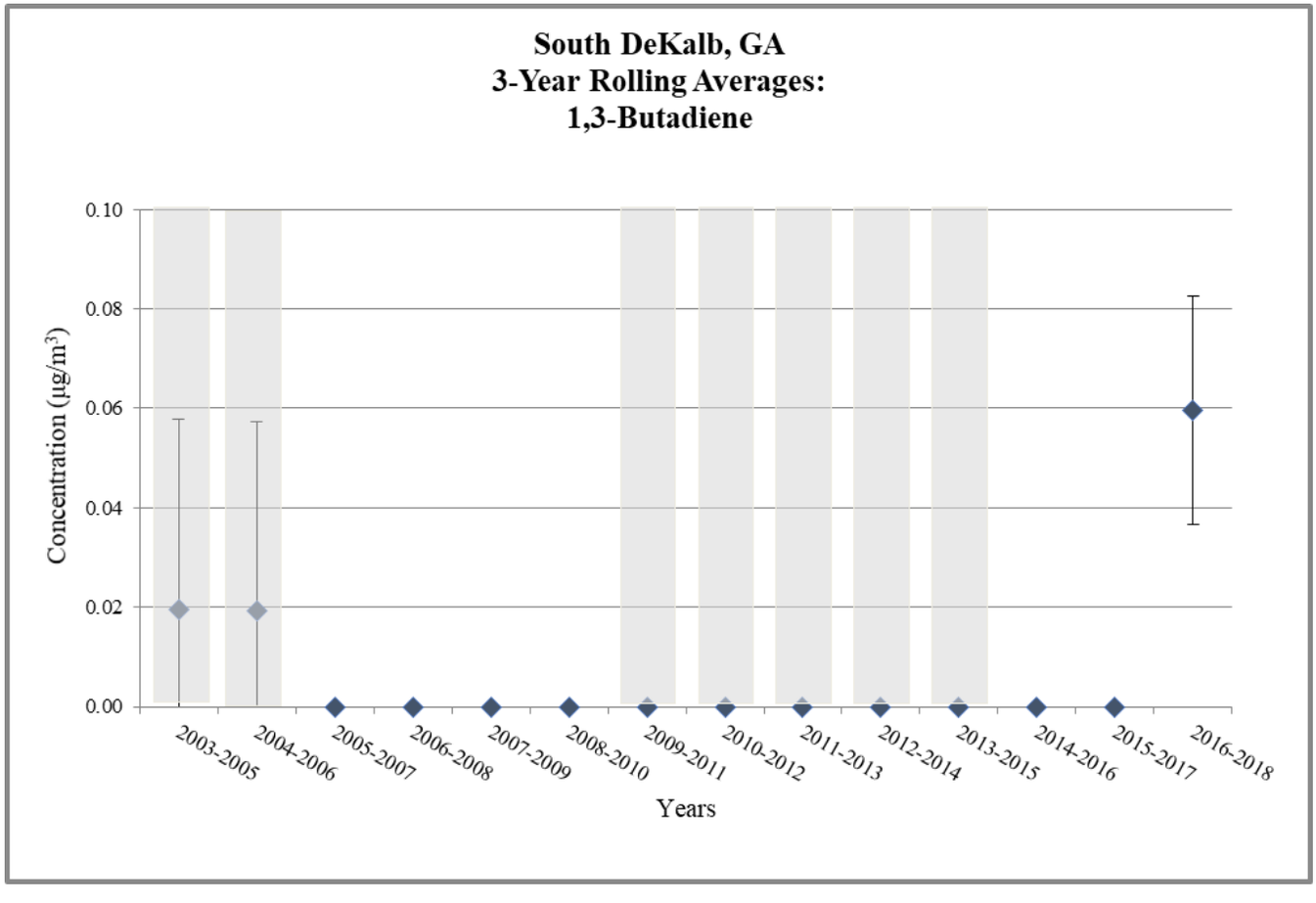

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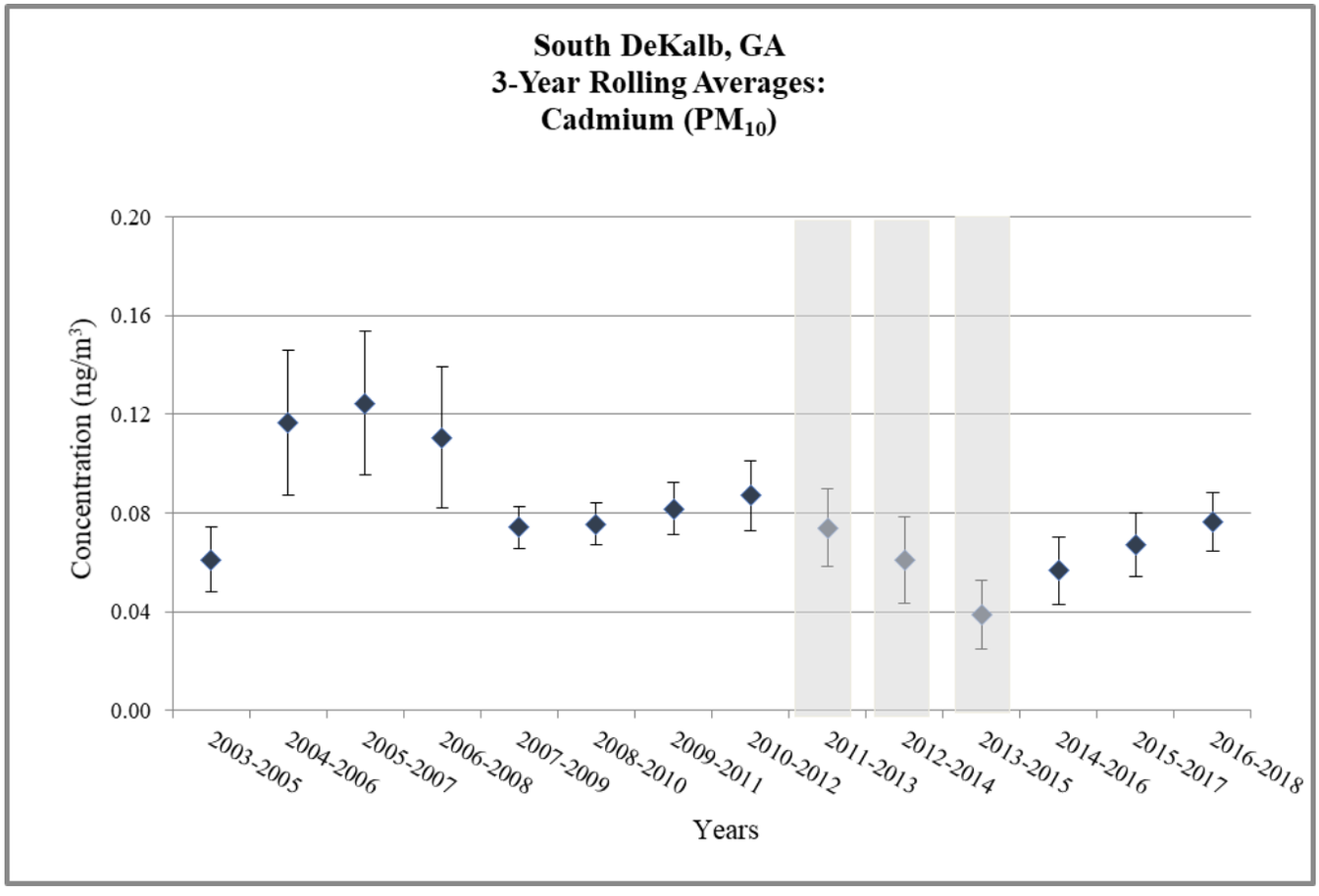

