

Bay County

Carp

**Kawkawlin River
(M-247)**

Bay County

Hg Analysis:

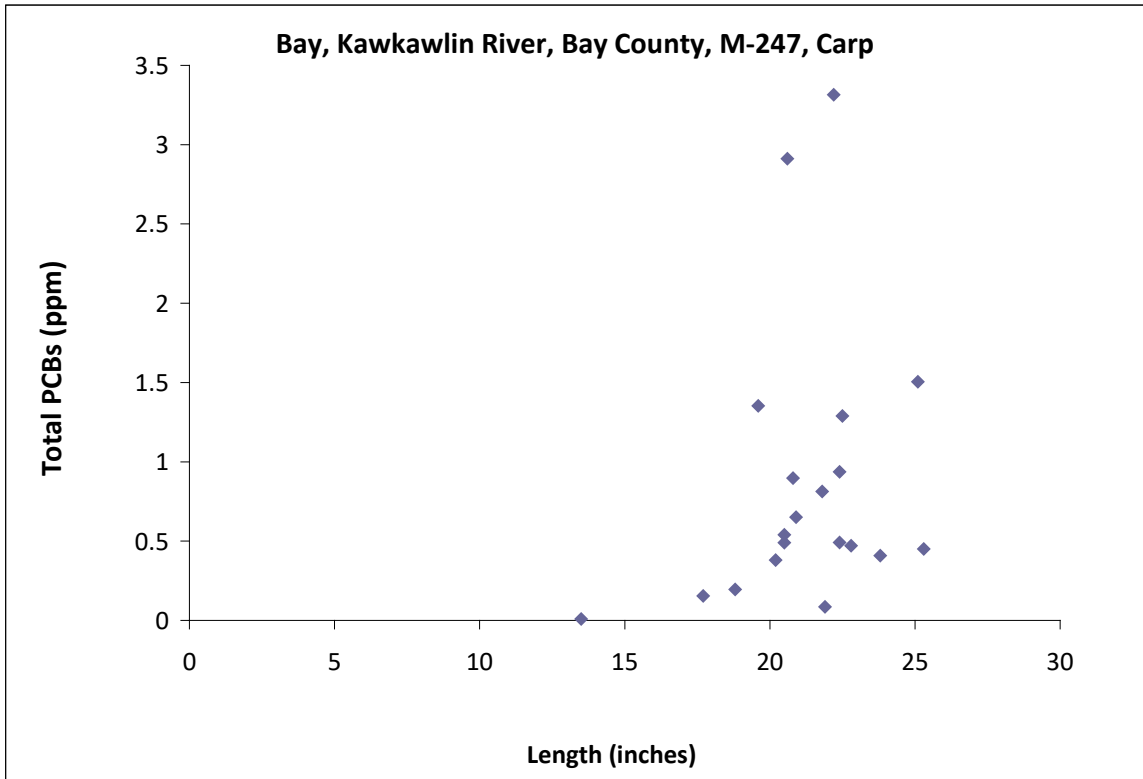
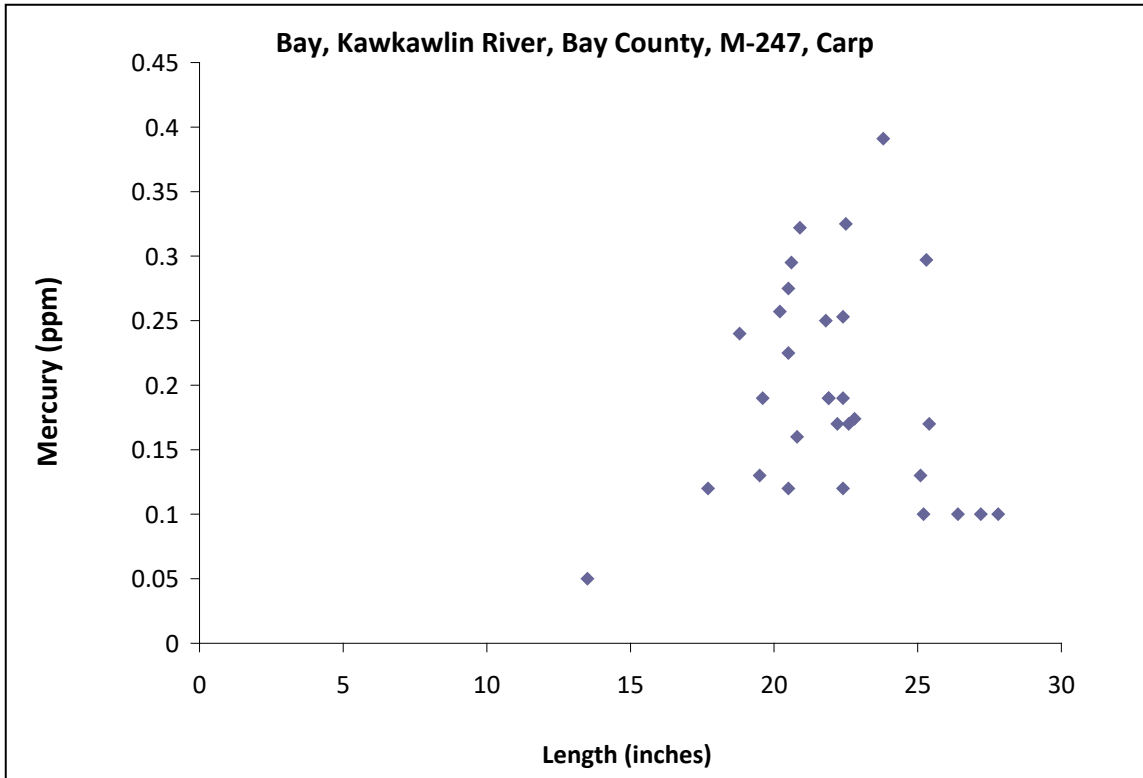
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1988	2008	30	13.5	na	13.5	27.8
Datasets available: 1988, 2008						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	30	0.193			0.22	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.001	0.001				

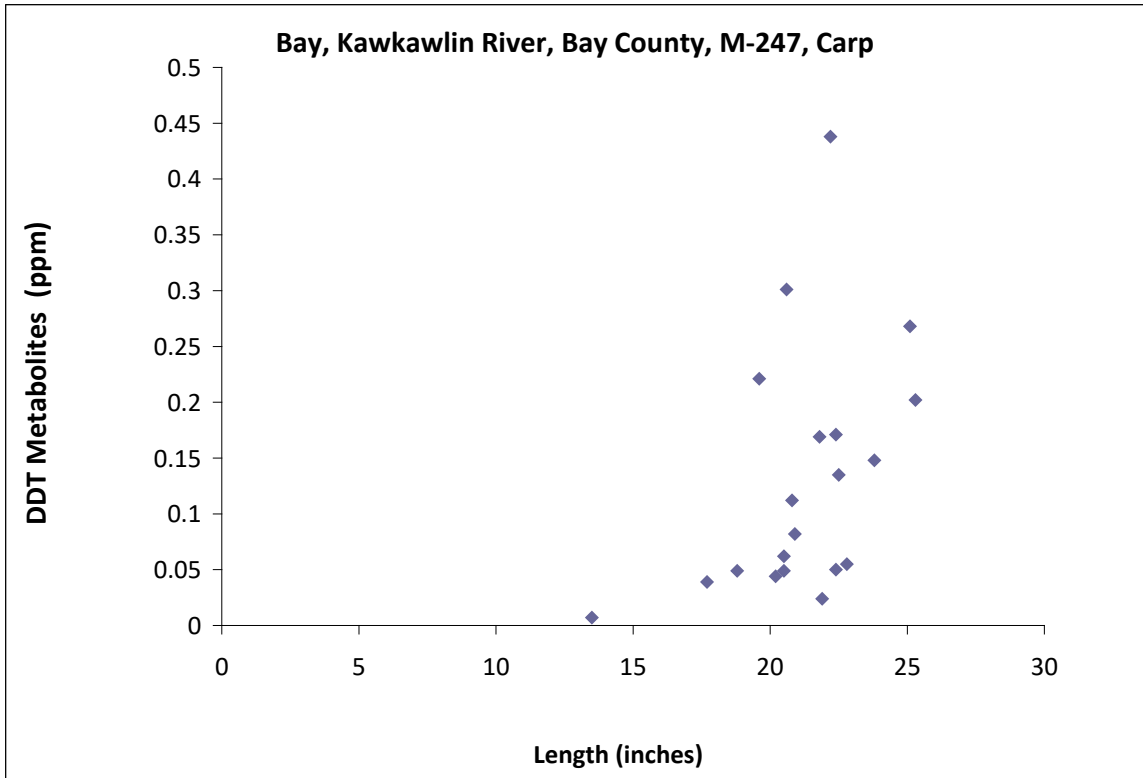
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2004	2008	20	13.5	na	13.5	25.3
Datasets available: 1988, 2004, 2008						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	20	0.867			1.280	Limited
DDT	20	0.131		0.180	8	
Chlordane	20	0.017		0.030	--	
Toxaphene	20	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.284	0.430				
DDT	0.308	0.444				
Chlordane	0.283	0.323				
Toxaphene						
Final meal category based on UCL:					Limited	

Existing Advisory: No one should eat any carp from the Kawkawlin River due to elevated levels of PCBs.

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





Northern Pike

**Kawkawlin River
(M-247)**

Bay 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	9	19.7	24	27.8	27.8
Datasets available: 1988						
Chemical	Sample Size (All)	Mean (ppm)		95%UCL		Meal Category
Mercury	9*	0.197		0.26		4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.013	0.034				

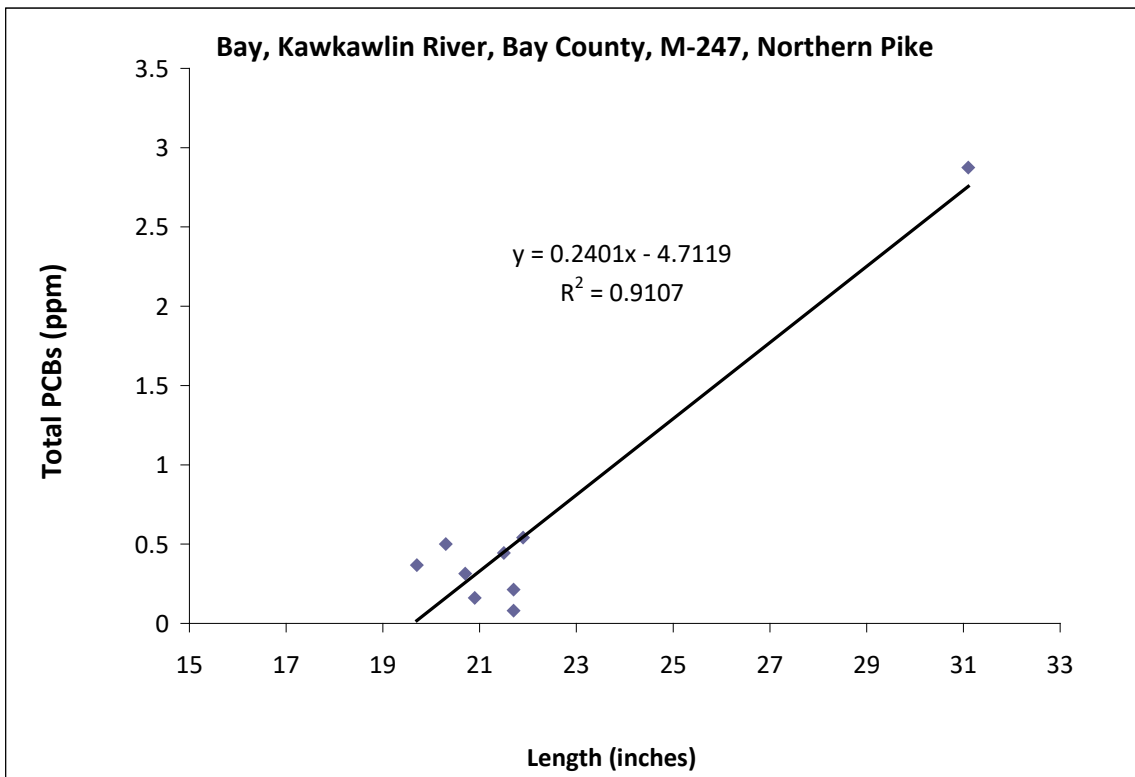
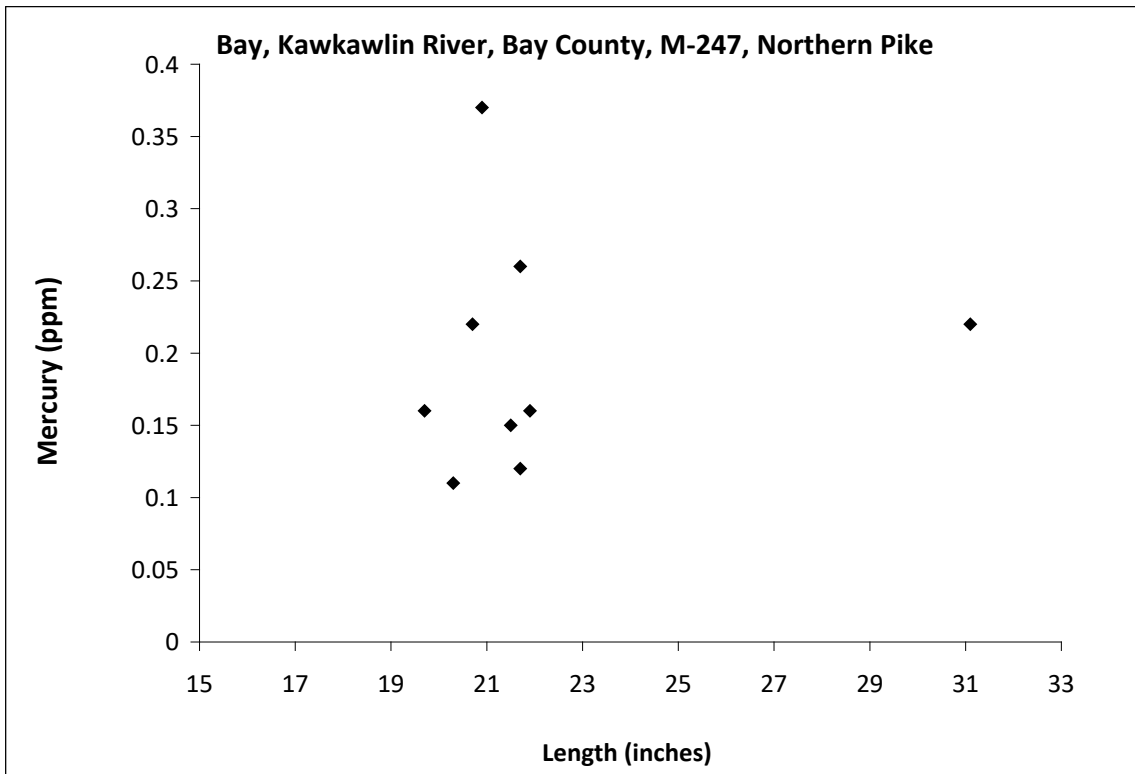
* 8 sub-legals included; no length vs concentration correlation

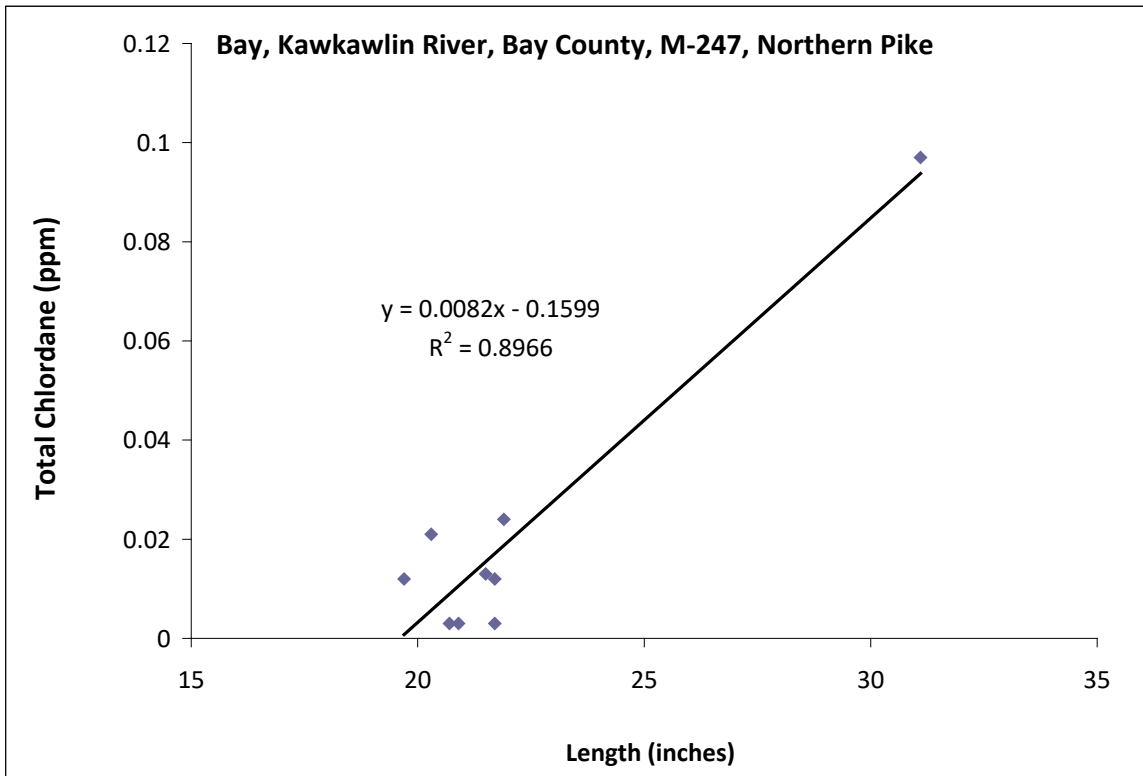
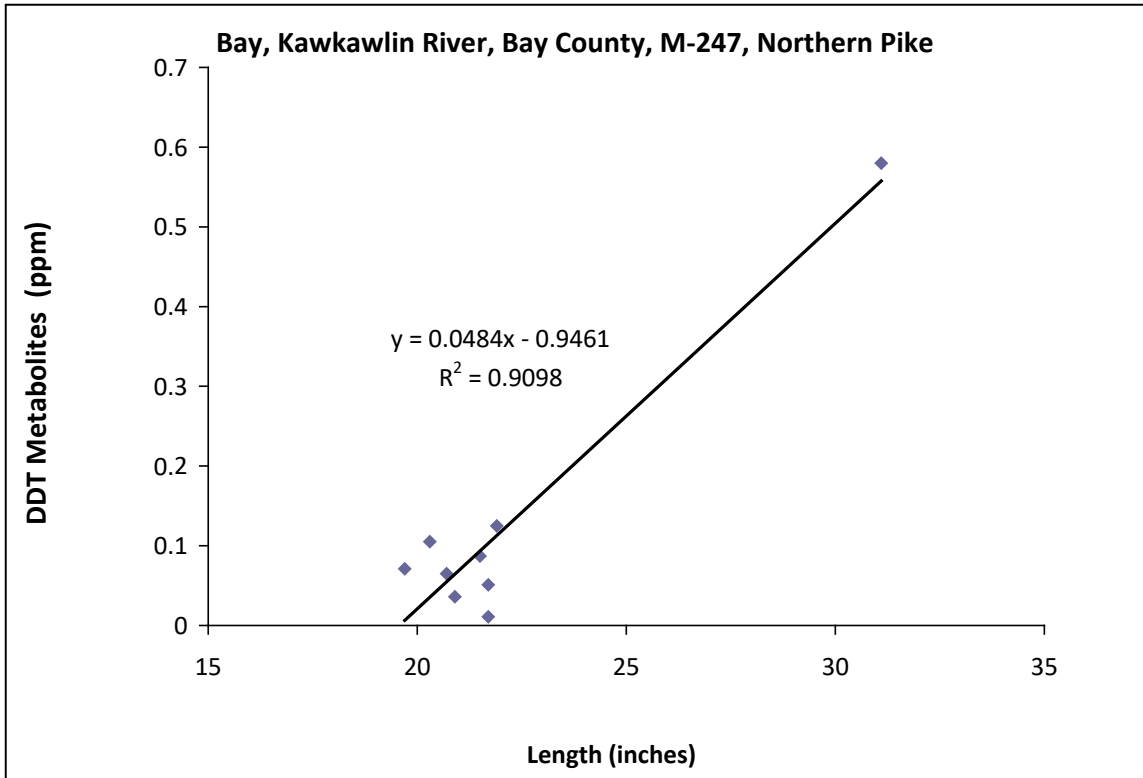
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1988	1988	9	19.7	24	27.8	27.8
Datasets available: 1988						
Chemical	Sample Size (All)	Mean (ppm)		95%UCL		Meal Category
PCB	9	0.611		1.270		Limited
DDT	9	0.126		0.260		4
Chlordane	9	0.021		0.040		--
Toxaphene	9	ND		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.911	0.532		<i>Organics regressions driven by single point and not used</i>		
DDT	0.910	0.463				
Chlordane	0.897	0.466				
Toxaphene	--	--				
Final meal category based on UCL:						Limited

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

Recommendation: Sensitive populations should not eat these fish. Healthy adults should not eat more than 1 or 2 meals per year of northern pike from the Kawkawlin River due to elevated concentrations of PCBs. Mercury and DDT would cause advisories. Dataset is limited due to the age of the data and the inclusion of eight sub-legal samples. Based on EGLE’s Fish Contaminant Monitoring Program, PCB and DDT concentrations ≥15 years old are expected to have declined, but concentrations would likely remain in the limited meal category.





Pumpkinseed

Squaconning Creek

Bay County

Hg Analysis:

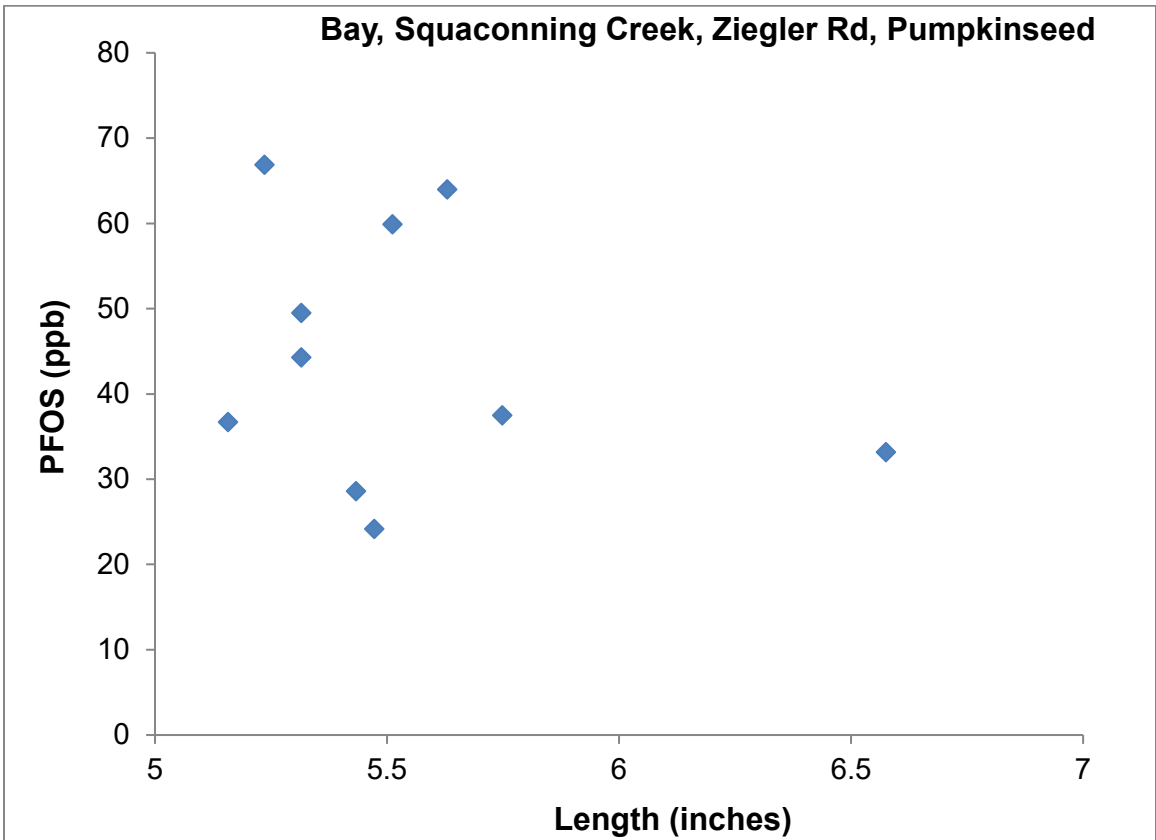
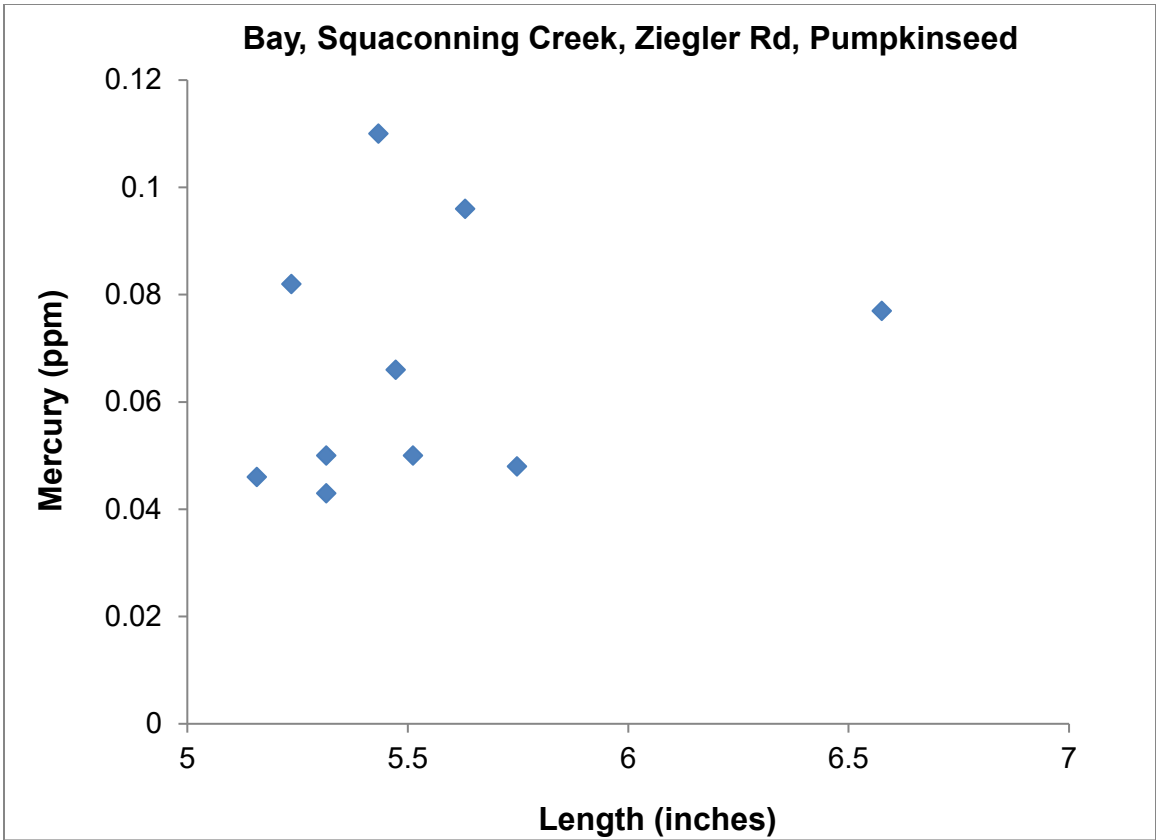
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		Meal Category
Earliest	Most Recent				Min	Max	
2021	2021	10	5.2	NA	5.2	6.6	
Datasets available: 2021							
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)		
Mercury	10	0.067	0.043	0.110	0.084	12	
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.042	0.064					

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		Meal Category
Earliest	Most Recent				Min	Max	
2021	2021	10	5.2	NA	5.2	6.6	
Datasets available: 2021							
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)		
PCB	--	--	--	--	--	--	
DDT	--	--	--	--	--	--	
Chlordane	--	--	--	--	--	--	
Toxaphene	--	--	--	--	--	--	
PFOS	10	44.5 ppb	24.2 ppb	66.9 ppb	55.3 ppb	2	
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	0.062	0.056					
Final meal category based on UCL:							2

Existing MDHHS Advisory: Bluegill and pumpkinseed from Squaconning Creek in Bay County are currently covered under the statewide mercury advisory. No one should eat more than 8 meals per month of bluegill or sunfish of any size.

Recommendation: No one should eat more than 2 meals per month of bluegill or sunfish of any size from Squaconning Creek in Bay County due to PFOS. Mercury causes less-restrictive advice.



Yellow Perch

Squaconning Creek

Bay County

Hg Analysis:

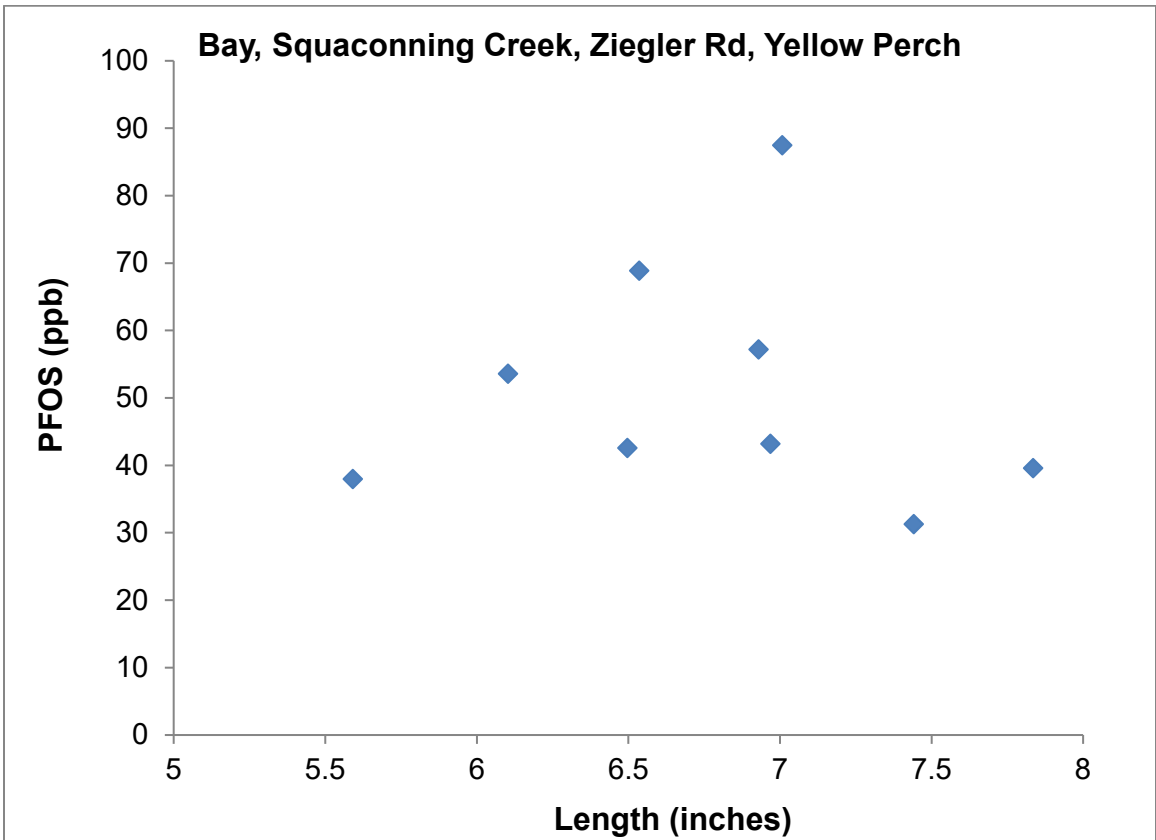
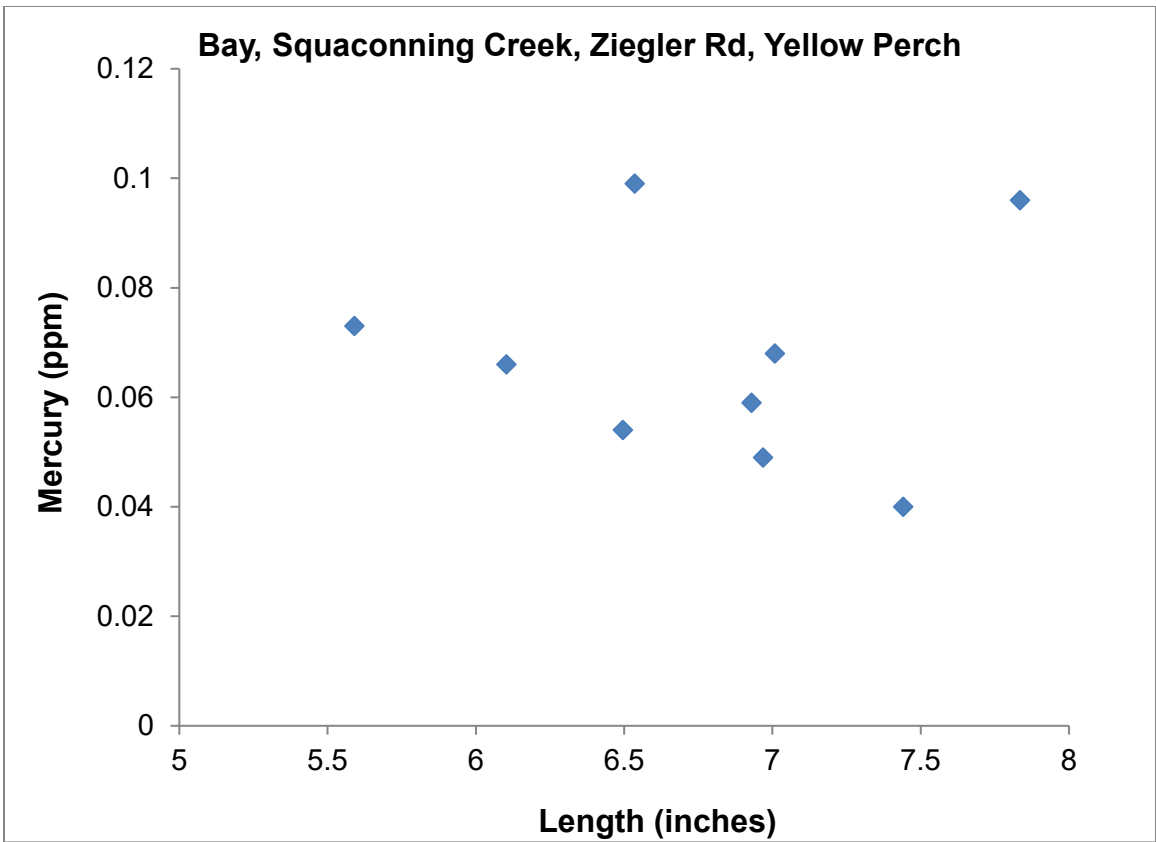
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2021	2021	9	5.6	NA	5.6	7.8
Datasets available: 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	9	0.067	0.040	0.099	0.082	12
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.000	0.011				

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	5.6	NA	5.6	7.8
Datasets available: 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	--	--	--	--	--	--
DDT	--	--	--	--	--	--
Chlordane	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--
PFOS	9	51.3 ppb	31.3 ppb	87.5 ppb	65.0 ppb	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.003	0.012				
Final meal category based on UCL:						2

Existing MDHHS Advisory: Yellow Perch from Squaconning Creek in Bay County are currently covered under the statewide mercury advisory. No one should eat more than 4 meals per month of yellow perch of any size.

Recommendation: No one should eat more than 2 meals per month of yellow perch of any size from Squaconning Creek in Bay County due to PFOS. Mercury causes less-restrictive advice.



Carp

**Tobico Marsh
(Wetland)**

Bay County

Hg Analysis:

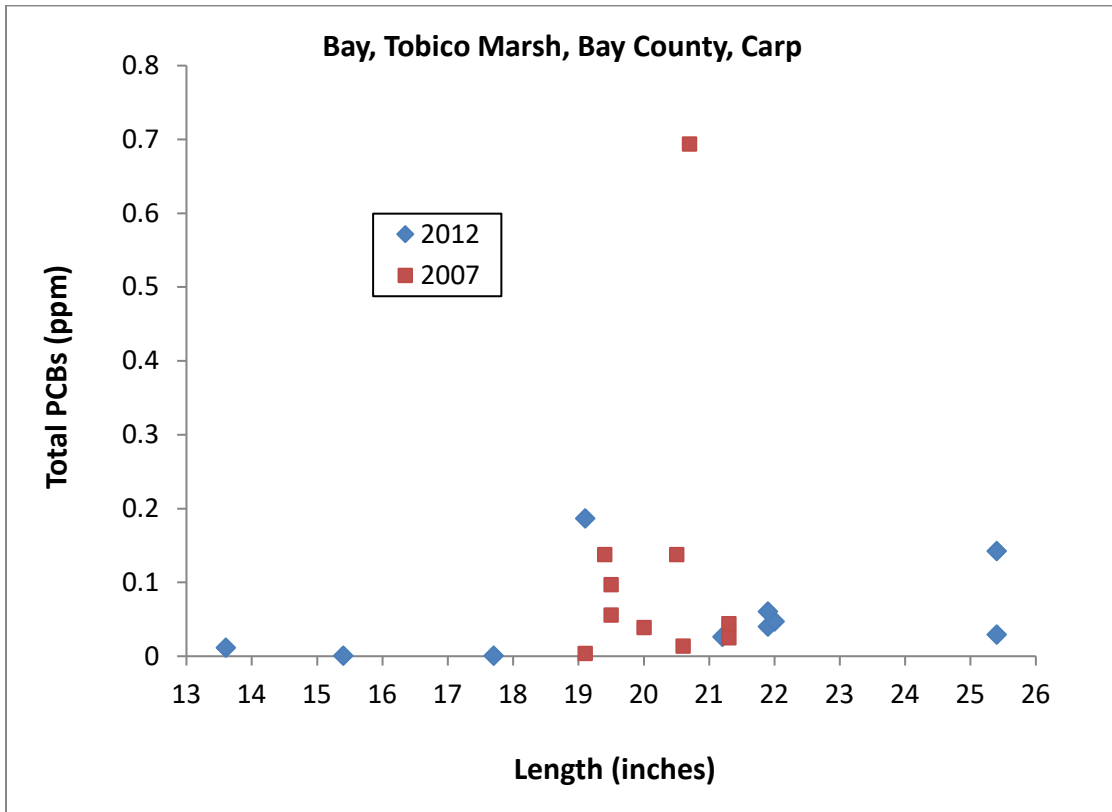
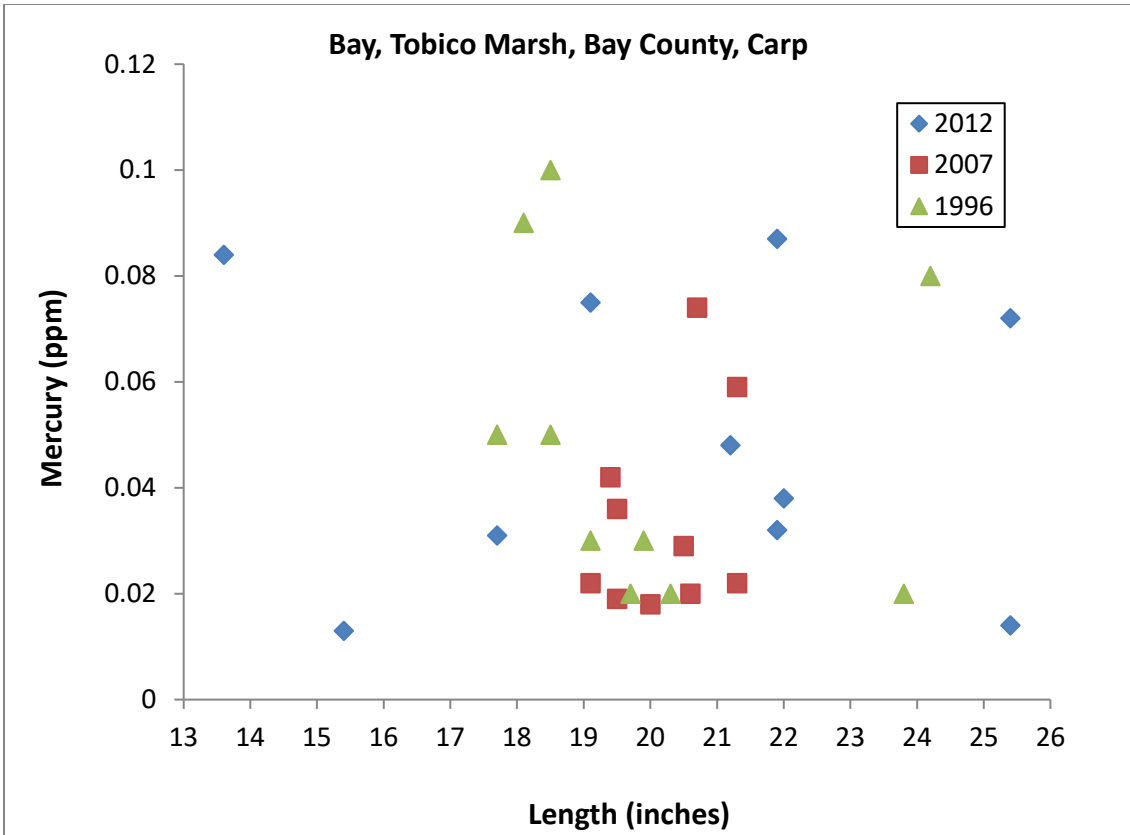
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1996	2012	30	13.6	na	13.6	25.4	
Datasets available: 1996, 2007, 2012							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	30	0.04		0.01	0.10	0.05	16
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.007	0.005					

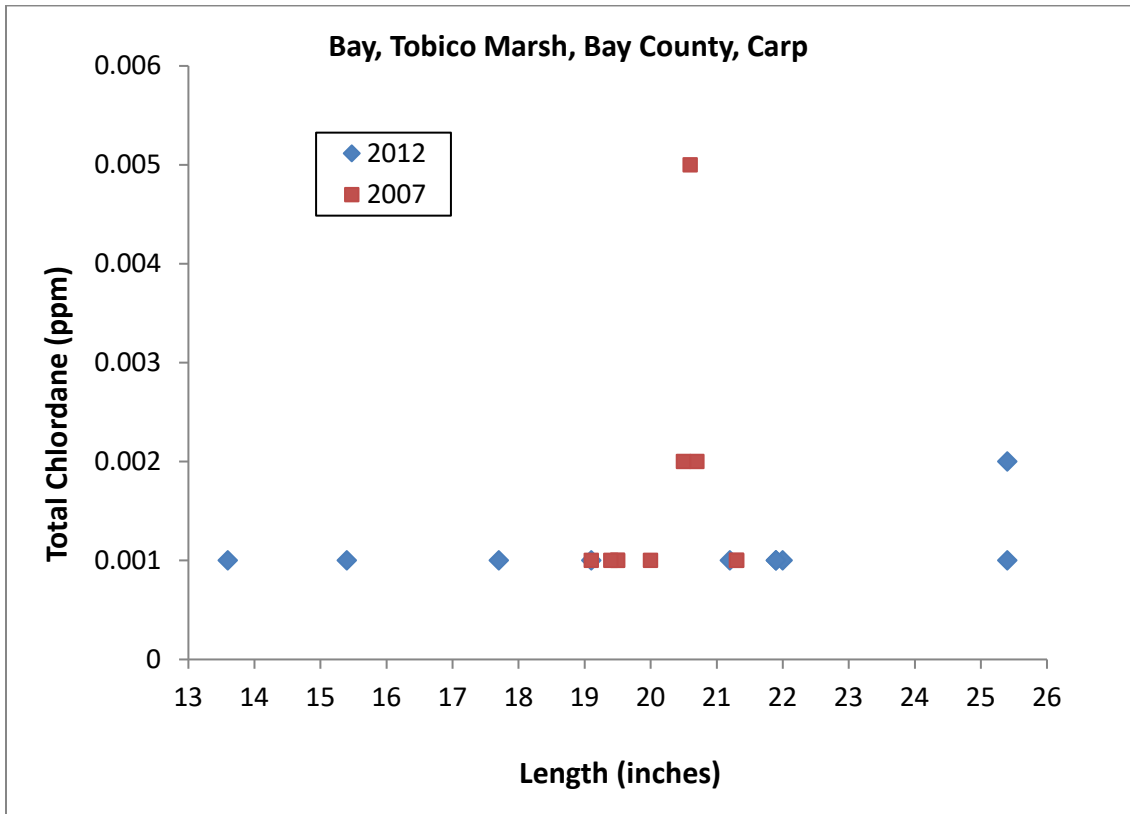
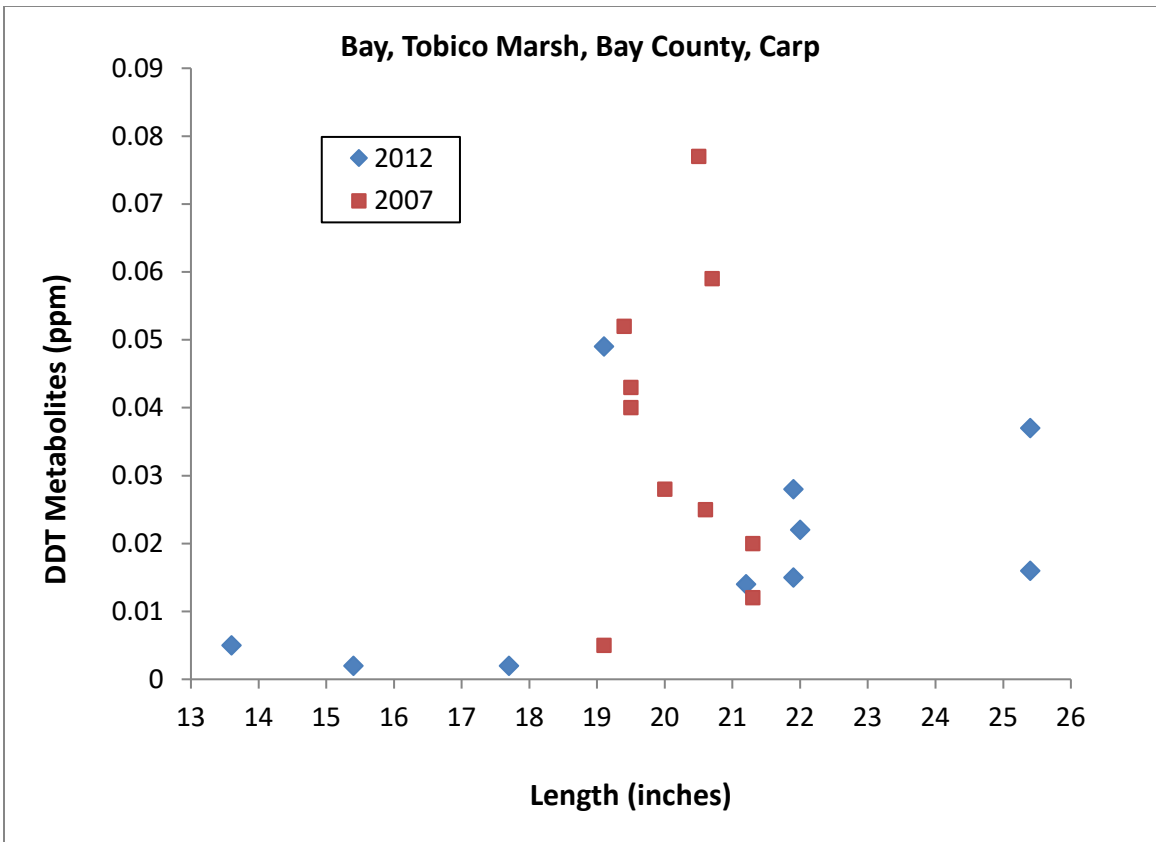
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2007	2012	20	13.6	na	13.6	25.4	
Datasets available: 1996, 2007, 2012							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	20	0.09		0.001	0.69	0.16	1
DDT	20	0.03		0.002	0.08	0.04	16
Chlordane	20	0.001		0.001	0.005	0.002	--
Toxaphene	20	ND		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.016	0.225					
DDT	0.052	0.241					
Chlordane	0.021	0.042					
Toxaphene	--	--					
Final meal category based on UCL:							1*

Existing Advisory: No one should eat more than 6 meals per year of Tobico Marsh carp due to PCBs.

Recommendation: No change. *An additional year of data to confirm the reduction in PCBs is needed before this guideline is changed.





Largemouth Bass

**Tobico Marsh
(Wetland)**

Bay 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	14	14.8	17.6
Datasets available: 2007						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL (ppm)	Meal Category	
Mercury	7	0.27		0.37	2	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.670	0.594				

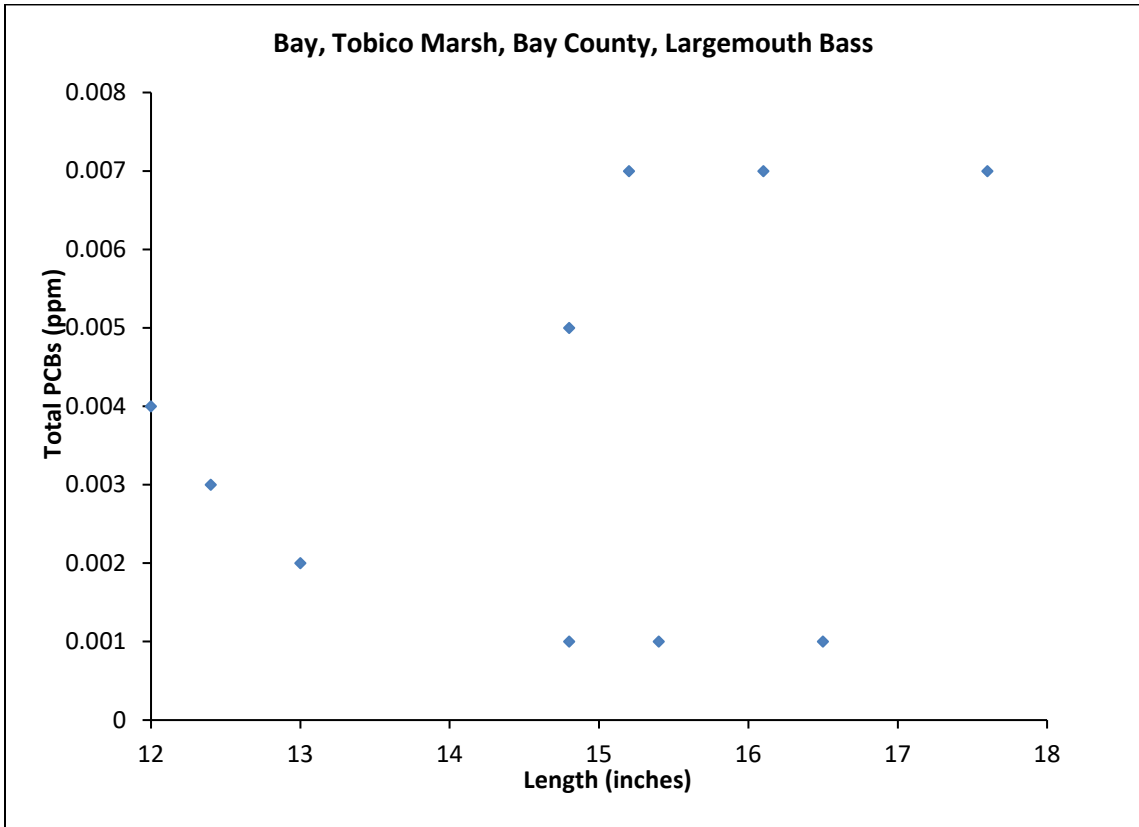
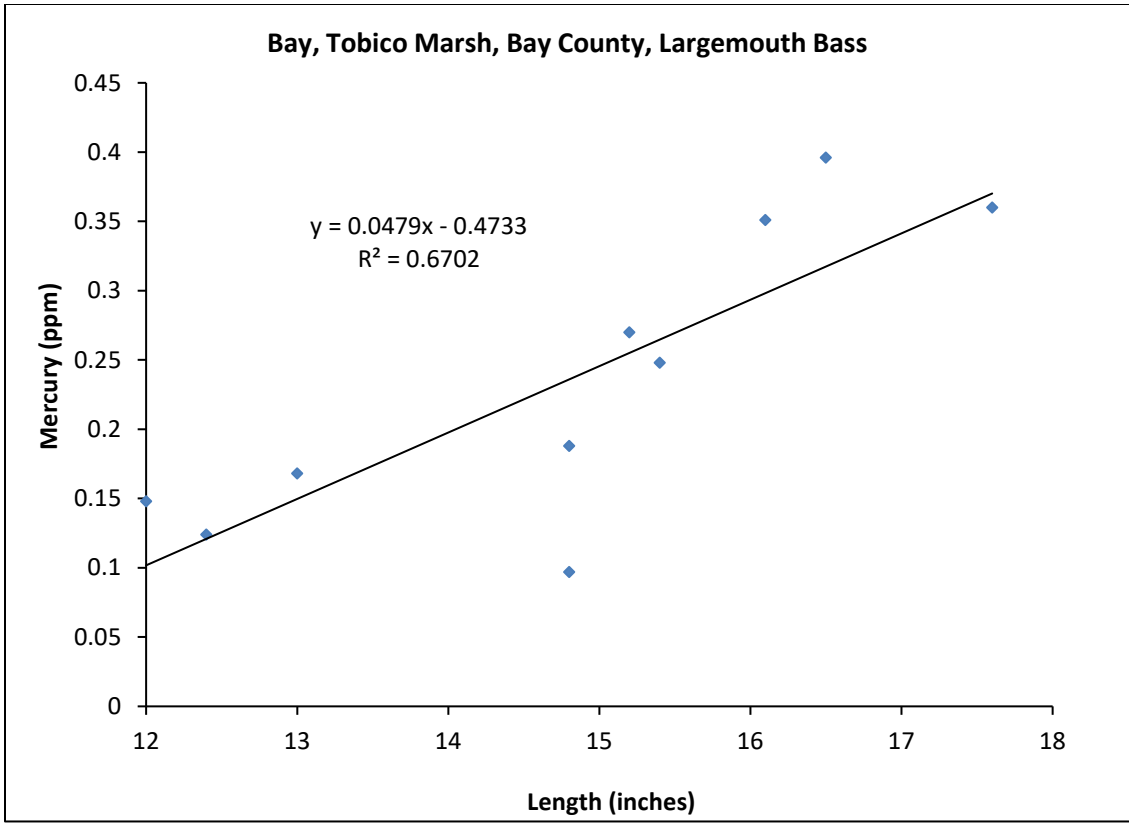
Organics Analysis:

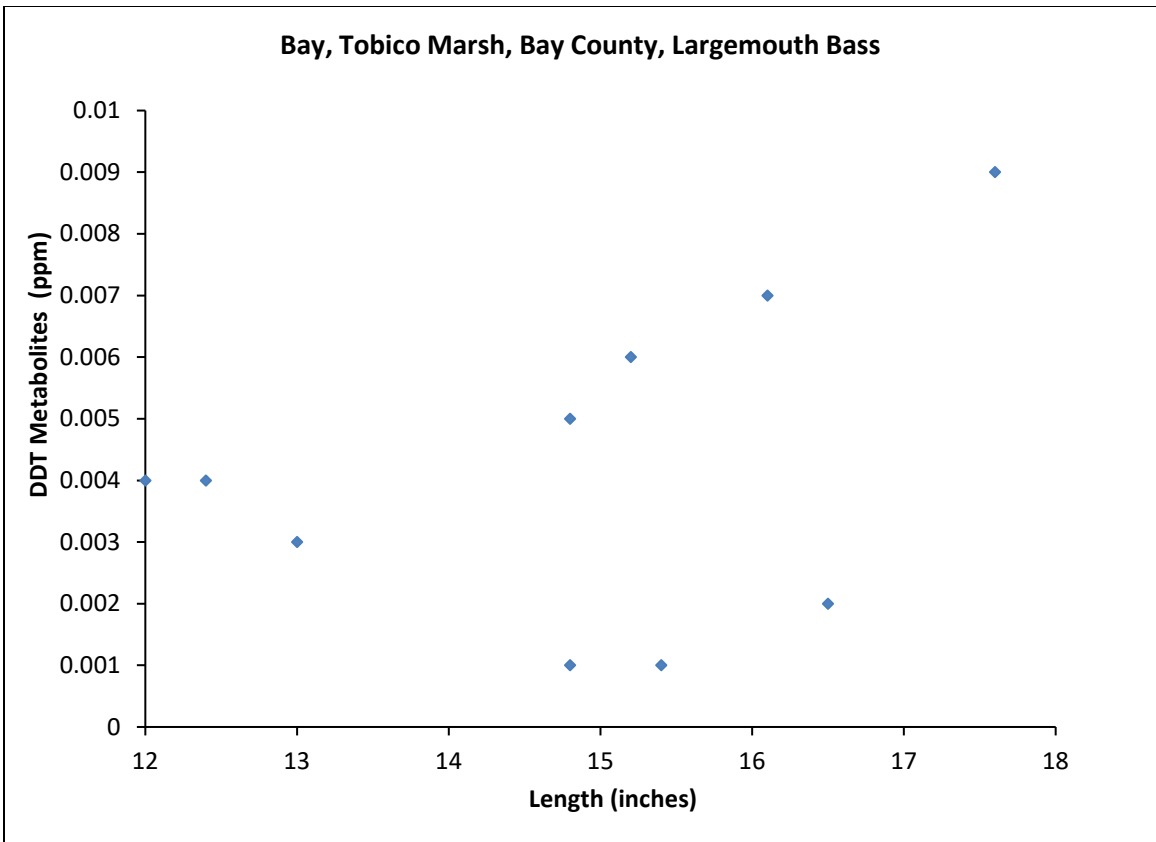
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2007	2007	10	12	14	14.8	17.6
Datasets available: 2007						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL (ppm)	Meal Category	
PCB	7	0.004		0.01	16	
DDT	7	0.004		0.01	16	
Chlordane	7	ND		--	--	
Toxaphene	7	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.089	0.008				
DDT	0.128	0.017				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						2

Existing Advisory: Tobico Marsh largemouth bass are covered under the statewide mercury consumption advisory.

Recommendation: No one should eat more than 2 meals per month of Tobico Marsh largemouth or smallmouth bass smaller than 18 inches or more than 1 meal per month of those fish larger than 18 inches. Statewide length break applied. Larger sizes set to one meal category more restrictive.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
14	0.197	4
15	0.245	4
16	0.293	2
17	0.341	2
18	0.389	2
19	0.437	2
20	0.485	2
21	0.533	1
22	0.581	1
<i>Shaded area denotes extrapolated estimates</i>		





Northern Pike

**Tobico Marsh
(Wetland)**

Bay County

Hg Analysis:

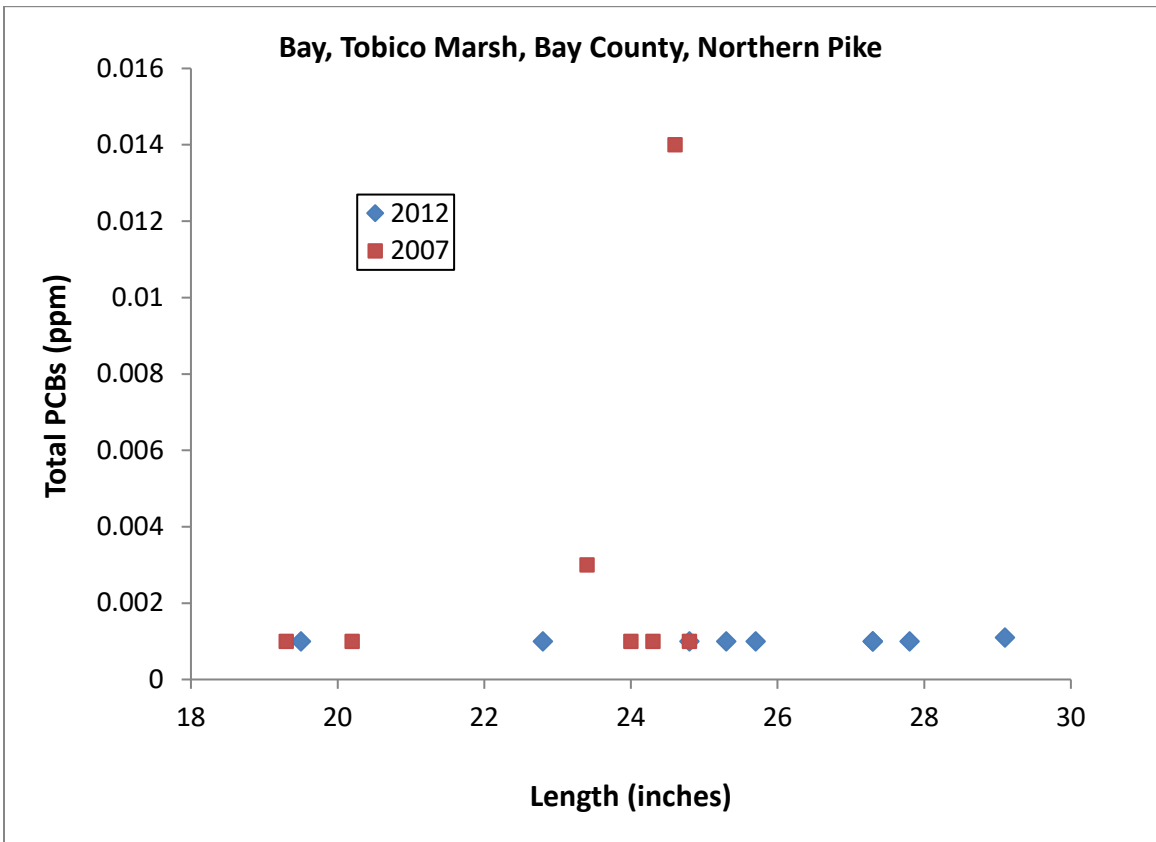
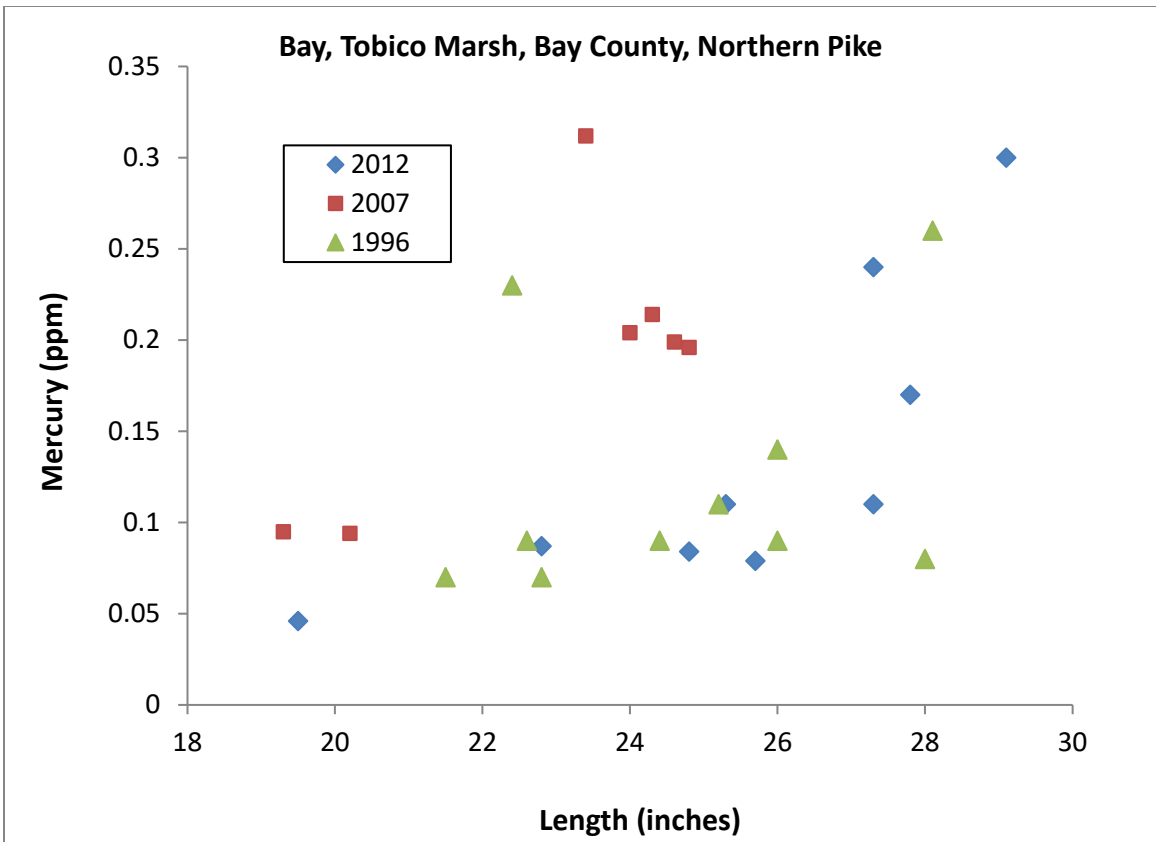
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1996	2012	26	19.3	24	24.0	29.1
Datasets available: 1996, 2007, 2012						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	17	0.16	0.08	0.30	0.19	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.161	0.202				

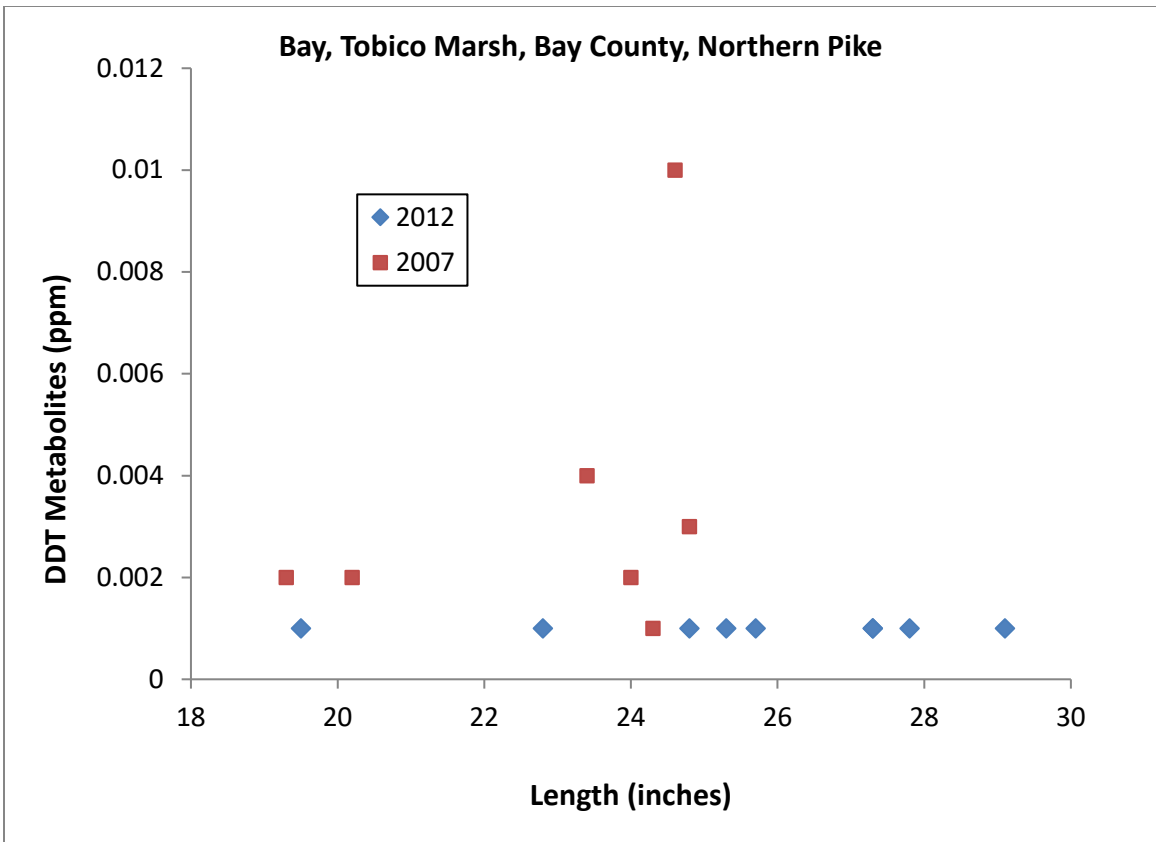
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2007	2012	16	19.3	24	29.1	
Datasets available: 1996, 2007, 2012						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	11	0.002	0.001	0.014	0.005	16
DDT	11	0.002	0.001	0.01	0.004	16
Chlordane	11	ND	--	--	--	--
Toxaphene	11	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.000	0.000				
DDT	0.010	0.059				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						4

Existing Advisory: No one should eat more than 4 meals per month of Tobico Marsh northern pike less than 30 inches, or 2 meals per month of northern pike greater than 30 inches due to mercury.

Recommendation: No change. The statewide length break was applied as the size range of the fish was limited.





Cass River Saginaw and Tuscola Counties

Black Bullhead

Cass River

Saginaw County

Hg Analysis:

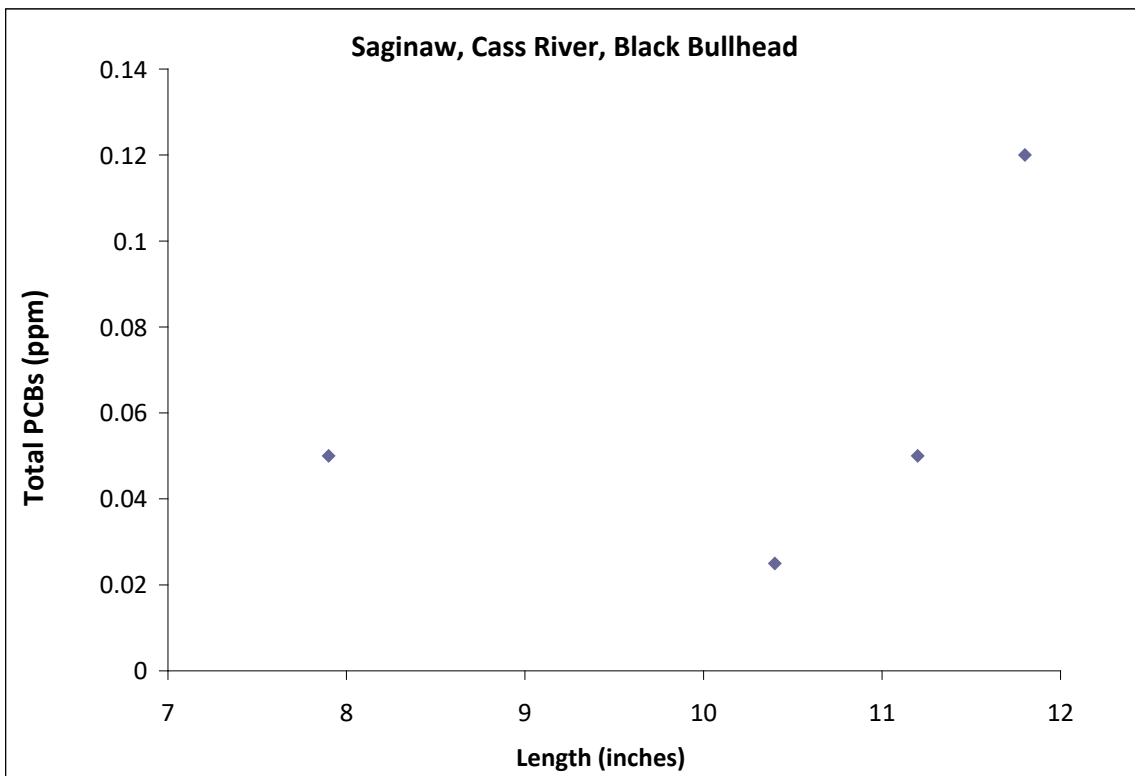
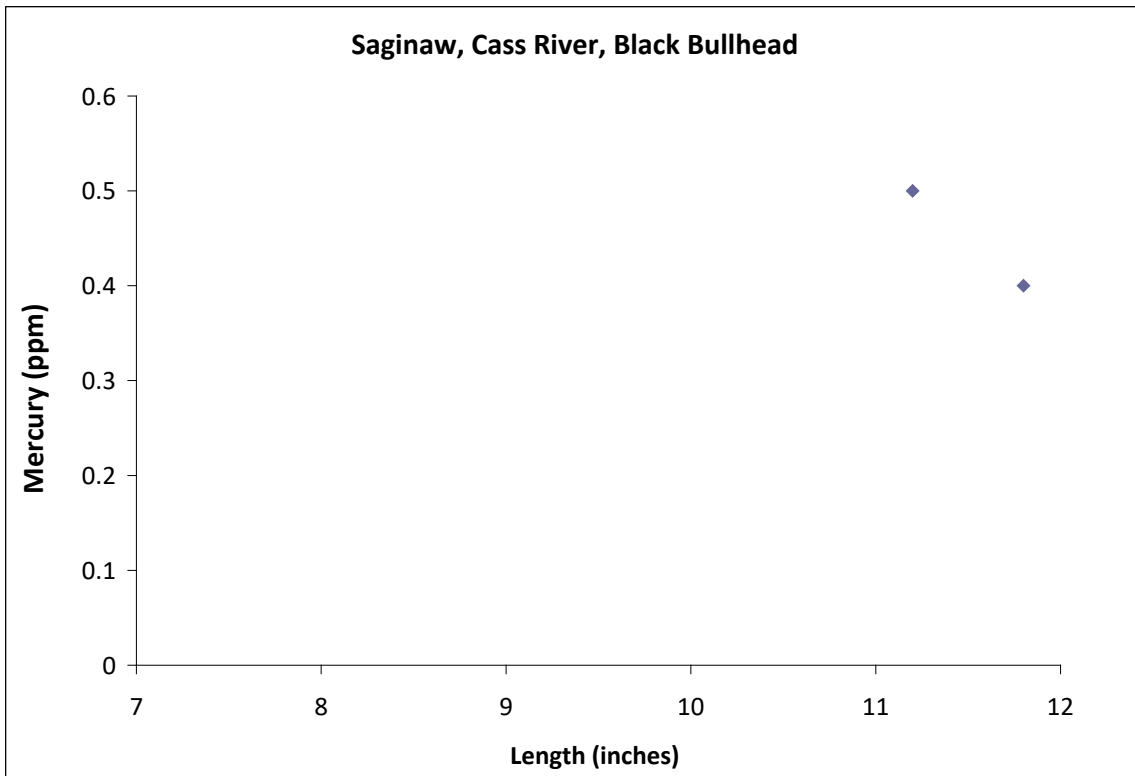
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1985	1985	2	11.2	na	11.2	11.8
Datasets available:		1985				
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	2	0.450		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

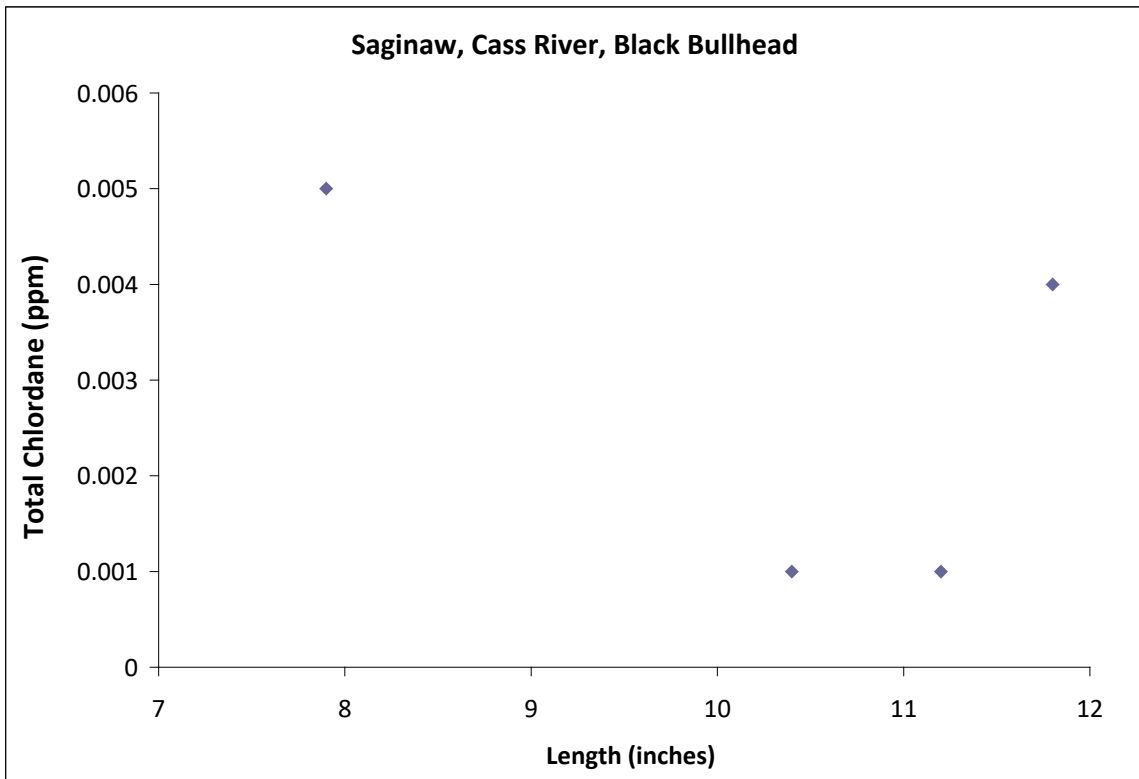
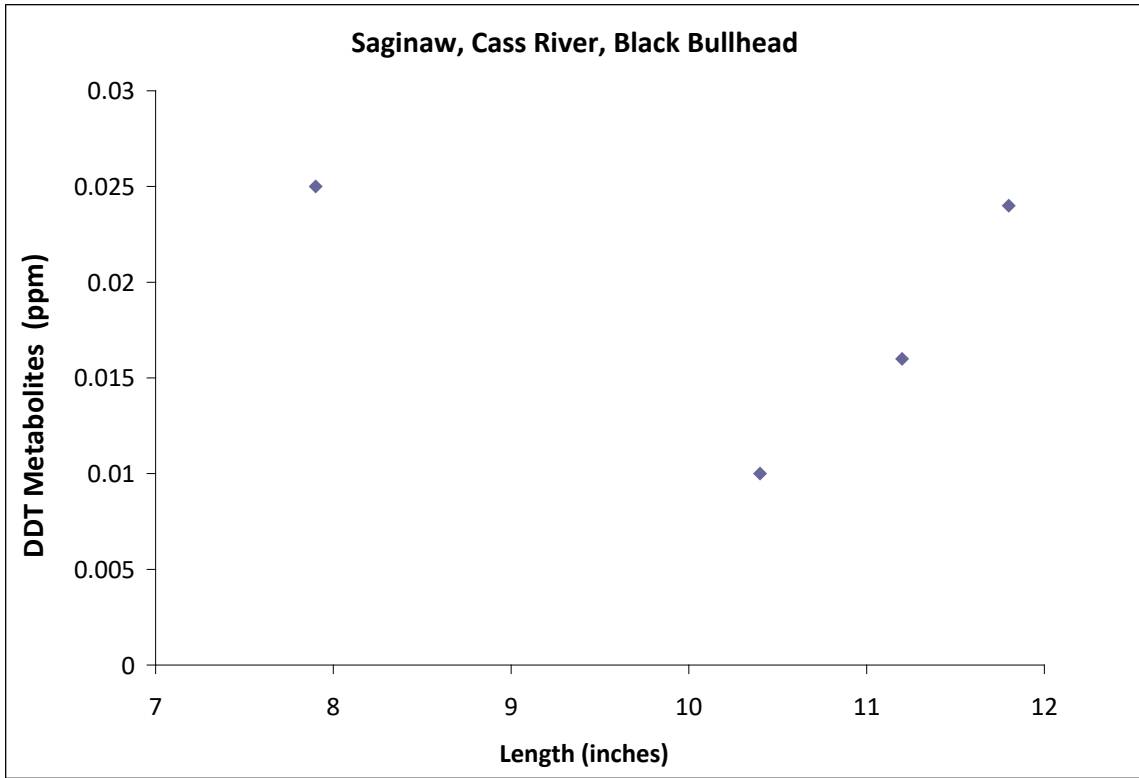
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1985	1985	4	7.9	na	7.9	11.8
Datasets available:		1985				
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	4	0.061		--		--
DDT	4	0.019		--		--
Chlordane	4	0.003		--		--
Toxaphene	4	ND		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.232	0.140				
DDT	0.082	0.056				
Chlordane	0.247	0.172				
Toxaphene				Final meal category based on UCL:		

Existing Advisory: Cass River black bullhead are not covered by an advisory.

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





Carp

**Cass River
Downstream of Frankenmuth**

Saginaw County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1992	2004	19	13.7	na	13.7	26.8
Datasets available: 1992, 2004						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	19	0.221		0.250	4	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.001	0.000				

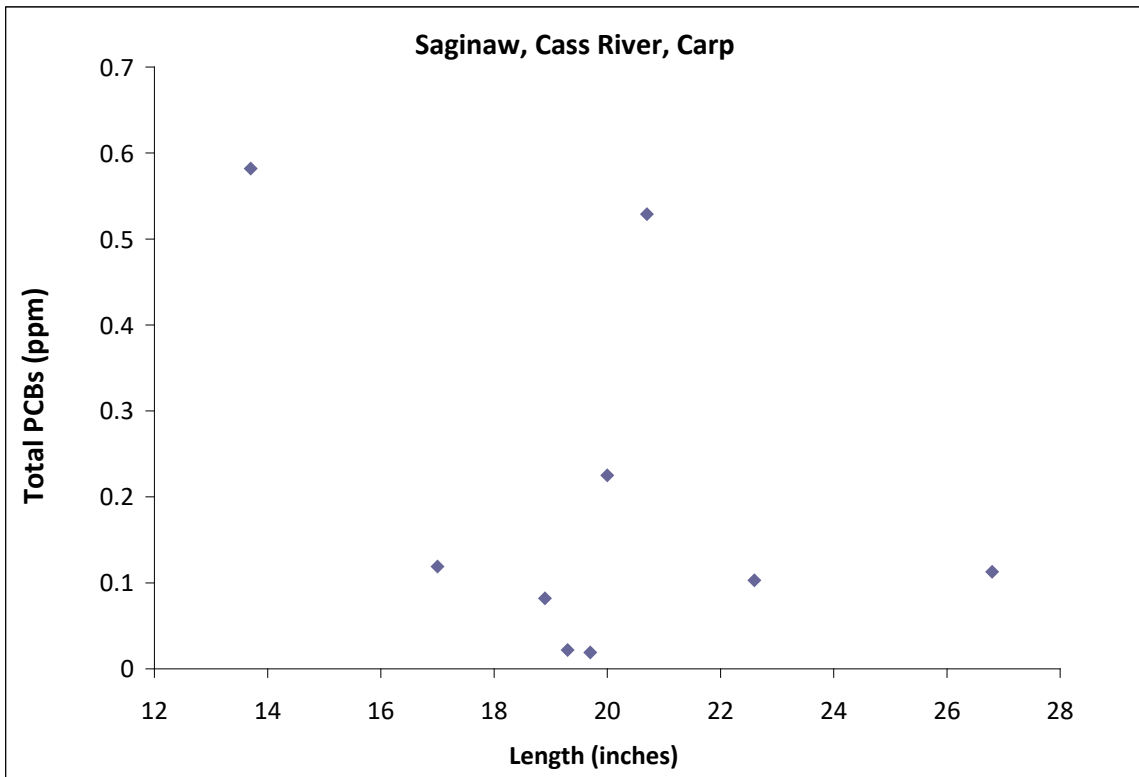
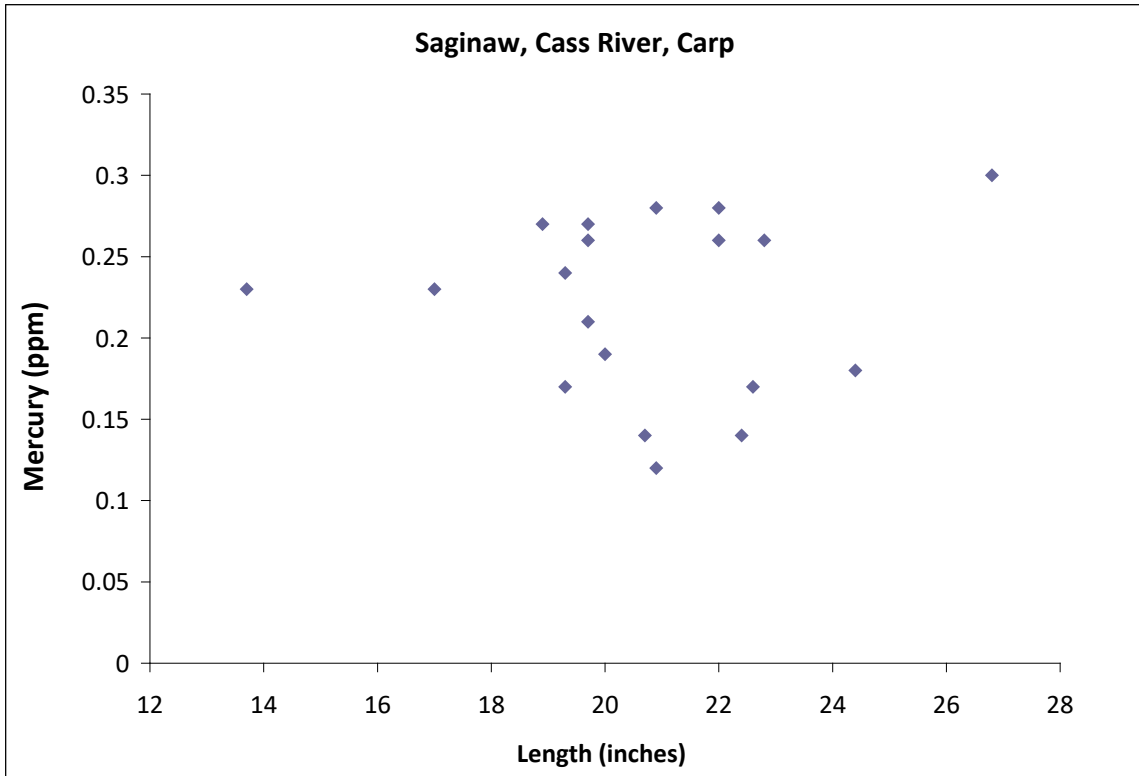
Organics Analysis:

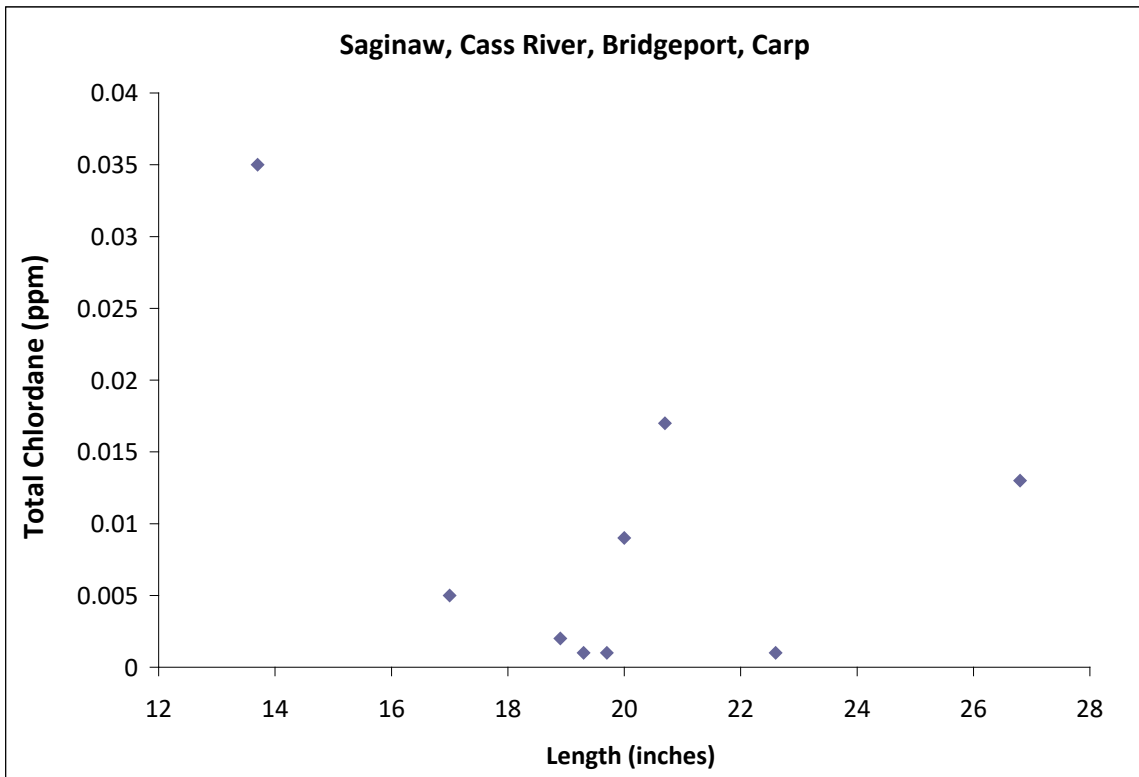
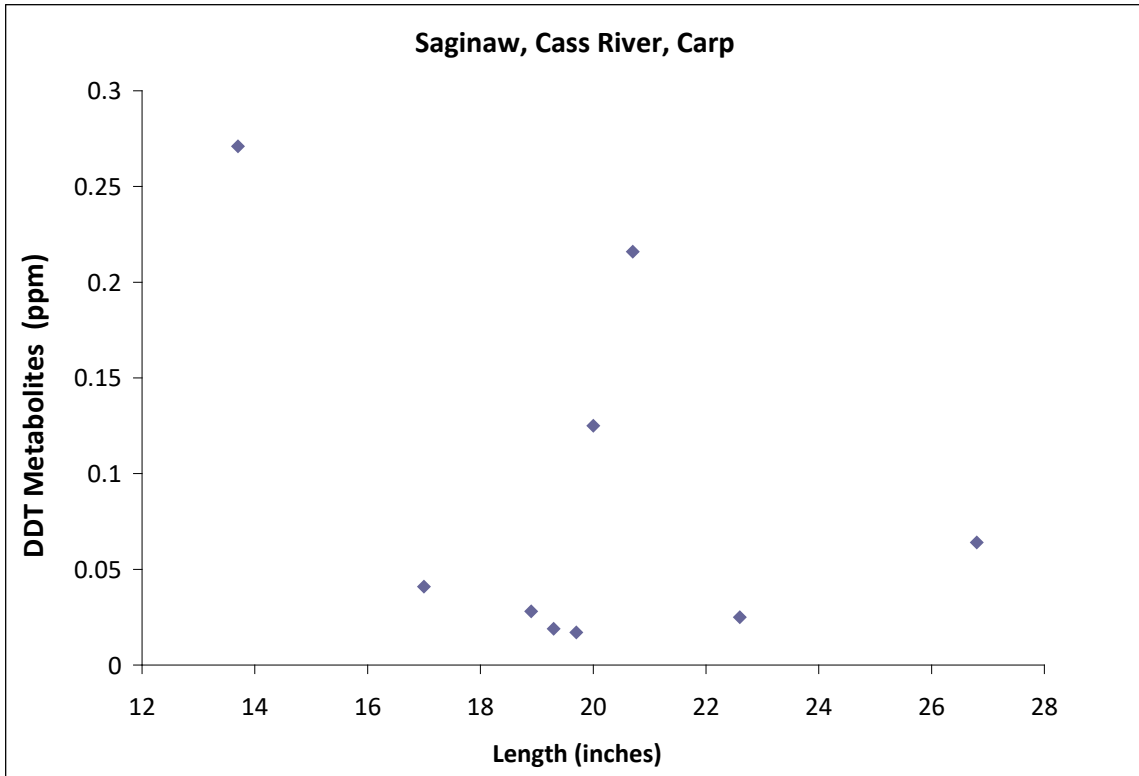
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2004	2004	9	13.7	na	13.7	26.8
Datasets available: 1985, 1992, 2004						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	9	0.199		0.360	0.5	
DDT	9	0.090		0.160	8	
Chlordane	9	0.009		0.020	--	
Toxaphene	9	ND		--	--	
TEQ*	9	6.1 ppt		11.6 ppt	0.5	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.165	0.048				
TEQ*	0.122	0.009				
DDT	0.167	0.060				
Chlordane	0.146	0.028				
Toxaphene						
					Final meal category based on UCL: 0.5	

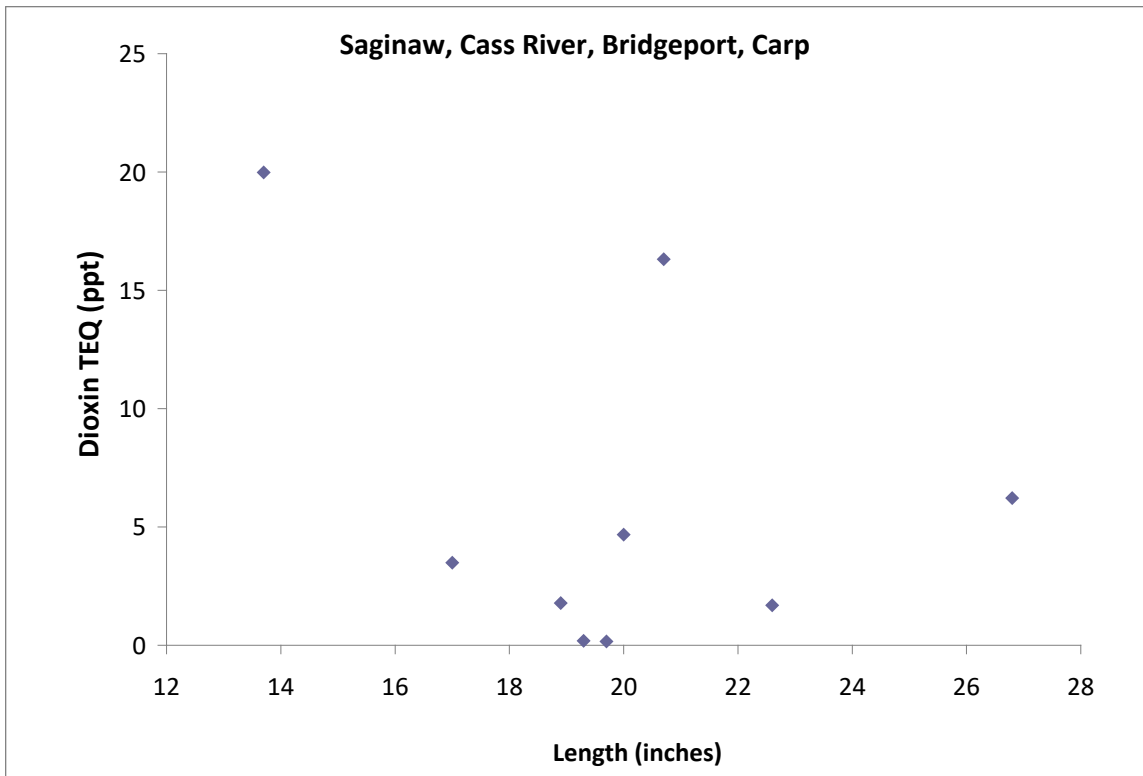
* TEQ based on 2005 WHO TEFs including coPCBs

Existing Advisory: The general population should not more than 1 meal per week and women and children should not eat any carp from the Cass River downstream of Frankenmuth due to elevated levels of PCBs and dioxins.

