

Allegan County

Carp**Fenner Lake****Allegan 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	2	20.7	na	20.7	23.2
Datasets available: 1992						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL (ppm)	Meal Category
Mercury	2	0.115			--	--
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
1992	1992	2	20.7	na	20.7	23.2
Datasets available: 1992						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL (ppm)	Meal Category
PCB	2	0.203			--	--
DDT	2	0.035			--	--
Chlordane	2	0.004			--	--
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 week of Fenner Lake carp less than 22 inches in length and no more than one meal per month of Fenner Lake carp greater than 22 inches in length due to PCBs.

Recommendation: There are insufficient data available to develop specific advice for Fenner Lake carp. The statewide consumption guideline for carp recommends that no one eat more than 2 meals per month of carp due to PCBs.

Largemouth Bass

Fenner Lake

Allegan 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	11.6	14	15.4	20.1
Datasets available: 1992						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL (ppm)	Meal Category
Mercury	2	0.595			--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.963	0.871				

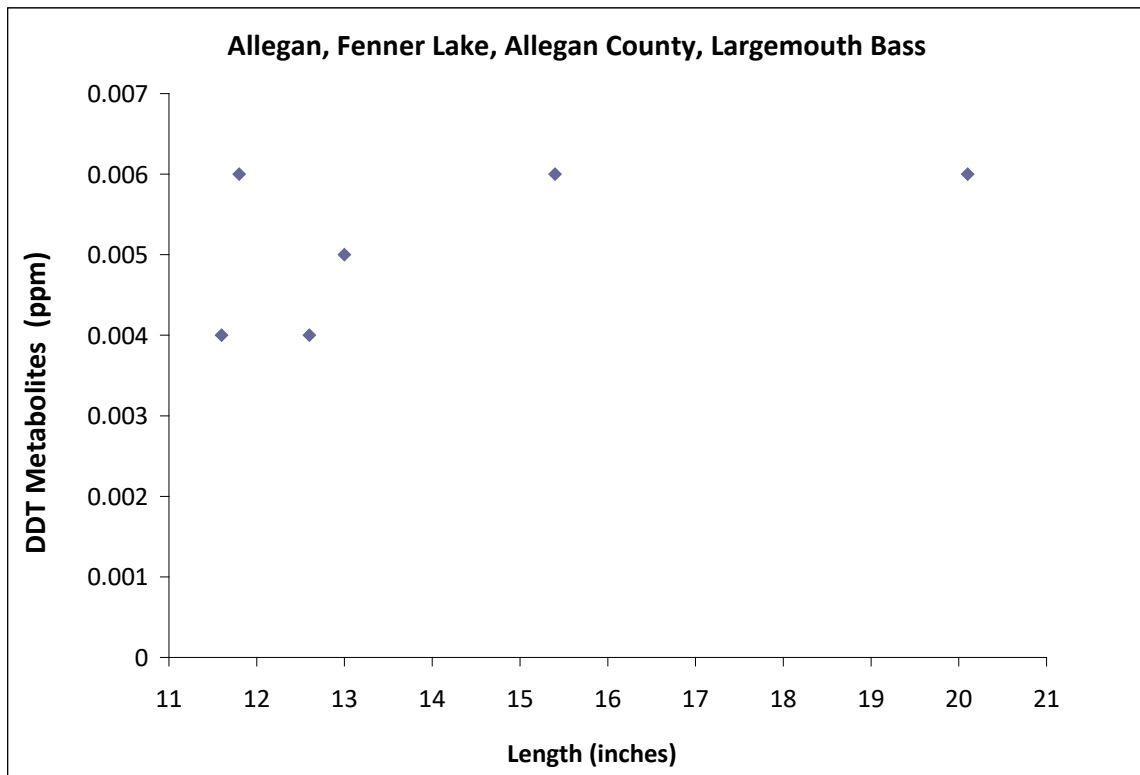
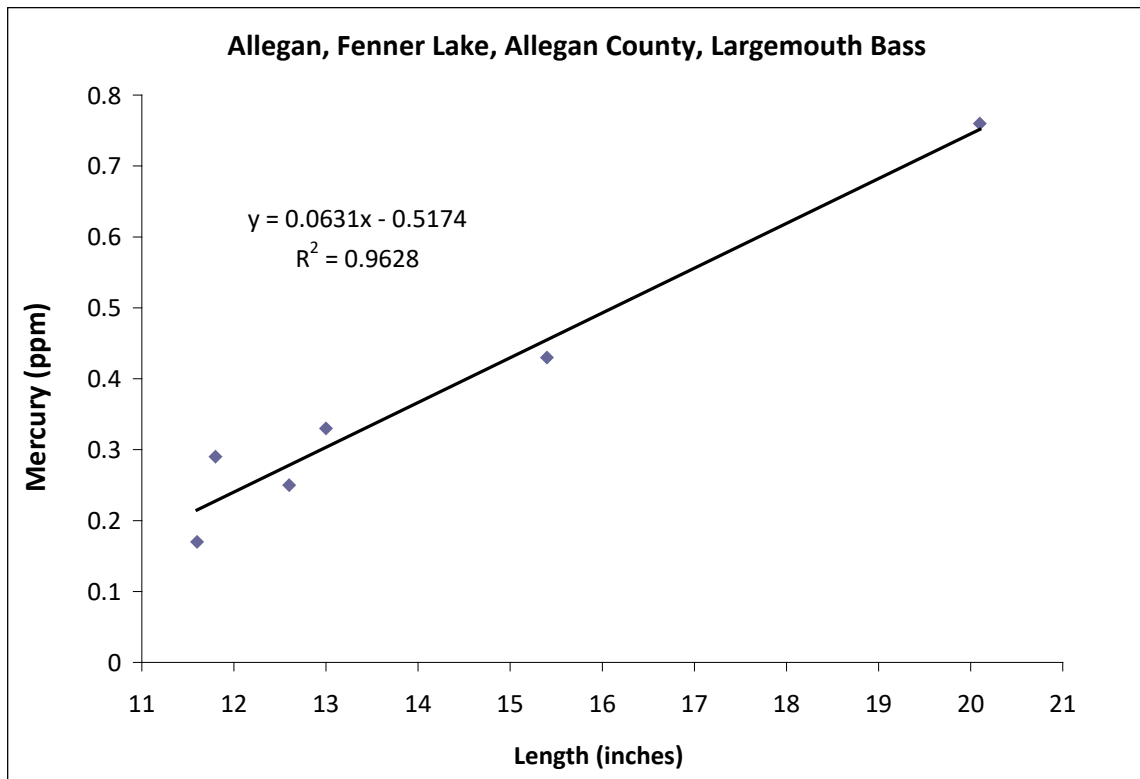
Organics Analysis:

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	11.6	14	15.4	20.1
Datasets available: 1992						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL (ppm)	Meal Category
PCB	2	ND			--	--
DDT	2	0.006			--	--
Chlordane	2	ND			--	--
Toxaphene	2	ND			--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	0.319	0.313				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						--

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

Recommendation: No one should eat more than 2 meals per month of Fenner Lake largemouth or smallmouth bass less than 16 inches or more than 1 meal per month of those fish larger than 16 inches due to mercury. PCBs would cause an advisory.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
14	0.366	2
15	0.429	2
16	0.492	2
17	0.555	1
18	0.618	1
19	0.682	1
20	0.745	1
21	0.808	1
22	0.871	1
Shaded area denotes extrapolated estimates		



Northern Pike

Hutchins Lake

Allegan County

Hg Analysis:

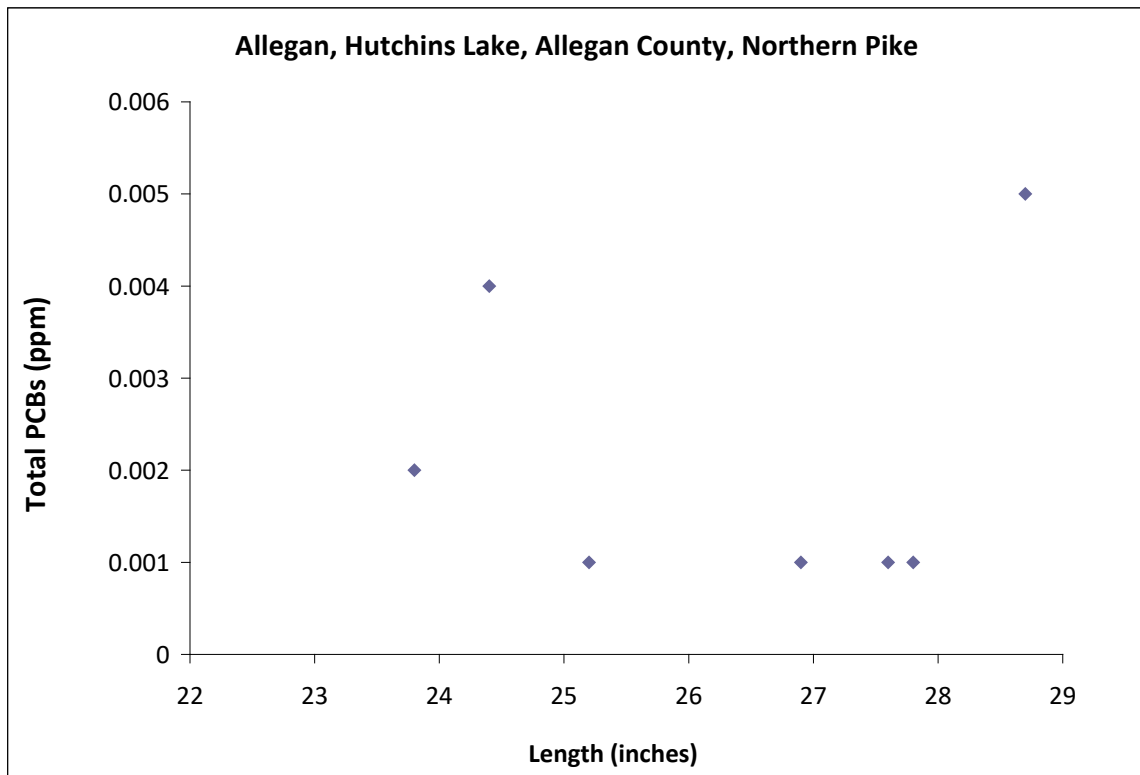
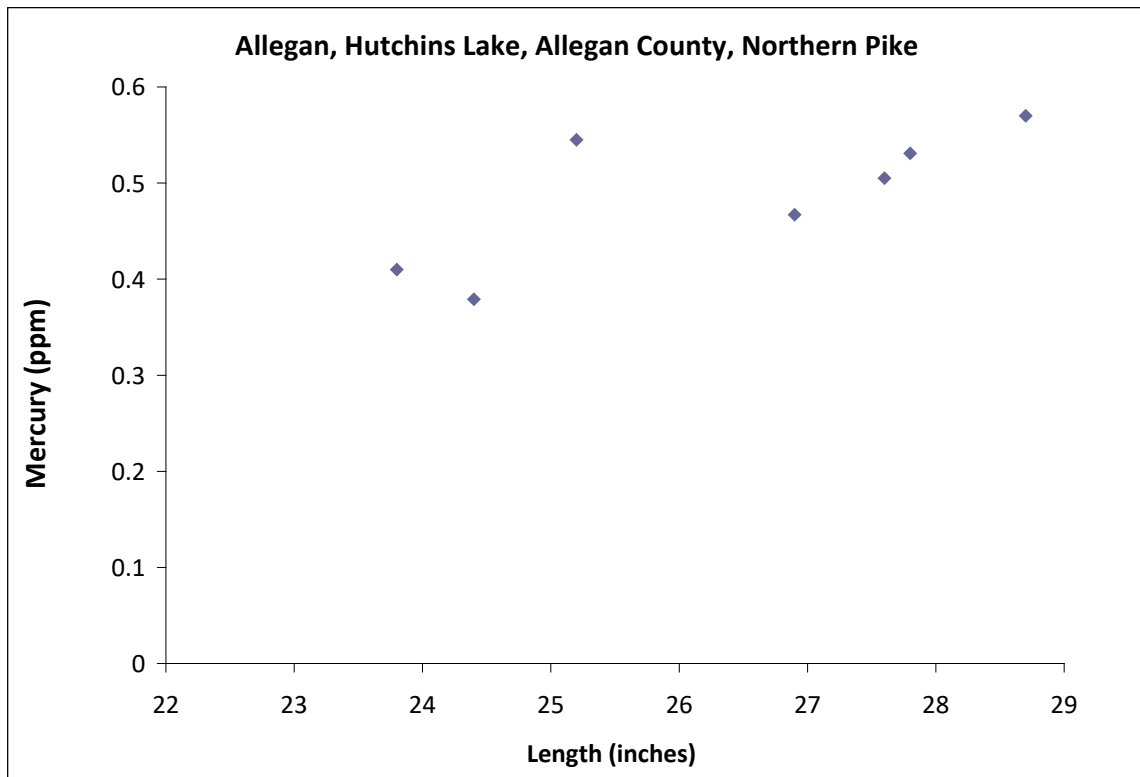
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2007	2007	10	22.8	24	23.8	28.7
Datasets available: 2007						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL (ppm)		Meal Category
Mercury	7	0.487		0.55		1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.055	0.060				

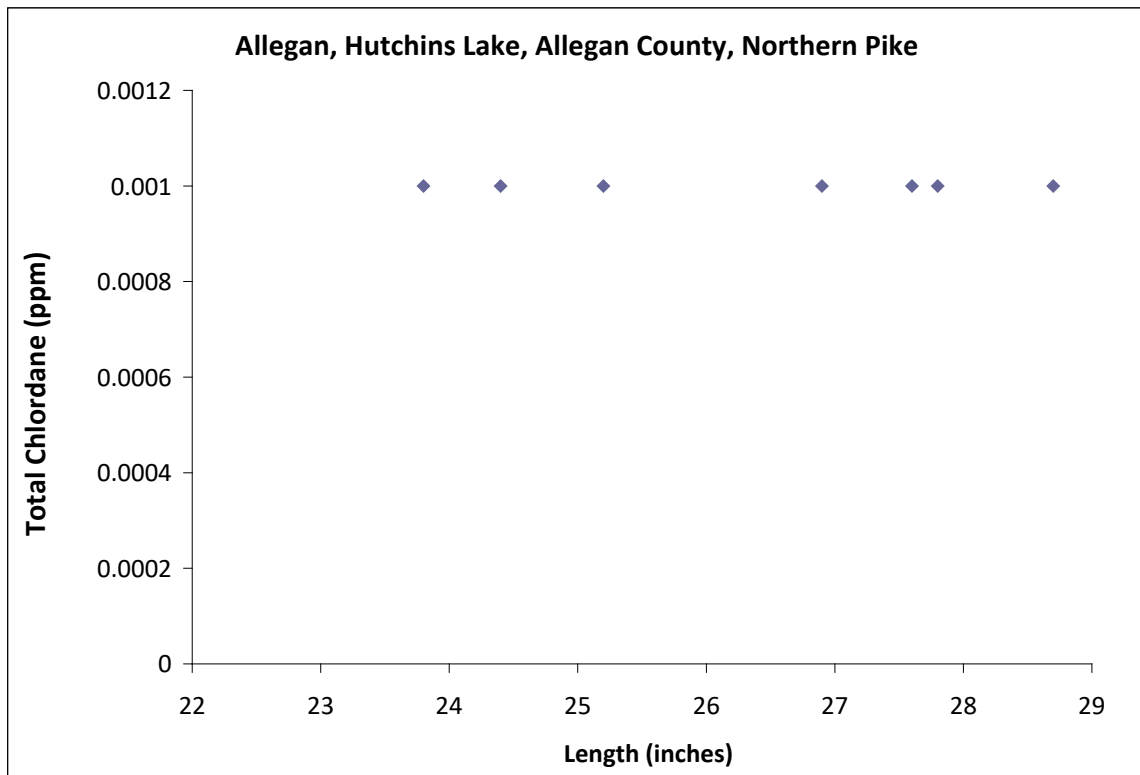
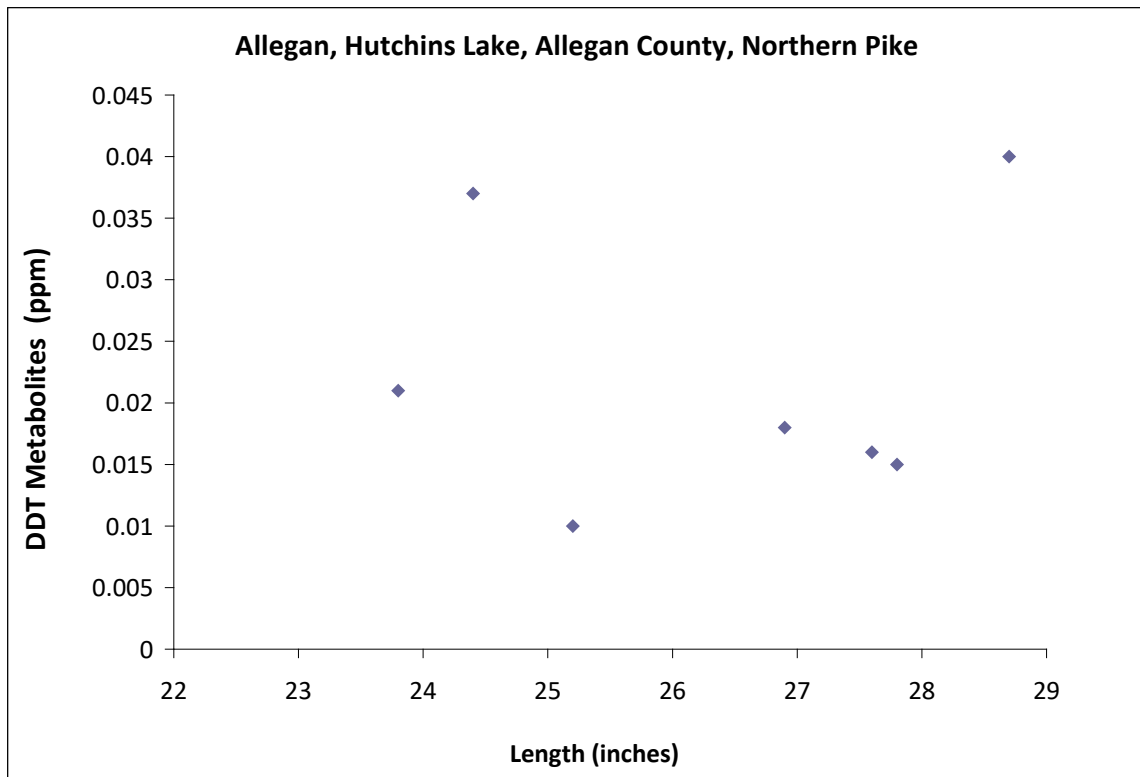
Organics Analysis:

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	22.8	24	23.8	28.7
Datasets available: 2007						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL (ppm)	Meal Category
PCB	7	0.002			0.003	16
DDT	7	0.022			0.03	16
Chlordane	7	0.001			0.003	--
Toxaphene	7	ND			--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.145	0.119				
DDT	0.096	0.044				
Chlordane	0.120	0.120				
Toxaphene	--	--				
Final meal category based on UCL:						1

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

Recommendation: No one should eat more than 1 meal per month of Hutchins Lake northern pike less than 30 inches, or more than six meals per year greater than 30 inches due to mercury. Statewide length break was applied.





Largemouth Bass

Osterhout Lake

Allegan 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	12.8	14	13.6	16.3
Datasets available: 2007						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL (ppm)	Meal Category
Mercury	7	0.315			0.400	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.796	0.755				

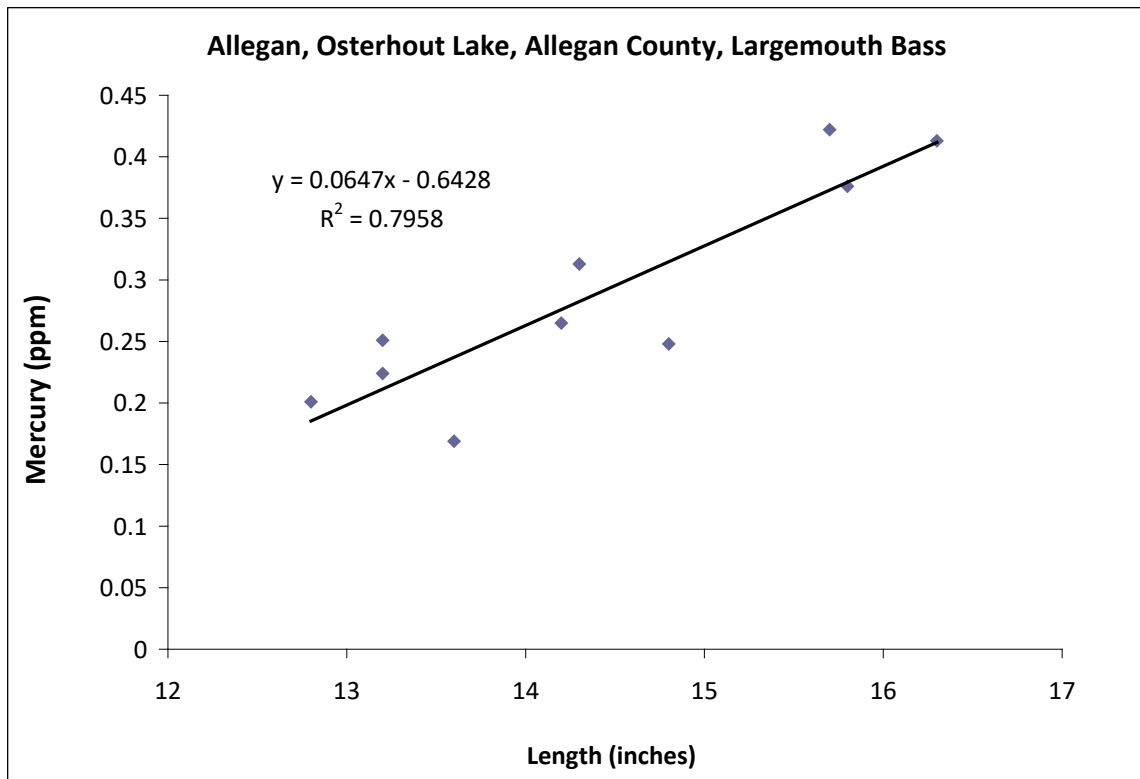
Organics Analysis:

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 (ppm)	Meal Category
PCB	0	NA			--	--
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:						2

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

Recommendation: No one should eat more than 2 meals per month of legal size Osterhout Lake largemouth bass or smallmouth bass under 18 inches or more than 1 meal per month of those fish larger than 18 inches due to mercury. Robust linear regression ($R^2=0.8$) supports using statewide length break.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
14	0.263	4
15	0.328	2
16	0.392	2
17	0.457	2
18	0.522	2
19	0.587	1
20	0.651	1
21	0.716	1
22	0.781	1
Shaded area denotes extrapolated estimates		



Bluegill**Pine Creek
Impoundment****Allegan 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
2012	2012	11	5.9	na	5.9	8.3
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
Mercury	11	0.07		0.05	0.10	0.09
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
Mercury	0.159	0.152				12

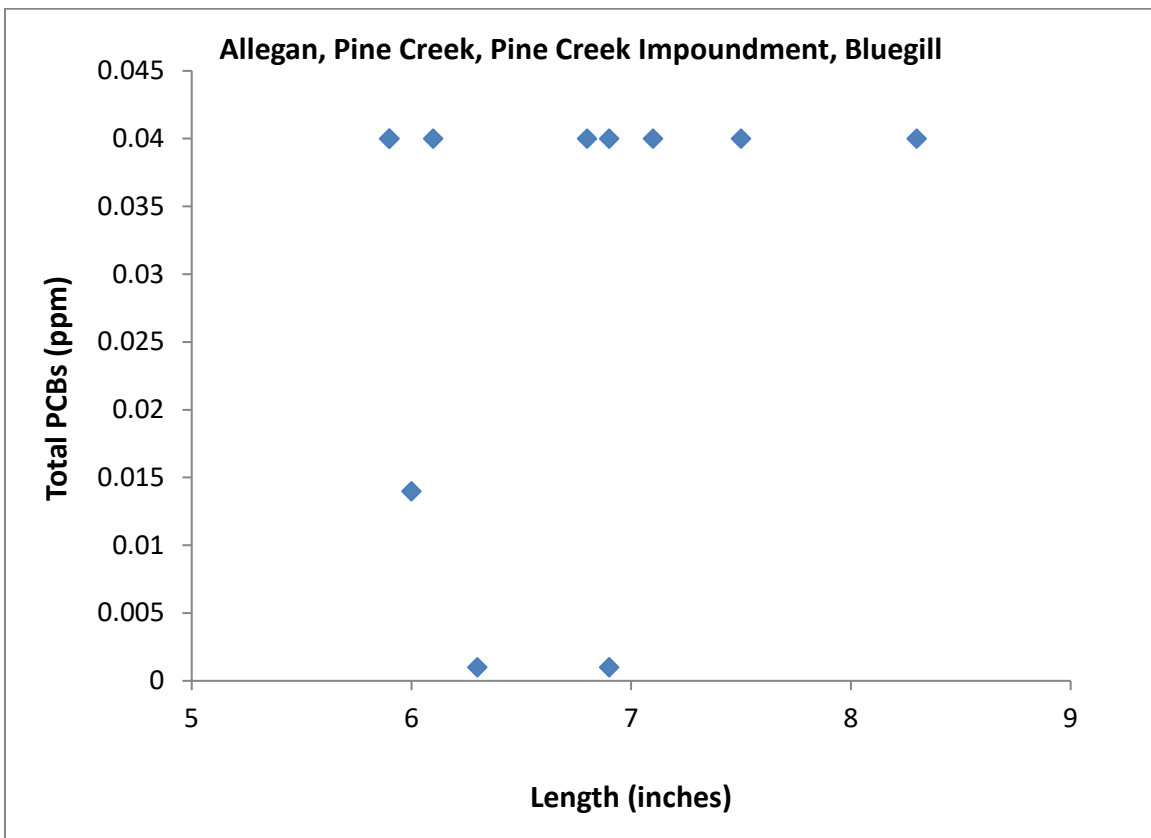
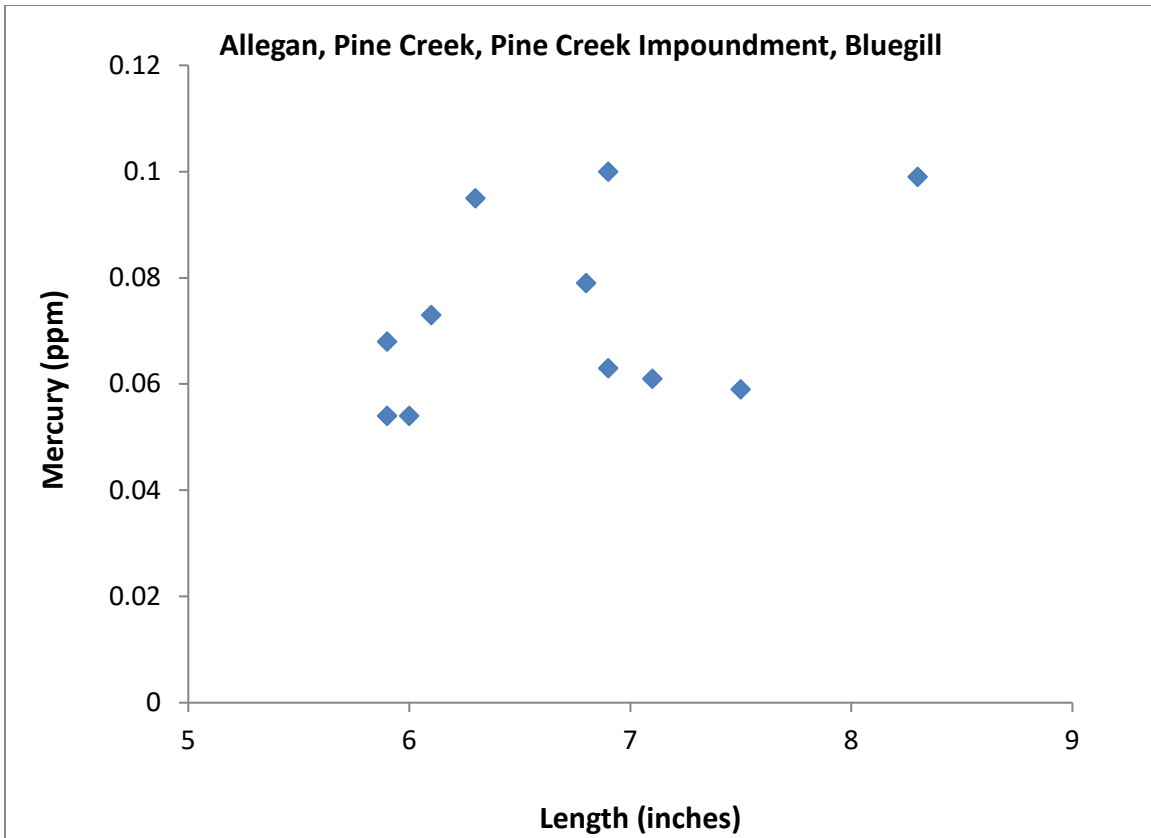
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	11	5.9	na	5.9	8.3
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
PCB	11	0.03		0.001	0.04	0.04
DDT	--	--		--	--	--
Chlordane	--	--		--	--	--
Toxaphene	--	--		--	--	--
TEQ	--	--		--	--	--
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
PCB	0.043	0.017				4
DDT	--	--				--
Chlordane	--	--				--
Toxaphene	--	--				--
TEQ	--	--				--
Final meal category based on UCL:						4

Existing Advisory: Specific guidelines for Pine Creek Impoundment bluegill were not developed since data were not available previously.

Recommendation: No one should eat more than 4 meals per month of bluegill or sunfish from the Pine Creek upstream of the dam at Jefferson Road, including the Pine Creek Impoundment due to PCBs. Mercury would cause an advisory.

Note: This stretch of Pine Creek had a legacy point-source release of PCBs and empties into the Kalamazoo River between the Morrow Pond Dam and Allegan Dam, which is also contaminated with PCBs; however, a dam impedes movement of fish from the Kalamazoo River to Pine Creek.



Carp**Pine Creek
Impoundment****Allegan 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	
2012	2012	11	24.1	na	24.1	31.1	
Datasets available: 2012							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	11	0.18		0.11	0.31	0.22	4
Chemical	Linear Regression	Exponential Regression					
	R²	R²					
Mercury	0.430	0.468					

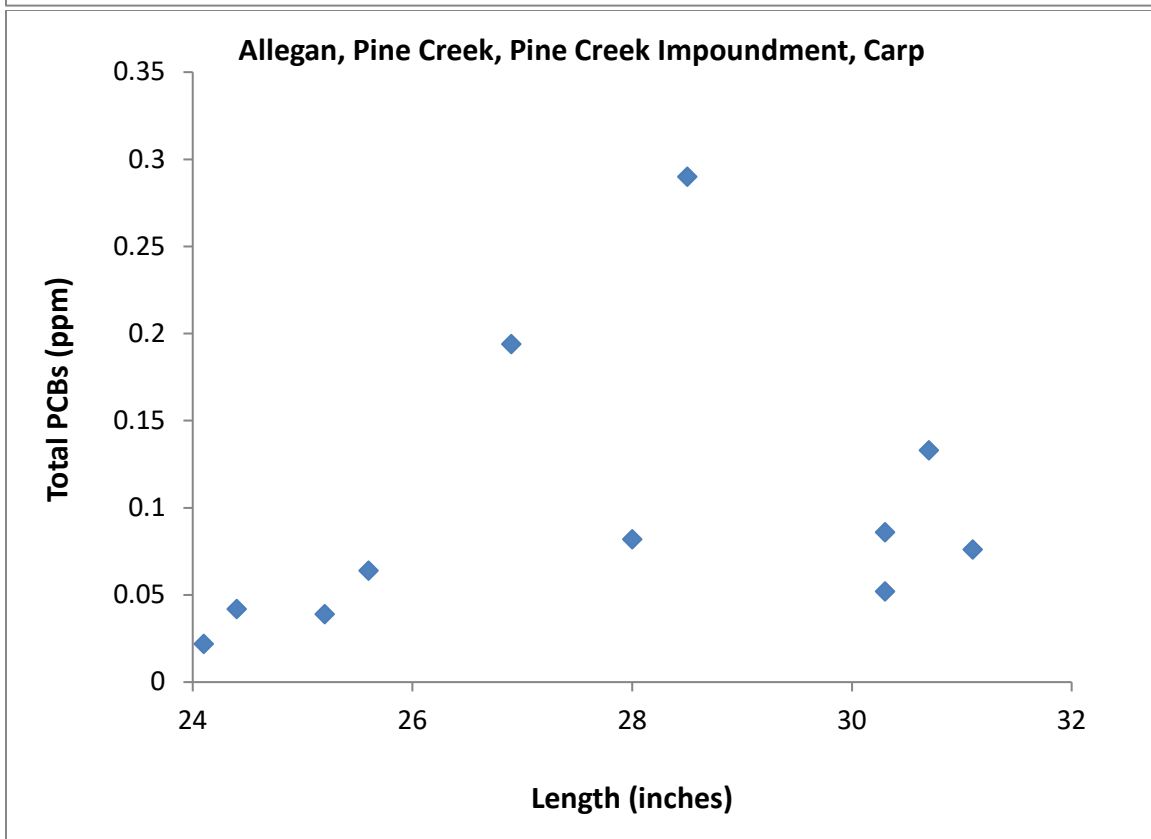
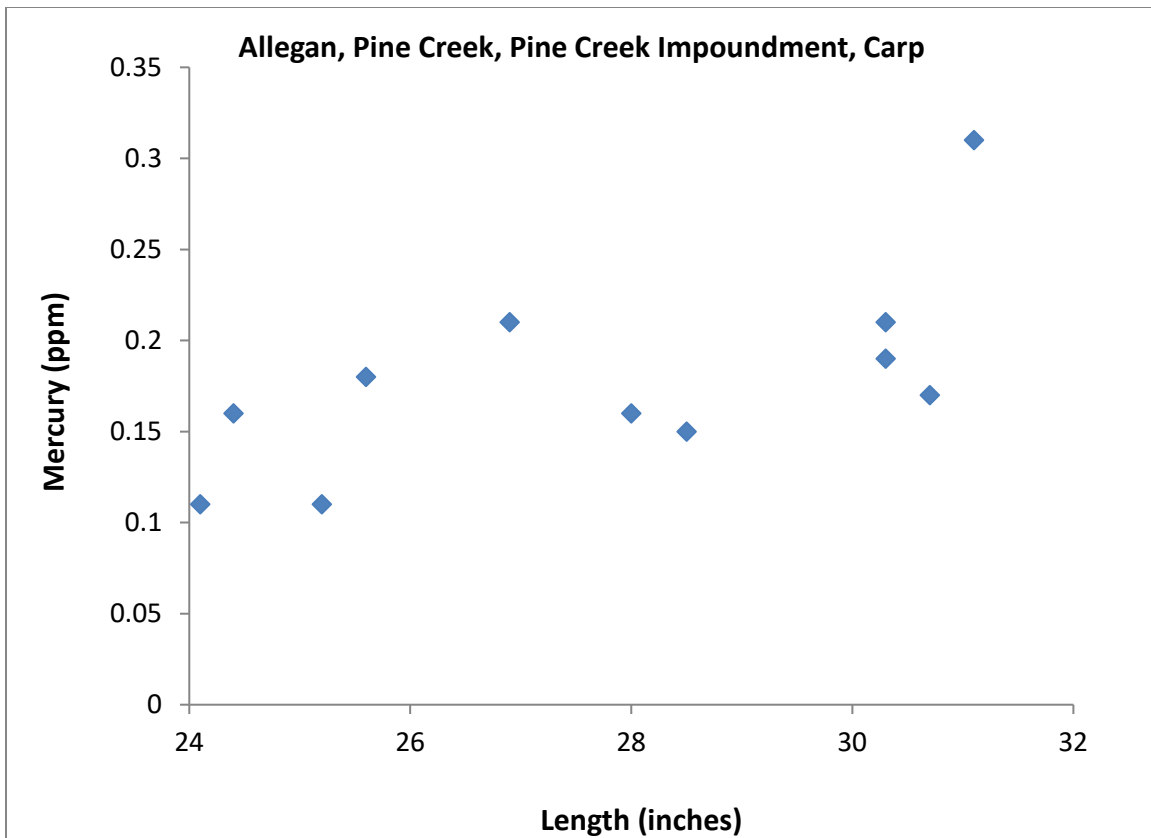
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2012	2012	11	24.1	na	24.1	31.1	
Datasets available: 2012							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	11	0.10		0.02	0.29	0.15	1
DDT	--	--		--	--	--	--
Chlordane	--	--		--	--	--	--
Toxaphene	--	--		--	--	--	--
TEQ	--	--		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.088	0.249					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
TEQ	--	--					
Final meal category based on UCL:							1

Existing Advisory: Specific guidelines for Pine Creek Impoundment carp were not developed since data were not available previously.

Recommendation: No one should eat more than 1 meal per month of carp from the Pine Creek upstream of the dam at Jefferson Road, including the Pine Creek Impoundment due to PCBs. Mercury would cause an advisory.

Note: This stretch of Pine Creek had a legacy point-source release of PCBs and empties into the Kalamazoo River between the Morrow Pond Dam and Allegan Dam, which is also contaminated with PCBs; however, a dam impedes movement of fish from the Kalamazoo River to Pine Creek.



Largemouth Bass

Pine Creek Impoundment

Allegan 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	
2012	2012	7	11.4	14	14.6	17.8	
Datasets available: 2012							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	5	0.45		0.22	0.61	0.63	1
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.806	0.753					

Organics Analysis:

Organics Analysis:

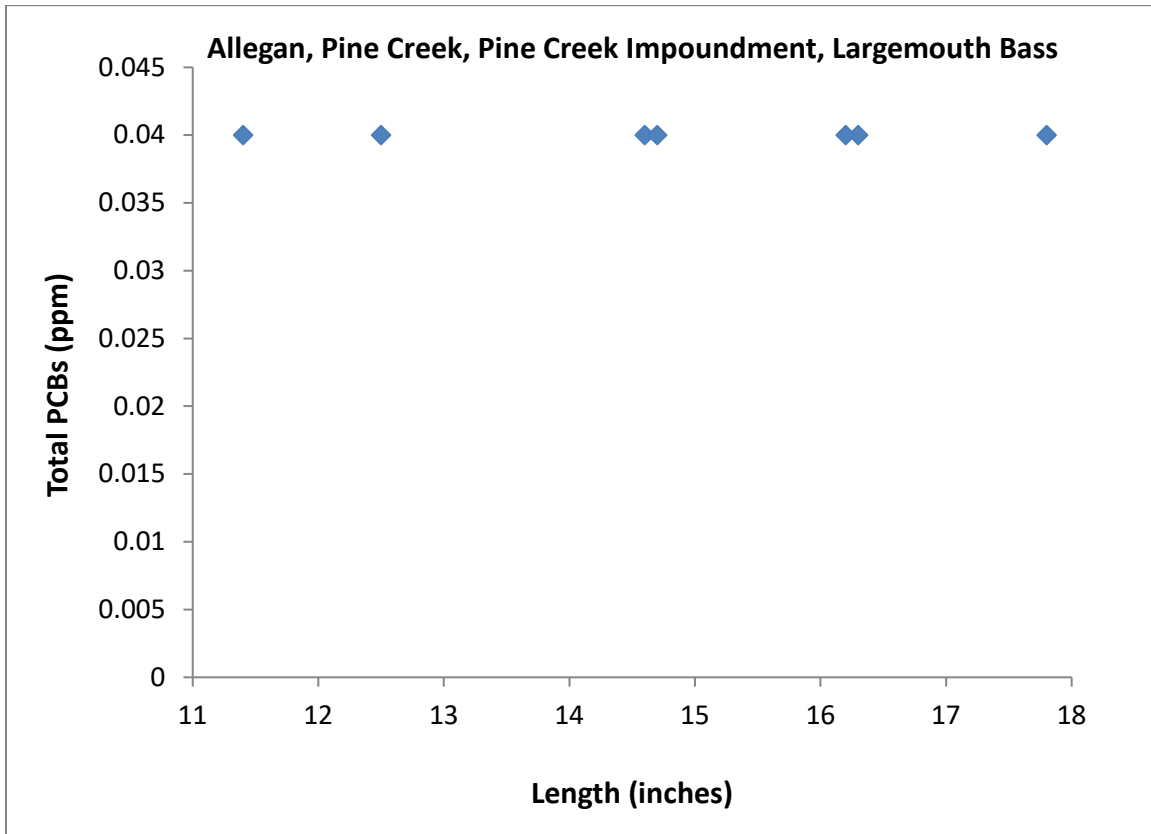
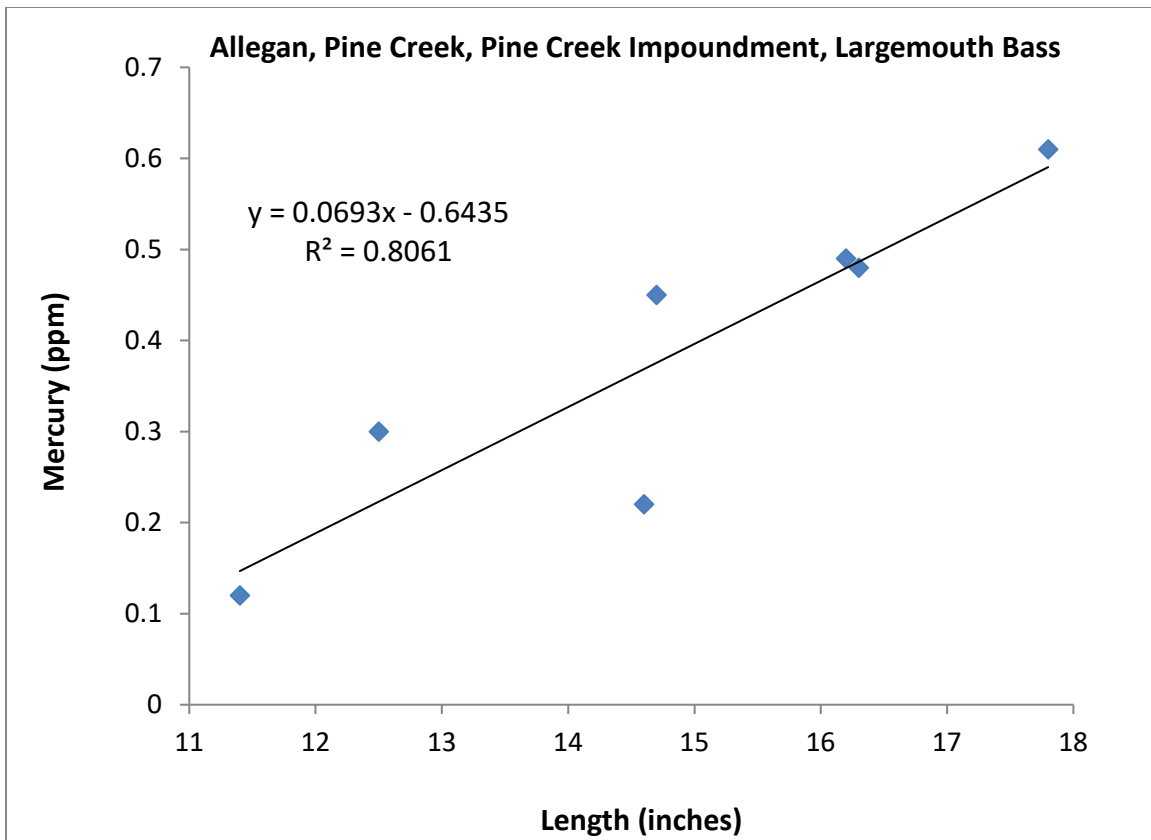
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2012	2012	7	11.4	14	14.6	17.8	
Datasets available: 2012							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	5	0.04		0.04	0.04	0.04	4
DDT	--	--		--	--	--	--
Chlordane	--	--		--	--	--	--
Toxaphene	--	--		--	--	--	--
TEQ	--	--		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
TEQ	--	--					
Final meal category based on UCL:							1

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
14	0.33	2
15	0.4	2
16	0.47	2
17	0.53	2
18	0.6	1
20	0.74	1
22	0.88	1
Shaded area denotes extrapolated estimates		

Existing Advisory: Specific guidelines for Pine Creek Impoundment largemouth or smallmouth bass were not developed since data were not available previously.

Recommendation: No one should eat more than 2 meals per month of largemouth or smallmouth bass from the Pine Creek upstream of the dam at Jefferson Road, including the Pine Creek Impoundment smaller than 17 inches, or more than 1 meal per month of those fish larger than 17 inches due to mercury. PCBs would cause an advisory.

Note: This stretch of Pine Creek had a legacy point-source release of PCBs and empties into the Kalamazoo River between the Morrow Pond Dam and Allegan Dam, which is also contaminated with PCBs; however, a dam impedes movement of fish from the Kalamazoo River to Pine Creek.



Largemouth Bass

Selkirk Lake

Allegan 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	1993	9	12.4	14	14	20.3	
Datasets available: 1993							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	7	0.479		0.27	0.69	0.610	1
Chemical	Linear Regression	Exponential Regression					
	R²	R²					
Mercury	0.774	0.658					

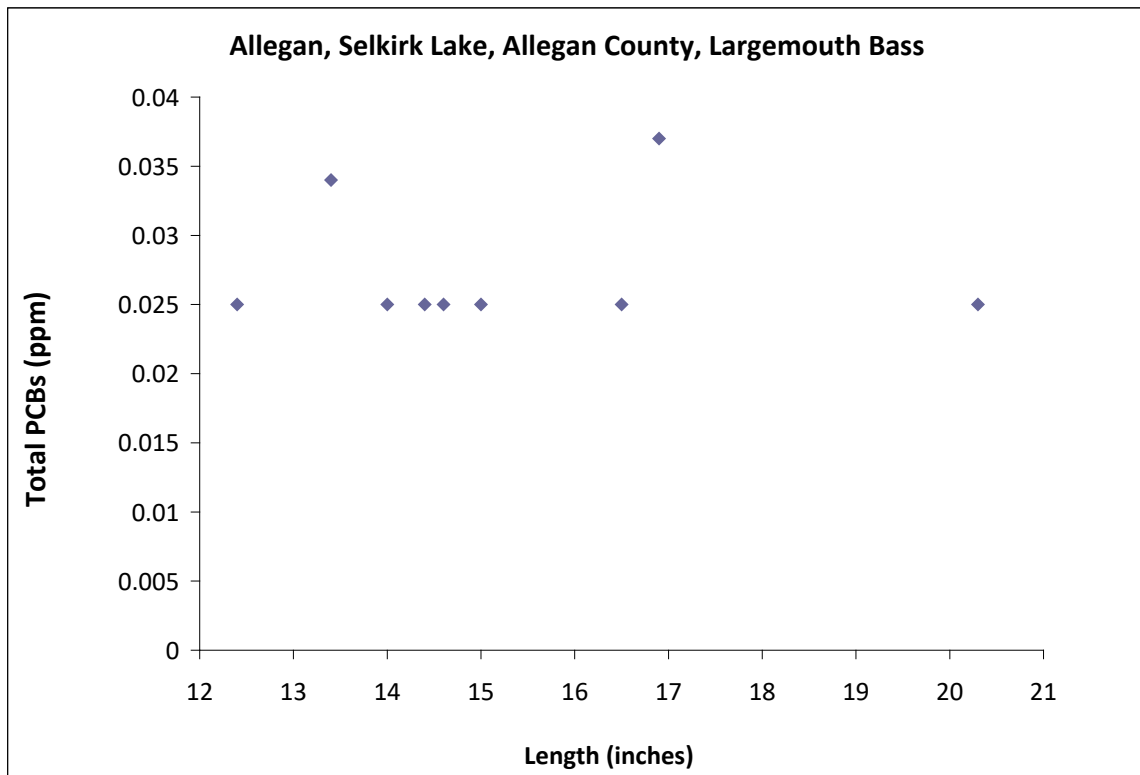
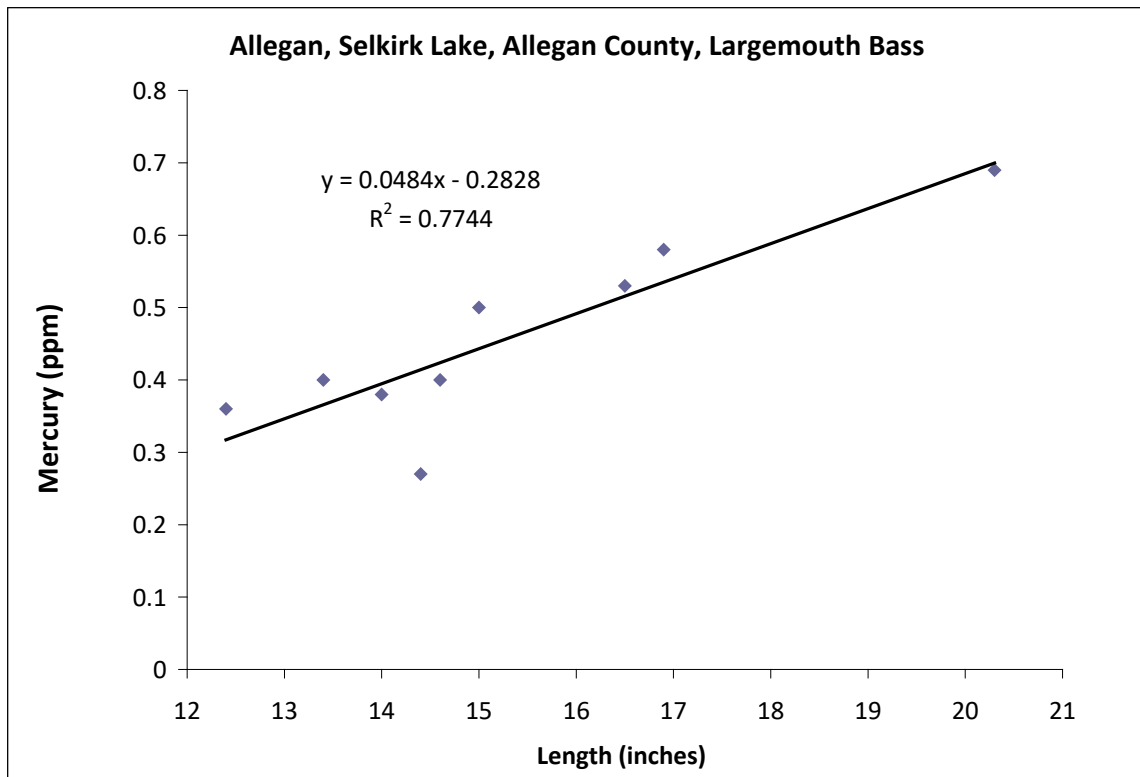
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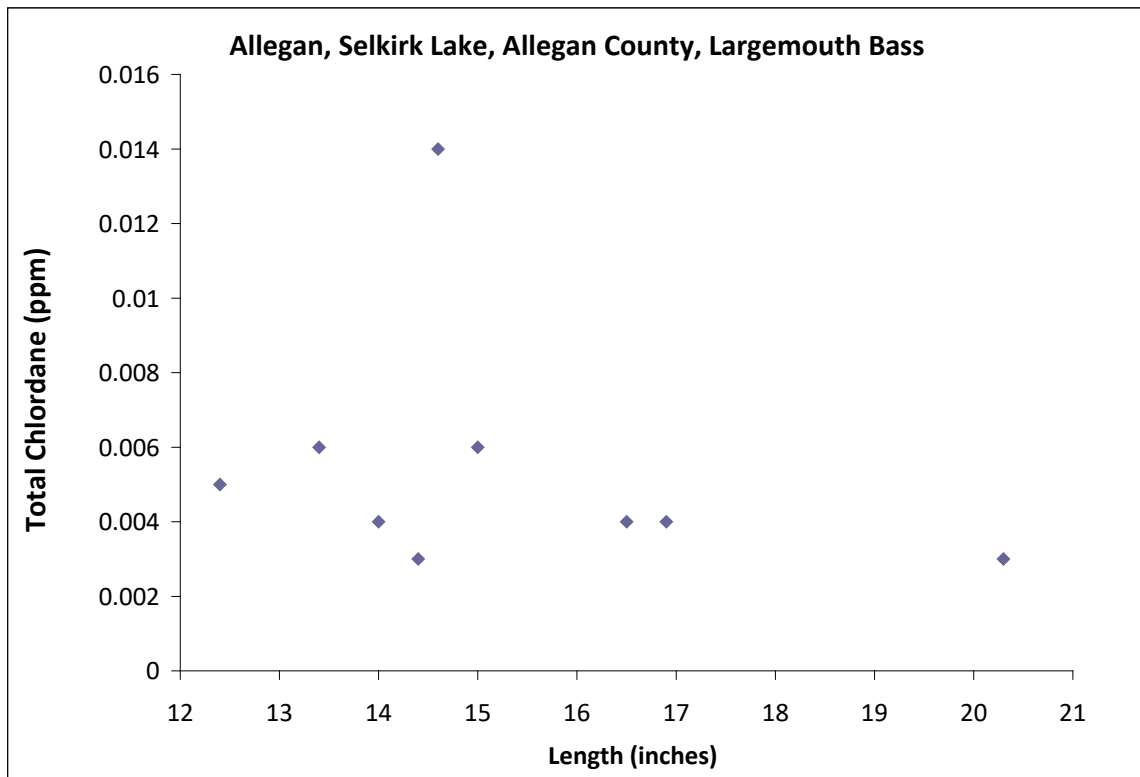
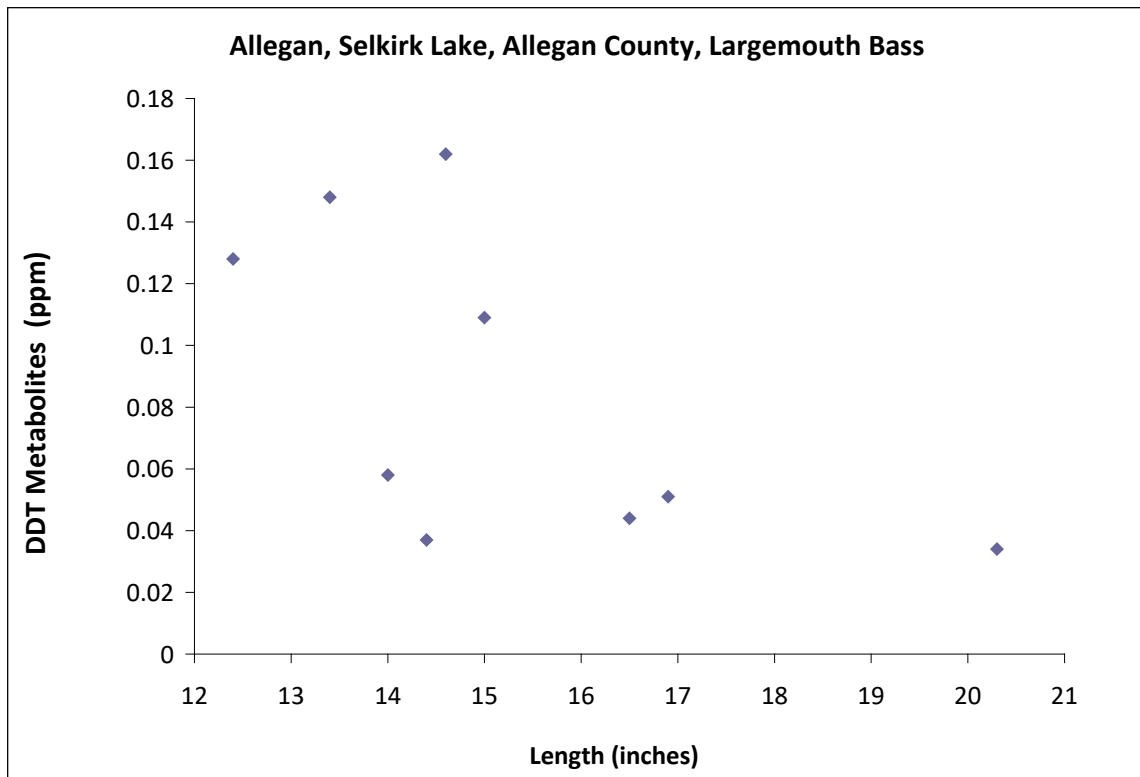
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1993	1993	9	12.4	14	14	20.3	
Datasets available: 1993							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	7	0.027		0.025	0.037	0.030	8
DDT	7	0.071		0.034	0.162	0.110	16
Chlordane	7	0.005		0.003	0.014	0.010	--
Toxaphene	7	ND					
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.001	0.000					
DDT	0.374	0.439					
Chlordane	0.081	0.161					
Toxaphene	--	--					
Final meal category based on UCL:							1

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

Recommendation: No one should eat more than 2 meals per month of Selkirk Lake largemouth or smallmouth bass less than 16 inches or more than 1 meal per month of those fish larger than 16 inches due to mercury. PCBs would cause an advisory.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
14	0.395	2
15	0.443	2
16	0.492	2
17	0.540	1
18	0.588	1
19	0.637	1
20	0.685	1
21	0.734	1
22	0.782	1
Shaded area denotes extrapolated estimates		





Yellow Bullhead**Selkirk Lake****Allegan County****Hg Analysis:**

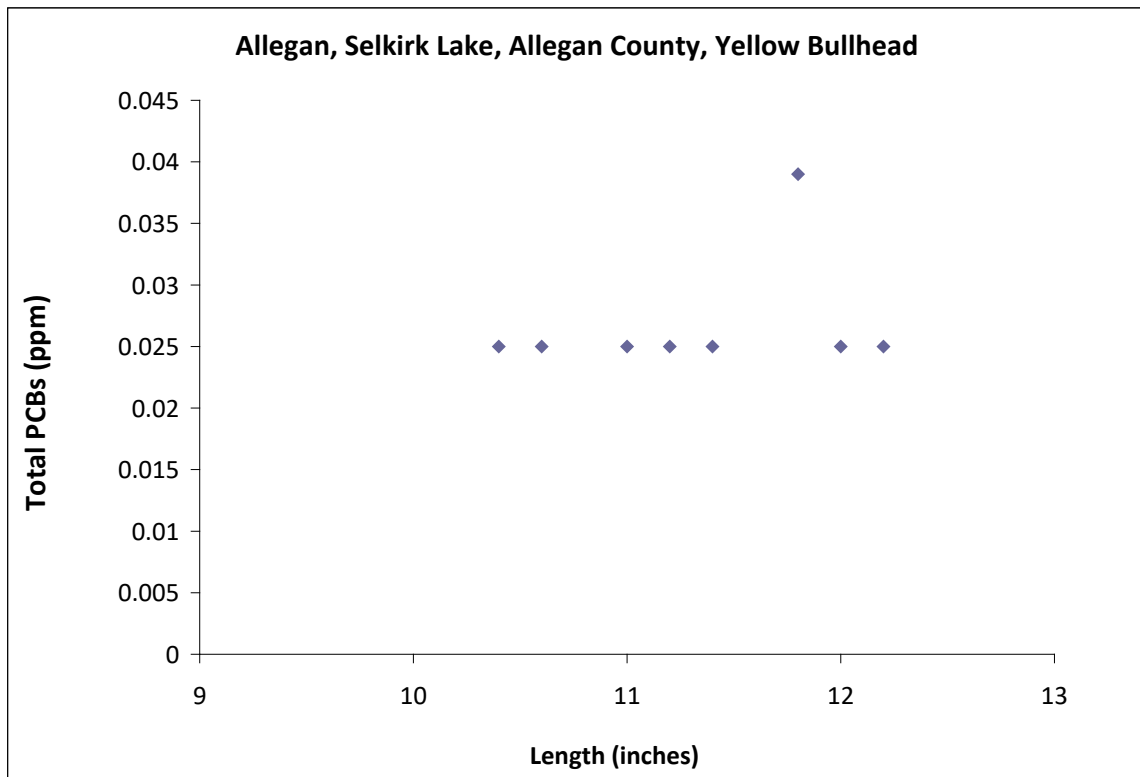
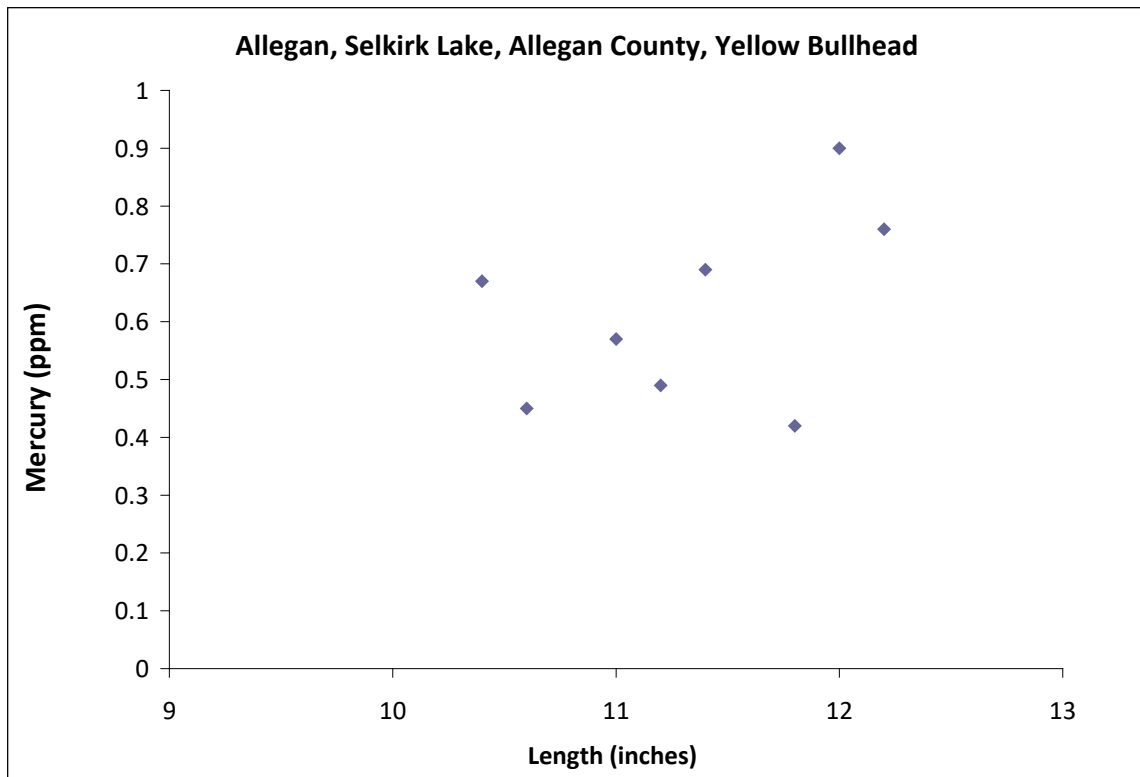
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1993	1993	8	10.4	na	10.4	12.2	
Datasets available:		1993					
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	8	0.619		0.42	0.90	0.760	1
Chemical	Linear Regression	Exponential Regression					
	R²	R²					
Mercury	0.192	0.148					

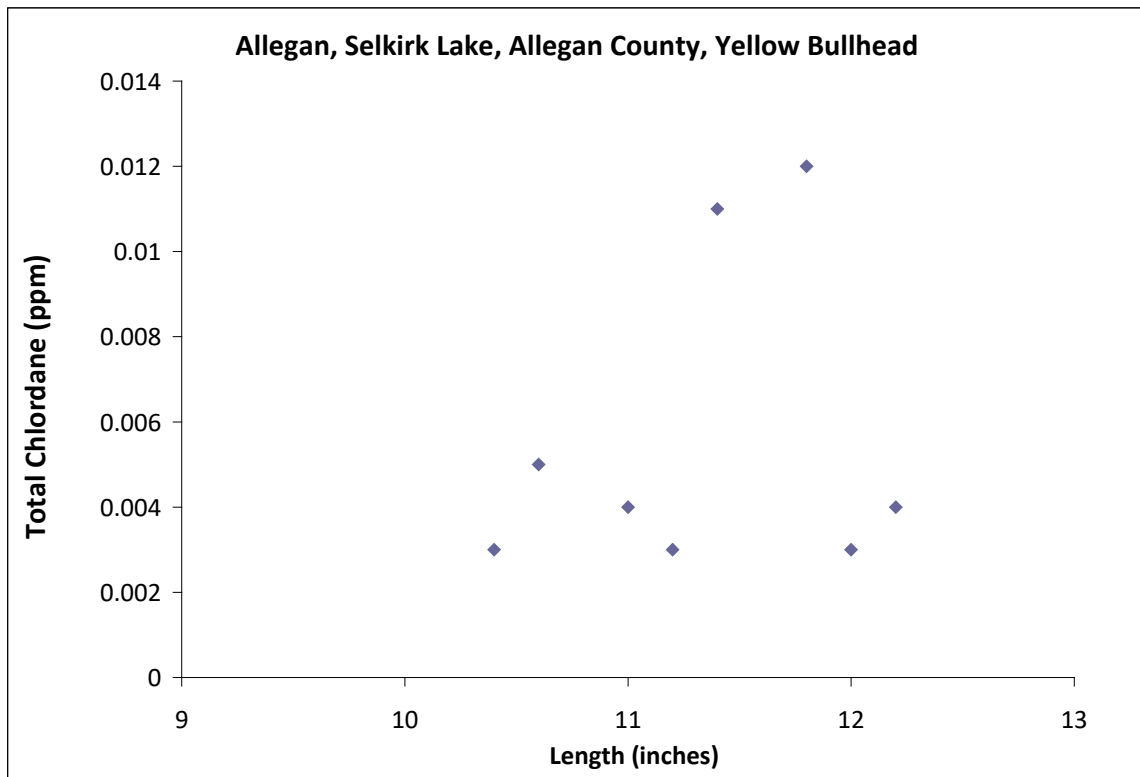
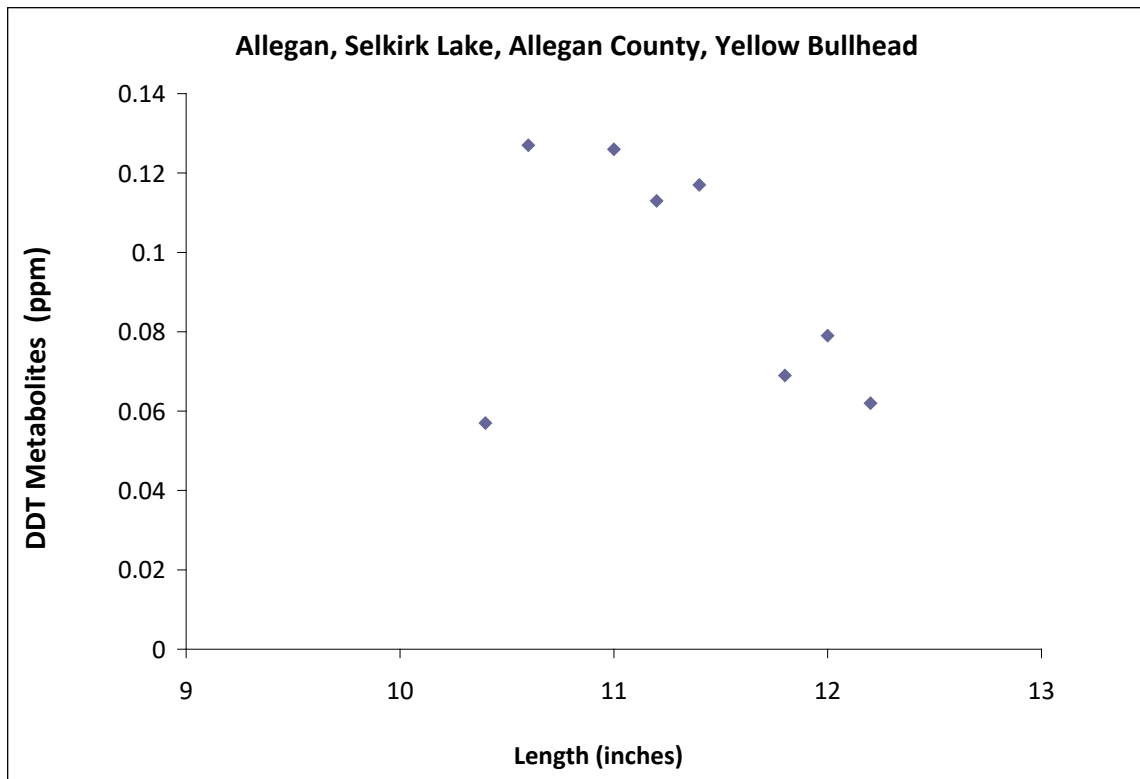
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1993	1993	8	10.4	na	10.4	12.2	
Datasets available: 1993							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	8	0.027		0.025	0.039	0.030	8
DDT	8	0.094		0.057	0.127	0.120	12
Chlordane	8	0.006		0.003	0.012	0.010	--
Toxaphene	8	ND					
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.087	0.087					
DDT	0.140	0.101					
Chlordane	0.056	0.044					
Toxaphene	--	--					
Final meal category based on UCL:							1

Existing Advisory: Due to elevated levels of mercury; women and children should eat no more than one meal per month of Selkirk Lake yellow bullhead between 10 and 18 inches in length.

Recommendation: No one should eat more than 1 meal per month of Selkirk Lake bullhead due to mercury. PCBs and DDT would cause advisories.





Bad River

Gratiot and Saginaw Counties

Carp**Bad River****Gratiot & Saginaw
Counties****Hg Analysis:**

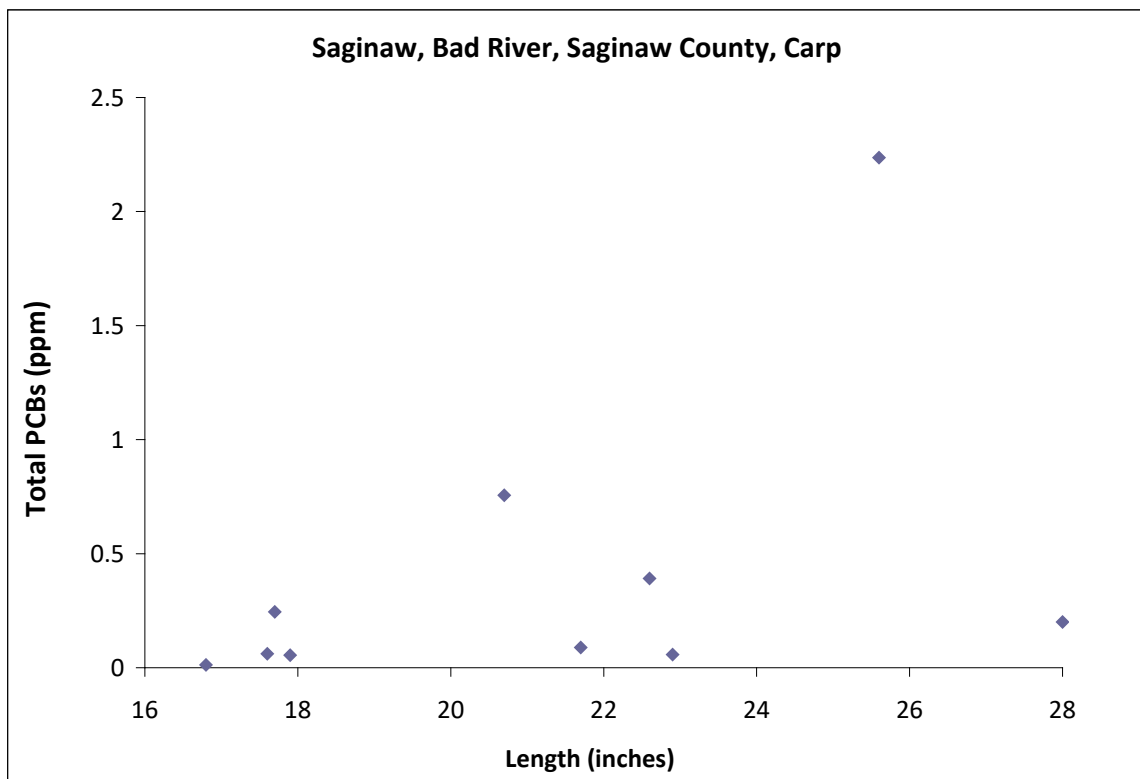
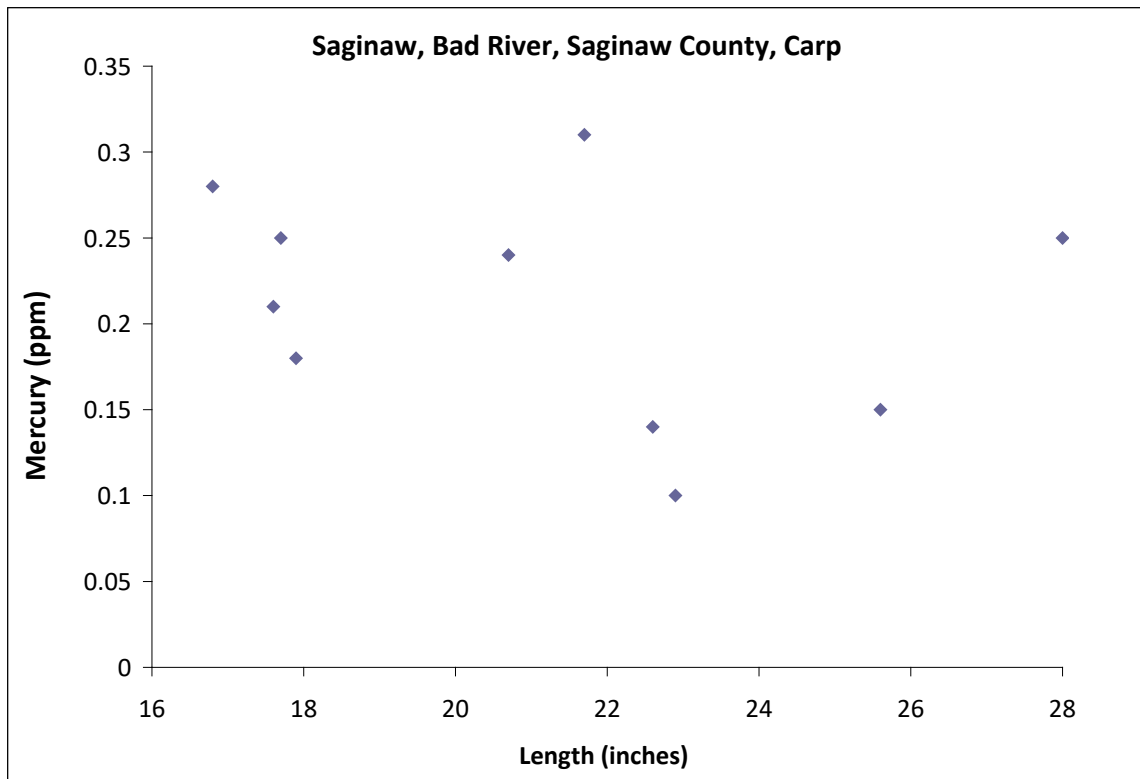
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2004	2004	10	16.8	na	16.8	28
Datasets available: 2004						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL (ppm)	Meal Category
Mercury	10	0.211			0.260	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.068	0.079				

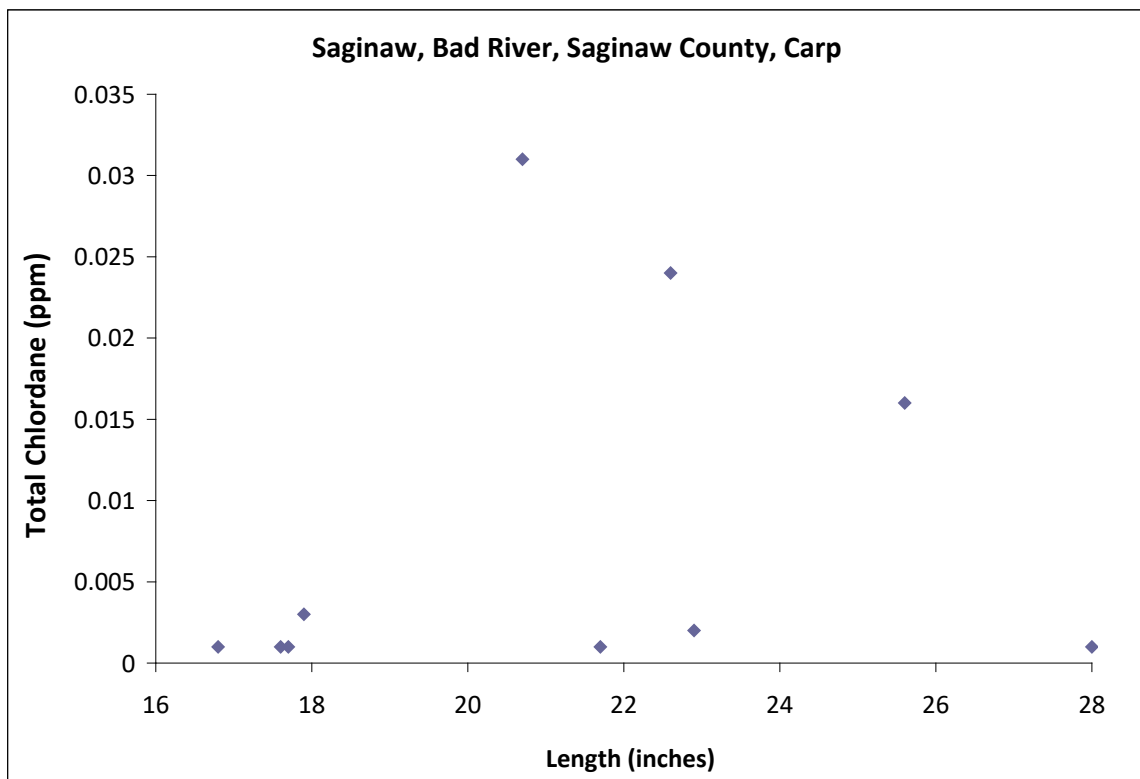
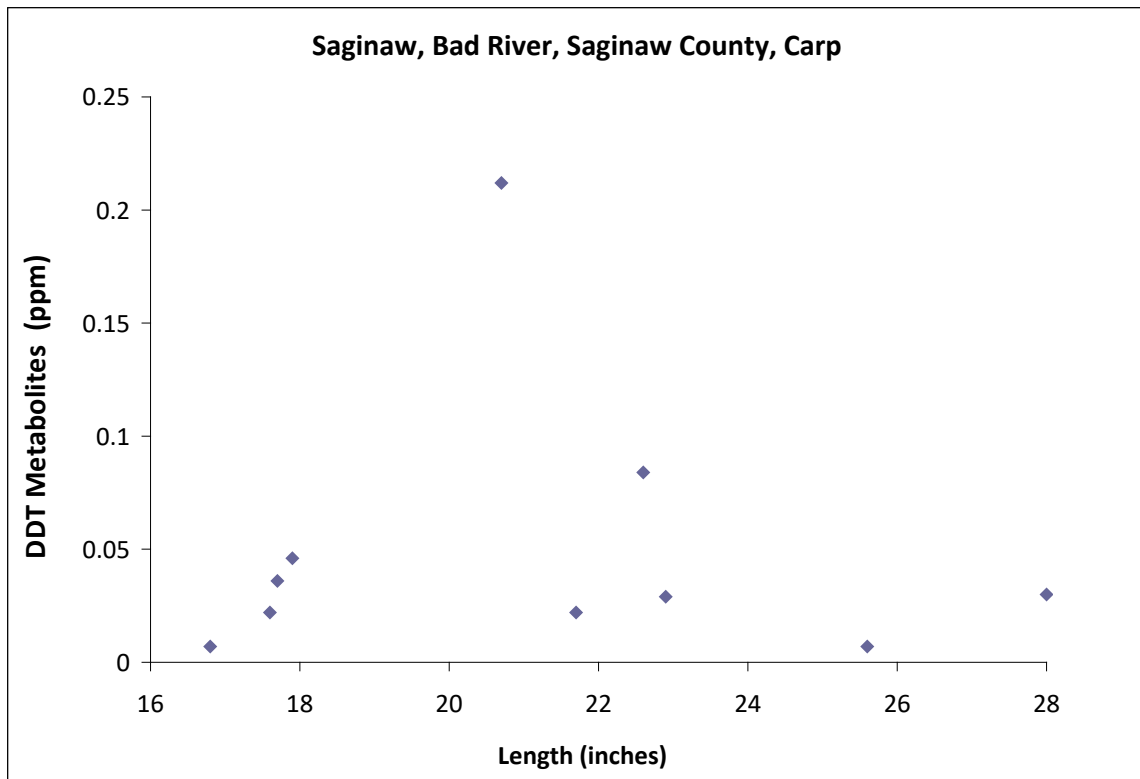
Organics Analysis:

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	16.8	na	16.8	28
Datasets available: 2004						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL (ppm)	Meal Category
PCB	10	0.410			0.900	Limited
DDT	10	0.050			0.090	16
Chlordane	10	0.008			0.020	--
Toxaphene	10	ND			--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.206	0.313				
DDT	0.001	0.000				
Chlordane	0.046	0.072				
Toxaphene						
Final meal category based on UCL: Limited						

Existing Advisory: Women and children should eat no more than one meal per week of Bad River carp less than 18 inches in length and no more than 1 meal per month of carp larger than 18 inches. The general population should eat no more than one meal per week of Bad 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 Bad River carp due to PCBs. Mercury would cause an advisory.





Channel Catfish

Bad River

Gratiot & 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
1994	2004	20	12	12	12	22.4
Datasets available: 1994, 2004						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL (ppm)	Meal Category
Mercury	20	0.276			0.350	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.341	0.424				

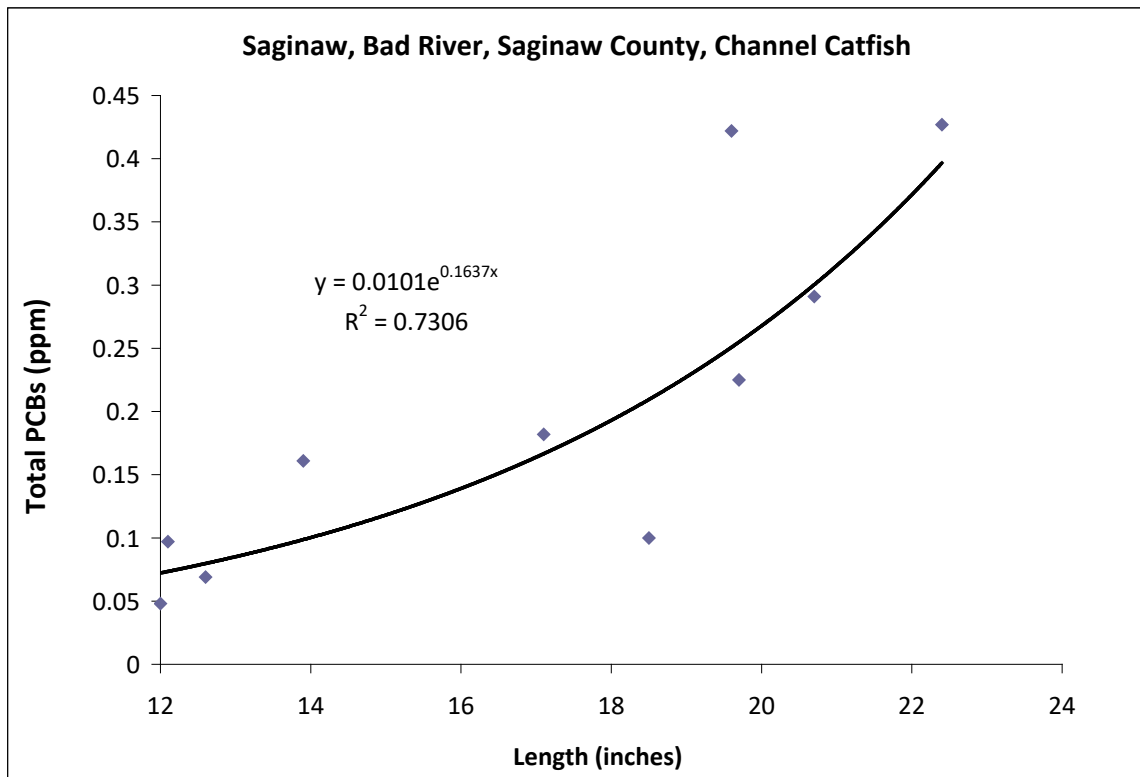
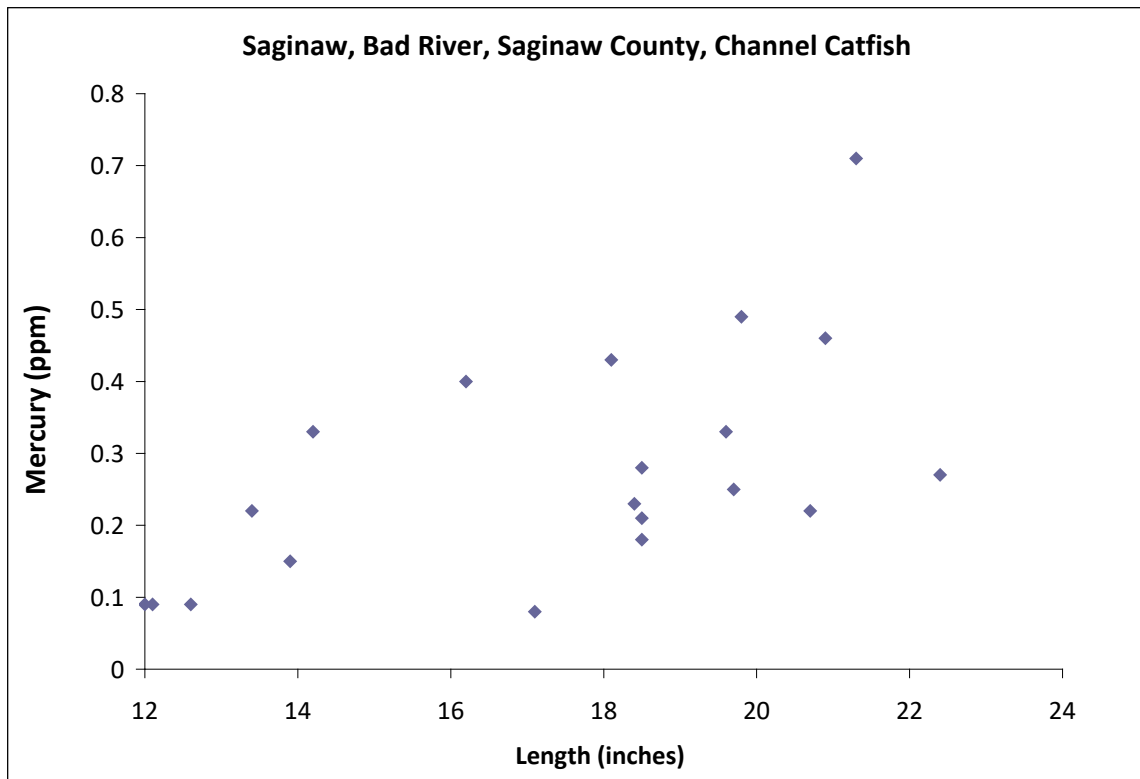
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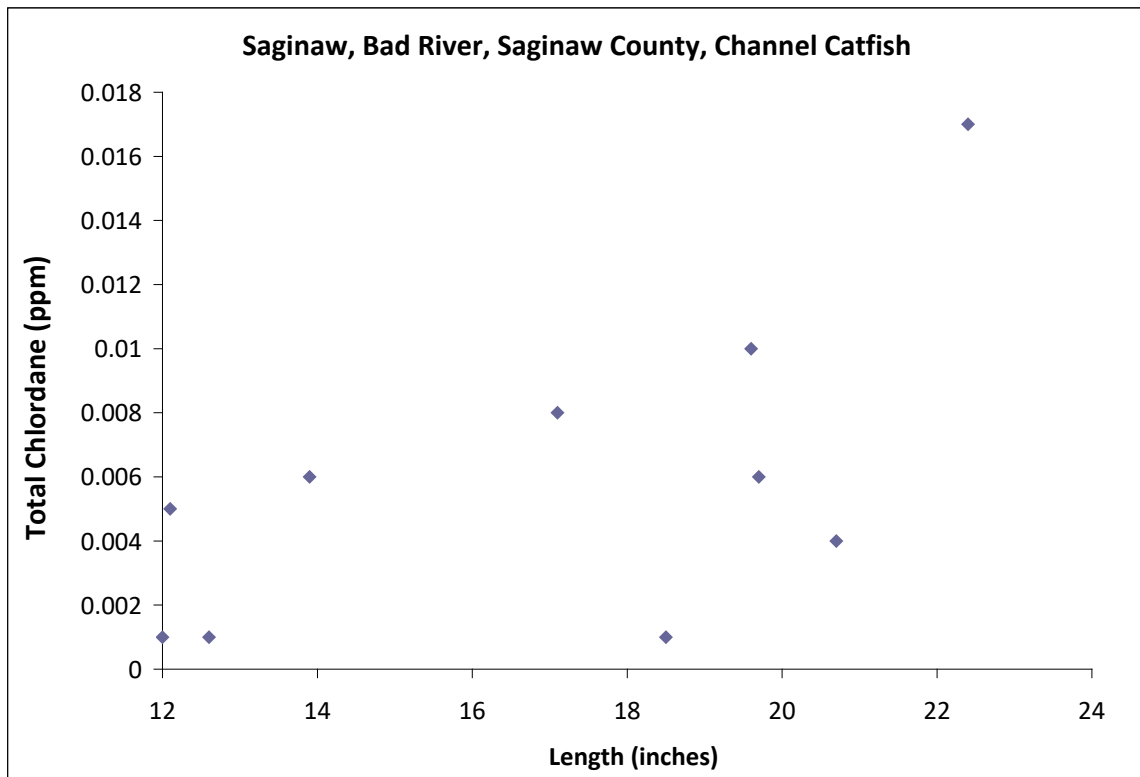
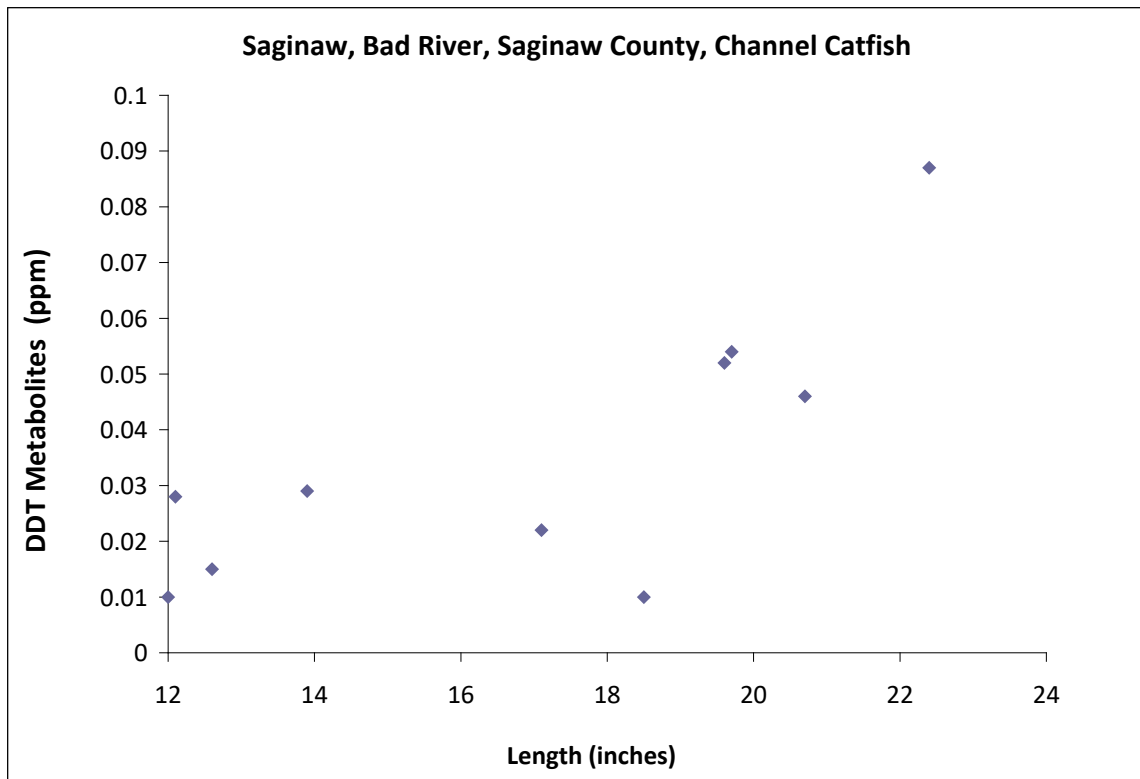
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2004	2004	10	12	12	12	22.4
Datasets available: 2004						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL (ppm)	Meal Category
PCB	10	0.202			0.300	0.5
DDT	10	0.035			0.050	16
Chlordane	10	0.006			0.010	--
Toxaphene	10	ND			--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.685	0.731				
DDT	0.564	0.458				
Chlordane	0.377	0.304				
Toxaphene						
Final meal category based on UCL:						0.5

Existing Advisory: Women and children should eat no more than one meal per week of Bad River channel catfish less than 18 inches in length, no more than one meal per month of channel catfish between 18 and 22 inches in length, and should not eat any Bad River channel catfish greater than 22 inches in length due to elevated levels of PCBs.

Recommendation: No one should eat more than 1 meal per month of Bad River channel catfish less than 18 inches in length or more than 6 meals per year of channel catfish greater than 18 inches due to elevated concentrations of PCBs. Mercury would cause an advisory.

Length (Inches)	PCB Regression Estimate (ppm)	Meal Category
12	0.072	2
14	0.100	2
16	0.139	1
18	0.192	1
20	0.267	0.5
22	0.370	0.5
24	0.514	0
26	0.712	0
28	0.988	0
Shaded area denotes extrapolated estimates		





Northern Pike

Bad River

Gratiot & 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
1994	2008	20	15.5	24	24	33.1
Datasets available: 1994, 2004, 2008						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL (ppm)	Meal Category
Mercury	8	0.310			0.410	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.605	0.620				

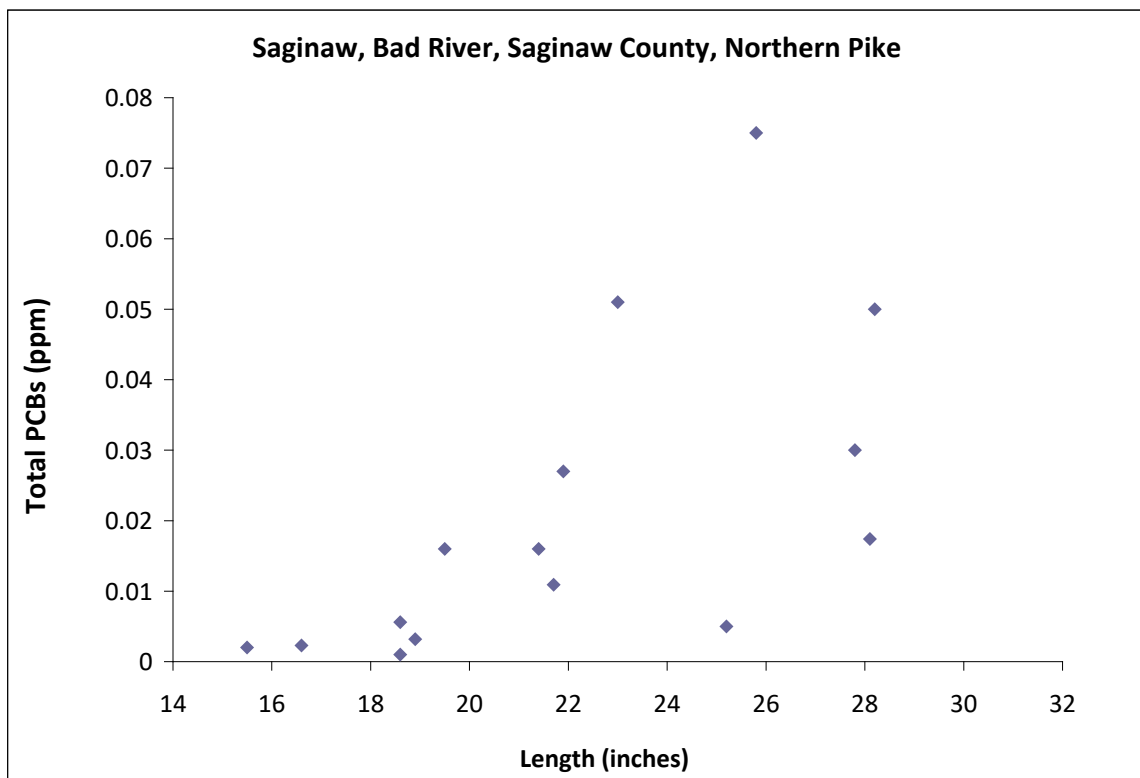
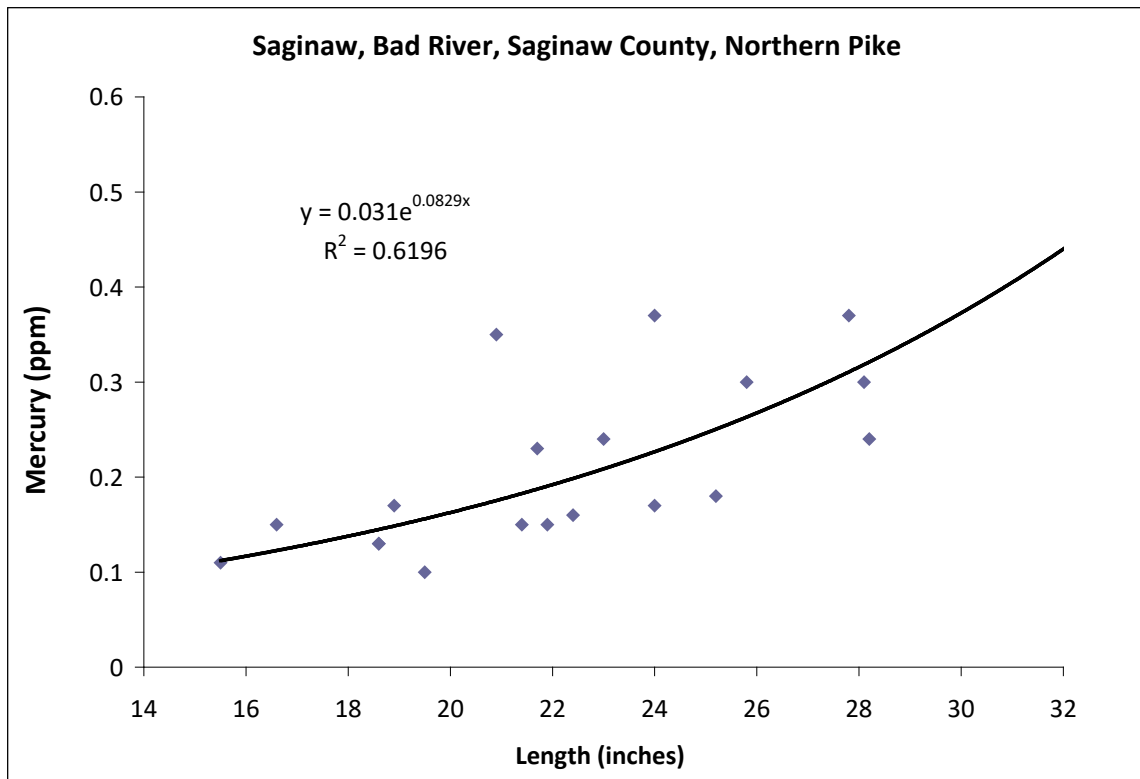
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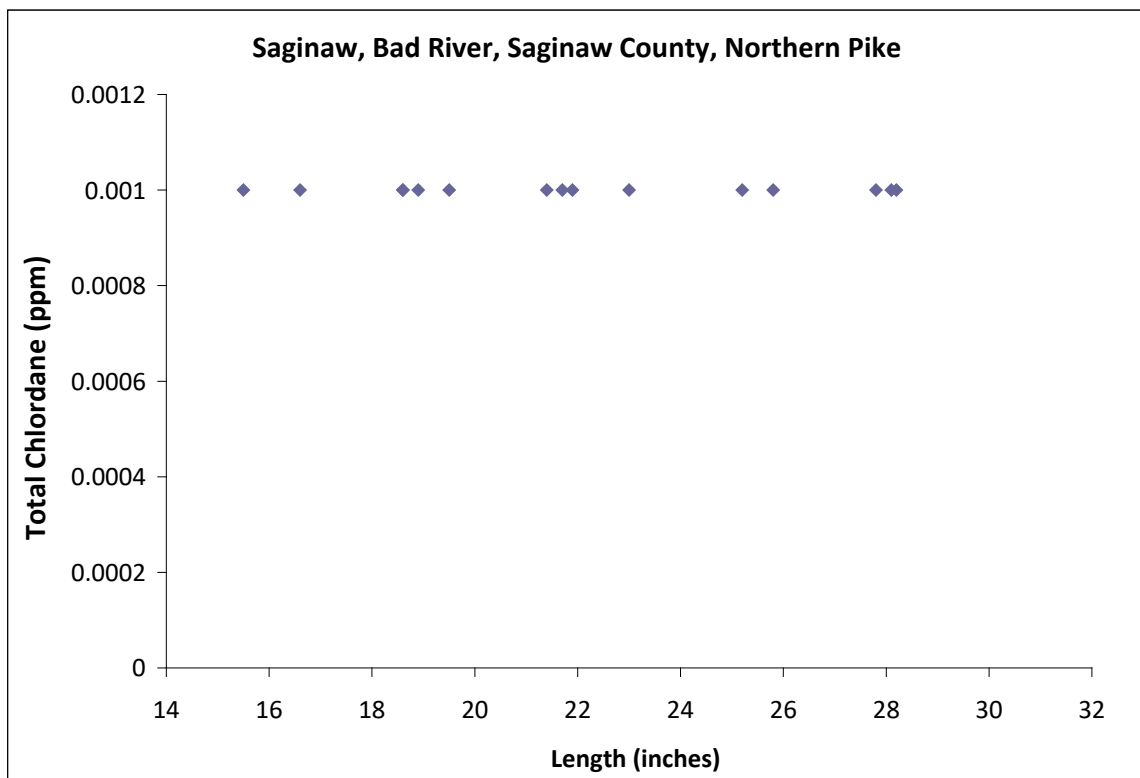
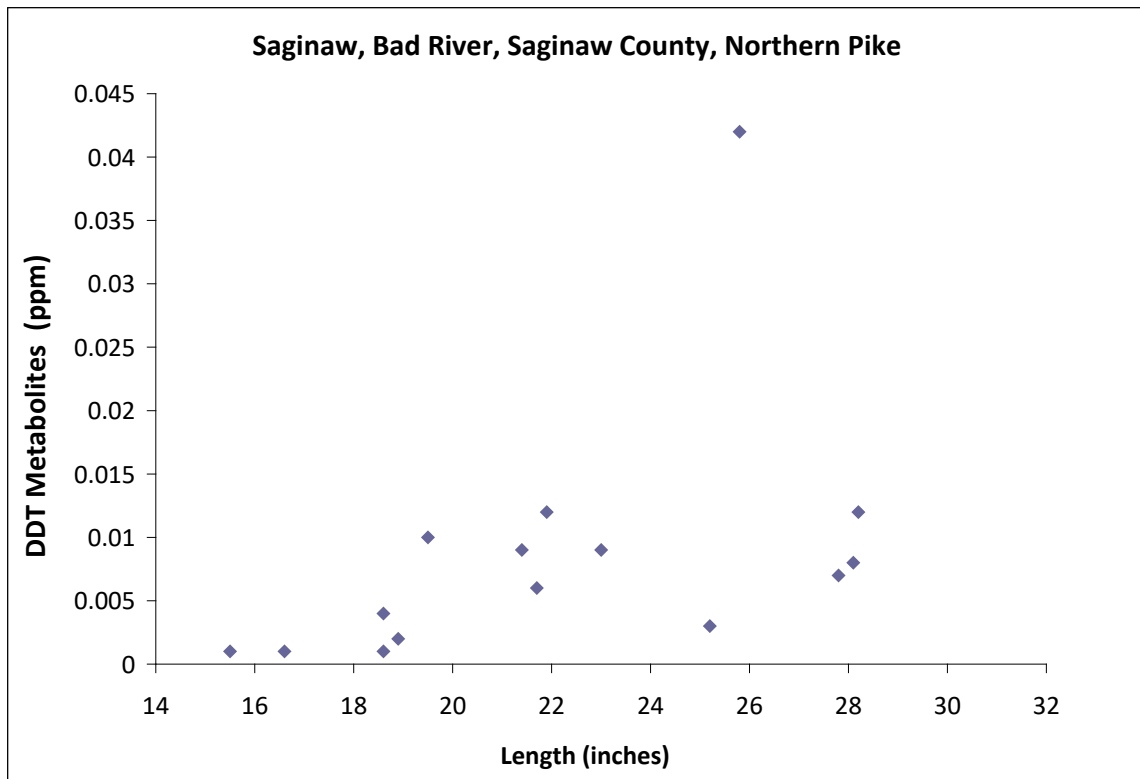
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2004	2008	15	15.5	24	25.2	28.2
Datasets available: 2004, 2008						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL (ppm)	Meal Category
PCB	5	0.035			0.070	2
DDT	5	0.014			0.030	16
Chlordane	5	0.001			0.000	--
Toxaphene	5	ND			--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.391	0.541				
DDT	0.204	0.461				
Chlordane	0.000	0.000				
Toxaphene						
Final meal category based on UCL:						2

Existing Advisory: Women and children should eat no more than one meal per week of Bad River northern pike due to elevated concentrations of PCBs.

Recommendation: No one should eat more than 2 meals per month of Bad River northern pike due to elevated concentrations of PCBs and mercury.

Length (Inches)	Hg Regression Estimate (ppm)	Meal Category
24	0.227	4
26	0.268	4
28	0.316	2
30	0.373	2
32	0.440	2
34	0.519	2
36	0.613	1
38	0.724	1
40	0.854	1
Shaded area denotes extrapolated estimates		





Barry County

Largemouth Bass

Bristol Lake

Barry 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	5	10.4	14	14.5	15.7
Datasets available: 2002						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
Mercury	2	0.435		0.44	0.43	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.679	0.609				

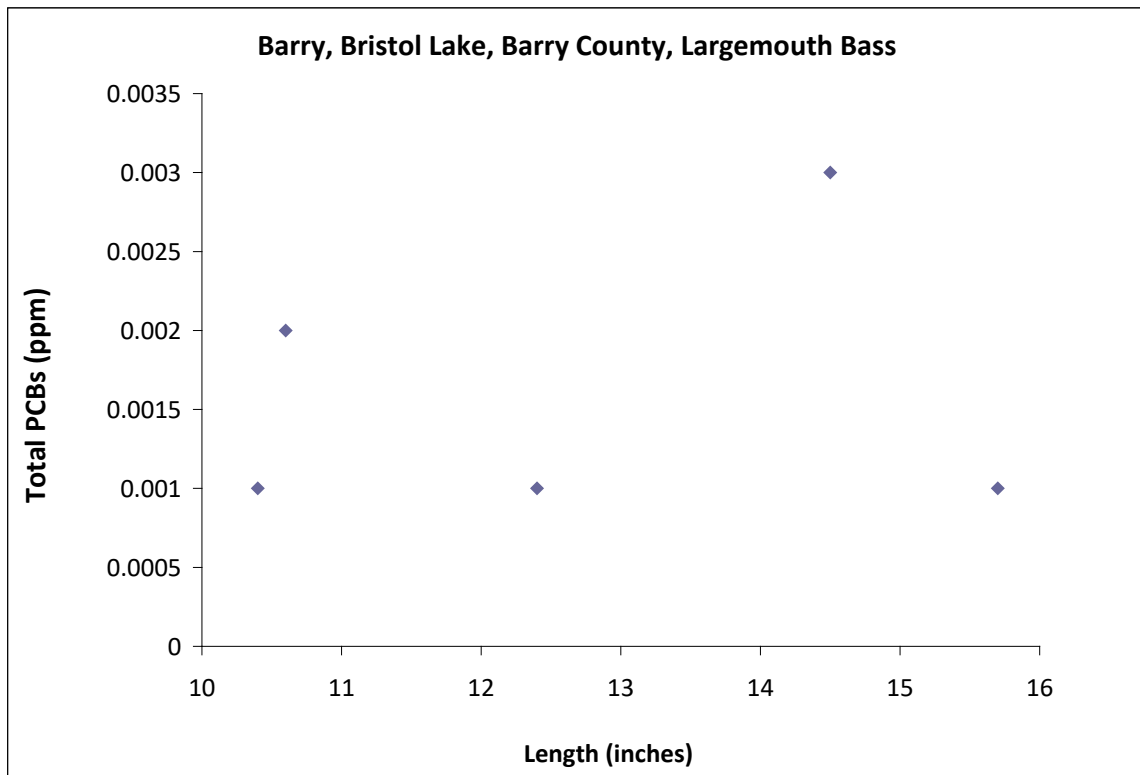
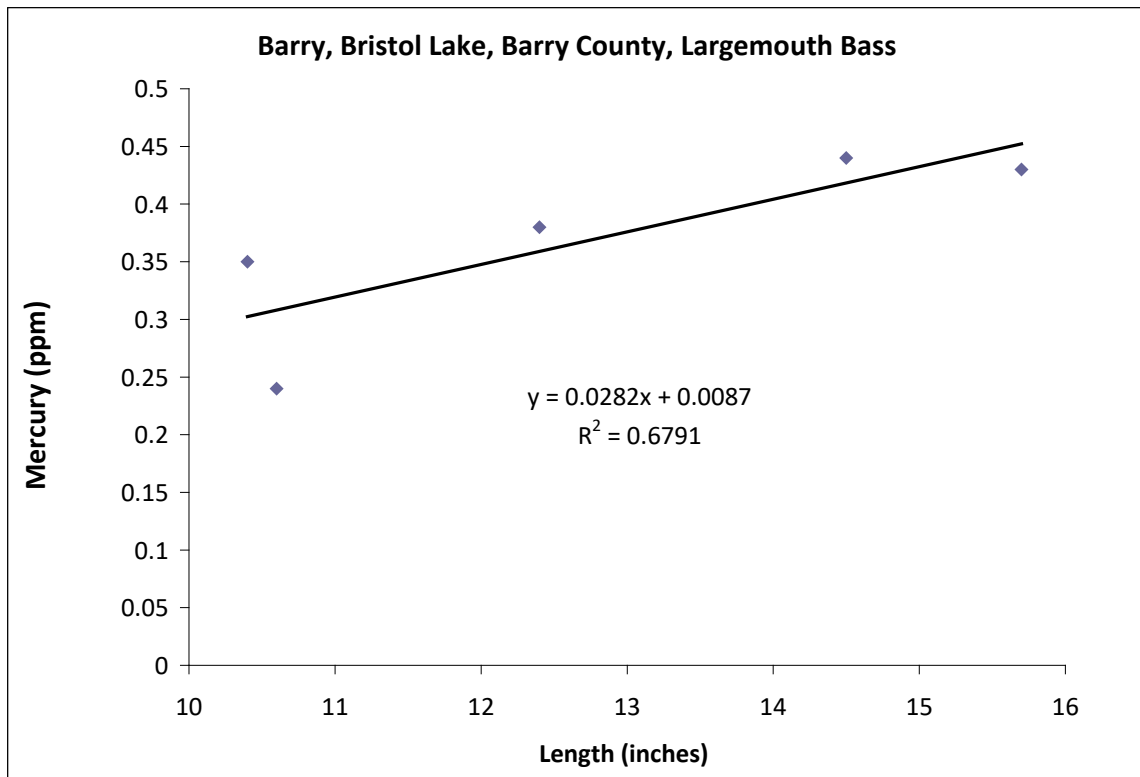
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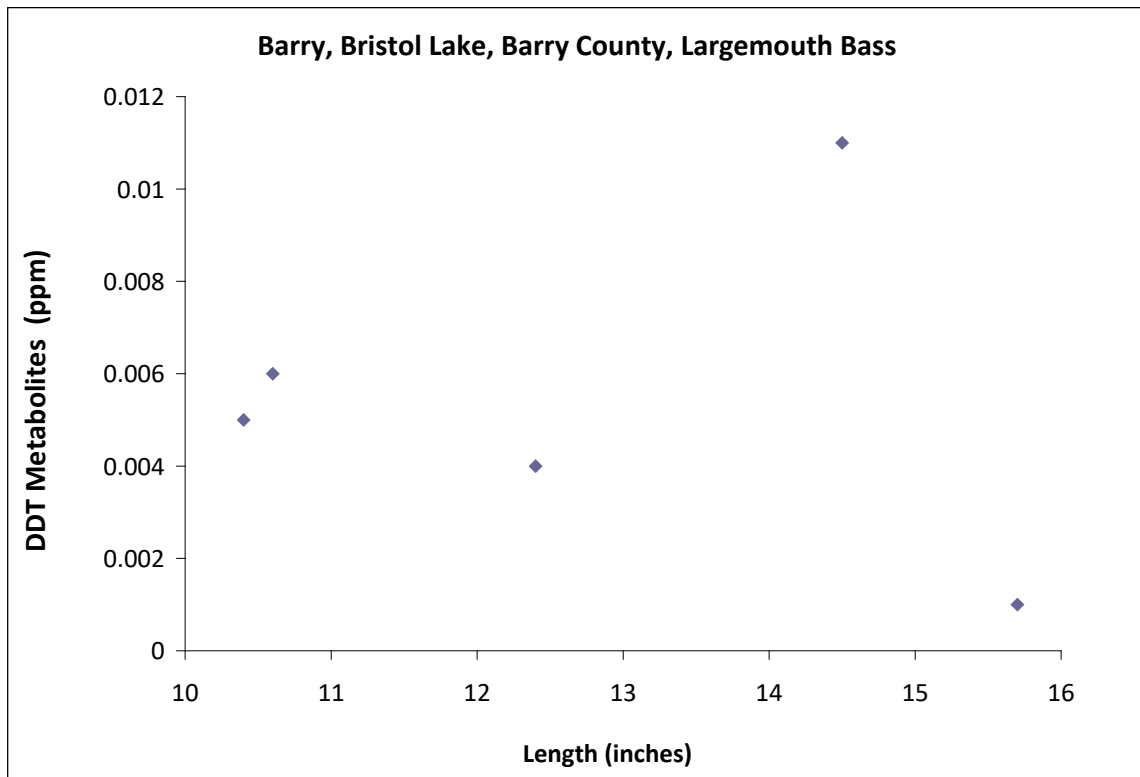
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2002	2002	5	10.4	14	14.5	15.7
Datasets available: 2002						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
PCB	2	0.002		0.001	0.003	--
DDT	2	0.006		0.001	0.011	--
Chlordane	2	ND		--	--	--
Toxaphene	2	ND		--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.029	0.010				
DDT	0.008	0.198				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						--

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

Recommendation: There are insufficient data available to develop specific advice for Bristol Lake largemouth bass (excessive extrapolation necessary). The statewide consumption guidelines apply, which recommend no one eat more than 2 meals per month of legal size largemouth bass under 18 inches or more than 1 meal per month of those fish larger than 18 inches.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
14	0.404	2
15	0.432	2
16	0.460	2
17	0.488	2
18	0.516	2
19	0.545	1
20	0.573	1
21	0.601	1
22	0.629	1
Shaded area denotes extrapolated estimates		





White Sucker

Bristol Lake

Barry County

Hg Analysis:

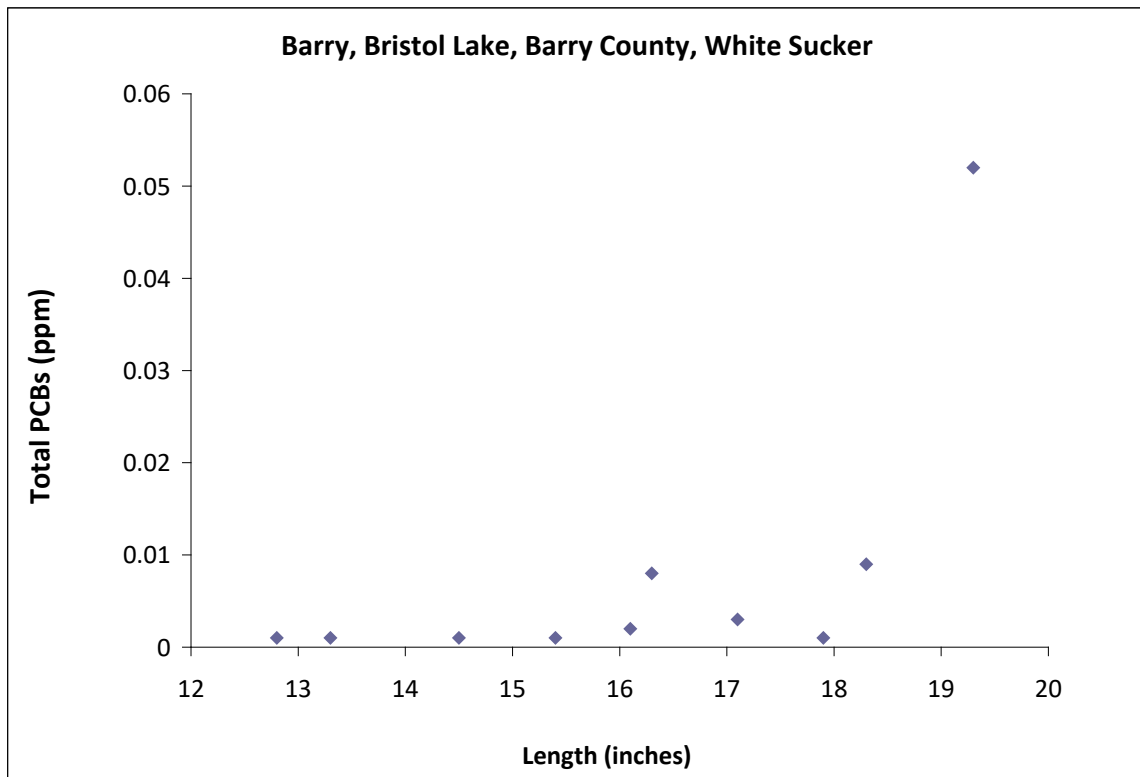
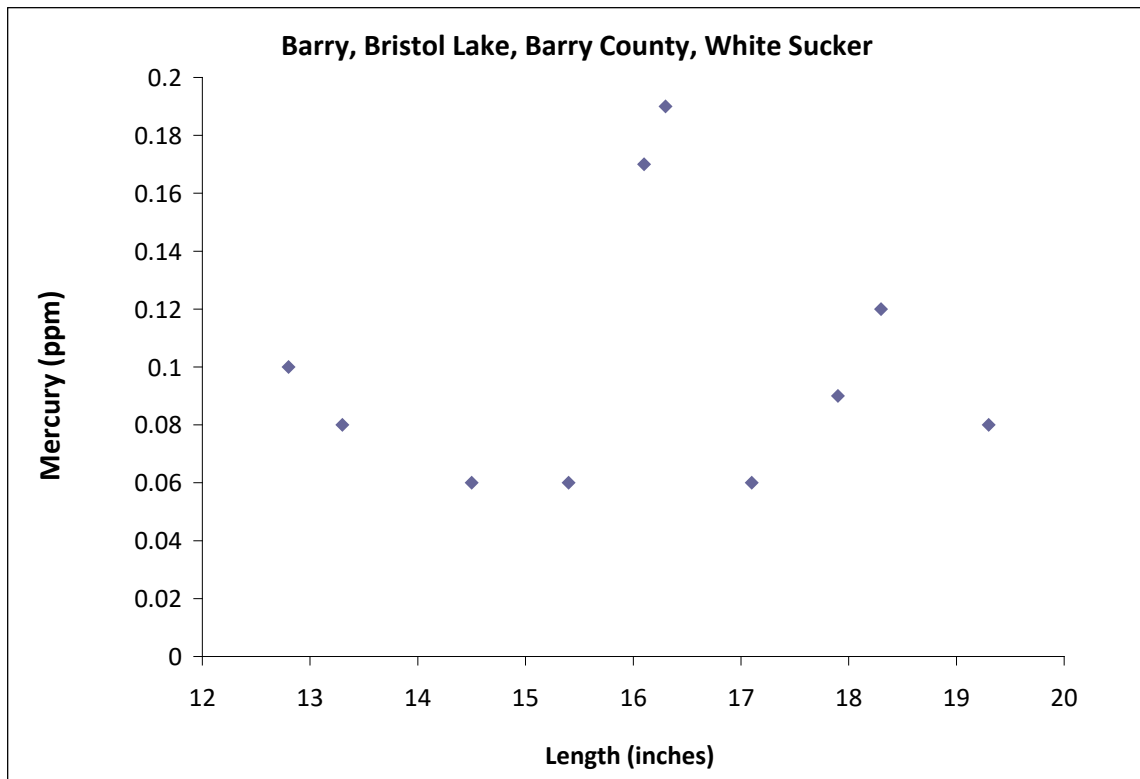
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2002	2002	10	12.8	na	12.8	19.3	
Datasets available: 2002							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.101		0.06	0.19	0.130	8
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.010	0.013					

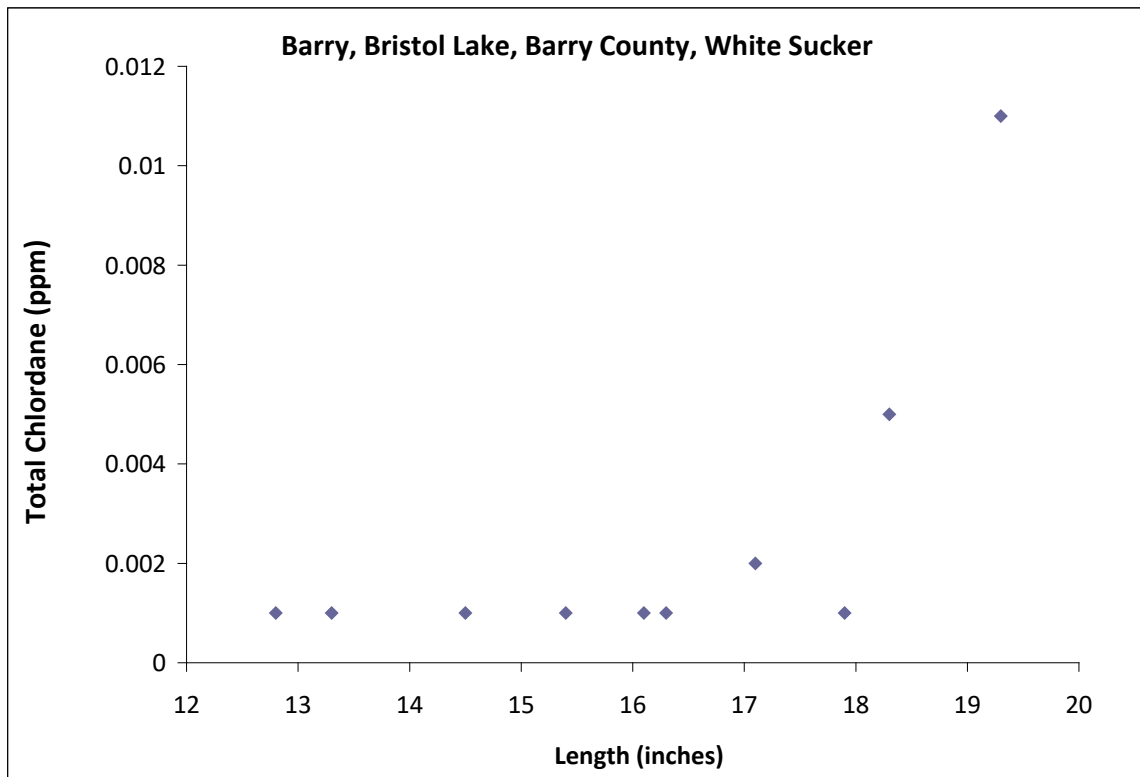
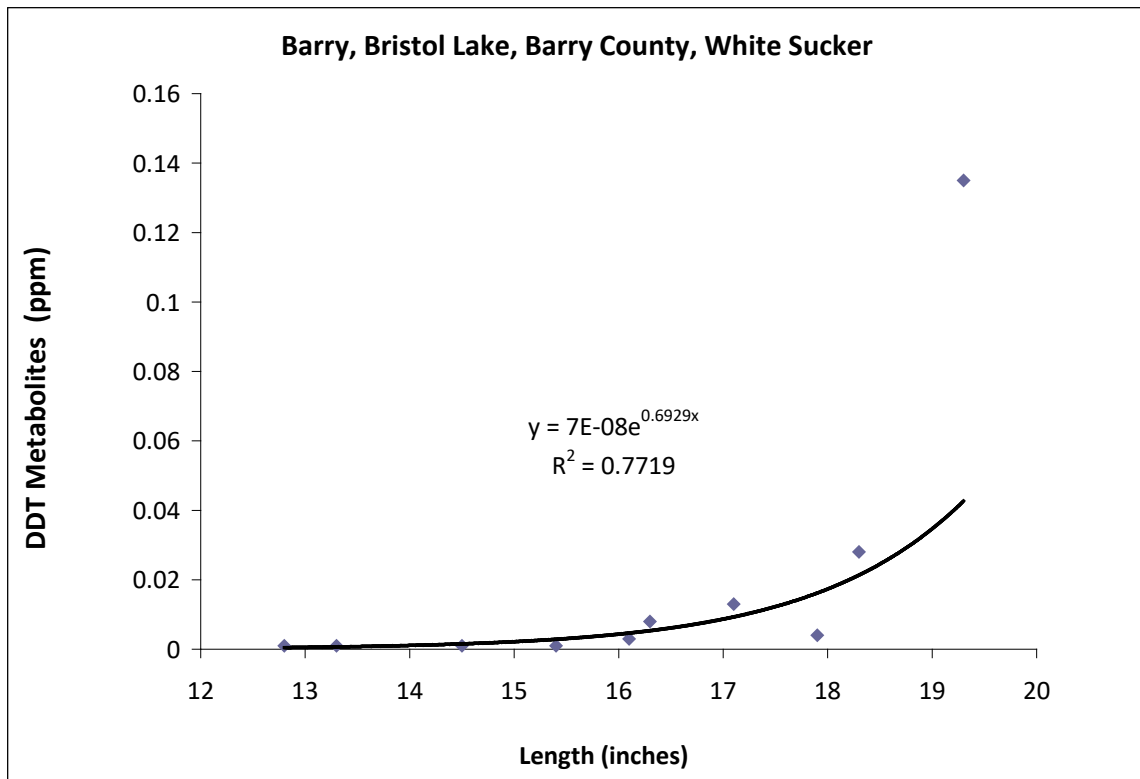
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2002	2002	10	12.8	na	12.8	19.3	
Datasets available: 2002							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.008		0.001	0.052	0.020	12
DDT	10	0.020		0.001	0.135	0.050	16
Chlordane	10	0.003		0.001	0.011	0.000	--
Toxaphene	10	ND					
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.368	0.534					
DDT	0.404	0.772					
Chlordane	0.449	0.521					
Toxaphene	--	--					
Final meal category based on UCL:							8

Existing Advisory: There are no current consumption advisories for Bristol Lake white sucker.

Recommendation: No one should eat more than 8 meals per month of Bristol Lake sucker due to mercury. PCBs would cause an advisory.





Pumpkinseed**Carter Lake****Barry County****Hg Analysis:**

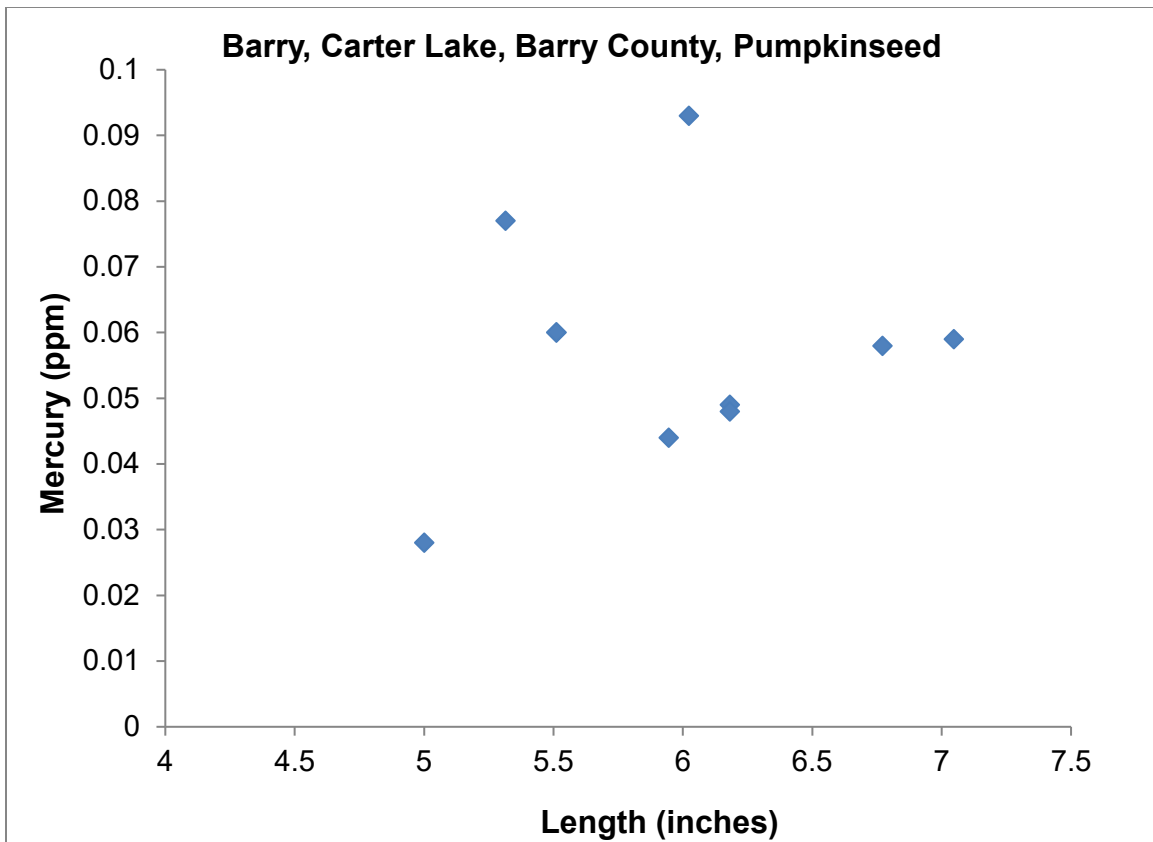
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent						
2019	2019	10	5.0	NA	5.0	7.0	
Datasets available: 2019							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.058		0.028	0.093	0.070	16
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.019	0.059					

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	5.0	NA	5.0	7.0	
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	< 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:							16

Existing MDHHS Advisory: Bluegill and sunfish from Carter Lake in Barry County are covered by the statewide advisory due to mercury: No one should eat more than 8 meals per month of these species of any size.

Recommendation: No one should eat more than 16 meals per month of bluegill or sunfish of any size from Carter Lake in Barry County due to mercury.



White Sucker**Coldwater River
Brown Road****Barry 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	2*	9.8	na	9.8	13.4	
Datasets available: 1998							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	2*	0.090		0.09	0.09	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.000	0.000					

Organics Analysis:

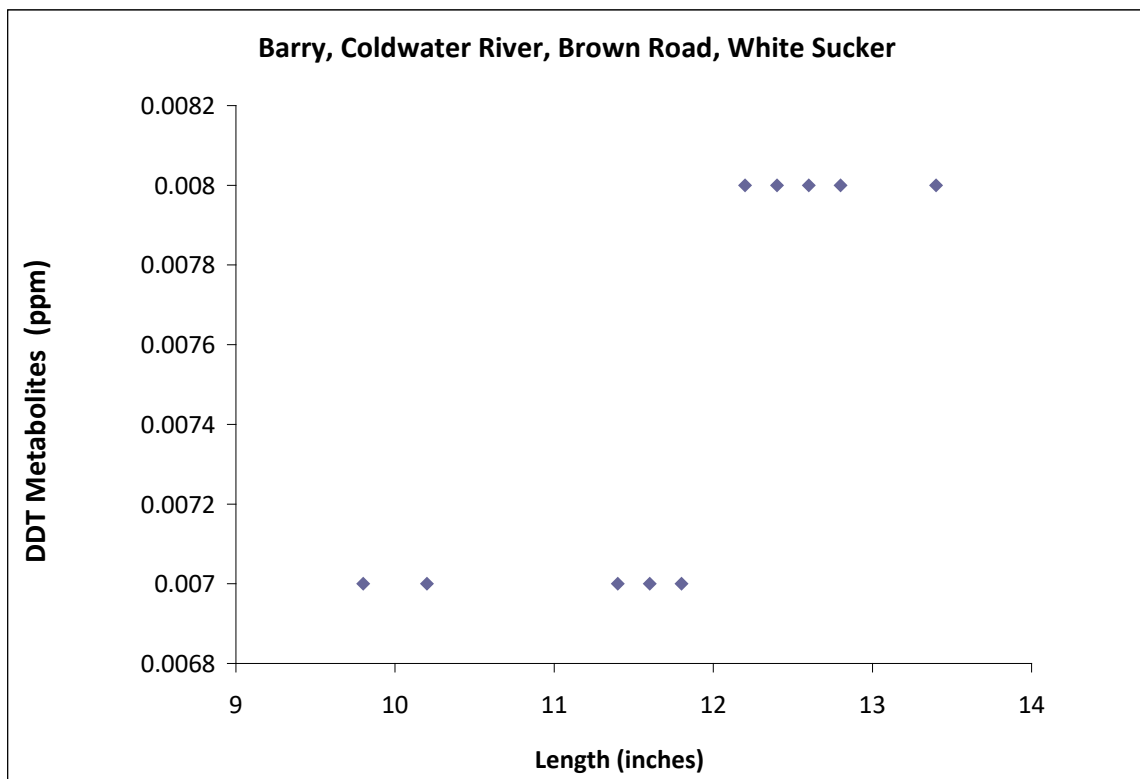
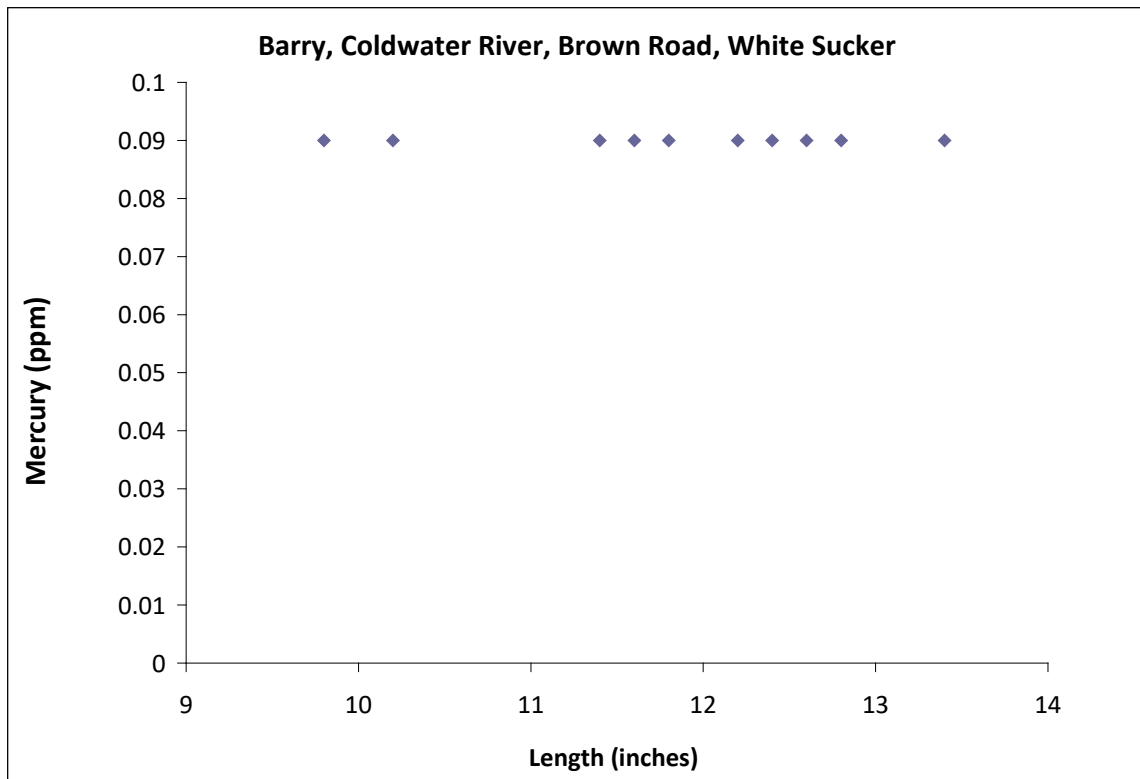
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1998	1998	2*	9.8	na	9.8	13.4	
Datasets available: 1998							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	2	ND		--	--	--	--
DDT	2	0.008		0.007	0.008	--	--
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:							--

* - 2 composite samples of 5 fish each

Existing Advisory: There are no current consumption advisories for Coldwater River white sucker.

Recommendation: There are insufficient data available to develop specific advice for Coldwater River sucker. The statewide consumption guidelines apply, which recommend that no one should eat more than 8 meals per month of sucker from inland waters.



Brown Bullhead**Crooked Lake****Barry 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	
2003	2003	10	9.4	na	9.4	12.4	
Datasets available: 2003							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.128		0.02	0.79	0.300	2
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.058	0.111					

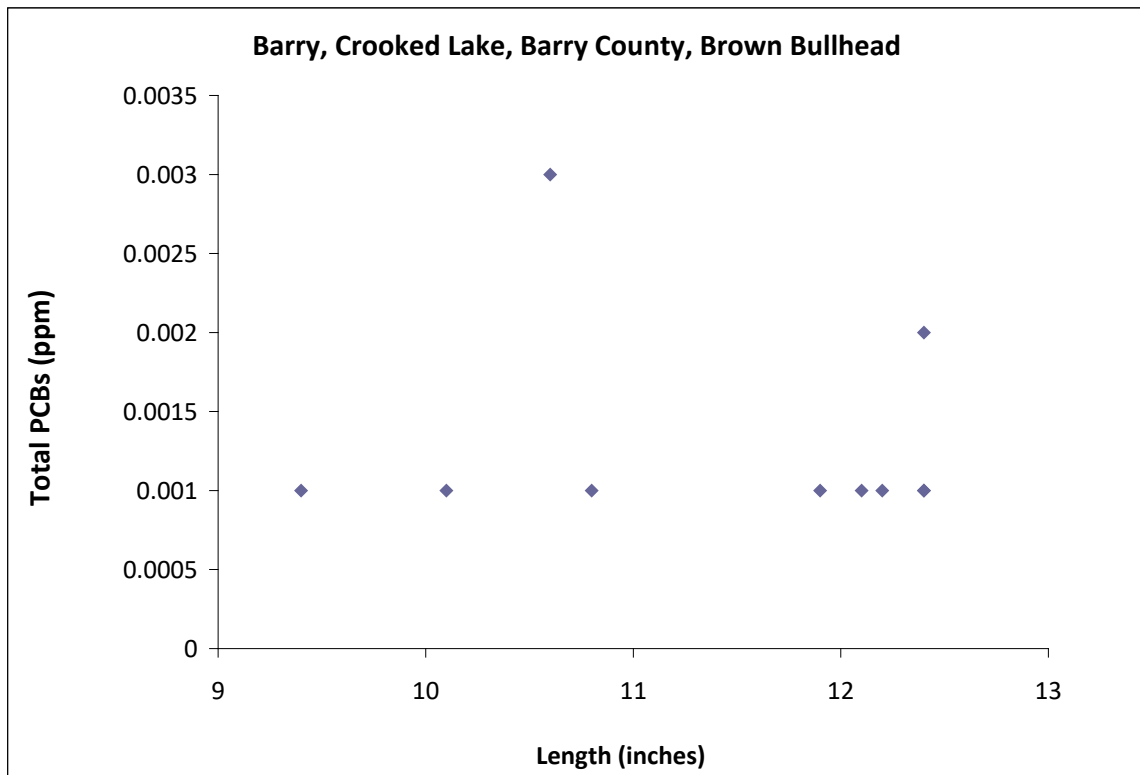
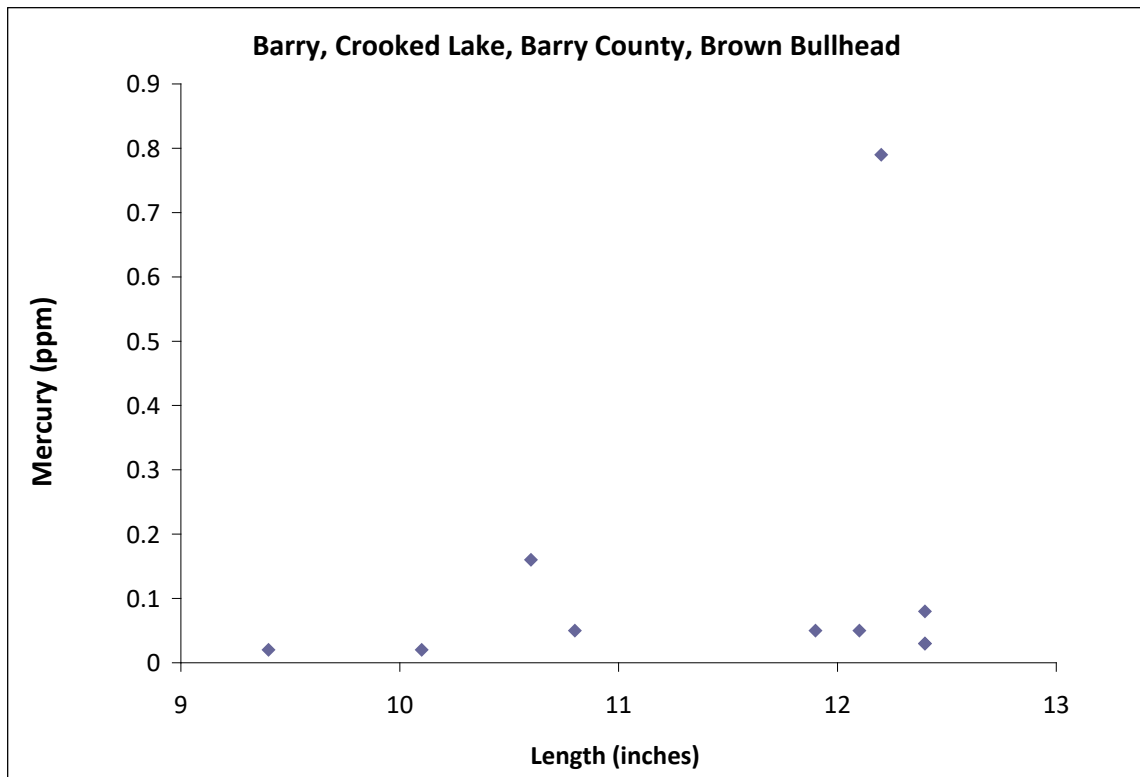
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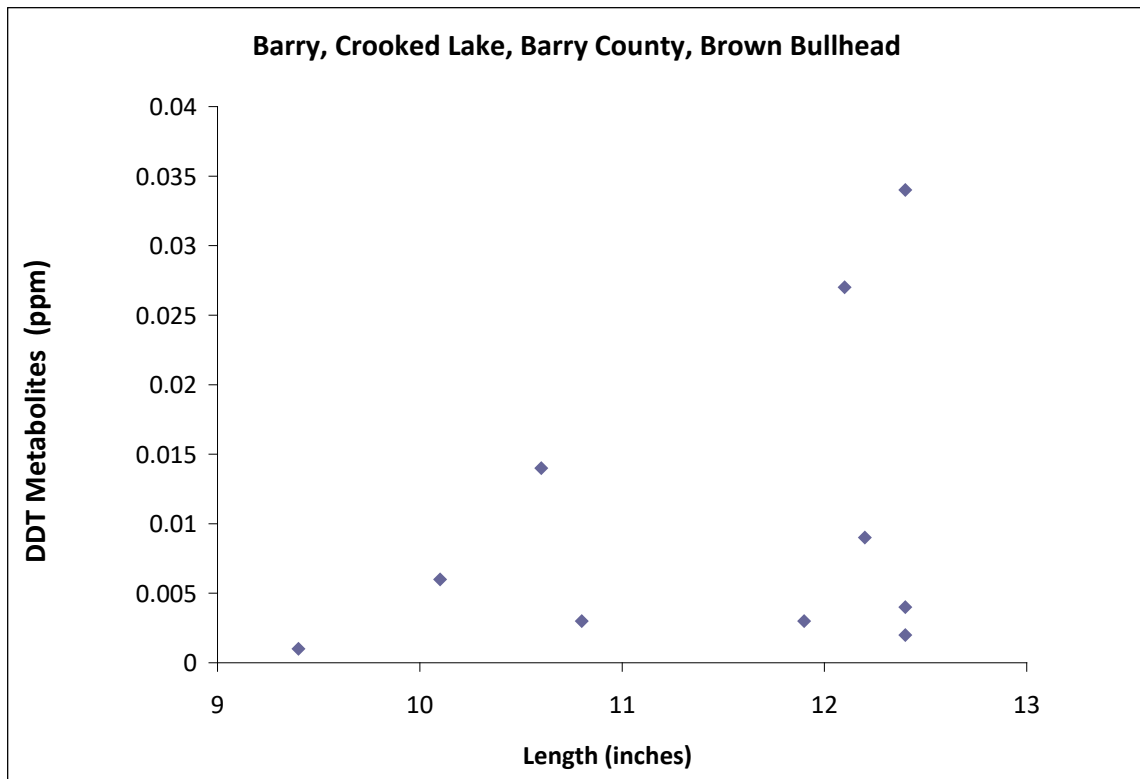
Organics Analysis:

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	9.4	na	9.4	12.4	
Datasets available: 2003							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.001		0.001	0.003	0.000	16
DDT	10	0.010		0.001	0.034	0.020	16
Chlordane	10	ND		--	--	--	--
Toxaphene	10	ND		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.010	0.004					
DDT	0.134	0.163					
Chlordane	--	--					
Toxaphene	--	--					
Final meal category based on UCL:							2

Existing Advisory: There are no current consumption advisories for Crooked Lake brown bullhead.

