

Oakland County

Largemouth Bass

Big Seven Lake

Oakland County

Hg Analysis:

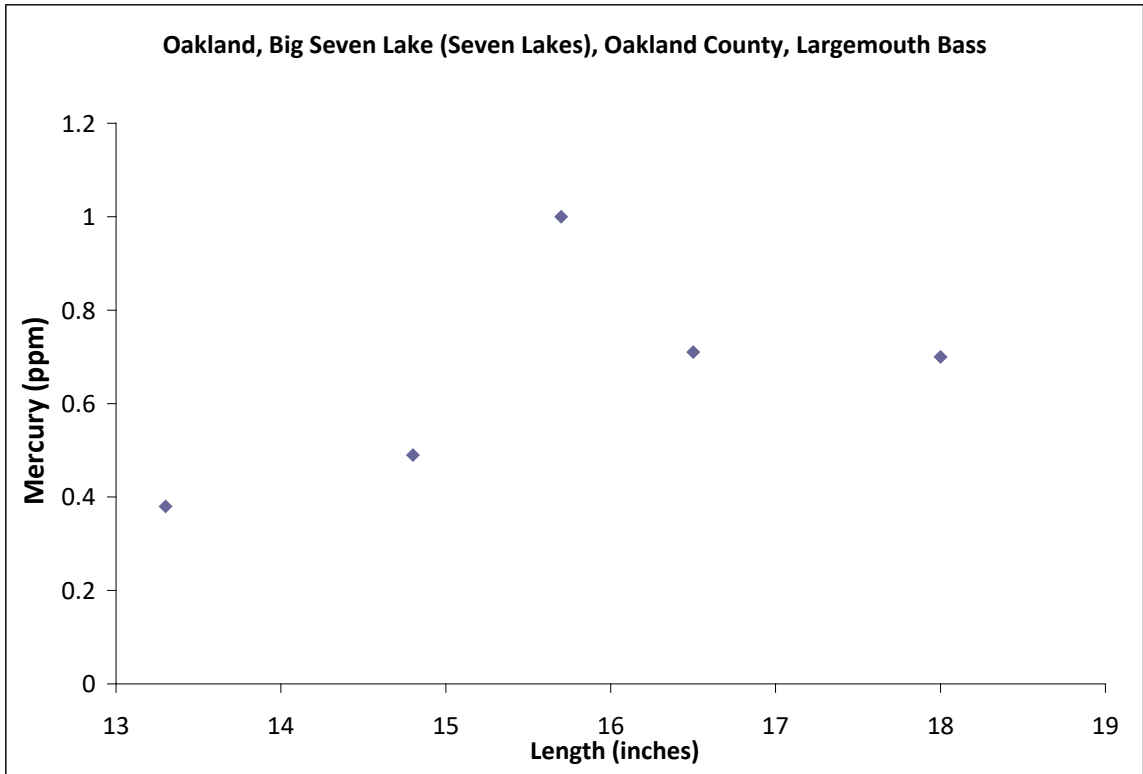
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2004	2004	5	13.3	14	14.8	18
Datasets available: 2004						
Chemical	Sample Size (All)	Mean (ppm)		95%UCL	Meal Category	
Mercury	5	0.656		0.95	1	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.323	0.453				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	0	--	14	--	--
Datasets available: 2004						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	0	--		--	--	
DDT	0	--		--	--	
Chlordane	0	--		--	--	
Toxaphene	0	--		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:					1	

Existing Advisory: Big Seven Lake largemouth bass are covered under the statewide mercury consumption advisory.

Recommendation: No one should eat more than 1 meal per month of Big Seven Lake largemouth or smallmouth bass less than 18 inches and no more than 6 meals per year of Big Seven Lake largemouth or smallmouth bass greater than 18 inches due to mercury. One sublegal size bass is included in the UCL. Statewide guideline length break applied.



Hg Analysis:

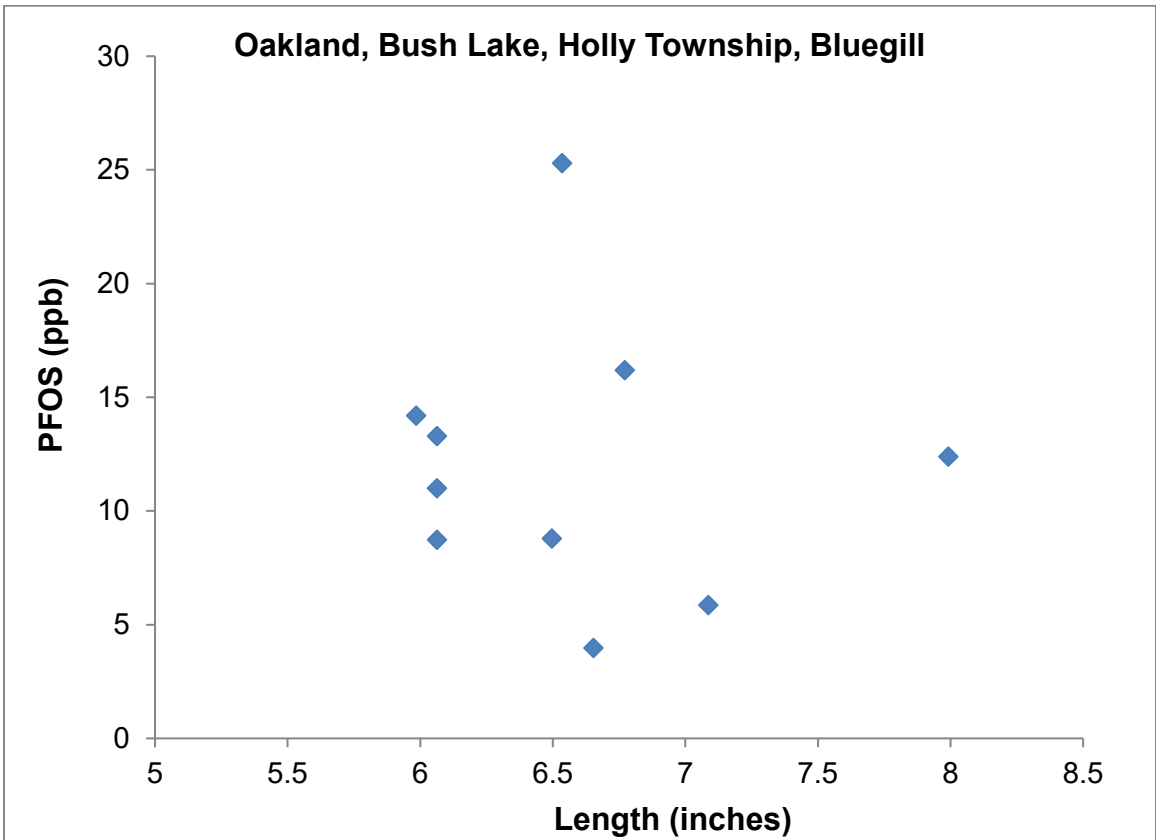
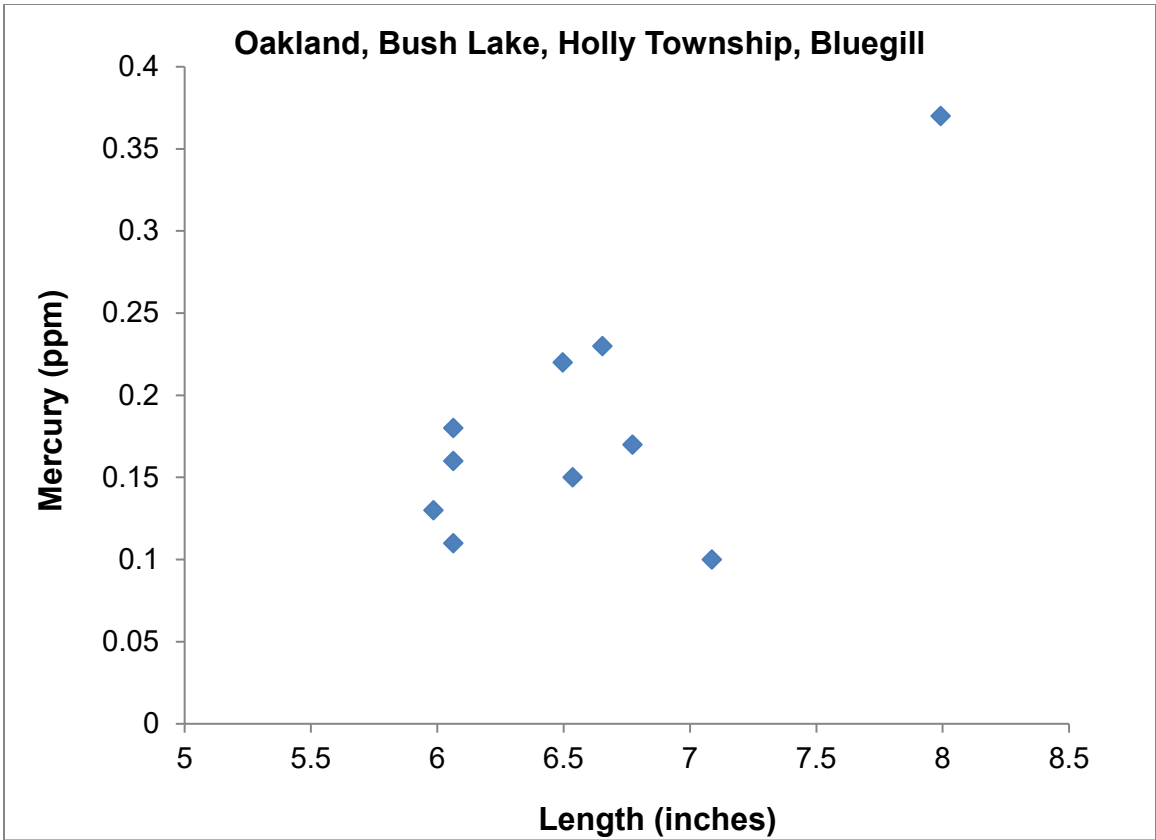
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		Meal Category
Earliest	Most Recent				Min	Max	
2021	2021	10	6.0	NA	6.0	8.0	
Datasets available:		2021					
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category	
Mercury	10	0.182	0.100	0.370	0.238	4	
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.483	0.325					

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		Meal Category
Earliest	Most Recent				Min	Max	
2021	2021	10	6.0	NA	6.0	8.0	
Datasets available:		2021					
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category	
PCB	0	--	--	--	--	--	
DDT	0	--	--	--	--	--	
Chlordane	0	--	--	--	--	--	
Toxaphene	0	--	--	--	--	--	
PFOS	10	12.0 ppb	4.0 ppb	25.3 ppb	16.3 ppb	8	
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB							
DDT							
Chlordane							
Toxaphene							
PFOS	0.005	0.011	Final meal category based on UCL:				4

Existing MDHHS Advisory: Bluegill and sunfish from Bush Lake in Holly Township are currently covered under the statewide guidance for mercury. No one should eat more than eight meals per month of bluegill or sunfish of any size.

Recommendation: No one should eat more than four meals per month of bluegill or sunfish of any size from Bush Lake in Holly Township due to mercury. PFOS causes less-restrictive advice.



Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2021	2021	10	7.9	14.0	7.9	14.4
Datasets available: 2021						
Chemical	Sample Size (All*)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.478	0.350	0.670	0.546	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.246	0.188				

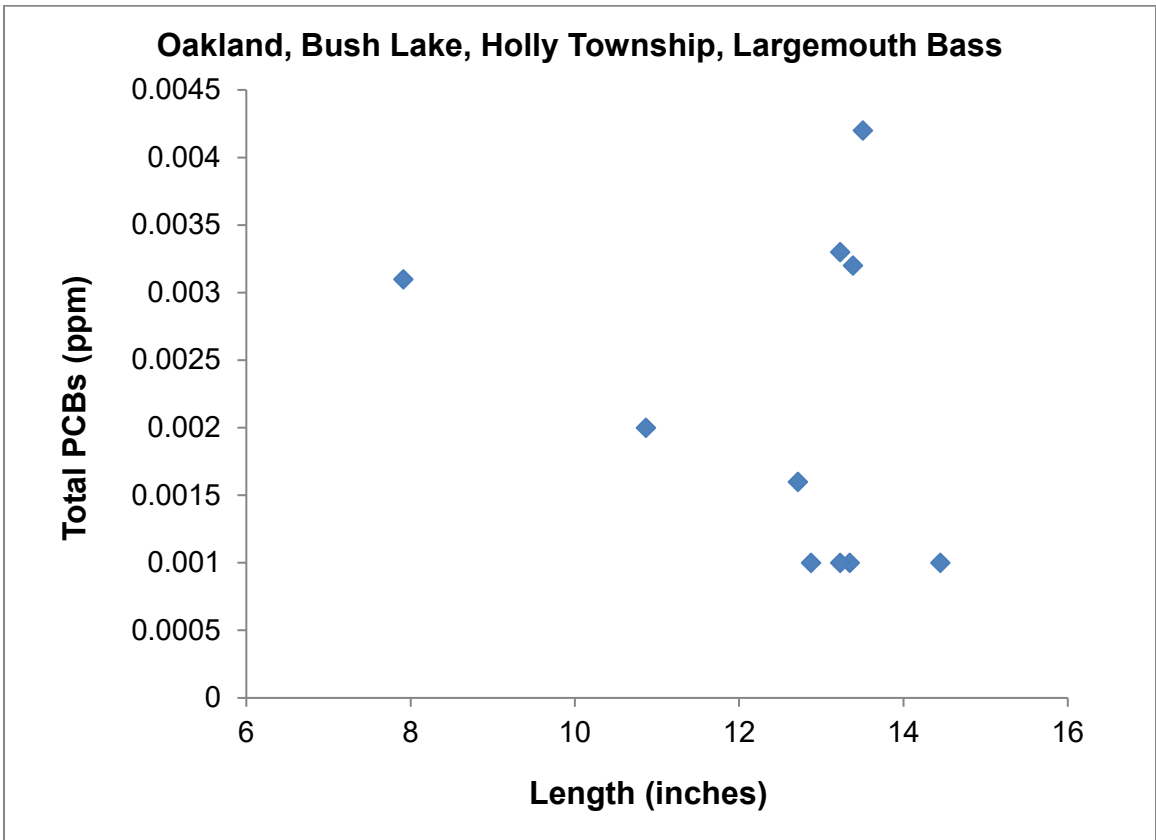
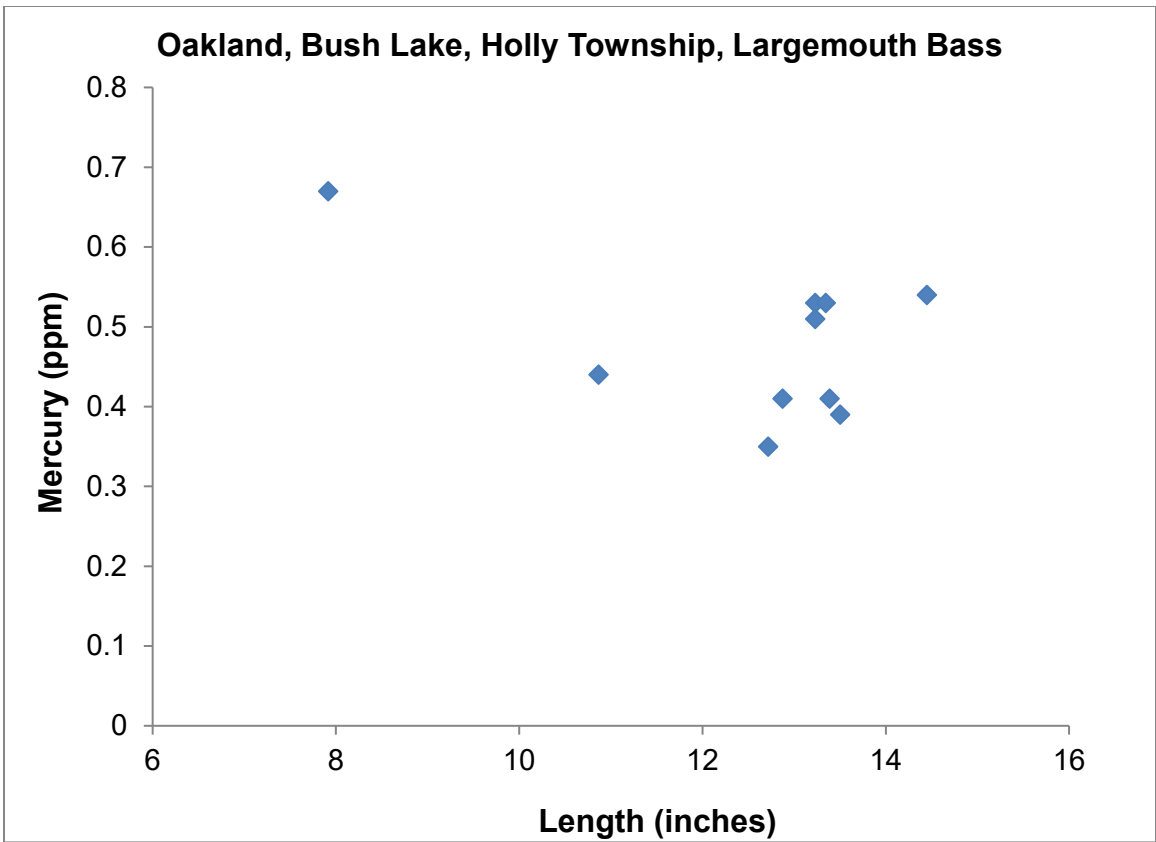
Organics Analysis:

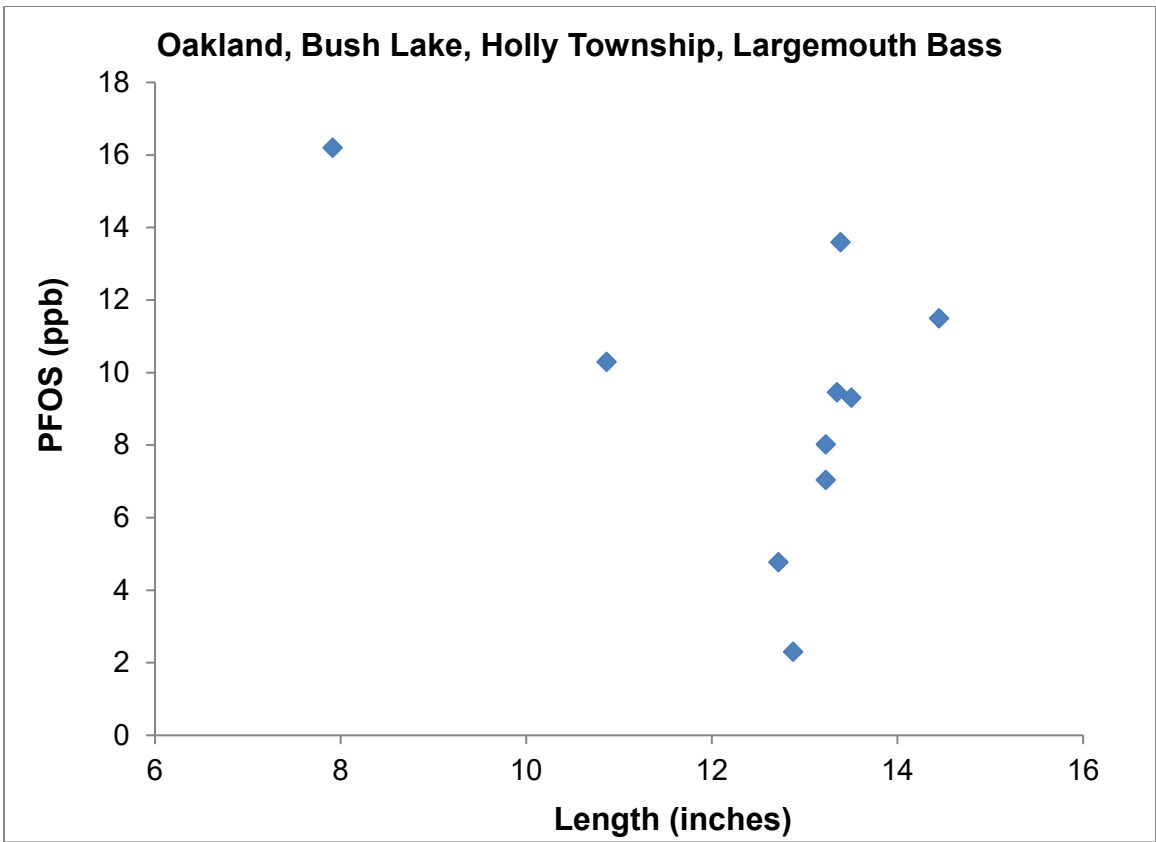
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2021	2021	10	7.9	14.0	7.9*	14.4
Datasets available: 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.002	<0.001	0.004	0.003	16
DDT	10	0.001	<0.001	0.001	0.001	16
Chlordane	10	ND	--	--	--	--
Toxaphene	10	ND	--	--	--	--
PFOS	10	9.3 ppb	2.3 ppb	16.2 ppb	12.2 ppb	12
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.058	0.105				
DDT	0.000	0.000				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.210	0.092				
Final meal category based on UCL:						1

*Only two legal sized bass were collected in 2021 from Bush Lake. Because the mercury concentrations in the sub-legal sized fish exceeded the 2 meal per month advisory screening level for mercury, they were included in the assessment.

Existing MDHHS Advisory: Largemouth and smallmouth bass from Bush Lake in Holly Township are currently covered under the statewide guidance for mercury. No one should eat more than 2 per month of largemouth or smallmouth bass less than 18 inches in length or no more than 1 meal per month of largemouth or smallmouth bass greater than 18 inches in length.

Recommendation: No one should eat more than one meal per month of largemouth or smallmouth bass smaller than 18 inches or no more than 6 meals per year of largemouth or smallmouth bass larger than 18 inches from Bush Lake in Holly Township due to mercury. PFOS causes less-restrictive advice. State-wide length break was applied due to limited size range of bass in the mercury analysis.





Largemouth/Smallmouth Bass

Cass Lake

Oakland County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1991	2018	17	11.0	14	13.6	18.6
Datasets available: 1991, 2018						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	17	0.658	0.250	1.100	0.807	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.761	0.723				

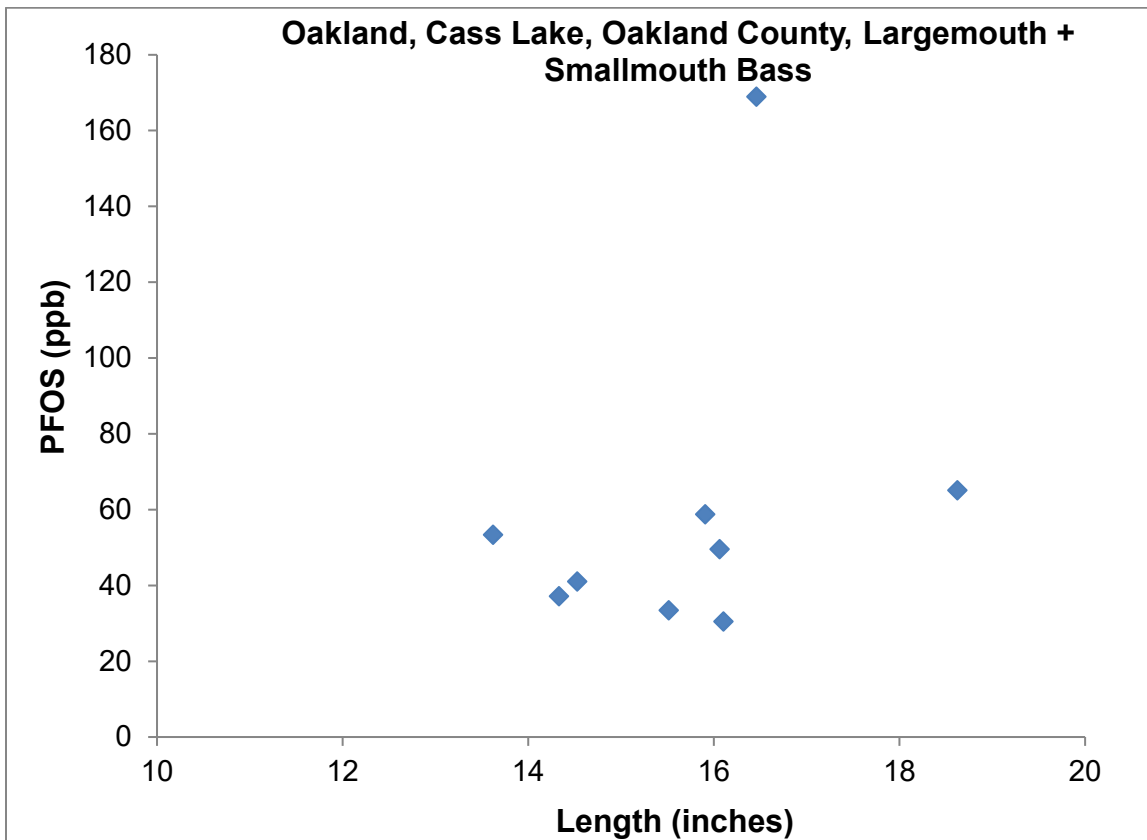
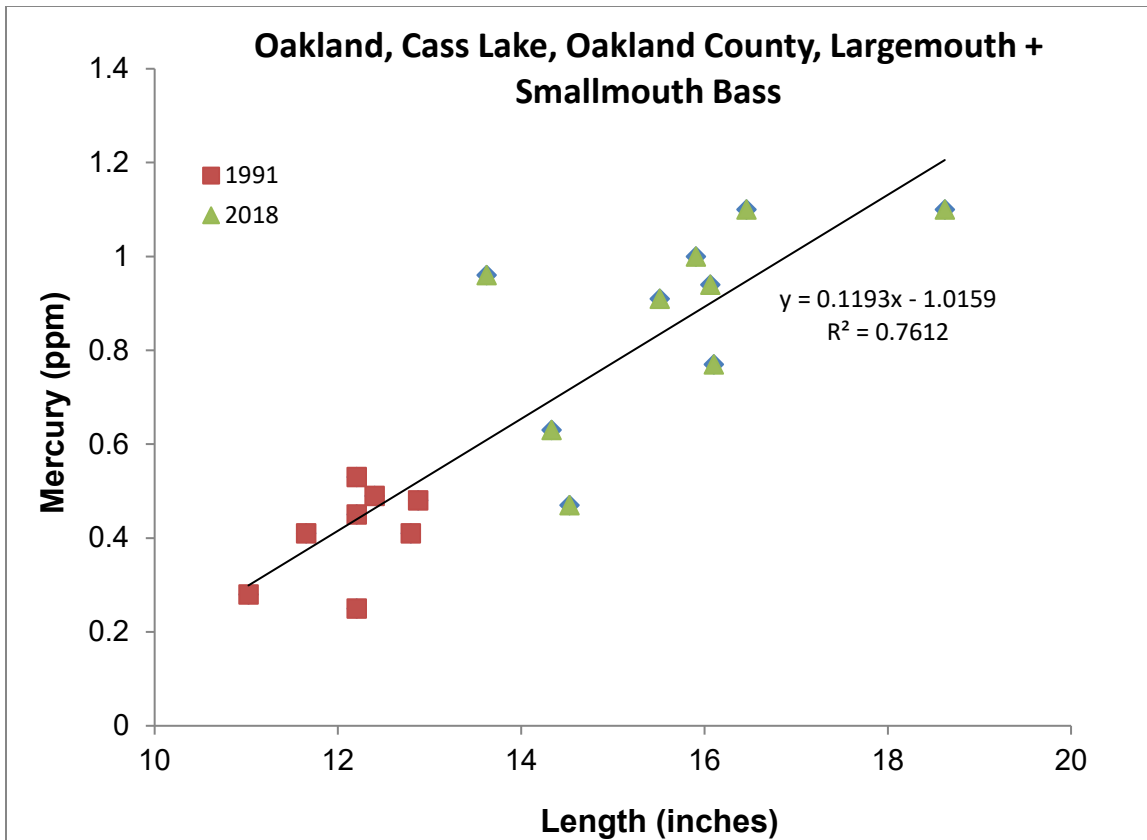
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2018	2018	9	13.6	14.0	13.6	18.6
Datasets available: 1991, 2018						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
PFOS	9	59.8 ppb	30.5 ppb	169 ppb	92.5 ppb	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.095	0.123				
Final meal category based on UCL:						1

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
12	0.4157	2
13	0.5350	2
14	0.6543	1
15	0.7736	1
16	0.8929	1
17	1.0122	1
18	1.1315	0.5
19	1.2508	0.5
<i>Shaded area denotes extrapolated estimates</i>		

Existing MDHHS Advisory: Largemouth and smallmouth bass from Cass Lake in Oakland County are covered by the statewide advisory due to mercury: No one should eat more than 2 meals per month of bass smaller than 18 inches or no more than 1 meal per month of bass larger than 18 inches.

Recommendation: No one should eat more than 1 meal per month of largemouth and smallmouth bass smaller than 18 inches due to PFOS and mercury or no more than 6 meals per year of largemouth and smallmouth bass larger than 18 inches due to mercury. Note: PCB, DDT, Chlordane, and Toxaphene data are available from the 1991 dataset; however, all fish from that year were under the legal size and the data do not warrant more restrictive advice. Therefore, those data were not used in this analysis.



Northern Pike

Cass Lake

Oakland County

Hg Analysis:

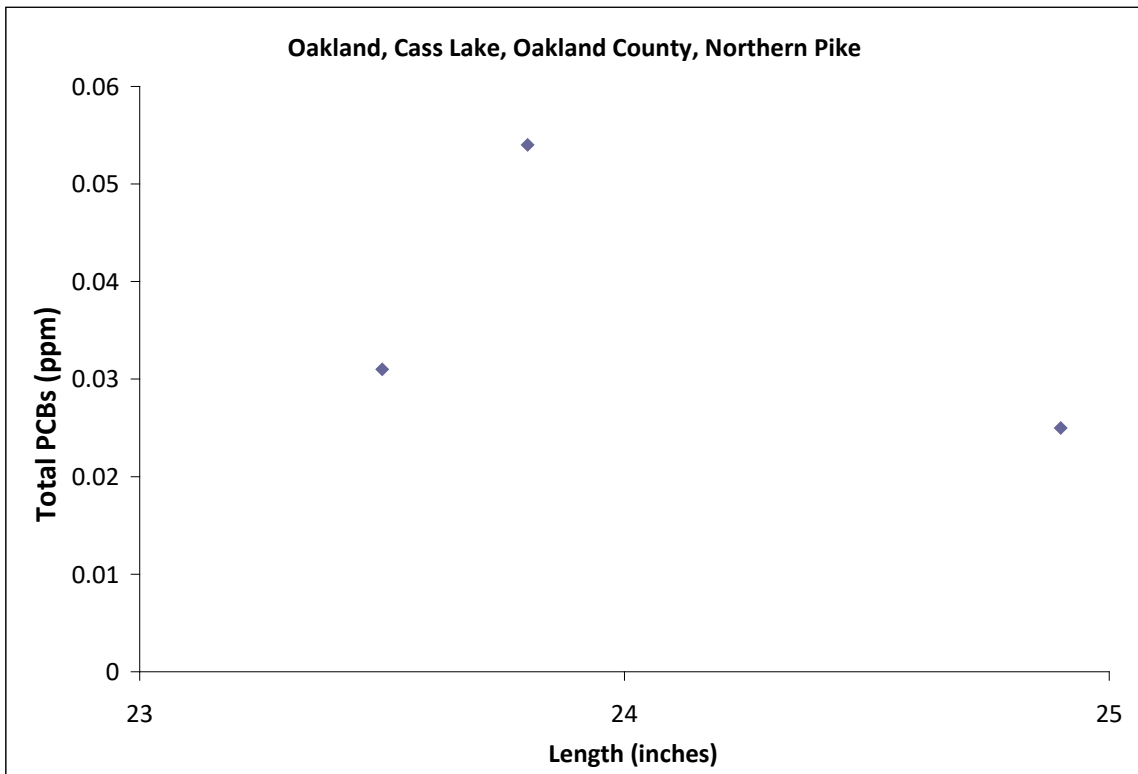
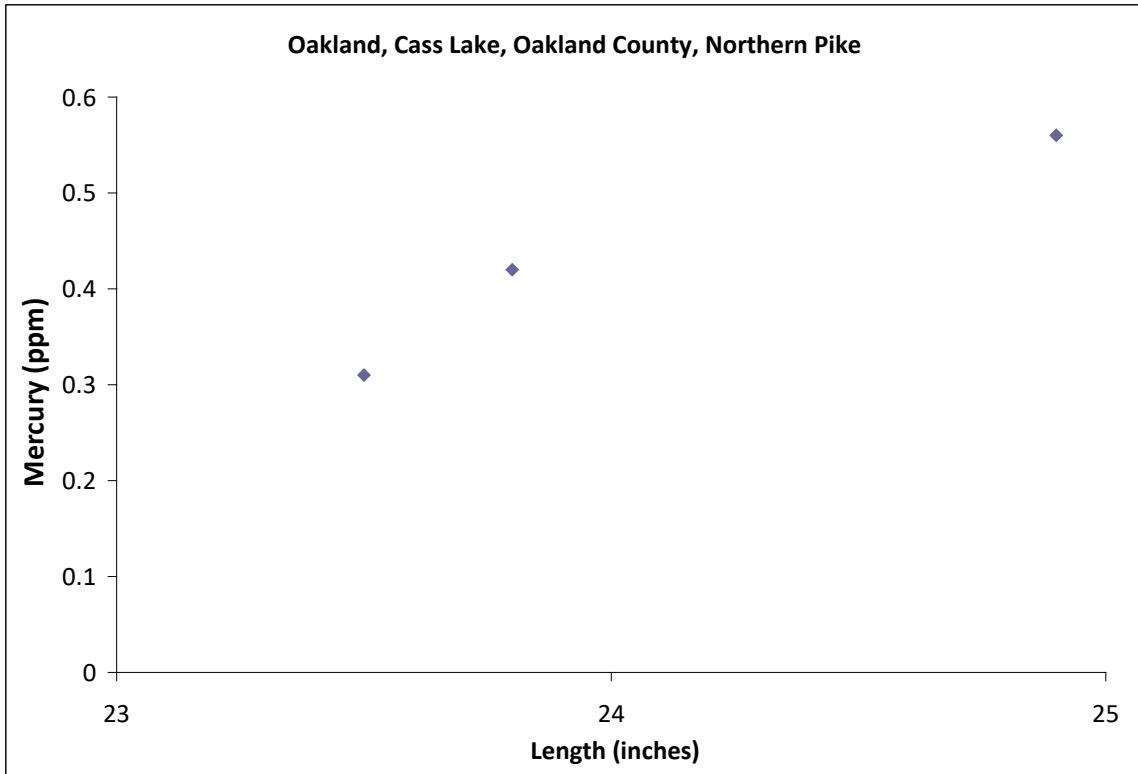
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1991	1991	3	23.5	24	23.5	24.9
Datasets available: 1991						
Chemical	Sample Size (Legal)	Mean (ppm)	95%UCL		Meal Category	
Mercury	3	0.43	--		--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.939	0.892	<i>limited data – regression not used</i>			

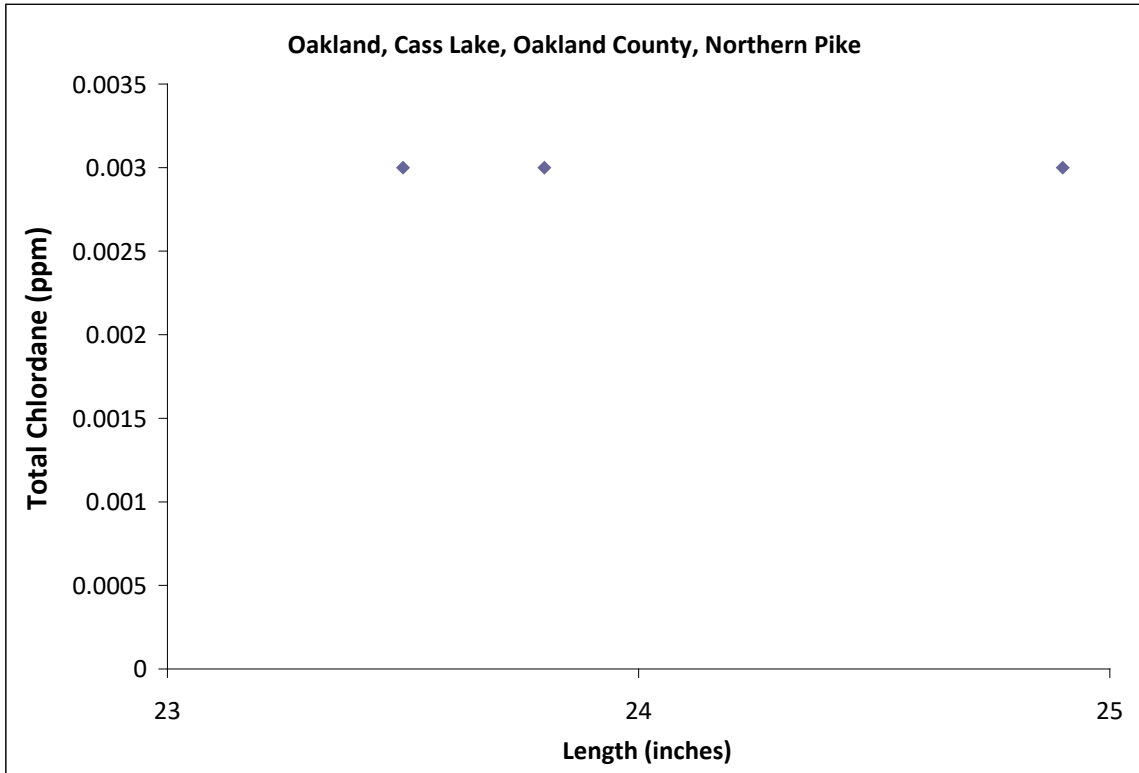
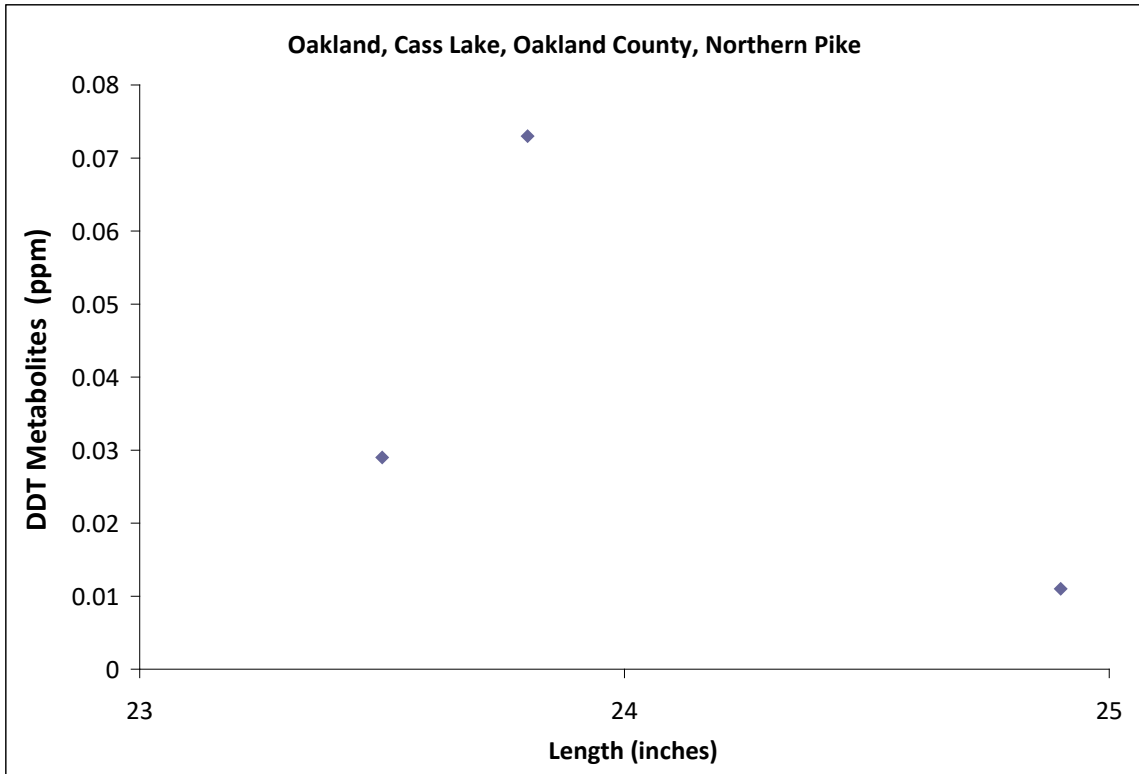
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1991	1991	3	23.5	24	23.5	24.9
Datasets available: 1991						
Chemical	Sample Size (Legal)	Mean (ppm)	95%UCL		Meal Category	
PCB	3	0.037	--		--	
DDT	3	0.038	--		--	
Chlordane	3	0.003	--		--	
Toxaphene	3	ND	--		--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.243	0.312				
DDT	0.323	0.571				
Chlordane	0.000	0.000				
Toxaphene	--	--	Final meal category based on UCL:		--	

Existing Advisory: Cass Lake northern pike are covered under the statewide mercury consumption advisory.

Recommendation: Statewide guidelines apply to Cass Lake northern pike. This dataset is limited due to the small sample size and age of the data. This dataset is not usable to provide a recommendation.





Smallmouth Bass

Cass Lake

Oakland County

Hg Analysis:

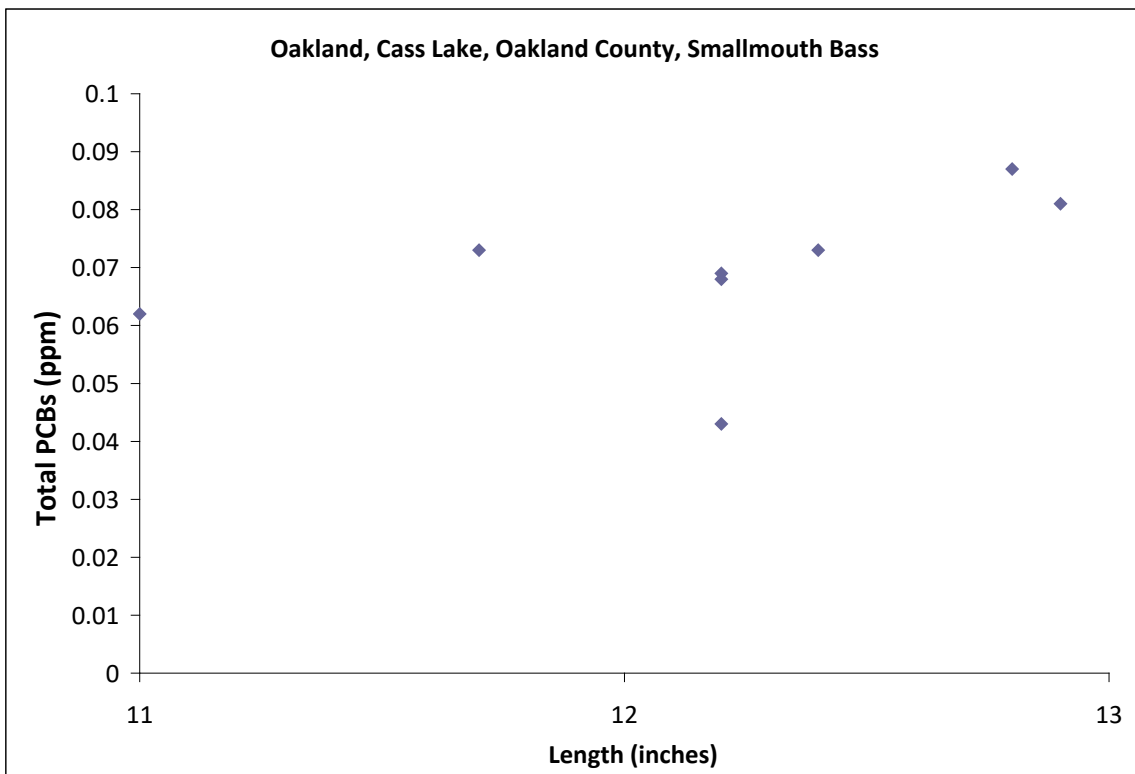
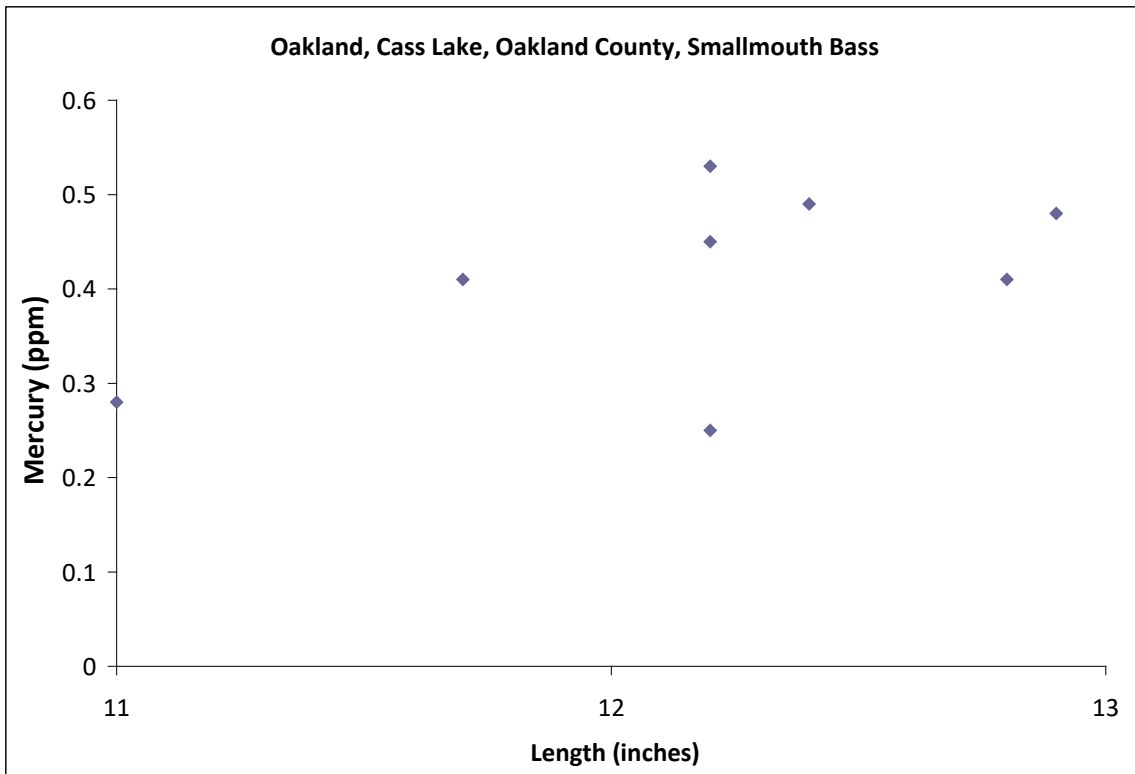
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Sub-Legal Sized Samples		Meal Category
Earliest	Most Recent				Min	Max	
1991	1991	8	11	14	11	12.9	
Datasets available:		1991					
Chemical	Sample Size (Sub-Legal)	Mean (ppm)		95%UCL		Meal Category	
Mercury	8	0.4125		0.500		2	
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.273	0.269					

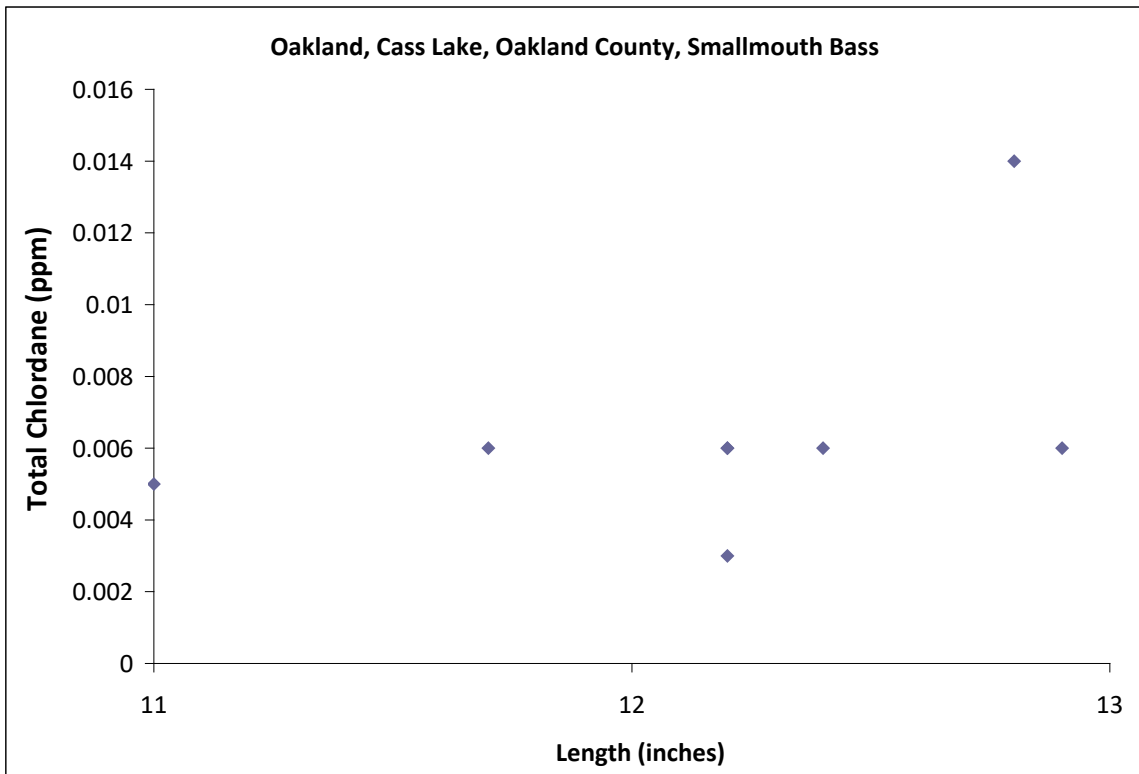
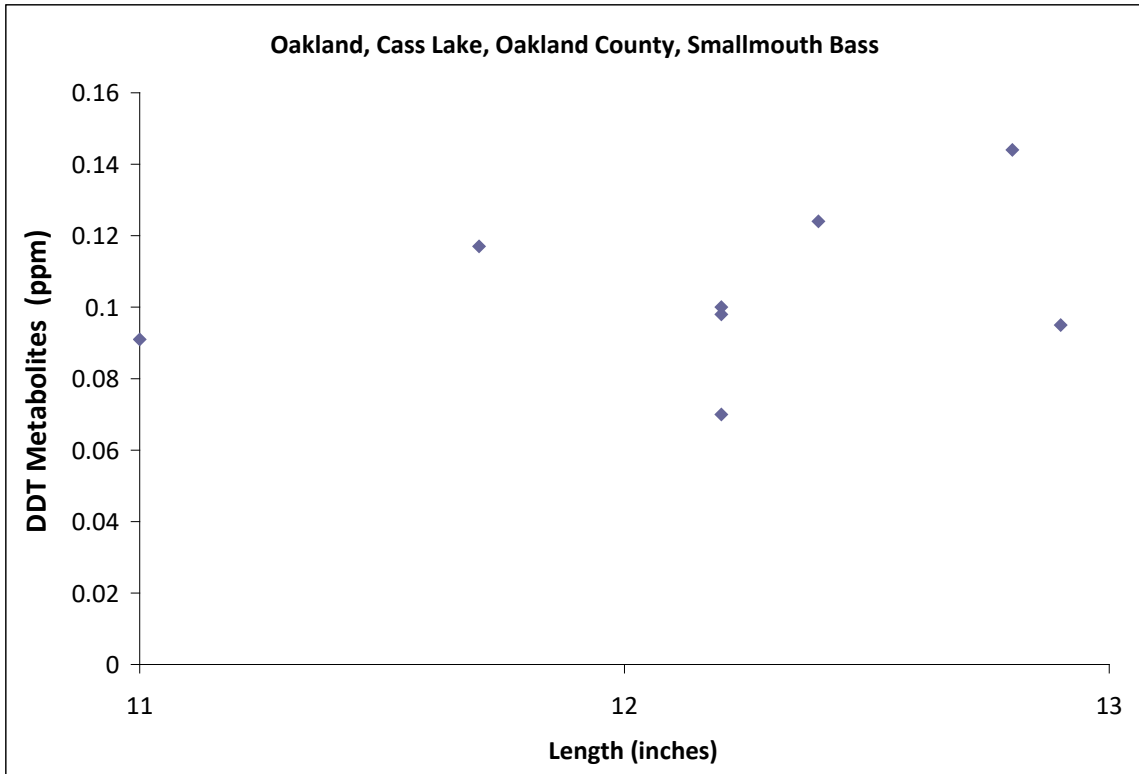
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		Meal Category
Earliest	Most Recent				Min	Max	
1991	1991	8	11	14	11	12.9	
Datasets available:		1991					
Chemical	Sample Size (Sub-Legal)	Mean (ppm)		95%UCL		Meal Category	
PCB	8	0.070		0.080		2	
DDT	8	0.105		0.120		12	
Chlordane	8	0.007		0.010		--	
Toxaphene	8	ND		--		--	
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.223	0.158					
DDT	0.103	0.081					
Chlordane	0.201	0.166					
Toxaphene							
Final meal category based on UCL:						2	

Existing Advisory: Women and children should eat no more than one meal per month and the general population should eat no more than one meal per week of Cass Lake smallmouth bass due to elevated levels of PCBs and mercury.

Recommendation: Statewide guidelines apply to Cass Lake smallmouth bass. This dataset is limited due to age of the data and sublegal lengths of the samples. Due to the limitations of this dataset, the statewide guidelines are recommended.





Walleye

Cass Lake

Oakland County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1991	1991	10	15.2	15	15.2	25.8
Datasets available: 1991						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	10	0.736		0.960	1	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.516	0.467				

Organics Analysis:

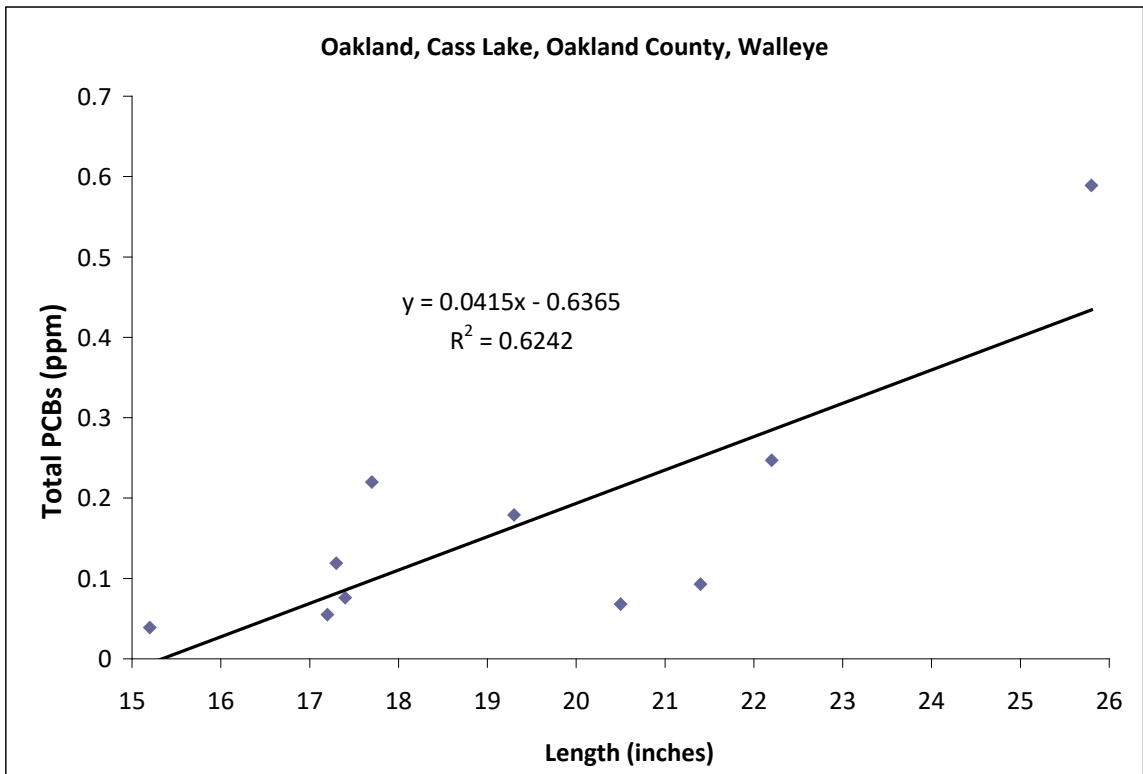
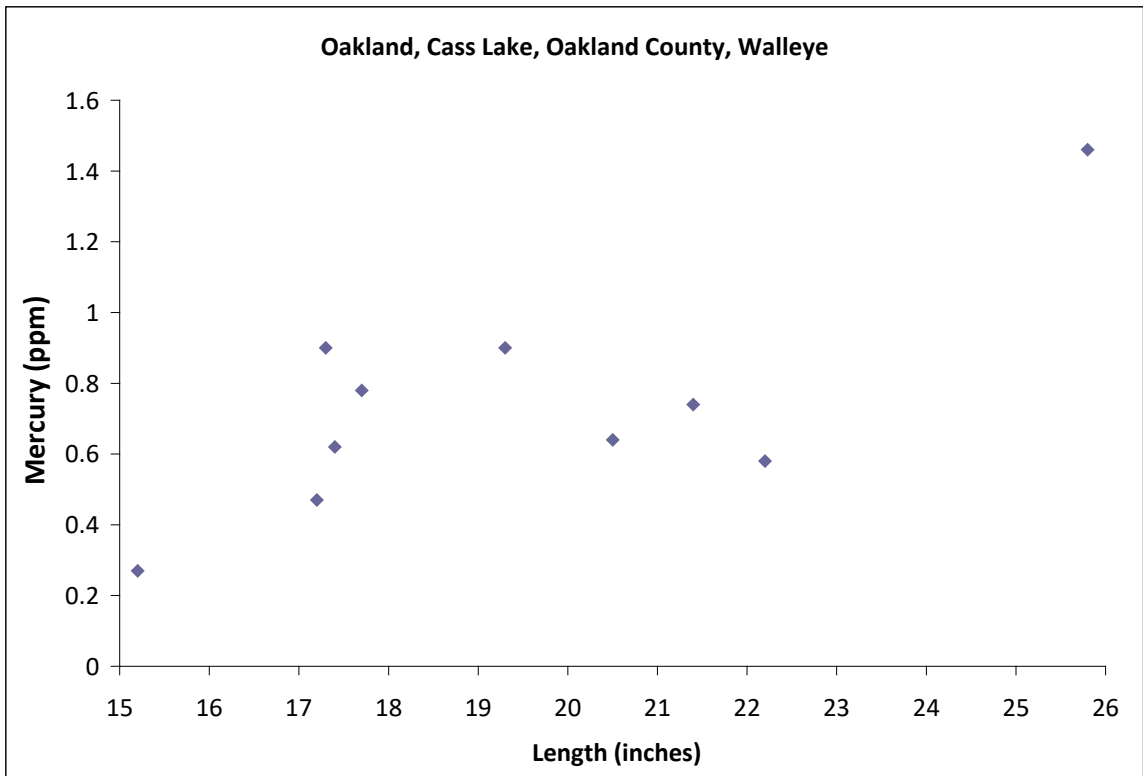
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1991	1991	10	15.2	15	15.2	25.8
Datasets available: 1991						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	10	0.169		0.290	0.5	
DDT	10	0.212		0.340	4	
Chlordane	10	0.027		0.050	--	
Toxaphene	10	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.624	0.568				
DDT	0.455	0.428				
Chlordane	0.477	0.392				
Toxaphene						
Final meal category based on UCL:					0.5	

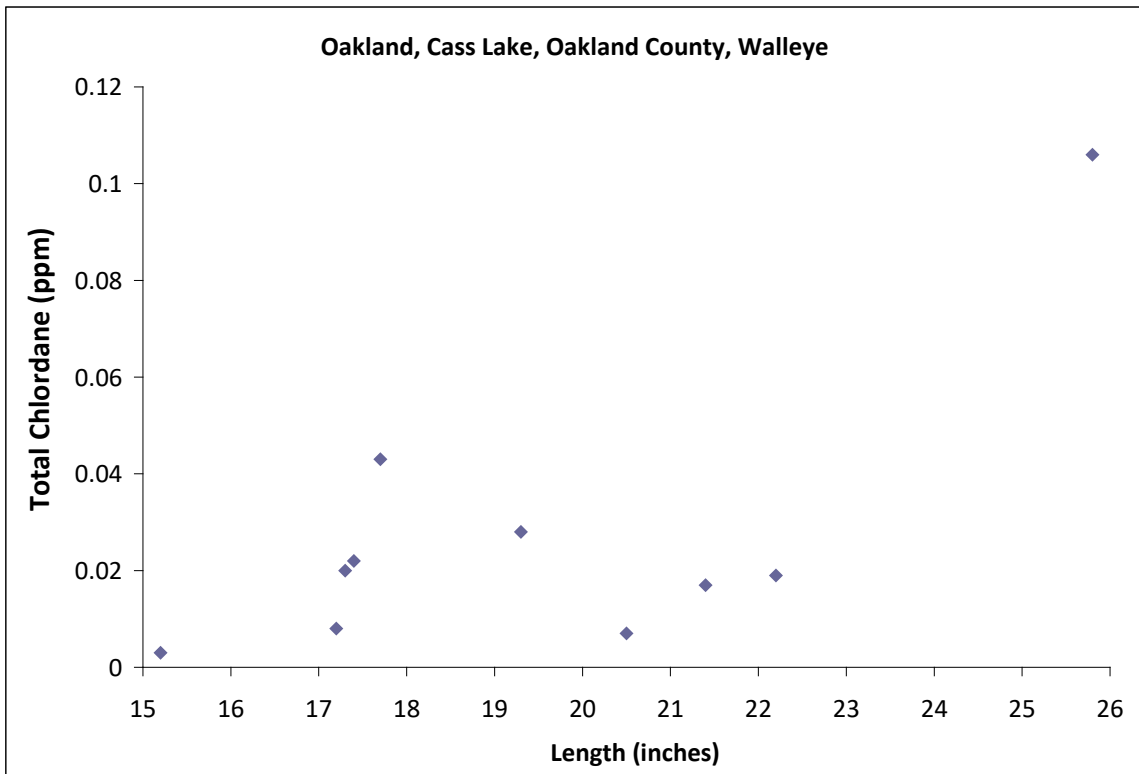
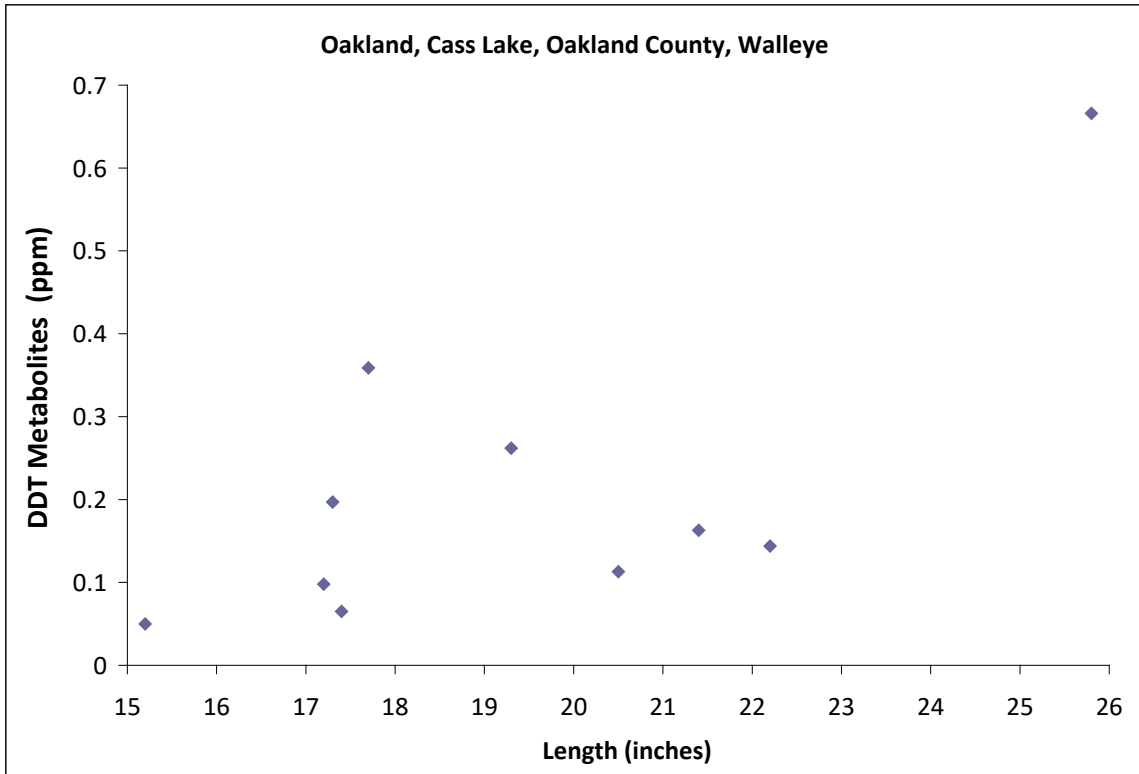
Existing Advisory: Women and children should eat no more than one meal per month of Cass Lake walleye due to elevated concentrations of PCBs and mercury.

Recommendation: No one should eat more than 1 meal per month of Cass Lake walleye less than 24 inches or 6 meals per year more than 24 inches due to mercury and PCBs. DDT would cause an advisory. This dataset is limited by the age of the data. Based on EGLE's Fish Contaminant Monitoring Program, PCB and DDT concentrations ≥15 years old are expected to have declined allowing one meal category less restrictive advice for PCBs. Mercury is causing the advisory in the shorter lengths, whereas PCBs would likely be causing the advisory in the longer lengths of fish.

Length (Inches)	PCB Regression Estimate (ppm)	Meal Category
15	0	16
16	0.028	8
18	0.111	2
20	0.194	1
22	0.277	0.5
24	0.360	0.5
26	0.443	0
28	0.526	0
30	0.609	0

Shaded area denotes extrapolated estimates





Carp

Crotched Lake

Oakland County

Hg Analysis:

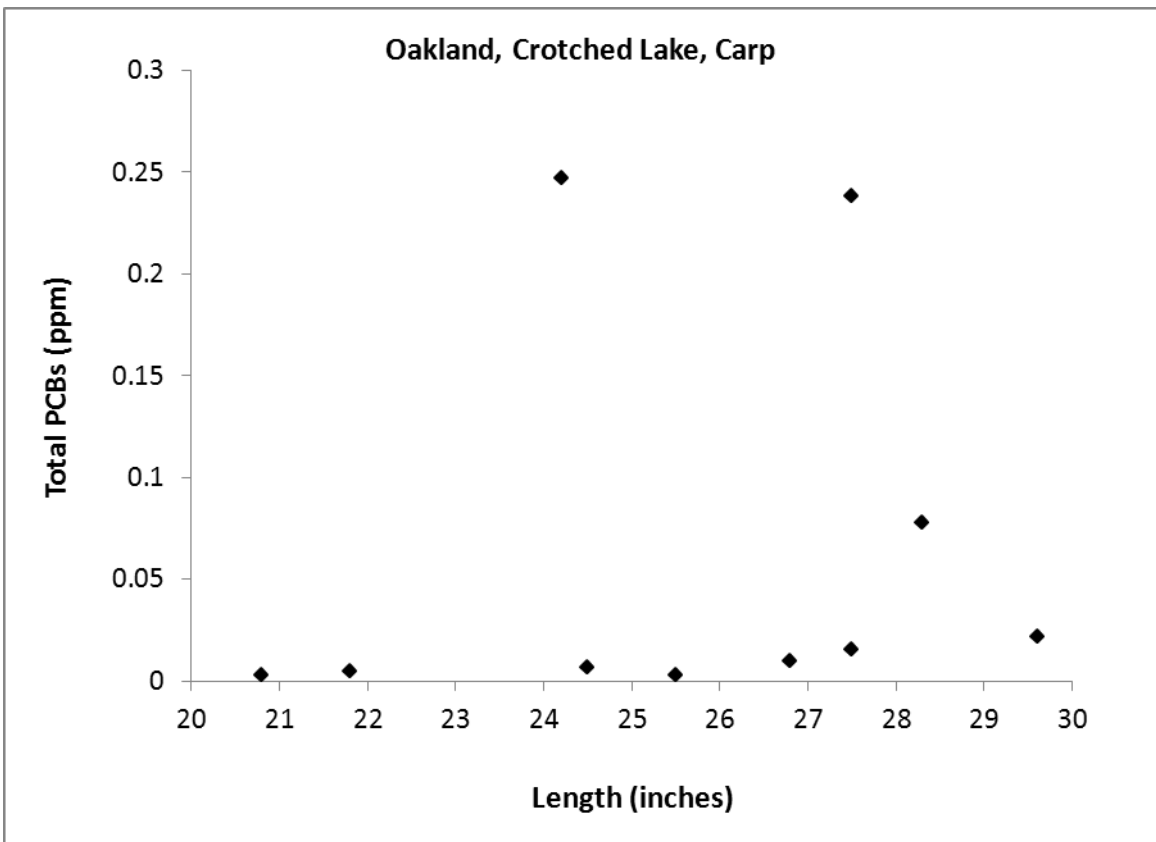
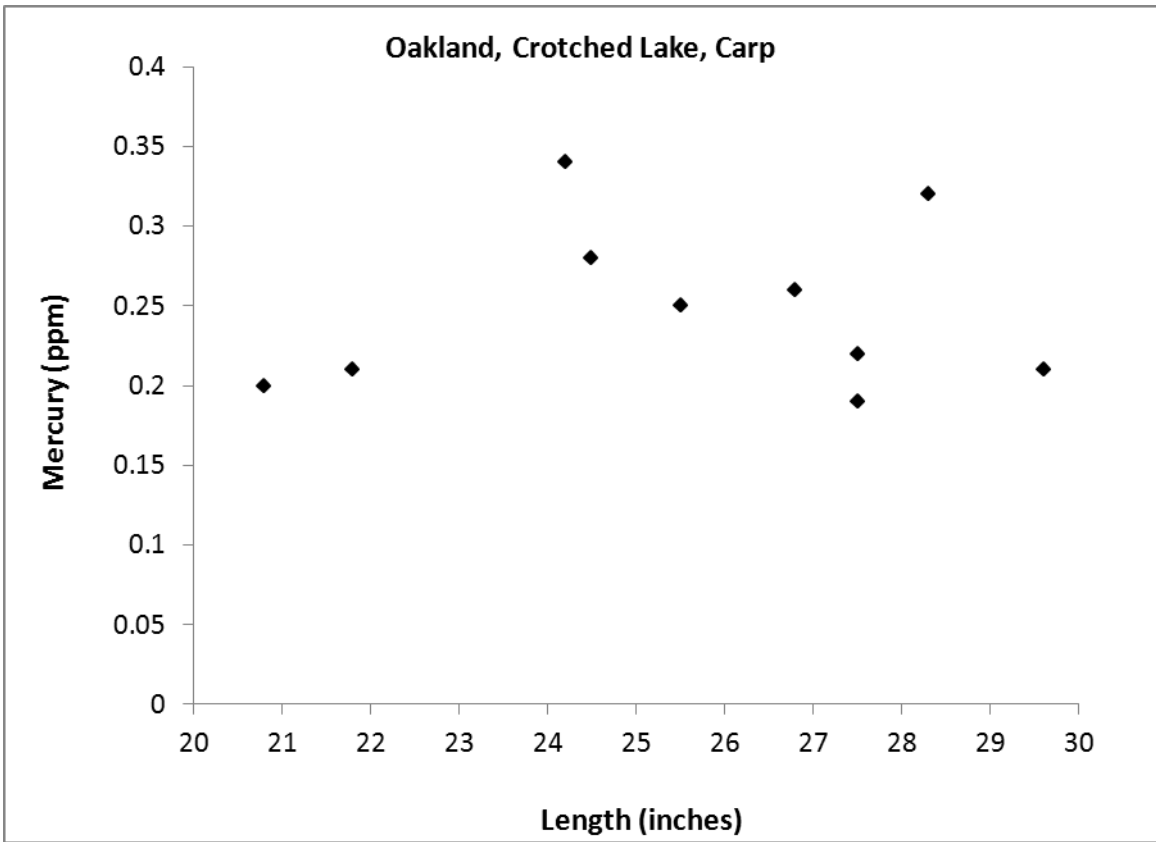
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2011	2011	10	20.8	na	20.8	29.6
Datasets available: 2011						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.25	0.19	0.34	0.29	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.006	0.007				

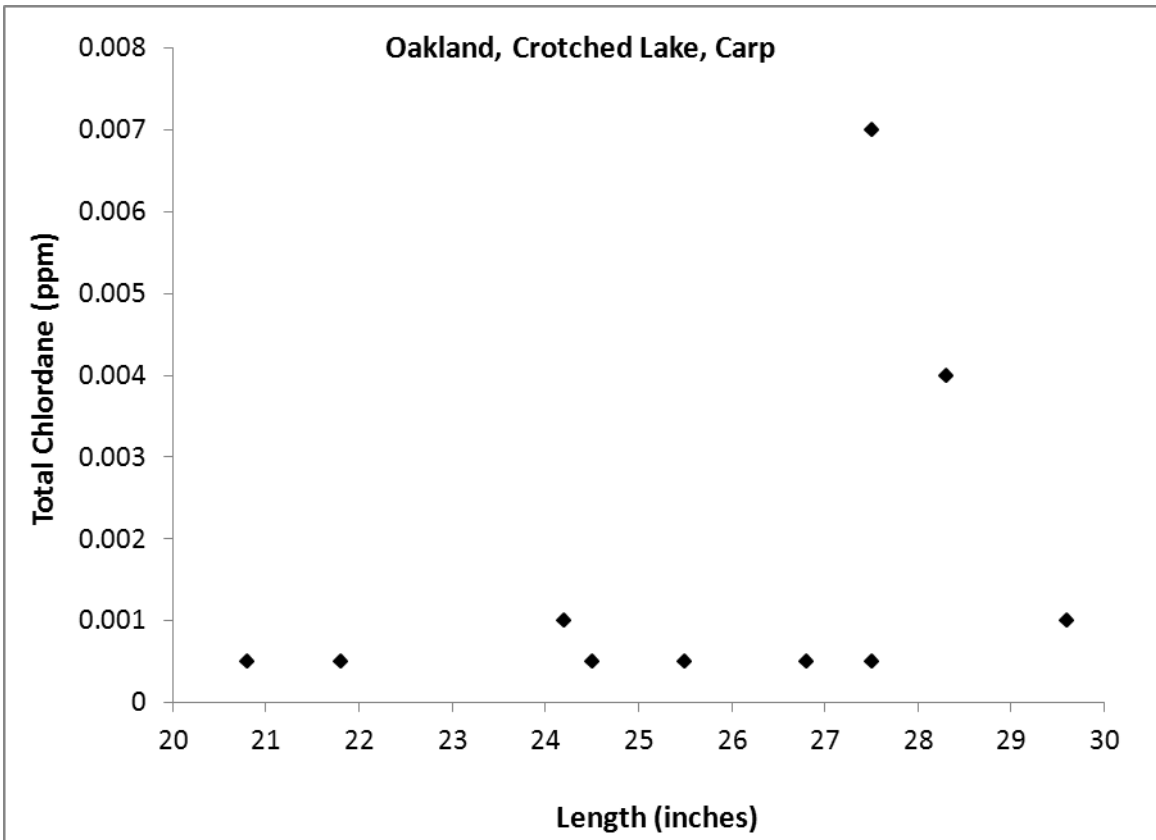
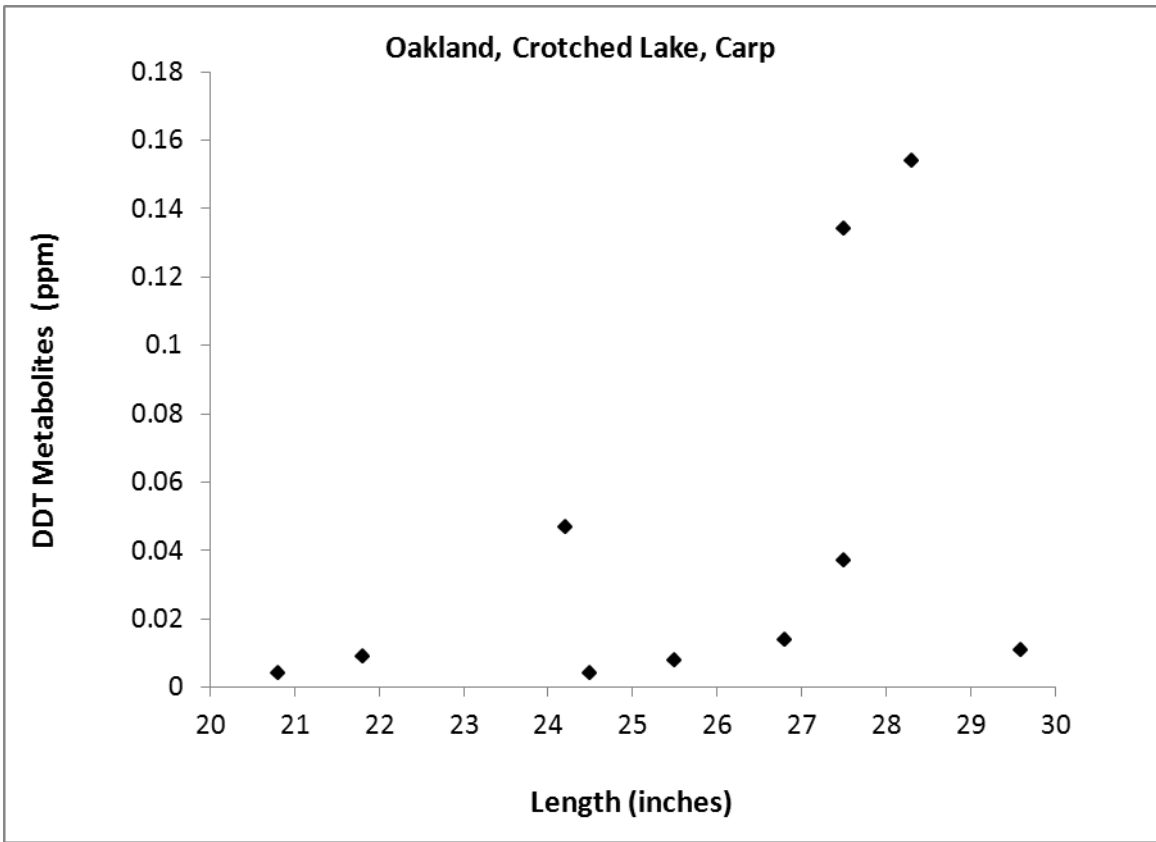
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2011	2011	10	20.8	na	20.8	29.6
Datasets available: 2011						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.063	0.0028	0.2472	0.130	1
DDT	10	0.042	0.004	0.154	0.08	16
Chlordane	10	0.002	0.0005	0.007	0.003	--
Toxaphene	10	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.023	0.217				
DDT	0.212	0.308				
Chlordane	0.163	0.238				
Toxaphene	--	--				
Final meal category based on UCL:						1

Existing Advisory: Crotched Lake carp are not covered by an advisory.

Recommendation: No one should eat more than 1 meal per month of Crotched Lake carp due to PCBs. Mercury would cause an advisory.





Carp

Galloway Lake

Oakland County

Hg Analysis:

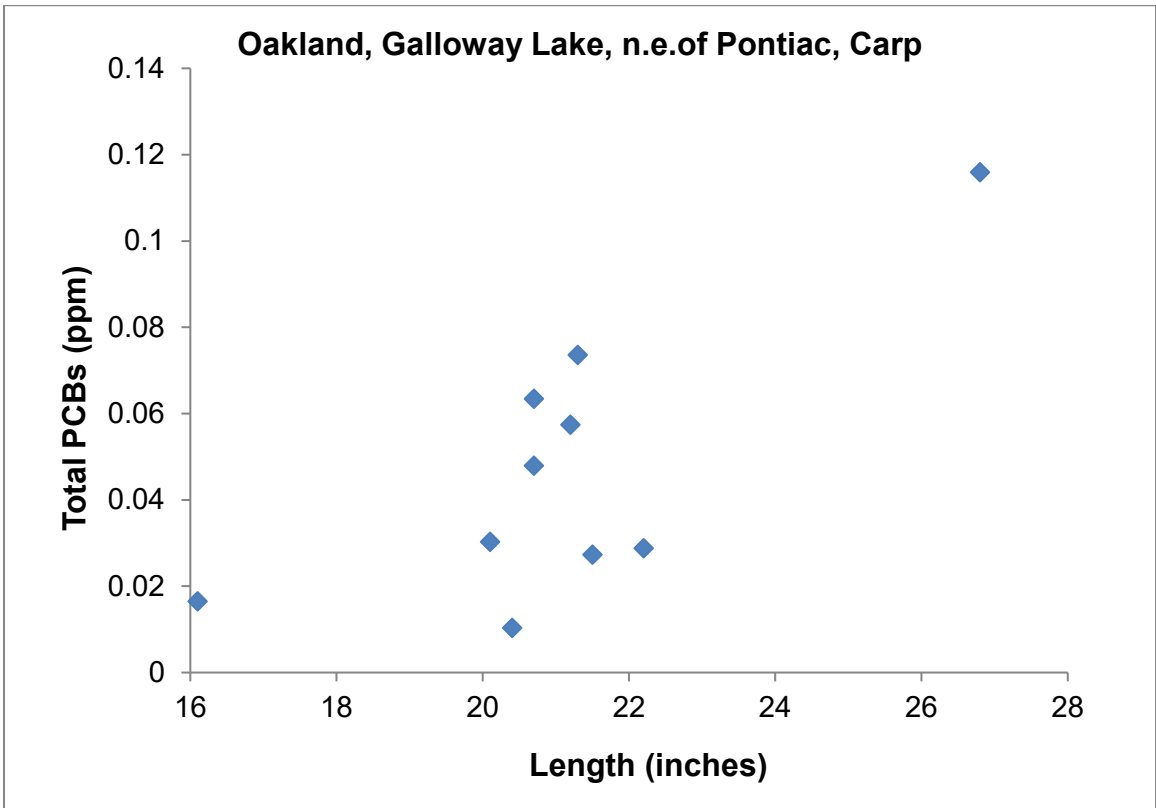
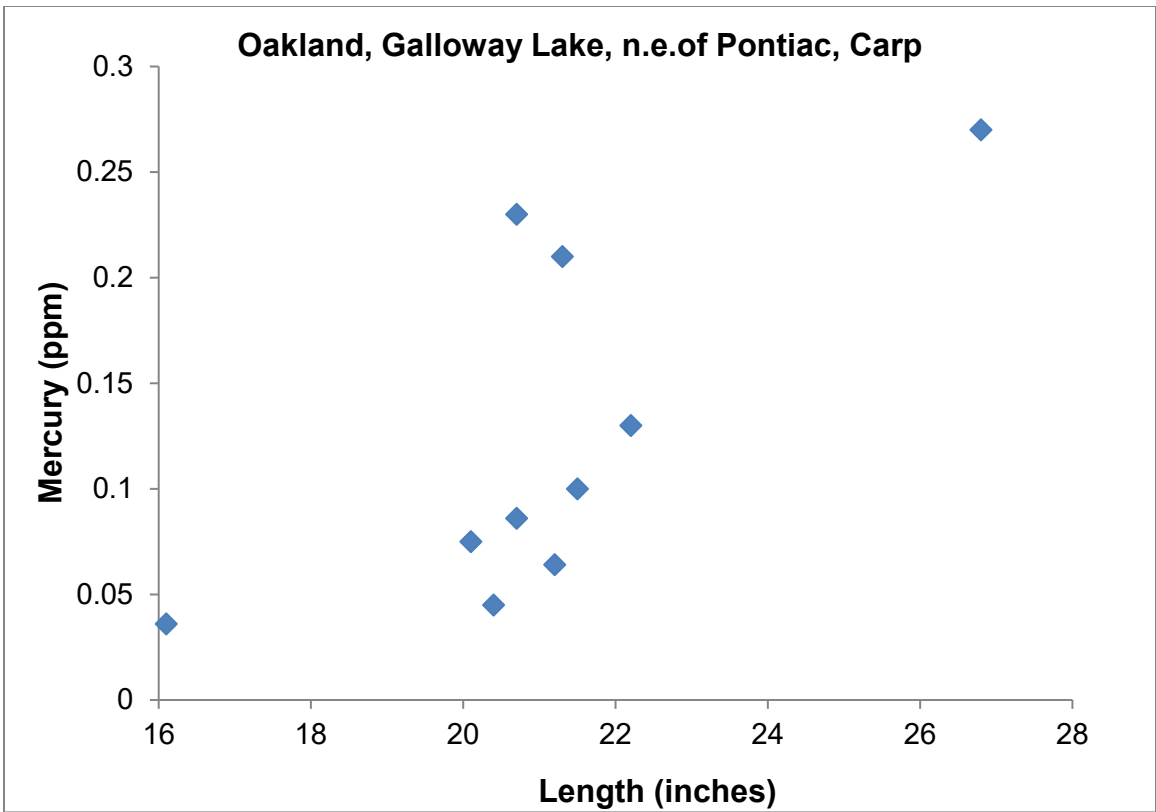
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2015	2015	10	16.1	na	16.1	26.8	
Datasets available: 2015							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.12		0.04	0.27	0.18	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.490	0.529					

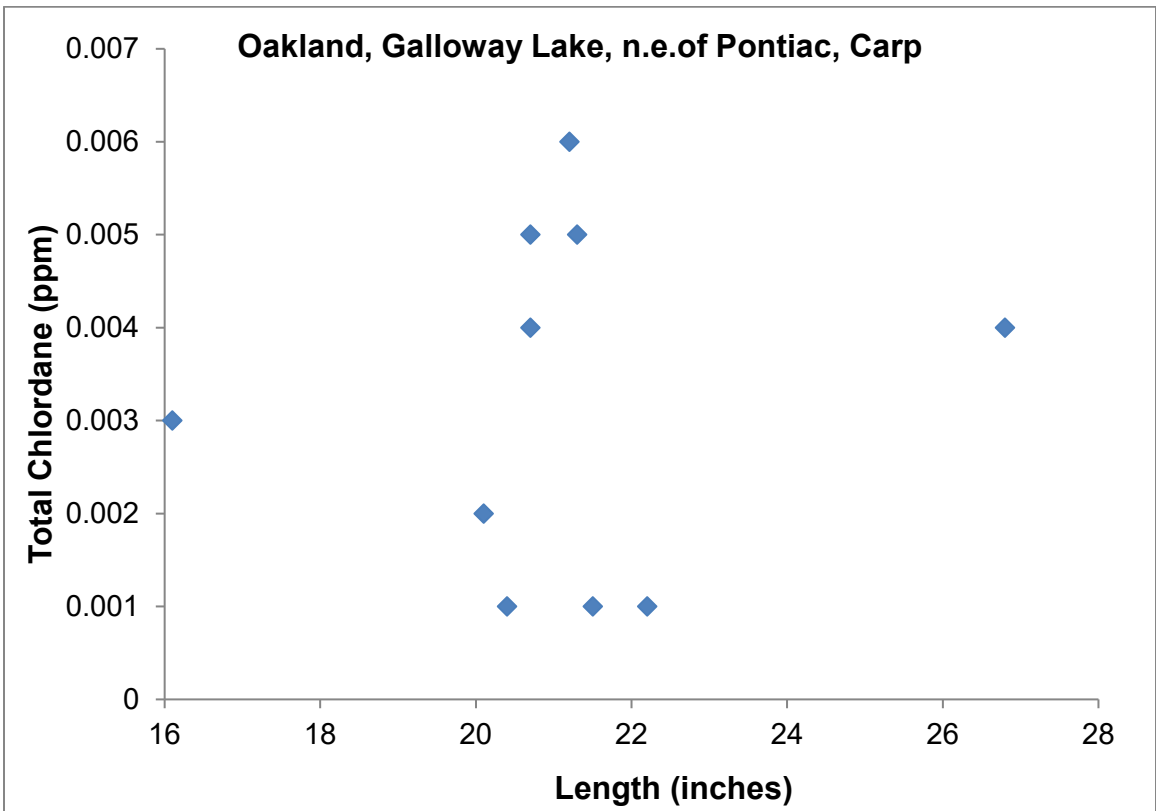
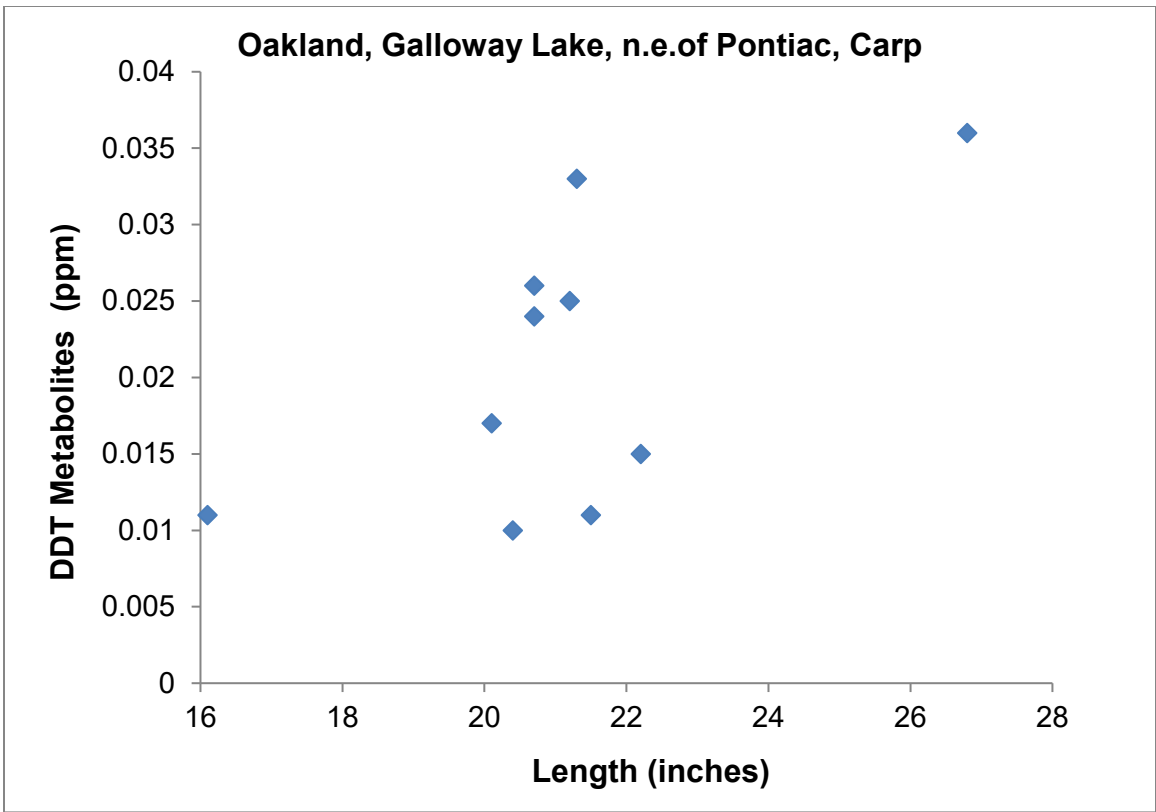
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2015	2015	10	16.1	na	16.1	26.8	
Datasets available: 2015							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.05		0.01	0.12	0.07	2
DDT	10	0.02		0.01	0.04	0.03	16
Chlordane	10	0.003		0.001	0.006	0.005	--
Toxaphene	10	ND		--	--	--	--
TEQ	0	--		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.565	0.423					
DDT	0.386	0.332					
Chlordane	0.011	0.004					
Toxaphene	--	--					
TEQ	--	--					
Final meal category based on UCL:							2

Existing MDHHS Advisory: Carp from Galloway Lake in Oakland County are covered by the statewide advisory due to PCBs: No one should eat more than 2 meals per month of carp of any size.

Recommendation: No one should eat more than 2 meals per month of Galloway Lake carp due to PCBs. Mercury would also cause an advisory.





Largemouth Bass

Galloway Lake

Oakland County

Hg Analysis:

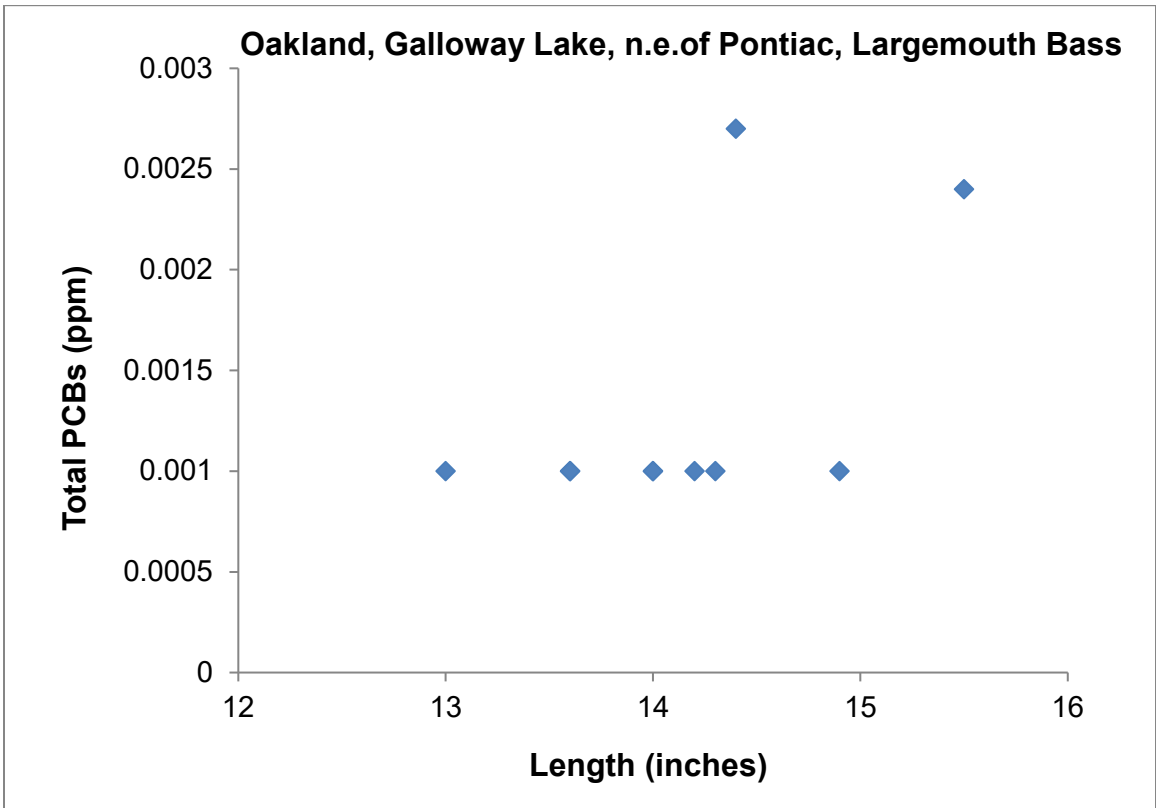
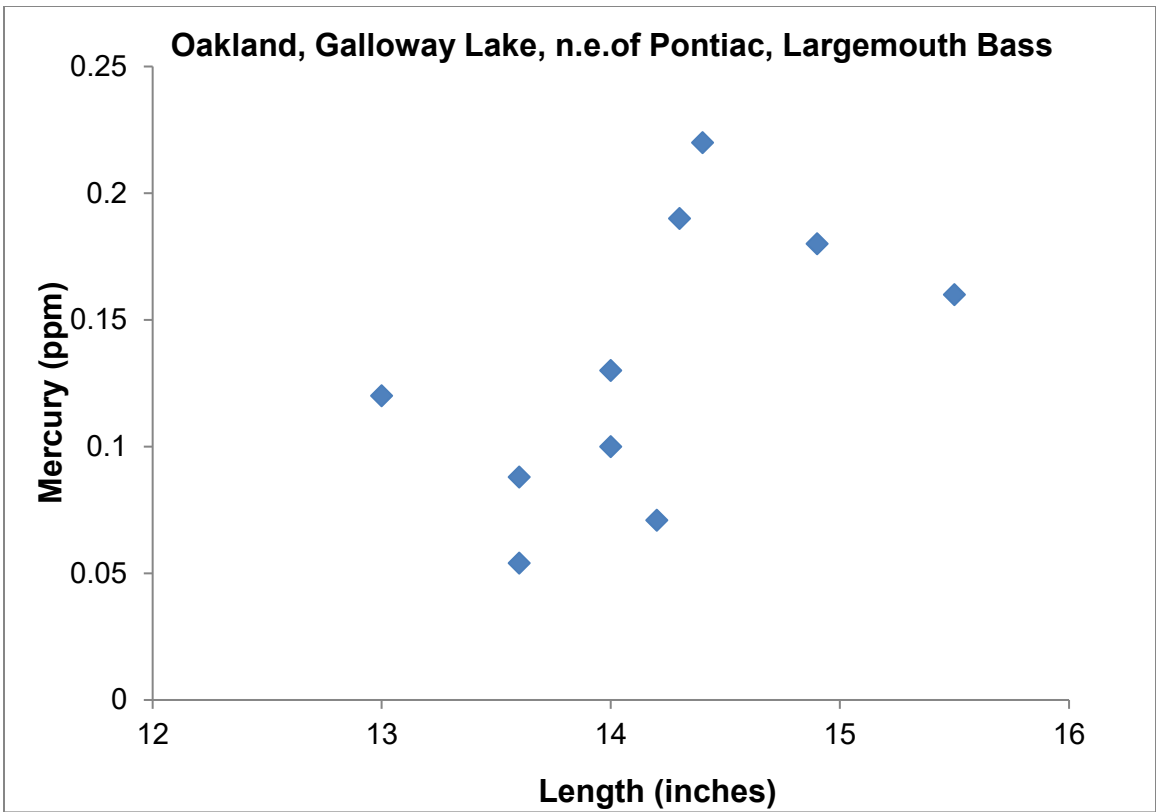
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2015	2015	10	13	14	13.6	15.5	
Datasets available: 2015							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	9	0.13		0.05	0.22	0.18	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.292	0.274					

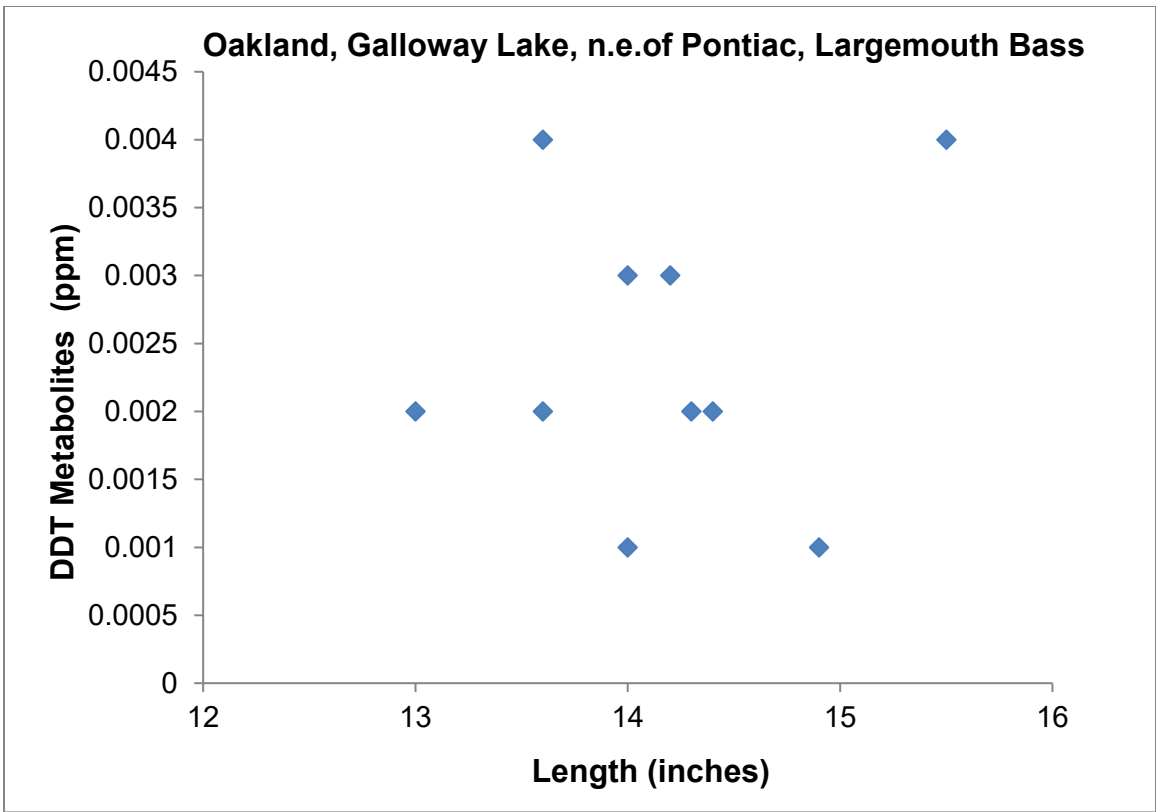
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2015	2015	10	13	14	13.6	15.5	
Datasets available: 2015							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	9	0.001		0.001	0.003	0.002	16
DDT	9	0.002		0.001	0.004	0.003	16
Chlordane	9	ND		--	--	--	--
Toxaphene	9	ND		--	--	--	--
TEQ	0	--		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.310	0.328					
DDT	0.018	0.001					
Chlordane	--	--					
Toxaphene	--	--					
TEQ	--	--					
Final meal category based on UCL:							4

Existing MDHHS Advisory: Largemouth and smallmouth bass from Galloway Lake in Oakland County are covered by the statewide advisory due to mercury: No one should eat more than 2 meals per month of largemouth or smallmouth bass smaller than 18 inches or more than 1 meal per month of largemouth or smallmouth bass larger than 18 inches.

Recommendation: No one should eat more than 4 meals per month of largemouth bass or smallmouth bass from Galloway Lake smaller than 18 inches or more than 2 meals per month of largemouth bass or smallmouth bass larger than 18 inches due to mercury. The statewide length break was applied as the size range of the fish was limited.





Brown Bullhead

Hawk Lake

Oakland County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1990	1990	2	11.8	na	11.8	13.2
Datasets available: 1990						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	2	0.390		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1990	1990	2	11.8	na	11.8	13.2
Datasets available: 1990						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	2	0.062		--		--
DDT	2	0.099		--		--
Chlordane	2	0.003		--		--
Toxaphene	2	ND		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						-

Existing Advisory: Hawk Lake brown bullhead are not covered by an advisory.

Recommendation: This dataset is limited due to sample size and age of the data. Dataset is not usable to provide a recommendation.

Northern Pike

Hawk Lake

Oakland County

Hg Analysis:

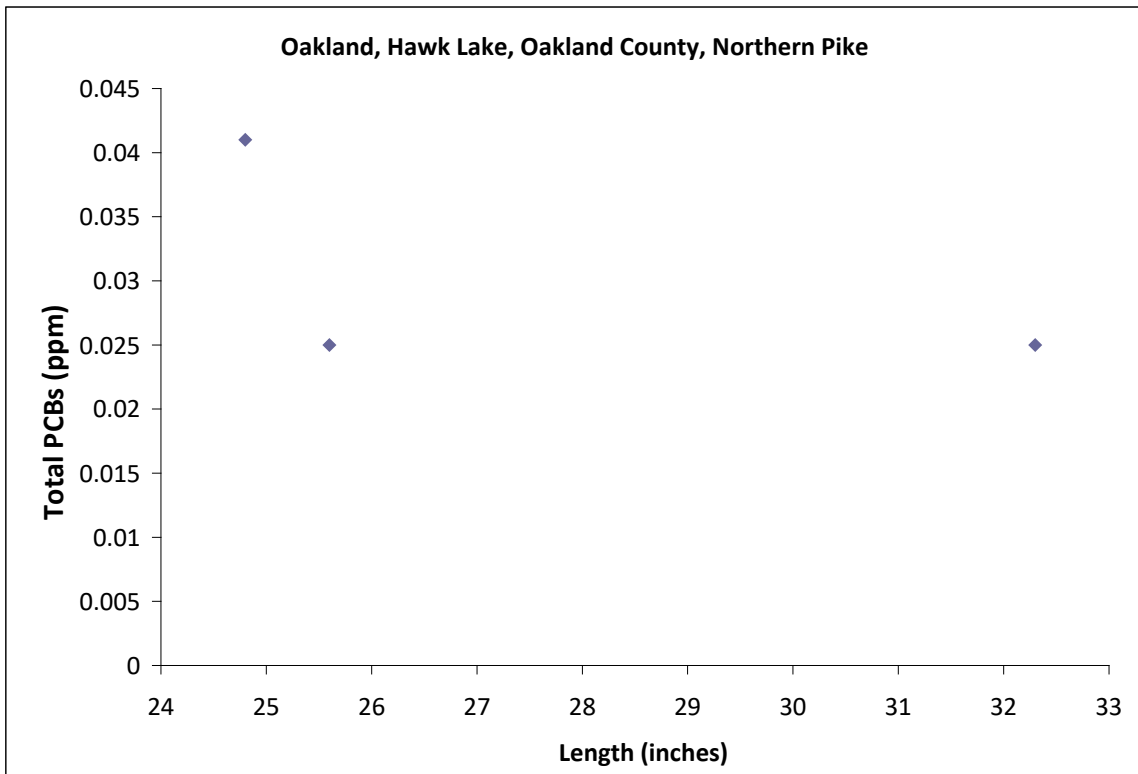
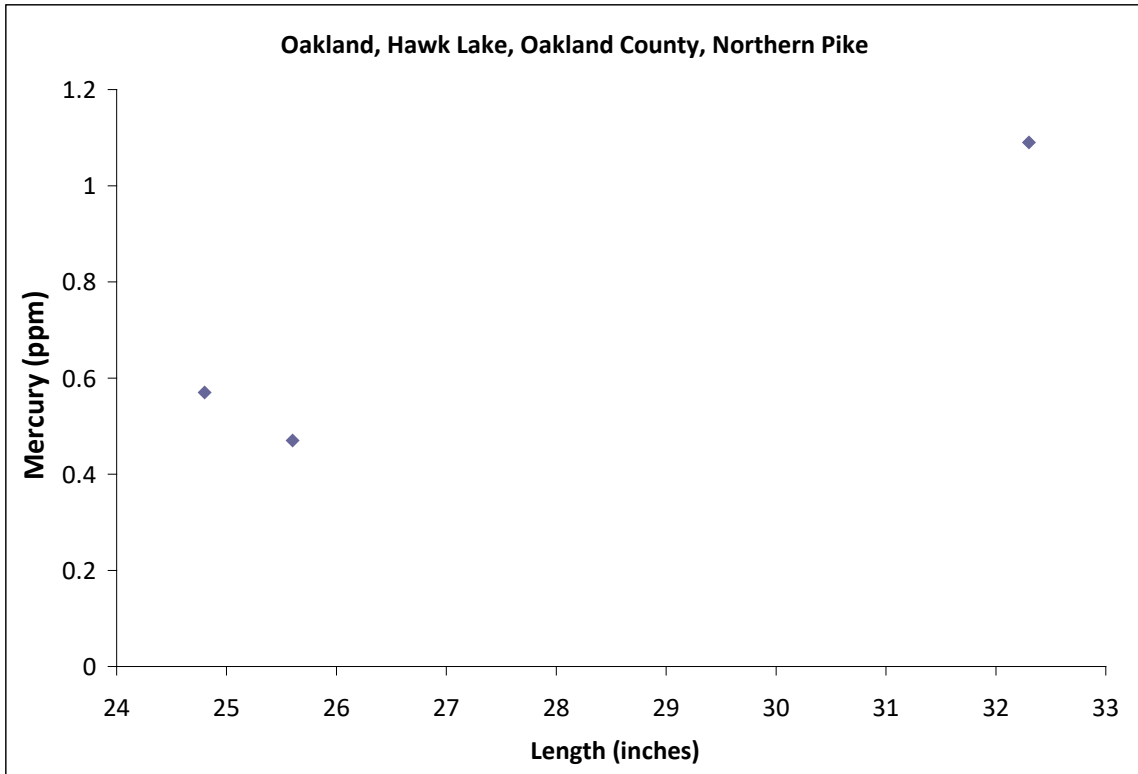
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1990	1990	3	24.8	24	24.8	32.3
Datasets available: 1990						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	3	0.71		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.940	0.902		<i>limited data – regression not used</i>		

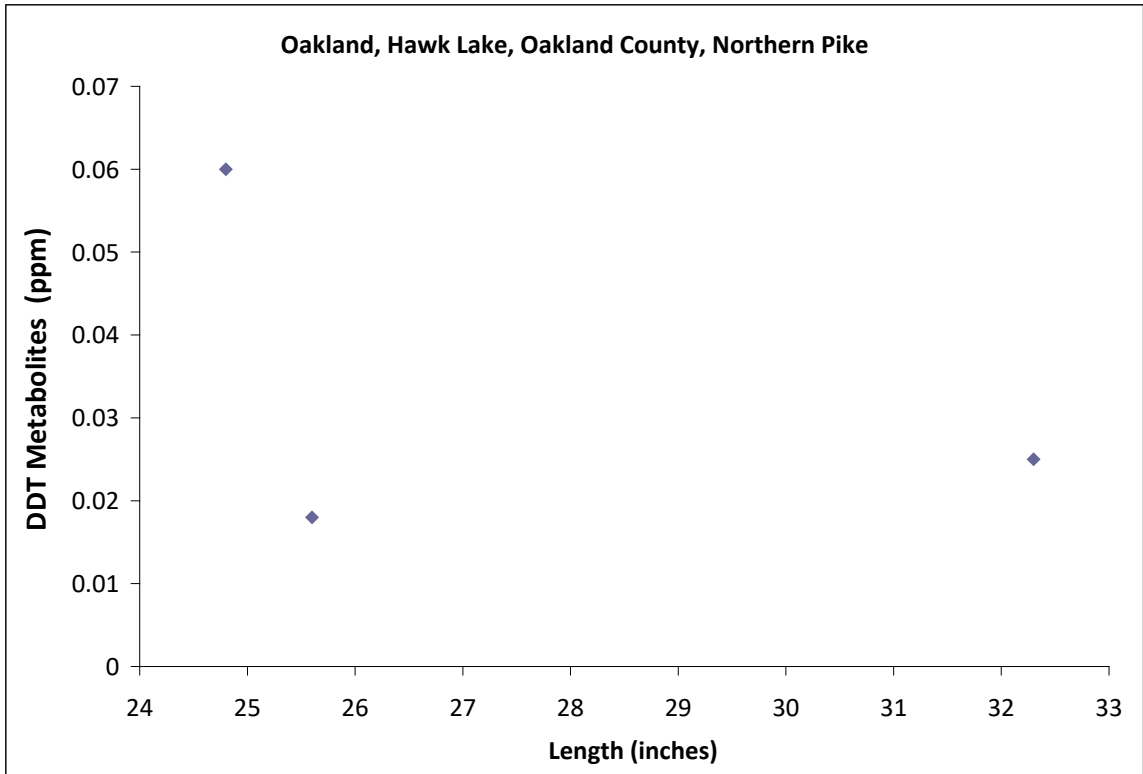
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1990	1990	3	24.8	24	24.8	32.3
Datasets available: 1990						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	3	0.030		--		--
DDT	3	0.034		--		--
Chlordane	3	ND		--		--
Toxaphene	3	ND		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.338	0.338				
DDT	0.201	0.120				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						-

Existing Advisory: Hawk Lake northern pike are covered under the statewide mercury consumption advisory.

Recommendation: Statewide guidelines apply to Hawk Lake Northern Pike. This dataset is limited due to sample size, age of the data, and is not usable to provide a recommendation.





Largemouth Bass

Heron Lake

Oakland County

Hg Analysis:

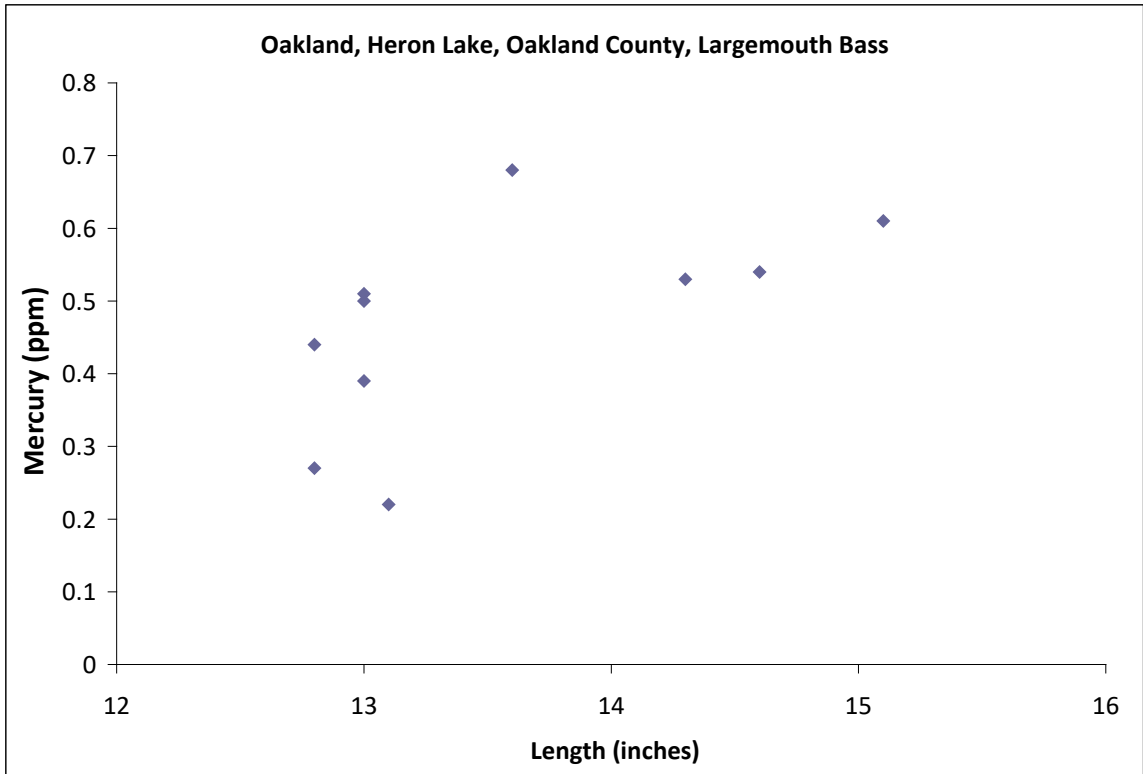
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		Meal Category
Earliest	Most Recent				Min	Max	
2000	2000	10	12.8	14	13.6	15.1	
Datasets available: 2000							
Chemical	Sample Size (All)	Mean (ppm)		95%UCL			
Mercury	10	0.47		0.57	1		
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.348	0.303					

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		Meal Category
Earliest	Most Recent				Min	Max	
2000	2000	10	12.8	14	13.6	15.1	
Datasets available: 2000							
Chemical	Sample Size (All)	Mean (ppm)		95%UCL	Meal Category		
PCB	10	ND		--	--		
DDT	10	ND		--	--		
Chlordane	10	ND		--	--		
Toxaphene	10	ND		--	--		
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
Final meal category based on UCL:							1

Existing Advisory: Heron Lake largemouth bass are covered under the statewide consumption advisory for mercury.

Recommendation: No one should eat more than 1 meal per month of Heron Lake largemouth or smallmouth bass less than 18 inches or 6 meals per year of largemouth or smallmouth bass greater than 18 inches. Dataset is limited by the smaller lengths of the fish. The statewide guideline length break was applied and the meal category for bass greater than 18 inches was set to one meal category more restrictive than the smaller lengths.



Carp

Lake Orion

Oakland County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2001	2001	9	19.1	na	19.1	28.1
Datasets available: 2001						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	9	0.040		0.050	16	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.390	0.255				

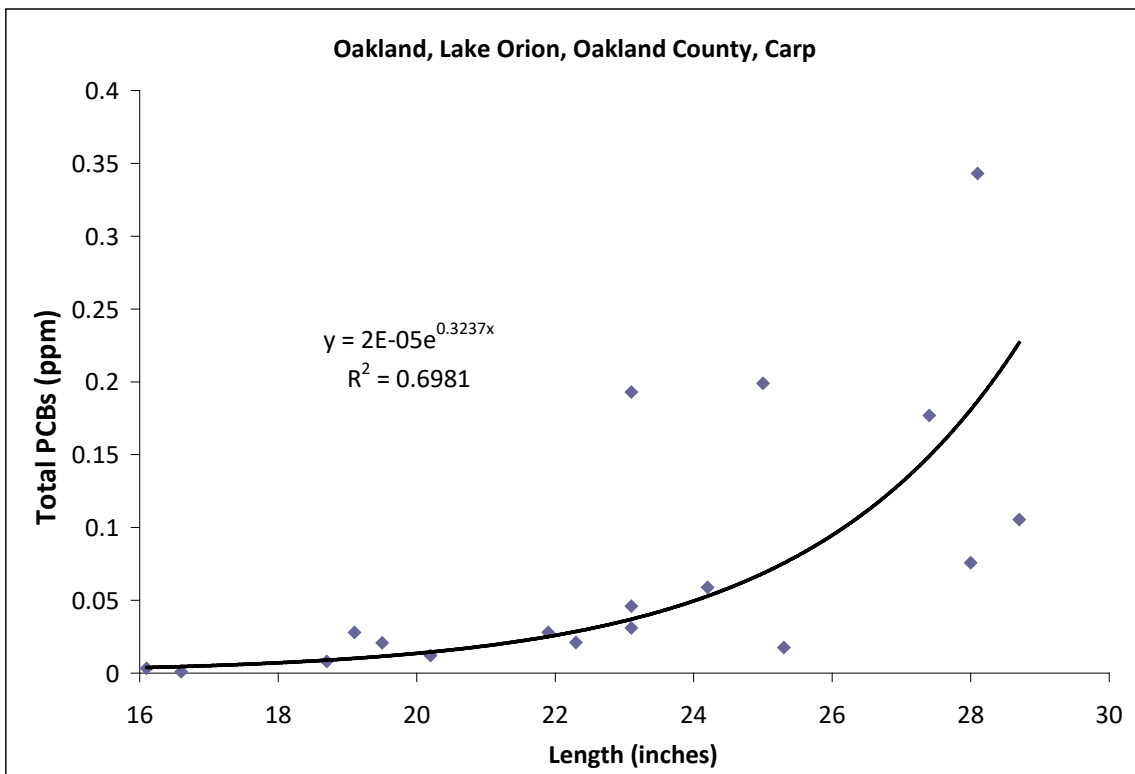
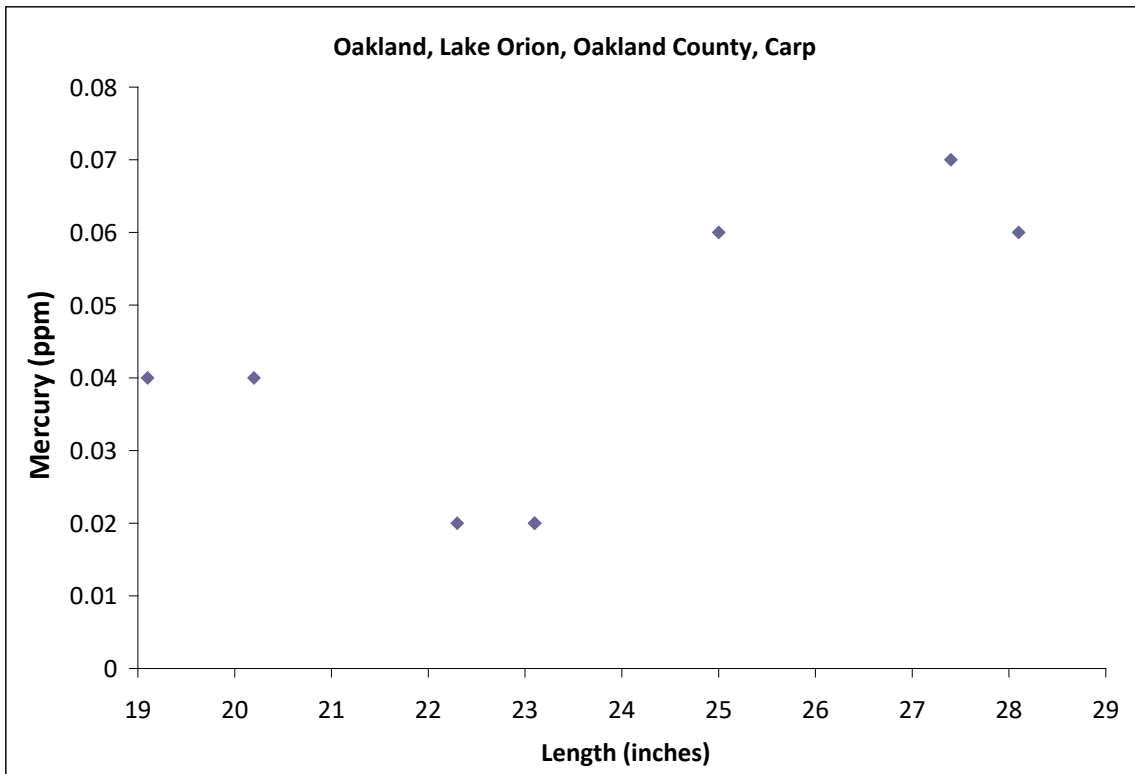
Organics Analysis:

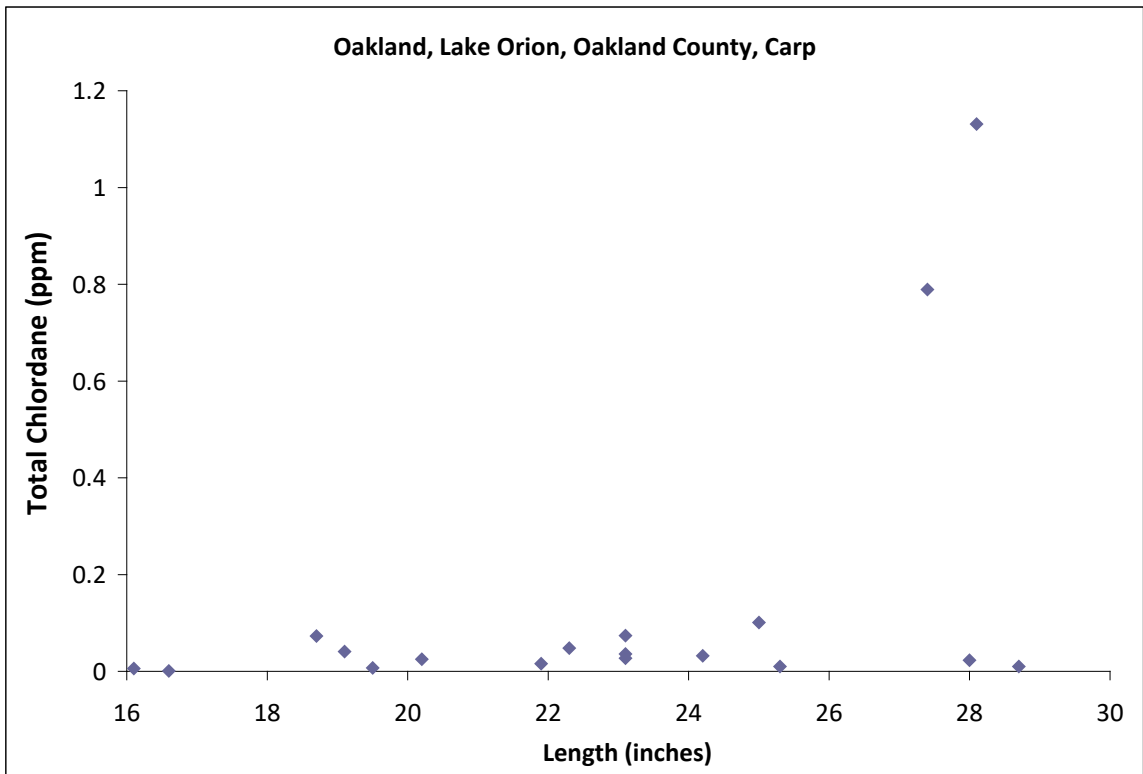
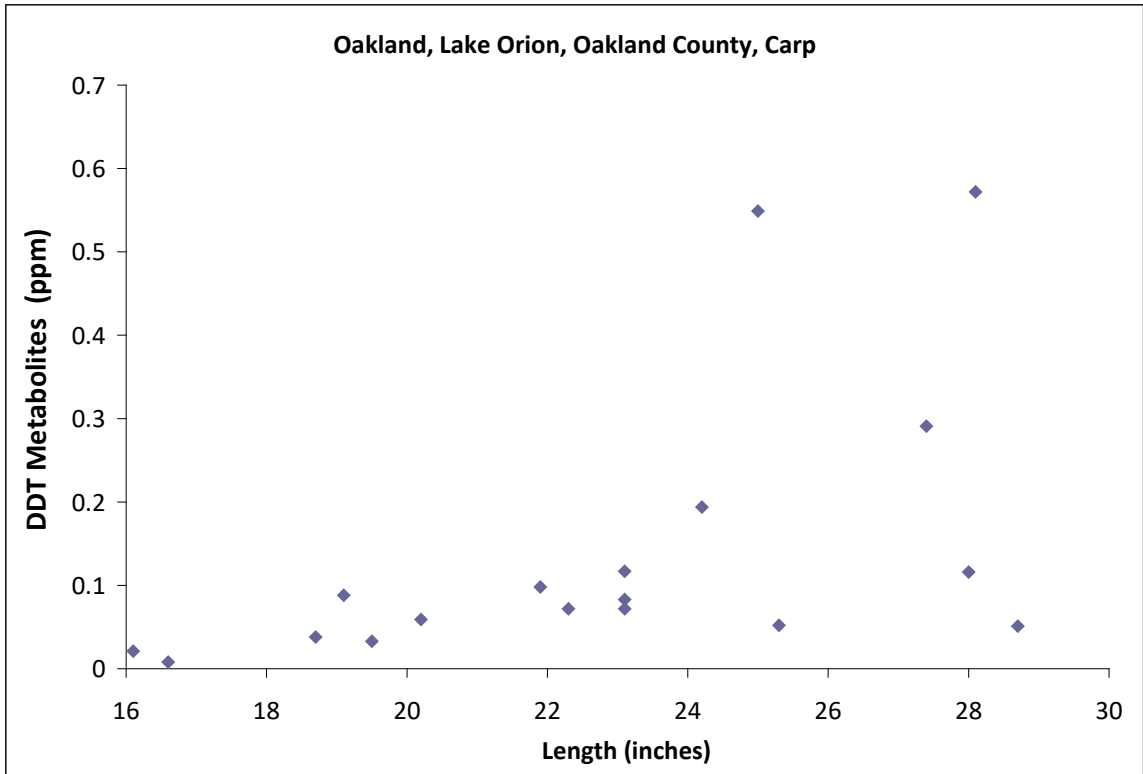
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2001	2009	18	16.1	na	16.1	28.7
Datasets available: 2001, 2009						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	18	0.076		0.120	1	
DDT	18	0.140		0.220	8	
Chlordane	18	0.136		0.290	--	
Toxaphene	18	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.419	0.698				
DDT	0.287	0.498				
Chlordane	0.220	0.296				
Toxaphene	--	--				
Final meal category based on UCL:						1

Existing Advisory: Women and children should eat no more than one meal per week of Lake Orion carp between 18 and 26 inches in length and no one should eat Lake Orion carp greater than 26 inches in length due to elevated concentrations of PCBs.

Recommendation: No one should eat more than 8 meals per month of Lake Orion carp less than 20 inches due to DDT, 2 meals per month between 20 and 26 inches due to PCBs, and 1 meal per month greater than 26 inches in length due to PCBs.

Length (Inches)	PCB Regression Estimate (ppm)	Meal Category
12	0.001	16
14	0.002	16
16	0.004	16
18	0.007	16
20	0.013	12
22	0.025	8
24	0.047	4
26	0.090	2
28	0.173	1
<i>Shaded area denotes extrapolated estimates</i>		





Largemouth Bass

Lake Orion

Oakland County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	2001	23	9.3	14	17.6	
Datasets available: 2001						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	13	0.902		1.130	1	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.517	0.640				

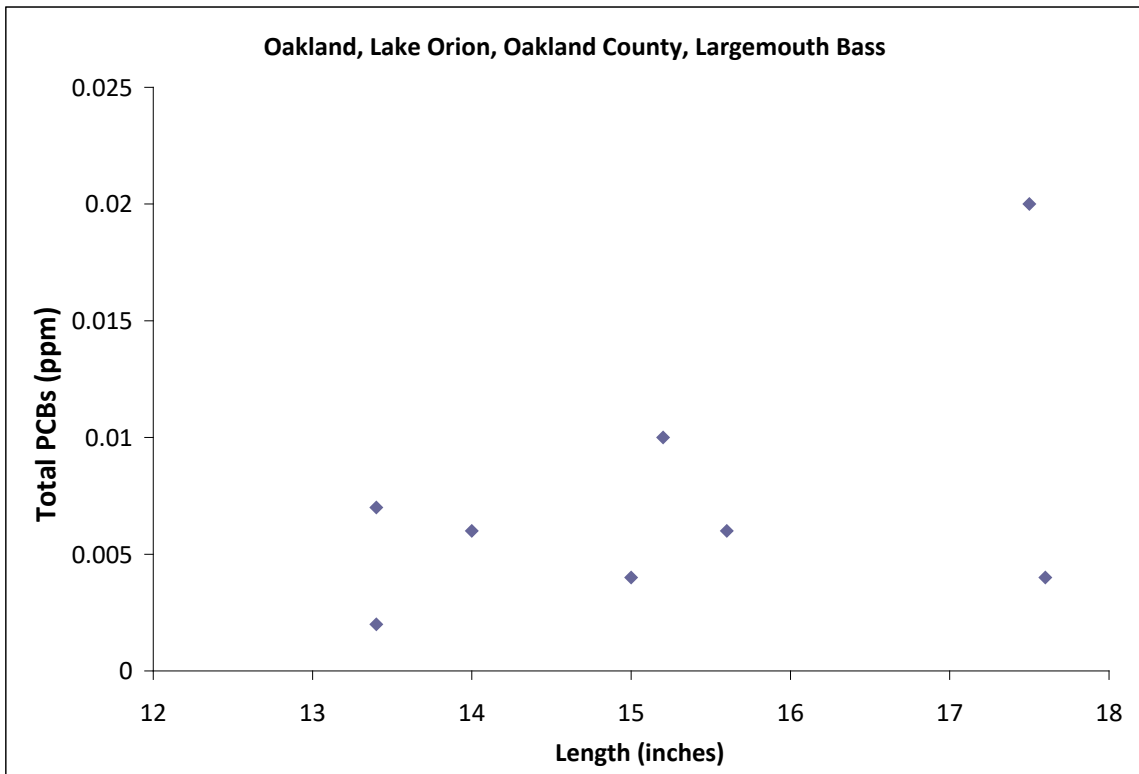
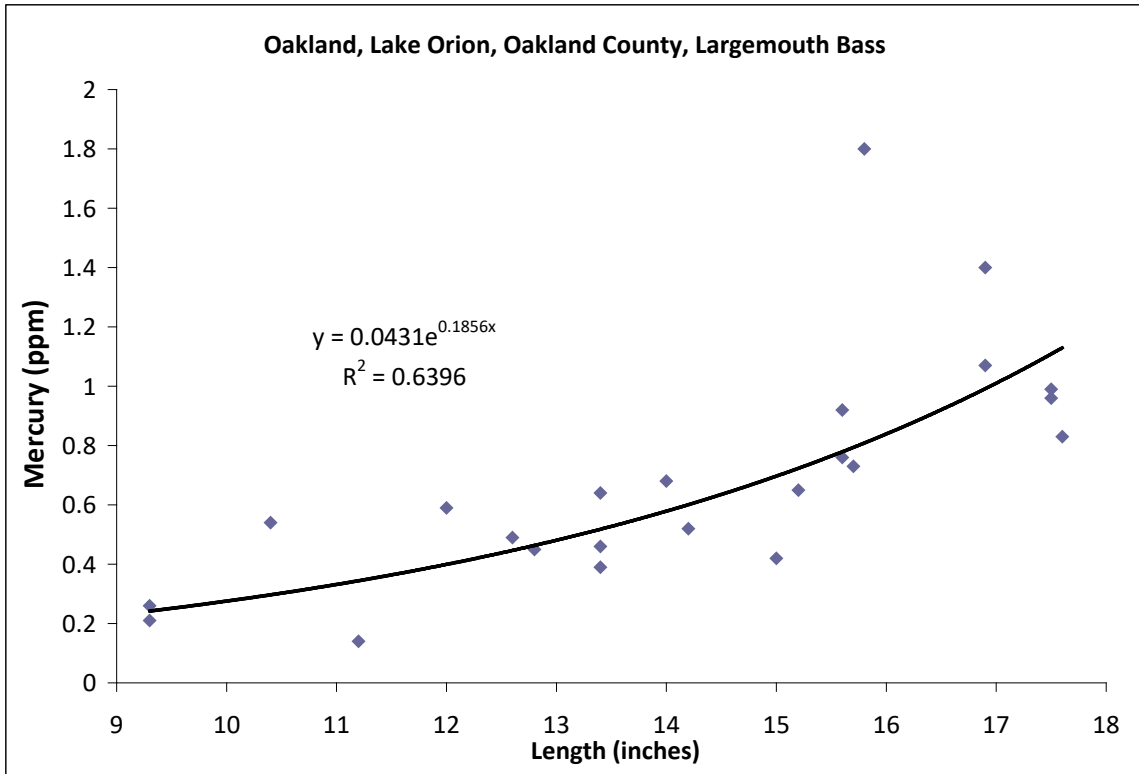
Organics Analysis:

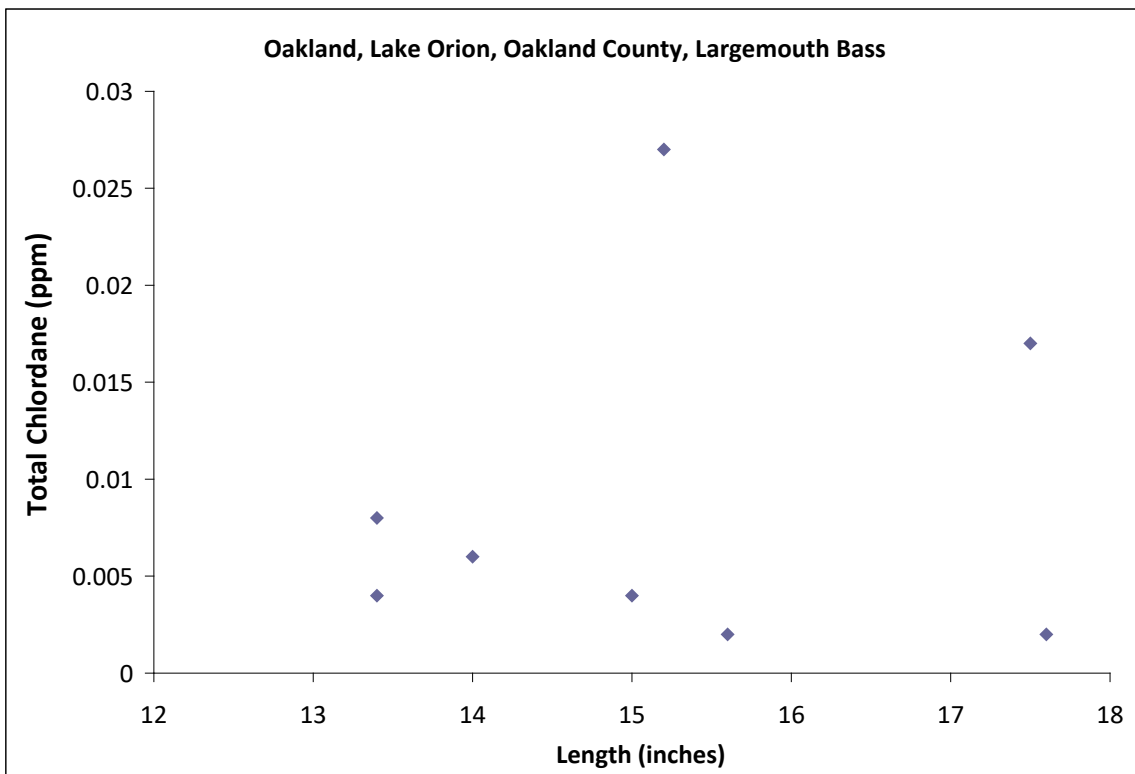
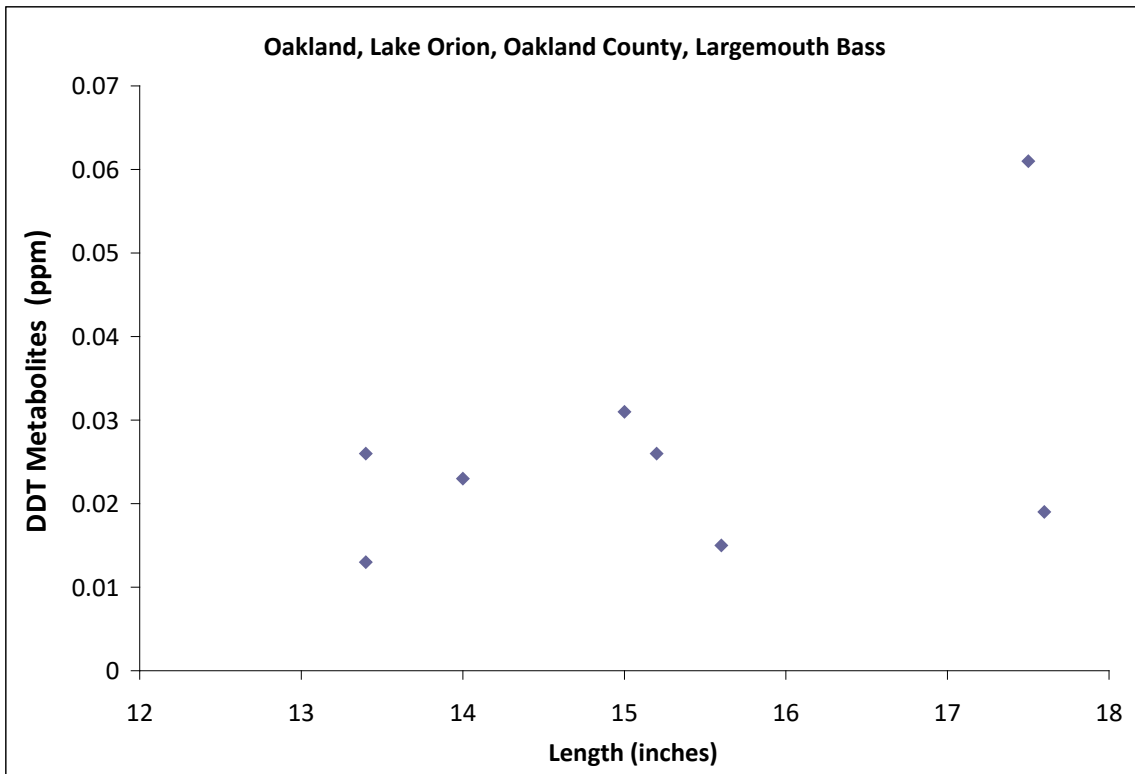
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2001	2001	8	13.4	14	17.6	
Datasets available: 2001, 2009						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	6	0.008		0.010	16	
DDT	6	0.029		0.050	16	
Chlordane	6	0.010		0.020	--	
Toxaphene	6	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.257	0.204				
DDT	0.238	0.181				
Chlordane	0.019	0.001				
Toxaphene	--	--				
Final meal category based on UCL:					1	

Existing Advisory: Lake Orion largemouth bass are covered under the statewide consumption advisory for mercury.

Recommendation: No one should eat more than 1 meal per month of Lake Orion largemouth or smallmouth bass smaller than 18 inches and no more than 6 meals per year of largemouth or smallmouth bass larger than 18 inches due to mercury. Statewide guidelines length break applied.

Length (Inches)	Hg Regression Estimate (ppm)	Meal Category
14	0.579	1
15	0.698	1
16	0.840	1
17	1.011	1
18	1.217	0.5
19	1.465	0.5
20	1.764	0.5
21	2.124	0.5
22	2.557	0
<i>Shaded area denotes extrapolated estimates</i>		





Northern Pike

Lake Orion

Oakland County

Hg Analysis:

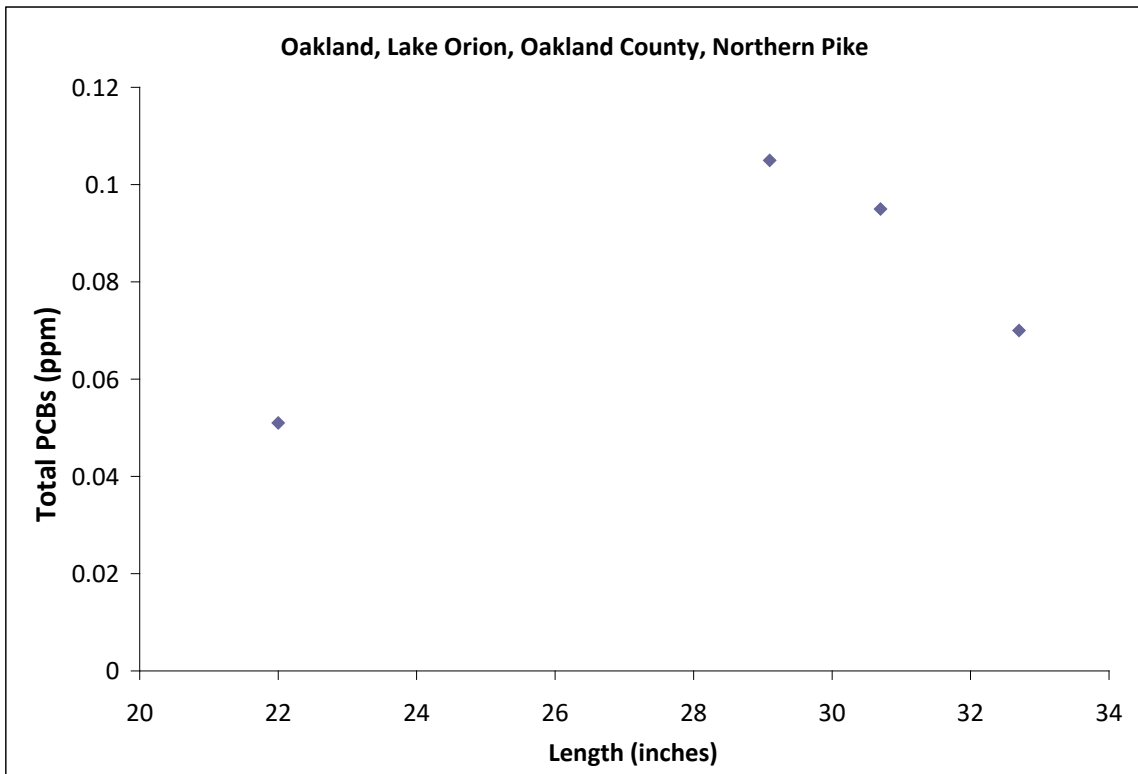
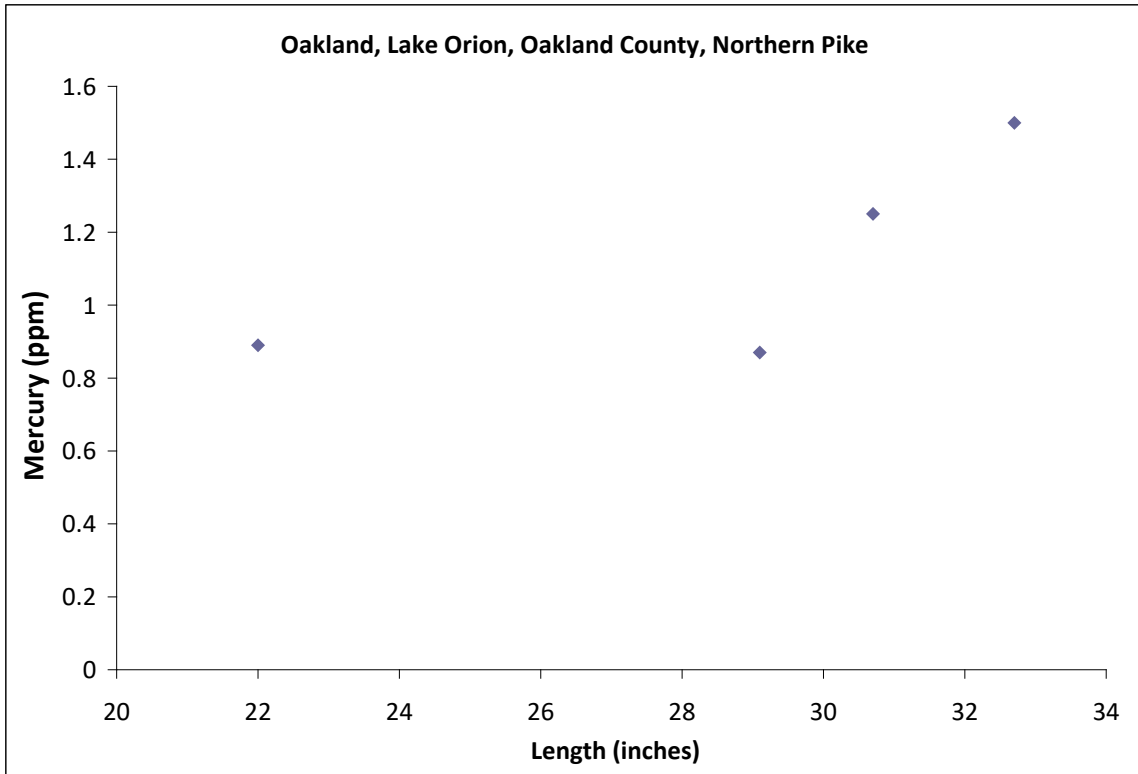
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		95%UCL	Meal Category
Earliest	Most Recent				Min	Max		
1989	1989	4	22	24	29.1	32.7		
Datasets available:		1989						
Chemical	Sample Size (Legal)	Mean (ppm)						
Mercury	3	1.207			--		--	
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
Mercury	0.578	0.576						

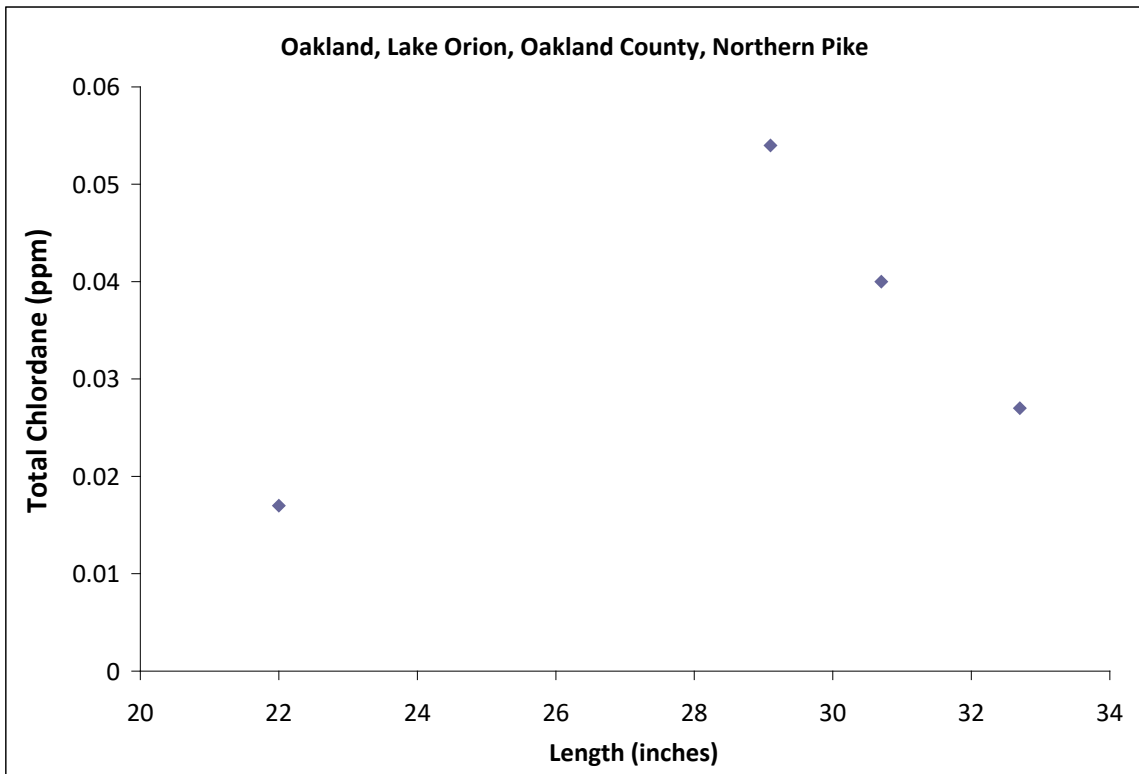
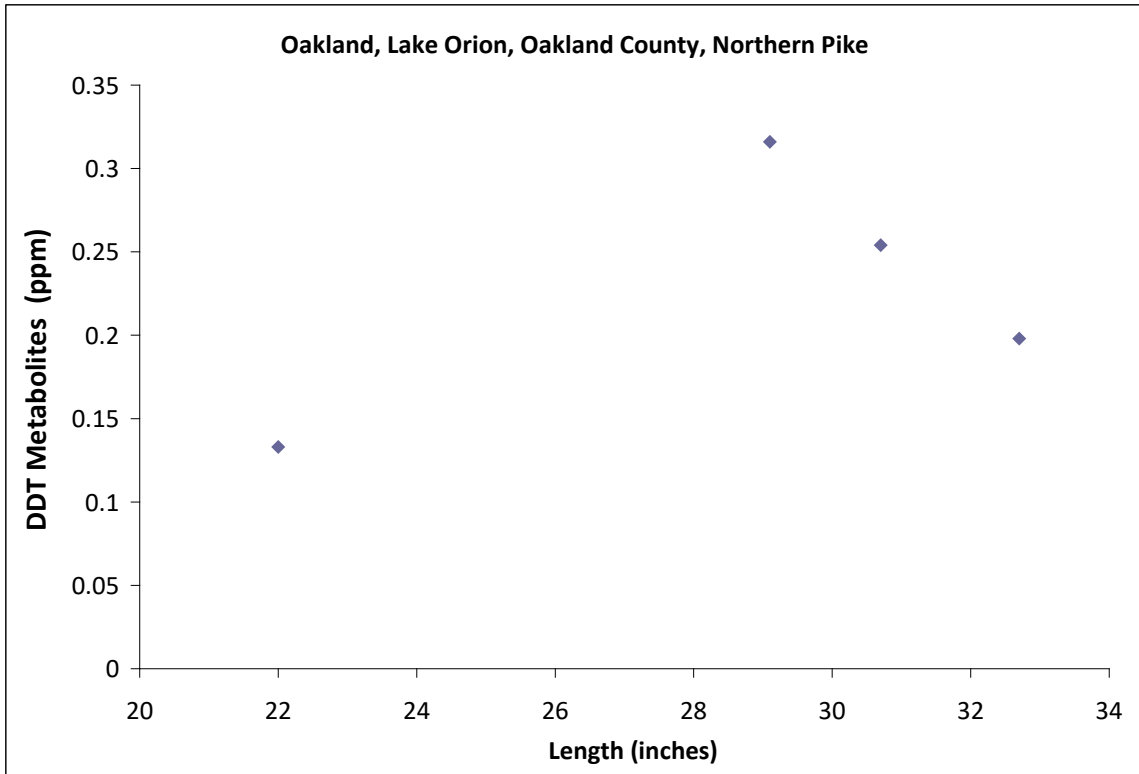
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		95%UCL	Meal Category
Earliest	Most Recent				Min	Max		
1989	1989	4	22	24	29.1	32.7		
Datasets available:		1989						
Chemical	Sample Size (Legal)	Mean (ppm)						
PCB	3	0.090			--		--	
DDT	3	0.256			--		--	
Chlordane	3	0.040			--		--	
Toxaphene	3	ND			--		--	
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
PCB	0.324	0.412						
DDT	0.305	0.424						
Chlordane	0.224	0.363						
Toxaphene	--	--						
Final meal category based on UCL:								--

Existing Advisory: Women and children should eat no more than one meal per month and the general population should eat no more than one meal per week of Lake Orion northern pike due to elevated levels of PCBs and mercury.

Recommendation: Statewide guidelines apply to Lake Orion northern pike. This dataset is limited due to sample size and age of the data making it not usable to provide a recommendation.





Carp

Lakeville Lake

Oakland County

Hg Analysis:

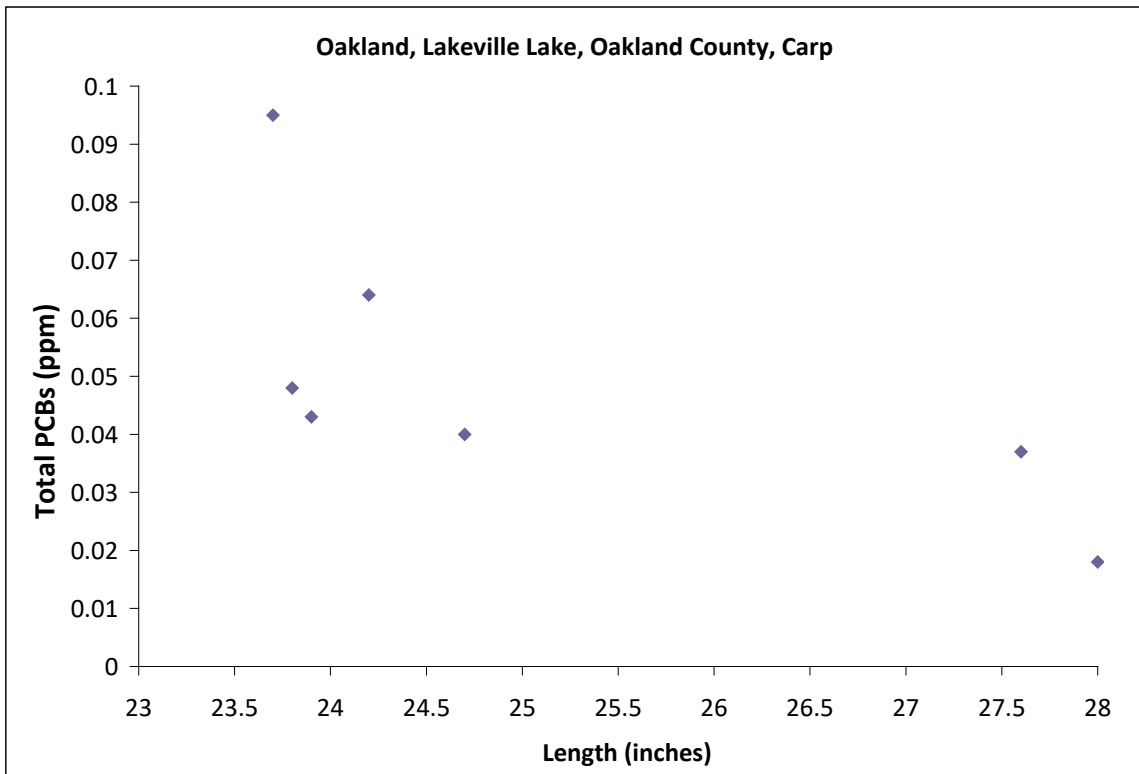
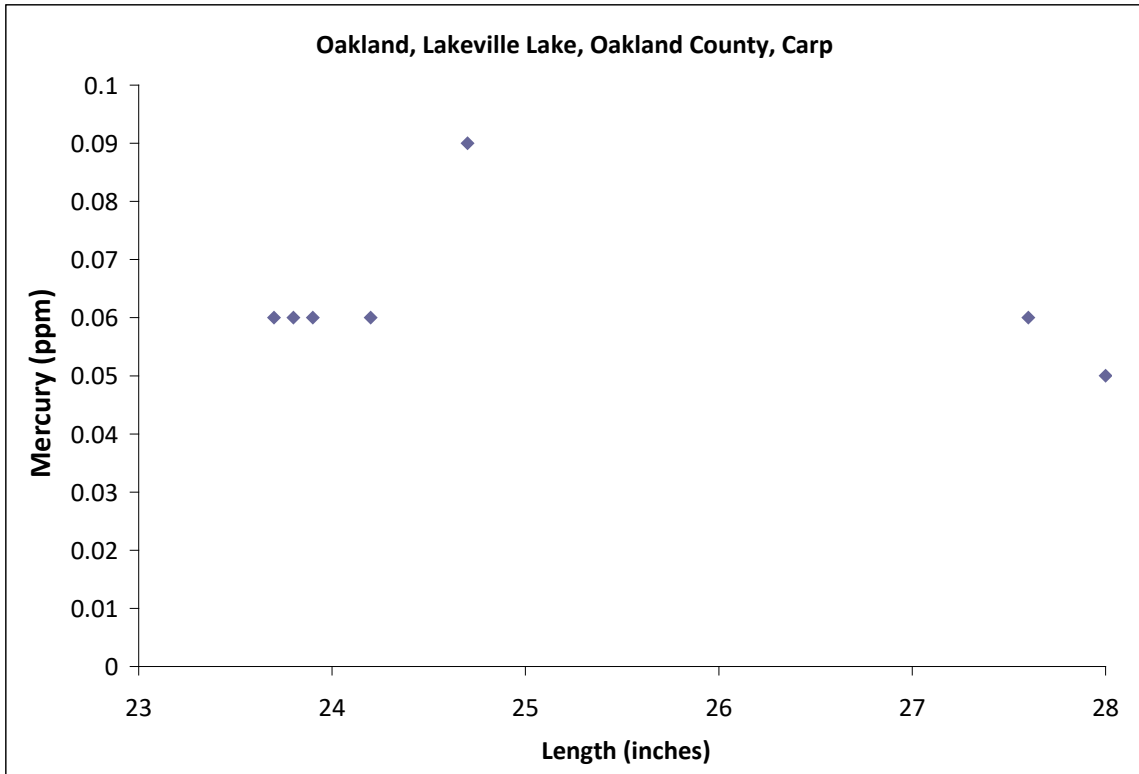
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2000	2000	7	23.7	na	23.7	28
Datasets available: 2000						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	7	0.063		0.070	16	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.088	0.123				

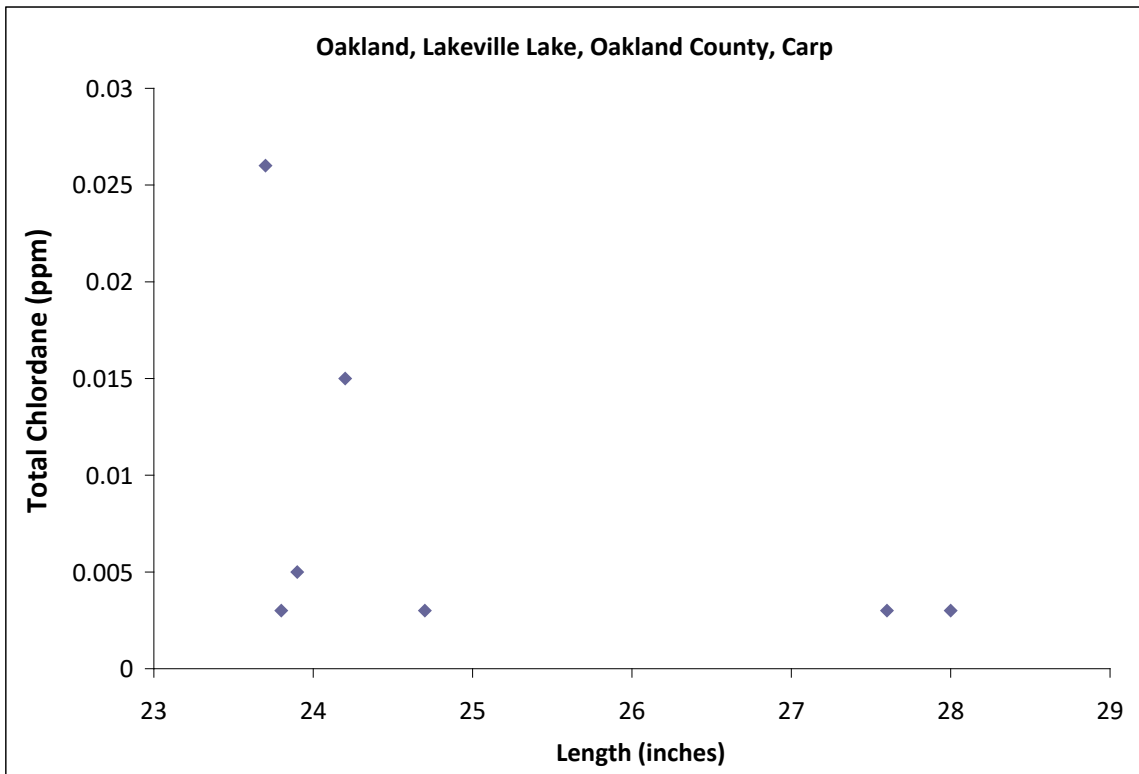
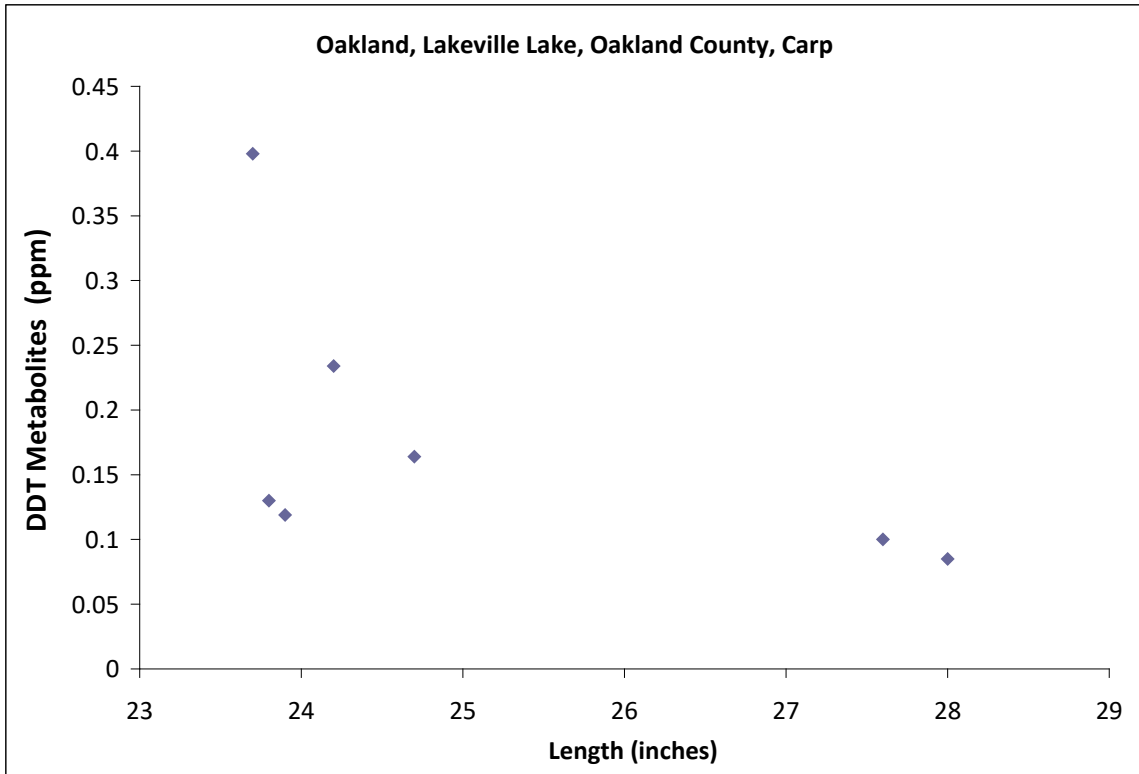
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2000	2000	7	23.7	na	23.7	28
Datasets available: 2000						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	7	0.049		0.070	2	
DDT	7	0.176		0.280	4	
Chlordane	7	0.008		0.020	--	
Toxaphene	7	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.467	0.616		<i>Regression has negative slope</i>		
DDT	0.313	0.451				
Chlordane	0.216	0.267				
Toxaphene						
Final meal category based on UCL:						1

Existing Advisory: Lakeville Lake carp are not covered under an advisory.

Recommendation: No one should eat more than 2 meal per month of Lakeville Lake carp due to PCBs. DDT would cause an advisory.





Largemouth Bass

Lakeville Lake

Oakland County

Hg Analysis:

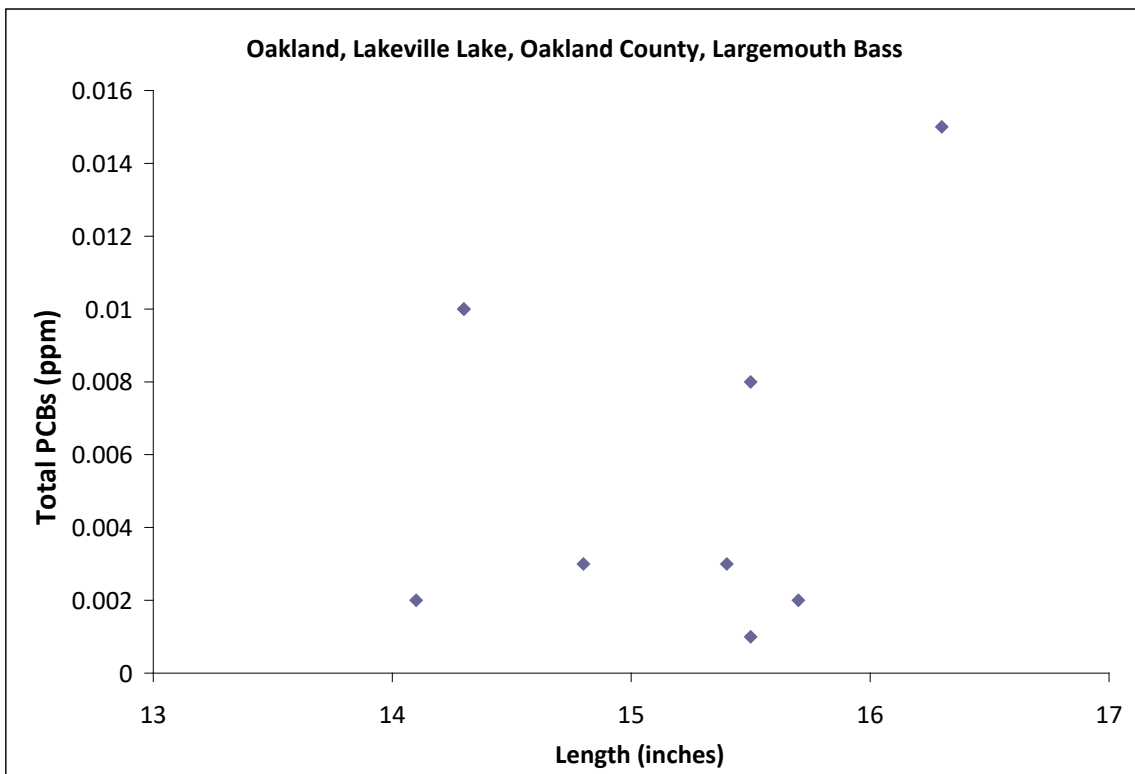
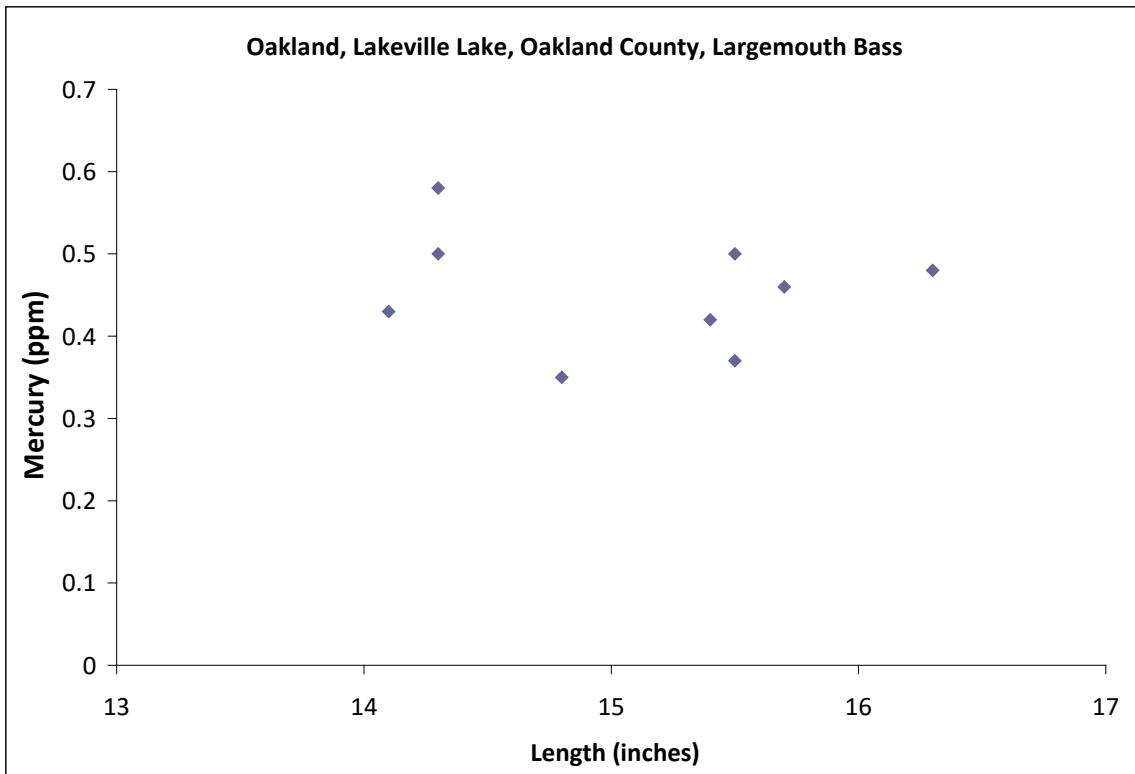
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2000	2000	10	13.1	14	14.4	16.3
Datasets available: 2000						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	9	0.454		0.510	2	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.083	0.125				

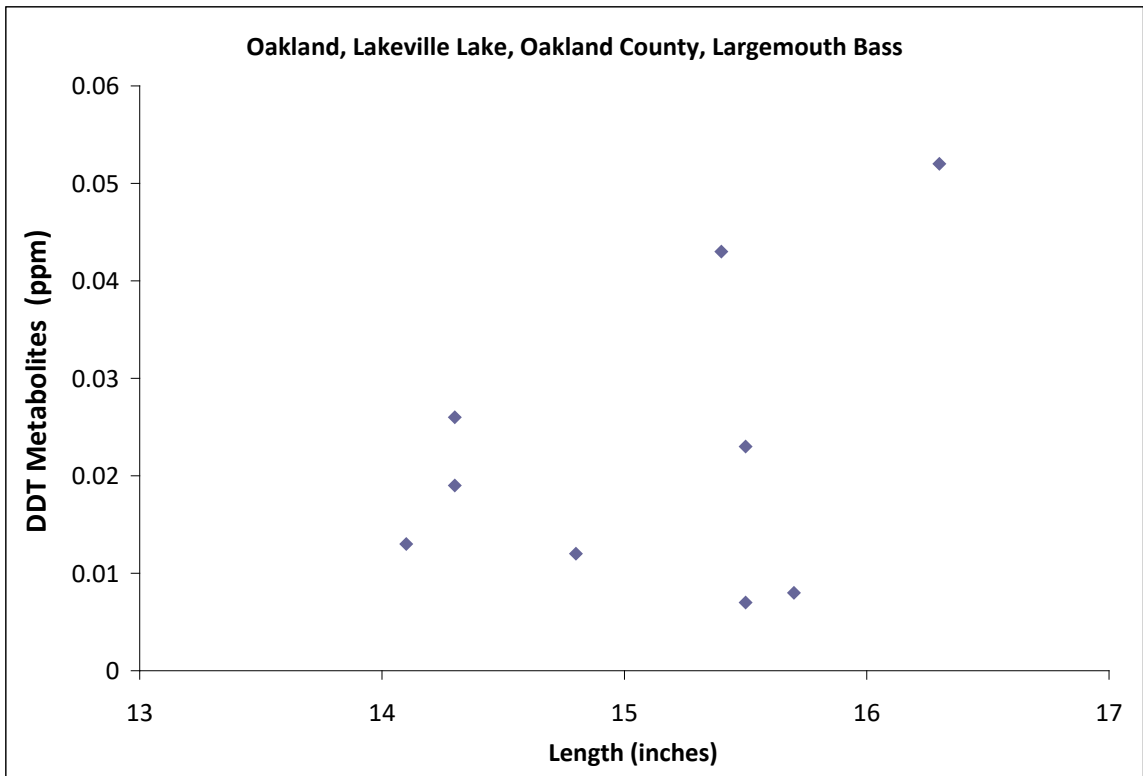
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2000	2000	10	13.1	14	14.4	16.3
Datasets available: 2000						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	9	0.006		0.010	16	
DDT	9	0.023		0.030	16	
Chlordane	9	ND		--	--	
Toxaphene	9	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.064	0.009				
DDT	0.181	0.056				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						2

Existing Advisory: Lakeville Lake largemouth bass are covered under the statewide mercury consumption advisory.

Recommendation: No one should eat more than 2 meals per month of Lakeville Lake largemouth or smallmouth bass less than 18 inches or 1 meal per month of Lakeville Lake largemouth or smallmouth bass greater than 18 inches due to mercury. Statewide guidelines length break applied.





Bluegill

Long Lake, w. of Pontiac

Oakland County

Hg Analysis:

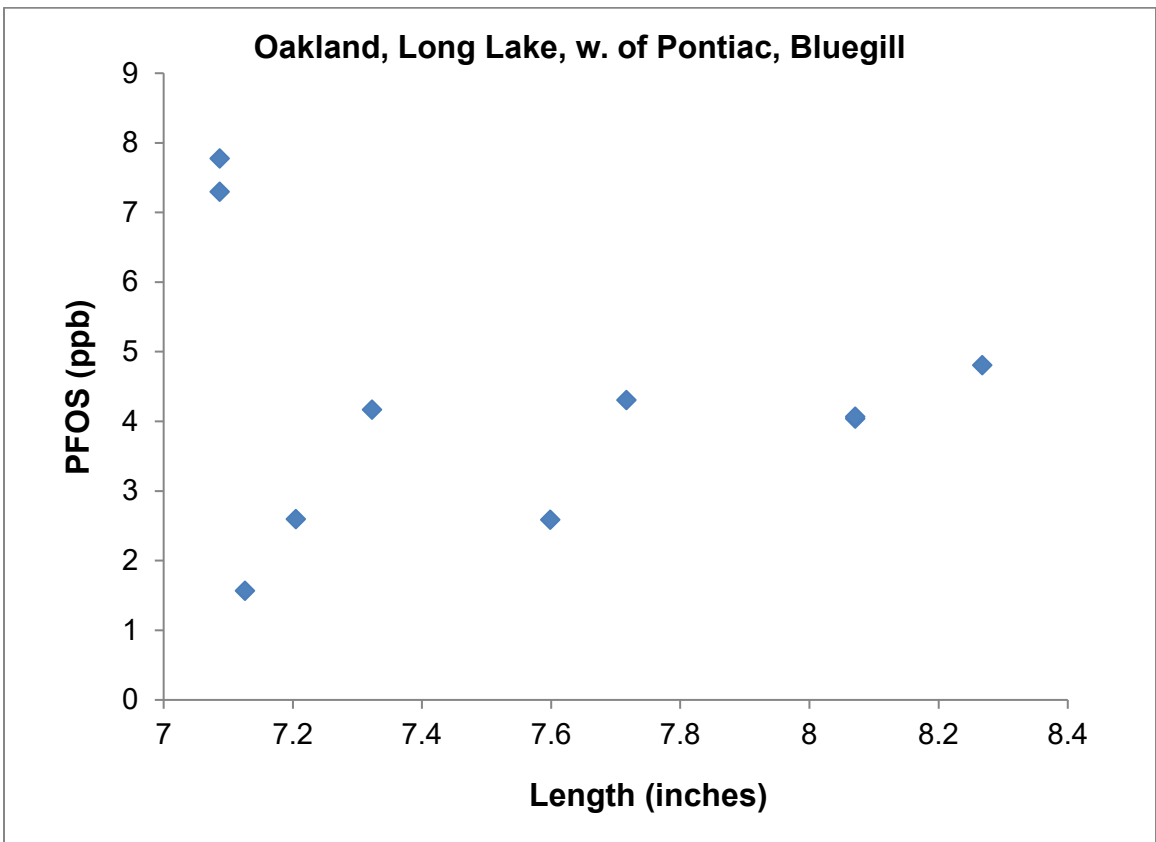
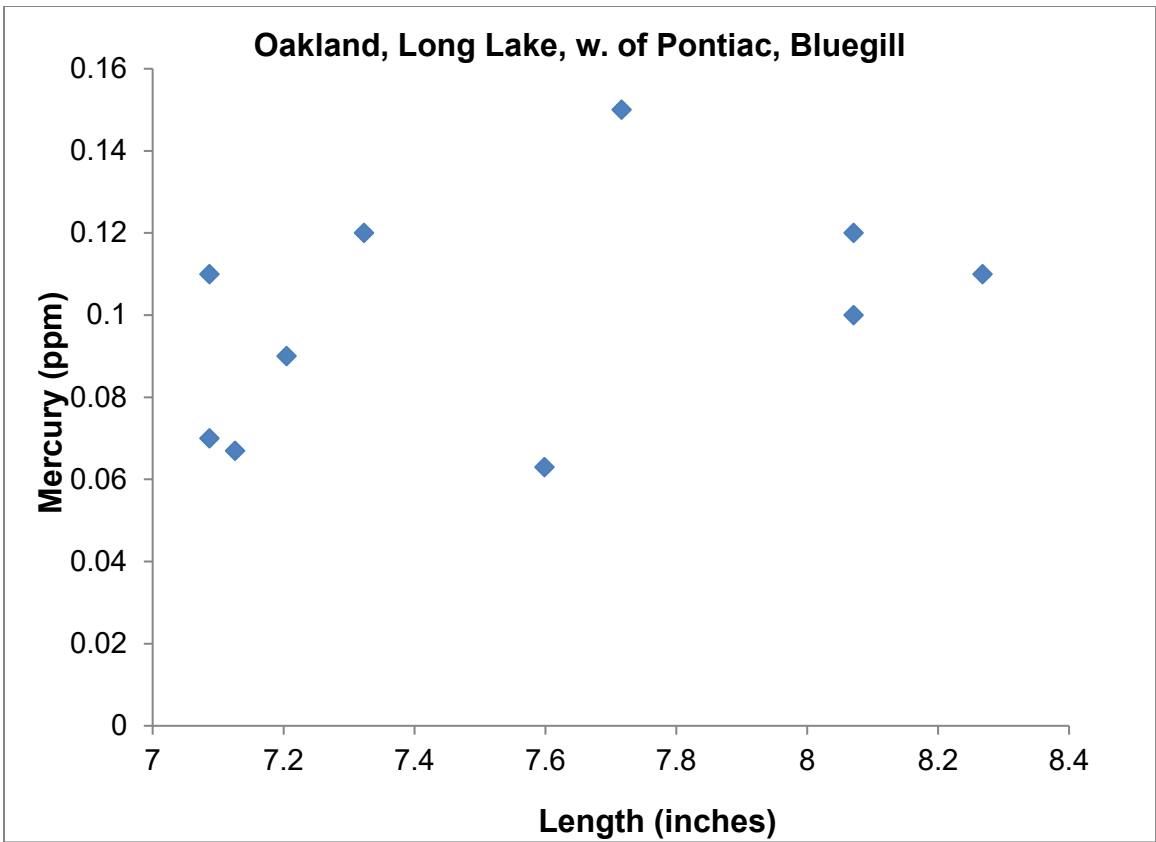
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples			
Earliest	Most Recent							
2019	2019	10	7.1	NA	7.1	8.3		
Datasets available: 2019								
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category		
Mercury	10	0.100	0.063	0.150	0.120	8		
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
Mercury	0.165	0.176						

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples				
Earliest	Most Recent								
2019	2019	10	7.1	NA	7.1	8.3			
Datasets available: 2019									
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category			
PCB	0	--	--	--	--	--			
DDT	0	--	--	--	--	--			
Chlordane	0	--	--	--	--	--			
Toxaphene	0	--	--	--	--	--			
PFOS	10	4.3 ppb	1.6 ppb	7.8 ppb	5.7 ppb	16			
Chemical	Linear Regression	Exponential Regression							
	R ²	R ²							
PCB	--	--							
DDT	--	--							
Chlordane	--	--							
Toxaphene	--	--							
PFOS	0.022	0.002	Final meal category based on UCL:				8		

Existing MDHHS Advisory: Bluegill and sunfish from Long Lake (west of Pontiac) are covered by the statewide advisory due to mercury: No one should eat more than 8 meals per month of bluegill or sunfish of any size.

Recommendation: No one should eat more than 8 meals per month of bluegill or sunfish from Long Lake (west of Pontiac) of any size due to mercury.



Largemouth Bass

Long Lake, w. of Pontiac

Oakland County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples			
Earliest	Most Recent							
2019	2019	10	12.6	14	13.7	17.2		
Datasets available: 2019								
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category	
Mercury	9	0.738		0.340	1.100	0.898	1	
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
Mercury	0.263	0.169						

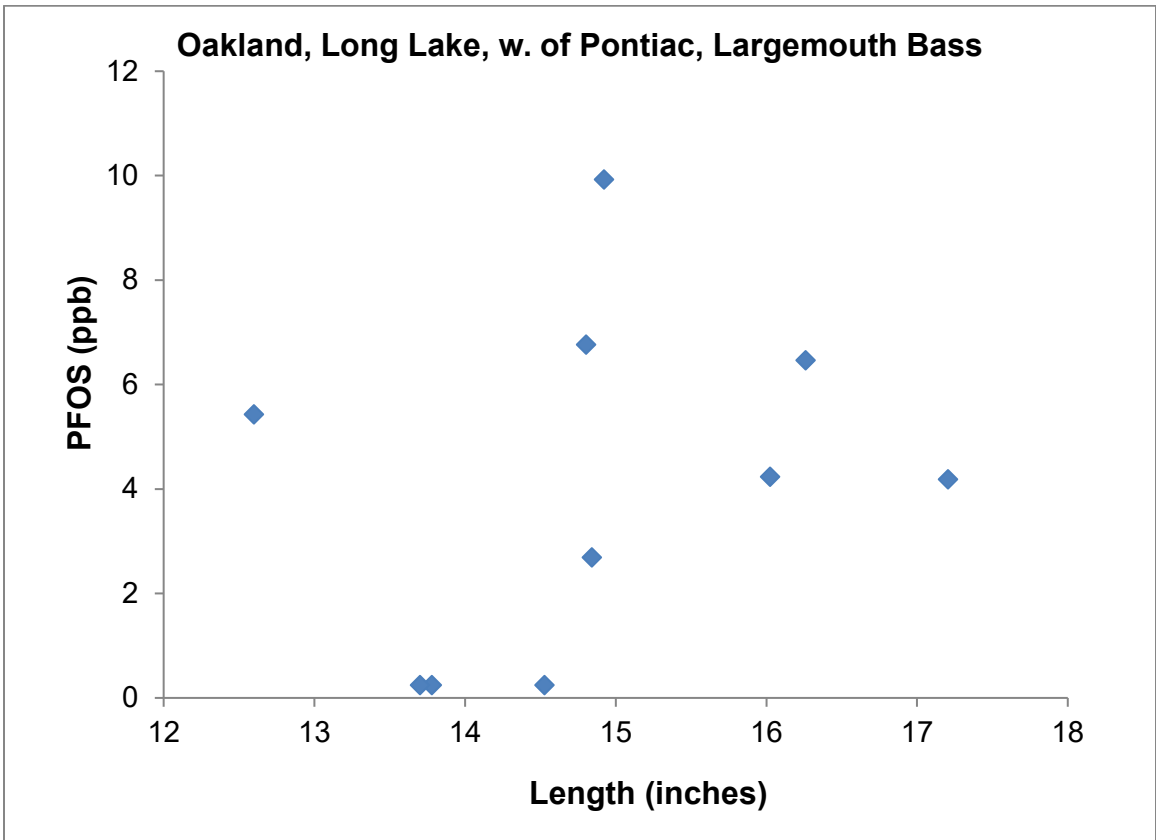
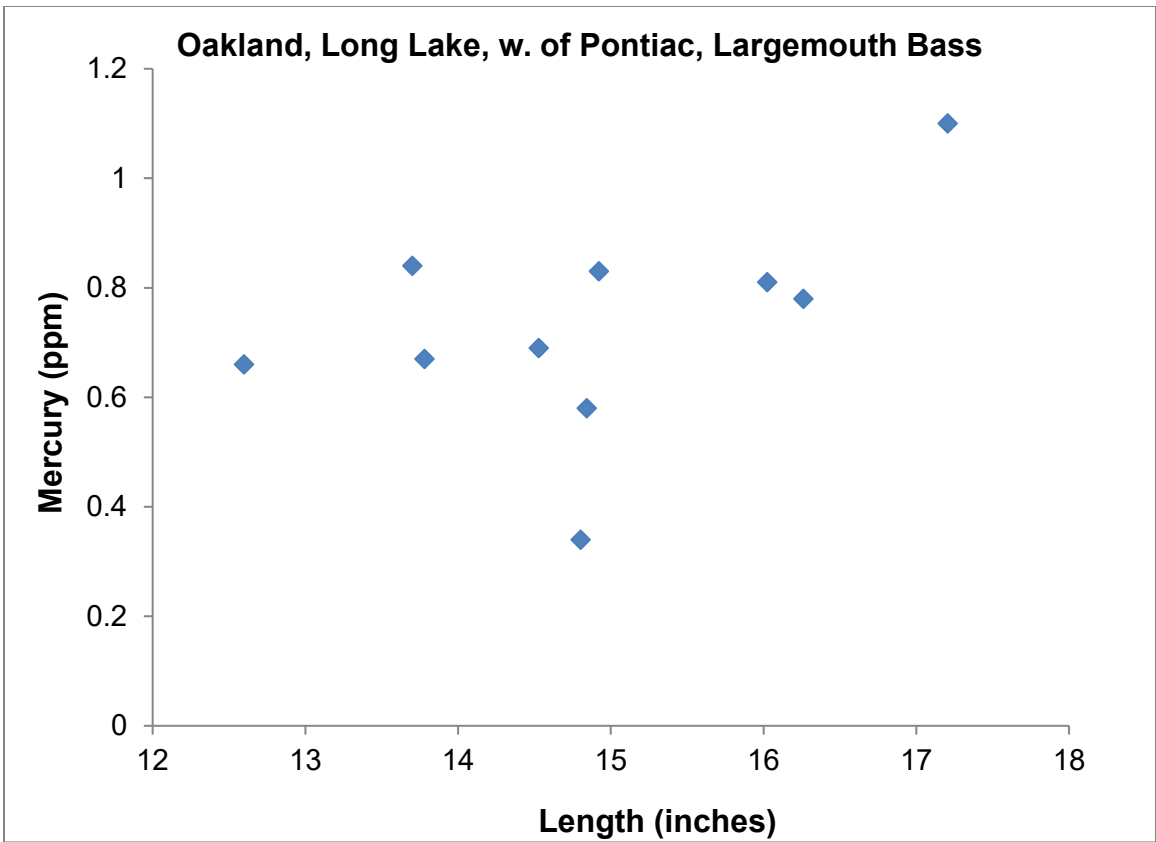
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples			
Earliest	Most Recent							
2019	2019	10	12.6	14	12.6	17.2		
Datasets available: 2019								
Chemical	Sample Size (All)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category	
PCB	0	--		--	--	--	--	
DDT	0	--		--	--	--	--	
Chlordane	0	--		--	--	--	--	
Toxaphene	0	--		--	--	--	--	
PFOS	10*	4.0 ppb		< 0.25 ppb	9.9 ppb	6.4 ppb	16	
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
PCB	--	--						
DDT	--	--						
Chlordane	--	--						
Toxaphene	--	--						
PFOS	0.074	0.159		Final meal category based on UCL:				1

*Sub-legal sized individuals were used in the PFOS data summary.

Existing MDHHS Advisory: Largemouth bass from Long Lake (west of Pontiac) in Oakland County are covered by the statewide advisory due to mercury: No one should eat more than 2 meals per month of largemouth and smallmouth bass smaller than 18 inches or no more than 1 meal per month of largemouth and smallmouth bass larger than 18 inches due to mercury.

Recommendation: No one should eat more than 1 meal per month of largemouth and smallmouth bass from Long Lake (west of Pontiac) of any size due to mercury.



Carp

Loon Lake

Oakland County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2000	2010	20	13.8	na	13.8	28
Datasets available: 2000, 2010						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	20	0.075			0.090	12
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.302	0.383				

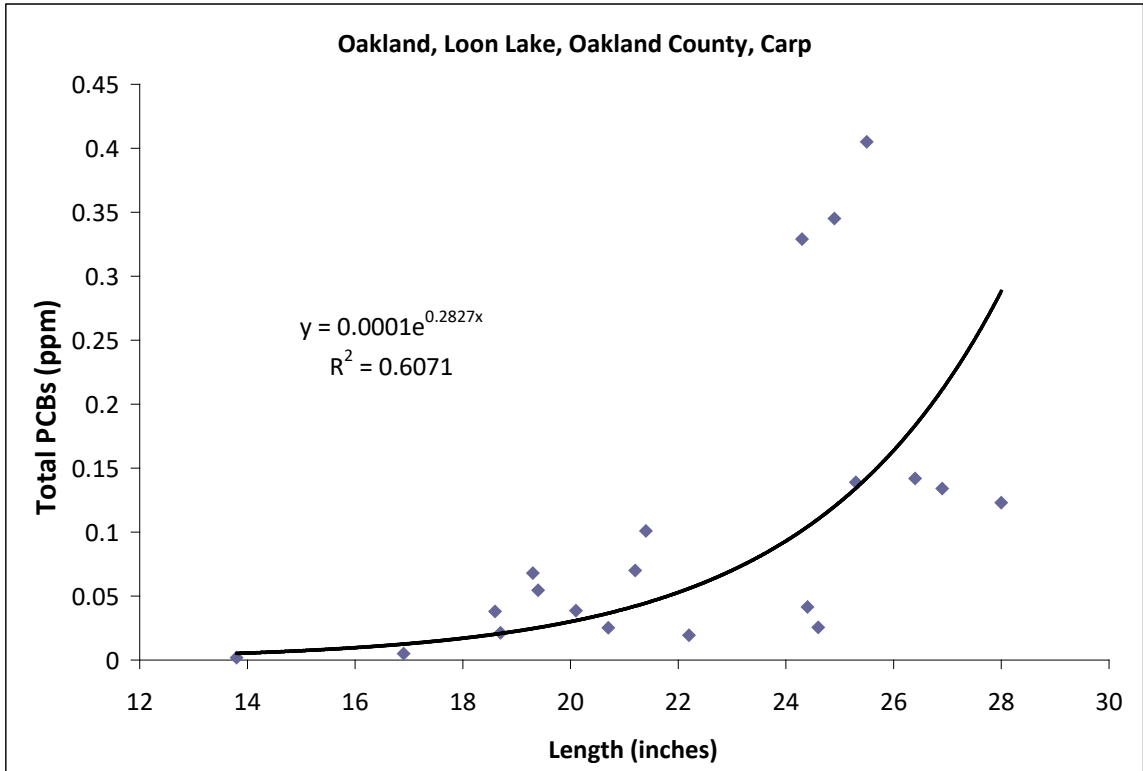
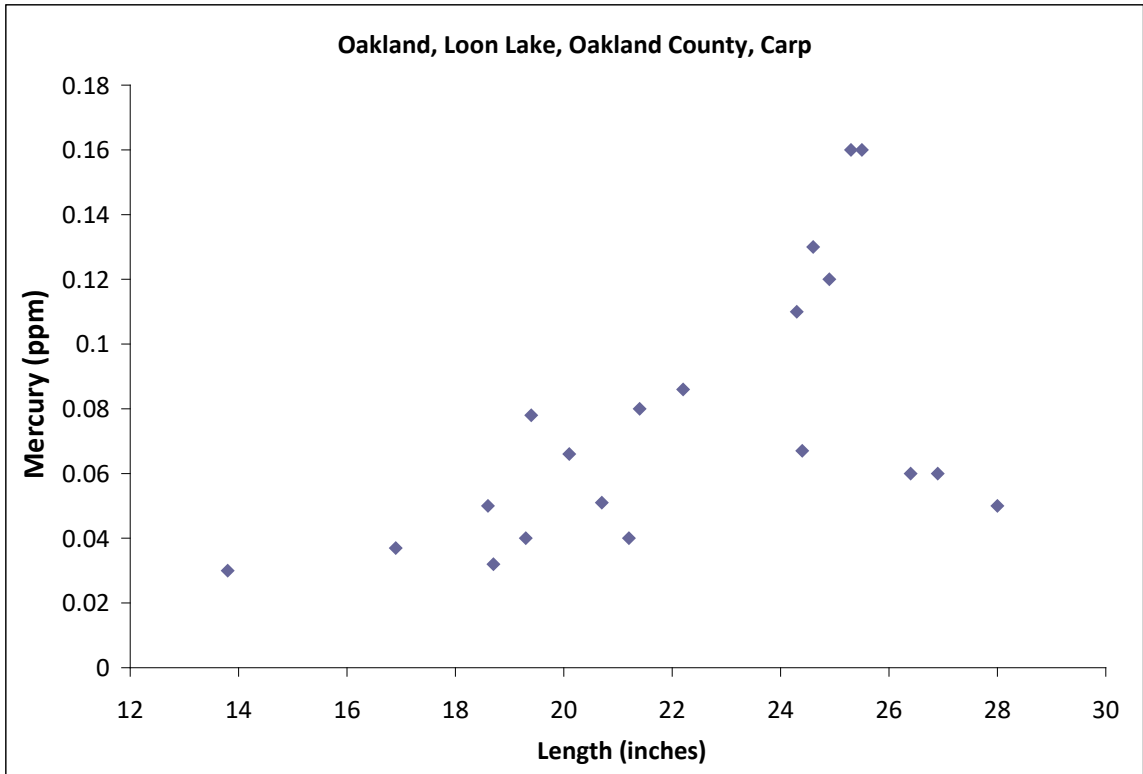
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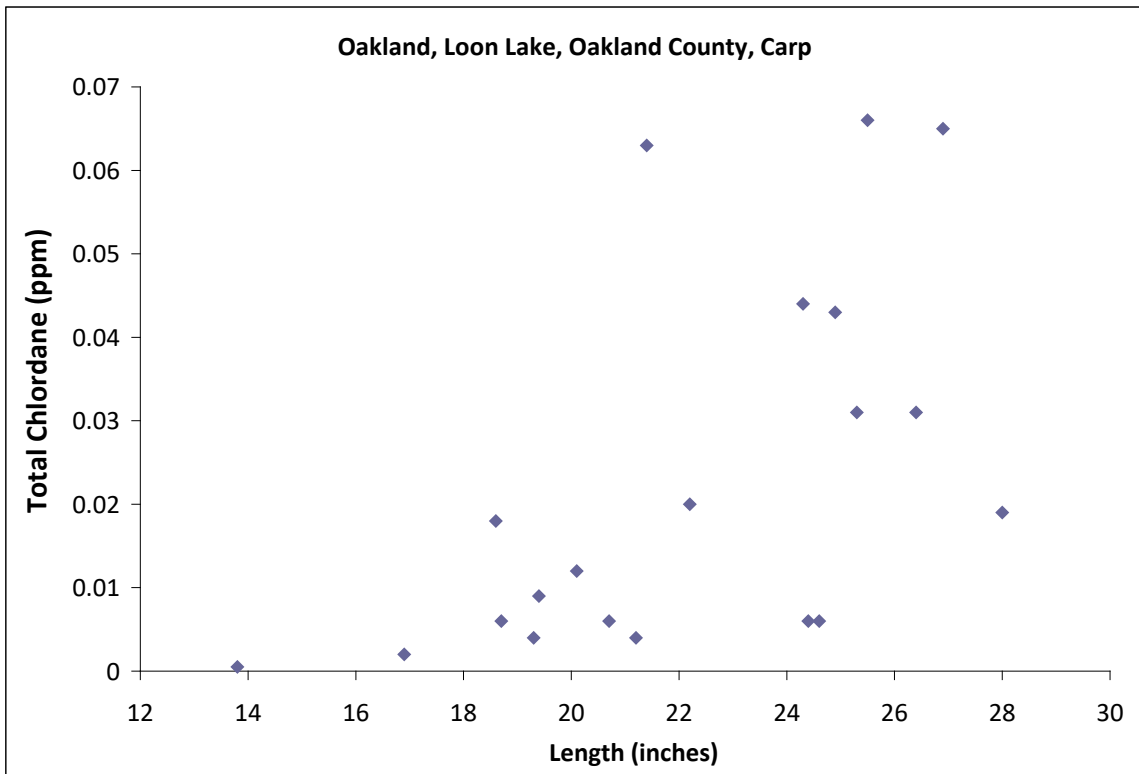
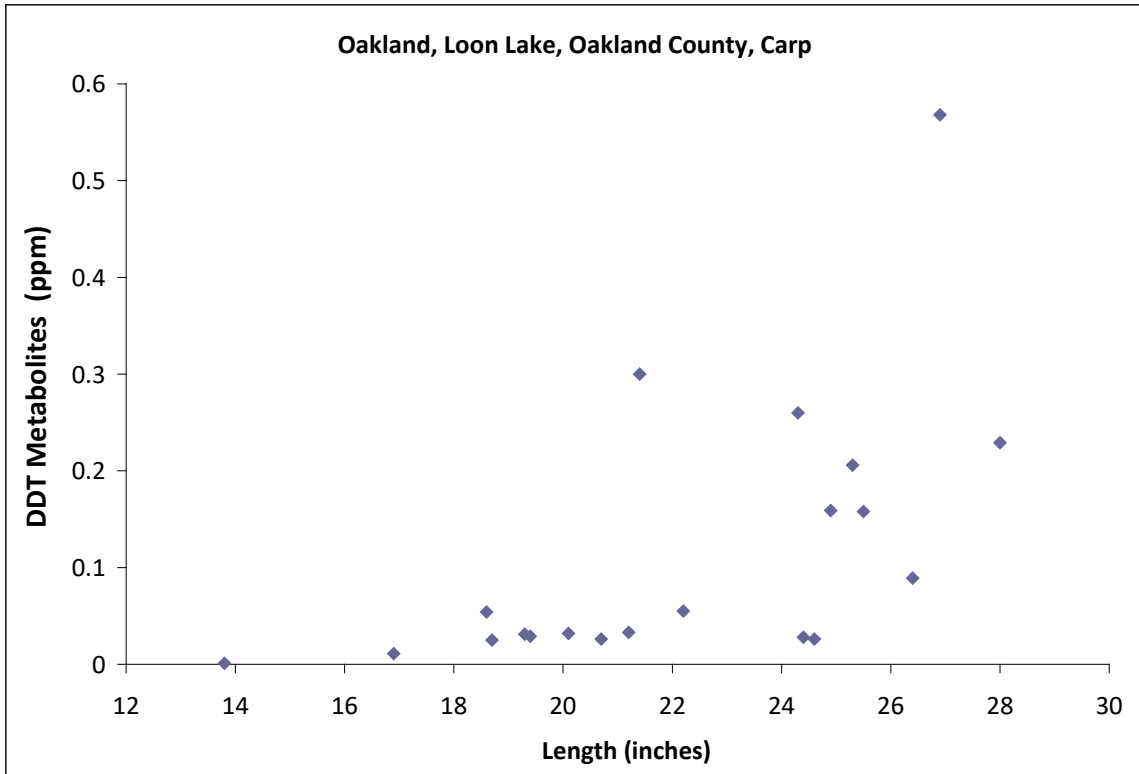
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2000	2010	20	13.8	na	13.8	28
Datasets available: 2000, 2010						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	20	0.106			0.160	1
DDT	20	0.116		0.180	8	
Chlordane	20	0.023		0.030	--	
Toxaphene	20	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.320	0.607				
DDT	0.349	0.643				
Chlordane	0.328	0.549				
Toxaphene	--	--				
Final meal category based on UCL:					1	

Existing Advisory: Women and children should eat no more than one meal per month of Loon Lake carp due to elevated levels of PCBs.