Recommendation: No one should eat more than 6 meals per year of the Cass River carp downstream of Frankenmuth due to dioxin TEQ and PCBs. Mercury and DDT would cause advisories.







Channel Catfish

**Cass River
Downstream of Frankenmuth**

Saginaw County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1985	2004	21	11.4	12	12.1	20.9
Datasets available: 1985, 1992, 2004						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	19	0.241		0.330	2	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.463	0.337				

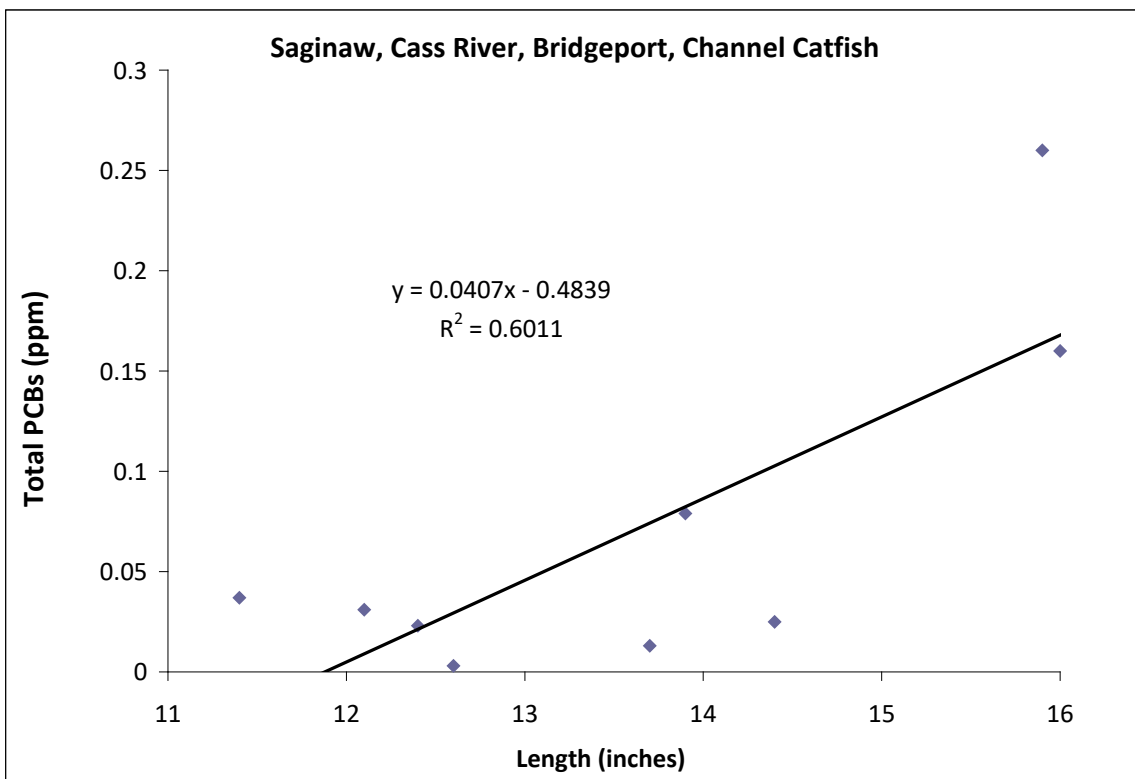
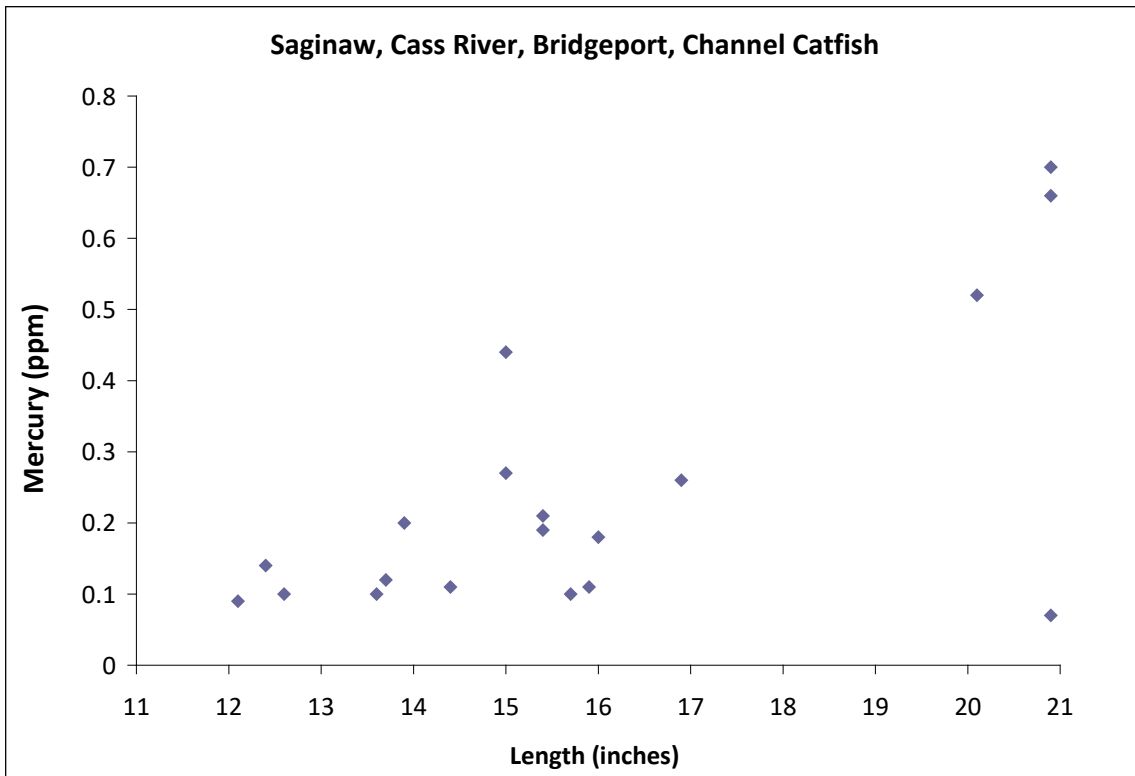
Organics Analysis:

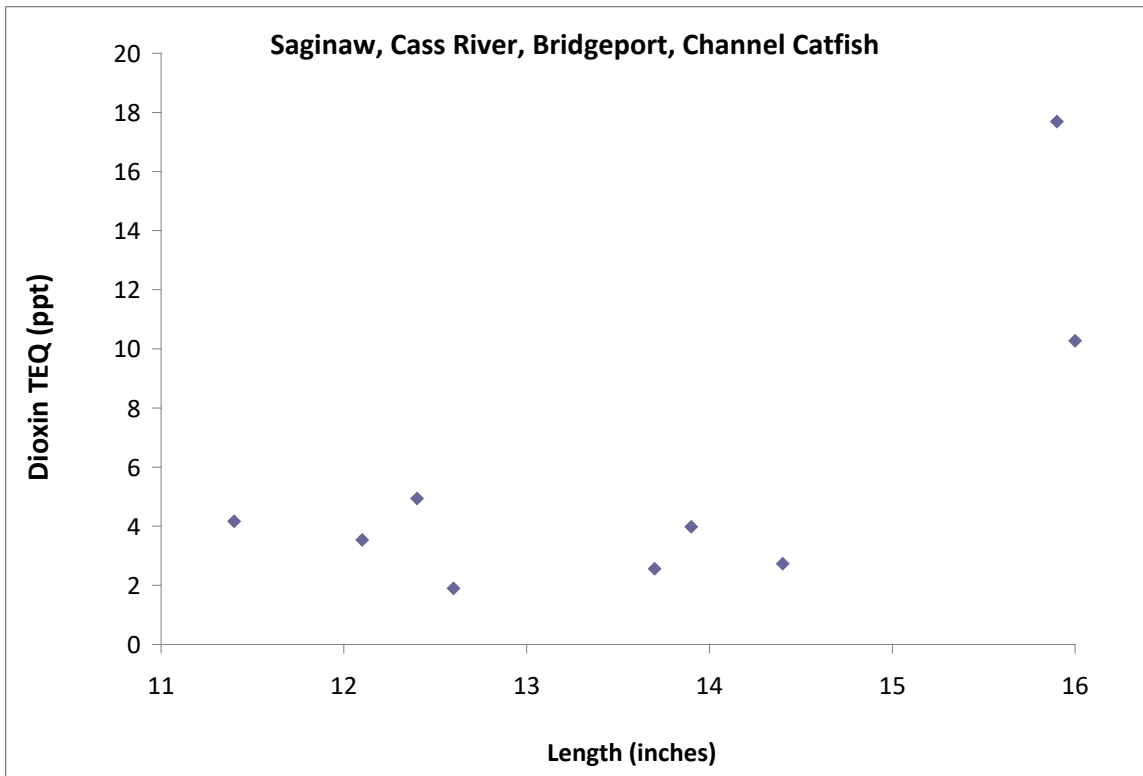
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2004	2004	9	11.4	12	12.1	16
Datasets available: 2004						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	8	0.074		0.150	1	
DDT	9	ND		--	--	
Chlordane	9	ND		--	--	
Toxaphene	9	ND		--	--	
TEQ	8	5.95 ppt		10.1 ppt	0.5	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.601	0.408				
TEQ	0.490	0.415				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:					0.5	

Existing Advisory: No one should eat Cass River channel catfish greater than 14 inches in length. Women and children should consume no more than one meal per week of Cass River channel catfish between 12 and 14 inches in length due to elevated levels of dioxins, mercury and PCBs.

Recommendation: No one should eat more than 6 meals per year of Cass River channel catfish due to dioxin TEQ. Mercury and PCBs would cause advisories.

Length (Inches)	PCB Regression Equation Estimate (ppm)	Meal Category
12	0.005	16
14	0.086	2
16	0.167	1
18	0.249	0.5
20	0.330	0.5
22	0.412	0.5
24	0.493	0
<i>Shaded area denotes extrapolated estimates</i>		





Freshwater Drum

**Cass River
Downstream of Frankenmuth**

Saginaw County

Hg Analysis:

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

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1985	1985	1	14	na	14	14
Datasets available: 1985						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL	Meal Category
PCB	1	0.154			--	--
DDT	1	0.059			--	--
Chlordane	1	0.015			--	--
Toxaphene	1	NA			--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						na

Existing Advisory: Cass River freshwater drum are not covered by an advisory.

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

**Largemouth Bass
Smallmouth Bass**

**Cass River
Downstream of Frankenmuth**

Saginaw County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1992	1992	1	13	14	13	13
Datasets available: 1992						
Chemical	Sample Size (Sub-Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	1	--	0.28	0.28	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1985	1992	10	7.5	14	14.4	14.4
Datasets available: 1985, 1992						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	1	--	0.163	0.163	--	--
DDT	1	--	0.050	0.050	--	--
Chlordane	1	--	0.013	0.013	--	--
Toxaphene	--	--	--	--	--	--
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 Cass River largemouth bass.

Recommendation: The statewide guideline applies to Cass River largemouth and smallmouth bass. This dataset is limited due to sample size and age of data, and is not usable to provide a recommendation.

Northern Pike

**Cass River
Downstream of Frankenmuth**

Saginaw County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1992	1992	5	18.9	24	31.7	31.7
Datasets available: 1992						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	1	0.370		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.015	0.027				

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	5	18.9	24	31.7	31.7
Datasets available: 1992						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	1	0.196		--		--
DDT	1	0.046		--		--
Chlordane	1	0.003		--		--
Toxaphene	1	ND		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.188	0.311				
DDT	0.033	0.162				
Chlordane	0.012	0.012				
Toxaphene				Final meal category based on UCL:		--

Existing Advisory: Women and children should eat no more than one meal per month of Cass River northern pike greater than 26 inches in length and no more than 1 meal per week of northern pike less than 26 inches in length due to elevated concentrations of PCBs.

Recommendation: The statewide guideline applies to Cass River northern pike. This dataset is limited due to sample size and age of data, and is not usable to provide a recommendation.

Carp

**Cass River
Upstream of Caro Dam**

Tuscola County

Hg Analysis:

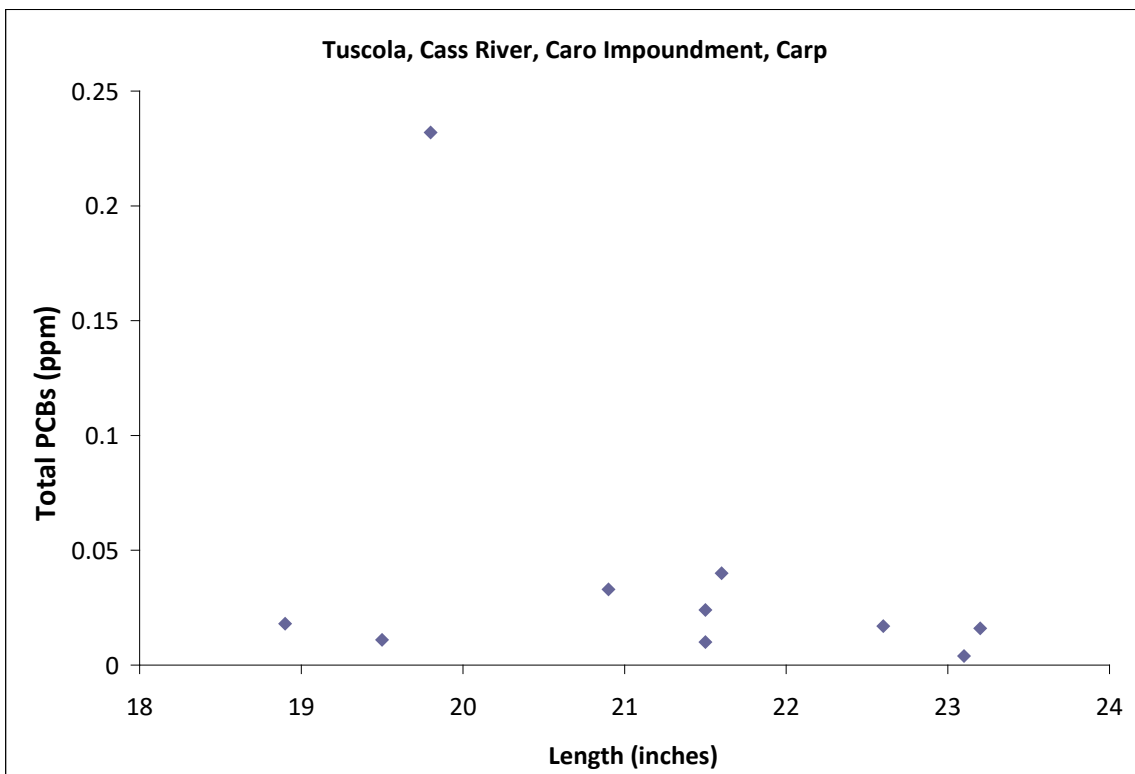
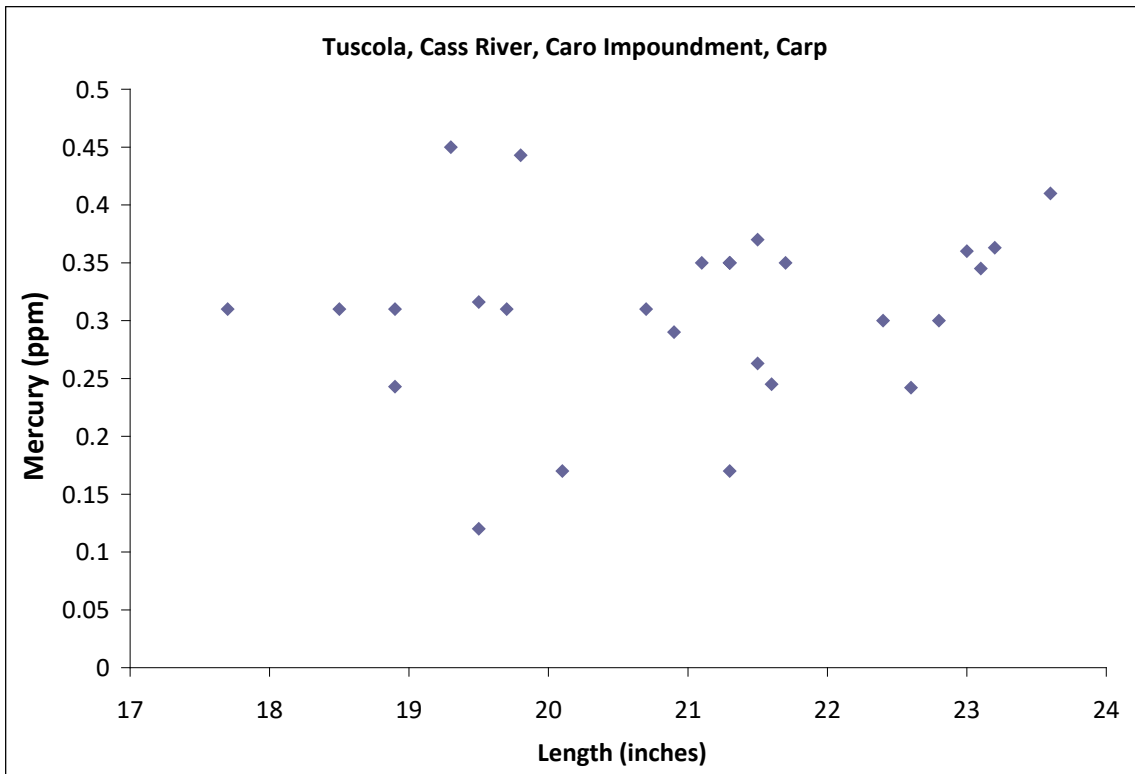
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1988	2006	20	17.7	na	17.7	23.2
Datasets available: 1988, 1998, 2006						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	30	0.320		0.350		2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.011	0.009				

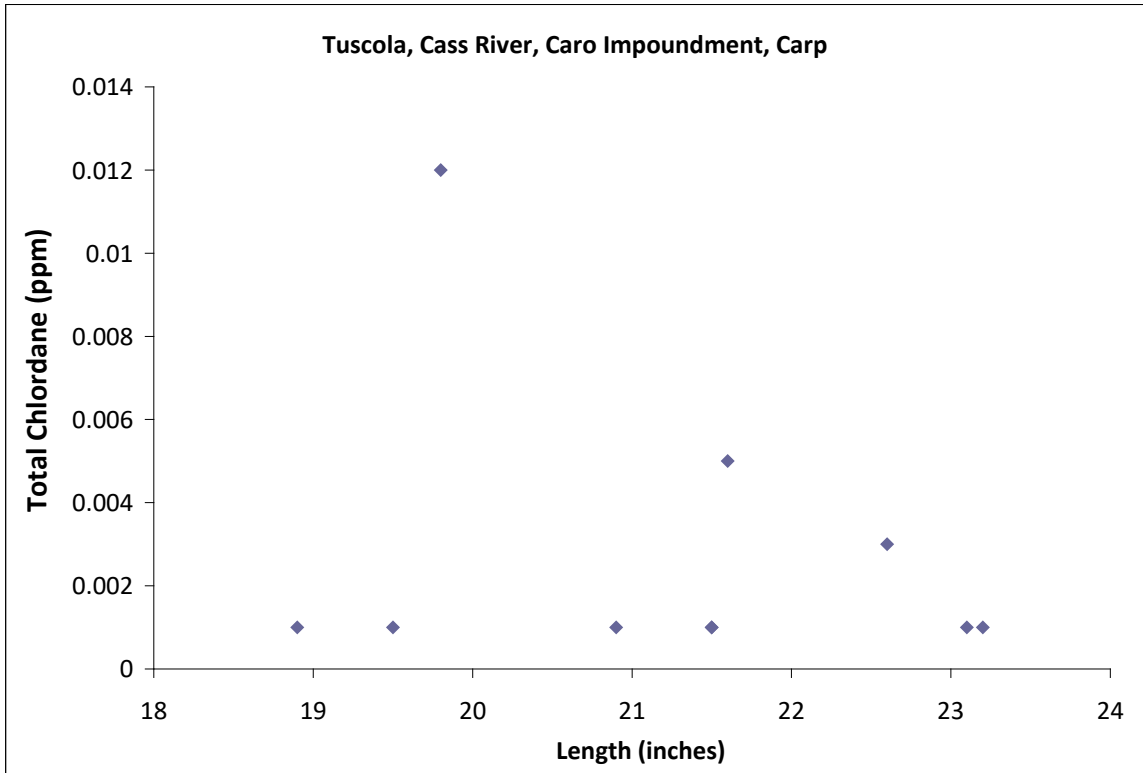
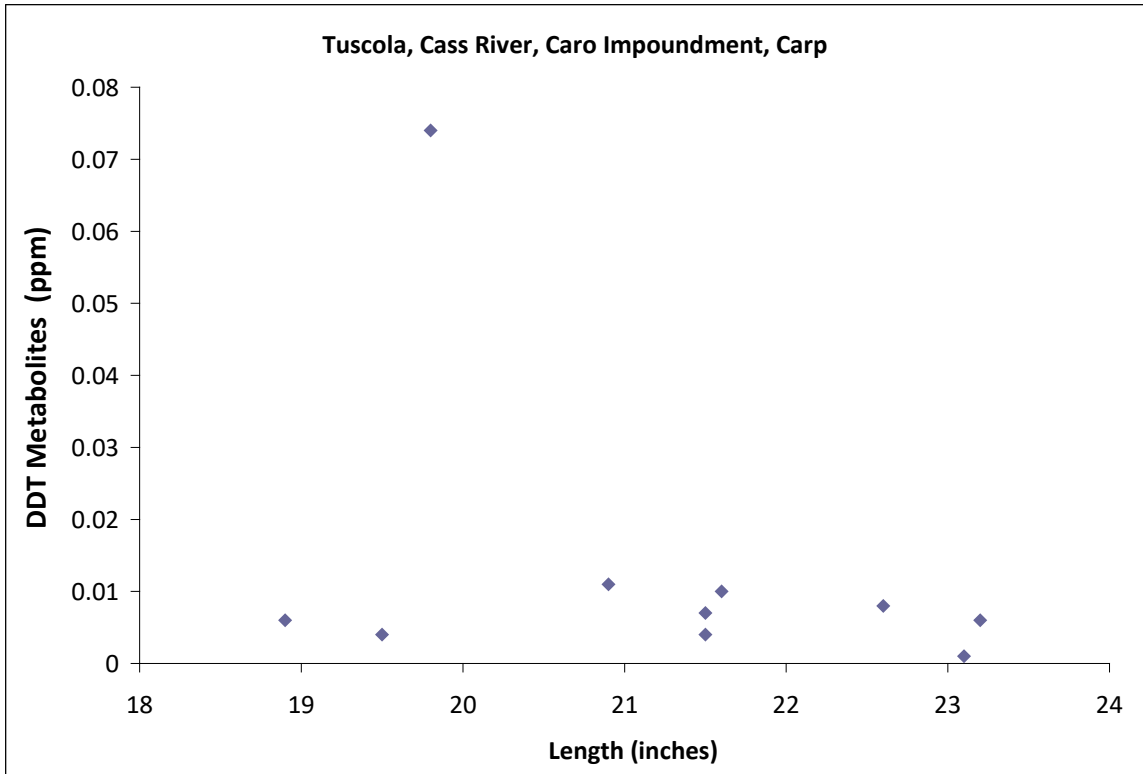
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2006	2006	10	18.9	na	18.9	23.2
Datasets available: 2006						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	10	0.041		0.090		2
DDT	10	0.013		0.030		16
Chlordane	10	0.003		0.010		--
Toxaphene	10	ND		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.129	0.172				
DDT	0.126	0.171				
Chlordane	0.064	0.018				
Toxaphene				Final meal category based on UCL:		2

Existing Advisory: Women and children should eat no more than one meal per week of Caro Impoundment carp of any size due to elevated levels of PCBs.

Recommendation: No one should eat more than 2 meals per month of Caro Impoundment carp due to PCBs and mercury.





Largemouth Bass

**Cass River
Upstream of Caro Dam**

Tuscola County

Hg Analysis:

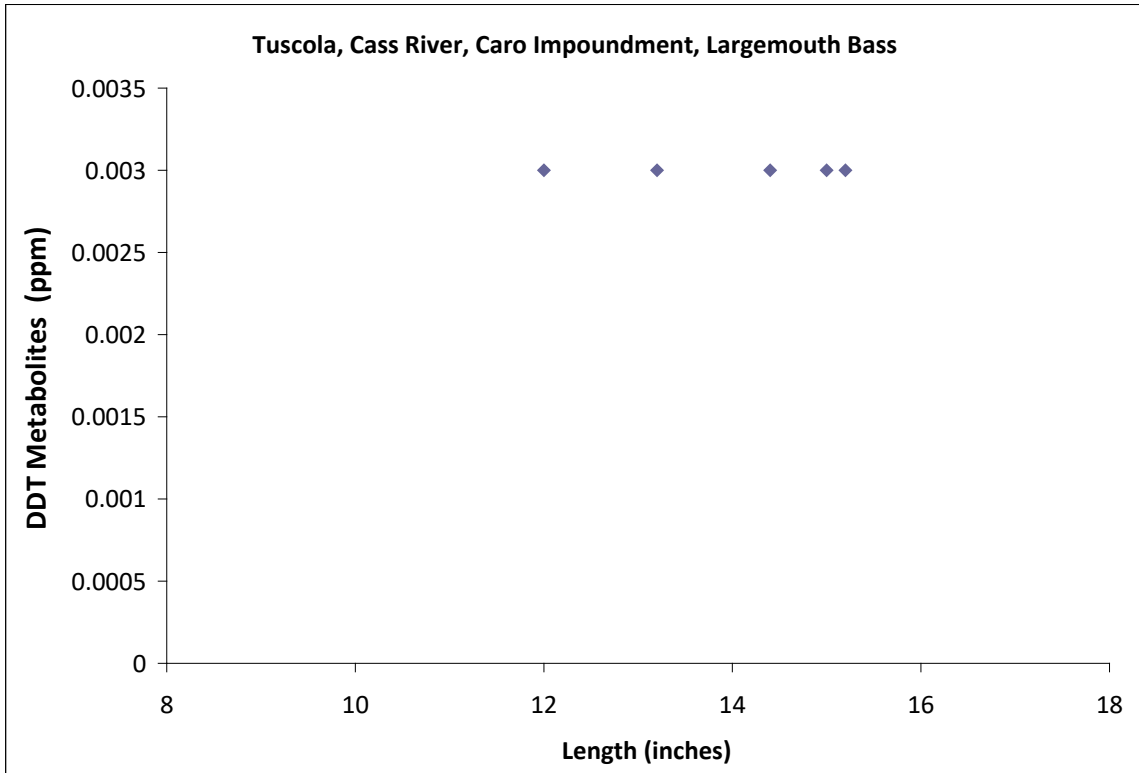
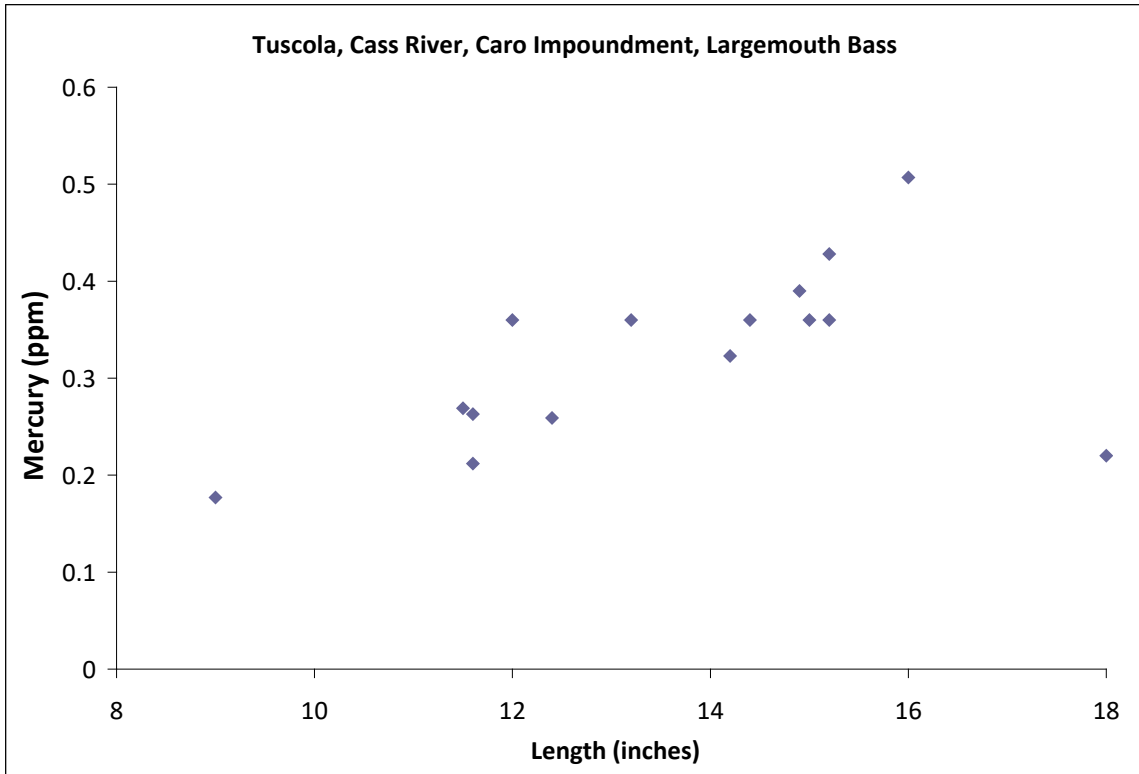
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		95%UCL	Meal Category
Earliest	Most Recent				Min	Max		
1998	2006	15	9	14	14.9	18		
Datasets available: 1998, 2000, 2006								
Chemical	Sample Size (Legal)	Mean (ppm)						
Mercury	6	0.3775			0.480			2
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
Mercury	0.284	0.290						

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		95%UCL	Meal Category
Earliest	Most Recent				Min	Max		
1998	2000	5	12	14	15	15.2		
Datasets available: 1998, 2000								
Chemical	Sample Size (Legal)	Mean (ppm)						
PCB	2	ND			--			--
DDT	2	0.003			0.003			16
Chlordane	2	ND			--			--
Toxaphene	2	ND			--			--
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
PCB	na	na						
DDT	na	na						
Chlordane	na	na						
Toxaphene	na	na						
Final meal category based on UCL:								2

Existing Advisory: Caro Impoundment largemouth bass are covered under the statewide mercury consumption advisory.

Recommendation: No one should eat more than 2 meals per month of Caro Impoundment largemouth bass less than 18 inches or 1 meal per month of Caro Impoundment largemouth bass greater than 18 inches due to mercury.



Northern Pike

**Cass River
Upstream of Caro Dam**

Tuscola County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1988	1988	10	16.9	24	24.6	28.3
Datasets available: 1988						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	4	0.513		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.707	0.756				

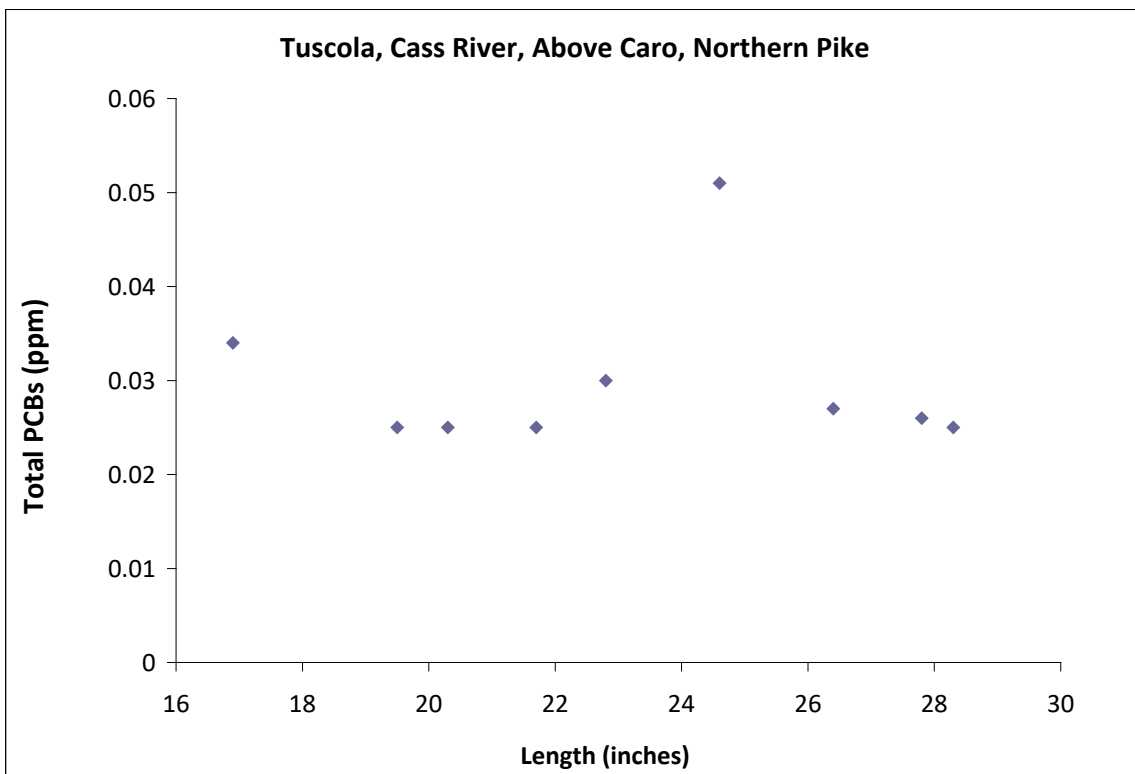
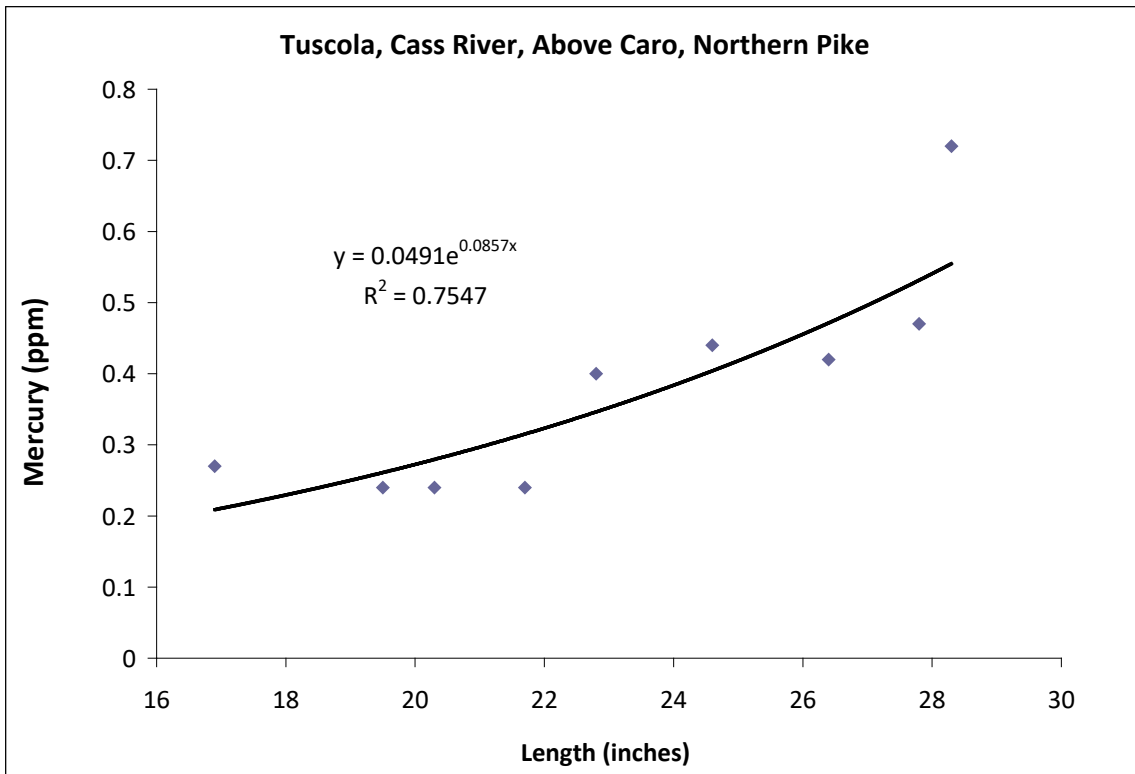
Organics Analysis:

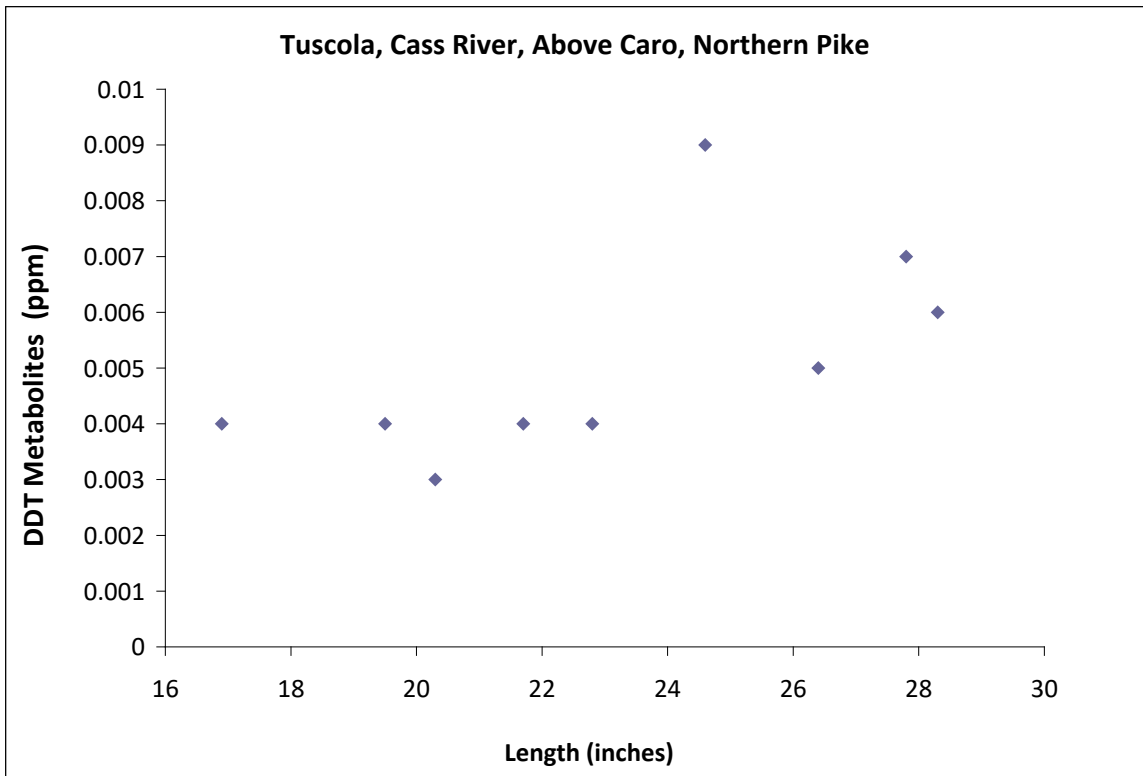
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1988	1988	10	16.9	24	24.6	28.3
Datasets available: 1988						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	4	0.032		--		--
DDT	4	0.007		--		--
Chlordane	4	ND		--		--
Toxaphene	4	ND		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.001	0.016				
DDT	0.315	0.344				
Chlordane						
Toxaphene						
Final meal category based on UCL:						--

Existing Advisory: Caro Impoundment northern pike are covered under the statewide mercury consumption advisory.

Recommendation: No one should eat more than 2 meals per month of northern pike less than 26 inches or 1 meal per month of northern pike greater than 26 inches from the Cass River upstream of the Caro Dam. This dataset is limited by age of the data. Based on EGLE's Fish Contaminant Monitoring Program (FCMP), temporal changes in Hg concentrations are waterbody specific in Michigan. The EGLE FCMP finds that mercury concentration in fish are either staying the same or increasing.

Length (Inches)	Hg Regression Estimate (ppm)	Meal Category
24	0.384	2
26	0.456	2
28	0.541	1
30	0.642	1
32	0.762	1
34	0.905	1
36	1.074	1
38	1.275	0.5
<i>Shaded area denotes extrapolated estimates</i>		





Redhorse Sucker

**Cass River
Upstream of Caro Dam**

Tuscola County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2005	2005	10	15.2	na	15.2	23.5
Datasets available: 2005						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	10	0.299		0.410	2	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.600	0.490				

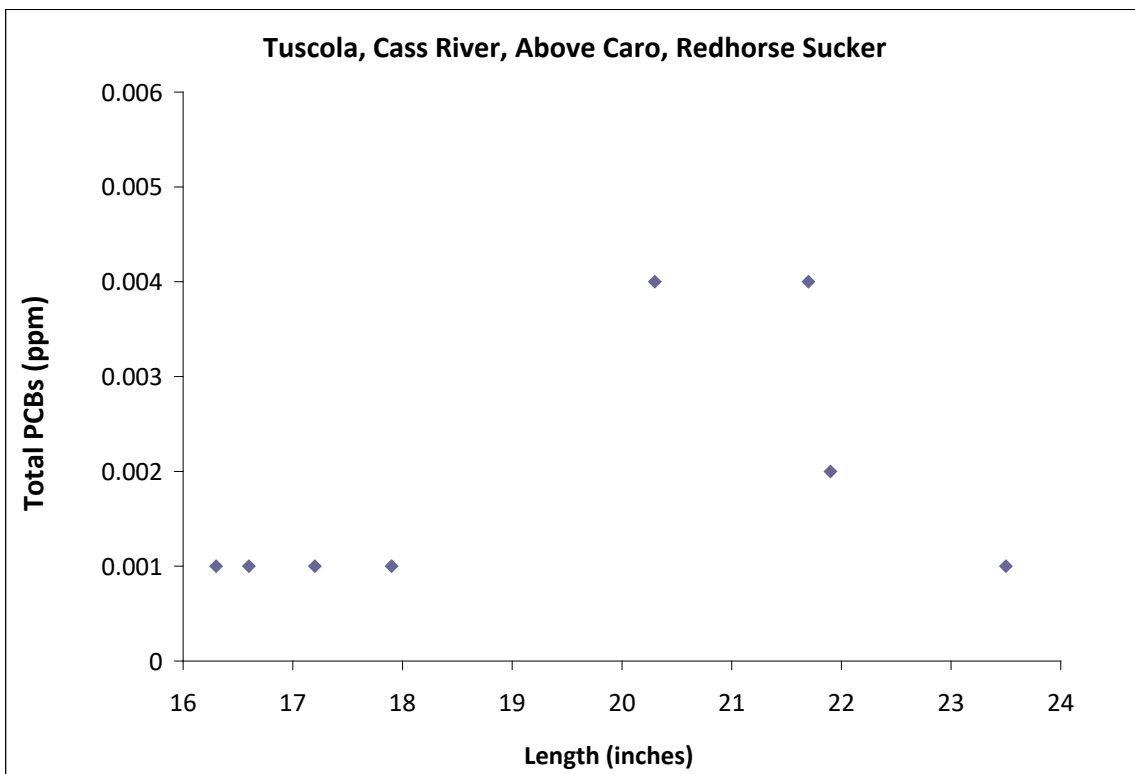
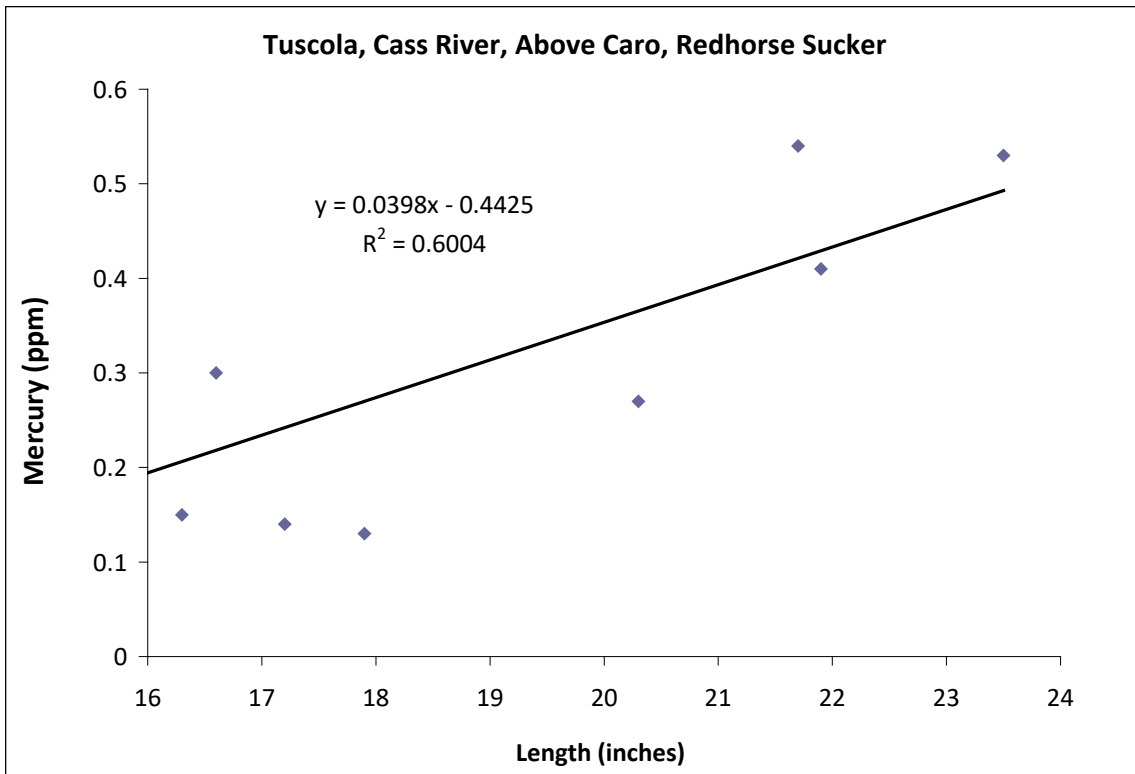
Organics Analysis:

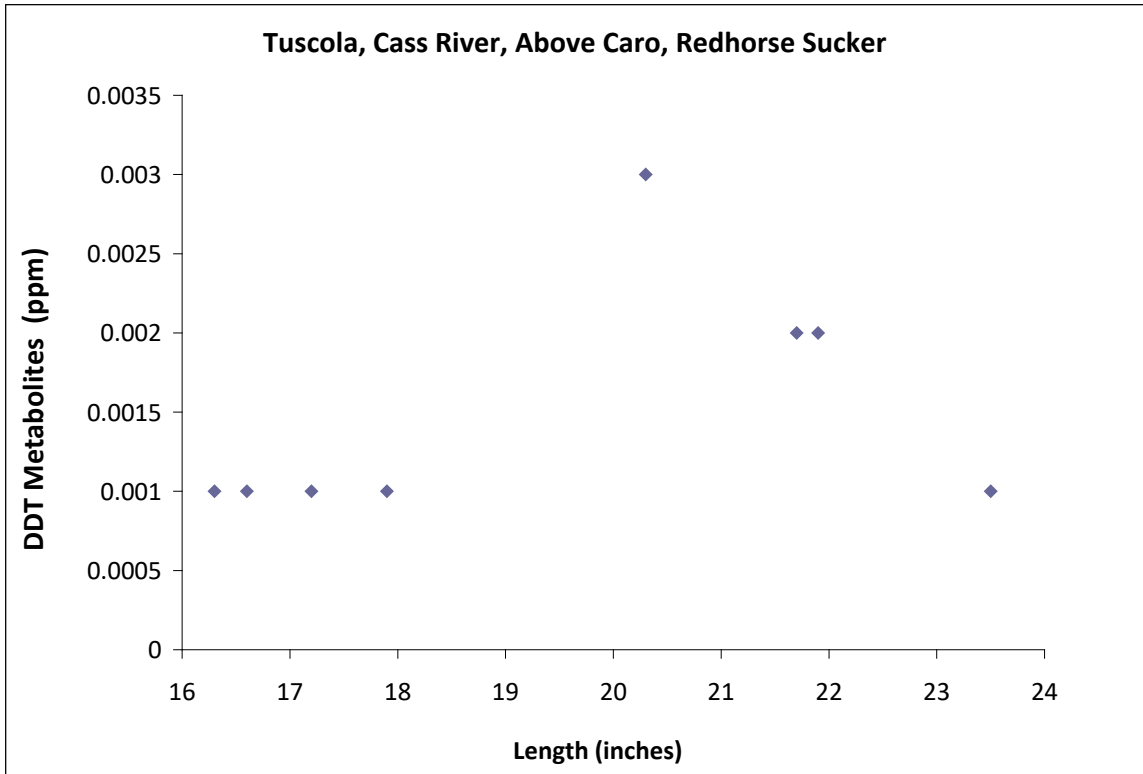
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2005	2005	10	15.2	na	15.2	23.5
Datasets available: 2005						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	10	0.002		0.003	16	
DDT	10	0.002		0.002	16	
Chlordane	10	ND		--	--	
Toxaphene	10	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.018	0.050				
DDT	0.128	0.136				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						2

Existing Advisory: Women and children should eat no more than one meal per month and the general population should eat no more than one meal per week of Caro Impoundment redhorse sucker greater than 22 inches in length due to elevated levels of mercury.

Recommendation: No one should eat more than 4 meals per month of sucker less than 16 inches from the Cass River upstream of the Caro Dam or no more than 2 meals per month of sucker larger than 16 inches due to mercury.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
14	0.115	8
16	0.194	4
18	0.274	2
20	0.354	2
22	0.433	2
24	0.513	2
26	0.592	1
28	0.672	1
30	0.752	1
<i>Shaded area denotes extrapolated estimates</i>		





Rock Bass

**Cass River
Upstream of Caro Dam**

Tuscola County

Hg Analysis:

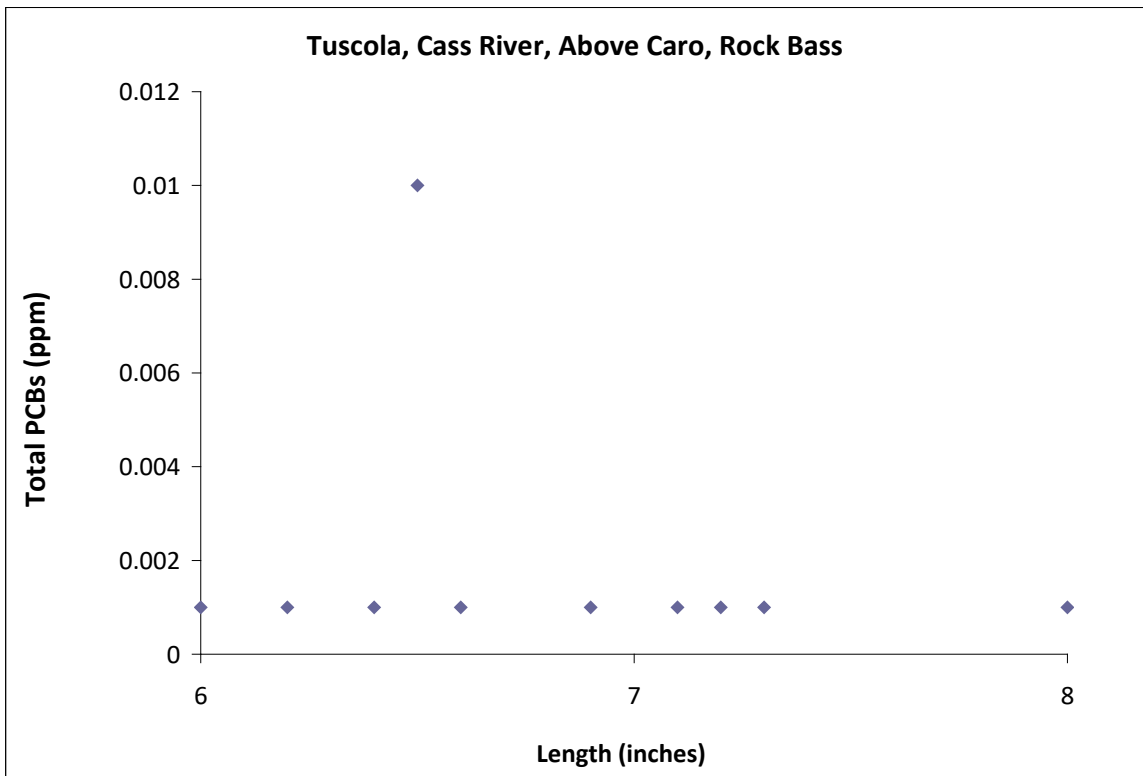
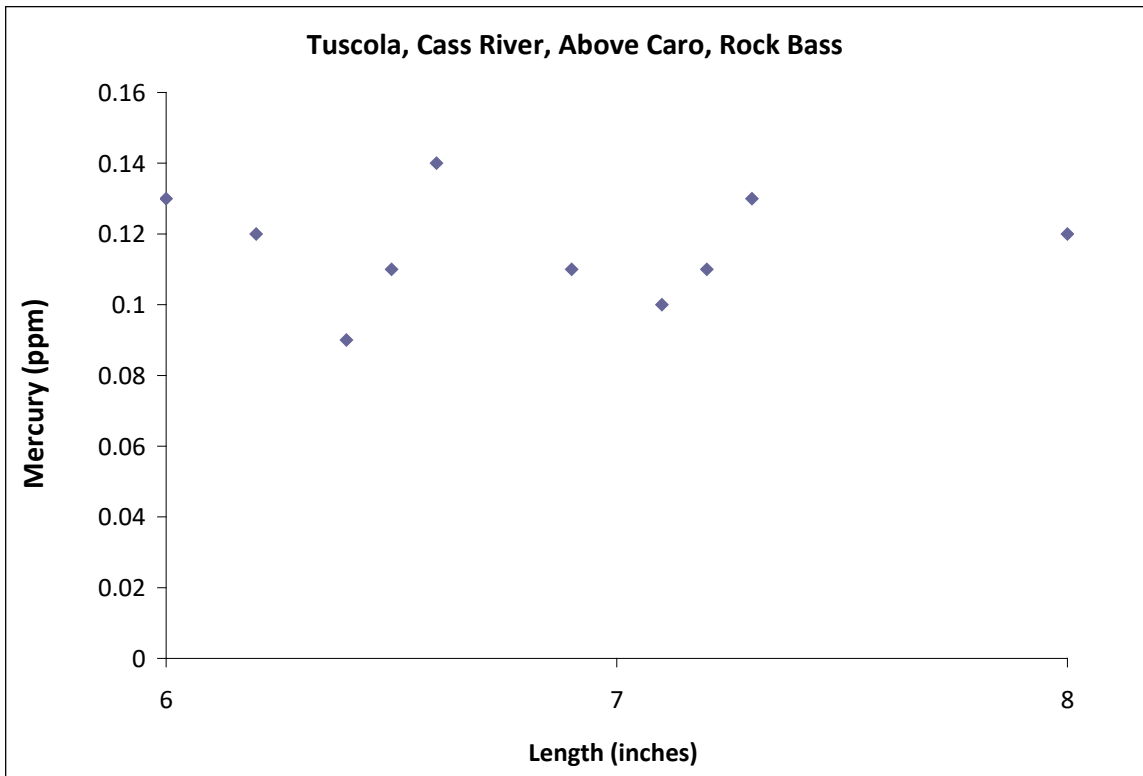
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2005	2005	10	6	na	6	8
Datasets available: 2005						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	10	0.116		0.130	8	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.001	0.000				

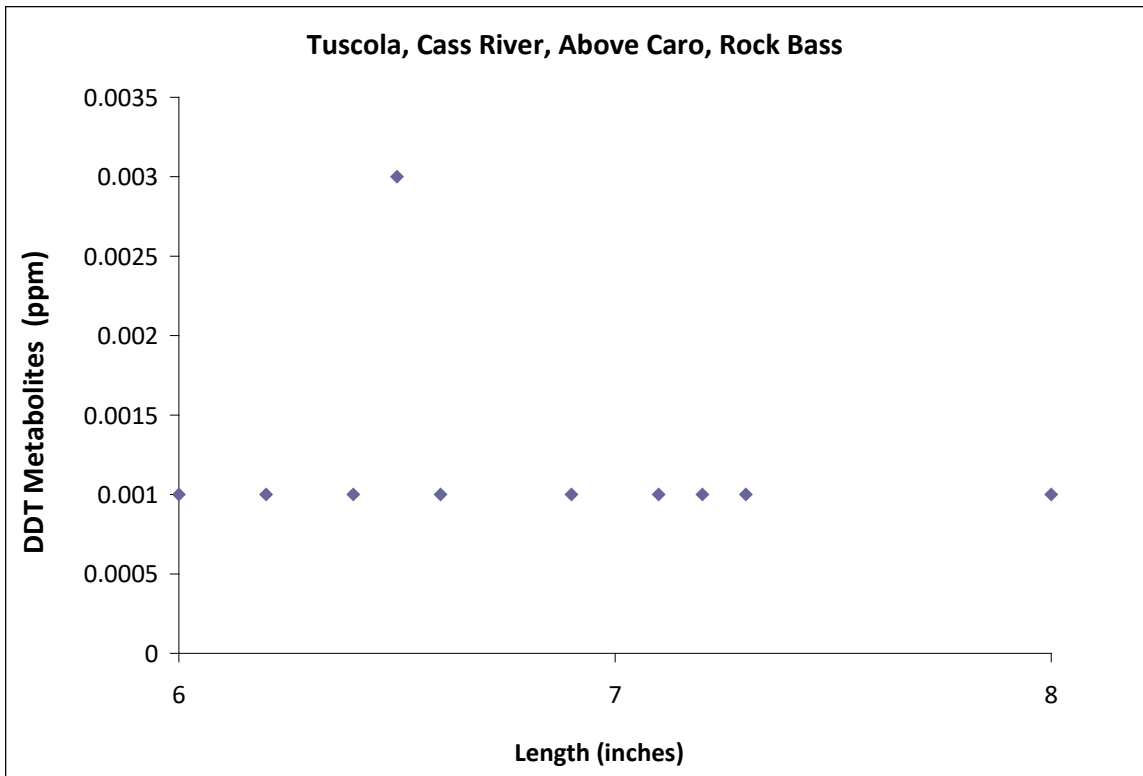
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2005	2005	10	6	na	6	8
Datasets available: 2005						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	10	0.002		0.004	16	
DDT	10	0.001		0.002	16	
Chlordane	10	ND		--	--	
Toxaphene	10	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.035	0.035				
DDT	0.035	0.035				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						8

Existing Advisory: Caro Impoundment rock bass are covered under the statewide mercury consumption advisory.

Recommendation: No one should eat more than 8 meals per month of rock bass from the Cass River upstream of the Caro Dam due to mercury.





Redhorse Sucker

**Cass River
Upstream Frankenmuth Dam**

Tuscola County

Hg Analysis:

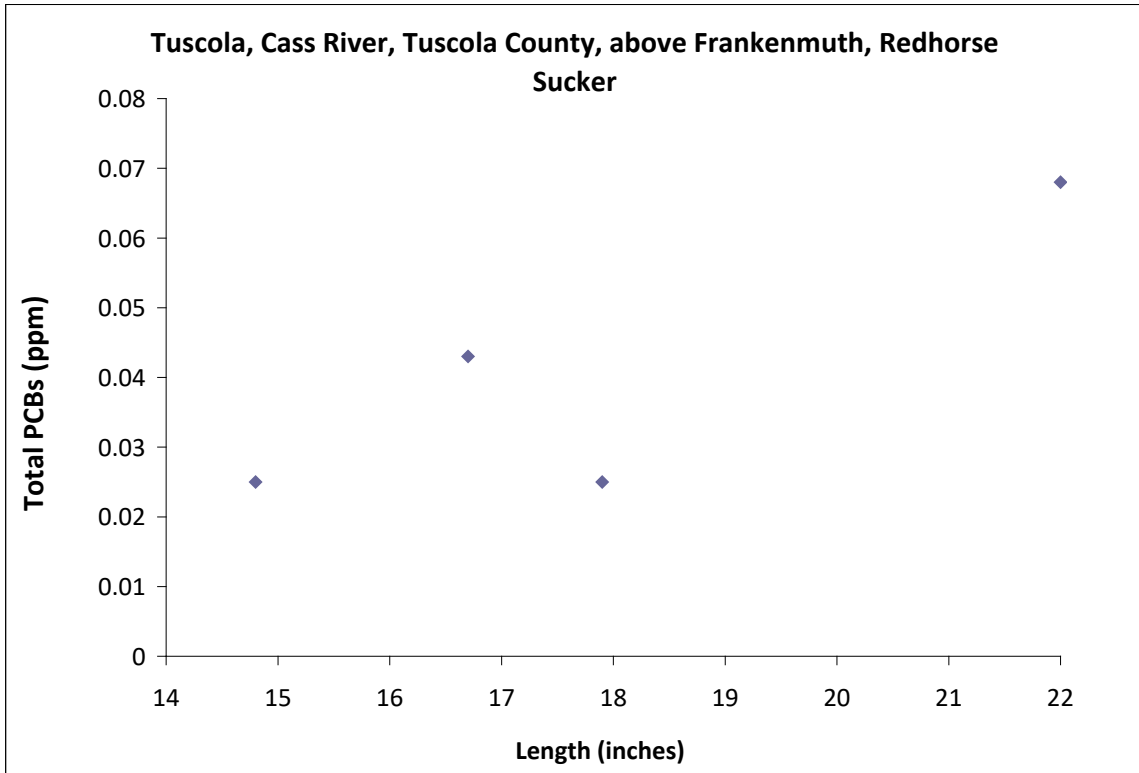
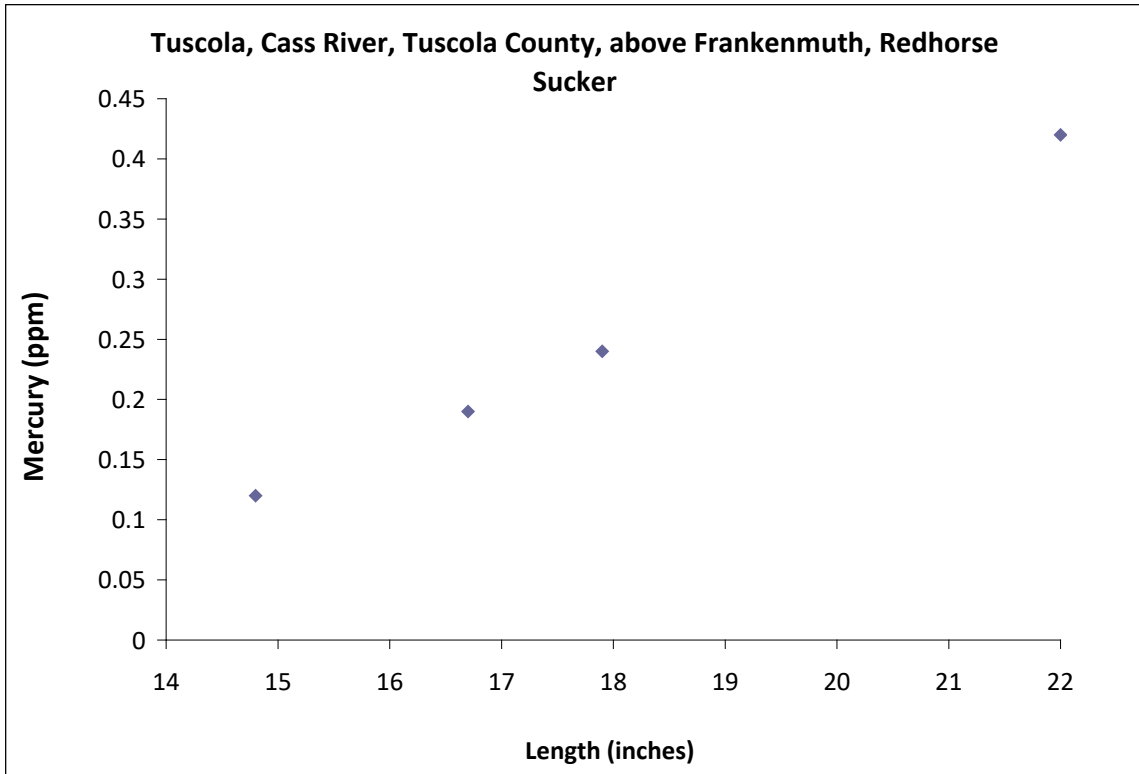
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1988	1988	4	14.8	na	14.8	22
Datasets available: 1988						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	4	0.243		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.998	0.976		<i>limited data – regression not acceptable</i>		

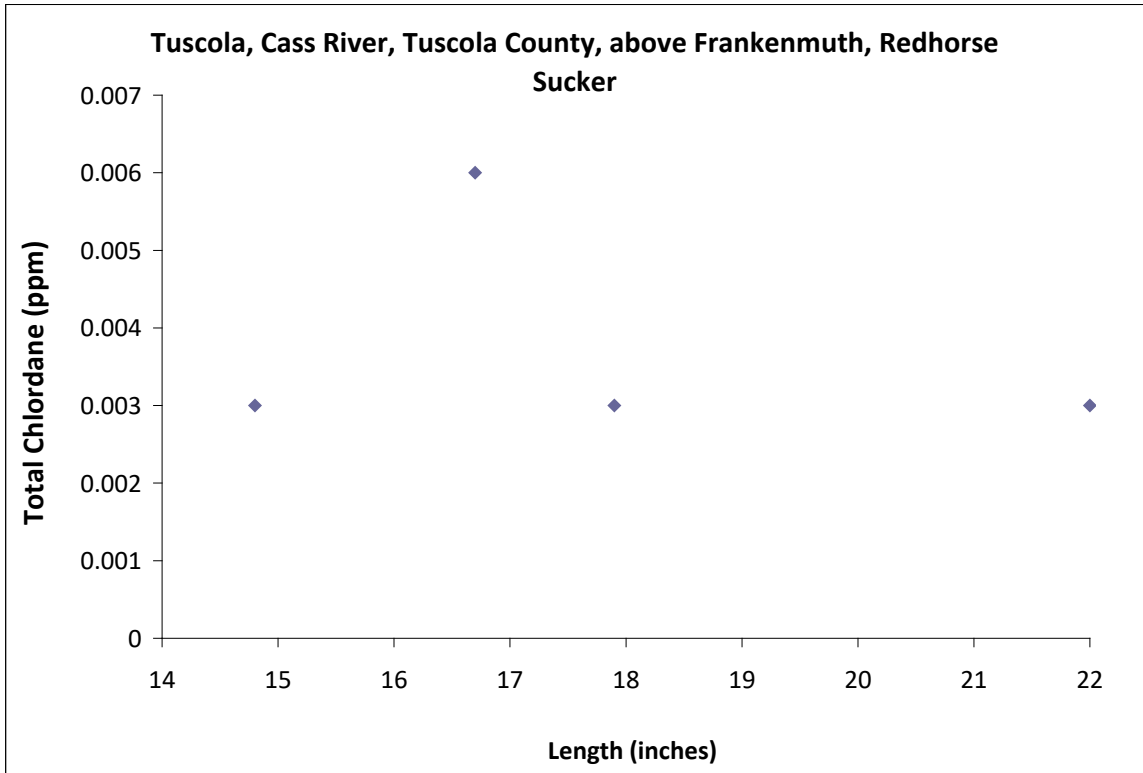
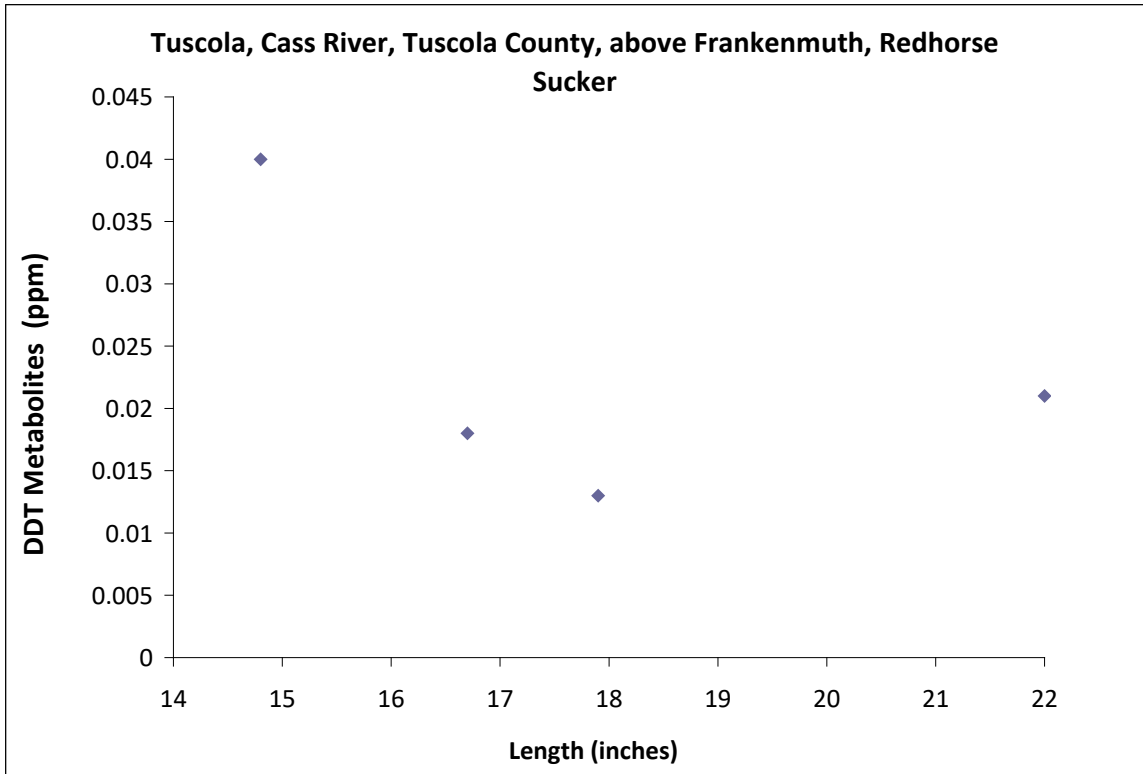
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1988	1988	4	14.8	na	14.8	22
Datasets available: 1988						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	4	0.040		--		--
DDT	4	0.023		--		--
Chlordane	4	0.004		--		--
Toxaphene	4	ND		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.719	0.639		<i>limited data – regression not acceptable</i>		
DDT	0.259	0.176				
Chlordane	0.063	0.063				
Toxaphene				Final meal category based on UCL:		--

Existing Advisory: Cass River (u/s Frankenmuth) redhorse sucker are not covered by an advisory.

Recommendation: Statewide guidelines apply to Cass River (u/s Frankenmuth) redhorse sucker. This dataset is limited due to sample size and age of the data and is not used to provide a recommendation.





Rock Bass

**Cass River
Upstream Frankenmuth Dam**

Tuscola County

Hg Analysis:

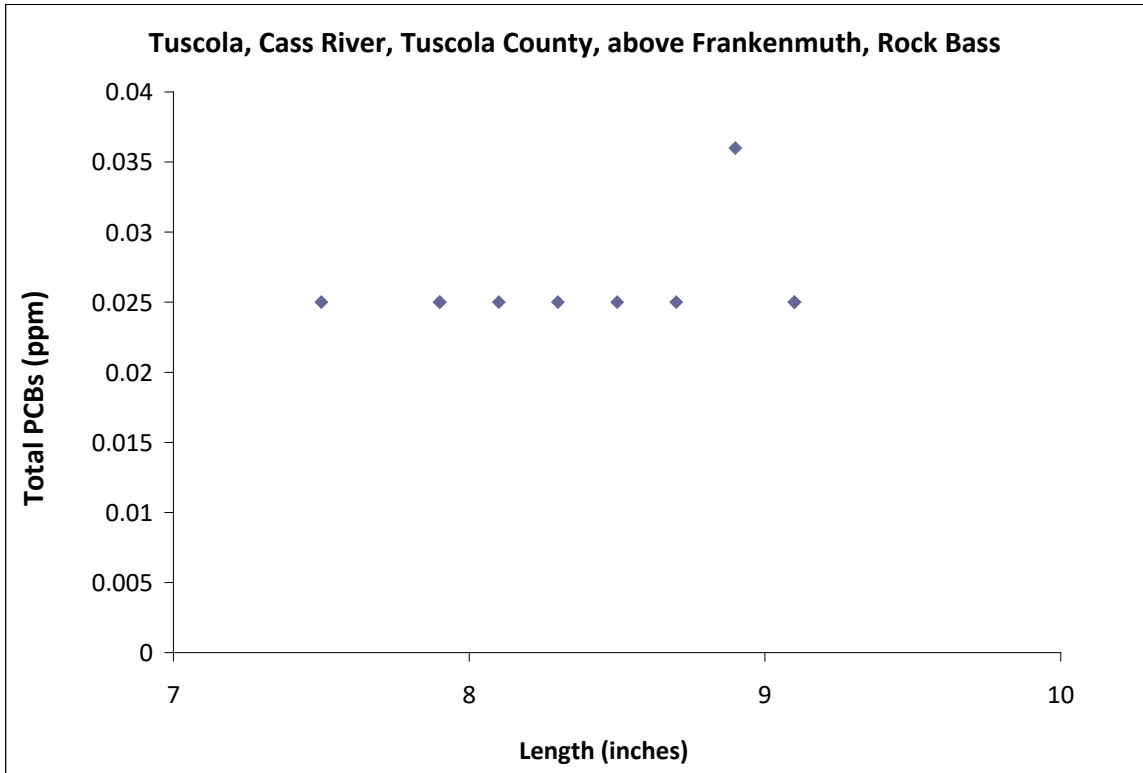
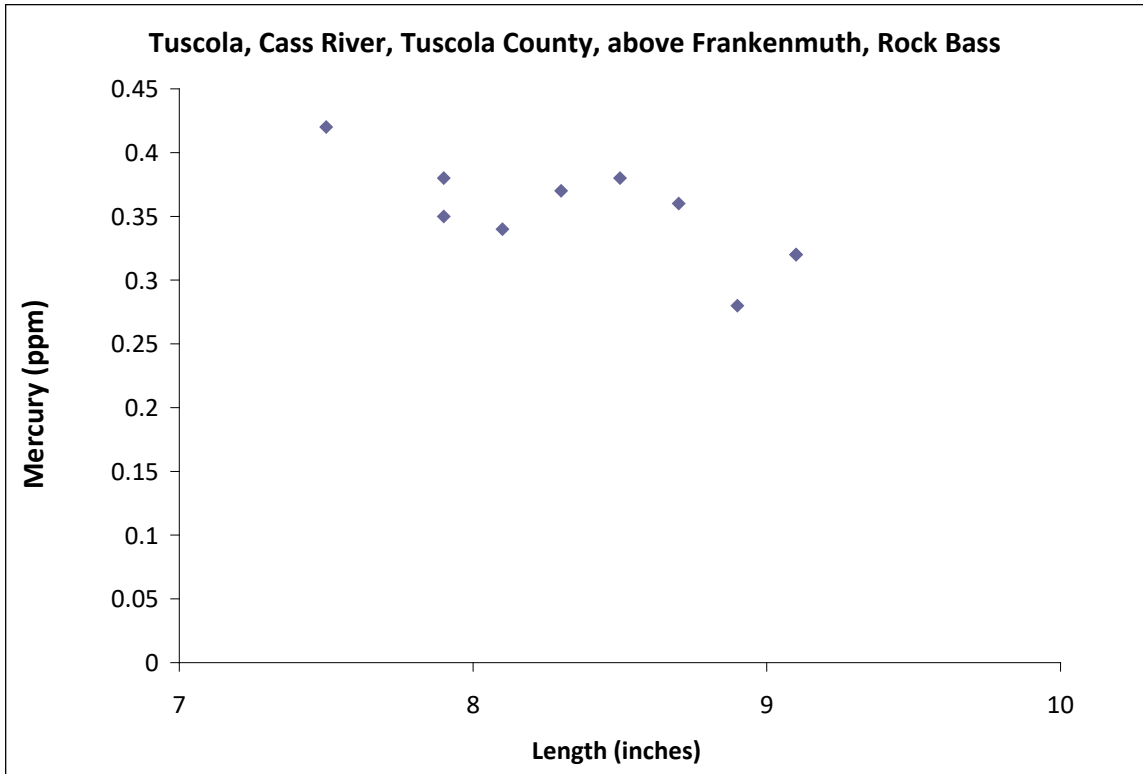
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1988	1988	10	7.5	na	7.5	9.1
Datasets available: 1988						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	10	0.352		0.380	2	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.573	0.555				

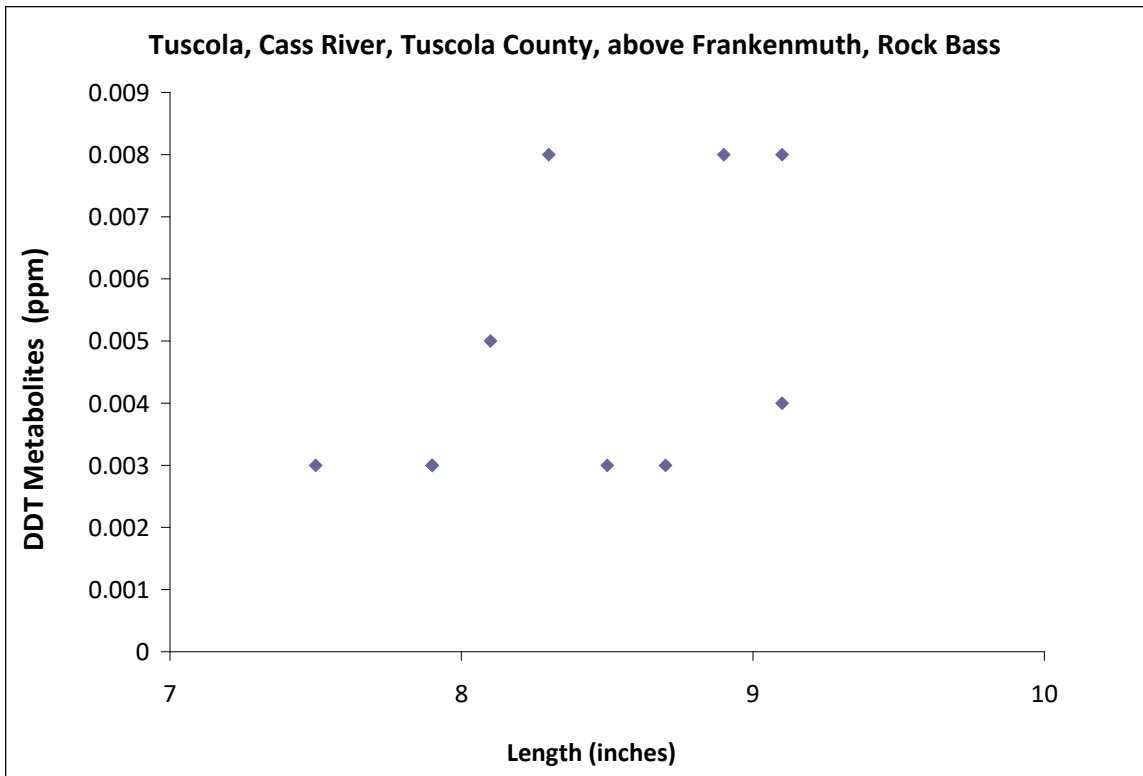
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1988	1988	10	7.5	na	7.5	9.1
Datasets available: 1988						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	10	0.026		0.030	8	
DDT	10	0.005		0.010	16	
Chlordane	10	ND		--	--	
Toxaphene	10	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.101	0.101				
DDT	0.240	0.253				
Chlordane						
Toxaphene						
Final meal category based on UCL:					2	

Existing Advisory: Cass River (u/s Frankenmuth) rock bass are not covered by an advisory.

Recommendation: No one should eat more than 2 meals per month of rock bass from the Cass River between Frankenmuth and Caro due to mercury. This dataset is limited by age of the data. Based on EGLE’s Fish Contaminant Monitoring Program (FCMP), temporal changes in mercury concentrations are waterbody specific in Michigan. The EGLE FCMP finds that mercury concentration in fish are either staying the same or increasing. The meal category is based on the available dataset.