Recommendation: No one should eat more than 2 meals per month of Crooked Lake bullhead due to mercury.





Largemouth Bass

Crooked Lake

Barry 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	
2003	2003	10	10.9	14	14.4	16.7	
Datasets available: 2003							
Chemical	Sample Size (All)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.22		0.13	0.52	0.31	2
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.406	0.482					

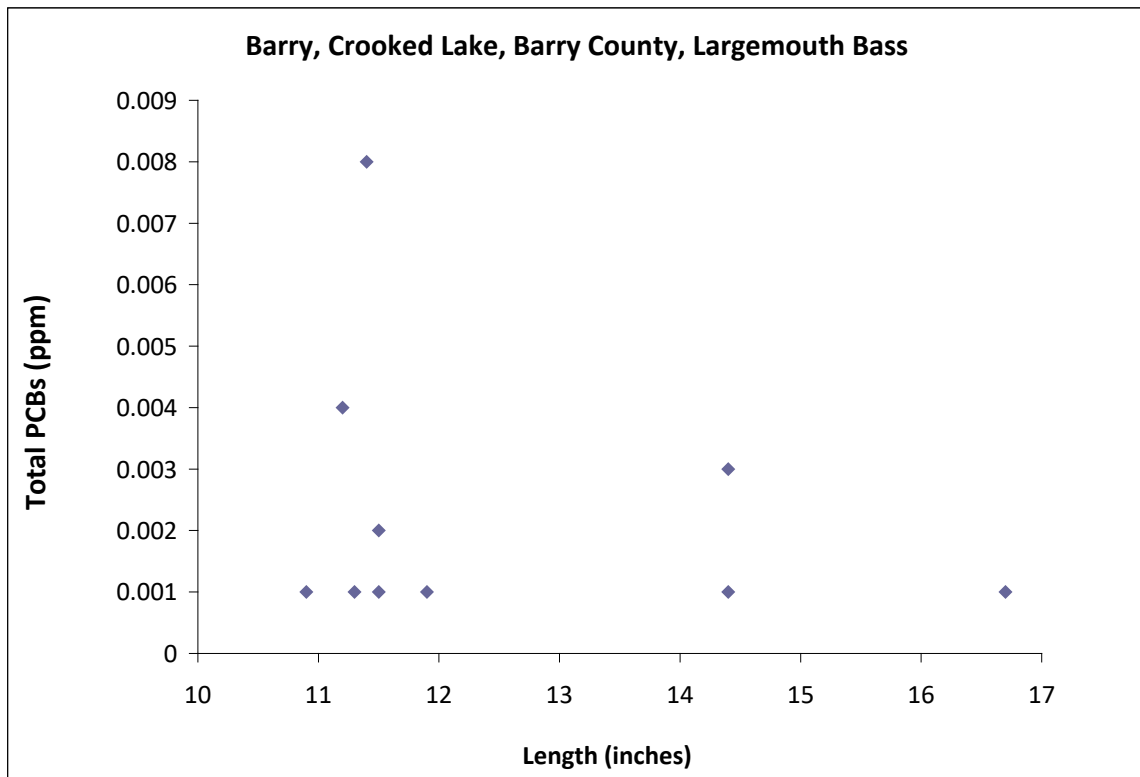
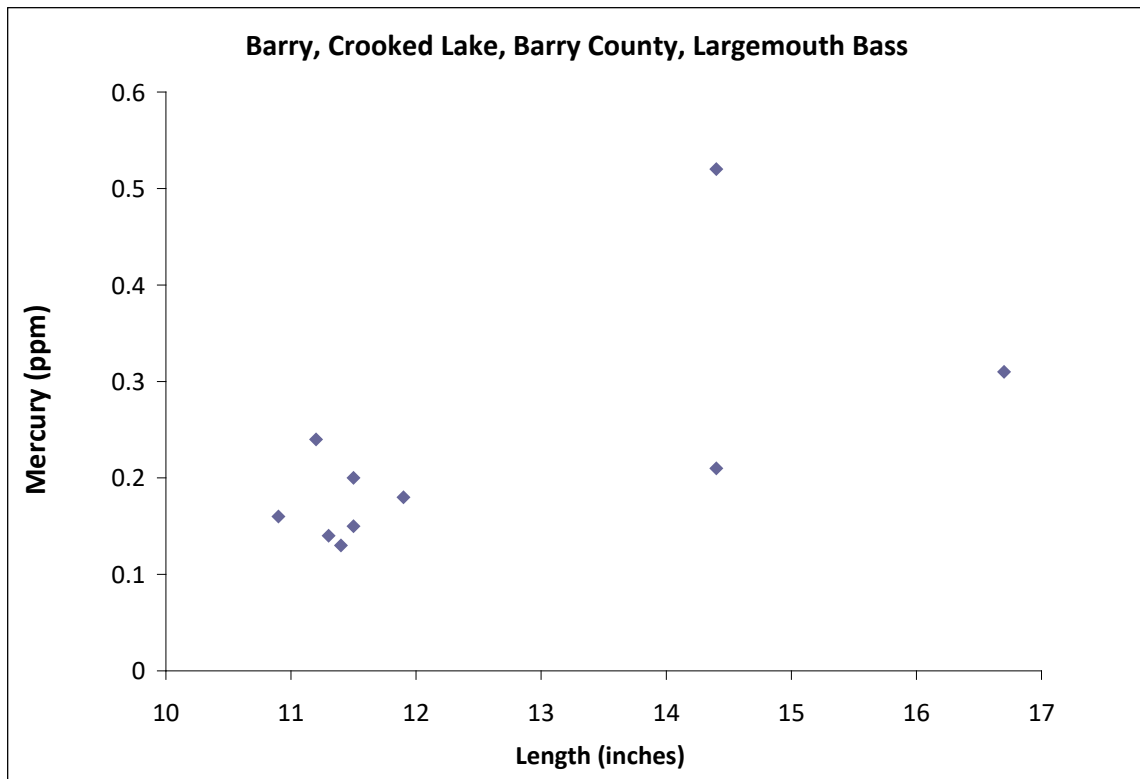
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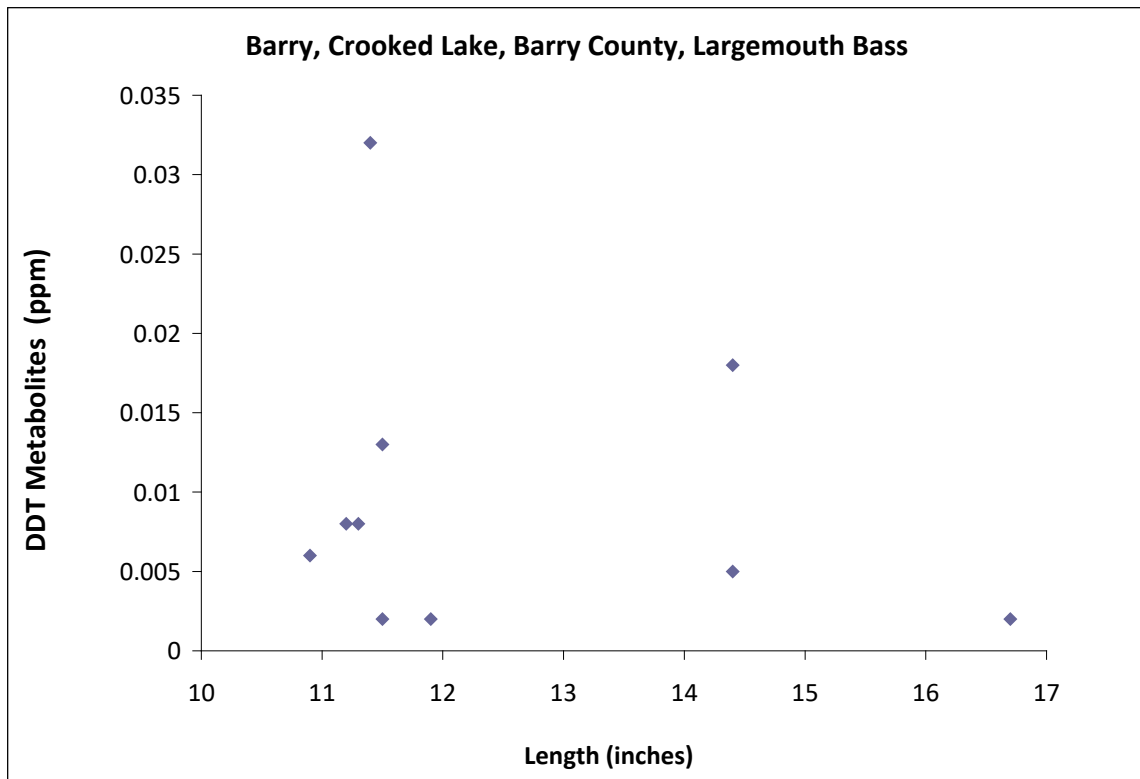
Organics Analysis:

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	10.9	14	14.4	16.7	
Datasets available: 2003							
Chemical	Sample Size (All)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.002		0.001	0.008	0.004	16
DDT	10	0.01		0.002	0.032	0.02	16
Chlordane	10	ND		--	--	--	--
Toxaphene	10	ND		--	--	--	16
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.052	0.044					
DDT	0.035	0.070					
Chlordane	--	--					
Toxaphene	--	--					
Final meal category based on UCL:							--

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

Recommendation: No one eat more than 2 meals per month of legal size largemouth bass under 18 inches or more than 1 meal per month of those fish larger than 18 inches. Sublegal length samples are included in the UCL calculations. Statewide length break was applied as the length range was limited.





Northern Pike

Fine Lake

Barry County

Hg Analysis:

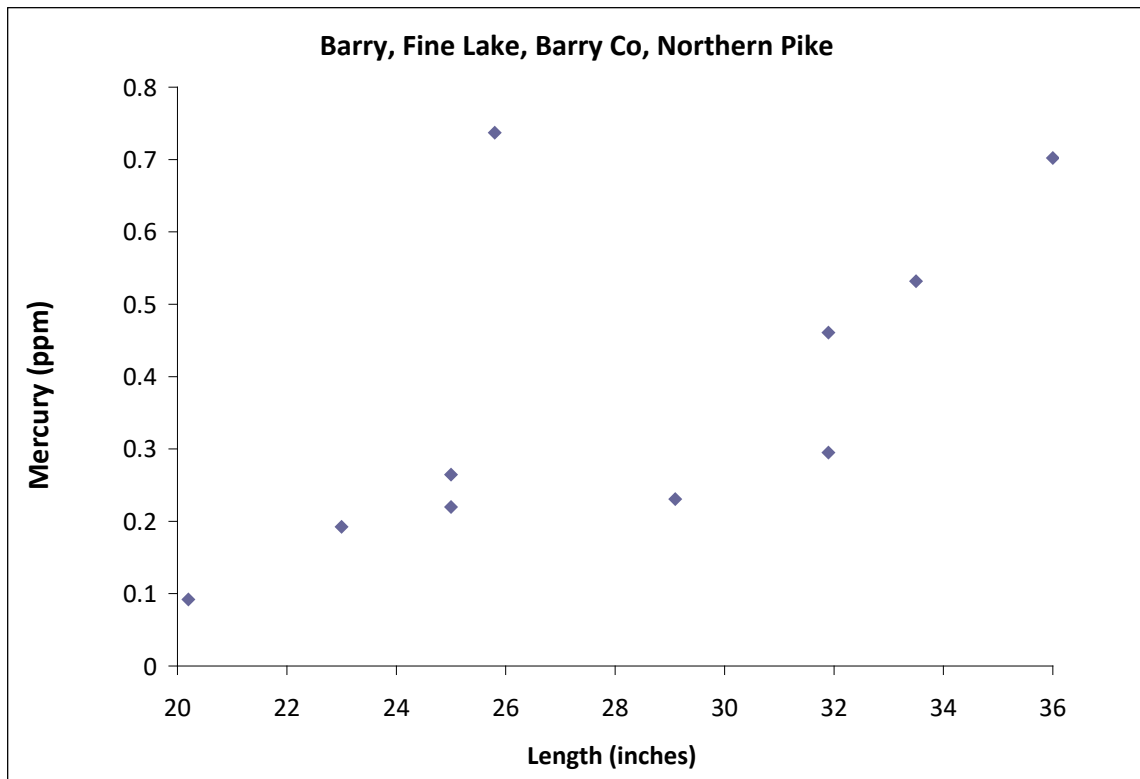
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2008	2008	10	20.2	24	25	36
Datasets available: 2008						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
Mercury	8	0.430		0.220	0.737	0.610
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
Mercury	0.399	0.542				1

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)
PCB	0	NA		--	--	--
DDT	0	NA		--	--	--
Chlordane	0	NA		--	--	--
Toxaphene	0	NA		--	--	--
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						1

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

Recommendation: No one should eat more than 1 meal per month of Fine Lake northern pike due to mercury.



Walleye

Fine Lake

Barry 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	14.6	15	14.6	20.1	
Datasets available: 2008							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.159		0.109	0.514	0.250	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.707	0.693					

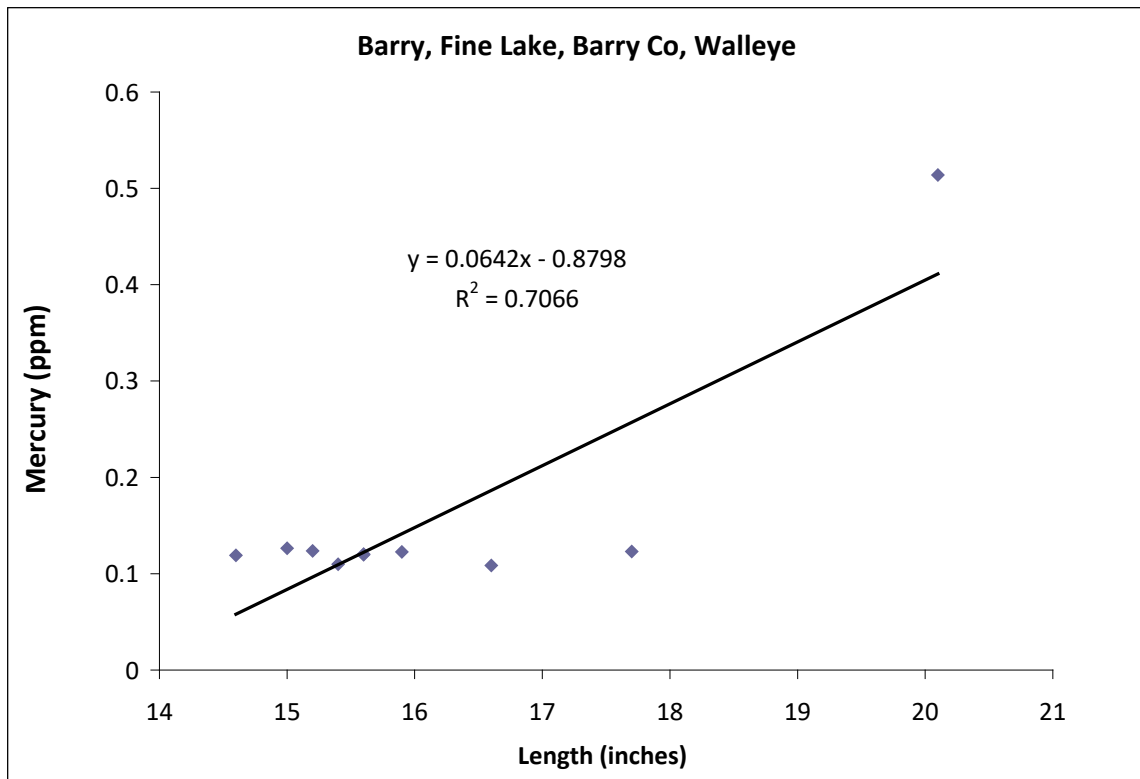
Organics Analysis:

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	0	NA		--	--	--	--
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:							4

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

Recommendation: No one should eat more than 2 meal per month of Fine Lake walleye over 20 inches in length or more than 4 meals per month of legal size walleye under 20 inches in length due to mercury. Guideline is based on the 95%UCL because the regression is driven by one data point. The statewide guideline length break was applied.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
15	0.083	12
16	0.147	4
17	0.212	4
18	0.276	2
19	0.340	2
20	0.404	2
21	0.468	2
22	0.533	1
23	0.597	1
Shaded area denotes extrapolated estimates		



Largemouth Bass**Fish Lake****Barry County****Hg Analysis:**

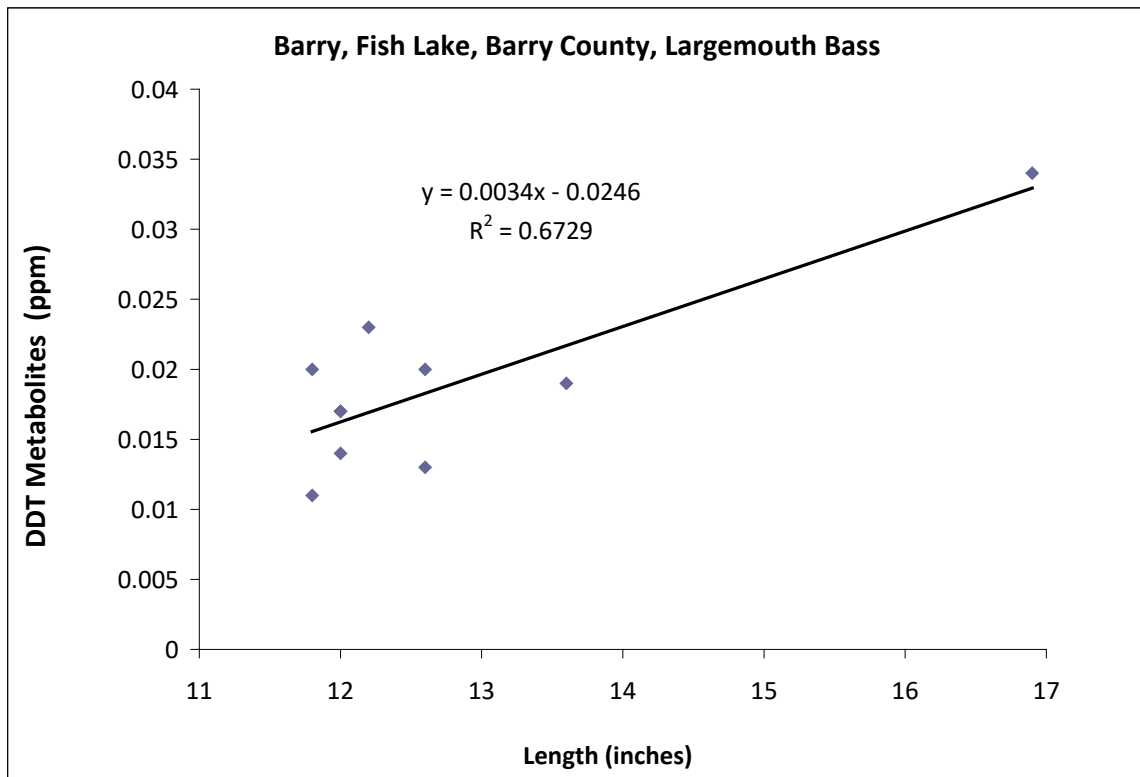
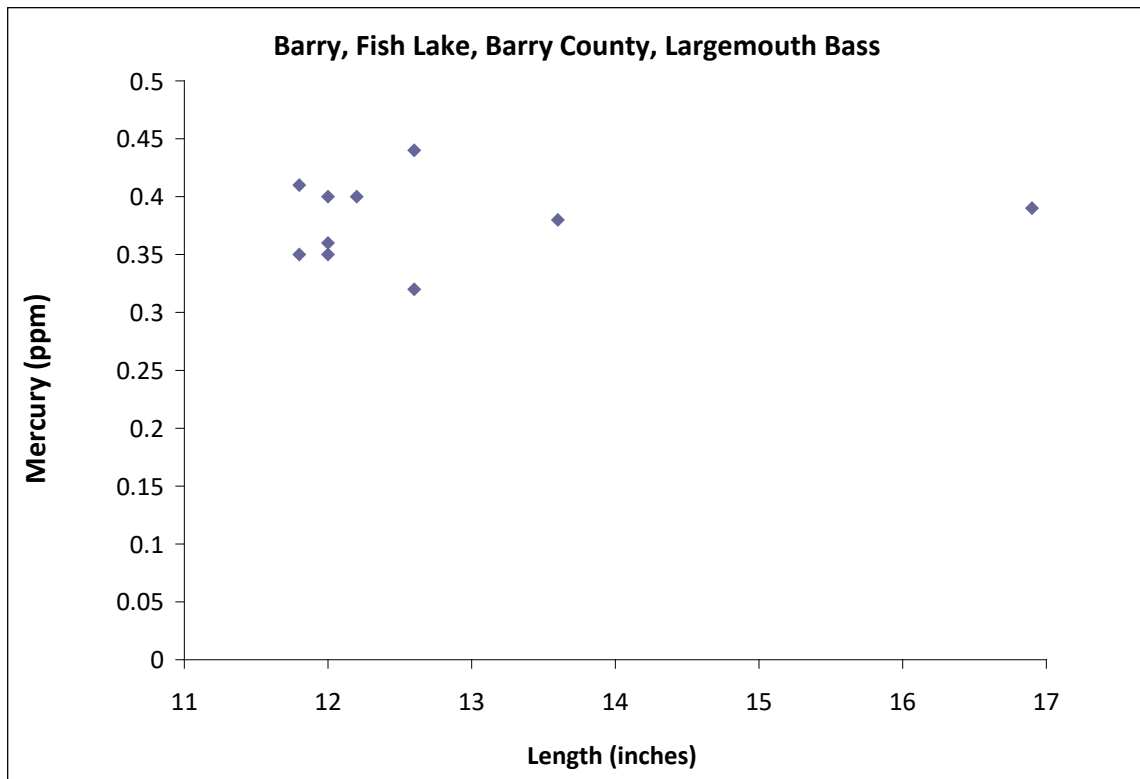
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1999	1999	10	11.8	14	13.6	16.9
Datasets available: 1999						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
Mercury	2	0.385		0.38	0.39	--
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
Mercury	0.012	0.014				

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	11.8	14	13.6	16.9
Datasets available: 1999						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
PCB	2	ND		--	--	--
DDT	2	0.027		0.019	0.034	--
Chlordane	2	ND		--	--	--
Toxaphene	2	ND		--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	0.673	0.526				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						--

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

Recommendation: There are insufficient data available to develop specific advice for Fish Lake largemouth bass. The statewide consumption guidelines apply and recommend that no one eat more than 2 meals per month of legal size largemouth bass under 18 inches or more than 1 meal per month of those fish larger than 18 inches.



Northern Pike

Fish Lake

Barry County

Hg Analysis:

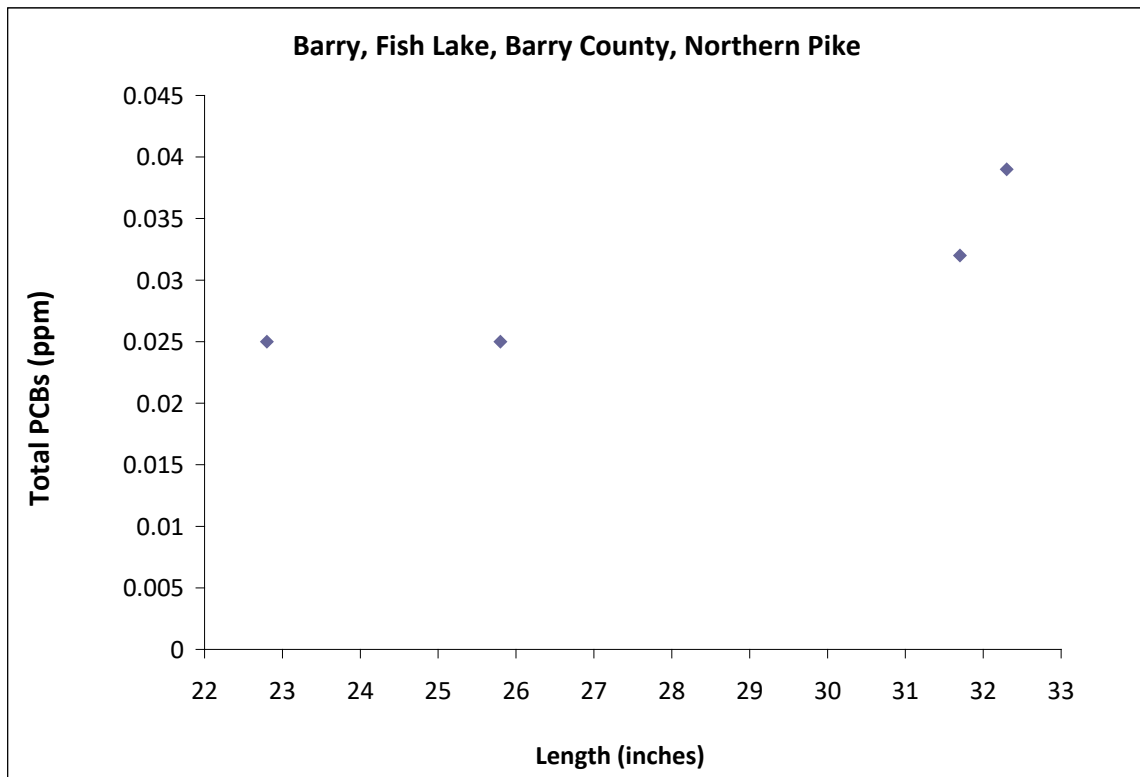
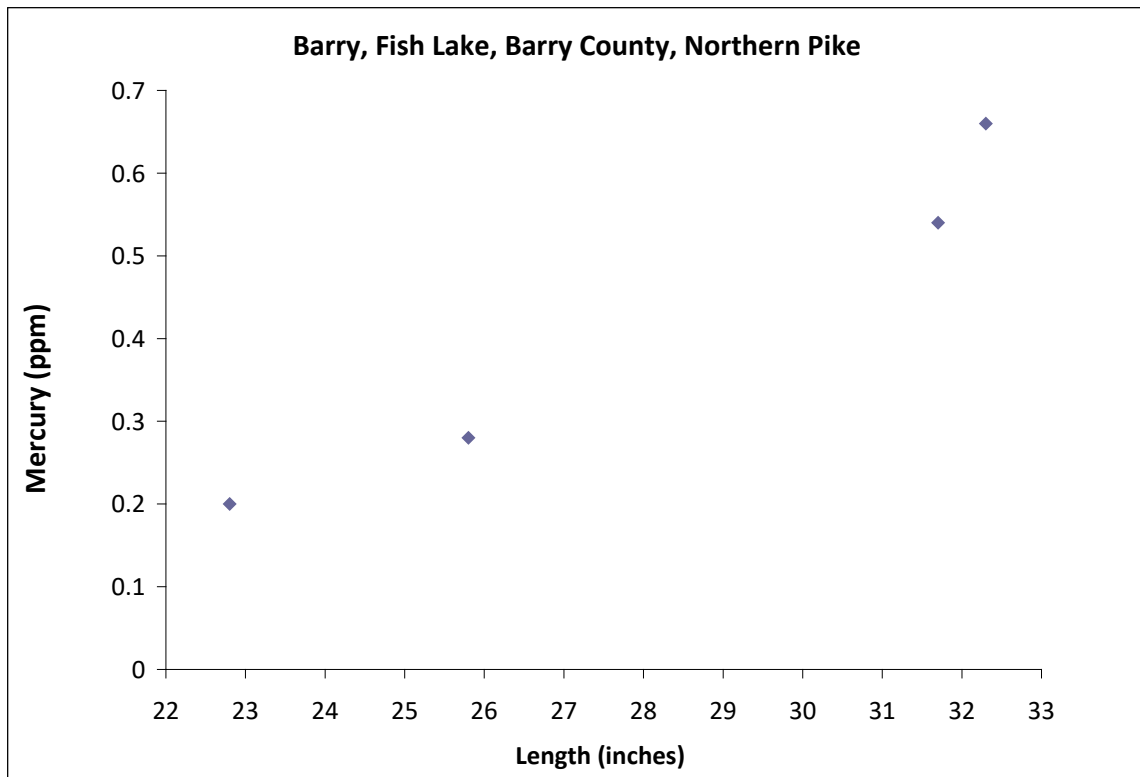
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1991	1991	4	22.8	24	25.8	32.3
Datasets available: 1991						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
Mercury	3	0.493		0.28	0.66	--
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
Mercury	0.957	0.991				

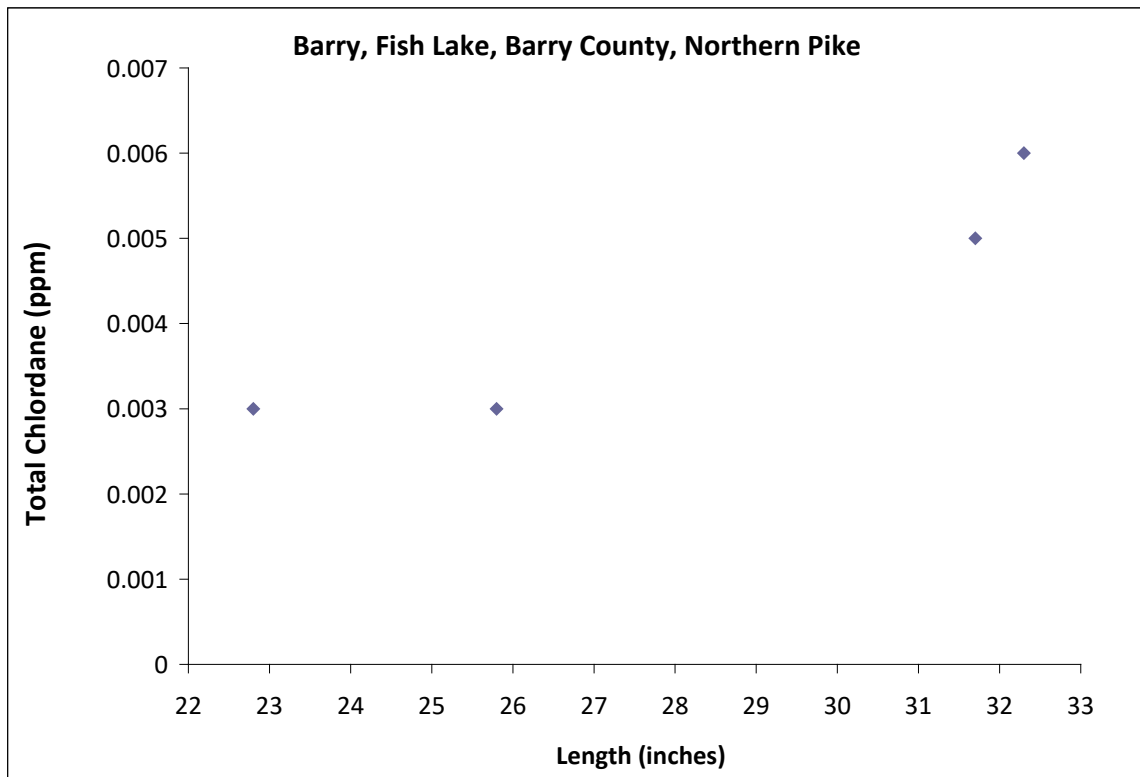
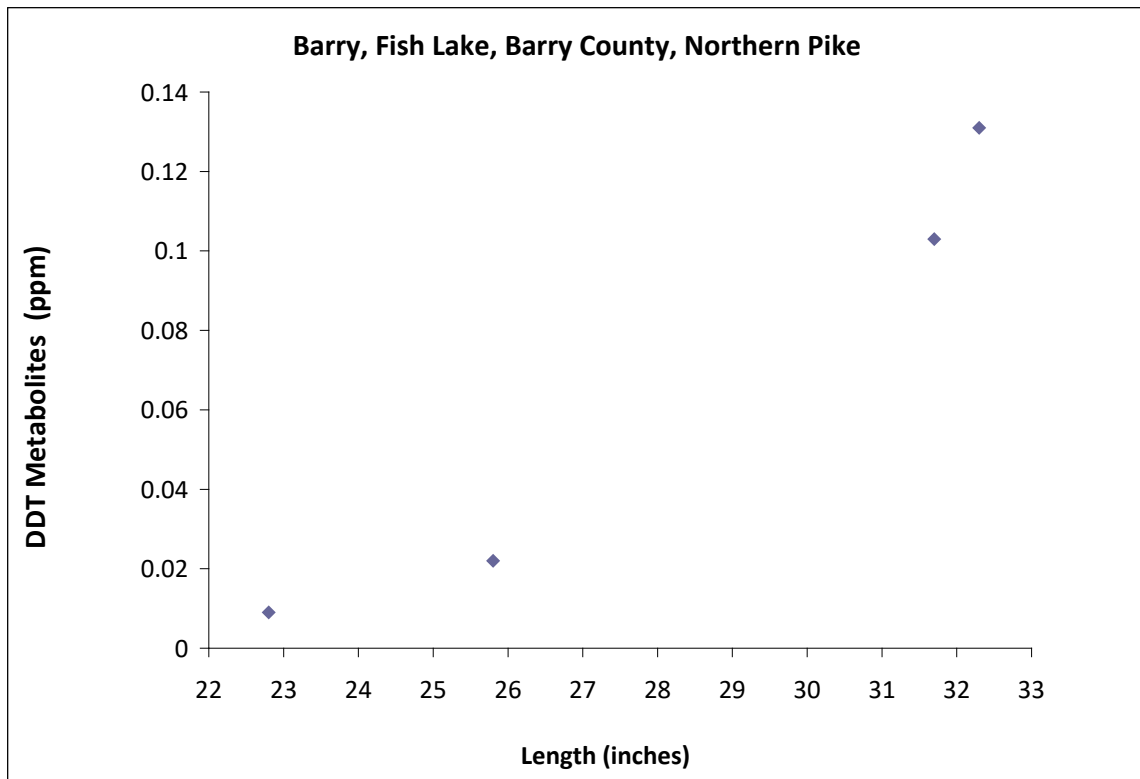
Organics Analysis:

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	22.8	24	25.8	32.3
Datasets available: 1991						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
PCB	3	0.032		0.025	0.039	--
DDT	3	0.085		0.009	0.131	--
Chlordane	3	0.005		0.003	0.006	--
Toxaphene	3	ND		--	--	--
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
PCB	0.798	0.832				
DDT	0.950	0.999				
Chlordane	0.885	--				
Toxaphene	--	--				
Final meal category based on UCL:						--

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

Recommendation: There are insufficient data available to develop specific advice for Fish Lake northern pike. The statewide consumption guidelines recommend that no one eat more than 1 meal per month of northern pike over 30 inches or more than 2 meals per month of northern pike under 30 inches in length.





Largemouth Bass

Gun Lake

Barry County

Hg Analysis:

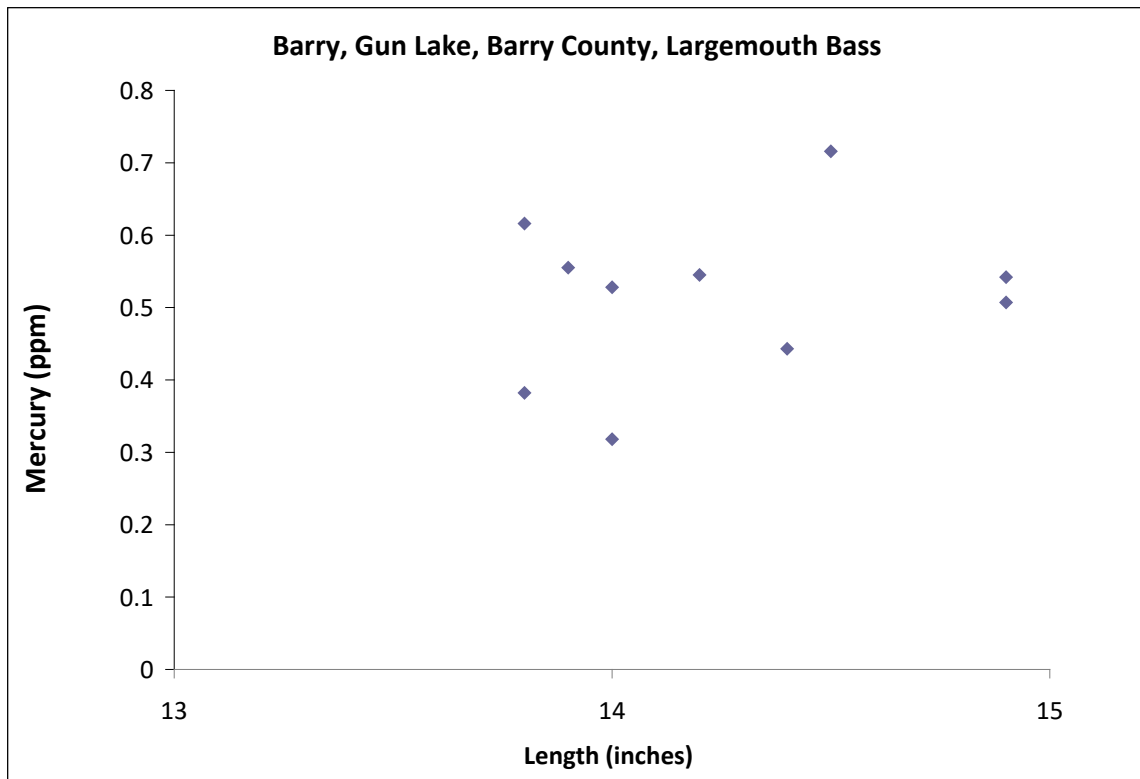
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2006	2006	10	13.8	14	13.8	14.9	
Datasets available: 2006							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.515		0.318	0.716	0.600	1
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.051	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	
--	--	0	--	--	--	--	
Datasets available:							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	NA		--	--	--	--
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:							1

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

Recommendation: No one should eat more than 1 meal per month of Gun Lake largemouth or smallmouth bass less than 18 inches or 6 meals per year of largemouth bass greater than 18 inches due to mercury. The 95% UCL was used to establish the guideline for less than 18 inch bass. The statewide guideline length break was applied.



Hg Analysis:

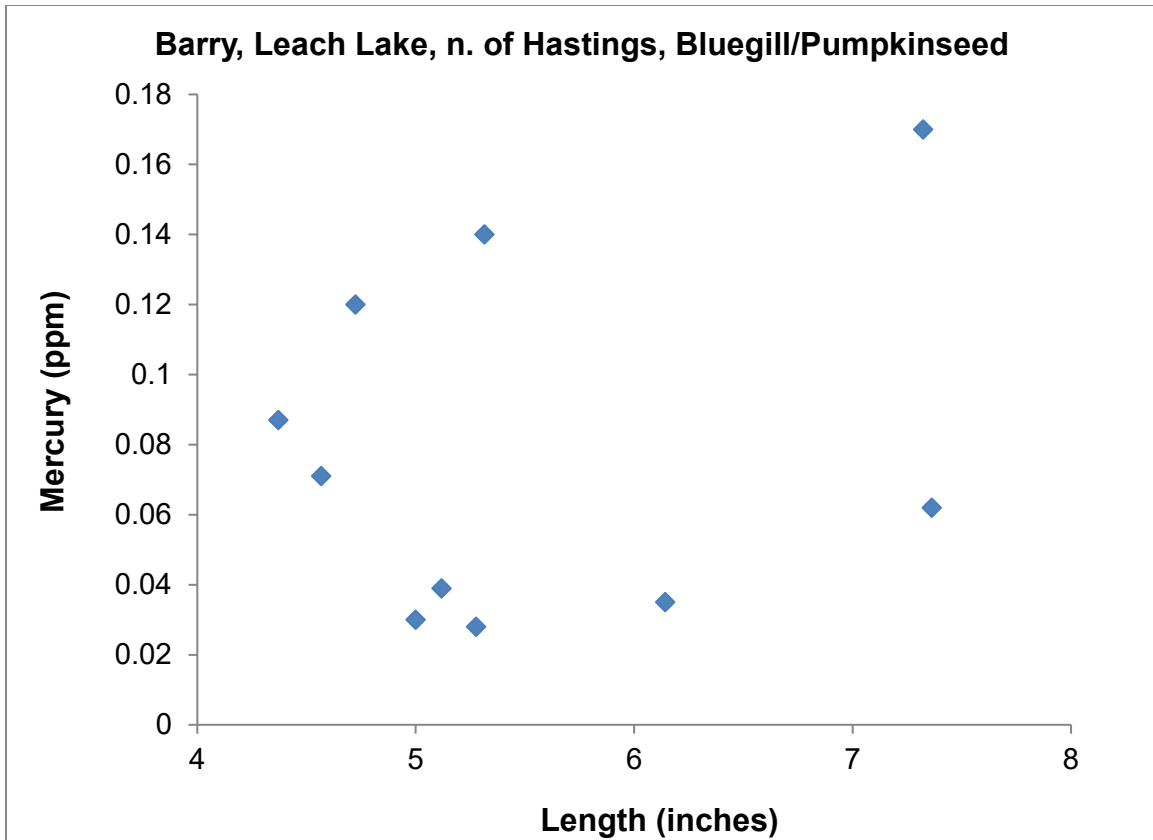
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent						
2019	2019	10	4.4	NA	4.4	7.4	
Datasets available: 2019							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.078		0.028	0.170	0.114	8
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.054	0.025					

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	4.4	NA	4.4	7.4	
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	< 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:							8

Existing MDHHS Advisory: Bluegill and pumpkinseed sunfish from Leach Lake near Hastings in Barry County are covered under the statewide mercury guidance. No one should eat more than 8 meals per month of these species of any size due to mercury.

Recommendation: No one should eat more than 8 meals per month of bluegill and pumpkinseed sunfish of any size from Leach Lake in Barry County due to mercury.



Largemouth Bass

Leach Lake

Barry 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	11.5	14	13.5	15.7	
Datasets available: 2019							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	5	0.506		0.430	0.570	0.580	1
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.006	0.003					

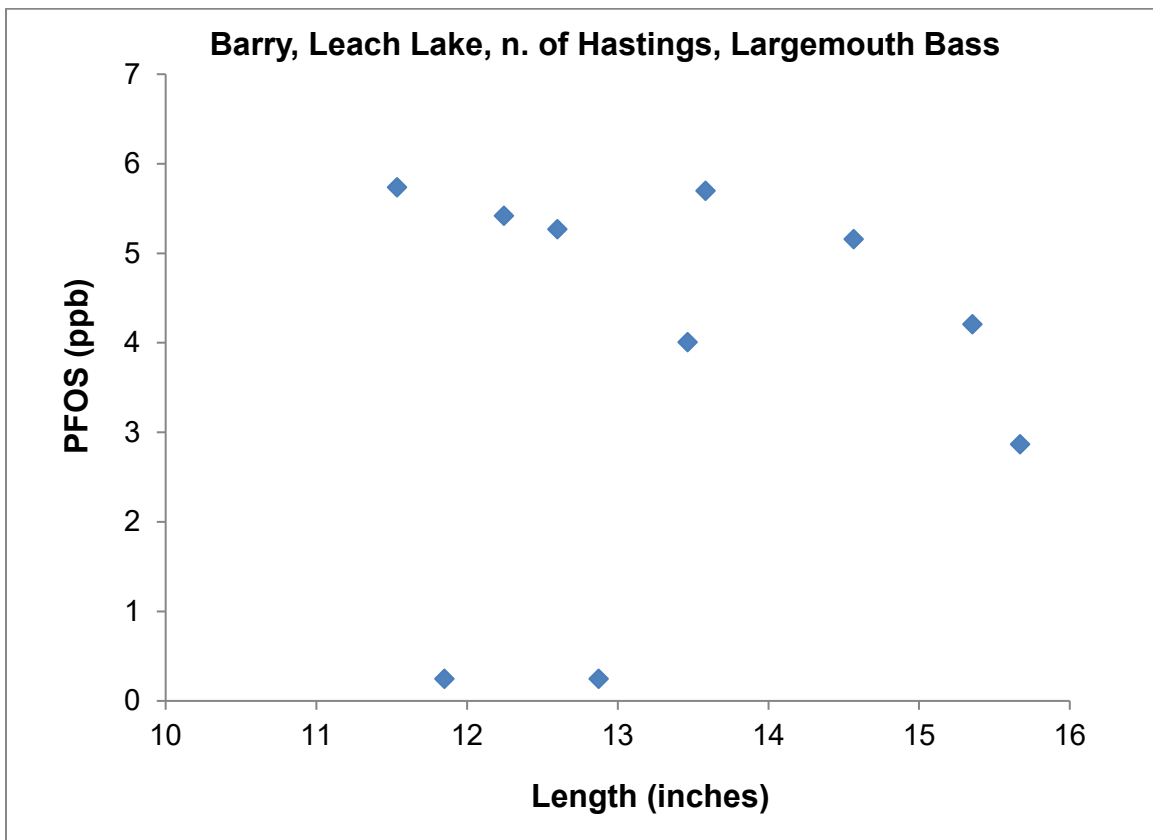
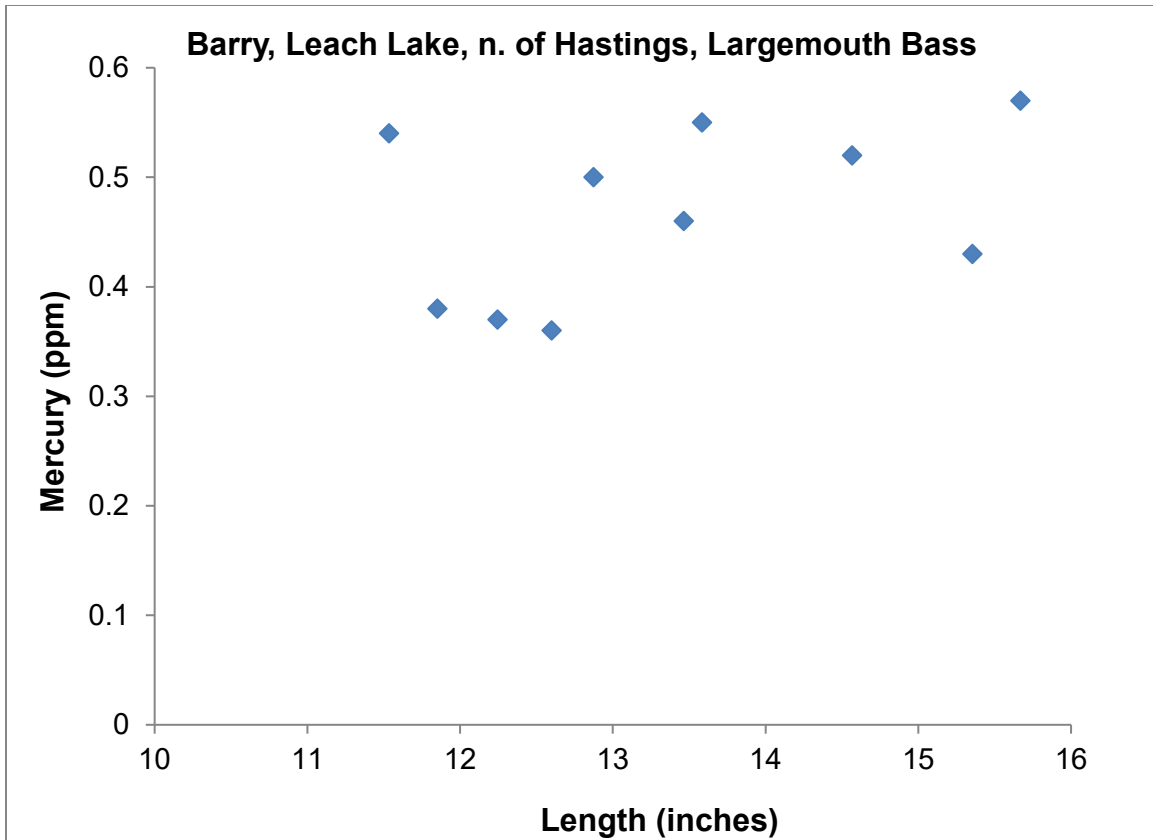
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent						
2019	2019	10	4.4	NA	4.4	7.4	
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*	3.9 ppb		<0.25 ppb	5.7 ppb	5.4 ppb	16
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	0.002	0.064					
Final meal category based on UCL:							1

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

Existing MDHHS Advisory: Largemouth bass from Leach Lake in Barry County are covered under the statewide mercury guidance. No one should eat more than 2 meals per month of largemouth bass smaller than 18 inches in length or no more than 1 meal per month of fish larger than 18 inches in length from Leach Lake in Barry County due to mercury.

Recommendation: No one should eat more than 1 meal per month of largemouth bass of any size from Leach Lake in Barry County due to mercury.



Northern Pike

Payne Lake

Barry County

Hg Analysis:

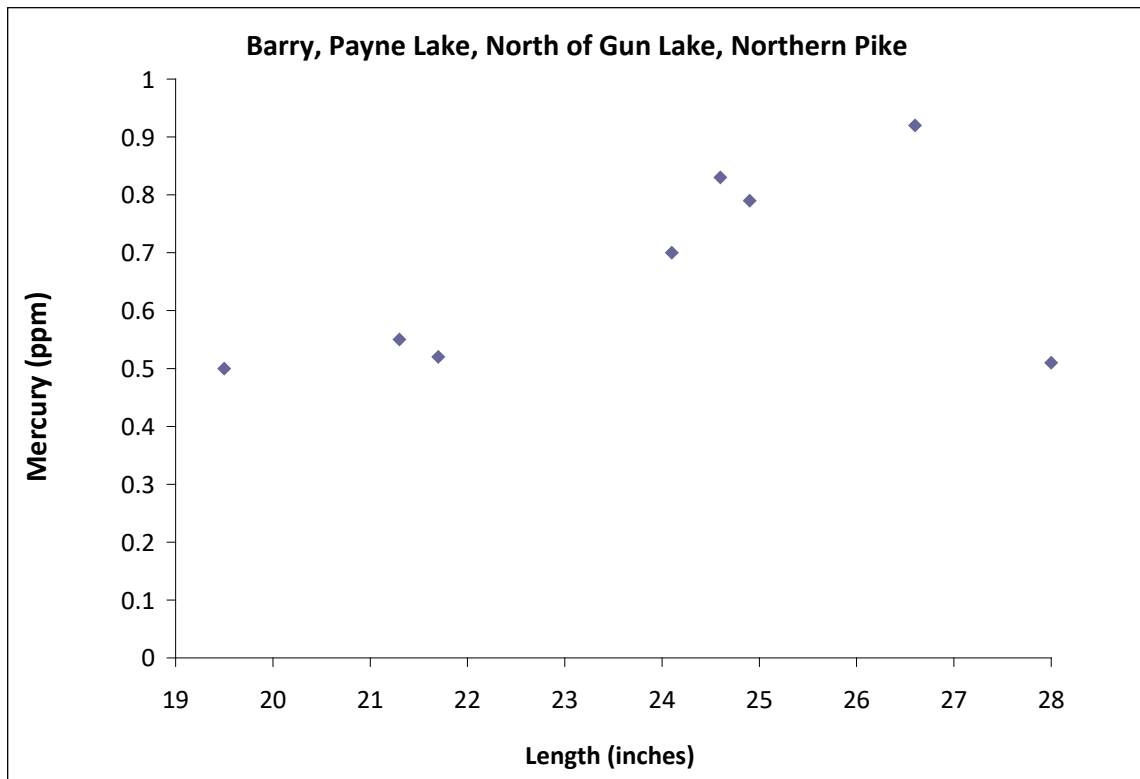
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2009	2009	8	19.5	24	24.1	28
Datasets available: 2009						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
Mercury	5	0.750		0.51	0.92	0.940
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
Mercury	0.246	0.238				1

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)
PCB	0	na		--	--	--
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:						1

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

Recommendation: No one should eat more than one meal per month of Payne Lake northern pike less than 30 inches, or more than six meals per year greater than 30 inches due to mercury. Statewide length break was applied.



Black Crappie

Pine Lake

Barry 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	1995	10	9.1	na	9.1	12.4	
Datasets available: 1995							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.296		0.19	0.43	0.360	2
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.728	0.675					

Organics Analysis:

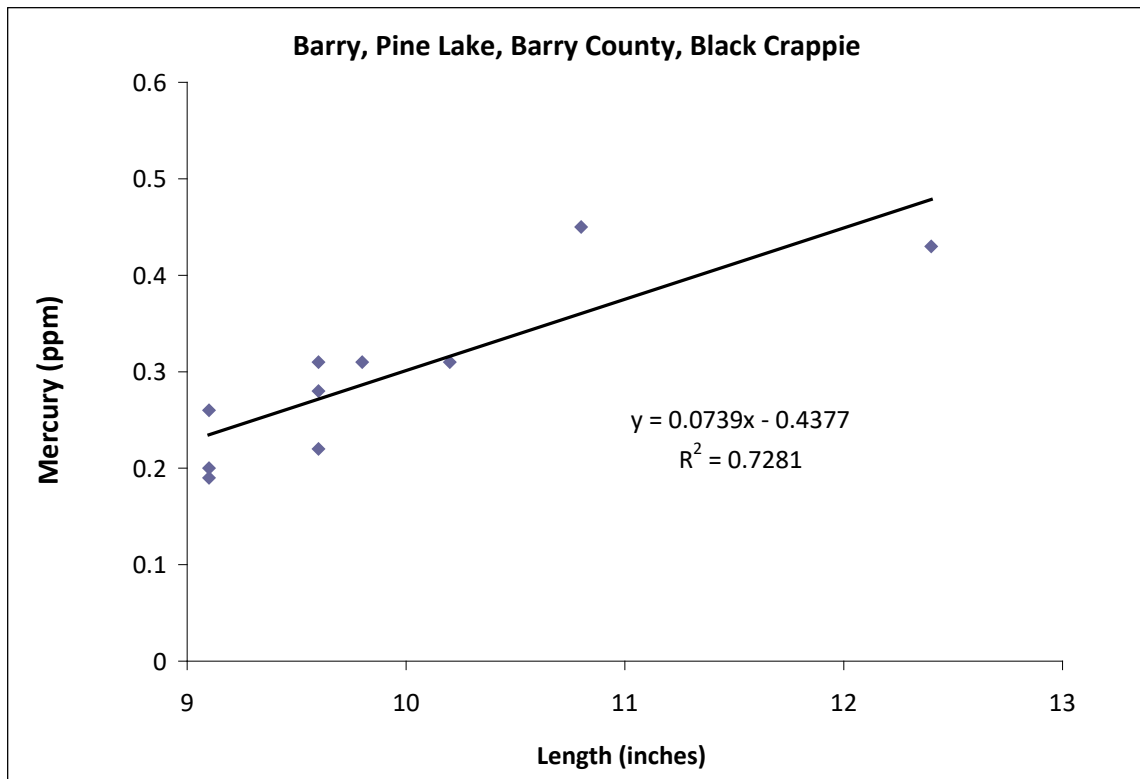
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
--	--	0	--	--	--	--	
Datasets available:							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	na		--	--	--	--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

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

Recommendation: No one should eat more than 4 meals per month of Pine Lake crappie smaller than 9 inches or more than 2 meals per month of those fish larger than 9 inches due to mercury.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
8	0.154	4
9	0.227	4
10	0.301	2
11	0.375	2
12	0.449	2
13	0.523	2
14	0.597	1
15	0.671	1
16	0.745	1

Shaded area denotes extrapolated estimates



Northern Pike

Pine Lake

Barry County

Hg Analysis:

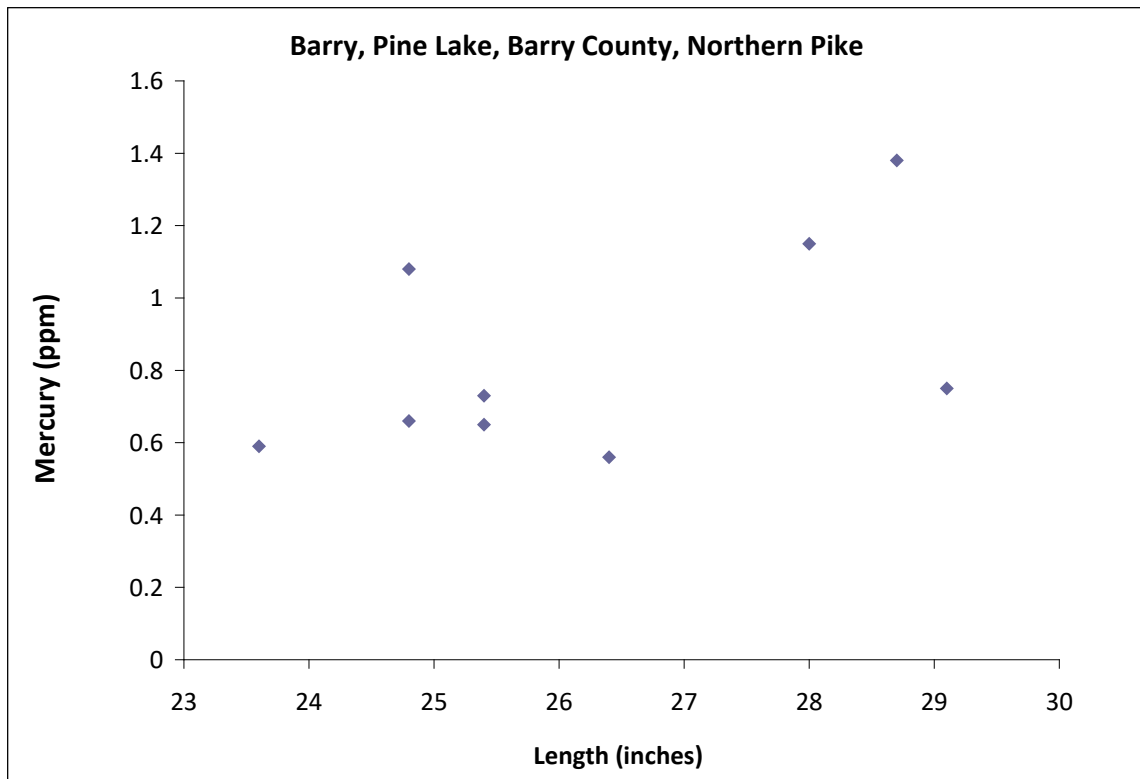
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1995	1995	10	23.4	24	23.6	29.1
Datasets available: 1995						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
Mercury	9	0.839		0.56	1.38	1.060
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
Mercury	0.339	0.343				1

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)
PCB	0	na		--	--	--
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:						1

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

Recommendation: No one should eat more than 1 meal per month of Pine Lake northern pike less than 30 inches, or more than six meals per year greater than 30 inches due to mercury. Statewide length break was applied.



Berrien County

Carp**Galien River
New Buffalo****Berrien 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	2007	16	22.1	na	22.1	31.9	
Datasets available: 1992, 2007							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	16	0.192		0.042	0.332	0.230	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.004	0.000					

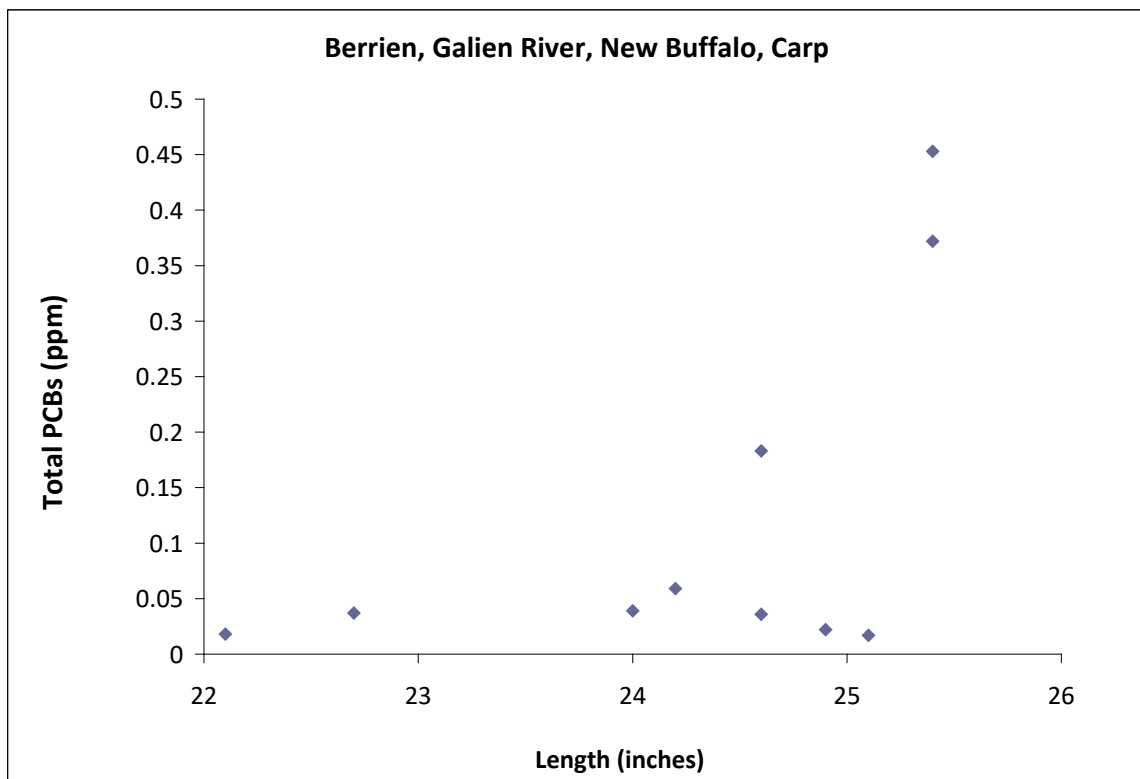
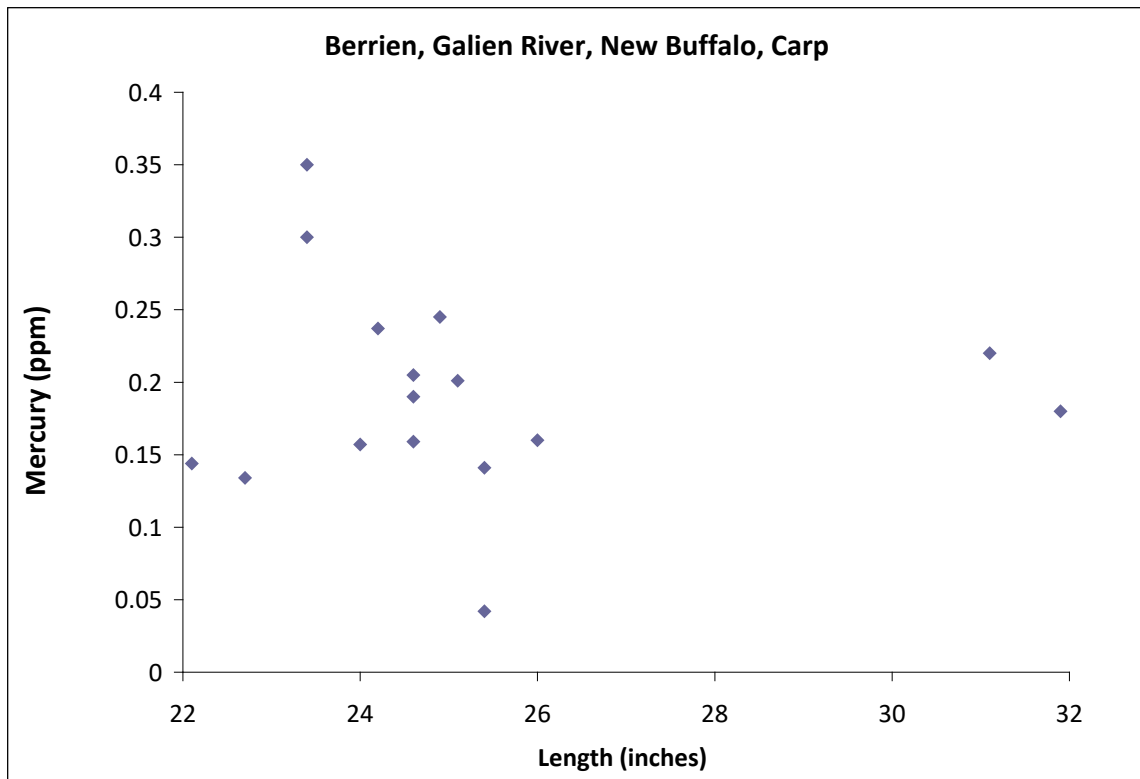
Organics Analysis:

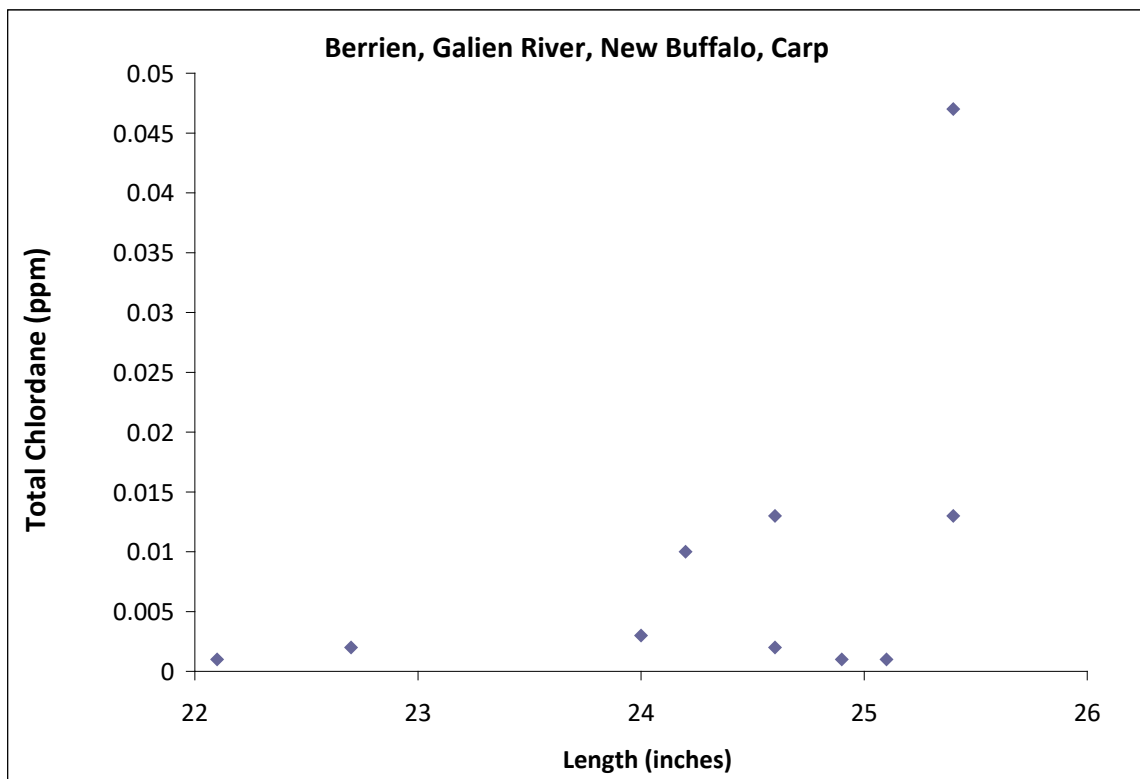
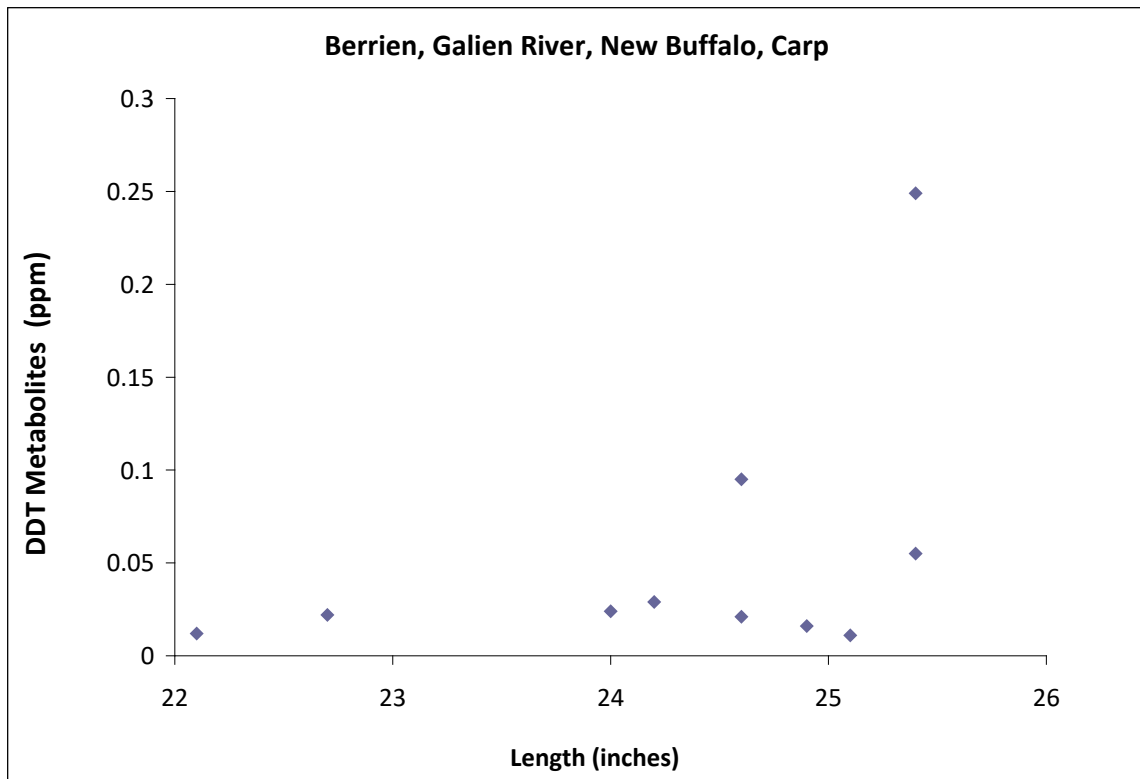
Organics Analysis:

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	22.1	na	22.1	25.4	
Datasets available: 1992, 2007							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.124		0.017	0.453	0.240	0.5
DDT	10	0.053		0.011	0.249	0.110	16
Chlordane	10	0.009		0.001	0.047	0.020	--
Toxaphene	10	ND		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.302	0.272					
DDT	0.186	0.223					
Chlordane	0.209	0.221					
Toxaphene	--	--					
Final meal category based on UCL:							0.5

Existing Advisory: Women and children should eat no more than one meal per week of Galien River carp between 12 and 14 inches in length, no more than one meal per month of Galien River carp between 14 and 22 inches in length and no more than six meals per year of Galien River carp greater than 22 inches in length due to PCBs.

Recommendation: No one should eat more than 6 meals per year of Galien River carp due to PCBs. Mercury would cause an advisory.





Largemouth Bass

Galien River New Buffalo

Berrien 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	1	14.8	14	14.8	14.8	
Datasets available: 1992							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	1	0.490		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	--	--					

Organics Analysis:

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	1	14.8	14	14.8	14.8	
Datasets available: 1992							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	1	0.129		--	--	--	--
DDT	1	0.065		--	--	--	--
Chlordane	1	0.014		--	--	--	--
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: Galien River largemouth bass are not covered by a consumption advisory.

Recommendation: There are insufficient data available to develop specific advice for Galien River largemouth bass. Statewide guidelines apply. No one should eat more than 2 meals per month of legal size largemouth or smallmouth bass under 18 inches or more than 1 meal per month of largemouth or smallmouth bass over 18 inches.

Rock Bass**Galien River
New Buffalo****Berrien 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	1	8.9	na	8.9	8.9	
Datasets available: 1992							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	1	0.320		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R²	R²					
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	
1992	1992	1	8.9	na	8.9	8.9	
Datasets available: 1992							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	1	ND		--	--	--	--
DDT	1	0.006		--	--	--	--
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: Galien River rock bass are covered under the statewide mercury consumption advisory.

Recommendation: There are insufficient data available to develop specific advice for Galien River rock bass. Statewide guidelines apply. No one should eat more than 4 meals per month of rock bass from inland waters.

Bluegill

Ox Creek

Berrien 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	5.4	NA	5.4	6.1	
Datasets available: 2021							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.036		0.025	0.044	0.040	16
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.001	0.000					

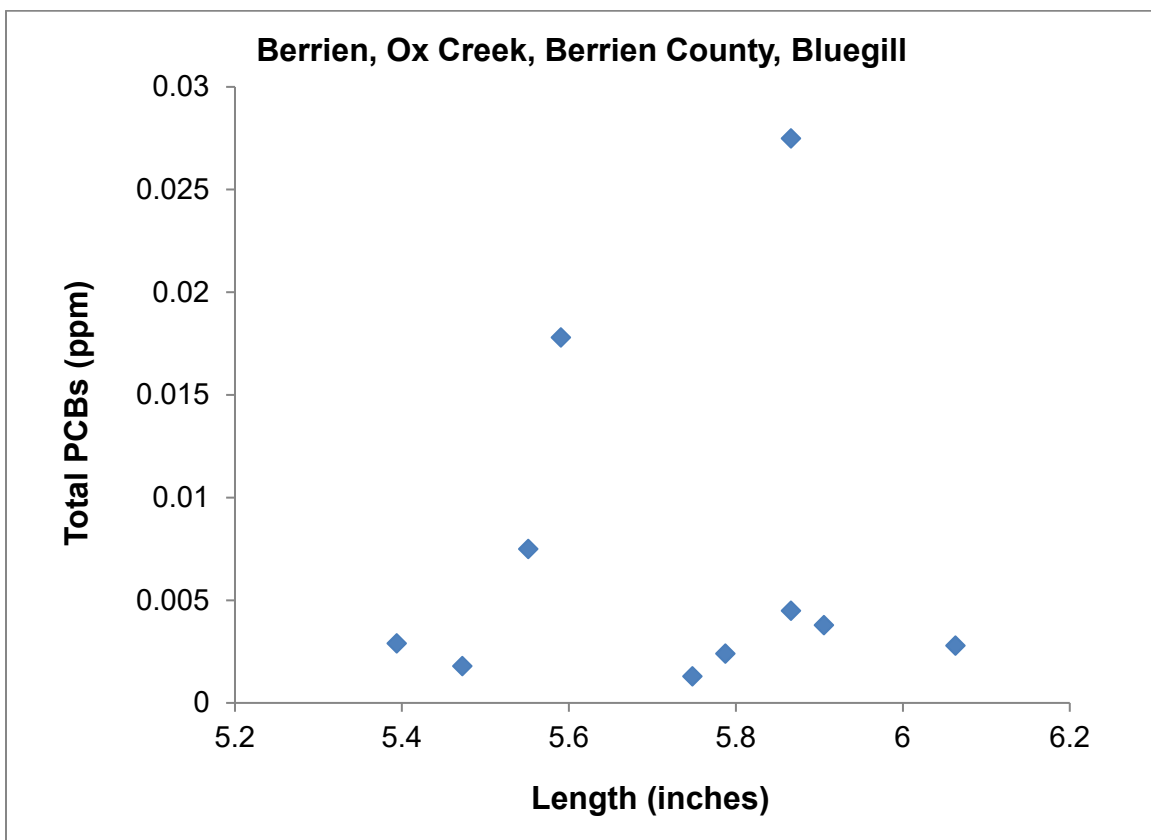
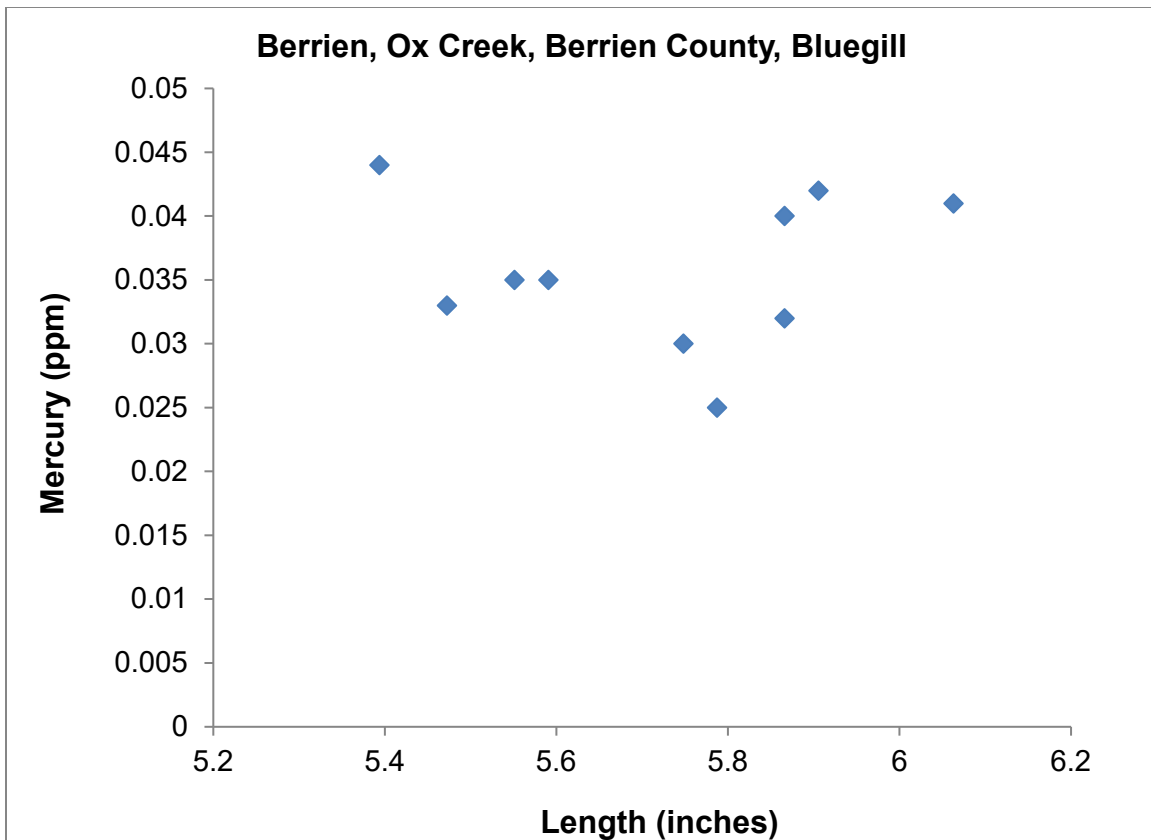
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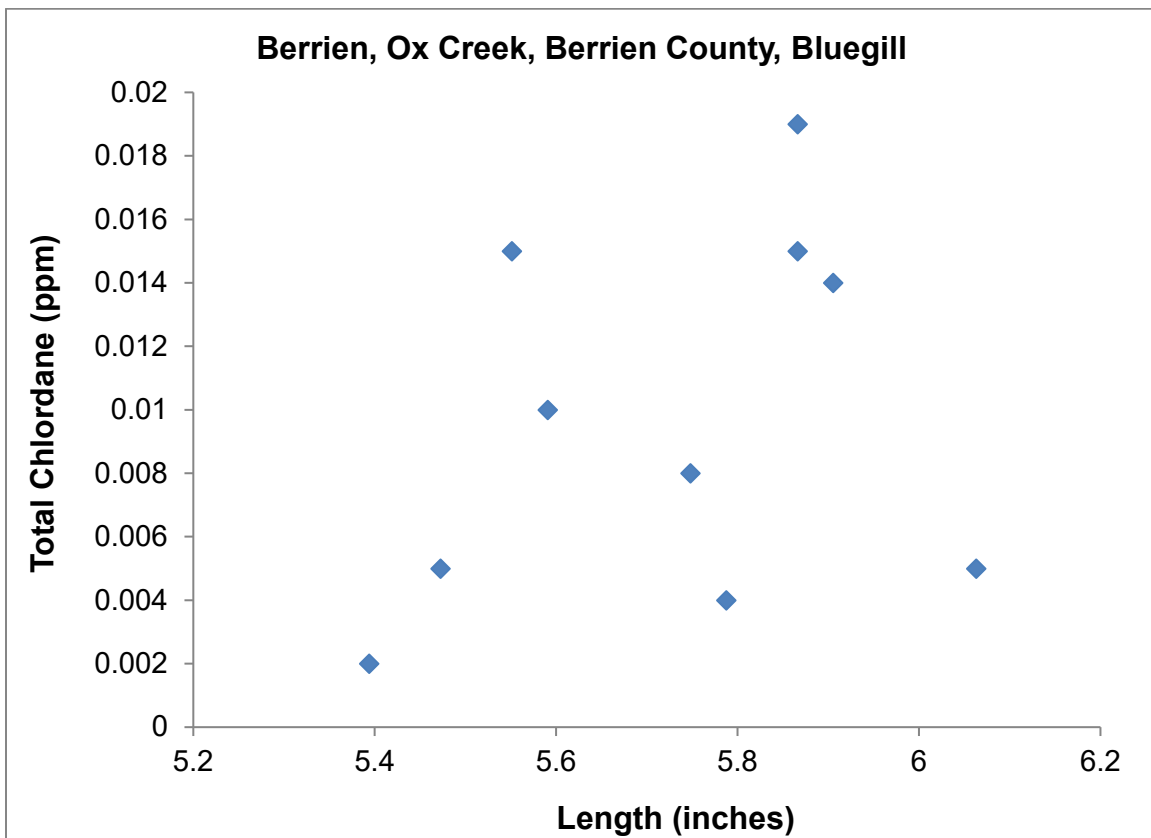
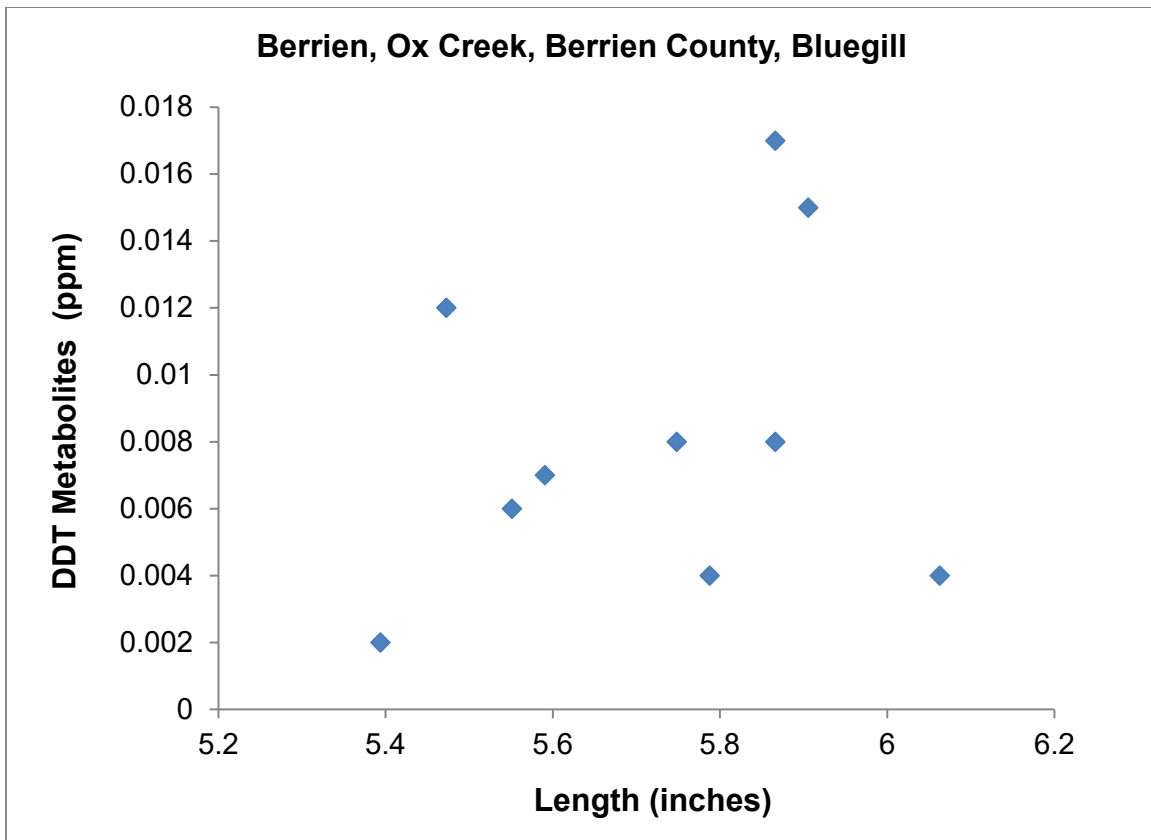
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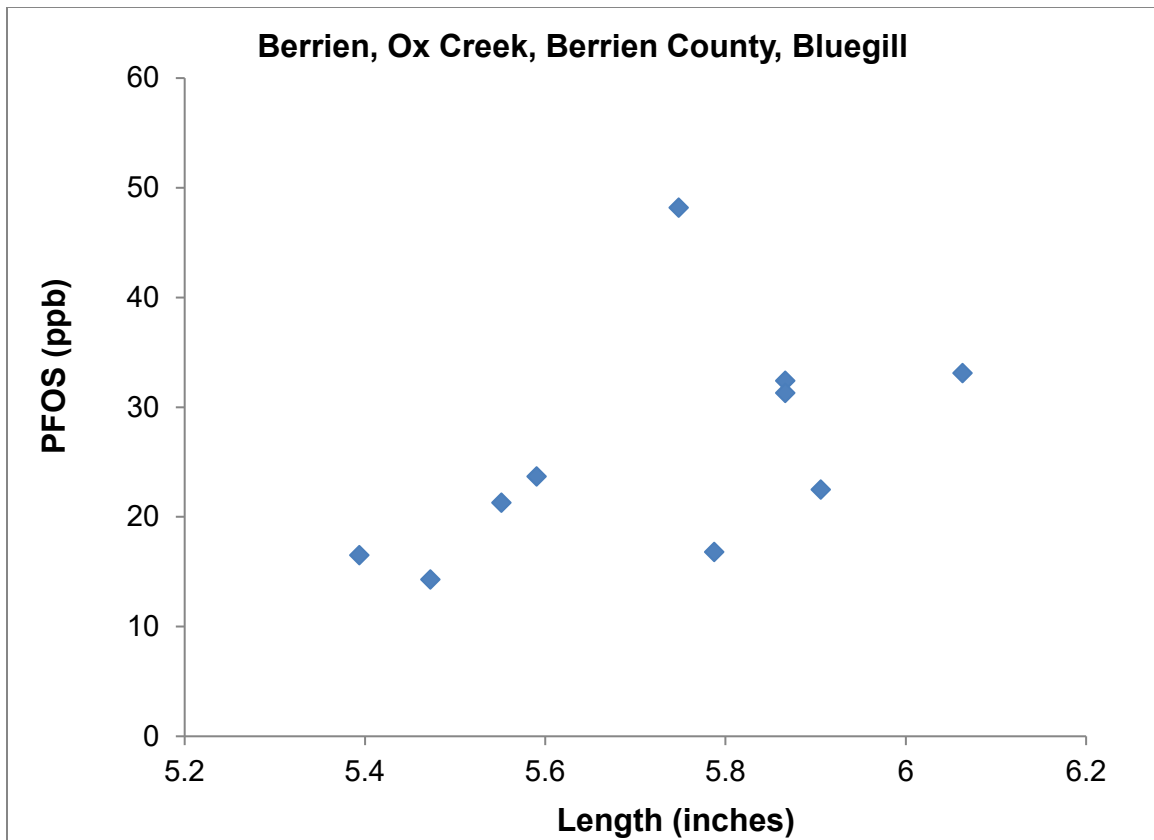
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2021	2021	10	5.4	NA	5.4	6.1	
Datasets available: 2021							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.007		0.001	0.028	0.013	12
DDT	10	0.008		0.002	0.017	0.012	16
Chlordane	10	0.010		0.002	0.019	0.014	16
Toxaphene	10	ND		--	--	--	--
PFOS	10	26.0 ppb		14.3 ppb	48.2 ppb	33.4 ppb	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.006	0.003					
DDT	0.064	0.083					
Chlordane	0.106	0.153					
Toxaphene	--	--					
PFOS	0.282	0.373					
Final meal category based on UCL:							4

Existing MDHHS Advisory: Bluegill and sunfish from Ox Creek in Berrien County are currently covered under the statewide guidance for 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 Ox Creek in Berrien County due to PFOS. PCBs cause less restrictive guidelines.







Largemouth Bass

Ox Creek

Berrien 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	8.3	14	8.3	13.8
Datasets available: 2021						
Chemical	Sample Size (All*)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
Mercury	5	0.179		0.050	0.320	0.322
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
Mercury	0.621	0.440				

Organics Analysis:

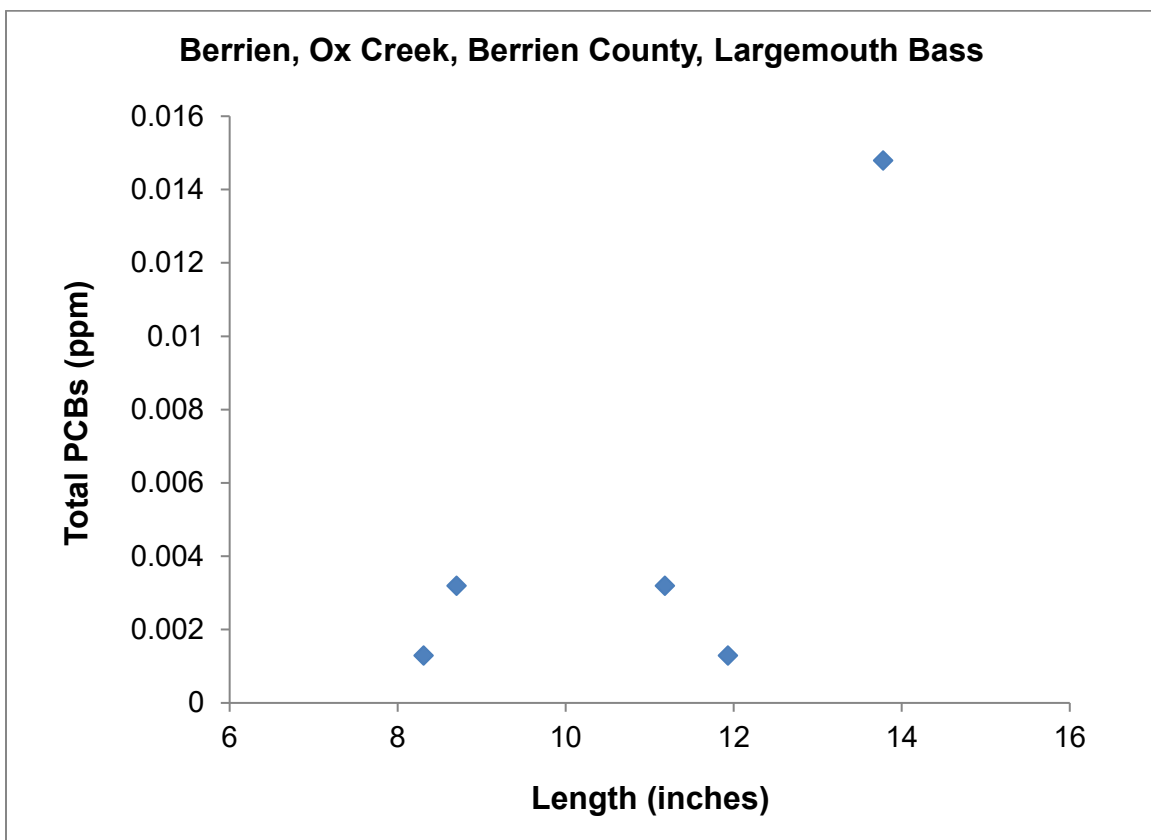
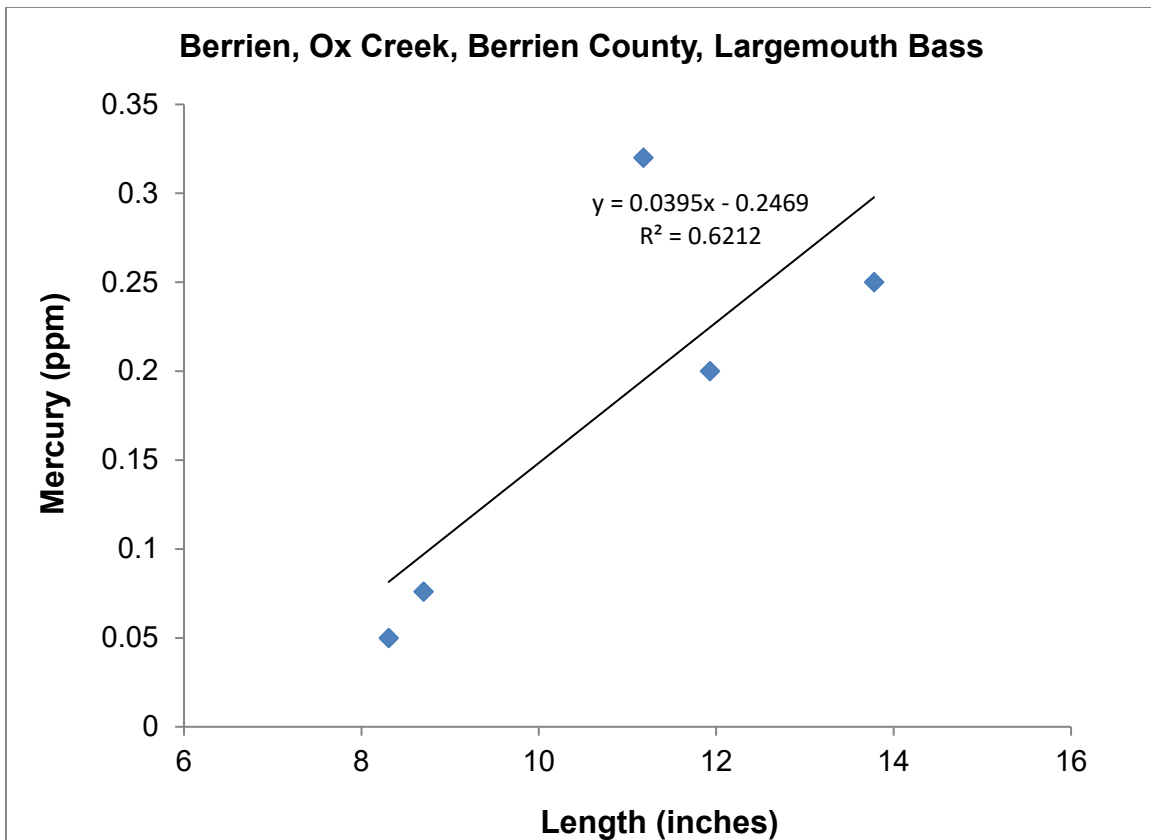
Range of Years Used		N (All*)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2021	2021	5	8.3	14	8.3	13.8
Datasets available: 2021						
Chemical	Sample Size (All*)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
PCB	5	0.005		0.001	0.015	0.012
DDT	5	0.006		0.002	0.011	0.011
Chlordane	5	0.006		0.001	0.013	0.011
Toxaphene	5	ND		--	--	--
PFOS	5	28.6 ppb		16.5 ppb	40.3 ppb	42.1 ppb
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
PCB	0.514	0.405				
DDT	0.088	0.044				
Chlordane	0.221	0.044				
Toxaphene	--	--				
PFOS	0.024	0.014				
Final meal category based on UCL:						2

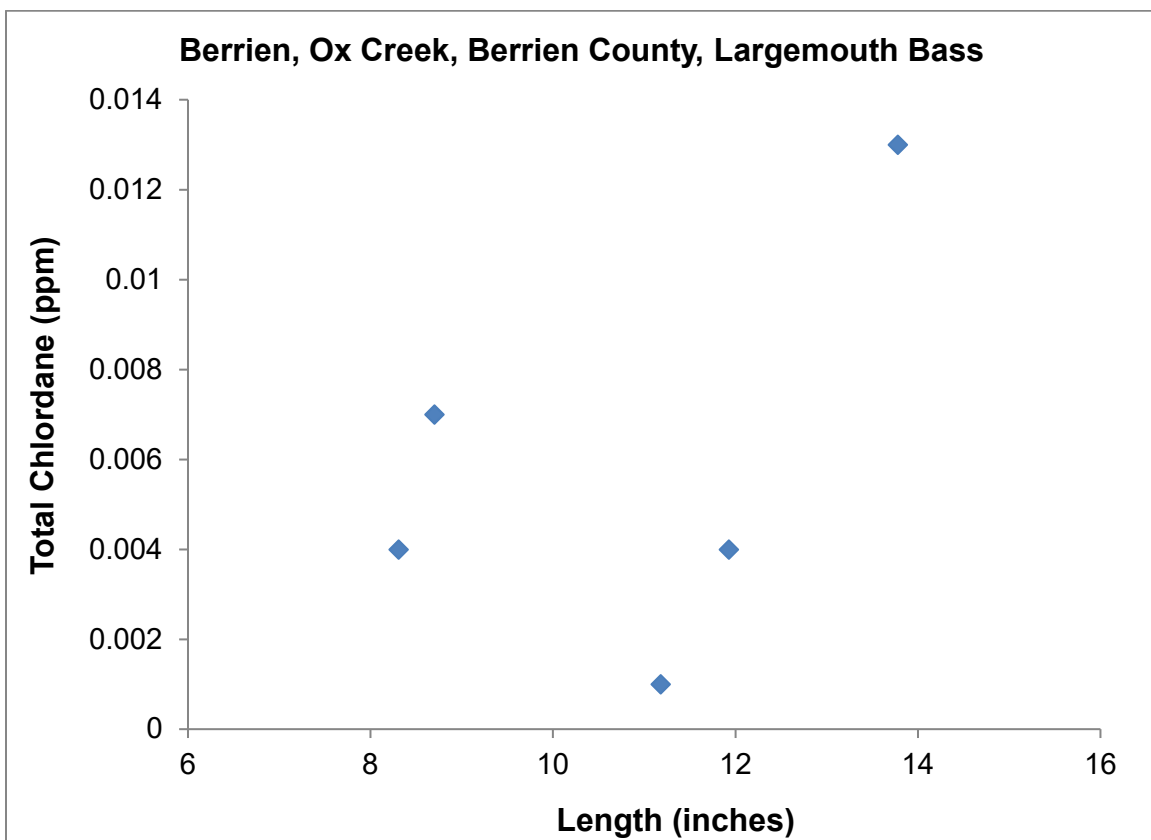
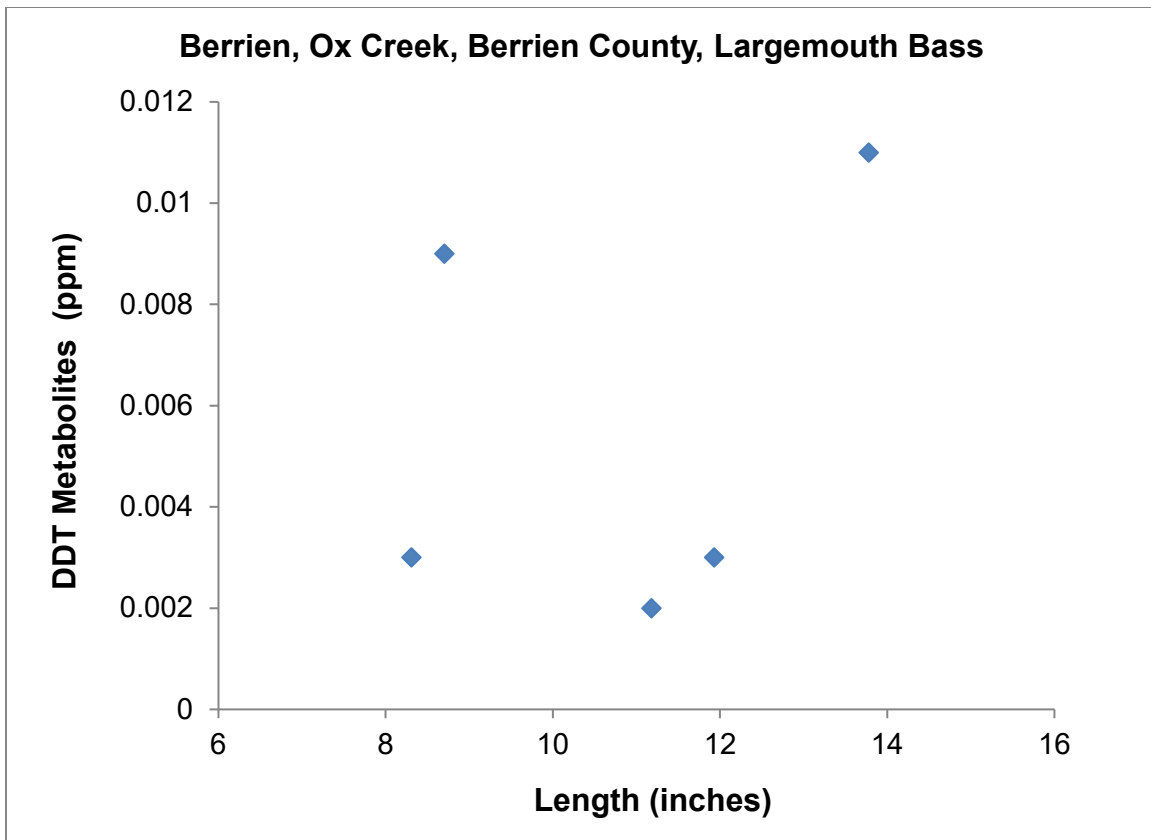
* Only sub-legal fish were collected; therefore the entire data set was used in the analysis.

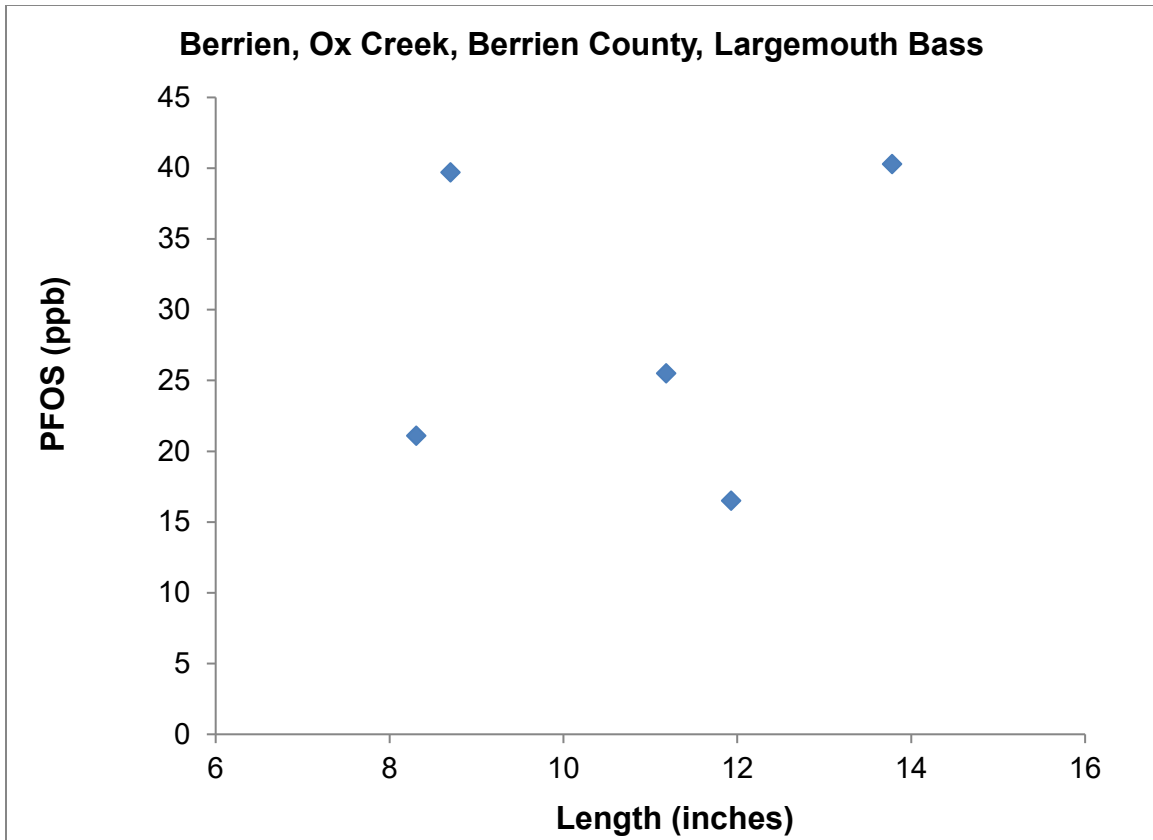
Existing MDHHS Advisory: Largemouth and smallmouth bass from Ox Creek in Berrien County are currently covered under the statewide guidance for mercury. No one should eat more than 2 meals per month of largemouth or smallmouth bass less than 18 inches or no more than 1 meal per month of these fish larger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

Recommendation: No one should eat more than 2 meals per month of largemouth or smallmouth bass less than 18 inches due to PFOS and mercury or no more than 1 meal per month of these fish larger than 18 inches due to mercury. Statewide length break applied as the size range of the dataset was limited. PCBs cause a less restrictive guideline.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
14	0.306	2
16	0.385	2
18	0.464	2
20	0.543	1
22	0.622	1
Shaded area denotes extrapolated estimates		







Rock Bass**Ox Creek****Berrien County****Hg Analysis:**

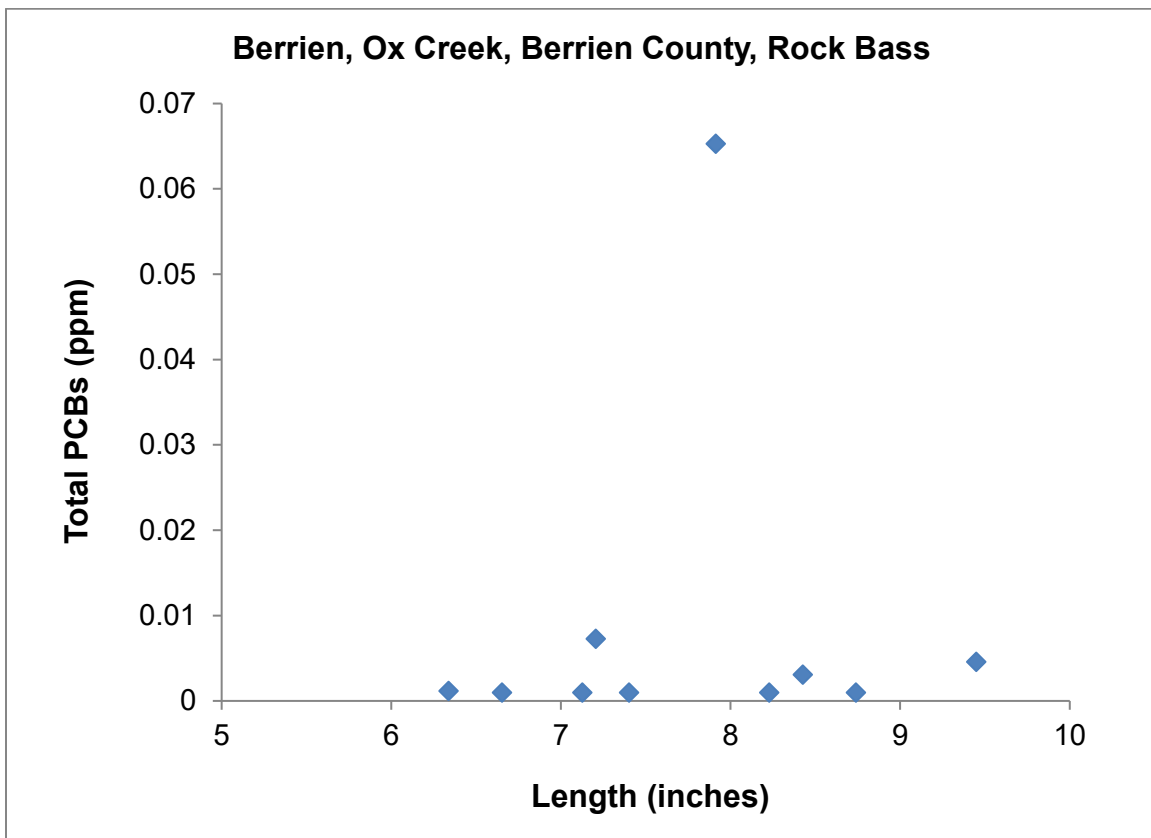
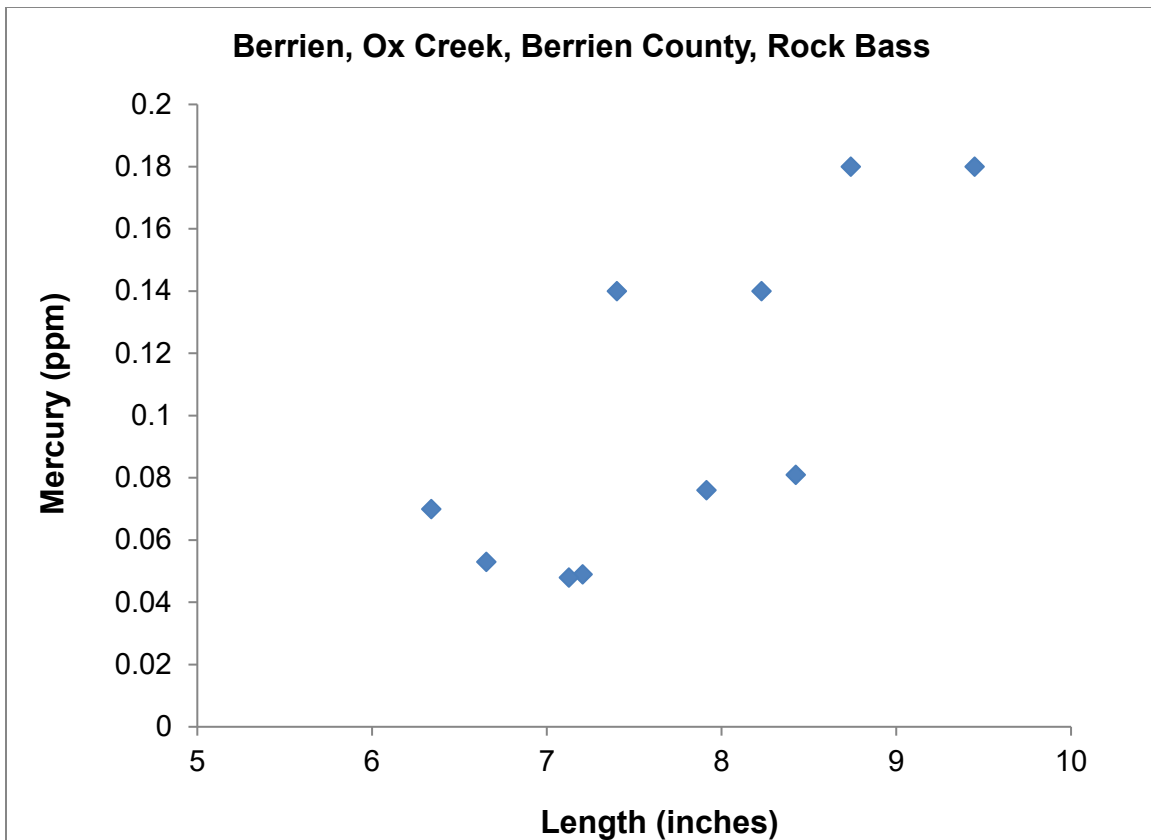
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2021	2021	10	6.3	NA	6.3	9.4	
Datasets available: 2021							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.102		0.048	0.180	0.140	4
Chemical	Linear Regression	Exponential Regression					
	R²	R²					
Mercury	0.589	0.565					

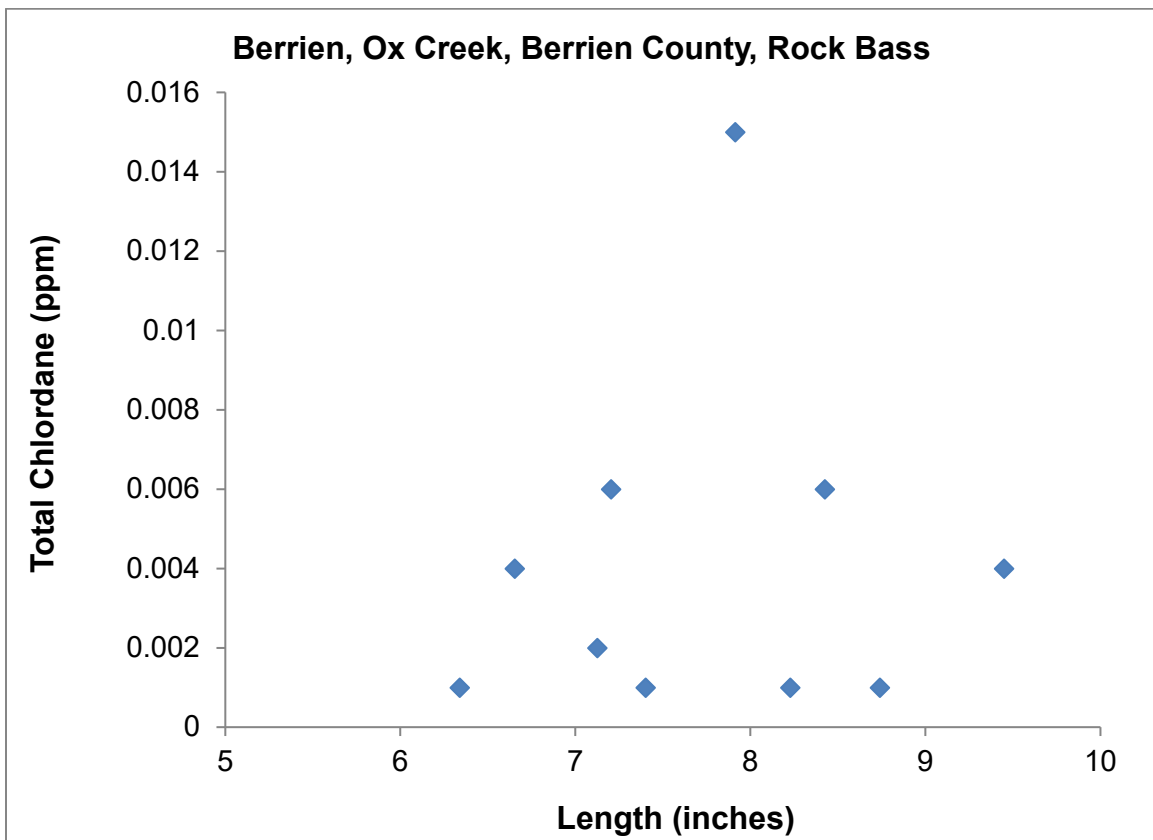
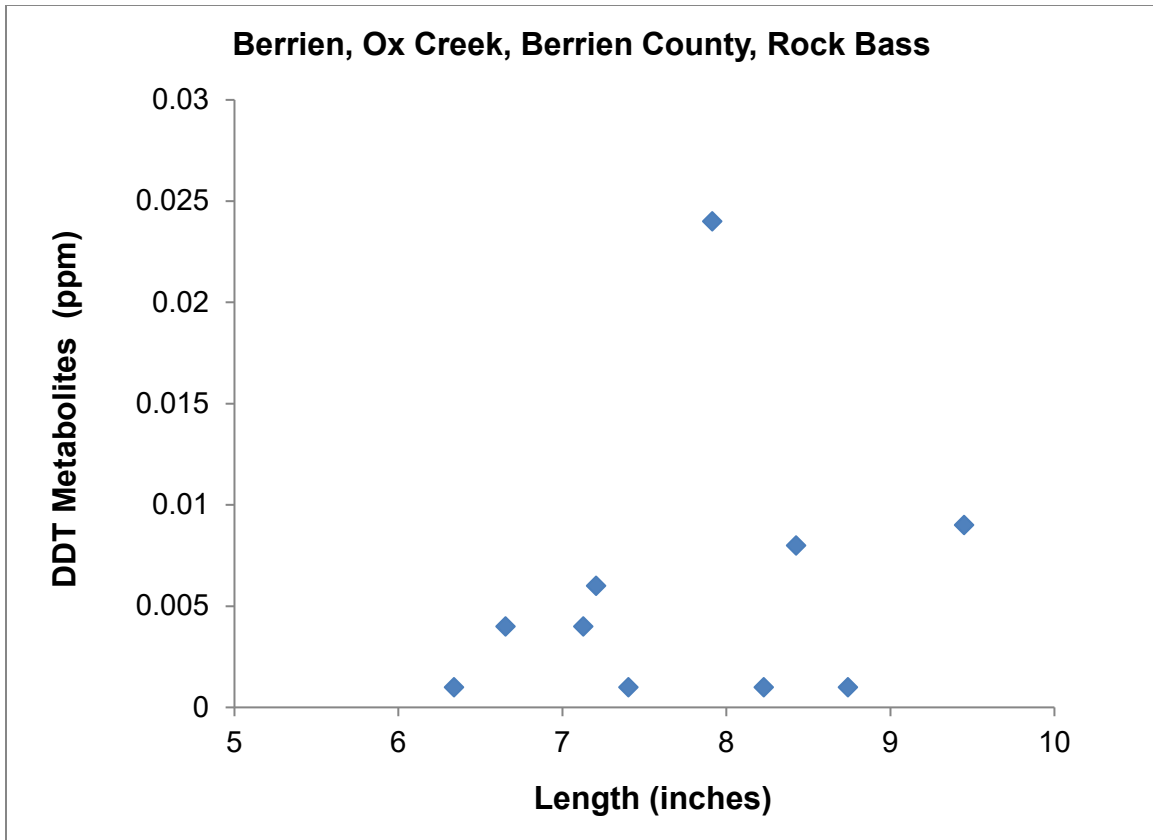
Organics Analysis:

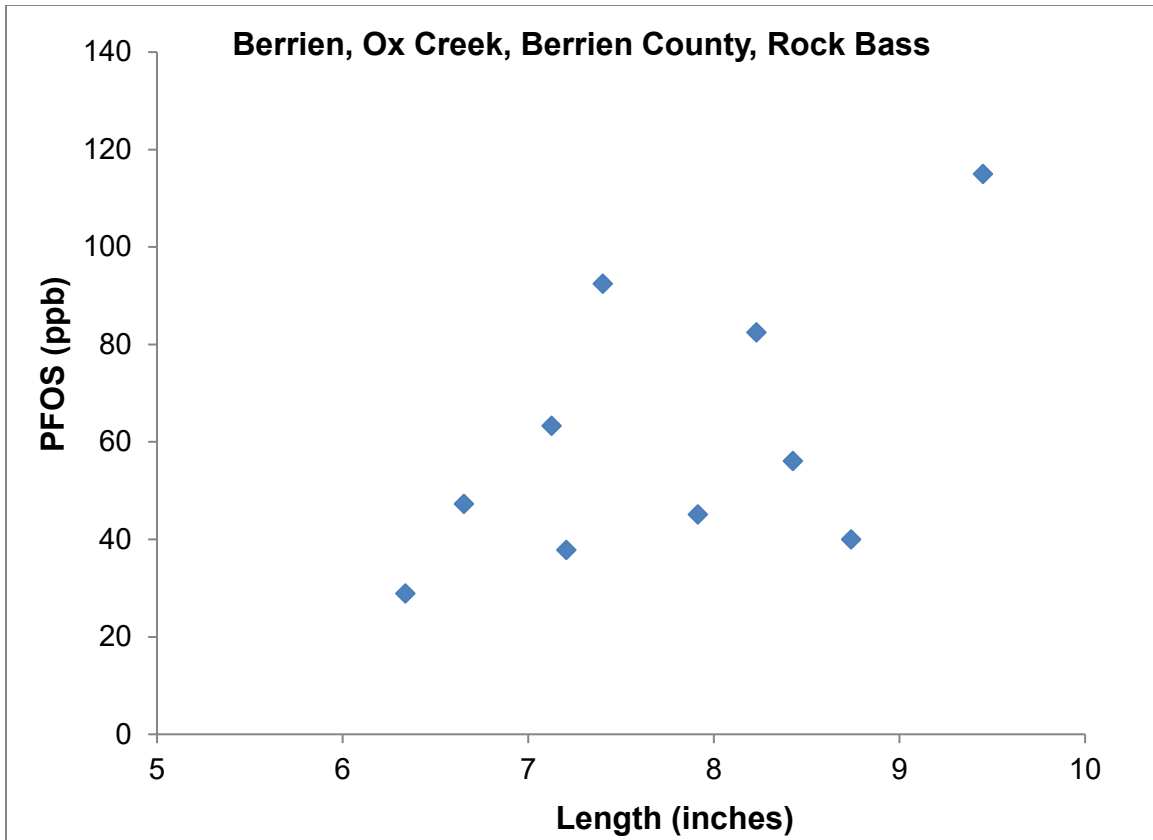
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2021	2021	10	6.3	NA	6.3	9.4	
Datasets available: 2021							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.009		<0.001	0.065	0.023	8
DDT	10	0.006		<0.001	0.024	0.011	16
Chlordane	10	0.004		<0.001	0.015	0.007	16
Toxaphene	10	ND		--	--	--	--
PFOS	10	60.9 ppb		28.9 ppb	115.0 ppb	80.6 ppb	1
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.007	0.051					
DDT	0.053	0.053					
Chlordane	0.012	0.016					
Toxaphene	--	--					
PFOS	0.314	0.306					
Final meal category based on UCL:							1

Existing MDHHS Advisory: Rock bass from Ox Creek in Berrien County are currently covered under the statewide guidance for mercury. 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 Ox Creek in Berrien County due to PFOS. Mercury and PCBs cause less restrictive guidelines.







Bluegill**Paw Paw Lake****Berrien County****Hg Analysis:**

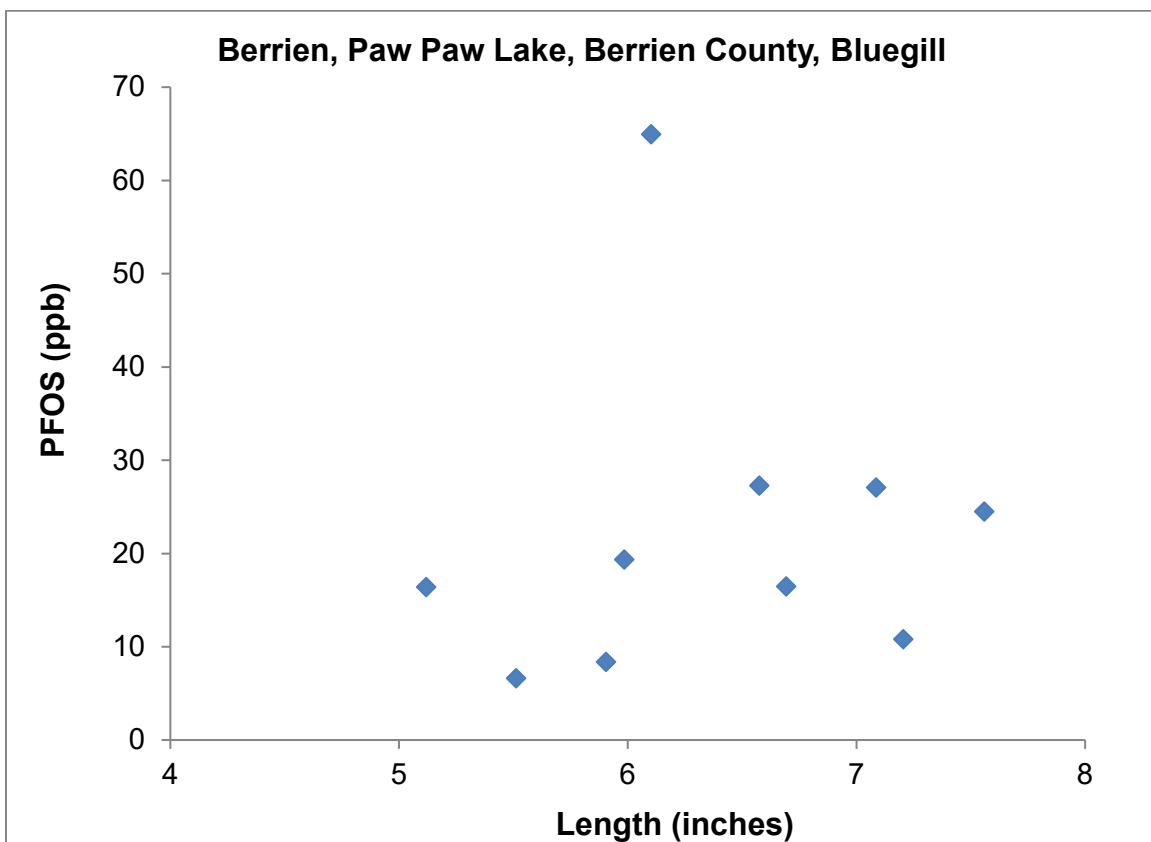
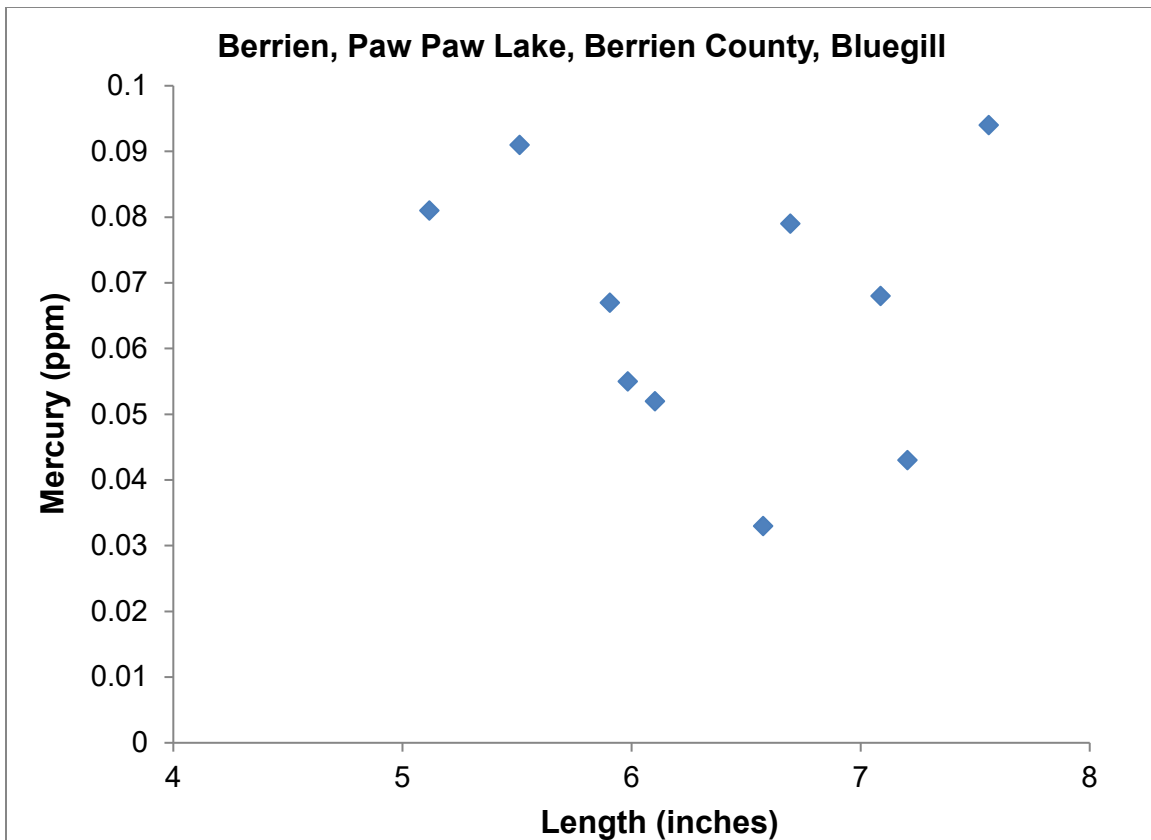
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2021	2021	10	5.1	NA	5.1	7.6	
Datasets available: 2021							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.066		0.033	0.094	0.081	12
Chemical	Linear Regression	Exponential Regression					
	R²	R²					
Mercury	0.019	0.028					

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	5.1	NA	5.1	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	22.2 ppb		6.7 ppb	65.0 ppb	34.2 ppb	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	0.011	0.072					
Final meal category based on UCL:							4

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

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



**Largemouth/Smallmouth
Bass**

Paw Paw Lake

Berrien 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	12.2	14.0	13.8	21.4
Datasets available: 2021						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
Mercury	9	0.523		0.300	0.900	0.721
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
Mercury	0.736	0.719				1

Organics Analysis:

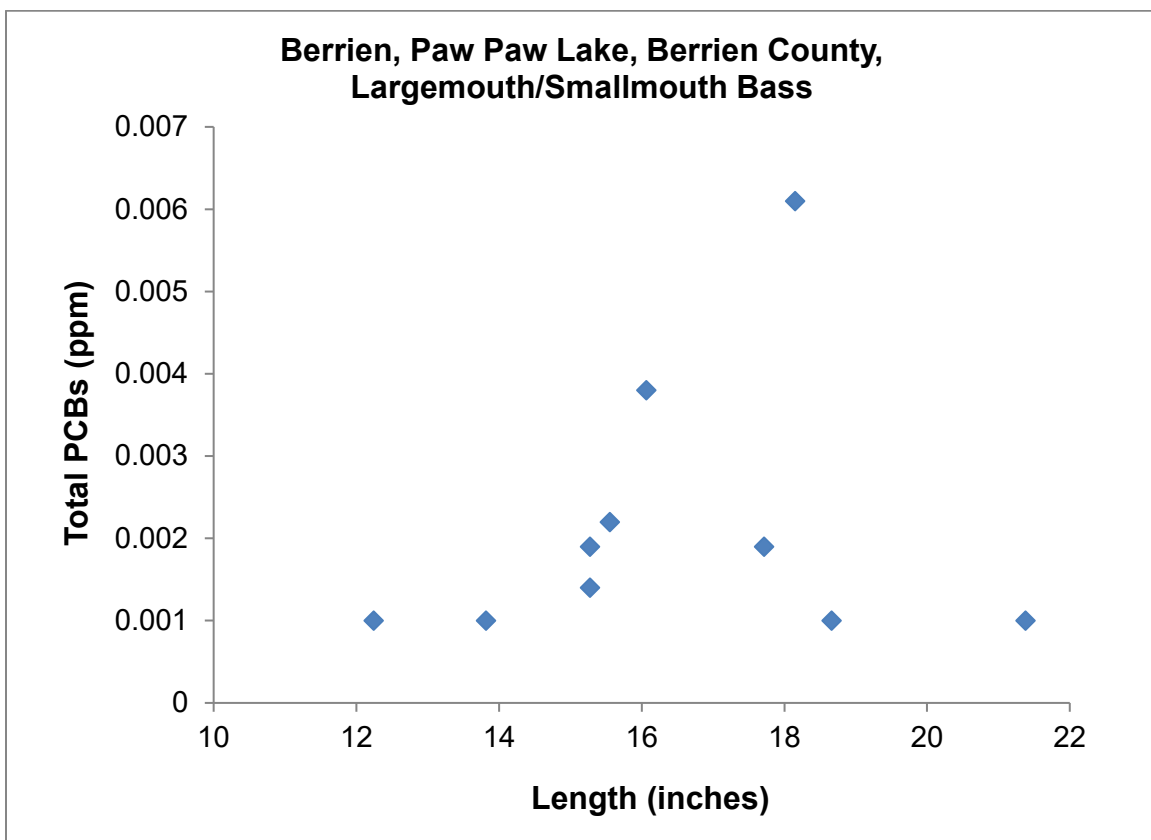
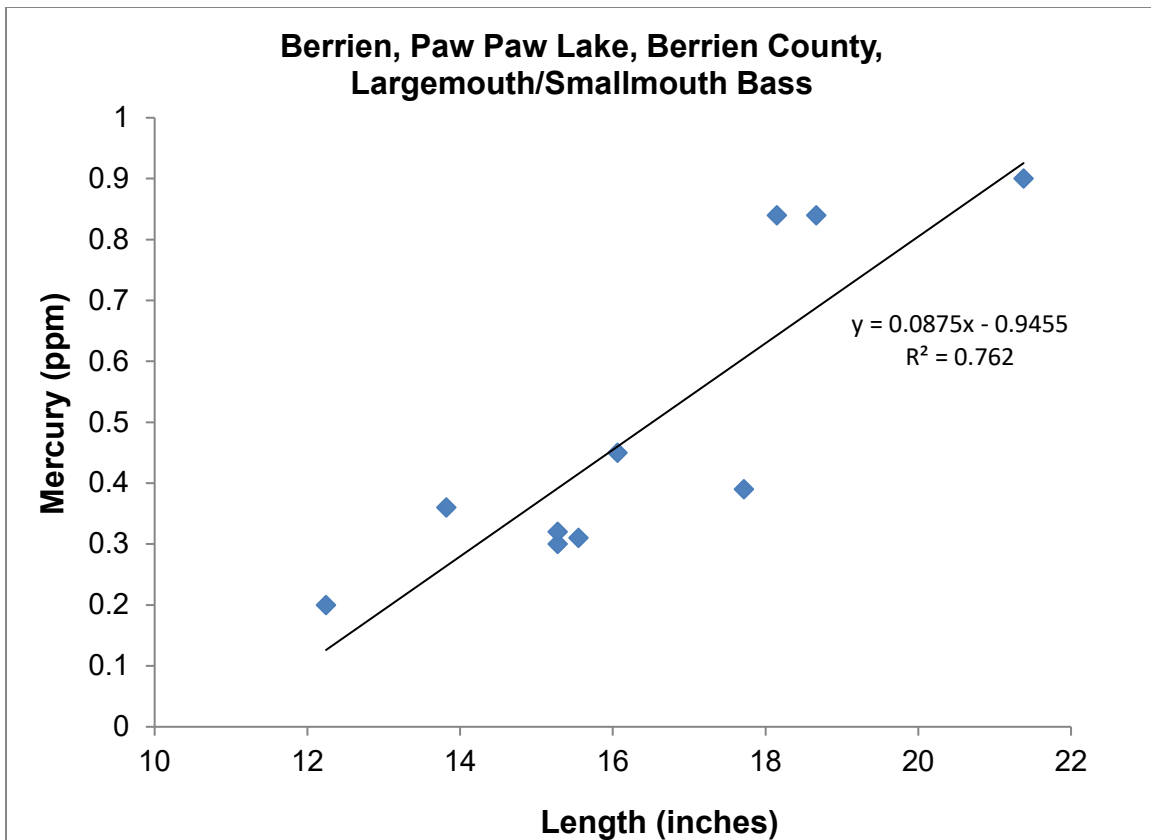
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2021	2021	10	12.2	14.0	13.8	21.4
Datasets available: 2021						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
PCB	9	0.002		<0.001	0.006	0.004
DDT	9	0.009		0.002	0.023	0.014
Chlordane	9	0.002		<0.001	0.006	0.004
Toxaphene	9	ND		--	--	--
PFOS	10*	19.4 ppb		8.6 ppb	29.8 ppb	24.3 ppb
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
PCB	0.002	0.005				16
DDT	0.009	0.132				16
Chlordane	0.000	0.002				16
Toxaphene	--	--				--
PFOS	0.235	0.326				4
Final meal category based on UCL:						1

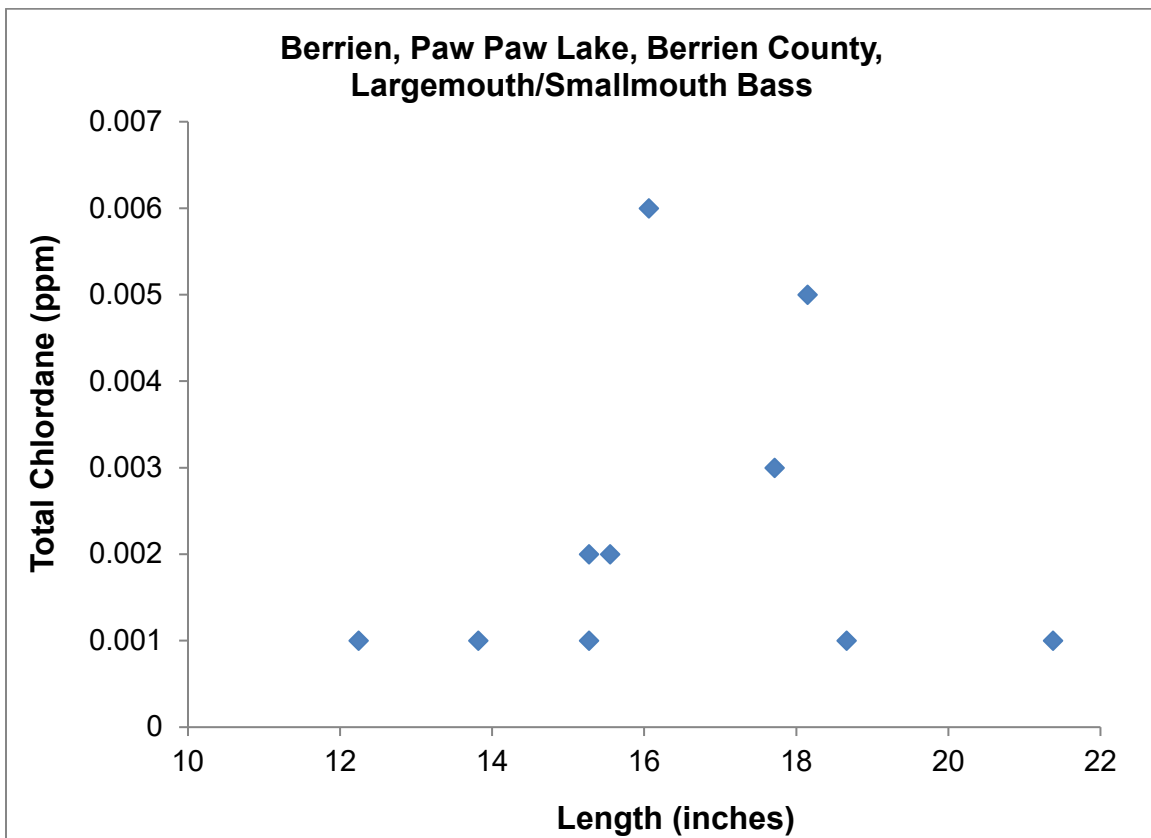
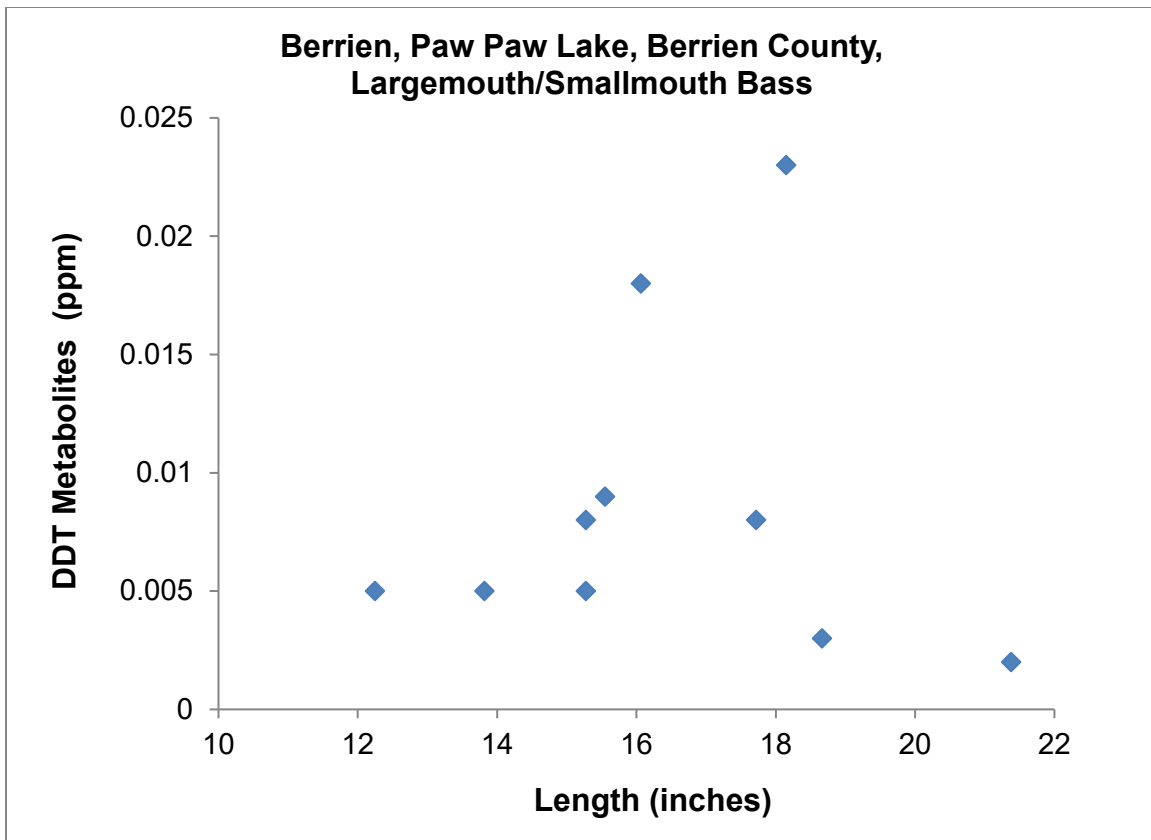
*Sub-legal sized fish used in the PFOS analysis as no correlation between fish size and PFOS has been observed in the statewide dataset.