Recommendation: No one should eat more than 8 meals per month of Loon Lake carp less than 20 inches, 2 meals per month from 20 to 24 inches, and 6 meals per year greater than 24 inches due to PCBs. DDT and mercury would cause advisories.

Length (Inches)	PCB Regression Estimate (ppm)	Meal Category
12	0.003	16
14	0.005	16
16	0.009	16
18	0.016	12
20	0.029	8
22	0.050	4
24	0.088	2
26	0.156	1
28	0.274	0.5
<i>Shaded area denotes extrapolated estimates</i>		





**Largemouth Bass
Smallmouth Bass**

Loon Lake

Oakland County

Hg Analysis:

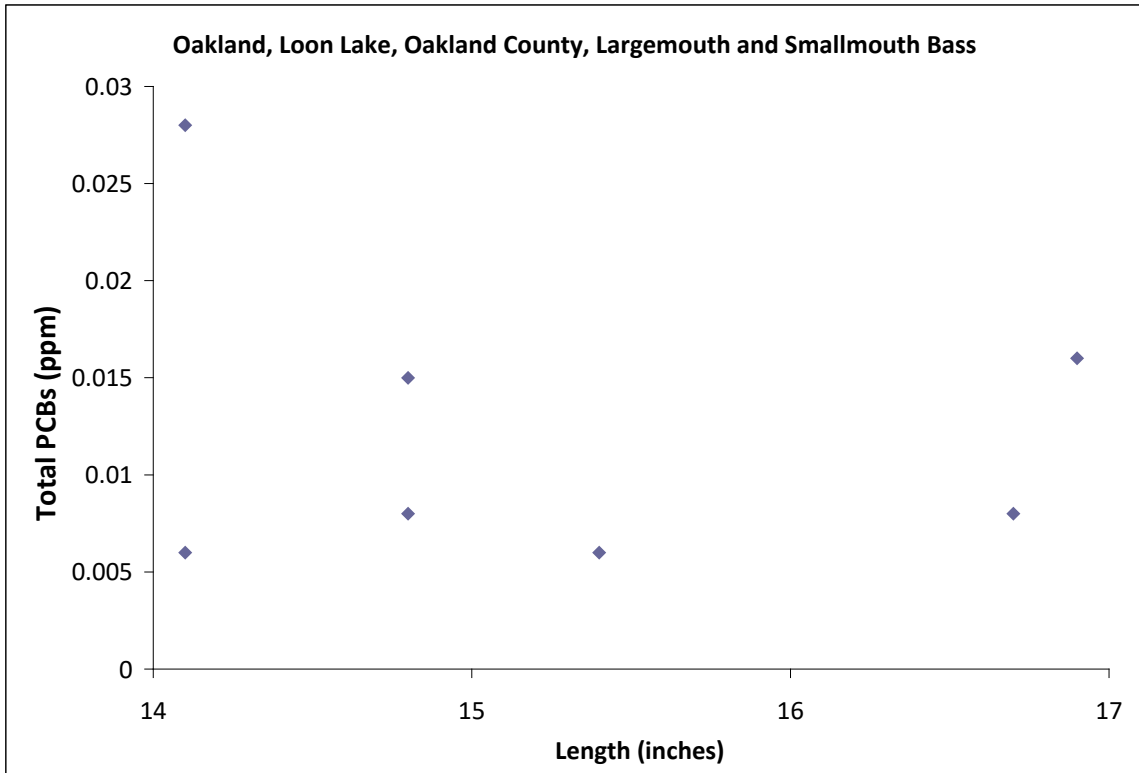
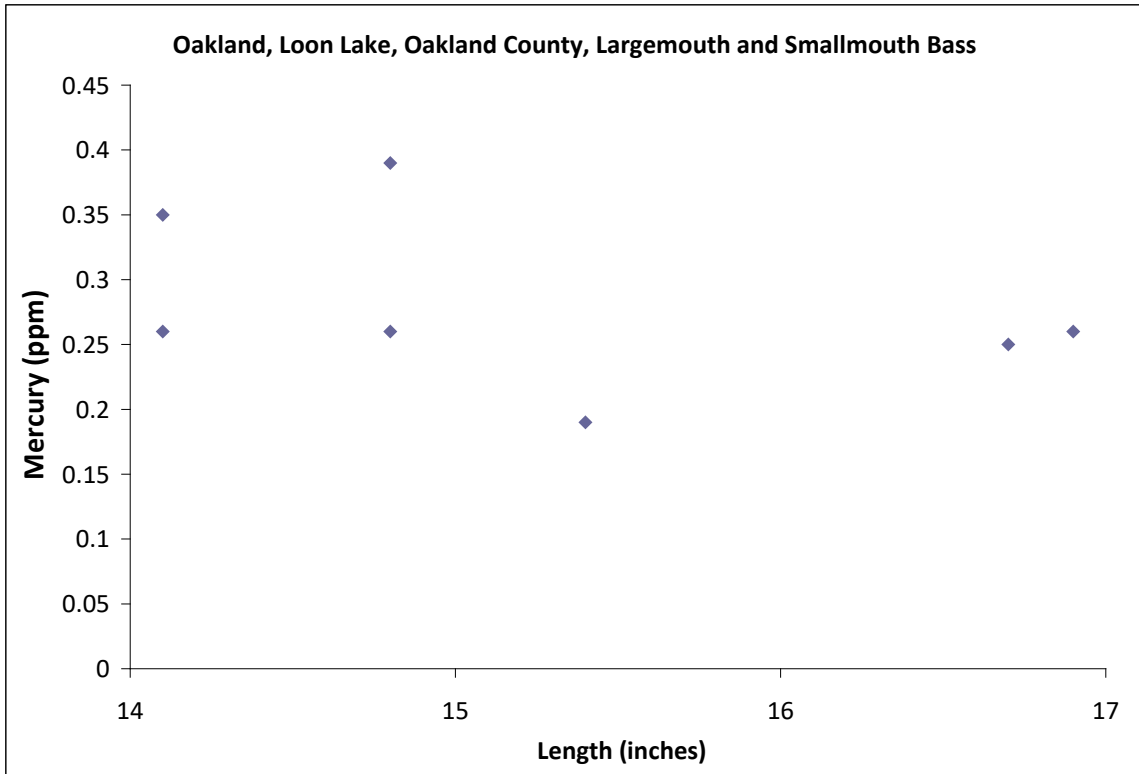
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2000	2000	9	13.4	14	14.1	16.9
Datasets available: 2000						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	7	0.28		0.340	2	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.002	0.007				

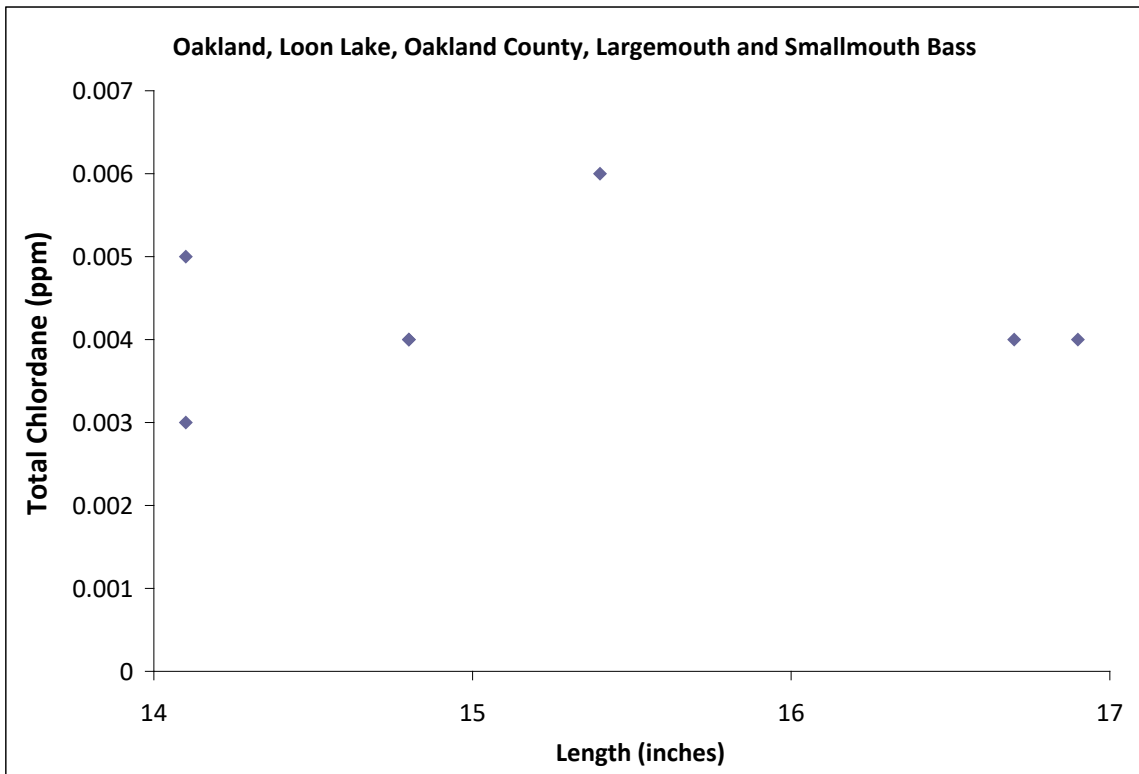
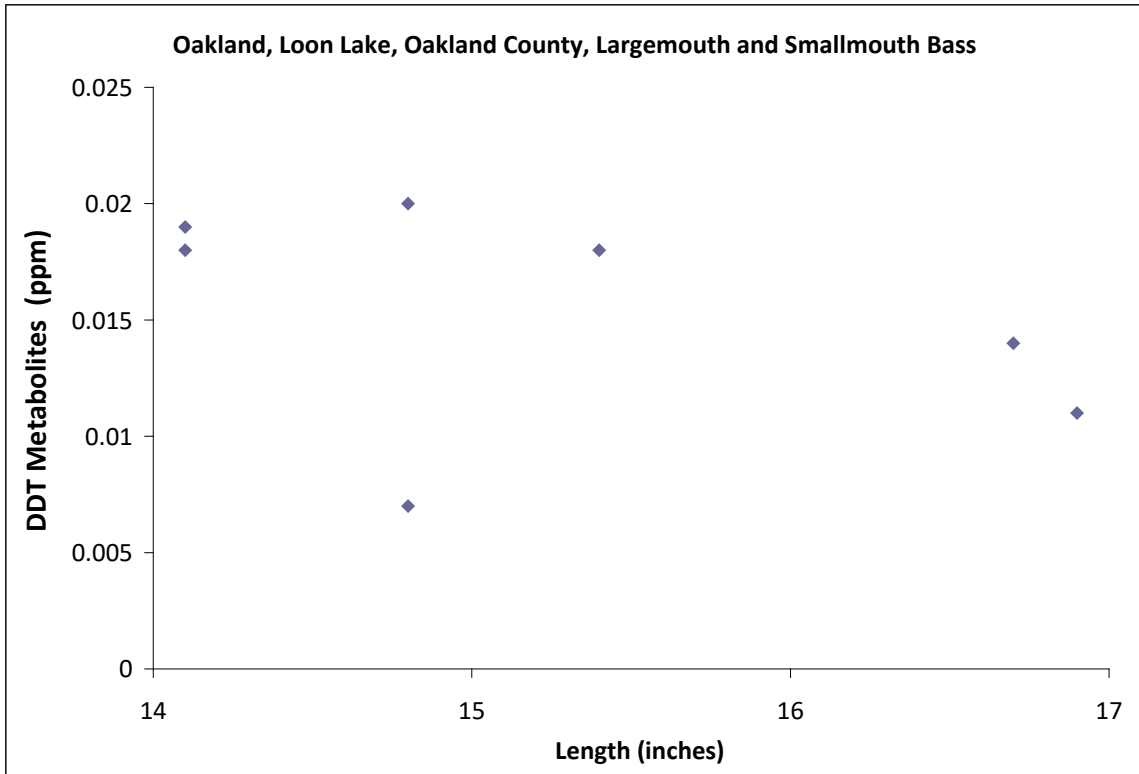
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2000	2000	9	13.4	14	14.1	16.9
Datasets available: 2000						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	7	0.012		0.020	12	
DDT	7	0.015		0.020	16	
Chlordane	7	0.004		0.010	--	
Toxaphene	7	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.000	0.013				
DDT	0.233	0.166				
Chlordane	0.151	0.202				
Toxaphene	--	--				
Final meal category based on UCL:						2

Existing Advisory: Women and children should eat no more than one meal per month and the general population should eat no more than one meal per week of Loon Lake largemouth or smallmouth bass larger than 18 inches in length due to elevated levels of mercury.

Recommendation: No one should eat more than 2 meals per month of Loon Lake largemouth or smallmouth bass less than 18 inches or 1 meal per month of Loon Lake largemouth or smallmouth bass greater than 18 inches due to mercury. Statewide guidelines length break applied.





Largemouth Bass

Lower Trout Lake

Oakland County

Hg Analysis:

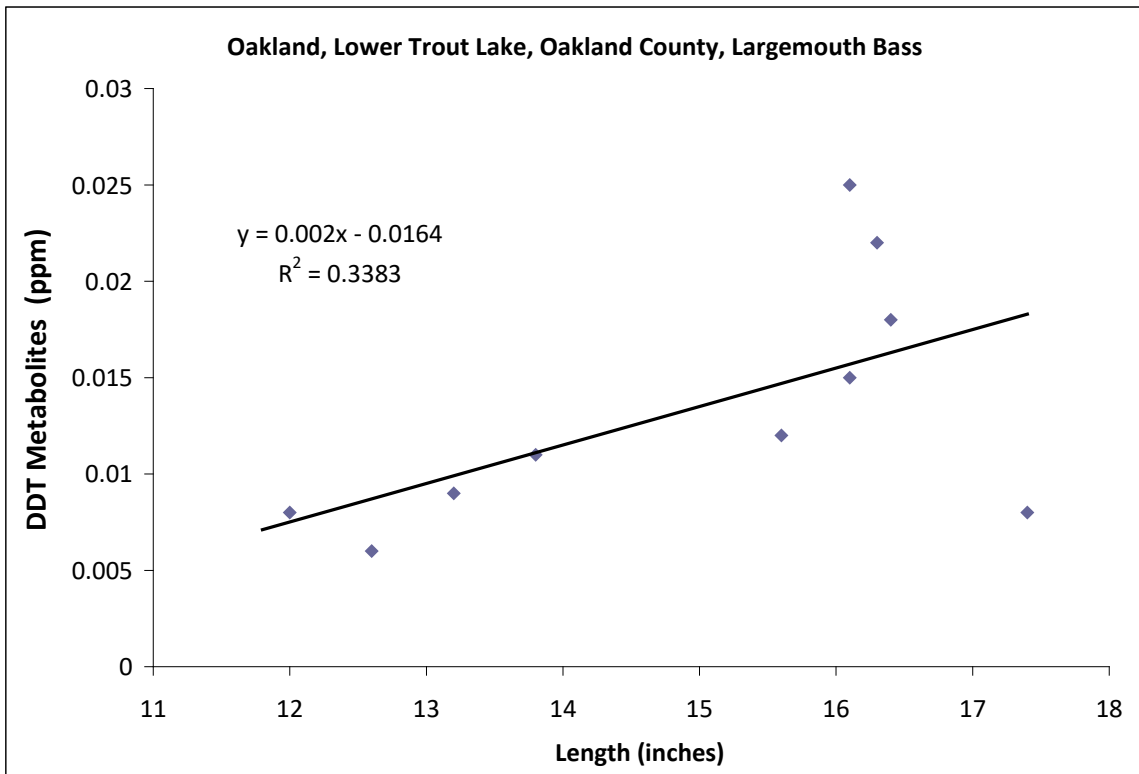
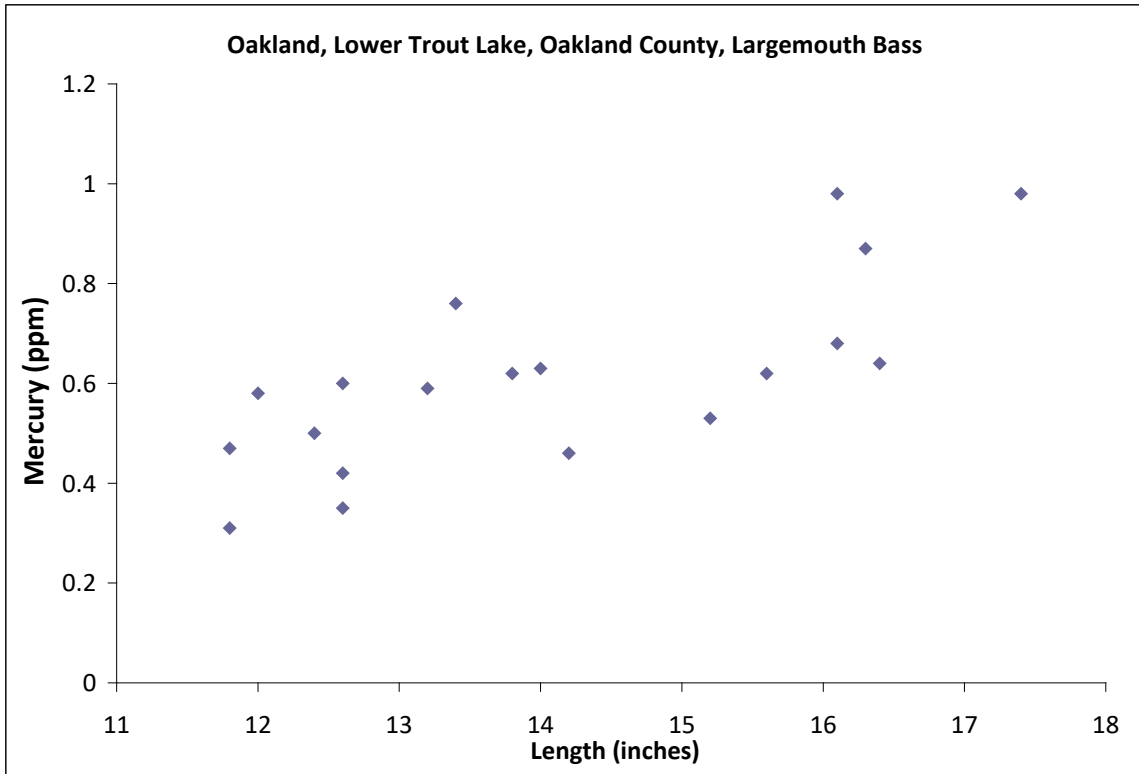
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1990	1993	19	11.8	14	13.8	17.4
Datasets available: 1990, 1993						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	9	0.71		0.860	1	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.556	0.534				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1990	1990	10	12	14	13.8	17.4
Datasets available: 1990						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	6	ND		--	--	
DDT	6	0.017		0.020	16	
Chlordane	6	ND		--	--	
Toxaphene	6	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	0.933	0.736				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:					1	

Existing Advisory: Lower Trout Lake largemouth bass are covered under the statewide mercury consumption advisory.

Recommendation: No one should eat more than 1 meal per month of Lower Trout Lake largemouth or smallmouth bass less than 18 inches or 6 meals per year of Lower Trout Lake largemouth or smallmouth bass greater than 18 inches due mercury. This dataset is limited due to age of the dataset. Based on EGLE’s Fish Contaminant Monitoring Program (FCMP), temporal changes in Hg concentrations are waterbody specific in Michigan. The EGLE FCMP finds that mercury concentration in fish are either staying the same or increasing. Statewide guidelines length break applied.



Northern Pike

Lower Trout Lake

Oakland County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1990	1990	1	35.8	24	35.8	35.8
Datasets available: 1990						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	1	1.64		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1990	1990	1	35.8	24	35.8	35.8
Datasets available: 1990						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	1	0.035		--		--
DDT	1	0.079		--		--
Chlordane	1	ND		--		--
Toxaphene	1	ND		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--		Final meal category based on UCL:		na

Existing Advisory: Lower Trout Lake northern pike are covered under the statewide mercury consumption advisory.

Recommendation: Statewide guidelines apply to Lower Trout Lake northern pike. This dataset is limited due to small sample size and age of the data.

Northern Pike

Maceday Lake

Oakland County

Hg Analysis:

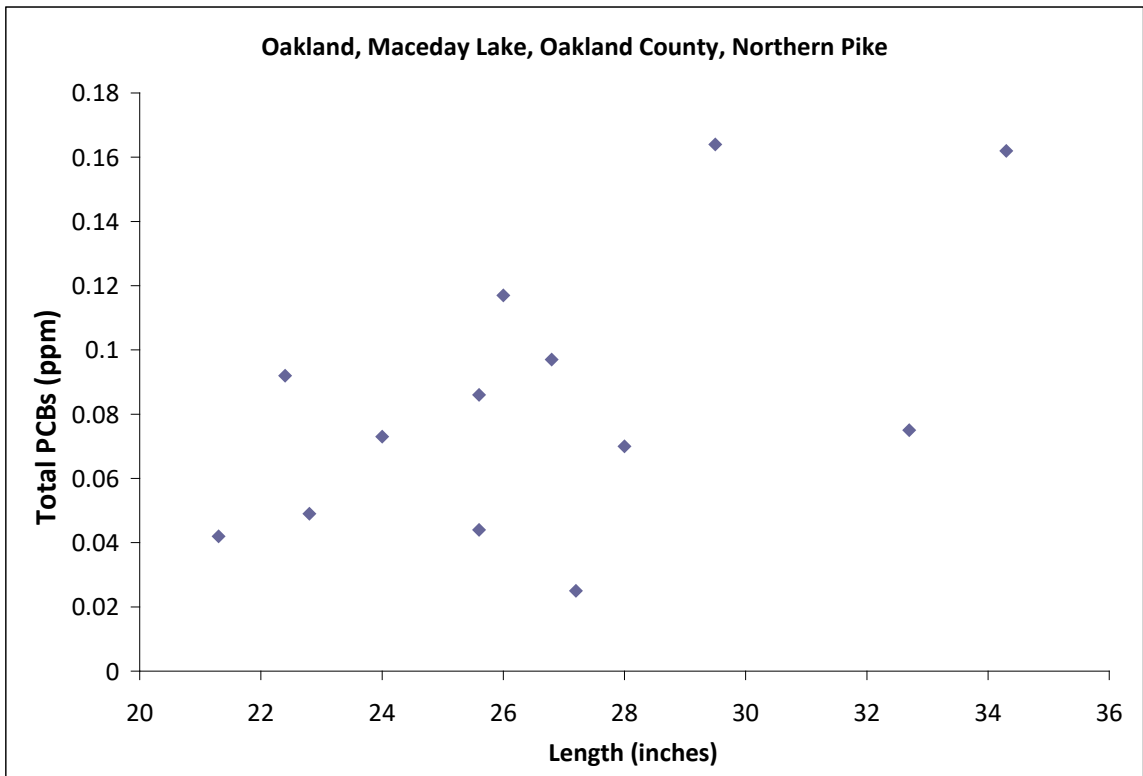
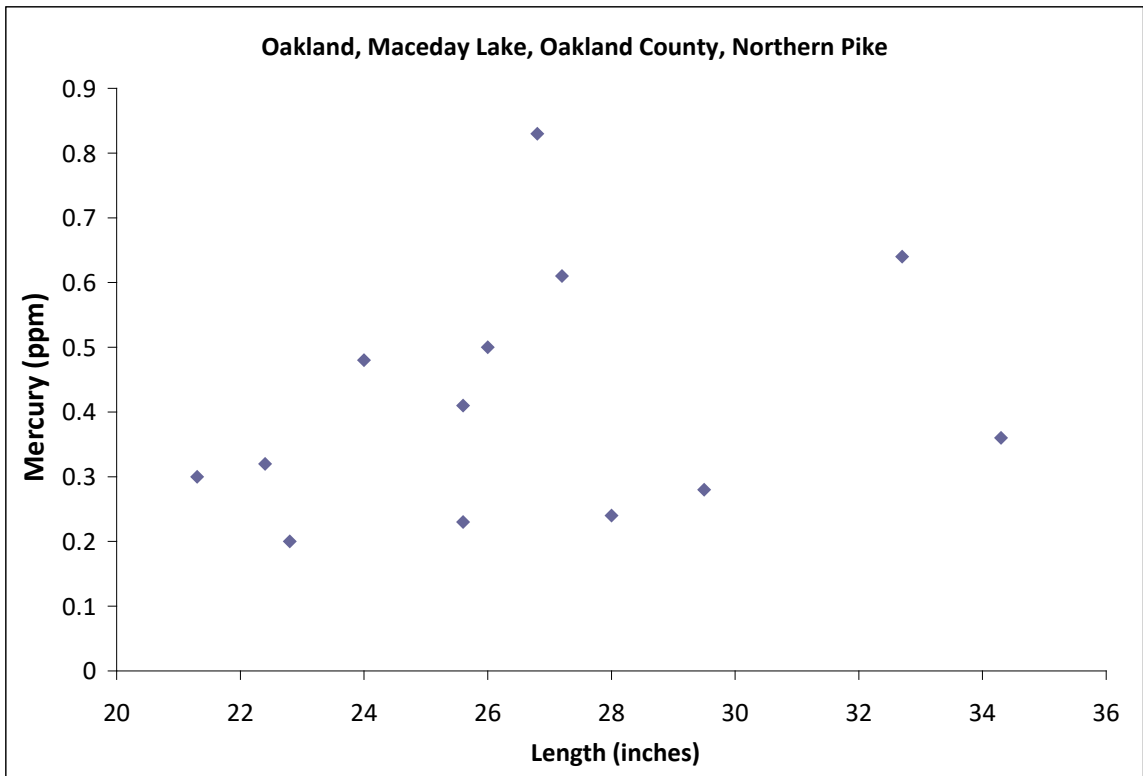
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1991	1996	13	21.3	24	24	34.3
Datasets available: 1991, 1996						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	10	0.458			0.600	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.071	0.081				

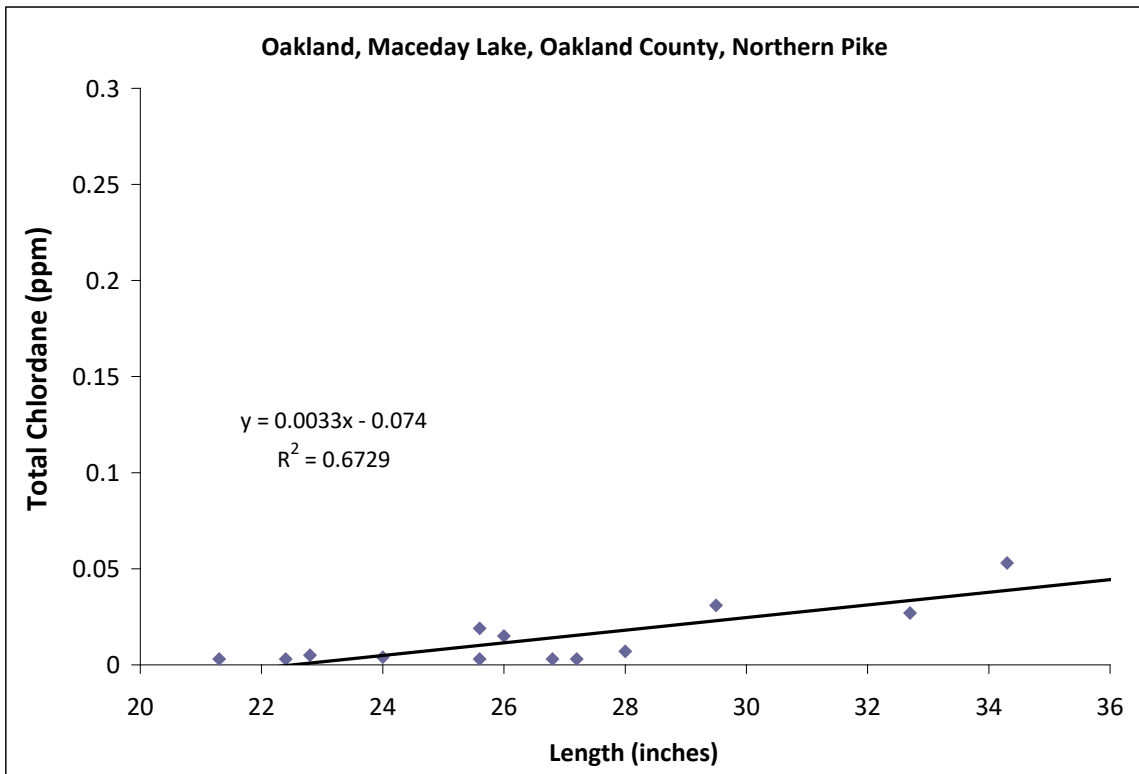
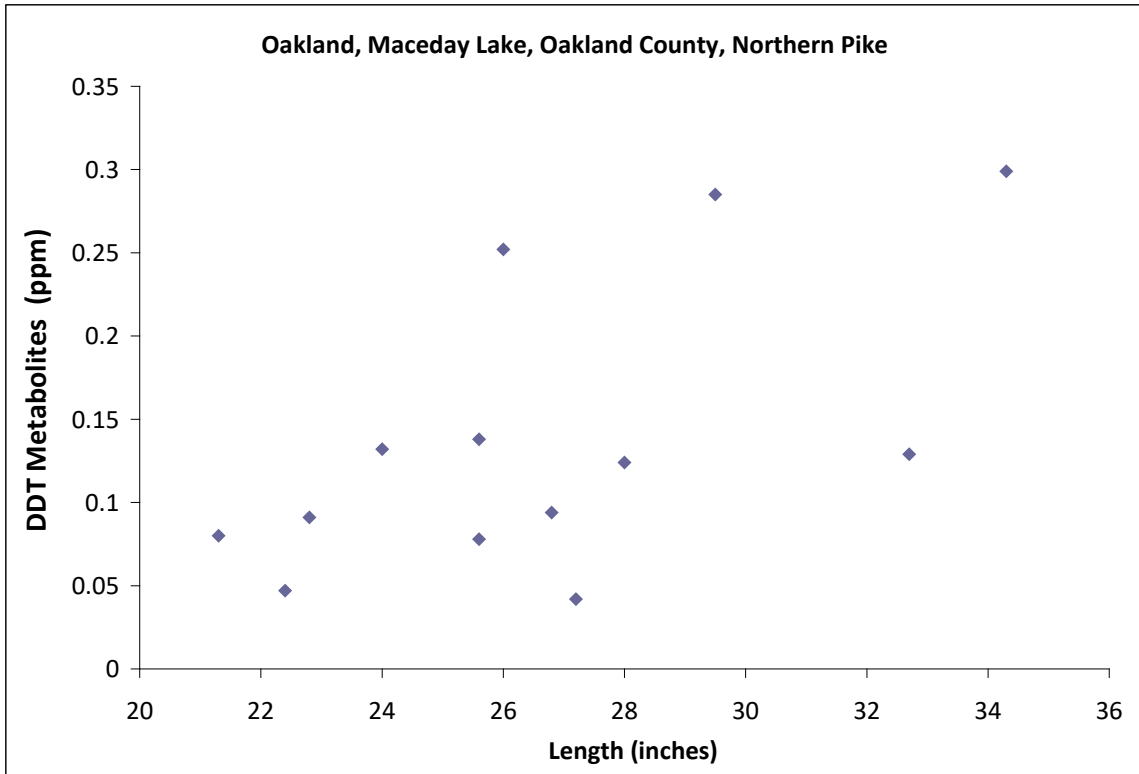
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1990	1990	10	35.8	24	35.8	35.8
Datasets available: 1990						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	10	0.091			0.120	1
DDT	10	0.157		0.220	2	
Chlordane	10	0.017		0.030	--	
Toxaphene	10	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.304	0.213				
DDT	0.365	0.318				
Chlordane	0.673	0.590				
Toxaphene	--	--				
Final meal category based on UCL:					1	

Existing Advisory: Women and children should eat no more than one meal per month and the general population should eat no more than one meal per week of Maceday Lake northern pike due to elevated levels of PCBs and mercury.

Recommendation: No one should eat more than 1 meal per month of Maceday Lake northern pike due to elevated levels of mercury. PCB and DDT would cause advisories. This dataset is limited due to age of the data. Based on EGLE's Fish Contaminant Monitoring Program, PCB and DDT concentrations ≥15 years old are expected to have declined leaving mercury as the chemical advisory driver. Mercury concentrations are not expected to decline.





Northern Pike

Middle Straits Lake

Oakland County

Hg Analysis:

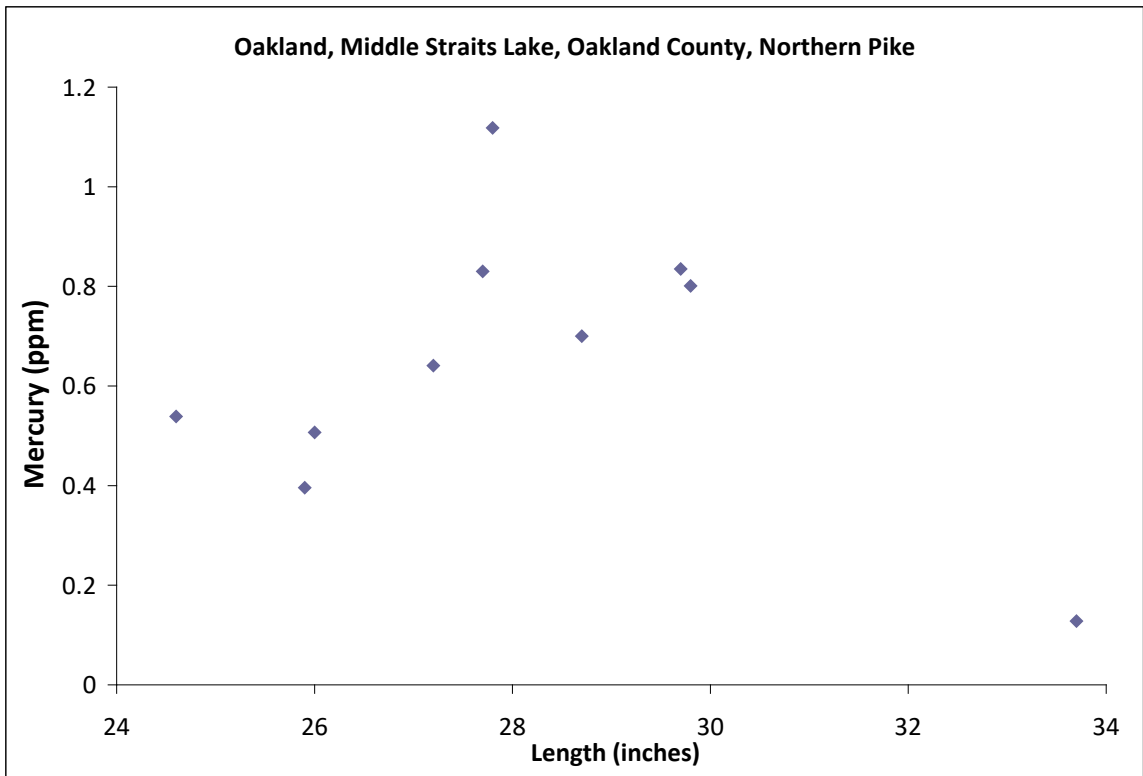
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2007	2007	10	24.6	24	24.6	33.7
Datasets available: 2007						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	10	0.650		0.850	1	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.041	0.200				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	0				
Datasets available: 2007						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	0	--		--	--	
DDT	0	--		--	--	
Chlordane	0	--		--	--	
Toxaphene	0	--		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:					1	

Existing Advisory: Middle Straits Lake northern pike are covered under the statewide mercury consumption advisory.

Recommendation: No one should eat more than 1 meal per month of Middle Straits Lake northern pike less than 30 inches or 6 meals per year greater than 30 inches due to mercury.



Bluegill

**Milford Pond
Pettibone Creek**

Oakland County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2018	2018	10	4.9	na	4.9	5.8
Datasets available: 2018						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.07	0.04	0.15	0.10	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.164	0.172				

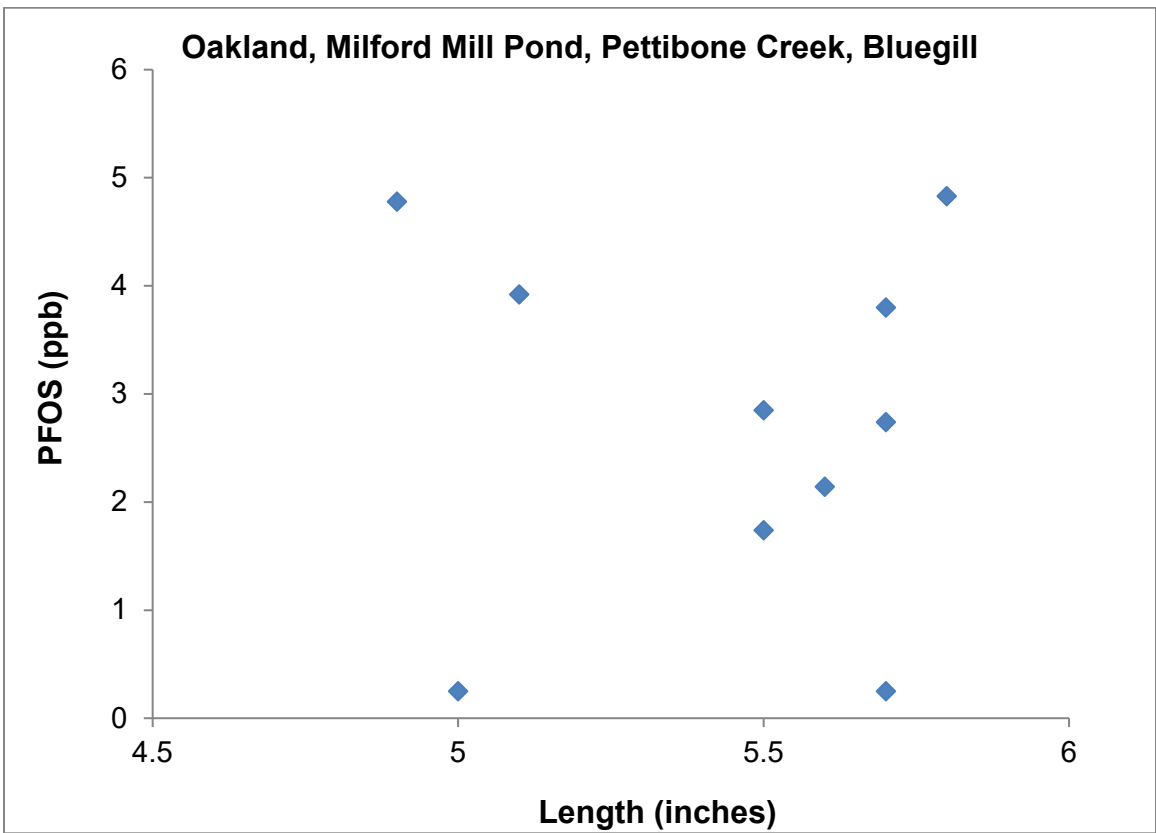
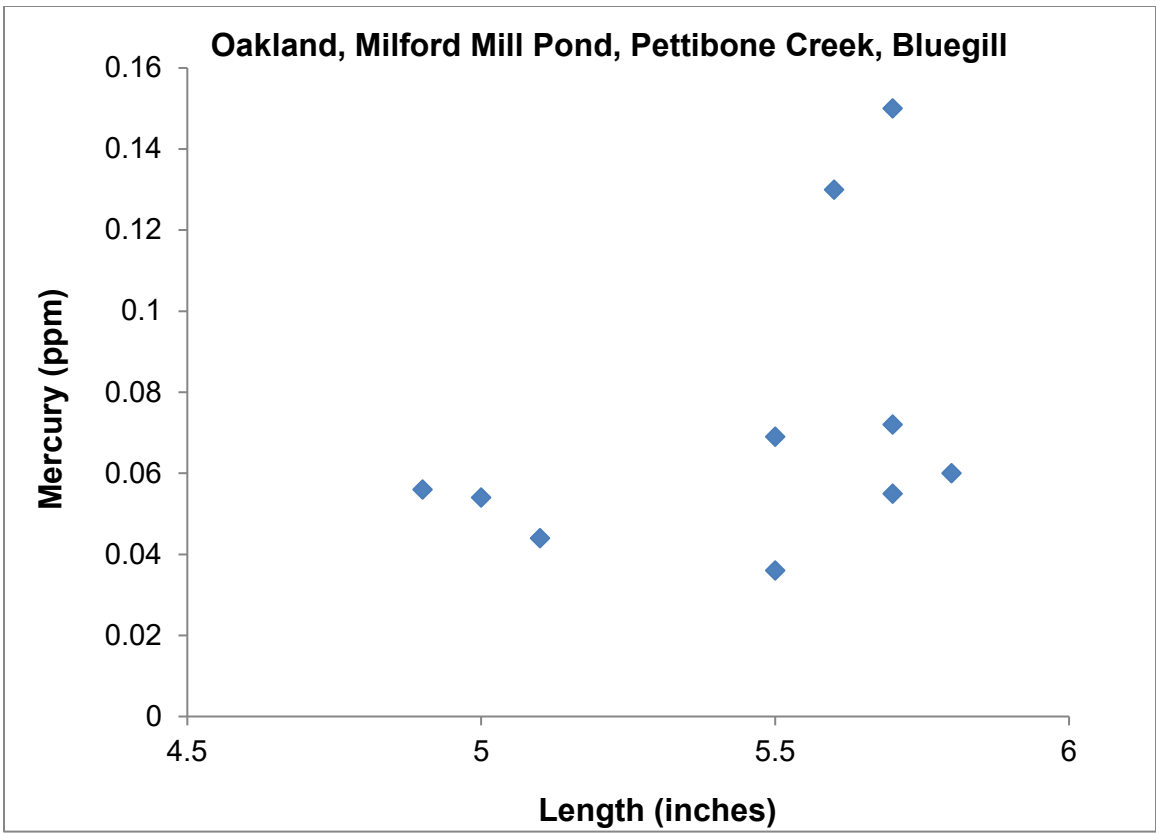
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2018	2018	10	4.9	na	4.9	5.8
Datasets available: 2018						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
PFOS	10	3 ppb	< 0.25 ppb	5 ppb	4 ppb	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.001	0.007				
Final meal category based on UCL:						8

Existing MDHHS Advisory: Milford Mill Pond bluegill and sunfish are covered by the statewide advisory: No one should eat more than 8 meals per month of bluegill or sunfish of any size due to mercury

Recommendation: No one should eat more than 8 meals per month of Milford Mill Pond bluegill or sunfish of any size due to mercury. This guideline includes Pettibone Creek between the Moore Lake Dam and Pettibone Creek Powerhouse Dam.

Note: The Huron River Do Not Eat Advisory applies to all fish caught from Pettibone Creek downstream of the Pettibone Creek Powerhouse Dam.



**Largemouth Bass
Smallmouth Bass**

Orchard Lake

Oakland County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	1989	9	9.1	14	15	16.5
Datasets available: 1987, 1989						
Chemical	Sample Size (All)	Mean (ppm)		95%UCL	Meal Category	
Mercury	9	0.59			0.80	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.706	0.780				

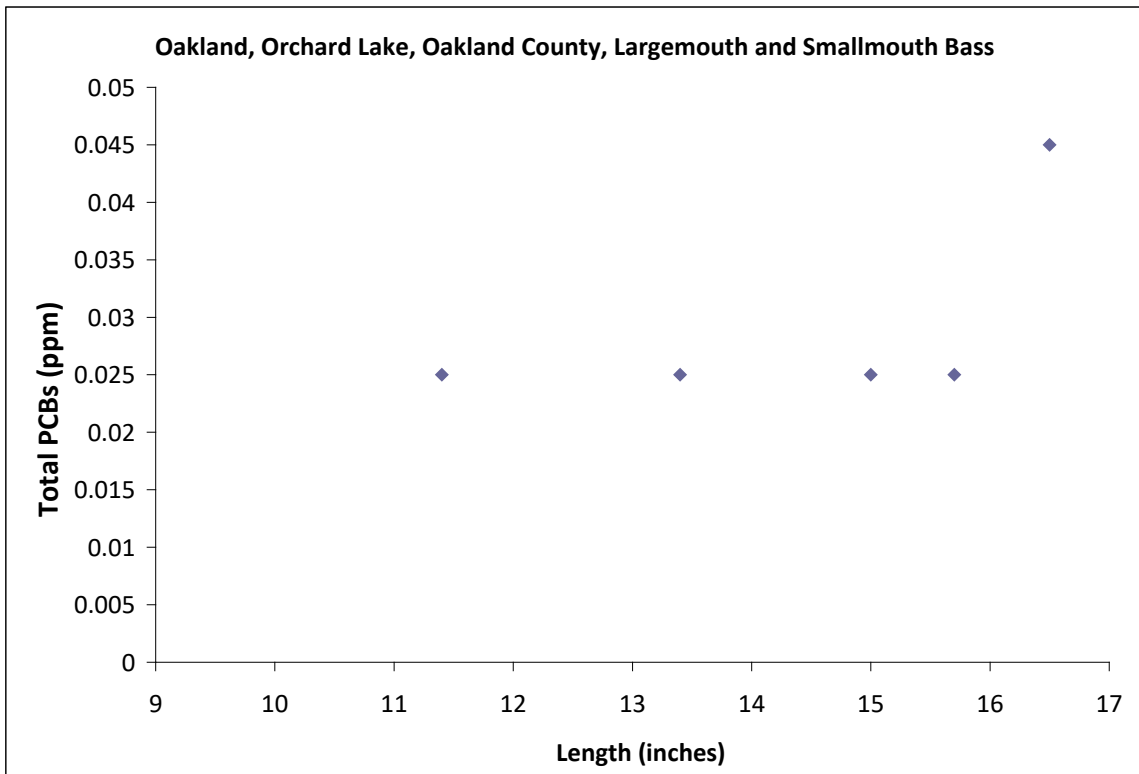
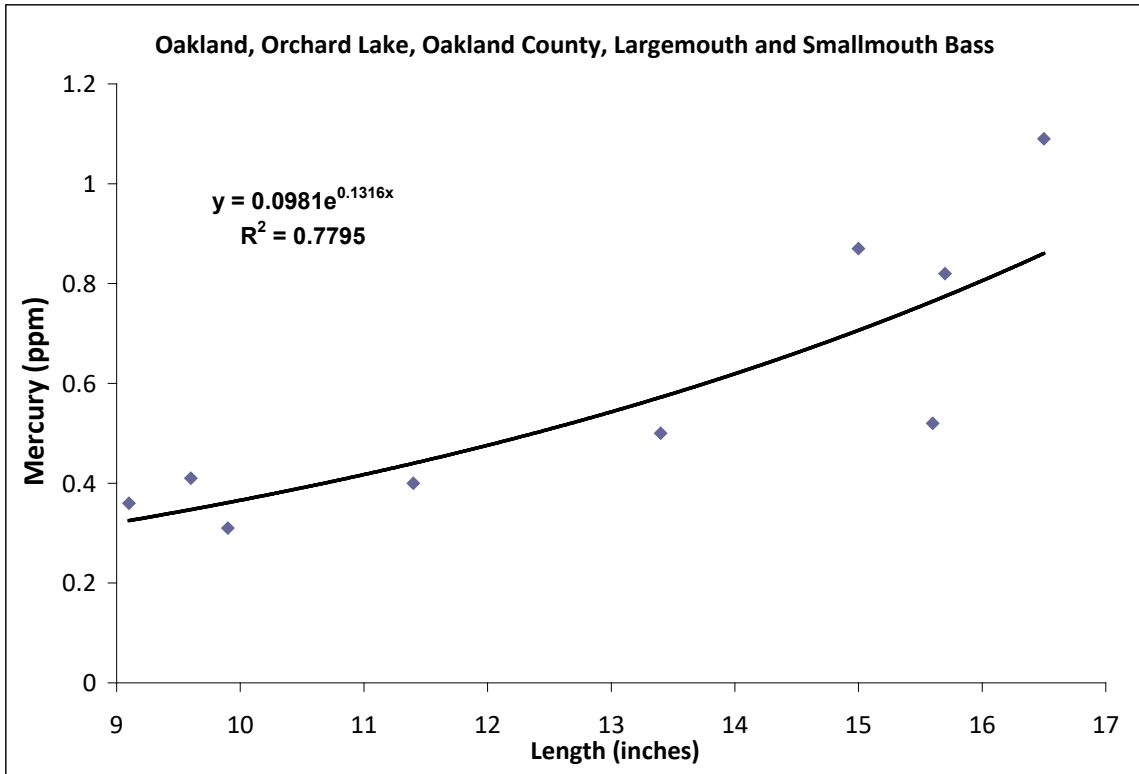
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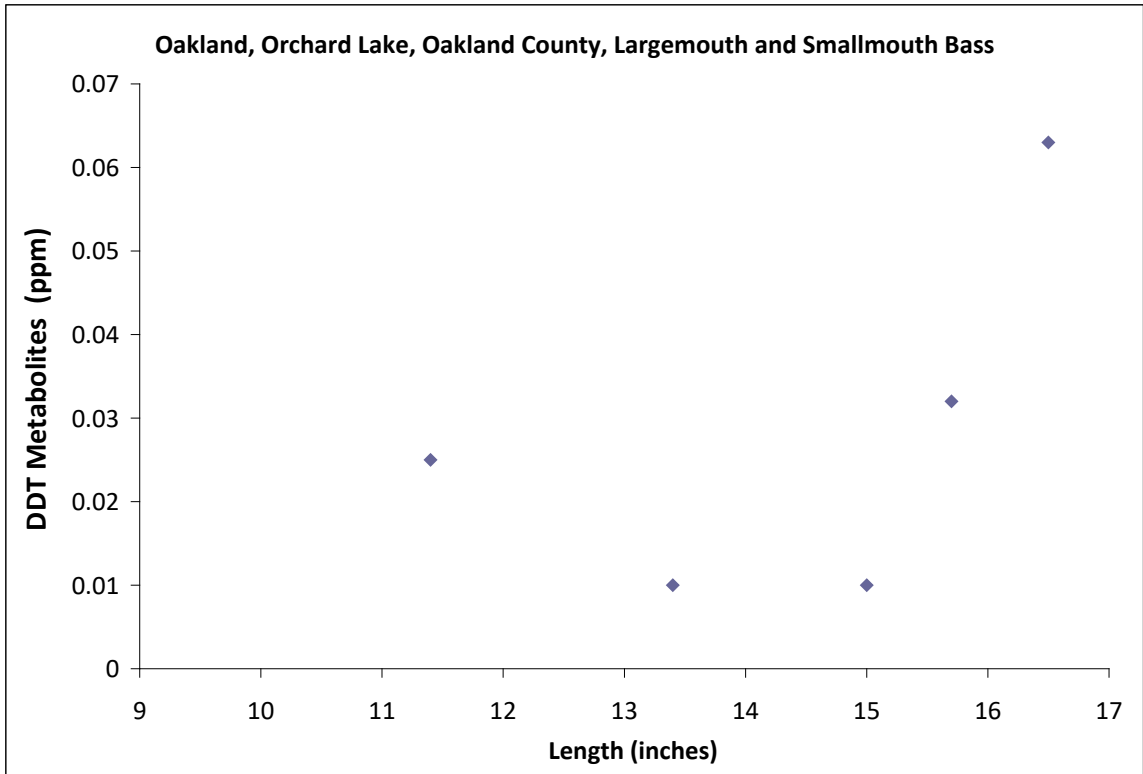
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	1989	5	11.4	14	15	16.5
Datasets available: 1989						
Chemical	Sample Size (All)	Mean (ppm)		95%UCL	Meal Category	
PCB	5	0.029			0.040	4
DDT	5	0.028		0.060	8	
Chlordane	5	ND		--	--	
Toxaphene	5	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.335	0.335				
DDT	0.288	0.167				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:					1	

Existing Advisory: Orchard Lake largemouth and smallmouth bass are covered under the statewide mercury consumption advisory.

Recommendation: No one should eat more than 1 meal per month of Orchard Lake largemouth or smallmouth bass less than 18 inches or more than 6 meals per year of fish larger than 18 inches due to mercury. This dataset is limited due to age of the data and sublegal lengths of the samples. PCBs and DDT would cause advisories. Statewide guidelines length break applied.

Length (Inches)	Hg Regression Estimate (ppm)	Meal Category
10	0.37	2
12	0.48	2
14	0.62	1
16	0.81	1
18	1.05	1
20	1.36	0.5
22	1.77	0.5
<i>Shaded area denotes extrapolated estimates</i>		





Northern Pike

Orchard Lake

Oakland County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	1994	25	15	24	23.6	30.1
Datasets available: 1987, 1989, 1994						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	10	1.124			1.490	0.5
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.481	0.640				

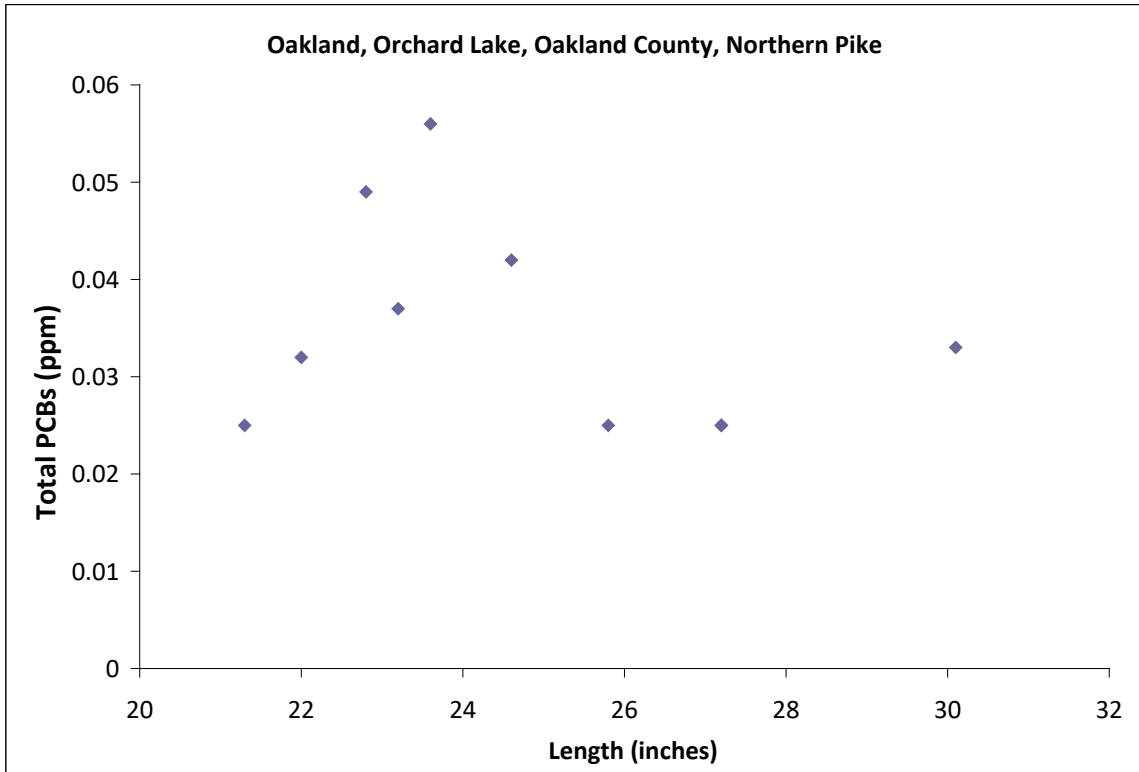
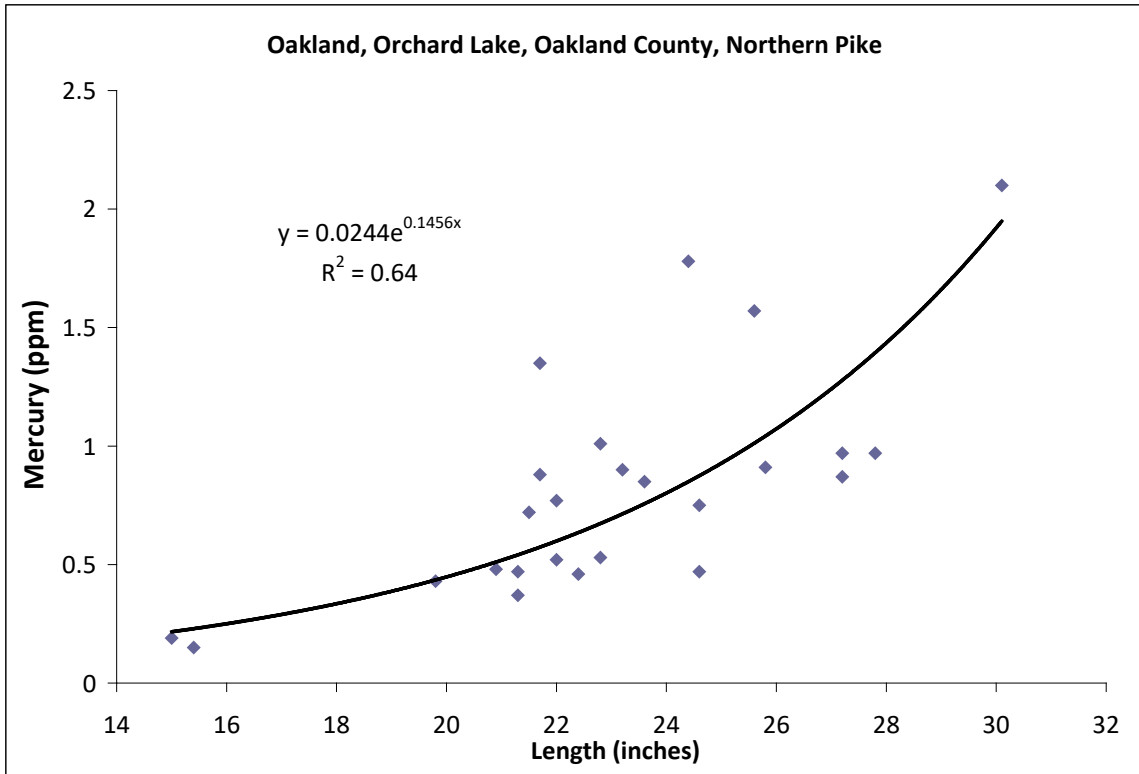
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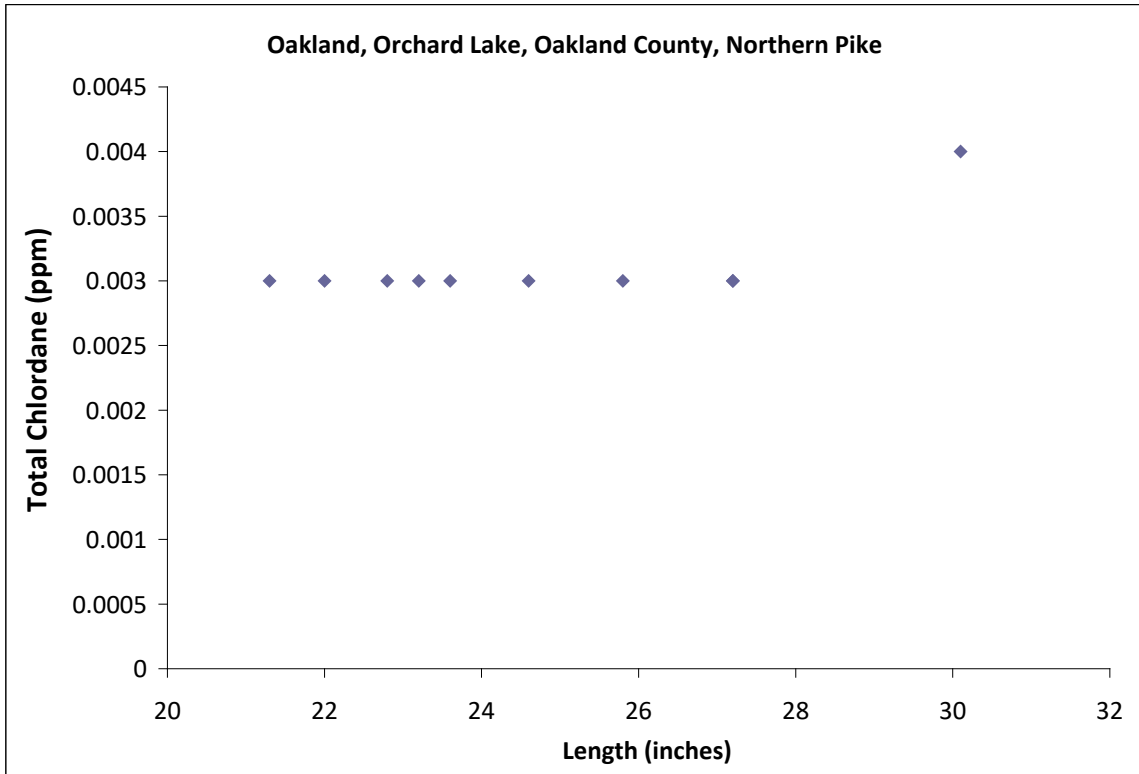
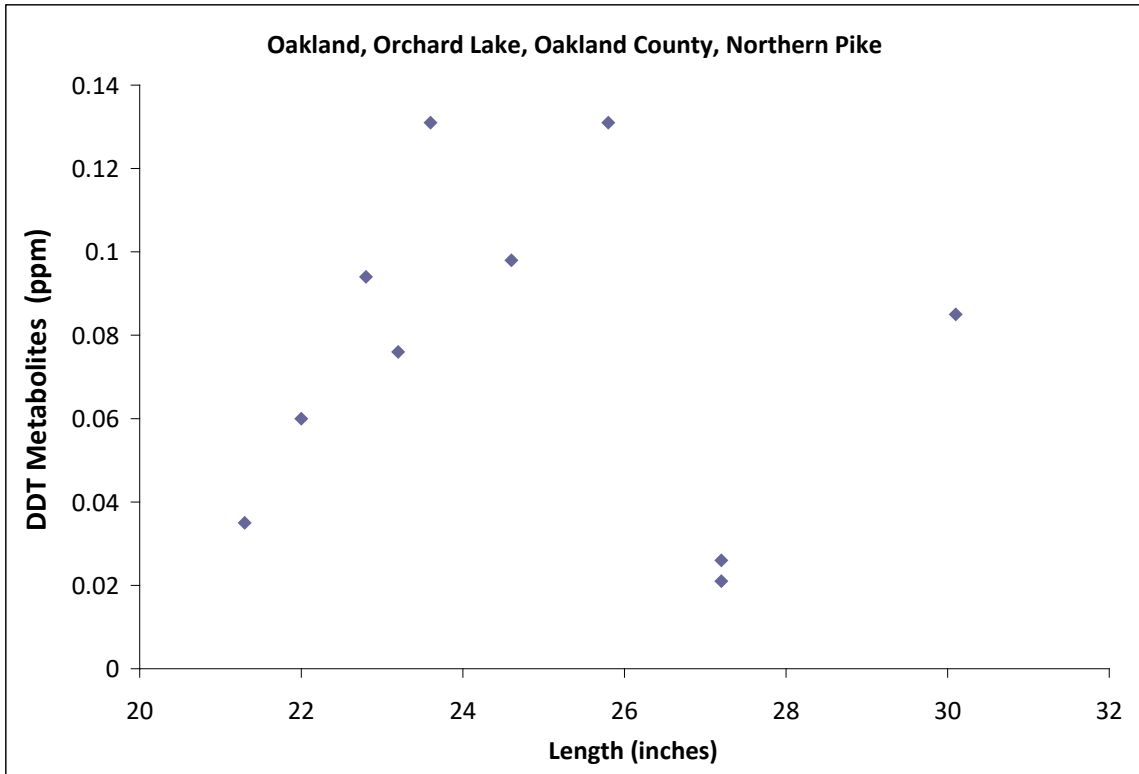
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	1994	25	21.3	24	23.6	30.1
Datasets available: 1987, 1989, 1994						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	6	0.034			0.050	4
DDT	6	0.082		0.130	2	
Chlordane	6	0.003		0.000	--	
Toxaphene	6	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.091	0.087				
DDT	0.005	0.020				
Chlordane	0.458	0.458				
Toxaphene	--	--				
Final meal category based on UCL:					0.5	

Existing Advisory: Orchard Lake northern pike are covered under the statewide mercury consumption advisory.

Recommendation: No one should eat more than 6 meals per year of Orchard Lake northern pike less than 30 inches due to mercury. No one should northern pike greater than 30 inches. This dataset is limited due to age of the data. Based on EGLE's Fish Contaminant Monitoring Program (FCMP), temporal changes in Hg concentrations are waterbody specific in Michigan. The EGLE FCMP finds that mercury concentration in fish are either staying the same or increasing.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
24	0.804	1
26	1.075	0.5
28	1.439	0.5
30	1.925	0.5
32	2.575	0
34	3.446	0
36	4.611	0
38	6.170	0
40	8.255	0
<i>Shaded area denotes extrapolated estimates</i>		





Carp

Osmun Lake

Oakland County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1999	1999	10	17.7	na	17.7	25.4
Datasets available: 1999						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	10	0.102		0.130	8	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.509	0.509				

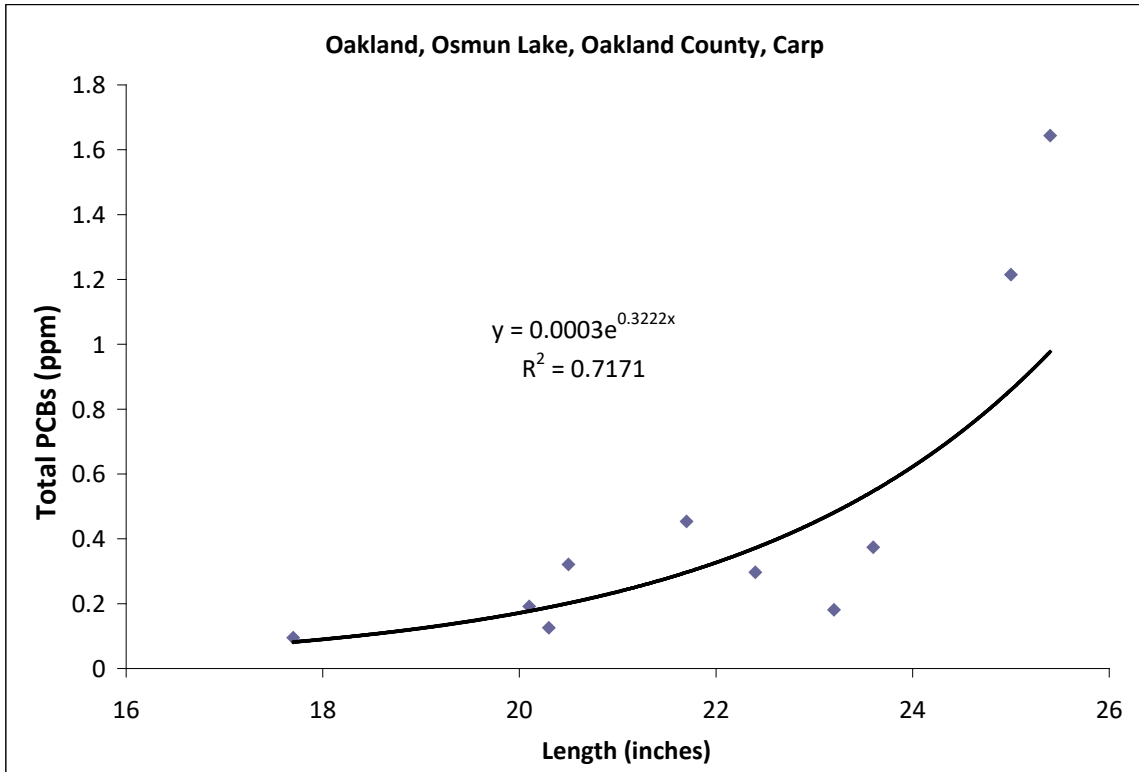
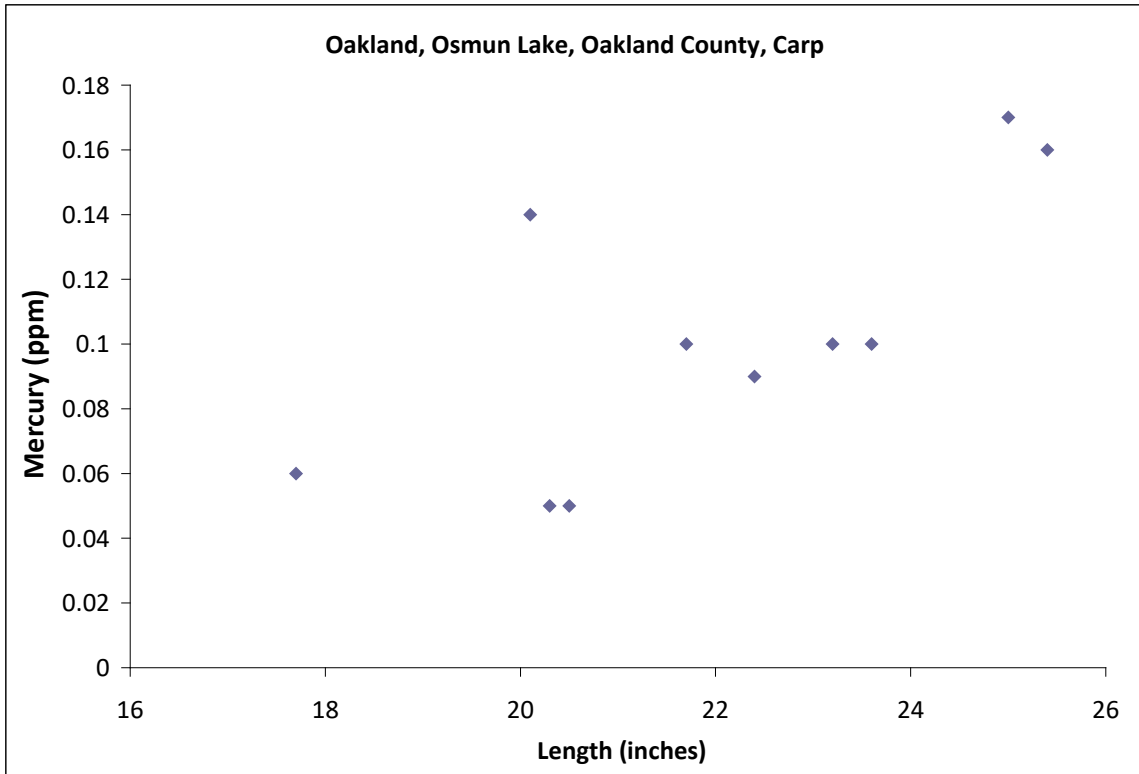
Organics Analysis:

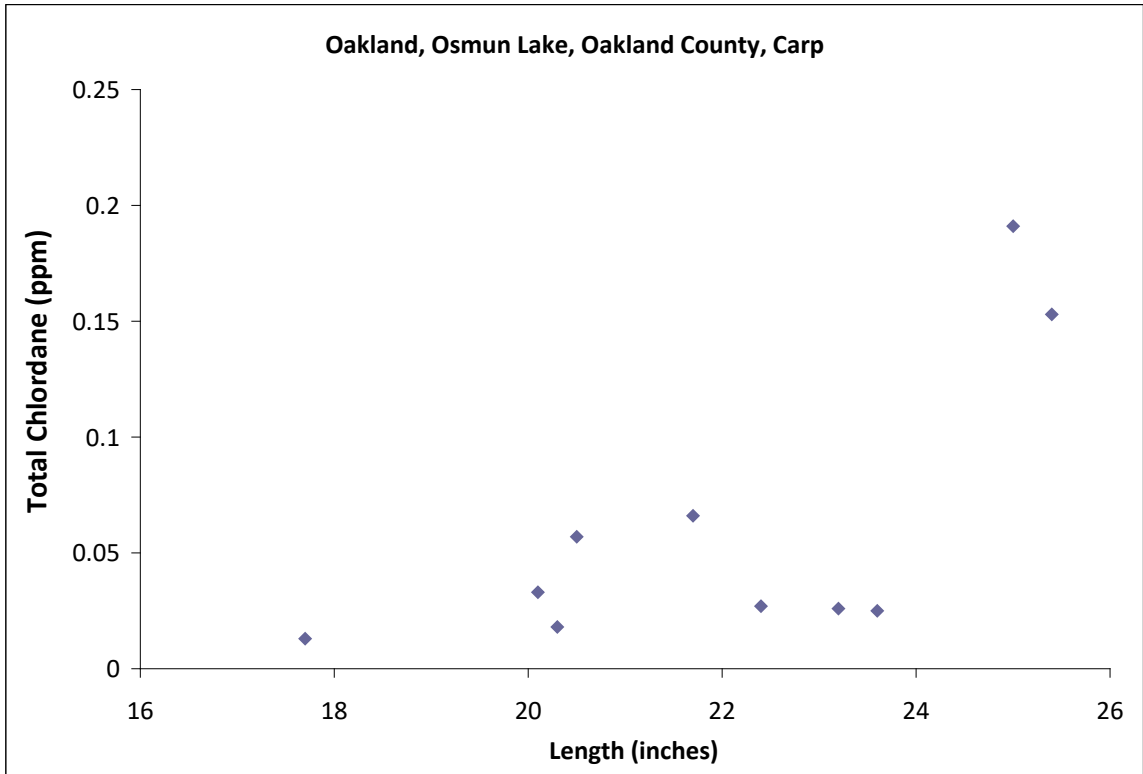
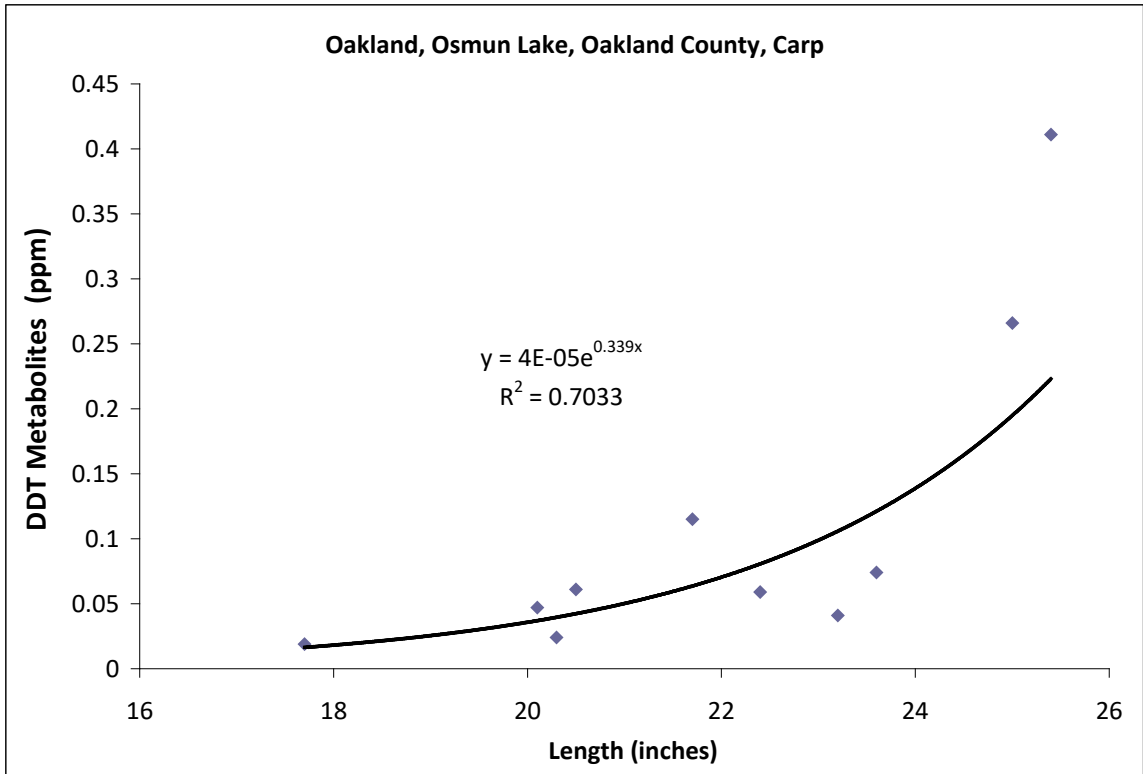
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1999	1999	10	17.7	na	17.7	25.4
Datasets available: 1999						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	10	0.490		0.860	Limited	
DDT	10	0.112		0.200	2	
Chlordane	10	0.061		0.100	--	
Toxaphene	10	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.591	0.717				
DDT	0.560	0.703				
Chlordane	0.485	0.508				
Toxaphene	--	--				
Final meal category based on UCL:					Limited	

Existing Advisory: Women and children should eat no more than one meal per month of Osmun Lake carp less than 26 inches in length and no more than six meals per year of Osmun Lake carp greater than 26 inches in length due to elevated concentrations of PCBs.

Recommendation: No one should eat more than 6 meals per year Osmun Lake carp less than 22 inches due to PCBs. Sensitive populations should not eat any Osmun Lake carp greater than 22 inches. Healthy adults should limit consumption to 1 or 2 meals per year of Osmun Lake carp greater than 22 inches.

Length (Inches)	PCB Regression Equation Estimate (ppm)	Meal Category
14	0.027	8
16	0.052	4
18	0.099	2
20	0.189	1
22	0.359	0.5
24	0.685	Limited
26	1.304	Limited
28	2.484	Limited
30	4.732	0
<i>Shaded area denotes extrapolated estimates</i>		





Largemouth Bass

Osmun Lake

Oakland County

Hg Analysis:

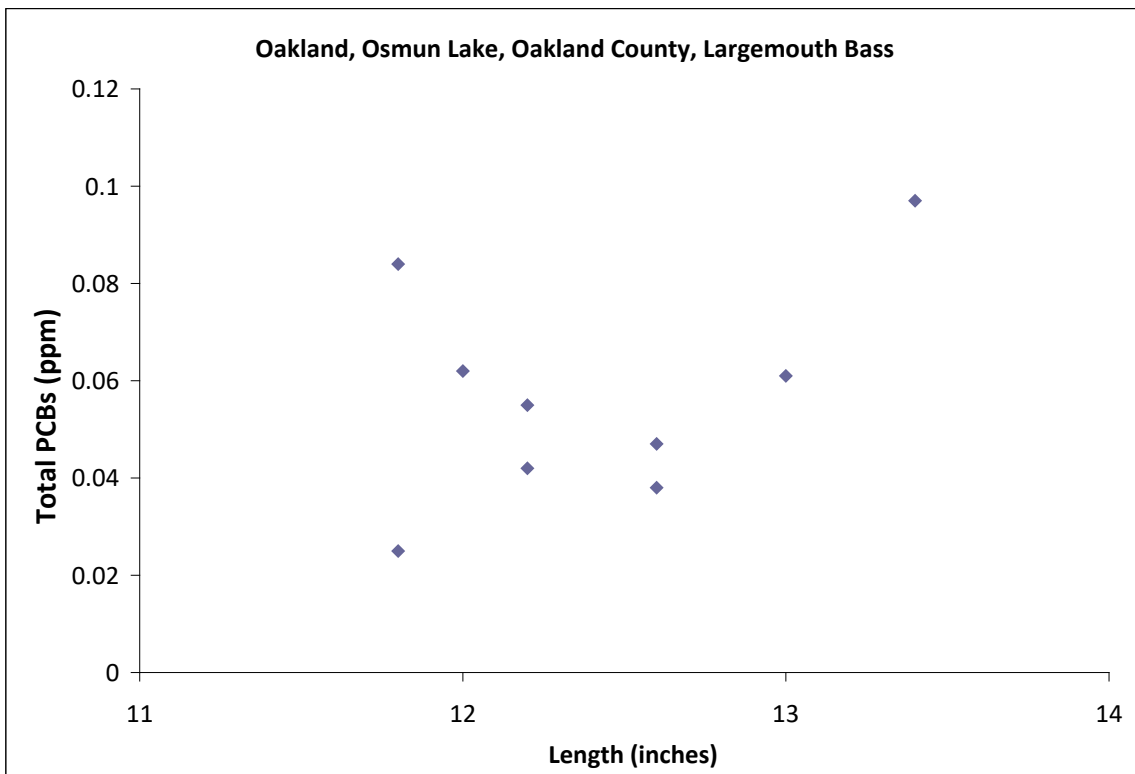
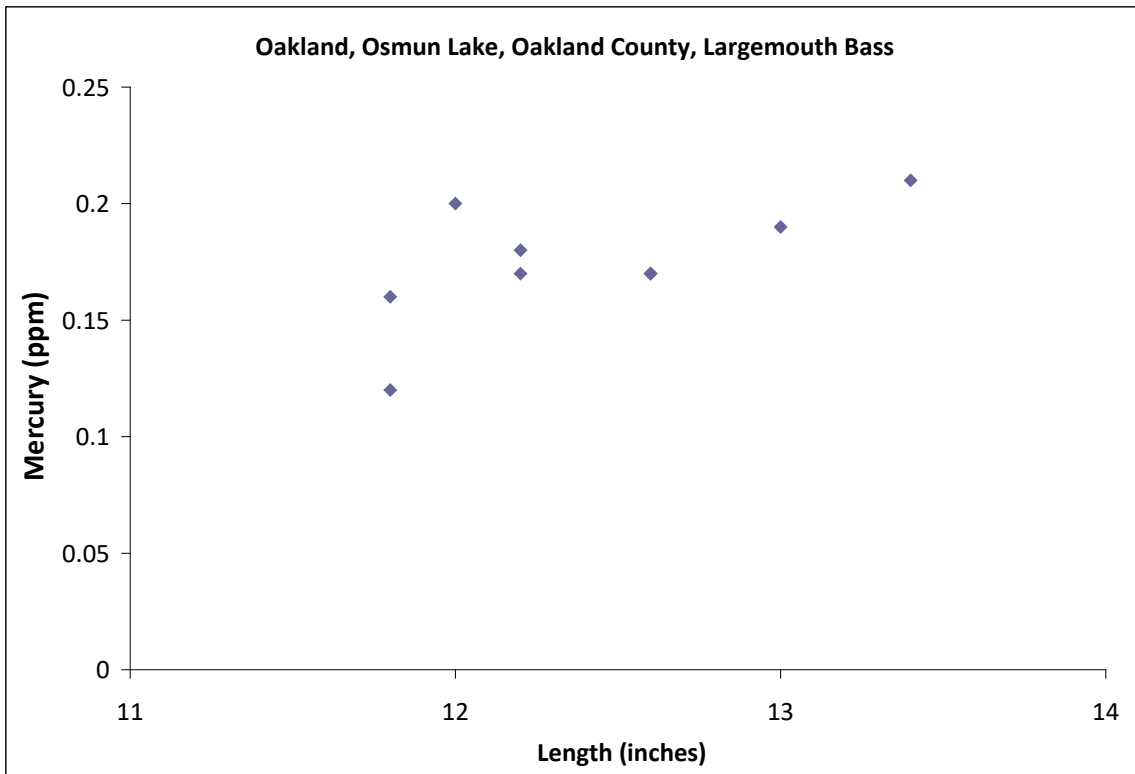
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Sub-Legal Sized Samples	
Earliest	Most Recent				Min	Max
1999	1999	9	11.8	14	11.8	13.4
Datasets available: 1999						
Chemical	Sample Size (Sub-Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	9	0.174		0.190		4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.421	0.397				

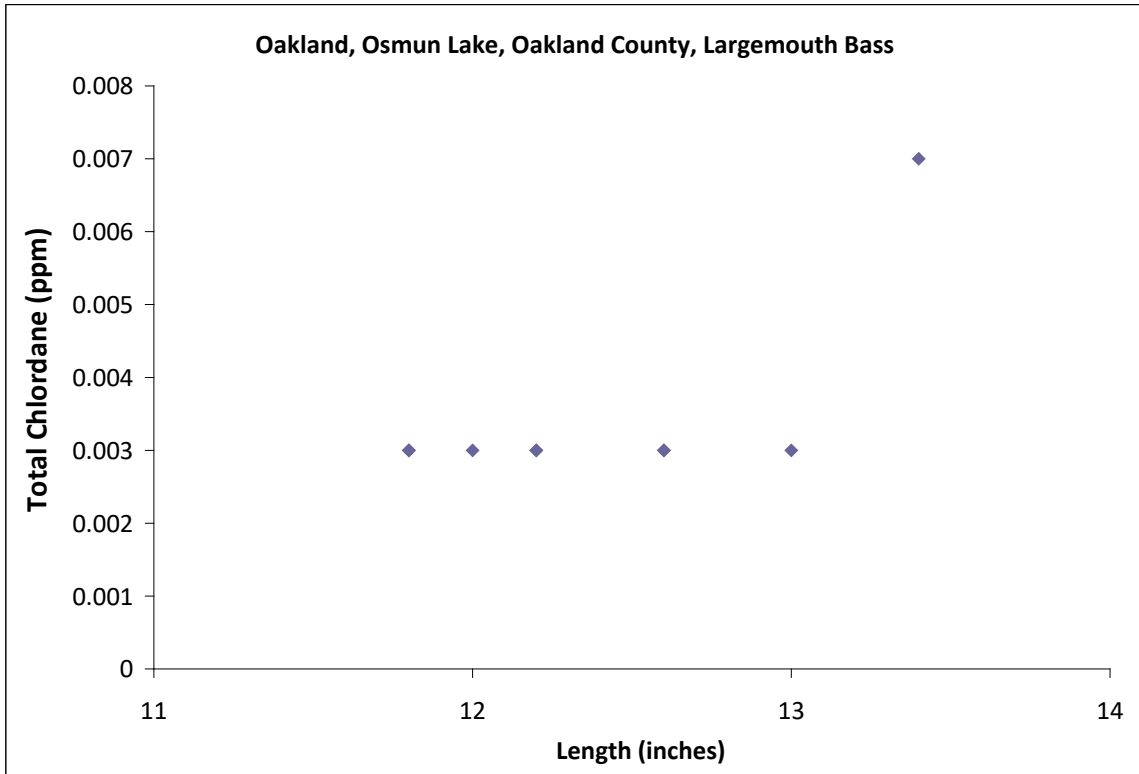
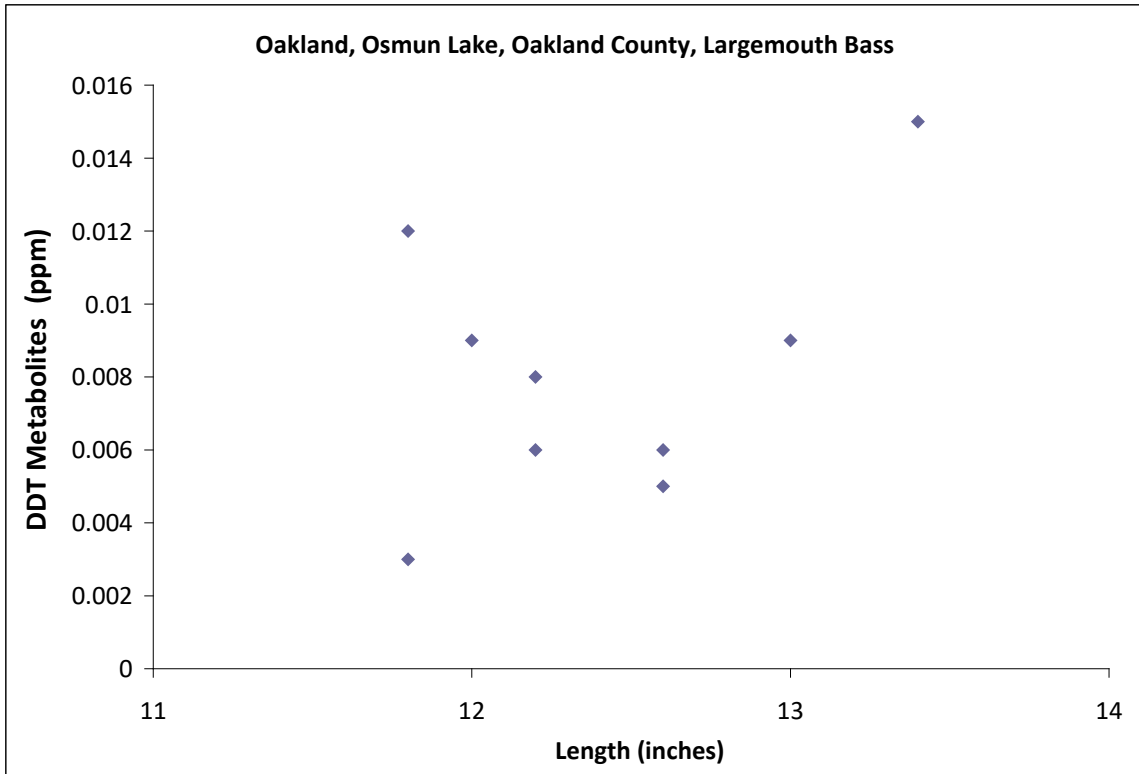
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1999	1999	9	11.8	14	11.8	13.4
Datasets available: 1999						
Chemical	Sample Size (Sub-Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	9	0.057		0.070		2
DDT	9	0.008		0.010		16
Chlordane	9	0.003		0.000		--
Toxaphene	9	ND		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.172	0.171				
DDT	0.198	0.182				
Chlordane	0.469	0.469				
Toxaphene	--	--		Final meal category based on UCL:		2

Existing Advisory: Women and children should eat no more than one meal per month of Osmun Lake largemouth bass due to elevated levels of PCBs and mercury.

Recommendation: No one should eat more than 2 meals per month of Osmun Lake largemouth or smallmouth bass less than 18 inches due to PCBs or 2 meals per month of Osmun Lake largemouth or smallmouth bass greater than 18 inches due to PCBs and Mercury. Statewide guideline length break applied.





White Sucker

Paint Creek

Oakland County

Hg Analysis:

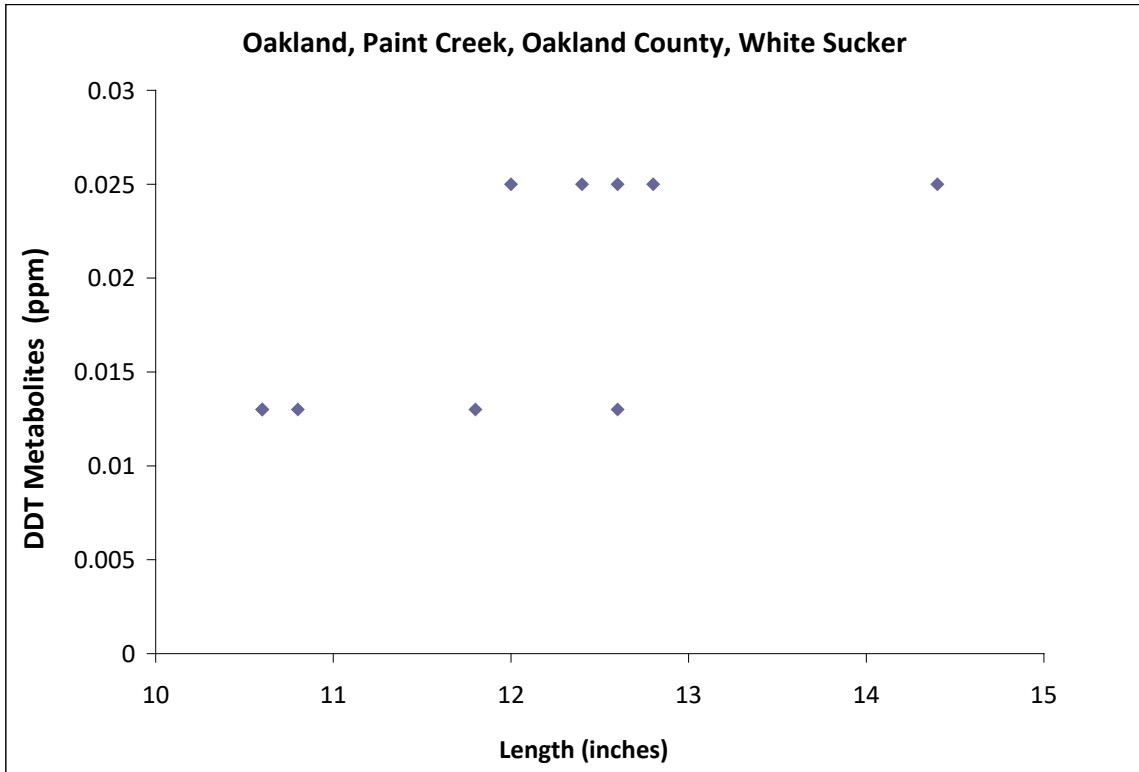
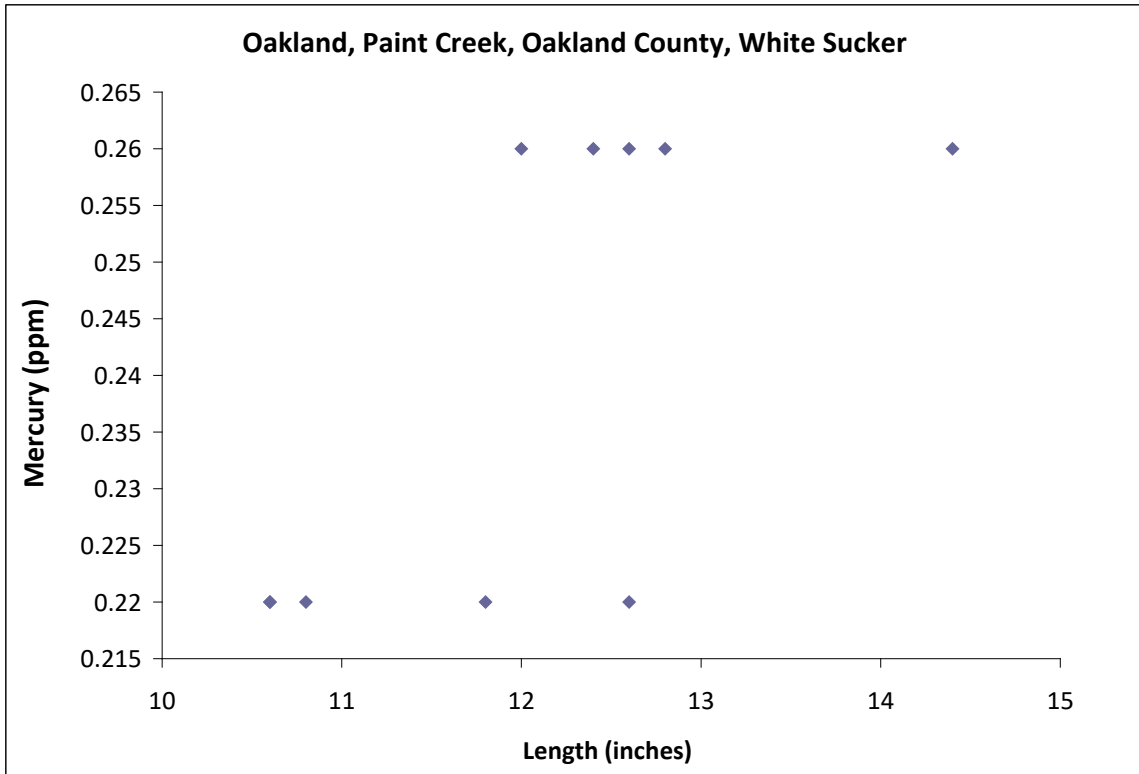
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1998	1998	10	10.6	na	10.6	14.4
Datasets available: 1998						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	10	0.240		0.260	4	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.481	0.481				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1998	1998	10	10.6	na	10.6	14.4
Datasets available: 1998						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	10	ND		--	--	
DDT	10	0.019		0.020	16	
Chlordane	10	ND		--	--	
Toxaphene	10	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	0.481	0.481				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						4

Existing Advisory: Paint Creek white sucker are not covered by an advisory.

Recommendation: No one should eat more than 4 meals per month of Paint Creek sucker due to mercury.



Bluegill

Paint Lake

Oakland County

Hg Analysis:

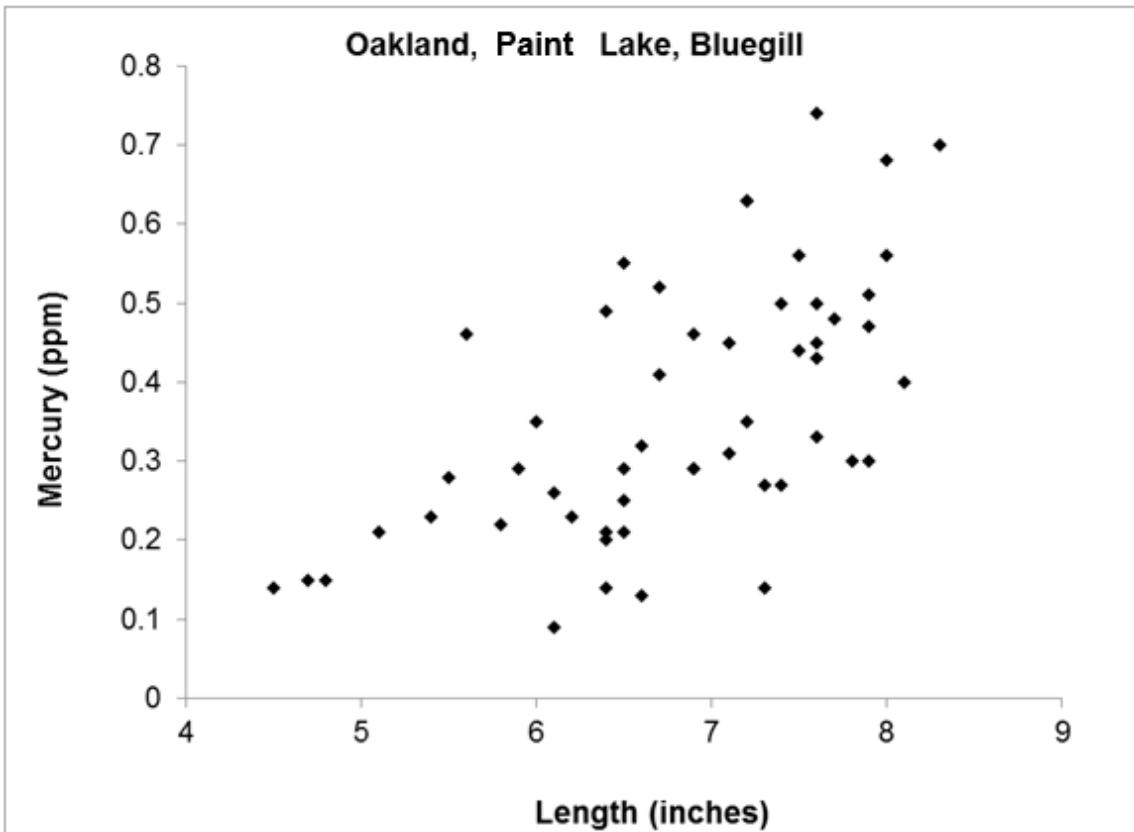
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2013	2013	53	4.5	na	4.5	8.3
Datasets available: 2013						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	53	0.36	0.09	0.74	0.41	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.375	0.389				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	0	--	--	--	--
Datasets available: --						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	--	--	--	--	--	--
DDT	--	--	--	--	--	--
Chlordane	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						2

Existing Advisory: Paint Lake bluegill are covered under the Statewide Guidance: No one should eat more than 8 meals per month due to mercury.

Recommendation: No one should eat more than 2 meals per month of Paint Lake bluegill, pumpkinseed, or other sunfish due to mercury.



Carp

Pontiac Lake

Oakland County

Hg Analysis:

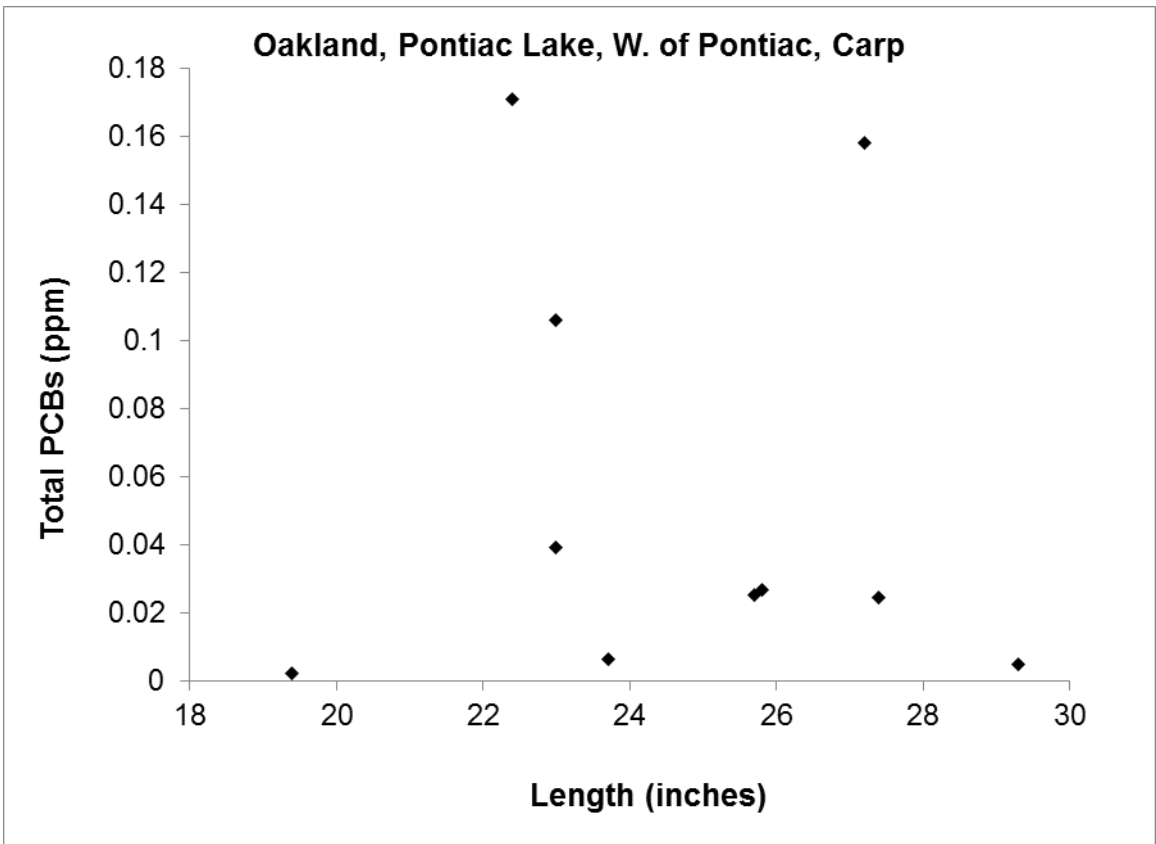
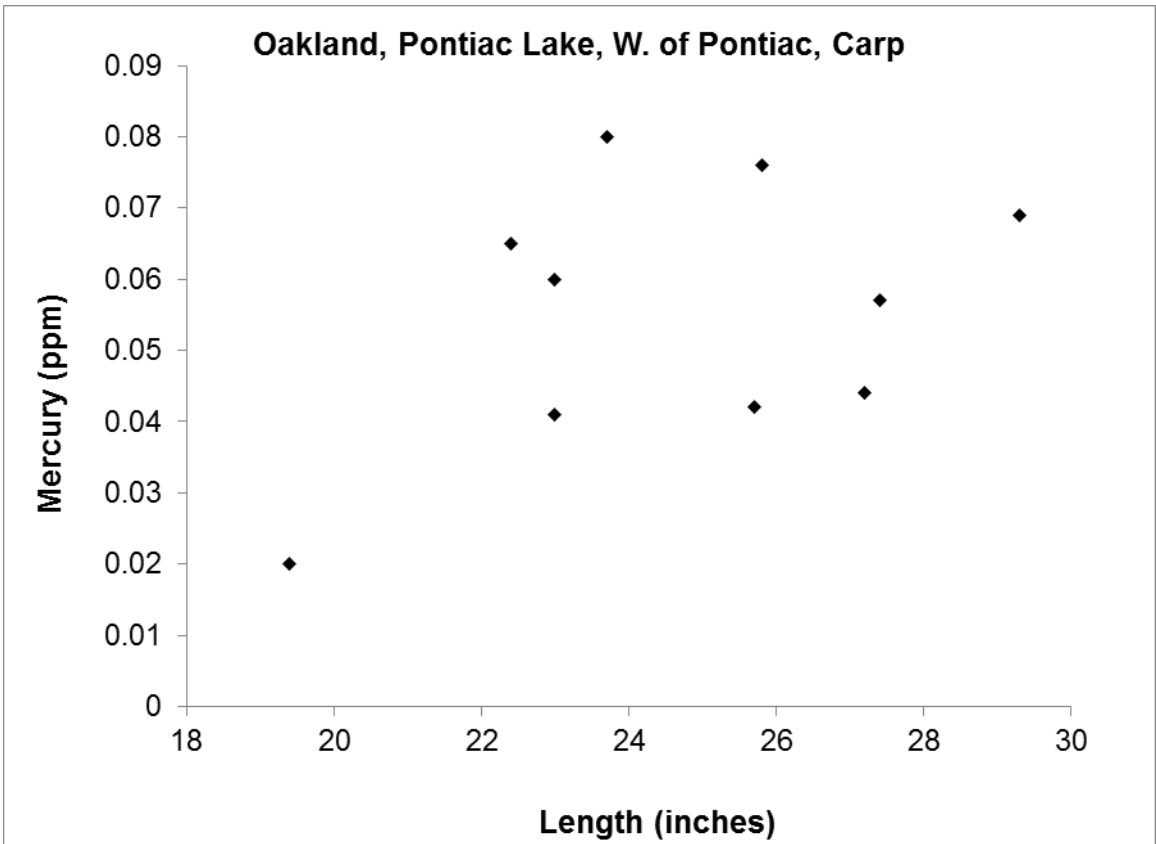
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2014	2014	10	19.4	na	19.4	29.3
Datasets available: 2014						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.06	0.02	0.08	0.07	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.176	0.267				

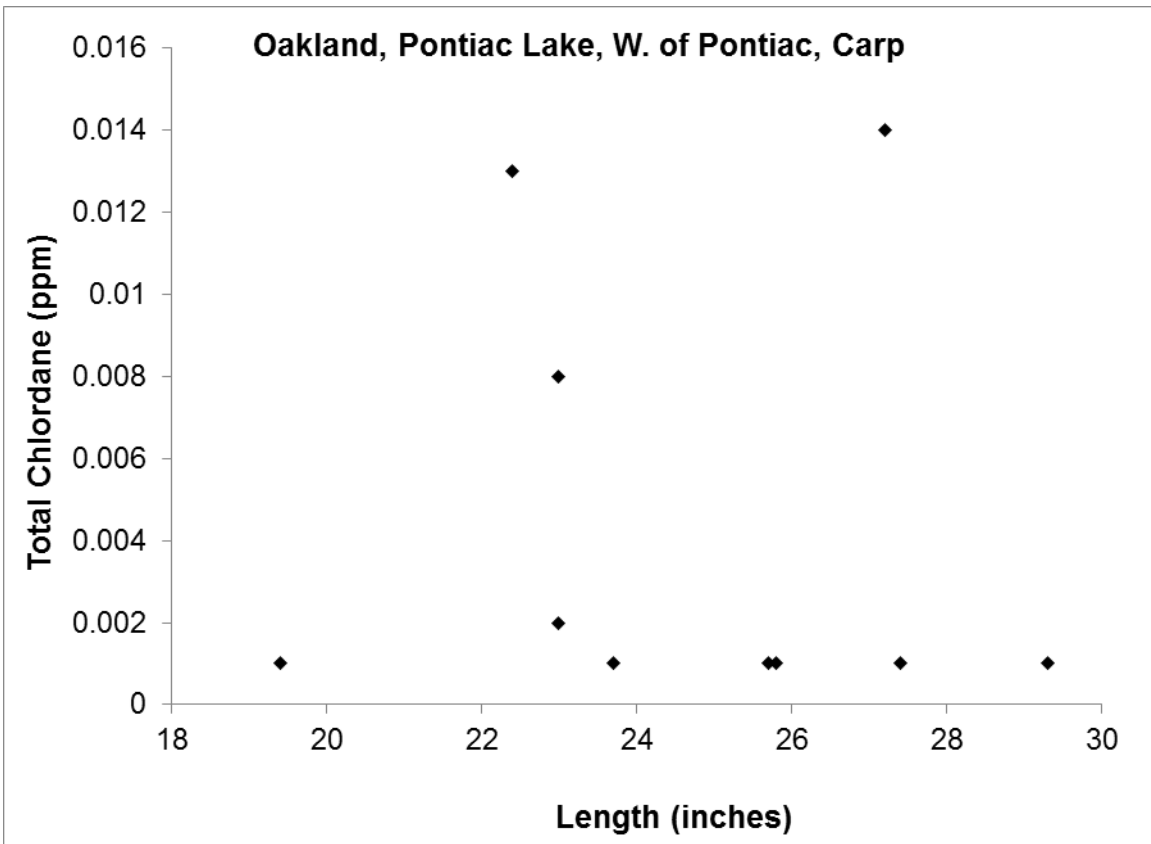
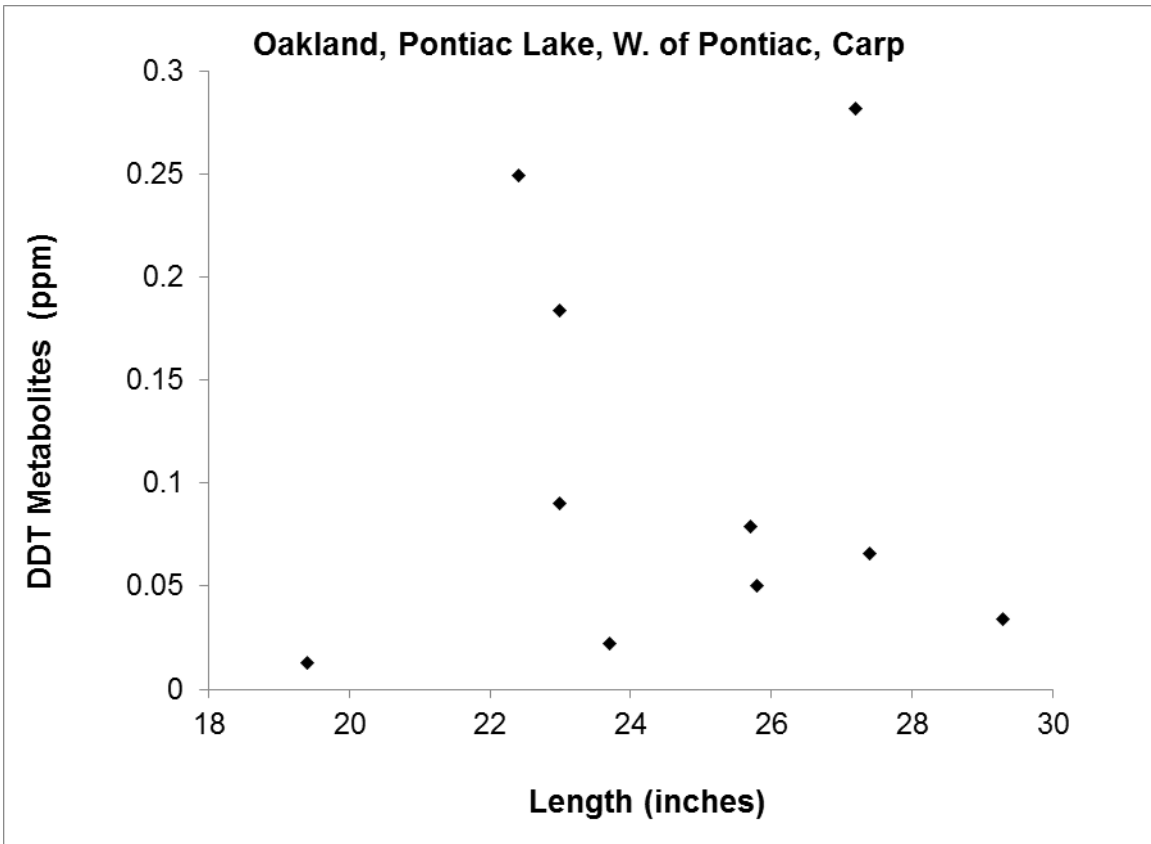
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2014	2014	10	19.4	na	19.4	29.3
Datasets available: 2014						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.056	0.0023	0.1708	0.102	2
DDT	10	0.107	0.013	0.282	0.176	8
Chlordane	10	0.004	0.001	0.014	0.008	--
Toxaphene	10	ND	--	--	--	--
TEQ*	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.005	0.007				
DDT	0.000	0.032				
Chlordane	0.004	0.017				
Toxaphene	--	--				
TEQ*	--	--				
Final meal category based on UCL:						2

Existing Advisory: Pontiac Lake carp are covered by the statewide advisory: No one should eat more than 2 meals per month of carp due to PCBs.

Recommendation: No one should eat more than 2 meals per month of carp due to PCBs. DDT would cause an advisory.





Channel Catfish

Pontiac Lake

Oakland County

Hg Analysis:

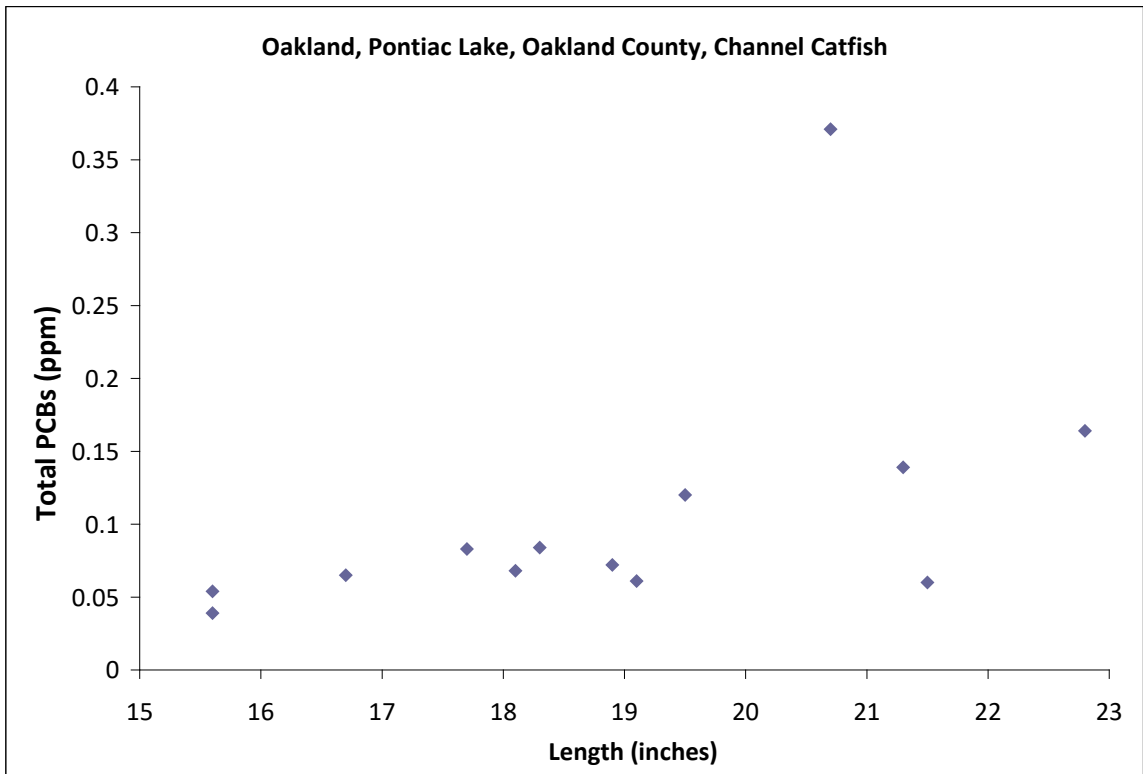
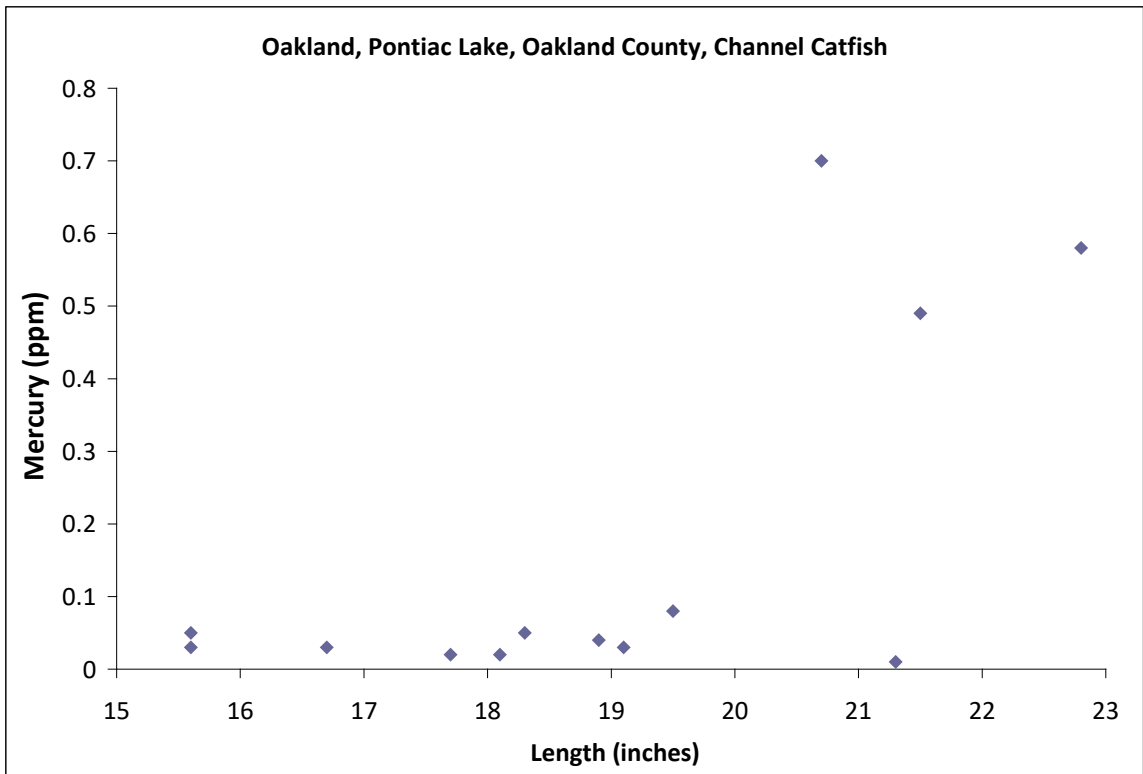
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1999	1999	13	15.6	12	15.6	22.8
Datasets available: 1999						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	13	0.164		0.310	2	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.448	0.323				

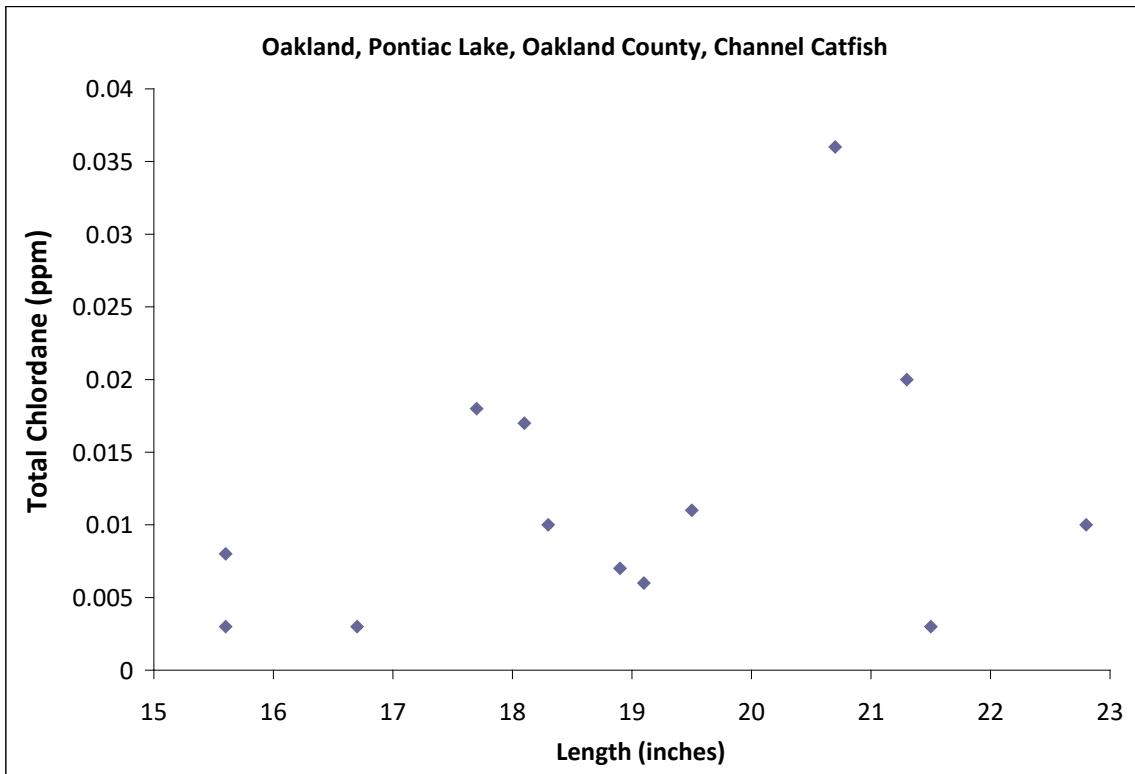
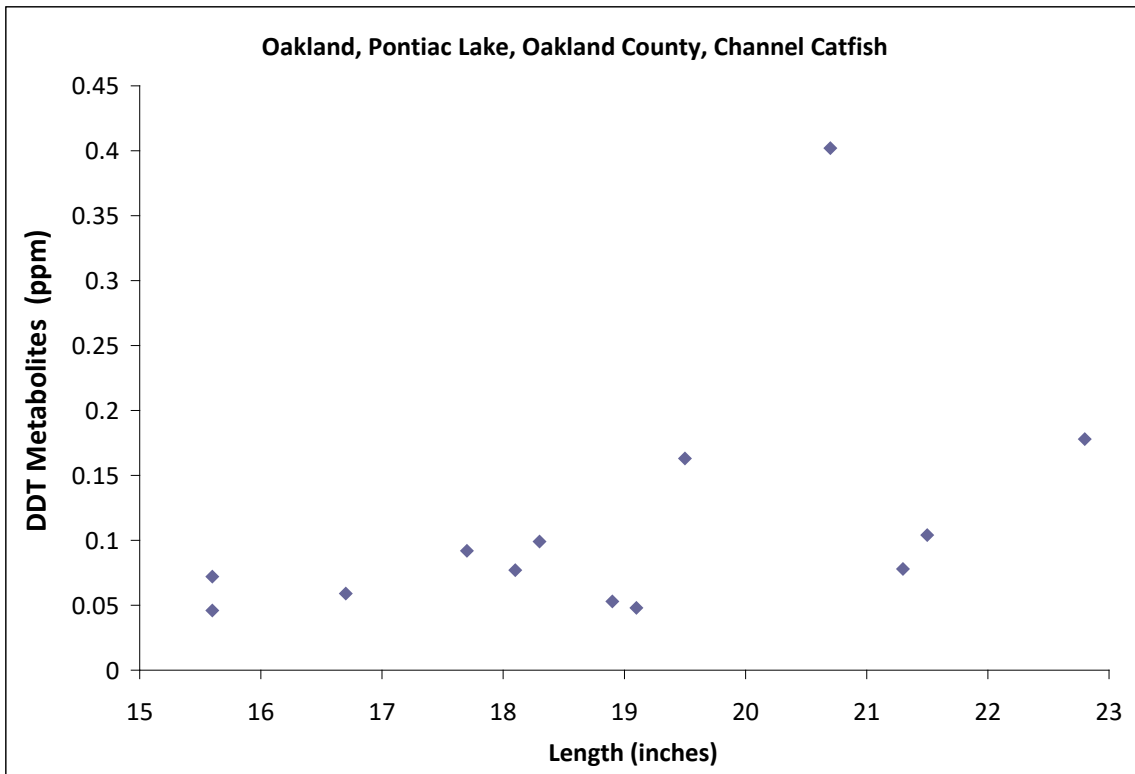
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1999	1999	13	15.6	12	15.6	22.8
Datasets available: 1999						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	13	0.106		0.160	1	
DDT	13	0.113		0.170	8	
Chlordane	13	0.012		0.020	--	
Toxaphene	13	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.268	0.440				
DDT	0.223	0.336				
Chlordane	0.109	0.111				
Toxaphene	--	--				
Final meal category based on UCL:					1	

Existing Advisory: Women and children should eat no more than one meal per week of Pontiac Lake channel catfish less than 22 inches in length. Women and children should eat no more than one meal per month of Pontiac Lake channel catfish larger than 22 inches in length due to elevated levels of mercury and PCBs.

Recommendation: No one should eat more than 1 meal per month of Pontiac Lake channel catfish due to PCBs. Mercury and DDT would cause advisories.





Hg Analysis:

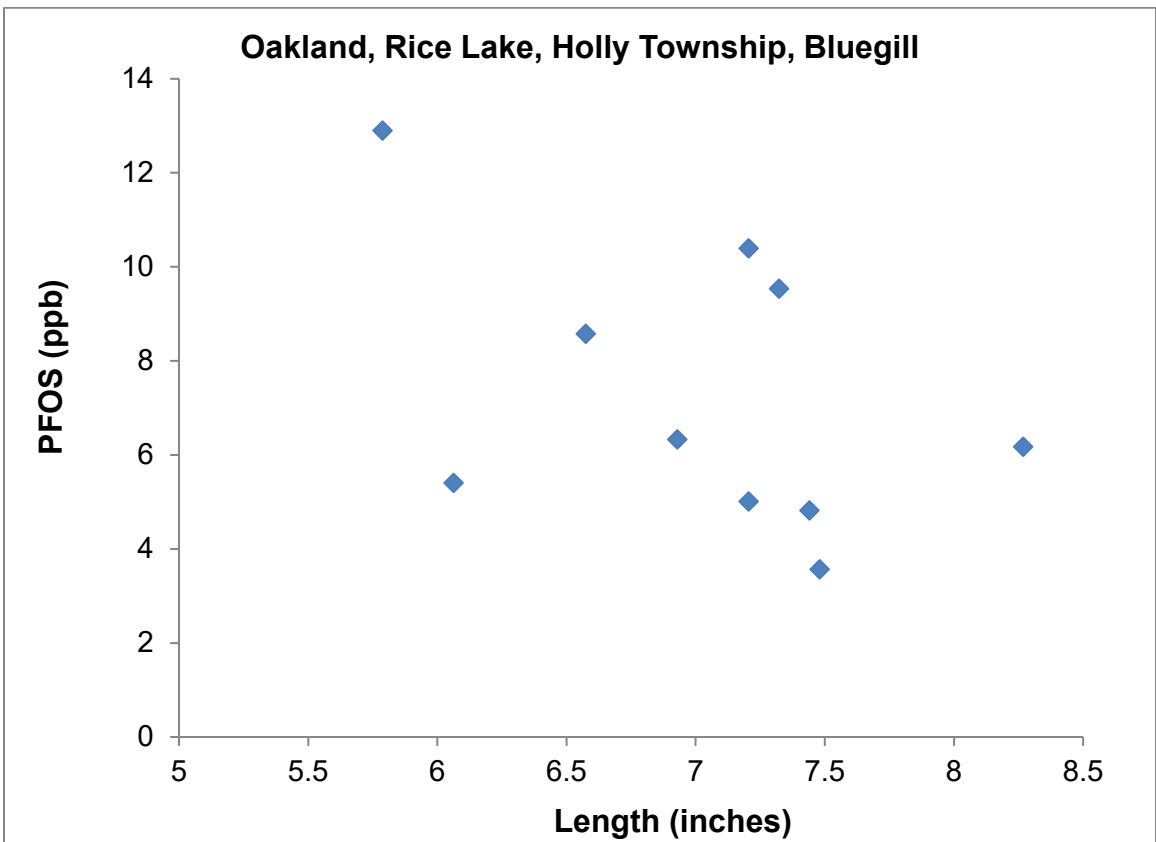
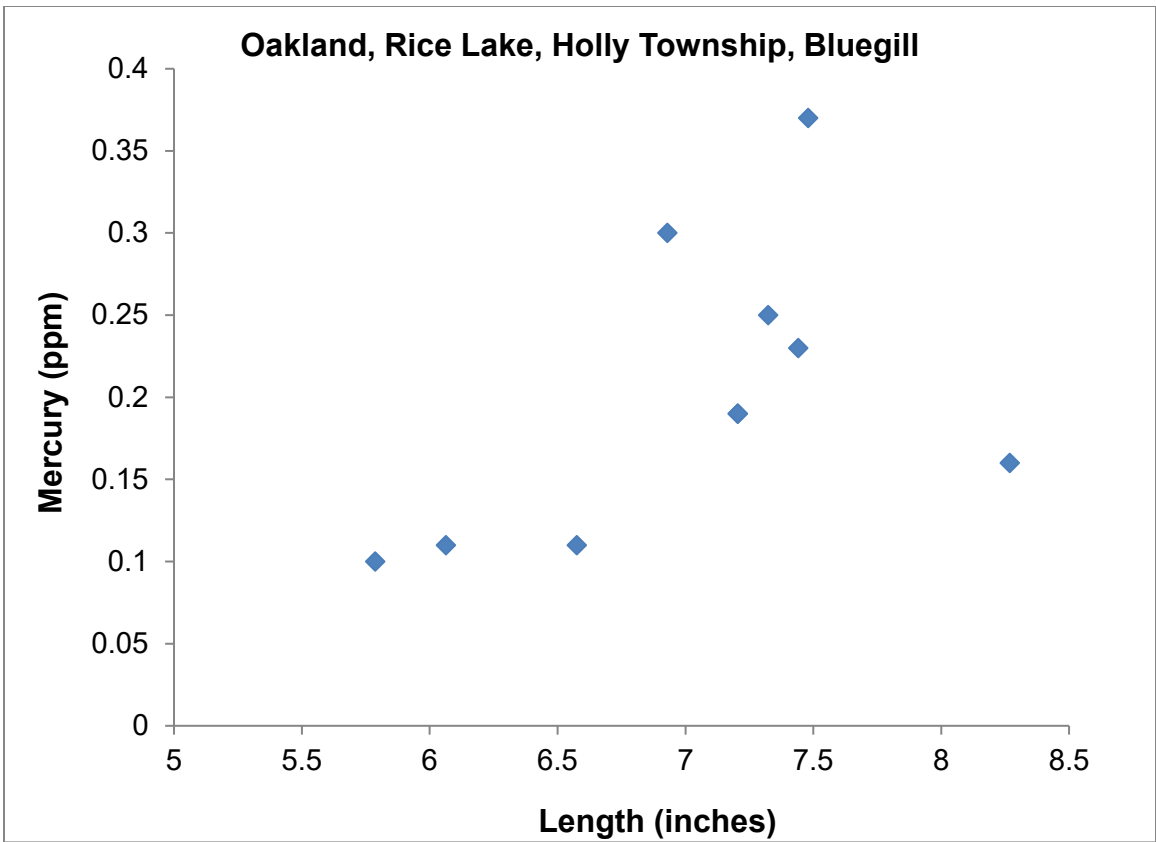
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2021	2021	10	5.8	NA	5.8	8.3
Datasets available: 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.201	0.100	0.370	0.264	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.257	0.370				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2021	2021	10	5.8	NA	5.8	8.3
Datasets available: 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
PFOS	10	7.3 ppb	3.6 ppb	12.9 ppb	9.4 ppb	12
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.212	0.177				
Final meal category based on UCL:						4

Existing MDHHS Advisory: Bluegill and sunfish from Rice Lake in Holly Township are currently covered under the statewide guidance for mercury. No one should eat more than eight meals per month of bluegill or sunfish of any size.

Recommendation: No one should eat more than four meals per month of bluegill or sunfish of any size from Rice Lake in Holly Township due to mercury. PFOS causes less-restrictive advice.



Carp

Schoolhouse Lake

Oakland County

Hg Analysis:

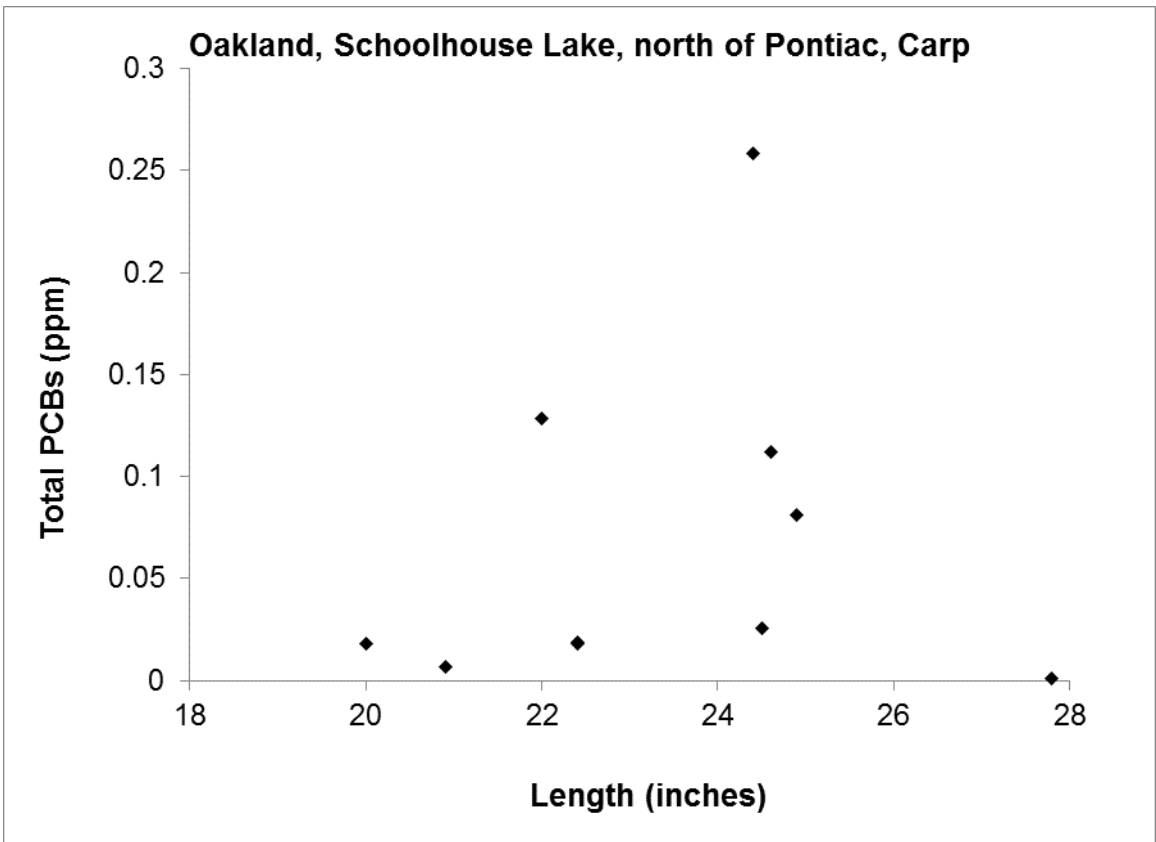
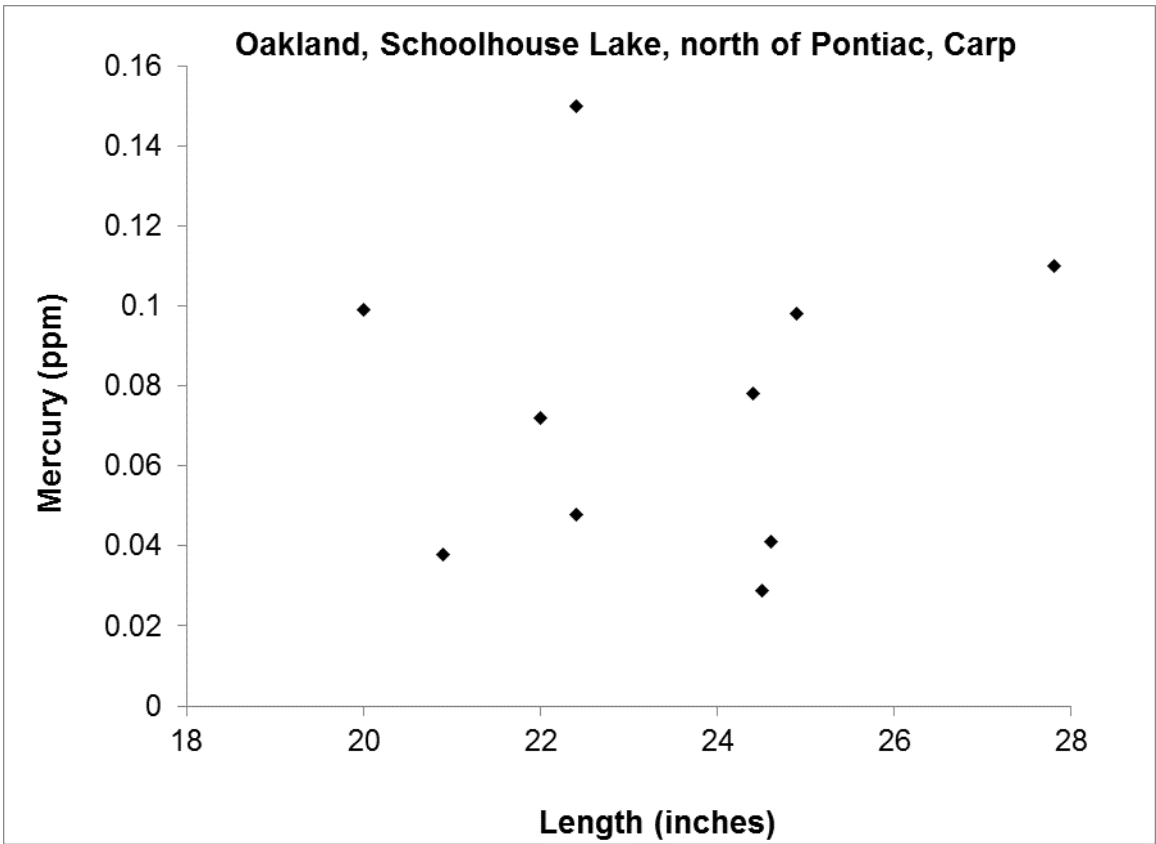
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2014	2014	10	20	na	20	27.8	
Datasets available: 2014							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.08		0.03	0.15	0.10	8
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.007	0.007					

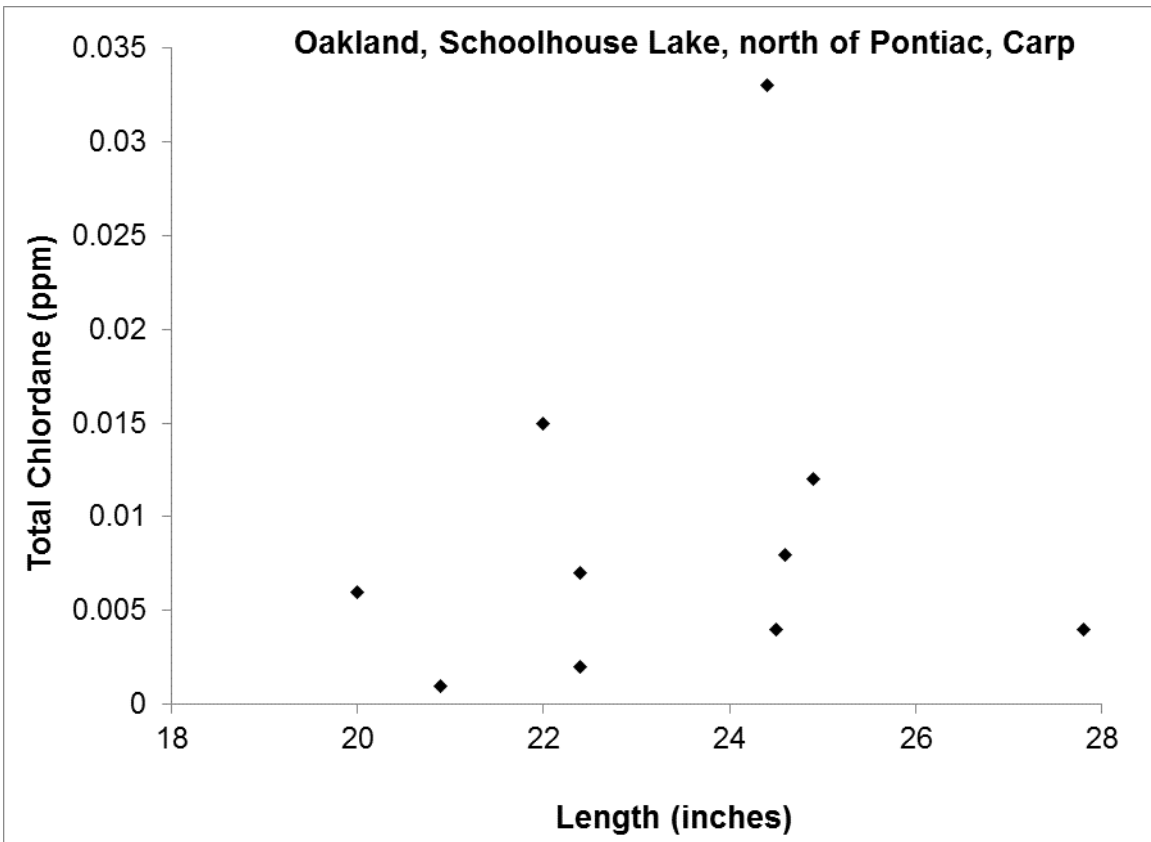
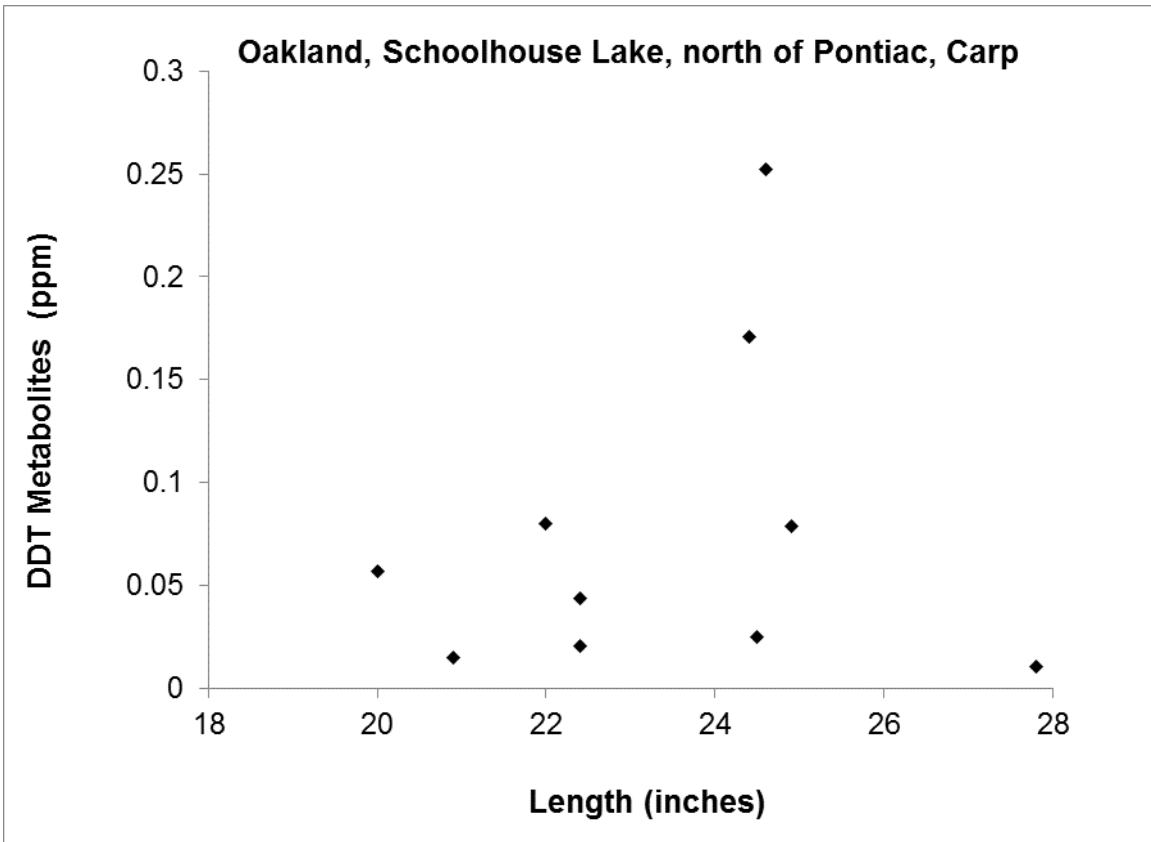
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2014	2014	10	20	na	20	27.8	
Datasets available: 2014							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.07		0.001	0.26	0.12	1
DDT	10	0.08		0.01	0.25	0.13	12
Chlordane	10	0.01		0.001	0.03	0.02	--
Toxaphene	10	ND		--	--	--	--
TEQ	0	--		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.024	0.028					
DDT	0.028	0.001					
Chlordane	0.025	0.059					
Toxaphene	--	--					
TEQ	--	--					
Final meal category based on UCL:							1

Existing Advisory: Schoolhouse Lake carp are covered under a statewide consumption advisory: No one should eat more than 2 meals per month of carp due to PCBs.

Recommendation: No one should eat more than 1 meal per month of Schoolhouse Lake carp due to PCBs. Mercury and DDT would cause advisories.





Carp

**Sylvan Lake
Otter Lake**

Oakland County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2008	2008	10	18.3	na	18.3	26.4
Datasets available: 2008						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	10	0.1441			0.200	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.315	0.316				

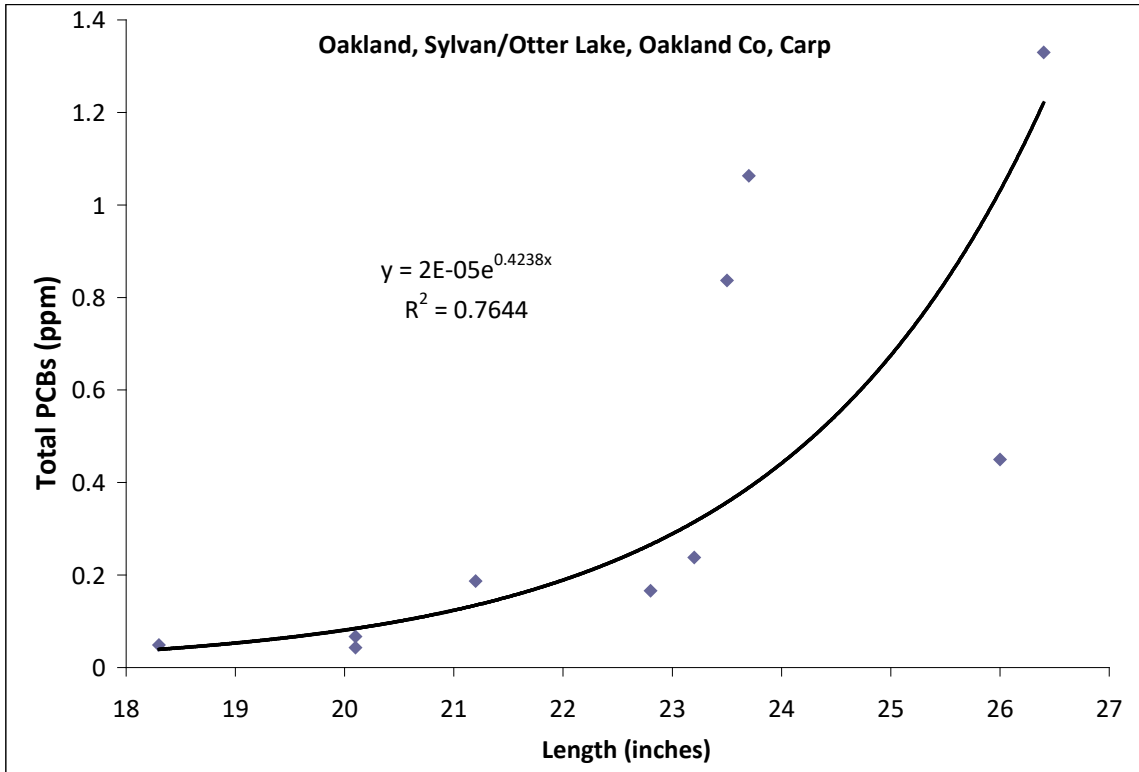
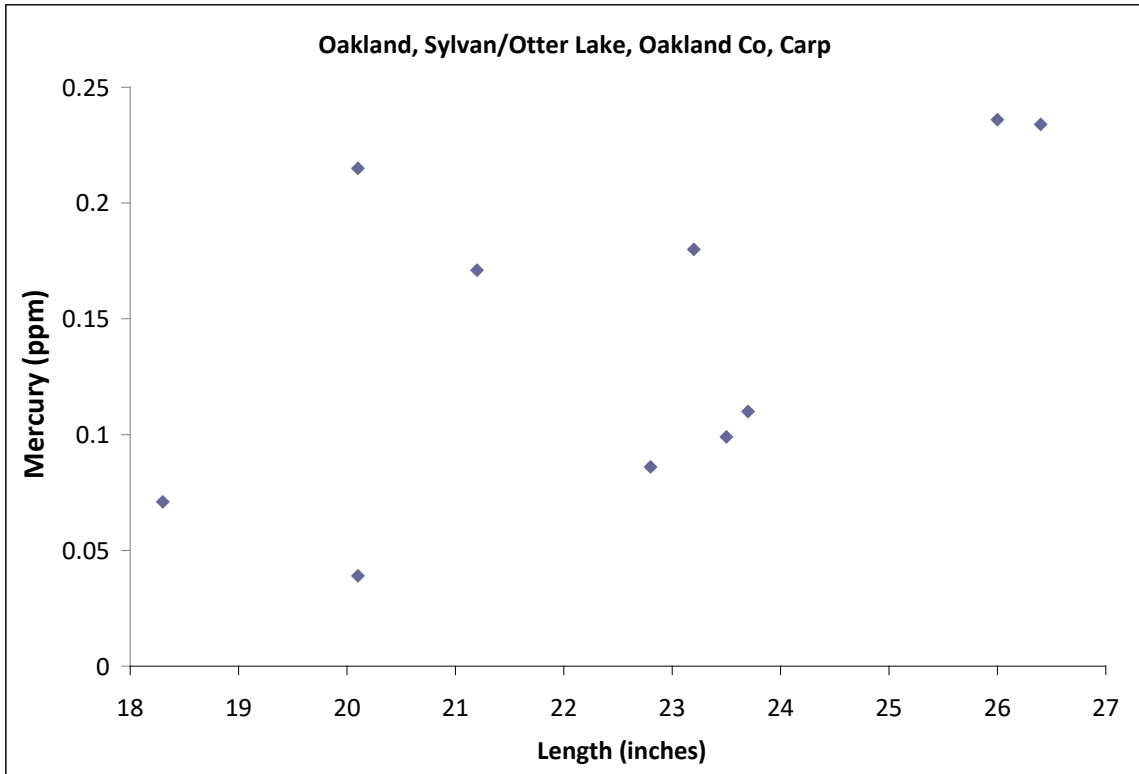
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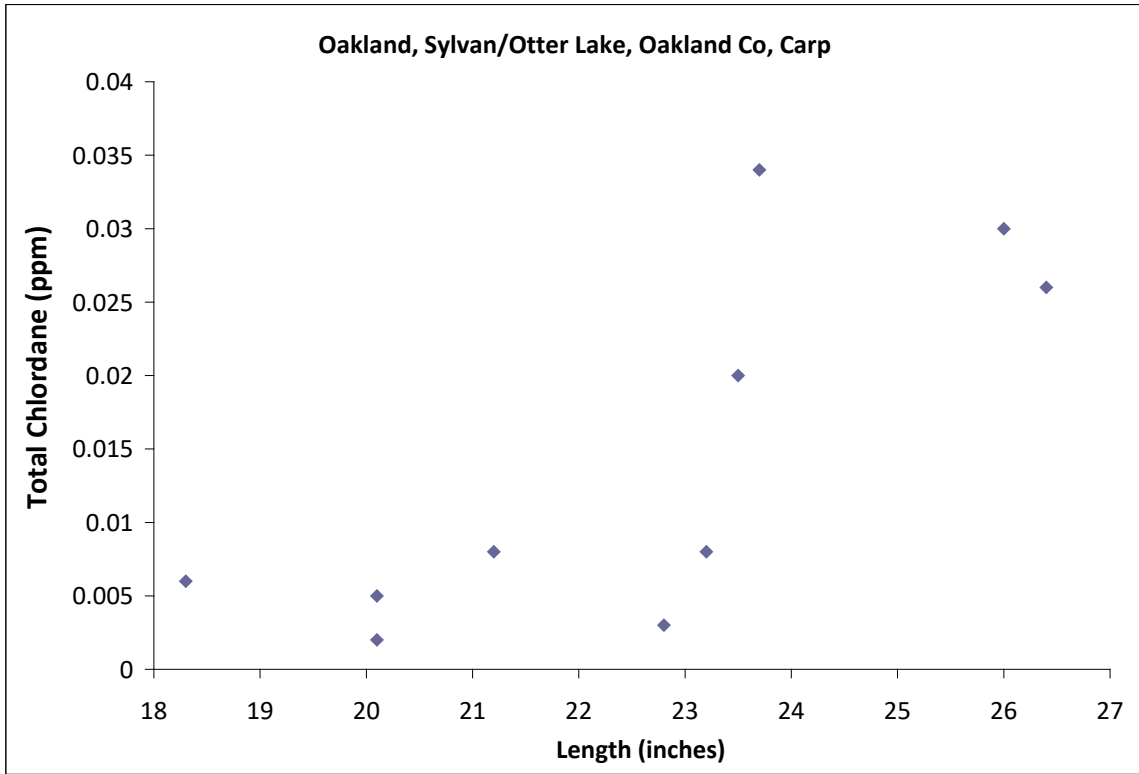
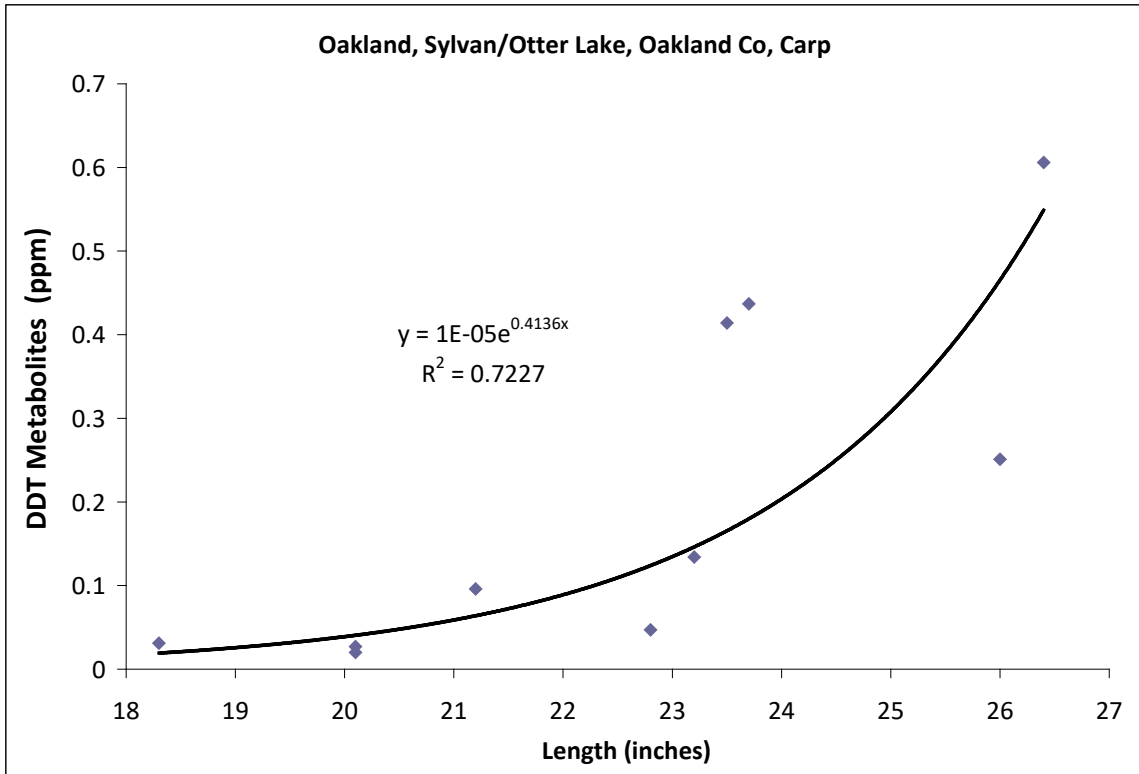
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2008	2008	10	18.3	na	18.3	26.4
Datasets available: 2008						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	10	0.443			0.780	Limited
DDT	10	0.206		0.360	1	
Chlordane	10	0.014		0.020	--	
Toxaphene	10	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.564	0.764				
DDT	0.609	0.723				
Chlordane	0.583	0.538				
Toxaphene	--	--				
Final meal category based on UCL:					Limited	

Existing Advisory: Women and children should eat no more than one meal per month of Sylvan/Otter Lake carp due to elevated levels of PCBs.

Recommendation: Sensitive populations should not eat any Sylvan/Otter Lake carp larger than 20 inches and healthy adults should limit consumption of those fish to 1 or 2 meals per year; consumption of carp smaller than 20 inches should be limited to 2 meals per month due to PCBs.

Length (Inches)	PCB Regression Equation Estimate (ppm)	Meal Category
12	0.003	16
14	0.008	16
16	0.018	12
18	0.041	4
20	0.096	2
22	0.224	0.5
24	0.523	Limited
26	1.220	Limited
28	2.848	Limited
<i>Shaded area denotes extrapolated estimates</i>		





Largemouth Bass

**Sylvan Lake
Otter Lake**

Oakland County

Hg Analysis:

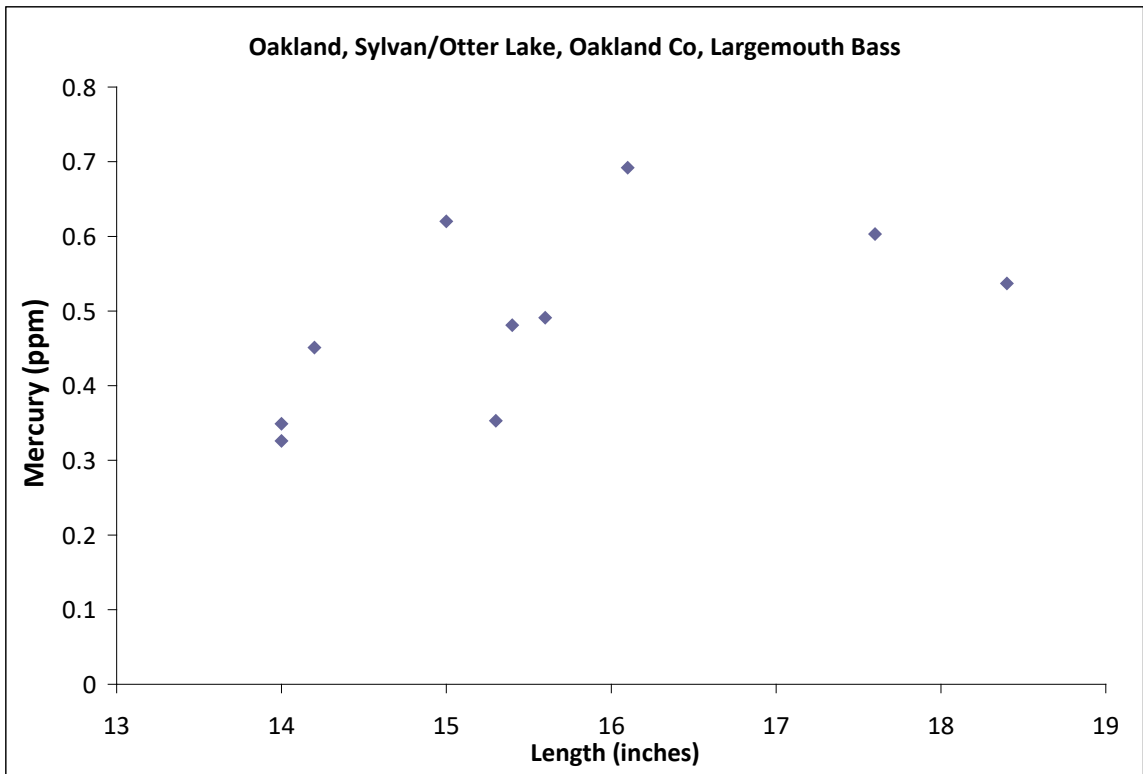
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2008	2008	10	14	14	18.4	
Datasets available: 2008						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	10	0.490		0.580	1	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.340	0.368				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2008	2008	10	14	14	18.4	
Datasets available: 2008						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	0	--		--	--	
DDT	0	--		--	--	
Chlordane	0	--		--	--	
Toxaphene	0	--		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:					1	

Existing Advisory: Sylvan/Otter Lake largemouth bass are covered under the statewide mercury consumption advisory.

Recommendation: No one should eat more than 1 meal per month of Sylvan/Otter Lake largemouth or smallmouth bass less than 18 inches or 6 meals per year of Sylvan/Otter Lake largemouth or smallmouth bass greater than 18 inches due to mercury. Statewide guideline length break applied.



Carp

Terry Lake

Oakland County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1999	1999	10	15.7	na	15.7	24.8
Datasets available: 1999						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.105	0.02	0.16	0.140	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.928	0.953				

Organics Analysis:

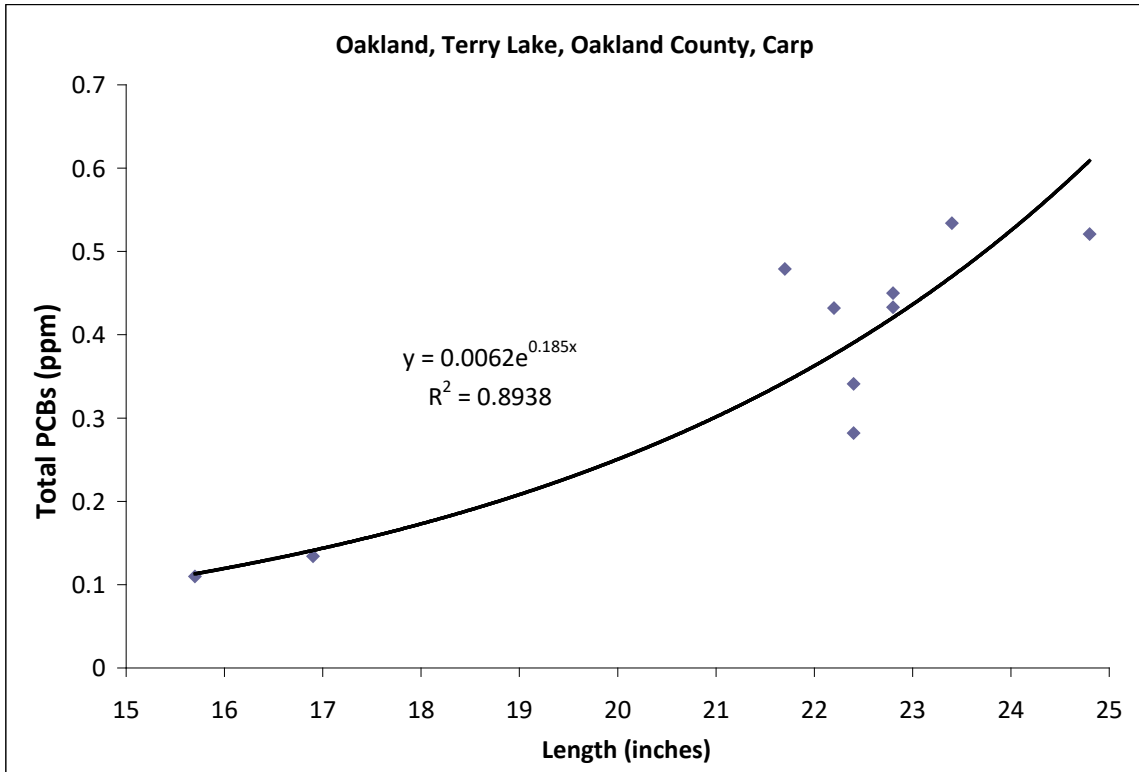
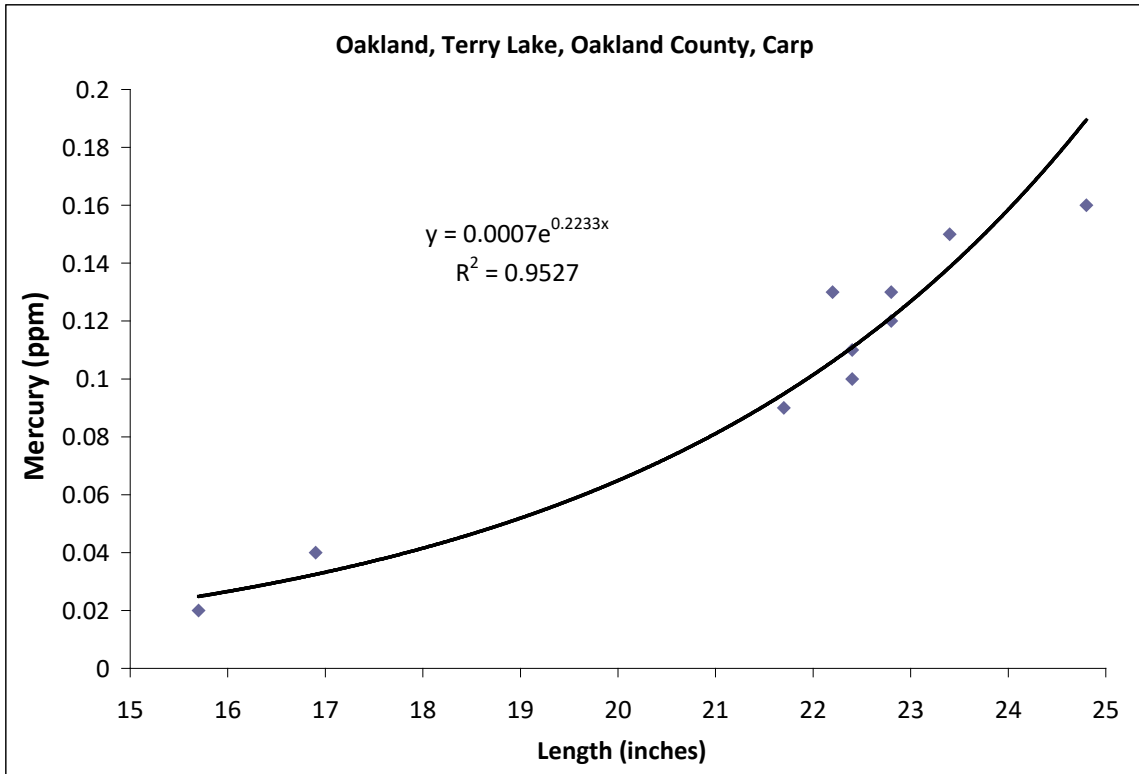
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1999	1999	10	15.7	na	15.7	24.8
Datasets available: 1999						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL	Meal Category
PCB	10	0.372	0.11	0.53	0.480	0
DDT	10	0.043	0.007	0.07	0.060	8
Chlordane	10	0.016	0.003	0.025	0.020	--
Toxaphene	10	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.811	0.894				
DDT	0.258	0.373				
Chlordane	0.484	0.607				
Toxaphene	--	--				
Final meal category based on UCL:						0

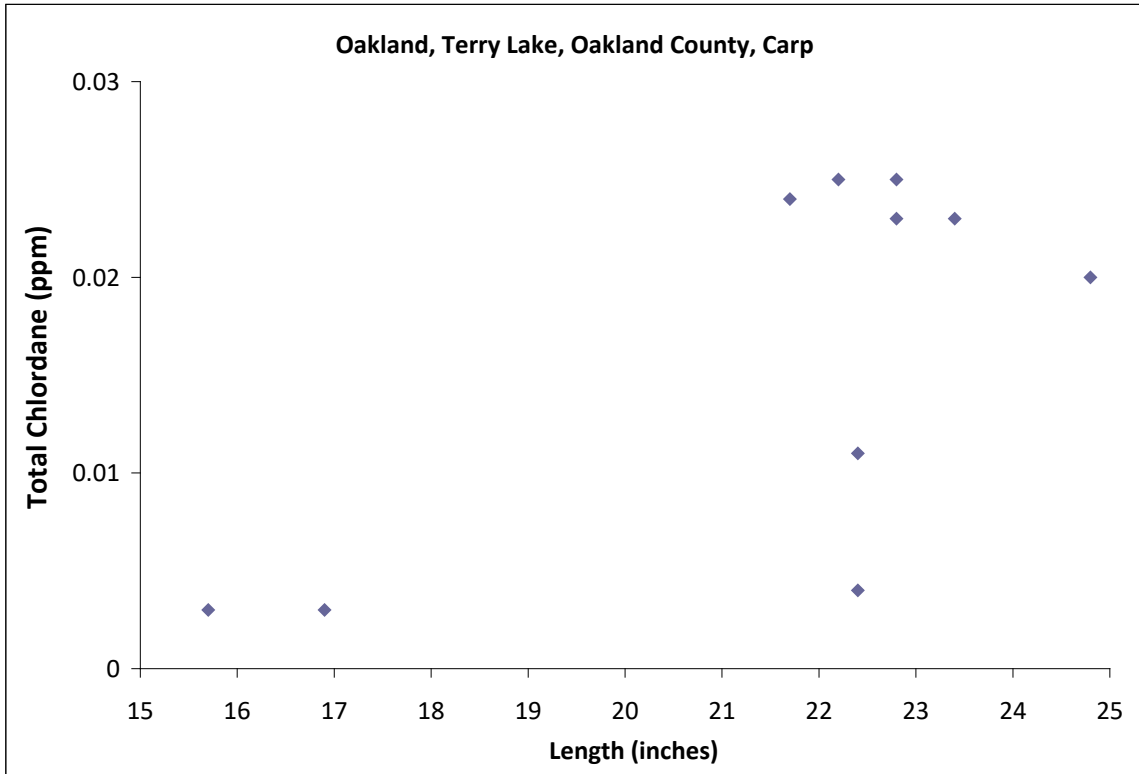
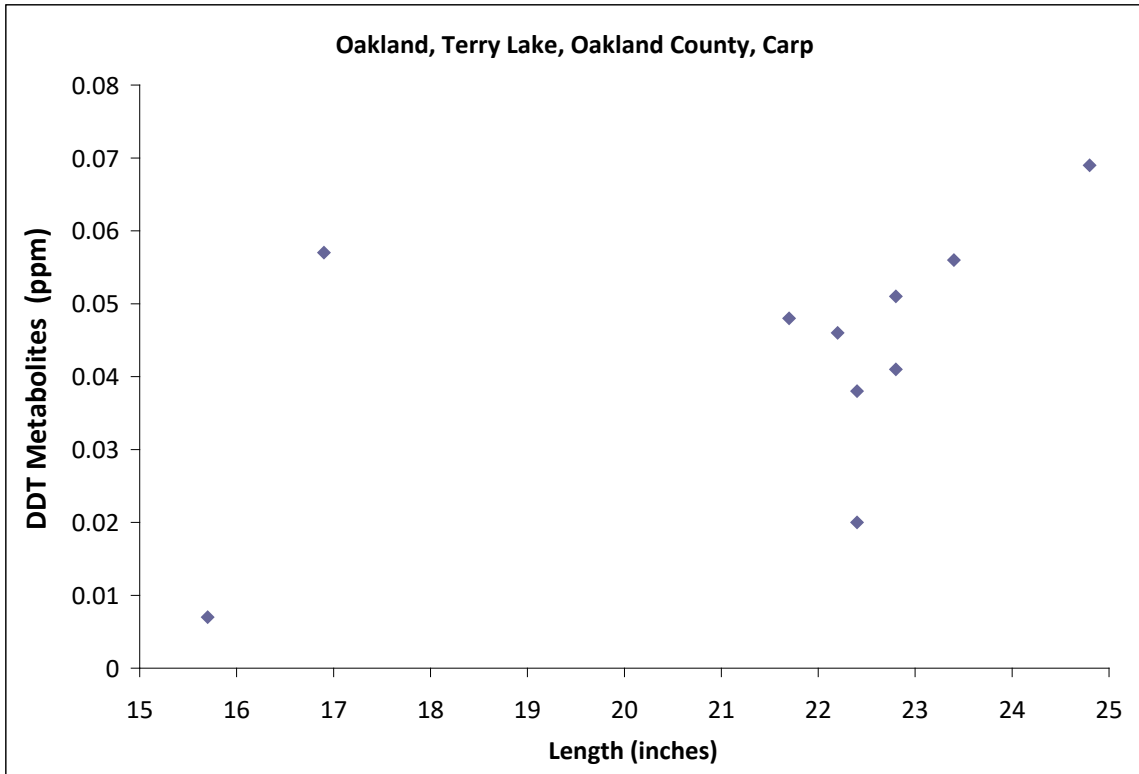
Existing Advisory: Women and children should eat no more than one meal per week of Terry Lake carp less than 18 inches in length and no more than one meal per month of Terry Lake carp larger than 18 inches in length due to elevated levels of PCBs.

Recommendation: No one should eat more than 1 meal per month of Terry Lake carp less than 18 inches in length. Sensitive populations should not eat any Terry Lake carp larger than 18 inches and healthy adults should limit consumption of those fish to 1 or 2 meals per year due to elevated concentrations of PCBs. Mercury and DDT should be listed as chemicals that would cause advisories.

Length (Inches)	Hg Regression Estimate (ppm)	Meal Category	PCB Regression Estimate (ppm)	Meal Category
14	0.016	16	0.083	2
16	0.025	16	0.120	1
18	0.039	16	0.173	1
20	0.061	16	0.251	0.5
22	0.095	8	0.363	0.5
24	0.149	4	0.526	0
26	0.233	4	0.761	0
28	0.363	2	1.102	0
30	0.568	1	1.595	0

Shaded area denotes extrapolated estimates





Largemouth Bass

Terry Lake

Oakland County

Hg Analysis:

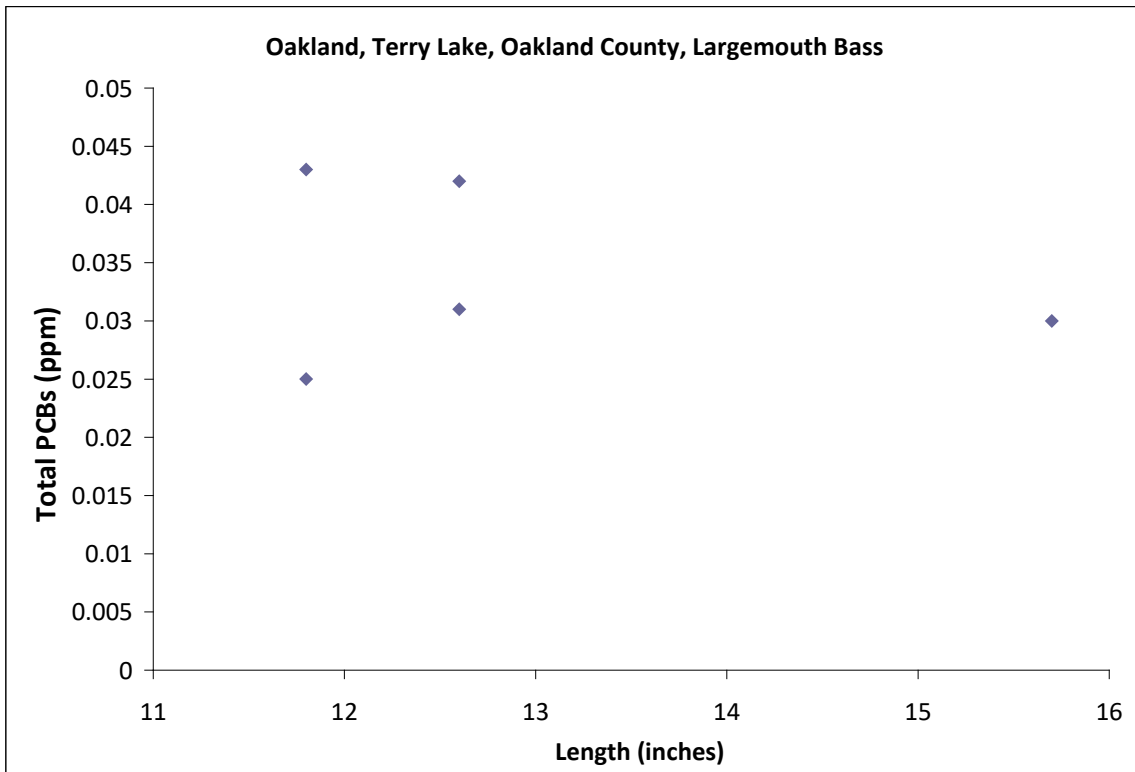
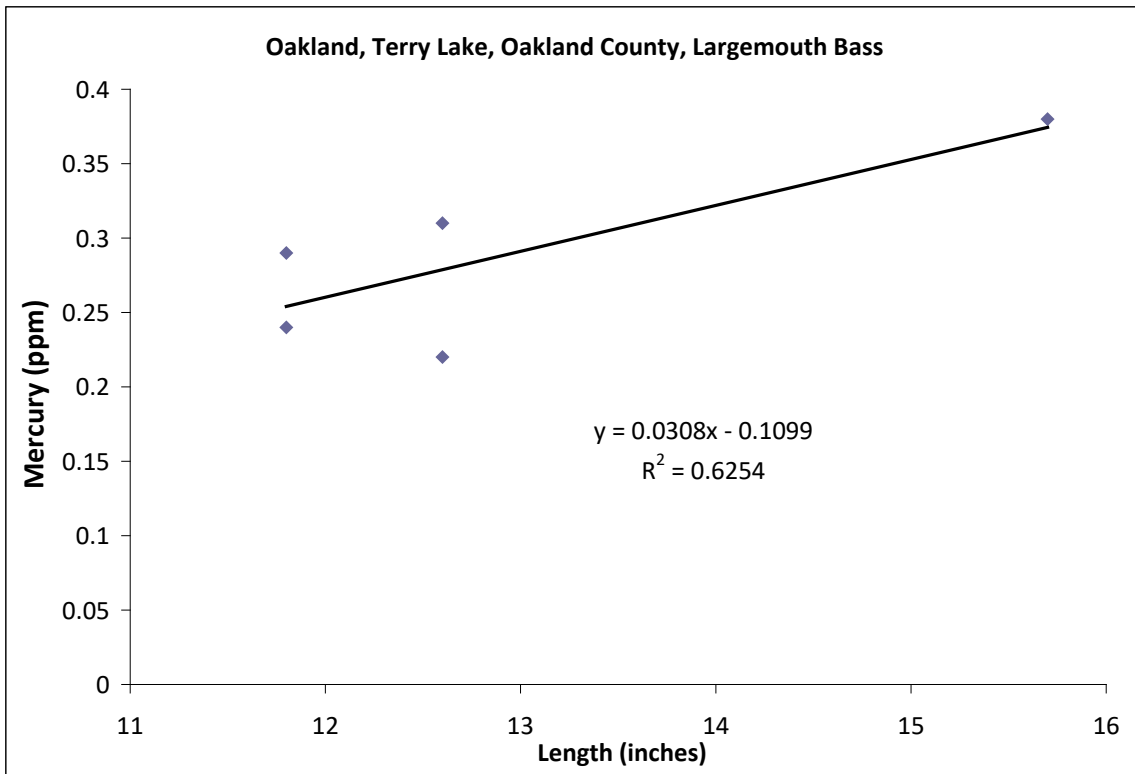
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1999	1999	5	11.8	14	15.7	15.7
Datasets available: 1999						
Chemical	Sample Size (All)	Mean (ppm)		95%UCL		Meal Category
Mercury	5	0.29		0.37		2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.625	0.543		<i>limited data – regression not used</i>		

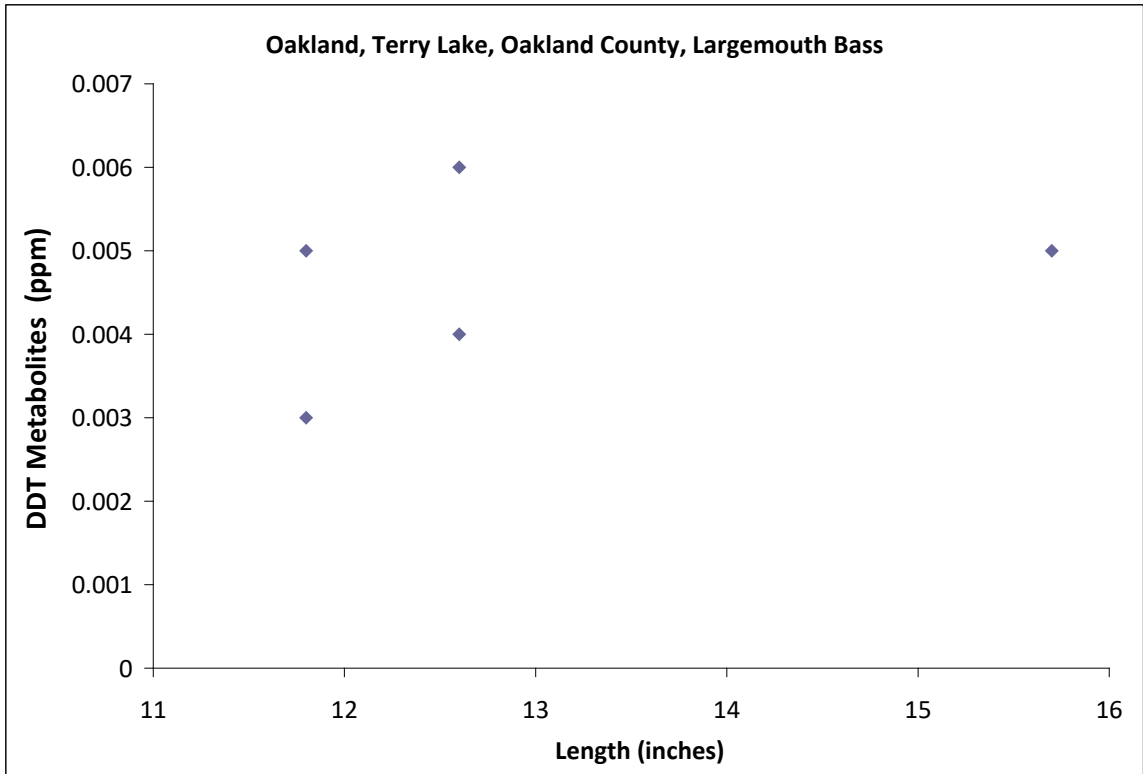
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1999	1999	5	11.8	14	15.7	15.7
Datasets available: 1999						
Chemical	Sample Size (All)	Mean (ppm)		95%UCL		Meal Category
PCB	5	0.034		0.040		4
DDT	5	0.005		0.010		16
Chlordane	5	ND		--		--
Toxaphene	5	ND		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.062	0.041				
DDT	0.089	0.112				
Chlordane	--	--				
Toxaphene	--	--		Final meal category based on UCL:		2

Existing Advisory: Terry Lake largemouth bass are covered under the statewide mercury consumption advisory.

Recommendation: No one should eat more than 2 meals per month of Terry Lake largemouth or smallmouth bass less than 18 inches or 1 meal per month of Terry Lake largemouth or smallmouth bass greater than 18 inches due to mercury. This dataset is limited by sub-legal lengths of the samples. Statewide guideline length break applied.





Northern Pike

Tipsico Lake

Oakland County

Hg Analysis:

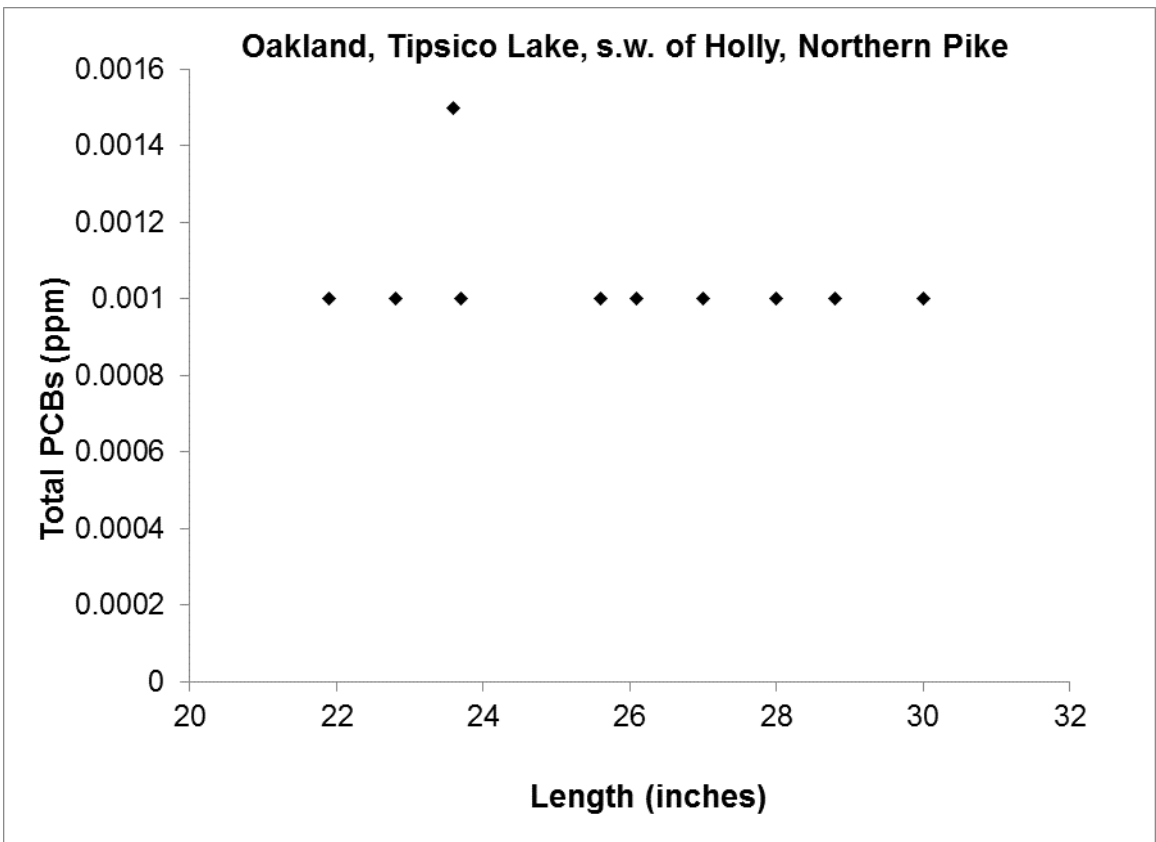
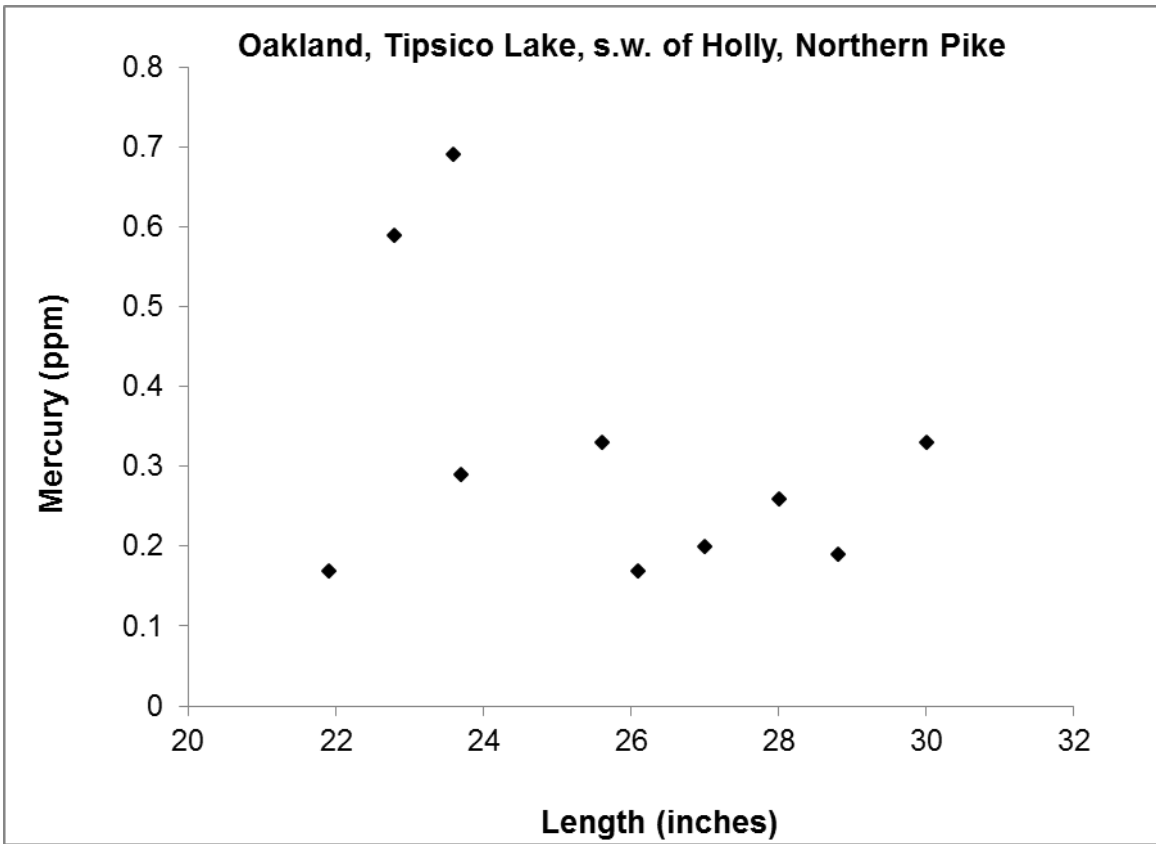
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2014	2014	10	21.9	24	23.6	30	
Datasets available: 2014							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	8	0.31		0.17	0.69	0.45	2
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.140	0.087					

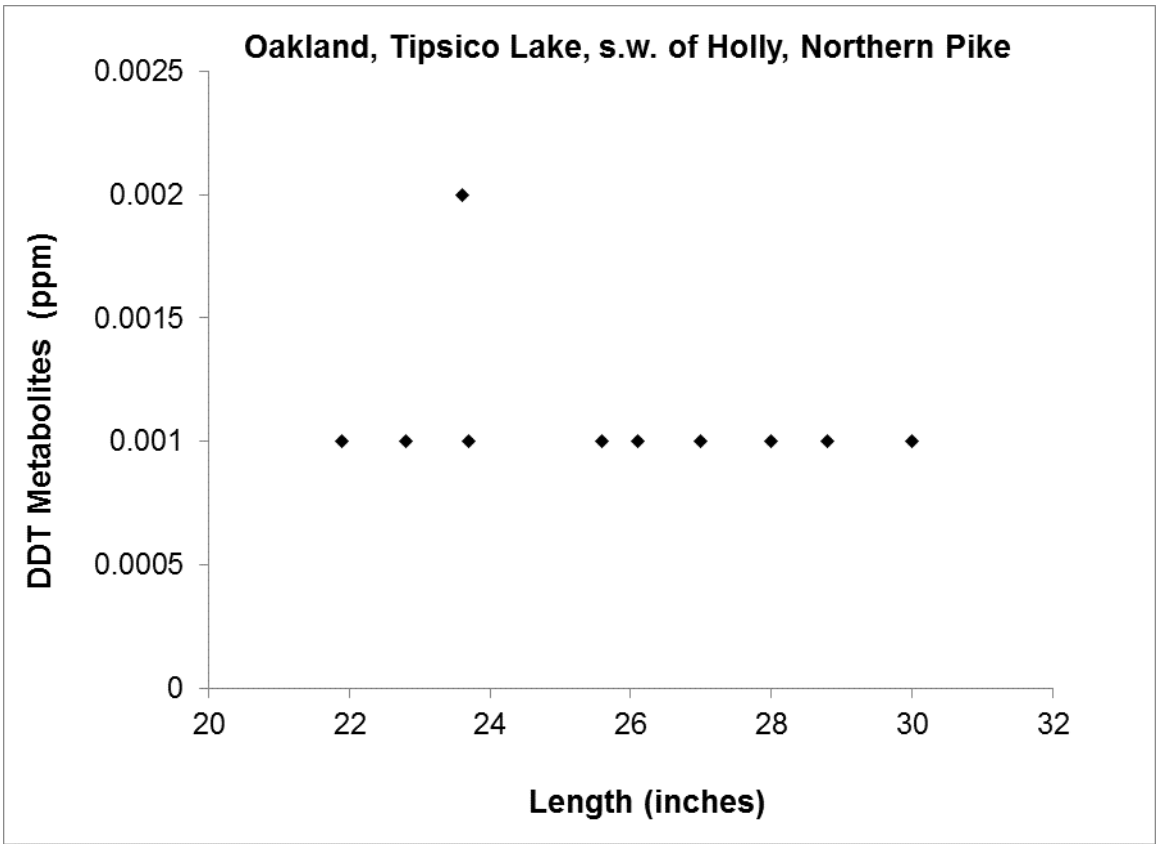
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2014	2014	10	21.9	24	23.6	30	
Datasets available: 2014							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	8	0.31		0.17	0.69	0.45	16
DDT	8	0.001		0.001	0.002	0.001	16
Chlordane	8	ND		--	--	--	--
Toxaphene	8	ND		--	--	--	--
TEQ	0	--		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.077	0.077					
DDT	0.077	0.077					
Chlordane	--	--					
Toxaphene	--	--					
TEQ	--	--					
Final meal category based on UCL:							2

Existing Advisory: Tipsico Lake northern pike are covered under the statewide mercury consumption advisory: No one should eat more than 2 meals per month of northern pike smaller than 30 inches or more than 1 meal per month of those fish larger than 30 inches due to mercury.

Recommendation: No one should eat more than 2 meals per month of Tipsico Lake northern pike smaller than 30 inches or more than 1 meal per month of those fish larger than 30 inches due to mercury. The statewide length break was applied as the size range of the fish were limited.





Carp

Tull Lake

Oakland County

Hg Analysis:

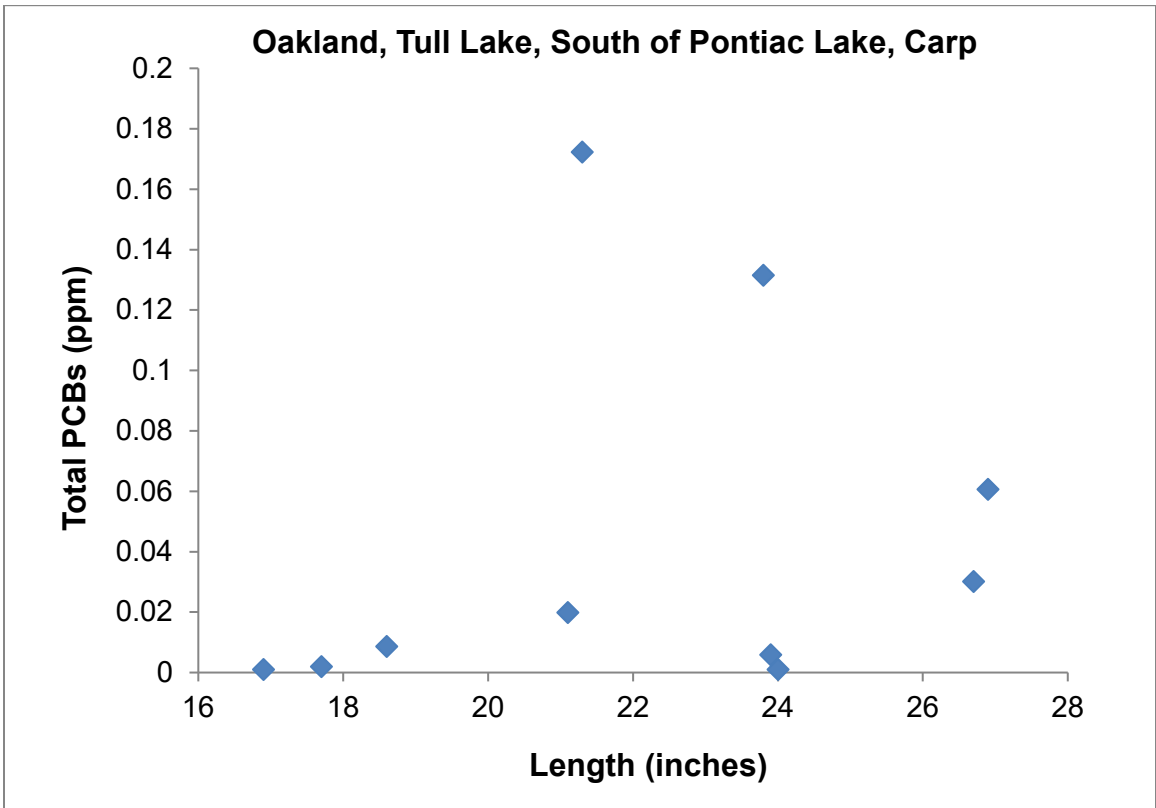
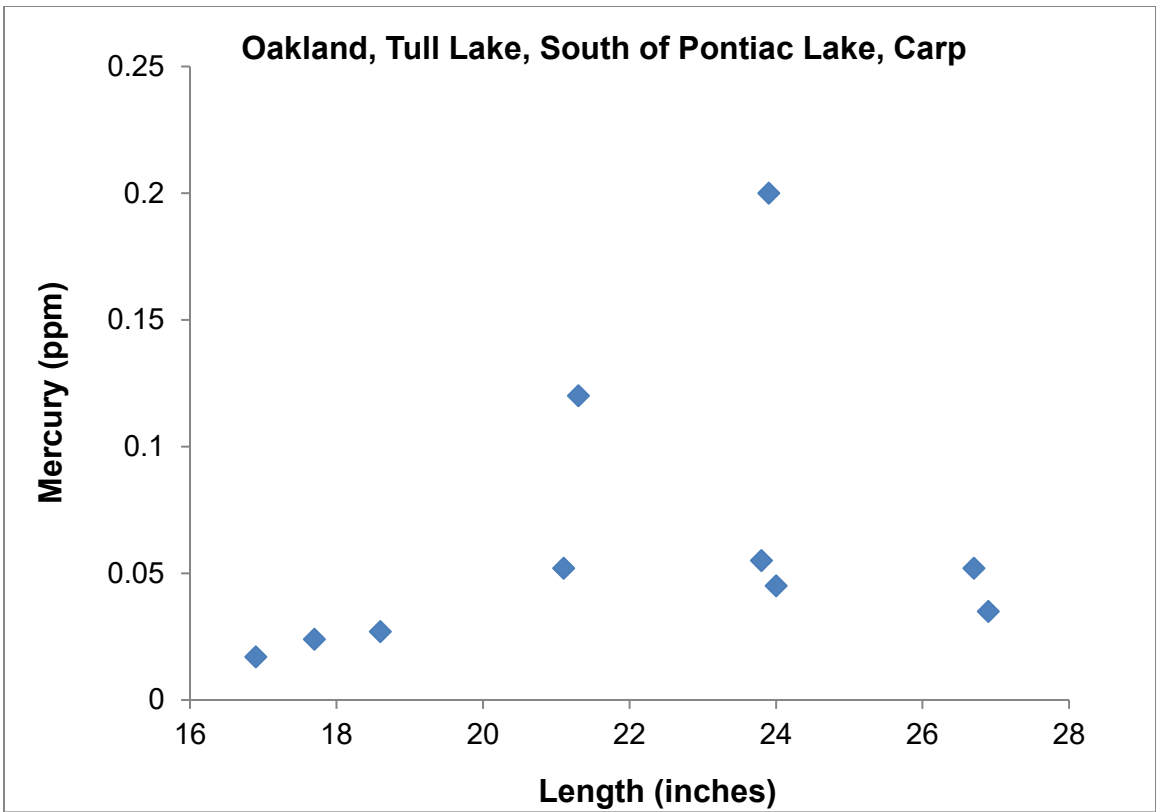
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2015	2015	10	16.9	na	16.9	26.9	
Datasets available: 2015							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.06		0.02	0.20	0.10	8
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.082	0.223					

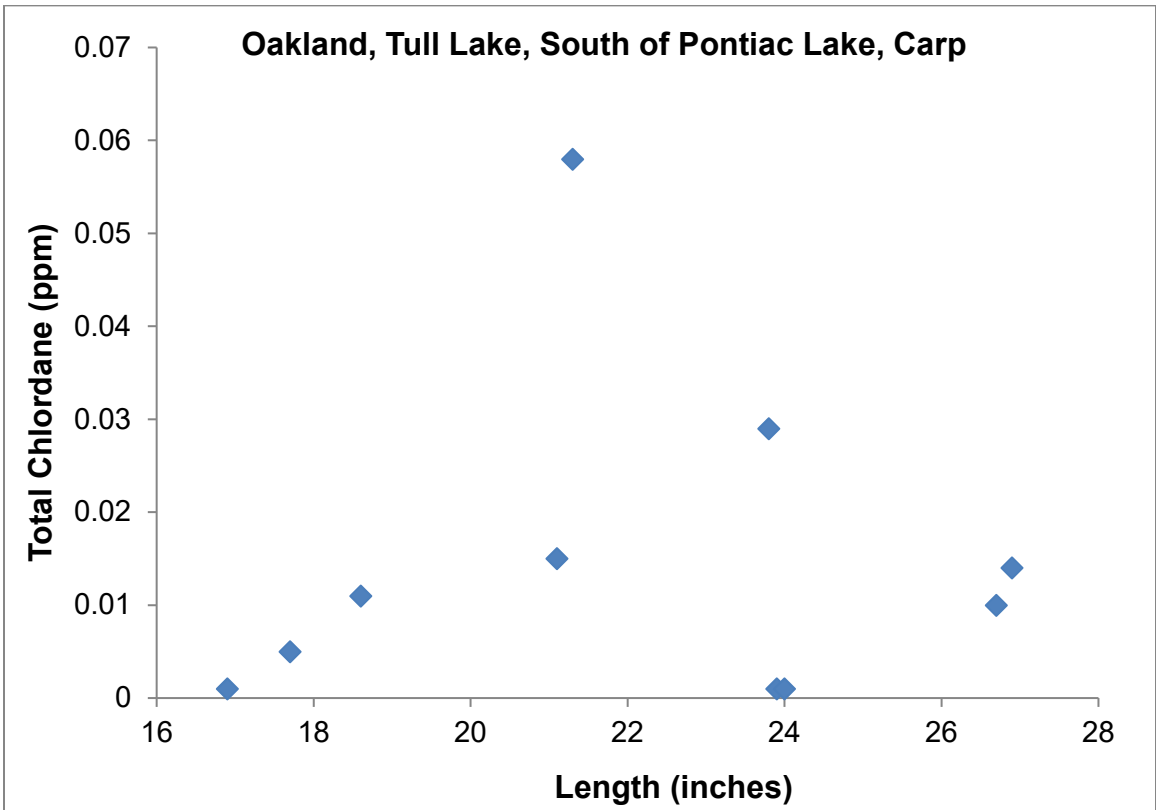
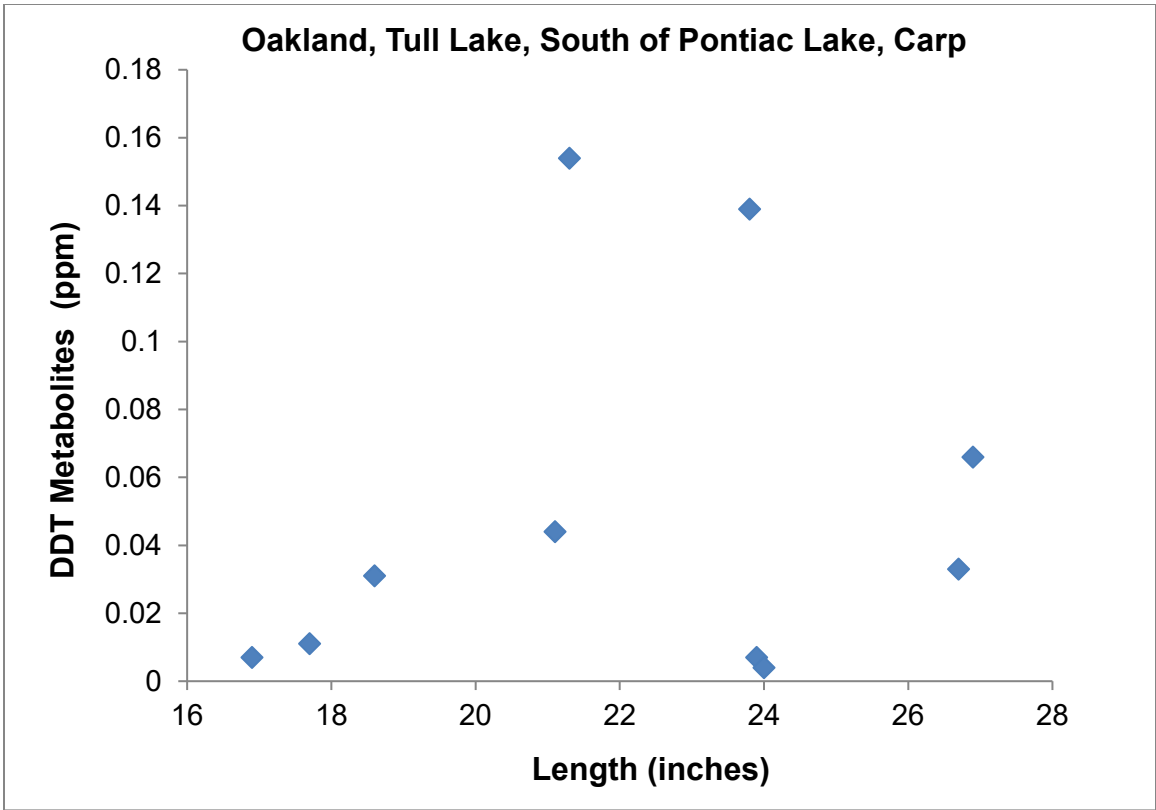
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2015	2015	10	16.9	na	16.9	26.9	
Datasets available: 2015							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.043		0.001	0.17	0.09	2
DDT	10	0.050		0.004	0.15	0.09	16
Chlordane	10	0.015		0.001	0.06	0.02	--
Toxaphene	10	ND		--	--	--	--
TEQ	0	--		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.058	0.233					
DDT	0.044	0.065					
Chlordane	0.005	0.027					
Toxaphene	--	--					
TEQ	--	--					
Final meal category based on UCL:							2

Existing MDHHS Advisory: Carp from Tull Lake in Oakland County are covered by the statewide advisory due to PCBs: No one should eat more than 2 meals per month of carp of any size.