Smallmouth Bass

**Cass River
Upstream Frankenmuth Dam**

Tuscola County

Hg Analysis:

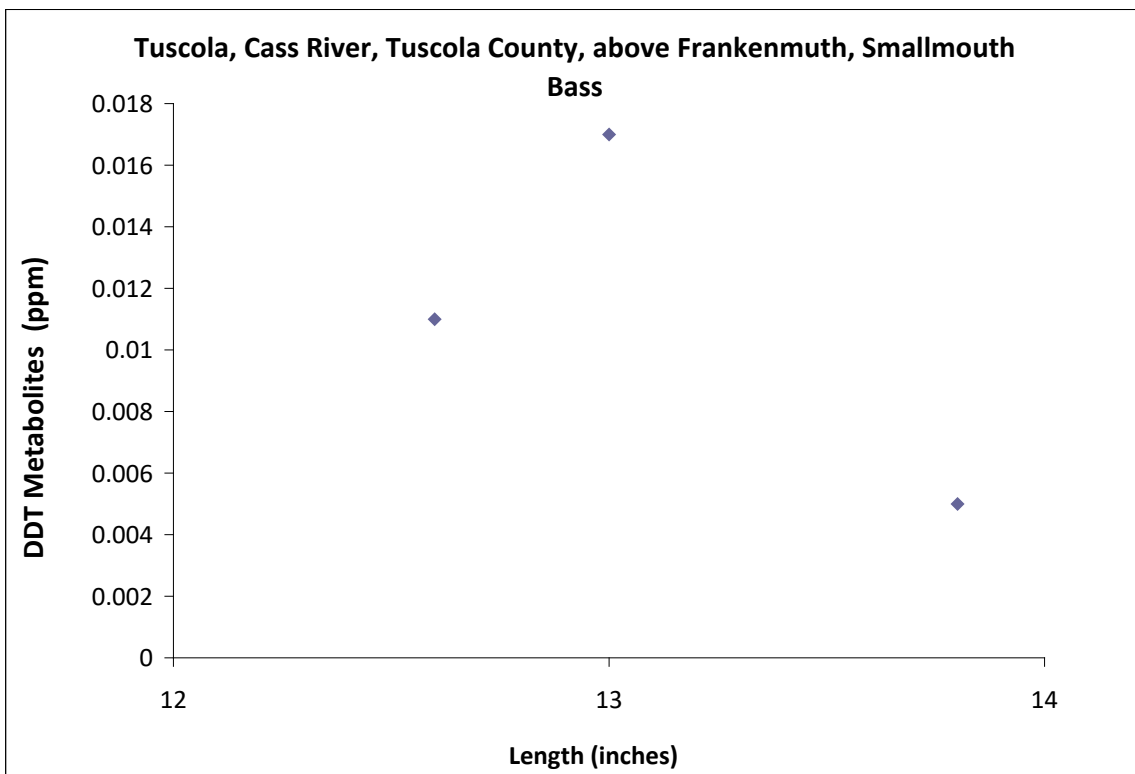
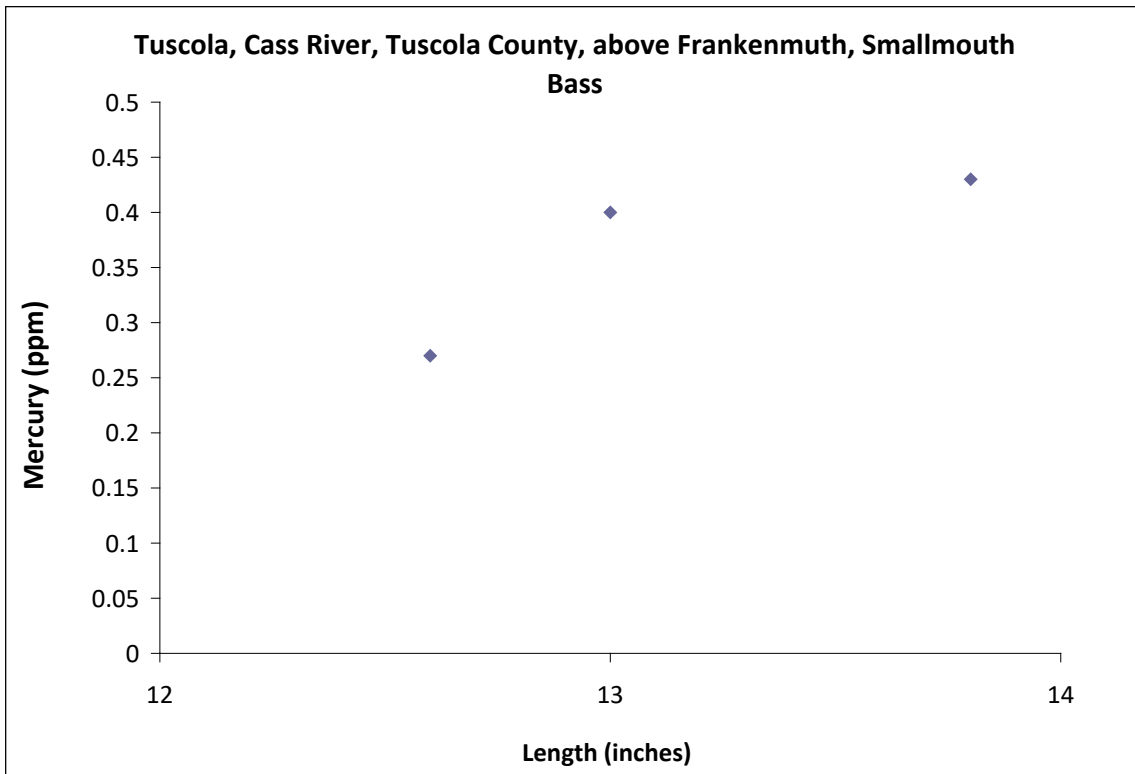
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1988	1988	3	12.6	14	13.8	13.8
Datasets available: 1988						
Chemical	Sample Size (Incl. Sub-Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	3	0.370		--		--
Chemical	Linear Regression	Exponential Regression		<i>limited data – regression not acceptable</i>		
	R ²	R ²				
Mercury	0.739	0.710				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1988	1988	3	12.6	14	13.8	13.8
Datasets available: 1988						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	3	0.030		--		--
DDT	3	0.011		--		--
Chlordane	3	ND		--		--
Toxaphene	3	ND		--		--
Chemical	Linear Regression	Exponential Regression		Final meal category based on UCL:		
	R ²	R ²				
PCB	0.036	0.036		--		
DDT	0.429	0.593		--		
Chlordane				--		
Toxaphene				--		

Existing Advisory: Cass River (u/s Frankenmuth) smallmouth bass are not covered by an advisory.

Recommendation: Statewide guidelines apply to Cass River (u/s Frankenmuth) smallmouth bass. This dataset is limited due to age of the data and sample size, and is not used to provide a recommendation.



Clinton River Macomb and Oakland Counties

Carp

**Clinton River
downstream of Yates Dam (incl. Red
Run Drain)**

Macomb County

Hg Analysis:

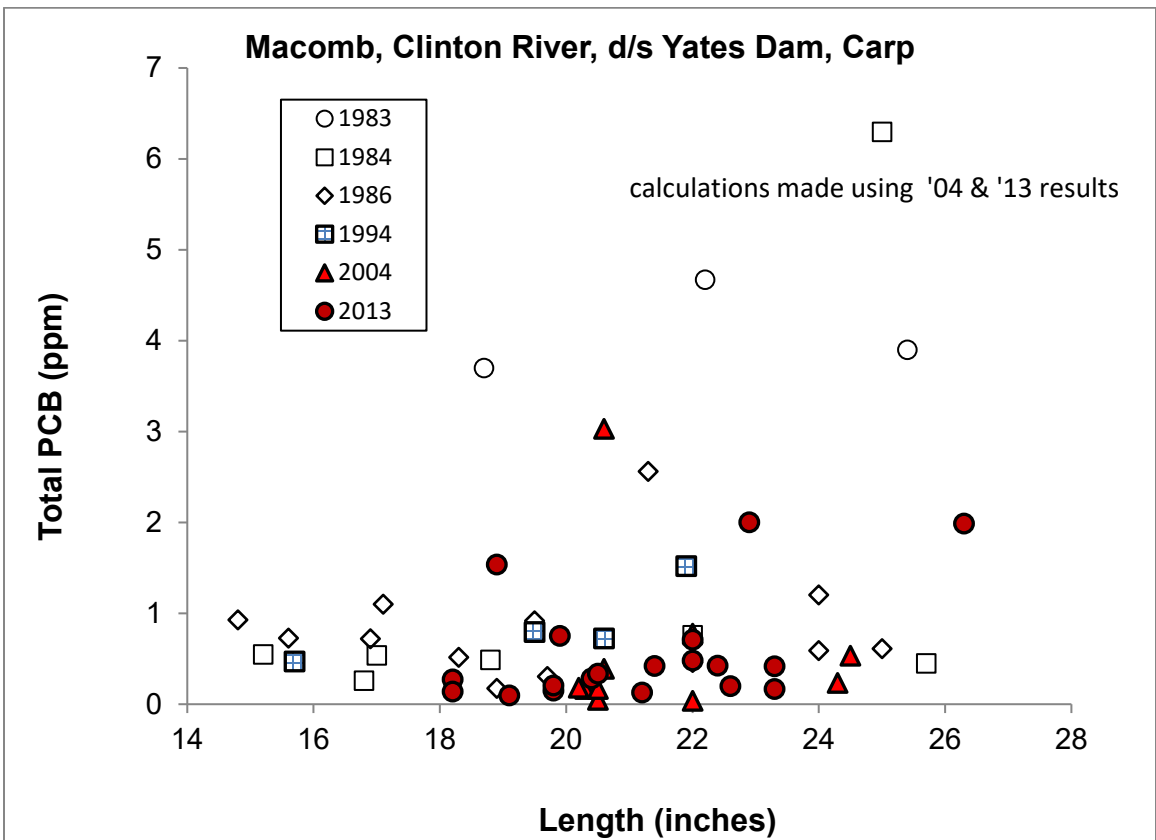
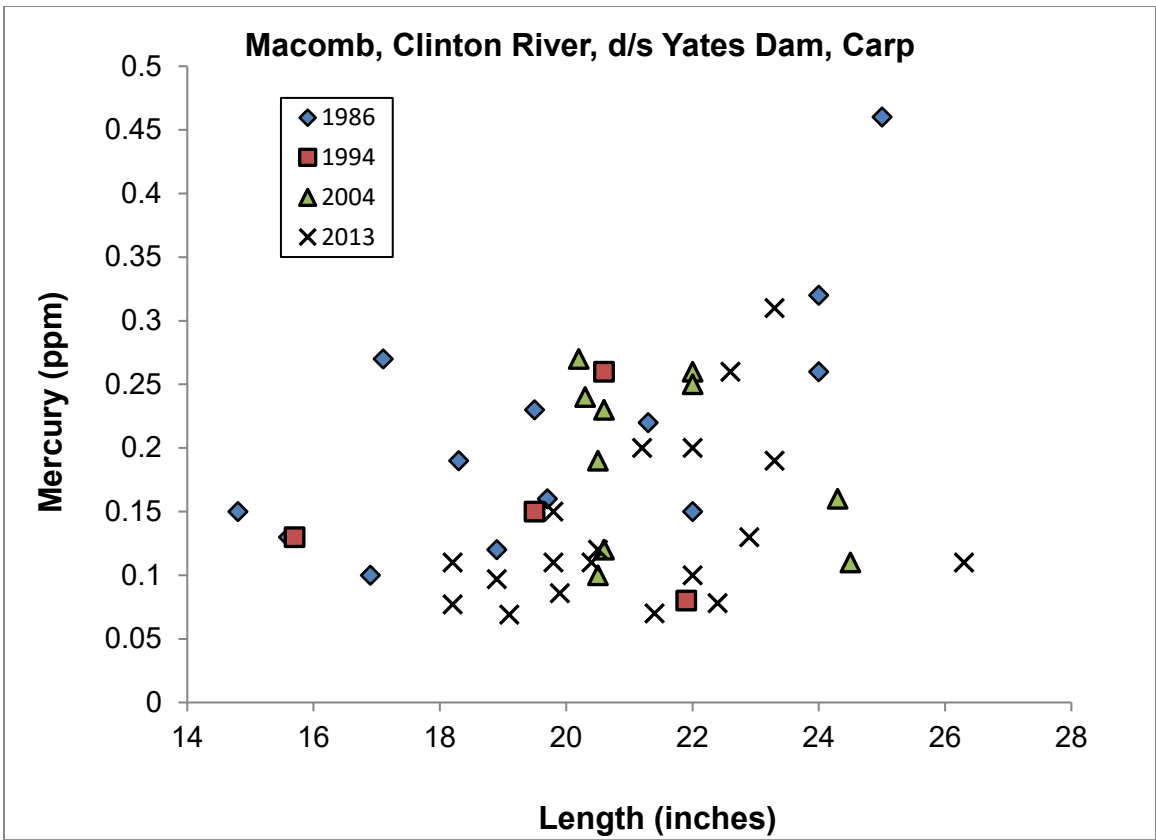
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1986	2013	46	14.8	na	14.8	26.3	
Datasets available: 1986, 1994, 2004, 2013							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	46	0.17		0.07	0.46	0.20	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.103	0.070					

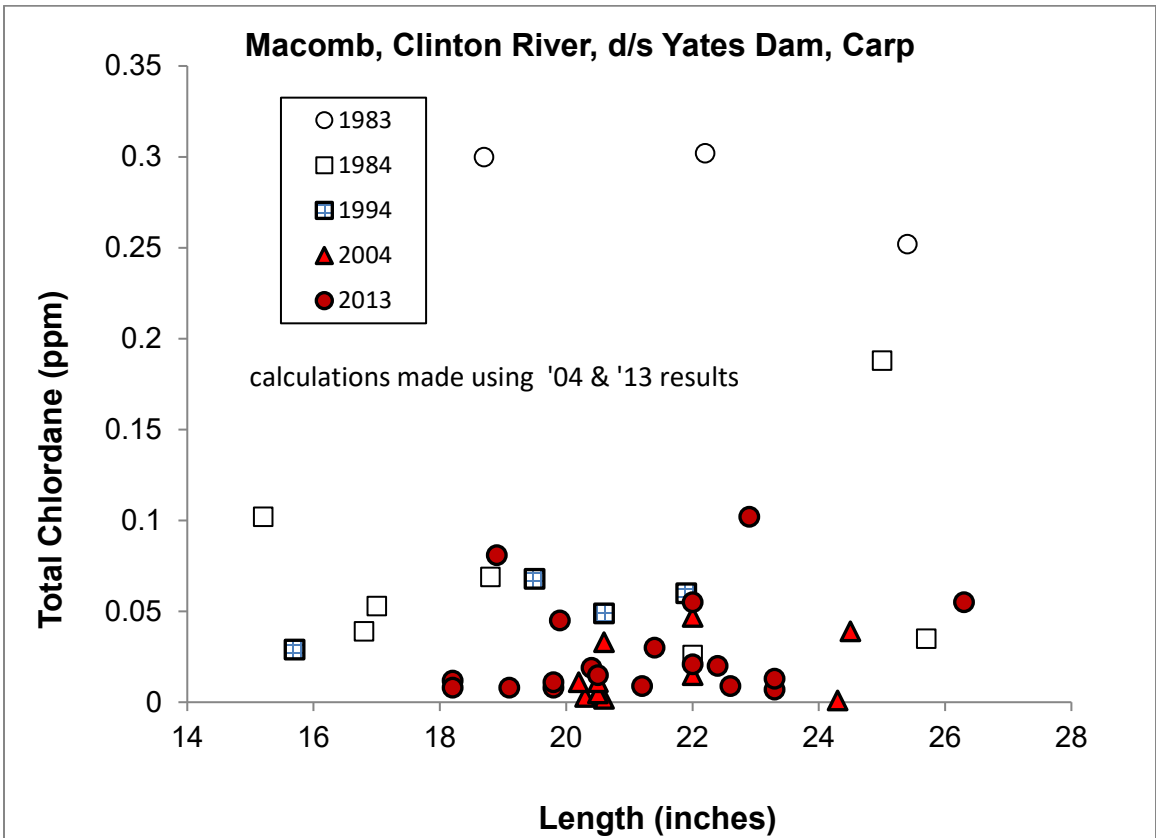
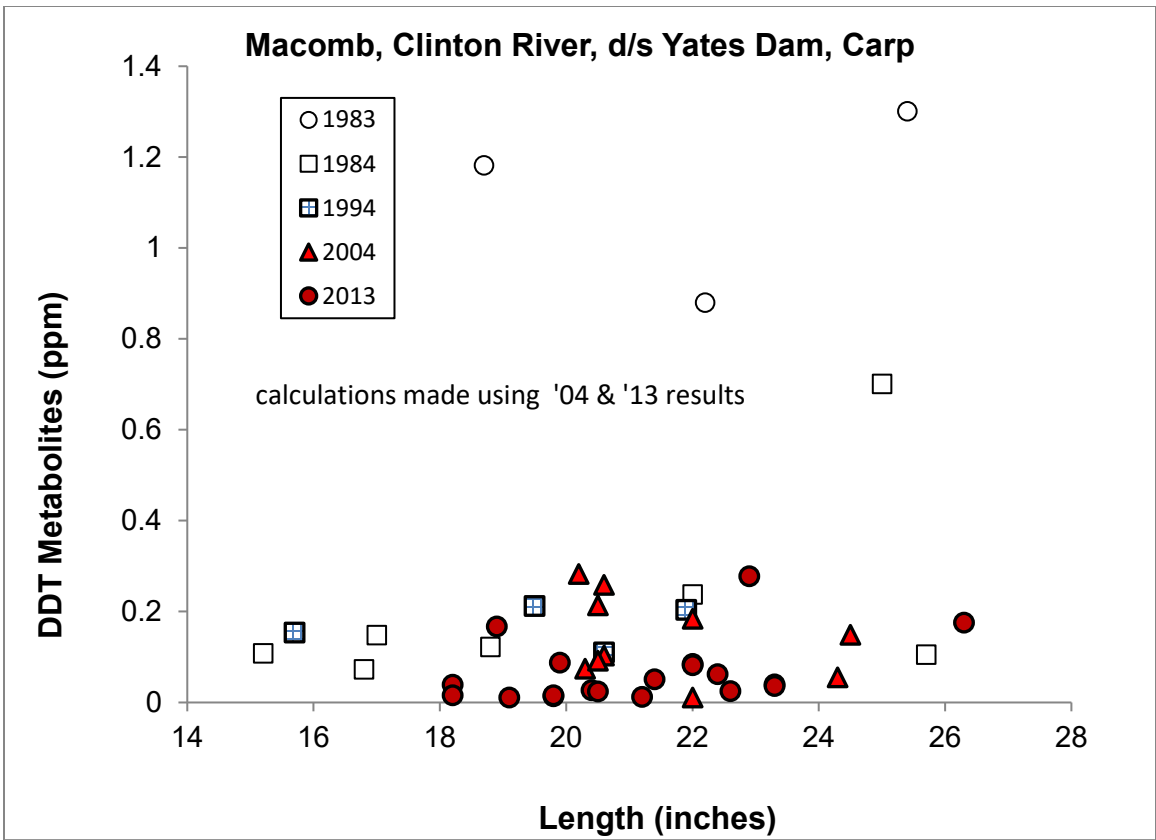
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2004	2013	29	18.2	na	18.2	26.3	
Datasets available: 1983, 1984, 1986, 1994, 2004, 2013							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	29	0.563		0.037	3.03	0.830	Limited
DDT	29	0.092		0.011	0.283	0.124	12
Chlordane	29	0.024		0.001	0.102	0.033	--
Toxaphene	29	ND		--	--	--	--
TEQ	0	--		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.053	0.081					
DDT	0.030	0.071					
Chlordane	0.049	0.019					
Toxaphene	--	--					
TEQ	--	--					
Final meal category based on UCL:							Limited

Existing Advisory: Sensitive populations should not eat these fish. For healthy adults, limit consumption to no more than 1 or 2 meals per year of carp from the Clinton River downstream of the Yates Dam, including the North Branch and Middle Branch of the Clinton River and the Red Run, due to PCBs. Mercury and DDT would cause advisories.

Recommendation: No change is recommended.





**Largemouth and
Smallmouth Bass**
Hg Analysis:

**Clinton River
downstream of Yates Dam**

Macomb County

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		Meal Category
Earliest	Most Recent				Min	Max	
1986	2013	17	10.2	14	13.8	15.4	
Datasets available: 1986, 1996, 2013							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	6	0.28		0.19	0.36	0.35	2
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.193	0.206					

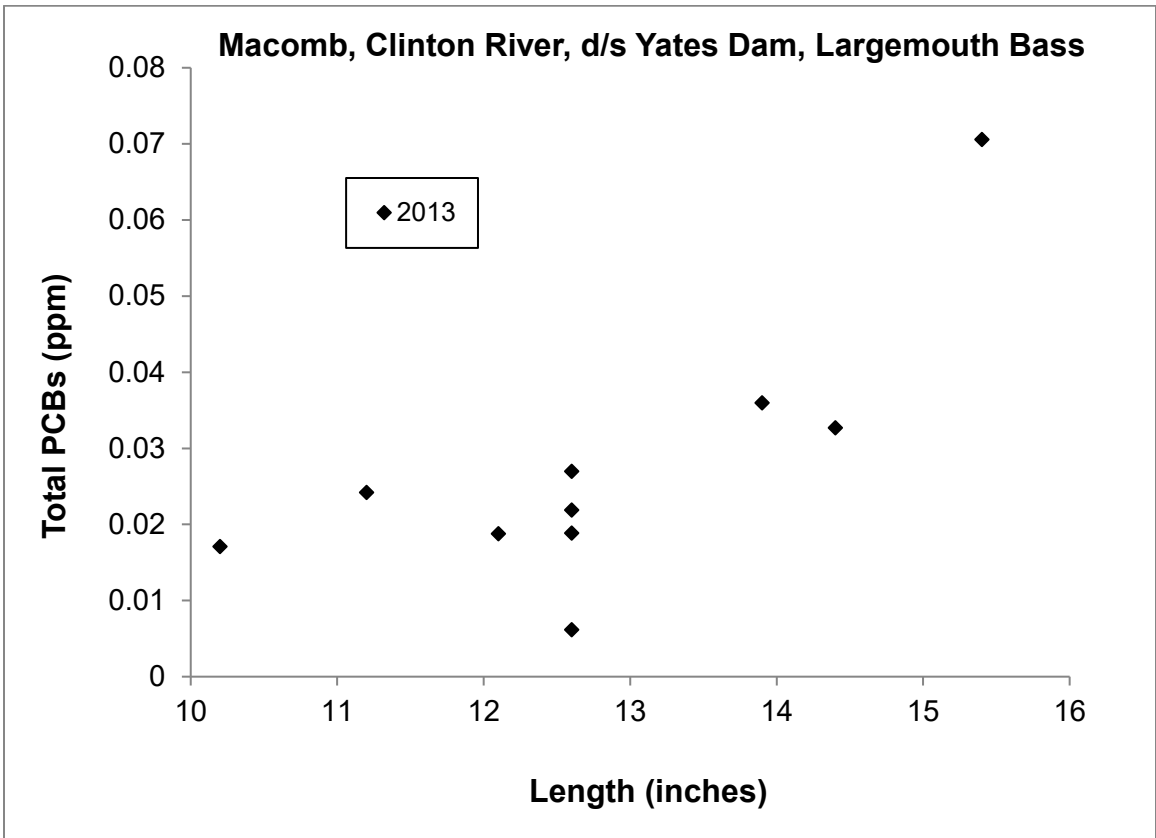
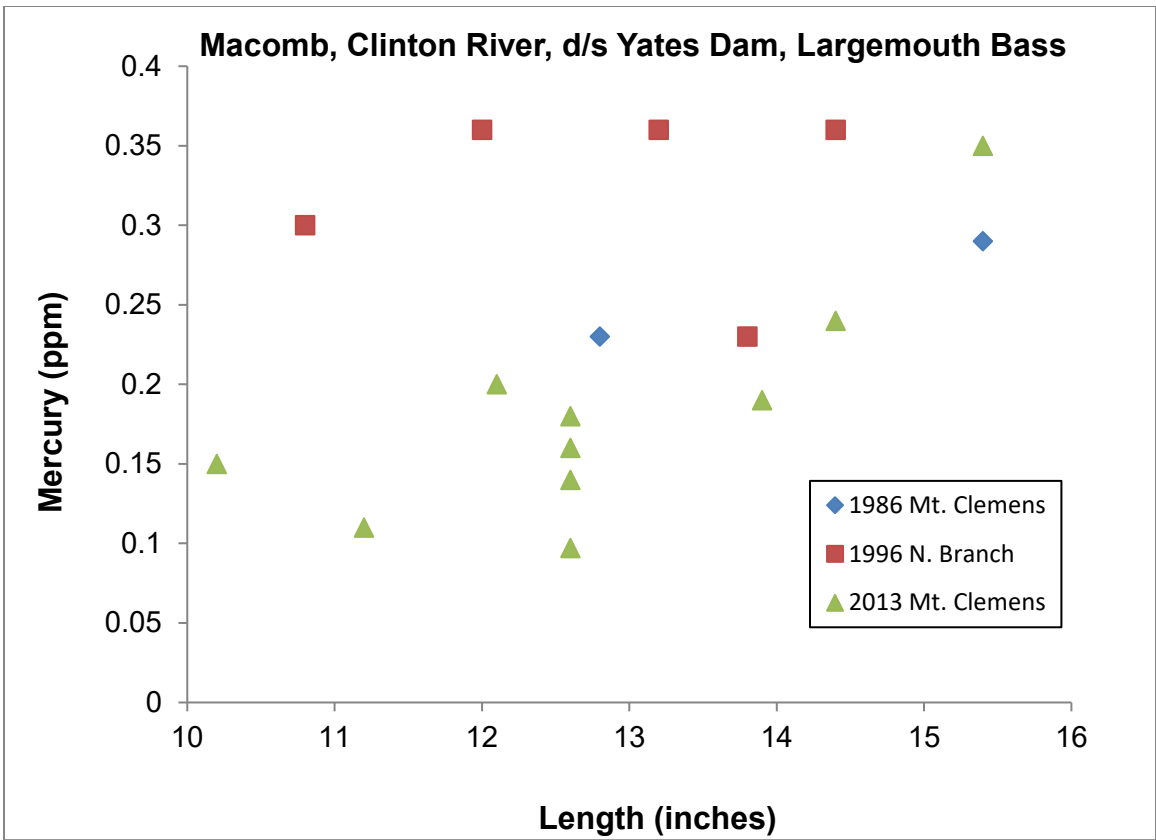
Organics Analysis:

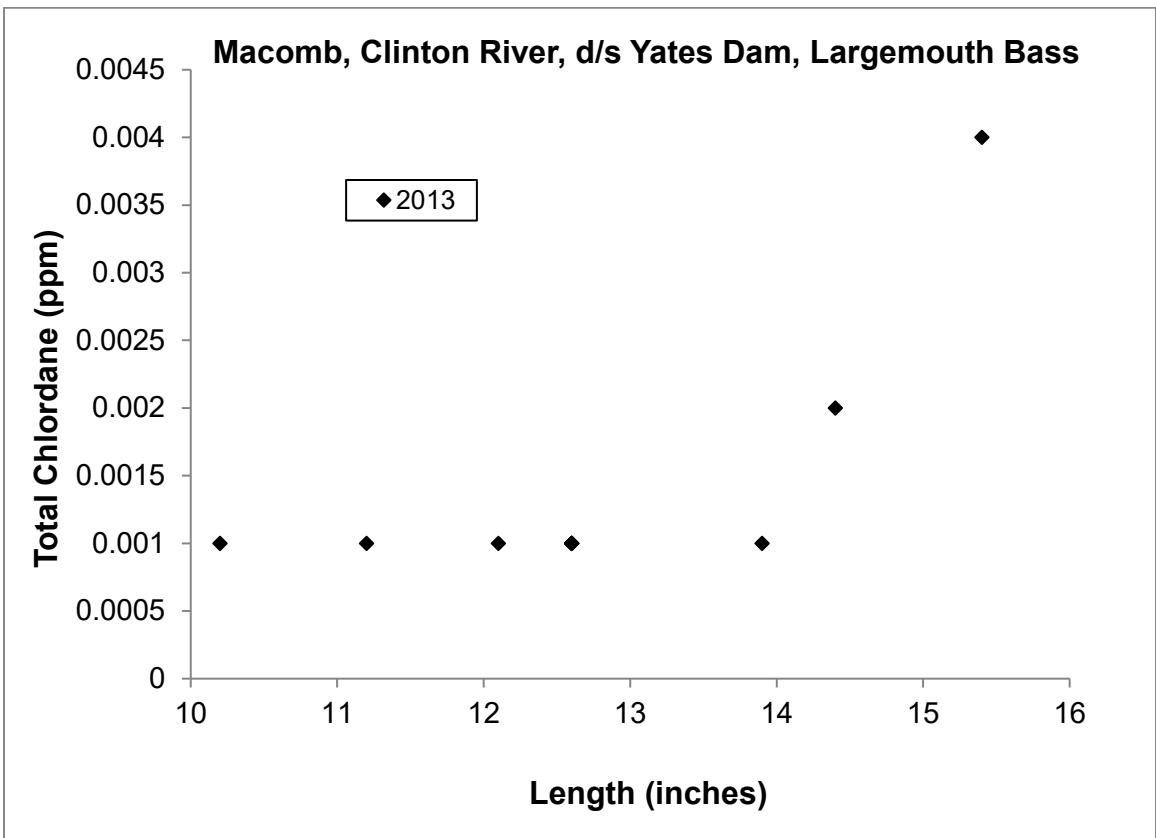
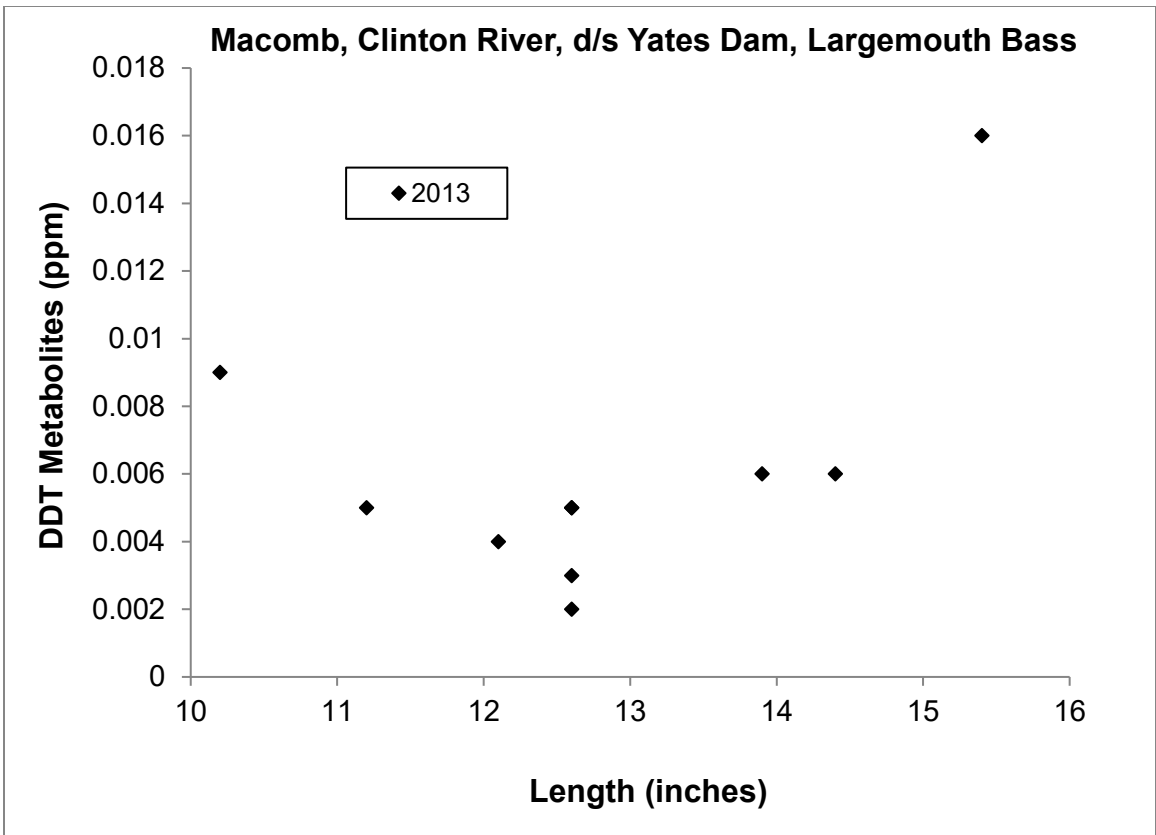
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		Meal Category
Earliest	Most Recent				Min	Max	
2013	2013	10	10.2	14	13.9	15.4	
Datasets available: 1986, 2013							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	3	0.05		0.03	0.07	0.10	--
DDT	3	0.01		0.01	0.02	0.02	--
Chlordane	3	0.002		0.001	0.004	0.01	--
Toxaphene	3	ND		--	--	--	--
TEQ	0	--		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.553	0.361					
DDT	0.184	0.101					
Chlordane	0.531	0.570					
Toxaphene	--	--					
TEQ	--	--					
Final meal category based on UCL:							2

Existing Advisory: Statewide guidelines apply to Clinton River smallmouth bass downstream of Yates Dam: No one should eat more than 2 meals per month of largemouth or smallmouth bass smaller than 18 inches or more than 1 meal per month of those fish larger than 18 inches due to mercury.

Recommendation: No one should eat more than 2 meals per month of largemouth or smallmouth bass smaller than 18 inches from the Clinton River downstream of Yates Dam, including the North Branch and Middle Branch of the Clinton River and the Red Run, or more than 1 meal per month of those fish larger than 18 inches due to mercury. The statewide length break was applied as the size range of the fish was limited.

Note: The organics analysis sample size is limited.





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	2020	48	4.5	NA	4.5	9.4
Datasets available: 1994, 1996, 2004, 2019, 2020						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	48	0.170	0.063	0.550	0.204	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.291	0.480				

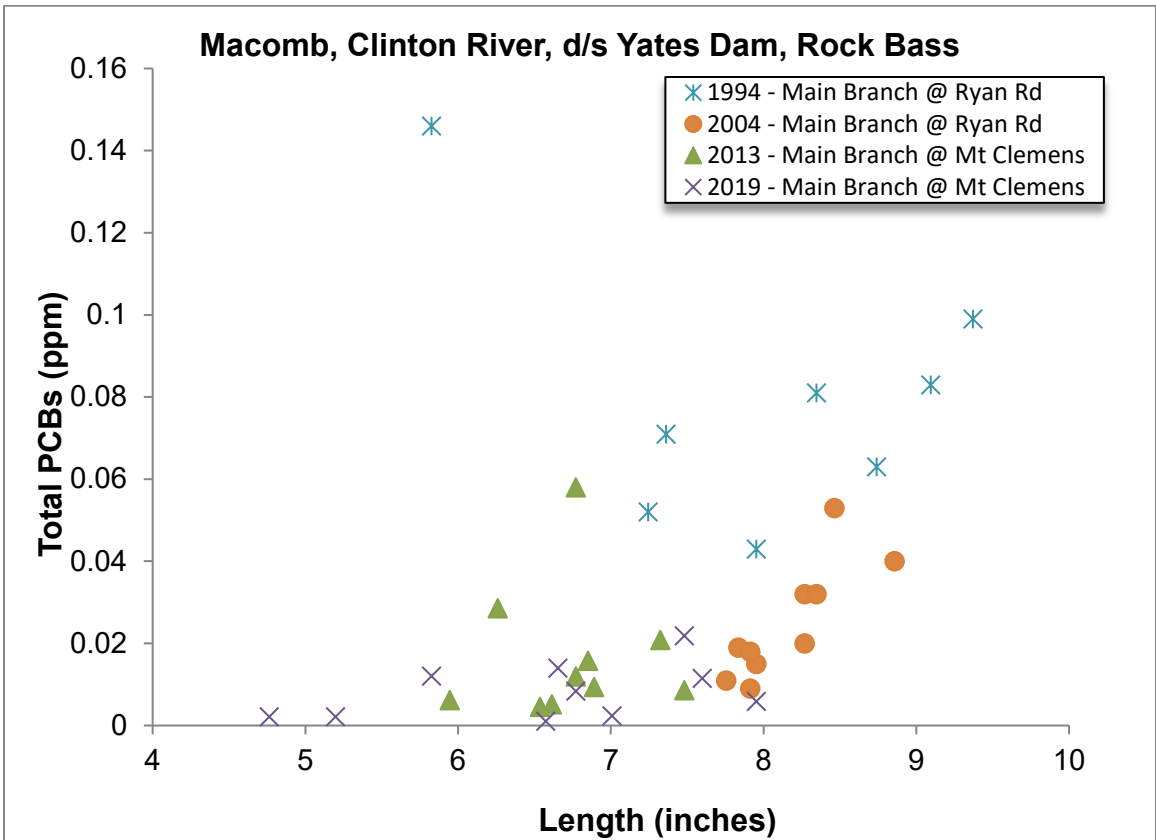
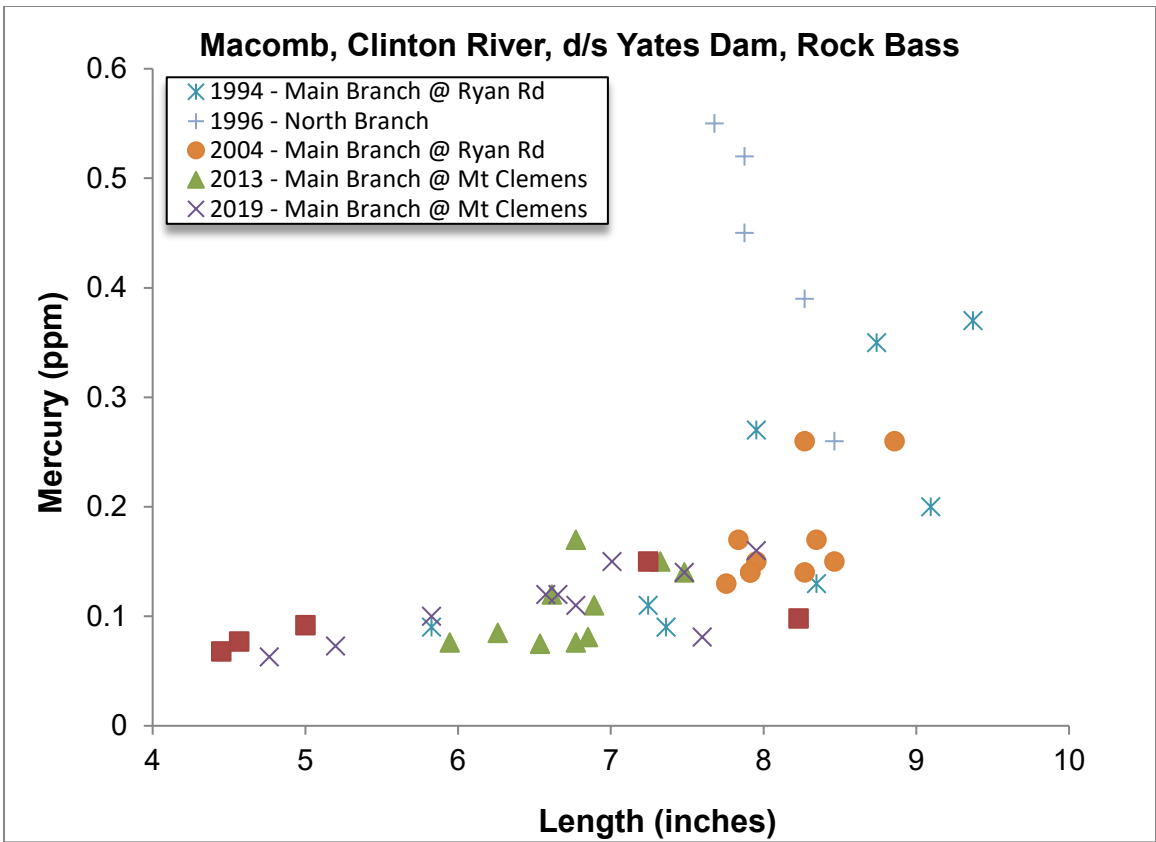
Organics Analysis:

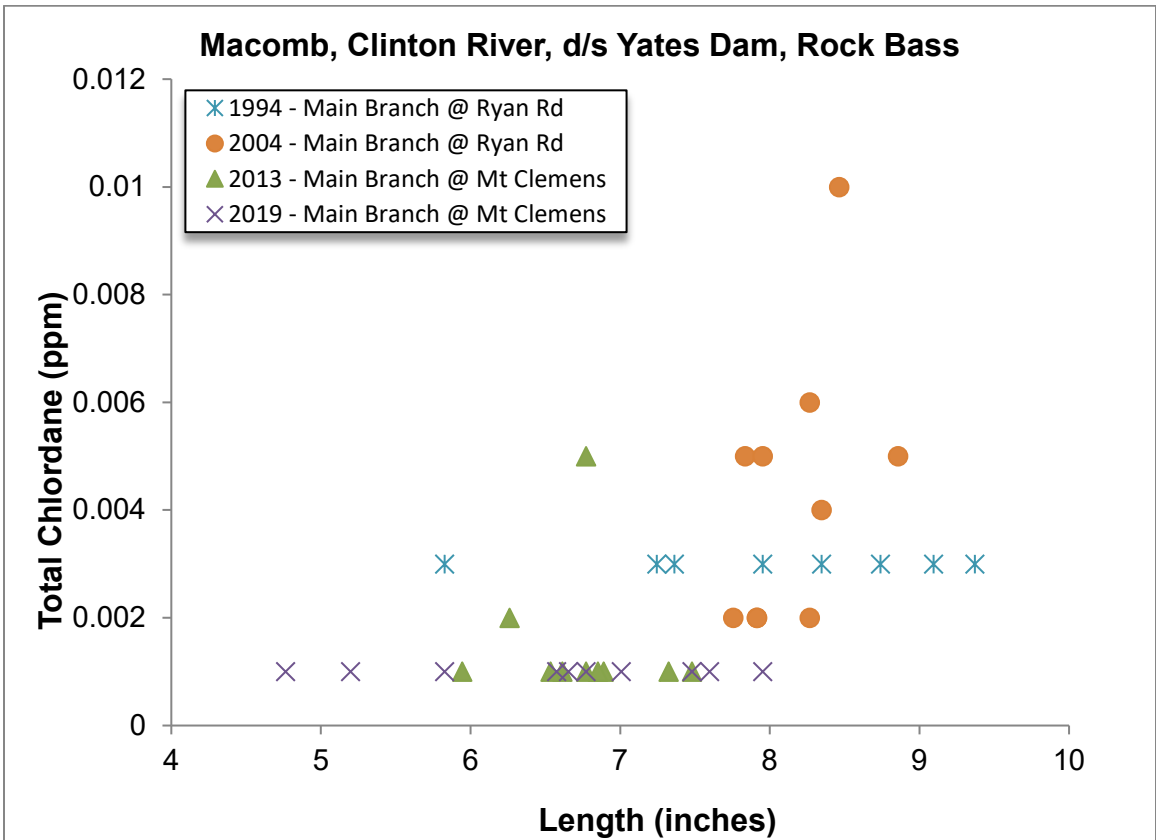
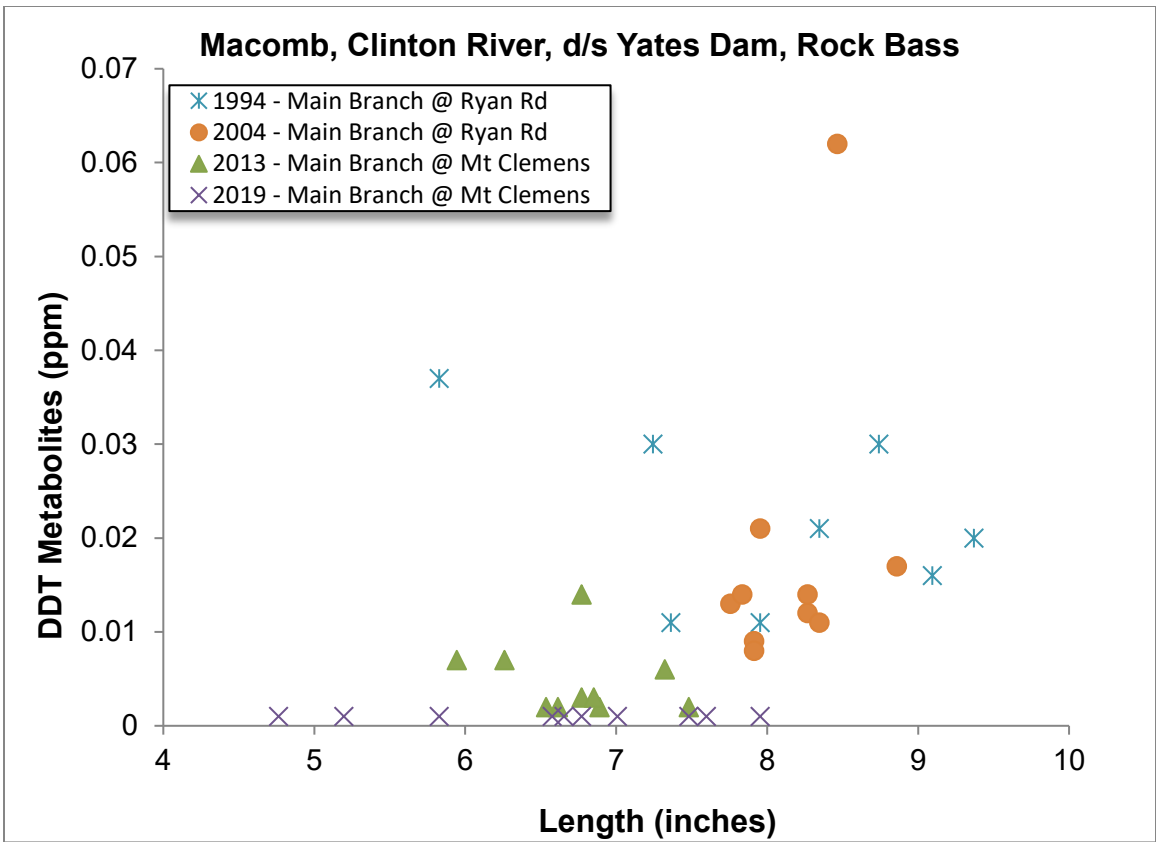
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2013	2020	25	4.5	NA	4.5	8.2
Datasets available: 1994 (No PFOS), 1996 (No PFOS), 2004 (No PFOS), 2019, 2020 (PFOS Only)						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	20	0.013	<0.001	0.058	0.019	12
DDT	20	0.003	<0.001	0.014	0.004	16
Chlordane	20	0.001	<0.001	0.005	0.002	16
Toxaphene	20	ND	--	--	--	--
PFOS	15	37.6 ppb	<0.25 ppb	247.0 ppb	76.3 ppb	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.036	0.138				
DDT	0.000	0.000				
Chlordane	0.000	0.000				
Toxaphene	--	--				
PFOS	0.236	0.111				
Final meal category based on UCL:						1

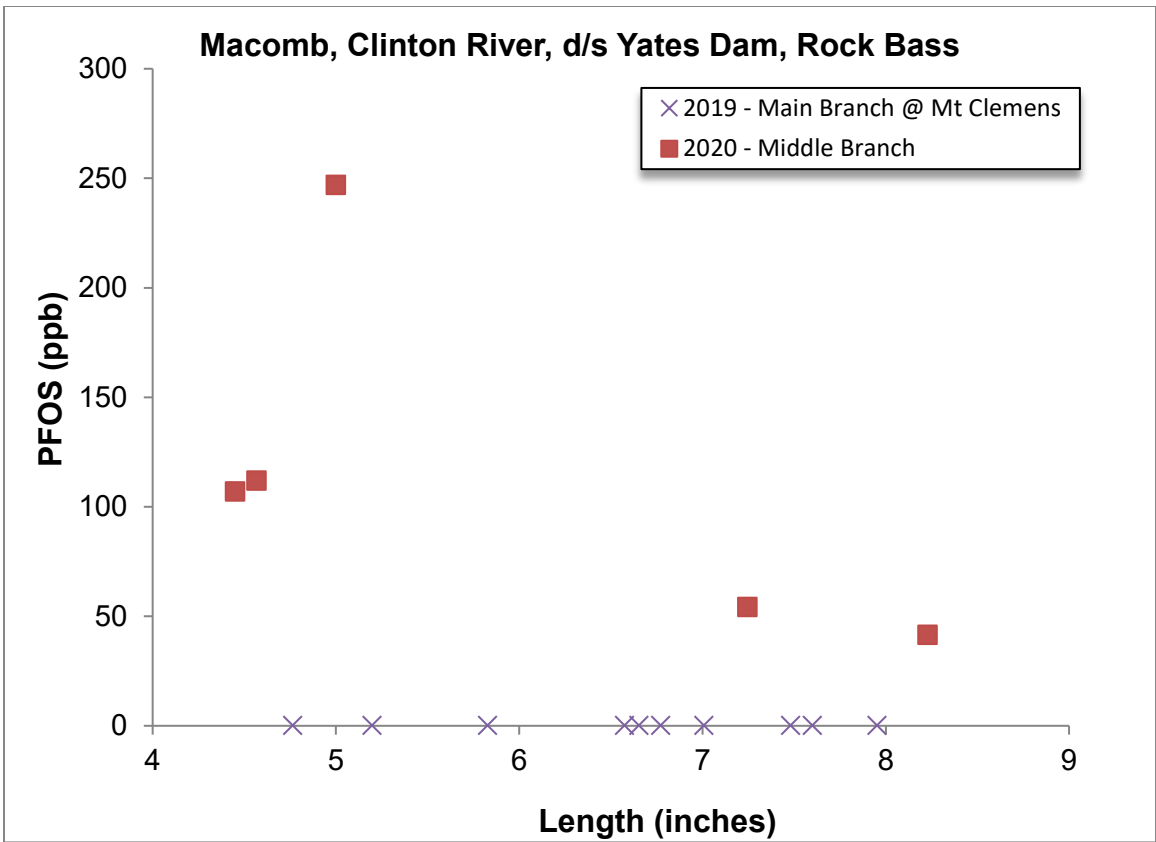
Existing MDHHS Advisory: No one should eat more than 2 meals per month of rock bass from the Clinton River downstream of the Yates Dam due to mercury. Dataset included 5 fish collected in 1996 from the North Branch Clinton River roughly 2 miles upstream of the Clinton River confluence. Those 5 fish had higher Hg levels relative to the Clinton and are the basis for the advisory.

Recommendation: No one should eat more than 1 meal per month of rock bass of any size from the Clinton River downstream of the Yates Dam, including Red Run, the Middle Branch, and North Branch of the river in Macomb County due to PFOS. Mercury and PCBs cause less-restrictive advice.

Note: Although PFOS was not detected in 2019 samples from the Main Branch, branch-specific advice is not recommended due to a lack of barriers to fish movement.







[Dataset: Lake St. Clair Over 2-Miles from Ten-Mile Canals]

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	2011	48	14.3	15	14.6	28.5
Datasets available: 1983, 1986, 1987, '91, '97, '98, 2001, 2011						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL	Meal Category
Mercury	47	0.41	0.14	1.06	0.48	2
Chemical	Linear Regression	LN Regression				
	R ²	R ²				
Mercury	0.570	0.607				

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	2011	25	14.3	15	14.7	26.6
Datasets available: 1983, 1986, 1987, '91, '97, '98, 2001, 2011						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL	Meal Category
PCB	24	0.160	0.032	0.450	0.203	1
DDT	24	0.028	0.002	0.072	0.035	16
Chlordane	24	0.008	0.001	0.022	0.011	--
Toxaphene	24	ND	--	--	--	--
Chemical	Linear Regression	LN Regression				
	R ²	R ²				
PCB	0.087	0.123				
DDT	0.125	0.091				
Chlordane	0.120	0.104				
Toxaphene	--	--				
Final meal category based on UCL:						1

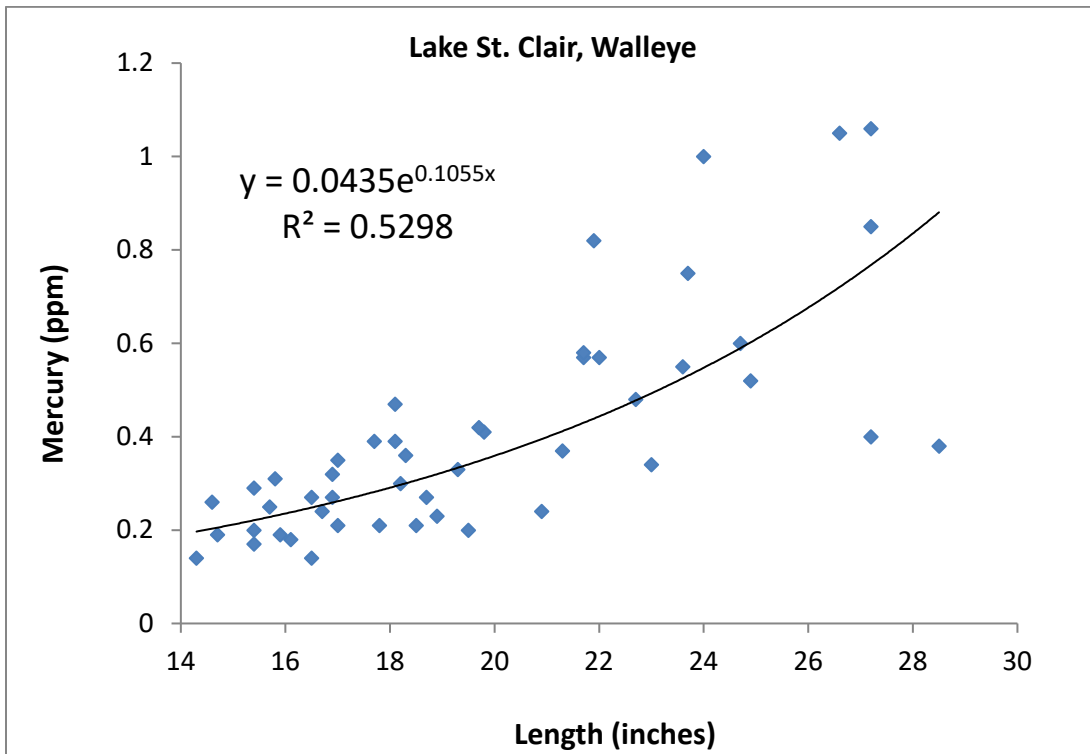
Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
14	0.19	4
16	0.24	4
18	0.29	2
20	0.36	2
22	0.44	2
24	0.55	1
26	0.68	1
28	0.83	1
30	1.03	1

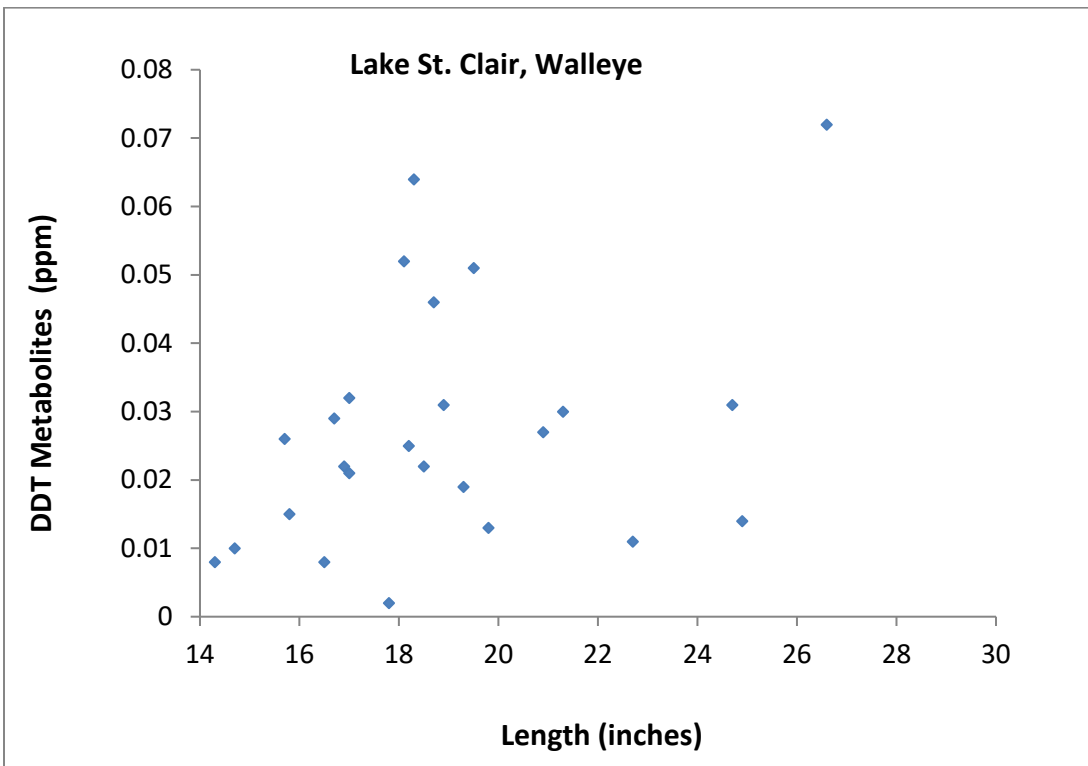
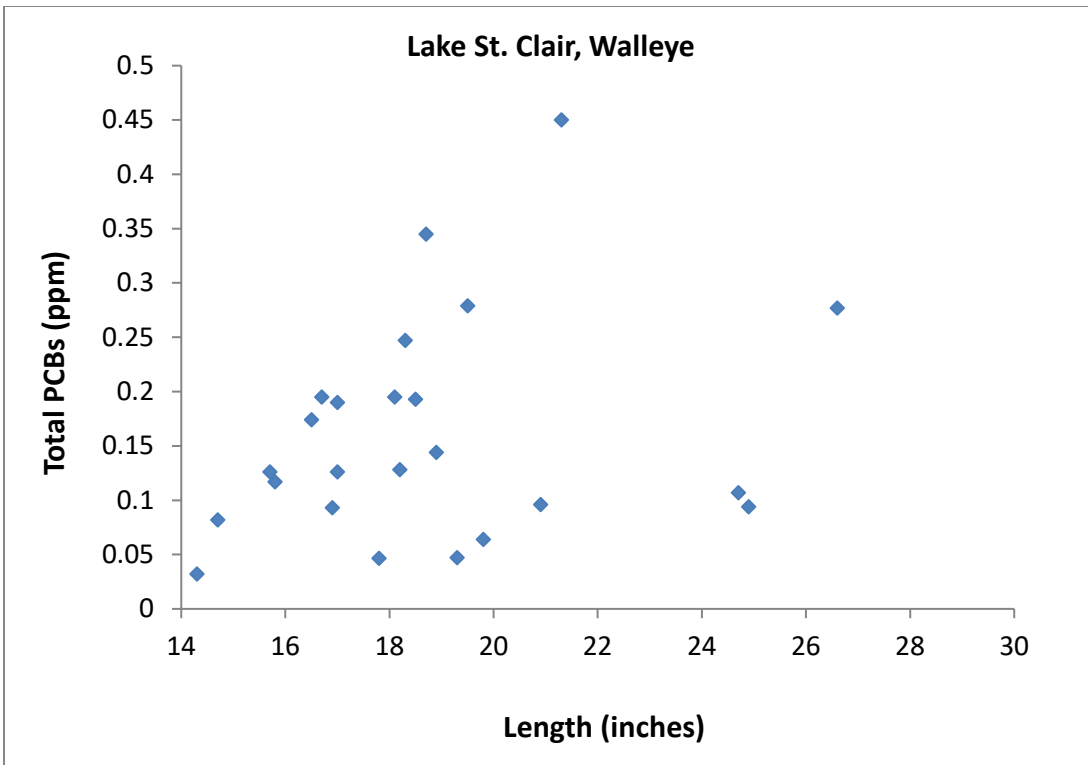
Shaded area denotes extrapolated estimates

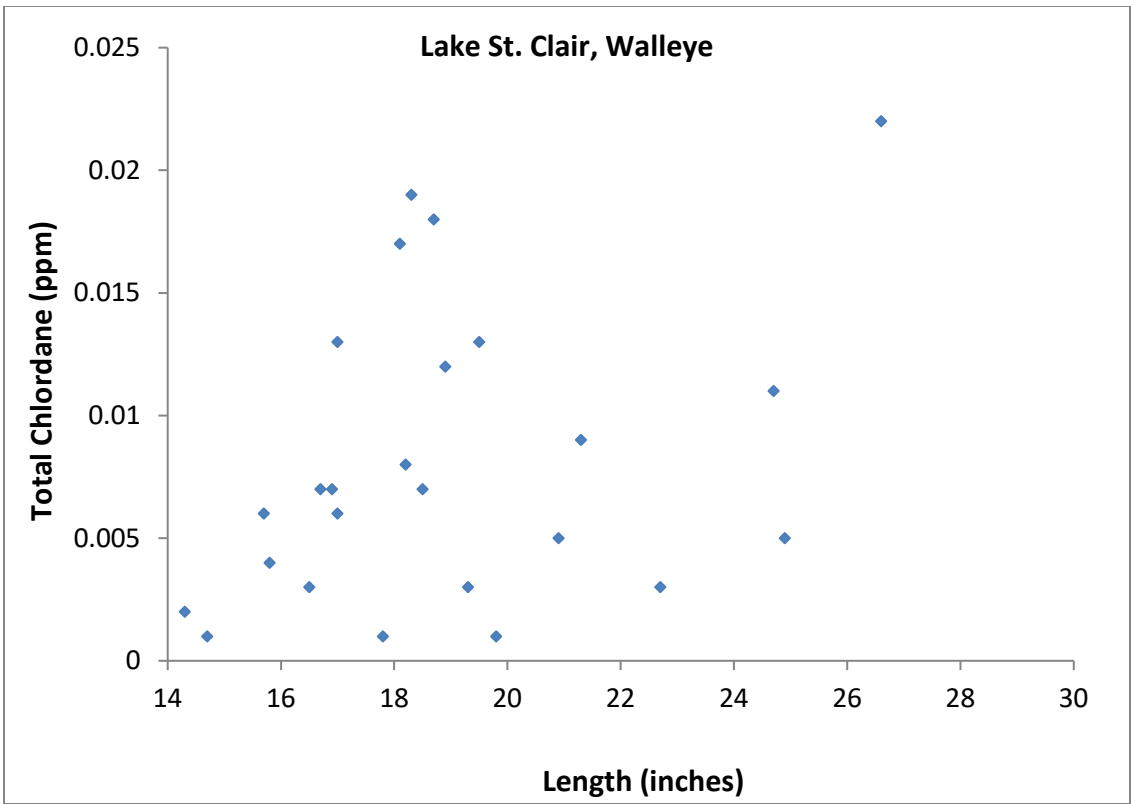
Existing Advisory: Clinton River walleye are not covered by an advisory.

Recommendation: No one should eat more than 1 meal per month of walleye less than 24 inches from the Clinton River ds of Yates Dam, including the North Branch, Middle Branch, and Red Run, and from Lake St. Clair more than 2 miles from the 10-Mile Canals due to PCBs. No one should eat more than 1 meal per month of these walleye greater than 24 inches due to PCBs and mercury.

Note: The PCB concentration in 1 fish collected in 2011 from near the Lange/Revere canals was 2.7 ppm. The 1 meal/month recommendation is excluding that fish. Exclusion of the 1998 results produces a higher 95% UCL for PCB of 0.75 ppm.







White Sucker

**Clinton River
downstream of Yates Dam**

Macomb County

Hg Analysis:

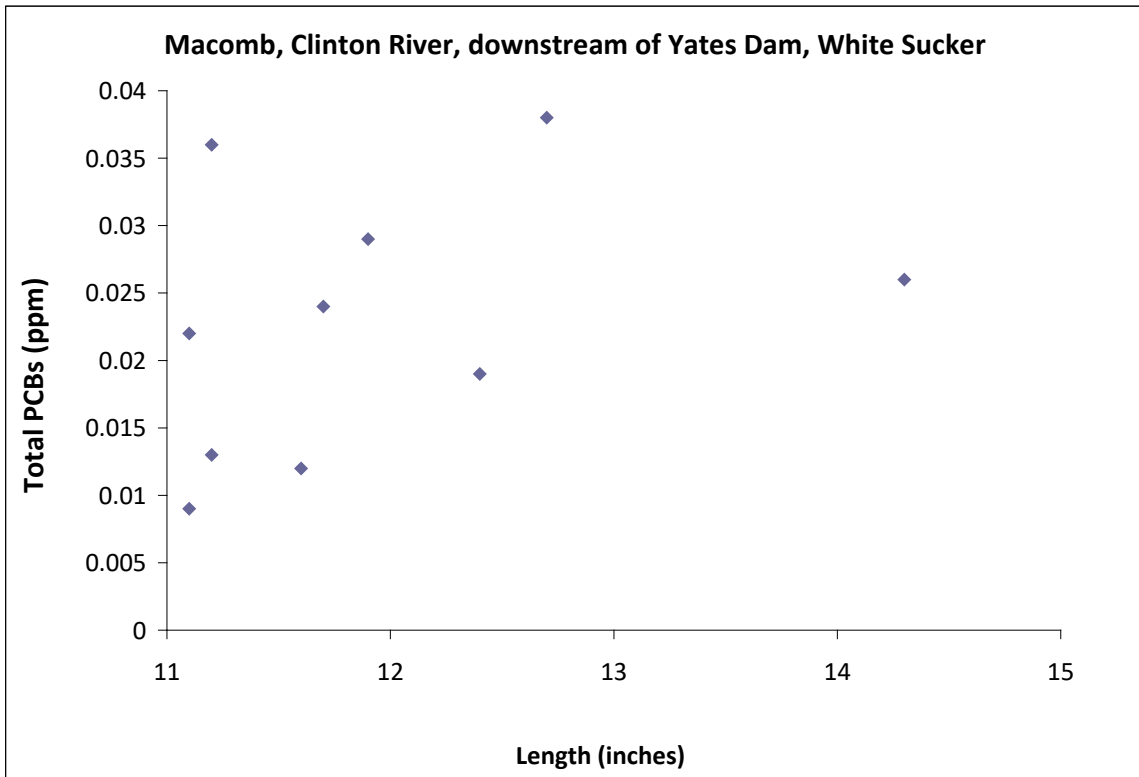
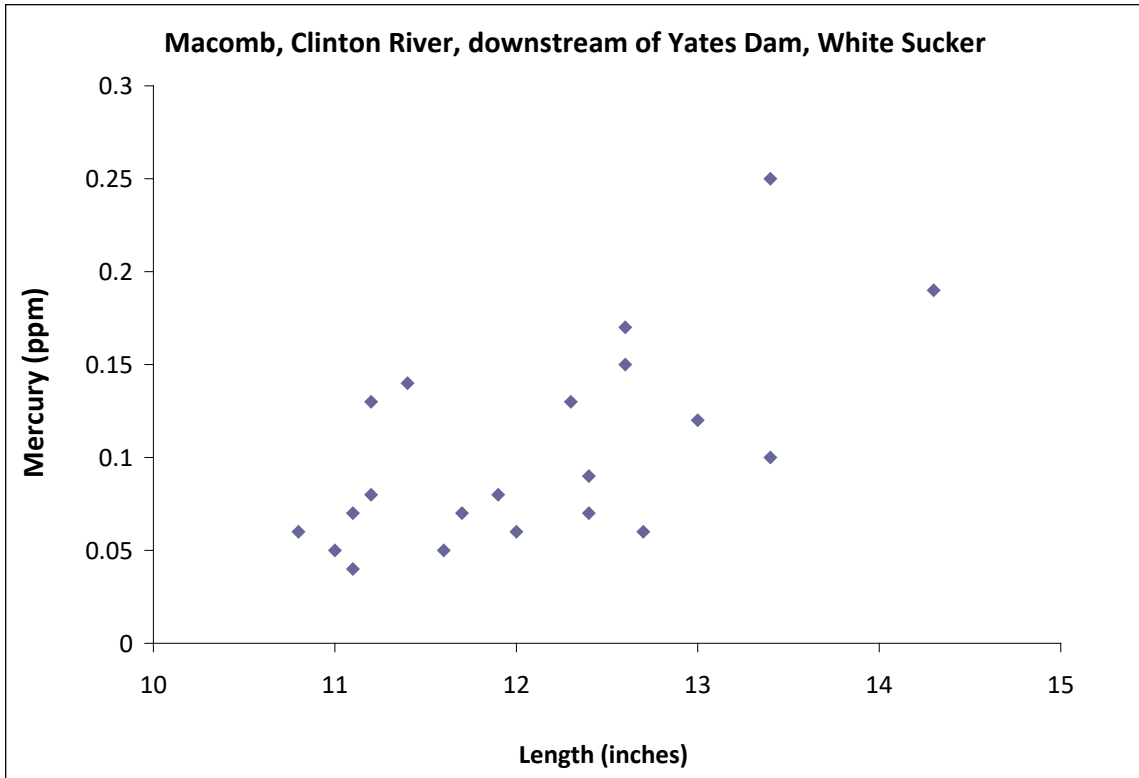
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1983	2004	21	10.8	na	10.8	14.3
Datasets available: 1983, 1984, 1994, 2004						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	21	0.103			0.130	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.405	0.400				

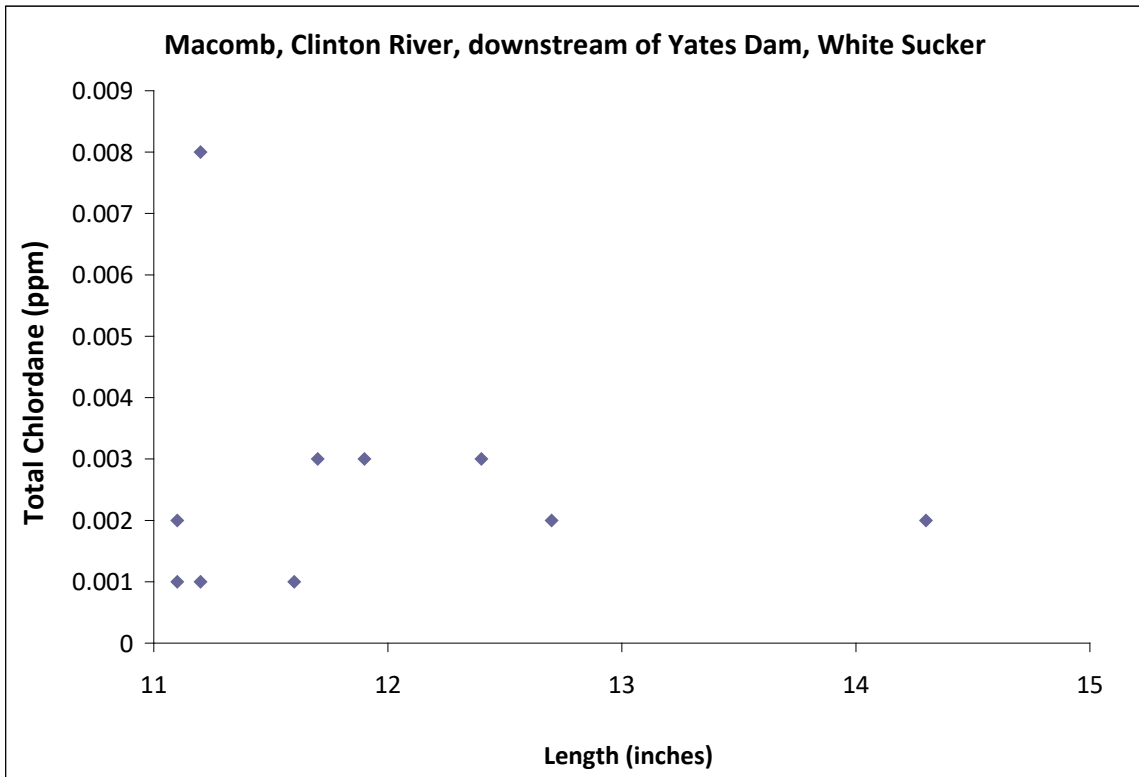
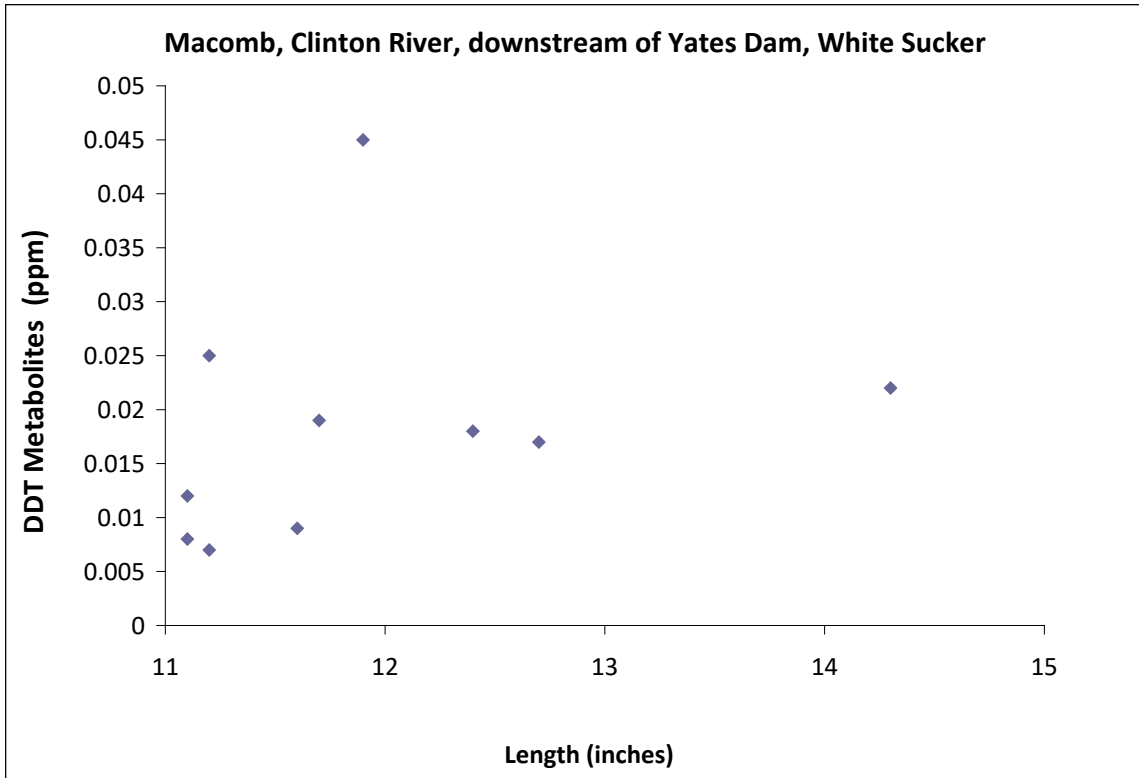
Organics Analysis:

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	11.1	na	11.1	14.3
Datasets available: 2004						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	10	0.023			0.030	8
DDT	10	0.018		0.030	16	
Chlordane	10	0.003		0.000	--	
Toxaphene	10	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.116	0.150				
DDT	0.070	0.158				
Chlordane	0.014	0.004				
Toxaphene						
Final meal category based on UCL:					8	

Existing Advisory: Clinton River white sucker are not covered by an advisory.

Recommendation: No one should eat more than 8 meals per month of sucker from the Clinton River downstream of the Yates Dam, including the North and Middle Branches and the Red Run, due to elevated concentrations of PCBs and mercury.





Hg Analysis:

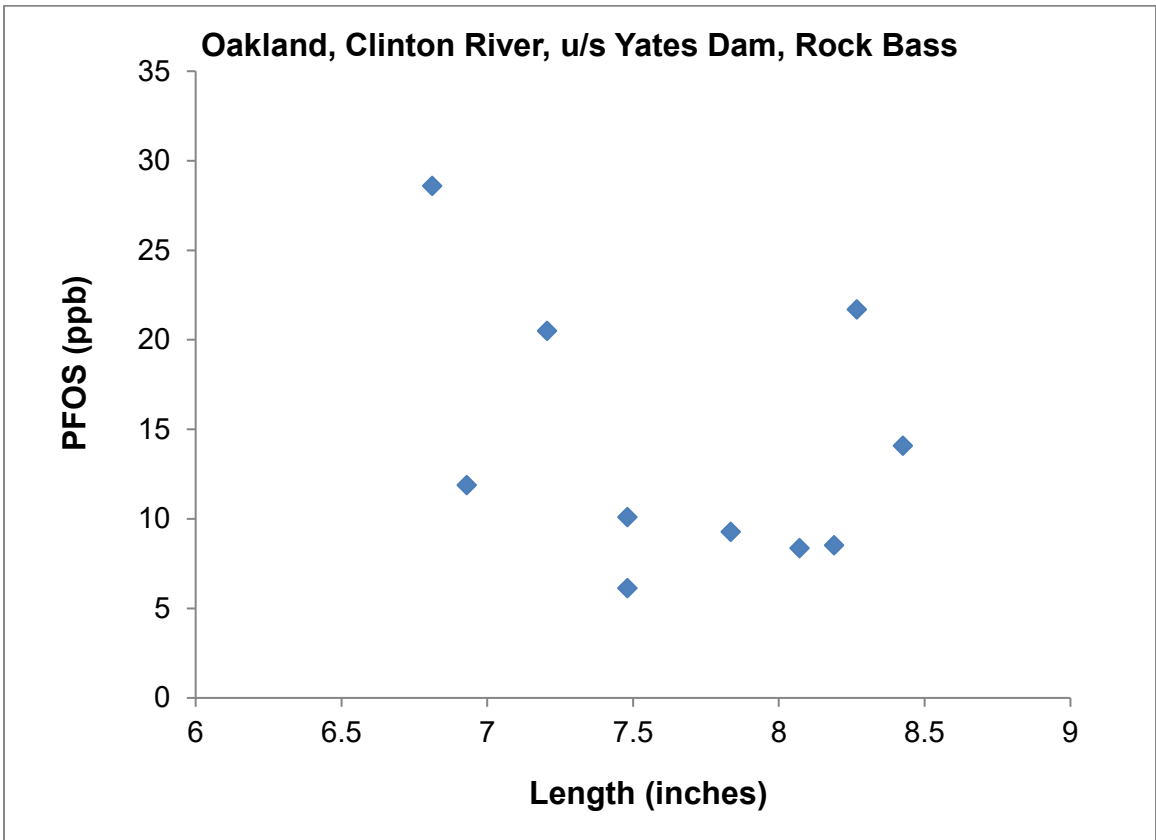
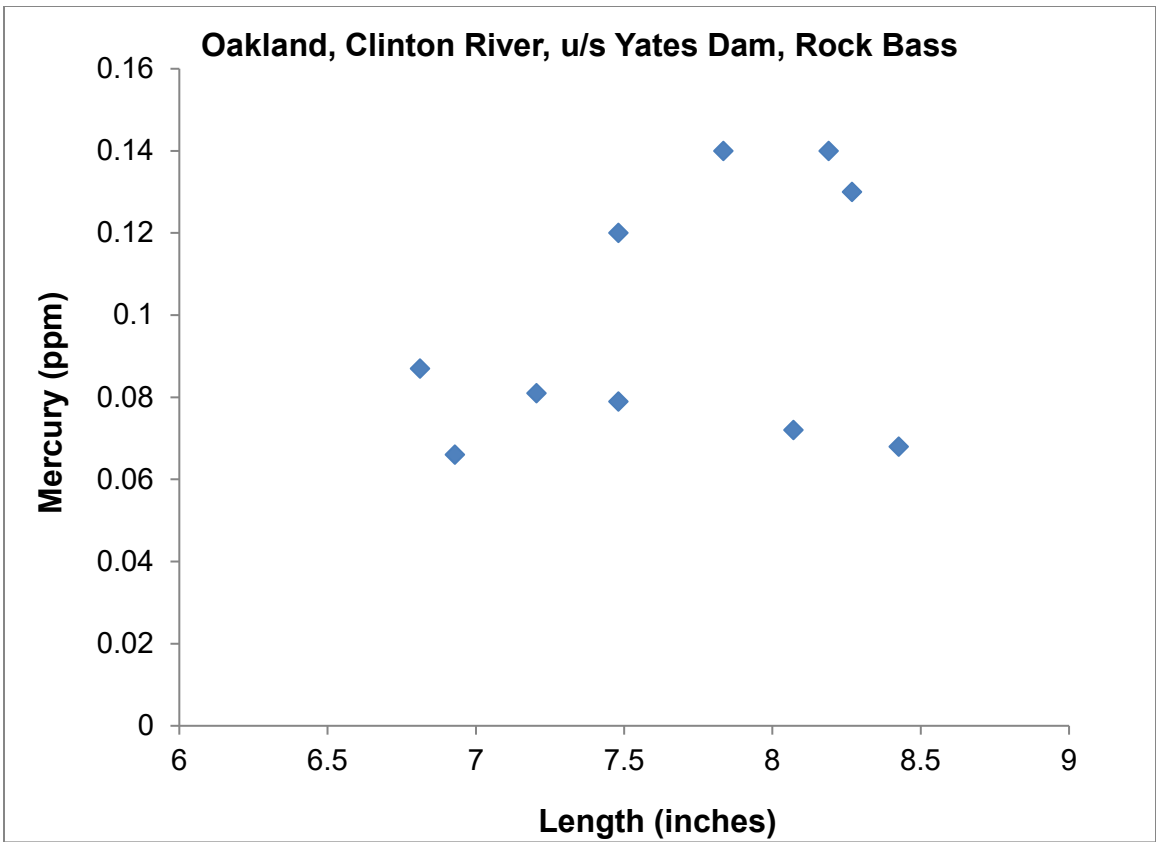
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2019	2019	10	6.8	NA	6.8	8.4
Datasets available: 2019						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.098	0.066	0.140	0.120	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.123	0.100				

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	6.8	NA	6.8	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	13.9 ppb	6.1 ppb	28.6 ppb	19.1 ppb	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.118	0.079				
Final meal category based on UCL:						4

Existing MDHHS Advisory: Rock bass from the Clinton River upstream of the Yates Dam are covered by the statewide advisory due to mercury: No one should eat more than 4 meals per month of rock bass of any size.

Recommendation: No one should eat more than 4 meals per month of rock bass from the Clinton River upstream of the Yates Dam, including Stony Creek up to the dam at Winkler Pond, of any size due to PFOS. Mercury would cause an advisory but is less restrictive than PFOS. Due to the range of PFOS levels, sampling of other species from this waterbody is recommended.