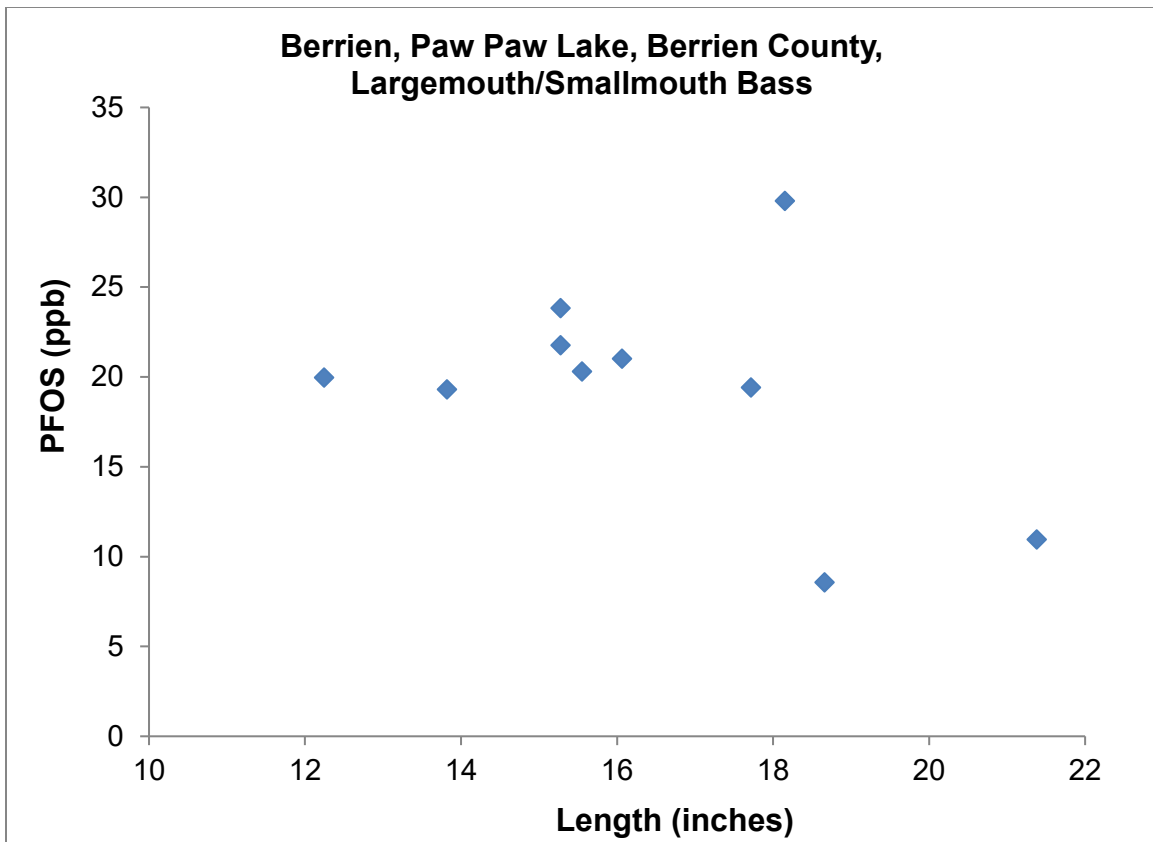
Existing MDHHS Advisory: Largemouth and smallmouth bass are currently covered under the statewide mercury guidance. No one should eat more than 2 meals per month of largemouth or smallmouth bass smaller than 18 inches or no more than 1 meal per month of these species larger than 18 inches.

Recommendation: No one should eat more than 2 meals per month of largemouth or smallmouth bass smaller than 16 inches from Paw Paw Lake in Berrien County due to mercury or no more than 1 meal per month of these fish larger than 16 inches due to mercury. PFOS causes less restrictive guidance.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
14	0.280	2
15	0.367	2
16	0.455	2
17	0.542	1
18	0.630	1
19	0.717	1







Branch County

Largemouth Bass

Cary Lake

Branch County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Size Range of All Samples		
Earliest	Most Recent				Min	Max	
2001	2001	10	11.5	14	11.5	13.2	
Datasets available: 2001							
Chemical	Sample Size (All)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.311		0.22	0.39	0.360	2
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.117	0.145					

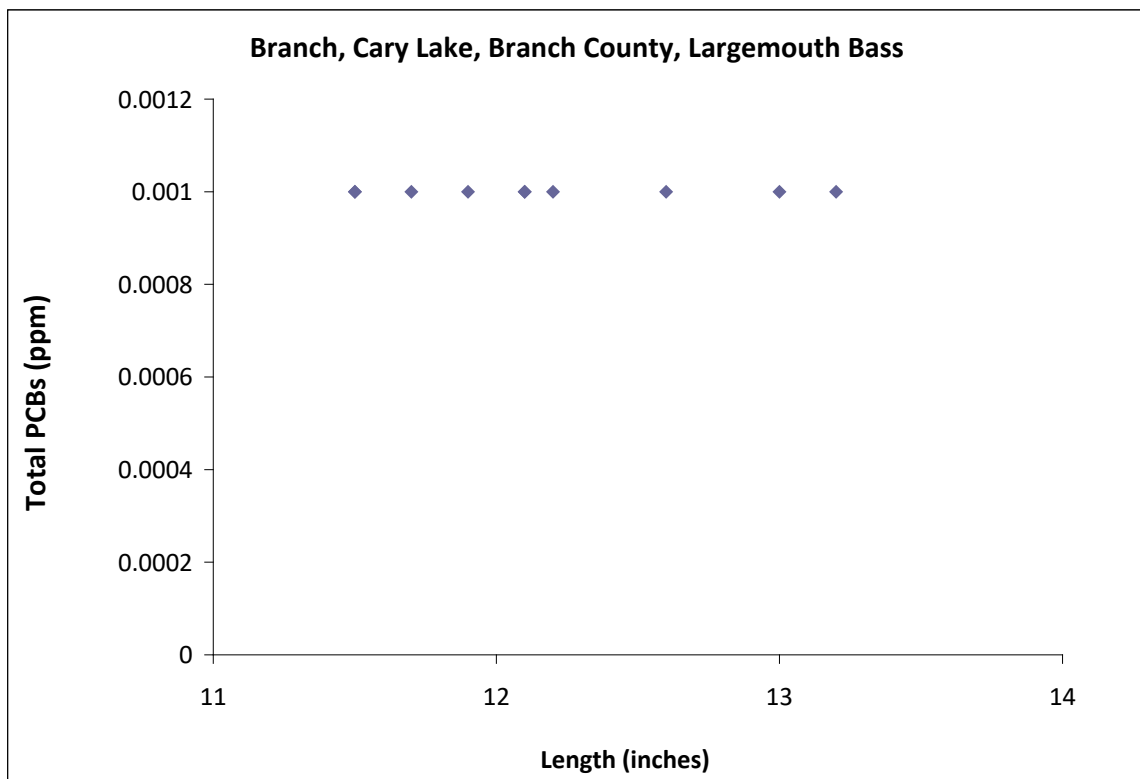
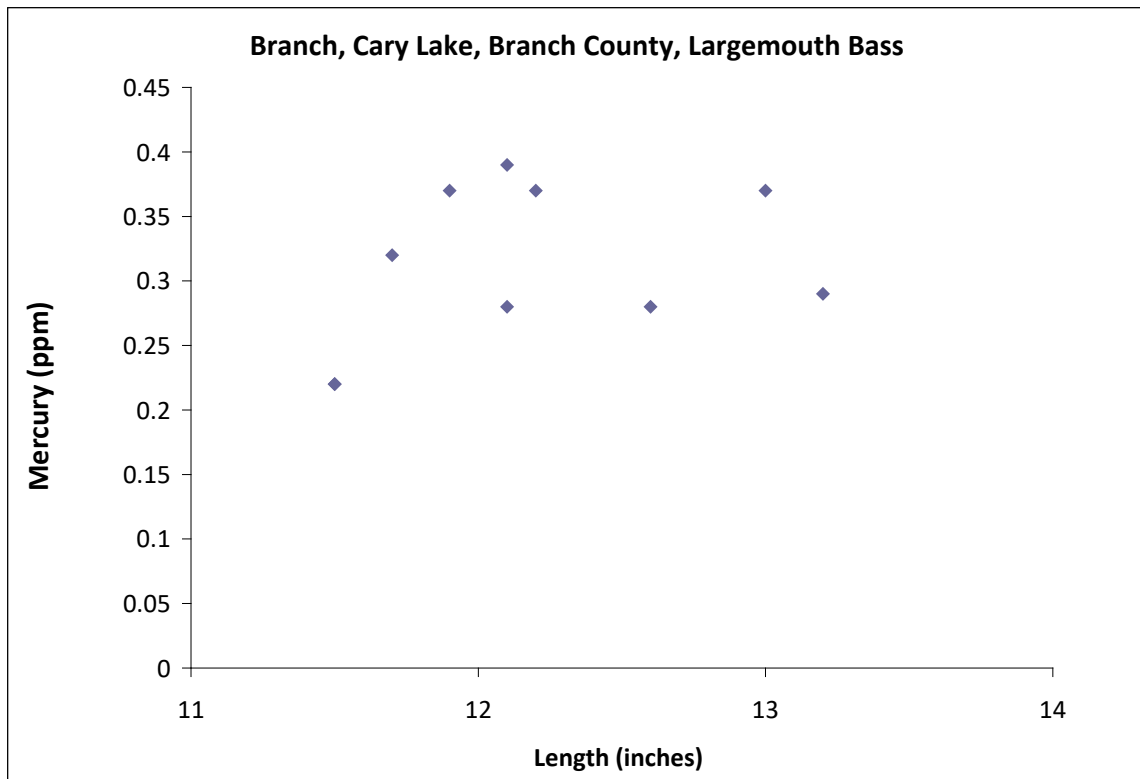
Organics Analysis:

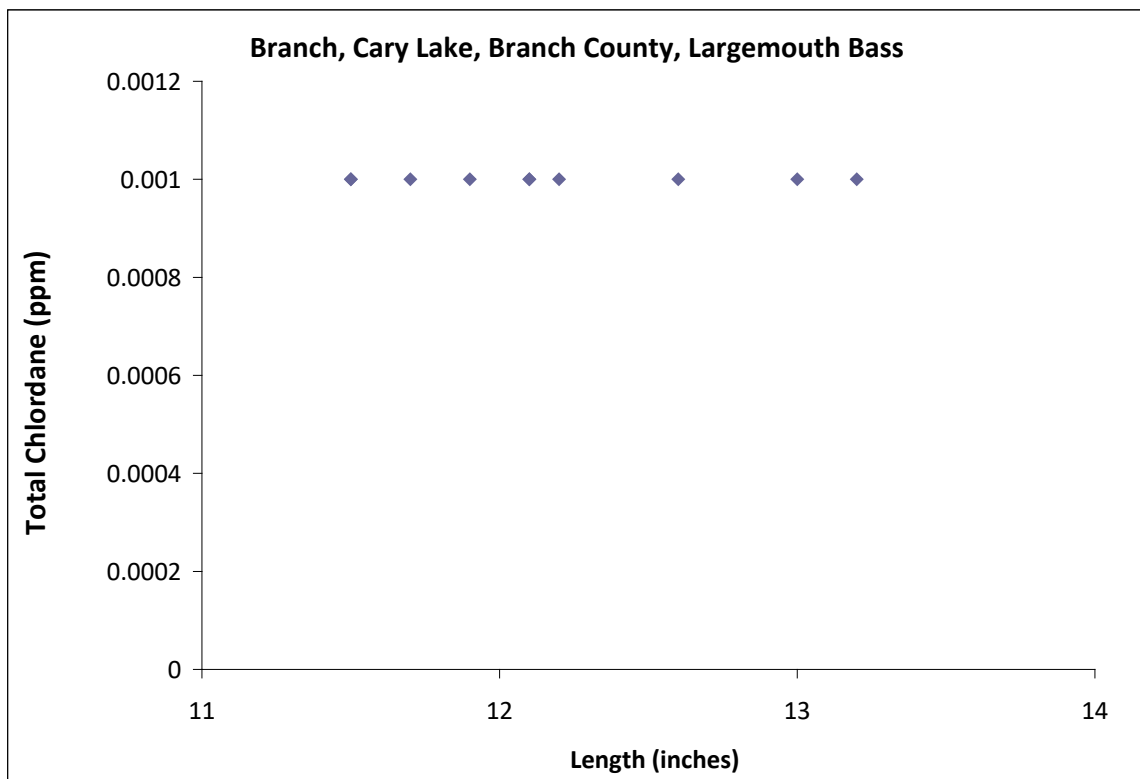
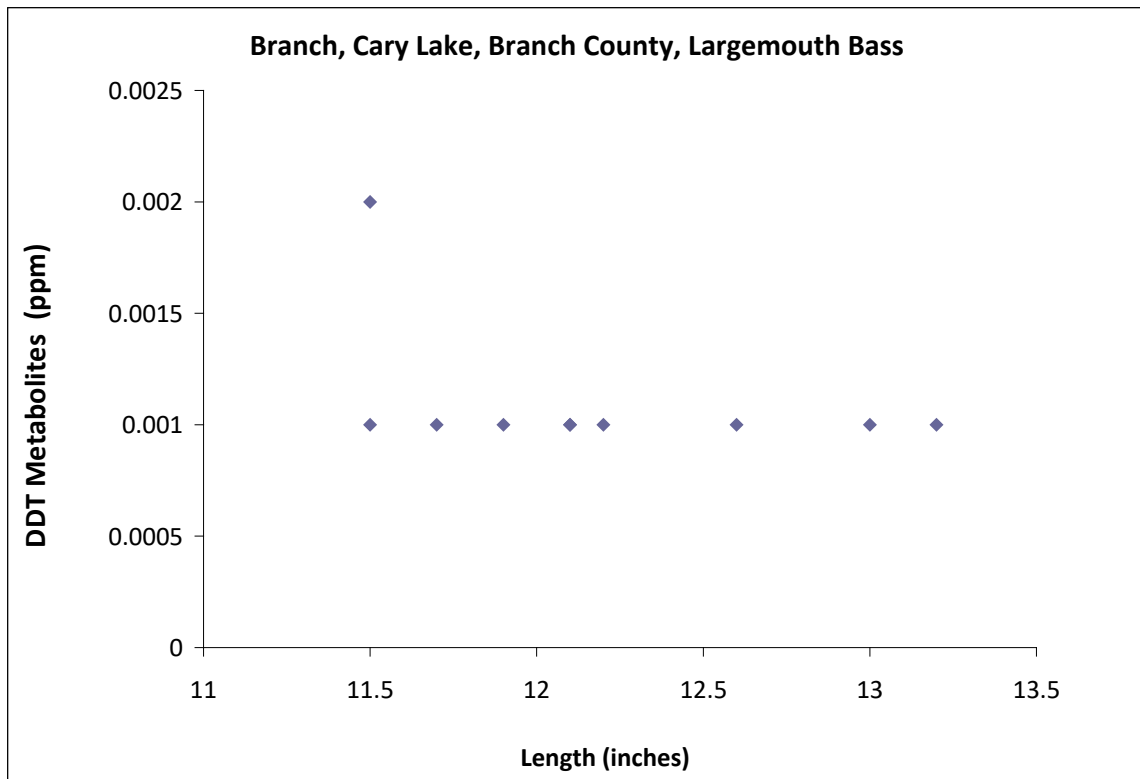
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Size Range of All Samples		
Earliest	Most Recent				Min	Max	
2001	2001	10	11.5	14	11.5	13.2	
Datasets available: 2001							
Chemical	Sample Size (All)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.001		0.001	0.001	0.000	16
DDT	10	0.001		0.001	0.002	0.001	16
Chlordane	10	0.001		0.001	0.001	0.001	--
Toxaphene	10	ND		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.000	--					
DDT	0.164	0.164					
Chlordane	0.000	--					
Toxaphene	--	--					
Final meal category based on UCL:							2

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

Recommendation: No one should eat more than 2 meals per month of Cary Lake largemouth or smallmouth bass under 18 inches or 1 meal per month larger than 18 inches due to mercury. The statewide length break was used as the size range of the fish was limited.





White Sucker

Cary Lake

Branch County

Hg Analysis:

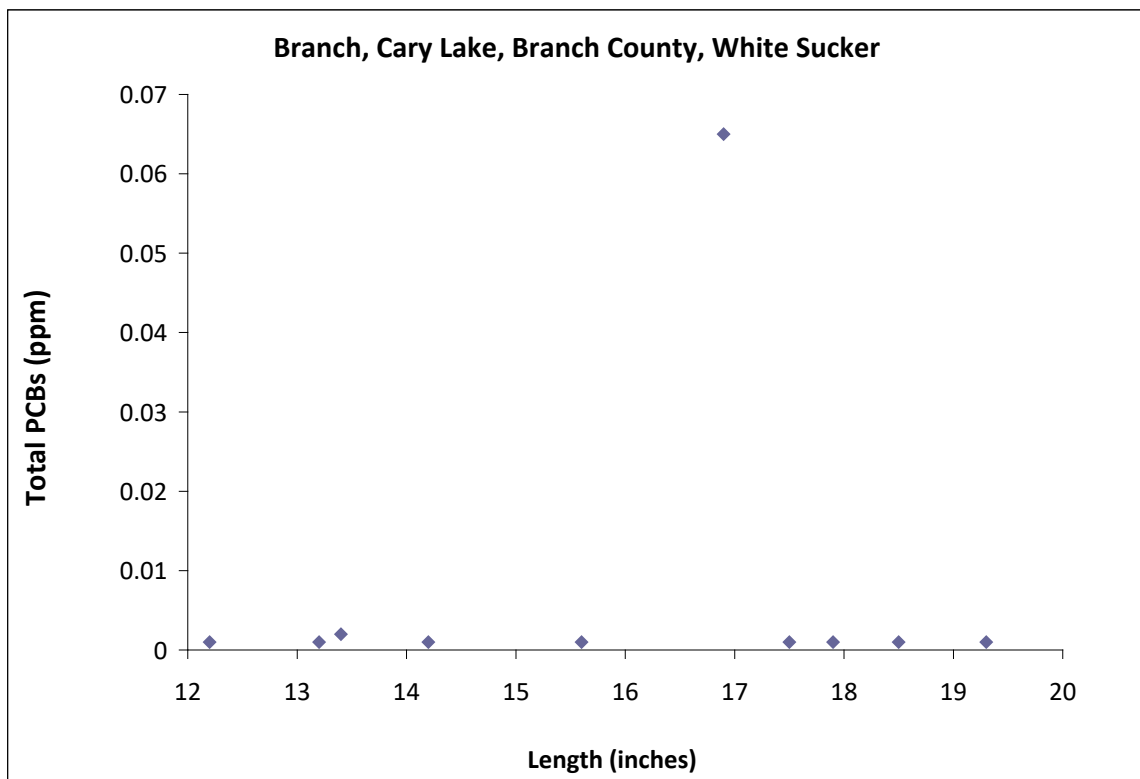
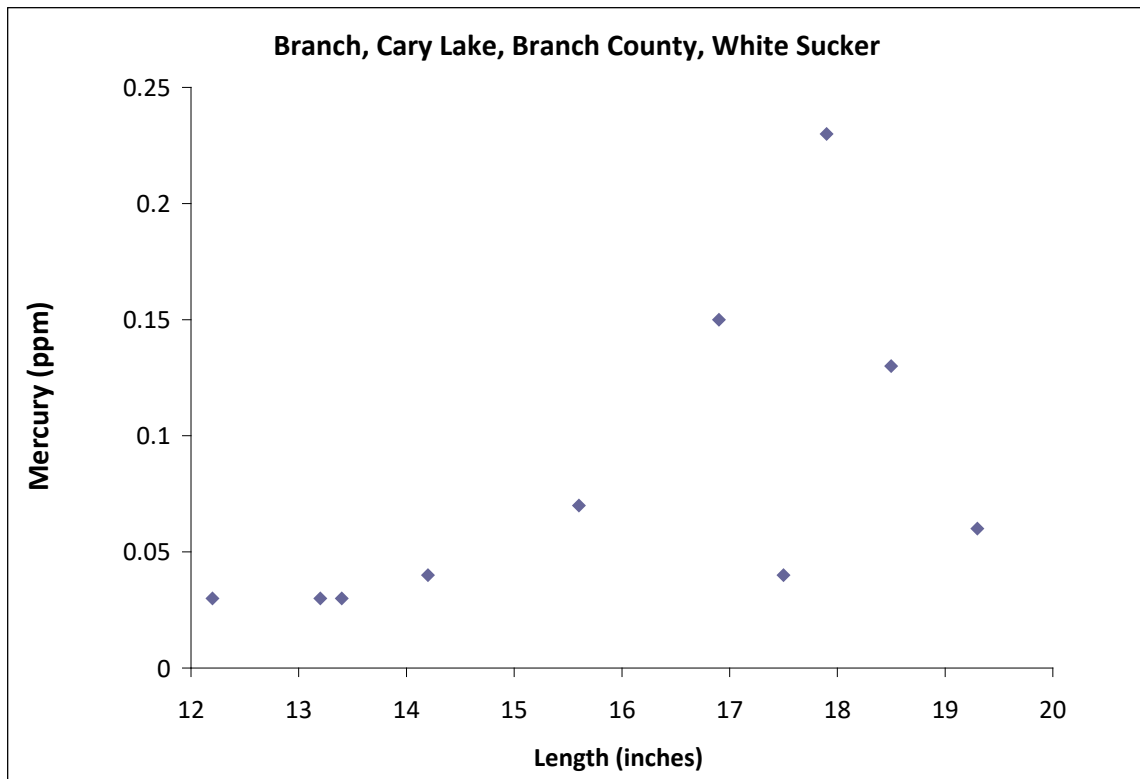
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2001	2001	10	12.2	na	12.2	19.3
Datasets available: 2001						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
Mercury	10	0.081		0.03	0.23	0.130
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
Mercury	0.339	0.493				8

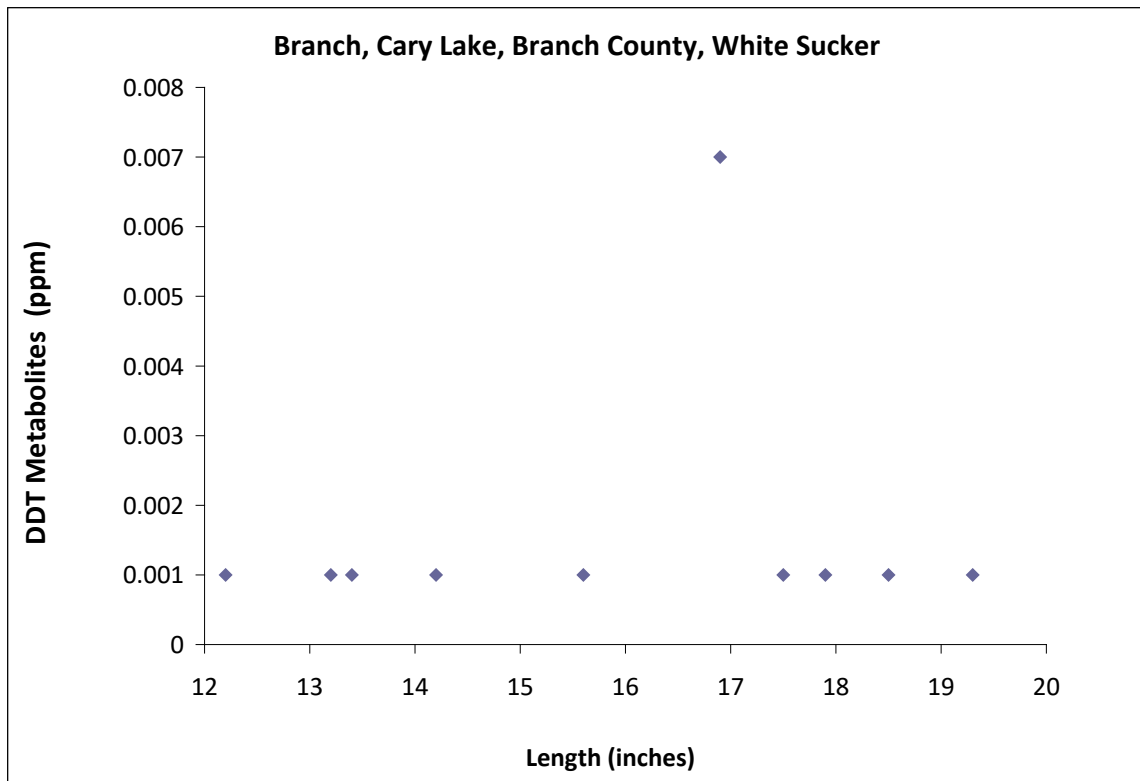
Organics Analysis:

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	12.2	na	12.2	19.3
Datasets available: 2001						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
PCB	10	0.008		0.001	0.065	0.020
DDT	10	0.002		0.001	0.007	0.003
Chlordane	10	ND		--	--	--
Toxaphene	10	ND		--	--	--
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
PCB	0.020	0.008				
DDT	0.021	0.021				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						8

Existing Advisory: There are no current consumption advisories for Cary Lake white sucker.

Recommendation: No one should eat more than 8 meals per month of Cary Lake white sucker due to mercury. PCBs would cause an advisory.





Bluegill**Coldwater Lake****Branch County****Hg Analysis:**

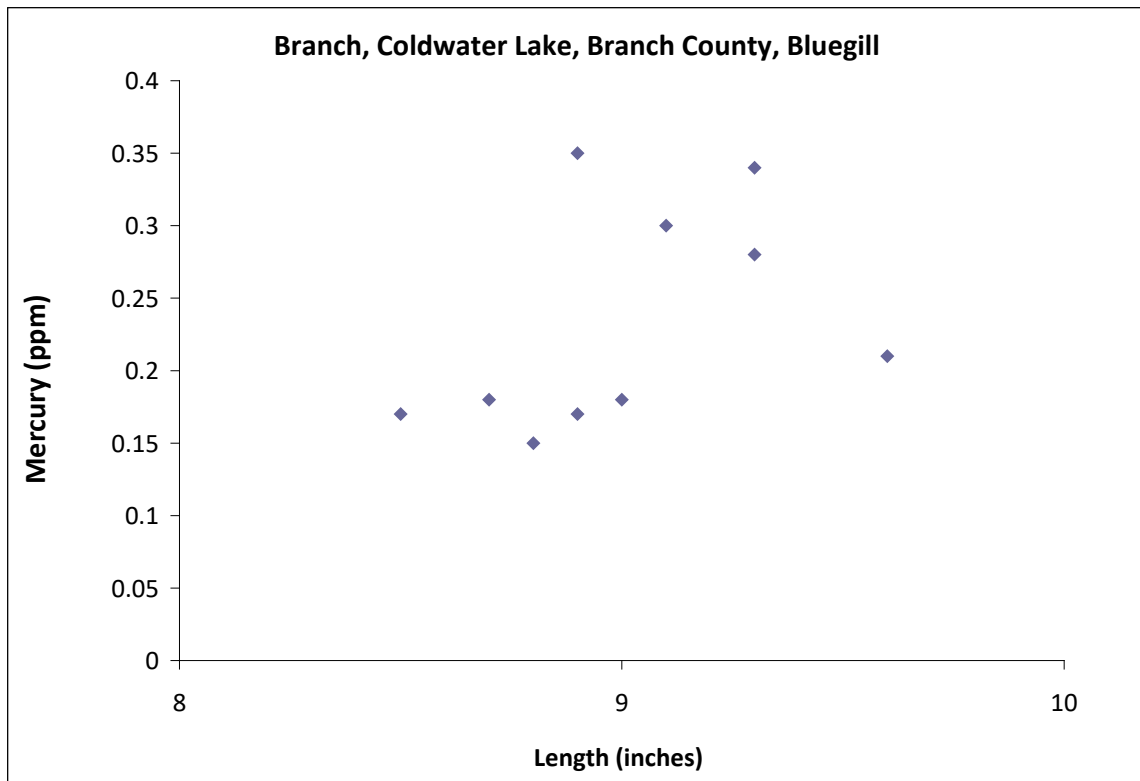
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1994	1994	10	8.5	na	8.5	9.6	
Datasets available: 1994							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.233		0.15	0.35	0.290	2
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.190	0.232					

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	0	NA		--	--	--	--
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:							2

Existing Advisory: There are no current consumption advisories for Coldwater Lake bluegill.

Recommendation: No one should eat more than 2 meals per month of Coldwater Lake bluegill and other sunfish due to mercury.



Largemouth Bass

Coldwater Lake

Branch 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	1994	30	10.6	14	13.5	13.6	
Datasets available: 1988, 1993, 1994							
Chemical	Sample Size (All)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	30^	0.41		0.23	0.65	0.45	2
Chemical	Linear Regression	Exponential Regression					
	R²	R²					
Mercury	0.038	0.062					

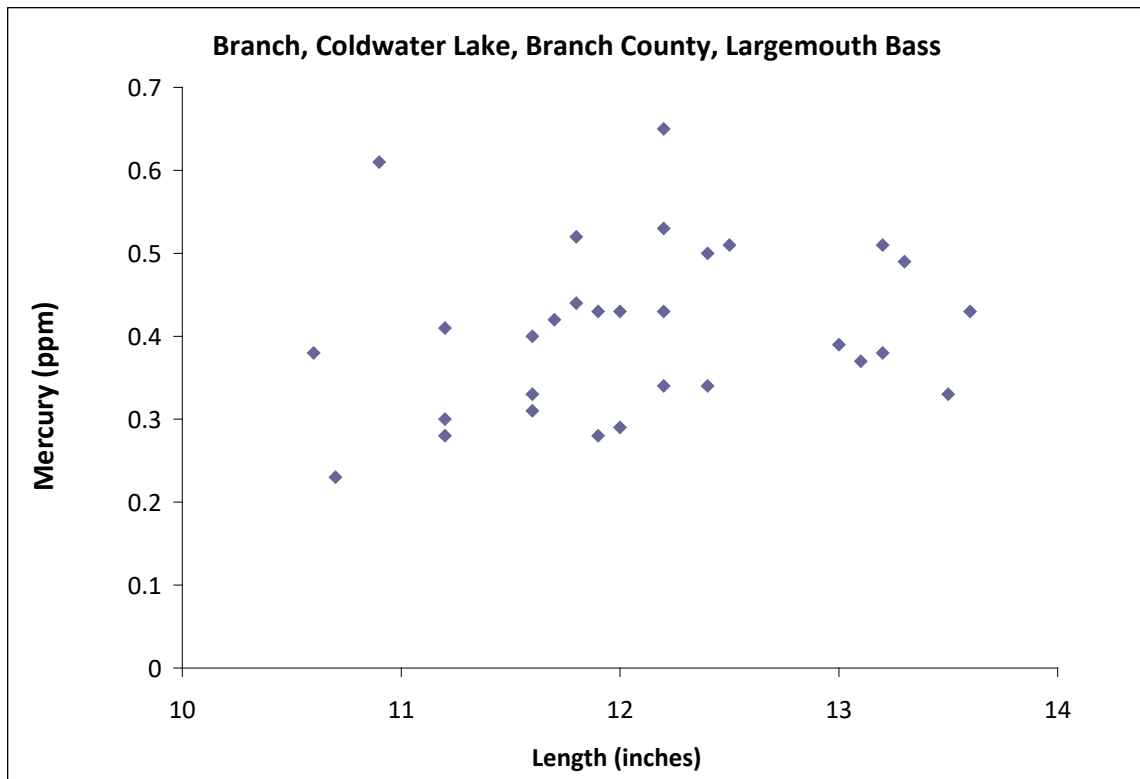
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
		na					
Datasets available:							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	NA		--	--	--	--
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:							2

^Sublegal samples included.

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

Recommendation: No one eat more than 2 meals per month of largemouth bass under 18 inches or more than 1 meal per month of those fish larger than 18 inches. The dataset is limited due to the large number of sublegal samples.



Northern Pike

Coldwater Lake

Branch 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	2014	42	15.9	24	23.6	31.9	
Datasets available: 1988, 1993, 1994, 2006, 2014							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	23	0.74		0.24	1.6	0.87	1
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
	Mercury	0.505	0.474				
Mercury	0.703	0.637		legal size only			

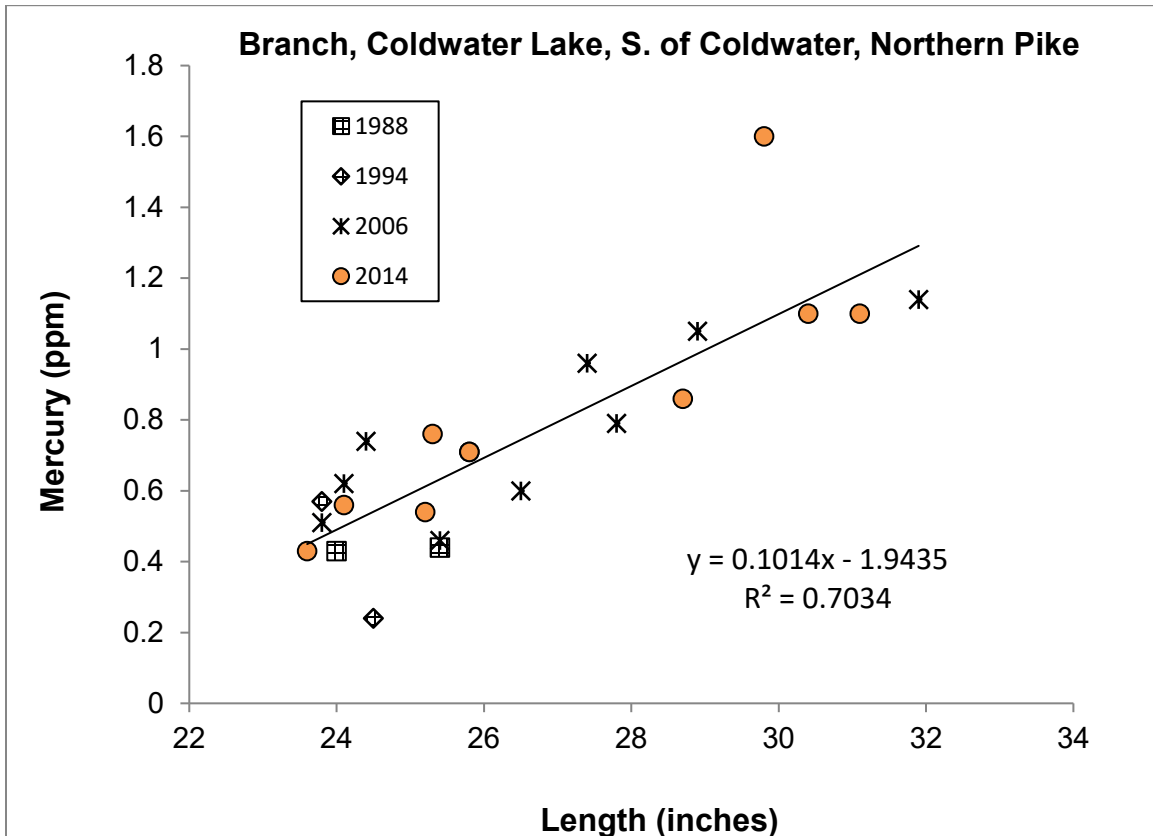
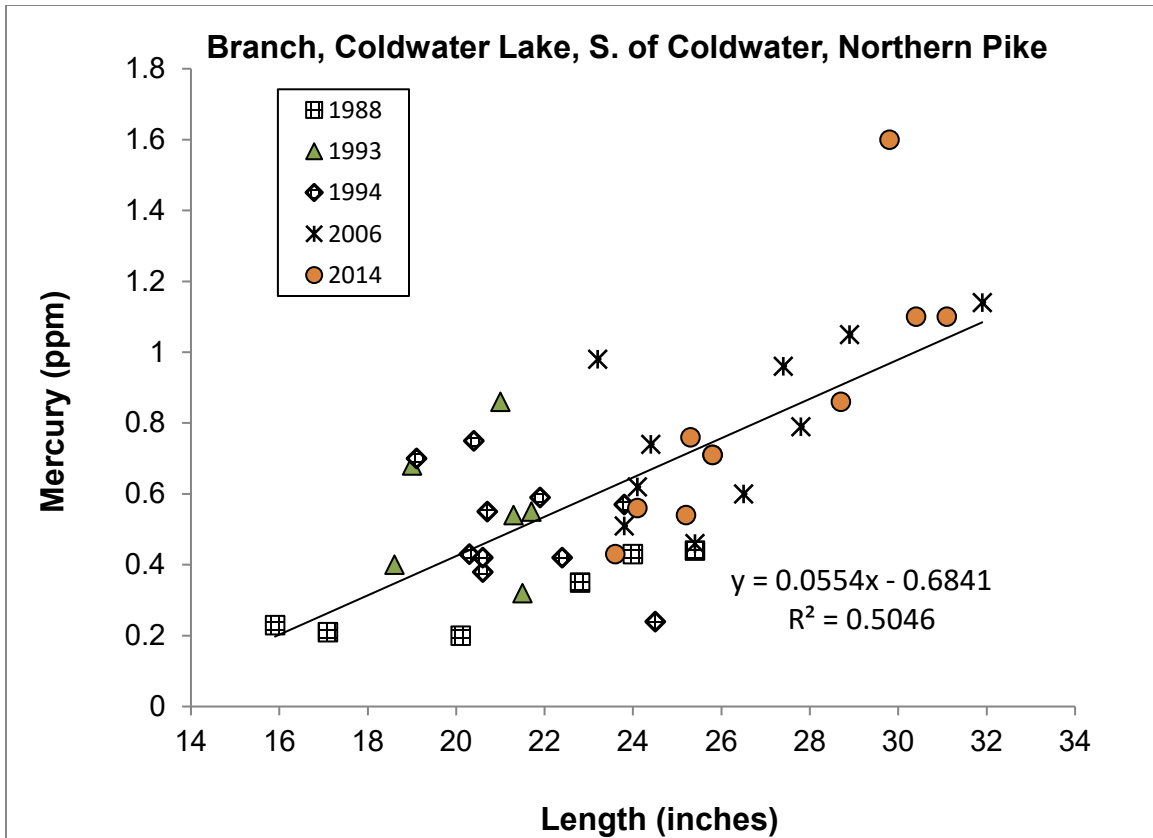
Organics Analysis:

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		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	NA		--	--	--	--
DDT	0	NA		--	--	--	--
Chlordane	0	NA		--	--	--	--
Toxaphene	0	NA		--	--	--	--
TEQ	0	NA		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
TEQ	--	--					
Final meal category based on UCL:							

Existing Advisory: No one should eat more than 1 meal per month of Coldwater Lake northern pike less than 30 inches or more than 6 meals per year of those fish larger than 30 inches due to mercury.

Recommendation: No change is recommended.

Length (Inches)	Hg Regression Equation* Estimate (ppm)	Meal Category
24	0.49	2
26	0.69	1
28	0.9	1
30	1.1	1
32	1.3	0.5
34	1.5	0.5
36	1.71	0.5
* - based on fish of legal size only		
Shaded area denotes extrapolated estimates		



Rock Bass

Coldwater Lake

Branch County

Hg Analysis:

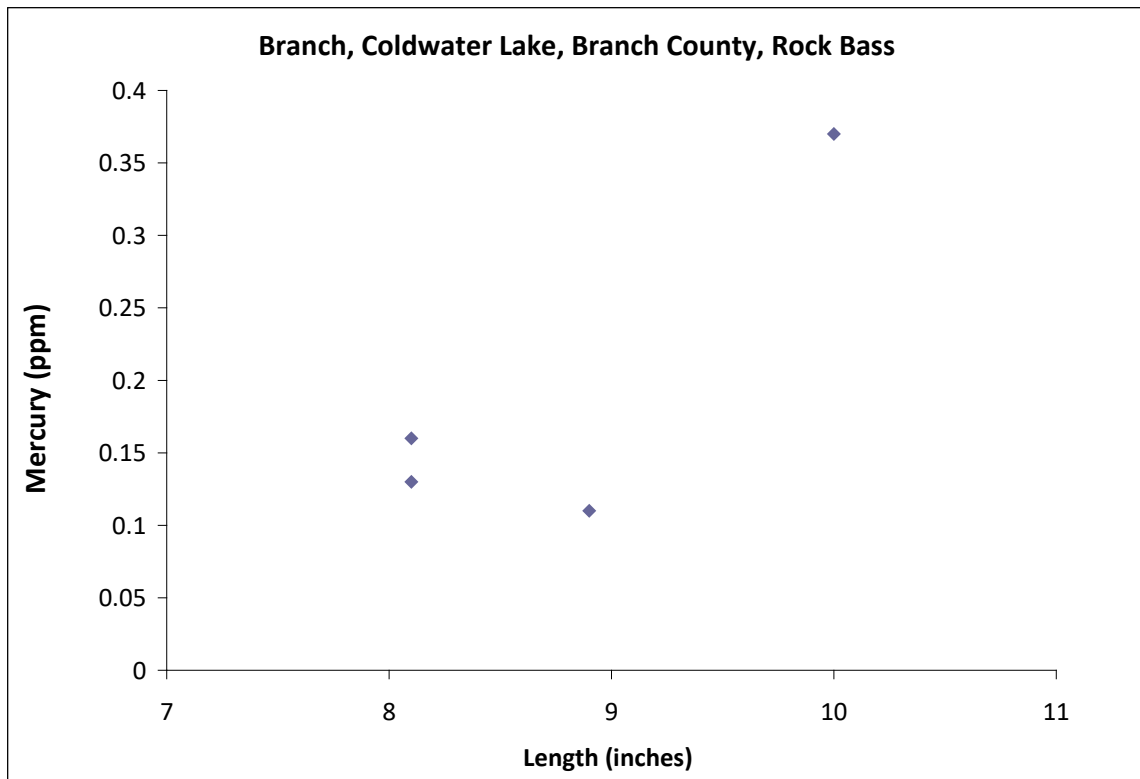
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1988	1988	4	8.1	na	8.1	10	
Datasets available: 1988							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	4	0.193		0.11	0.37	--	--
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	
--	--	0	--	--	--	--	
Datasets available:							
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	--		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					--

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

Recommendation: There are insufficient data available to develop specific advice for Coldwater Lake rock bass. The statewide consumption guidelines recommend that no one should eat more than 4 meals per month of rock bass from inland waters.



Northern Pike

East Long Lake

Branch 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	22.4	24	24.8	31.3	
Datasets available: 2011							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	8	0.79		0.37	1.20	1.00	1
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.271	0.267					

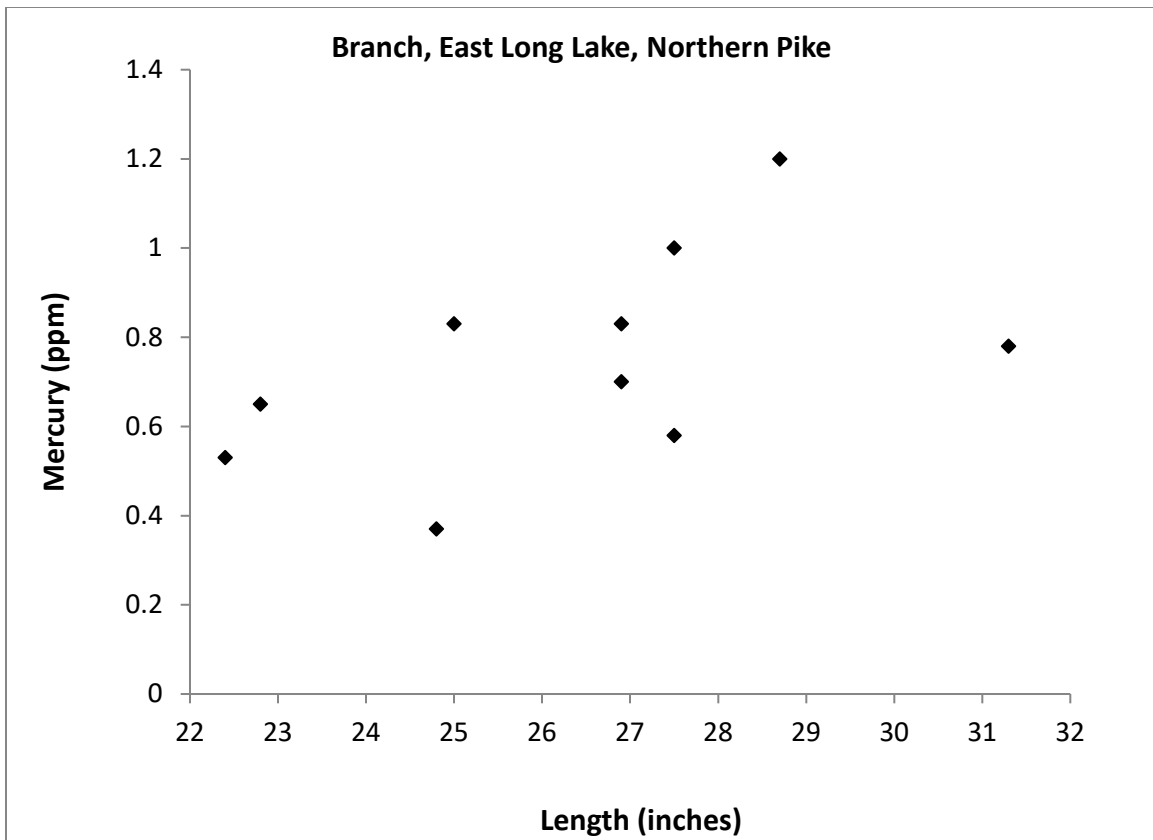
Organics Analysis:

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	0	--		--	--	--	--
DDT	0	--		--	--	--	--
Chlordane	0	--		--	--	--	--
Toxaphene	0	--		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					1

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

Recommendation: No one should eat more than 1 meal per month of East Long Lake northern pike smaller than 30 inches or more than 6 meals per year of those fish larger than 30 inches due to mercury. The statewide length break was applied as the size range of fish was limited.



Northern Pike

Lake Lavine

Branch County

Hg Analysis:

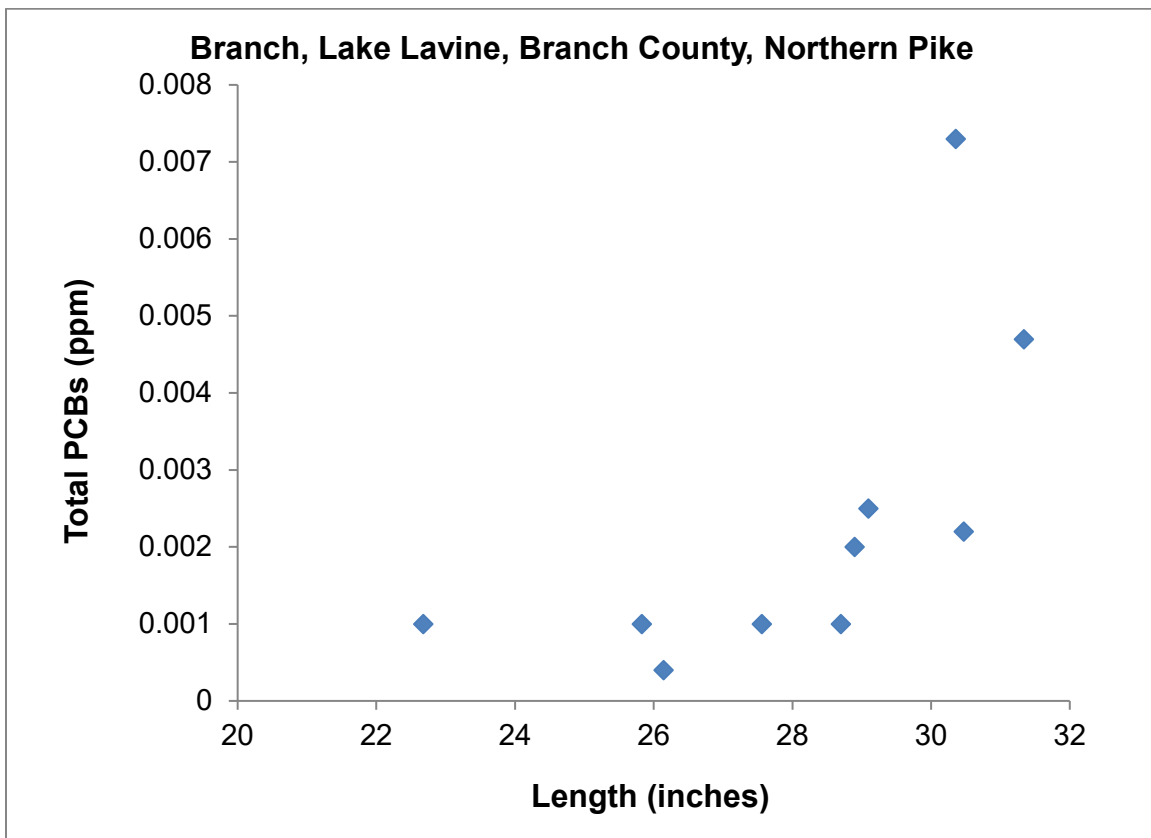
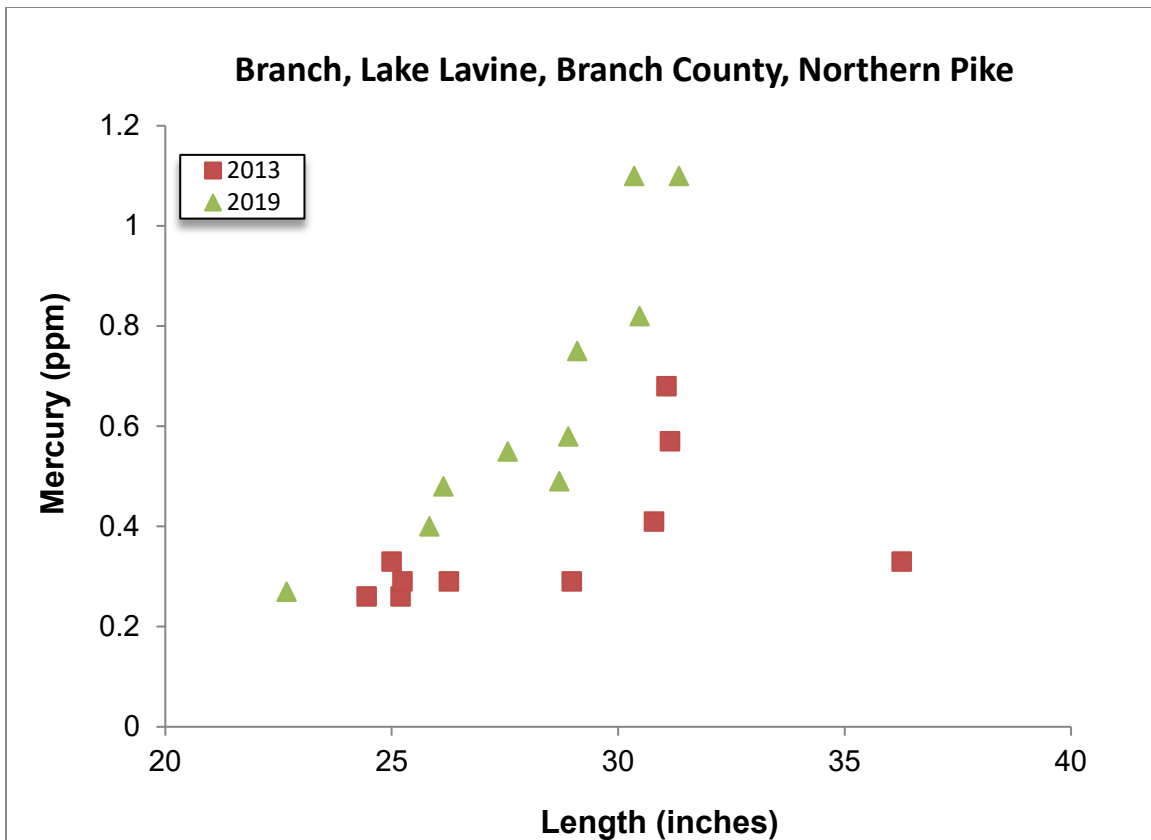
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2013	2019	20	22.7	24.0	24.4	36.3	
Datasets available: 2013, 2019							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	19	0.525		0.260	1.100	0.652	1
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.201	0.228					

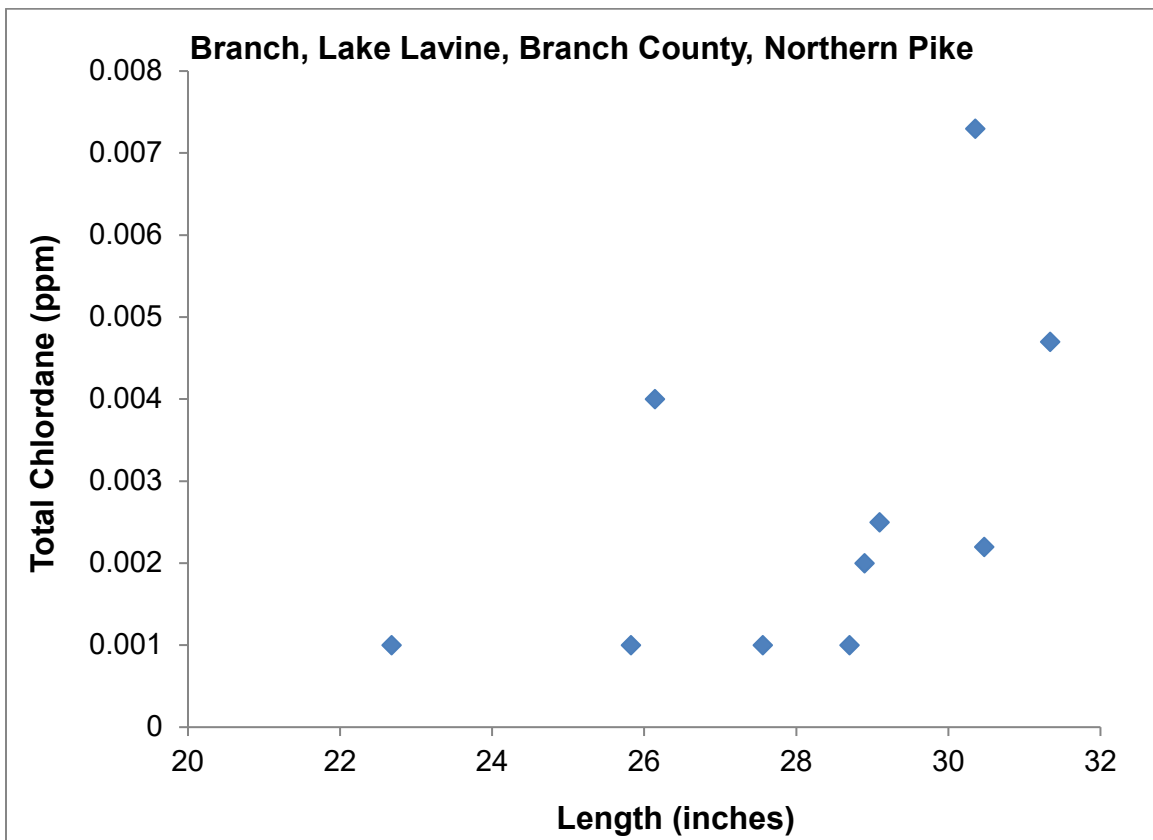
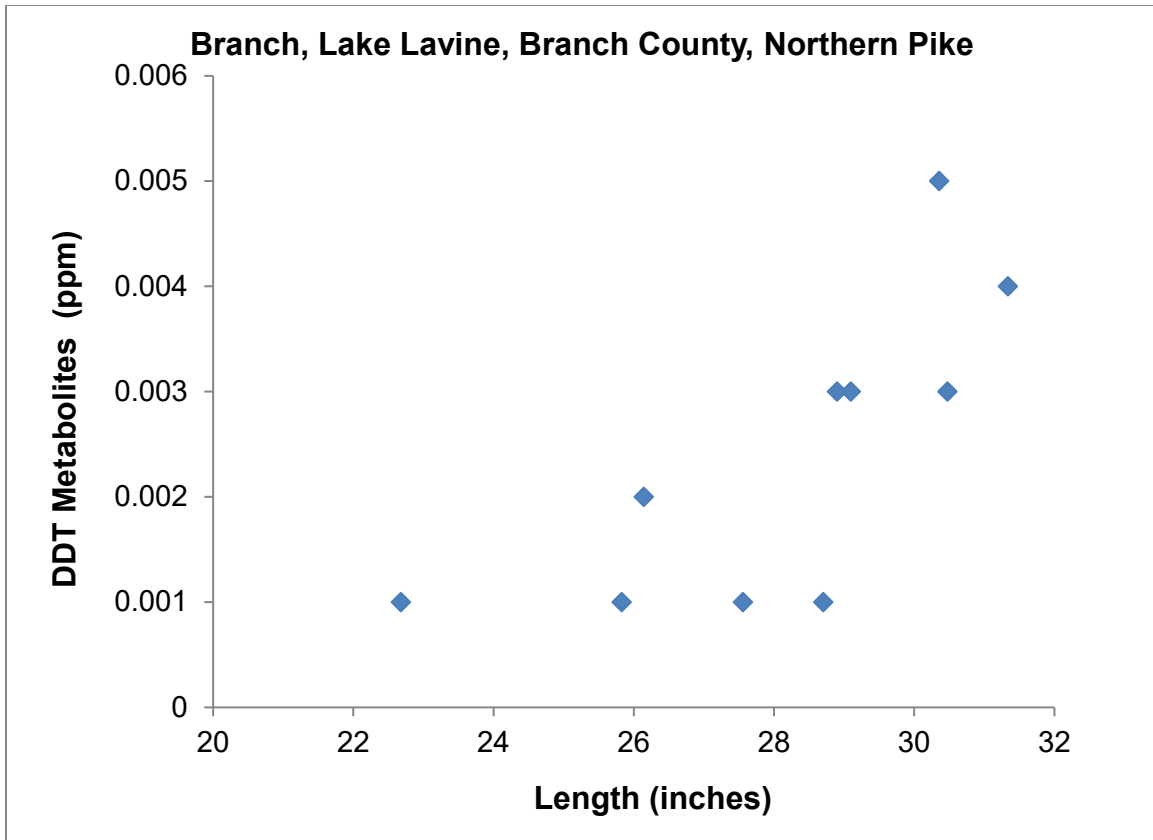
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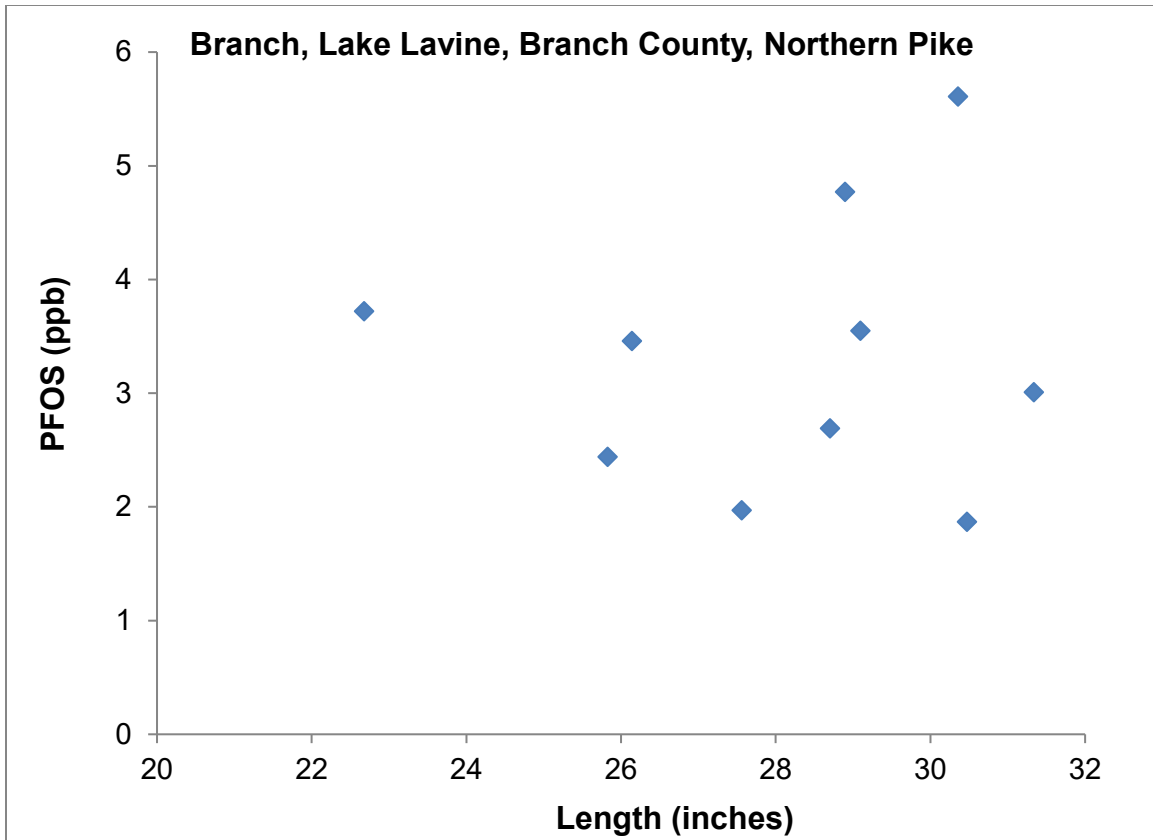
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2019	2019	10	22.7	24.0	25.8	31.3	
Datasets available: 2019							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	9	0.002		<0.001	0.007	0.004	16
DDT	9	0.003		<0.001	0.005	0.004	16
Chlordane	9	0.003		<0.001	0.007	0.004	16
Toxaphene	9	ND		--	--	--	--
PFOS	9	3.3 ppb		1.9 ppb	5.6 ppb	4.2 ppb	16
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.411	0.520					
DDT	0.550	0.552					
Chlordane	0.265	0.337					
Toxaphene	--	--					
PFOS	0.005	0.000					
Final meal category based on UCL:							1

Existing MDHHS Advisory: No one should eat more than 2 meals per month of Lake Lavine northern pike smaller than 30 inches or more than 1 meal per month of northern pike larger than 30 inches.

Recommendation: No one should eat more than 1 meal per month of northern pike of any size from Lake Lavine in Branch County due to mercury.







Black Crappie

Randall Lake Chain Morrison, Randall, and Craig

Branch 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	5	10.1	na	10.1	11.3	
Datasets available: 1990							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	5	0.404		0.22	0.51	0.560	1
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.910	0.853					

Organics Analysis:

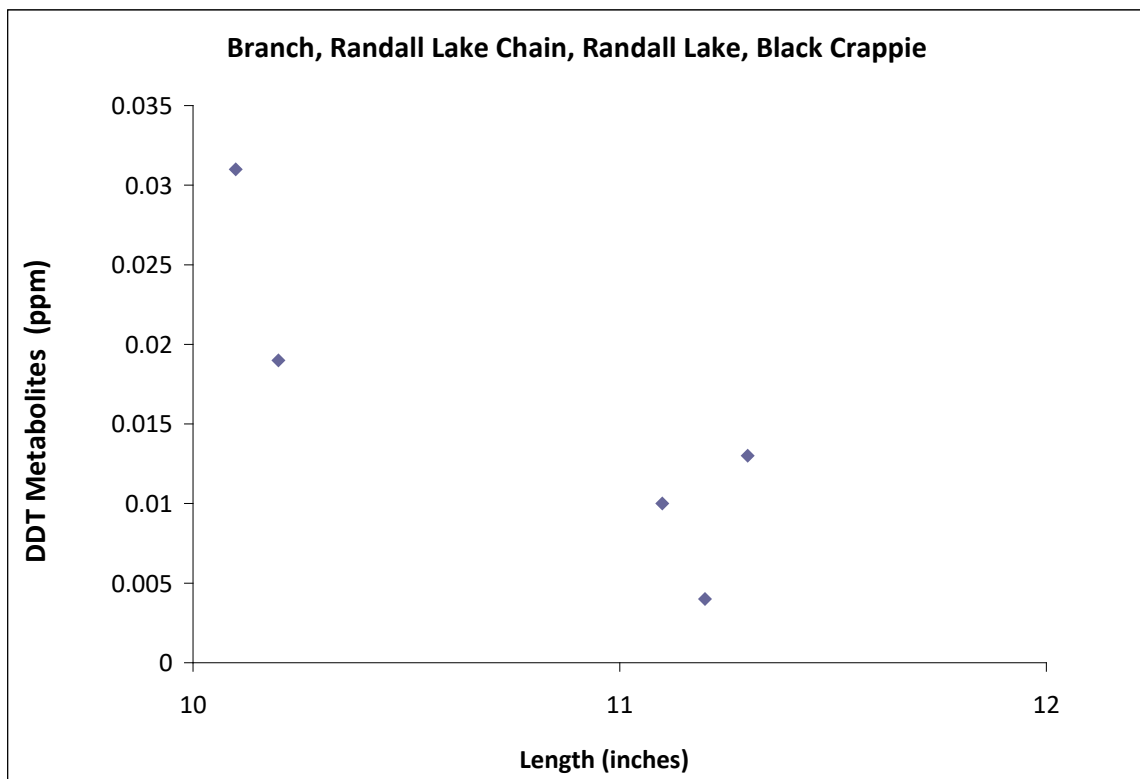
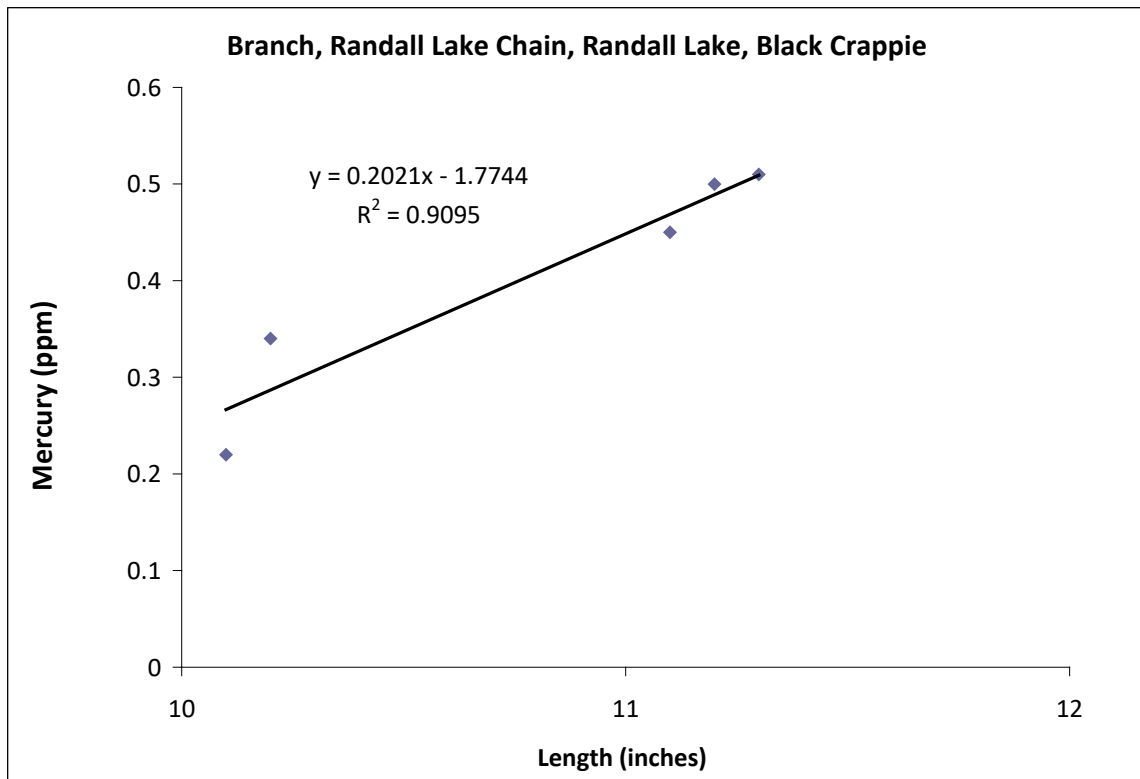
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1990	1990	5	10.1	na	10.1	11.3	
Datasets available: 1990							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	5	ND		--	--	--	--
DDT	5	0.015		0.004	0.031	0.030	16
Chlordane	5	ND		--	--	--	--
Toxaphene	5	ND		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	0.737	0.610					
Chlordane	--	--					
Toxaphene	--	--					
Final meal category based on UCL:							1

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

Recommendation: No one should eat more than 2 meals per month of Randall Lake Chain black or white crappie smaller than 10 inches or more than 1 meal per month of those fish larger than 10 inches due to mercury. Sample size is limited below 10 inches, length range is limited making the regression not useful for predicting concentrations. The UCL is used to set the guideline for fish longer than 10 inches, and a more relaxed guideline is set for smaller sizes.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
6	0	16
7	0	16
8	0	16
9	0.045	16
10	0.247	4
11	0.449	2
12	0.651	1
13	0.853	1
14	1.055	1
Shaded area denotes extrapolated estimates		



Largemouth Bass**Randall Lake Chain
Morrison, Randall, and Craig****Branch County****Hg Analysis:**

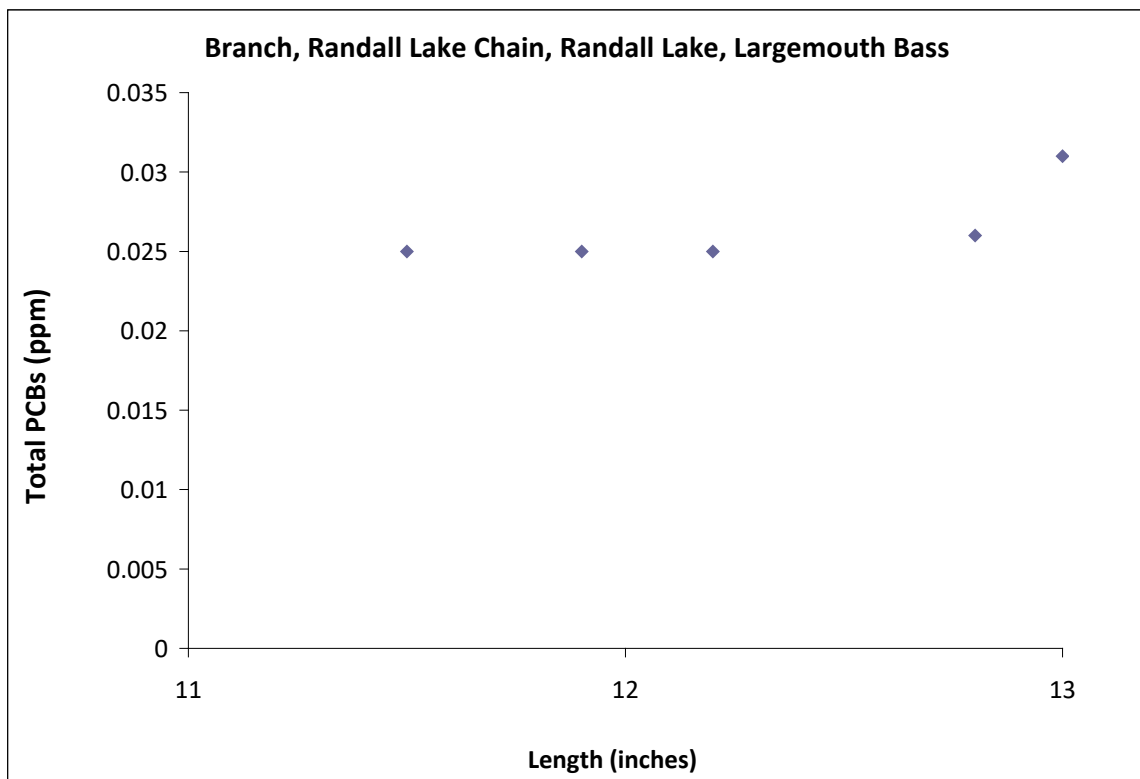
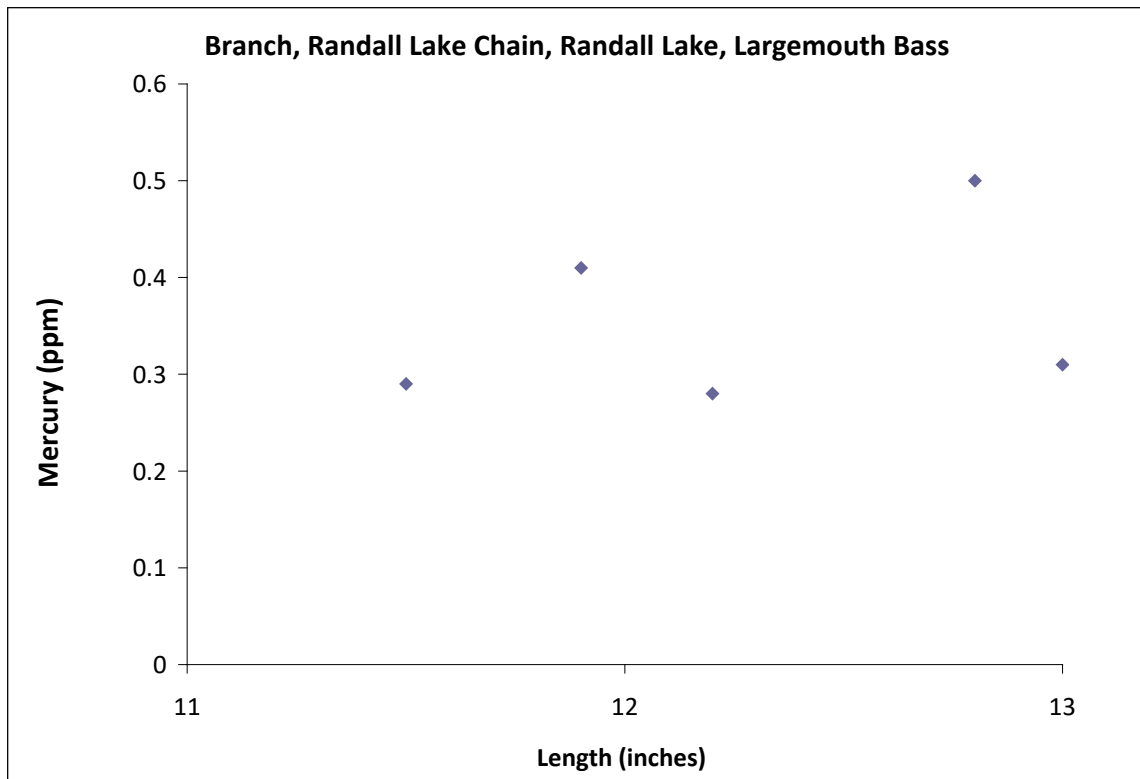
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1990	1990	5	11.5	14	11.5	13	
Datasets available: 1990							
Chemical	Sample Size (All)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	5	0.358		0.28	0.50	0.480	2
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.112	0.105					

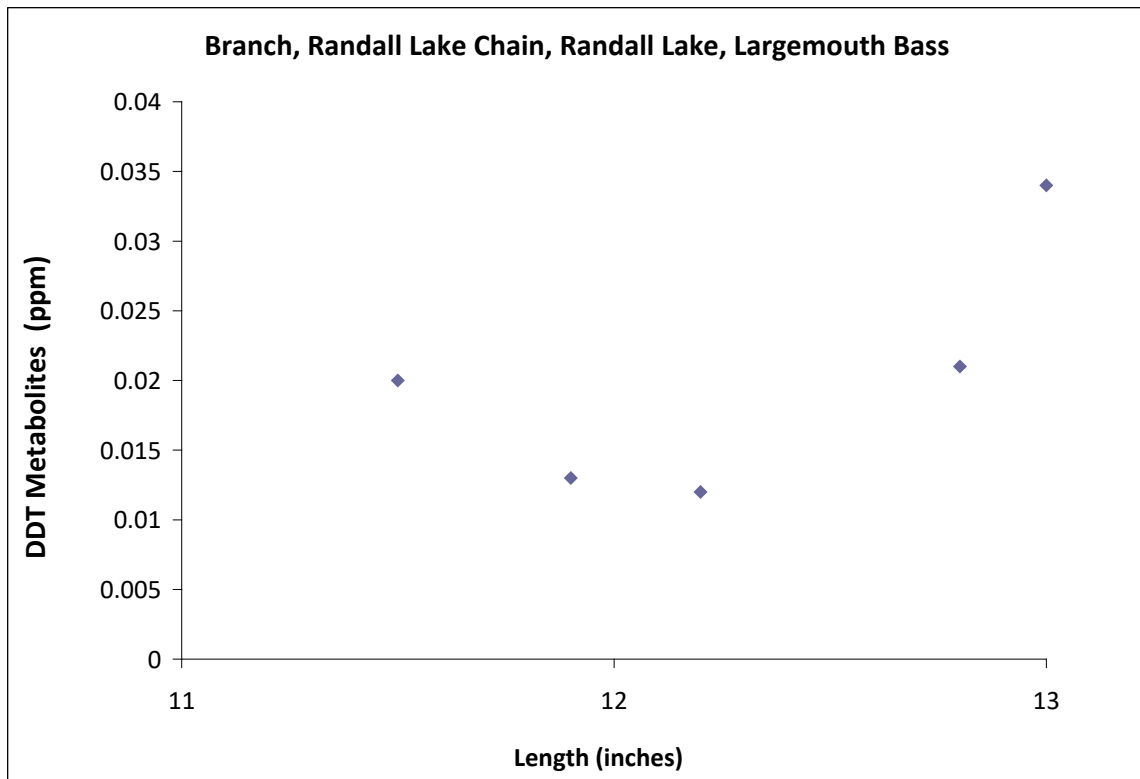
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1990	1990	5	11.5	14	11.5	13	
Datasets available: 1990							
Chemical	Sample Size (All)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	5	0.026		0.025	0.031	0.030	8
DDT	5	0.020		0.012	0.034	0.030	16
Chlordane	5	ND		--	--	--	--
Toxaphene	5	ND		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.556	0.569					
DDT	0.403	0.344					
Chlordane	--	--					
Toxaphene	--	--					
Final meal category based on UCL:							2

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

Recommendation: No one should eat more than 2 meals per month of Randall Lake Chain largemouth or smallmouth bass under 18 inches or 1 meal per month larger than 18 inches due to mercury. The statewide length break was used as the size range of the fish was limited.





Northern Pike

Randall Lake Chain Morrison, Randall, and Craig

Branch 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	2007	18	20.8	24	24.7	34.8	
Datasets available: 1990, 2007							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	12	0.599		0.370	0.967	0.720	1
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.138	0.175					

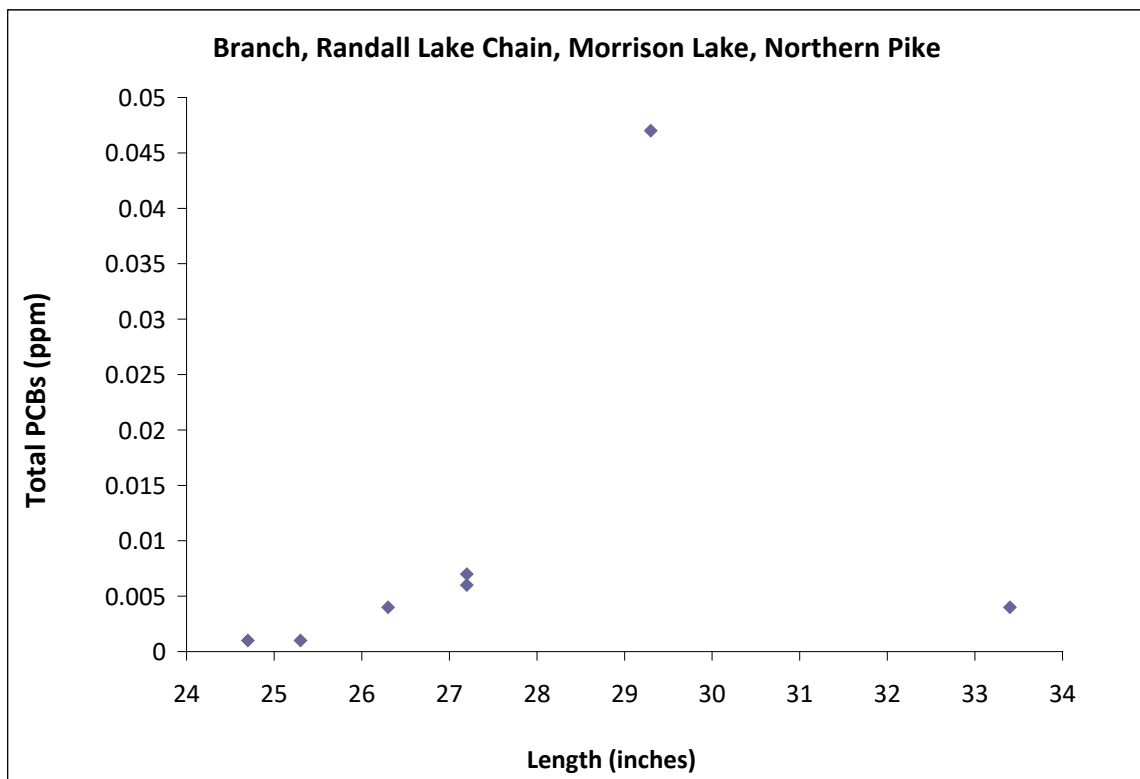
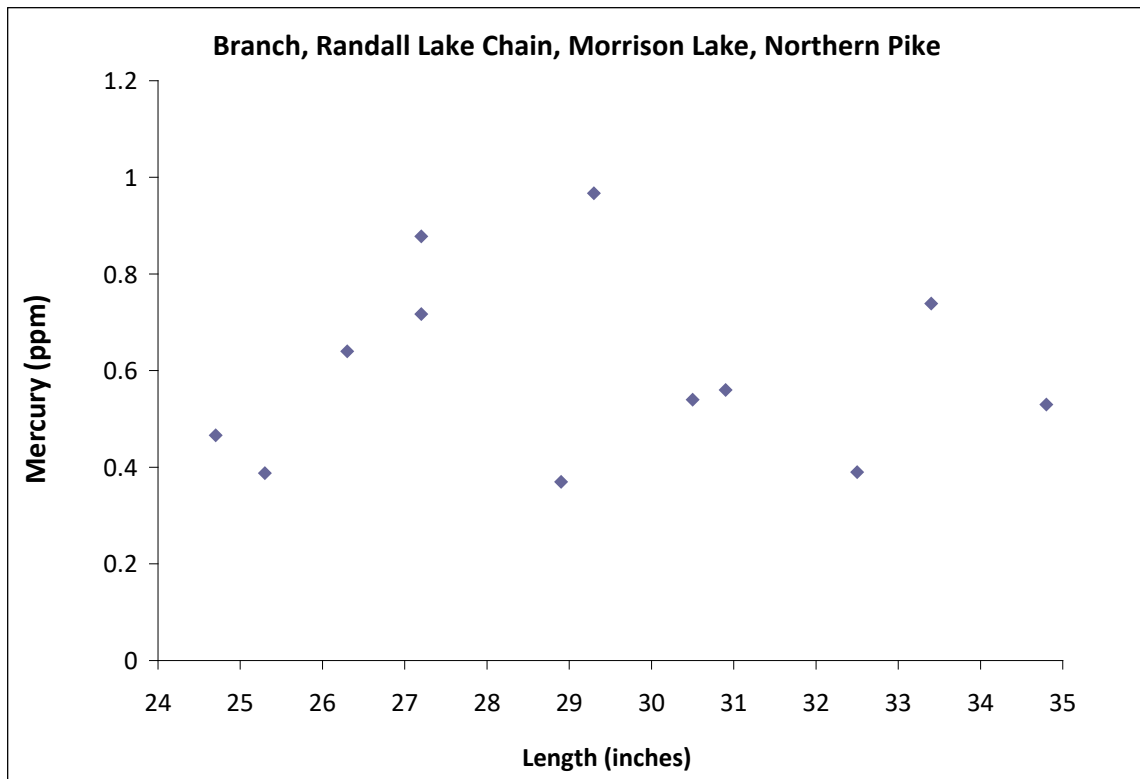
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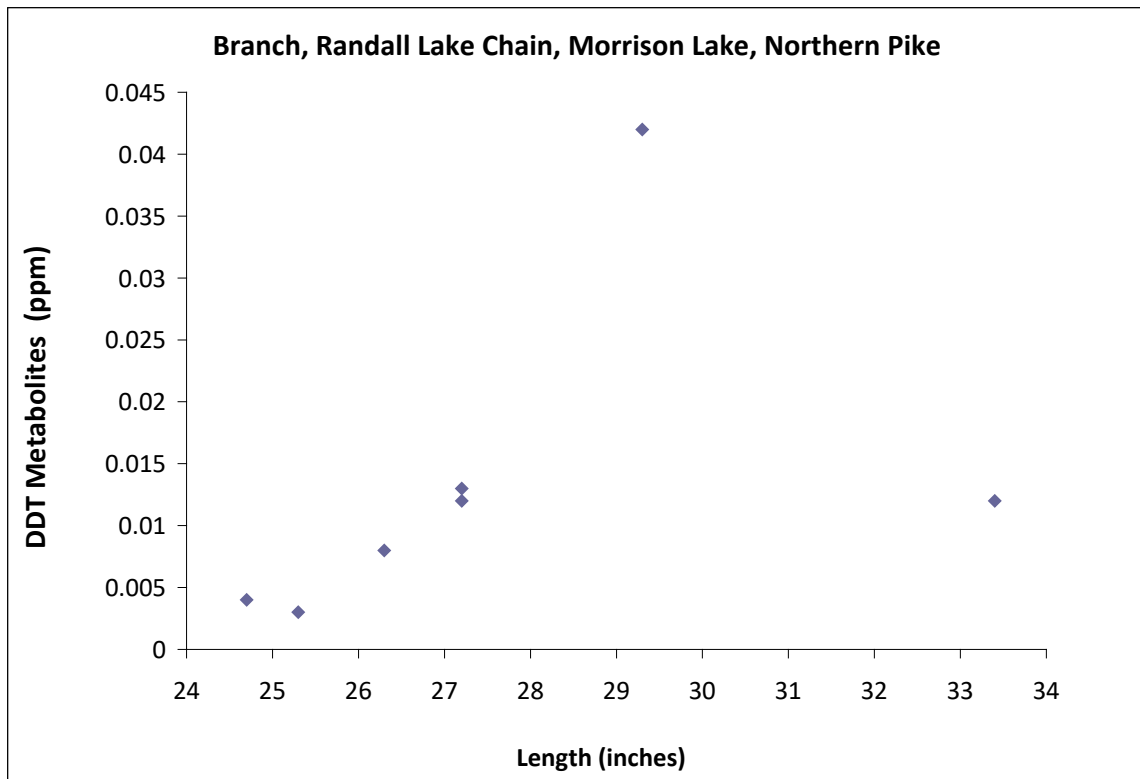
Organics Analysis:

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	20.8	24	24.7	33.4	
Datasets available: 1990, 2007							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	7	0.010		0.001	0.047	0.030	8
DDT	7	0.013		0.003	0.042	0.030	16
Chlordane	7	ND		--	--	--	--
Toxaphene	7	ND		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.123	0.163					
DDT	0.173	0.217					
Chlordane	--	--					
Toxaphene	--	--					
Final meal category based on UCL:							1

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

Recommendation: No one should eat more than 1 meal per month of Randall Lake Chain northern pike due to mercury. PCBs would cause an advisory.





Calhoun County

Carp**Battle Creek River
Battle Creek****Calhoun County****Hg Analysis:**

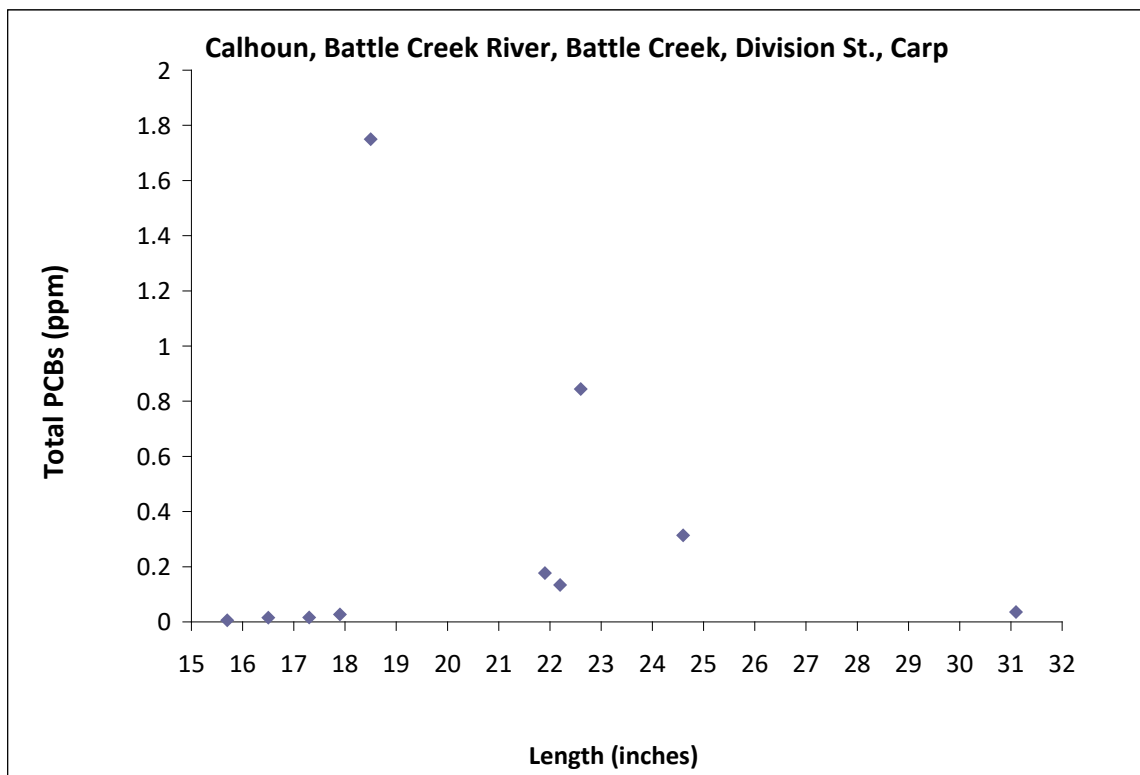
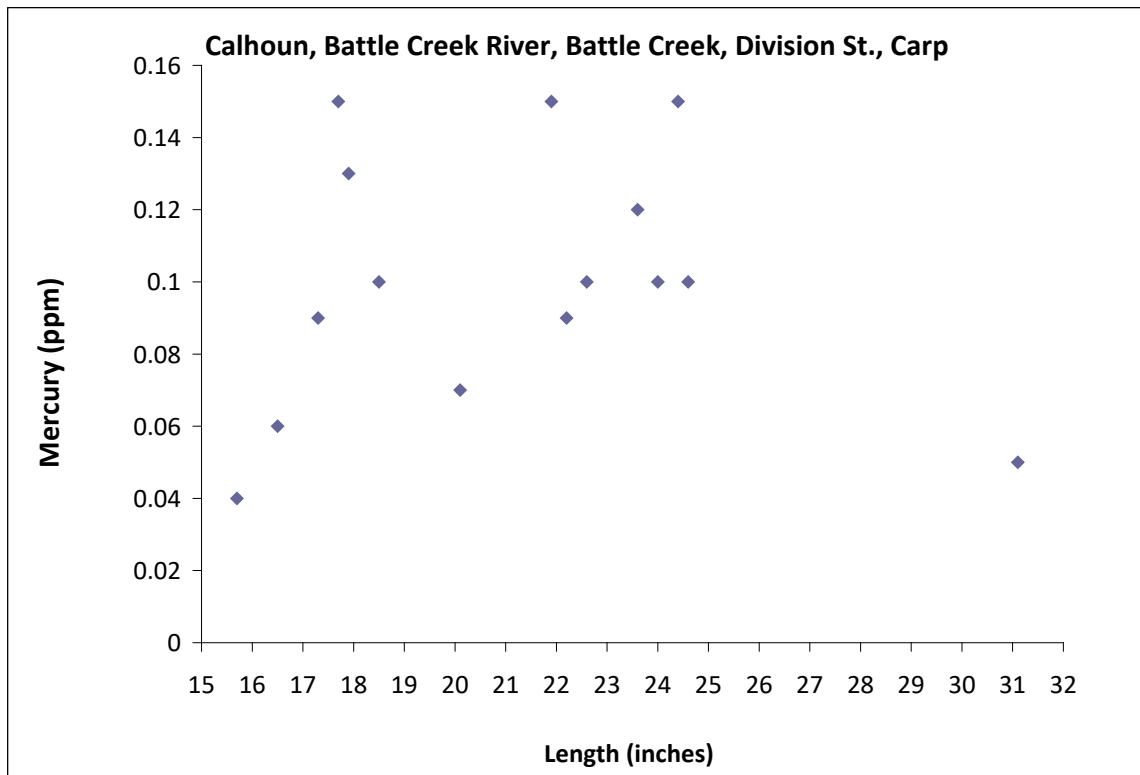
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1991	2004	15	15.7	NA	15.7	31.1
Datasets available: 1991, 2004						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL (ppm)	Meal Category
Mercury	15	0.100			0.120	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.001	0.002				

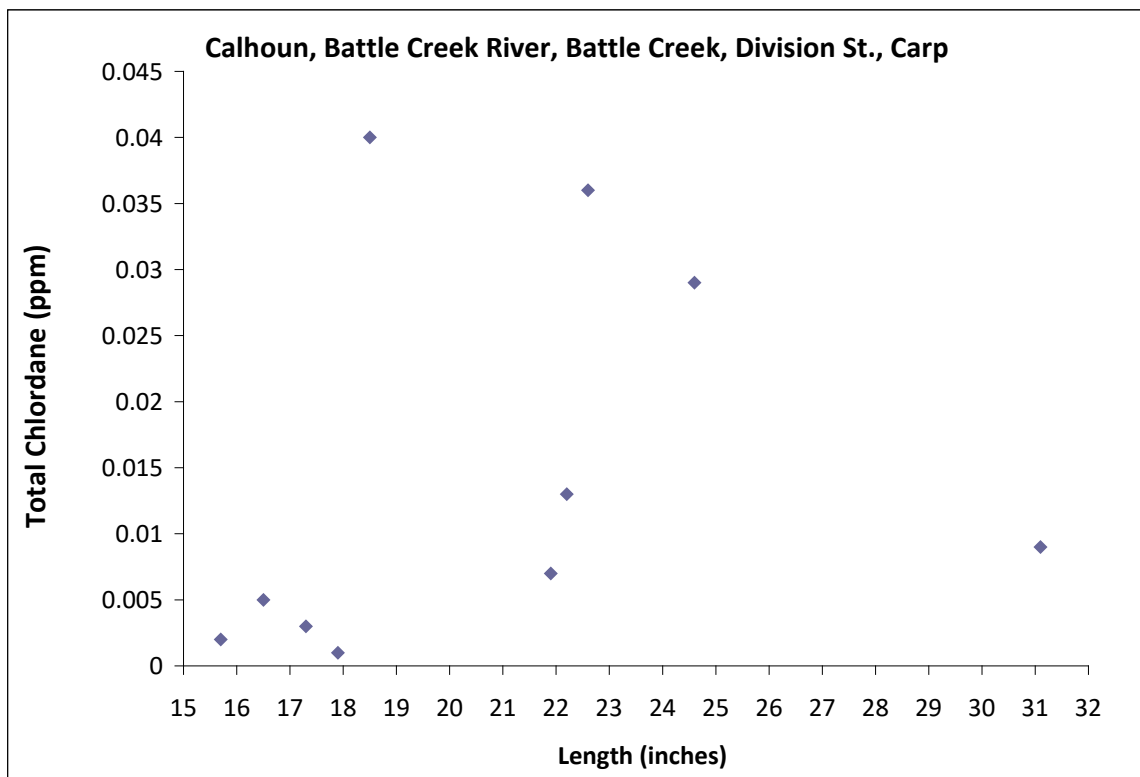
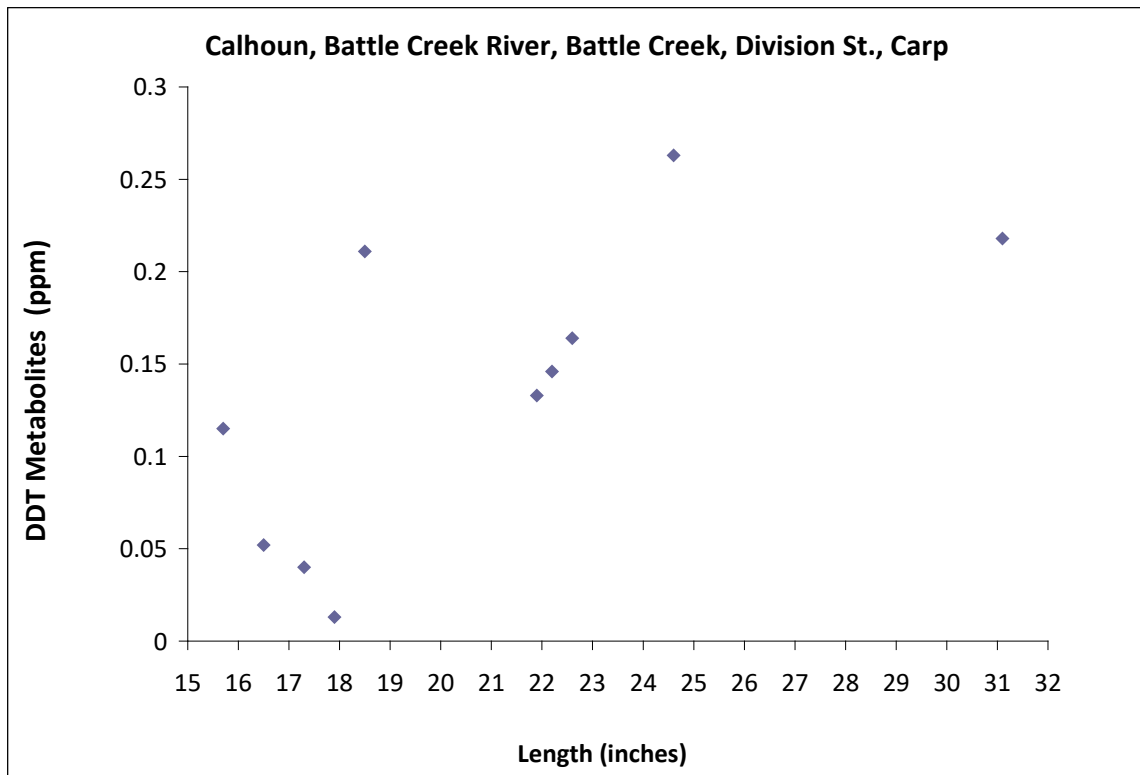
Organics Analysis:

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	15.7	NA	15.7	31.1
Datasets available: 1991, 2004						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL (ppm)	Meal Category
PCB	10	0.332			0.730	Limited
DDT	10	0.136			0.190	8
Chlordane	10	0.015			0.030	--
Toxaphene	10	ND			--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.001	0.099				
DDT	0.468	0.333				
Chlordane	0.059	0.209				
Toxaphene	--	--				
Final meal category based on UCL:						Limited

Existing Advisory: Women and children should not eat more than one meal per week of Battle Creek River carp less than 22 inches in length and no more than one meal per month of Battle Creek River carp greater than 22 inches in length.

Recommendation: Sensitive populations should not eat these fish. Healthy adults should not eat more than 1 or 2 meals per year of Battle Creek River carp due to PCBs. Mercury and DDT would cause advisories.





Smallmouth Bass

Battle Creek River Battle Creek

Calhoun County

Hg Analysis:

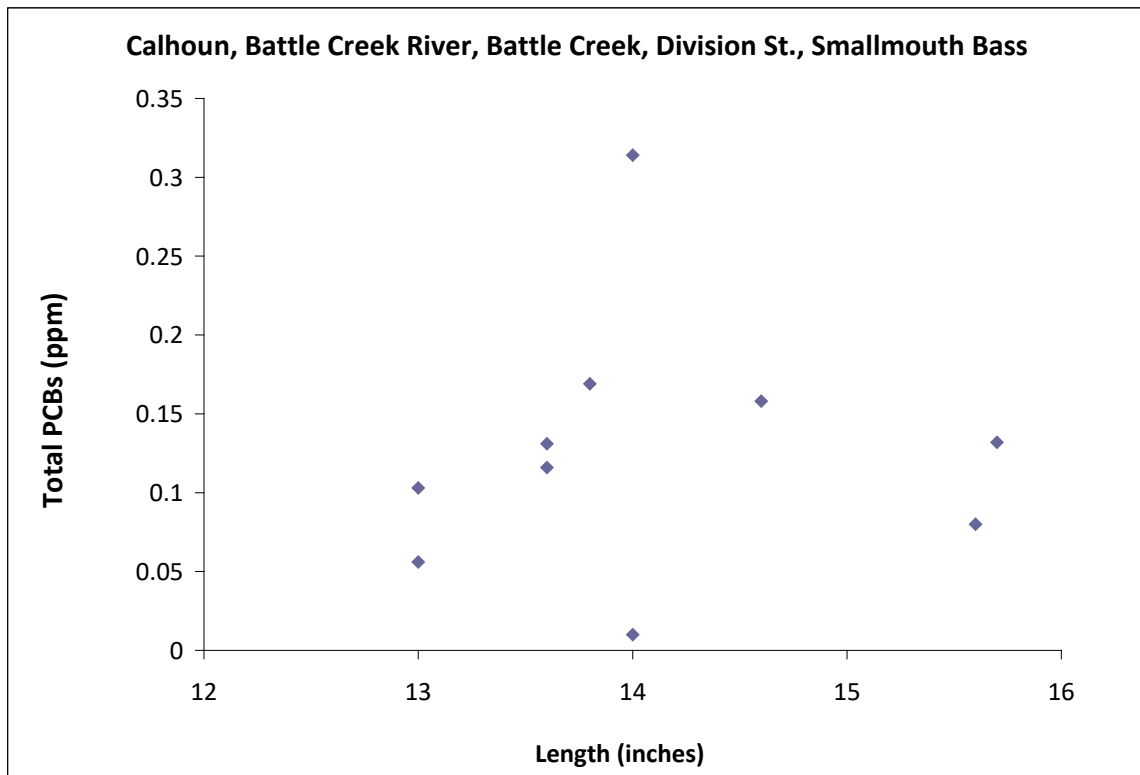
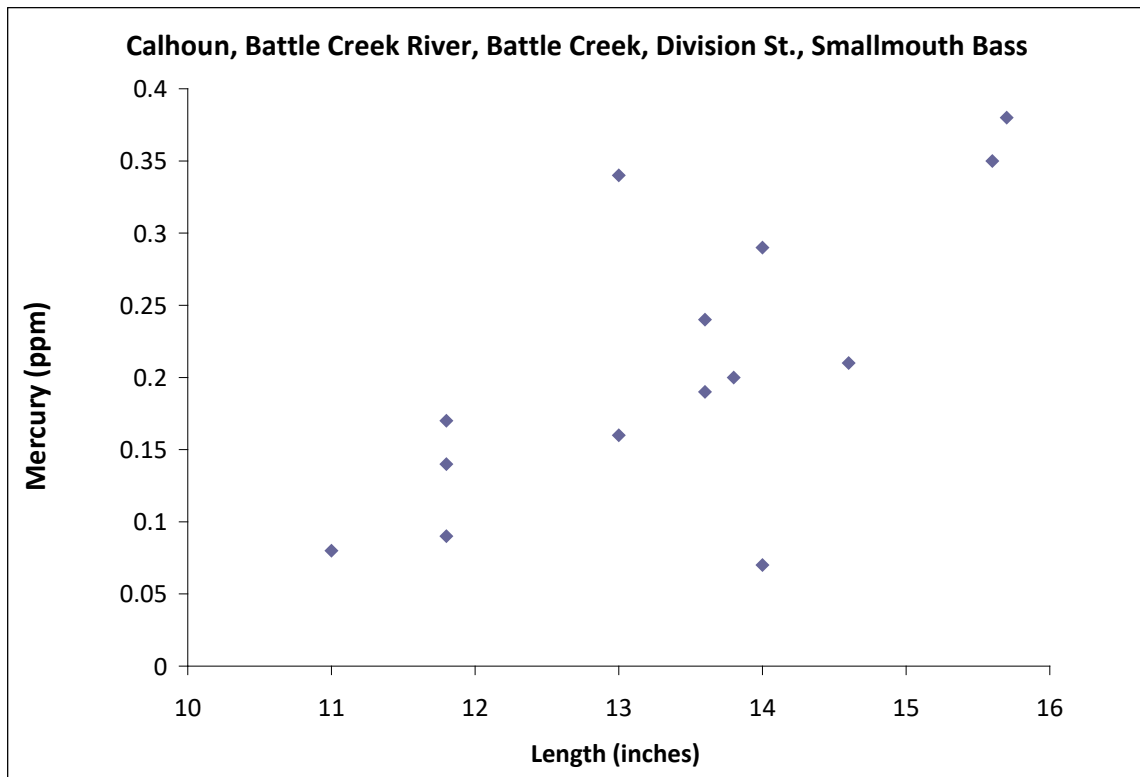
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1991	2004	14	11	14	13.6	15.7
Datasets available: 1991, 2004						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL (ppm)	Meal Category
Mercury	8	0.241			0.320	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.490	0.422				

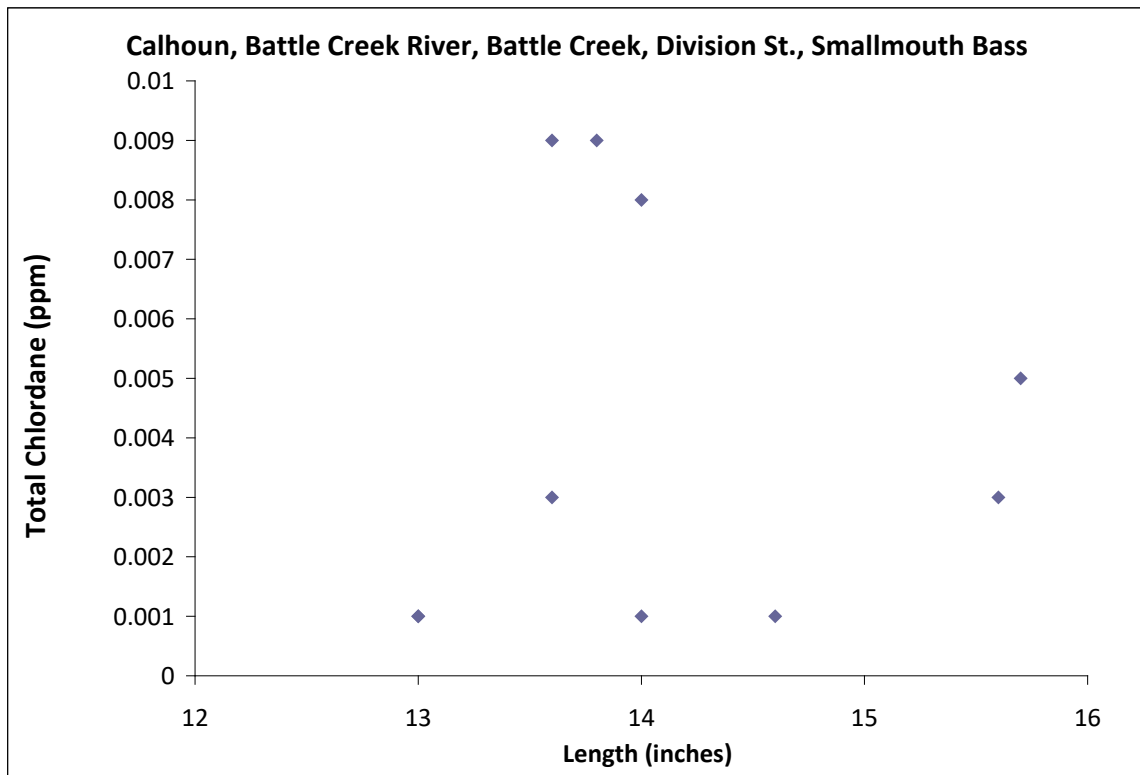
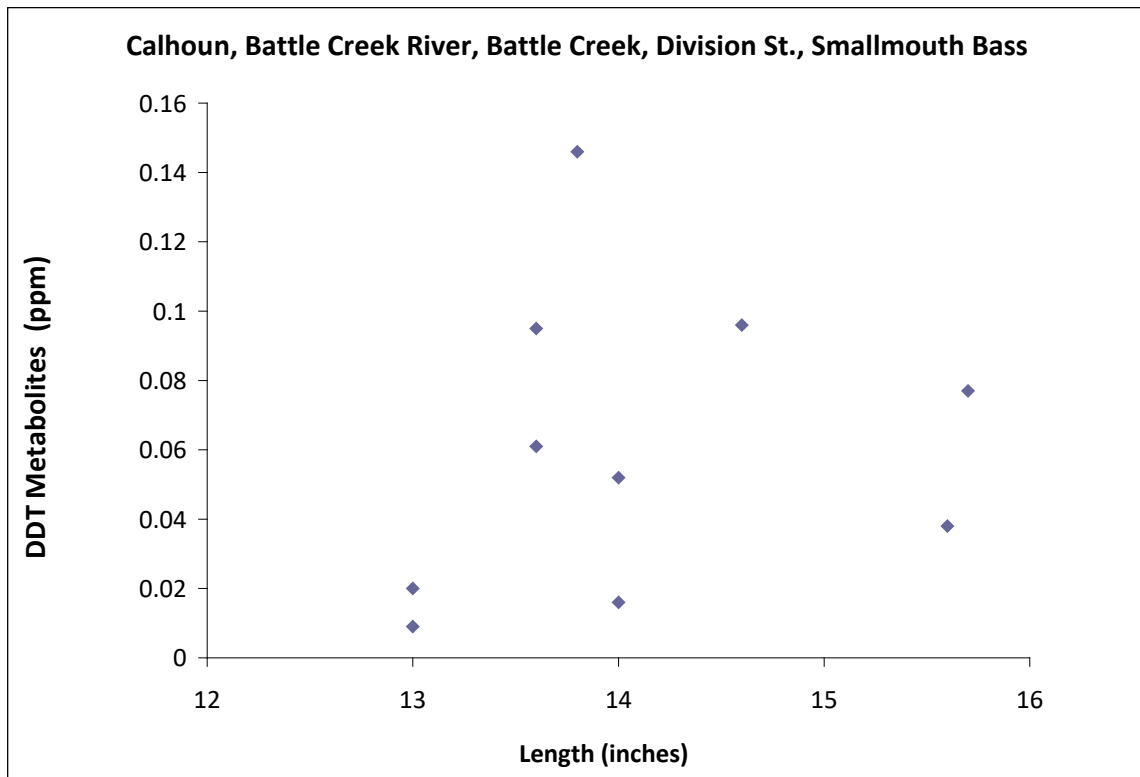
Organics Analysis:

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	11	14	13.6	15.7
Datasets available: 1991, 2004						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL (ppm)	Meal Category
PCB	8	0.139			0.21	1
DDT	8	0.073			0.11	16
Chlordane	8	0.005			0.01	--
Toxaphene	8	ND			--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.004	0.008				
DDT	0.040	0.139				
Chlordane	0.003	0.048				
Toxaphene	--	--				
Final meal category based on UCL:						1

Existing Advisory: Women and children should eat no more than one meal per week of Battle Creek River smallmouth bass between 14 and 30 inches in length due to PCBs.

Recommendation: No one should eat more than 1 meal per month of Battle Creek River smallmouth bass or largemouth bass less than 18 inches due to PCBs, or 1 meal per month of Battle Creek River smallmouth bass or largemouth bass greater than 18 inches due to PCBs and mercury. Statewide length break applied.





**Bluegill &
Redear Sunfish**
Hg Analysis:

Duck Lake

Calhoun County

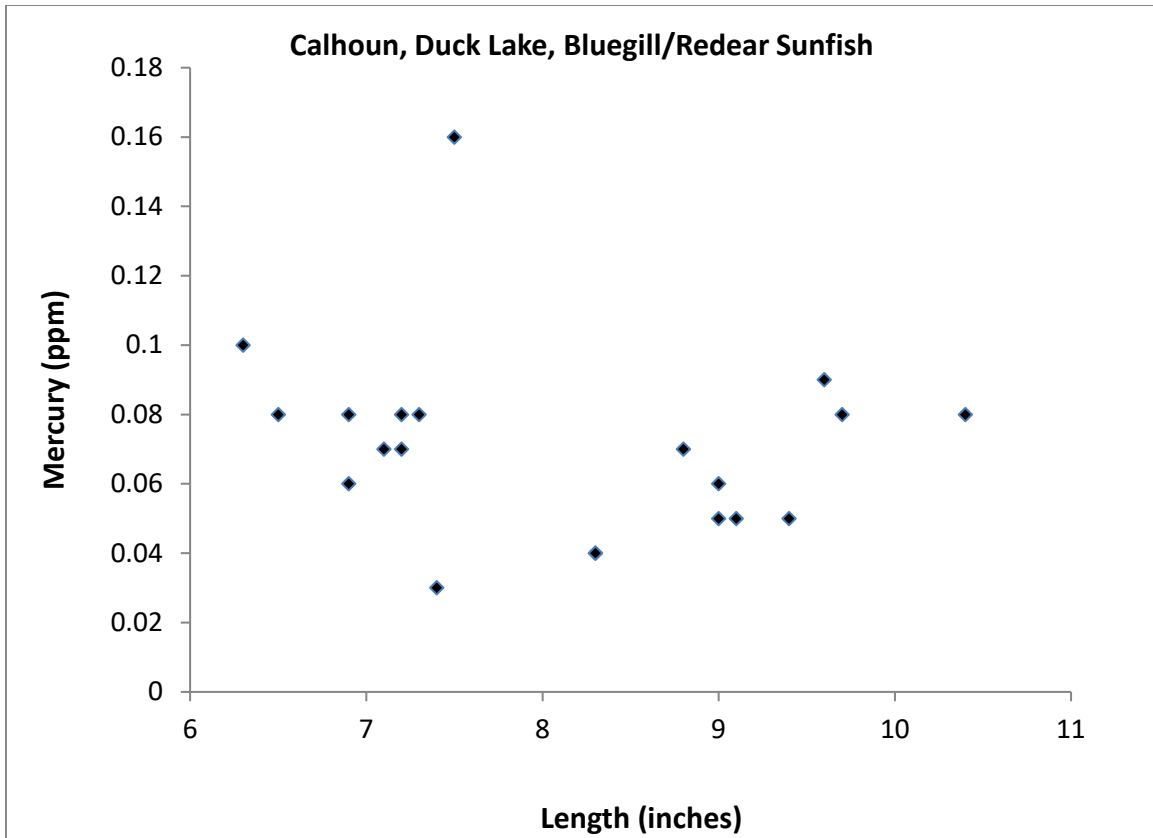
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1994	1994	20	6.3	NA	6.3	10.4
Datasets available: 1994						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL (ppm)		Meal Category
Mercury	20	0.07		0.08		12
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.040	0.031				

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 (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: 12		

Existing Advisory: There are no consumption advisories on Duck Lake bluegill or redear sunfish.

Recommendation: No one should eat more than 12 meals per month of Duck Lake bluegill or redear sunfish due to mercury.



Largemouth Bass

Duck Lake

Calhoun County

Hg Analysis:

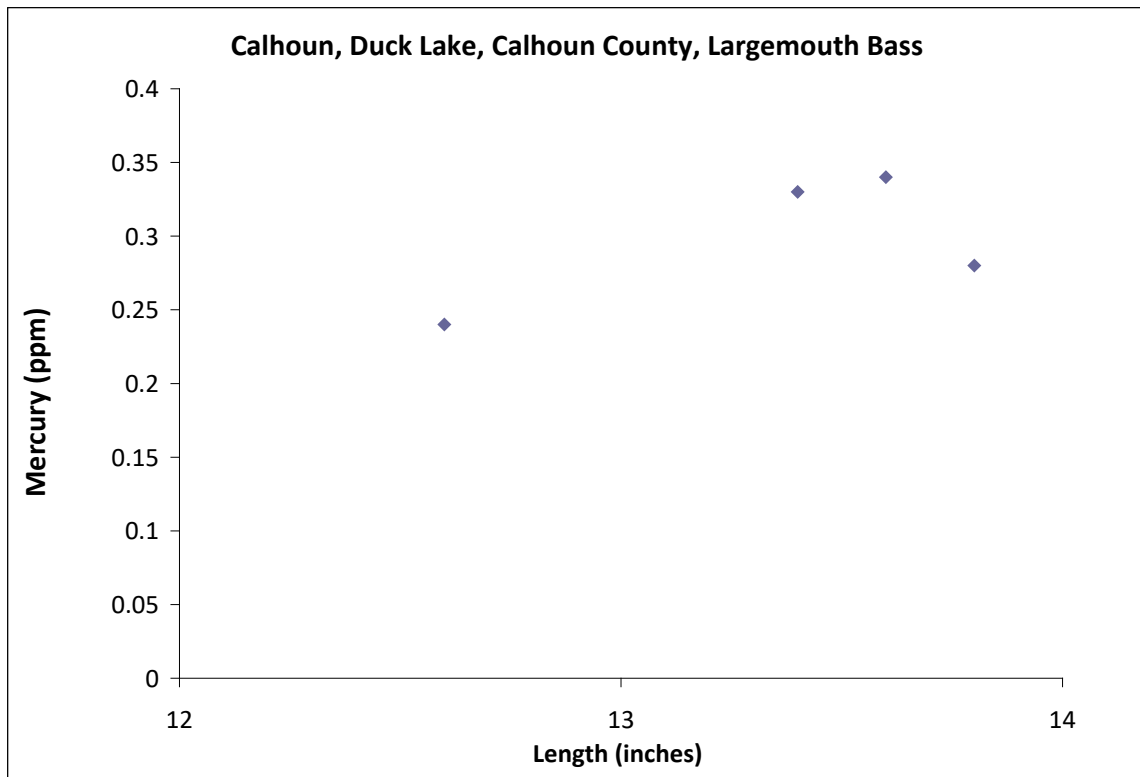
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1994	1994	4	12.6	14	6.3	7.5
Datasets available: 1994						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL (ppm)	Meal Category
Mercury	3	0.317			--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.420	0.459				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
Datasets available:						
Chemical	Sample Size (Legal)	Mean (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:						--

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

Recommendation: Insufficient dataset to issue an advisory. Statewide guidelines apply.



Walleye

Duck Lake

Calhoun 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	1	18.3	15	18.3	18.3
Datasets available: 1994						
Chemical	Sample Size (Legal)	Mean (ppm)	95%UCL (ppm)		Meal Category	
Mercury	1	0.420	--		--	
Chemical	Linear Regression	Exponential Regression				
	R²	R²				
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
		0				
Datasets available:						
Chemical	Sample Size (Legal)	Mean (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:						--

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

Recommendation: There are insufficient data available to develop specific advice for Duck Lake walleye. The statewide consumption guidelines recommend that no one eat more than 1 meal per month of walleye over 20 inches in length or more than 2 meals per month of legal size walleye under 20 inches in length.

Yellow Perch

Duck Lake

Calhoun County

Hg Analysis:

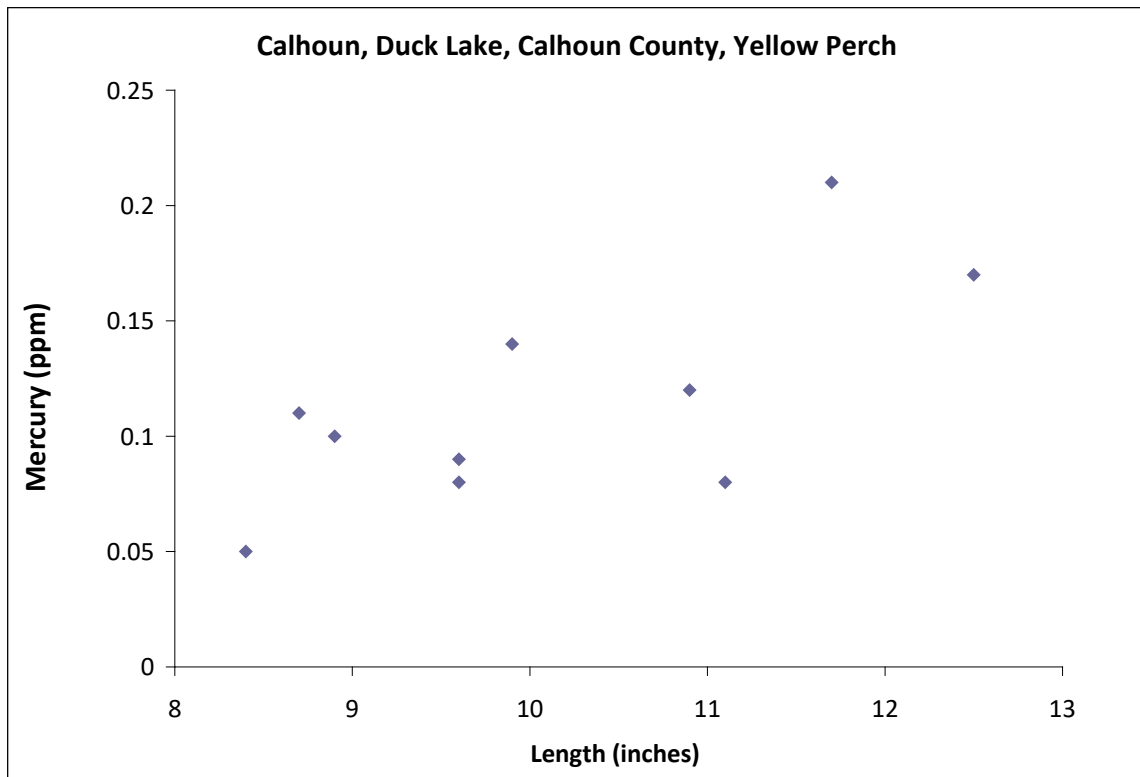
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1994	1994	10	8.4	NA	8.4	12.5
Datasets available: 1994						
Chemical	Sample Size (Legal)	Mean (ppm)	95%UCL (ppm)		Meal Category	
Mercury	10	0.115	0.15		4	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.503	0.476				

Organics Analysis:

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 (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:						4

Existing Advisory: Duck Lake yellow perch are covered under the statewide mercury consumption advisory.

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



**Bluegill and
Sunfish**

**Elks Lodge Pond
Battle Creek**

Calhoun County

Hg Analysis:

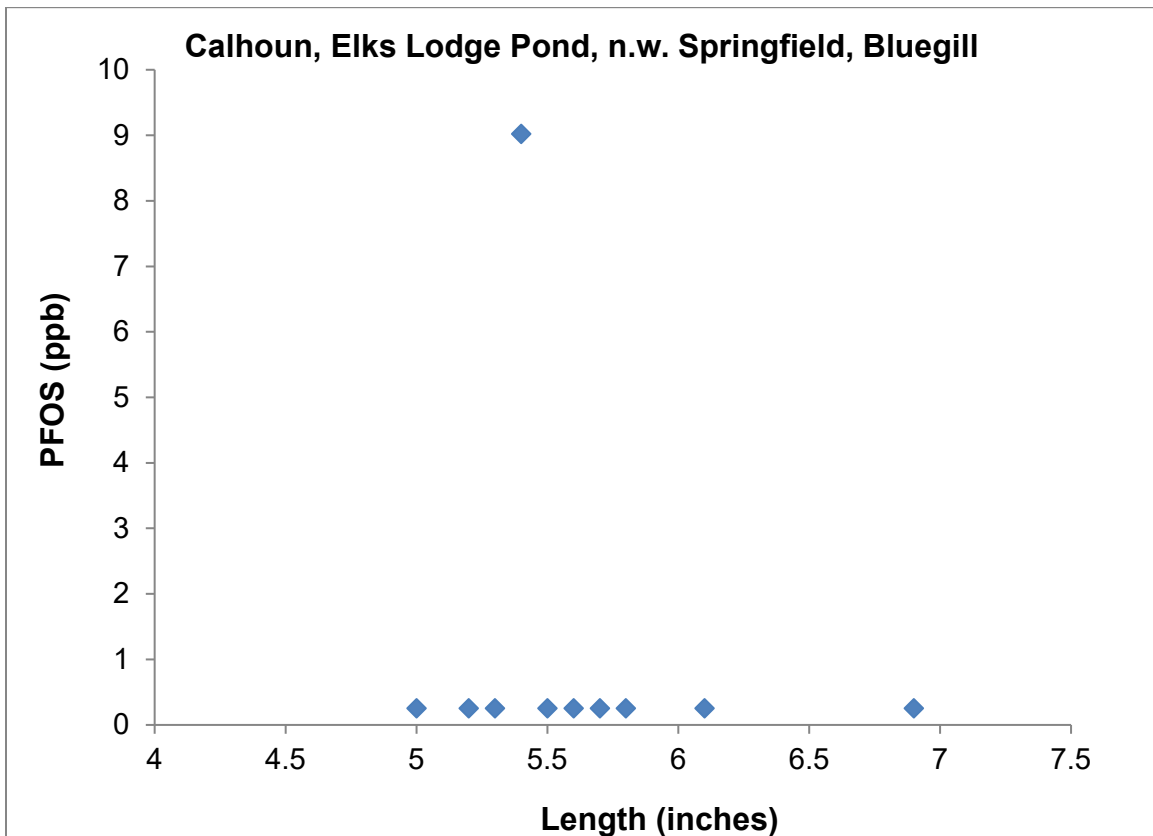
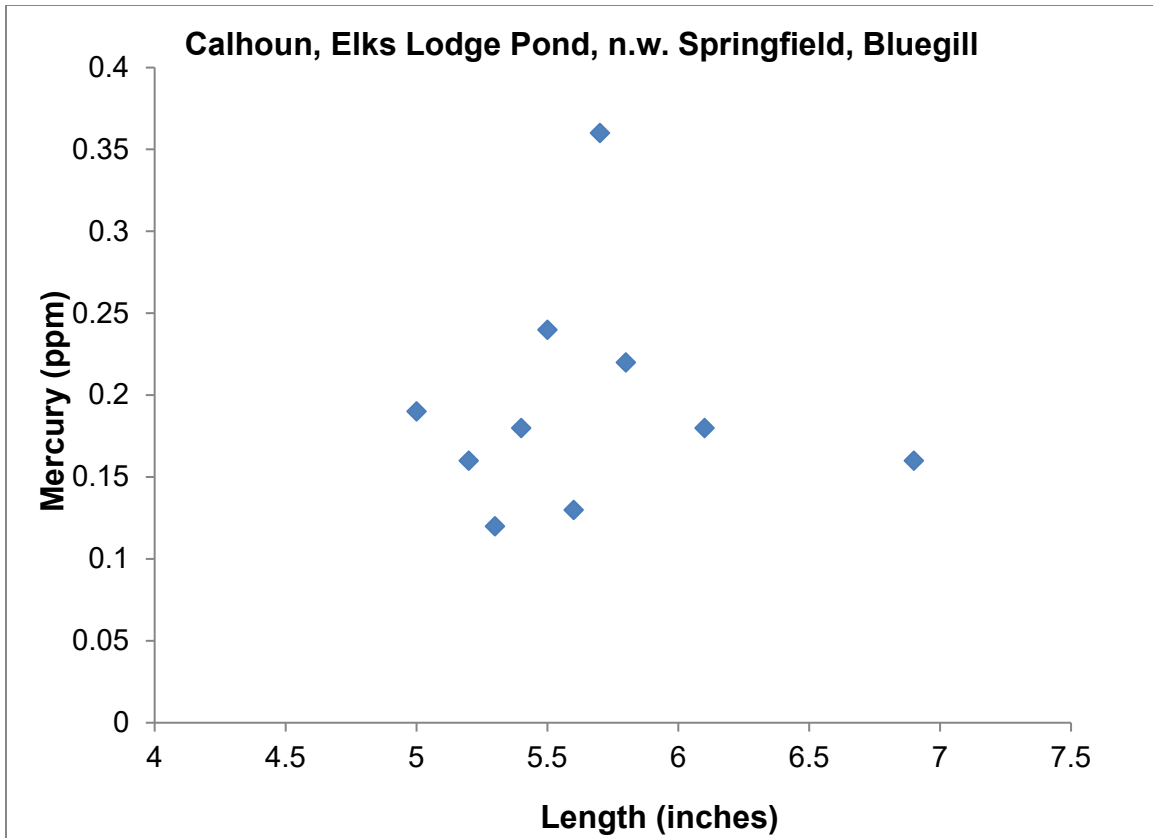
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2018	2018	10	5	na	5	6.9
Datasets available: 2018						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
Mercury	10	0.19		0.12	0.36	0.24
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
Mercury	0.000	0.001				4

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	5	na	5	6.9
Datasets available: 2018						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
PCB	0	--		--	--	--
DDT	0	--		--	--	--
Chlordane	0	--		--	--	--
Toxaphene	0	--		--	--	--
PFOS	10	1 ppb		< 0.25 ppb	9 ppb	3 ppb
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.026	0.026				
Final meal category based on UCL:						4

Existing MDHHS Advisory: Elks Lodge Pond bluegill and pumpkinseed (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 Elks Lodge Pond bluegill or sunfish of any size due to mercury.



Bluegill

Goguac Lake

Calhoun County

Hg Analysis:

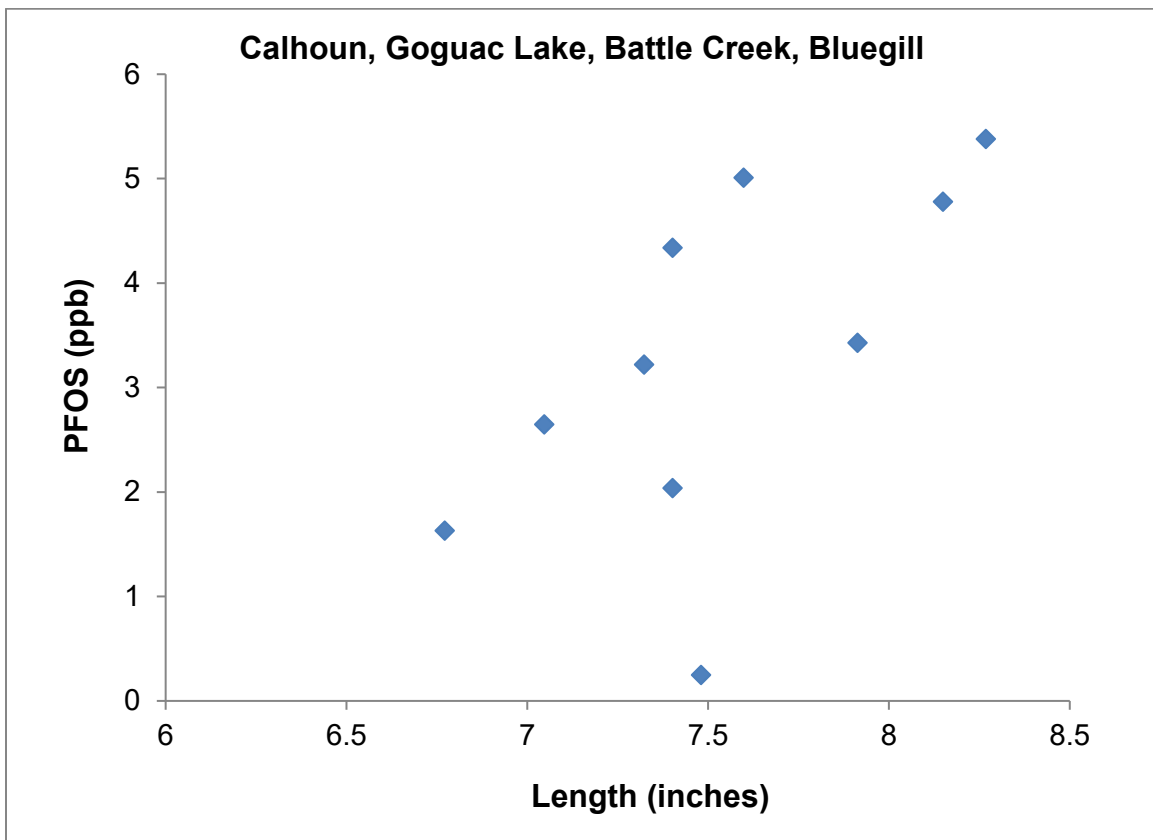
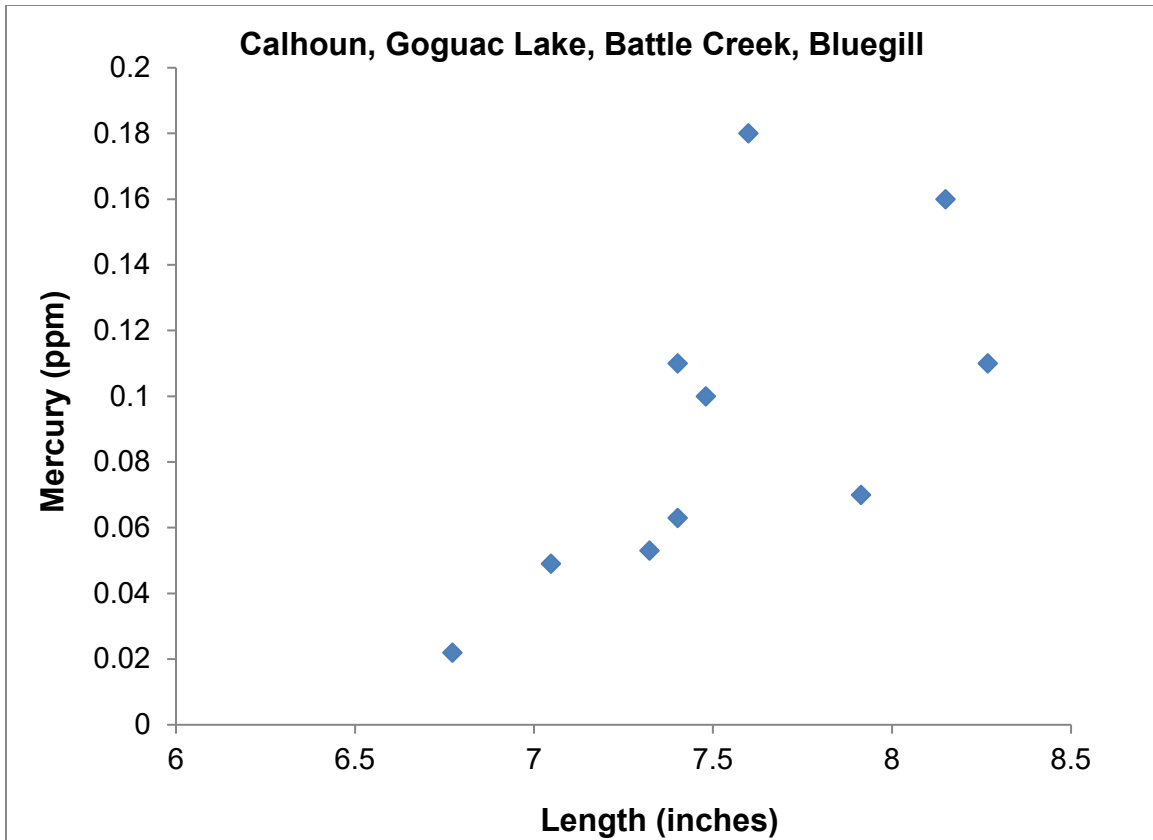
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent						
2019	2019	10	6.8	NA	6.8	8.3	
Datasets available: 2019							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.092		0.022	0.180	0.128	8
Chemical	Linear Regression	Exponential Regression					
	R²	R²					
Mercury	0.415	0.546					

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	6.8	NA	6.8	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	3.3 ppb		<0.25 ppb	5.4 ppb	4.5 ppb	16
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	0.399	0.143					
Final meal category based on UCL:							8

Existing MDHHS Advisory: Bluegill and sunfish from Goguac Lake near Battle Creek in Calhoun County are covered under the statewide mercury guidance. No one should eat more than 8 meals per month of these species of any size due to mercury.

Recommendation: No one should eat more than 8 meals per month of bluegill and sunfish of any size from Goguac Lake in Calhoun County due to mercury.