Recommendation: No one should eat more than 2 meals per month of carp from Tull Lake of any size due to PCBs. Mercury would cause an advisory.





**Largemouth Bass
Smallmouth Bass**

Union Lake

Oakland County

Hg Analysis:

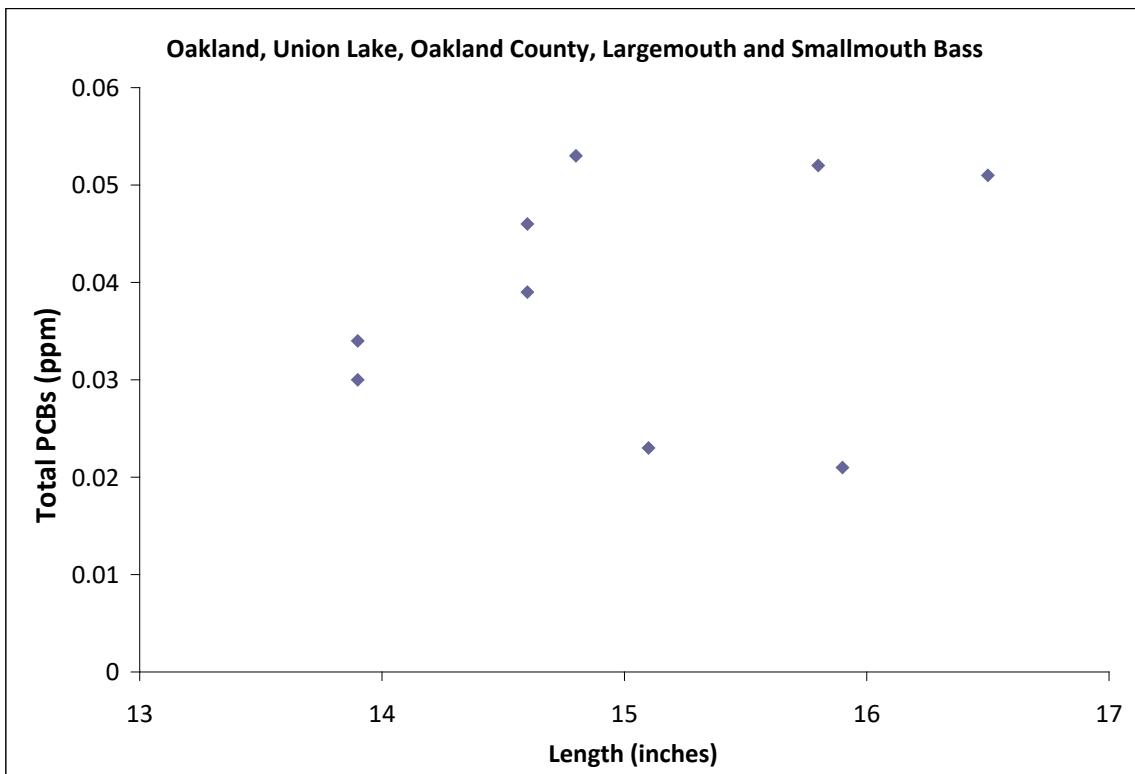
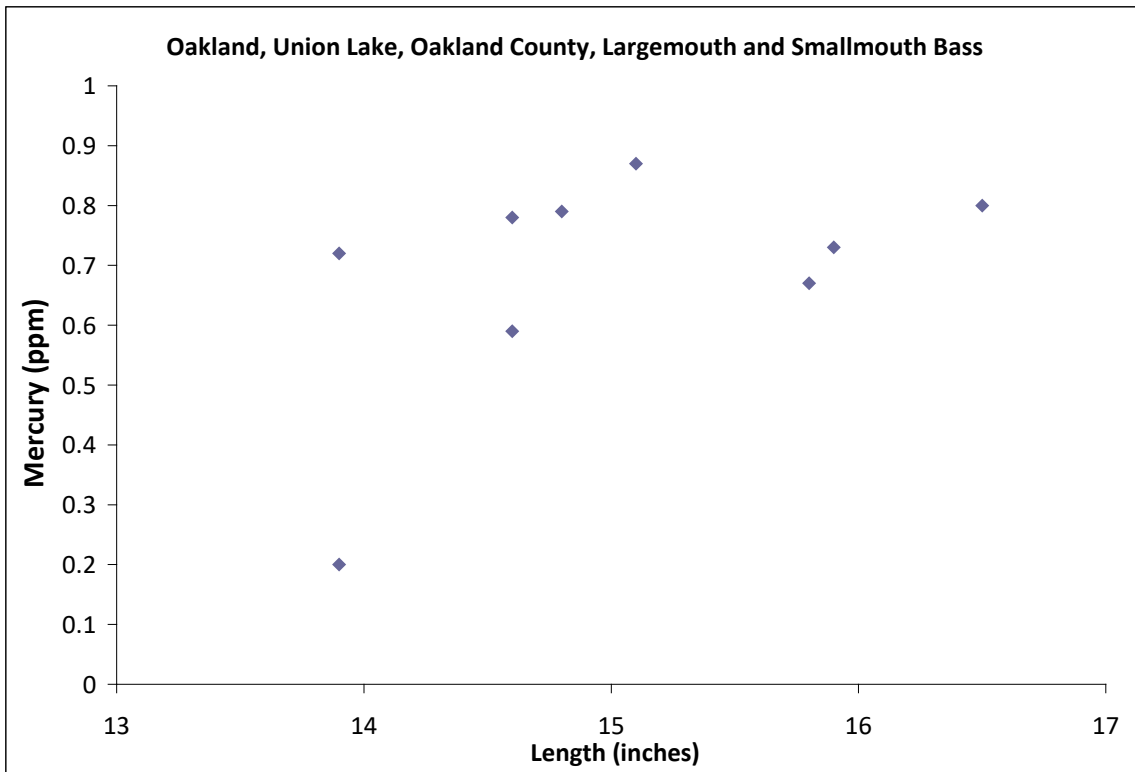
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2002	2002	9	13.9	14	13.9	16.5
Datasets available: 2002						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	9	0.683		0.840	1	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.235	0.035				

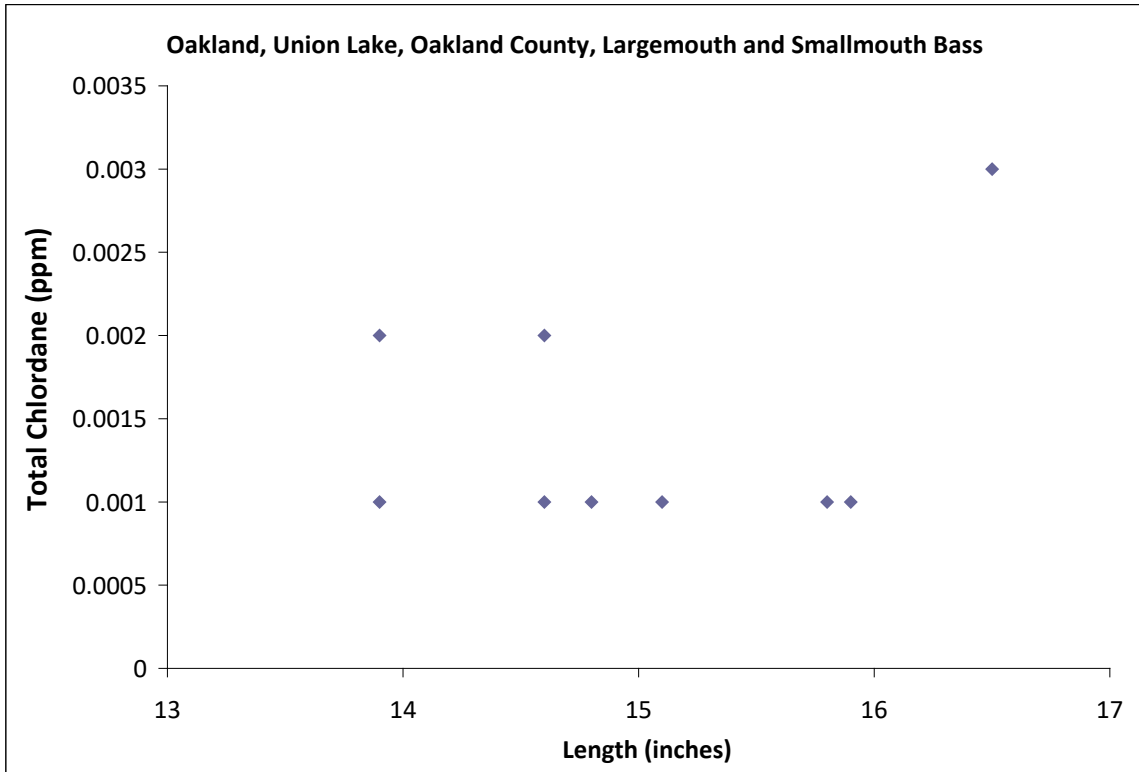
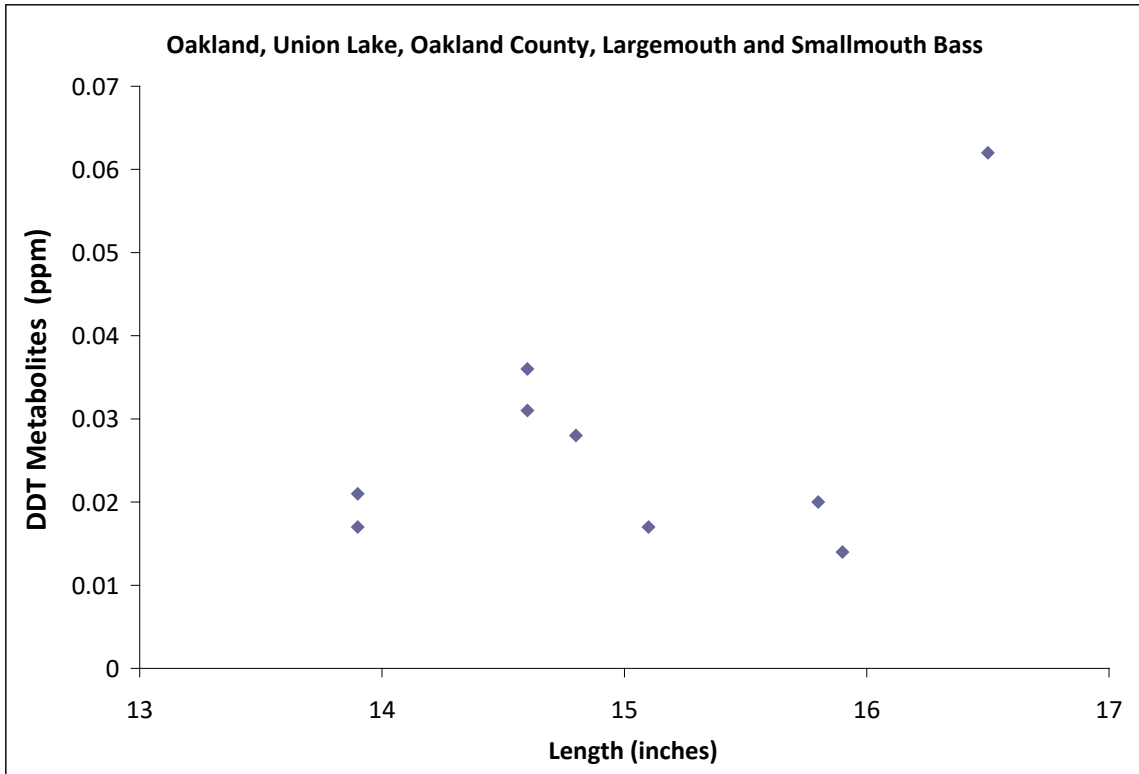
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2002	2002	9	13.9	14	13.9	16.5
Datasets available: 2002						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	9	0.039		0.050	4	
DDT	9	0.027		0.040	16	
Chlordane	9	0.001		0.000	--	
Toxaphene	9	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.052	0.018				
DDT	0.187	0.087				
Chlordane	0.077	0.035				
Toxaphene	--	--				
Final meal category based on UCL:						1

Existing Advisory: Union Lake largemouth and smallmouth bass are covered under the statewide mercury consumption advisory.

Recommendation: No one should eat more than 1 meal per month of Union Lake largemouth or smallmouth bass less than 18 inches or 6 meals per year of Union Lake largemouth or smallmouth bass greater than 18 inches due to mercury. PCBs would cause an advisory. Statewide guideline length break applied.





Carp

Walled Lake

Oakland County

Hg Analysis:

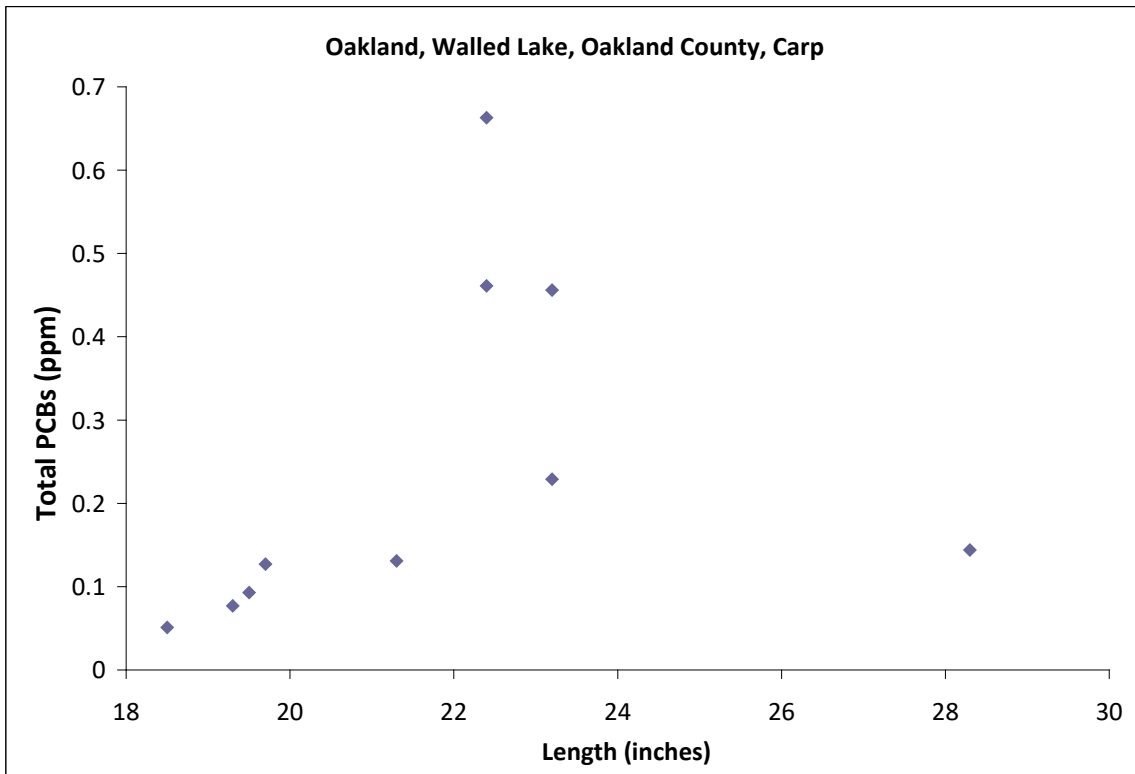
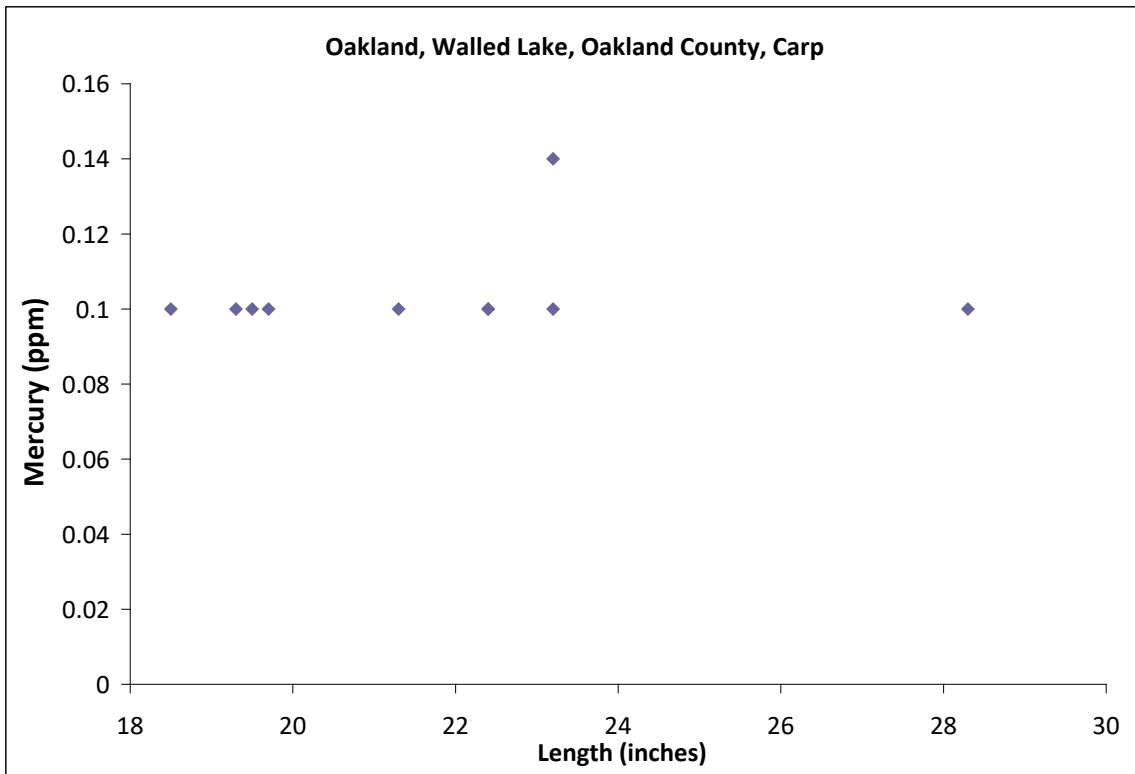
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1988	1988	10	18.5	na	18.5	28.3
Datasets available: 1988						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	10	0.104		0.110		8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.030	0.030				

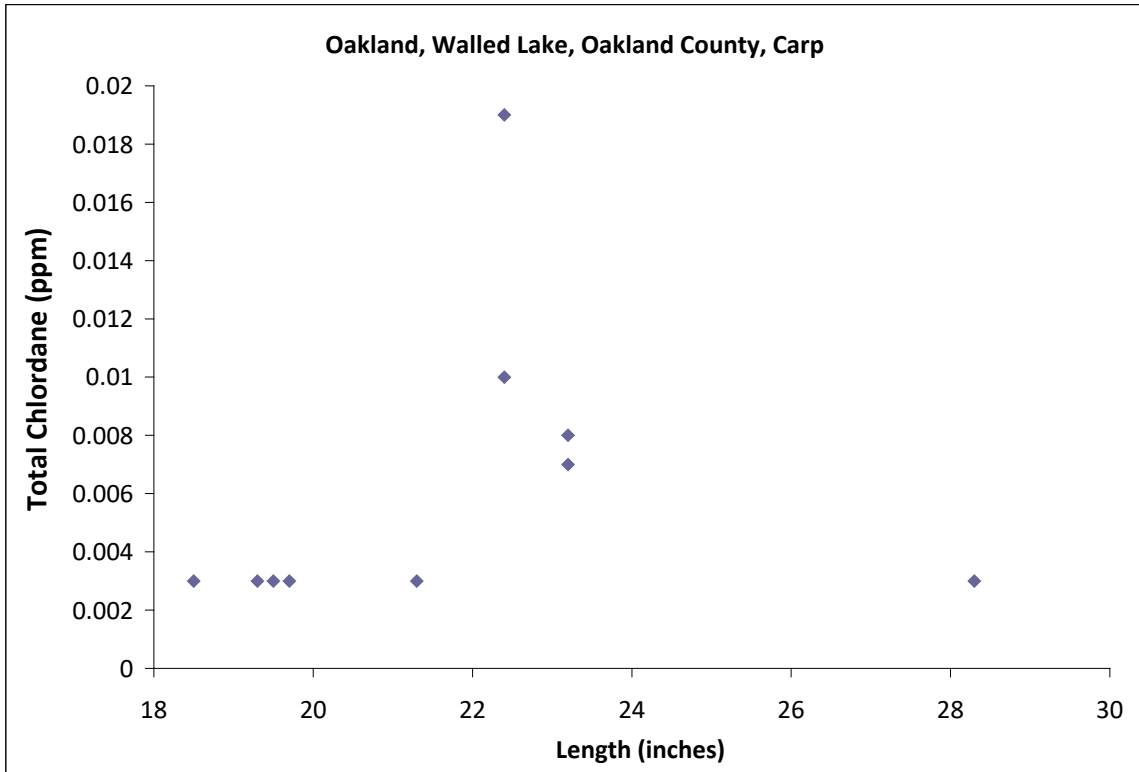
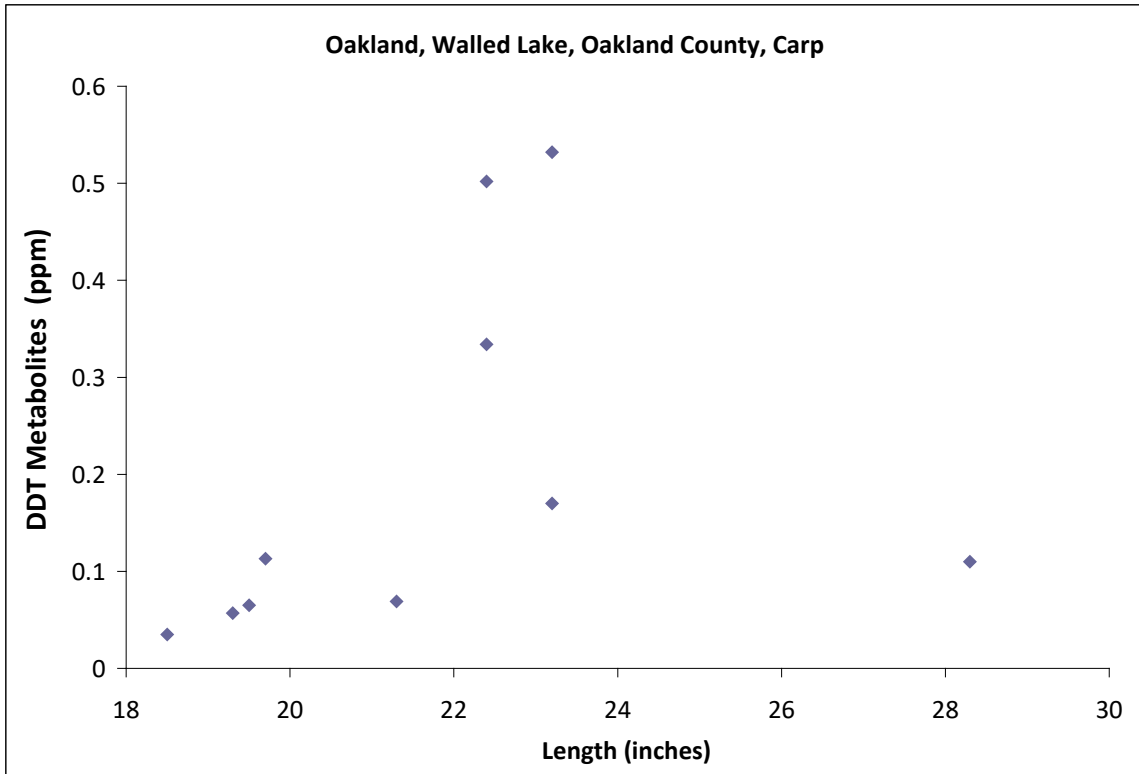
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1988	1988	10	18.5	na	18.5	28.3
Datasets available: 1988						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	10	0.243		0.390		0.5
DDT	10	0.199		0.330		4
Chlordane	10	0.006		0.010		--
Toxaphene	10	ND		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.101	0.217				
DDT	0.103	0.211				
Chlordane	0.041	0.065				
Toxaphene				Final meal category based on UCL:		0.5*

Existing Advisory: Women and children should eat no more than one meal per week of Walled Lake carp less than 22 inches in length and no more than one meal per month of Walled Lake carp greater than 22 inches in length due to elevated levels of PCBs.

Recommendation: No one should eat more than 1 meal per month of Walled Lake carp due to PCBs. Mercury and DDT would cause advisories. This dataset is limited due to age of the data. *Based on EGLE’s Fish Contaminant Monitoring Program (FCMP), PCB and DDT concentrations ≥15 years old are expected to have declined. Recommendation is one meal category less restrictive than estimated by the standard evaluation method.





Northern Pike

Walled Lake

Oakland County

Hg Analysis:

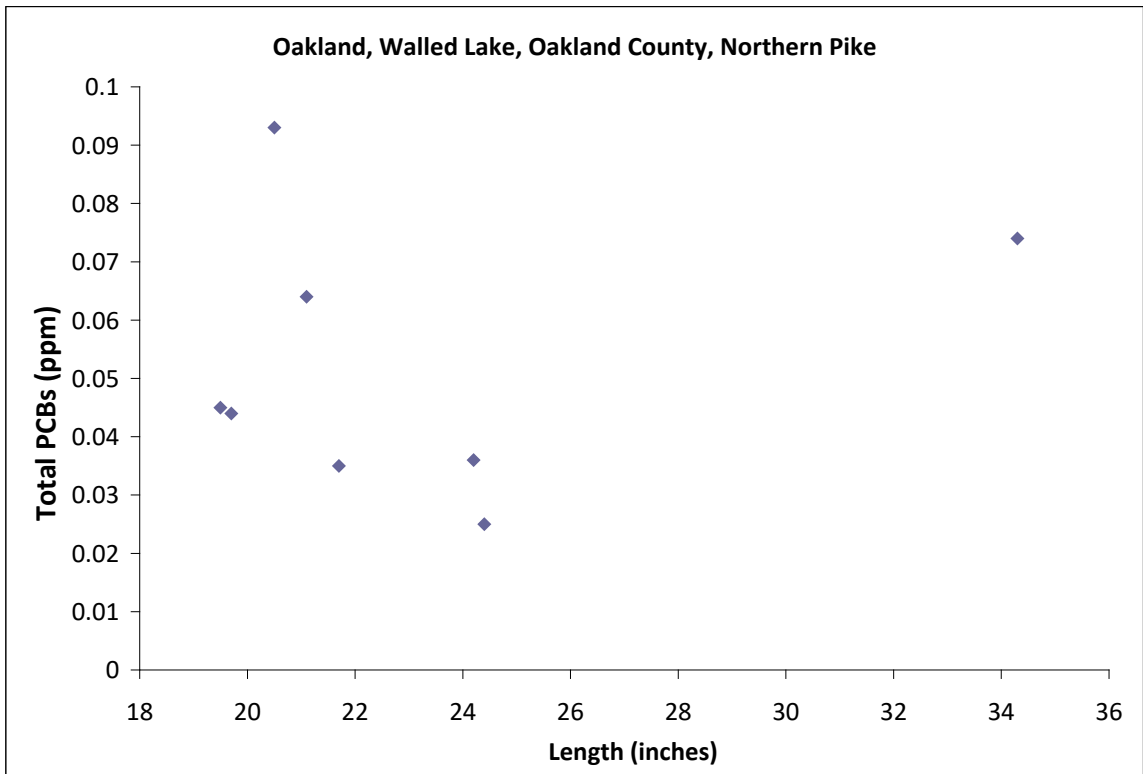
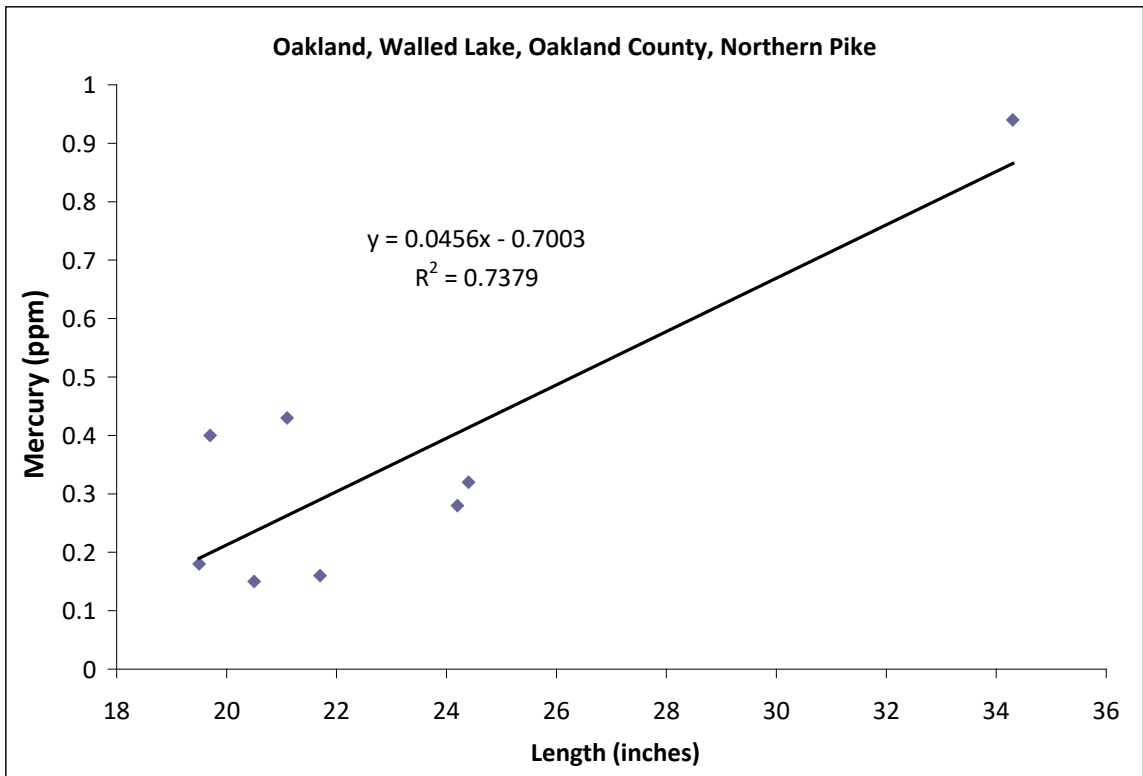
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1988	1988	8	19.5	24	24.2	34.3
Datasets available: 1988						
Chemical	Sample Size (All)	Mean (ppm)		95%UCL	Meal Category	
Mercury	8	0.36		0.57	1	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.738	0.554		<i>Regression driven by 1 data point</i>		

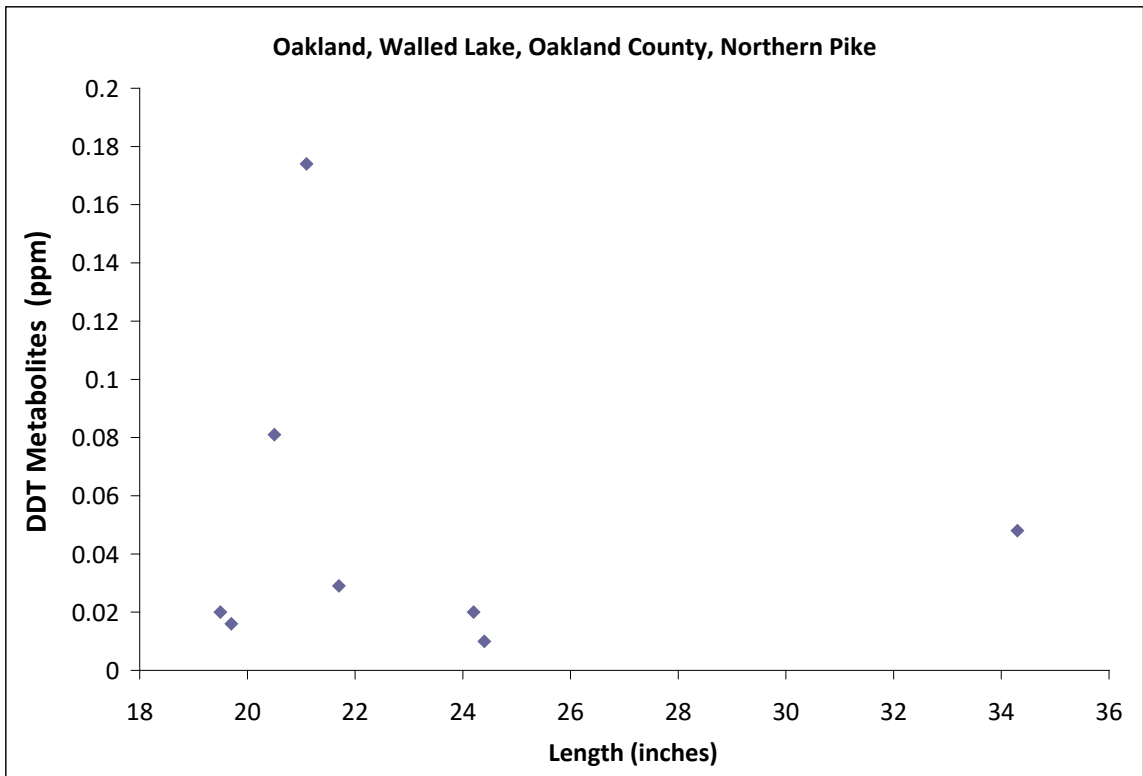
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1988	1988	8	19.5	24	24.2	34.3
Datasets available: 1988						
Chemical	Sample Size (All)	Mean (ppm)		95%UCL	Meal Category	
PCB	8	0.052		0.070	2	
DDT	8	0.050		0.100	16	
Chlordane	3	ND		--	--	
Toxaphene	3	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.032	0.025				
DDT	0.009	0.001				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						1

Existing Advisory: Women and children should eat no more than one meal per month of Walled Lake northern pike due to elevated levels of mercury and PCBs.

Recommendation: Statewide guidelines apply to Walled Lake northern pike. This dataset is limited due to age of the data and sublegal lengths of the samples. The dataset supports the statewide guidelines.





Rock Bass

White Lake

Oakland County

Hg Analysis:

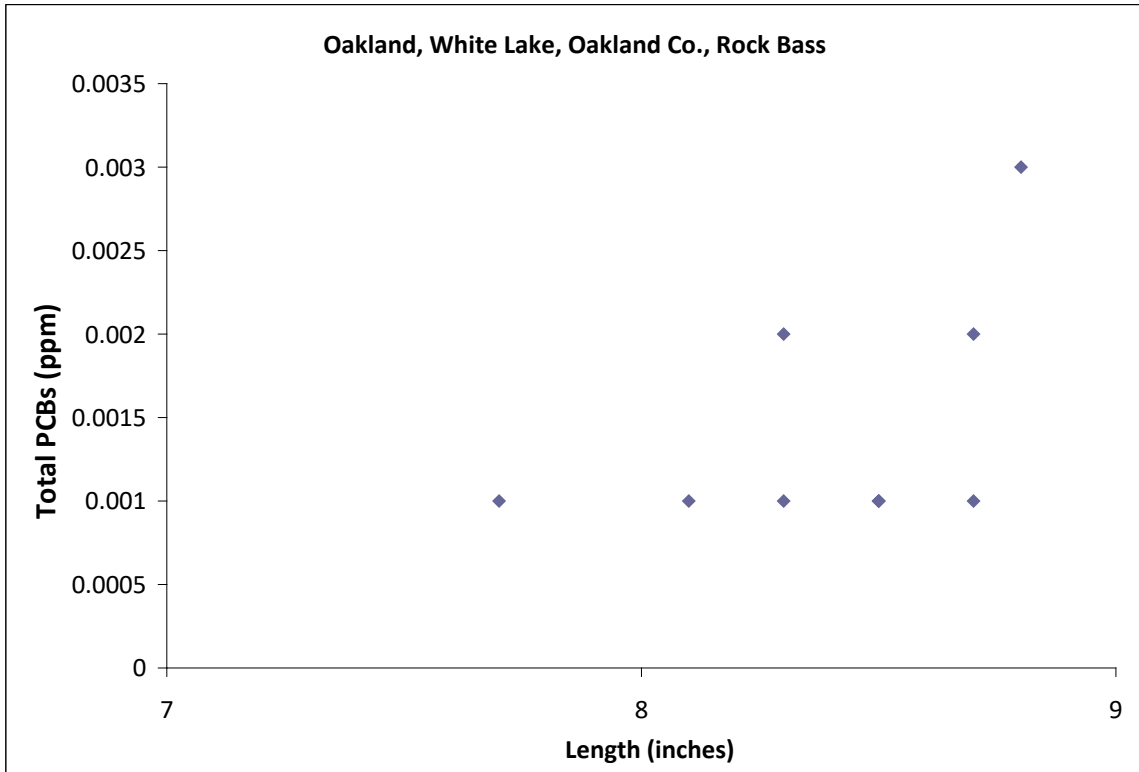
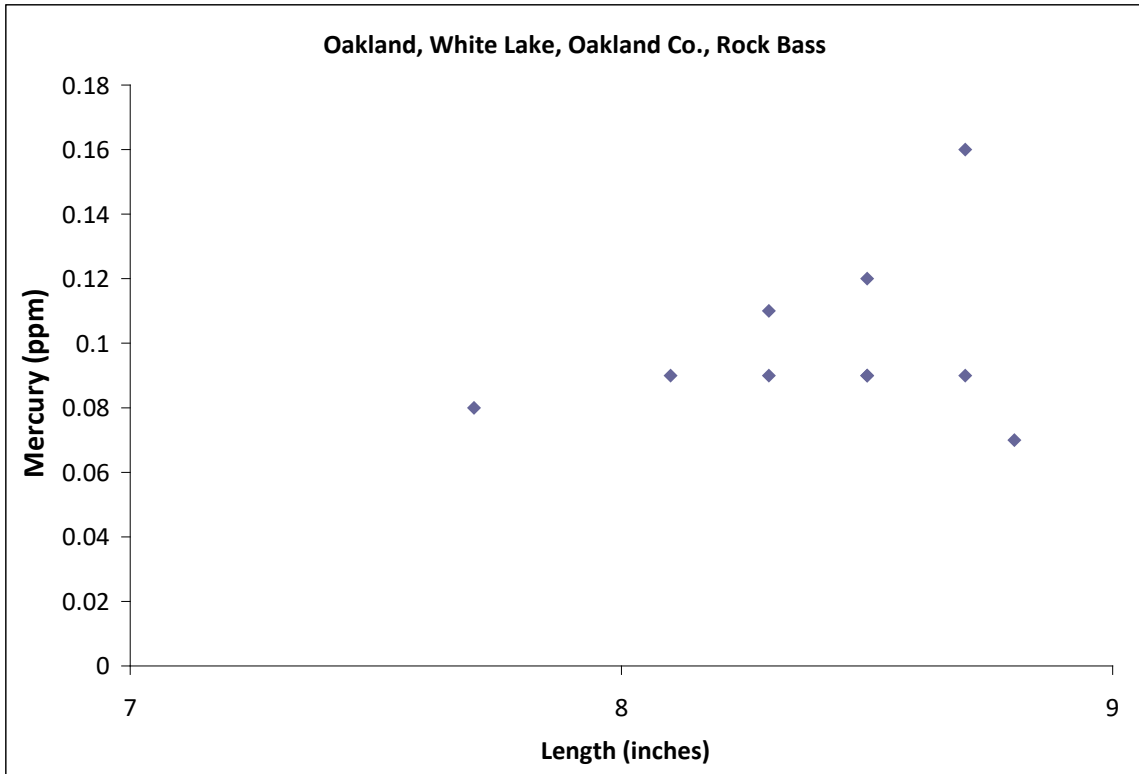
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2001	2001	10	7.7	na	7.7	8.8
Datasets available: 2001						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	10	0.099		0.120	8	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.071	0.052				

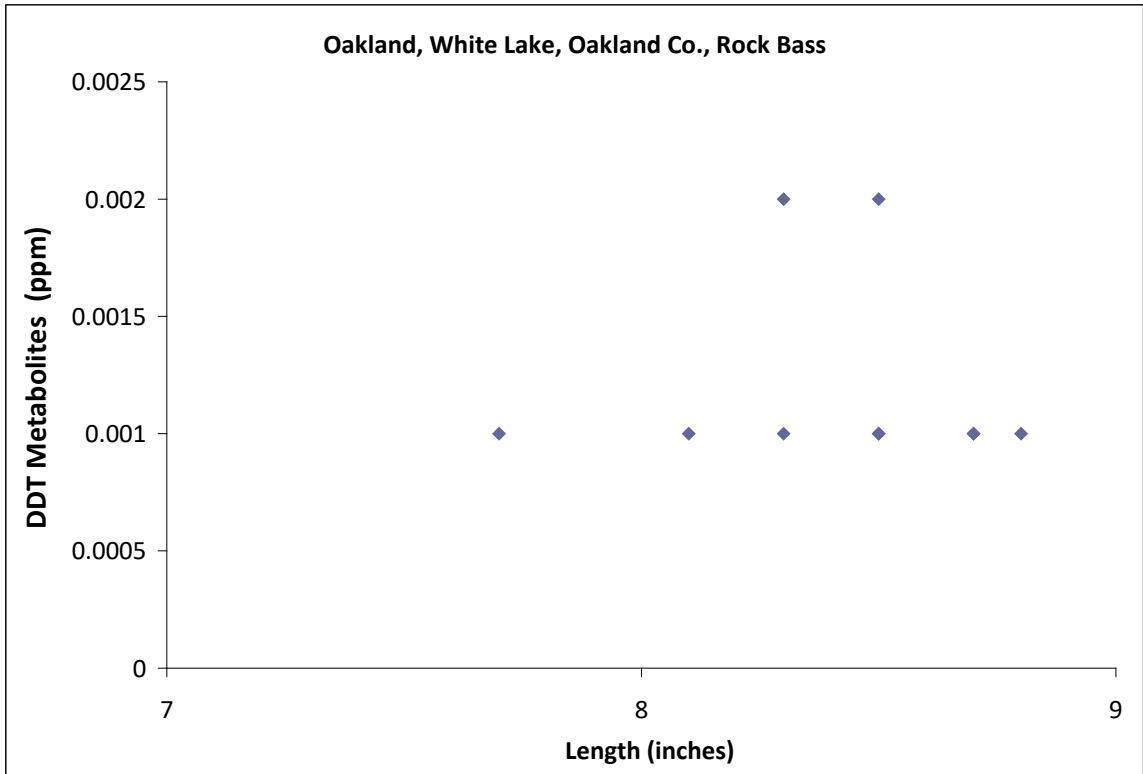
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2001	2001	10	7.7	na	7.7	8.8
Datasets available: 2001						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	10	0.001		0.002	16	
DDT	10	0.001		0.002	16	
Chlordane	10	ND		--	--	
Toxaphene	10	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.216	0.204				
DDT	0.000	0.000				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						8

Existing Advisory: White Lake rock bass are covered under the statewide mercury consumption advisory.

Recommendation: No one should eat more than 8 meals per month of White Lake rock bass due to mercury.





Walleye

White Lake

Oakland County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2007	2007	10	16	15	16	25.2
Datasets available: 2007						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	10	0.466		0.610	1	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.727	0.774				

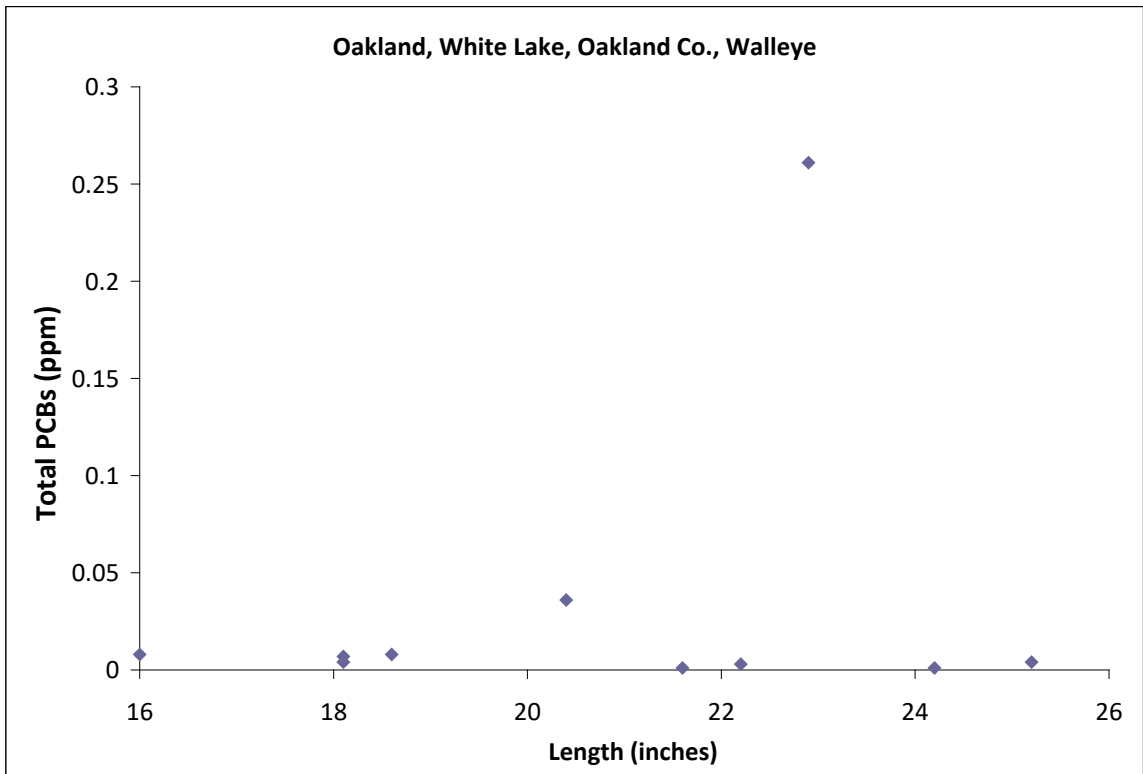
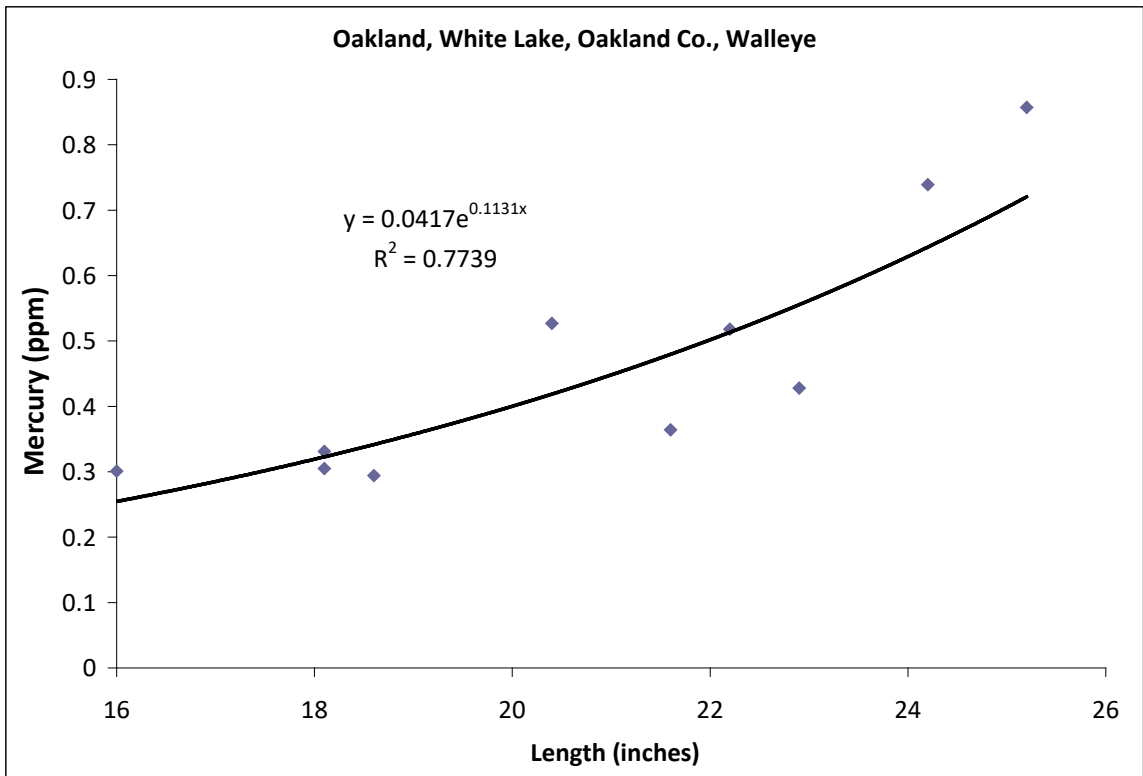
Organics Analysis:

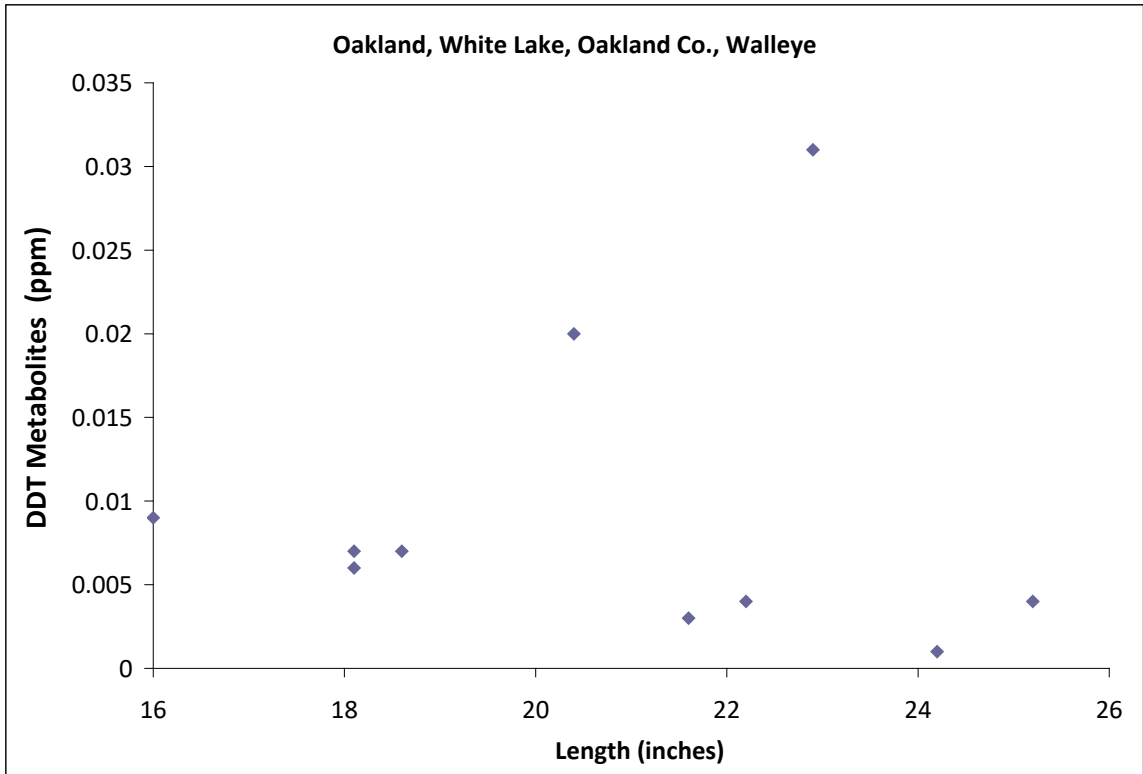
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2007	2007	10	16	15	16	25.2
Datasets available: 2007						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	10	0.033		0.090	2	
DDT	10	0.009		0.020	16	
Chlordane	10	0.002		0.000	--	
Toxaphene	10	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.052	0.009				
DDT	0.000	0.113				
Chlordane	0.065	0.065				
Toxaphene	--	--				
Final meal category based on UCL:						1

Existing Advisory: White Lake walleye are covered under the statewide mercury consumption advisory.

Recommendation: No one should eat more than 2 meals per month of White Lake walleye less than 22 inches in length or more than 1 meal per month of walleye larger than 22 inches due to mercury. PCBs would cause an advisory.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
15	0.227	4
16	0.255	4
18	0.319	2
20	0.400	2
22	0.502	2
24	0.629	1
26	0.789	1
28	0.990	1
30	1.241	0.5
<i>Shaded area denotes extrapolated estimates</i>		





River Raisin Lenawee and Monroe Counties

Data for certain species have been combined with Lake Erie data. See Lake Erie recommendation sheets for channel catfish and freshwater drum.

Carp

Lake Erie – Western Basin

Monroe County

[Dataset: Lake Erie, Plum Creek, River Raisin d/s
Dundee, Ottawa River mouth, N. Maumee Bay]

Hg Analysis:

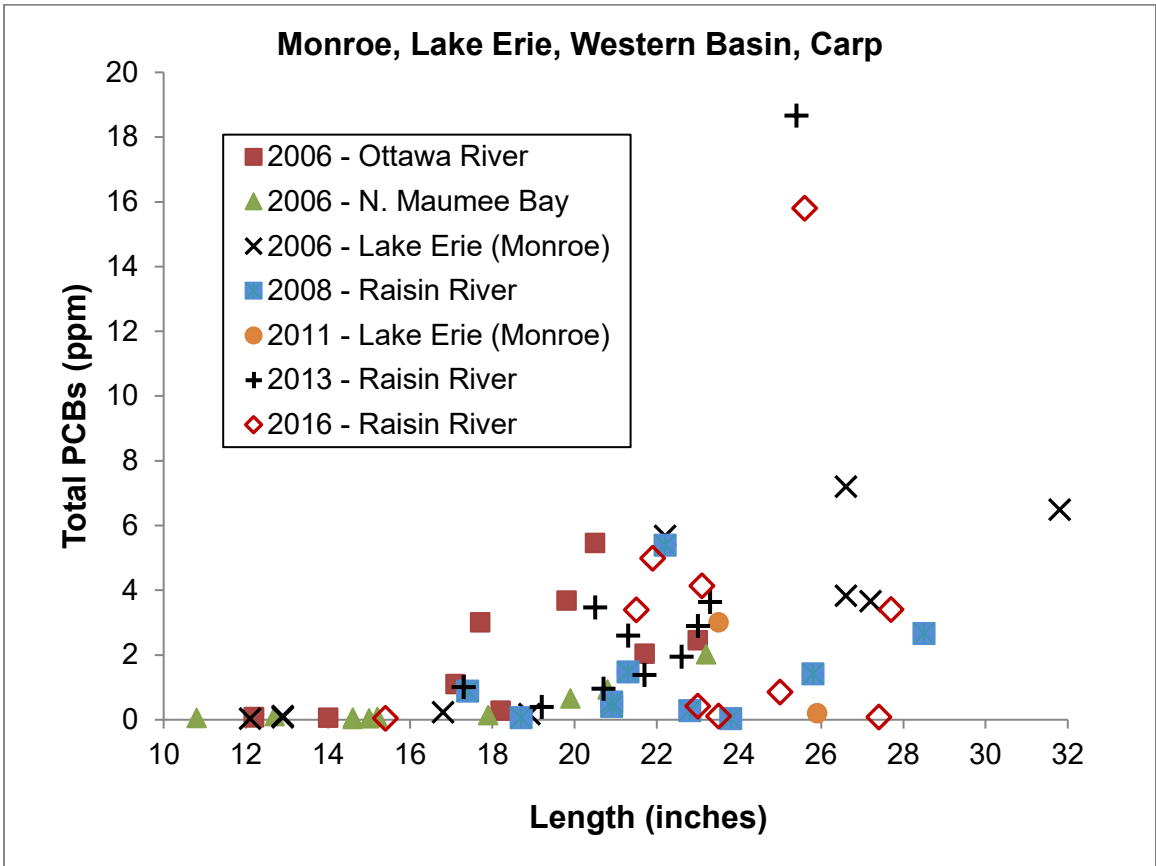
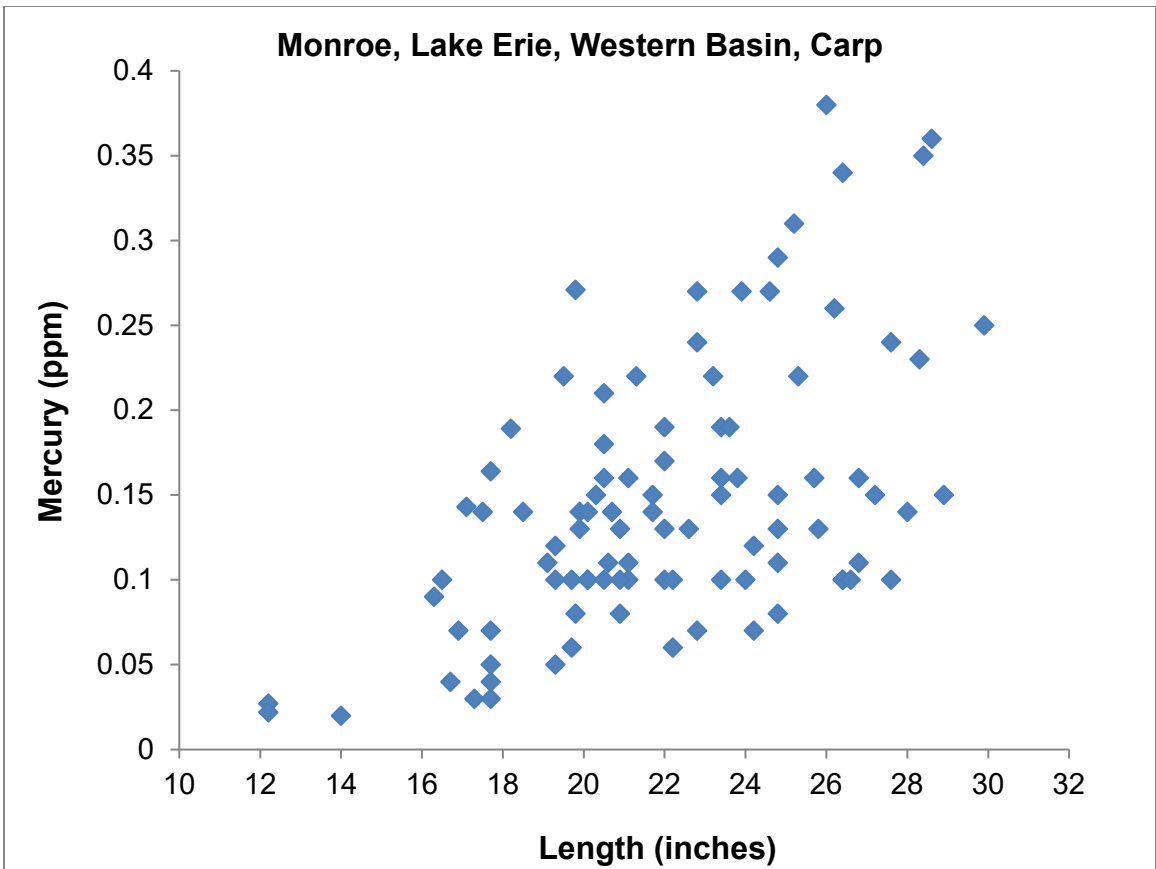
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1986	2016	149	12.2	na	9.4	29.9	
Datasets available: 1986, '87, '93, '95, '98, '99, 2000, '04, '06, '08, '11, '13							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	149	0.16		0.01	0.84	0.18	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.275	0.476					

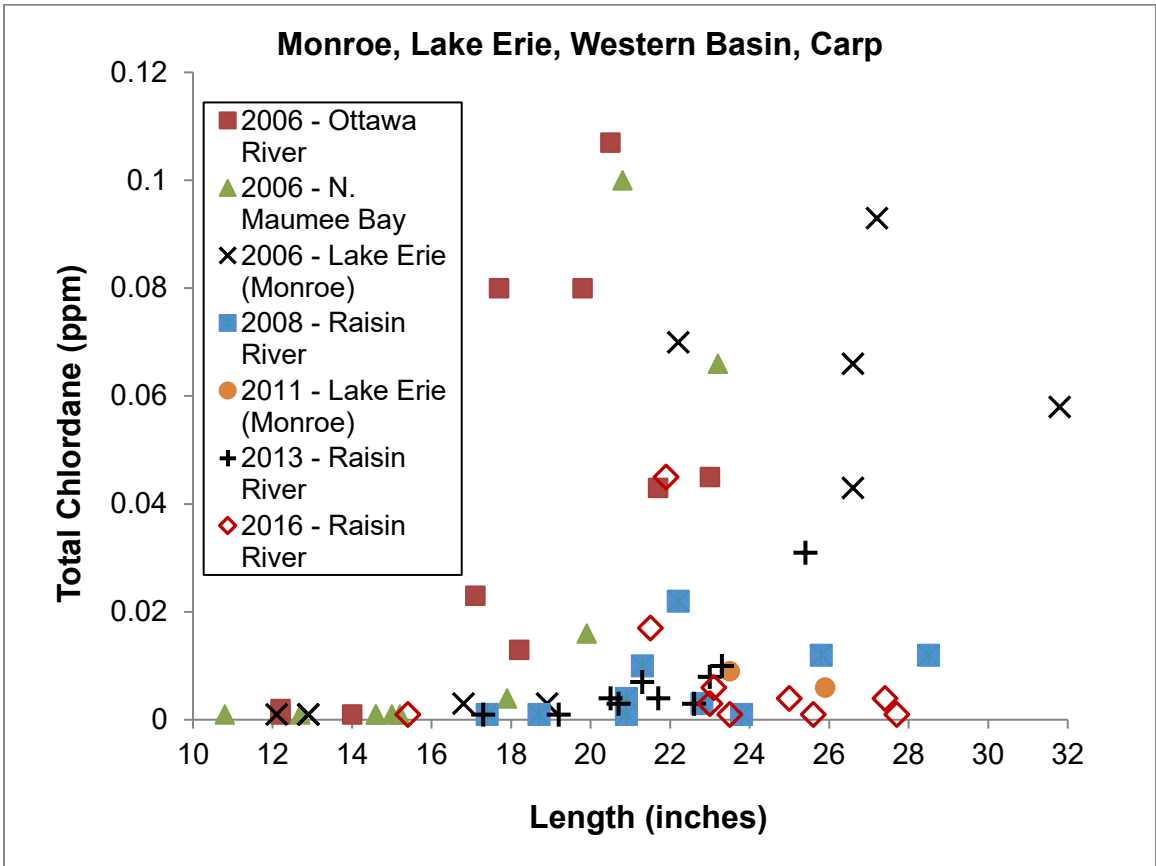
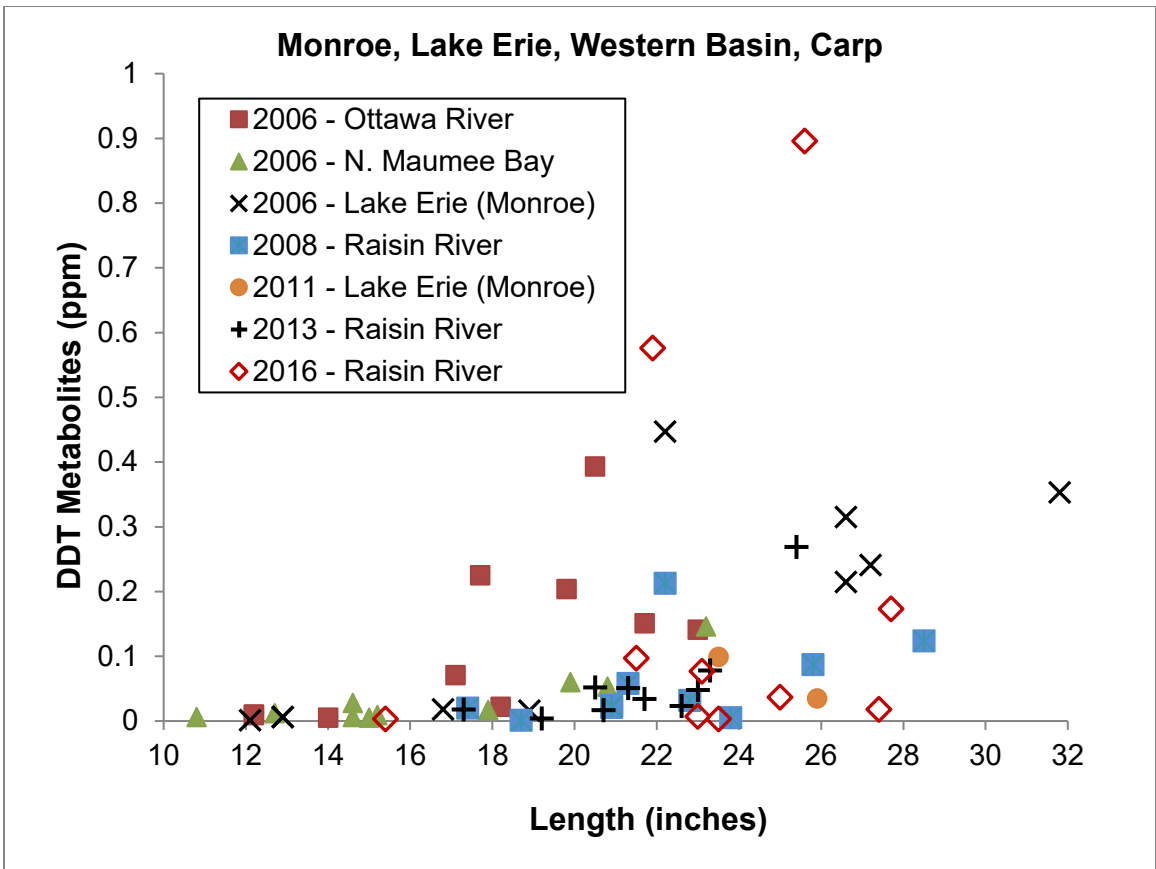
Organics Analysis:

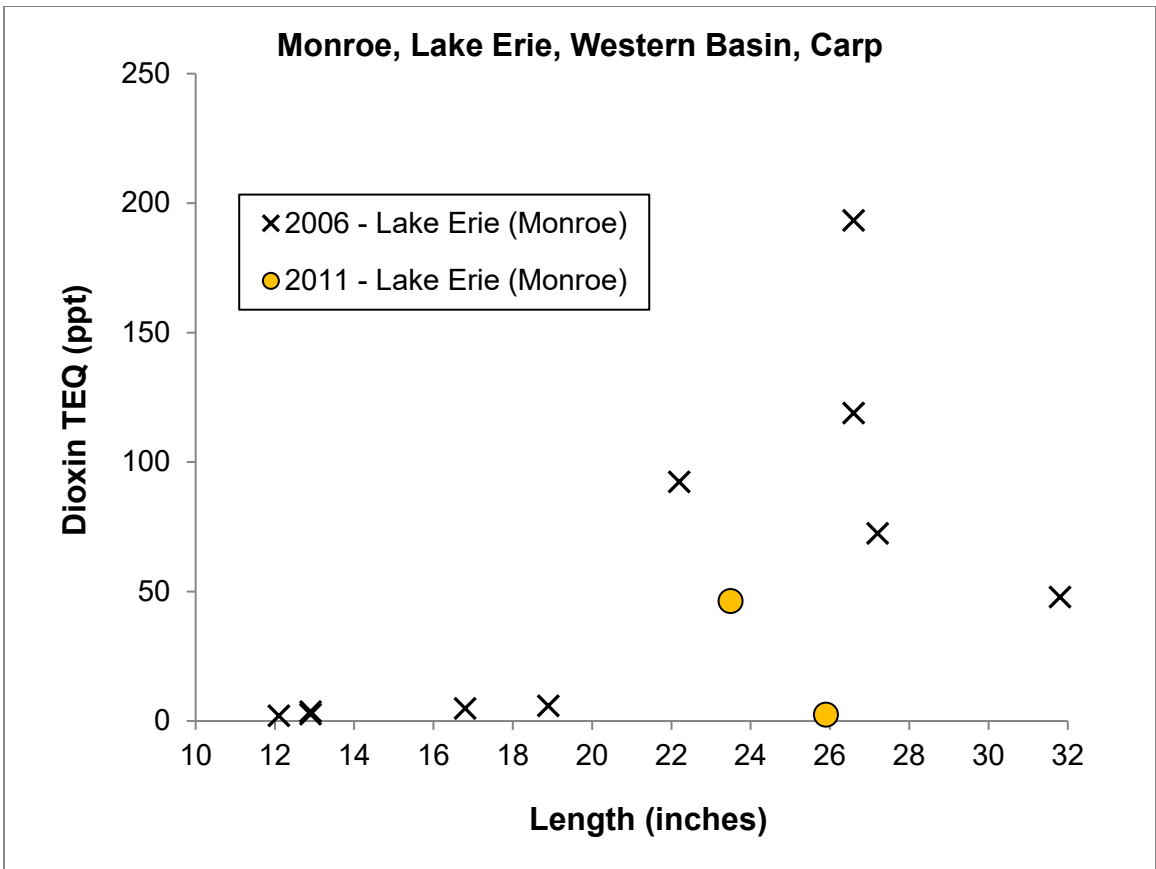
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2006	2016	62	10.8	na	10.8	31.8	
Datasets available: 1984, '86, '87, '93, '95, '98, '99, 2000, '04, '06, '08, '11, '13, 2016							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	62	2.21		0.034	18.665	3.059	0
DDT	62	0.10		0.001	0.896	0.144	12
Chlordane	62	0.02		0.001	0.107	0.026	--
Toxaphene	62	ND		<0.05	<0.05	--	--
TEQ	12	49 ppt		2 ppt	193 ppt	88 ppt	Limited
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.224	0.448					
DDT	0.188	0.395					
Chlordane	0.098	0.257					
Toxaphene	--	--					
TEQ	0.344	0.547					
Final meal category based on UCL:							0

Existing MDHHS Advisory: No one should eat carp from the western basin of Lake Erie including N. Maumee Bay, or from tributaries up to the first dam (Ottawa River, Plum Creek, or the River Raisin downstream of the Dundee Dam) due to PCBs. Dioxin, mercury, and DDT would cause advisories.

Recommendation: No change is recommended.







**Largemouth and
Smallmouth Bass**

Lake Erie – Western Basin

Monroe County

[Dataset: Lake Erie, Plum Creek, River Raisin d/s
Dundee, Ottawa River mouth, N. Maumee Bay]

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1987	2016	85	9.8	14	13.5	18.9	
Datasets available: 1987, '93, '97, '98, '06, '08, '13, 2016							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	59	0.25		0.06	0.82	0.28	2
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.342	0.458					

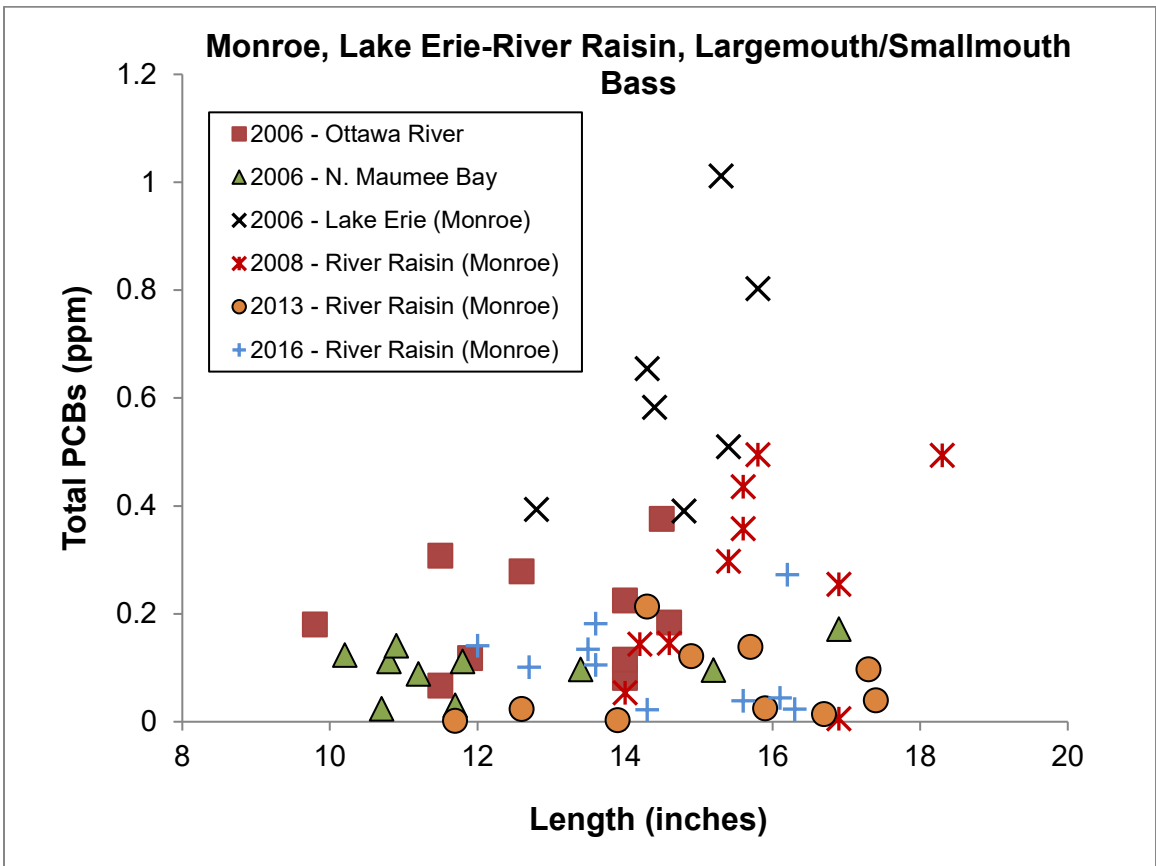
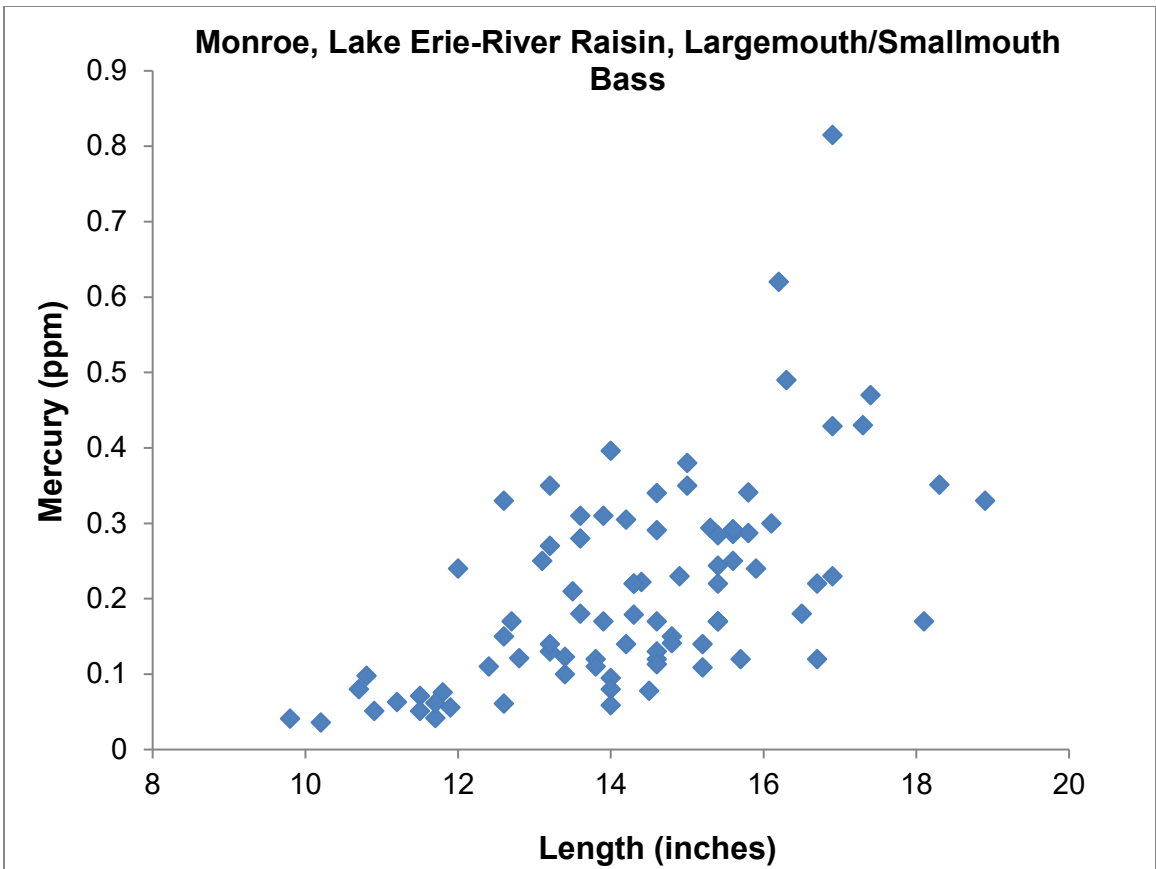
Organics Analysis:

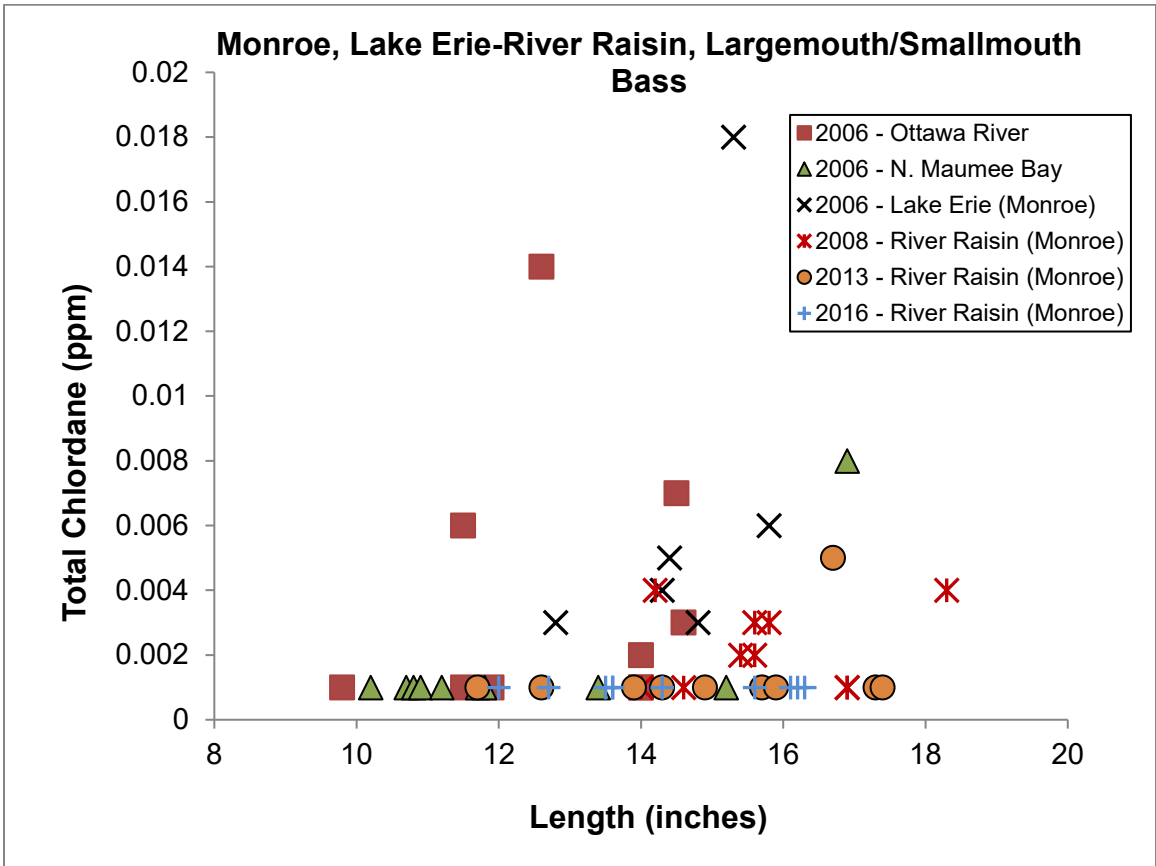
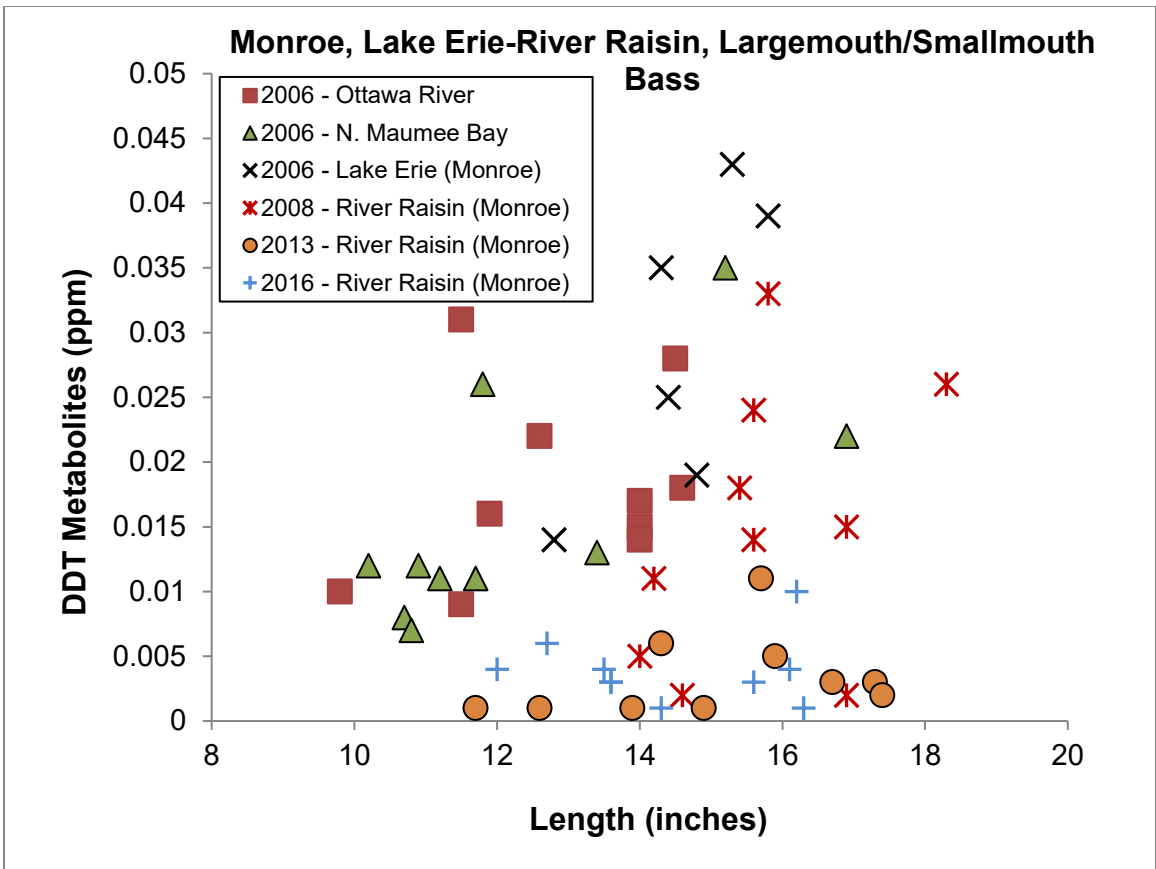
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2006	2016	57	9.8	14		18.3	
Datasets available: 1984, '87, '93, '97, '98, '06, '08, '13, 2016							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	39	0.24		0.003	1.01	0.32	0.5
DDT	38	0.01		0.001	0.04	0.02	16
Chlordane	38	0.003		0.001	0.02	0.004	--
Toxaphene	39	ND		<0.05	<0.05	--	--
PFOS	8	21 ppb		11 ppb	35 ppb	28 ppb	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.053	0.013					
DDT	0.008	0.001					
Chlordane	0.021	0.053					
Toxaphene	--	--					
PFOS	0.470	0.445					
Final meal category based on UCL:							0.5

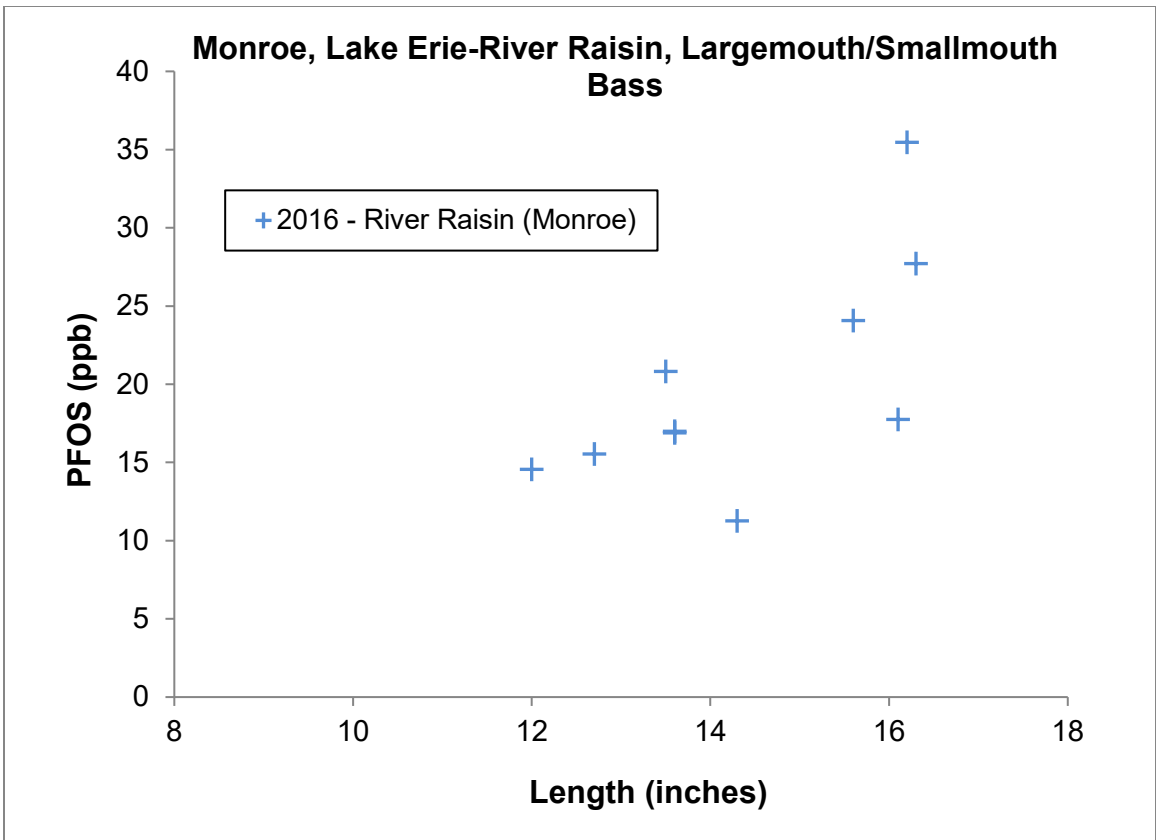
Existing MDHHS Advisory: Sensitive populations should not eat these fish. Healthy adults should limit consumption of largemouth and smallmouth bass from Lake Erie and the lower River Raisin (Ottawa River, Plum Creek, or the River Raisin downstream of the Dundee Dam) to no more than 1 or 2 meals per year due to PCBs. Mercury and dioxins would cause advisories.

Recommendation: No change is recommended. PFOS should be added to the list of contaminants that would cause an advisory. Additional samples should be collected from Lake Erie, off of Monroe, to determine if the advisory due to PCBs can be relaxed.

Note: Additional sampling beyond the typical two years of data is needed as fish from Lake Erie off of Monroe were not included.







Rock Bass

**River Raisin
Downstream of Dundee Dam**

Monroe County

Hg Analysis:

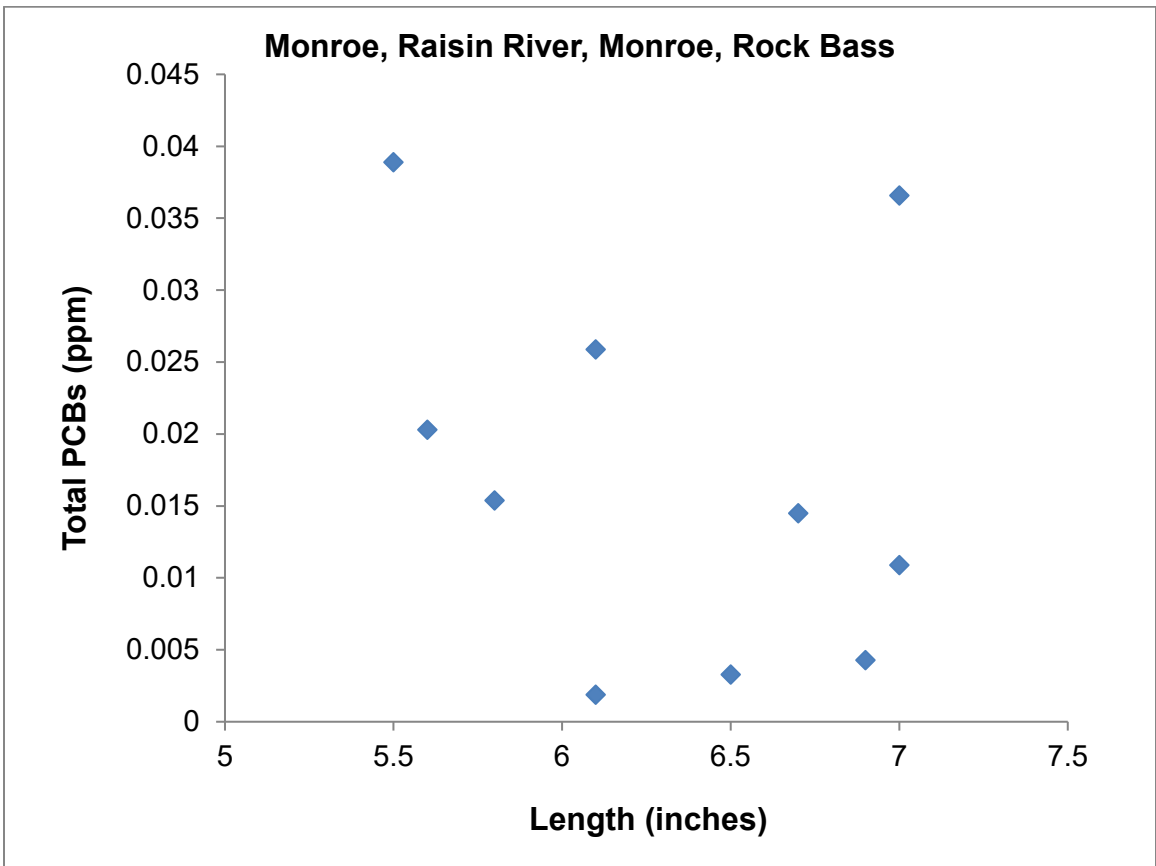
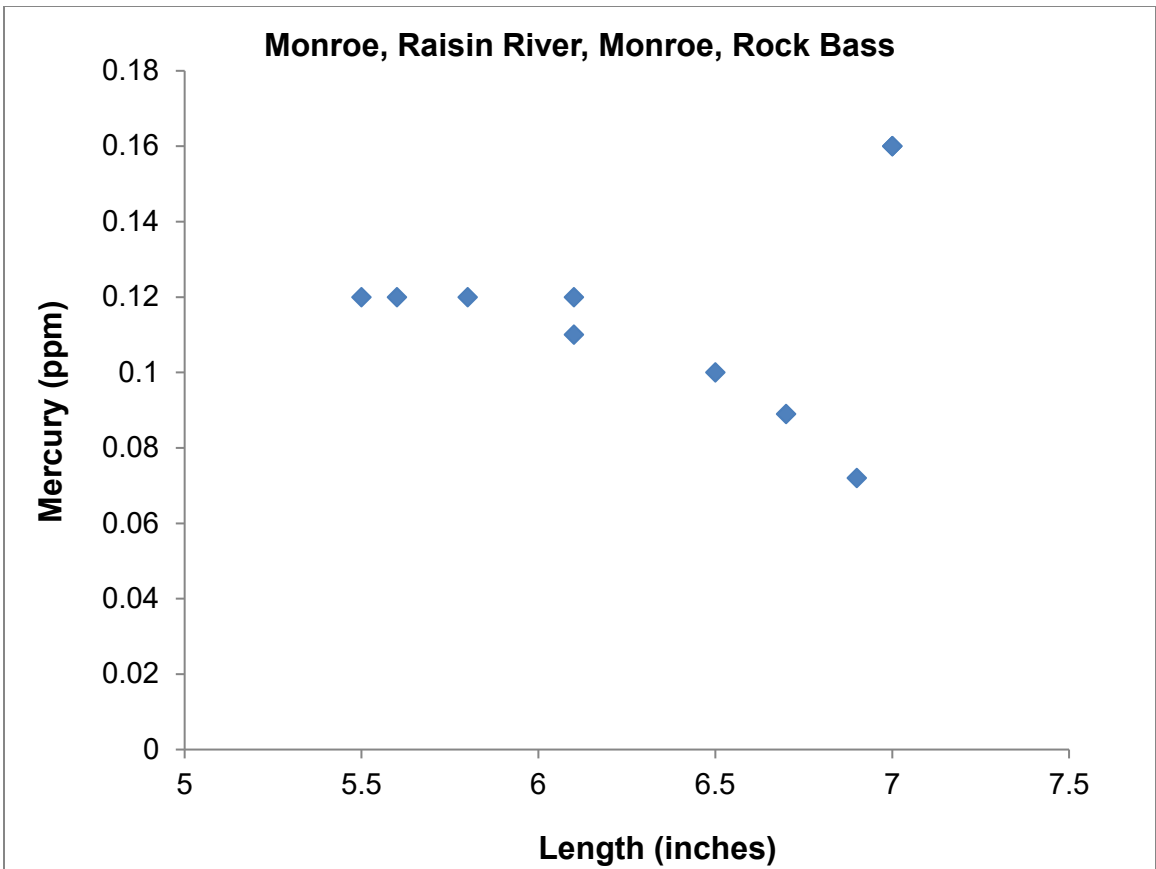
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2016	2016	10	5.5	na	5.5	7
Datasets available:		2016				
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.12	0.07	0.16	0.14	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.009	0.001				

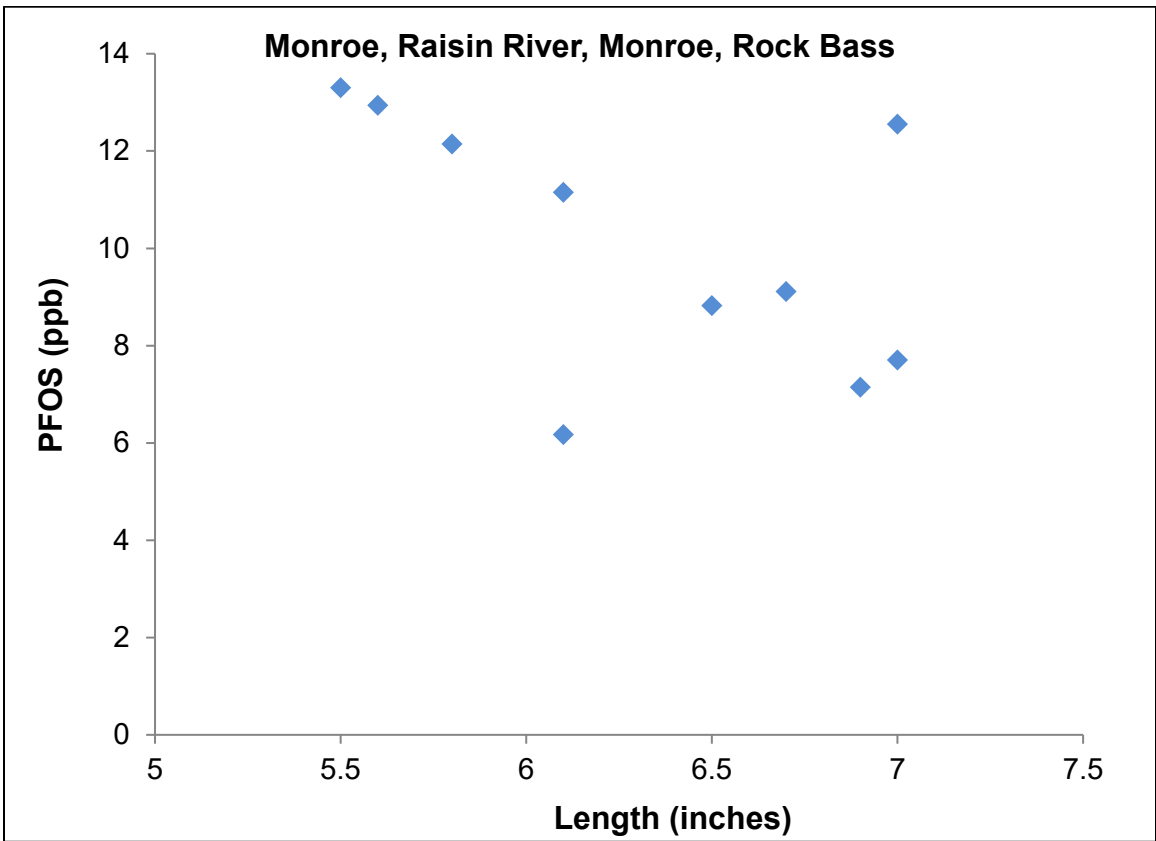
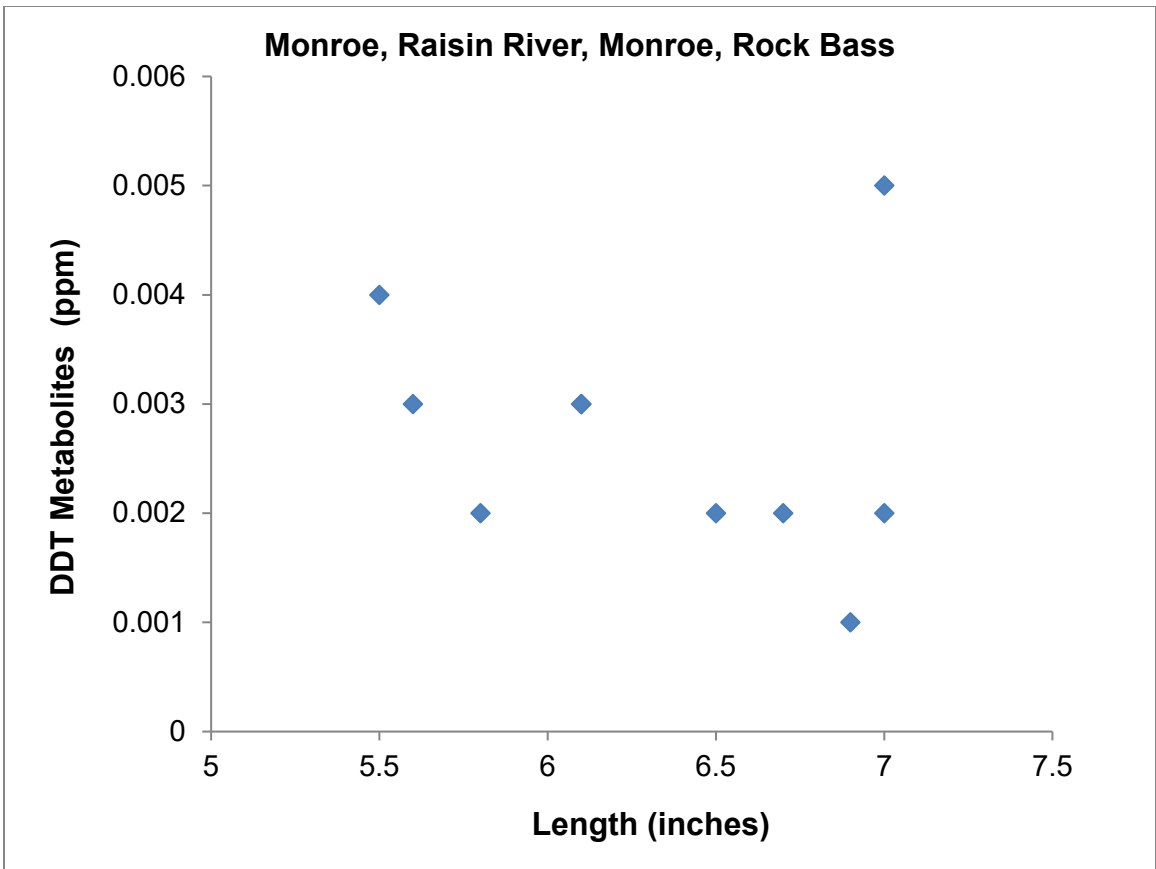
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2016	2016	10	5.5	na	5.5	7
Datasets available:		2016				
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.02	0.002	0.039	0.027	8
DDT	10	0.003	0.001	0.005	0.004	16
Chlordane	10	ND	<0.001	<0.001	--	--
Toxaphene	10	ND	<0.05	<0.05	--	--
PFOS	10	10 ppb	6 ppb	13 ppb	12 ppb	12
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.083	0.058				
DDT	0.050	0.121				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.293	0.250				
Final meal category based on UCL:						4

Existing MDHHS Advisory: A waterbody-wide advisory of 6 meals per year applies to rock bass from the River Raisin downstream of Dundee Dam (no data for this species were available prior to 2016).

Recommendation: No one should eat more than 4 meals per month of rock bass from the River Raisin downstream of the Dundee Dam due to mercury. PCBs and PFOS would cause advisories.





**Bluegill & Pumpkinseed
Hg Analysis:**

**River Raisin
Dundee Impoundment**

Monroe County

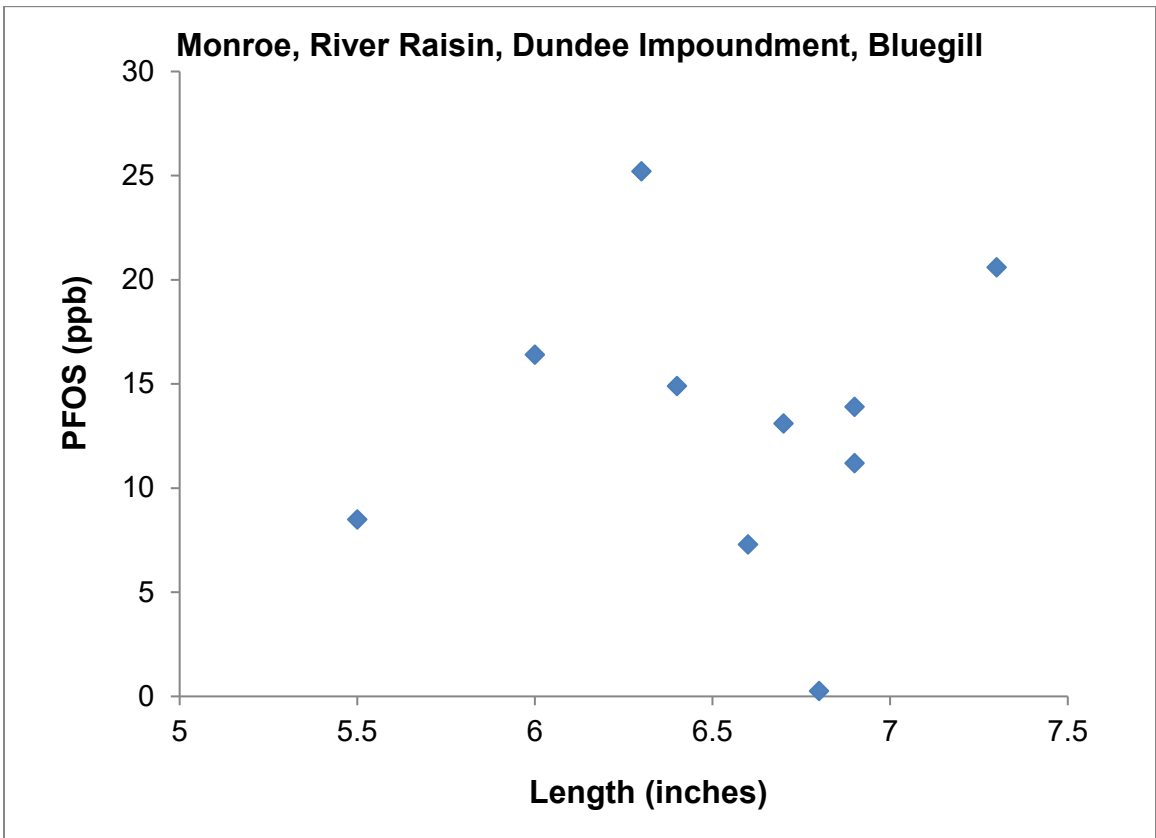
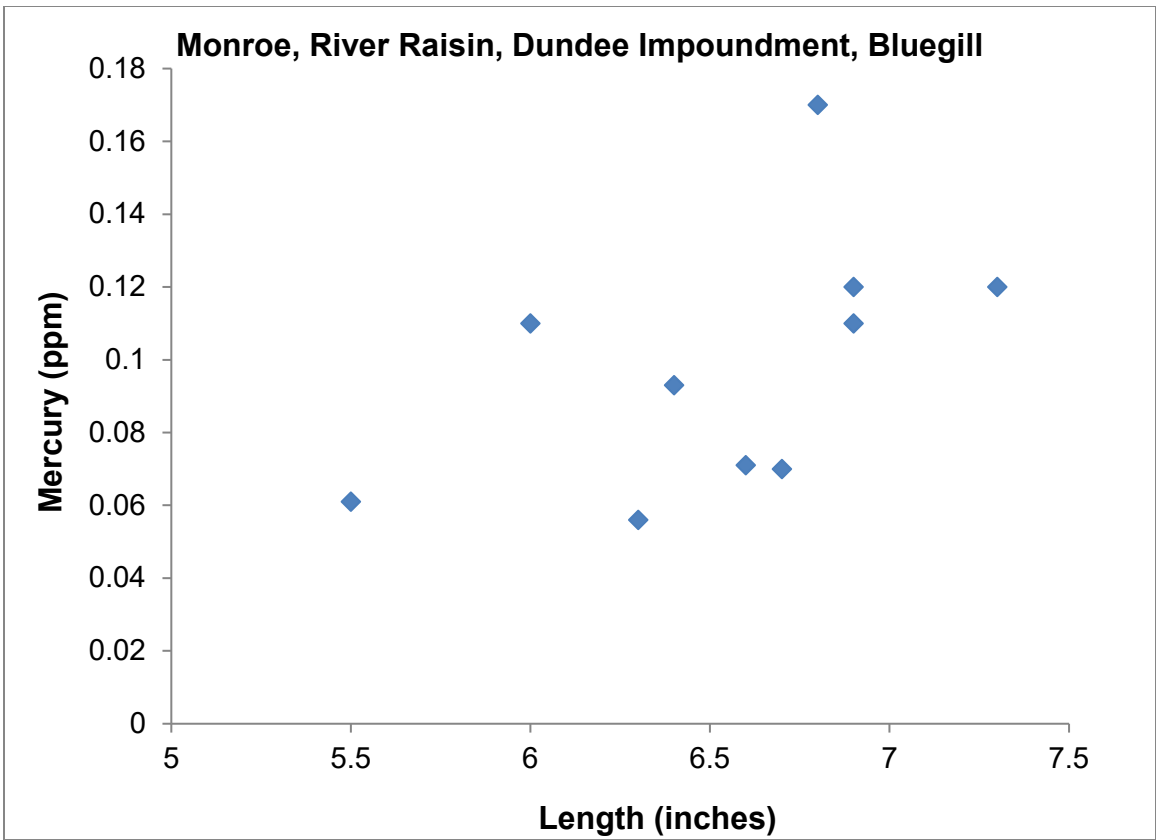
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		Meal Category
Earliest	Most Recent				Min	Max	
2018	2018	10	5.5	na	5.5	7.3	
Datasets available: 2018							
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category	
Mercury	10	0.10	0.06	0.17	0.12	8	
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.269	0.306					

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		Meal Category
Earliest	Most Recent				Min	Max	
2018	2018	10	5.5	na	5.5	7.3	
Datasets available: 2018							
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category	
PCB	0	--	--	--	--	--	
DDT	0	--	--	--	--	--	
Chlordane	0	--	--	--	--	--	
Toxaphene	0	--	--	--	--	--	
PFOS	10	13 ppb	< 0.25 ppb	25 ppb	18 ppb	8	
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	0.002	0.010					
Final meal category based on UCL:						8	

Existing MDHHS Advisory: Bluegill and sunfish from the Dundee Impoundment of the River Raisin are covered by the statewide advisory due to mercury: No one should eat more than 8 meals per month of bluegill or sunfish of any size.

Recommendation: No one should eat more than 8 meals per month of bluegill or sunfish from the Dundee Impoundment of the River Raisin due to mercury and PFOS. This guideline also applies to the River Raisin upstream of the Dundee Dam.



Channel Catfish

**River Raisin
Dundee Impoundment**

Monroe County

Hg Analysis:

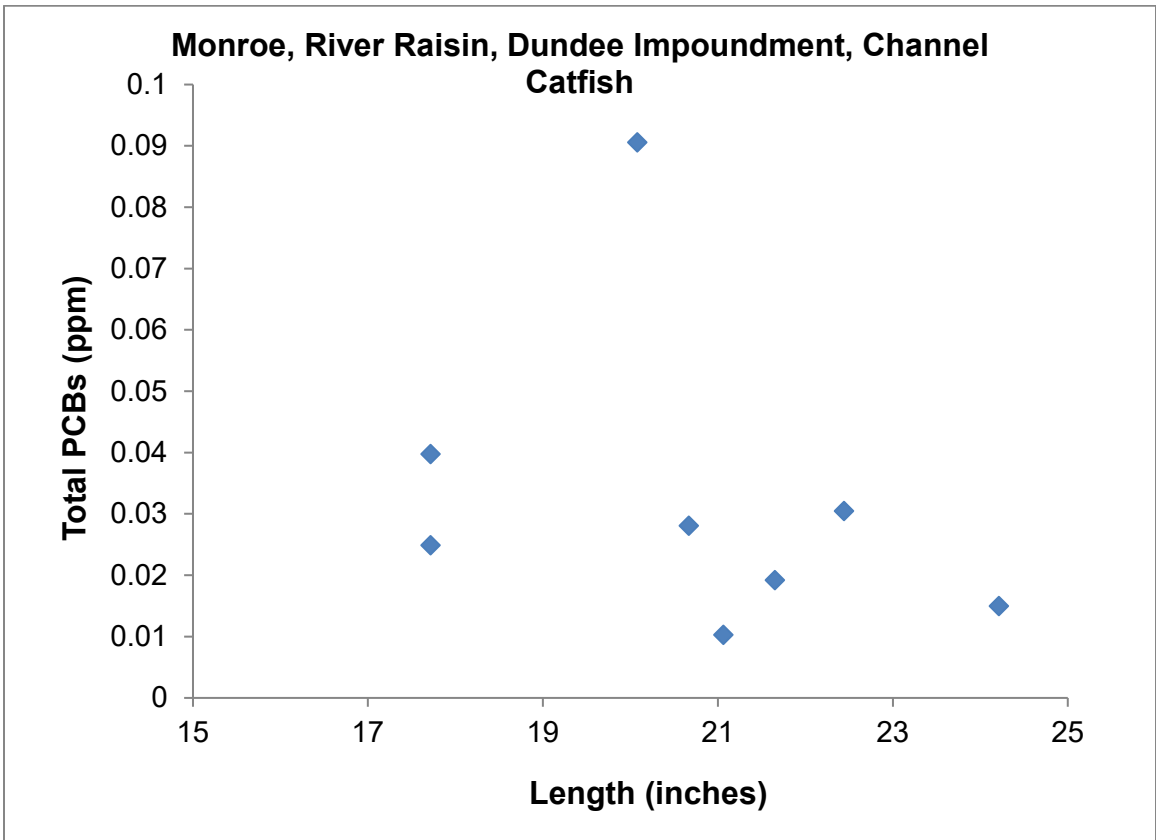
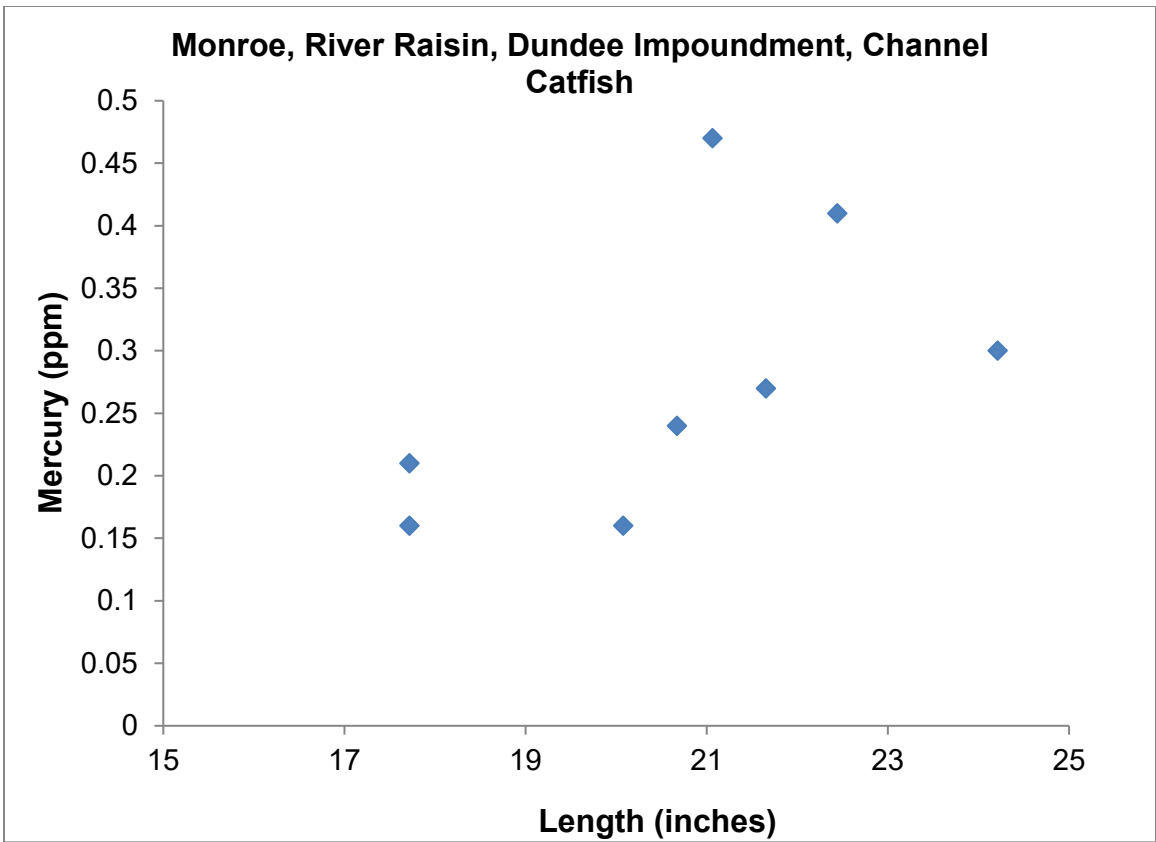
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		Meal Category
Earliest	Most Recent				Min	Max	
2018	2018	8	17.7	12.0	17.7	24.2	
Datasets available: 2018							
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category	
Mercury	8	0.278	0.160	0.470	0.372	2	
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.325	0.406					

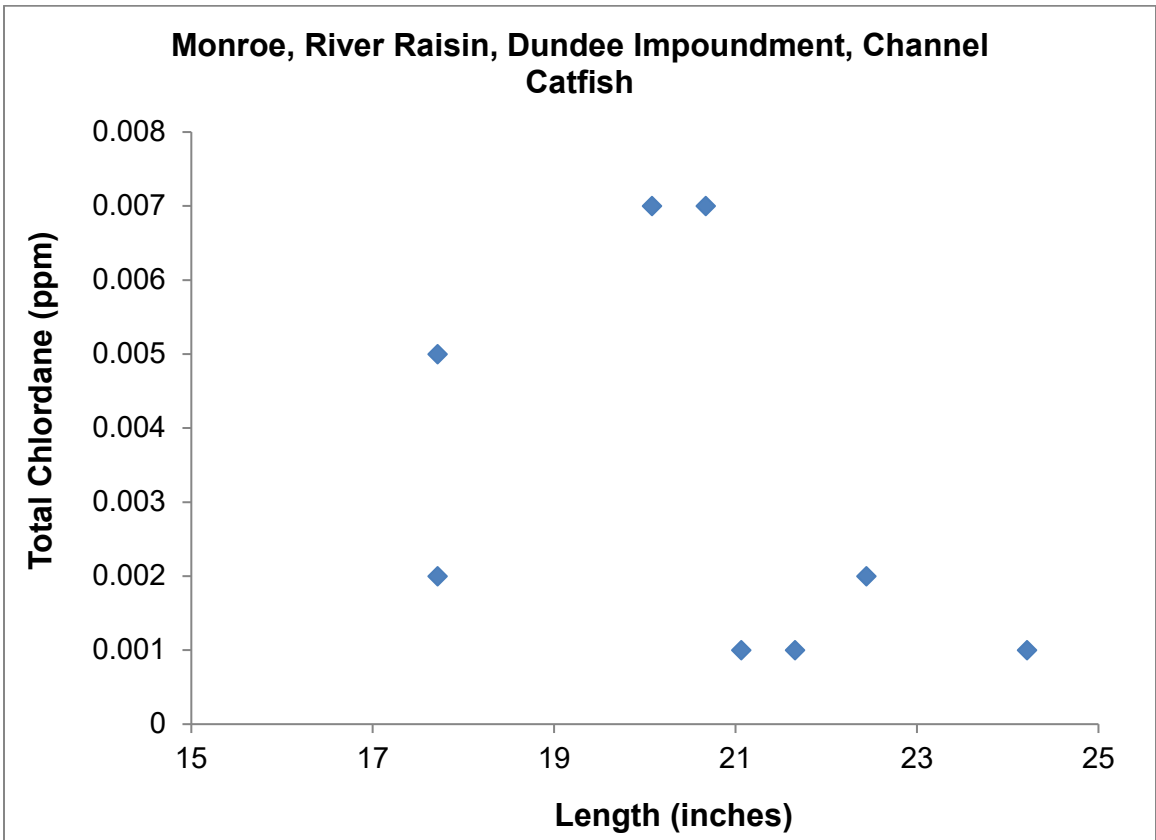
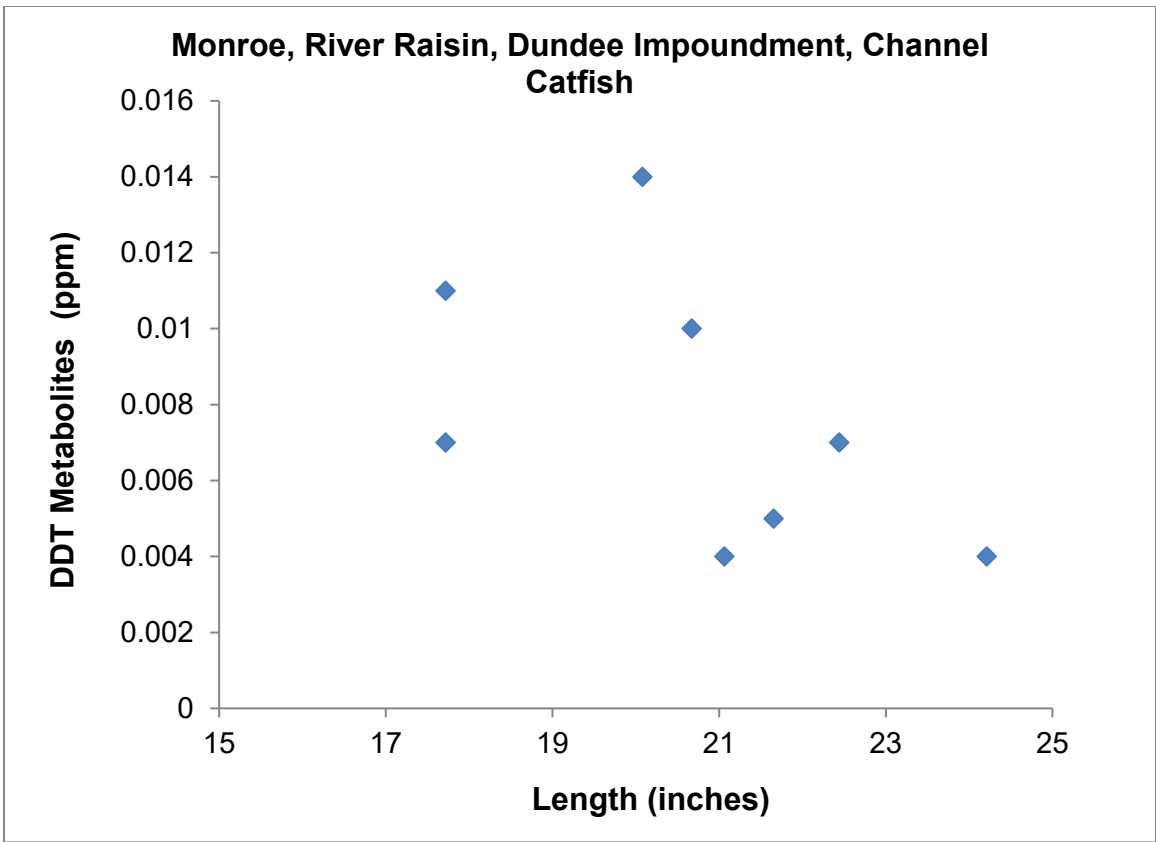
Organics Analysis:

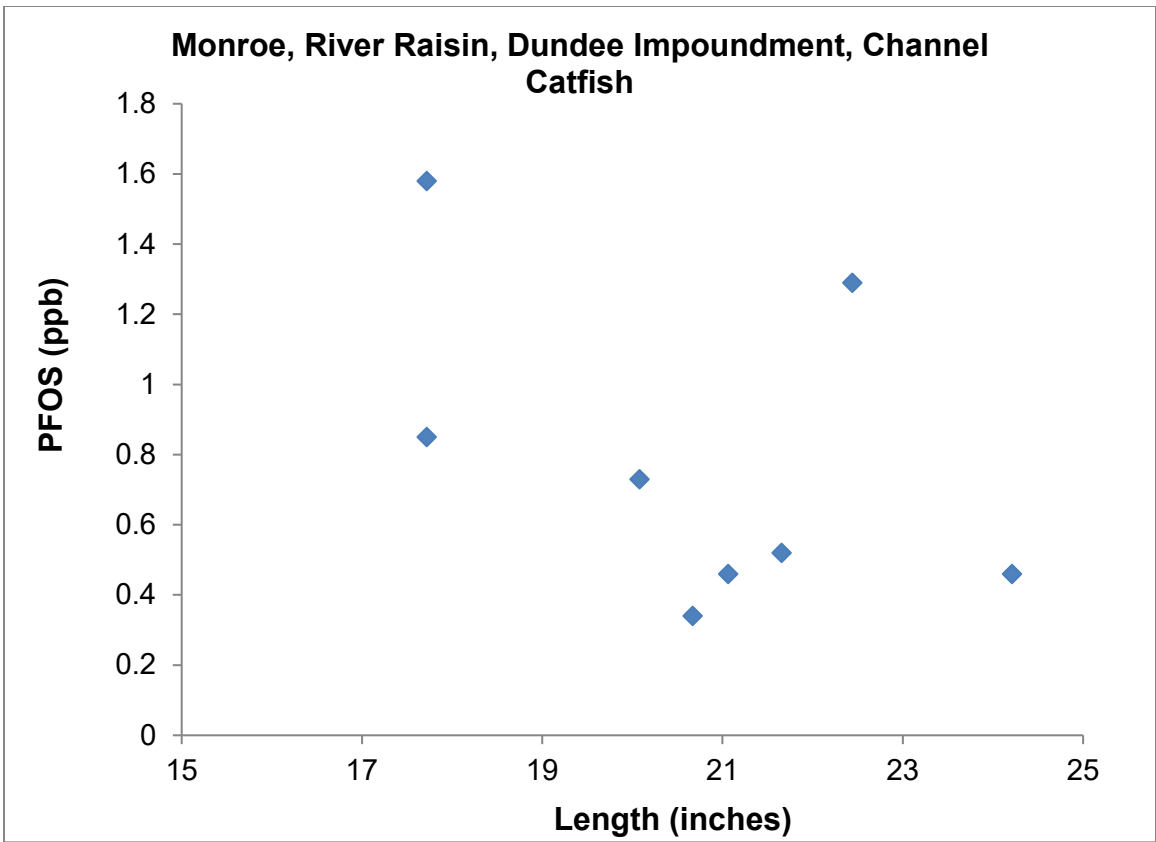
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		Meal Category
Earliest	Most Recent				Min	Max	
2018	2018	8	17.7	12.0	17.7	24.2	
Datasets available: 2018							
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category	
PCB	8	0.032	0.010	0.091	0.053	2	
DDT	8	0.008	0.004	0.014	0.011	16	
Chlordane	8	0.003	0.001	0.007	0.005	16	
Toxaphene	8	ND	--	--	--	--	
PFOS	8	0.78 ppb	0.34 ppb	1.58 ppb	1.15 ppb	16	
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.094	0.168					
DDT	0.282	0.341					
Chlordane	0.168	0.264					
Toxaphene	--	--					
PFOS	0.209	0.212					
Final meal category based on UCL:							2

Existing MDHHS Advisory: Channel catfish from the River Raisin upstream of the Dundee Dam in Monroe County are currently covered under the statewide mercury and PCB guidance. No one should eat more than 4 meals per month of channel catfish of any size.

Recommendation: No one should eat more than 2 meals per month of channel catfish of any size from the River Raisin upstream of the Dundee Dam in Monroe County due to mercury and PCBs. This guideline also applies to the River Raisin upstream of the Dundee Dam.







Common Carp

**River Raisin
Dundee Impoundment**

Monroe County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2020	2020	10	20.5	NA	20.5	31.1
Datasets available: 2020						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.200	0.098	0.350	0.262	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.735	0.715				

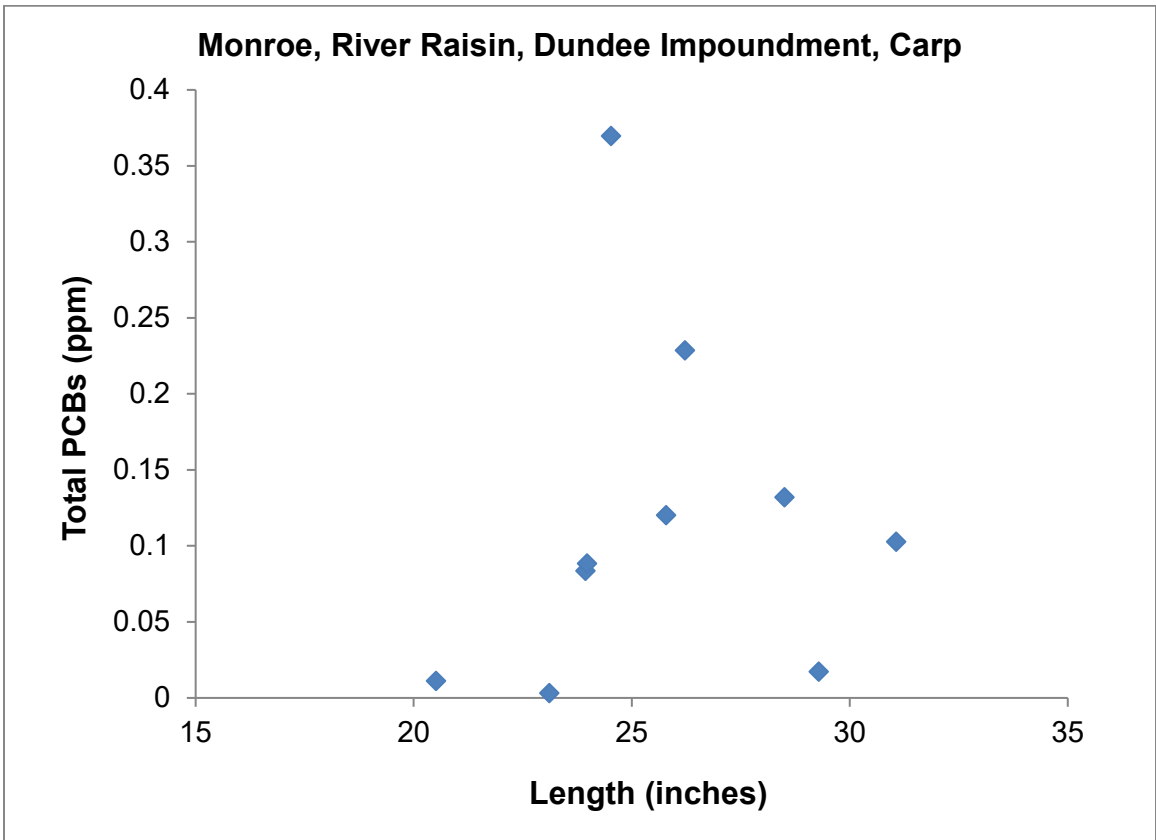
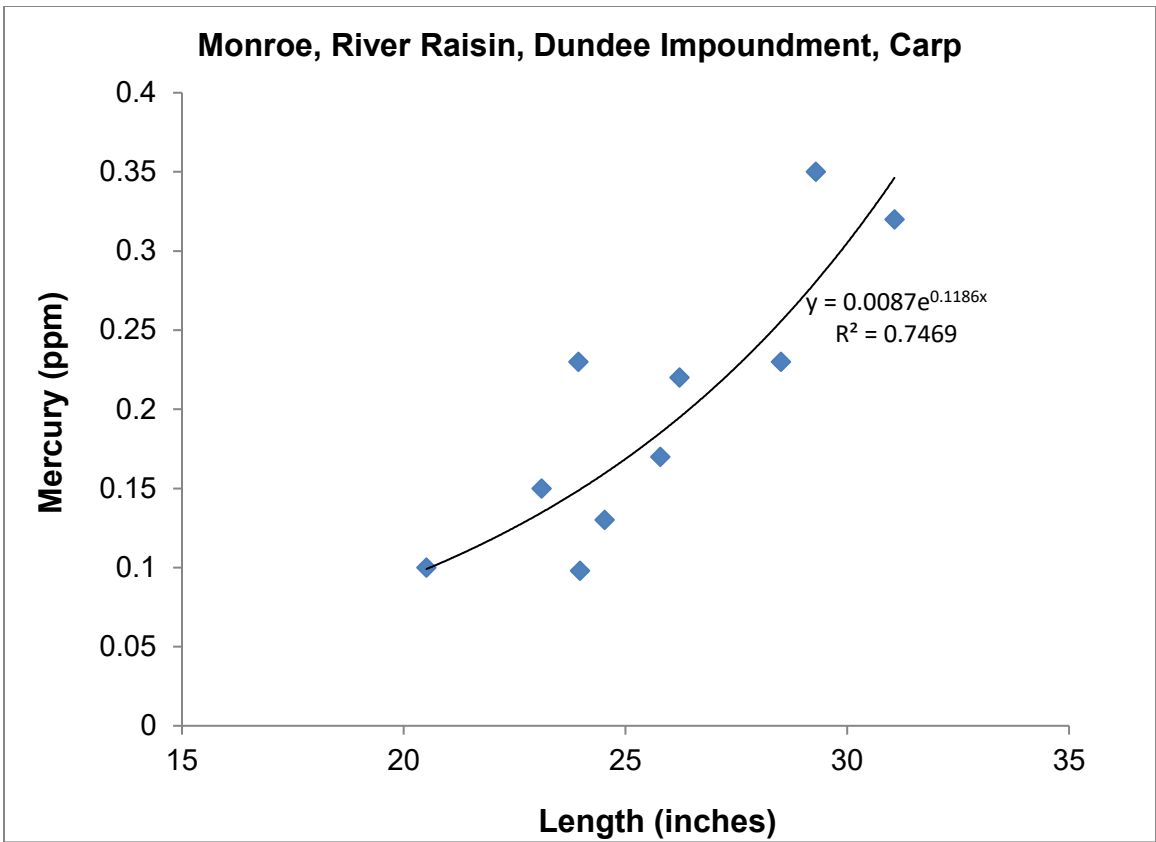
Organics Analysis:

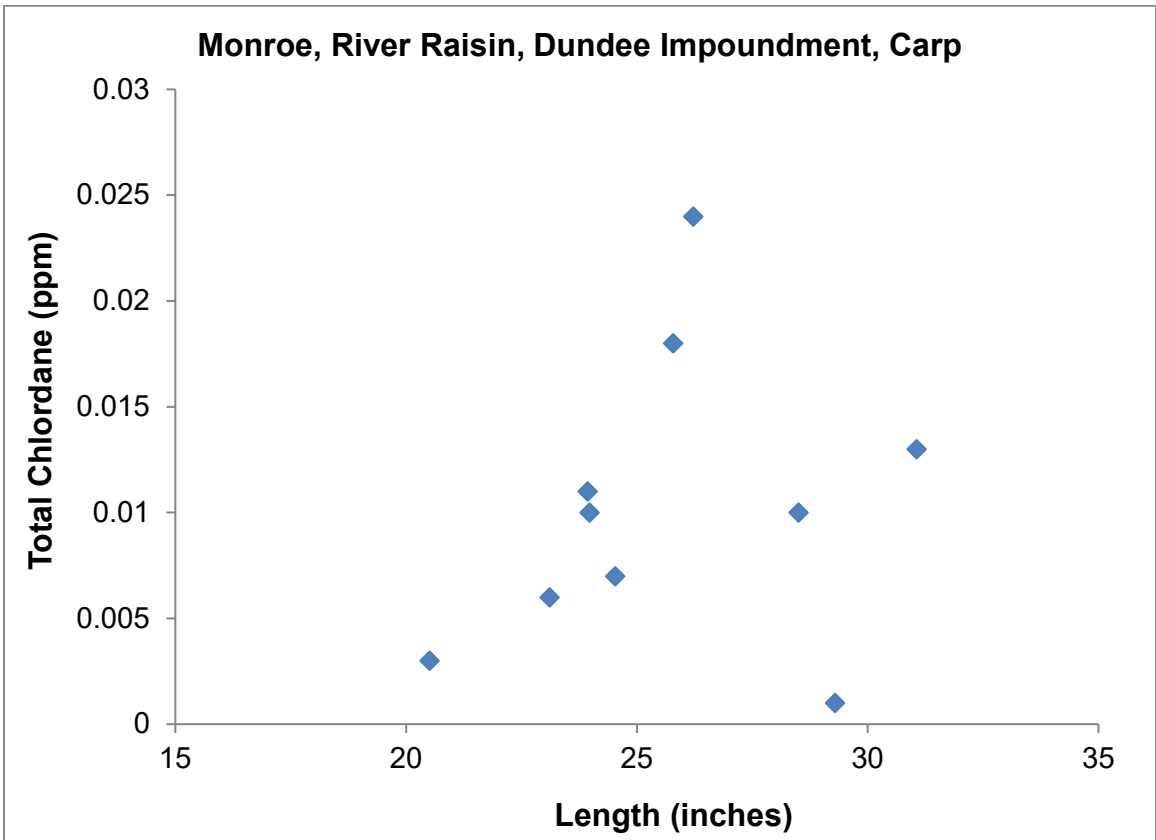
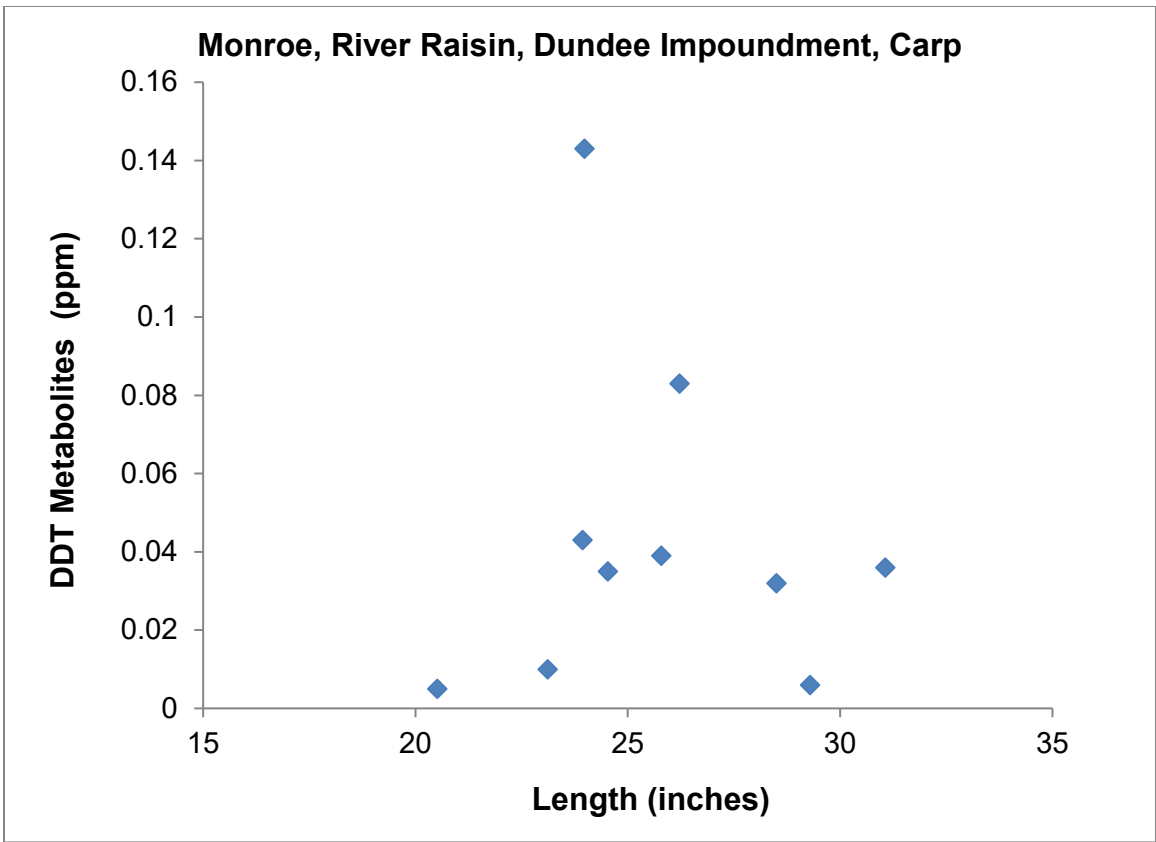
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2020	2020	10	20.5	NA	20.5	31.1
Datasets available: 2020						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.116	0.003	0.370	0.196	1
DDT	10	0.043	0.005	0.143	0.073	16
Chlordane	10	0.010	<0.001	0.024	0.015	16
Toxaphene	10	ND	--	--	--	--
PFOS	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.010	0.114				
DDT	0.003	0.021				
Chlordane	0.042	0.003				
Toxaphene	--	--				
PFOS	--	--				
Final meal category based on UCL:						1

Existing MDHHS Advisory: Common carp from the River Raisin upstream of the dam in Dundee are covered under the statewide PCB guidance. No one should eat more than 2 meals per month of common carp of any size.

Recommendation: No one should eat more than 1 meal per month of common carp of any size from the Dundee Impoundment due to PCBs. This guideline also applies to the River Raisin upstream of the Dundee Dam.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
20	0.093	8
22	0.118	8
24	0.150	4
26	0.190	4
28	0.241	4
30	0.305	2
32	0.387	2
<i>Shaded area denotes extrapolated estimates</i>		





Smallmouth Bass

**River Raisin
Dundee Impoundment**

Monroe County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2018	2018	7	11.1	14	14.1	17.2
Datasets available: 2018						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	4	0.34	0.25	0.52	0.54	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.931	0.957				

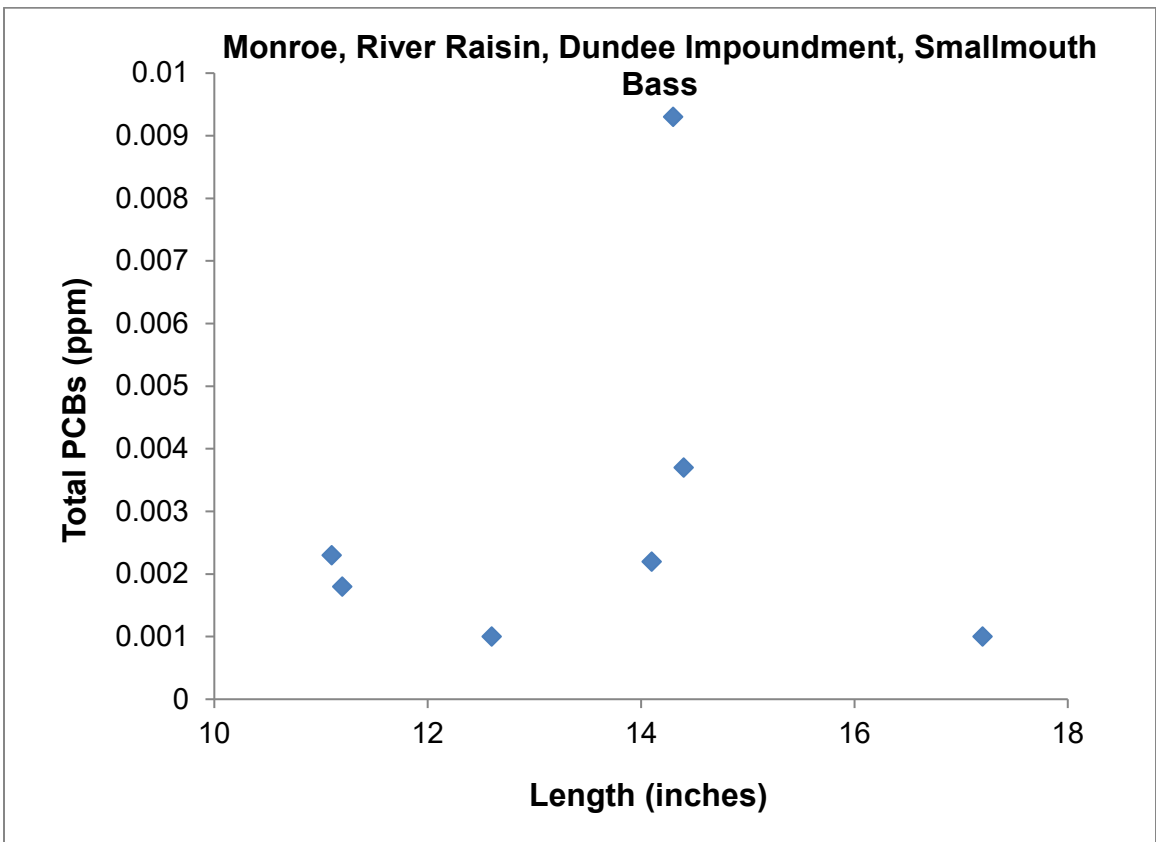
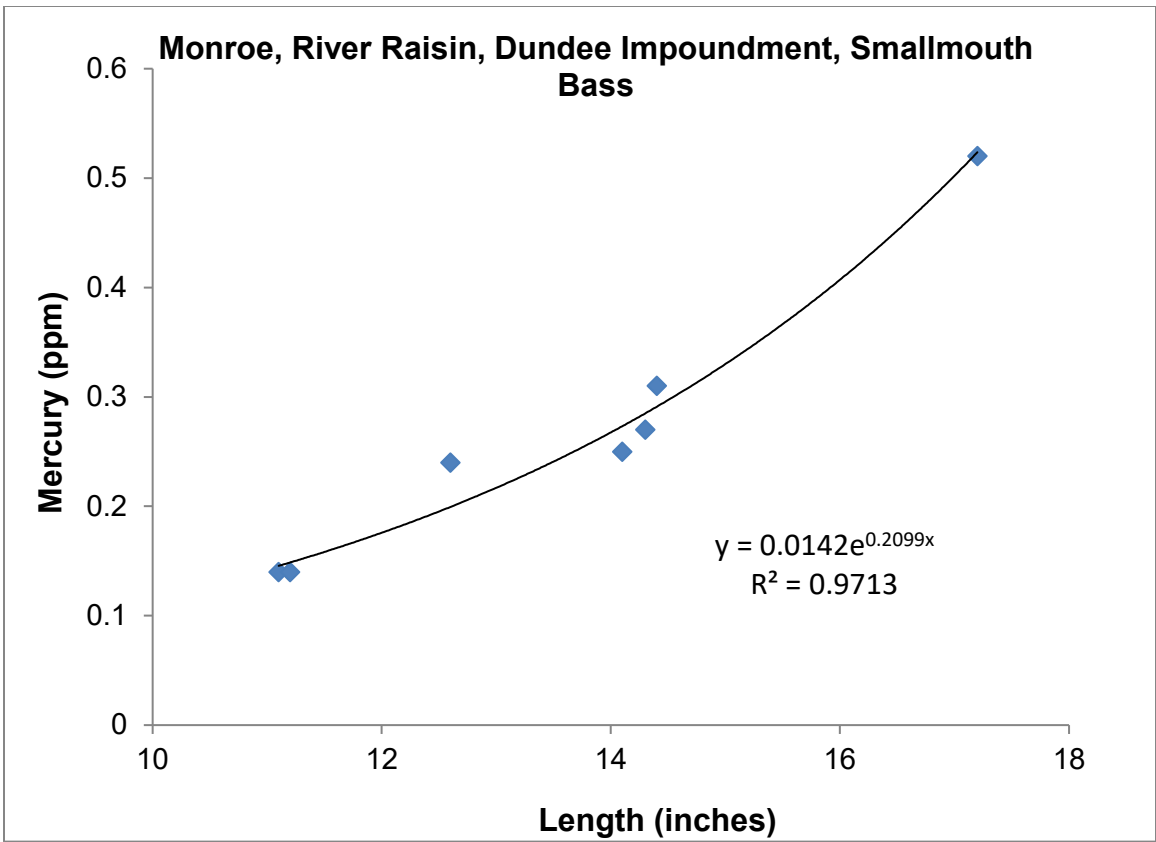
Organics Analysis:

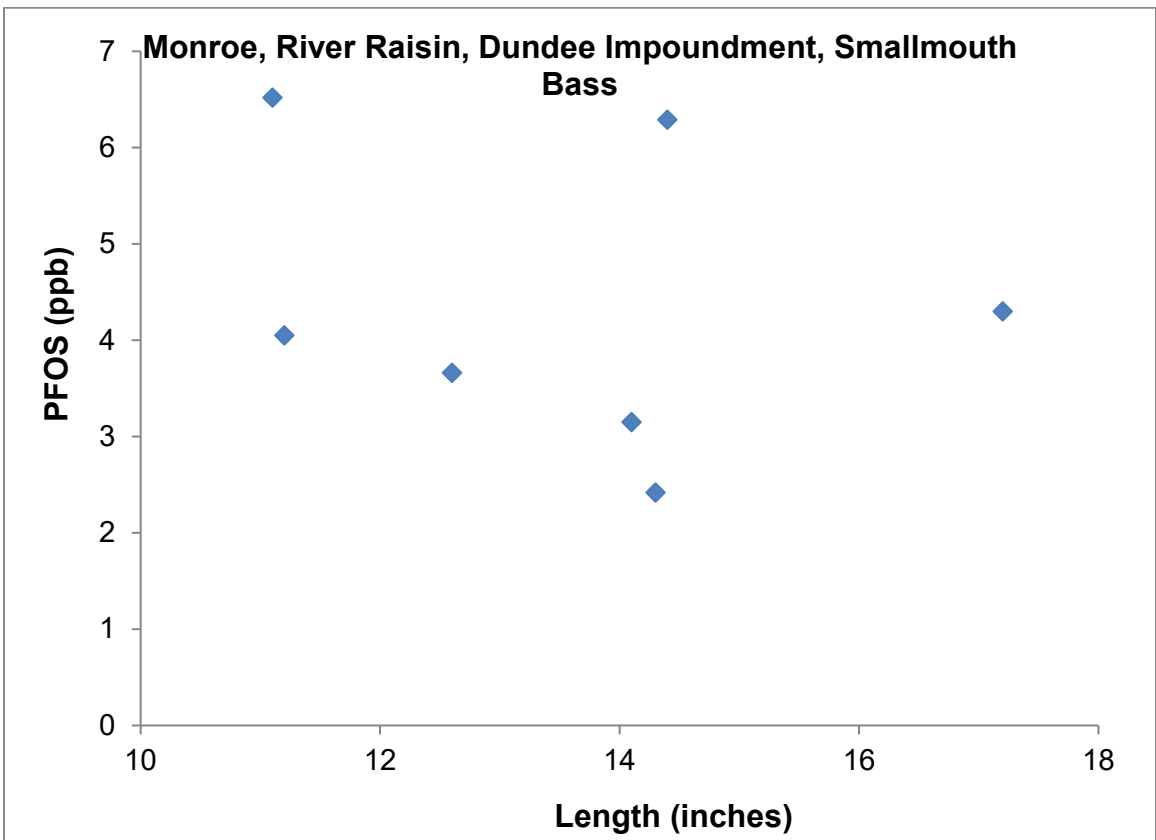
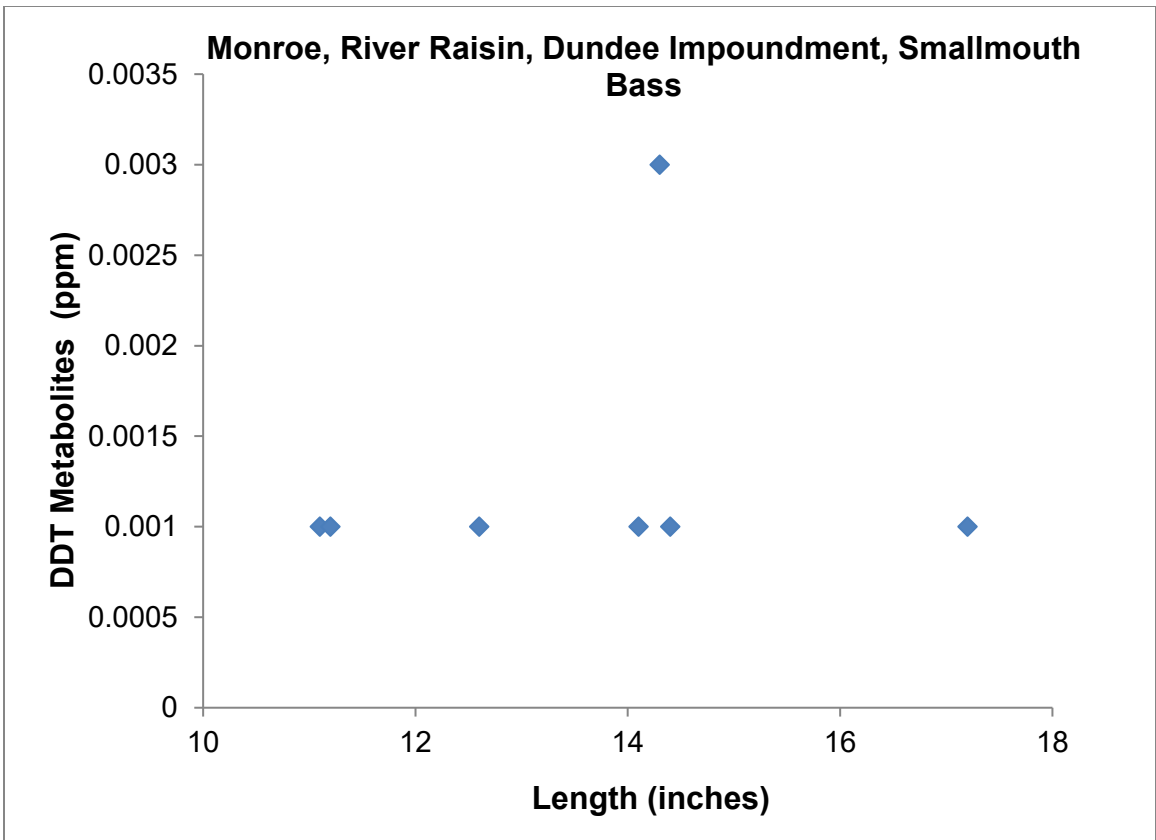
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2018	2018	7	11.1	14	14.1	17.2
Datasets available: 2018						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	4	0.004	0.001	0.009	0.01	16
DDT	4	0.002	0.001	0.003	0.003	16
Chlordane	4	ND	< 0.001	< 0.001	--	--
Toxaphene	4	ND	< 0.05	< 0.05	--	--
PFOS	4	4 ppb	2 ppb	6 ppb	7 ppb	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.012	0.001				
DDT	0.024	0.024				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.054	0.048				
Final meal category based on UCL:						1

Existing MDHHS Advisory: Dundee impoundment smallmouth and largemouth bass are covered by the statewide advisory due to mercury: No one should eat more than 2 meals per month of smallmouth or largemouth bass smaller than 18 inches or more than 1 meal per month of those fish larger than 18 inches.

Recommendation: No change is recommended. A minimum of five legal size fish are required to assign waterbody specific guidance based on the 95% UCL. Although the dataset regression is sufficient to assign a guideline, the size range of the dataset is limited and does not include any individuals above the statewide length break of 18 inches.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
10	0.12	8
11	0.14	4
12	0.18	4
14	0.27	4
16	0.41	2
18	0.62	1
20	0.95	1
<i>Shaded area denotes extrapolated estimates</i>		





Carp

**River Raisin
South Branch**

Lenawee County

Hg Analysis:

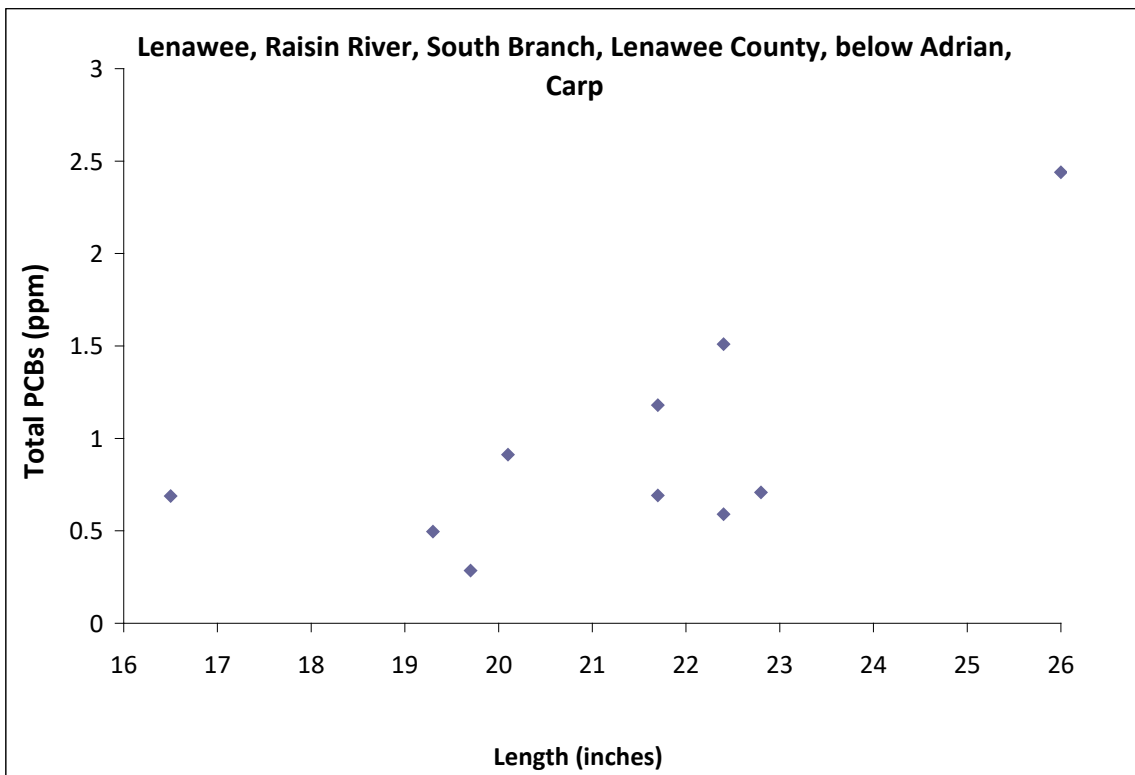
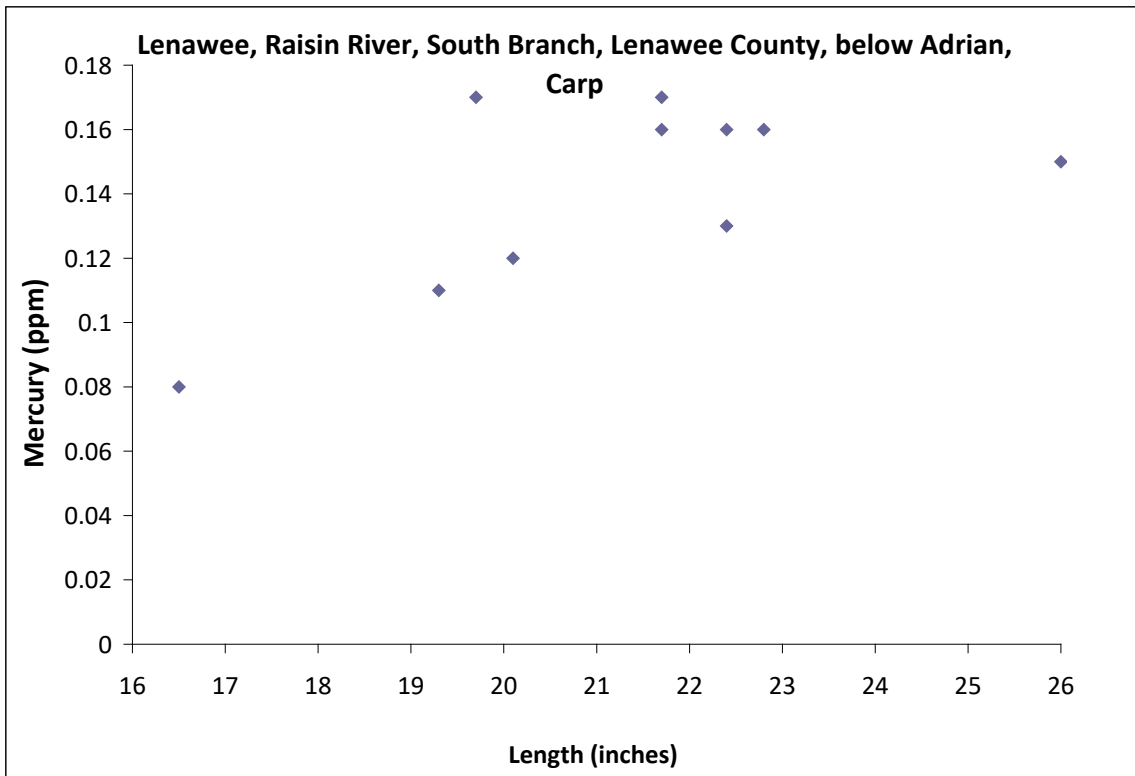
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1991	1991	10	16.5	na	16.5	26
Datasets available: 1991						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	10	0.141		0.160	4	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.398	0.457				

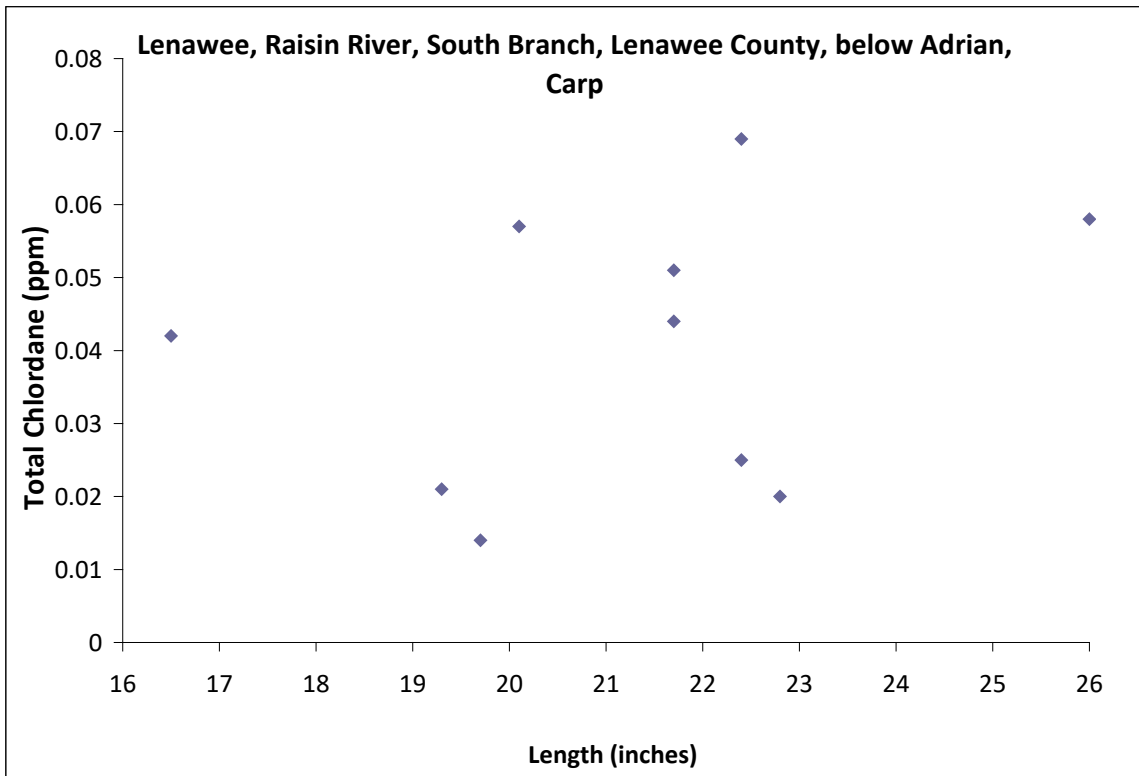
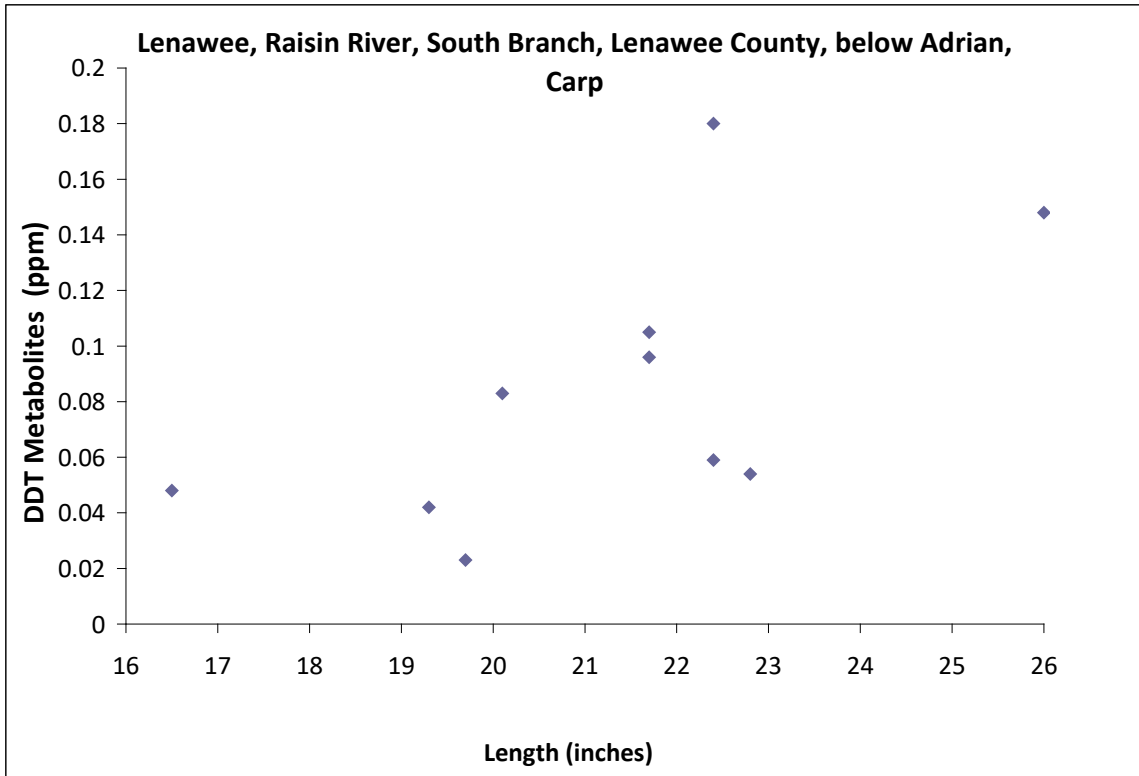
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1991	1991	10	16.5	na	16.5	26
Datasets available: 1991						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	10	0.950		1.400	Limited	
DDT	10	0.084		0.120	4	
Chlordane	10	0.040		0.050	--	
Toxaphene	10	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.496	0.399				
DDT	0.383	0.373				
Chlordane	0.083	0.065				
Toxaphene						
Final meal category based on UCL:					Limited	

Existing Advisory: Women and children should eat no more than one meal per month of South Branch River Raisin carp of any size due to elevated levels of PCBs.

Recommendation: Sensitive populations should not eat these fish. For healthy adults, limit consumption to no more than 1 or 2 meals per year of South Branch River Raisin carp due to PCBs. Mercury would cause an advisory. Dataset is limited due to age to the data. Based on EGLE’s Fish Contaminant Monitoring Program, PCB and DDT concentrations ≥15 years old are expected to have declined, but PCB concentrations would remain in the limited meal category.





Northern Pike

**River Raisin
South Branch**

Lenawee County

Hg Analysis:

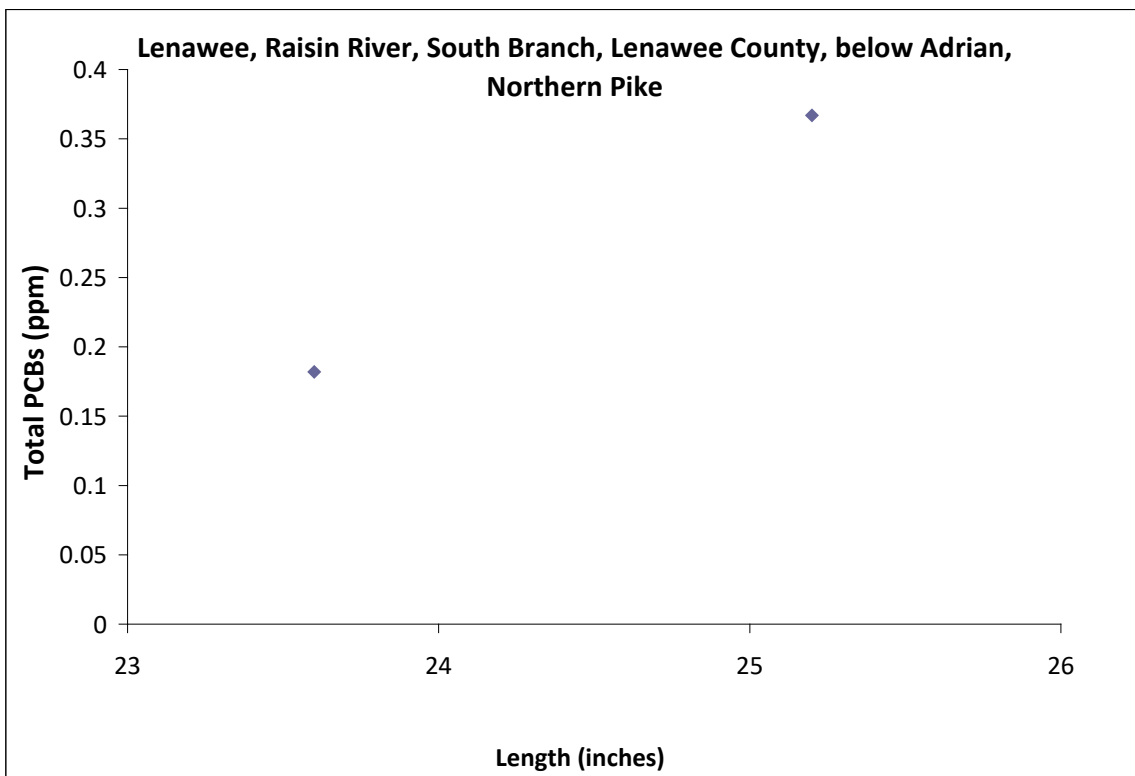
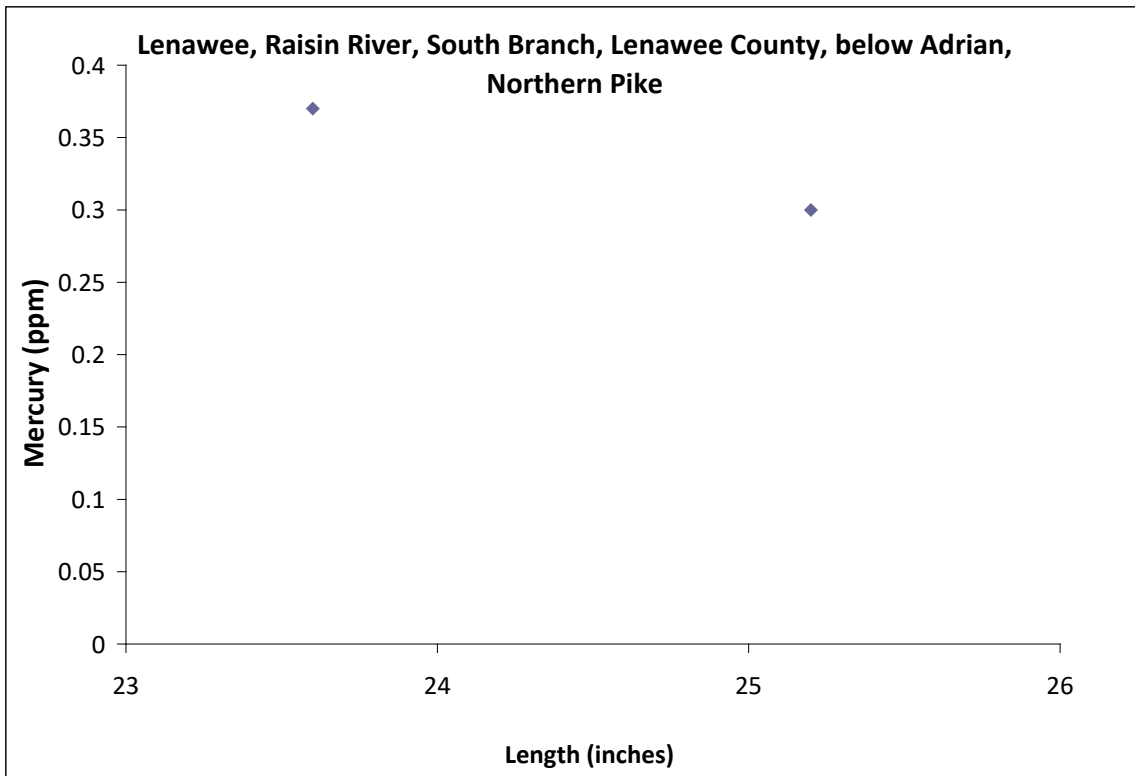
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1991	1991	2	23.6	24	23.6	25.2
Datasets available: 1991						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	2	0.335			--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

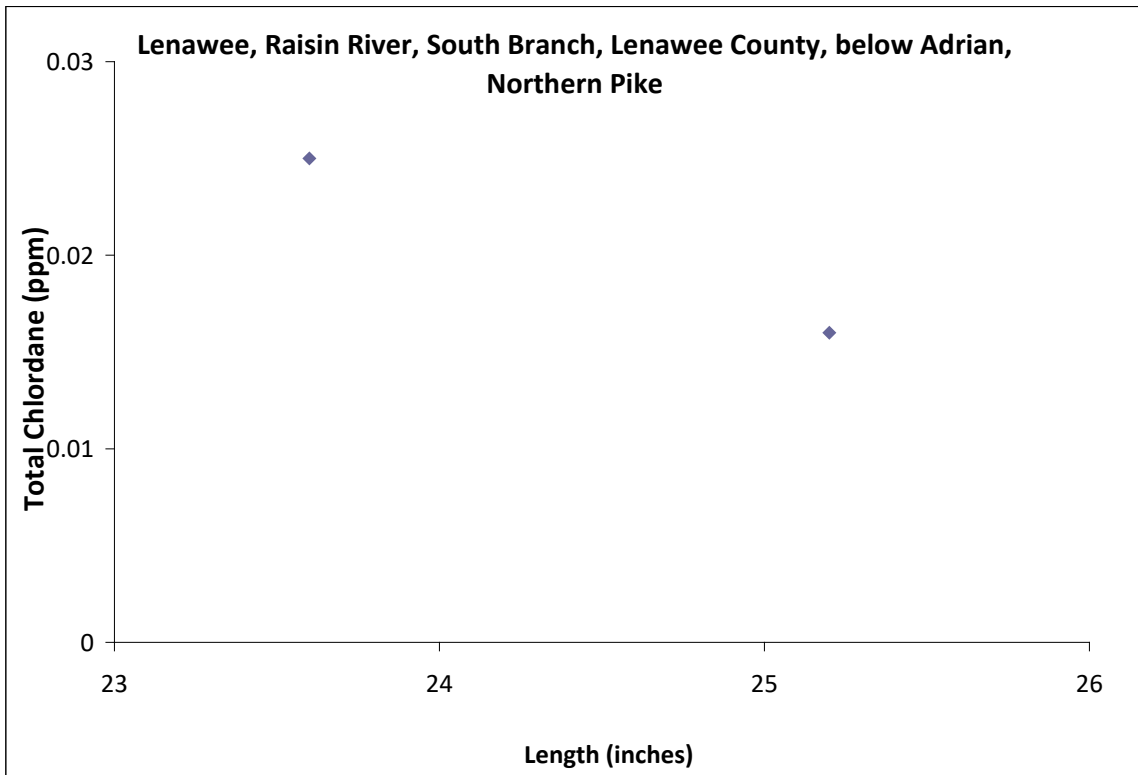
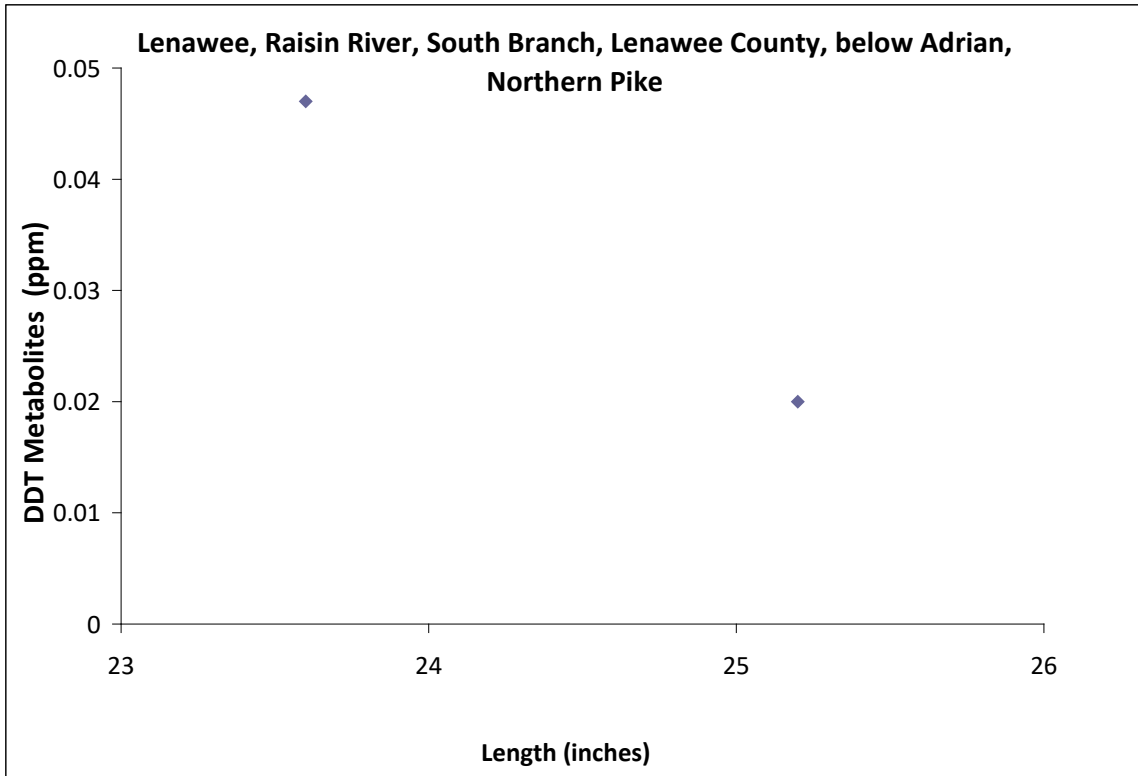
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1991	1991	2	23.6	24	23.6	25.2
Datasets available: 1991						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	2	0.275			--	--
DDT	2	0.034		--	--	
Chlordane	2	0.021		--	--	
Toxaphene	2	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene				Final meal category based on UCL: --		

Existing Advisory: Women and children should eat no more than one meal per month of South Branch River Raisin northern pike due to elevated levels of PCBs.

Recommendation: Statewide mercury advisory applies. Dataset is limited by sample size and age. Based on EGLE’s Fish Contaminant Monitoring Program, PCB and DDT concentrations ≥15 years old are expected to have declined leaving mercury as the cause of the advisory.





Redhorse Sucker

**River Raisin
South Branch**

Lenawee County

Hg Analysis:

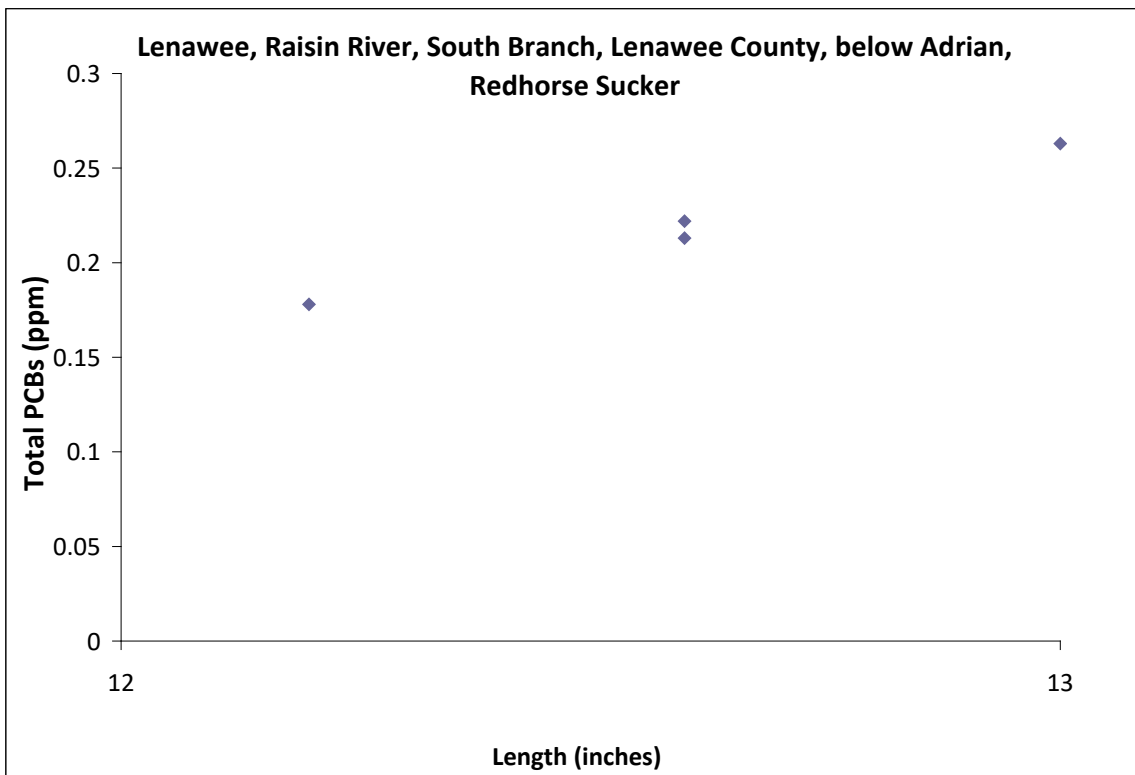
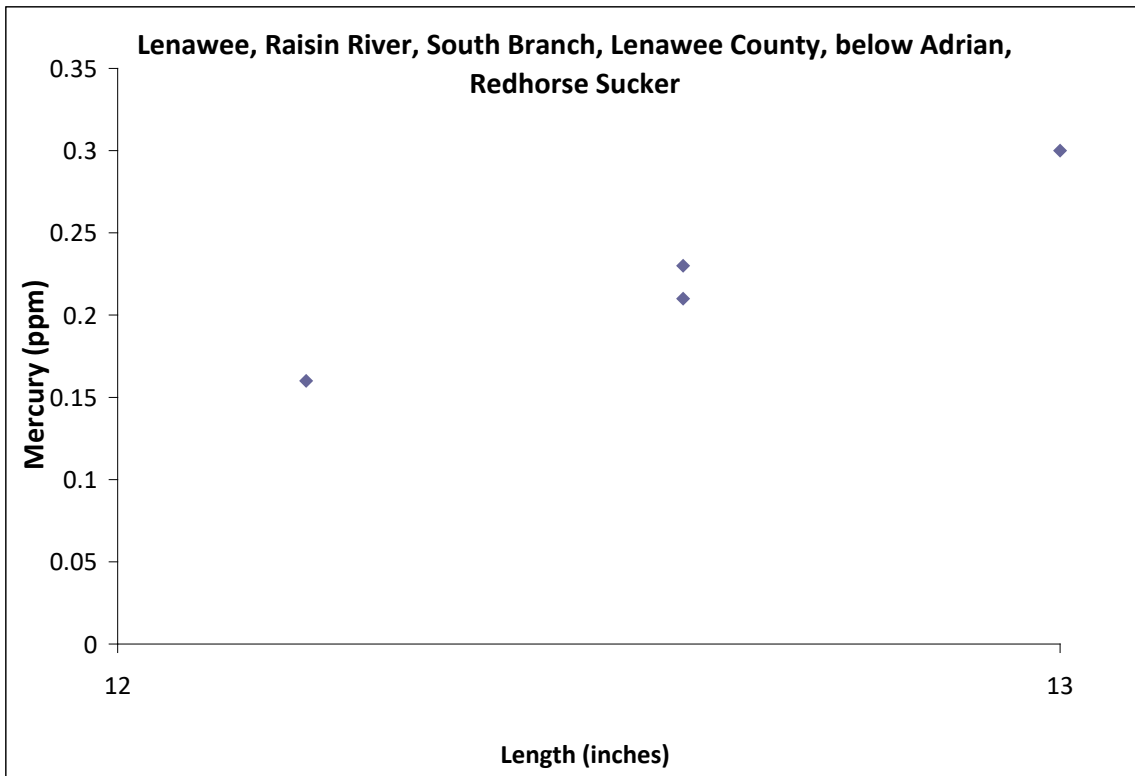
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1991	1991	4	12.2	na	12.2	13
Datasets available: 1991						
Chemical	Sample Size (Legal)	Mean		95%UCL		Meal Category
Mercury	4	0.22		--		--
Chemical	Linear Regression	LN Regression				
	R ²	R ²				
Mercury	0.970	0.979				

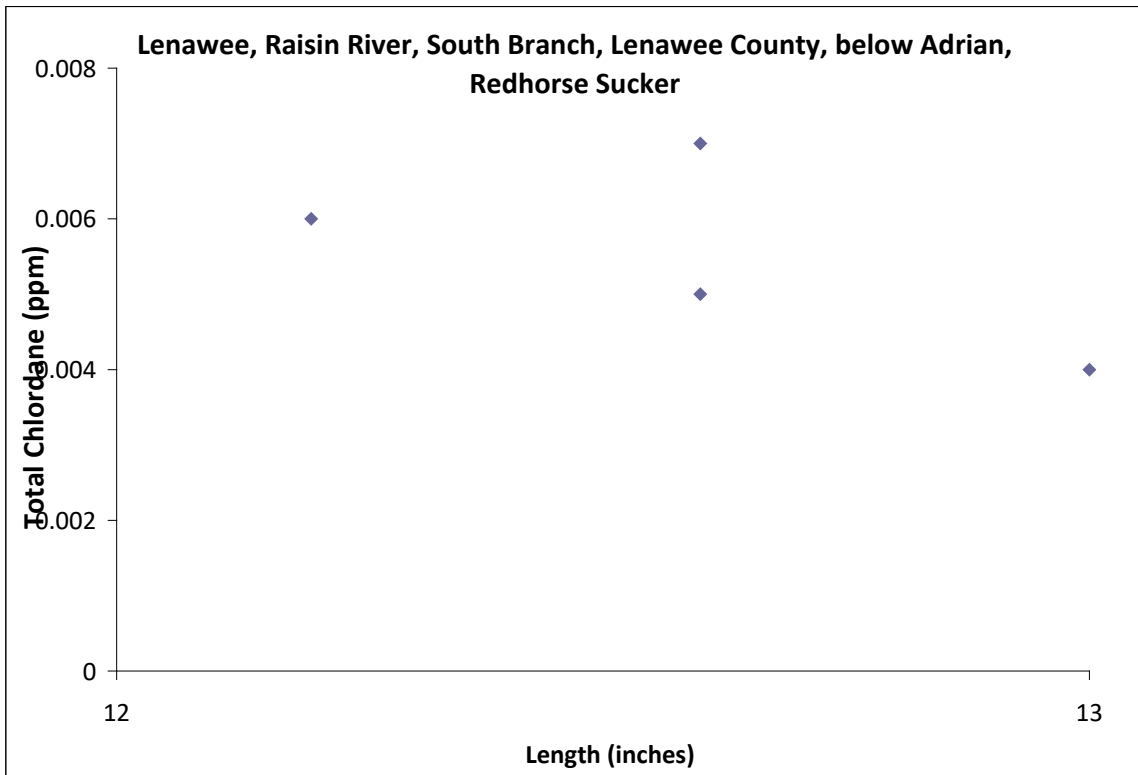
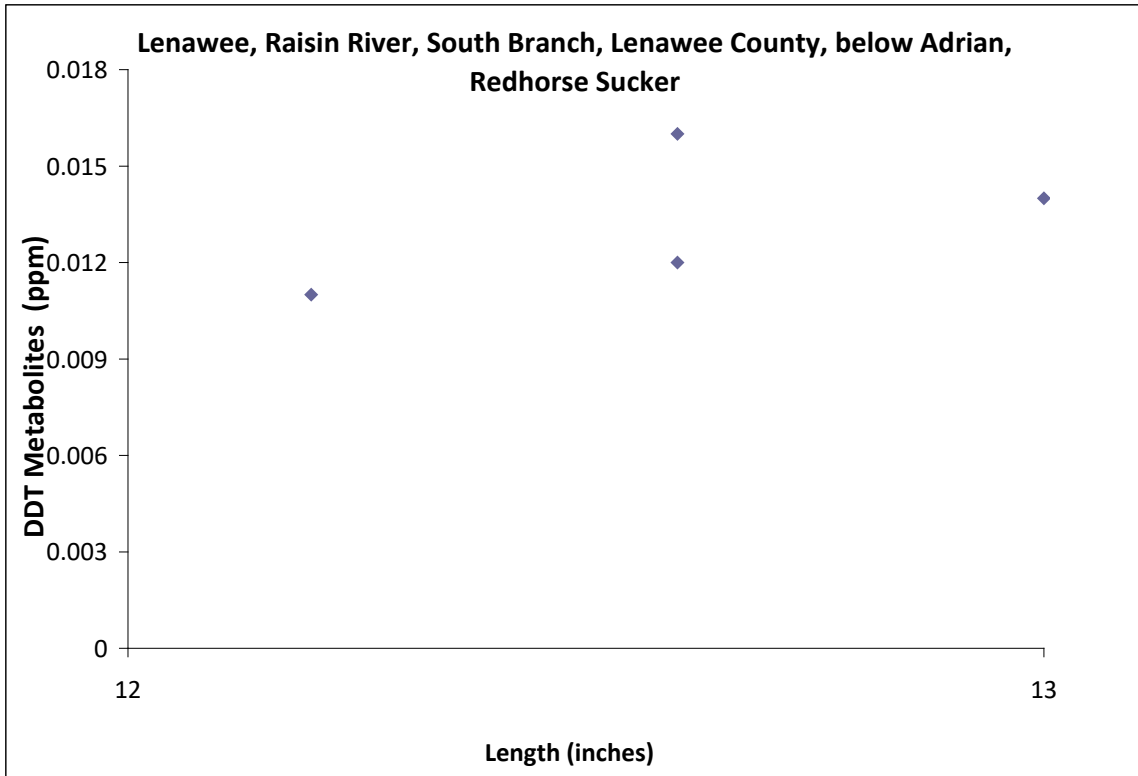
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1991	1991	4	12.2	na	12.2	13
Datasets available: 1991						
Chemical	Sample Size (Legal)	Mean		95%UCL		Meal Category
PCB	4	0.22		--		--
DDT	4	0.01		--		--
Chlordane	4	0.006		--		--
Toxaphene	4	ND		--		--
Chemical	Linear Regression	LN Regression				
	R ²	R ²				
PCB	0.986	0.989				
DDT	0.305	0.352				
Chlordane	0.400	0.471				
Toxaphene	--	--		Final meal category based on UCL:		--

Existing Advisory: Women and children should eat no more than one meal per week of South Branch River Raisin sucker less than 12 inches in length and no more than one meal per month of River Raisin sucker greater than 12 inches in length due to elevated levels of PCBs.

Recommendation: No one should eat more than 1 meal per month of South Branch River Raisin sucker under 13 inches, or 6 meals per year of sucker over 13 inches due to PCBs. Mercury would cause an advisory. Dataset is limited due to age of the data and sample size. A dataset specific consideration to use the mean mercury and PCB concentrations for this recommendation was applied. Based on the EGLE Fish Contaminant Monitoring Program, PCB concentrations ≥15 years old are expected to have declined to a concentration that allows a less restrictive meal category for the size range of fish in this dataset. A length break was applied and one meal category more restrictive advice was applied to the upper length range.