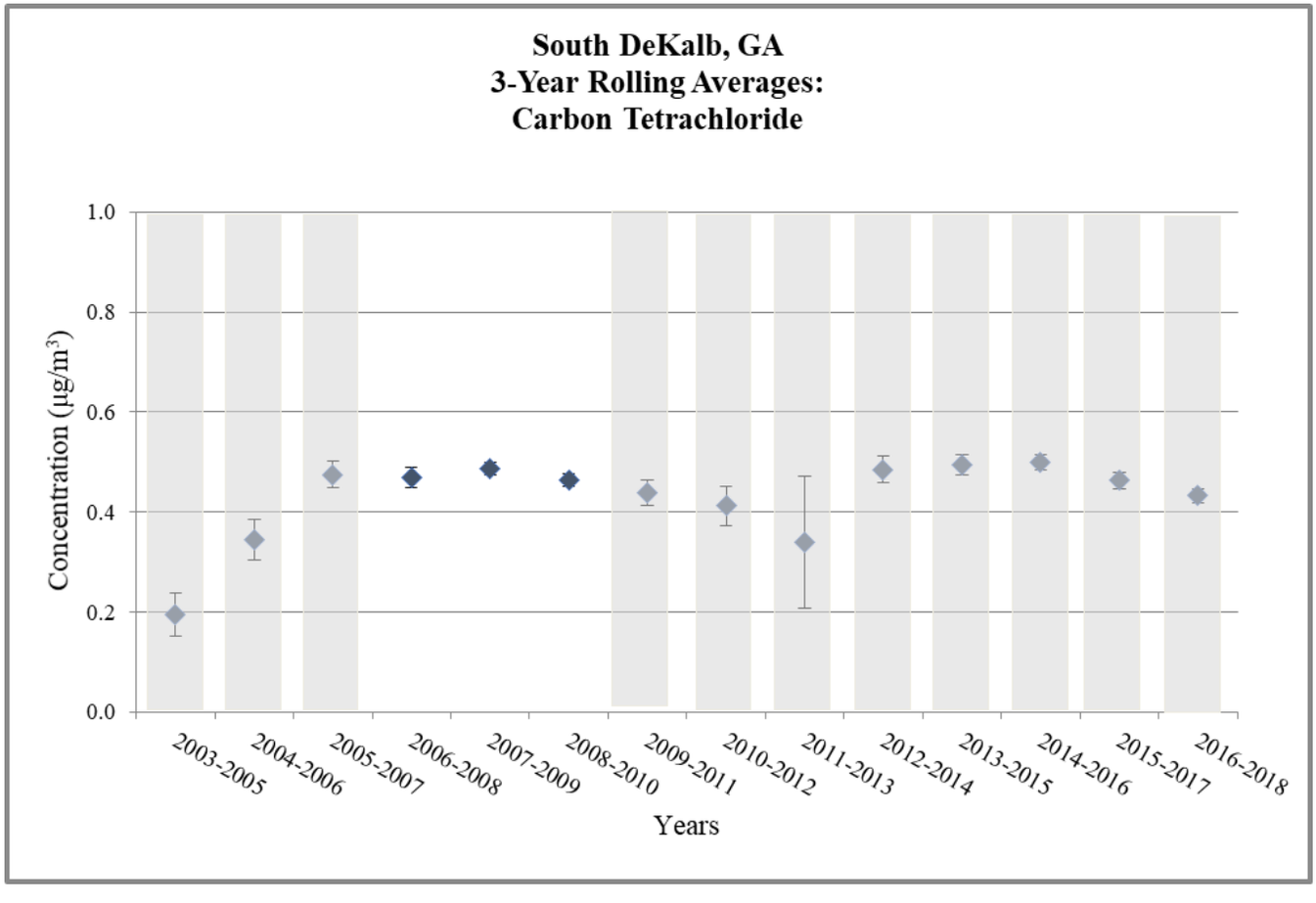

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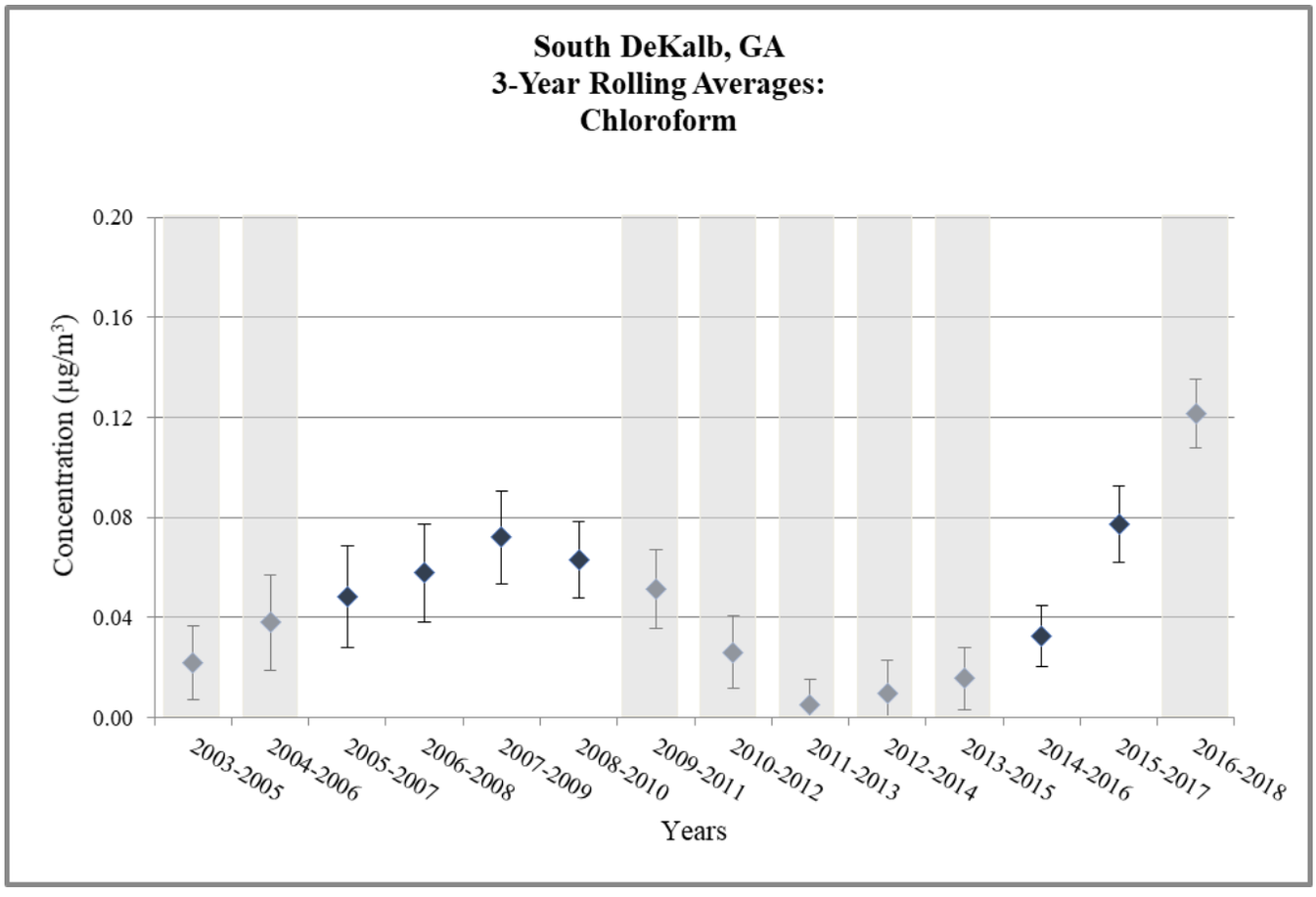