Largemouth Bass

Goguac Lake

Calhoun 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	13.5	16.5	
Datasets available: 2019							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	7	0.299		0.160	0.390	0.389	2
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.012	0.001					

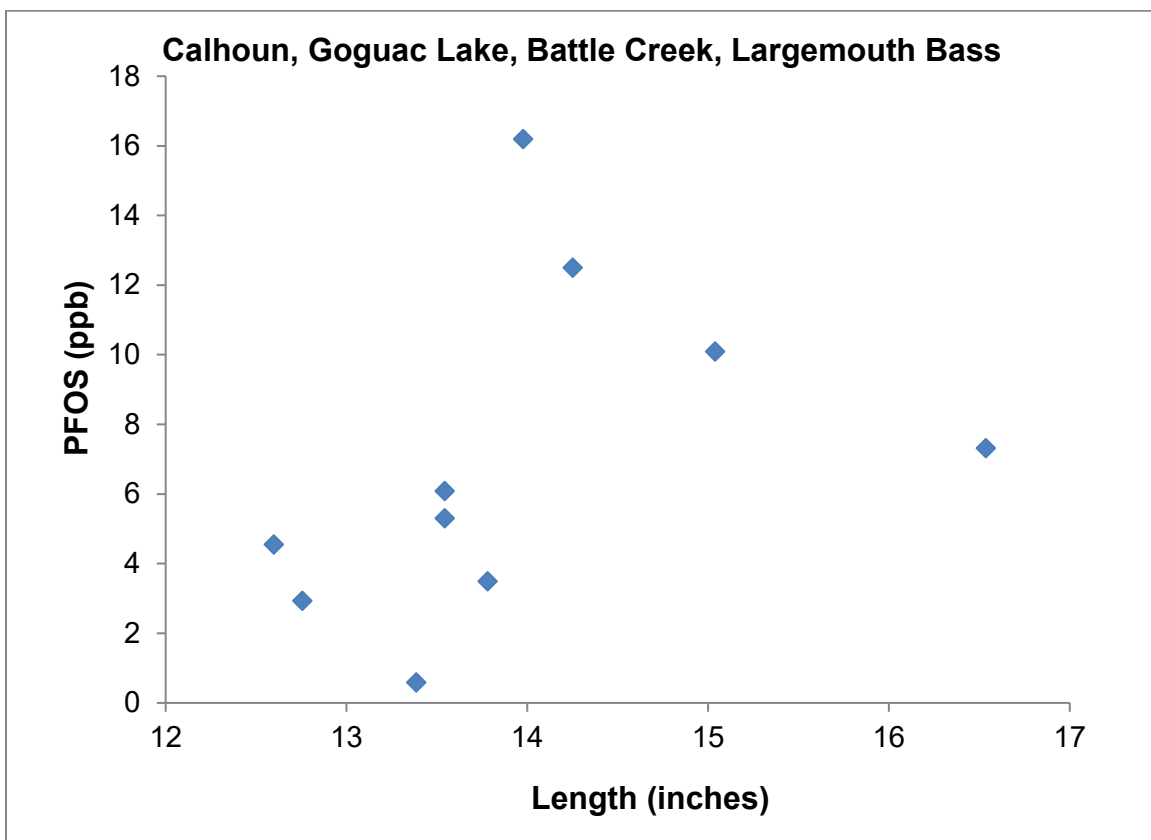
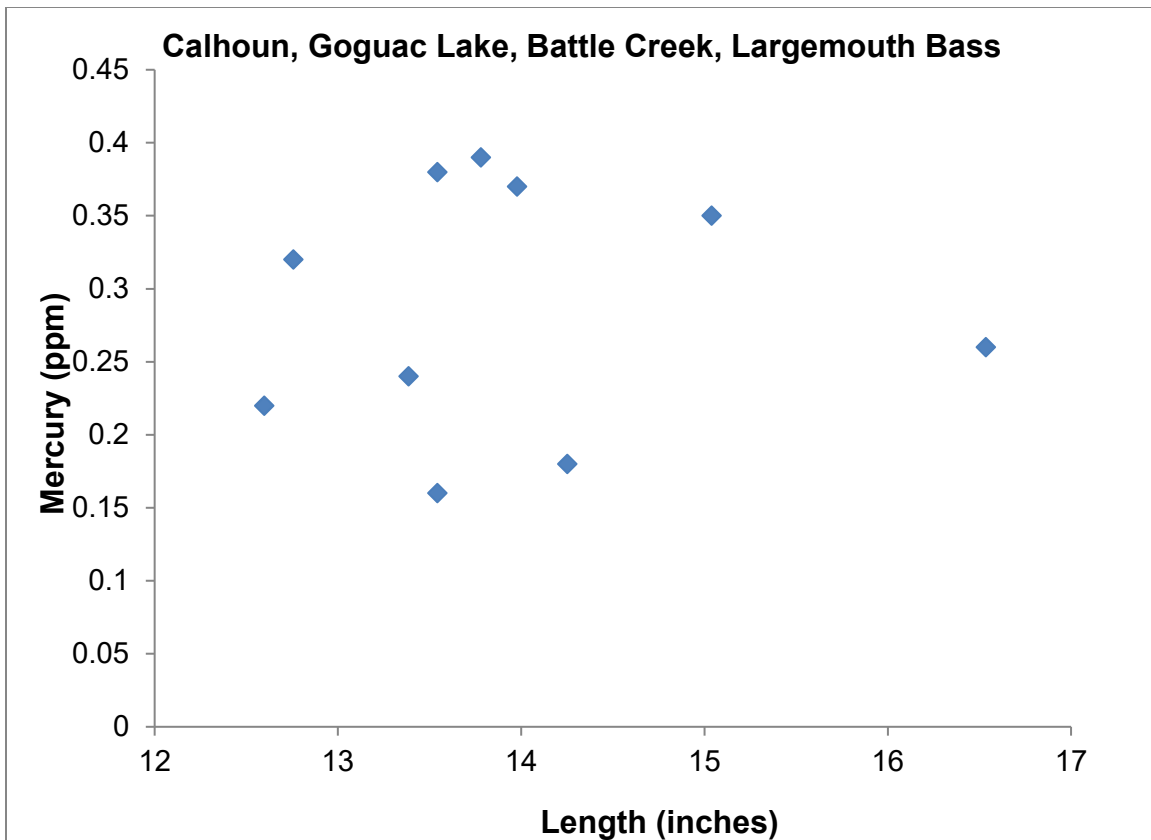
Organics Analysis:

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*	16.5	
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*	6.6 ppb		0.6 ppb	16.2 ppb	10.2 ppb	12
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	0.209	0.275					
Final meal category based on UCL:							2

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

Existing MDHHS Advisory: Largemouth bass from Goguac Lake near Battle Creek in Calhoun County are covered under the statewide mercury guidance. No one should eat more than 2 meals per month of largemouth bass smaller than 18 inches in length or no more than 1 meal per month of fish larger than 18 inches in length from Goguac Lake in Calhoun County due to mercury.

Recommendation: No one should eat more than 2 meals per month of largemouth bass of any size from Goguac Lake in Calhoun County due to mercury. PFOS would cause a less restrictive advisory in this species.



**Bluegill and
Sunfish**

Harts Lake

Calhoun County

Hg Analysis:

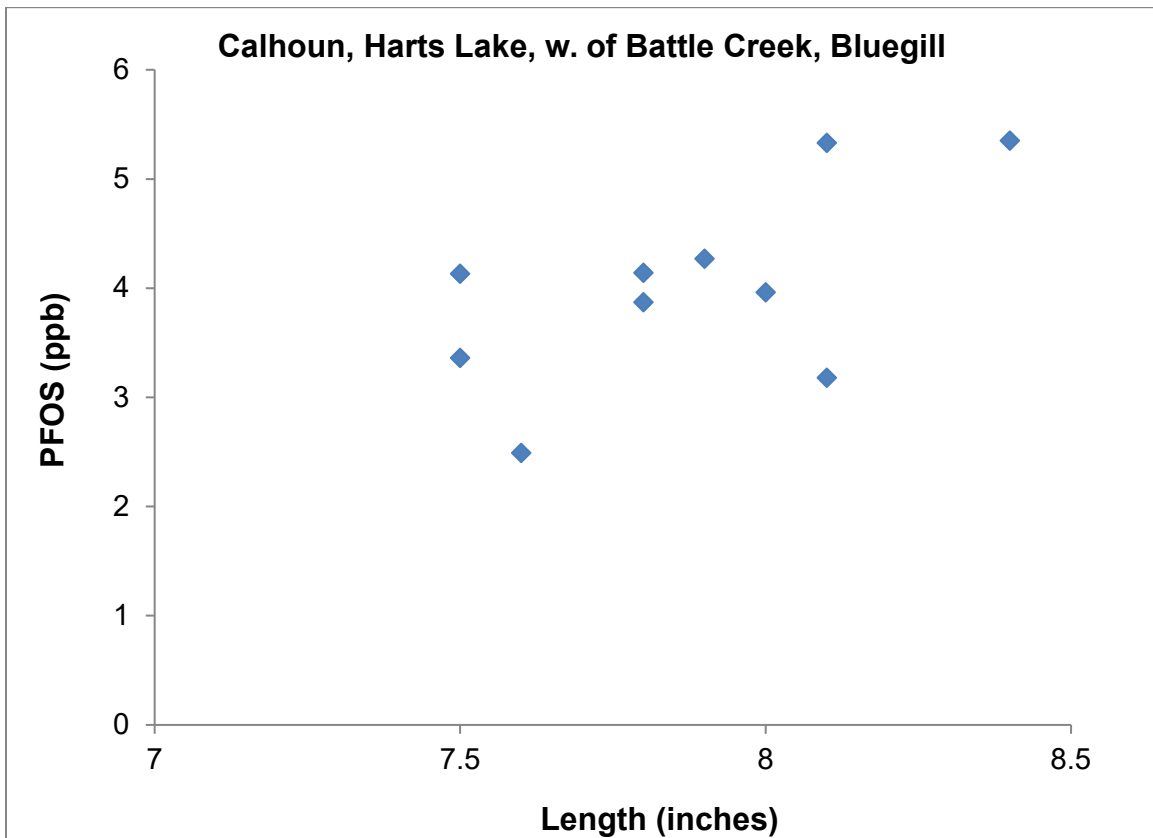
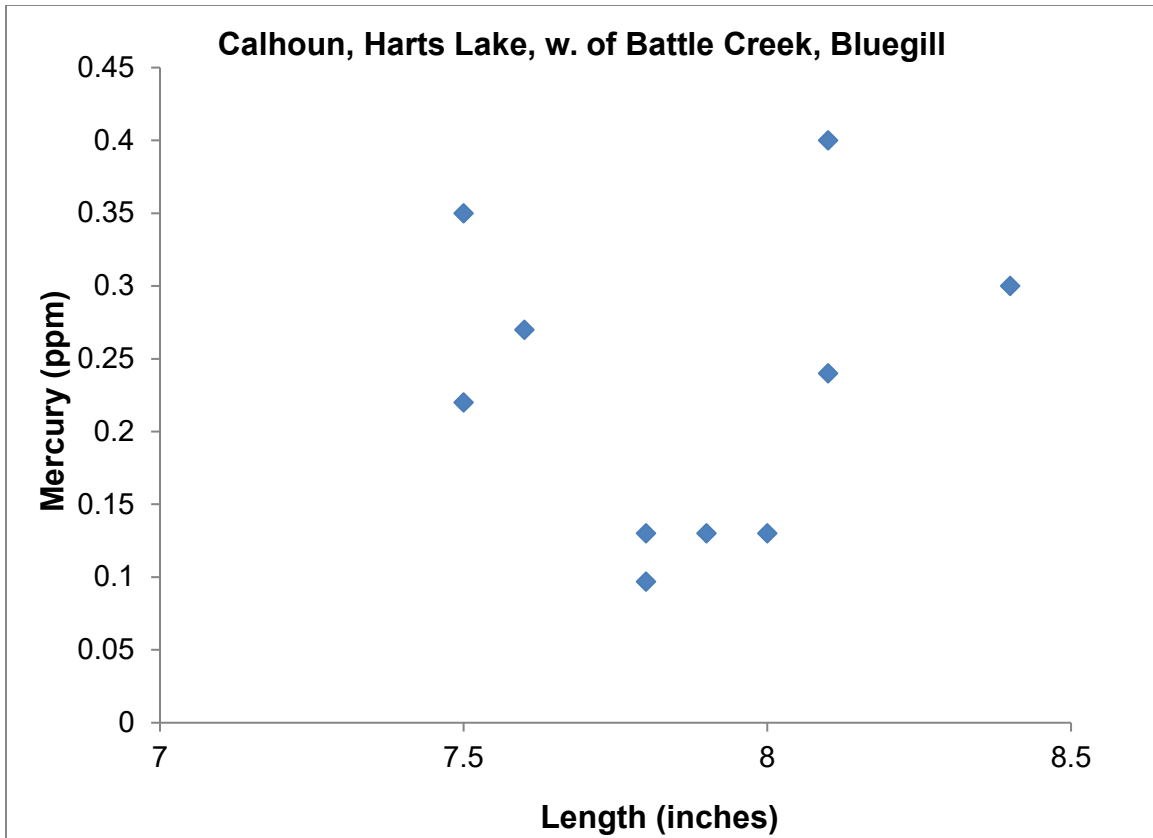
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2019	2019	10	7.5	na	7.5	8.4	
Datasets available:		2019					
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.23		0.10	0.40	0.30	2
Chemical	Linear Regression	Exponential Regression					
	R²	R²					
Mercury	0.010	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	
2019	2019	10	7.5	na	7.5	8.4	
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 ppb		2 ppb	5 ppb	5 ppb	16
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	0.380	0.334					
Final meal category based on UCL:							2

Existing MDHHS Advisory: Harts Lake bluegill and pumpkinseed (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 Harts Lake bluegill or sunfish of any size due to mercury.



Bluegill and Sunfish

Helmer Creek

Calhoun County

Hg Analysis:

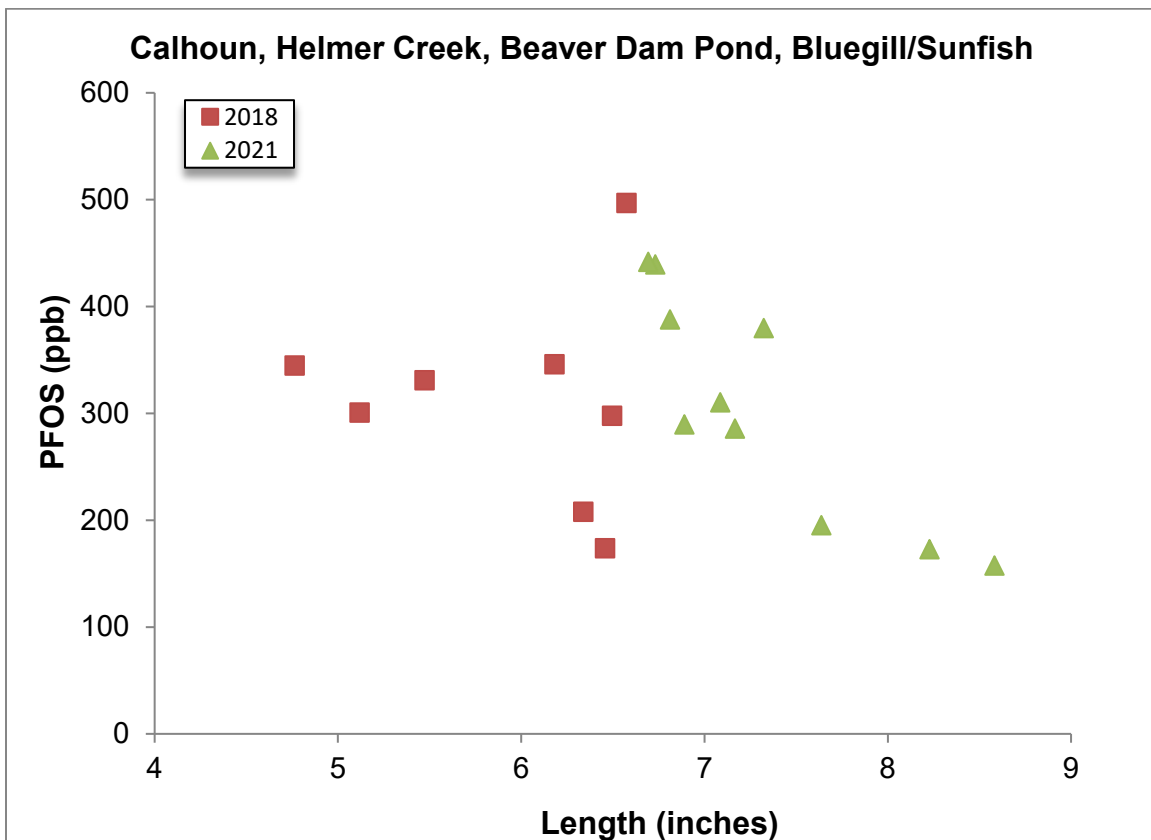
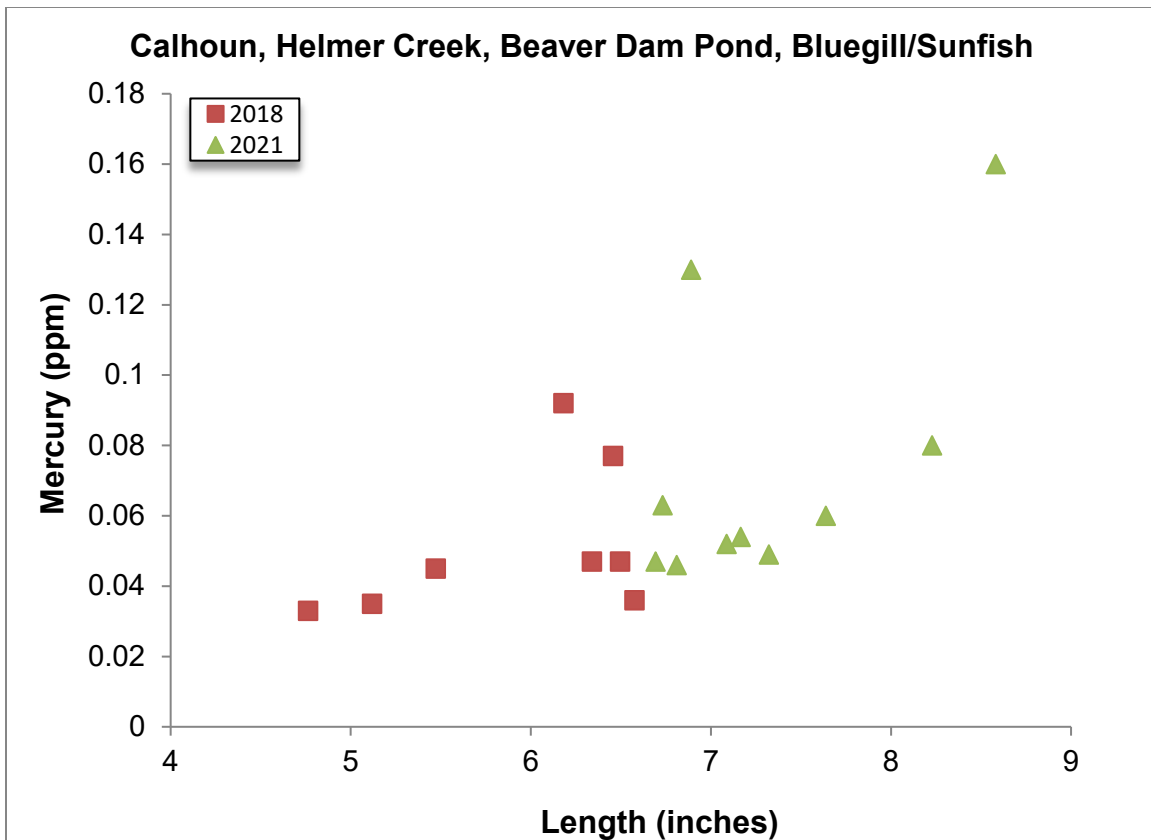
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2018	2021	18	4.8	NA	4.8	8.6	
Datasets available: 2018, 2021							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	18	0.064		0.033	0.160	0.081	12
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.329	0.394					

Organics Analysis:

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	2021	18	4.8	NA	4.8	8.6	
Datasets available: 2018, 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	18	309.0 ppb		157.7 ppb	497.0 ppb	358.4 ppb	0
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	0.141	0.201					
Final meal category based on UCL:							0

Existing MDHHS Advisory: No one should eat any fish from Helmer Creek including Beaver Dam Pond due to PFOS.

Recommendation: No change to the advisory is recommended.



Brown Trout

Nottawa River

Calhoun 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	3	11.5	10	11.5	12
Datasets available: 1998						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL (ppm)	Meal Category
Mercury	1*	0.340			--	--
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
1998	1998	3	11.5	10	11.5	12
Datasets available: 1998						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL (ppm)	Meal Category
PCB	1*	ND			--	--
DDT	1*	0.039			--	--
Chlordane	1*	0.006			--	--
Toxaphene	1*	ND				
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						--

* - one composite of 3 fillets

Existing Advisory: There are no current consumption advisories for Nottawa River brown trout.

Recommendation: There are insufficient data available to develop specific advice for Nottawa River brown trout.

Sucker
White and N. Hogsucker
Hg Analysis:

Nottawa River

Calhoun County

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1998	1998	9	9.2	NA	9.2	17
Datasets available: 1998						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL (ppm)		Meal Category
Mercury	2*	0.090		--		--
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
1998	1998	9	9.2	NA	9.2	17
Datasets available: 1998						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL (ppm)	Meal Category
PCB	2*	ND			--	--
DDT	2*	0.015			--	--
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:						--

* - 2 composite samples

Existing Advisory: There are no current consumption advisories for Nottawa River sucker.

Recommendation: There are insufficient data available to develop specific advice for Nottawa River sucker. The statewide consumption guidelines recommend that no eat more than 8 meals per month of sucker from inland waters.

Largemouth Bass

Prairie Lake

Calhoun 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	13.7	14	13.7	20.7
Datasets available: 2013						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
Mercury	10	0.63		0.32	1.0	0.80
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
Mercury	0.728	0.712				1

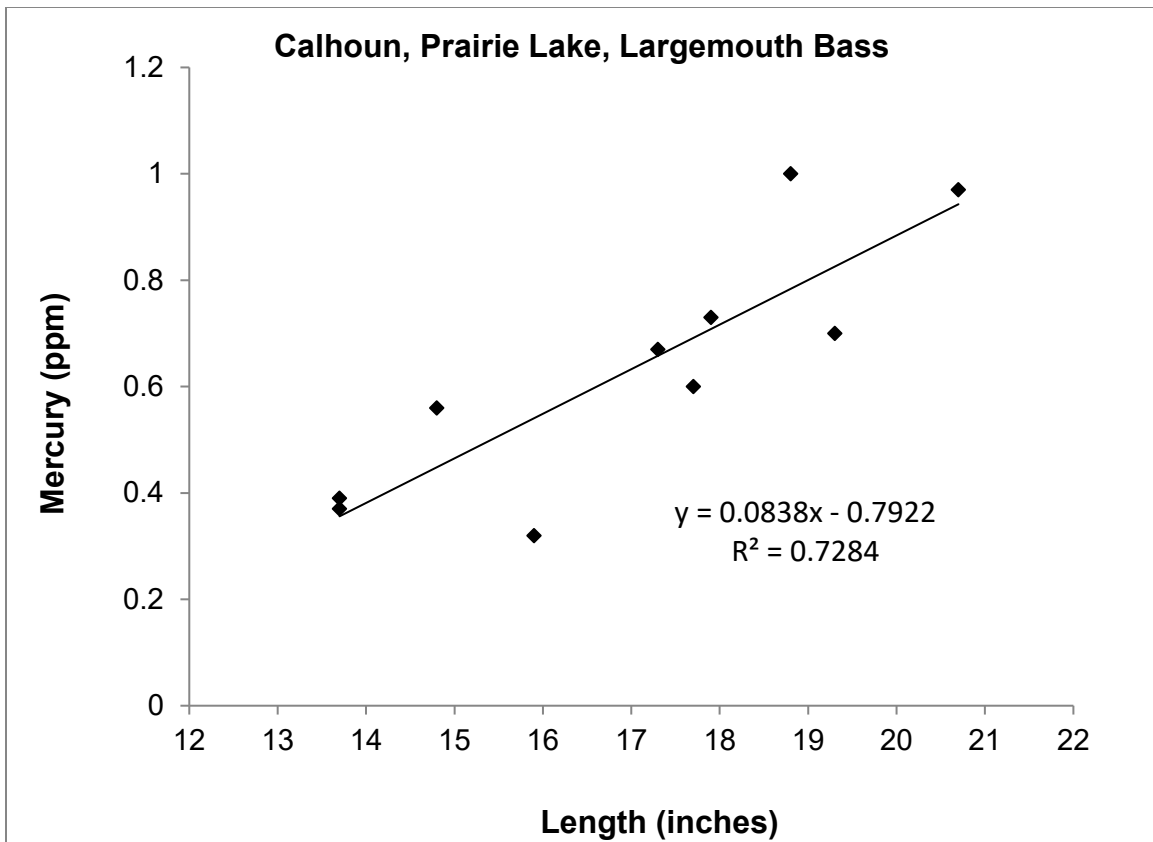
Organics Analysis:

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)
PCB	0	--		--	--	--
DDT	0	--		--	--	--
Chlordane	0	--		--	--	--
Toxaphene	0	--		--	--	--
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						1

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

Recommendation: No one should eat more than 1 meal per month of Prairie Lake largemouth or smallmouth bass due to mercury.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
12	0.21	4
14	0.38	2
16	0.55	1
18	0.72	1
20	0.88	1
22	1.05	1
24	1.22	0.5
Shaded area denotes extrapolated estimates		



Rock Bass

Wabascon Creek

Calhoun 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	6.7	NA	6.7	10
Datasets available: 1998						
Chemical	Sample Size (Legal)	Mean (ppm)	95%UCL (ppm)		Meal Category	
Mercury	2*	0.140	--		--	
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
1998	1998	10	6.7	NA	6.7	10
Datasets available: 1998						
Chemical	Sample Size (Legal)	Mean (ppm)	95%UCL (ppm)		Meal Category	
PCB	2*	ND	--		--	
DDT	2*	0.005	--		--	
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:						--

* - 2 composite samples of 5 fish each

Existing Advisory: Wabascon Creek rock bass are not covered by a consumption advisory.

Recommendation: There are insufficient data available to develop specific advice for Wabascon Creek rock bass. The statewide consumption guidelines recommend that no one eat more than 4 meals per month of rock bass from inland waters.

White Sucker

Wabascon Creek

Calhoun 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	2	9.3	NA	9.3	10
Datasets available: 1998						
Chemical	Sample Size (Legal)	Mean (ppm)	95%UCL (ppm)		Meal Category	
Mercury	2	0.090	--		--	
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
1998	1998	2	9.3	NA	9.3	10
Datasets available: 1998						
Chemical	Sample Size (Legal)	Mean (ppm)	95%UCL (ppm)		Meal Category	
PCB	2	ND	--		--	
DDT	2	0.003	--		--	
Chlordane	2	ND	--		--	
Toxaphene	2	ND	--		--	
Chemical	Linear Regression	Exponential Regression	Final meal category based on UCL: --			
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				

Existing Advisory: There are no current consumption advisories for Wabascon Creek white sucker.

Recommendation: There are insufficient data available to develop specific advice for Wabascon Creek white sucker. The statewide consumption guidelines recommend that no one eat more than 8 meals per month of sucker from inland waters.

Cass County

Northern Pike

Christiana Lake

Cass County

Hg Analysis:

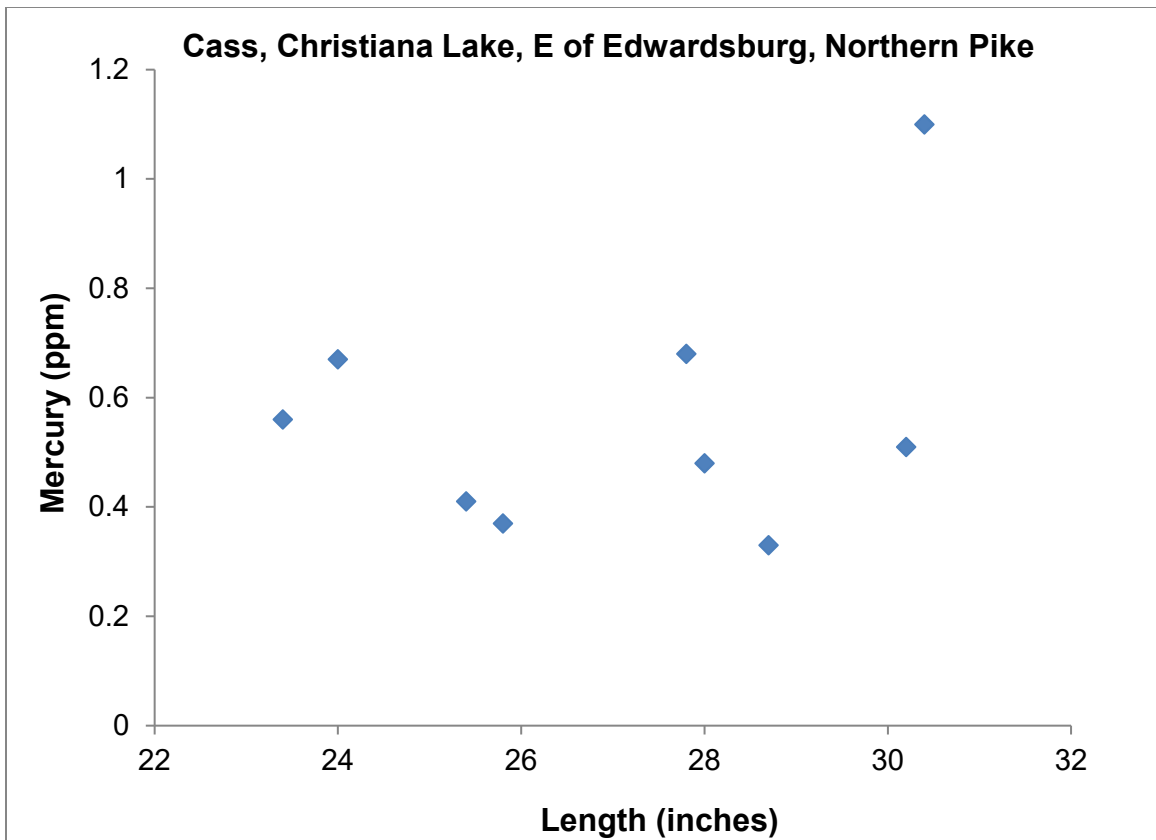
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2017	2017	9	23.4	24	24	30.4	
Datasets available: 2017							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	8	0.57		0.33	1.1	0.78	1
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.090	0.045					

Organics Analysis:

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

Existing MDHHS Advisory: Christiana Lake northern pike are covered by the statewide advisory due to mercury: No one should eat more than 2 meals per month of northern pike less than 30 inches or more than 1 meal per month of northern pike greater than 30 inches.

Recommendation: No one should eat more than 1 meal per month of Christiana Lake northern pike of any size due to mercury.



Brown Trout**Dowagiac Creek
u/s LaGrange Lake****Cass 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	8	10	9.9	12.7	
Datasets available: 1998							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	2*	0.108		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R²	R²					
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	
1998	1998	10	8	10	9.9	12.7	
Datasets available: 1998							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	2*	0.039		--	--	--	--
DDT	2*	0.013		--	--	--	--
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:							--

* - 2 composite samples of 5 fillets each

Existing Advisory: There are no current consumption advisories on Dowagiac Creek brown trout.

Recommendation: There are insufficient data available to develop specific advice for Dowagiac Creek brown trout.

White Sucker

Dowagiac Creek u/s LaGrange Lake

Cass 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	9.3	NA	9.3	16.3	
Datasets available: 1998							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	2*	0.075		--	--	--	--
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	
1998	1998	10	9.3	NA	9.3	16.3	
Datasets available: 1998							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	2*	ND		--	--	--	--
DDT	2*	0.004		--	--	--	--
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:			--

* - 2 composite samples of 5 fillets each

Existing Advisory: There are no current consumption advisories on Dowagiac Creek white sucker.

Recommendation: There are insufficient data available to develop specific advice for Dowagiac Creek sucker. The statewide consumption guidelines recommend that no one should eat more than 8 meals per month of sucker from inland waters.

Carp**Dowagiac River****Cass County****Hg Analysis:**

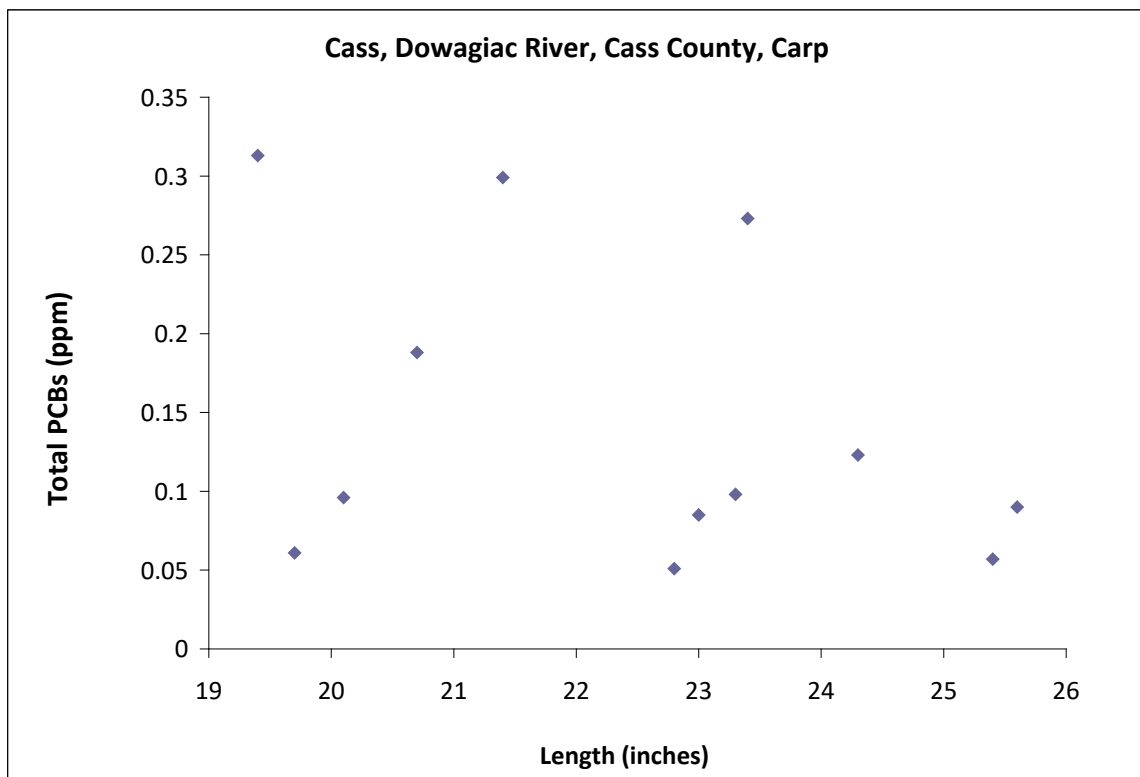
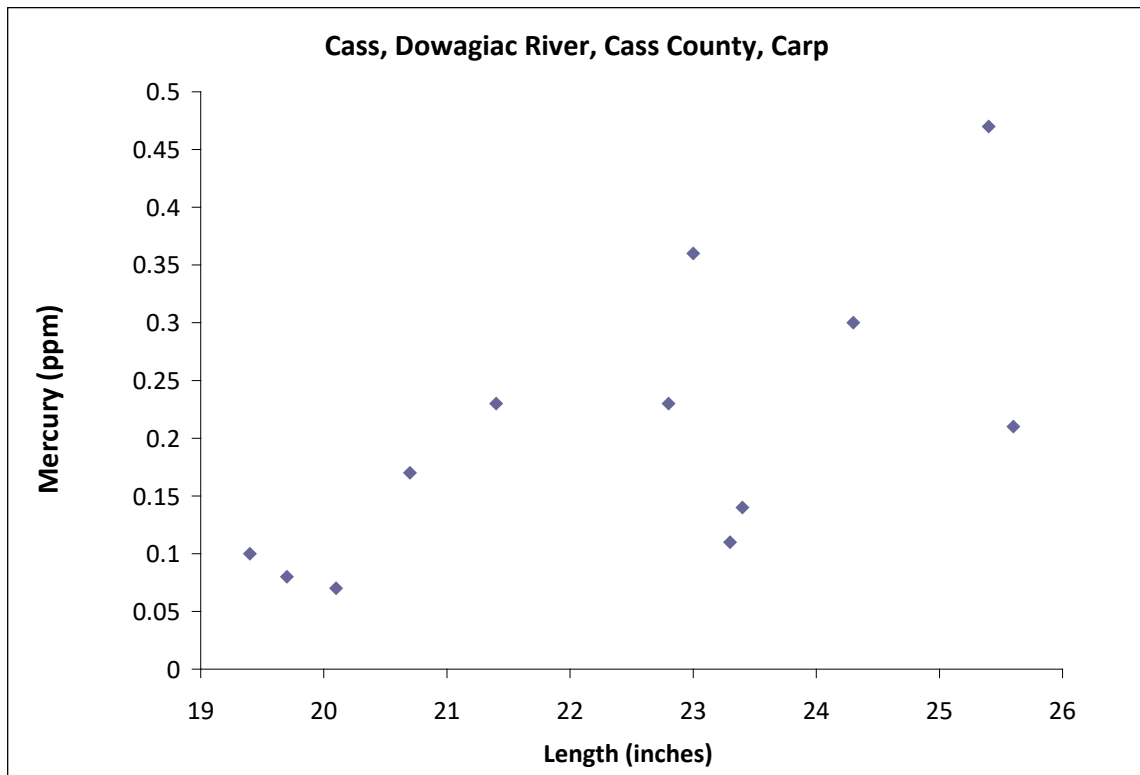
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1991	2000	12	19.4	NA	19.4	25.6	
Datasets available: 1991, 2000							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	12	0.206		0.070	0.470	0.280	2
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.454	0.508					

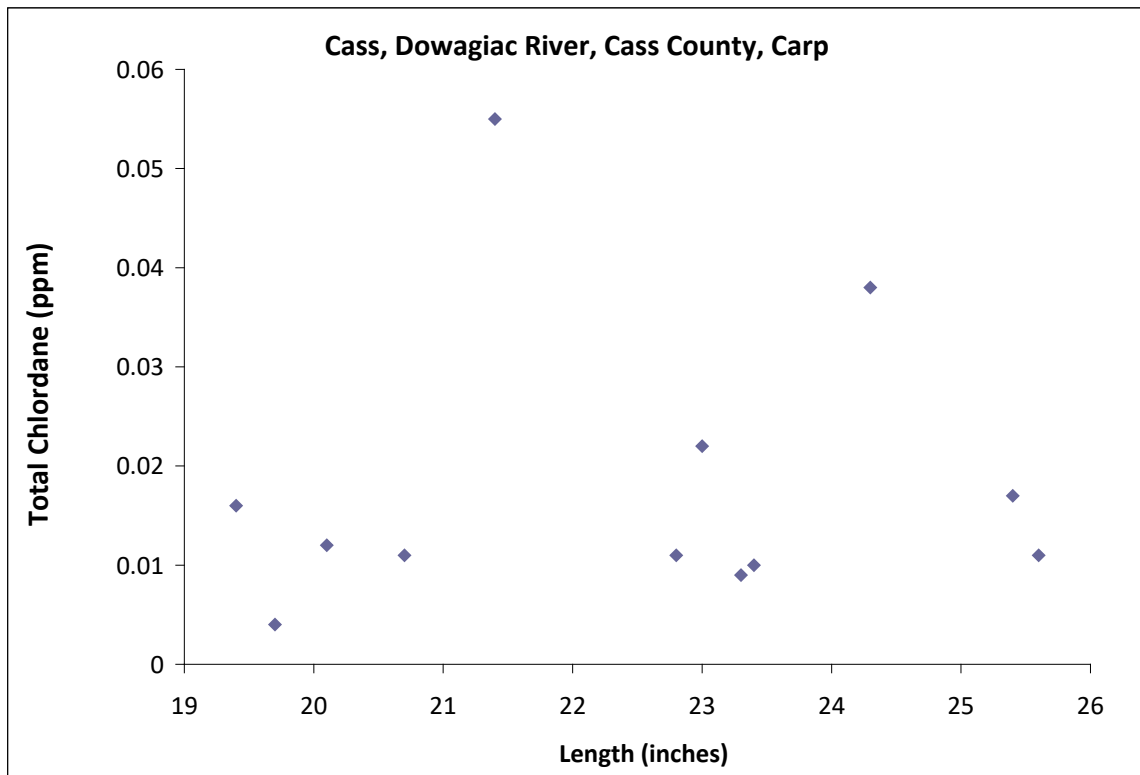
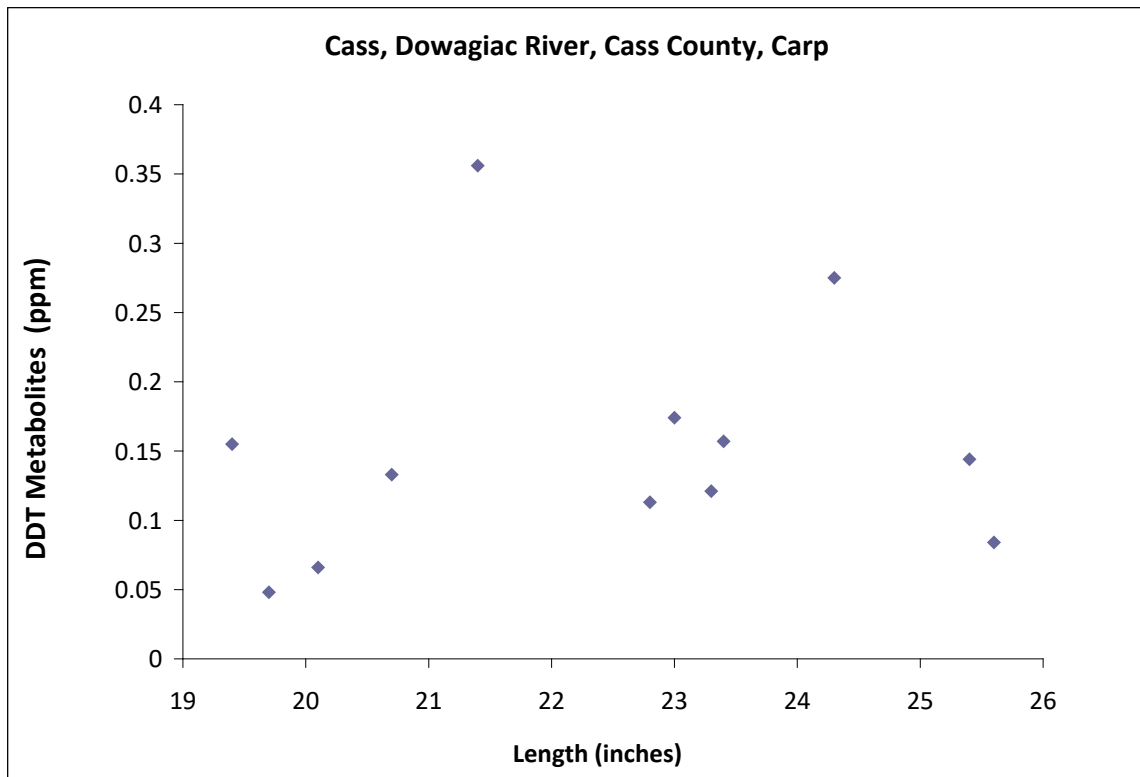
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1991	2000	12	19.4	NA	19.4	25.6	
Datasets available: 1991, 2000							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	12	0.145		0.051	0.313	0.210	1
DDT	12	0.152		0.048	0.356	0.210	8
Chlordane	12	0.018		0.004	0.055	0.030	--
Toxaphene	12	ND		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.139	0.116					
DDT	0.017	0.061					
Chlordane	0.007	0.047					
Toxaphene	--	--					
Final meal category based on UCL:							1

Existing Advisory: Women and children should not eat more than one meal per week of Dowagiac River carp of any size due to PCBs.

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





Largemouth Bass

Eagle Lake

Cass County

Hg Analysis:

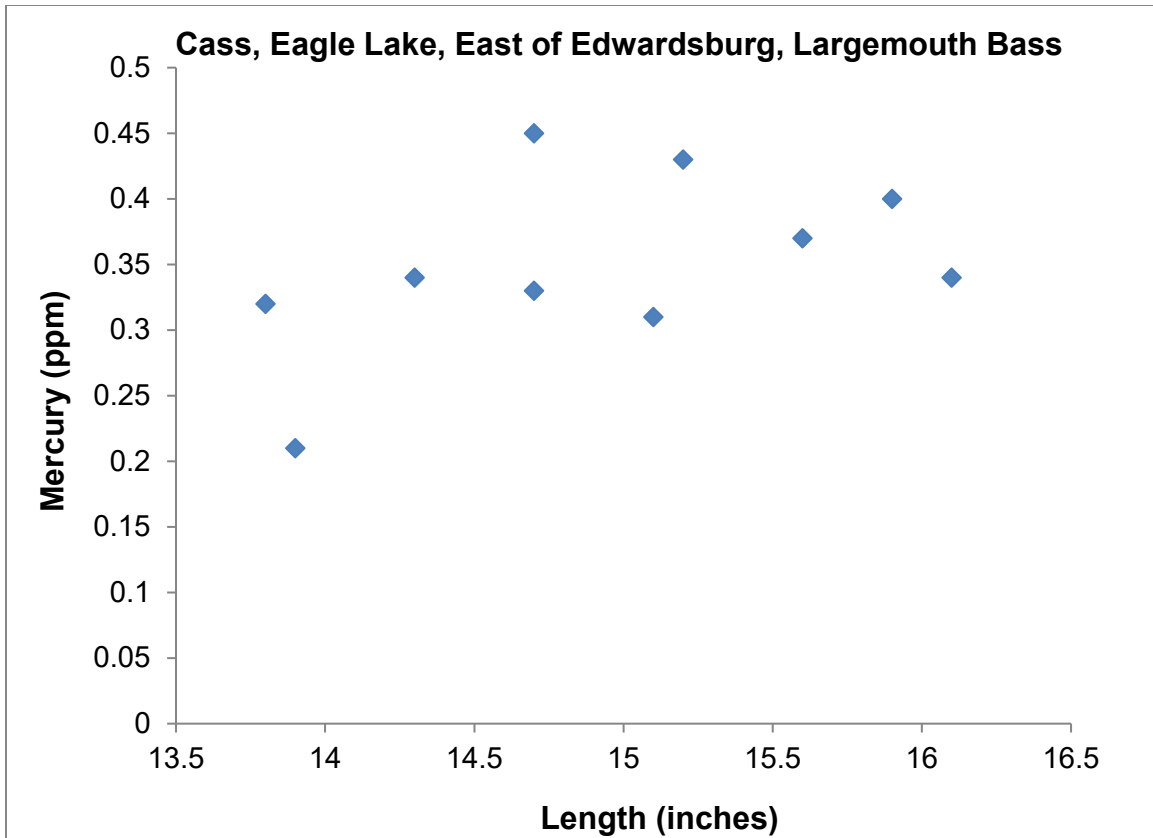
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2017	2017	10	13.8	14	13.8	16.1	
Datasets available: 2017							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.35		0.21	0.45	0.40	2
Chemical	Linear Regression	Exponential Regression					
	R²	R²					
Mercury	0.223	0.252					

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	0	--		--	--	--	--
DDT	0	--		--	--	--	--
Chlordane	0	--		--	--	--	--
Toxaphene	0	--		--	--	--	--
TEQ	0	--		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
TEQ	--	--					
Final meal category based on UCL:							2

Existing MDHHS Advisory: Eagle Lake largemouth bass are covered by the statewide advisory due to mercury: No one should eat more than 2 meals per month of largemouth or smallmouth bass less than 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 Eagle Lake largemouth or smallmouth bass less than 18 inches or more than 1 meal per month of those fish larger than 18 inches due to mercury. Statewide length break applied as the size range of the dataset was limited.



Carp**Indian Lake****Cass County****Hg Analysis:**

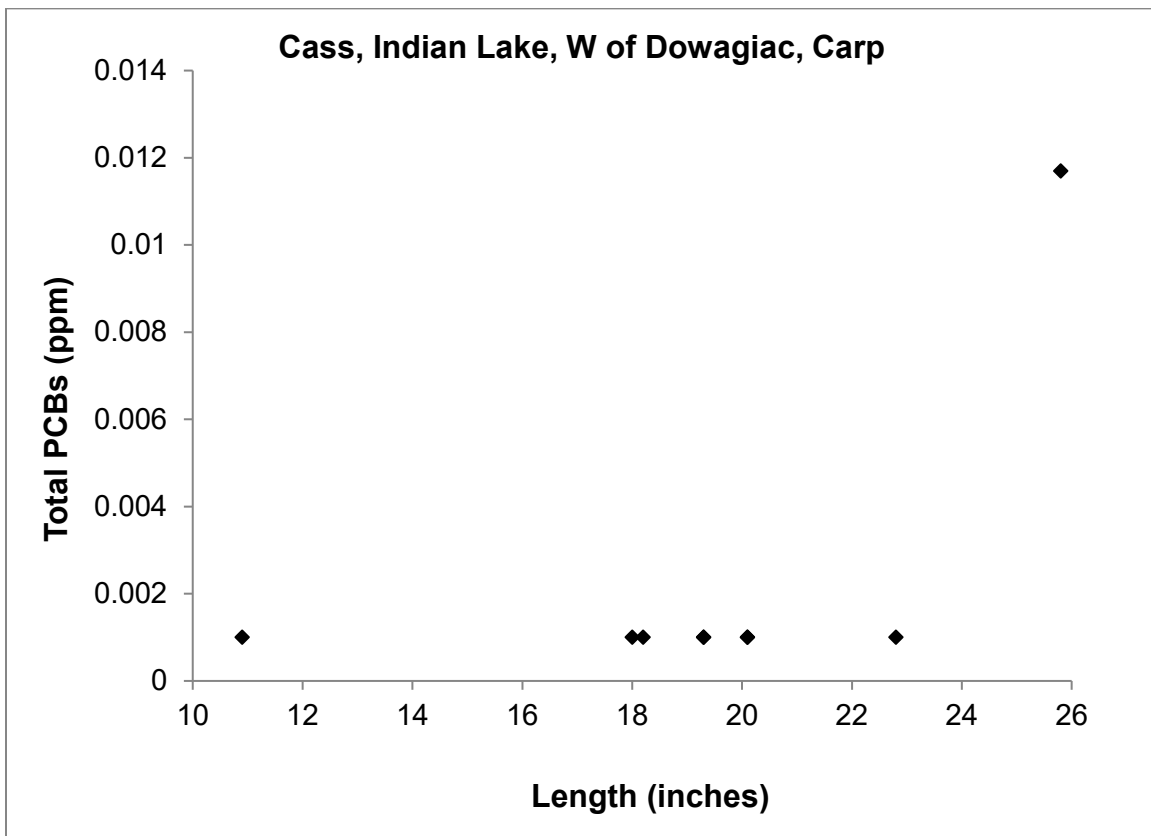
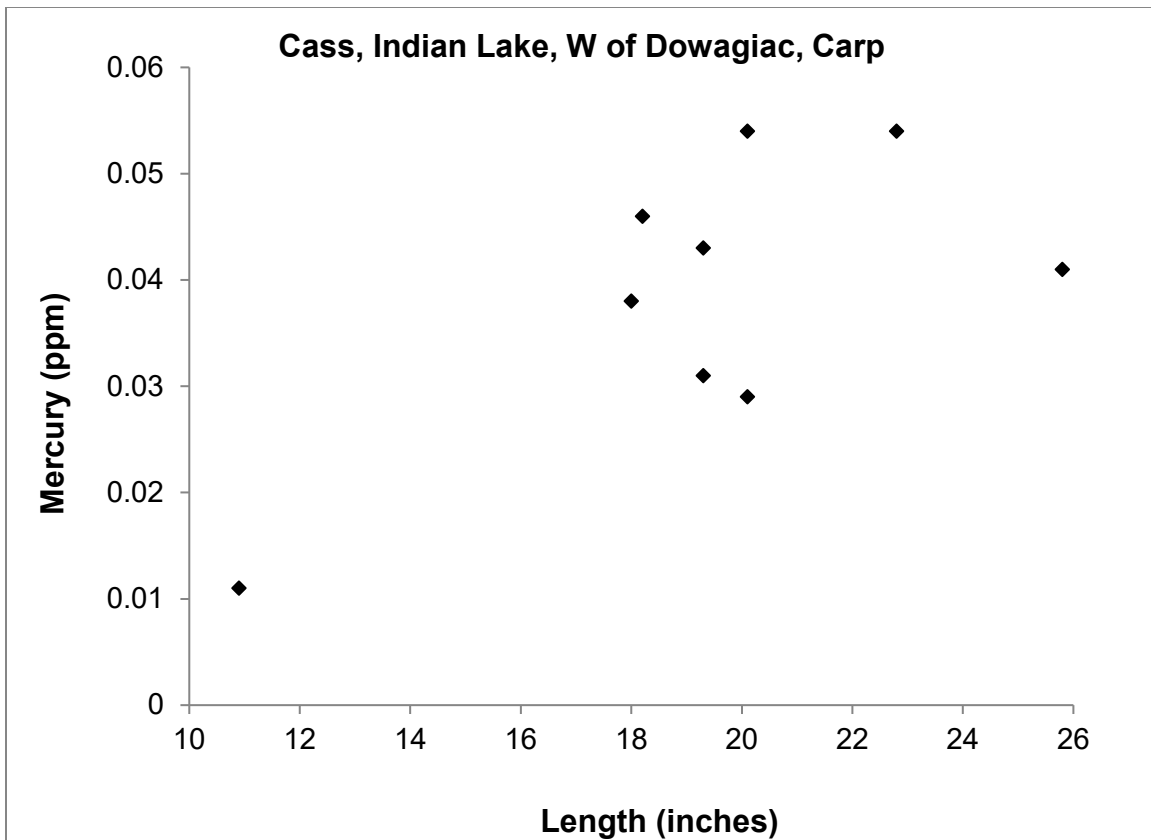
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2014	2014	9	10.9	na	10.9	25.8	
Datasets available: 2014							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	9	0.04		0.01	0.05	0.05	16
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.471	0.587					

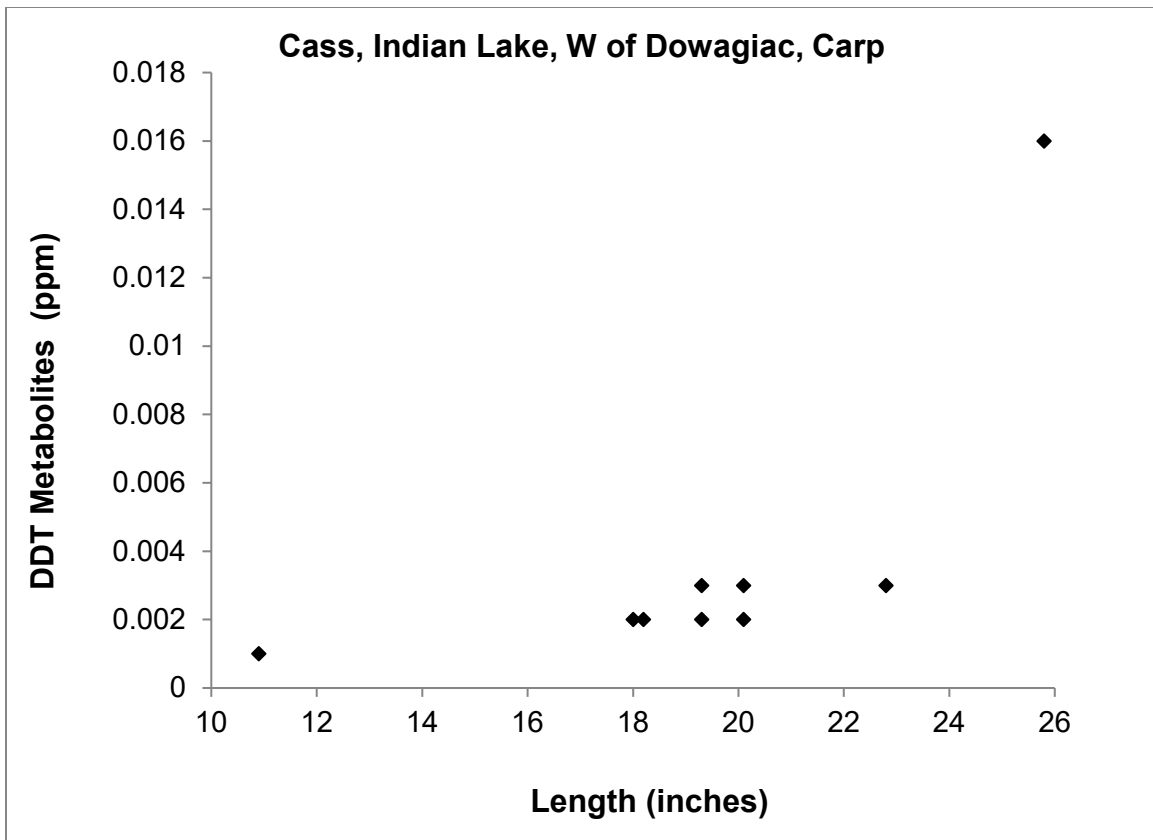
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2014	2014	9	10.9	na	10.9	25.8	
Datasets available: 2014							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	9	0.002		0.001	0.01	0.01	16
DDT	9	0.004		0.001	0.02	0.01	16
Chlordane	9	ND		--	--	--	--
Toxaphene	9	ND		--	--	--	--
TEQ	0	--		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.358	0.358					
DDT	0.472	0.741					
Chlordane	--	--					
Toxaphene	--	--					
TEQ	--	--					
Final meal category based on UCL:							16

Existing Advisory: Indian 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 consumption advisory is necessary for Indian Lake carp. These fish will be listed at 16 meals per month as the upper limit of the assessment. As the size range of the fish was limited, collection of larger fish, if any are present, are needed to refine the advisory.





Walleye

Indian Lake

Cass 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	15.9	15	15.9	26.1	
Datasets available: 2014							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.30		0.12	0.78	0.48	2
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.904	0.942					

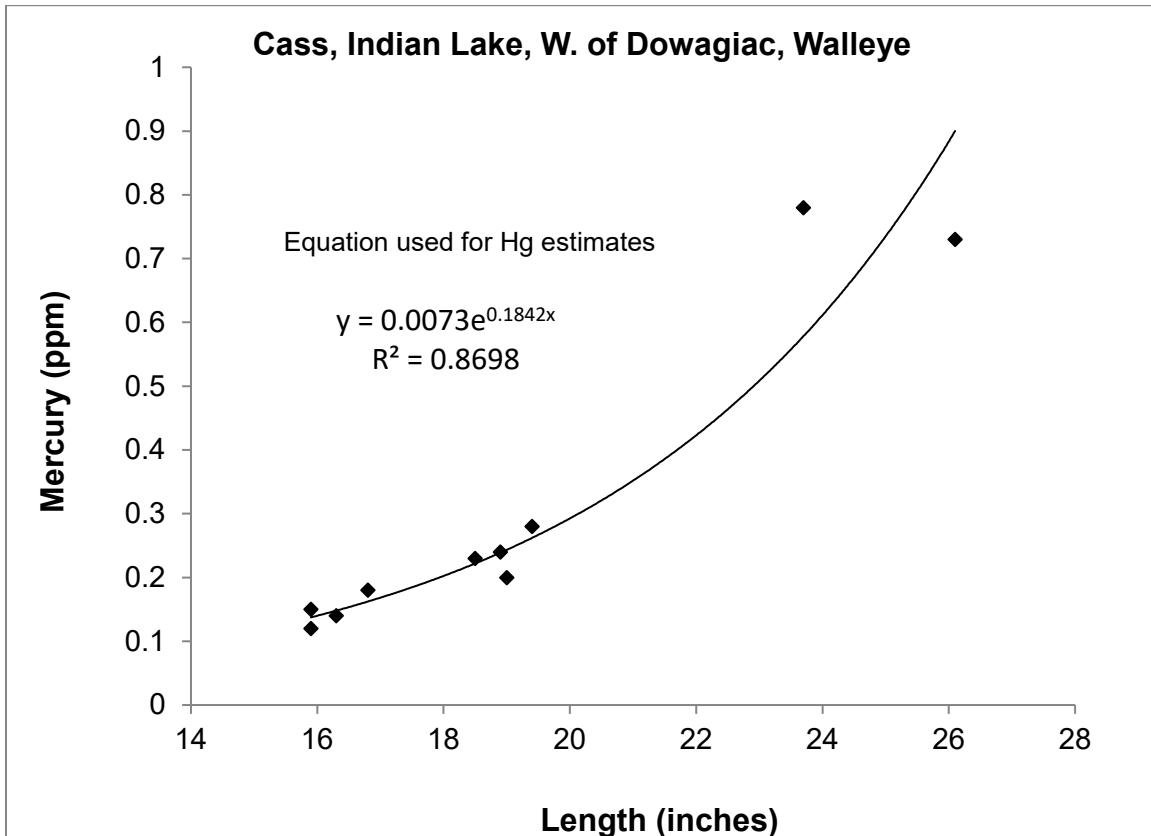
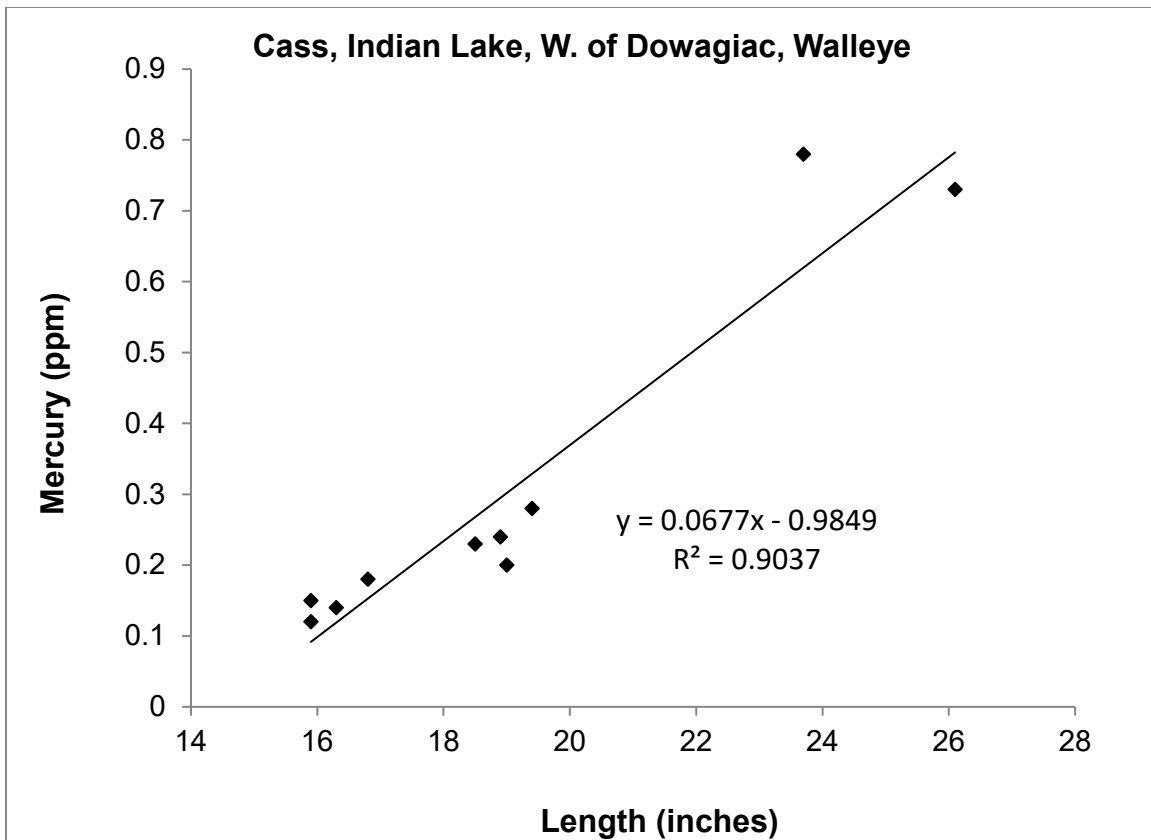
Organics Analysis:

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		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	NA		--	--	--	--
DDT	0	NA		--	--	--	--
Chlordane	0	NA		--	--	--	--
Toxaphene	0	NA		--	--	--	--
TEQ	0	NA		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
TEQ	--	--					
Final meal category based on UCL:							2

Existing Advisory: Indian Lake walleye are covered under the statewide mercury consumption advisory: No one should eat more than 2 meals per month of walleye smaller than 20 inches or more than 1 meal per month of walleye larger than 20 inches.

Recommendation: No one should eat more than 2 meals per month of Indian Lake walleye smaller than 22 inches or more than 1 meal per month of those fish larger than 22 inches due to mercury.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
14	0.1	8
16	0.14	4
18	0.2	4
20	0.29	2
22	0.42	2
24	0.61	1
26	0.88	1
28	1.27	0.5
Shaded area denotes extrapolated estimates		



Chippewa River Isabella and Midland Counties

Carp**Chippewa River****Isabella and Midland
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	2015	14	17.5	na	17.5	30.5	
Datasets available: 1985, 1997, 2015							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	14	0.33		0.14	0.59	0.41	2
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.005	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	
2015	2015	6	21.3	na	21.3	28.4	
Datasets available: 1985, 1997, 2015							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	6	0.56		0.004	2.66	1.66	Limited
DDT	6	0.07		0.006	0.27	0.18	8
Chlordane	6	0.02		0.005	0.02	0.02	--
Toxaphene	6	ND		--	--	--	--
TEQ*	6	13 ppt		0.6 ppt	59 ppt	37 ppt	Limited
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.487	0.873					
DDT	0.562	0.855					
Chlordane	0.102	0.159					
Toxaphene	--	--					
TEQ*	0.478	0.791					
Final meal category based on UCL:							Limited

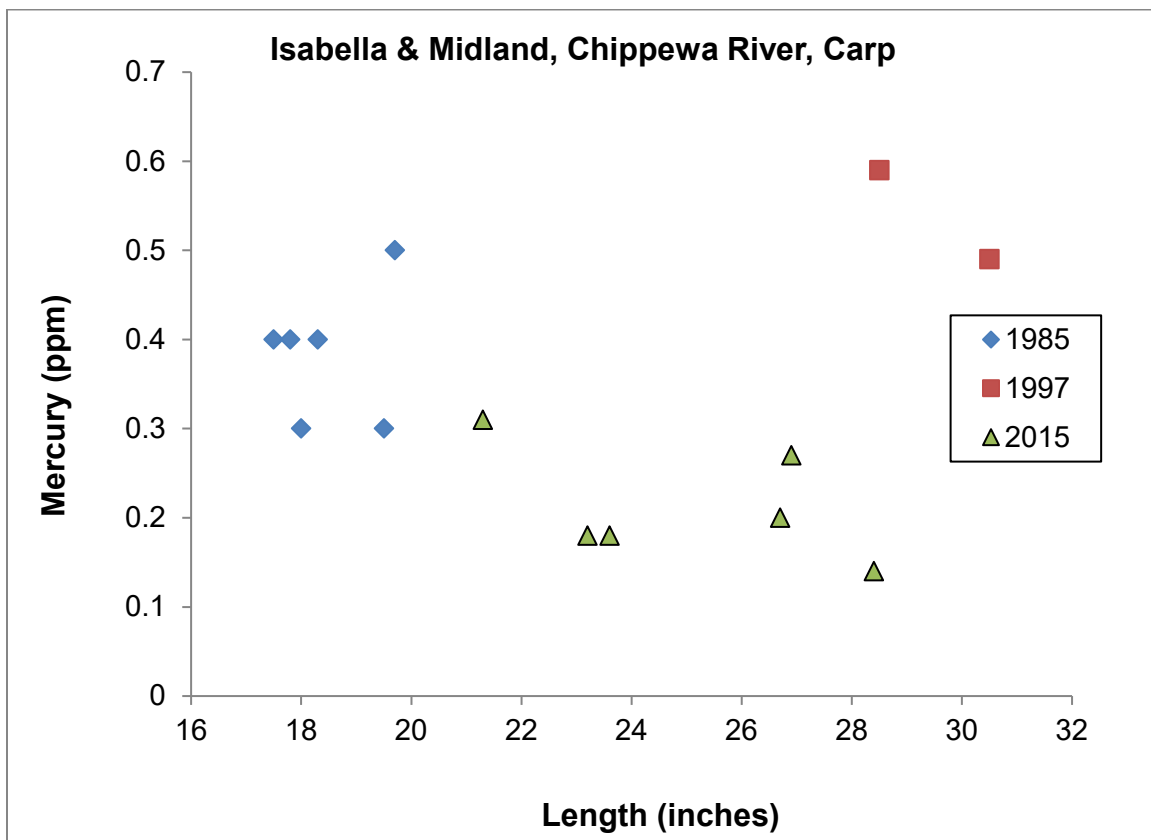
*2005 WHO TEFs; dl-PCBs included

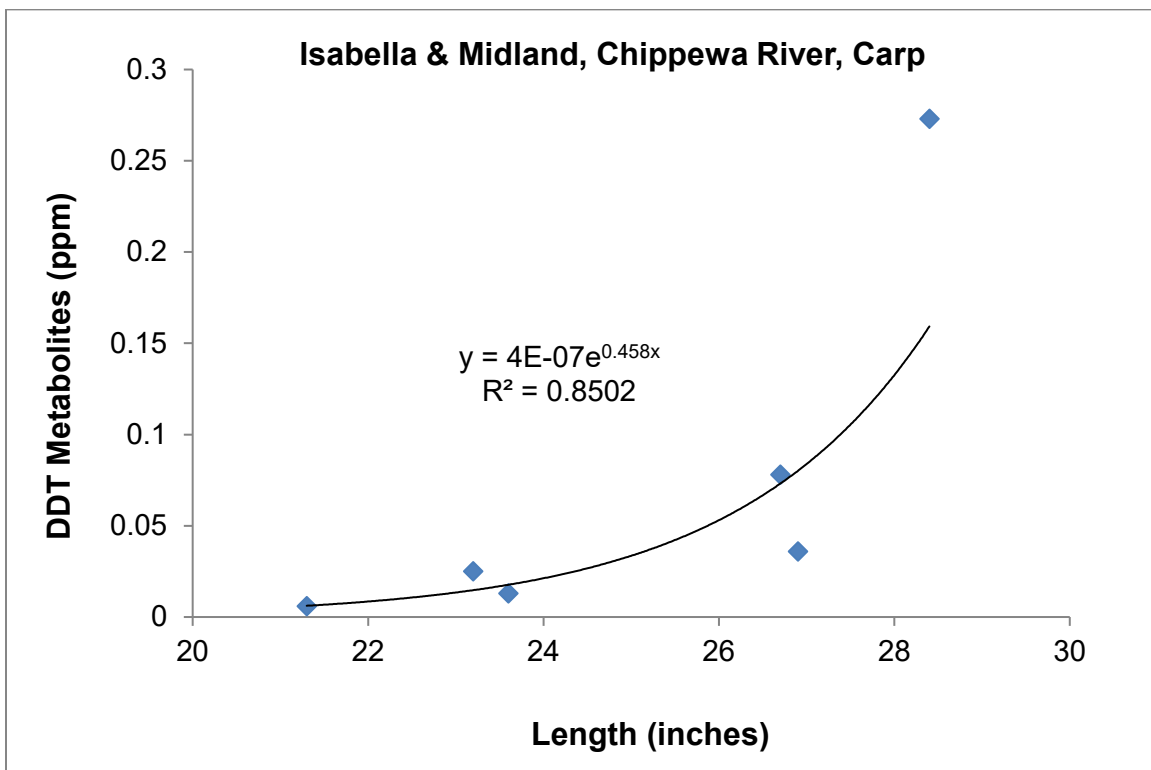
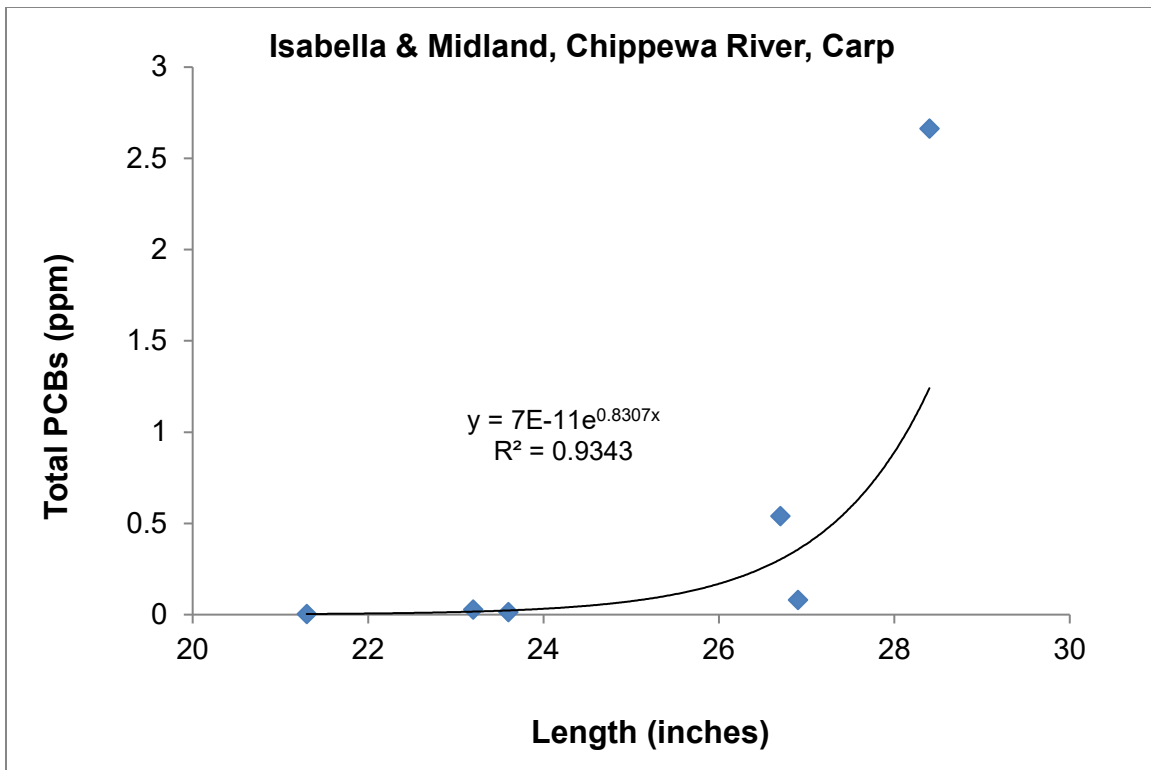
Existing Advisory: No one should eat more than 2 meals per month of Chippewa River carp due to mercury.

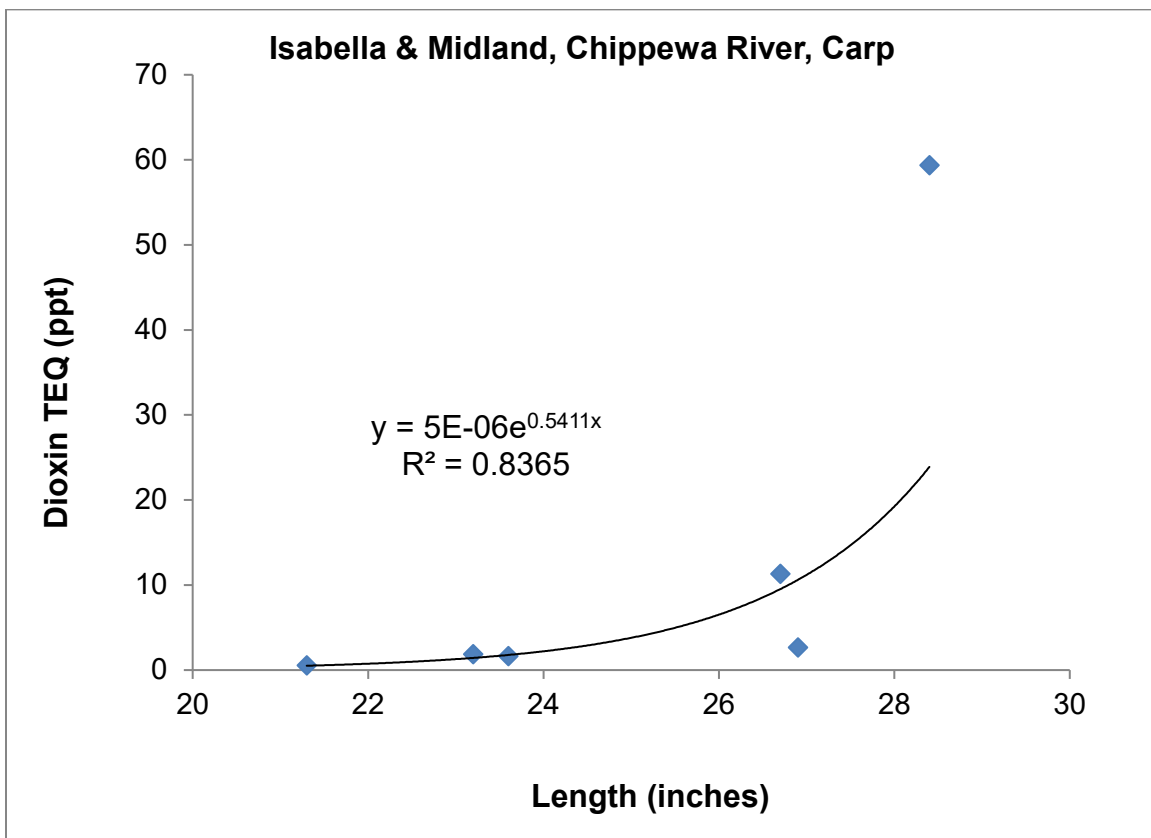
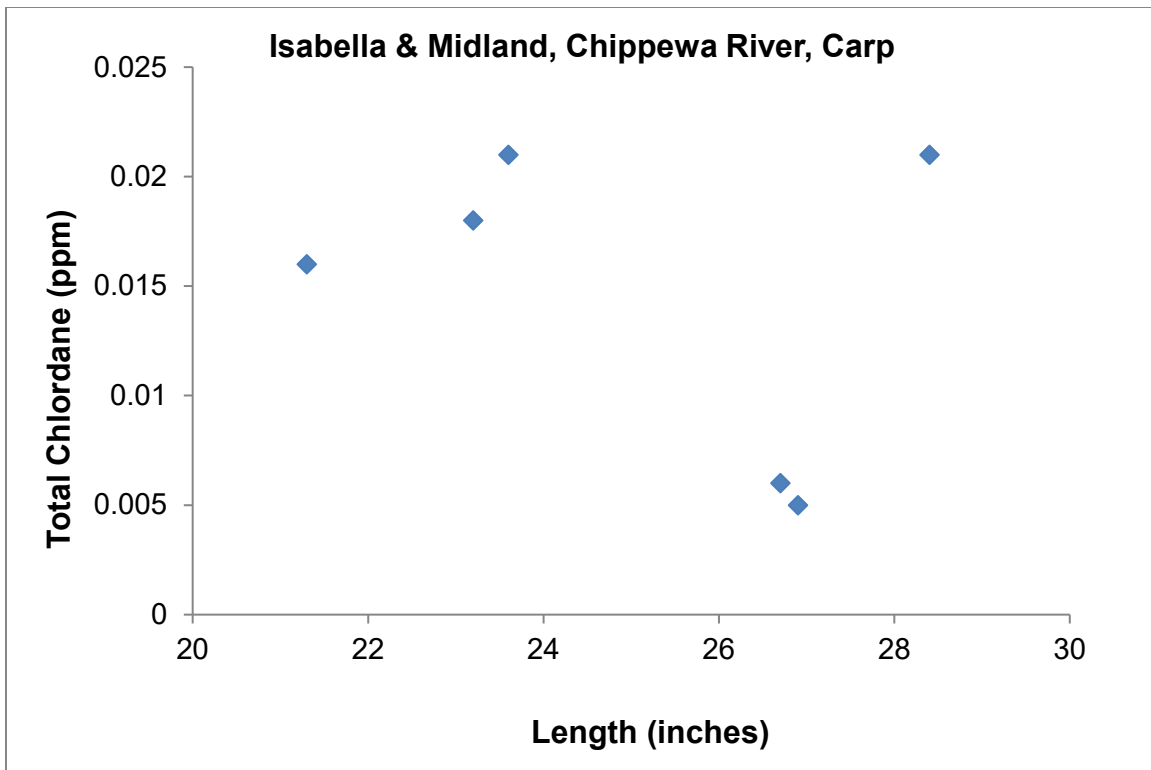
Recommendation: Sensitive populations should not eat these fish. Healthy adults should not eat more than 1 or 2 meals per year of Chippewa River carp due to PCBs and dioxins. Mercury and DDT would cause advisories.

Note: Additional carp samples from the Chippewa River near or downstream of Mt. Pleasant should be analyzed to better characterize contamination levels. Smaller carp (less than 24 inches) may not need such restrictive guidelines, and the small sample size represented here does not provide confidence in the length/concentration regressions. Sampling is planned for 2016.

Length (Inches)	PCB Regression Equation Estimate (ppm)	Meal Category	DDT Regression Equation Estimate (ppm)	Meal Category	TEQ Regression Equation Estimate (ppt)	Meal Category
20	0	16	0	16	0.25	16
22	0.01	16	0.01	16	0.74	8
24	0.03	8	0.02	16	2.18	2
26	0.17	1	0.06	16	6.44	1
28	0.88	Limited	0.15	12	19.01	Limited
30	4.66	DNE	0.37	4	56.09	Limited
<i>Shaded area denotes extrapolated estimates</i>						







Rock Bass**Chippewa River
Mt. Pleasant****Isabella 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	2018	48	4.5	na	4.5	9.3	
Datasets available: 2015, 2016, 2018							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	48	0.15		0.08	0.35	0.16	4
Chemical	Linear Regression	Exponential Regression					
	R²	R²					
Mercury	0.547	0.524					

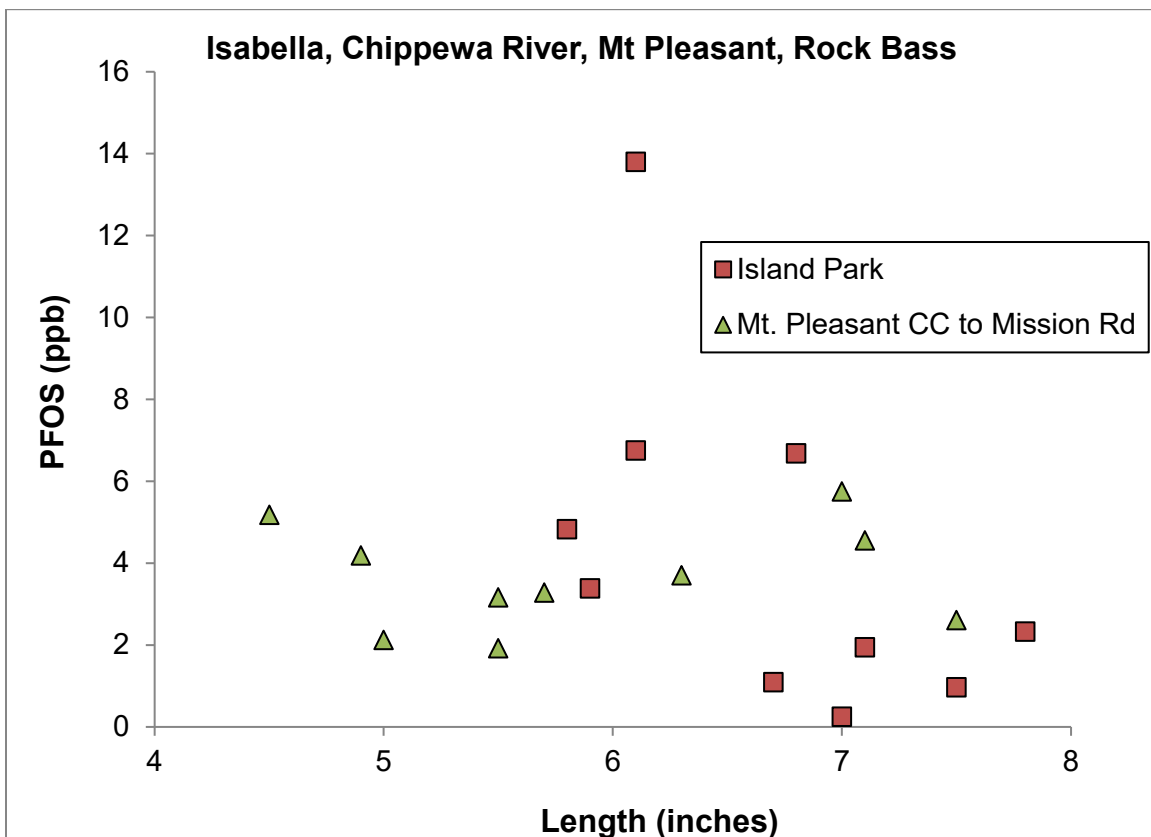
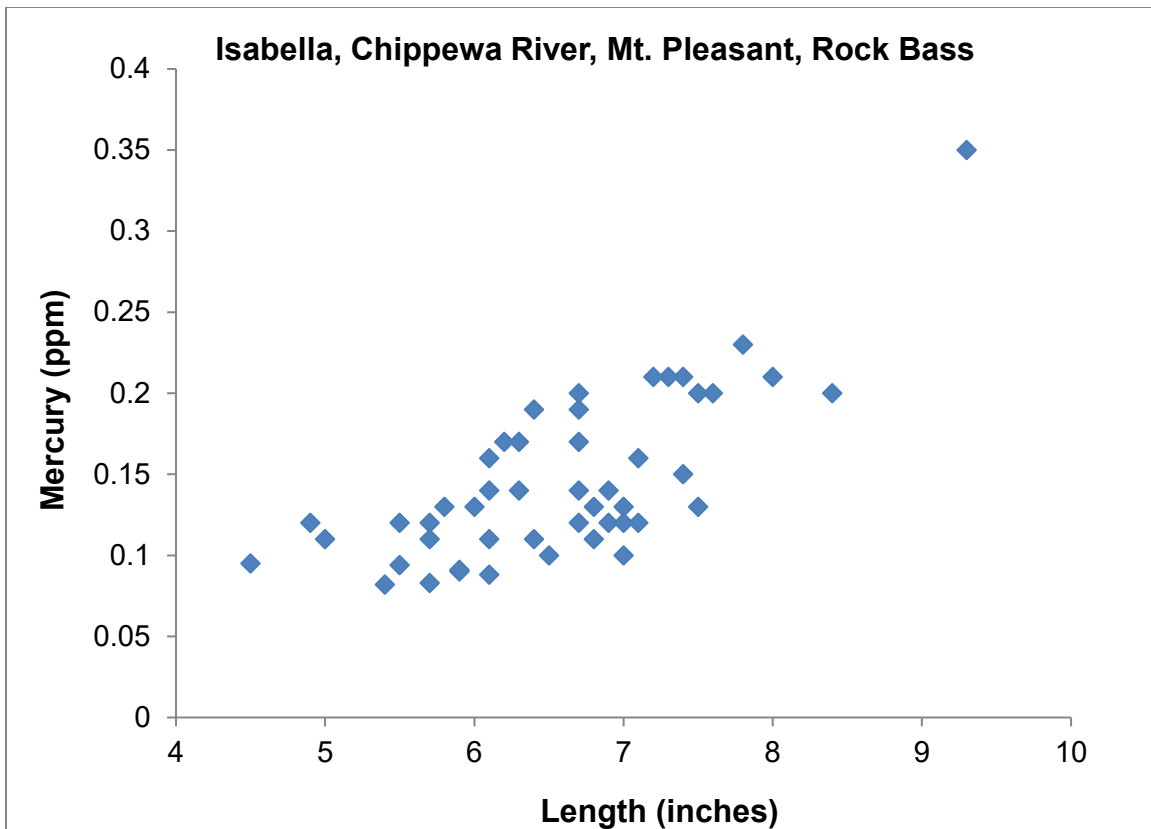
Organics Analysis:

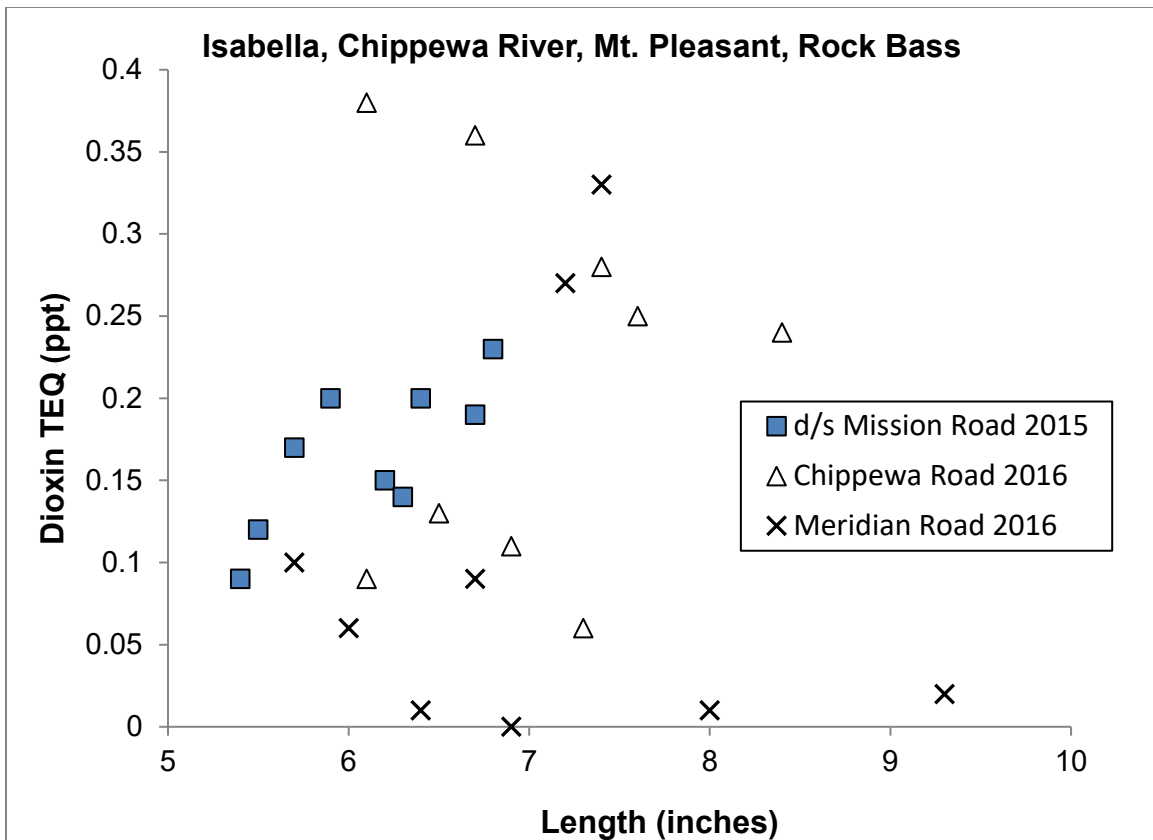
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2015	2018	48	4.5	na	4.5	9.3	
Datasets available: 2015, 2016, 2018							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	24	ND		< 0.001	< 0.001	--	16
DDT	24	ND		< 0.001	< 0.001	--	16
Chlordane	24	ND		< 0.001	< 0.001	--	--
Toxaphene	24	ND		< 0.05	< 0.05	--	--
TEQ*	27	0.2 ppt		0.01 ppt	0.4 ppt	0.22 ppt	16
PFOS	20	4 ppb		< 0.25 ppb	14 ppb	5 ppb	16
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
TEQ*	0.037	0.040					
PFOS	0.037	0.094					
Final meal category based on UCL:							4

* - 2005 WHO TEFs; dl-PCBs included

Existing MDHHS Advisory: No one should eat more than 4 meals per month of rock bass less than 8 inches from the Chippewa River downstream of the Lake Isabella Dam or more than 2 meals per month of those fish larger than 8 inches due to mercury.

Recommendation: No change to the advisory is recommended. Length break based on 2015 & 2016 results; addition of 2018 data reduced regression significance.





**Redhorse and
White Sucker**
Hg Analysis:

Chippewa River

**Isabella and Midland
Counties**

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2015	2016	33	8.9	na	8.9	17.4	
Datasets available: 2000, 2015, 2016							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	33	0.20		0.05	0.51	0.24	4
Chemical	Linear Regression	Exponential Regression					
	R²	R²					
Mercury	0.563	0.615					

Organics Analysis:

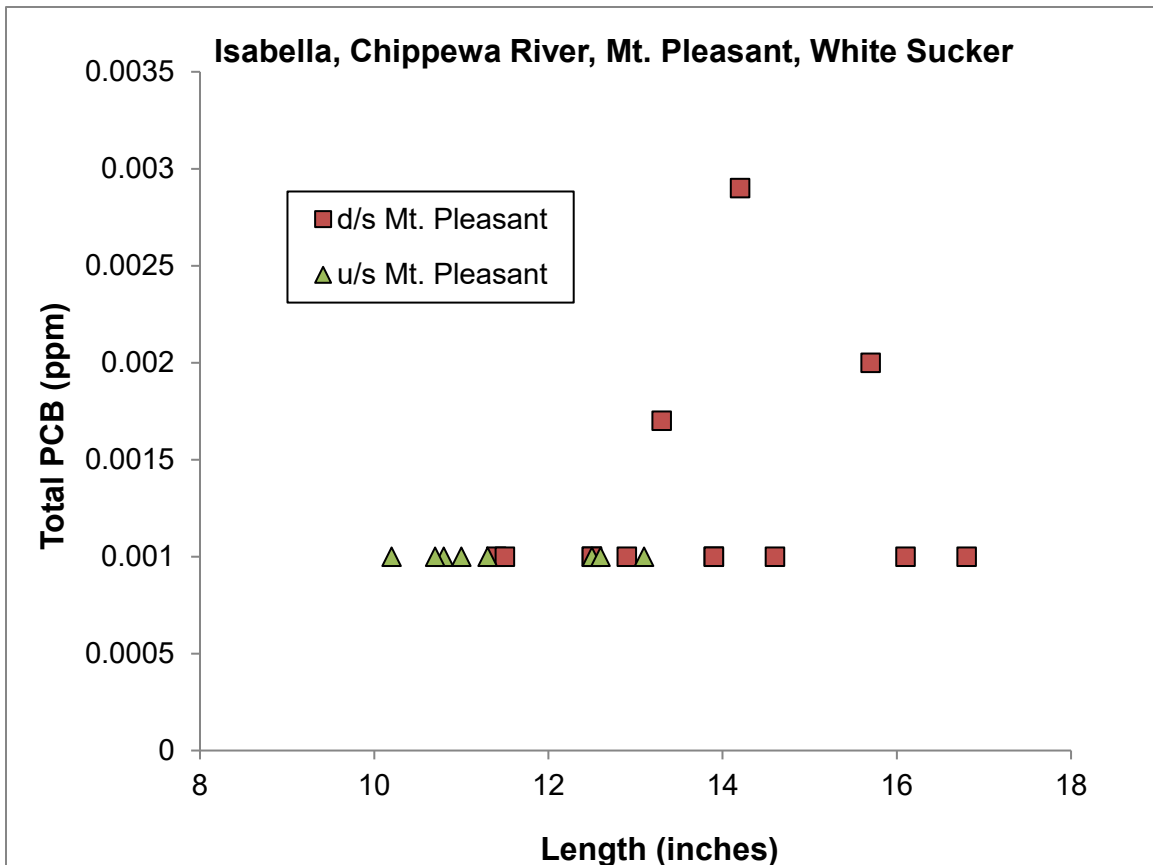
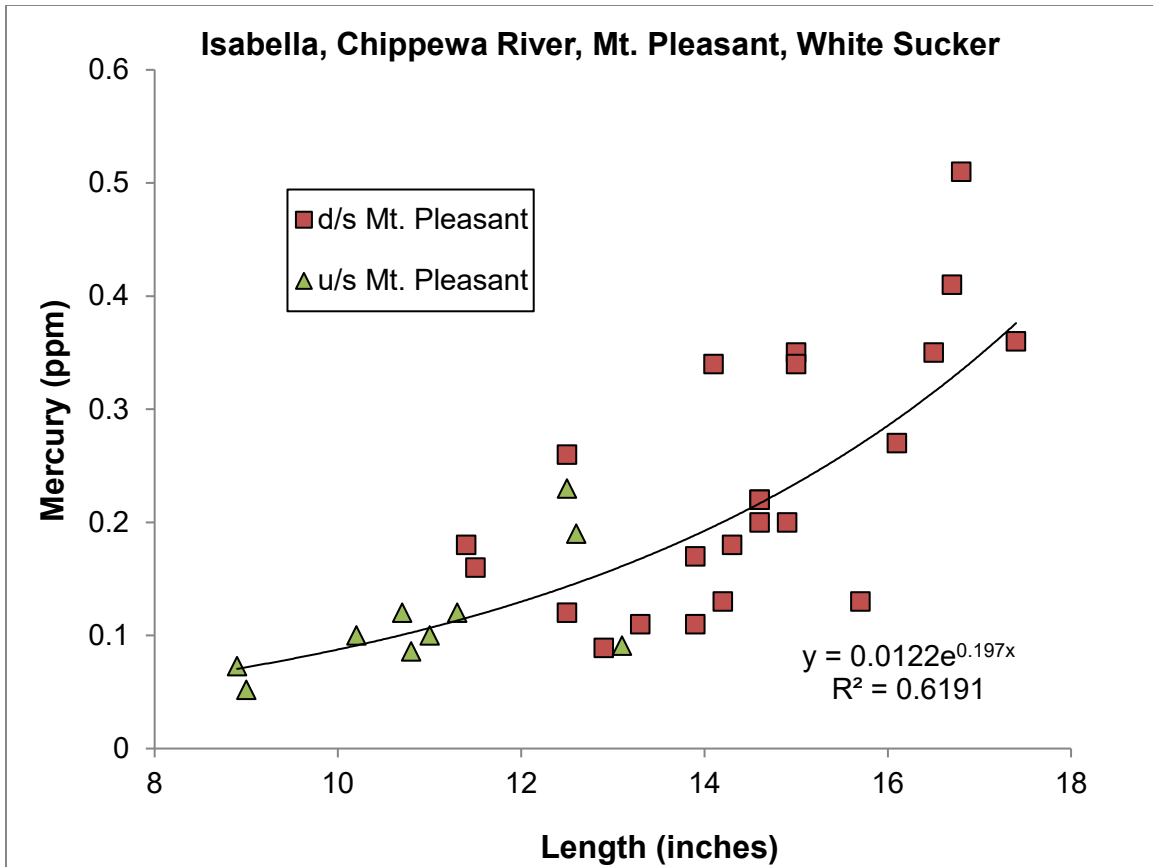
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2015	2016	21	10.2	na	10.2	16.8	
Datasets available: 1984, 2000, 2015, 2016							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	21	0.001		< 0.001	0.003	0.001	16
DDT	21	0.002		< 0.001	0.004	0.002	16
Chlordane	21	ND		< 0.001	< 0.001	--	--
Toxaphene	21	ND		< 0.05	< 0.05	--	--
TEQ*	23	0.24 ppt		0.02 ppt	1.11 ppt	0.34 ppt	16
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.098	0.108					
DDT	0.184	0.168					
Chlordane	--	--					
Toxaphene	--	--					
TEQ*	0.028	0.157					
Final meal category based on UCL:							4

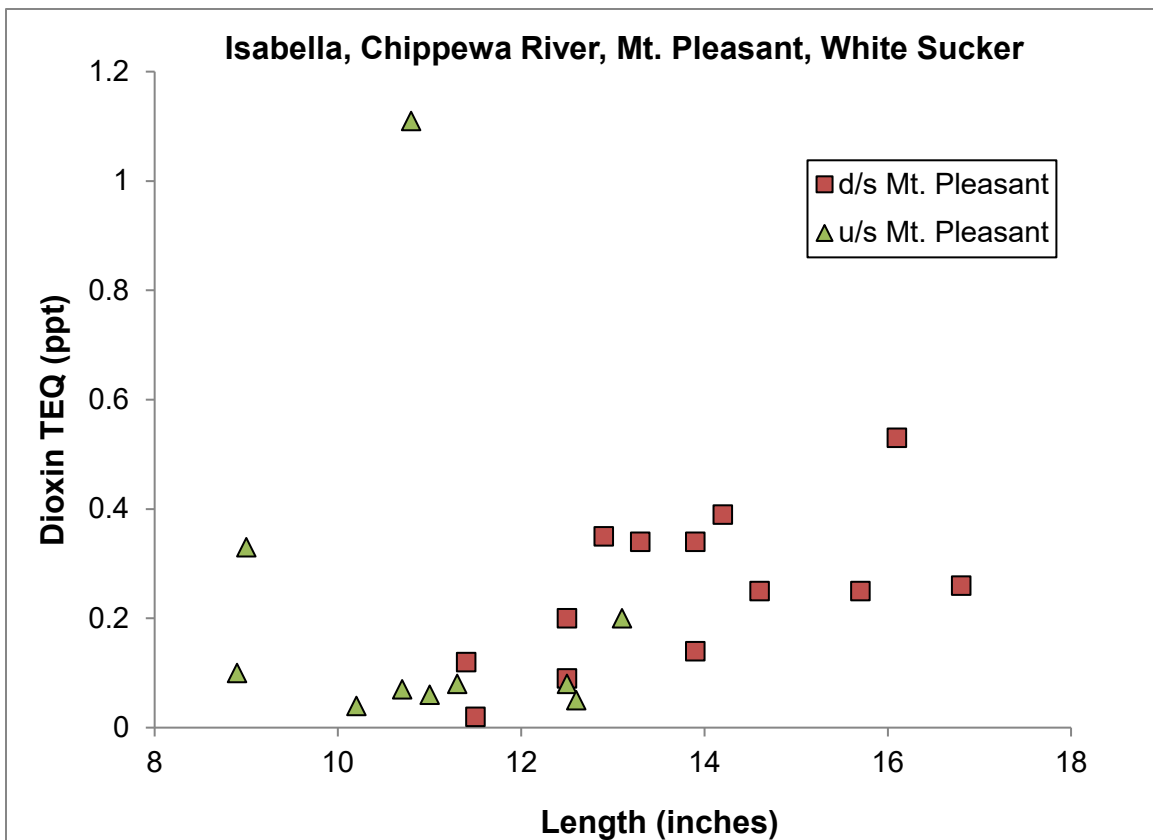
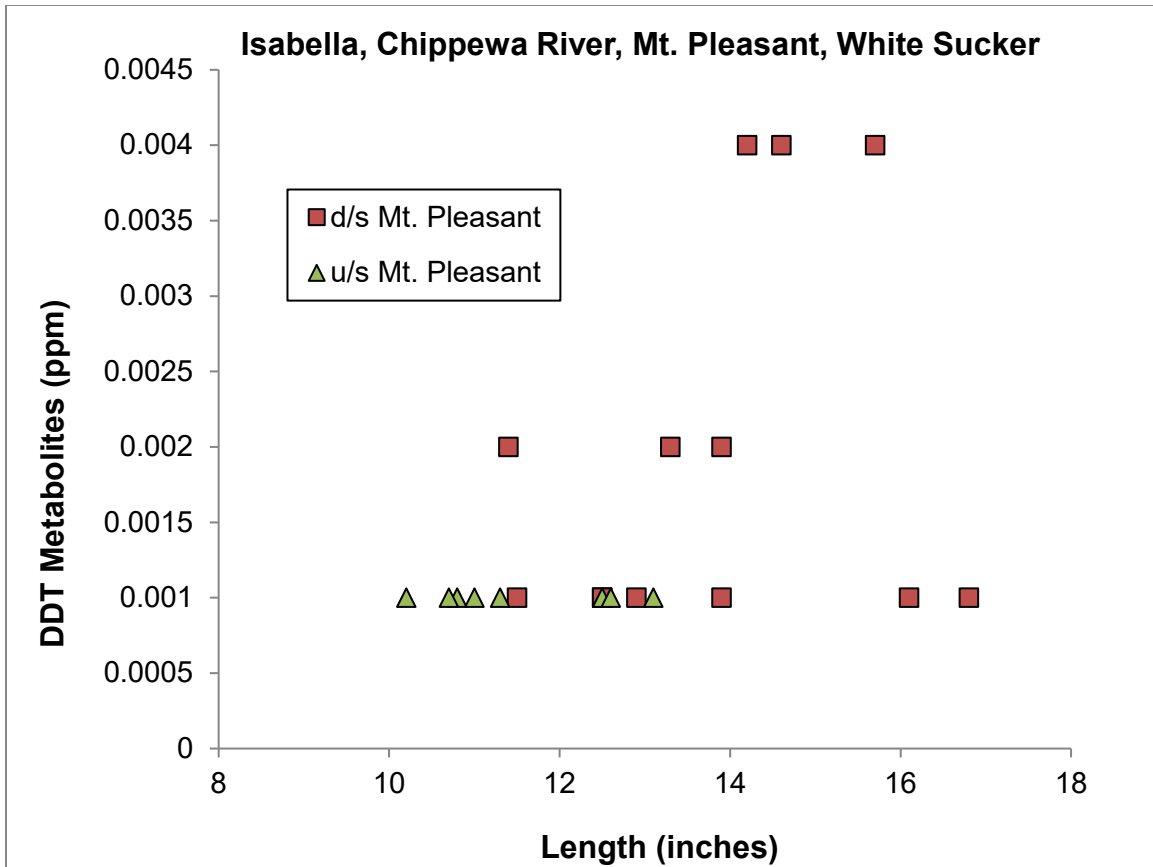
* 2005 WHO TEFs; dl-PCBs included

Existing MDHHS Advisory: No one should eat more than 4 meals per month of suckers from the Chippewa River downstream of Lake Isabella less than 13 inches or more than 2 meals per month of suckers larger than 13 inches due to mercury.

Recommendation: No change is recommended.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
8	0.06	16
10	0.09	12
12	0.13	8
14	0.19	4
16	0.29	2
18	0.42	2
20	0.63	1
<i>Shaded area denotes extrapolated estimates</i>		





Carp**Chippewa River
u/s Lake Isabella****Isabella 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	
1997	1997	2	28.5	NA	28.5	30.5	
Datasets available: 1997							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	2	0.540		0.49	0.59	--	--
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	
1997	1997	2	28.5	NA	28.5	30.5	
Datasets available: 1997							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	2	0.071		0.06	0.08	--	--
DDT	2	0.081		0.04	0.13	--	--
Chlordane	2	0.009		0.008	0.01	--	--
Toxaphene	2	ND		--	--	--	--
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 for Chippewa River carp.

Recommendation: There are insufficient data available to develop specific advice for carp from the Chippewa River upstream of Lake Isabella. The statewide consumption guidelines recommend that no one eat more than 2 meals per month of carp from any river or inland lake.

Rock Bass

Chippewa River u/s Lake Isabella

Isabella 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	
1997	1997	10	6.8	NA	6.8	10.1	
Datasets available: 1997							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.21		0.13	0.39	0.28	2
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.776	0.677					

Organics Analysis:

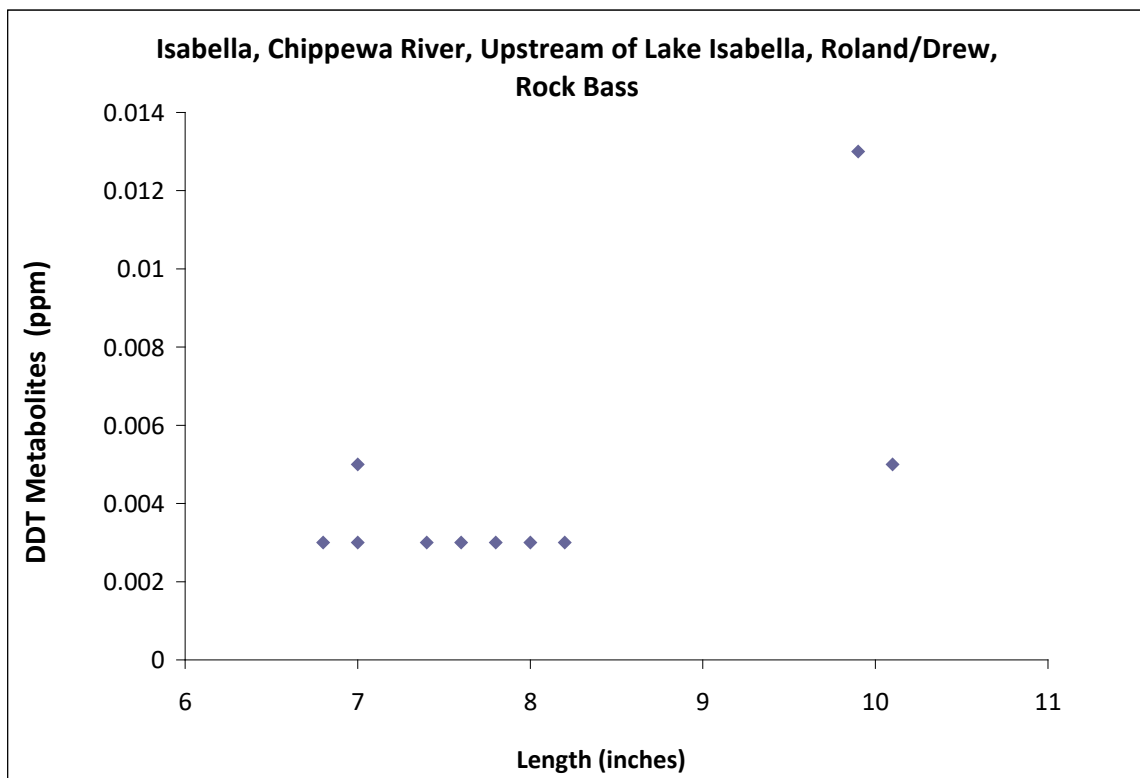
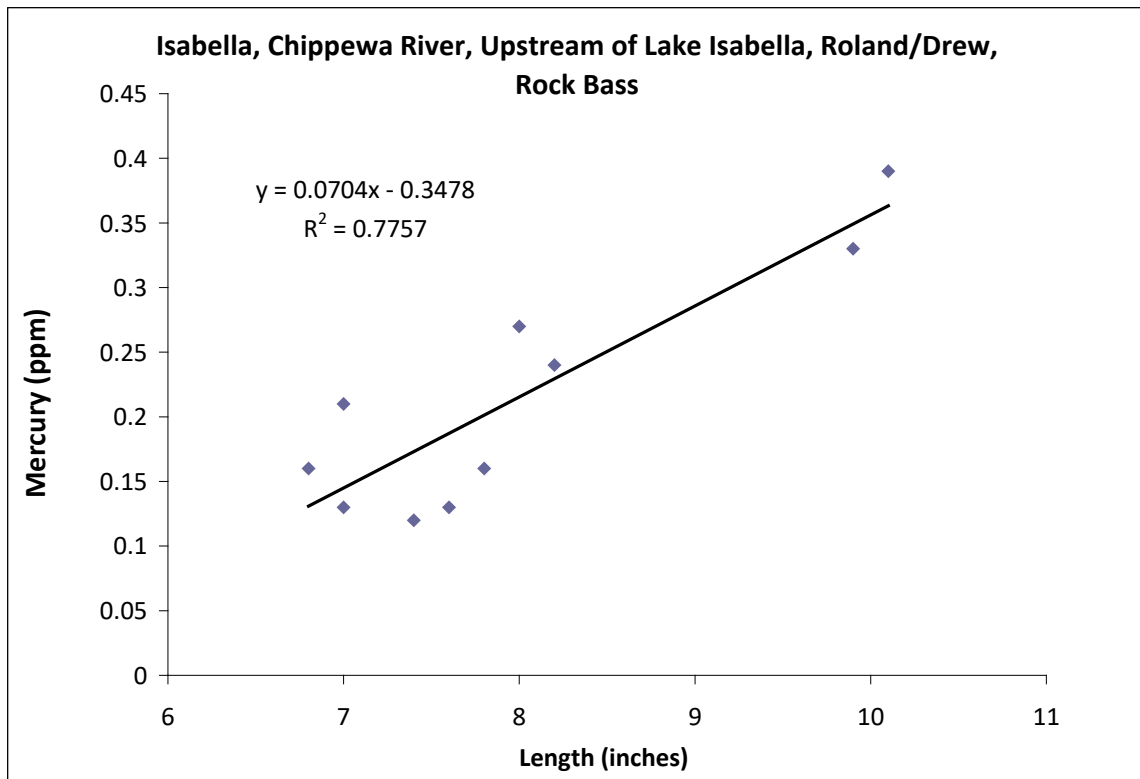
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1997	1997	10	6.8	NA	6.8	10.1	
Datasets available: 1997							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	ND		--	--	--	--
DDT	10	0.004		0.003	0.013	0.010	16
Chlordane	10	ND		--	--	--	--
Toxaphene	10	ND		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	0.433	0.466					
Chlordane	--	--					
Toxaphene	--	--					
Final meal category based on UCL:							2

Existing Advisory: Chippewa River rock bass are not covered by a consumption advisory.

Recommendation: No one should eat more than 4 meals per month of rock bass less than 8 inches from the Chippewa River upstream of Lake Isabella or more than 2 meals per month of those fish greater than 8 inches due to mercury.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
5	0.004	16
6	0.075	12
7	0.145	4
8	0.215	4
9	0.286	2
10	0.356	2
11	0.427	2
12	0.497	2
13	0.567	1
Shaded area denotes extrapolated estimates		



White Sucker

Chippewa River u/s Lake Isabella

Isabella 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	
1997	1997	10	11	NA	11	14.2	
Datasets available:		1997					
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.20		0.13	0.39	0.28	2
Chemical	Linear Regression	Exponential Regression					
	R²	R²					
Mercury	0.686	0.720					

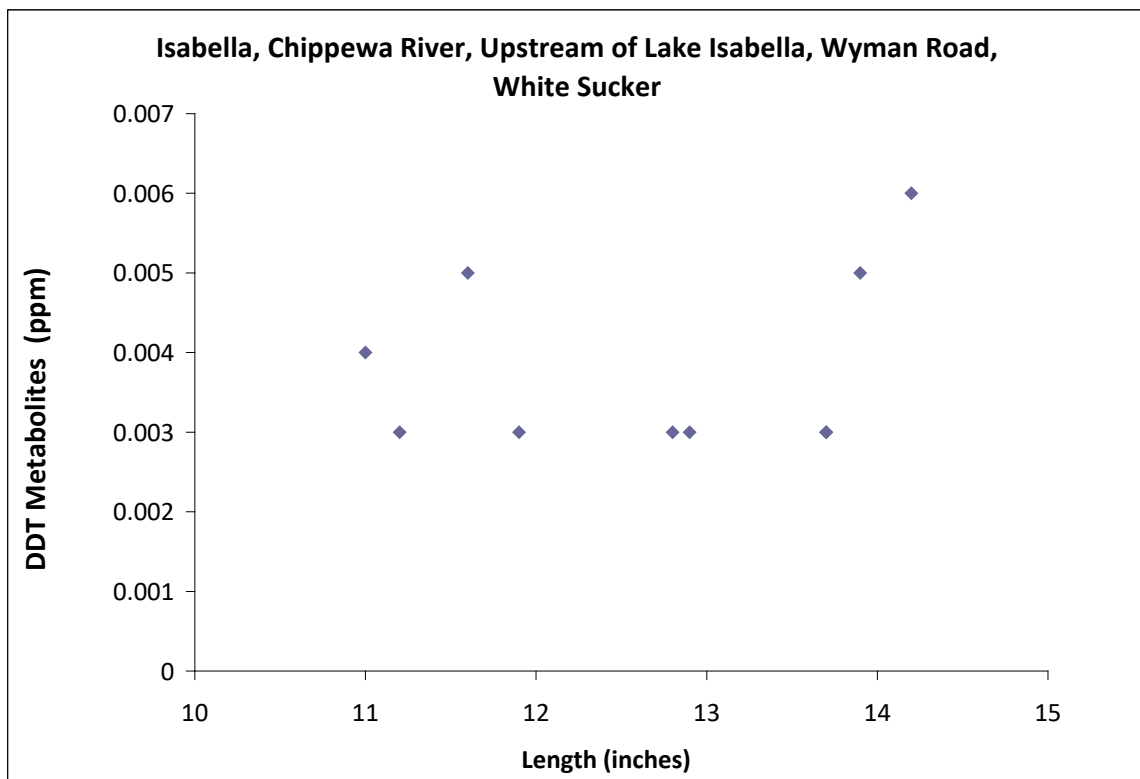
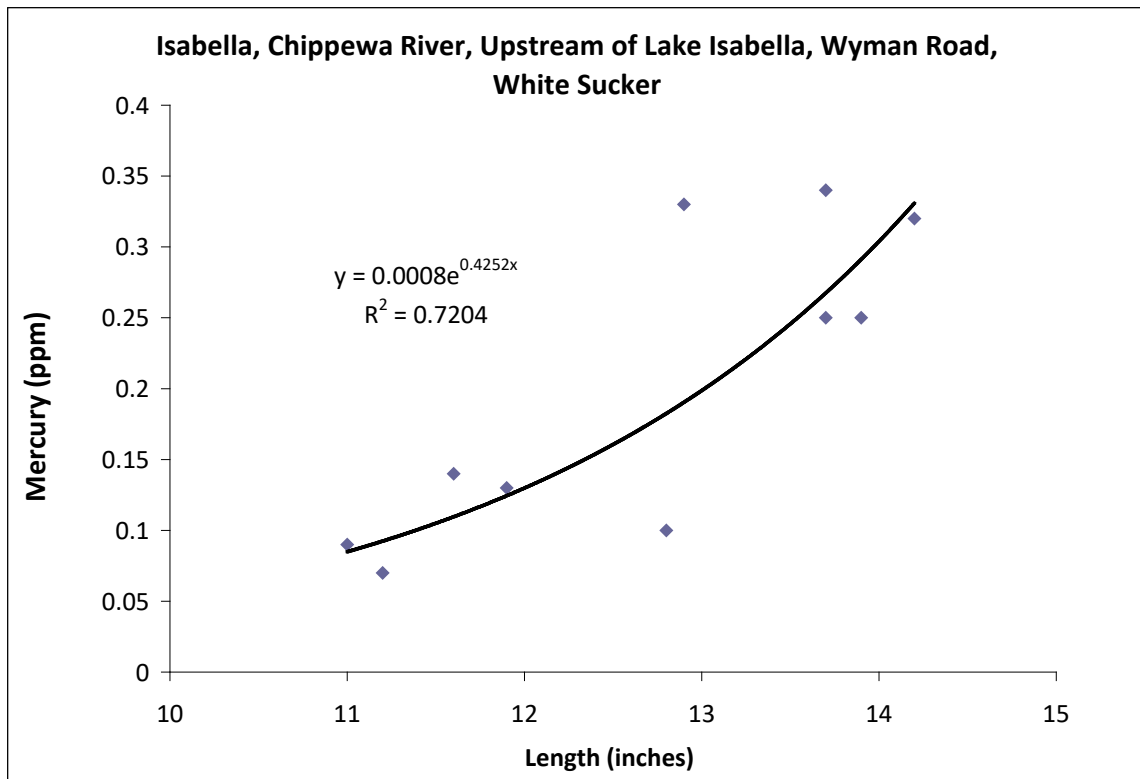
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1997	1997	10	11	NA	11	14.2	
Datasets available: 1997							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	ND		--	--	--	--
DDT	10	0.004		0.003	0.013	0.005	16
Chlordane	10	ND		--	--	--	--
Toxaphene	10	ND		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	0.064	0.044					
Chlordane	--	--					
Toxaphene	--	--					
Final meal category based on UCL:							2

Existing Advisory: There are no current consumption advisories for Chippewa River white sucker.

Recommendation: No one should eat more than 4 meals per month of sucker smaller than 13 inches from the Chippewa River upstream of Lake Isabella or more than 2 meals per month of those fish larger than 13 inches due to mercury.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
10	0.056	16
11	0.086	12
12	0.132	4
13	0.201	4
14	0.308	2
15	0.471	2
16	0.721	1
17	1.102	0.5
18	1.687	0.5
Shaded area denotes extrapolated estimates		



Clinton County

Black Crappie

Lake Ovid

Clinton 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	1	8.7	NA	8.7	8.7	
Datasets available: 1989							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	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		
Earliest	Most Recent				Min	Max	
1989	1989	1	8.7	NA	8.7	8.7	
Datasets available: 1989							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	1	ND		--	--	--	--
DDT	1	ND		--	--	--	--
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:							--

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

Recommendation: There are insufficient data available to develop specific advice for Lake Ovid crappie. The statewide consumption guidelines recommend that no one eat more than 4 meals per month of crappie from inland waters.

**Bullhead
Black & Yellow
Hg Analysis:**

Lake Ovid

Clinton County

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	10	NA	10	14.4	
Datasets available: 1989							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.071		0.030	0.160	0.100	8
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.202	0.315					

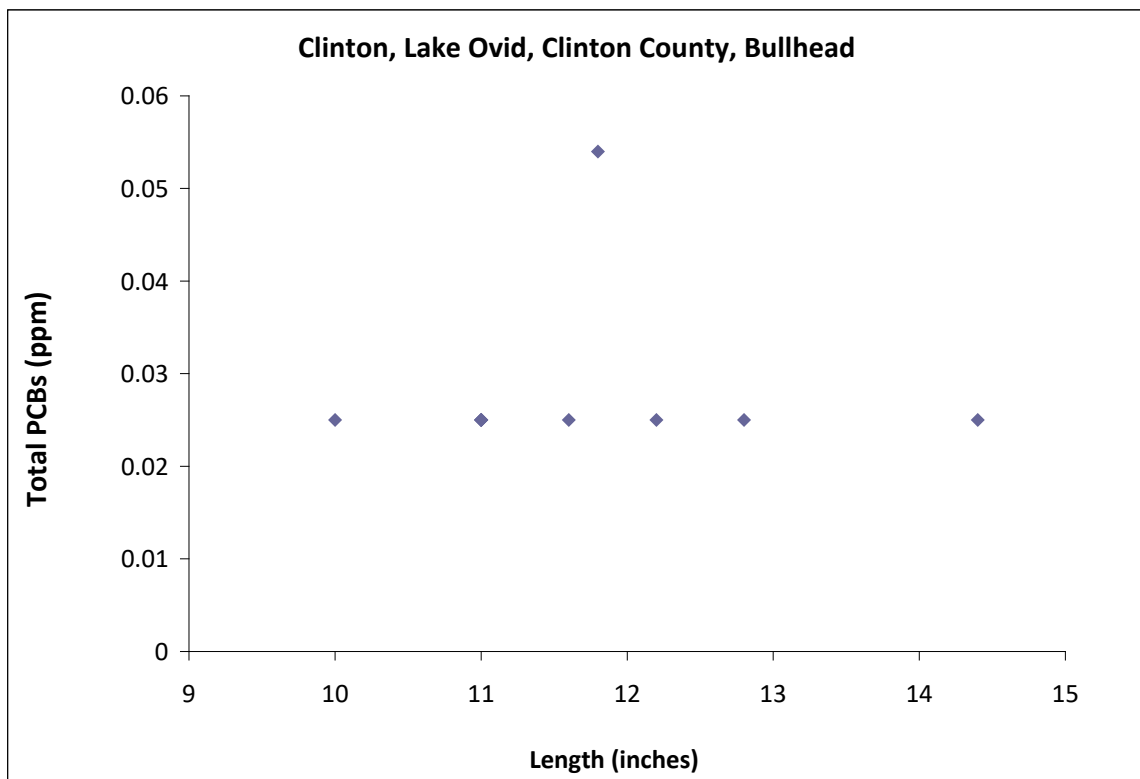
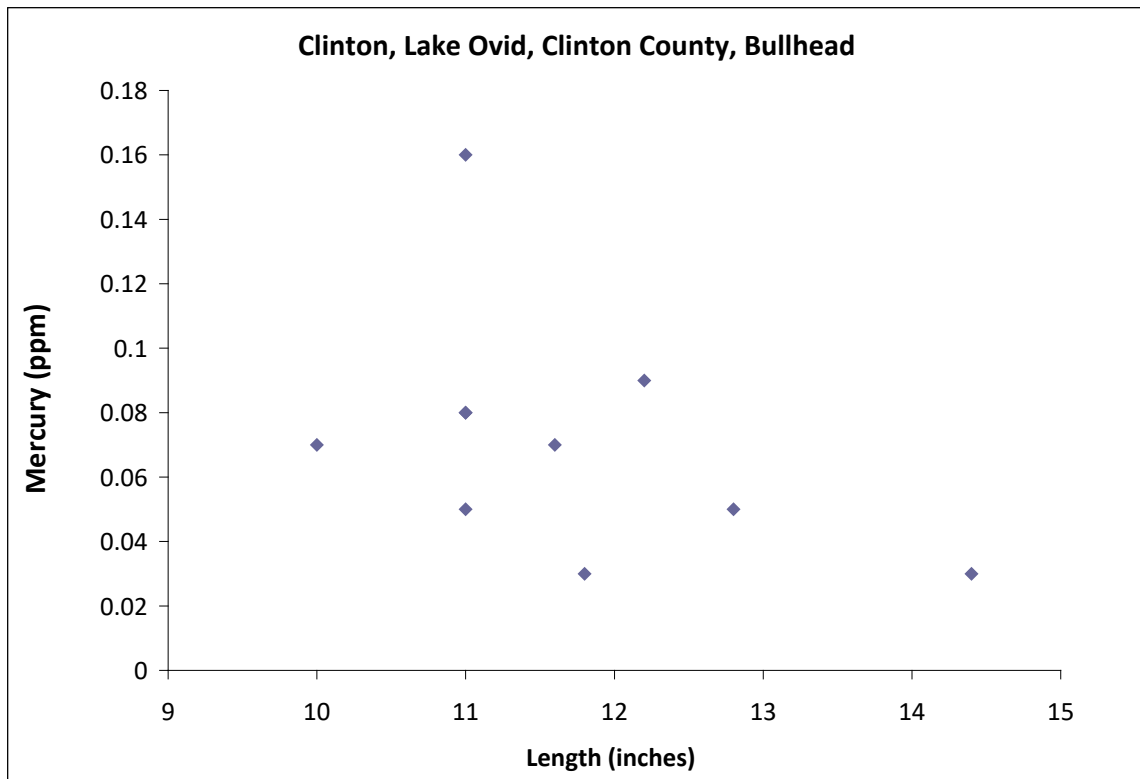
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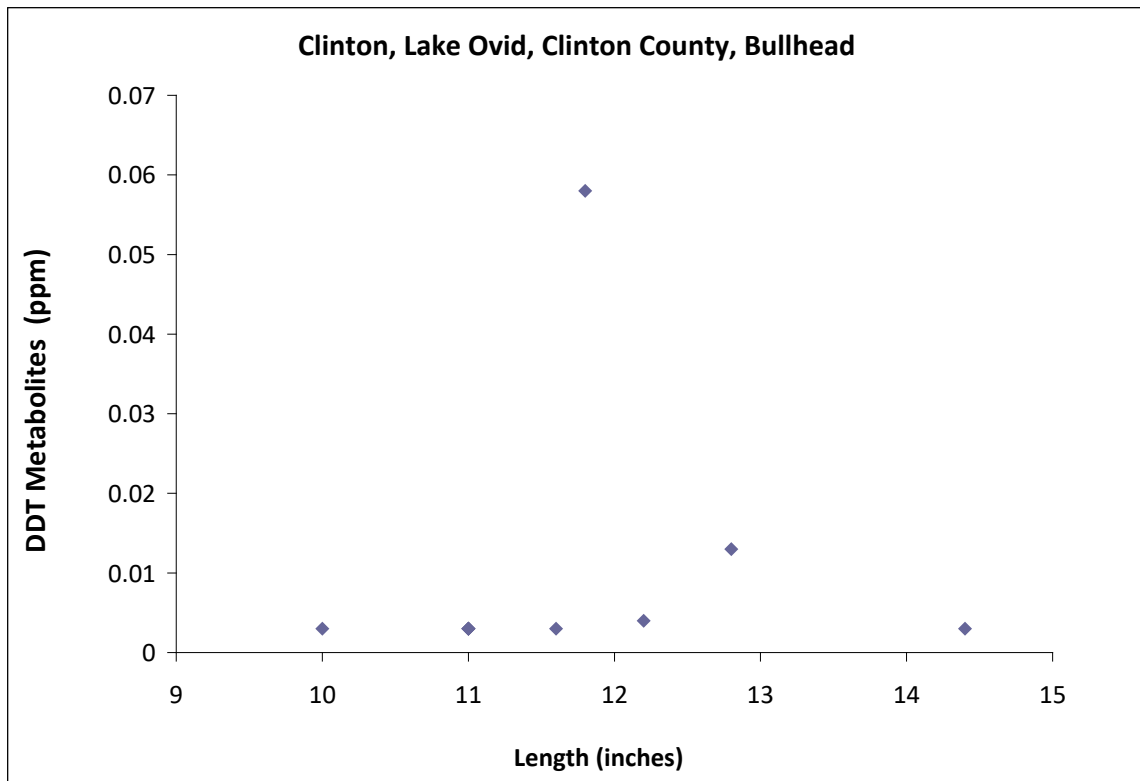
Organics Analysis:

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	10	NA	10	14.4	
Datasets available: 1989							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.028		0.0250	0.054	0.030	8
DDT	10	0.010		0.003	0.058	0.020	16
Chlordane	10	ND		--	--	--	--
Toxaphene	10	ND		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.001	0.001					
DDT	0.009	0.039					
Chlordane	--	--					
Toxaphene	--	--					
Final meal category based on UCL:							8

Existing Advisory: There are no current consumption advisories for Lake Ovid bullhead.

Recommendation: No one should eat more than 8 meals per month of Lake Ovid bullhead due to mercury. Based on EGLE's Fish Contaminant Monitoring Program, PCB and DDT concentrations ≥15 years old are expected to have declined to concentrations that allow a less restrictive meal category than determined by the standard evaluation method. PCBs would not be expected to cause an advisory.





Largemouth Bass

Lake Ovid

Clinton 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	2003	12	13.6	14	13.6	18.5	
Datasets available: 1989, 2003							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	12	0.413		0.280	0.740	0.490	2
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.691	0.753					

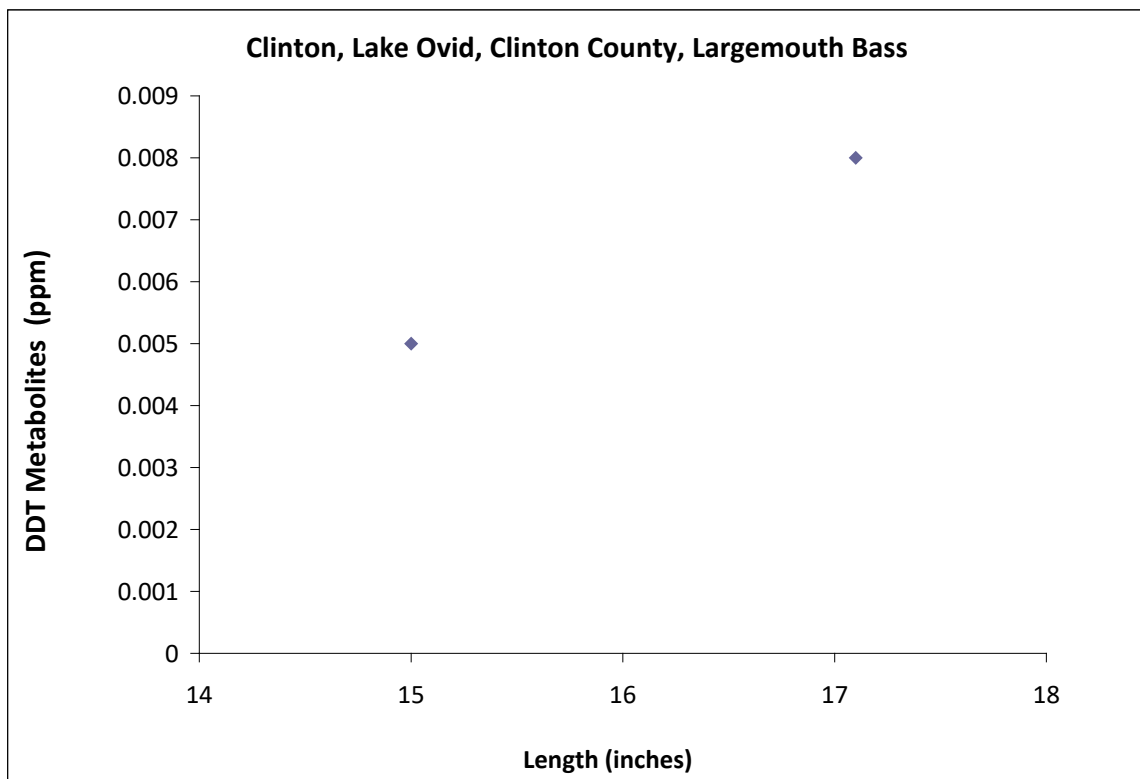
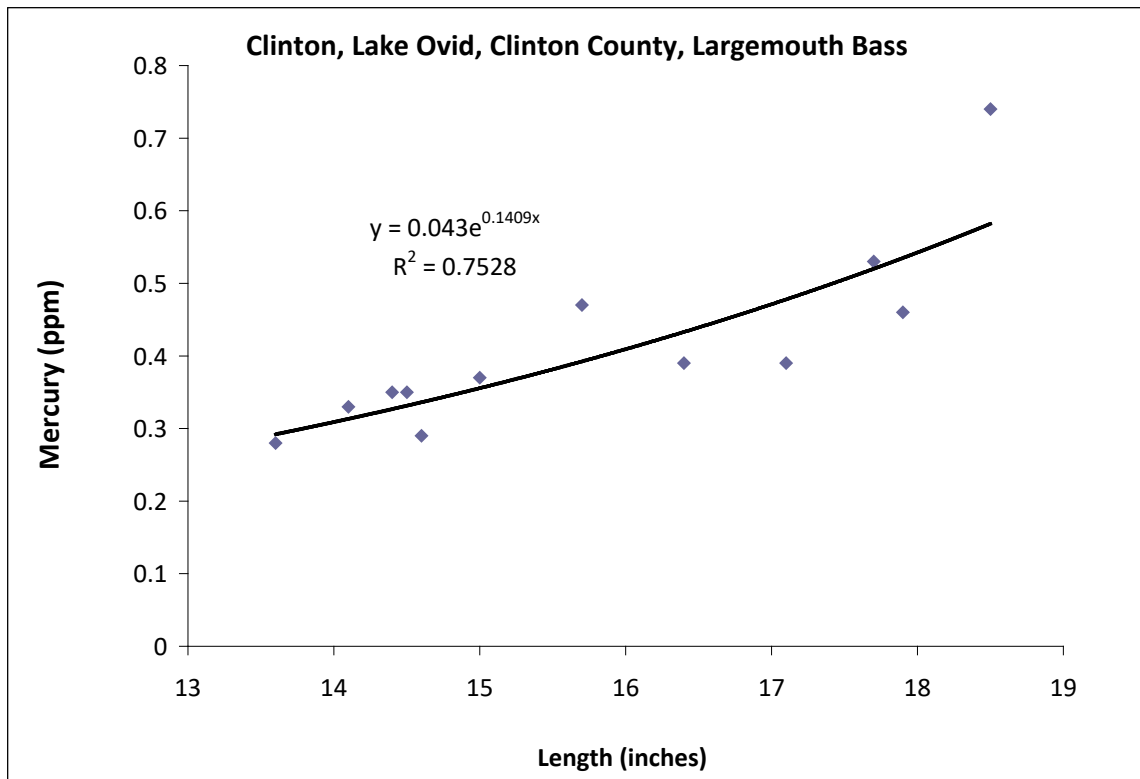
Organics Analysis:

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	2	15	14	15	17.1	
Datasets available: 1989							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	2	ND		--	--	--	--
DDT	2	0.007		--	--	--	--
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:							2

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

Recommendation: No one should eat more than 2 meals per month of legal size Lake Ovid largemouth or smallmouth bass under 18 inches or more than 1 meal per month of largemouth or smallmouth bass over 18 inches. Robust regression ($R^2 \approx 0.8$) supports using statewide length break.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
14	0.309	2
15	0.356	2
16	0.410	2
17	0.472	2
18	0.543	1
19	0.625	1
20	0.720	1
21	0.829	1
22	0.954	1
Shaded area denotes extrapolated estimates		



Northern Pike

Lake Ovid

Clinton County

Hg Analysis:

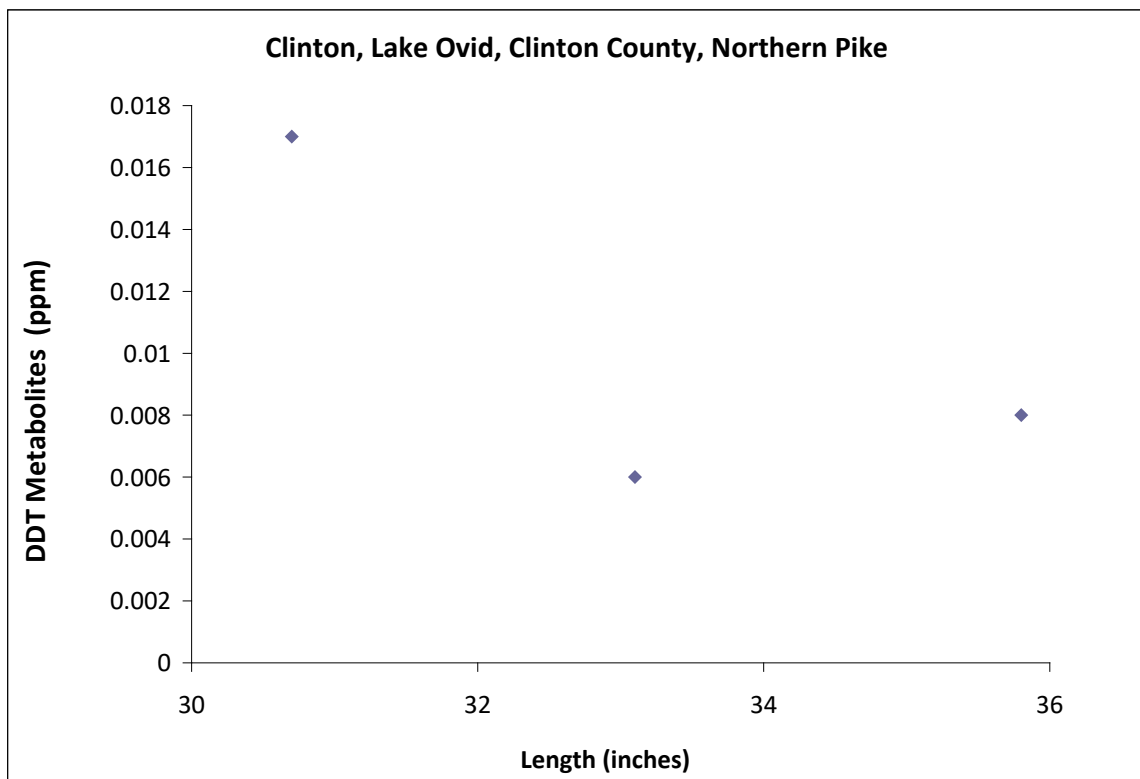
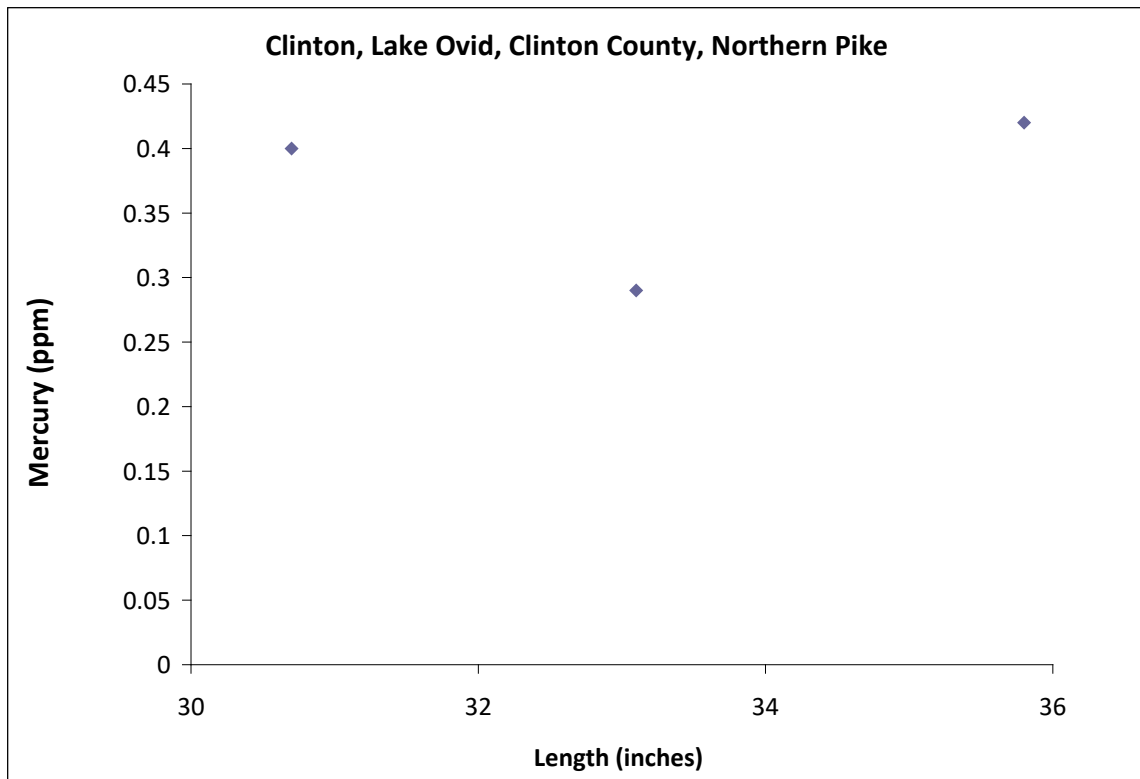
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1989	1989	3	30.7	24	30.7	35.8	
Datasets available: 1989							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	3	0.370		0.290	0.420	--	--
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	
1989	1989	3	30.7	24	30.7	35.8	
Datasets available: 1989							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	3	ND		--	--	--	--
DDT	3	0.010		--	--	--	--
Chlordane	3	ND		--	--	--	--
Toxaphene	3	ND		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
Final meal category based on UCL:							--

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

Recommendation: There are insufficient data available to develop specific advice for Lake Ovid northern pike. The statewide consumption guidelines recommend that no one eat more than 1 meal per month of northern pike over 30 inches or more than 2 meals per month of northern pike under 30 inches in length.