Rouge River Oakland and Wayne Counties

**Bluegill and
Pumpkinseed**

**Rouge River, Main Branch d/s Ford
Dam and Lower Branch**

Wayne County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2021	2021	15	4.9	NA	4.9	7.5
Datasets available: 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	15	0.050	0.029	0.095	0.060	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.028	0.012				

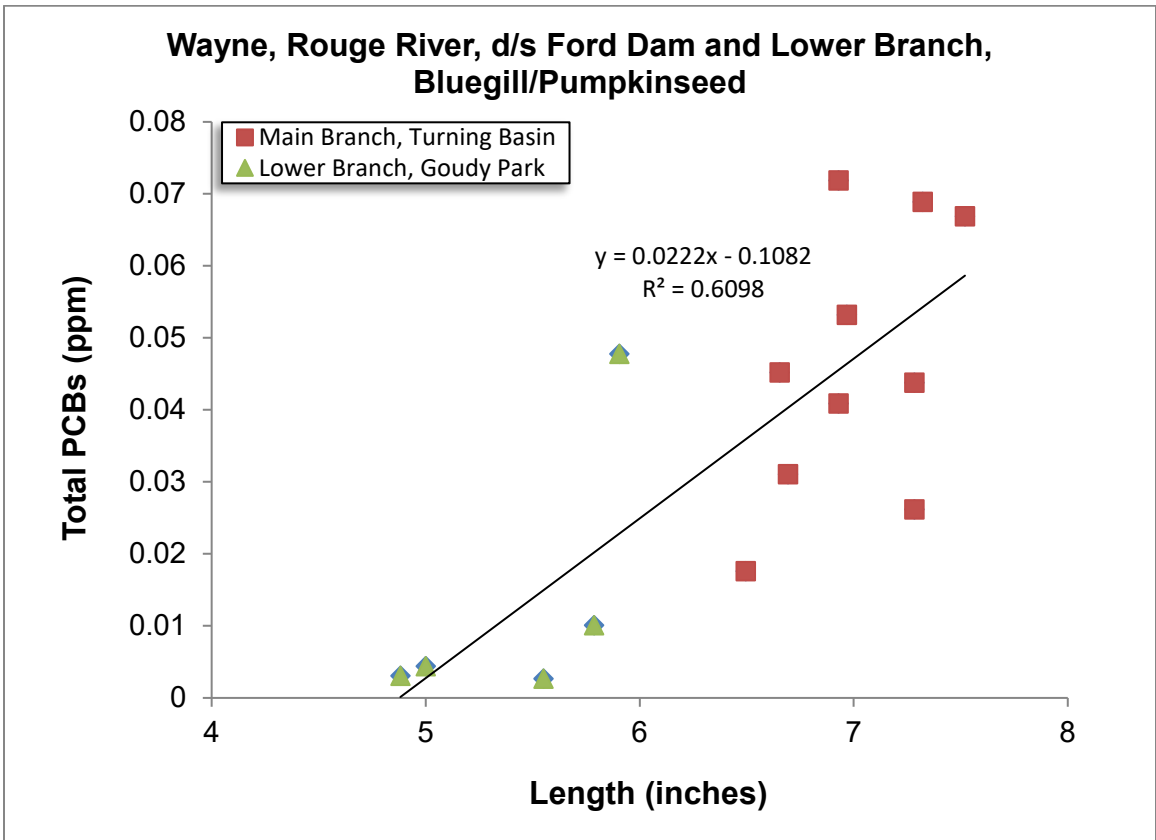
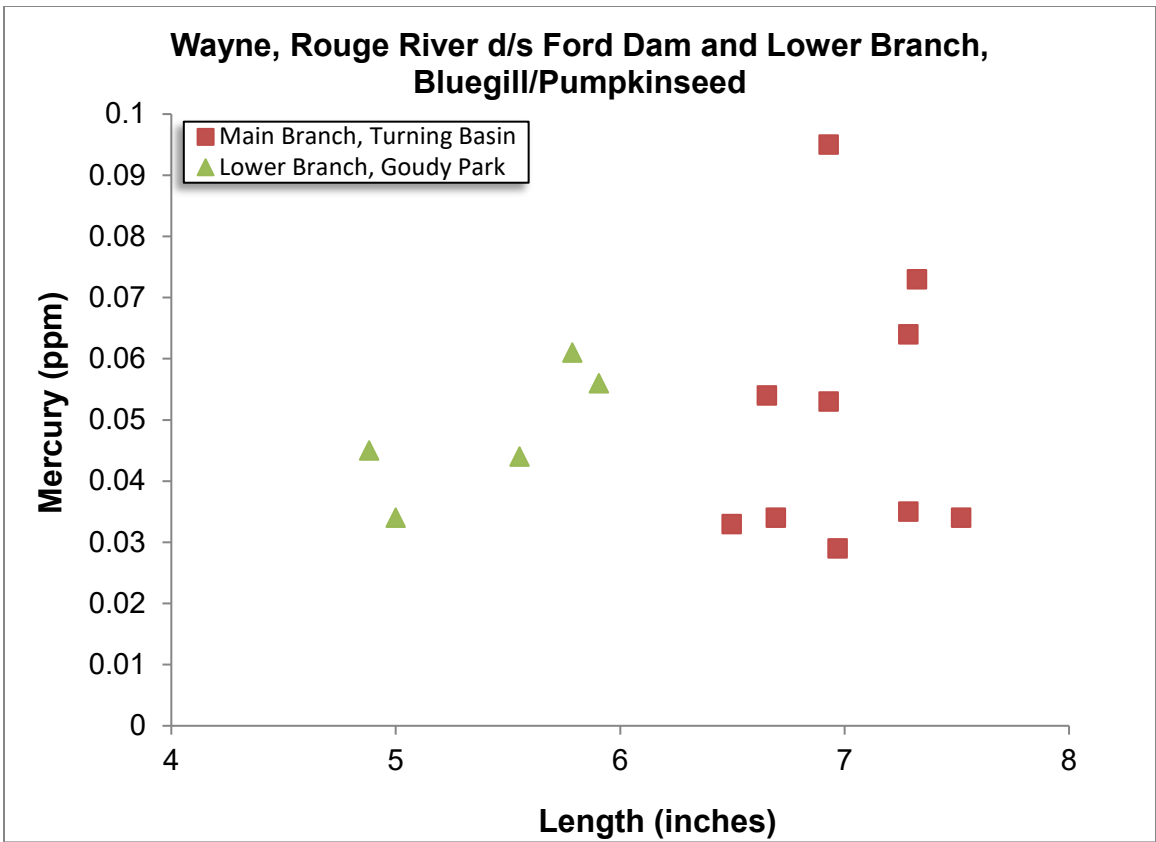
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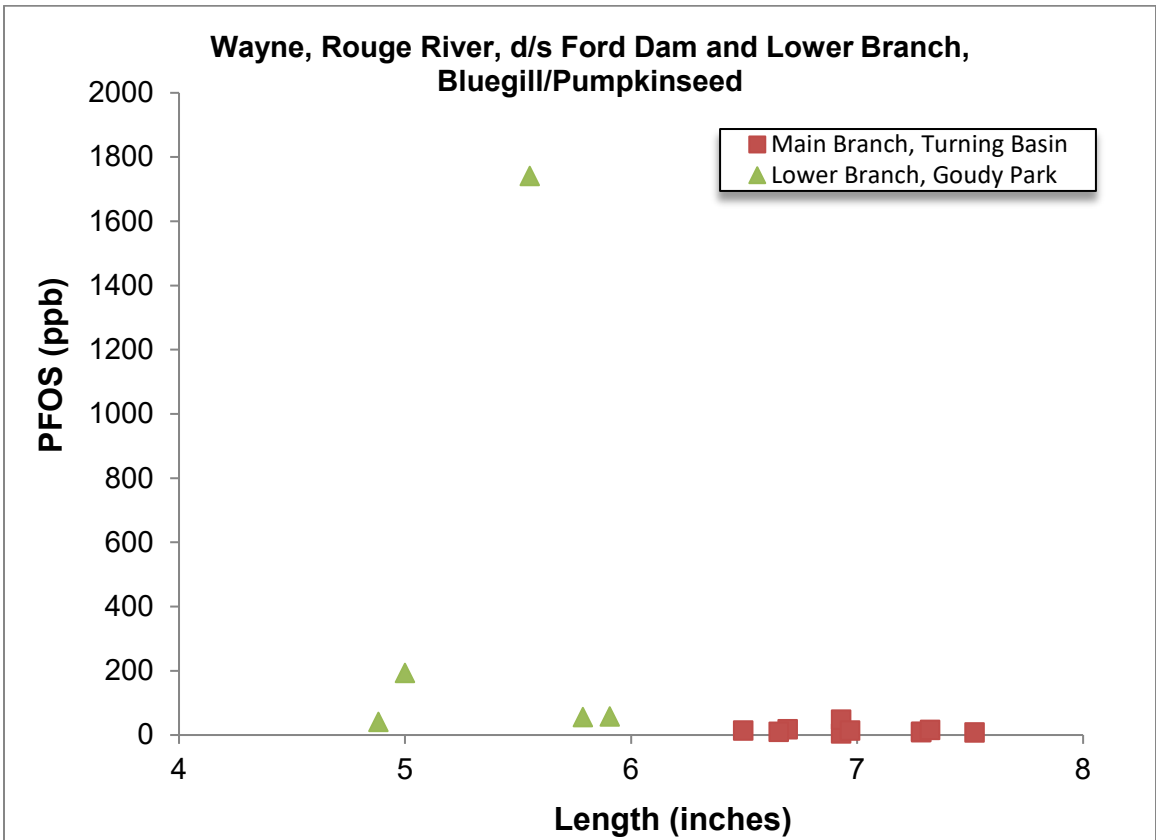
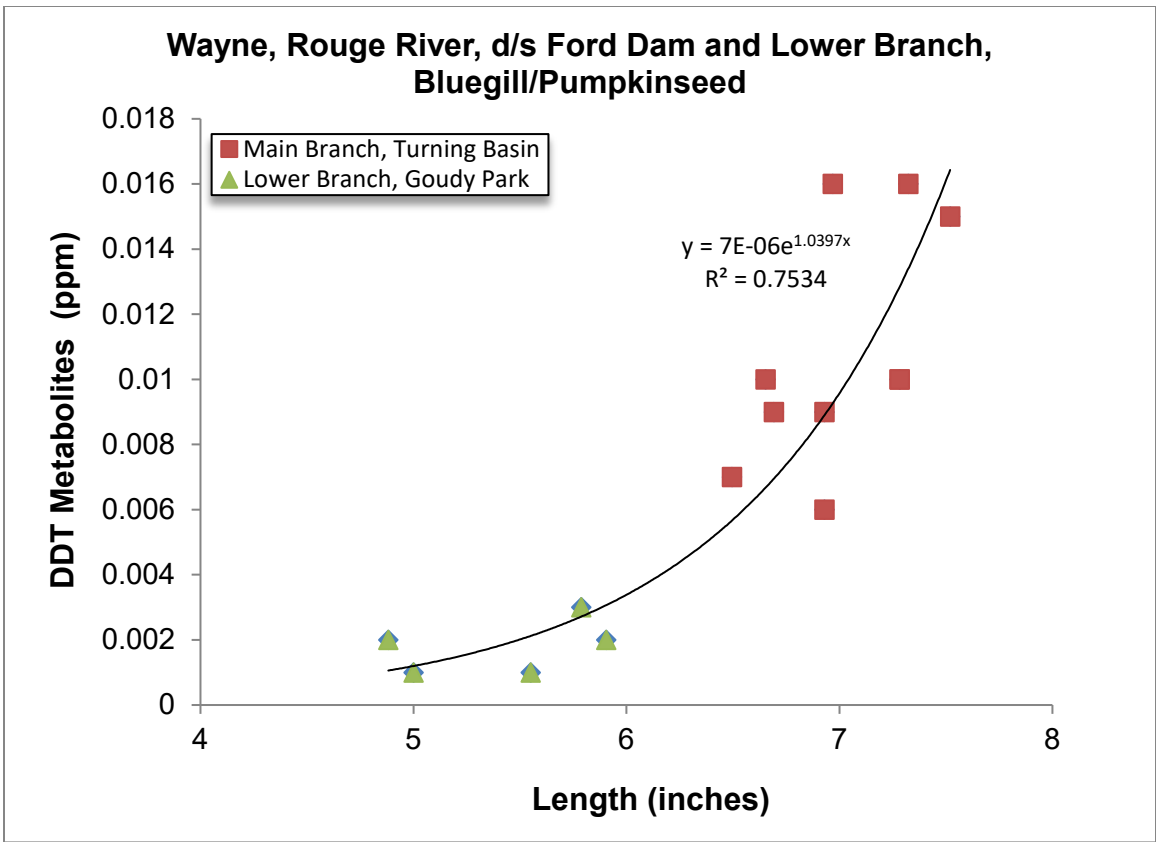
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2021	2021	15	4.9	NA	4.9	7.5
Datasets available: 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	15	0.036	0.003	0.072	0.049	4
DDT	15	0.008	< 0.001	0.016	0.011	16
Chlordane	15	0.001	< 0.001	0.002	0.001	16
Toxaphene	15	ND	--	--	--	--
PFOS	15	150 ppb	5.8 ppb	1,741 ppb	395.1 ppb	0
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.610	0.540				
DDT	0.747	0.753				
Chlordane	0.229	0.229				
Toxaphene	--	--				
PFOS	0.138	0.061				
Final meal category based on UCL:						0

Existing MDHHS Advisory: Bluegill and sunfish from the Main Branch of the Rouge River downstream of the Henry Ford Dam, including the Lower Branch of the Rouge River, are currently covered under the statewide guidance for mercury. No one should eat more than eight meals per month of bluegill or sunfish of any size.

Recommendation: No one should eat bluegill or sunfish of any size from the Main Branch of the Rouge River downstream of the Henry Ford Dam, including the Lower Branch of the Rouge River, due to PFOS. PCBs cause less restrictive guidance in these species.

Note: A [fish passage project](#) is underway at the Henry Ford Dam on the Main Branch of the Rouge River just upstream of its confluence with the Lower Branch. Therefore, the extent of the main branch included in this advisory will be re-evaluated once the project is completed.





Hg Analysis:

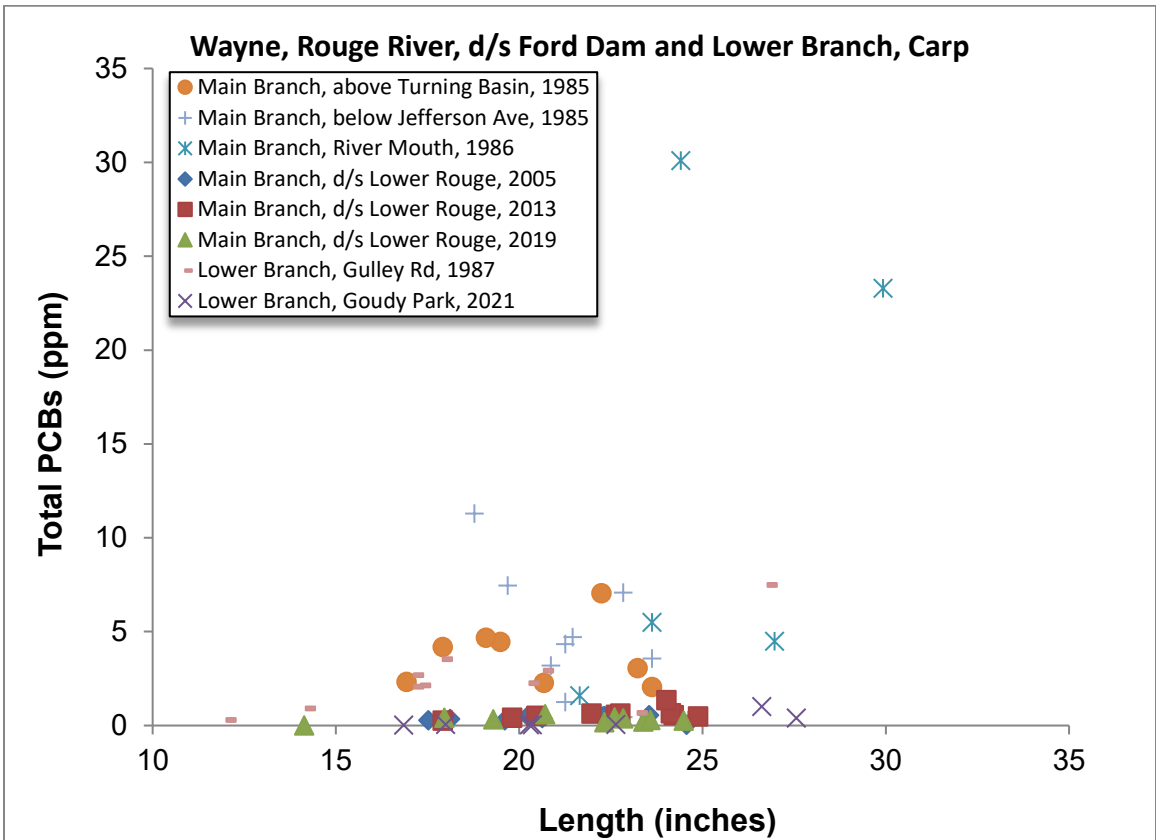
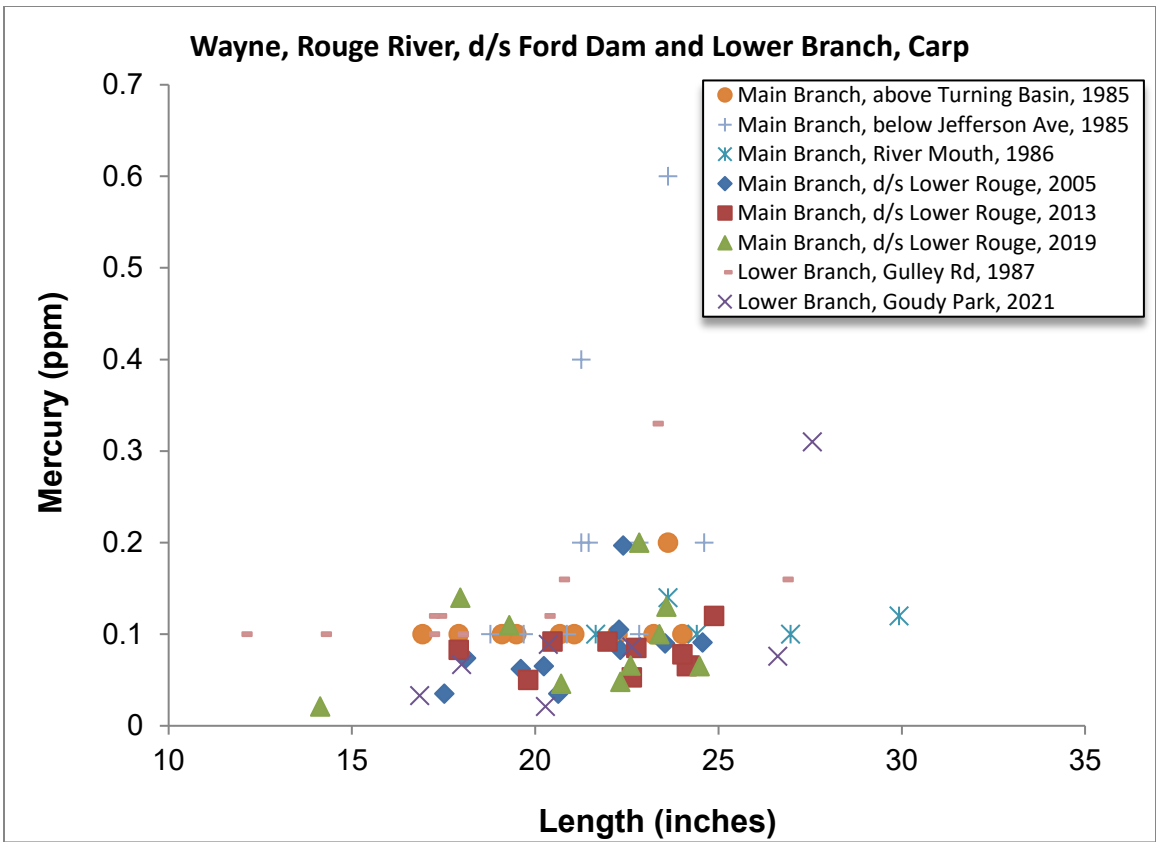
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		Meal Category
Earliest	Most Recent						
1985	2021	72	12.0	NA	12.0	29.9	
Datasets available: 1985, 1986, 1987, 2005, 2013, 2019, 2021							
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)		
Mercury	72	0.118	0.021	0.600	0.139	4	
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.066	0.100					

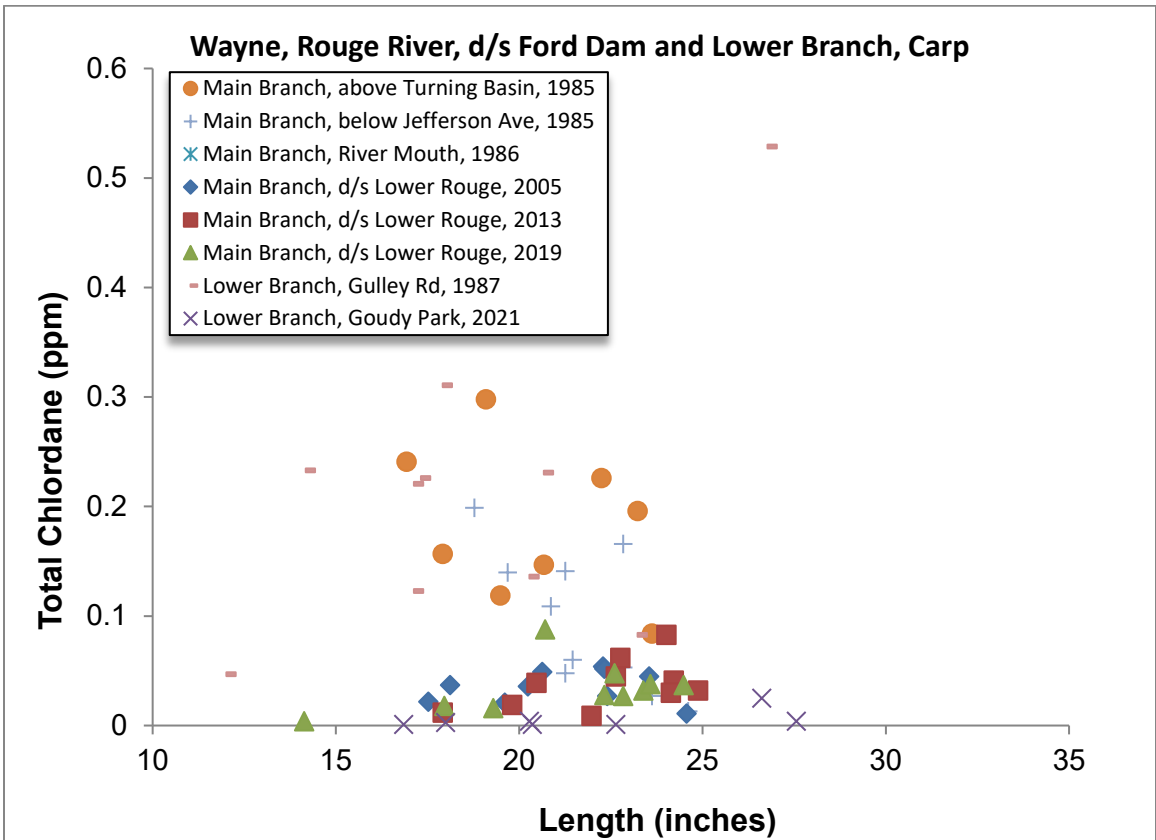
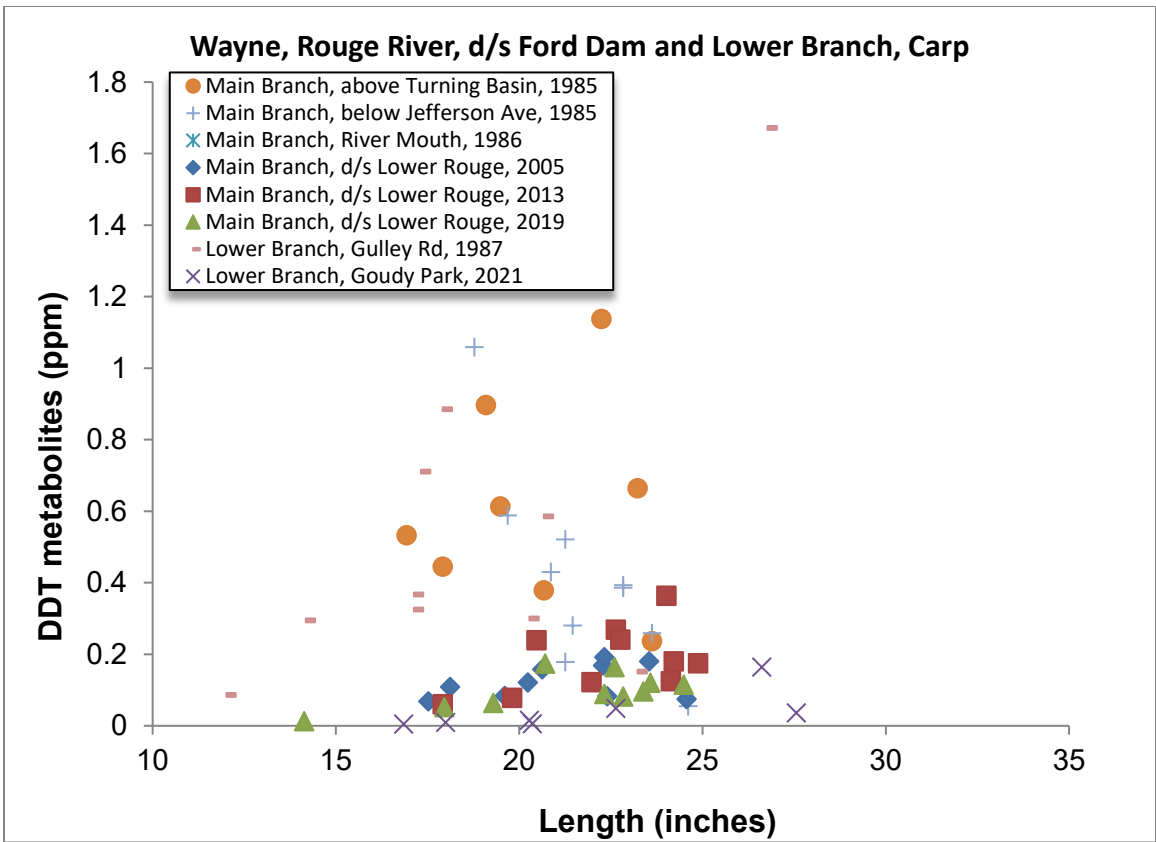
Organics Analysis:

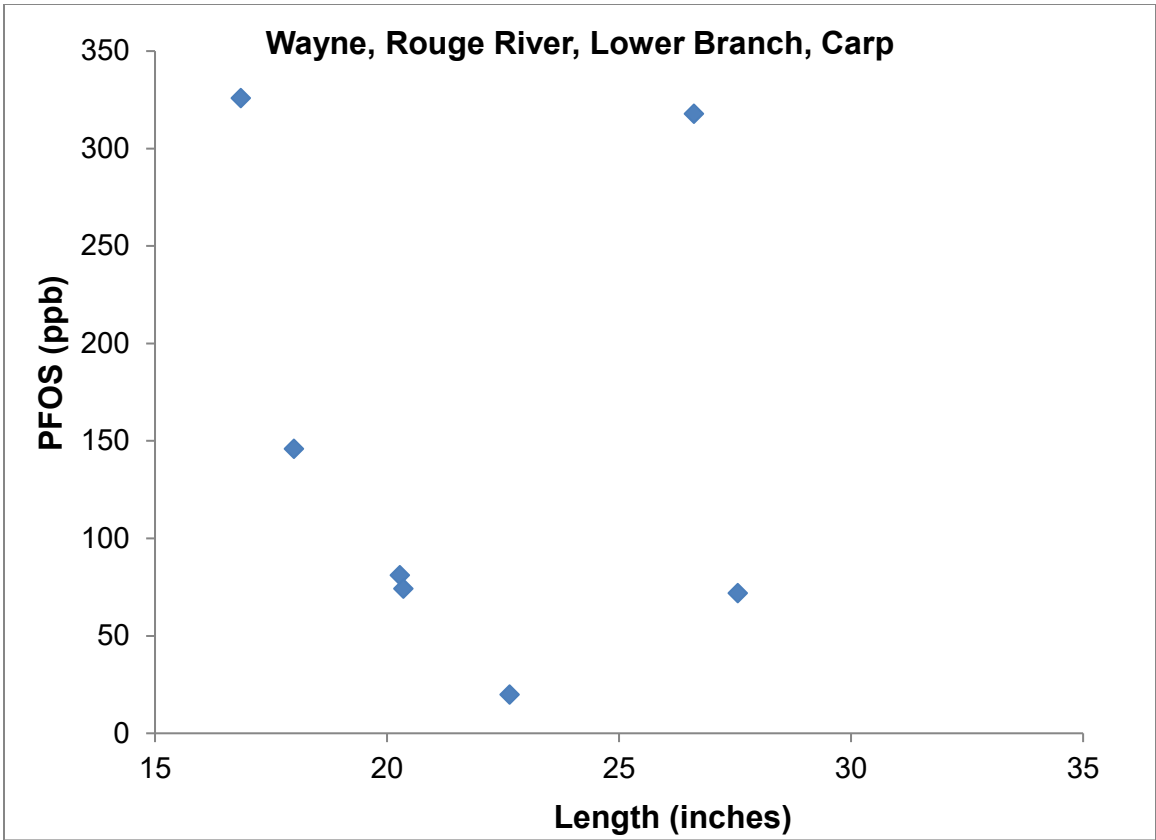
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		Meal Category
Earliest	Most Recent						
2005	2021	37	14.1	NA	14.1	27.6	
Datasets available: 1985, 1986, 1987, 1995, 2005, 2013, 2019, 2021							
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)		
PCB	37	0.395	0.012	1.353	0.488	Limited	
DDT	37	0.117	0.005	0.364	0.144	12	
Chlordane	37	0.030	0.001	0.088	0.037	16	
Toxaphene	37	ND	--	--	--	--	
PFOS	7	148.1	19.9 ppb	326.6 ppb	263.1 ppb	0.5	
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.204	0.243					
DDT	0.193	0.271					
Chlordane	0.086	0.104					
Toxaphene	NA	NA					
PFOS	0.017	0.031					
Final meal category based on UCL:							Limited

Existing MDHHS Advisory: Sensitive populations should not eat carp from the Main Branch of the Rouge River up to the Ford Dam, including the Lower Branch of the Rouge River. Healthy adults should limit consumption of these fish to no more than 1 or 2 meals per year due to PCBs. DDT and mercury would cause advisories.

Recommendation: No change to the advisory is recommended. PFOS should be added to the list of contaminants causing a less restrictive advisory. A [fish passage project](#) is underway at the Henry Ford Dam on the Rouge River. Therefore, the extent of the main branch included in this advisory will be re-evaluated once the project is completed.







**Largemouth and
Smallmouth Bass**

**Rouge River, Main Branch d/s Ford Dam
and Lower Branch**

Wayne County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2013	2013	10	8.3	14	14.4	14.4
Datasets available: 2013						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	1	0.2	0.2	0.2	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.698	0.655				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2013	2013	10	8.3	14	14.4	14.4
Datasets available: 2013						
Chemical	Sample Size (All)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.06	0.005	0.14	0.09	2
DDT	10	0.04	0.008	0.11	0.06	16
Chlordane	10	0.004	0.001	0.009	0.01	--
Toxaphene	10	0.05	ND	0.05	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.077	0.026				
DDT	0.169	0.134				
Chlordane	0.014	0.026				
Toxaphene	0.418	0.418				
Final meal category based on UCL:						2

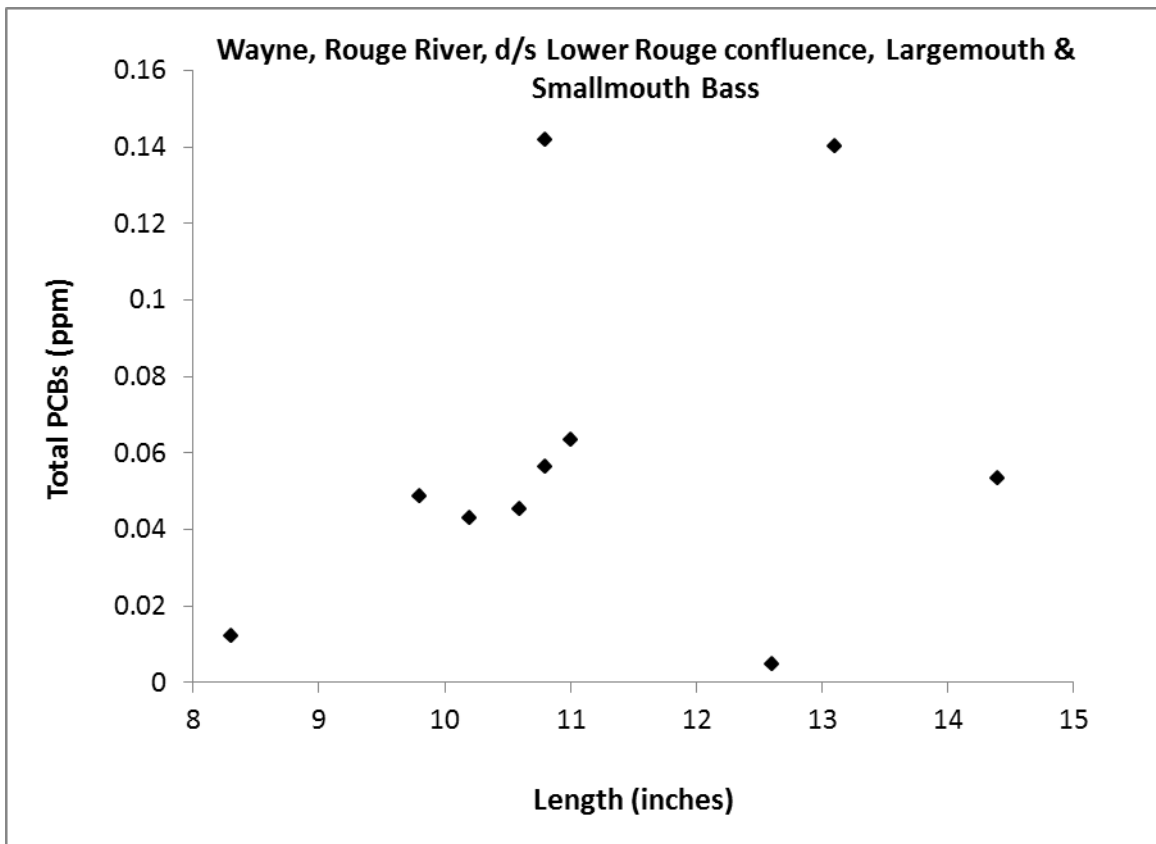
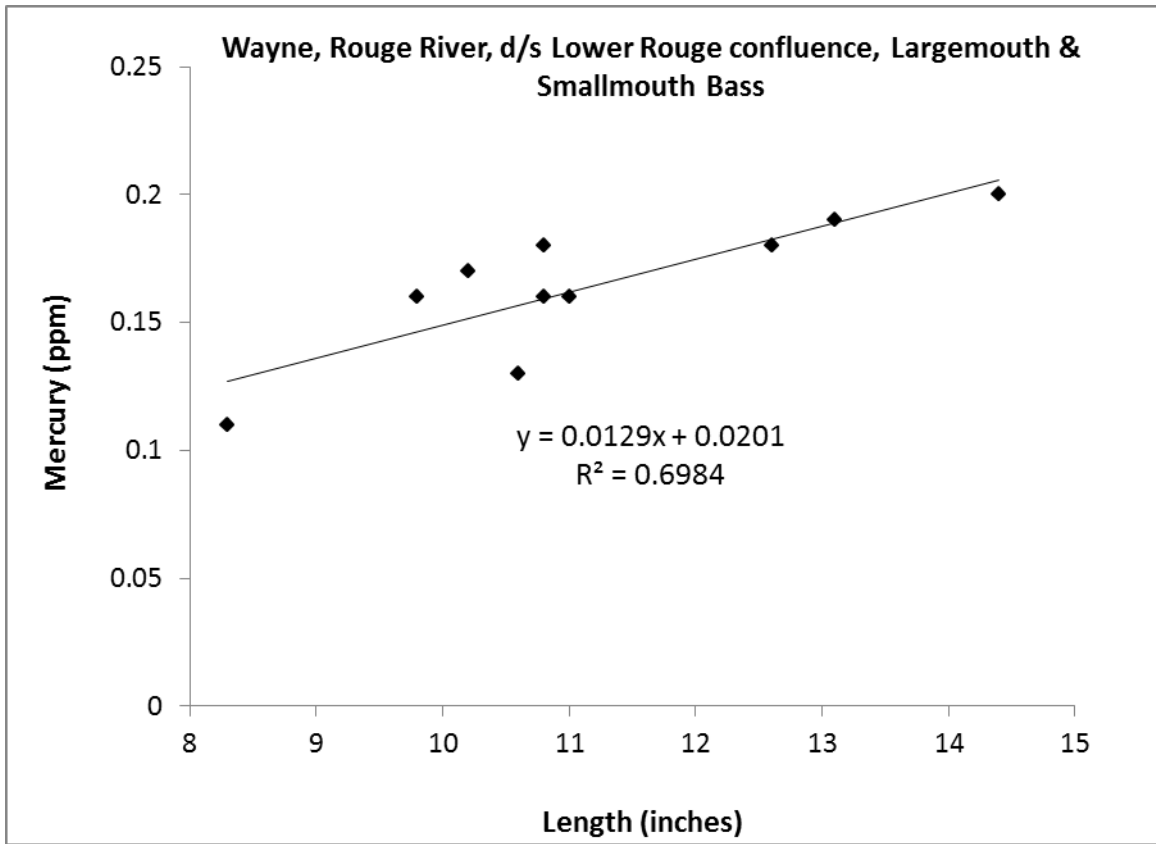
Existing Advisory: Lower Rouge River largemouth and smallmouth bass are covered by the statewide guidelines.

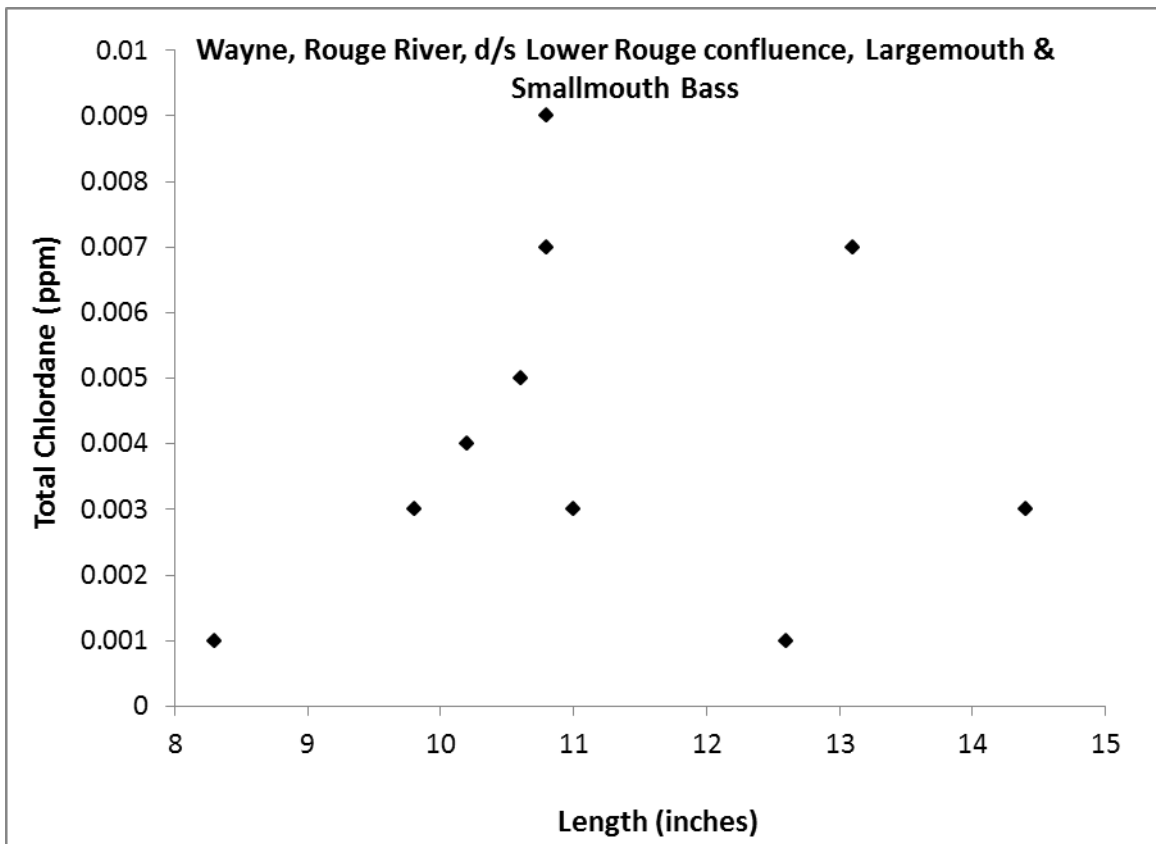
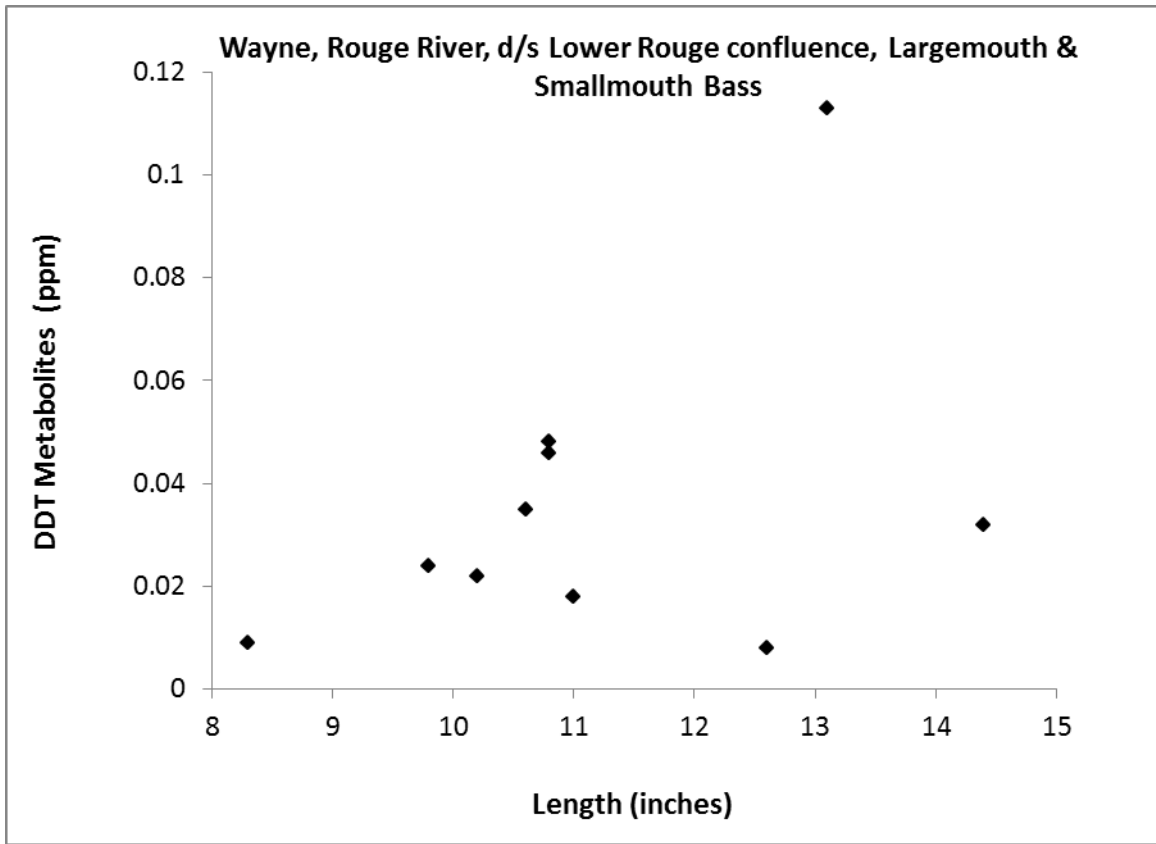
Recommendation: No one should eat more than 2 meals per month of Lower Rouge River largemouth and smallmouth bass under 18 inches, due to PCBs, or more than 1 meal per month of fish over 18 inches due to PCBs and mercury. The statewide length break was added as the size range of the fish was limited.

Note: Limited size range; results suggest mercury is relatively low but PCBs would drive the guidance.

Note: A [fish passage project](#) is underway at the Henry Ford Dam on the Rouge River. Therefore, the extent of the main branch included in this advisory will be re-evaluated once the project is completed.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
8	0.12	8
10	0.15	4
12	0.17	4
14	0.2	4
16	0.23	4
18	0.25	4
<i>Shaded area denotes extrapolated estimates</i>		





Rock Bass

Rouge River, Main Branch d/s Ford Dam and Lower Branch

Wayne

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2013	2019	20	5.8	NA	5.8	8.3
Datasets available: 2013, 2019						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	20	0.134	0.056	0.210	0.151	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.031	0.012				

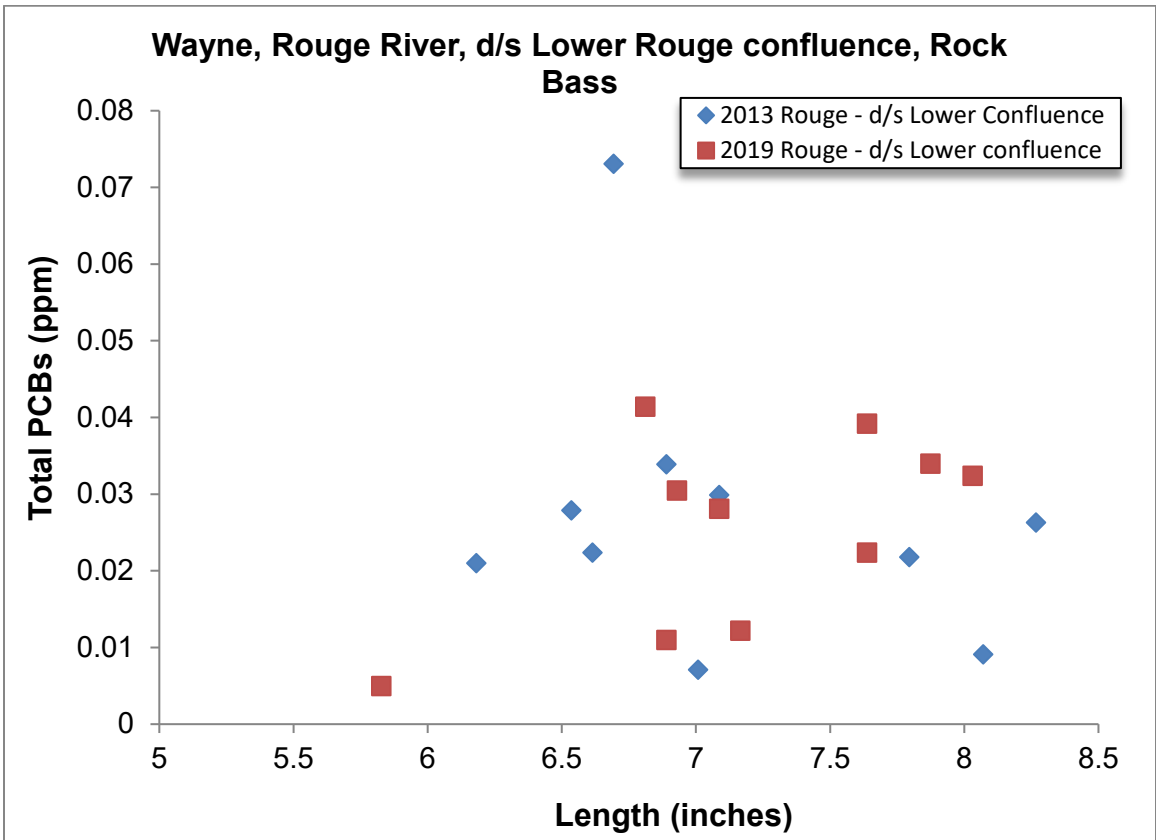
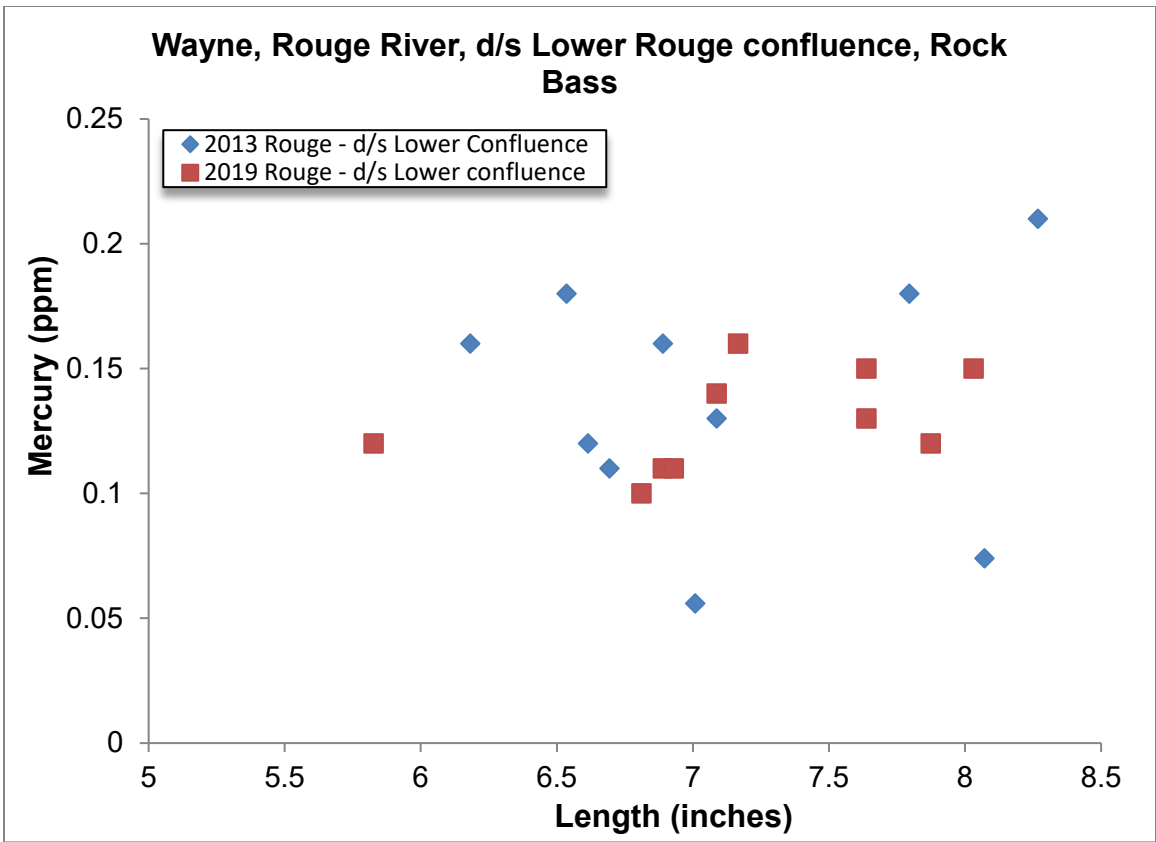
Organics Analysis:

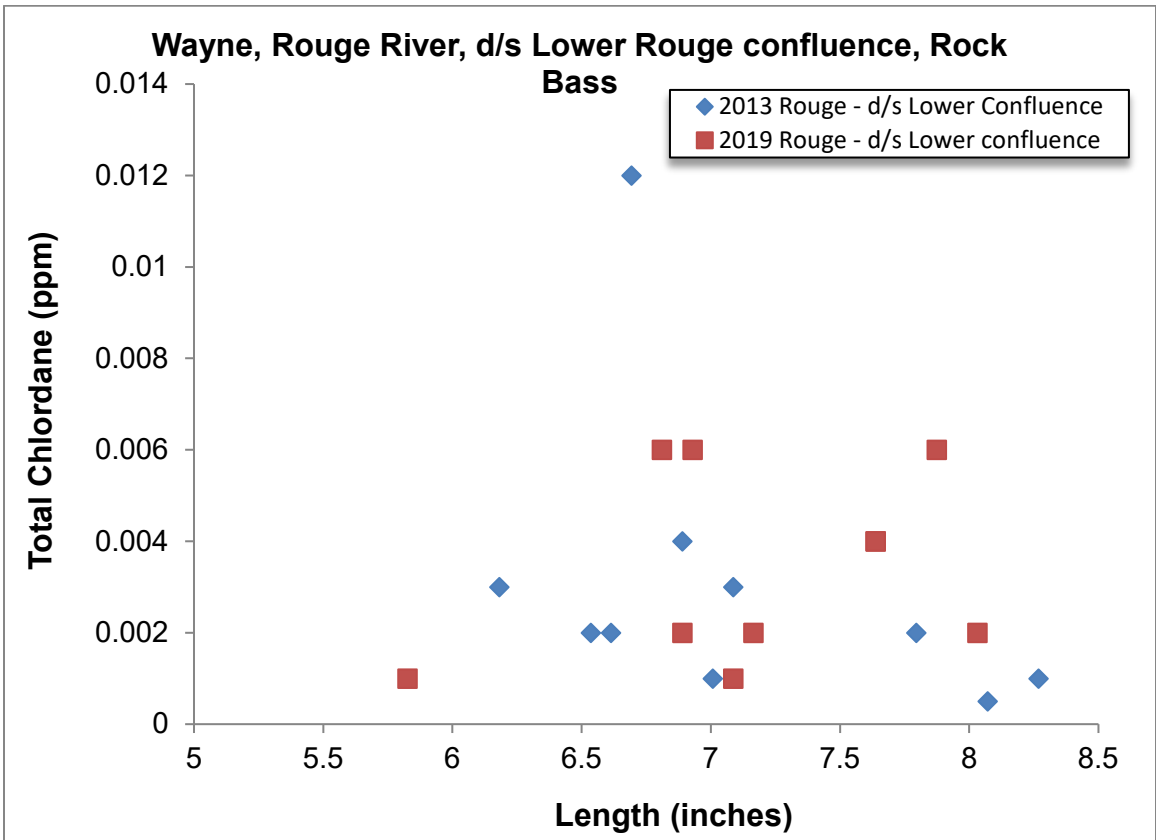
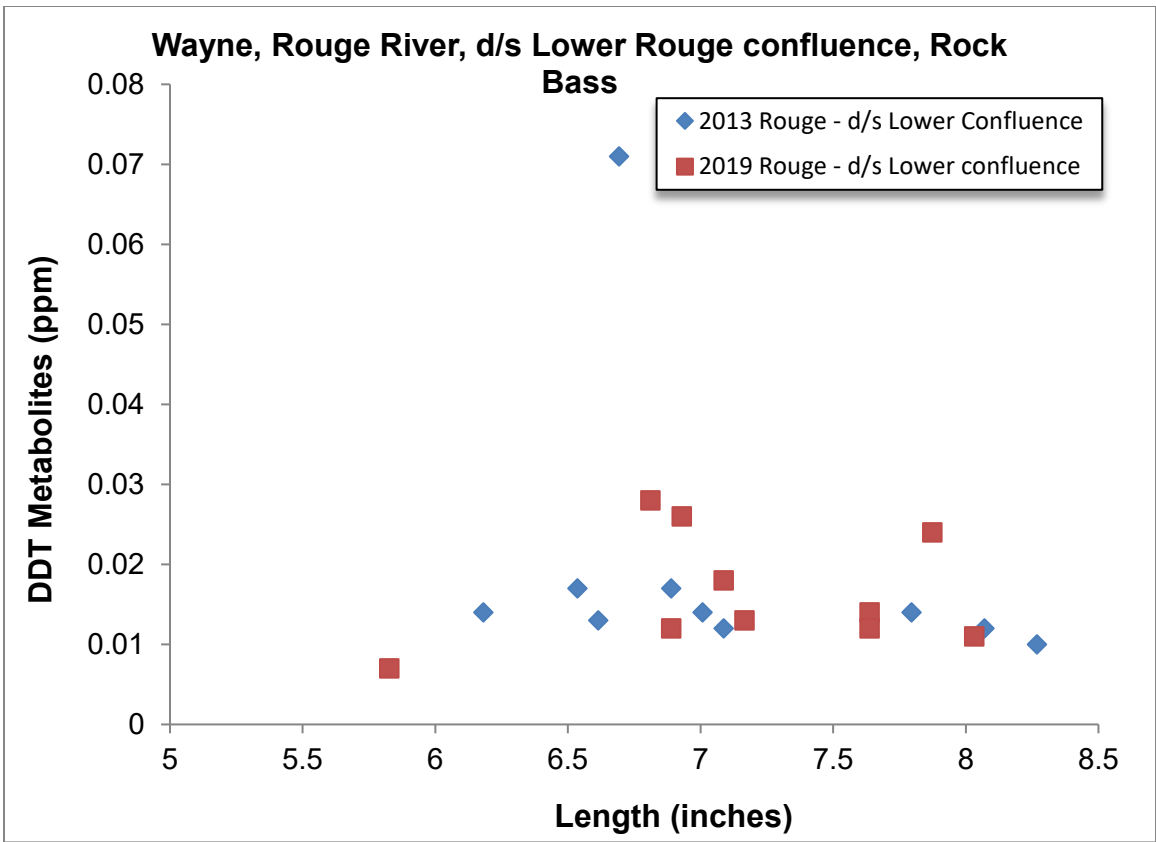
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2013	2019	20	5.8	NA	5.8	8.3
Datasets available: 2013 (No PFOS), 2019						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	20	0.026	0.005	0.073	0.034	4
DDT	20	0.018	0.007	0.071	0.024	16
Chlordane	20	0.003	<0.001	0.012	0.004	16
Toxaphene	20	ND	--	--	--	--
PFOS	10	11.5 ppb	7.1 ppb	20.3 ppb	14.3 ppb	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.002	0.035				
DDT	0.029	0.014				
Chlordane	0.018	0.025				
Toxaphene	--	--				
PFOS	0.001	0.013				
Final meal category based on UCL:						4

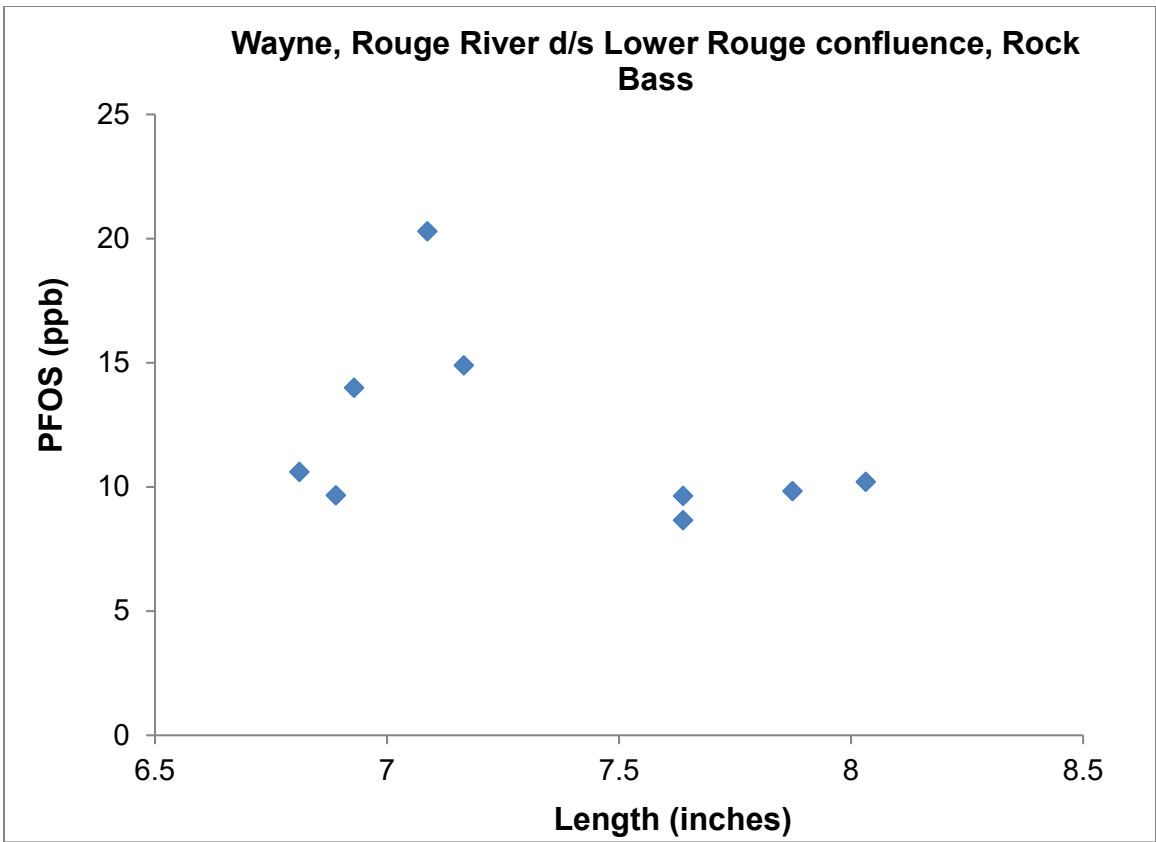
Existing MDHHS Advisory: No one should eat more than 4 meals per month of rock bass of any size from the Rouge River downstream of the Henry Ford Dam in Wayne County due to PCBs and mercury.

Recommendation: No change to the advisory is warranted. PFOS should be added as a contaminant causing less-restrictive advice.

Note: A [fish passage project](#) is underway at the Henry Ford Dam on the Rouge River. Therefore, the extent of the main branch included in this advisory will be re-evaluated once the project is completed.







**White and Redhorse
Sucker**

**Rouge River, Main Branch d/s Ford
Dam and Lower Branch**

Wayne County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent					
2005	2021	20	9.1	NA	9.1	14.2
Datasets available: 2005, 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	20	0.055	0.021	0.154	0.072	12
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.615	0.647				

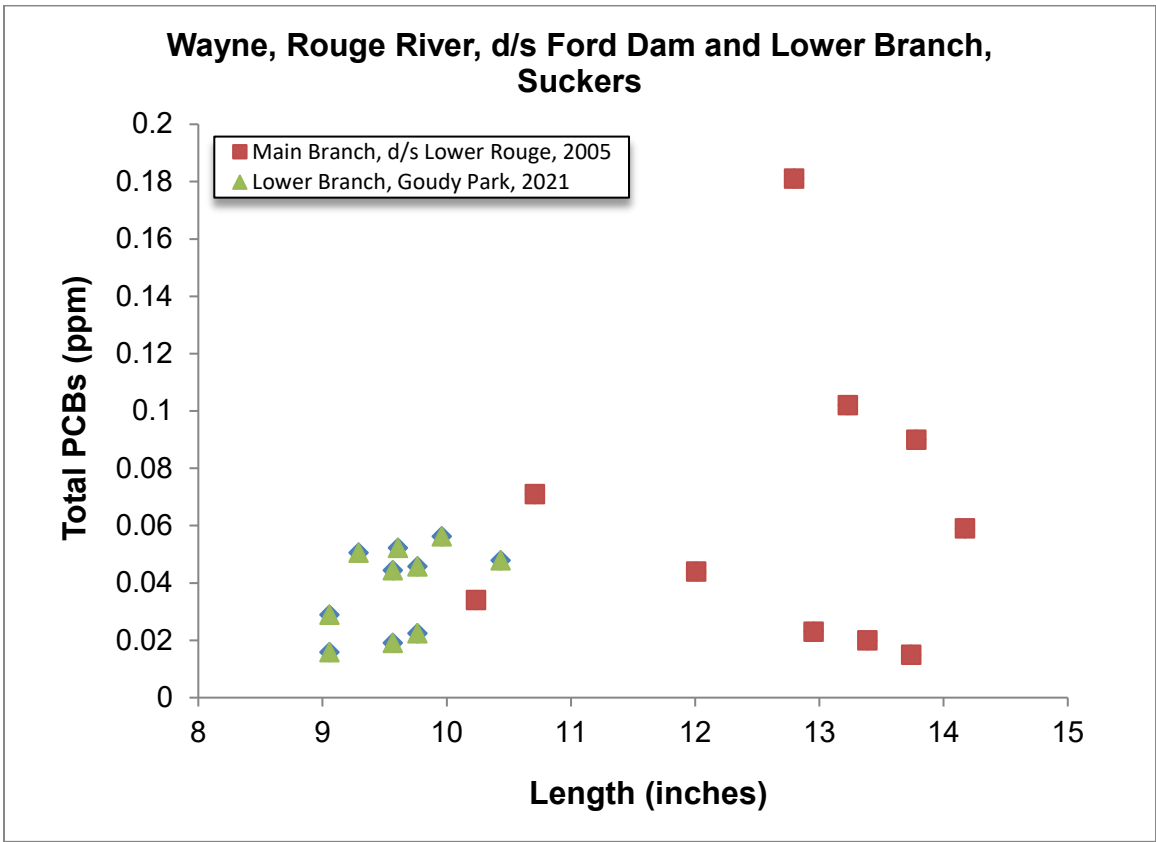
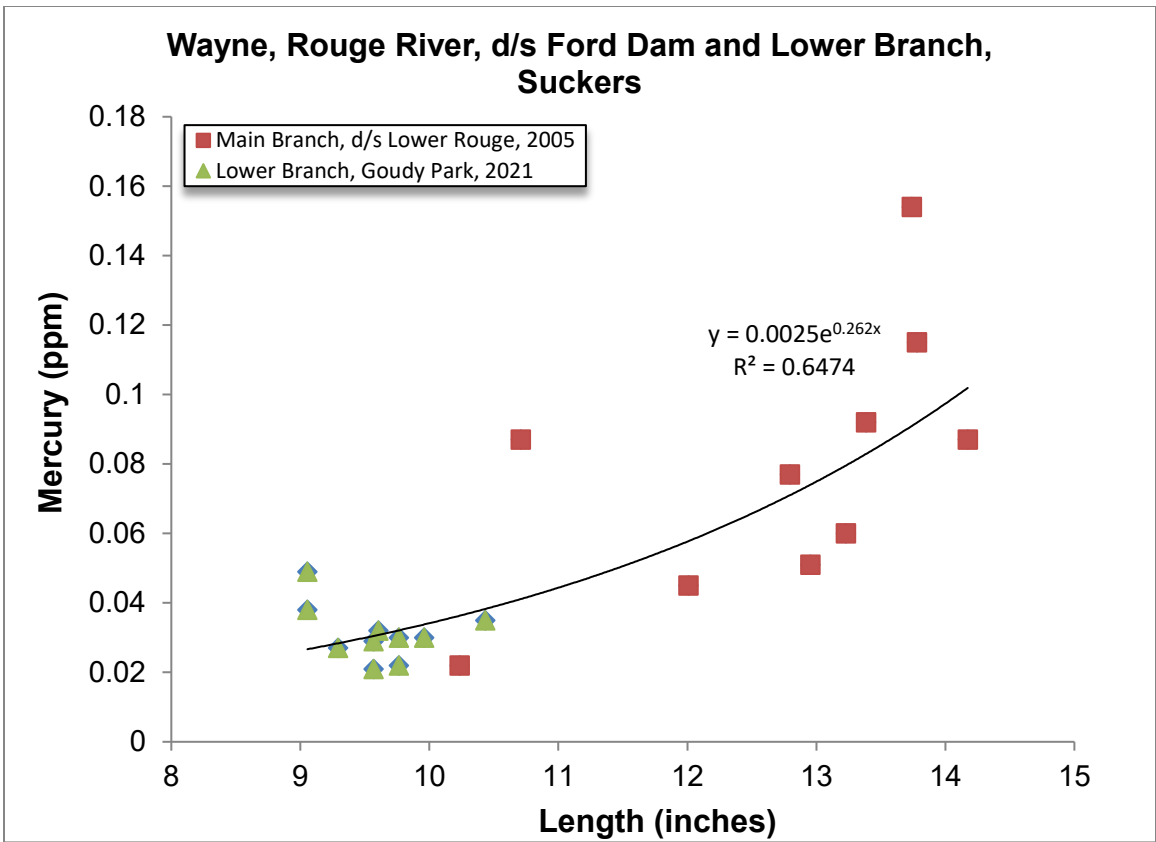
Organics Analysis:

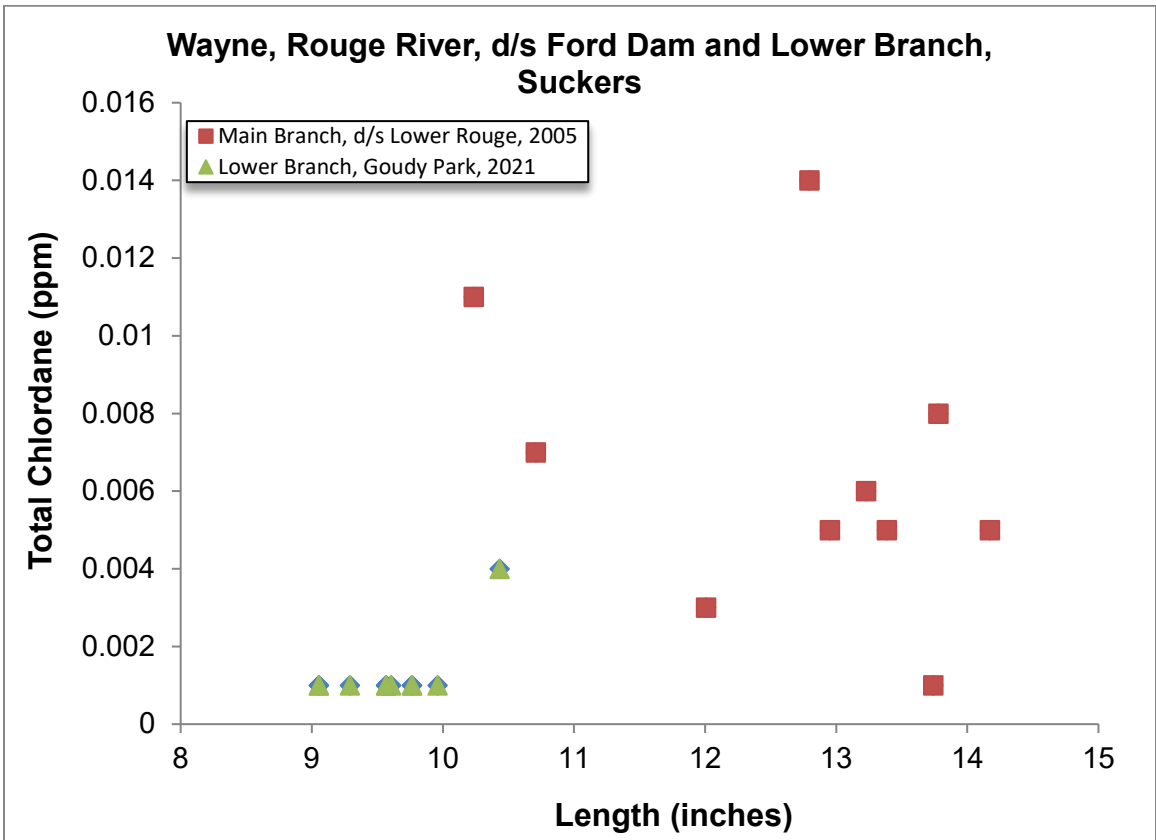
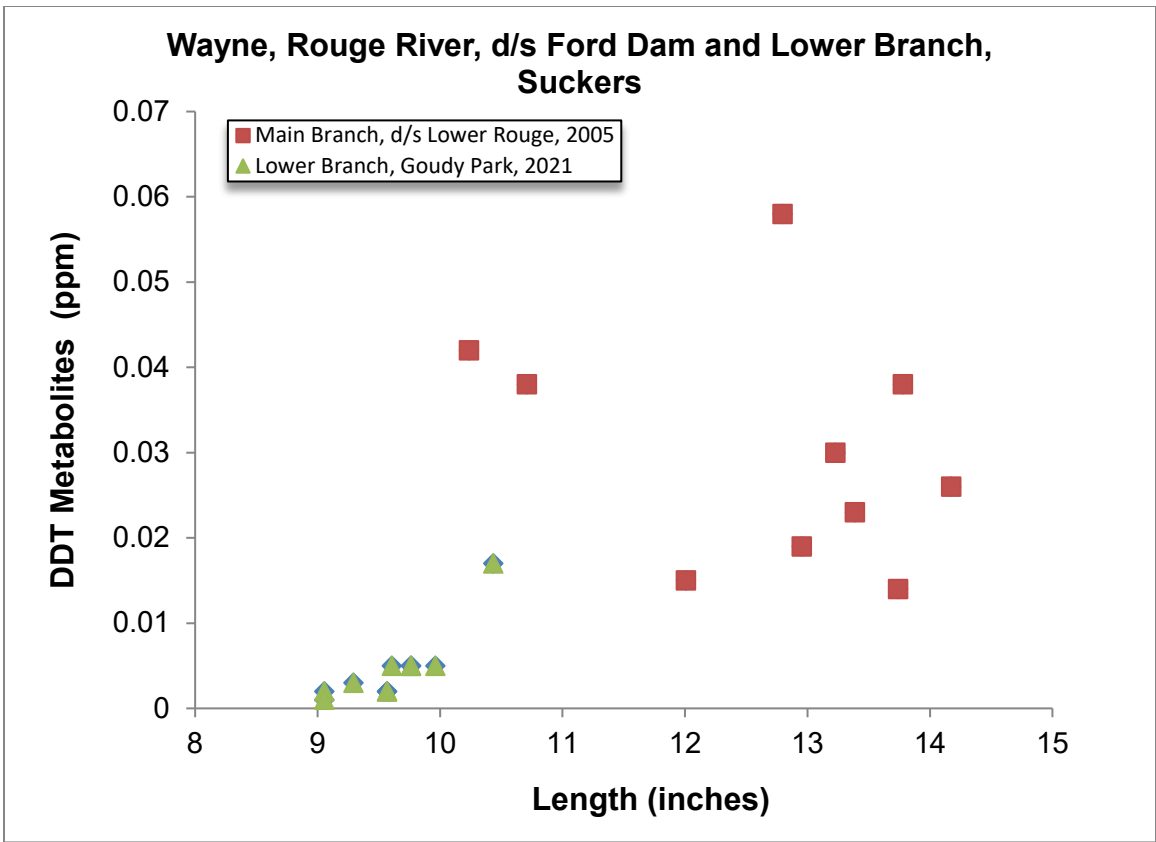
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent					
2005	2021	20	9.1	NA	9.1	14.2
Datasets available: 2005 (No PFOS), 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	20	0.051	0.015	0.181	0.069	2
DDT	20	0.018	< 0.001	0.058	0.025	16
Chlordane	20	0.004	< 0.001	0.014	0.006	16
Toxaphene	20	ND	--	--	--	--
PFOS	10	12.8 ppb	7.7 ppb	31.7 ppb	17.8 ppb	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.112	0.000				
DDT	0.376	0.573				
Chlordane	0.246	0.393				
Toxaphene	NA	NA				
PFOS	0.163	0.118				
Final meal category based on UCL:						2

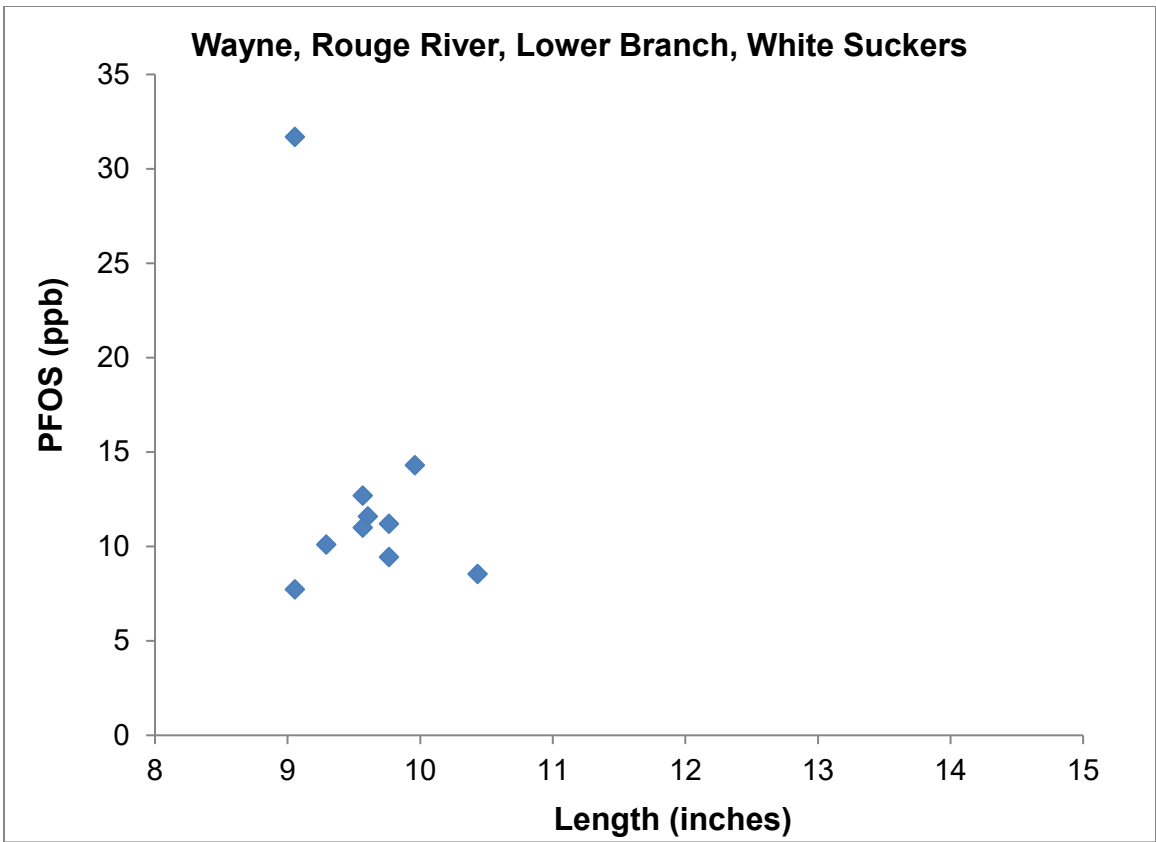
Existing MDHHS Advisory: Suckers from the main branch of the Rouge River downstream of the Henry Ford Dam, including the Lower Branch of the Rouge River, are currently covered under the statewide guidance for mercury. No one should eat more than 8 meals per month of suckers of any size.

Recommendation: No one should eat more than 2 meals per month of sucker species from the main branch of the Rouge River downstream of the Henry Ford Dam, including the Lower Branch of the Rouge River, due to PCBs. Mercury and PFOS cause less restrictive guidance.

Note: A [fish passage project](#) is underway at the Henry Ford Dam on the Rouge River. Therefore, the extent of the main branch included in this advisory will be re-evaluated once the project is completed.







Hg Analysis:

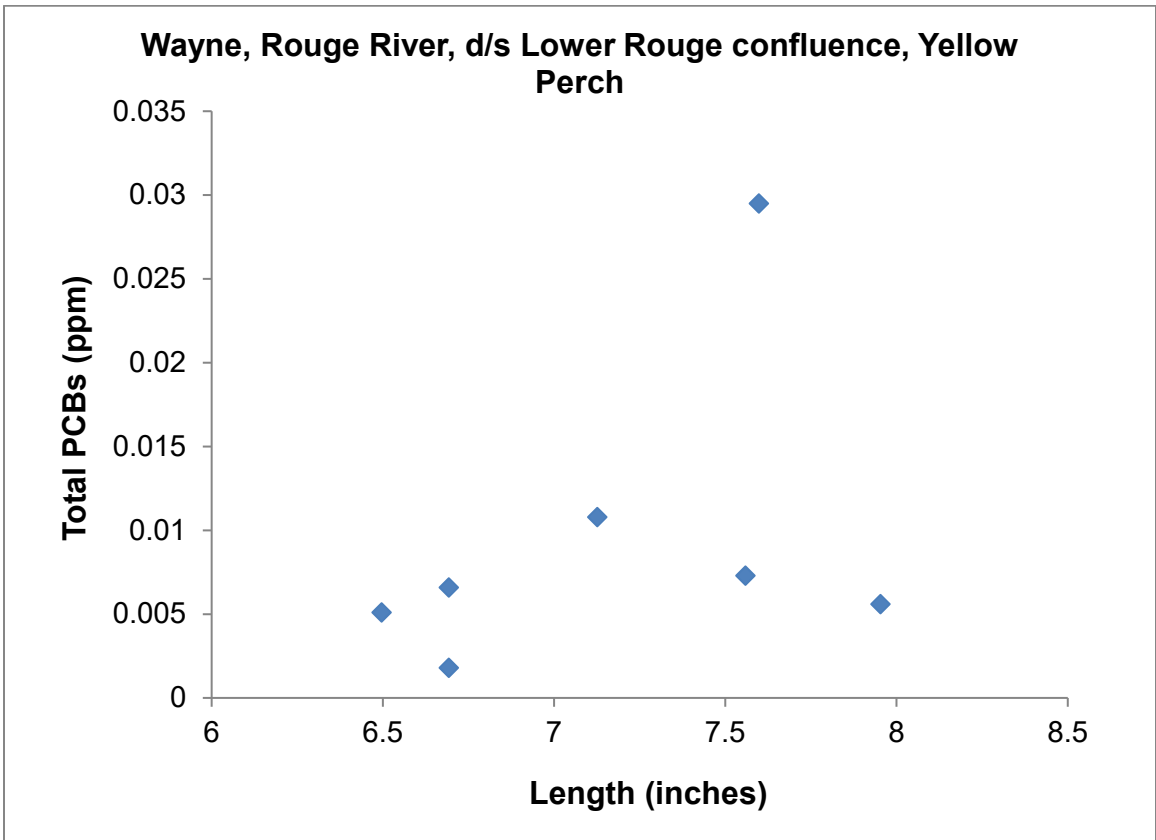
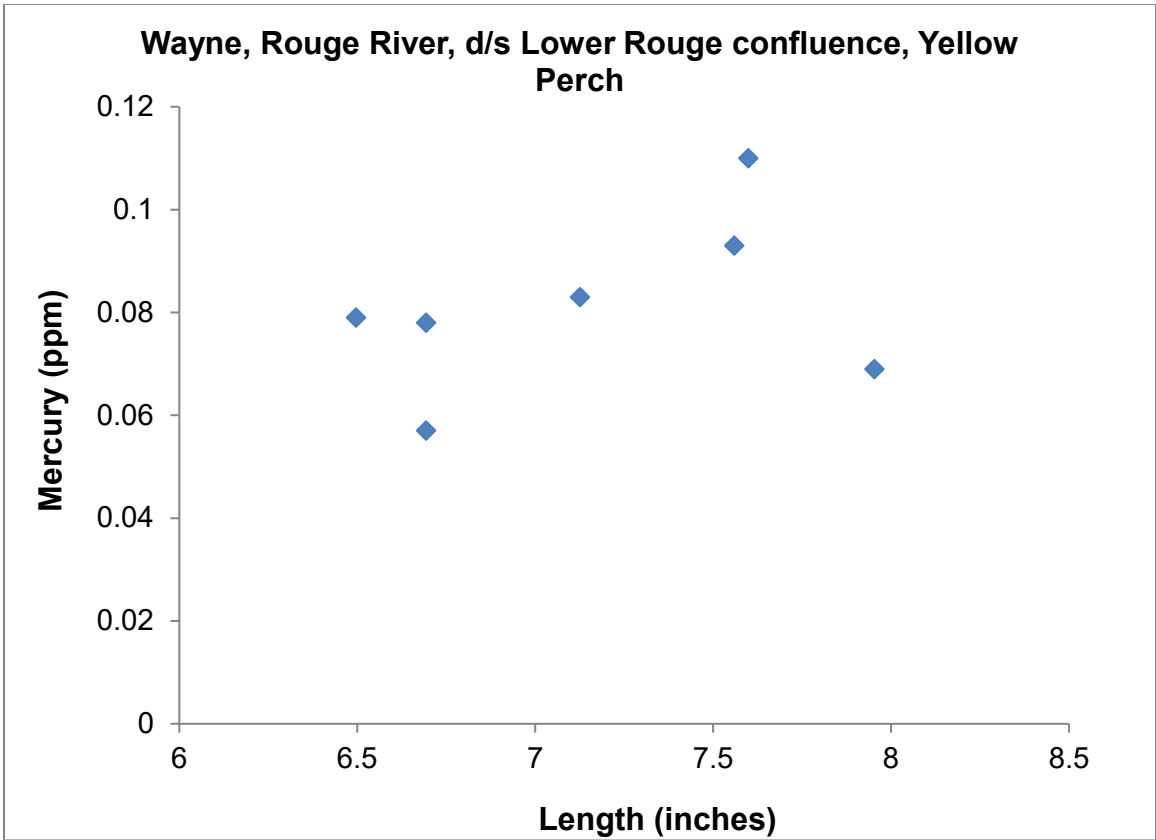
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		Meal Category
Earliest	Most Recent				Min	Max	
2019	2019	7	6.5	NA	6.5	8.0	
Datasets available:		2019					
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category	
Mercury	7	0.081	0.057	0.110	0.097	8	
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.149	0.138					

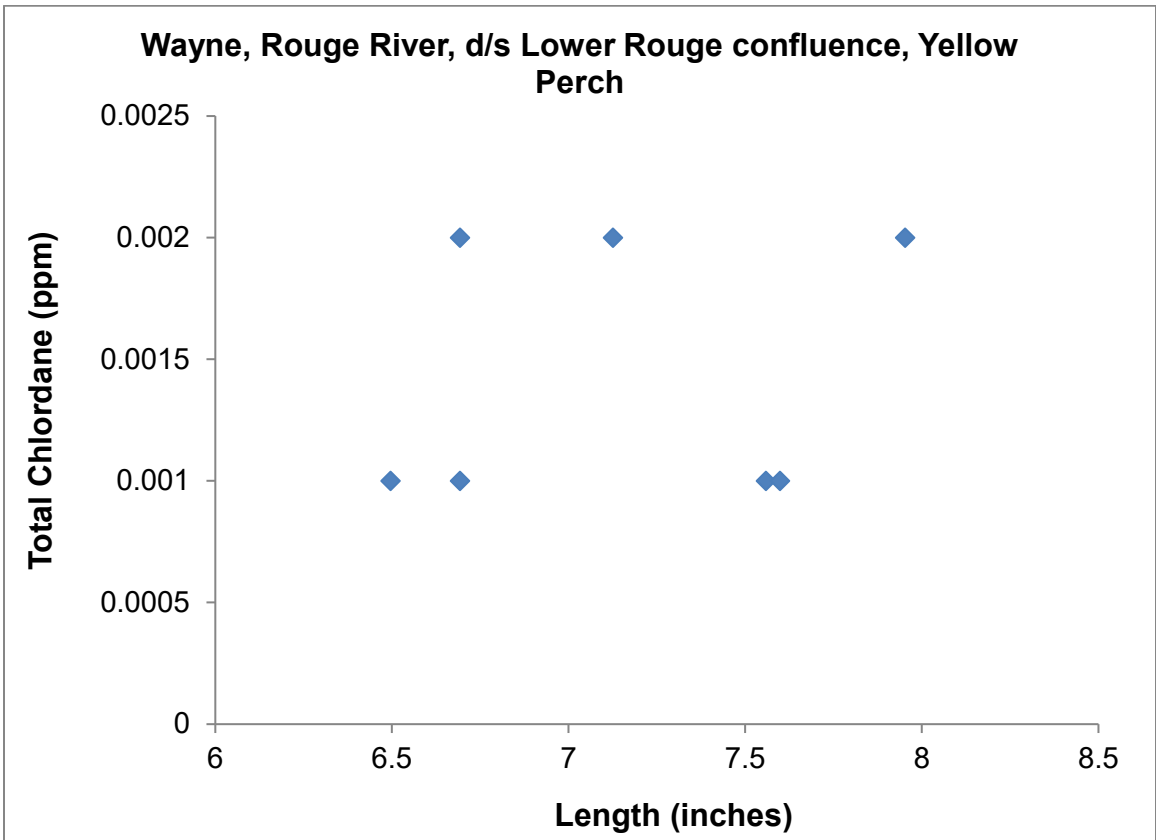
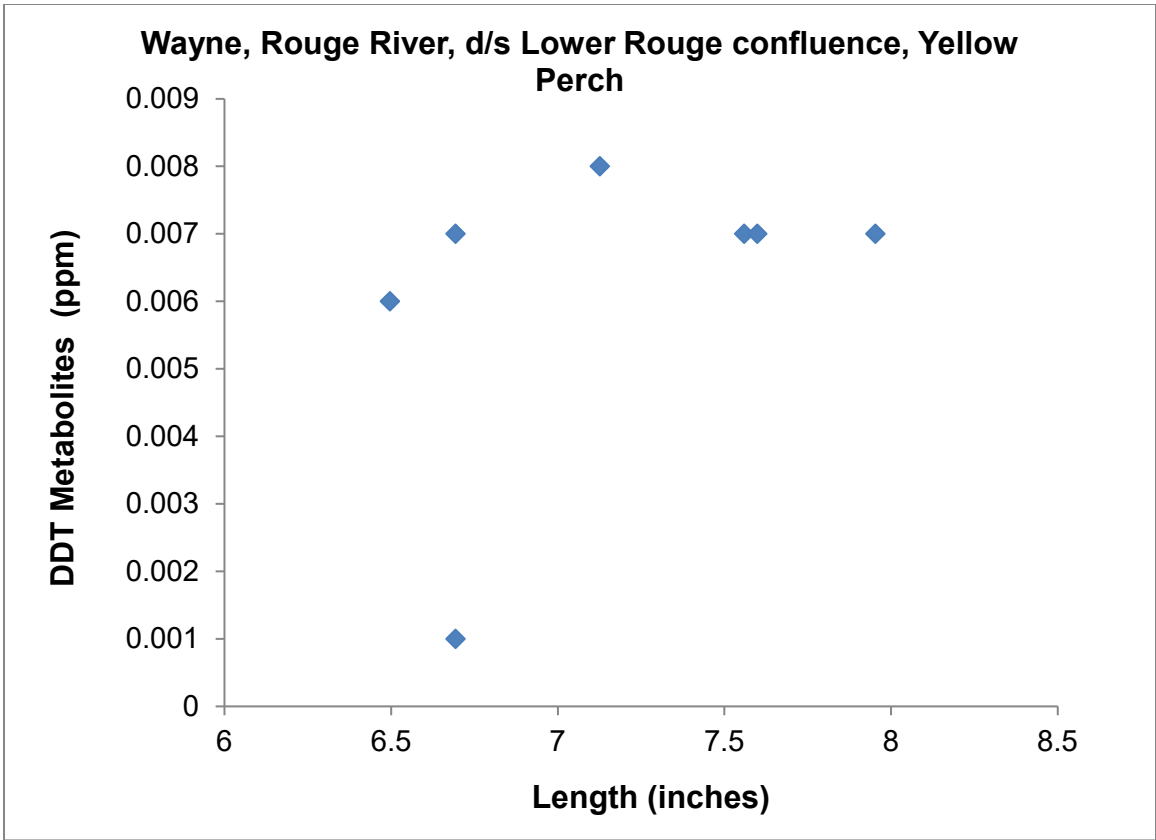
Organics Analysis:

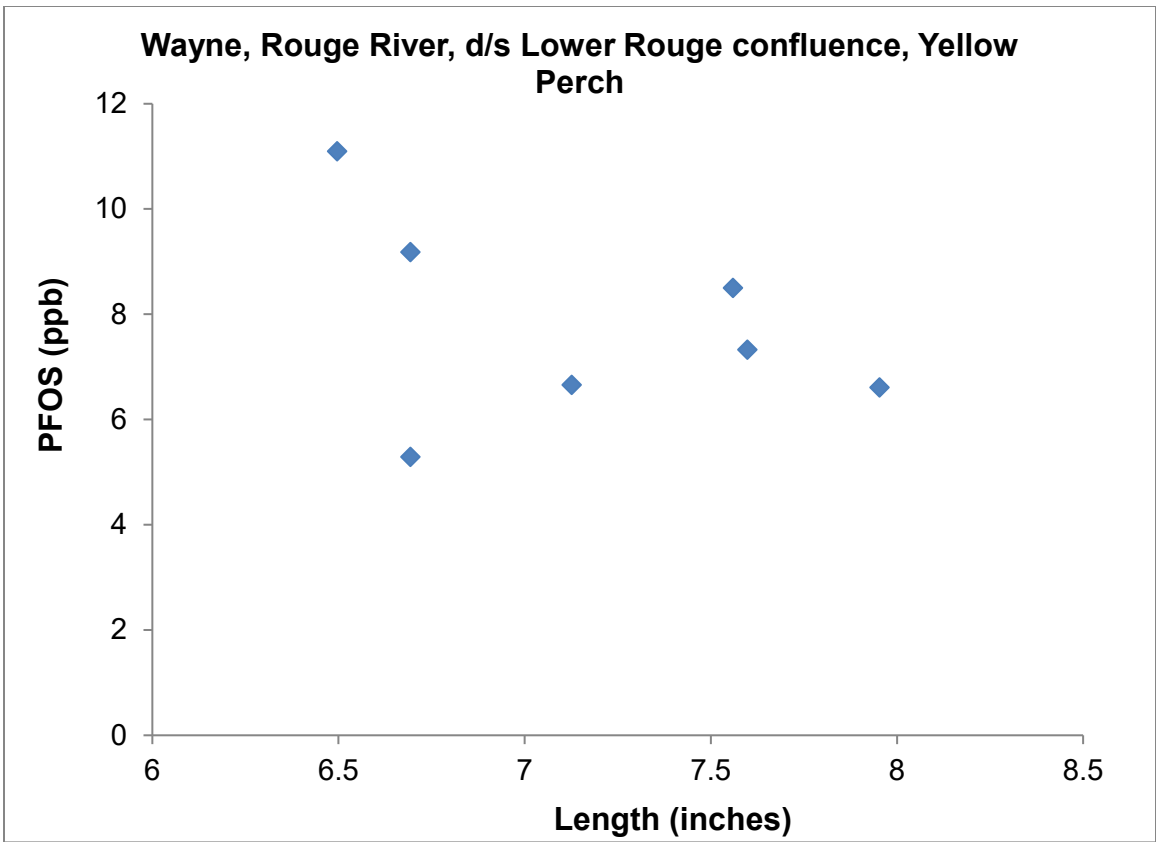
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		Meal Category
Earliest	Most Recent				Min	Max	
2019	2019	7	6.5	NA	6.5	8.0	
Datasets available:		2019					
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category	
PCB	7	0.010	0.002	0.030	0.018	12	
DDT	7	0.006	0.001	0.008	0.008	16	
Chlordane	7	0.001	<0.001	0.002	0.002	16	
Toxaphene	7	ND	--	--	--	--	
PFOS	7	7.8 ppb	5.3 ppb	11.1 ppb	9.6 ppb	12	
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.169	0.223					
DDT	0.193	0.166					
Chlordane	0.027	0.027					
Toxaphene	--	--					
PFOS	0.149	0.092					
Final meal category based on UCL:						8	

Existing MDHHS Advisory: Yellow Perch from the main branch of the Rouge River downstream of the Henry Ford Dam, including the Lower Branch of the Rouge River, are currently covered under the statewide guidance for mercury. No one should eat more than 4 meals per month of yellow perch of any size.

Recommendation: No one should eat more than 8 meals per month of yellow perch from the Rouge River downstream of the Henry Ford Dam in Wayne County due to mercury.







Carp

Middle Rouge River
Nankin Dam u/s to Newburg Dam

Wayne County

Hg Analysis:

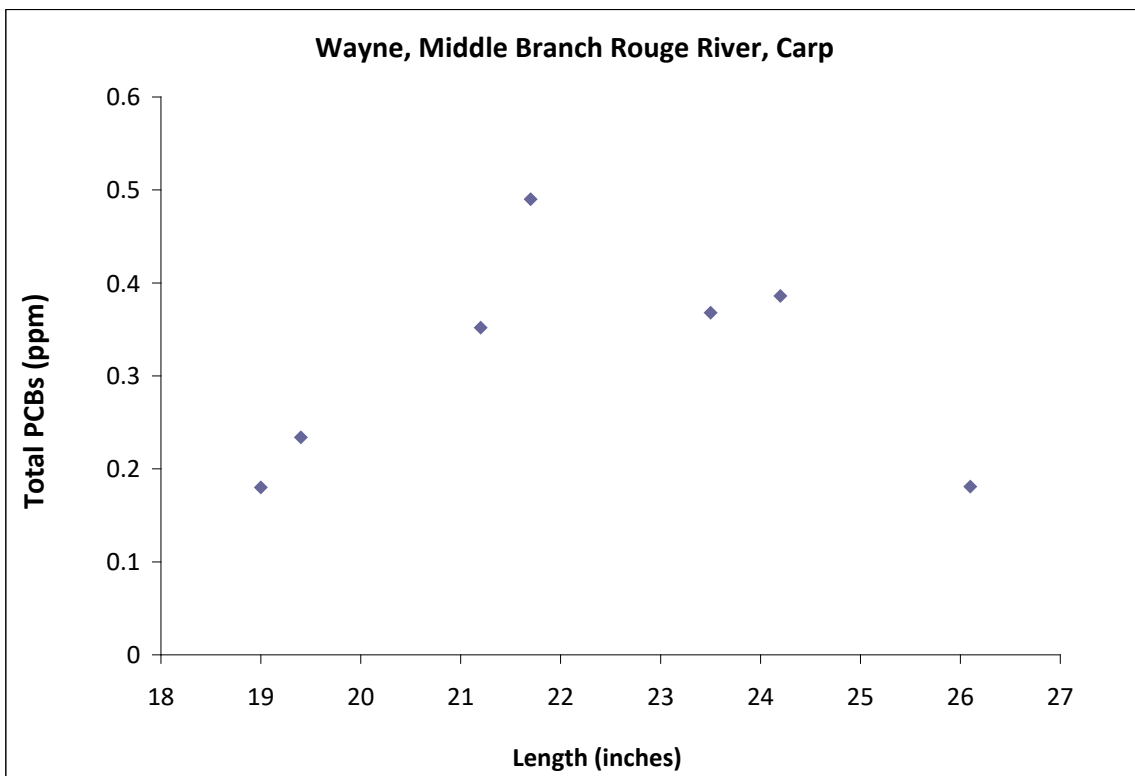
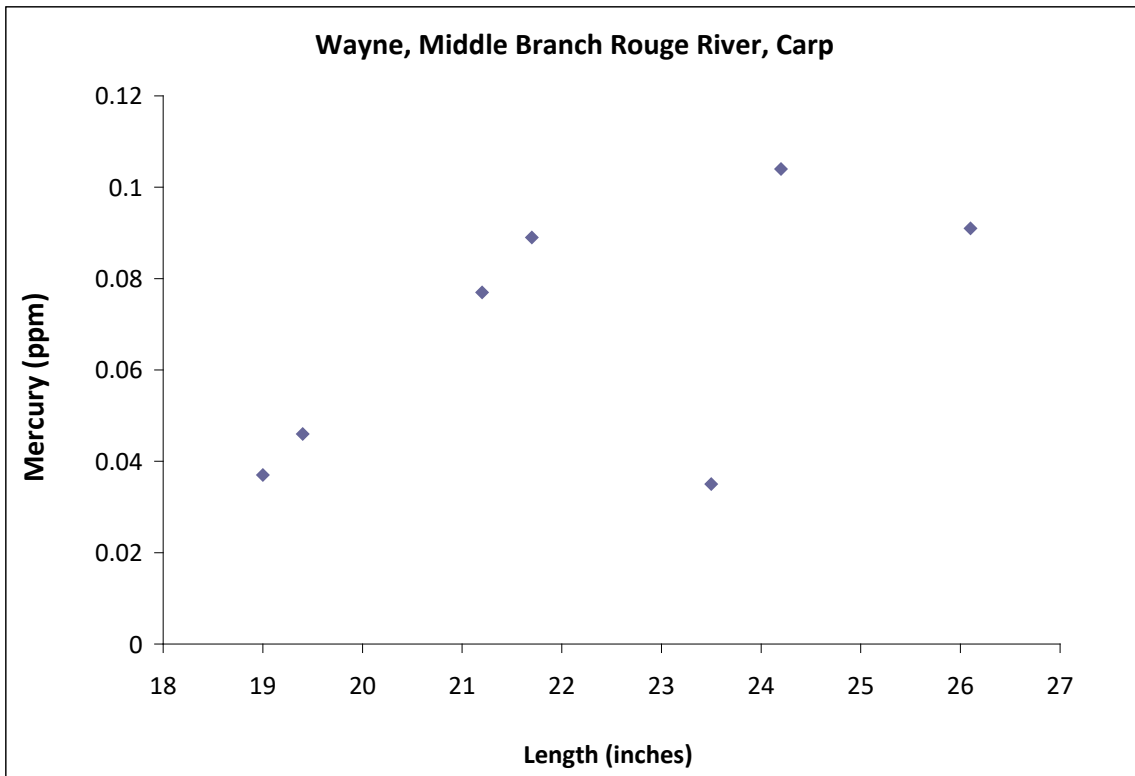
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2005	2005	7	19	na	19	26.1
Datasets available: 2005						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	7	0.068		0.090	12	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.345	0.294				

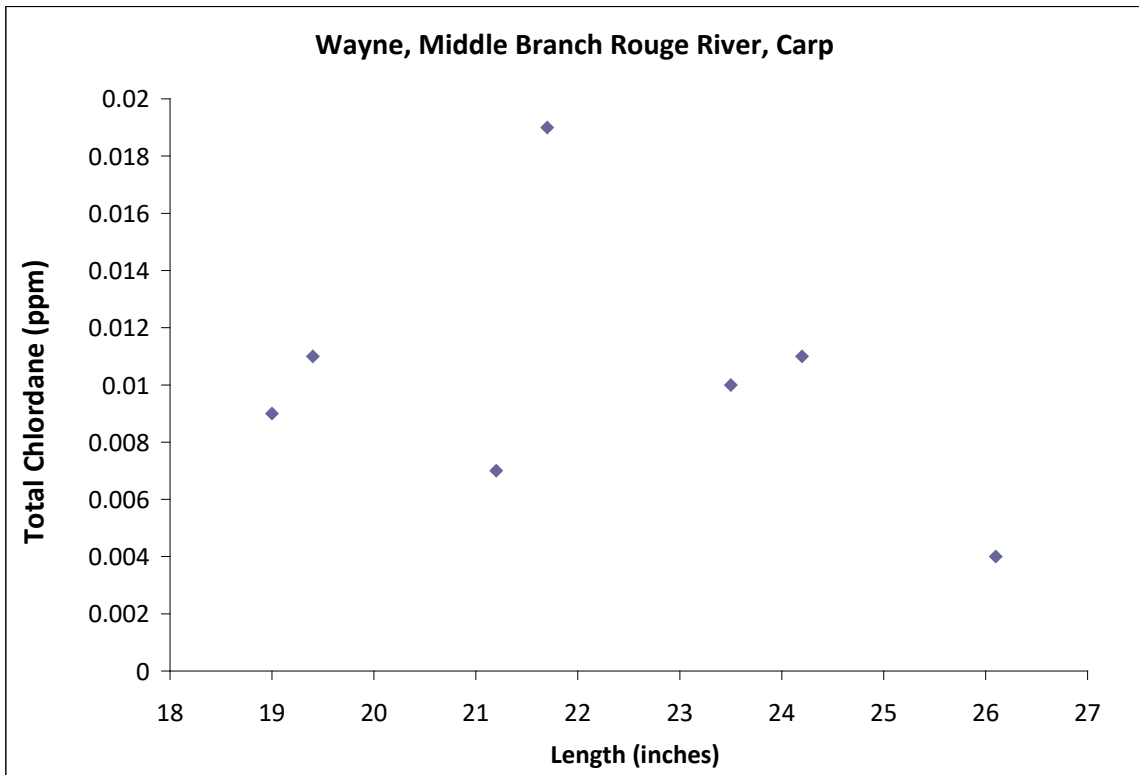
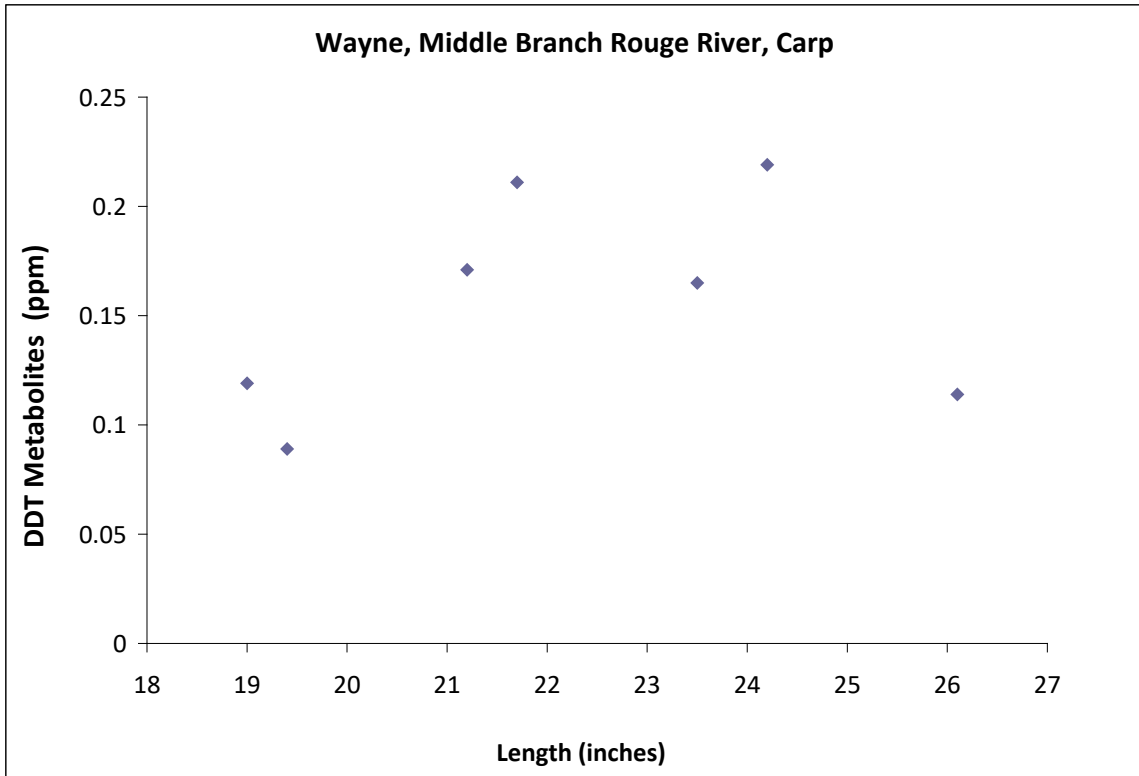
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2005	2005	7	19	na	19	26.1
Datasets available: 2005						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	7	0.313		0.420	0.5	
DDT	7	0.155		0.200	8	
Chlordane	7	0.010		0.010	--	
Toxaphene	7	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.015	0.014				
DDT	0.094	0.106				
Chlordane	0.097	0.198				
Toxaphene	--	--				
Final meal category based on UCL:						0.5

Existing Advisory: Women and children should eat no more than six meals per year of Middle Rouge River carp less than 30 inches and no one should eat Middle Rouge River carp greater than 30 inches in length due to elevated levels of PCBs.

Recommendation: No one should eat more than 6 meals per year of carp from the Middle Rouge River between the Nankin and Newburgh Dams due to PCBs. DDT and mercury would cause advisories.





Northern Pike

**Middle Rouge River
Nankin Dam u/s to Newburg Dam**

Wayne County

Hg Analysis:

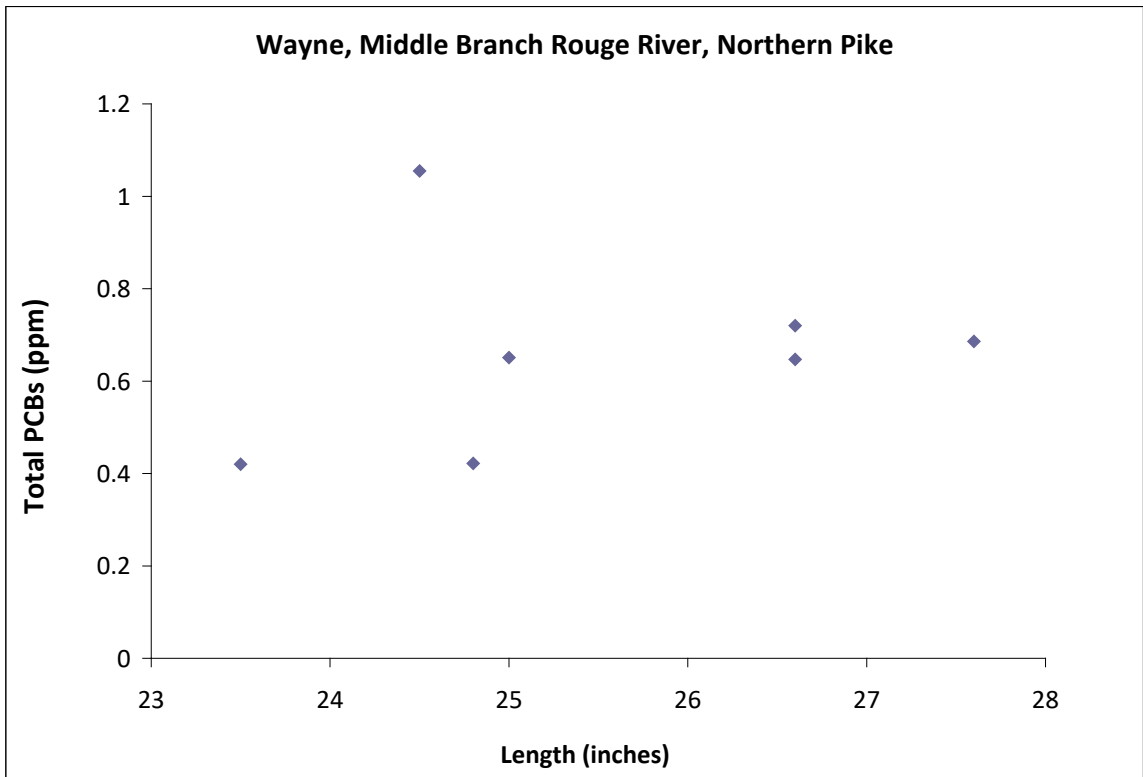
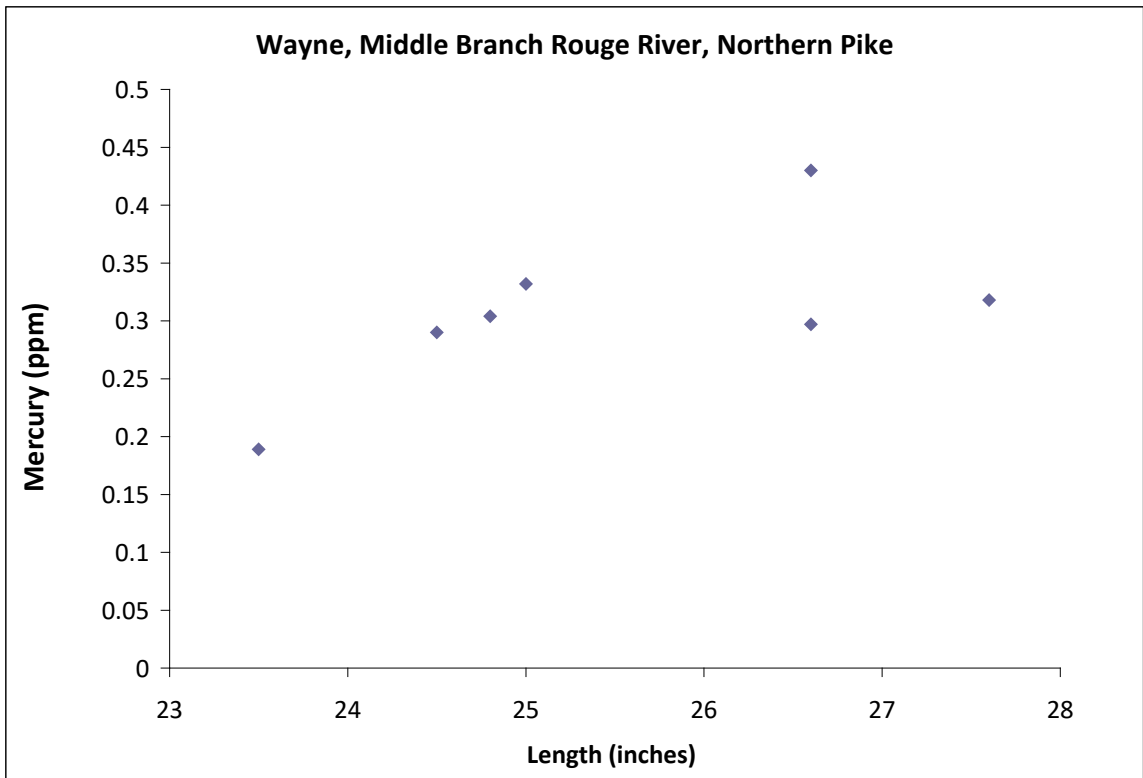
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2005	2005	7	23.5	24	23.5	27.6
Datasets available: 2005						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	7	0.309		0.370	2	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.401	0.439				

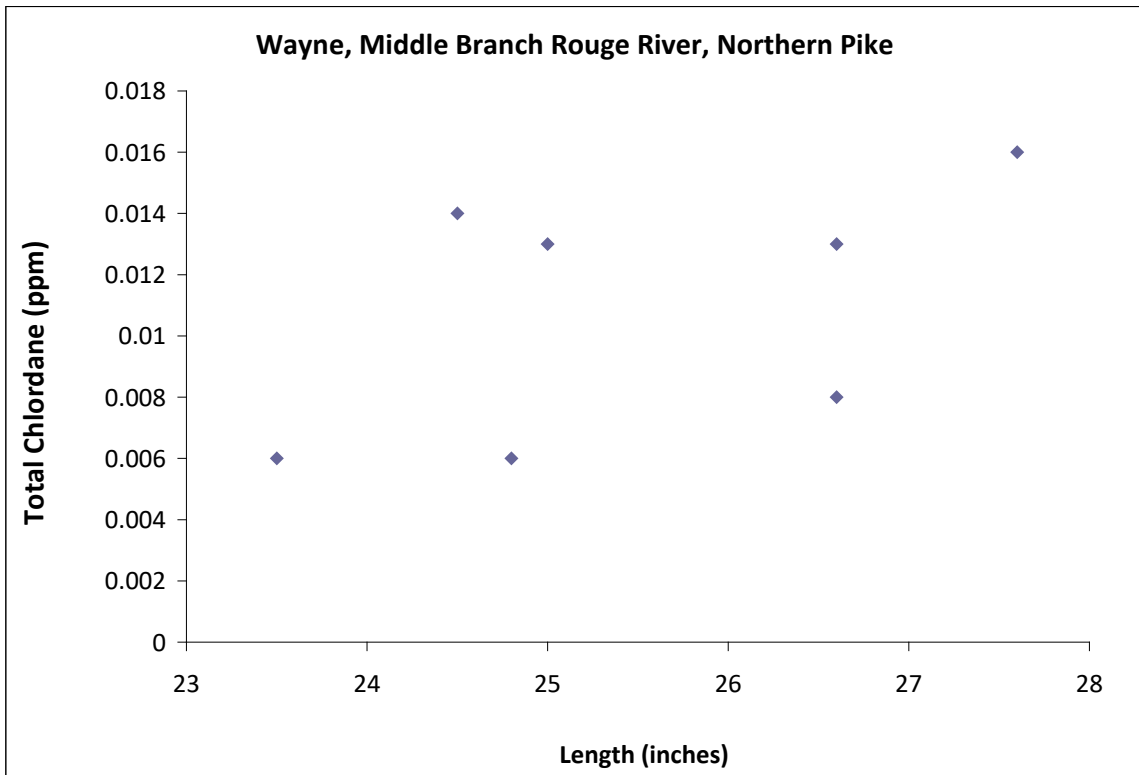
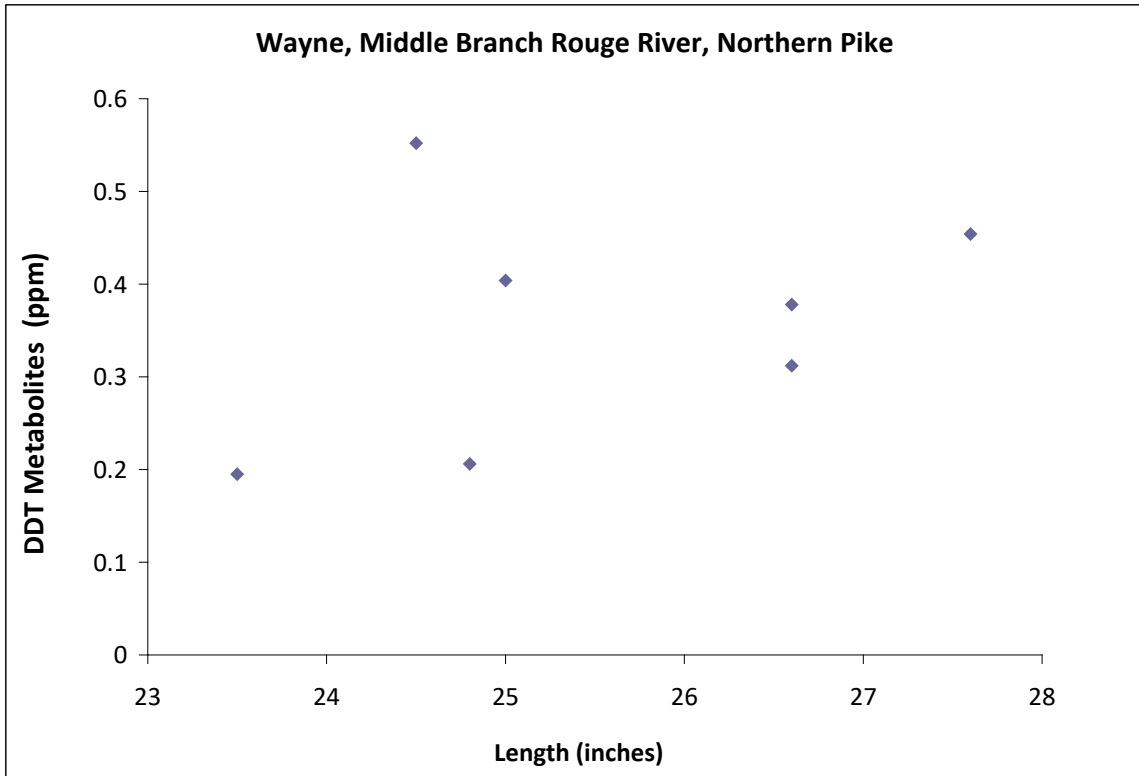
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2005	2005	7	23.5	24	23.5	27.6
Datasets available: 2005						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	7	0.657		0.860	Limited	
DDT	7	0.357		0.480	2	
Chlordane	7	0.011		0.010	--	
Toxaphene	7	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.038	0.108				
DDT	0.119	0.199				
Chlordane	0.282	0.287				
Toxaphene	--	--				
Final meal category based on UCL:					Limited	

Existing Advisory: Women and children should eat no more than six meals per year of Middle Rouge River northern pike due to elevated levels of PCBs.

Recommendation: Sensitive populations should not eat these fish. Healthy adults should limit consumption of these fish to no more than 1 or 2 meals per year due to PCBs. DDT and mercury would cause advisories.





Rock Bass

**Middle Rouge River
Nankin Dam u/s to Newburg Dam**

Wayne County

Hg Analysis:

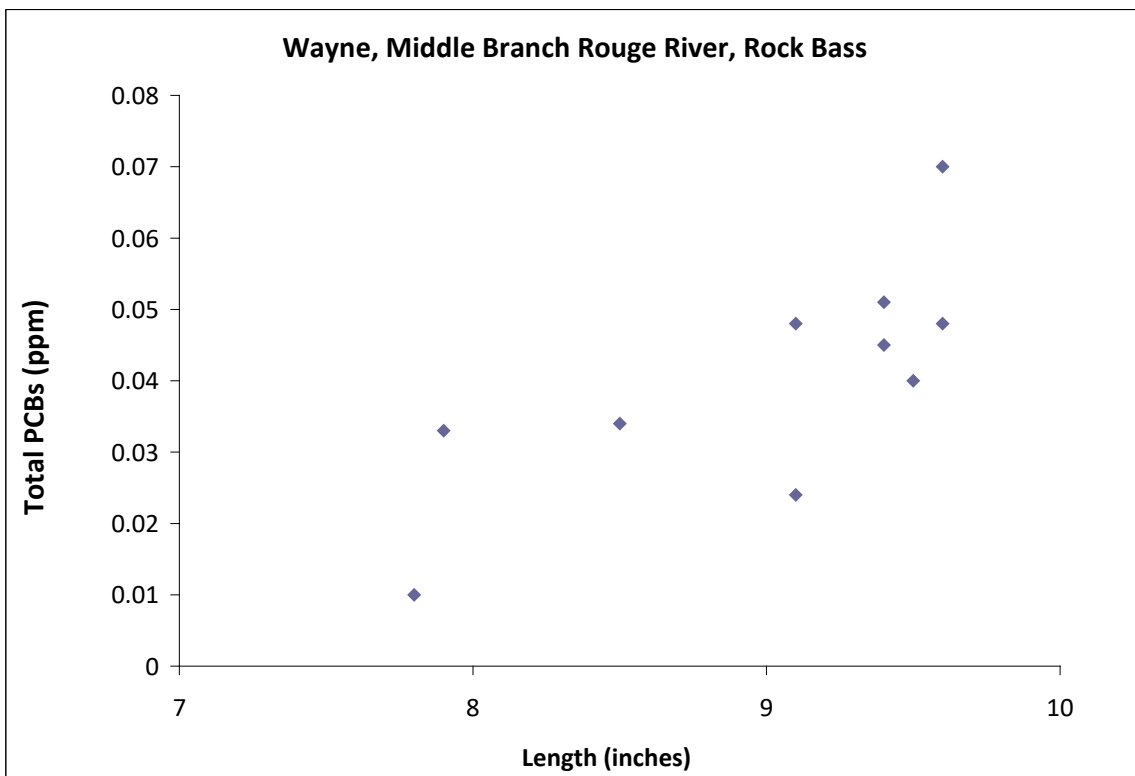
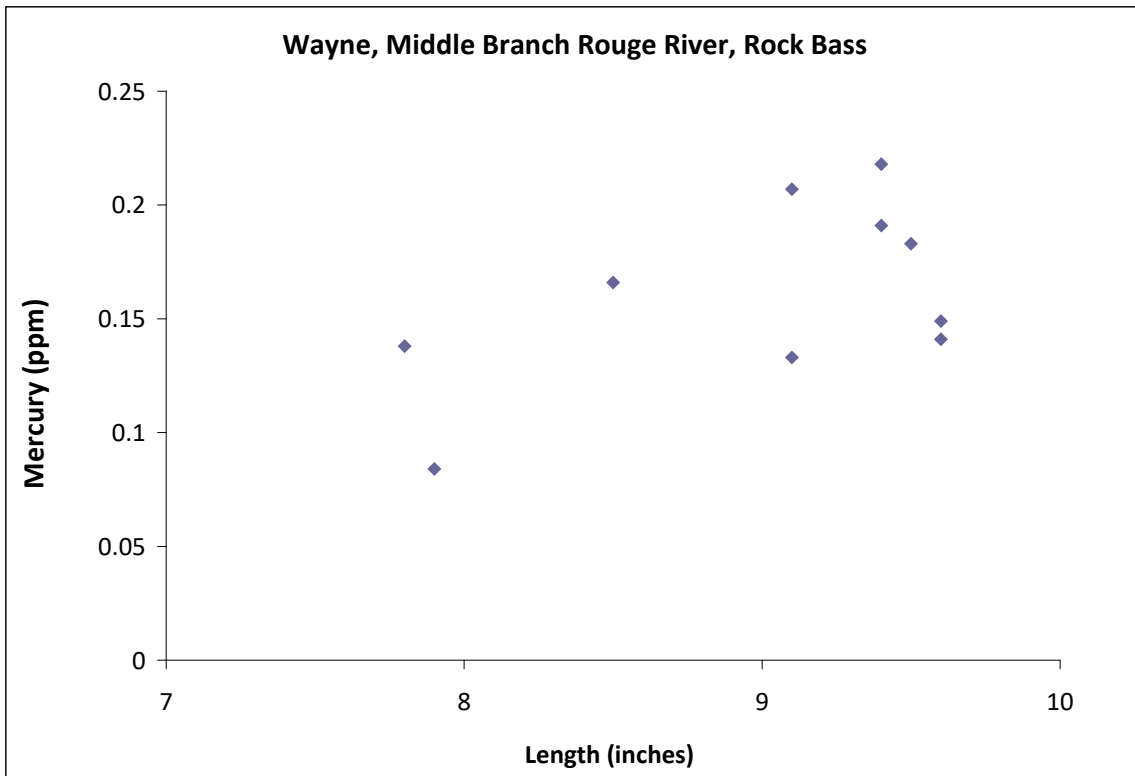
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2005	2005	10	7.8	na	7.8	9.6
Datasets available: 2005						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	10	0.161		0.190	4	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.312	0.351				

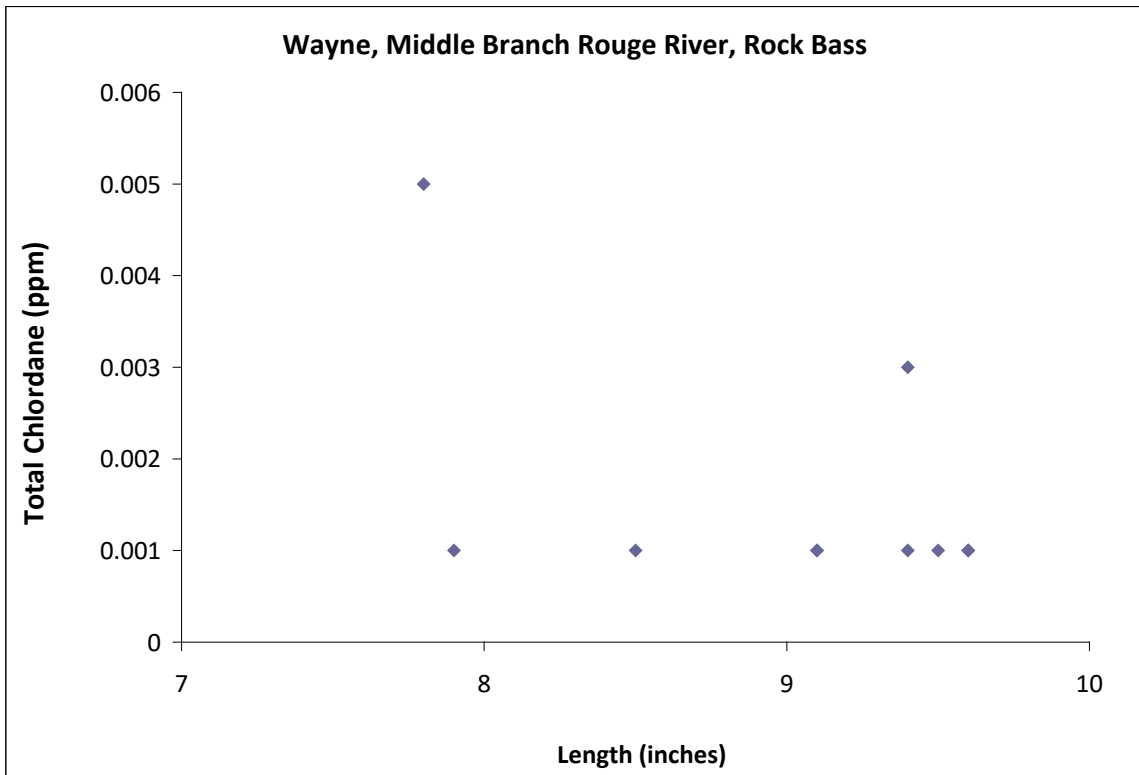
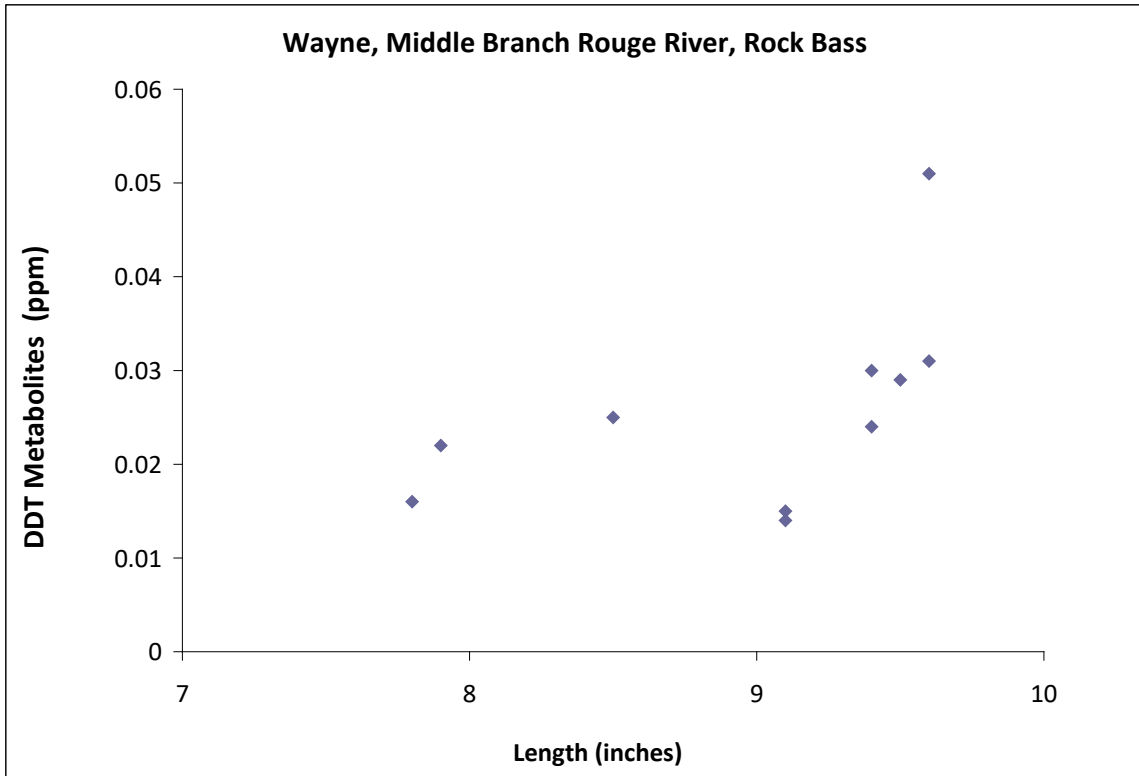
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2005	2005	10	7.8	na	7.8	9.6
Datasets available: 2005						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	10	0.040		0.050	4	
DDT	10	0.026		0.030	16	
Chlordane	10	0.002		0.002	--	
Toxaphene	10	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.556	0.572				
DDT	0.273	0.264				
Chlordane	0.225	0.166				
Toxaphene	--	--				
Final meal category based on UCL:						4

Existing Advisory: Women and children should eat no more than one meal per week of Middle Rouge River rock bass due to elevated levels of PCBs.

Recommendation: No one should eat more than 4 meals per month of rock bass from the Middle Rouge River between the Nankin and Newburgh Dams due to PCBs and mercury.





White Sucker

**Middle Rouge River
Nankin Dam u/s to Newburg Dam**

Wayne County

Hg Analysis:

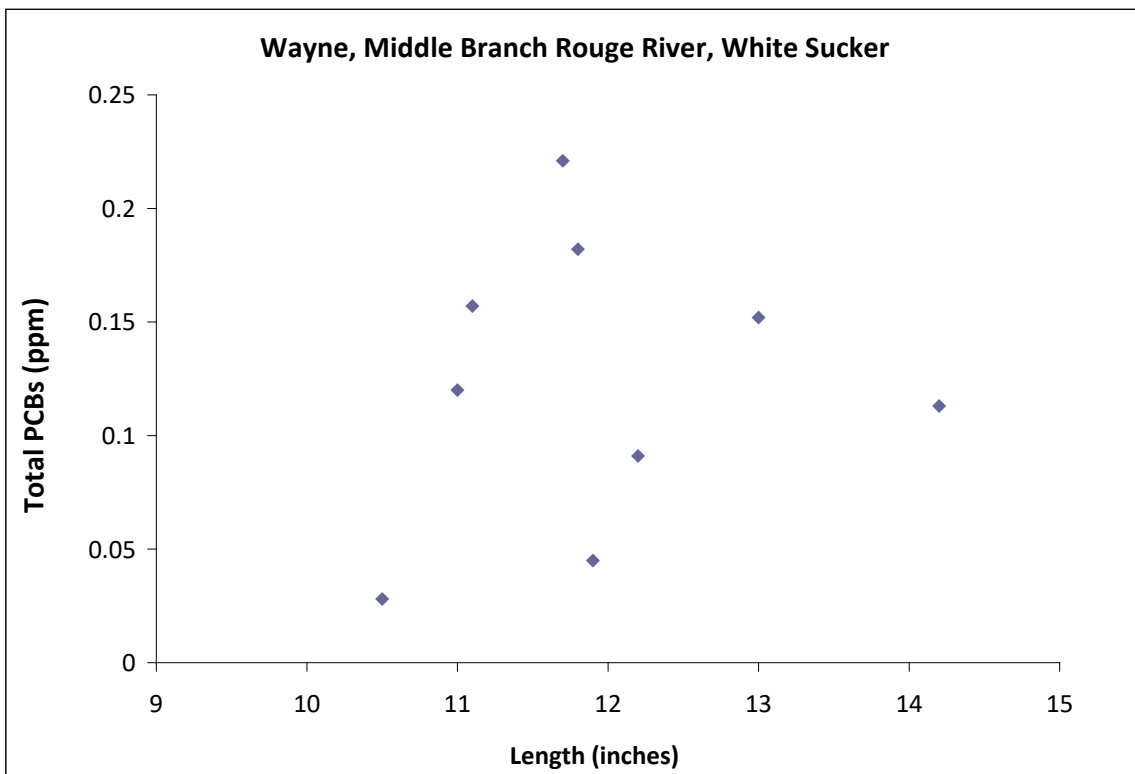
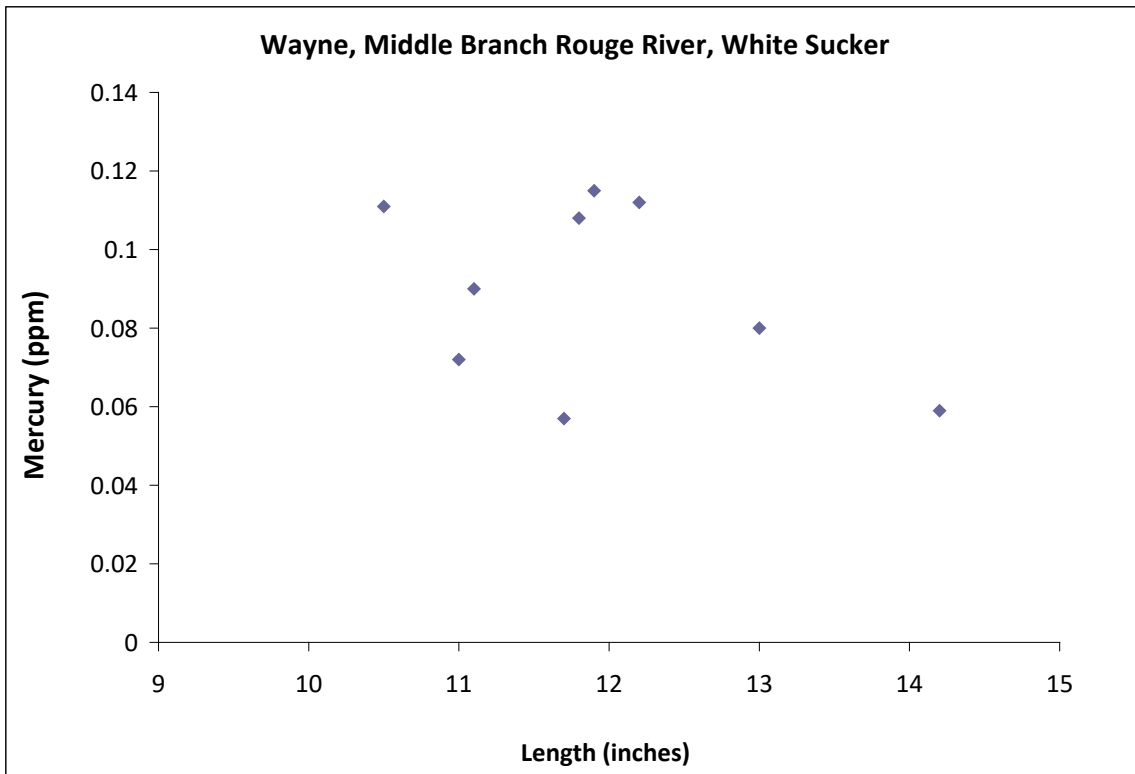
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2002	2005	9	9.5	na	9.5	14.2
Datasets available: 2002, 2005						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	9	0.09		0.11		8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.161	0.174				

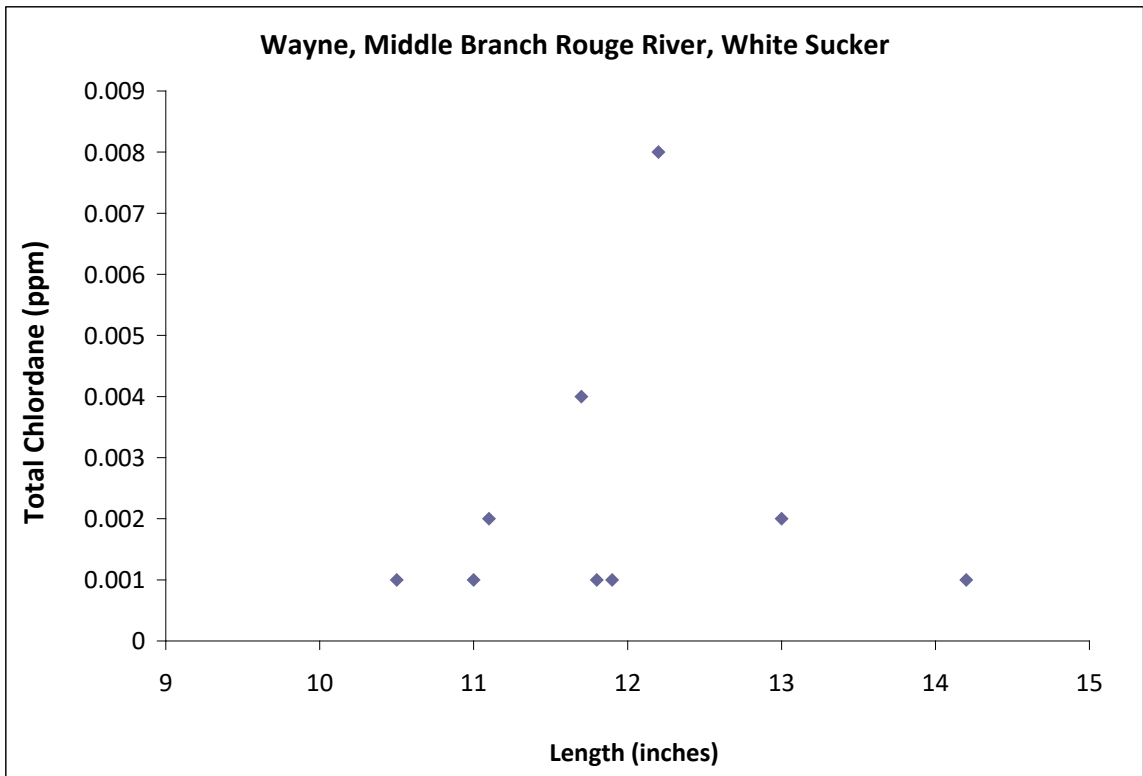
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2002	2005	19	9.5	na	9.5	14.2
Datasets available: 2002, 2005						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	9	0.123		0.170		1
DDT	9	0.063		0.090		16
Chlordane	9	0.002		0.000		--
Toxaphene	8	ND		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.022	0.082				
DDT	0.033	0.103				
Chlordane	0.004	0.003				
Toxaphene	--	--		Final meal category based on UCL:		1

Existing Advisory: Women and children should eat no more than one meal per month of Middle Rouge River white sucker less than 14 inches and no more than six meals per year of Middle Rouge River white sucker larger than 14 inches in length, due to elevated levels of PCBs.

Recommendation: No one should eat more than 1 meal per month of sucker from the Middle Rouge River due to PCBs. Mercury would cause an advisory.





Bluegill/Pumpkinseed

**Rouge River
Newburgh Lake**

Wayne County

Hg Analysis:

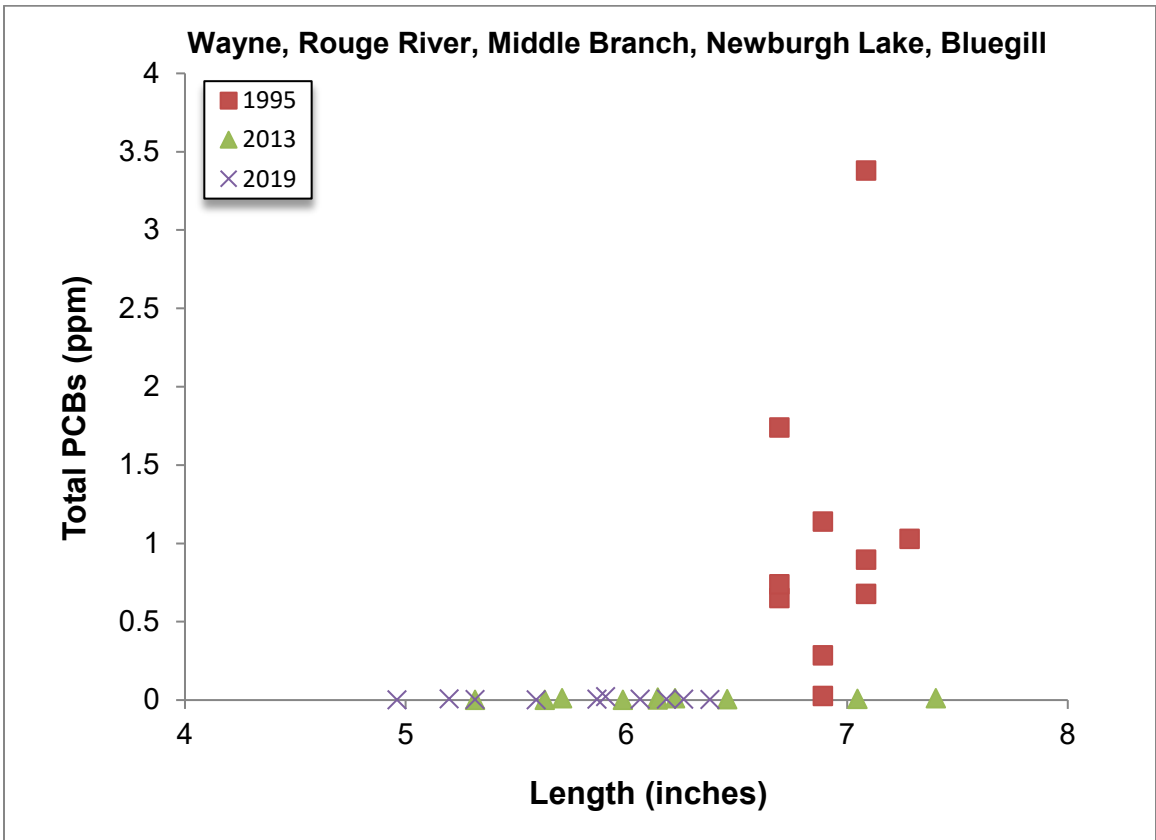
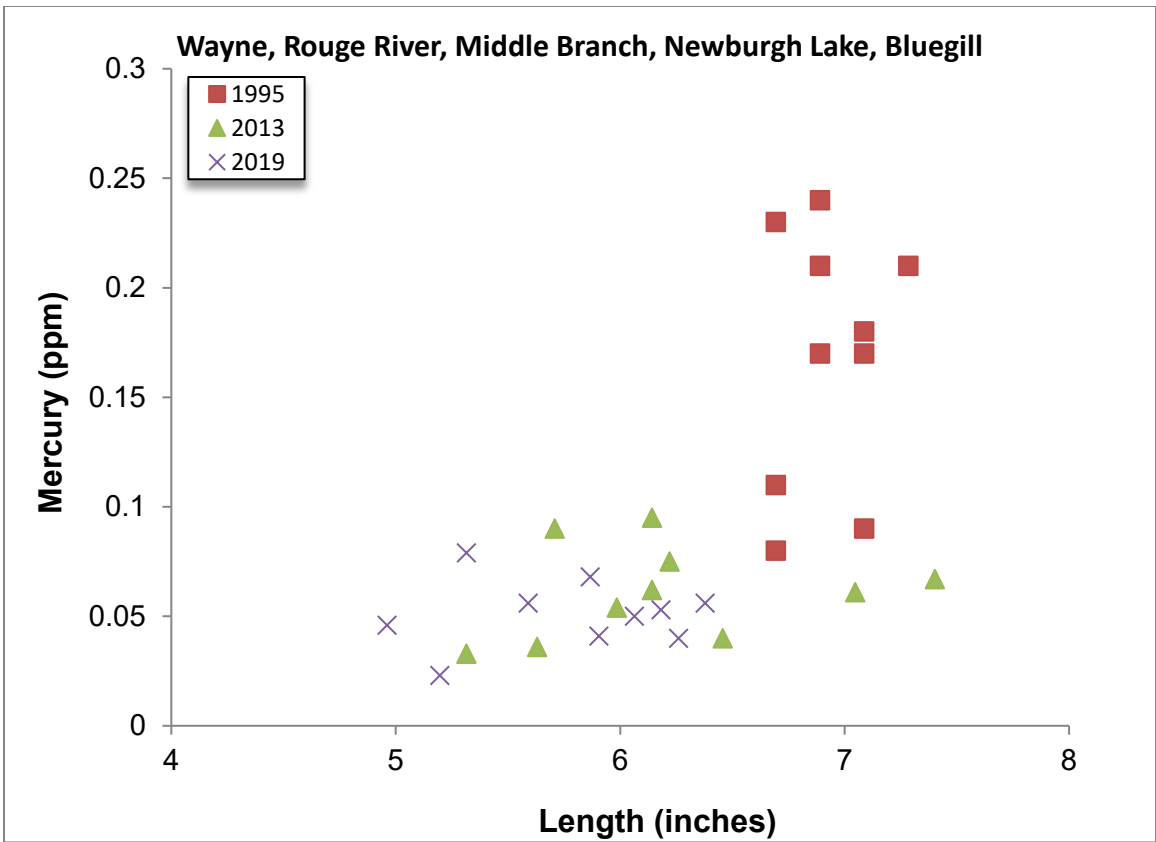
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent						
1995	2019	30	5.0	NA	5.0	7.4	
Datasets available: 1995, 2013, 2019							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	30	0.094		0.023	0.240	0.118	8
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.387	0.455					

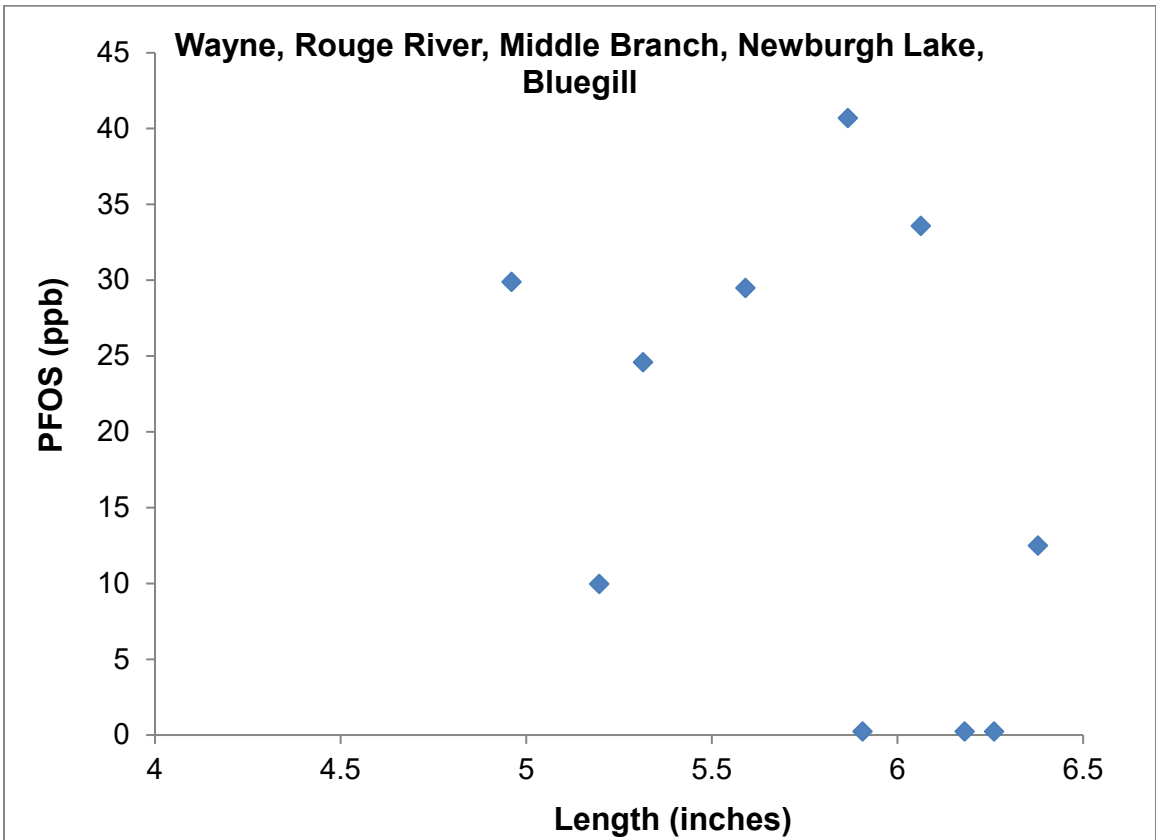
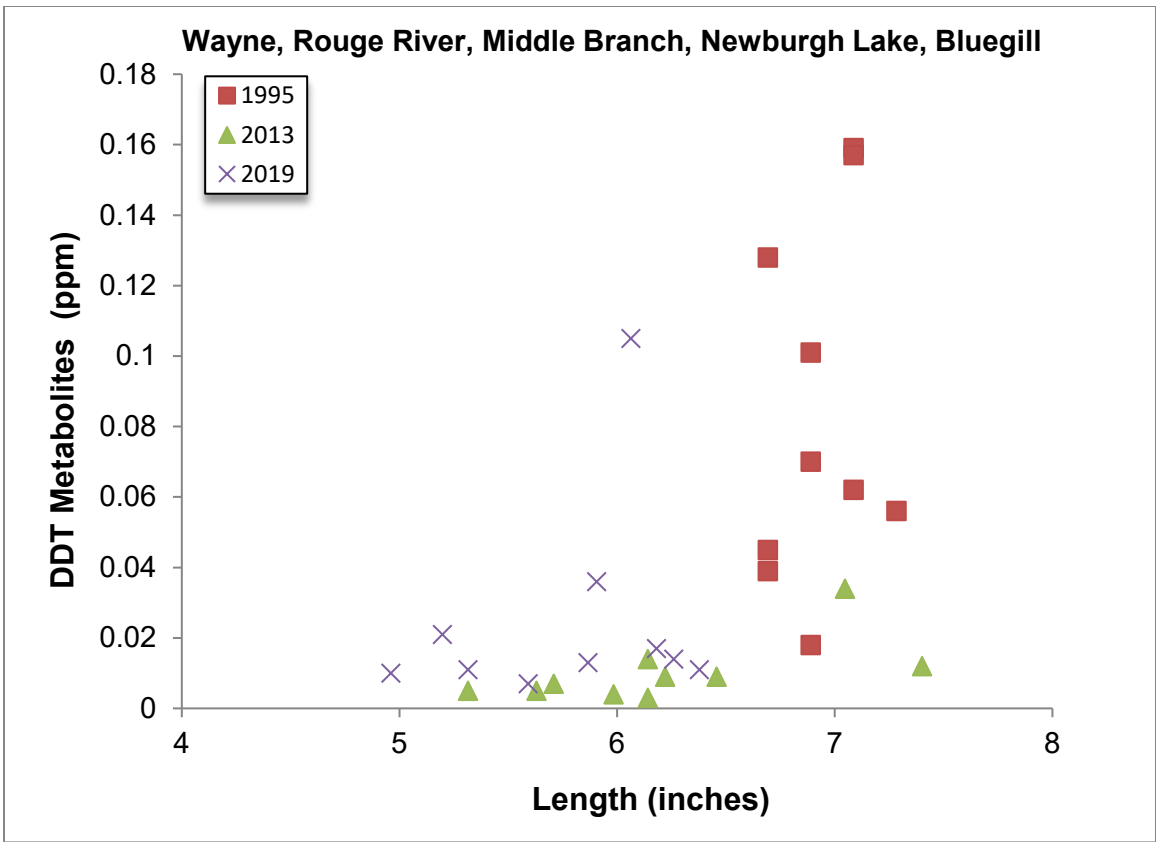
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent						
2013	2019	20	5.0	NA	5.0	7.4	
Datasets available: 1995 (No PFOS), 2013 (No PFOS), 2019							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	20	0.008		<0.002	0.023	0.010	16
DDT	20	0.017		<0.003	0.105	0.028	16
Chlordane	20	ND		--	--	--	--
Toxaphene	20	ND		--	--	--	--
PFOS	10	18.1 ppb		<0.25 ppb	40.7 ppb	29.1 ppb	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.112	0.210					
DDT	0.016	0.043					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	0.141	0.231					
Final meal category based on UCL:							4

Existing MDHHS Advisory: A waterbody-wide guideline of 6 meals per year exists for Newburgh Lake due to PCBs. Sediment remediation work has been completed but additional samples are needed before the guidance can be relaxed.

Recommendation: No one should eat more than four meals per month of bluegill and pumpkinseed sunfish from Newburgh Lake due to PFOS. Two years of post-remediation (1998) data show significant declines in Newburgh Lake PCB concentrations in bluegill and pumpkinseed since the first sampling in 1995. Therefore, the waterbody-wide guideline of 6 meals per year was relaxed for these species. Mercury would cause an advisory.





Channel Catfish

**Rouge River
Newburgh Lake**

Wayne County

Hg Analysis:

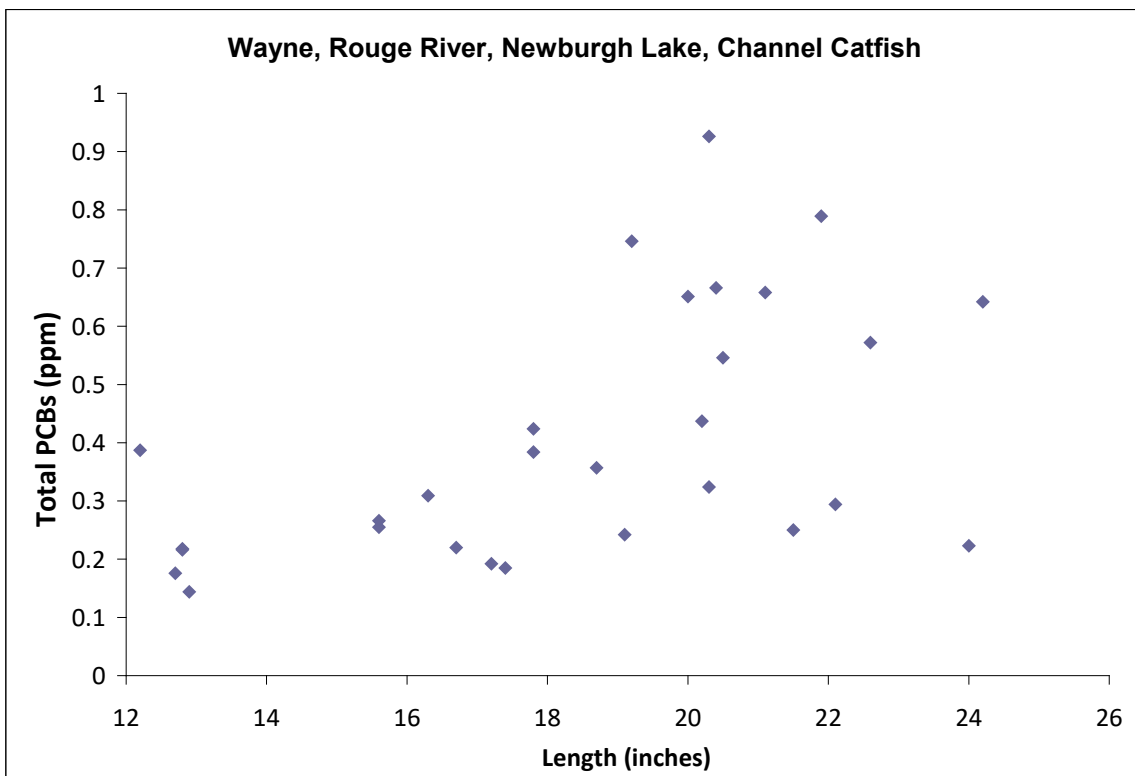
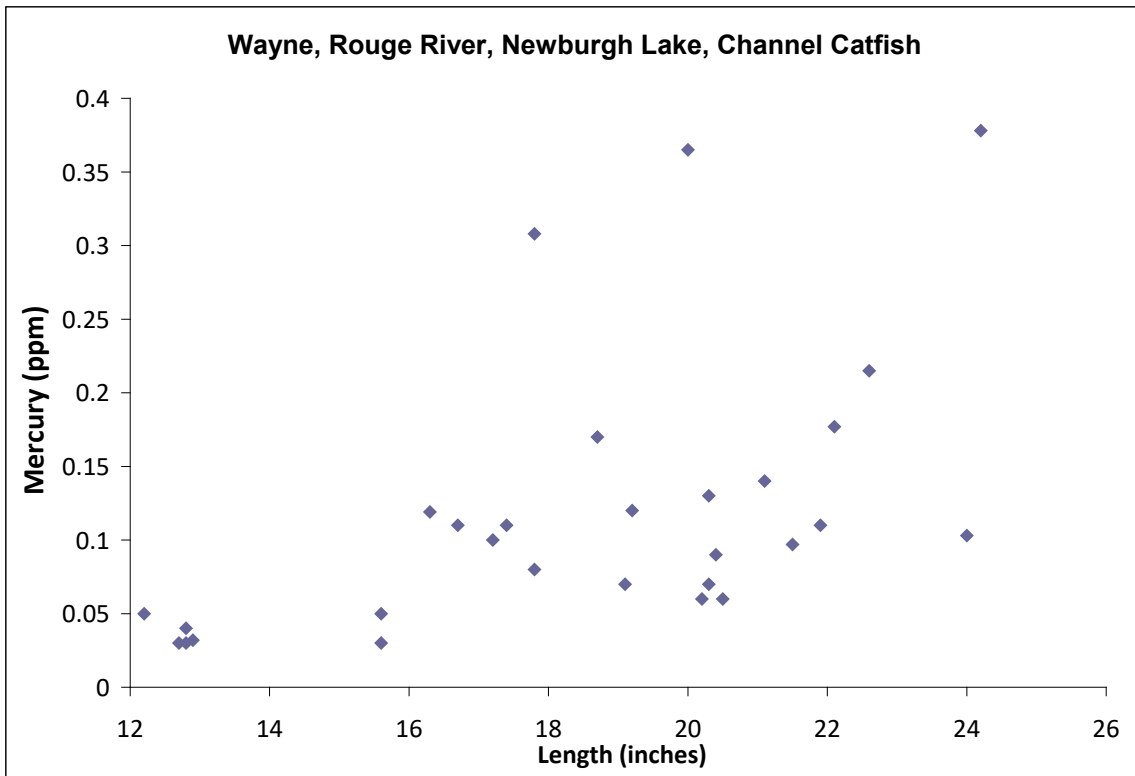
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2001	2005	29	12.2	12	12.2	24.2	
Datasets available: 2001, 2002, 2005							
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL		Meal Category
Mercury	29	0.119			0.150		4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.277	0.468					

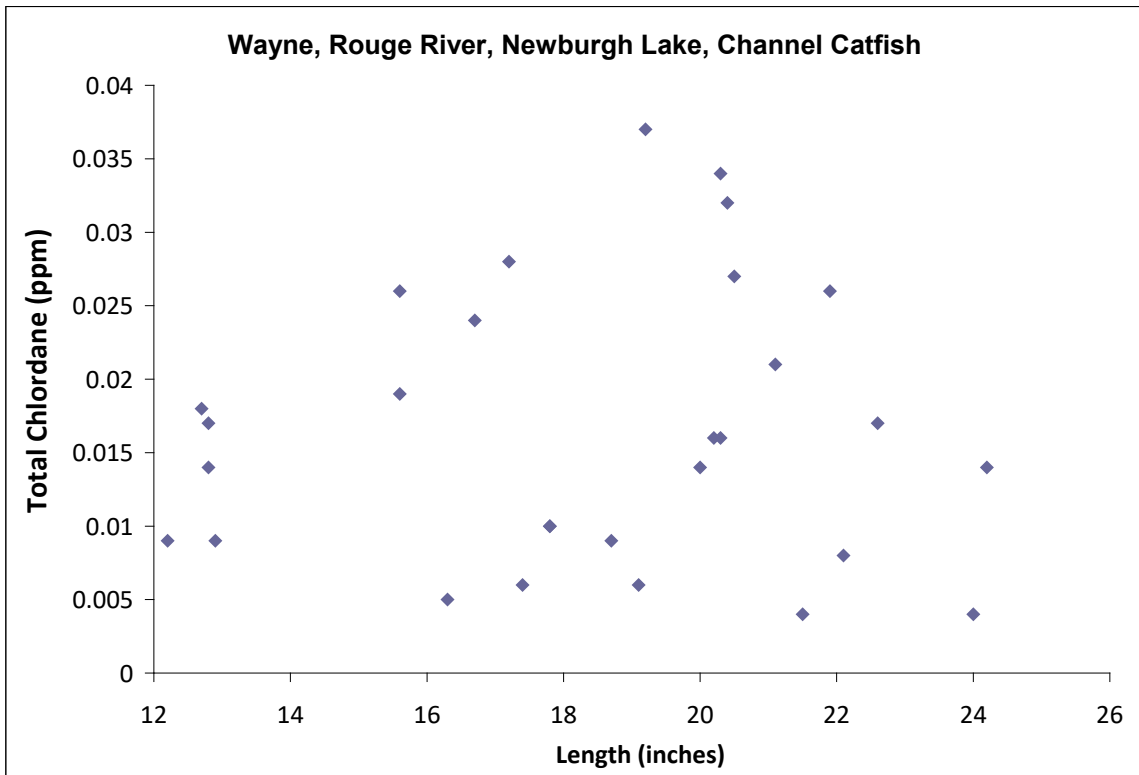
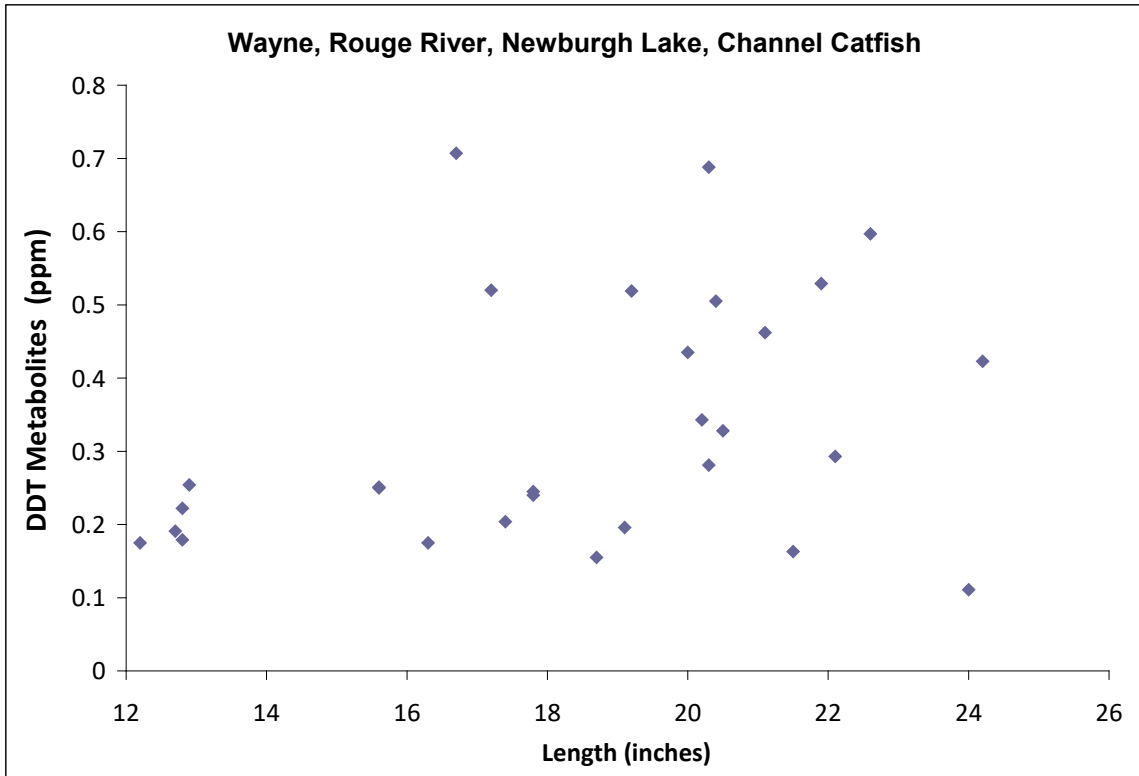
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2001	2005	29	12.2	12	12.2	24.2	
Datasets available: 2001, 2002, 2005							
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL		Meal Category
PCB	29	0.403			0.490		Limited
DDT	29	0.332			0.400		4
Chlordane	29	0.017			0.020		--
Toxaphene	27	ND			--		--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.284	0.325					
DDT	0.121	0.108					
Chlordane	0.003	0.001					
Toxaphene	--	--					
Final meal category based on UCL:							Limited

Existing Advisory: Women and children should eat no more than one meal per month of Newburgh Lake (Rouge River) channel catfish due to elevated levels of PCBs.

Recommendation: Sensitive populations should not eat these fish. Healthy adults should limit consumption of Newburgh Lake channel catfish to no more than 1 or 2 meals per year due to PCBs. DDT and mercury would cause advisories.





Common Carp

**Rouge River
Newburgh Lake**

Wayne County

Hg Analysis:

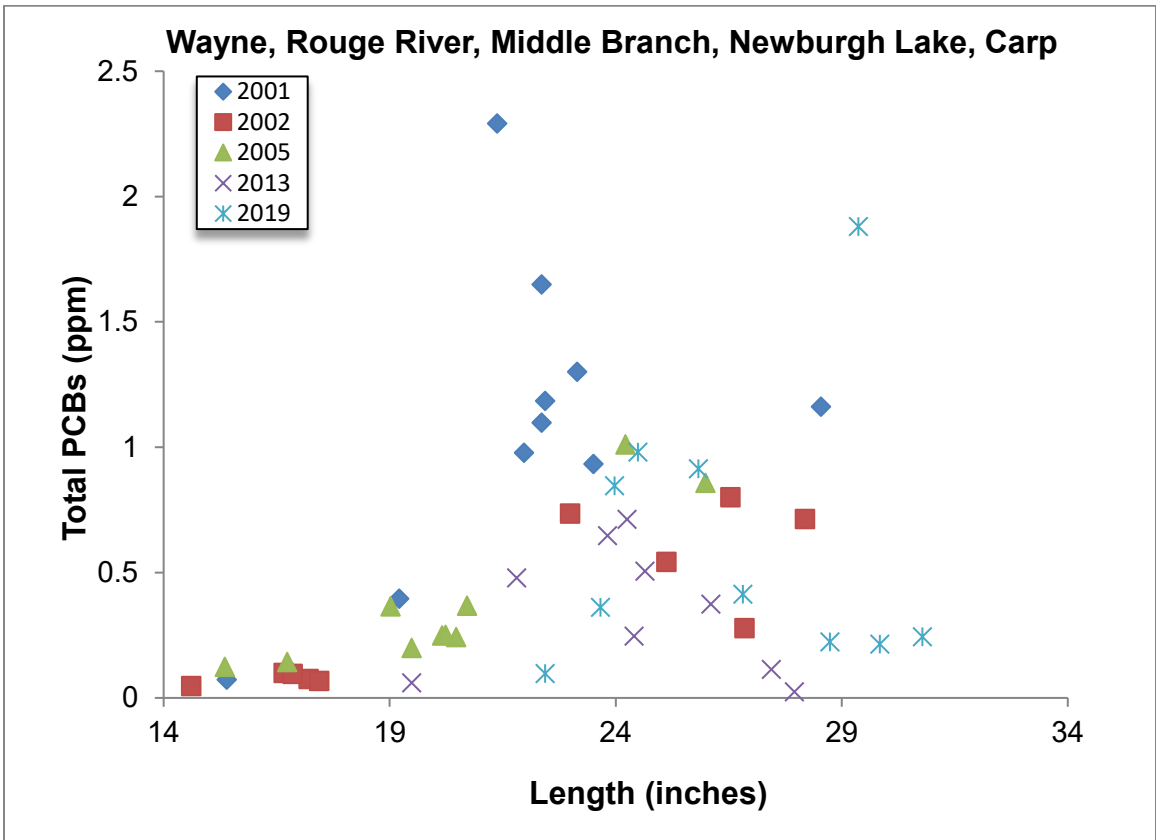
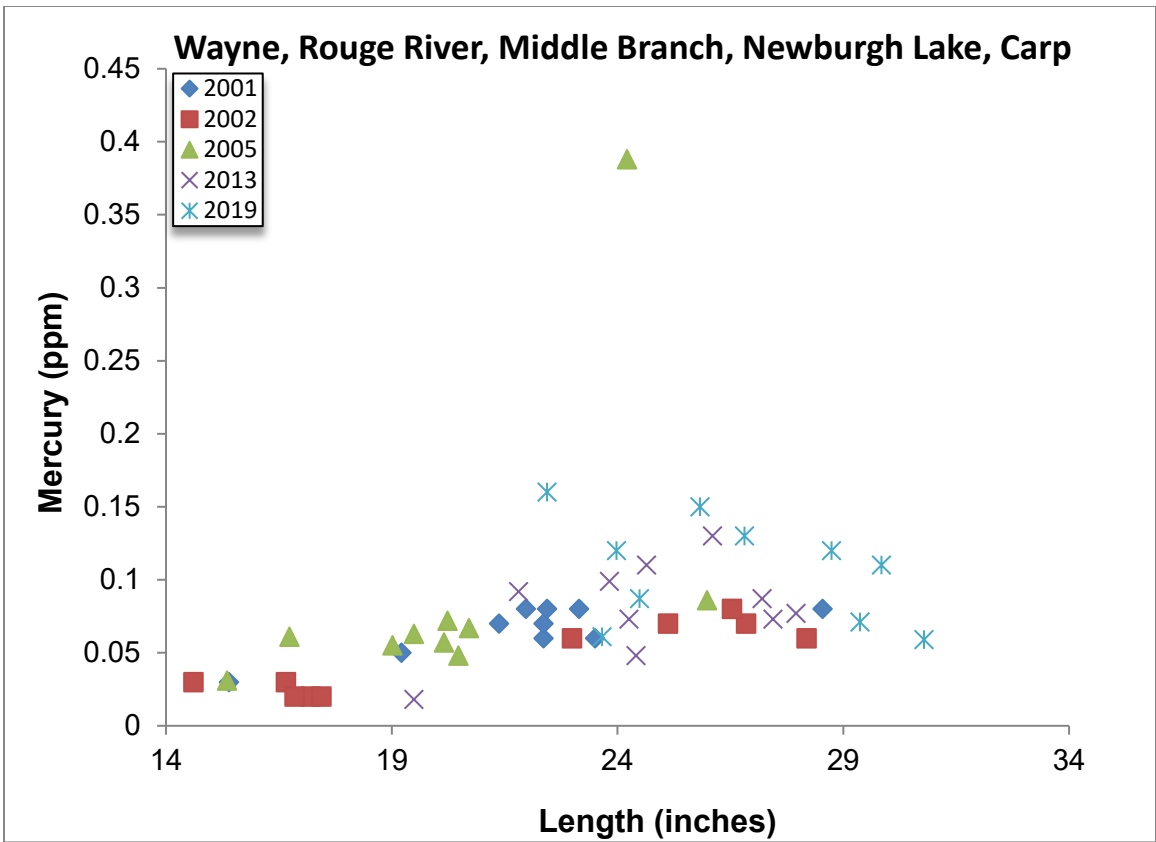
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent						
2001	2019	50	14.6	NA	14.6	30.8	
Datasets available: 2001, 2002, 2005, 2013, 2019							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	50	0.078		0.018	0.388	0.094	8
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.149	0.390					

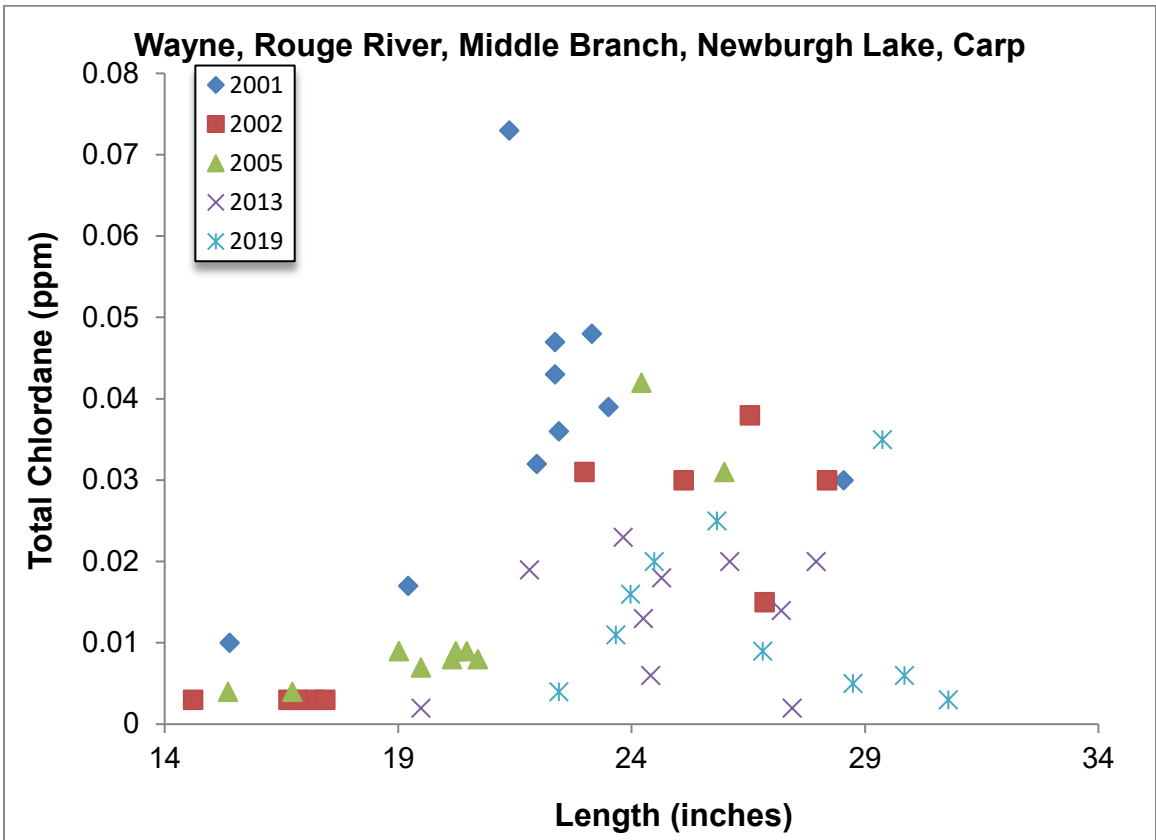
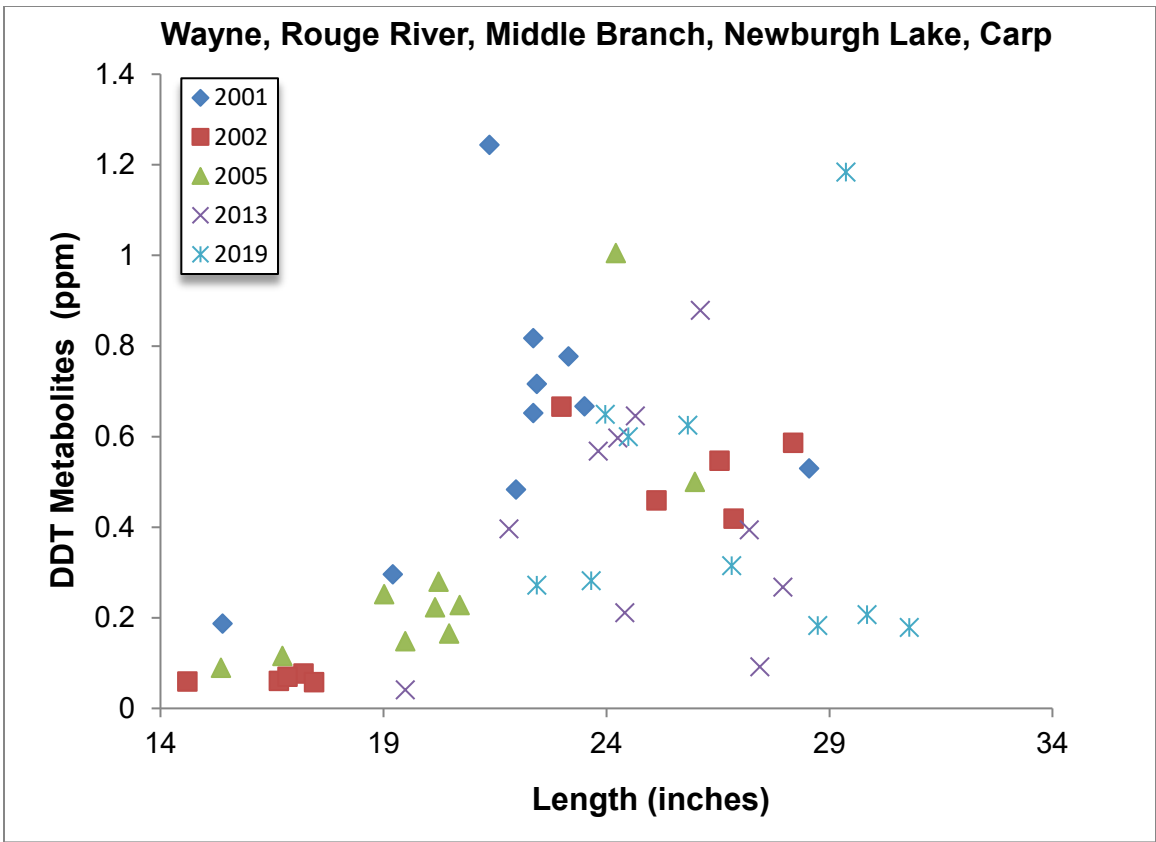
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent						
2013	2019	20	19.5	NA	19.5	30.8	
Datasets available: 2001, 2002, 2005, 2013, 2019							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	19	0.492		0.025	1.880	0.706	Limited
DDT	20	0.429		0.041	1.184	0.563	2
Chlordane	20	0.014		0.002	0.035	0.018	16
Toxaphene	20	ND		--	--	--	--
PFOS	0	--		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.015	0.001					
DDT	0.006	0.014					
Chlordane	0.003	0.000					
Toxaphene	--	--					
PFOS	--	--					
Final meal category based on UCL:							Limited

Existing MDHHS Advisory: Sensitive populations should not eat carp from Newburgh Lake impoundment of the Middle Branch of the Rouge River upstream to the Phoenix Lake dam. Healthy adults should limit consumption of Newburgh Lake carp to no more than 1 or 2 meals per year due to PCBs. DDT and mercury would cause advisories.

Recommendation: No change to the advisory is recommended.





Largemouth Bass

**Rouge River
Newburgh Lake**

Wayne County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent					
1995	2019	39	10.2	14.0	13.7	18.7
Datasets available: 1995, 2001, 2013, 2019						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	29	0.384	0.110	0.870	0.463	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.402	0.454				

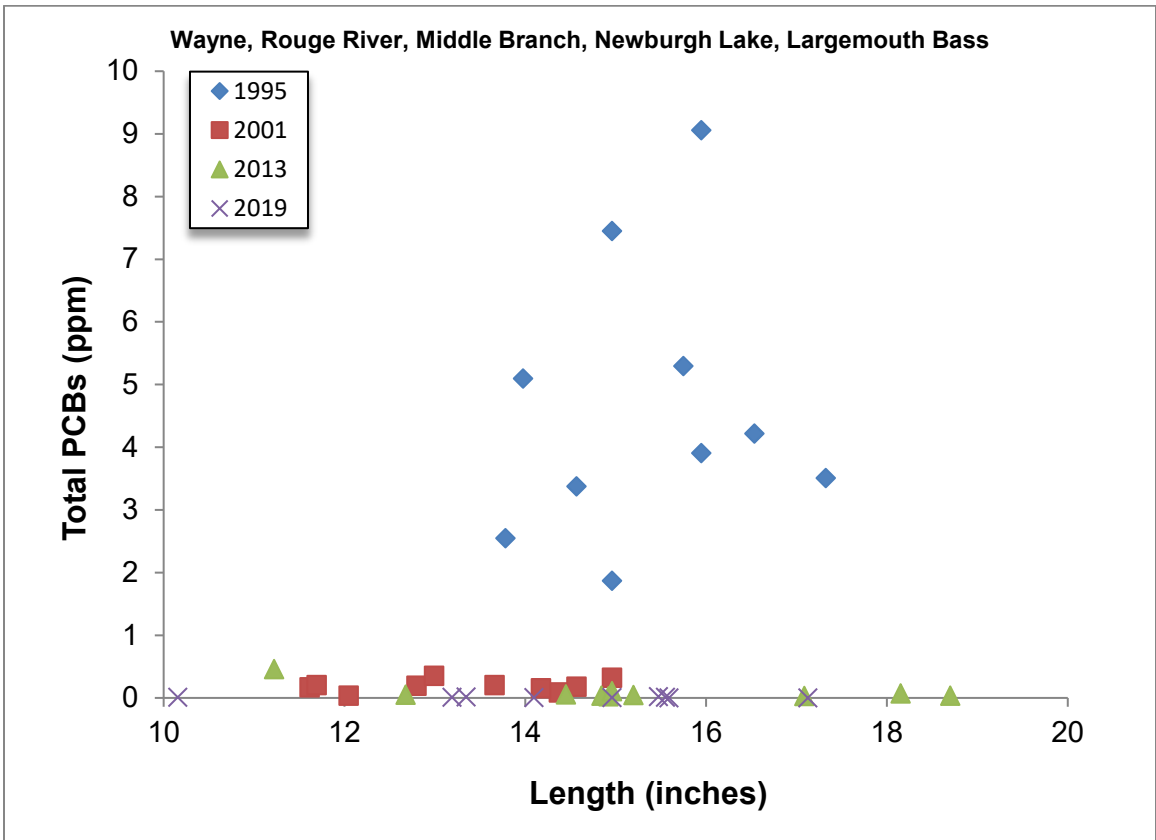
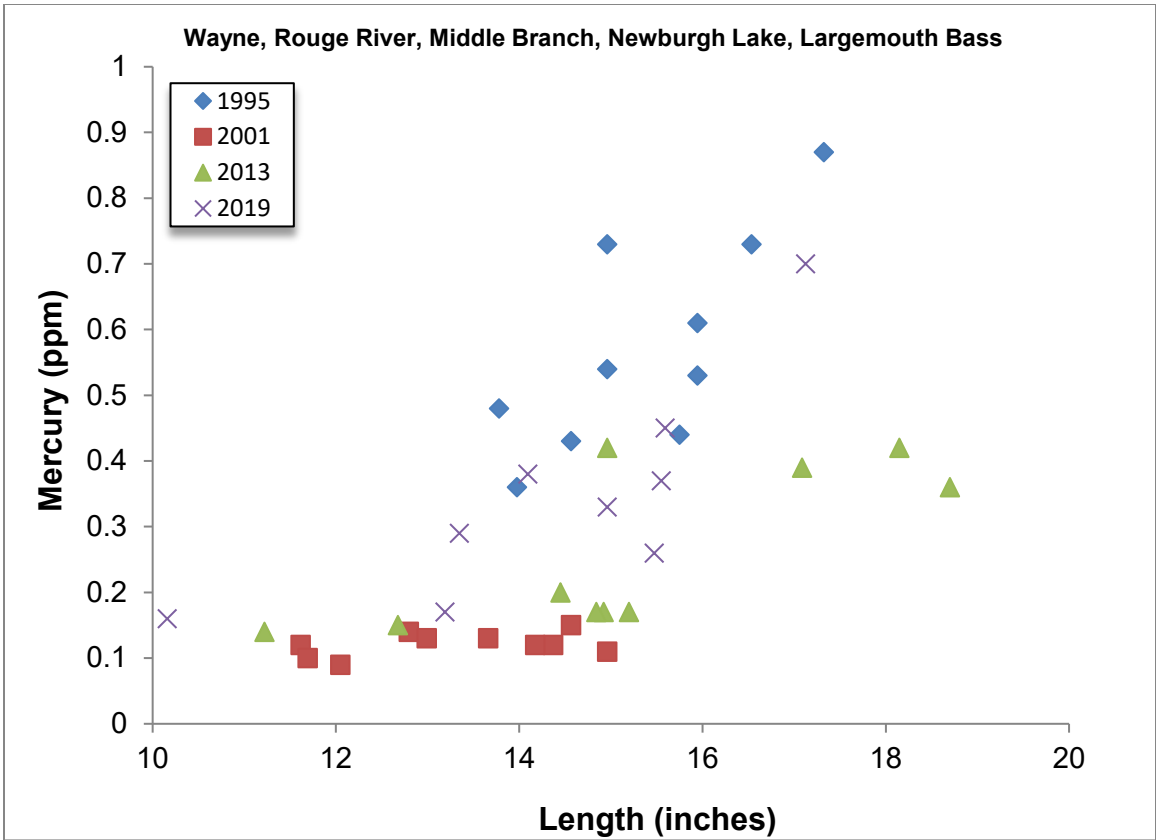
Organics Analysis:

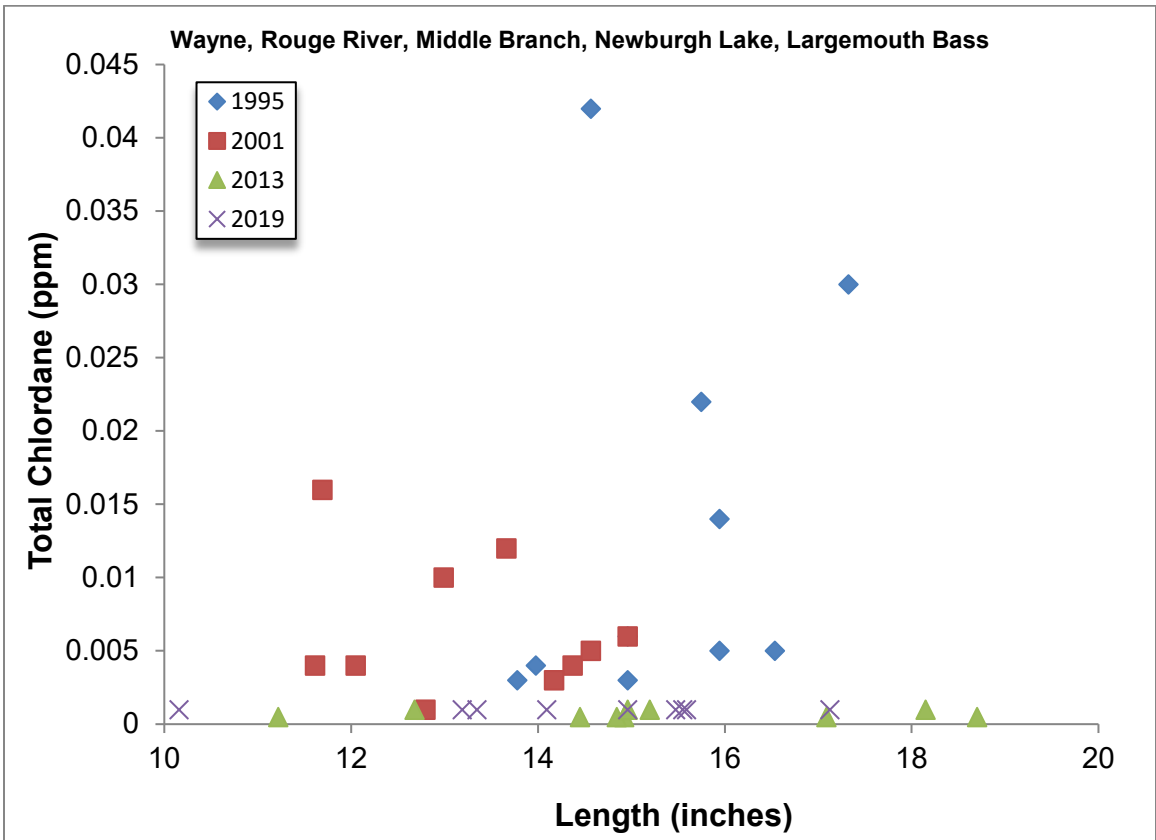
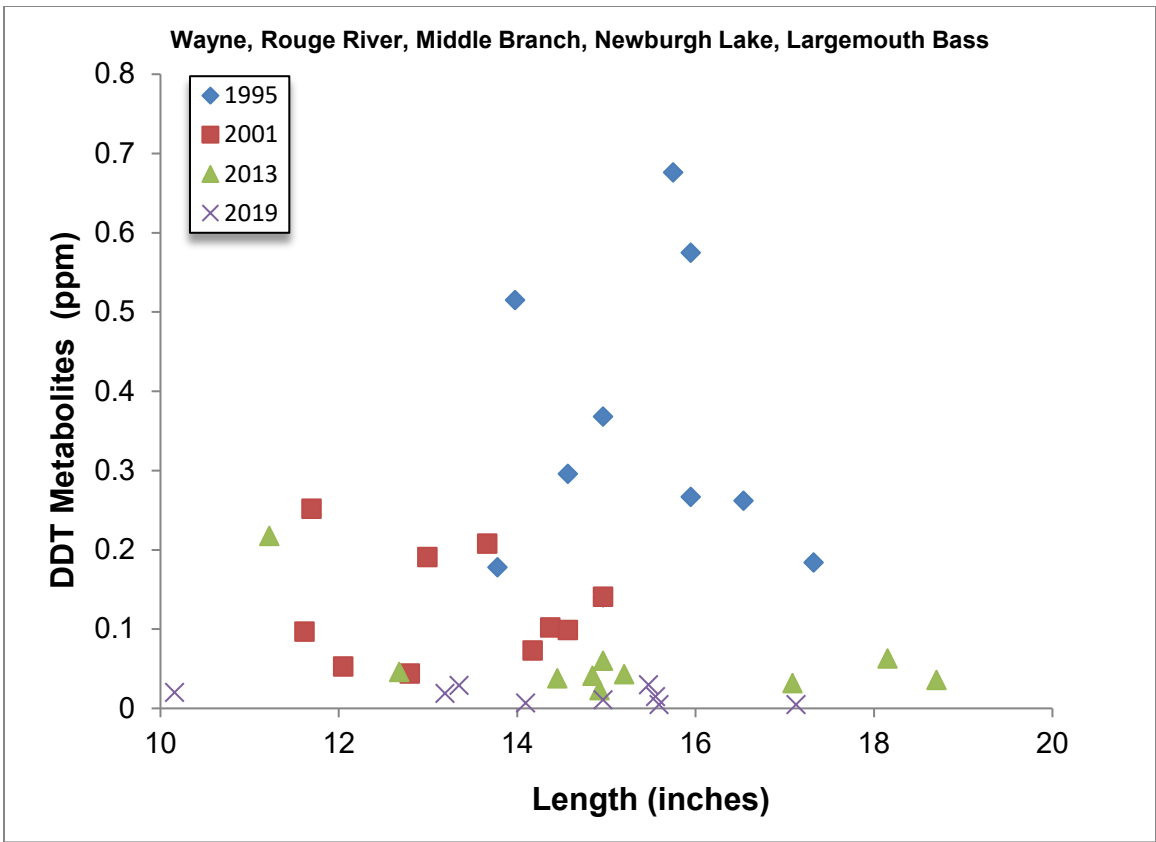
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent					
2013	2019	19	10.2	14.0	13.7	18.7
Datasets available: 1995, 2001, 2013, 2019						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	14	0.034	0.001	0.107	0.010	2
DDT	14	0.029	<0.005	0.063	0.028	16
Chlordane	14	0.001	<0.0005	0.001	0.001	--
Toxaphene	14	ND	--	--	--	--
PFOS	10 [^]	77.1 ppb	24.6 ppb	129 ppb	104 ppb	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.121	0.028				
DDT	0.102	0.038				
Chlordane	0.015	0.015				
Toxaphene	--	--				
PFOS	0.240	0.198				
Final meal category based on UCL:						1

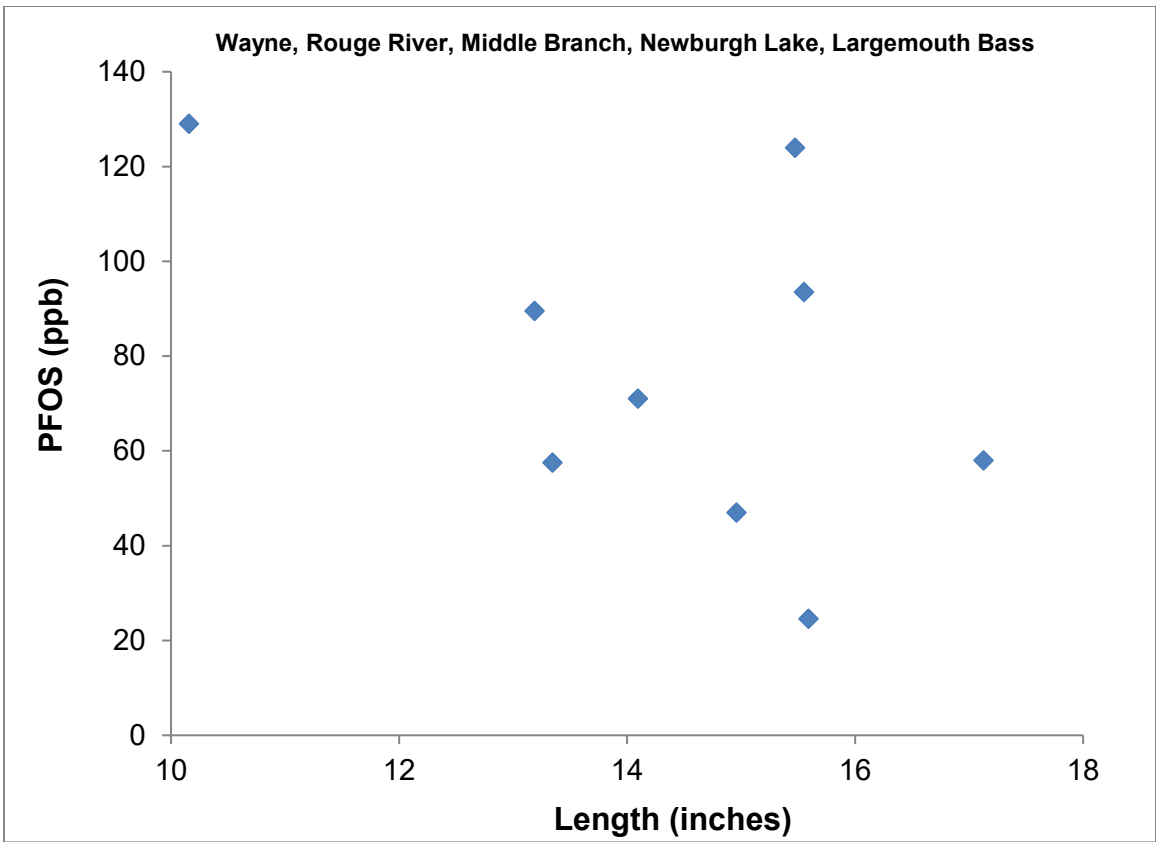
[^] Sub-legal sized fish used for PFAS analysis as there has not been a size-dependent relationship observed in the statewide dataset for PFOS concentrations in edible portion monitoring of fish tissue.

Existing MDHHS Advisory: No one should eat more than 6 meals per year of Rouge River largemouth or smallmouth bass from Newburgh Lake upstream to the Phoenix Dam less than 18 inches due to PCBs. No one should eat more than 6 meals per year of these fish larger than 18 inches due to PCBs and mercury. Newburgh Lake has known legacy PCB contamination. Sediment remediation work has been completed but additional samples are needed before the guidance can be relaxed.

Recommendation: No one should eat more than one meal per month of largemouth or smallmouth bass of any size from the middle branch of the Rouge River from Newburgh Lake upstream to the Phoenix dam due to PFOS. Two years of post-remediation (1998) data show significant declines in Newburgh Lake PCB concentrations in largemouth bass since the first sampling in 1995. Therefore, it is recommended to update the advisory using data within the last 15 years (2013 and 2019) to reflect decreased PCB concentrations. Mercury would cause an advisory.







Northern Pike

**Rouge River
Newburgh Lake**

Wayne County

Hg Analysis:

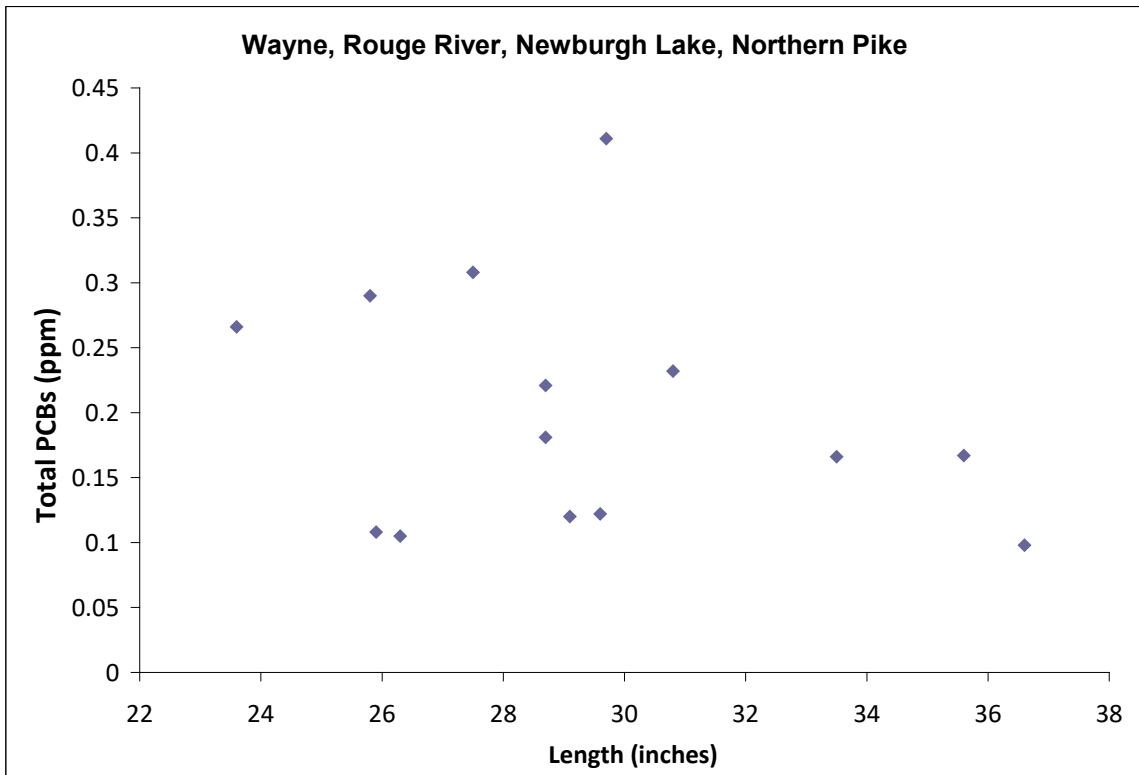
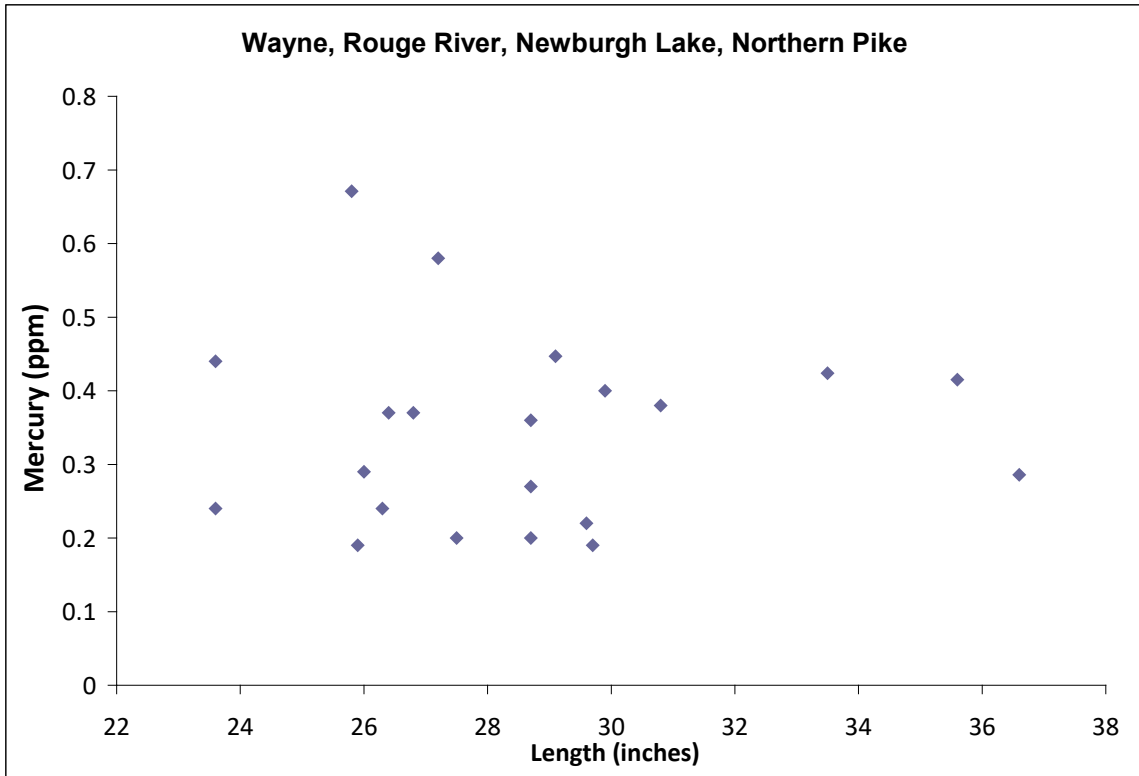
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1993	2005	24	20.9	24	23.6	36.6
Datasets available: 1988, 1993, 2002, 2005						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	21	0.342			0.400	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.012	0.019				

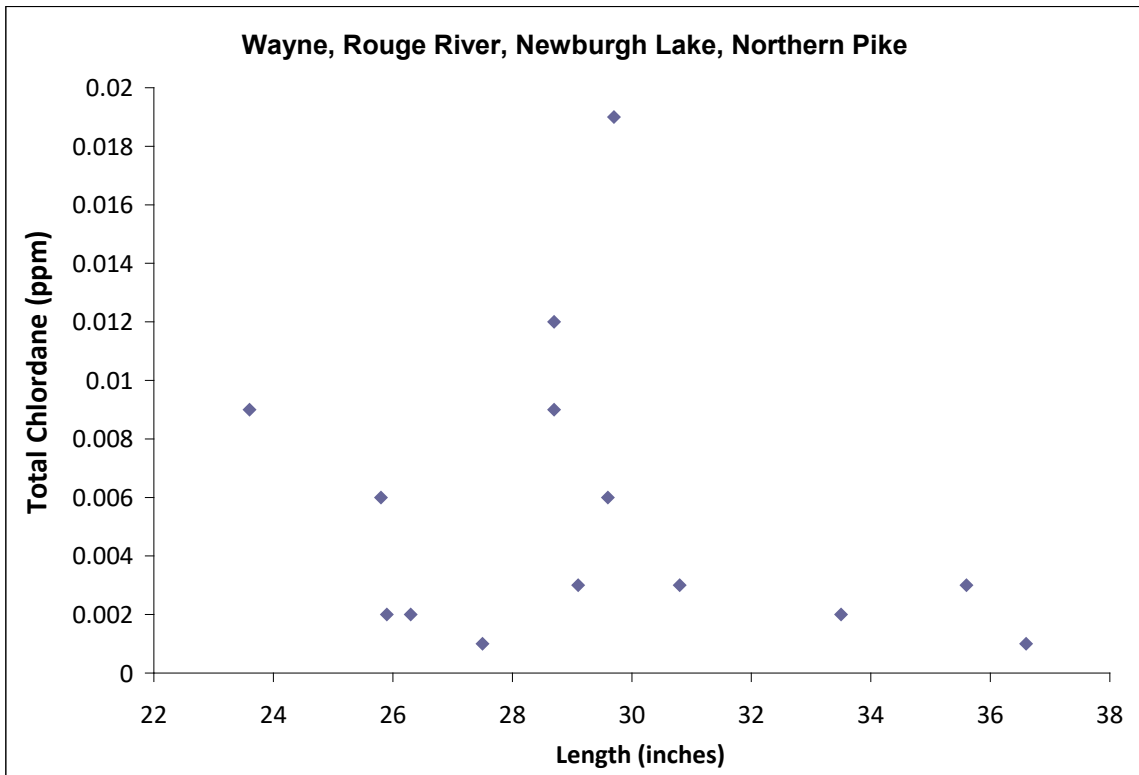
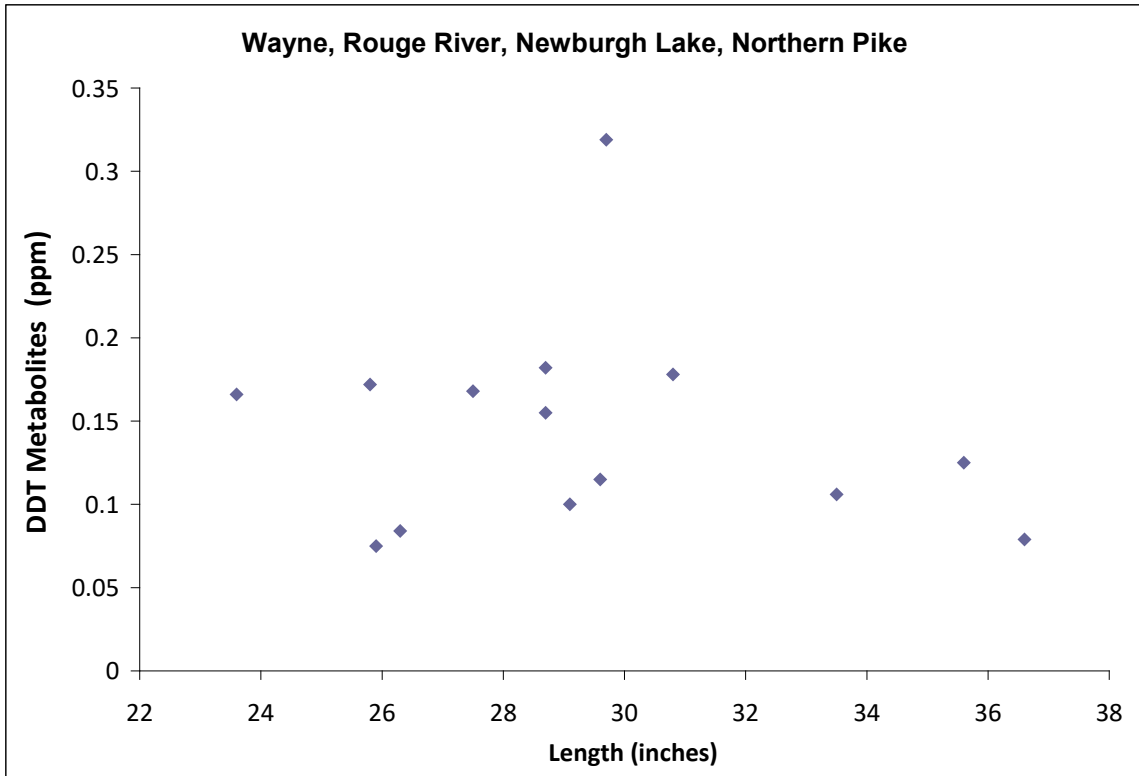
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2002	2005	15	22.4	24	23.6	36.6
Datasets available: 2002, 2005						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	14	0.200			0.250	0.5
DDT	14	0.145		0.180	8	
Chlordane	14	0.006		0.010	--	
Toxaphene	14	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.166	0.157				
DDT	0.074	0.093				
Chlordane	0.029	0.091				
Toxaphene	--	--				
Final meal category based on UCL:					0.5	

Existing Advisory: Women and children should eat no more than one meal per month of Newburgh Lake (Rouge River) northern pike due to elevated levels of PCBs.