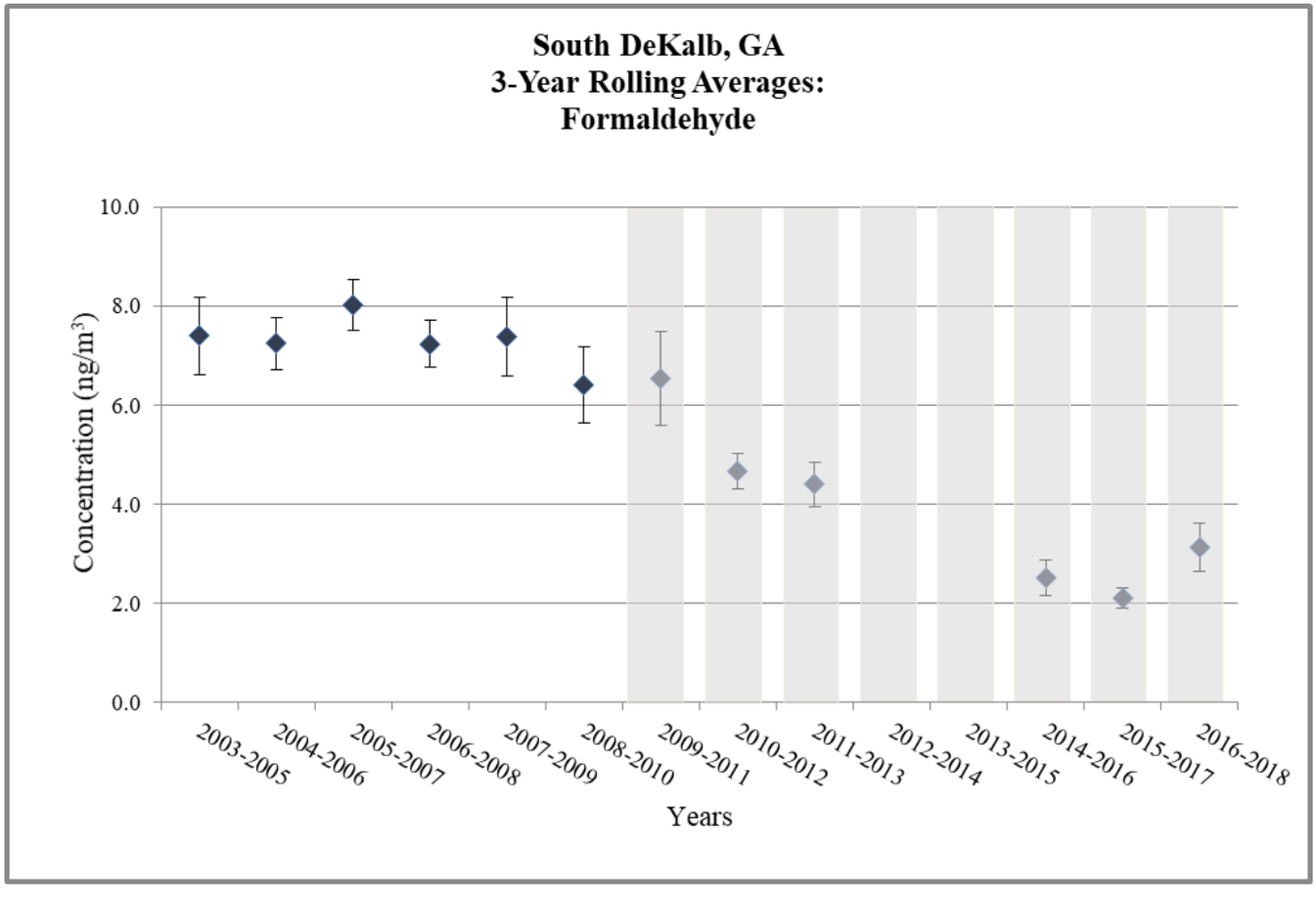

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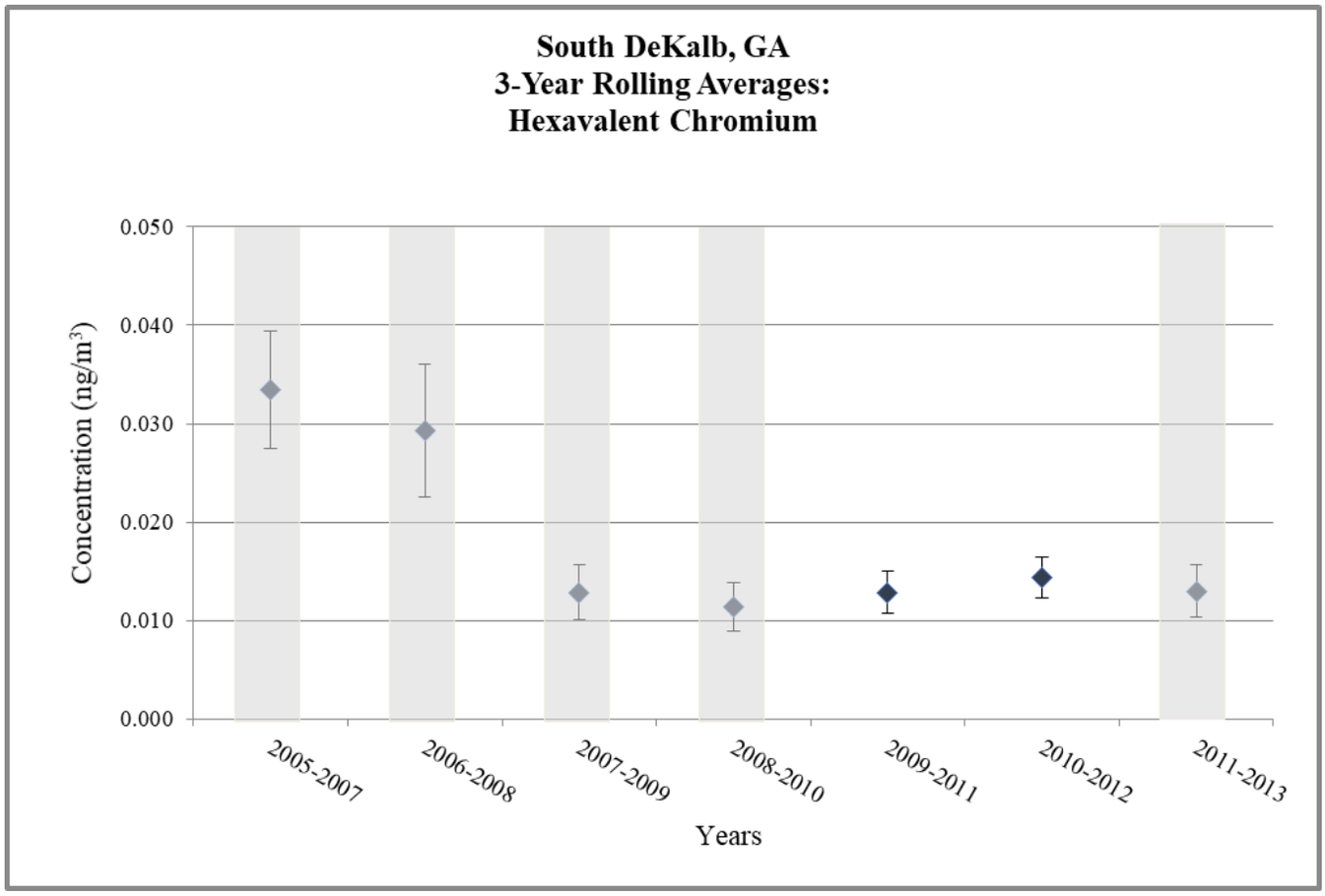