Tiger Muskellunge

Lake Ovid

Clinton County

Hg Analysis:

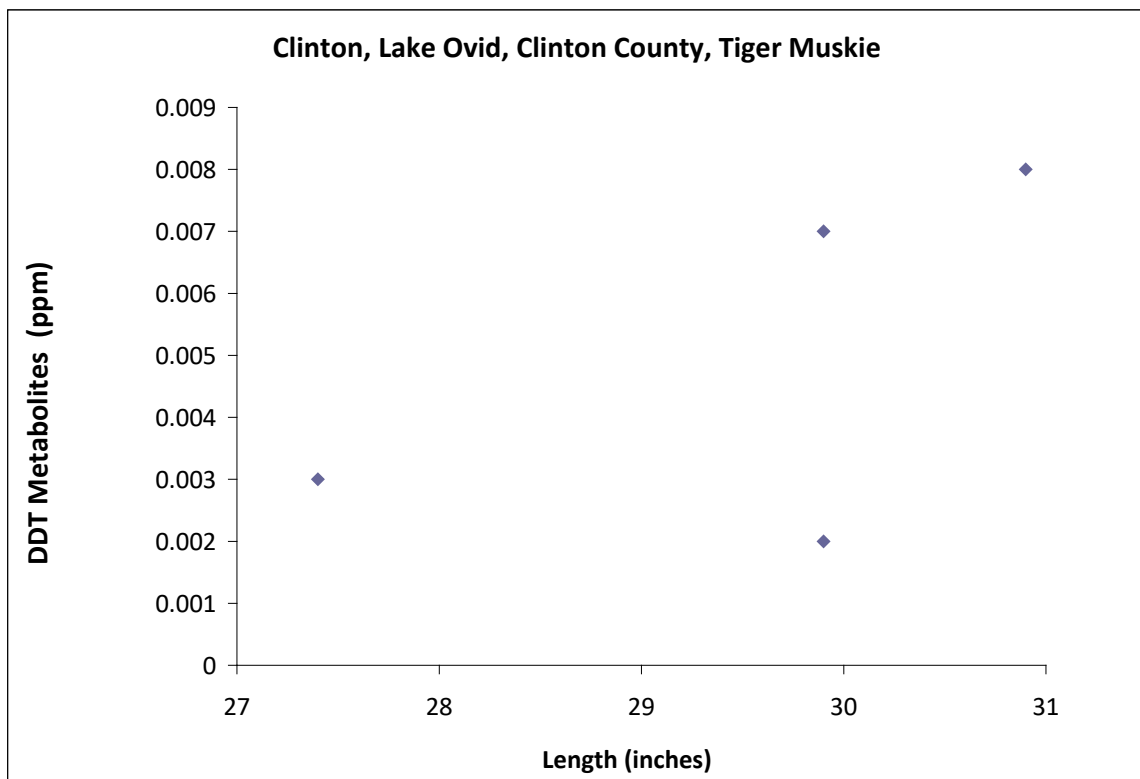
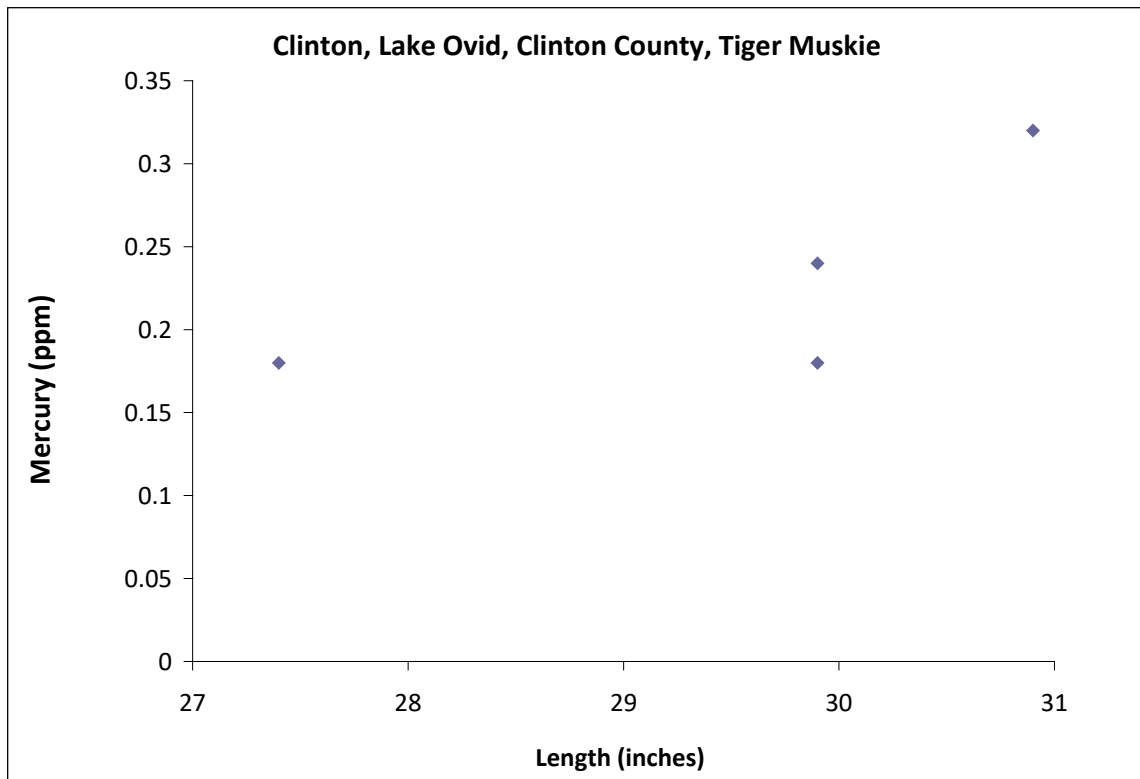
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Size Range of All Samples	
Earliest	Most Recent				Min	Max
1989	1989	4	27.4	42	27.4	30.9
Datasets available: 1989						
Chemical	Sample Size (All)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
Mercury	4	0.230		0.180	0.320	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.524	0.531				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Size Range of All Samples	
Earliest	Most Recent				Min	Max
1989	1989	4	27.4	42	27.4	30.9
Datasets available: 1989						
Chemical	Sample Size	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
PCB	4	ND		--	--	--
DDT	4	0.005		0.002	0.008	--
Chlordane	4	ND		--	--	--
Toxaphene	4	ND		--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	0.368	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						--

Existing Advisory: Lake Ovid tiger muskellunge are covered under the statewide mercury consumption advisory.

Recommendation: There are insufficient data available to develop specific advice for Lake Ovid muskellunge. The statewide consumption guidelines recommend that no one eat more than 1 meal per month of muskellunge.



Rock Bass

Looking Glass River Dewitt

Clinton County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Size Range of All Samples		
Earliest	Most Recent				Min	Max	
1998	1998	5	6.3	NA	6.3	7.9	
Datasets available:		1998					
Chemical	Sample Size	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	1*	0.140		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	--	--					

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Size Range of All Samples		
Earliest	Most Recent				Min	Max	
1998	1998	5	6.3	NA	6.3	7.9	
Datasets available: 1998							
Chemical	Sample Size	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	1*	ND		--	--	--	--
DDT	1*	0.004		--	--	--	--
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:							--

* - 1 composite sample of 5 fillets

Existing Advisory: Looking Glass River rock bass are not covered by a consumption advisory.

Recommendation: There are insufficient data available to develop specific advice for Looking Glass River rock bass. The statewide consumption guidelines recommend that no one eat more than 4 meals per month of rock bass from inland waters.

White Sucker

Looking Glass River Dewitt

Clinton County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Size Range of All Samples		
Earliest	Most Recent				Min	Max	
1998	1998	10	10.4	NA	10.4	14.6	
Datasets available: 1998							
Chemical	Sample Size	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	2*	0.095		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	--	--					

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Size Range of All Samples		
Earliest	Most Recent				Min	Max	
1998	1998	10	10.4	NA	10.4	14.6	
Datasets available: 1998							
Chemical	Sample Size	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	2*	ND		--	--	--	--
DDT	2*	0.007		--	--	--	--
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:							--

* - 2 samples of 5 fillets each

Existing Advisory: There are no current consumption advisories for Looking Glass River white sucker.

Recommendation: There are insufficient data available to develop specific advice for Looking Glass River sucker. The statewide consumption guidelines recommend that no one eat more than 8 meals per month of sucker from inland waters.

Eaton County

Largemouth Bass

Crandall Lake

Eaton County

Hg Analysis:

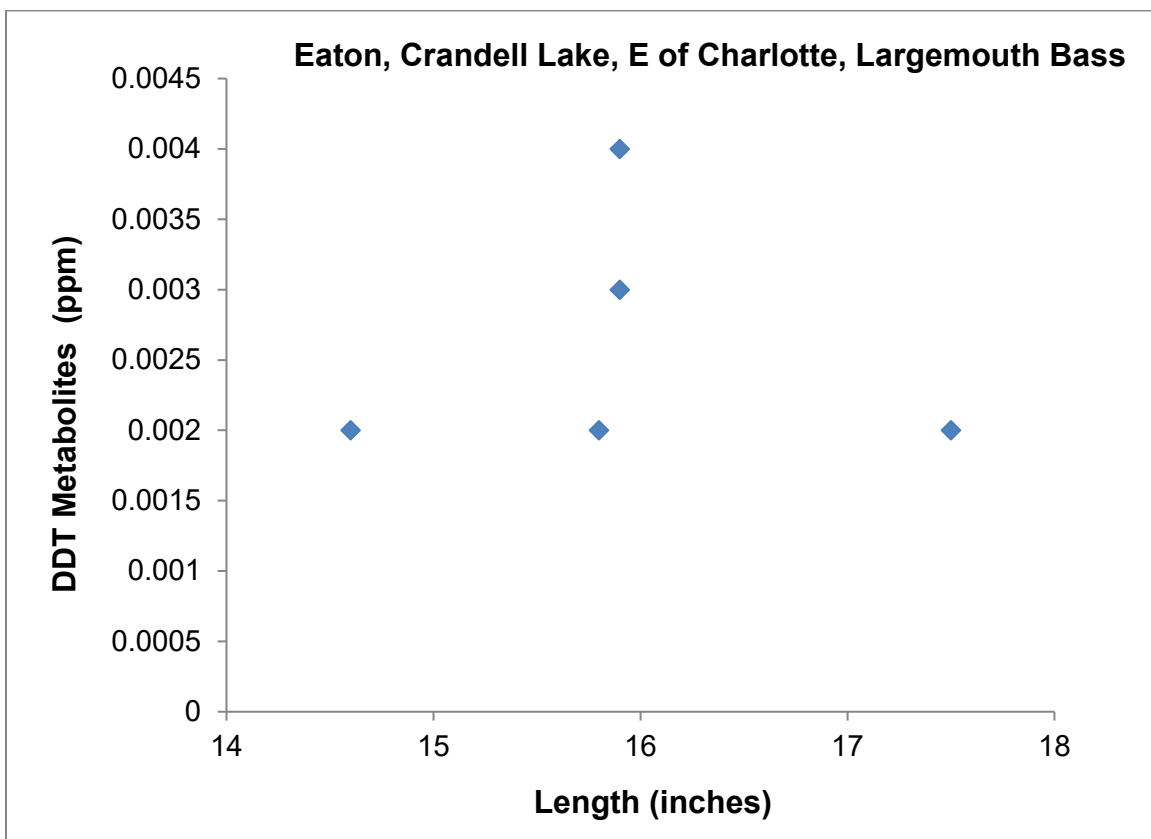
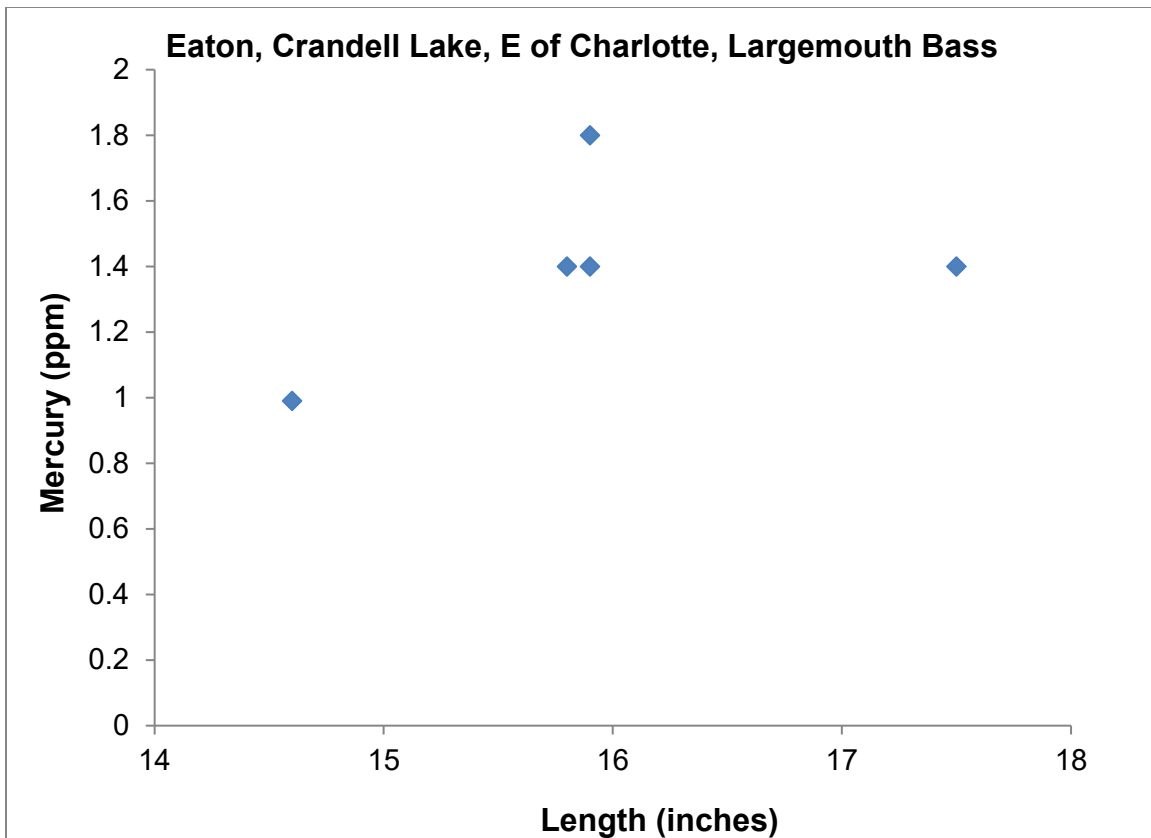
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2017	2017	5	14.6	14	14.6	17.5	
Datasets available: 2017							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	5	1.4		0.99	1.8	1.75	0.5
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.204	0.268					

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2017	2017	5	14.6	14	14.6	17.5	
Datasets available: 2017							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	5	ND		< 0.001	< 0.001	--	16
DDT	5	0.003		0.002	0.004	0.004	16
Chlordane	5	ND		< 0.001	< 0.001	--	--
Toxaphene	5	ND		< 0.05	< 0.05	--	--
TEQ	0	--		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	0.001	0.001					
Chlordane	--	--					
Toxaphene	--	--					
TEQ	--	--					
Final meal category based on UCL:							0.5

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

Recommendation: No one should eat more than 6 meals per year of Crandall Lake largemouth bass of any size due to mercury.



Brown Bullhead

Erickson Power Plant Pond

Eaton 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	3	--*	na	--	--
Datasets available: 1986						
Chemical	Sample Size (Legal)		Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
Mercury	3		0.13	0.10	0.20	--
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
1986	1986	3	--*	na	--	--
Datasets available: 1986						
Chemical	Sample Size (Legal)		Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
PCB	3		0.81	0.40	0.68	--
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:						--

* - length data not recorded

Existing Advisory: Erickson Power Plant pond bullhead are not covered by an advisory.**Recommendation:** A dataset of less than five data points for a given chemical, species and waterbody is considered insufficient for evaluation using the standard evaluation method. The statewide advice applies: No one should eat more than 4 meals per month of bullhead from inland waters.

Sunfish

Erickson Power Plant Pond

Eaton County

Hg Analysis:

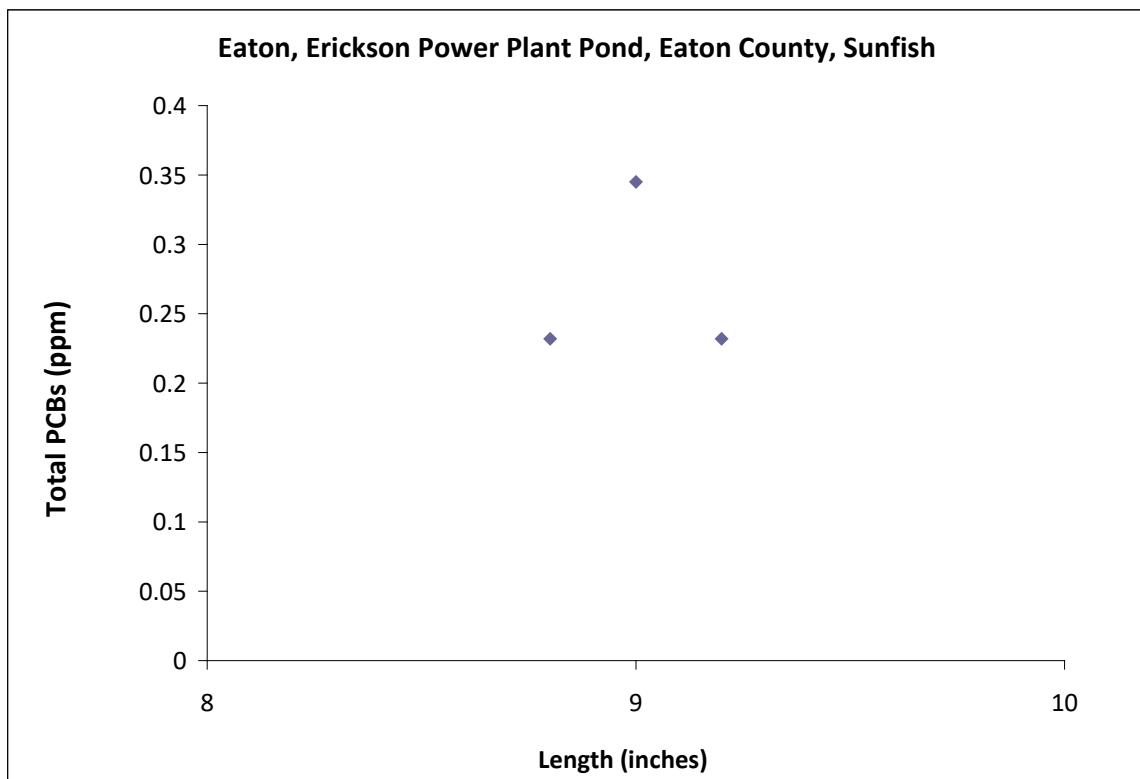
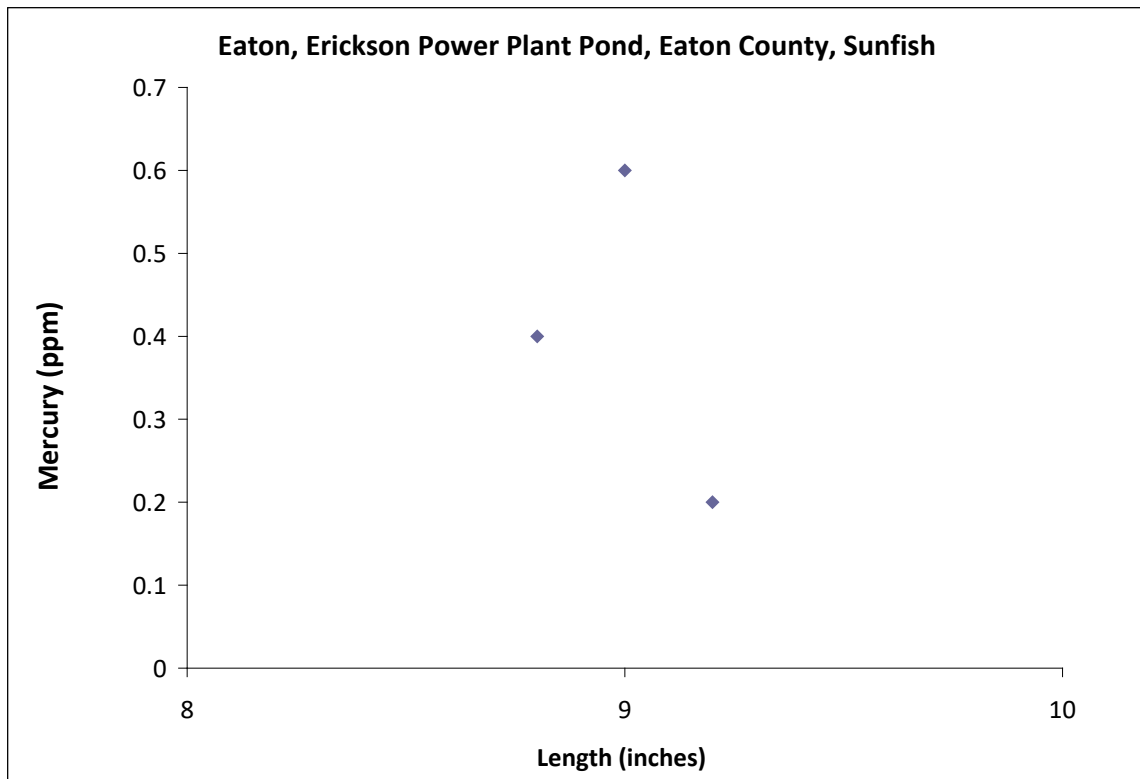
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1986	1986	3	8.8	NA	8.8	9.2	
Datasets available: 1986							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	3	0.400		0.200	0.600	--	--
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	
1986	1986	3	8.8	NA	8.8	9.2	
Datasets available: 1986							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	3	0.270		0.232	0.345	--	--
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:							--

Existing Advisory: There are no current consumption advisories on Erickson Power Plant Pond sunfish.

Recommendation: There are insufficient data available to develop specific advice for Erickson Power Plant Pond sunfish. Dataset is limited due to age. The statewide consumption guidelines recommend that no one eat more than 8 meals per month of sunfish or bluegill from inland waters.



Flat River

Ionia, Kent, and Montcalm Counties

Rock Bass**Flat River
Upstream of Greenville Dam****Montcalm County****Hg Analysis:**

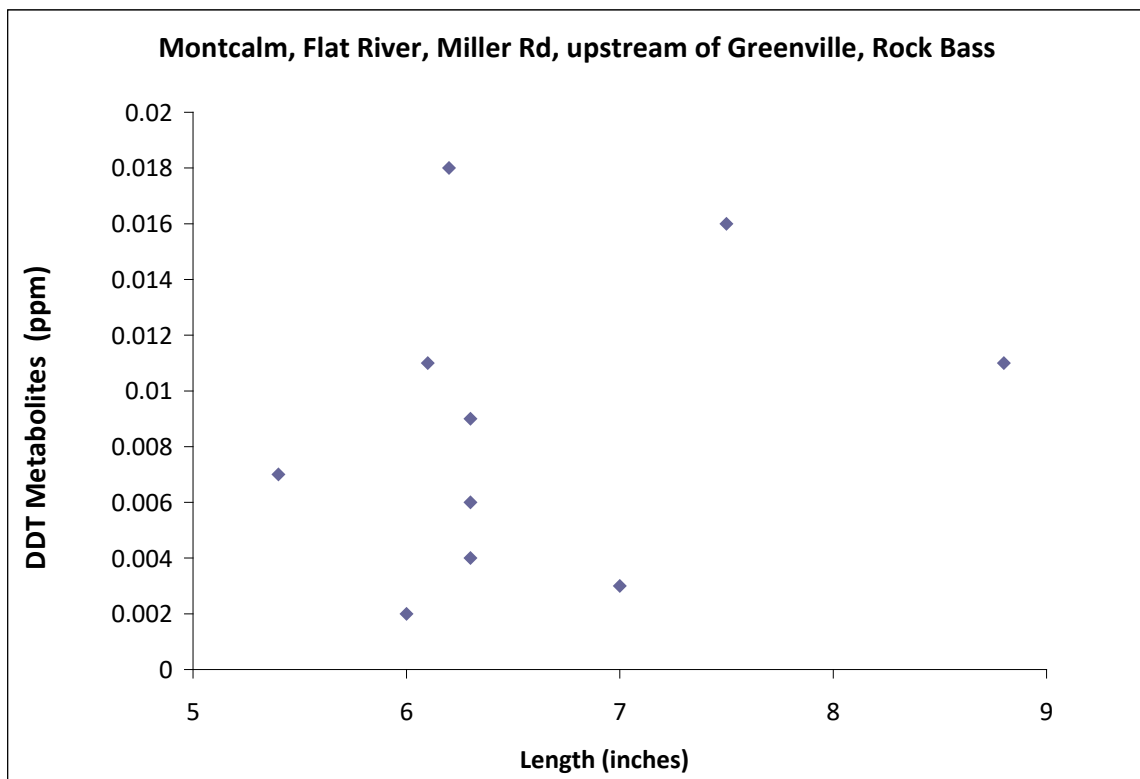
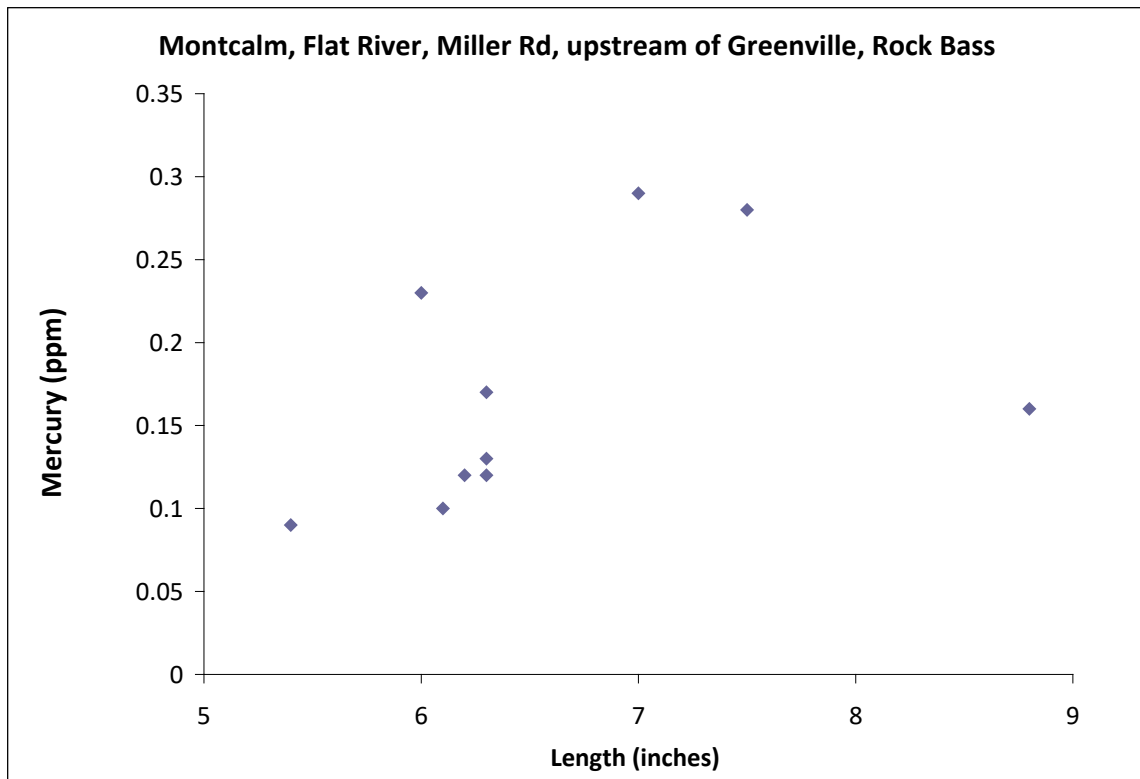
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2003	2003	10	5.4	na	5.4	8.8
Datasets available: 2003						
Chemical	Sample Size (Legal)		Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
Mercury	10		0.17	0.09	0.29	0.22
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.179	0.222				

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	5.4	na	5.4	8.8
Datasets available: 2003						
Chemical	Sample Size (Legal)		Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
PCB	10		ND	--	--	--
DDT	10		0.009	0.002	0.02	0.01
Chlordane	10		ND	--	--	--
Toxaphene	10		ND	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	0.074	0.074				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						4

Existing Advisory: Rock bass from the Flat River upstream of Greenville are not covered by an advisory.

Recommendation: No one should eat more than 4 meals per month of rock bass from the Flat River upstream of the Greenville Dam due to mercury.



White Sucker

Flat River Upstream of Greenville Dam

Montcalm 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
2003	2003	10	10.4	na	10.4	12.7
Datasets available: 2003						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
Mercury	10	0.07		0.05	0.11	0.08
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
Mercury	0.638	0.685				

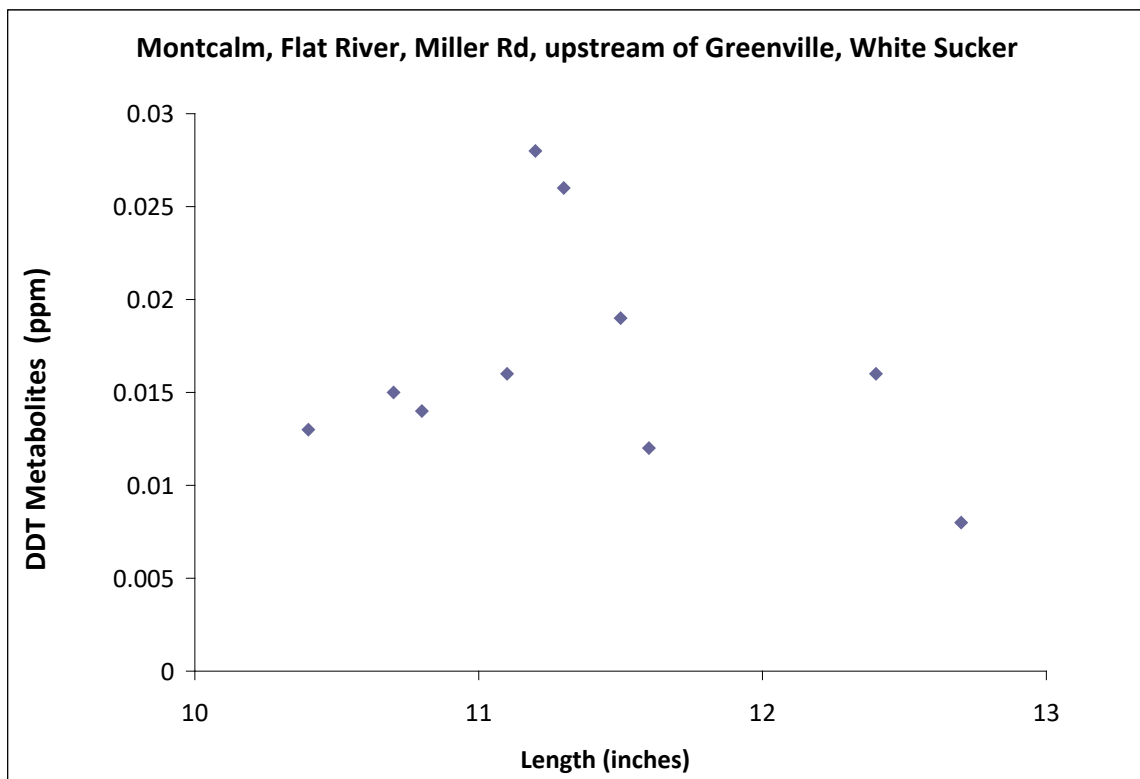
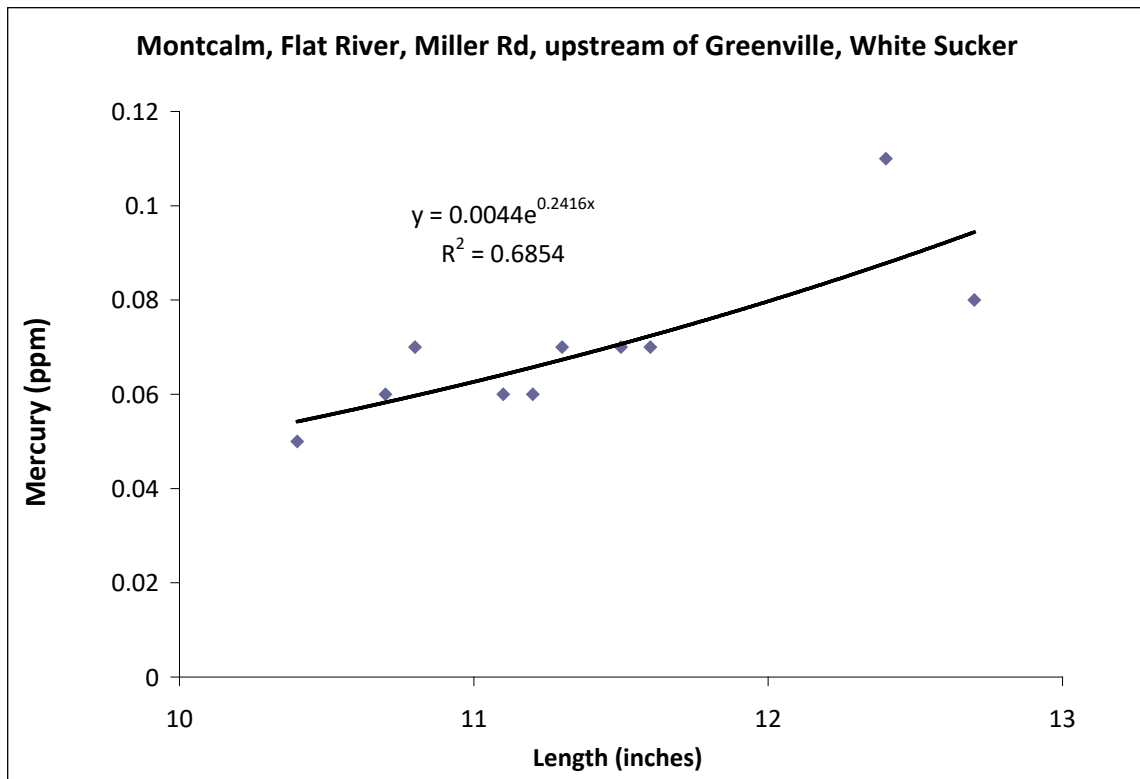
Organics Analysis:

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	10.4	na	10.4	12.7
Datasets available: 2003						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
PCB	10	ND		--	--	--
DDT	10	0.02		0.008	0.03	0.02
Chlordane	10	ND		--	--	--
Toxaphene	10	ND		--	--	--
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
PCB	--	--				
DDT	0.052	0.105				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						12

Existing Advisory: White sucker from the Flat River upstream of Greenville are not covered by an advisory.

Recommendation: No one should eat more than 12 meals per month of sucker smaller than 12 inches from the Flat River upstream of the Greenville Dam or more than 8 meals per month of those fish larger than 12 inches due to mercury.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
10	0.05	16
11	0.06	16
12	0.08	12
13	0.10	8
14	0.13	8
15	0.16	4
16	0.21	4
Shaded area denotes extrapolated estimates		



Rock Bass

Flat River Between Greenville and Belding Dams

Ionia & Montcalm 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
1998	1998	10*	5.5	na	5.5	7.5
Datasets available: 1998						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
Mercury	10*	0.08		--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

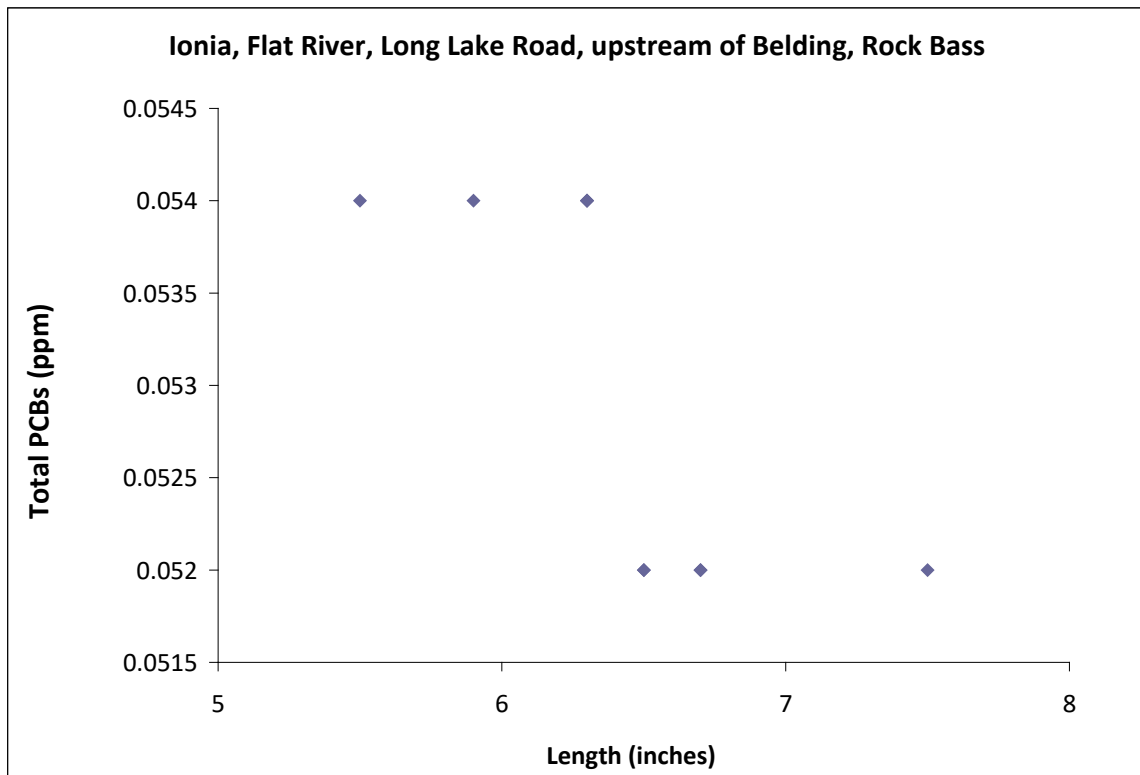
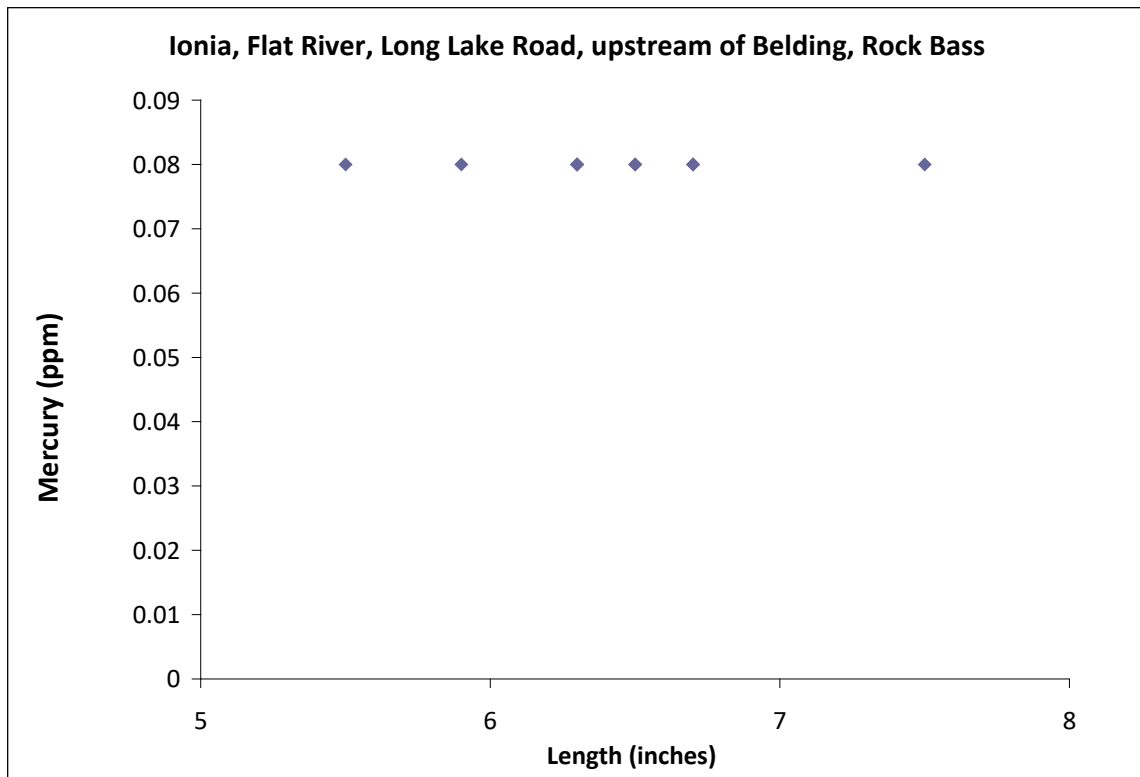
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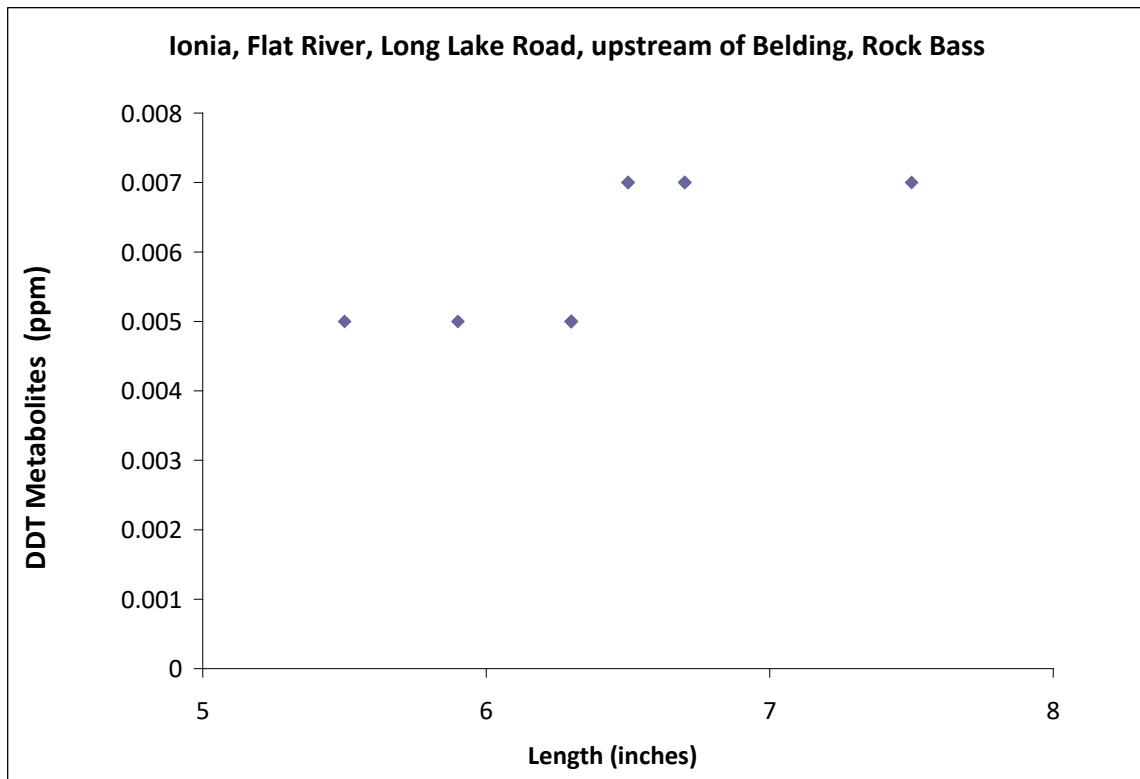
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1998	1998	10	5.5	na	5.5	7.5
Datasets available: 1998						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
PCB	10*	0.05		--	--	--
DDT	10*	0.006		--	--	--
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:						--

* - 2 composites of 5 fillets each

Existing Advisory: Women and children should not eat more than one meal per week of rock bass from the Flat River downstream of the Greenville Dam due to PCBs.

Recommendation: A dataset of less than five data points for a given chemical, species and waterbody is considered insufficient for evaluation using the standard evaluation method. Statewide guideline applies: No one should eat more than 4 meals per month of rock bass from inland waters.





Bluegill/Pumpkinseed**Flat River
Between Belding and Fallasburg Dams****Ionia & Kent
Counties****Hg Analysis:**

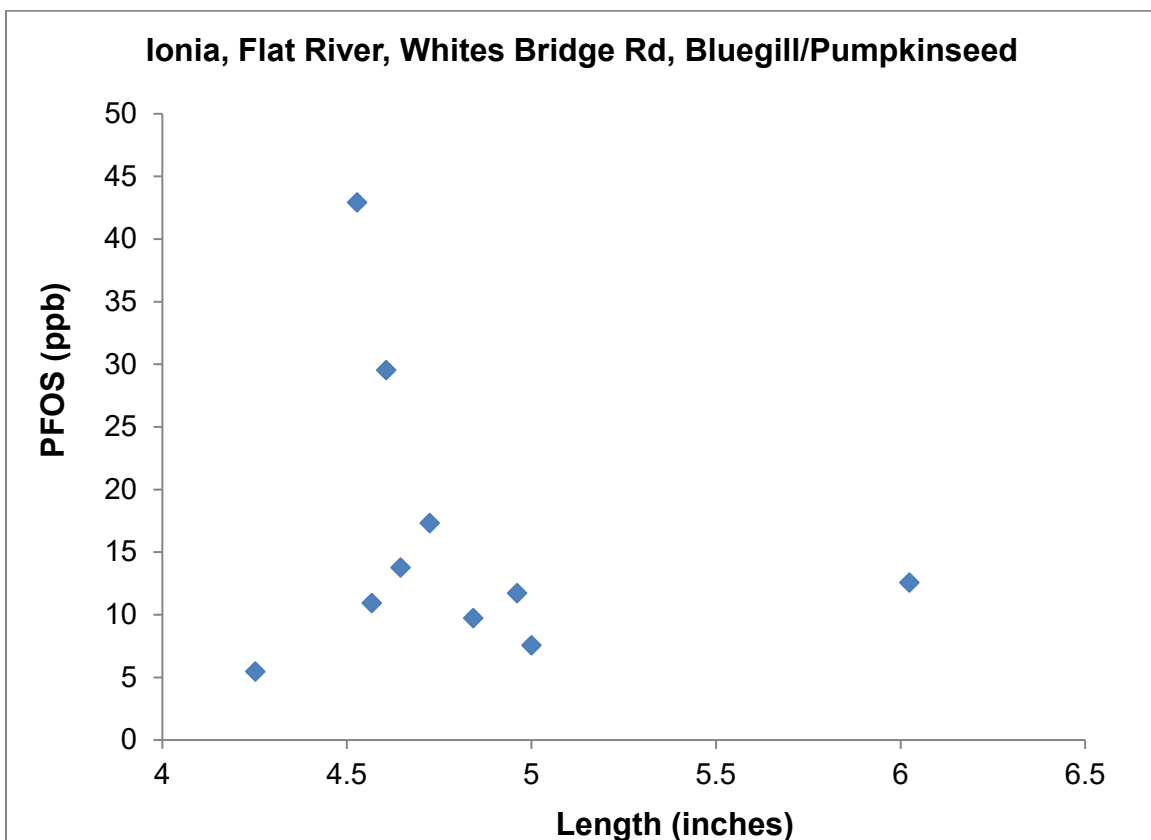
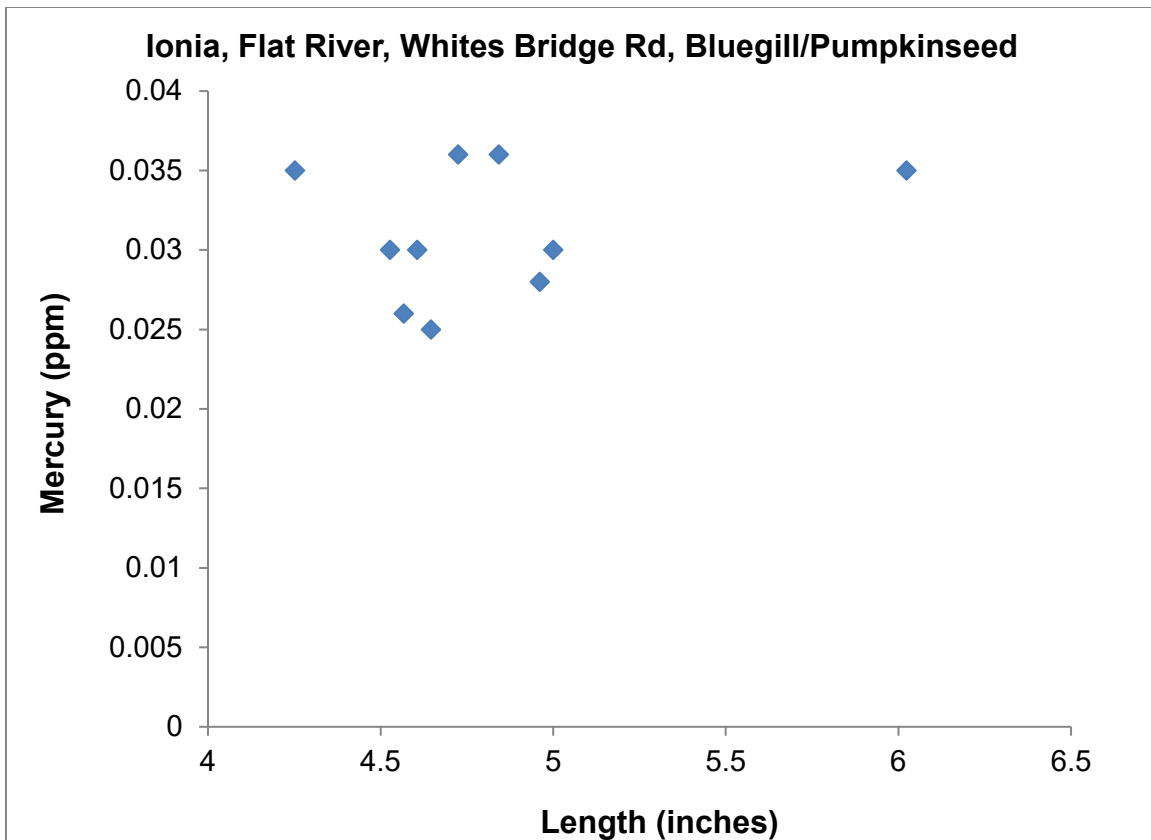
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2021	2021	10	4.3	NA	4.3	6.0
Datasets available: 2021						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
Mercury	10	0.031		0.025	0.036	0.034
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
Mercury	0.061	0.061				16

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	4.3	NA	4.3	6.0
Datasets available: 2021						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
PCB	0	--		--	--	--
DDT	0	--		--	--	--
Chlordane	0	--		--	--	--
Toxaphene	0	--		--	--	--
PFOS	10	16.2 ppb		5.5 ppb	42.9 ppb	24.4 ppb
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.038	0.005				
Final meal category based on UCL:						4

Existing MDHHS Advisory: Bluegill and sunfish from the Flat River upstream of the Fallasburg Dam to the Belding 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 4 meals per month of bluegill or sunfish of any size from the Flat River upstream of the Fallasburg dam to the Belding dam due to PFOS.



Rock Bass**Flat River
Between Belding and Fallasburg Dams****Ionia & Kent
Counties****Hg Analysis:**

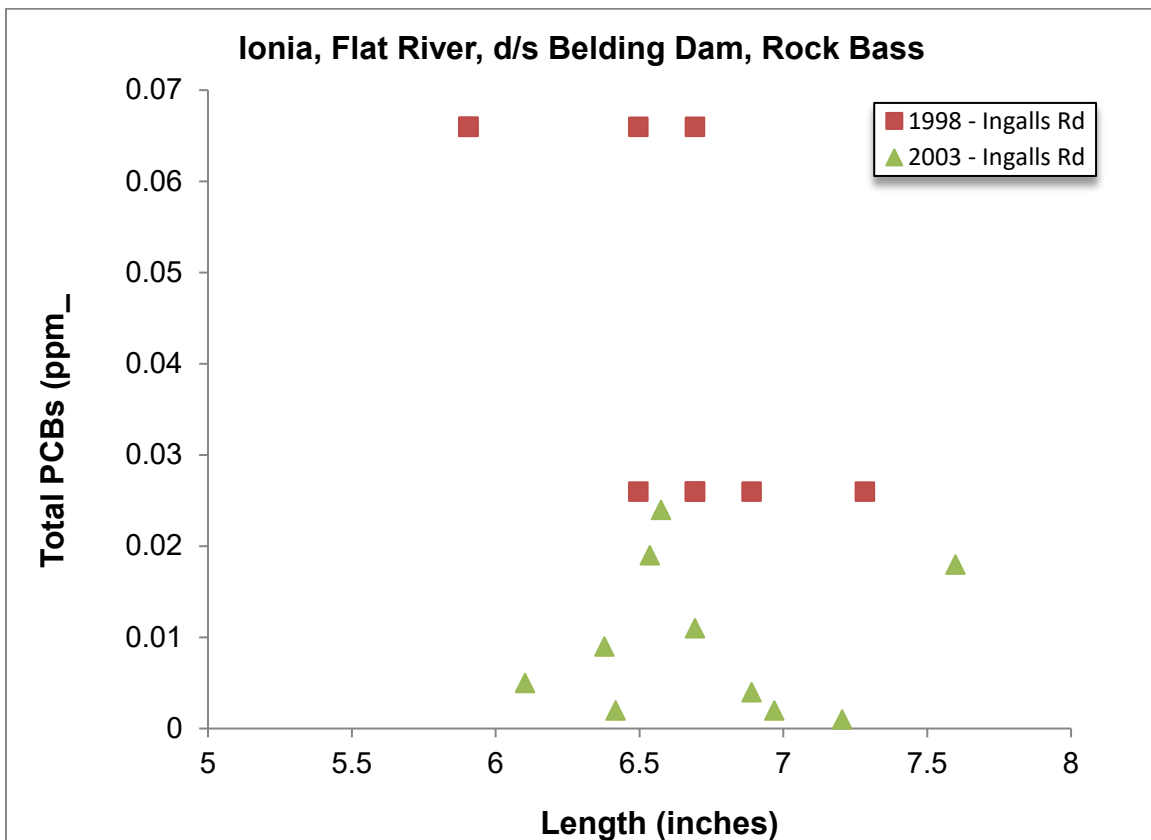
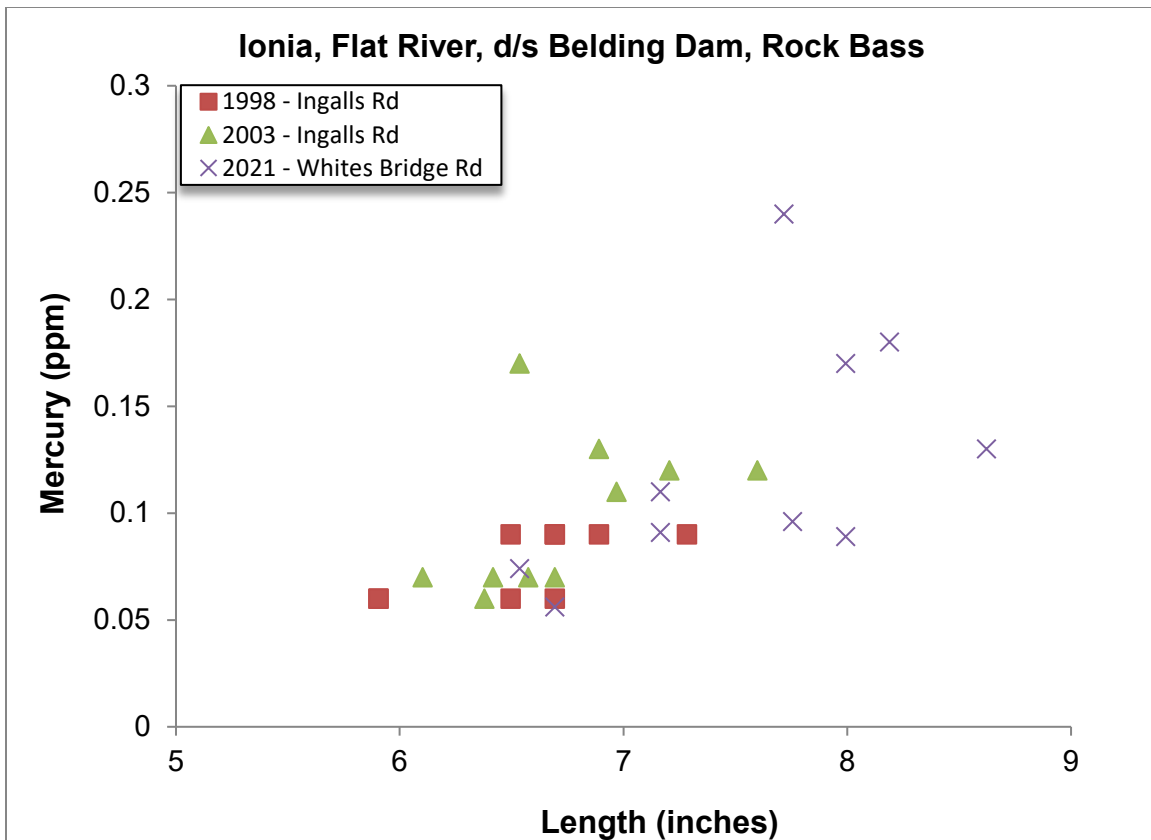
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1998	2021	29	5.9	NA	5.9	8.6	
Datasets available: 1998, 2003, 2021							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	29	0.101		0.056	0.240	0.117	8
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.393	0.467					

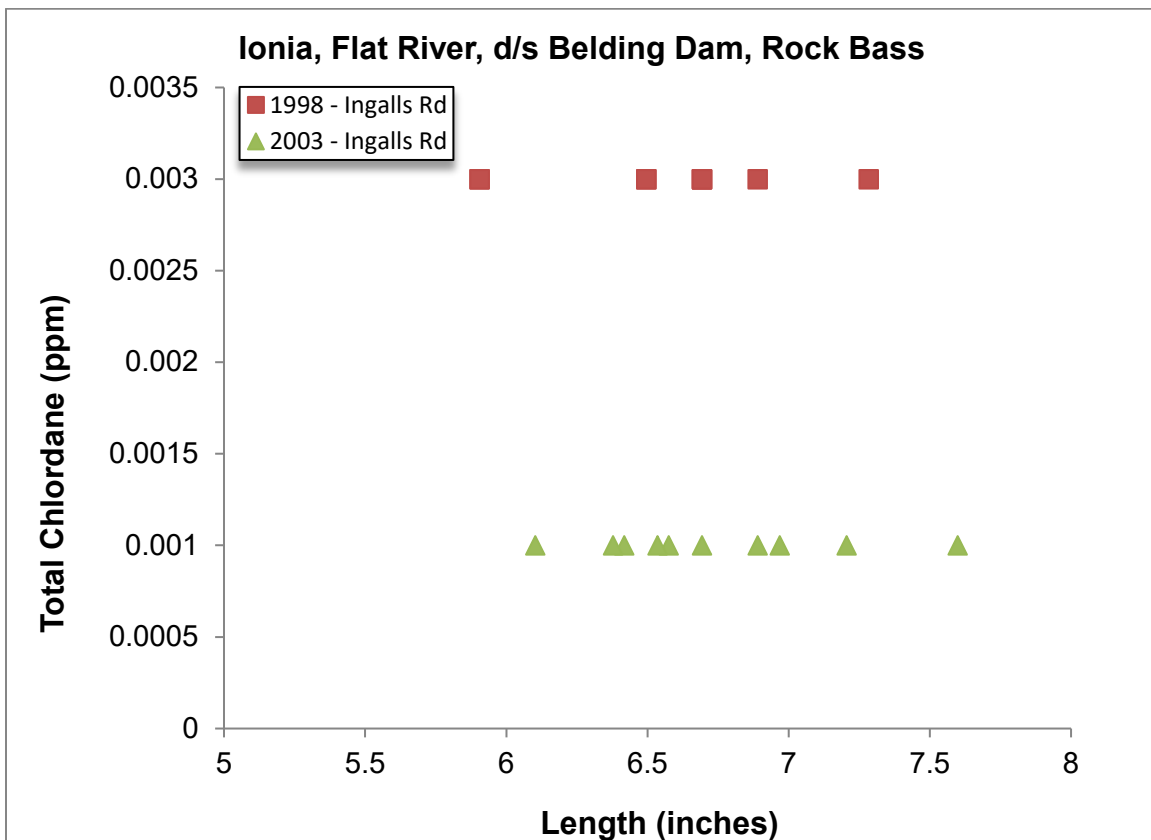
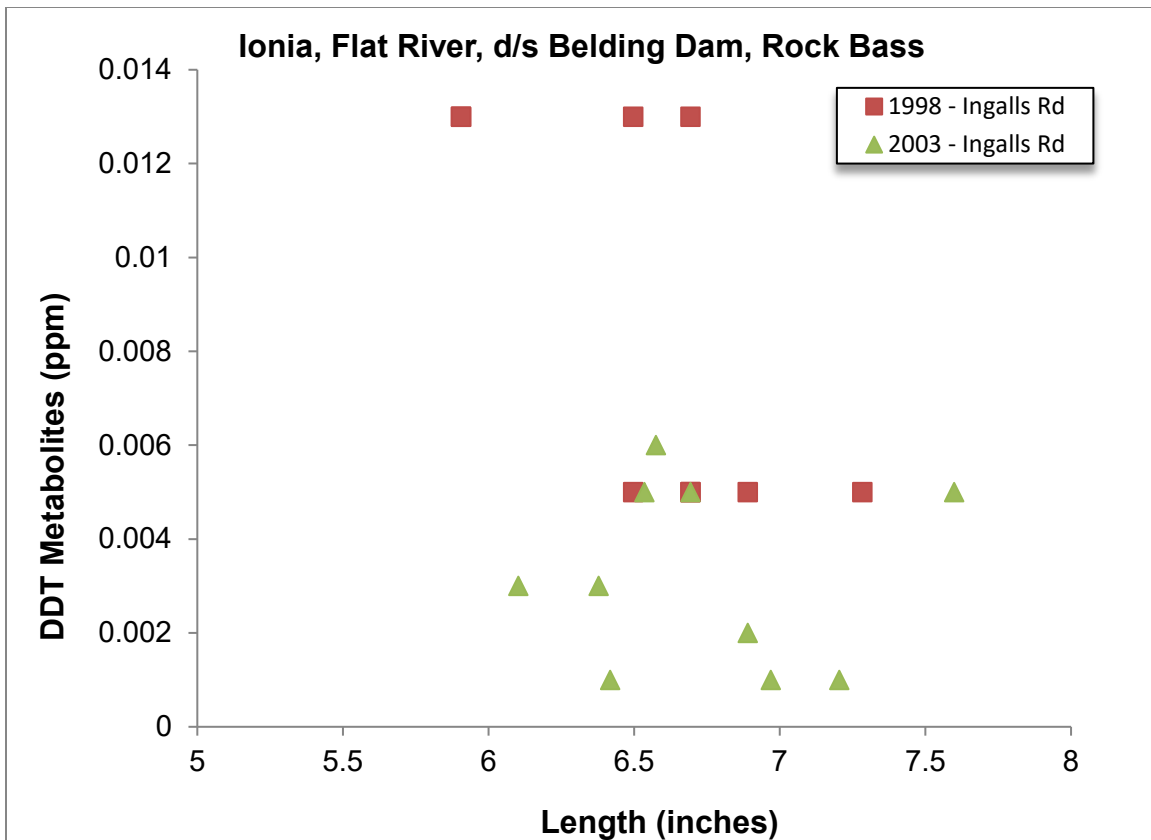
Organics Analysis:

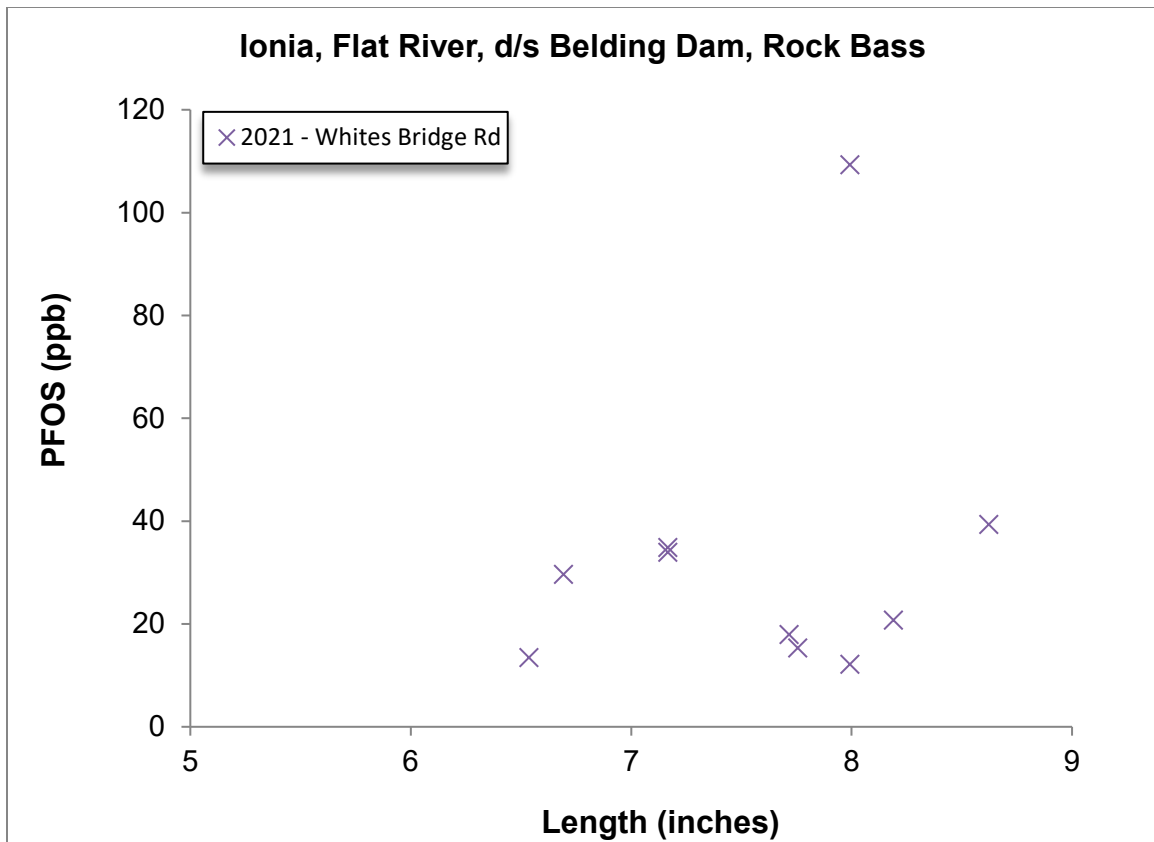
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2003	2021	20	6.1	NA	6.1	8.6	
Datasets available: 1998 (No PFOS), 2003 (No PFOS), 2021 (PFOS Only)							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.010		<0.001	0.024	0.015	12
DDT	10	0.003		<0.001	0.006	0.005	16
Chlordane	10	ND		--	--	--	--
Toxaphene	10	ND		--	--	--	--
PFOS	10	32.7 ppb		12.2 ppb	109.3 ppb	53.2 ppb	2
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.003	0.007					
DDT	0.000	0.009					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	0.051	0.037					
Final meal category based on UCL:							2

Existing MDHHS Advisory: No one should eat more than 8 meals per month of rock bass of any size from the Flat River between the Fallasburg Dam upstream to the Belding Dam due to mercury.

Recommendation: No one should eat more than 2 meals per month of rock bass of any size from the Flat River between the Fallasburg Dam upstream to the Belding Dam due to PFOS. Mercury and PCBs cause less restrictive guidance.







White Sucker

Flat River Between Belding and Fallasburg Dams

Ionia & Kent 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
2003	2003	10	9.6	na	9.6	15.2
Datasets available: 2003						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
Mercury	10	0.08		0.03	0.14	0.11
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
Mercury	0.892	0.915				8

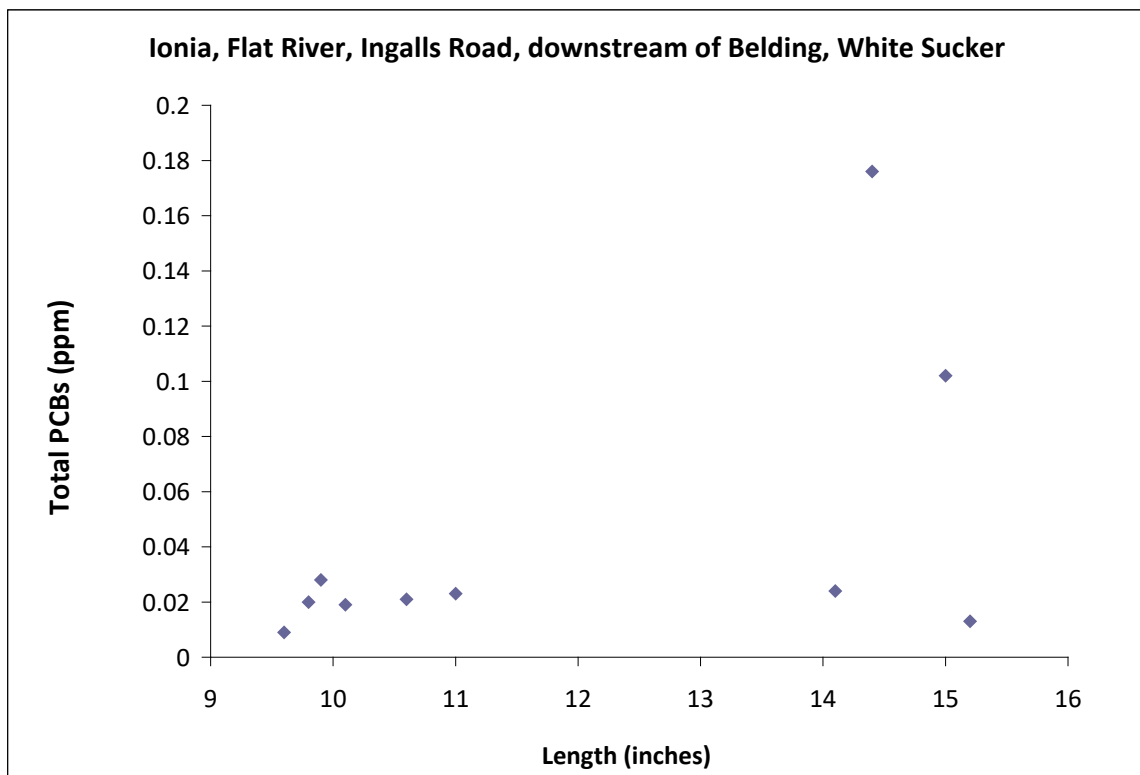
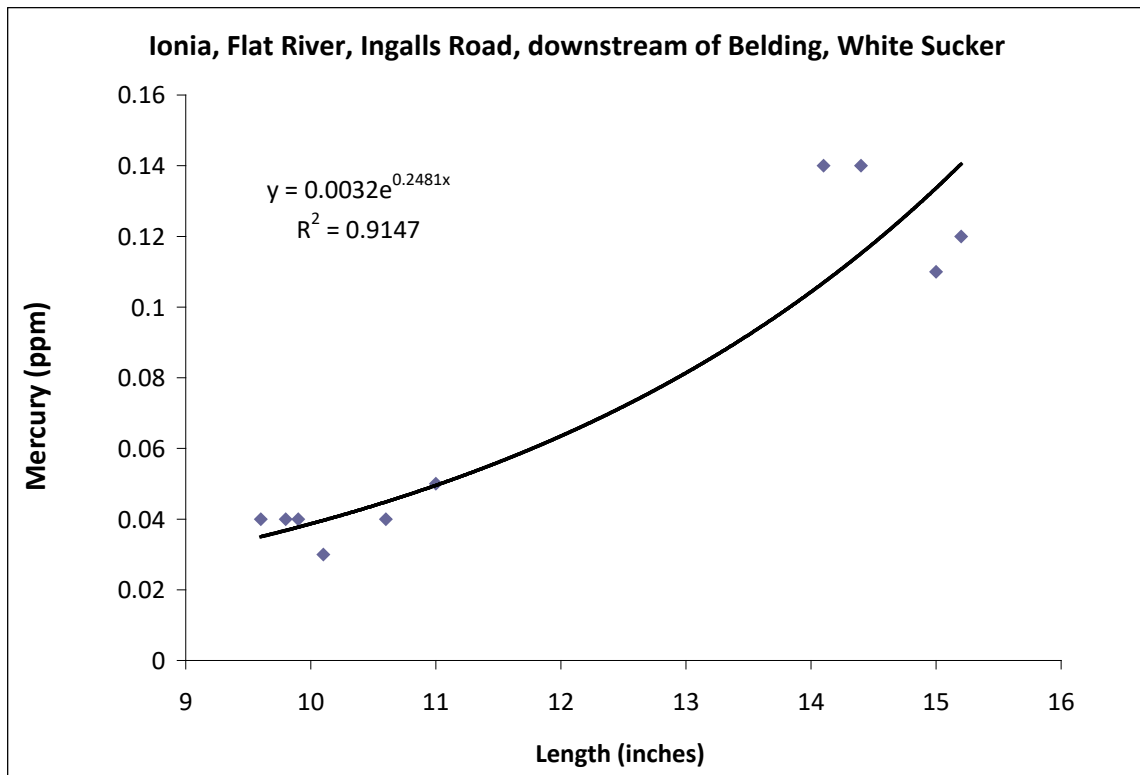
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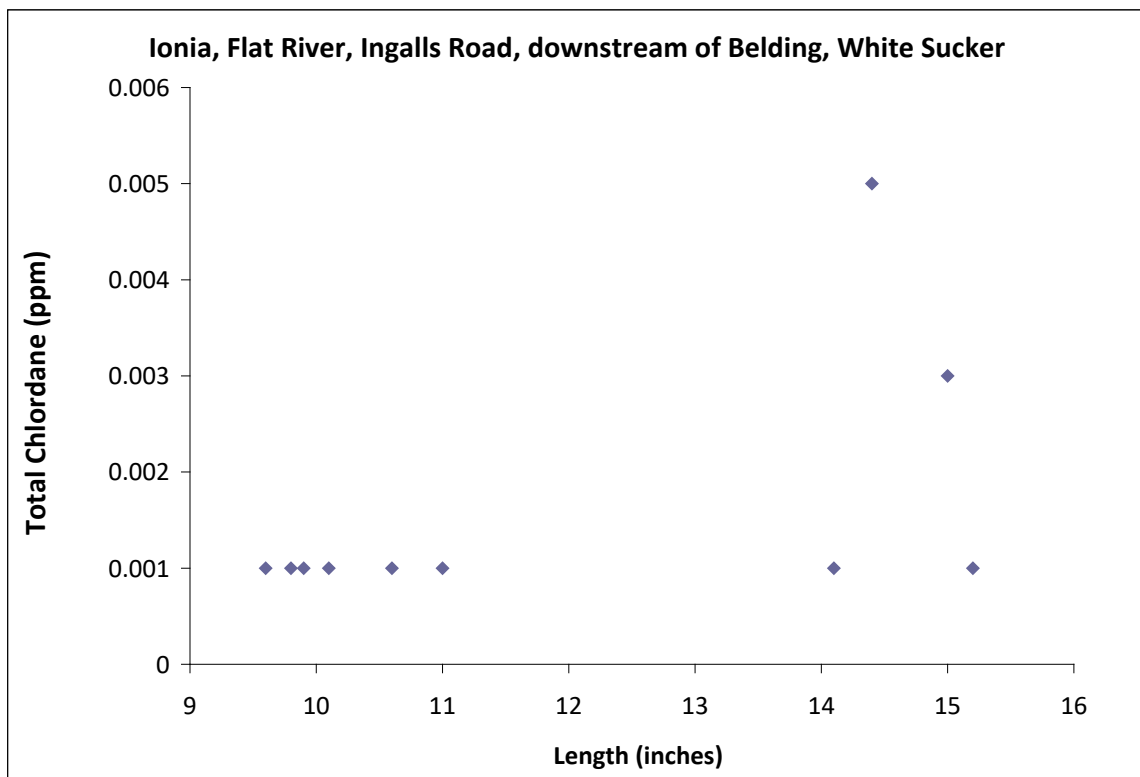
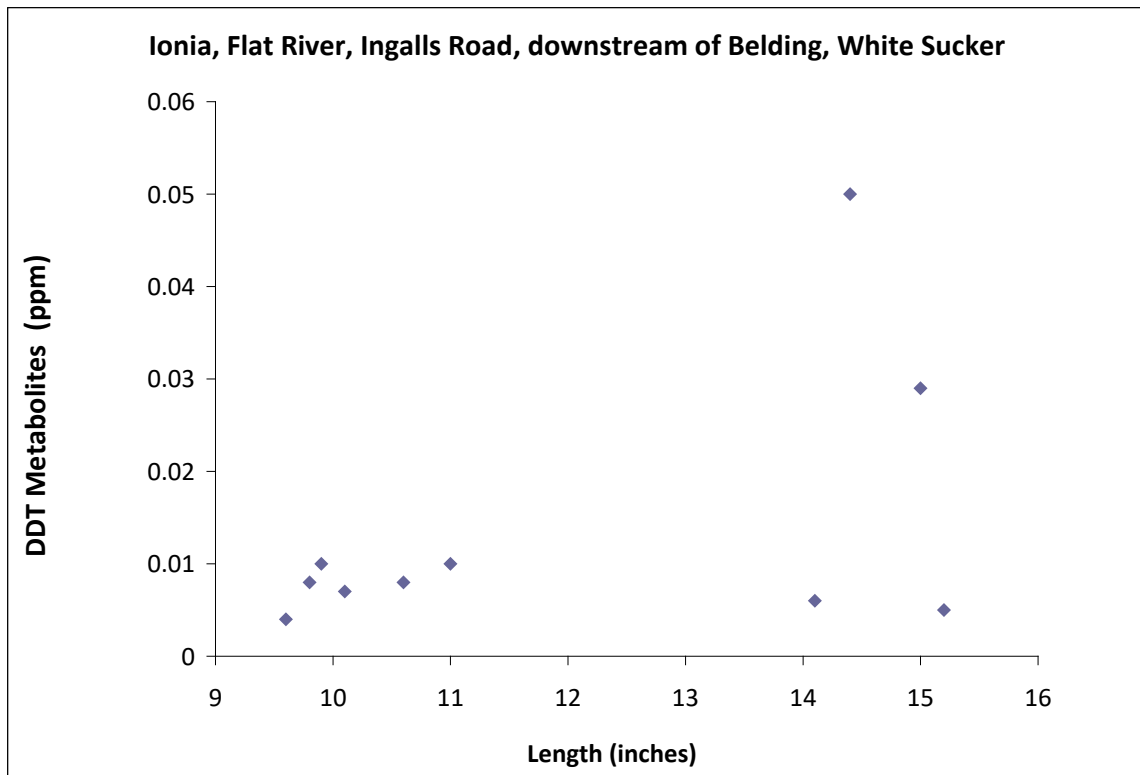
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2003	2003	10	9.6	NA	9.6	15.2
Datasets available: 2003						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
PCB	10	0.044		0.009	0.18	0.08
DDT	10	0.014		0.004	0.03	0.02
Chlordane	10	0.002		0.001	0.005	0.003
Toxaphene	10	ND		--	--	--
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
PCB	0.293	0.284				2
DDT	0.252	0.196				16
Chlordane	0.298	0.336				--
Toxaphene	--	--				--
Final meal category based on UCL:						2

Existing Advisory: Women and children should not eat more than one meal per week of sucker larger than 14 inches from the Flat River downstream of the Greenville Dam due to PCBs.

Recommendation: No one should eat more than 2 meals per month of sucker from the Flat River between the Belding and Fallasburg Dams due to PCBs. Mercury would cause an advisory.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
10	0.038	16
11	0.049	16
12	0.063	16
13	0.081	12
14	0.103	8
15	0.132	4
16	0.169	4
17	0.217	4
18	0.278	2
Shaded area denotes extrapolated estimates		





Carp**Flat River
Between Fallasburg and Lowell Dams****Kent County****Hg Analysis:**

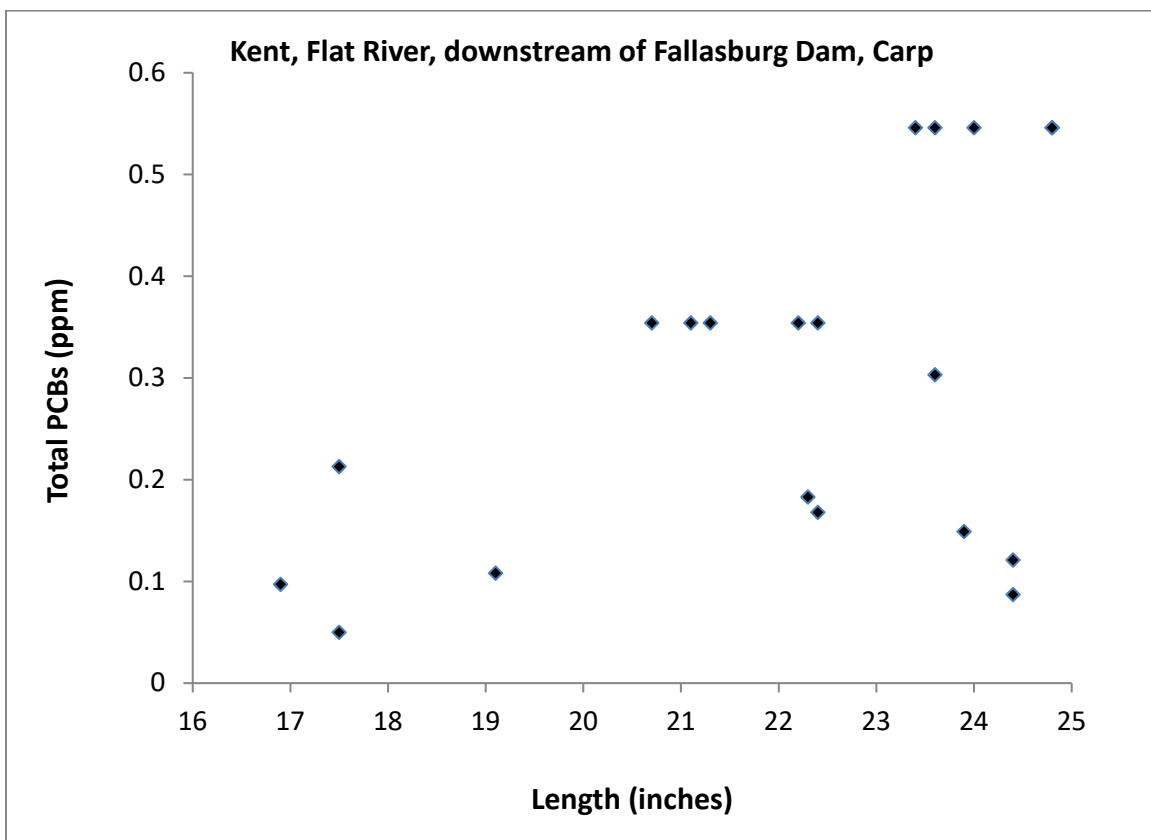
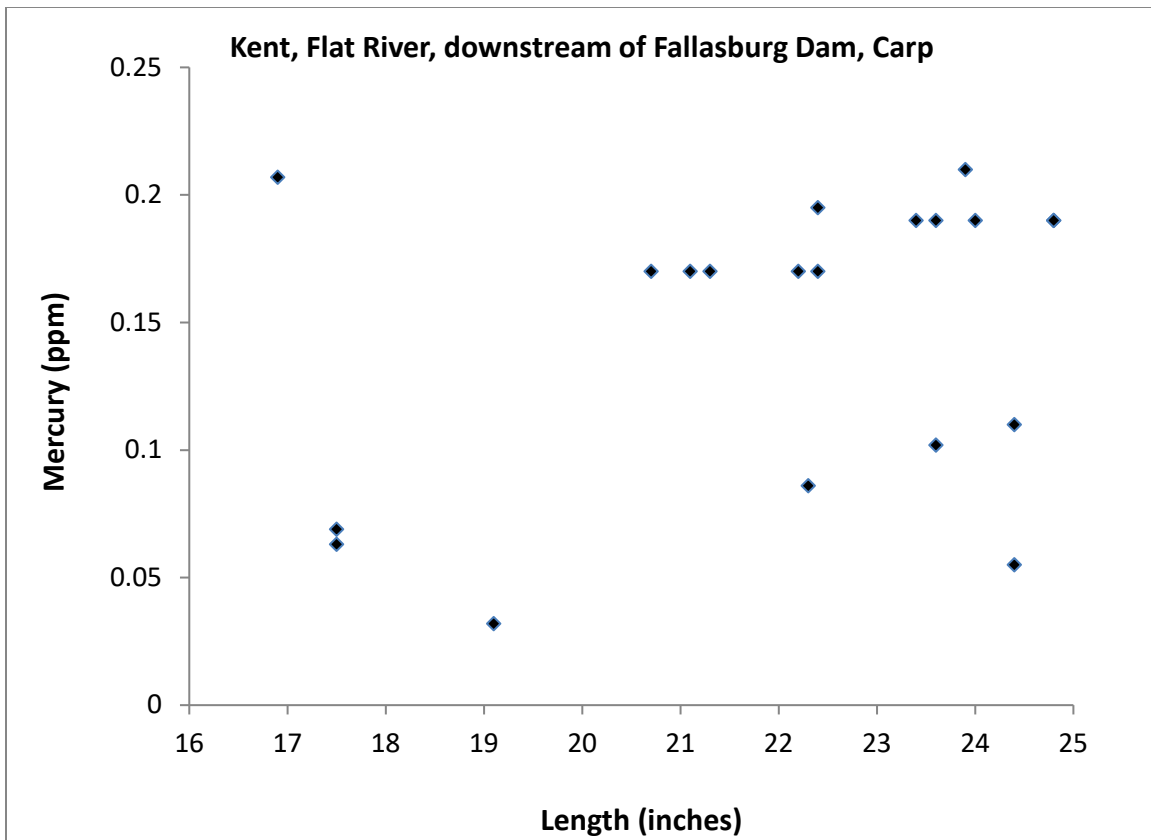
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1998	2008	20	16.9	na	16.9	24.8	
Datasets available: 1998, 2008							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	20	0.15		0.03	0.21	0.17	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.105	0.129					

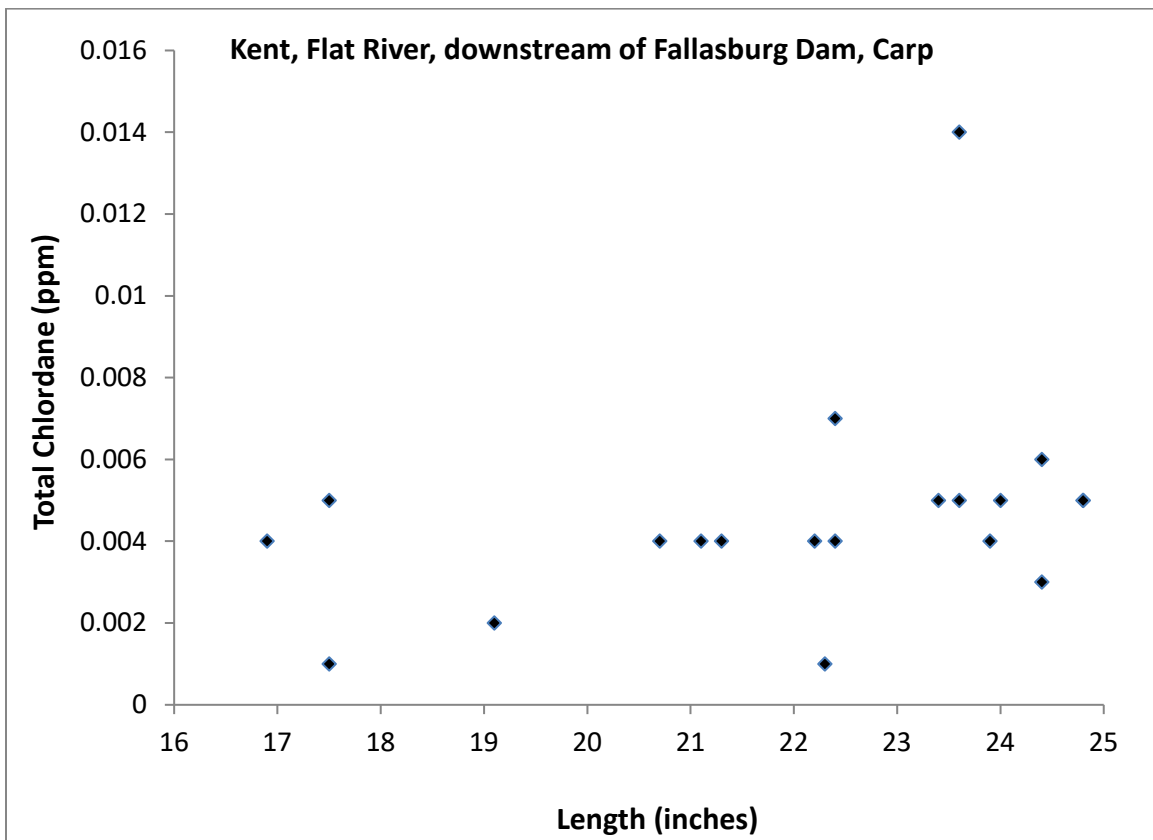
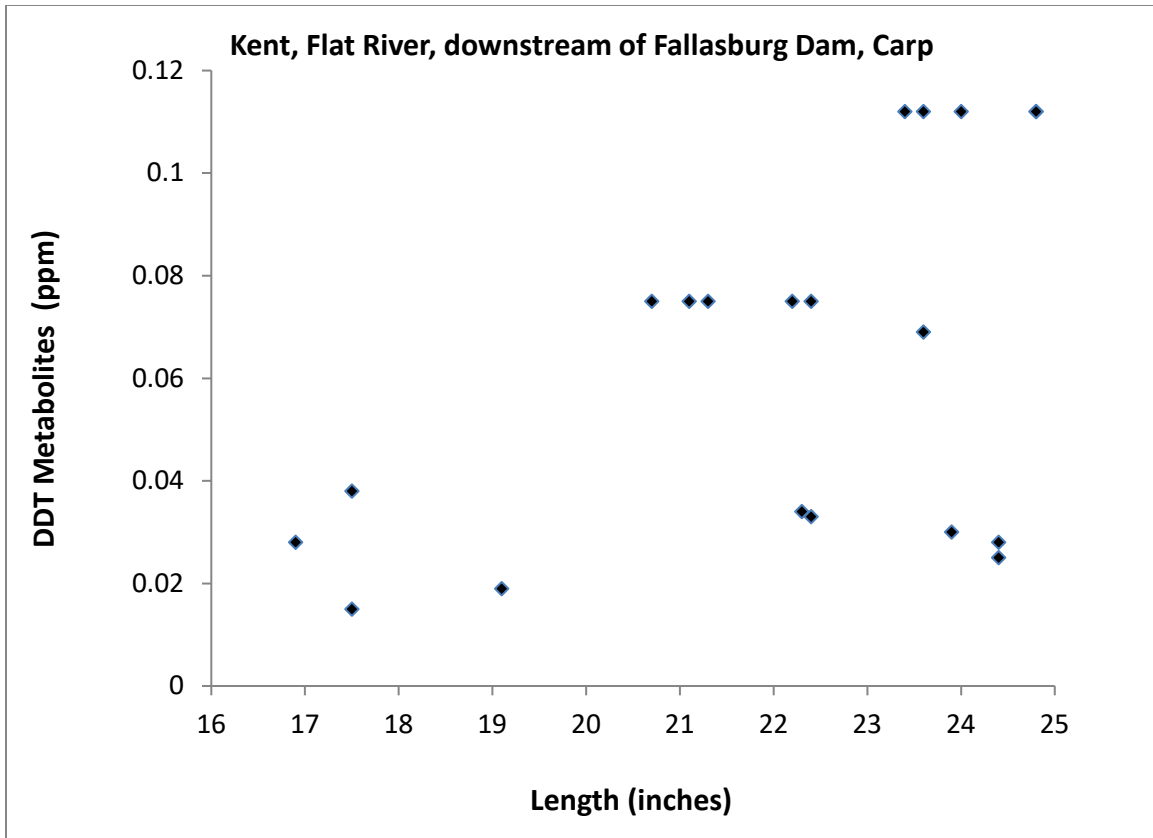
Organics Analysis:

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	16.9	na	16.9	24.4	
Datasets available: 1998, 2008							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.148		0.05	0.303	0.200	1
DDT	10	0.032		0.015	0.069	0.040	16
Chlordane	10	0.005		0.001	0.014	0.010	--
Toxaphene	10	ND		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.081	0.119					
DDT	0.111	0.148					
Chlordane	0.134	0.126					
Toxaphene	--	--					
Final meal category based on UCL:							1

Existing Advisory: Women and children should not eat more than one meal per month of Flat River carp due to PCBs.

Recommendation: No one should eat more than 1 meal per month of carp from the Flat River between the Fallasburg and Lowell Dams due to PCBs. Mercury would cause an advisory.





**Largemouth/Smallmouth
Bass**

**Flat River
Lowell Impoundment**

Kent 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	12.6	14.0	13.5	20.5	
Datasets available: 2021							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	9	0.299		0.170	0.530	0.403	2
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.550	0.546					

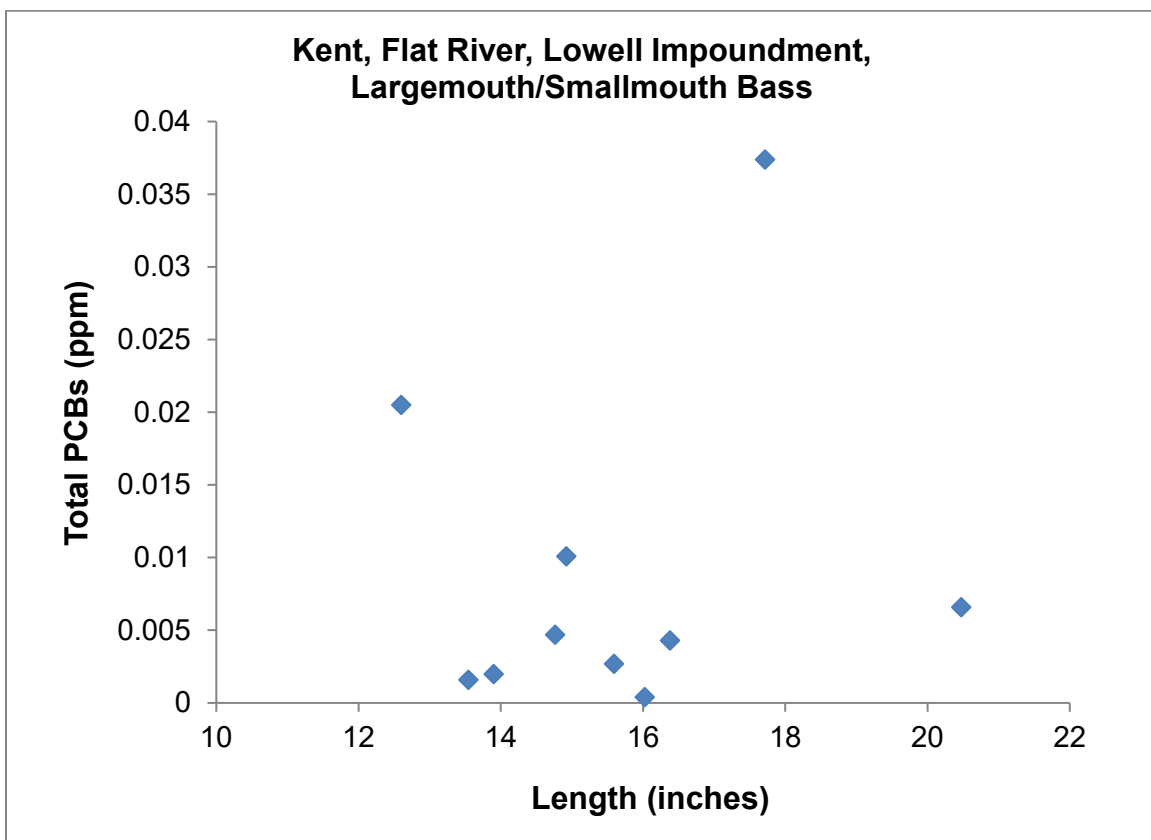
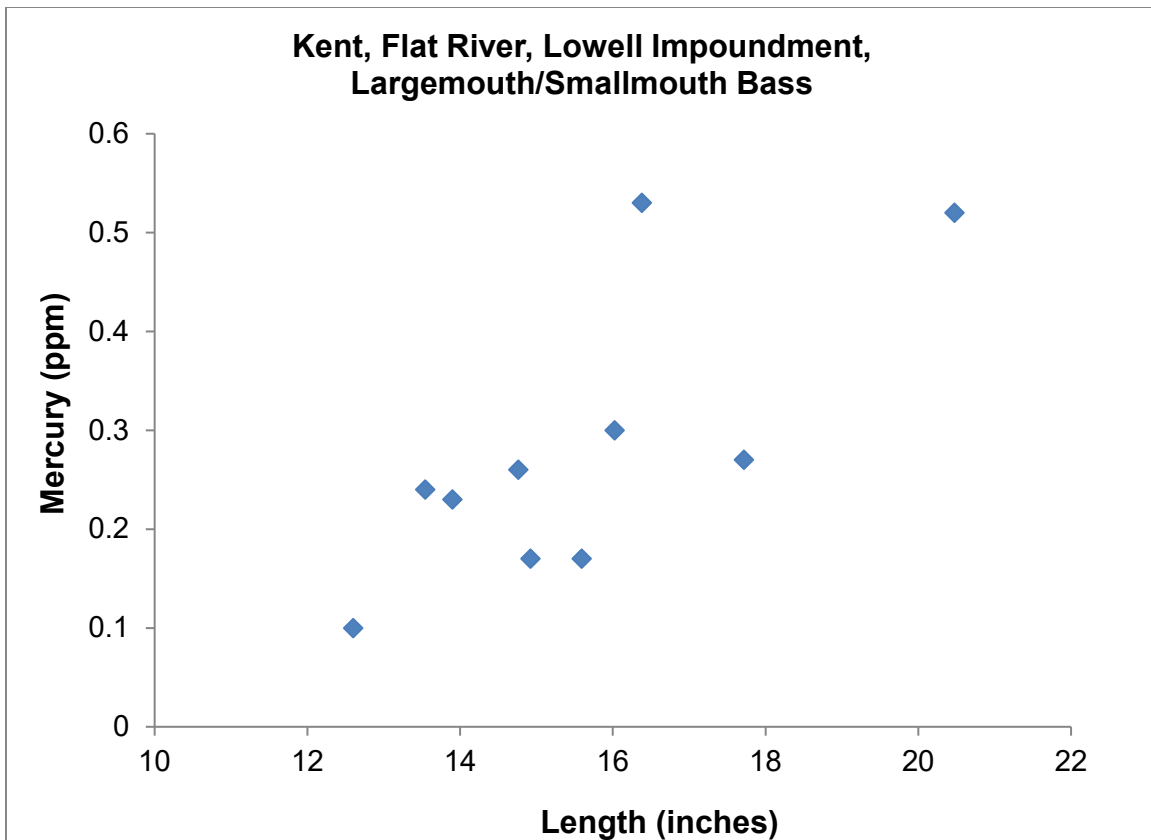
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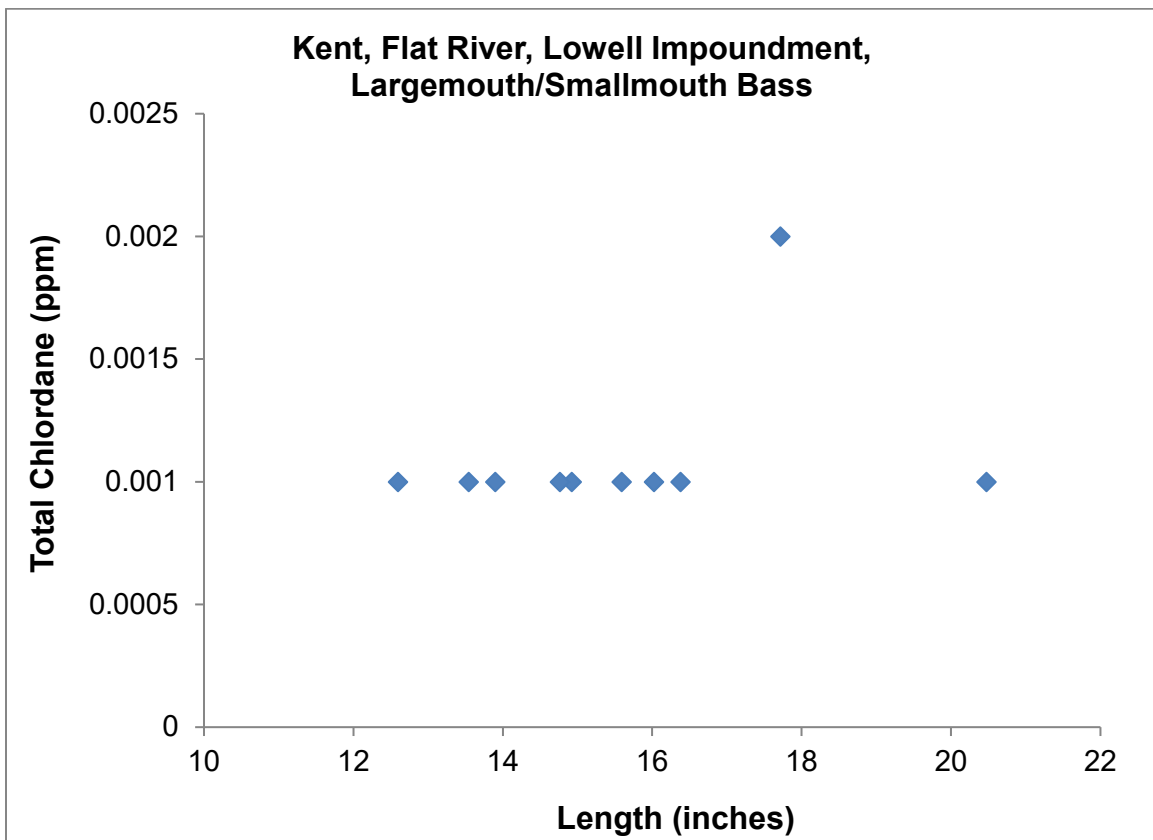
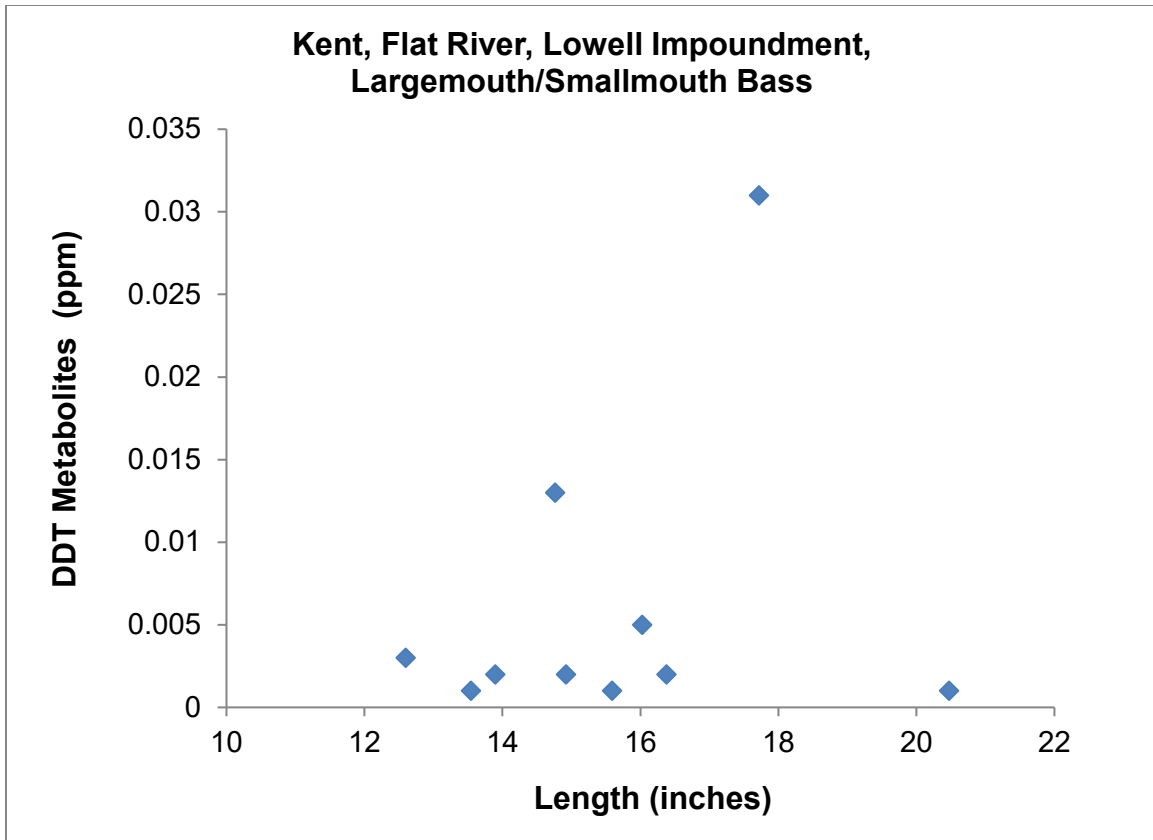
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2021	2021	10	12.6	14.0	13.5	20.5	
Datasets available: 2021							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	9	0.008		<0.001	0.037	0.017	12
DDT	9	0.006		<0.001	0.031	0.014	16
Chlordane	9	0.001		<0.001	0.002	0.001	16
Toxaphene	9	ND		--	--	--	--
PFOS	10*	8.4 ppb		4.2 ppb	16.3 ppb	11.2 ppb	12
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.024	0.019					
DDT	0.062	0.004					
Chlordane	0.108	0.108					
Toxaphene	--	--					
PFOS	0.030	0.006					
Final meal category based on UCL:							2

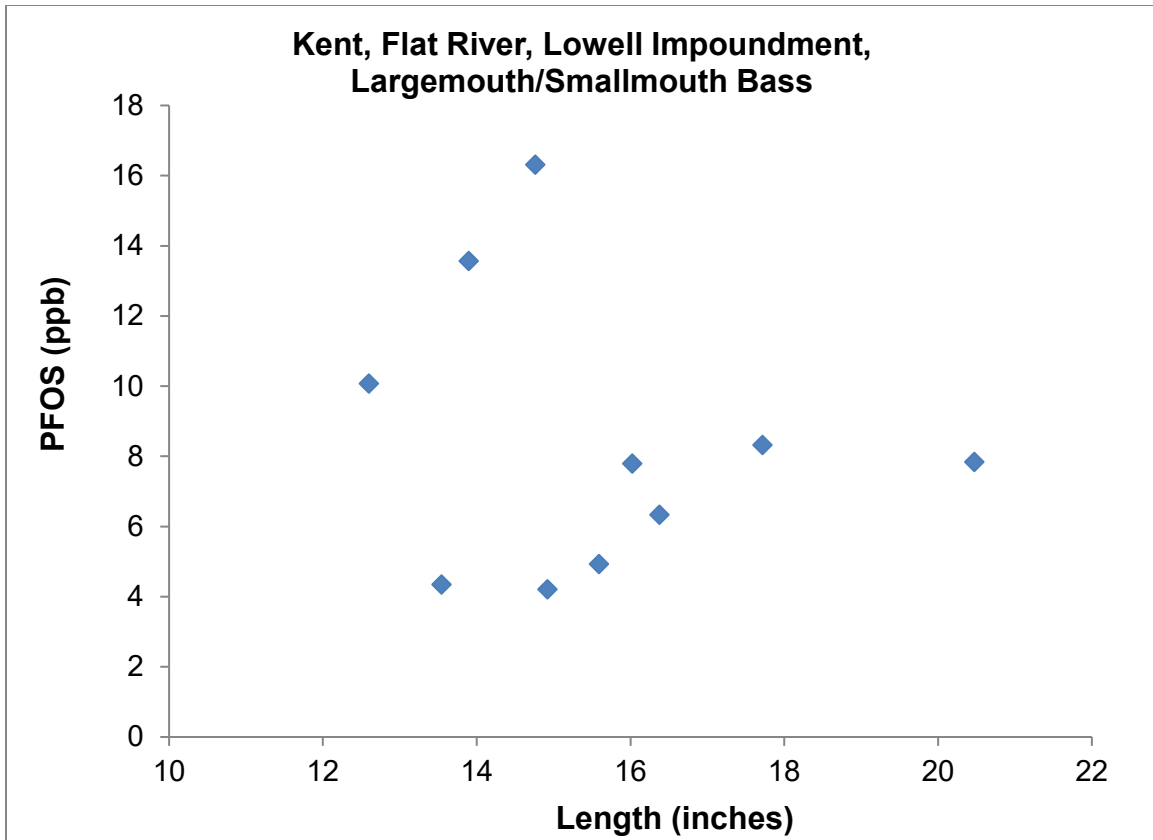
* Sub-legal sized individuals included in the analysis as no correlation between fish size and PFOS concentration has been observed in the statewide dataset.

Existing MDHHS Advisory: Largemouth and smallmouth bass from the Flat River between the Fallasburg and Lowell Dams are currently covered under the statewide mercury guidance. No one should eat more than 2 meals per month of largemouth or smallmouth bass smaller than 18 inches or no more than 1 meal per month of these fish larger than 18 inches.

Recommendation: No one should eat more than 2 meals per month of largemouth or smallmouth bass smaller than 18 inches from the Flat River between the Fallasburg Dam and Lowell Dam or no more than 1 meal per month of these fish larger than 18 inches due to mercury. Statewide length break applied due to limited size of fish used in the analysis. PCBs and PFOS cause less restrictive guidance.







Pumpkinseed

**Flat River
Lowell Impoundment**

Kent County

Hg Analysis:

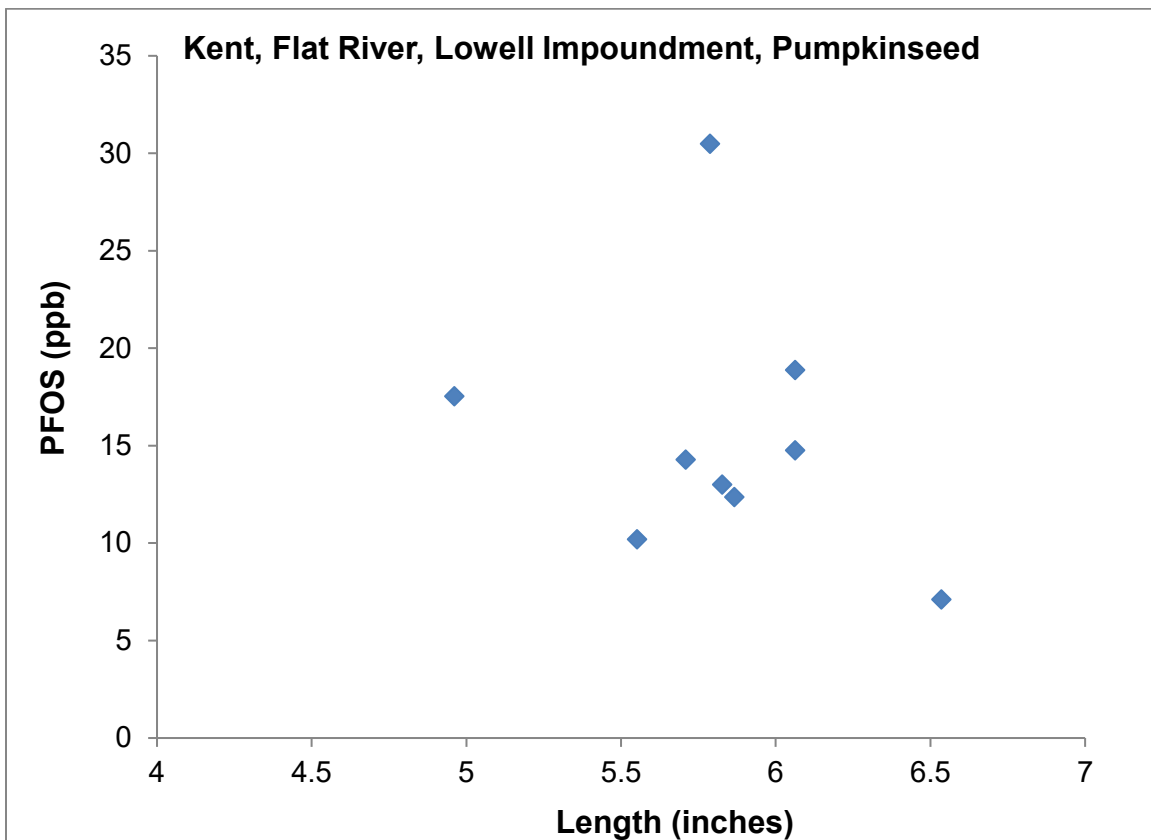
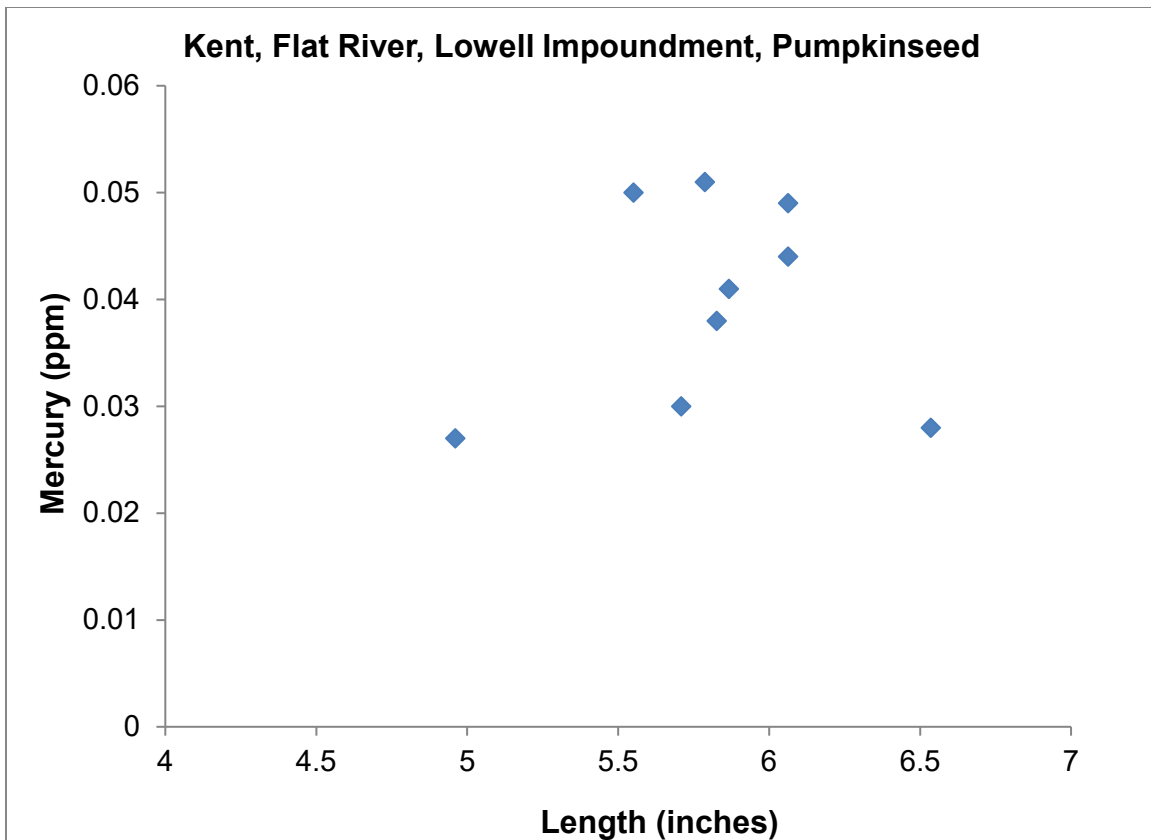
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2021	2021	9	5.0	NA	5.0	6.5	
Datasets available: 2021							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	9	0.040		0.027	0.051	0.047	16
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.014	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	
2021	2021	9	5.0	NA	5.0	6.6	
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	9	15.4 ppb		7.1 ppb	30.5 ppb	20.5 ppb	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	0.074	0.151					
Final meal category based on UCL:							4

Existing MDHHS Advisory: Bluegill and sunfish from the Flat River between the Fallasburg and Lowell Dams 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 the Flat River between the Fallasburg and Lowell Dams due to PFOS.



Rock Bass

Flat River Between Fallasburg and Lowell Dams

Kent 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	5.5	na	5.5	7.7
Datasets available: 2008						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
Mercury	10	0.07		0.03	0.14	0.09
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.402	0.407				

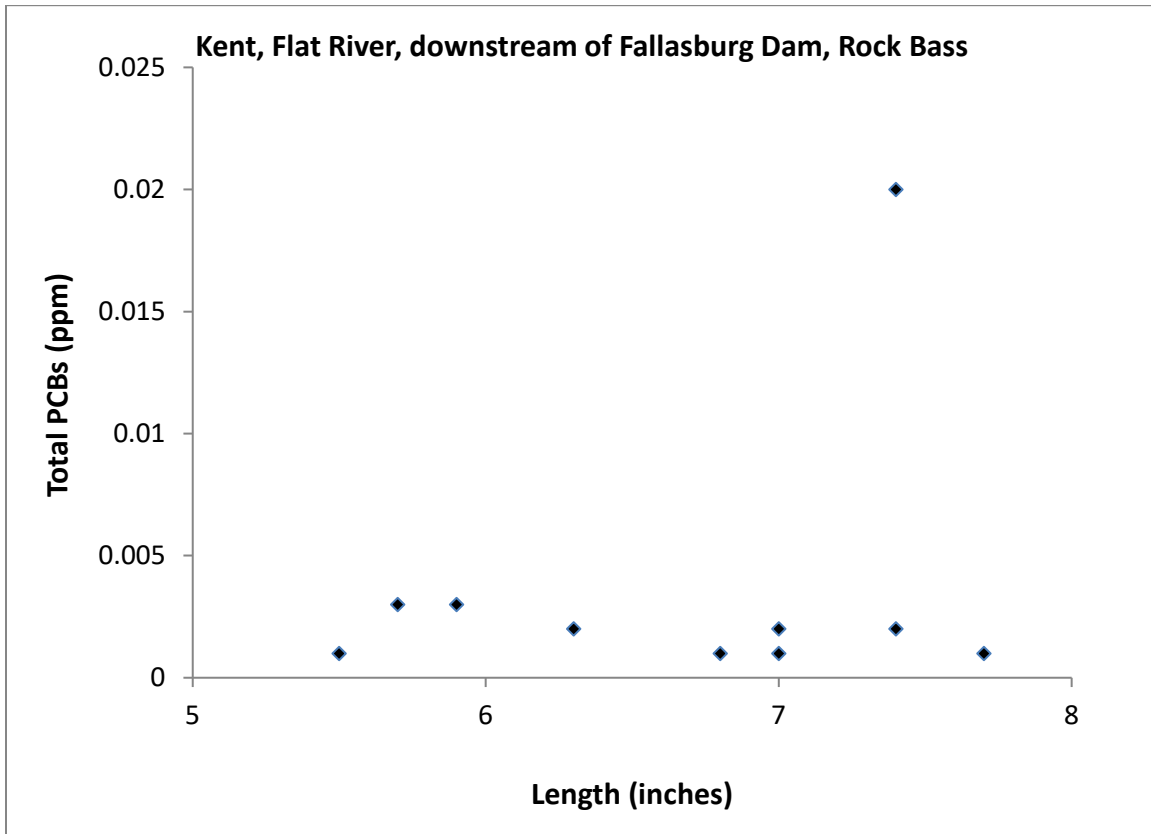
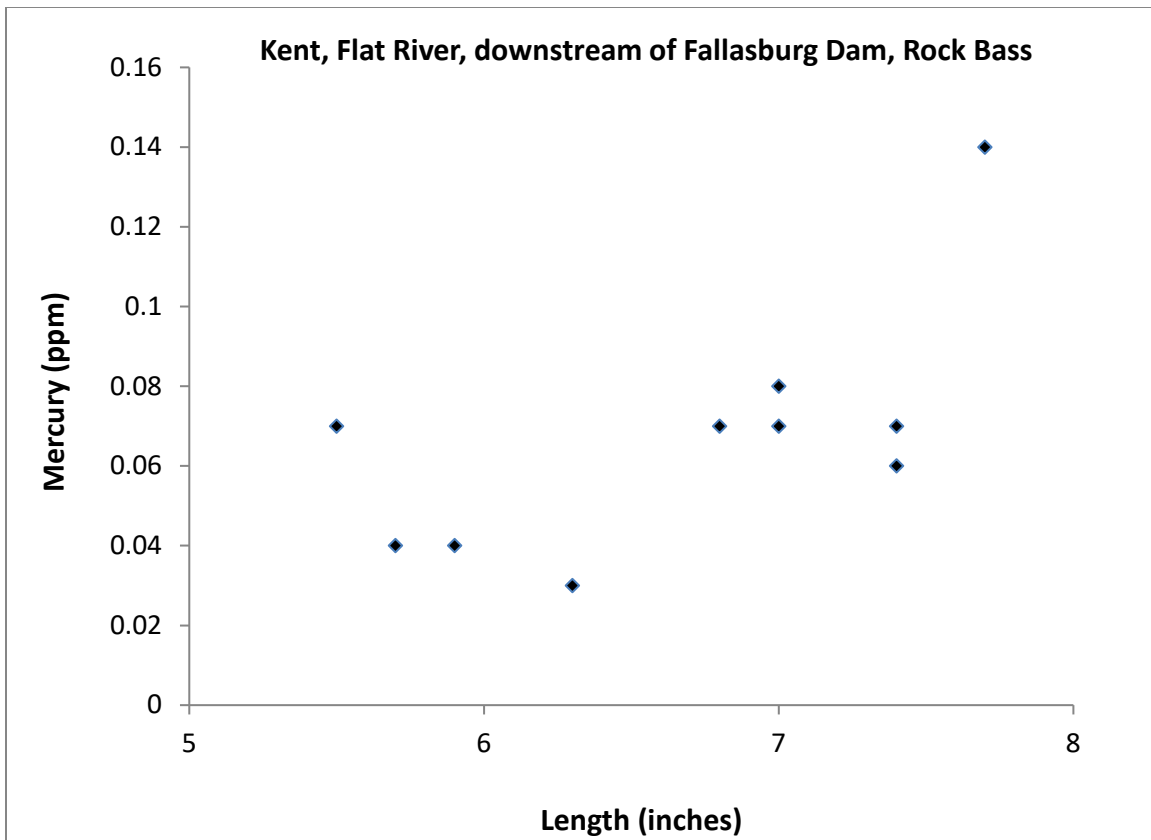
Organics Analysis:

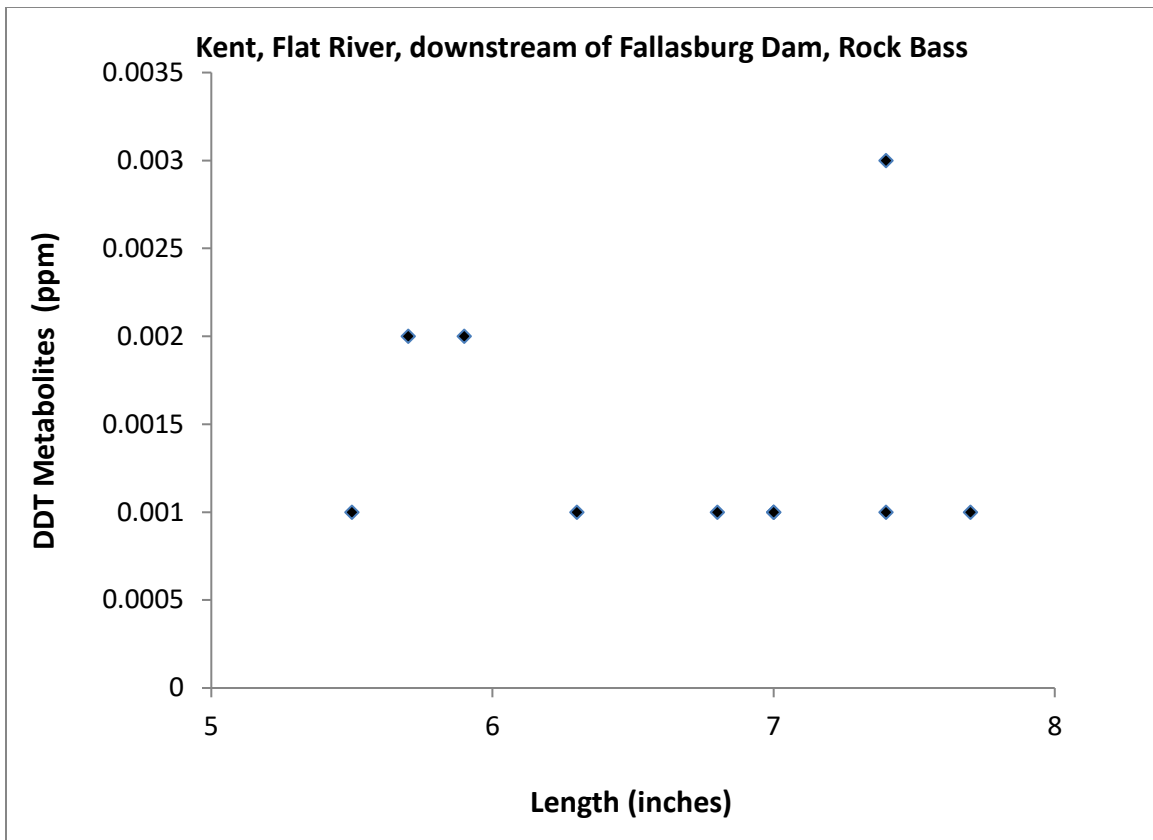
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2008	2008	10	5.5	na	5.5	7.7
Datasets available: 2008						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
PCB	10	0.004		0.001	0.02	0.008
DDT	10	0.001		0.001	0.003	0.002
Chlordane	10	ND		--	--	--
Toxaphene	10	ND		--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.075	0.014				
DDT	0.003	0.020				
Chlordane	--	--				
Toxaphene	--	--				

Final meal category based on UCL: 12

Existing Advisory: Women and children should not eat more than one meal per week of Flat River rock bass due to PCBs.

Recommendation: No one should eat more than 12 meals per month of rock bass from the Flat River between the Fallasburg and Lowell Dams due to mercury.





White Sucker

Flat River Between Fallasburg and Lowell Dams

Kent County

Hg Analysis:

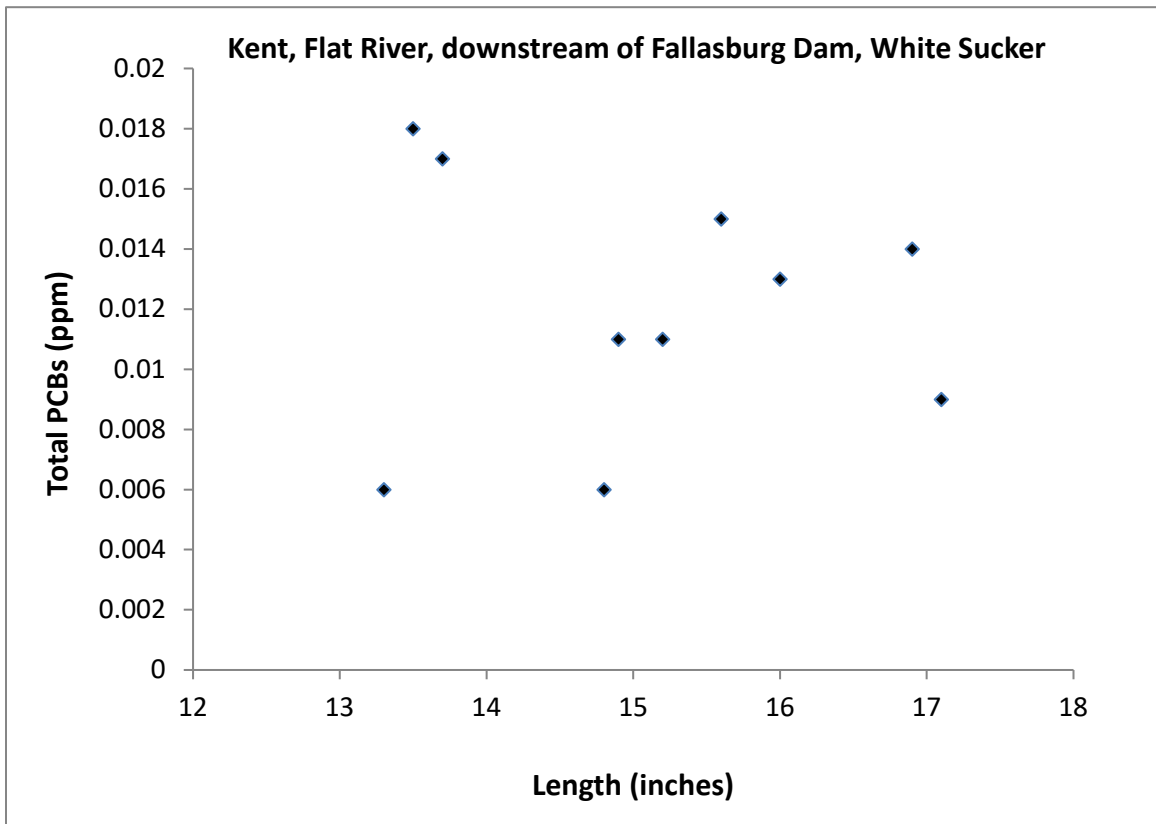
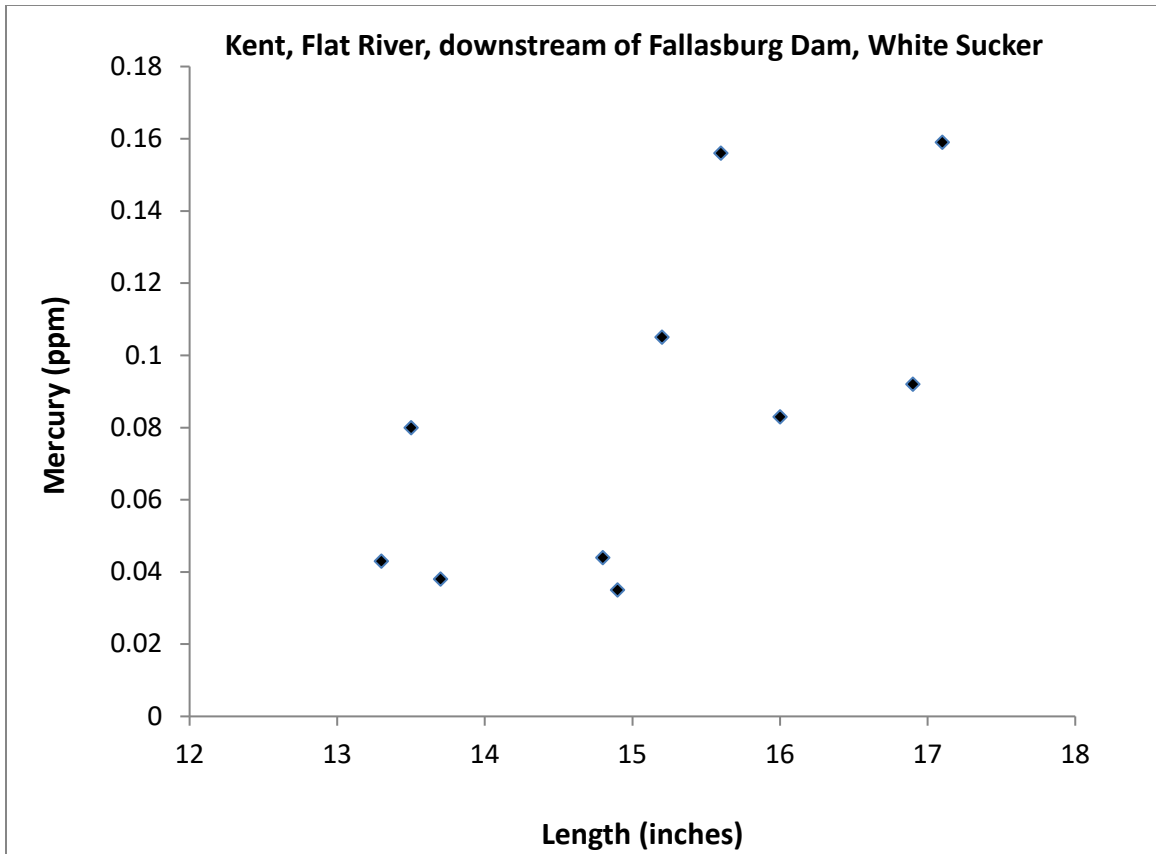
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2008	2008	10	13.3	na	13.3	17.1	
Datasets available: 2008							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.08		0.04	0.16	0.12	8
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.437	0.436					

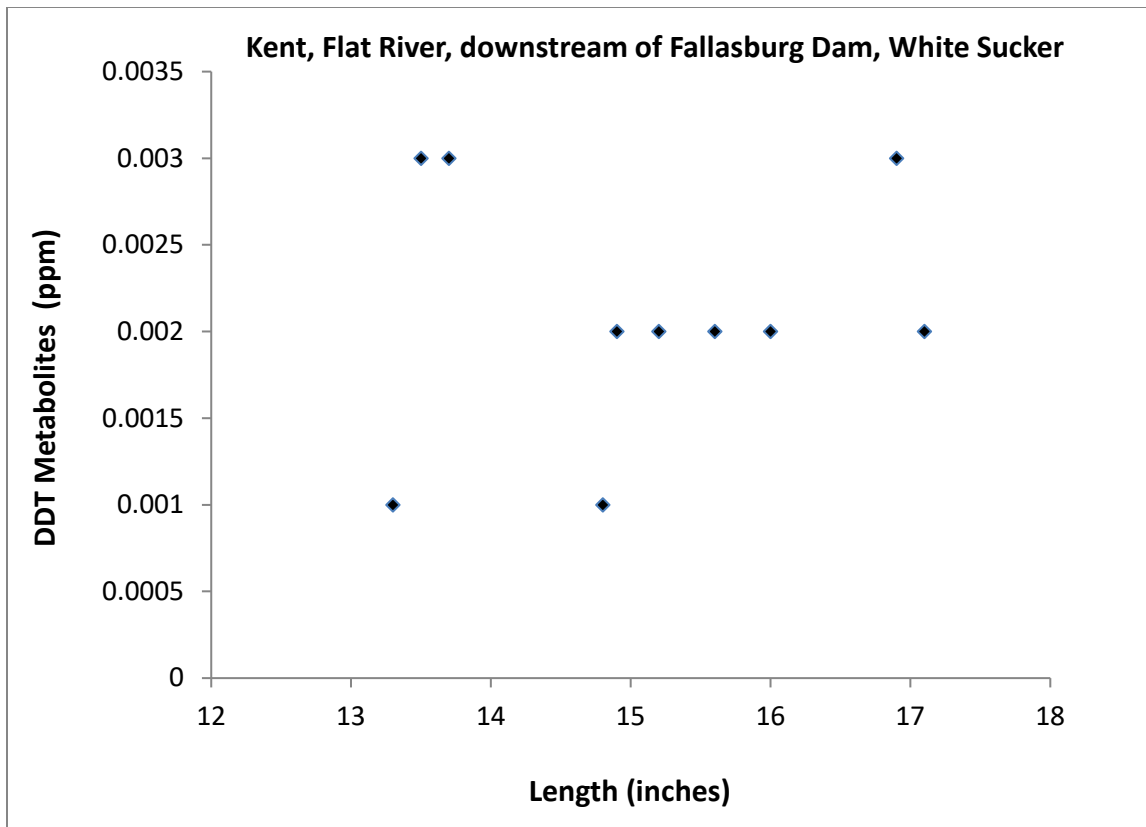
Organics Analysis:

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	13.3	na	13.3	17.1	
Datasets available: 2008							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.08		0.006	0.02	0.02	12
DDT	10	0.01		0.001	0.003	0.003	16
Chlordane	10	ND		--	--	--	--
Toxaphene	10	ND		--	--	--	--
Chemical							
	10	0.050					
	R ²	R ²					
PCB	0.006	0.002					
DDT	0.010	0.040					
Chlordane	--	--					
Toxaphene	--	--					
Final meal category based on UCL:							8

Existing Advisory: Women and children should not eat more than one meal per week of Flat River sucker larger than 14 inches due to PCBs.

Recommendation: No one should eat more than 8 meals per month of sucker from the Flat River between the Fallasburg and Lowell Dams due to mercury. PCBs would cause an advisory.