Recommendation: No one should eat more than 6 meals per year of Newburgh Lake northern pike due to PCBs. DDT and mercury would cause advisories.





Rock Bass

**Rouge River
Newburgh Lake**

Wayne County

Hg Analysis:

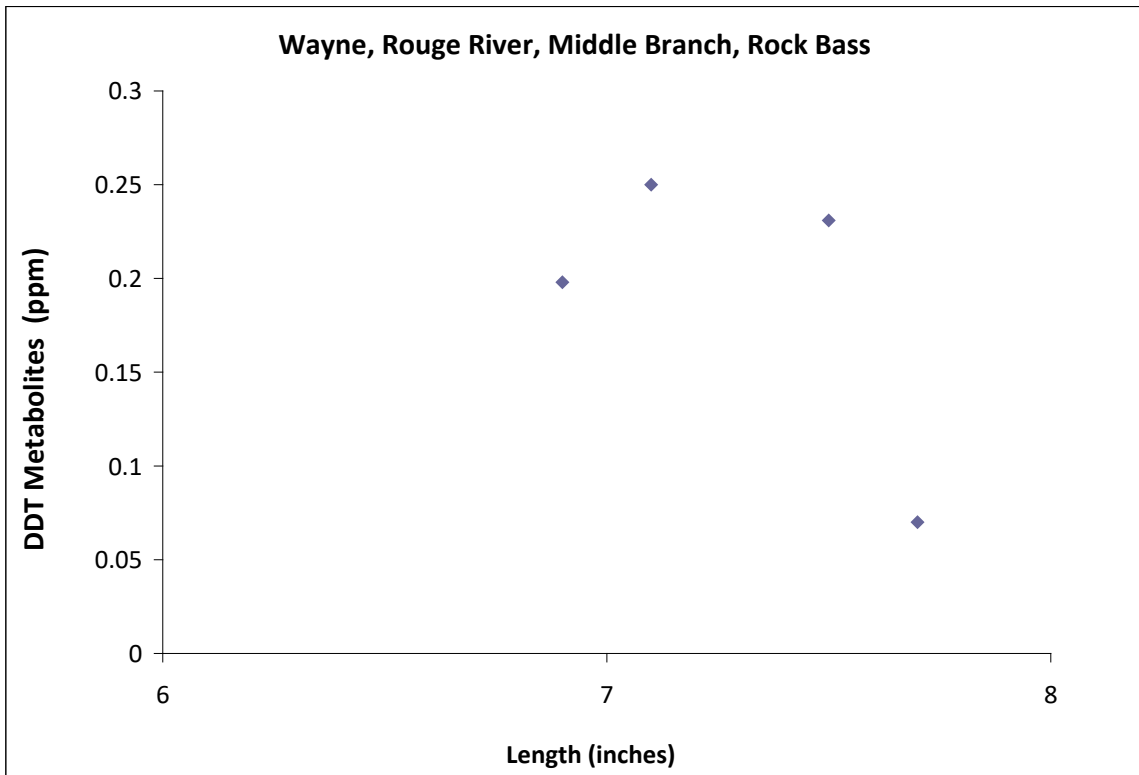
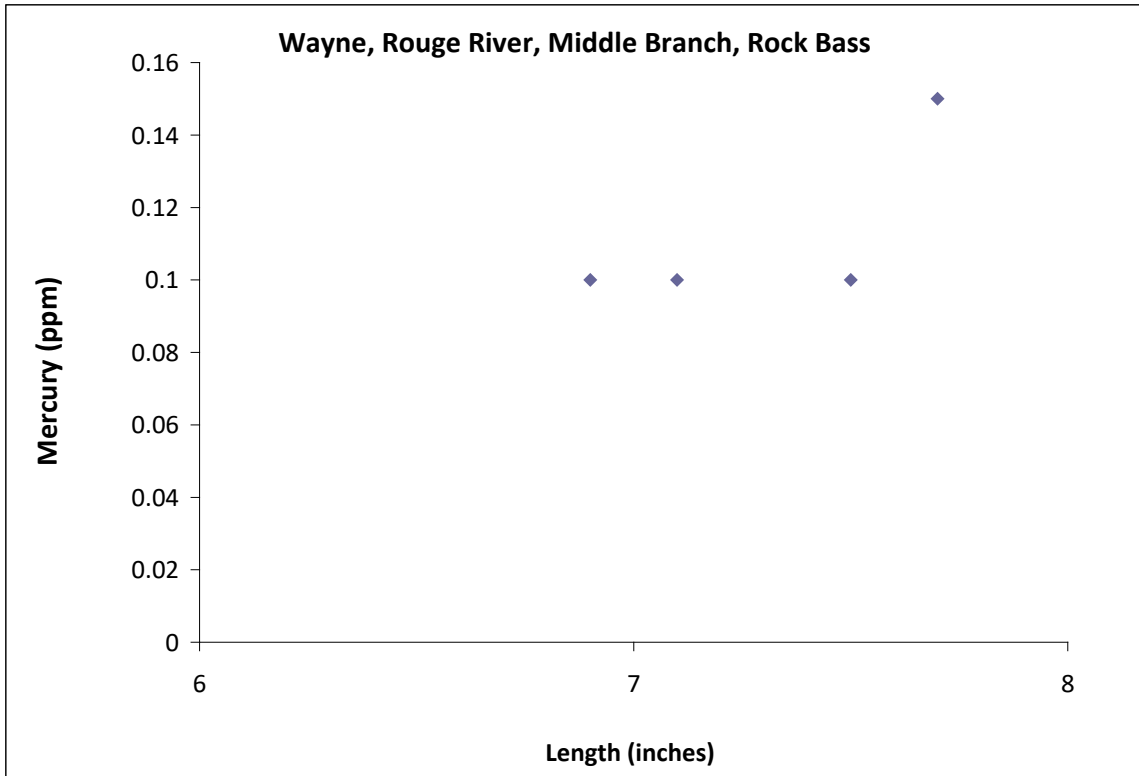
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	1987	4	6.9	na	6.9	7.7
Datasets available:		1987				
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	4	0.113			--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.533	0.533				

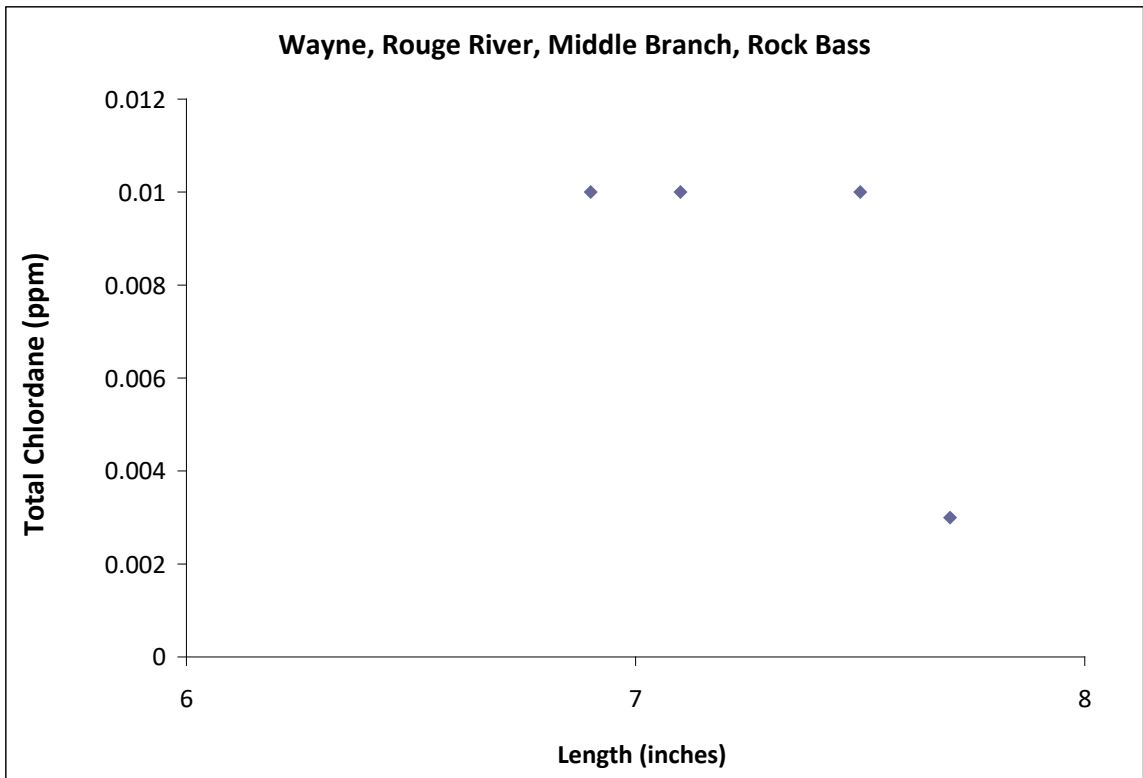
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	1987	4	6.9	na	6.9	7.7
Datasets available:		1987				
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	0	--			--	--
DDT	4	0.187		--	--	
Chlordane	4	0.008		--	--	
Toxaphene	4	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	0.384	0.443				
Chlordane	0.533	0.533				
Toxaphene	--	--				
Final meal category based on UCL:					--	

Existing Advisory: Rouge River (Newburgh Lake) rock bass are covered under the statewide mercury consumption advisory.

Recommendation: Newburgh Lake has known legacy PCB contamination. This dataset is limited by the age and size of the dataset and was used to provide a recommendation. Covered by waterbody-wide advisory of 6 meals per year.





White Sucker

**Rouge River
Newburgh Lake**

Wayne County

Hg Analysis:

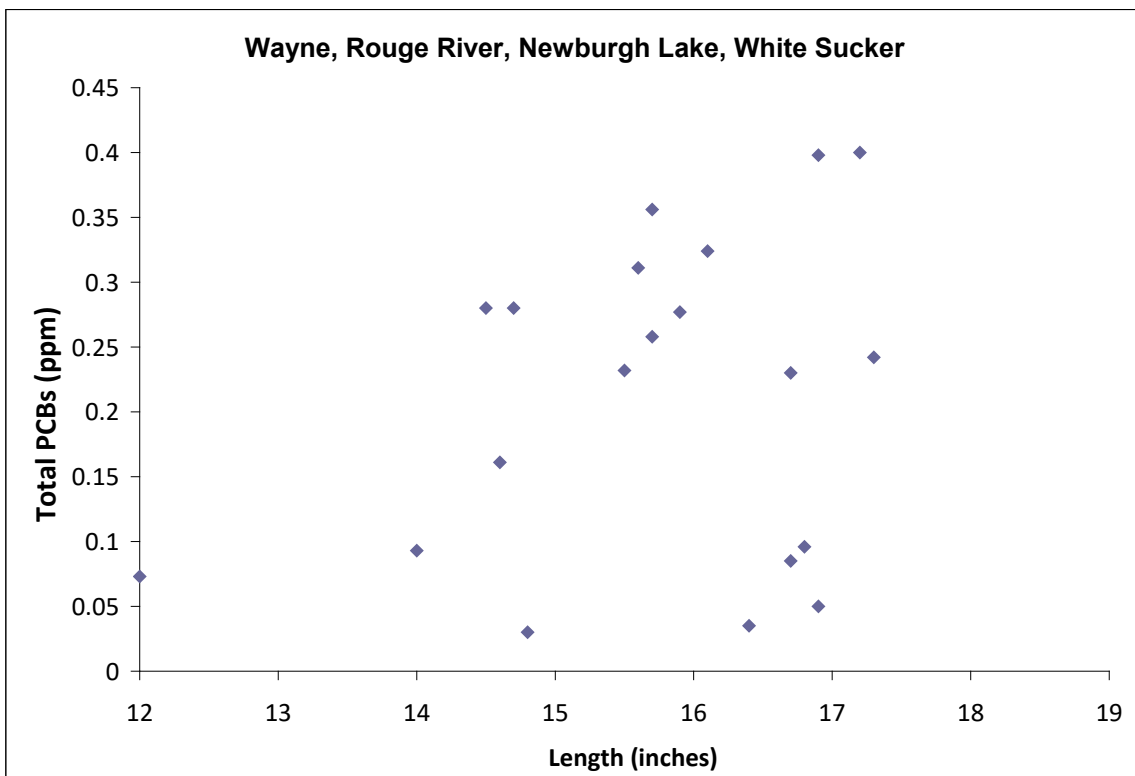
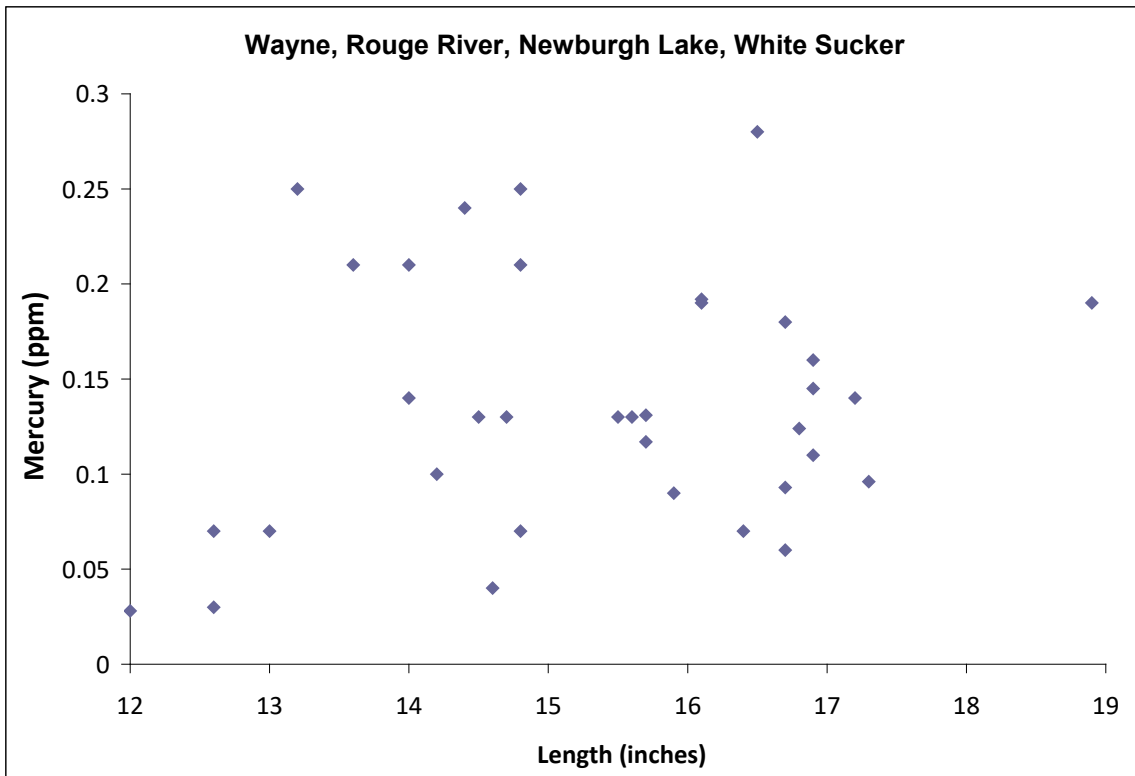
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	2005	35	12	na	12	18.9
Datasets available: 1987,1993,2002,2005						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	35	0.137			0.160	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.030	0.105				

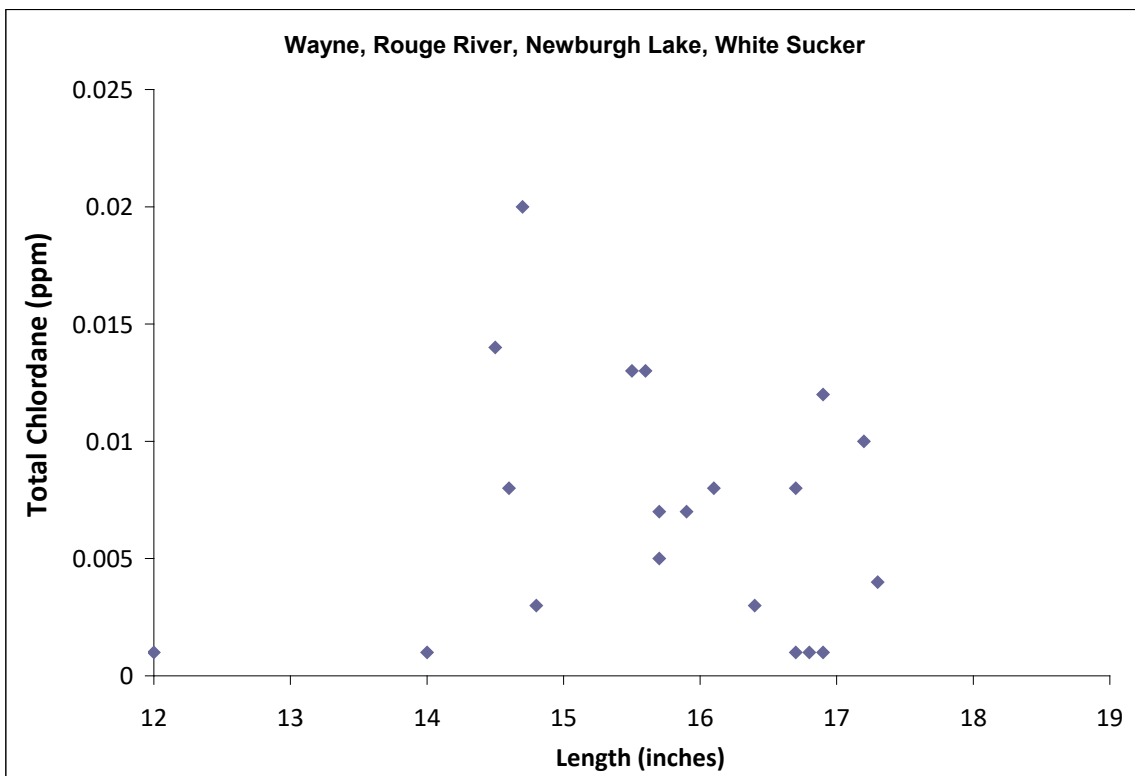
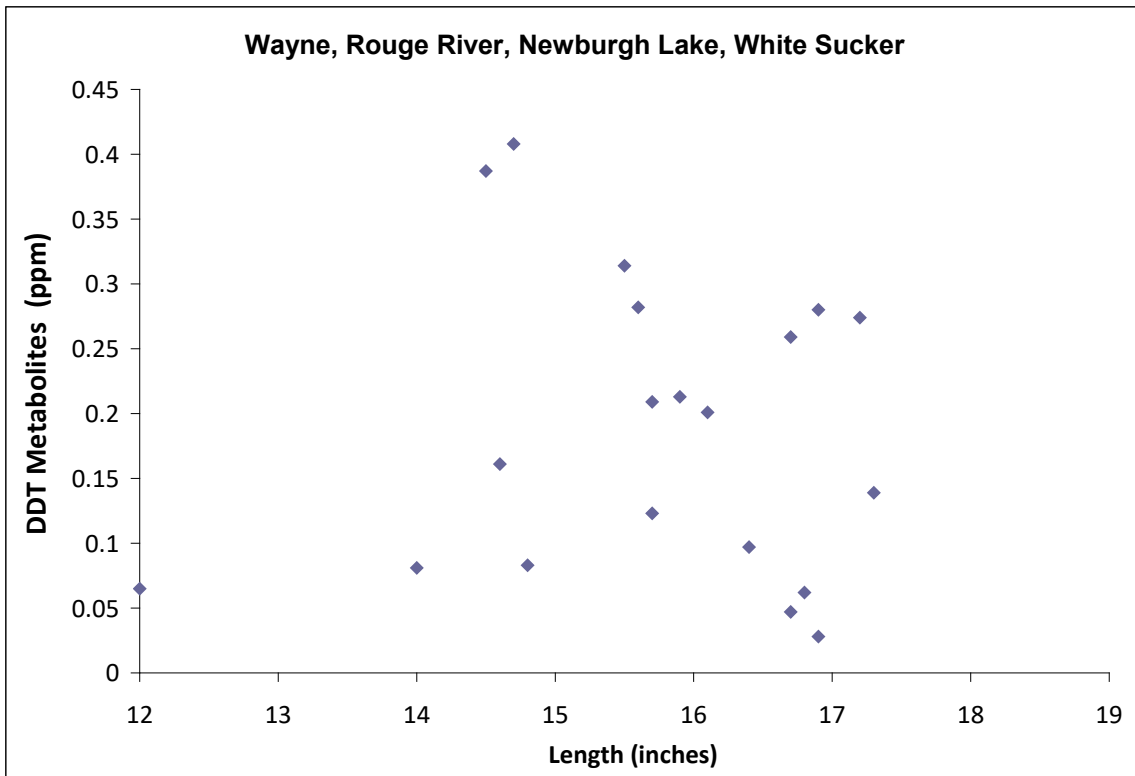
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2002	2005	20	12	na	12	17.3
Datasets available: 2002, 2005						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	20	0.211			0.270	0.5
DDT	20	0.186		0.240	4	
Chlordane	20	0.007		0.010	--	
Toxaphene	20	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.073	0.042				
DDT	0.000	0.000				
Chlordane	0.001	0.009				
Toxaphene						
Final meal category based on UCL:					0.5	

Existing Advisory: Women and children should eat no more than one meal per week of Newburgh Lake (Rouge River) white sucker less than 14 inches in length and no more than one meal per month of Newburgh Lake white sucker larger than 14 inches in length due to elevated levels of PCBs.

Recommendation: No one should eat more than 6 meals per year of Newburgh Lake sucker due to PCBs. DDT and mercury would cause advisories.





Bluegill/Pumpkinseed

**Middle Rouge River
Phoenix Lake**

Wayne County

Hg Analysis:

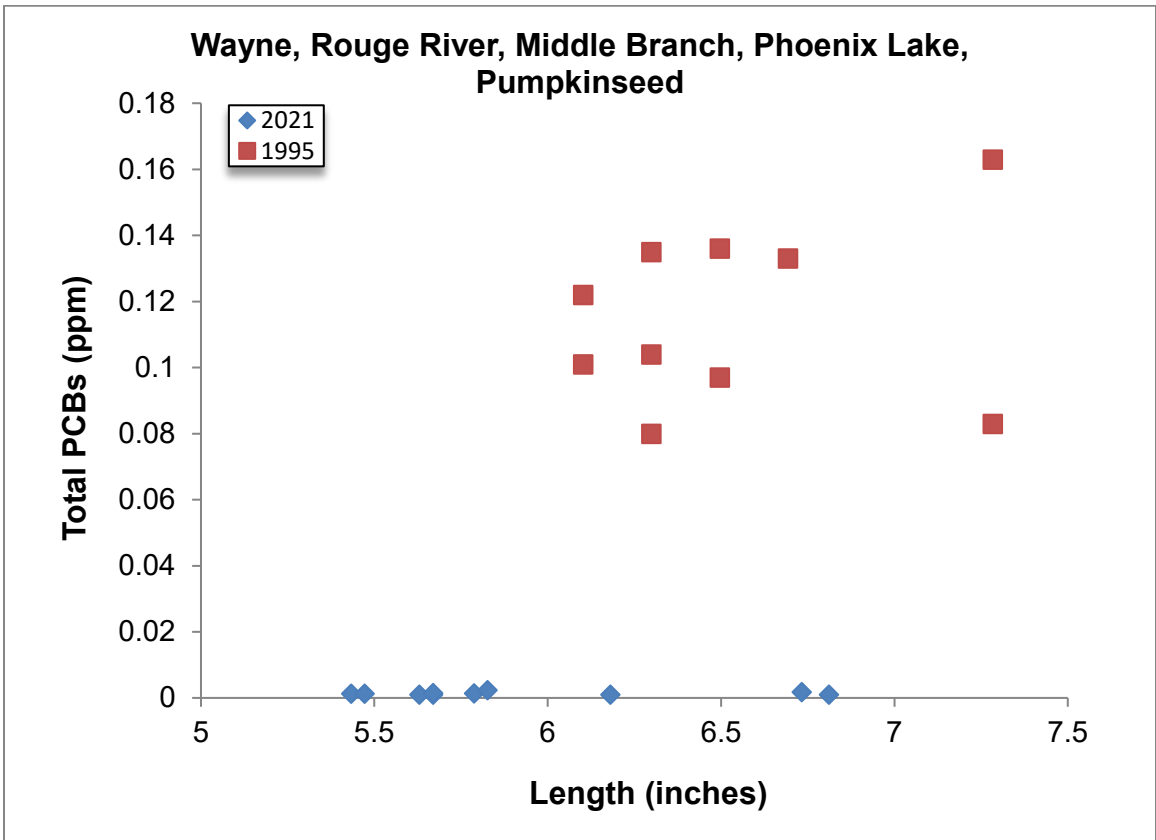
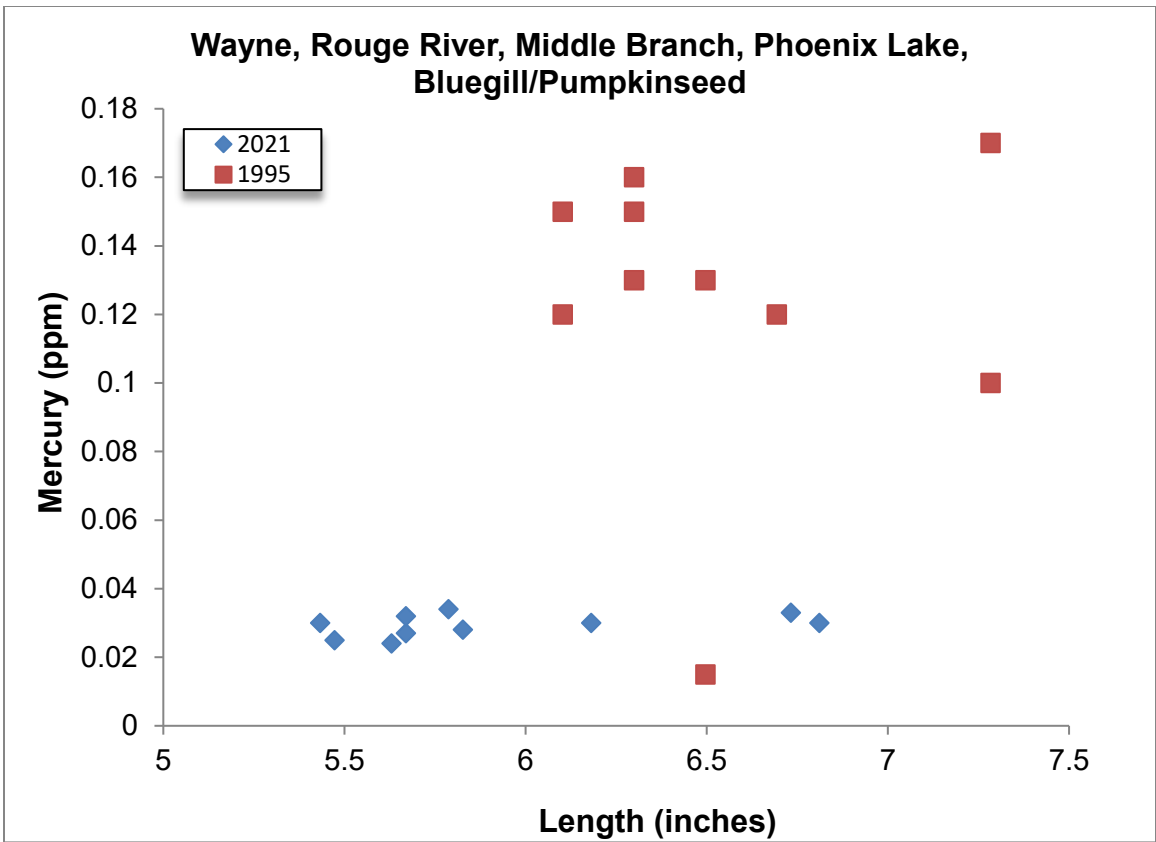
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent						
1995	2021	20	5.4	NA	5.4	7.3	
Datasets available: 1995, 2021							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	20	0.077		0.015	0.170	0.104	8
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.237	0.232					

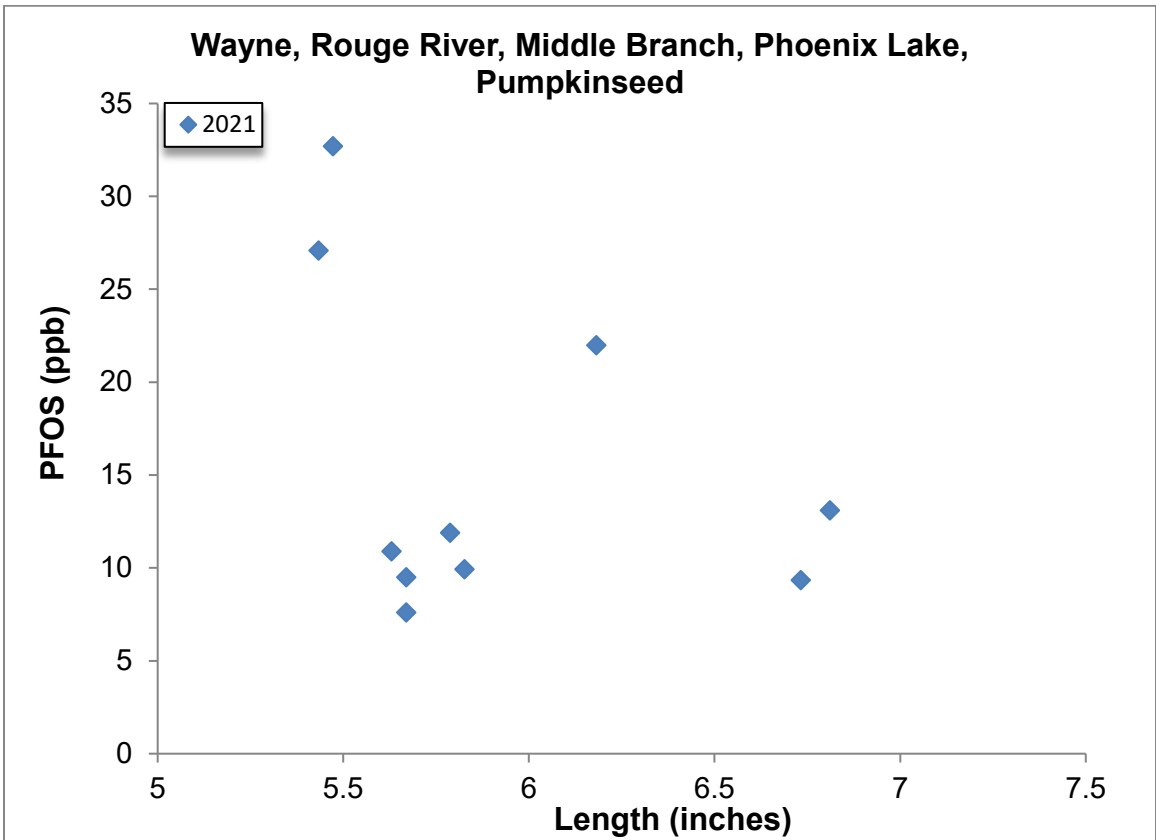
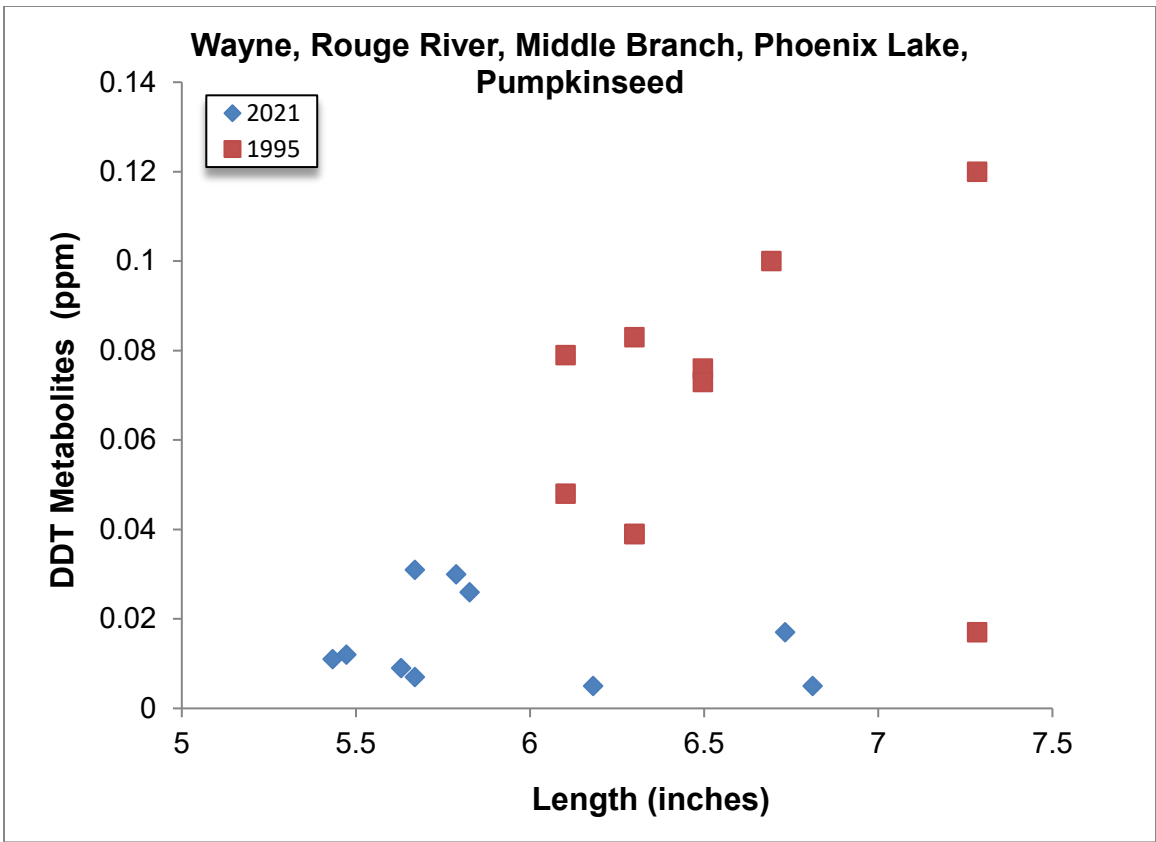
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent						
2021	2021	10	5.4	NA	5.4	6.8	
Datasets available: 1995 (no PFOS), 2021 (only PFOS)							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.001		<0.001	0.002	0.002	16
DDT	10	0.015		0.005	0.031	0.023	16
Chlordane	10	ND		--	--	--	16
Toxaphene	10	ND		--	--	--	--
PFOS	10	15.4 ppb		7.6 ppb	32.7 ppb	21.6 ppb	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.001	0.000					
DDT	0.048	0.084					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	0.113	0.072					
Final meal category based on UCL:							4

Existing MDHHS Advisory: No one should eat more than 4 meals per month of bluegill and sunfish from Phoenix Lake in Wayne County due to mercury.

Recommendation: No one should eat more than 4 meals per month of bluegill or sunfish from the Phoenix Lake impoundment in Wayne County upstream to the Waterford Pond dam of the Middle Branch of the Rouge River due to mercury and PFOS. Additional fish should be collected to confirm the reduction in mercury concentrations before relaxing the mercury-specific recommendation.





Carp

**Middle Rouge River
Phoenix Lake**

Wayne County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1995	2002	15	15.6	na	15.6	23.4
Datasets available: 1995, 2001, 2002						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL	Meal Category
Mercury	15	0.169			0.210	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.527	0.667				

Organics Analysis:

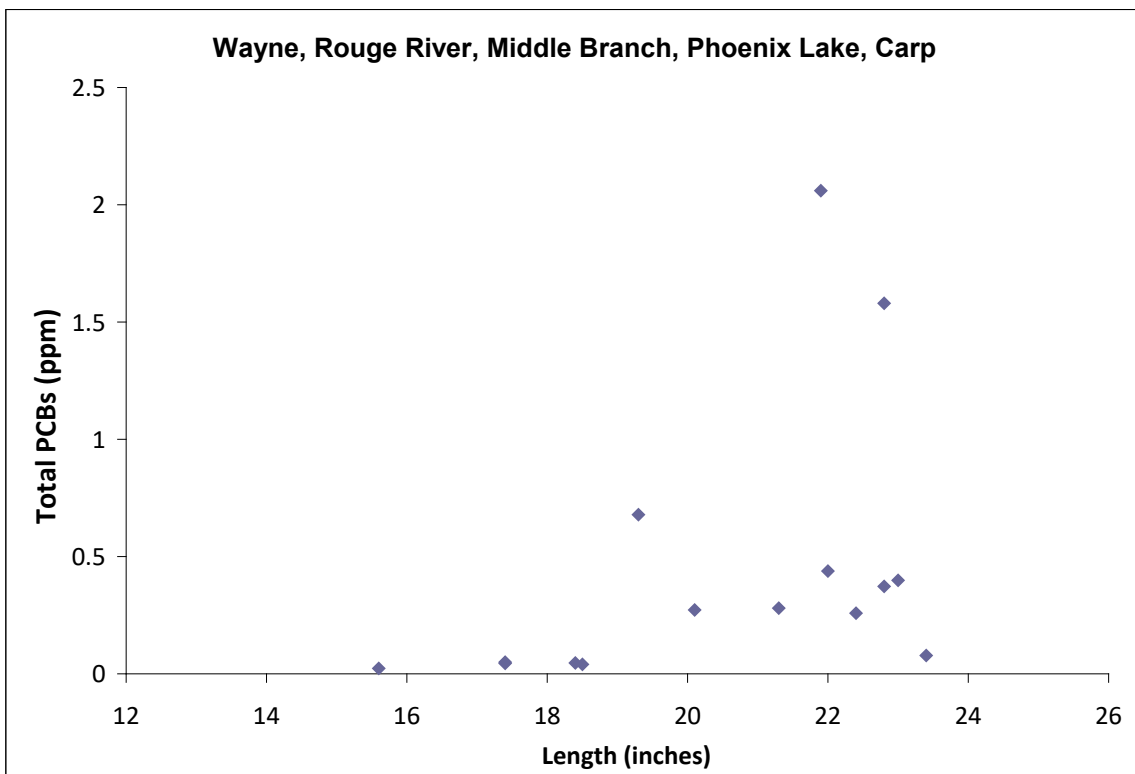
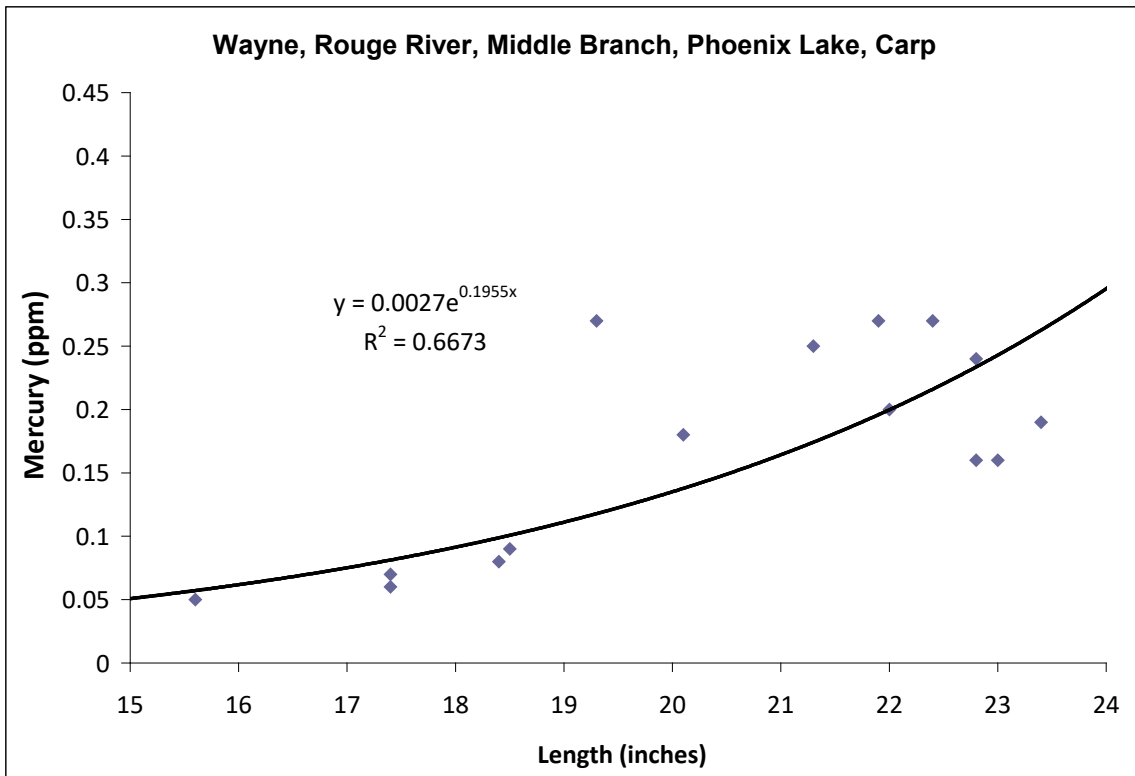
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1995	2002	15	13	na	13	25.4
Datasets available: 1988, 1995, 2001, 2002						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL	Meal Category
PCB	15	0.441			0.770	Limited
DDT	15	0.596			1.020	1
Chlordane	15	0.023			0.040	--
Toxaphene	15	ND			--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.186	0.503				
DDT	0.128	0.218				
Chlordane	0.046	0.011				
Toxaphene	--	--				
Final meal category based on UCL:						Limited

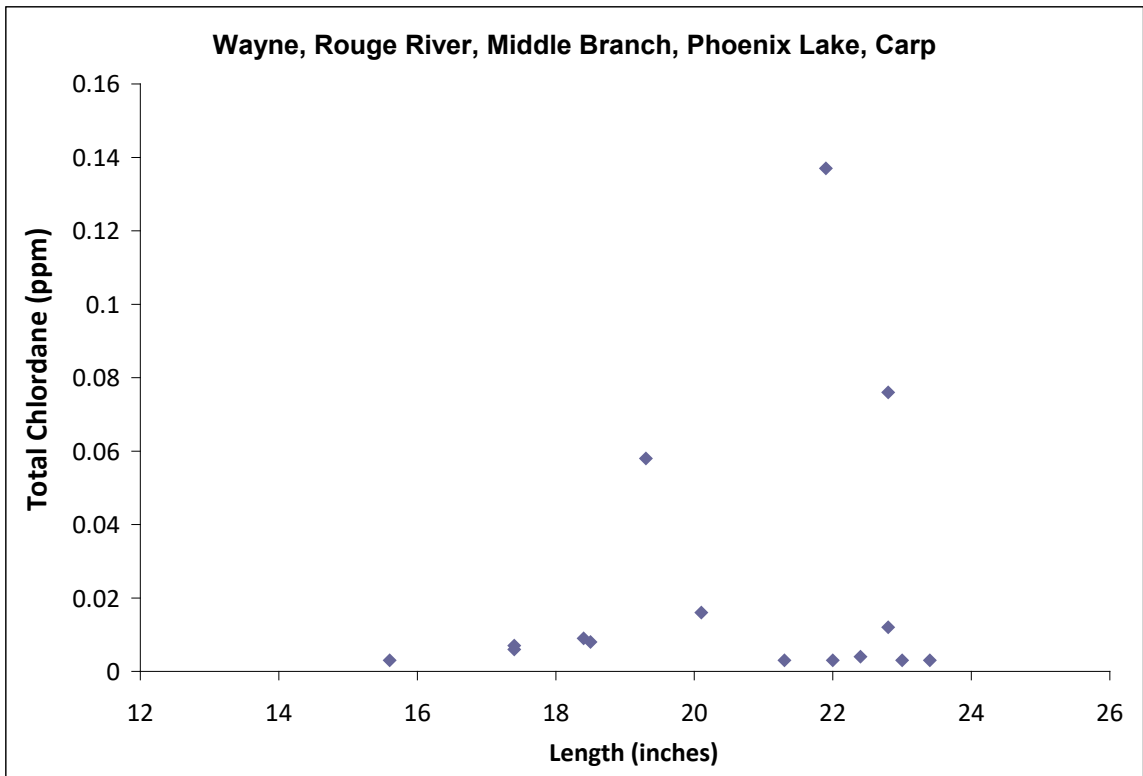
Existing Advisory: Women and children should eat no more than one meal per week of Phoenix Lake (Middle Rouge River) carp less than 18 inches in length and no more than one meal per month of Rouge River carp greater than 18 inches in length due to elevated levels of PCBs.

Recommendation: Sensitive populations should not eat these fish. Healthy adults should limit consumption of Phoenix Lake carp to no more than 1 or 2 meals per year due to PCBs. DDT and mercury would cause advisories. The sample set used for this evaluation includes 1995 data because the fish collected in 2001 and 2002 were few and small. Based on EGLE’s Fish Contaminant Monitoring Program, PCB and DDT concentrations ≥15 years old are expected to have declined however concentrations are too elevated to adjust the meal category.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
12	0.028	16
14	0.042	16
16	0.062	16
18	0.091	8
20	0.135	4
22	0.199	4
24	0.294	2
26	0.435	2
28	0.644	1

Shaded area denotes extrapolated estimates





Channel Catfish

**Middle Rouge River
Phoenix Lake**

Wayne County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		Meal Category
Earliest	Most Recent				Min	Max	
2001	2001	1	15.9	12	15.9	15.9	
Datasets available:		2001					
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category	
Mercury	1	0.110		--		--	
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	--	--					

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		Meal Category
Earliest	Most Recent				Min	Max	
2001	2001	1	15.9	12	15.9	15.9	
Datasets available:		2001					
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category	
PCB	1	0.176		--		--	
DDT	1	0.404		--		--	
Chlordane	1	0.020		--		--	
Toxaphene	1	ND		--		--	
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
Final meal category based on UCL:						--	

Existing Advisory: Phoenix Lake (Middle Rouge River) channel catfish are not covered by an advisory.

Recommendation: This dataset is limited by sample size and is not used to provide a recommendation. The statewide guidelines apply to Phoenix Lake (Middle Rouge River) channel catfish.

Northern Pike

**Middle Rouge River
Phoenix Lake**

Wayne County

Hg Analysis:

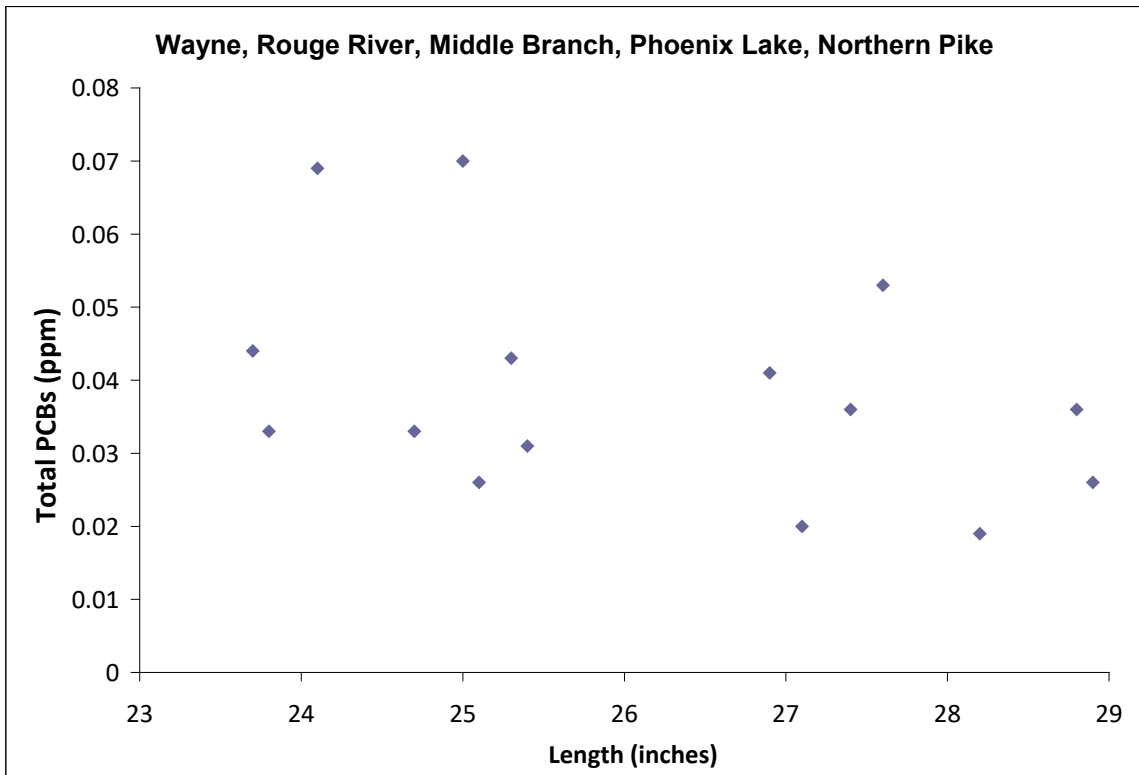
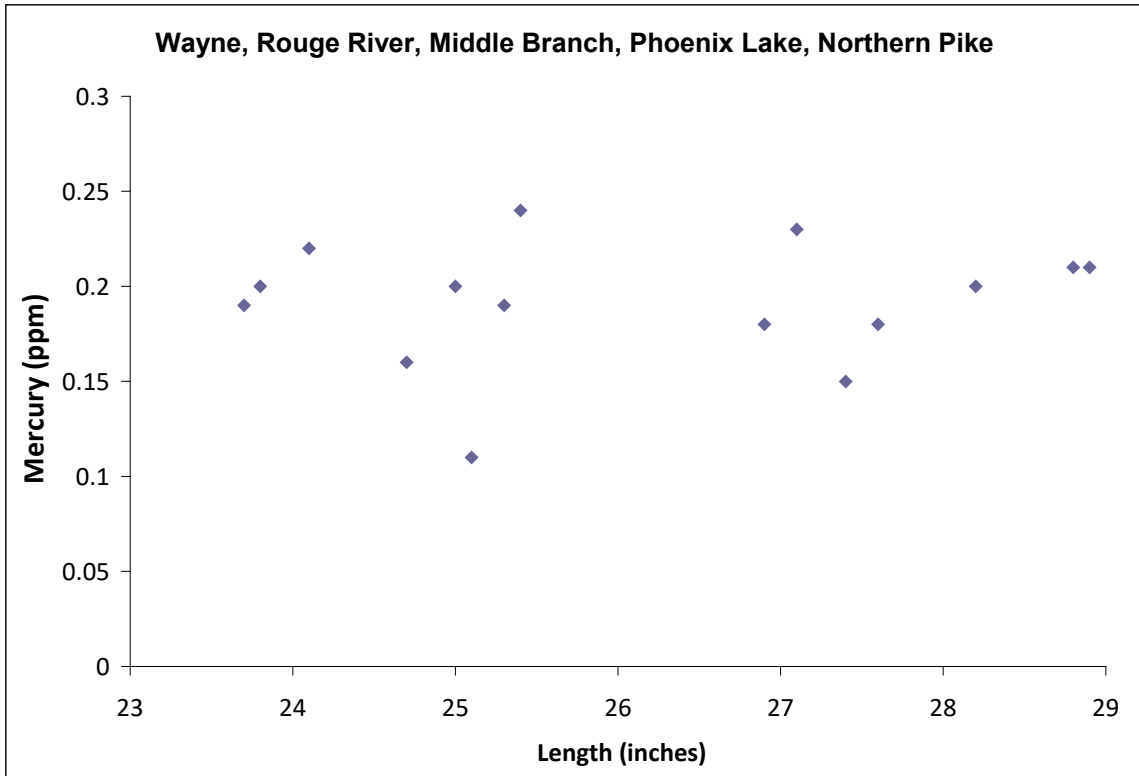
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2001	2002	18	19.2	24	23.7	28.9
Datasets available: 2001, 2002						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	15	0.191		0.210	4	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.129	0.177				

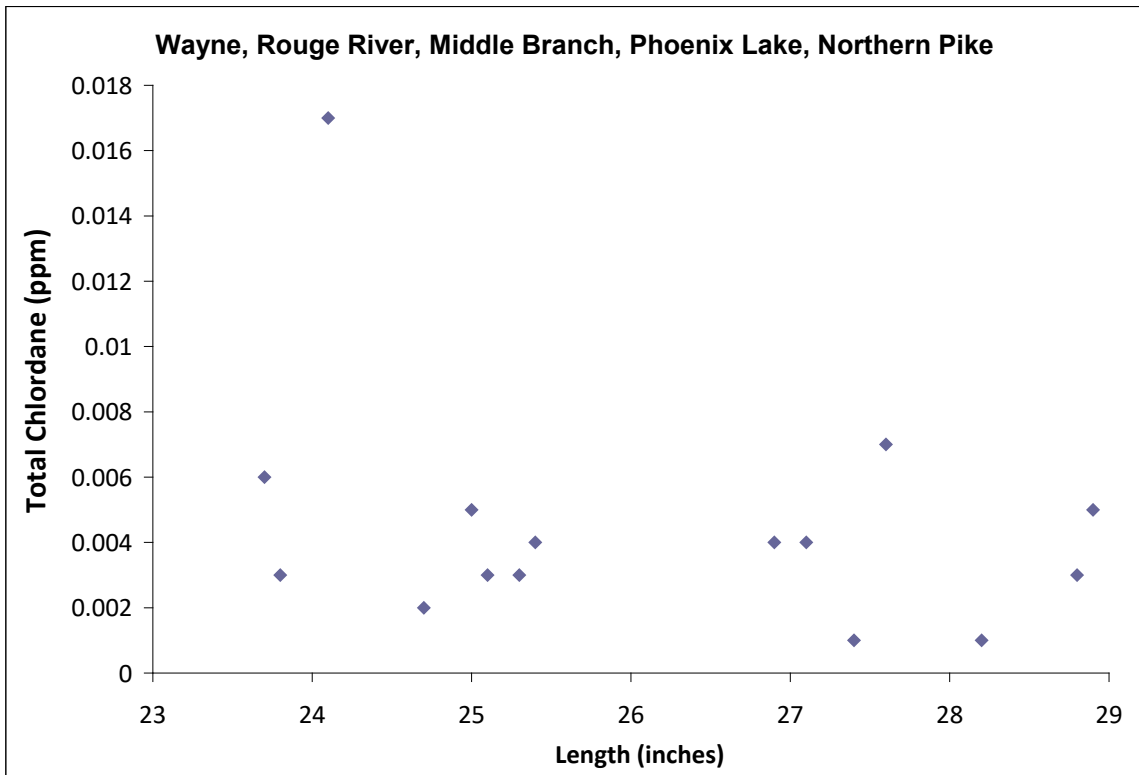
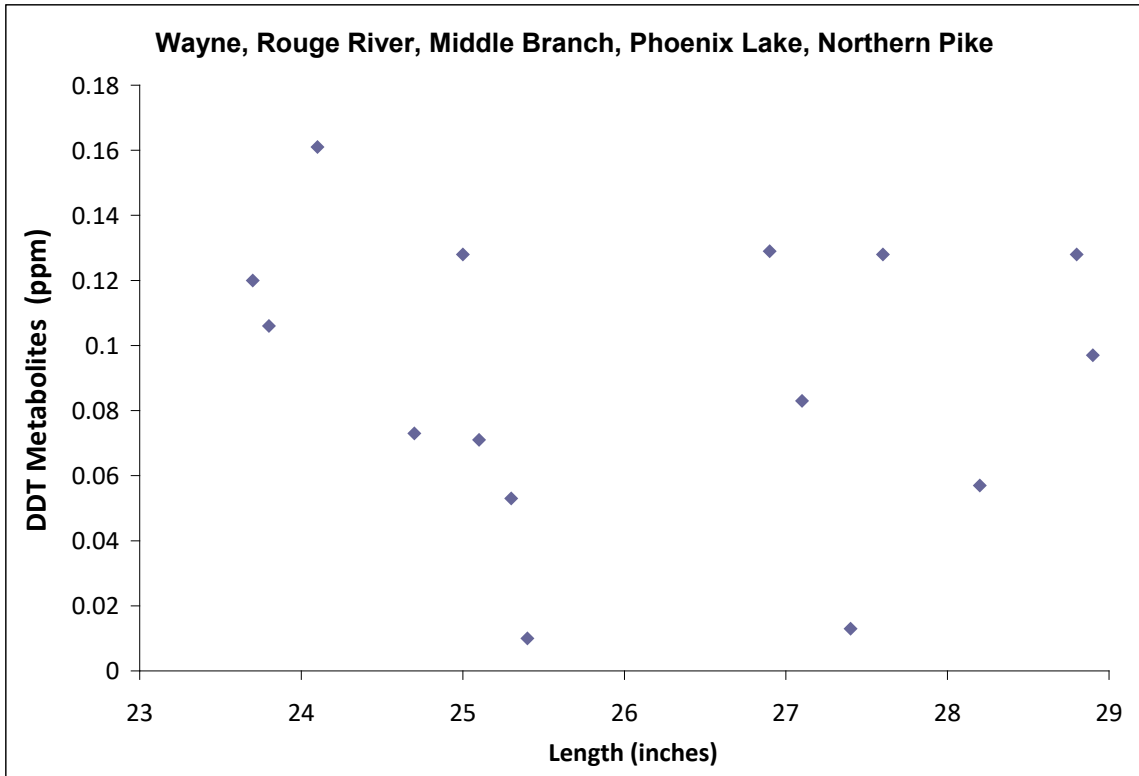
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2001	2002	18	19.2	24	23.6	28.9
Datasets available: 2001, 2002						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	15	0.039		0.050	4	
DDT	15	0.090		0.120	12	
Chlordane	15	0.005		0.010	--	
Toxaphene	15	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.146	0.181				
DDT	0.004	0.008				
Chlordane	0.025	0.061				
Toxaphene	--	--				
Final meal category based on UCL:						4

Existing Advisory: Women and children should eat no more than one meal per month of Phoenix Lake (Middle Rouge River) northern pike larger than 30 inches in length.

Recommendation: No one should eat more than 4 meals per month of Phoenix Lake northern pike due to PCBs and mercury.





White Sucker

**Middle Rouge River
Phoenix Lake**

Wayne County

Hg Analysis:

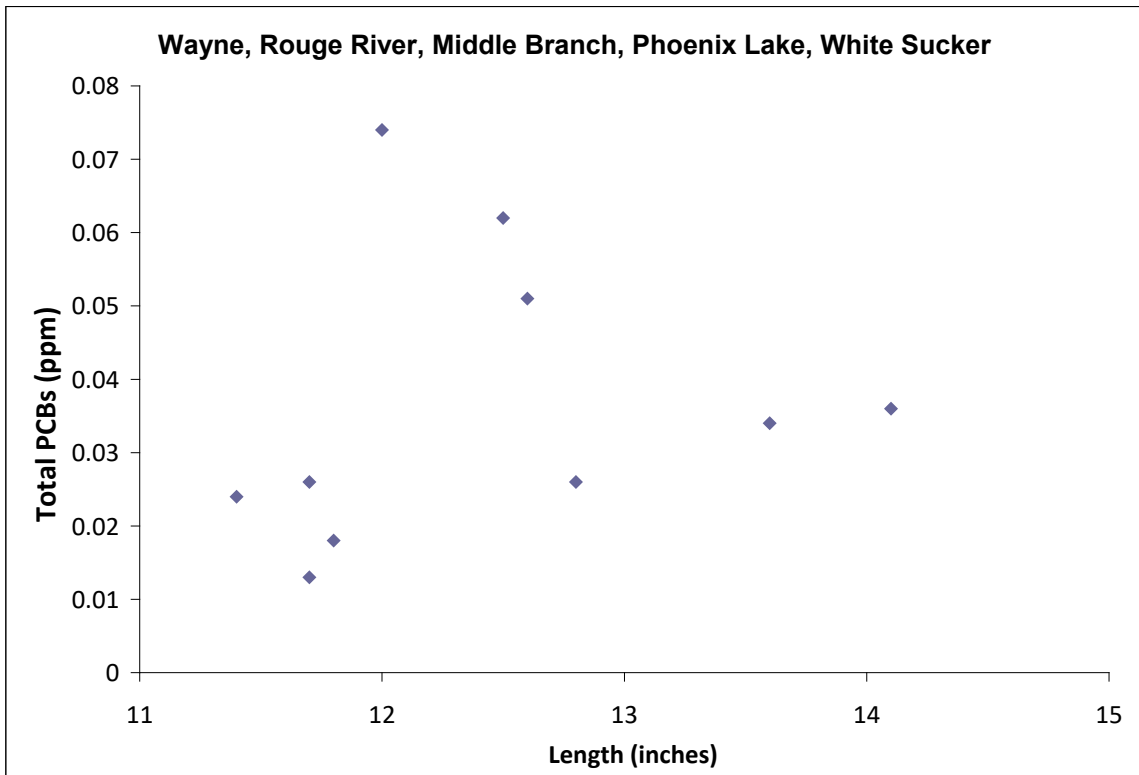
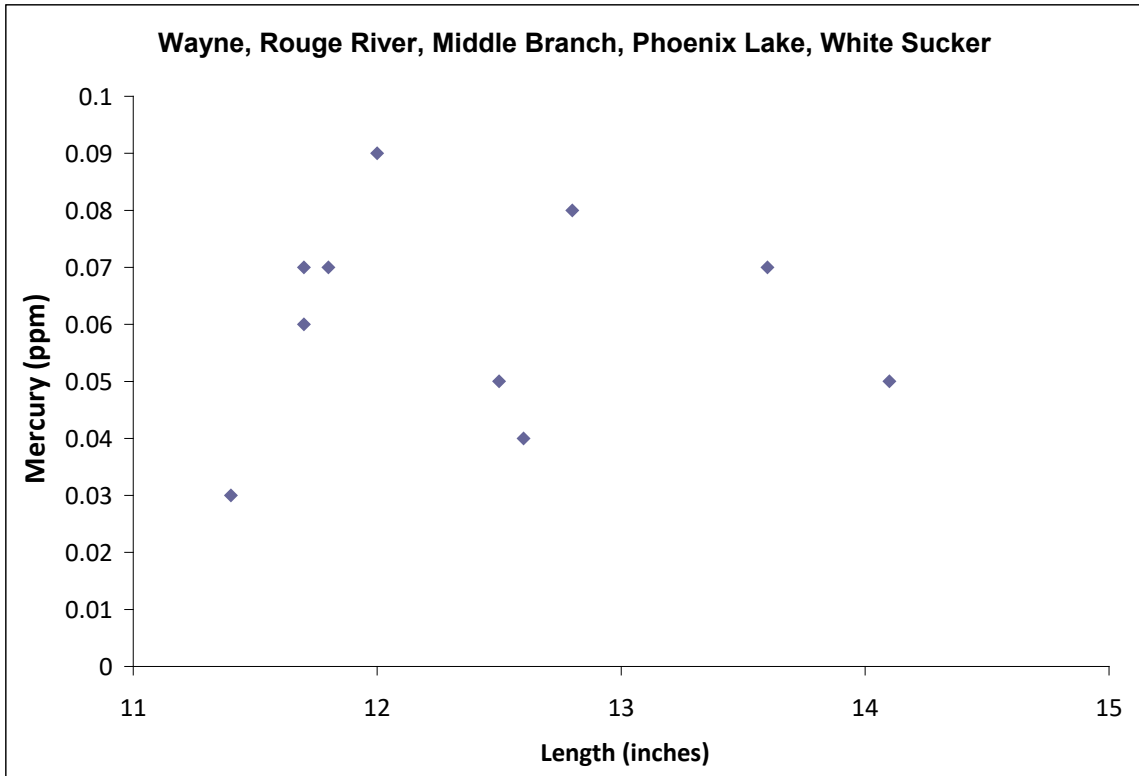
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2002	2002	10	11.4	na	11.4	14.1
Datasets available: 2002						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	10	0.061		0.070	16	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.000	0.007				

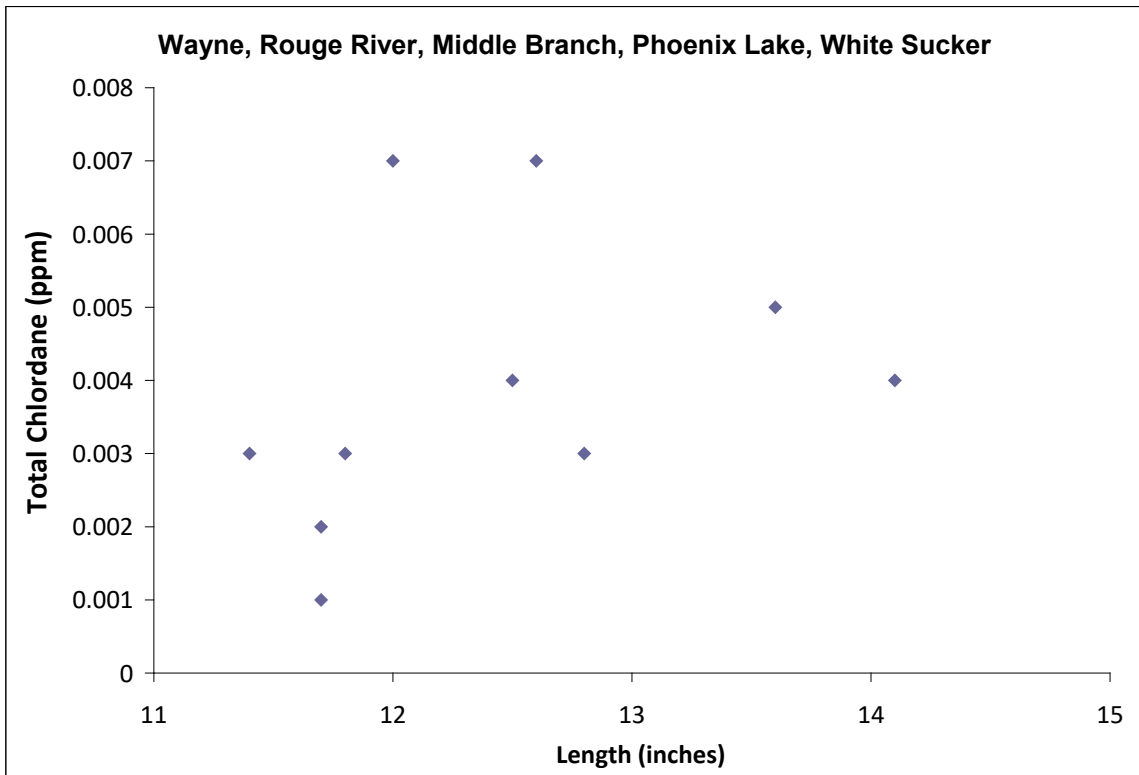
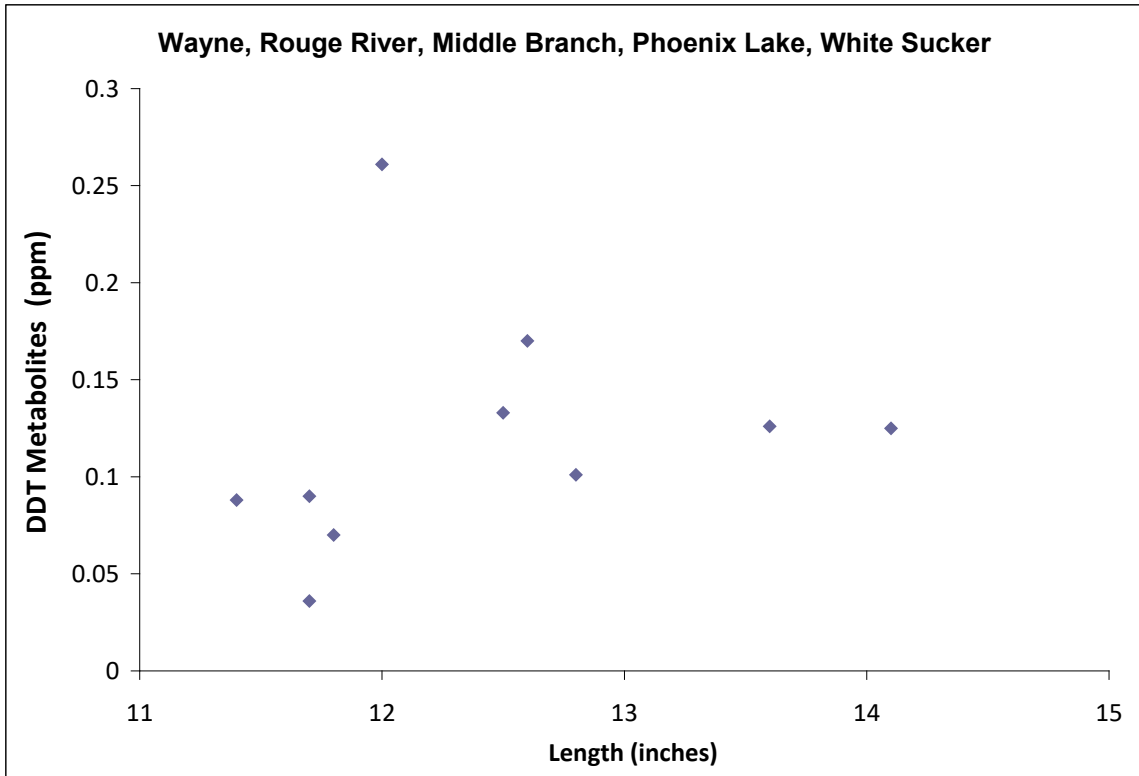
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2002	2002	10	11.4	na	11.4	14.1
Datasets available: 1988, 2002						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	10	0.036		0.050	4	
DDT	10	0.120		0.160	8	
Chlordane	10	0.004		0.010	--	
Toxaphene	10	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.036	0.107				
DDT	0.045	0.131				
Chlordane	0.115	0.183				
Toxaphene	--	--				
Final meal category based on UCL:						4

Existing Advisory: Women and children should eat no more than one meal per week of Phoenix Lake (Middle Rouge River) white sucker greater than 14 inches in length due to elevated levels of PCBs.

Recommendation: No one should eat more than 4 meals per month of Phoenix Lake sucker due to PCBs. DDTs would cause an advisory.





Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent					
2021	2021	10	4.5	NA	4.5	6.7
Datasets available: 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.023	0.013	0.043	0.031	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.605	0.613				

Organics Analysis:

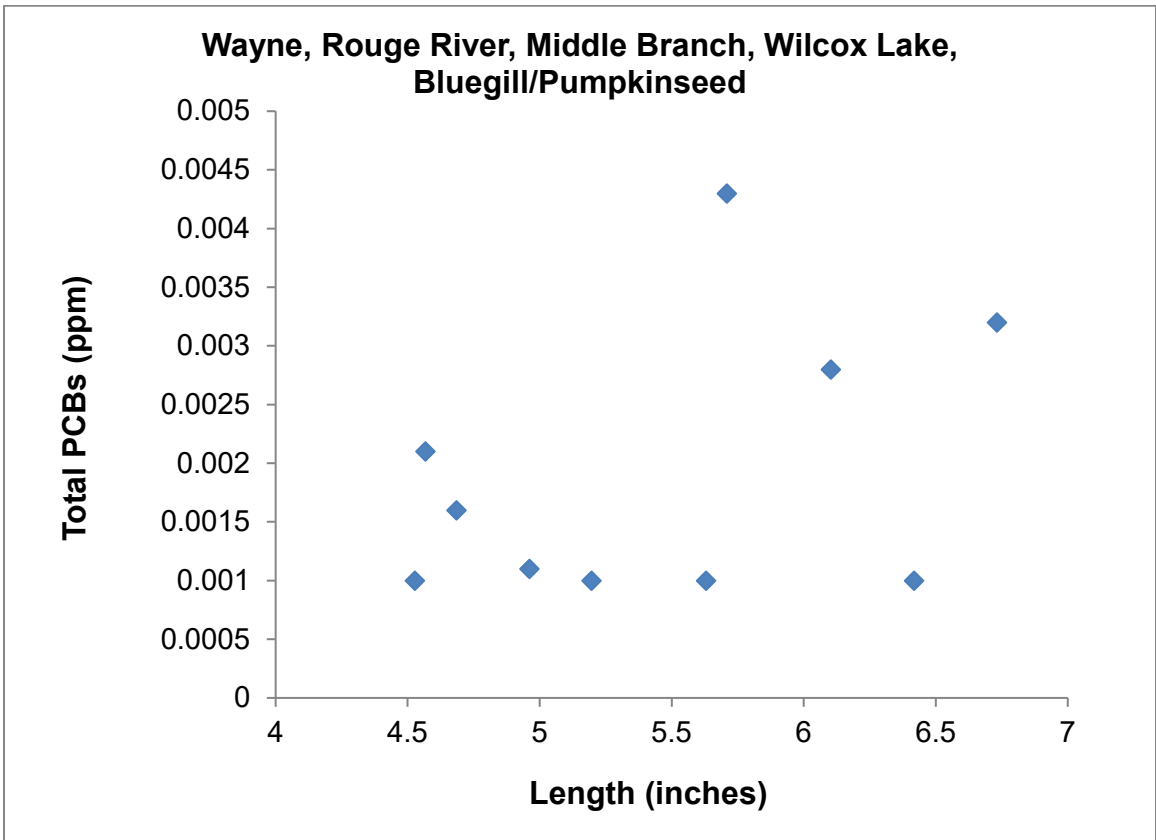
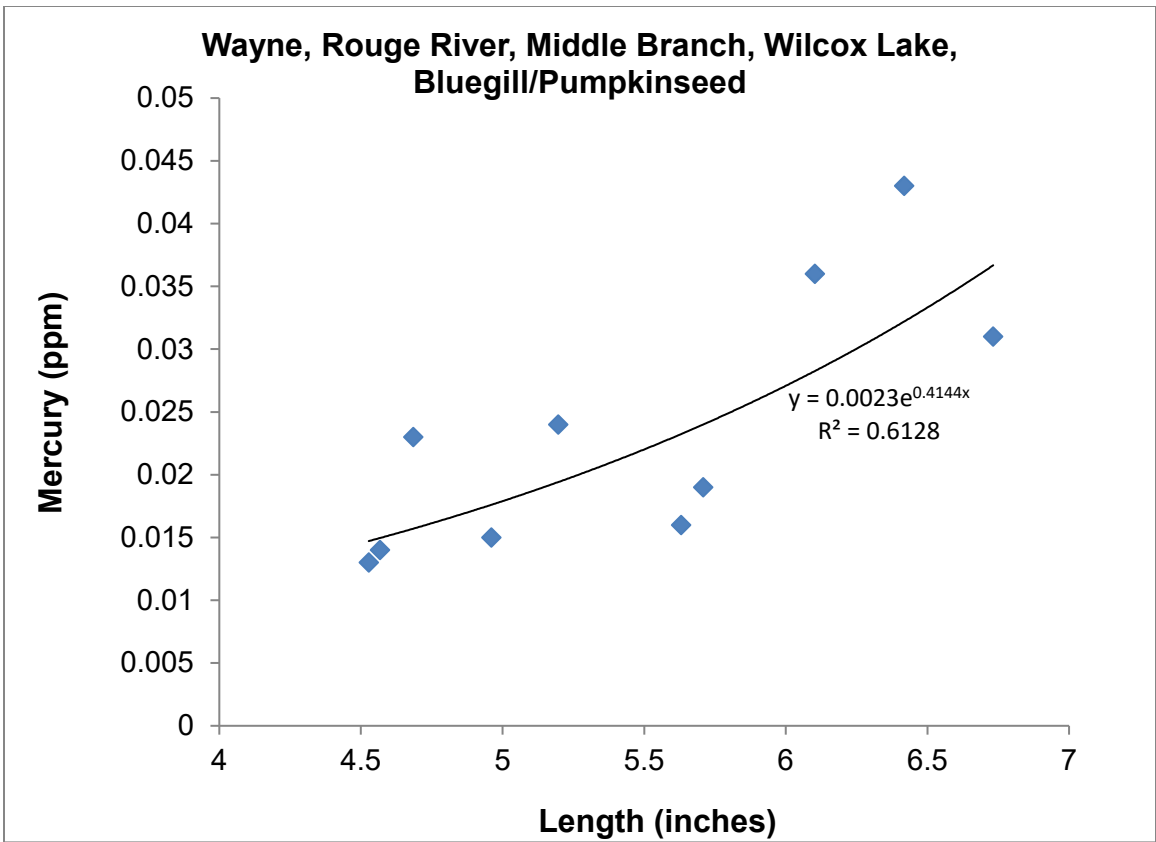
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent					
2021	2021	10	4.5	NA	4.5	6.7
Datasets available: 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.002	<0.001	0.004	0.003	16
DDT	10	0.014	0.009	0.020	0.017	16
Chlordane	10	0.001	<0.001	0.002	0.001	16
Toxaphene	10	ND	--	--	--	--
PFOS	10	19.8 ppb	7.3 ppb	36.2 ppb	27.1 ppb	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.601	0.588				
Final meal category based on UCL:						4

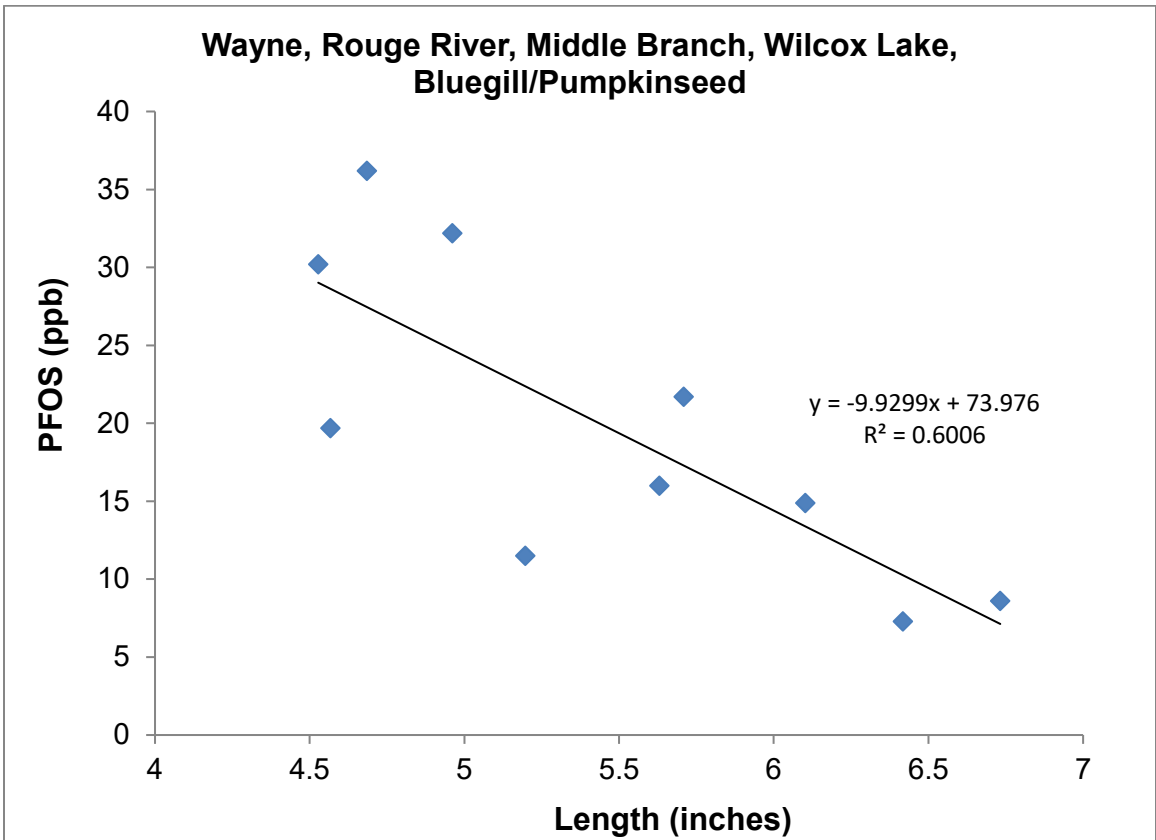
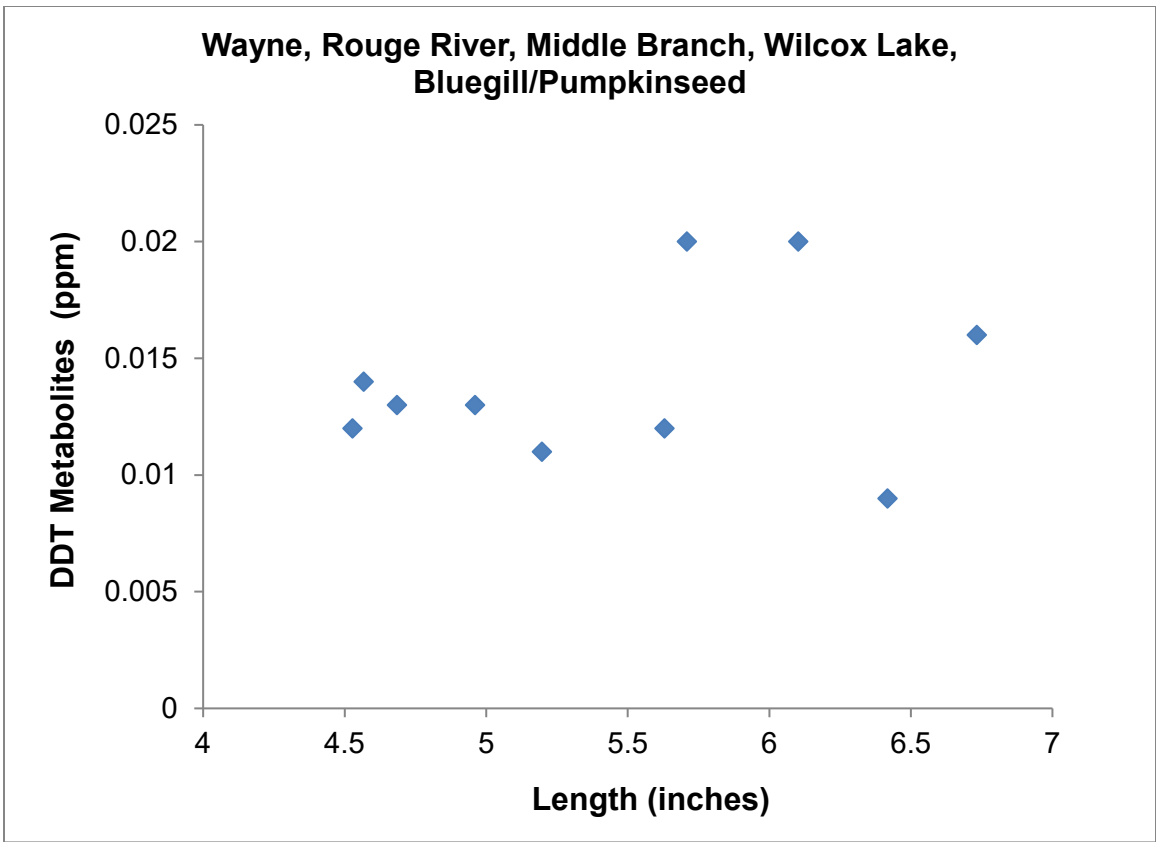
Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
5	0.018	16
6	0.028	16
7	0.042	16
8	0.063	16
9	0.096	8
<i>Shaded area denotes extrapolated estimates</i>		

Existing MDHHS Advisory: This section of the river was previously grouped in with the advisory for Newburgh Lake (from the Phoenix Lake dam down to the Newburgh Lake dam). No one should eat more than 6 meals per year of “All Other Species” from the Middle Branch of the Rouge River from the Phoenix Lake dam down to the Newburgh Lake dam.

Recommendation: There is a dam at Wilcox Lake that restricts fish movement. No one should eat more than 4 meals per month of bluegill or sunfish from the Wilcox Lake impoundment upstream to the Phoenix Dam of the Middle Branch of the Rouge River due to PFOS.

Note: While there was a significant negative correlation between fish size and PFOS concentration, it is not recommended to implement a size-based advisory unless additional data are available providing a biological reason for the negative correlation.





Carp**Rouge River
Upper and Main Branch u/s Ford Dam****Wayne & Oakland
Counties****Hg Analysis:**

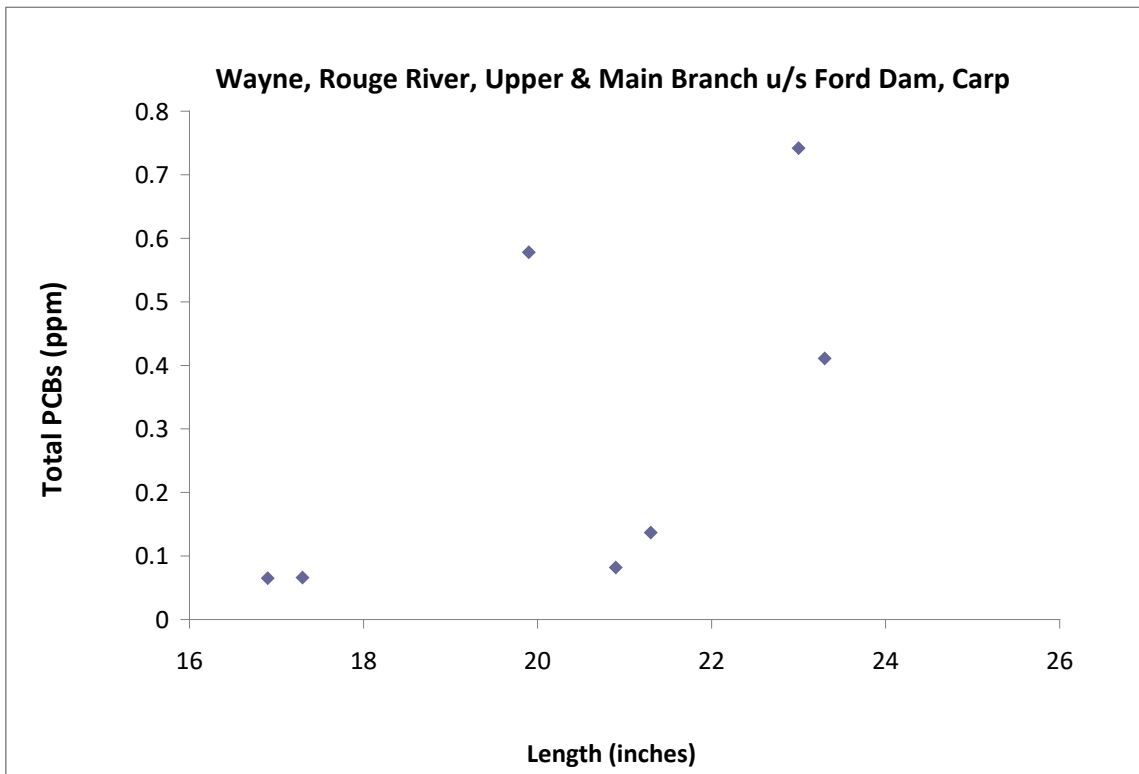
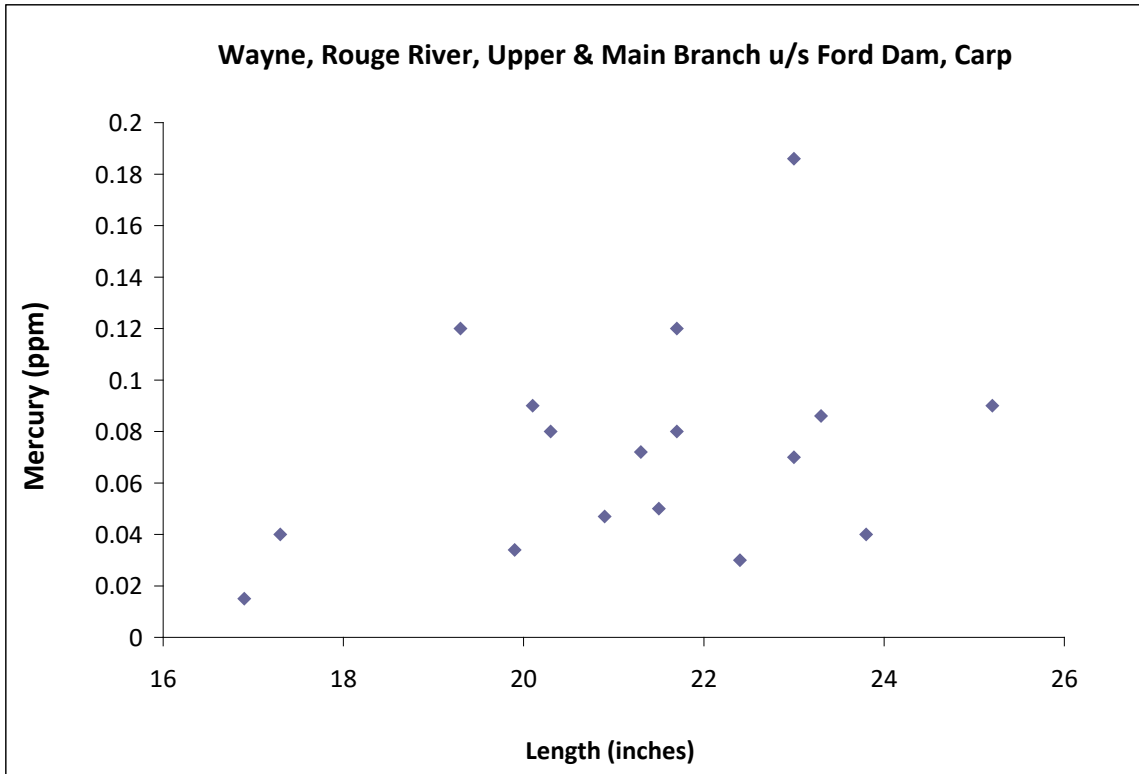
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1995	2005	17	16.9	na	16.9	25.2	
Datasets available: 1987, 1995, 2005							
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL		Meal Category
Mercury	17	0.07			0.10		8
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.115	0.197					

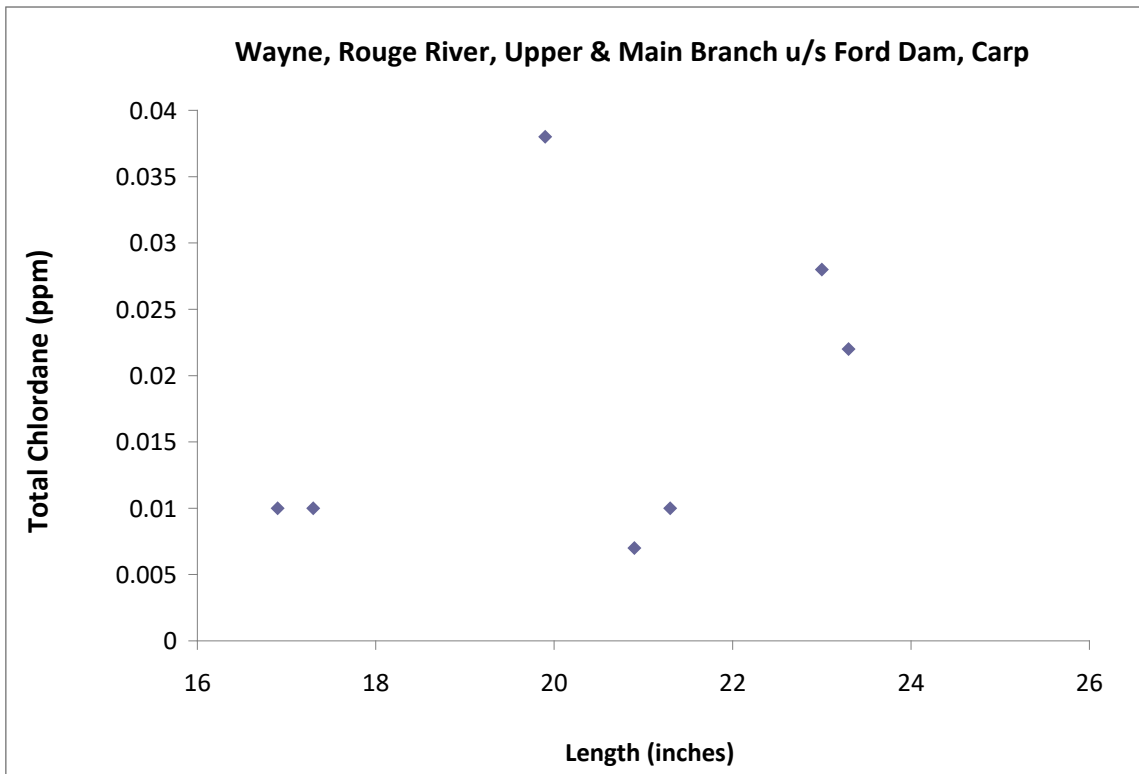
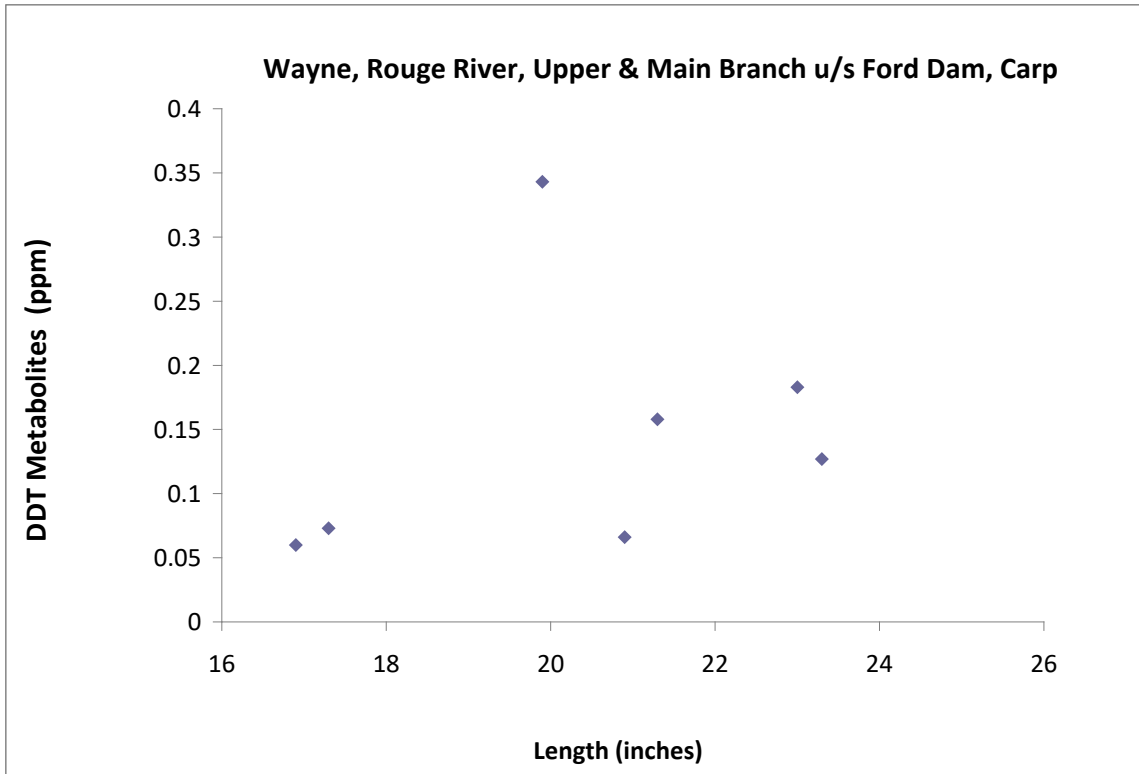
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2005	2005	7	16.9	na	16.9	24.6	
Datasets available: 2005							
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL		Meal Category
PCB	7	0.297			0.560		Limited
DDT	7	0.144			0.240		4
Chlordane	7	0.018			0.030		--
Toxaphene	7	ND			--		--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.383	0.513					
DDT	0.085	0.231					
Chlordane	0.144	0.186					
Toxaphene	--	--					
Final meal category based on UCL:							Limited

Existing Advisory: Women and children should eat no more than six meals per year of Upper Rouge River carp less than 30 inches in length and no one should eat Rouge River carp greater than 30 inches in length due to elevated levels of PCBs.

Recommendation: Sensitive populations should not eat these fish. Healthy adults should limit consumption to 1 or 2 meals per month of carp from the Rouge River upstream of the Ford Dam, including the Upper Rouge and the Middle Rouge downstream of the Nankin Dam due to PCBs. DDT and mercury would cause advisories.





Goldfish

**Rouge River
Upper and Main Branch u/s Ford Dam**

**Wayne & Oakland
Counties**

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	1987	1	7.3	na	7.3	7.3
Datasets available:		1987				
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	1	ND		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	1987	1	7.3	na	7.3	7.3
Datasets available:		1987				
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	1	0.520		--		--
DDT	1	0.417		--		--
Chlordane	1	0.113		--		--
Toxaphene	1	ND		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--		Final meal category based on UCL:		na

Existing Advisory: Rouge River goldfish are not covered by an advisory.

Recommendation: Goldfish are not likely to be taken by anglers regularly; more importantly, the data are old and insufficient to support an advisory.

Northern Pike

**Rouge River
Upper and Main Branch u/s Ford Dam**

**Wayne & Oakland
Counties**

Hg Analysis:

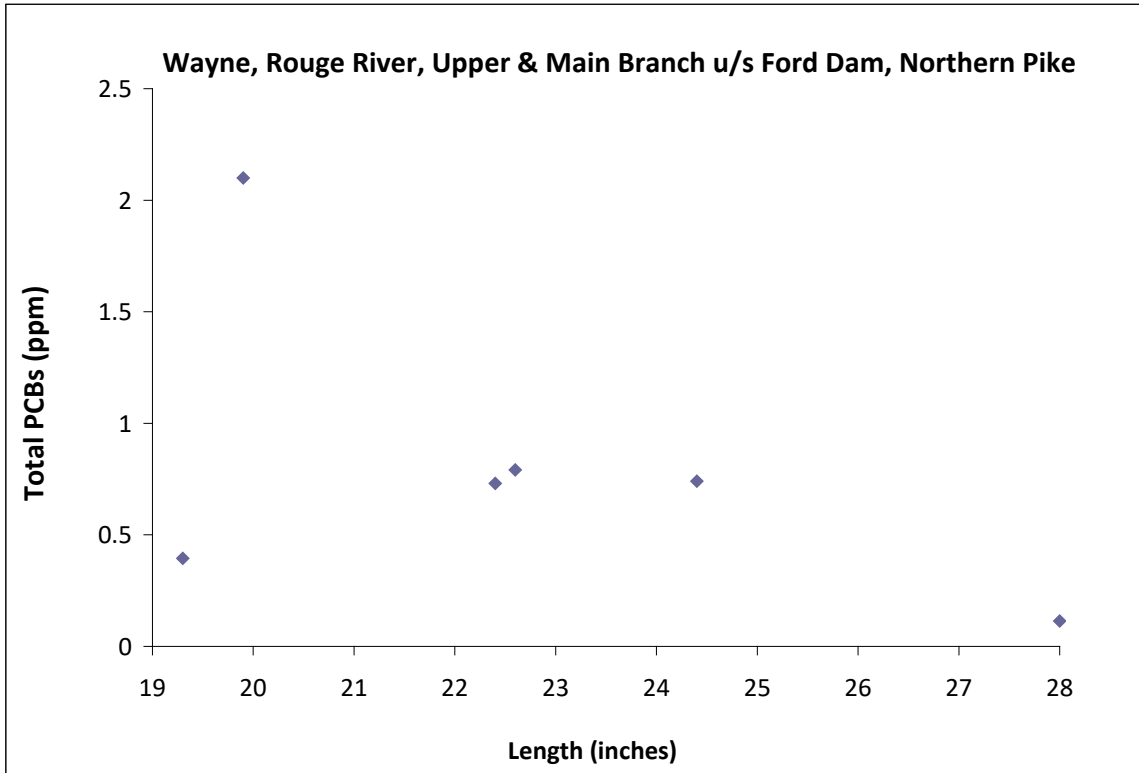
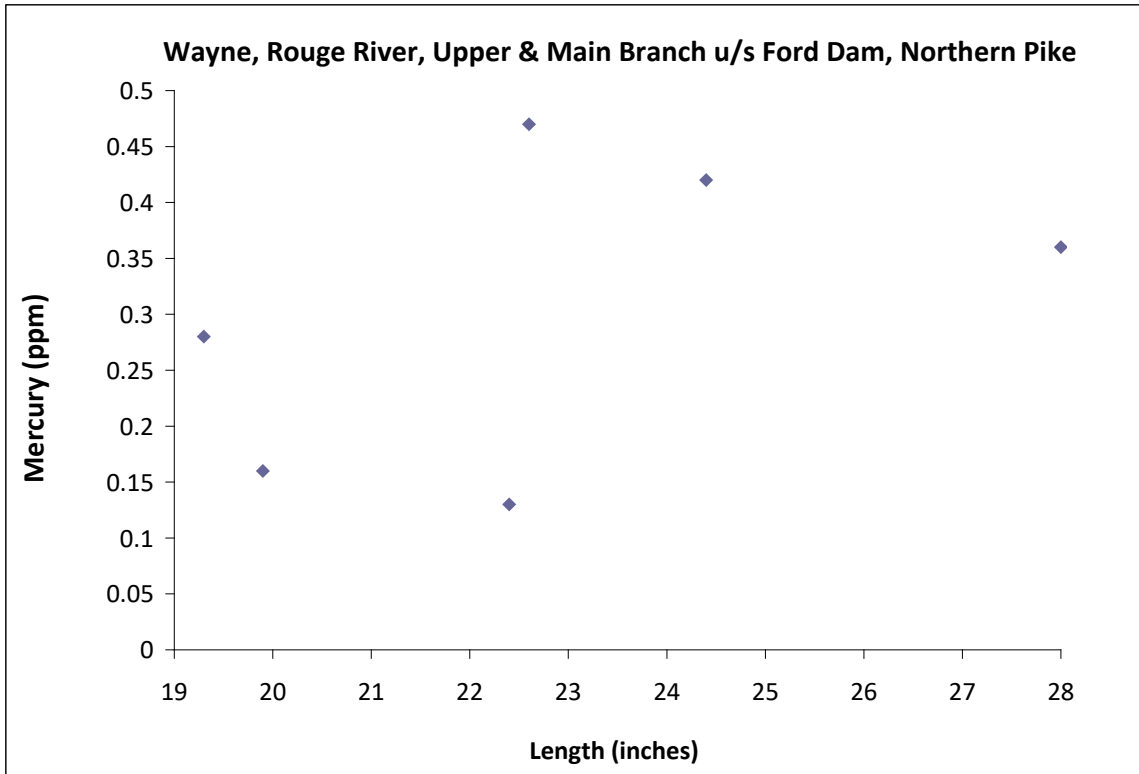
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1995	1995	6	19.3	24	24.4	28
Datasets available: 1995						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	2	0.390		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.213	0.203				

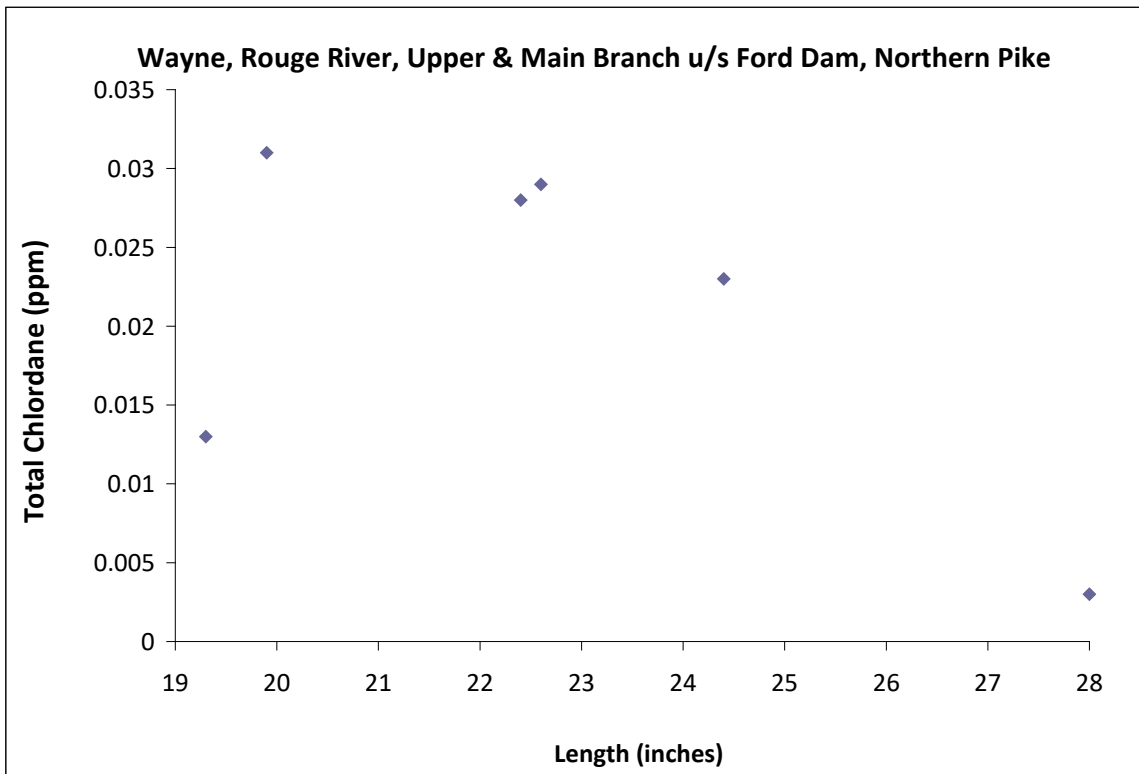
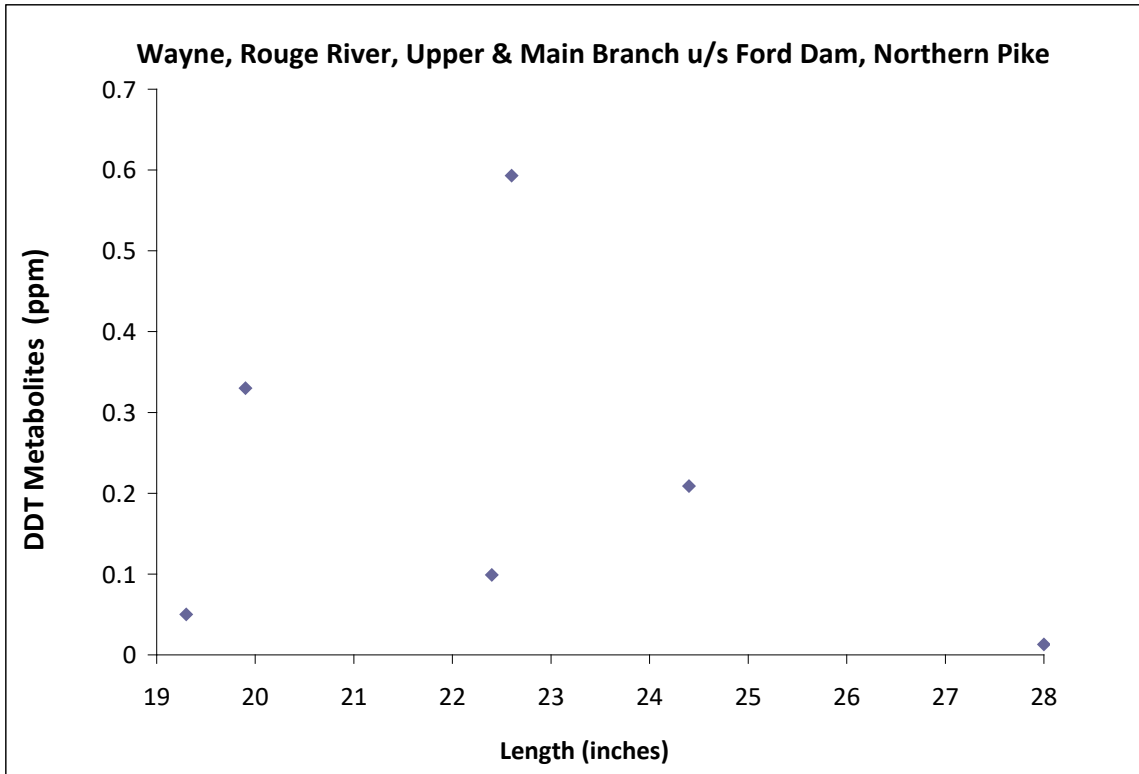
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1995	1995	6	19.3	24	24.4	28
Datasets available: 1995						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	2	0.428		--		--
DDT	2	0.111		--		--
Chlordane	2	0.013		--		--
Toxaphene	2	ND		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.304	0.479				
DDT	0.060	0.240				
Chlordane	0.301	0.454				
Toxaphene	--	--		Final meal category based on UCL:		--

Existing Advisory: Women and children should eat no more than six meals per year of Rouge River northern pike.

Recommendation: Dataset is limited due to sample size and age of the data. Dataset is not usable for providing a recommendation. Statewide advisory would apply to Rouge River northern pike.





Rock Bass

Rouge River – Upper Branch, Main Branch upstream Ford Dam, Middle Branch downstream of Nankin Dam

Oakland and Wayne Counties

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples			
Earliest	Most Recent				Min	Max		
2021	2021	5	6.9	NA	6.9	9.0		
Datasets available:		2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category		
Mercury	5	0.135	0.093	0.190	0.181	4		
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
Mercury	0.527	0.486						

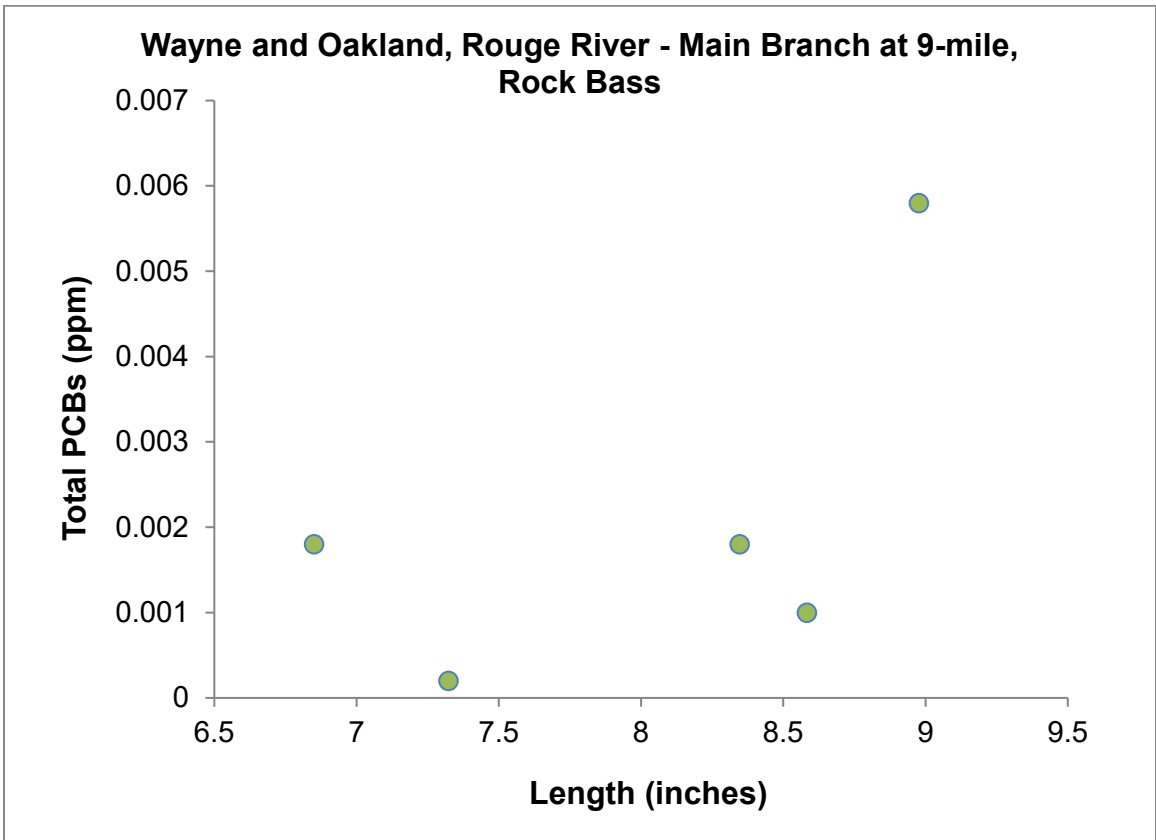
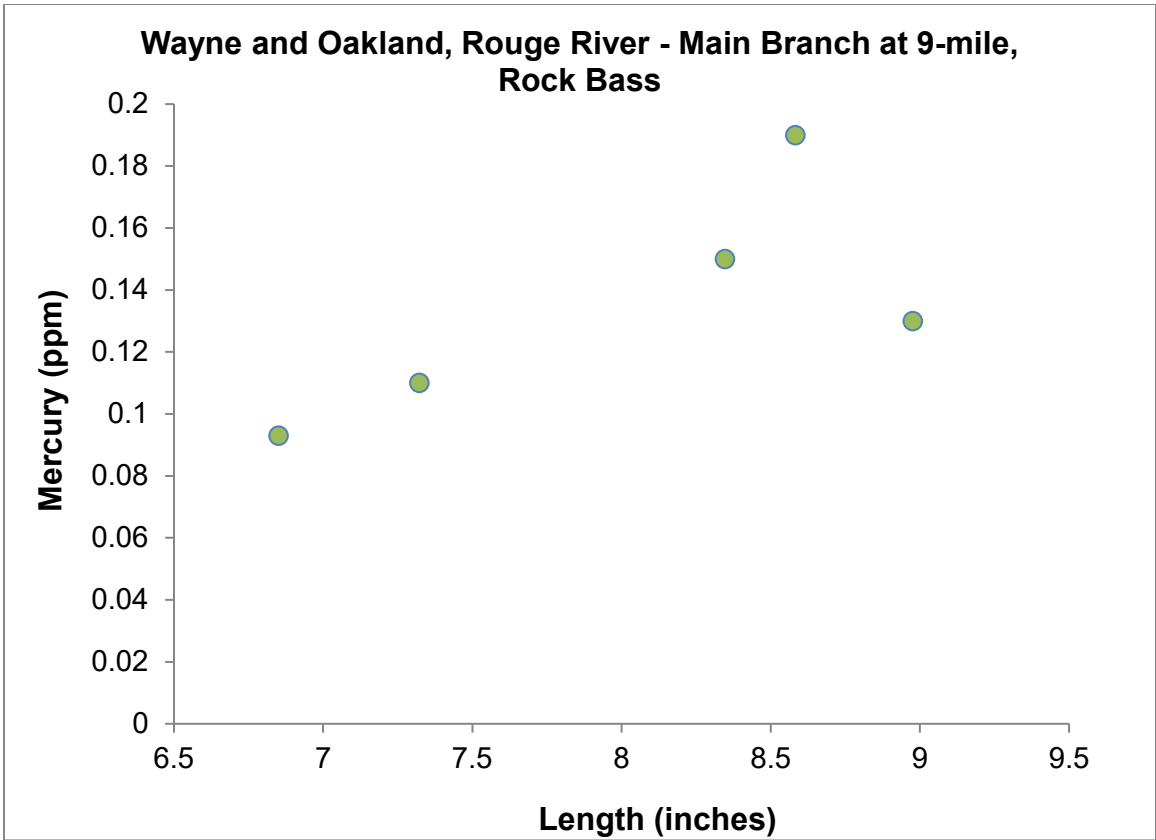
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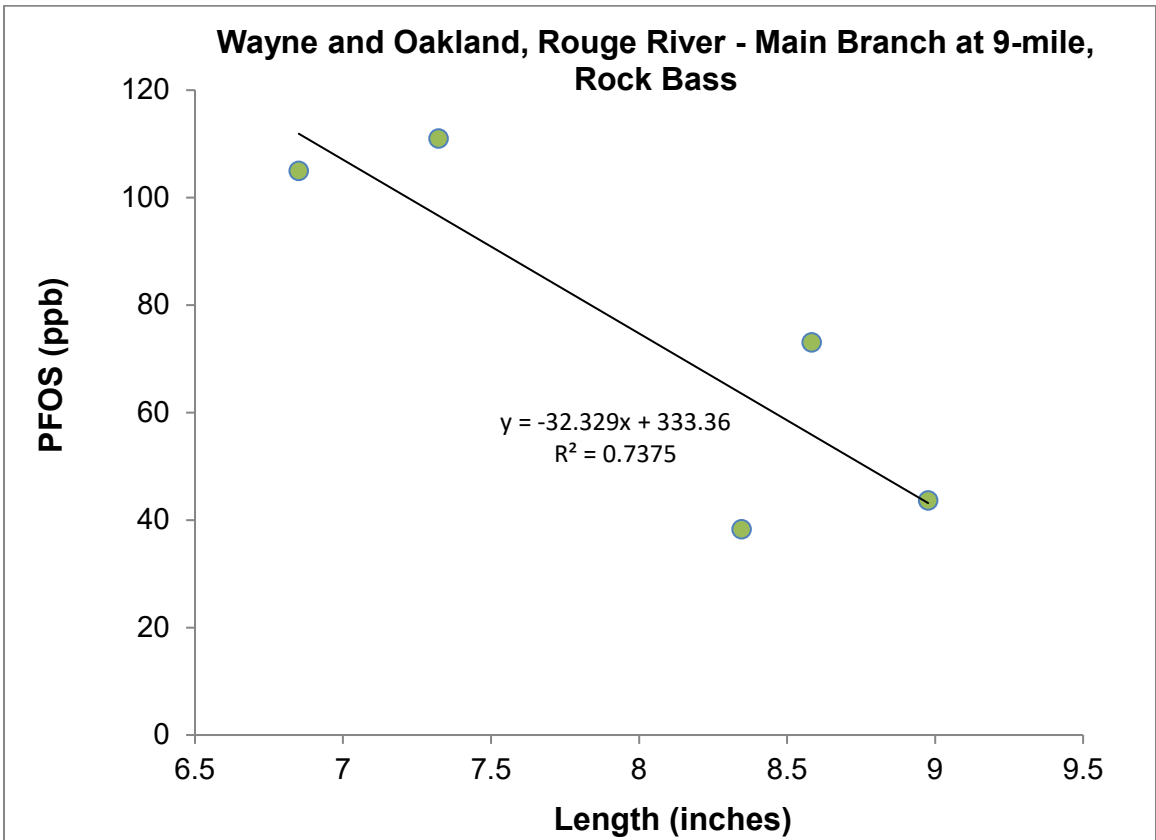
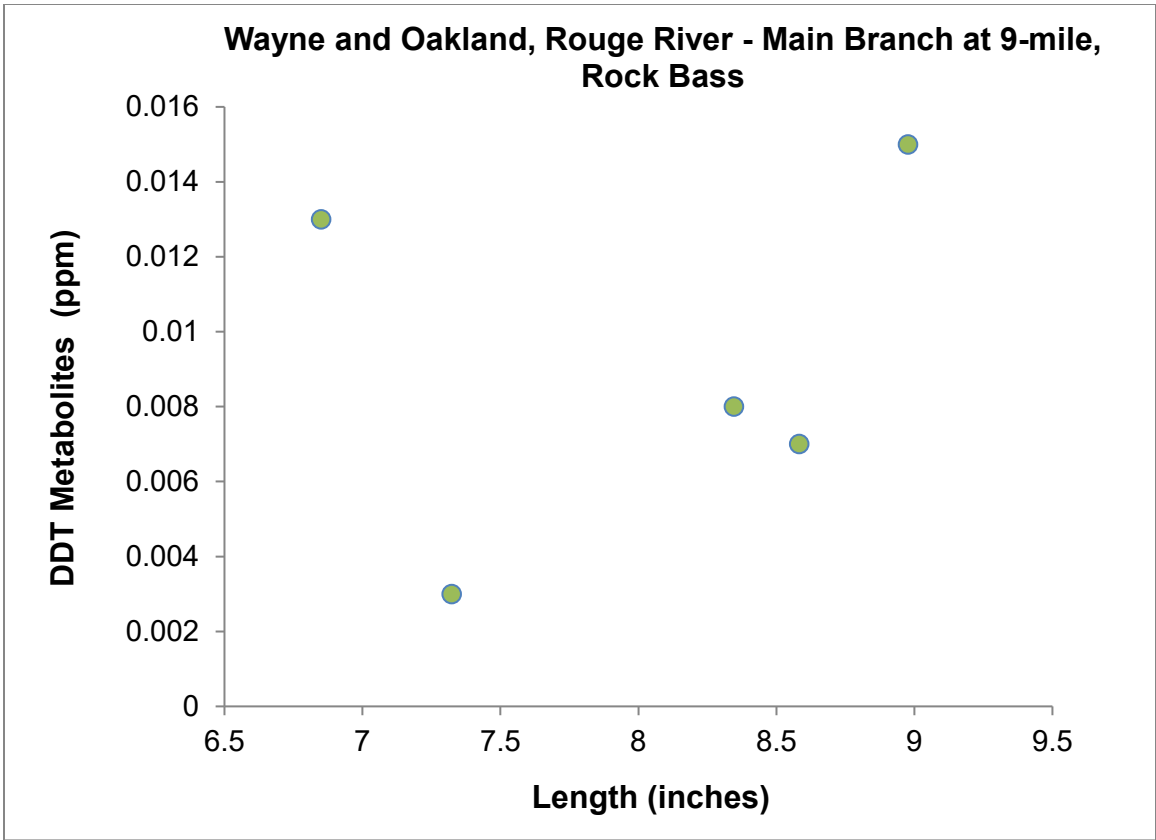
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples			
Earliest	Most Recent				Min	Max		
2021	2021	5	6.9	NA	6.9	9.0		
Datasets available:		2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category		
PCB	5	0.002	<0.001	0.006	0.005	16		
DDT	5	0.009	0.003	0.015	0.015	16		
Chlordane	5	0.001	<0.001	0.002	0.002	16		
Toxaphene	5	ND	--	--	--	--		
PFOS	5	74.2 ppb	38.3 ppb	111.0 ppb	116.0 ppb	1		
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
PCB	0.339	0.278						
DDT	0.049	0.080						
Chlordane	0.361	0.361						
Toxaphene	--	--						
PFOS	0.738	0.658						
						Final meal category based on UCL:	1	

Existing MDHHS Advisory: Rock bass from the Upper Branch and Main Branch upstream of the Ford Dam are currently covered under the statewide mercury guidance. No one should eat more than 4 meals per month of rock bass of any size.

Recommendation: No one should eat more than 1 meal per month of rock bass of any size from the Rouge River upstream of the Ford Dam, including the entire Upper Branch of the river and the Middle Branch of the river downstream of the Nankin Dam, due to PFOS. Mercury causes less restrictive advice.

Note: While there was a significant negative correlation between fish size and PFOS concentration, it is not recommended to implement a size-based advisory unless additional data are available providing a biological reason for the negative correlation.





White Sucker

Rouge River Main Branch upstream of the Ford Dam, Upper Branch, and Middle Branch downstream of the Nankin Dam

Wayne and Oakland Counties

Hg Analysis:

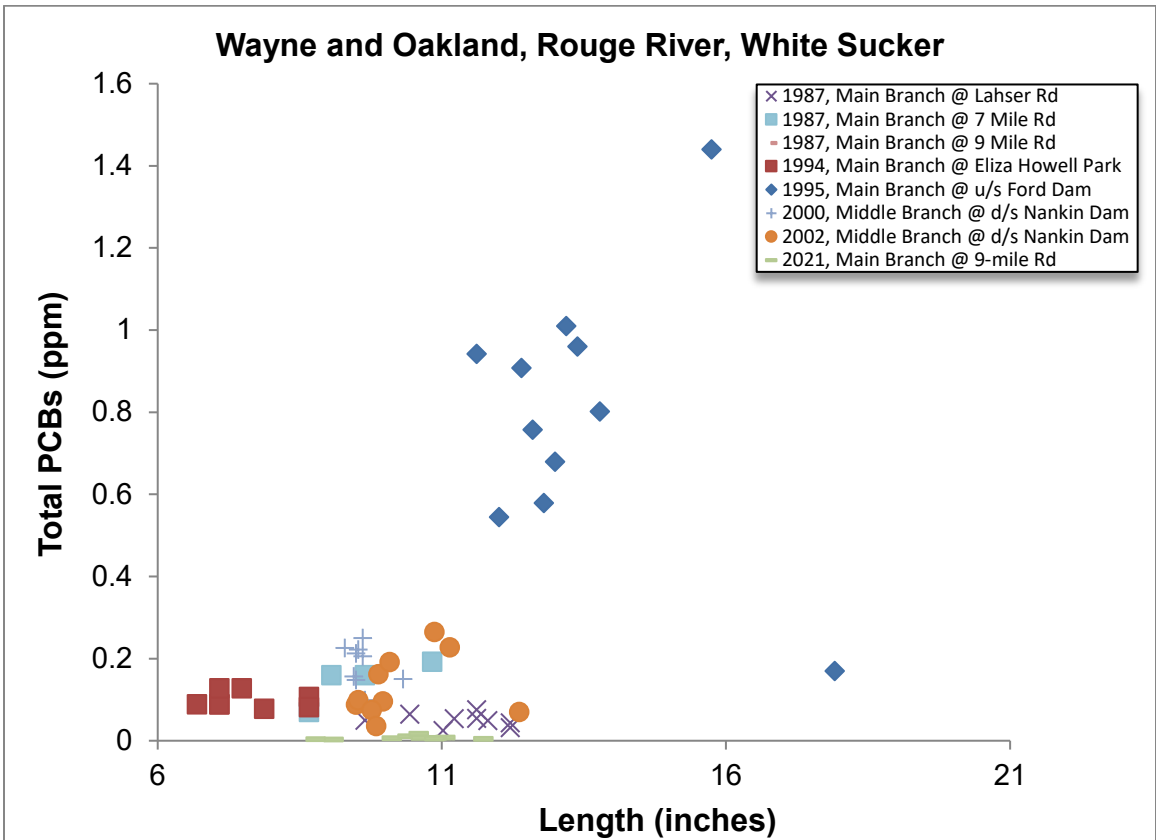
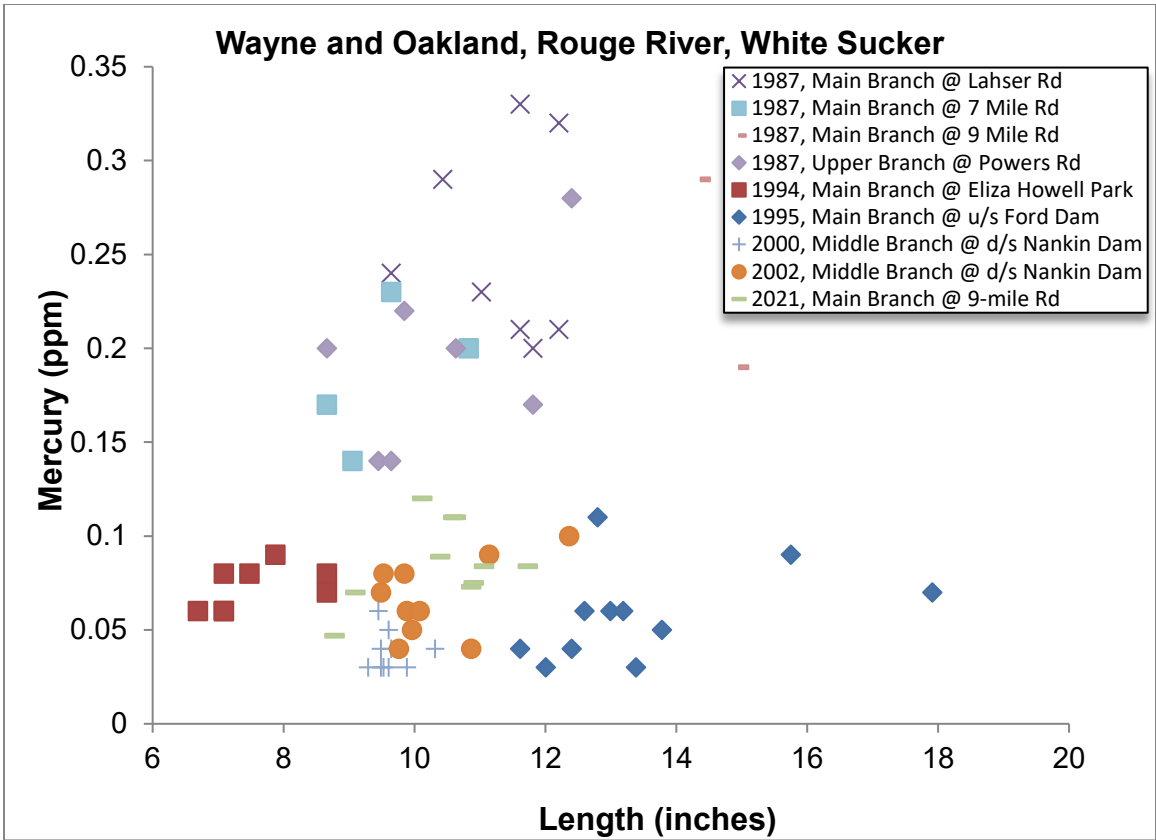
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	2021	71	6.7	NA	6.7	17.9
Datasets available: 1987, 1994, 1995, 2000, 2002, 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	71	0.112	0.030	0.330	0.131	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.046	0.033				

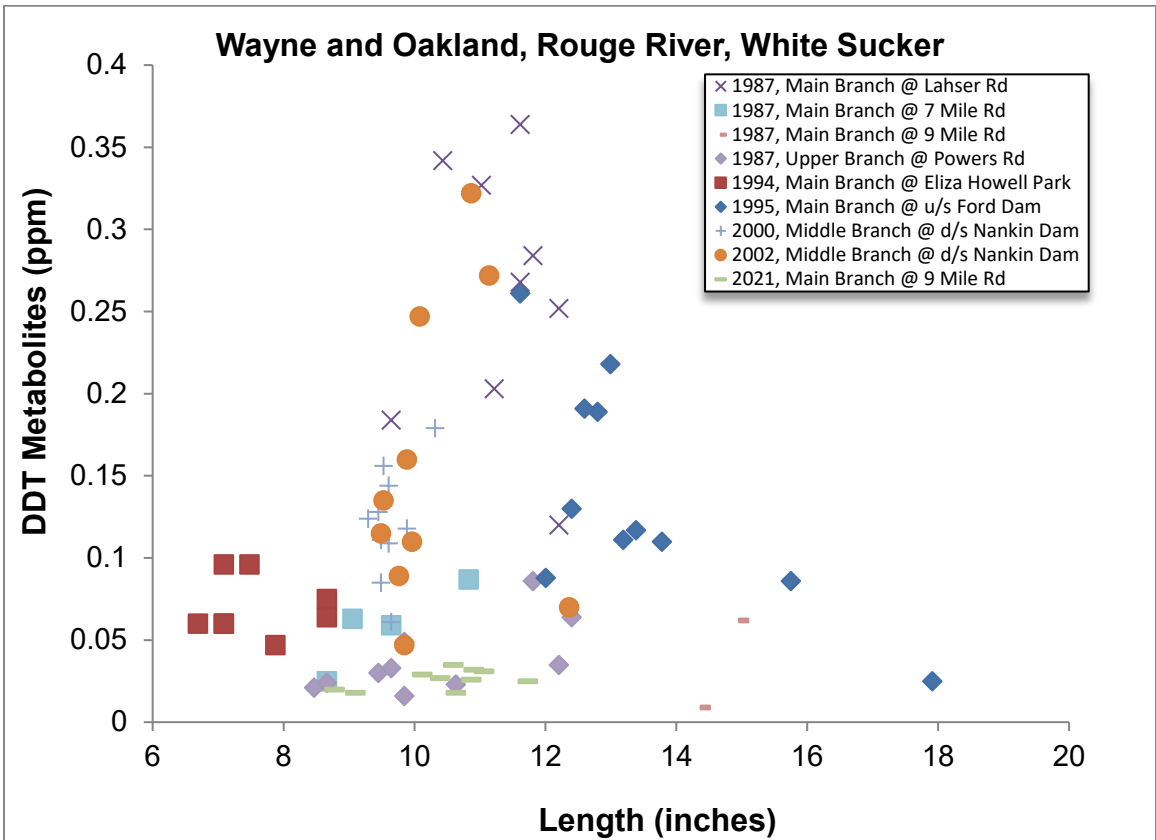
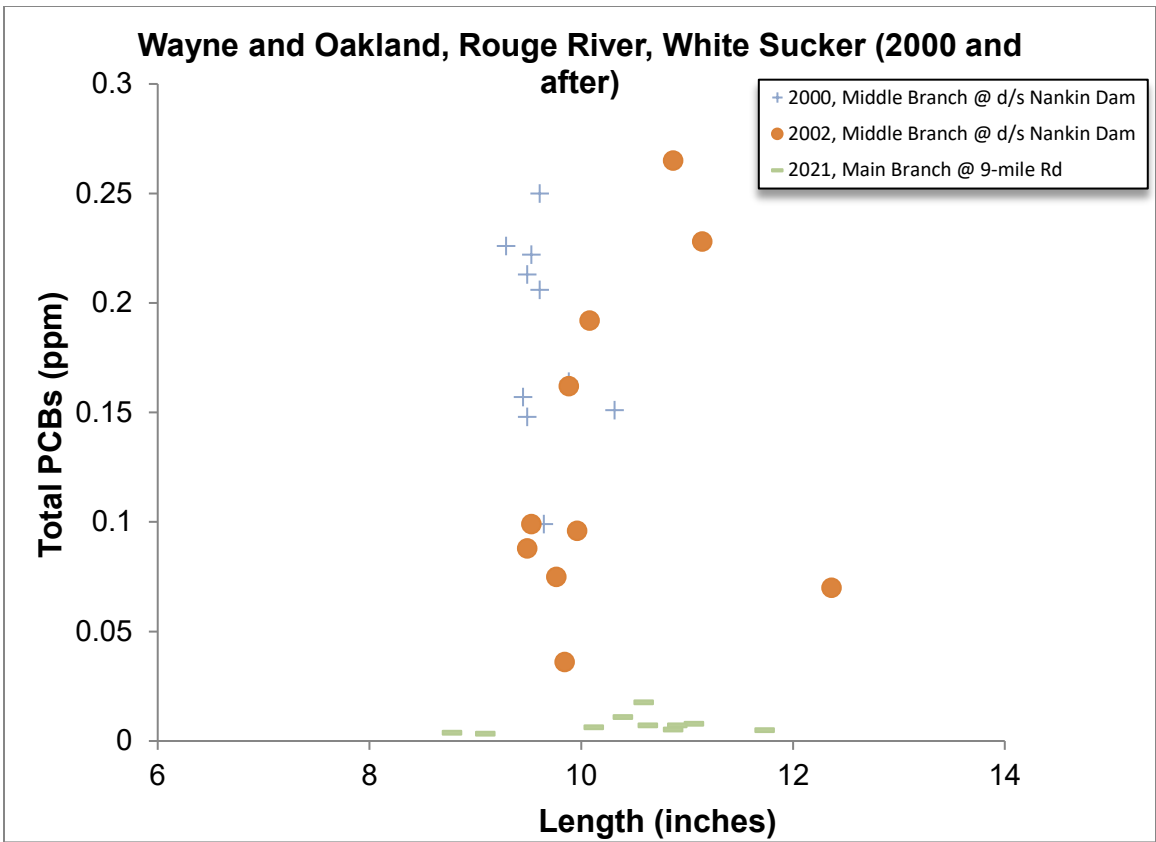
Organics Analysis:

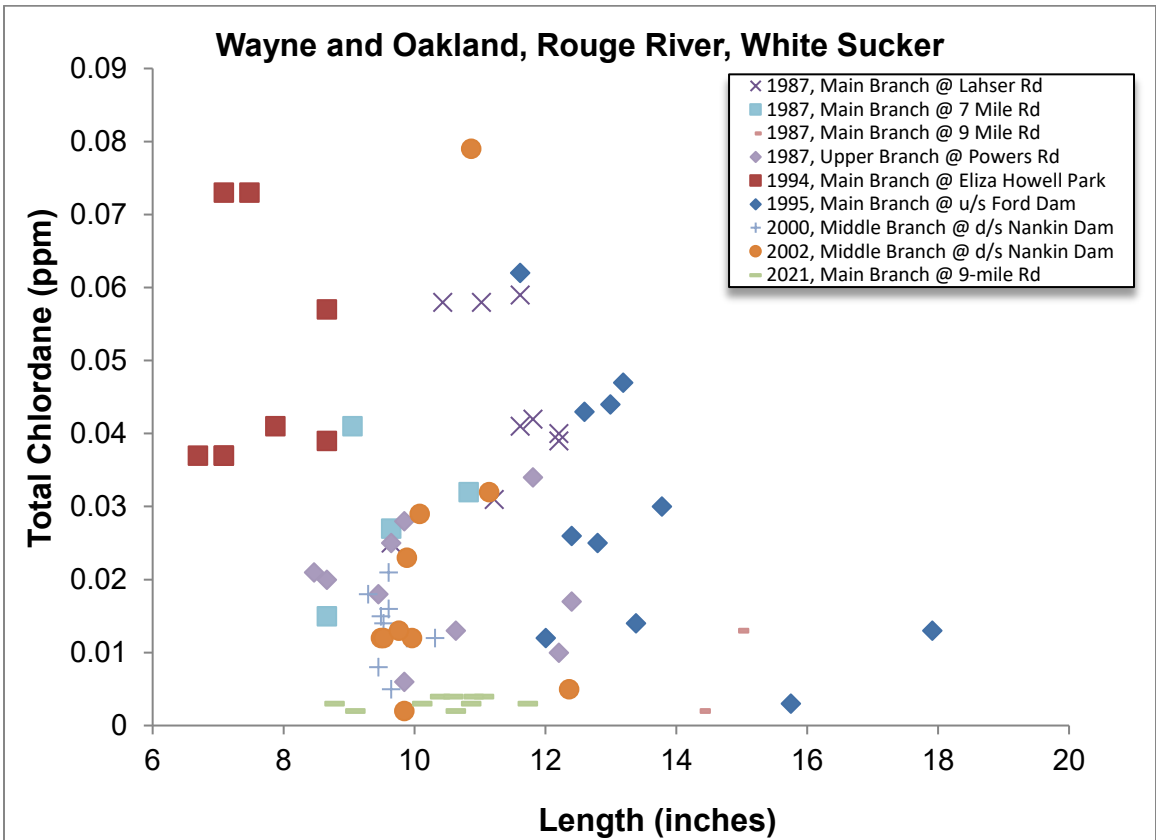
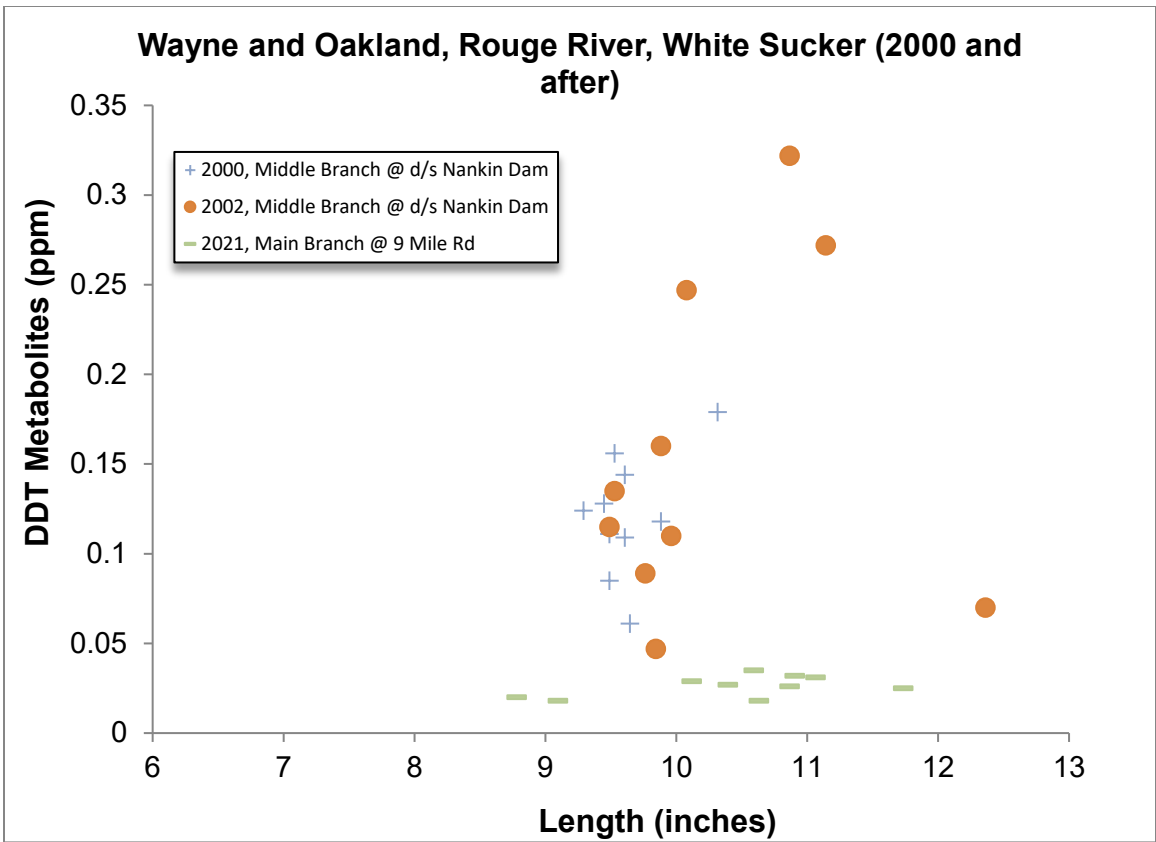
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2000	2021	30	8.8	NA	8.8	12.4
Datasets available: 1987, 1994, 1995, 2000, 2002, 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	30	0.107	0.003	0.265	0.141	1
DDT	30	0.101	0.018	0.322	0.131	12
Chlordane	30	0.013	0.002	0.079	0.018	16
Toxaphene	30	ND	--	--	--	--
PFOS	10	8.8 ppb	5.8 ppb	15.1 ppb	10.9 ppb	12
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.059	0.055				
DDT	0.000	0.018				
Chlordane	0.004	0.017				
Toxaphene	--	--				
PFOS	0.159	0.227				
Final meal category based on UCL:						1

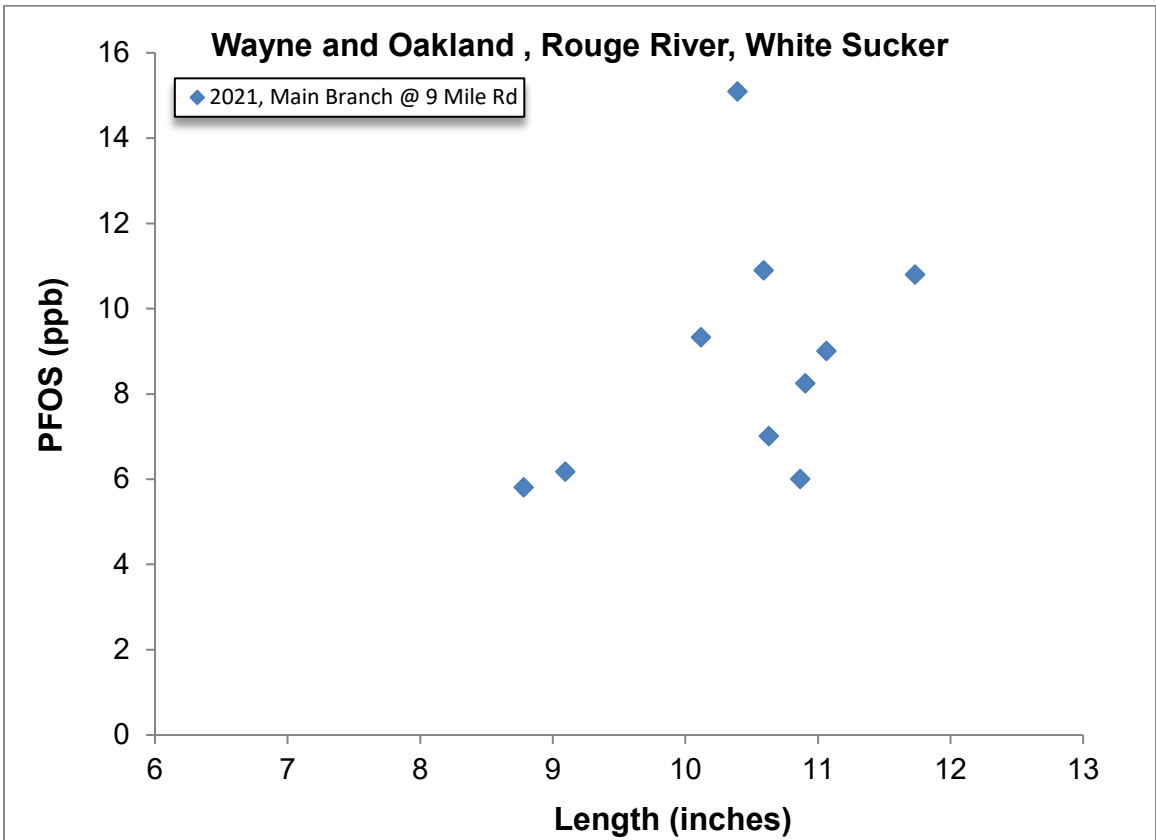
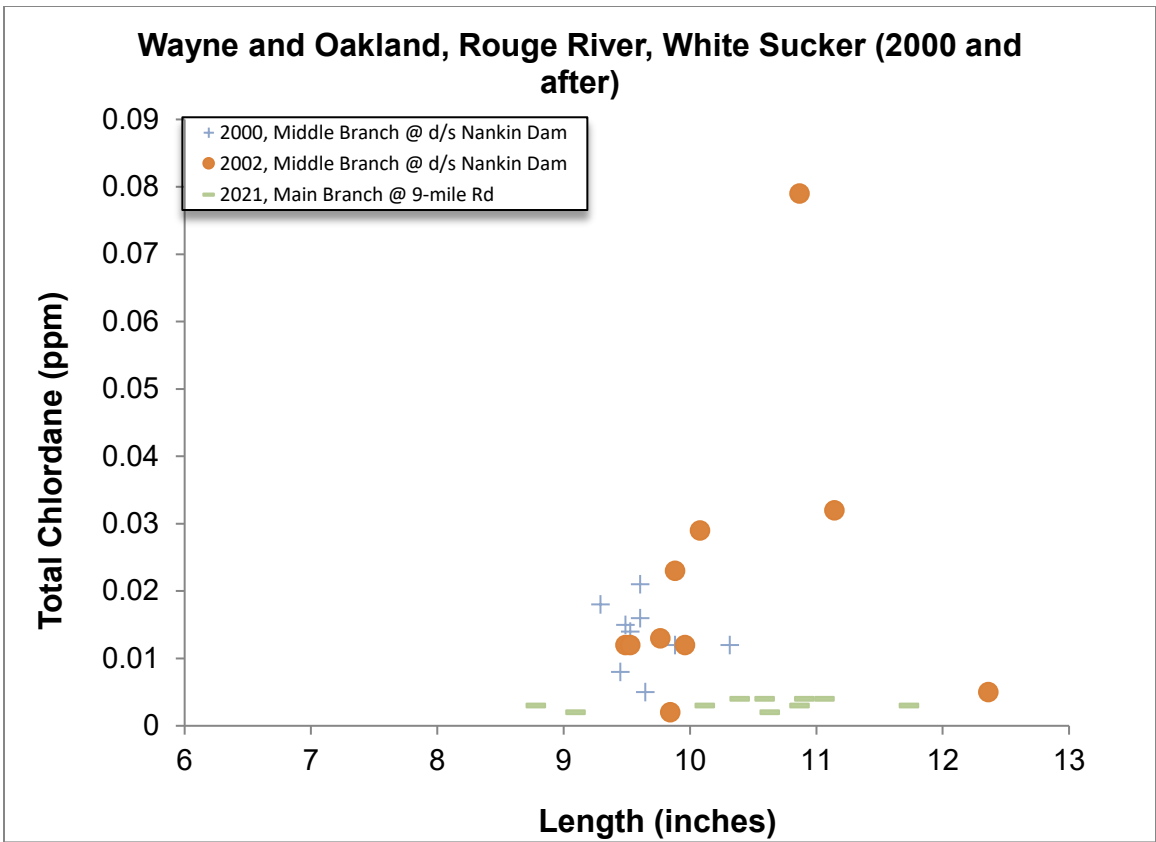
Existing MDHHS Advisory: No one should eat more than 6 meals per year of suckers of any size from the Upper Branch of the Rouge River and the Main Branch of the river upstream of the Ford Dam due to PCBs.

Recommendation: No one should eat more than 1 meal per month of suckers of any size from the entire Upper Branch of the Rouge River, the Middle Branch of the river downstream of the Nankin Dam, and the Main Branch of the river upstream of the Ford Dam due to PCBs. Mercury, DDT, and PFOS cause less restrictive guidance.









Saginaw County

Carp

Cheboyganing Creek

Saginaw County

Hg Analysis:

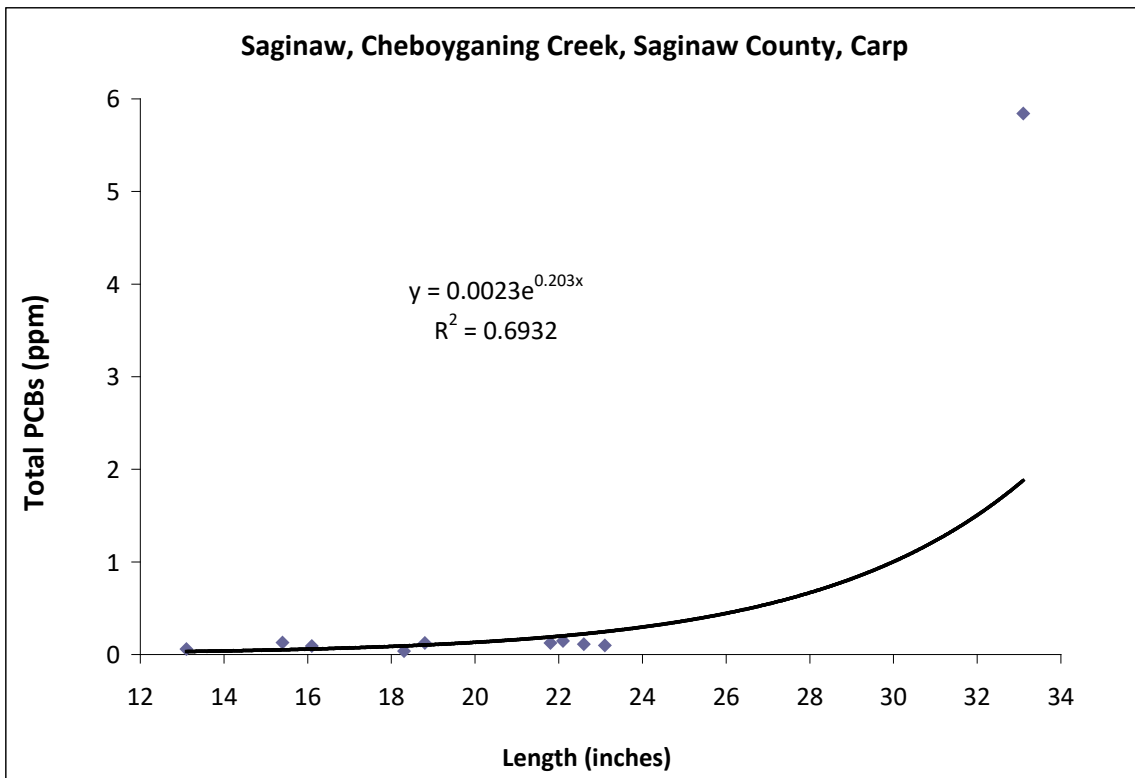
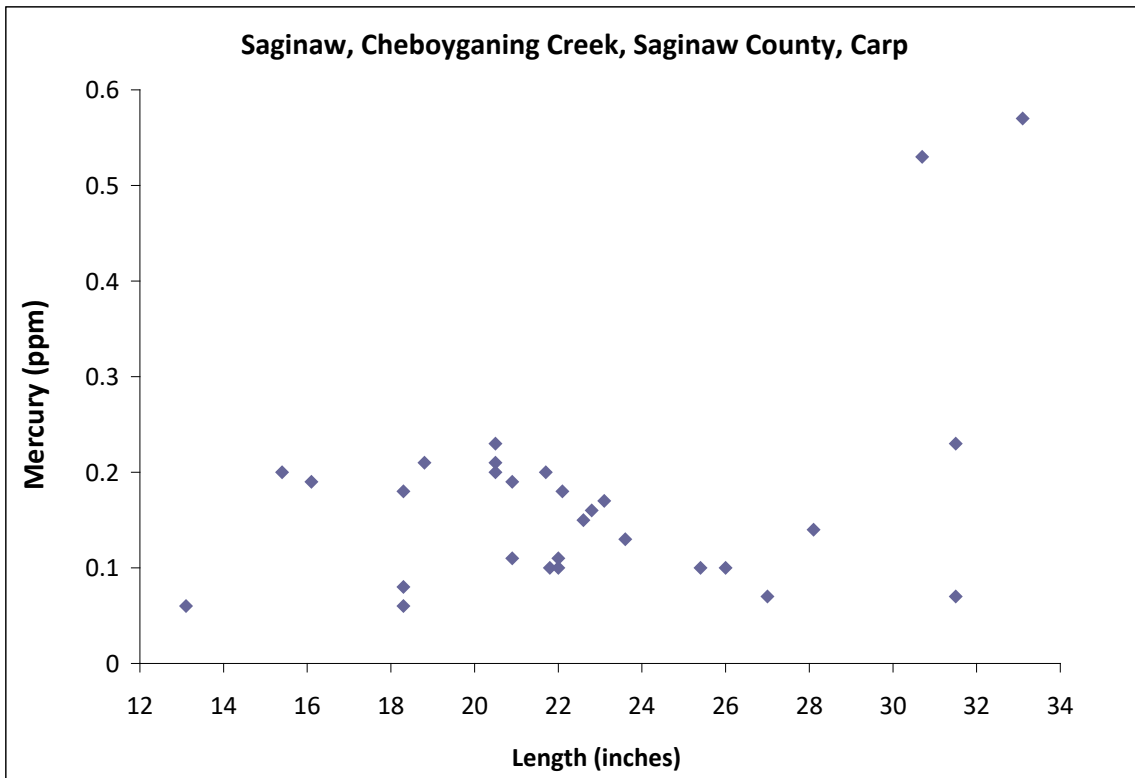
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	2004	29	13.1	na	13.1	33.1
Datasets available: 1989, 1994, 2004						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	29	0.173		0.220	4	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.183	0.091				

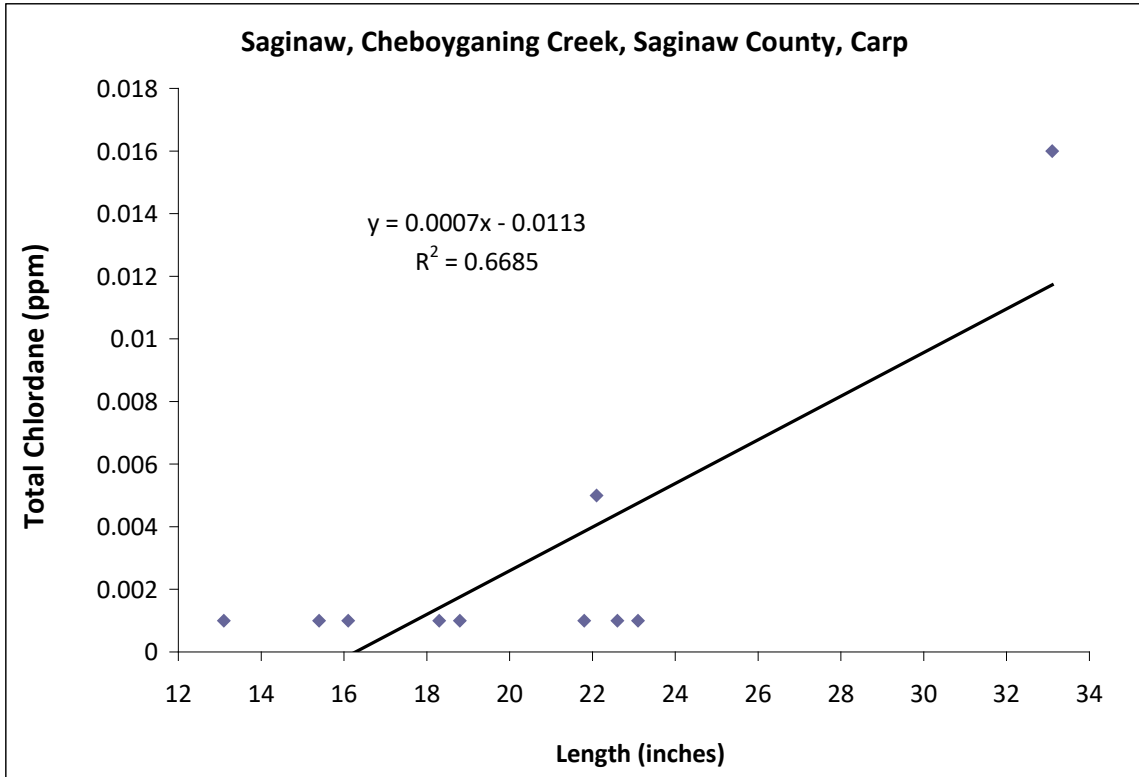
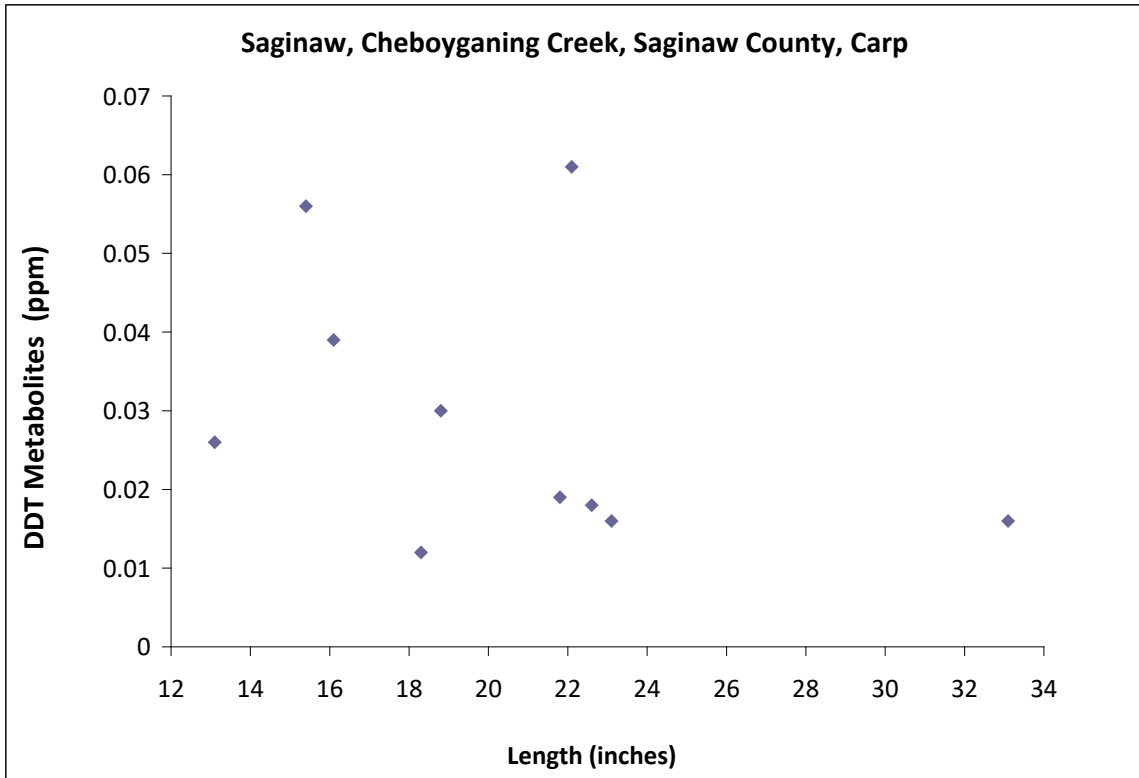
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2004	2004	10	13.1	na	13.1	33.1
Datasets available: 2004						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	10	0.677		1.980	Limited	
DDT	10	0.029		0.040	16	
Chlordane	10	0.003		0.010	--	
Toxaphene	10	ND				
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.639	0.693		<i>Regression driven by 1 data point and not used.</i>		
DDT	0.123	0.166				
Chlordane	0.669	0.605				
Toxaphene						
					Final meal category based on UCL: Limited	

Existing Advisory: Women and children should eat no more than one meal per month and the general population should eat no more than one meal per week of Cheboyganing Creek carp less than 22 inches in length. No one should eat Cheboyganing Creek carp larger than 22 inches in length due to elevated levels of PCBs.

Recommendation: Sensitive populations should not eat these fish. For healthy adults, limit consumption to no more than 1 or 2 meals per year of Cheboyganing Creek carp. Mercury would cause an advisory.





Northern Pike

Cheboyganing Creek

Saginaw County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	1989	6	21.3	24	27	30.7
Datasets available: 1989						
Chemical	Sample Size (Legal)	Mean (ppm)	95%UCL		Meal Category	
Mercury	3	0.140	--		--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.297	0.249				

Organics Analysis:

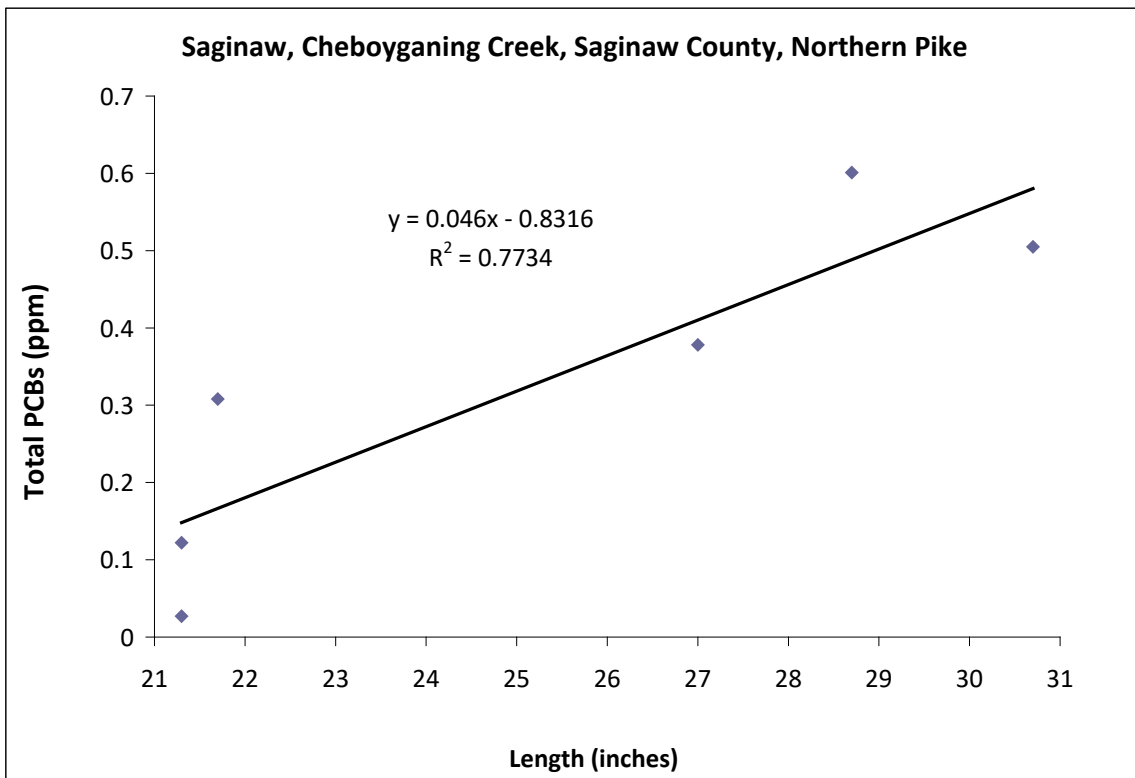
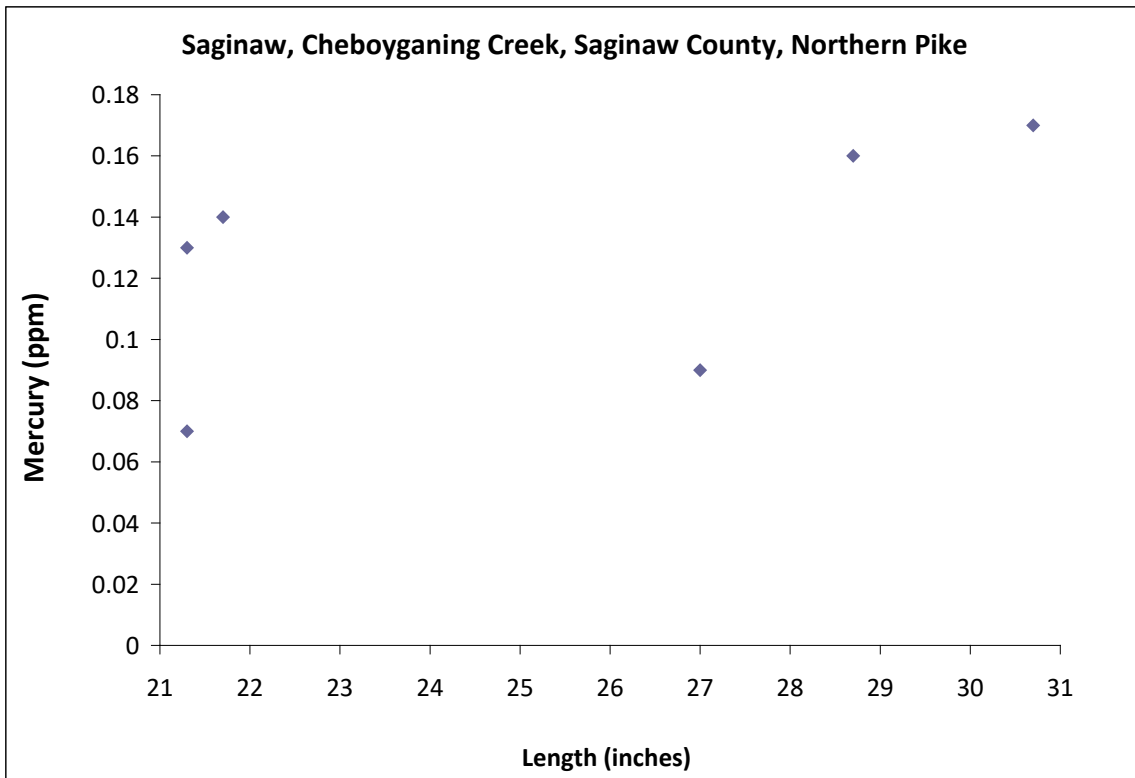
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	1989	6	21.3	24	27	30.7
Datasets available: 1989						
Chemical	Sample Size (Legal)	Mean (ppm)	95%UCL		Meal Category	
PCB	3	0.495	--		--	
DDT	3	0.115	--		--	
Chlordane	3	0.013	--		--	
Toxaphene	3	ND	--		--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.773	0.557				
DDT	0.794	0.619				
Chlordane	0.912	0.884				
Toxaphene						
Final meal category based on UCL:						--

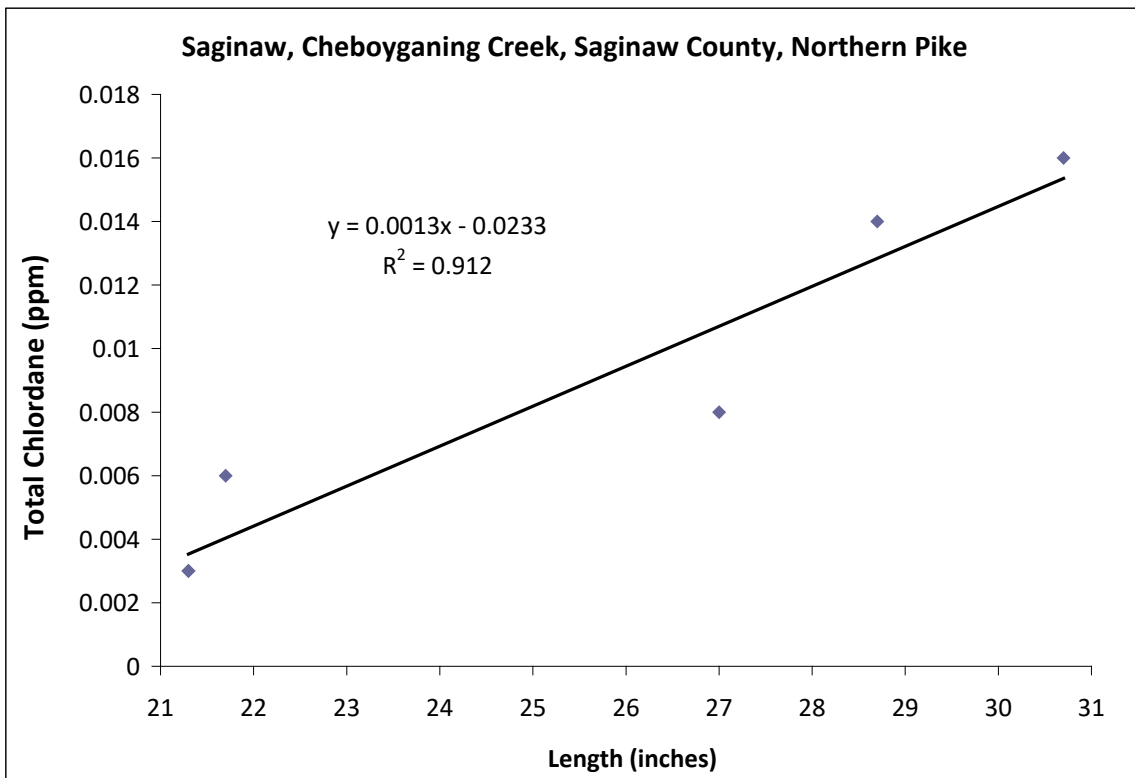
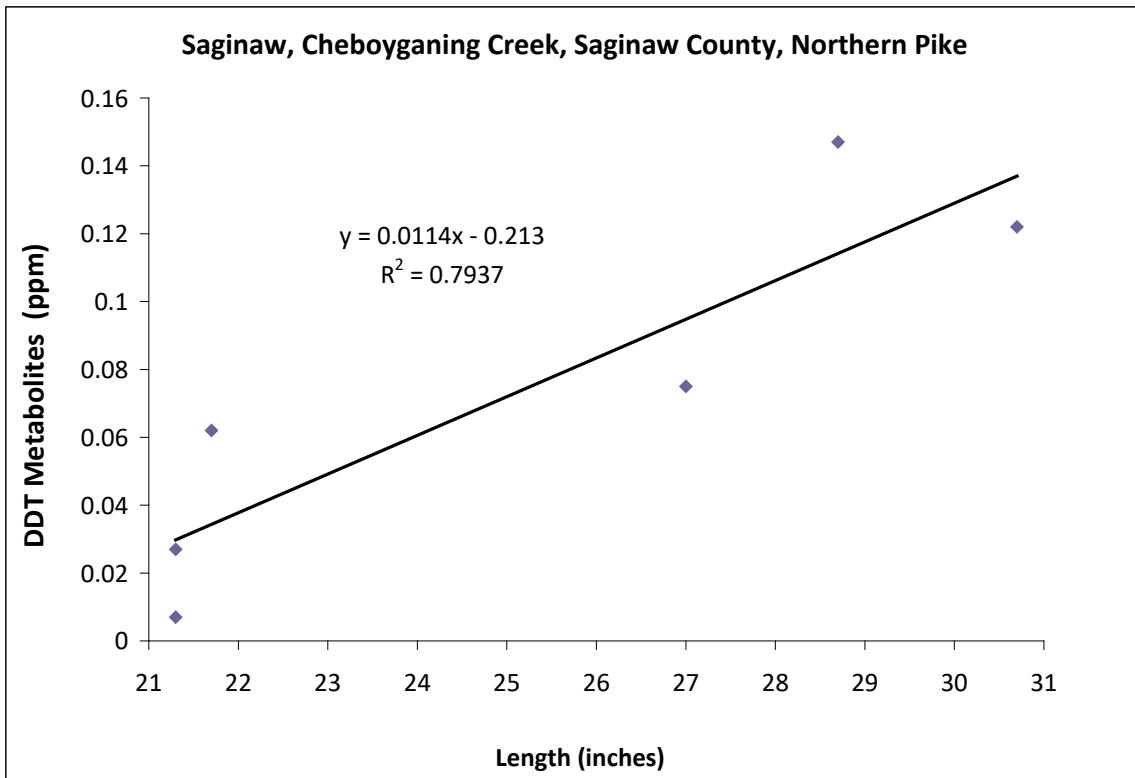
Existing Advisory: Women and children should eat no more than one meal per month of Cheboyganing Creek northern pike due to elevated concentrations of PCBs.

Recommendation: No one should eat more than 1 meal per month of Cheboyganing Creek northern pike less than 26 inches due to PCBs. No one should eat more than 6 meals per year of Cheboyganing Creek northern pike greater than 26 inches due to PCBs. This dataset is limited by age of the data. Based on EGLE’s Fish

Contaminant Monitoring Program, PCB and DDT concentrations ≥15 years old are expected to have declined to a concentration that allows a less restrictive meal category than determined by the standard evaluation method for northern pike less than 26 inches. For northern pike greater than 26 inches, a management determination to apply this additional consideration to the Limited category was implemented. This is in agreement with similar species in the adjoining Saginaw River.

Length (Inches)	PCB Regression Estimate (ppm)	Meal Category
24	0.272	0.5
26	0.364	0.5
28	0.456	Limited
30	0.548	Limited
32	0.640	Limited
34	0.732	Limited
36	0.824	Limited
<i>Shaded area denotes extrapolated estimates</i>		





Black Crappie

Haithco Lake

Saginaw County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2016	2016	5	7.3	na	7.3	8.8
Datasets available: 2016						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	5	0.17	0.14	0.20	0.20	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.721	0.731				

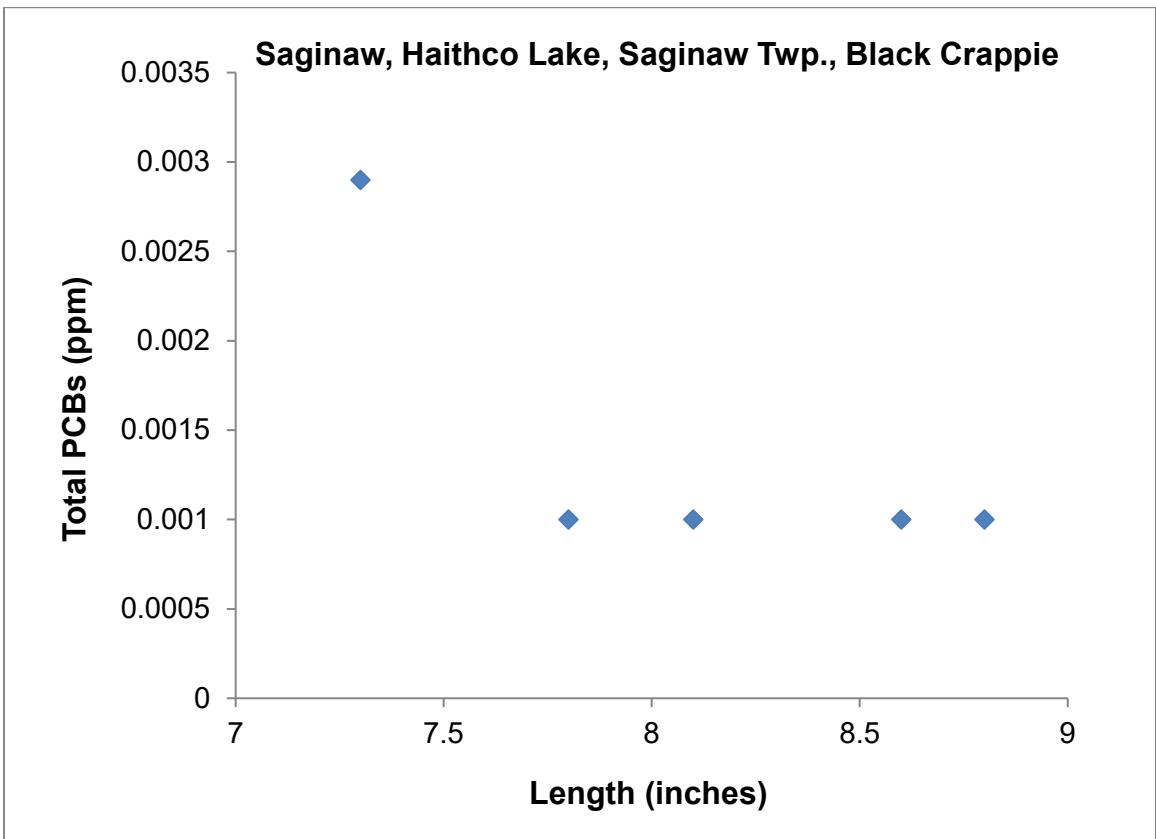
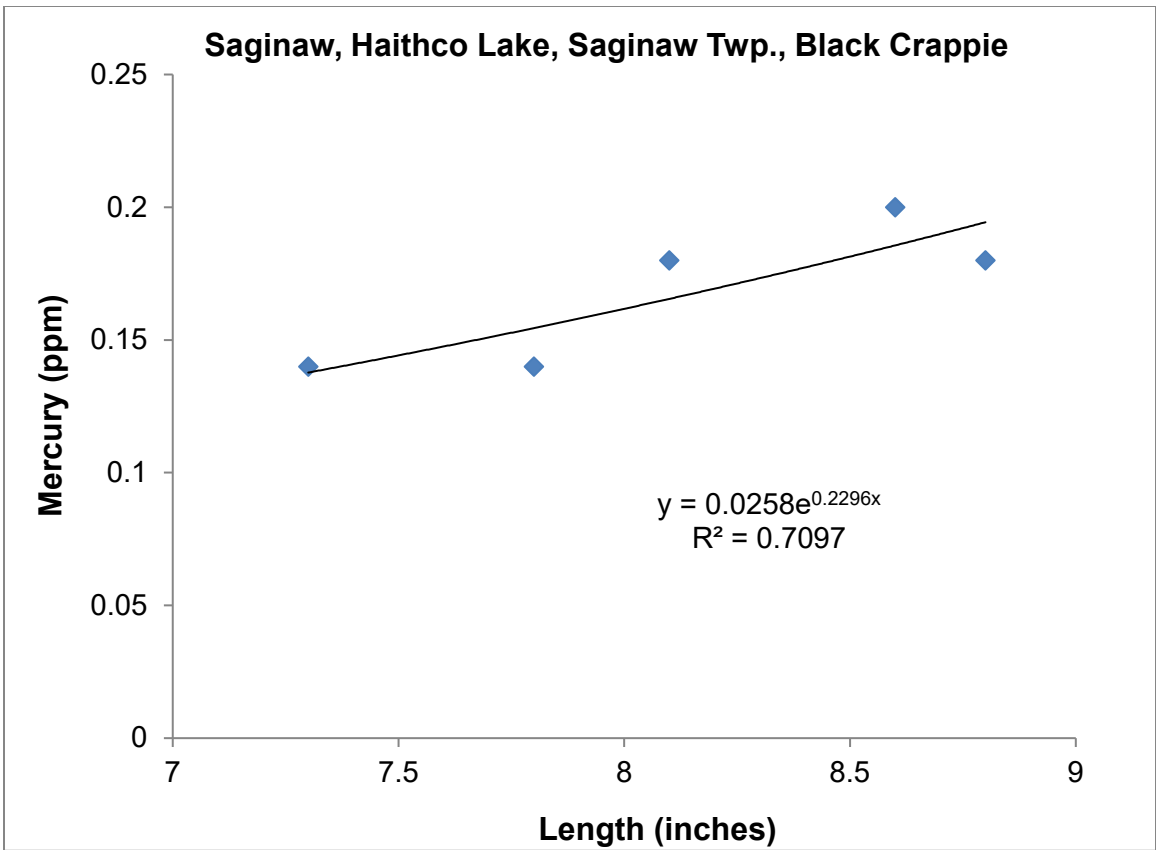
Organics Analysis:

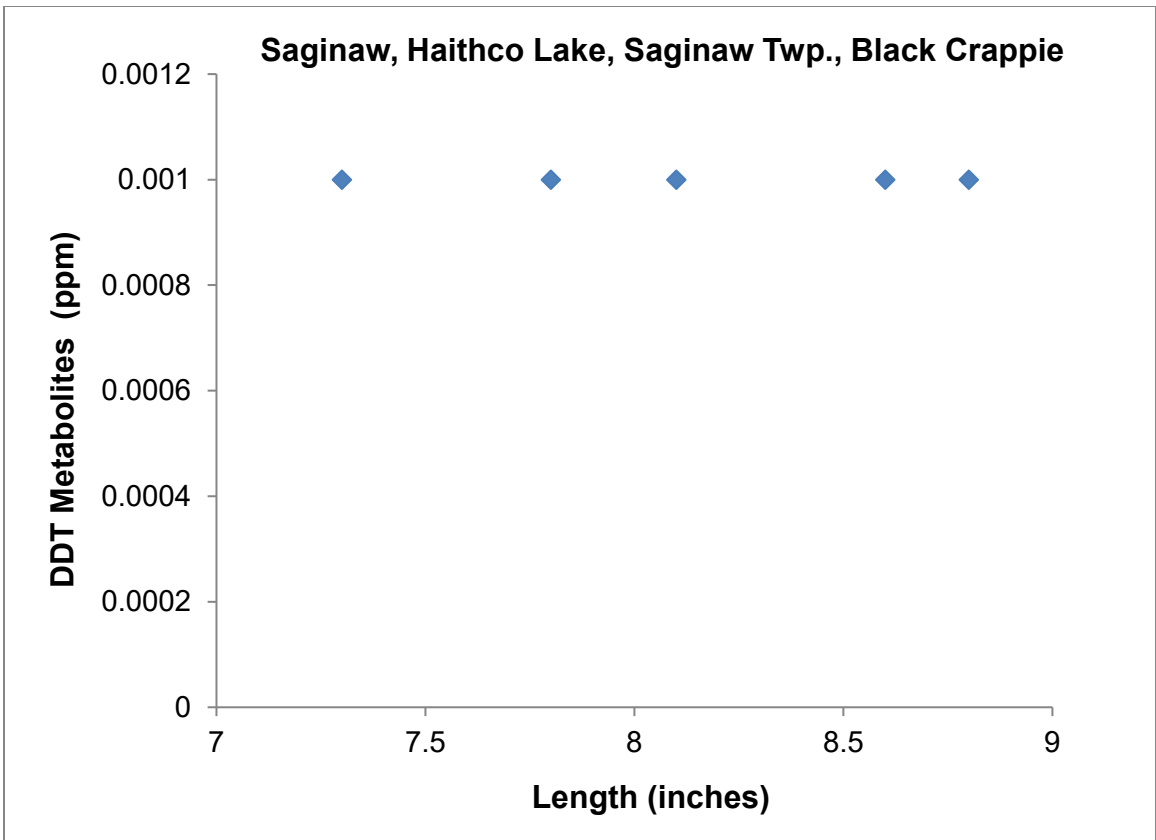
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2016	2016	5	7.3	na	7.3	8.8
Datasets available: 2016						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	5	0.001	< 0.001	0.003	0.002	16
DDT	5	0.001	< 0.001	0.001	0.001	16
Chlordane	5	< 0.001	--	--	--	--
Toxaphene	5	< 0.05	--	--	--	--
TEQ	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.573	0.573				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
TEQ	--	--				
Final meal category based on UCL:						4

Existing MDHHS Advisory: Haithco Lake crappie are covered by the statewide guideline for mercury. No one should eat more than 4 meals per month of black or white crappie due to mercury.

Recommendation: No one should eat more than 4 meals per month of Haithco Lake black or white crappie due to mercury.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
7	0.13	8
8	0.16	4
9	0.2	4
10	0.26	4
<i>Shaded area denotes extrapolated estimates</i>		





Yellow Perch

Haithco Lake

Saginaw County

Hg Analysis:

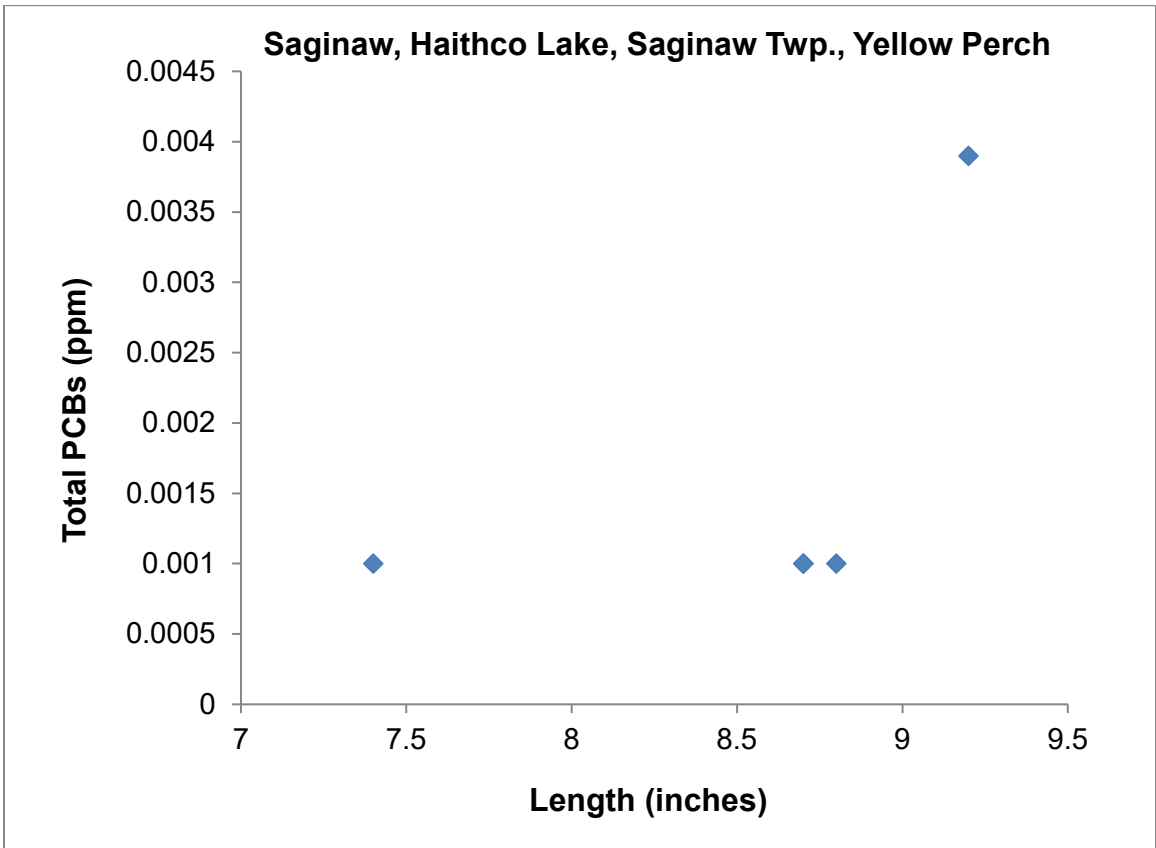
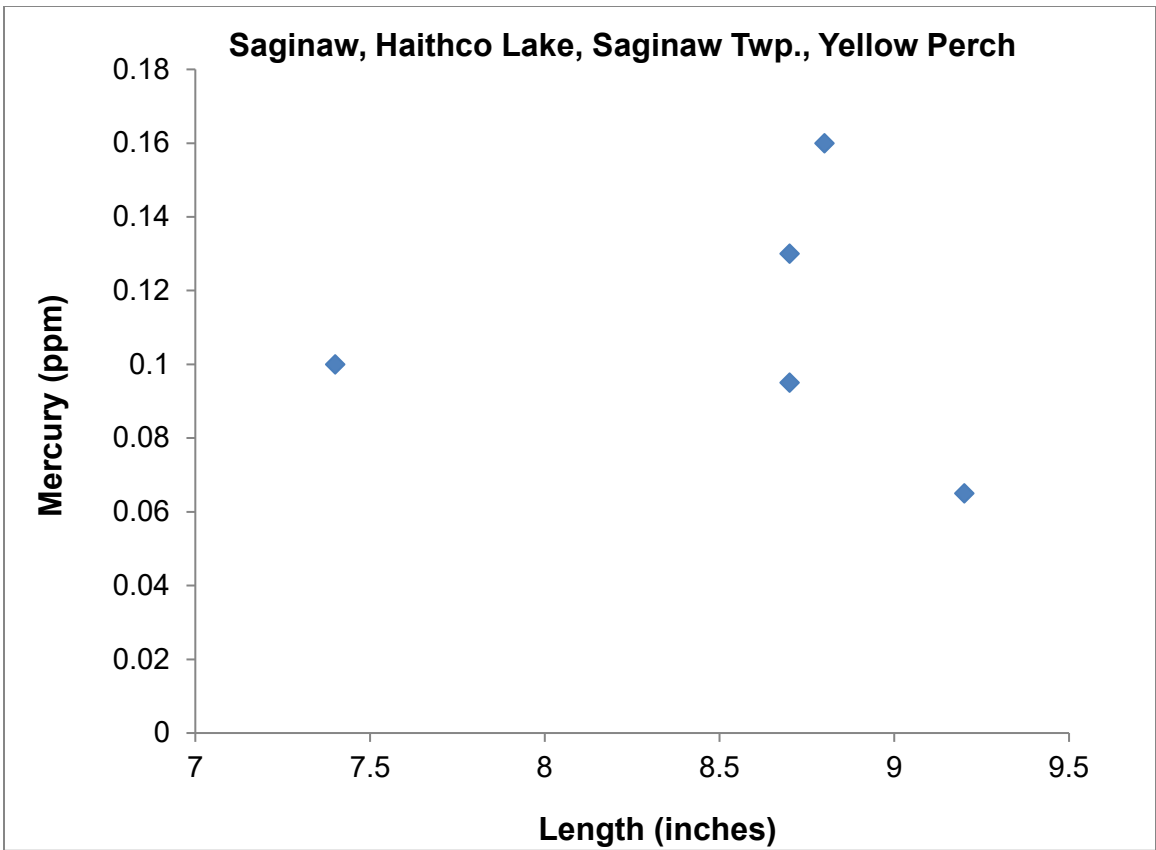
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2016	2016	5	7.4	na	7.4	9.2
Datasets available: 2016						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	5	0.11	0.06	0.16	0.16	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.002	0.021				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2016	2016	5	7.4	na	7.4	9.2
Datasets available: 2016						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	5	0.002	< 0.001	0.004	0.003	16
DDT	5	< 0.001	--	--	--	16
Chlordane	5	< 0.001	--	--	--	--
Toxaphene	5	< 0.05	--	--	--	--
TEQ	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.276	0.276				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
TEQ	--	--				
Final meal category based on UCL:						4

Existing MDHHS Advisory: Yellow perch from Haithco Lake in Saginaw County are covered by the statewide advisory due to mercury: No one should eat more than 4 meals per month of yellow perch of any size due to mercury.

Recommendation: No one should eat more than 4 meals per month of yellow perch of any size from Haithco Lake due to mercury.