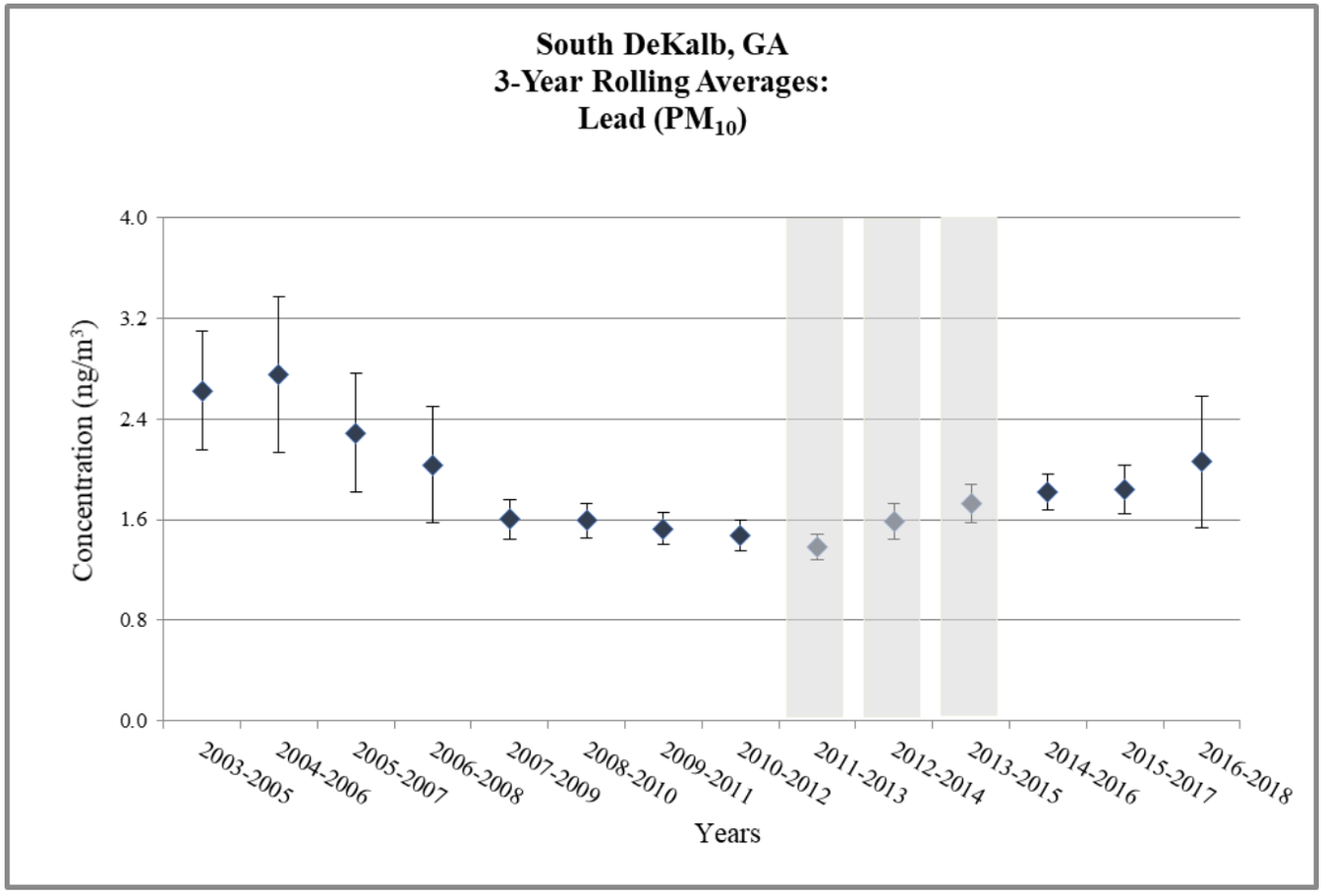

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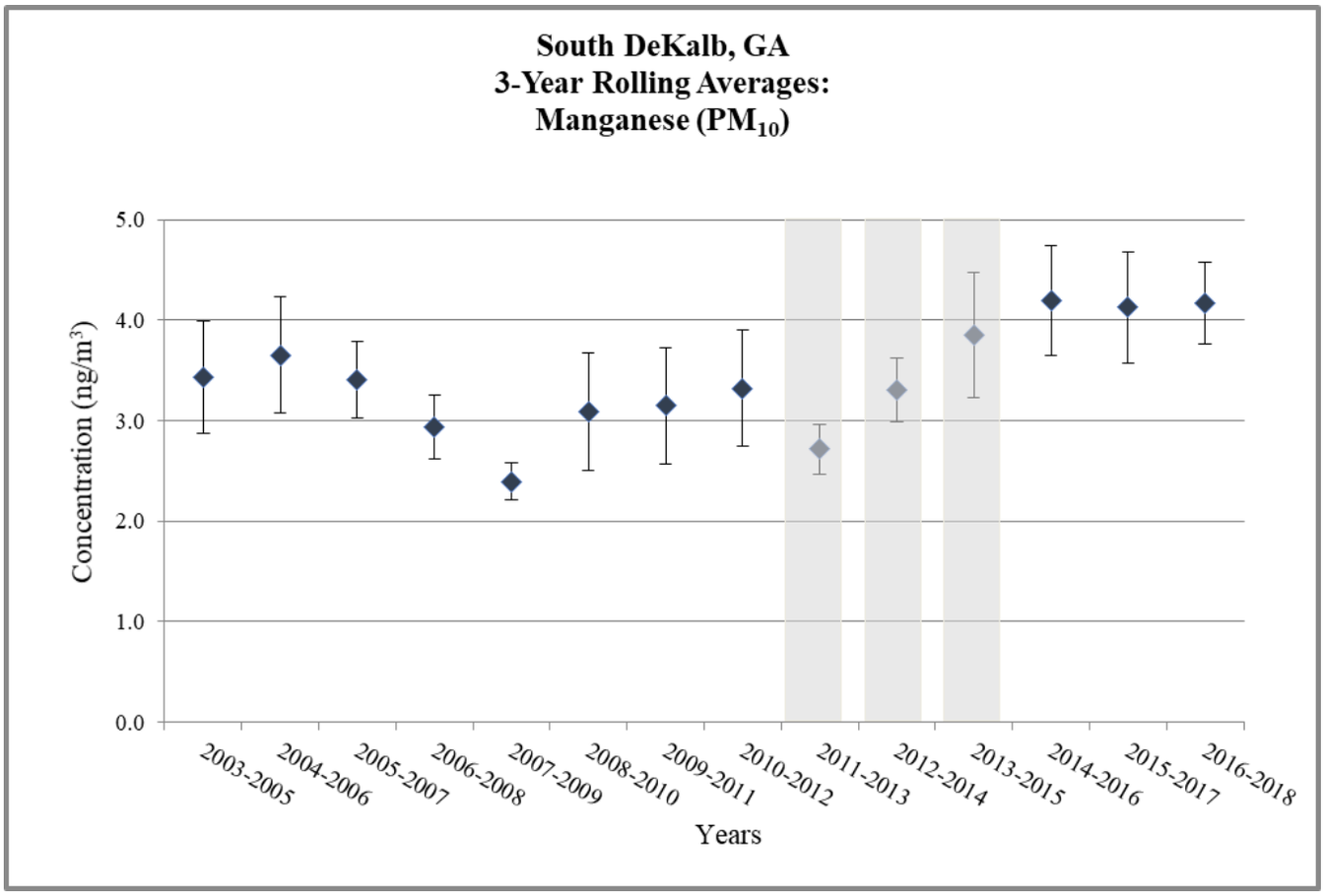

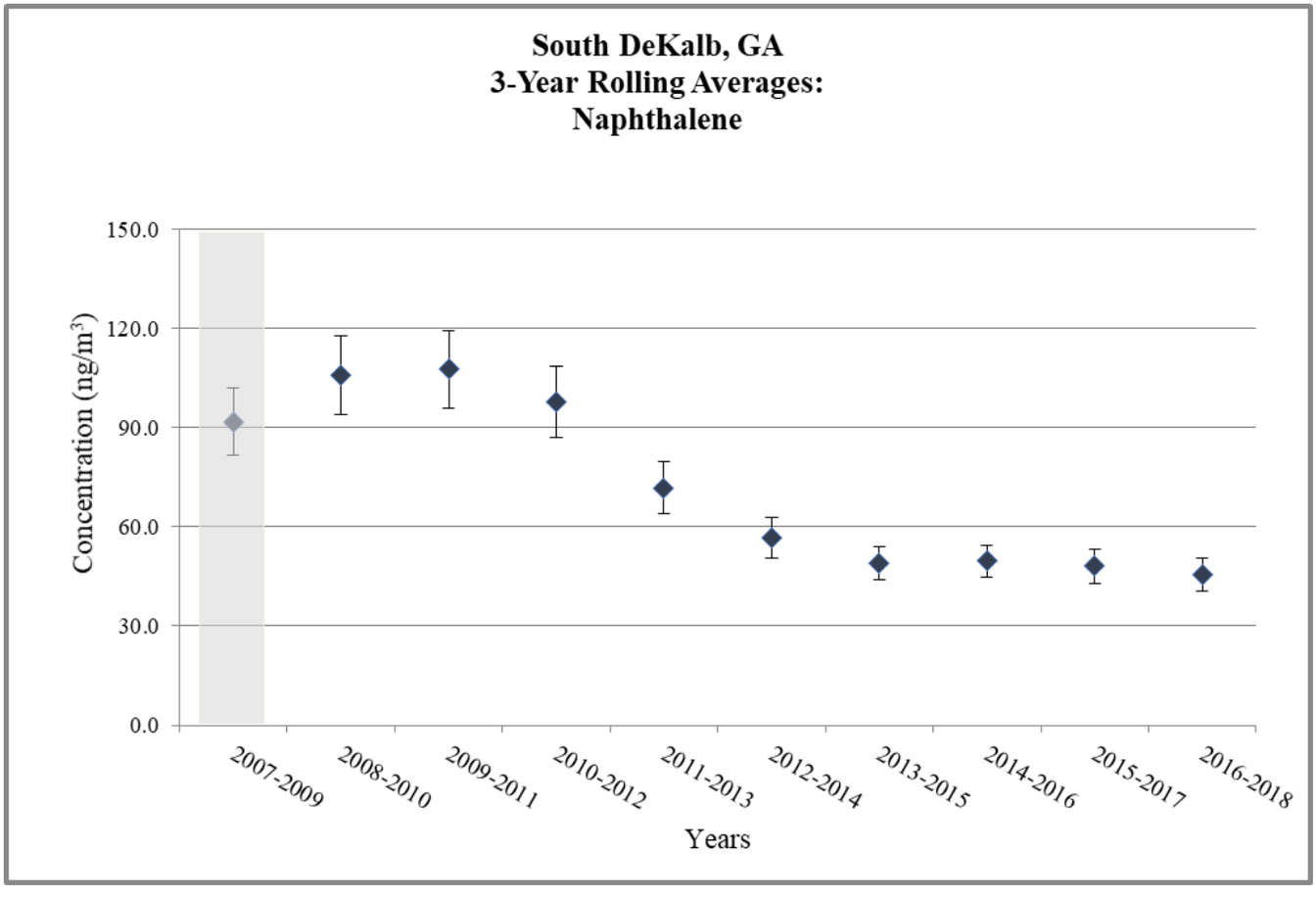

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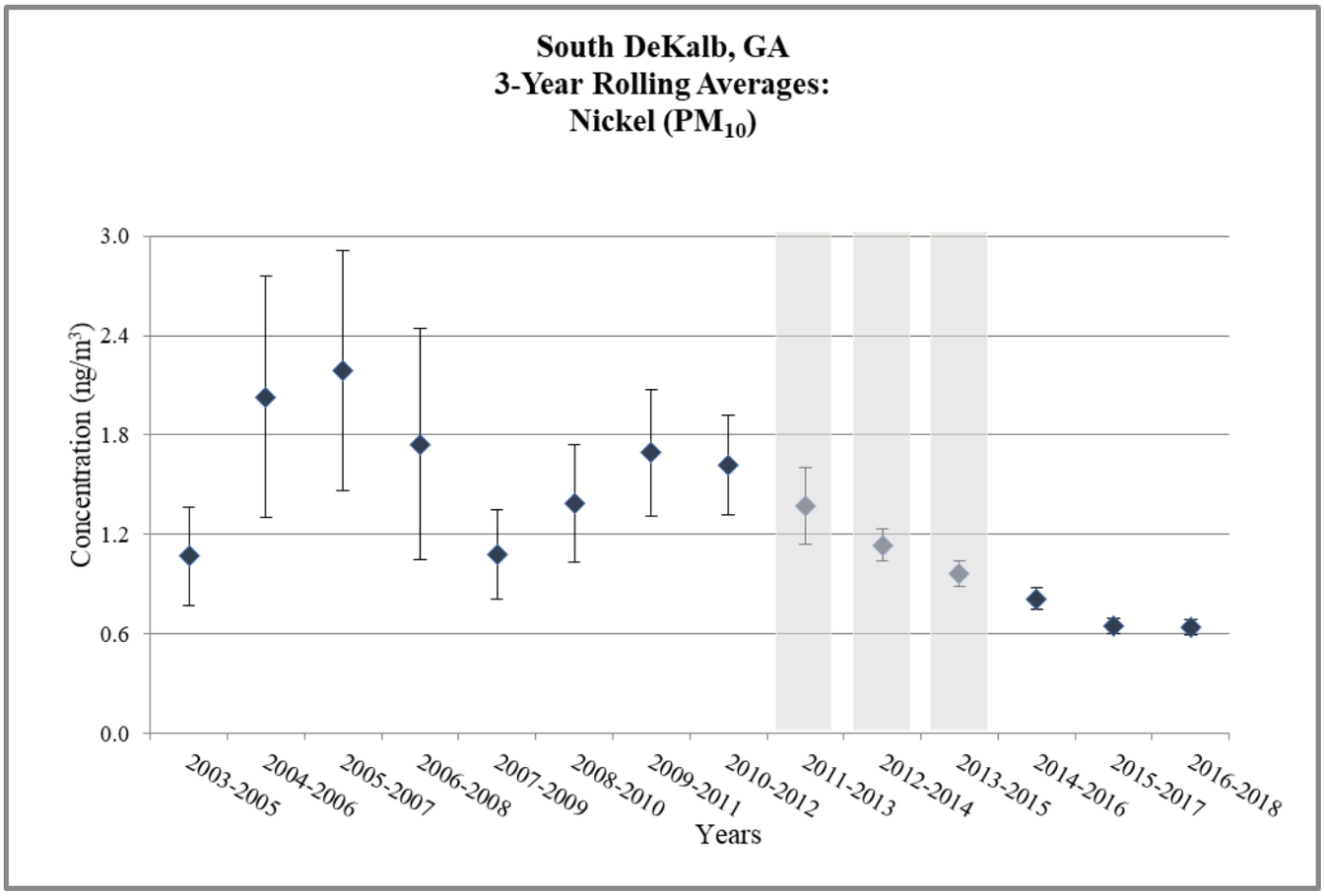