Grand River
Clinton, Eaton, Ingham, Ionia, Jackson,
Kent and Ottawa Counties

Common Carp**Grand River
Moores Park Dam to Webber Dam****Clinton/Ionia/Ingham****Hg Analysis:**

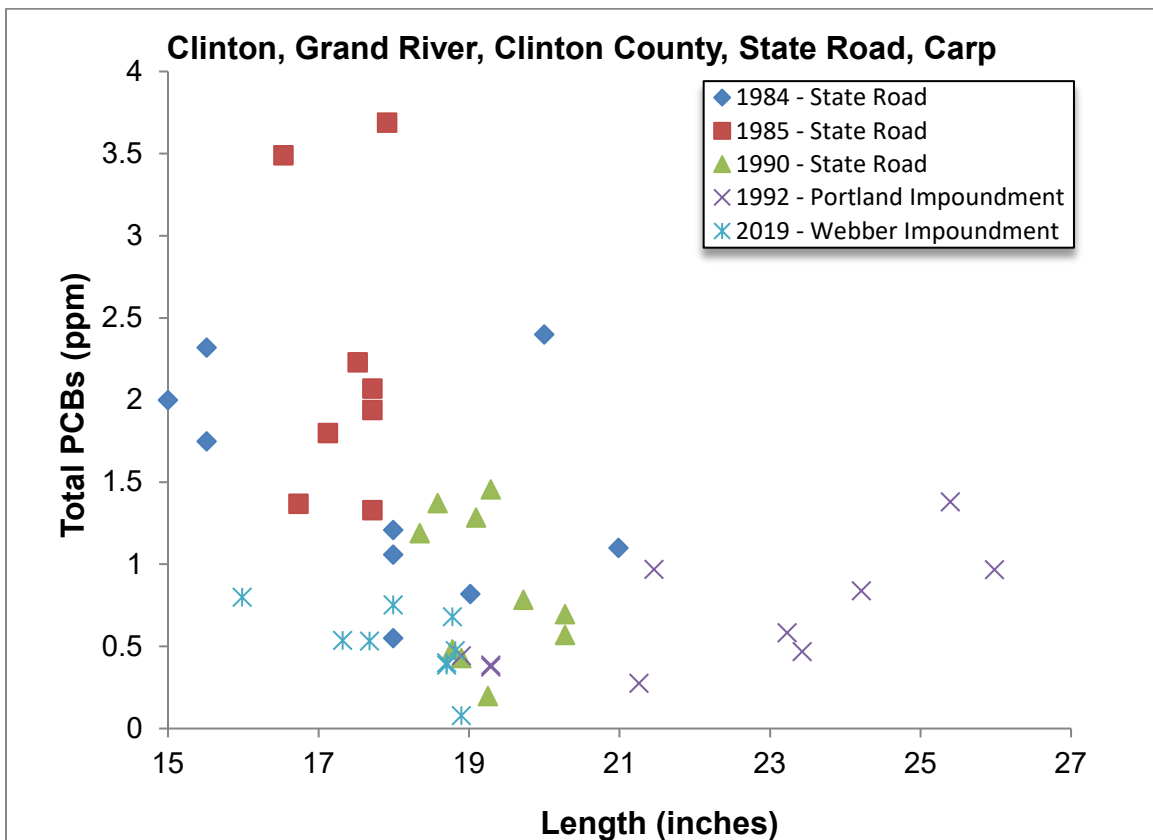
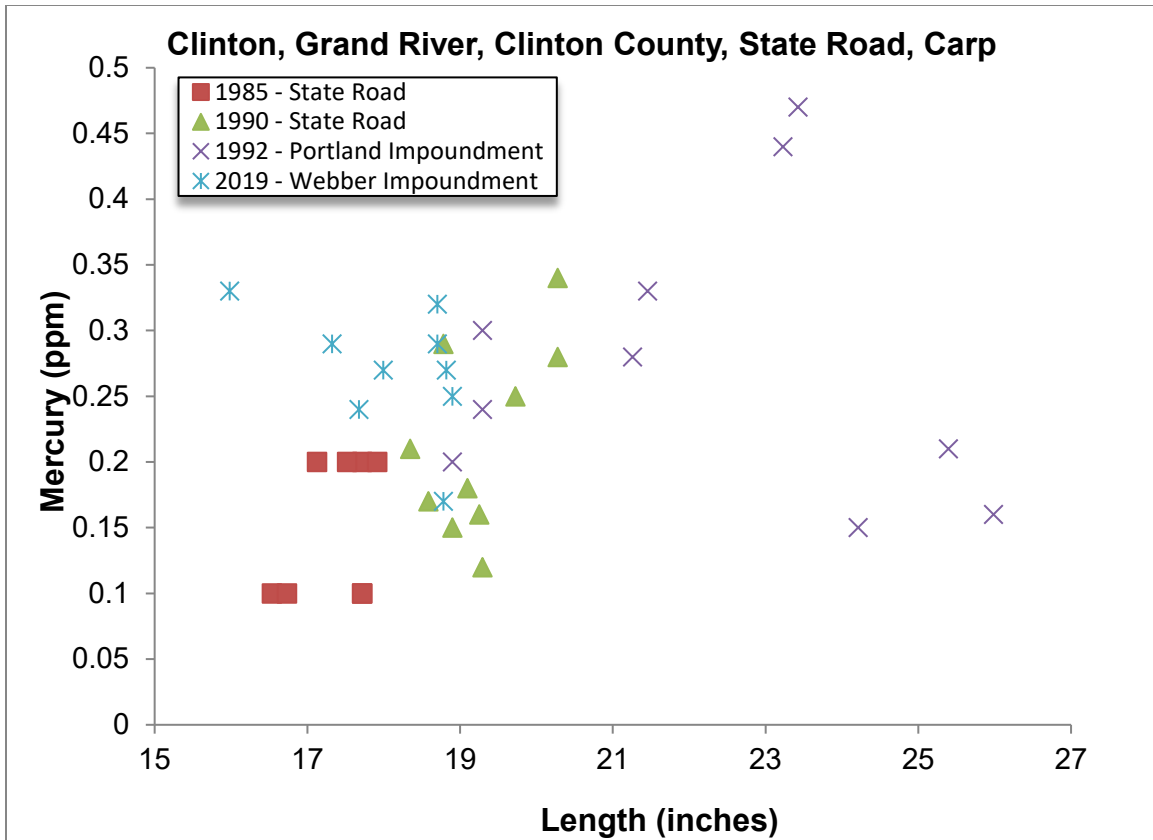
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1985	2019	38	15.0	NA	15.0	26.0	
Datasets available: 1985, 1990, 1992, 2019							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	38	0.233		0.100	0.470	0.263	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.077	0.064					

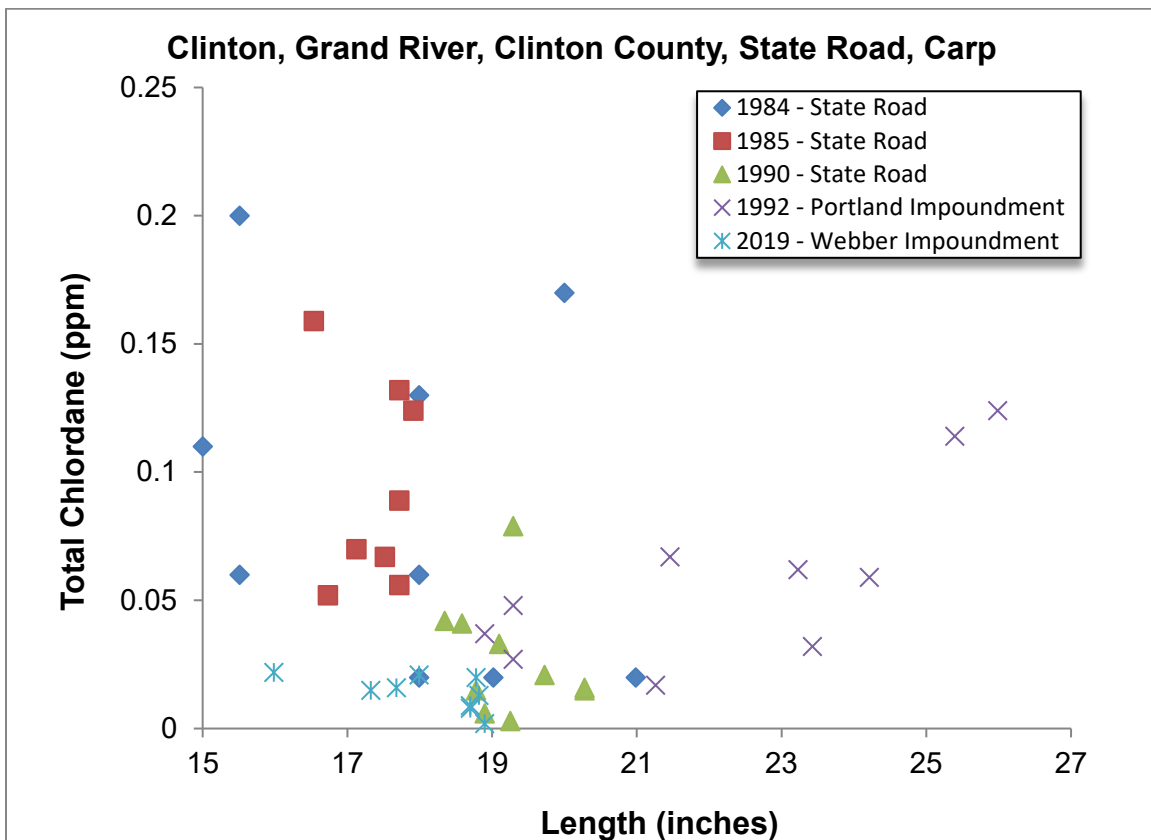
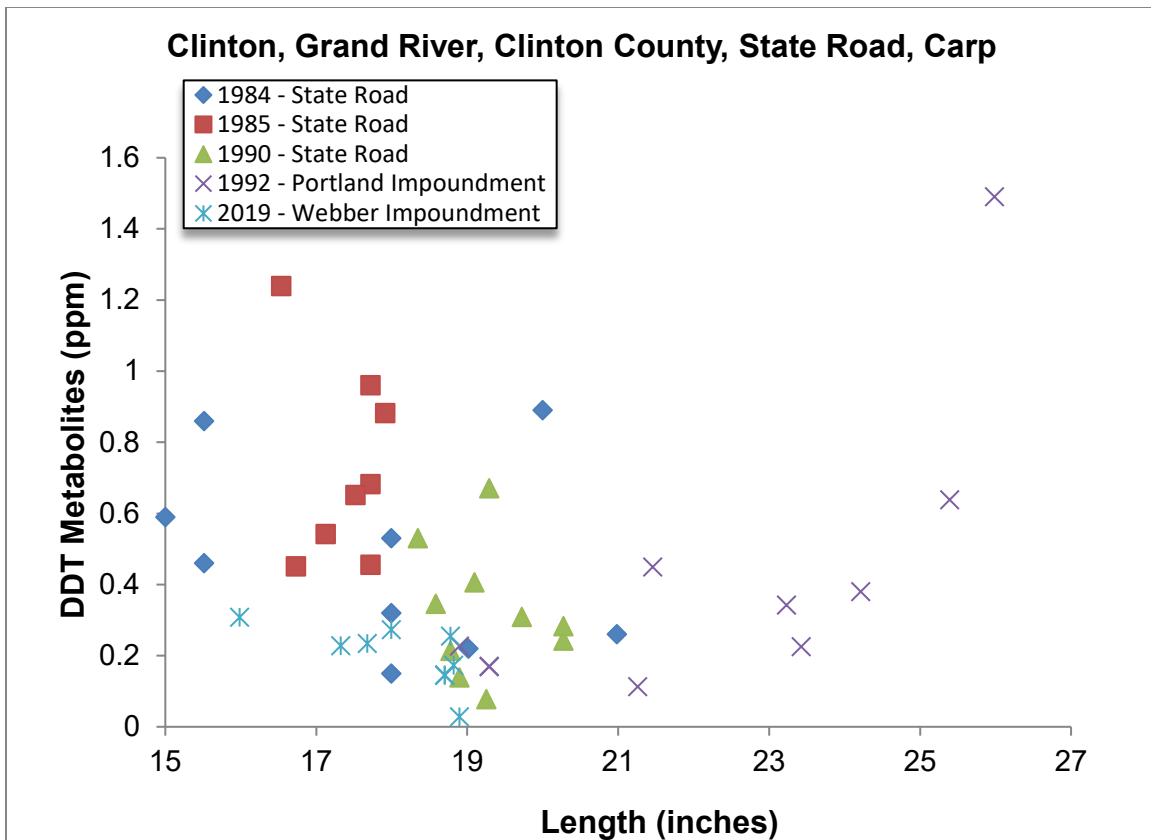
Organics Analysis:

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	16.0	NA	16.0	19.0	
Datasets available: 1984, 1985, 1990, 1992, 2019							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.512		0.080	0.801	0.661	Limited
DDT	10	0.197		0.028	0.308	0.255	4
Chlordane	10	0.014		0.002	0.022	0.018	16
Toxaphene	10	ND		--	--	--	--
PFOS	0	--		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.385	0.250					
DDT	0.473	0.282					
Chlordane	0.377	0.275					
Toxaphene	--	--					
PFOS	--	--					
Final meal category based on UCL:							Limited

Existing MDHHS Advisory: Sensitive populations should not eat these fish. Healthy adults should limit consumption of carp from the Grand River between the Moores Park and Webber Dams to 1 or 2 meals per year due to PCBs. Mercury and DDT would cause advisories.

Recommendation: No change to the advisory is recommended.





**Largemouth/Smallmouth
Bass**

**Grand River
Moore's Park Dam to Webber Dam**

Clinton/Ionia/Ingham

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	2021	18	8.0	14.0	14.2	17.7	
Datasets available: 1990, 2019, 2021							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	16	0.331		0.220	0.420	0.346	2
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
	Mercury	0.515	0.527				

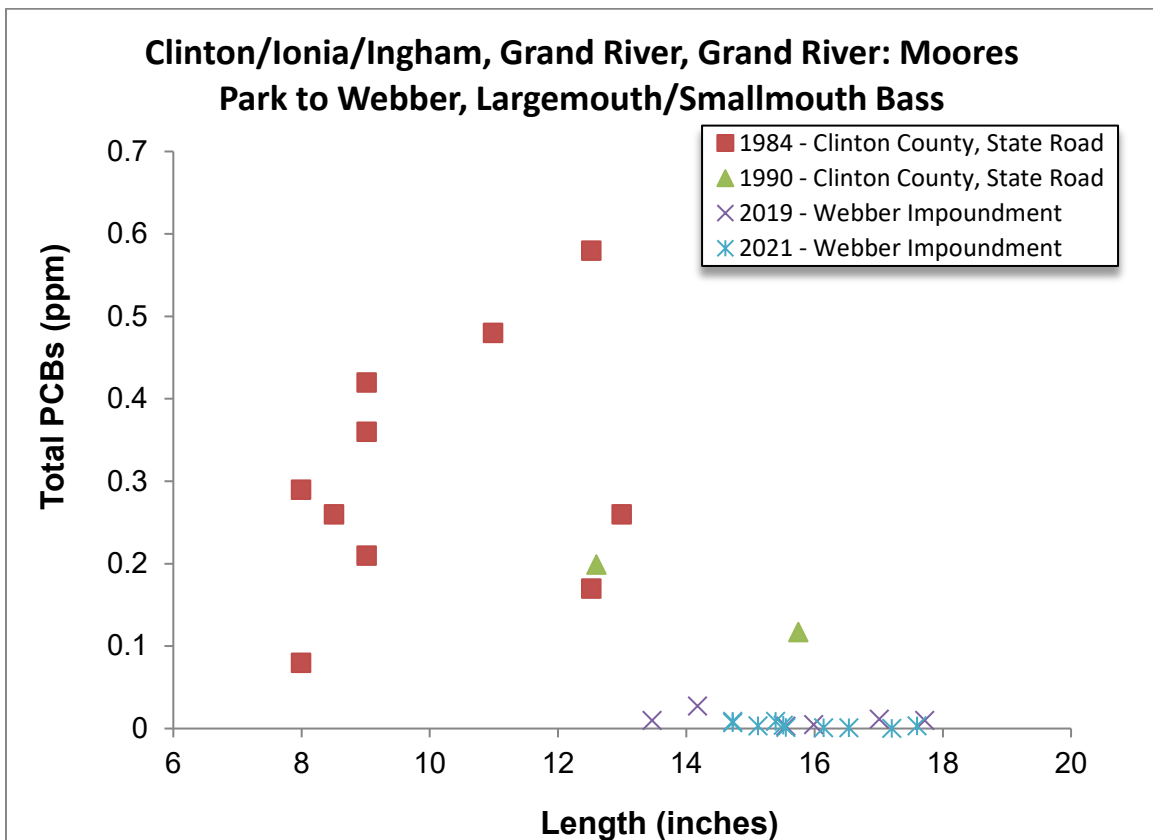
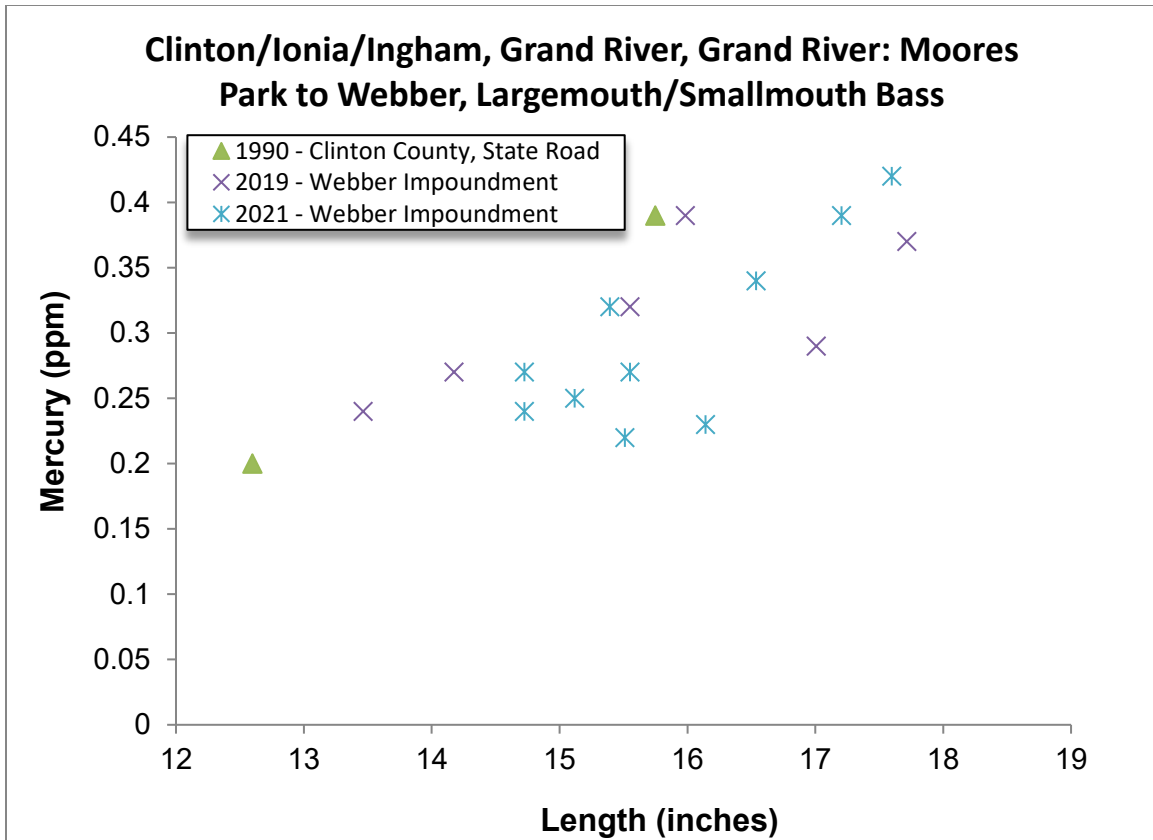
Organics Analysis:

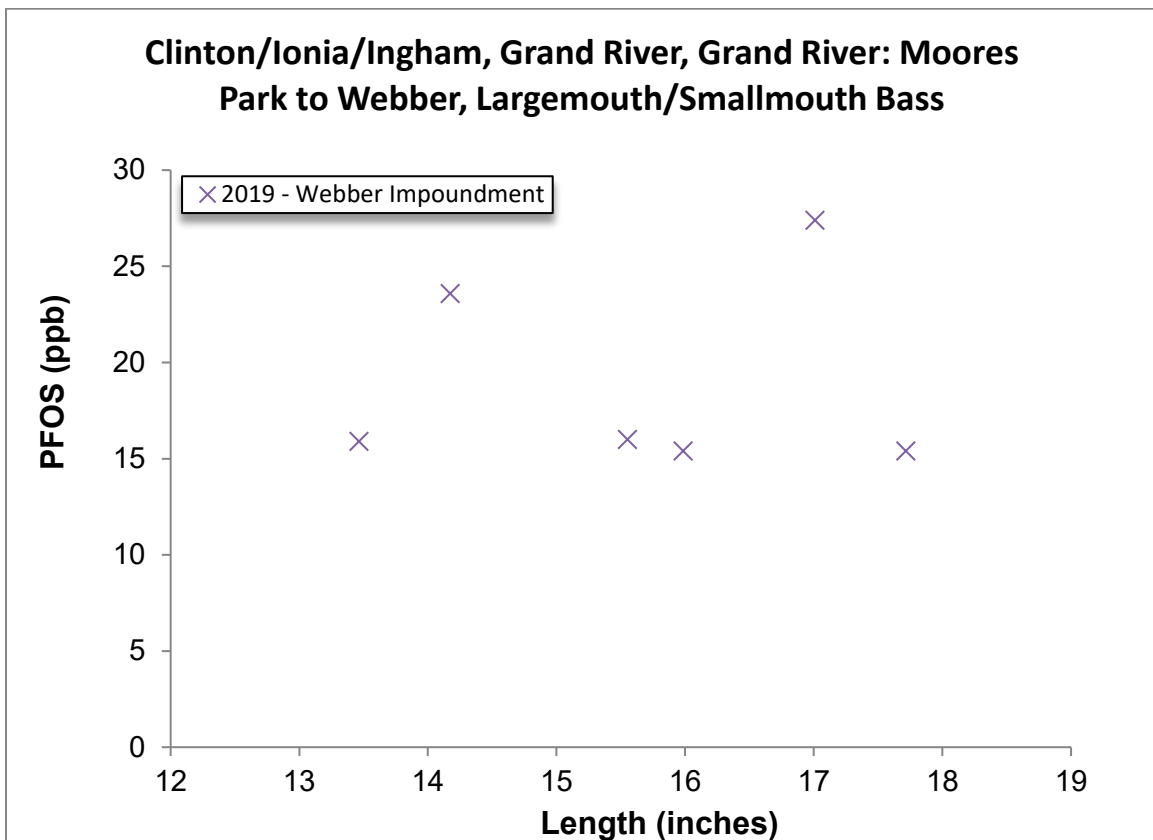
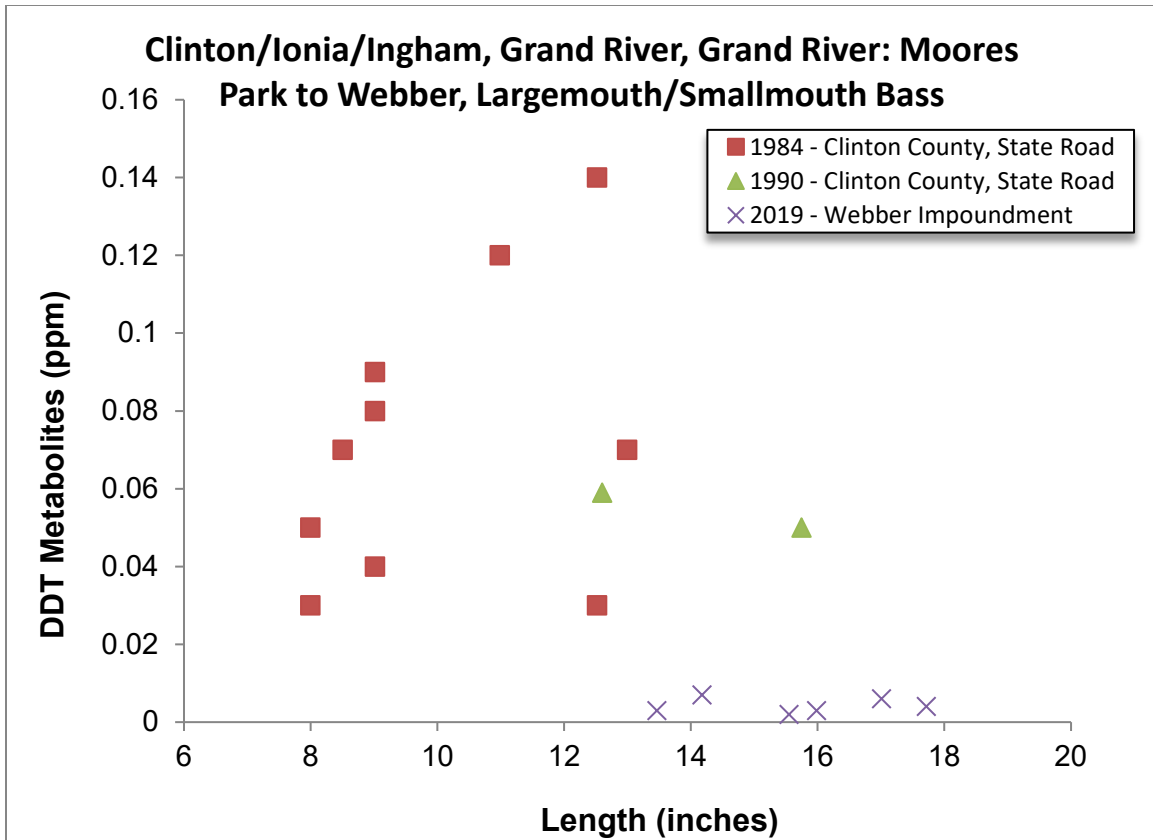
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2019	2021	16	13.5	14.0	13.5	17.7	
Datasets available: 1984 (No PFOS), 1990 (No PFOS), 2019, 2021 (PCB Only)							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	16	0.007		<0.001	0.027	0.010	16
DDT	6	0.004		0.002	0.007	0.006	16
Chlordane	6	ND		--	--	--	16
Toxaphene	6	ND		--	--	--	--
PFOS	6	19.0 ppb		15.4 ppb	27.4 ppb	24.4 ppb	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.166	0.182					
DDT	0.000	0.007					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	0.005	0.001					
Final meal category based on UCL:							2

Existing MDHHS Advisory: Largemouth and smallmouth bass from the Grand River between Moore's Park Dam and Webber County are currently covered under the statewide mercury guidance. No one should eat more than 2 meals per month of largemouth or smallmouth bass smaller than 18 inches or no more than 1 meal per month of these fish larger than 18 inches.

Recommendation: No one should eat more than 2 meals per month of largemouth or smallmouth bass smaller than 18 inches from the Grand River between Moore's Park Dam and Webber County or no more than 1 meal per month of these fish larger than 18 inches due to mercury. PFOS causes less restrictive advice. Statewide length break applied due to the limited size of fish used in the mercury analysis.





Bluegill/Pumpkinseed**Grand River
between Smithville and Moores Park
Dams****Ingham
& Eaton Counties****Hg Analysis:**

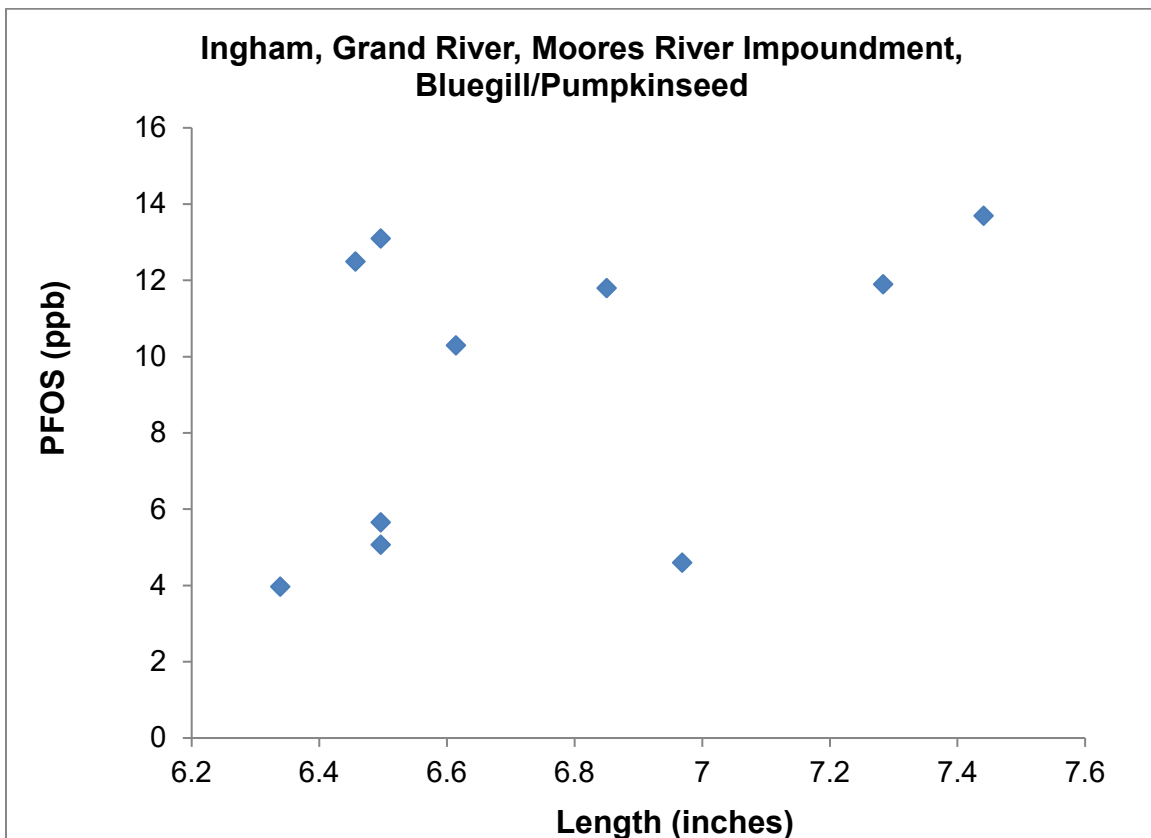
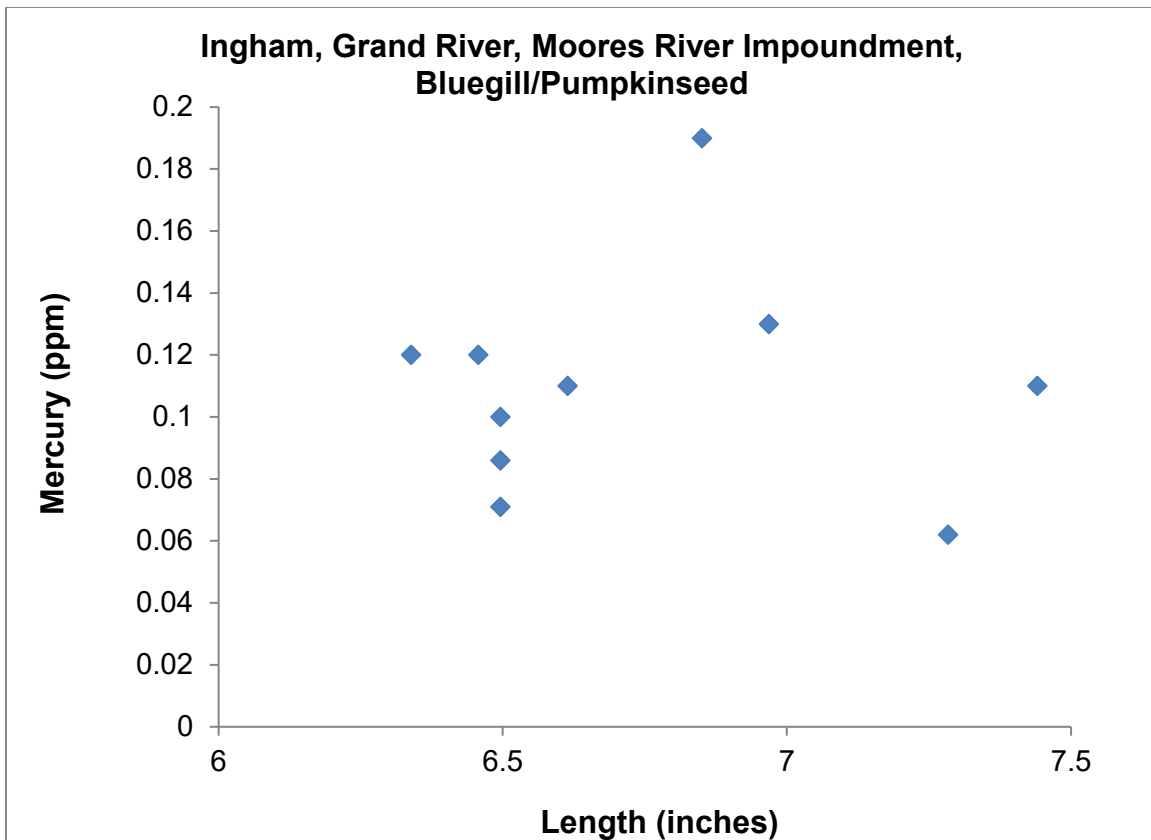
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2019	2019	10	6.3	NA	6.3	7.4	
Datasets available:		2019					
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.110		0.062	0.190	0.135	4
Chemical	Linear Regression	Exponential Regression					
	R²	R²					
Mercury	0.000	0.006					

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	6.3	NA	6.3	7.4	
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	9.3 ppb		4.0 ppb	13.7 ppb	12.1 ppb	12
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	0.187	0.175		Final meal category based on UCL:			4

Existing MDHHS Advisory: Bluegill and sunfish from the Grand River between the Smithville Dam and Moores Park 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 4 meals per month of bluegill or sunfish of any size from the Grand River between the Smithville Dam and Moores Park Dam due to mercury. PFOS causes less restrictive guidance.



Carp**Grand River
Between Smithville & Moores Park
Dams****Ingham &
Eaton Counties****Hg Analysis:**

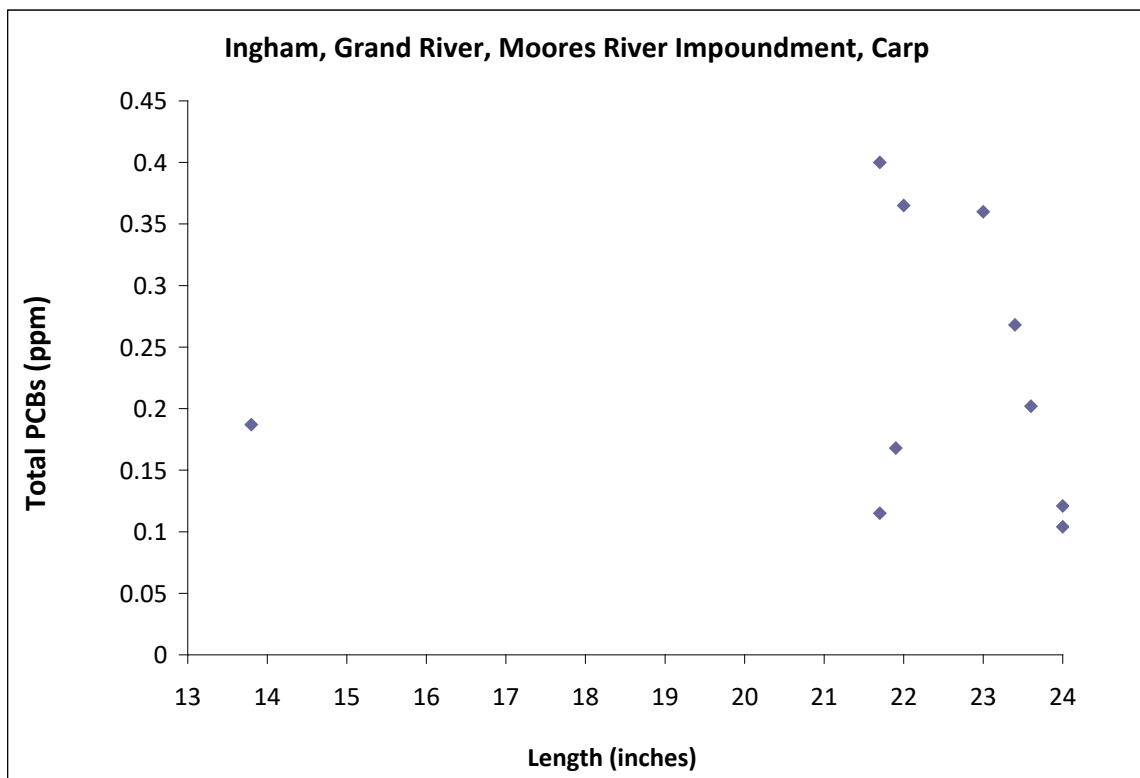
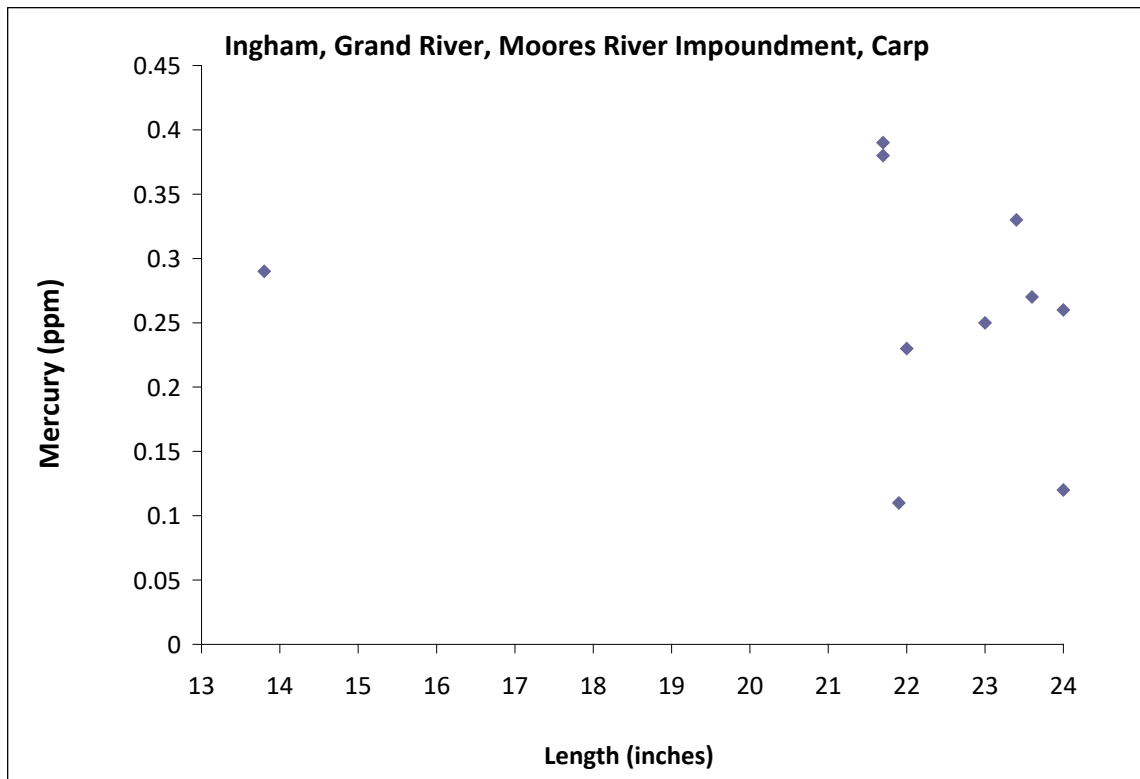
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1996	1996	10	13.8	na	13.8	24	
Datasets available:		1996					
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.26		0.11	0.38	0.33	2
Chemical	Linear Regression	Exponential Regression					
	R²	R²					
Mercury	0.035	0.038					

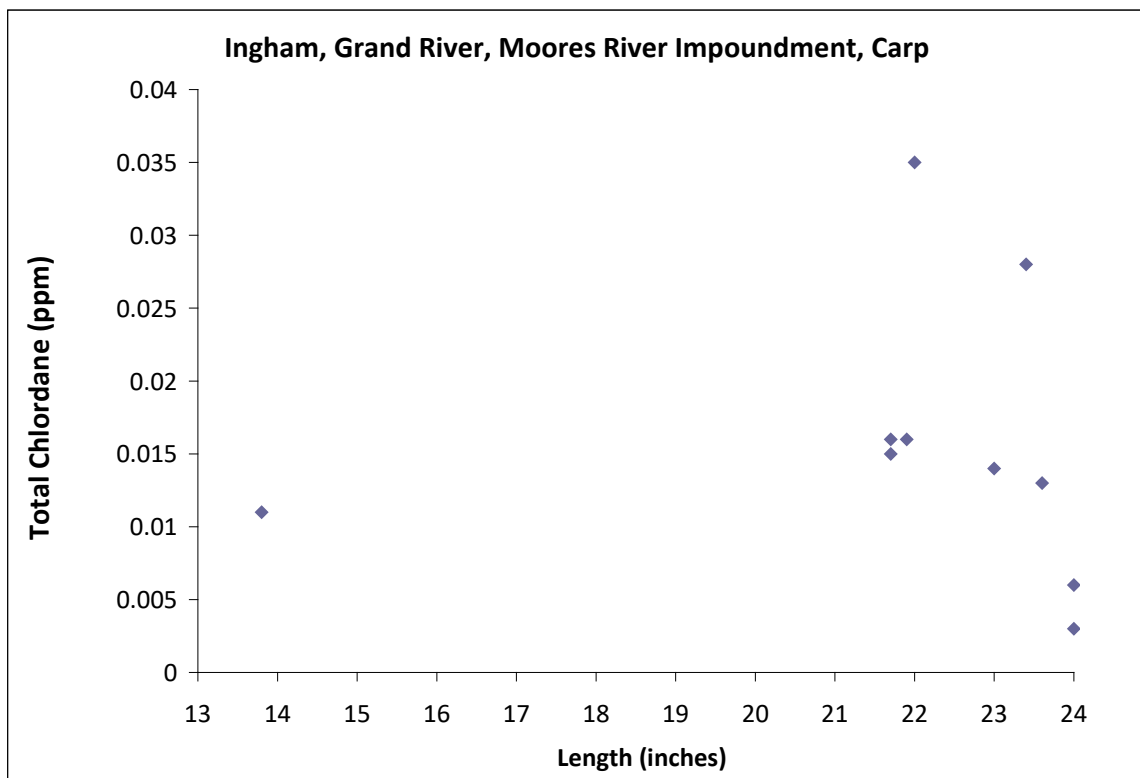
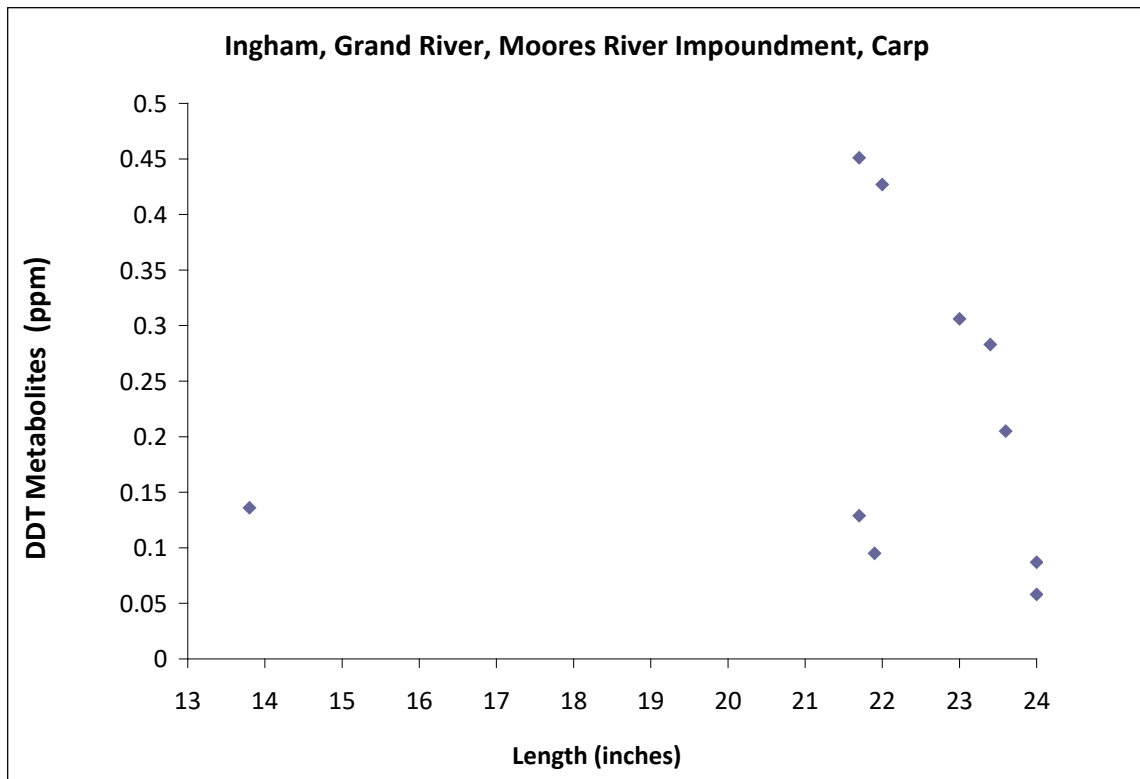
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1996	1996	10	13.8	na	13.8	24	
Datasets available: 1996							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.229		0.12	0.36	0.31	0.5
DDT	10	0.218		0.06	0.45	0.32	4
Chlordane	10	0.016		0.003	0.04	0.02	--
Toxaphene	10	ND		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.000	0.003					
DDT	0.003	0.000					
Chlordane	0.000	0.012					
Toxaphene	--	--		Final meal category based on UCL:			0.5*

Existing Advisory: Women and children should not eat more than one meal per month of carp from the Grand River upstream of Webber Dam due to PCBs.

Recommendation: No one should eat more than 1 meal per month of carp from the Grand River between the Moores Park Dam in Lansing and the Smithville Dam in Eaton Rapids due to PCBs. Mercury and DDT would cause advisories. The quality of this dataset is limited due to the age of the data. *Based on the EGLE 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.





Channel Catfish

Grand River Between Smithville & Moores Park Dams

Ingham & Eaton 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
1989	1989	10	15	12	15	24.8
Datasets available: 1989						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
Mercury	10	0.18		0.07	0.47	0.26
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.656	0.818				

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	12	15	24.8
Datasets available: 1989						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
PCB	10	0.24		0.10	0.46	0.34
DDT	10	0.25		0.10	0.49	0.36
Chlordane	10	0.04		0.003	0.10	0.06
Toxaphene	10	ND		--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.577	0.551				
DDT	0.669	0.668				
Chlordane	0.347	0.140				
Toxaphene	--	--				

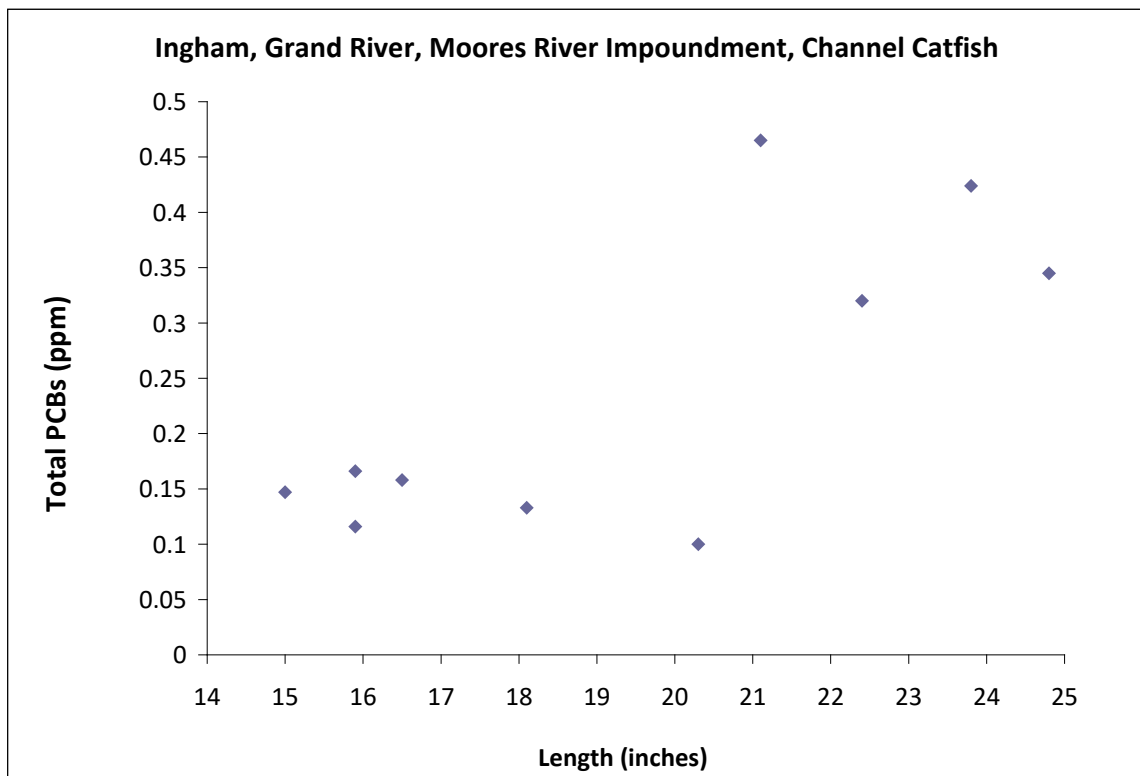
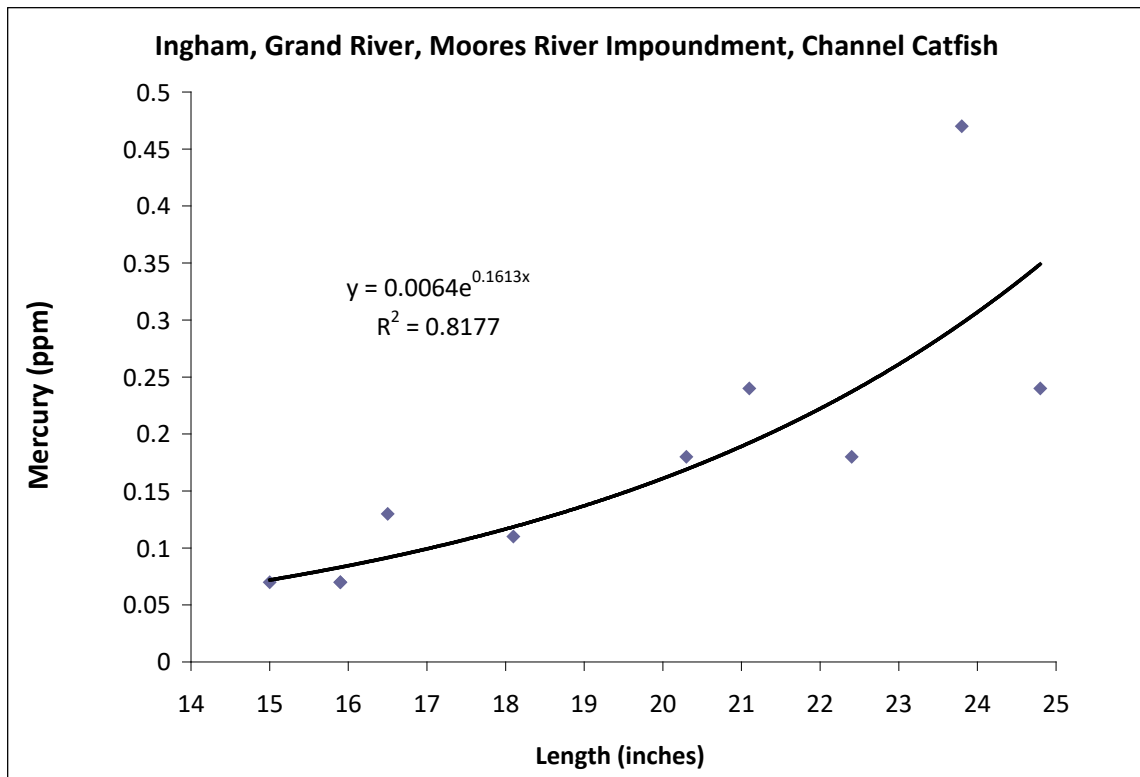
Final meal category based on UCL: 0.5*

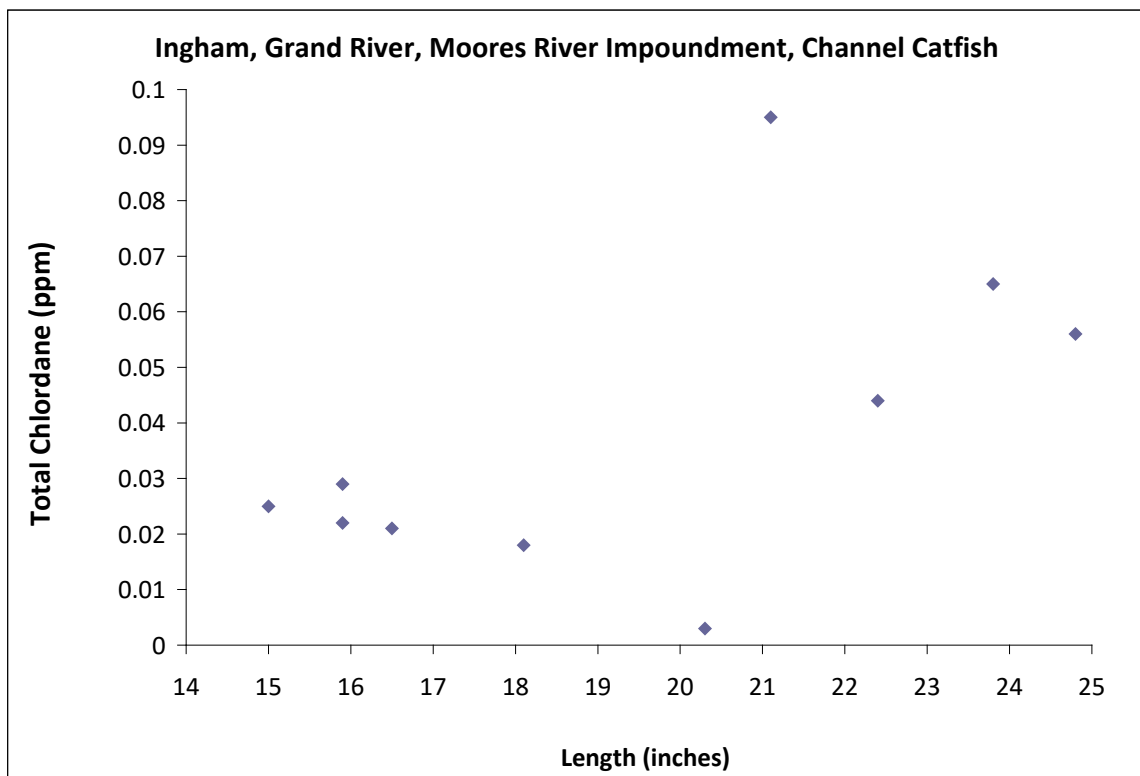
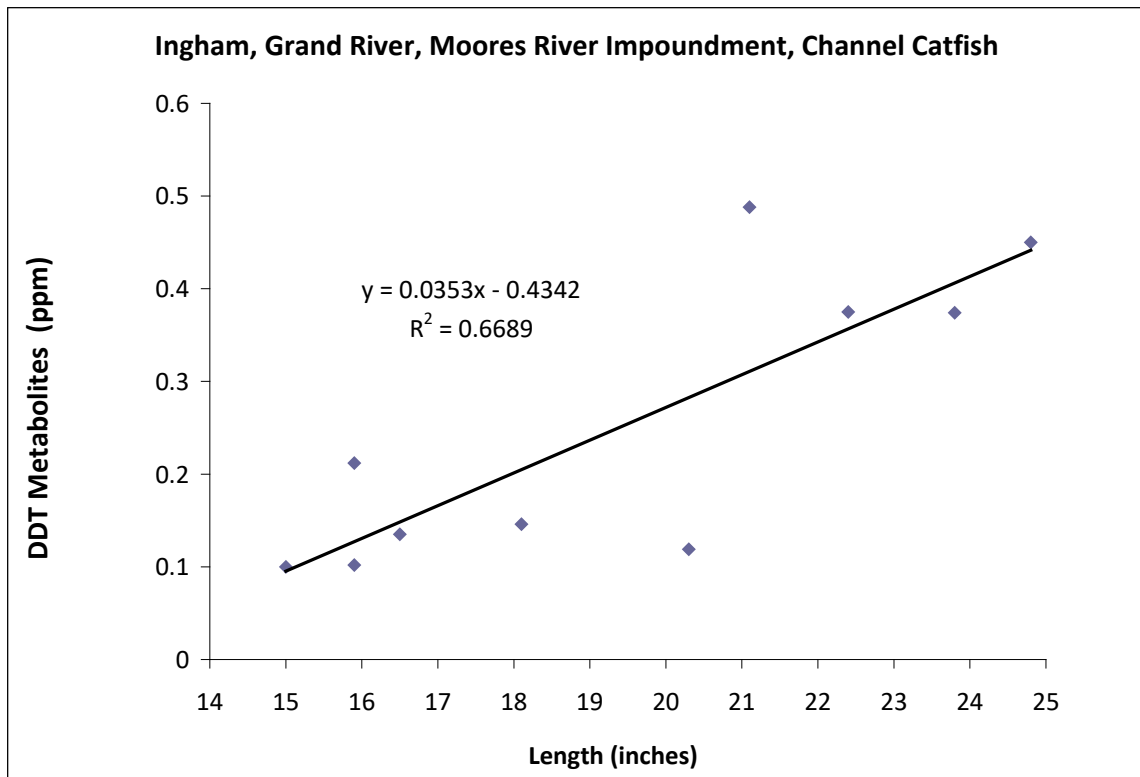
Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category	DDT Regression Equation Estimate (ppm)	Meal Category
12	0.044	16	-0.011	16
14	0.061	16	0.060	16
16	0.085	12	0.131	12
18	0.117	8	0.201	8
20	0.161	4	0.272	8
22	0.222	4	0.342	4
24	0.307	2	0.413	4
26	0.424	2	0.484	2

Shaded area denotes extrapolated estimates

Existing Advisory: Women and children should eat no more than one meal per week of channel catfish less than 18 inches from the Grand River upstream of Webber Dam and no more than one meal per month of those fish larger than 18 inches due to PCBs.

Recommendation: No one should eat more than 1 meal per month of channel catfish from the Grand River between the Moores Park Dam in Lansing and the Smithville Dam in Eaton Rapids due to PCBs. Mercury and DDT would cause advisories. The quality of this dataset is limited due to the age of the data. *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.





**Largemouth/Smallmouth
Bass**

**Grand River
Between Smithville and Moores
Park Dams**

Ingham & Eaton 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	
1989	2019	18	9.9	14.0	13.8	16.9	
Datasets available: 1989, 1996, 2019							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.422		0.210	0.830	0.551	1
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.306	0.303					

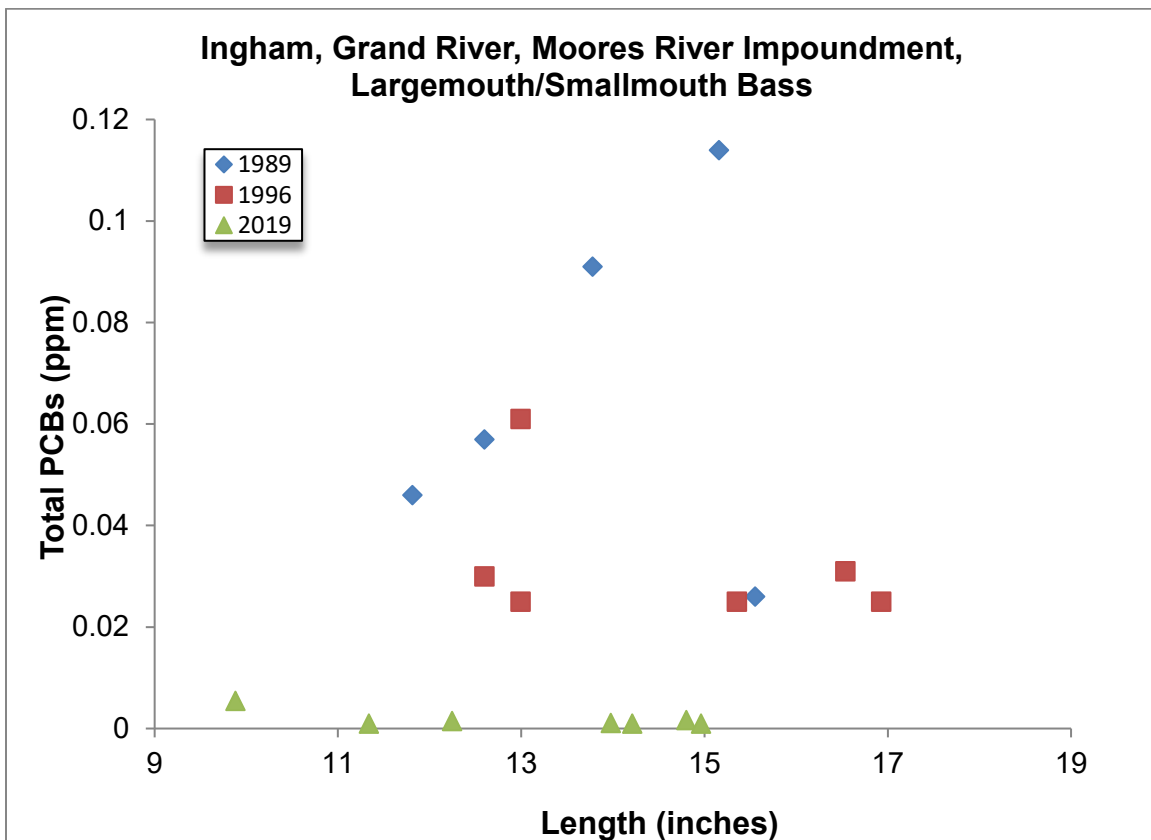
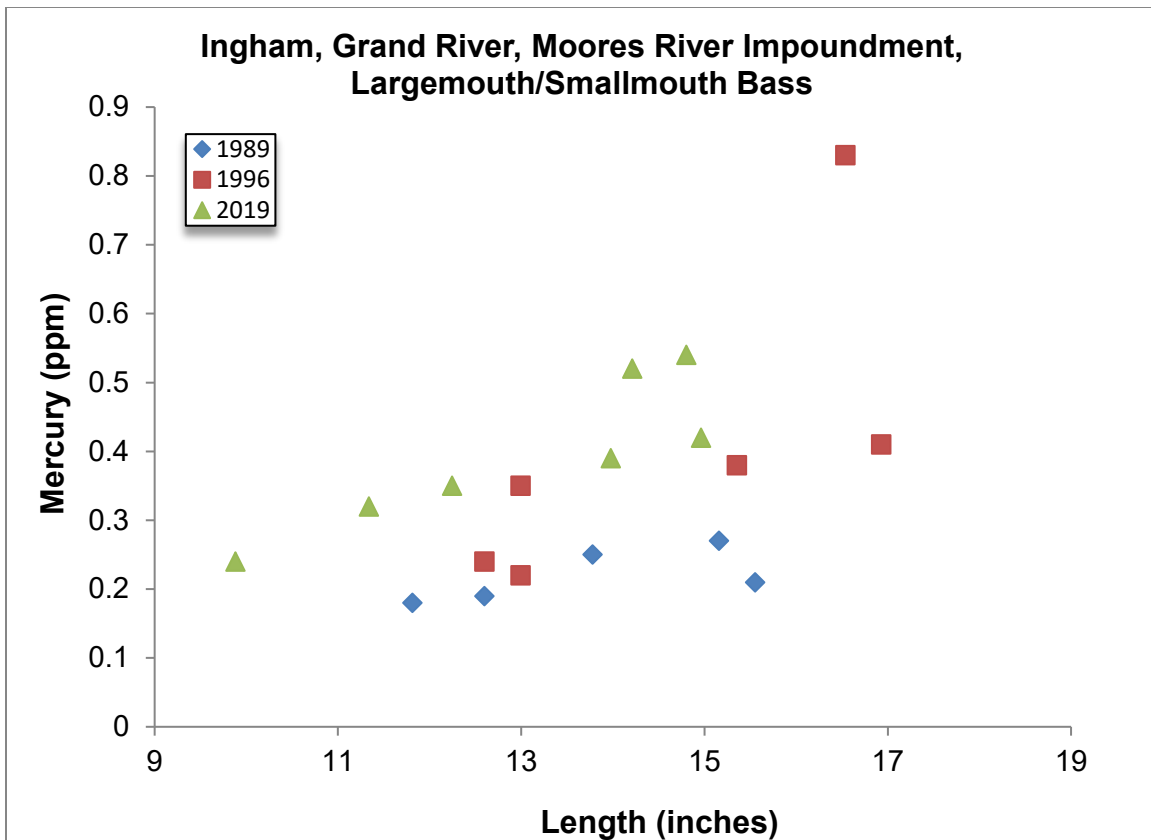
Organics Analysis:

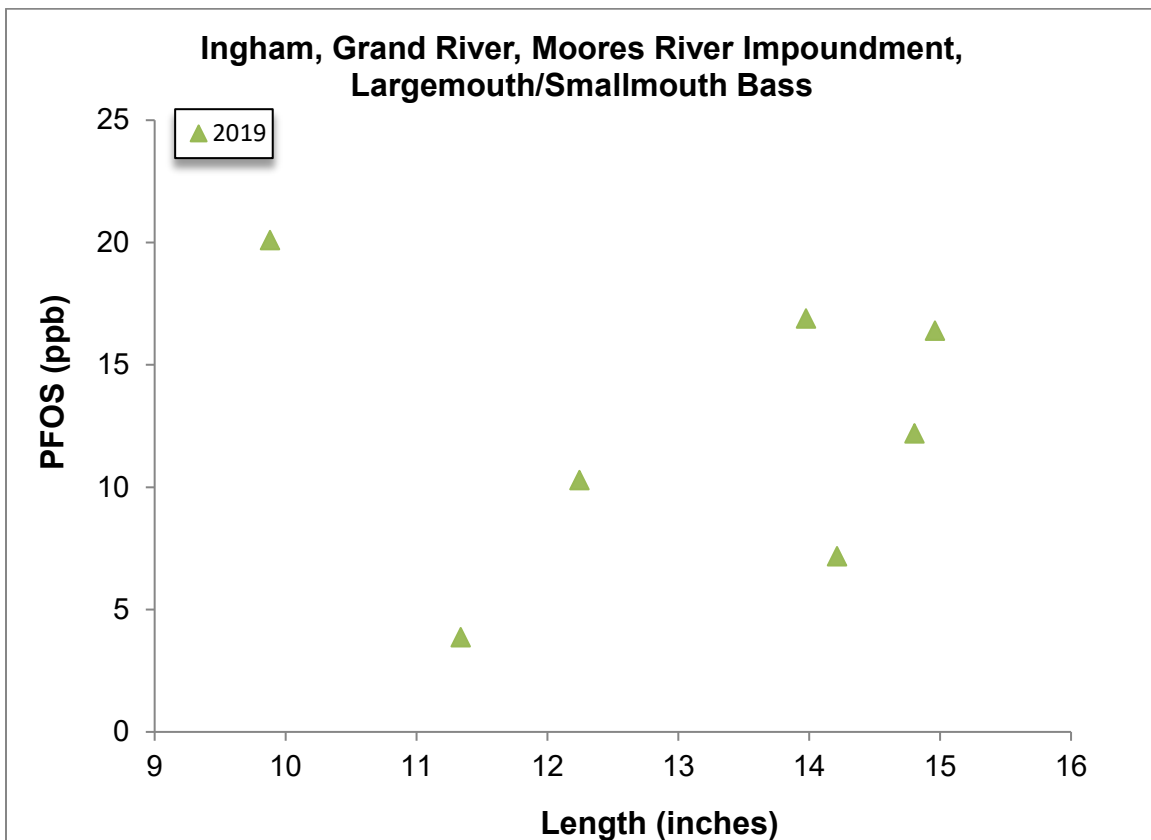
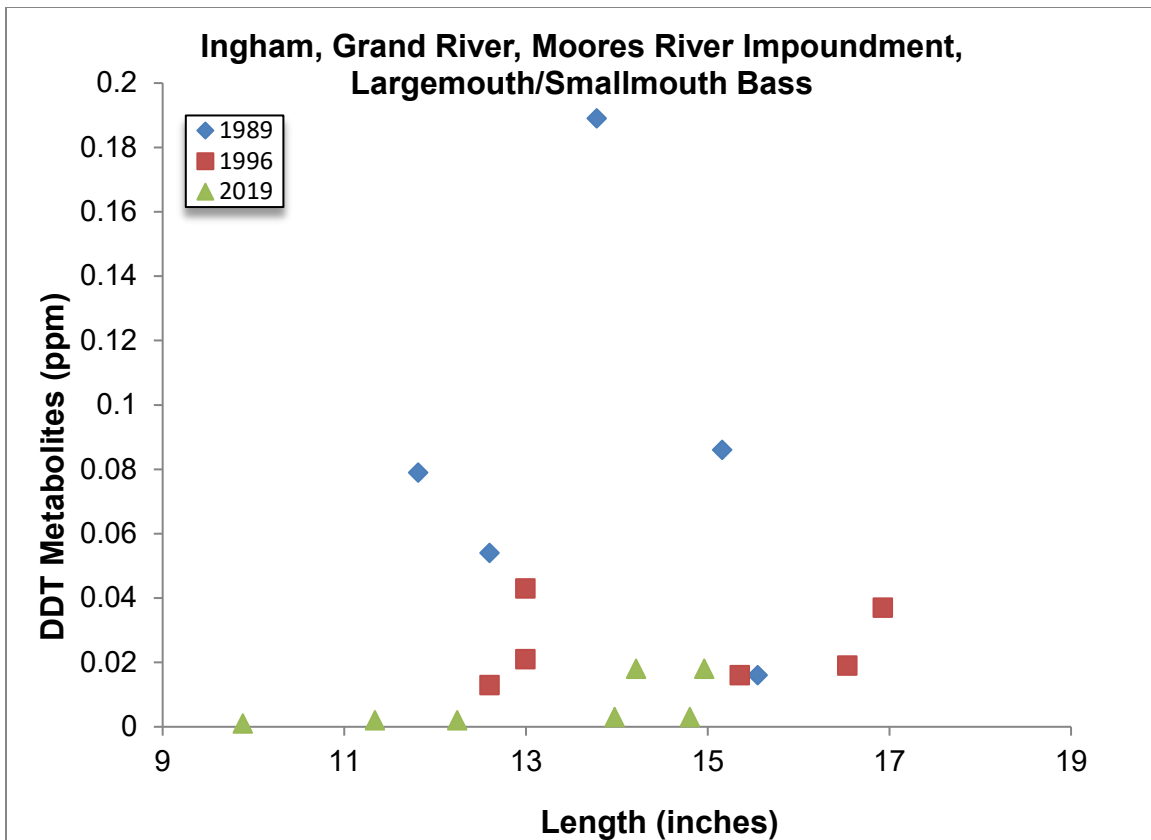
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1996	2019	13	9.9	14.0	14.0	16.9	
Datasets available: 1989 (No PFOS), 1996 (No PFOS), 2019							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	7	0.012		<0.001	0.031	0.025	8
DDT	7	0.016		0.003	0.037	0.027	16
Chlordane	7	ND		--	--	--	--
Toxaphene	7	ND		--	--	--	--
PFOS	7*	12.4 ppb		3.9 ppb	20.1 ppb	17.8 ppb	8
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.034	0.048					
DDT	0.224	0.408					
Chlordane	0.150	0.150					
Toxaphene	--	--					
PFOS	0.002	0.013					
Final meal category based on UCL:							1

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

Existing MDHHS Advisory: No one should eat more than 1 meal per month of largemouth or smallmouth bass less than 18 inches or more than 6 meals per year of those greater than 18 inches from the Grand River between the Moores Park Dam in Lansing to the Smithville Dam in Eaton Rapids due to mercury. The statewide length break was applied as the size range of the fish was limited.

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





Northern Pike

**Grand River
Between Smithville and Moores Park Dams**

**Ingham & Eaton
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	
1989	2004	6	21.7	24	23.6	26	
Datasets available: 1989, 2004							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	5	0.36		0.11	0.65	0.65	1
Chemical	Linear Regression	Exponential Regression					
	R²	R²					
Mercury	0.026	0.027					

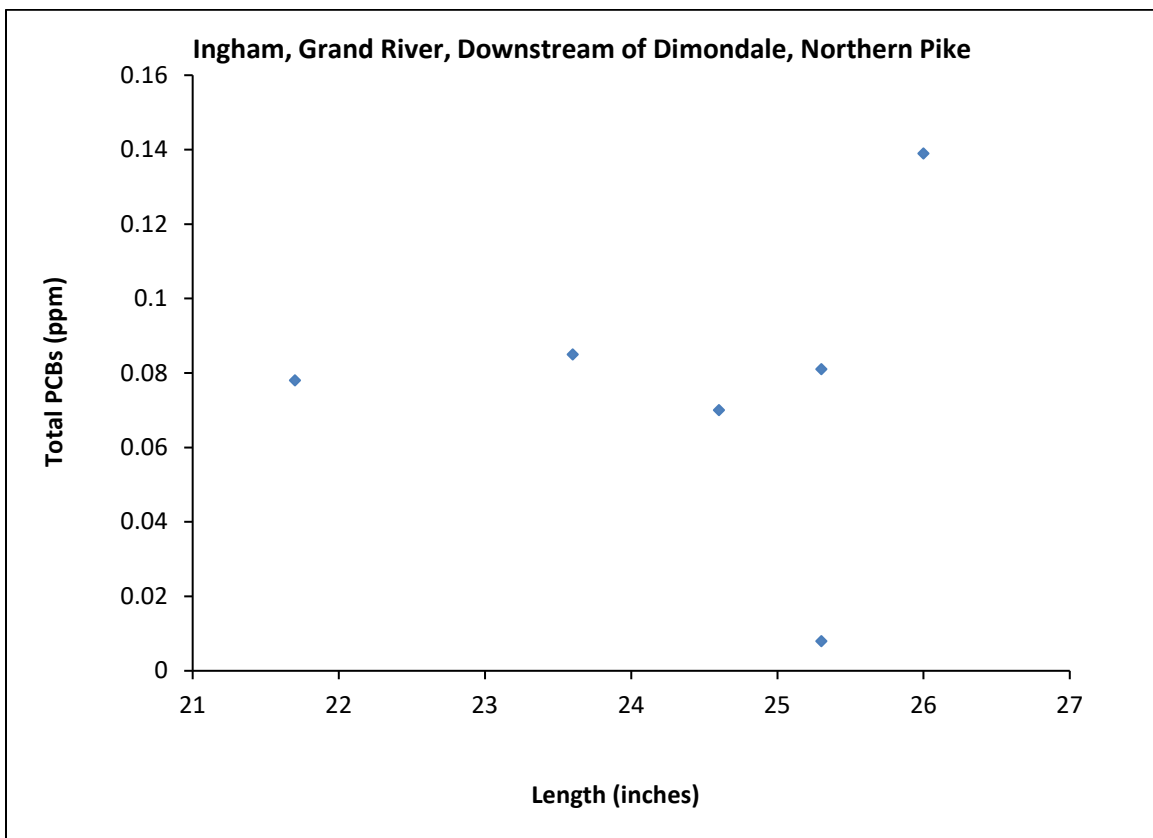
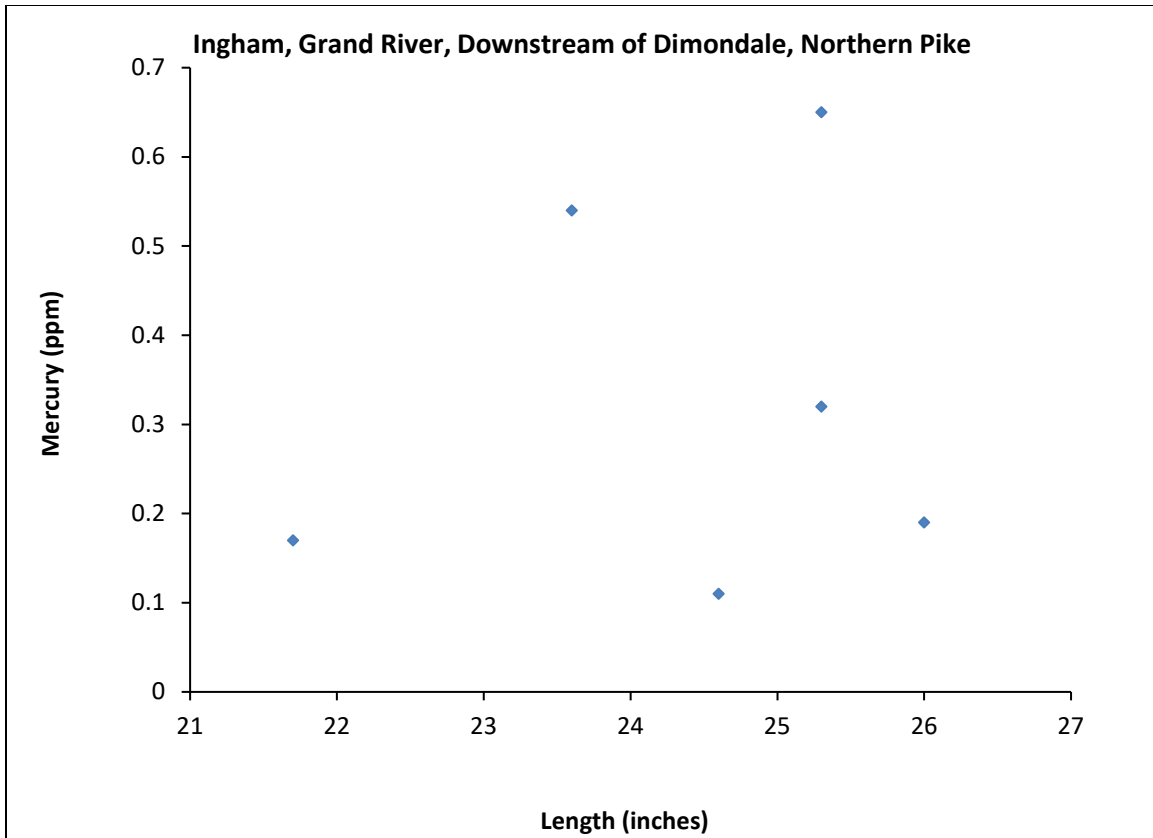
Organics Analysis:

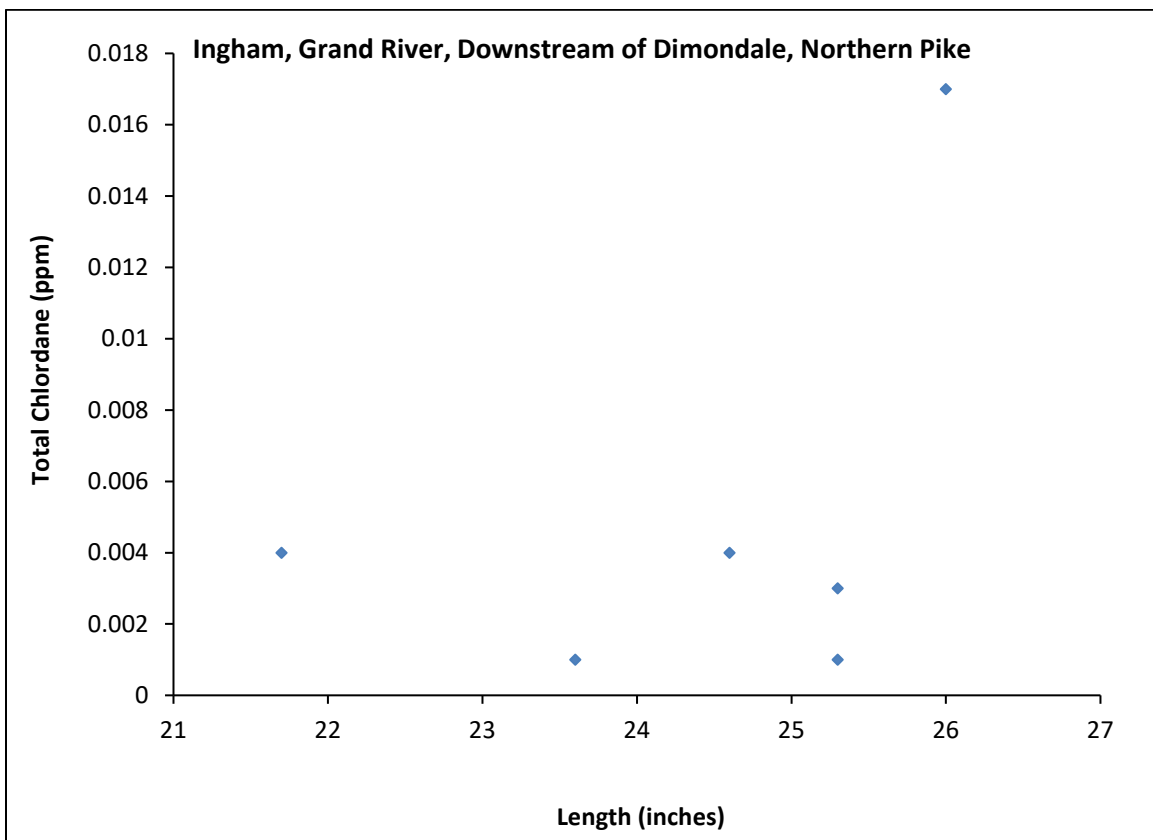
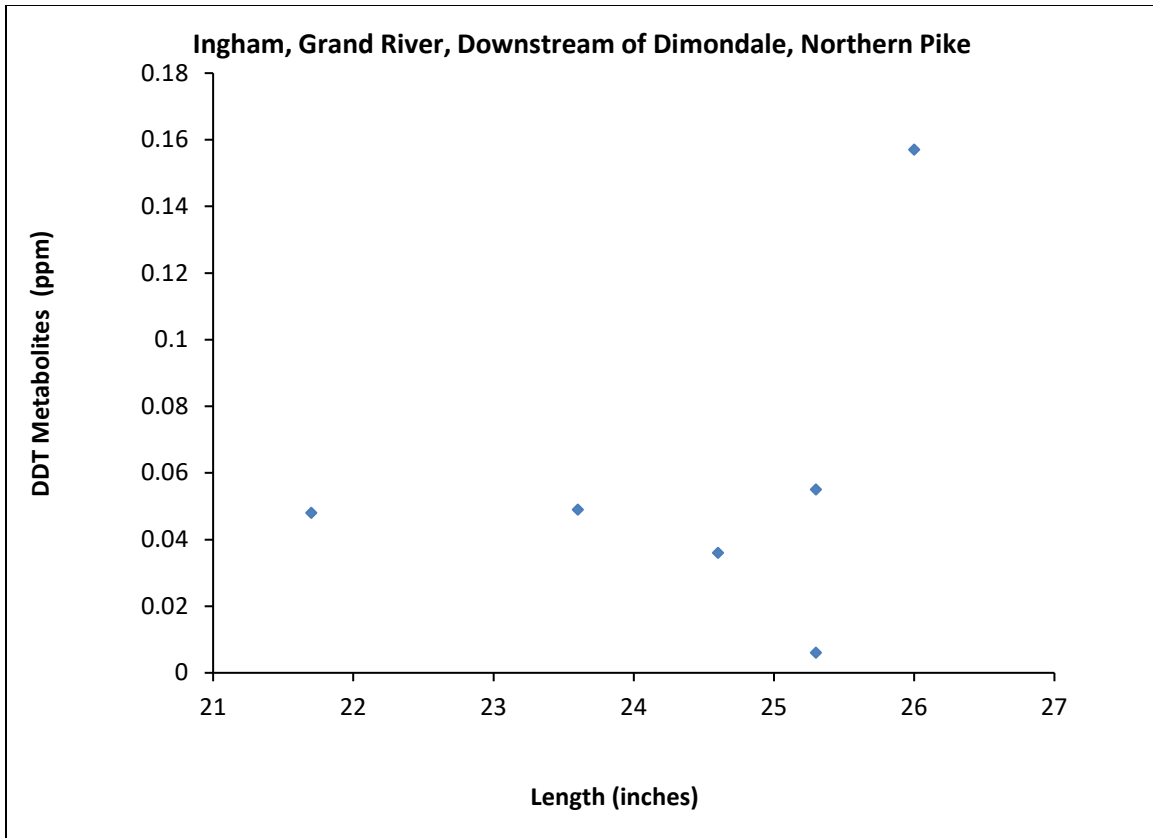
Organics Analysis:							
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1989	2004	6	21.7	24	23.6	26	
Datasets available: 1989, 2004							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	5	0.08		0.008	0.14	0.13	1
DDT	5	0.06		0.006	0.16	0.13	12
Chlordane	5	0.005		0.001	0.02	0.01	--
Toxaphene	5	ND		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.009	0.022					
DDT	0.120	0.000					
Chlordane	0.172	0.056					
Toxaphene	--	--					
Final meal category based on UCL:							1

Existing Advisory: Women and children should not eat more than one meal per week of northern pike from the Grand River upstream of Webber Dam.

Recommendation: No one should eat more than 1 meal per month of northern pike smaller than 30 inches from the Grand River between the Smithville and Moores Park Dams, or more than 6 meals per year of those fish larger than 30 inches due to mercury and PCBs. Statewide size break applied as the size range of the fish was limited.

Note: 2 fish, 1 legal-size and 1 sub-legal, were collected from this reach of river in 1989. Including the 1989 organics results (0.14 ppm, 0.08 ppm) for the legal-size fish increases the PCB mean from 0.06 ppm to 0.08 ppm and leads to a 95%UCL in the 1 meal per month range. The length range of all northern pike is very limited. The 1989 data and the 2004 data overlap in range and thus are combined to reach the largest possible sample size for this dataset.





Walleye**Grand River
Between Smithville & Moores Park
Dams****Ingham &
Eaton Counties****Hg Analysis:**

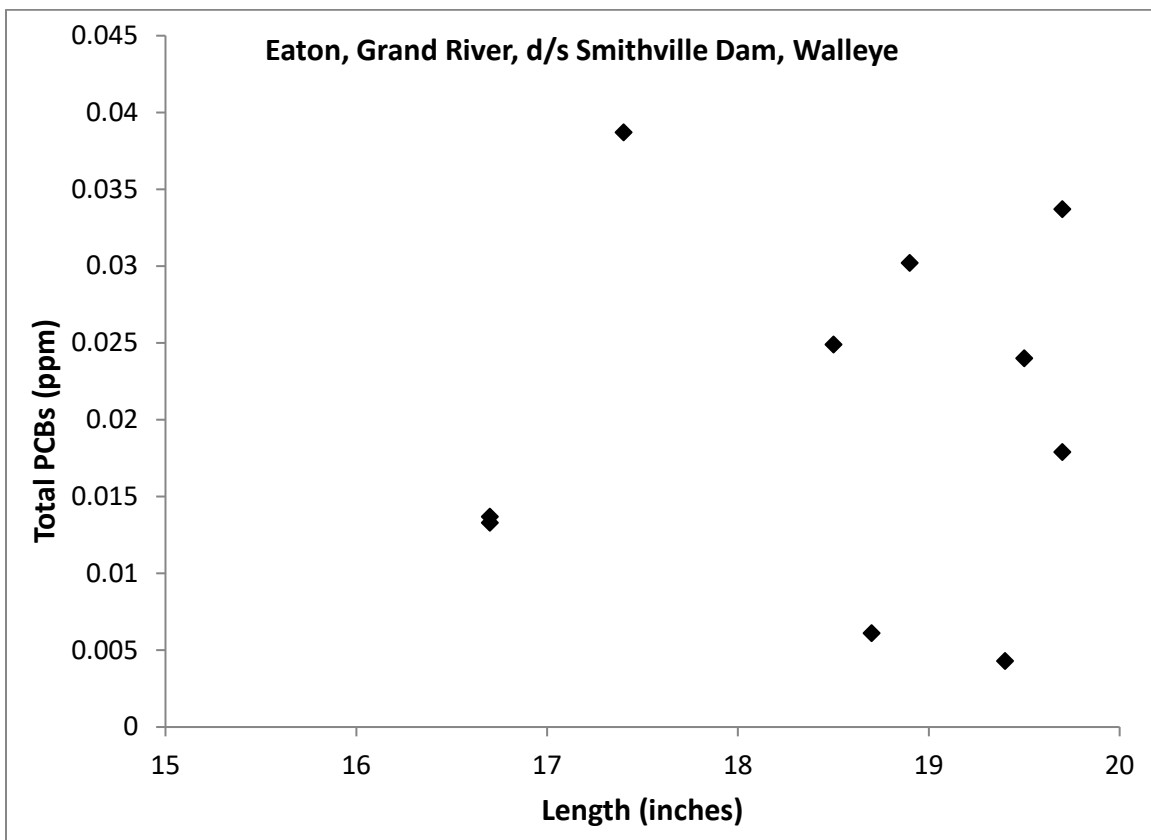
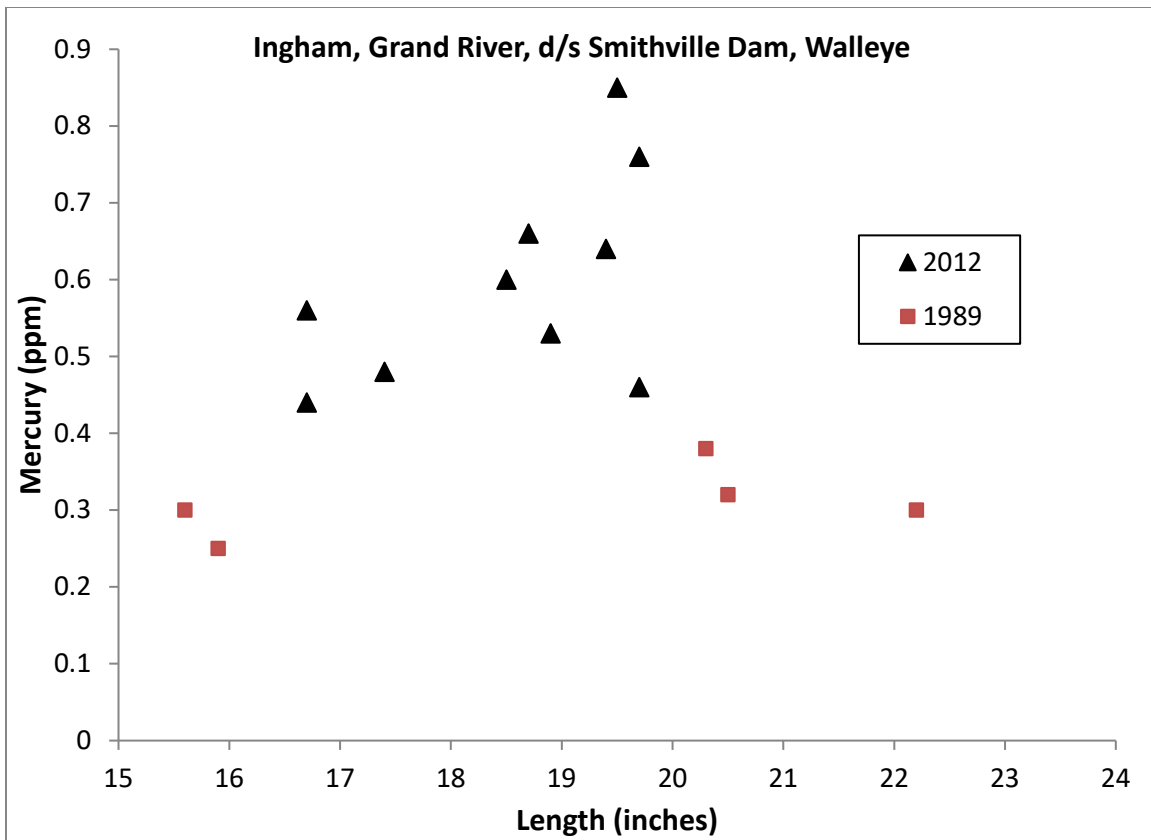
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1989	2012	15	15.6	15	15.6	22.2	
Datasets available: 1989							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	15	0.50		0.25	0.85	0.60	1
Chemical	Linear Regression	Exponential Regression					
	R²	R²					
Mercury	0.024	0.023					

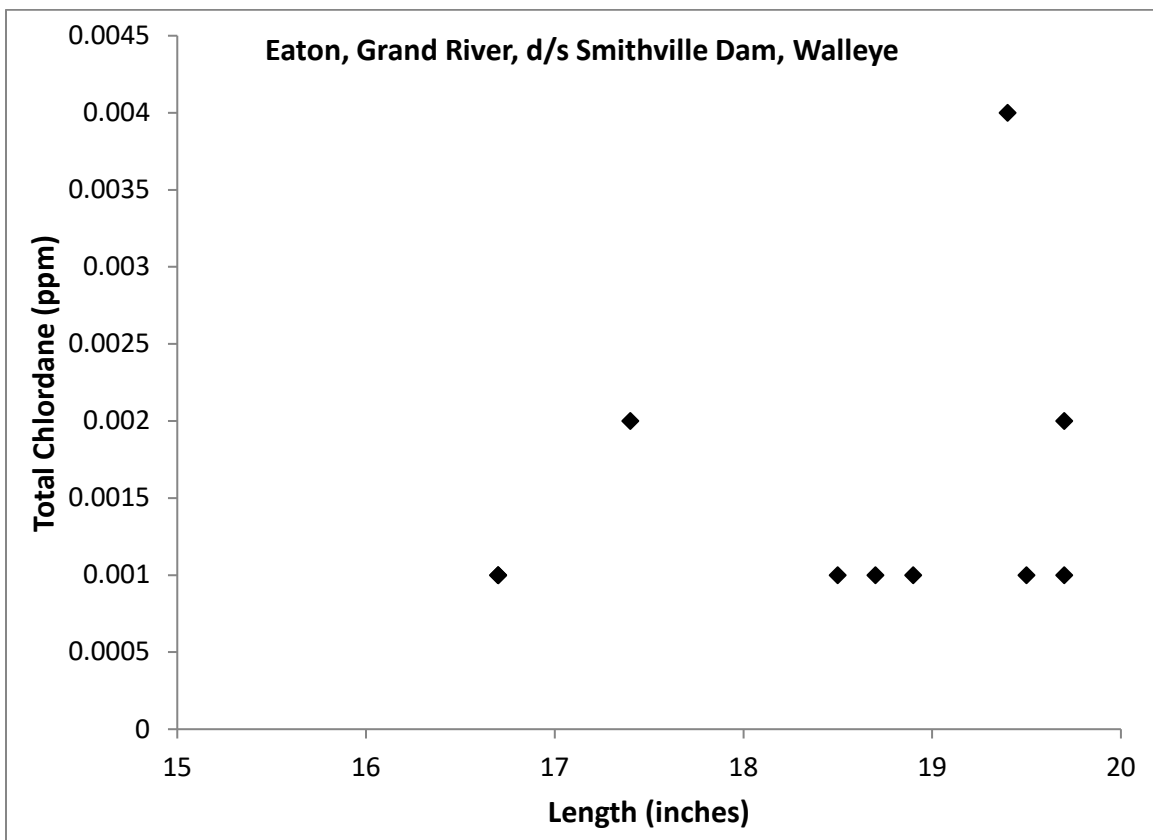
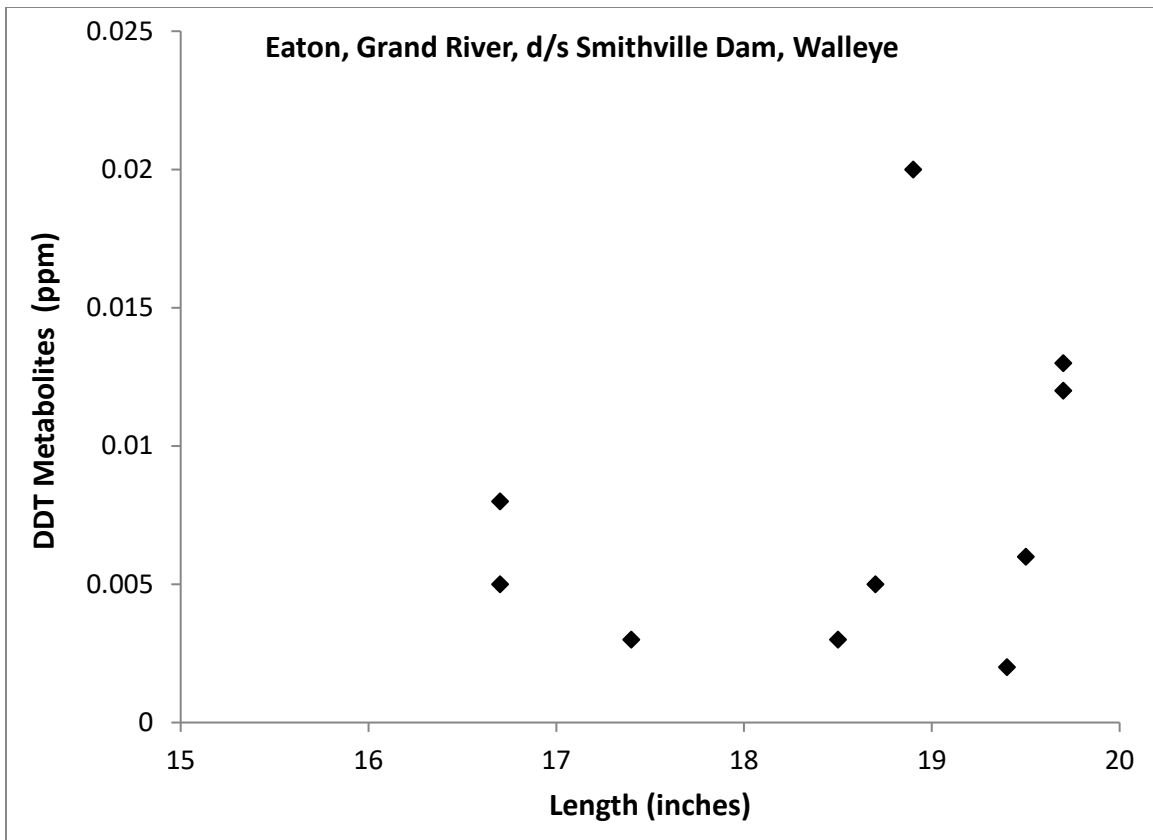
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2012	2012	10	16.7	15	16.7	19.7	
Datasets available:		1989, 2012					
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.02		0.004	0.04	0.03	8
DDT	10	0.008		0.002	0.02	0.01	16
Chlordane	10	0.002		0.001	0.004	0.002	--
Toxaphene	10	ND		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.004	0.000					
DDT	0.094	0.052					
Chlordane	0.068	0.060					
Toxaphene	--	--		Final meal category based on UCL:			1

Existing Advisory: No one should eat more than 2 meals per month of walleye from the Grand River between Moores Park Dam (Lansing) and Smithville Dam (Eaton Rapids) due to mercury and PCBs.

Recommendation: No one should eat more than 1 meal per month of walleye from the Grand River between Moores Park Dam (Lansing) and Smithville Dam (Eaton Rapids) due to mercury. PCBs would cause an advisory.





Bluegill**Grand River
Upstream of Smithville Dam****Ingham, Eaton, &
Jackson Counties****Hg Analysis:**

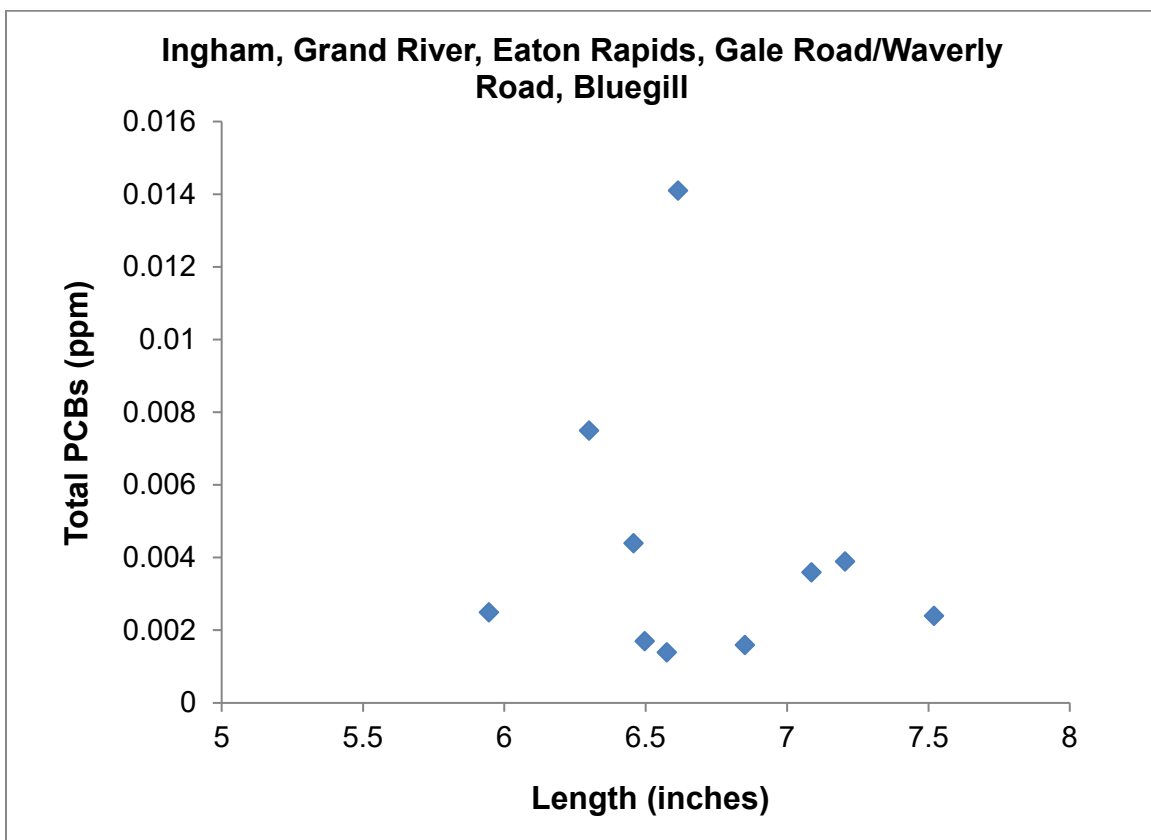
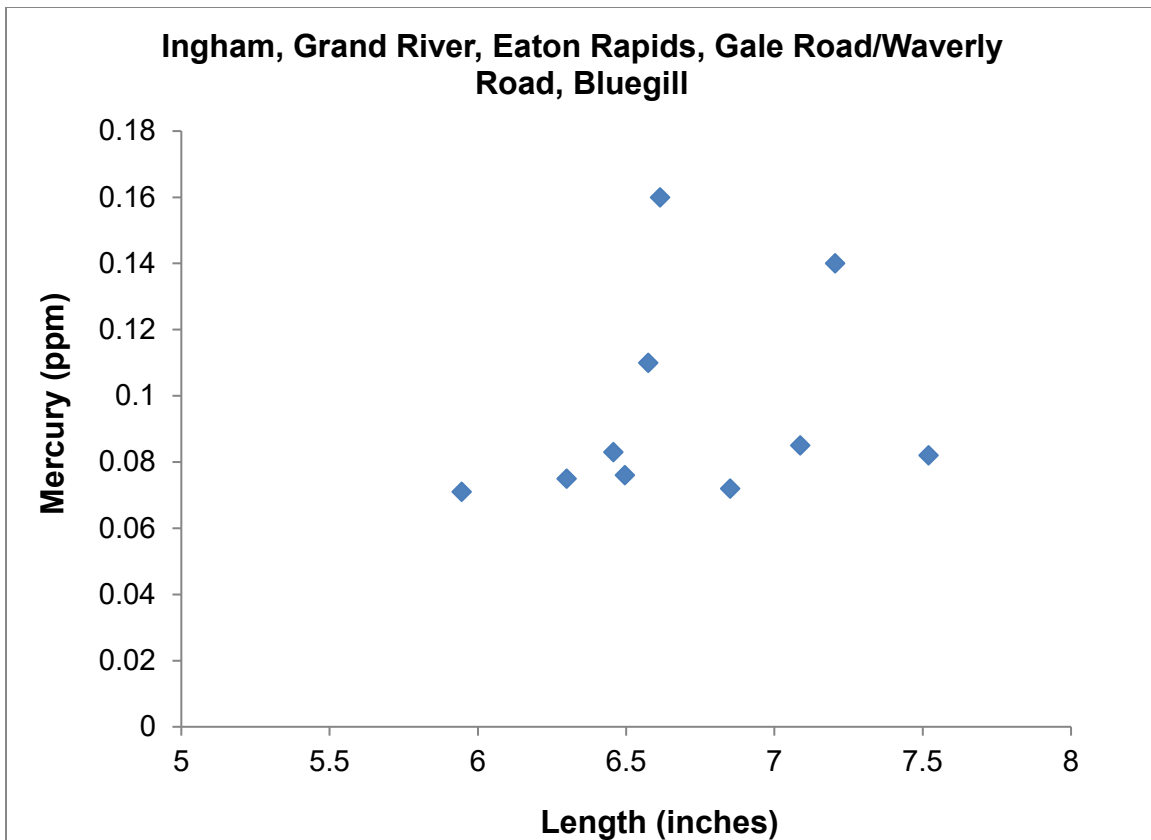
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2019	2019	10	5.9	NA	5.9	7.5	
Datasets available: 2019							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.095		0.071	0.160	0.118	8
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.053	0.071					

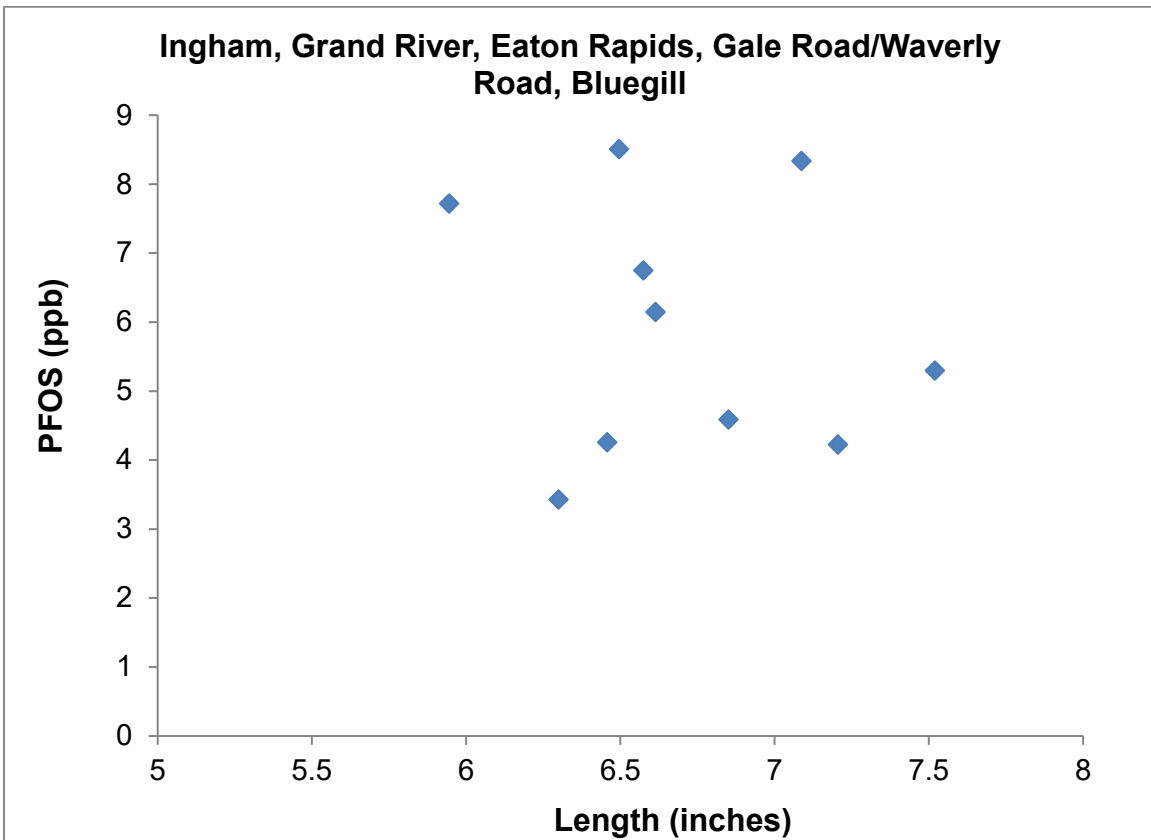
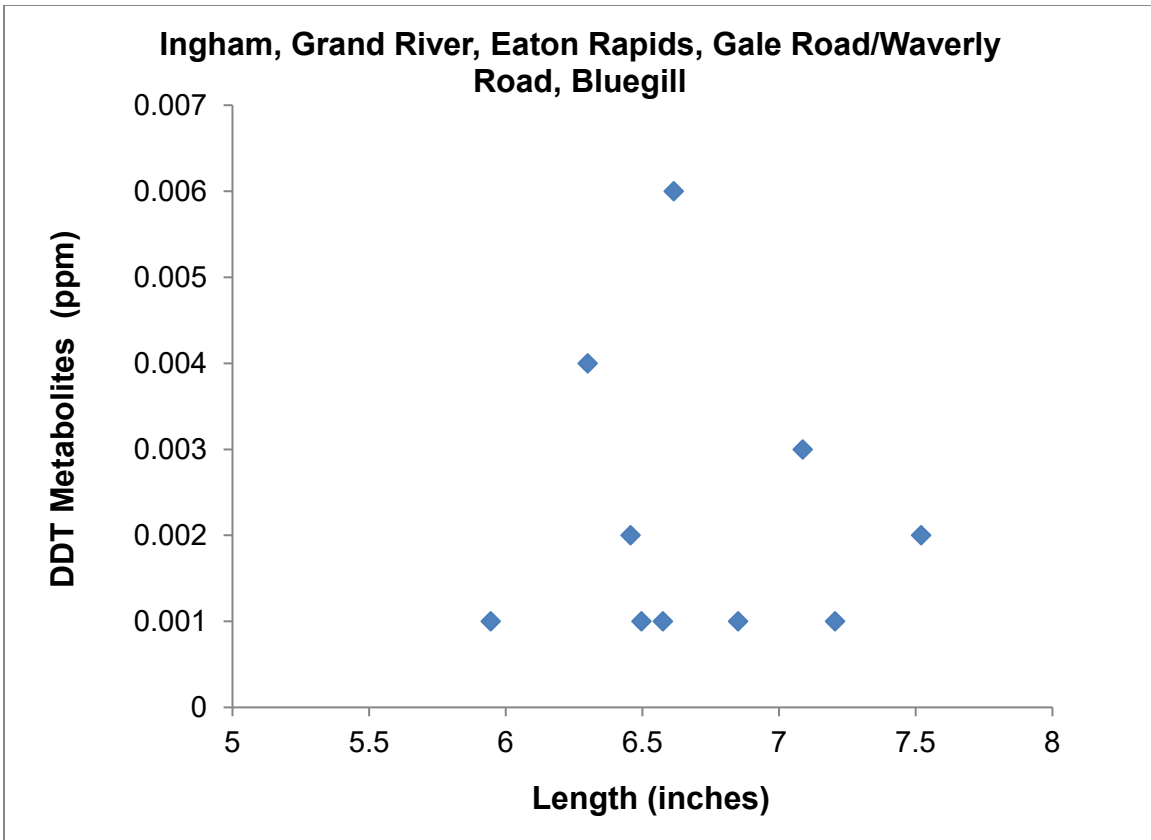
Organics Analysis:

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	5.9	NA	5.9	7.5	
Datasets available: 2019							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.004		0.001	0.014	0.007	16
DDT	10	0.002		<0.001	0.006	0.003	16
Chlordane	10	ND		--	--	--	16
Toxaphene	10	ND		--	--	--	--
PFOS	10	5.9 ppb		3.4 ppb	8.5 ppb	7.2 ppb	16
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.020	0.011					
DDT	0.002	0.001					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	0.026	0.014					
Final meal category based on UCL:							8

Existing MDHHS Advisory: Bluegill and sunfish from the Grand River upstream of the Smithville 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 8 meals per month of bluegill or sunfish of any size from the Grand River upstream of the Smithville dam due to mercury.





Carp**Grand River
Upstream of Smithville Dam****Ingham, Eaton &
Jackson Counties****Hg Analysis:**

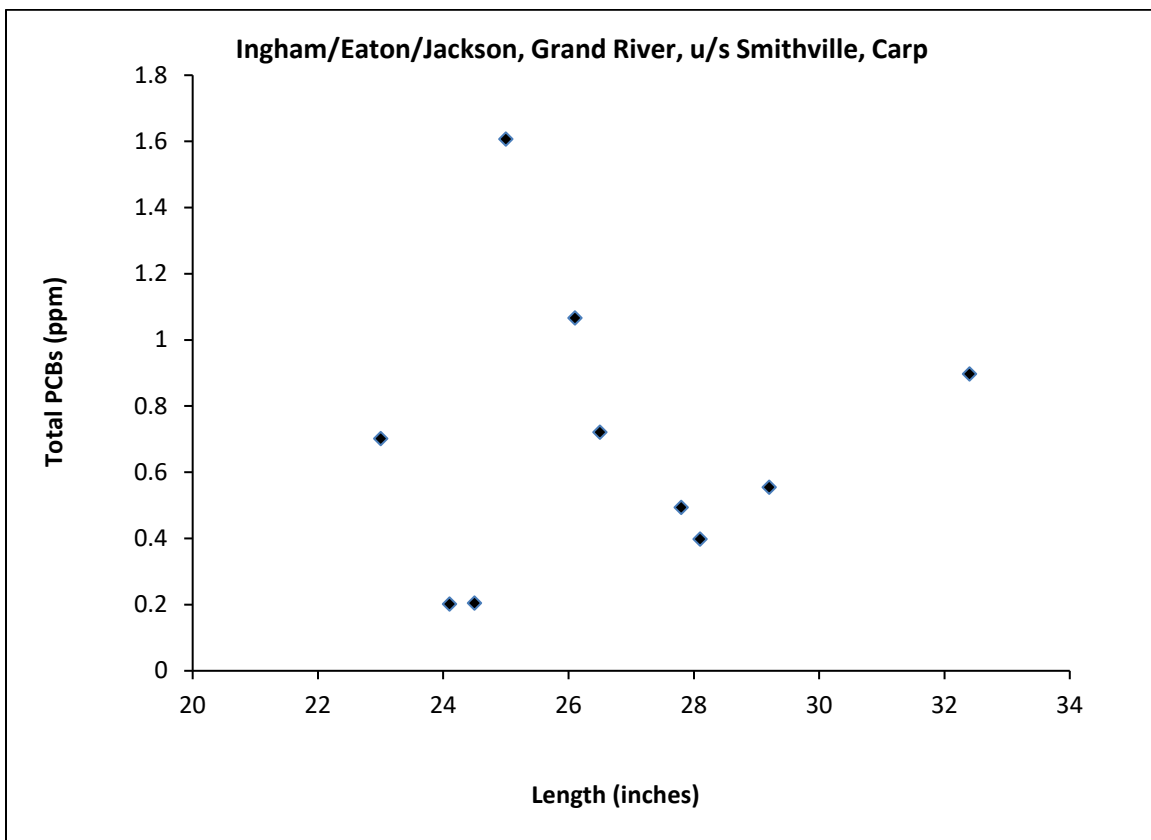
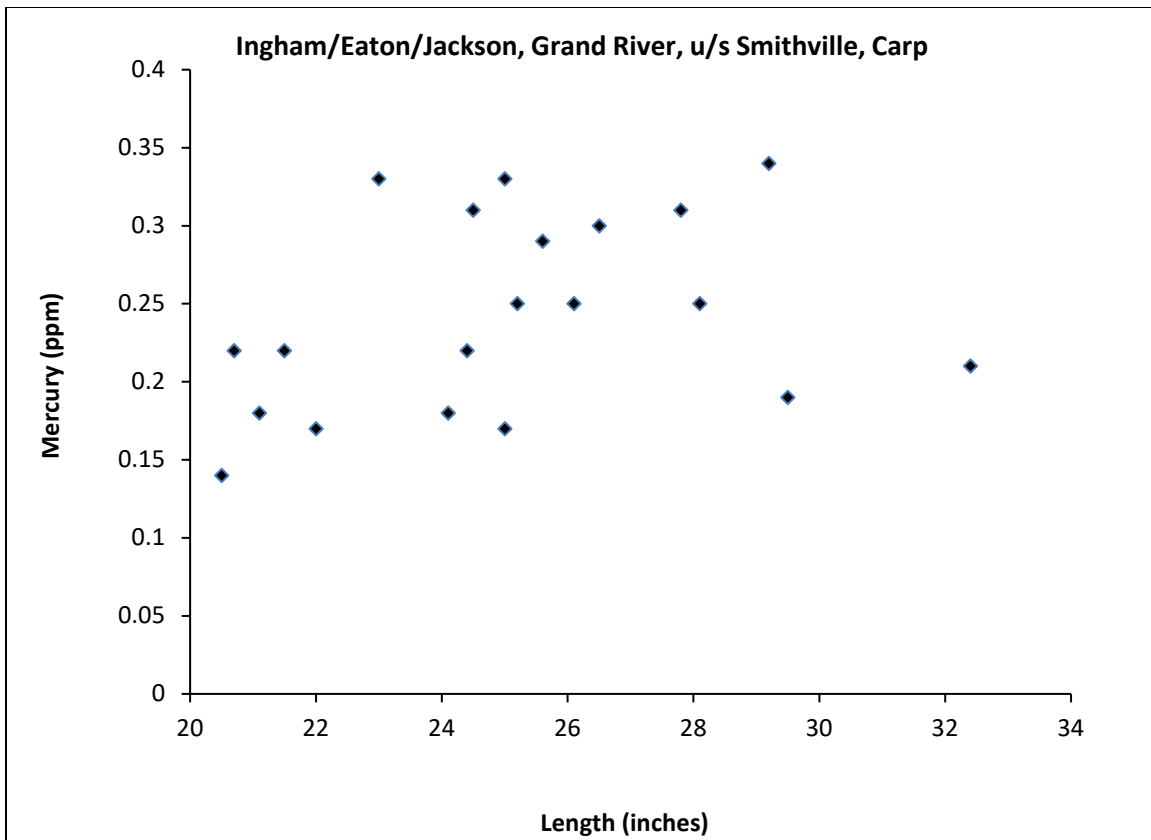
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1990	2001	20	20.5	na	20.5	32.4	
Datasets available: 1990, 2001							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	20	0.24		0.14	0.34	0.27	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.105	0.122					

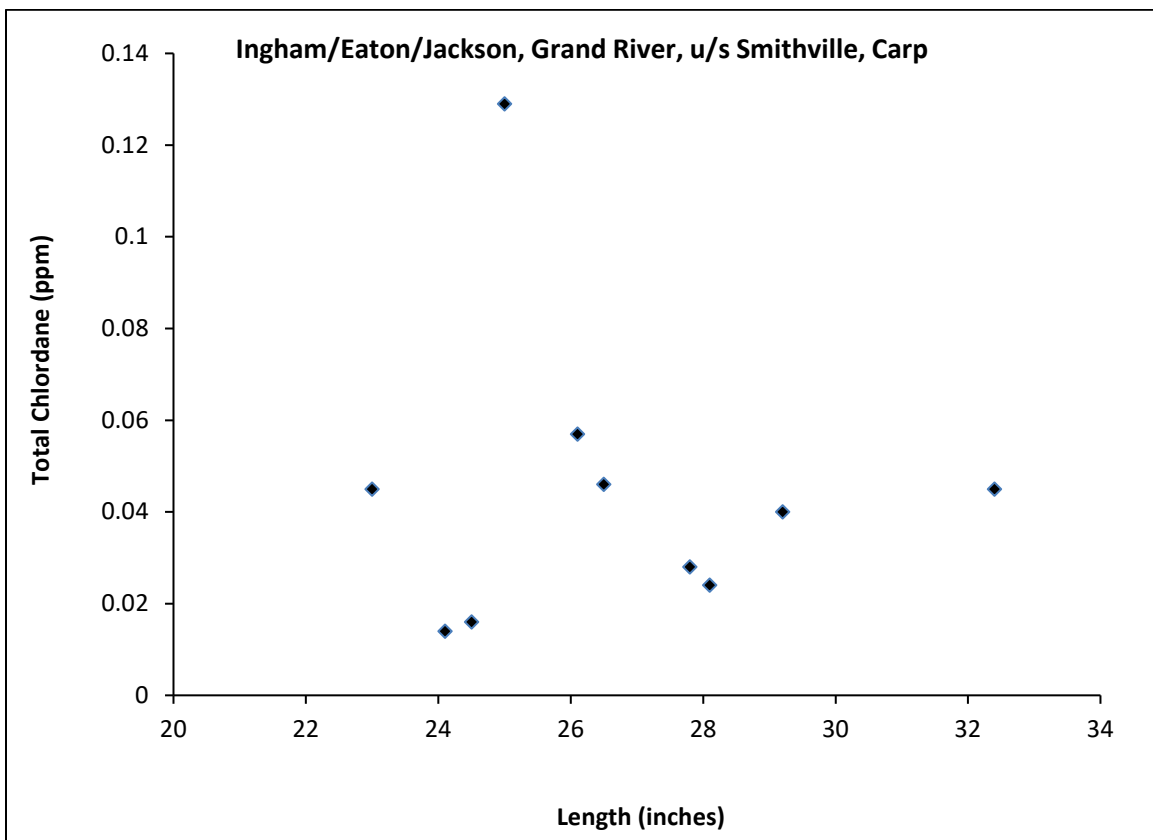
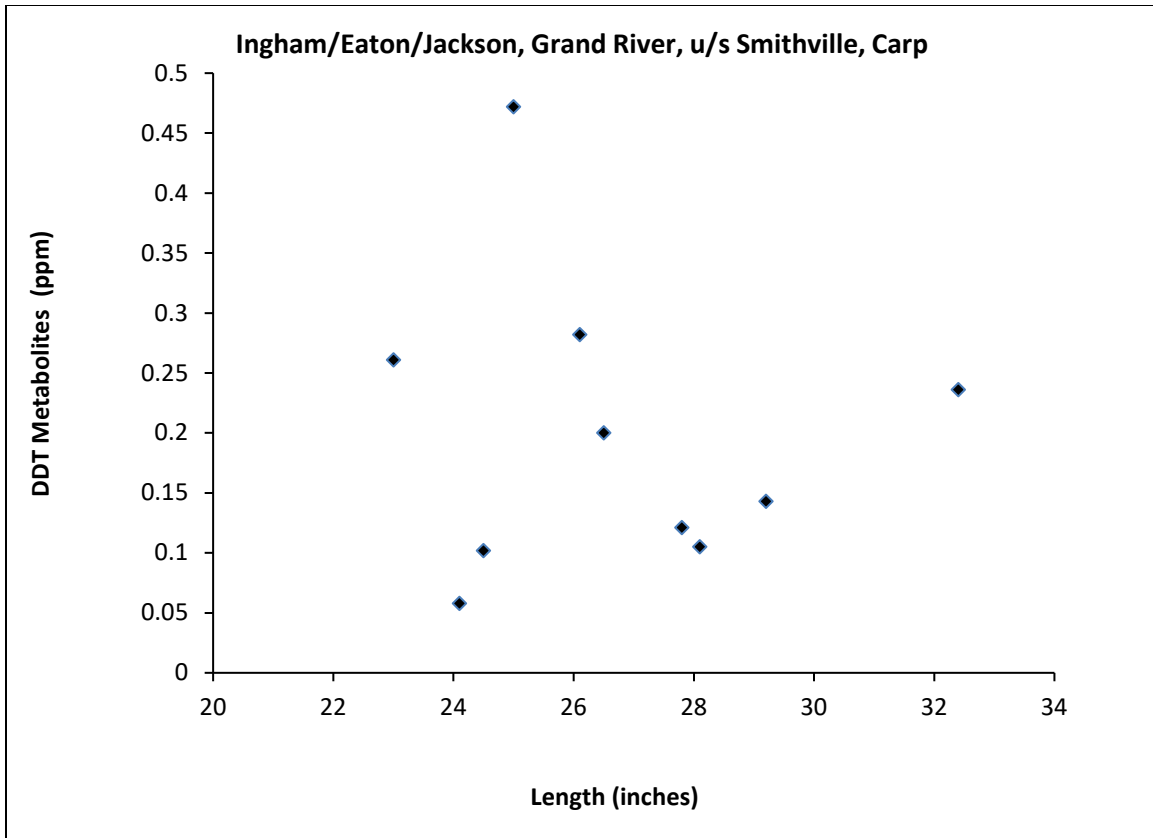
Organics Analysis:

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	23.0	na	23.0	32.4	
Datasets available: 1990, 2001							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.685		0.202	1.607	0.990	Limited
DDT	10	0.198		0.058	0.472	0.290	4
Chlordane	10	0.044		0.014	0.129	0.070	16
Toxaphene	10	ND		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.004	0.052					
DDT	0.010	0.002					
Chlordane	0.006	0.010					
Toxaphene	--	--		Final meal category based on UCL:			Limited

Existing Advisory: Women and children should not eat more than 1 meal per month of Grand River carp due to PCBs.

Recommendation: Sensitive populations should not eat these fish. Healthy adults should limit consumption of carp from the Grand River upstream of the Smithville Dam to 1 or 2 meals per year due to PCBs. Mercury and DDT would cause advisories.





Largemouth Bass**Grand River
Upstream of Smithville Dam****Ingham, Eaton, &
Jackson 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	
2001	2019	20	11.1	14.0	13.6	17.8	
Datasets available: 2001, 2019							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	13	0.350		0.180	0.660	0.431	2
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.297	0.254					

Organics Analysis:

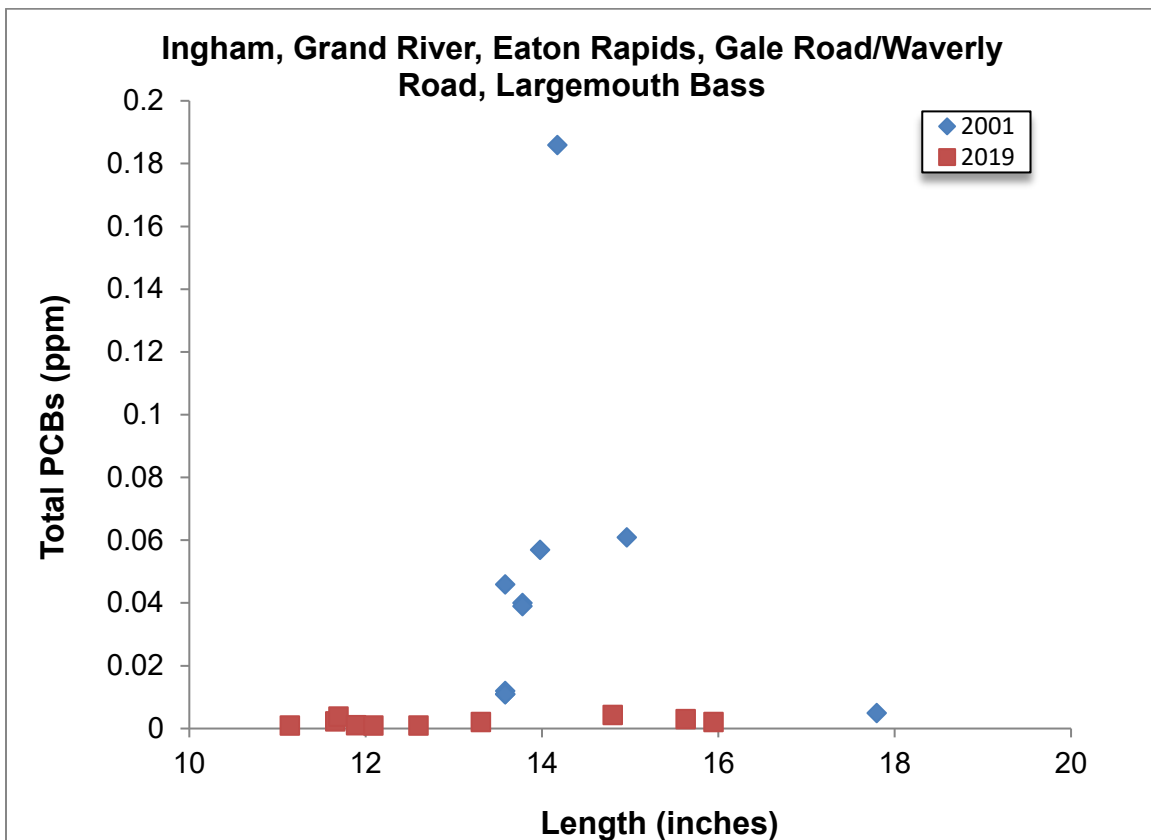
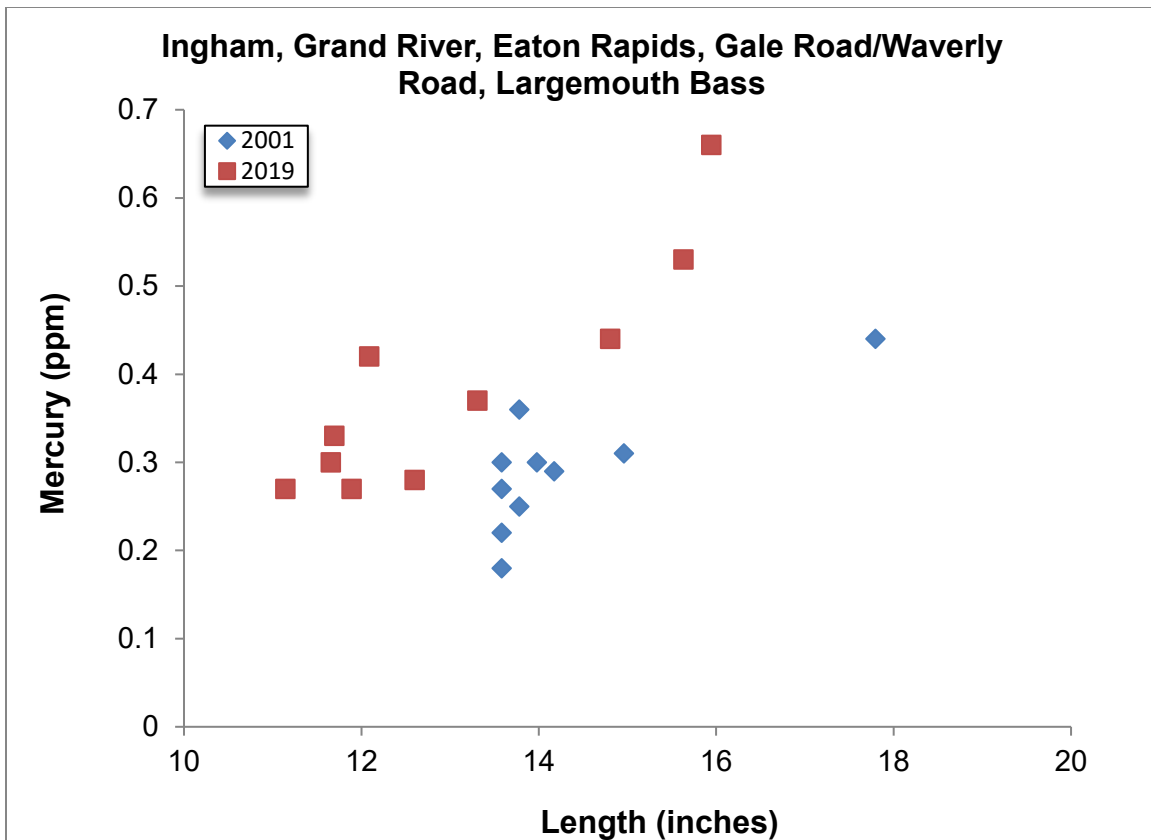
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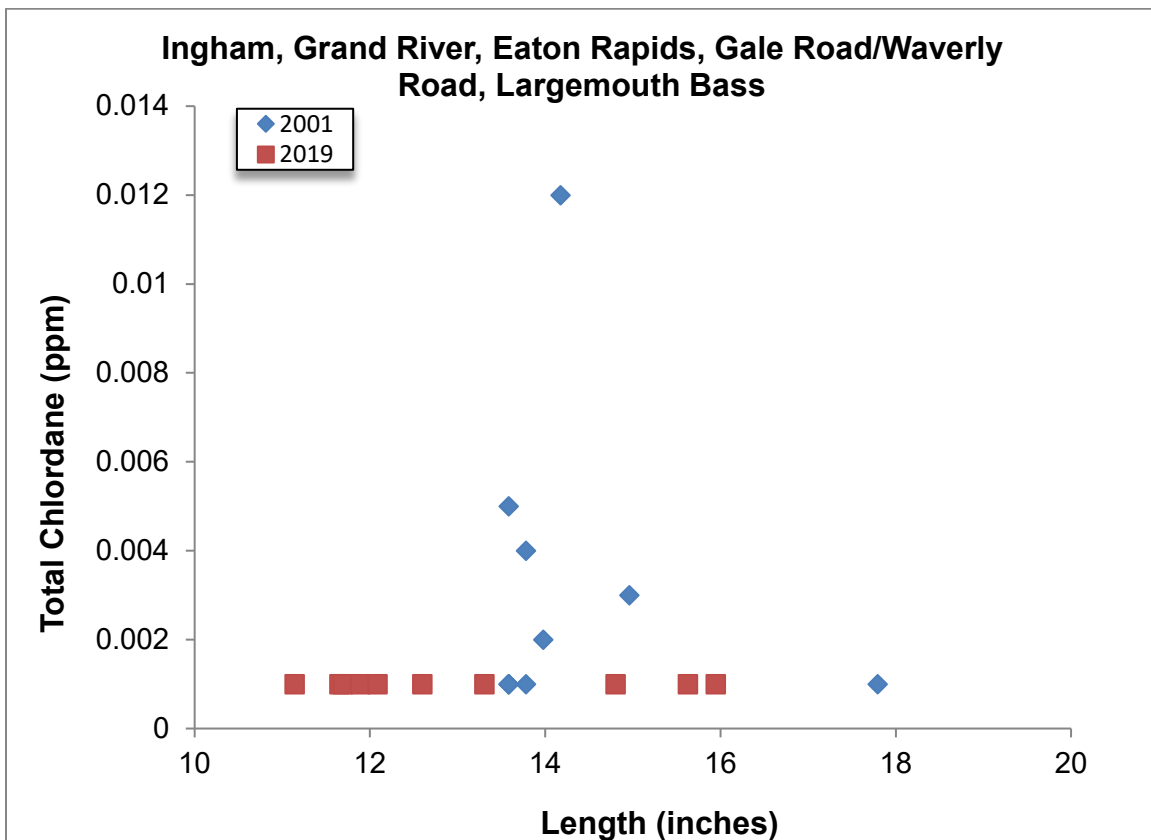
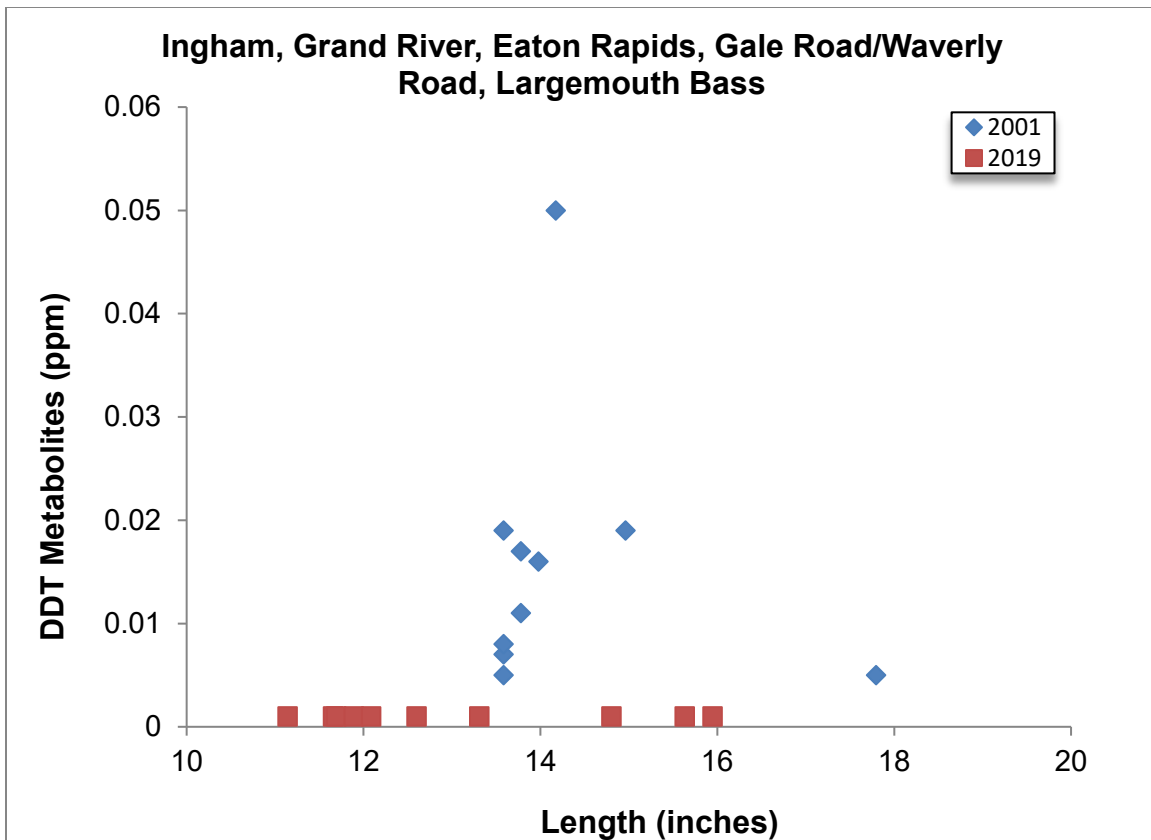
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2001	2019	20	11.1	14.0	13.6	17.8	
Datasets available: 2001, 2019							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	13	0.037		0.002	0.186	0.067	2
DDT	13	0.012		<0.001	0.050	0.020	16
Chlordane	13	0.003		<0.001	0.012	0.005	16
Toxaphene	13	ND		--	--	--	--
PFOS	10*	9.9 ppb		4.7 ppb	16.7 ppb	12.6 ppb	12
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.023	0.101					
DDT	0.034	0.091					
Chlordane	0.010	0.016					
Toxaphene	--	--					
PFOS	0.352	0.324					
Final meal category based on UCL:							2

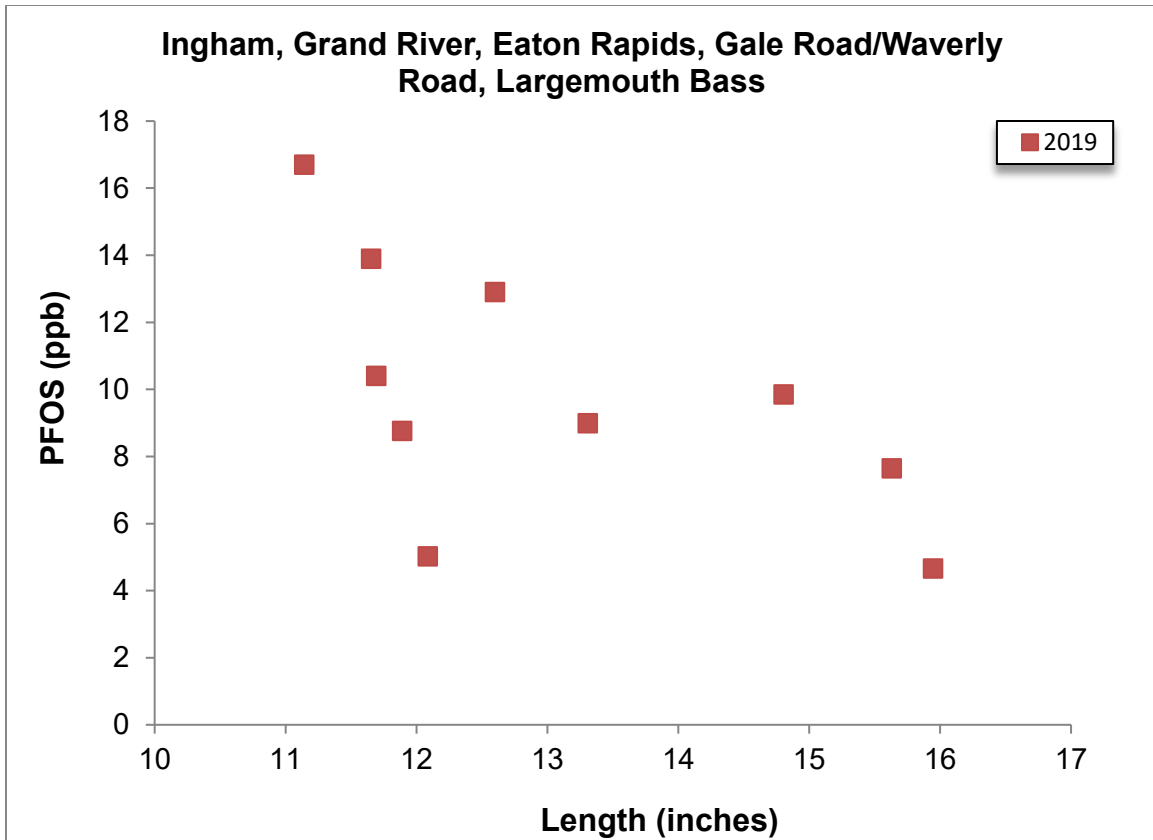
*Sub-legal sized fish used in the analysis as no correlation between fish size and PFOS concentration has been observed in the statewide data set.

Existing MDHHS Advisory: No one should eat more than 2 meals per month of legal size largemouth or smallmouth bass under 18 inches due to PCBs and mercury or more than 1 meal per month of largemouth or smallmouth bass over 18 inches due to mercury. Statewide length break applied as the size range of the dataset was limited.