Flint River

Lapeer, Genesee, and Saginaw Counties

Carp

**Flint River
Downstream of Mott Dam**

Genesee County

Hg Analysis:

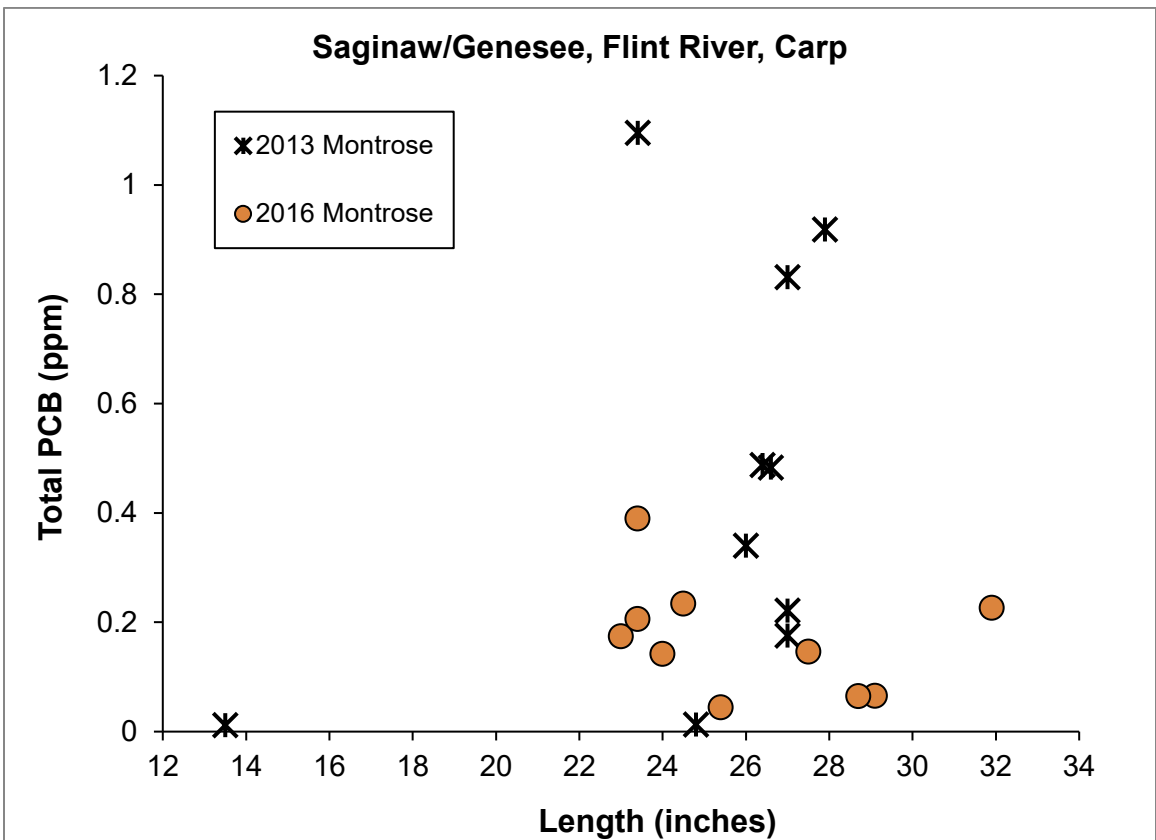
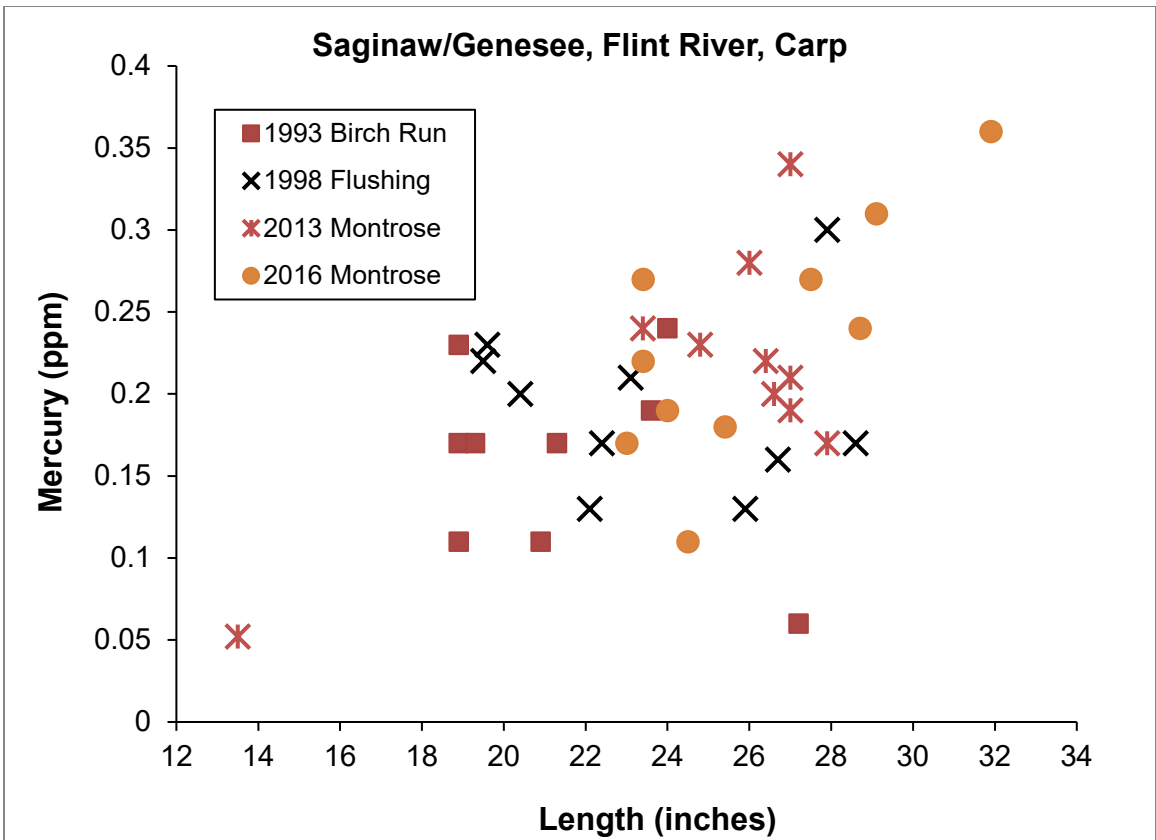
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1993	2016	39	13.5	na	13.5	31.9	
Datasets available: 1993, 1998, 2013, 2016							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	39	0.20		0.05	0.36	0.22	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.236	0.208					

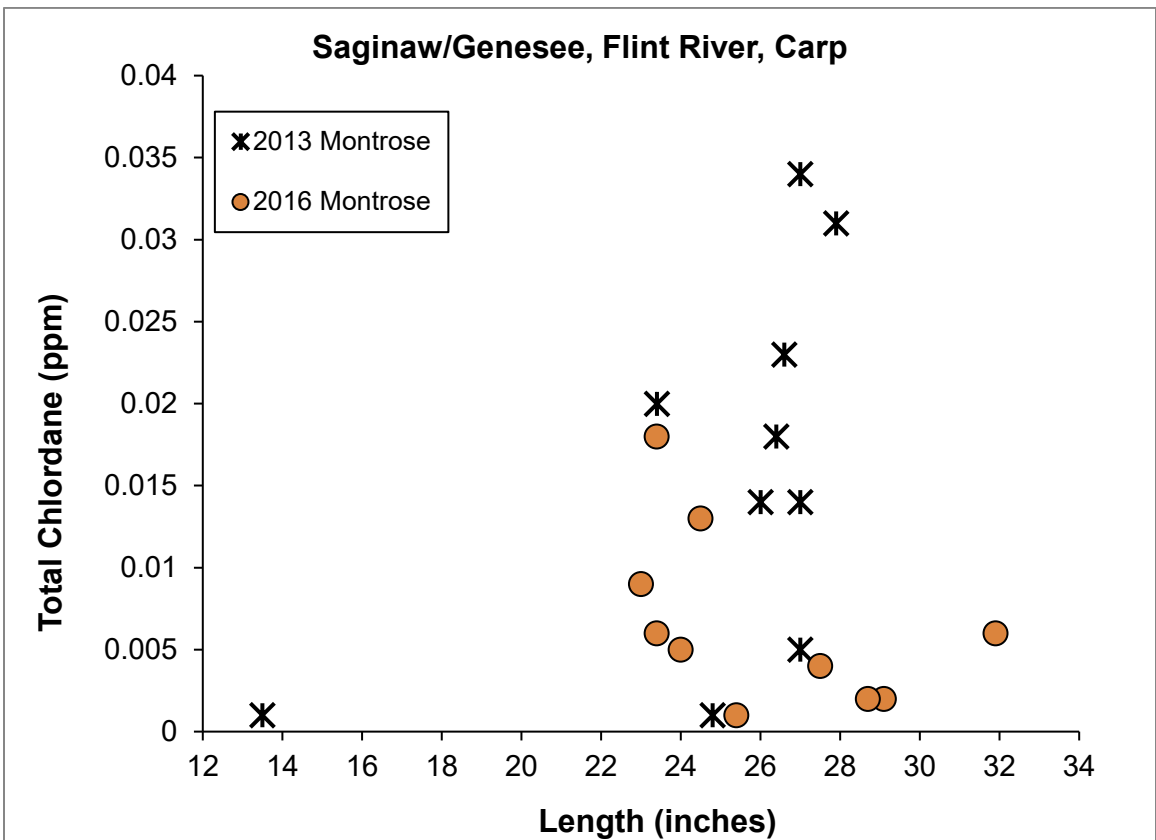
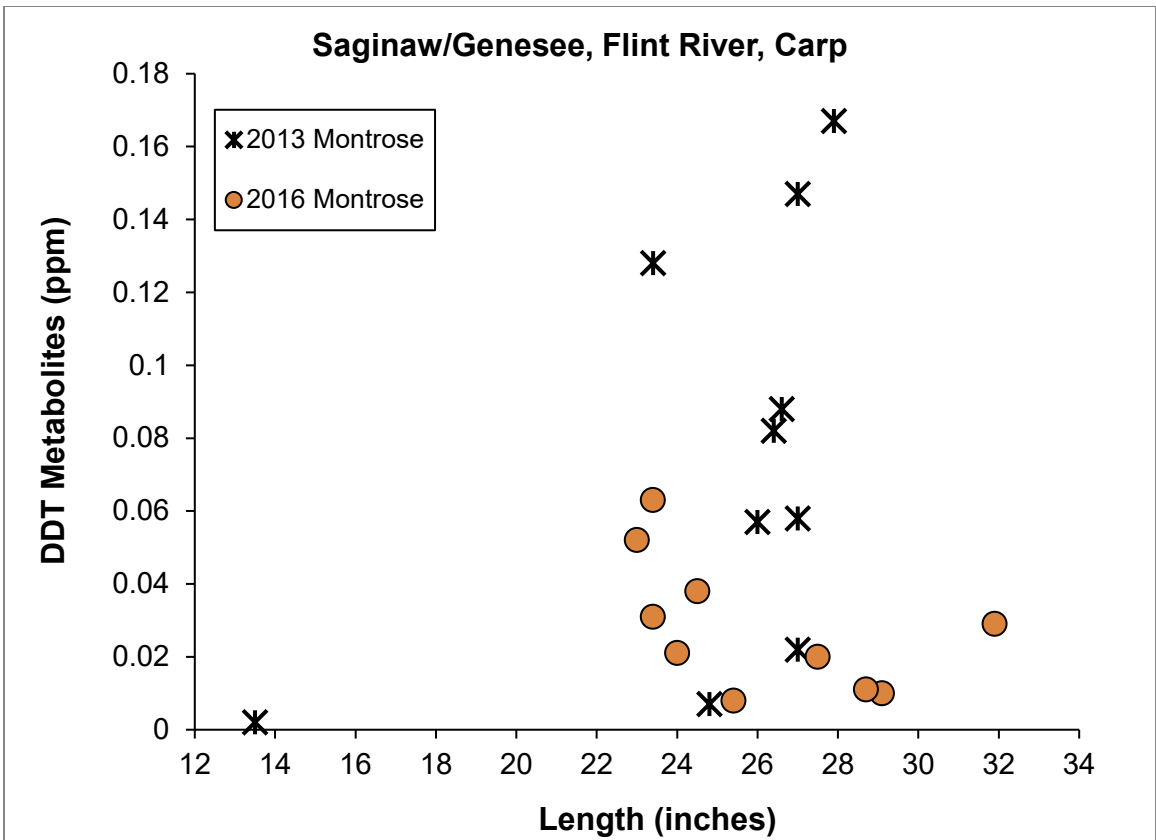
Organics Analysis:

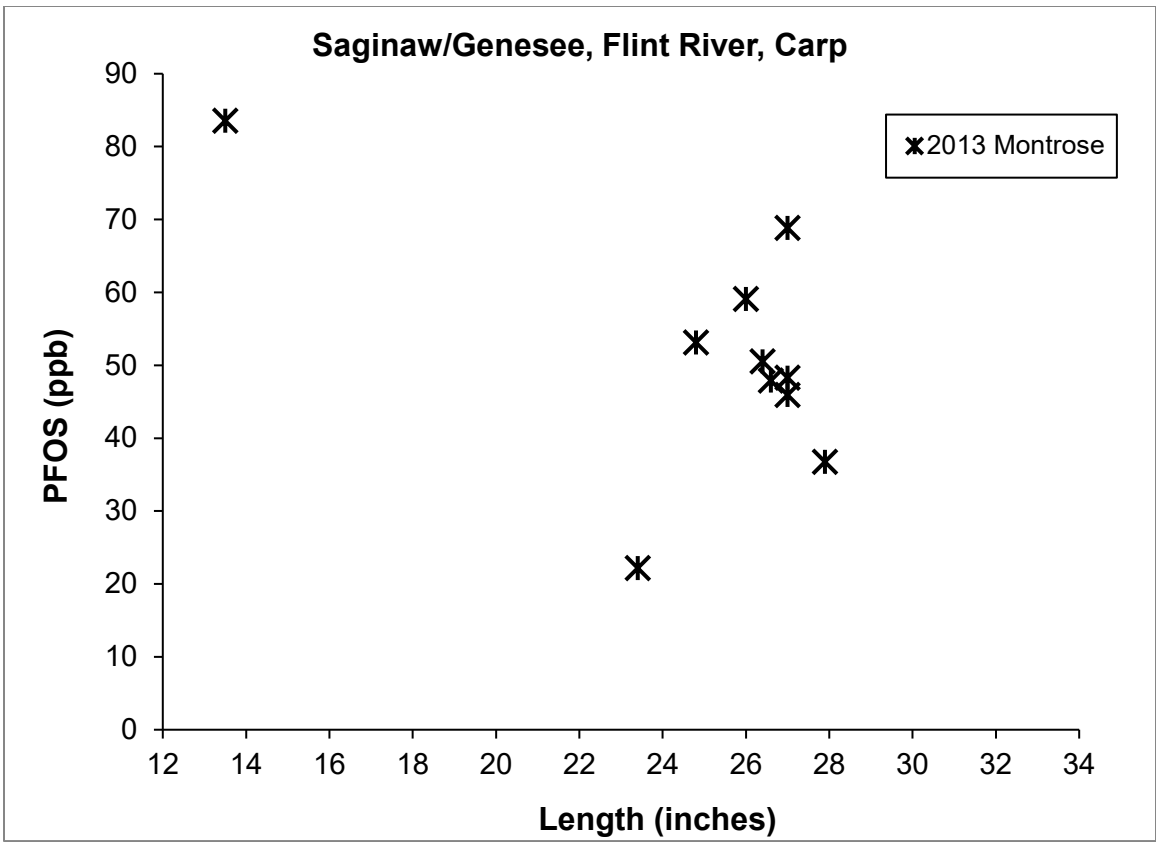
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2013	2016	20	13.5	na	13.5	31.9	
Datasets available: 1993, 1998, 2013, 2016							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	20	0.314		0.012	1.095	0.458	Limited
DDT	20	0.052		0.002	0.167	0.075	16
Chlordane	20	0.011		0.001	0.034	0.016	16
Toxaphene	20	ND		--	--	--	--
PFOS	10	52 ppb		22 ppb	84 ppb	64 ppb	2
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.015	0.135					
DDT	0.024	0.134					
Chlordane	0.025	0.055					
Toxaphene	--	--					
PFOS	0.297	0.134					
Final meal category based on UCL:							Limited

Existing MDHHS Advisory: Sensitive populations should not eat carp from the Flint River downstream of Mott Dam and healthy adults should limit consumption of those fish to no more than 1 or 2 meals per year due to PCBs.

Recommendation: No change is recommended. PFOS and mercury would also cause advisories.







**Largemouth
and Smallmouth Bass
Hg Analysis:**

**Flint River
Downstream of Mott Dam**

**Genesee and Saginaw
Counties**

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1998	2013	20	11.6	14	13.9	17.6
Datasets available: 1998, 2013						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	7	0.22	0.16	0.36	0.29	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.591	0.488				

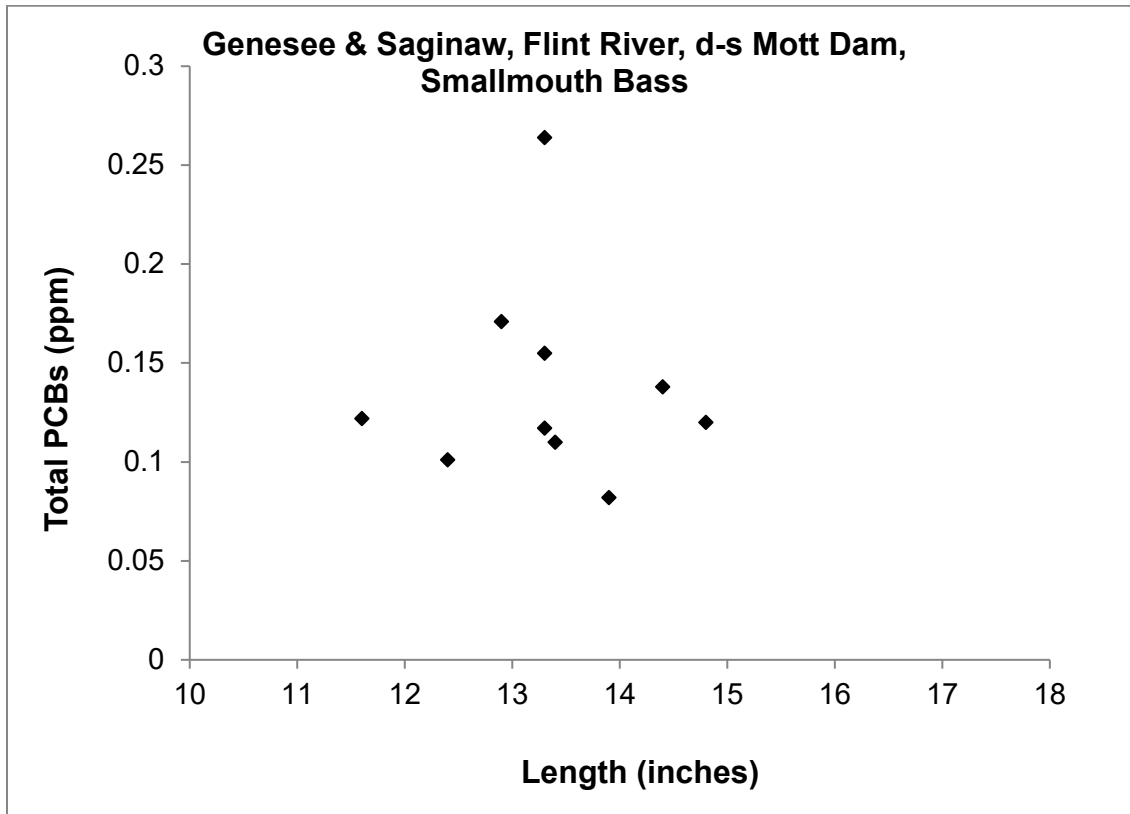
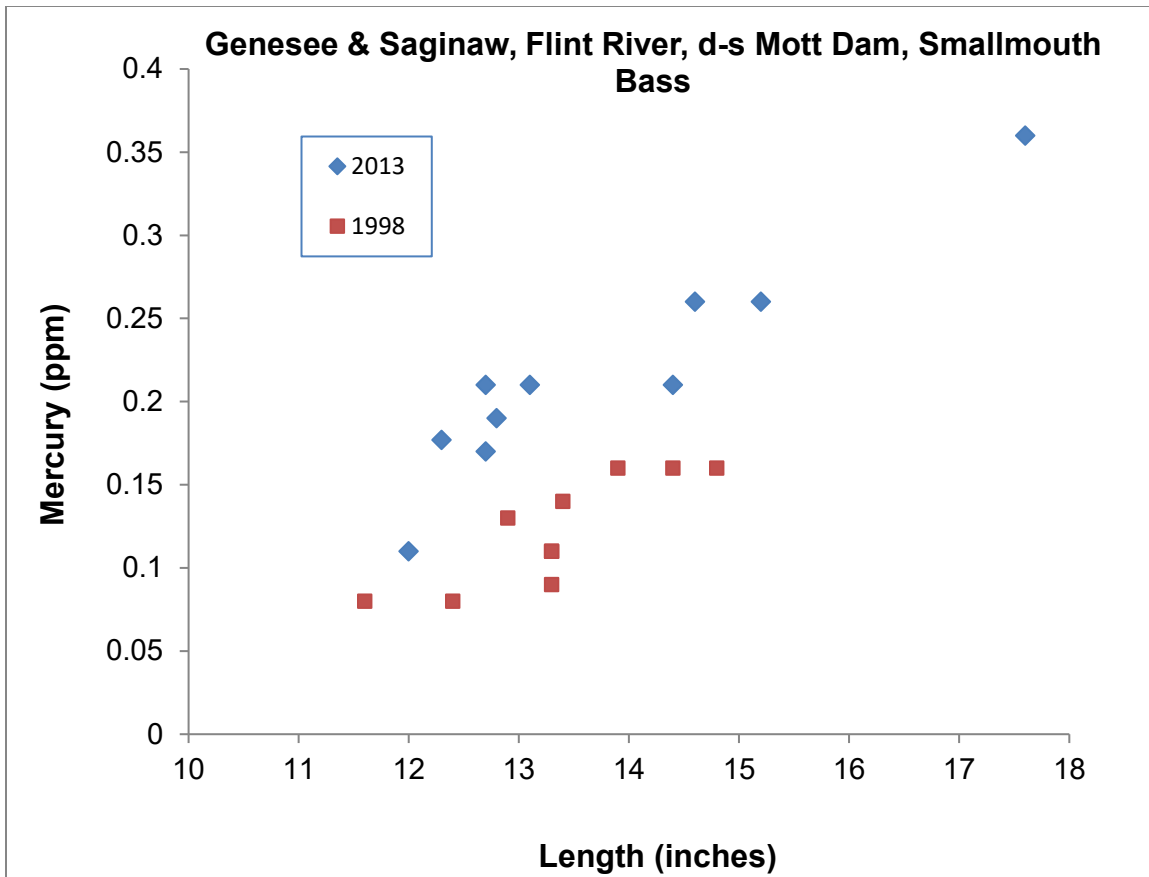
Organics Analysis:

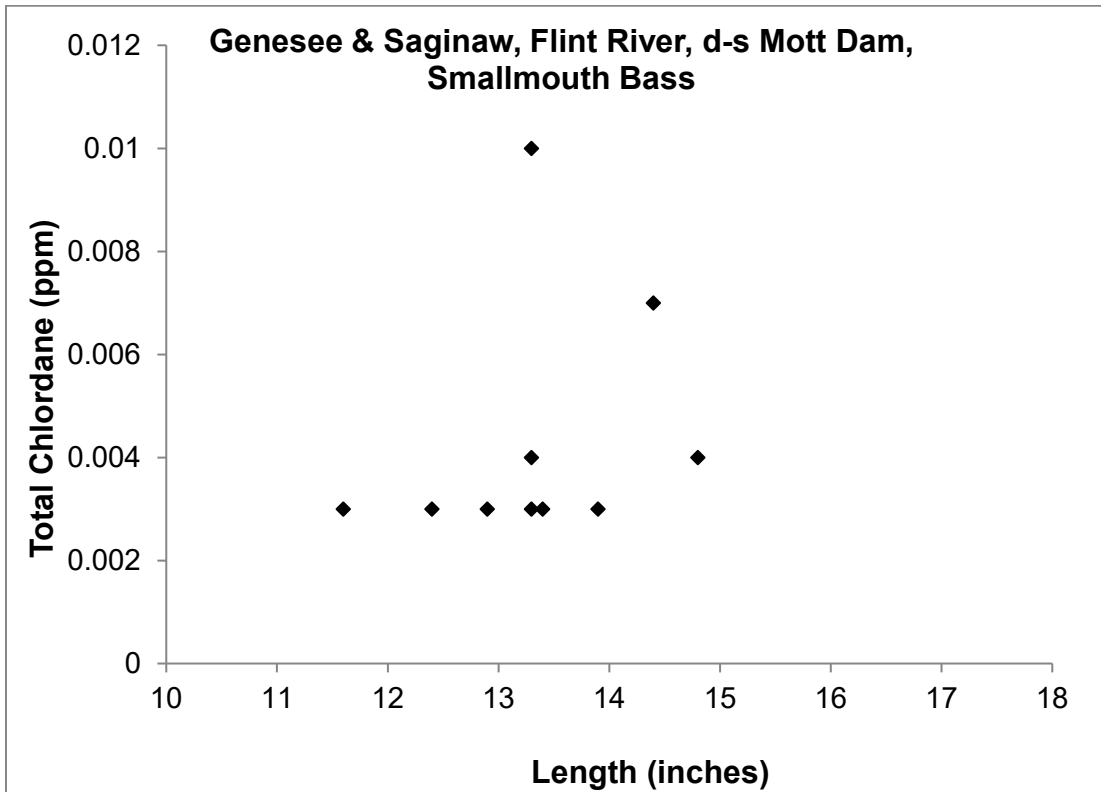
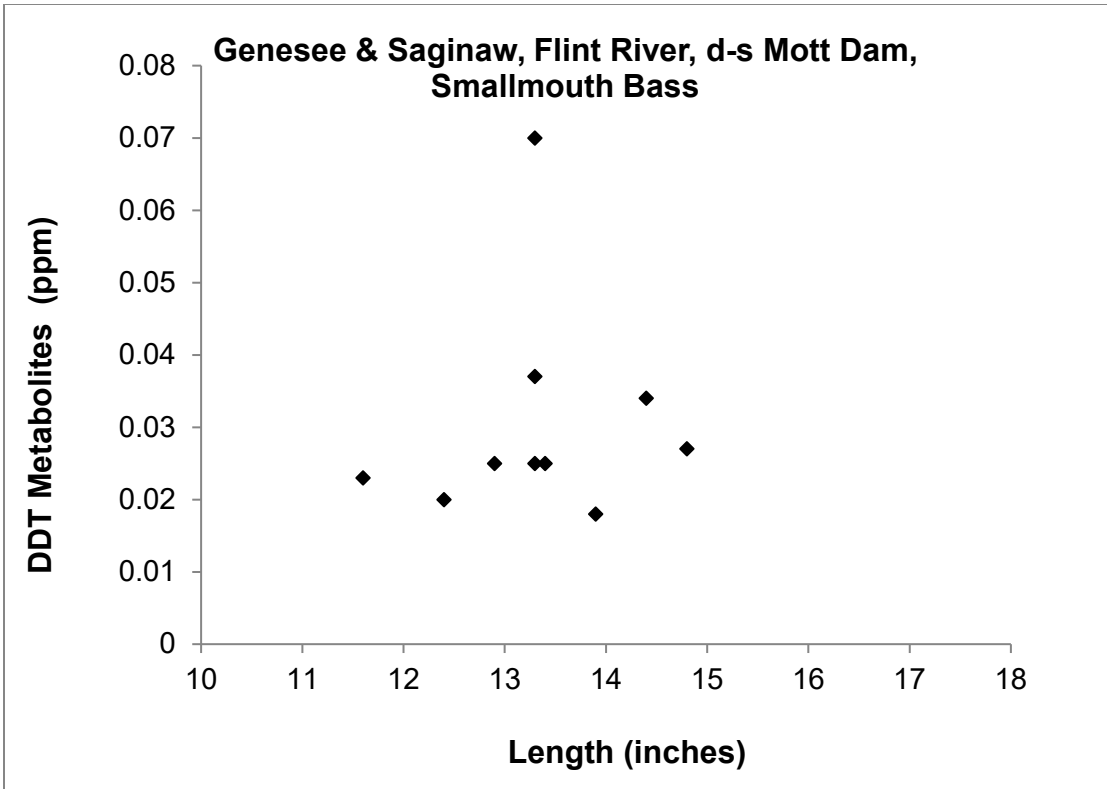
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1998	2013*	10	11.6	14	13.9	17.6
Datasets available: 1998, 2013*						
Chemical	Sample Size (All)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.14	0.082	0.264	0.175	1
DDT	10	0.03	0.018	0.07	0.041	16
Chlordane	10	0.004	0.003	0.01	0.006	16
Toxaphene	10	ND	--	--	--	--
PFOS	10	132 ppb	88 ppb	181 ppb	154 ppb	0.5
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.001	0.002				
DDT	0.014	0.031				
Chlordane	0.079	0.131				
Toxaphene	--	--				
PFOS	0.086	0.048				
Final meal category based on UCL:						0.5

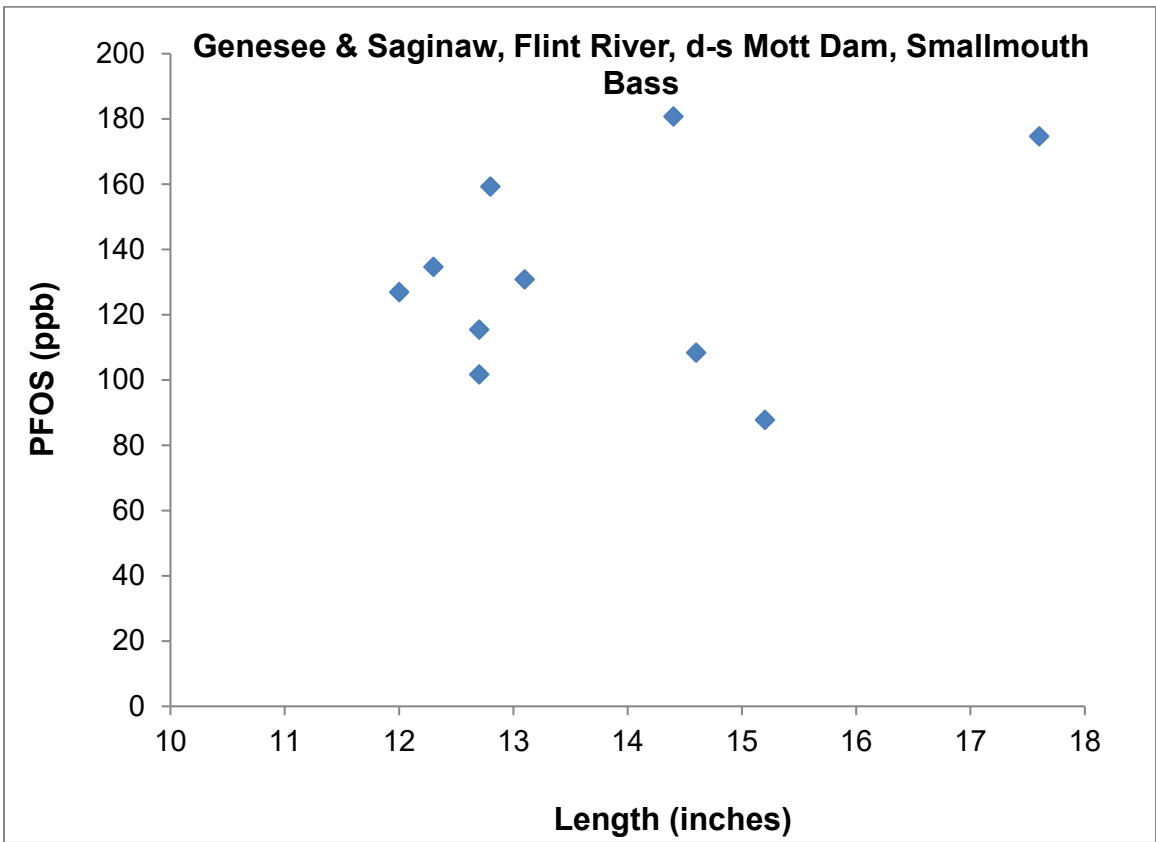
* - only PFOS and Hg analyzed in 2013

Existing Advisory: No one should eat more than 6 meals per year of largemouth or smallmouth bass of any size due to PFOS.

Recommendation: No change is recommended. PCBs and mercury would cause advisories.







Rock Bass

**Flint River
Downstream of Mott Dam**

**Genesee and Saginaw
County**

Hg Analysis:

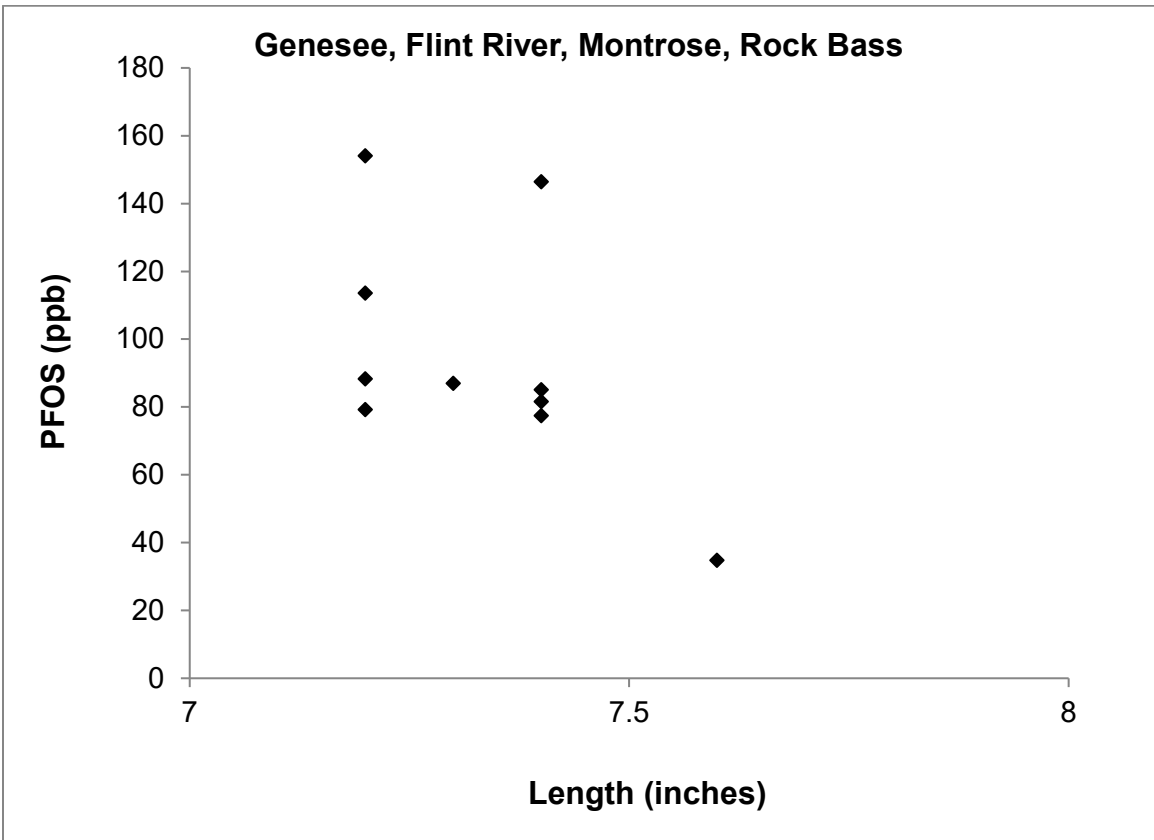
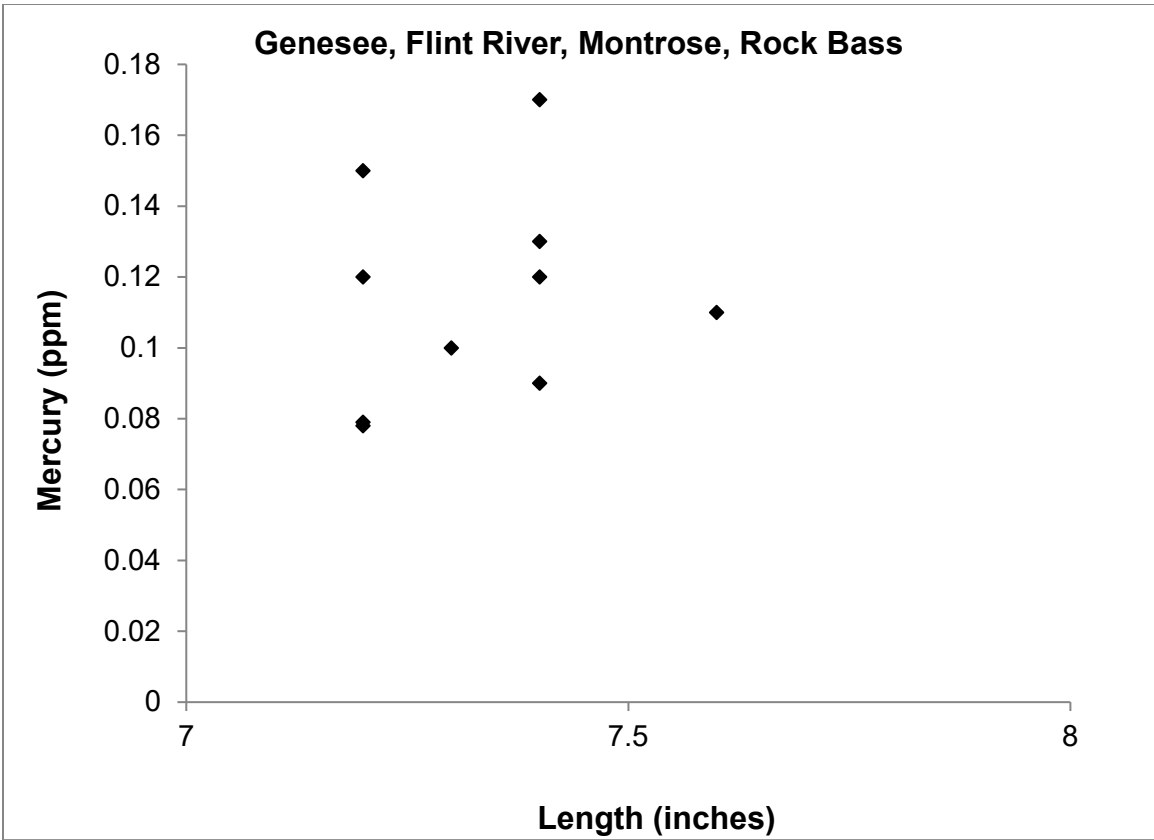
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2013	2013	10	7.2	na	7.2	7.6
Datasets available: 2013						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.12	0.08	0.17	0.14	4
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
2013	2013	10	7.2	NA	7.2	7.6
Datasets available: 2013						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	--	--	--	--	--	--
DDT	--	--	--	--	--	--
Chlordane	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--
PFOS	10	95 ppb	35 ppb	154 ppb	120 ppb	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.283	0.425	Final meal category based on UCL:			1

Existing Advisory: No one should eat more than 1 meal per month of rock bass from the Flint River downstream of the Mott Dam due to PFOS.

Recommendation: No change is recommended. Mercury would cause an advisory.



Black Crappie

**Flint River
Upstream of Mott Dam
Holloway Reservoir**

Genesee County

Hg Analysis:

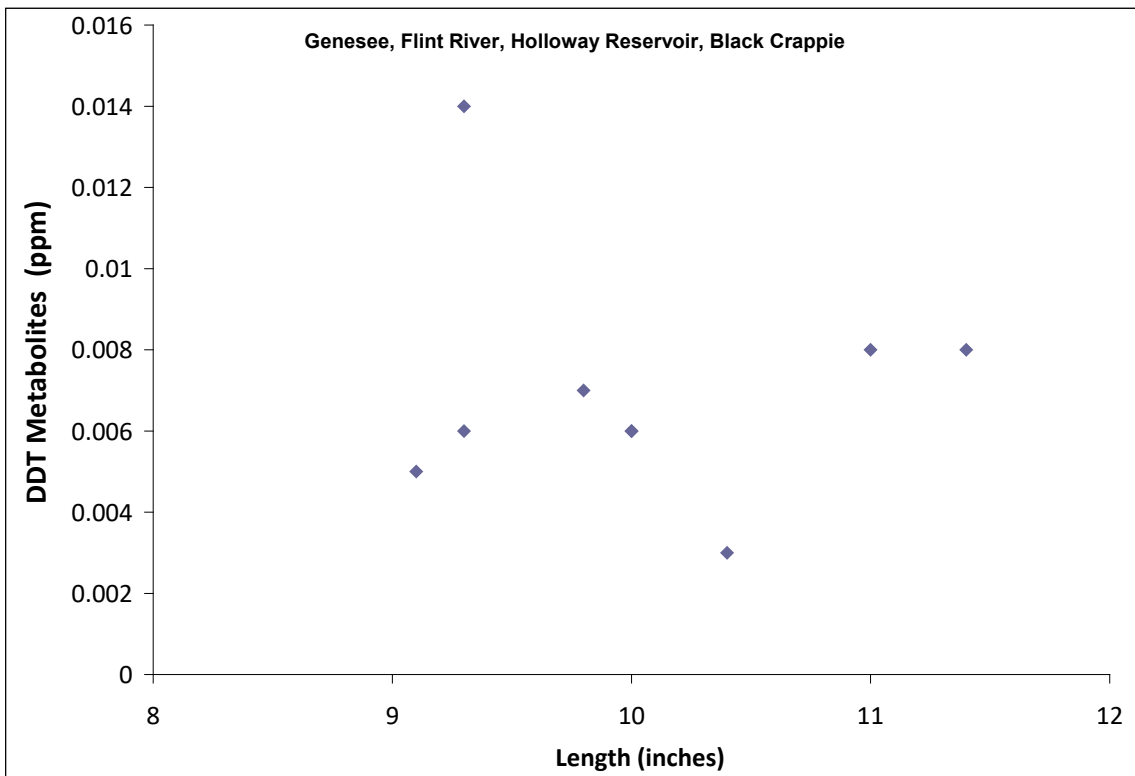
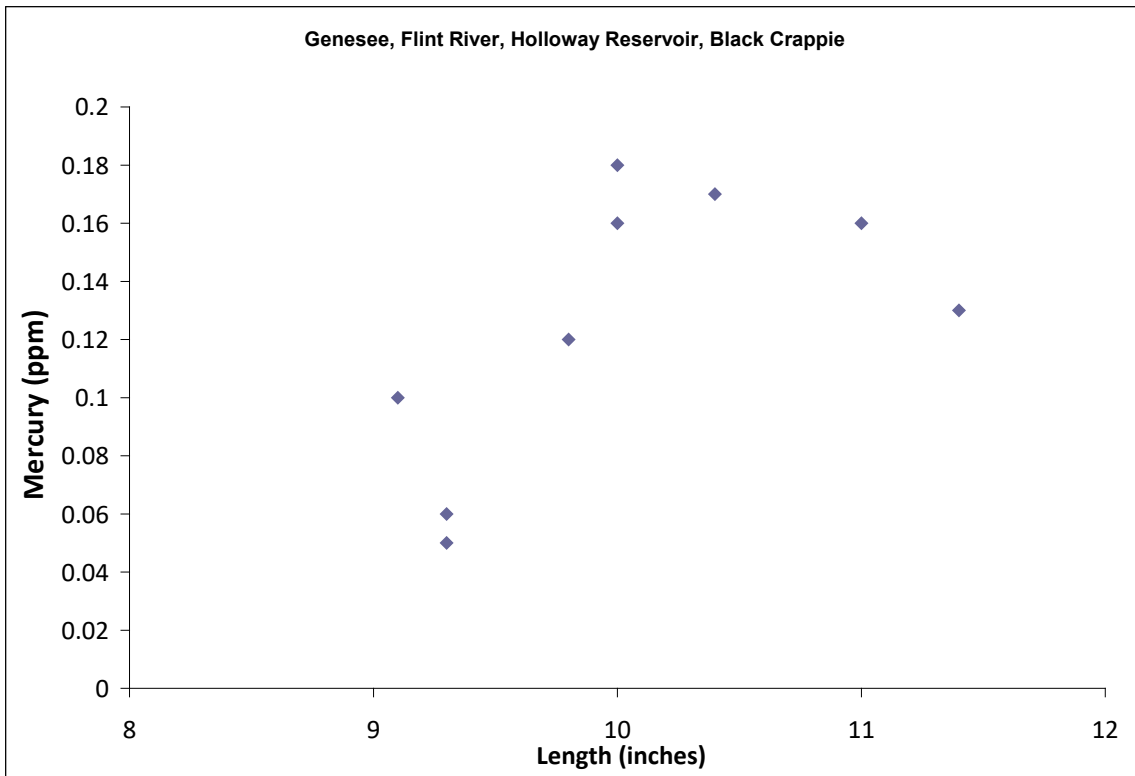
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	1989	9	9.1	na	9.1	11
Datasets available: 1989						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	9	0.126		0.160	4	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.369	0.386				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	1989	9	9.1	na	9.1	11
Datasets available: 1989						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	9	ND		--	--	
DDT	9	0.007		0.010	16	
Chlordane	9	ND		--	--	
Toxaphene	9	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	0.007	0.001				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						4

Existing MDHHS Advisory: Holloway Reservoir black crappie are covered under the statewide mercury consumption advisory.

Recommendation: No one should eat more than 4 meals per month of black or white crappie from the Flint River upstream of the Mott Dam, including the Mott Reservoir, Holloway Reservoir, and North and South Branches of the Flint River, due to mercury.



Hg Analysis:

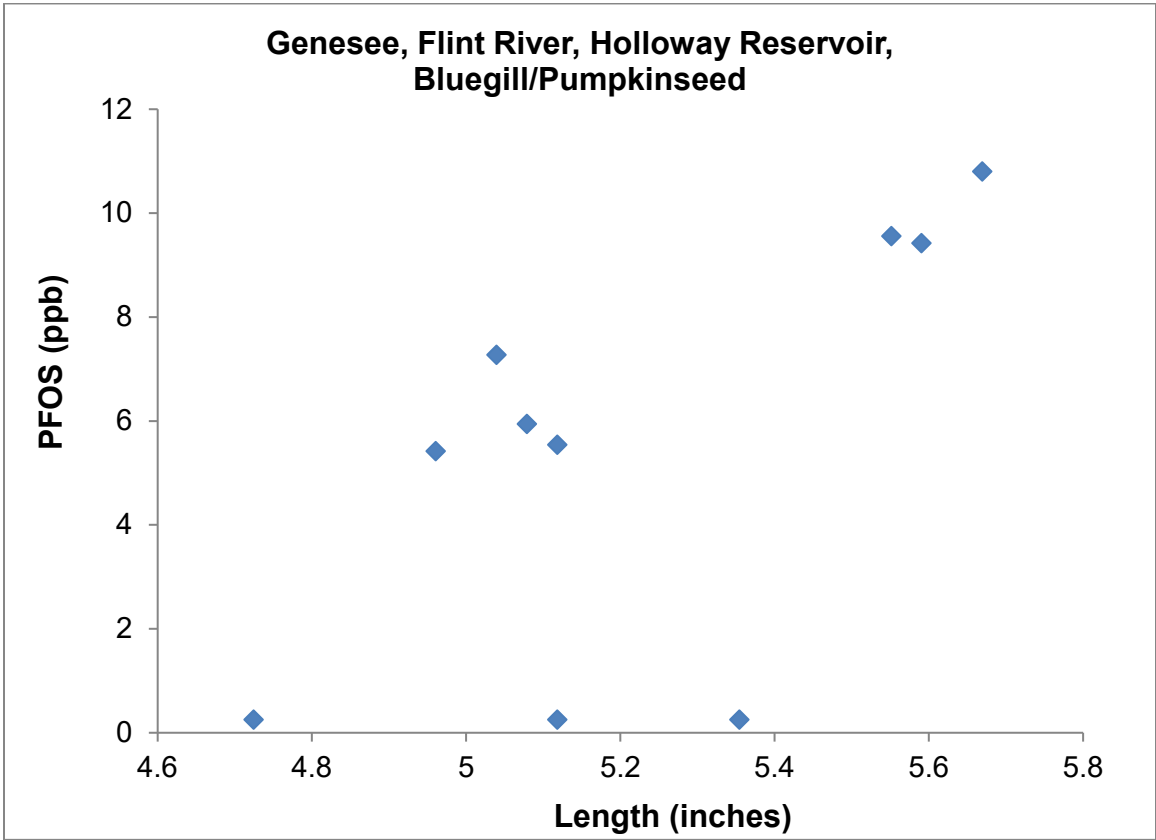
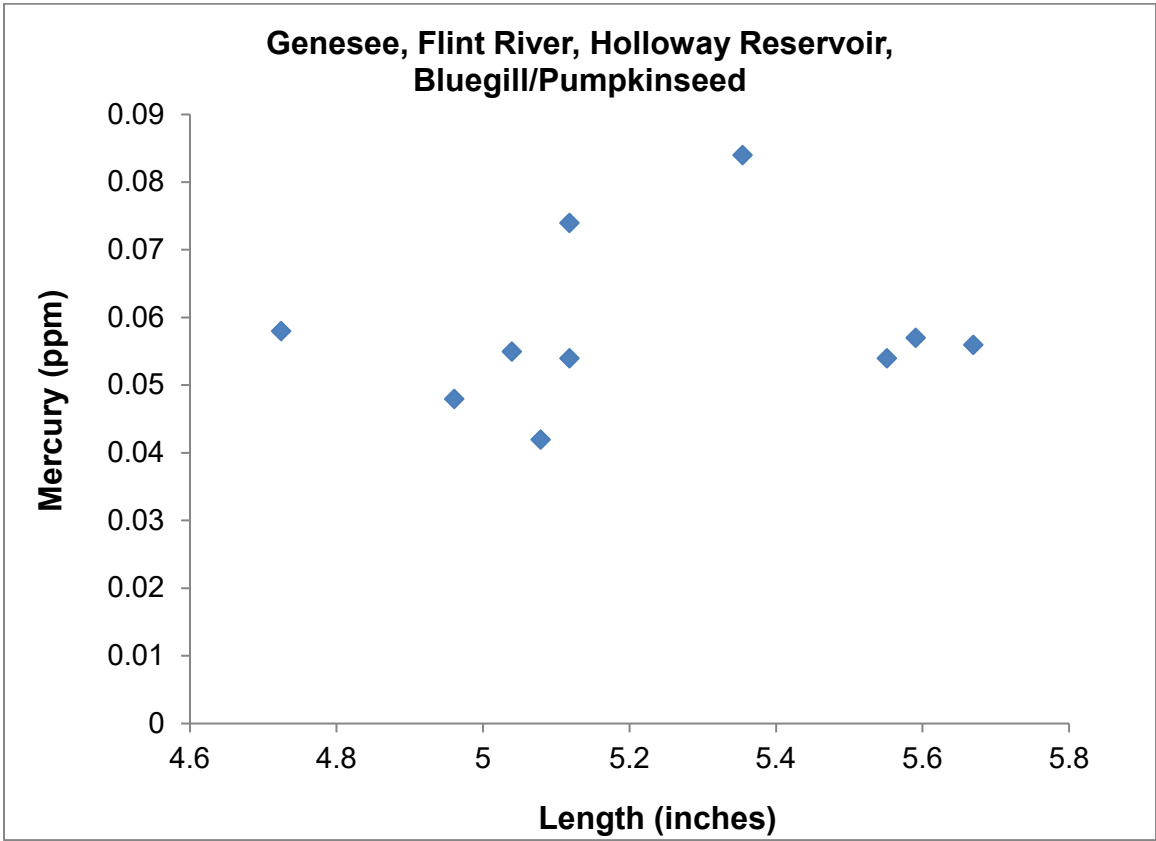
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2019	2019	10	4.7	NA	4.7	5.7
Datasets available: 2019						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.058	0.042	0.084	0.067	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.023	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
2019	2019	10	4.7	NA	4.7	5.7
Datasets available: 2019						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	ND	--	--	--	16
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
PFOS	10	5.5 (ppb)	<0.25 (ppb)	10.8 (ppb)	8.4 (ppb)	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.422	0.202				
Final meal category based on UCL:						16

Existing MDHHS Advisory: Bluegill and pumpkinseed from the Flint River upstream of the Mott Dam, including the Mott Reservoir, the Holloway Reservoir, and the North and South Branch of the river are currently covered under the statewide mercury guidance. No one should eat more than 8 meals per month of bluegill or pumpkinseed of any size.

Recommendation: No change to the advisory is recommended at this time. In 2017, EGLE discovered a source contributing PFAS to the Flint River. A granular activated carbon system was installed to mitigate this contamination, which appears to be decreasing in other species collected from this stretch of the Flint River. Additional fish are being analyzed in 2022 from both the Mott and Holloway Reservoirs. Once these data are received, a reevaluation of the advisory will be conducted.



Carp

**Flint River
Upstream of Mott Dam
Mott Reservoir**

**Genesee & Lapeer
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	2016	20	18.1	na	18.1	27.2
Datasets available: 1996, 2016						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	20	0.20	0.11	0.28	0.21	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.087	0.106				

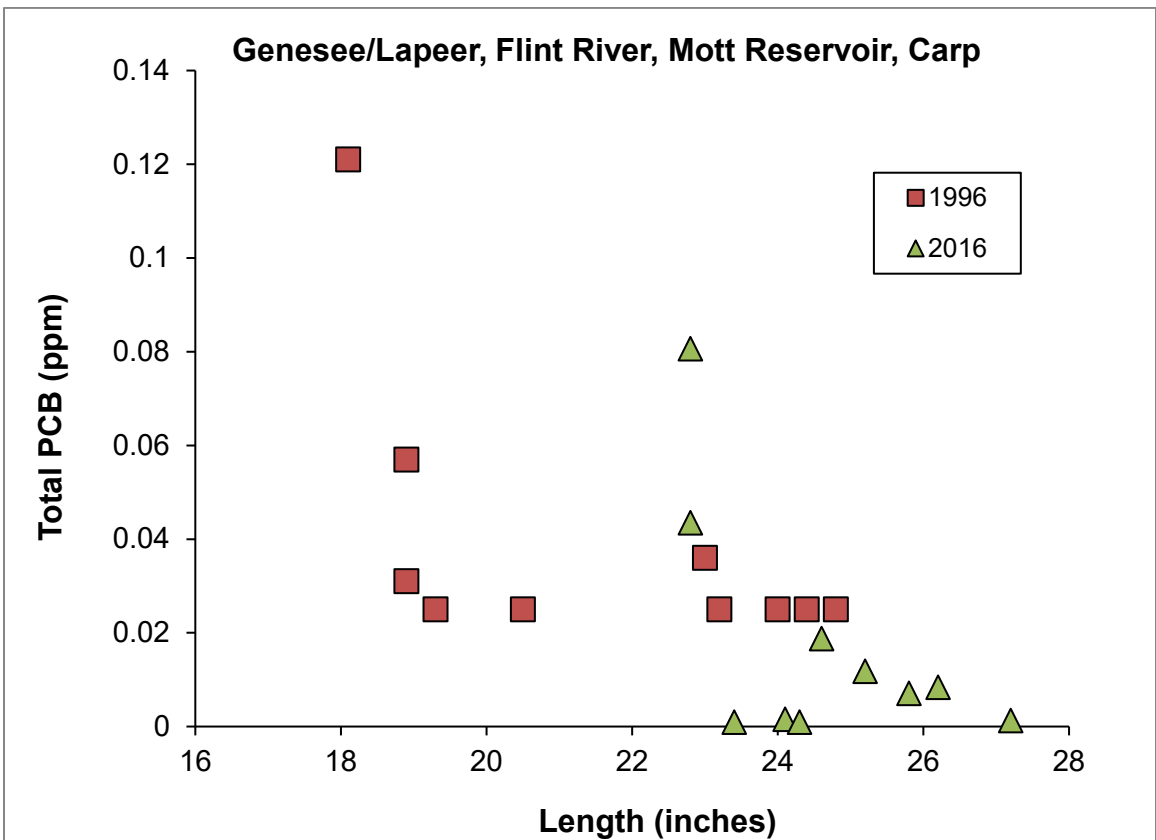
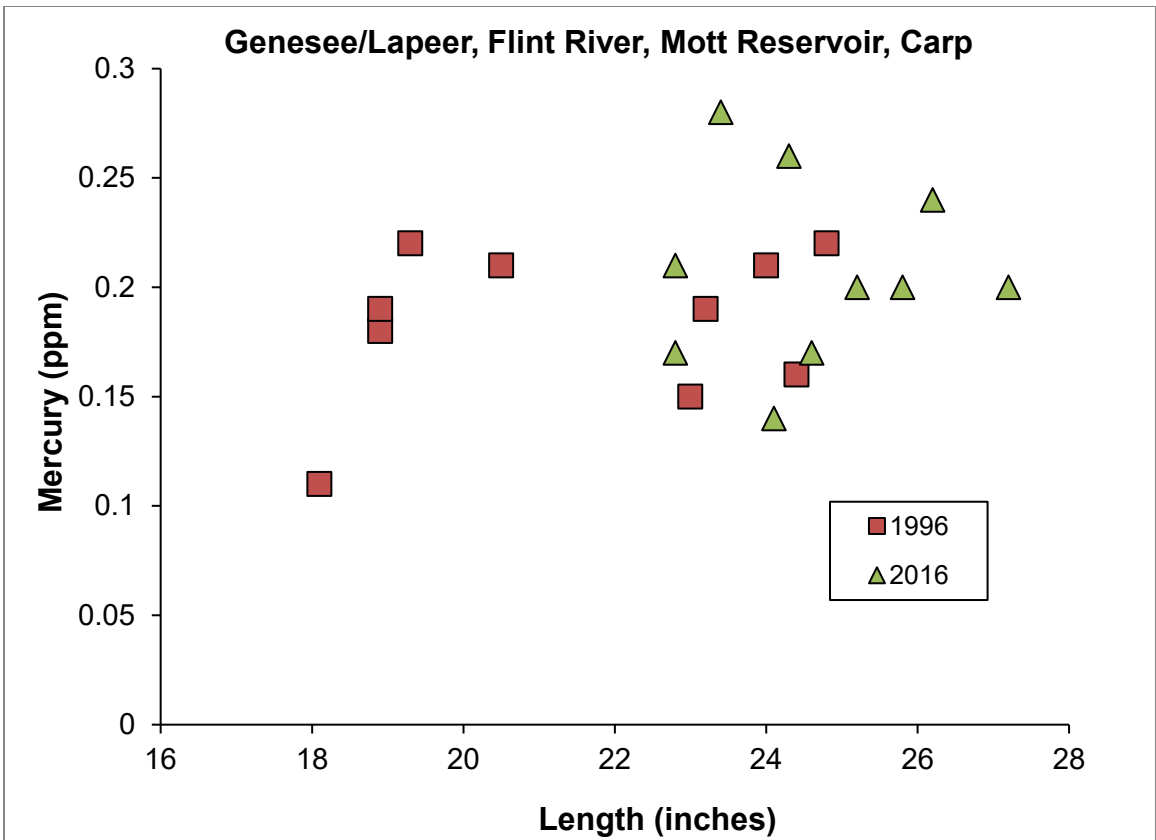
Organics Analysis:

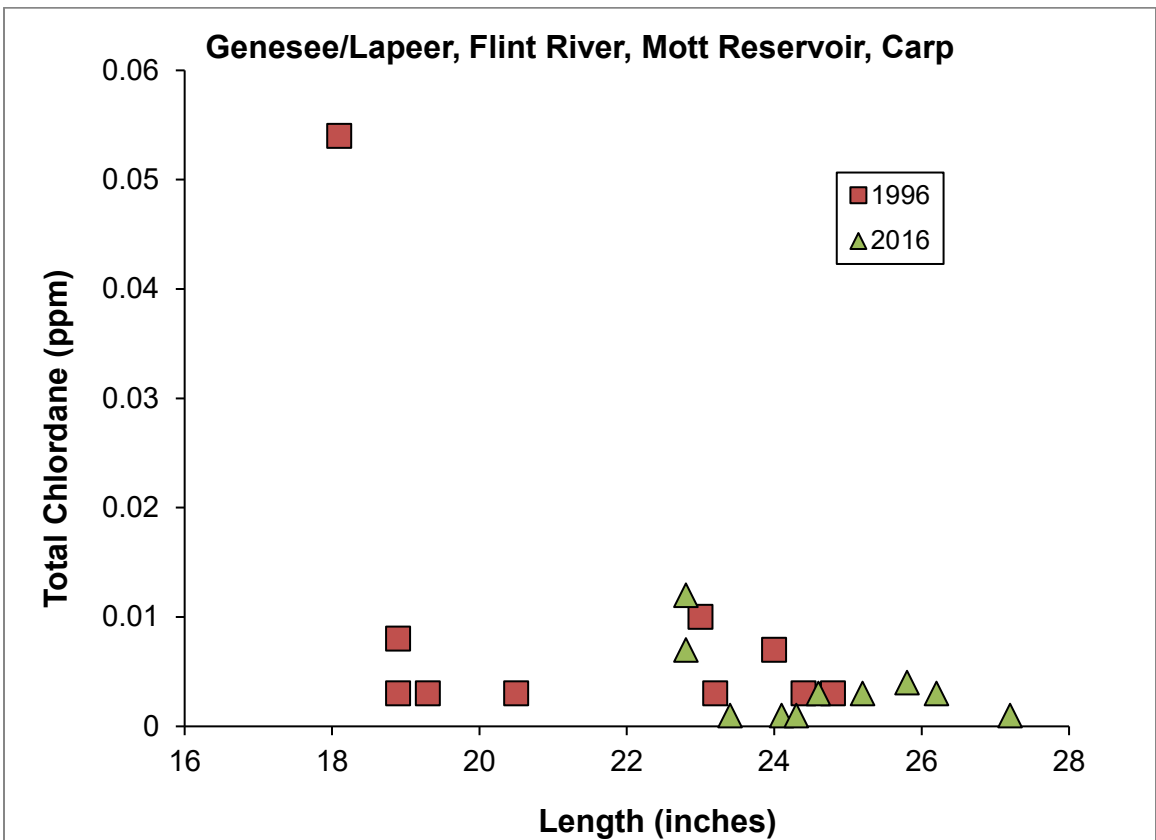
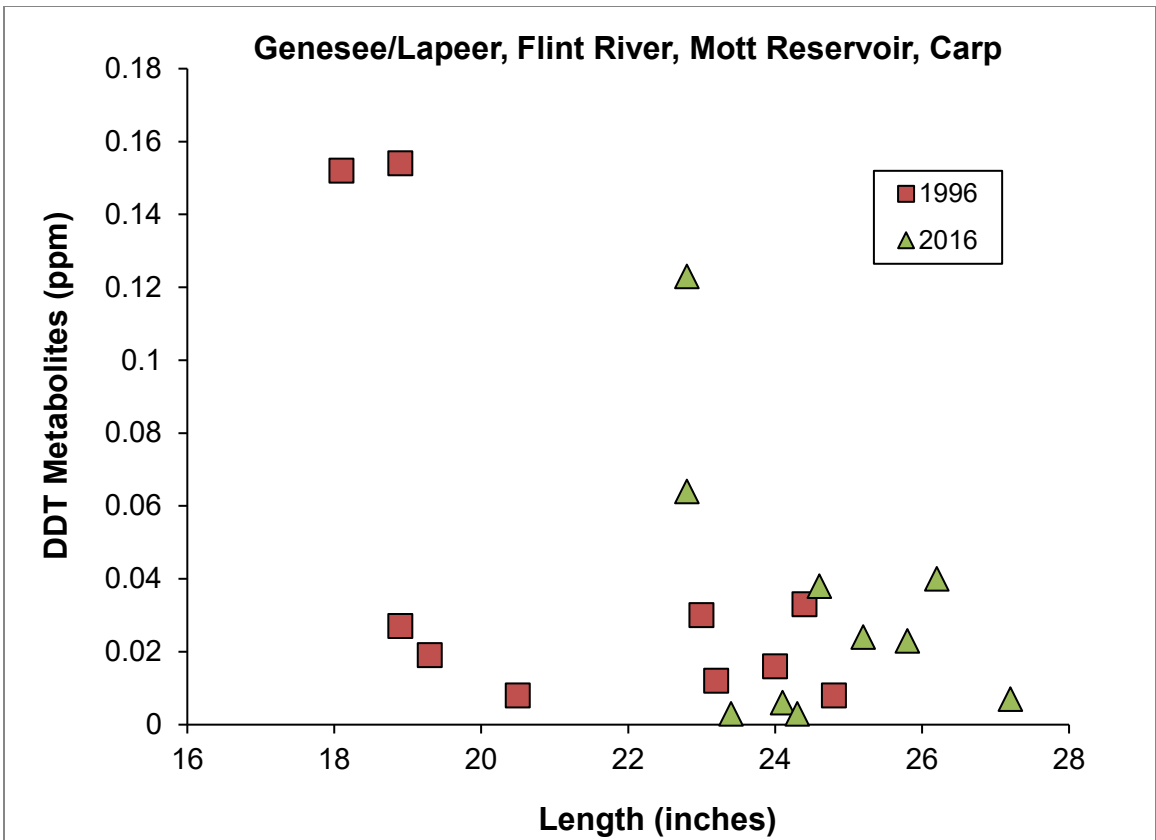
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1996	2016	20	18.1	na	18.1	27.2
Datasets available: 1996, 2016						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	20	0.03	0.001	0.12	0.04	4
DDT	20	0.04	0.003	0.15	0.06	16
Chlordane	20	0.007	0.001	0.05	0.01	--
Toxaphene	20	ND	--	--	--	--
PFOS	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.421	0.336				
DDT	0.281	0.169				
Chlordane	0.247	0.263				
Toxaphene	--	--				
PFOS			Final meal category based on UCL:			4*

Existing MDHHS Advisory: No one should eat more than 4 meals of carp from upstream of the Mott Dam due to PCBs and mercury.

Recommendation: No one should eat more than 2 meals per month of carp from the Flint River upstream of Mott Dam due to PFOS. Mercury and PCBs would also cause an advisory.

*Note: The recommendation is based on PFOS concentrations in carp from downstream of the Mott Dam (at Montrose). Concentrations of PFOS in other species collected both upstream and downstream of the dam were not different and it is likely that carp from upstream are similar to those downstream.





Channel Catfish

**Flint River
Upstream of Mott Dam
Mott, Holloway Reservoirs**

**Genesee & Lapeer
Counties**

Hg Analysis:

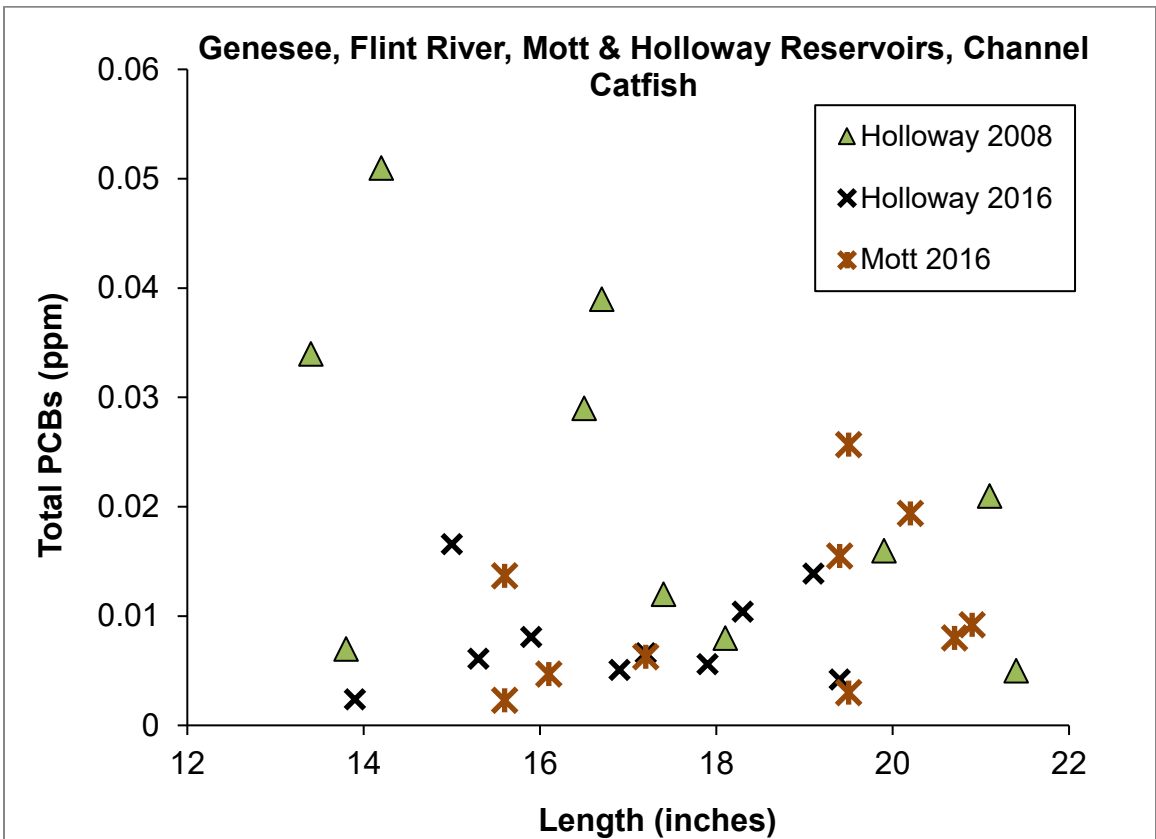
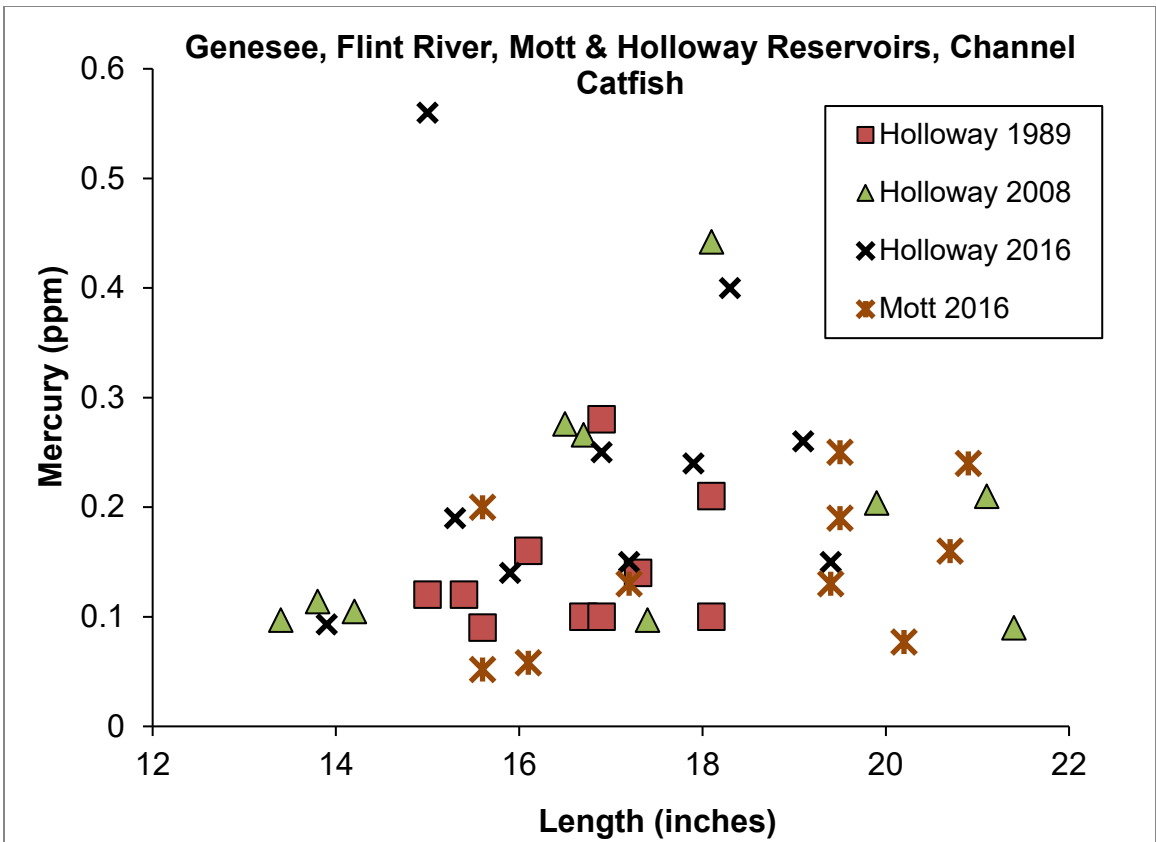
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	2016	40	13.4	12	13.4	21.4
Datasets available: 1989, 2008, 2016						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	40	0.18	0.05	0.56	0.22	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.016	0.047				

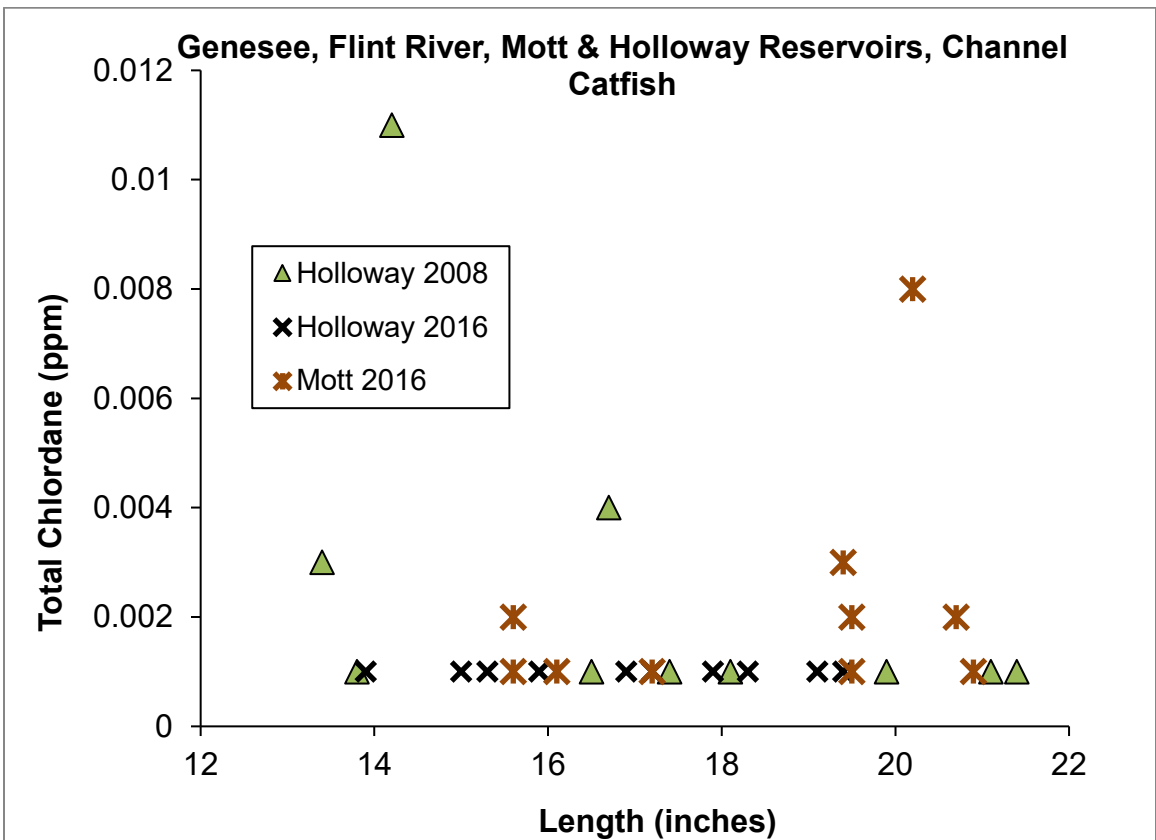
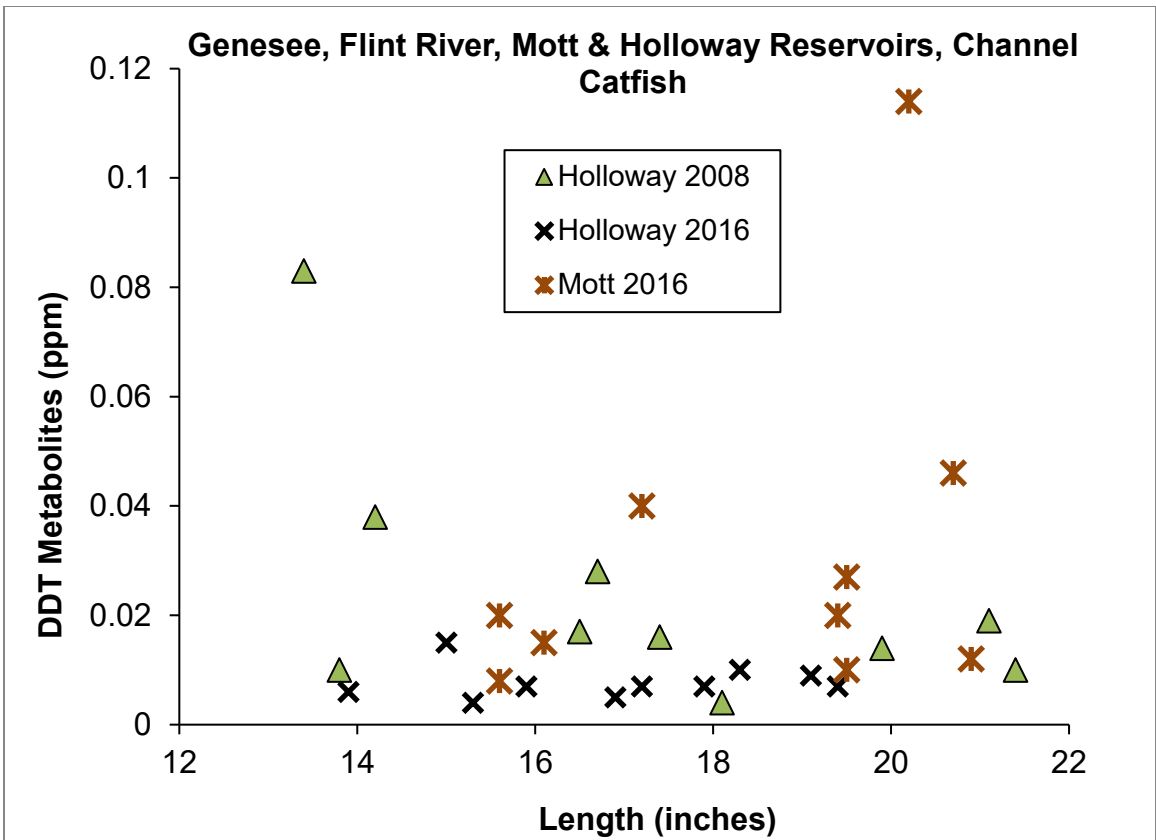
Organics Analysis:

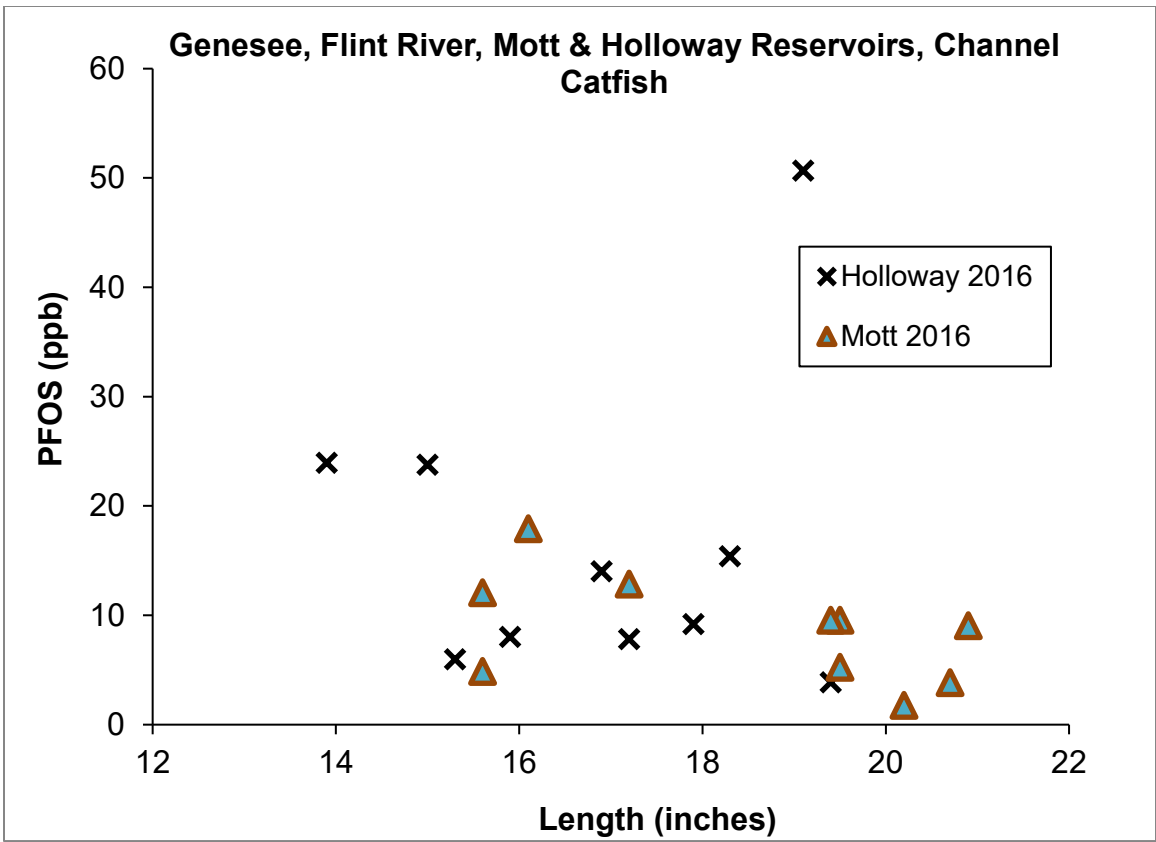
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2008	2016	30	13.4	12	13.4	21.4
Datasets available: 1989, 2008, 2016						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	30	0.01	0.002	0.05	0.02	12
DDT	30	0.02	0.004	0.11	0.03	16
Chlordane	30	0.002	0.001	0.011	0.003	--
Toxaphene	30	ND	--	--	--	--
PFOS	20	12 ppb	1.8 ppb	51 ppb	18 ppb	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.037	0.001				
DDT	0.001	0.005				
Chlordane	0.015	0.008				
Toxaphene	--	--				
PFOS	0.042	0.160				
Final meal category based on UCL:						4

Existing MDHHS Advisory: No one should eat more than 4 meals per month of channel catfish from the Holloway Reservoir of the Flint River due to mercury.

Recommendation: No one should eat more than 4 meals of channel catfish from the Flint River including the Mott Reservoir, Holloway Reservoir, and the North and South Branches of the Flint River upstream of the Holloway Reservoir due to mercury. PFOS and PCBs would cause advisories.







Largemouth/Smallmouth Bass

**Flint River
Upstream of Mott Dam
Mott, Holloway Reservoirs**

Genesee/Lapeer Counties

Hg Analysis:

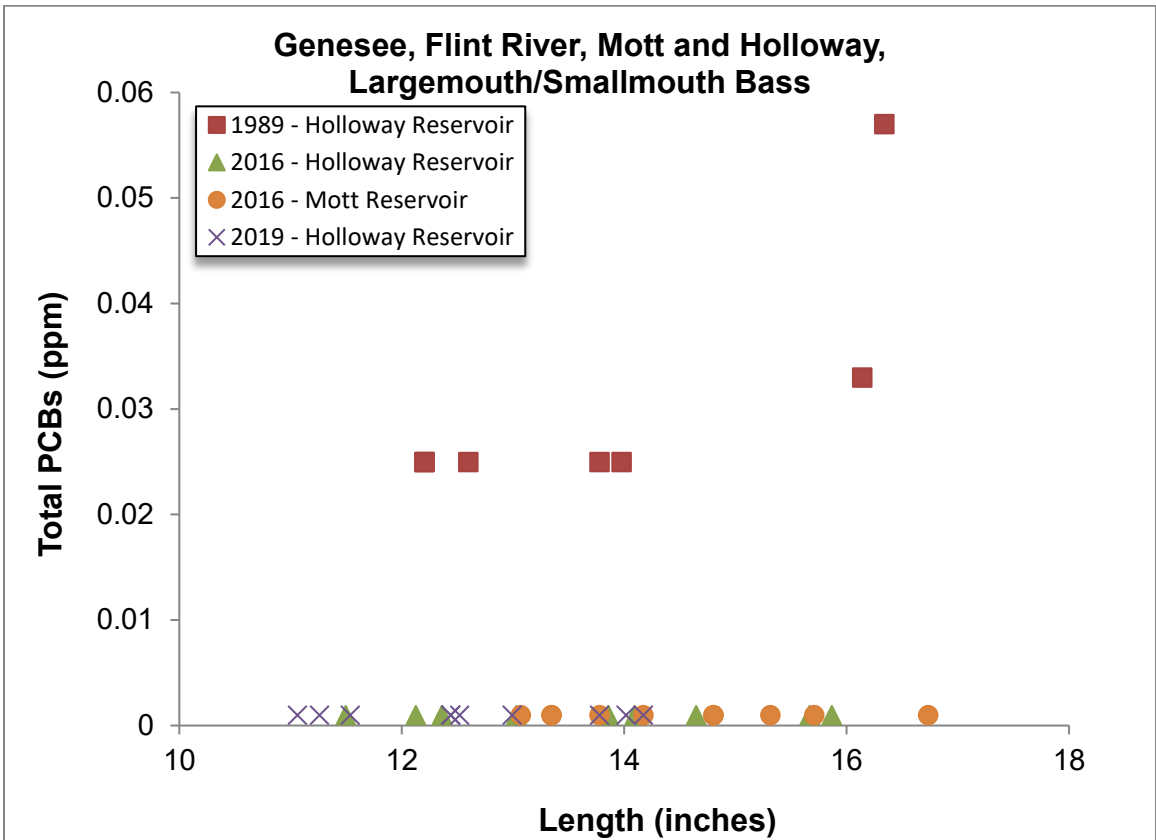
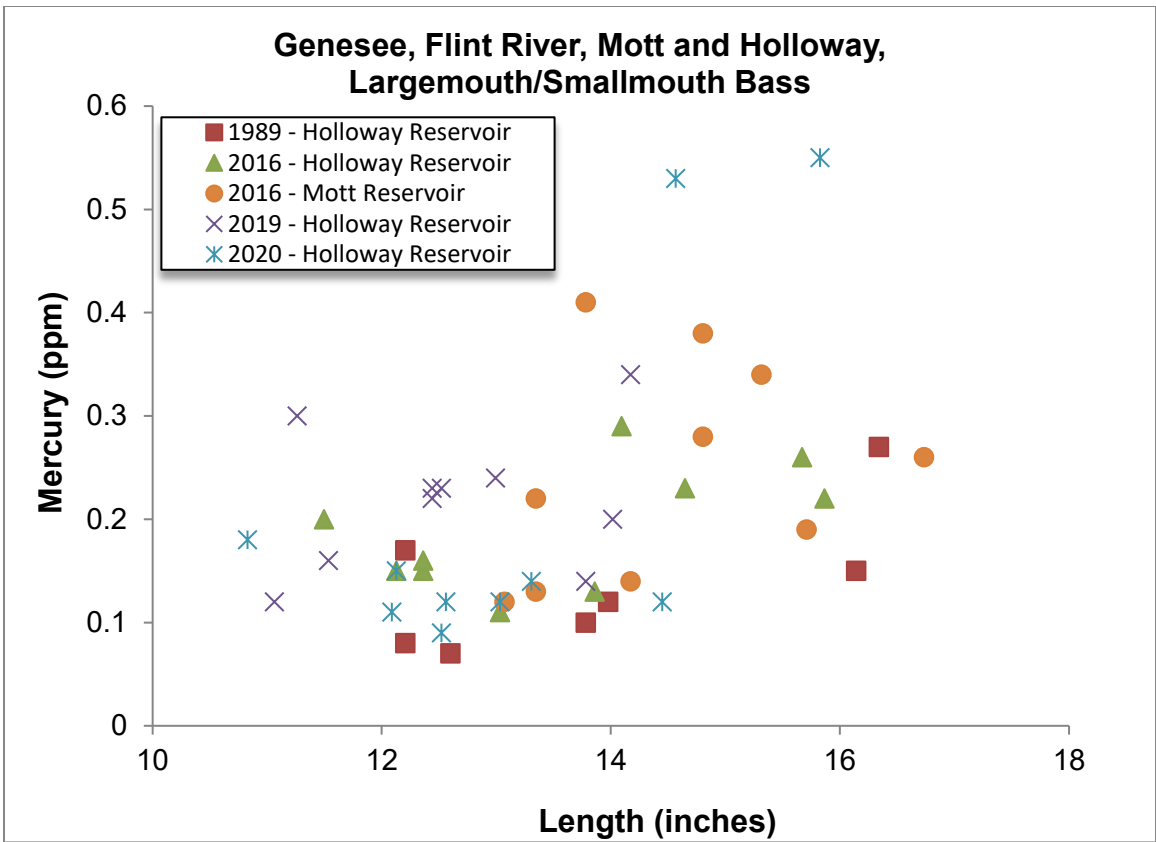
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1989	2020	47	10.8	14.0	13.8	16.7	
Datasets available: 1989, 2016, 2018, 2020							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	22	0.257		0.100	0.550	0.313	2
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.186	0.187					

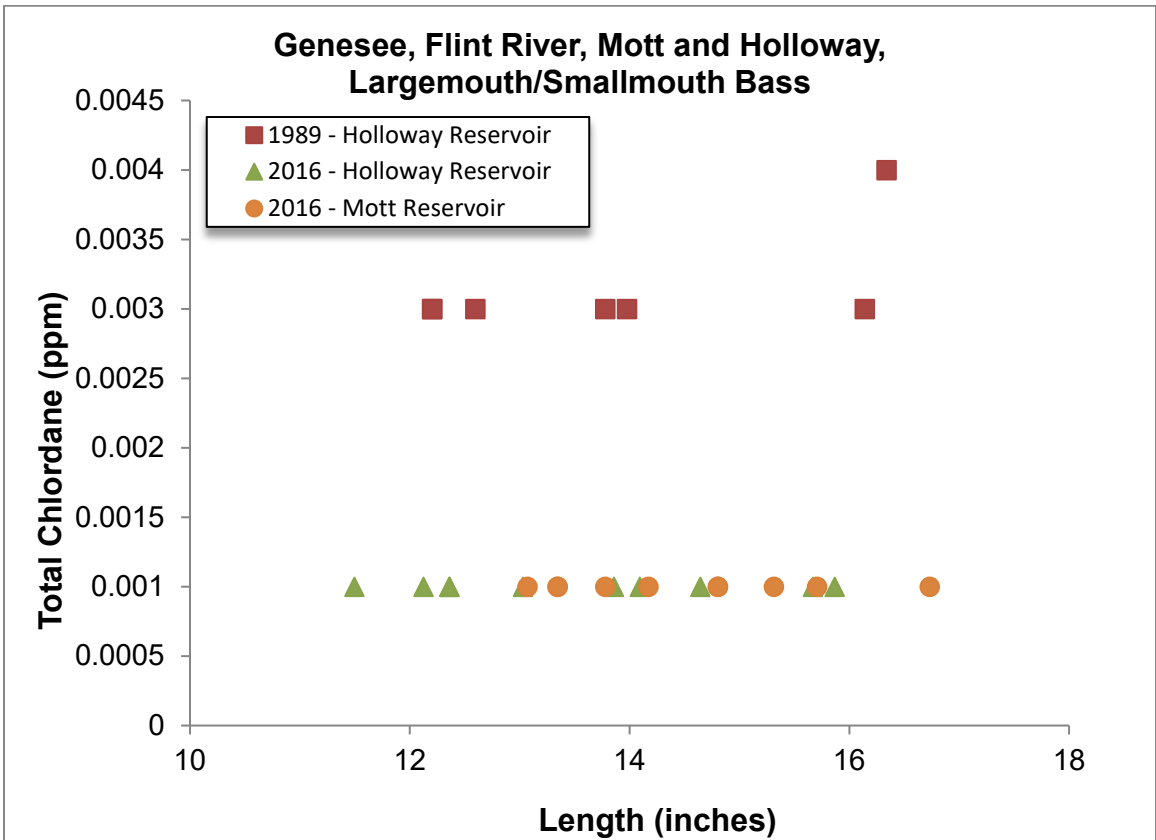
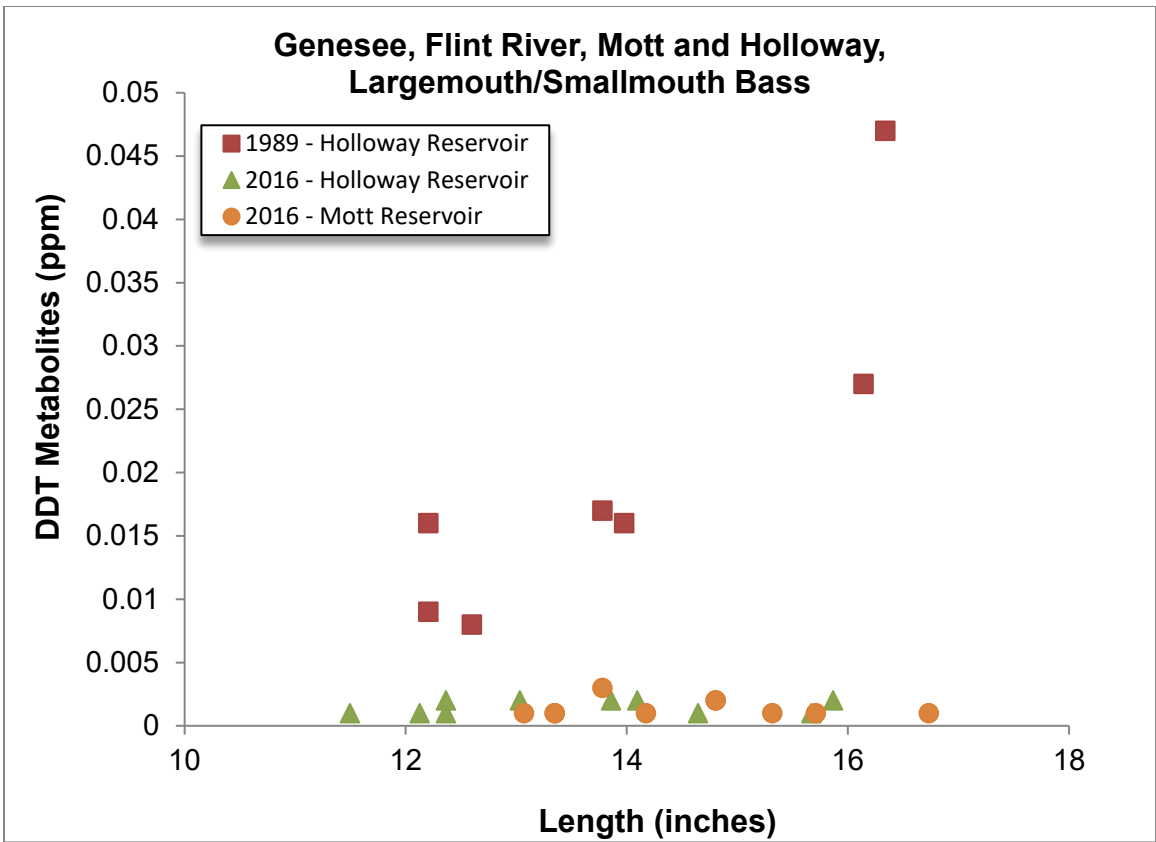
Organics Analysis:

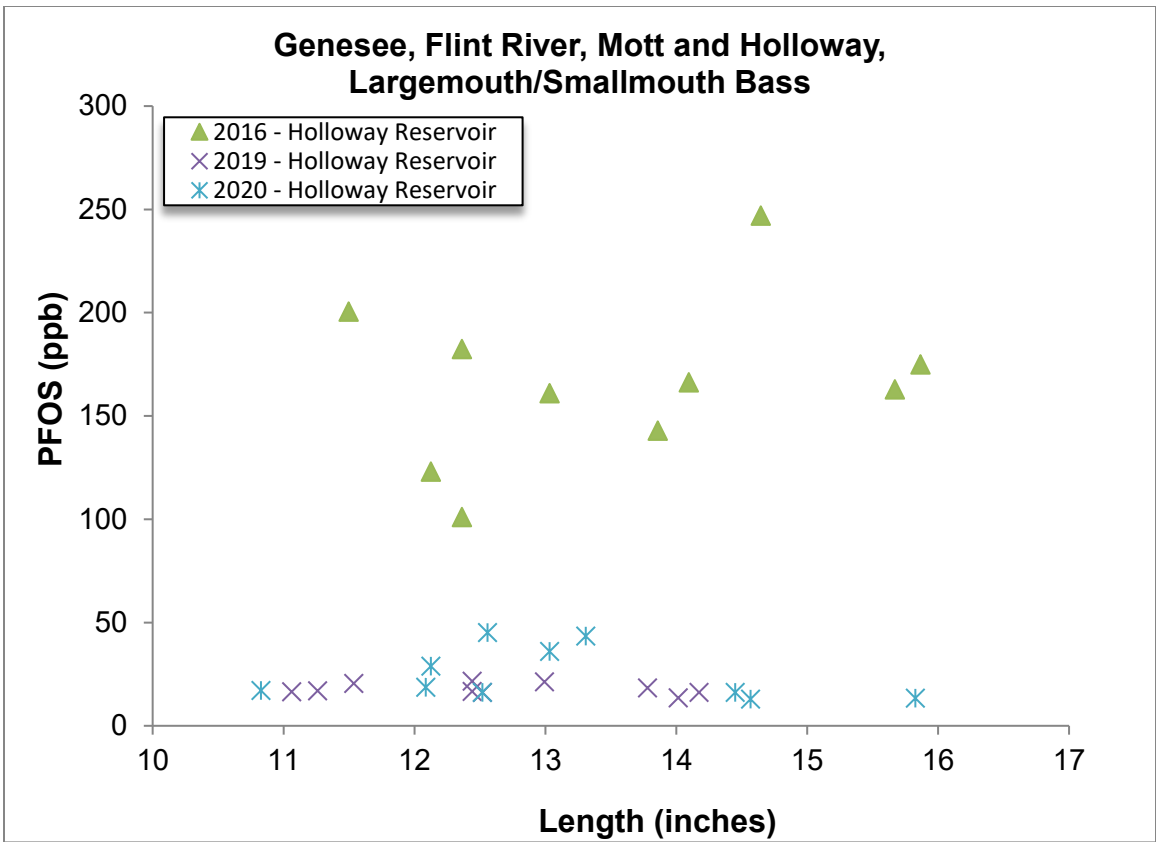
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2016	2020	40	10.8	14.0	13.8	16.7	
Datasets available: 1989 (No PFOS); 2016, 2018 (PCB Only); 2020 (PFOS Only)							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	15	0.001		<0.001	0.001	0.001	16
DDT	12	0.002		<0.001	0.003	0.002	16
Chlordane	12	0.001		<0.001	0.001	0.001	16
Toxaphene	12	ND		--	--	--	--
PFOS	30	69.6 ppb		13.0 ppb	247.0 ppb	97.0 ppb	1
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	0.000	0.000					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	0.067	0.040					
Final meal category based on UCL:							1

Existing MDHHS Advisory: No one should eat more than 6 meals per year of largemouth or smallmouth bass of any size from the Flint River upstream of the Mott Dam including the Mott Reservoir, Holloway Reservoir, and the North and South Branches of the river due to PFOS.