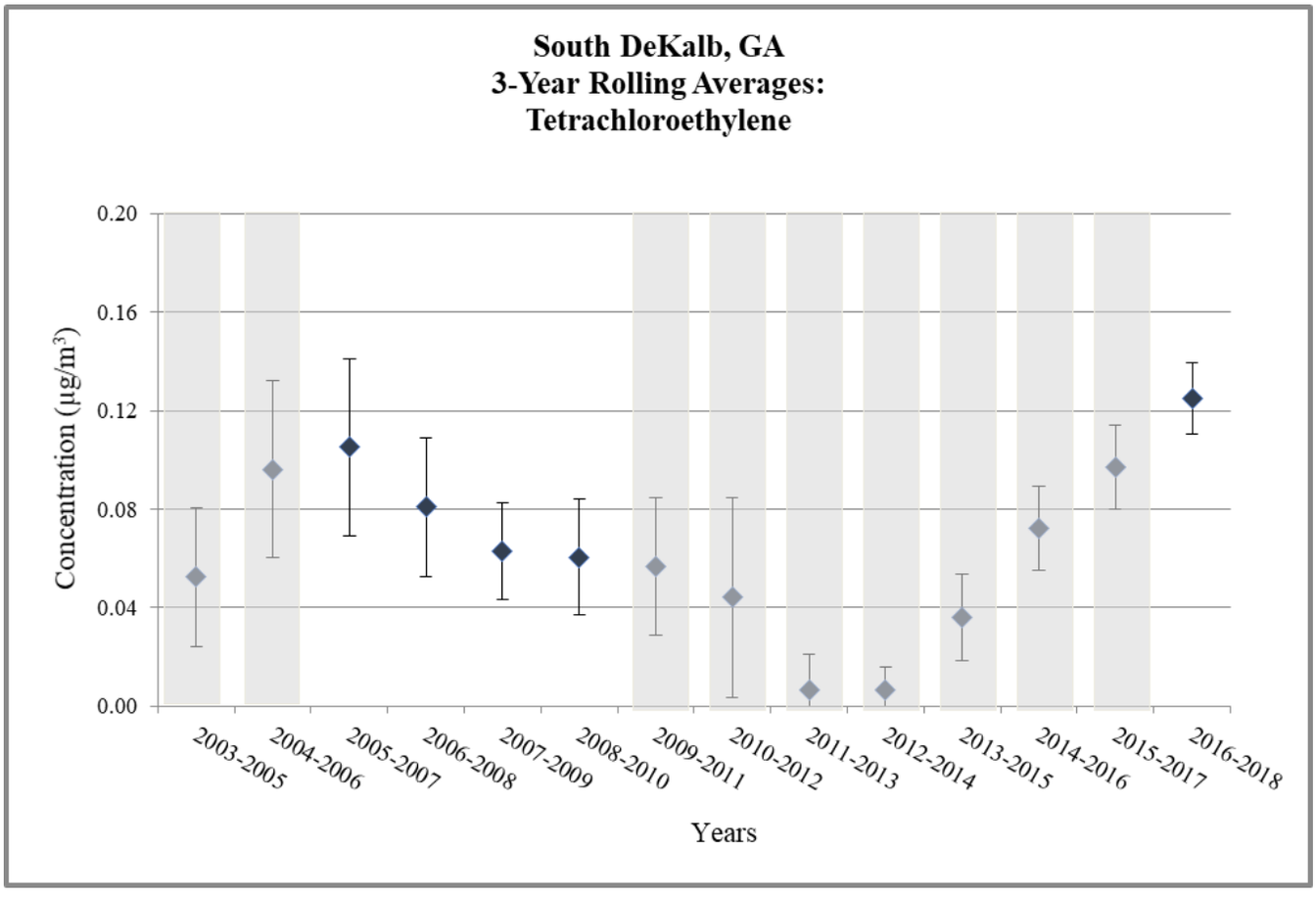

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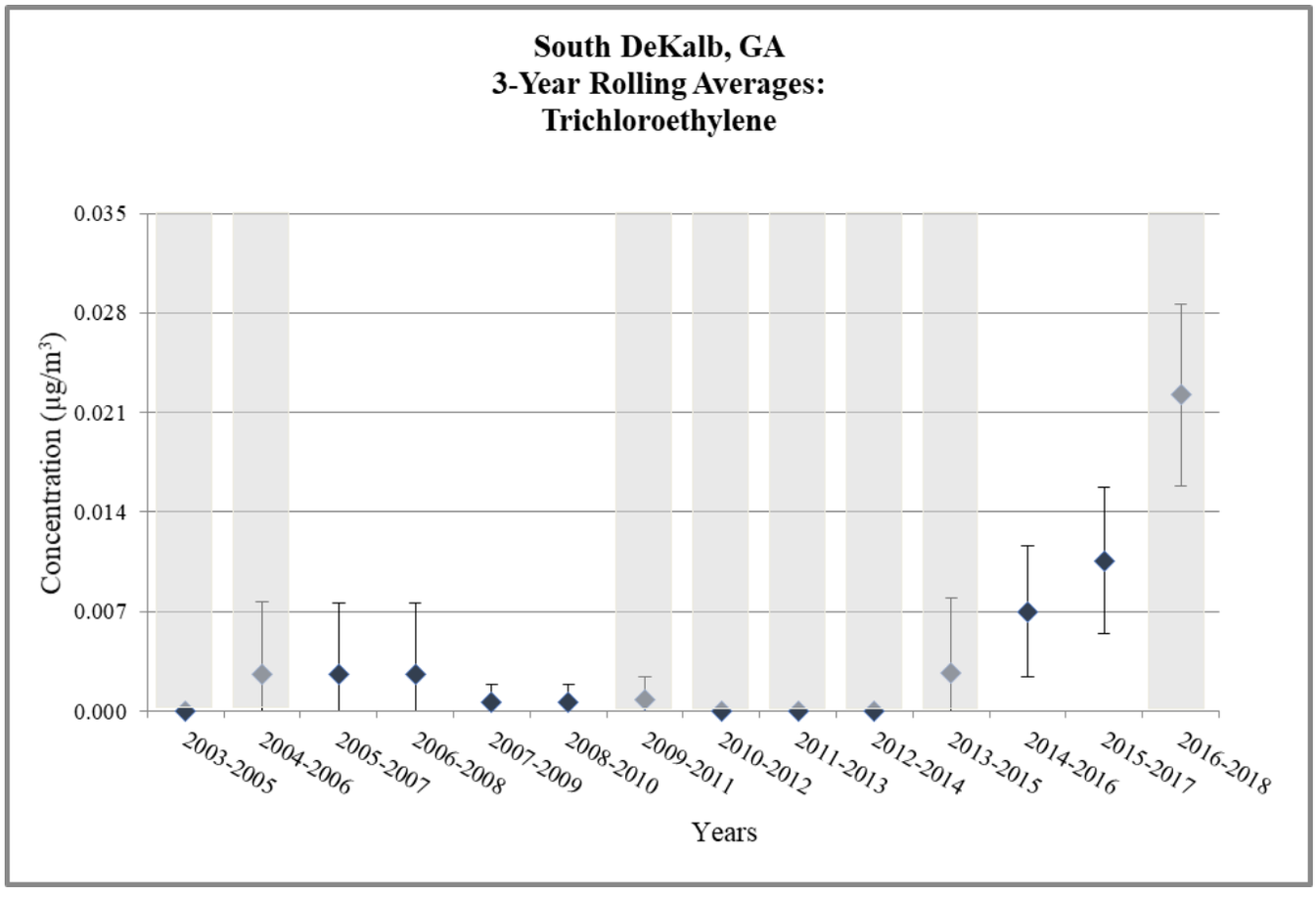