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







Northern Pike

Grand River Upstream of Smithville Dam

Ingham, Eaton & Jackson Counties

Hg Analysis:

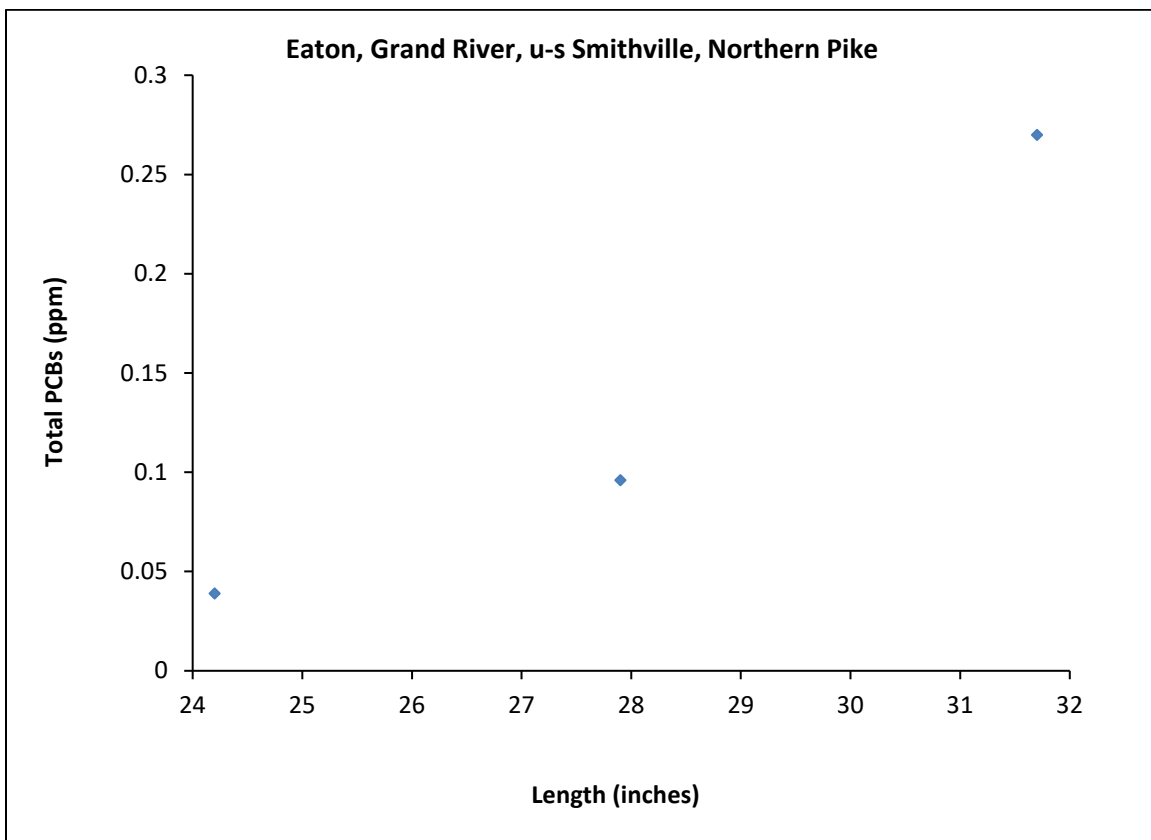
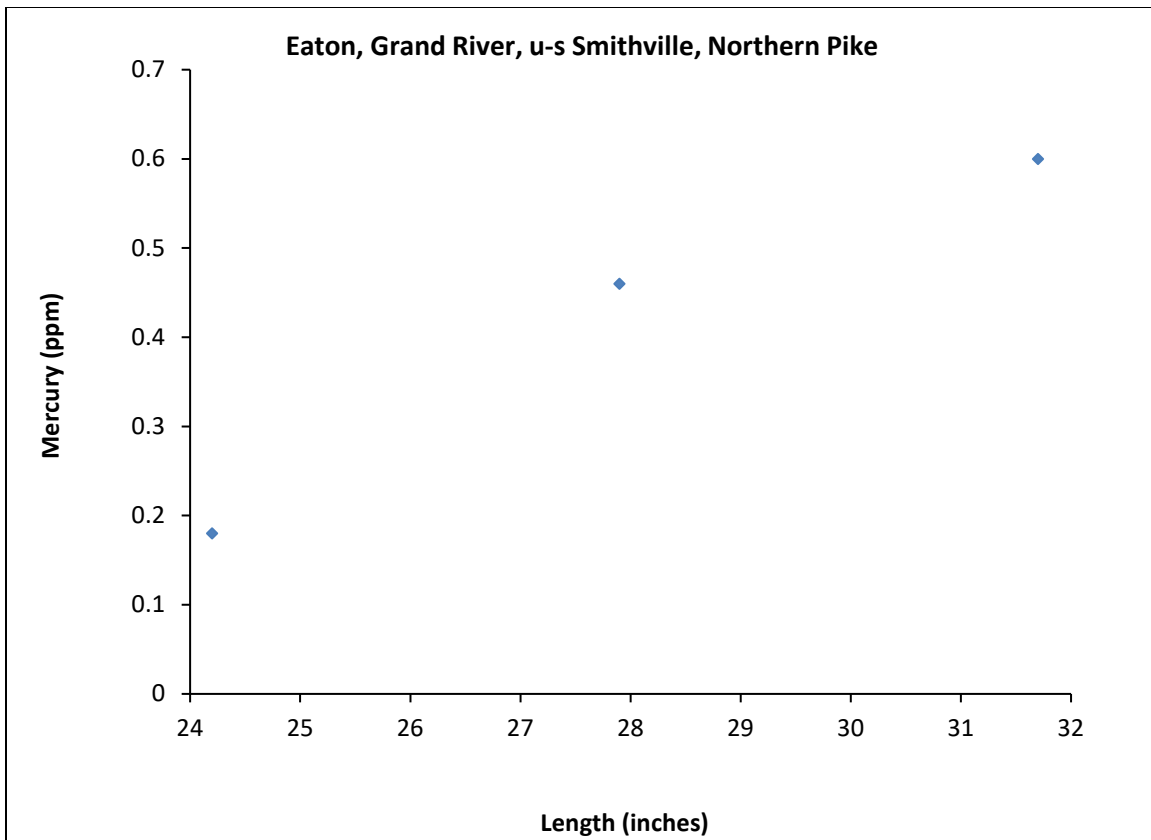
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2002	2004	3	24.2	24	24.2	31.7
Datasets available: 2002, 2004						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
Mercury	3	0.41		0.18	0.60	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

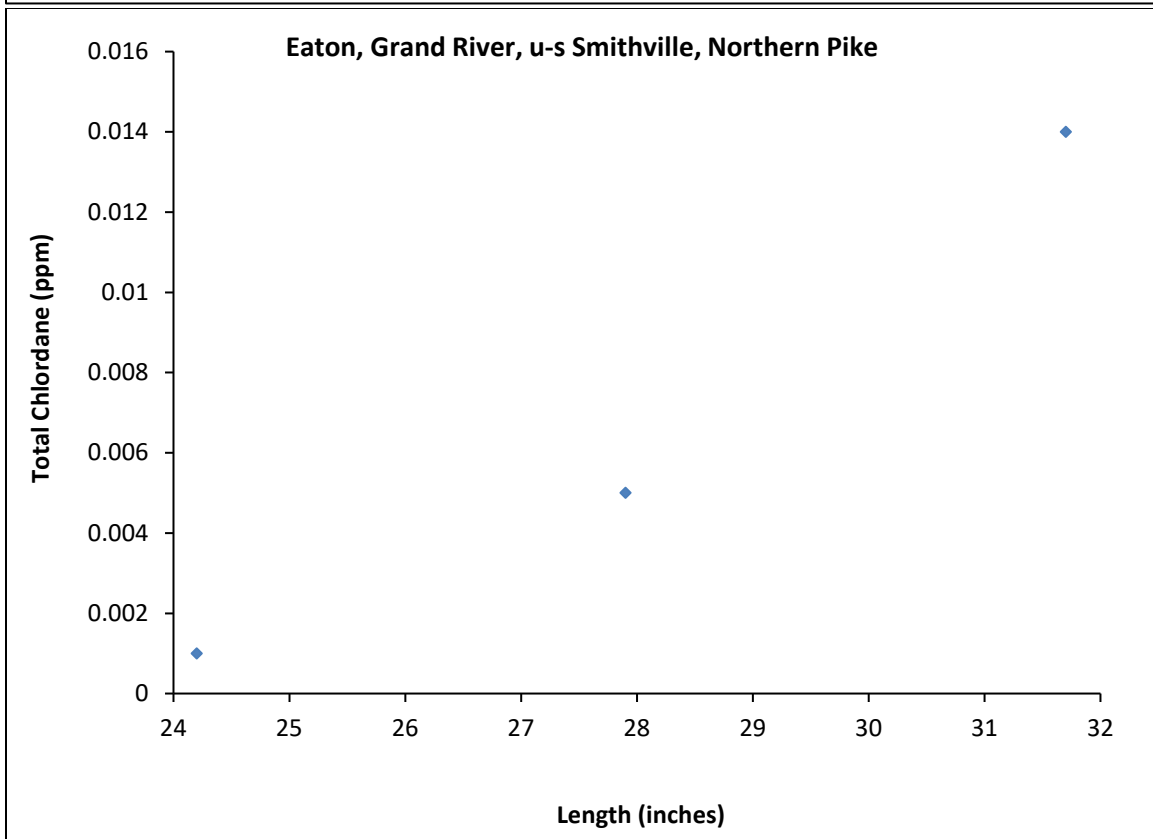
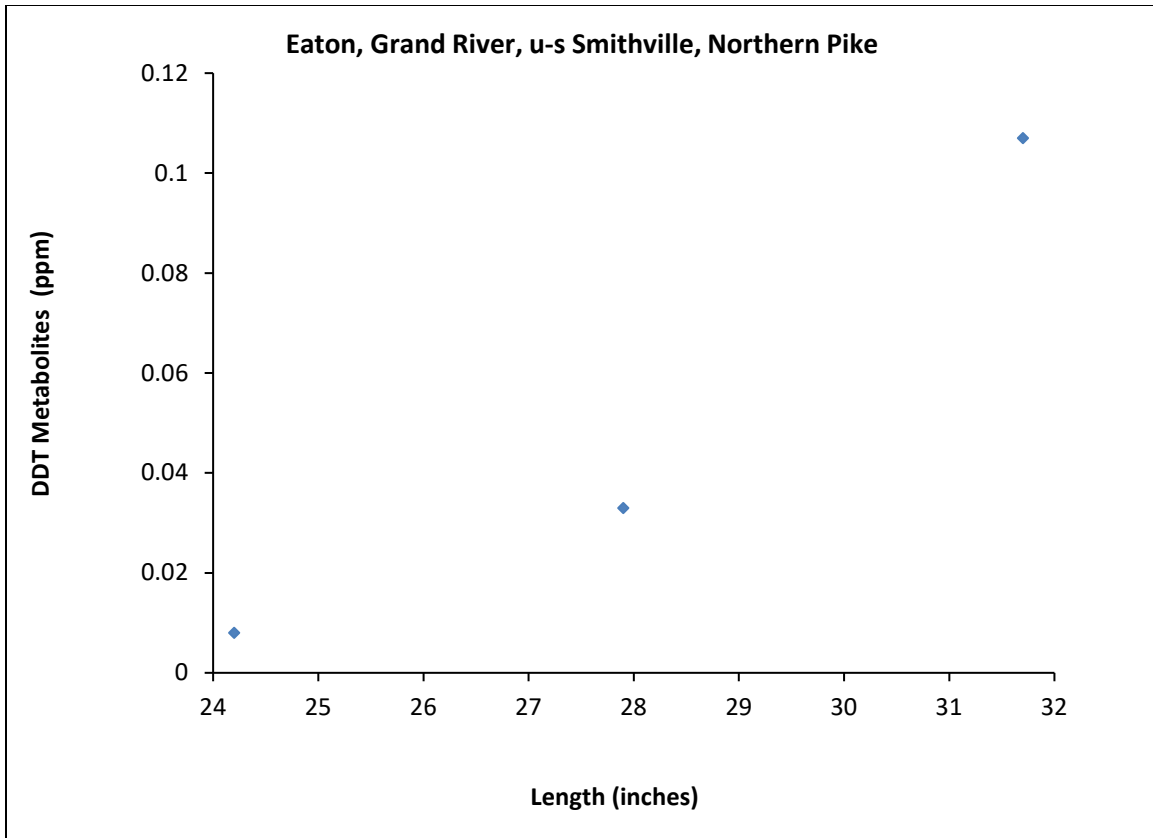
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2002	2004	3	24.2	24	24.2	31.7
Datasets available: 2002, 2004						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
PCB	3	0.13		0.04	0.27	--
DDT	3	0.05		0.008	0.11	--
Chlordane	3	0.007		0.001	0.01	--
Toxaphene	3	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 not eat more than one meal per week of Grand River northern pike due to PCBs.

Recommendation: There are insufficient data available to develop specific advice for northern pike from this reach of the Grand River. The statewide consumption advice recommends that no one eat more than 1 meal per month of northern pike over 30 inches or more than 2 meals per month of northern pike under 30 inches in length.





Rock Bass**Grand River
Upstream of Smithville Dam****Ingham, Eaton, &
Jackson Counties****Hg Analysis:**

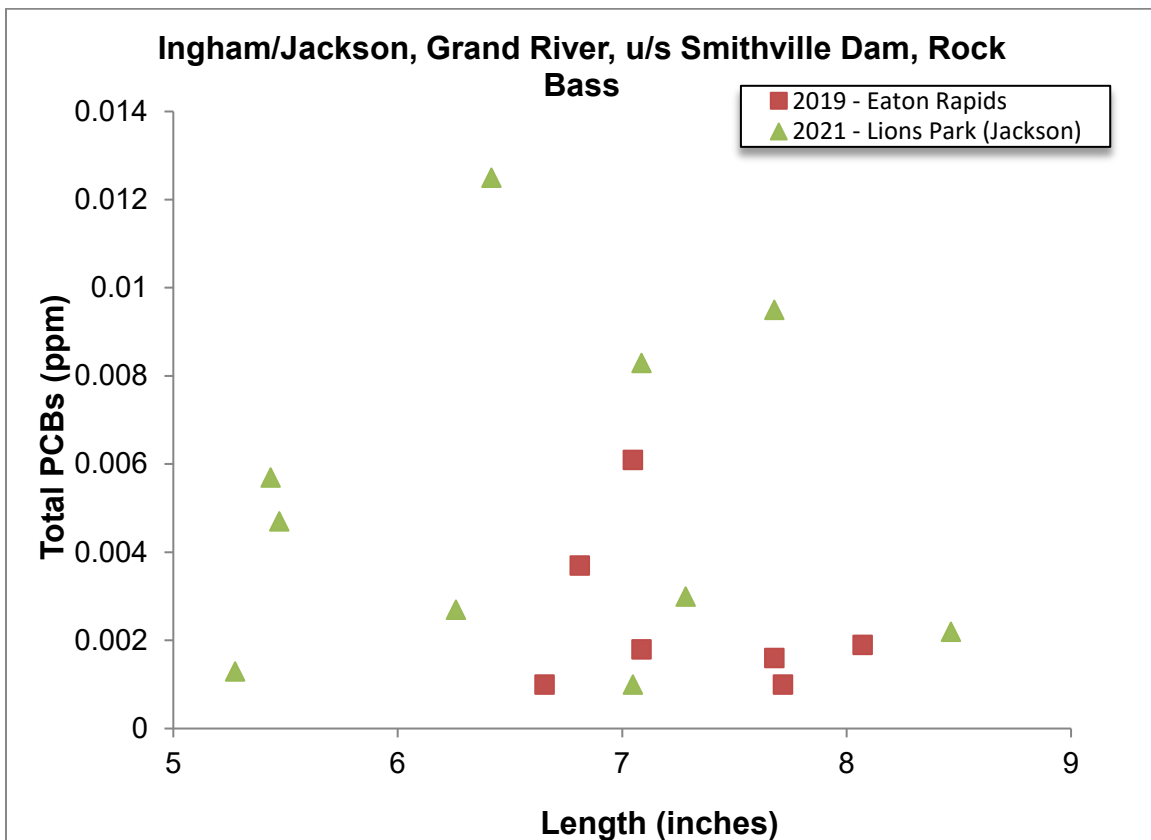
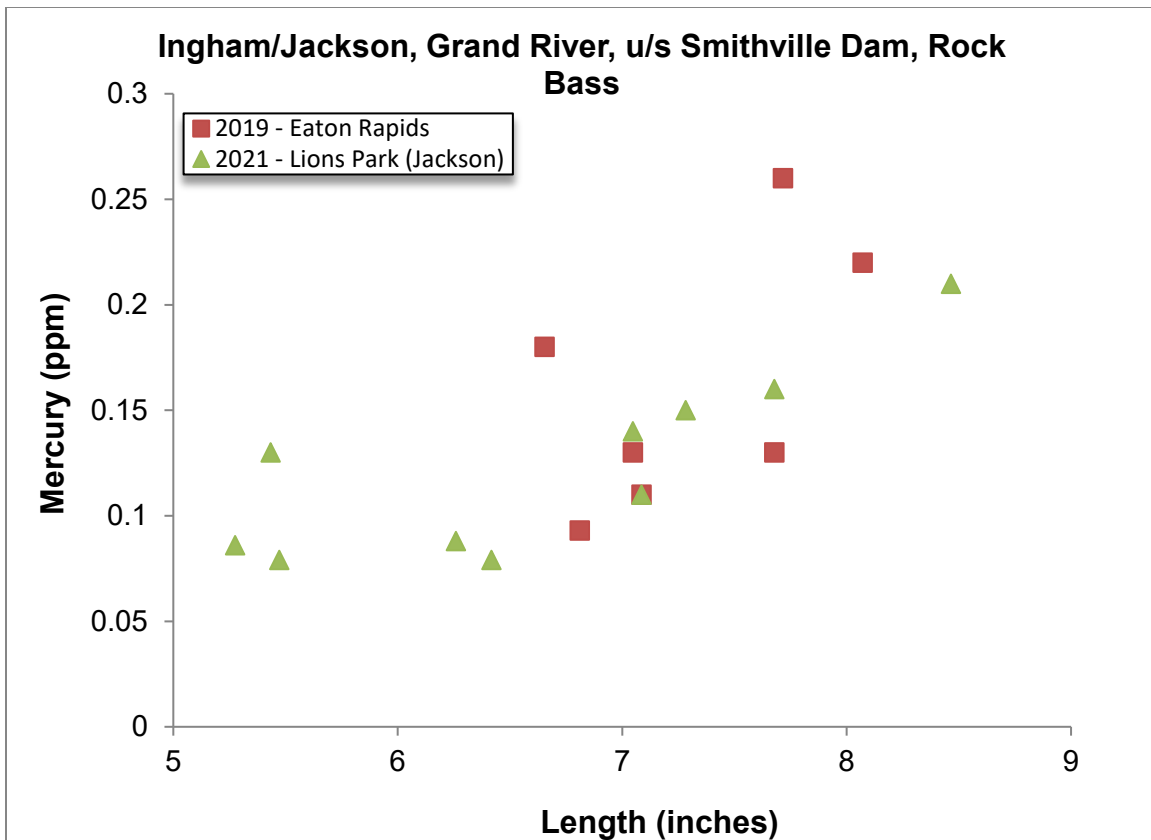
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2019	2021	17	5.3	NA	5.3	8.5	
Datasets available: 2019, 2021							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	17	0.139		0.079	0.260	0.166	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.491	0.530					

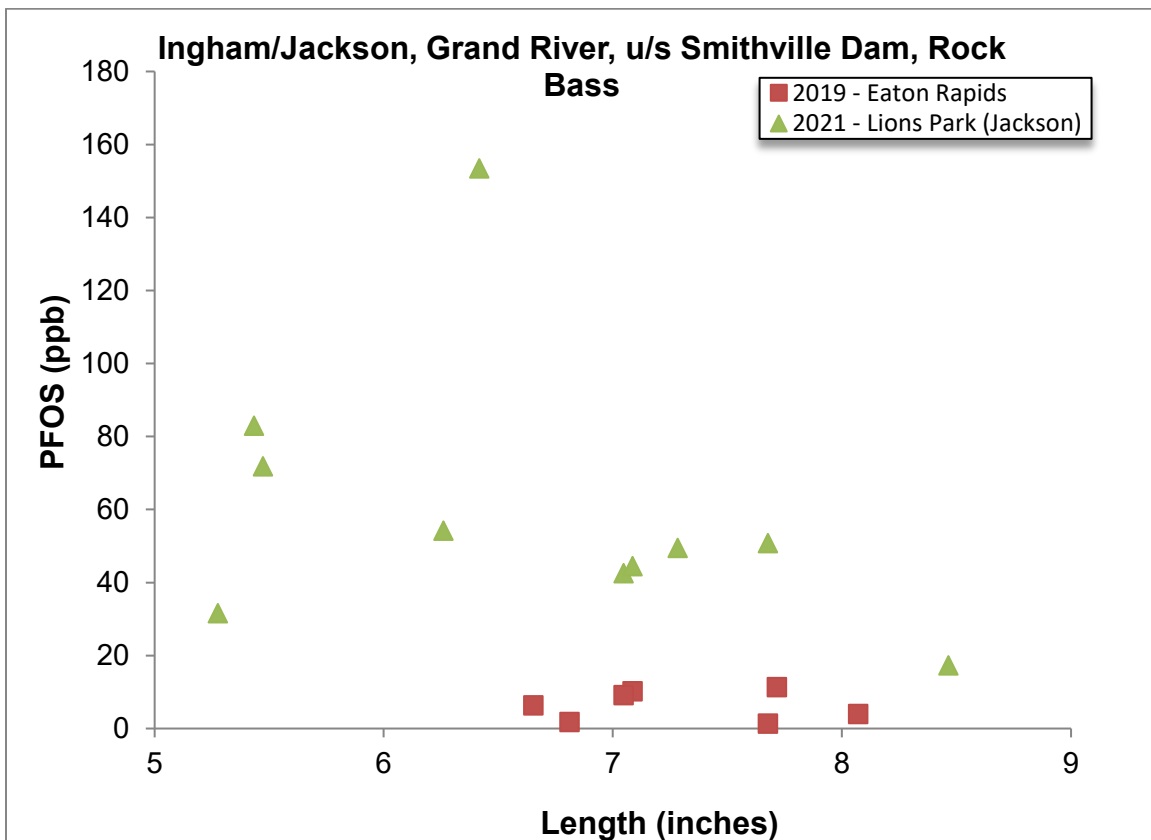
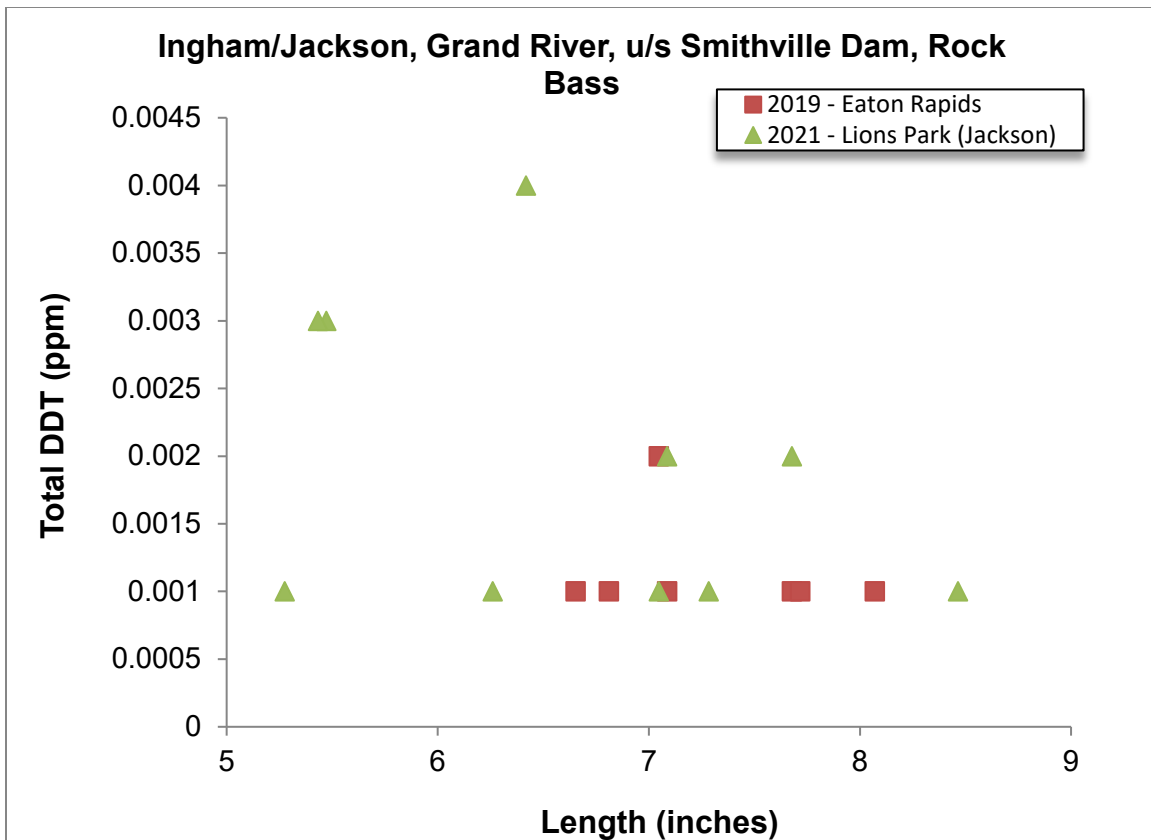
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2019	2021	17	5.3	NA	5.3	8.5	
Datasets available: 2019, 2021							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	17	0.004		<0.001	0.013	0.006	16
DDT	17	0.002		<0.001	0.004	0.002	16
Chlordane	17	0.001		<0.001	0.001	0.001	16
Toxaphene	17	ND		--	--	--	--
PFOS	17	37.8 ppb		1.4 ppb	153.5 ppb	58.0 ppb	2
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.020	0.029					
DDT	0.204	0.188					
Chlordane	0.000	0.000					
Toxaphene	--	--					
PFOS	0.226	0.215					
Final meal category based on UCL:							2

Existing MDHHS Advisory: Rock bass from the Grand River upstream of the Smithville Dam in Eaton County 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 2 meals per month of rock bass of any size from the Grand River upstream of the Smithville Dam in Eaton County due to PFOS. Mercury causes less restrictive guidance.





Walleye**Grand River
Upstream of Smithville Dam****Ingham, Eaton
& Jackson Counties****Hg Analysis:**

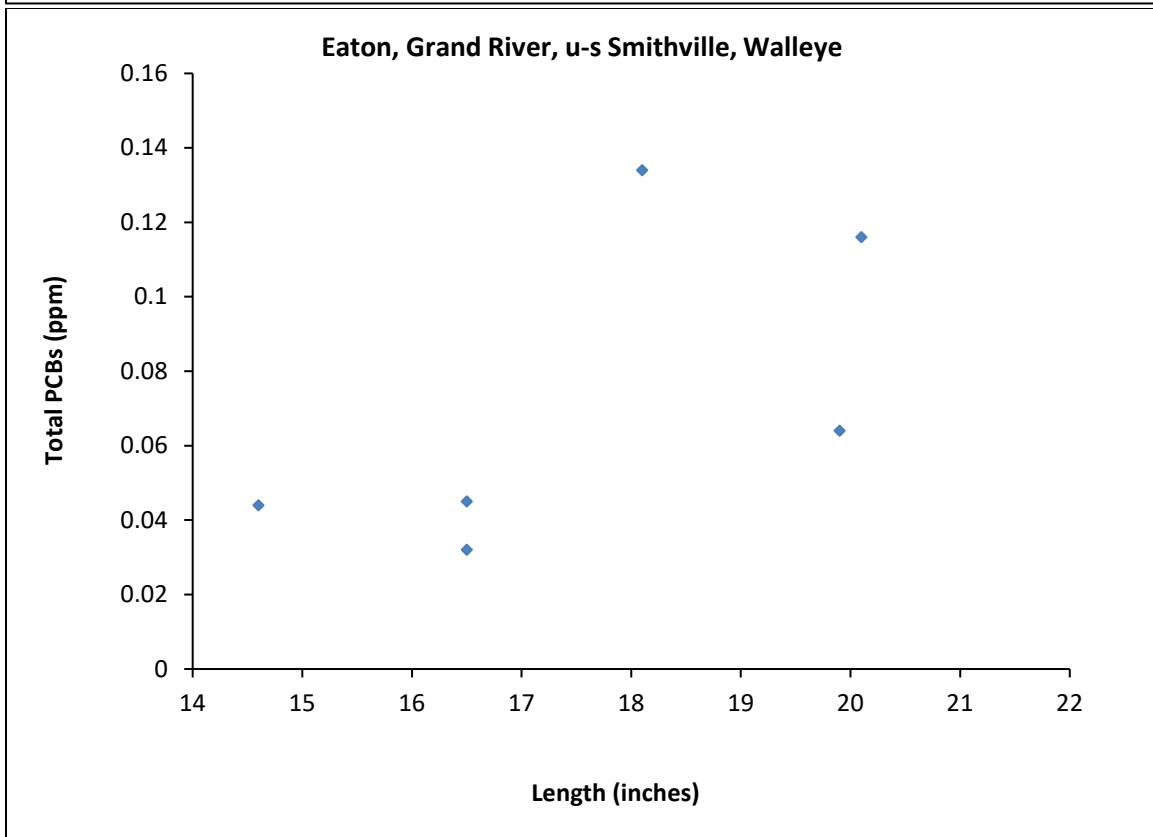
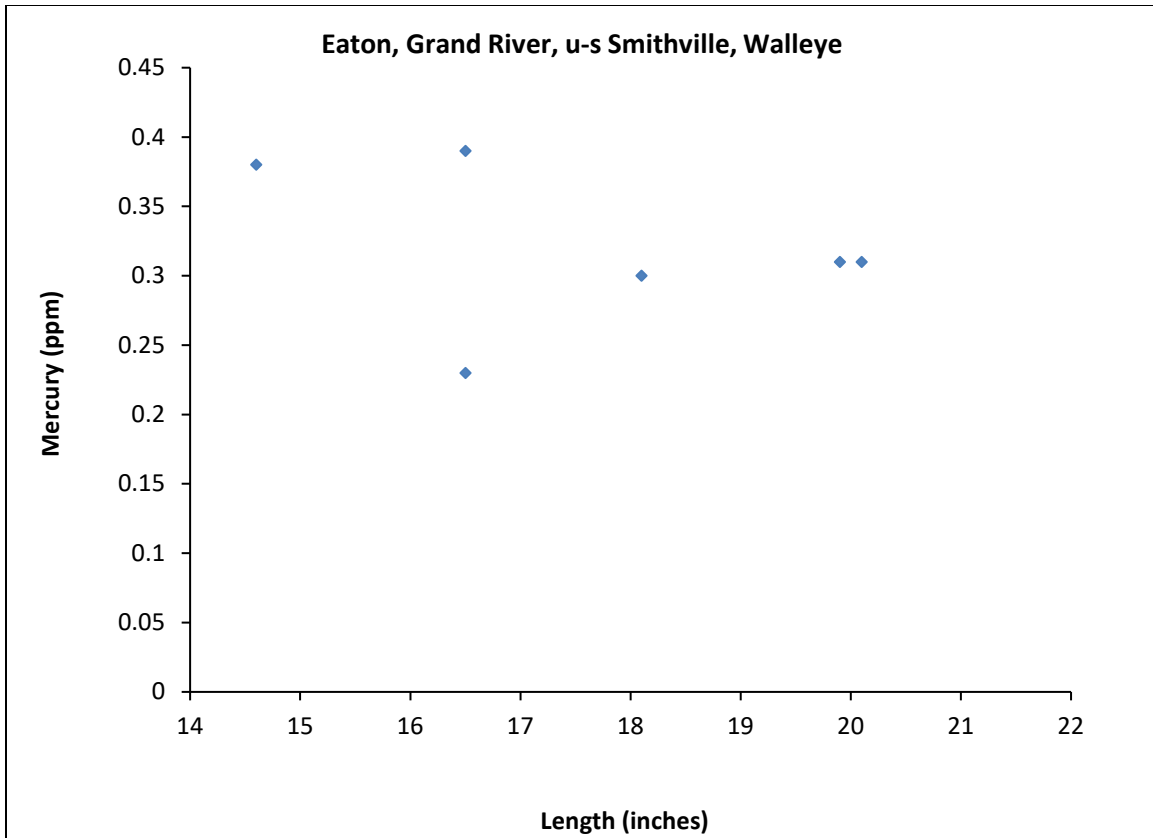
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1990	2001	6	14.6	15	14.6	20.1	
Datasets available: 1990, 2001							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	6	0.32		0.23	0.39	0.38	2
Chemical	Linear Regression	Exponential Regression					
	R²	R²					
Mercury	0.117	0.072					

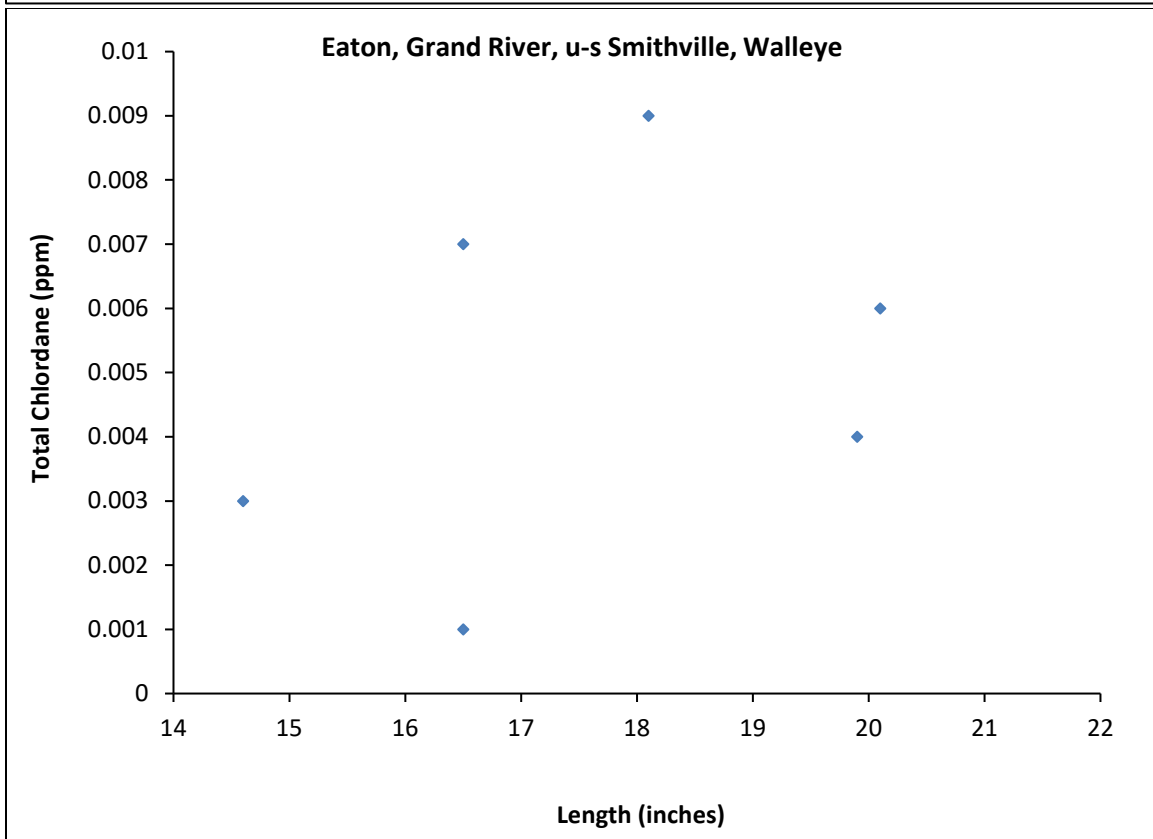
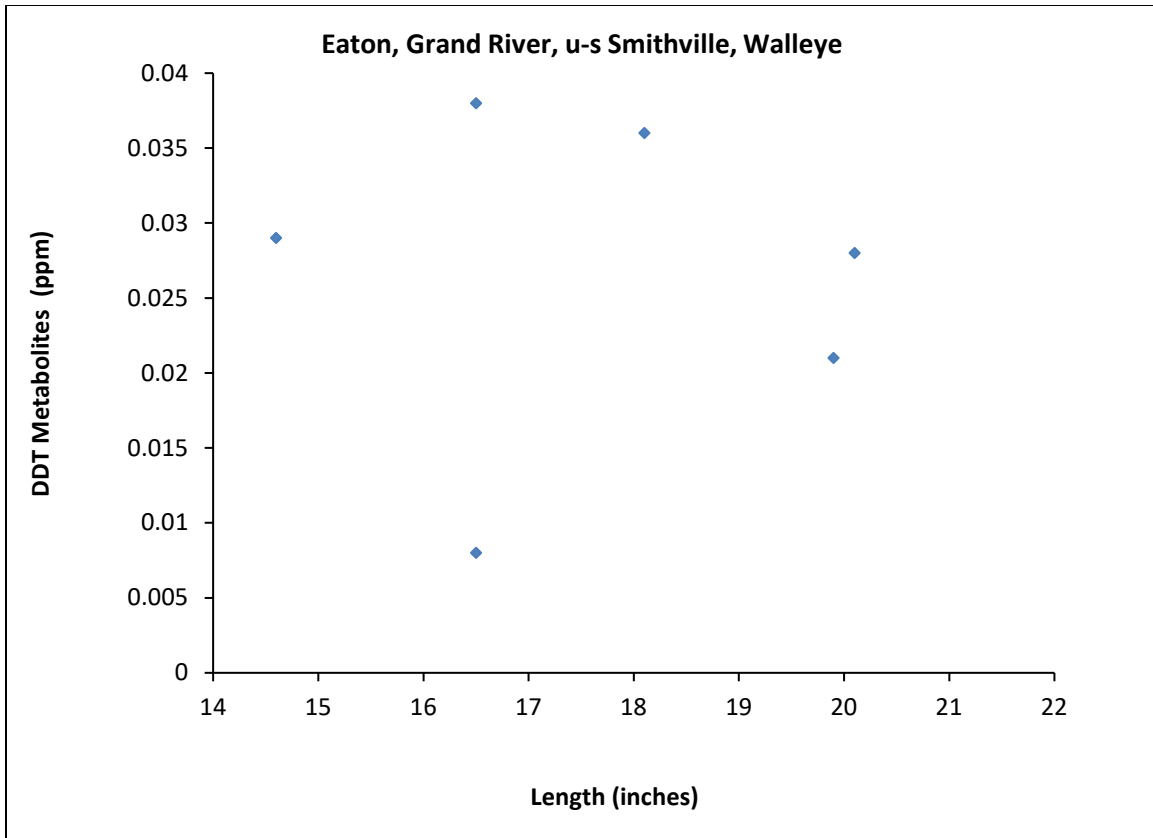
Organics Analysis:

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	2001	6	14.6	15	14.6	20.1	
Datasets available: 1990, 2001							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	6	0.07		0.03	0.13	0.12	1
DDT	6	0.03		0.008	0.04	0.04	16
Chlordane	6	0.005		0.001	0.009	0.01	--
Toxaphene	6	ND		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.378	0.448					
DDT	0.001	0.005					
Chlordane	0.111	0.140					
Toxaphene	--	--					
Final meal category based on UCL:							1

Existing Advisory: Women and children should eat no more than one meal per week of walleye from the Grand River upstream of Webber Dam (Ionia County).

Recommendation: No one should eat more than 1 meal per month of walleye less than 20 inches due to PCBs or more than 1 meal per month of those walleye greater than 20 inches from the Grand River upstream of the Smithville Dam due to mercury and PCBs. Mercury would cause an advisory.





White Sucker**Grand River
Upstream of Smithville Dam****Ingham, Eaton &
Jackson Counties****Hg Analysis:**

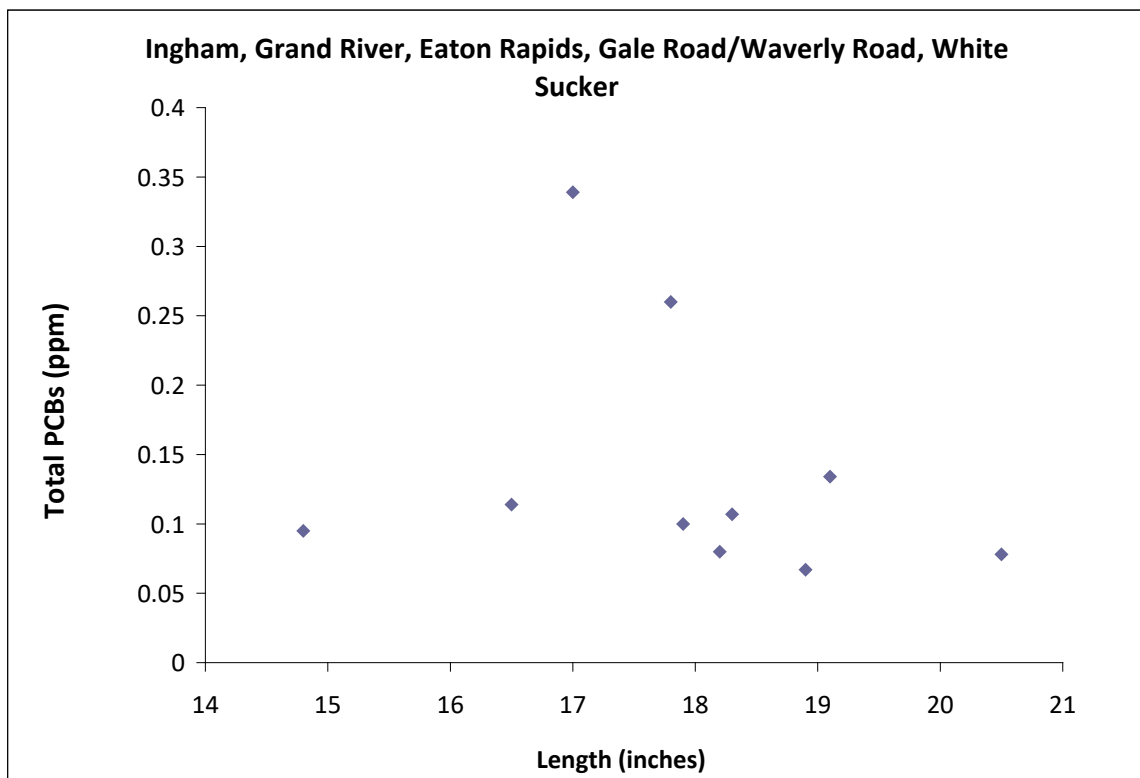
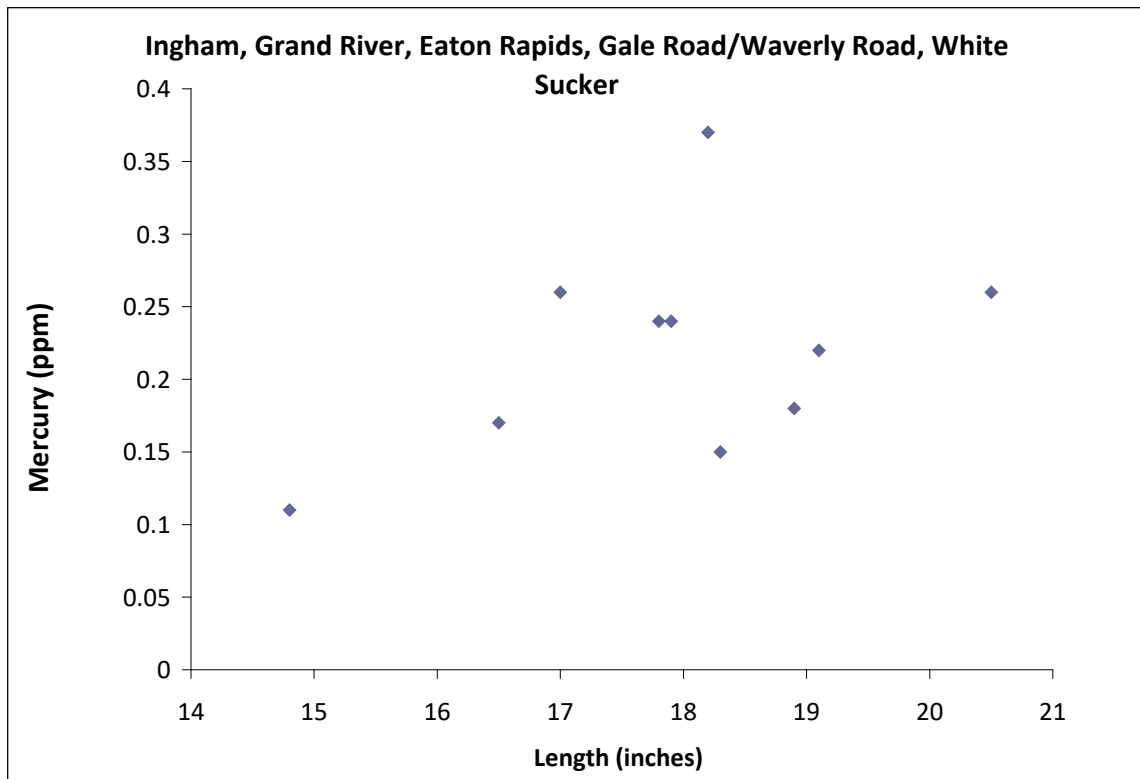
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2001	2001	10	14.8	na	14.8	20.5	
Datasets available: 2001							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.22		0.11	0.37	0.27	4
Chemical	Linear Regression	Exponential Regression					
	R²	R²					
Mercury	0.198	0.292					

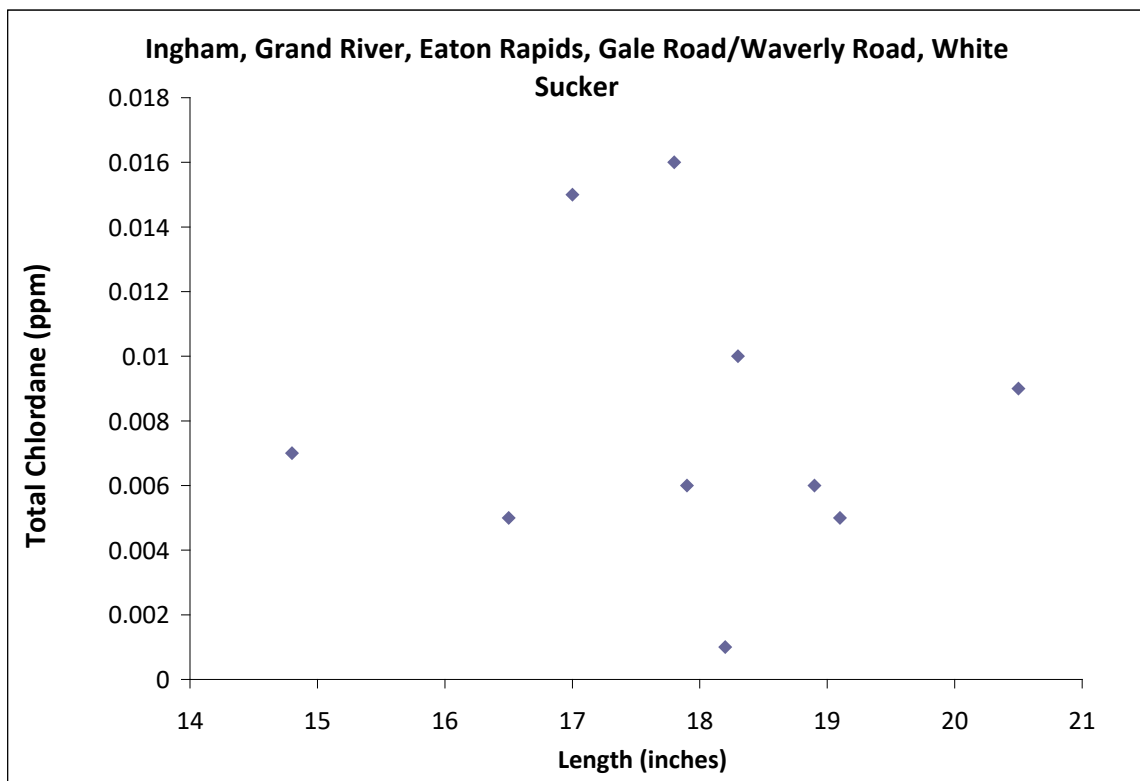
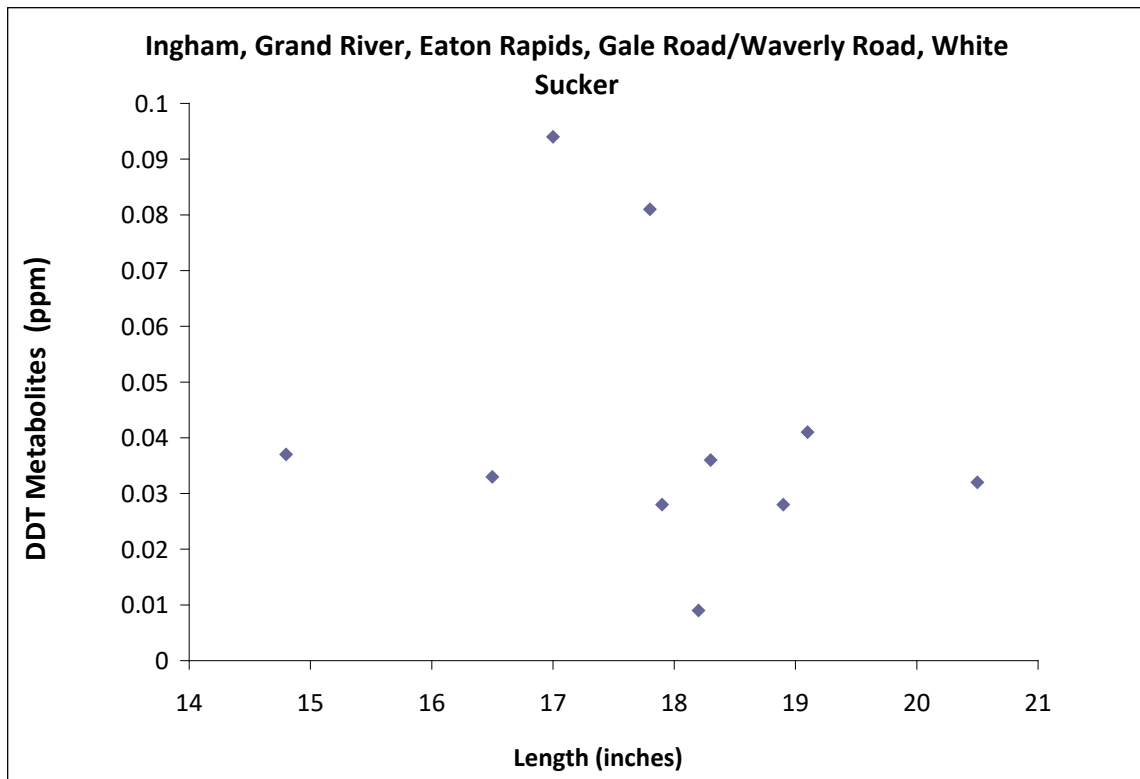
Organics Analysis:

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	14.8	na	14.8	20.5		
Datasets available: 2001								
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category	
PCB	10	0.137		0.067	0.339	0.200	1	
DDT	10	0.042		0.009	0.094	0.060	16	
Chlordane	10	0.008		0.001	0.016	0.010	--	
Toxaphene	10	ND		--	--	--	--	
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
PCB	0.053	0.070						
DDT	0.045	0.037						
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 Grand River white sucker due to PCBs.

Recommendation: No one should eat more than one meal per month of white sucker from the Grand River upstream of Smithville Dam due to PCBs. Mercury would cause an advisory.





Bluegill/Pumpkinseed**Grand River
Webber Dam to Grand Haven****Ionia, Kent, & Ottawa
Counties****Hg Analysis:**

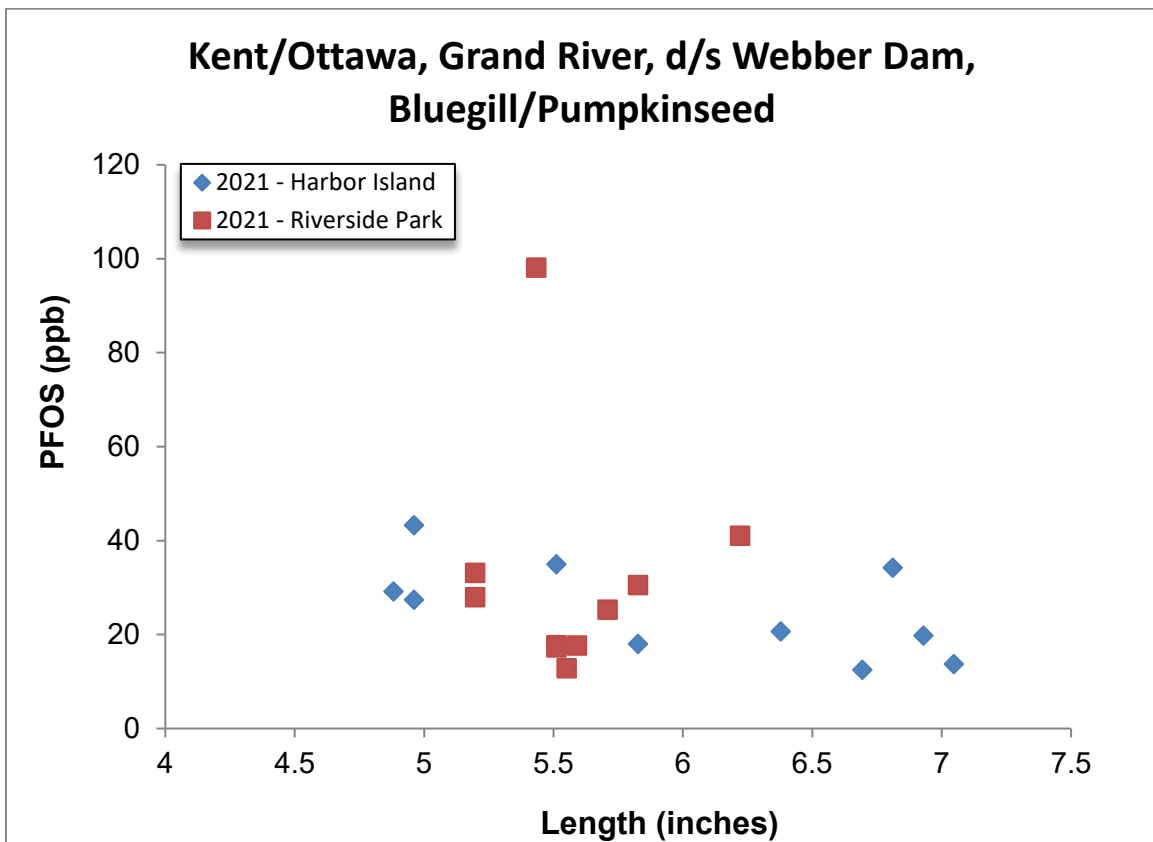
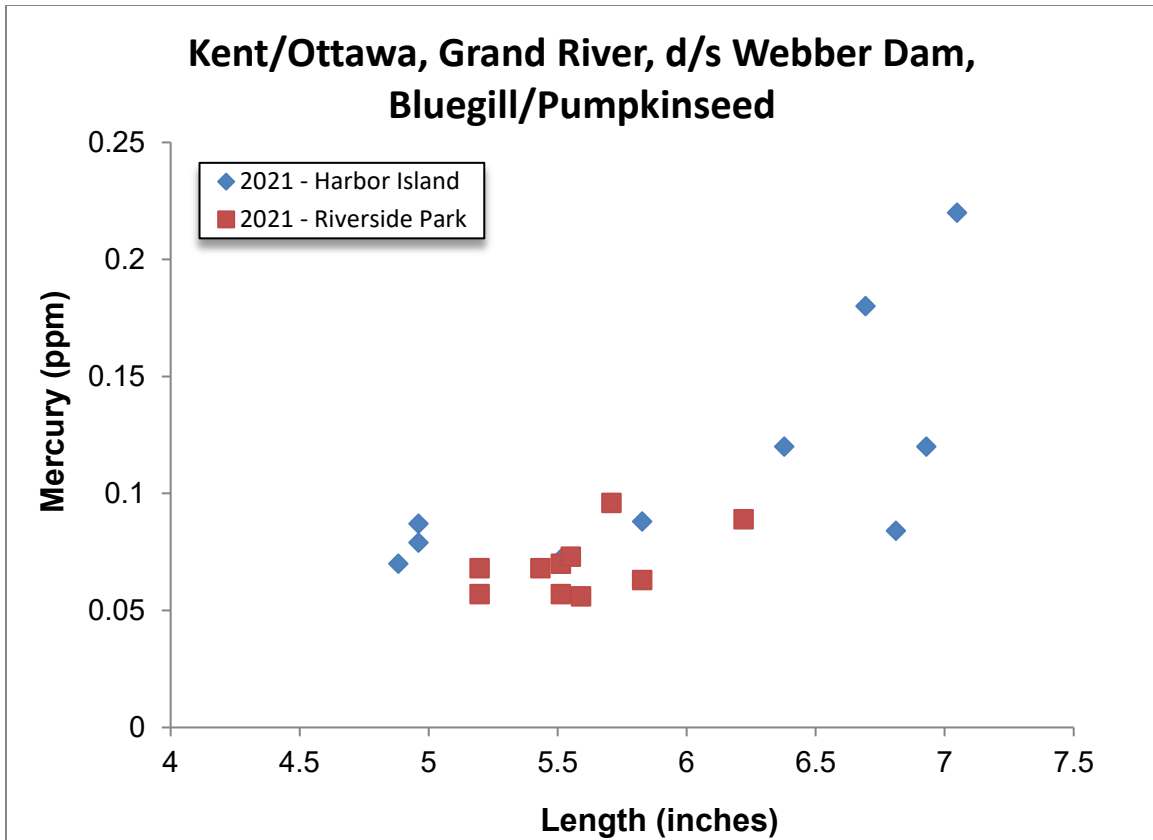
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2021	2021	20	4.9	NA	4.9	7.0	
Datasets available: 2021							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	20	0.091		0.056	0.220	0.110	16
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.525	0.544					

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	4.9	NA	4.9	7.0	
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	28.8 ppb		12.5 ppb	98.2 ppb	37.6 ppb	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	0.074	0.130					
Final meal category based on UCL:							4

Existing MDHHS Advisory: Bluegill and sunfish from the Grand River downstream of the Webber dam to the mouth of the river in Grand Haven 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 the Grand River downstream of the Webber dam to the mouth of the river in Grand Haven due to PFOS. Note: Additional fish were collected in 2022 from this stretch of the river including upstream of the 6th street dam in Grand Rapids, downstream of the Thornapple River confluence in Ada, and downstream of Saranac.



Carp**Grand River
Webber Dam to Grand Haven****Ionia, Kent,
& Ottawa Counties****Hg Analysis:**

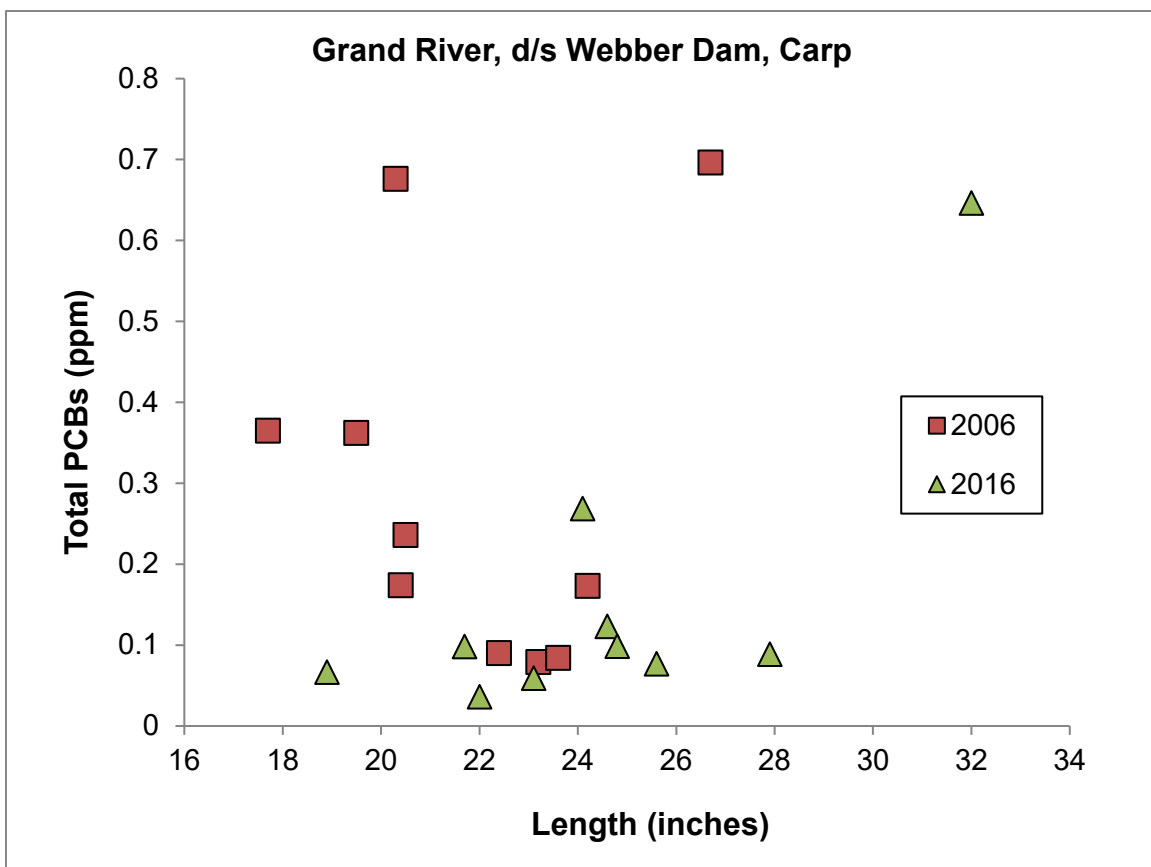
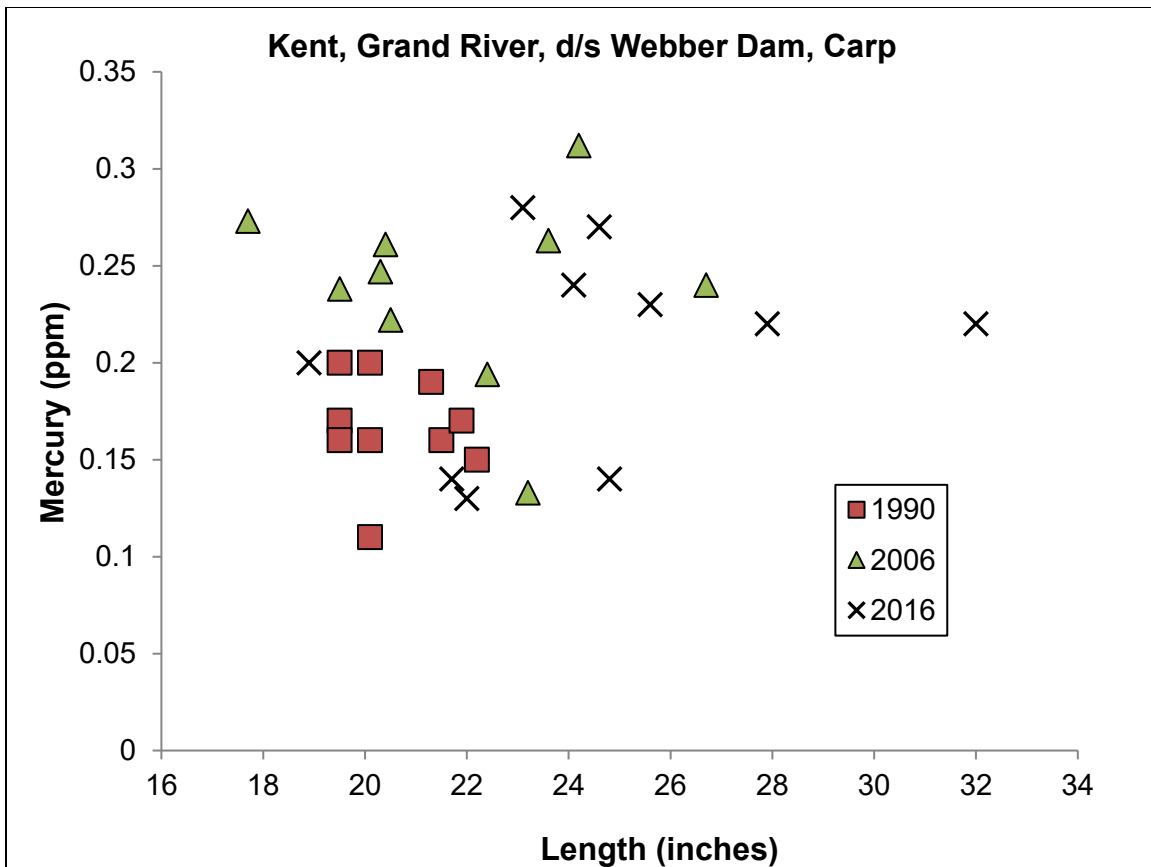
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1990	2016	30	17.7	na	17.7	32	
Datasets available: 1990, 2006, 2016							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	30	0.20		0.11	0.31	0.22	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.035	0.036					

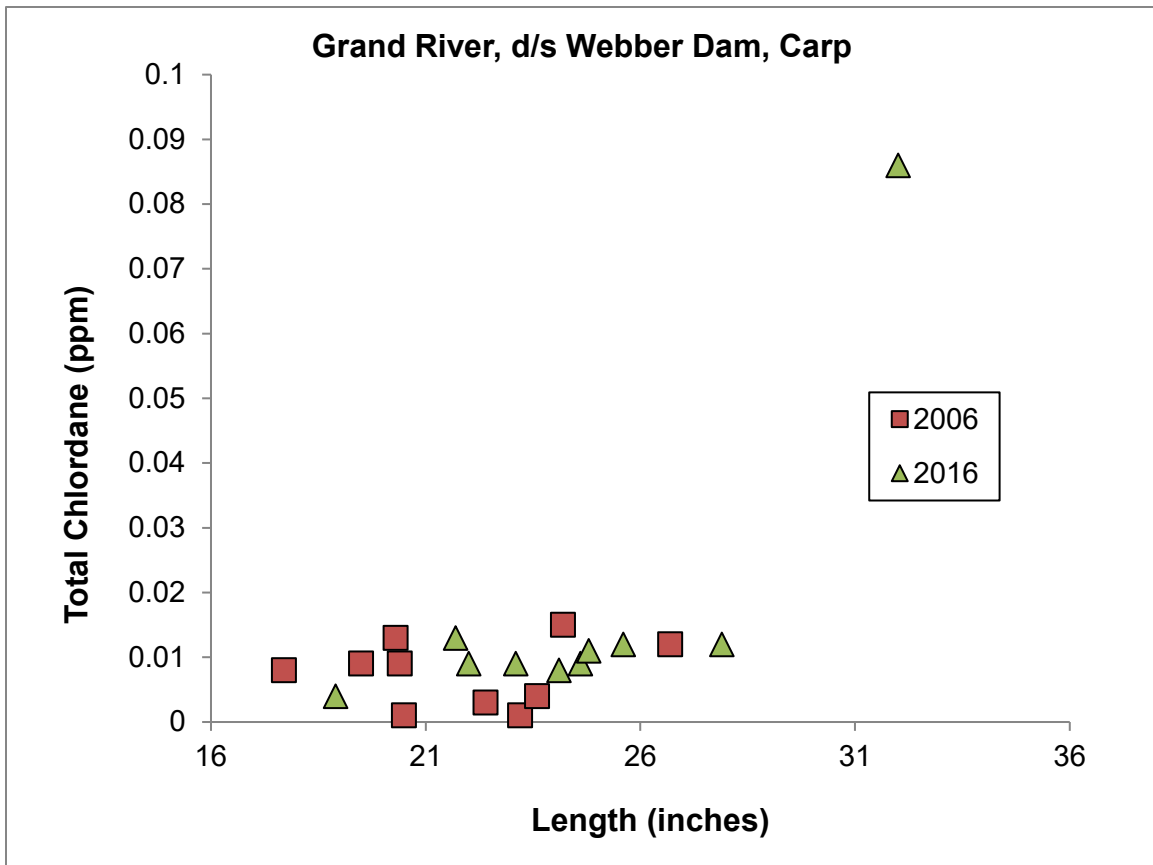
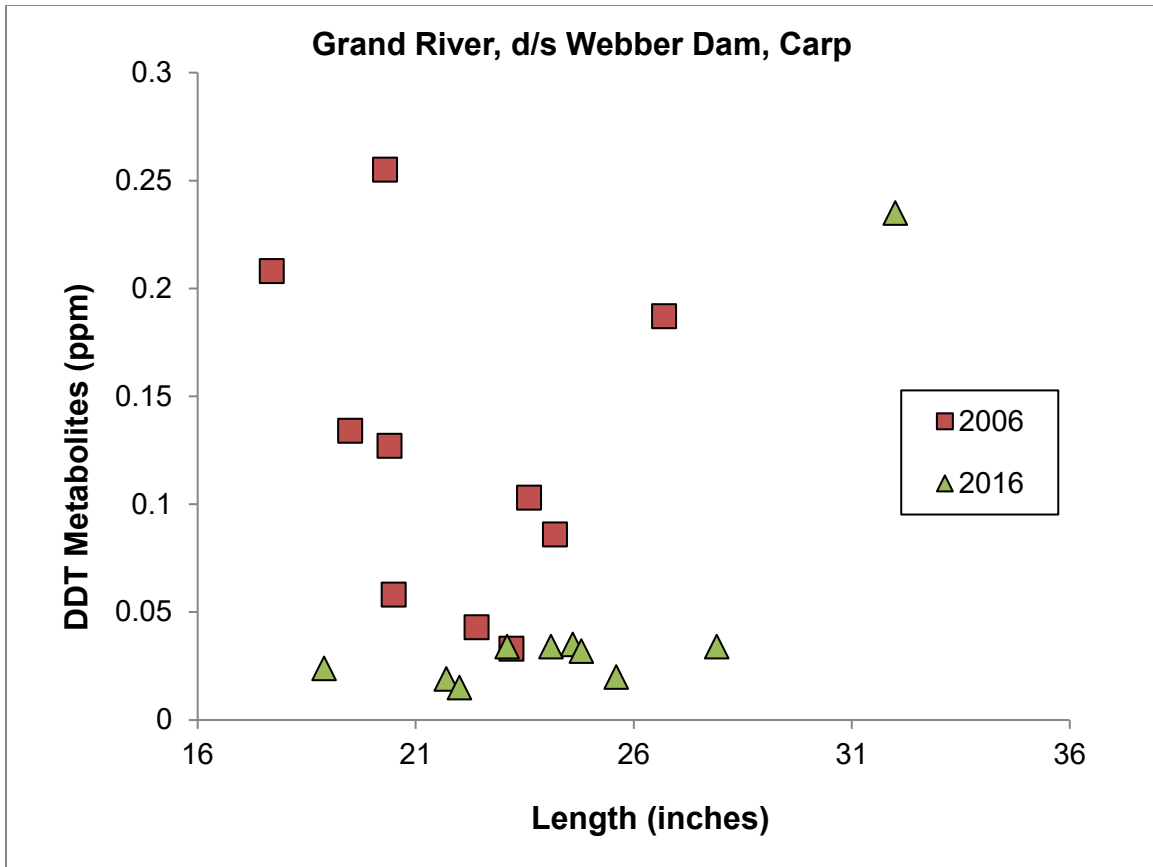
Organics Analysis:

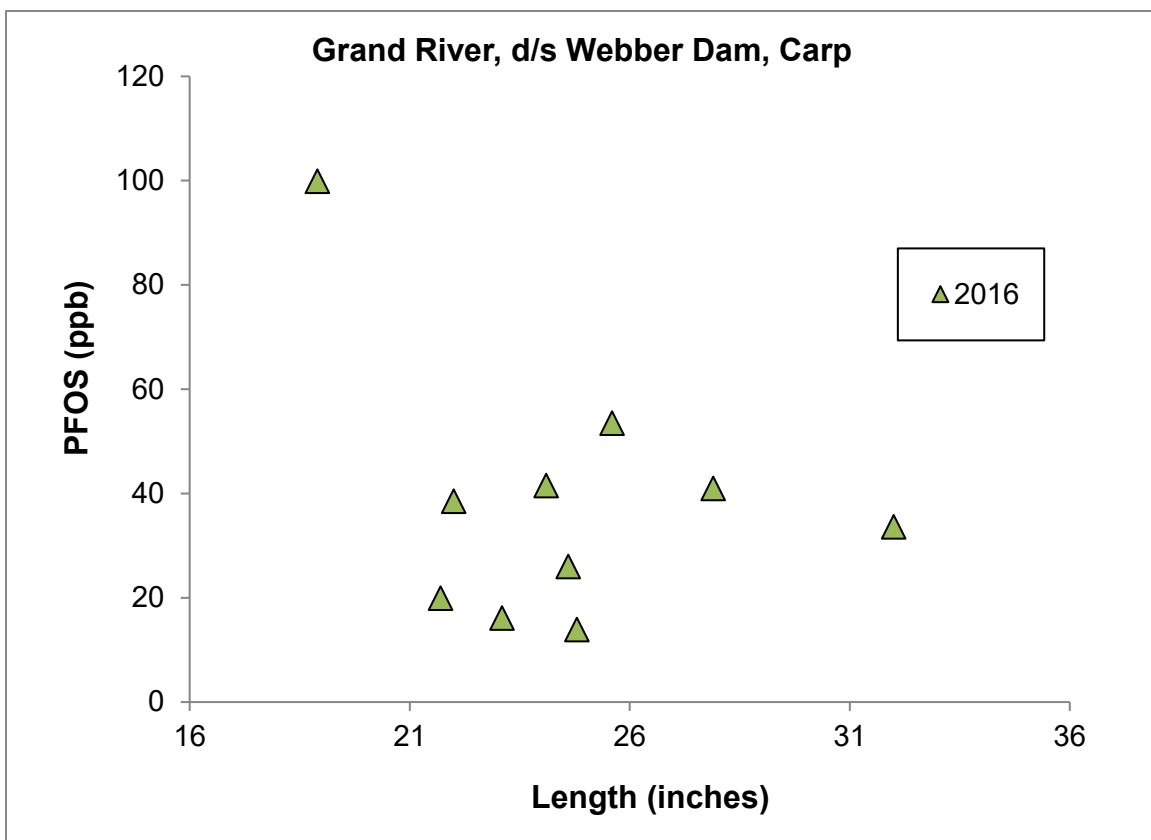
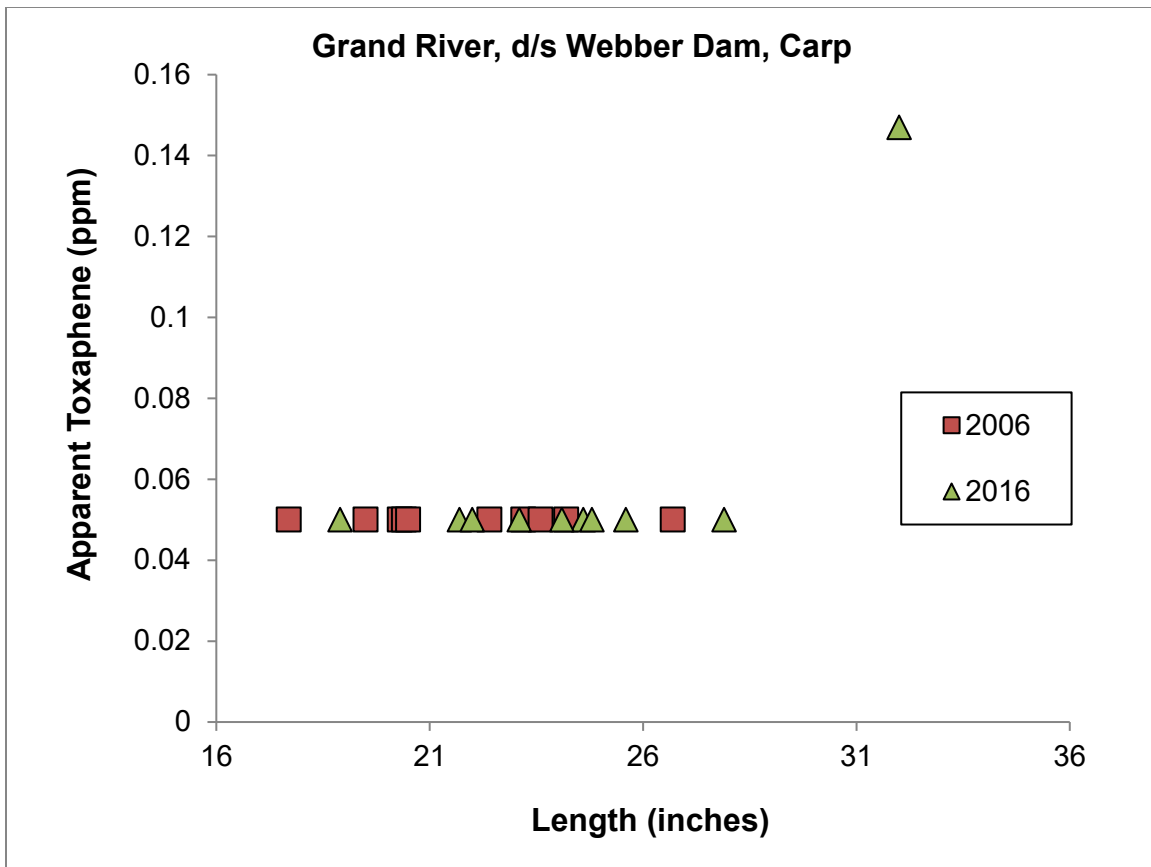
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2006	2016	20	17.7	na	17.7	32	
Datasets available: 1990, 2006, 2016							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	20	0.22		0.04	0.70	0.33	0.5
DDT	20	0.22		0.02	0.26	0.12	12
Chlordane	20	0.09		0.001	0.09	0.02	--
Toxaphene	20	0.01		< 0.05	0.15	0.06	--
PFOS	10	38 ppb		14 ppb	100 ppb	56 ppb	2
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.039	0.011					
DDT	0.001	0.000					
Chlordane	0.441	0.278					
Toxaphene	0.384	0.384					
PFOS	0.121	0.027					
Final meal category based on UCL:							0.5

Existing MDHHS Advisory: Sensitive populations should not eat these fish. Healthy adults should limit consumption of carp from the Grand River between the Webber Dam and Grand Haven to no more than 1 or 2 meals per year due to PCBs. Mercury and DDT would cause advisories.

Recommendation: No change to the advisory is recommended. Additional sampling is required in order to relax the current advisory. PFOS would also cause an advisory.







Channel Catfish**Grand River
Webber Dam to Grand Haven****Ionia, Kent,
& Ottawa Counties****Hg Analysis:**

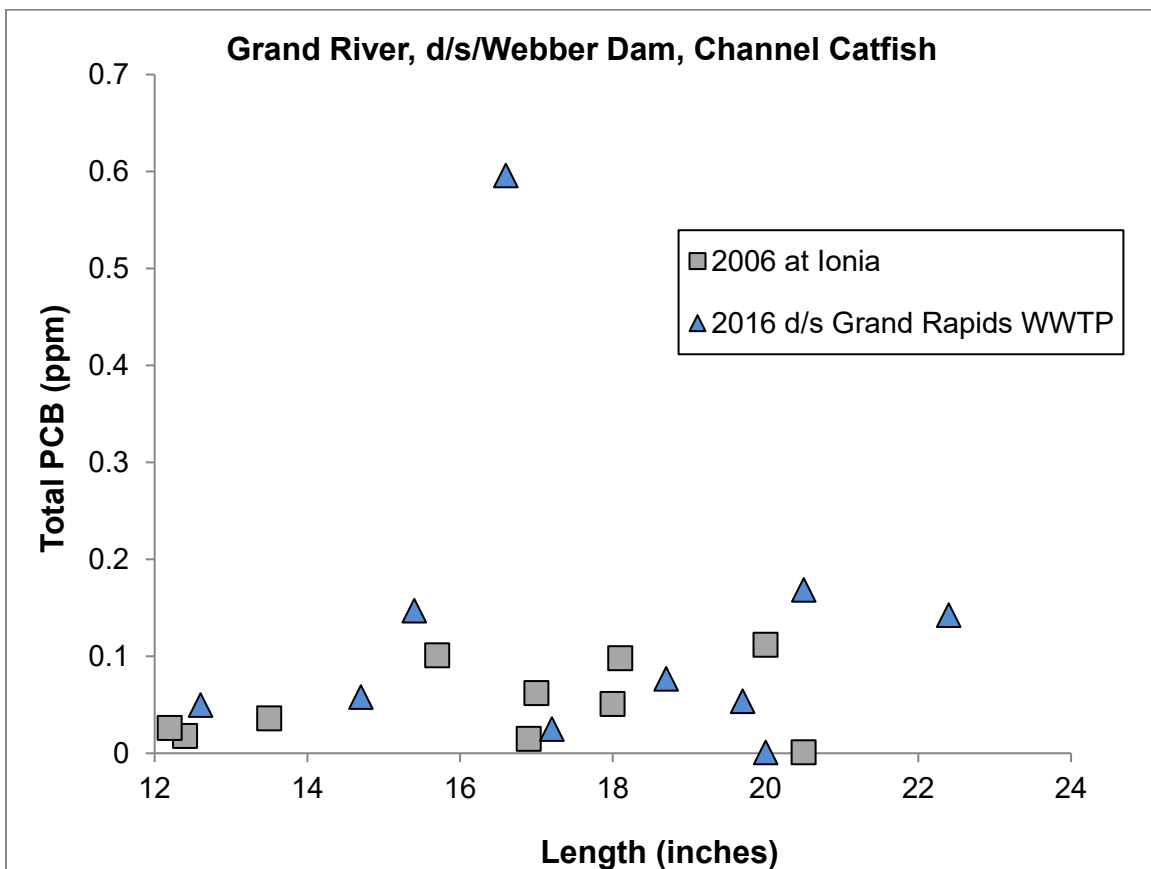
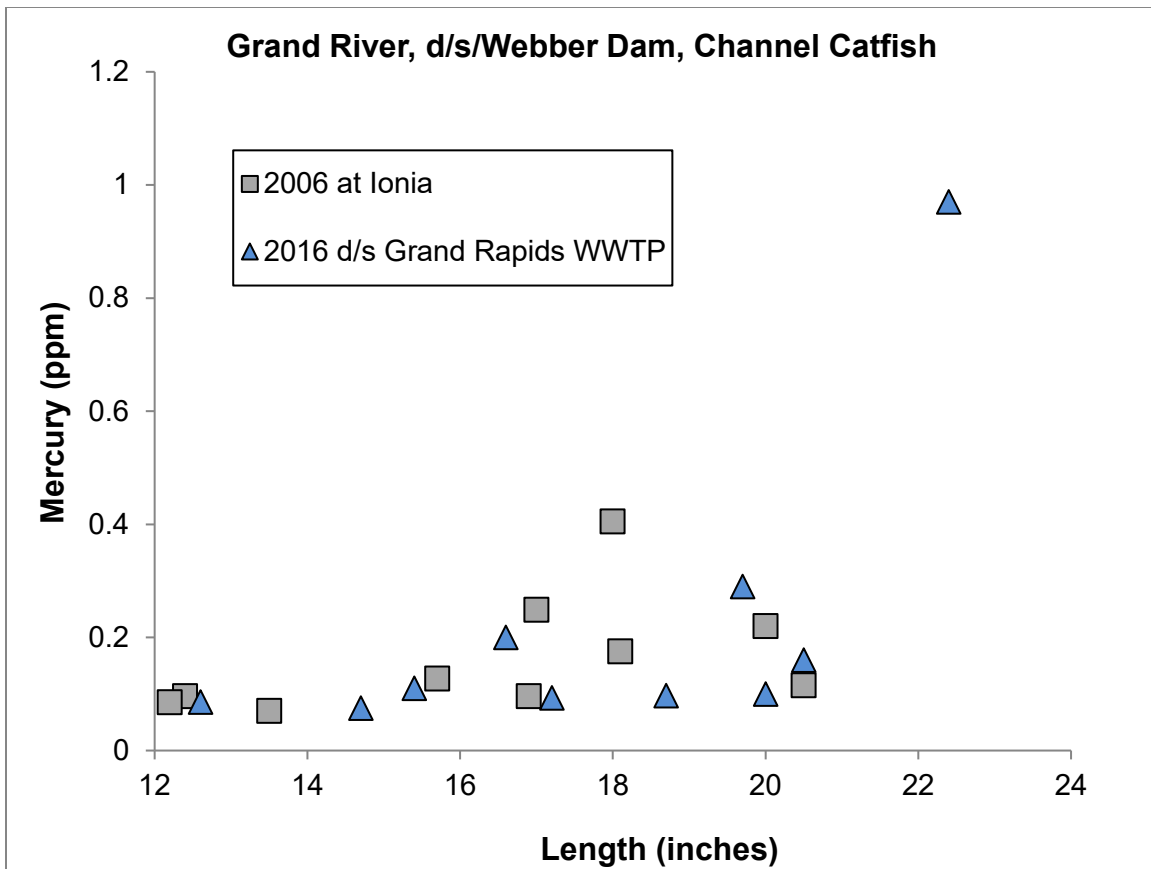
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2006	2016	20	12.2	12	12.2	22.4
Datasets available: 2006, 2016						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
Mercury	20	0.19		0.07	0.97	0.29
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
Mercury	0.296	0.398				2

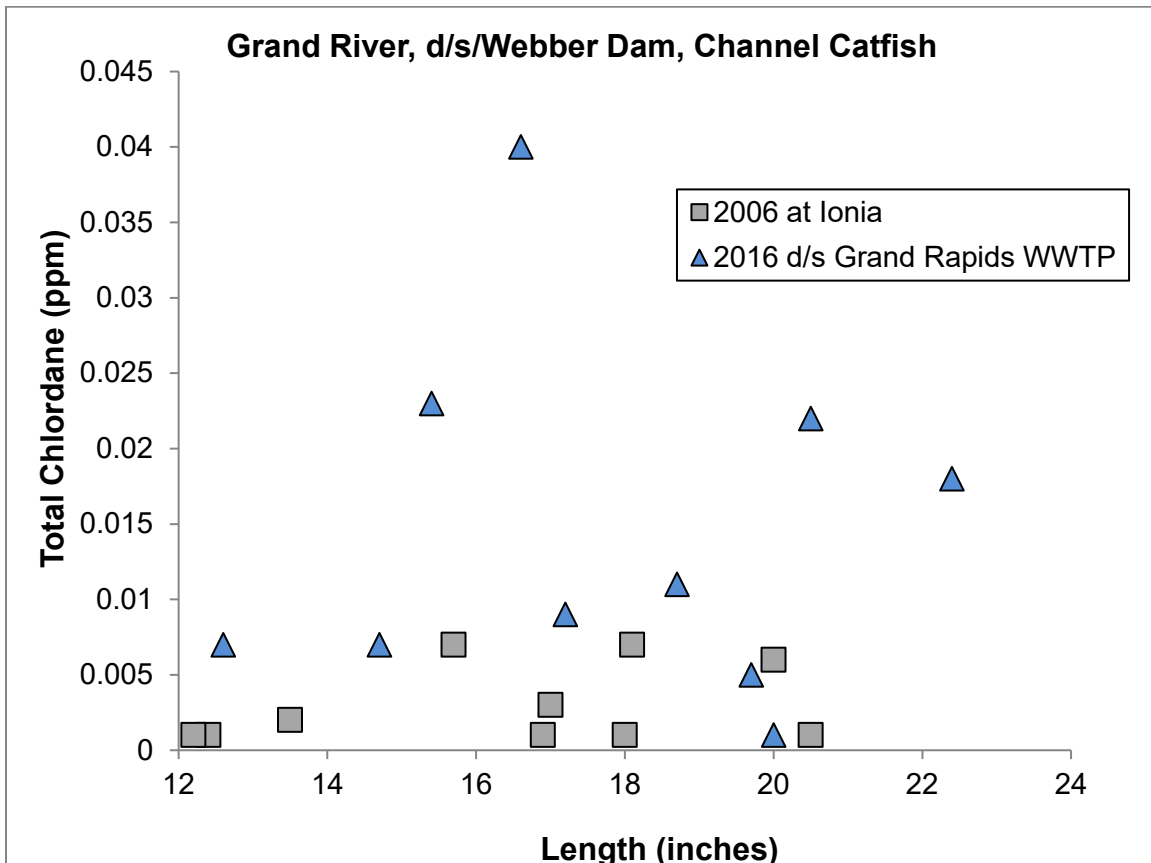
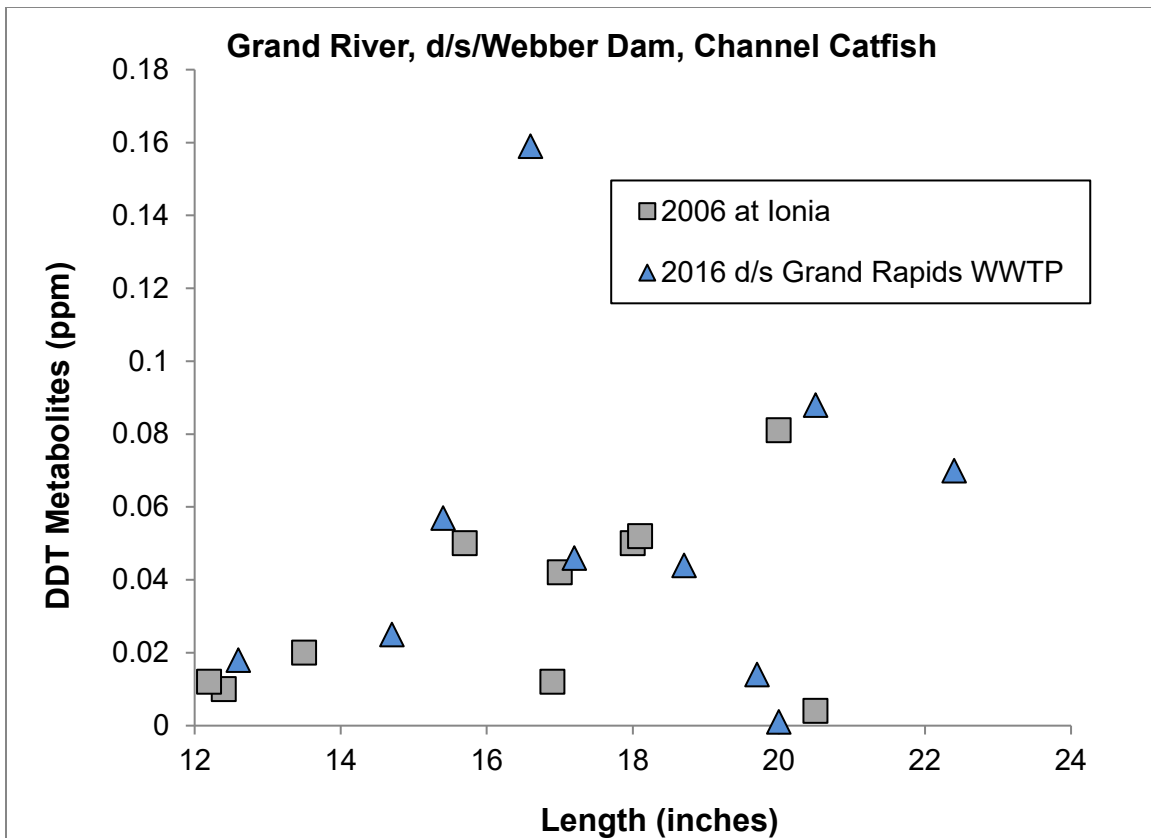
Organics Analysis:

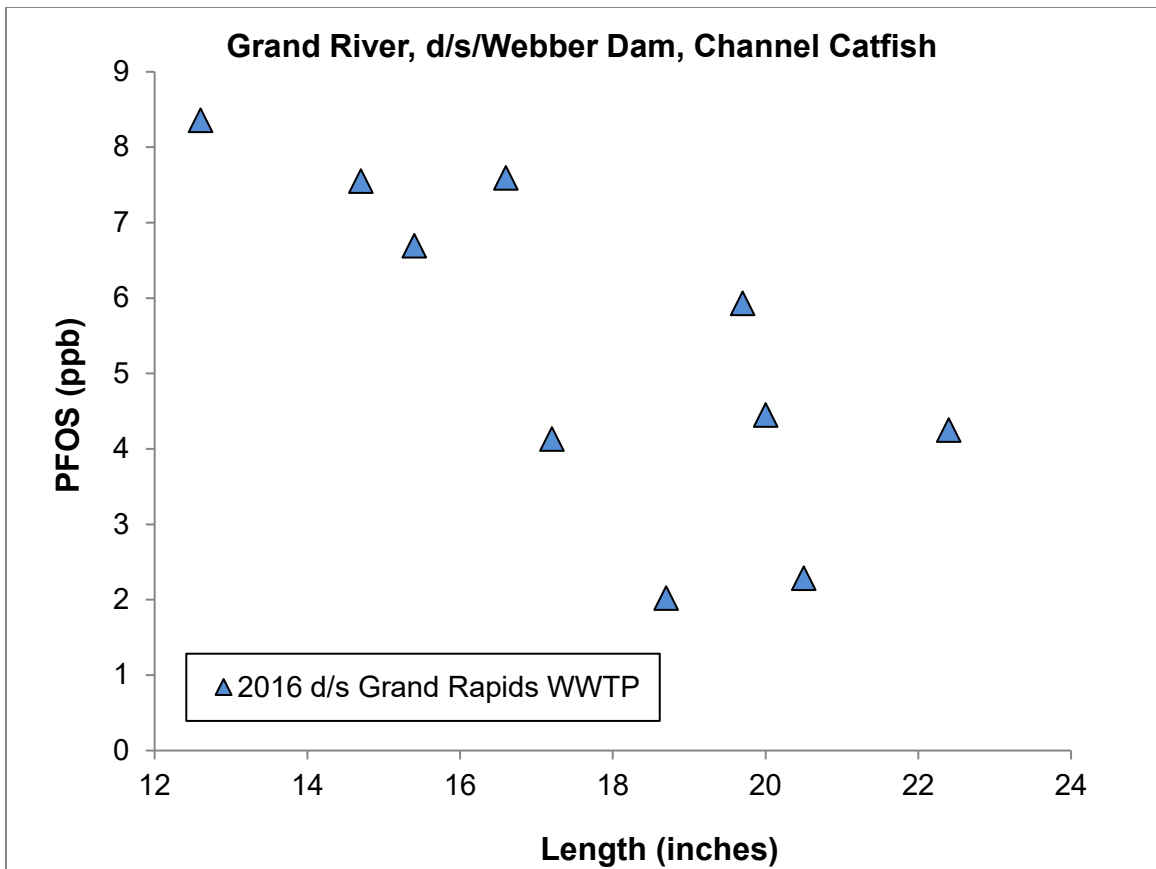
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2006	2016	20	12.2	12	12.2	22.4
Datasets available: 2006, 2016						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
PCB	20	0.09		0.001	0.596	0.152
DDT	20	0.04		0.001	0.159	0.060
Chlordane	20	0.01		0.001	0.040	0.013
Toxaphene	20	ND		<0.05	<0.05	--
PFOS	10	5 ppb		2 ppb	8 ppb	7 ppb
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
PCB	0.008	0.005				1
DDT	0.068	0.006				16
Chlordane	0.030	0.048				--
Toxaphene	--	--				--
PFOS	0.546	0.412				16
Final meal category based on UCL:						1

Existing MDHHS Advisory: No one should eat more than 2 meals per month of channel catfish from the Grand River between Webber Dam and Grand Haven due to PCBs. Mercury would cause an advisory.

Recommendation: No one should eat more than 1 meal per month of channel catfish from the Grand River between Webber Dam and Grand Haven due to PCBs. Mercury would cause an advisory.







Northern Pike**Grand River
Webber Dam to Grand Haven****Ionia, Kent,
& Ottawa Counties****Hg Analysis:**

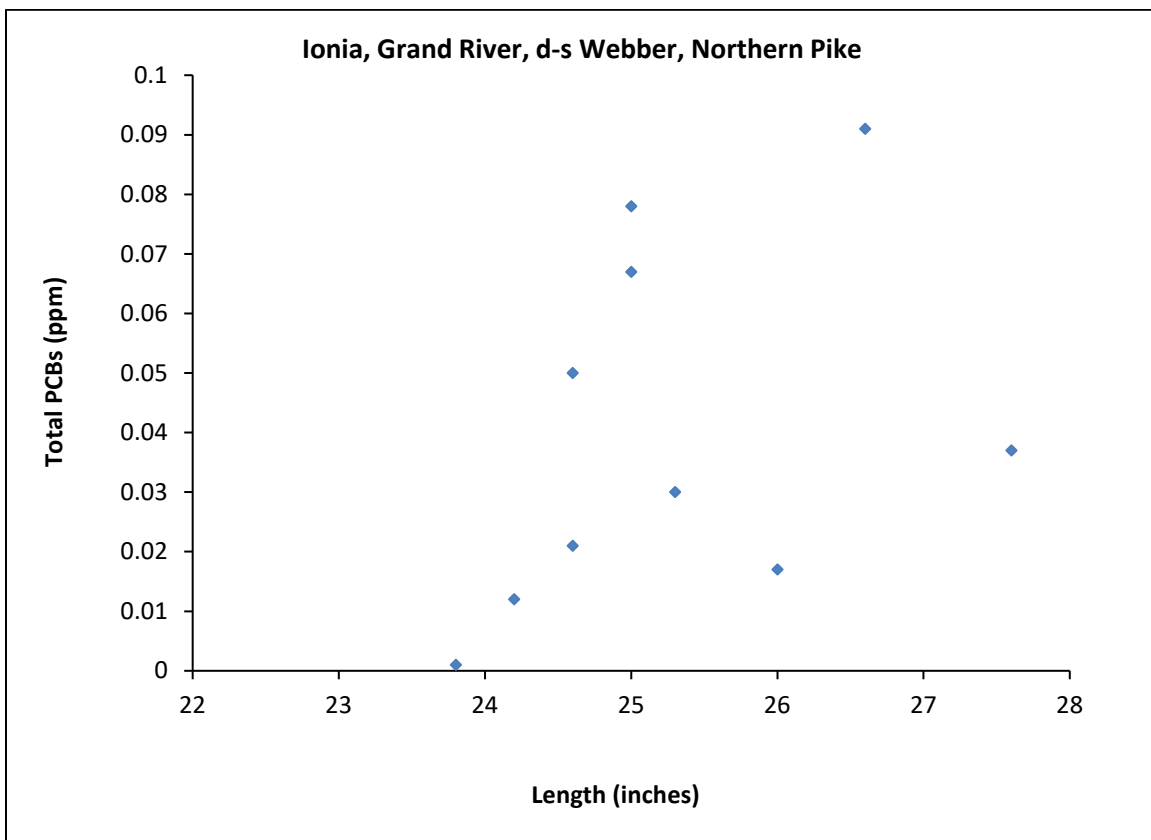
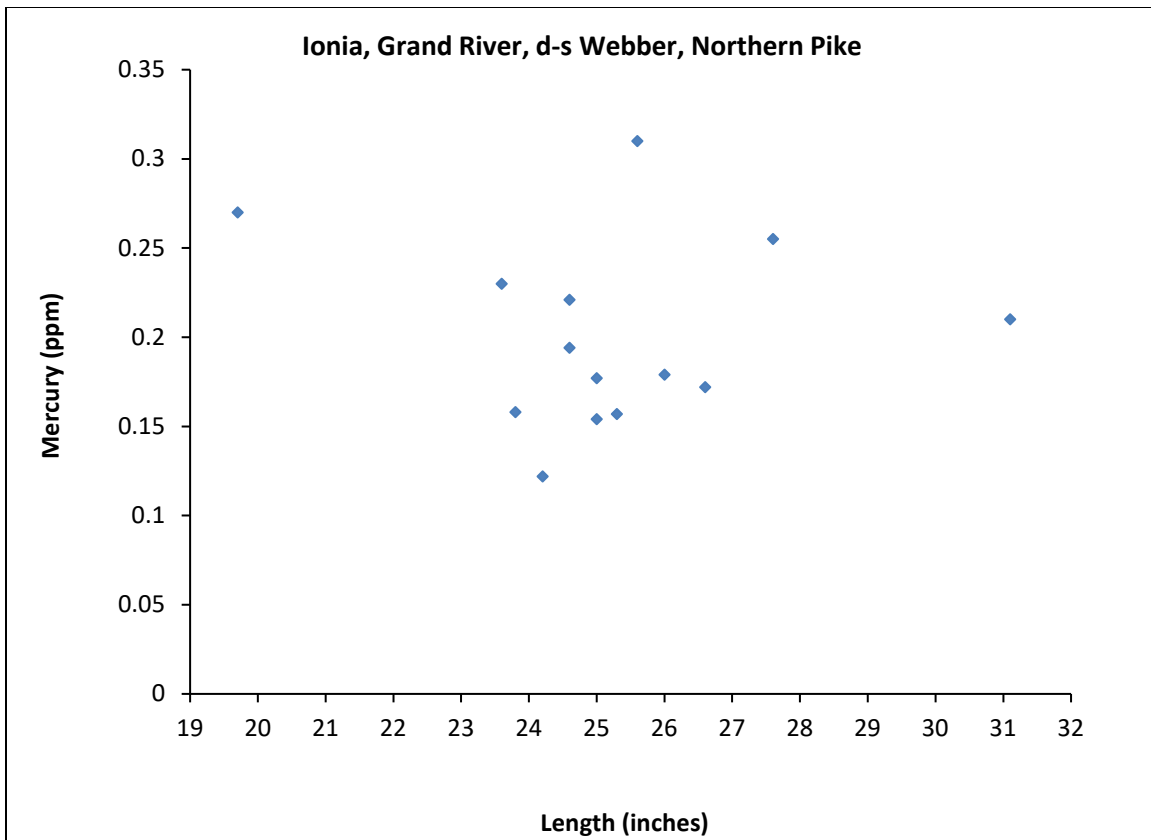
Hg Analysis:							
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1998	2007	14	19.7	24	23.6	31.1	
Datasets available: 1998, 1999, 2007							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	13	0.20		0.12	0.31	0.23	4
Chemical	Linear Regression	Exponential Regression					
	R²	R²					
Mercury	0.005	0.001					

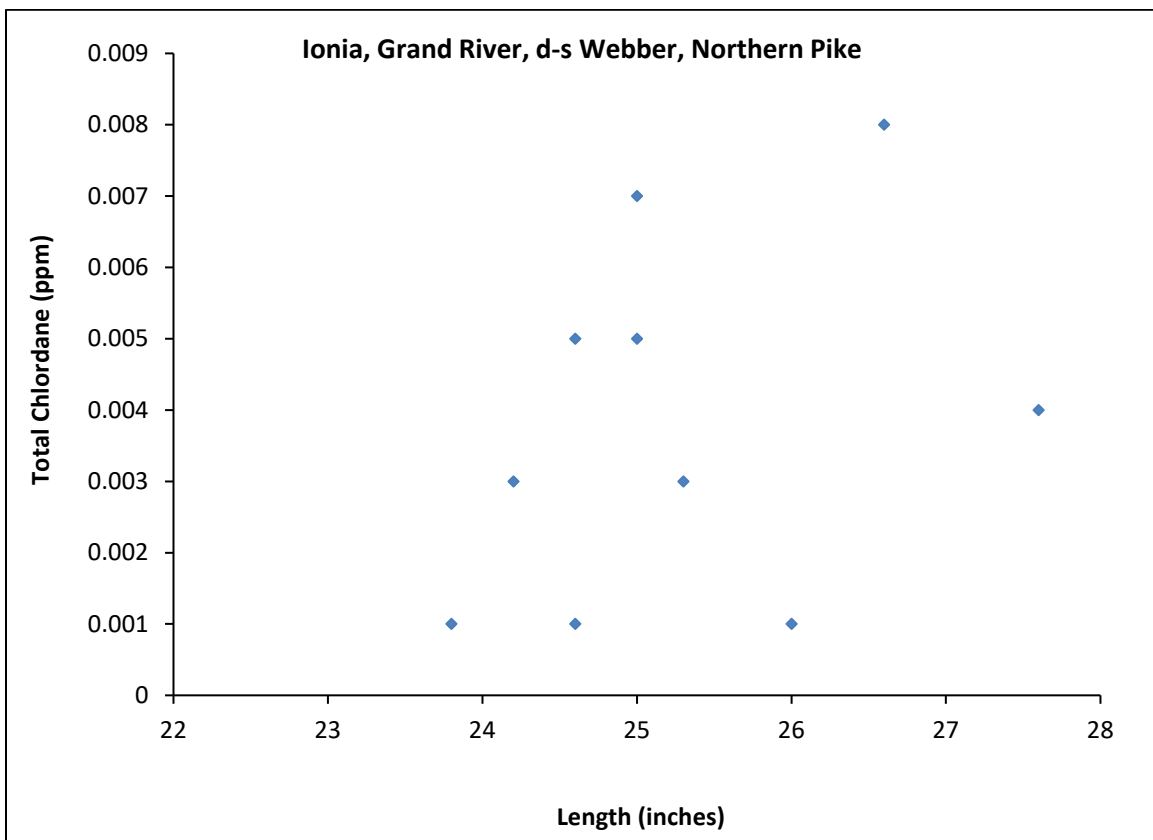
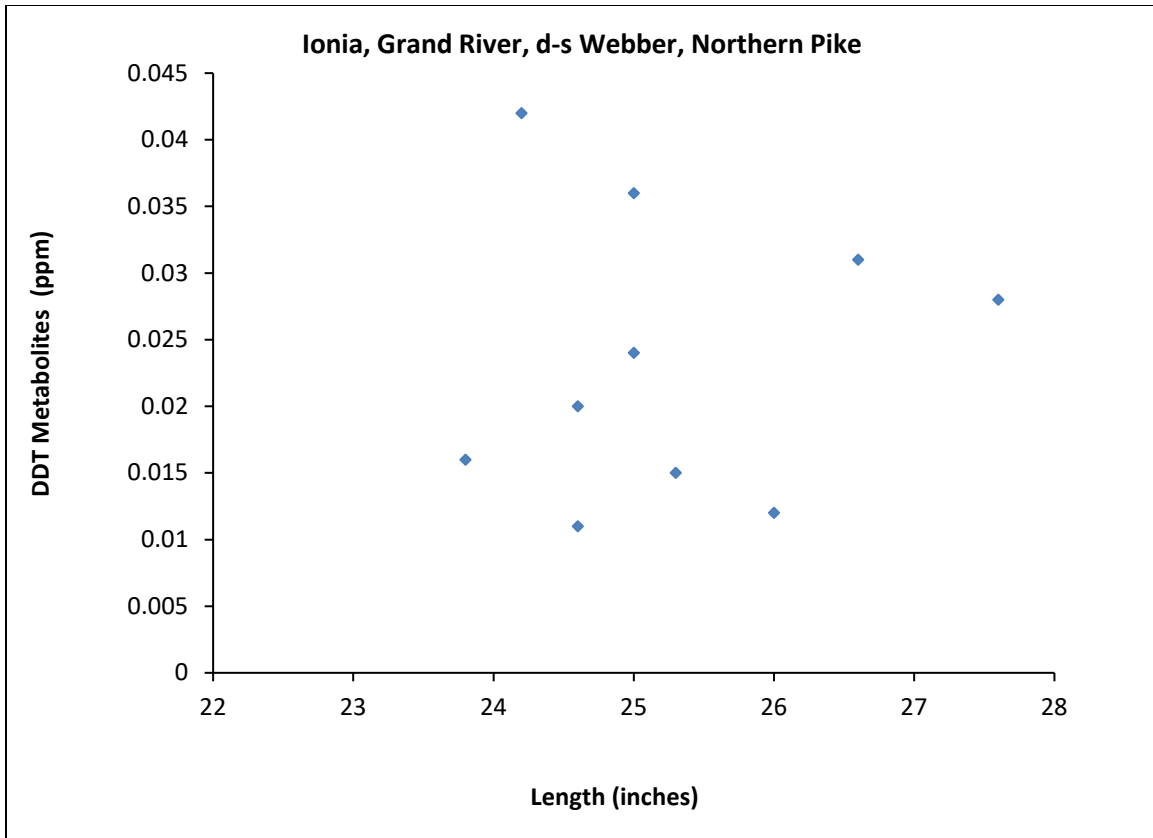
Organics Analysis:

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	23.8	24	23.8	27.6	
Datasets available: 1998, 1999, 2007							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.040		0.001	0.09	0.06	2
DDT	10	0.024		0.01	0.04	0.03	16
Chlordane	10	0.004		0.001	0.008	0.01	--
Toxaphene	10	ND		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.145	0.255					
DDT	0.009	0.022					
Chlordane	0.116	0.111					
Toxaphene	--	--					
Final meal category based on UCL:							2

Existing Advisory: Women and children should not eat more than 1 meal per week of northern pike from the Grand River downstream of Webber Dam due to PCBs.

Recommendation: No one should eat more than 2 meals per month of northern pike from the Grand River between Webber Dam and Grand Haven less than 30 inches due to PCBs or more than 2 meals per month of those fish larger than 30 inches due to mercury and PCBs. Statewide length break applied as the size range of the dataset was limited.





Redhorse Sucker**Grand River
Webber Dam to Grand Haven****Ionia, Kent,
& Ottawa Counties****Hg Analysis:**

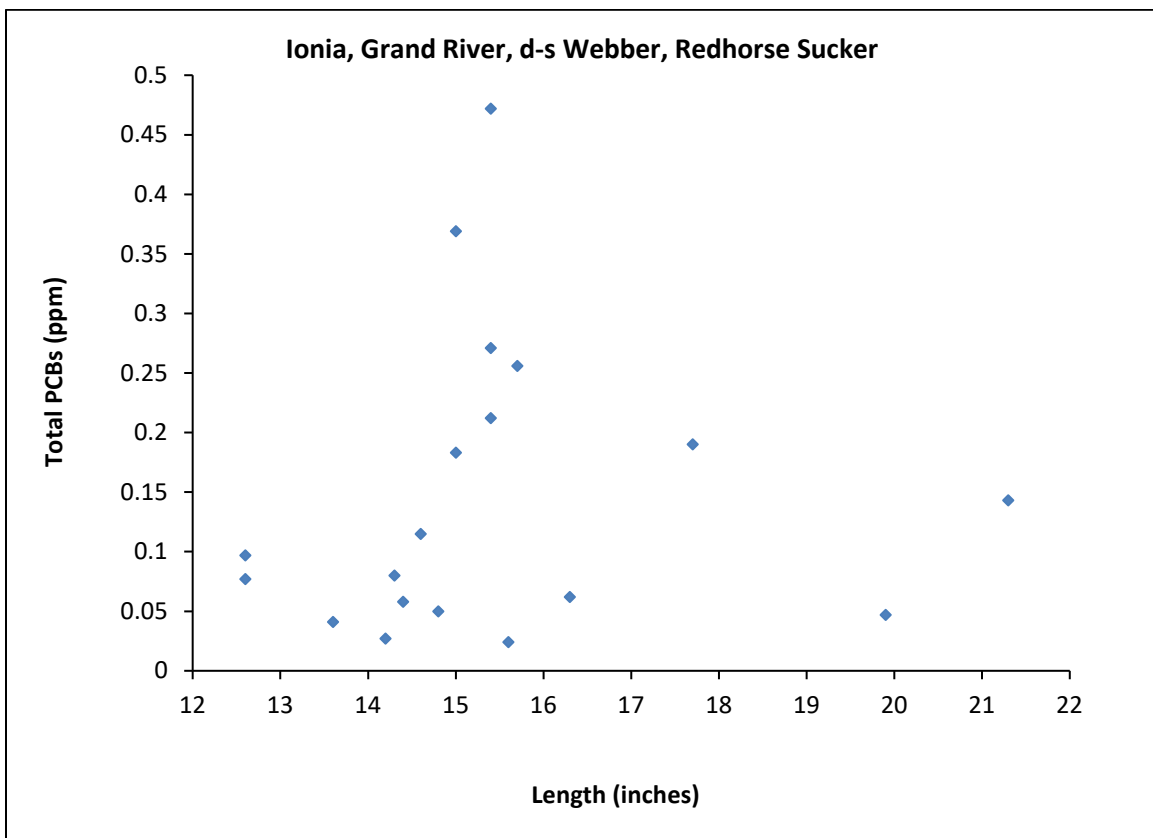
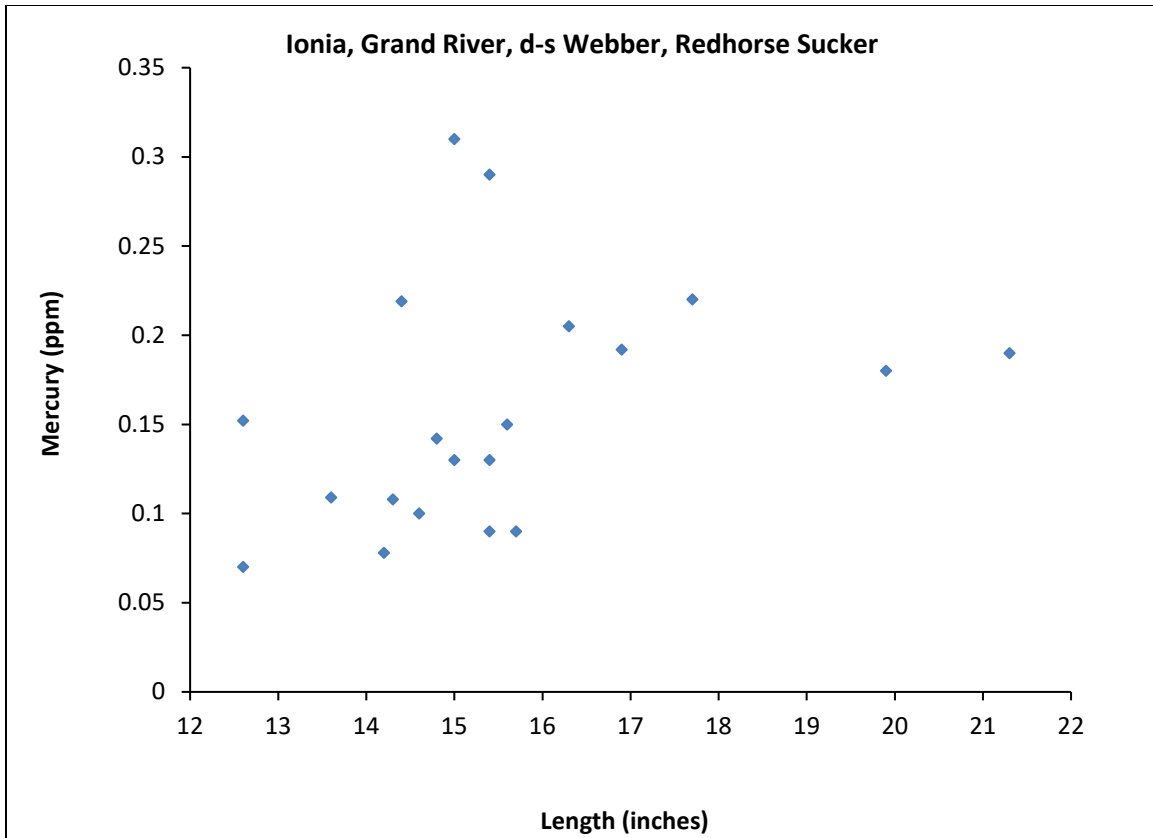
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1998	2006	20	12.6	na	12.6	21.3	
Datasets available: 1998, 2006							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	20	0.16		0.07	0.31	0.19	4
Chemical	Linear Regression	Exponential Regression					
	R²	R²					
Mercury	0.120	0.176					

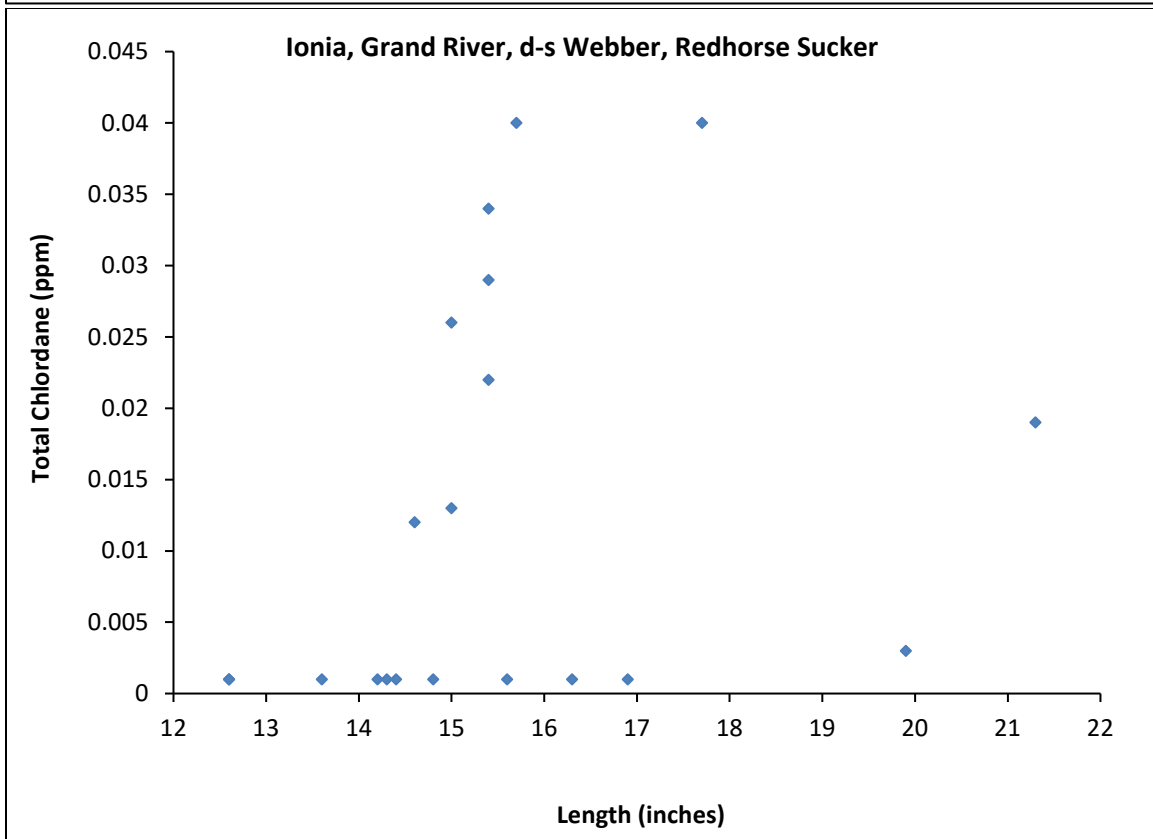
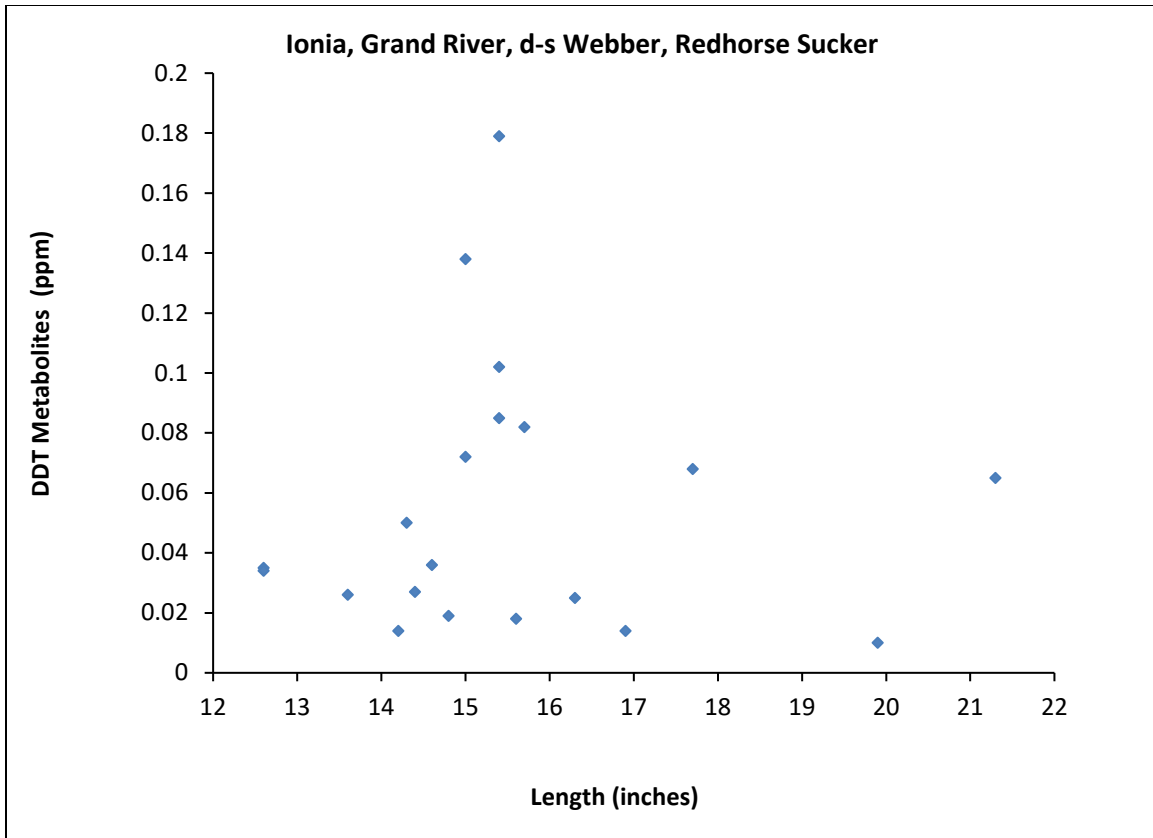
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1998	2006	20	12.6	na	12.6	21.3	
Datasets available: 1998, 2006							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	19	0.15		0.02	0.47	0.21	1
DDT	20	0.06		0.01	0.18	0.08	16
Chlordane	20	0.01		0.001	0.04	0.02	--
Toxaphene	20	ND		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.006	0.014					
DDT	0.001	0.002					
Chlordane	0.076	0.129					
Toxaphene	--	--					
Final meal category based on UCL:							1

Existing Advisory: Women and children should not eat more than 1 meal per month of sucker from the Grand River downstream of Webber Dam due to PCBs.

Recommendation: No one should eat more than 1 meal per month of sucker from the Grand River between Webber Dam and Grand Haven due to PCBs. Mercury would cause an advisory.





Walleye**Grand River
Webber Dam to Grand Haven****Ionia, Kent,
& Ottawa Counties****Hg Analysis:**

ing Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1986	2013	41	13.4	15	14.6	23.6	
Datasets available: 1986, 1991, 1998, 2006, 2013							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	39	0.27		0.03	1.1	0.33	2
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.140	0.119					

Organics Analysis:

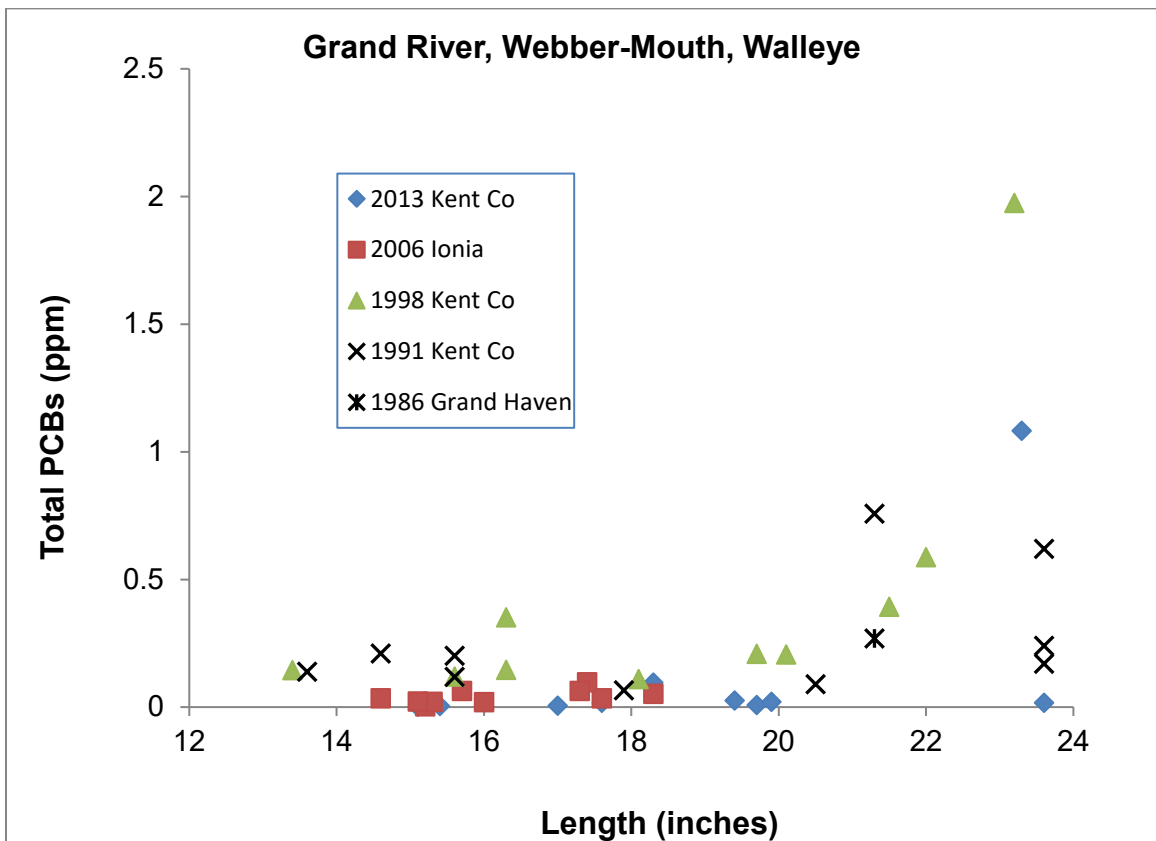
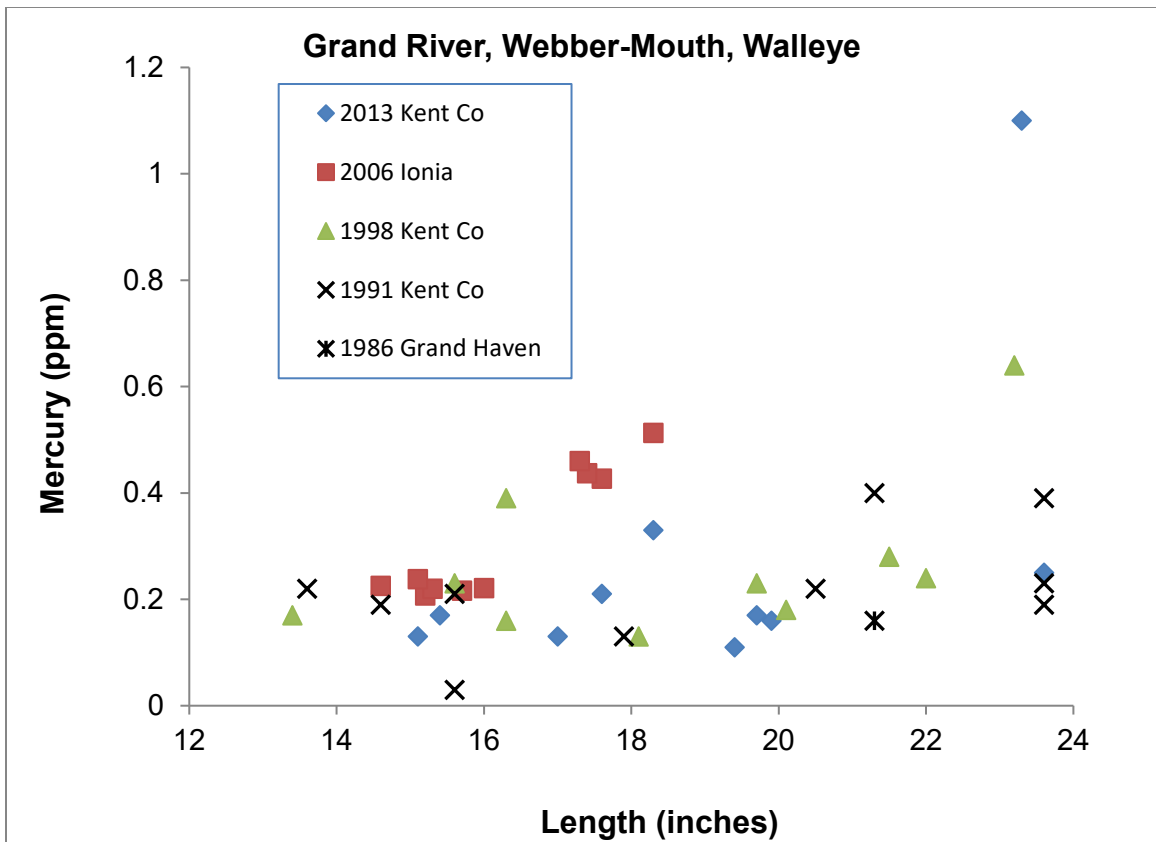
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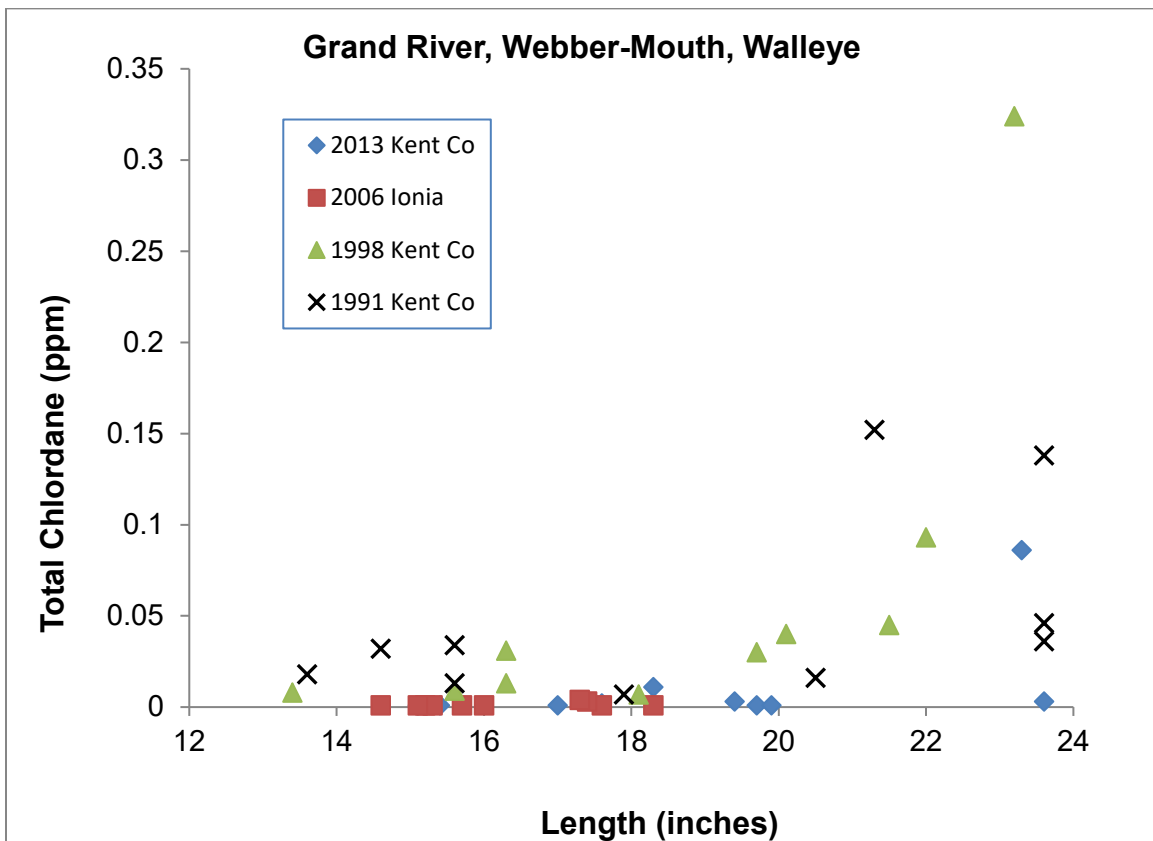
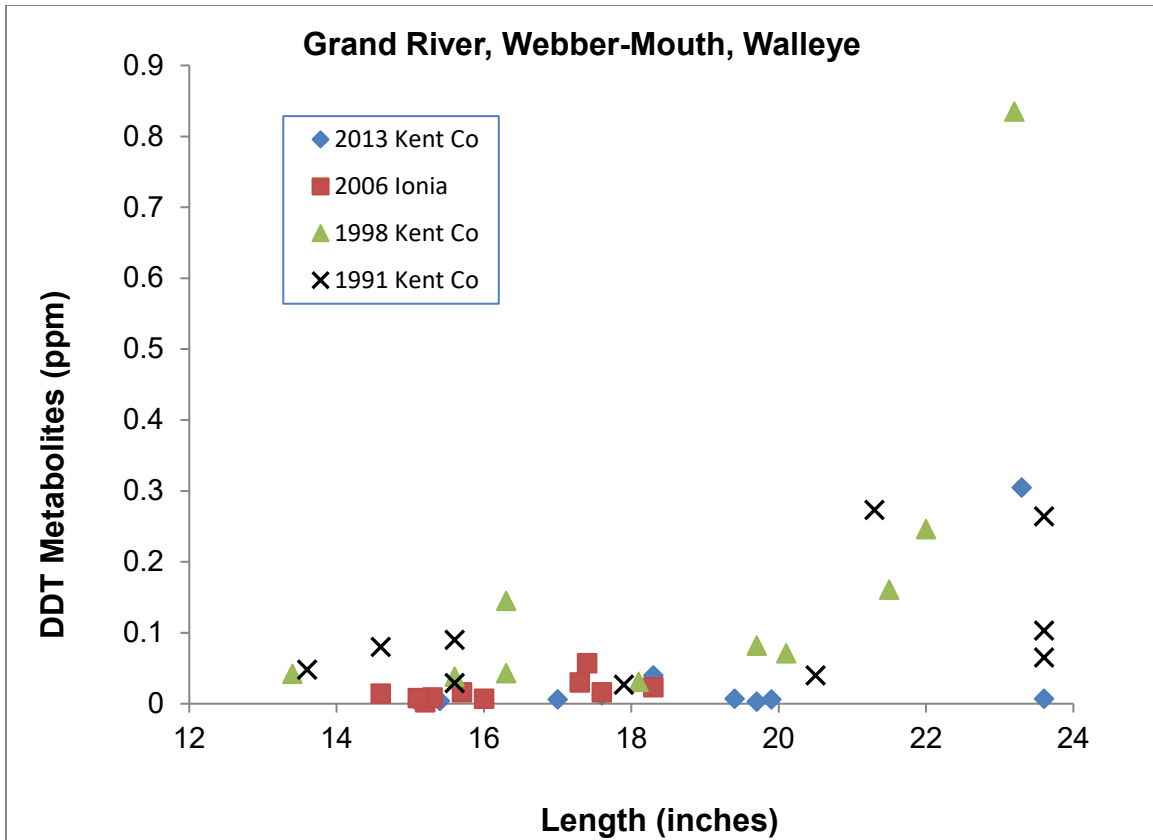
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1998	2013	30	13.4	15	14.6	23.6	
Datasets available: 1986, 1991, 1998, 2006, 2013							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	29	0.199		0.002	1.98	0.36	0.5
DDT	29	0.077		0.002	0.84	0.14	12
Chlordane	29	0.025		0.001	0.32	0.05	--
Toxaphene	29	ND		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.332	0.240					
DDT	0.306	0.244					
Chlordane	0.300	0.355					
Toxaphene	--	--					
Final meal category based on UCL:							0.5

Existing Advisory: Sensitive populations should not eat these fish. Healthy adults should limit consumption of walleye from the Grand River downstream of the Webber Dam to no more than 1 or 2 meals per year due to PCBs.

Recommendation: No one should eat more than 6 meals per year of walleye from the Grand River downstream of the Webber Dam.

Note: exclusion of 1998 data, which pre-dates the most recent results by 15 years, leads to a 1 meal per month recommendation.





Gratiot County

**Bluegill and
Pumpkinseed
Hg Analysis:**

Rainbow Lake

Gratiot County

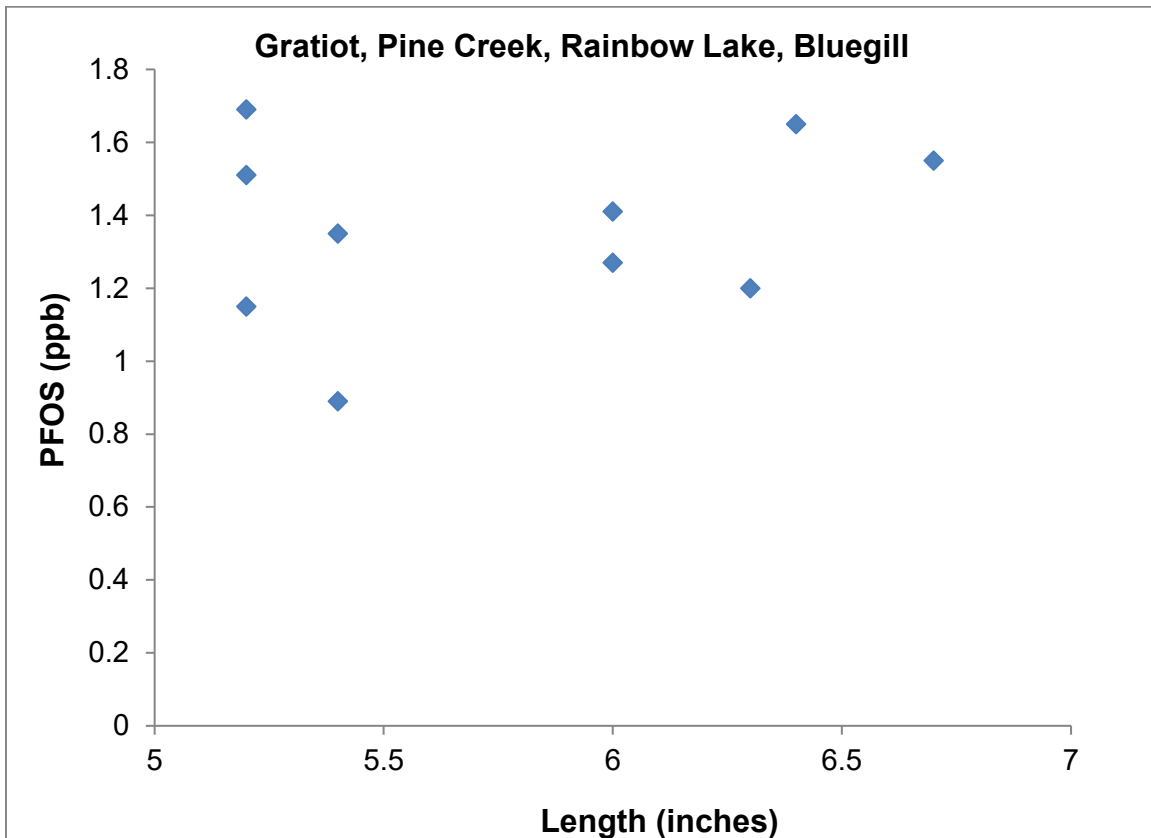
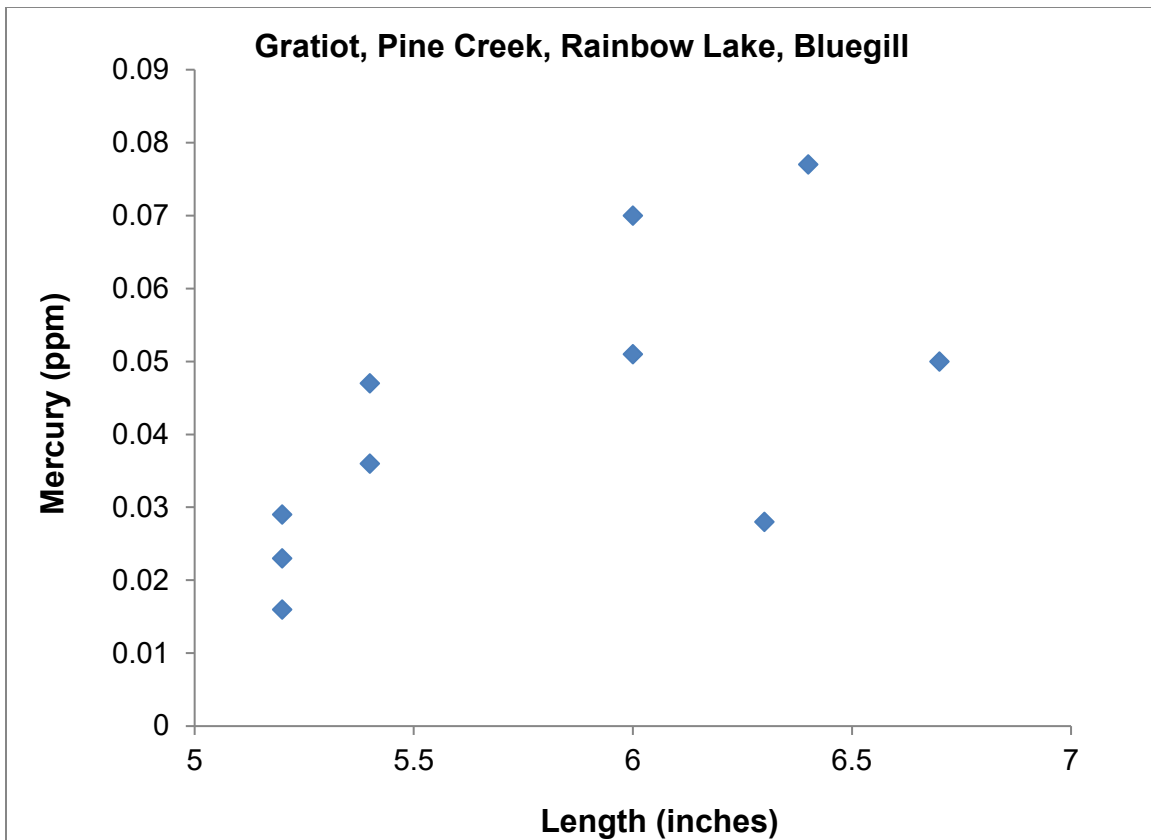
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2019	2019	10	5.2	na	5.2	6.7
Datasets available: 2019						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
Mercury	10	0.04		0.02	0.08	0.06
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
Mercury	0.391	0.403				16

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	5.2	na	5.2	6.7
Datasets available: 2019						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
PCB	0	--		--	--	--
DDT	0	--		--	--	--
Chlordane	0	--		--	--	--
Toxaphene	0	--		--	--	--
PFOS	10	1 ppb		0.9 ppb	1.7ppb	1.5 ppb
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.052	0.060				
Final meal category based on UCL:						16

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

Recommendation: No one should eat more than 16 meals per month of Rainbow Lake bluegill or pumpkinseed sunfish of any size due to mercury.



Hillsdale County

Bluegill

Bird Lake

Hillsdale County

Hg Analysis:

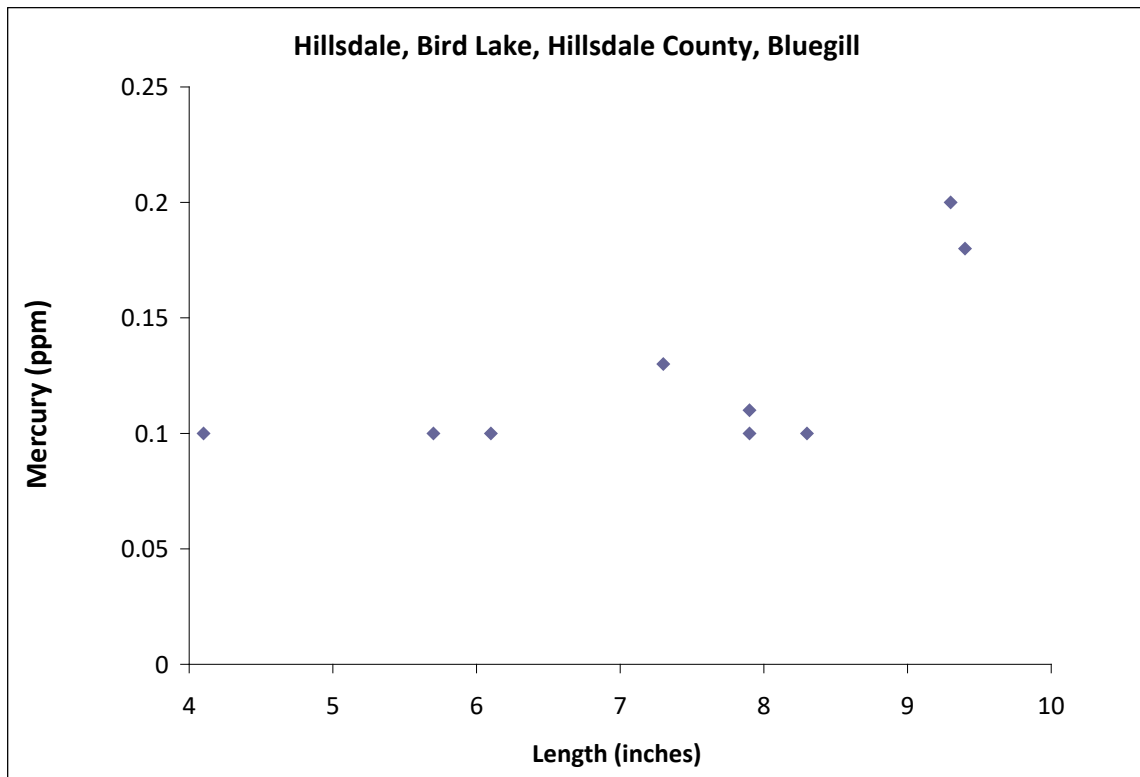
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	1987	9	4.1	na	4.1	9.4
Datasets available: 1987						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
Mercury	9	0.12		0.10	0.20	0.15
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
Mercury	0.459	0.467				4

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)
PCB	0	NA		--	--	--
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:						4

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

Recommendation: No one should eat more than 4 meals per month of Bird Lake bluegill and sunfish of any size due to mercury.



Northern Pike

Bird Lake

Hillsdale 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	33.7	24	33.7	33.7	
Datasets available: 1987							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	1	0.200		--	--	--	--
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	
--	--	0	--	--	--	--	
Datasets available:		--					
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	--		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
Final meal category based on UCL:							--

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

Recommendation: There are insufficient data available to develop specific advice for Bird Lake northern pike. The statewide consumption guidelines recommend that no one eat more than 1 meal per month of northern pike over 30 inches or more than 2 meals per month of northern pike under 30 inches in length.