Recommendation: No change to the advisory is recommended at this time. While it appears PFOS concentrations in bass from this stretch of river have decreased since the granular activated carbon system was installed to mitigate the Lapeer Wastewater Treatment Plant's effluent PFAS contamination, additional fish from both reservoirs were collected in 2022. Once these data are received, a reevaluation of the advisory will be conducted.







Hg Analysis:

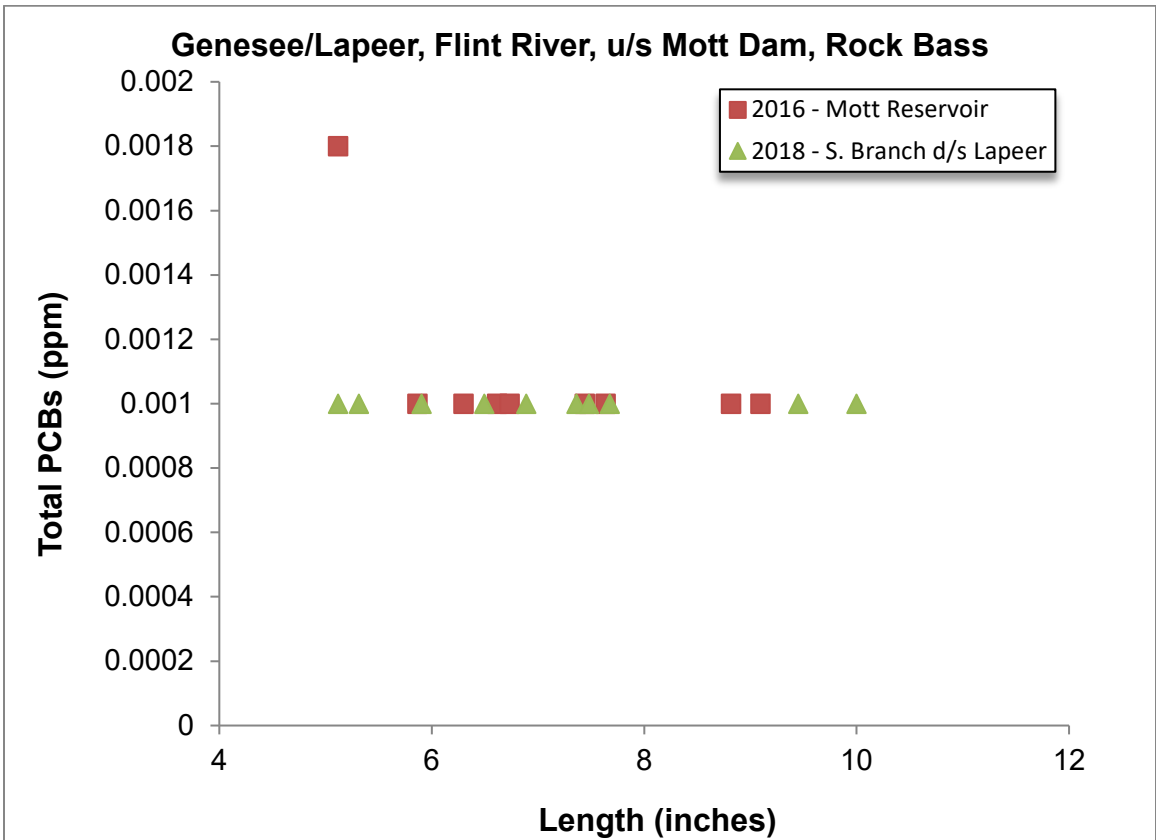
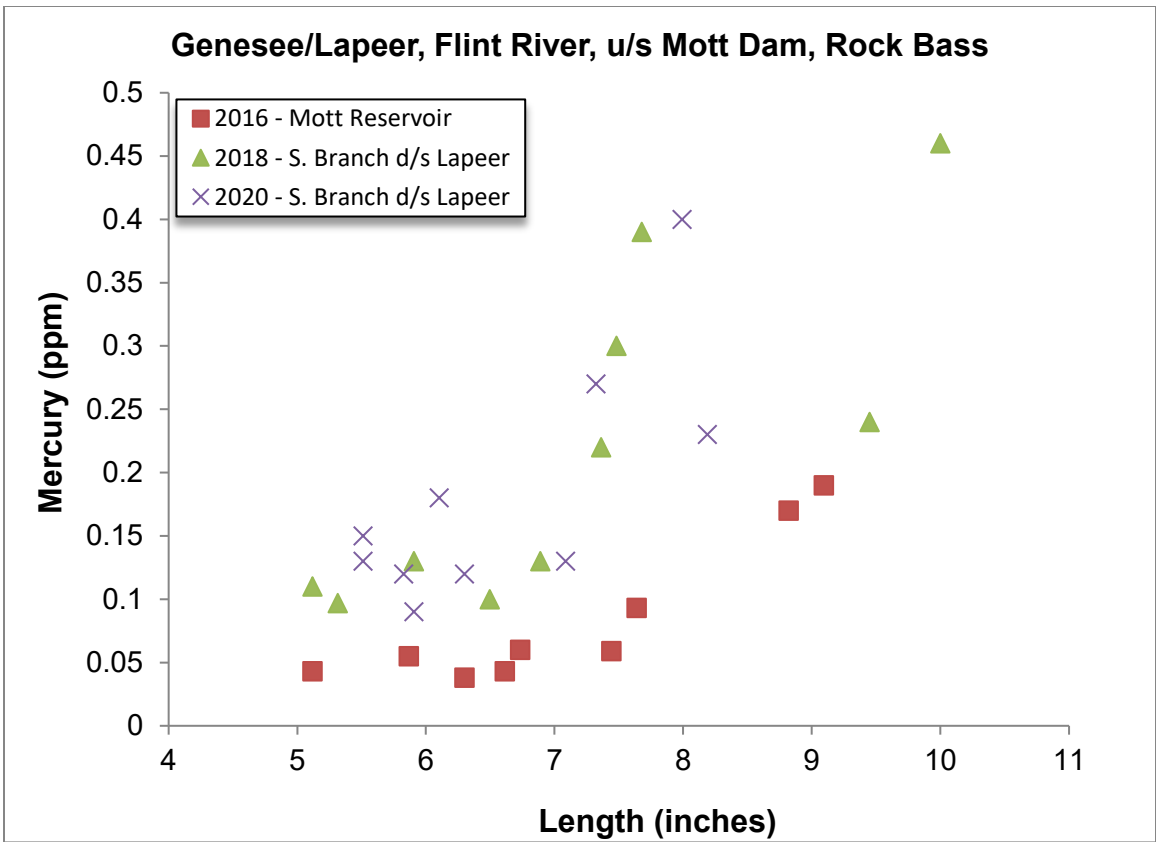
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2016	2020	29	5.1	NA	5.1	10.0
Datasets available: 2016, 2018, 2020						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	29	0.164	0.038	0.460	0.206	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.420	0.357				

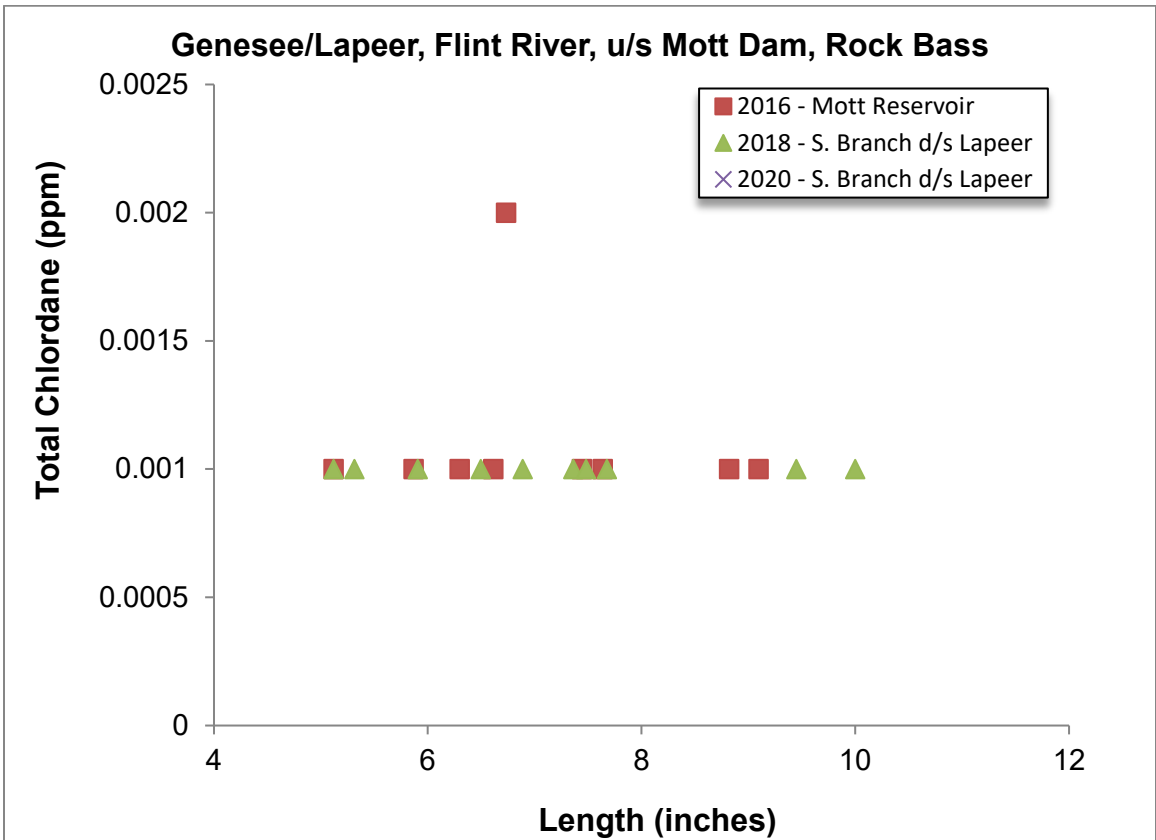
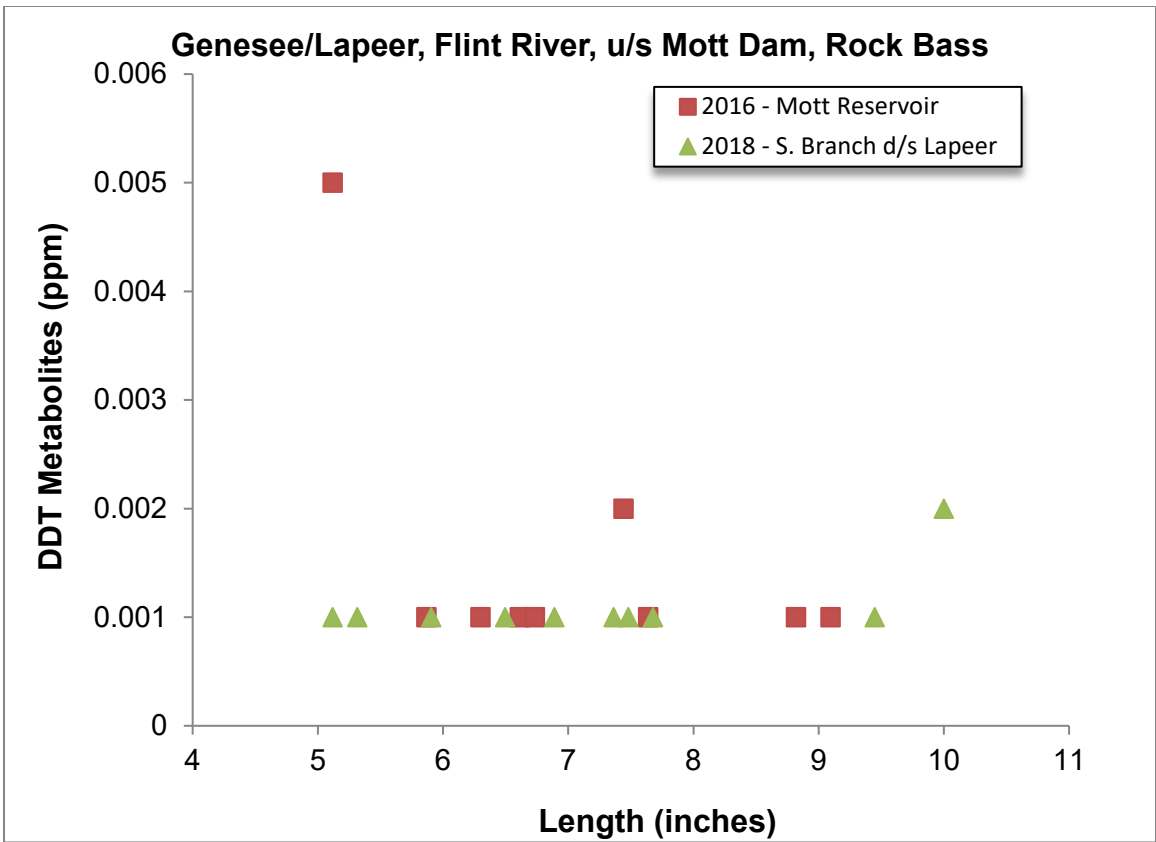
Organics Analysis:

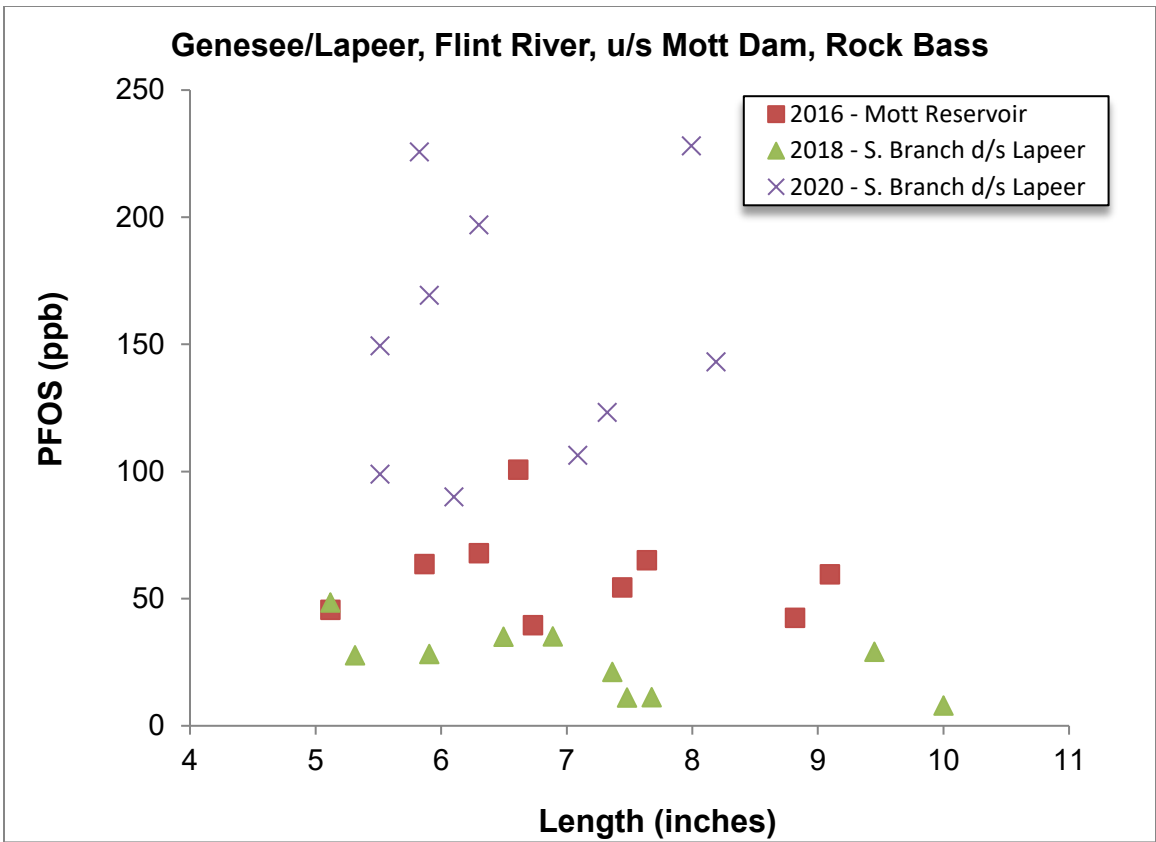
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2016	2020	29	5.1	NA	5.1	10.0
Datasets available: 2016, 2018, 2020 (PFOS Only)						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	19	0.001	<0.001	0.002	0.001	16
DDT	19	0.001	<0.001	0.005	0.002	16
Chlordane	19	0.001	<0.001	0.002	0.001	16
Toxaphene	19	ND	--	--	--	--
PFOS	29	80.2 ppb	8.0 ppb	228.1 ppb	104.5 ppb	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.114	0.114				
DDT	0.039	0.009				
Chlordane	0.004	0.004				
Toxaphene	--	--				
PFOS	0.045	0.113				
Final meal category based on UCL:						1

Existing MDHHS Advisory: No one should eat more than 1 meal per month of rock bass of any size from the Flint River upstream of the Mott Dam including the Mott Reservoir, Holloway Reservoir, and the North and South Branches of the river due to PFOS.

Recommendation: No change to the advisory is warranted.







Walleye

**Flint River
Upstream of Mott Dam
Mott, Holloway Reservoirs**

Genesee/Lapeer 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	2020	36	12.8	15.0	14.6	24.4
Datasets available: 1996, 2016, 2018, 2020						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	30	0.106	0.035	0.250	0.128	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.100	0.068				

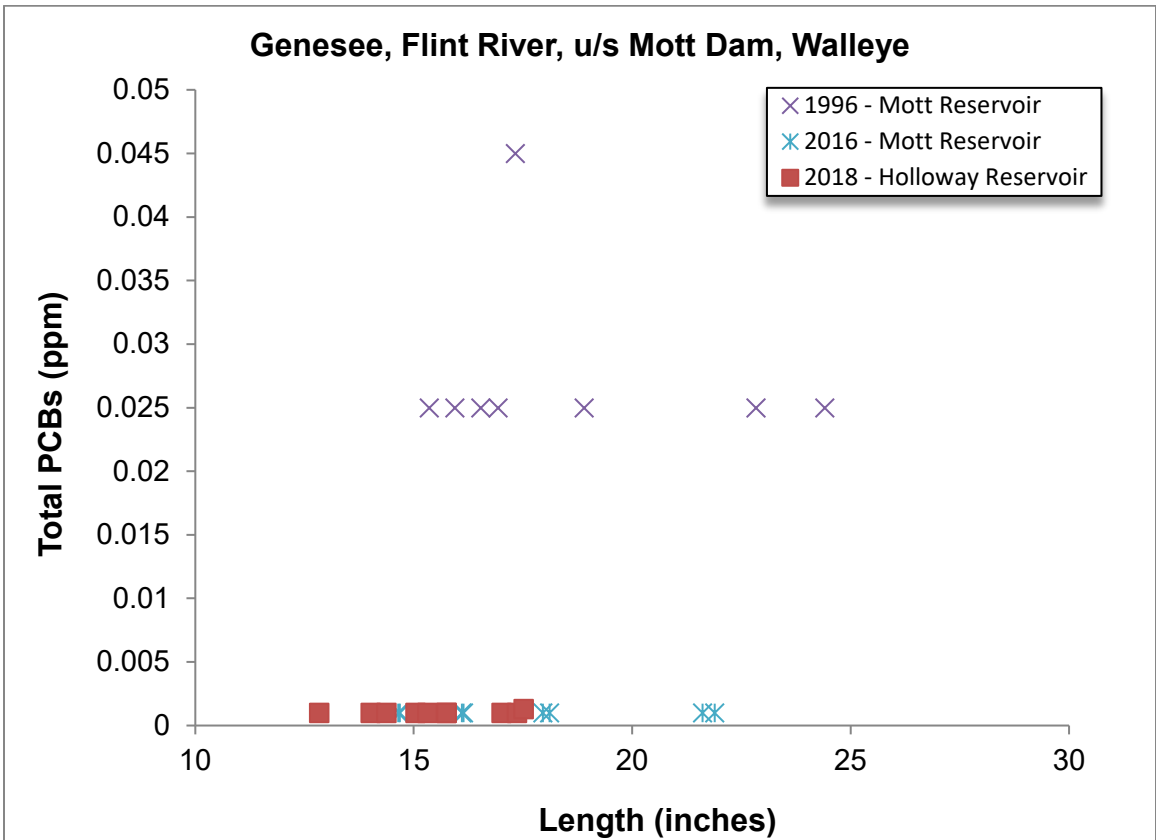
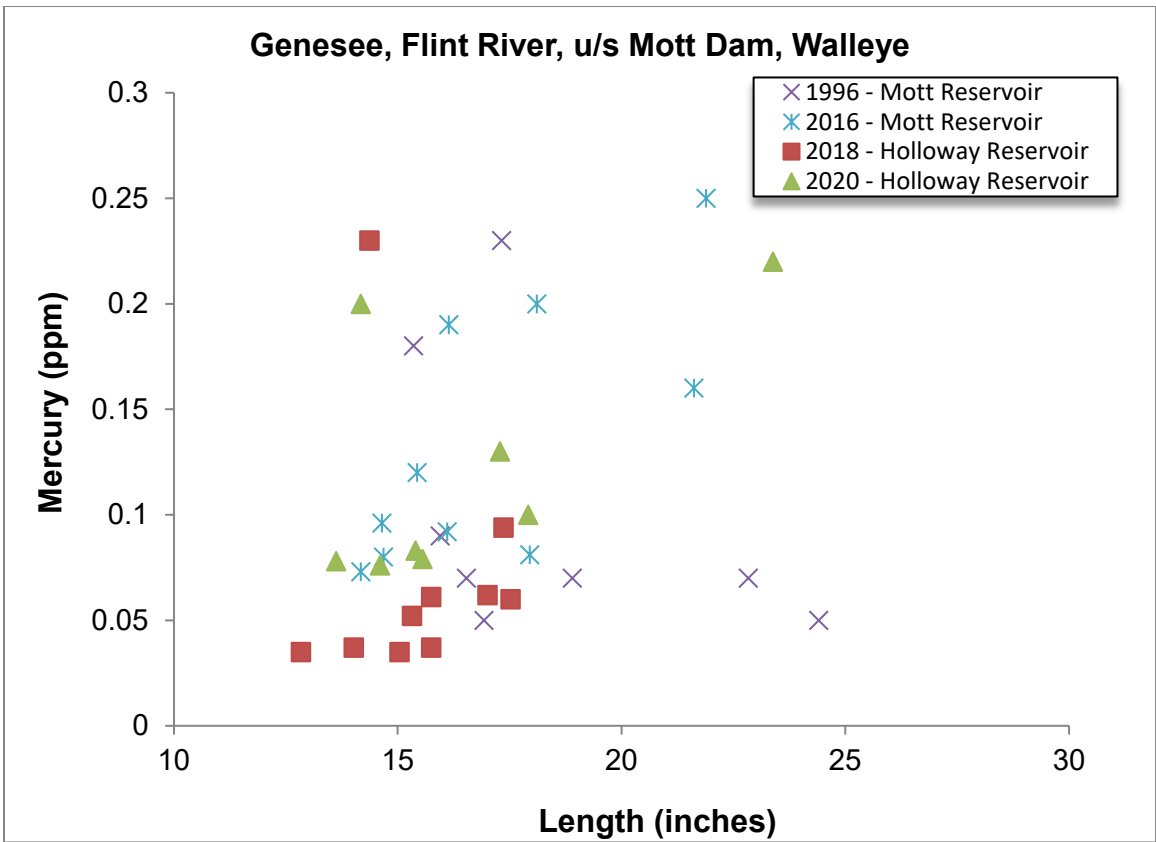
Organics Analysis:

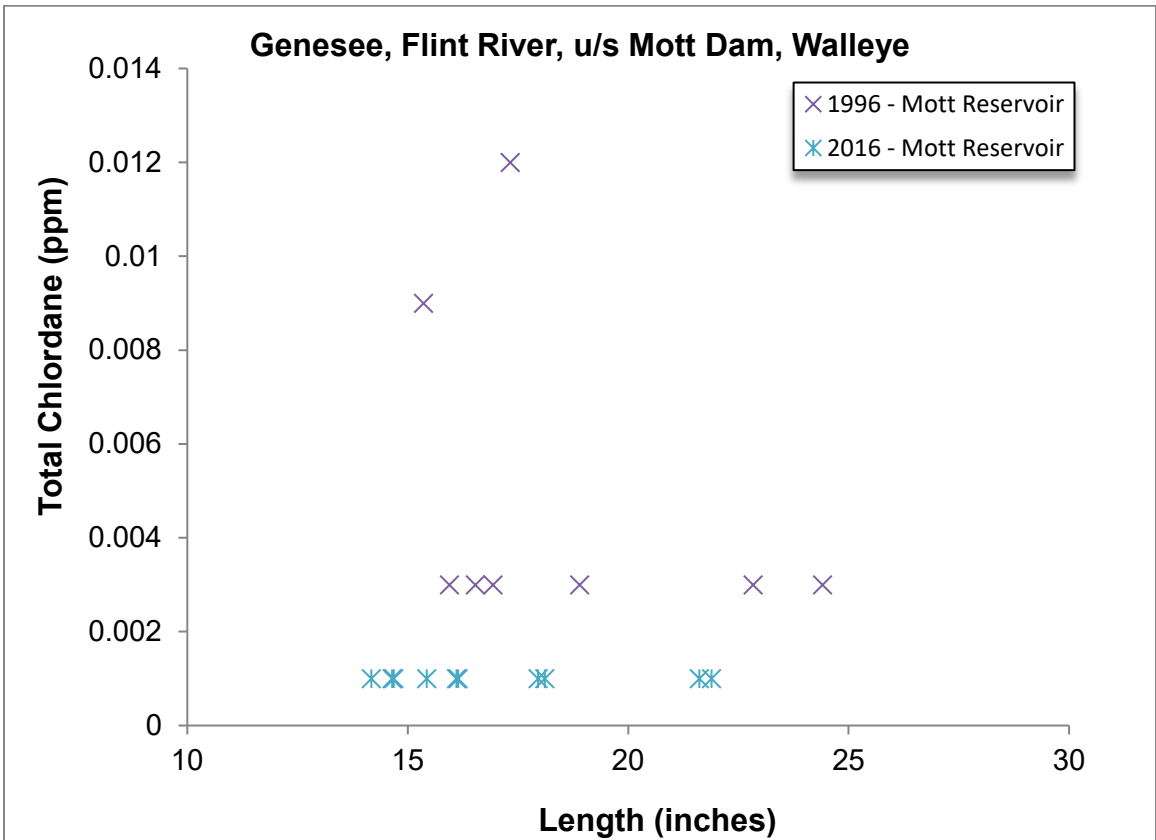
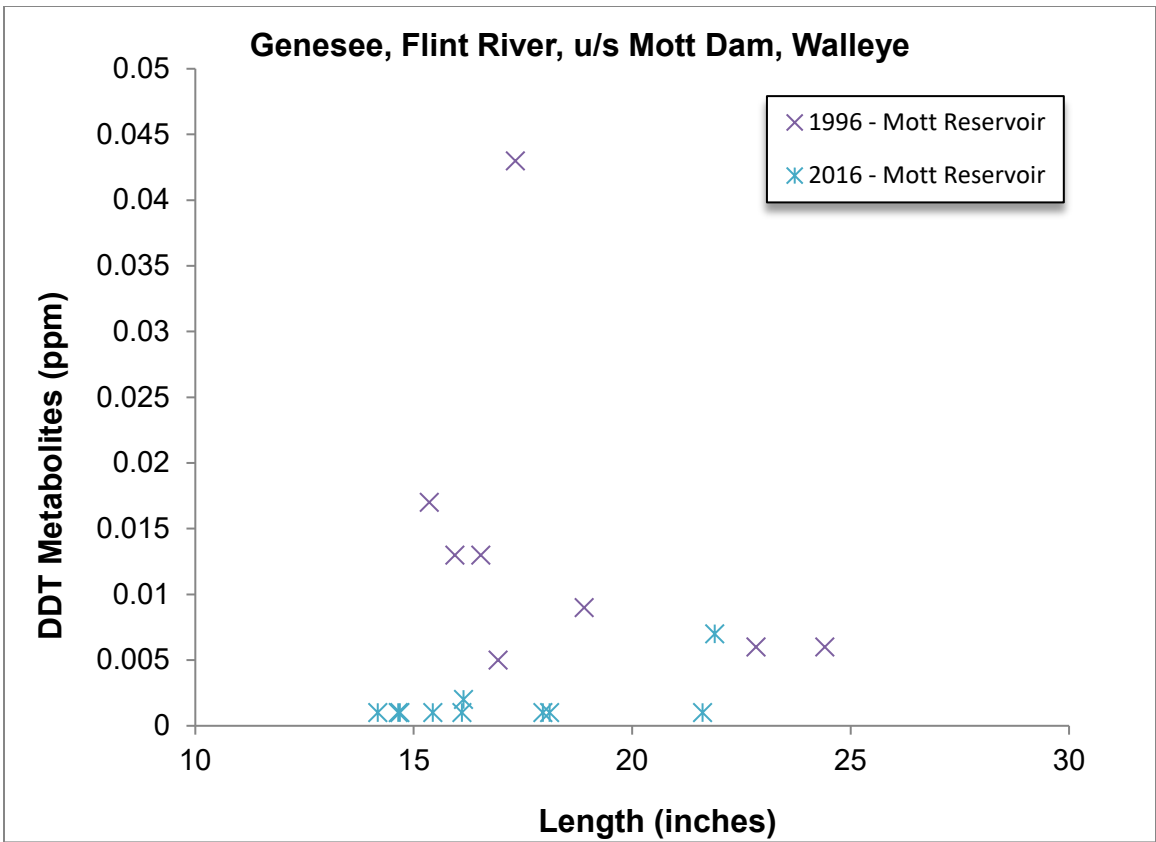
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2016	2020	20	12.8	15.0	14.6	23.4
Datasets available: 1996 (No PFOS), 2016, 2018 (PFOS and PCB Only), 2020 (PFOS Only)						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	16	0.001	<0.001	0.001	0.001	16
DDT	9	0.002	<0.001	0.007	0.003	16
Chlordane	9	0.001	<0.001	0.001	0.001	16
Toxaphene	9	ND	--	--	--	--
PFOS	28*	48.9 ppb	<0.25 ppb	145.3 ppb	67.6 ppb	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.016	0.016				
DDT	0.347	0.304				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.044	0.014				
Final meal category based on UCL:						2

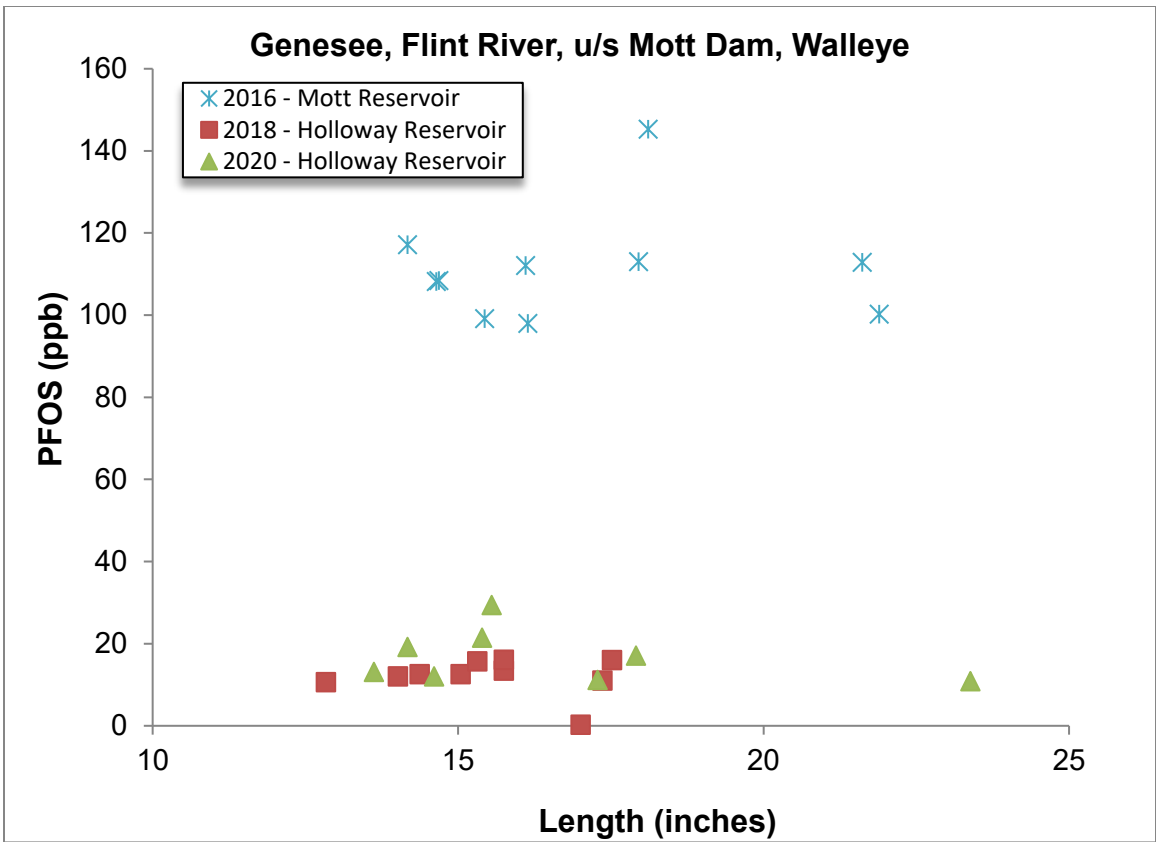
*Sub-legal sized fish used in the analysis as no correlation between fish size and PFOS concentration has been observed in the statewide dataset.

Existing MDHHS Advisory: No one should eat more than 1 meal per month of walleye of any size from the Flint River upstream of the Mott Dam, including the Mott Reservoir, Holloway Reservoir, and the North and South Branches of the Flint River due to PFOS.

Recommendation: No change to the advisory is recommended at this time. While it appears PFOS concentrations in bass from this stretch of river have decreased since the granular activated carbon system was installed to mitigate the Lapeer Wastewater Treatment Plant's effluent PFAS contamination, additional fish from both reservoirs were collected in 2022. Once these data are received, this advisory will be reevaluated.







Genesee County

Bluegill

Flint Park Lake

Genesee County

Hg Analysis:

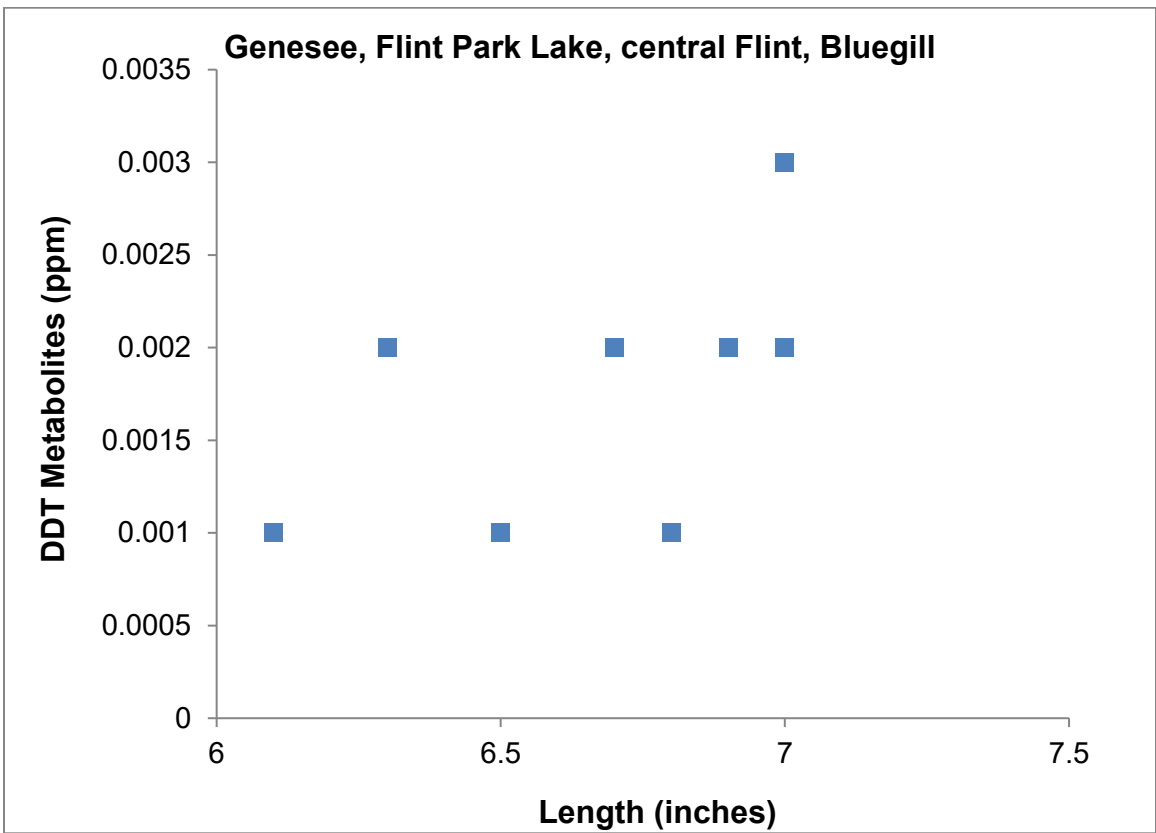
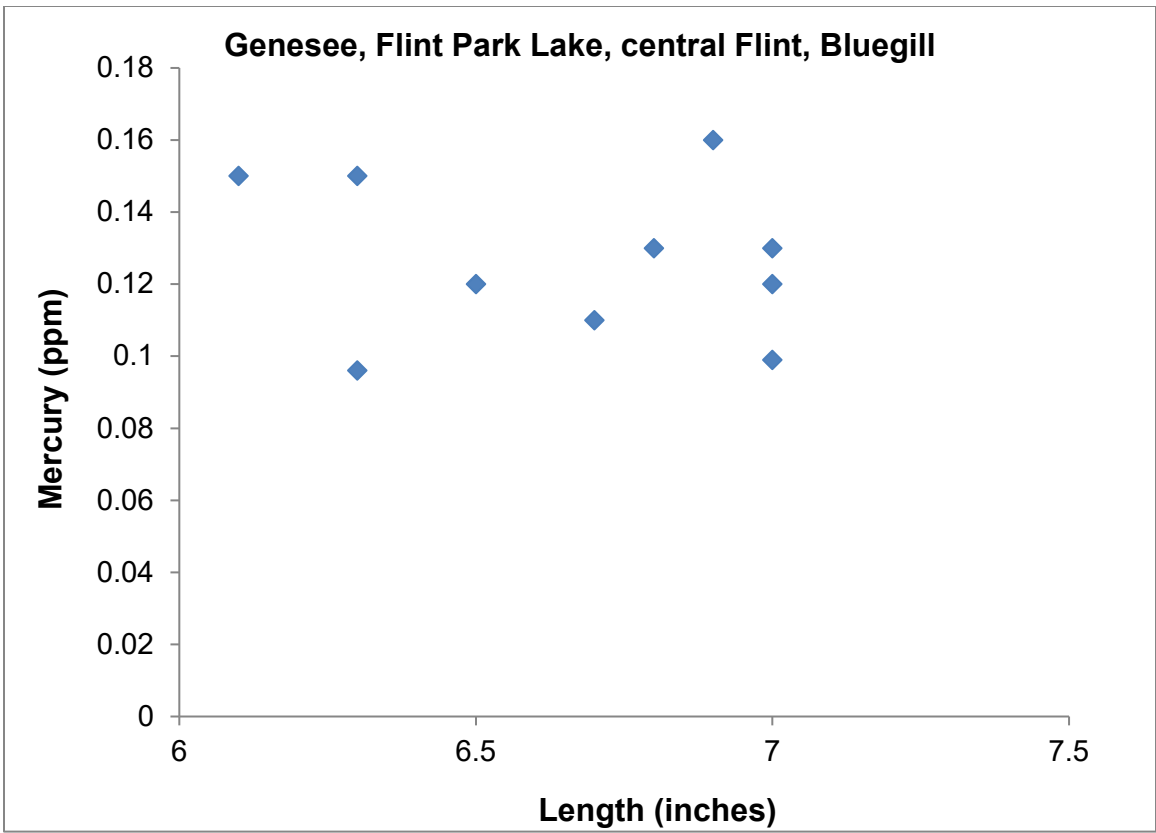
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2019	2019	10	6.1	na	6.1	7
Datasets available: 2019						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.13	0.10	0.16	0.14	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.033	0.027				

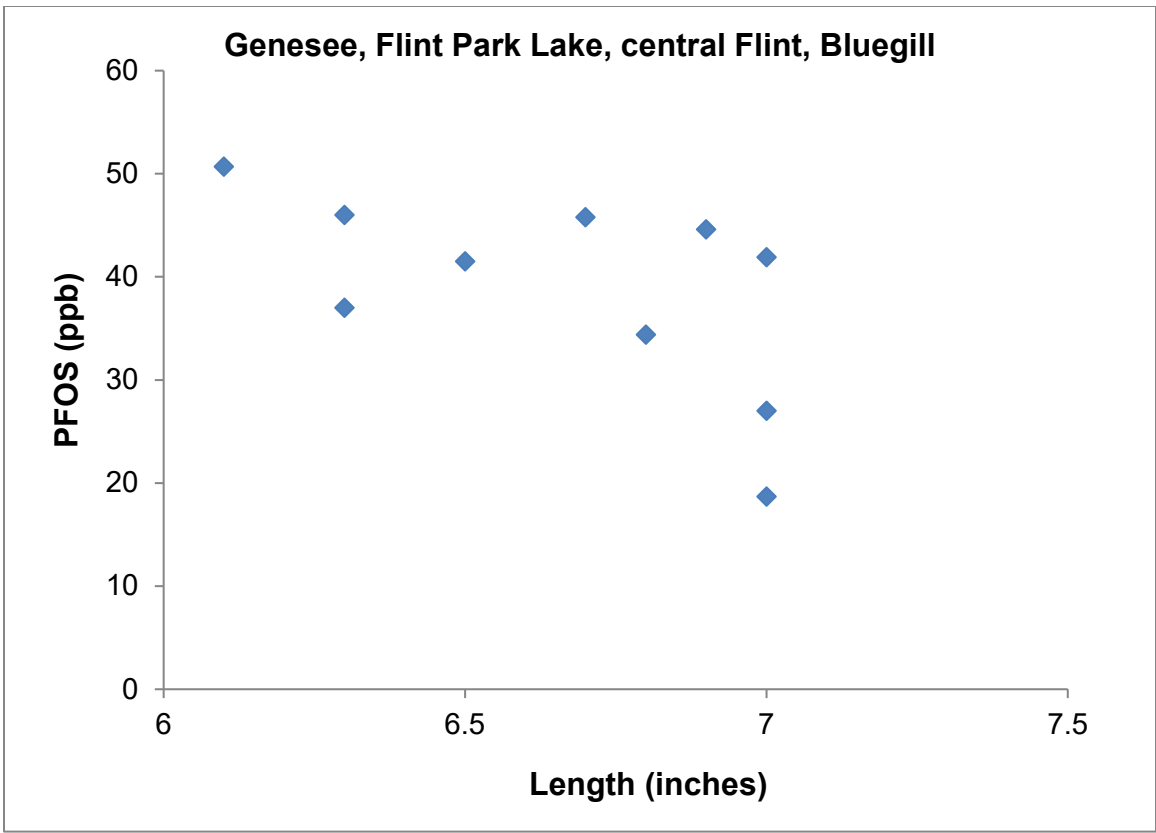
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2019	2019	10	6.1	na	6.1	7
Datasets available: 2019						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	ND	< 0.001	< 0.001	--	16
DDT	10	--	< 0.001	0.003	0.002	16
Chlordane	10	ND	< 0.001	< 0.001	--	--
Toxaphene	10	ND	< 0.05	< 0.05	--	--
PFOS	10	39 ppb	19 ppb	51 ppb	46 ppb	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	0.230	0.215				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.359	0.329				
Final meal category based on UCL:						2

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

Recommendation: No one should eat more than 2 meals per month of Flint Park Lake bluegill or sunfish of any size due to PFOS. Mercury would cause an advisory.





Hg Analysis:

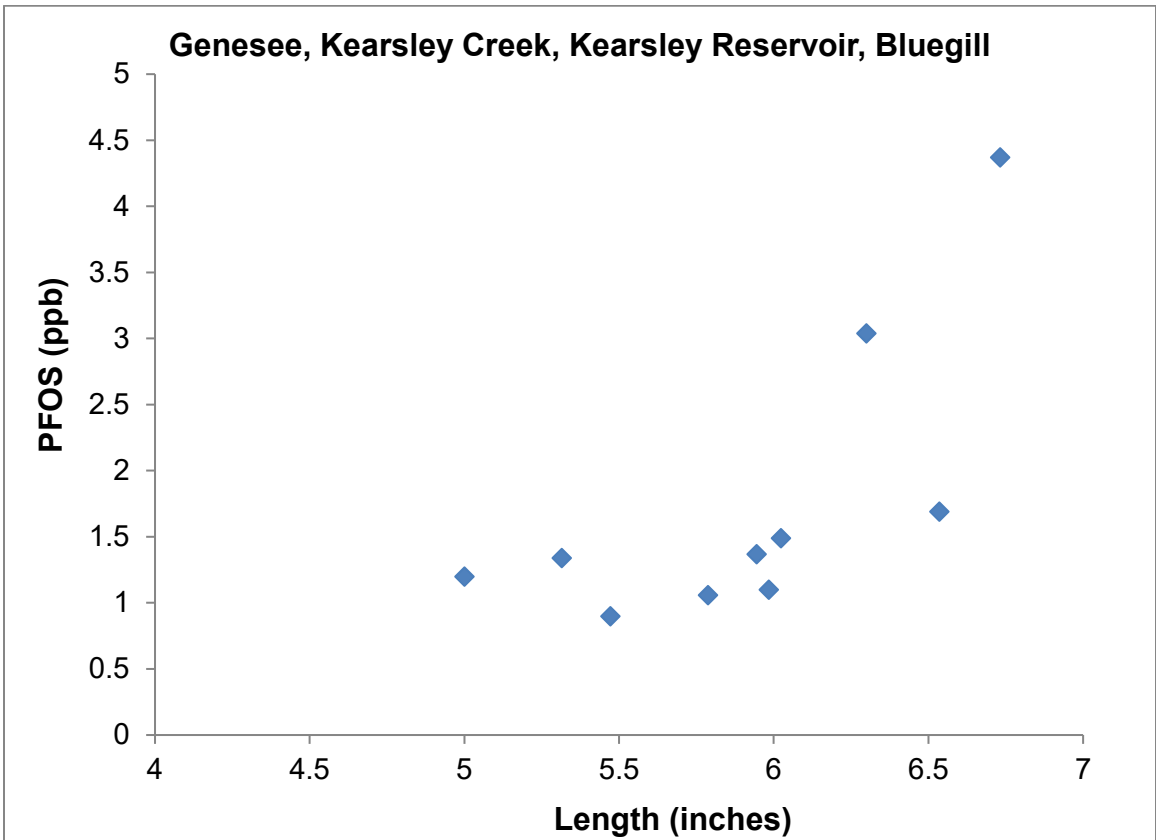
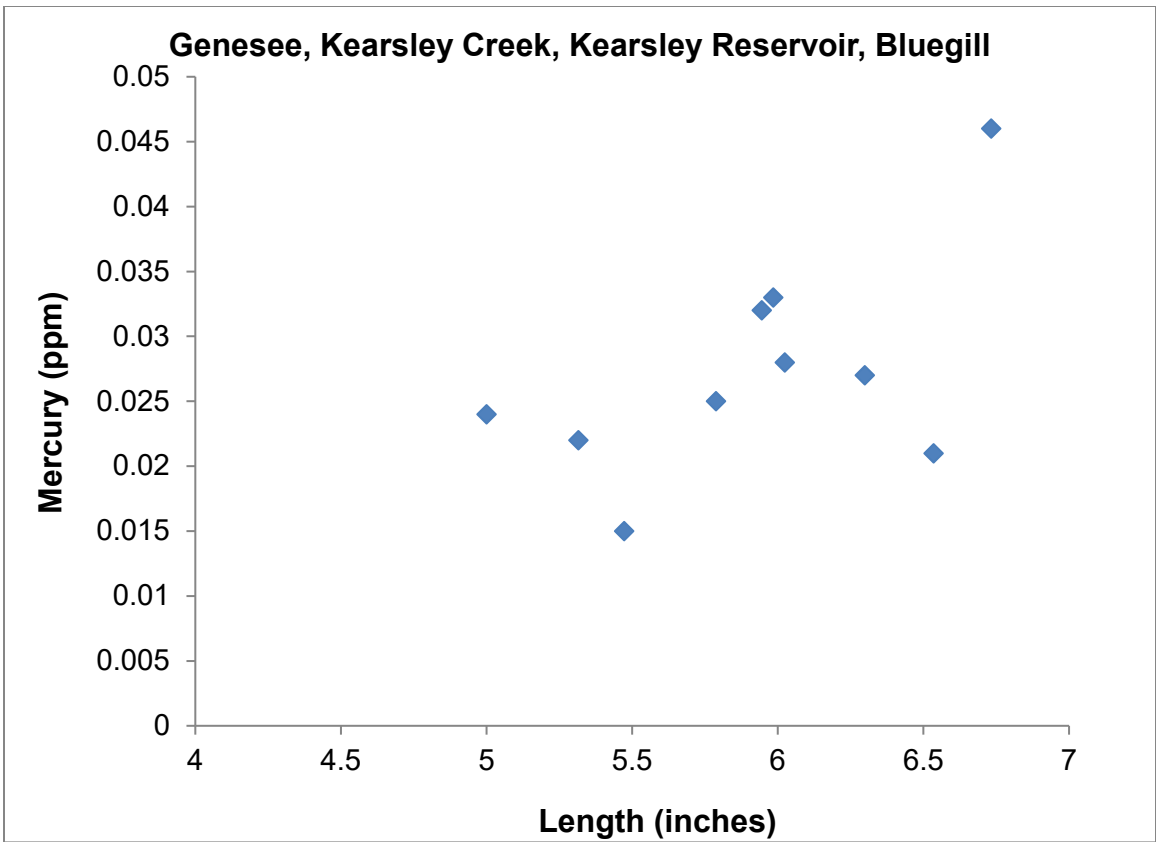
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples				
Earliest	Most Recent								
2019	2019	10	5.0	NA	5.0	6.7			
Datasets available:		2019							
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category			
Mercury	10	0.027	0.015	0.046	0.033	16			
Chemical	Linear Regression	Exponential Regression							
	R ²	R ²							
Mercury	0.337	0.300							

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	6.7			
Datasets available:		2019							
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category			
PCB	--	--	--	--	--	--			
DDT	--	--	--	--	--	--			
Chlordane	--	--	--	--	--	--			
Toxaphene	--	--	--	--	--	--			
PFOS	10	1.8 ppb	0.9 ppb	4.4 ppb	2.5 ppb	16			
Chemical	Linear Regression	Exponential Regression							
	R ²	R ²							
PCB	--	--							
DDT	--	--							
Chlordane	--	--							
Toxaphene	--	--							
PFOS	0.488	0.524	Final meal category based on UCL:				16		

Existing MDHHS Advisory: Bluegill and sunfish from Kearsley Reservoir and Kearsley Creek upstream of Kearsley Reservoir in Genesee 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 16 meals per month of bluegill or sunfish of any size from Kearsley Reservoir and Kearsley Creek upstream of Kearsley Reservoir in Genesee County. There are no specific contaminants of concern for bluegill or sunfish from these waterbodies. Anglers fishing downstream of the Kearsley Dam should follow the consumption guidance listed for the Flint River.



Hg Analysis:

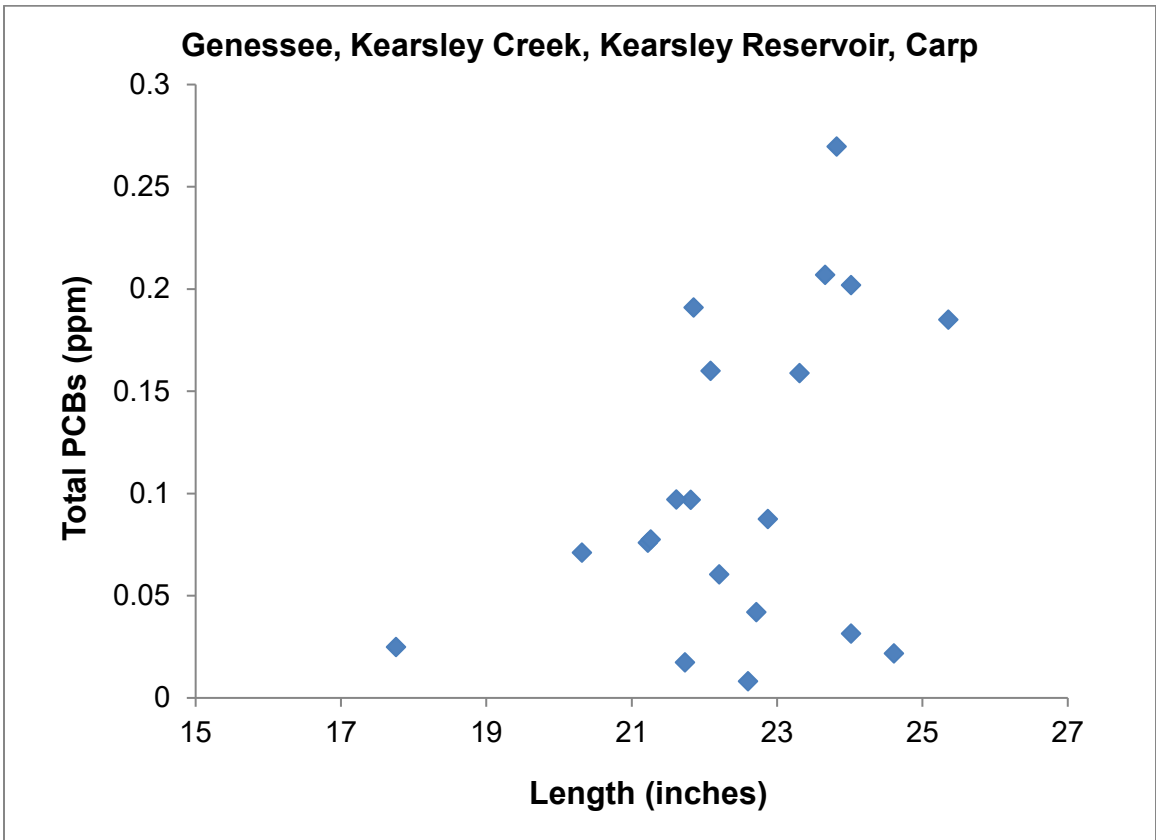
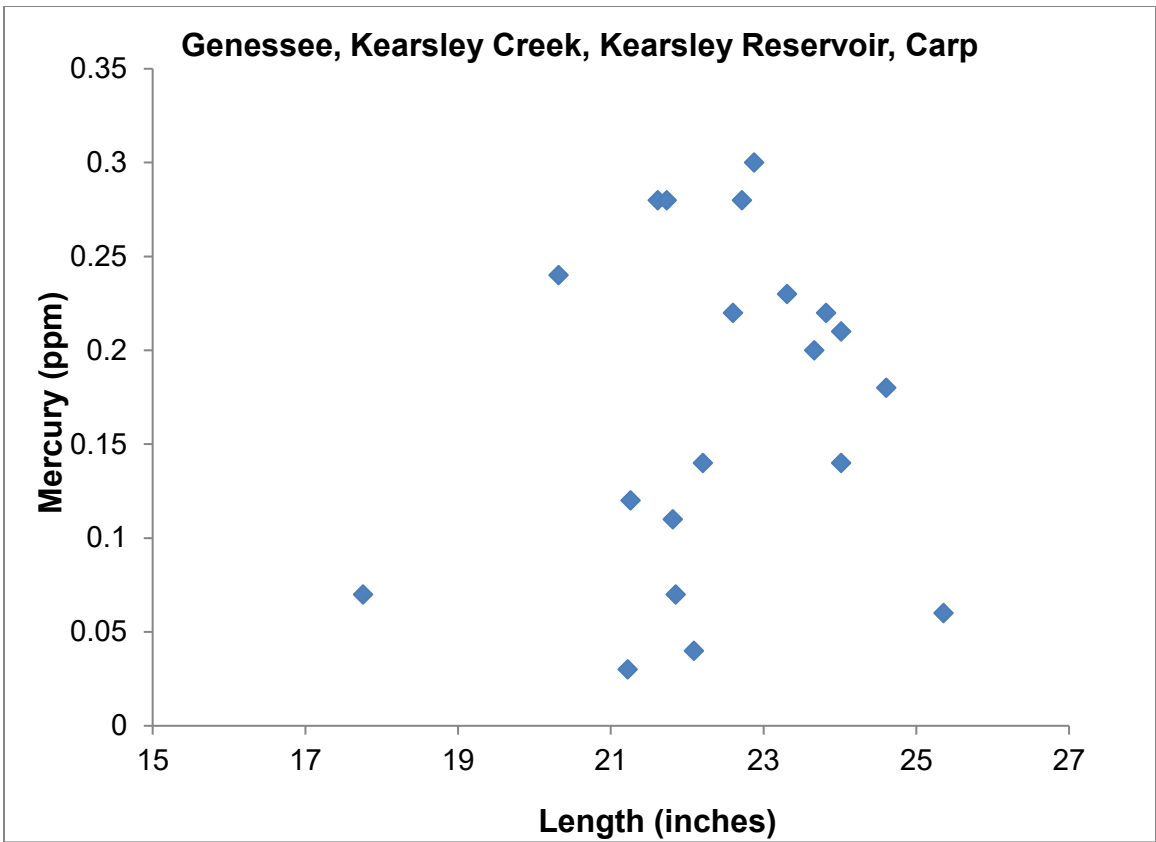
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent					
2000	2019	20	17.8	NA	17.8	25.4
Datasets available: 2000, 2019						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	20	0.171	0.030	0.300	0.212	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.032	0.049				

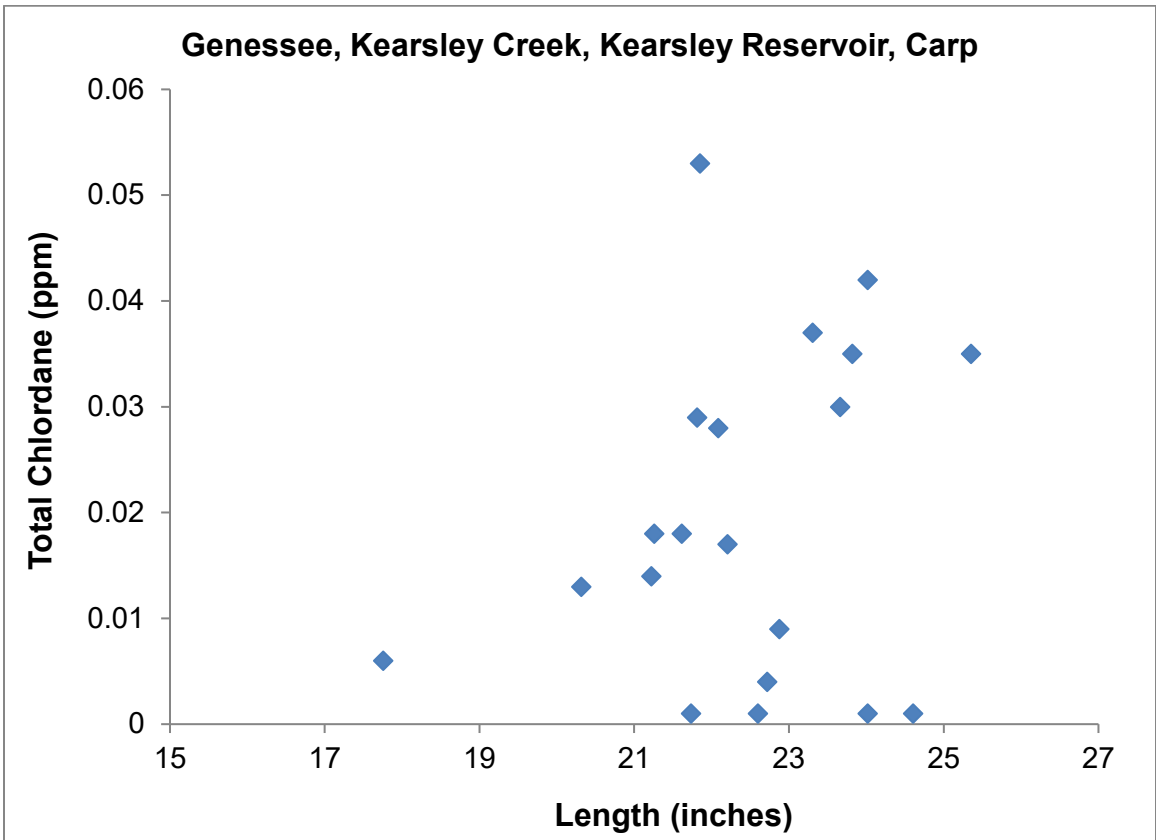
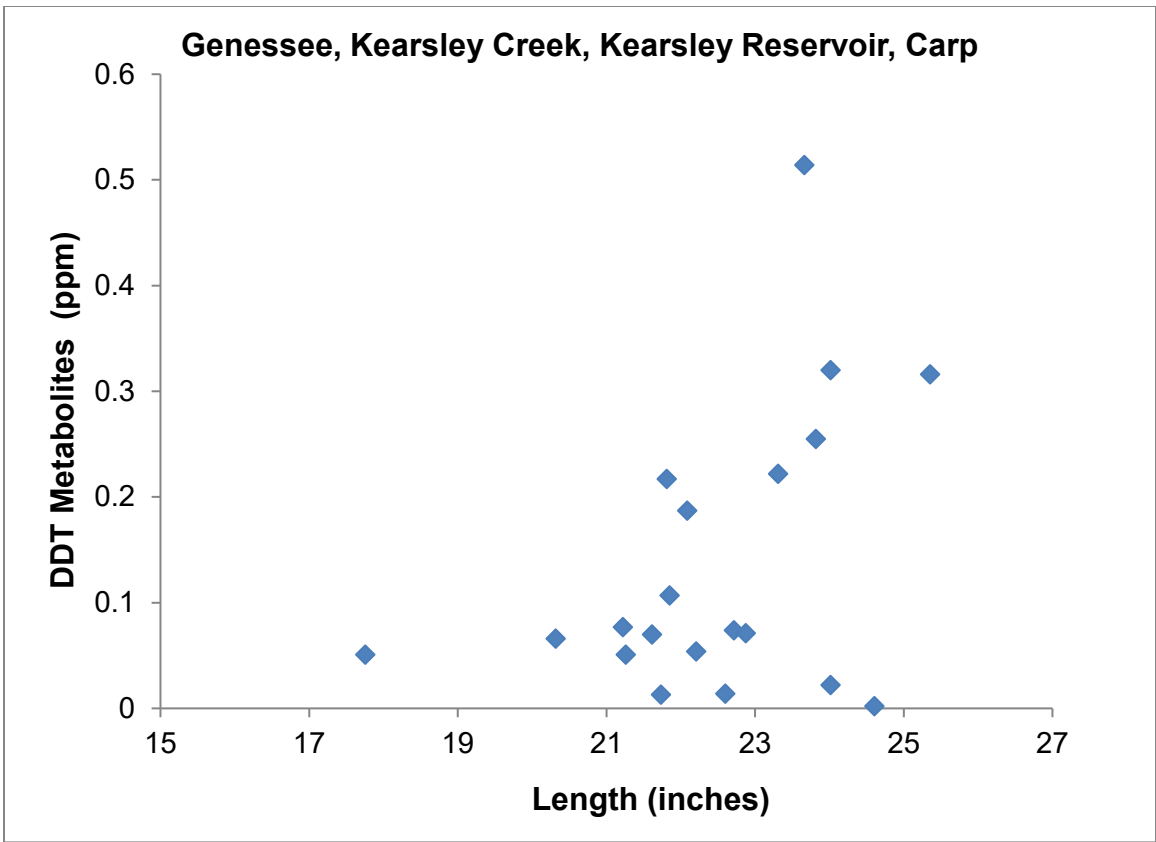
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent					
2000	2019	20	17.8	NA	17.8	25.4
Datasets available: 2000, 2019						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	20	0.104	0.008	0.270	0.140	1
DDT	20	0.135	0.002	0.514	0.198	8
Chlordane	20	0.020	<0.001	0.053	0.027	16
Toxaphene	20	ND	--	--	--	--
PFOS	--	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.158	0.076				
DDT	0.176	0.009				
Chlordane	0.058	0.000				
Toxaphene	--	--				
PFOS	--	--				
Final meal category based on UCL:						1

Existing MDHHS Advisory: No one should eat more than one meal per month of carp from Kearsley Reservoir and Kearsley Creek upstream of Kearsley Reservoir in Genesee County due to PCBs.

Recommendation: No change to the advisory is recommended.





Largemouth Bass

Kearsley Creek & Reservoir

Genesee County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent					
2000	2019	20	12.1	14.0	13.7	16.7
Datasets available: 2000, 2019						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	17	0.234	0.170	0.390	0.264	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.746	0.739				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent					
2000	2019	20	12.1	14.0	13.7	16.7
Datasets available: 2000, 2019						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	17	0.012	0.002	0.039	0.018	12
DDT	17	0.015	0.002	0.042	0.021	16
Chlordane	17	0.002	<0.001	0.005	0.003	16
Toxaphene	17	ND	--	--	--	--
PFOS	10*	17.7 ppb	8.3 ppb	27.5 ppb	22.1 ppb	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.013	0.051				
DDT	0.000	0.005				
Chlordane	0.092	0.151				
Toxaphene	--	--				
PFOS	0.132	0.159				
Final meal category based on UCL:						4

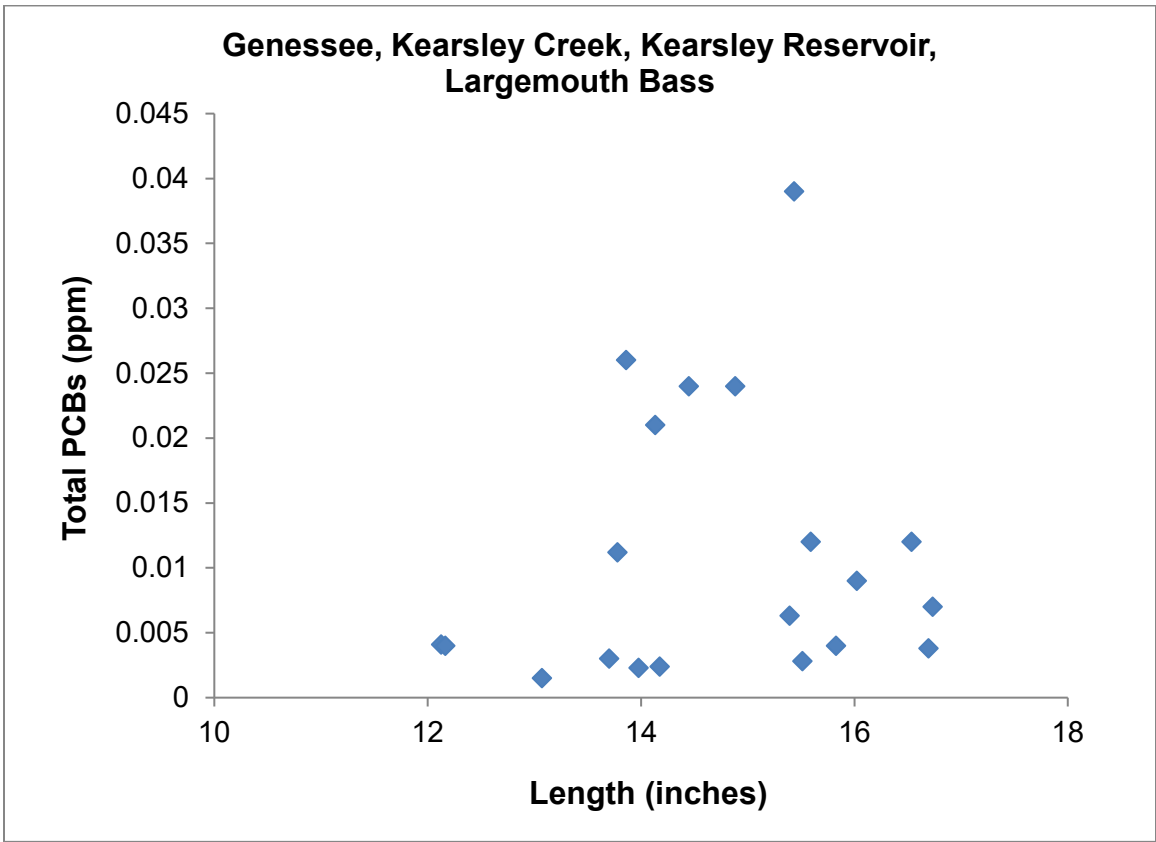
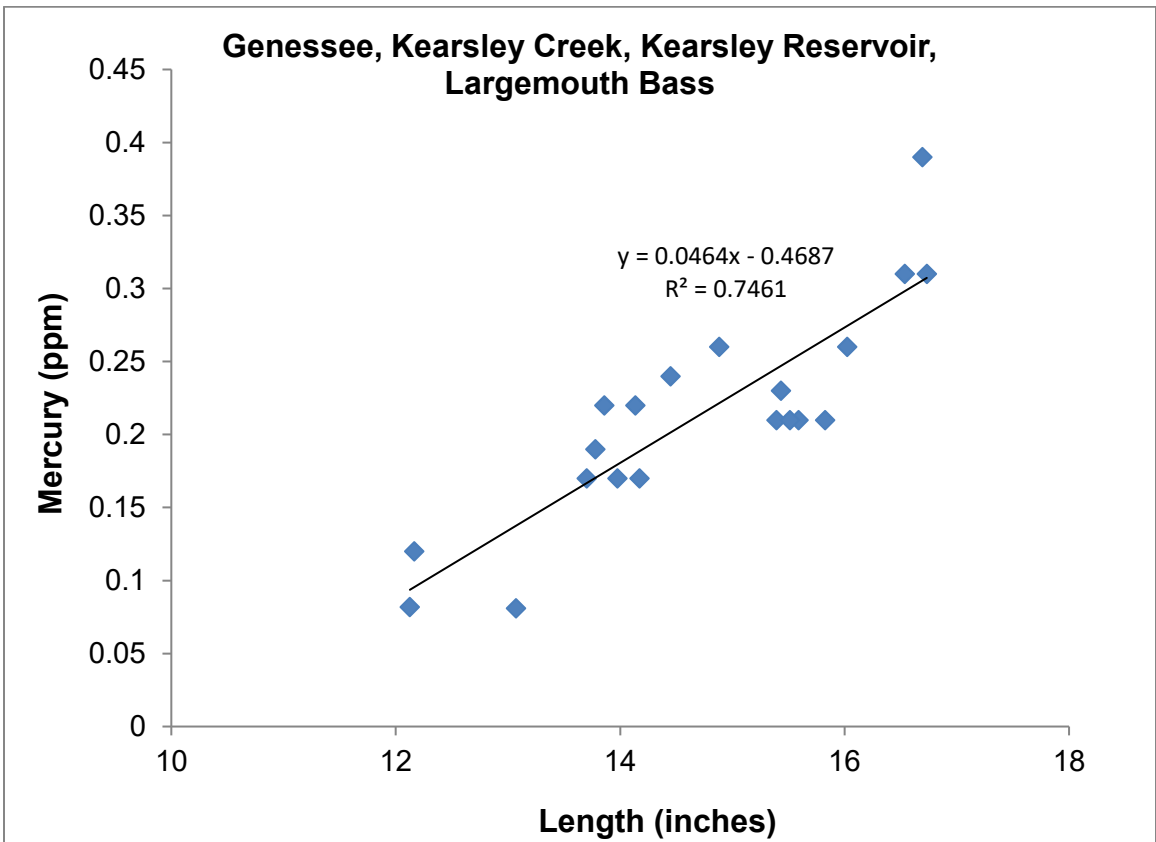
*Note: Sub-legal sized fish were used in the analysis as a correlation between fish size and PFOS concentration has not been observed in the statewide data set.

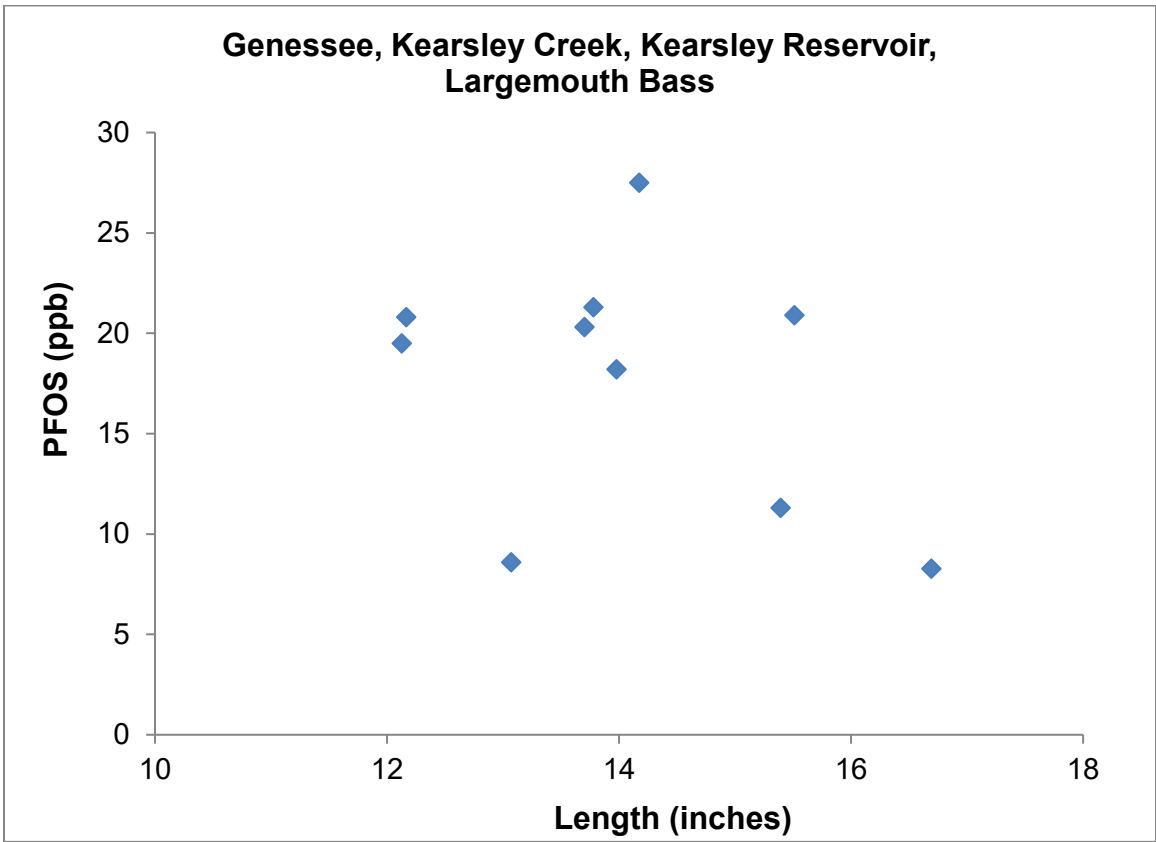
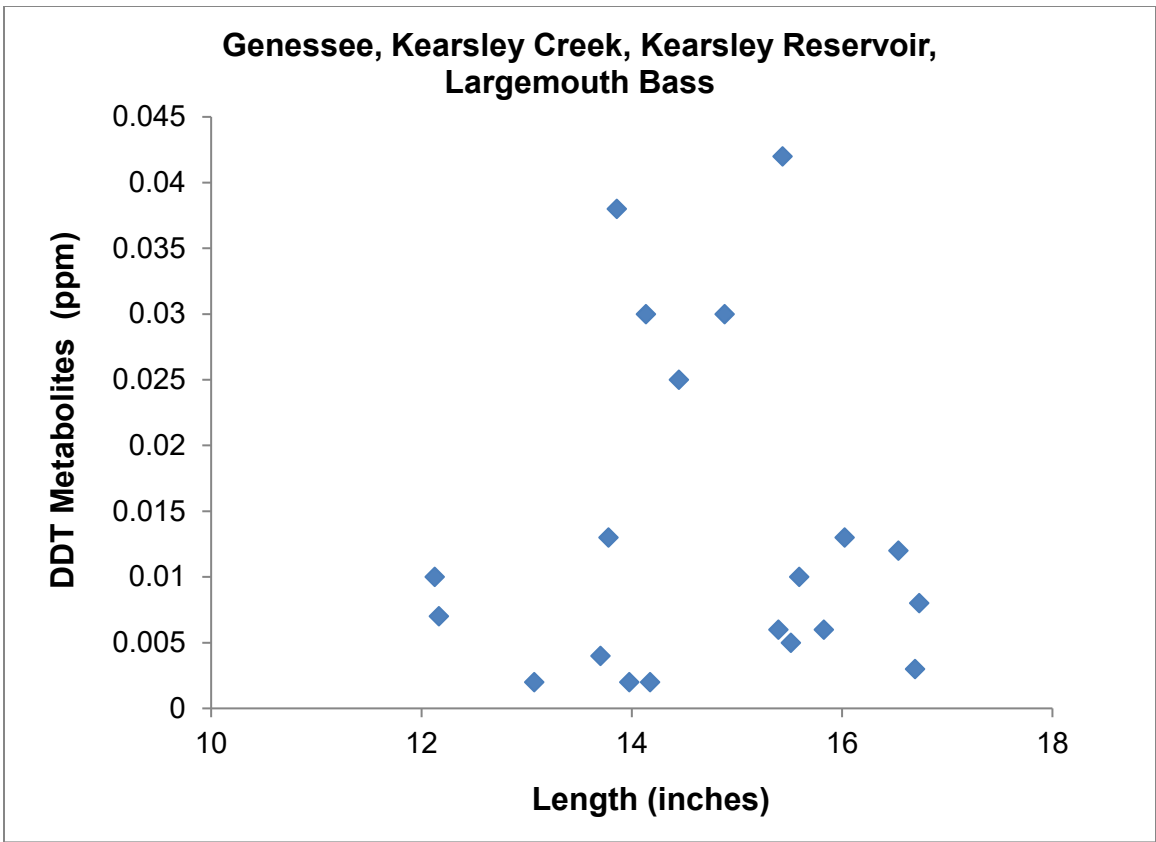
Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
14	0.181	4
15	0.227	4
16	0.274	2
17	0.320	2
18	0.367	2
19	0.413	2
20	0.459	2

Shaded area denotes extrapolated estimates

Existing MDHHS Advisory: No one should eat more than four meals per month of largemouth and smallmouth bass from Kearsley Reservoir and Kearsley Creek upstream of Kearsley Reservoir in Genesee County smaller than 18 inches in length or no more than 2 meals per month of bass larger than 18 inches in length due to mercury.

Recommendation: No one should eat more than four meals per month of largemouth and smallmouth bass from Kearsley Reservoir and Kearsley Creek upstream of Kearsley Reservoir in Genesee County smaller than 16 inches in length due to mercury and PFOS or no more than 2 meals per month of bass larger than 16 inches in length due to mercury. PCBs cause a less restrictive advisory.