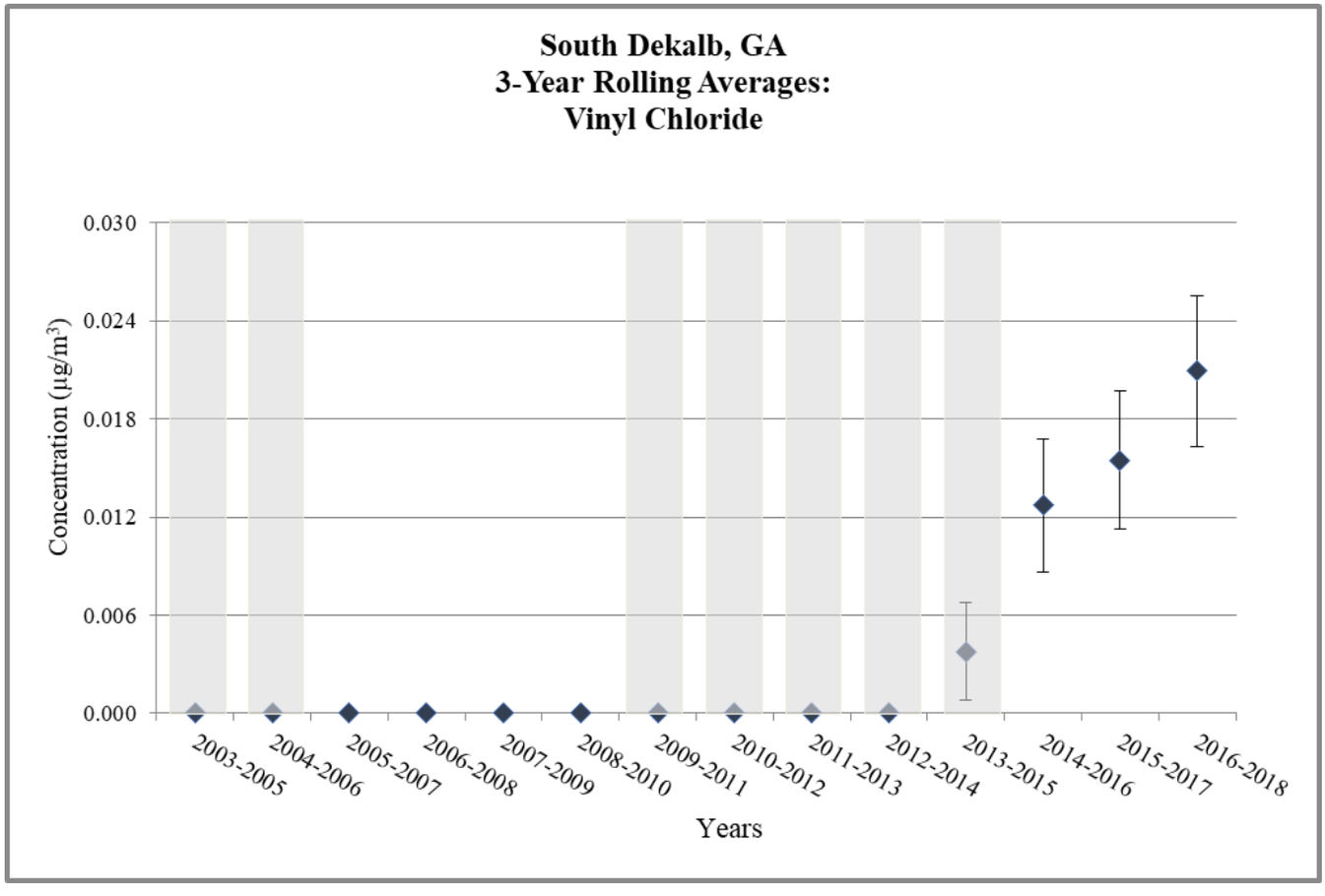

Does not meet MQO or wasn't able to collect enough samples

Table 6. NATTS Network Assessment: MQO#1 - Completeness Percentage at South DeKalb, GA

Pollutant Group	Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Carbonyl	Acetaldehyde	90	97	95	95	93	90	93	93	34	a	a	a	a	44	93	97
Carbonyl	Formaldehyde	92	97	95	93	93	90	93	93	34	a	a	a	a	44	93	89
Chromium VI	Chromium VI	--	--	94	93	68	48	95	98	100	89	--	--	--	--	--	--
PAH	Benzo(a)pyrene	--	--	--	--	--	98	97	97	100	95	92	92	100	92	98	97
PAH	Naphthalene	--	--	--	--	--	98	97	97	100	95	92	92	100	92	98	92
PM_{10} Metals	Arsenic (PM_{10})	84	93	90	97	95	89	97	97	93	93	46	82	98	100	100	100
PM_{10} Metals	Beryllium (PM_{10})	84	93	90	97	95	89	97	97	93	93	48	82	98	100	100	100
PM_{10} Metals	Cadmium (PM_{10})	84	93	90	97	95	89	97	97	93	93	48	82	98	100	100	100
PM_{10} Metals	Lead (PM_{10})	89	93	90	97	95	89	97	97	93	93	48	82	98	100	100	100
PM_{10} Metals	Manganese (PM_{10})	89	93	90	97	95	89	97	97	93	93	48	82	98	100	100	97
PM_{10} Metals	Nickel (PM_{10})	84	93	90	97	95	89	97	97	93	93	48	82	98	100	100	100
VOC	Benzene	113	120	89	100	95	89	89	92	34	a	a	98	102	98	98	98
VOC	Butadiene, 1,3-	97	92	89	100	95	89	89	92	34	a	a	98	102	98	98	100
VOC	Carbon tetrachloride	97	92	89	100	95	89	89	92	34	a	a	98	102	98	98	89
VOC	Chloroform	97	92	89	100	95	89	89	92	34	a	a	98	102	98	98	93
VOC	Tetrachloroethylene	97	92	89	100	95	89	89	92	34	a	a	98	102	98	98	102
VOC	Trichloroethylene	97	92	89	100	95	89	89	92	34	a	a	98	102	98	98	98
VOC	Vinyl chloride	97	92	89	100	95	89	89	92	34	a	a	98	102	98	98	95

A-rated: ≥85%

B-rated: Between 75% to 85%

Does not meet: ≤75%

-- No data available

Table 7. NATTS Network Assessment: MQO#2 - Reported Method Detection Limits (MDLs) at South DeKalb, GA

Pollutant Group	Pollutant Name	Target MDL	Units	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Carbonyl	Acetaldehyde	0.45	µg/m^3	0.002	2.85	2.69	2.85	0.34	2.69	2.69	2.85	2.85	b	b	b	b	0.12	0.0001	0.17
Carbonyl	Formaldehyde	0.98/0.08[a]	µg/m^3	0.001	1.31	1.24	1.31	0.15	1.24	1.24	1.31	1.31	b	b	b	b	0.14	0.0001	0.49
Chromium VI	Chromium VI	0.08	ng/m^3	--	--	0.15	0.14	0.09	0.08	0.05	0.01	0.03	0.04	0.05	--	--	--	--	--
PAH	Benzo(a)pyrene	0.91	ng/m^3	--	--	--	--	0.09	0.09	0.08	0.05	0.06	0.00	0.07	0.09	0.07	0.00	0.07	0.03
PAH	Naphthalene	29.00	ng/m^3	--	--	--	--	0.003	0.018	0.010	0.011	0.004	0.000	0.001	0.001	0.002	0.000	0.005	0.02
PM_{10} Metals	Arsenic (PM_{10})	0.23	ng/m^3	9.39	1.39	1.35	1.30	1.39	1.43	0.65	0.61	0.65	1.22	1.00	2.09	1.35	1.61	3.30	1.91
PM_{10} Metals	Beryllium (PM_{10})	0.42	ng/m^3	1.02	0.10	0.07	0.07	0.10	0.10	0.02	0.02	0.02	0.02	0.07	0.12	0.02	0.02	0.05	0.05
PM_{10} Metals	Cadmium (PM_{10})	0.56	ng/m^3	0.77	0.04	0.04	0.04	0.04	0.04	0.05	0.30	0.54	0.05	0.05	0.29	0.02	0.02	0.04	0.04
PM_{10} Metals	Lead (PM_{10})	15.0	ng/m^3	0.03	0.005	0.005	0.005	0.005	0.005	0.001	0.001	0.001	0.001	0.002	0.003	0.001	0.004	0.03	0.01
PM_{10} Metals	Manganese (PM_{10})	5.0	ng/m^3	0.09	0.02	0.02	0.02	0.02	0.02	0.002	0.002	0.002	0.002	0.006	0.010	0.002	0.06	0.10	0.06
PM_{10} Metals	Nickel (PM_{10})	2.1	ng/m^3	1.03	0.07	0.07	0.06	0.07	0.07	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.36	0.19	0.23
VOC	Benzene	0.13	µg/m^3	0.82	0.82	1.18	0.88	0.71	0.54	0.54	0.66	0.66	b	b	0.96	0.96	0.96	0.32	0.32
VOC	Butadiene, 1,3-	0.10	µg/m^3	11.06	5.53	1.26	0.66	0.42	0.42	0.53	0.42	0.42	b	b	0.53	0.53	0.53	0.42	0.27
VOC	Carbon tetrachloride	0.17	µg/m^3	18.50	9.25	3.11	1.15	0.37	0.37	0.26	0.22	0.22	b	b	1.22	1.22	1.22	0.74	0.74
VOC	Chloroform	0.50	µg/m^3	4.88	2.44	0.72	0.39	0.17	0.16	0.16	0.22	0.22	b	b	0.57	0.57	0.57	0.25	0.22
VOC	Tetrachloroethylene	0.17	µg/m^3	19.95	9.97	1.99	1.12	0.84	0.72	0.72	0.80	0.68	b	b	1.00	1.00	1.00	0.64	0.64
VOC	Trichloroethylene	0.5/0.2[a]	µg/m^3	5.37	2.69	0.64	0.41	0.38	0.26	0.26	0.42	0.42	b	b	1.10	1.10	1.10	0.46	0.46
VOC	Vinyl chloride	0.11	µg/m^3	11.62	5.81	1.30	0.56	0.56	0.44	0.44	0.49	0.58	b	b	0.65	0.65	0.65	0.51	0.51