Yellow Perch

Bird Lake

Hillsdale County

Hg Analysis:

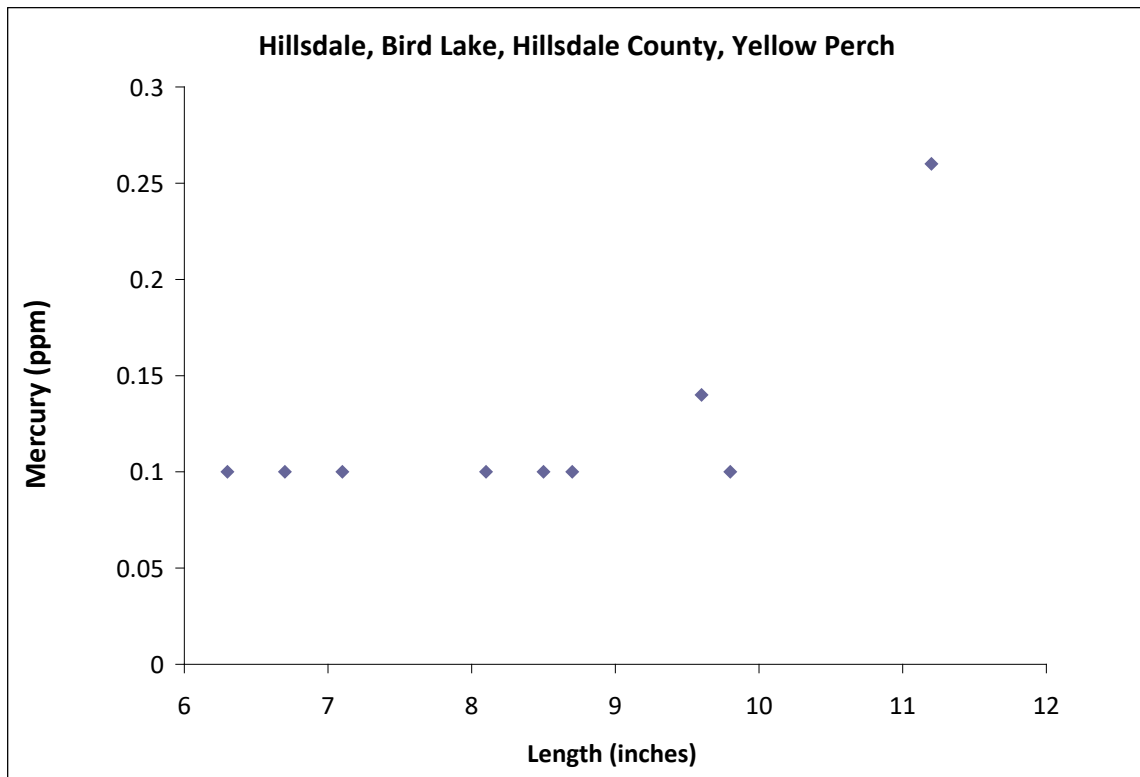
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	1987	9	6.3	NA	6.3	11.2
Datasets available: 1987						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
Mercury	9	0.12		0.10	0.26	0.16
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
Mercury	0.511	0.532				4

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)
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:						4

Existing Advisory: Bird Lake yellow perch are covered under the statewide mercury consumption advisory.

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



Channel Catfish**Lake Diane****Hillsdale County****Hg Analysis:**

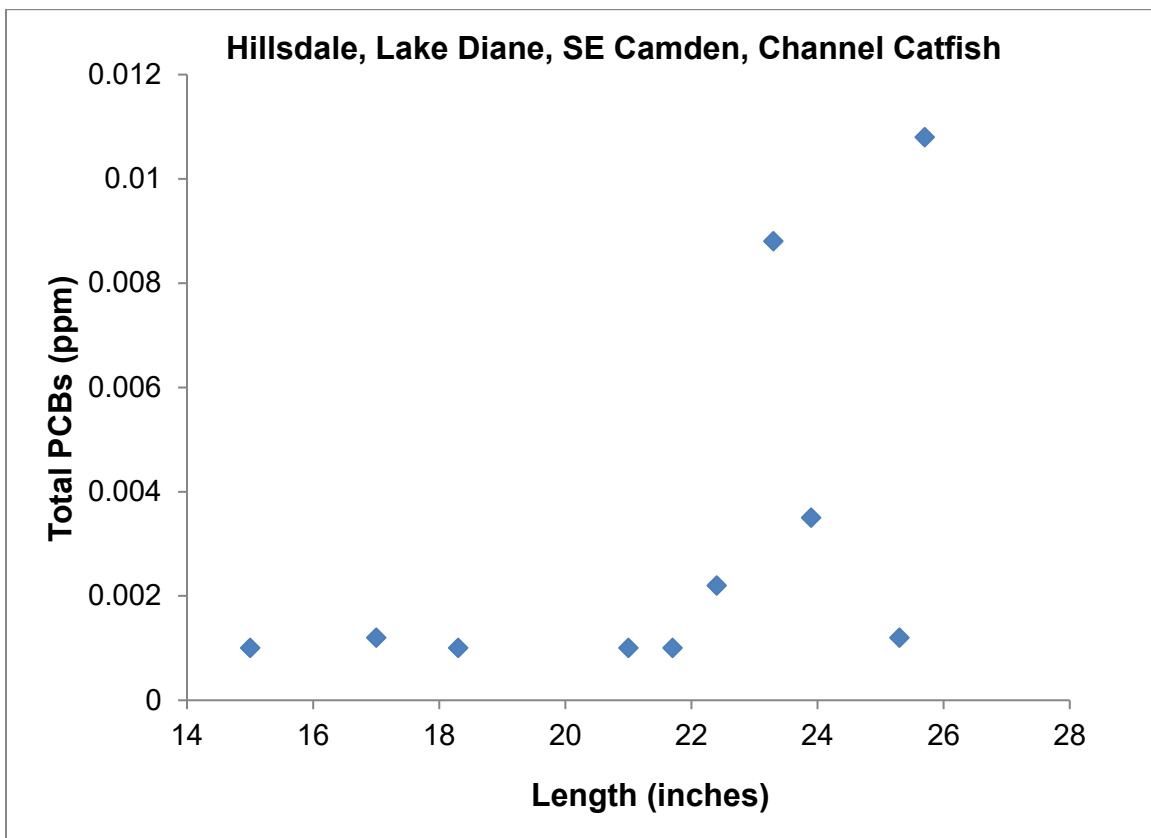
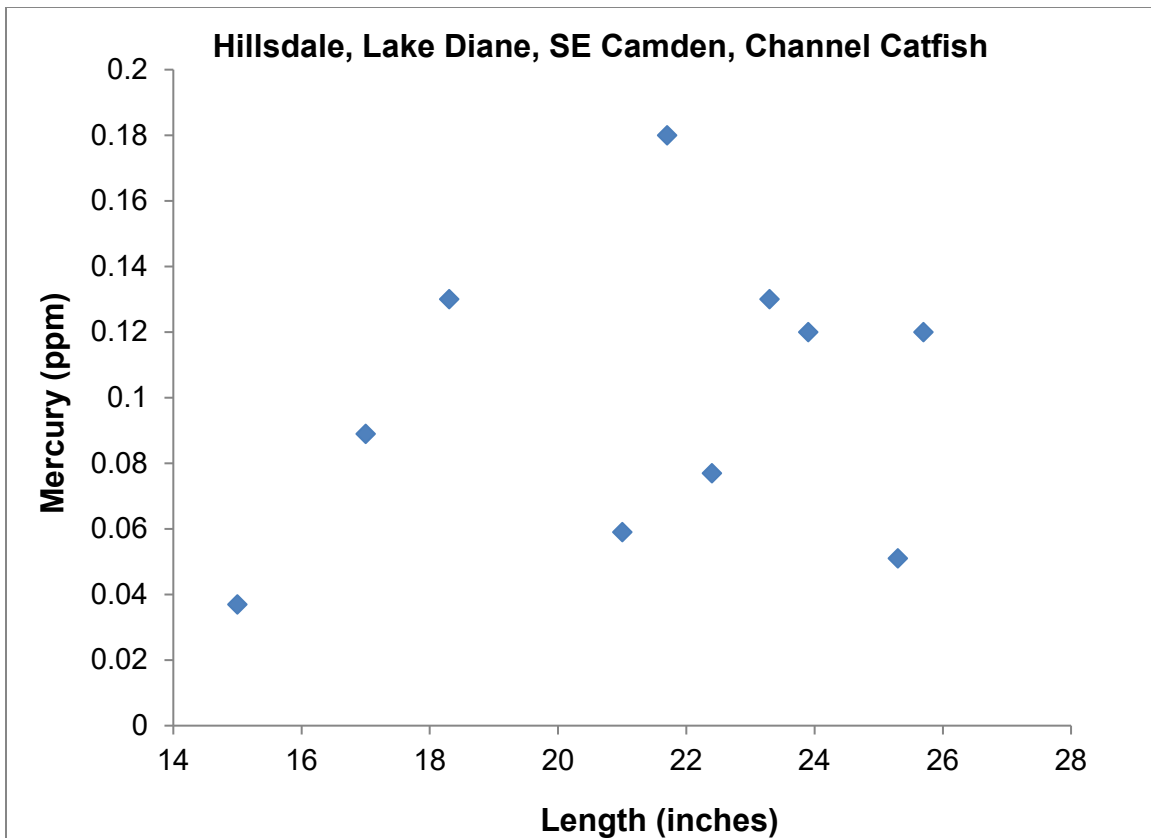
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2016	2016	10	15	12	15	25.7	
Datasets available:		2016					
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.10		0.04	0.18	0.13	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.070	0.108					

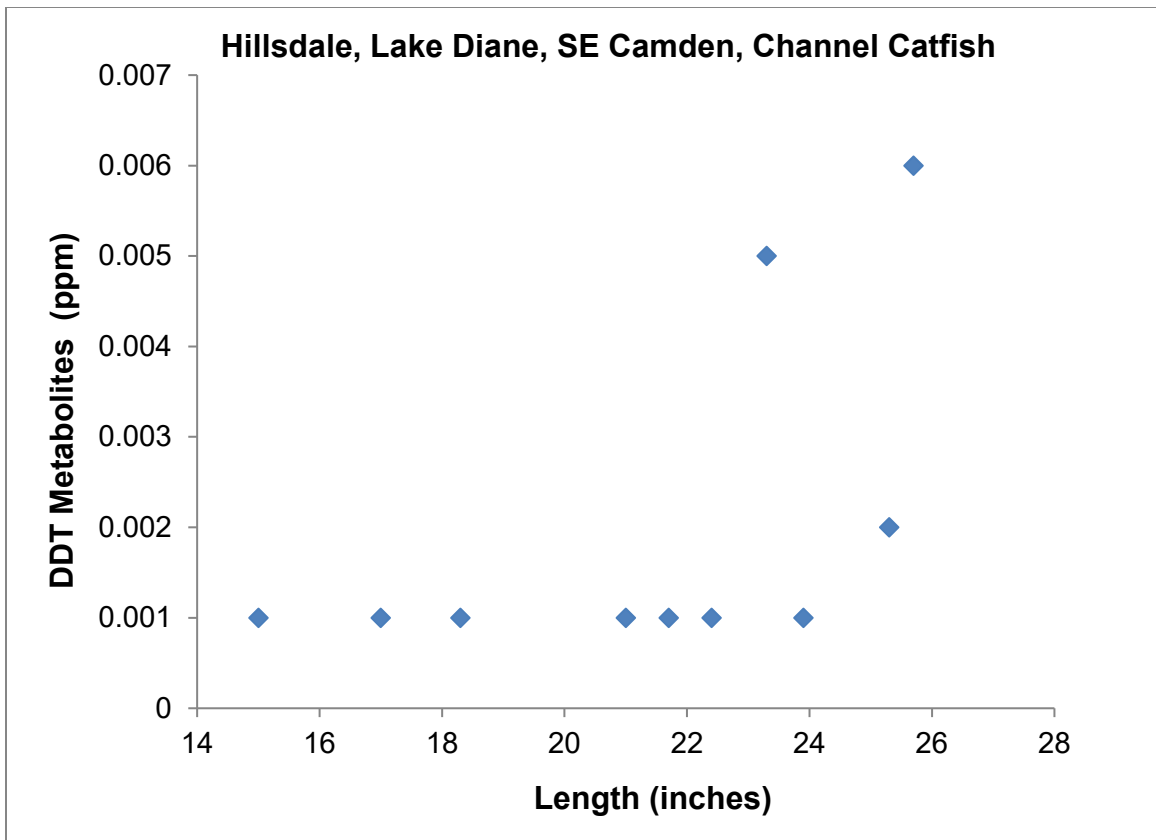
Organics Analysis:

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	15	12	15	25.7	
Datasets available: 2016							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.003		< 0.001	0.01	0.006	16
DDT	10	0.002		< 0.001	0.006	0.003	16
Chlordane	10	ND		< 0.001	< 0.001	--	--
Toxaphene	10	ND		< 0.05	< 0.05	--	--
PFOS	0	--		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.315	0.381					
DDT	0.304	0.352					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	--	--					
Final meal category based on UCL:							4

Existing MDHHS Advisory: Catfish are covered by a statewide advisory due to PCBs and mercury: No one should eat more than 4 meals per month of catfish of any size.

Recommendation: No one should eat more than 4 meals per month of channel catfish of any size from Lake Diane due to mercury.





Largemouth Bass

Lake LeAnn

Hillsdale 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	9.0	14	9.0	11.4
Datasets available: 2019						
Chemical	Sample Size (All*)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
Mercury	10	0.245		0.130	0.390	0.301
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
Mercury	0.085	0.020				2

* Only sub-legal fish were collected.

Organics Analysis:

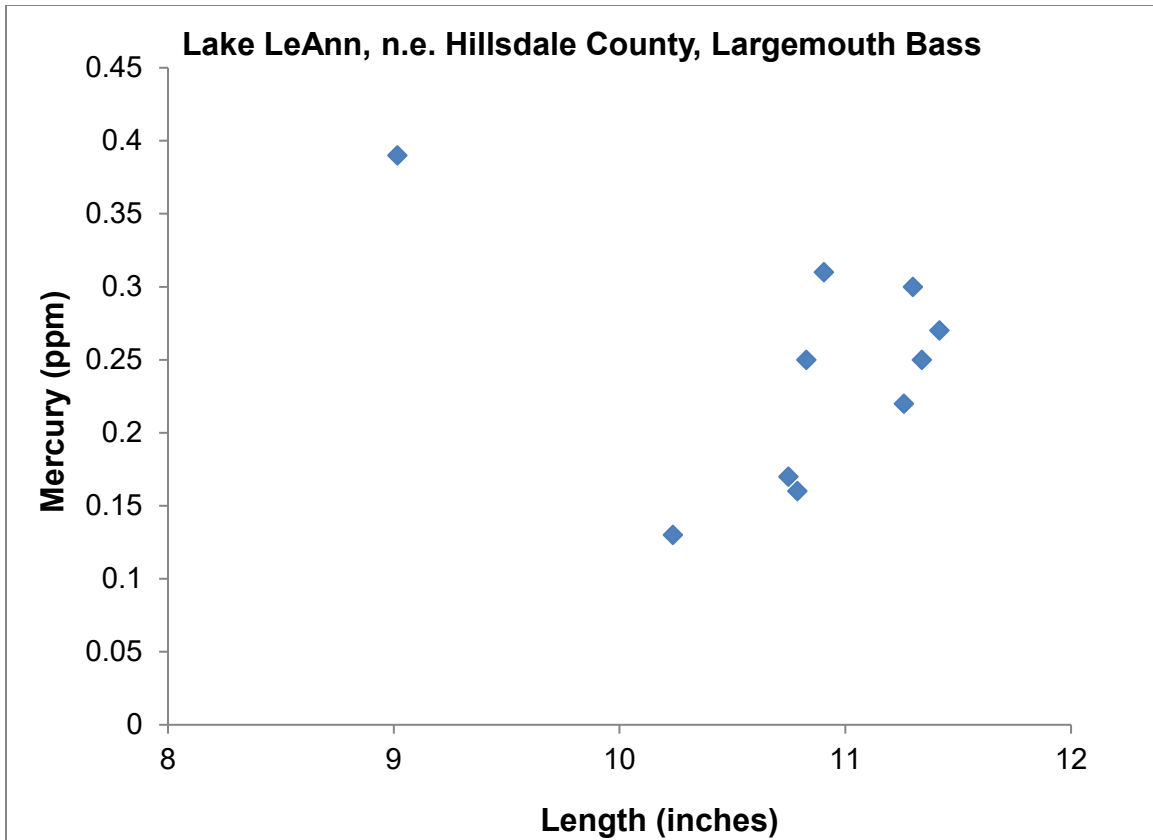
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent					
Datasets available:						
Chemical	Sample Size (All*)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
PCB	0	--		--	--	--
DDT	0	--		--	--	--
Chlordane	0	--		--	--	--
Toxaphene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

* Only sub-legal fish were collected.

** All samples exhibited laboratory reported interference for PFOS; therefore, PFOS concentrations were unable to be determined.

Existing MDHHS Advisory: Largemouth bass from Lake LeAnn in Hillsdale County are covered under the statewide mercury guidance. No one should eat more than 2 meals per month of largemouth bass smaller than 18 inches in length or no more than 1 meal per month of fish larger than 18 inches in length from Lake LeAnn in Hillsdale County due to mercury.

Recommendation: Insufficient data available to complete an assessment; therefore, the statewide advisory should remain in effect for fish from Lake LeAnn in Hillsdale County.



Ingham County

Black Crappie

Fidelity Lake

Ingham 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	2020	10	5.8	NA	5.8	12.9	
Datasets available: 2010*, 2020							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.153		0.075	0.570	0.260	4
Chemical	Linear Regression	Exponential Regression					
	R²	R²					
Mercury	0.783^	0.722^					

*The 2010 dataset contained one sample.

[^] Regression driven by one individual; therefore, regression was not used to set a length break.

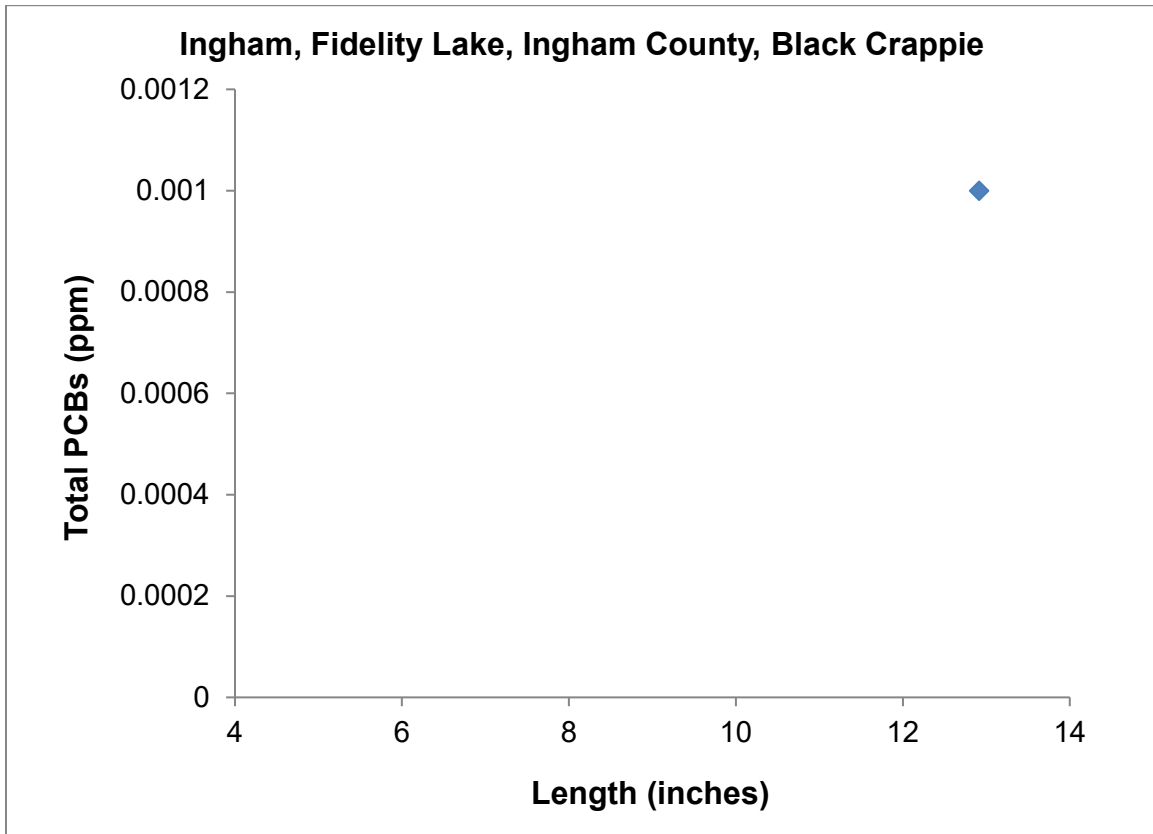
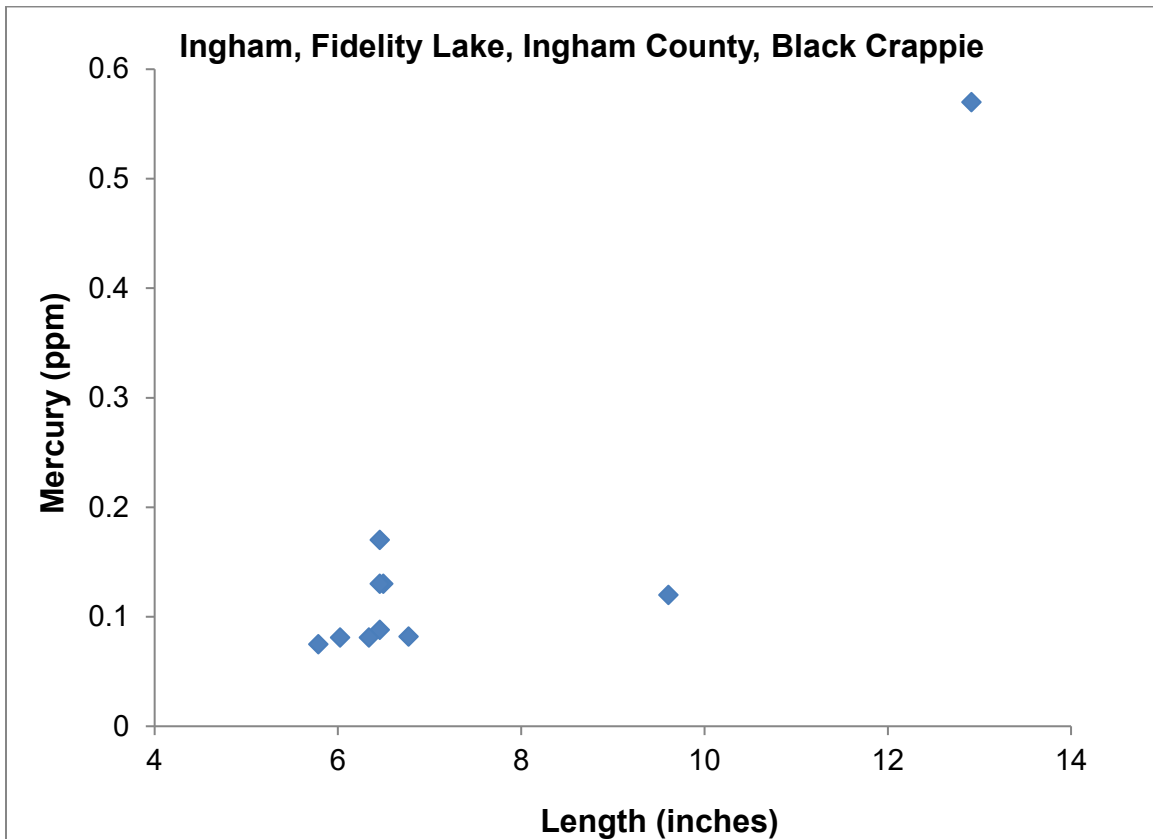
Organics Analysis:

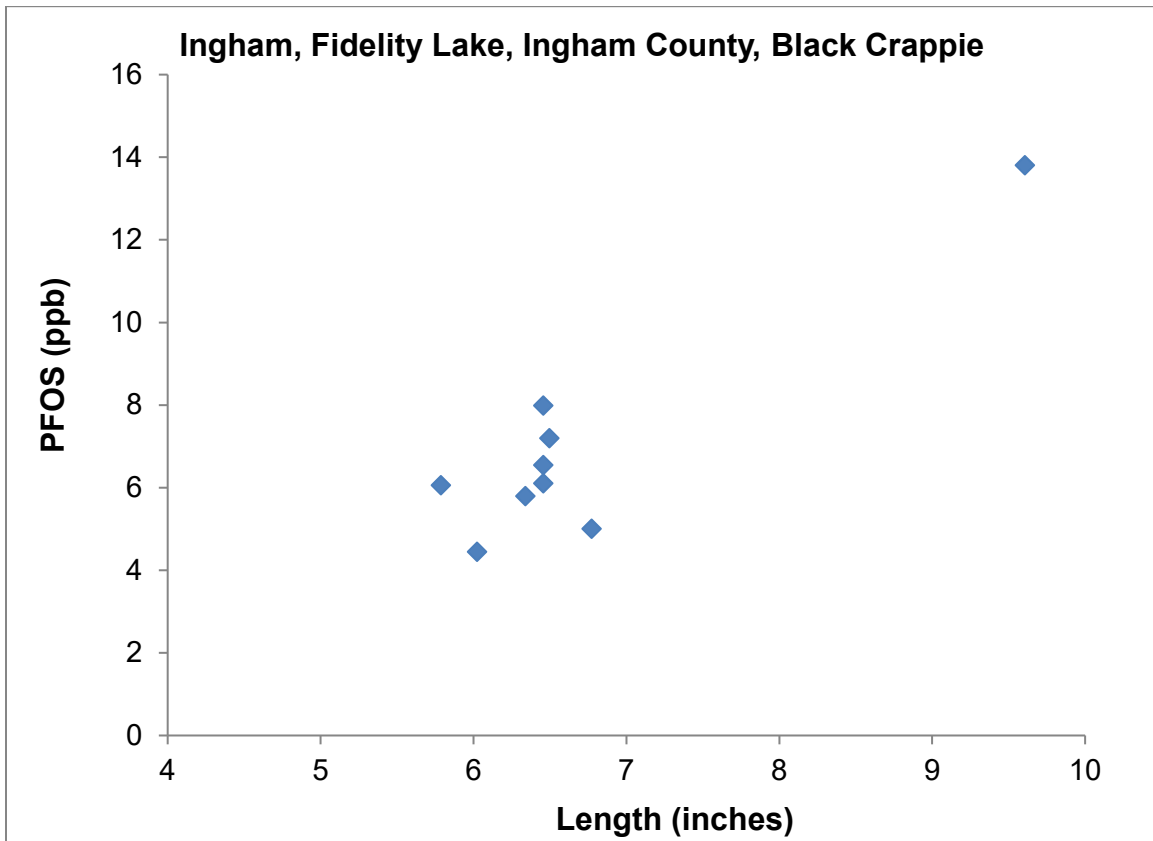
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2020	2020	9	5.8	NA	5.8	9.6	
Datasets available: 2010, 2020							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	1	0.001		<0.001	0.001	--	--
DDT	1	ND		--	--	--	--
Chlordane	1	ND		--	--	--	--
Toxaphene	1	ND		--	--	--	--
PFOS	9	7.0 (ppb)		4.5 (ppb)	13.8 (ppb)	9.1 (ppb)	12
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	0.835^	0.713^					
Final meal category based on UCL:							8

[^] Regression driven by one individual; therefore, regression was not used to set a length break.

Existing MDHHS Advisory: Black and white crappie from Fidelity Lake in Ingham County are currently covered under the statewide mercury guidance. No one should eat more than 4 meals per month of black or white of any size due to mercury.

Recommendation: No one should eat more than 4 meals per month of black or white crappie of any size from Fidelity Lake in Ingham County due to mercury. PFOS causes a less restrictive guideline.





Bluegill**Fidelity Lake****Ingham County****Hg Analysis:**

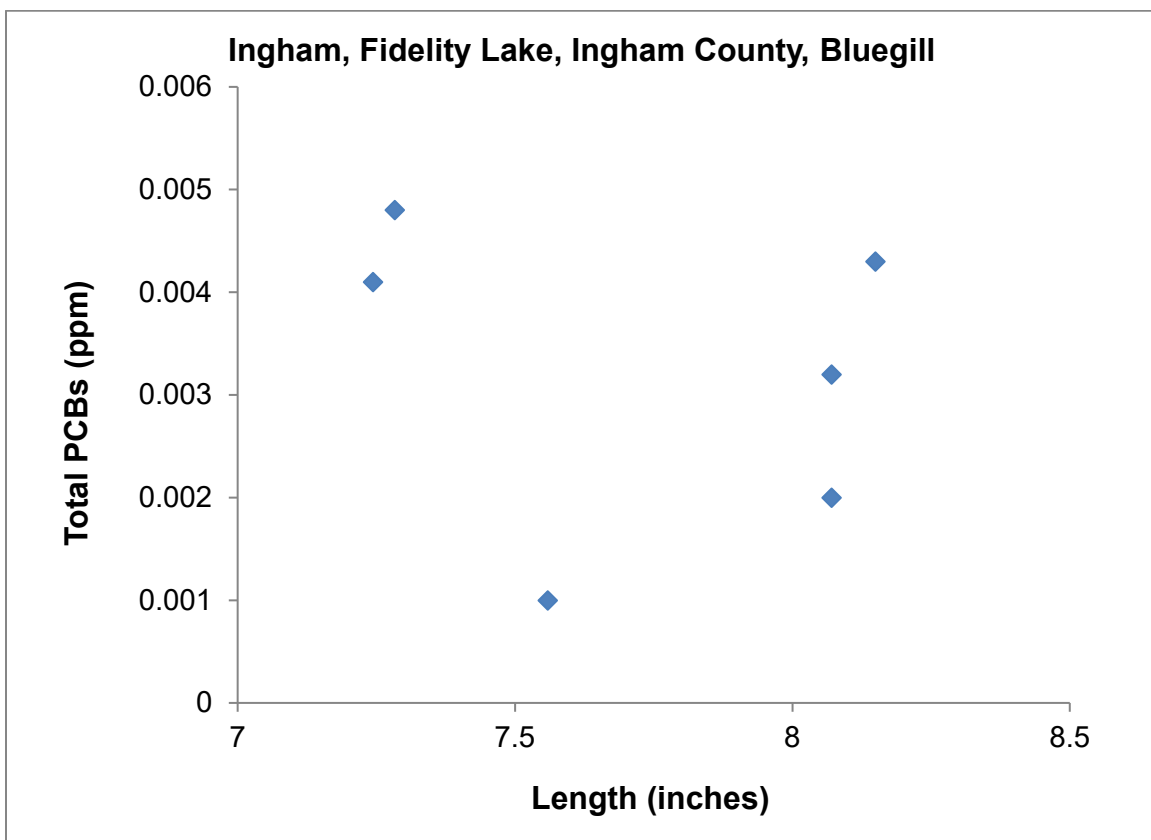
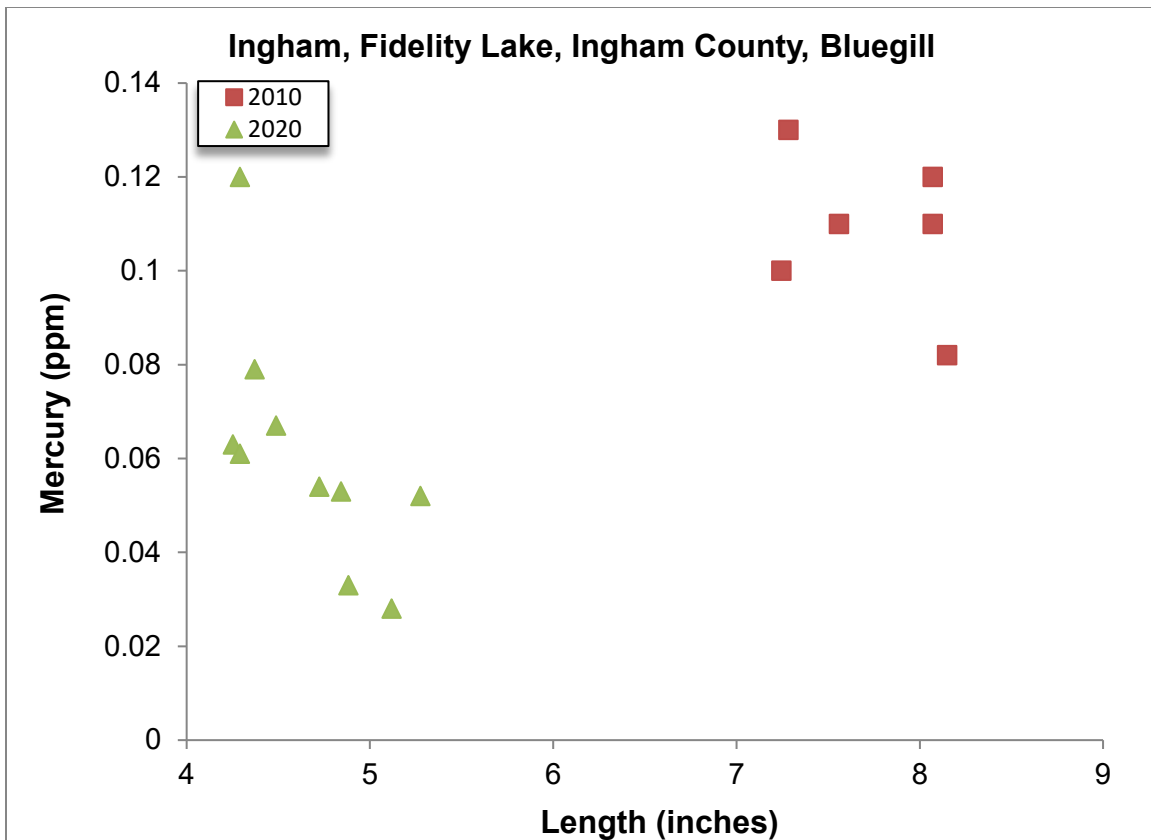
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2010	2020	16	4.3	NA	4.3	8.1	
Datasets available: 2010, 2020							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	16	0.079		0.028	0.130	0.096	8
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.388	0.331					

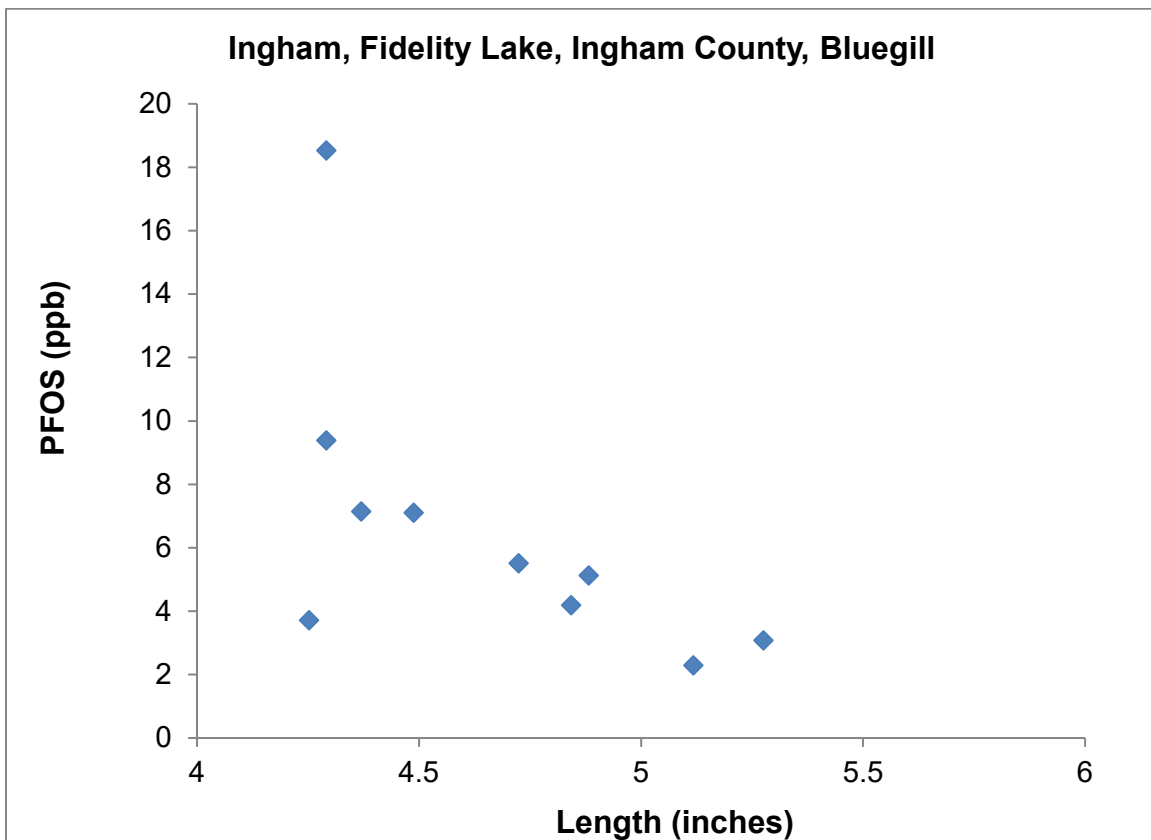
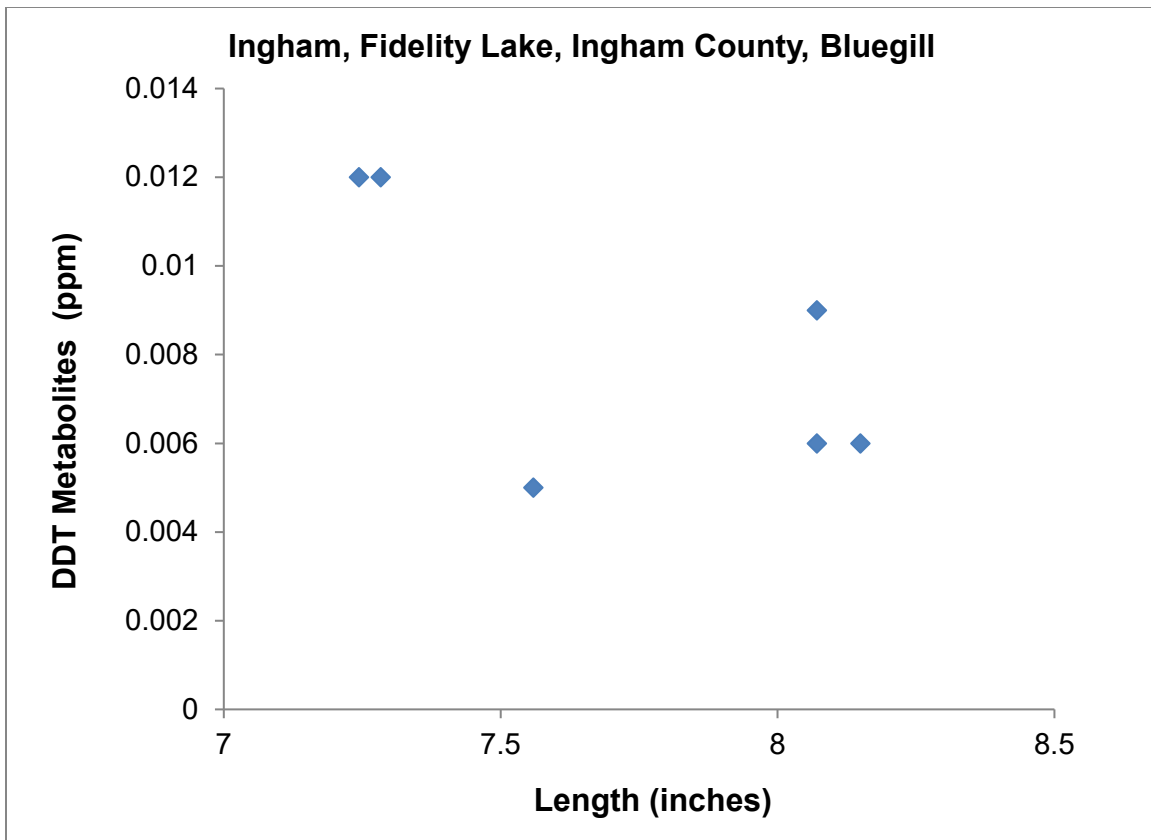
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2010	2020	16	4.3	NA	4.3	8.1	
Datasets available: 2010 (No PFOS); 2020 (Only PFOS)							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	6	0.003		<0.001	0.005	0.005	16
DDT	6	0.008		0.005	0.012	0.012	16
Chlordane	6	ND		--	--	--	16
Toxaphene	6	ND		--	--	--	--
PFOS	10	6.6 ppb		2.3 ppb	18.5 ppb	10.0 ppb	12
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.055	0.012					
DDT	0.449	0.358					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	0.367	0.514					
Final meal category based on UCL:							8

Existing MDHHS Advisory: No one should eat more than 8 meals per month of bluegill or sunfish from Fidelity Lake in Ingham County of any size due to mercury.

Recommendation: No change to the advisory is recommended. PFOS should be added as a contaminant causing less restrictive guidance.





Largemouth Bass

Fidelity Lake

Ingham County

Hg Analysis:

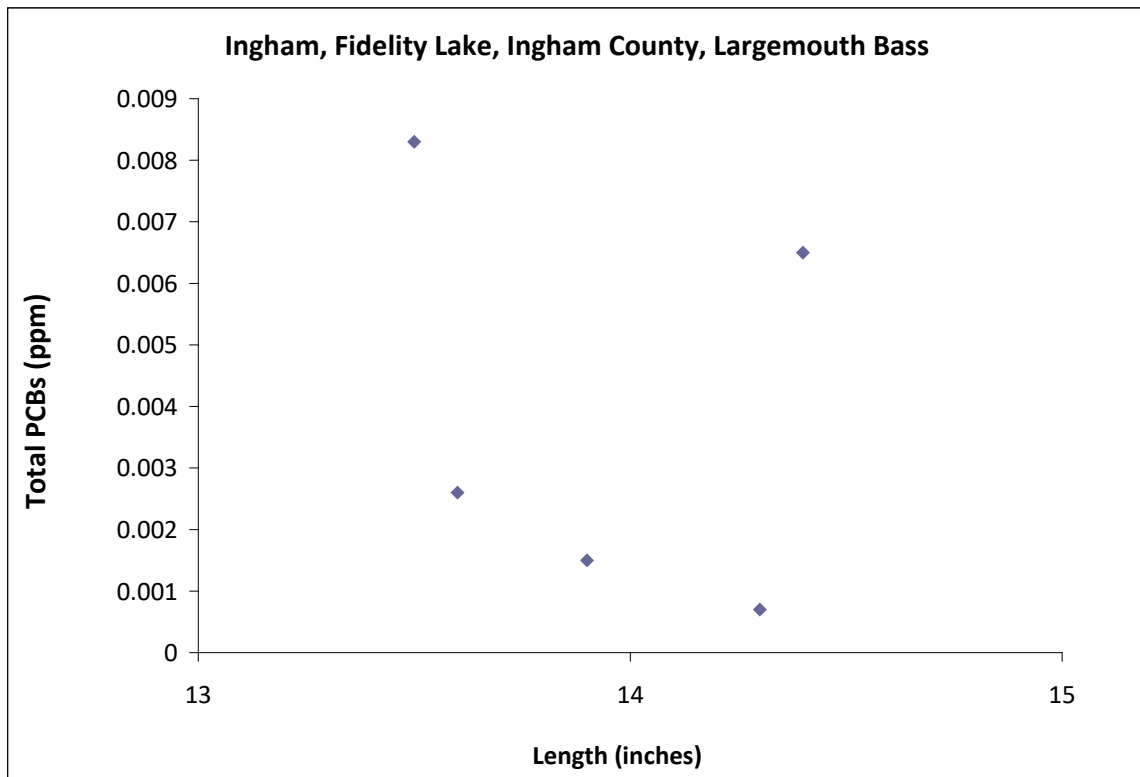
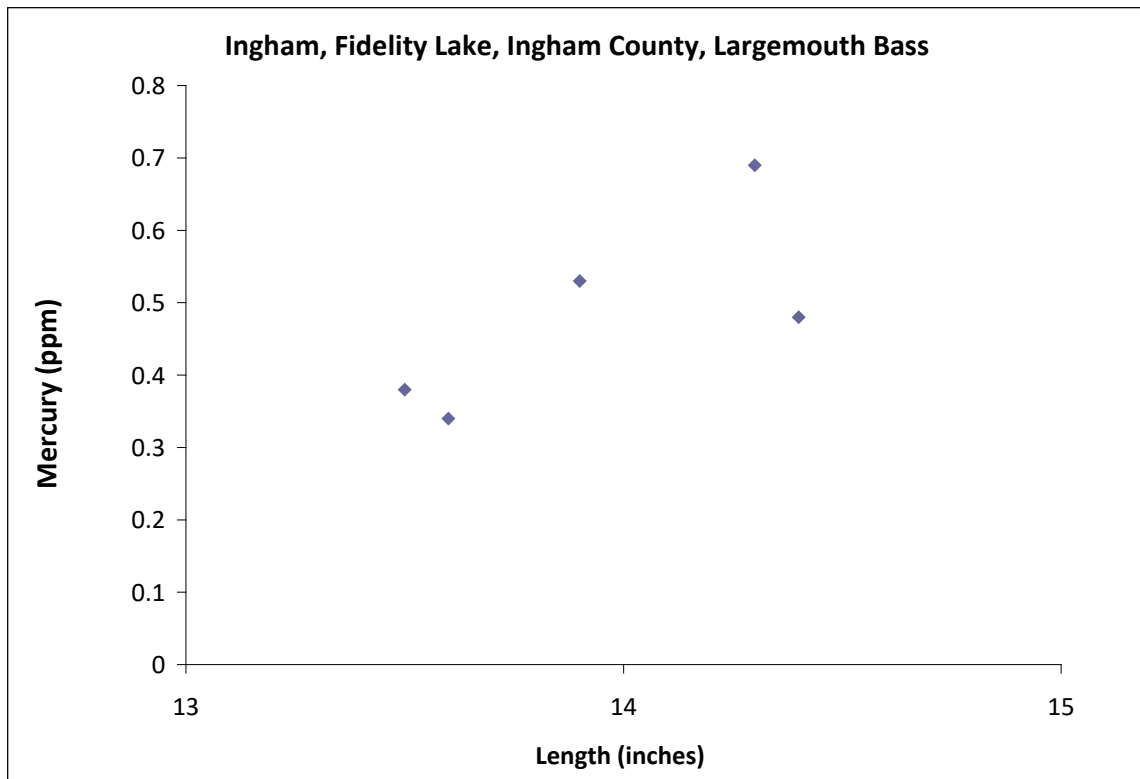
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2010	2010	5	13.5	14	13.5	14.4	
Datasets available: 2010							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	5	0.48		0.34	0.69	0.66	1
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.550	0.590					

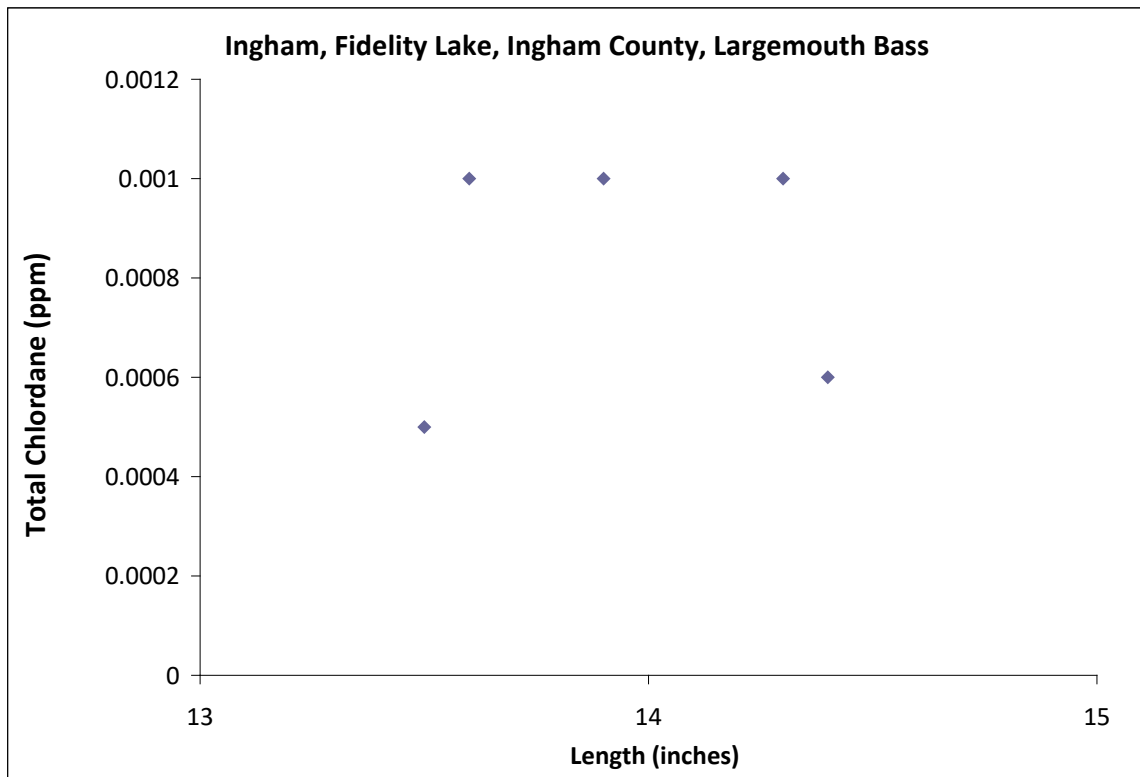
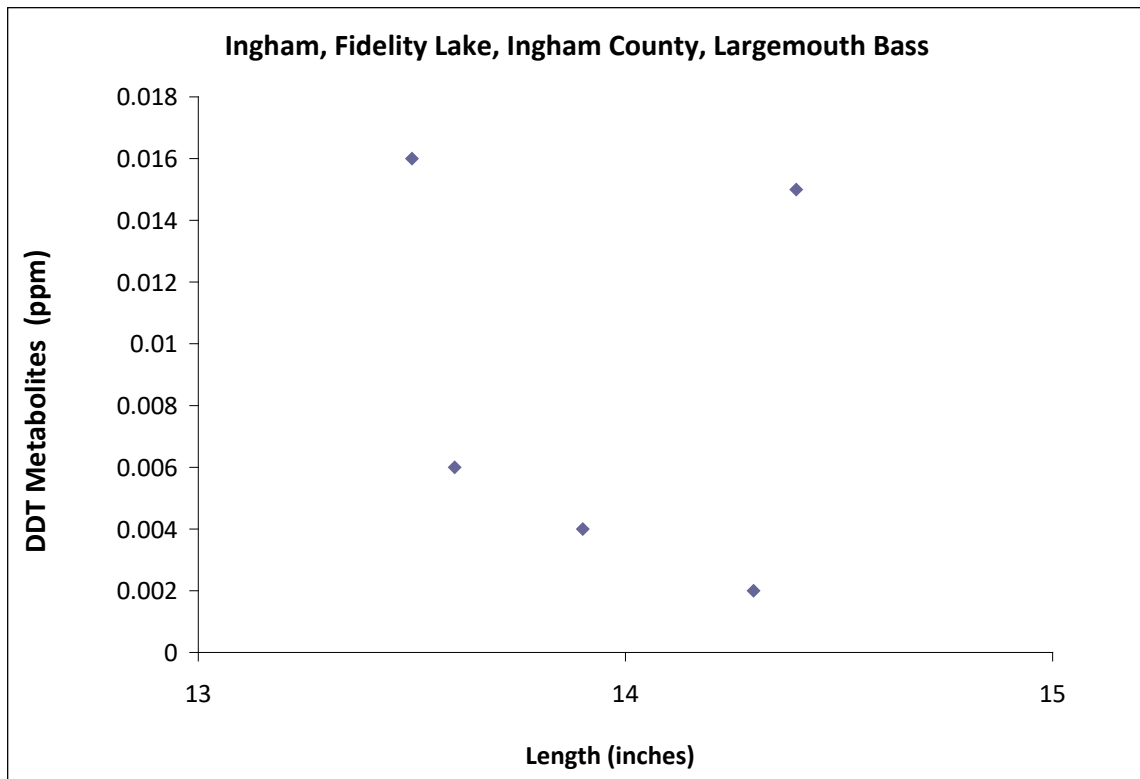
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2010	2010	5	13.5	14	13.5	14.4	
Datasets available: 2010							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	5	0.004		0.002	0.008	0.01	16
DDT	5	0.009		0.002	0.016	0.02	16
Chlordane	5	0.001		0.001	0.001	0.001	--
Toxaphene	5	ND		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.064	0.106					
DDT	0.024	0.074					
Chlordane	0.008	0.017					
Toxaphene	--	--					
Final meal category based on UCL:							1

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

Recommendation: No one should eat more than 1 meal per month of largemouth or smallmouth bass less than 18 inches or more than 6 meals per year of these fish greater than 18 inches. Statewide length break applied.





Bluegill

Jones Lake

Ingham County

Hg Analysis:

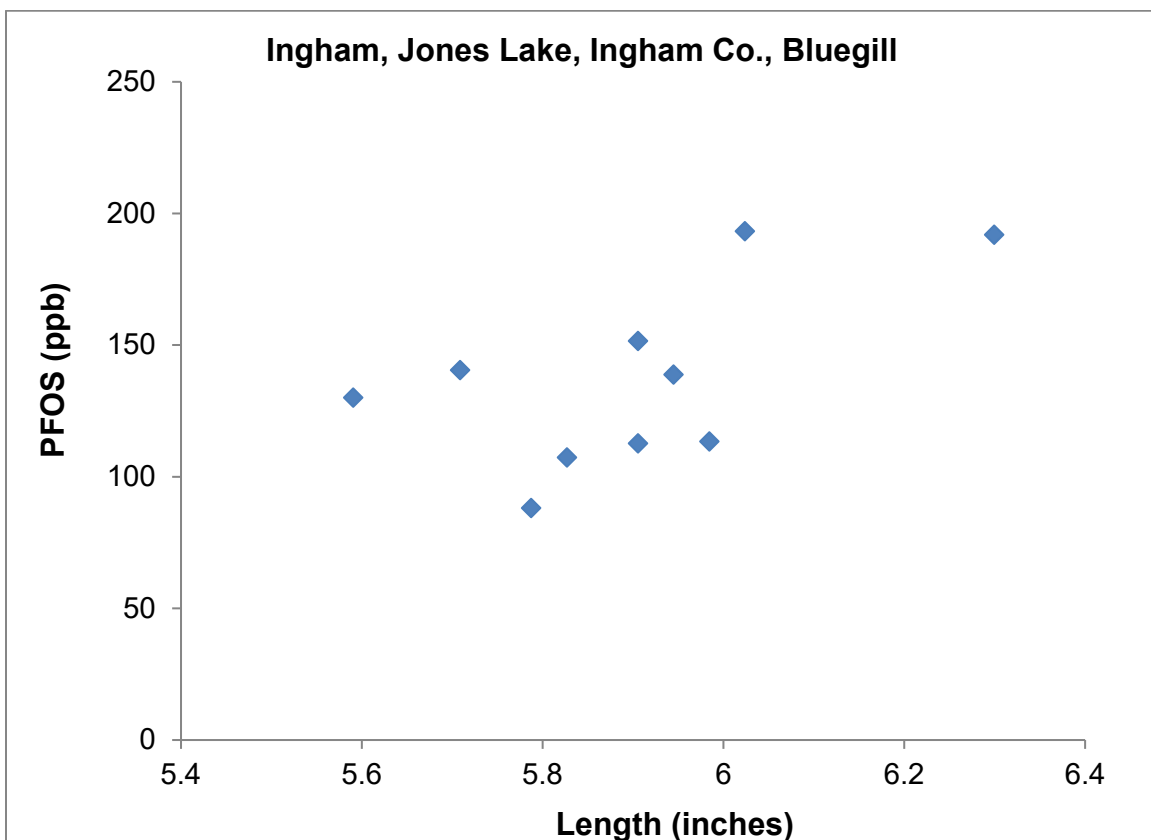
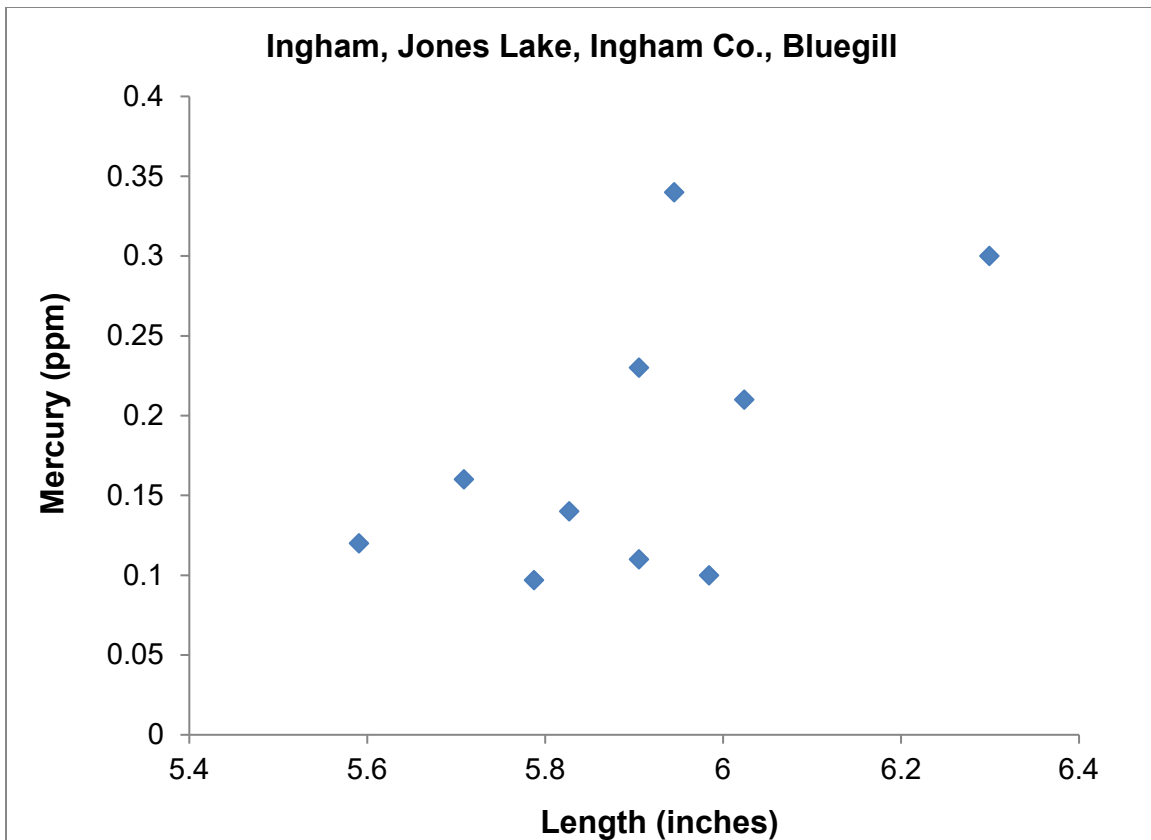
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2021	2021	10	5.6	NA	5.6	6.3	
Datasets available:		2021					
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.181		0.097	0.340	0.243	4
Chemical	Linear Regression	Exponential Regression					
	R²	R²					
Mercury	0.334	0.301					

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	5.6	NA	5.6	6.3	
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	136.8 ppb		88.1 ppb	193.3 ppb	161.7 ppb	0.5
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	0.358	0.304		Final meal category based on UCL:			0.5

Existing MDHHS Advisory: Bluegill and sunfish from Jones Lake in Ingham County are currently covered under the statewide advisory for mercury. No one should eat more than 8 meals per month of these species of any size.

Recommendation: No one should eat more than 6 meals per year of bluegill or sunfish from Jones Lake in Ingham County due to PFOS. Mercury causes a less restrictive guideline.



Black Crappie

Lake Lansing

Ingham 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	8.1	NA	8.1	11.4	
Datasets available: 1989							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.24		0.17	0.53	0.32	2
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.904	0.907					

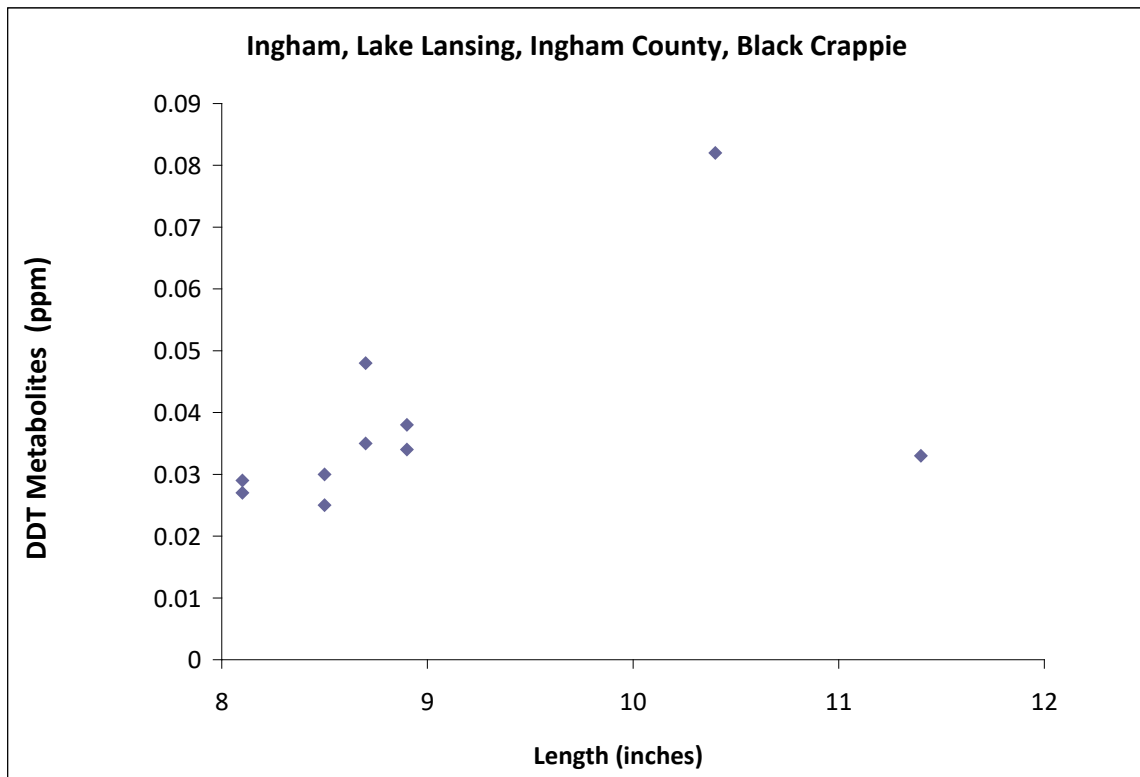
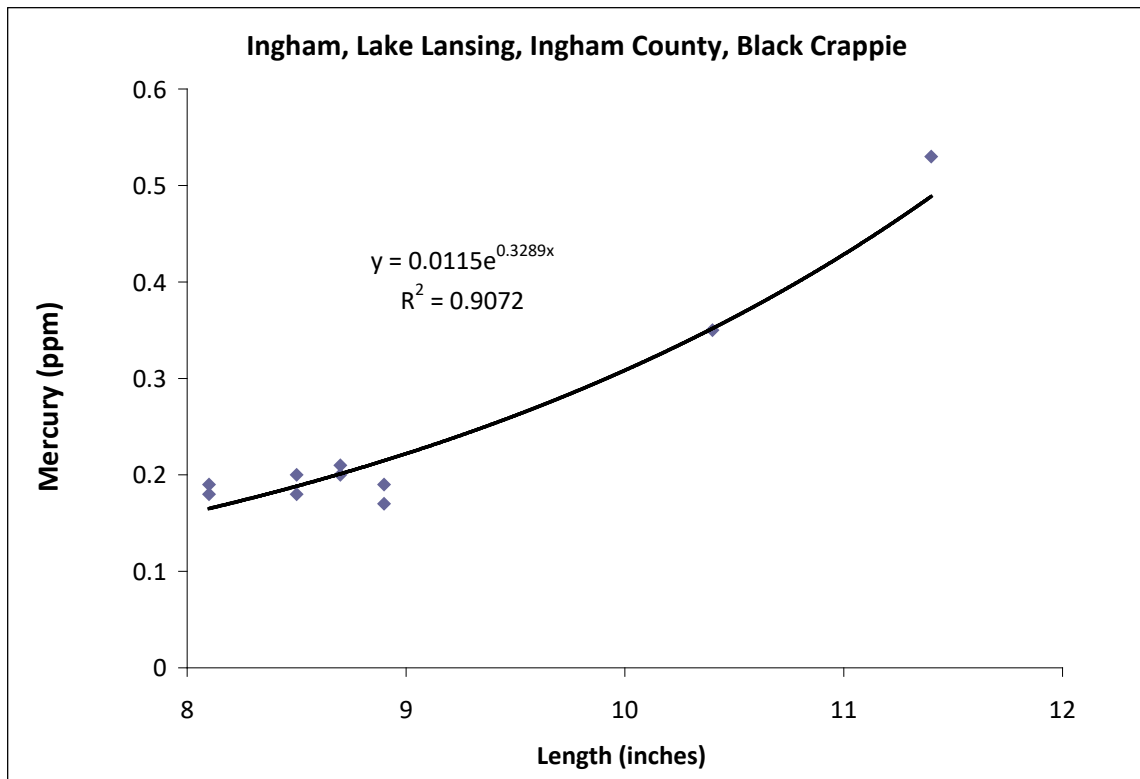
Organics Analysis:

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	8.1	NA	8.1	11.4	
Datasets available: 1989							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	ND		--	--	--	--
DDT	10	0.038		0.025	0.05	0.05	16
Chlordane	10	ND		--	--	--	--
Toxaphene	10	ND		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	0.231	0.237					
Chlordane	--	--					
Toxaphene	--	--					
Final meal category based on UCL:							2

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

Recommendation: No one should eat more than 2 meals per month of Lake Lansing crappie larger than 9 inches or more than 4 meals per month of crappie less than 9 inches due to mercury.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
6	0.083	12
7	0.115	8
8	0.160	4
9	0.222	4
10	0.308	2
11	0.428	2
12	0.595	1
13	0.827	1
14	1.149	0.5
Shaded area denotes extrapolated estimates		



Largemouth Bass

Lake Lansing

Ingham 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	2020	20	10.4	14.0	13.8	16.9	
Datasets available: 1989, 2020							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	9	0.332		0.210	0.710	0.450	2
Chemical	Linear Regression	Exponential Regression					
	R²	R²					
Mercury	0.337	0.359					

Organics Analysis:

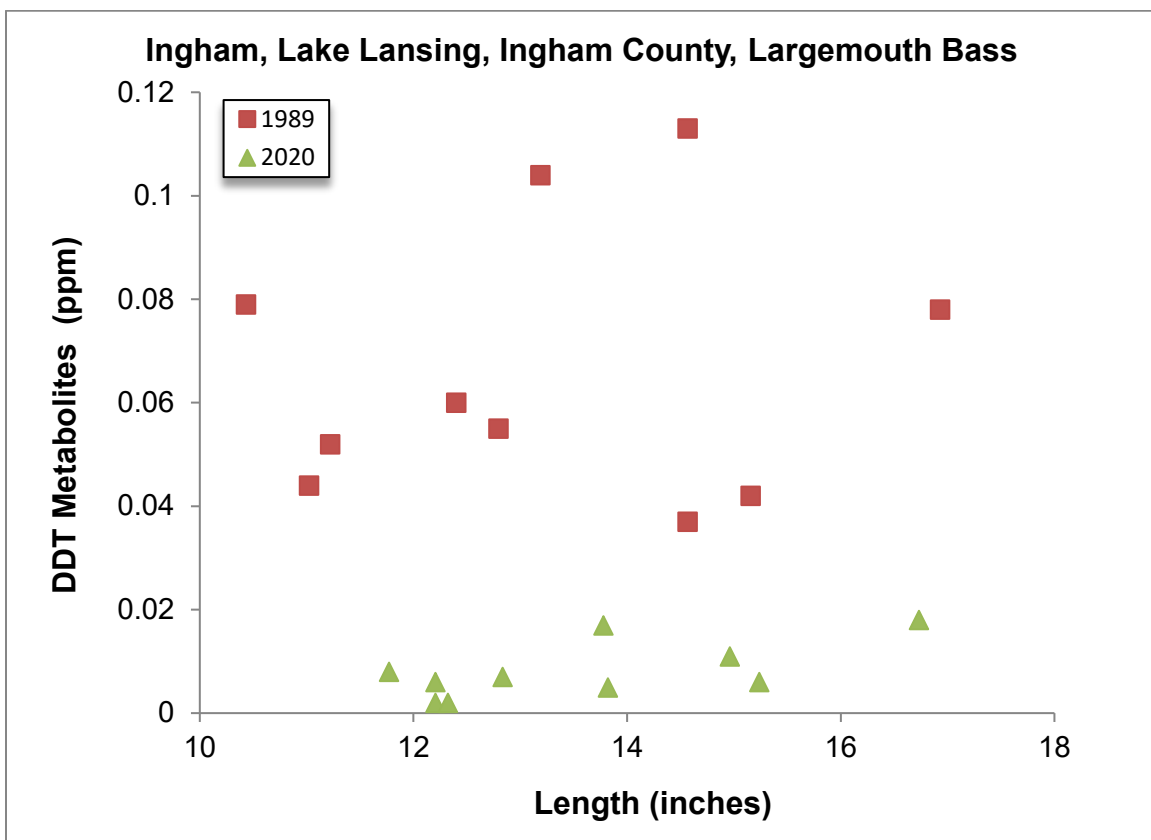
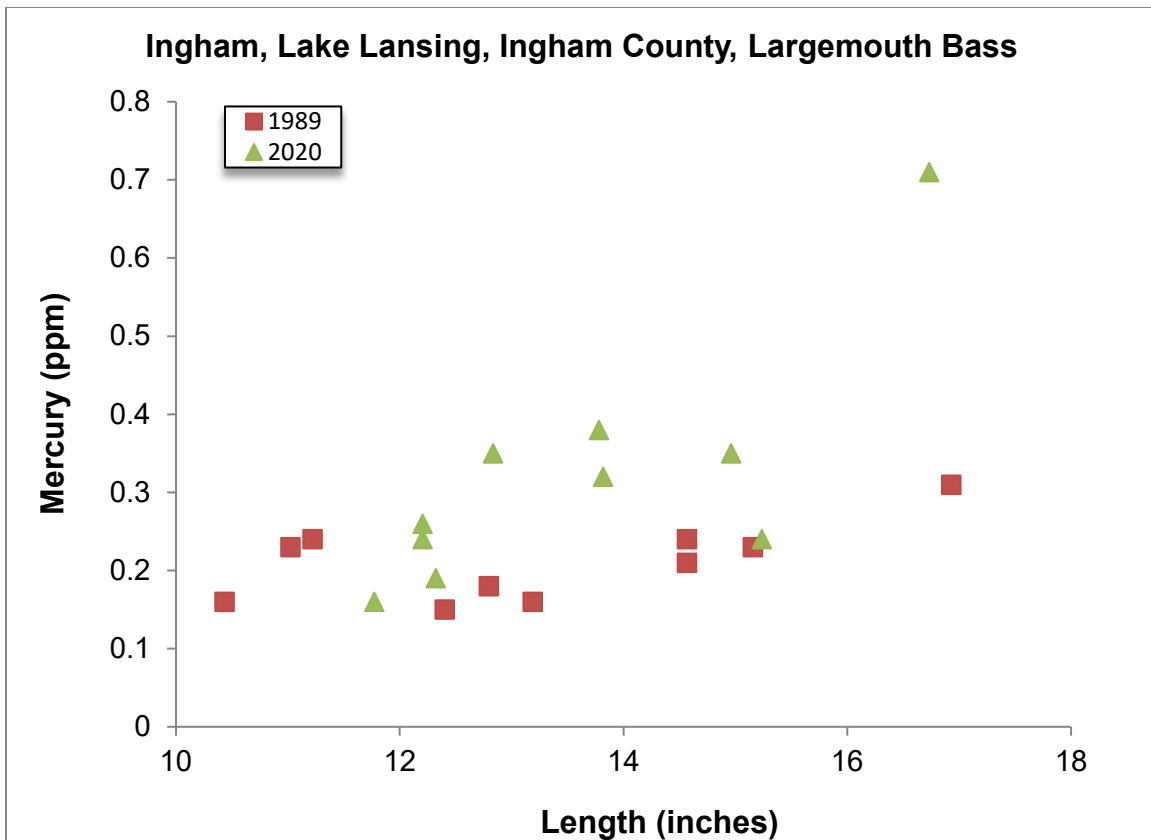
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2020	2020	10	11.8	14.0	13.8	16.9	
Datasets available: 1989 (No PFOS), 2020							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	5	0.001		<0.001	0.001^	0.001	16
DDT	5	0.011		0.005	0.018	0.019	16
Chlordane	5	ND		--	--	--	16
Toxaphene	5	ND		--	--	--	--
PFOS	10*	15.5 ppb		7.2 ppb	34.0 ppb	20.9 ppb	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.010	0.007					
DDT	0.000	0.006					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	0.005	0.001					
Final meal category based on UCL:							2

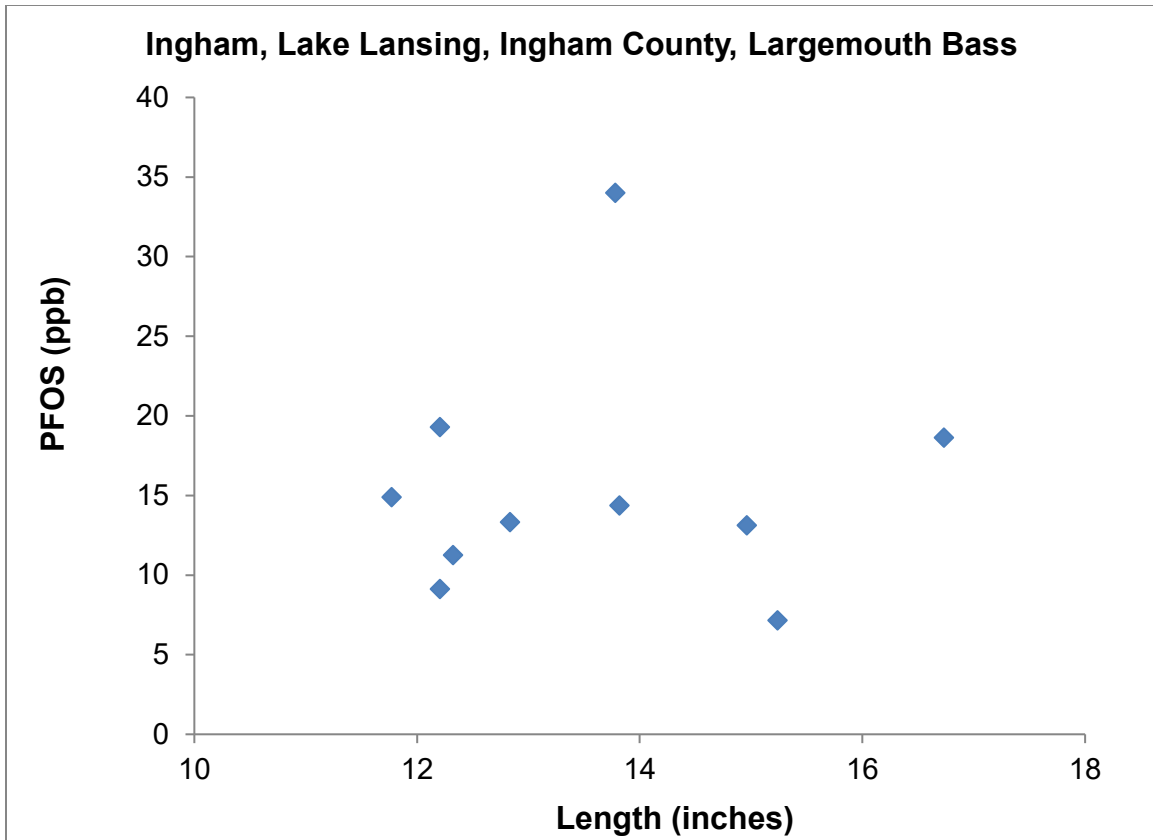
^ Only one sample had a detectable level of total PCBs at 0.0013 ppm.

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

Existing MDHHS Advisory: Largemouth and smallmouth bass from Lake Lansing in Ingham County are currently covered under the statewide mercury guidance. No one should eat more than 2 meals per month of largemouth or smallmouth bass smaller 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 2 meals per month of largemouth or smallmouth bass from Lake Lansing in Ingham County smaller than 18 inches or no more than 1 meal per month of these species from this water body larger than 18 inches due to mercury. Statewide length break applied as the size range and sample size of the dataset was limited. PFOS causes a less restrictive guideline.





Pumpkinseed

Lake Lansing

Ingham County

Hg Analysis:

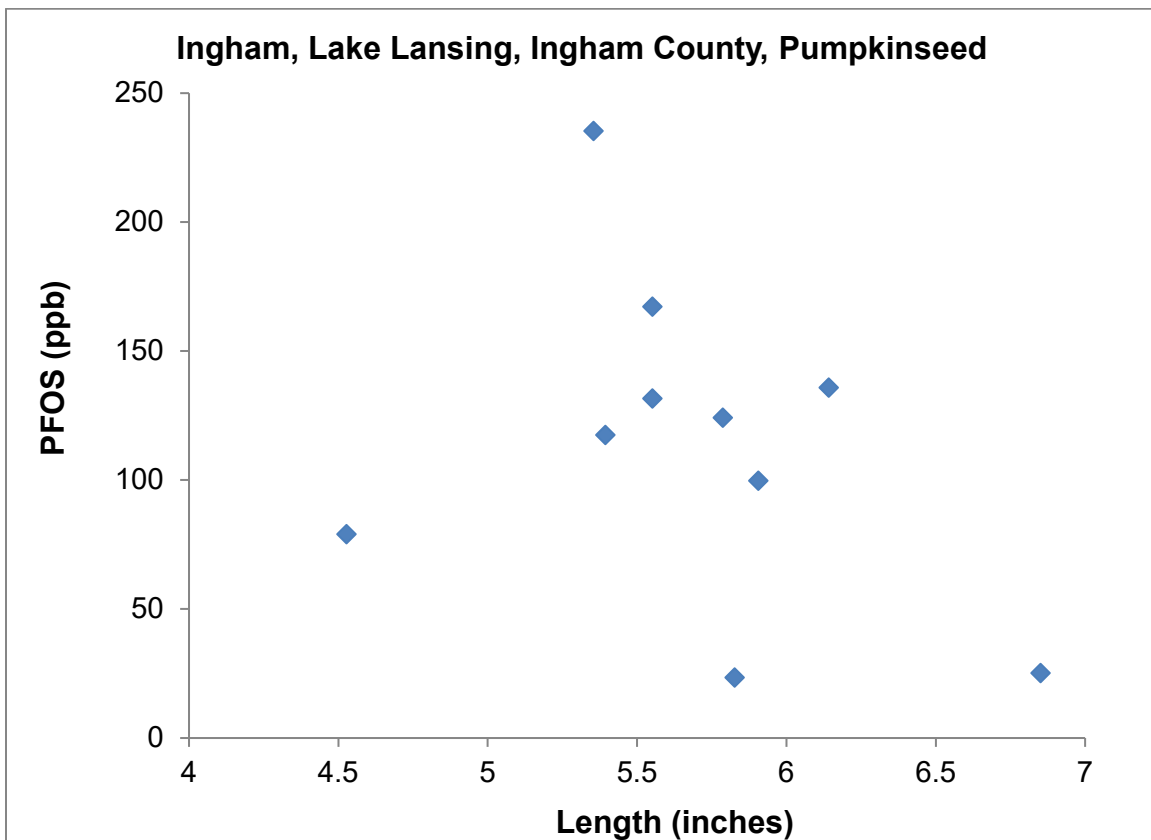
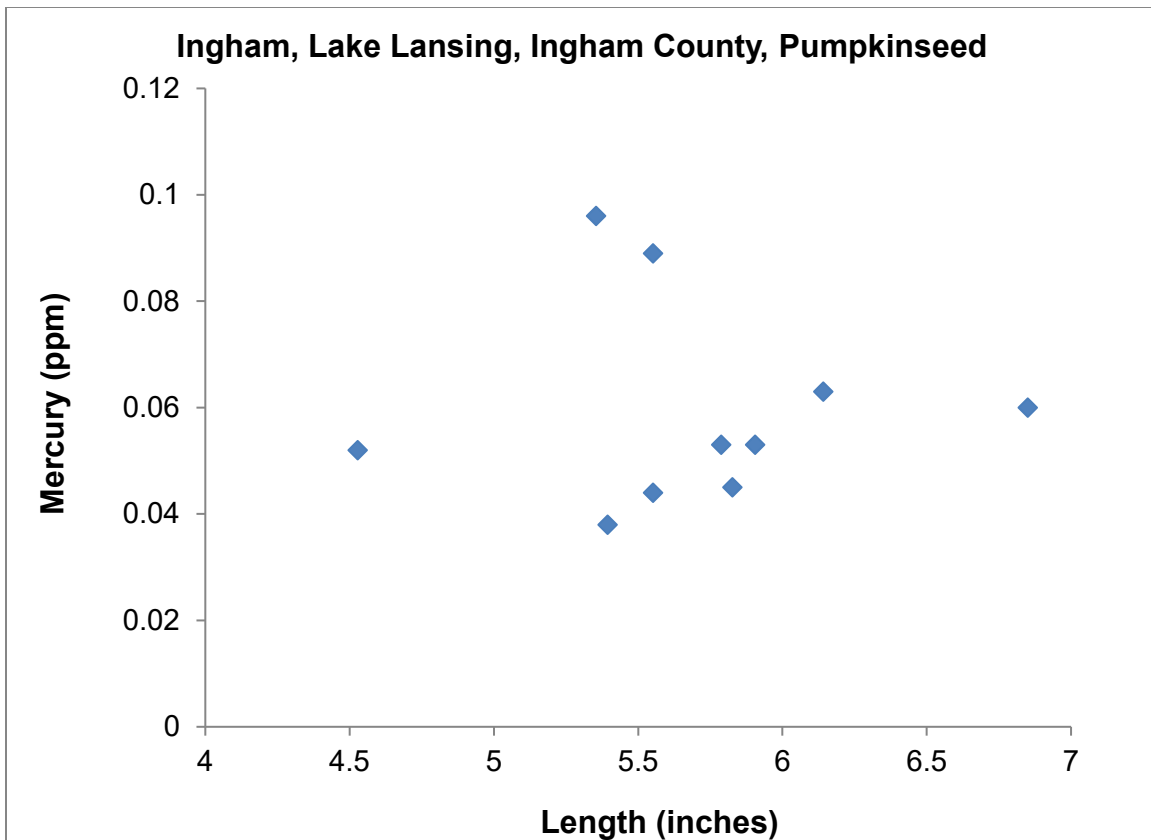
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2020	2020	10	4.5	NA	4.5	6.9
Datasets available: 2020						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
Mercury	10	0.059		0.038	0.096	0.073
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
Mercury	0.000	0.002				

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	4.5	NA	4.5	6.9
Datasets available: 2020						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
PCB	0	--		--	--	--
DDT	0	--		--	--	--
Chlordane	0	--		--	--	--
Toxaphene	0	--		--	--	--
PFOS	10	114.0 ppb		23.6 ppb	235.4 ppb	159.2 ppb
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.122	0.195				
Final meal category based on UCL:						0.5

Existing MDHHS Advisory: Bluegill and sunfish from Lake Lansing in Ingham 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 6 meals per year of bluegill or sunfish of any size from Lake Lansing in Ingham County due to PFOS. Mercury causes a less restrictive guideline.



Black Crappie**Okemos Historical Village Pond****Ingham County****Hg Analysis:**

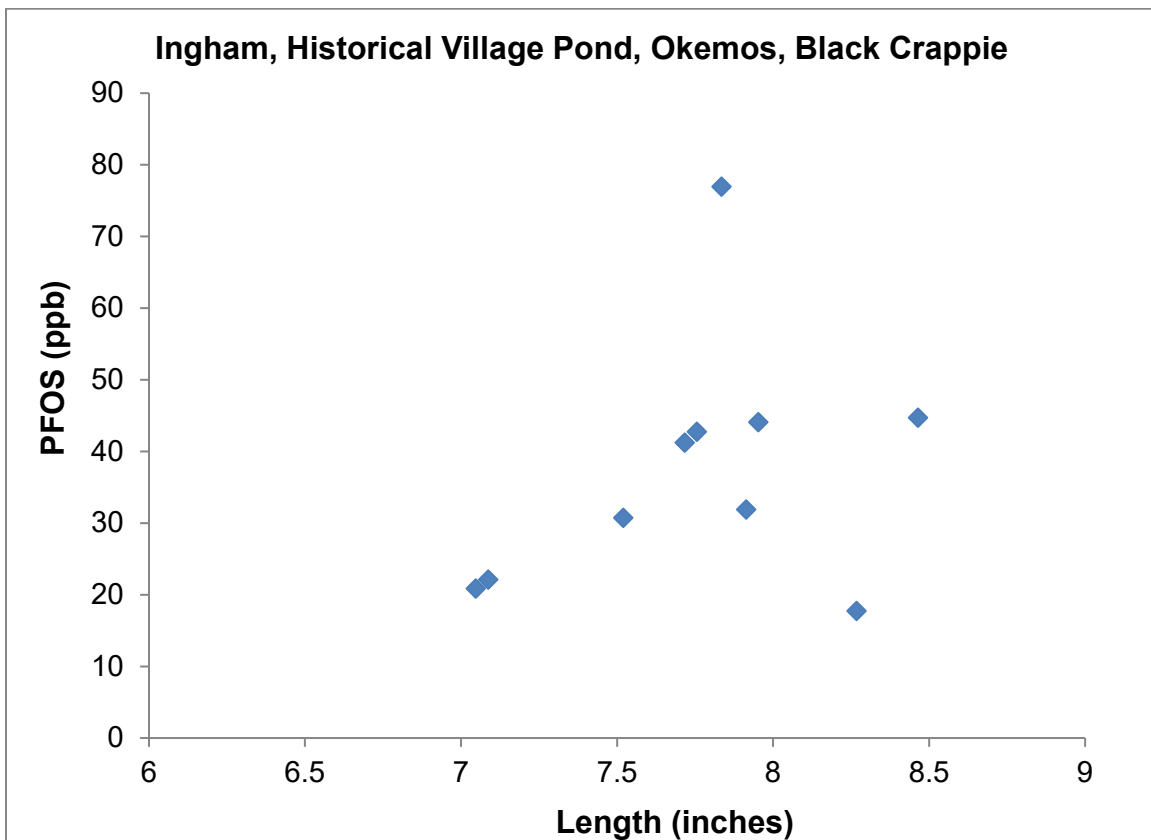
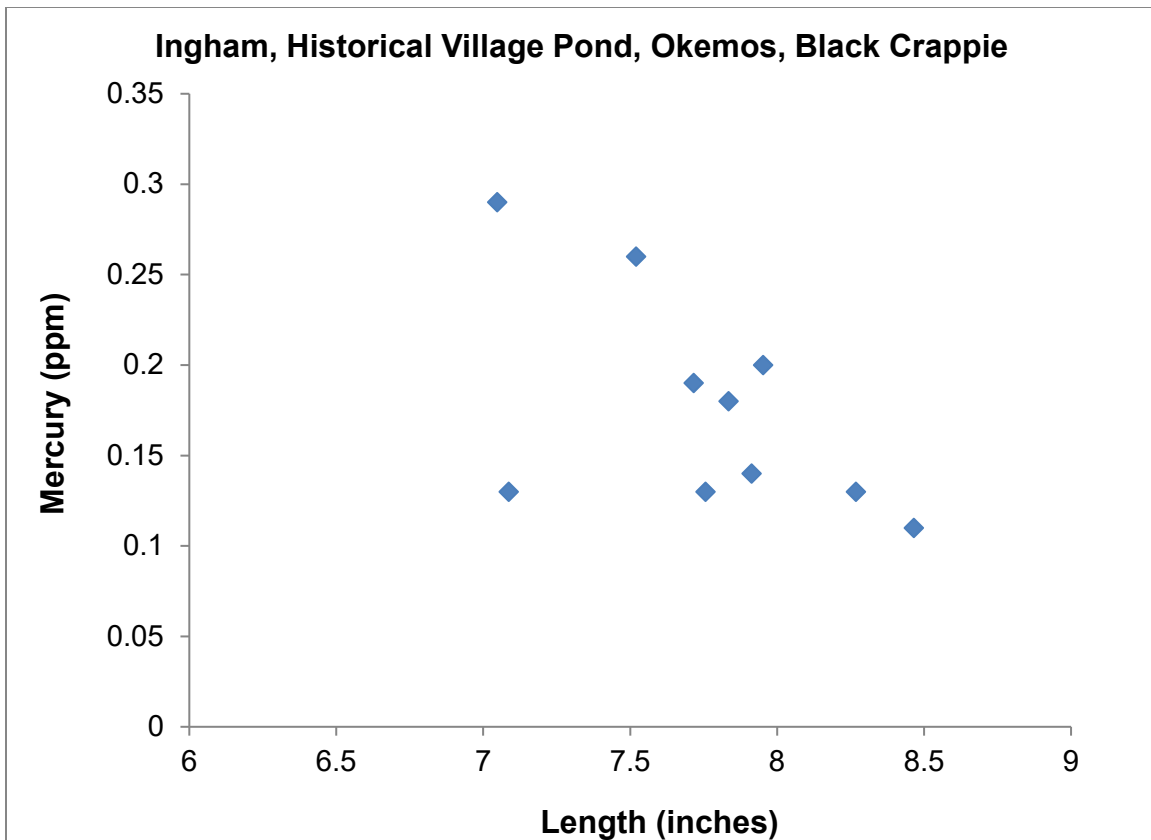
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2021	2021	10	7.0	NA	7.0	8.5	
Datasets available: 2021							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.176		0.110	0.290	0.219	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.330	0.316					

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	7.0	NA	7.0	8.5	
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	37.3 ppb		17.8 ppb	77.0 ppb	49.7 ppb	2
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	0.099	0.118					
Final meal category based on UCL:							2

Existing MDHHS Advisory: Black and white crappie from the Historical Village Pond in Okemos of Ingham County are currently covered under the statewide mercury guidance. No one should eat more than 4 meals per month of black or white crappie of any size.

Recommendation: No one should eat more than 2 meals per month of black or white crappie of any size from the Historical Village Pond in Okemos of Ingham County due to PFOS. Mercury causes less restrictive guidance.



Carp**Red Cedar River
Webberville / East Lansing****Ingham 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	2001	16	13.8	NA	13.8	30.8	
Datasets available: 1991, 2000, 2001							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	16	0.20		0.03	0.27	0.23	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.140	0.300					

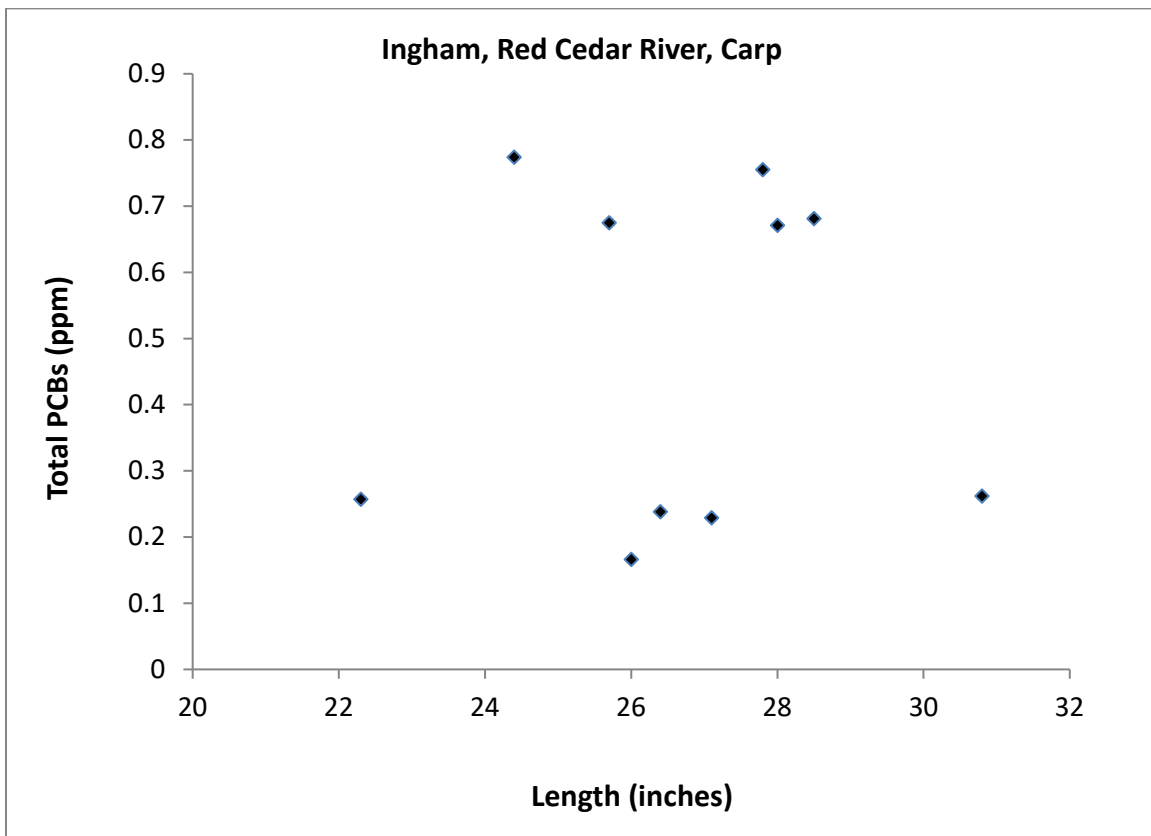
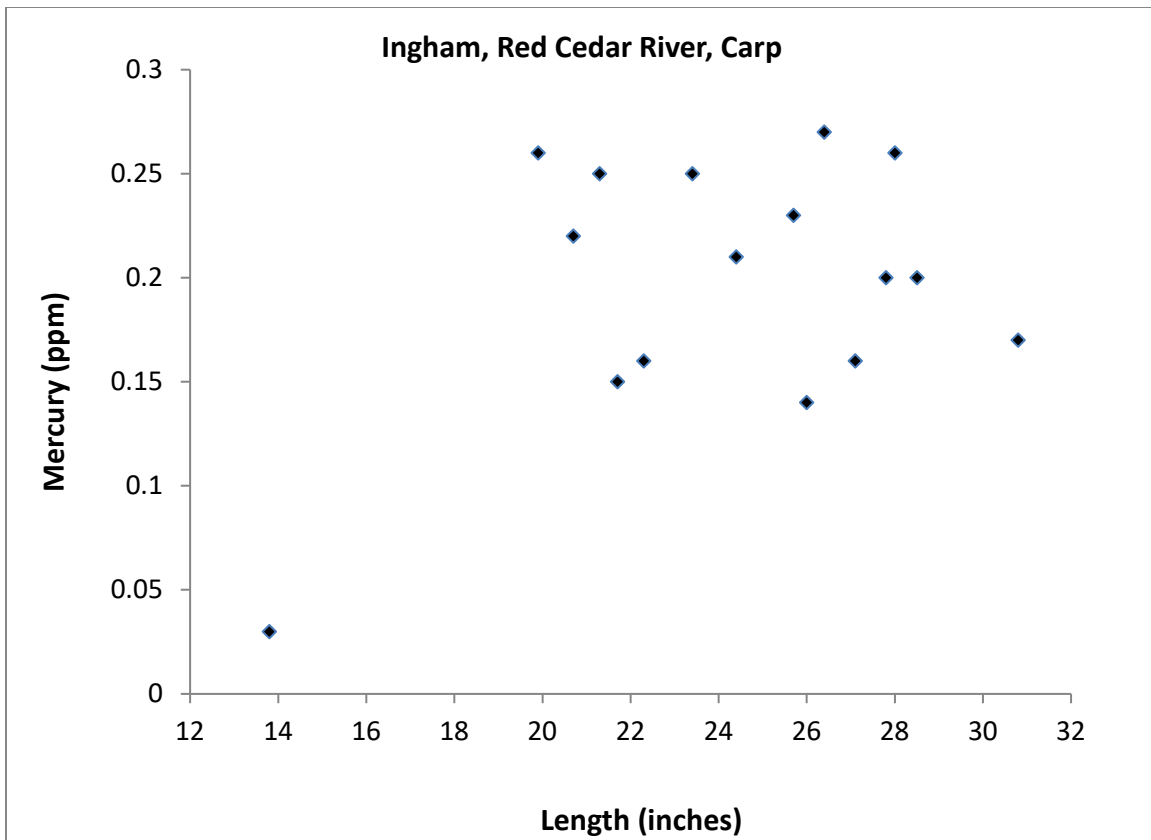
Organics Analysis:

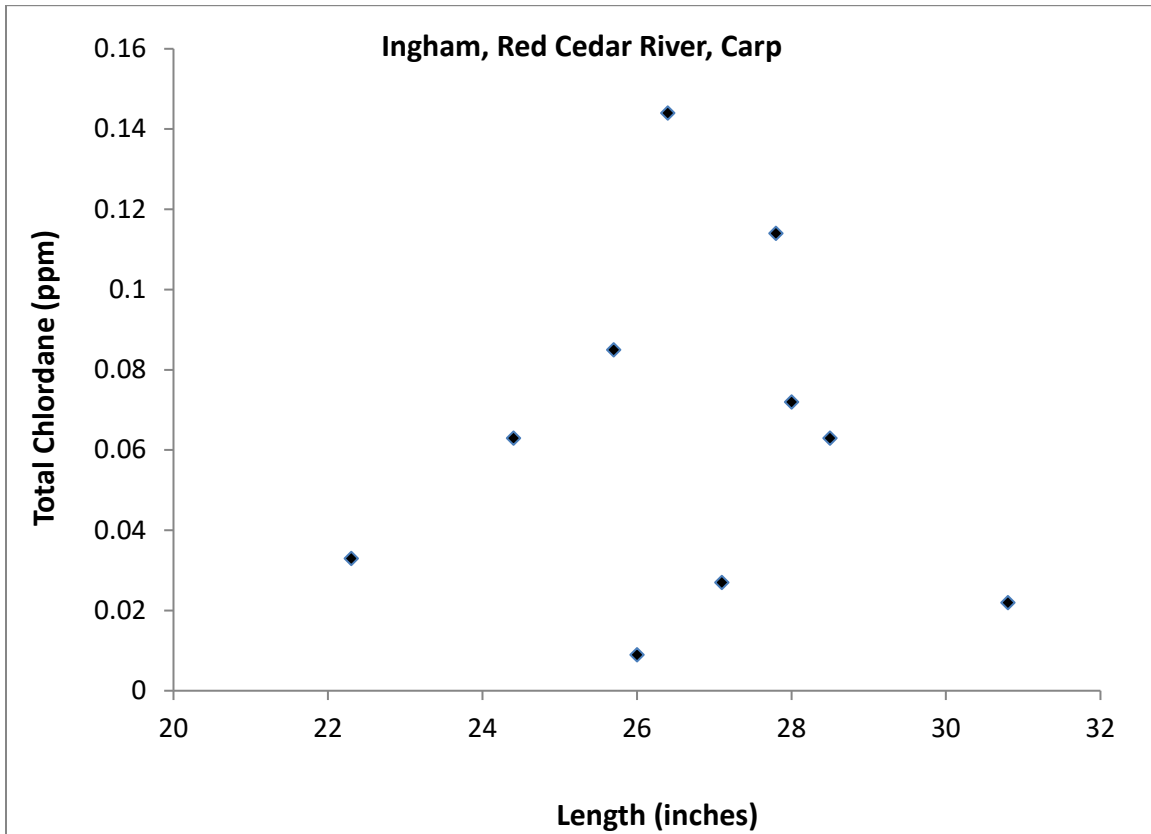
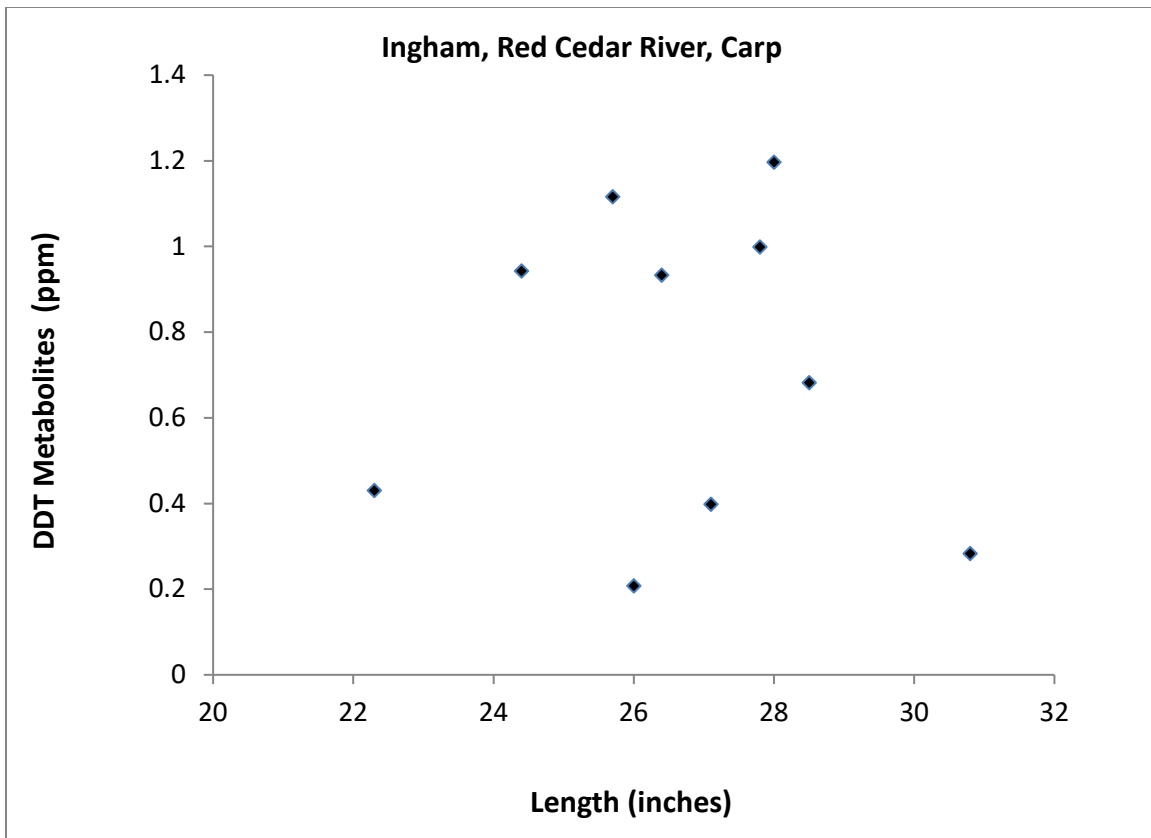
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2000	2001	16	13.8	NA	13.8	30.8	
Datasets available: 1991, 2000, 2001							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.471		0.17	0.77	0.650	Limited
DDT	10	0.719		0.21	1.20	0.980	1
Chlordane	10	0.063		0.009	0.14	0.090	--
Toxaphene	10	ND		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.004	0.007					
DDT	0.003	0.008					
Chlordane	0.000	0.000					
Toxaphene	--	--					
Final meal category based on UCL:							Limited

Existing Advisory: Women and children should not eat more than one meal per week of Red Cedar River carp less than 18 inches or more than one meal per month of those fish larger than 18 inches due to PCBs.

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





Northern Pike

Red Cedar River Webberville / East Lansing

Ingham County

Hg Analysis:

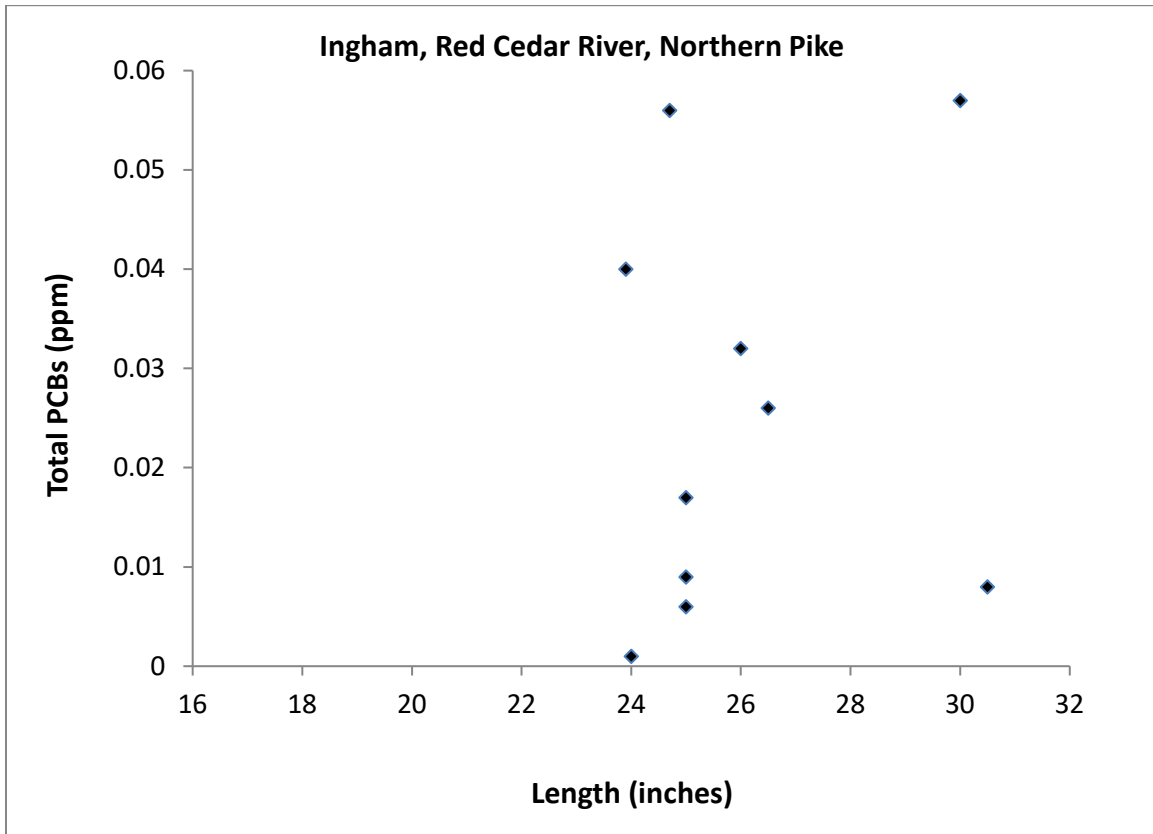
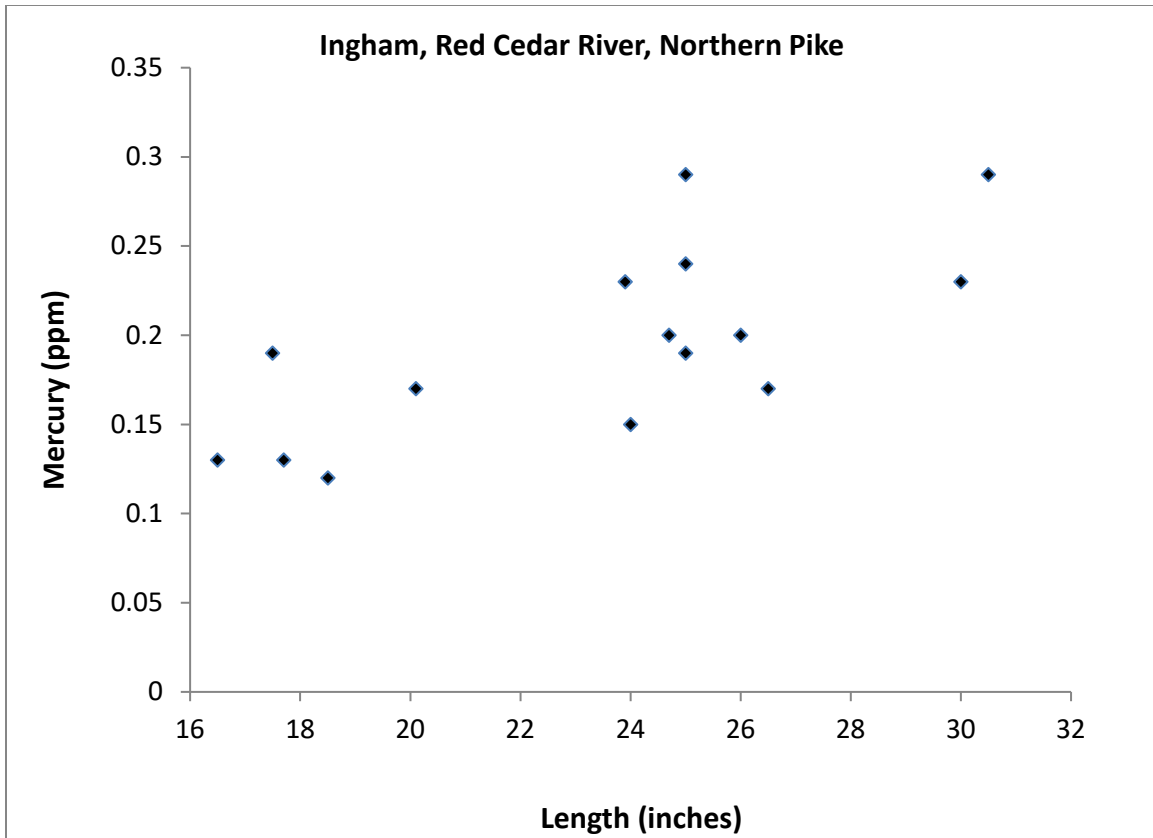
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Size Range of All Samples		
Earliest	Most Recent				Min	Max	
1991	2001	15	16.5	24	23.9	30.5	
Datasets available: 1991, 2000, 2001							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.22		0.15	0.29	0.25	4
Chemical	Linear Regression	Exponential Regression					
	R²	R²					
	Mercury	0.513	0.543				

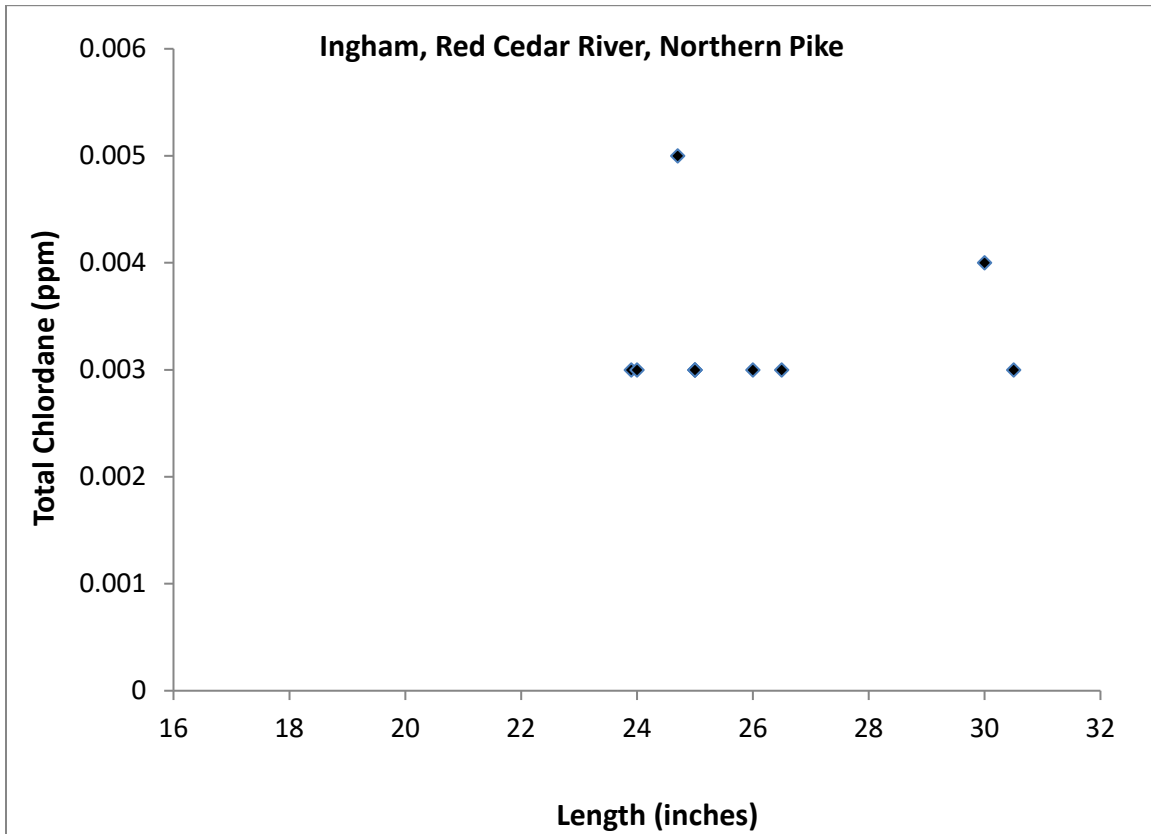
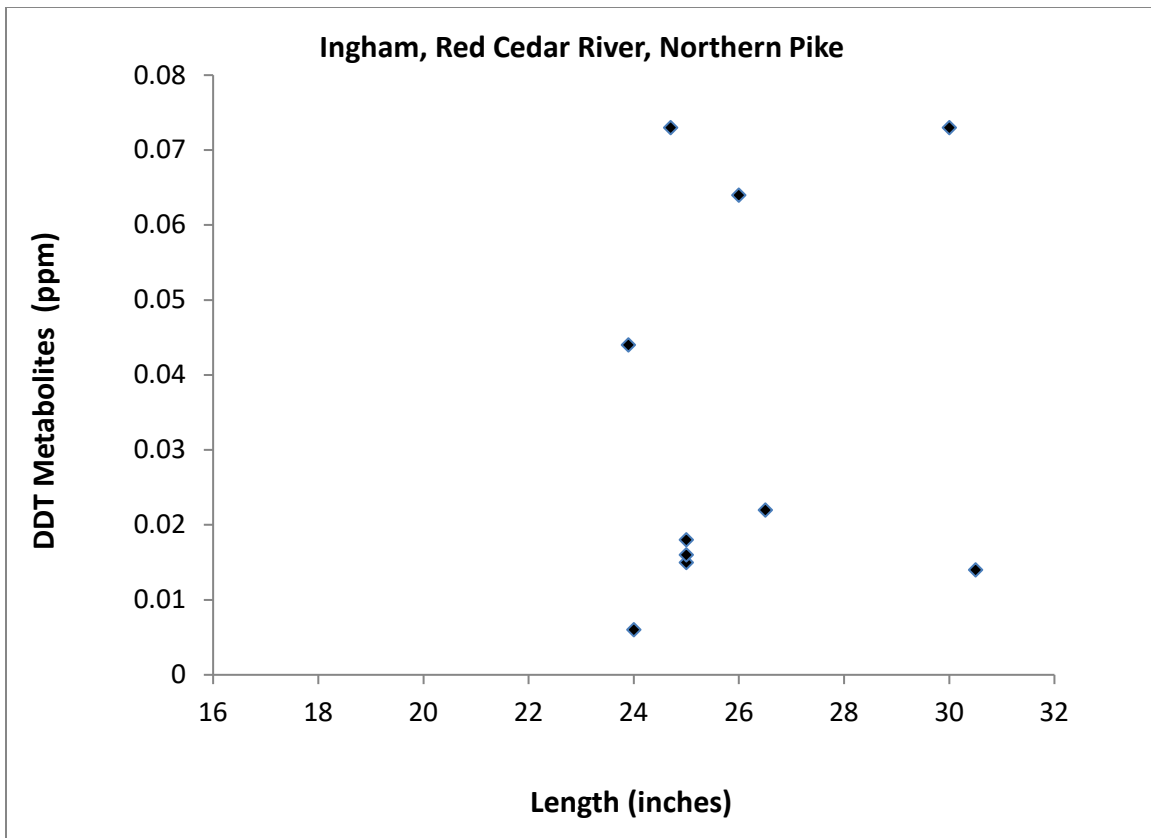
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Size Range of All Samples		
Earliest	Most Recent				Min	Max	
2000	2001	10	23.9	24	23.9	30.5	
Datasets available: 1991, 2000, 2001							
Chemical	Sample Size	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.025		0.001	0.06	0.04	4
DDT	10	0.035		0.006	0.07	0.05	16
Chlordane	10	0.003		0.003	0.005	0.004	--
Toxaphene	10	ND		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.027	0.046					
DDT	0.030	0.031					
Chlordane	0.007	0.014					
Toxaphene	--	--					
Final meal category based on UCL:							4

Existing Advisory: Red Cedar River northern pike are not covered by a consumption advisory.

Recommendation: No one should eat more than 4 meals per month of Red Cedar northern pike less than 30 inches due to mercury and PCBs or 2 meals per month of those greater than 30 inches due to mercury. Statewide length break applied.





Rock Bass**Red Cedar River
Webberville / East Lansing****Ingham County****Hg Analysis:**

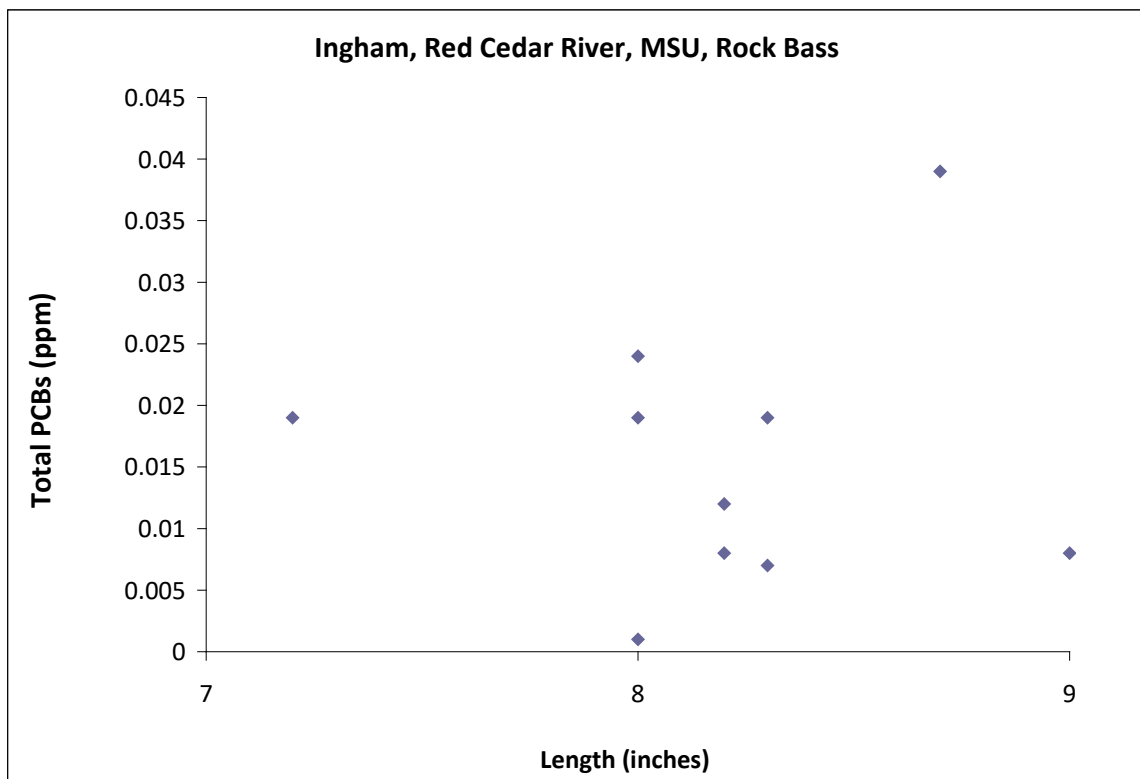
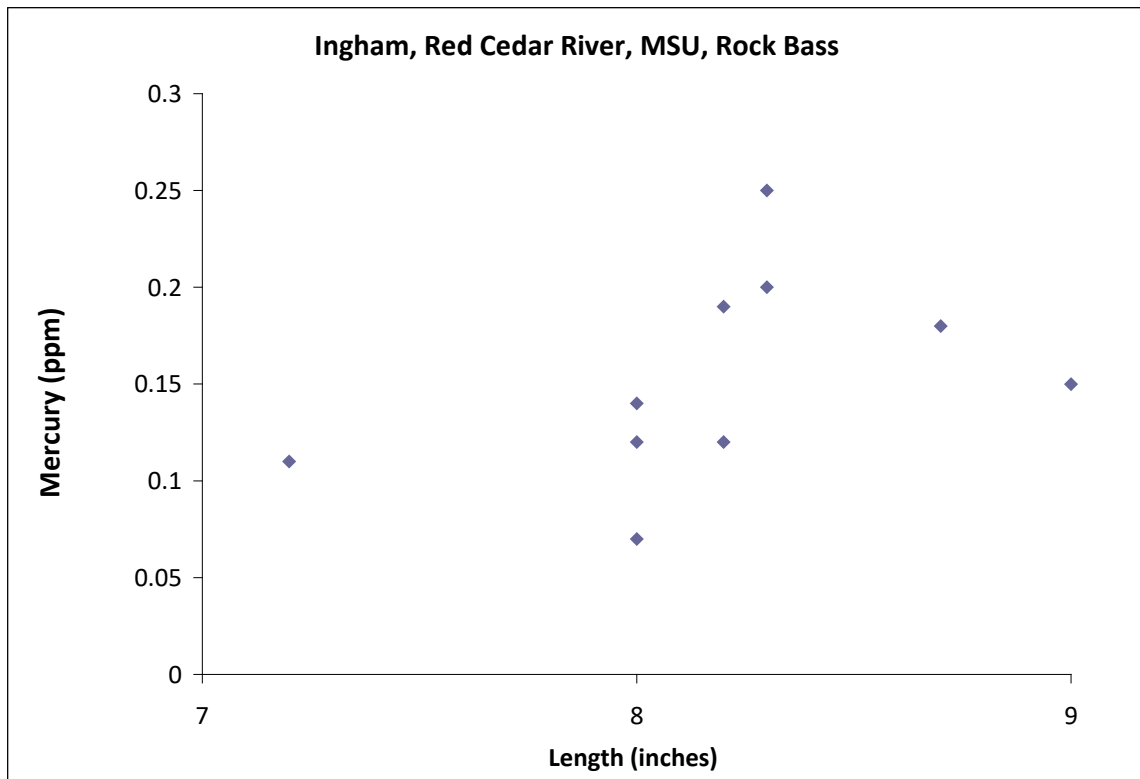
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2000	2001	10	7.2	NA	7.2	9
Datasets available: 2000, 2001						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
Mercury	10	0.153		0.07	0.25	0.19
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
Mercury	0.177	0.195				4

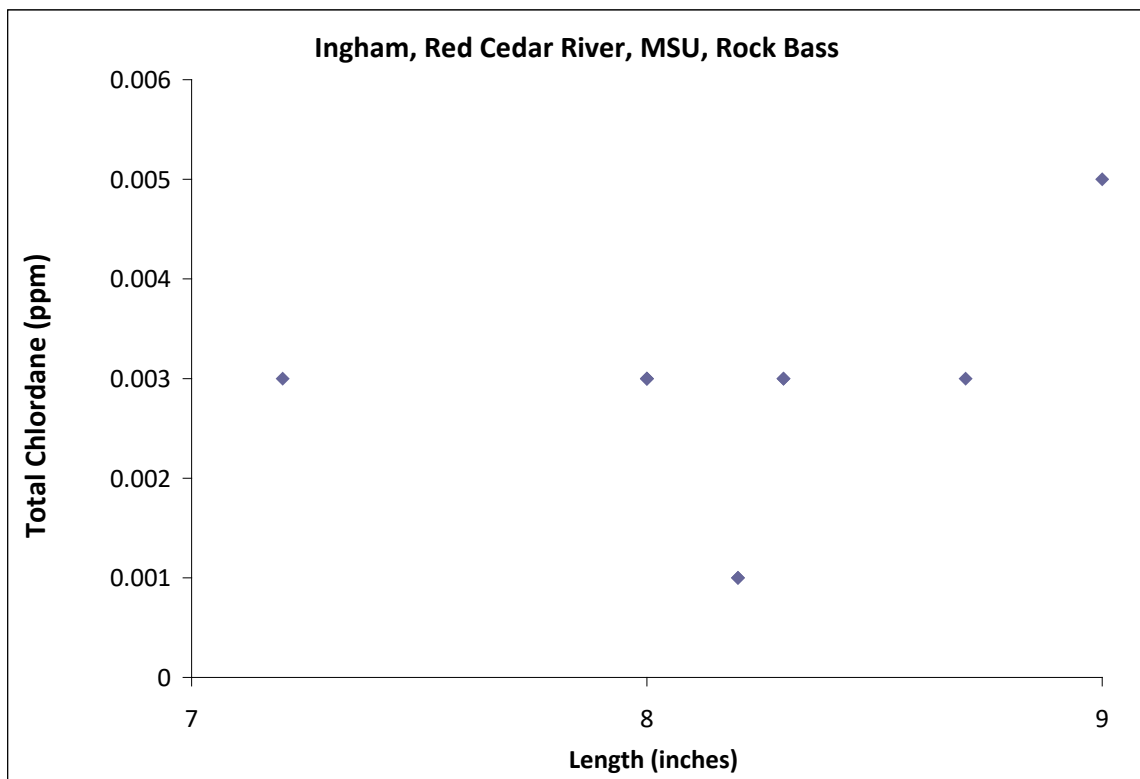
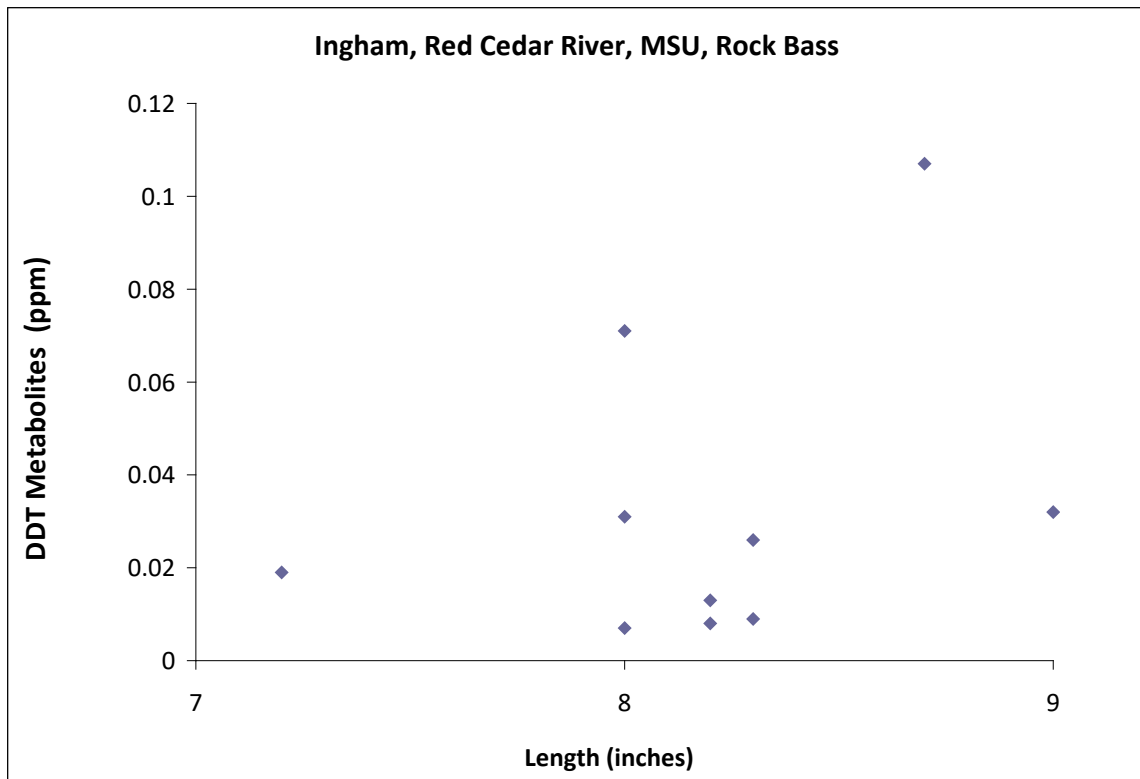
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2000	2001	10	7.2	NA	7.2	9
Datasets available: 2000, 2001						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
PCB	10	0.016		0.001	0.04	0.02
DDT	10	0.032		0.008	0.11	0.06
Chlordane	10	0.003		0.001	0.005	0.004
Toxaphene	10	ND		--	--	--
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
PCB	0.002	0.000				
DDT	0.106	0.077				
Chlordane	0.106	0.032				
Toxaphene	--	--				
Final meal category based on UCL:						4

Existing Advisory: Red Cedar River rock bass are not covered by a consumption advisory.

Recommendation: No one should eat more than 4 meals per month of Red Cedar rock bass due to mercury. PCBs would cause an advisory.





Smallmouth Bass**Red Cedar River
Webberville / East Lansing****Ingham County****Hg Analysis:**

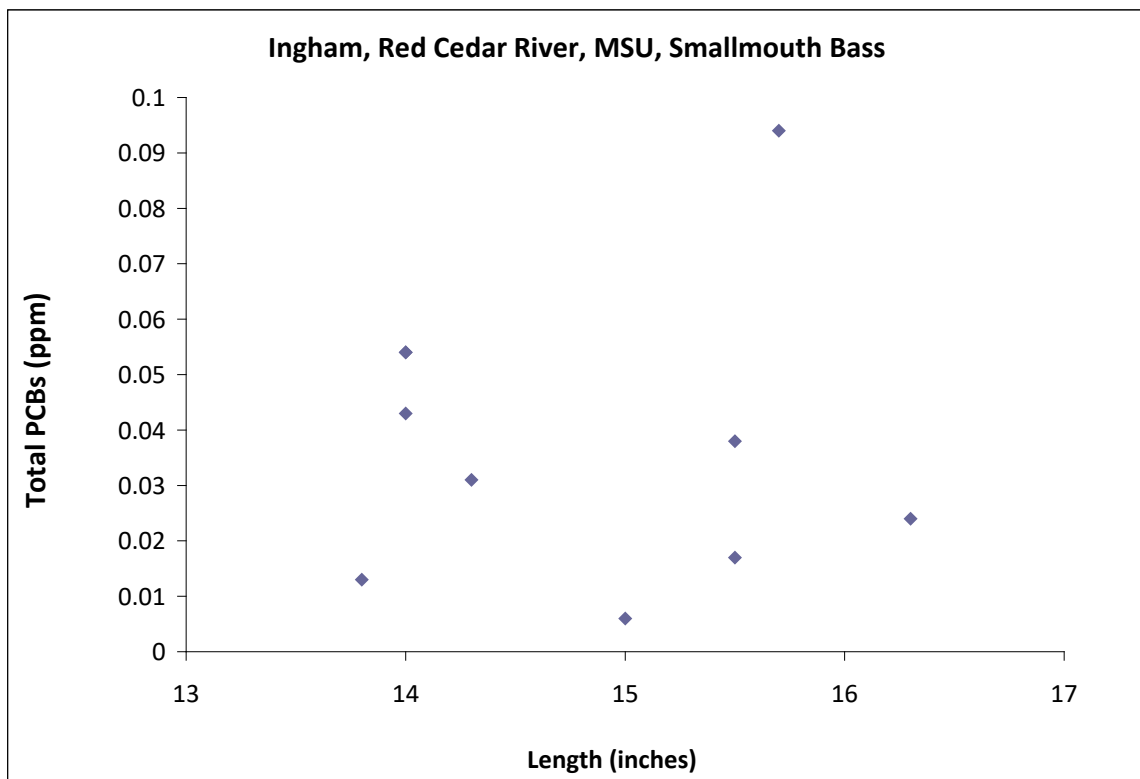
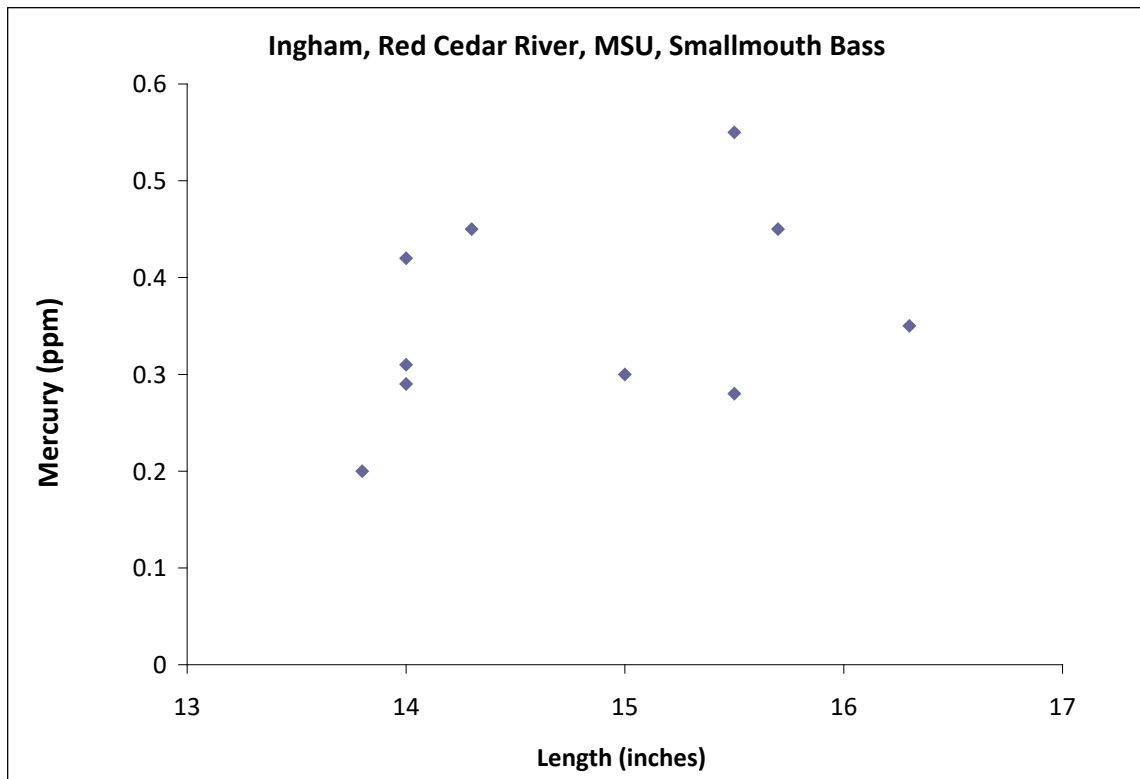
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2000	2000	10	13.8	14	13.8	16.3
Datasets available: 2000						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
Mercury	10	0.36		0.20	0.55	0.44
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
Mercury	0.120	0.137				2

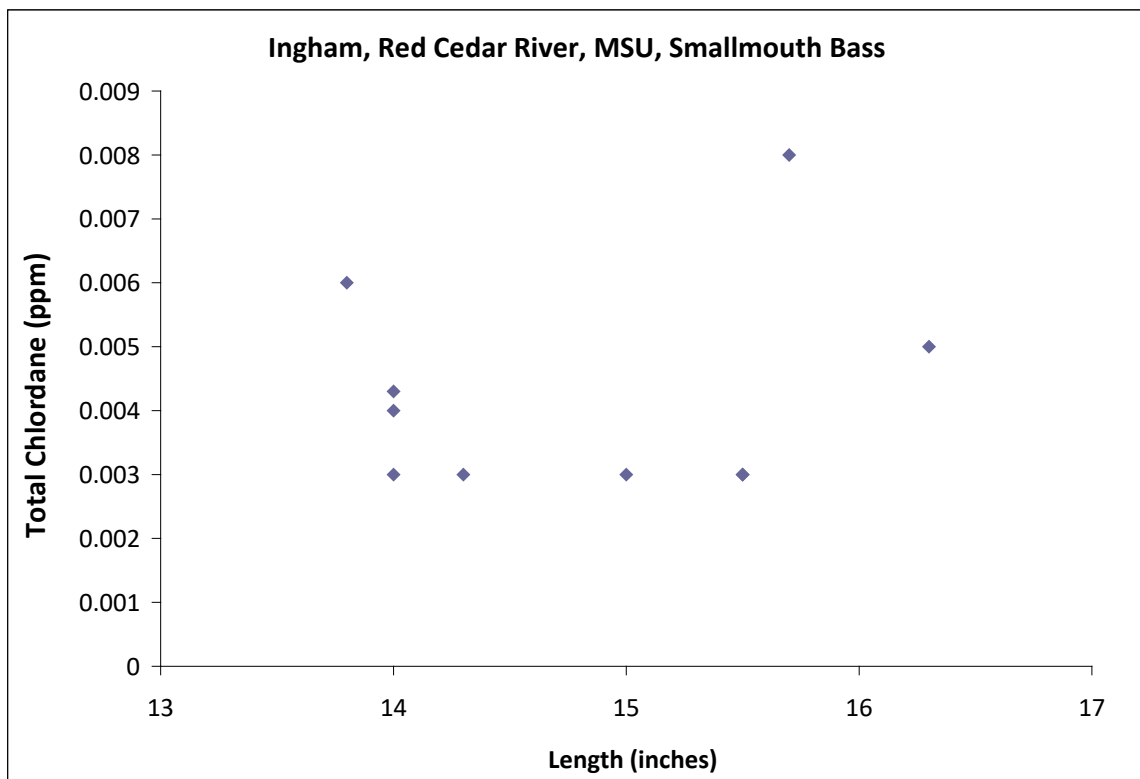
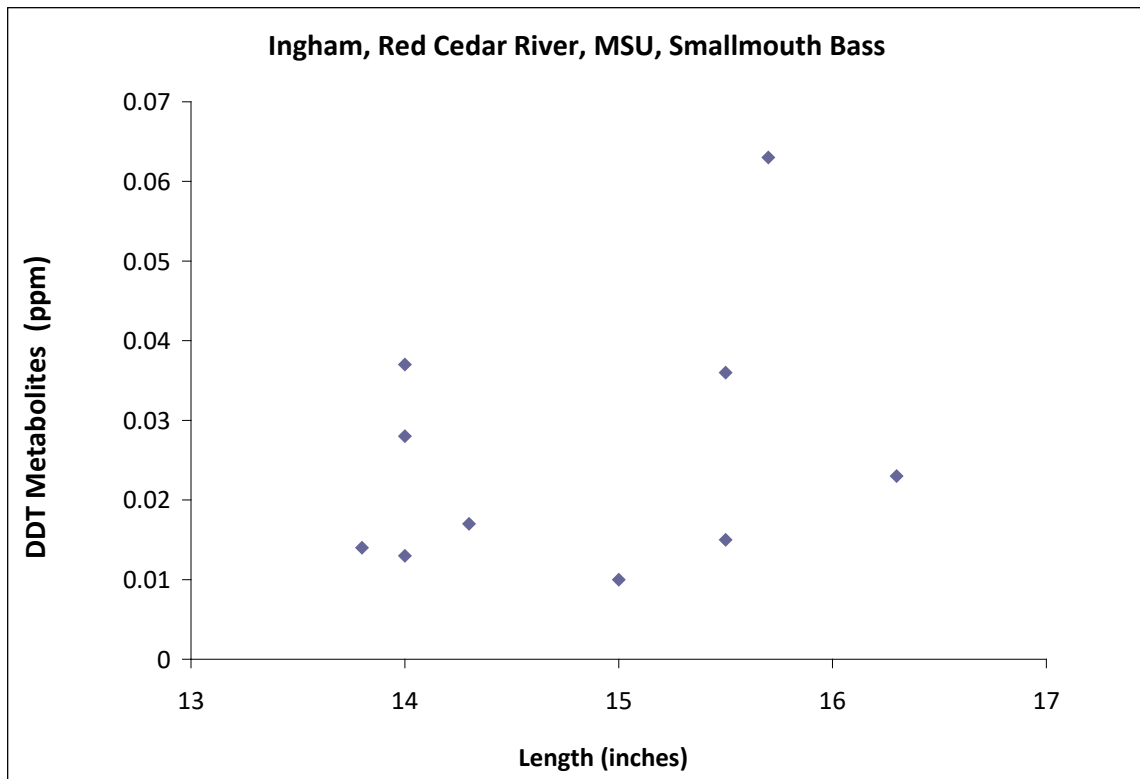
Organics Analysis:

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	13.8	14	13.8	16.3
Datasets available: 2000						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
PCB	10	0.037		0.006	0.094	0.06
DDT	10	0.026		0.013	0.063	0.04
Chlordane	10	0.004		0.003	0.008	0.01
Toxaphene	10	ND		--	--	--
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
PCB	0.001	0.002				
DDT	0.100	0.081				
Chlordane	0.035	0.021				
Toxaphene	--	--				
Final meal category based on UCL:						2

Existing Advisory: Red Cedar River smallmouth bass are not covered by a consumption advisory.

Recommendation: No one should eat more than 2 meals per month of Red Cedar smallmouth or largemouth bass less than 18 inches due to PCBs and mercury or 1 meal per month of those fish greater than 18 inches due to mercury. Statewide length break applied.





Bluegill**Reynold's Drain Pond****Ingham 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	5.2	NA	5.2	6.1
Datasets available: 2020						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
Mercury	10	0.094		0.053	0.140	0.113
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
Mercury	0.005	0.017				8

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	5.2	NA	5.2	6.1
Datasets available: 2020						
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)
PCB	--	--		--	--	--
DDT	--	--		--	--	--
Chlordane	--	--		--	--	--
Toxaphene	--	--		--	--	--
PFOS	10	70.6 ppb		19.1 ppb	107 ppb	92.6 ppb
Chemical	Linear Regression	Exponential Regression				Meal Category
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.254	0.205				
Final meal category based on UCL:						1

Existing MDHHS Advisory: Bluegill and sunfish from Reynold's Drain Pond in Ingham County are currently covered under the statewide mercury guidance. 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 1 meal per month of bluegill or sunfish of any size from Reynold's Drain Pond in Ingham County due to PFOS. Mercury causes less restrictive advice.