Saginaw River Bay and Saginaw Counties

Largemouth & Smallmouth Bass
Hg Analysis:

**Saginaw River
Essexville**

Bay & Saginaw Counties

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2013	2013	10	11	14	14.3	16.2
Datasets available: 2013						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	5	0.30	0.16	0.39	0.43	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.681	0.667				

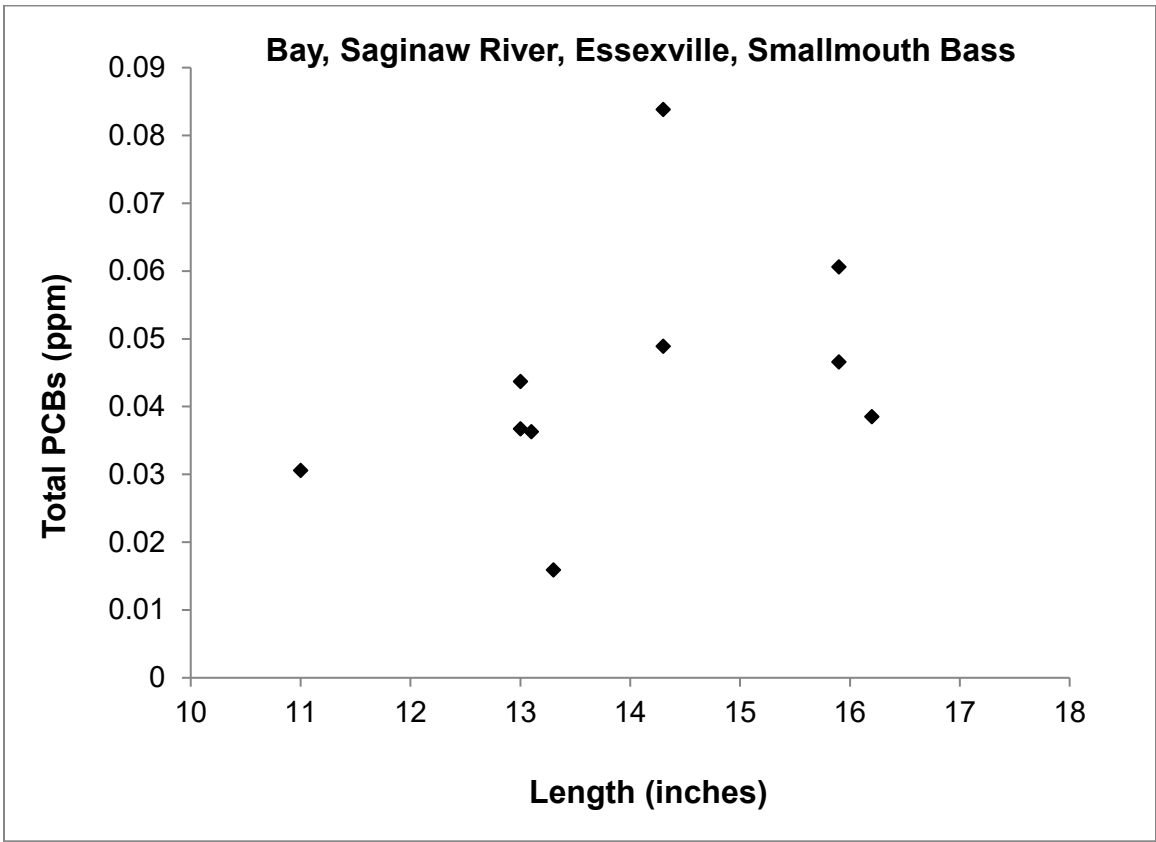
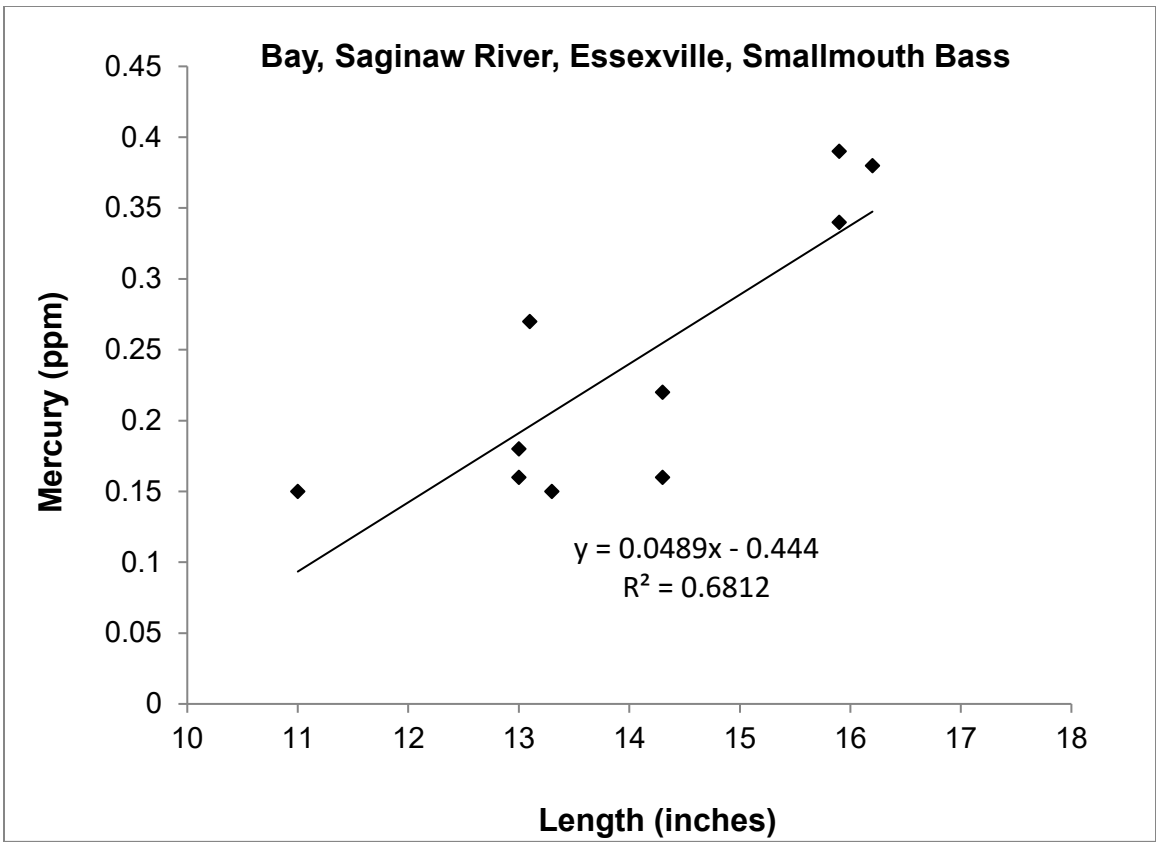
Organics Analysis:

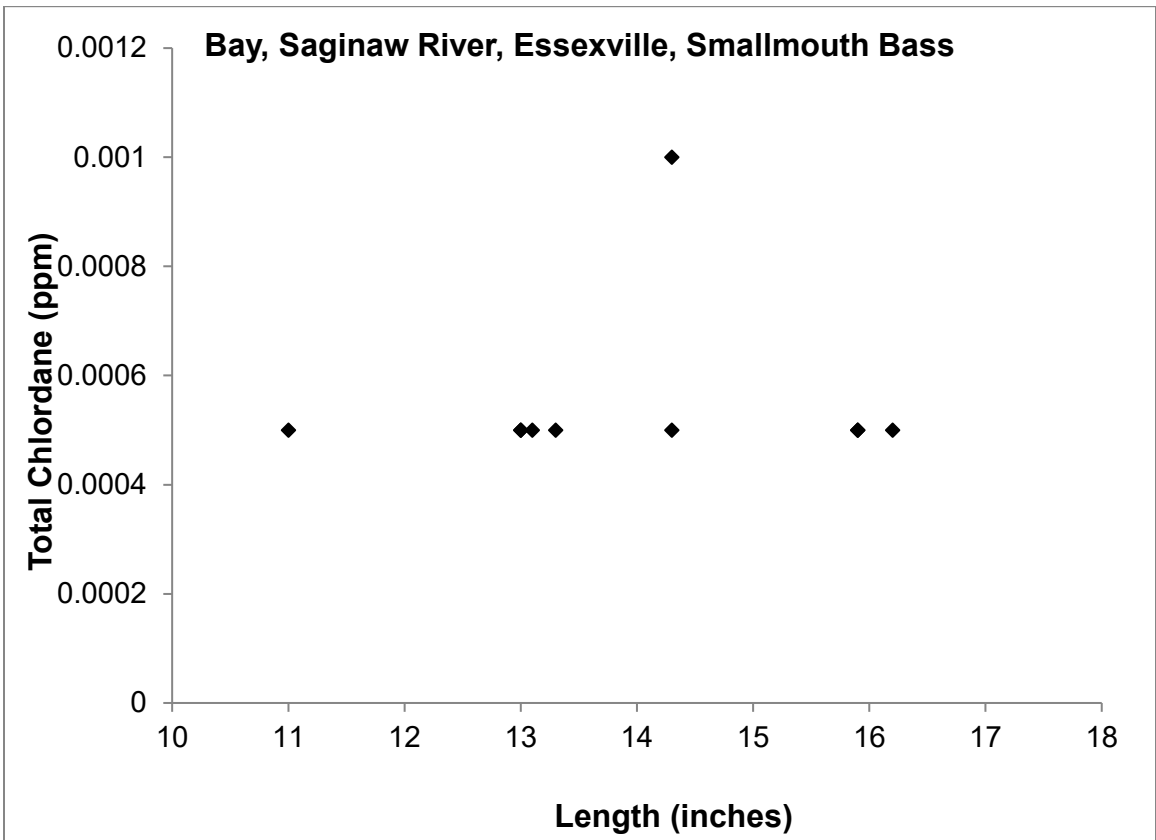
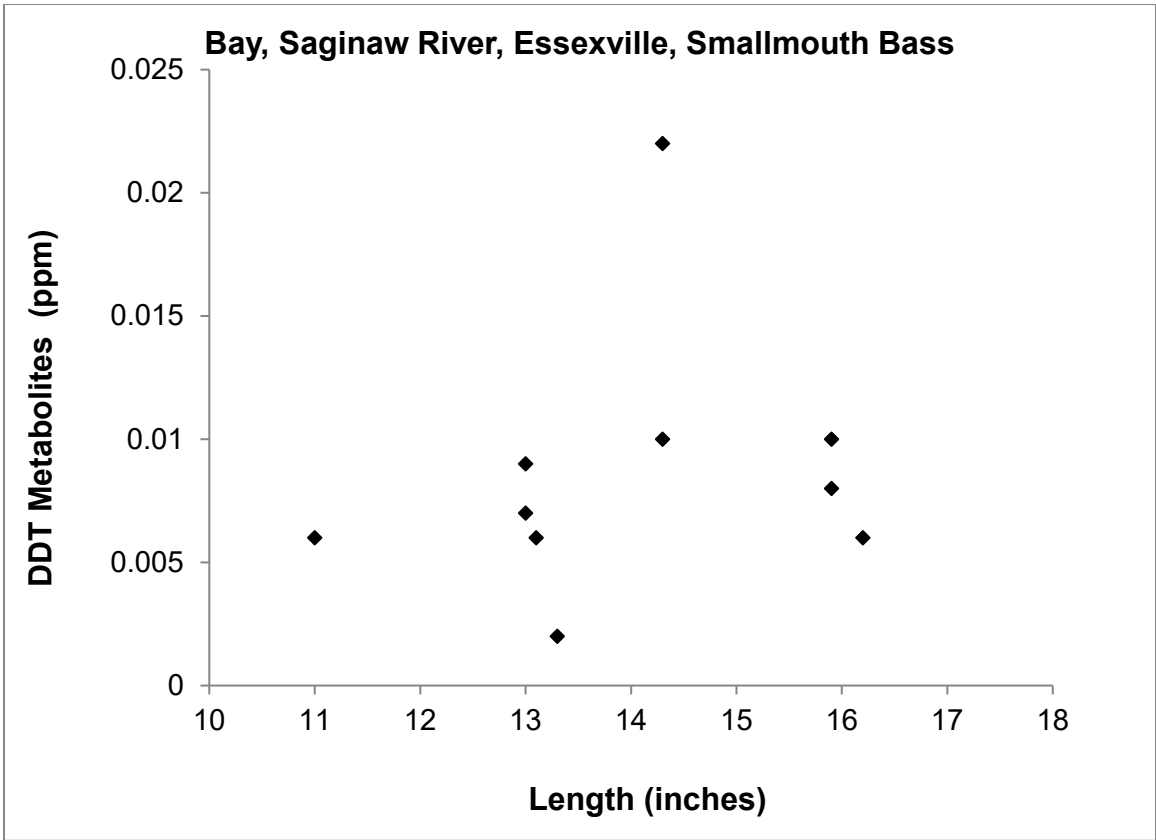
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2013	2013	10	11	14	14.3	16.2
Datasets available: 2013						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	5	0.06	0.038	0.08	0.08	2
DDT	5	0.01	0.006	0.02	0.02	16
Chlordane	5	0.001	0.0005	0.001	0.001	--
Toxaphene	5	ND	--	--	--	--
PFOS	5	32.4 ppb	20 ppb	42 ppb	43 ppb	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.171	0.186				
DDT	0.043	0.064				
Chlordane	0.004	0.004				
Toxaphene	--	--				
PFOS	0.262	0.203				
Final meal category based on UCL:						2

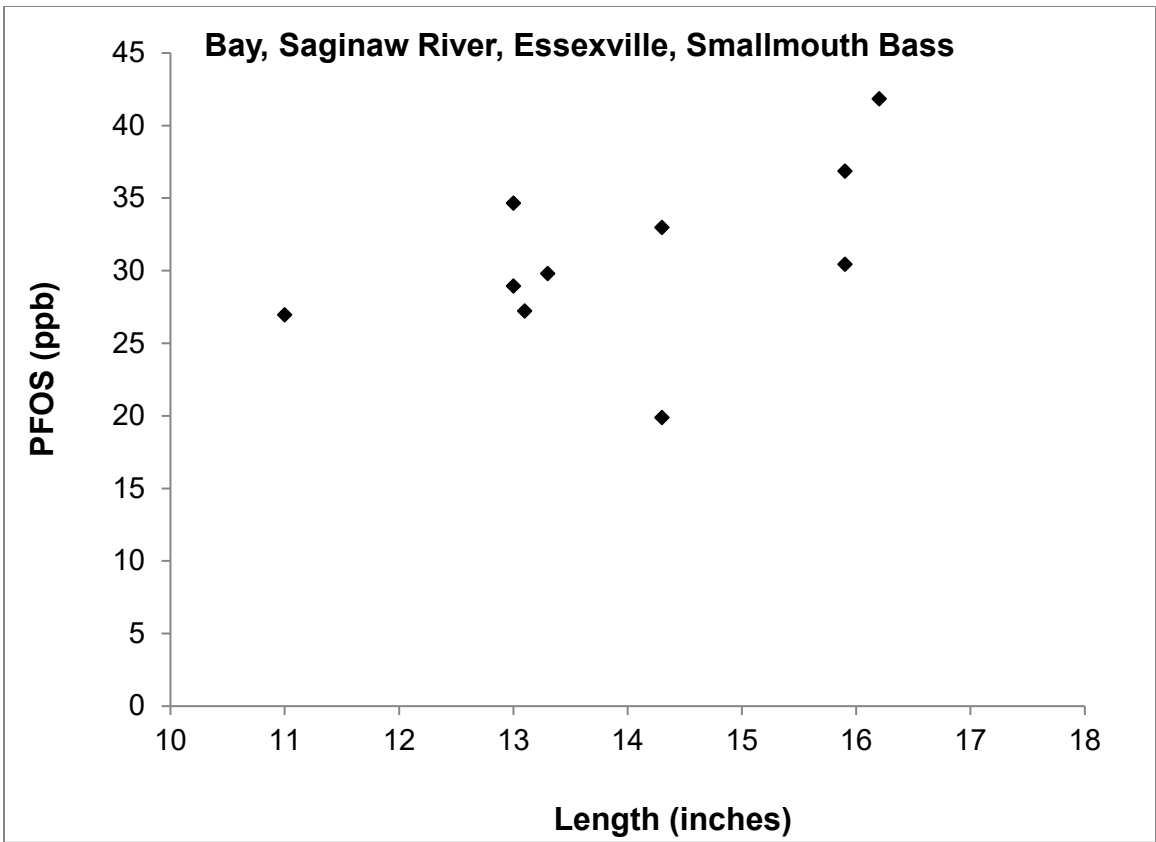
Existing Advisory: Saginaw River smallmouth bass are covered under the statewide mercury consumption advisory: No one should eat more than 2 meals per month of largemouth or smallmouth bass under 18 inches or more than 1 meal per month of those fish larger than 18 inches.

Recommendation: No one should eat more than 2 meals per month of largemouth or smallmouth bass under 18 inches or more than 1 meal per month of those fish larger than 18 inches due to mercury, PCBs, and PFOS. Statewide length break was applied as the size range of legal size fish is limited.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
10	0.05	16
12	0.14	4
14	0.24	4
16	0.34	2
18	0.44	2
20	0.53	2
22	0.63	1
<i>Shaded area denotes extrapolated estimates</i>		







Pumpkinseed

**Saginaw River
Essexville**

Bay & Saginaw Counties

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2013	2013	9	4.6	na	4.6	6.1
Datasets available: 2013						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	9	0.04	0.03	0.04	0.04	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.611*	0.638*	* - negative slope			

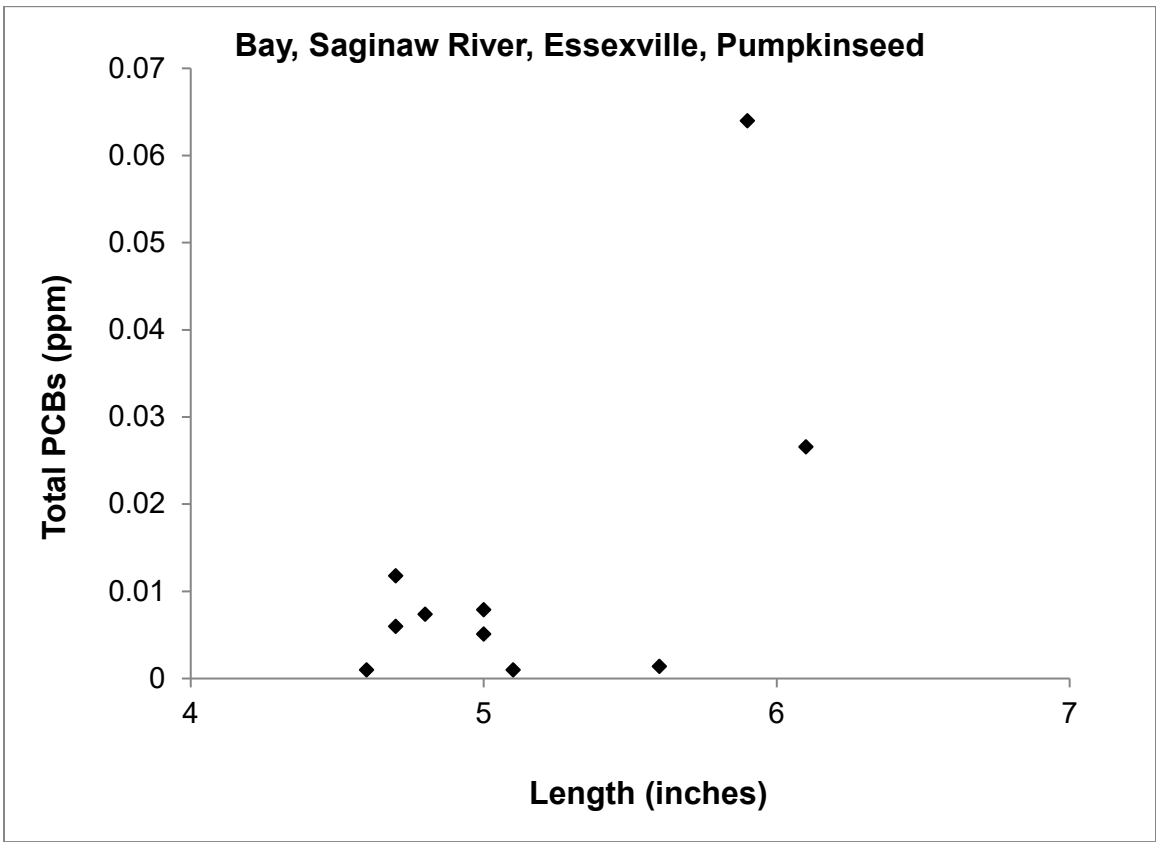
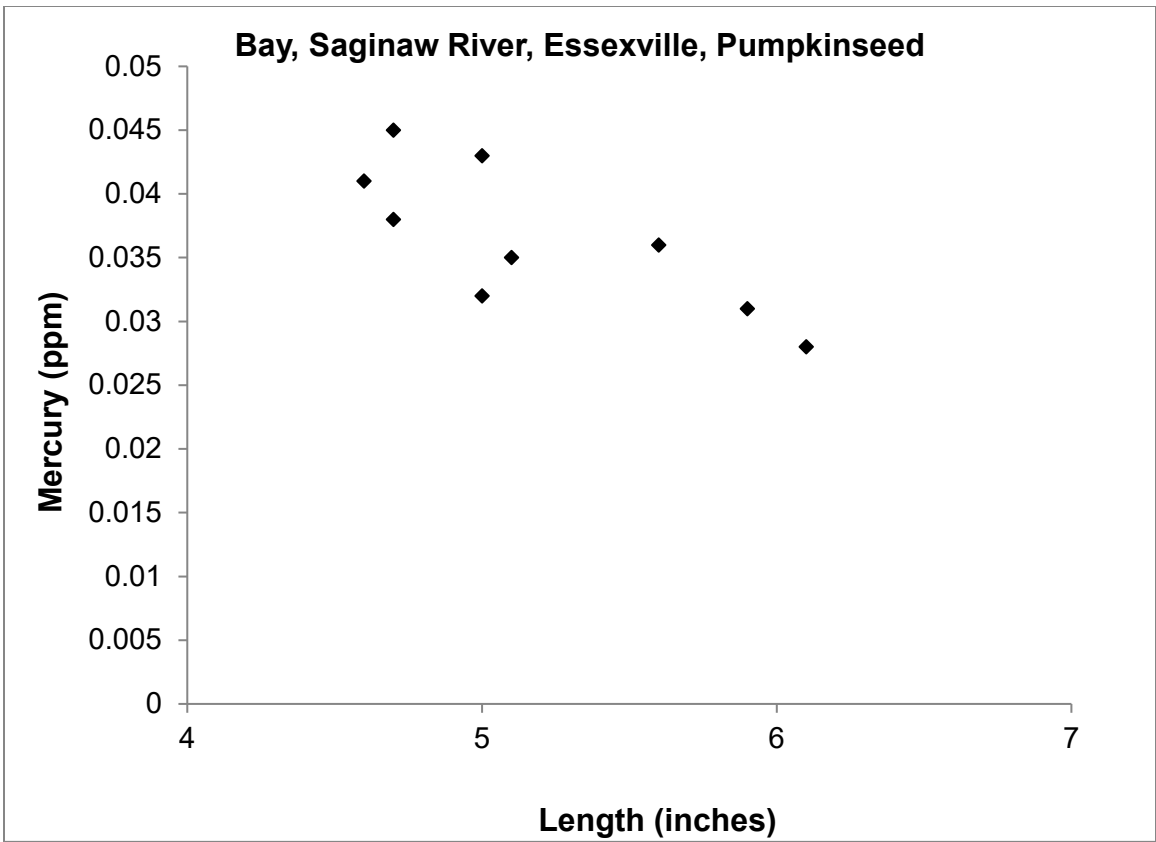
Organics Analysis:

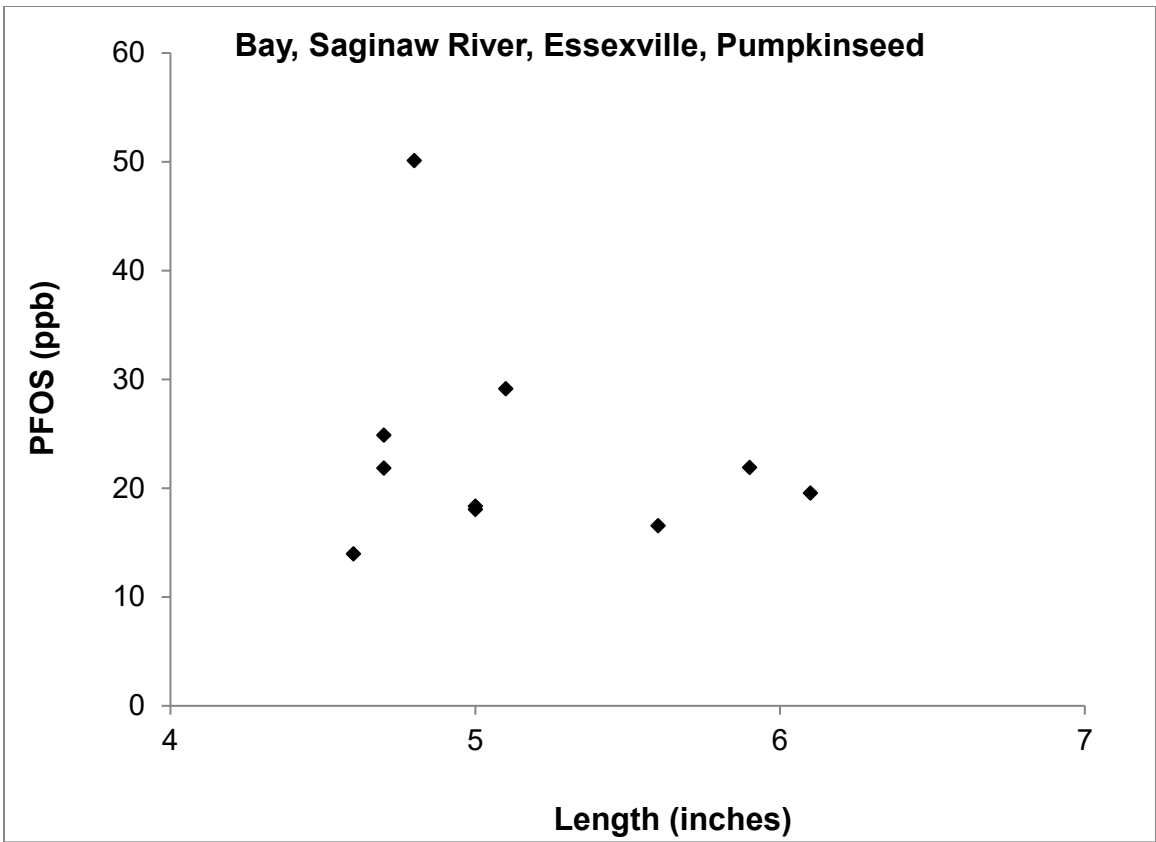
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2013	2013	9	4.6	na	4.6	6.1
Datasets available: 2013						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.01	0.001	0.06	0.03	8
DDT	10	0.003	0.001	0.009	0.004	16
Chlordane	10	ND	--	--	--	--
Toxaphene	10	ND	--	--	--	--
PFOS	10	23.4 ppb	14 ppb	50 ppb	31 ppb	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.429	0.240				
DDT	0.361	0.286				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.047	0.029				
Final meal category based on UCL:						4

Existing Advisory: Saginaw River pumpkinseed (sunfish) are covered under the statewide mercury consumption advisory: No one should eat more than 8 meals per month of pumpkinseed of any size.

Recommendation: No one should eat more than 4 meals per month of Saginaw River bluegill or sunfish due to PFOS. PCBs would cause an advisory.

Note: Yellow perch have TEQ levels in the 4 meals per month category. Sunfish/bluegill are likely to have lower TEQ concentrations than yellow perch.





Sanilac County

Carp

**Black River
Croswell Impoundment**

Sanilac County

Hg Analysis:

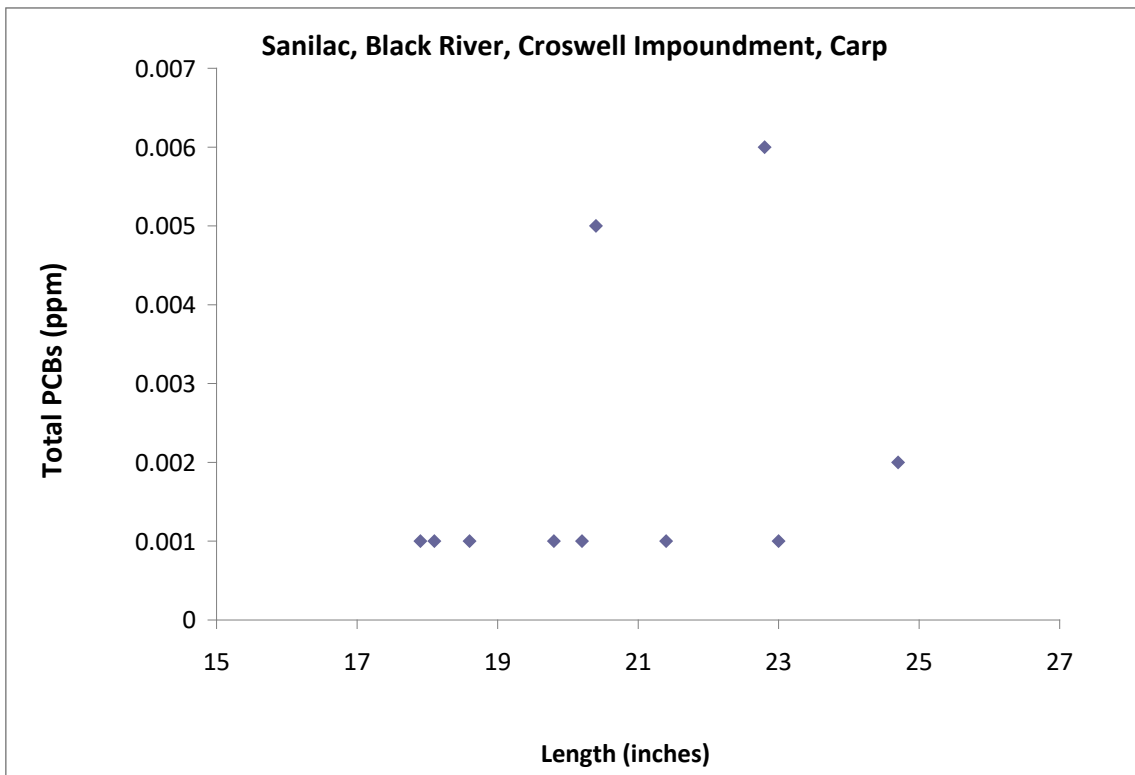
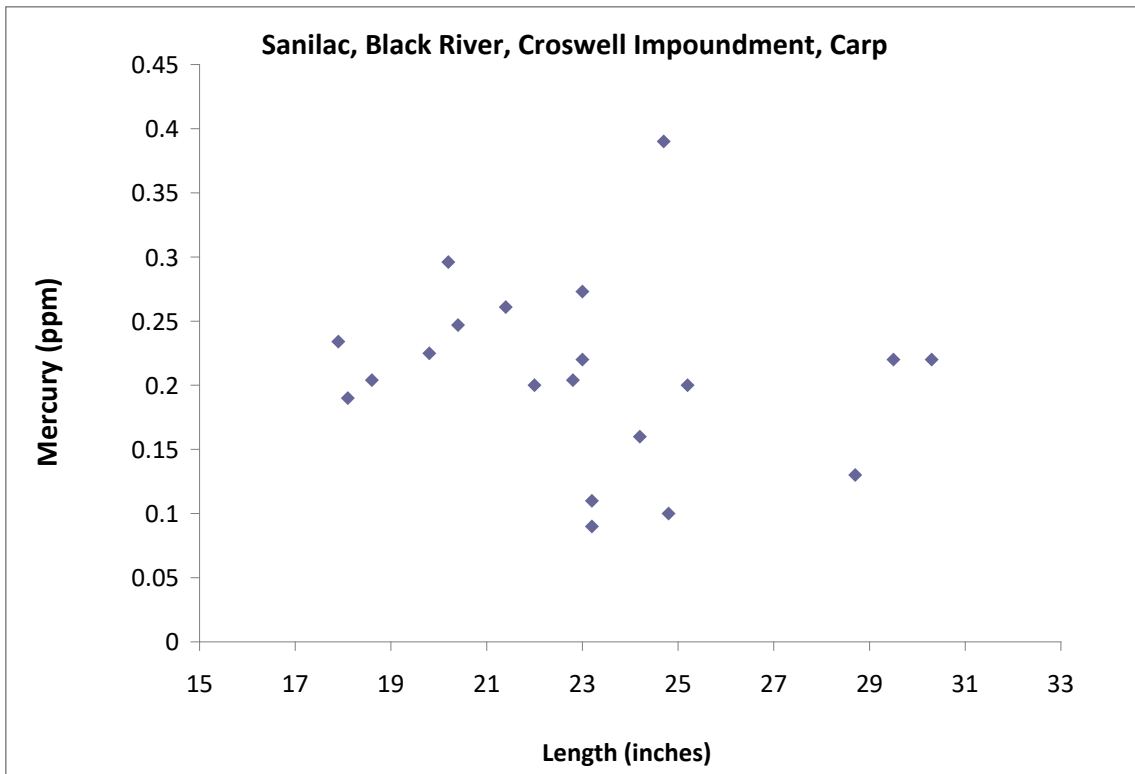
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	2007	20	17.9	na	17.9	30.3
Datasets available: 1989, 2007						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	20	0.21		0.24	4	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.027	0.039				

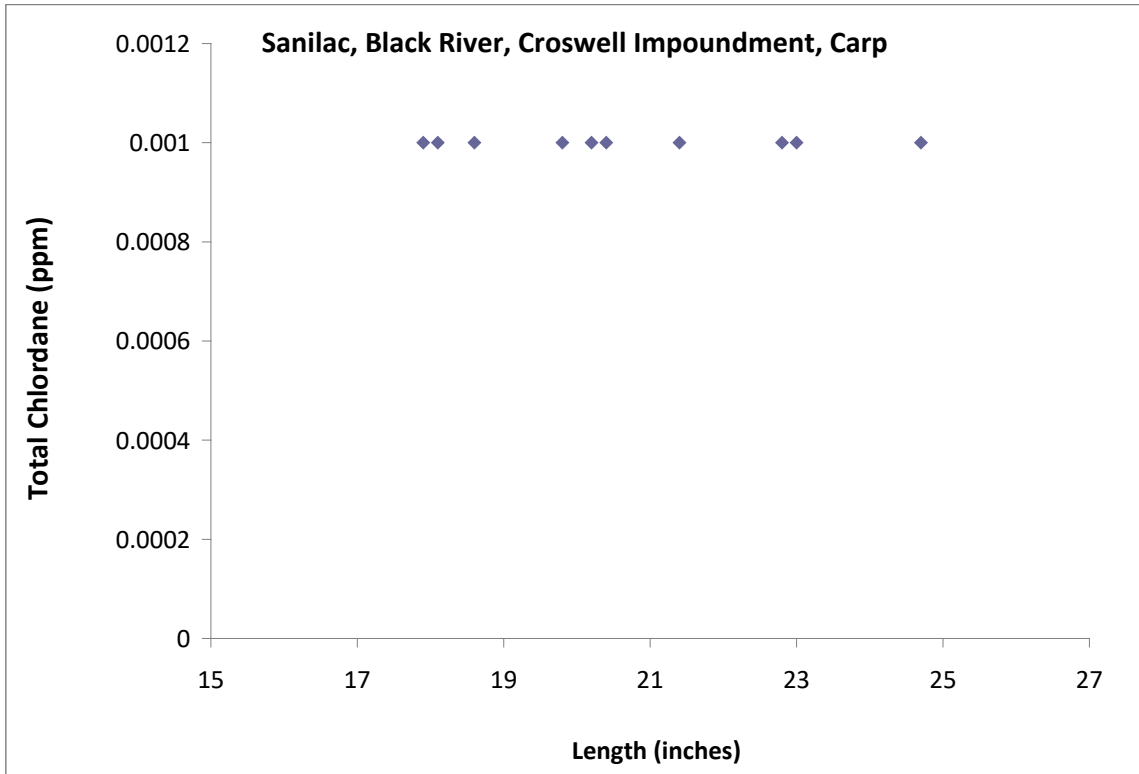
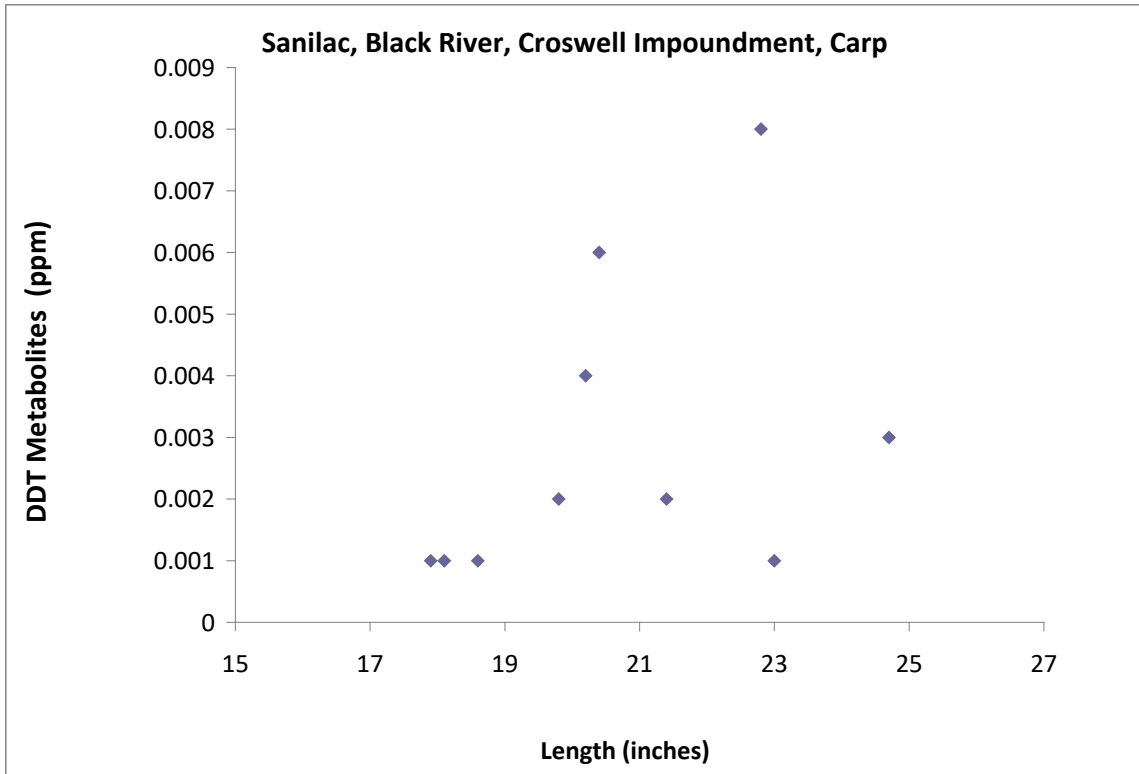
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2007	2007	10	17.9	na	17.9	24.7
Datasets available: 1989, 2007						
Chemical	Sample Size (Legal)	Mean		95%UCL	Meal Category	
PCB	10	0.002		0.003	16	
DDT	10	0.003		0.005	16	
Chlordane	10	ND		--	--	
Toxaphene	10	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.121	0.174				
DDT	0.158	0.214				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						4

Existing Advisory: Women and children should not eat more than 1 meal per week of Black River carp larger than 26 inches due to elevated concentrations of PCBs.

Recommendation: No one should eat more than 4 meals per month of Black River carp due to mercury.





Shiawassee County

Largemouth Bass

Hopkins Lake

Shiawassee County

Hg Analysis:

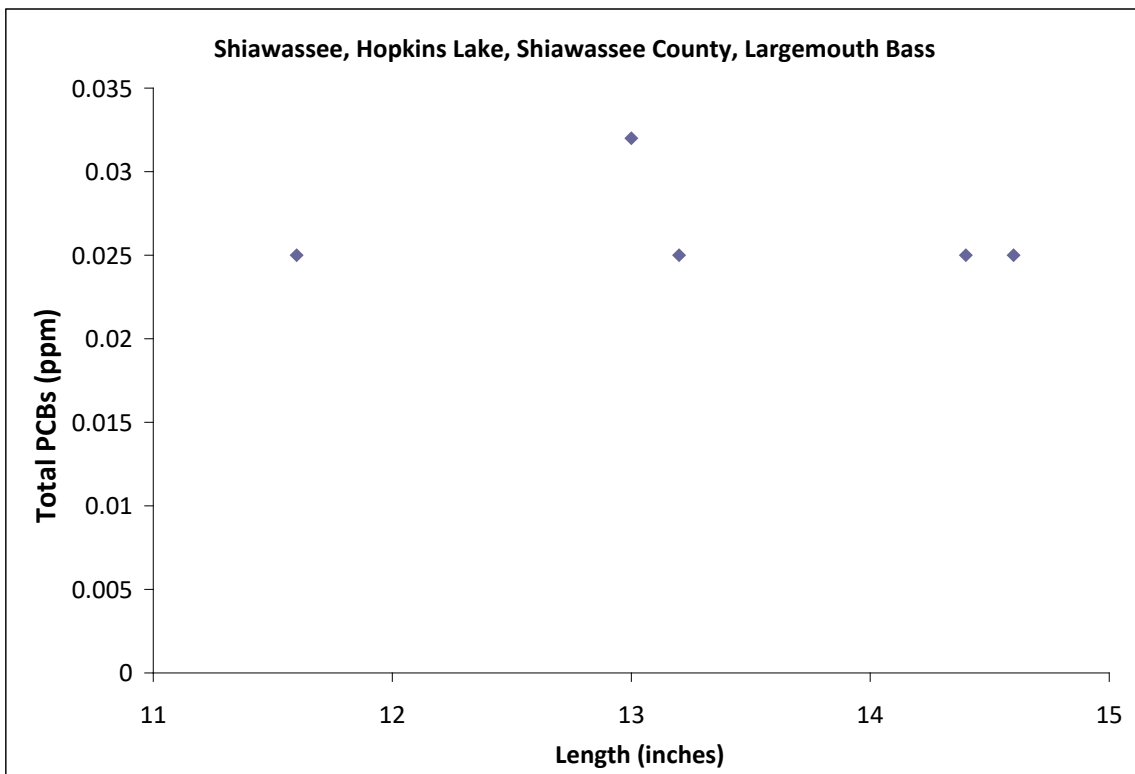
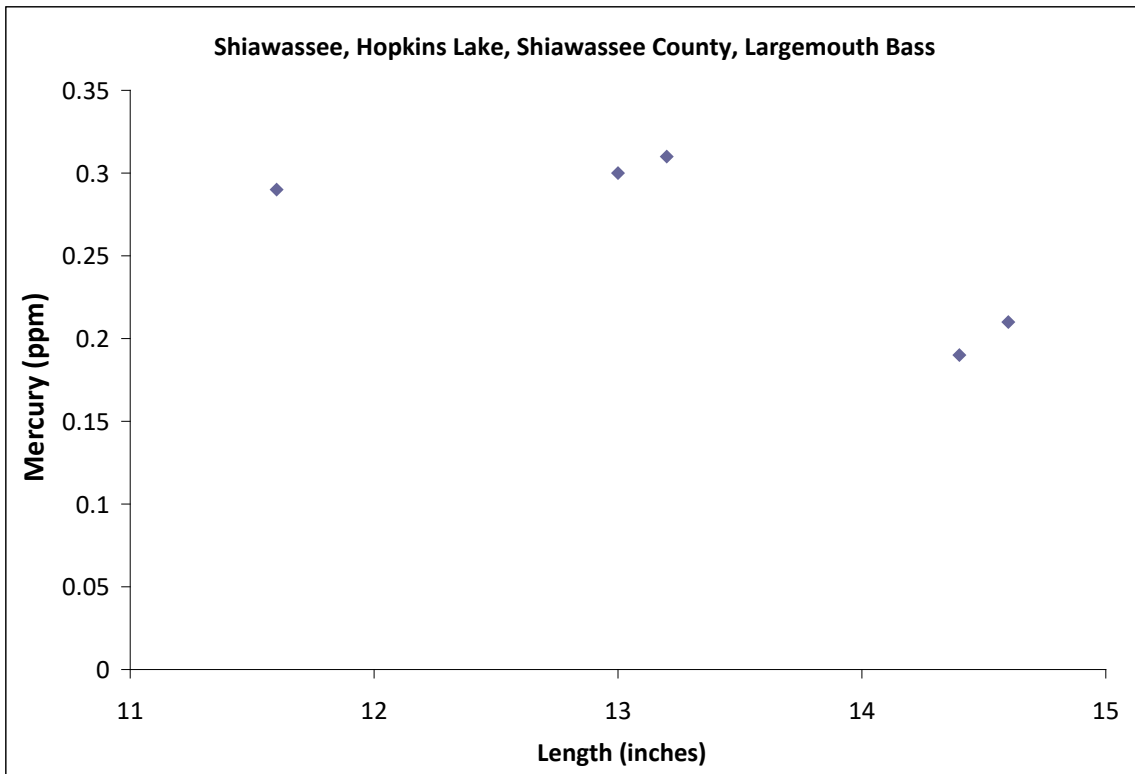
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1991	1991	5	11.6	14	14.4	14.6
Datasets available: 1991						
Chemical	Sample Size (Incl. Sub- Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	5	0.3		0.33		2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--		<i>limited data – regression not used</i>		

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1991	1991	5	11.6	14	14.4	14.6
Datasets available: 1991						
Chemical	Sample Size (Legal)	Mean		95%UCL		Meal Category
PCB	5	ND		--		--
DDT	5	0.026		0.03		16
Chlordane	5	ND		--		--
Toxaphene	5	ND		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--		Final meal category based on UCL:		2

Existing Advisory: Hopkins Lake largemouth bass are covered under the statewide mercury consumption advisory.

Recommendation: Statewide guidelines apply to Hopkins Lake largemouth bass. This dataset is limited by sub-legal length samples and age of the data, and is not used to provide a recommendation.



Shiawassee River Livingston, Oakland, Saginaw, and Shiawassee Counties

Carp

Shiawassee River

Oakland County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	1987	1	24.4	na	24.4	24.4
Datasets available: 1987						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	1	0.180		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	1987	1	24.4	na	24.4	24.4
Datasets available: 1987						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	1	0.170		--		--
DDT	1	0.148		--		--
Chlordane	1	0.045		--		--
Toxaphene	1	ND		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						--

Existing Advisory: Shiawassee River (Oakland County) carp are not covered by an advisory.

Recommendation: Statewide guidelines apply. This dataset is limited due to sample size and age of the data. This dataset cannot be used to provide a recommendation.

Largemouth Bass

Shiawassee River

Oakland County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Sub-Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	1987	1	10.4	14	10.4	10.4
Datasets available:		1987				
Chemical	Sample Size (Sub-Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	1	0.180		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	1987	1	24.4	na	24.4	24.4
Datasets available:		1987				
Chemical	Sample Size (Sub-Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	1	0.103		--		--
DDT	1	0.015		--		--
Chlordane	1	0.003		--		--
Toxaphene	1	ND		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--		Final meal category based on UCL:		--

Existing Advisory: Shiawassee River (Oakland County) largemouth bass are not covered by an advisory.

Recommendation: Statewide guidelines apply. This dataset is limited due to sample size and age of the data. This dataset cannot be used to provide a recommendation.

Rock Bass

Shiawassee River

Oakland County

Hg Analysis:

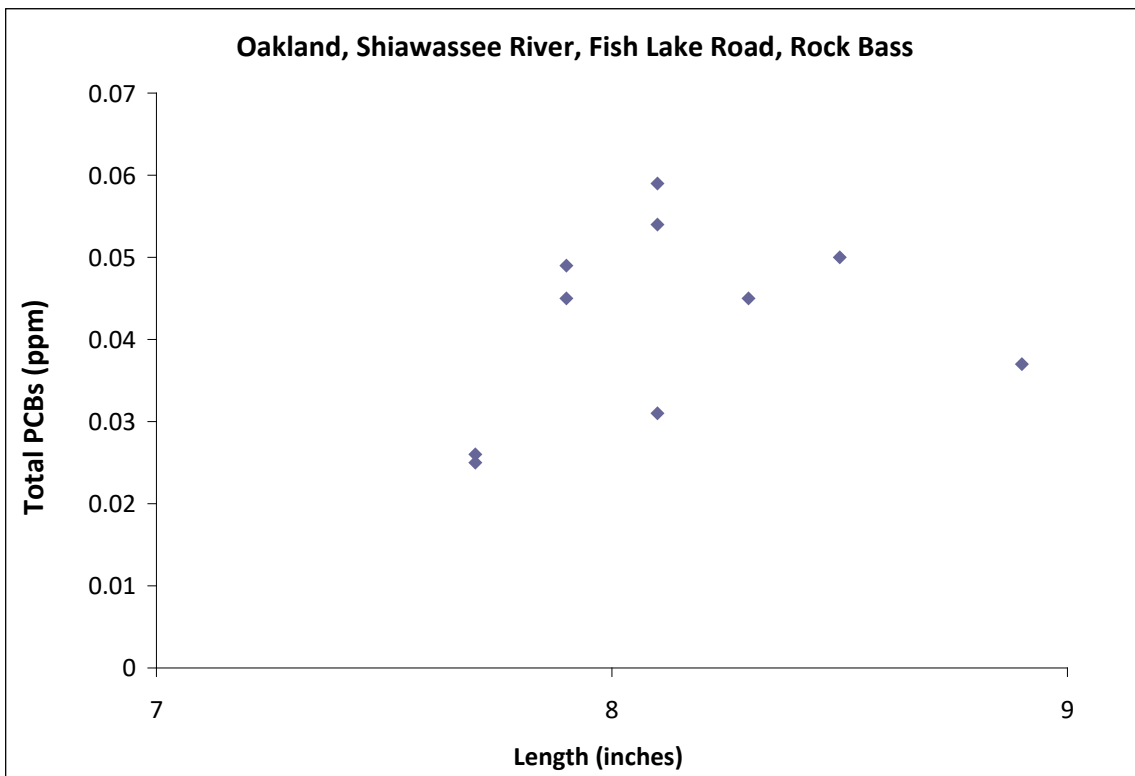
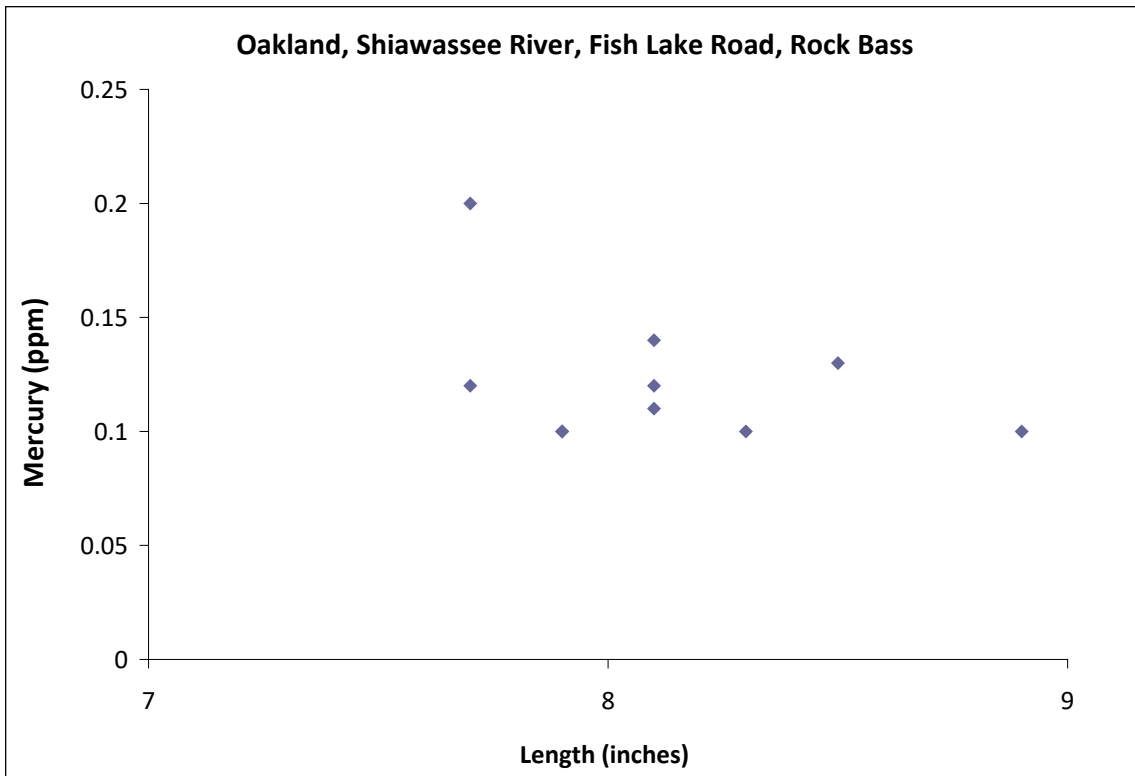
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	1987	10	7.7	na	7.7	8.9
Datasets available: 1987						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	10	0.122		0.140	4	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.154	0.147				

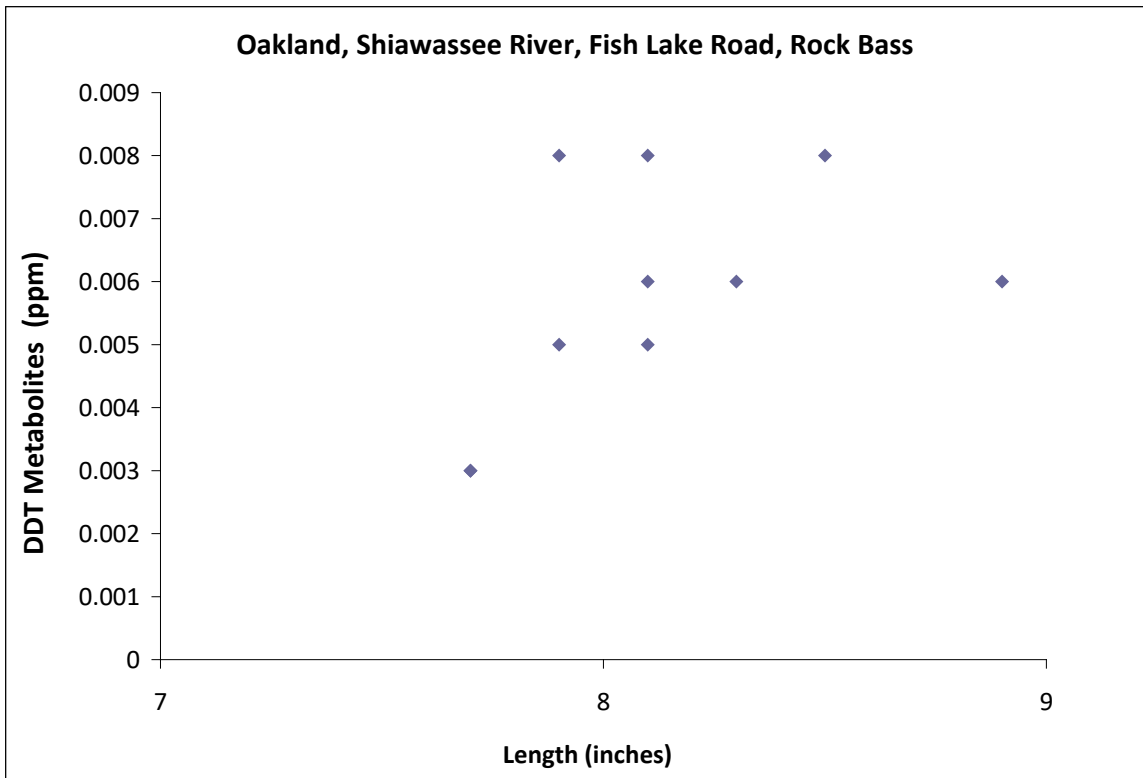
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	1987	10	7.7	na	7.7	8.9
Datasets available: 1987						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	10	0.042		0.050	4	
DDT	10	0.006		0.010	16	
Chlordane	10	ND		--	--	
Toxaphene	10	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.078	0.115				
DDT	0.237	0.300				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:					4*	

Existing Advisory: Shiawassee River (Oakland County) rock bass are not covered by an advisory.

Recommendation: No one should eat more than 4 meals per month of rock bass from the Shiawassee River (Oakland Co.) due to mercury. *Based on EGLE’s Fish Contaminant Monitoring Program, PCB and DDT concentrations ≥15 years old are expected to have declined to a concentration that allows a less restrictive meal category than determined by the standard evaluation method.





Hg Analysis:

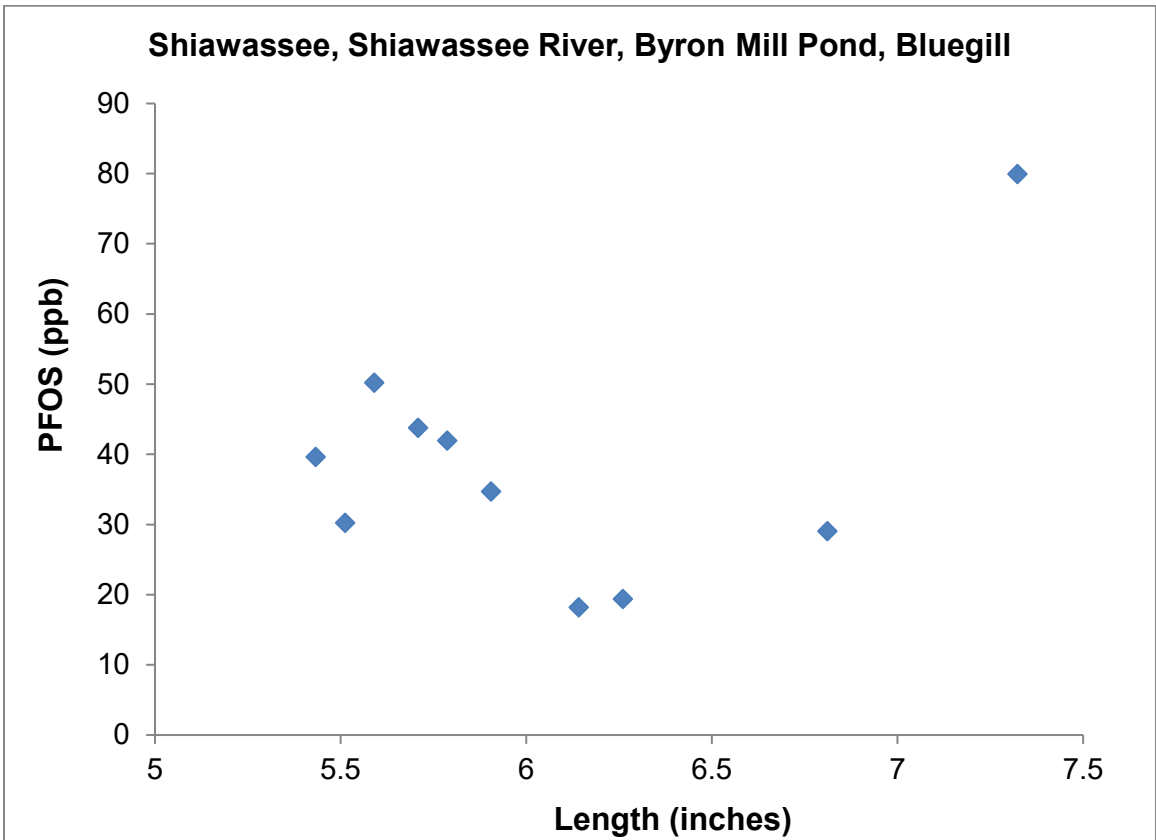
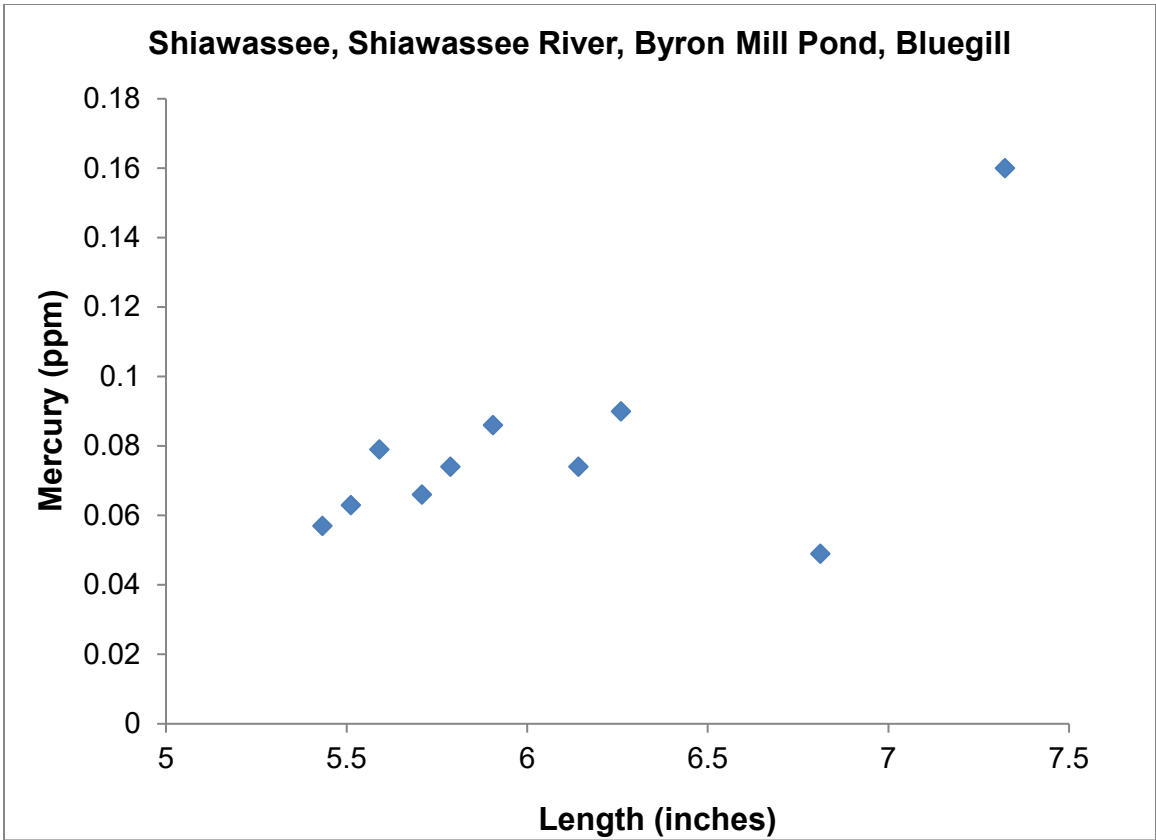
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2020	2020	10	5.4	NA	5.4	7.3
Datasets available:		2020				
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.080	0.049	0.160	0.102	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.415	0.287				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2020	2020	10	5.4	NA	5.4	7.3
Datasets available:		2020				
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	ND	--	--	--	16
DDT	10	0.001	<0.001	0.001	0.001	16
Chlordane	10	ND	--	--	--	16
Toxaphene	10	ND	--	--	--	--
PFOS	10	38.7 ppb	18.2 ppb	80.0 ppb	51.5 ppb	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	0.000	0.000				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.136	0.033				
Final meal category based on UCL:						2

Existing MDHHS Advisory: Bluegill and sunfish from the Shiawassee River upstream of the dam in Byron to the Linden Dam are currently covered under the statewide mercury guidance. No one should eat more than 8 meals per month of bluegill or sunfish of any size.

Recommendation: No one should eat more than 2 meals per month of bluegill or sunfish of any size from the Shiawassee River upstream of the Byron Dam to the Linden Dam, including the Byron Millpond, due to PFOS. Mercury causes less restrictive guidance.



Black Crappie

**Shiawassee River
Byron to Owosso**

Shiawassee County

Hg Analysis:

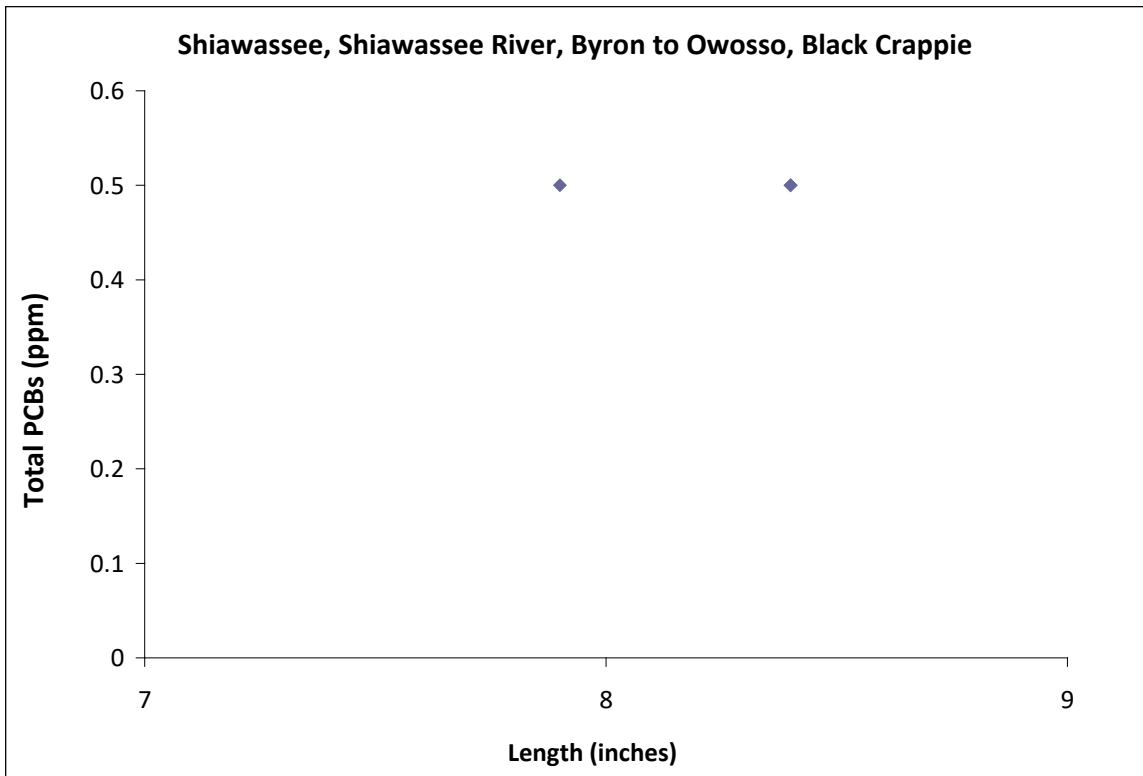
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	0	--	na	--	--
Datasets available:						
Chemical	Sample Size (Legal)	Mean		95%UCL	Meal Category	
Mercury	0	--		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1981	1981	3	7.9	na	7.9	8.4
Datasets available: 1981						
Chemical	Sample Size (Legal)	Mean		95%UCL	Meal Category	
PCB	3	0.50		0.50	--	
DDT	0	NA		--		
Chlordane	0	NA		--		
Toxaphene	0	NA		--		
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:					--	

Existing Advisory: There are no current consumption advisories on Shiawassee River black crappie.

Recommendation: Statewide guidelines apply to Shiawassee River crappie. Dataset is limited due to sample size and age of the data. Dataset cannot be used to support a recommendation.



Carp

**Shiawassee River
Byron to Owosso**

Shiawassee County

Hg Analysis:

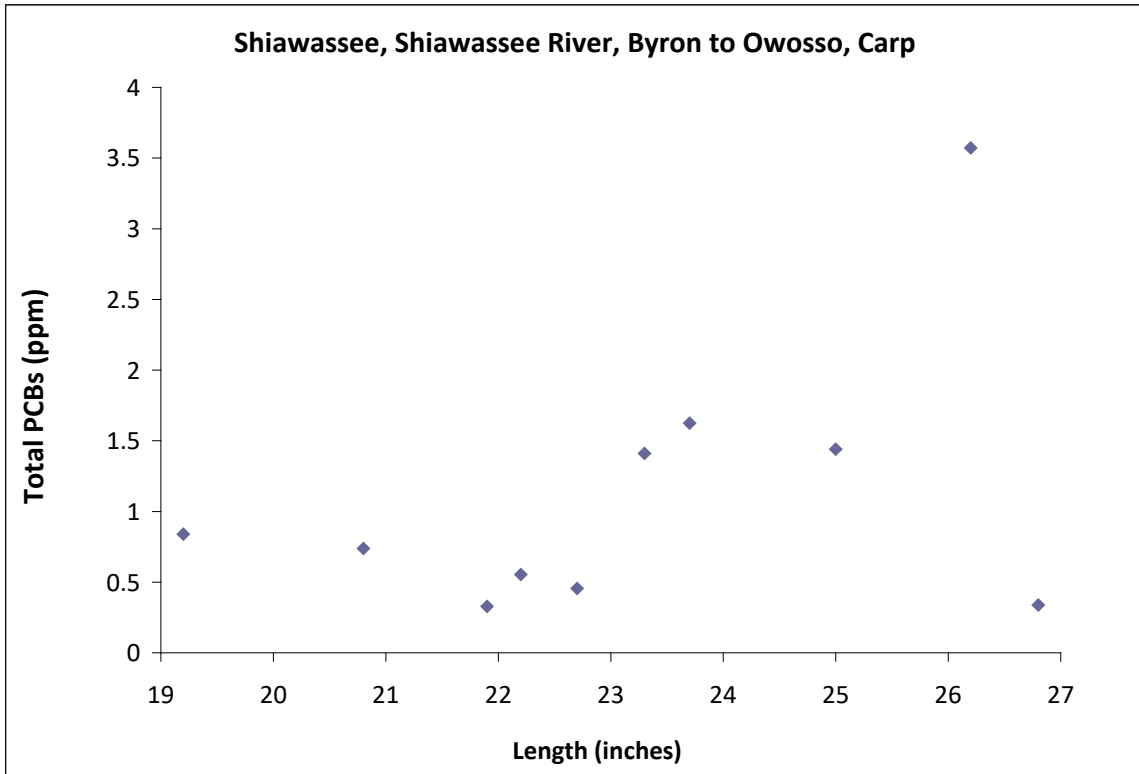
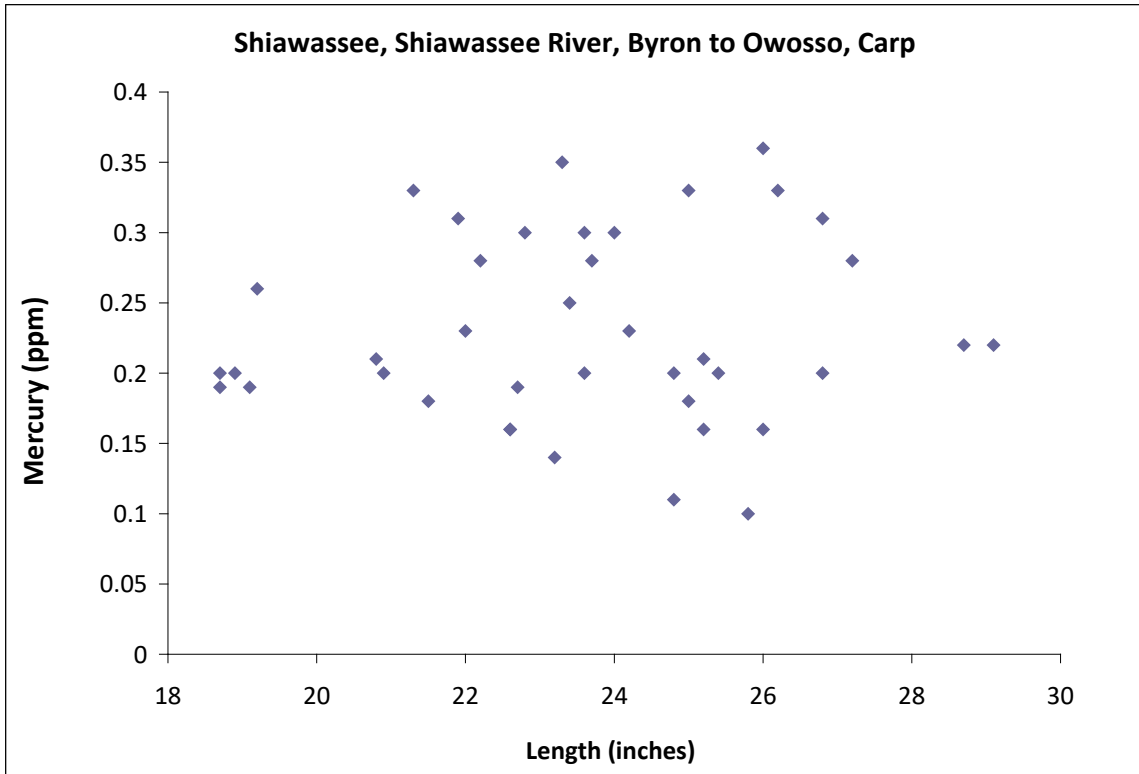
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1985	2003	40	18.7	na	18.7	29.1
Datasets available: 1985, 1987, 1995, 2003						
Chemical	Sample Size (Legal)	Mean		95%UCL	Meal Category	
Mercury	40	0.230		0.250	4	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.006	0.001				

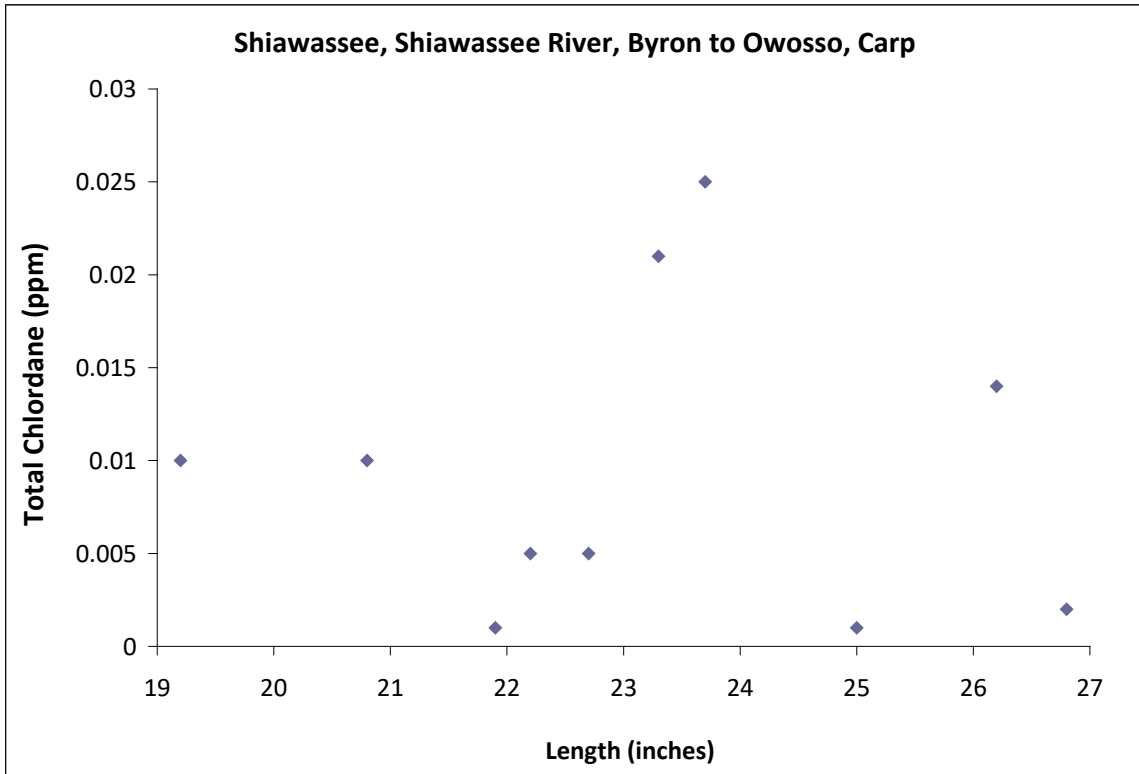
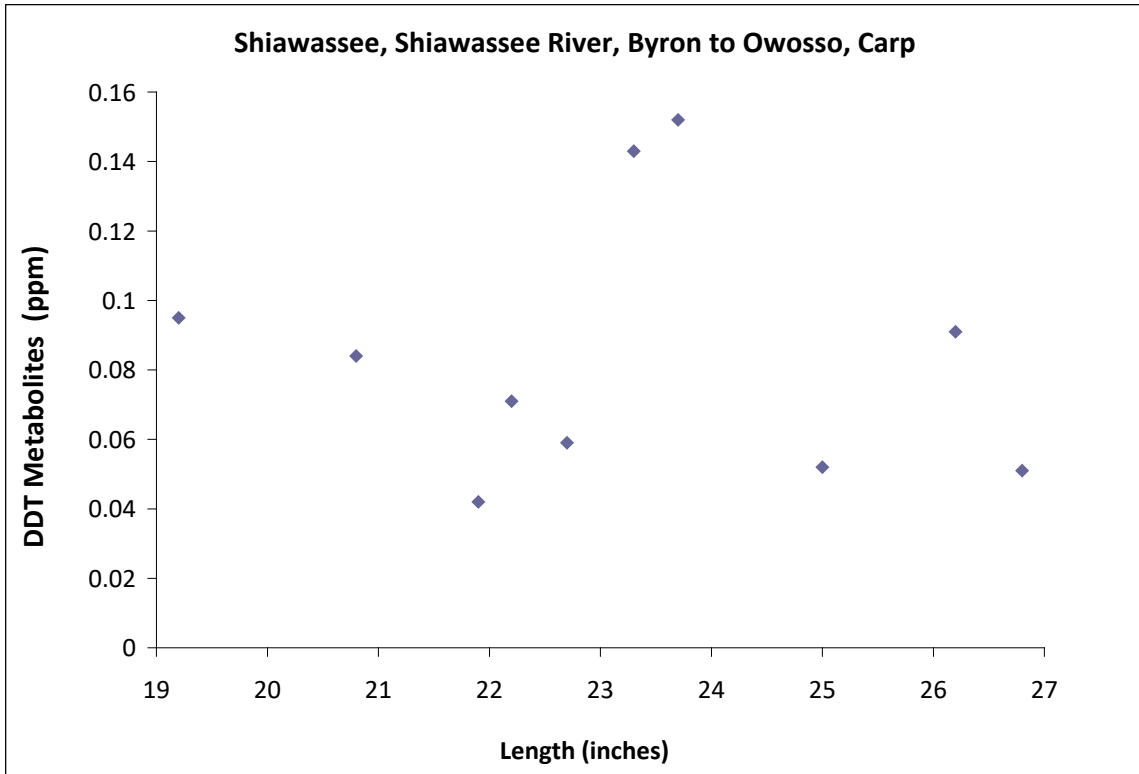
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2003	2003	10	19.2	na	19.2	26.8
Datasets available: 2003						
Chemical	Sample Size (Legal)	Mean		95%UCL	Meal Category	
PCB	10	1.13		1.83	Limited	
DDT	10	0.08		0.11	16	
Chlordane	10	0.009		0.02	--	
Toxaphene	10	ND				
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.202	0.082				
DDT	0.010	0.021				
Chlordane	0.001	0.032				
Toxaphene						
Final meal category based on UCL:					Limited	

Existing Advisory: Women and children should eat no more than six meals per year and the general population should eat no more than one meal per week of Shiawassee River carp less than 22 inches in length. No one should eat any Shiawassee River carp greater than 22 inches in length due to elevated levels of PCBs.

Recommendation: Sensitive populations should not eat these fish. For healthy adults, limit consumption to no more than 1 or 2 meals per year of carp from the Shiawassee River between Byron and Owosso due to PCBs. Mercury would cause an advisory.





Northern Pike

**Shiawassee River
Byron to Owosso**

Shiawassee County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	1995	6	21.9	24	23.8	38.6
Datasets available: 1987, 1995						
Chemical	Sample Size (All)	Mean		95%UCL	Meal Category	
Mercury	6^	0.26^		0.41	2^	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.401	0.377				

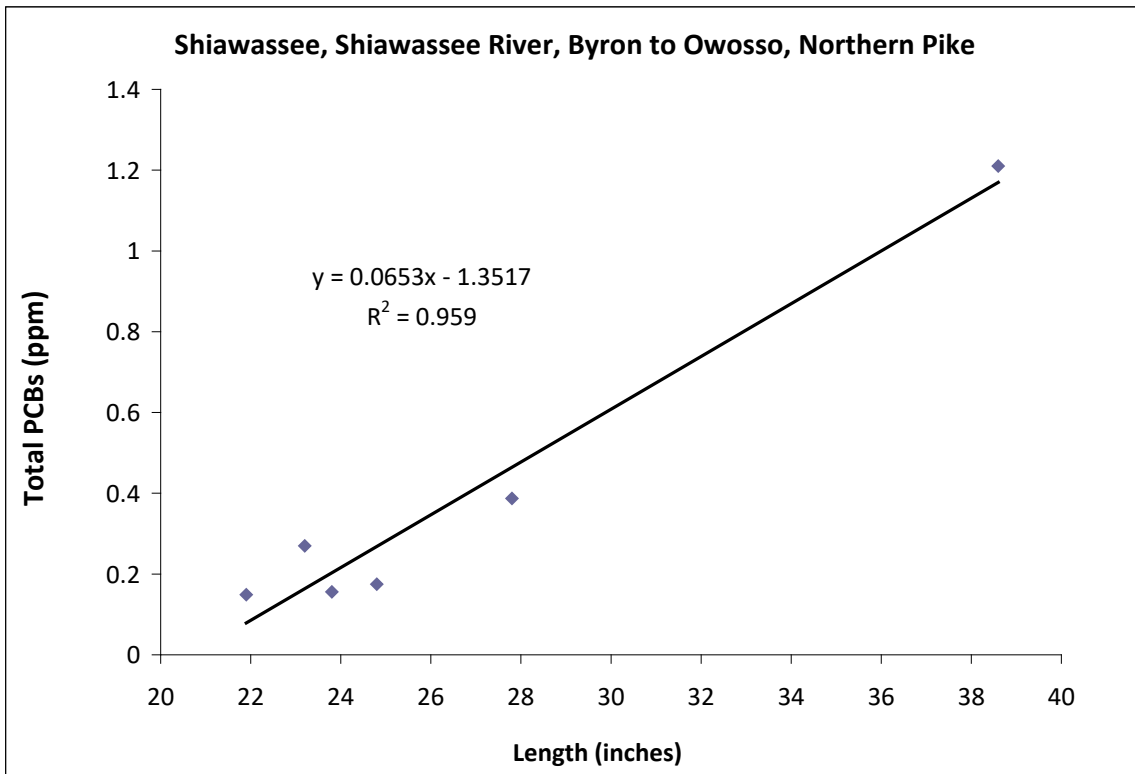
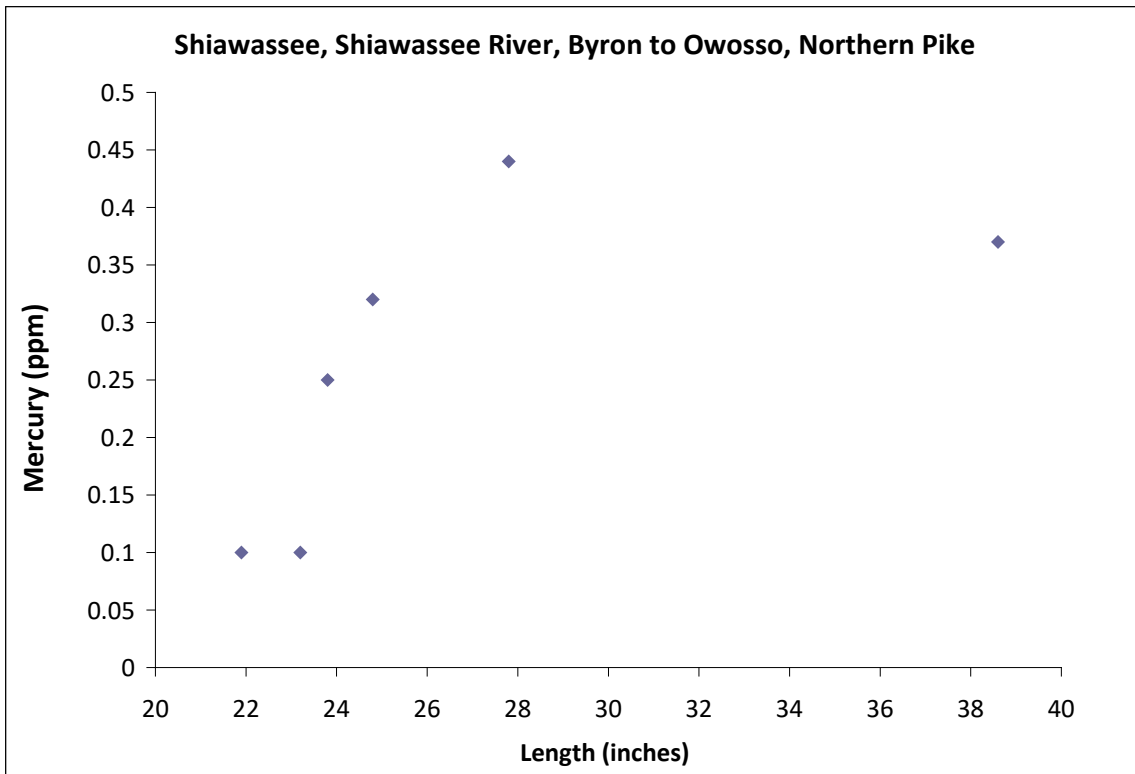
Organics Analysis:

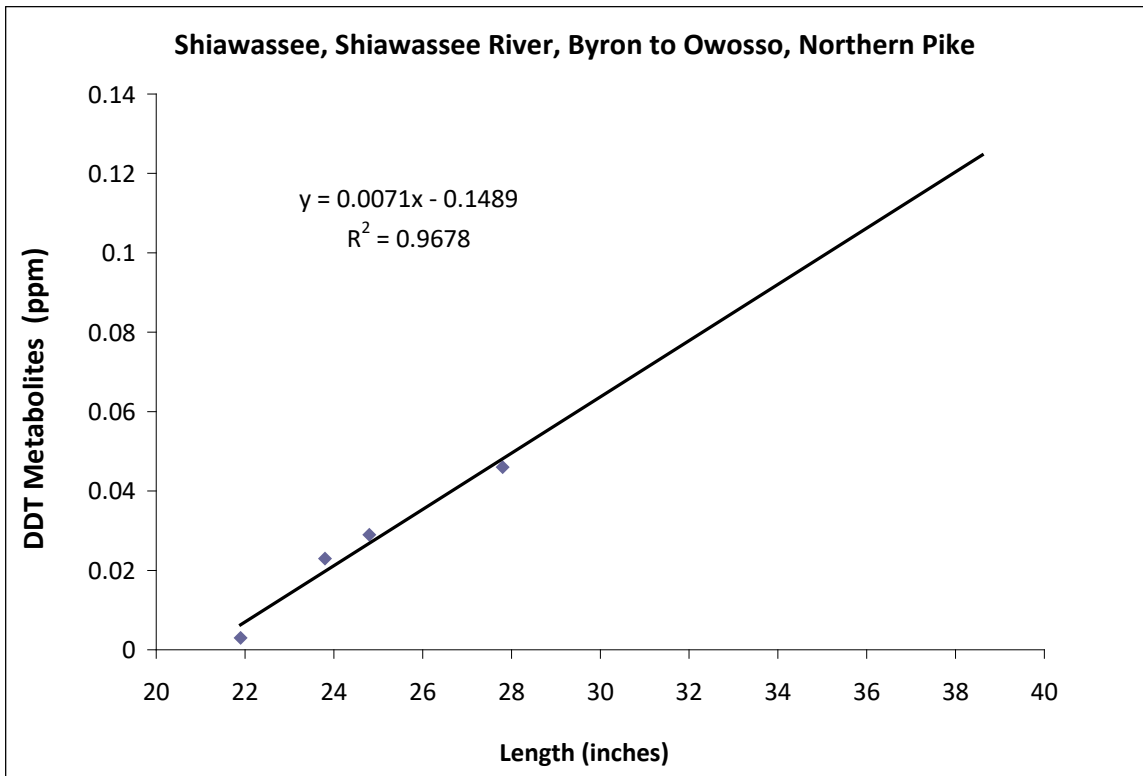
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	1995	6	21.9	24	23.8	38.6
Datasets available: 1987, 1995						
Chemical	Sample Size (All)	Mean		95%UCL	Meal Category	
PCB	6^	0.39		0.82	Limited	
DDT	4^	0.03		--	--	
Chlordane	6^	ND		--	--	
Toxaphene	6^	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.959	0.907		<i>Regression driven by 1 data point</i>		
DDT	0.968	0.752				
Chlordane						
Toxaphene						
					Final meal category based on UCL: Limited*	

^ Includes sublegal samples.

Existing Advisory: Women and children should eat no more than one meal per month of Shiawassee River northern pike less than 30 inches in length and no more than six meals per year of Shiawassee River northern pike greater than 30 in length due to elevated levels of PCBs.

Recommendation: No one should eat more than 6 meals per year of northern pike less than 30 inches in length from the Shiawassee River between Byron and Owosso due to PCBs. Sensitive populations should not eat the northern pike greater than 30 inches in length from the Shiawassee River between Byron and Owosso. Healthy adults should limit consumption to no more than 1 or 2 meals per year of northern pike greater than 30 inches from the Shiawassee River between Byron and Owosso due to PCBs. *Based on EGLE's Fish Contaminant Monitoring Program, PCB concentrations ≥ 15 years old are expected to have declined to a concentration that allows a less restrictive meal category of 6 meals per year based on the UCL. The linear regression is driven mainly by one data point, so it was not used to set the length break, however it does suggest that PCB concentrations are increasing with length. The statewide guideline length break was applied and the larger sizes were set to a meal category of limited.





Redhorse Sucker

**Shiawassee River
Byron to Owosso**

Shiawassee County

Hg Analysis:

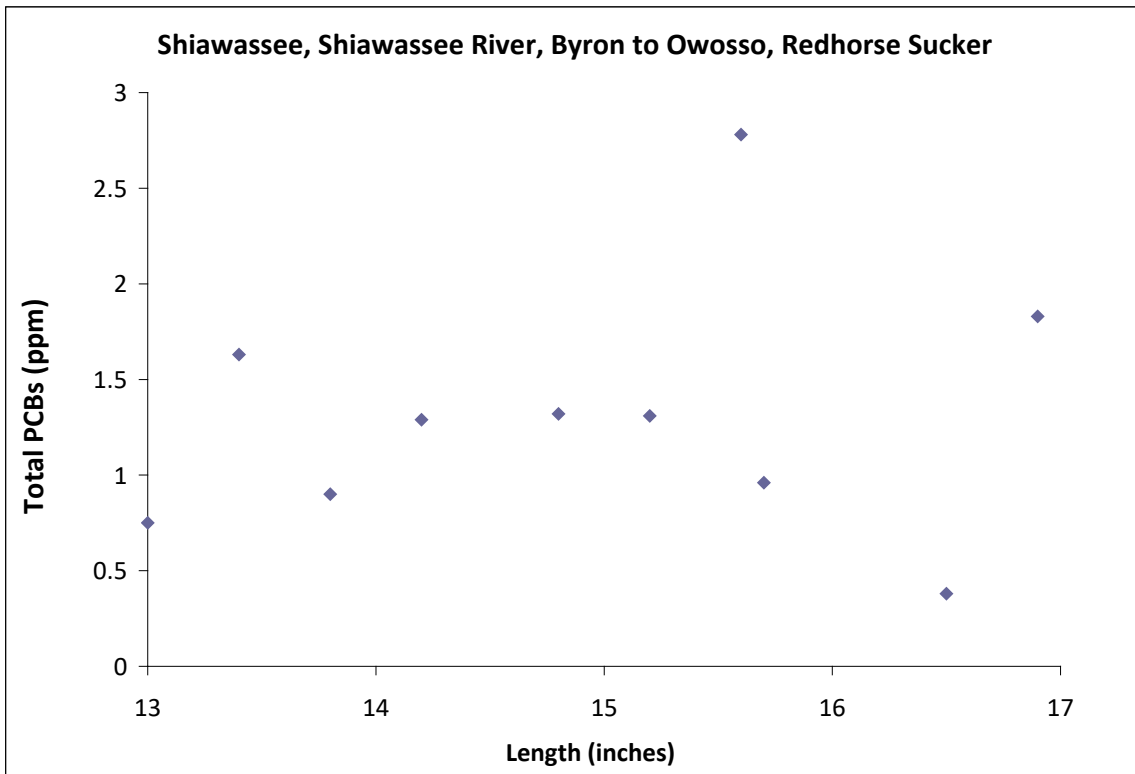
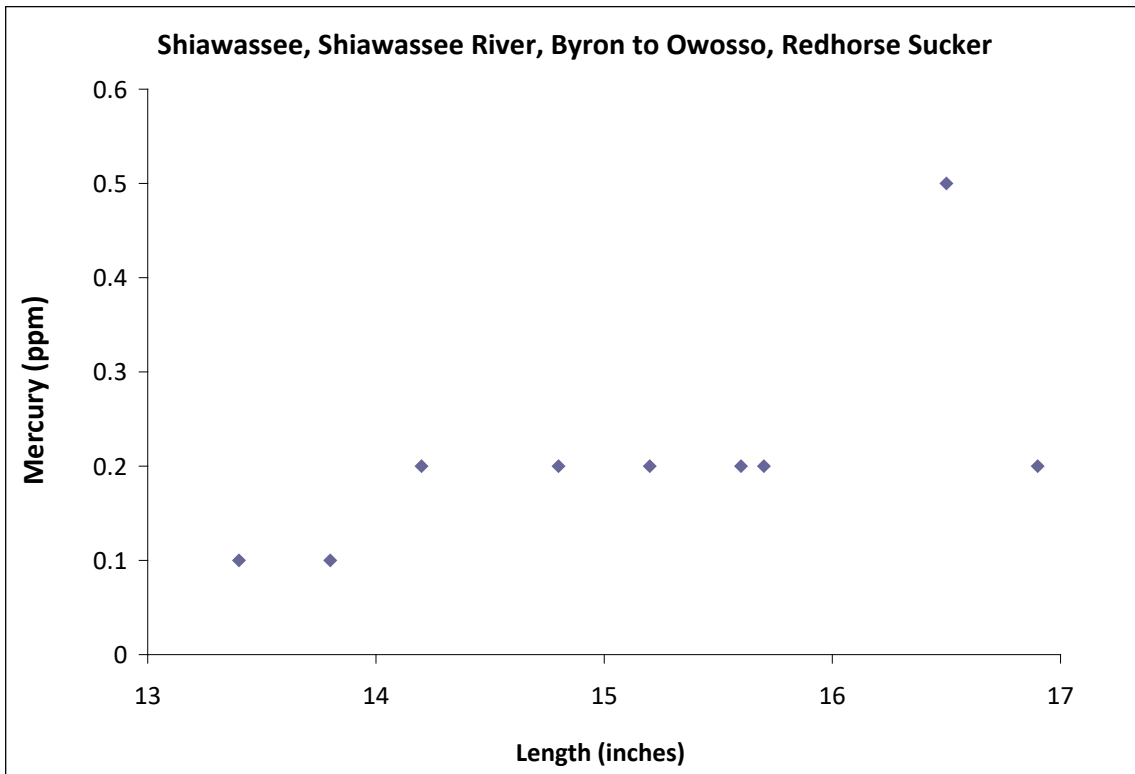
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1985	1985	9	13.4	na	13.4	16.9
Datasets available:		1985				
Chemical	Sample Size (Legal)	Mean		95%UCL	Meal Category	
Mercury	9	0.211		0.300	2	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.419	0.567				

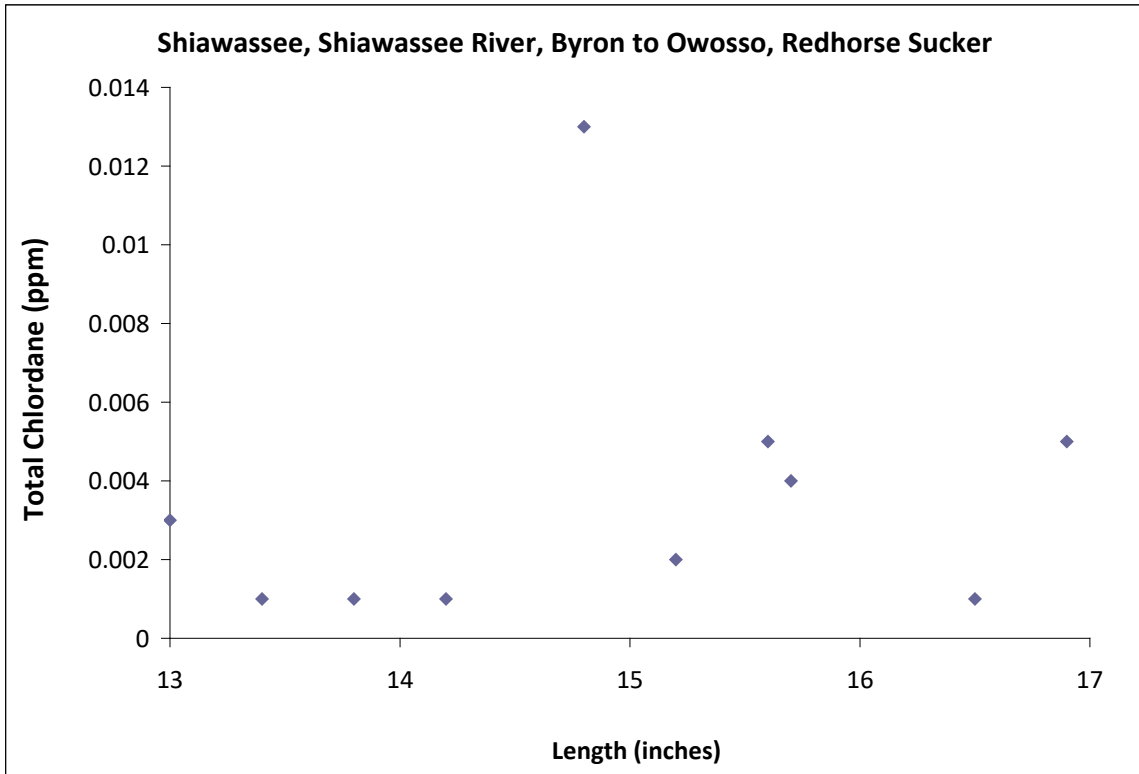
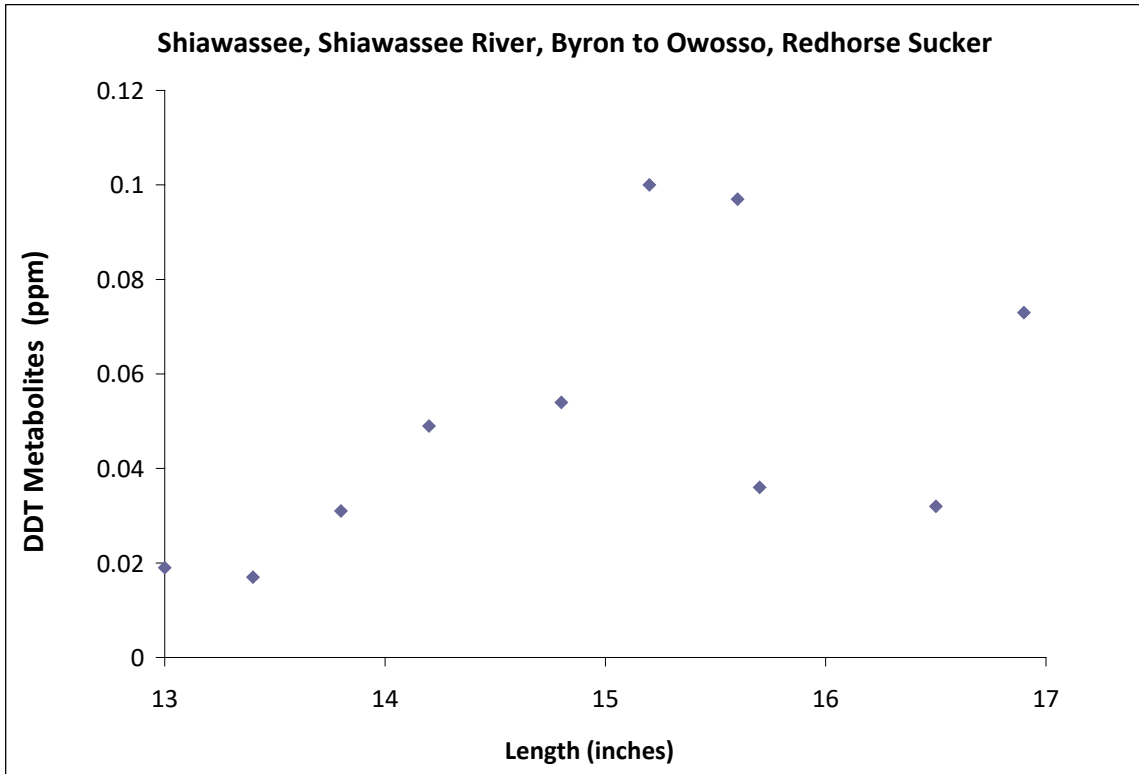
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1985	1985	10	13	na	13	16.9
Datasets available:		1985				
Chemical	Sample Size (Legal)	Mean		95%UCL	Meal Category	
PCB	10	1.315		1.790	Limited	
DDT	10	0.051		0.070	16	
Chlordane	10	0.004		0.010	-	
Toxaphene	10	ND				
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.030	0.000				
DDT	0.268	0.372				
Chlordane	0.036	0.093				
Toxaphene						
Final meal category based on UCL:					Limited*	

Existing Advisory: Shiawassee River redhorse sucker are not covered by an advisory.

Recommendation: No one should eat more than 6 meals per year of sucker from the Shiawassee River between Byron and Owosso due to elevated concentrations of PCBs. Mercury would cause an advisory. *Based on EGLE’s Fish Contaminant Monitoring Program, PCB concentrations ≥15 years old are expected to have declined to a concentration that allows a less restrictive meal category than determined by the standard evaluation method. Upon management review, a one meal category adjustment was applied due to the age of the dataset.





Rock Bass

**Shiawassee River
Byron to Owosso**

Shiawassee County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	0	--	--	--	--
Datasets available:						
Chemical	Sample Size (Legal)	Mean		95%UCL	Meal Category	
Mercury	0	--		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

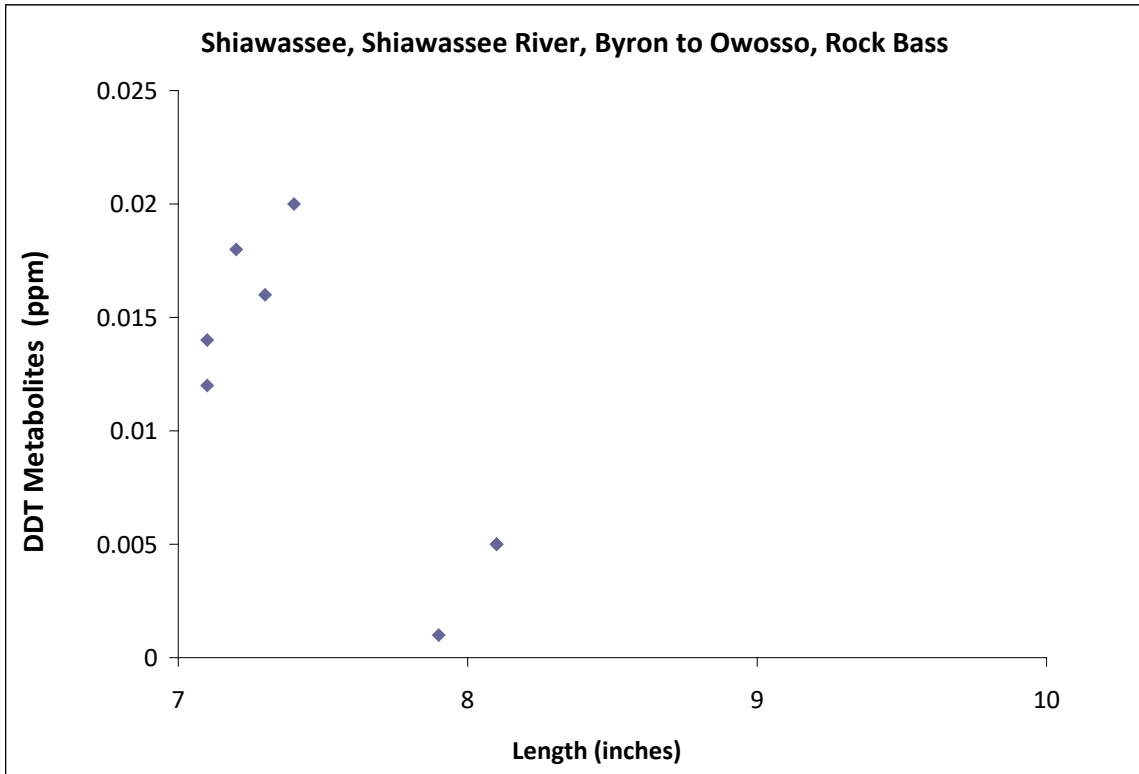
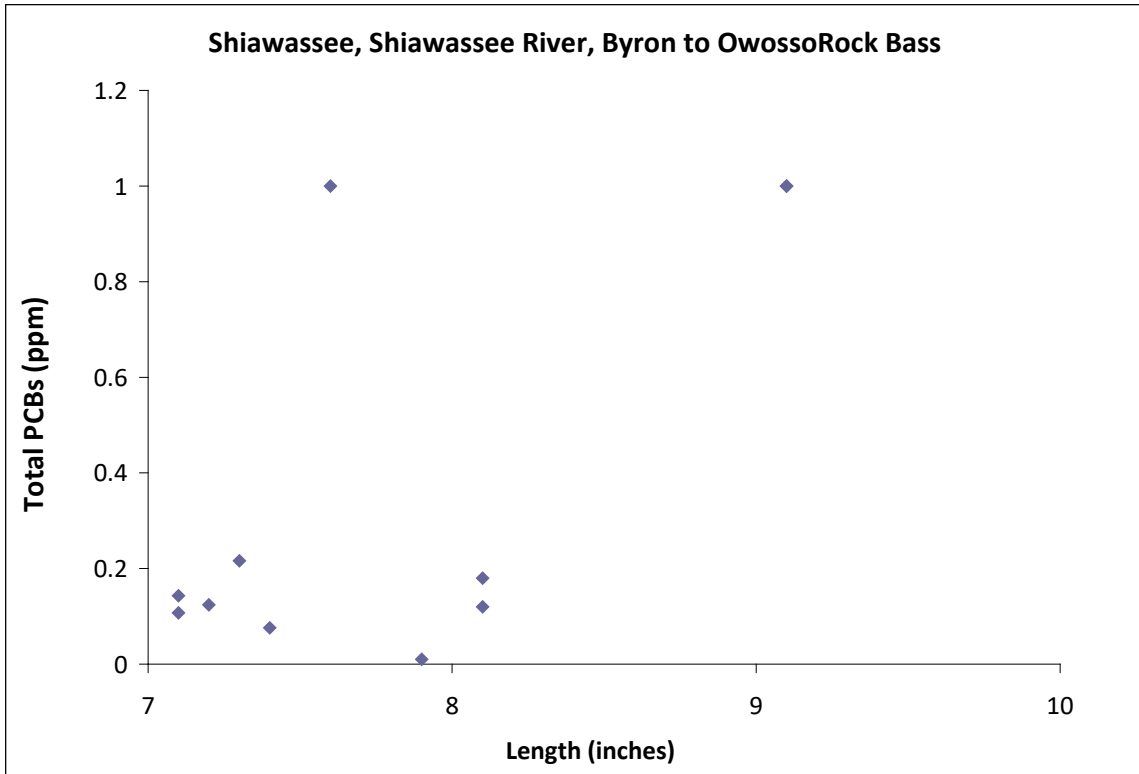
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1981	1985	11	7.1	na	7.1	9.1
Datasets available: 1981, 1985						
Chemical	Sample Size (Legal)	Mean		95%UCL	Meal Category	
PCB	11	0.361		0.640	Limited	
DDT	8	0.011		0.020	16	
Chlordane	8	ND				
Toxaphene	8	ND				
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.450	0.223				
DDT	0.635	0.533				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:					Limited*	

Existing Advisory: Shiawassee River rock bass are not covered by an advisory.

Recommendation:

No one eat more than 6 meals per year of rock bass from the Shiawassee River between Byron and Owosso due to elevated concentrations of PCBs. Dataset is limited by age of the data. *Based on EGLE’s Fish Contaminant Monitoring Program, PCB and DDT concentrations ≥15 years old are expected to have declined to a concentration that allows a less restrictive meal category than determined by the standard evaluation method.



Smallmouth Bass

**Shiawassee River
Byron to Owosso**

Shiawassee County

Hg Analysis:

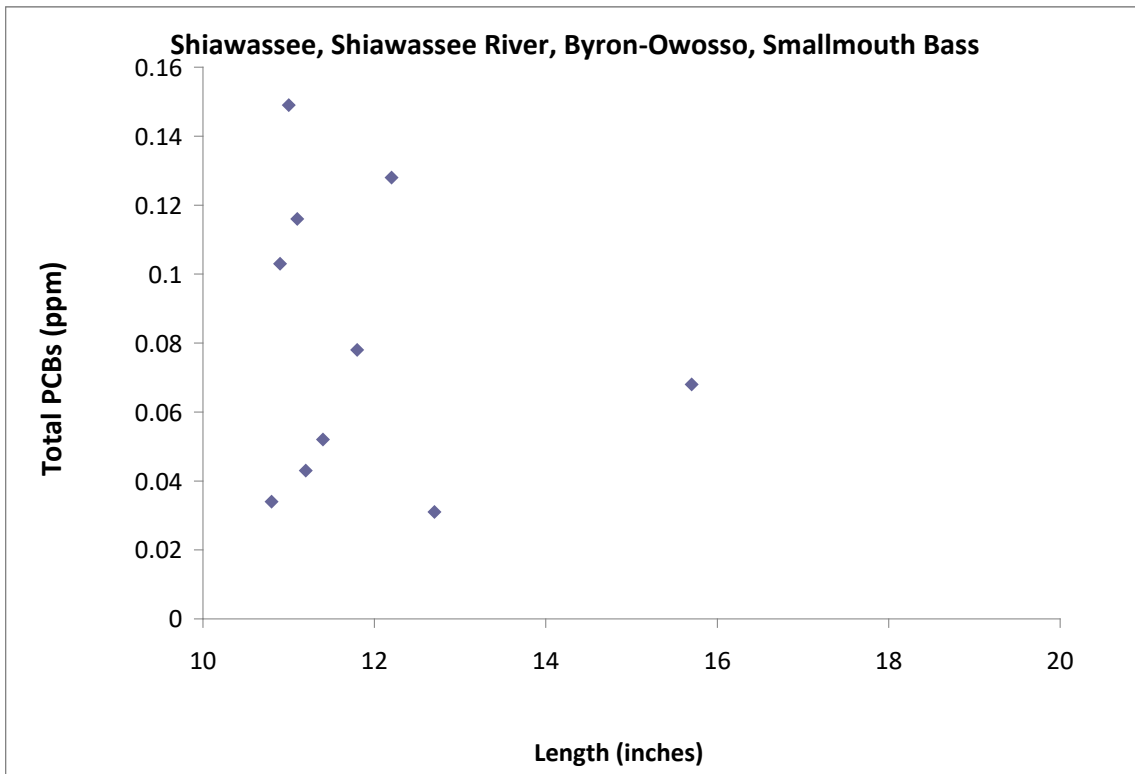
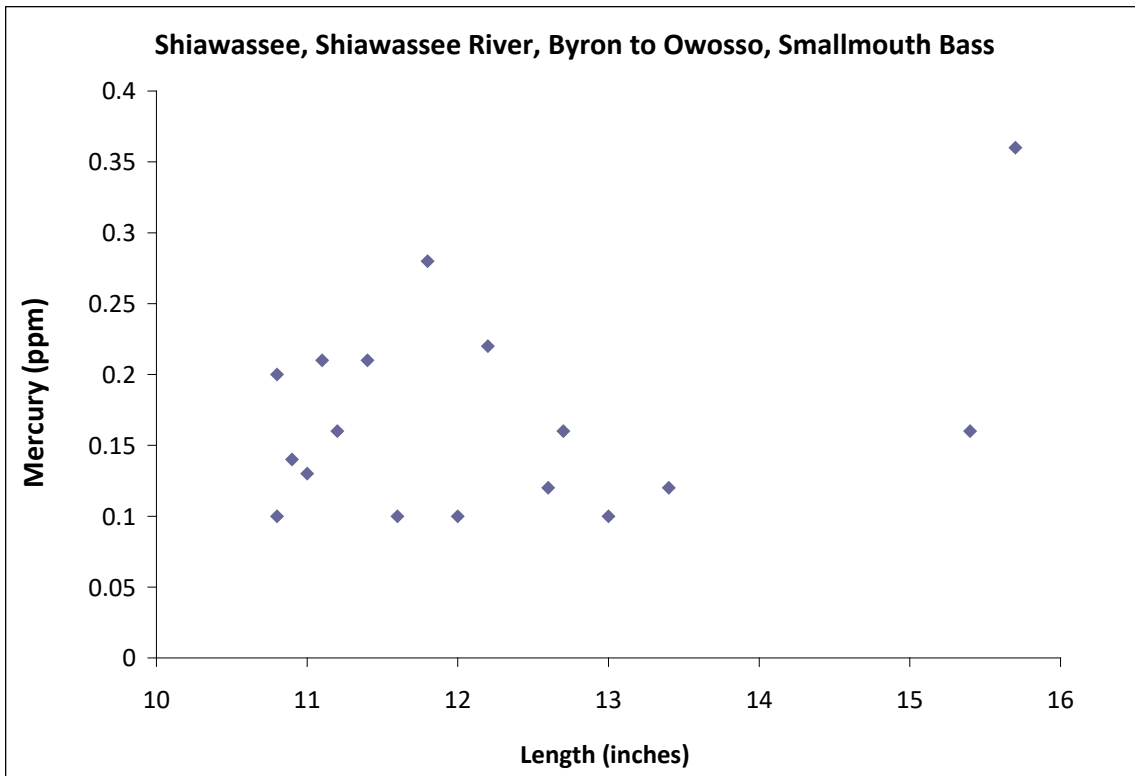
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	2003	17	10.8	14	15.4	15.7
Datasets available: 1987, 2003						
Chemical	Sample Size (All)	Mean		95%UCL	Meal Category	
Mercury	17	0.169		0.210	4	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.116	0.069				

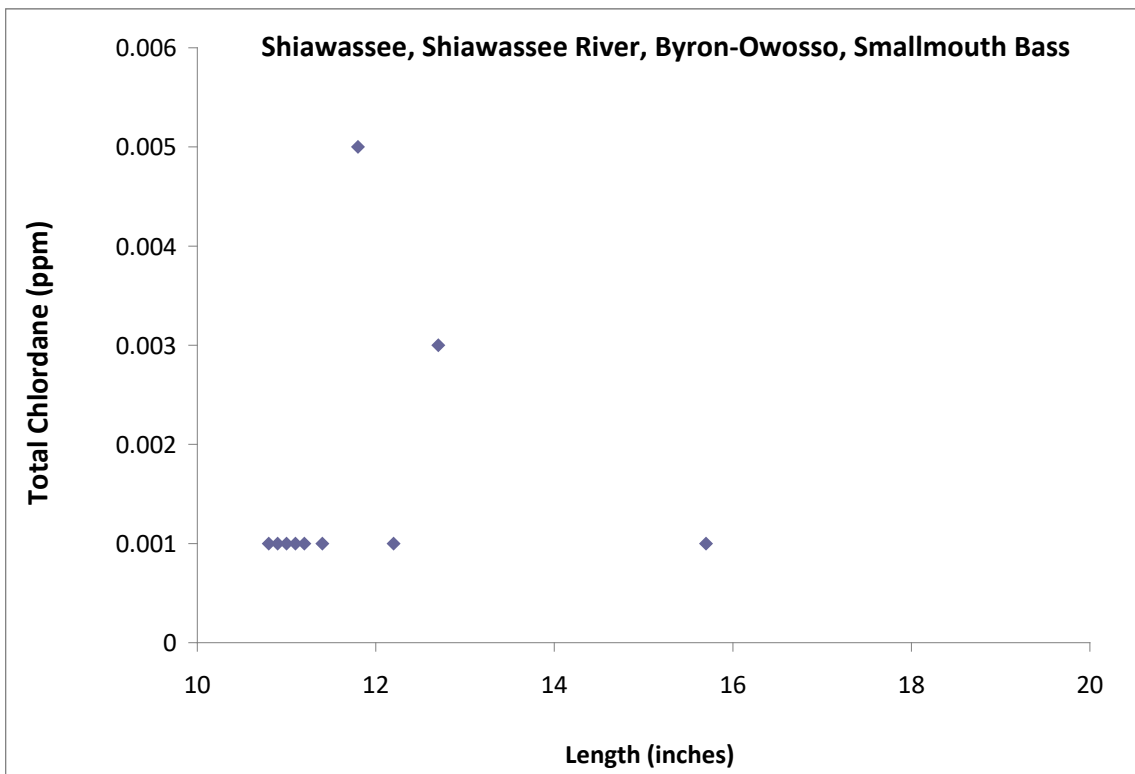
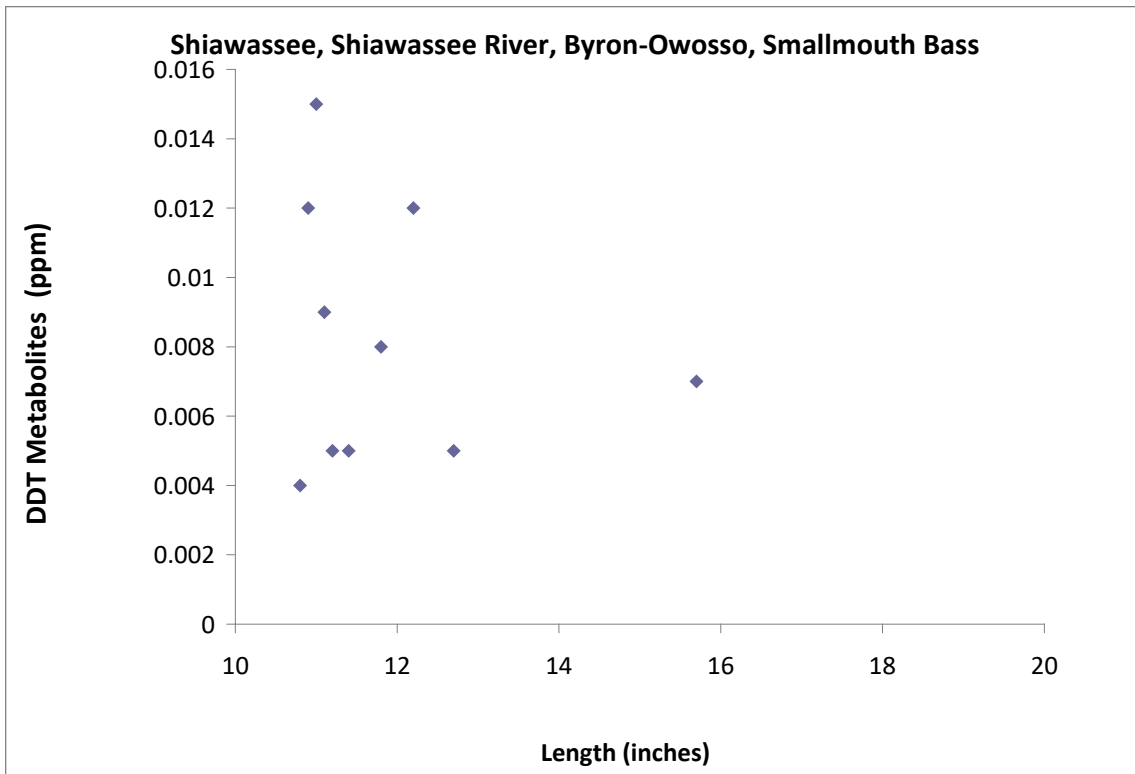
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2003	2003	10	10.8	14	15.7	15.7
Datasets available: 1985, 1987, 2003						
Chemical	Sample Size (All)	Mean		95%UCL	Meal Category	
PCB	10	0.080		0.110	2	
DDT	10	0.008		0.010	16	
Chlordane	10	0.002		0.000	--	
Toxaphene	10	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.028	0.011				
DDT	0.026	0.007				
Chlordane	0.005	0.010				
Toxaphene	--	--				
Final meal category based on UCL:						2

Existing Advisory: Shiawassee River (Byron to Owosso) smallmouth bass are not covered by an advisory.

Recommendation: No one eat more than 2 meals per month of Shiawassee River (Byron to Owosso) smallmouth bass less than 18 inches due to PCBs, or 2 meals per month of Shiawassee River (Byron to Owosso) smallmouth bass greater than 18 inches due to PCBs and mercury. This dataset is limited by sub-legal length samples. The size break for smallmouth bass from the statewide guideline was applied.





Carp

**Shiawassee River
Downstream of Owosso**

**Shiawassee & Saginaw
Counties**

Hg Analysis:

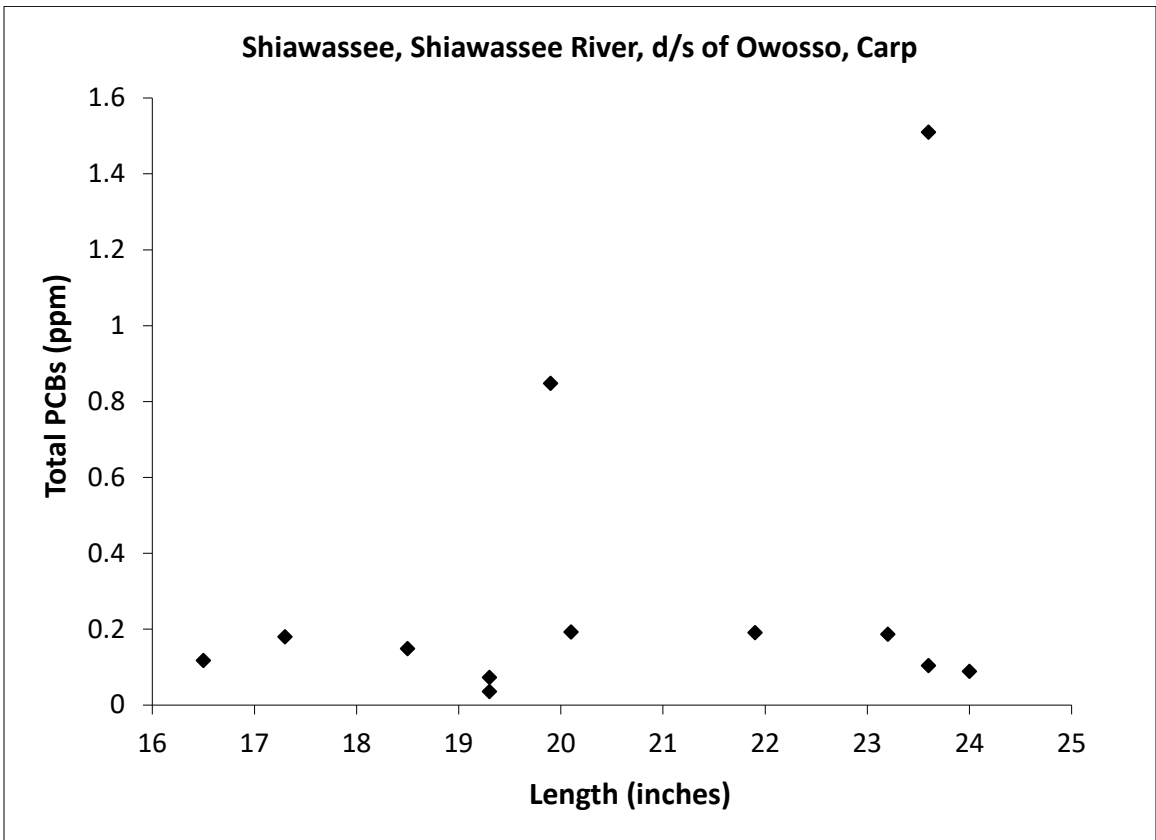
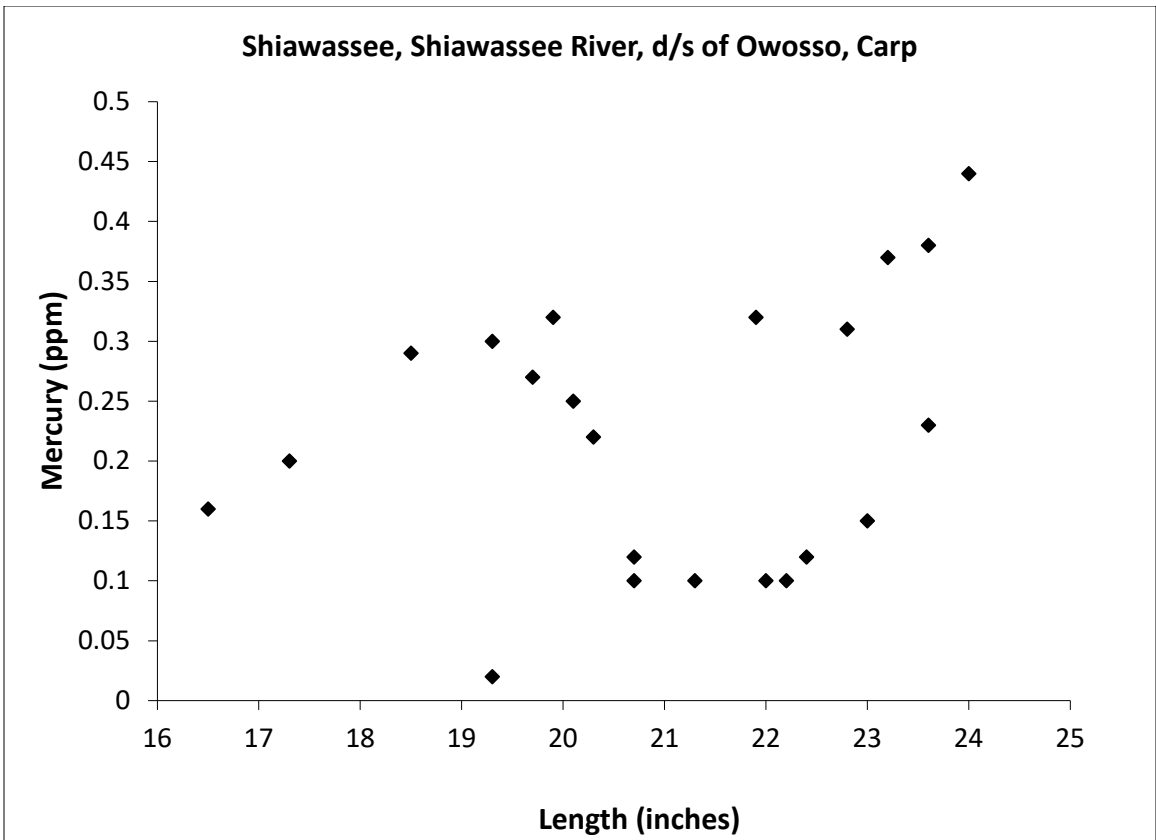
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	1992	22	16.5	na	16.5	24
Datasets available: 1987, 1992						
Chemical	Sample Size (Legal)	Mean		95%UCL		Meal Category
Mercury	22	0.22		0.27		4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.394	0.161				

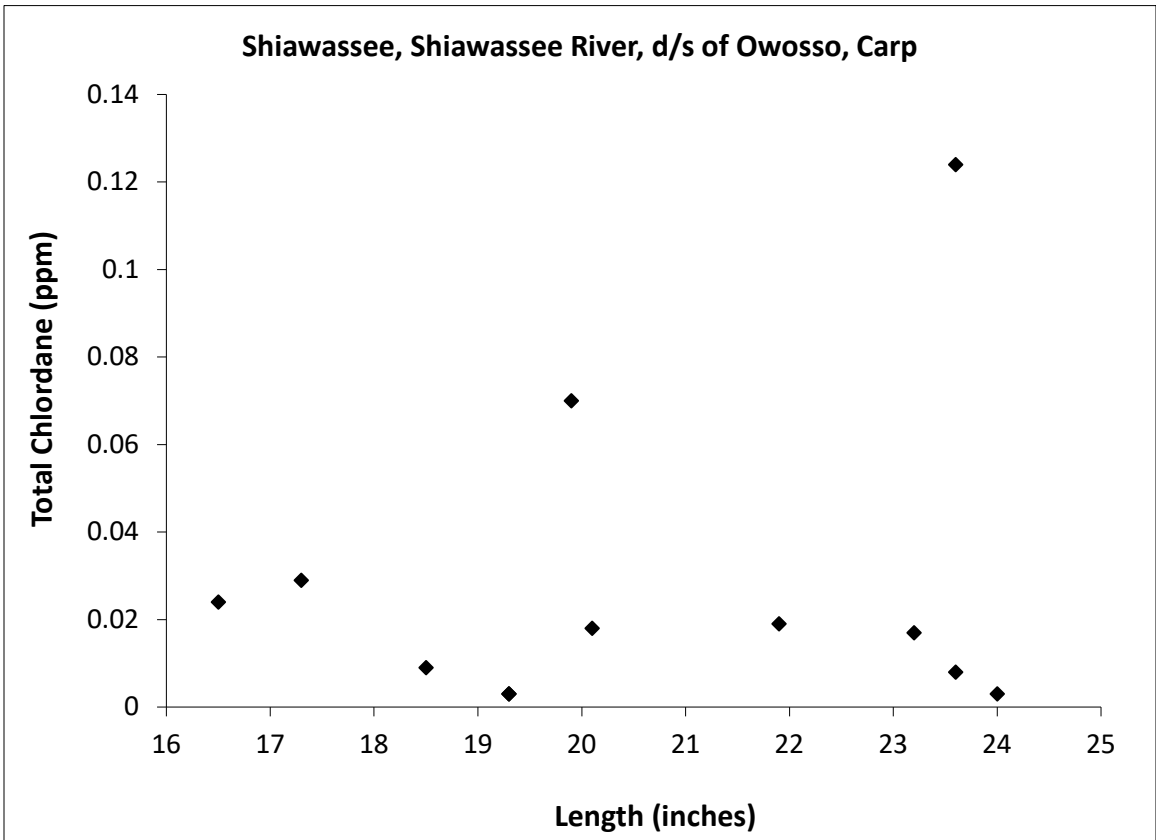
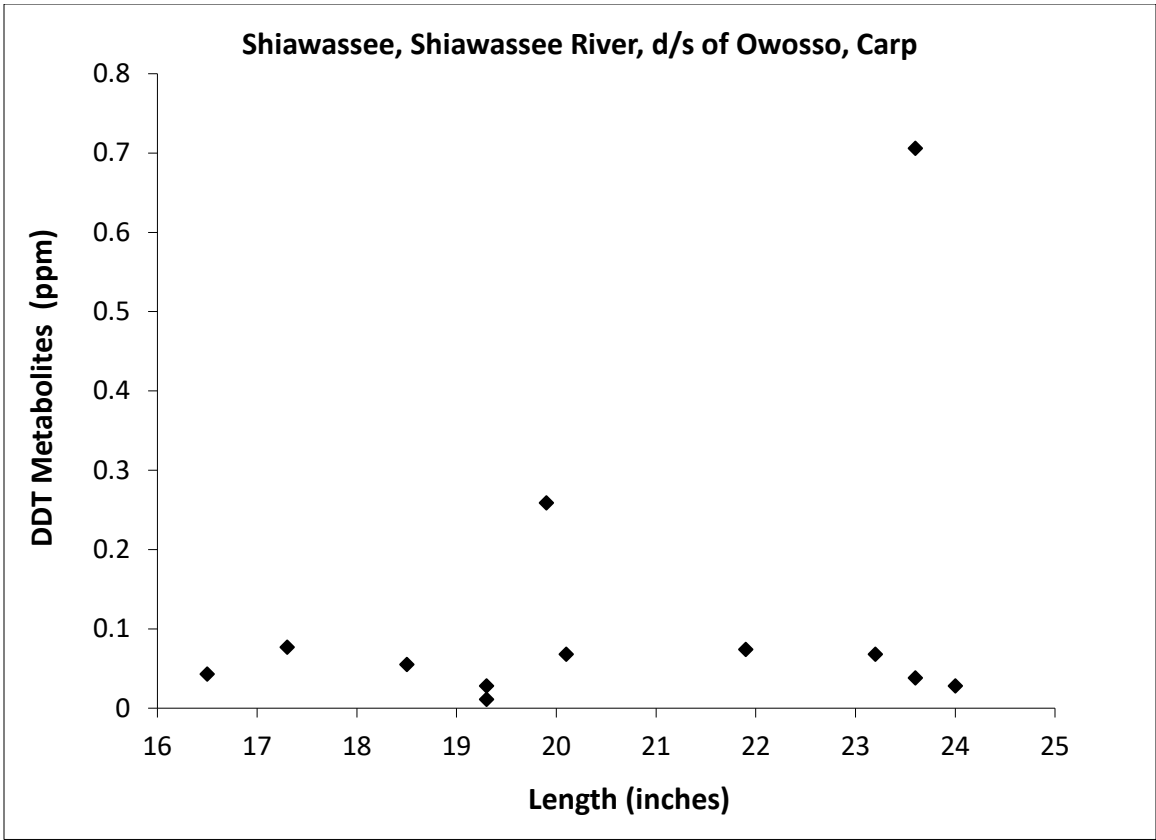
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1992	1992	12	16.5	na	16.5	24
Datasets available: 1992						
Chemical	Sample Size (Legal)	Mean		95%UCL		Meal Category
PCB	12	0.307		0.580		Limited
DDT	12	0.121		0.250		4
Chlordane	12	0.027		0.050		--
Toxaphene	12	ND				
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.087	0.055				
DDT	0.103	0.050				
Chlordane	0.037	0.000				
Toxaphene						
Final meal category based on UCL:						Limited*

Existing Advisory: Women and children should eat no more than one meal per week of Shiawassee River (d/s of Owosso) carp less than 22 inches in length and no more than one meal per month of Shiawassee River carp greater than 22 inches in length due to elevated levels of PCBs.

Recommendation: No one eat more than 6 meals per year of carp from the Shiawassee River downstream of Owosso due to PCBs. Mercury and DDT would cause advisories. Dataset is limited by age of the data. *Based on EGLE’s Fish Contaminant Monitoring Program, PCB and DDT concentrations ≥15 years old are expected to have declined to a concentration that allows a less restrictive meal category than determined by the standard evaluation method.





Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1992	2020	18	10.1	14.0	10.1	16.3
Datasets available: 1992, 2020						
Chemical	Sample Size (All)*	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	18	0.257	0.120	0.500	0.310	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.630	0.668				

Organics Analysis:

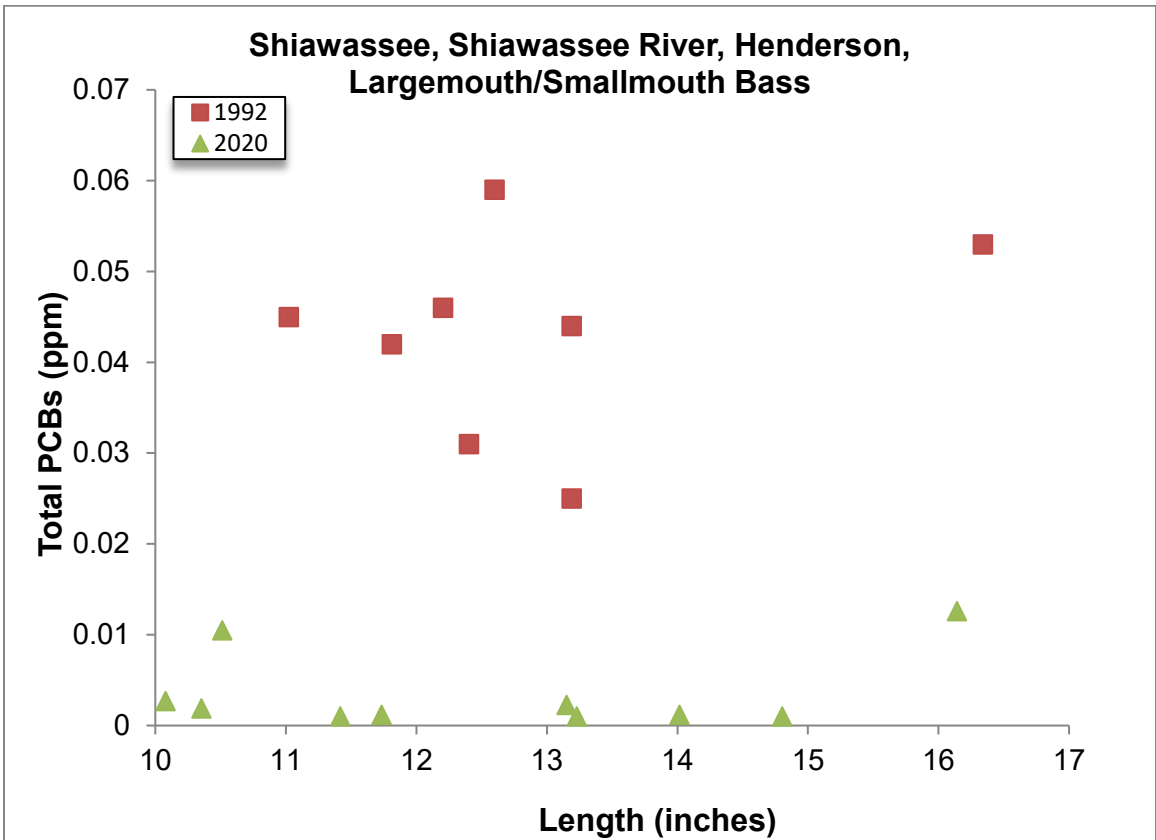
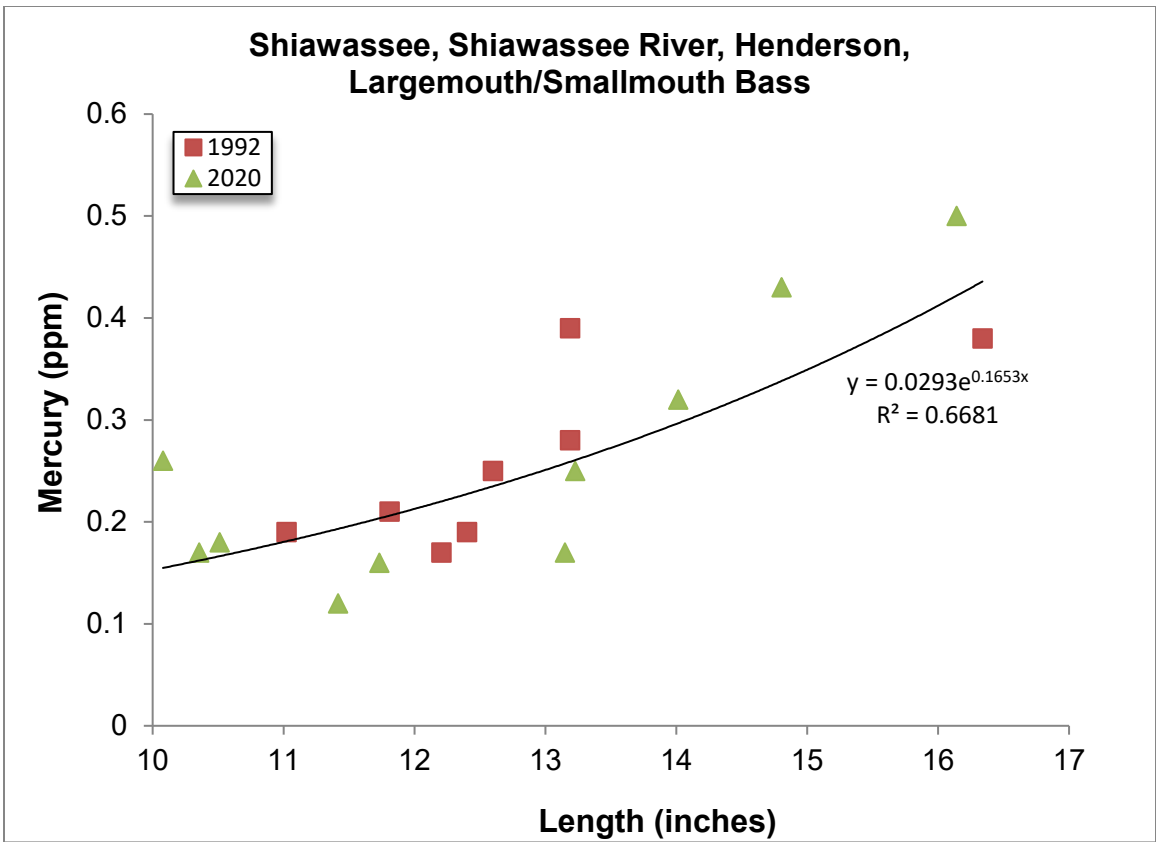
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2020	2020	10	10.1	14.0	10.1	16.1
Datasets available: 1992, 2020						
Chemical	Sample Size (All)*	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.004	<0.001	0.013	0.007	16
DDT	10	0.002	<0.001	0.004	0.003	16
Chlordane	10	ND	--	--	--	16
Toxaphene	10	ND	--	--	--	--
PFOS	10	20.9 ppb	4.7 ppb	43.3 ppb	29.7 ppb	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.047	0.004				
DDT	0.183	0.078				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.183	0.204				
Final meal category based on UCL:						2

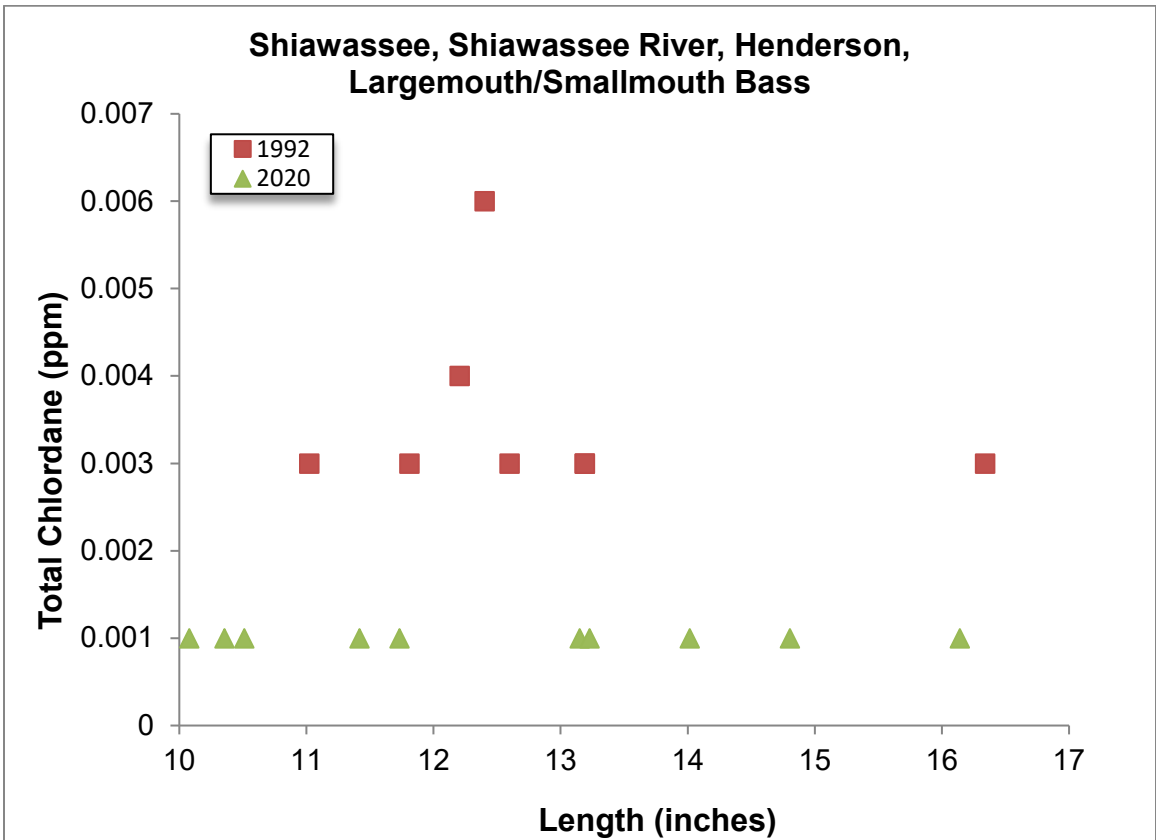
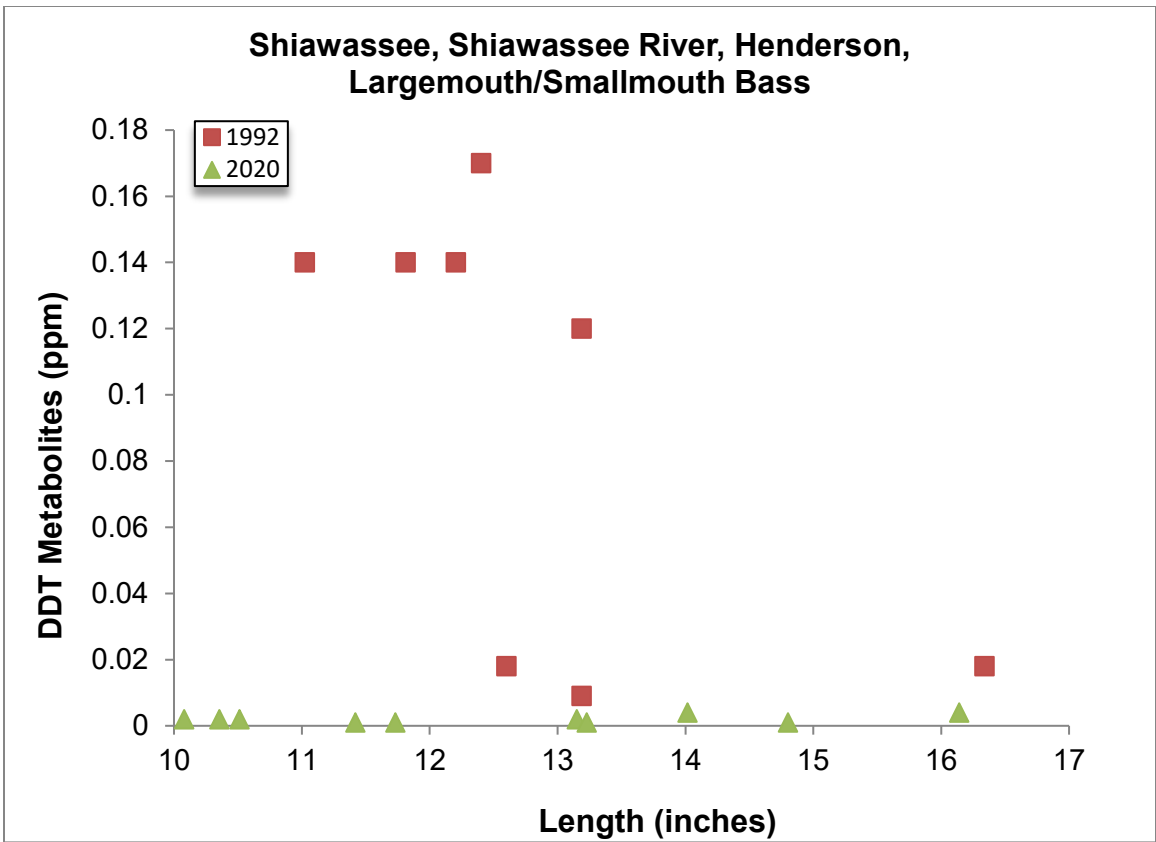
* Only 4 fish in the data set were of legal-size. Therefore, sublegal sized fish were included in the analysis.

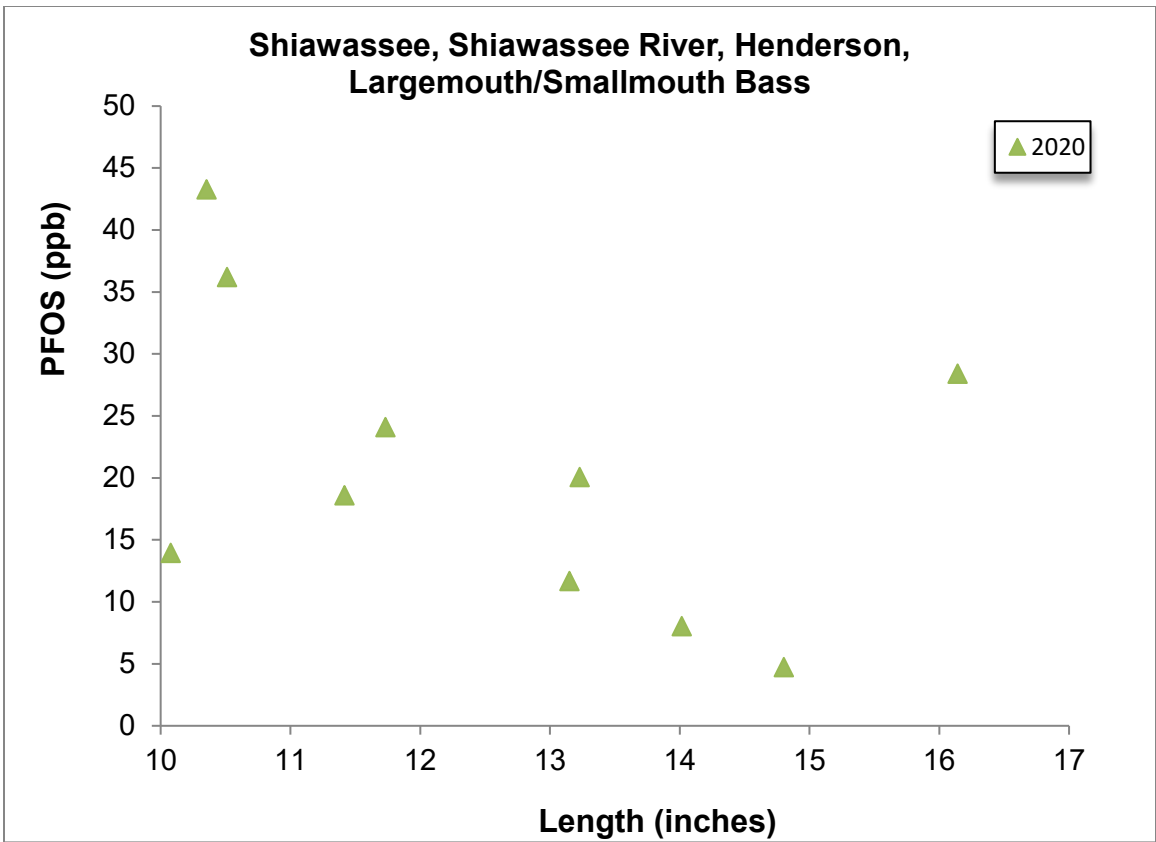
Existing MDHHS Advisory: No one should eat more than 2 meals per month of largemouth or smallmouth bass smaller than 18 inches from the Shiawassee River downstream of Owosso or no more than 1 meal per month of these fish larger than 18 inches due to mercury. Dataset is limited by age of the data and sub-legal length samples. Statewide length break was applied.

Recommendation: No change to the advisory is warranted. PFOS should be added to list of contaminants causing less restrictive guidance.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
10	0.153	4
12	0.213	4
14	0.296	2
16	0.413	2
18	0.574	1
20	0.799	1
<i>Shaded area denotes extrapolated estimates</i>		







Hg Analysis:

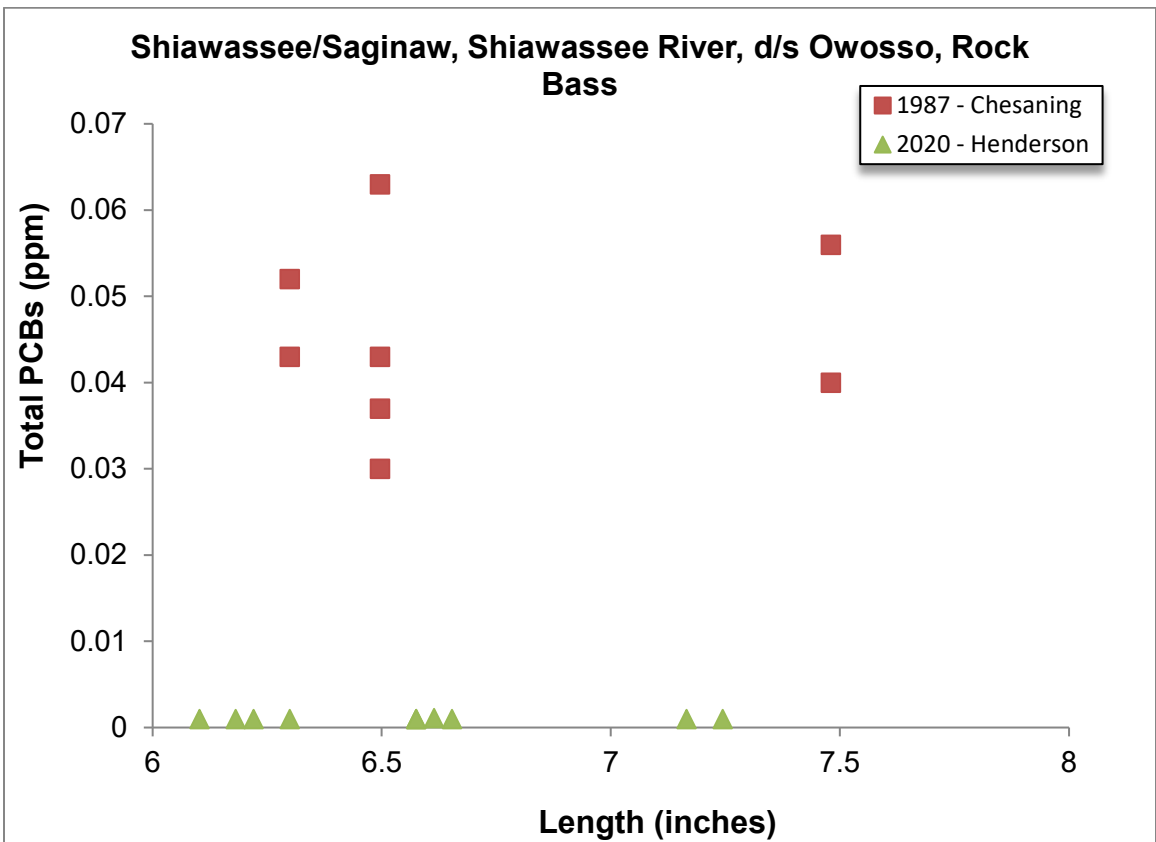
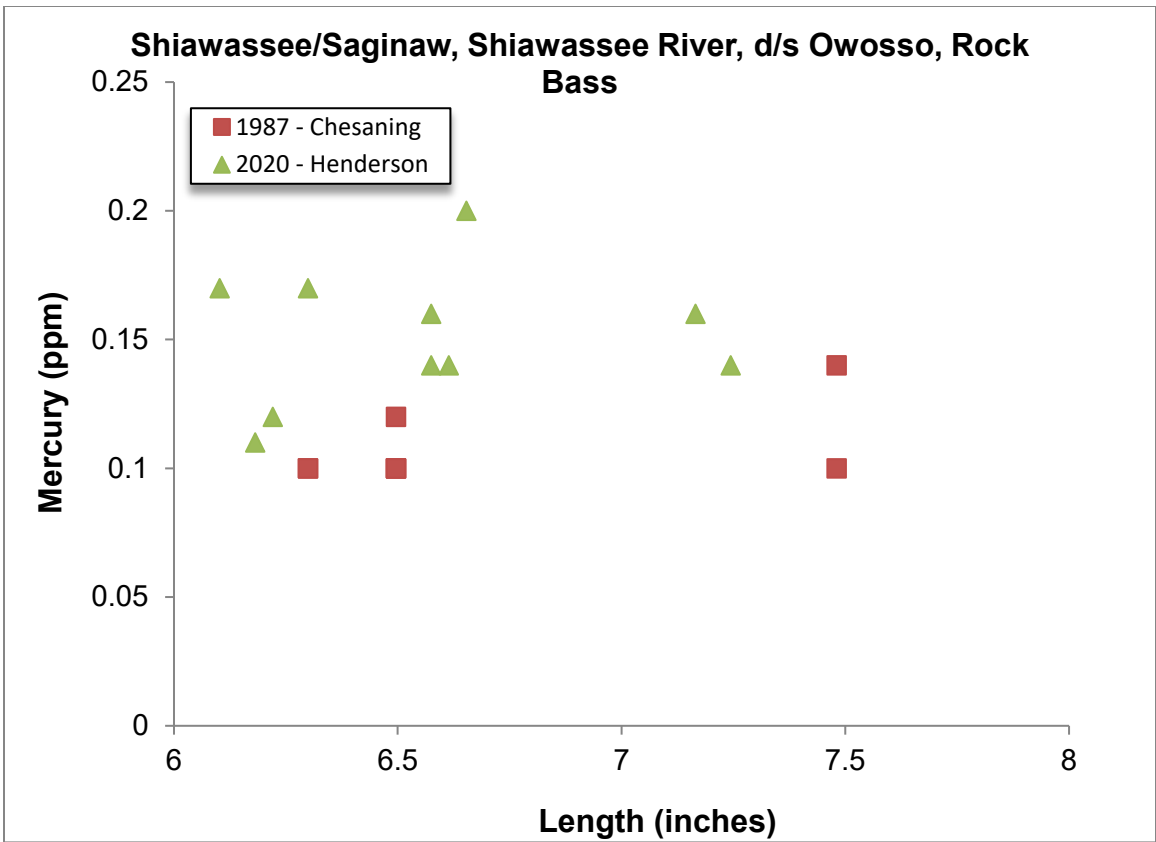
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	2020	18	6.1	NA	6.1	7.5
Datasets available: 1987, 2020						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	18	0.132	<0.100	0.200	0.147	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.005	0.009				

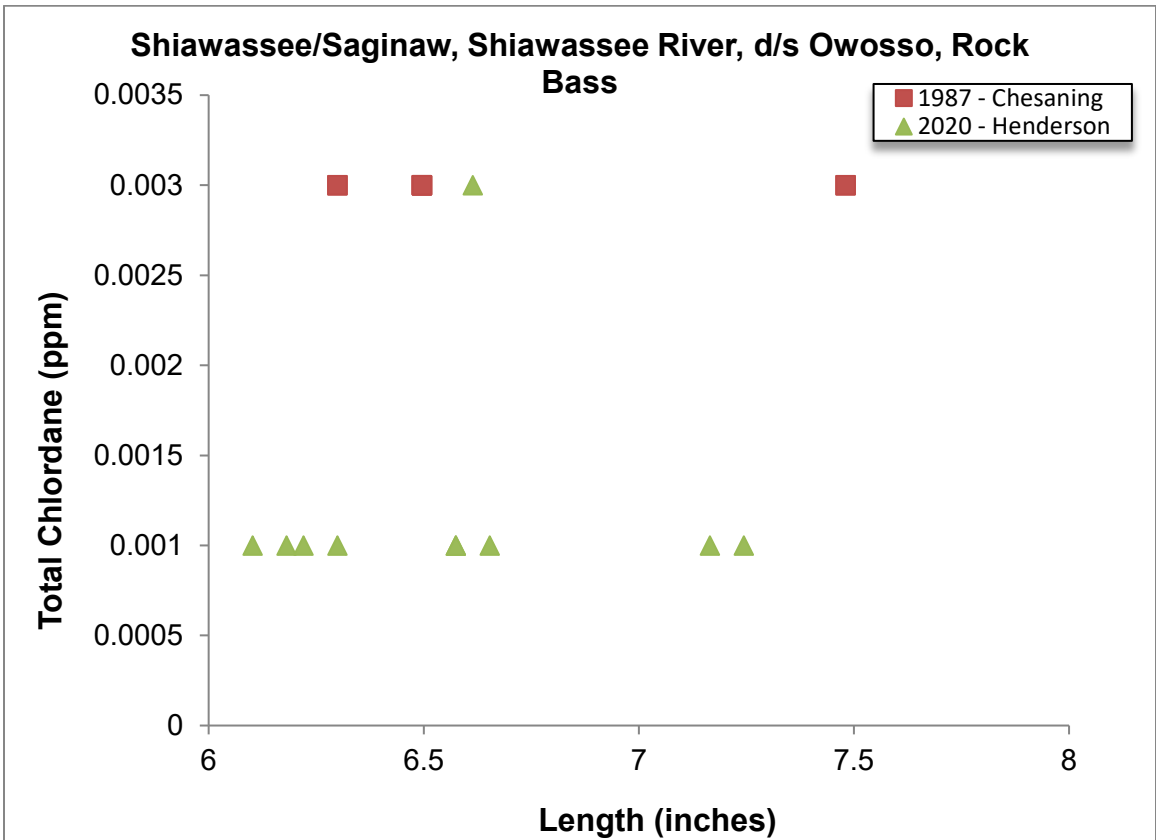
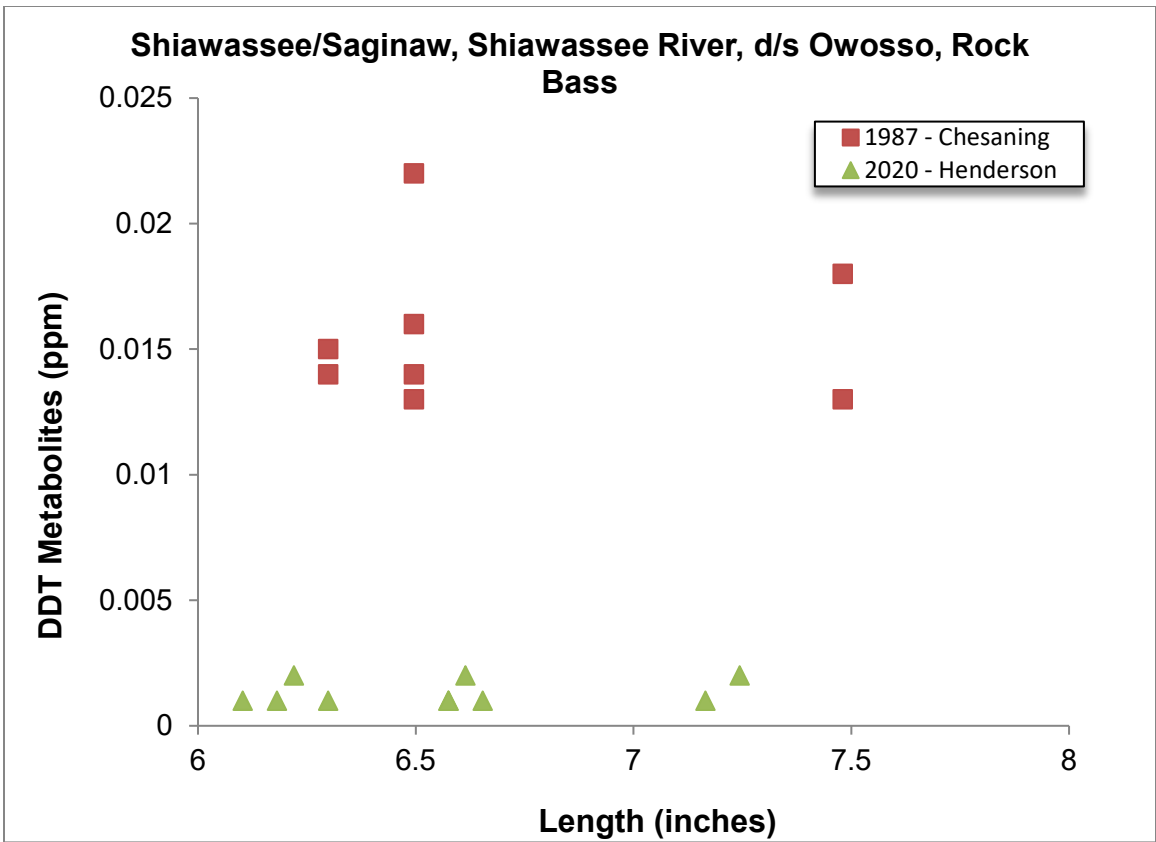
Organics Analysis:

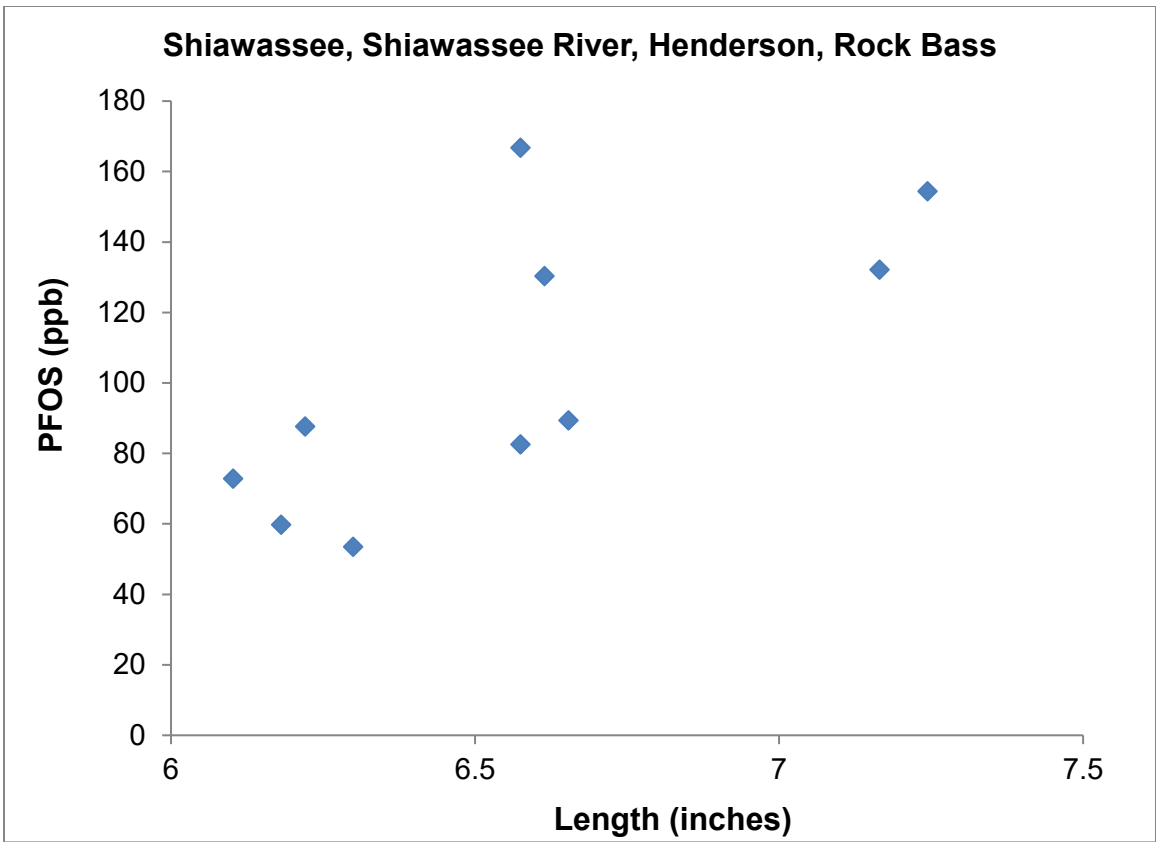
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2020	2020	10	6.1	NA	6.1	7.2
Datasets available: 1987 (No PFOS), 2020						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.001	<0.001	0.001	0.001	16
DDT	10	0.001	<0.001	0.002	0.002	16
Chlordane	10	0.001	<0.001	0.003	0.002	16
Toxaphene	10	ND	--	--	--	--
PFOS	10	102.9 ppb	53.5 ppb	166.7 ppb	131.5 ppb	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.002	0.002				
DDT	0.052	0.052				
Chlordane	0.002	0.002				
Toxaphene	--	--				
PFOS	0.523	0.539				
Final meal category based on UCL:						1

Existing MDHHS Advisory: No one should eat more than 8 meals per month of Shiawassee River rock bass downstream of Owosso due to mercury. This dataset is limited due to the age of the data. Based on EGLE's Fish Contaminant Monitoring Program, PCB concentrations ≥ 15 years old are expected to have declined leaving mercury as the cause of the advisory. This recommendation is based on the available dataset.

Recommendation: No one should eat more than 1 meal per month of rock bass of any size from the Shiawassee River downstream of Owosso due to PFOS. Mercury causes less restrictive guidance.







Black Crappie

**Shiawassee River
South Branch**

Livingston County

Hg Analysis:

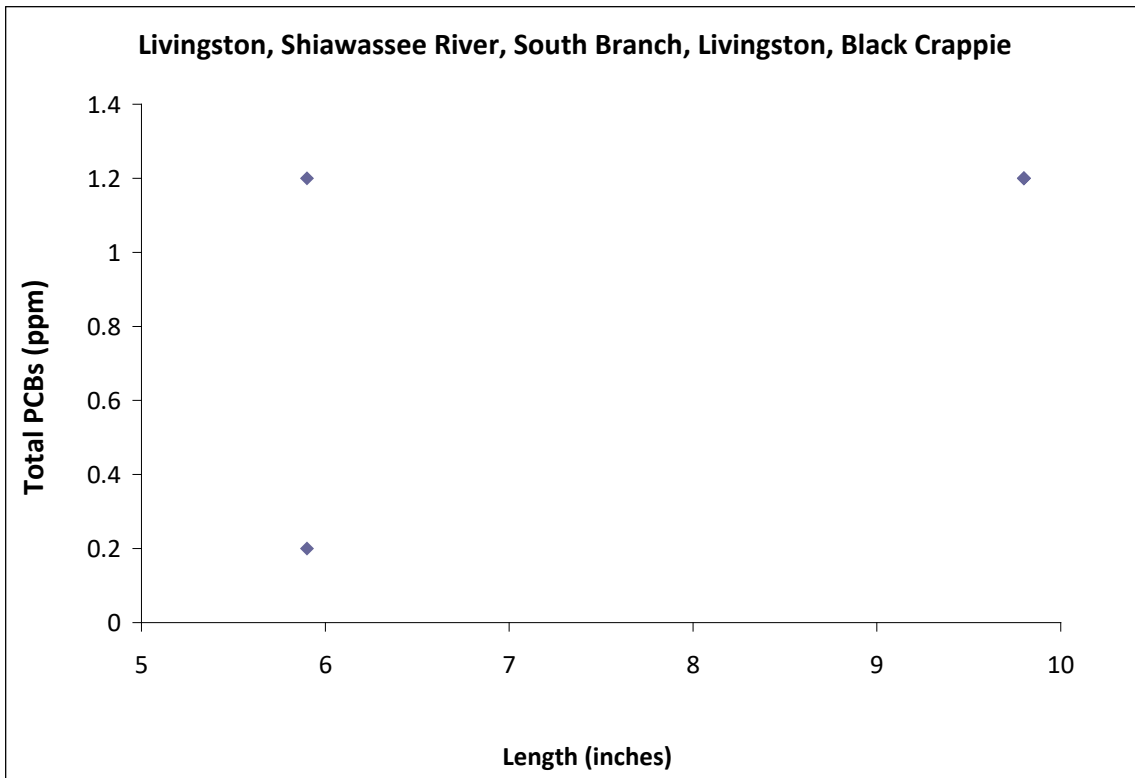
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1981	1984	5	5.9	na	5.9	9.8
Datasets available: 1981, 1984						
Chemical	Sample Size (Legal)	Mean		95%UCL		Meal Category
Mercury	5	--		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1981	1984	5	5.9	na	5.9	9.8
Datasets available: 1981, 1984						
Chemical	Sample Size (Legal)	Mean		95%UCL		Meal Category
PCB	5	1.00		1.56		Limited
DDT	1	0.01		--		--
Chlordane	1	ND		--		--
Toxaphene	0	NA		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.375	0.375				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						Limited*

Existing Advisory: No one should eat South Branch Shiawassee River black crappie of any size due to elevated levels of PCBs.

Recommendation: Waterbody-wide advisory of no fish consumption of any species applies to South Branch Shiawassee River and include black and white crappie. This river segment has been impacted by legacy contamination that has been previously documented by an environmental regulatory agency. Remediation has not been demonstrated. *This dataset is limited by age of the data and is not useable to provide a recommendation given the legacy contamination.



**Bullhead
(Black and Yellow)
Hg Analysis:**

**Shiawassee River
South Branch**

Livingston County

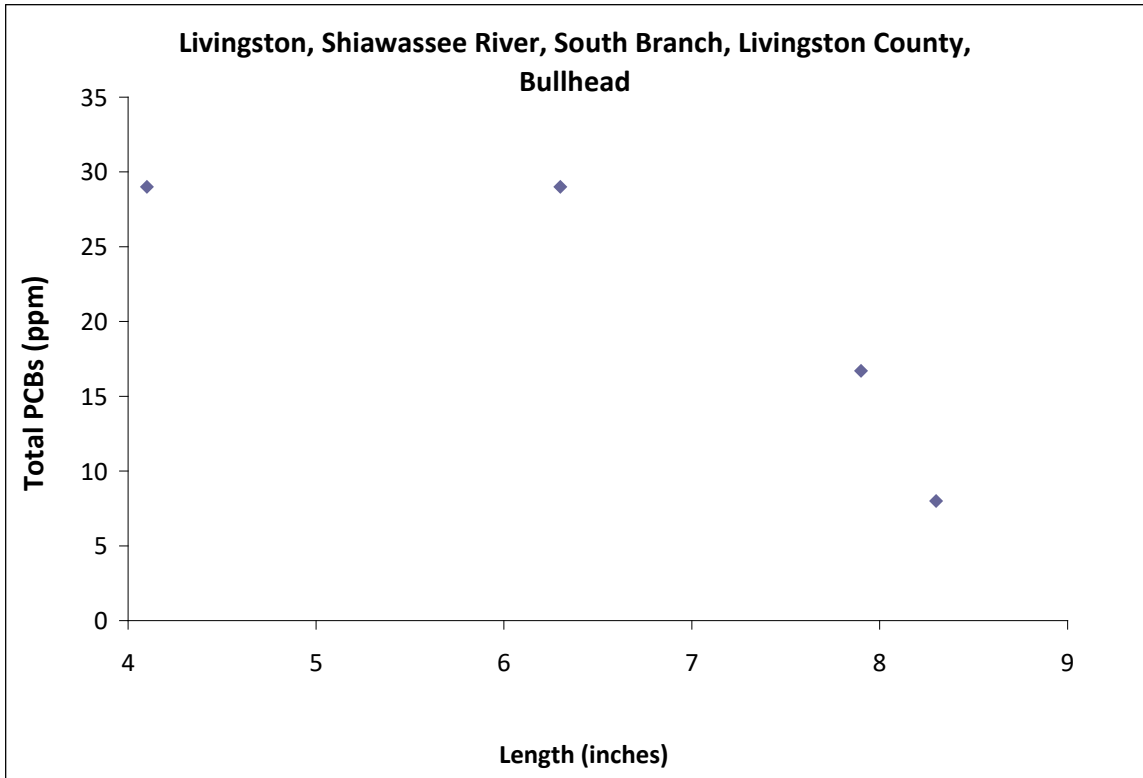
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1981	1981	4	4.1	na	4.1	8.3
Datasets available:		1981				
Chemical	Sample Size (Legal)	Mean		95%UCL		Meal Category
Mercury	0	--		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1981	1981	4	4.1	na	4.1	8.3
Datasets available:		1981				
Chemical	Sample Size (Legal)	Mean		95%UCL		Meal Category
PCB	4	20.68		36.98		0
DDT	0	NA				
Chlordane	0	NA				
Toxaphene	0	NA				
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--		<i>Small sample size, regression not used</i>		
DDT						
Chlordane						
Toxaphene						
Final meal category based on UCL:						0

Existing Advisory: No one should eat South Branch Shiawassee River bullhead of any size due to elevated levels of PCBs.

Recommendation: Waterbody-wide advisory of no fish consumption of any species applies to South Branch Shiawassee River and include bullhead. This river segment has been impacted by legacy contamination that has been previously documented by an environmental regulatory agency. Remediation has not been demonstrated. This dataset is limited by age of the data, sample size, and is not useable to provide a recommendation given the legacy contamination.



Carp

**Shiawassee River
South Branch**

Livingston County

Hg Analysis:

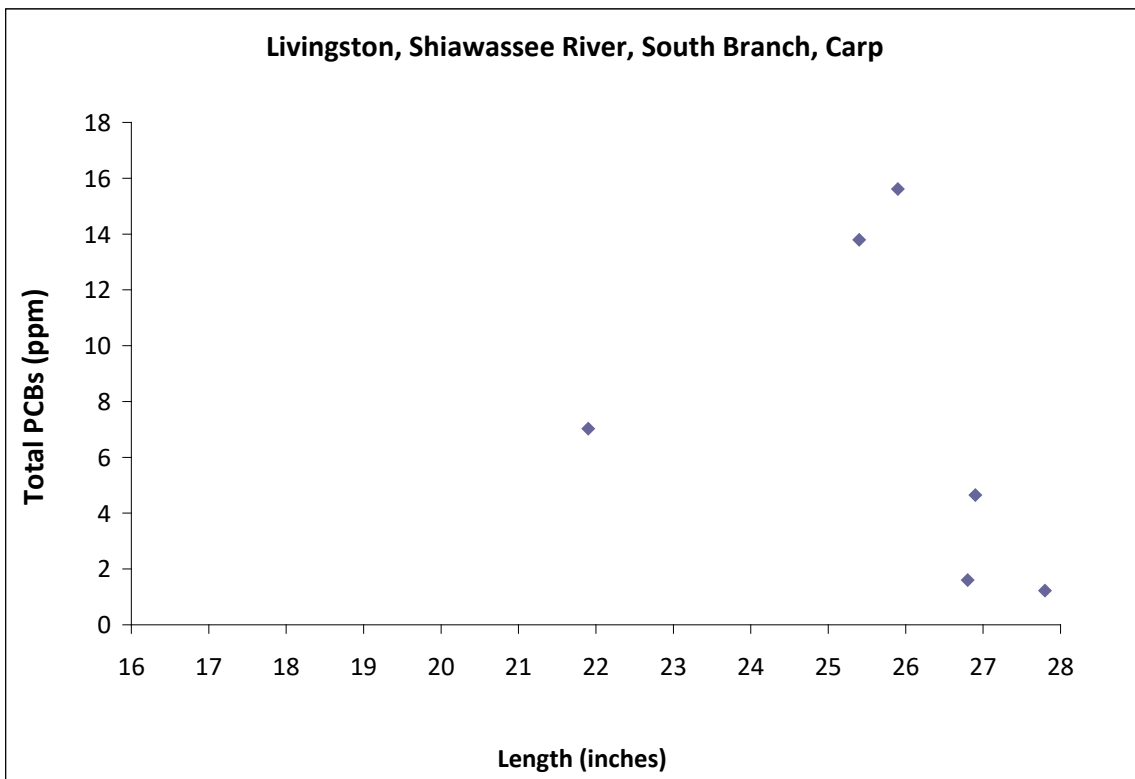
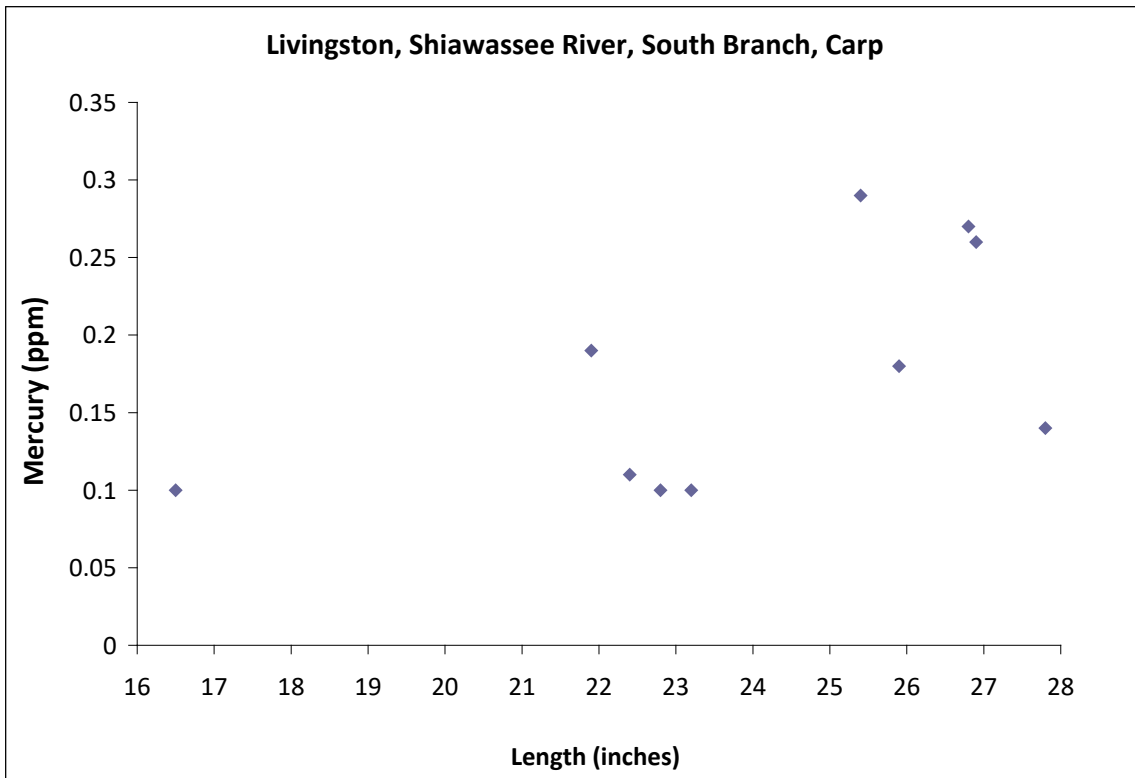
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1986	2004	10	16.5	na	16.5	27.8
Datasets available: 1986, 2004						
Chemical	Sample Size (Legal)	Mean		95%UCL	Meal Category	
Mercury	10	0.174		0.230	4	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.337	0.376				

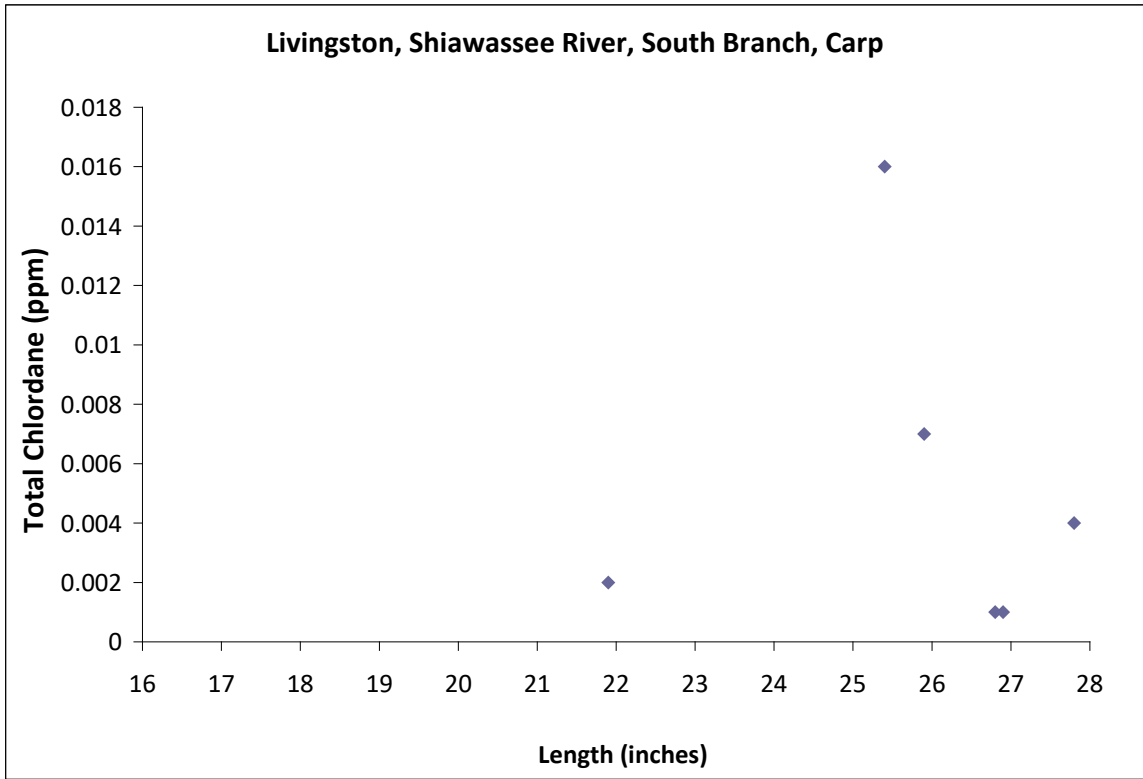
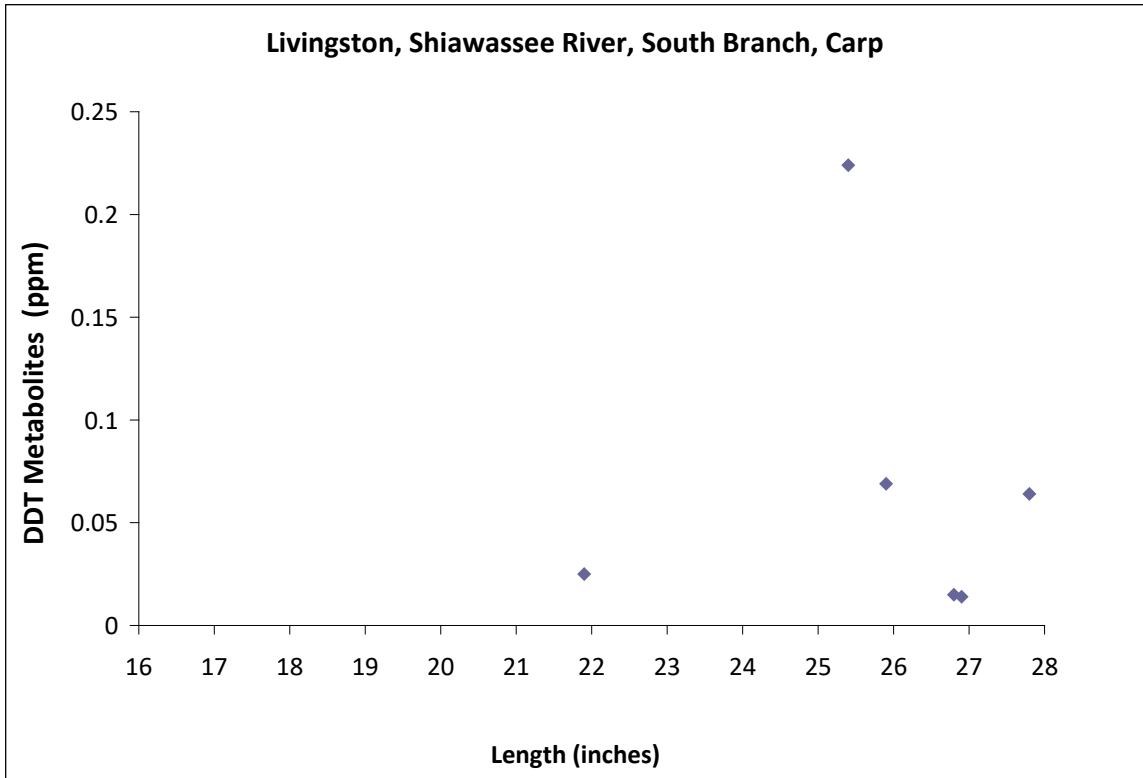
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2004	2004	6	21.9	na	21.9	27.8
Datasets available: 2004						
Chemical	Sample Size (Legal)	Mean		95%UCL	Meal Category	
PCB	6	7.32		13.75	0	
DDT	6	0.07		0.15	12	
Chlordane	6	0.005		0.01	--	
Toxaphene	6	ND				
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.114	0.259				
DDT	0.000	0.000				
Chlordane	0.002	0.004				
Toxaphene						
Final meal category based on UCL:						0

Existing Advisory: No should eat South Branch Shiawassee River carp of any size due to elevated levels of PCBs.

Recommendation: No one should eat any carp from the South Branch Shiawassee River due to elevated concentrations of PCBs. Mercury would cause an advisory.





Northern Pike

**Shiawassee River
South Branch**

Livingston County

Hg Analysis:

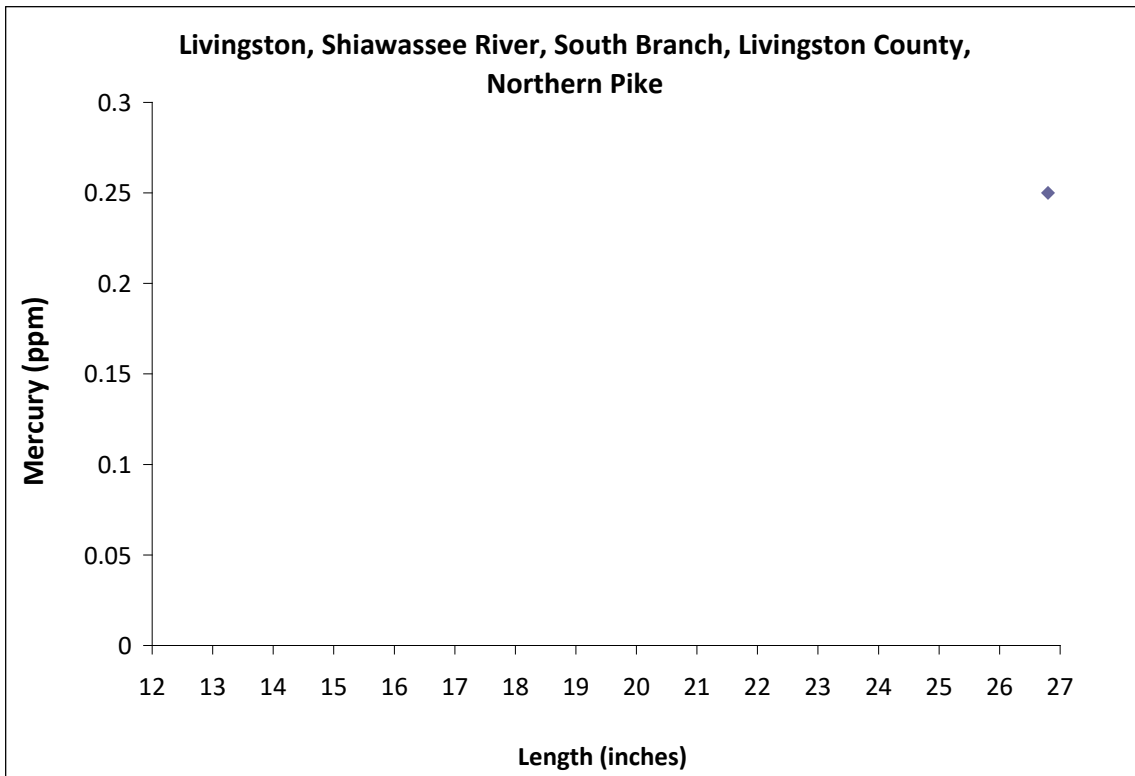
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1986	1986	1	26.8	24	26.8	26.8
Datasets available: 1986						
Chemical	Sample Size (all)	Mean		95%UCL		Meal Category
Mercury	1	0.250		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

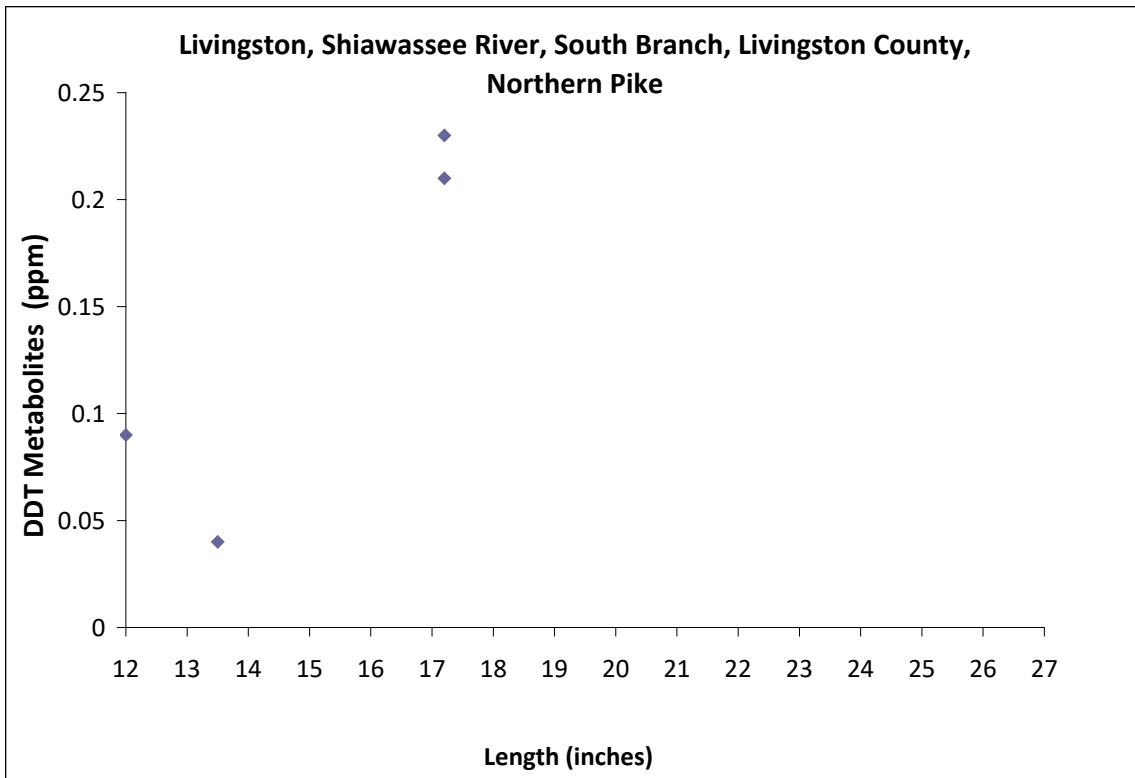
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1984	1986	5	12	24	12	26.8
Datasets available: 1984, 1986						
Chemical	Sample Size (all)	Mean		95%UCL		Meal Category
PCB	5	5.98		10.93		0
DDT	4	0.14		0.29		1
Chlordane	4	ND		--		--
Toxaphene	0	--		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.241	0.597				
DDT	0.798	0.633		regression not appropriate – small N		
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						0

Existing Advisory: No member of the population should consume South Branch Shiawassee River northern pike of any size due to elevated levels of PCBs.

Recommendation: Waterbody-wide advisory of no fish consumption of any species applies to South Branch Shiawassee River and include northern pike. This river segment has been impacted by legacy contamination that has been previously documented by an environmental regulatory agency. Remediation has not been demonstrated. This dataset is limited by age of the data, inclusion of sub-legal lengths, and is not useable to provide a species specific recommendation given the legacy contamination.





Rock Bass

**Shiawassee River
South Branch**

Livingston County

Hg Analysis:

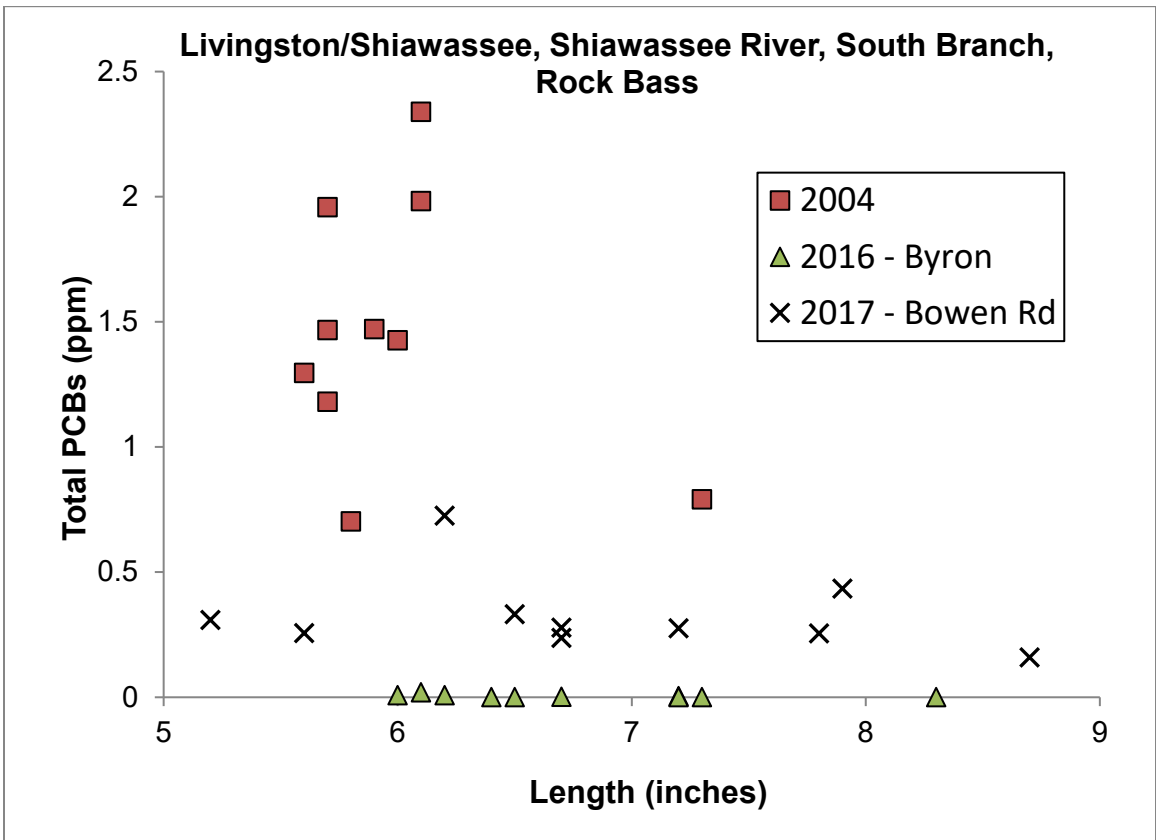
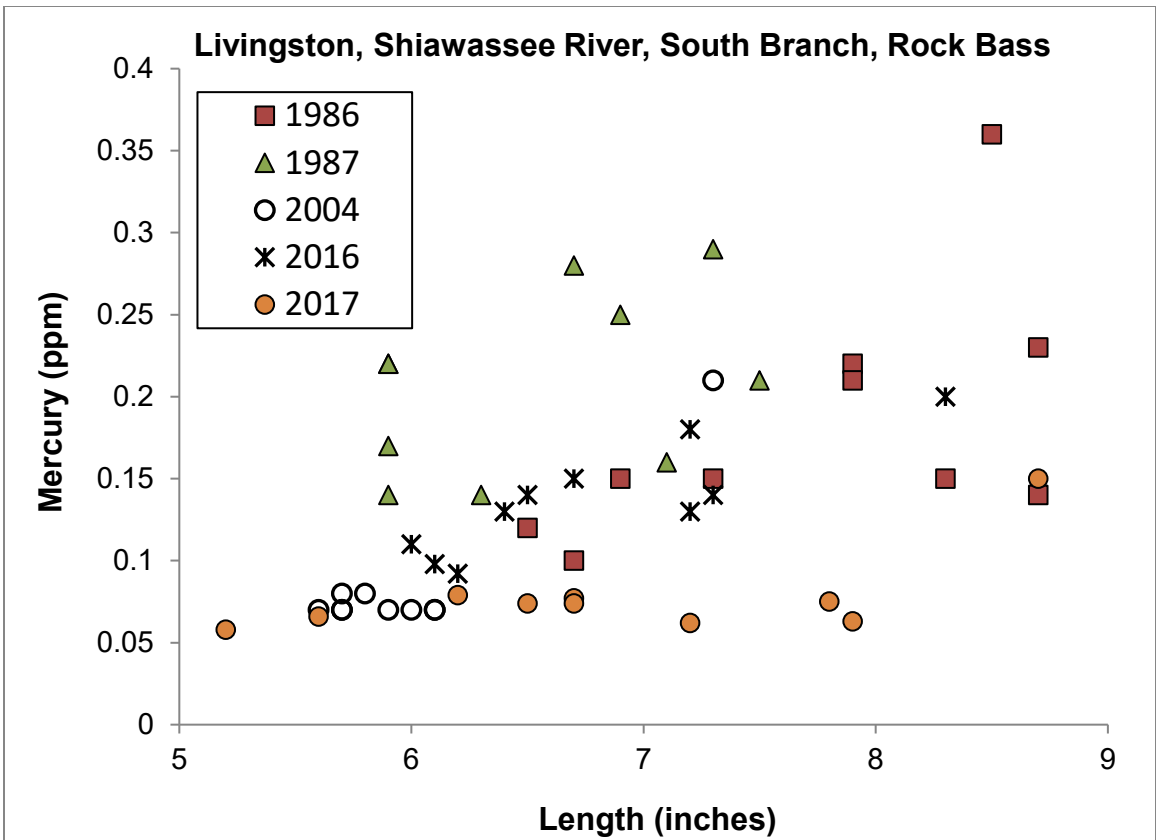
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1986	2017	50	5.2	na	5.2	8.7
Datasets available: 1986, 1987, 2004, 2016, 2017						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	50	0.14	0.06	0.36	0.16	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.250	0.267				

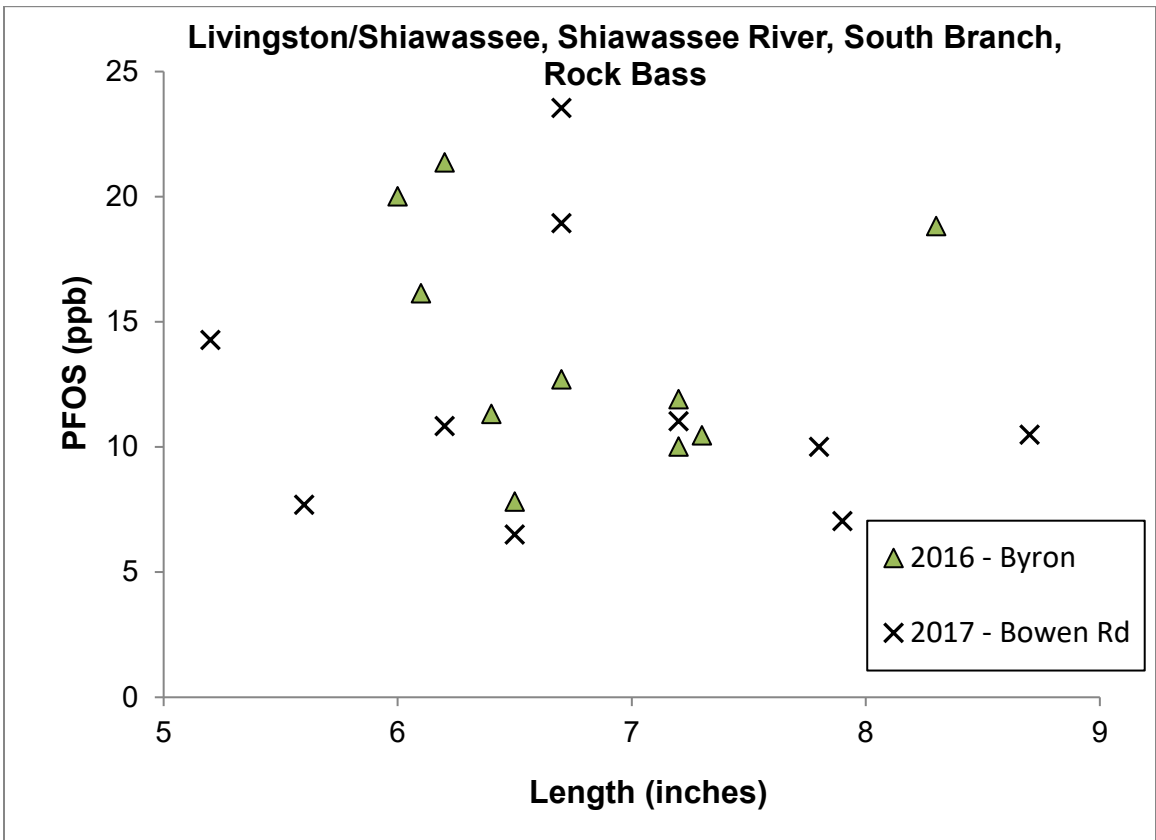
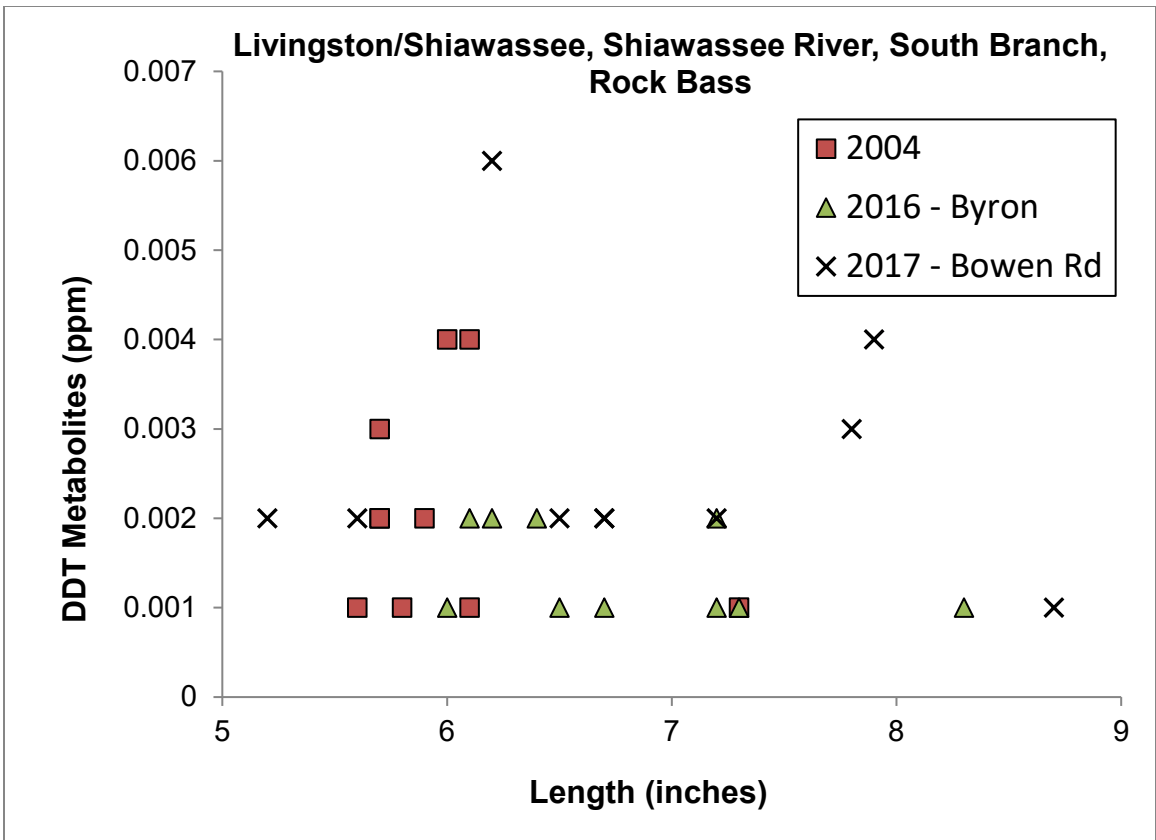
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
PCBs: 2004	2017	30	5.2	na	5.2	8.7
PFOS: 2016	2017	20	5.2	na	5.2	8.7
Datasets available: 2004, 2016, 2017						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	30	0.6	0.001	2.3	0.86	Limited
DDT	30	0.002	0.001	0.006	0.002	16
Chlordane	30	ND	< 0.001	< 0.001	--	--
Toxaphene	30	ND	< 0.05	< 0.05	--	--
TEQ	0	--	--	--	--	--
PFOS	20	13 ppb	6 ppb	24 ppb	15 ppb	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.209	0.140				
DDT	0.016	0.034				
Chlordane	--	--				
Toxaphene	--	--				
TEQ	--	--				
PFOS	0.027	0.022				
Final meal category based on UCL:						Limited

Existing MDHHS Advisory: Waterbody-wide advisory of no fish consumption of any species applies to South Branch Shiawassee River and includes rock bass. This river segment has been impacted by legacy contamination that has been previously documented by an environmental regulatory agency. Remediation has not been demonstrated. *Given the lack of remediation, rock bass are included with the waterbody-wide advisory of no consumption for anyone.