A-rated: MDL to Target MDL ratio ≤ 1

B-rated" MDL to Target MDL ratio between 1 and 2

Does Not Meet MDL to Target MDL ratio>2

-- No data available

[a]: For the 2012 sampling year, the Target MDL for this pollutant was reduced.

[b]: Pollutant was expected, but invalidated at this site for this year.

Table 8. NATTS Network Assessment: MQO#3 - Bias Percent Difference at South DeKalb, GA

Pollutant Group	Pollutant Name	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Carbonyls	Acetaldehyde	-9.7	2.6	-13.8	-26.6	-14.3	-22.1	-2.7	-16.5	a	0.1	-4.3	a	-7.1	0.9	-11.2
Carbonyls	Formaldehyde	4.4	16.7	-8.5	-16.6	-3.2	-7.8	-4.3	-21.7	a	0.5	-2.2	a	-8.6	-8.8	-5.2
Chromium VI	Chromium VI	--	a	a	a	a	-5.6[b]	10.5[b]	a	19.5	-6.5	--	--	--	--	--
PAH	Benzo(a)pyrene	--	--	--	a	a	-1.7	-2.3	-2.1	25.2	-23.6	-33.4	-24.6	-23.3	-16.2	-10.2
PAH	Naphthalene	--	--	--	a	a	-7.7	-17.1	-13.9	21.4	-2.8	-35.3	-35.1	-34.0	-30.4	-34.9
PM_{10} Metals	Arsenic (PM_{10})	6.3	134.0	-0.5	8.2	13.3	-0.3	5.9	-5.5	4.9	-22.8	22.5	a	-25.1	-40.8	-6.3
PM_{10} Metals	Beryllium (PM_{10})	41.0	525.5	-2.3	19.9	-1.7	2.9	4.8	-2.5	7.2	-4.2	c	a	-11.0	-1.8	-6.9
PM_{10} Metals	Cadmium (PM_{10})	5.9	146.8	-10.5	7.2	7.3	-6.9	0.0	-9.2	4.2	-8.6	c	a	-8.6	2.7	-9.4
PM_{10} Metals	Lead (PM_{10})	-9.3	160.5	-5.9	6.1	14.0	32.4	-1.1	-6.6	10.9	-6.5	5.6	a	-9.4	8.0	-5.6
PM_{10} Metals	Manganese (PM_{10})	-4.2	122.5	-14.2	-10.1	-19.5	-27.8	1.0	-4.3	11.0	3.6	21.1	a	-7.1	0.6	-1.5
PM_{10} Metals	Nickel (PM_{10})	14.9	143.7	-14.7	-2.8	8.4	-13.9	8.6	-8.1	2.1	-6.2	d	a	12.3	17.8	-0.6
VOC	Benzene	-12.4	-2.6	-4.3	-9.9	-15.4	-15.3	-13.2	-11.3	a	4.5	-1.5	-16.5	-30.6	-6.9	-32.1
VOC	Butadiene, 1,3-	-4.2	-2.0	0.5	-14.0	1.0	-17.8	25.6	-13.7	a	1.7	-8.2	-6.4	-16.9	-32.0	-3.1
VOC	Carbon tetrachloride	0.4	2.9	2.3	1.6	5.5	-12.3	2.0	-20.0	a	-9.4	2.1	116.9	51.2	2.3	-21.5
VOC	Chloroform	-8.0	-1.2	-3.4	-4.0	-13.0	-17.5	-16.5	-25.8	a	5.7	3.4	-5.4	-16.3	4.5	-25.0
VOC	Tetrachloroethylene	-14.9	-6.9	-8.1	-9.5	-4.5	-15.9	-10.8	-20.8	a	-7.6	3.1	-40.6	-18.0	-3.9	-34.3
VOC	Trichloroethylene	-5.0	-5.5	4.1	-2.3	-6.3	-12.1	-10.1	-19.7	a	-2.0	-8.3	-19.5	-29.2	-3.0	-37.0
VOC	Vinyl chloride	-19.1	-12.4	-4.3	-1.3	-15.5	-8.5	-2.4	-14.4	a	-7.7	-0.7	1.3	-16.9	-8.8	-24.9

A-rated:±25%

B-rated: Between 25% to 35% or between -25% to -35%

Does not meet:>35% or <35%

-- No data available

[a]: No Proficiency Test samples were sent for this pollutant and year.

[b]: Proficiency Test results are from the National Contract Lab for EPA's School Air Toxics Monitoring Program. The %Difference was -5.55% in 2009 and 10.53% in 2010.

[c]: The Proficiency Test sample for this pollutant was 0; the site reported a concentration as "< MDL", rather than 0. EPA accepted this result.

[d]: Although a Proficiency Test sample was sent to the lab supporting this site and year, the results were nullified by EPA due to QA issues.

Table 9. NATTS Network Assessment: MQO#4 - Overall Method Precision %CV at South DeKalb, GA

Pollutant Group	Pollutant Name	Overall Method precision % CV															
		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Carbonyls	Acetaldehyde	--	--	--	22.0	31.5	17.1	14.9	27.9	23.3	--	--	--	--	52.1	33.3	56.9
Carbonyls	Formaldehyde	--	--	--	45.4	42.9	23.2	41.5	51.3	41.6	--	--	--	--	10.8	25.6	55.8
Chromium VI	Chromium VI	--	--	63.1	18.8	13.4	31.9	14.1	22.0	16.8	31.9	7.9	--	--	--	--	--
PAH	Benzo(a)pyrene	--	--	--	--	11.0	1.9	a	10.9	5.2	a	a	a	a	141.1	106.7	30.6
PAH	Naphthalene	--	--	--	--	9.1	7.0	11.8	9.1	6.4	46.3	38.0	22.1	11.0	136.9	81.1	4.3
PM_{10} Metals	Arsenic (PM_{10})	--	--	--	17.4	28.4	16.4	18.3	27.7	19.5	15.9	41.8	39.0	39.9	a	14.7	a
PM_{10} Metals	Beryllium (PM_{10})	--	--	--	a	a	a	84.9	0	53.3	a	a	a	a	a	a	a
PM_{10} Metals	Cadmium (PM_{10})	--	--	--	44.0	33.0	31.0	22.0	43.8	46.9	20.4	66.5	56.0	10.3	a	35.2	a
PM_{10} Metals	Lead (PM_{10})	--	--	--	25.2	26.5	21.6	27.2	17.3	15.5	14.2	34.9	29.6	30.9	a	6.5	5.5
PM_{10} Metals	Manganese (PM_{10})	--	--	--	33.1	27.5	23.7	24.6	25.5	15.5	22.8	45.2	31.5	33.3	a	13.8	0.3
PM_{10} Metals	Nickel (PM_{10})	--	--	--	47.0	33.7	23.3	15.2	41.0	23.8	16.7	37.3	31.7	40.6	a	4.6	18.2
VOC	Benzene	58.2	57.3	13.3	15.5	21.1	23.1	28.5	23.7	22.3	--	--	23.9	27.9	25.6	44.5	21.8
VOC	Butadiene, 1,3-	--	--	a	a	a	a	a	a	a	--	--	a	a	a	a	19.5
VOC	Carbon tetrachloride	--	--	a	19.1	14.9	12.0	9.5	12.6	16.5	--	--	13.9	16.9	11.8	10.2	12.6
VOC	Chloroform	--	--	a	7.7	22.1	10.8	15.0	0.0	a	--	--	28.3	a	17.7	8.8	13.8
VOC	Tetrachloroethylene	--	--	23.6	18.8	20.0	23.5	21.9	47.3	a	--	--	a	26.3	41.2	11.7	16.0
VOC	Trichloroethylene	--	--	a	a	a	a	a	a	a	--	--	a	a	118.4	3.8	39.4
VOC	Vinyl chloride	--	--	a	a	a	a	a	a	a	--	--	a	a	88.8	a	24.1

A-rated:≤ 15% CV

B-rated: Between 15%CV to25% CV

Does Not Meet: >25% CV or did not report Precision (required in the NATTS Workplan Template since 2012)

-- No data available

[a]: Although both primary and secondary data were reported, both sets of values were less than the MDL. Thus no %CV was calculated.