Largemouth Bass

Lake Fenton

Genesee 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	2011	24	9.8	14	13.8	19.7
Datasets available: 1987, 1989, 1990, 2011						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	9	0.42	0.22	0.74	0.54	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.708	0.664				

Organics Analysis:

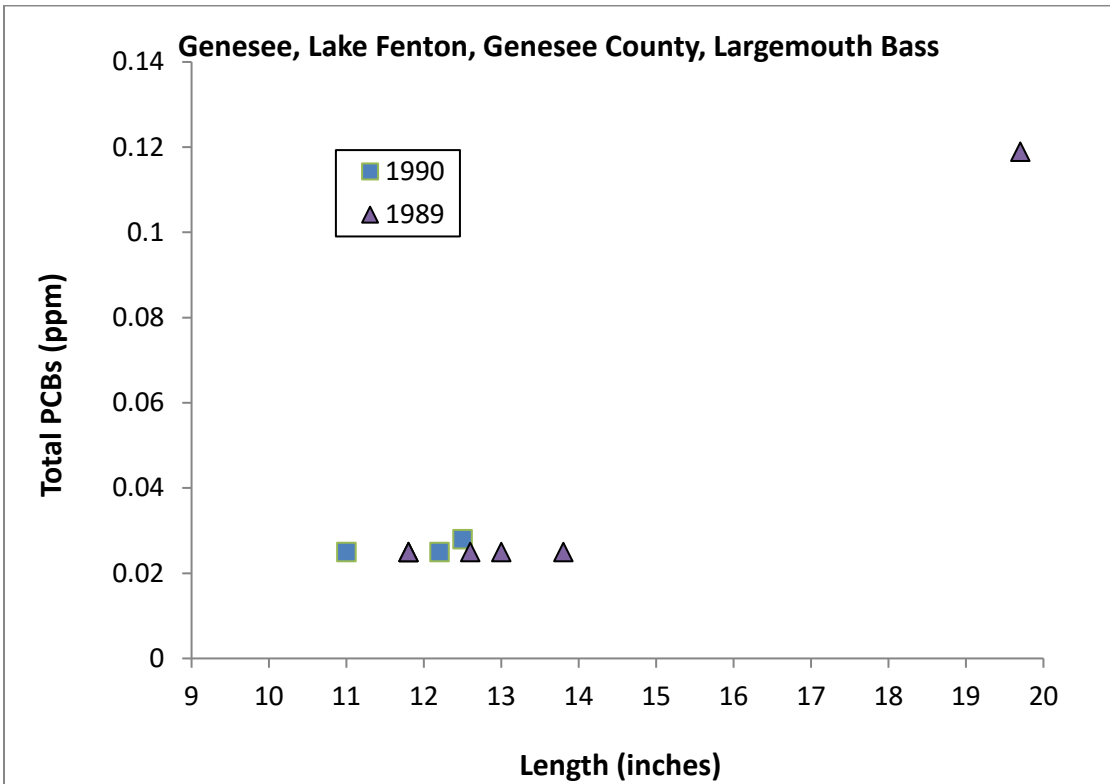
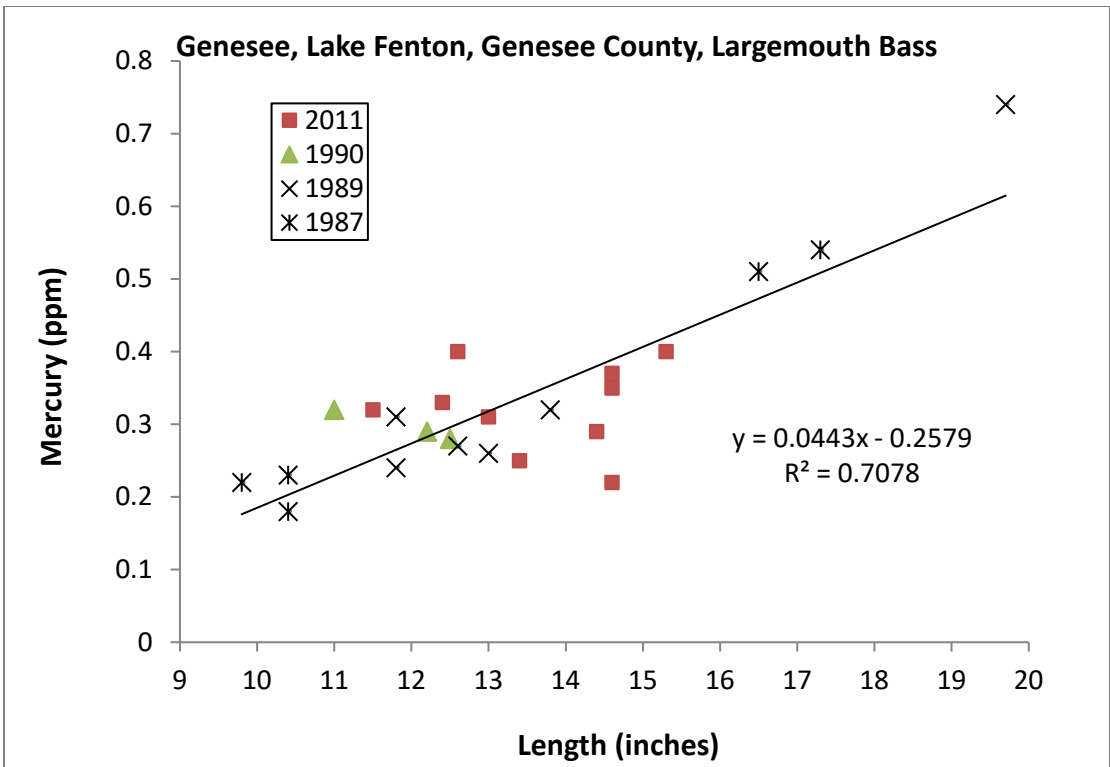
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	1990	9	11	14	13.8	19.7
Datasets available: 1989, 1990						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	2	0.07	0.02	0.12	--	--
DDT	2	0.16	0.02	0.29	--	--
Chlordane	2	0.01	0.003	0.02	--	--
Toxaphene	2	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.906	0.904	* - regressions all driven by 1 elevated point			
DDT	0.793	0.571				
Chlordane	0.895	0.865				
Toxaphene	--	--				
Final meal category based on UCL:						1

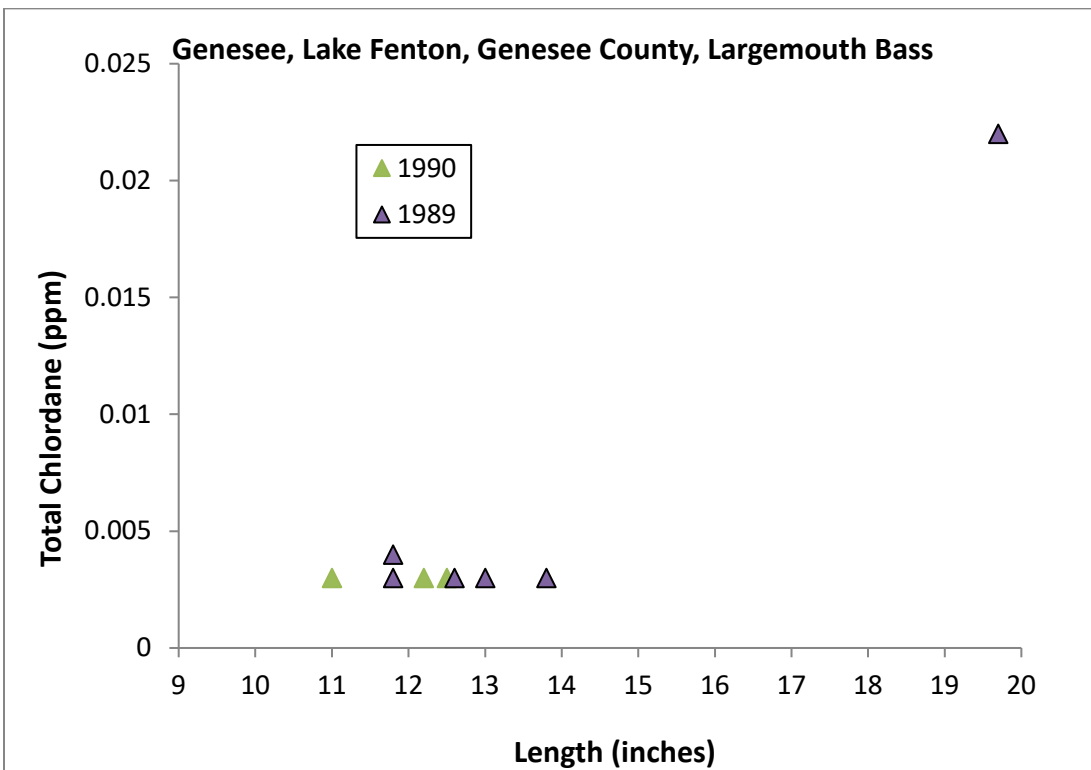
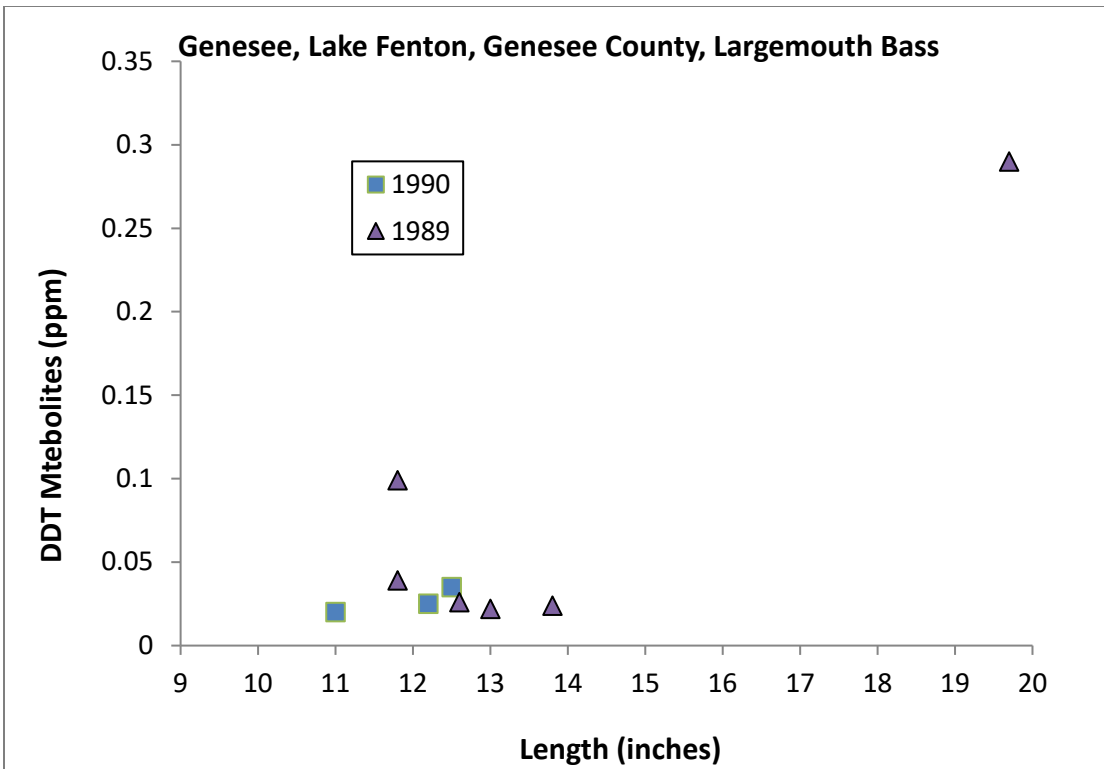
Existing Advisory: Statewide guidelines apply to Fenton Lake largemouth bass. No one should eat more than two meals per month of Lake Fenton largemouth or smallmouth bass less than 18 inches, or one meal per month of Lake Fenton largemouth bass greater than 18 inches due to mercury.

Recommendation: No one should eat more than 2 meals per month of Fenton Lake largemouth or smallmouth bass less than 18 inches or one meal per month of fish greater than 18 inches due to mercury.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
14	0.36	2
16	0.45	2
18	0.54	1
20	0.63	1
22	0.72	1
24	0.81	1
26	0.89	1
<i>Shaded area denotes extrapolated estimates</i>		

Note: The mercury regression equation estimate has 18 inch fish near the transition from 2 meals to 1 meal per month.





Northern Pike

Lake Fenton

Genesee County

Hg Analysis:

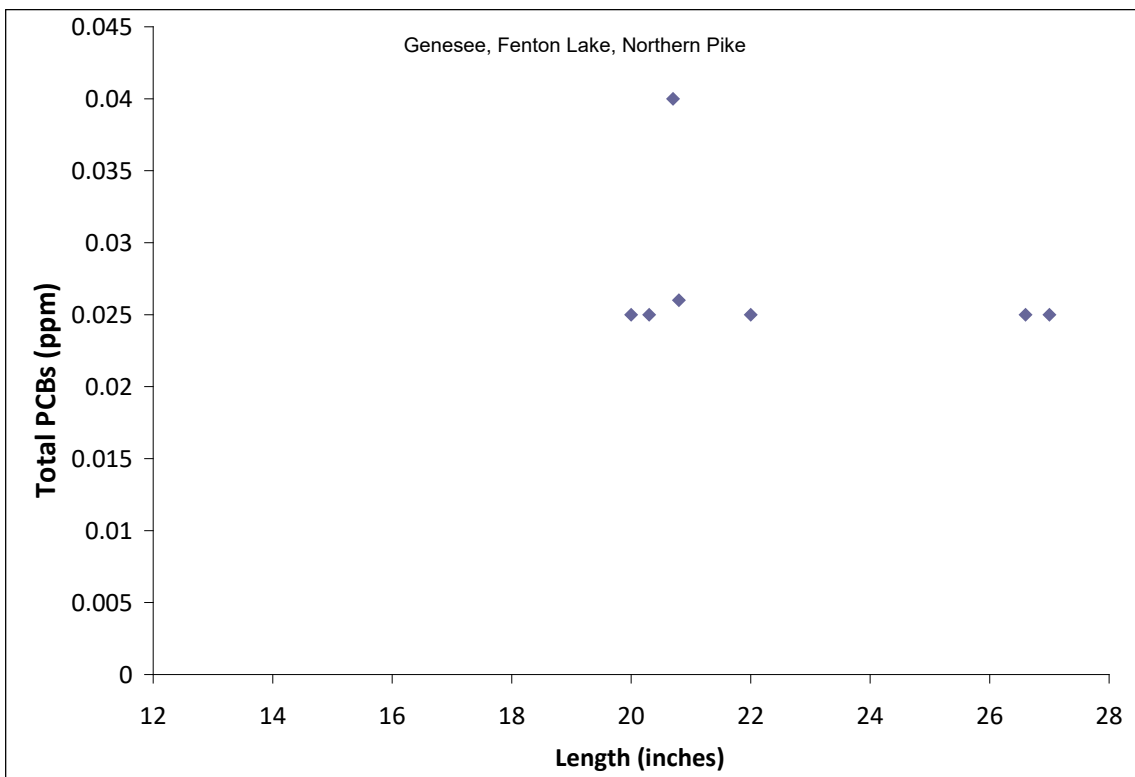
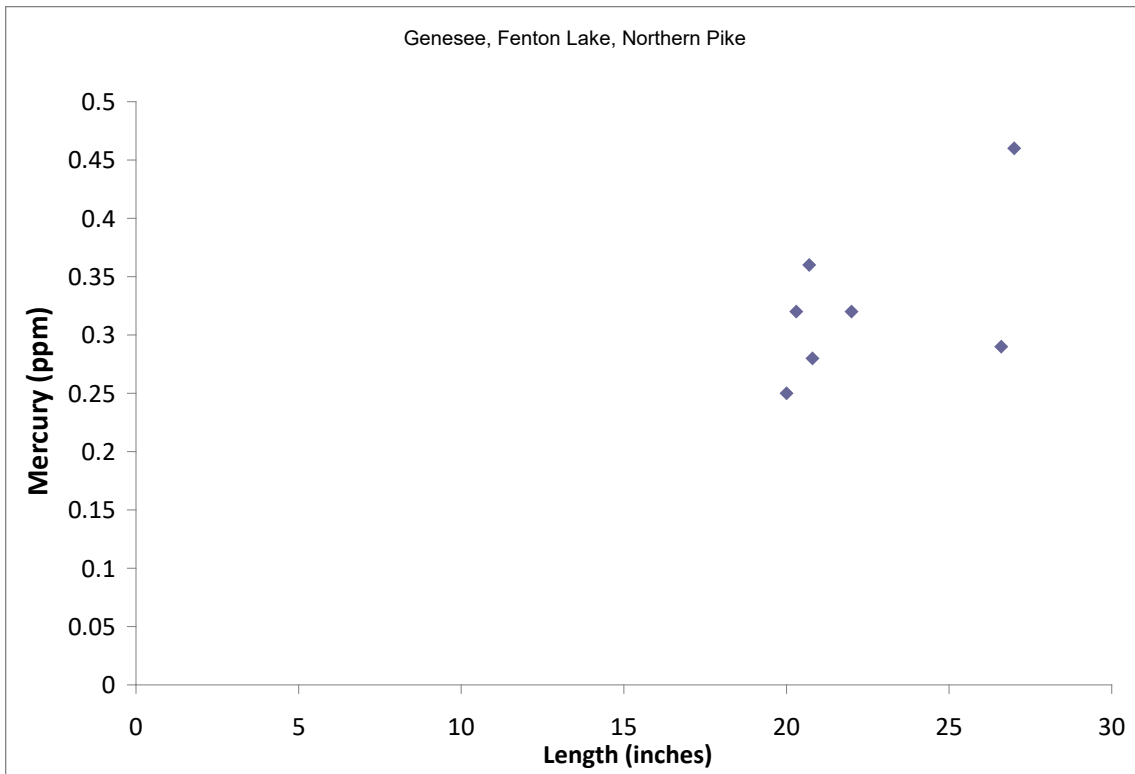
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1990	1990	7	20.0	24	26.6	27
Datasets available: 1990						
Chemical	Sample Size (All)	Mean (ppm)		95%UCL	Meal Category	
Mercury	7	0.32		0.39	2	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.298	0.272				

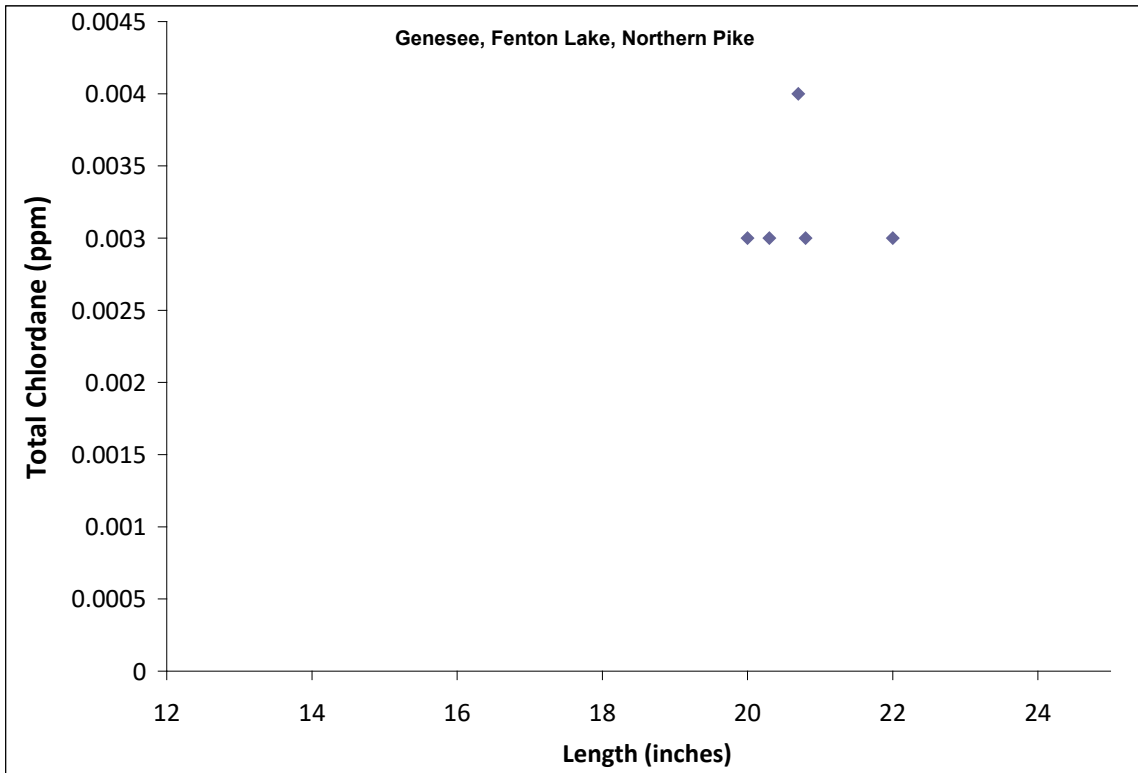
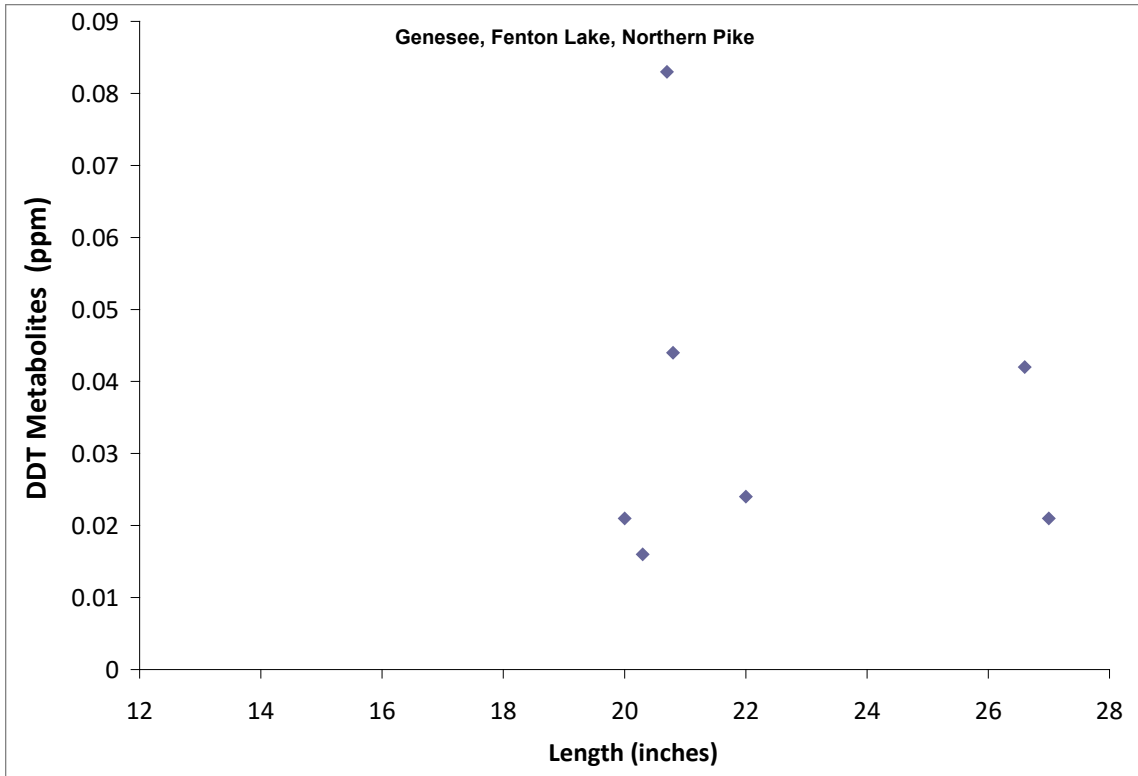
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1990	1990	7	20.0	24	26.6	27
Datasets available: 1990						
Chemical	Sample Size (All)	Mean (ppm)		95%UCL	Meal Category	
PCB	7	0.027		0.030	8*	
DDT	7	0.036		0.060	16	
Chlordane	7	0.003		0.004	--	
Toxaphene	7	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.078	0.081				
DDT	0.016	0.001				
Chlordane	0.068	0.068				
Toxaphene	--	--				
Final meal category based on UCL:						2

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

Recommendation: The statewide guidelines apply to the Lake Fenton northern pike due to mercury. The dataset is limited by the age of the data, but supports the application of the statewide guidelines. *Based on EGLE’s Fish Contaminant Monitoring Program, PCB concentrations ≥15 years old are expected to have declined resulting in less restrictive meal category for PCBs.





Walleye

Lake Fenton

Genesee County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1990	1990	2	16.8	15	16.8	18.2
Datasets available: 1990						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	2	0.54		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury						

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1990	1990	2	16.8	15	16.8	18.2
Datasets available:						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	2	0.032		--		--
DDT	2	0.038		--		--
Chlordane	ND	--		--		--
Toxaphene	ND	--		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						--

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

Recommendation: The statewide mercury advisory would apply for Lake Fenton walleye. This dataset is limited due to small sample size and age of the data.

Carp

Lake Ponemah

Genesee County

Hg Analysis:

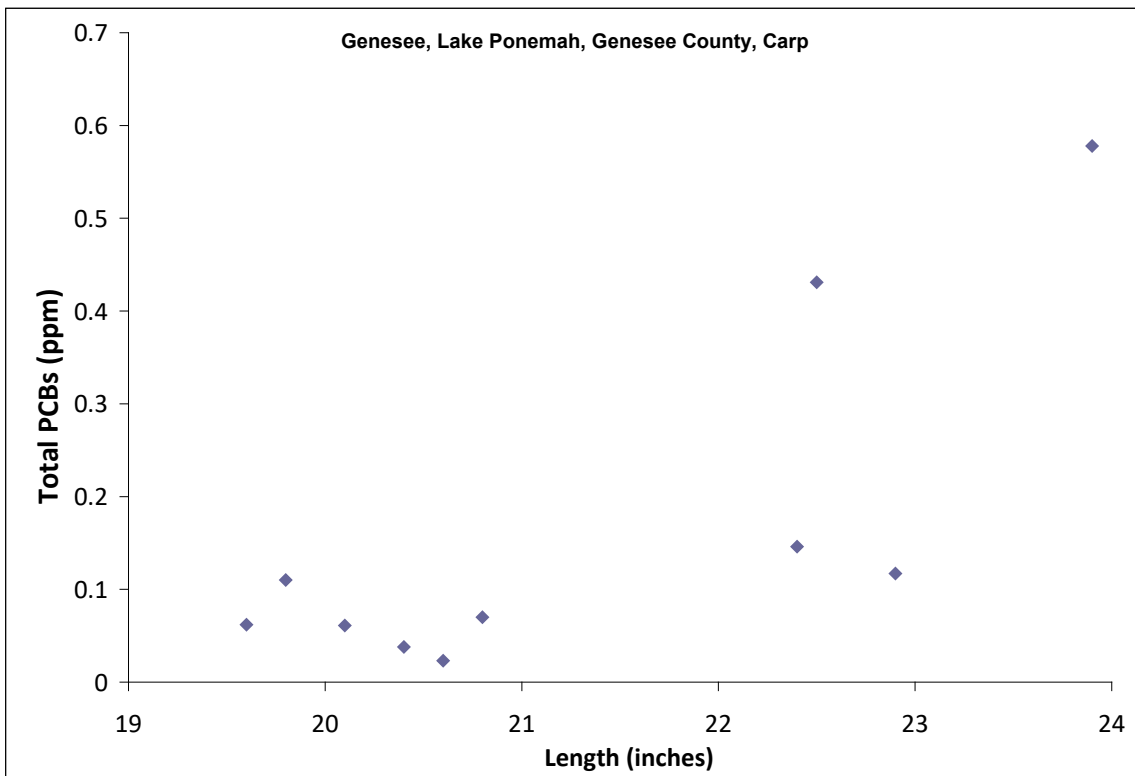
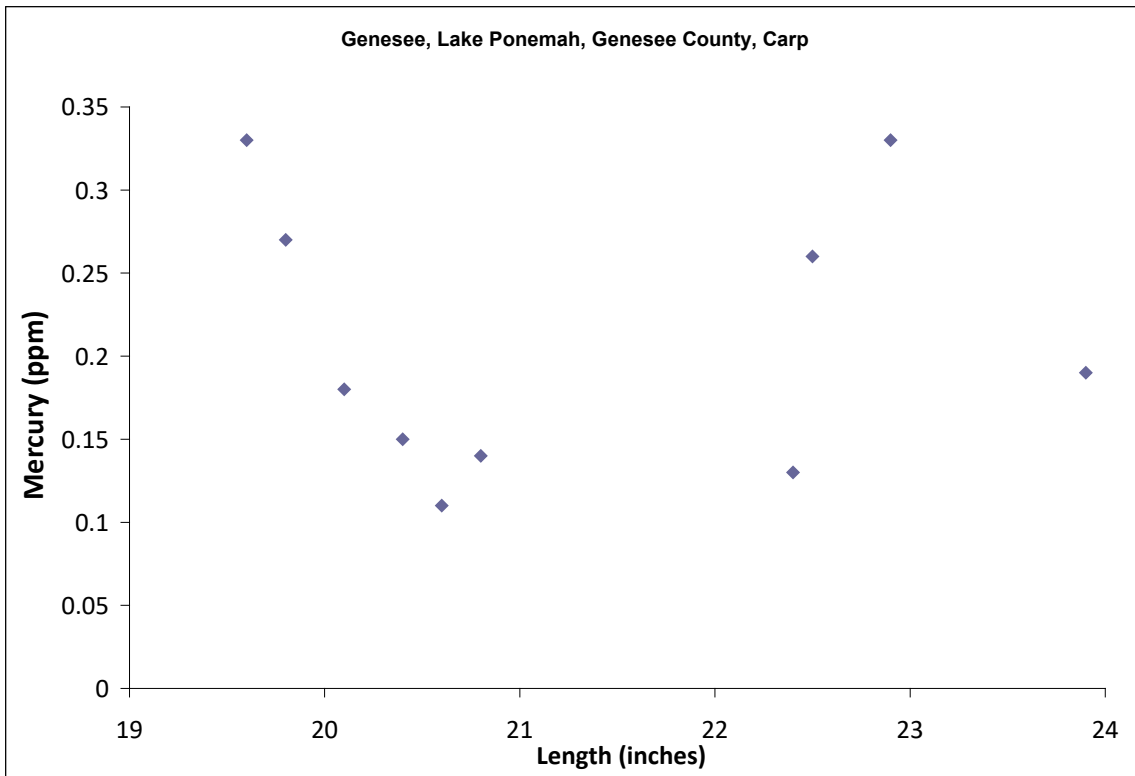
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2000	2000	10	19.6	na	19.6	23.9
Datasets available: 2000						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	10	0.21		0.27	4	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.000	0.001				

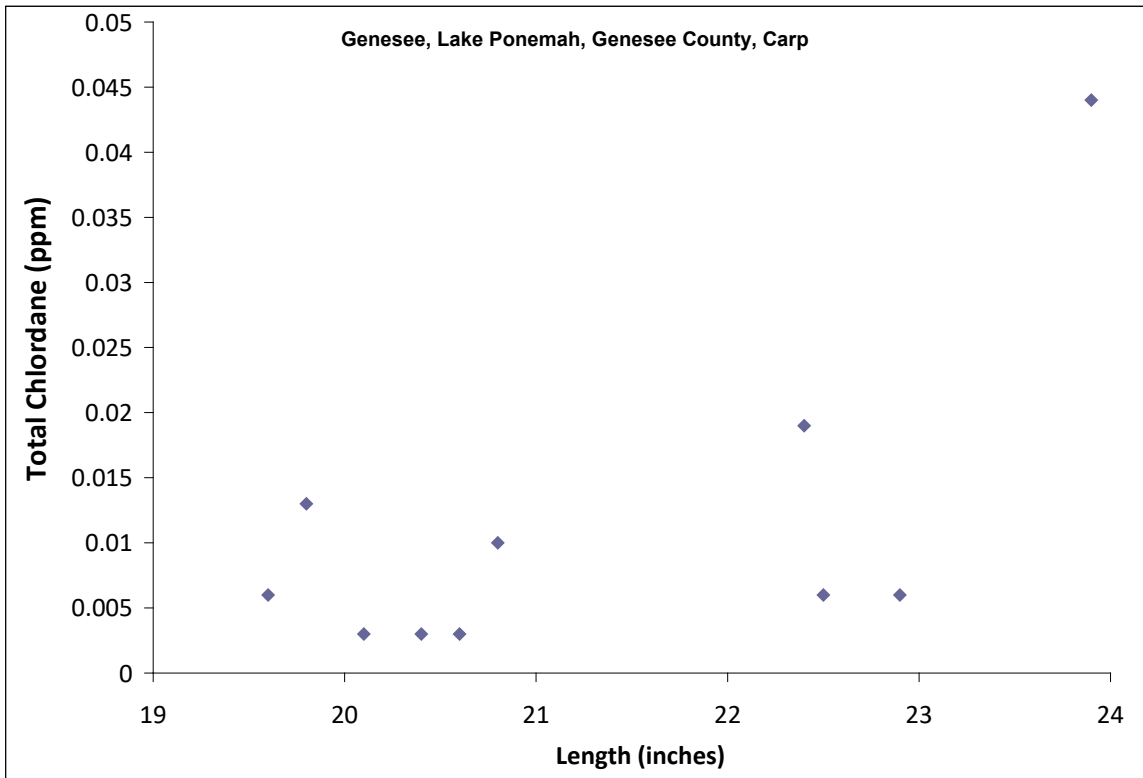
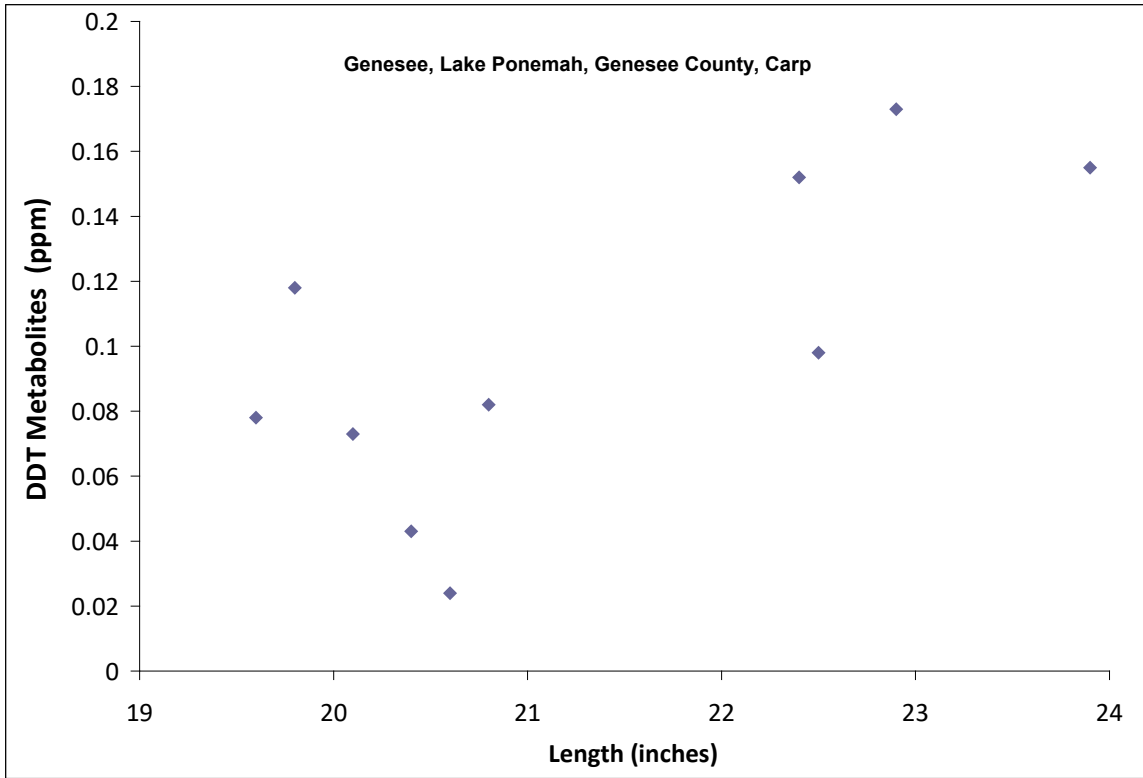
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2000	2000	10	19.6	na	19.6	23.9
Datasets available: 2000						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	10	0.164		0.300	0.5	
DDT	10	0.100		0.130	12	
Chlordane	10	0.011		0.020	--	
Toxaphene	10	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.596	0.584				
DDT	0.503	0.343				
Chlordane	0.415	0.343				
Toxaphene	--	--				
Final meal category based on UCL:					0.5	

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

Recommendation: No one should eat more than 6 meals per year of Lake Ponemah carp due to PCBs. Mercury and DDT would cause advisories.





Hg Analysis:

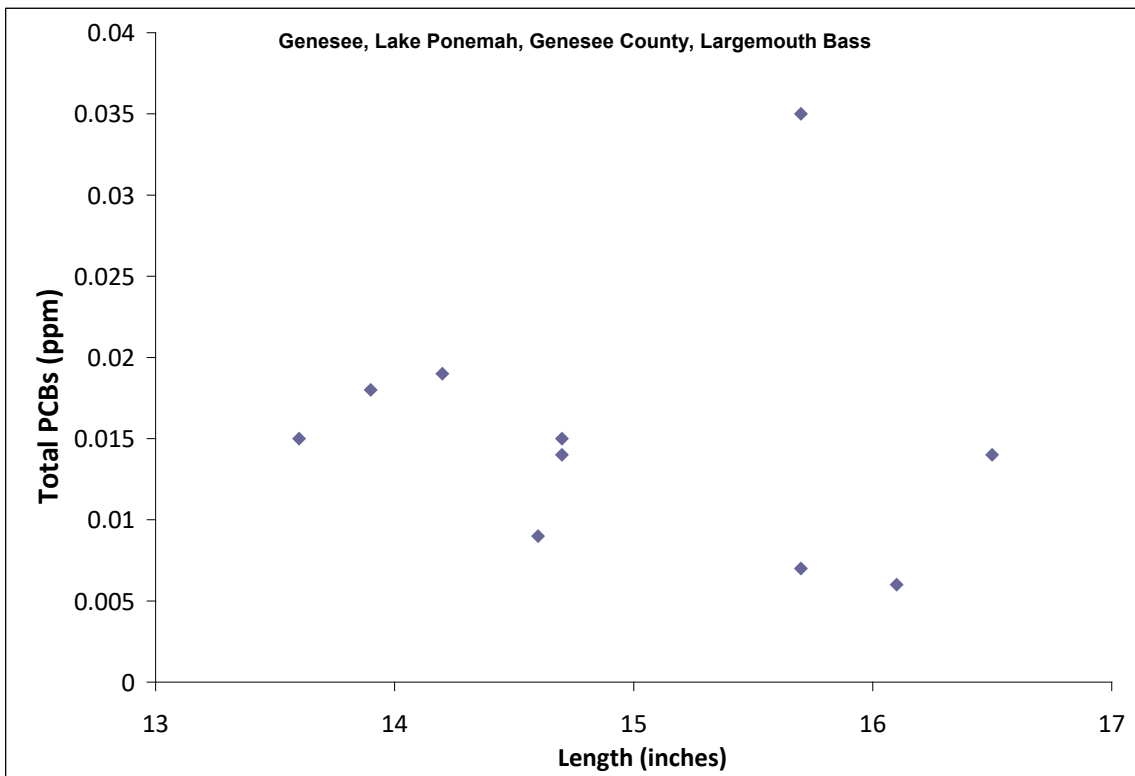
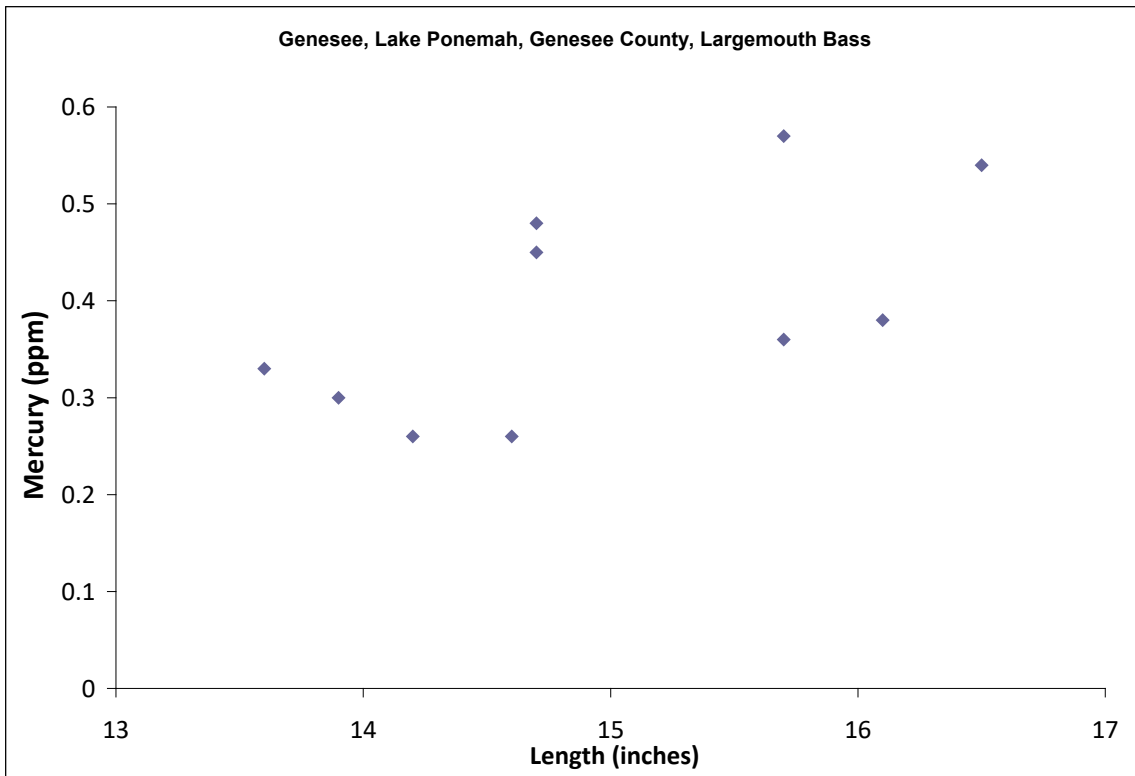
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2000	2000	10	13.6	14	13.6	16.5
Datasets available: 2000						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	10	0.39		0.47	2	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.389	0.387				

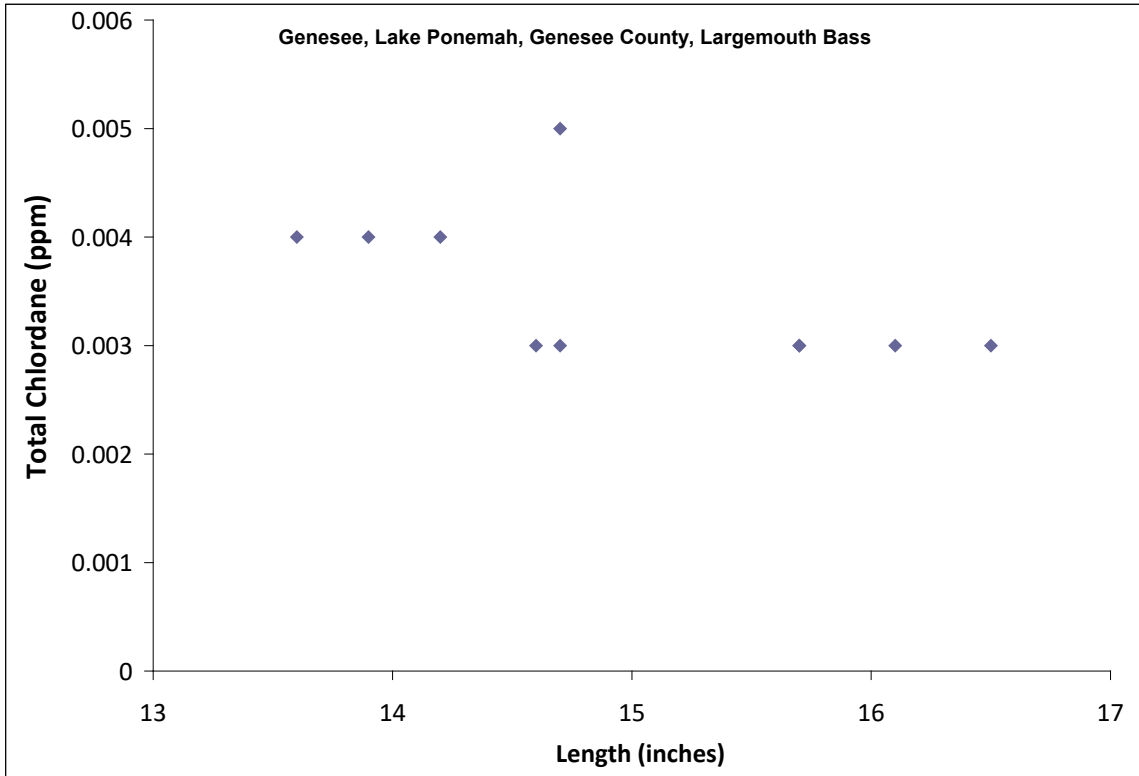
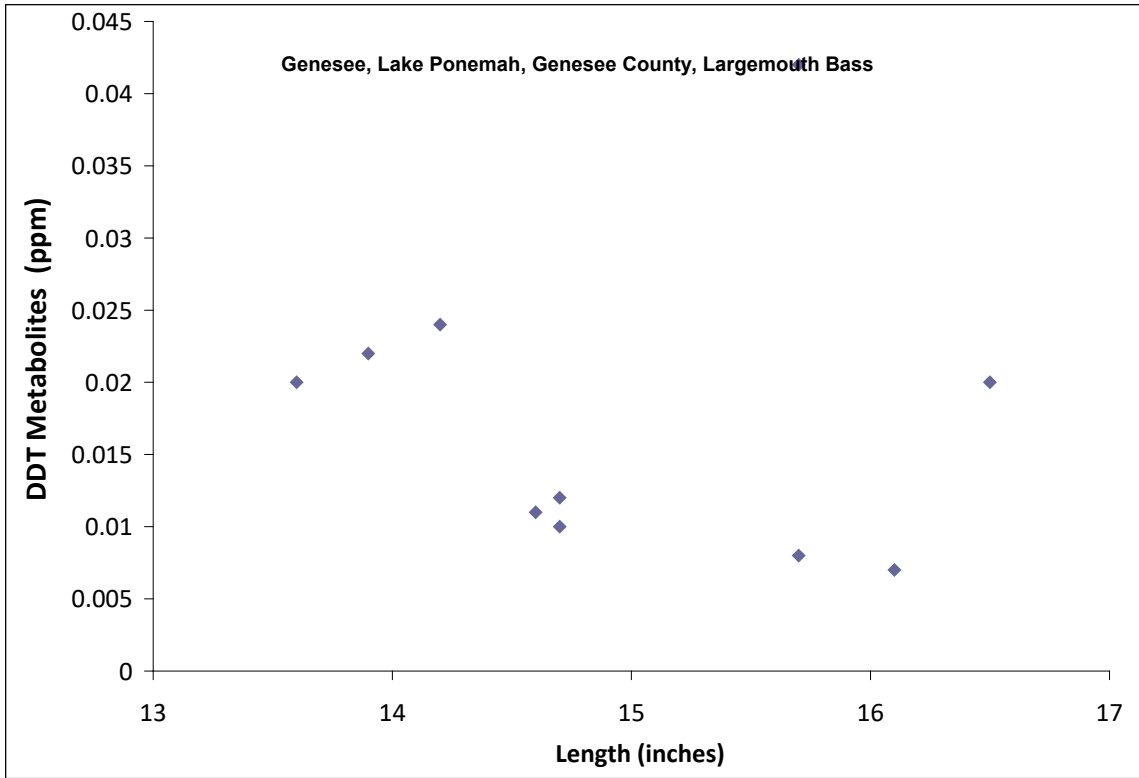
Organics Analysis:

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	19.6	14	19.6	23.9
Datasets available: 2000						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	10	0.015		0.020	12	
DDT	10	0.018		0.030	16	
Chlordane	10	0.004		0.004	--	
Toxaphene	10	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.009	0.076				
DDT	0.002	0.041				
Chlordane	0.364	0.410				
Toxaphene	--	--				
Final meal category based on UCL:						2

Existing Advisory: The general population should eat no more than one meal per week of Lake Ponemah largemouth bass greater than 18 inches in length and women and children should eat no more than one meal per month of Lake Ponemah largemouth bass greater than 18 inches due to elevated levels of mercury.

Recommendation: No one should eat more than 2 meals per month of Lake Ponemah largemouth bass less than 18 inches or 1 meal per month of Lake Ponemah largemouth bass greater than 18 inches due to mercury. PCBs would cause an advisory.





Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2003	2003	10	14.8	na	14.8	27.2
Datasets available: 2003						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	10	0.05			0.07	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.616	0.744				

Organics Analysis:

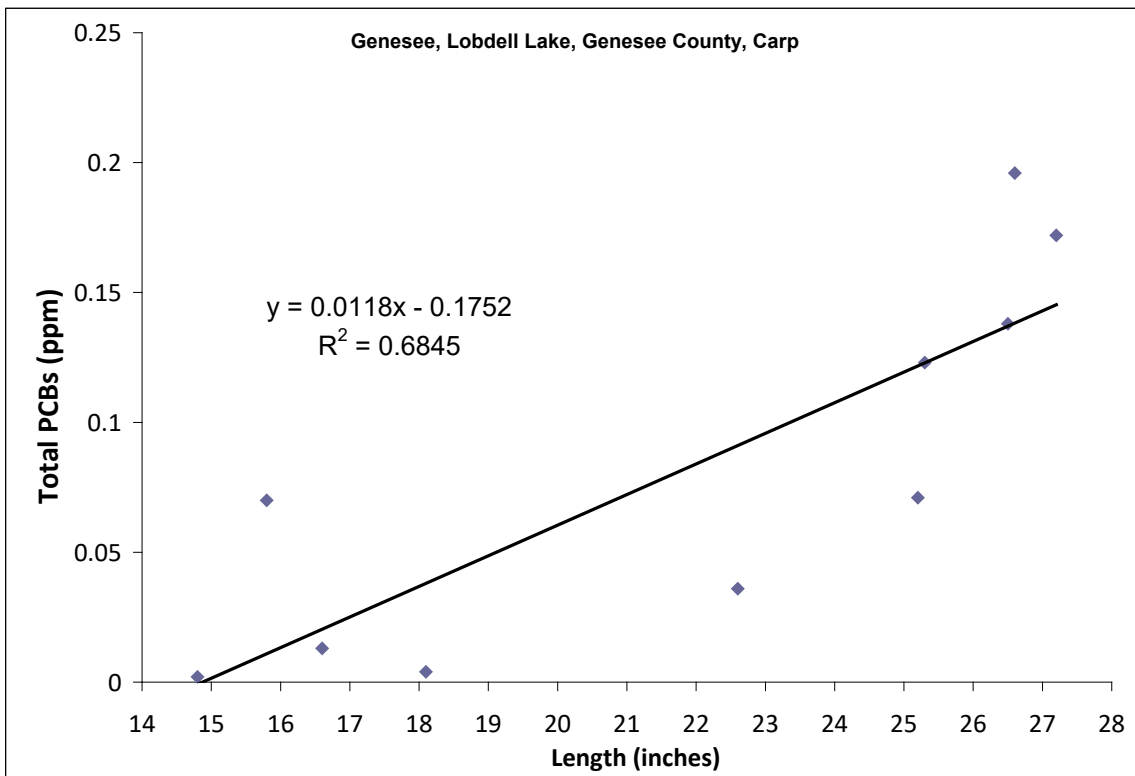
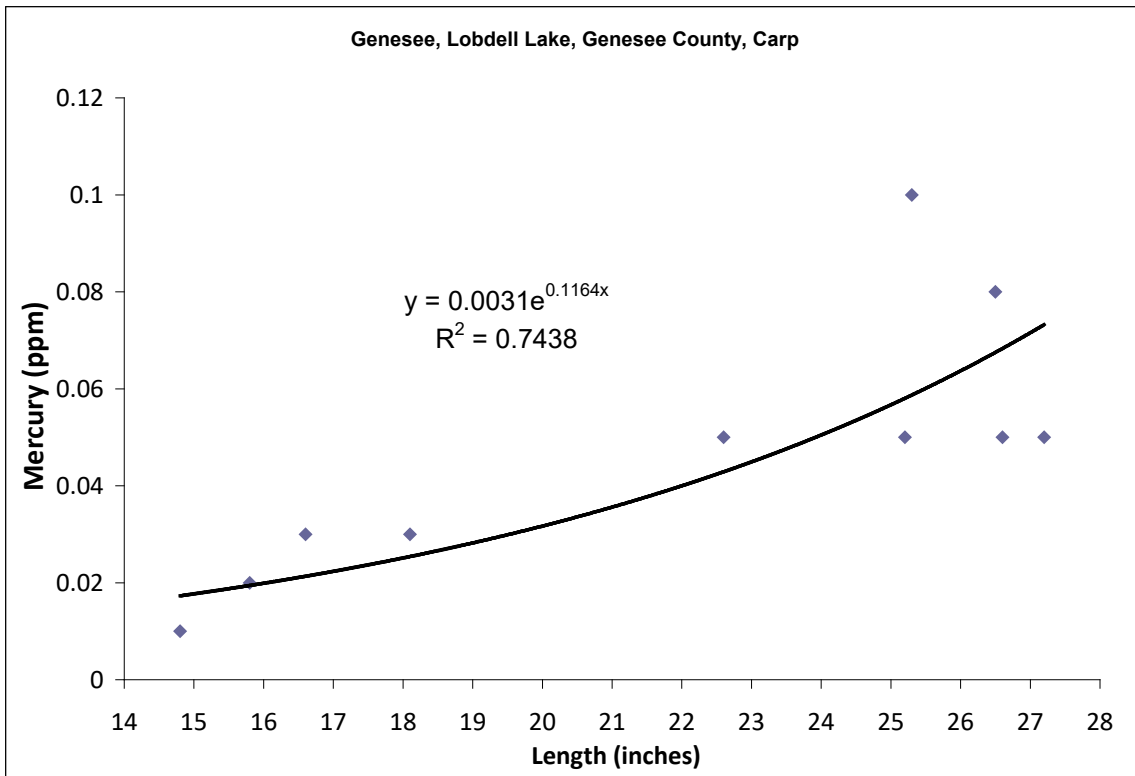
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2003	2003	10	14.8	na	14.8	27.2
Datasets available: 2003						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	10	0.083			0.130	1
DDT	10	0.167		0.290	4	
Chlordane	10	0.020		0.030	--	
Toxaphene	10	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.684	0.658				
DDT	0.621	0.936				
Chlordane	0.719	0.891				
Toxaphene	--	--				
Final meal category based on UCL:					1	

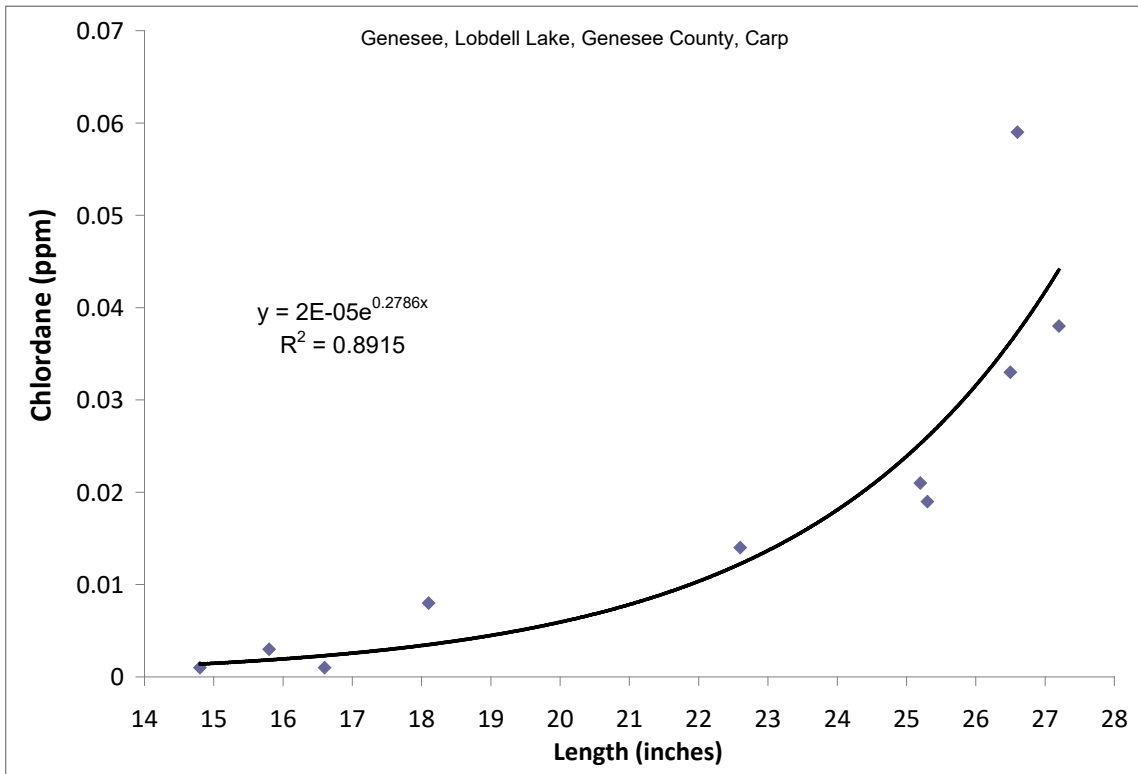
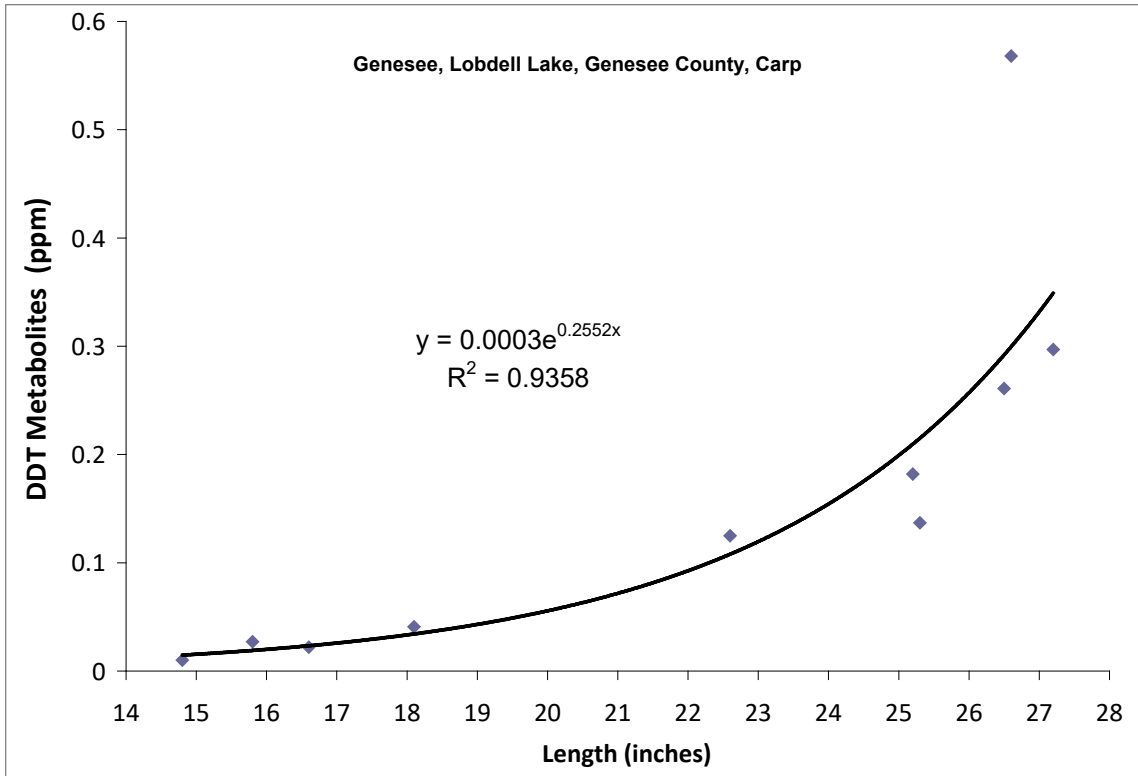
Existing Advisory: Women and children should eat no more than one meal per week of Lobdell Lake carp between 18 and 30 inches in length and no more than one meal per month of Lobdell Lake carp greater than 30 inches in length.

Recommendation: No one should eat more than 2 meals per month of Lobdell Lake carp less than 24 inches and no more than 1 meal per month of carp larger than 24 inches in length due to PCBs. DDT would cause an advisory.

Length (Inches)	PCB Regression Estimate (ppm)	Meal Category
16	0.0136	12
18	0.0372	4
20	0.0608	2
22	0.0844	2
24	0.108	2
26	0.1316	1
28	0.1552	1
30	0.1788	1

Shaded area denotes extrapolated estimates





Largemouth Bass

Lobdell Lake

Genesee County

Hg Analysis:

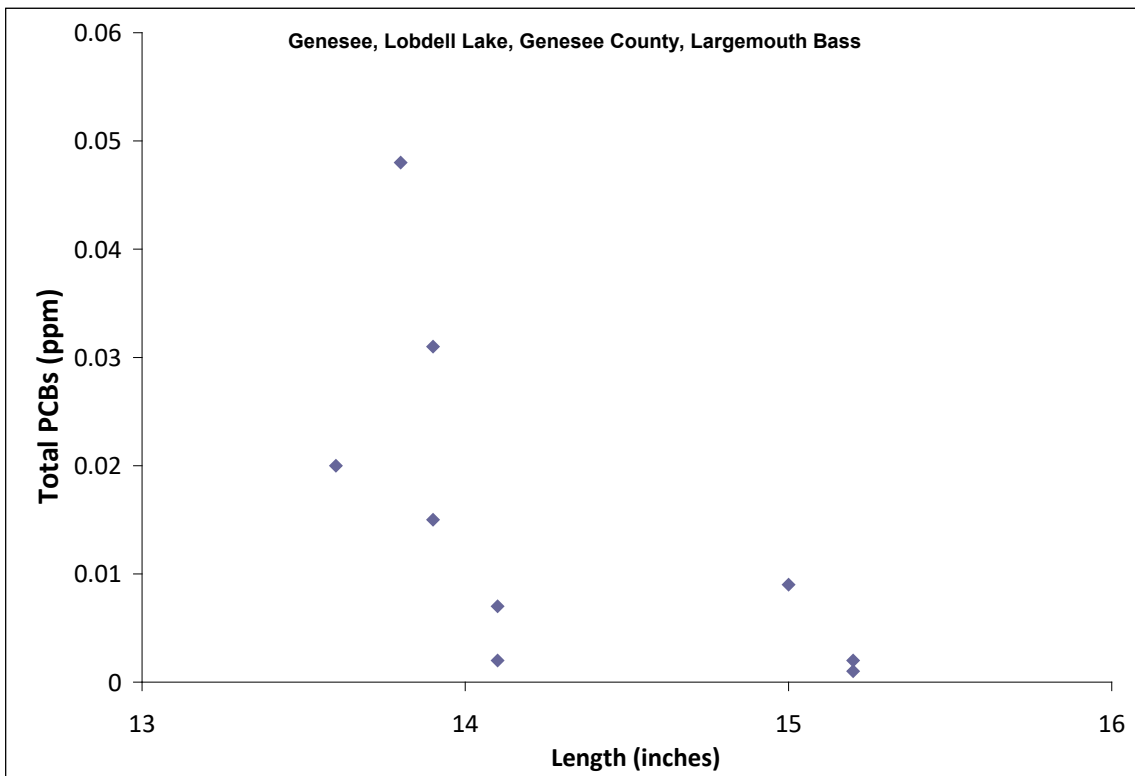
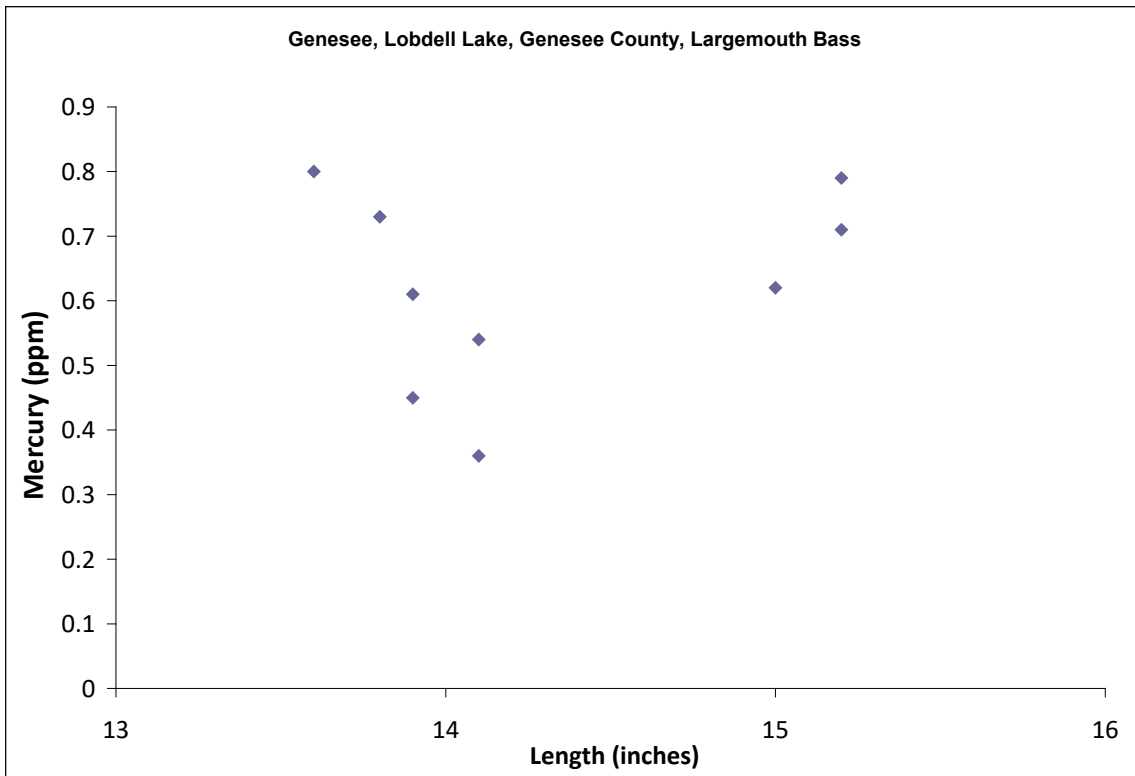
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2003	2003	10	13.3	14	13.6	15.2
Datasets available: 2003						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	9	0.62			0.74	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.096	0.090				

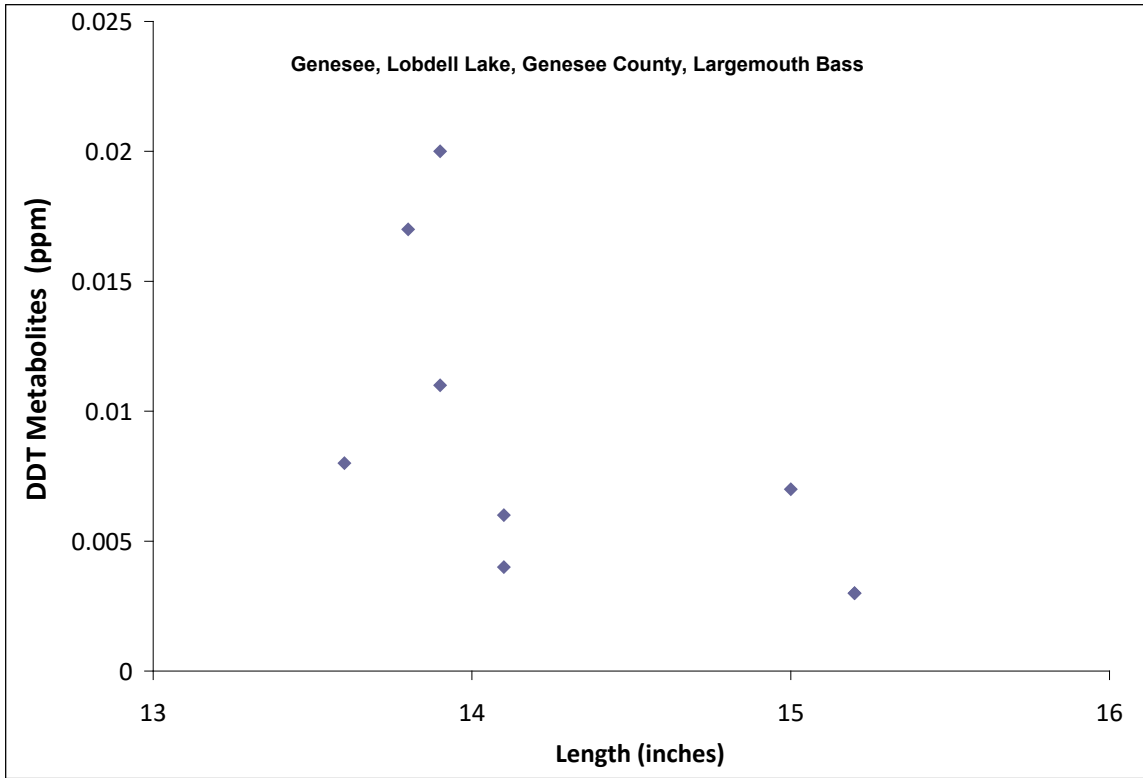
Organics Analysis:

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	13.3	14	13.6	15.2
Datasets available: 2003						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	9	0.015			0.030	8
DDT	9	0.009		0.010	16	
Chlordane	9	ND		--	--	
Toxaphene	9	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.219	0.407				
DDT	0.242	0.389				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						1

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

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





Carp

**Thread Creek
Including Thread Lake**

Genesee County

Hg Analysis:

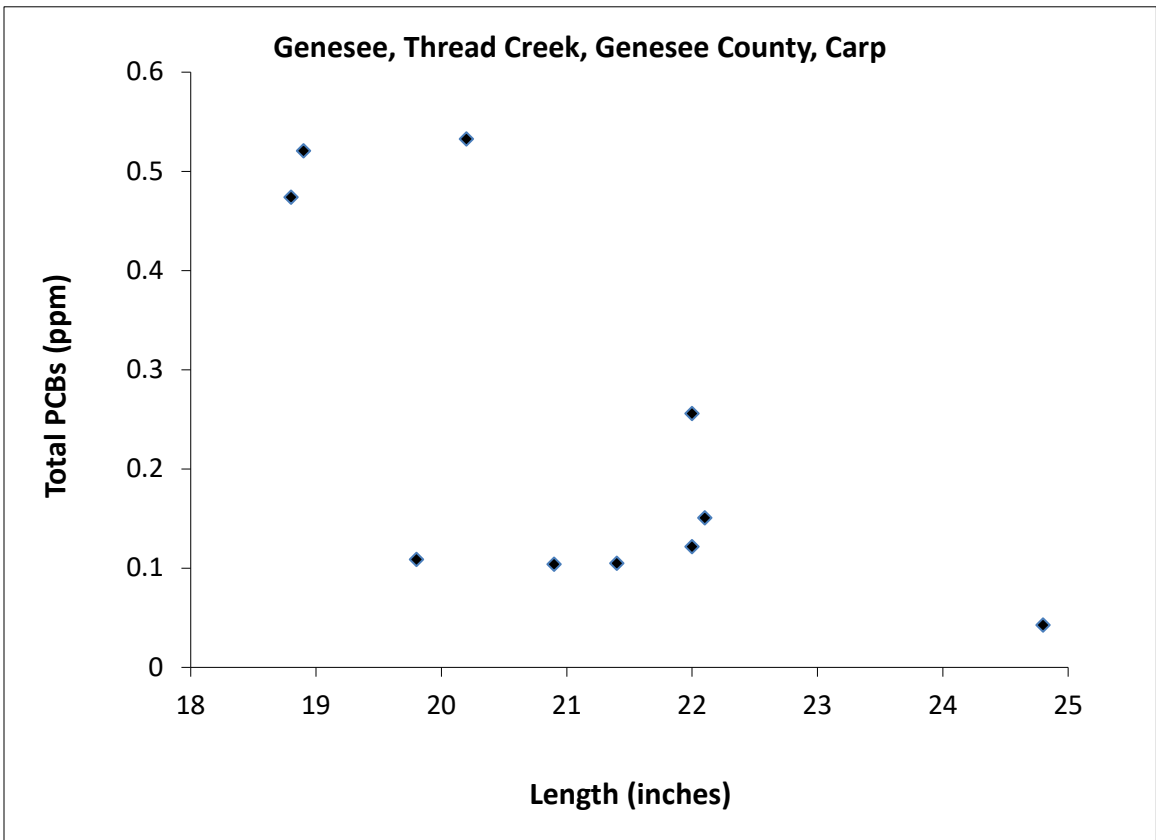
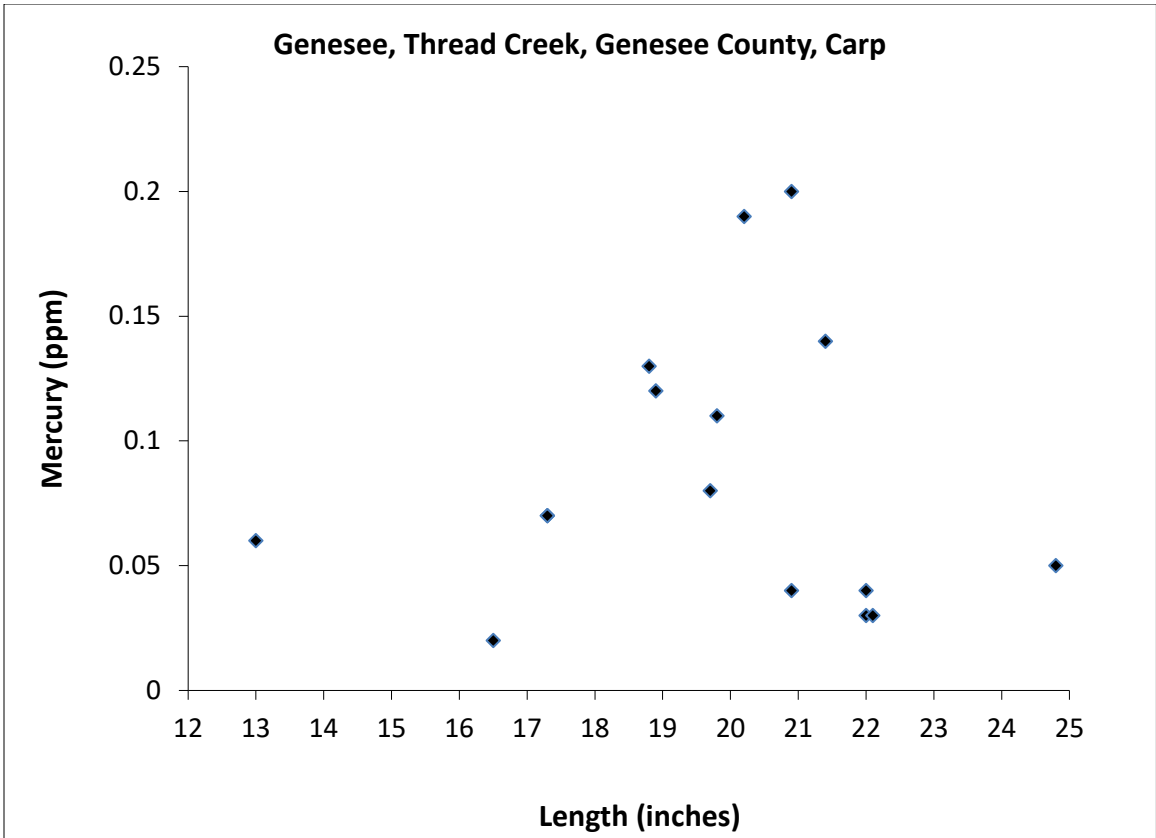
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1993	2000	16	13	na	13	24.8
Datasets available: 1993, 2000						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL (ppm)	Meal Category
Mercury	16	0.09			0.12	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.001	0.000				

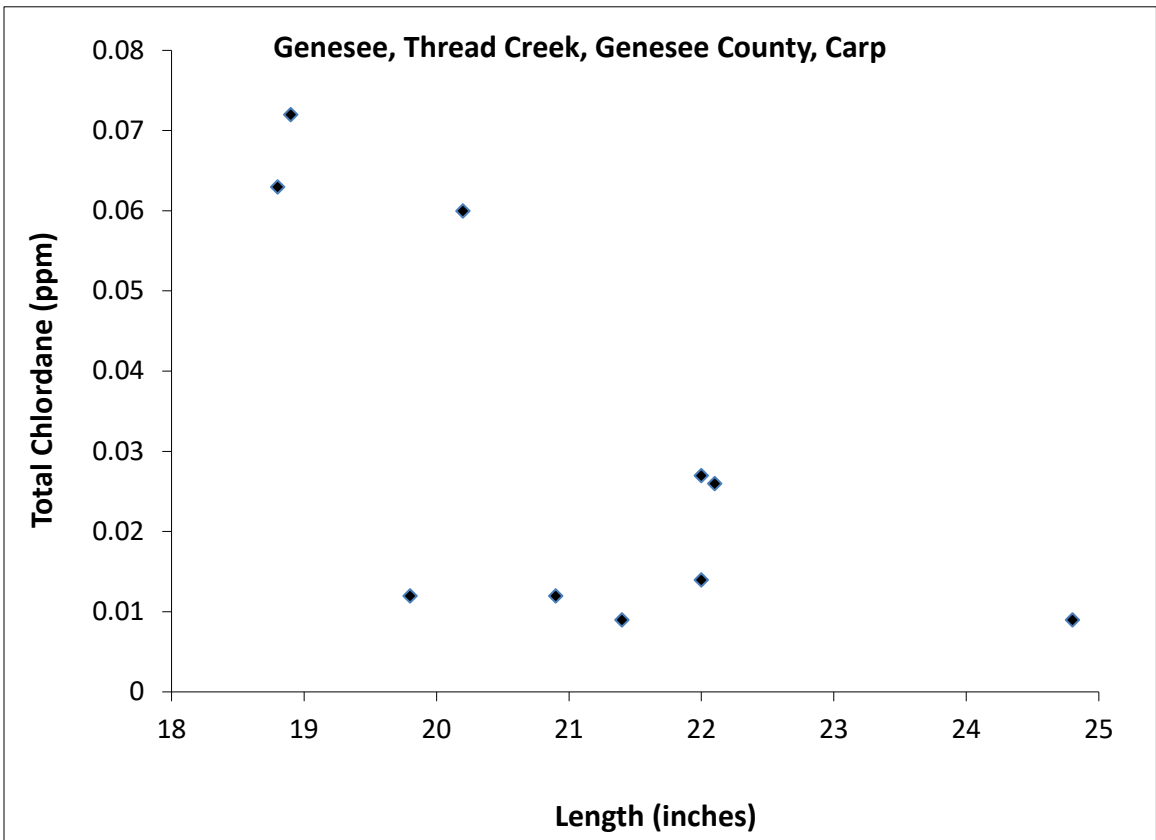
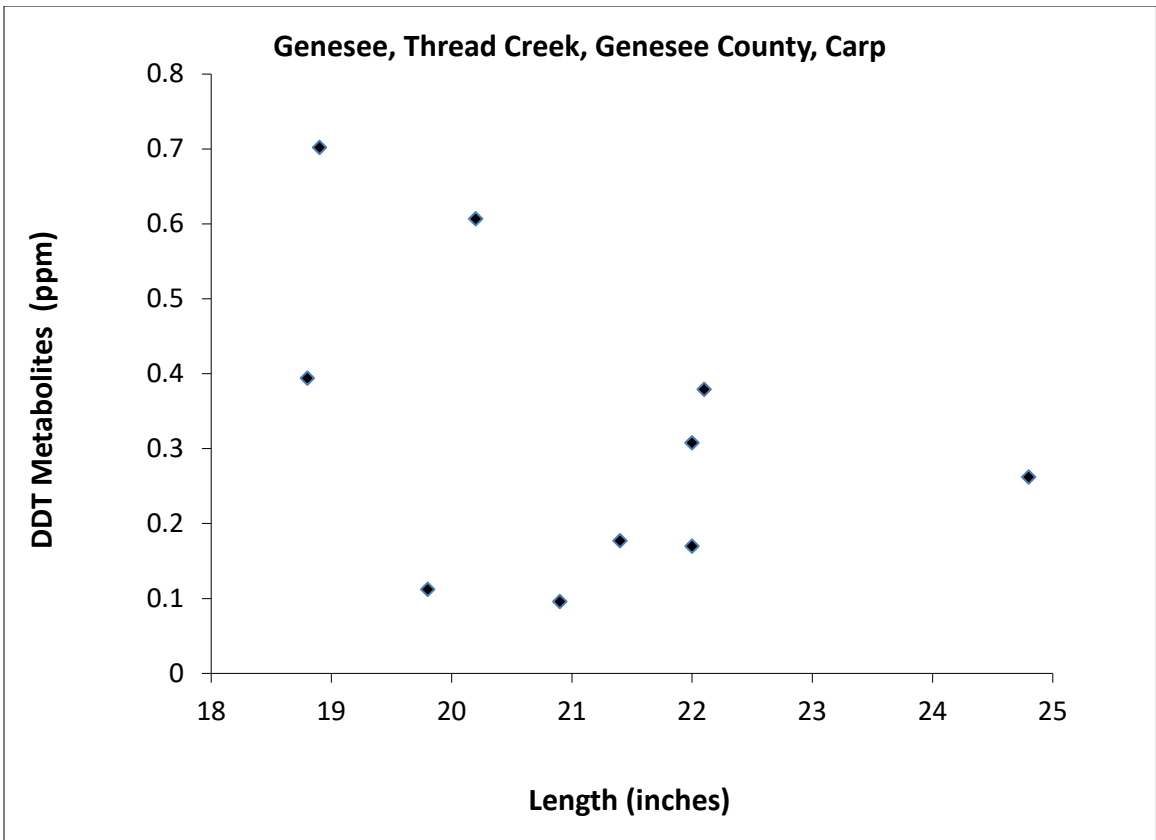
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2000	2000	10	18.8	na	18.8	24.8
Datasets available: 2000						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL (ppm)	Meal Category
PCB	10	0.24			0.38	0.5
DDT	10	0.32			0.47	2
Chlordane	10	0.03			0.05	--
Toxaphene	10	ND			--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.018	0.034				
DDT	0.332	0.503				
Chlordane	0.083	0.238				
Toxaphene	--	--				
Final meal category based on UCL:						0.5

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

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





Largemouth Bass

**Thread Creek
Including Thread Lake**

Genesee County

Hg Analysis:

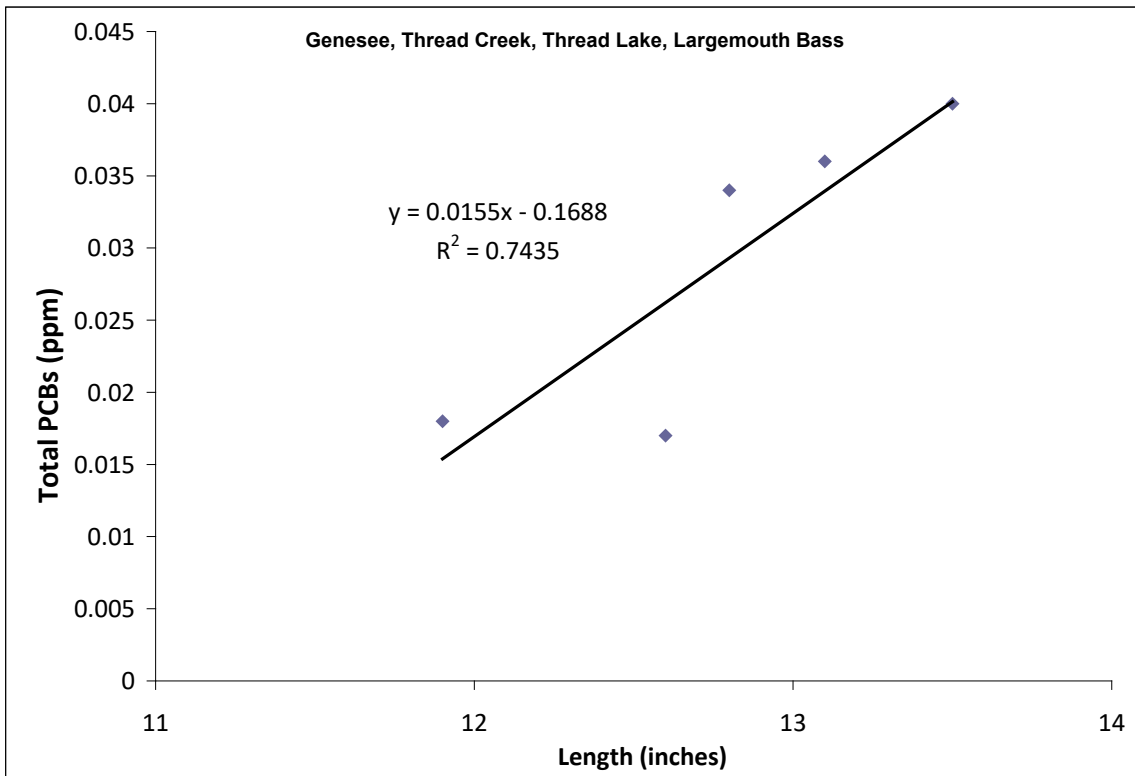
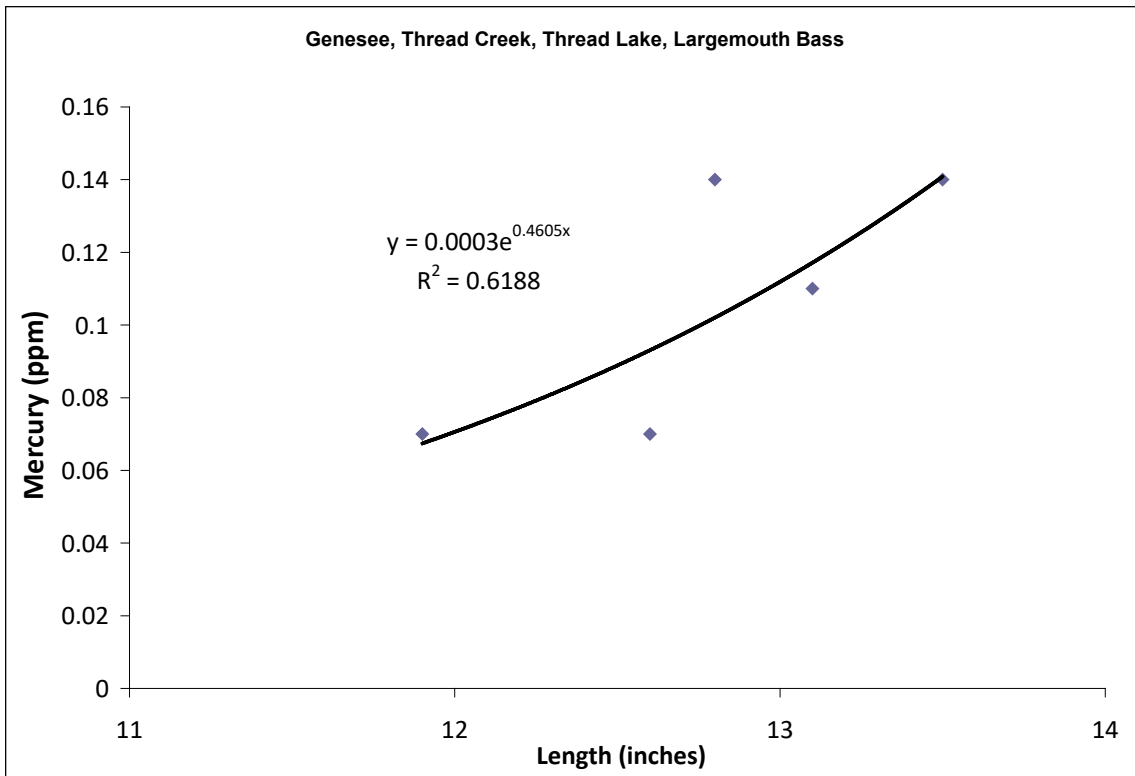
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2000	2000	5	11.9	14	13.5	13.5
Datasets available: 2000						
Chemical	Sample Size (All)	Mean (ppm)		95%UCL (ppm)		Meal Category
Mercury	5	0.11		0.15		4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.594	0.619		* see note below		

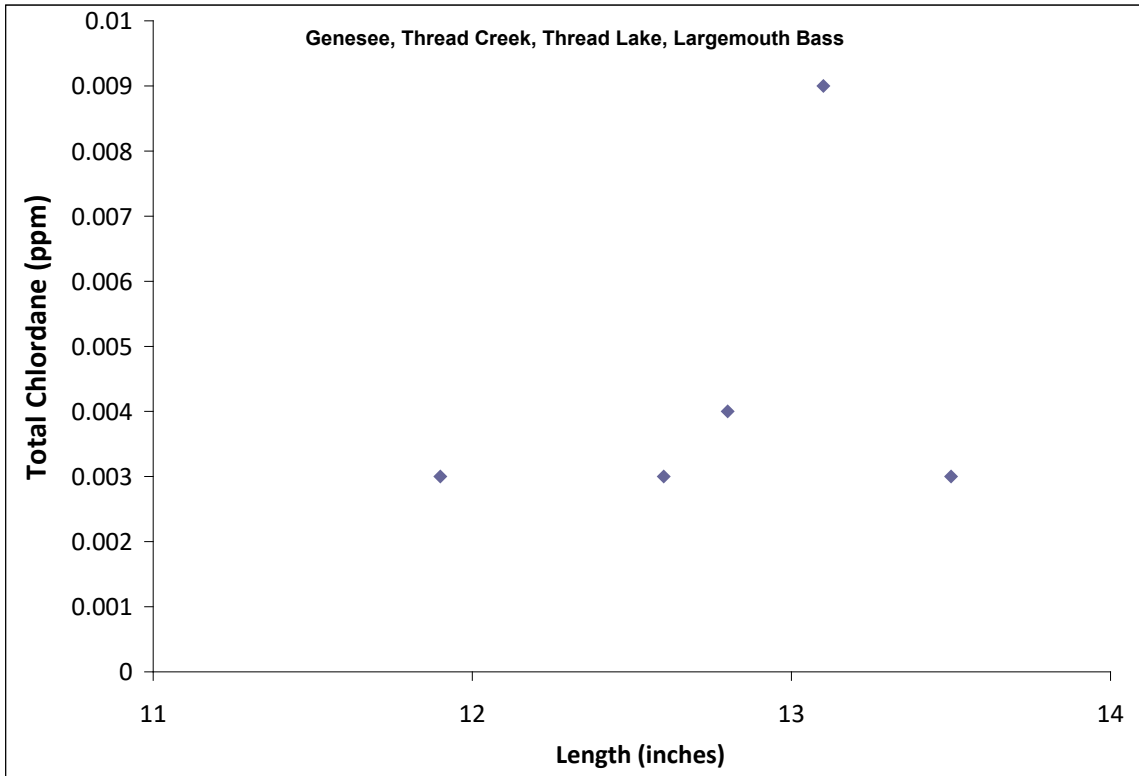
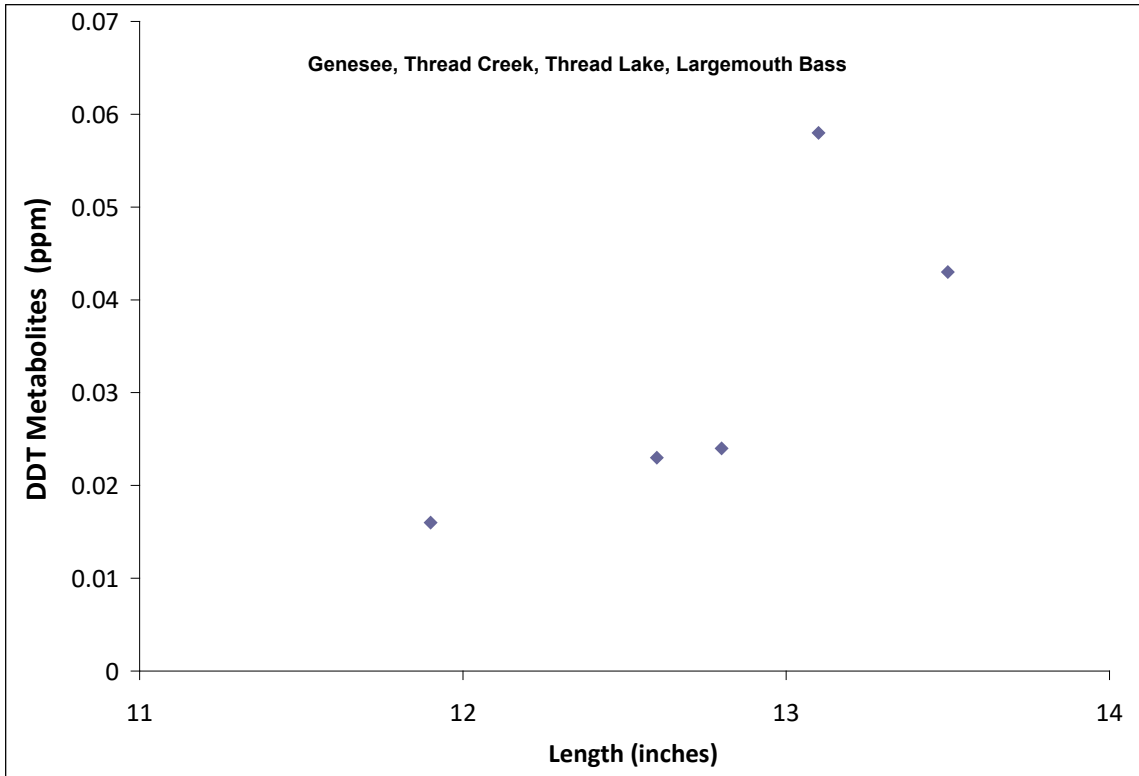
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2000	2000	5	11.9	14	13.5	13.5
Datasets available: 2000						
Chemical	Sample Size (All)	Mean (ppm)		95%UCL (ppm)		Meal Category
PCB	5	0.029		0.040		4
DDT	5	0.033		0.050		16
Chlordane	5	0.004		0.010		16
Toxaphene	5	ND				
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.744	0.704		*regression estimates are all extrapolations and should not be the basis for consumption advice		
DDT	0.592	0.739				
Chlordane	0.097	0.099				
Toxaphene						
Final meal category based on UCL:						4

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

Recommendation: The statewide mercury advisory would apply to Thread Lake largemouth bass. The quality of this dataset is limited due small sample size and sub-legal size samples.