Recommendation: No change to the advisory is recommended. PFOS should be added to the list of contaminants causing an advisory.





White Sucker

**Shiawassee River
South Branch**

Livingston County

Hg Analysis:

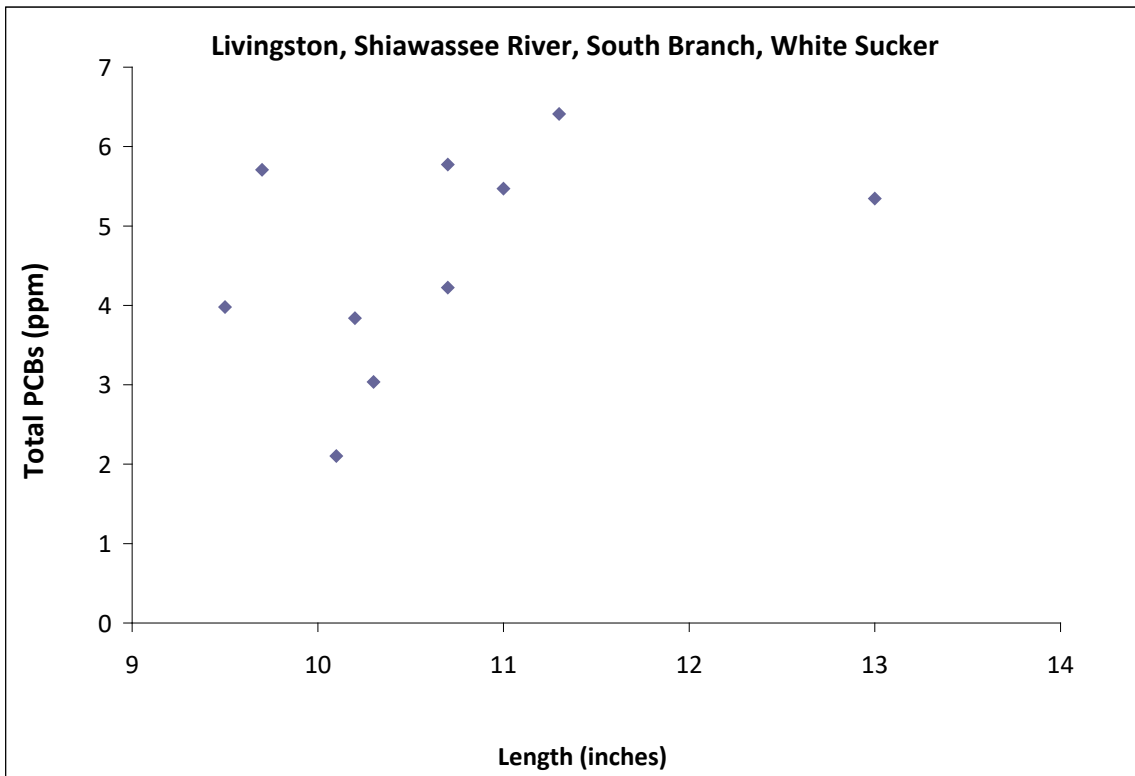
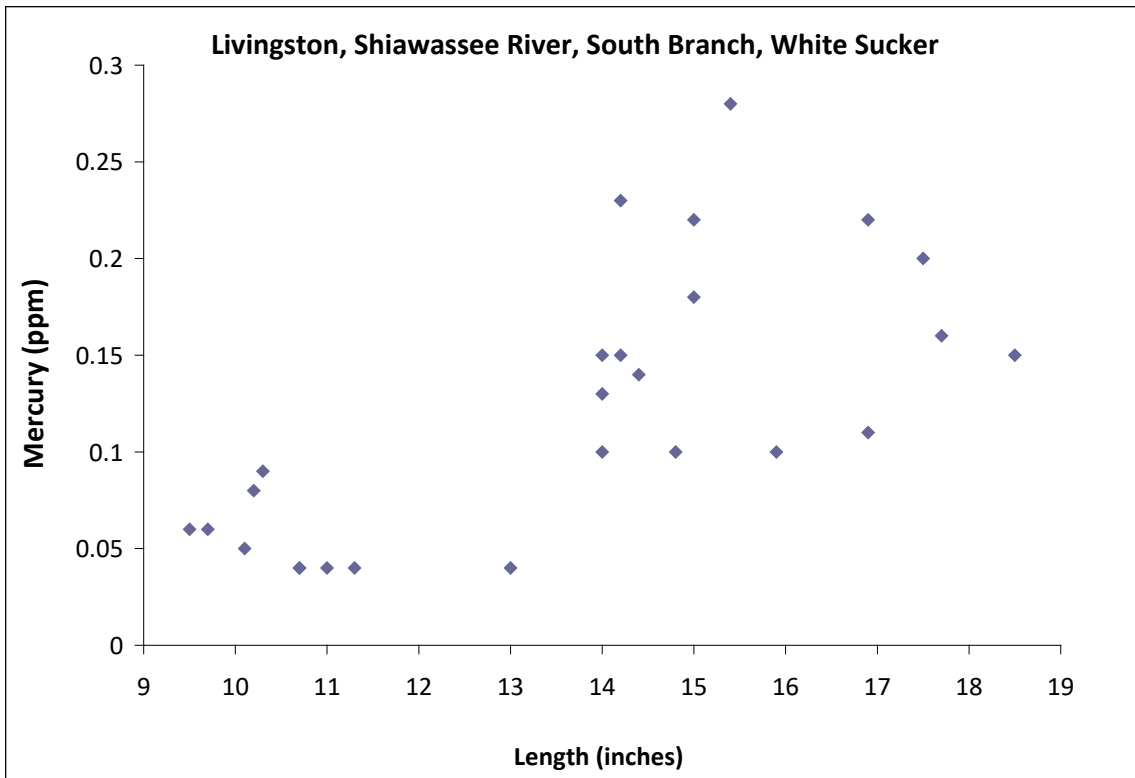
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1984	2004	26	9.5	na	9.5	18.5
Datasets available: 1984,1986,1987, 2004						
Chemical	Sample Size (Legal)	Mean			95%UCL	Meal Category
Mercury	26	0.122			0.150	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.487	0.560				

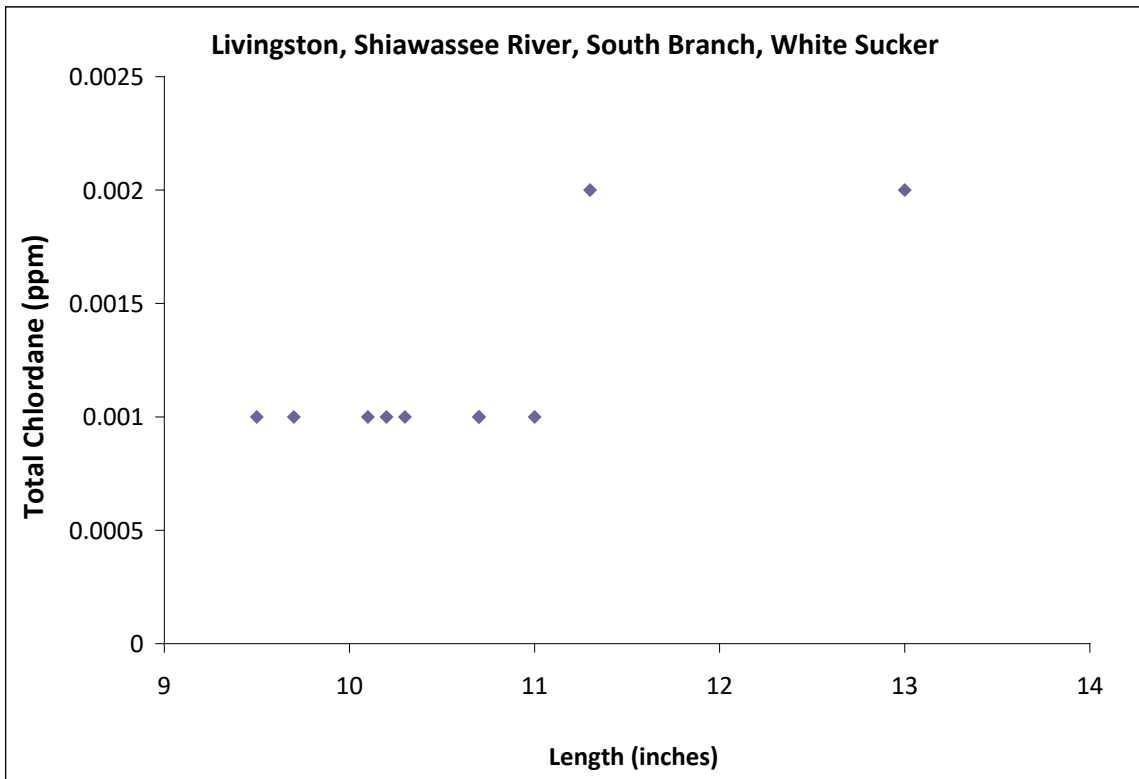
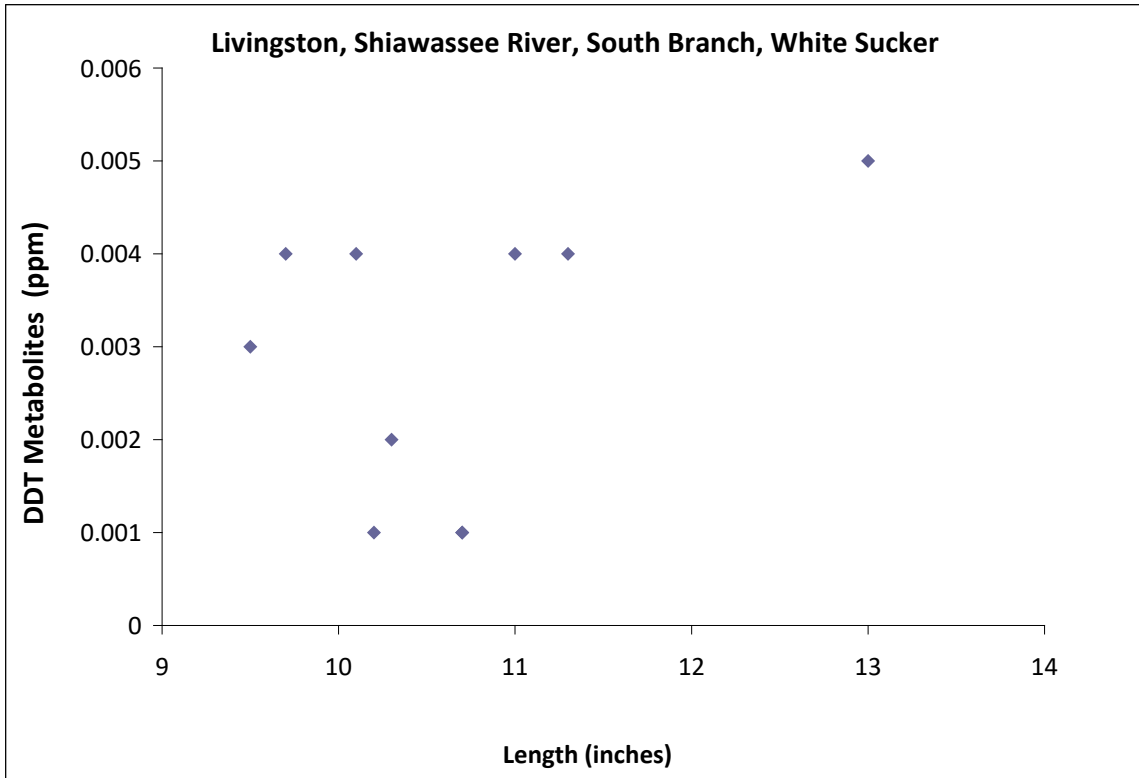
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2004	2004	10	9.5	na	9.5	13
Datasets available: 2004						
Chemical	Sample Size (Legal)	Mean			95%UCL	Meal Category
PCB	10	4.59			5.57	0
DDT	10	0.003			0.00	16
Chlordane	10	0.001			0.00	--
Toxaphene	10	ND			--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.178	0.163				
DDT	0.148	0.071				
Chlordane	0.630	0.630				
Toxaphene	--	--				
Final meal category based on UCL:						0

Existing Advisory: No member of the population should consume South Branch Shiawassee River white sucker of any size due to elevated levels of PCBs.

Recommendation: No one should eat any South Branch Shiawassee River white sucker. This river segment has been impacted by legacy contamination that has been previously documented by an environmental regulatory agency. Remediation has not been demonstrated.





St. Clair County

Hg Analysis:

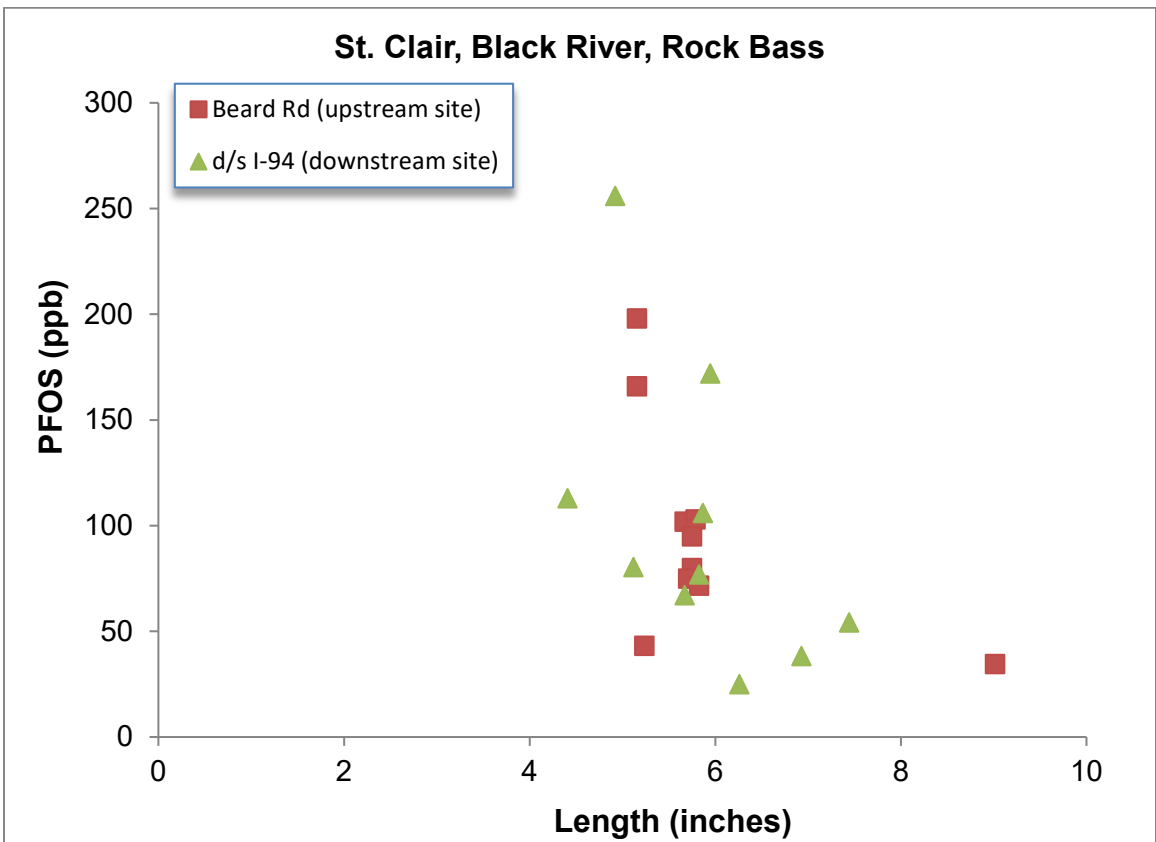
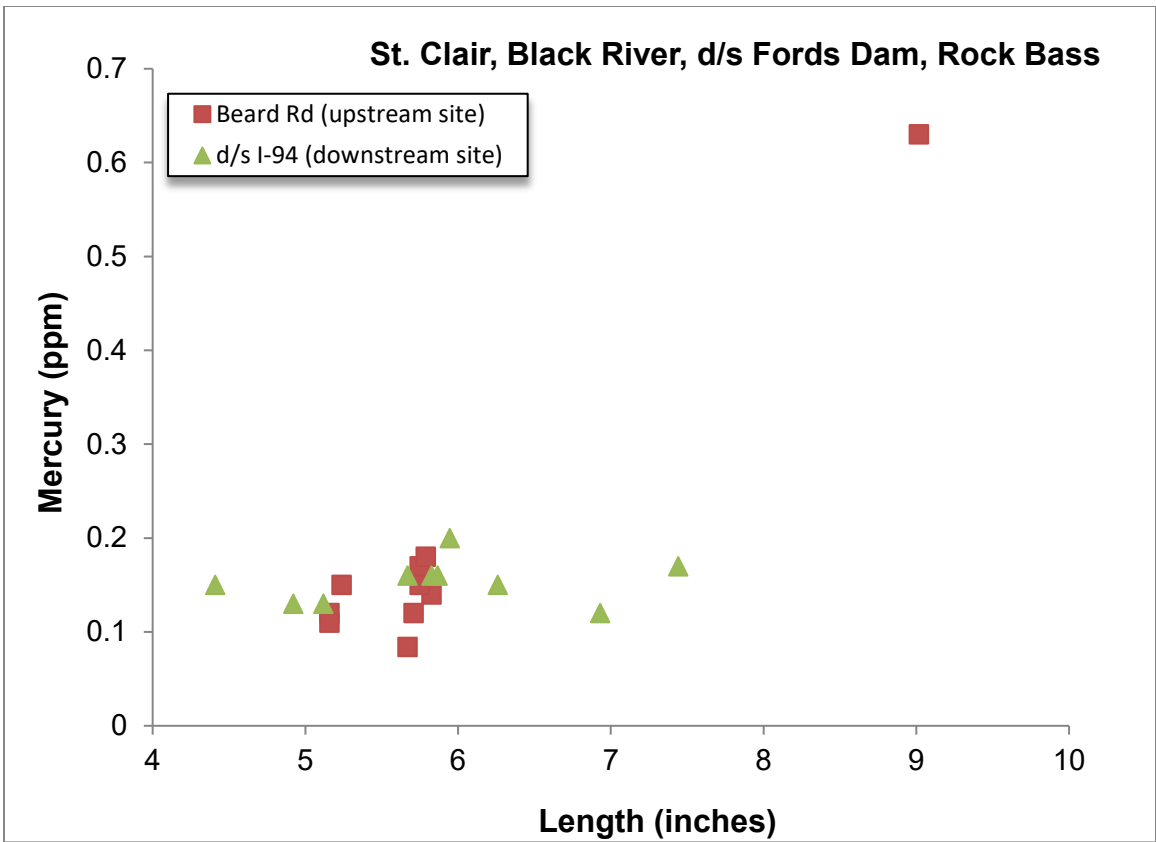
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2021	2021	20	4.4	NA	4.4	9.0
Datasets available: 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	20	0.169	0.084	0.630	0.221	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.580	0.512				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2021	2021	20	4.4	NA	4.4	9.0
Datasets available: 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
PFOS	20	97.9 ppb	25.1 ppb	256.0 ppb	125.6 ppb	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.274	0.368				
Final meal category based on UCL:						1

Existing MDHHS Advisory: Rock bass from the Black River downstream of the Fords Dam in St. Clair County are currently covered under the statewide guidance for mercury. No one should eat more than four meals per month of rock bass of any size.

Recommendation: No one should eat more than one meal per month of rock bass of any size from the Black River downstream of the Fords Dam in St. Clair County due to PFOS. Mercury causes less restrictive advice.



Bluegill

**Fort Gratiot Nature Preserve Pond
West of Parker Rd**

St. Clair County

Hg Analysis:

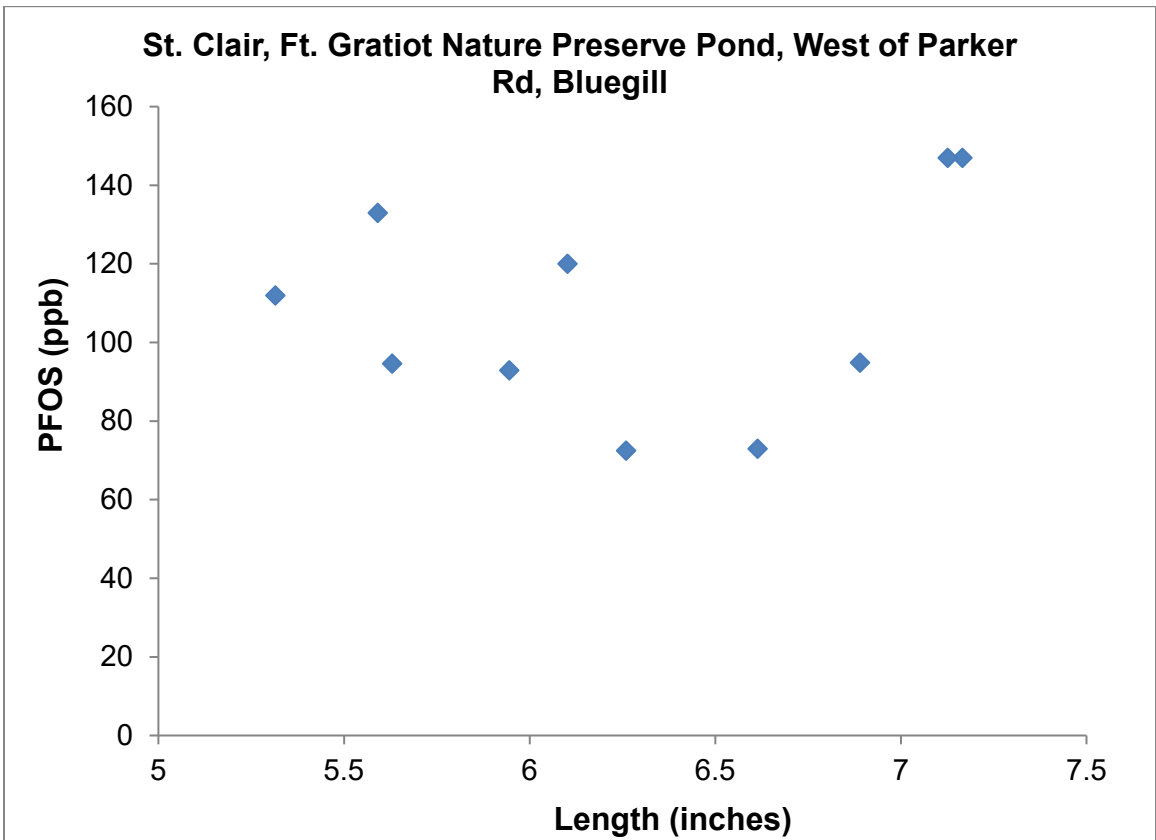
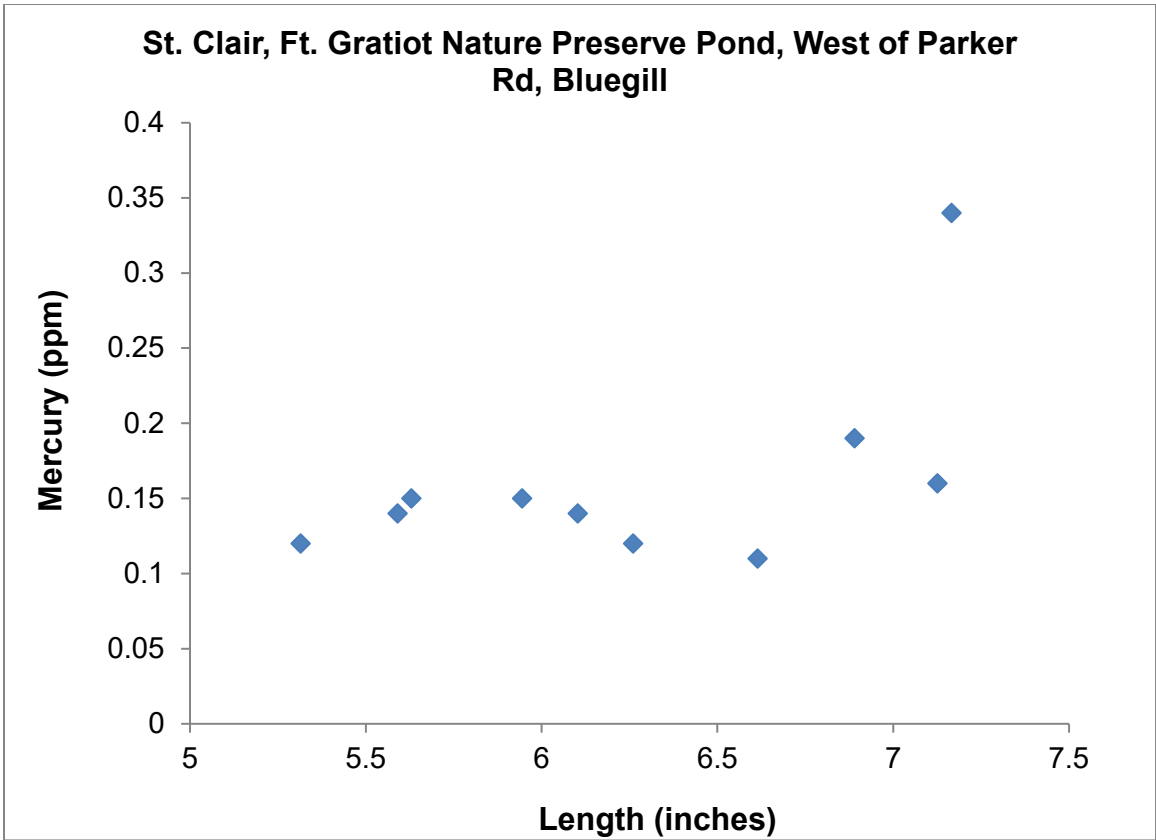
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples			
Earliest	Most Recent							
2020	2020	10	5.3	NA	5.3	7.2		
Datasets available:		2020						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category		
Mercury	10	0.162	0.110	0.340	0.210	4		
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
Mercury	0.329	0.331						

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples				
Earliest	Most Recent								
2020	2020	10	5.3	NA	5.3	7.2			
Datasets available:		2020							
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category			
PCB	--	--	--	--	--	--			
DDT	--	--	--	--	--	--			
Chlordane	--	--	--	--	--	--			
Toxaphene	--	--	--	--	--	--			
PFOS	10	109 ppb	72.5 ppb	147 ppb	128.5 ppb	1			
Chemical	Linear Regression	Exponential Regression							
	R ²	R ²							
PCB	--	--							
DDT	--	--							
Chlordane	--	--							
Toxaphene	--	--							
PFOS	0.056	0.030	Final meal category based on UCL:				1		

Existing MDHHS Advisory: Bluegill and sunfish from the Fort Gratiot Nature Preserve west of Parker Rd in St. Clair County are currently covered under the statewide mercury advice. No one should eat more than eight meals per month of bluegill or sunfish of any size due to mercury.

Recommendation: No one should eat more than one meal per month of bluegill or sunfish of any size from the Fort Gratiot Nature Preserve west of Parker Rd in St. Clair County due to PFOS. Mercury causes a less restrictive advisory.



Bluegill and Sunfish

**Fort Gratiot Pond
McIntyre Park**

St. Clair County

Hg Analysis:

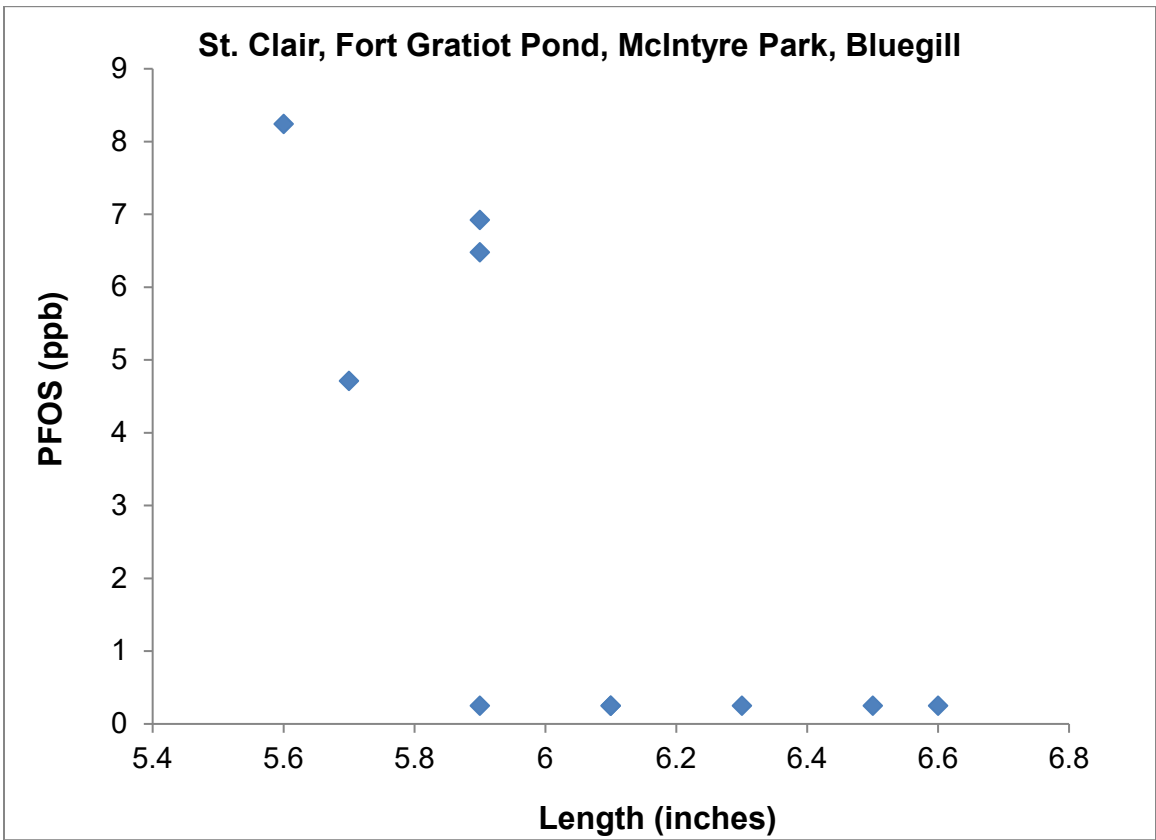
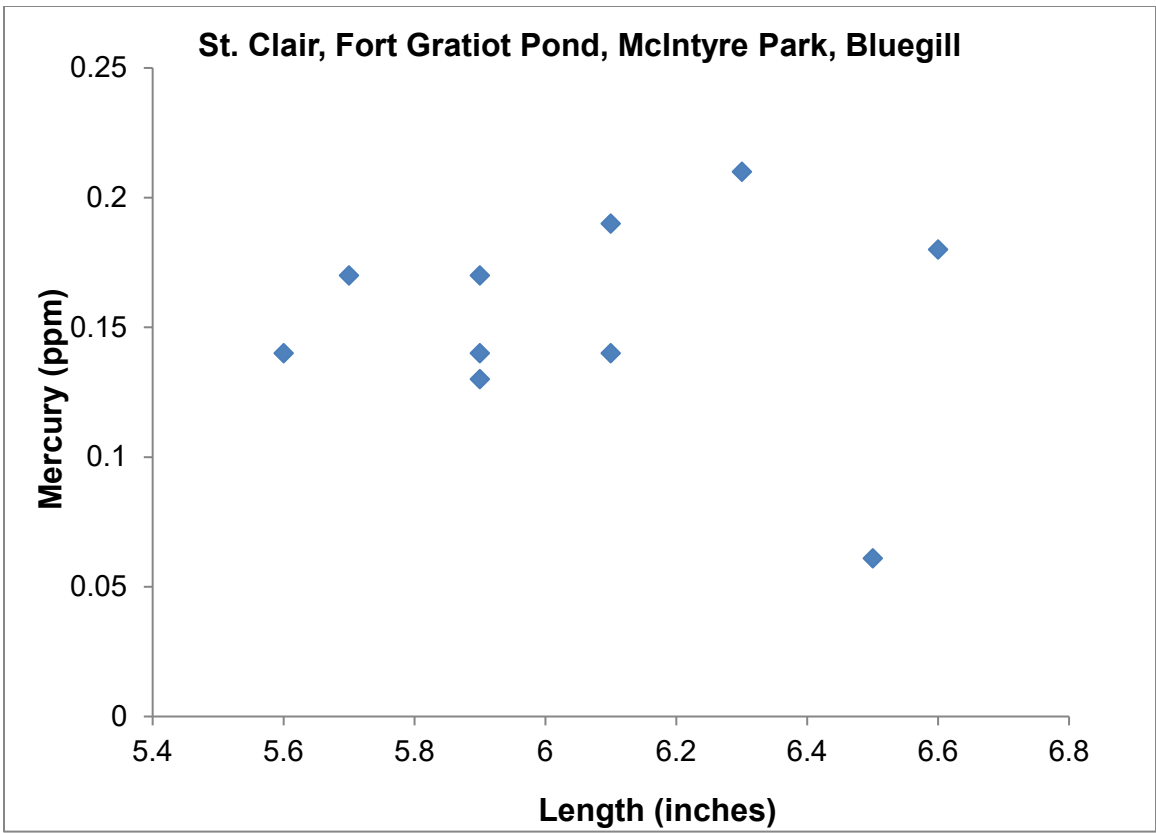
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2019	2019	10	5.6	na	5.6	6.6
Datasets available: 2019						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.15	0.06	0.21	0.18	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.005	0.042				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2019	2019	10	5.6	na	5.6	6.6
Datasets available: 2019						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
PFOS	10	3 ppb	< 0.25 ppb	8 ppb	5 ppb	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.545	0.561				
Final meal category based on UCL:						4

Existing MDHHS Advisory: Ft. Gratiot Pond (McIntyre Park) bluegill and sunfish are covered by the statewide advisory due to mercury: No one should eat more than 8 meals per month of bluegill or sunfish of any size.

Recommendation: No one should eat more than 4 meals per month of Ft. Gratiot Pond (McIntyre Park) bluegill or sunfish of any size due to mercury.



Rock Bass

Howe Drain

St. Clair County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples				
Earliest	Most Recent								
2020	2020	7	4.5	NA	4.5	6.4			
Datasets available:		2020							
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category			
Mercury	7	0.082	0.066	0.110	0.094	8			
Chemical	Linear Regression	Exponential Regression							
	R ²	R ²							
Mercury	0.206	0.147							

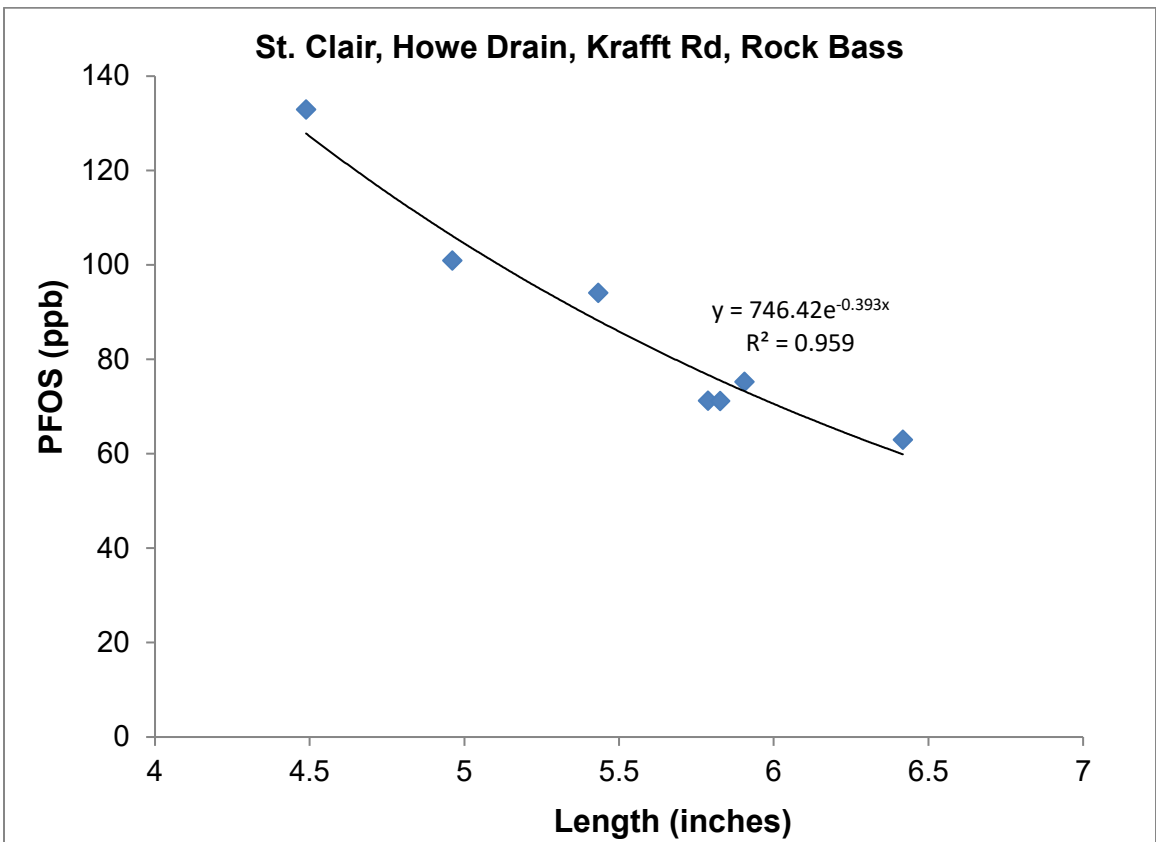
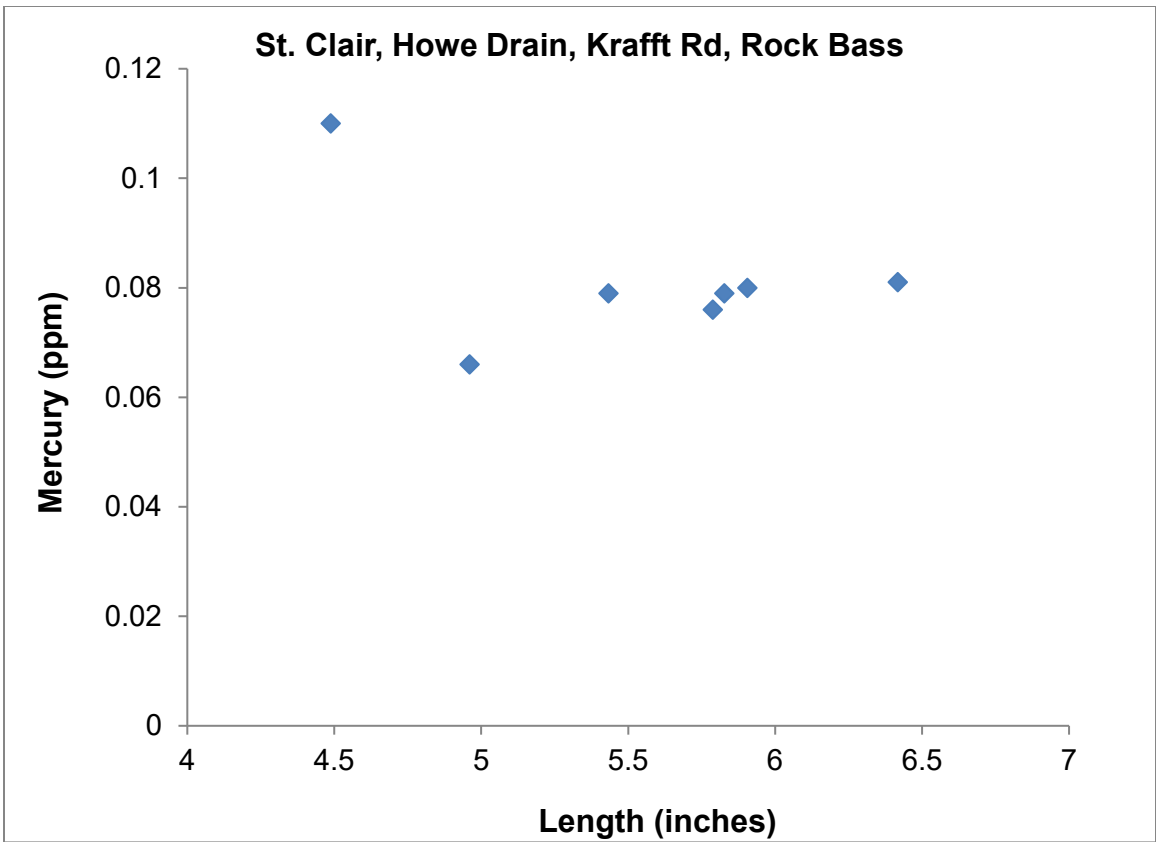
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples				
Earliest	Most Recent								
2020	2020	7	4.5	NA	4.5	6.4			
Datasets available:		2020							
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category			
PCB	--	--	--	--	--	--			
DDT	--	--	--	--	--	--			
Chlordane	--	--	--	--	--	--			
Toxaphene	--	--	--	--	--	--			
PFOS	7	87 ppb	63 ppb	133 ppb	110 ppb	1			
Chemical	Linear Regression	Exponential Regression							
	R ²	R ²							
PCB	--	--							
DDT	--	--							
Chlordane	--	--							
Toxaphene	--	--							
PFOS	0.928	0.950	Final meal category based on UCL:				1		

Note: While there was a significant negative correlation between fish size and PFOS concentration, it is not recommended to implement a size-based advisory unless additional data are available providing a biological reason for the negative correlation.

Existing MDHHS Advisory: Rock bass from the Howe Drain in St. Clair County are currently covered under the statewide mercury advice. No one should eat more than four meals per month of Rock Bass of any size due to mercury.

Recommendation: No one should eat more than one meal per month of rock bass of any size from the Howe Drain in St. Clair County due to PFOS. Mercury causes a less restrictive advisory.



Carp

Pine River

St. Clair County

Hg Analysis:

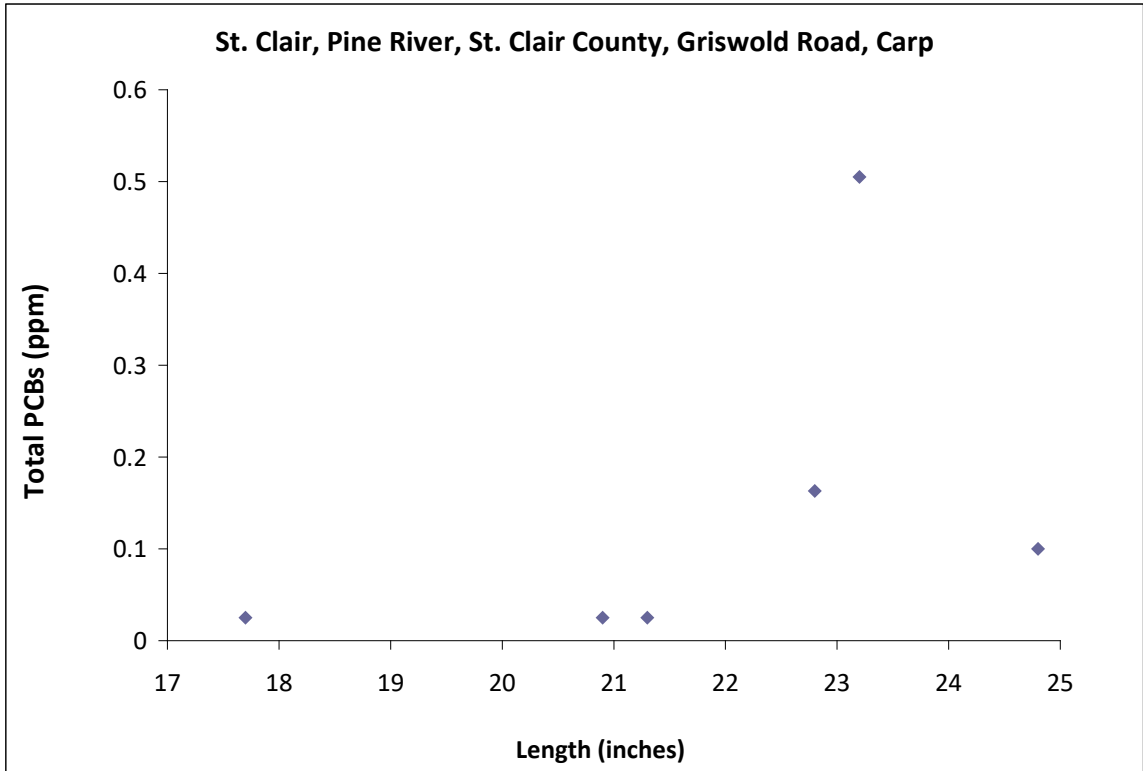
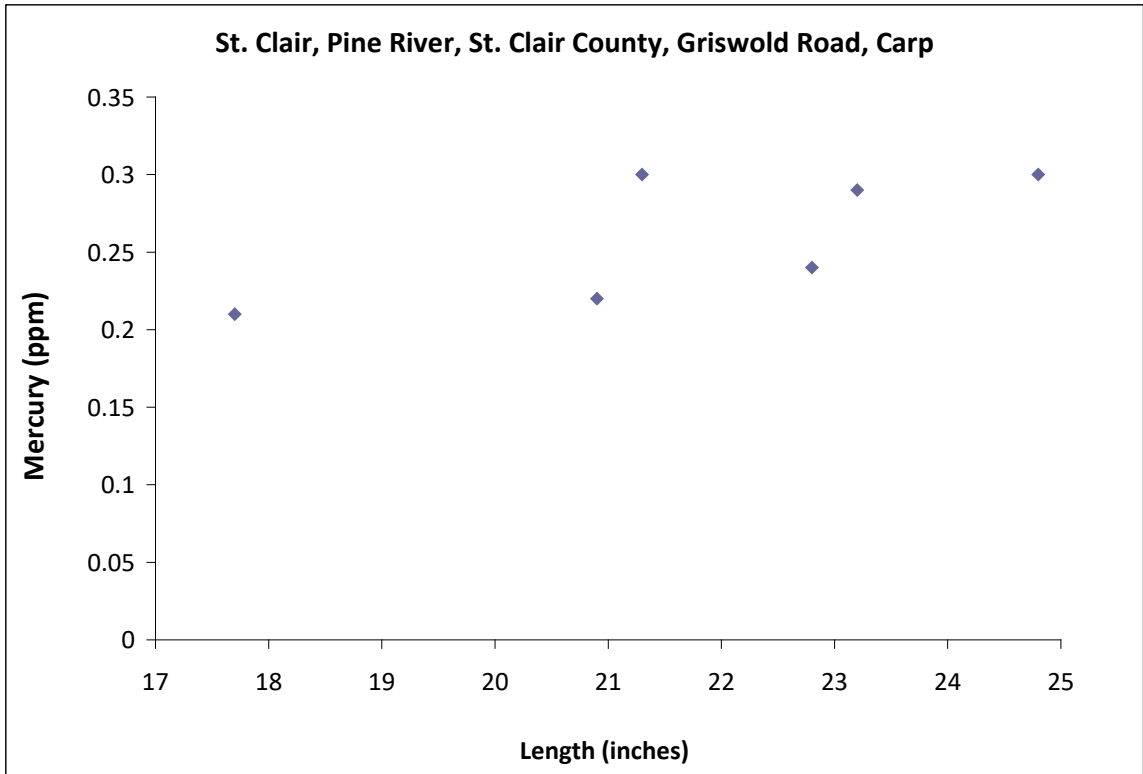
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1992	1992	6	17.7	na	17.7	24.8
Datasets available: 1992						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	6	0.260		0.300		2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.514	0.538				

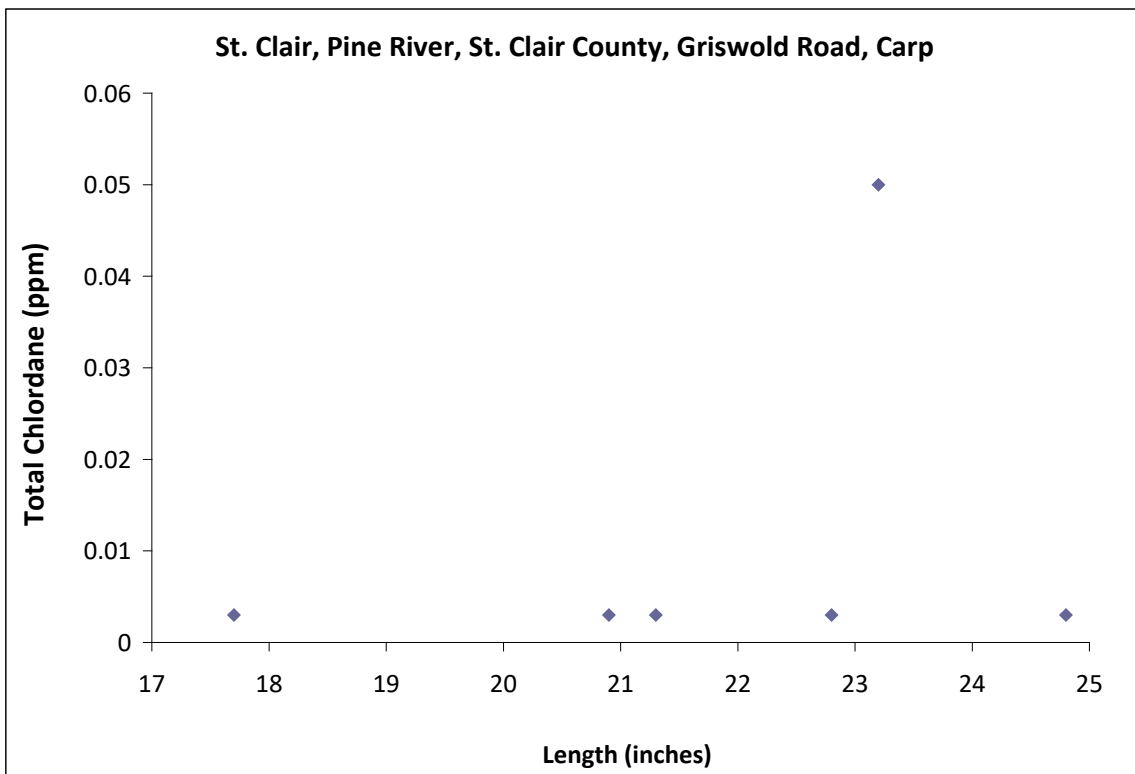
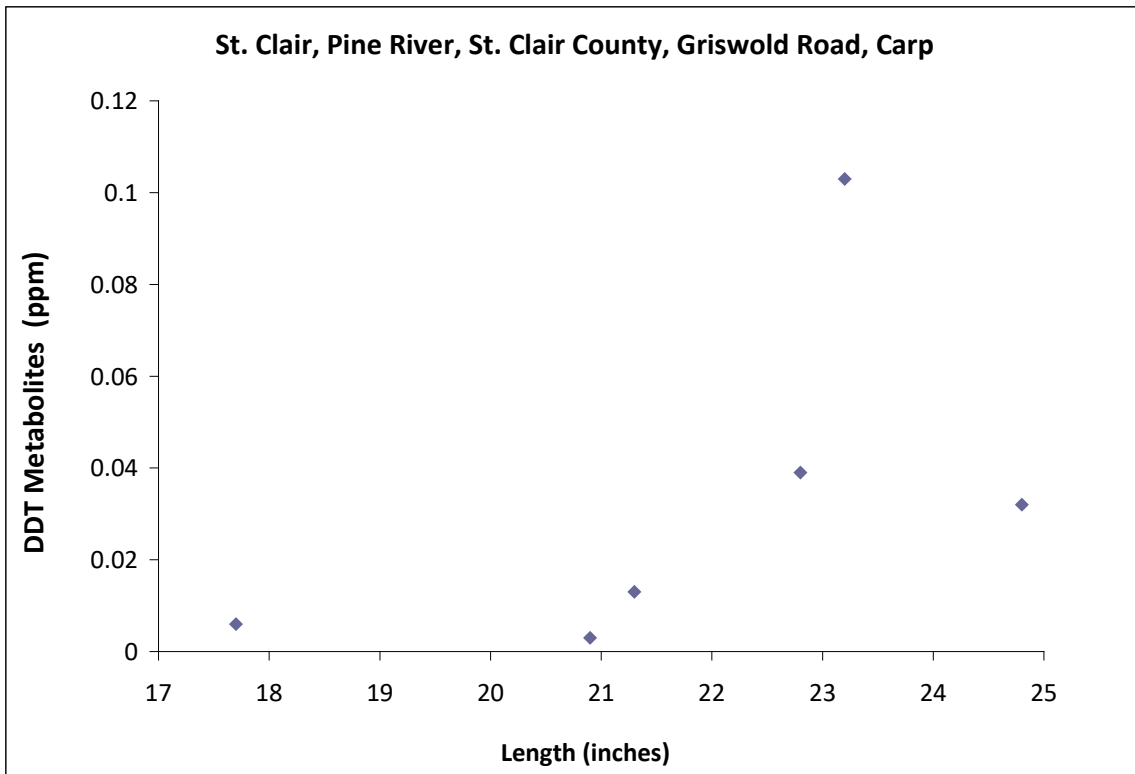
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1992	1992	6	17.7	na	17.7	24.8
Datasets available: 1992						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	6	0.141		0.340		0.5
DDT	6	0.033		0.070		16
Chlordane	6	0.011		0.030		--
Toxaphene	6	ND				
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.210	0.453				
DDT	0.298	0.497				
Chlordane	0.081	0.081				
Toxaphene				Final meal category based on UCL:		0.5*

Existing Advisory: Women and children should eat no more than one meal per week of Pine River carp greater than 18 inches in length due to elevated levels of PCBs.

Recommendation: No one should eat more than 1 meal per month of Pine River carp due to PCBs. Mercury would cause an advisory. *Based on EGLE’s Fish Contaminant Monitoring Program, PCB and DDT concentrations ≥15 years old are expected to have declined to a concentration that allows a less restrictive meal category than determined by the standard evaluation method.





Tittabawassee River Midland, Saginaw, and Gladwin Counties

See Lake Huron recommendations for walleye and white bass data.

Black Crappie

**Sanford Lake
Tittabawassee River**

Midland County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	1999	20	9.1	na	9.1	11.8
Datasets available: 1989, 1999						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	20	0.128			0.140	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.669	0.638				

Organics Analysis:

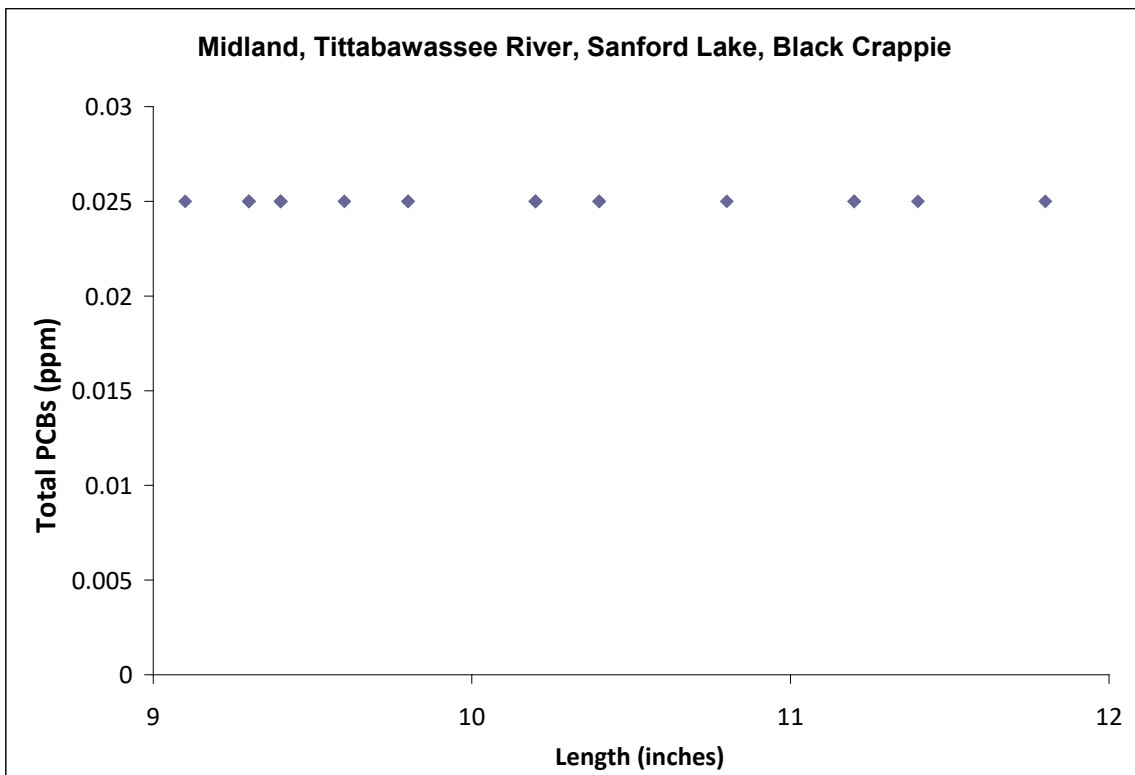
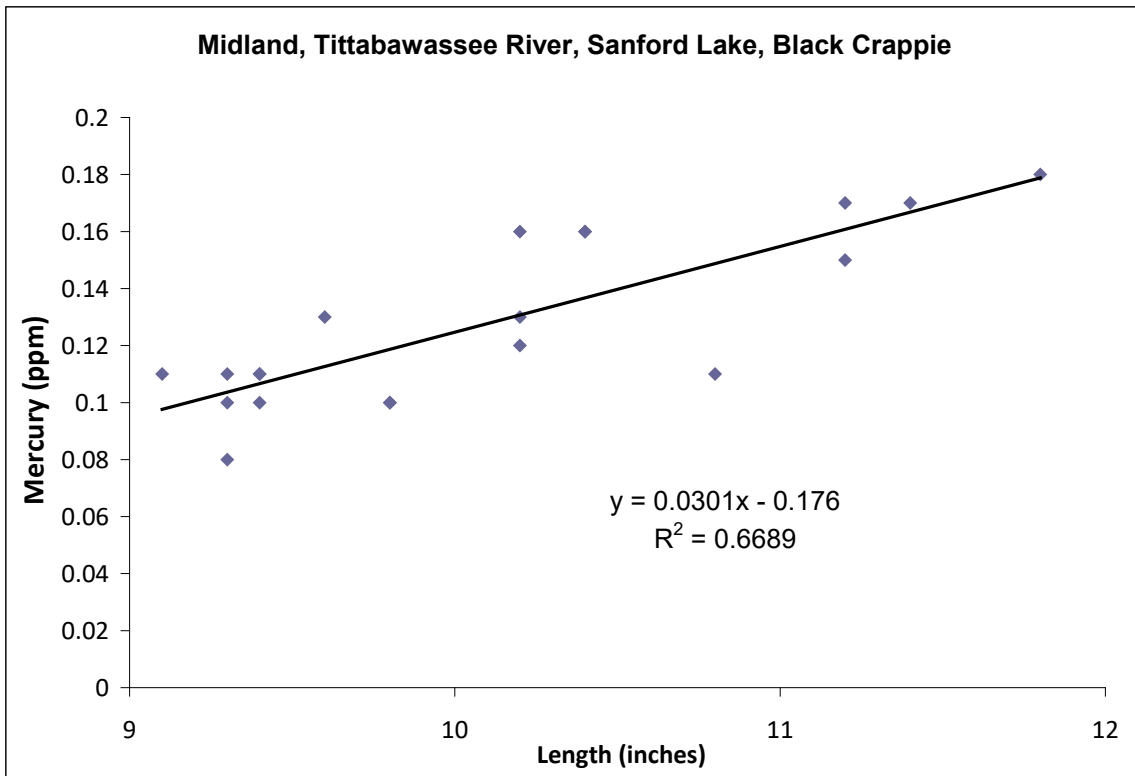
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	1999	20	9.1	na	9.1	11.8
Datasets available: 1989, 1999						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	20	ND			--	--
DDT	20	0.004		0.004	16	
Chlordane	20	ND		--	--	
Toxaphene	20	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB						
DDT	0.039	0.036				
Chlordane						
Toxaphene						
Final meal category based on UCL:					4	

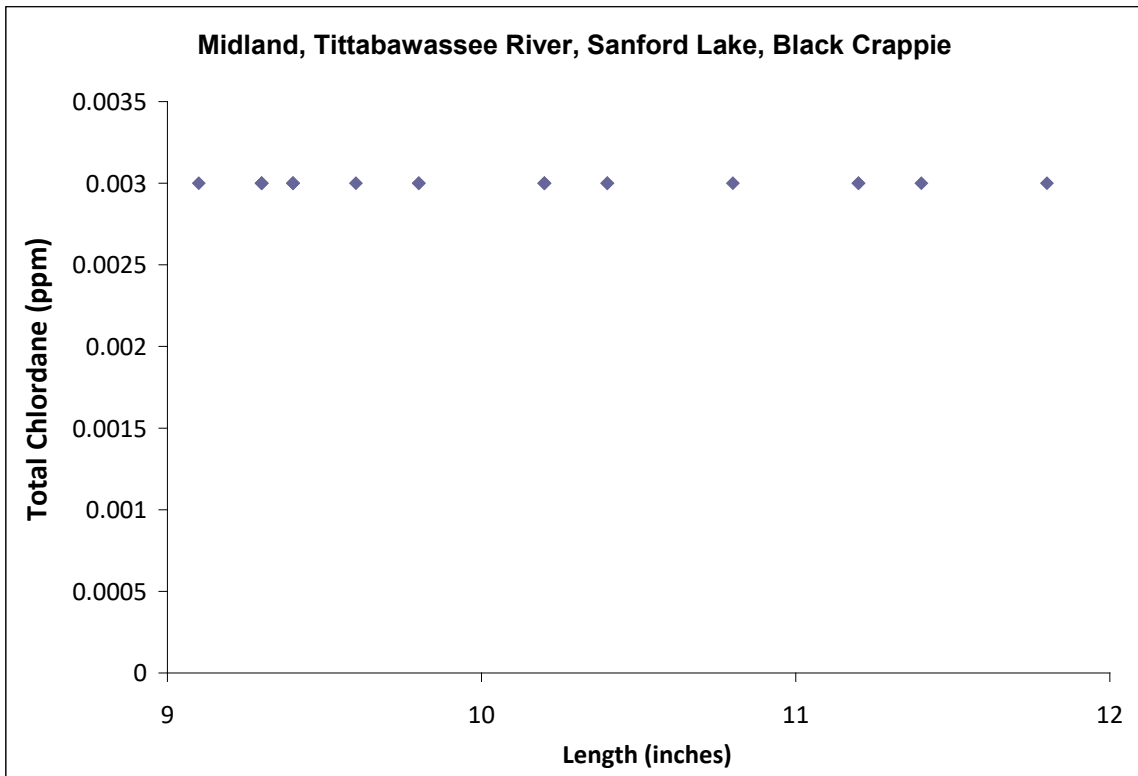
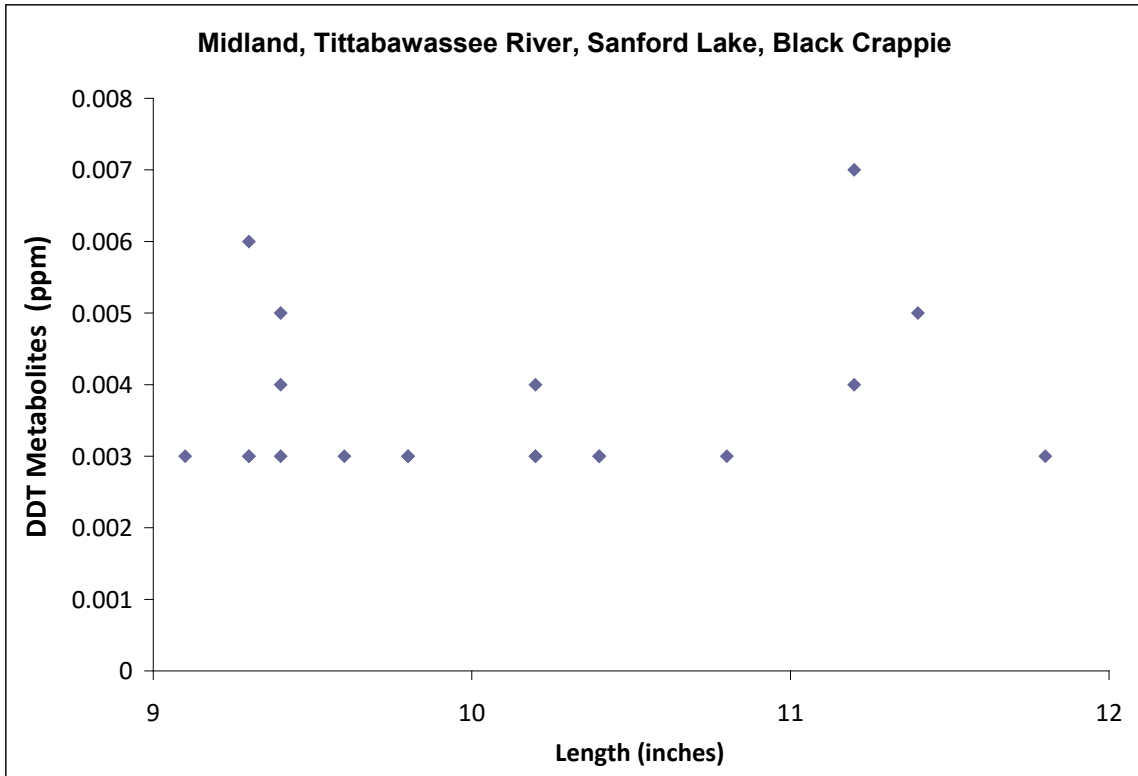
Existing Advisory: Sanford Lake black crappie are covered under the statewide mercury consumption advisory.

Recommendation: No one should eat more than 8 meals per month of Sanford Lake black crappie under 9 inches or 4 meals per month of Sanford Lake black crappie over 9 inches due to mercury.

Length (Inches)	Hg Regression Estimate (ppm)	Meal Category
8	0.065	12
9	0.095	8
10	0.125	4
11	0.155	4
12	0.185	4
13	0.215	4
14	0.245	4
15	0.276	2
16	0.306	2

Shaded area denotes extrapolated estimates





Channel Catfish

**Tittabawassee River
Sanford Lake**

Midland County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1999	2015	25	17.7	12	17.7	29.4
Datasets available: 1999, 2007, 2015						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	25	0.31	0.05	0.70	0.39	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.307	0.219				

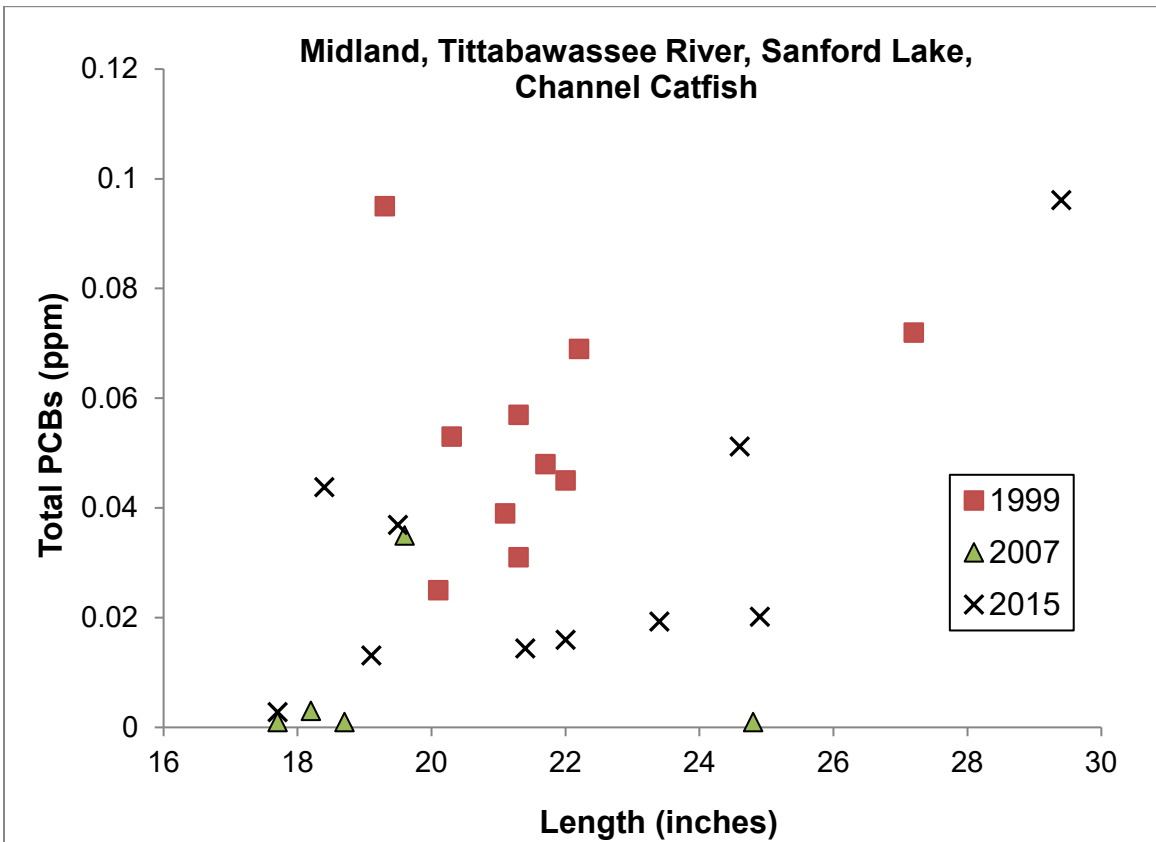
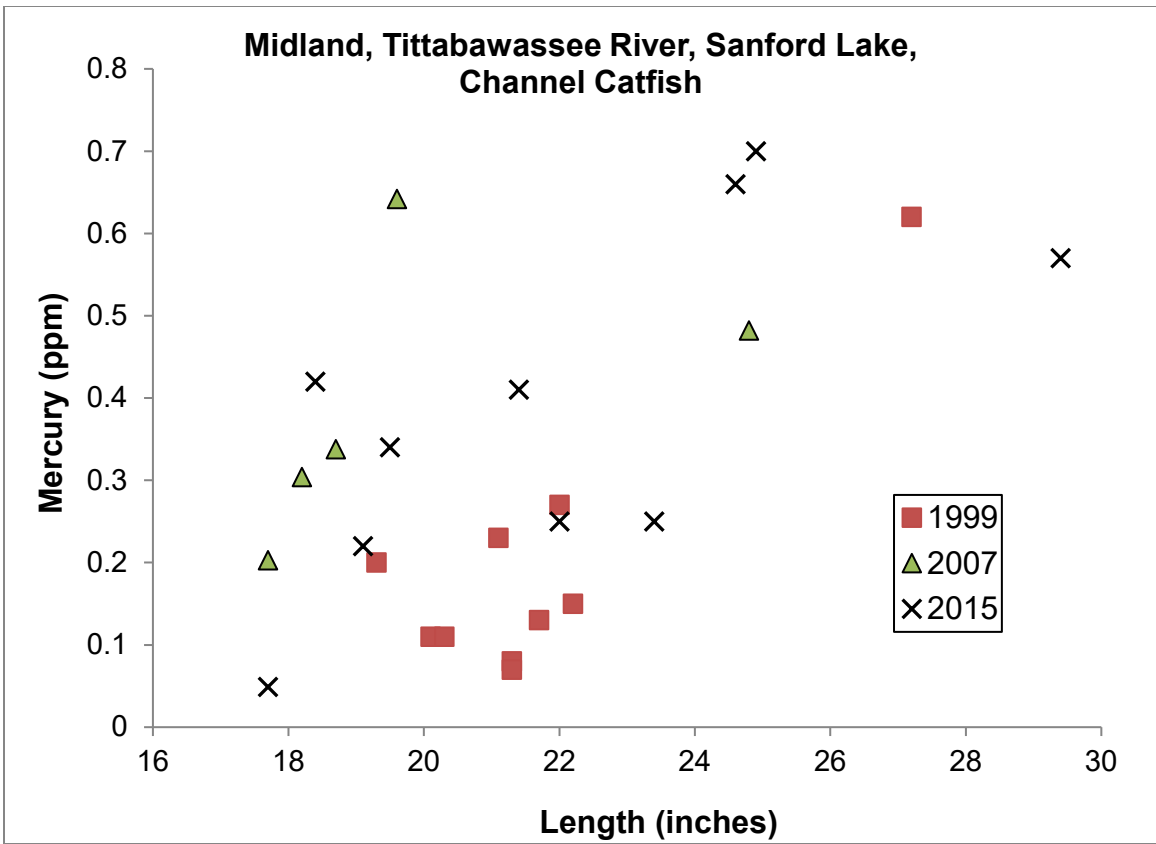
Organics Analysis:

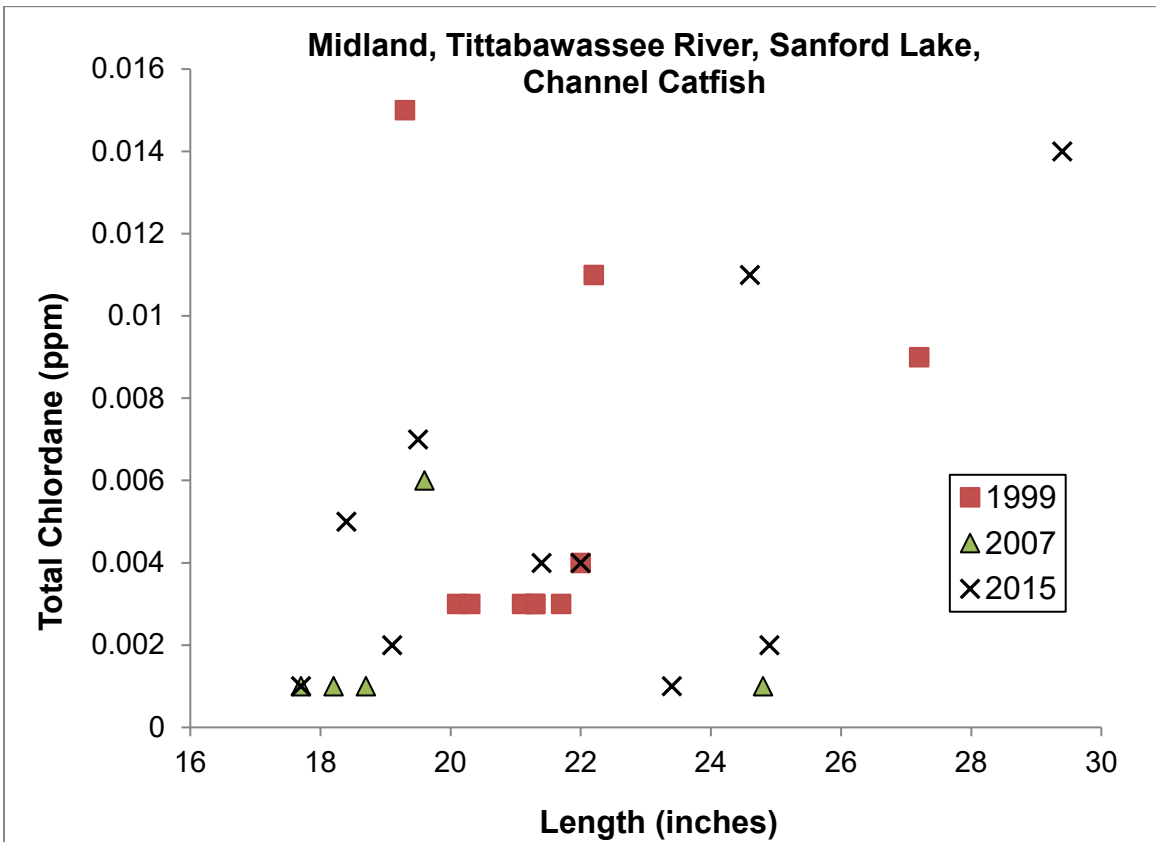
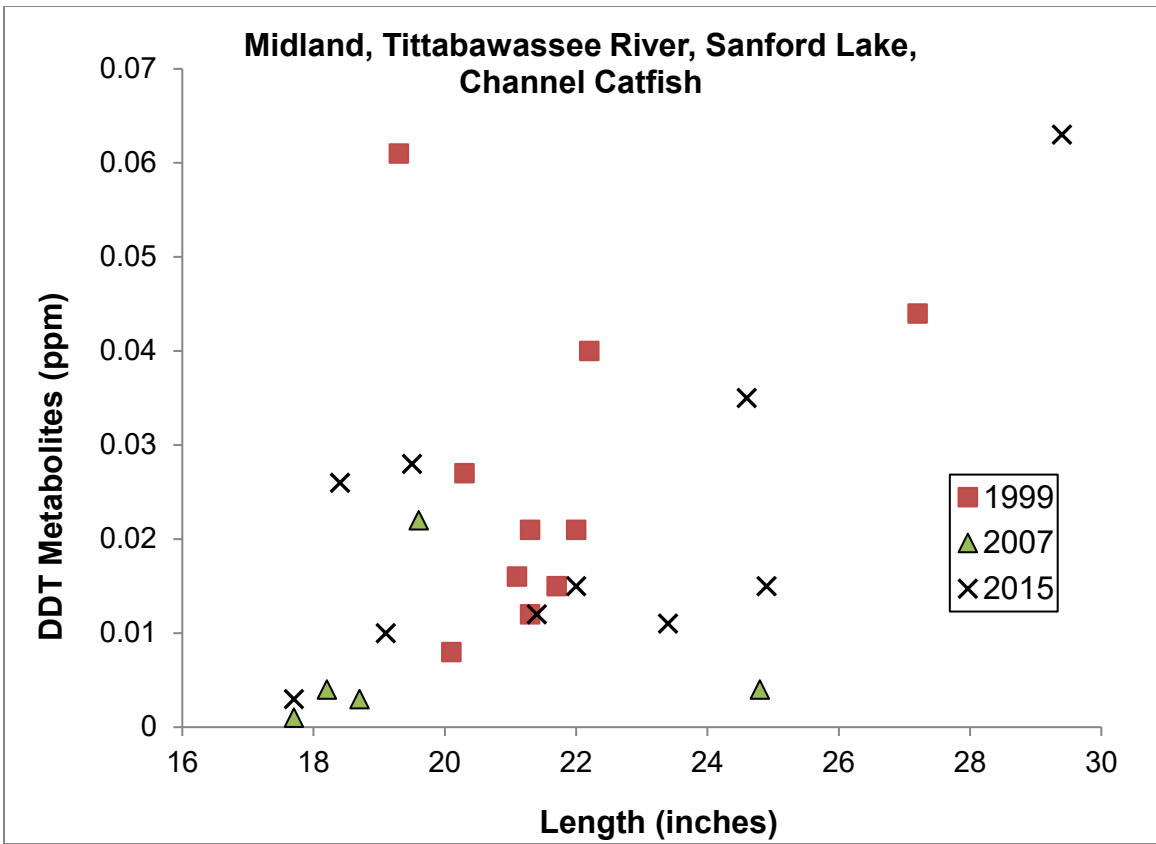
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1999	2015	25	17.7	12	17.7	29.4
Datasets available: 1999, 2007, 2015						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	25	0.04	0.001	0.10	0.05	4
DDT	25	0.02	0.001	0.06	0.03	16
Chlordane	25	0.005	0.001	0.02	0.01	--
Toxaphene	25	ND	--	--	--	--
TEQ*	10	1.6 ppt	0.8 ppt	3.3 ppt	2.2 ppt	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.209	0.142				
DDT	0.243	0.240				
Chlordane	0.179	0.154				
Toxaphene	--	--				
TEQ*	0.175	0.108				
Final meal category based on UCL:						2

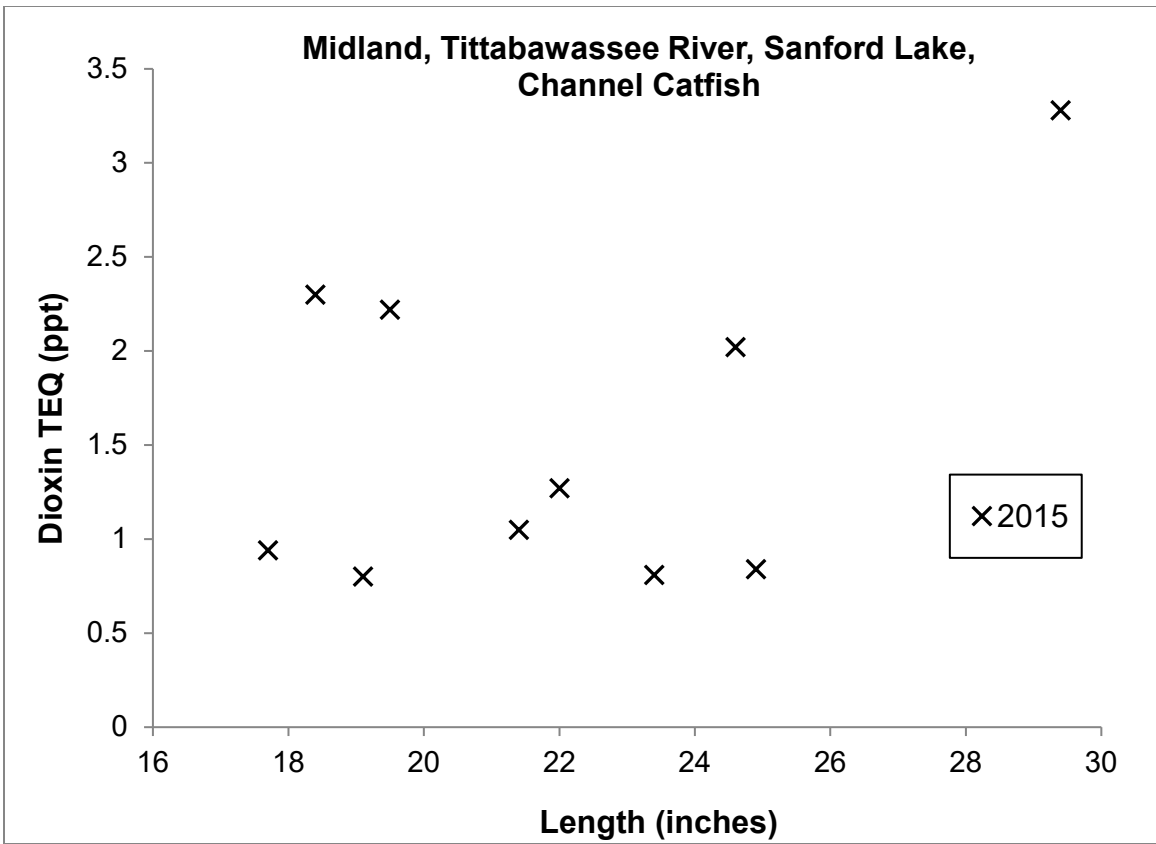
* 2005 WHO TEFs; dl-PCBs included

Existing MDHHS Advisory: No one should eat more than 2 meals per month of channel catfish from Sanford Lake due to mercury.

Recommendation: No one should eat more than 2 meals per month of channel catfish from Sanford Lake due to mercury and dioxins.







Northern Pike

**Tittabawassee River
Sanford Lake**

Midland County

Hg Analysis:

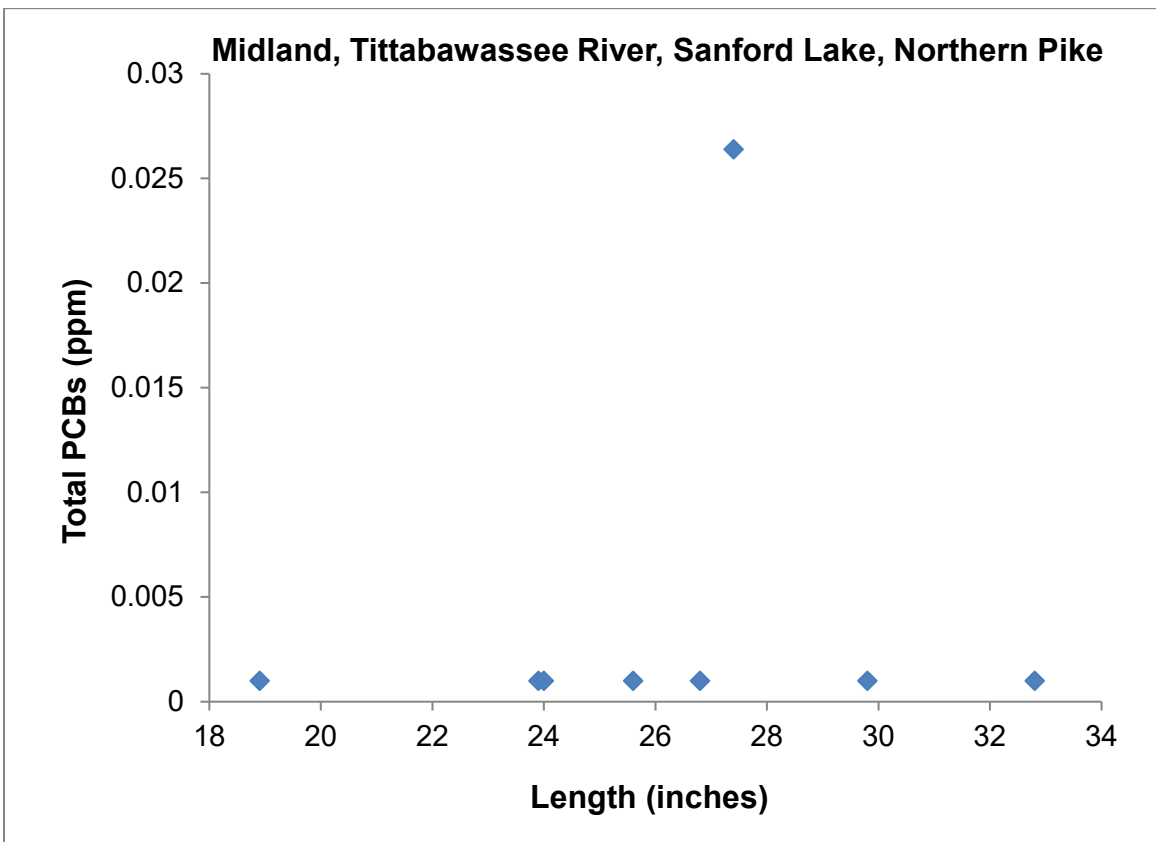
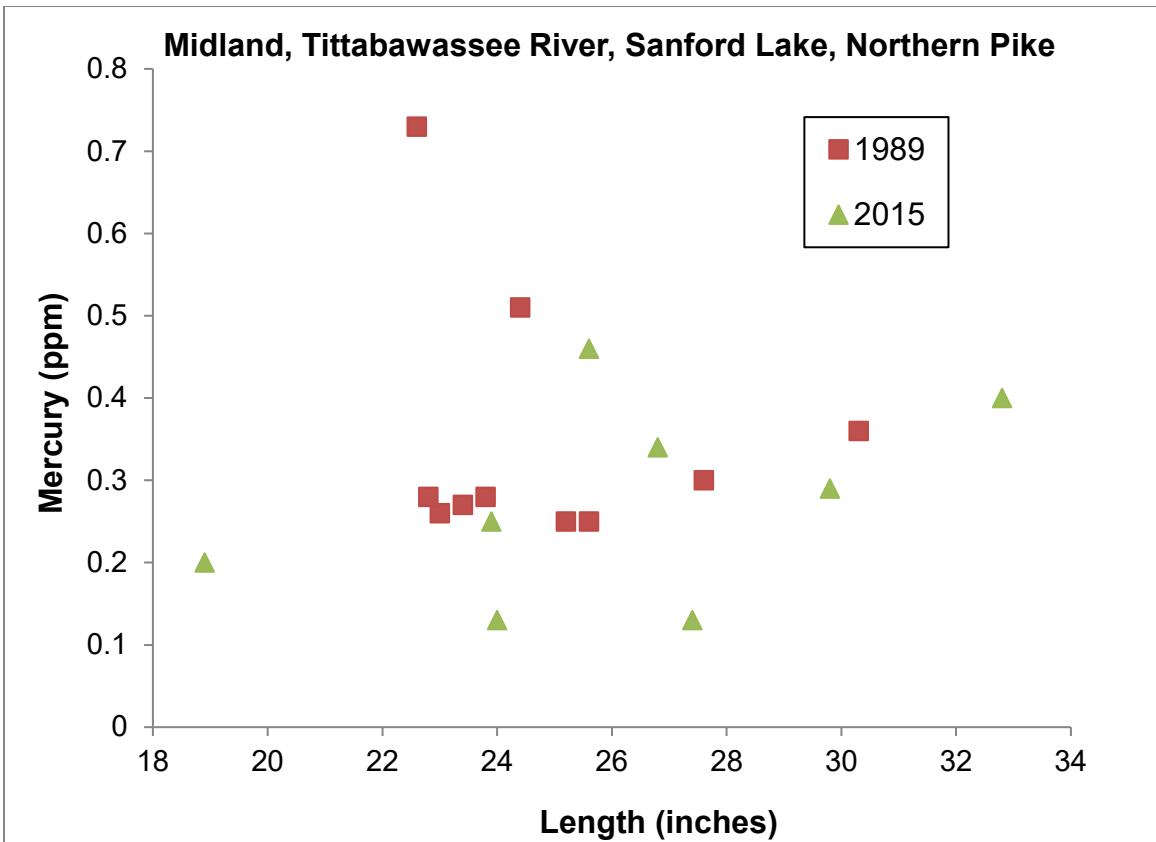
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	2015	18	18.9	24	23.8	32.8
Datasets available: 1989, 2015						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	13	0.30	0.13	0.51	0.37	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.004	0.020				

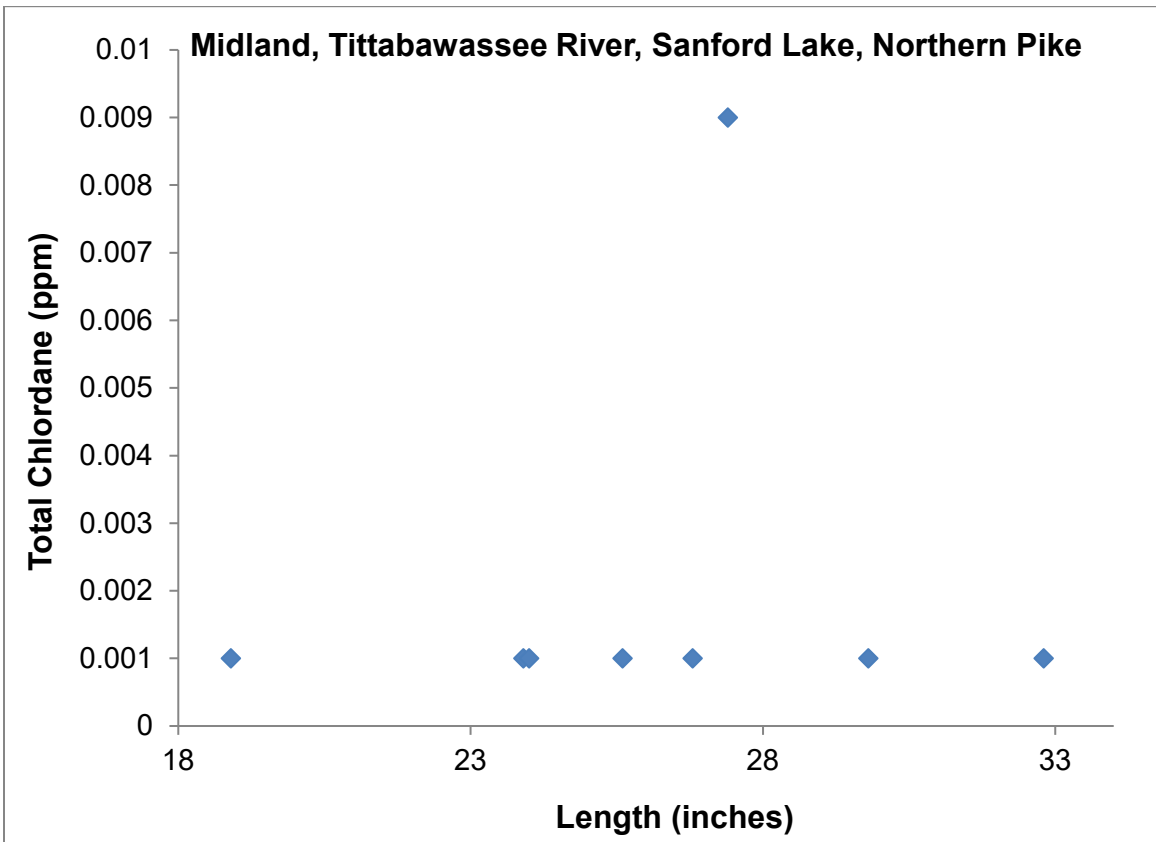
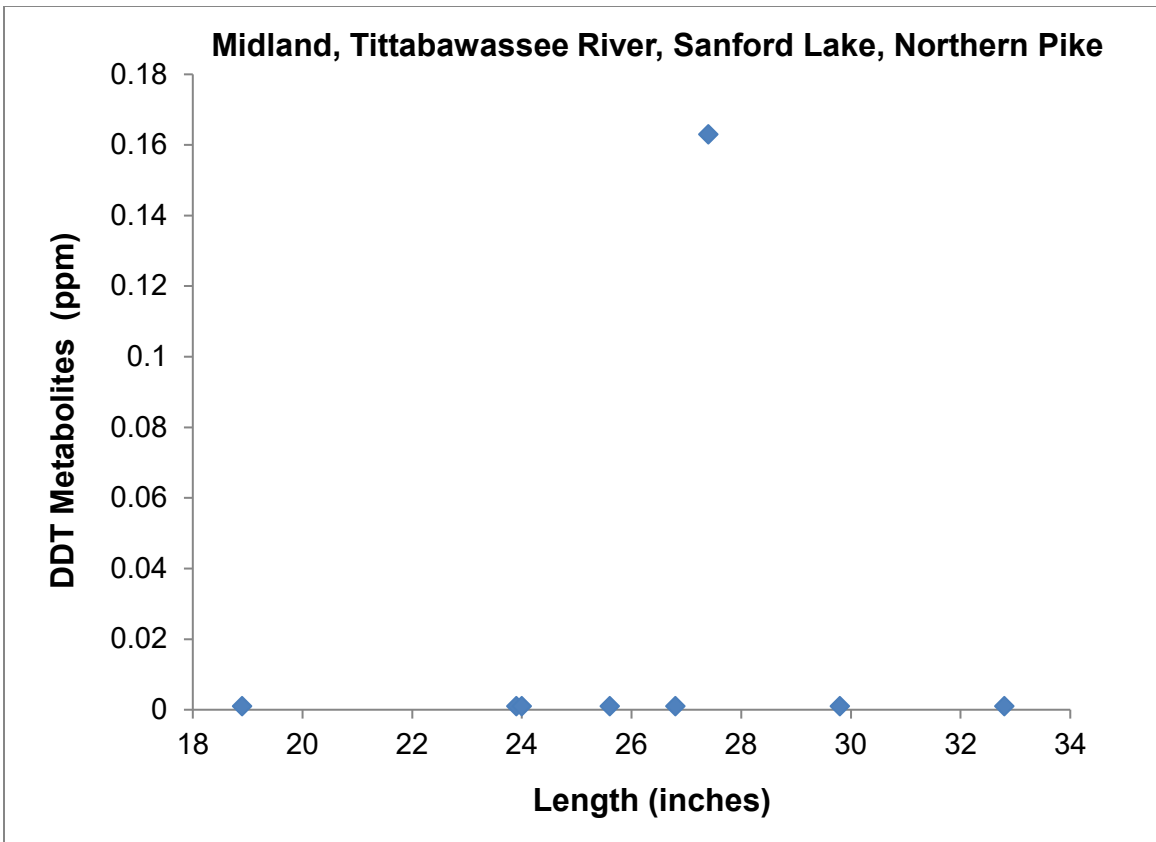
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2015	2015	8	18.9	24	23.9	32.8
Datasets available: 1989, 2015						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	7	0.005	0.001	0.03	0.01	12
DDT	7	0.02	0.001	0.16	0.08	16
Chlordane	7	0.002	0.001	0.009	0.005	--
Toxaphene	7	ND	--	--	--	--
TEQ	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.015	0.015				
DDT	0.015	0.015				
Chlordane	0.015	0.015				
Toxaphene	--	--				
TEQ	--	--				
Final meal category based on UCL:						2

Existing MDHHS Advisory: No one should eat more than 2 meals per month of northern pike from Sanford Lake less than 30 inches or more than 1 meal per month of those fish larger than 30 inches due to mercury. The statewide length break was applied as the size range of the fish was limited.

Recommendation: No change is recommended.





Rock Bass

**Sanford Lake
Tittabawassee River**

Midland County

Hg Analysis:

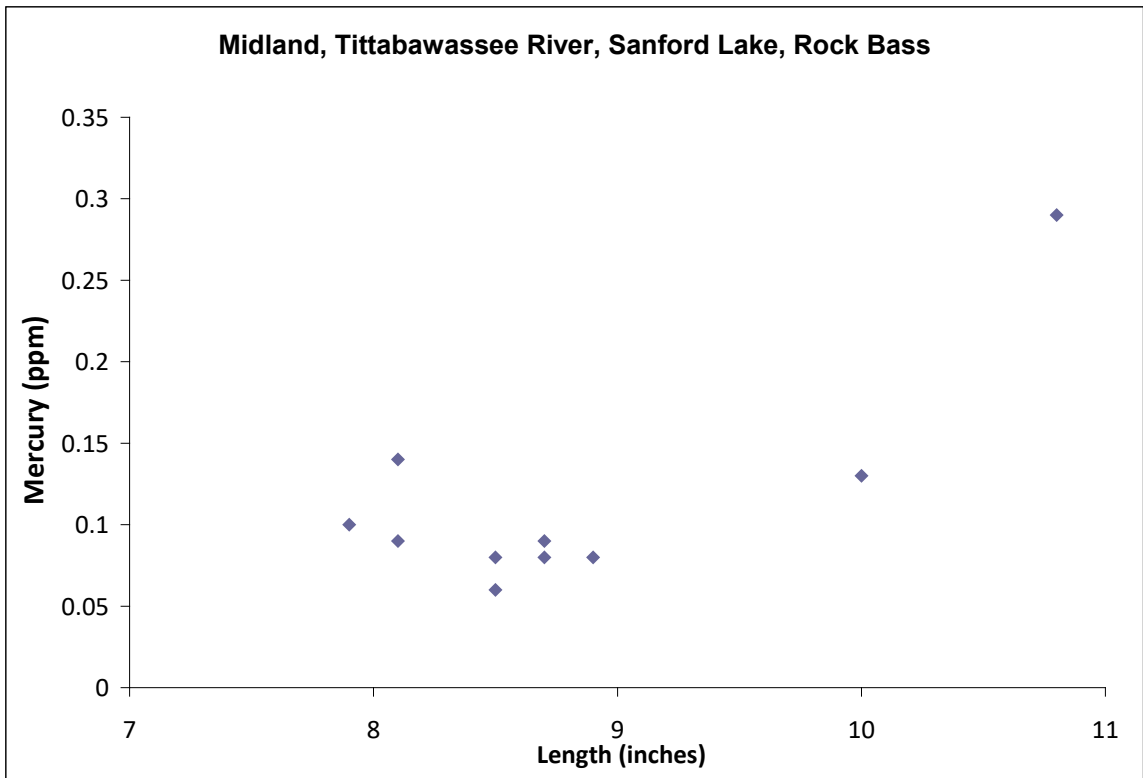
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1999	1999	10	7.9	na	7.9	10.8
Datasets available: 1999						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	10	0.114		0.160		4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.574	0.486				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1999	1999	10	7.9	na	7.9	10.8
Datasets available: 1999						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	10	ND		--		--
DDT	10	ND		--		--
Chlordane	10	ND		--		--
Toxaphene	10	ND		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--		Final meal category based on UCL:		4

Existing Advisory: Sanford Lake rock bass are covered under the statewide mercury consumption advisory.

Recommendation: No one should eat more than 4 meals per month of Sanford Lake rock bass due to mercury.



Walleye**Sanford Lake
Tittabawassee River****Midland County****Hg Analysis:**

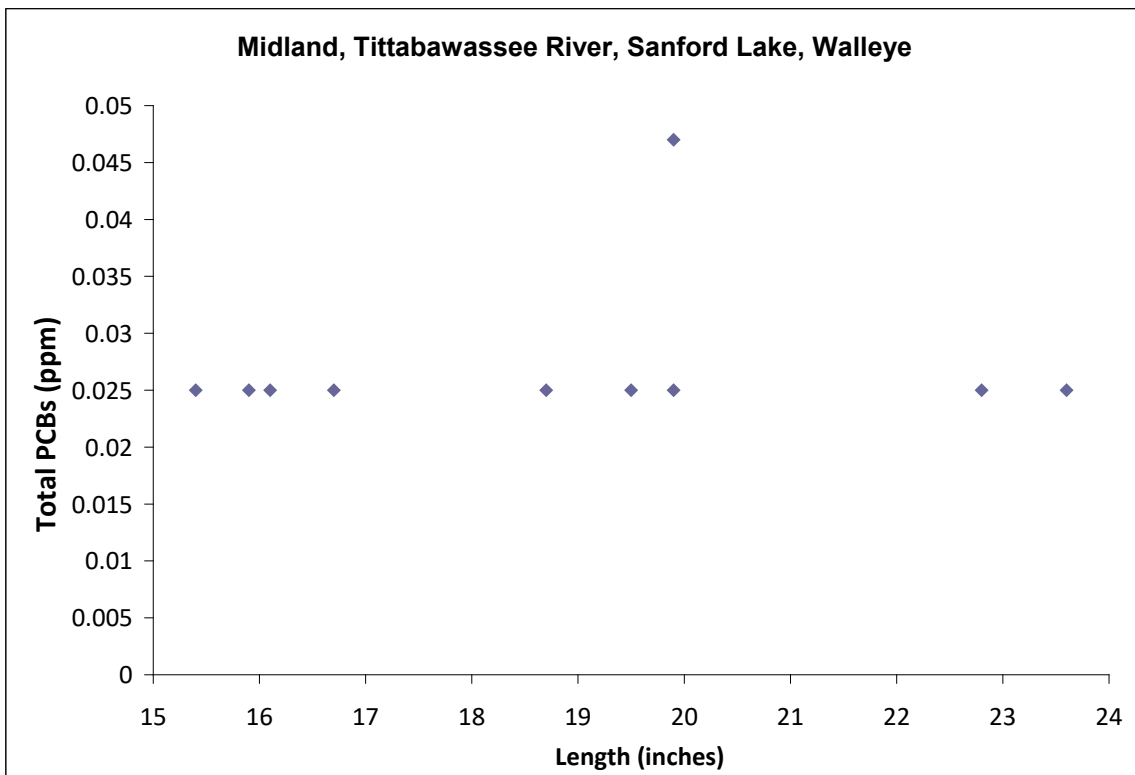
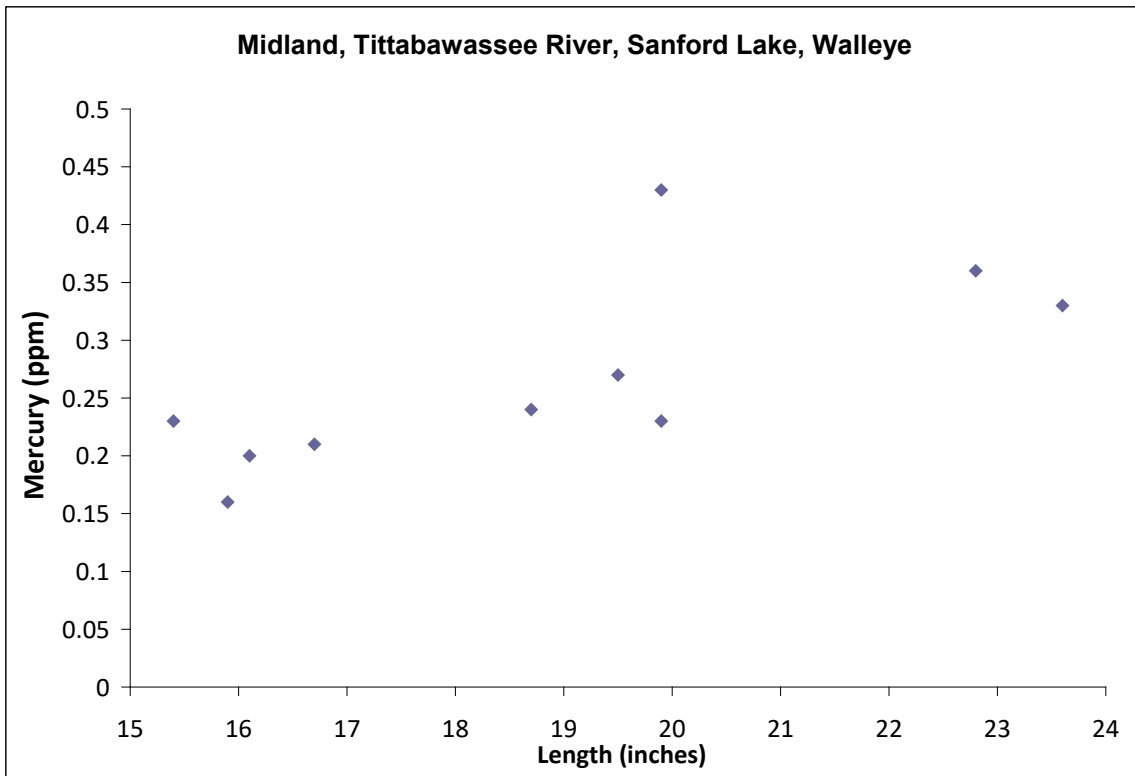
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	1989	10	15.4	15	15.4	23.6
Datasets available: 1989						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	10	0.266		0.330		2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.531	0.589				

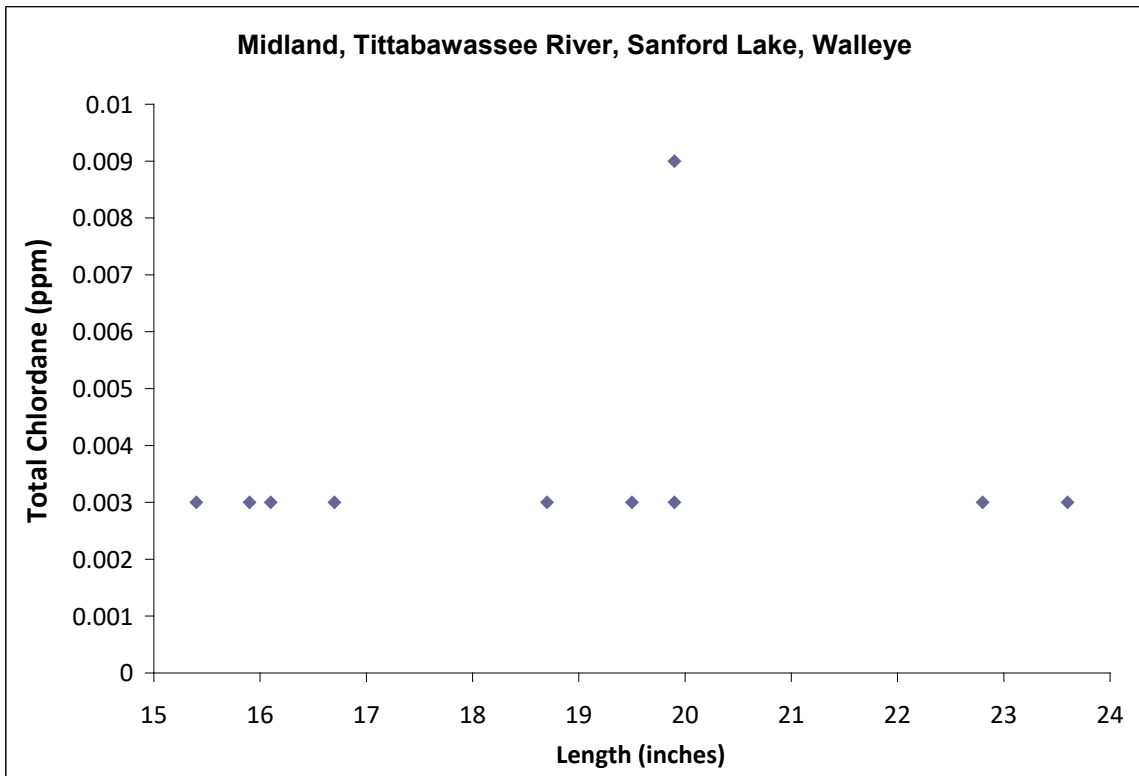
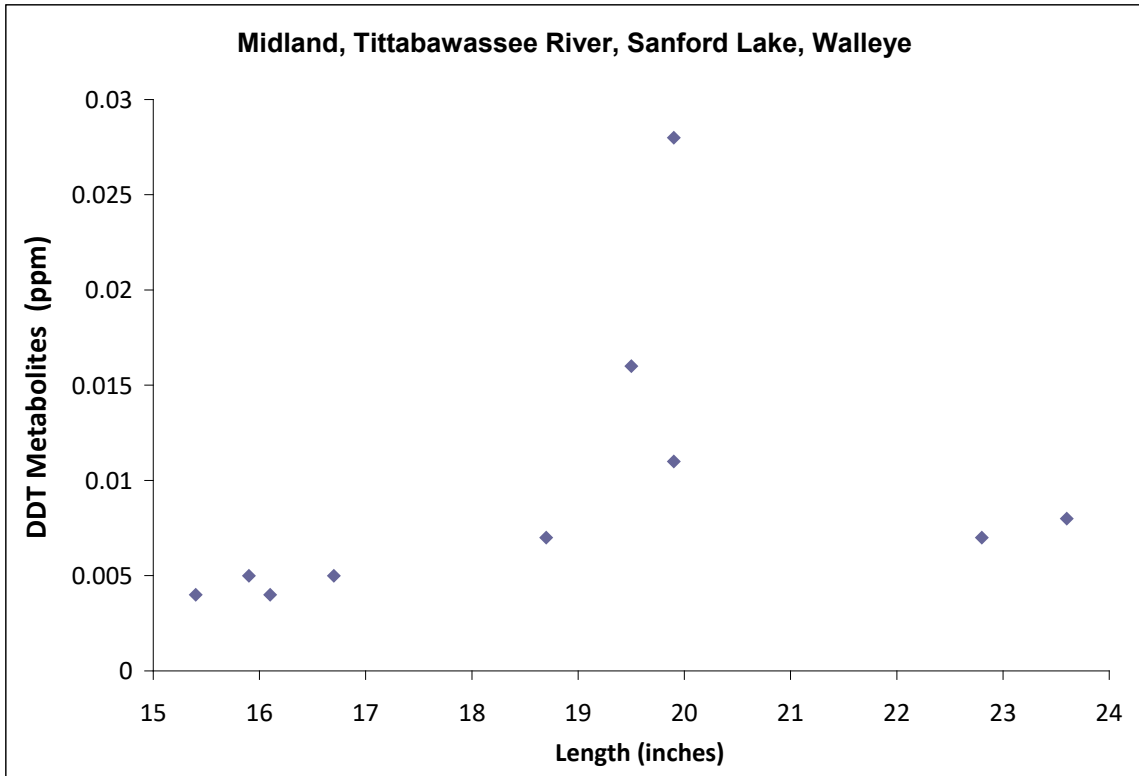
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	1989	10	15.4	15	15.4	23.6
Datasets available: 1989						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	10	0.027		0.030		8
DDT	10	0.010		0.010		16
Chlordane	10	0.004		0.004		16
Toxaphene	10	ND		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.017	0.032				
DDT	0.117	0.261				
Chlordane	0.017	0.017				
Toxaphene				Final meal category based on UCL:		2

Existing Advisory: Sanford Lake walleye are covered under the statewide mercury consumption advisory.

Recommendation: No one should eat more than 2 meals per month of Sanford Lake walleye less than 20 inches or more than 1 meal per month greater than 20 inches due to mercury. This dataset is limited due to the age of the data. Based on EGLE's Fish Contaminant Monitoring Program (FCMP), temporal changes in mercury concentrations are waterbody specific in Michigan. The EGLE FCMP finds that mercury concentration in fish are either staying the same or increasing. Statewide guideline length break applied.





Channel Catfish

Wixom Lake

Gladwin County

Hg Analysis:

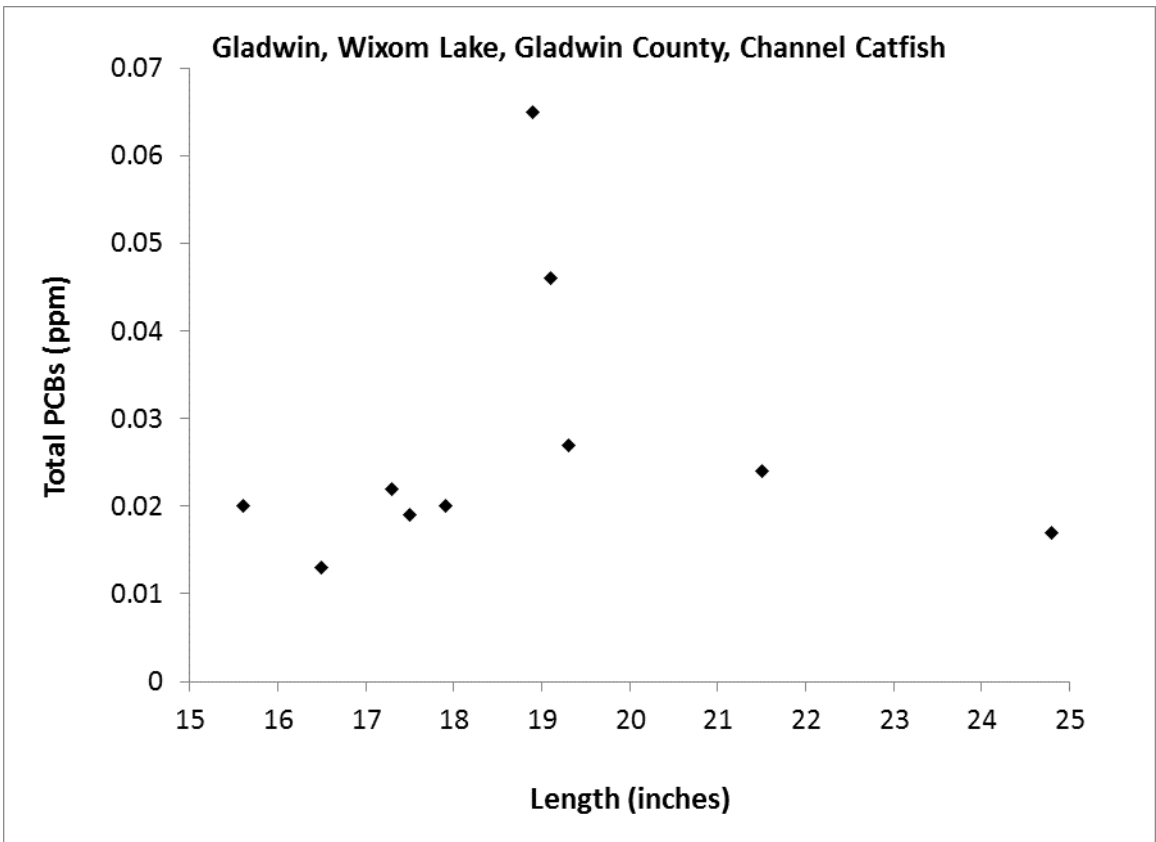
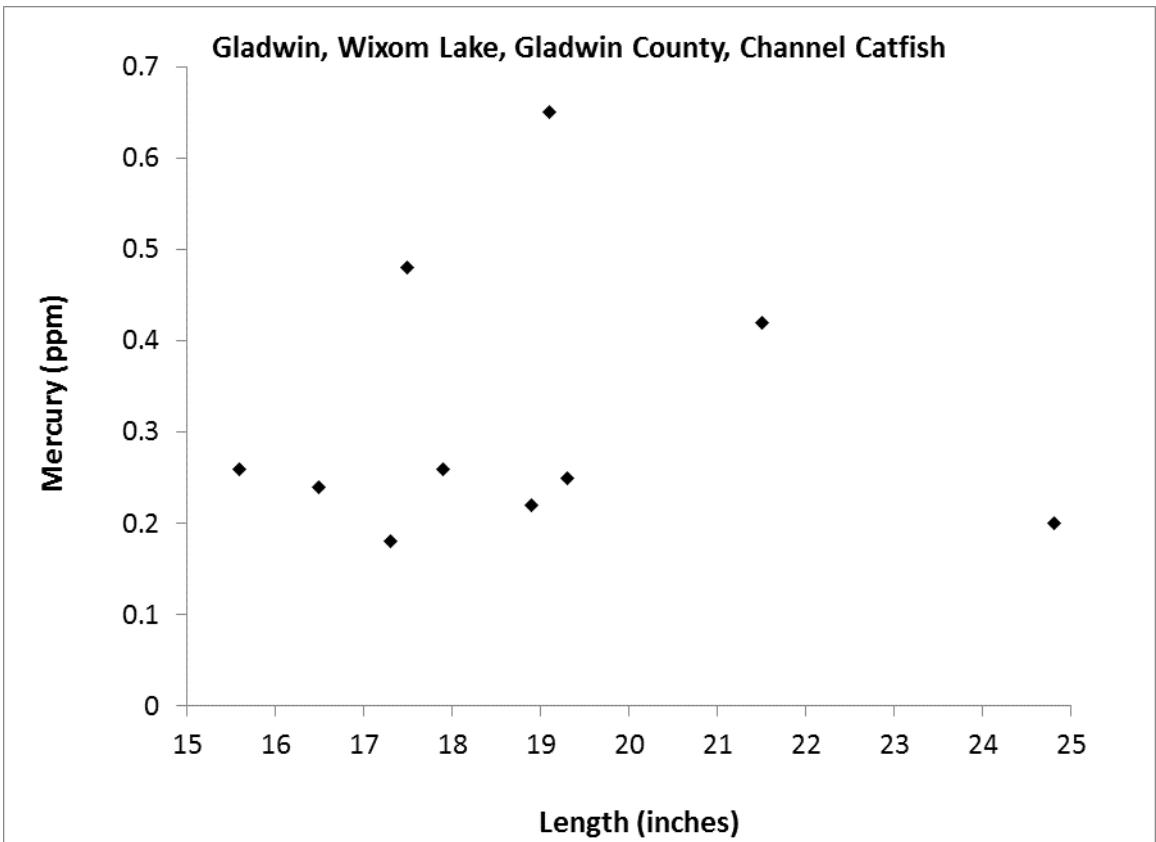
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2002	2002	10	15.6	12	15.6	24.8
Datasets available: 2002						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.32	0.18	0.65	0.42	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.000	0.000				

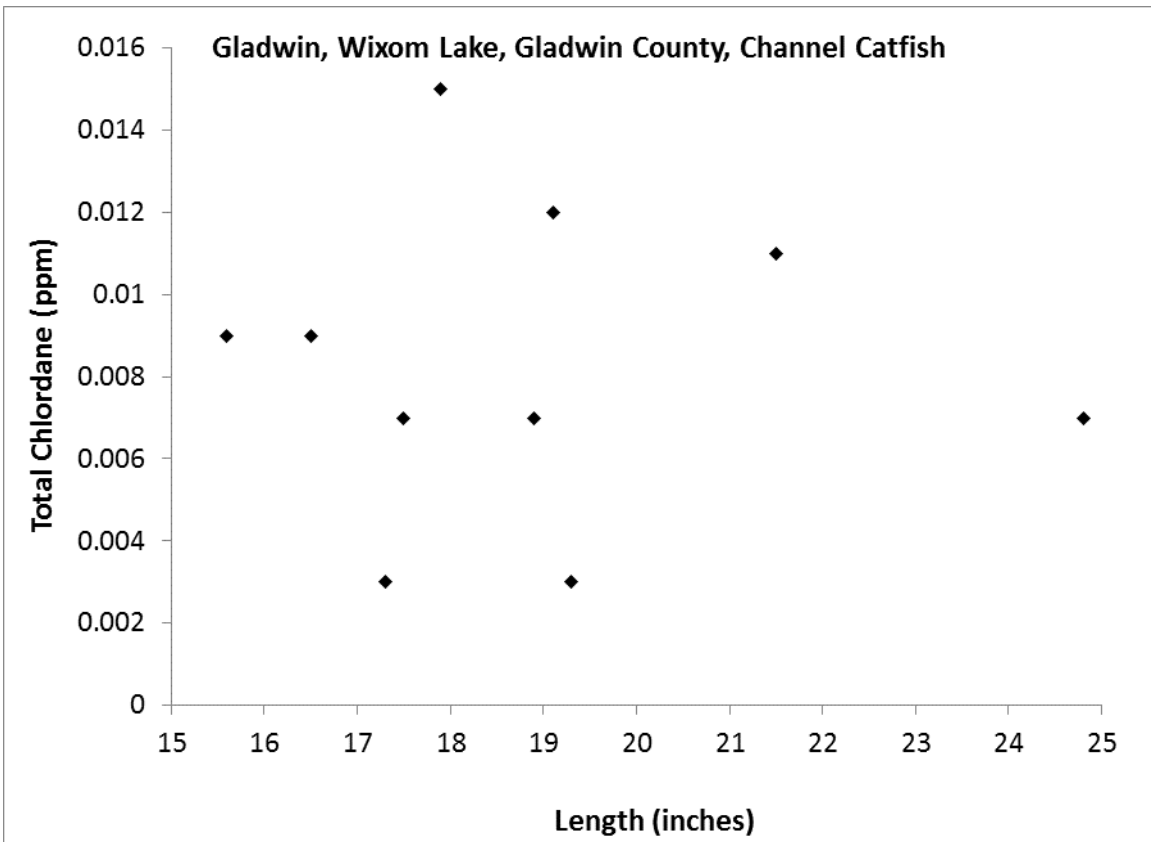
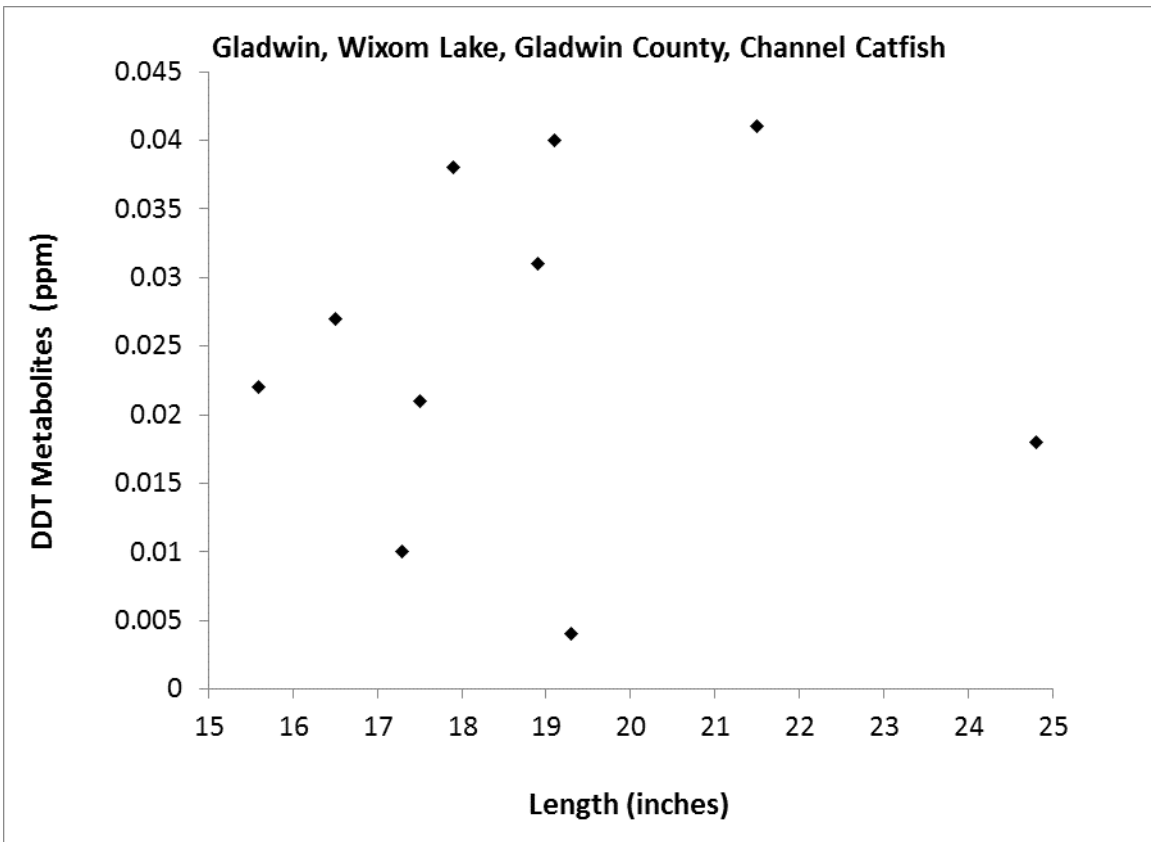
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2002	2002	10	15.6	12	15.6	24.8
Datasets available: 2002						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.03	0.01	0.06	0.04	4
DDT	10	0.02	0.004	0.04	0.03	16
Chlordane	10	0.008	0.003	0.02	0.01	--
Toxaphene	10	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.003	0.006				
DDT	0.003	0.000				
Chlordane	0.001	0.000				
Toxaphene	--	--				
Final meal category based on UCL:						2

Existing Advisory: Wixom Lake channel catfish are not covered by an advisory.

Recommendation: No one should eat more than 2 meals per month of Wixom Lake channel catfish due to mercury. PCBs would cause an advisory.





Northern Pike

**Tittabawassee River
Wixom Lake**

Gladwin County

Hg Analysis:

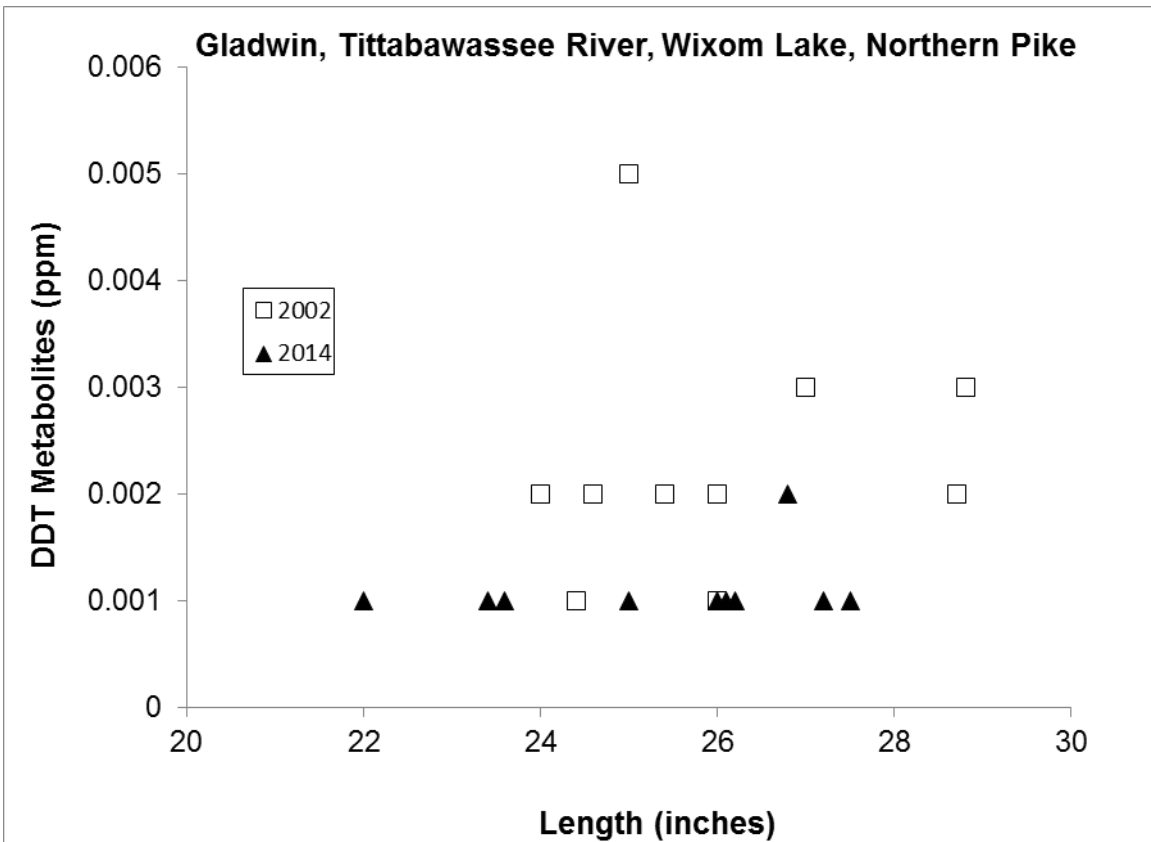
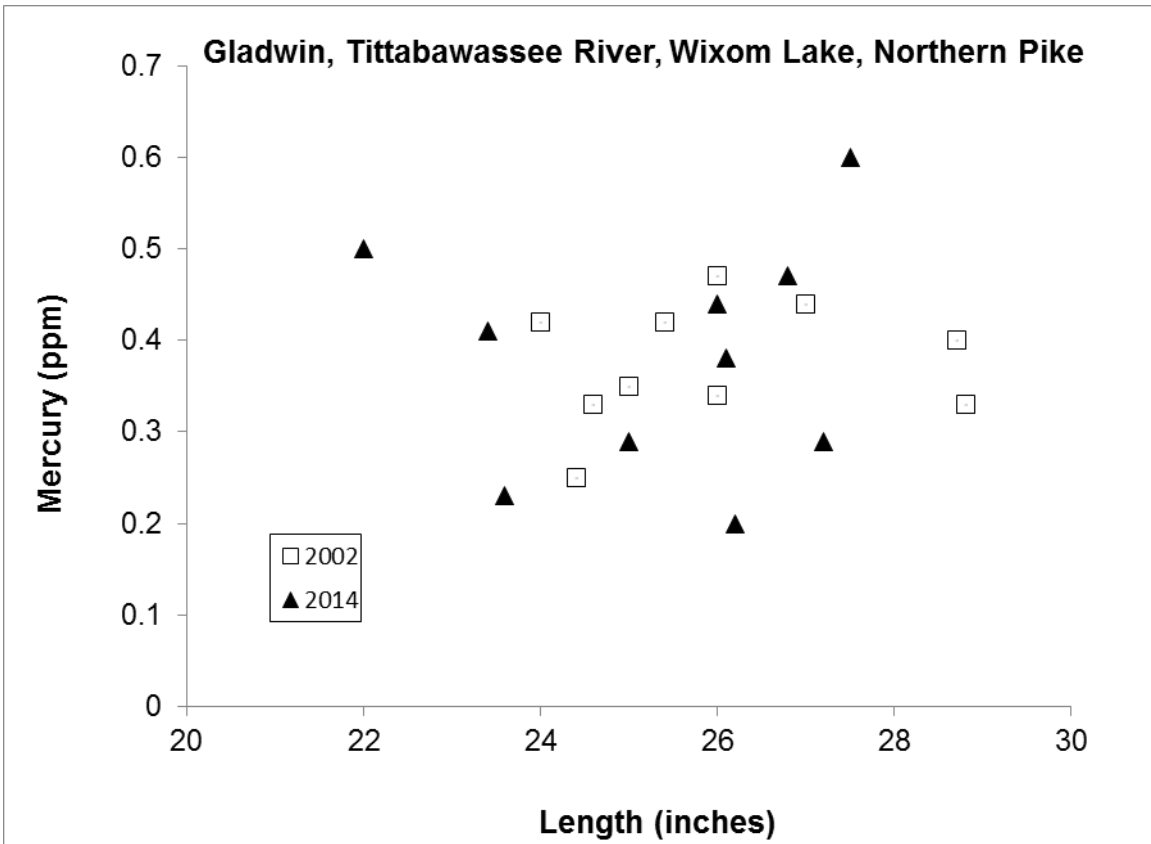
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2002	2014	20	22	24	23.6	28.8
Datasets available: 2002, 2014						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	18	0.37	0.20	0.60	0.42	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.009	0.010				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2002	2014	20	22	24	23.6	28.8
Datasets available: 2002, 2014						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	18	ND	--	--	--	16
DDT	18	ND	--	--	--	16
Chlordane	18	ND	--	--	--	--
Toxaphene	18	ND	--	--	--	--
TEQ	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
TEQ	--	--				
Final meal category based on UCL:						2

Existing Advisory: No one should eat more than 2 meals per month of Wixom Lake northern pike smaller than 30 inches or more than 1 meal per month of those fish larger than 30 inches due to mercury. The statewide length break was applied as the size range of fish was limited.

Recommendation: No change is recommended.



Black Crappie

**Tittabawassee River
Downstream of Midland**

**Midland & Saginaw
Counties**

Hg Analysis:

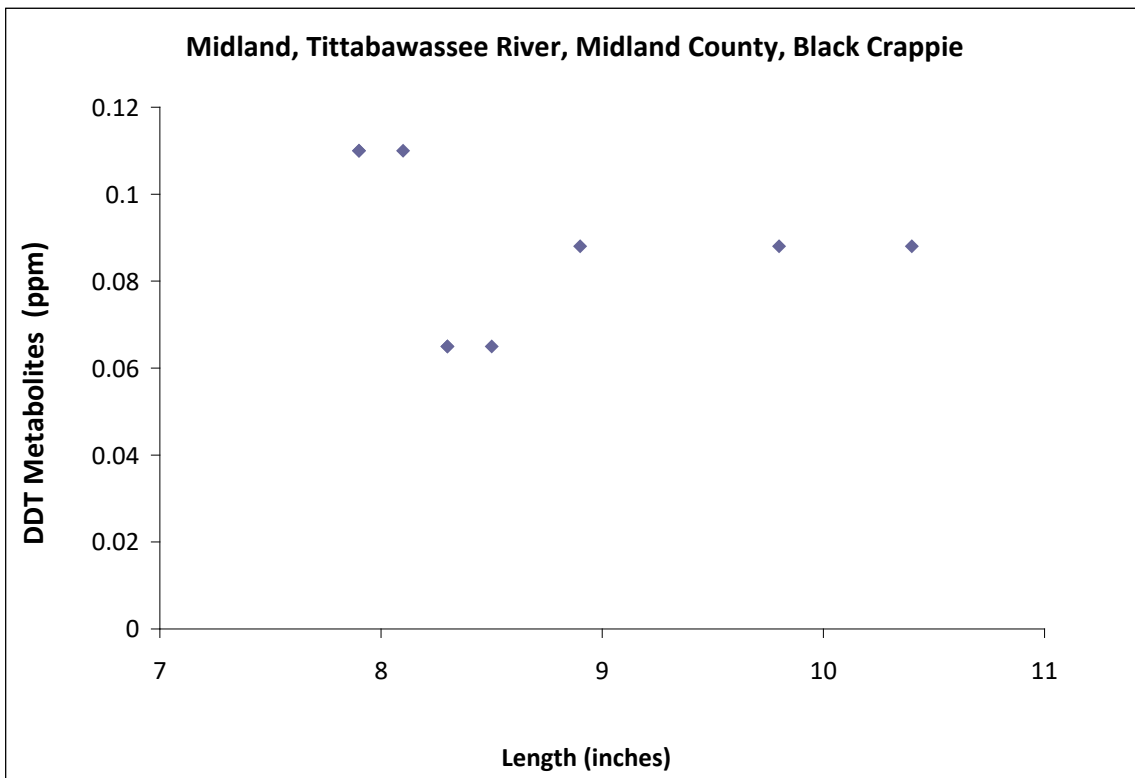
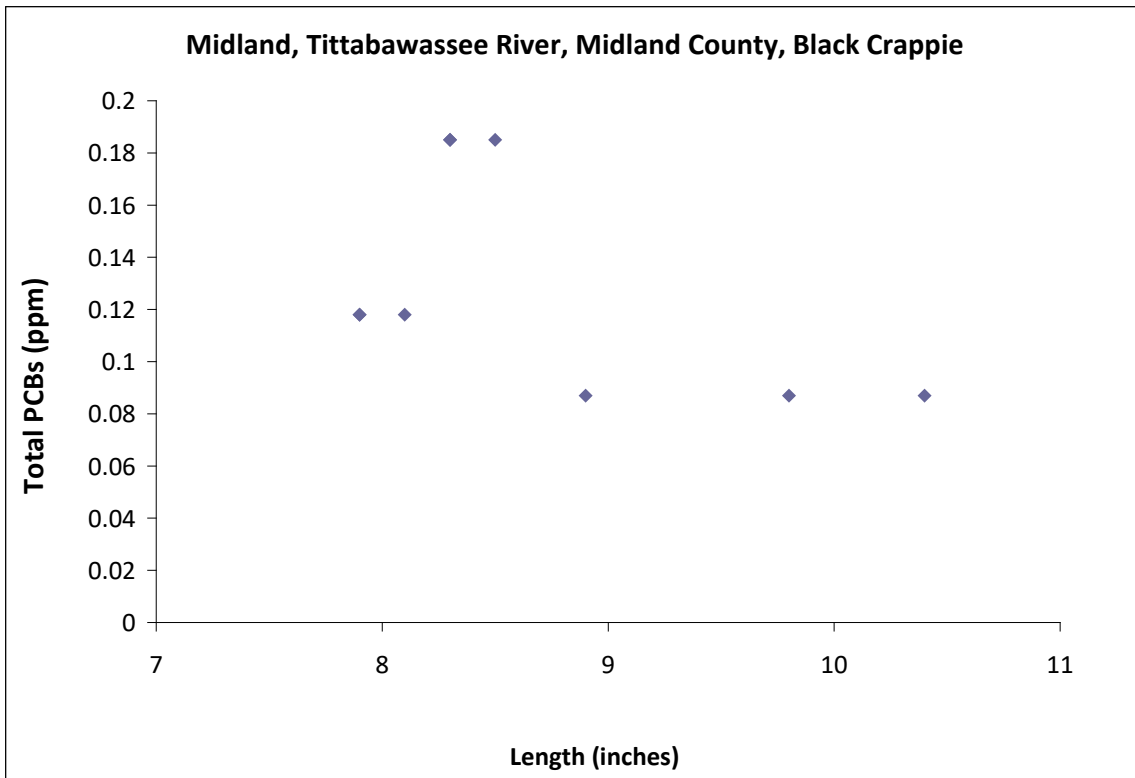
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1985	1985	0	--	na	--	--
Datasets available: 1985						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	0	--		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	---				

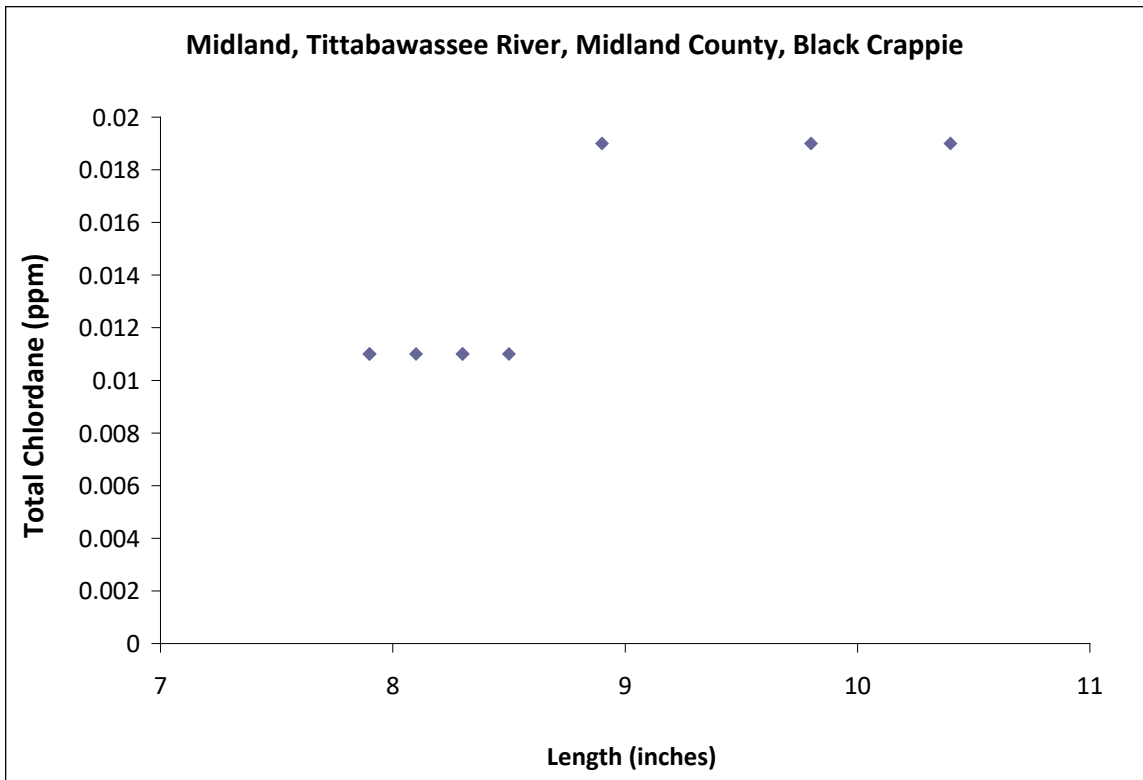
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1985	1985	10	7.9	na	7.9	10.4
Datasets available: 1985						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	9	0.130		0.160		1
DDT	9	0.088		0.100		16
Chlordane	9	0.014		0.020		--
Toxaphene	9	0.023		0.025		16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.269	0.346				
DDT	0.035	0.015				
Chlordane	0.766	0.766				
Toxaphene	0.010	0.013		Final meal category based on UCL:		1

Existing Advisory: Women and children should eat no more than one meal per month and the general population should eat no more than one meal per week of Tittabawassee River black crappie due to elevated concentrations of PCBs and dioxins.

Recommendation: A waterbody-wide advisory applies to Tittabawassee River black crappie. This dataset is limited due to the age of the data and is not used to provide a guideline given mercury analyses were not conducted.





Carp

**Saginaw Bay, Saginaw River
& Tittabawassee River
(South of Midland)**

**Bay, Midland, and
Saginaw Counties**

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1992	2004	64	14.5	na	14.5	29.5	
Datasets available: 1987, '88, '91, '92, '93, '98, '99, '03, '04							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL	Meal Category
Mercury	64	0.16		0.03	0.38	0.18	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.007	0.016					

Organics Analysis:

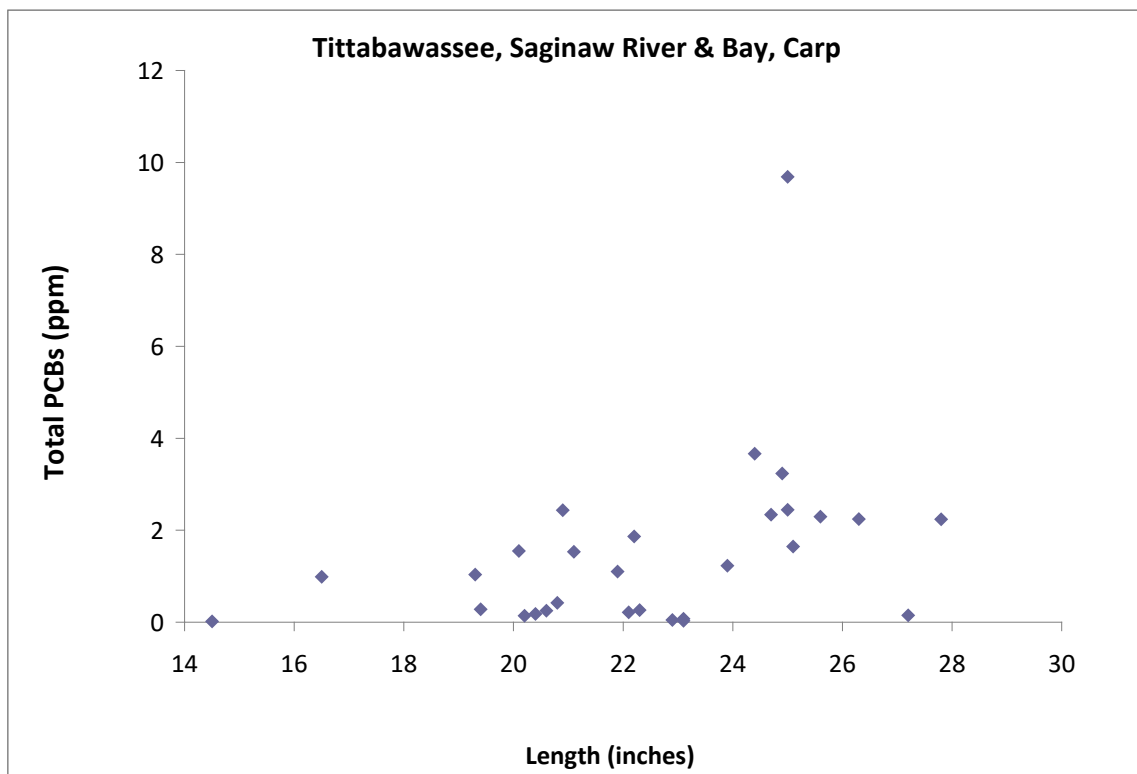
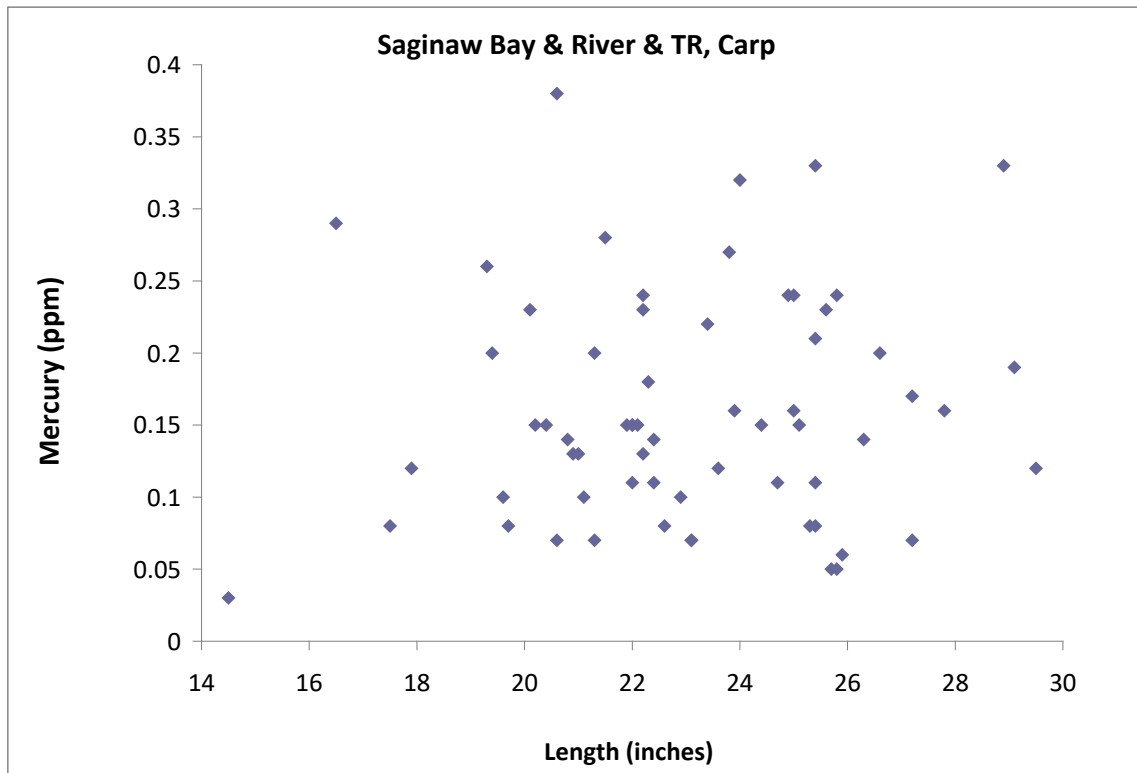
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2003	2004	29	14.5	na	14.5	27.8	
Datasets available: '92, '93, '99, '03, '04							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL	Meal Category
PCB	29	1.50		0.02	9.7	2.2	Limited
DDT	29	0.91		0.01	15	2.0	0.5
Chlordane	29	0.05		0.001	0.71	0.11	--
Toxaphene	29	0.11		0.05	0.51	0.15	2
TEQ*	19	35 ppt		1.8 ppt	118 ppt	53 ppt	Limited
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.153	0.184					
DDT	0.079	0.116					
Chlordane	0.097	0.098					
Toxaphene	0.002	0.006					
TEQ*	0.284	0.243					
Final meal category based on UCL:							Limited

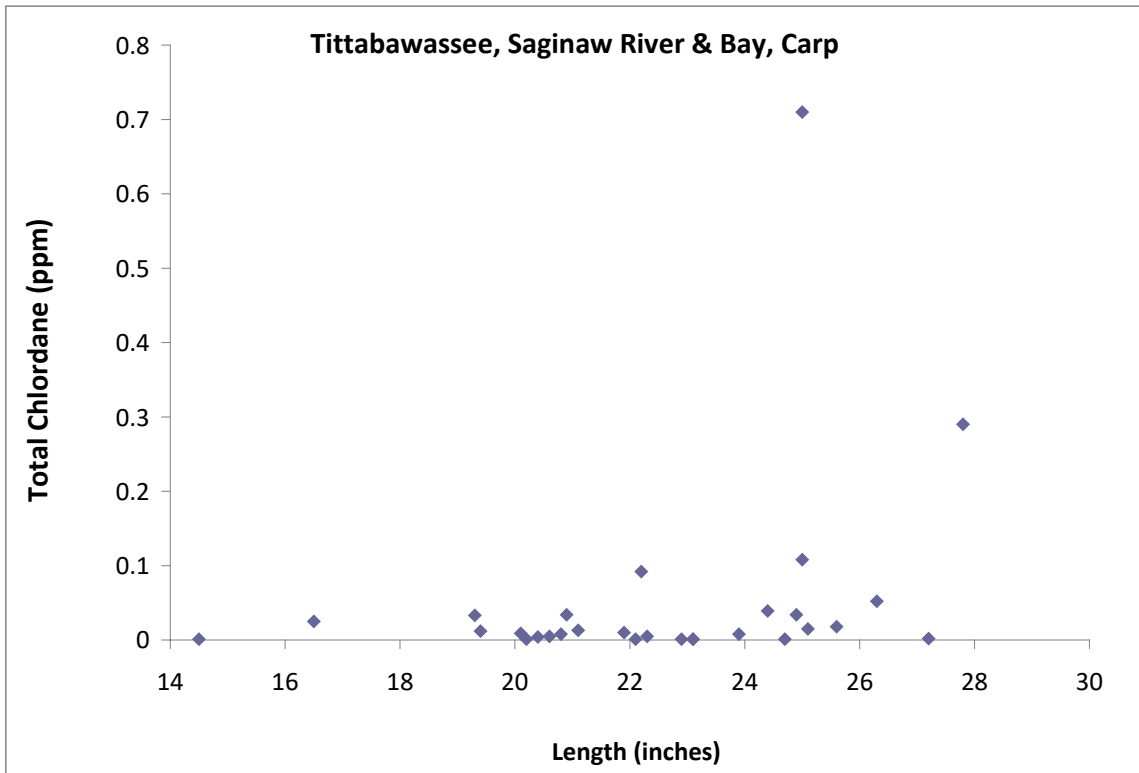
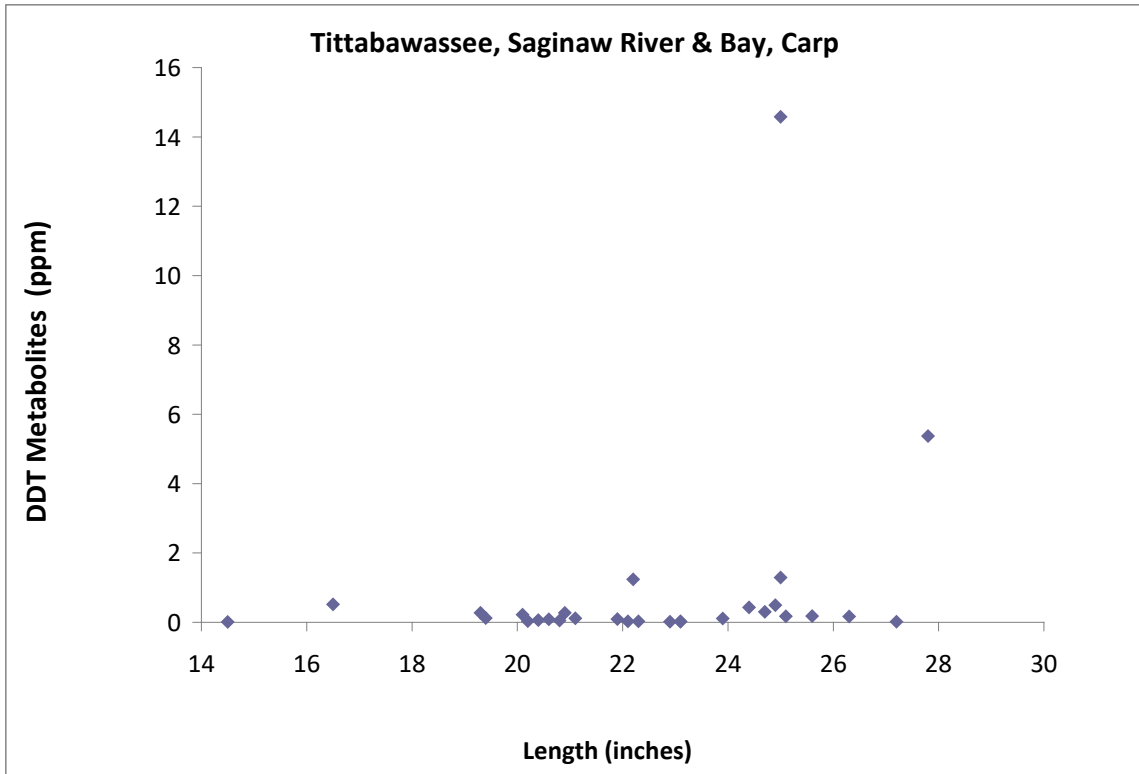
* 2005WHO; dl-PCBs included

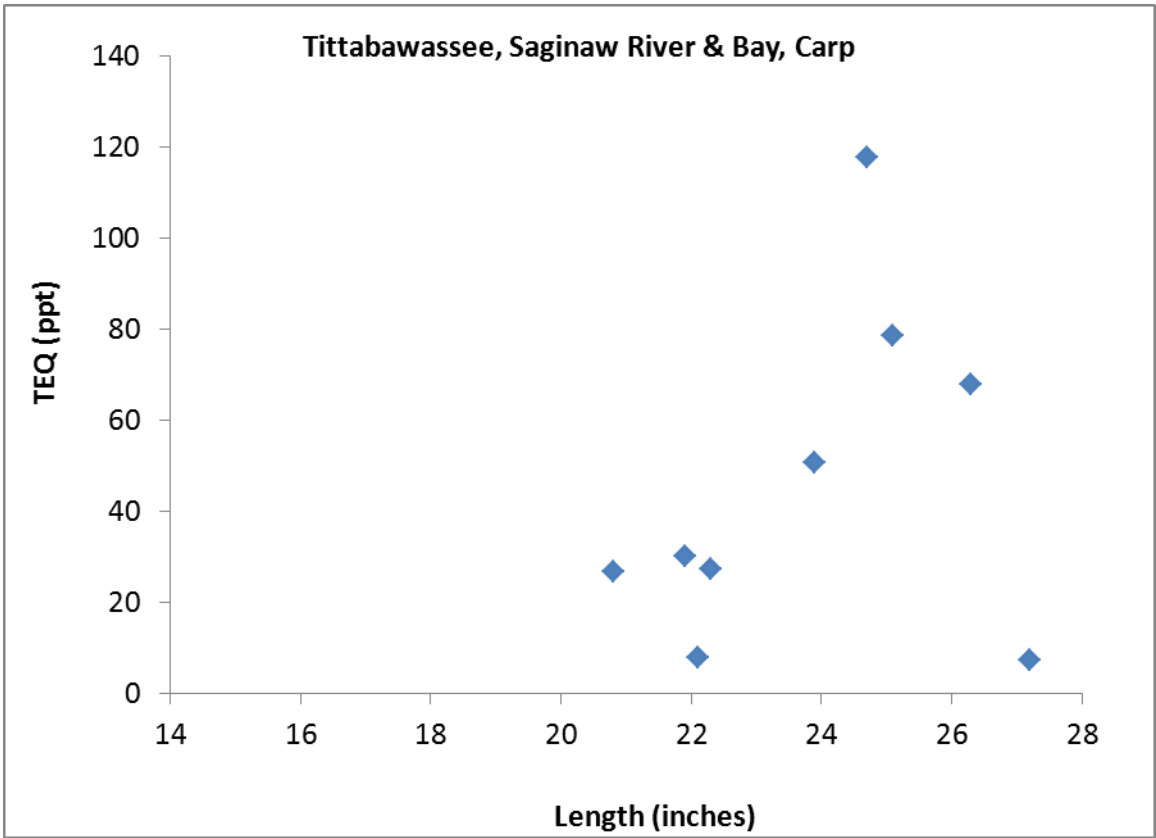
Existing Advisory: No one should eat carp from Saginaw Bay, the Saginaw River, or the Tittabawassee River due to elevated concentrations of PCBs and dioxins.

Recommendation: No one should eat carp from Saginaw Bay, the Saginaw River, or Tittabawassee River due to elevated concentrations of dioxins and PCBs. Mercury, DDT, and toxaphene would cause advisories. Uncertainty due to uncontrolled secondary sources (e.g. concentrated deposits) and yet to be determined remediation actions is the basis for continuing the no consumption advisory for everyone.

Note: TEQ was measured in carp from both Saginaw Bay and River (2004); dl-PCBs caused approximately 50% of the TEQ in the river samples and over 70% of the TEQ in the Bay samples. PCBs in carp collected from the TR in 2003 and the Saginaw River in 2004 were equivalent, and higher than the PCBs in the Saginaw Bay carp.







Northern Pike

**Tittabawassee River
Downstream of Midland**

**Midland & Saginaw
Counties**

Hg Analysis:

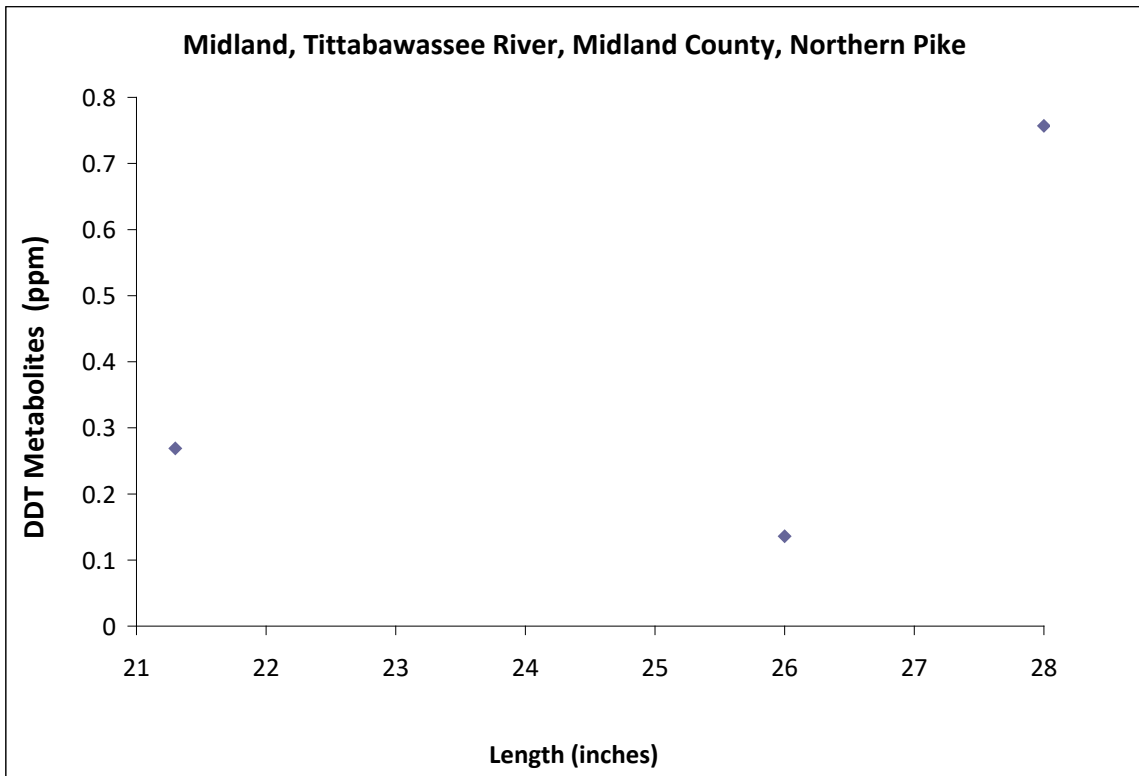
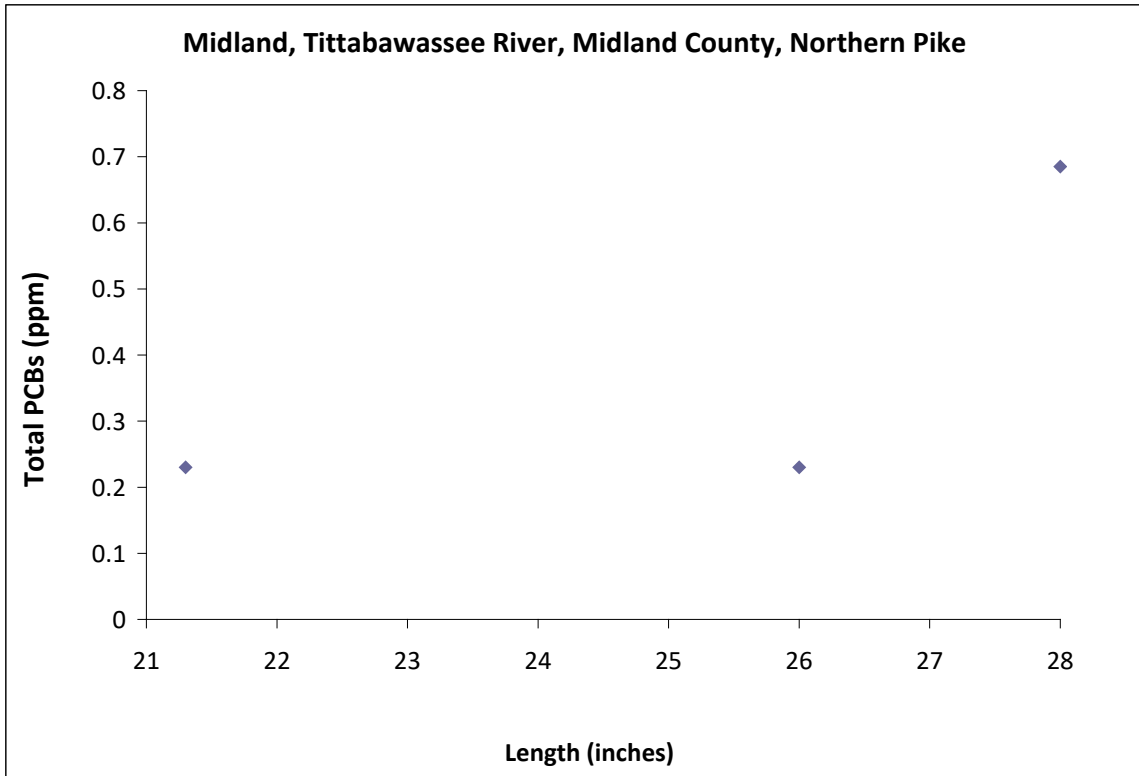
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1985	1985	0	--	24	--	--
Datasets available: 1985						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	0	--		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

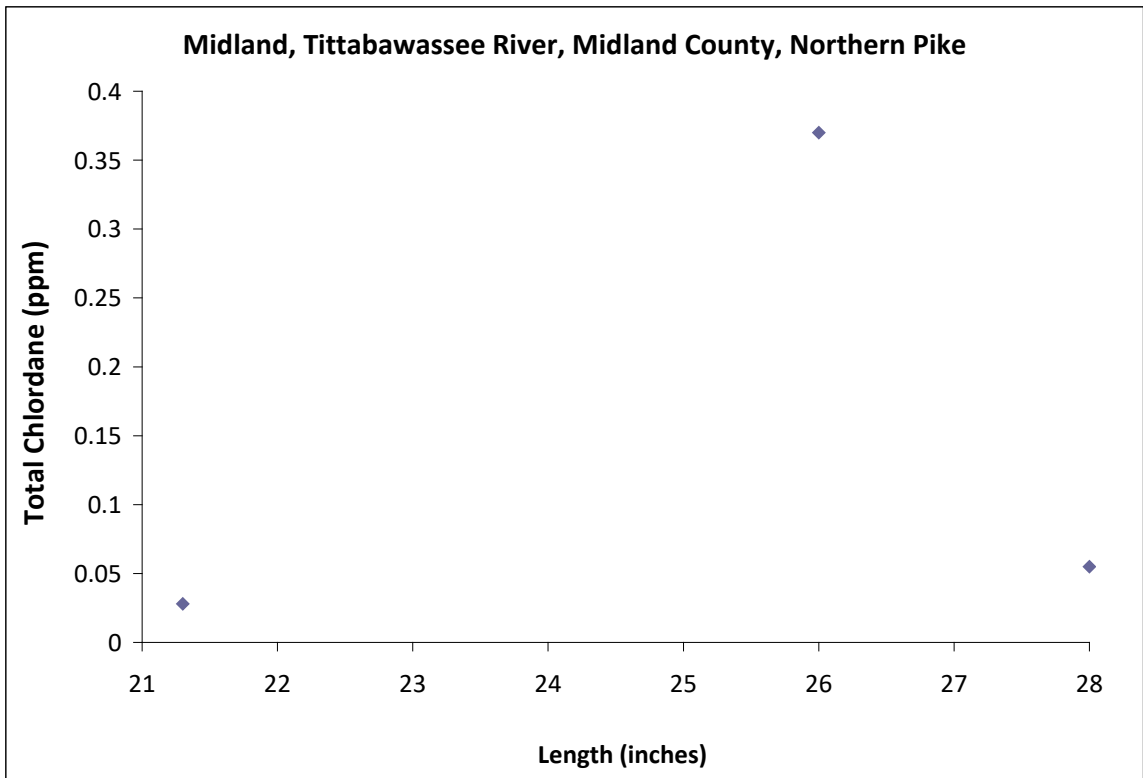
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1985	1985	0	21.3	24	26	28
Datasets available: 1985						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	2	0.458		--		--
DDT	2	0.447		--		--
Chlordane	2	0.213		--		--
Toxaphene	2	0.073		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						--

Existing Advisory: Women and children should eat no more than one meal per month and the general population should eat no more than one meal per week of Tittabawassee River northern pike due to elevated concentrations of PCBs and dioxin.

Recommendation: A waterbody-wide advisory applies to Tittabawassee River northern pike. This dataset is limited due to the age of the data and sample size; it is not usable to provide a recommendation.





Smallmouth Bass

**Tittabawassee River
Downstream of Midland**

**Midland & Saginaw
Counties**

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1985	2003	25	13.3	14	13.5	18.3
Datasets available: 1985, 1999, 2000, 2003						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	22	0.329			0.380	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.292	0.382				

Organics Analysis:

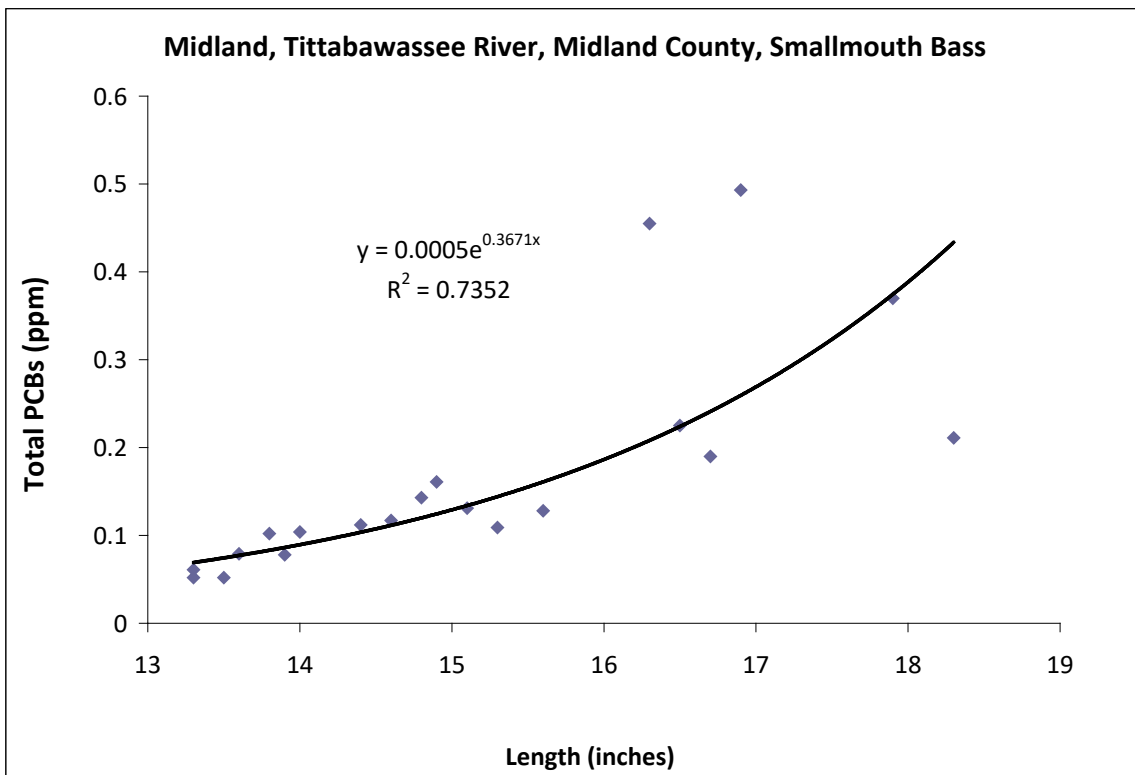
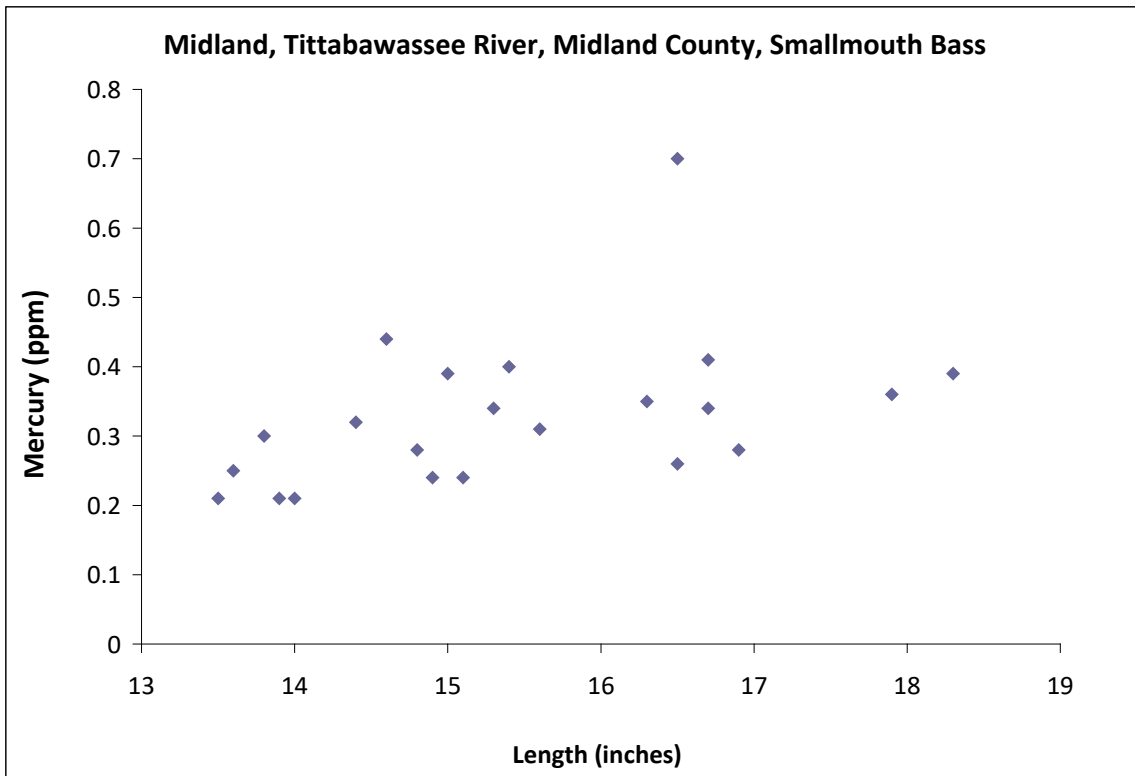
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2000	2003	20	13.3	14	13.5	18.3
Datasets available: 2000, 2003						
Chemical	Sample Size (All)	Mean (ppm)		95%UCL	Meal Category	
PCB	20	0.169			0.230	0.5
DDT	20	0.127		0.180	8	
Chlordane	20	0.003		0.003	--	
Toxaphene	20	ND		--	--	
TEQ*	20	6.7 ppt		7.8 ppt	0.5	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.563	0.735				
DDT	0.113	0.139				
Chlordane	0.133	0.072				
Toxaphene						
Final meal category based on UCL:					0.5	

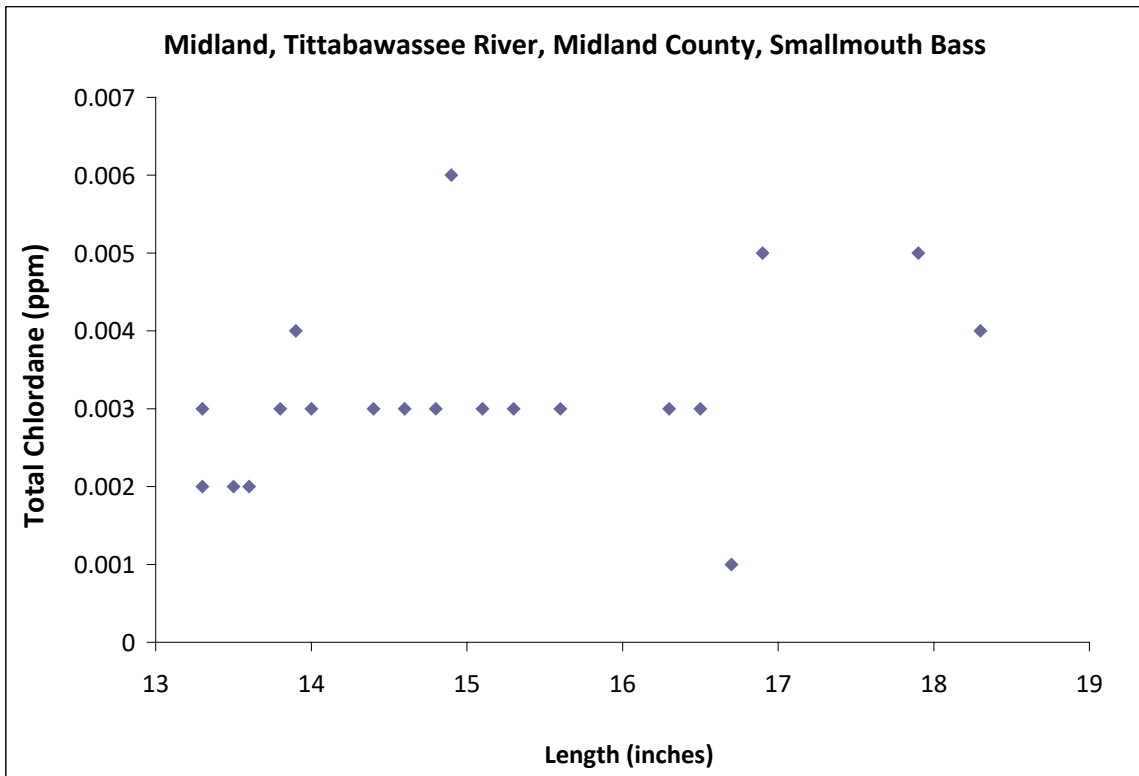
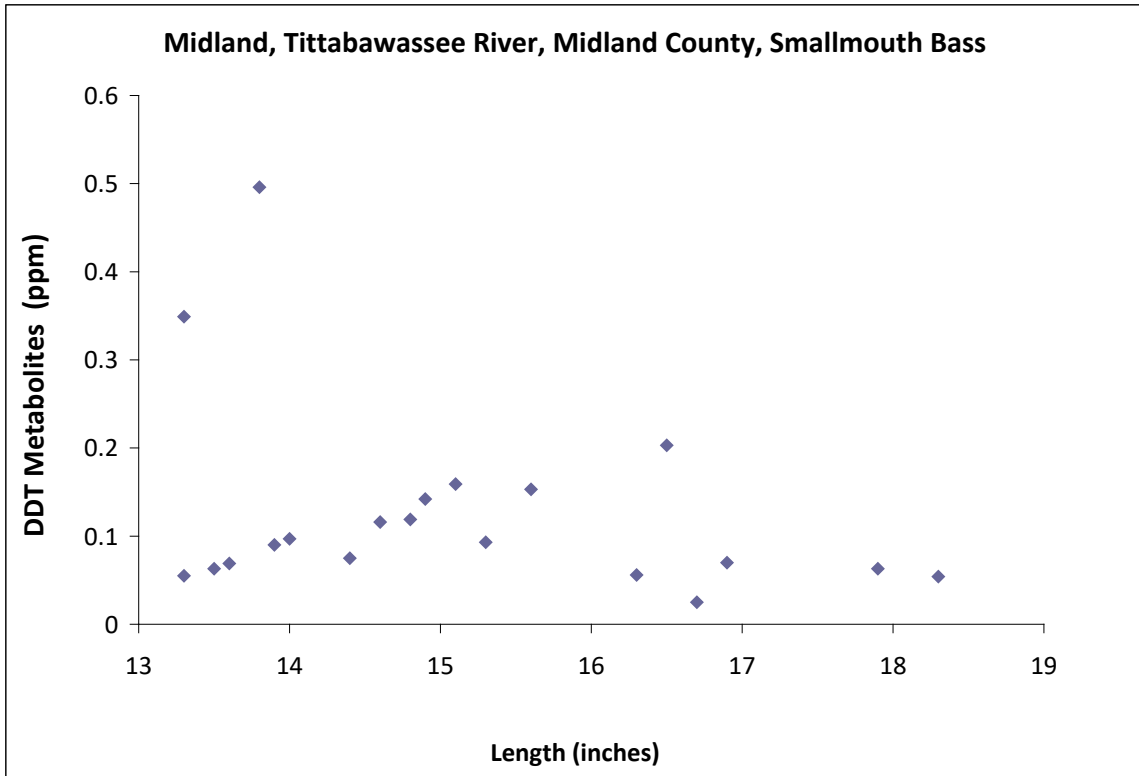
* 2005 WHO TEFs - TEQ is dioxin/furan congeners only

Length (Inches)	PCB Regression Equation Estimate (ppm)	Meal Category
14	0.085	2
15	0.123	1
16	0.178	1
17	0.257	0.5
18	0.370	0.5
19	0.535	Limited
20	0.772	Limited
21	1.114	Limited
22	1.608	Limited
<i>Shaded area denotes extrapolated estimates</i>		

Existing Advisory: Women and children should not eat any and the general population should eat no more than one meal per week of Tittabawassee River smallmouth bass due to elevated levels of PCBs and dioxins.

Recommendation: No one should eat more than 6 meals per year of Tittabawassee River smallmouth or largemouth bass less than 18 inches due to elevated concentrations of PCBs and dioxin TEQ. Sensitive populations should not eat Tittabawassee River smallmouth or largemouth bass greater than 18 inches. Healthy adults should limit consumption to 1 or 2 meals per year of smallmouth or largemouth bass greater than 18 inches due to elevated concentrations of PCBs and dioxin TEQ. Mercury and DDT would cause advisories. Dataset is limited due to lack of complete dioxin TEQ analysis.





White Sucker

**Tittabawassee River
Downstream of Midland**

**Midland & Saginaw
Counties**

Hg Analysis:

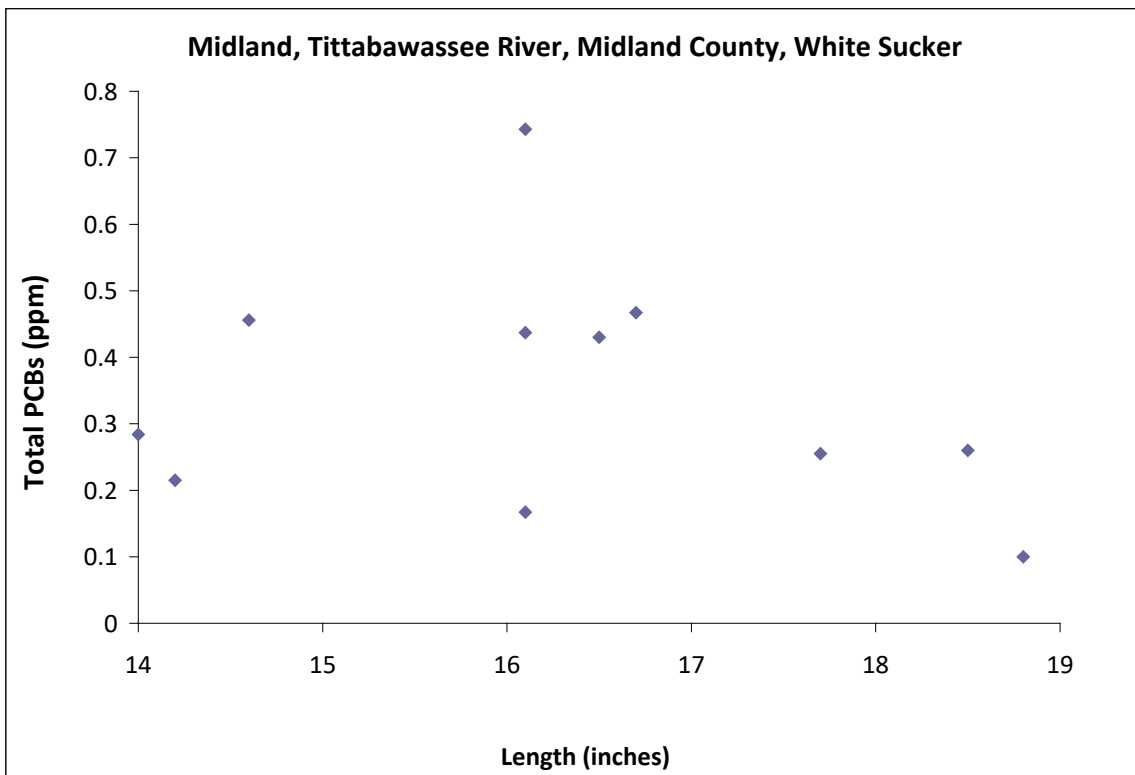
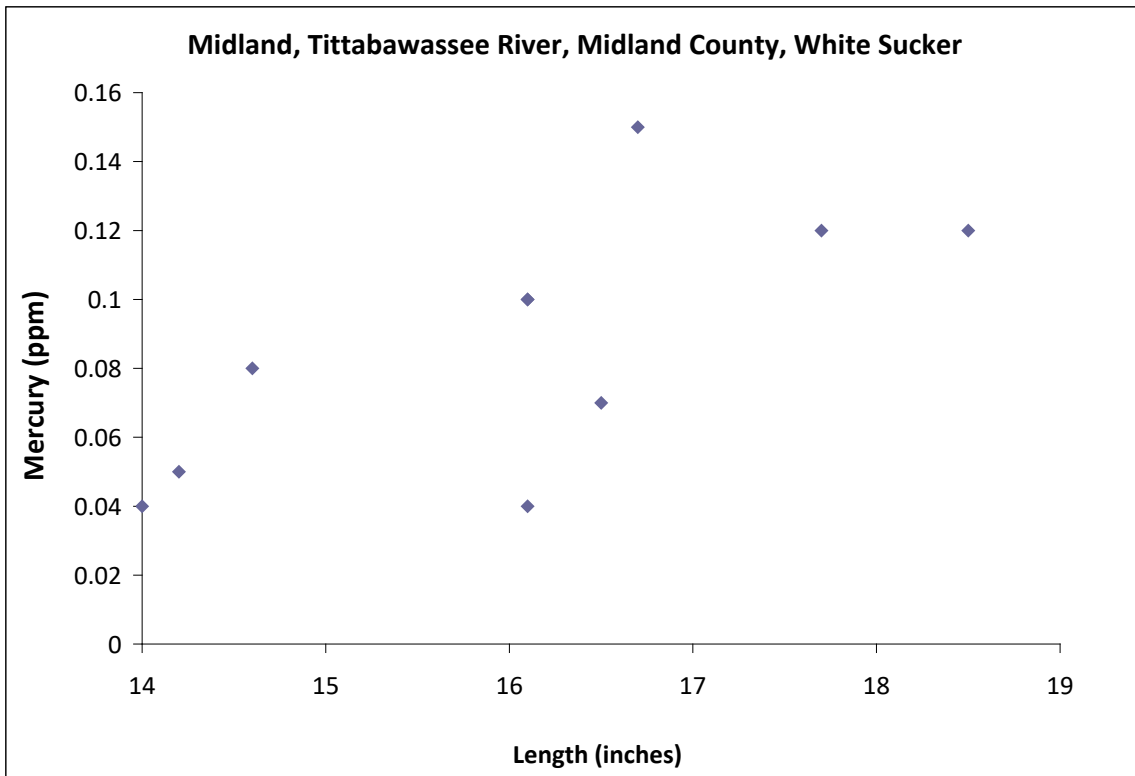
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1995	1995	10	14	na	14	18.5
Datasets available: 1984, 1995						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL	Meal Category
Mercury	10	0.09			0.110	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.487	0.477				

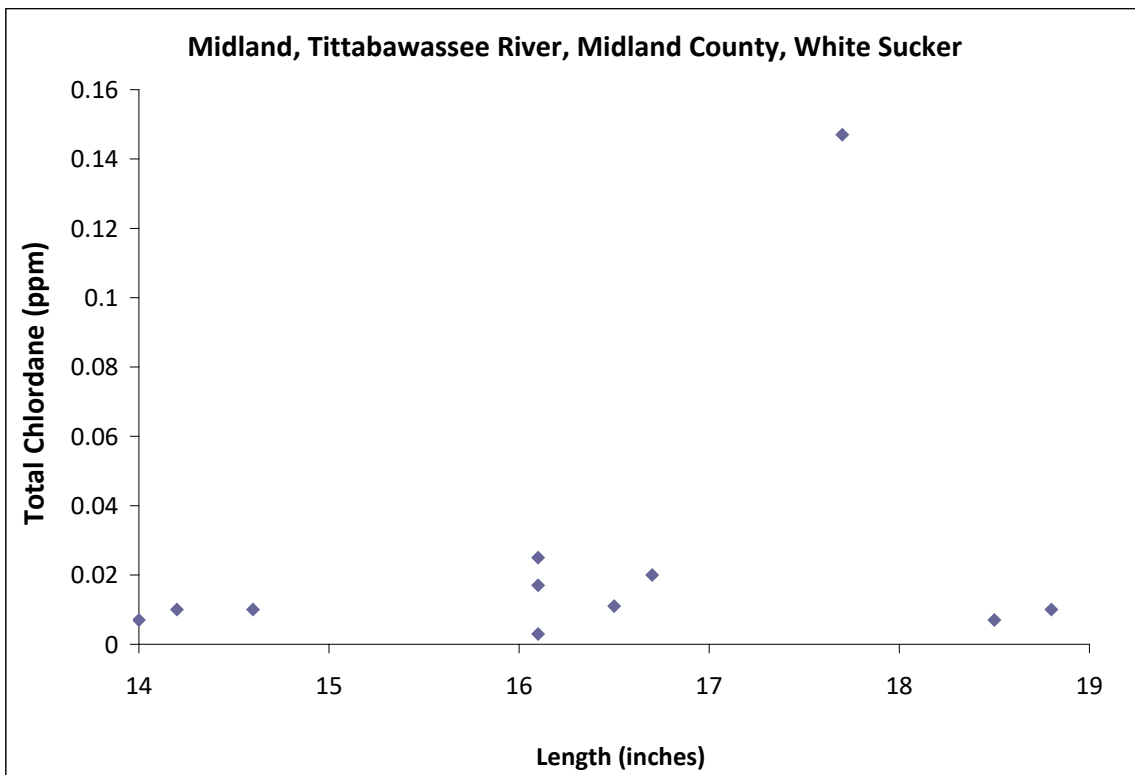
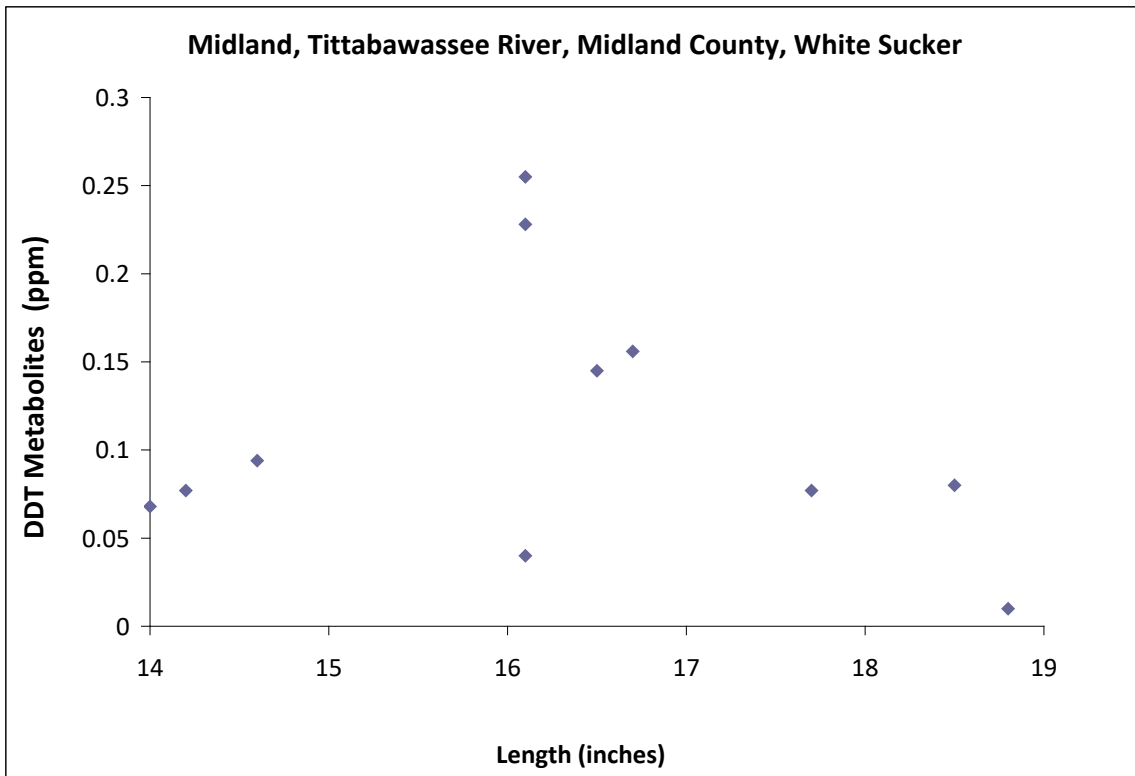
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1995	1995	11	14	na	14	18.5
Datasets available: 1984, 1995						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL	Meal Category
PCB	10	0.371			0.490	Limited
DDT	10	0.122			0.170	8
Chlordane	10	0.026			0.060	--
Toxaphene	10	ND			--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.322	0.275				
DDT	0.289	0.398				
Chlordane	0.296	0.304				
Toxaphene	0.032	0.025				
Final meal category based on UCL:						Limited

Existing Advisory: Women and children should eat no more than one meal per month and the general population should eat no more than one meal per week of Tittabawassee River white sucker due to elevated levels of PCBs and dioxins.

Recommendation: No one should eat more than 6 meals per year of Tittabawassee River white sucker. This dataset is limited by the age of the data. Based on EGLE’s Fish Contaminant Monitoring Program, PCB and DDT concentrations ≥15 years old are expected to have declined allowing one meal category less restrictive advice for PCBs.