Table 10. NATTS Network Assessment: MQO#4 - Analytical Precision %CV at South DeKalb, GA

Pollutant Group	Pollutant Name	Analytical Method precision % CV															
		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Carbonyls	Acetaldehyde	--	--	--	--	--	--	--	--	--	a	a	a	a	a	1.4	b
Carbonyls	Formaldehyde	--	--	--	--	--	--	--	--	--	a	a	a	a	0.4	1.7	0.5
Chromium VI	Chromium VI	--	--	--	5.2	5.0	5.0	8.2	4.7	5.4	3.0	7.0	--	--	--	--	--
PAH	Benzo(a)pyrene	--	--	--	--	4.2	5.5	b	9.4	1.1	3.1	a	a	a	a	a	a
PAH	Naphthalene	--	--	--	--	1.4	1.4	2.9	1.3	2.8	3.3	a	a	a	a	a	b
PM_{10} Metals	Arsenic (PM_{10})	--	--	--	--	--	--	--	--	--	a	a	a	a	a	b	b
PM_{10} Metals	Beryllium (PM_{10})	--	--	--	--	--	--	--	--	--	a	a	a	a	a	b	b
PM_{10} Metals	Cadmium (PM_{10})	--	--	--	--	--	--	--	--	--	a	a	a	a	a	b	b
PM_{10} Metals	Lead (PM_{10})	--	--	--	--	--	--	--	--	--	a	a	a	a	a	0	b
PM_{10} Metals	Manganese (PM_{10})	--	--	--	--	--	--	--	--	--	a	a	a	a	a	0	b
PM_{10} Metals	Nickel (PM_{10})	--	--	--	--	--	--	--	--	--	a	a	a	a	a	b	b
VOC	Benzene	--	--	--	--	--	--	--	--	--	a	a	a	a	a	a	1.2
VOC	Butadiene, 1,3-	--	--	--	--	--	--	--	--	--	a	a	a	a	a	a	a
VOC	Carbon tetrachloride	--	--	--	--	--	--	--	--	--	a	a	a	a	a	a	a
VOC	Chloroform	--	--	--	--	--	--	--	--	--	a	a	a	a	a	a	a
VOC	Tetrachloroethylene	--	--	--	--	--	--	--	--	--	a	a	a	a	a	a	a
VOC	Trichloroethylene	--	--	--	--	--	--	--	--	--	a	a	a	a	a	a	a
VOC	Vinyl chloride	--	--	--	--	--	--	--	--	--	a	a	a	a	a	a	a

	A-rated:≤ 15% CV
	B-rated: Between 15%CV to25% CV
	Does Not Meet: >25% CV or did not report Precision (required in the NATTS Workplan Template since 2012)
--	No data available

[a]: Per the NATTS Workplan template, analytical replicates were required to be reported to AQS for this sampling year

[b]: The primary and/or replicate value were less than the MDL, so no calculation could be made.

Appendix A. Equipment Inventory

Pollutant Type	Year(s)	Manufacturer/Model, Extraction Type, and Year
Sampling Equipment		
Carbonyls	2003-2004	ATEC 800 Sequential Sampler (Year Deployed: 2003)
	2005-2009	ATEC 8000 Cartridge Sampler (Year Deployed: 2005)
	2010-2018	ATEC 8000 Cartridge Sampler (Year Deployed: 2010)
Chormium VI	2005-2006	RM Environmental Systems (Year Deployed: 2005)
	2007-2010	ATEC 3400 Toxic Air Sampler (Year Deployed: 2007)
	2011-2013	ATEC model 3400 Toxic Air Sampler (2 units) (Year Deployed: 2007, 2008)
PAHs	2007-2010	Anderson Hi-Vol Sampler (Year Deployed: unknown)
	2011-2011	Tisch Environmental TE-1000 PUF Sampler (2 units) (Year Deployed: 2006)
	2012-2012	Tisch Environmental TE-1000 PUF Sampler (2 units) (Year Deployed: 2006/<2000)
	2013-2015	Tisch 1000 sampler (Year Deployed: <2000)
	2016-2018	Tisch Puf Hi-Vol (2) (Year Deployed: 2016)
PM_{10} Metals	2003-2010	Anderson A-1200 Hi-Volume Sampler (Year Deployed: <1980)
	2011-2015	Anderson A-1200 Hi-Volume Sampler (2 units) (Year Deployed: 2000)
	2016-2018	Graseby-Andersen Hi-Vol (2) (Year Deployed: 2016)
VOCs	2003-2004	Anderson A-1200 Hi-Volume Sampler (Year Deployed: 2003)
	2005-2009	ATEC 2200 Toxic Air Sampler (Year Deployed: 2005)
	2010-2018	ATEC model 2200 Toxic Air Sampler (Year Deployed: 2010)
Analytical Equipment		
Carbonyls	2003-2003	HPLC with PE LC-95 UV/Vis detection (Year Deployed: unknown)
	2004-2010	Waters HPLC/ PDA detection (Year Deployed: 2004)
	2011-2015	PC 200 HPLC/ variable wavelength detection (Year Deployed: 2004)
	2016-2018	PE Series 200 HPLC/UV-VIS (1); PE Flexar HPLC/UV-VIS (2) (Year Deployed: 2016)
Chormium VI	2005-2013	Dionex 300 ion chromatography system (Year Deployed: 2001)
PAHs	2007-2007	HP/Agilent 5890/5971 GC/MS (Year Deployed: 1990)
	2008-2011	HP/Agilent 5890/5971 GC/MS (Year Deployed: 2008)
	2012-2012	HP/Agilent 5890/5971 GC/MS; Agilent 5973/6890 (Year Deployed: 2008/2000)
	2013-2015	Agilent 5973/6890 (Year Deployed: 2000)
	2016-2018	Agilent 6890/5973N GC/MS (Year Deployed: 2016)
PM_{10} Metals	2003-2005	PE ELAN 9000 ICP-MS (Year Deployed: 2002)
	2006-2018	PE ELAN 9000 ICP-MS (Year Deployed: 2006)
VOCs	2003-2004	HP/Agilent 5890/5972 GC/MS (Year Deployed: 1993)
	2005-2006	HP/Agilent 6890/5973 GC/MS (Year Deployed: 2005)
	2007-2018	HP/Agilent 6890N/5973 GC/MS (Year Deployed: 2007)
Preconcentrator Equipment		
VOCs	2003-2005	Entech 7100 (1), Entech 7016CA (2) (Year Deployed: 1998)
	2006-2010	Entech 7100 (1), Entech 7016CA (2); Entech 7100 (3), Entech 7016CA (4) (Year Deployed: 1998 (1,2), 2006 (3,4))
	2011-2015	Entech 7100A (1), Entech 7016CA (2) (Year Deployed: 1998 (1), 2006 (2))
	2016-2018	Entech 7100 (Year Deployed: 2016)

Appendix A. Equipment Inventory

Pollutant Type	Year(s)	Manufacturer/Model, Extraction Type, and Year
Standards Preparation Equipment		
VOCs	2003-2010	Entech 4560SL (dynamic dilution) (Year Deployed: 1995)
	2011	Entech model 4560L (1),Entech model 4560A (2) (hot) (Year Deployed: 1995 (1), 2010 (2))
	2012-2015	Entech 4560A (dynamic dilution) (Year Deployed: 2010)
	2016-2018	Entech 4600 (dynamic dilution) (Year Deployed: 2016)
Canister Cleaning Equipment		
VOCs	2003-2013	Entech 3100SL (Hot) (Year Deployed: 2000)
	2011-2015	Entech model 3100SL (hot) (Year Deployed: 2000)
	2016-2018	Entech 3100 (3)(Hot) (Year Deployed: 2016)
PM_{10} Extraction Equipment		
PM_{10} Metals	2003-2011	Environmental Express (Hotblock) (Year Deployed: 2000)
	2012-2018	Environmental Express (Hotblock) (Year Deployed: 2012)
Chromium VI Extraction Equipment		
Chormium VI	2005-2010	Branson 8510 (Sonicator) (Year Deployed: 2001)
	2011	Branson 8510 Sonicator/ Branson Shaker (Year Deployed: 2001/2011)
	2012-2013	Branson Shaker (Year Deployed: 2011)
PAHs Extraction Equipment		
PAHs	2007-2011	Dionex -300 (ASE) (Year Deployed: 2004)
	2012	Dionex -300 (ASE); Electrothermal 6 position heating mantle (Year Deployed: 2004/1996)
	2013-2015	Electrothermal 6 position heating mantle (Soxhlet) (Year Deployed: 1996)
	2016-2018	Electrothermal 6 position heating mantle (Soxhlet) (Year Deployed: 2015)