Northern Pike

**Thread Creek
Including Thread Lake**

Genesee 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	1	19.7	24	19.7	19.7
Datasets available:		1993				
Chemical	Sample Size (sub-Legal)	Mean (ppm)		95%UCL (ppm)		Meal Category
Mercury	1	0.150		---		--
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
1993	1993	1	19.7	24	19.7	19.7
Datasets available:		1993				
Chemical	Sample Size (All)	Mean (ppm)		95%UCL (ppm)		Meal Category
PCB	1	0.025		--		
DDT	1	0.010		--		--
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: Thread Creek northern pike are covered under the statewide mercury consumption advisory.

Recommendation: Dataset is insufficient due to sample size to set a waterbody-species specific guideline. Statewide guidelines apply, which recommend no one should eat more than 1 meal per month of northern pike larger than 30 inches or more than 2 meals per month of northern pike smaller than 30 inches in length.

Huron County

Carp

Sebawaing River

Huron County

Hg Analysis:

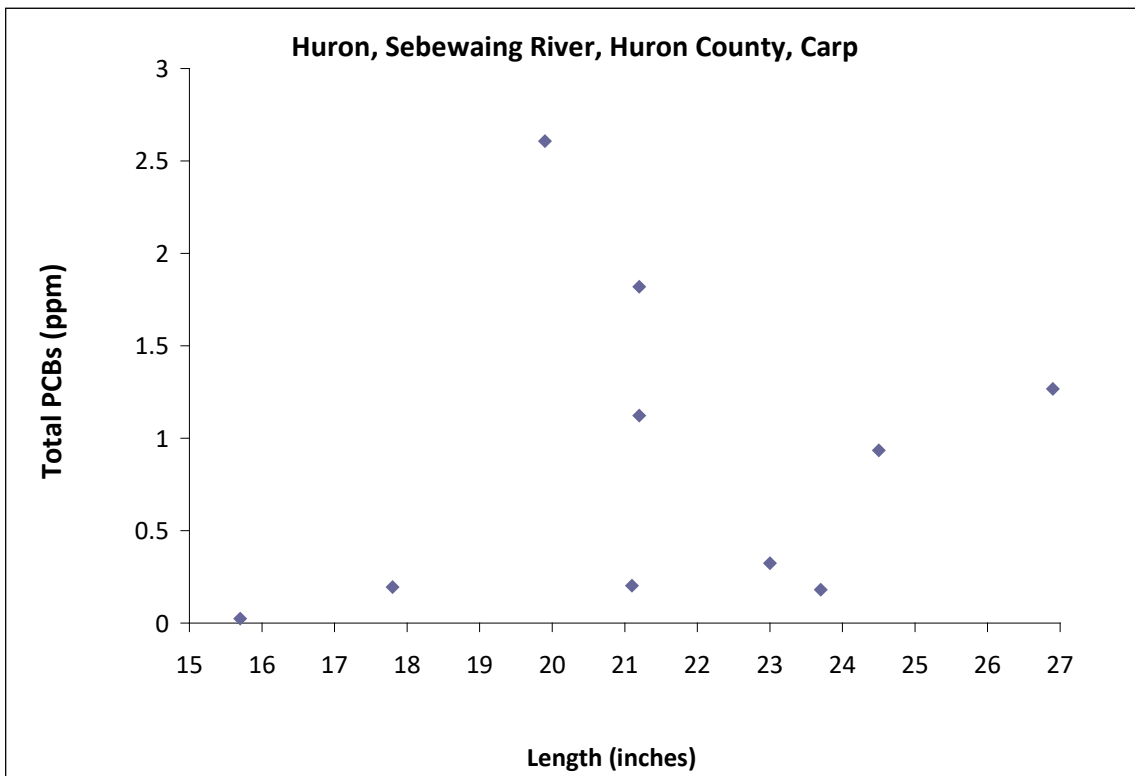
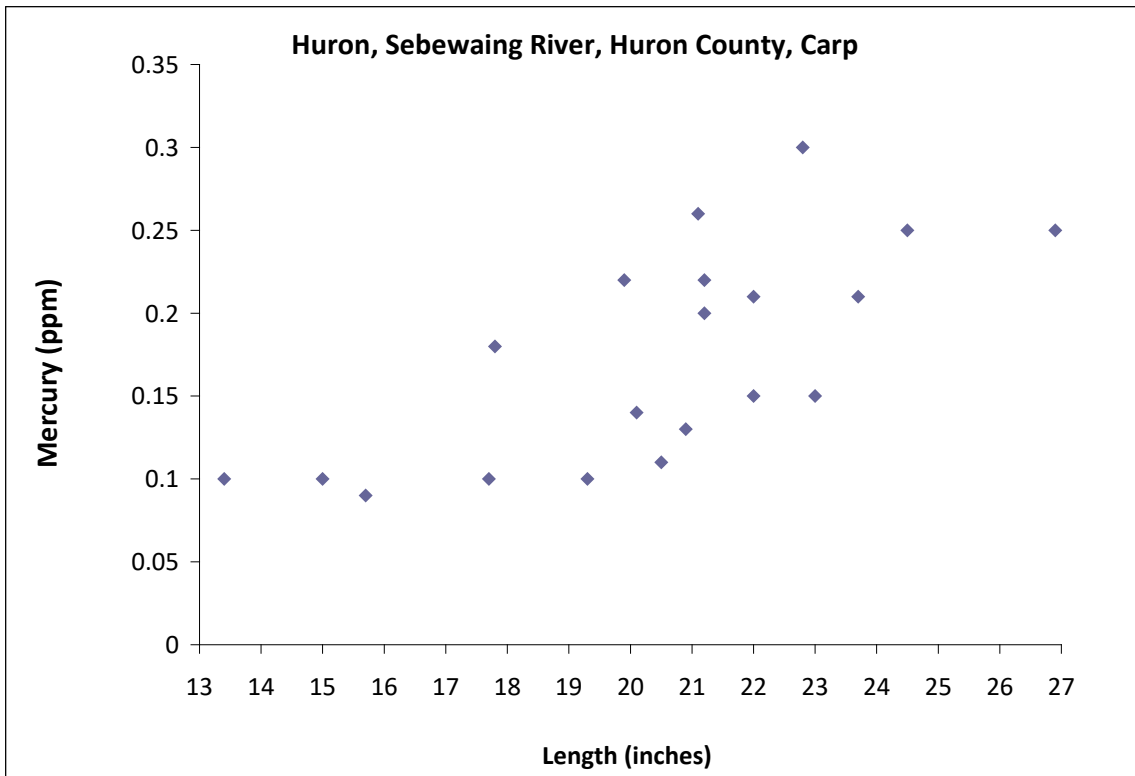
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1988	2004	20	13.4	na	13.4	26.9
Datasets available: 1988, 2004						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	20	0.174		0.200		4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.492	0.539				

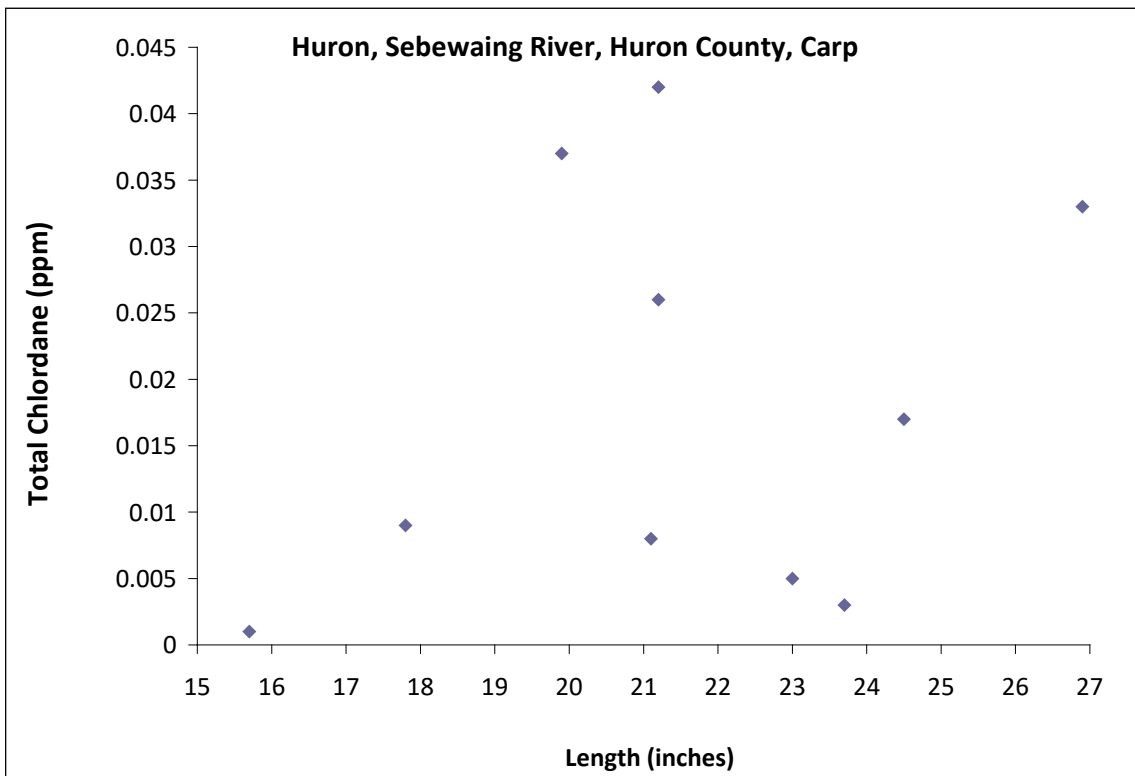
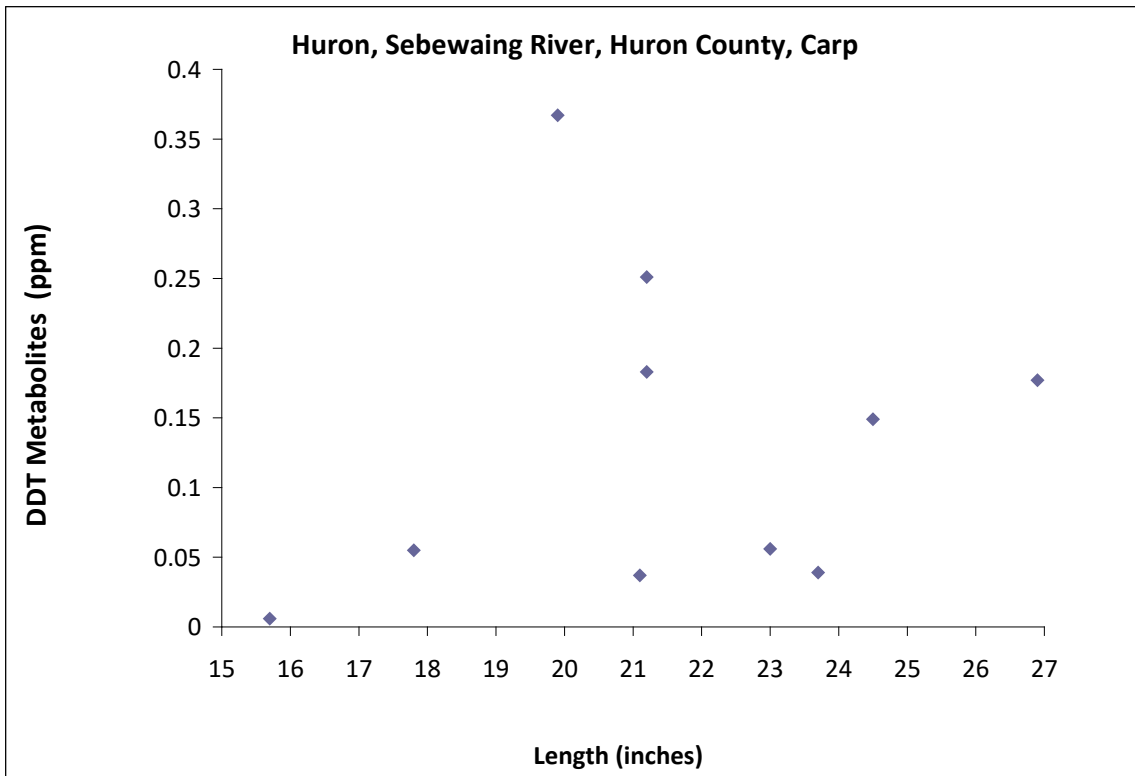
Organics Analysis:

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	26.9
Datasets available: 2004						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	10	0.868		1.480		Limited
DDT	10	0.132		0.210		8
Chlordane	10	0.018		0.030		--
Toxaphene	10	ND		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.033	0.281				
DDT	0.032	0.245				
Chlordane	0.074	0.182				
Toxaphene				Final meal category based on UCL:		Limited

Existing Advisory: Women and children should eat no more than one meal per week of Sebawaing River carp less than 14 inches in length and no more than one meal per month of carp greater than 14 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 Sebawaing River carp due to PCBs. Mercury and DDT would cause advisories.





Northern Pike

Sebawaing River

Huron County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2004	2004	7	18.9	24	26.5	26.5
Datasets available: 2004						
Chemical	Sample Size (All)	Mean (ppm)	95%UCL		Meal Category	
Mercury	7	0.14	0.17		4	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.259	0.192				

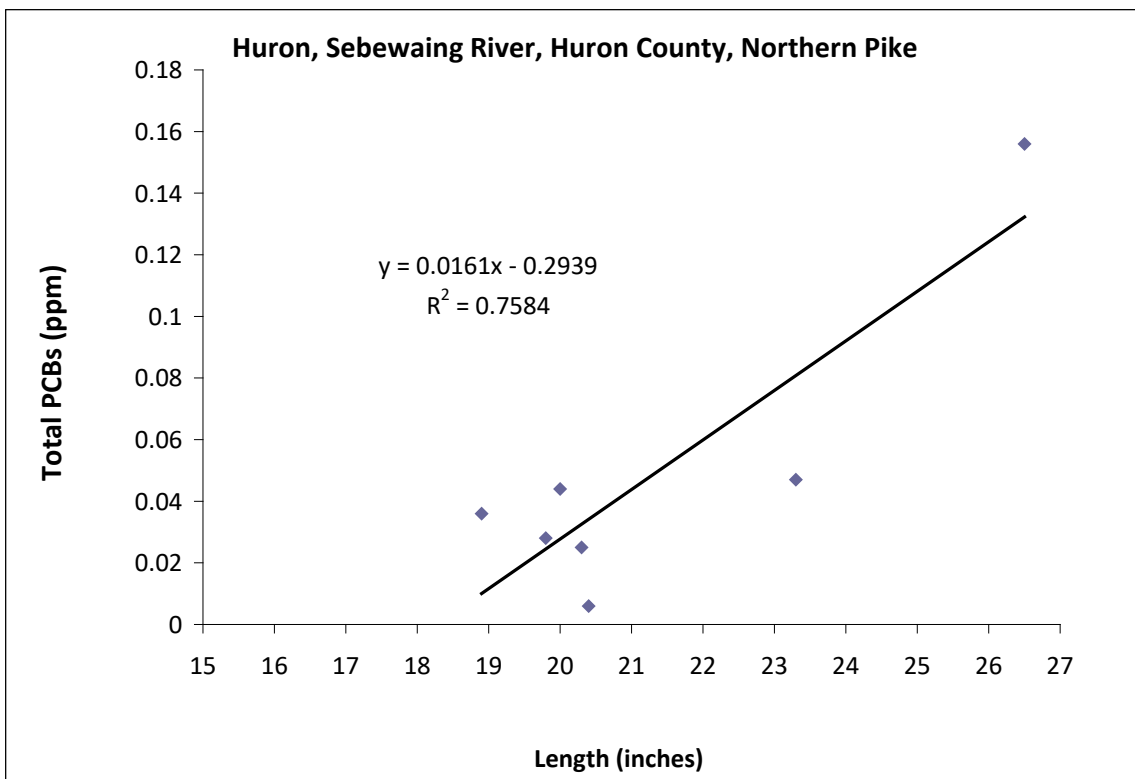
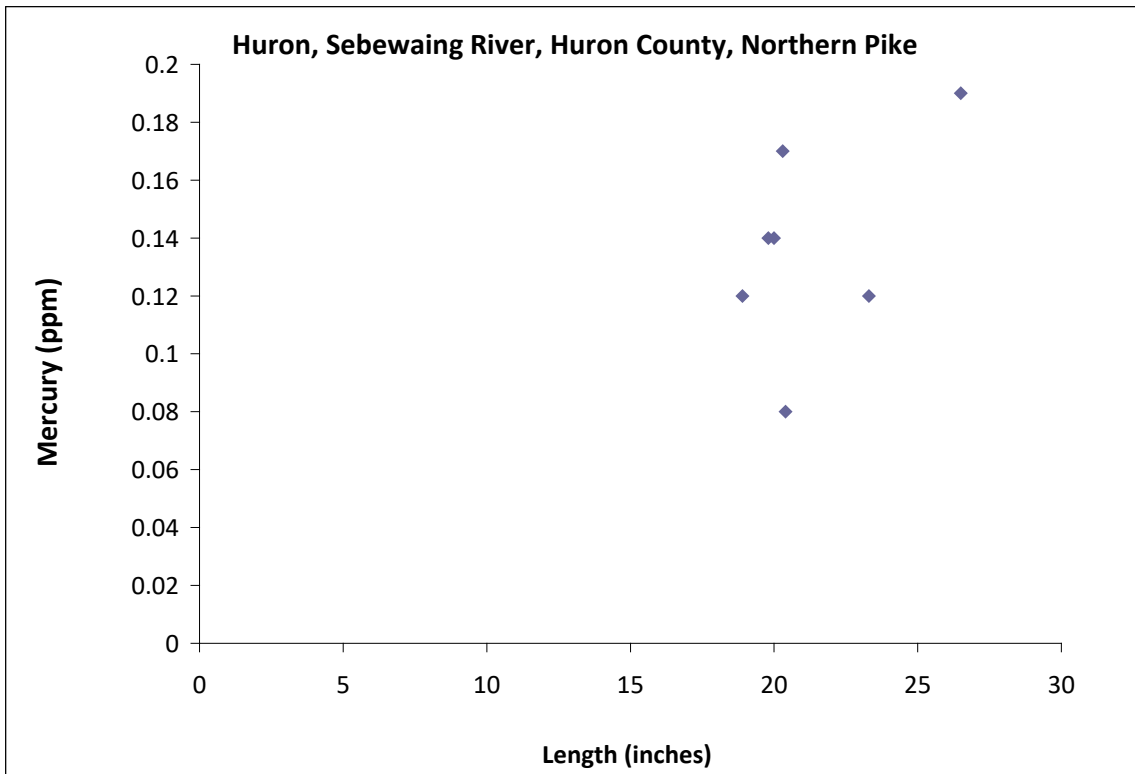
Organics Analysis:

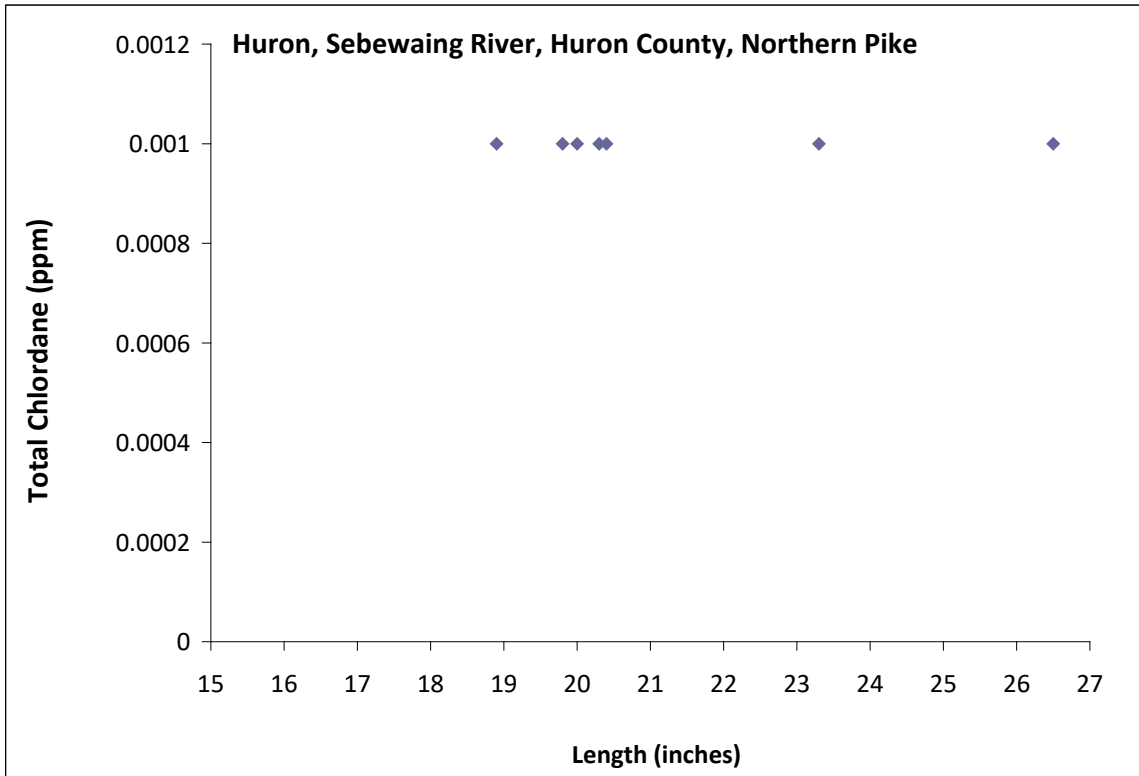
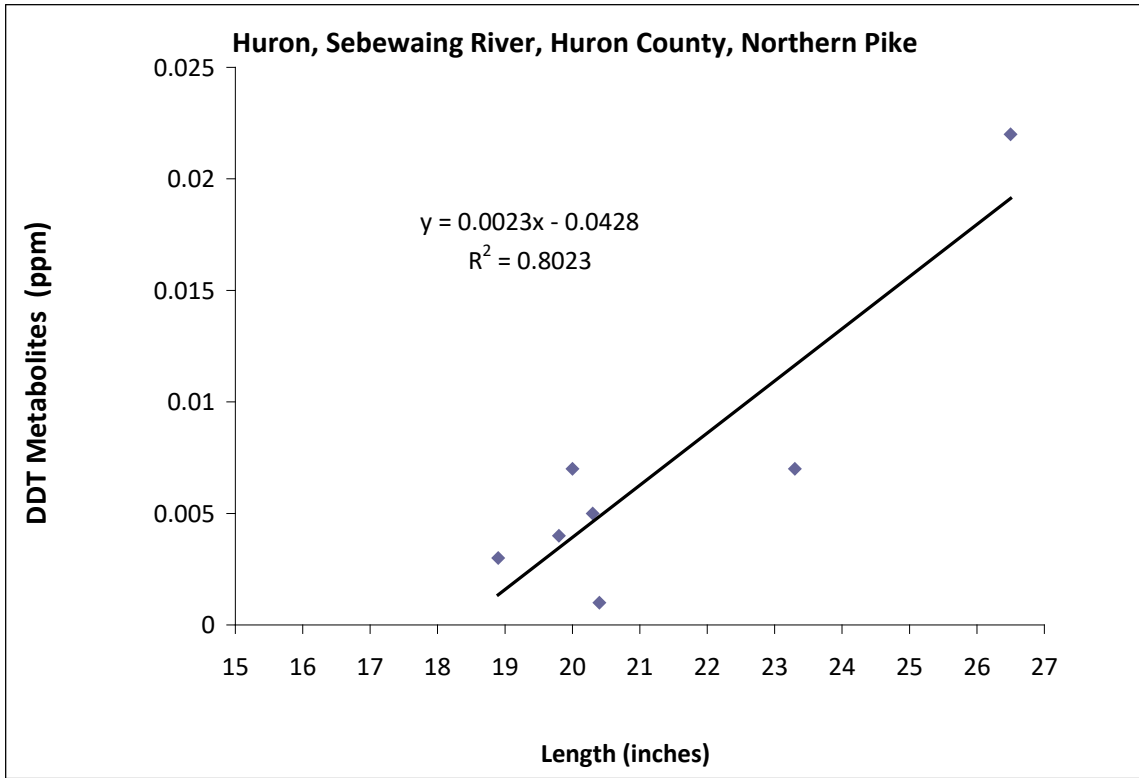
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2004	2004	7	18.9	24	26.5	26.5
Datasets available: 2004						
Chemical	Sample Size (All)	Mean (ppm)	95%UCL		Meal Category	
PCB	7	0.049	0.090		2	
DDT	7	0.007	0.010		16	
Chlordane	7	0.001	0.001		--	
Toxaphene	7	ND	--		--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.758	0.439				
DDT	0.802	0.530				
Chlordane	n/a	n/a				
Toxaphene	--	--				
Final meal category based on UCL:						2

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

Recommendation: No one should eat more than 1 meal per month of Sebawaing River northern pike due to PCBs. Mercury would cause an advisory. The dataset is limited due to sub-legal length samples. The 95% UCL includes sublegal lengths, which may result in a lower estimated concentration. Linear regression of PCBs was used to determine the recommendation.

Length (Inches)	PCB Regression Estimate (ppm)	Meal Category
24	0.0925	2
26	0.1247	1
28	0.1569	1
30	0.1891	1
32	0.2213	0.5
34	0.2535	0.5
36	0.2857	0.5
38	0.3179	0.5
40	0.3501	0.5
<i>Shaded area denotes extrapolated estimates</i>		





Huron River Livingston, Oakland, Washtenaw, and Wayne Counties

Bluegill

**Argo Pond
Huron River**

Washtenaw County

Hg Analysis:

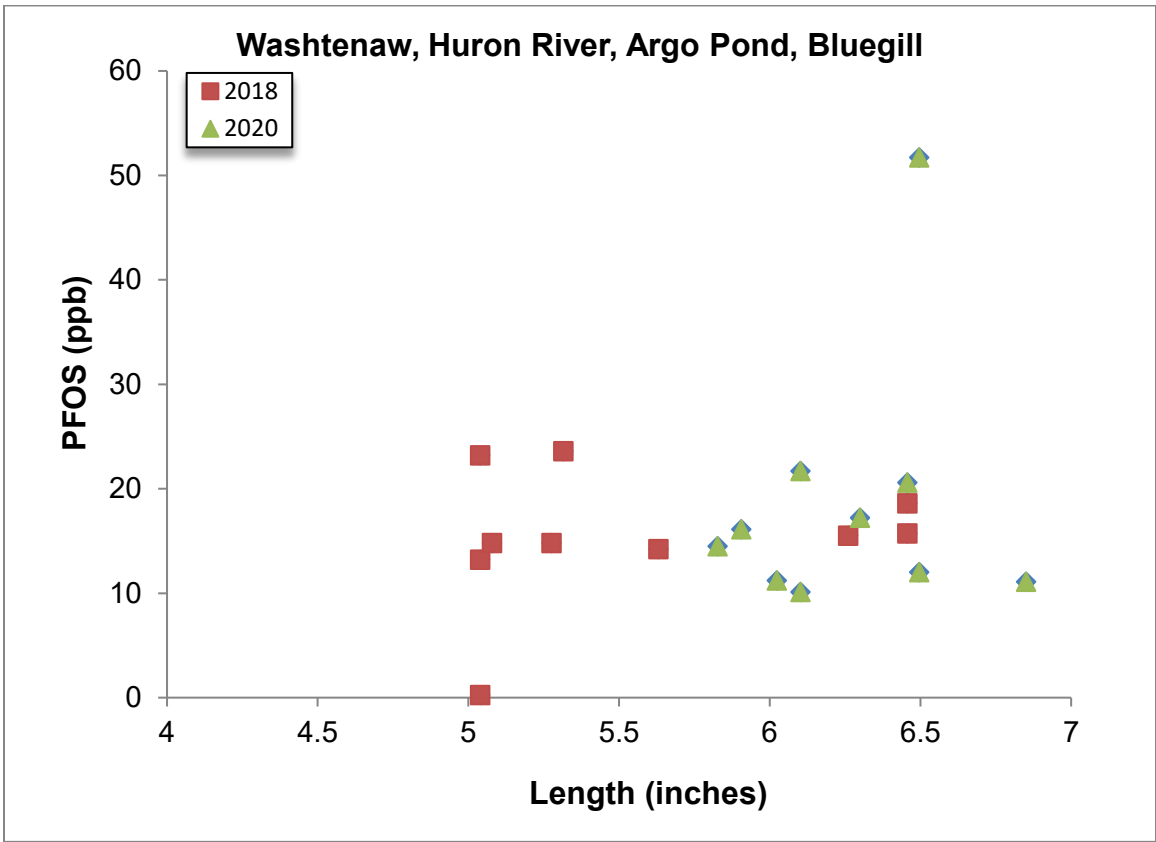
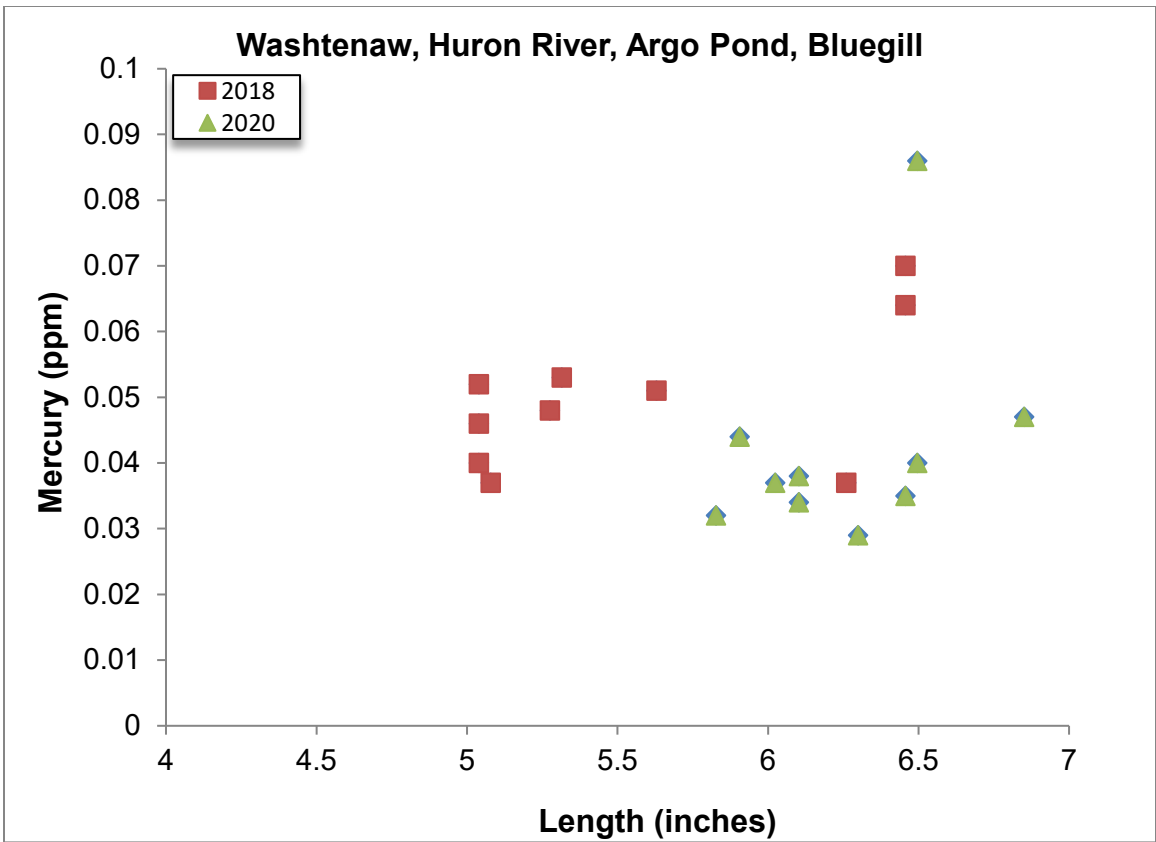
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent						
2018	2020	20	5.0	NA	5.0	6.9	
Datasets available: 2018, 2020							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	20	0.046		0.029	0.086	0.053	16
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.025	0.008					

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent						
2018	2020	20	5.0	NA	5.0	6.9	
Datasets available: 2018, 2020							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--		--	--	--	--
DDT	0	--		--	--	--	--
Chlordane	0	--		--	--	--	--
Toxaphene	0	--		--	--	--	--
PFOS	20	17 ppb		<0.25 ppb	51.7 ppb	21.5 ppb	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	0.054	0.108					
Final meal category based on UCL:							4

Existing MDHHS Advisory: There is a Do Not Eat advisory for all fish species from this section of the Huron River due to PFOS.

Recommendation: No change to the advisory is recommended. MDHHS will continue to evaluate PFOS concentrations in fish throughout the Huron River to determine whether the existing Do Not Eat advisory for all species from this section of the river is appropriate.



Channel Catfish

**Argo Pond
Huron River**

Washtenaw County

Hg Analysis:

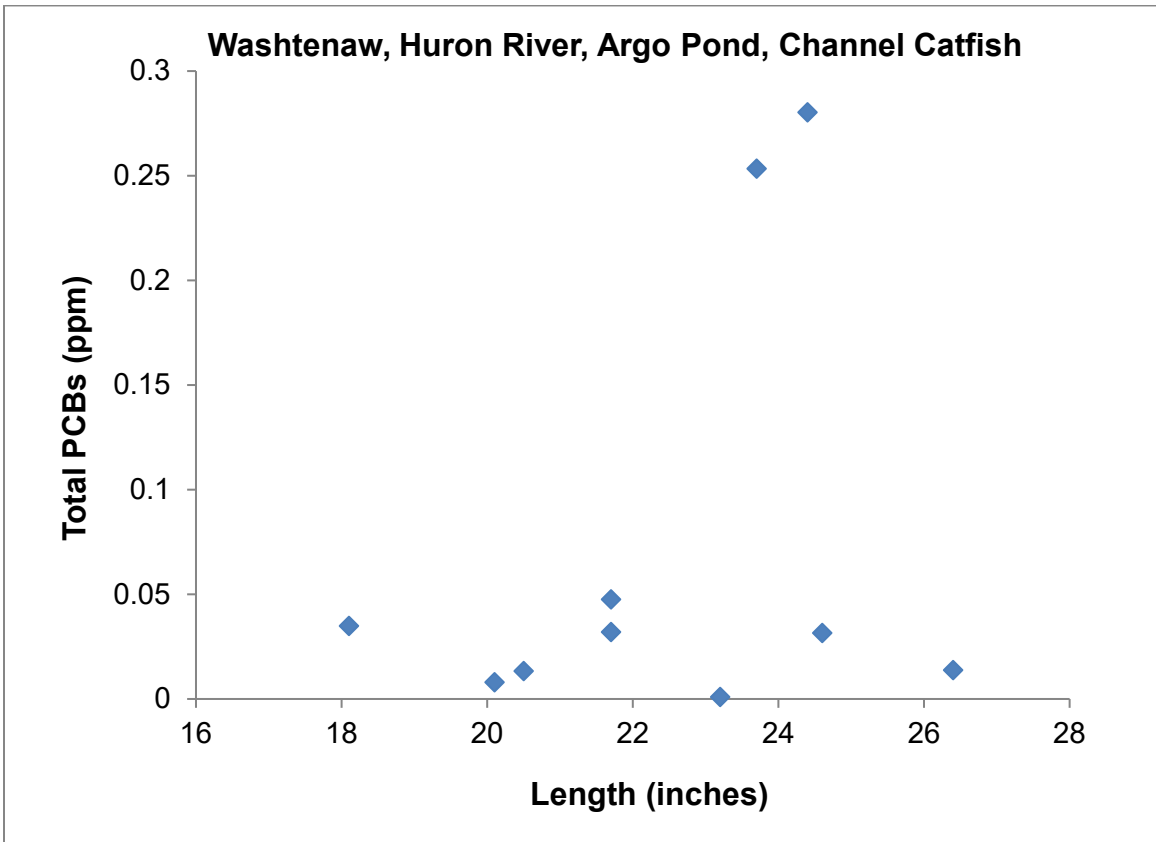
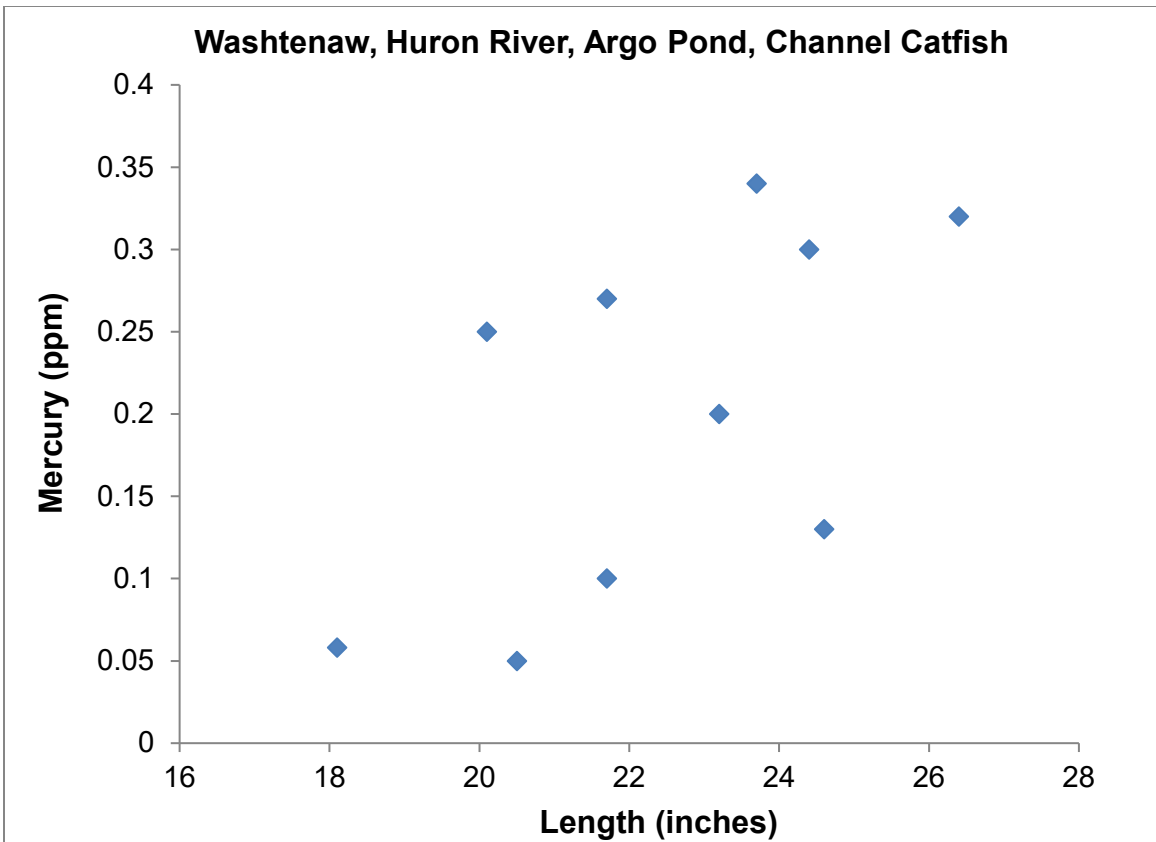
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2015	2015	10	18.1	12	18.1	26.4
Datasets available: 2015						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.20	0.05	0.34	0.28	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.376	0.410				

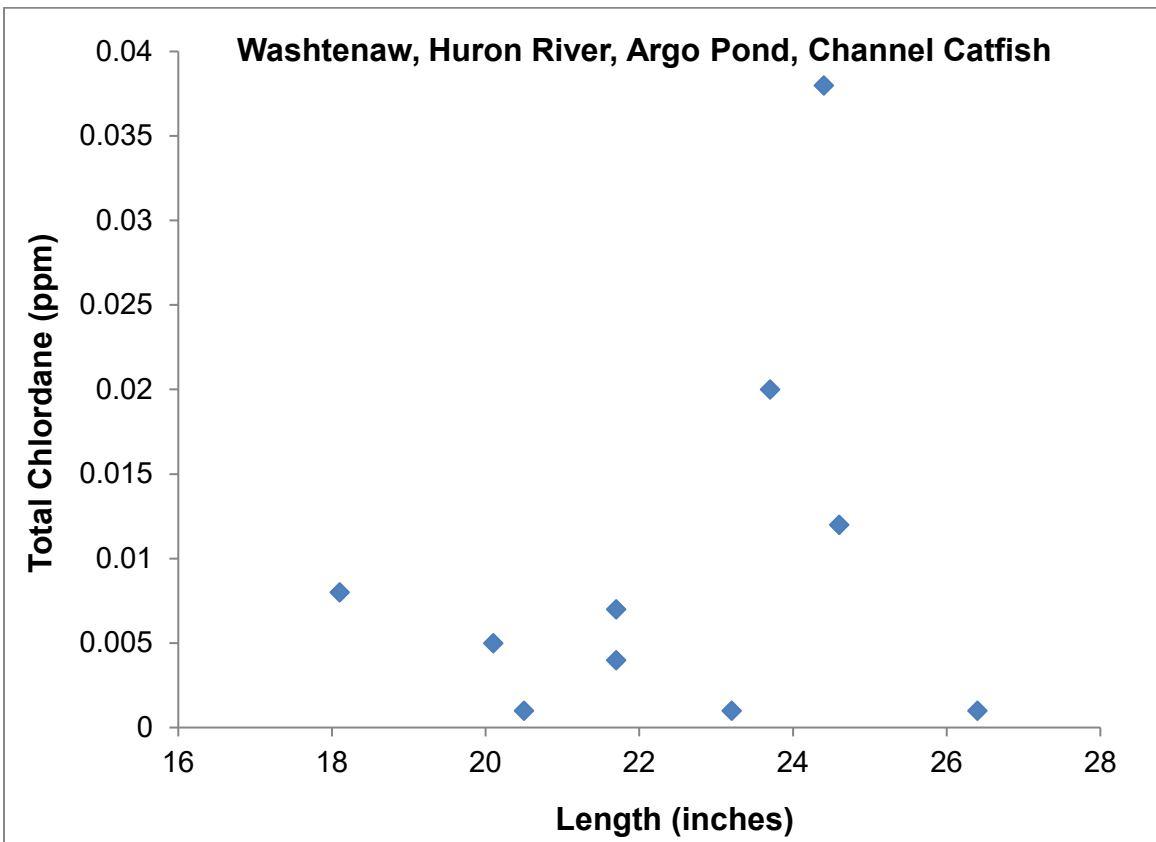
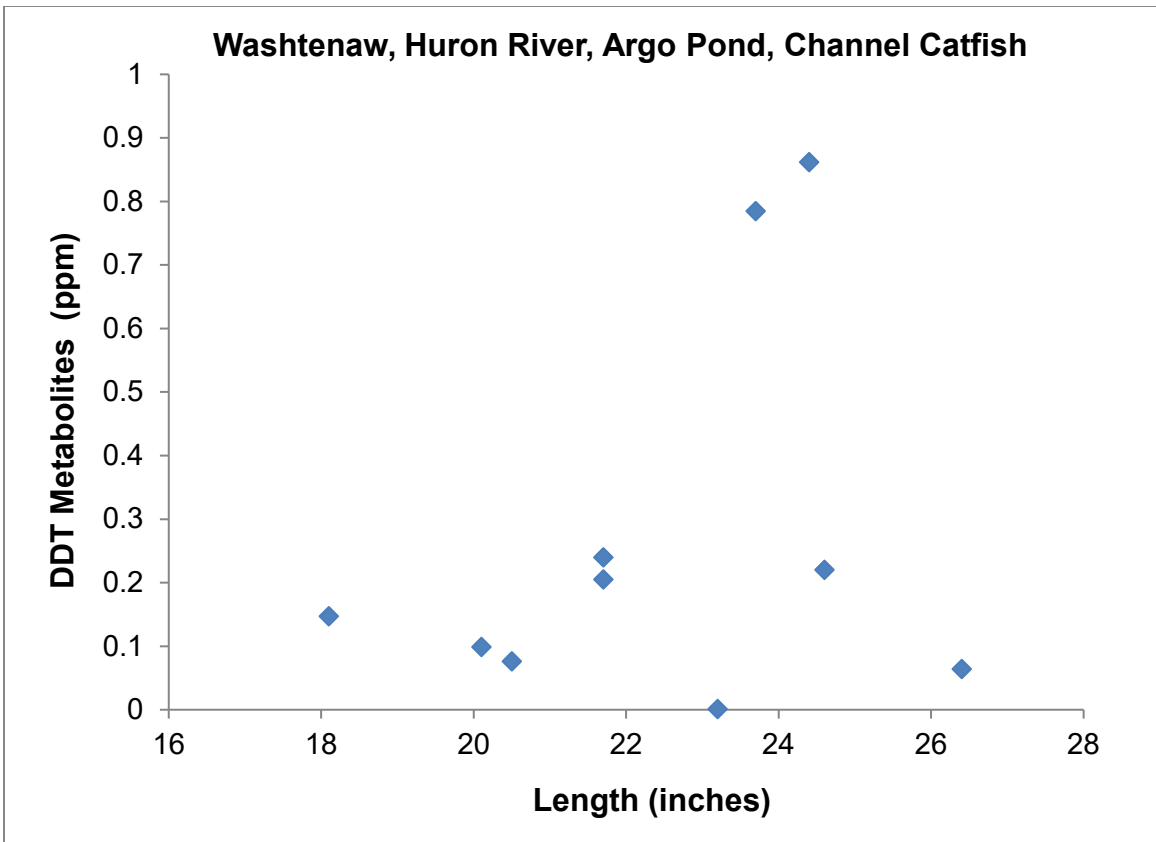
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2015	2015	10	18.1	12	18.1	26.4
Datasets available: 2015						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.07	0.001	0.28	0.15	1
DDT	10	0.27	0.001	0.86	0.49	2
Chlordane	10	0.01	0.001	0.04	0.02	--
Toxaphene	10	ND	--	--	--	--
TEQ	0	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.100	0.019				
DDT	0.093	0.001				
Chlordane	0.082	0.001				
Toxaphene	--	--				
TEQ	--	--				
Final meal category based on UCL:						1

Existing MDHHS Advisory: There is a Do Not Eat advisory for all fish species from this section of the Huron River due to PFOS.

Recommendation: No change to the advisory is recommended. MDHHS will continue to evaluate PFOS concentrations in fish throughout the Huron River to determine whether the existing Do Not Eat advisory for all species from this section of the river is appropriate.





**Largemouth and
Smallmouth Bass**

**Argo Pond
Huron River**

Washtenaw County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples			
Earliest	Most Recent							
2018	2020	20	10.7	14	13.6	17.5		
Datasets available: 2018, 2020								
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category	
Mercury	12	0.309		0.140	0.450	0.371	2	
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
Mercury	0.477	0.463						

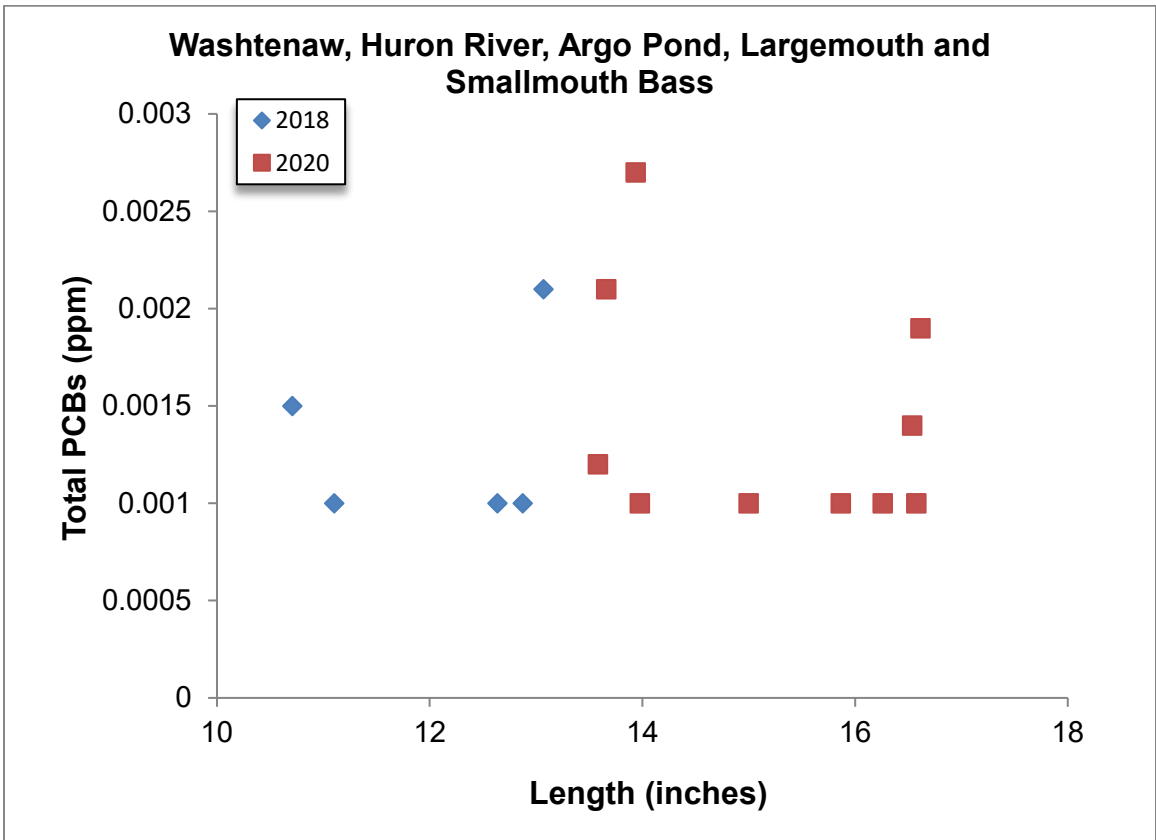
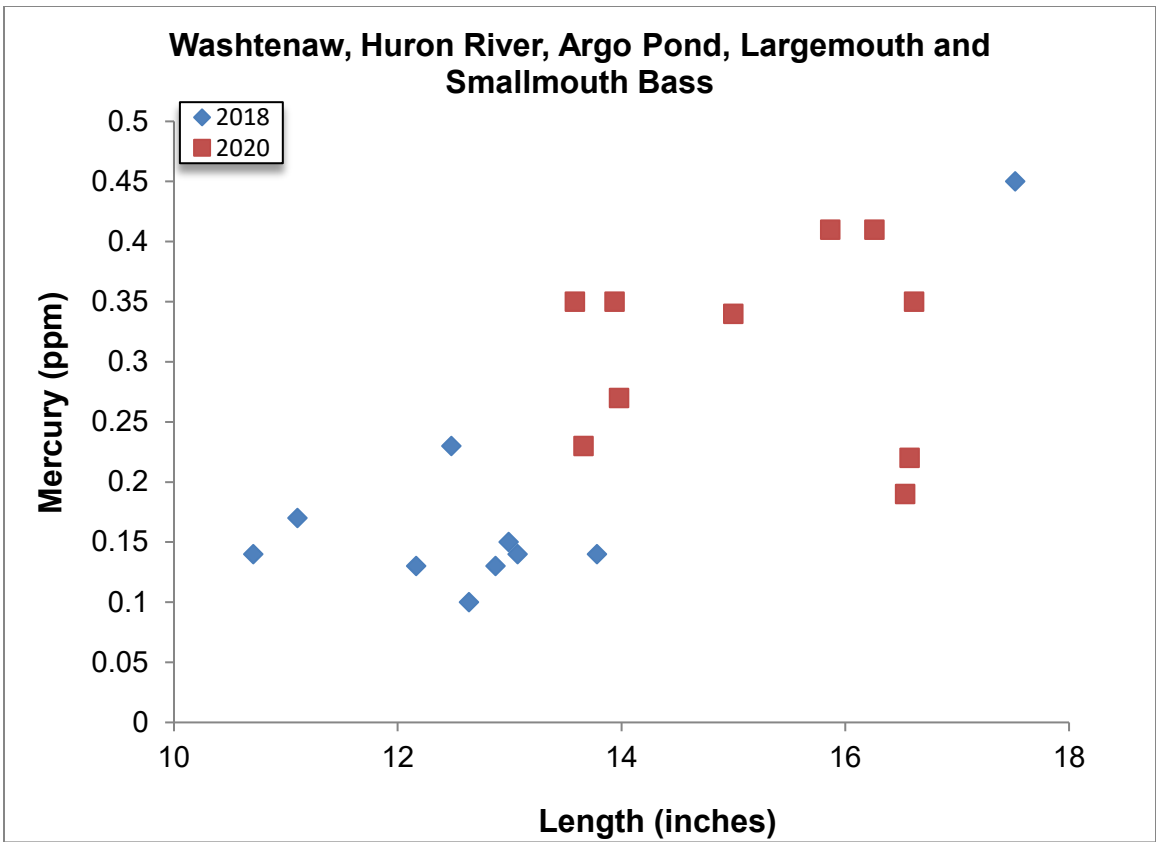
Organics Analysis:

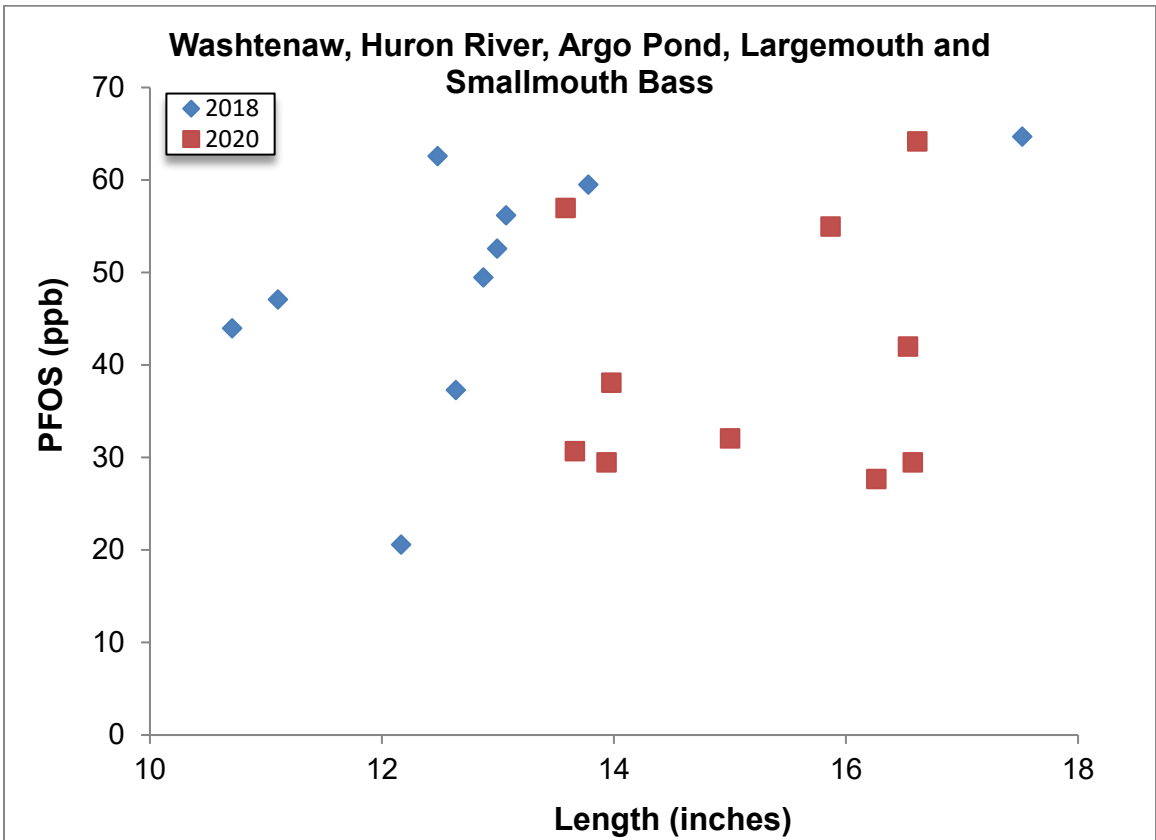
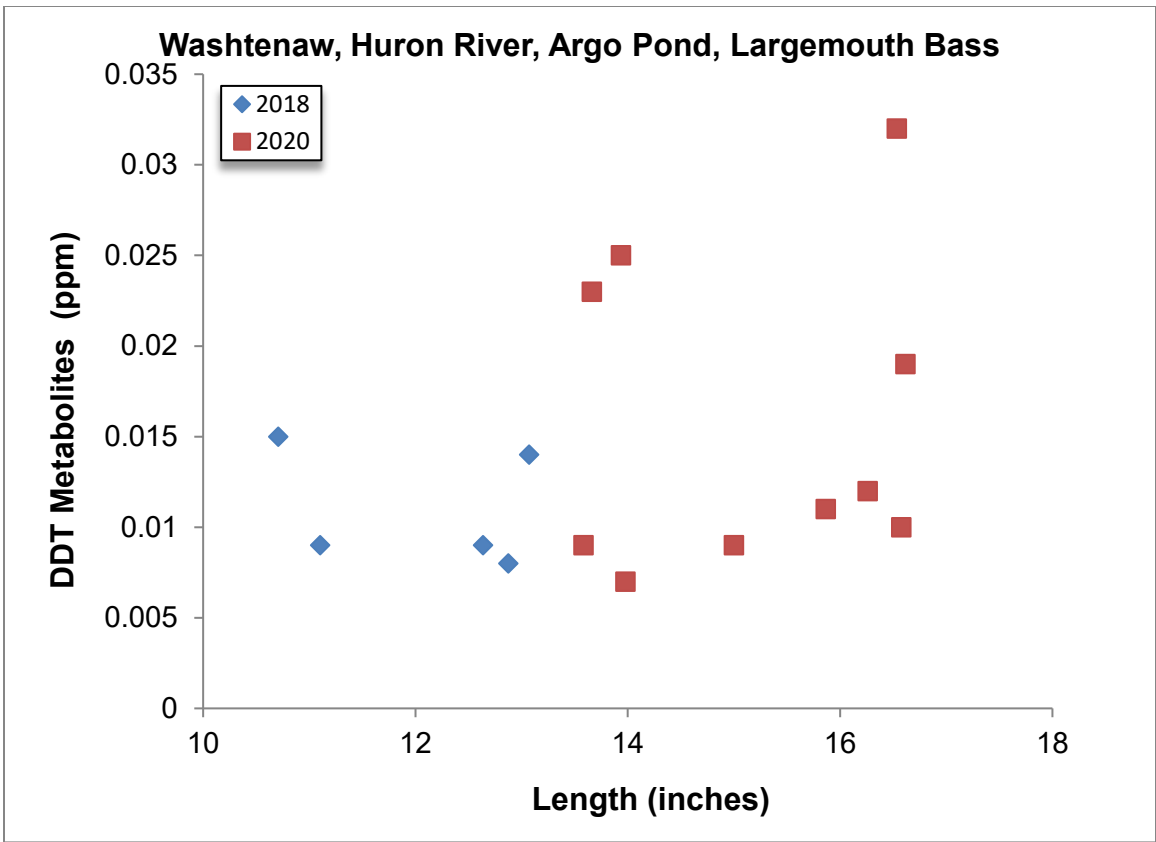
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples			
Earliest	Most Recent							
2018	2020	20	10.7	14	13.6	17.5		
Datasets available: 2018, 2020								
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category	
PCB*	10	0.001		0.001	0.003	0.002	16	
DDT	10	0.016		0.007	0.032	0.022	16	
Chlordane	10	0.001		<0.001	0.001	0.001	16	
Toxaphene	10	ND		--	--	--	--	
PFOS**	20	45.0 ppb		20.6 ppb	64.7 ppb	51.4 ppb	2	
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
PCB	0.111	0.092						
DDT	0.079	0.069						
Chlordane	0.000	0.000						
Toxaphene	--	--						
PFOS	0.006	0.002					Final meal category based on UCL: 2	

* PCB analysis of five sub-legal fish collected in 2018 was omitted from statistical analysis; ** Entire dataset including sub-legal fish used for PFOS statistical analysis.

Existing MDHHS Advisory: There is a Do Not Eat advisory for all fish species from this section of the Huron River.

Recommendation: No change to the advisory is recommended. MDHHS will continue to evaluate PFOS concentrations in fish throughout the Huron River to determine whether the existing Do Not Eat advisory for all species from this section of the river is appropriate.





Rock Bass

**Argo Pond
Huron River**

Washtenaw County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent						
2015	2020	24	5.9	NA	5.9	9.5	
Datasets available: 2015, 2018*, 2020							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	24	0.126		0.051	0.450	0.160	4
Chemical	Linear Regression R ²	Exponential Regression R ²					
Mercury	0.026	0.087					

* Note: only 4 fish were analyzed in 2018

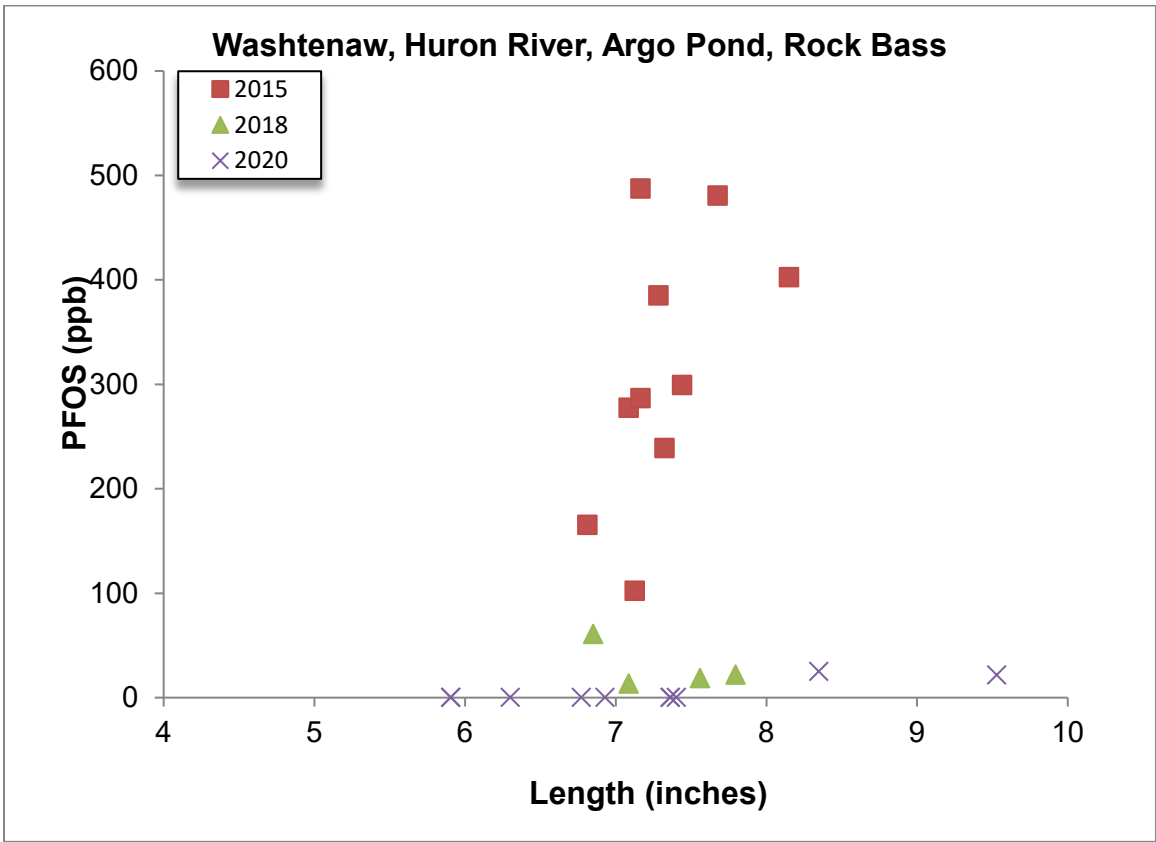
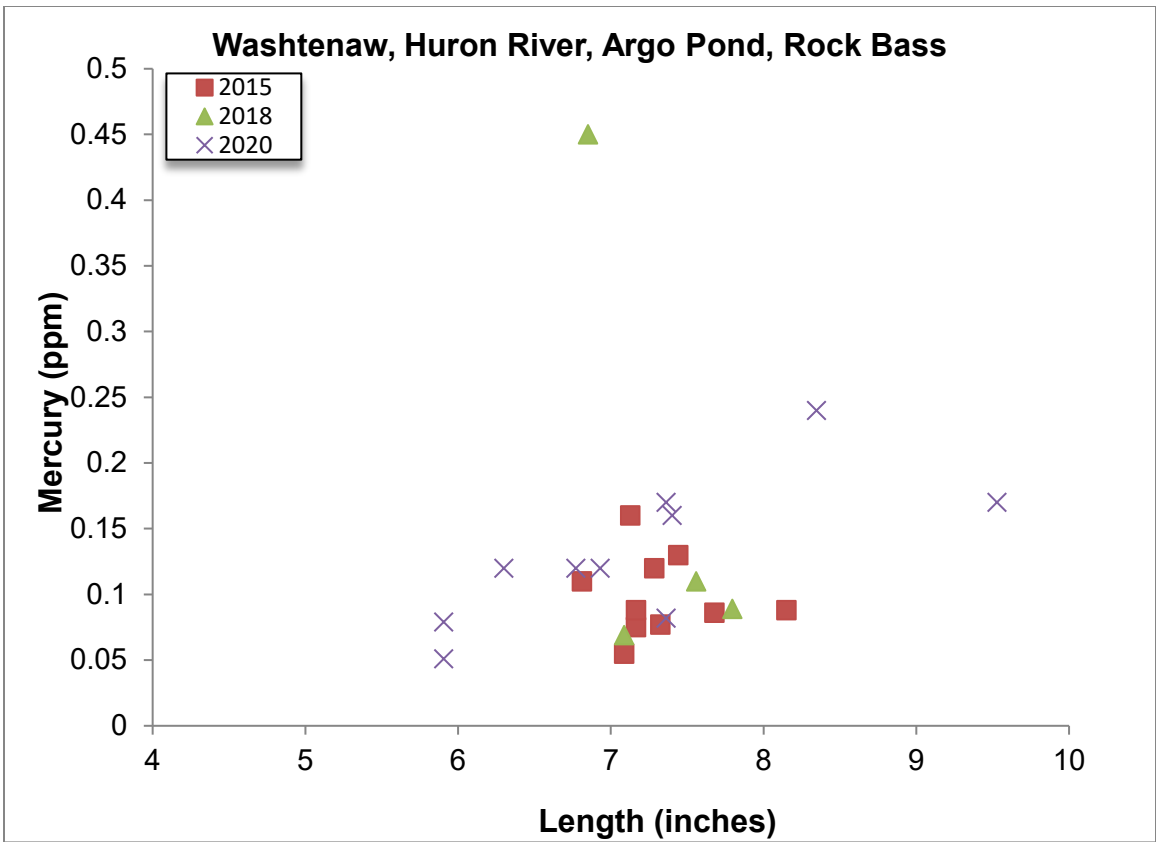
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent						
2018	2020	24	5.9	NA	5.9	9.5	
Datasets available: 2015, 2018*, 2020							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--		--	--	--	--
DDT	0	--		--	--	--	--
Chlordane	0	--		--	--	--	--
Toxaphene	0	--		--	--	--	--
PFOS	24	137.1 ppb		<0.25 ppb	487.5 ppb	209.5 ppb	0.5
Chemical	Linear Regression R ²	Exponential Regression R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	0.026	0.146					
Final meal category based on UCL:							0.5

* Note: only 4 fish were analyzed in 2018

Existing MDHHS Advisory: There is a Do Not Eat advisory for all fish species from this section of the Huron River.

Recommendation: No change to the advisory is recommended. MDHHS will continue to evaluate PFOS concentrations in fish throughout the Huron River to determine whether the existing Do Not Eat advisory for all species from this section of the river is appropriate.



Bluegill

**Barton Pond
Huron River**

Washtenaw County

Hg Analysis:

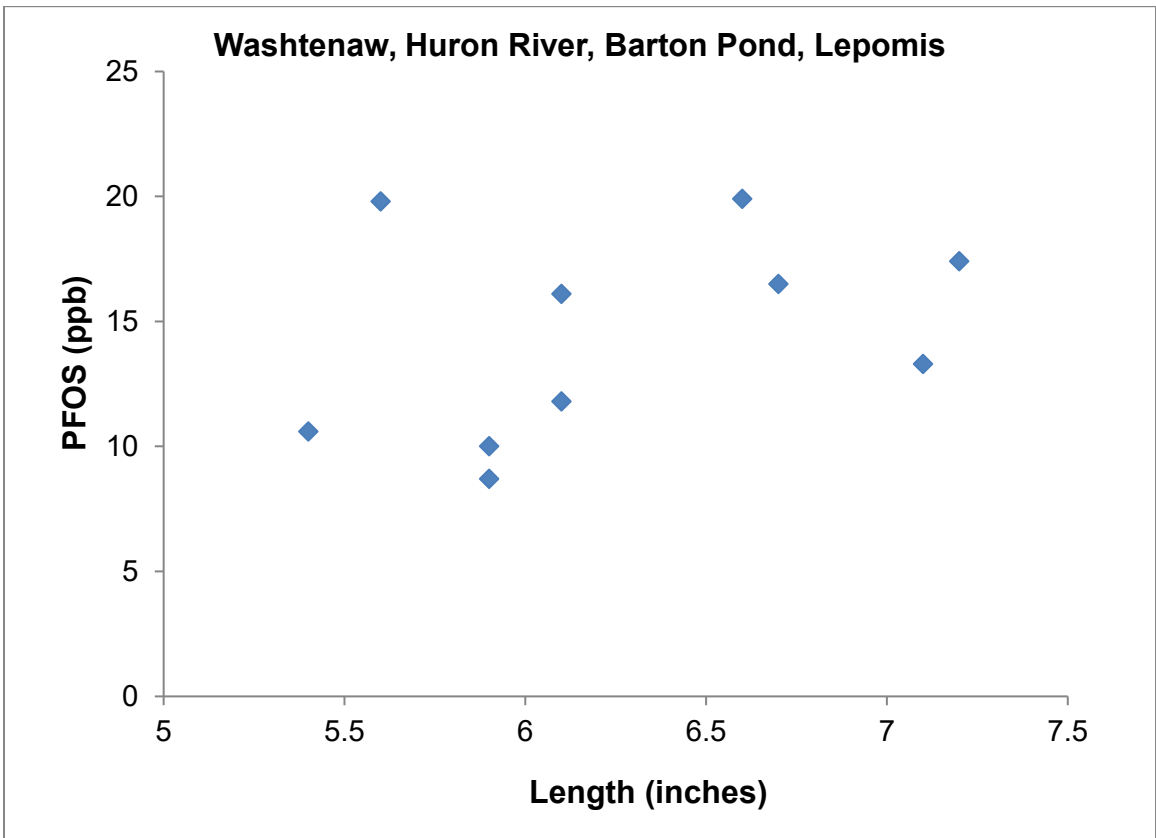
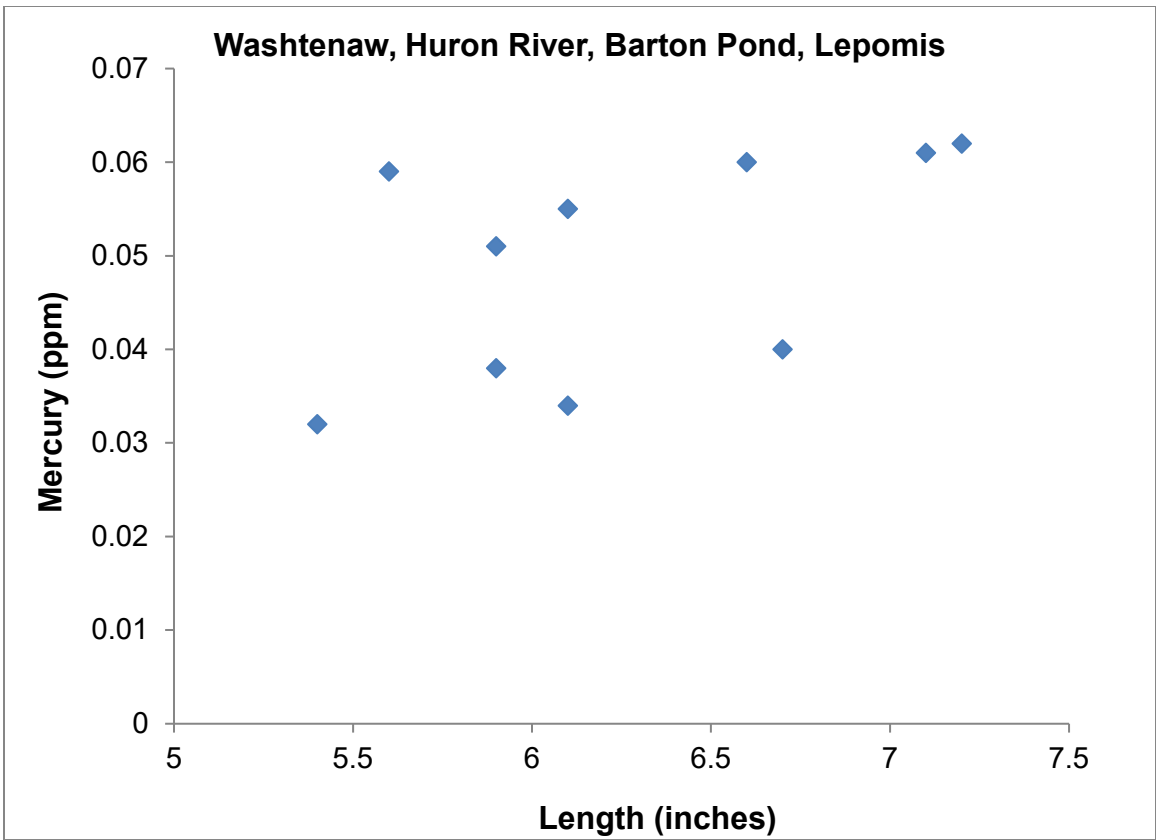
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2018	2018	10	5.4	na	5.4	7.2
Datasets available: 2018						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.05	0.03	0.06	0.06	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.277	0.270				

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	5.4	na	5.4	7.2
Datasets available: 2018						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
PFOS	10	14 ppb	9 ppb	20 ppb	17 ppb	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.132	0.164				
Final meal category based on UCL:						8

Existing MDHHS Advisory: There is a Do Not Eat advisory for all fish species from this section of the Huron River.

Recommendation: No change to the advisory is recommended. MDHHS will continue to evaluate PFOS concentrations in fish throughout the Huron River to determine whether the existing Do Not Eat advisory for all species from this section of the river is appropriate. Additional bluegill should be collected to determine if PFOS concentrations remain below the Do Not Eat advisory threshold.



Carp

**Barton Pond
Huron River**

Washtenaw County

Hg Analysis:

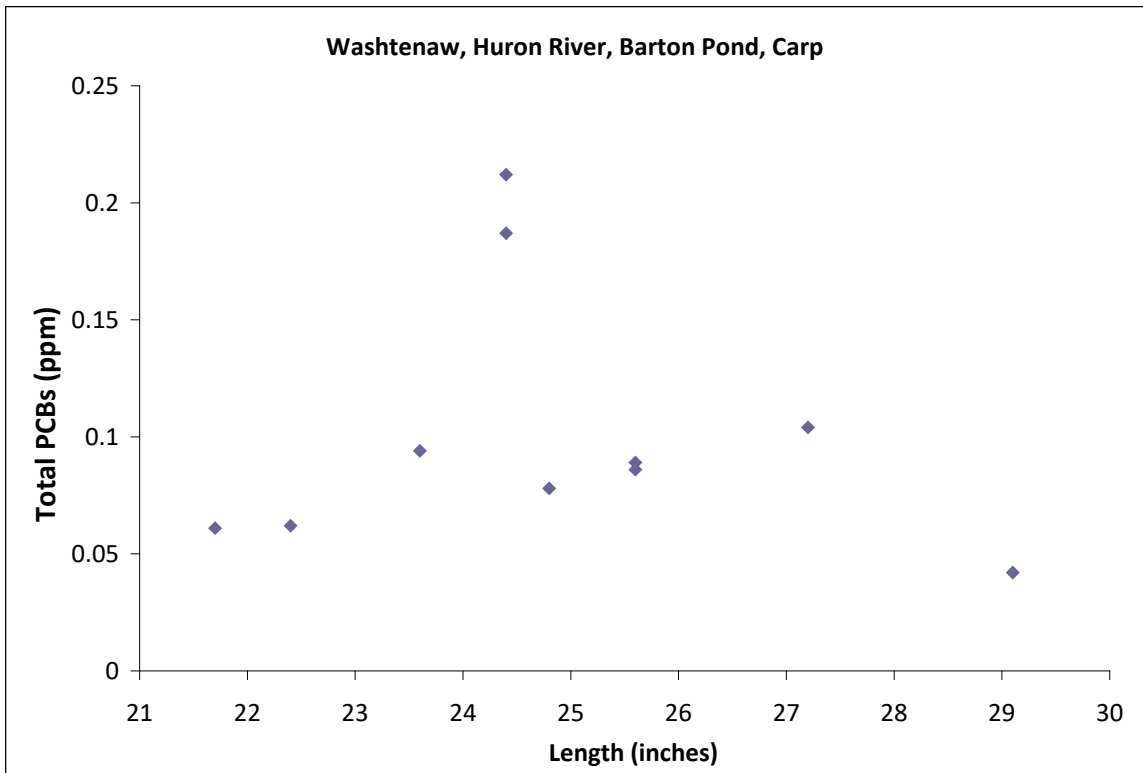
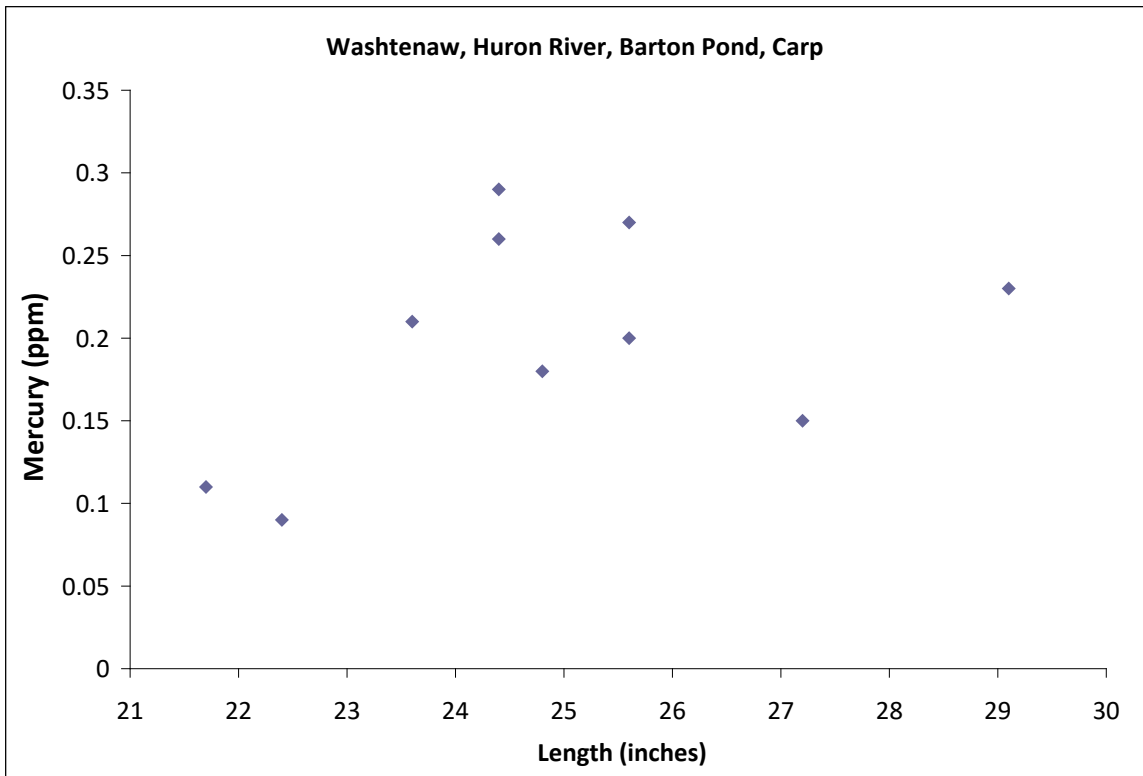
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1992	1992	10	21.7	na	21.7	29.1
Datasets available: 1992						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	10	0.199		0.250		4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.166	0.231				

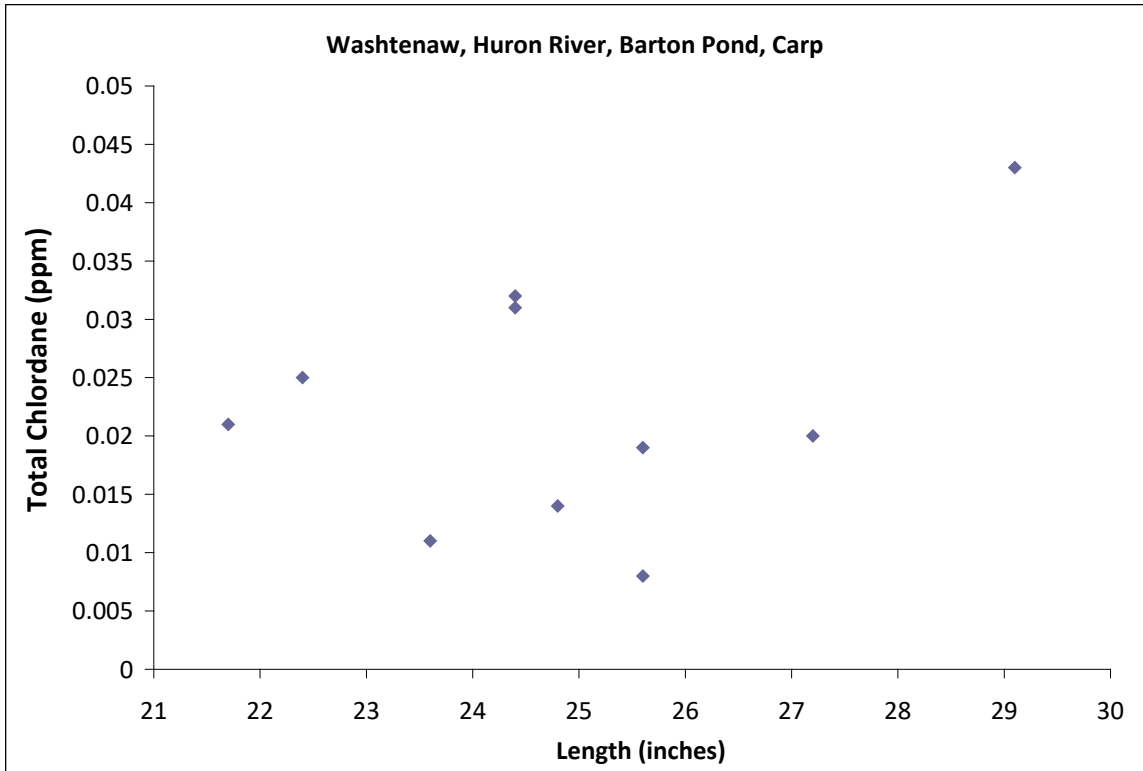
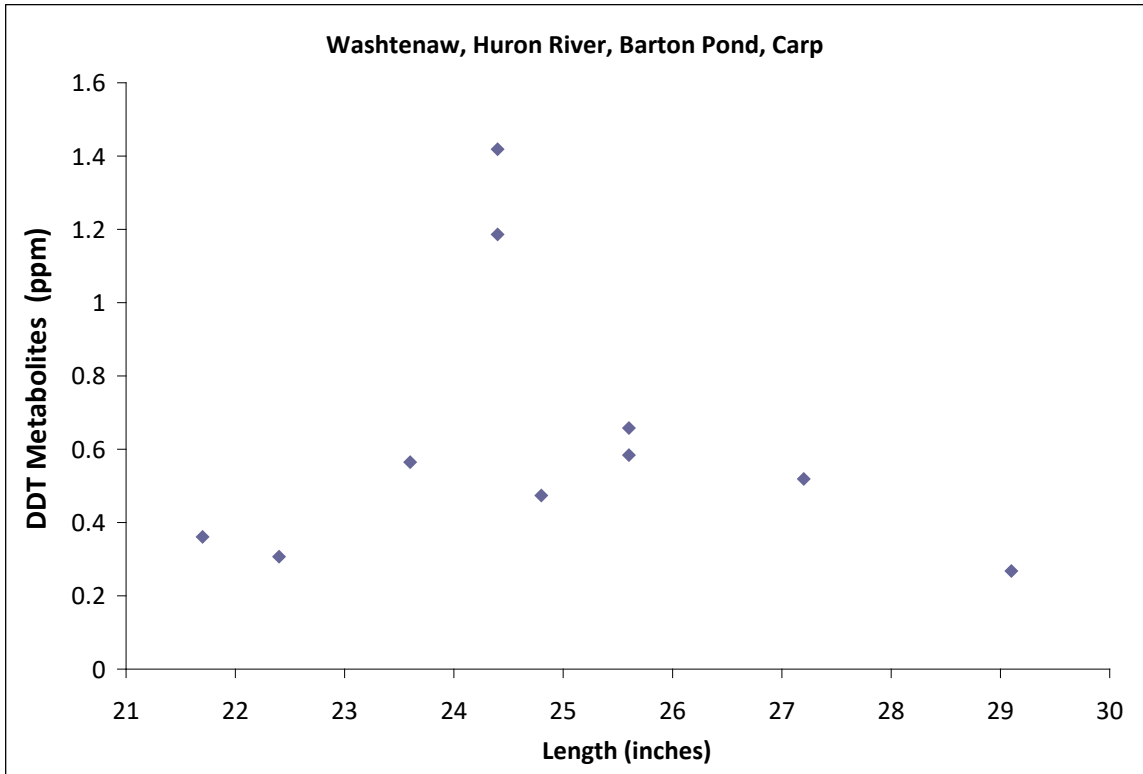
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1992	1992	10	21.7	na	21.7	29.1
Datasets available: 1992						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	10	0.102		0.140		1
DDT	10	0.634		0.900		2
Chlordane	10	0.022		0.030		--
Toxaphene	10	ND		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.013	0.026				
DDT	0.009	0.010				
Chlordane	0.122	0.047				
Toxaphene	--	--		Final meal category based on UCL:		1*

Existing Advisory: No one should eat more than 2 meals per month of Barton Pond carp due to PCBs. Mercury and DDT would cause advisories. Dataset is limited based on the age of the data. *Based on EGLE’s Fish Contaminant Monitoring Program, PCB and DDT concentrations ≥15 years old are expected to have declined to concentrations that allow a less restrictive meal category than determined by the standard evaluation method.

Recommendation: There is a Do Not Eat advisory for all fish species from this section of the Huron River due to PFOS.