Yellow Perch

**Lake Huron, Saginaw Bay,
Saginaw River
& Tittabawassee River
(South of Midland)**

**Bay, Midland, and
Saginaw Counties**

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1991	2004	39	7.8	na	7.8	11.3
Datasets available: 1987, 1988, 1991, 1993, 1995, 2004						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL	Meal Category
Mercury	39	0.09	0.03	0.25	0.10	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.391	0.372				

Organics Analysis:

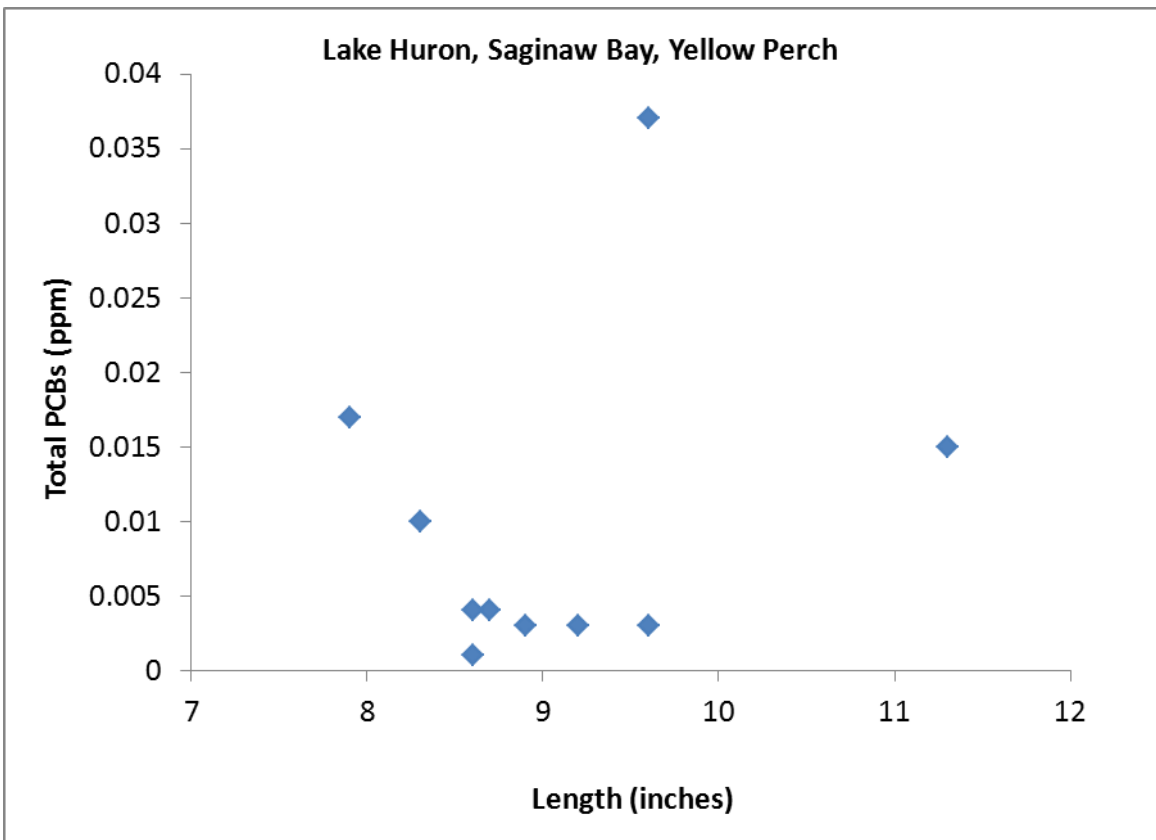
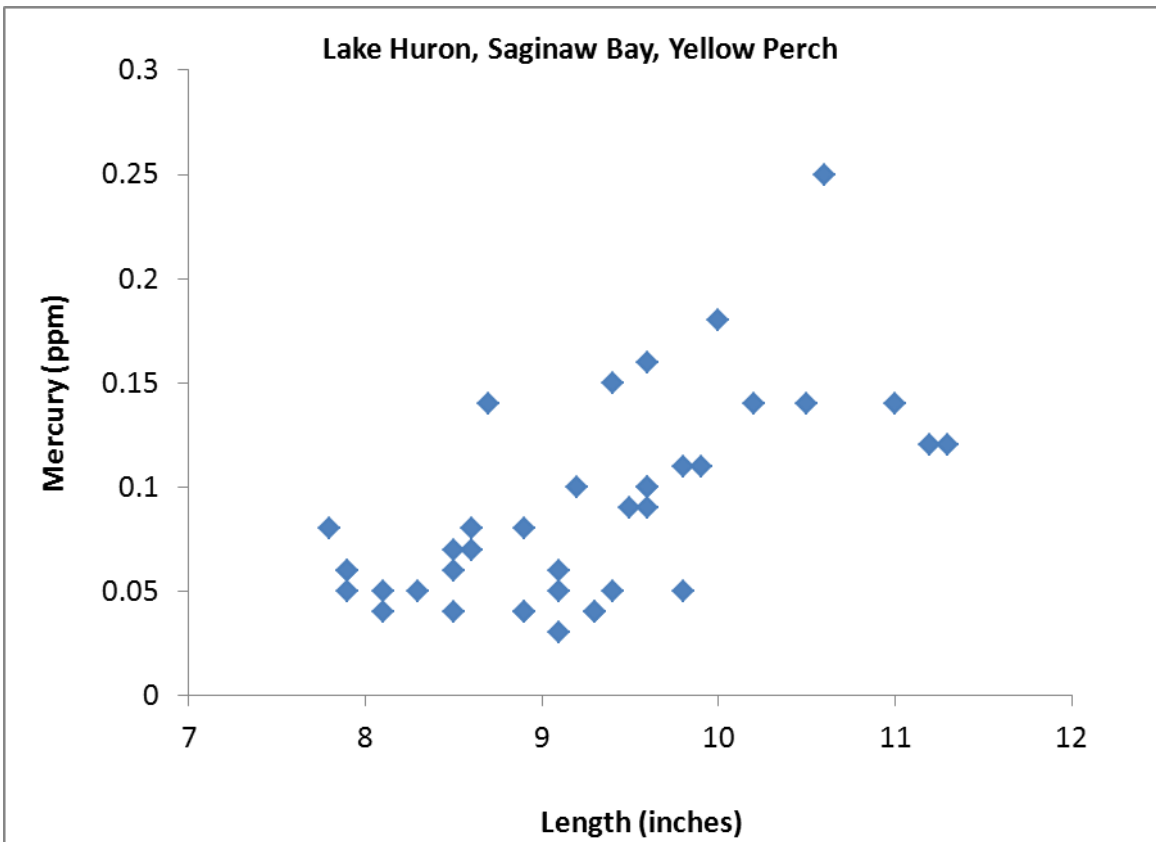
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2004	2004	10	7.9	na	7.9	11.3
Datasets available: 1987, 1988, 1991, 1993, 1995 2004						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL	Meal Category
PCB	10	0.010	0.001	0.04	0.02	12
DDT	10	0.002	0.001	0.004	0.003	16
Chlordane	10	ND	--	--	--	--
Toxaphene	10	ND	--	--	--	--
TEQ*	7	1.4 ppt	0.27 ppt	4.1 ppt	2.8 ppt	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.060	0.059				
DDT	0.202	0.189				
Chlordane	--	--				
Toxaphene	--	--				
TEQ*	0.305	0.283	Final meal category based on UCL: 2			

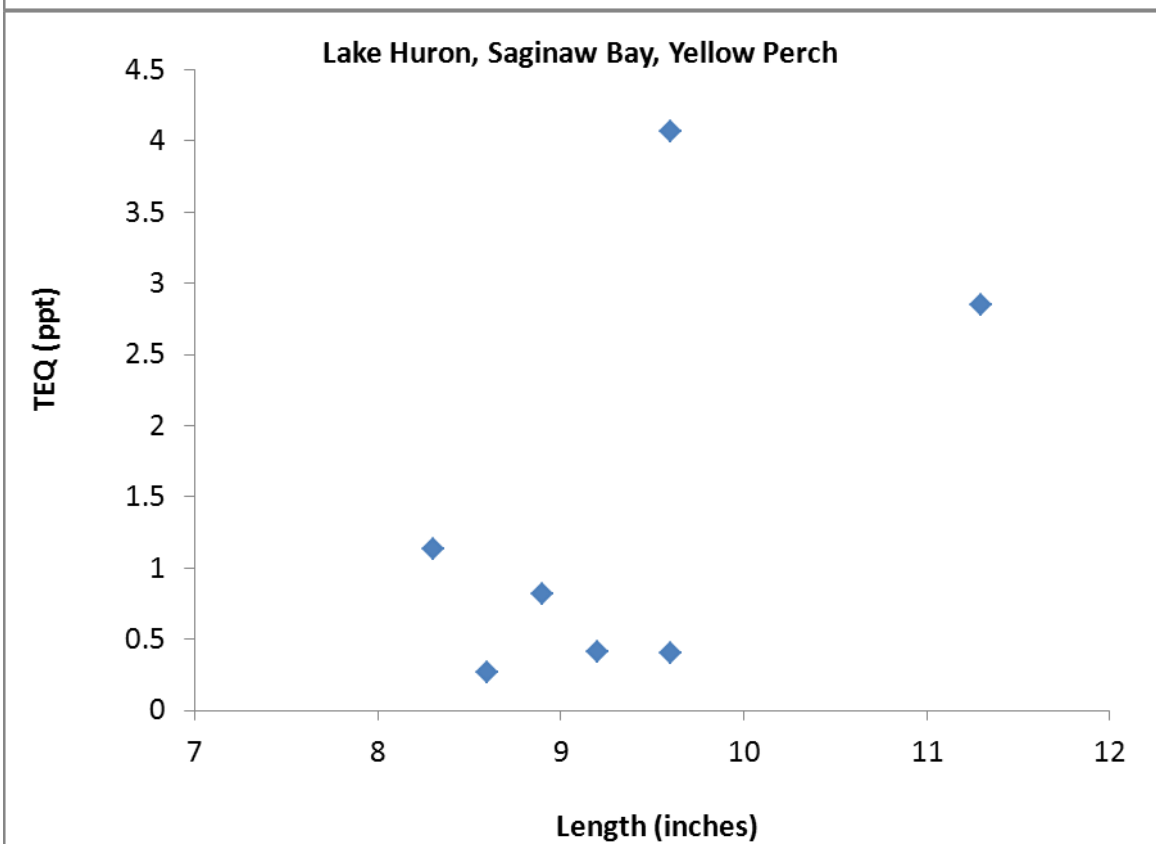
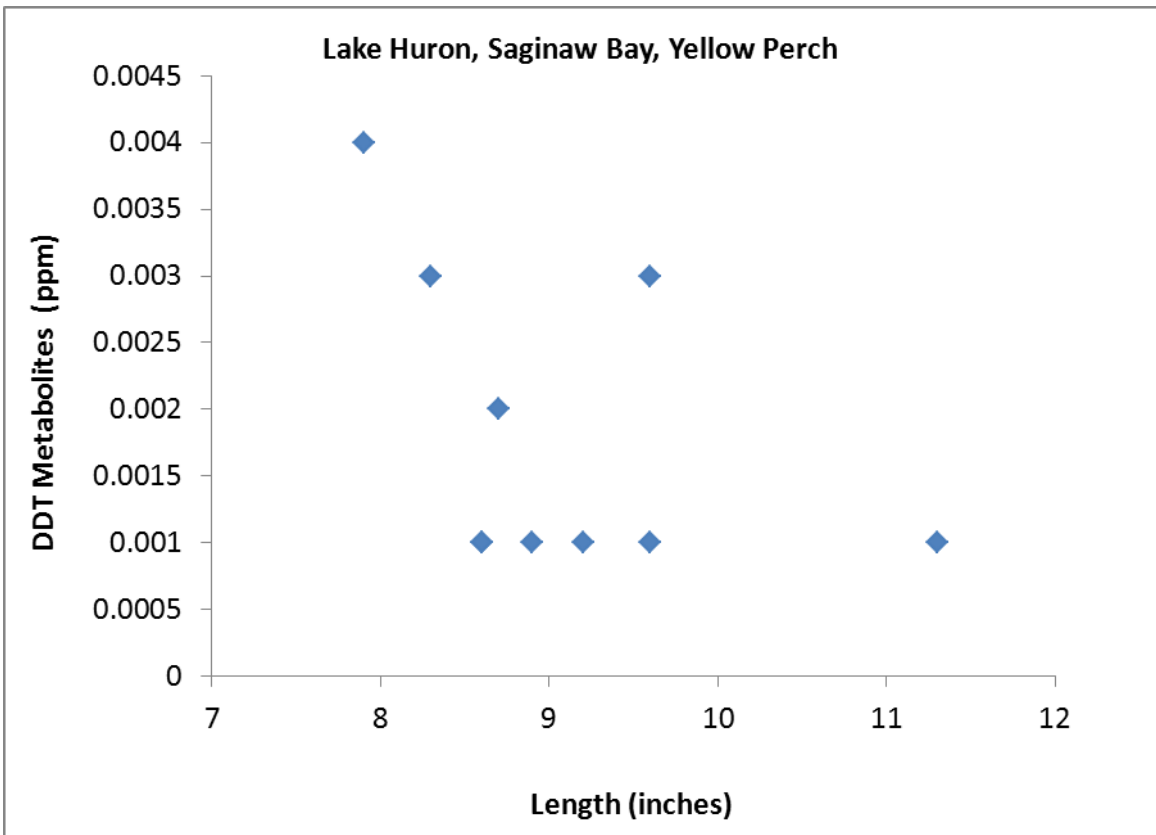
* 2005 WHO; dl-PCBs included

Existing Advisory: Women and children should not eat more than 1 meal per week of Saginaw Bay yellow perch due to elevated concentrations of PCBs.

Recommendation: No one should eat more than 2 meals per month of yellow perch from Saginaw Bay, Saginaw River, or Tittabawassee River downstream of the Midland Dam due to elevated concentrations of dioxin. Mercury and PCBs would cause advisories.

Note: The recommendation is based only on samples collected from Saginaw Bay, but is expanded to include the Saginaw and Tittabawassee Rivers; yellow perch are not likely to move from the bay upstream to Midland, but it is expected that any perch in the rivers will have contaminant concentrations no less than those in the bay.





Tuscola County

Northern Pike

Murphy Lake

Tuscola County

Hg Analysis:

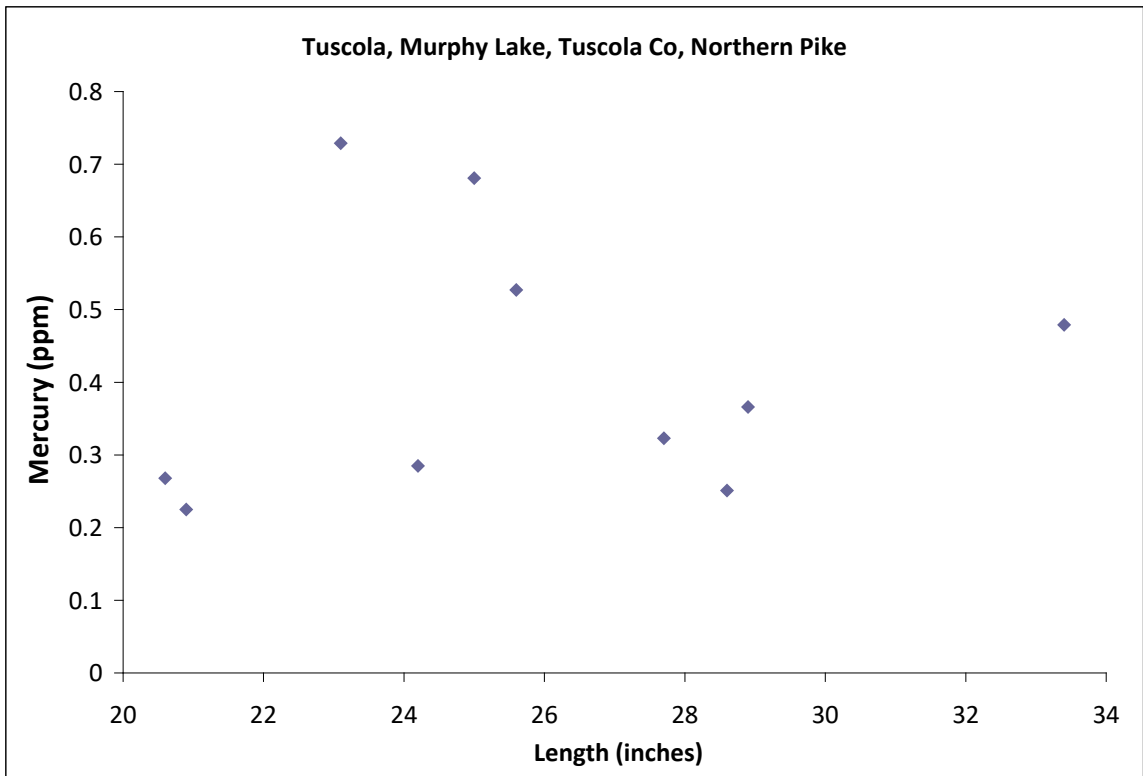
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1988	1988	10	20.6	24	24.2	33.4
Datasets available: 1988						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	7	0.416		0.560	1	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.006	0.033				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	0	--	--	--	--
Datasets available:						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	0	--		--	--	
DDT	0	--		--	--	
Chlordane	0	--		--	--	
Toxaphene	0	--		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:					1	

Existing Advisory: Murphy Lake northern pike are covered under the statewide mercury consumption advisory.

Recommendation: No one should eat more than 1 meal per month of Murphy Lake northern pike less than 30 inches or 6 meals per year of Murphy Lake northern pike greater than 30 inches due to mercury. This dataset is limited by age of the data. Based on EGLE’s Fish Contaminant Monitoring Program (FCMP), temporal changes in mercury concentrations are waterbody specific in Michigan. The EGLE FCMP finds that mercury concentration in fish are either staying the same or increasing. The meal category is based on the available dataset. Statewide guideline length break was applied.



Washtenaw County

Bluegill/Pumpkinseed

Bruin Lake

Washtenaw County

Hg Analysis:

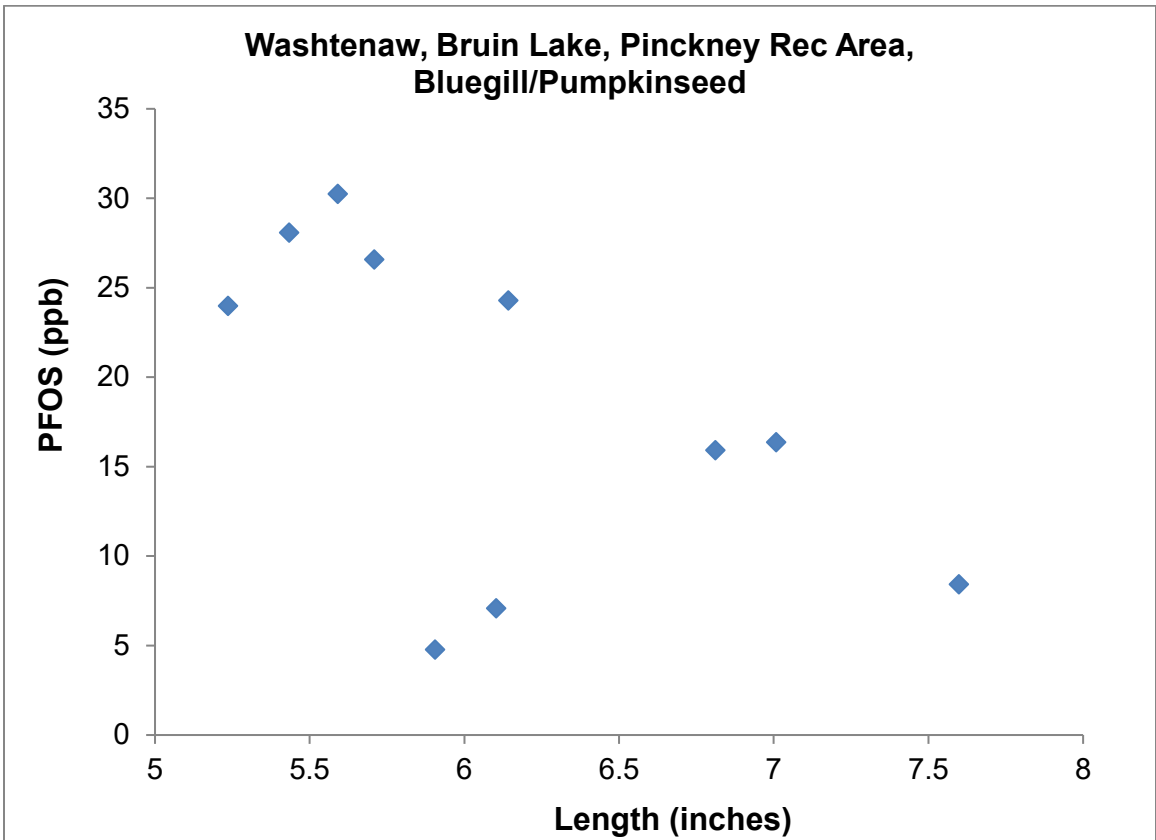
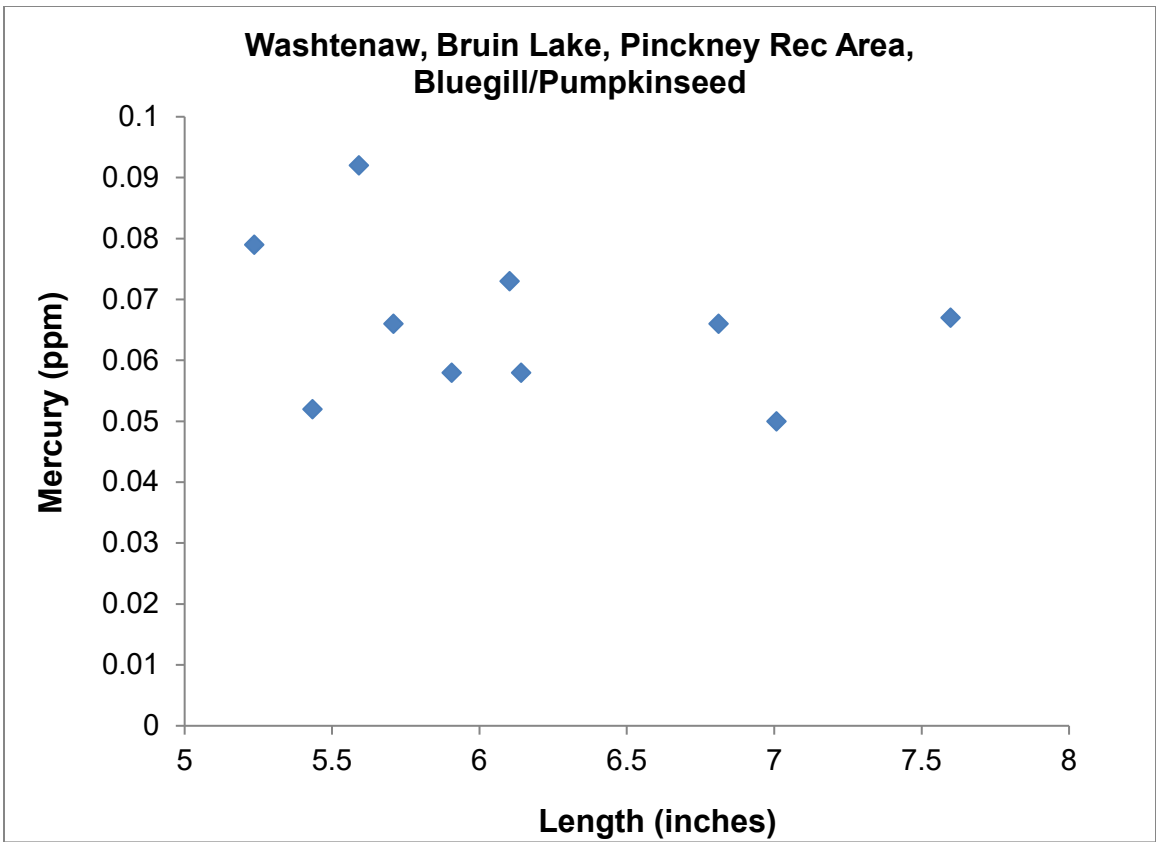
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2021	2021	10	5.2	NA	5.2	7.6
Datasets available: 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.066	0.050	0.092	0.075	12
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.095	0.082				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2021	2021	10	5.2	NA	5.2	7.6
Datasets available: 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
PFOS	10	18.6 ppb	4.8 ppb	30.3 ppb	25.3 ppb	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.321	0.187				
Final meal category based on UCL:						4

Existing MDHHS Advisory: Bluegill and sunfish from Bruin Lake in Washtenaw County are currently covered under the statewide mercury guidance. No one should eat more than 8 meals per month of bluegill or sunfish of any size.

Recommendation: No one should eat more than 4 meals per month of bluegill or sunfish of any size from Bruin Lake in Washtenaw County due to PFOS. Mercury causes less restrictive advice.



Brown Bullhead

First Sister Lake

Washtenaw County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1994	1994	6	8.7	na	8.7	11.4
Datasets available: 1994						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	6	0.112		0.180		4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.404	0.203				

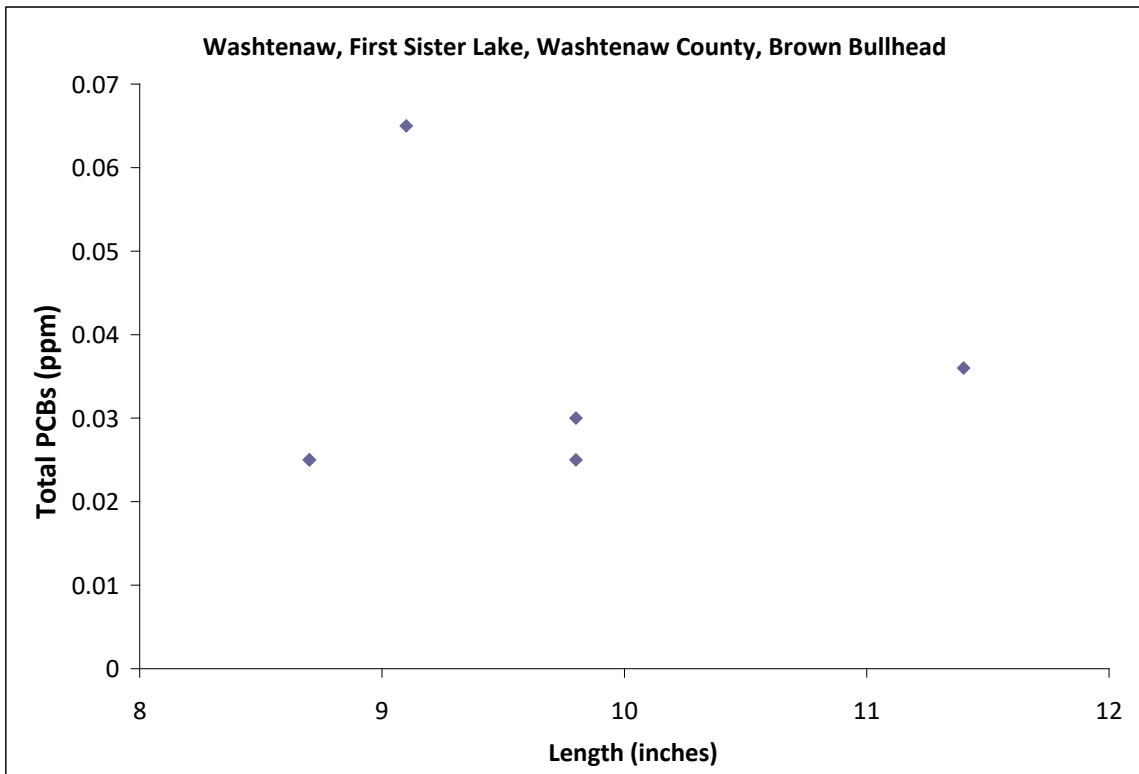
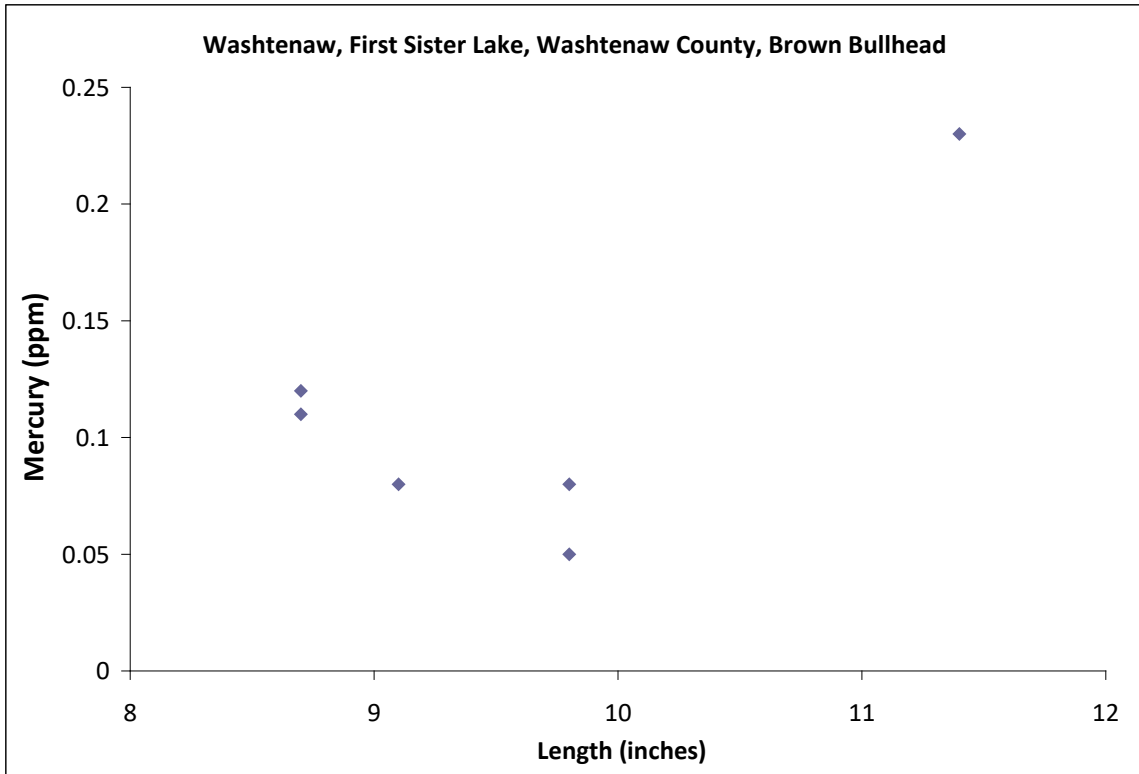
Organics Analysis:

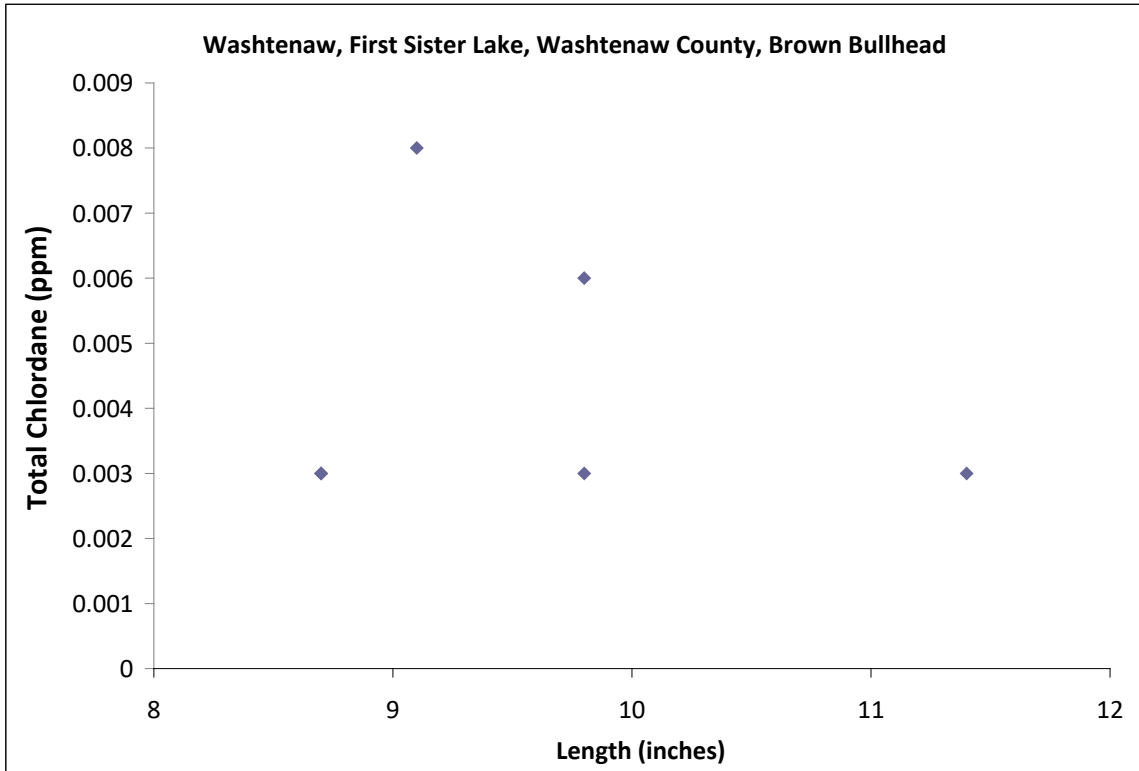
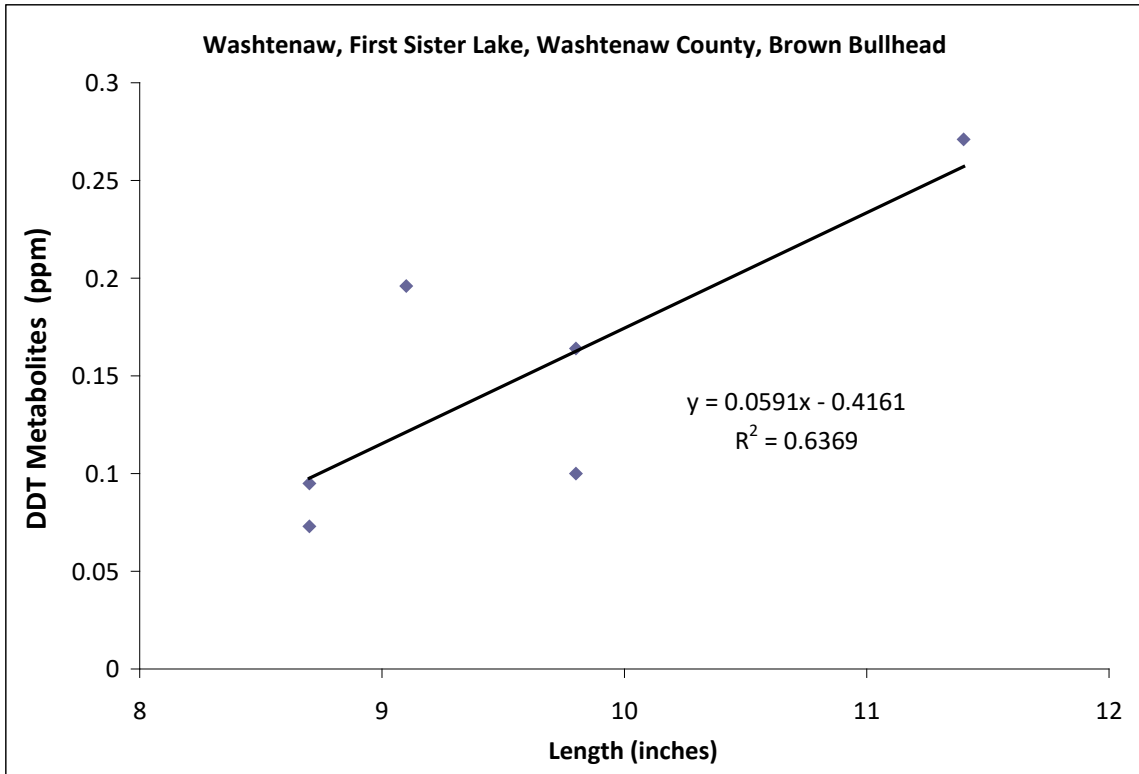
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1994	1994	6	8.7	na	8.7	11.4
Datasets available: 1994						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	6	0.034		0.050		4
DDT	6	0.150		0.230		8
Chlordane	6	0.004		0.010		--
Toxaphene	6	ND		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.000	0.016				
DDT	0.637	0.564				
Chlordane	0.026	0.021				
Toxaphene	--	--				
Final meal category based on UCL:						4

Existing Advisory: First Sister Lake brown bullhead are not covered by an advisory.

Recommendation: No one should eat more than 4 meals per month of First Sister Lake bullhead due to mercury. PCBs and DDT would cause advisories. Based on EGLE's Fish Contaminant Monitoring Program, PCB and DDT concentrations ≥15 years old are expected to have declined leaving mercury as the cause of the advisory.

Length (Inches)	DDT Regression Equation Estimate (ppm)	Meal Category
8	0.057	16
9	0.116	12
10	0.175	8
11	0.234	4
12	0.293	4
13	0.352	4
14	0.411	4
15	0.470	2
16	0.530	2
<i>Shaded area denotes extrapolated estimates</i>		





White Crappie

First Sister Lake

Washtenaw County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1994	1994	2	8.7	na	8.7	9.1
Datasets available: 1994						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	2	0.245				
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.404	0.203				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1994	1994	2	8.7	na	8.7	9.1
Datasets available: 1994						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	2	ND		--		--
DDT	2	0.044		--		--
Chlordane	2	ND		--		--
Toxaphene	2	ND		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						1

Existing Advisory: First Sister Lake white crappie are covered under the statewide mercury consumption advisory.

Recommendation: Statewide guidelines would apply to First Sister Lake white crappie.

Northern Pike

Four Mile Lake

Washtenaw County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2000	2000	10	19.9	24	25.1	32.3
Datasets available: 2000						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10^	0.74	0.42	1.49	0.95	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.517	0.364				

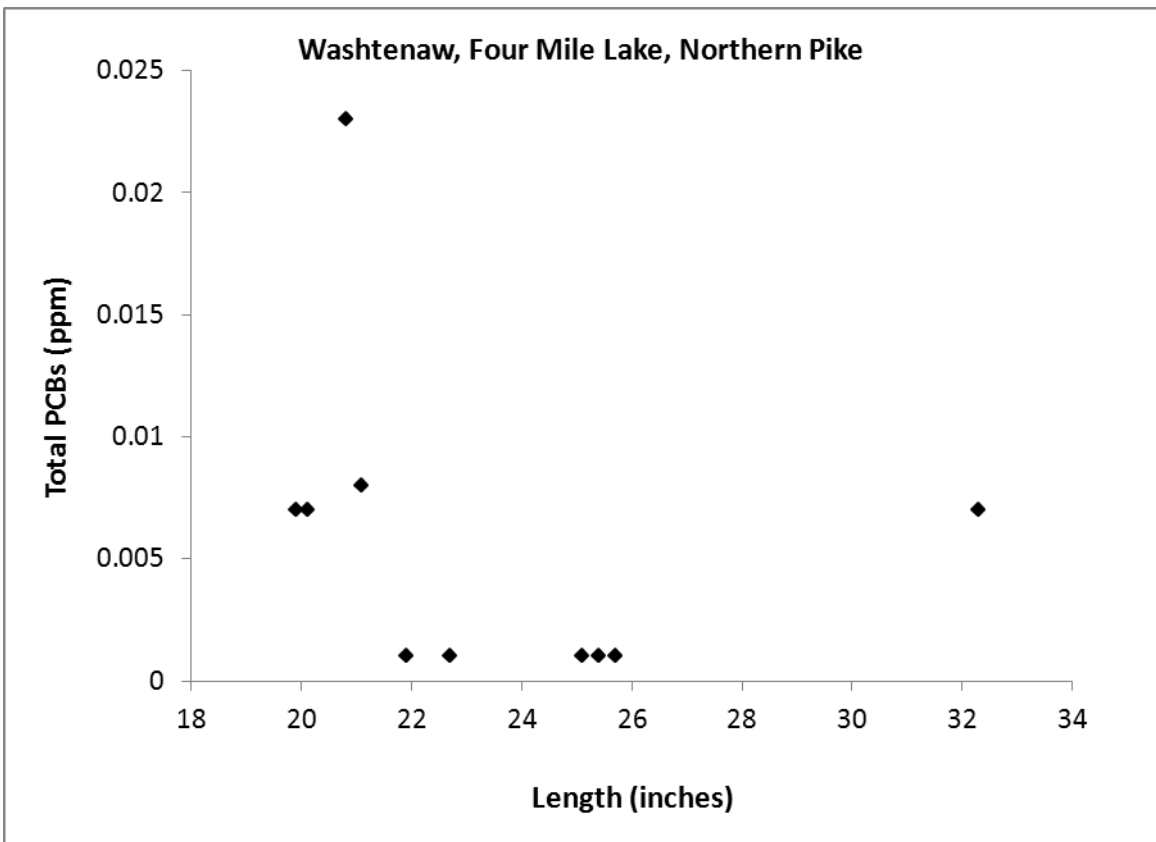
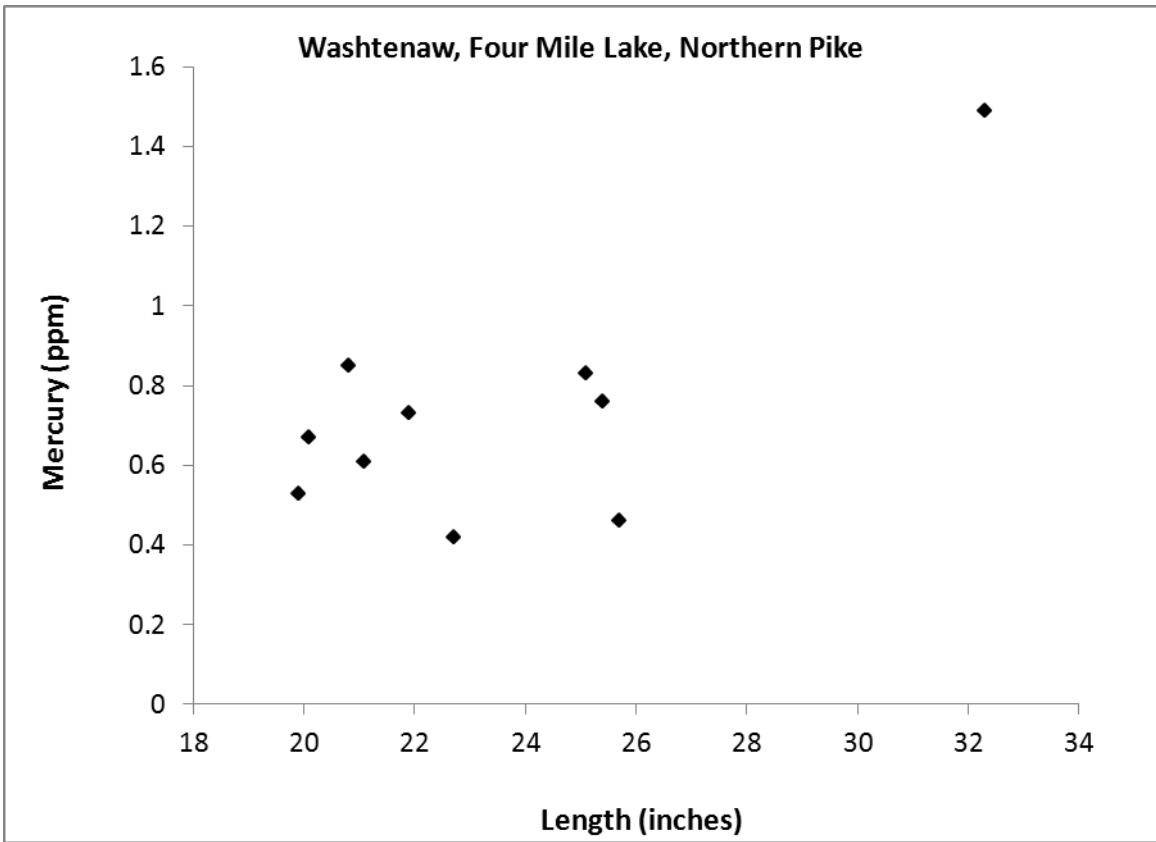
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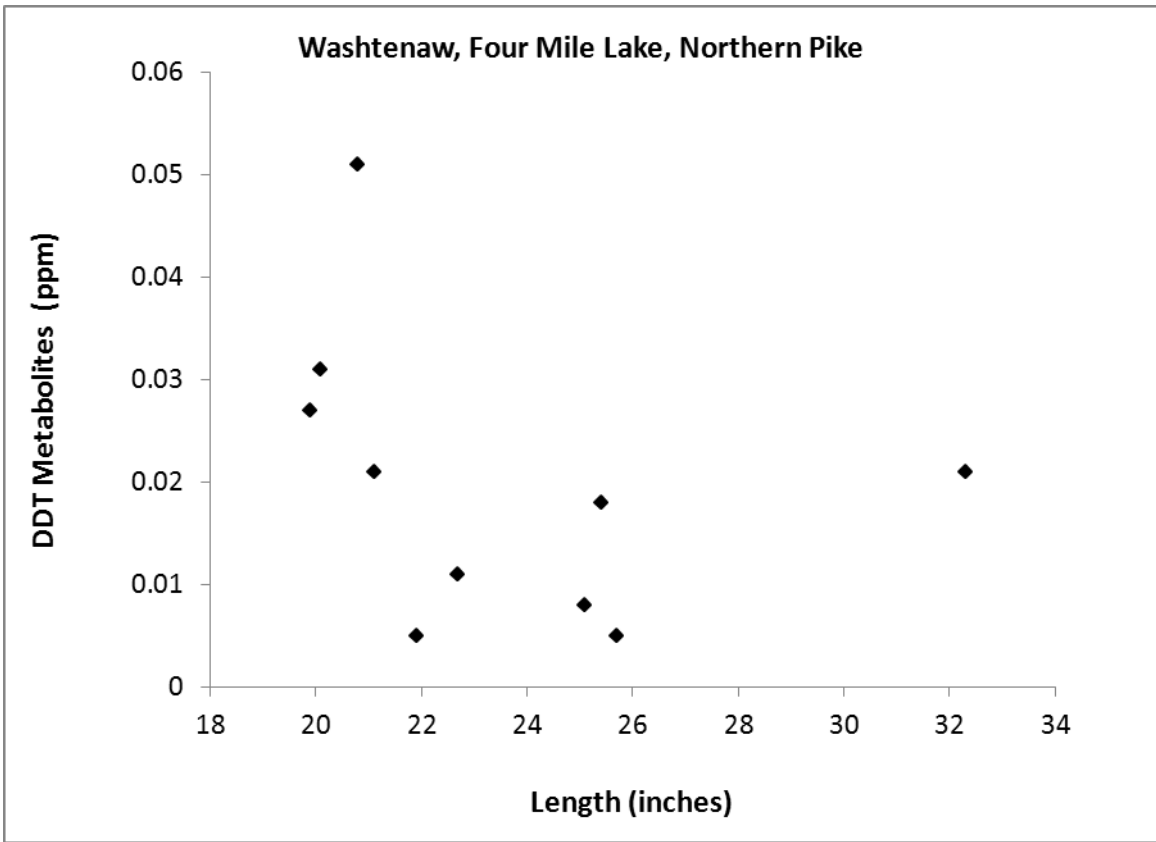
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2000	2000	10	19.9	24	25.1	32.3
Datasets available: 2000						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10^	0.006	0.001	0.02	0.01	--
DDT	10^	0.02	0.005	0.05	0.03	--
Chlordane	10^	ND	--	--	--	--
Toxaphene	10^	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.079	0.058				
DDT	0.116	0.065				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						1

^sublegal samples are included.

Existing Advisory: Four Mile Lake northern pike are covered under the statewide mercury advisory.

Recommendation: No one should eat more than 1 meal per month of Four Mile Lake northern pike less than 30 inches or more than 6 meals per year of those greater than 30 inches. The dataset includes six sublegal fish and has limited samples greater than 30 inches. The statewide length break was applied.





Hg Analysis:

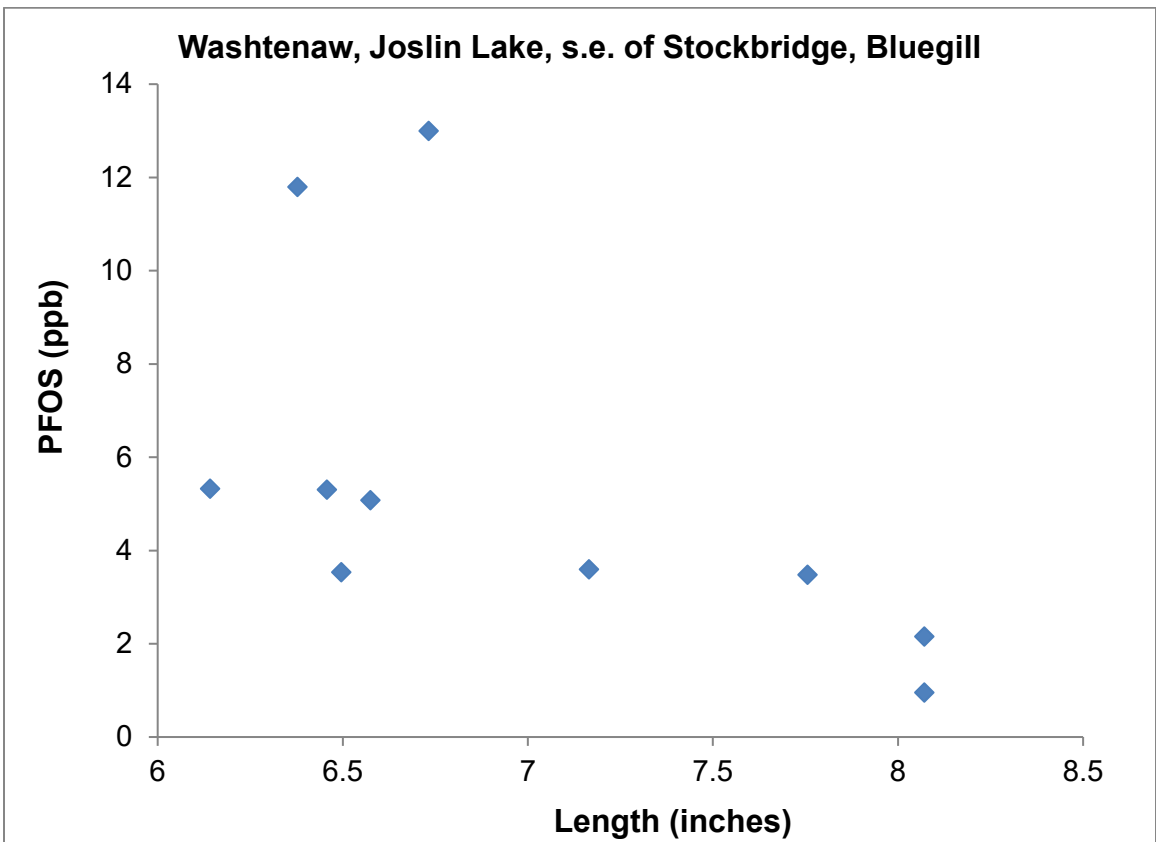
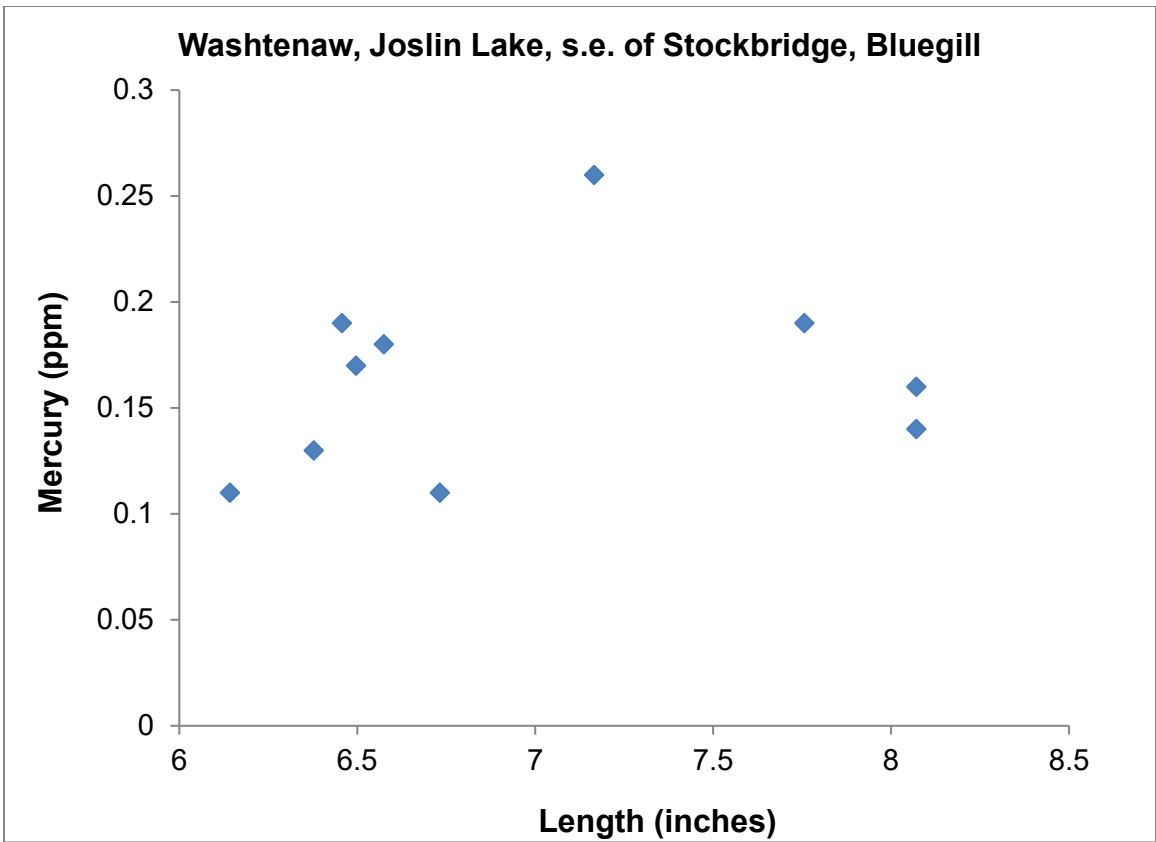
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2019	2019	10	6.1	NA	6.1	8.1
Datasets available: 2019						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.164	0.110	0.260	0.196	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.045	0.062				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2019	2019	10	6.1	NA	6.1	8.1
Datasets available: 2019						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
PFOS	10	5.4 ppb	1.0 ppb	13.0 ppb	8.2 ppb	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.326	0.556	Final meal category based on UCL:			4

Existing MDHHS Advisory: Bluegill and sunfish from Joslin Lake in Washtenaw County are currently covered under the statewide mercury guidance. No one should eat more than 8 meals per month of bluegill or sunfish of any size.

Recommendation: No one should eat more than 4 meals per month of bluegill or sunfish from Joslin Lake in Washtenaw County due to mercury.



Largemouth Bass

Joslin Lake

Washtenaw County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2019	2019	10	13.3	14.0	13.5	17.4
Datasets available: 2019						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	6	0.845	0.680	1.100	1.019	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.381	0.378				

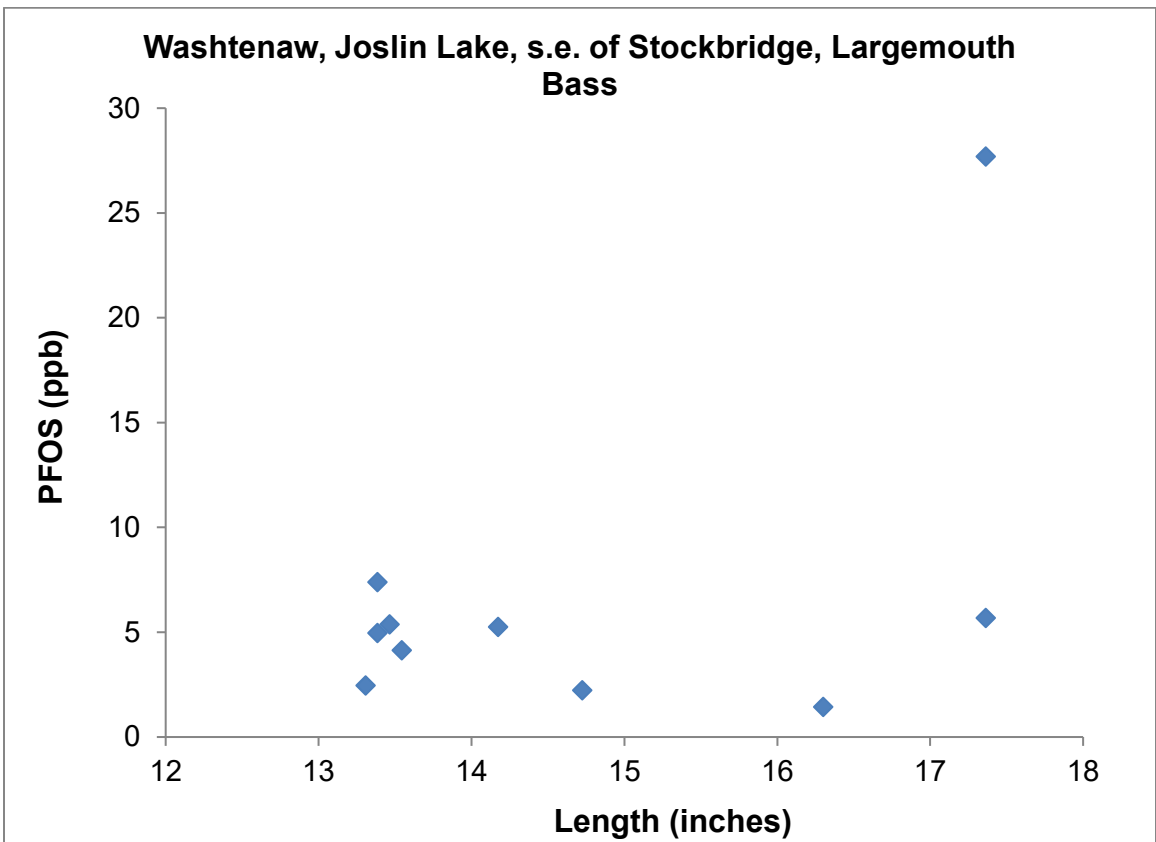
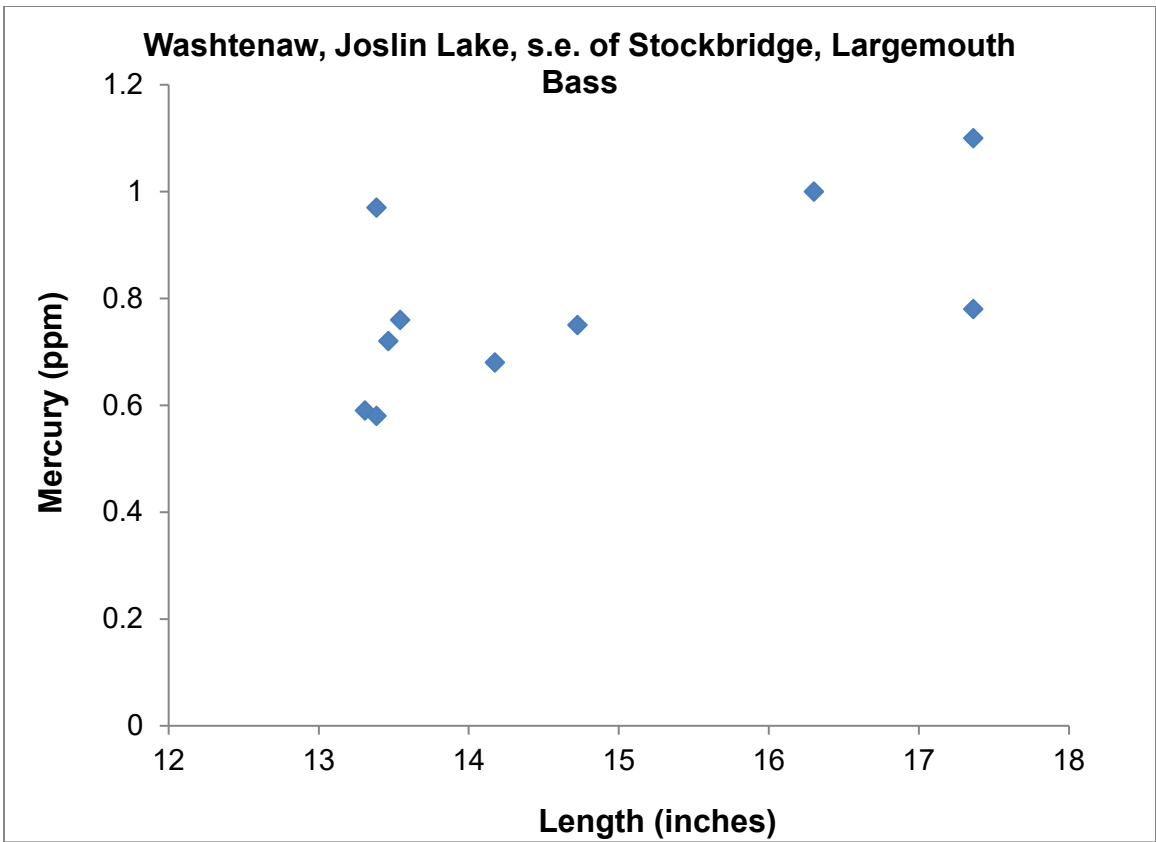
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2019	2019	10	13.3	14.0	13.3	17.4
Datasets available: 2019						
Chemical	Sample Size (All*)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
PFOS	10	6.7 ppb	1.4 ppb	27.7 ppb	12.1 ppb	12
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.249	0.082	Final meal category based on UCL:			1

* Sub-legal sized fish were used in the PFOS analysis as no correlation between fish size and PFOS concentration has been observed in the statewide dataset.

Existing MDHHS Advisory: Largemouth and smallmouth bass from Joslin Lake in Washtenaw County are currently covered under the statewide mercury guidance. No one should eat more than 2 meals per month of largemouth or smallmouth bass less than 18 inches or no more than 1 meal per month of these species larger than 18 inches.

Recommendation: No one should eat more than 1 meal per month of largemouth or smallmouth bass from Joslin Lake in Washtenaw County less than 18 inches due to mercury or no more than 6 meals per year of these fish larger than 18 inches due to mercury. Statewide length break applied due to the limited size range of fish used in this assessment. PFOS causes less restrictive guidance.



Bluegill

**Saline Pond
Saline River**

Washtenaw County

Hg Analysis:

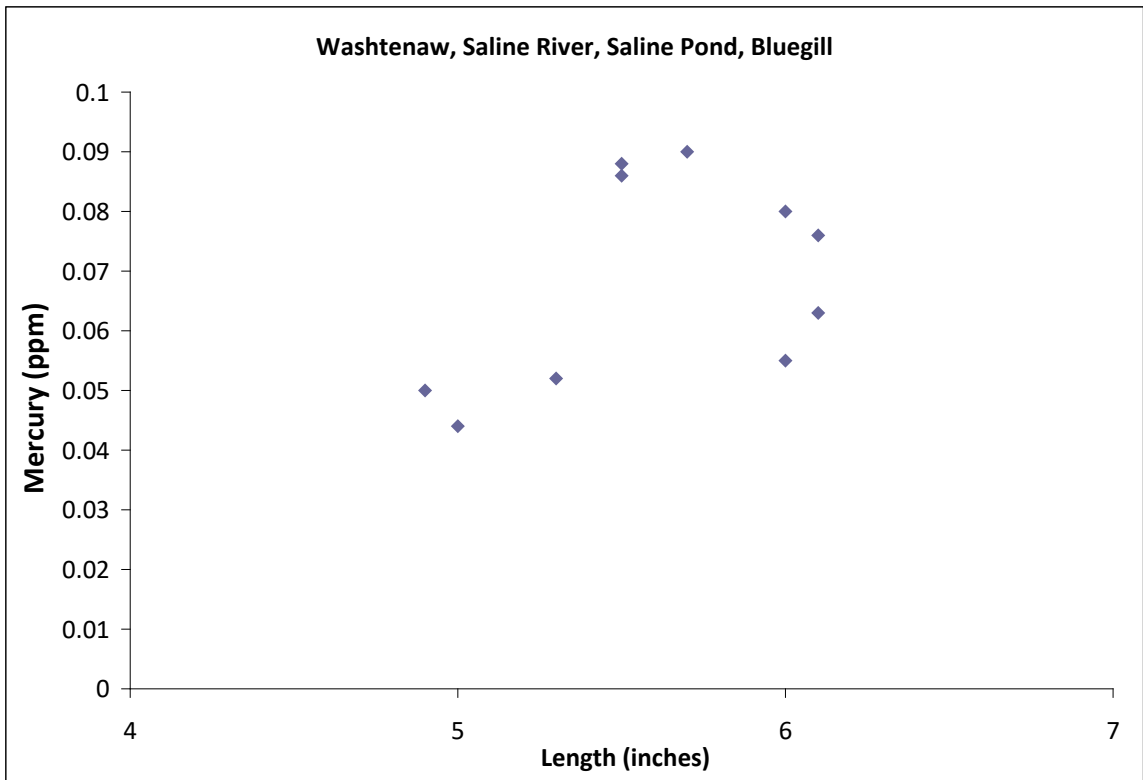
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2010	2010	10	4.9	na	4.9	6.1
Datasets available: 2010						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	10	0.068		0.080	12	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.198	0.251				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
		0				
Datasets available:						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	0	--		--	--	
DDT	0	--		--	--	
Chlordane	0	--		--	--	
Toxaphene	0	--		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:					12	

Existing Advisory: Saline Pond bluegill are not covered by an advisory.

Recommendation: No one should eat more than 12 meals per month of Saline Pond bluegill due to mercury.



Largemouth Bass

**Saline Pond
Saline River**

Washtenaw County

Hg Analysis:

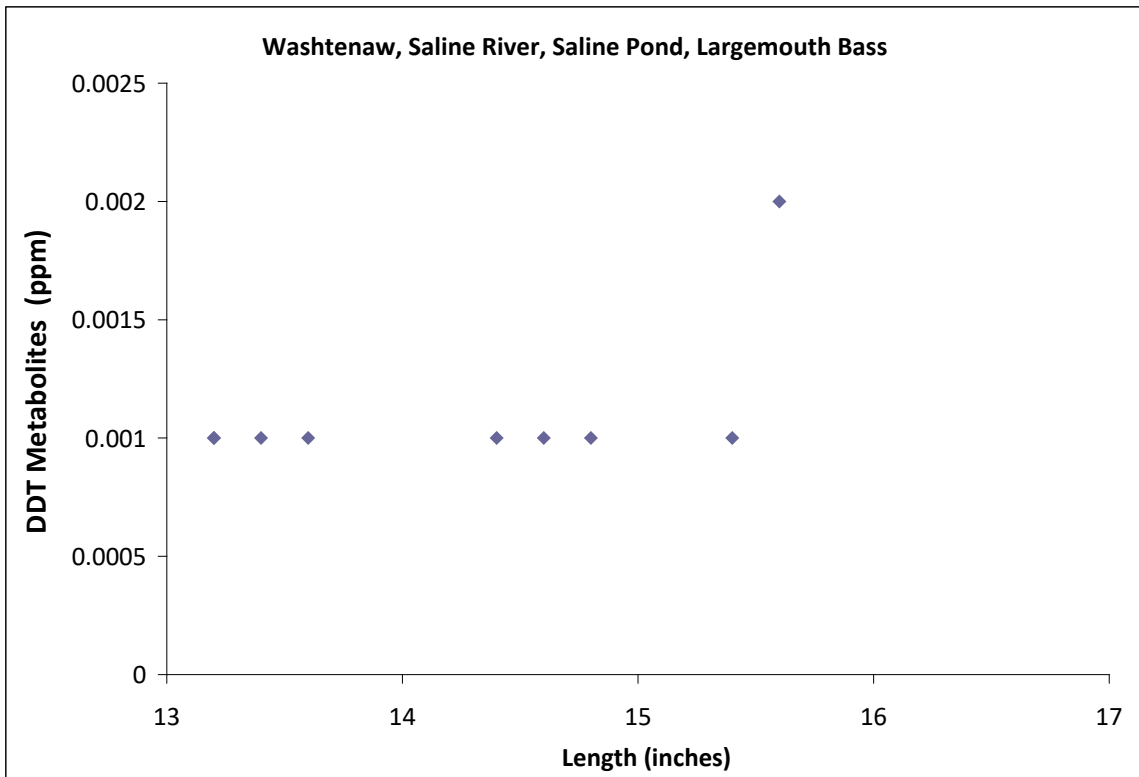
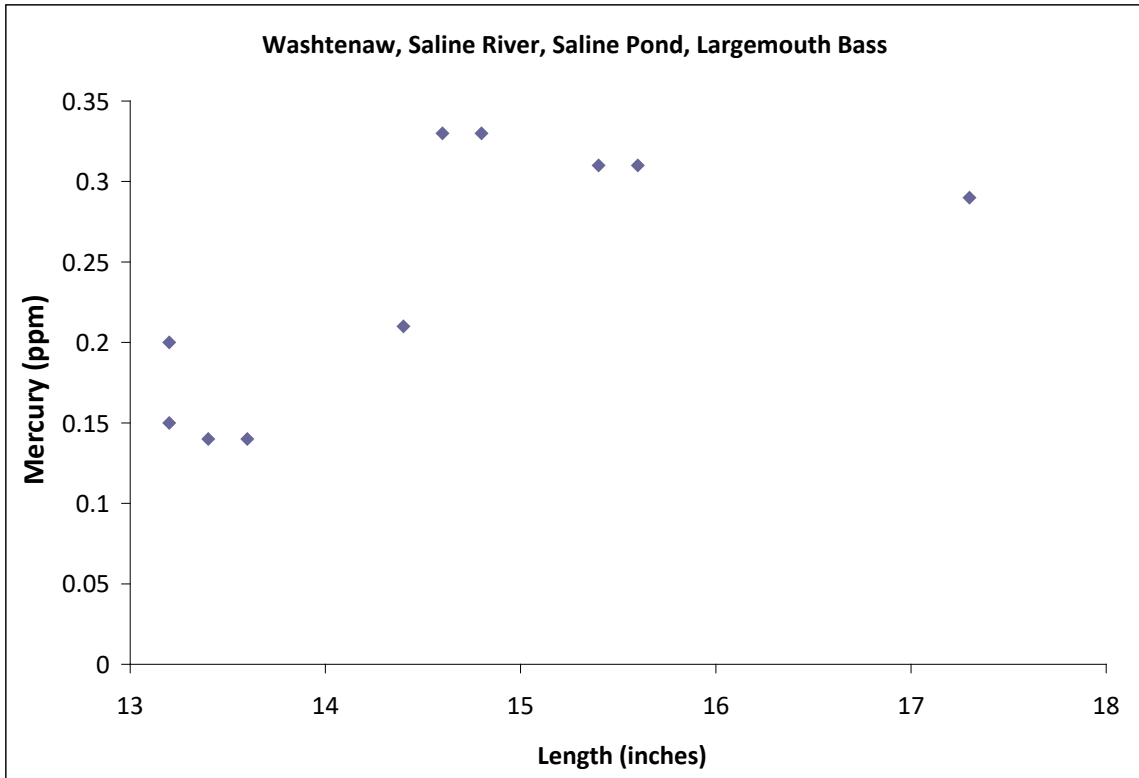
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2010	2010	10	13.2	14	13.6	17.3
Datasets available: 2010						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	7	0.274		0.340	2	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.521	0.536				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2010	2010	10	13.2	14	13.6	17.3
Datasets available: 2010						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	7	ND		--	--	
DDT	7	0.001		0.002	16	
Chlordane	7	ND		--	--	
Toxaphene	7	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	0.080	0.080				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						2

Existing Advisory: Saline Pond largemouth bass are covered under the statewide mercury consumption advisory.

Recommendation: No one should eat more than 2 meals per month of Saline Pond largemouth bass less than 18 inches or 1 meal per month of Saline Pond largemouth bass greater than 18 inches due to mercury. Statewide guideline length break applied.



Brown Bullhead

Second Sister Lake

Washtenaw County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1994	1994	10	9.5	na	9.5	13.2
Datasets available: 1994						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	10	0.443		0.520		2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.196	0.284				

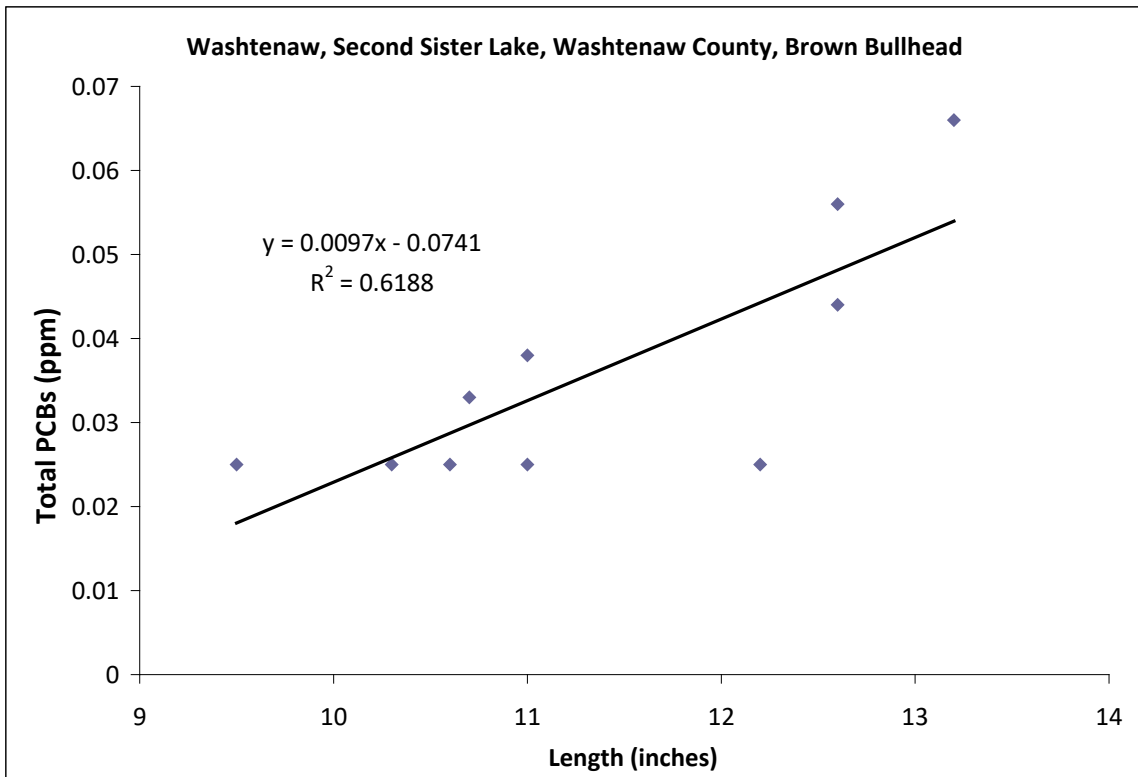
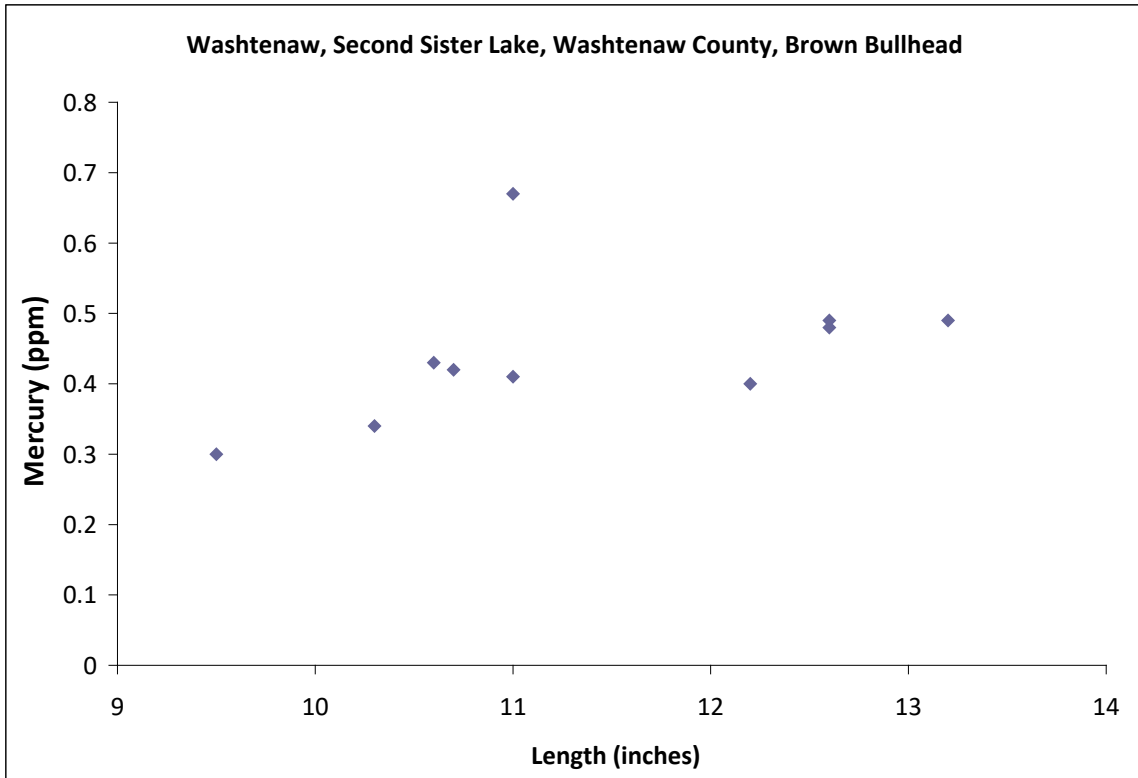
Organics Analysis:

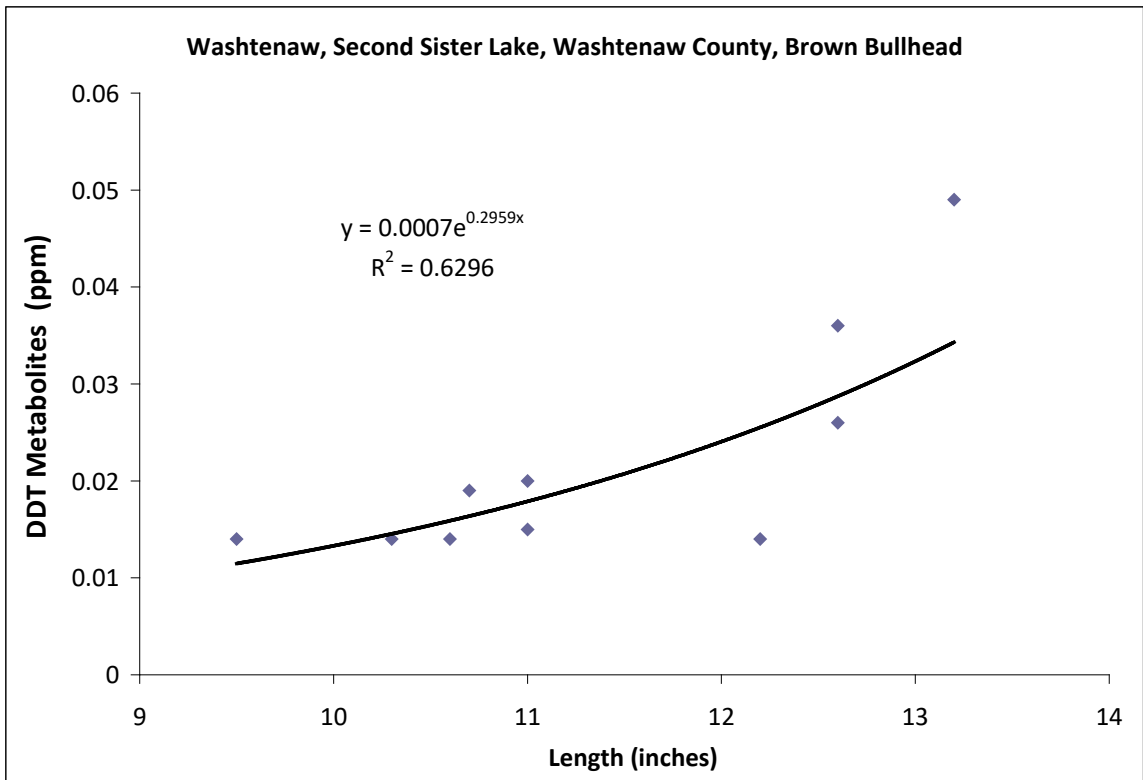
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1994	1994	10	9.5	na	9.5	13.2
Datasets available: 1994						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	10	0.036		0.050		4
DDT	10	0.022		0.030		16
Chlordane	10	ND		--		--
Toxaphene	10	ND		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.619	0.603				
DDT	0.609	0.630				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						2

Existing Advisory: Second Sister Lake brown bullhead are not covered by an advisory.

Recommendation: No one should eat more than 2 meals per month of Second Sister Lake bullhead due to mercury. Based on EGLE’s Fish Contaminant Monitoring Program (FCMP), temporal changes in Hg concentrations are waterbody specific in Michigan. The EGLE FCMP finds that mercury concentration in fish are either staying the same or increasing. The meal category is based on the available dataset. PCBs can cause an advisory.

Length (Inches)	PCB Regression Equation Estimate (ppm)	Meal Category
8	0.004	16
9	0.013	12
10	0.023	8
11	0.033	4
12	0.042	4
13	0.052	2
14	0.062	2
<i>Shaded area denotes extrapolated estimates</i>		





Bluegill

Silver Lake, Pinckney Recreation Area

Washtenaw County

Hg Analysis:

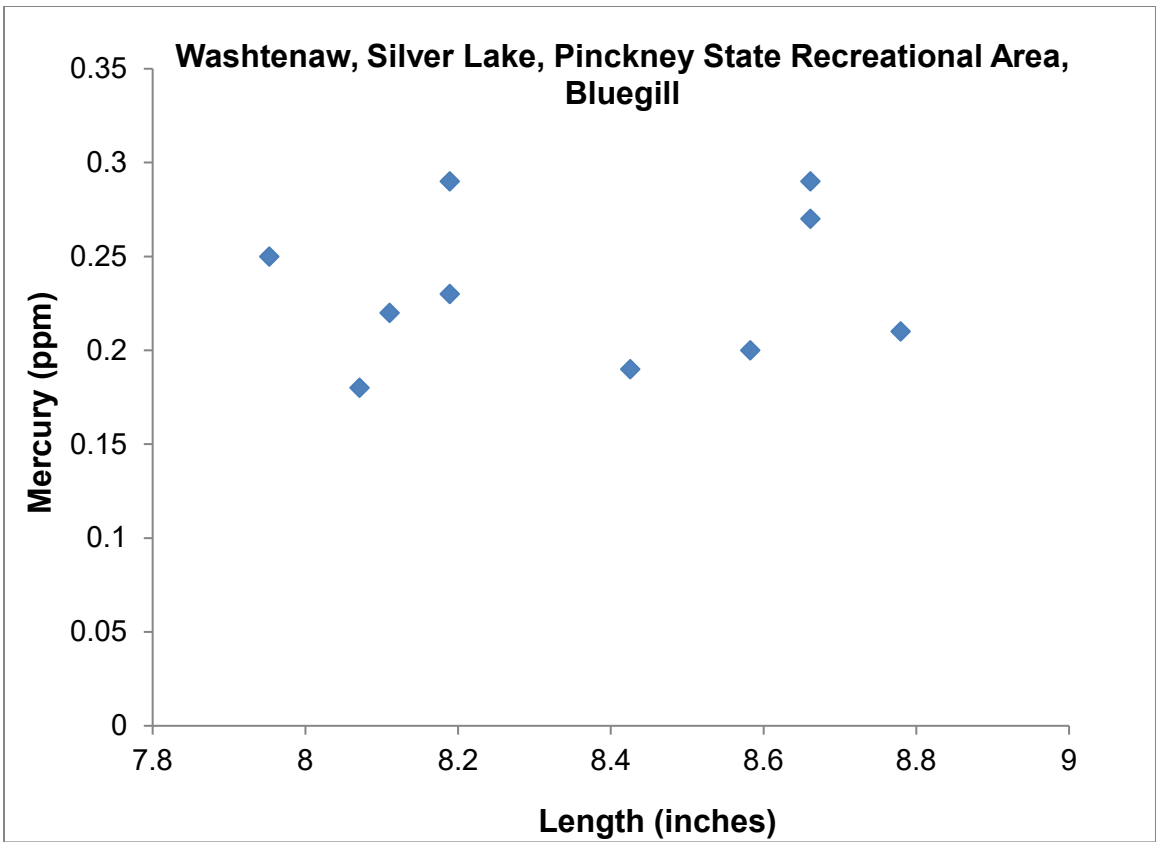
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples			
Earliest	Most Recent							
2020	2020	10	8.0	NA	8.0	8.8		
Datasets available: 2020								
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category		
Mercury	10	0.233	0.18	0.290	0.262	4		
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
Mercury	0.010	0.010						

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples			
Earliest	Most Recent							
2020	2020	10	8.0	NA	8.0	8.8		
Datasets available: 2020								
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category		
PCB	0	--	--	--	--	--		
DDT	0	--	--	--	--	--		
Chlordane	0	--	--	--	--	--		
Toxaphene	0	--	--	--	--	--		
PFOS	10	--	< 0.25 ppb	< 0.25 ppb	--	16		
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
PCB	--	--						
DDT	--	--						
Chlordane	--	--						
Toxaphene	--	--						
PFOS	NA	NA						
						Final meal category based on UCL:	4	

Existing MDHHS Advisory: Bluegill and sunfish from Silver Lake in the Pinckney Recreation area are covered by the statewide advisory due to mercury: No one should eat more than 8 meals per month of bluegill or sunfish of any size.

Recommendation: No one should eat more than 4 meals per month of bluegill or sunfish of any size from Silver Lake in the Pinckney Recreation area due to mercury.



Hg Analysis:

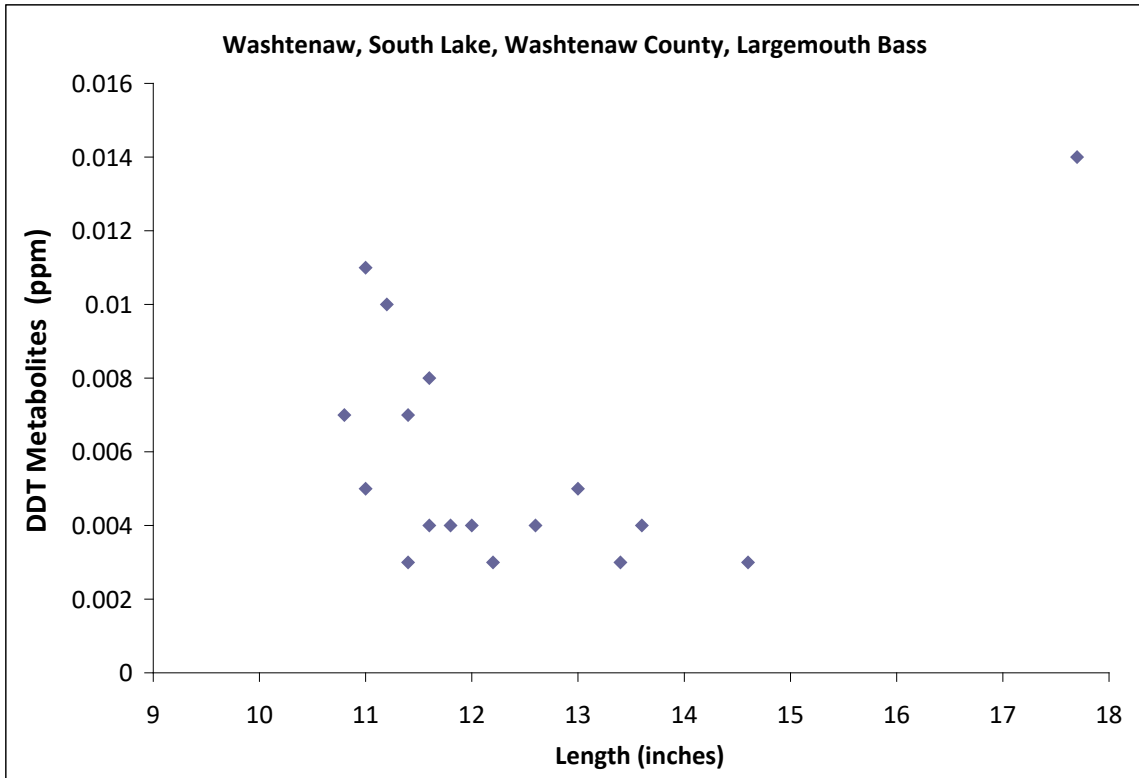
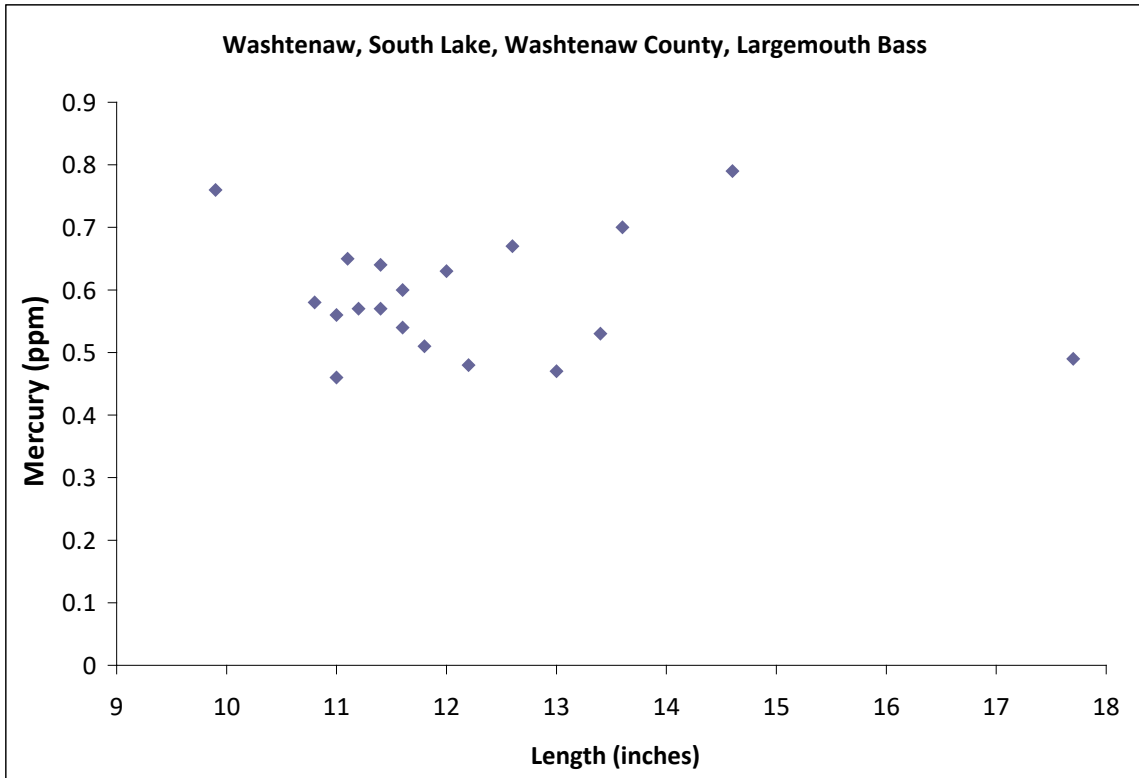
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	1989	19	9.9	14	13.6	17.7
Datasets available: 1987, 1988, 1989						
Chemical	Sample Size (Incl. Sublegal)	Mean (ppm)	95%UCL		Meal Category	
Mercury	19	0.59	0.64		1	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.008	0.013				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	1989	17	10.8	14	13.6	17.7
Datasets available: 1987, 1988, 1989						
Chemical	Sample Size (Incl. Sublegal)	Mean (ppm)	95%UCL		Meal Category	
PCB	17	ND	0.010		16	
DDT	17	0.006				
Chlordane	17	ND				
Toxaphene	17	ND				
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	0.061	0.010				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:					1	

Existing Advisory: South Lake largemouth bass are covered under the statewide mercury consumption advisory.

Recommendation No one should eat more than 1 meal per month of South Lake largemouth bass less than 18 inches or no more than 6 meals per year of bass greater than 18 inches due to mercury. This dataset is limited due to age of the data and sublegal lengths of the samples. Statewide guideline length break was applied.



Northern Pike

South Lake

Washtenaw County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	2008	22	15	24	23.7	31.5
Datasets available: 1987, 1988, 1989, 2008						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	8	0.963			1.31	0.5
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.702	0.711				

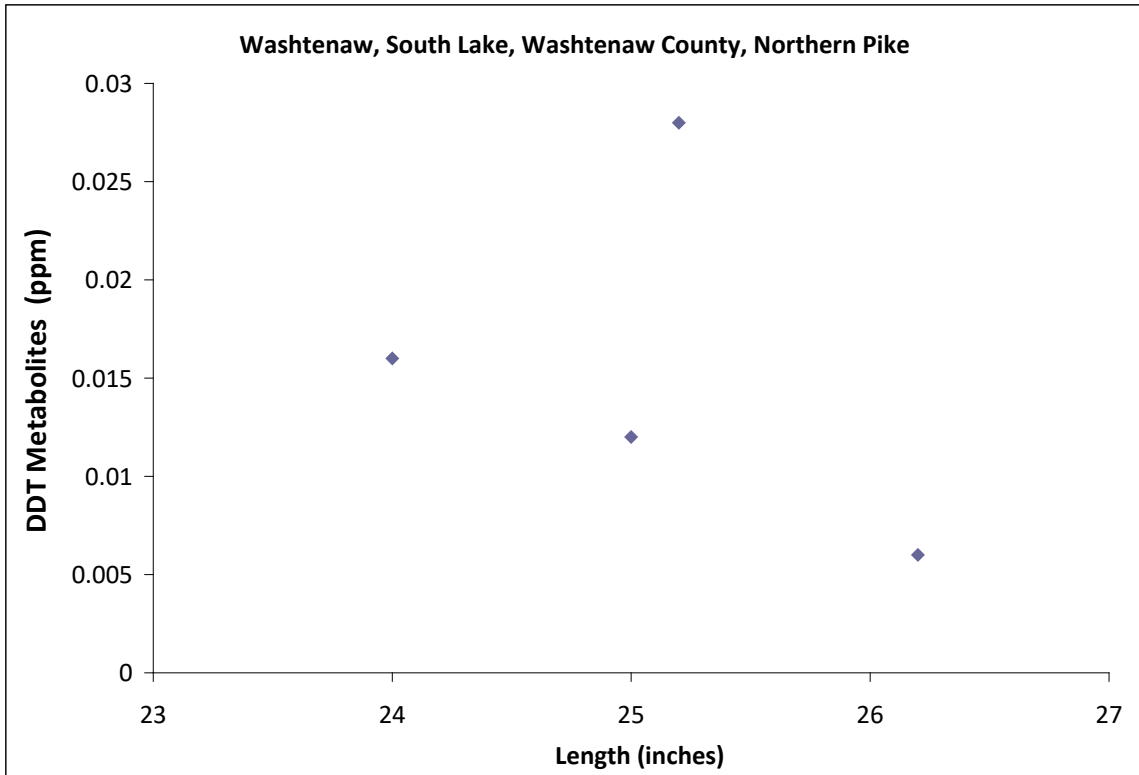
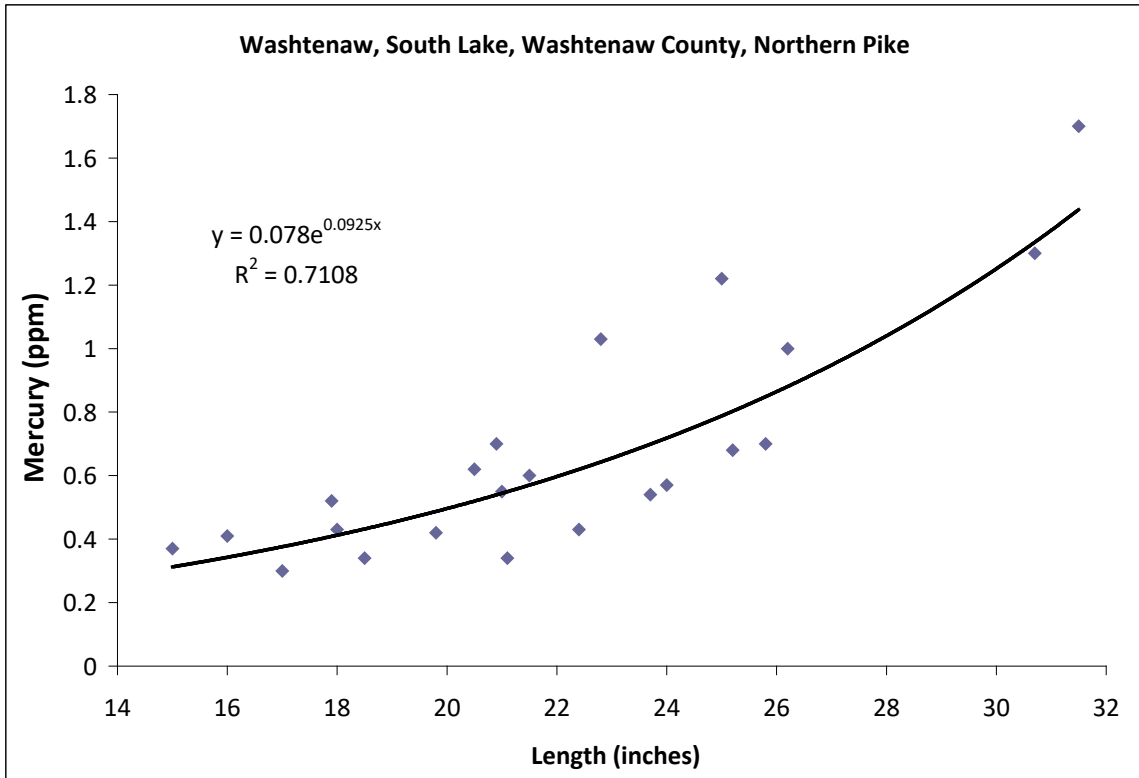
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1988	1989	7	20.5	24	24	26.2
Datasets available: 1988, 1989						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	4	ND			--	--
DDT	4	0.016		--	--	
Chlordane	4	ND		--	--	
Toxaphene	4	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	0.191	0.245				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:					0.5	

Existing Advisory: Women and children should eat no more than one meal per month of South Lake northern pike less than 30 inches in length. No one should eat South Lake northern pike larger than 30 inches in length due to elevated levels of mercury.

Recommendation: No one should eat more than 1 meal per month of South Lake northern pike less than 28 inches in length or more than 6 meals per year of South Lake northern pike greater than 28 inches due to mercury.

Length (Inches)	Hg Regression Estimate (ppm)	Meal Category
24	0.718	1
25	0.788	1
26	0.864	1
27	0.948	1
28	1.040	1
29	1.140	0.5
30	1.251	0.5
31	1.372	0.5
32	1.505	0.5
<i>Shaded area denotes extrapolated estimates</i>		



Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	1987	8	4.7	na	4.7	7.7
Datasets available: 1987						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	8	0.271		0.410	2	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.702	0.711				

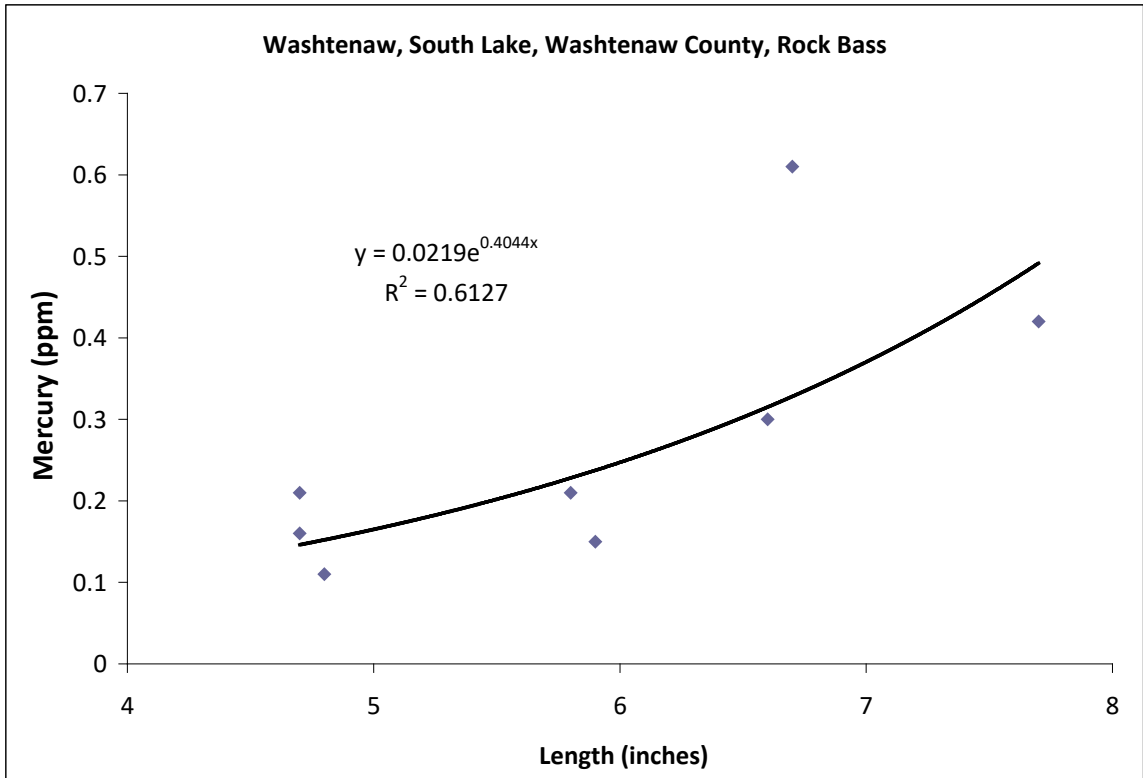
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
		0				
Datasets available:						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	0	--		--	--	
DDT	0	--		--	--	
Chlordane	0	--		--	--	
Toxaphene	0	--		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:					2	

Existing Advisory: South Lake rock bass are covered under the statewide mercury consumption advisory.

Recommendation: No one should eat more than 2 meals per month of South Lake rock bass due to elevated concentrations of mercury. Although the dataset is limited due to age of the data, the EGLE FCMP finds that mercury concentration in fish are either staying the same or increasing. This is based on EGLE's Fish Contaminant Monitoring Program (FCMP). The meal category is based on the available mercury dataset.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
4	0.110	8
5	0.165	4
6	0.248	4
7	0.371	2
8	0.557	1
9	0.834	1
10	1.249	0.5
11	1.872	0.5
12	2.805	0
<i>Shaded area denotes extrapolated estimates</i>		



Bullhead

**Unnamed Lake
T3S/R7E/S26**

Washtenaw County

Hg Analysis:

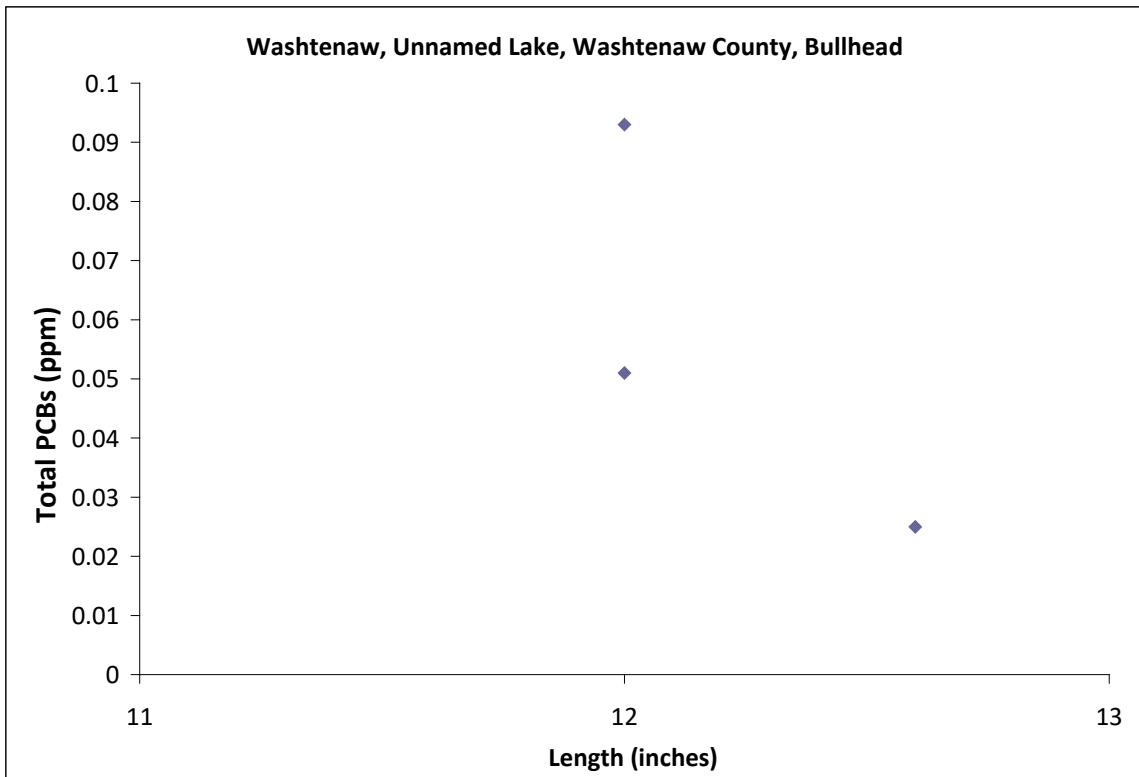
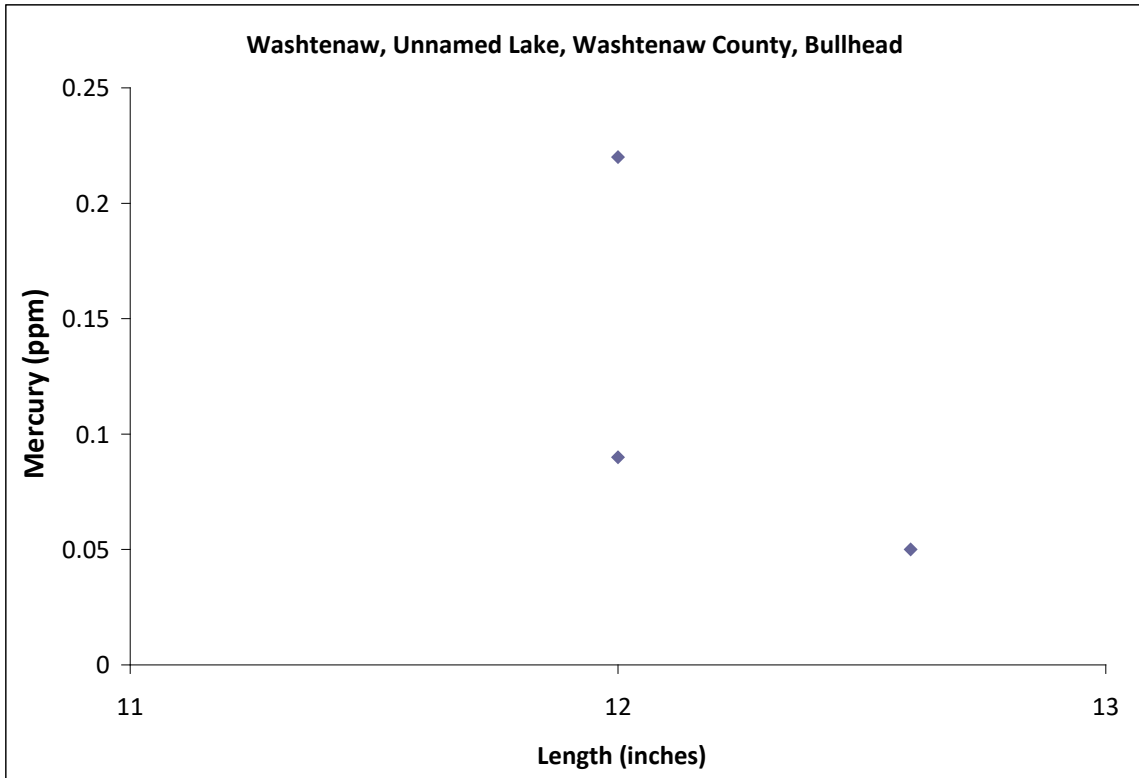
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	1989	3	12	na	12	12.6
Datasets available: 1989						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	3	0.12		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.465	0.641		<i>limited data – regression not used</i>		

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	1989	3	12	na	12	12.6
Datasets available: 1989						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	3	0.056		--		--
DDT	3	0.005		--		--
Chlordane	3	ND		--		--
Toxaphene	3	ND		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.625	0.791		<i>limited data – regression not used</i>		
DDT	0.429	0.527				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						

Existing Advisory: Women and children should eat no more than one meal per week of Unnamed Lake (T3S/R7E/S26) bullhead due to elevated levels of PCBs.

Recommendation: This dataset is limited due to small sample size and age of the data. No recommendation can be provided based on this dataset.





Wayne County

Common Carp

Ecorse River

Wayne County

Hg Analysis:

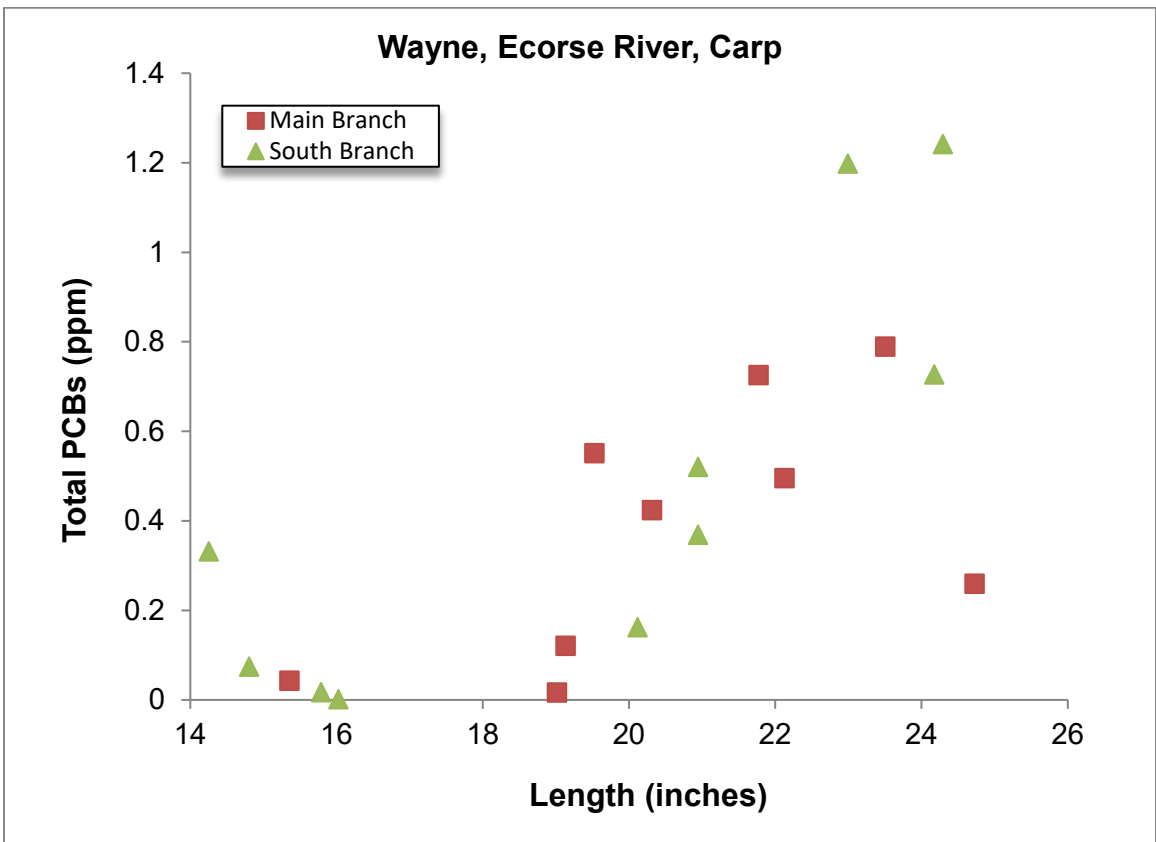
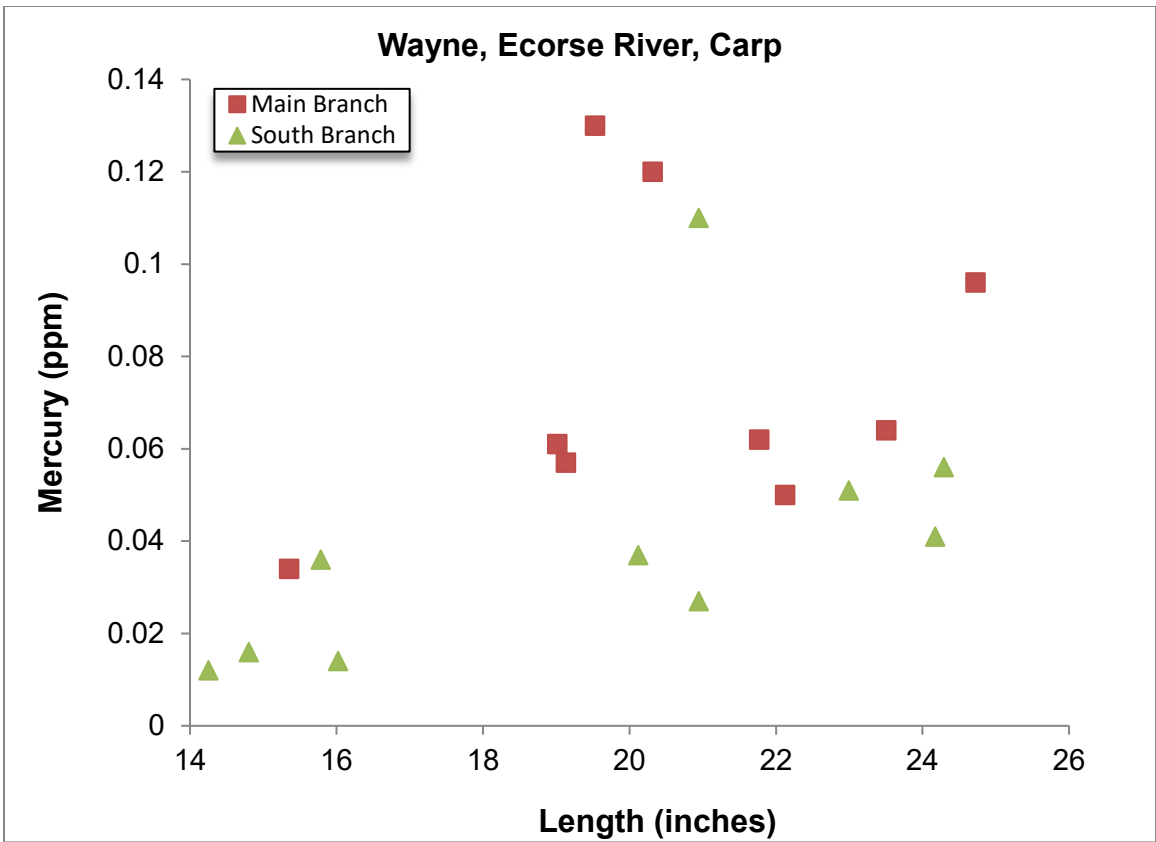
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2021	2021	19	14.3	NA	14.3	24.7
Datasets available: 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	19	0.057	0.012	0.130	0.073	12
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.201	0.386				

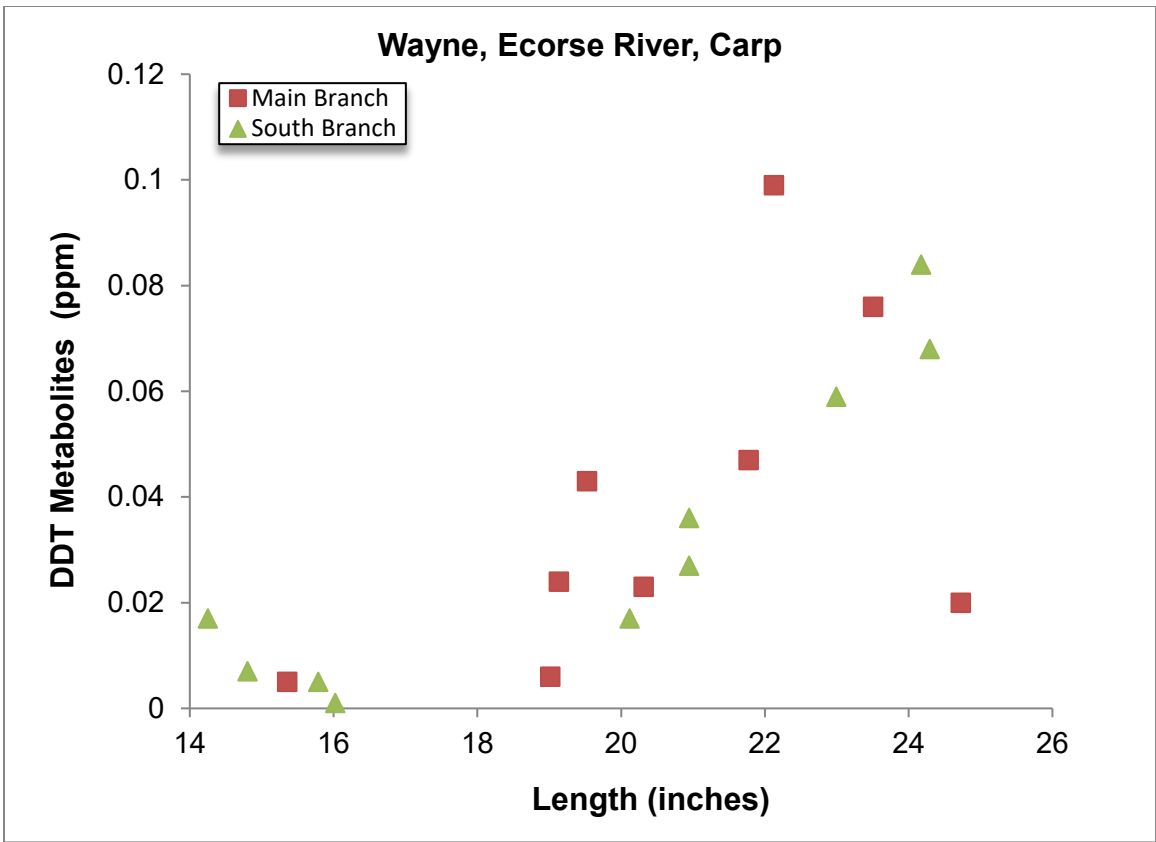
Organics Analysis:

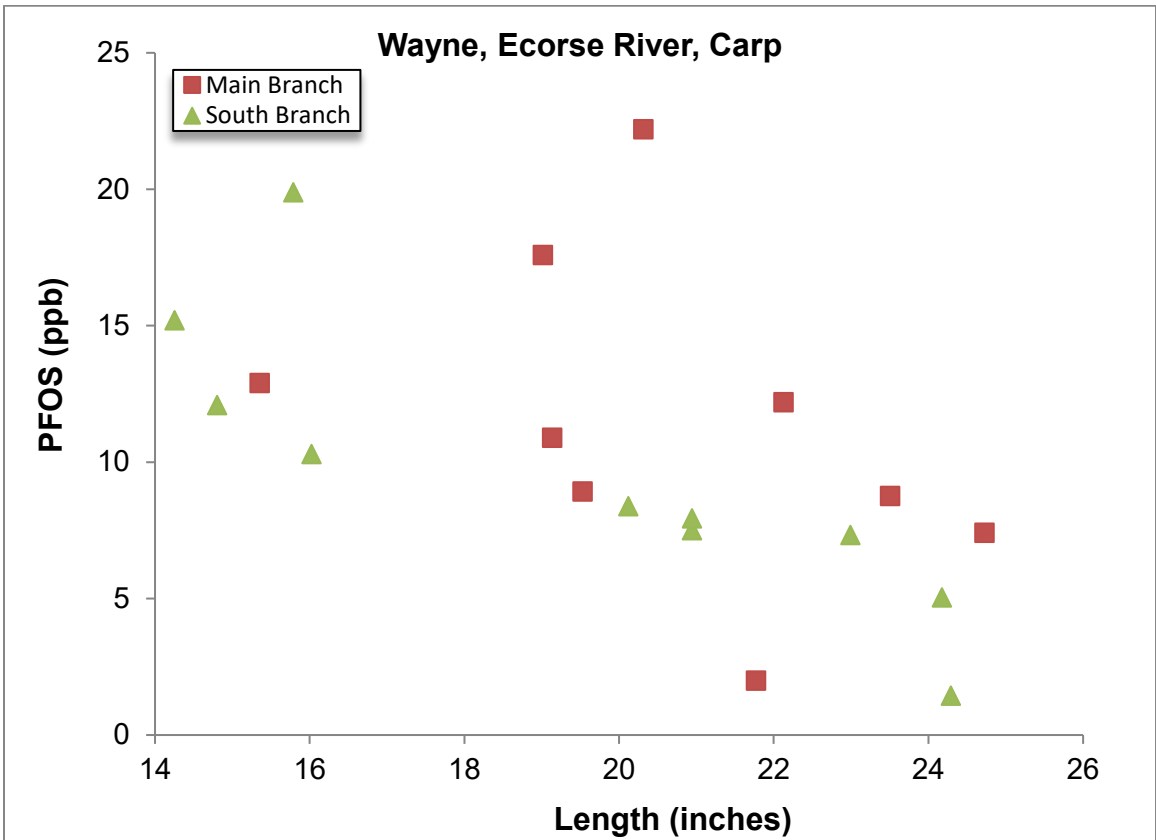
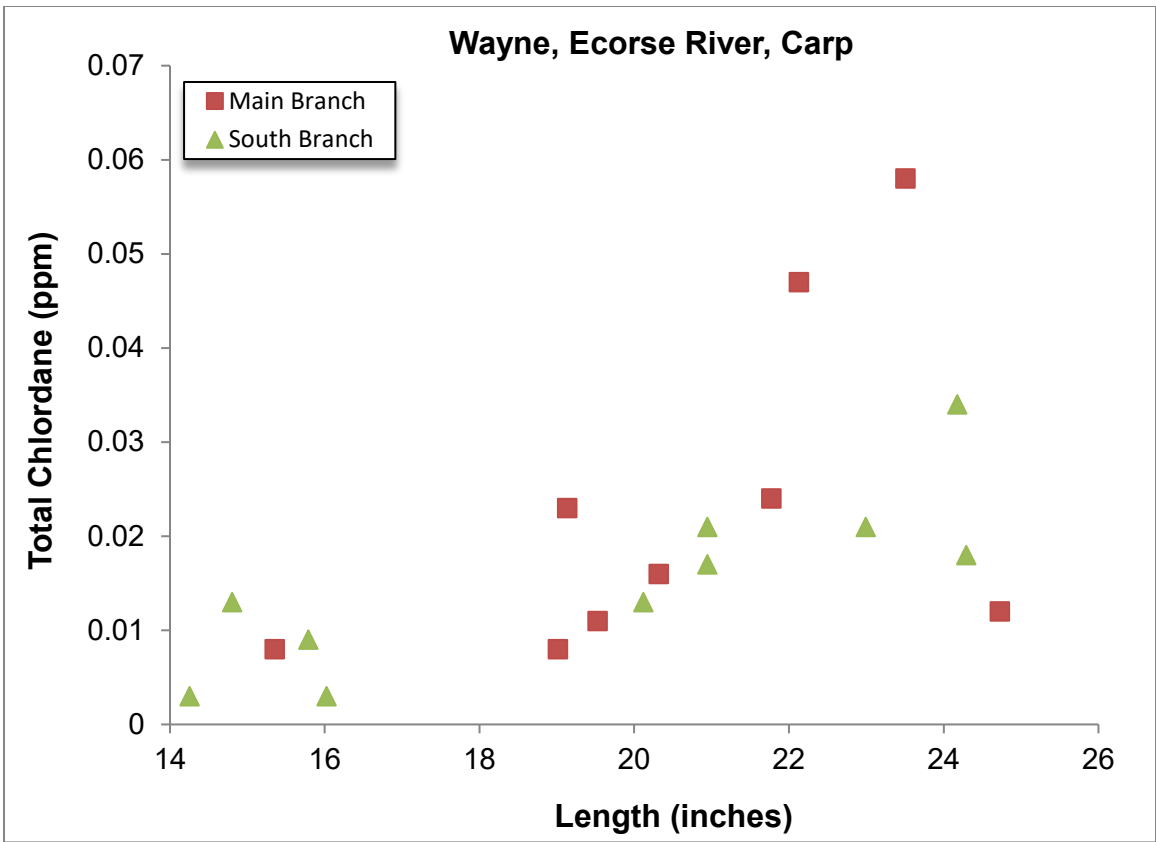
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2021	2021	19	14.3	NA	14.3	24.7
Datasets available: 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	19	0.425	0.002	1.24	0.608	Limited
DDT	19	0.035	0.001	0.099	0.049	16
Chlordane	19	0.019	0.003	0.058	0.026	16
Toxaphene	19	ND	--	--	--	--
PFOS	19	10.4 ppb	1.5 ppb	22.2 ppb	13.1 ppb	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.504	0.459				
DDT	0.534	0.584				
Chlordane	0.369	0.529				
Toxaphene	NA	NA				
PFOS	0.349	0.348				
Final meal category based on UCL:						Limited

Existing MDHHS Advisory: Carp from the main branch and south branch of the Ecorse River are currently covered under the statewide advisory for PCBs. No one should eat more than 2 meals per month of carp of any size.

Recommendation: Sensitive populations should not eat carp of any size from either the main branch or south branch of the Ecorse River due to PCBs. Healthy adults should limit consumption to 1 or 2 meals per year. Mercury and PFOS cause less restrictive advice.







Bluegill/Pumpkinseed

Frank and Poet Drain

Wayne County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2021	2021	5	4.5	NA	4.5	7.9
Datasets available: 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	5	0.052	0.011	0.084	0.088	12
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.773	0.549				

Organics Analysis:

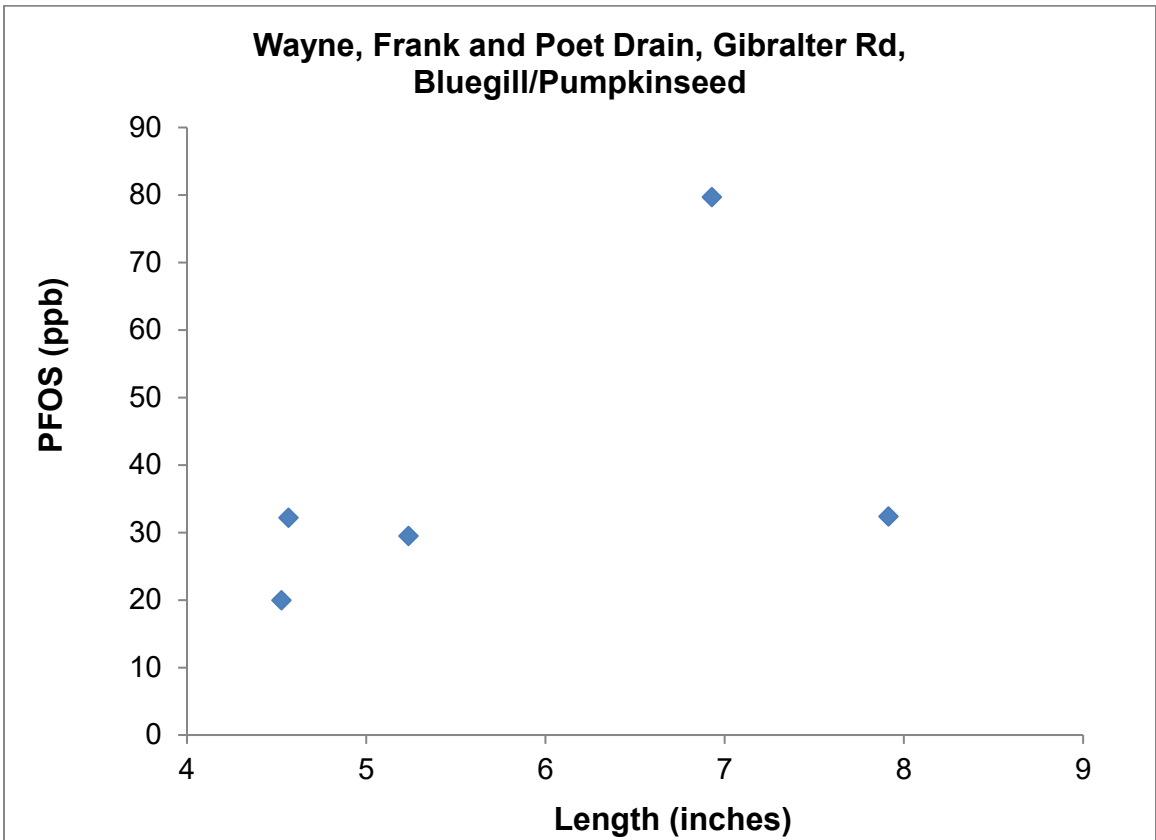
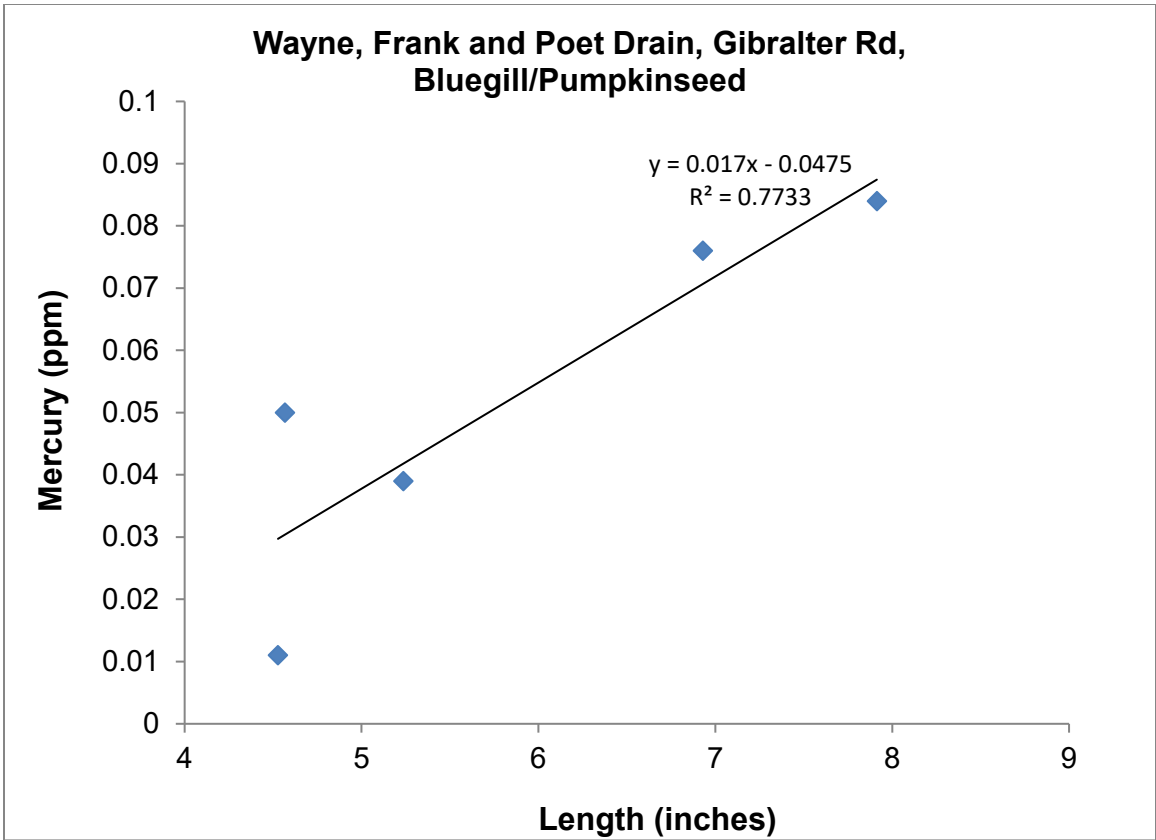
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2021	2021	5	4.5	NA	4.5	7.9
Datasets available: 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
PFOS	10	38.8 ppb	20.0 ppb	79.7 ppb	67.9 ppb	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.078	0.281				
Final meal category based on UCL:						2

Existing MDHHS Advisory: Bluegill and sunfish from the Frank and Poet Drain in Wayne County are currently covered under the statewide guidance due to mercury. No one should eat more than 8 meals per month of bluegill or sunfish of any size.

Recommendation: No one should eat more than 2 meals per month of bluegill or sunfish of any size from the Frank and Poet Drain in Wayne County due to PFOS. Mercury causes less restrictive advice.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
5	0.038	16
6	0.055	16
7	0.072	12
8	0.089	12
9	0.106	8
10	0.123	8

Shaded area denotes extrapolated estimates



Common Carp

Frank and Poet Drain

Wayne County

Hg Analysis:

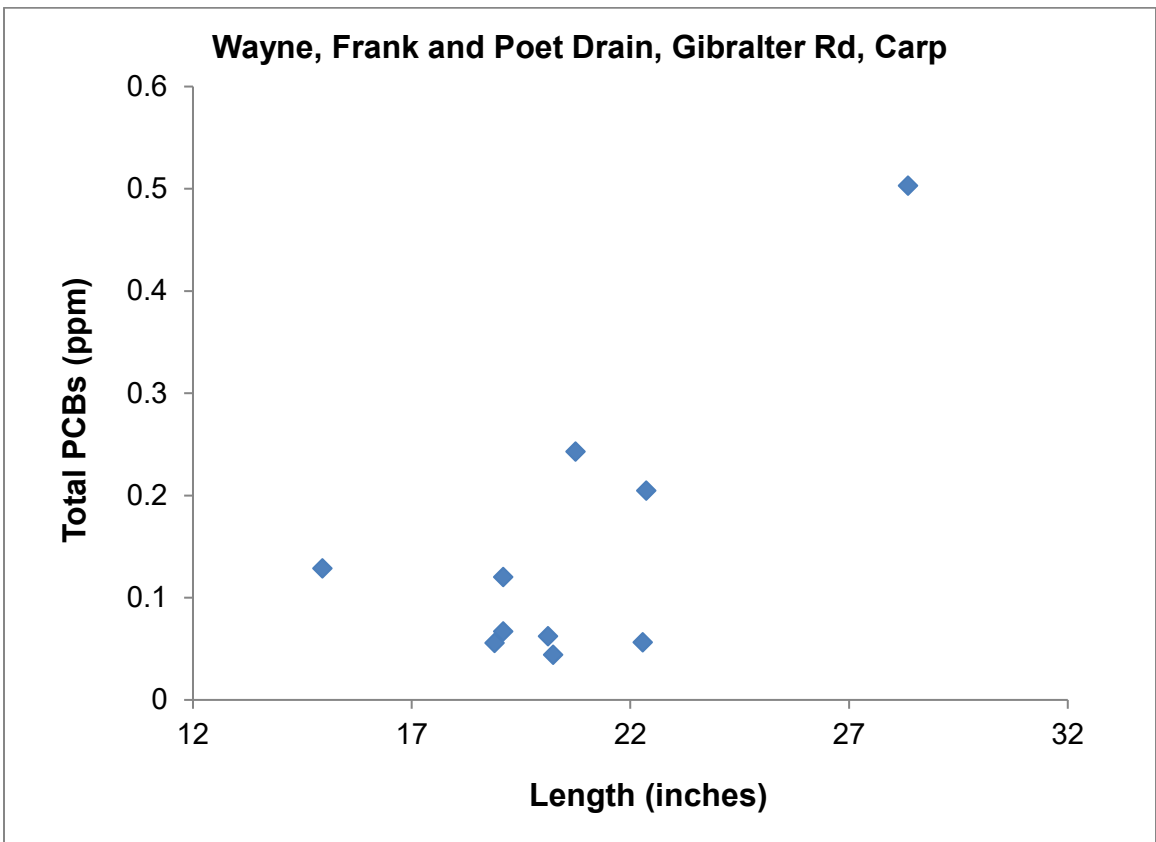
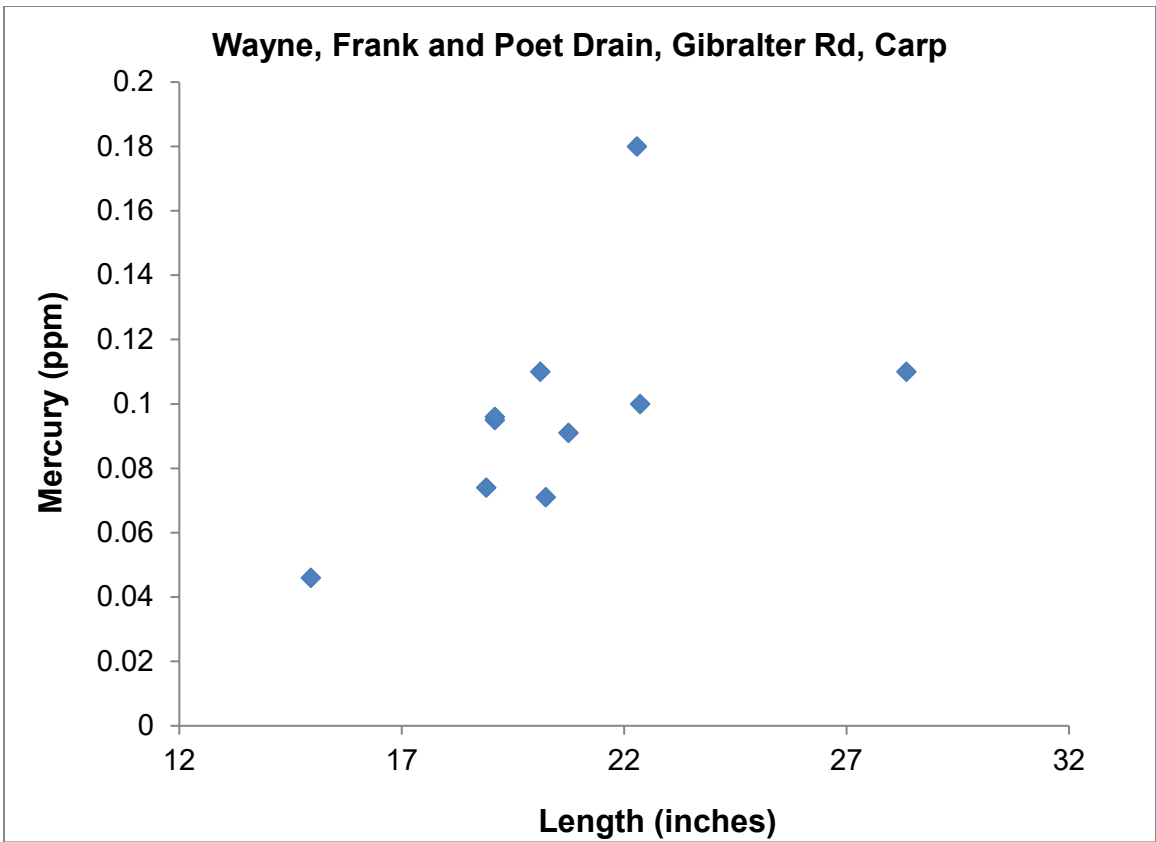
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2021	2021	10	15.0	NA	15.0	28.4
Datasets available: 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.097	0.046	0.180	0.122	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.287	0.395				

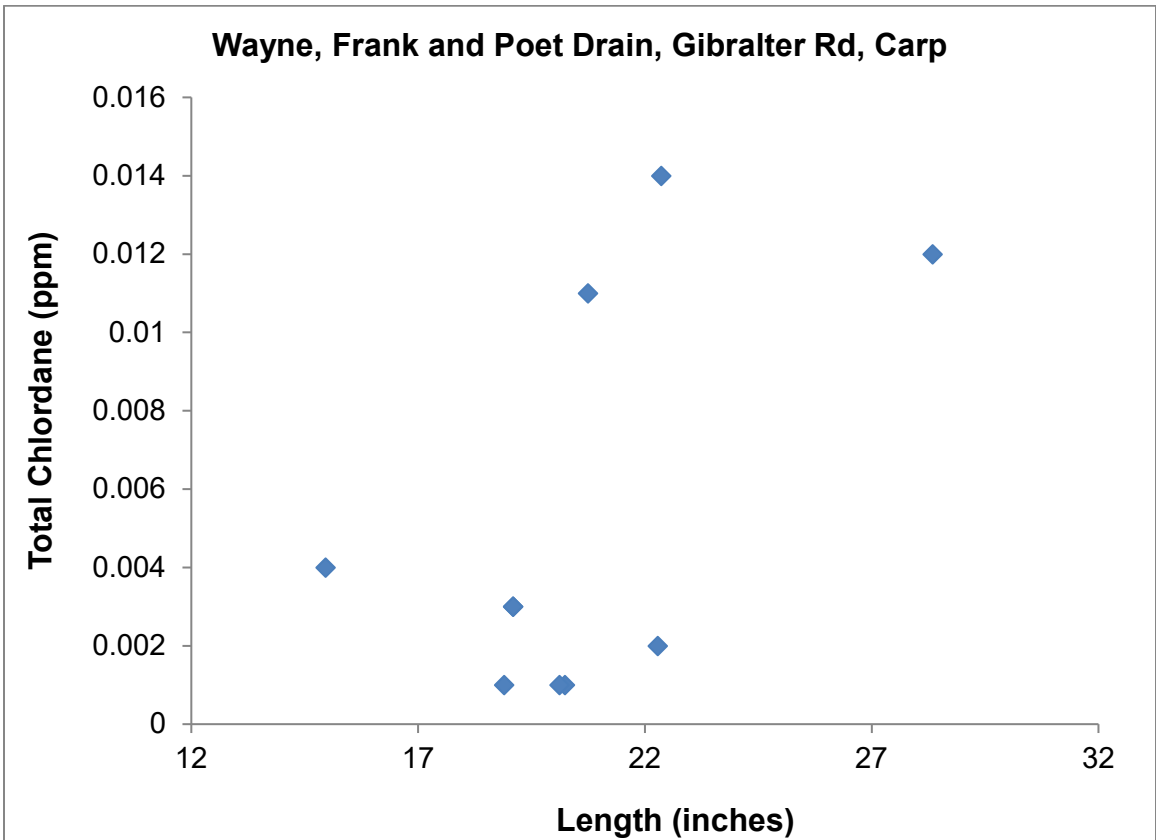
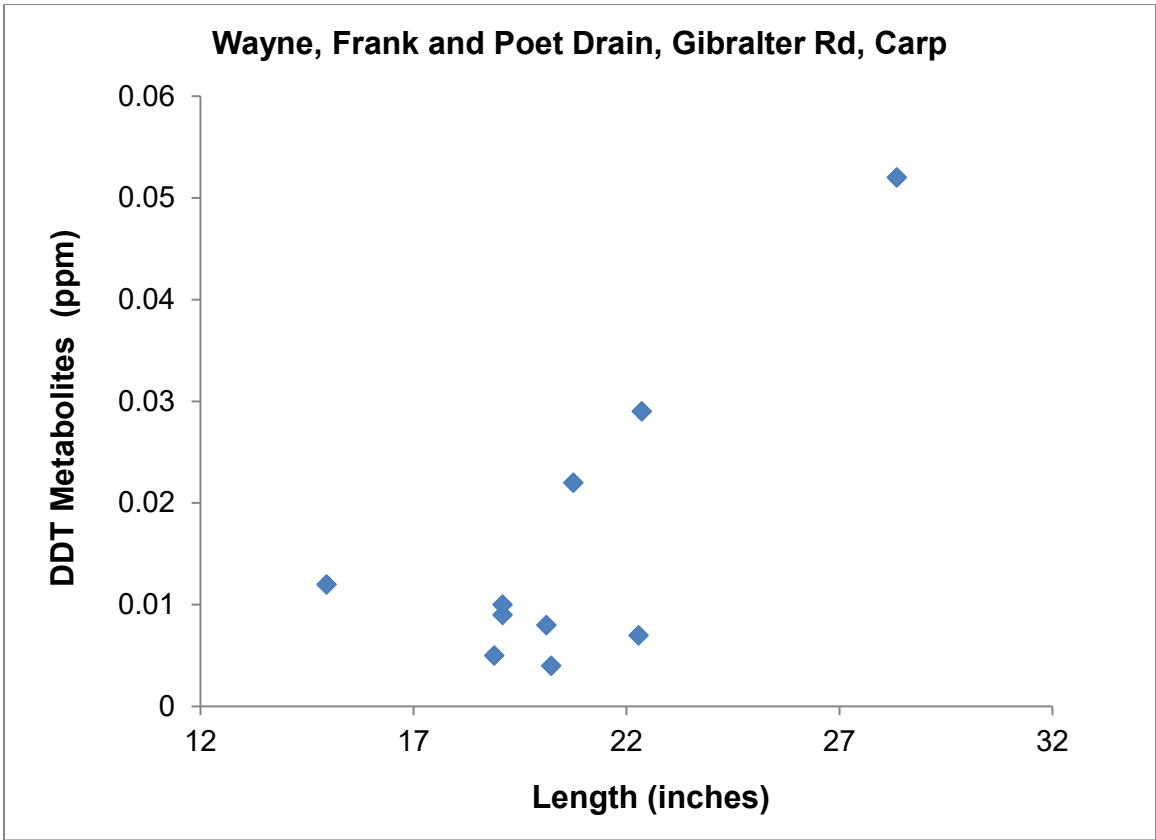
Organics Analysis:

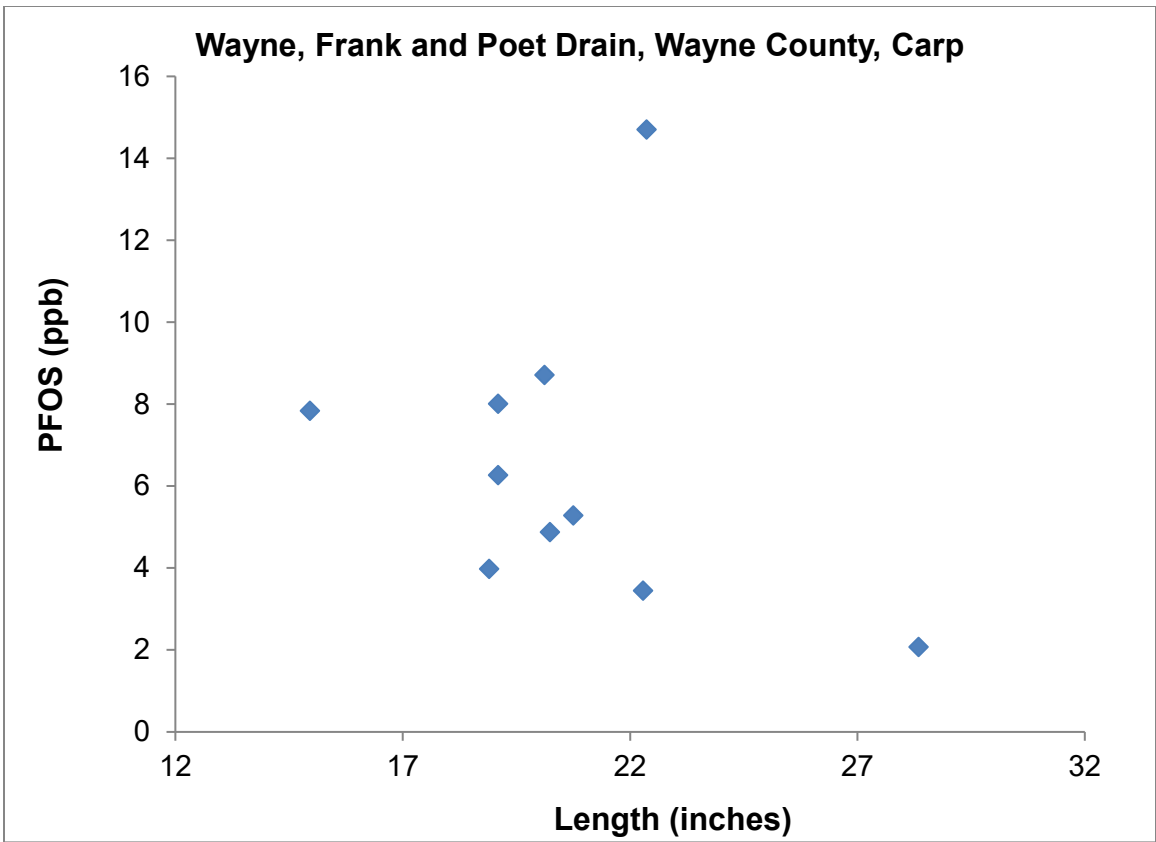
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2021	2021	10	15.0	NA	15.0	28.4
Datasets available: 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.149	0.044	0.503	0.250	0.5
DDT	10	0.016	0.004	0.052	0.026	16
Chlordane	10	0.005	0.001	0.014	0.009	16
Toxaphene	10	ND	--	--	--	--
PFOS	10	6.5 ppb	2.1 ppb	14.7 ppb	9.1 ppb	12
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.542	0.298				
DDT	0.599	0.361				
Chlordane	0.315	0.193				
Toxaphene	NA	NA				
PFOS	0.078	0.281				
Final meal category based on UCL:						0.5

Existing MDHHS Advisory: Carp from the Frank and Poet Drain in Wayne County are currently covered under the statewide guidance due to PCBs. No one should eat more than 2 meals per month of carp of any size.

Recommendation: No one should eat more than 6 meals per year of carp of any size from the Frank and Poet Drain in Wayne County due to PCBs. Mercury and PFOS cause less restrictive advice.







Largemouth Bass

Frank and Poet Drain

Wayne County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2021	2021	4	8.7	14.0	17.0	17.6
Datasets available: 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	2	0.315	0.220	0.410	1.522	0.5
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

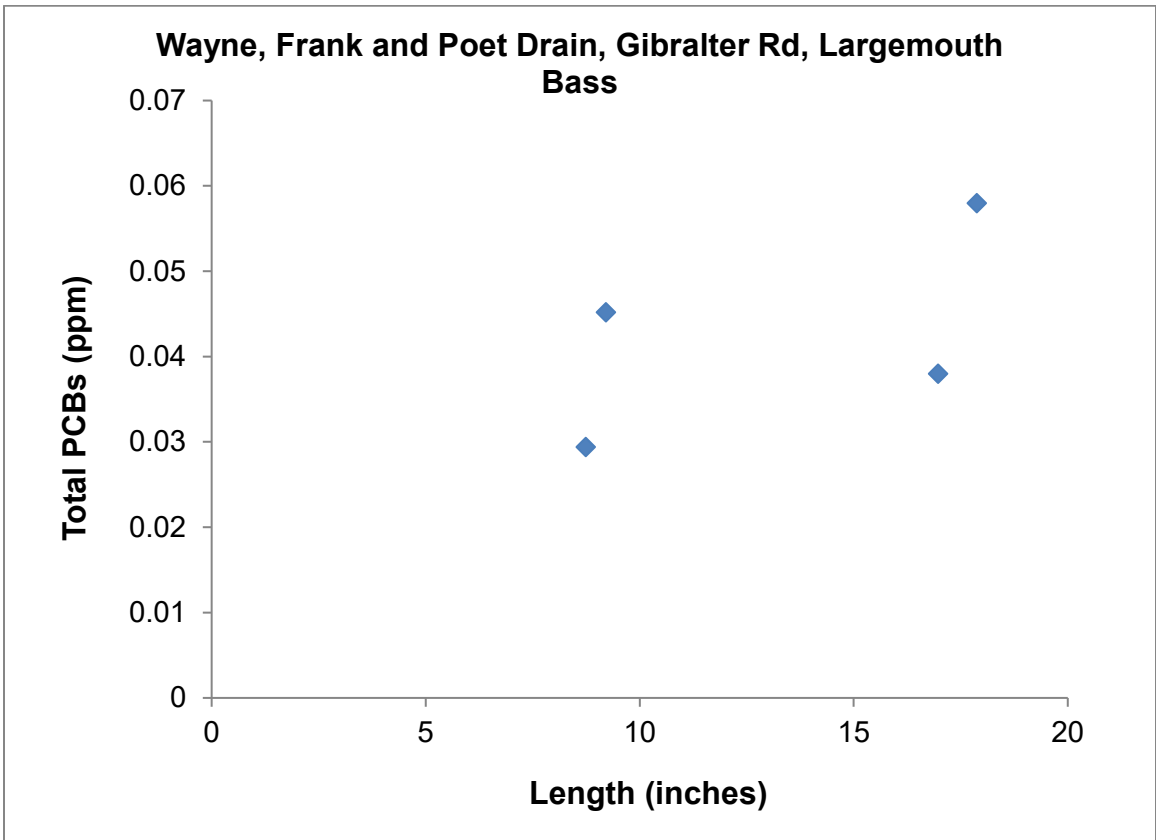
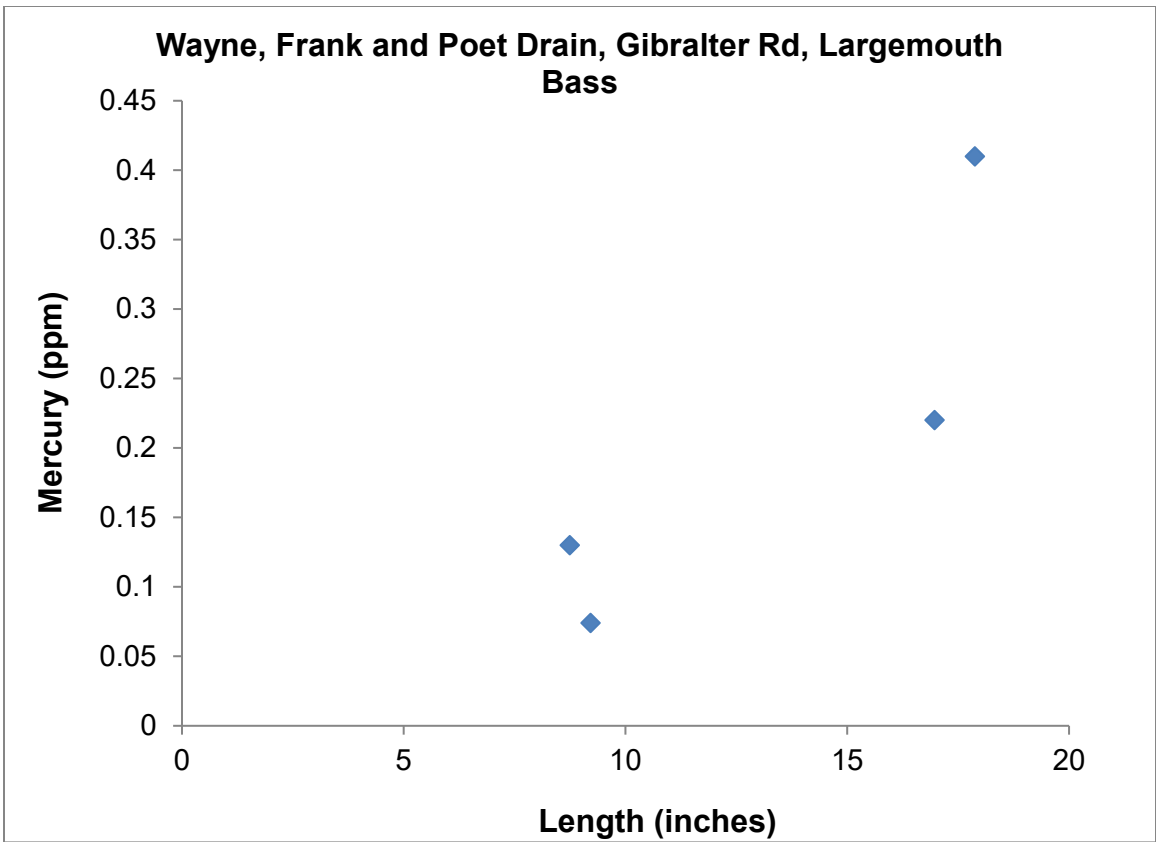
Organics Analysis:

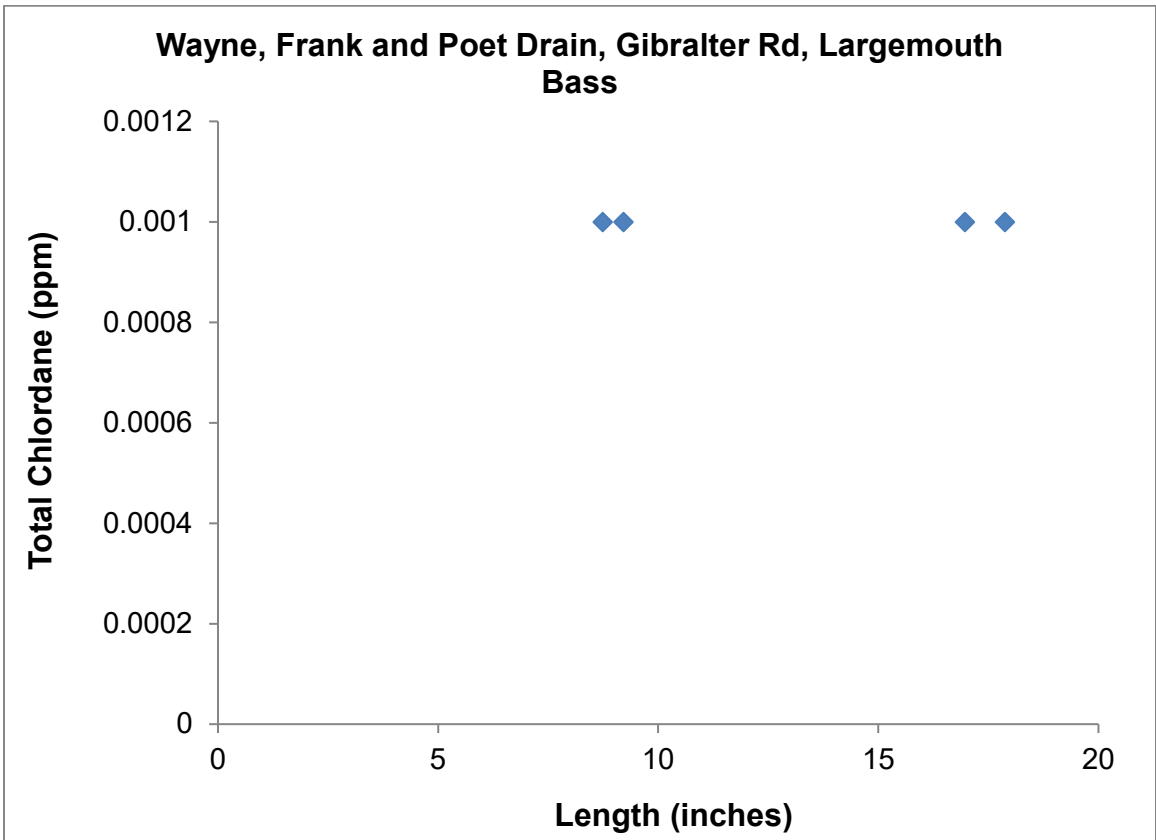
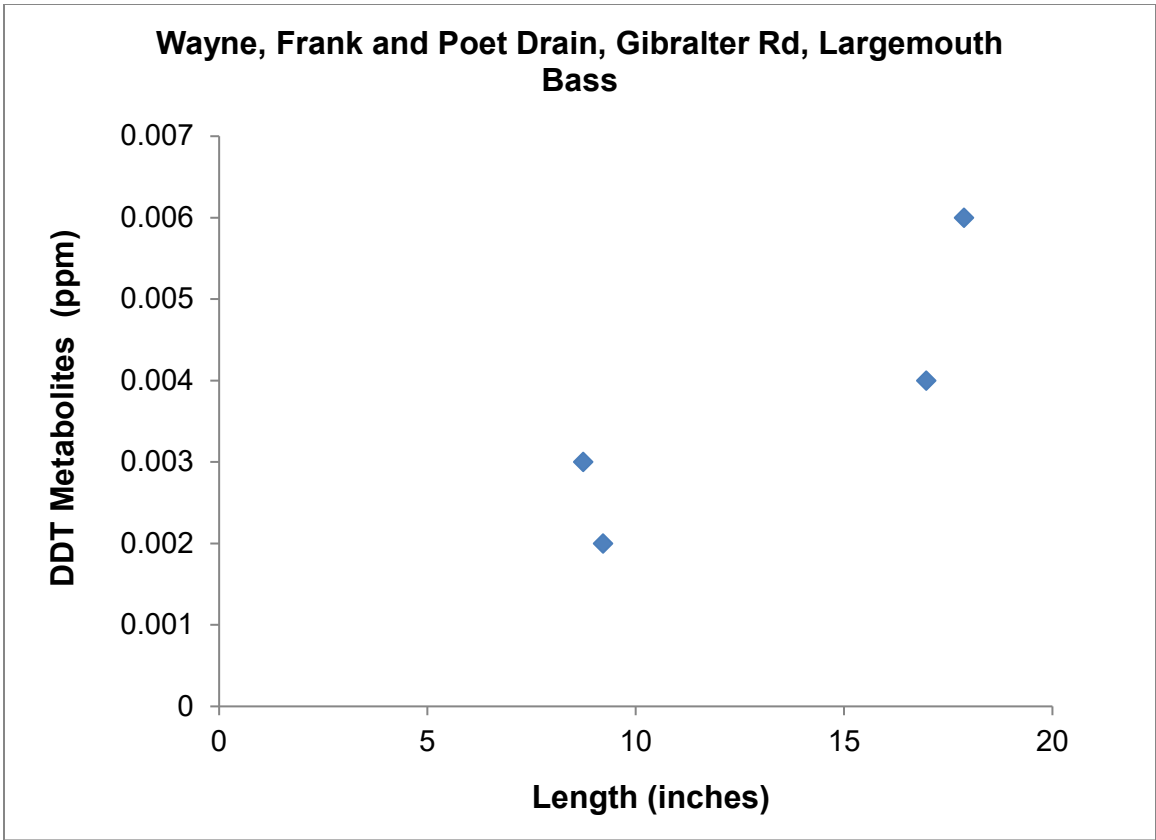
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2021	2021	4	8.7	14.0	17.0	17.6
Datasets available: 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	2	0.048	0.038	0.058	0.175	1
DDT	2	0.005	0.004	0.003	0.018	16
Chlordane	2	0.001	<0.001	0.001	0.001	16
Toxaphene	2	ND	--	--	--	--
PFOS	4*	42.6 ppb	24.0 ppb	67.6 ppb	71.5 ppb	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.057	0.005	Final meal category based on UCL:			--

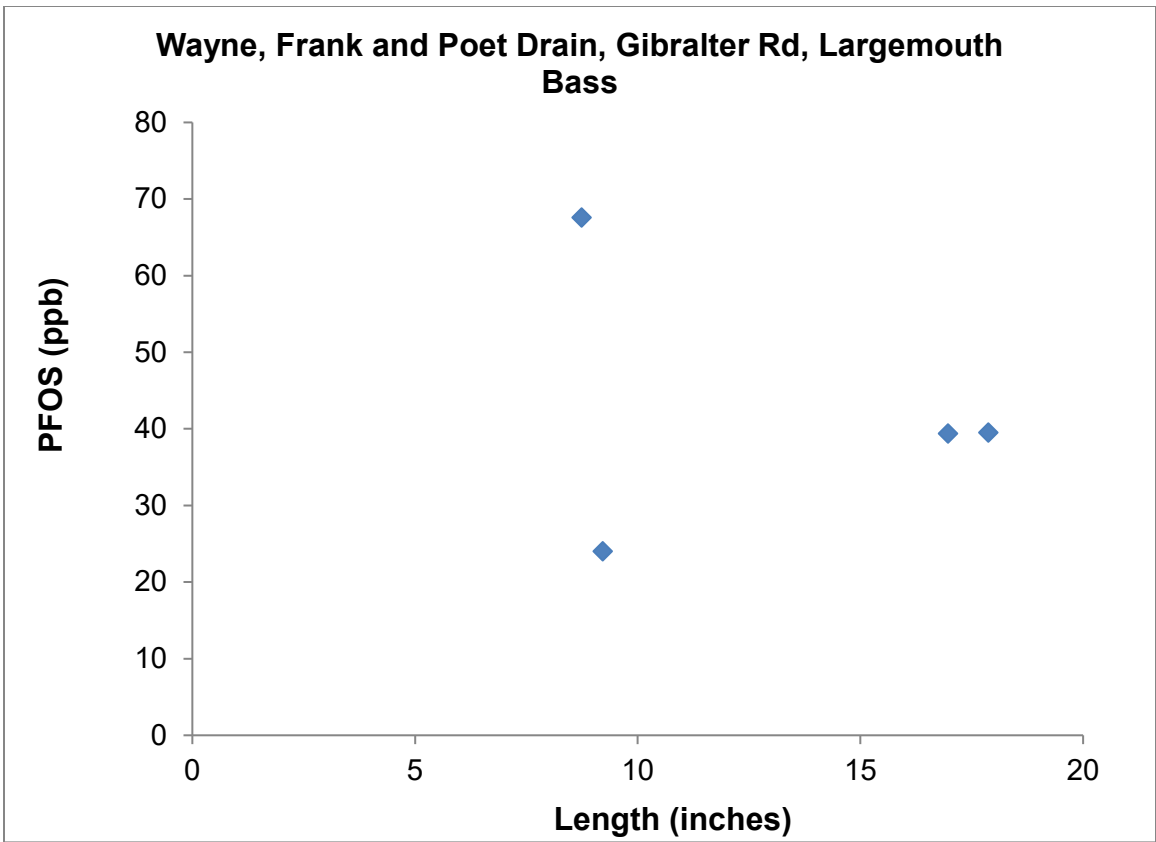
* Sub-legal sized fish used in the analysis as no relationship between PFOS and fish length has been observed in the statewide dataset.

Existing MDHHS Advisory: Largemouth and smallmouth bass from the Frank and Poet Drain in Wayne County are currently covered under the statewide guidance due to mercury. No one should eat more than 2 meals per month of bass smaller than 18 inches or no more than 1 meal per month of bass larger than 18 inches.

Recommendation: The statewide advice should continue to apply to these species due to an insufficient sample size (< 5 legal sized individuals) for this assessment.







Brown Trout

Johnson Drain

Wayne County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2021	2021	10	7.8	8.0	7.8	19.9
Datasets available: 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.119	0.053	0.240	0.164	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.484	0.676				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2021	2021	10	7.8	8.0	7.8	19.9
Datasets available: 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.031	0.007	0.067	0.048	4
DDT	10	0.038	0.020	0.066	0.052	16
Chlordane	10	0.002	0.001	0.004	0.003	16
Toxaphene	10	ND	--	--	--	--
PFOS	10	17.7 ppb	5.7 ppb	49.5 ppb	27.0 ppb	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.901	0.848				
DDT	0.777	0.796				
Chlordane	0.010	0.000				
Toxaphene	--					
PFOS	0.484	0.488				
Final meal category based on UCL:						4

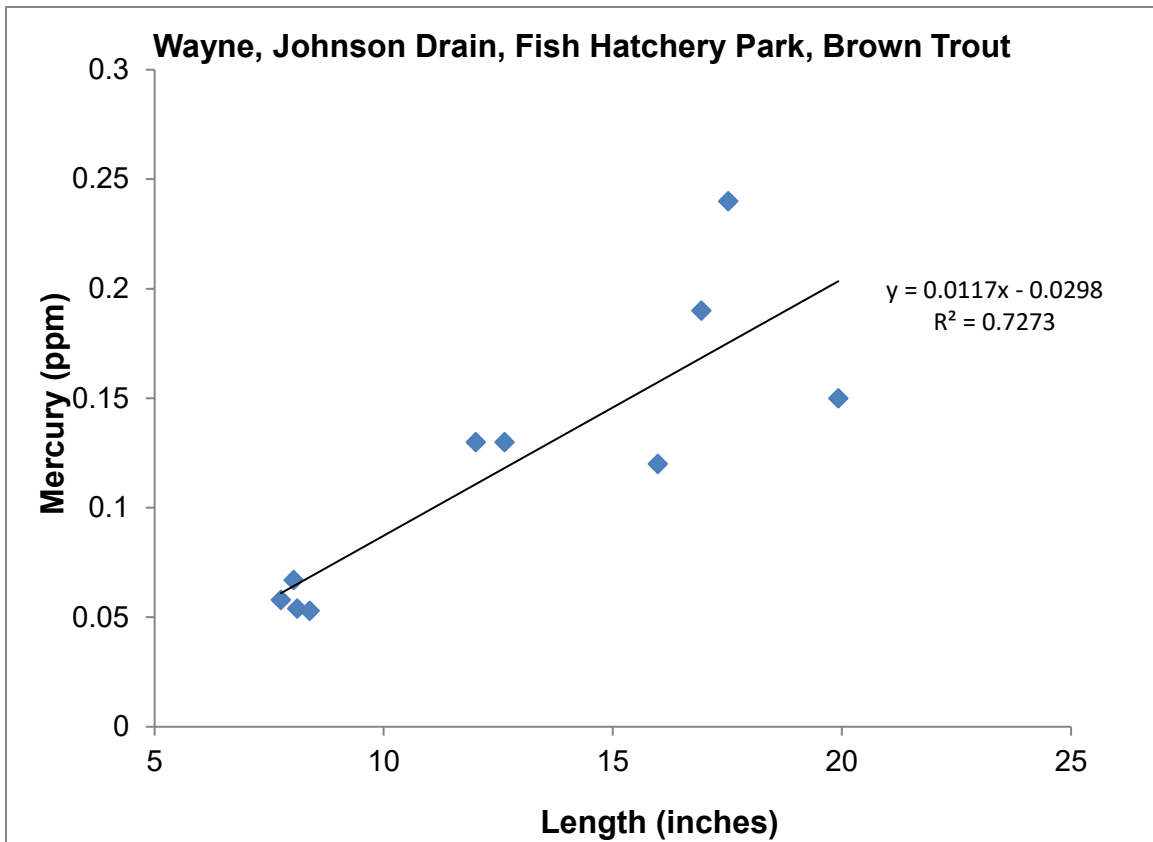
Existing MDHHS Advisory: Brown trout from the Johnson Drain in Wayne County are currently covered under the statewide mercury guidance. No one should eat more than 4 meals per month of brown trout of any size.

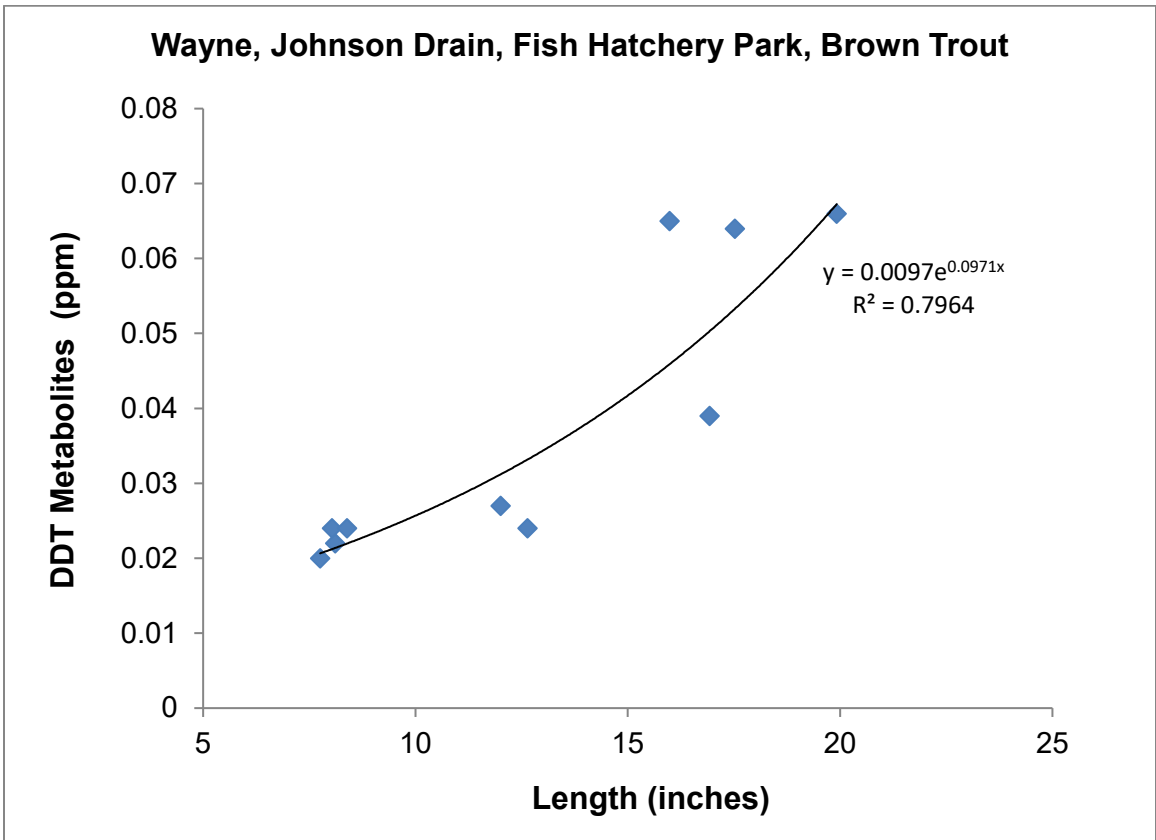
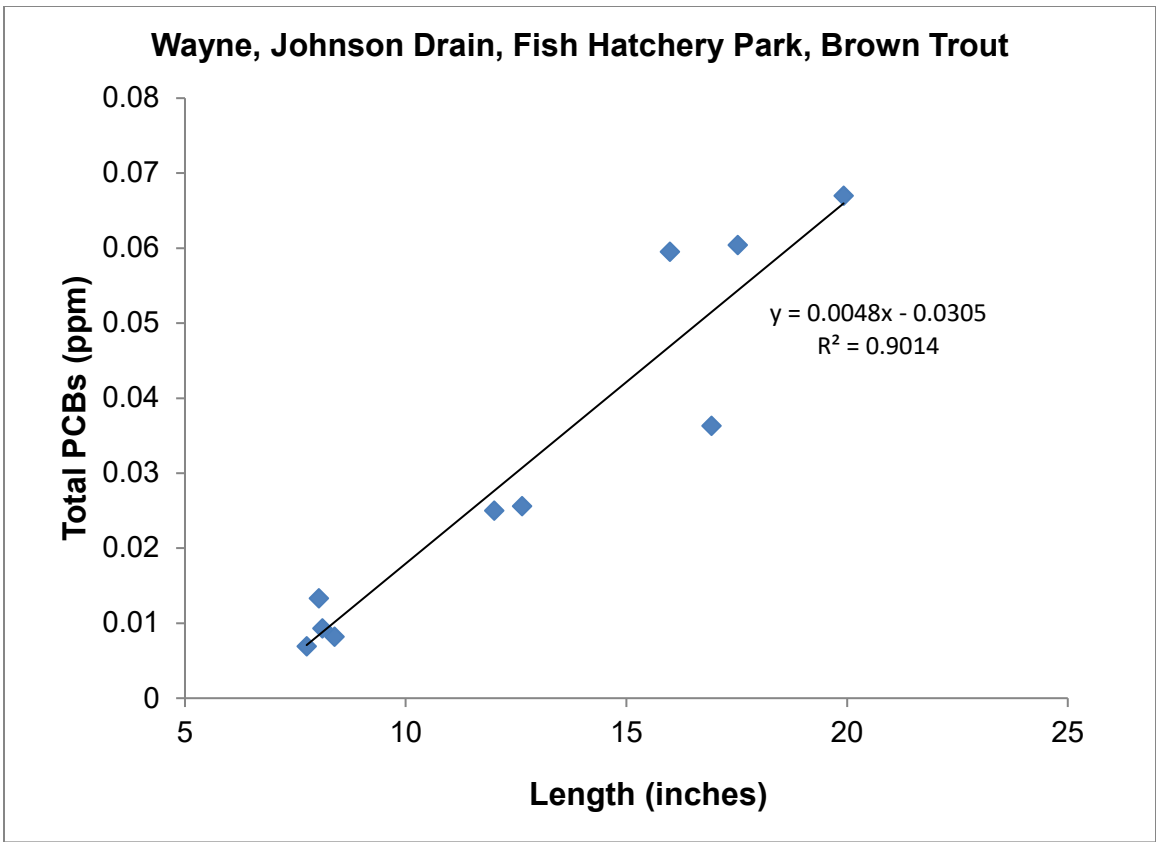
Recommendation: No one should eat more than 2 meals per month of brown trout greater than 18 inches from the Johnson Drain in Wayne County, including Waterford Pond, due to PCBs or no more than 4 meals per month of brown trout smaller than 18 inches due to PCBs, mercury, and PFOS.

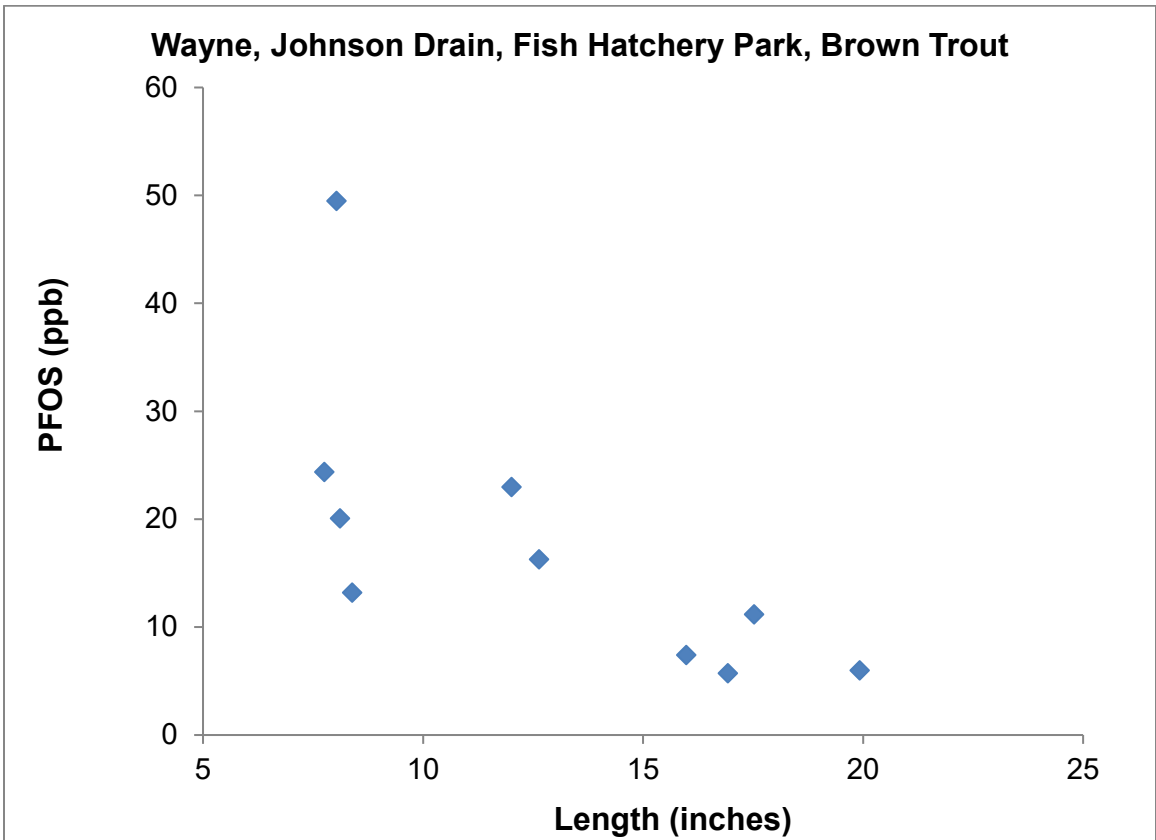
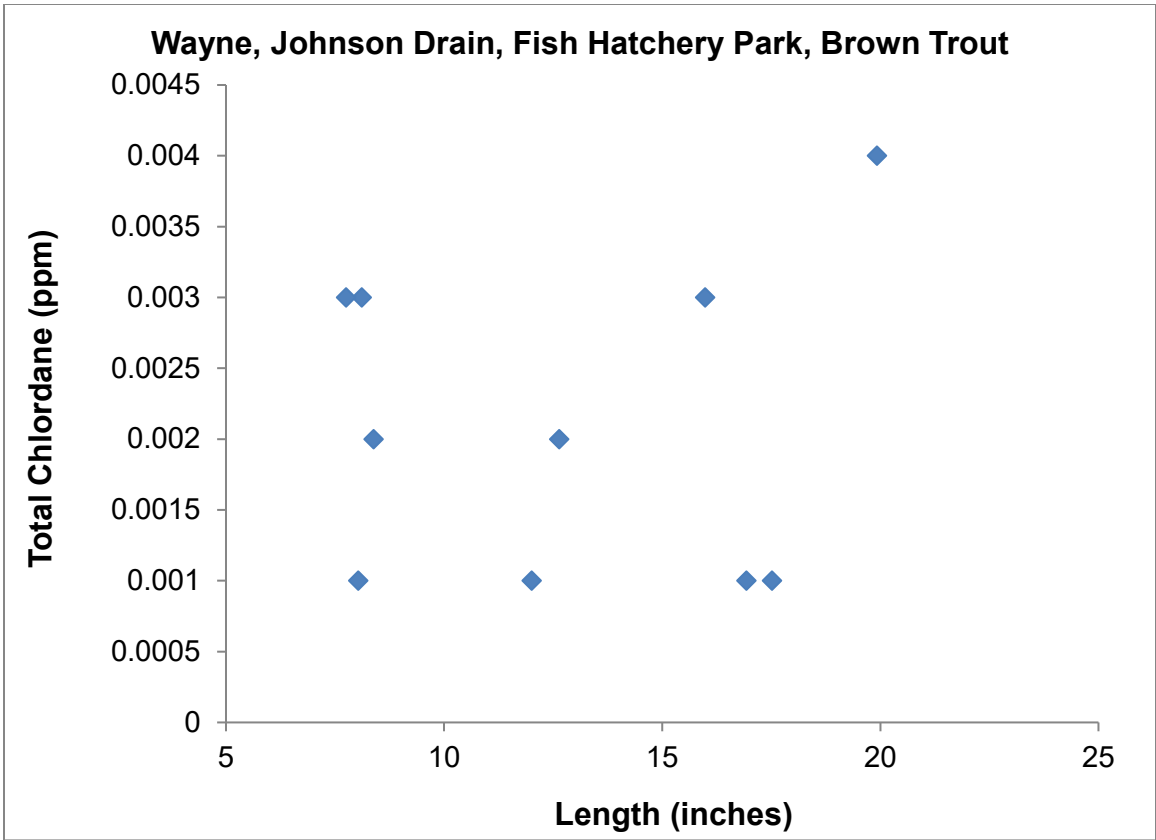
Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
8	0.064	16
10	0.087	12
12	0.111	8
14	0.134	4
16	0.157	4
18	0.181	4
20	0.204	4

Length (Inches)	DDT	
	Regression Equation Estimate (ppm)	Meal Category
8	0.021	16
10	0.026	16
12	0.031	16
14	0.038	16
16	0.046	16
18	0.056	16
20	0.068	16

Length (Inches)	PCB	
	Regression Equation Estimate (ppm)	Meal Category
8	0.008	16
10	0.018	12
12	0.01627	8
14	0.03127	4
16	0.0468	4
18	0.0564	2
20	0.0664	2







Bluegill

**Lake Okonoka
Belle Isle**

Wayne County

Hg Analysis:

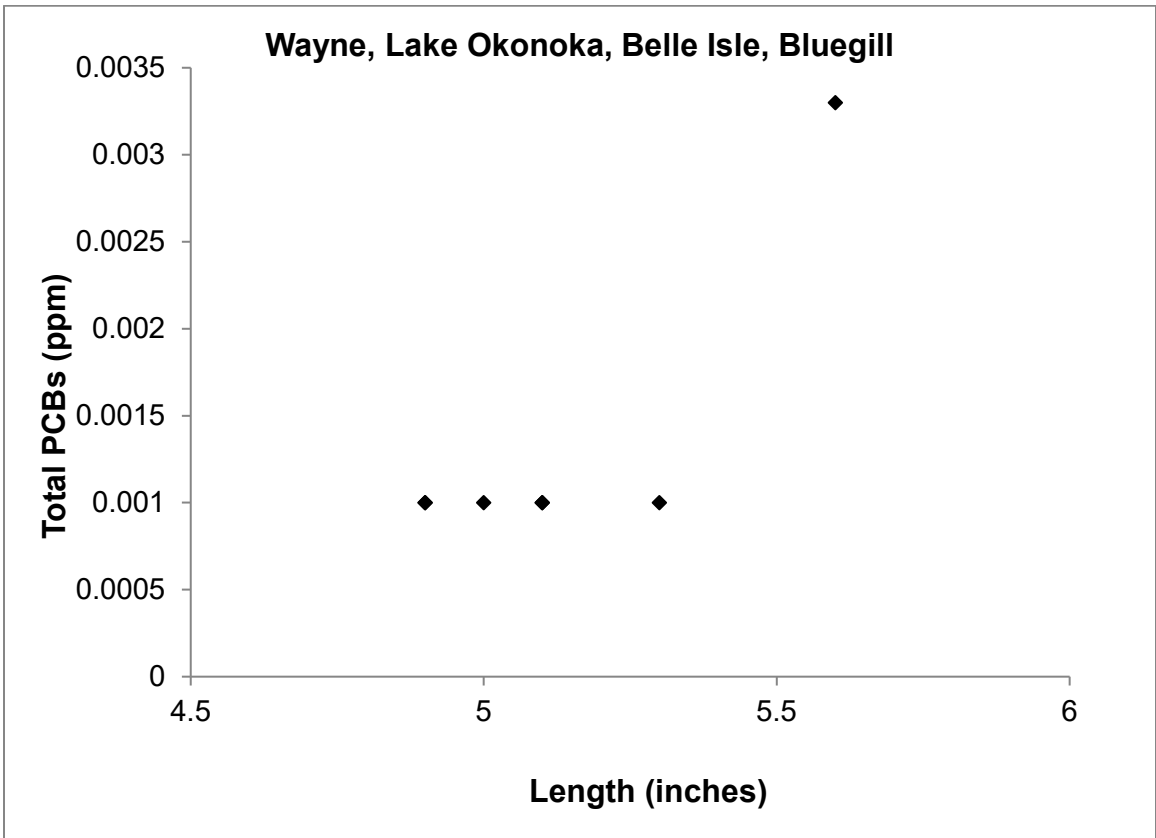
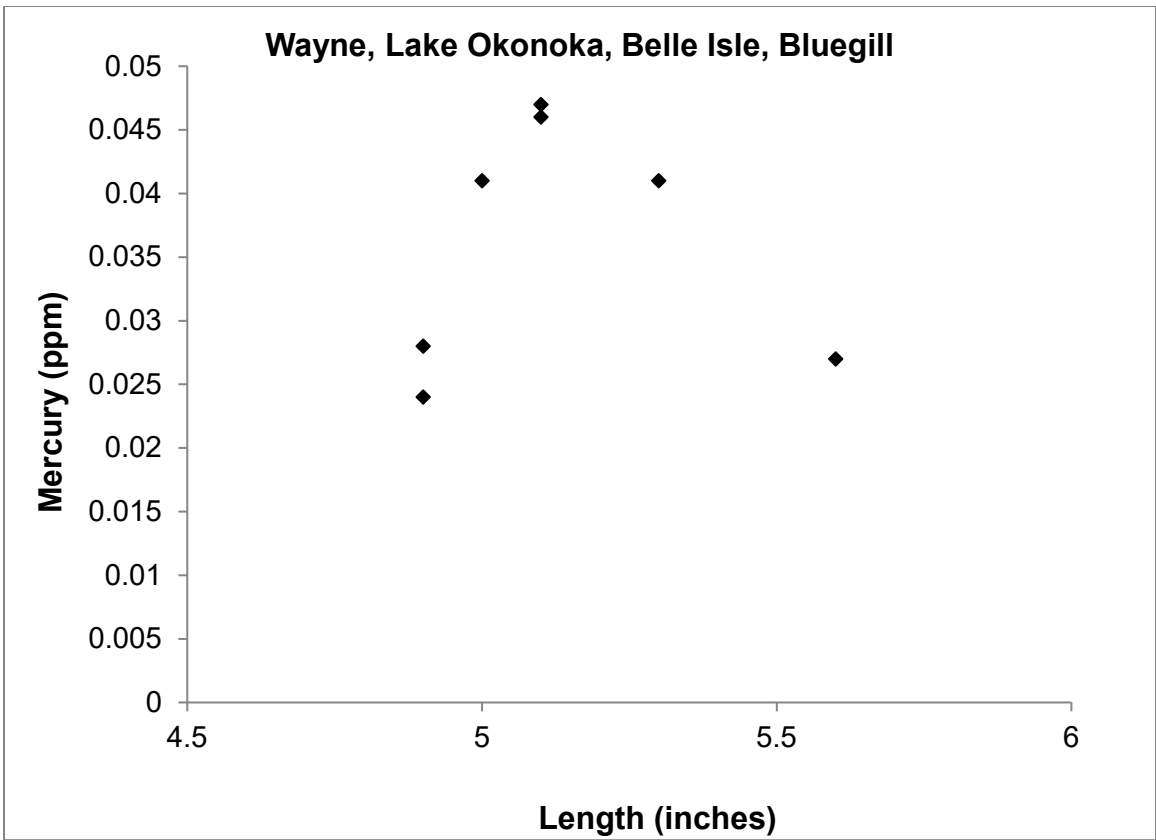
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples				
Earliest	Most Recent				Min	Max			
2014	2014	7	4.9	na	4.9	5.6			
Datasets available:		2014							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category		
Mercury	7	0.04		0.02	0.05	0.045	16		
Chemical	Linear Regression	Exponential Regression							
	R ²	R ²							
Mercury	0.000	0.000							

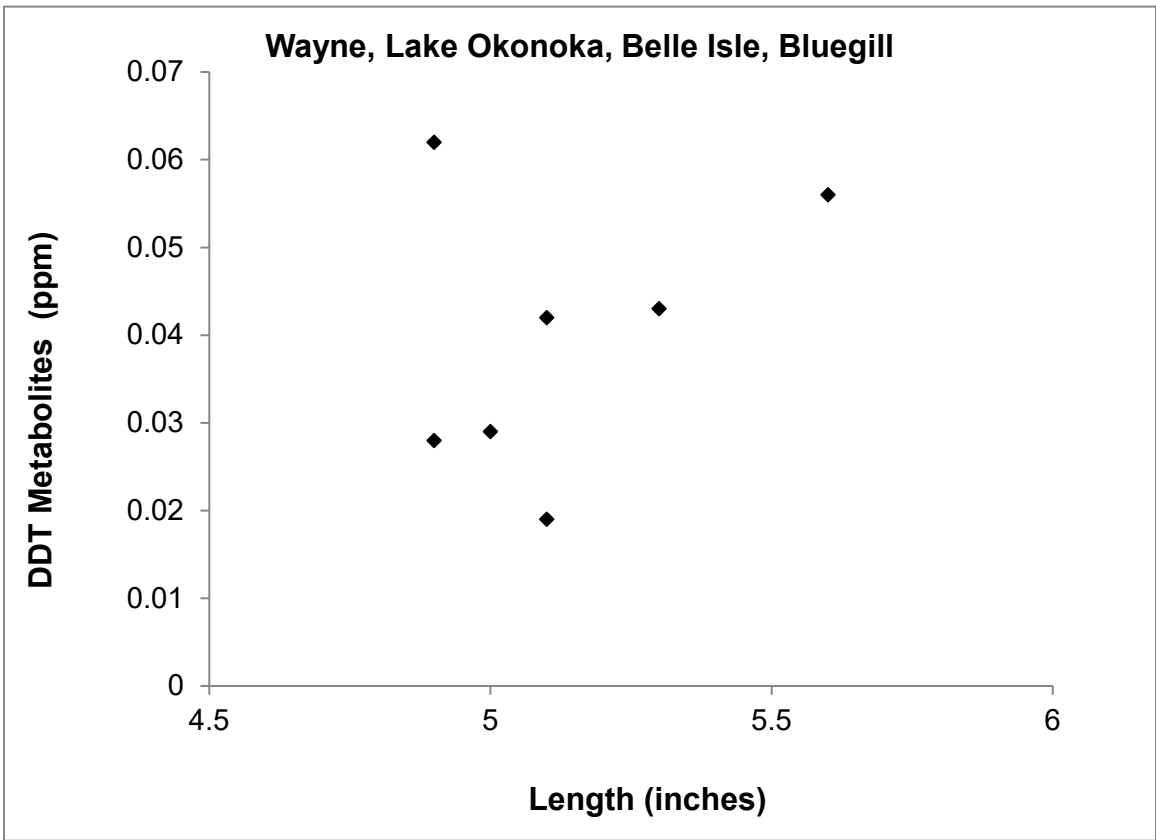
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples				
Earliest	Most Recent				Min	Max			
2014	2014	7	4.9	na	4.9	5.6			
Datasets available:		2014							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category		
PCB	7	0.001		0.001	0.003	0.002	16		
DDT	7	0.040		0.02	0.06	0.05	16		
Chlordane	7	ND		--	--	--	--		
Toxaphene	7	ND		--	--	--	--		
TEQ	0	--		--	--	--	--		
Chemical	Linear Regression	Exponential Regression							
	R ²	R ²							
PCB	0.693	0.693							
DDT	0.109	0.115							
Chlordane	--	--							
Toxaphene	--	--							
TEQ	--	--							
							Final meal category based on UCL: 16		

Existing Advisory: Lake Okonoka sunfish (bluegill and pumpkinseed) are covered by the statewide mercury advisory: No one should eat more than 8 meals per month of sunfish.

Recommendation: No consumption advisory is necessary for Lake Okonoka bluegill sunfish. Bluegill and sunfish will be listed at 16 meals per month as the upper limit of the assessment.





White Crappie

**Lake Okonoka
Belle Isle**

Wayne County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2014	2014	10	5.7	na	5.7	8.3	
Datasets available: 2014							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.14		0.04	0.26	0.19	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.760	0.791					

Organics Analysis:

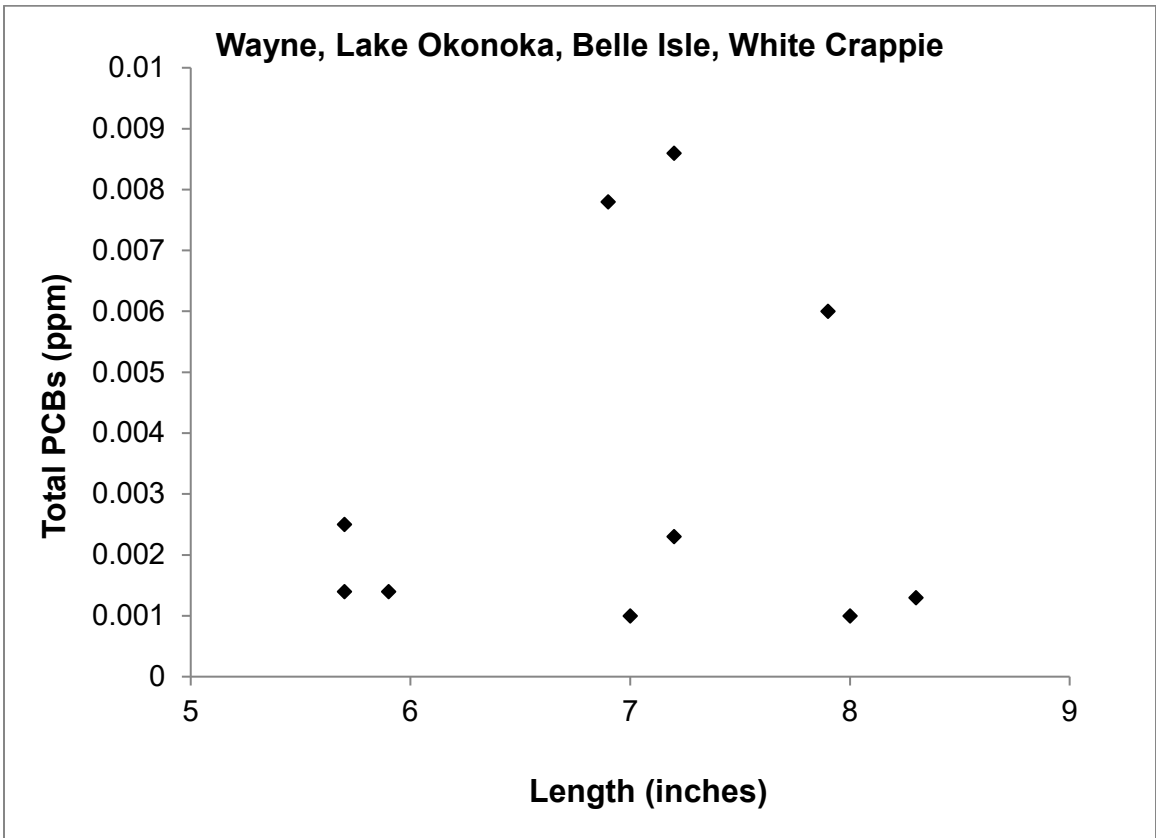
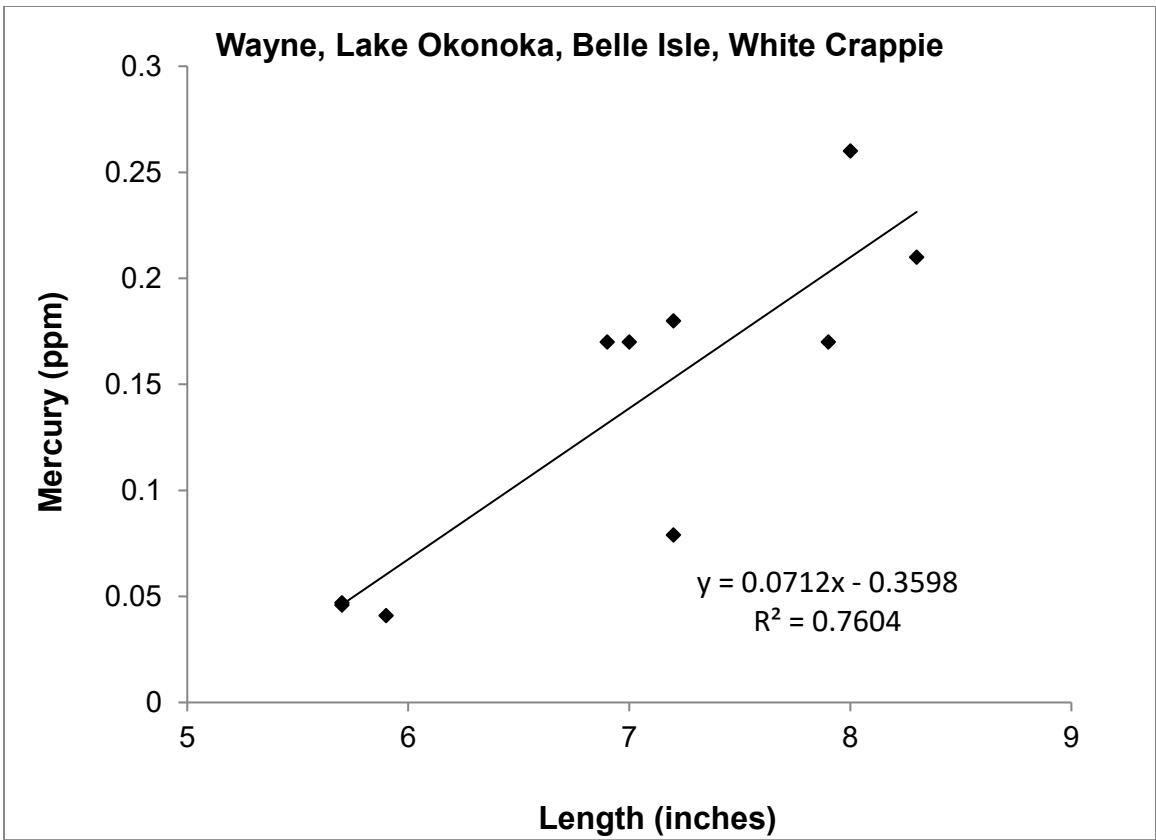
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2014	2014	10	5.7	na	5.7	8.3	
Datasets available: 2014							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.003		0.001	0.009	0.005	16
DDT	10	0.06		0.02	0.16	0.08	16
Chlordane	10	ND		--	--	--	--
Toxaphene	10	ND		--	--	--	--
TEQ	0	--		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.019	0.005					
DDT	0.003	0.040					
Chlordane	--	--					
Toxaphene	--	--					
TEQ	--	--					
Final meal category based on UCL:							4

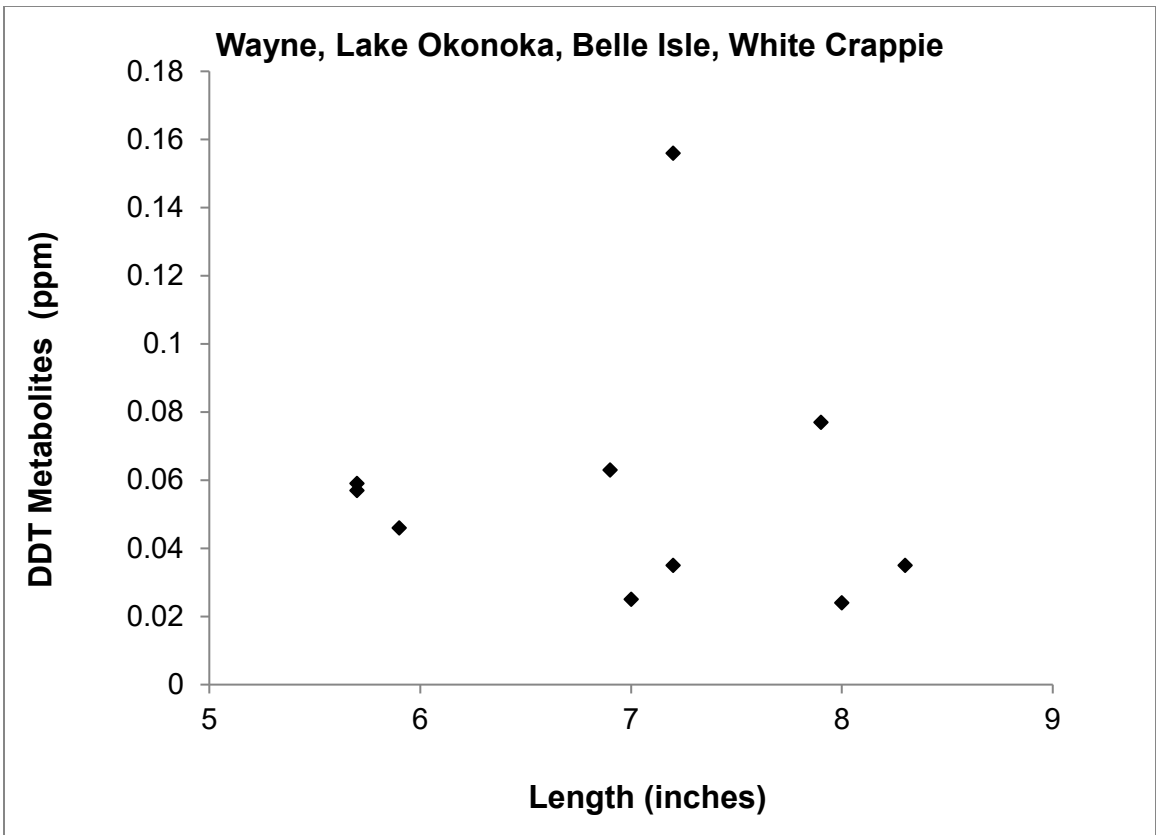
Existing Advisory: Lake Okonoka crappie are covered by the statewide mercury advisory: No one should eat more than 4 meals per month of white or black crappie.

Recommendation: No one should eat more than 4 meals per month of Lake Okonoka white or black crappie smaller than 8 inches or more than 2 meals per month of those fish larger than 8 inches due to mercury.

Note: Linear regression equation was used instead of the exponential equation because the curve and estimates were judged to be more realistic.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
5	0	16
6	0.07	16
7	0.14	4
8	0.21	4
9	0.28	2
10	0.35	2
11	0.42	2
12	0.49	2
<i>Shaded area denotes extrapolated estimates</i>		





Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent					
2020	2020	10	5.1	NA	5.1	6.5
Datasets available: 2020						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.032	0.017	0.068	0.046	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.611	0.617				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent					
2020	2020	10	5.1	NA	5.1	6.5
Datasets available: 2020						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
PFOS	10	50.7 ppb	< 0.25 ppb	110.0 ppb	71.14 ppb	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.05	0.10				
Final meal category based on UCL:						2

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
4	0.01	16
4.5	0.01	16
5	0.01	16
5.5	0.02	16
6	0.03	16
6.5	0.05	16
7	0.08	12
7.5	0.12	8
8	0.29	4
<i>Shaded area denotes extrapolated estimates</i>		

Existing MDHHS Advisory: Washago Pond bluegill and sunfish are covered by the statewide advisory due to mercury: No one should eat more than 8 meals per month of bluegill or sunfish of any size.

Recommendation: No one should eat more than 2 meals per month of Washago Pond bluegill or sunfish of any size due to PFOS.

Note: Washago Pond is part of the Huron-Clinton Metropark system and open for public shore and ice fishing. It is an impoundment of the Regan Drain, a tributary to the Huron River. It is very unlikely that fish can move from the Huron River into the pond. The source of PFOS contamination to the pond is unknown and is being investigated.

Update: The dam at Washago Pond failed on May 21, 2021, and the pond is now almost fully drained. As previously discussed, the source of PFOS contamination to the pond has not been identified. At this time, the guideline for Washago Pond bluegill and sunfish will remain in place. MDHHS will re-evaluate this recommendation once there is clarity on future construction at the pond.