Smallmouth Bass

**Barton Pond
Huron River**

Washtenaw County

Hg Analysis:

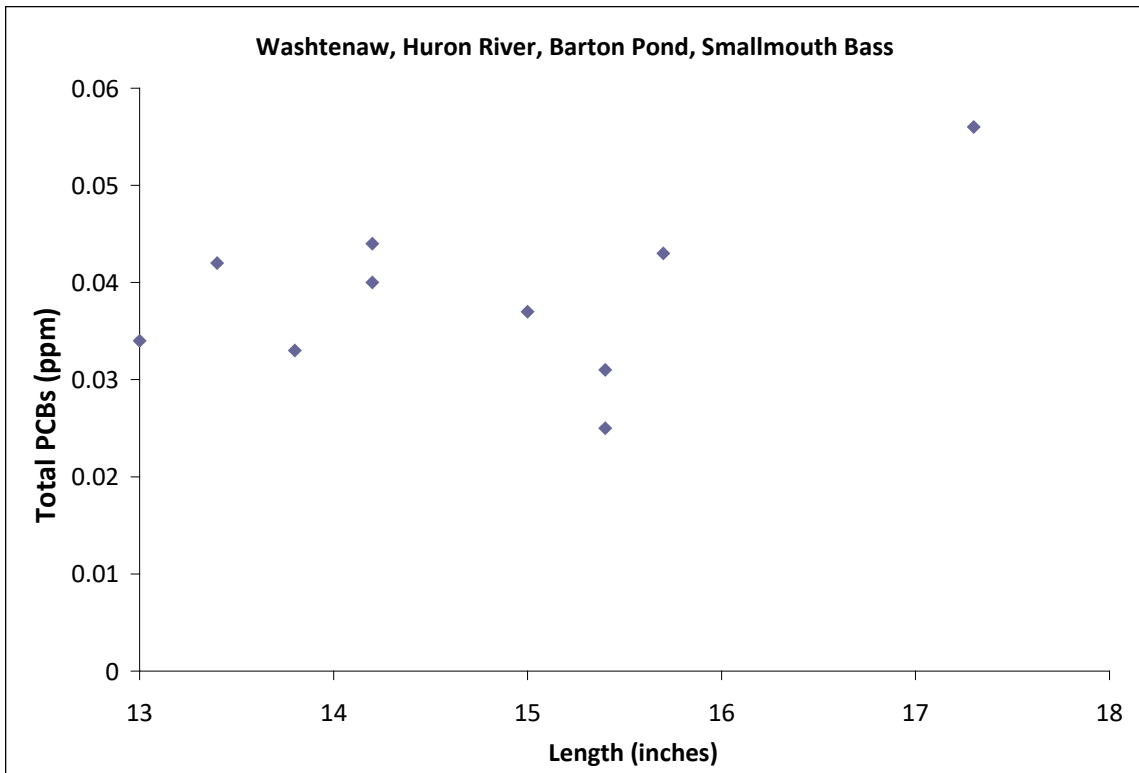
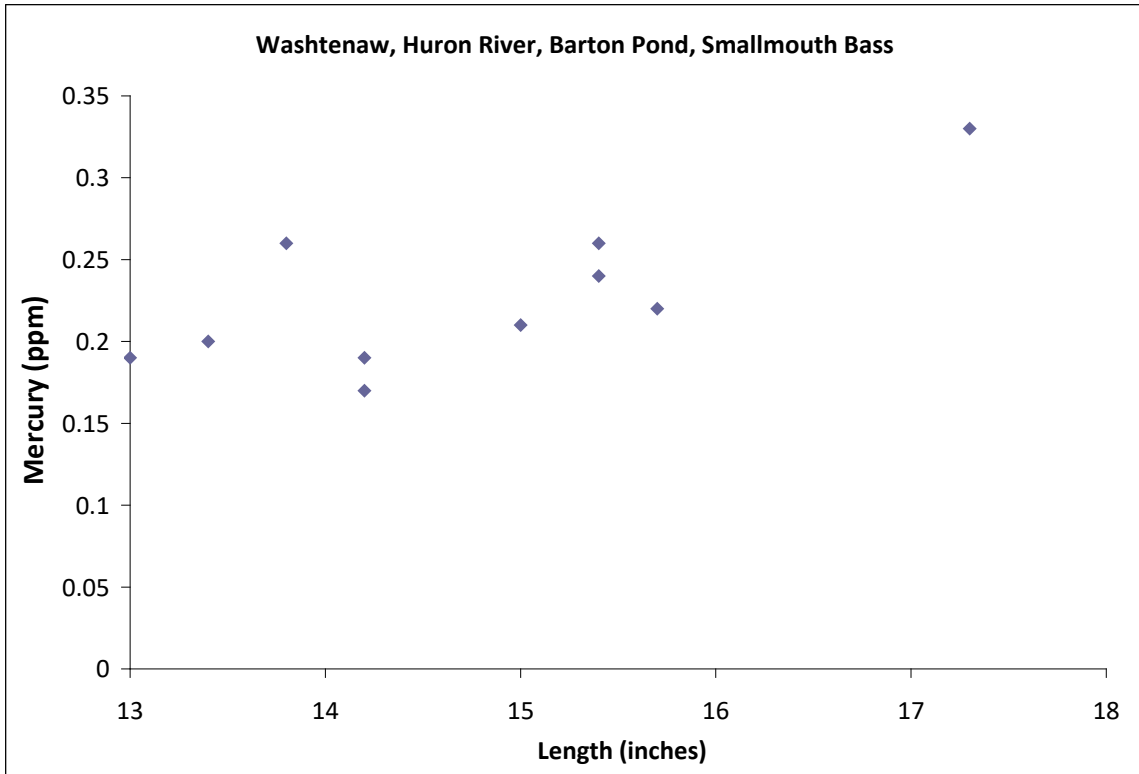
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1992	1992	10	13	14	13.8	17.3
Datasets available: 1992						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	8	0.235		0.280		2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.553	0.526				

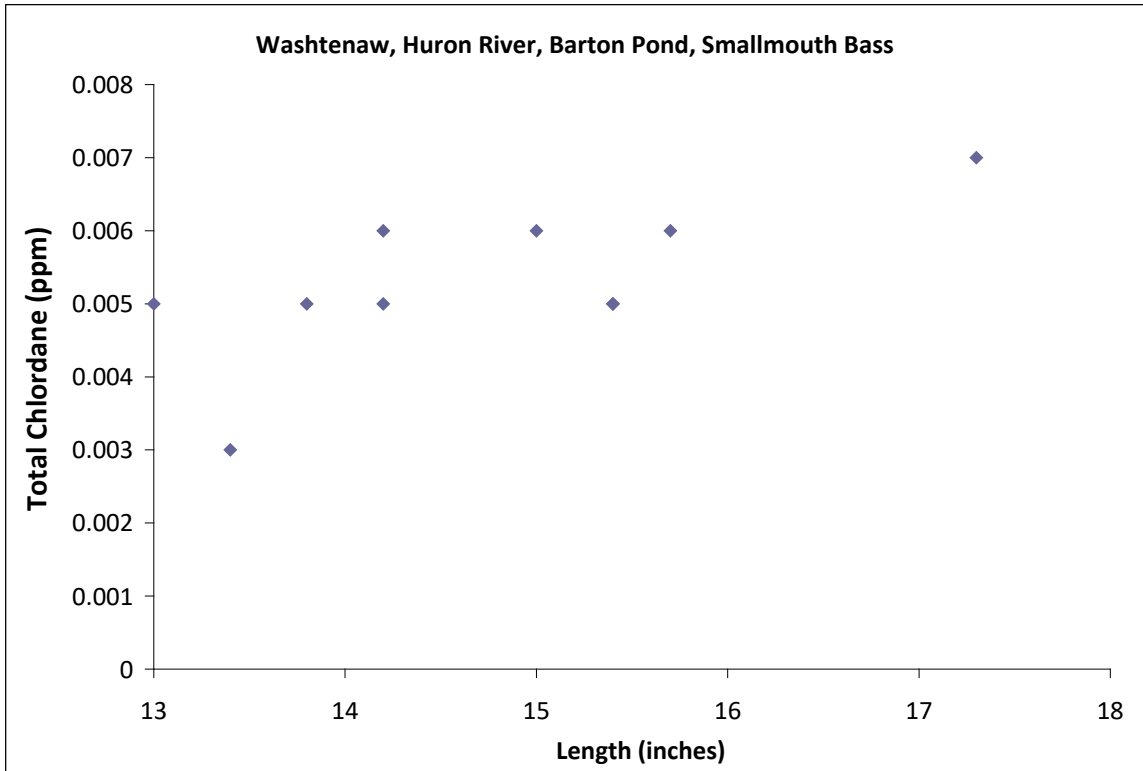
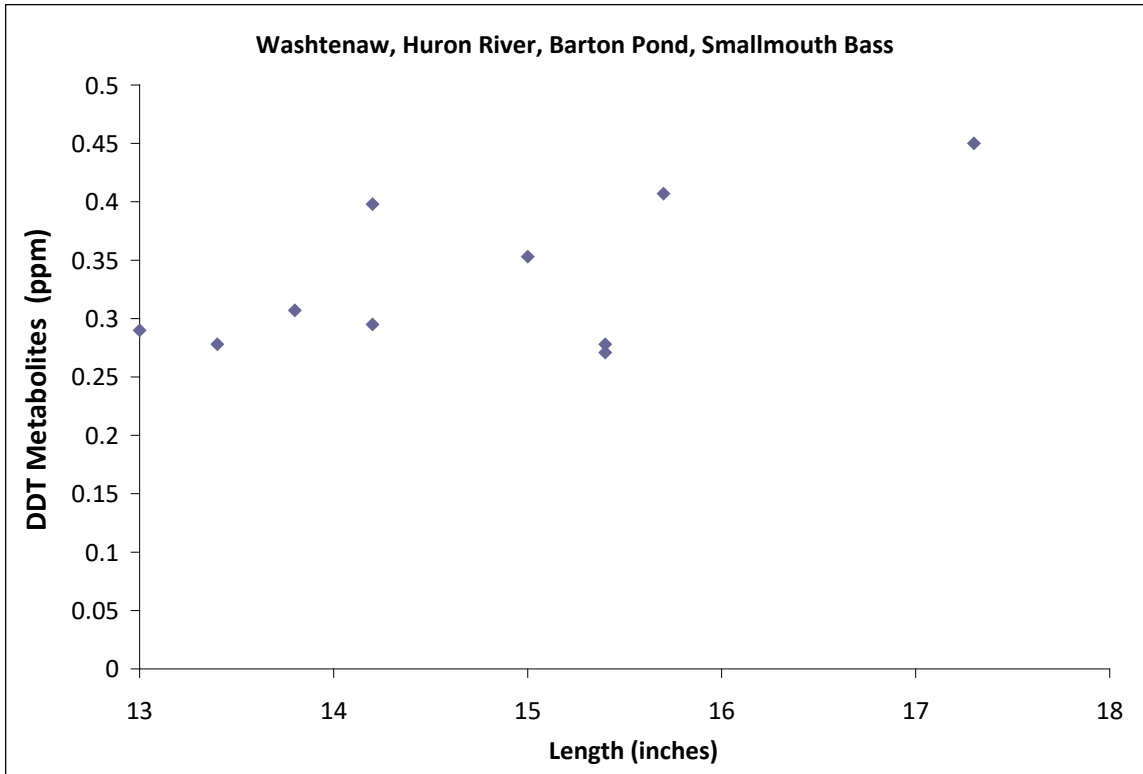
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1992	1992	10	13	14	13.8	17.3
Datasets available: 1992						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	8	0.039		0.050		4
DDT	8	0.345		0.400		4
Chlordane	8	0.006		0.010		--
Toxaphene	8	ND		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.159	0.092				
DDT	0.377	0.342				
Chlordane	0.484	0.412				
Toxaphene	--	--				
Final meal category based on UCL:						2

Existing Advisory: No one should eat more than 2 meals per month of Barton Pond smallmouth bass less than 18 inches or 1 meal per month of Barton Pond smallmouth bass greater than 18 inches due to mercury. PCBs and DDT would cause advisories. Based on EGLE’s Fish Contaminant Monitoring Program, PCB and DDT concentrations ≥15 years old are expected to have declined. Statewide guideline length break applied.

Recommendation: There is a Do Not Eat advisory for all fish species from this section of the Huron River due to PFOS.





Bluegill

**Base Line Lake
Huron River**

**Livingston, Washtenaw
Counties**

Hg Analysis:

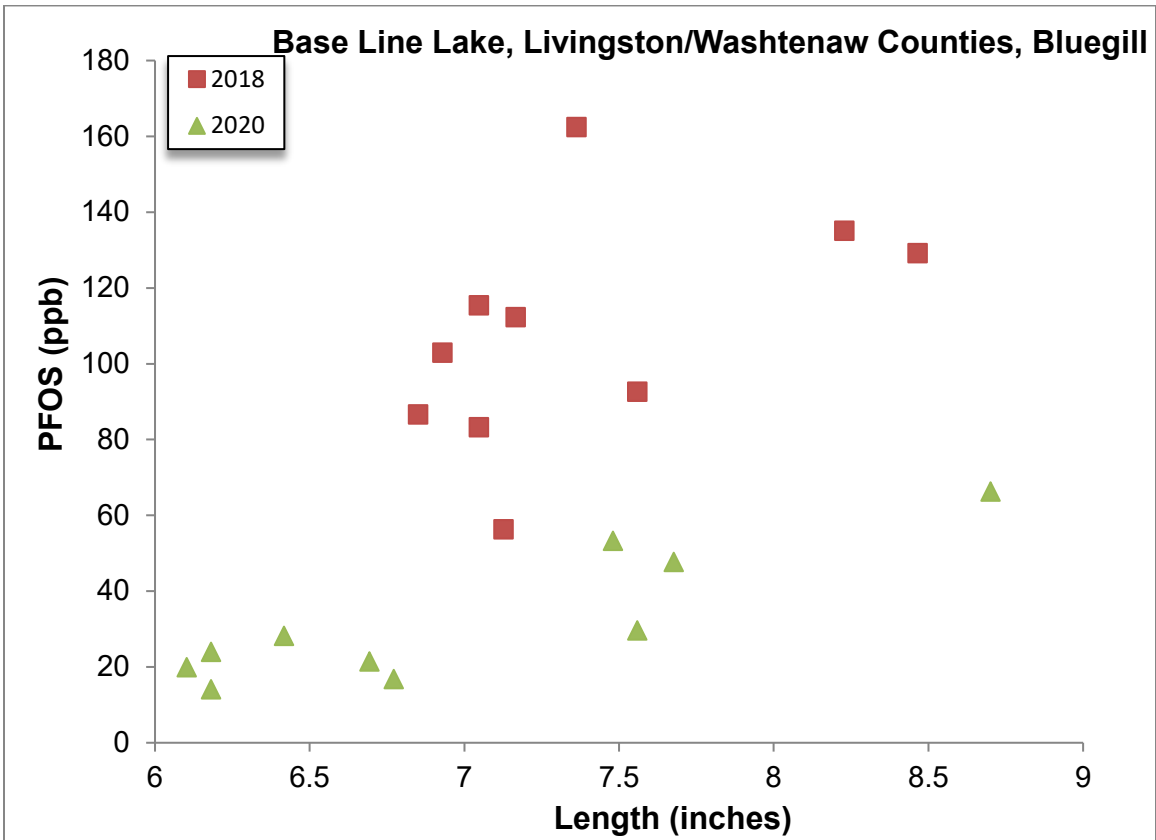
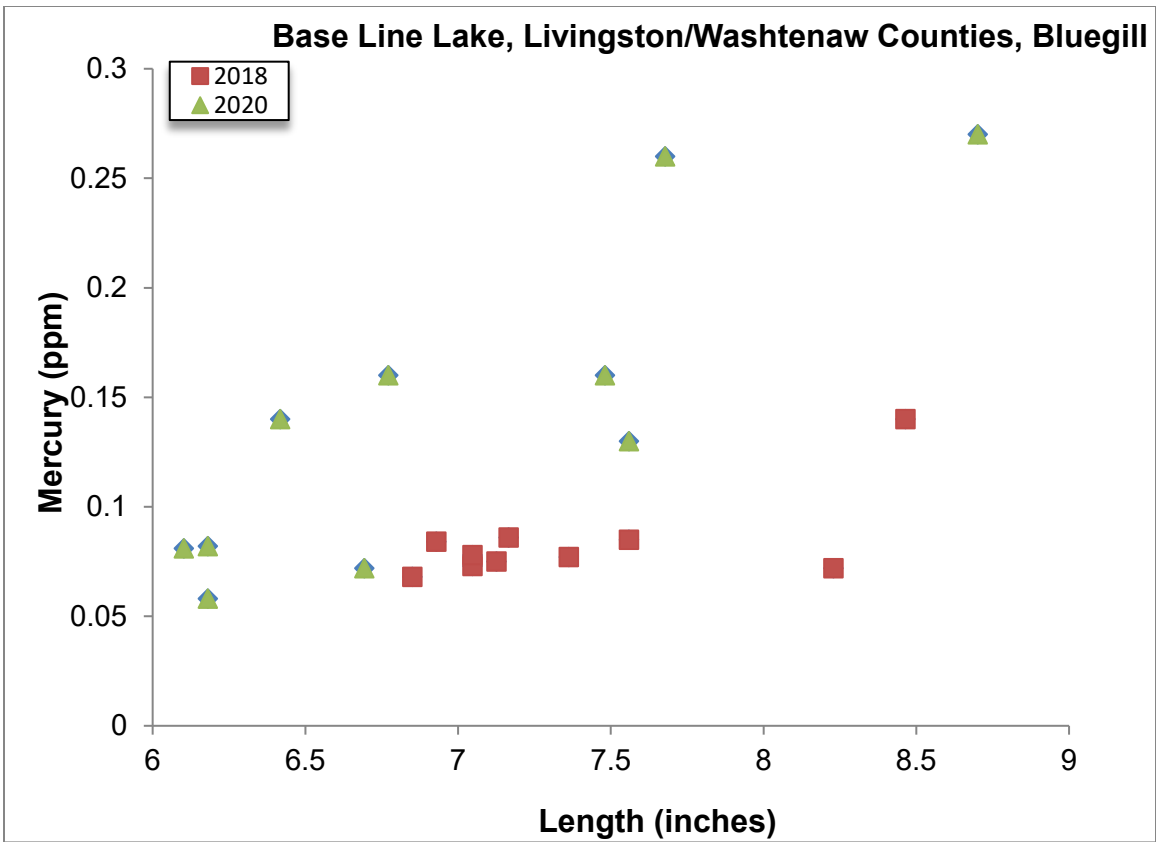
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent						
2018	2020	20	6.1	NA	6.1	8.7	
Datasets available: 2018, 2020							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	20	0.113		0.058	0.270	0.141	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.274	0.261					

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent						
2018	2020	20	6.1	NA	6.1	8.7	
Datasets available: 2018, 2020							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--		--	--	--	--
DDT	0	--		--	--	--	--
Chlordane	0	--		--	--	--	--
Toxaphene	0	--		--	--	--	--
PFOS	20	69.9 ppb		14.1 ppb	162.4 ppb	91.2 ppb	1
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	0.298	0.382					
Final meal category based on UCL:							1

Existing MDHHS Advisory: There is a Do Not Eat advisory for all fish species from this section of the Huron River due to PFOS.

Recommendation: No change to the advisory is recommended. MDHHS will continue to evaluate PFOS concentrations in fish throughout the Huron River to determine whether the existing Do Not Eat advisory for all species from this section of the river is appropriate.



Carp

**Base Line Lake
Huron River**

Livingston County

Hg Analysis:

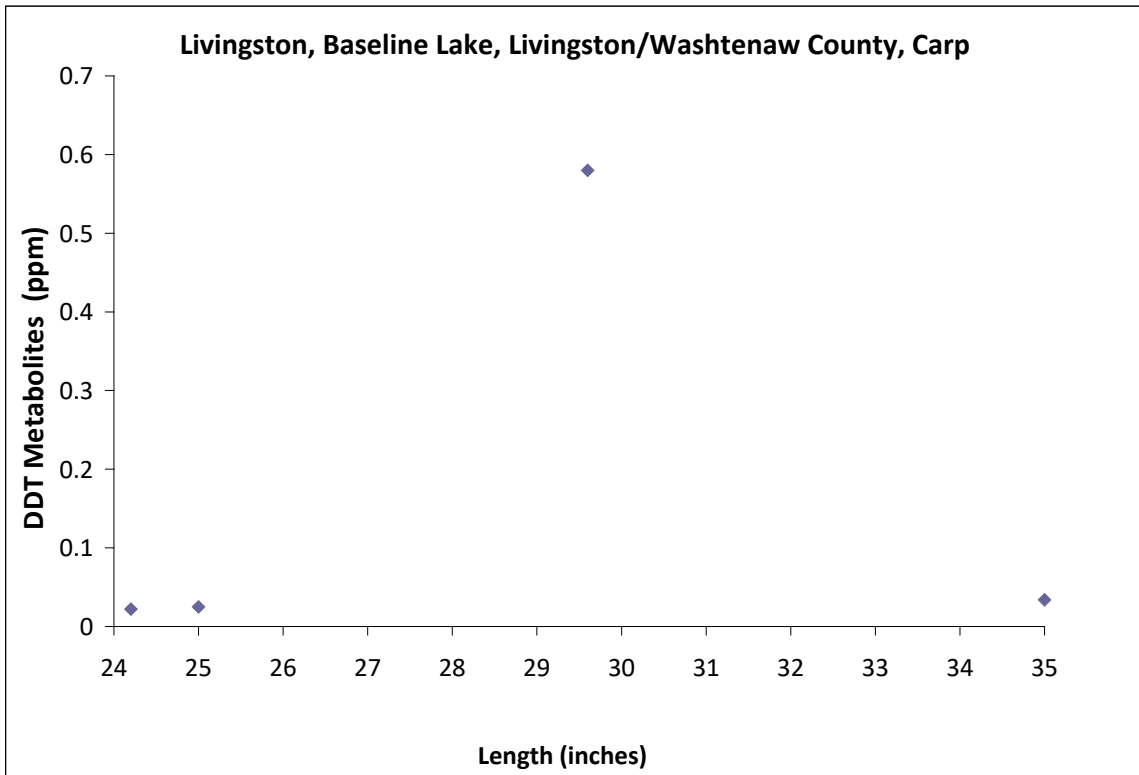
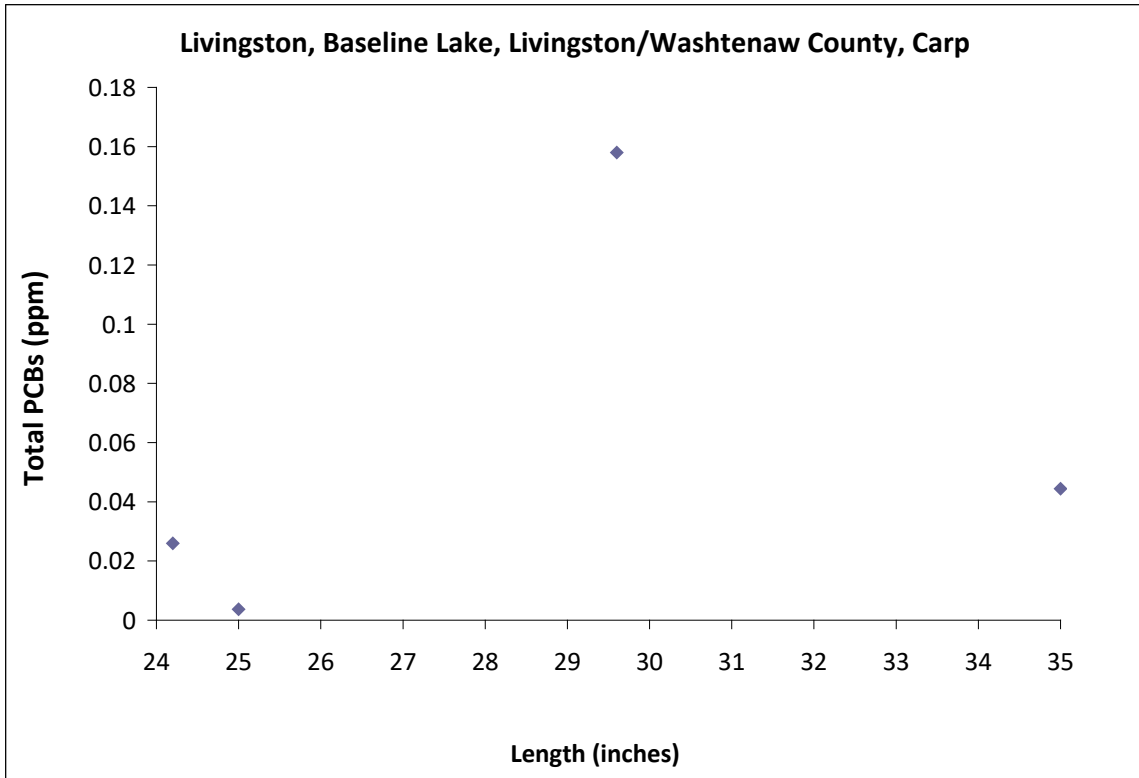
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2009	2009	4	24.2	na	24.2	35
Datasets available: 2009						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	0	--		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

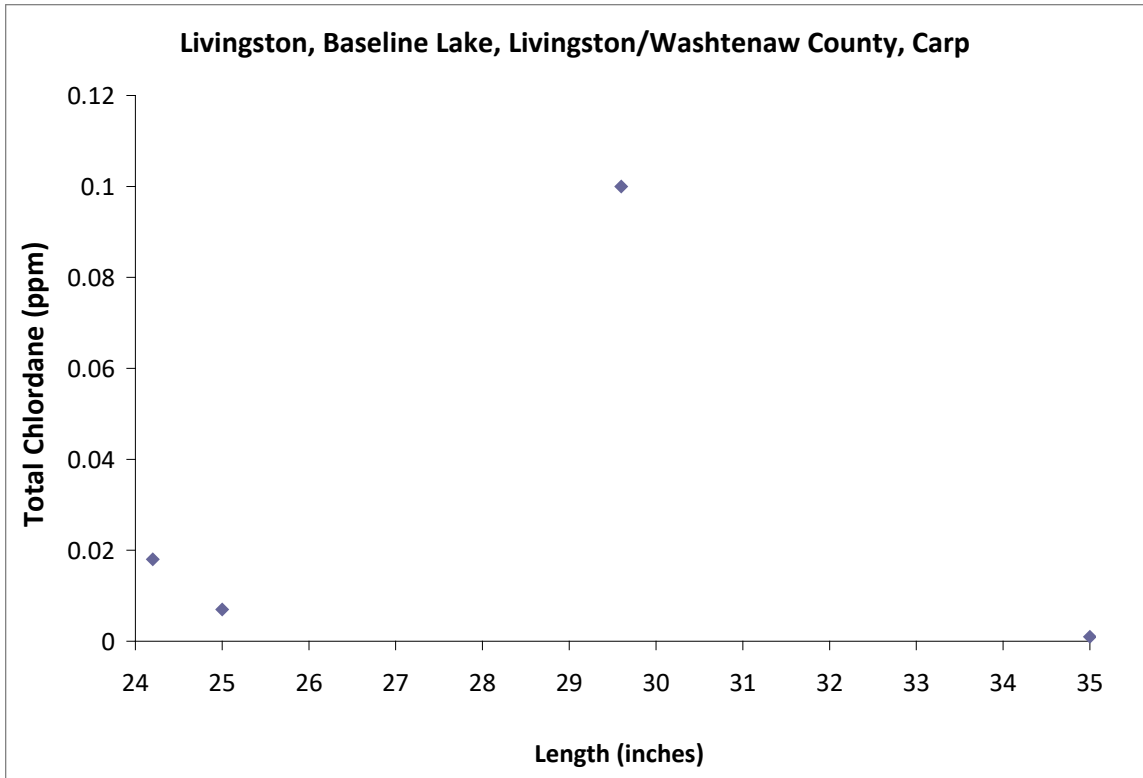
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2009	2009	4	24.2	na	24.2	35
Datasets available: 2009						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	4	0.058		--		--
DDT	4	0.165		--		--
Chlordane	4	0.032		--		--
Toxaphene	4	ND		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.116	0.279				
DDT	0.030	0.071				
Chlordane	0.001	0.229				
Toxaphene				Final meal category based on UCL:		--

Existing Advisory: This dataset is limited by small sample size. Therefore, Base Line Lake carp are covered by the statewide advisory due to PCBs: No one should eat more than 2 meals per month of carp of any size.

Recommendation: There is a Do Not Eat advisory for all fish species from this section of the Huron River due to PFOS.





Largemouth Bass

**Base Line Lake
Huron River**

**Livingston, Washtenaw
Counties**

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent						
2009	2020	30	11.6	14	13.6	16.9	
Datasets available: 2009, 2018, 2020							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	26	0.448		0.230	0.670	0.500	2
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.194	0.240					

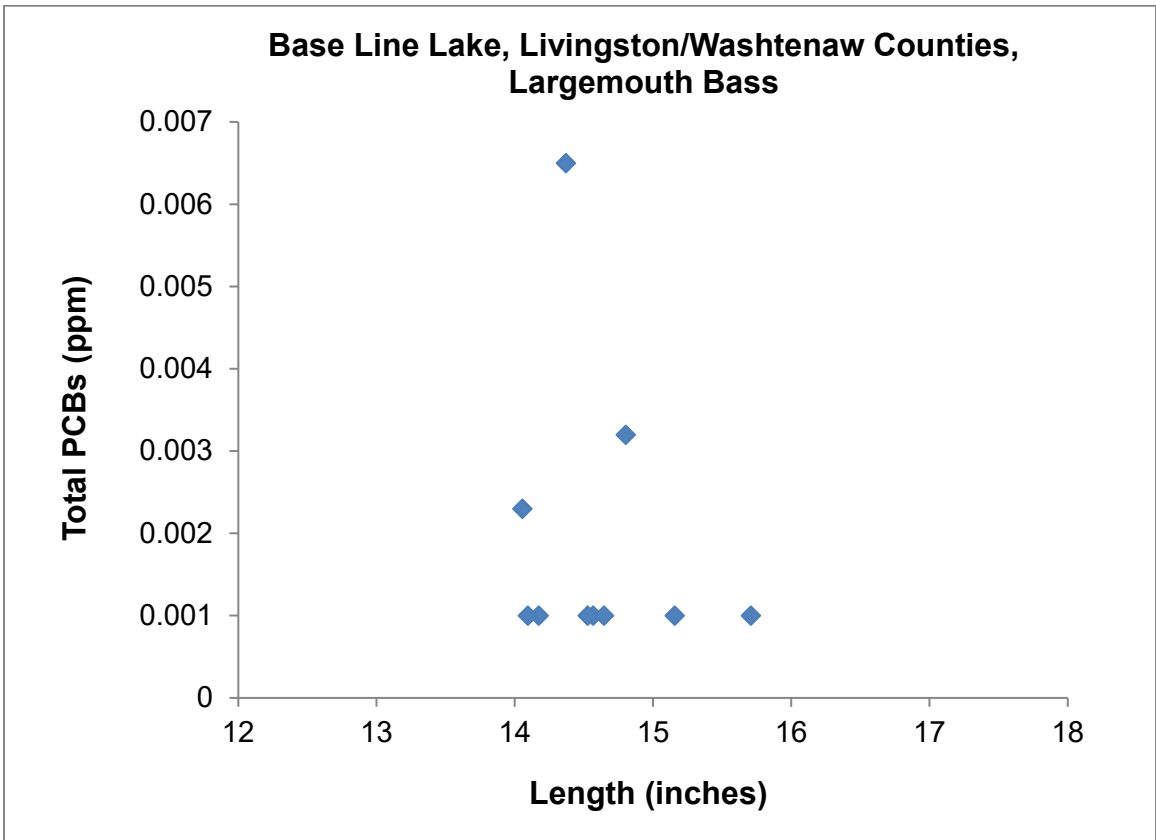
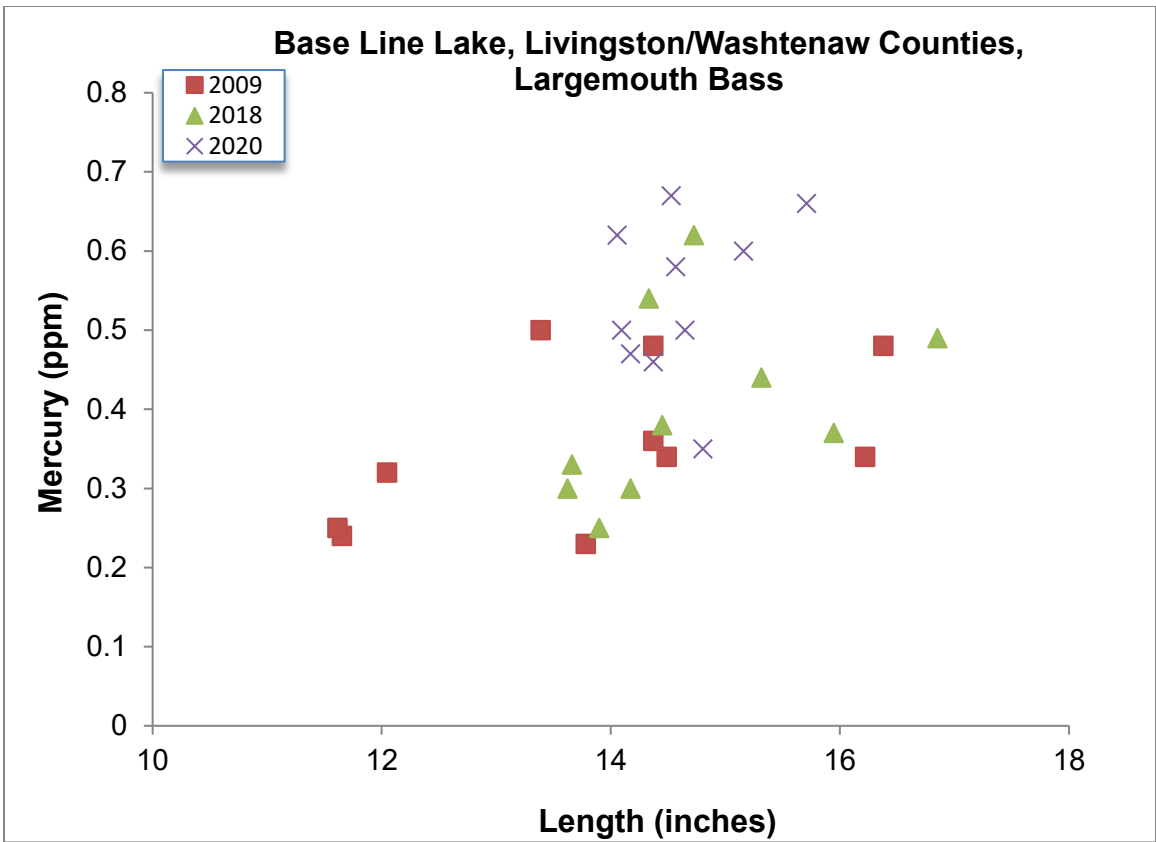
Organics Analysis:

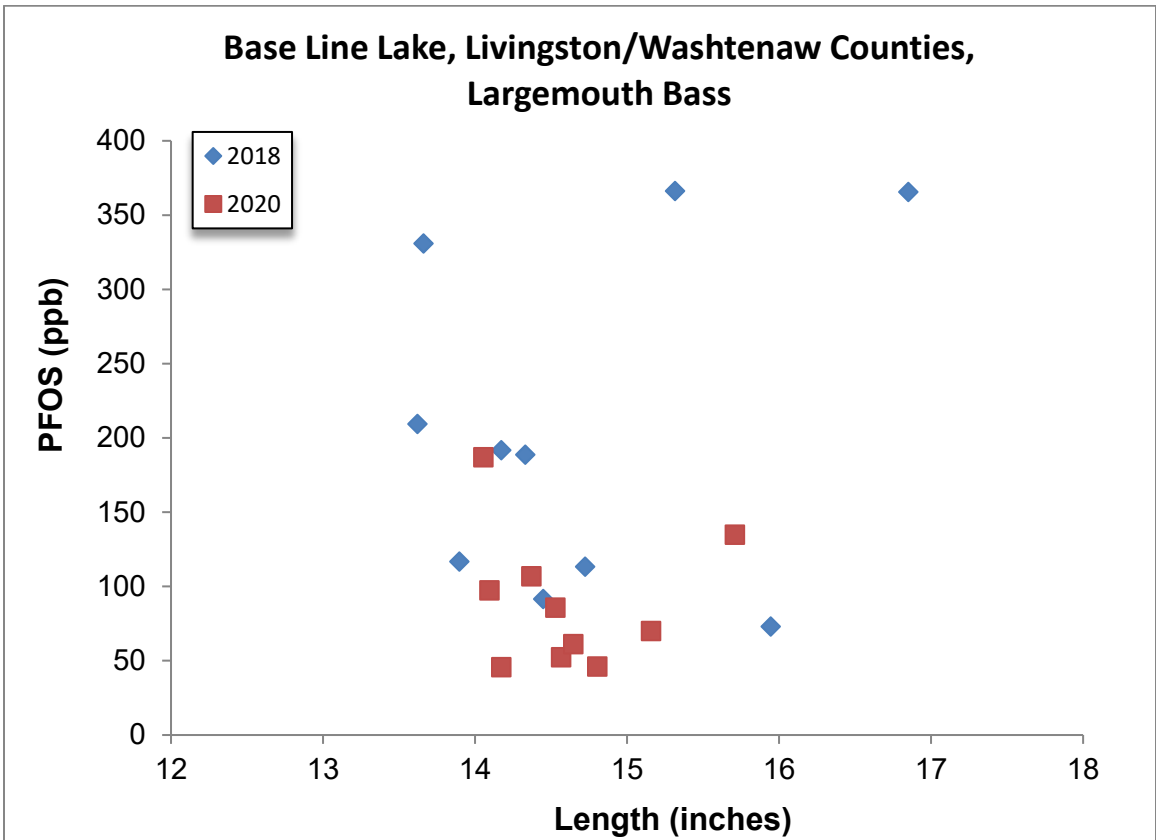
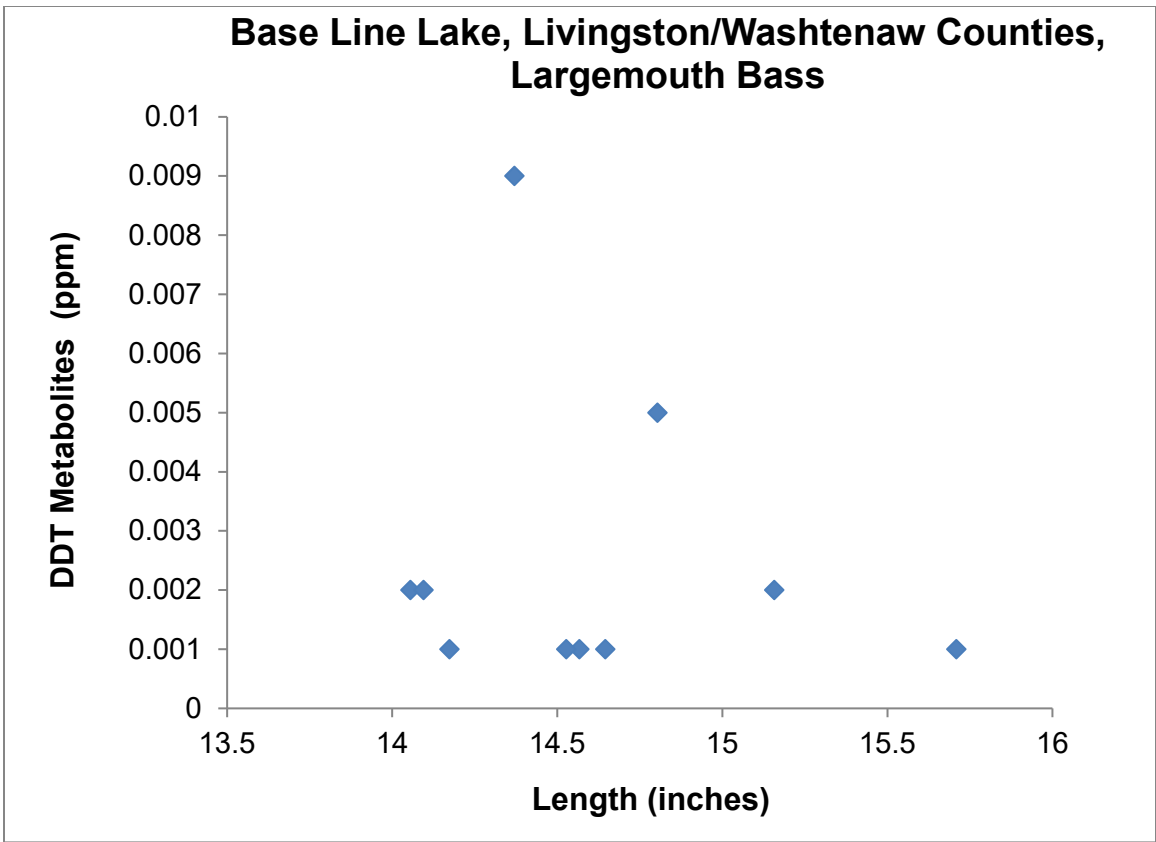
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent						
2018	2020	30	11.6	14	13.6	16.9	
Datasets available: 2018 (PFOS only), 2020							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.002		0.001	0.007	0.003	16
DDT	10	0.003		0.001	0.009	0.004	16
Chlordane	10	0.001		<0.001	0.001	0.001	16
Toxaphene	10	ND		--	--	--	--
PFOS	20*	146.8 ppb		45.7 ppb	366.3 ppb	194.8 ppb	0.5
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.061	0.084					
DDT	0.019	0.026					
Chlordane	0.000	0.000					
Toxaphene	--	--					
PFOS	0.035	0.007					
Final meal category based on UCL:							0.5

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

Existing MDHHS Advisory: There is a Do Not Eat advisory for all fish species from this section of the Huron River due to PFOS.

Recommendation: No change to the advisory is recommended. MDHHS will continue to evaluate PFOS concentrations in fish throughout the Huron River to determine whether the existing Do Not Eat advisory for all species from this section of the river is appropriate.





Rock Bass

**Base Line Lake
Huron River**

**Livingston, Washtenaw
Counties**

Hg Analysis:

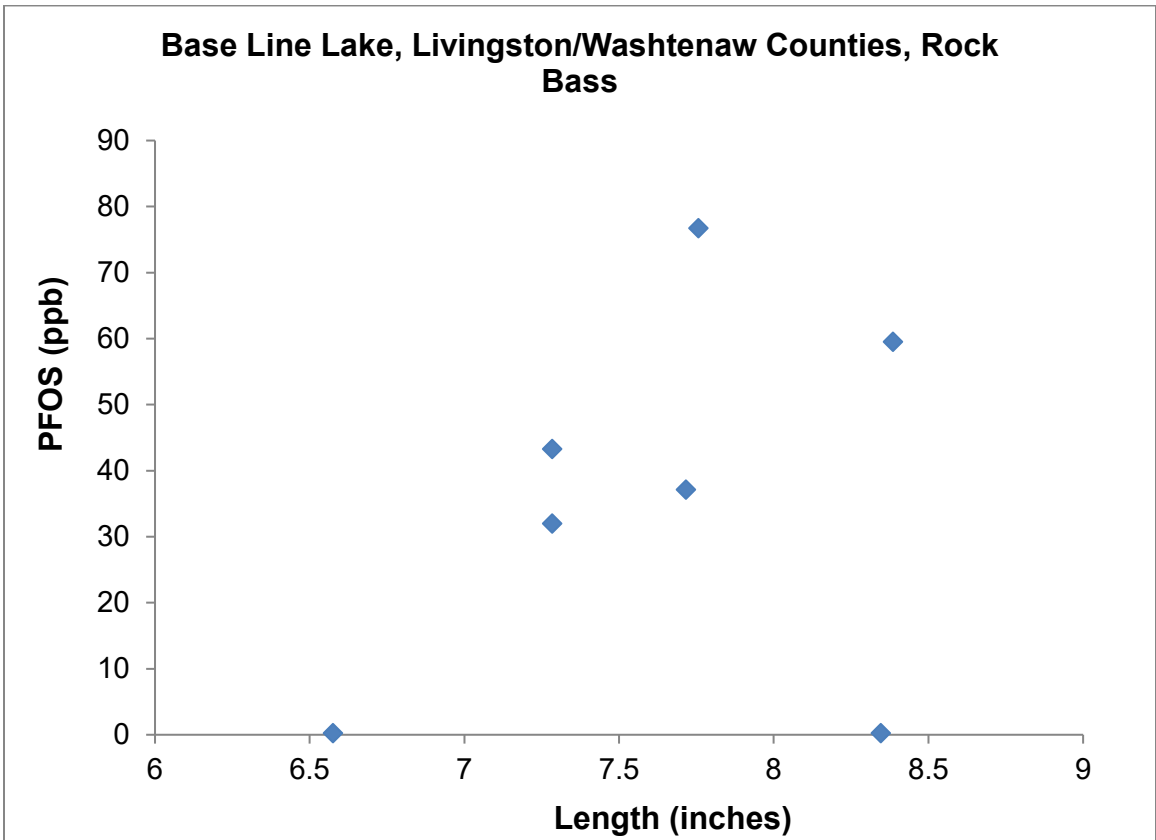
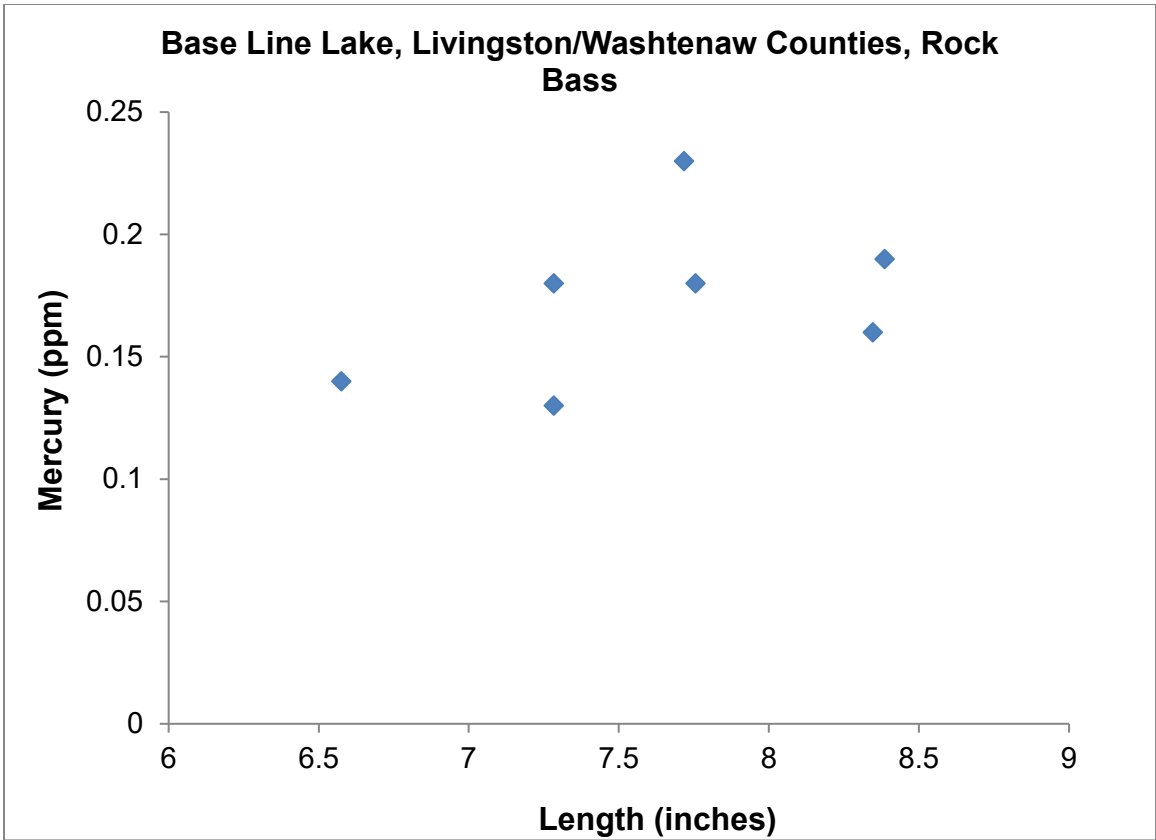
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent						
2020	2020	7	6.6	NA	6.6	8.4	
Datasets available: 2020							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	7	0.173		0.130	0.230	0.204	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.193	0.225					

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent						
2020	2020	7	6.6	NA	6.6	8.4	
Datasets available: 2020							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--		--	--	--	--
DDT	0	--		--	--	--	--
Chlordane	0	--		--	--	--	--
Toxaphene	0	--		--	--	--	--
PFOS	7	35.6 ppb		<0.25 ppb	76.7 ppb	61.8 ppb	2
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	0.097	0.043					
Final meal category based on UCL:							2

Existing MDHHS Advisory: There is a Do Not Eat advisory for all fish species from this section of the Huron River due to PFOS.

Recommendation: No change to the advisory is recommended. MDHHS will continue to evaluate PFOS concentrations in fish throughout the Huron River to determine whether the existing Do Not Eat advisory for all species from this section of the river is appropriate. Additional rock bass should be collected to determine if PFOS concentrations remain below the Do Not Eat advisory threshold.



Bluegill

**Belleville Lake
Huron River**

Wayne County

Hg Analysis:

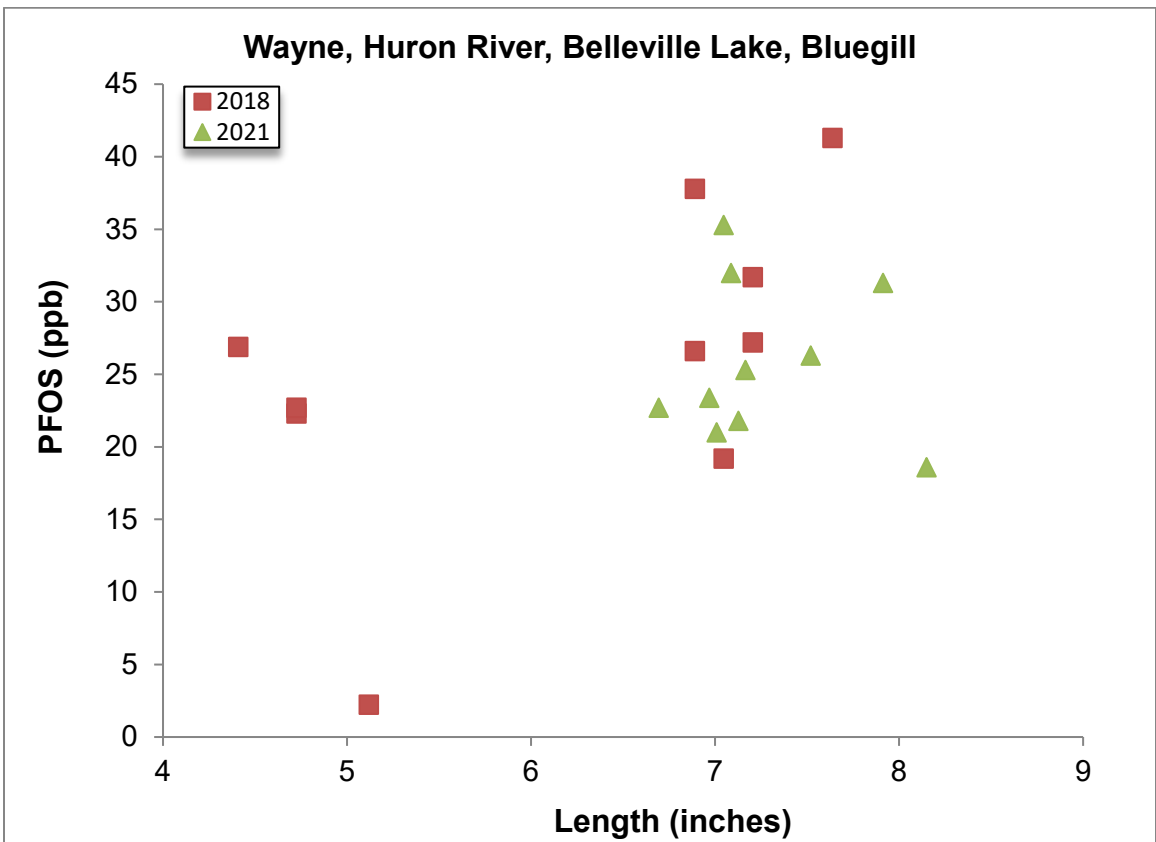
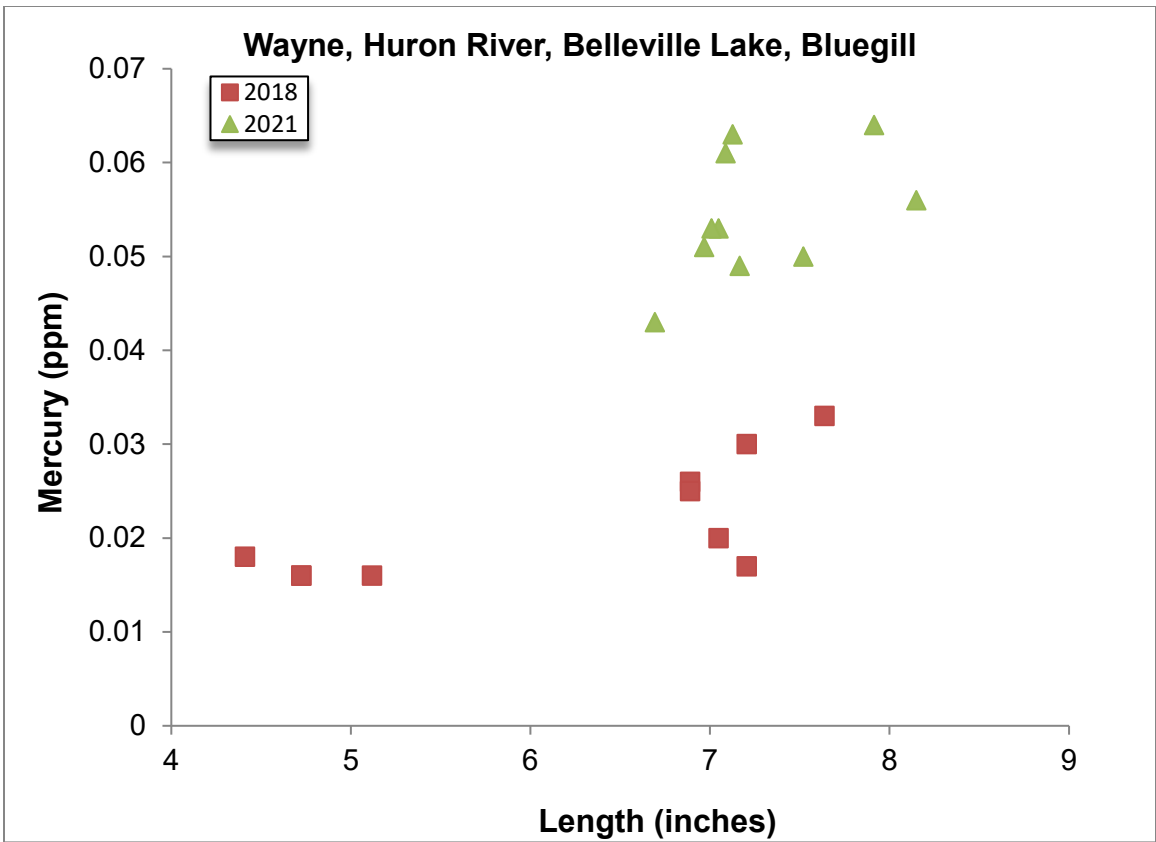
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2018	2021	20	4.4	NA	4.4	8.1
Datasets available: 2018, 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	20	0.038	0.016	0.064	0.046	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.436	0.510				

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	20	4.4	NA	4.4	8.1
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	20	25.8 ppb	2.2 ppb	41.3 ppb	29.7 ppb	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.143	0.149				
Final meal category based on UCL:						4

Existing MDHHS Advisory: There is a Do Not Eat advisory for all fish species from this section of the Huron River due to PFOS.

Recommendation: No change to the advisory is recommended. MDHHS will continue to evaluate PFOS concentrations in fish throughout the Huron River to determine whether the existing Do Not Eat advisory for all species from this section of the river is appropriate.



Carp

**Belleville Lake
Huron River**

Wayne County

Hg Analysis:

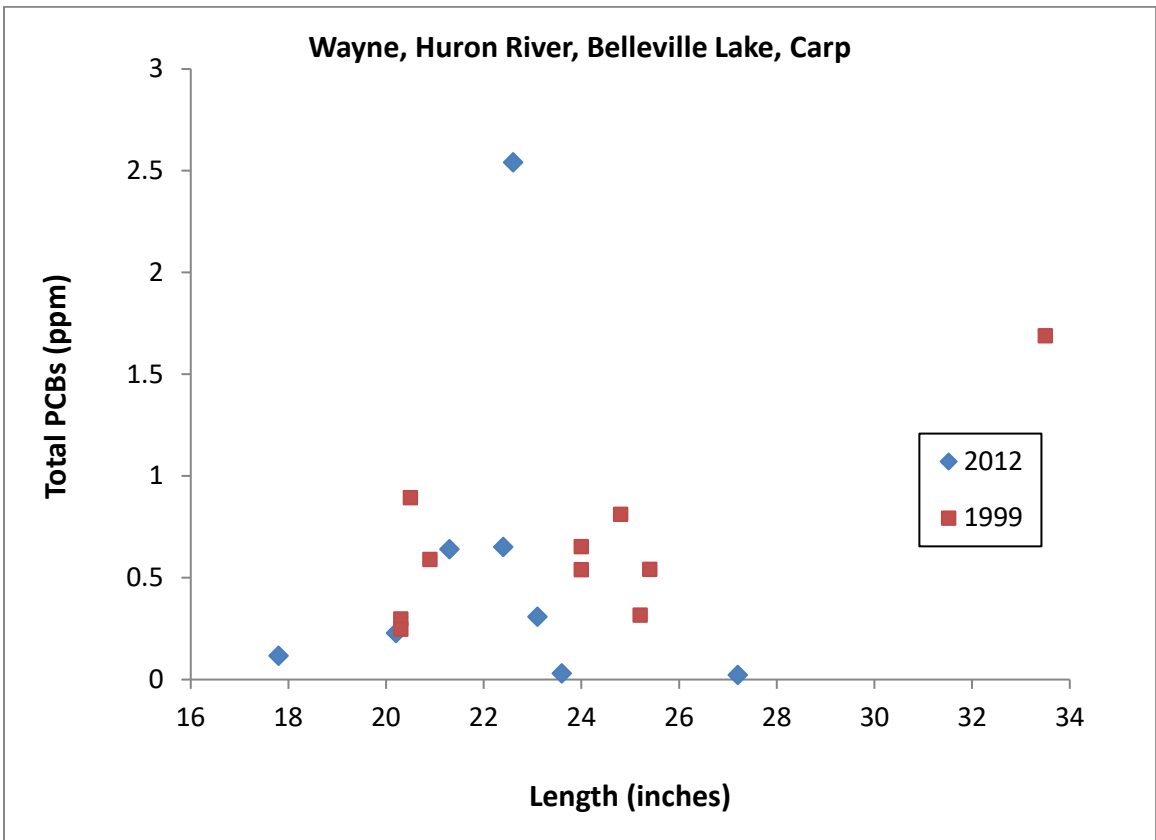
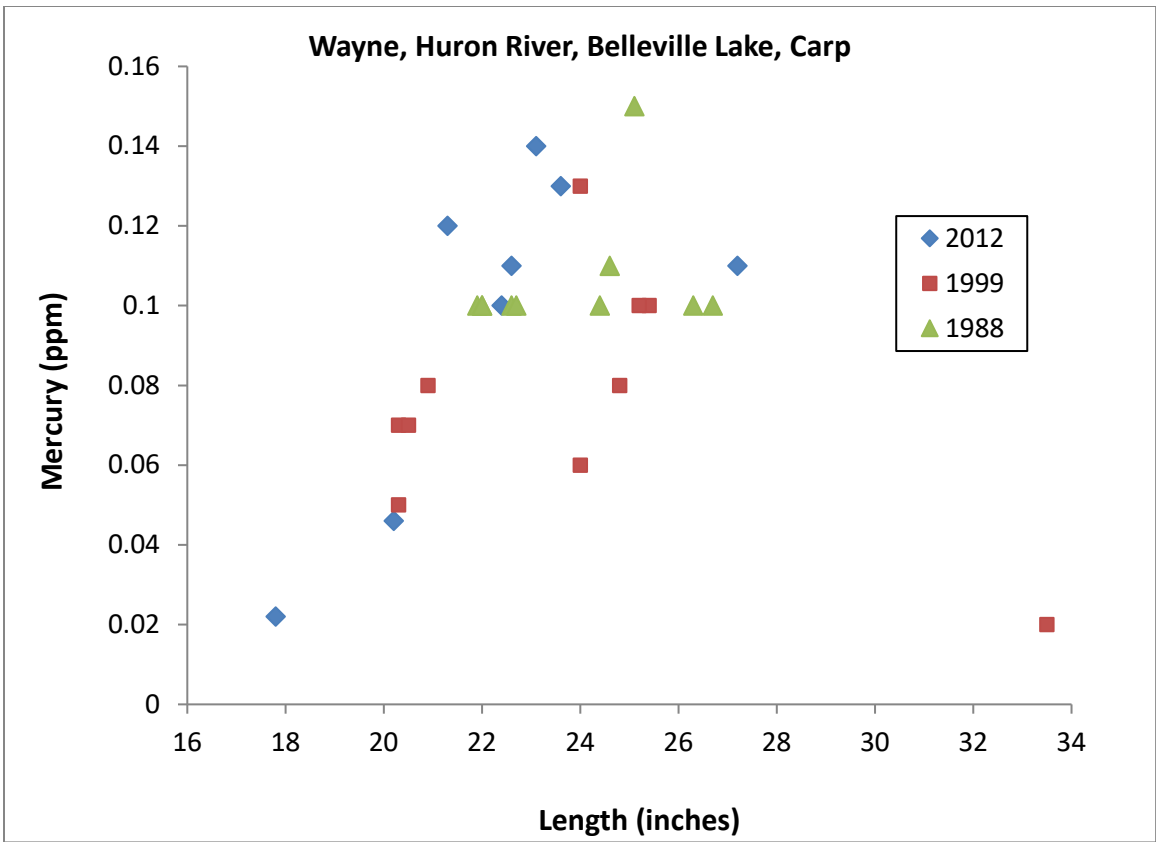
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples			
Earliest	Most Recent				Min	Max		
1988	2012	28	17.8	na	17.8	33.5		
Datasets available: 1988, 1999, 2012								
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category	
Mercury	28	0.09		0.02	0.15	0.11	8	
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
Mercury	0.008	0.000						

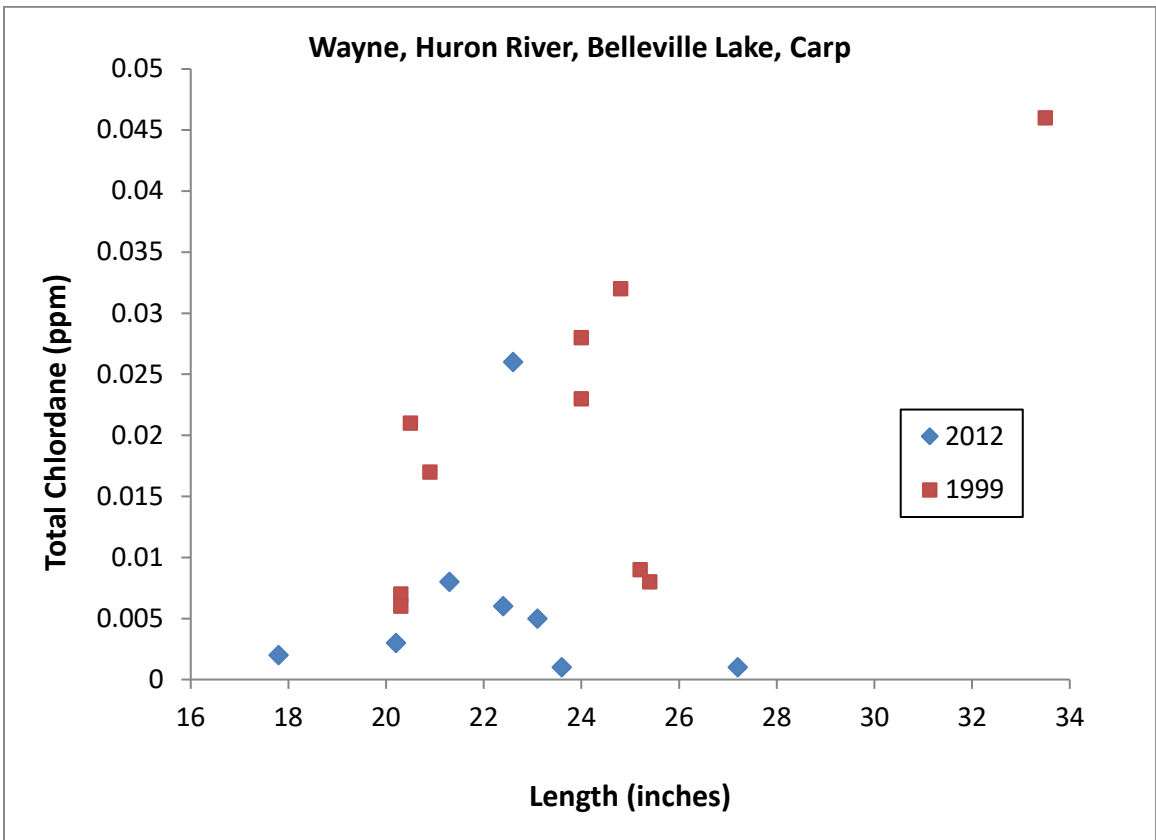
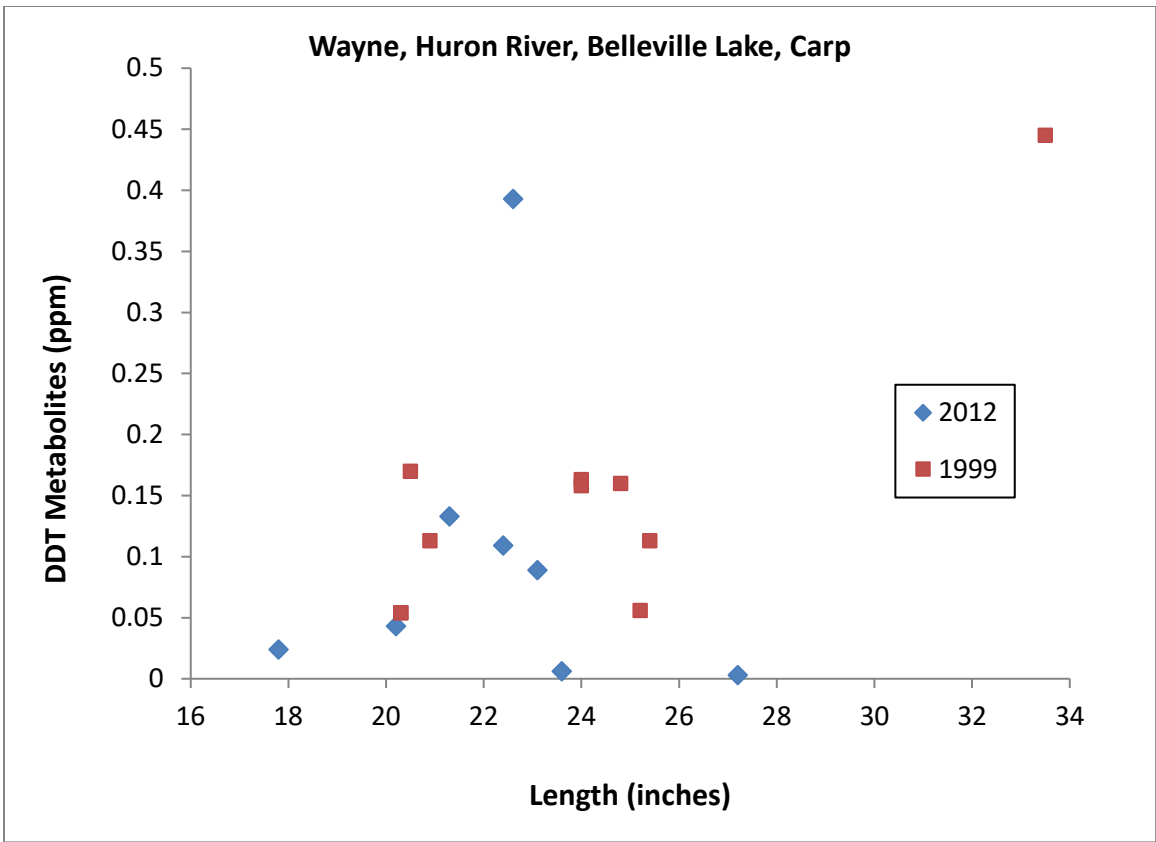
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples			
Earliest	Most Recent				Min	Max		
1999	2012	18	17.8	na	17.8	33.5		
Datasets available: 1988, 1999, 2012								
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category	
PCB	18	0.62		0.022	2.54	0.93	Limited	
DDT	18	0.13		0.003	0.44	0.19	8	
Chlordane	18	0.01		0.001	0.05	0.02	--	
Toxaphene	18	ND		--	--	--	--	
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
PCB	0.106	0.017						
DDT	0.266	0.022						
Chlordane	0.311	0.087						
Toxaphene	--	--						
Final meal category based on UCL:							Limited	

Existing Advisory: Sensitive populations should not eat these fish. Healthy adults should limit consumption of Belleville Lake carp to no more than 1 or 2 meals per year due to PCBs. DDT and mercury would cause advisories. Belleville Lake has legacy contamination from a point source of PCBs.

Recommendation: There is a Do Not Eat advisory for all fish species from this section of the Huron River due to PFOS.





Channel Catfish

**Belleville Lake
Huron River**

Wayne County

Hg Analysis:

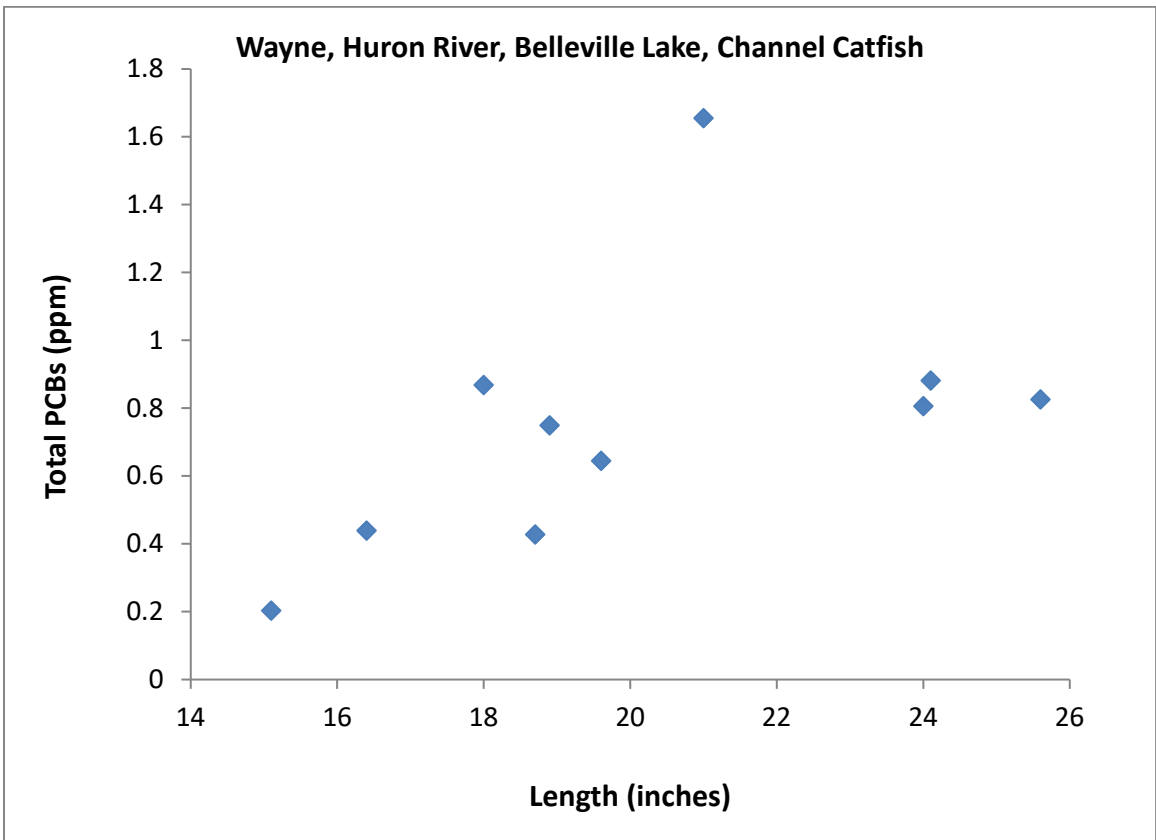
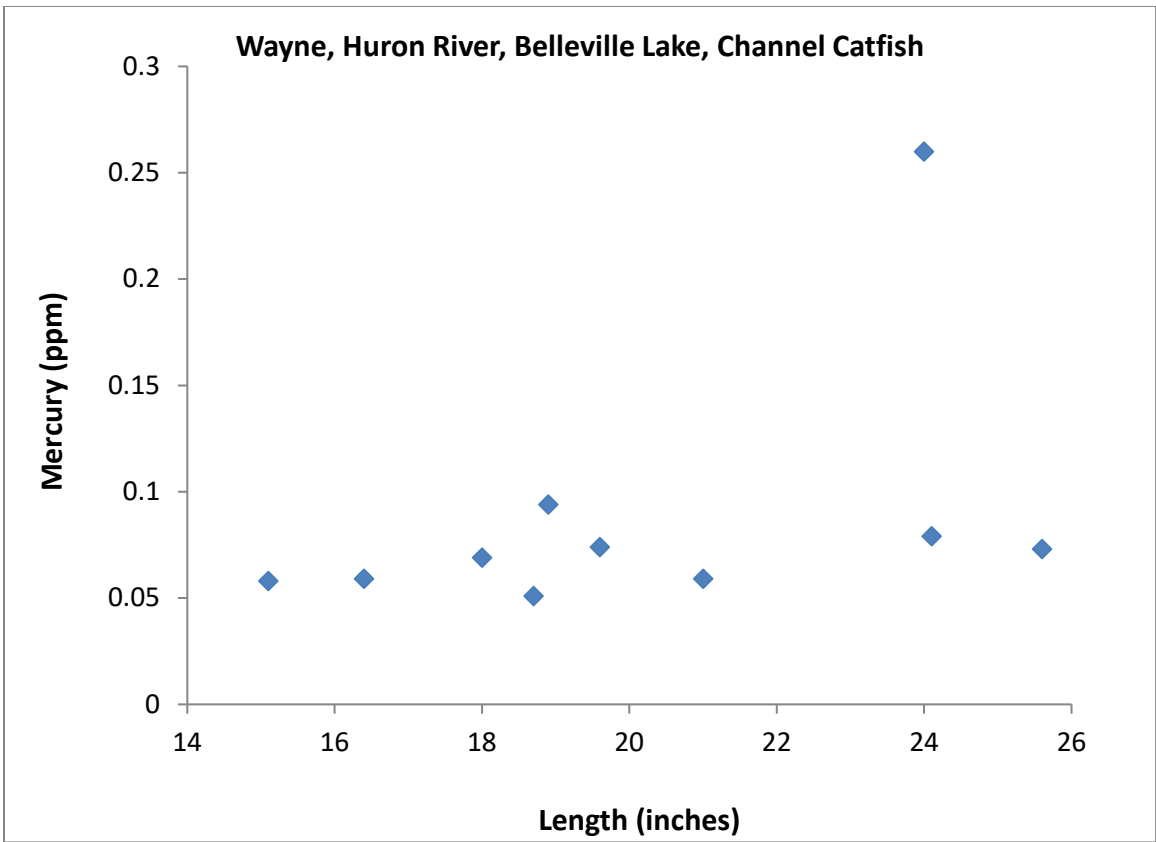
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	10	15.1	12	15.1	25.6
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.09	0.05	0.26	0.13	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.204	0.254				

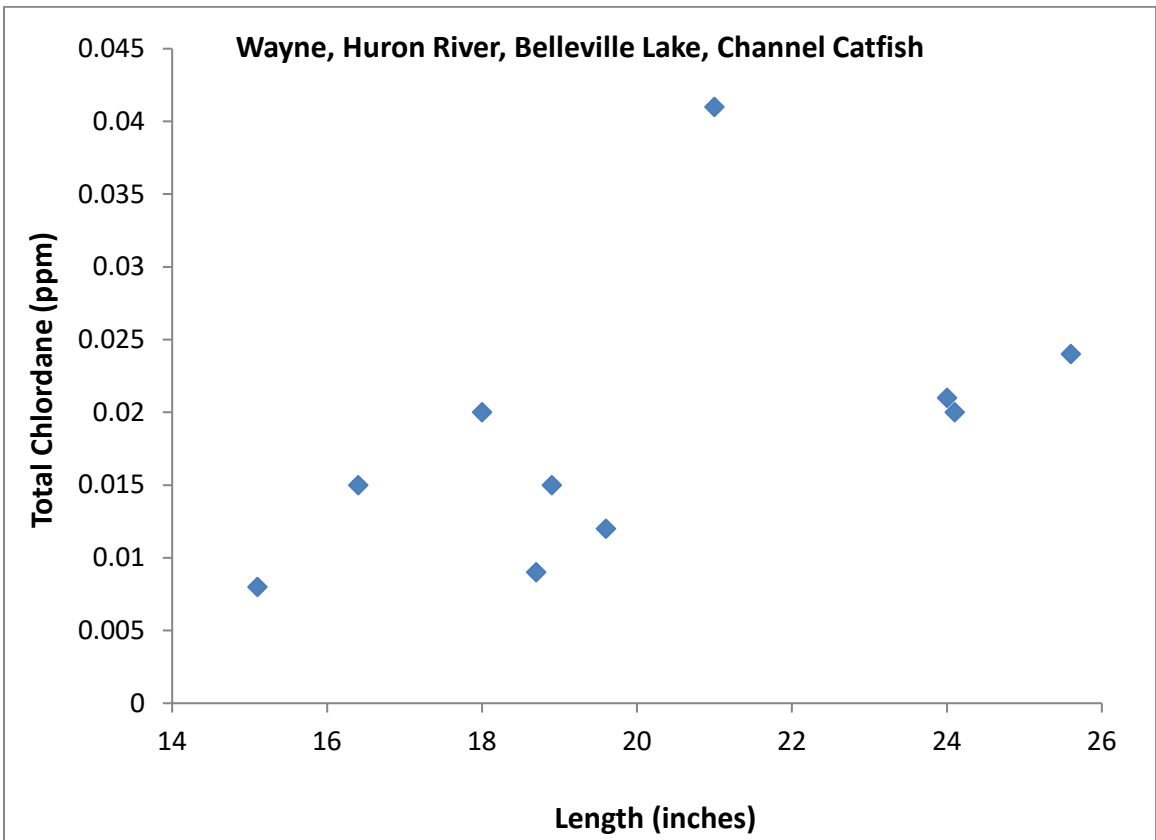
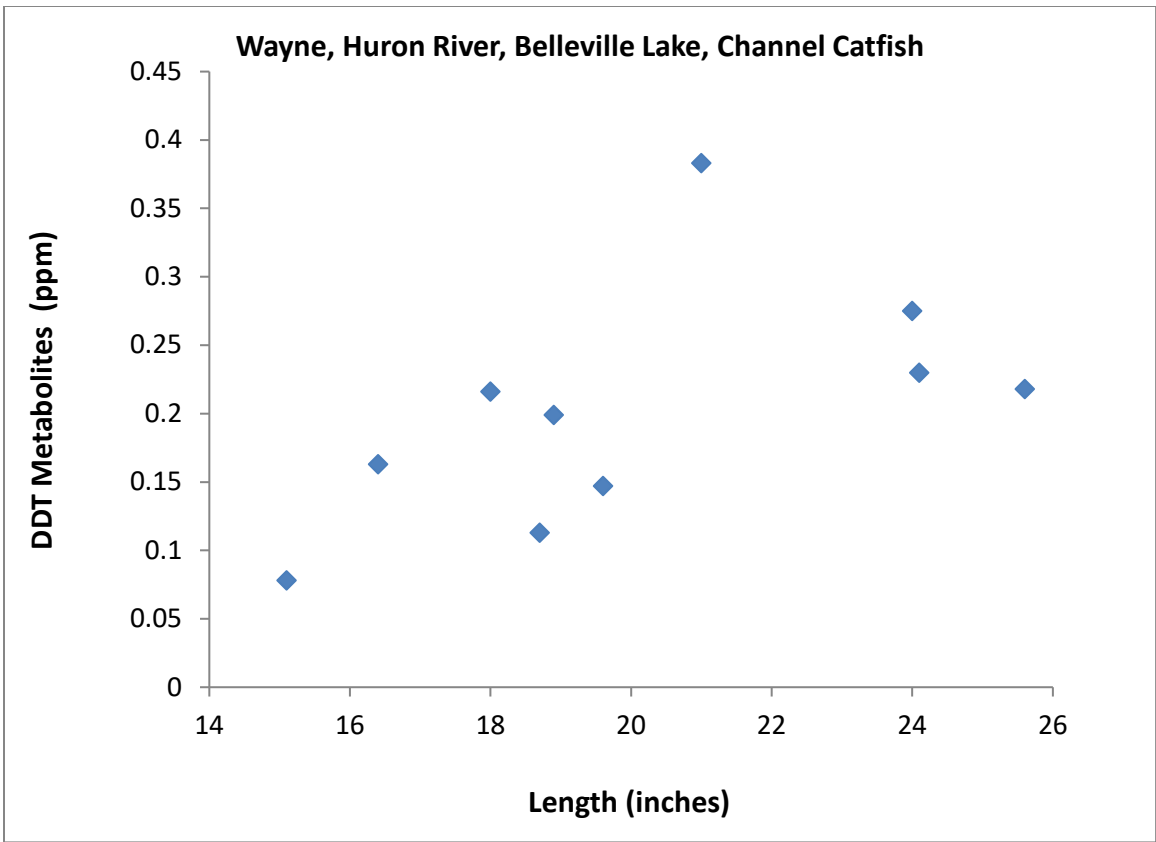
Organics Analysis:

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	15.1	12	15.1	25.6
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.75	0.20	1.66	1.03	Limited
DDT	10	0.20	0.08	0.38	0.26	4
Chlordane	10	0.02	0.01	0.04	0.02	--
Toxaphene	10	ND				
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.250	0.410				
DDT	0.323	0.416				
Chlordane	0.251	0.374				
Toxaphene	--	--	Final meal category based on UCL: Limited			

Existing Advisory: Sensitive populations should not eat these fish. Healthy adults should limit consumption of Belleville Lake catfish to no more than 1 or 2 meals per year due to PCBs. DDT and mercury would cause advisories. Belleville Lake has legacy contamination from a point source of PCBs.

Recommendation: There is a Do Not Eat advisory for all fish species from this section of the Huron River due to PFOS.





Gizzard Shad

**Belleville Lake
Huron River**

Wayne County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1999	1999	10	10.2	na	10.2	15.6
Datasets available: 1999						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	10	0.037			0.040	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.551	0.551				

Organics Analysis:

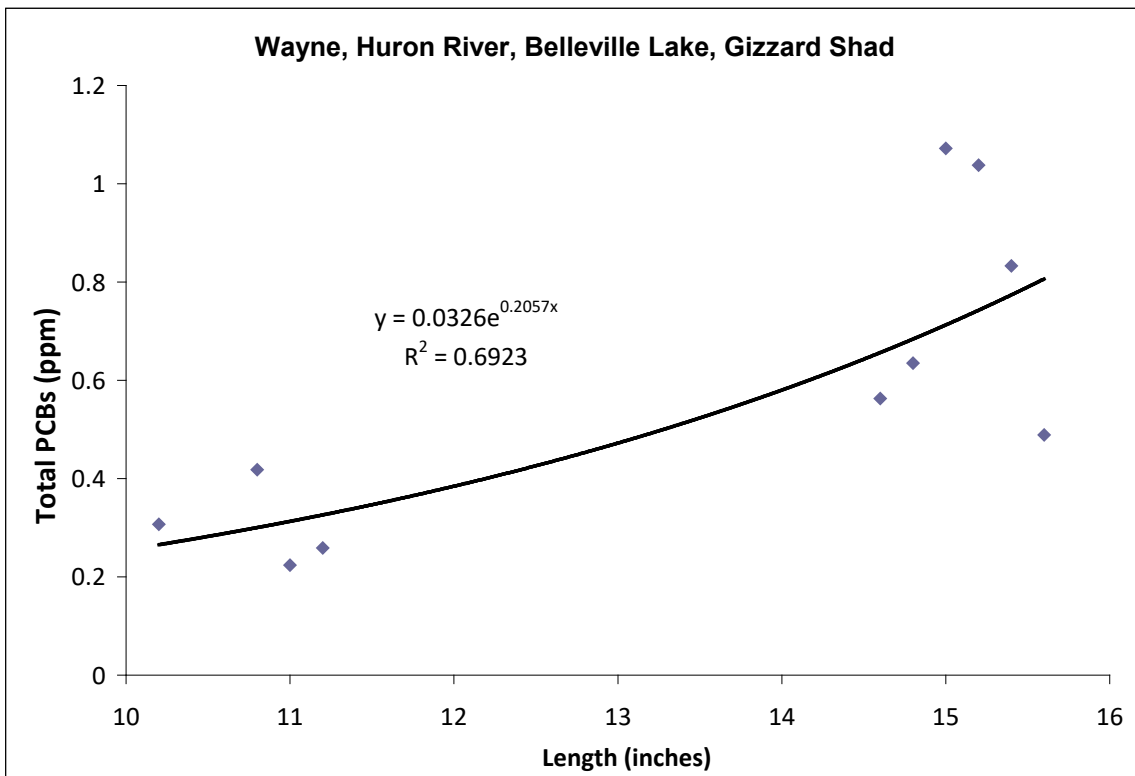
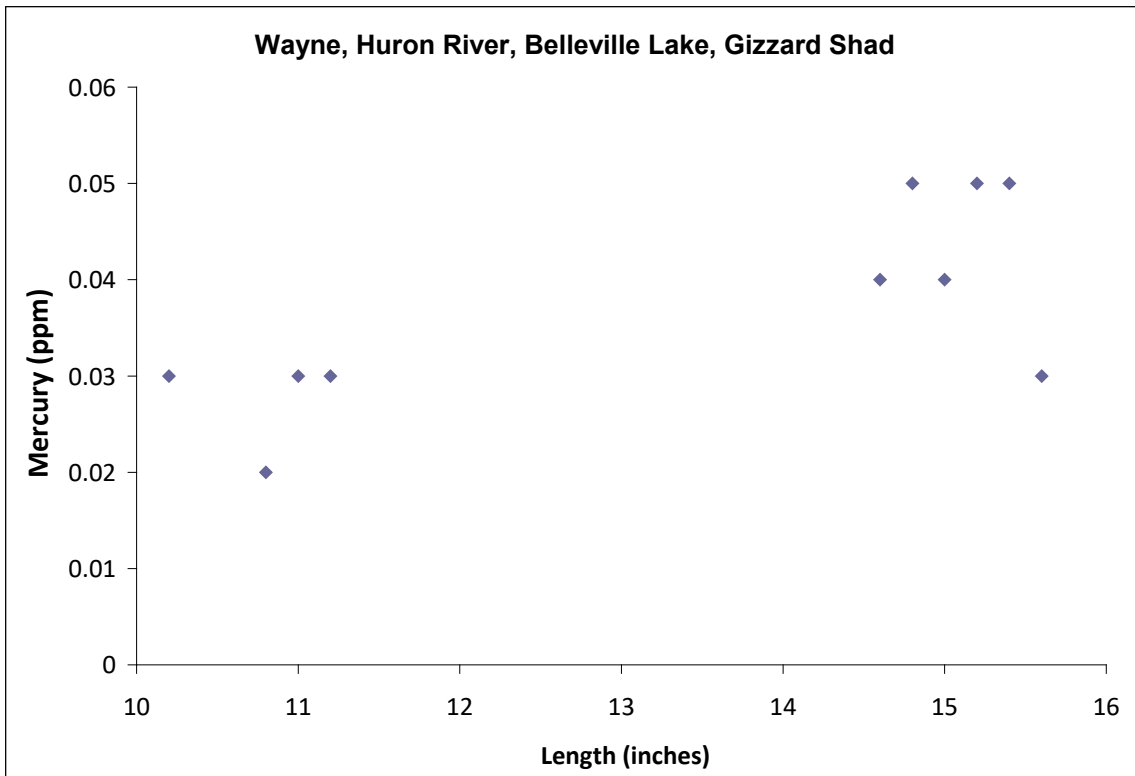
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1999	1999	10	10.2	na	10.2	15.6
Datasets available: 1999						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	10	0.584			0.800	Limited
DDT	10	0.158		0.220	4	
Chlordane	10	0.024		0.040	--	
Toxaphene	10	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.596	0.692				
DDT	0.596	0.710				
Chlordane	0.741	0.757				
Toxaphene	--	--				
Final meal category based on UCL:					Limited	

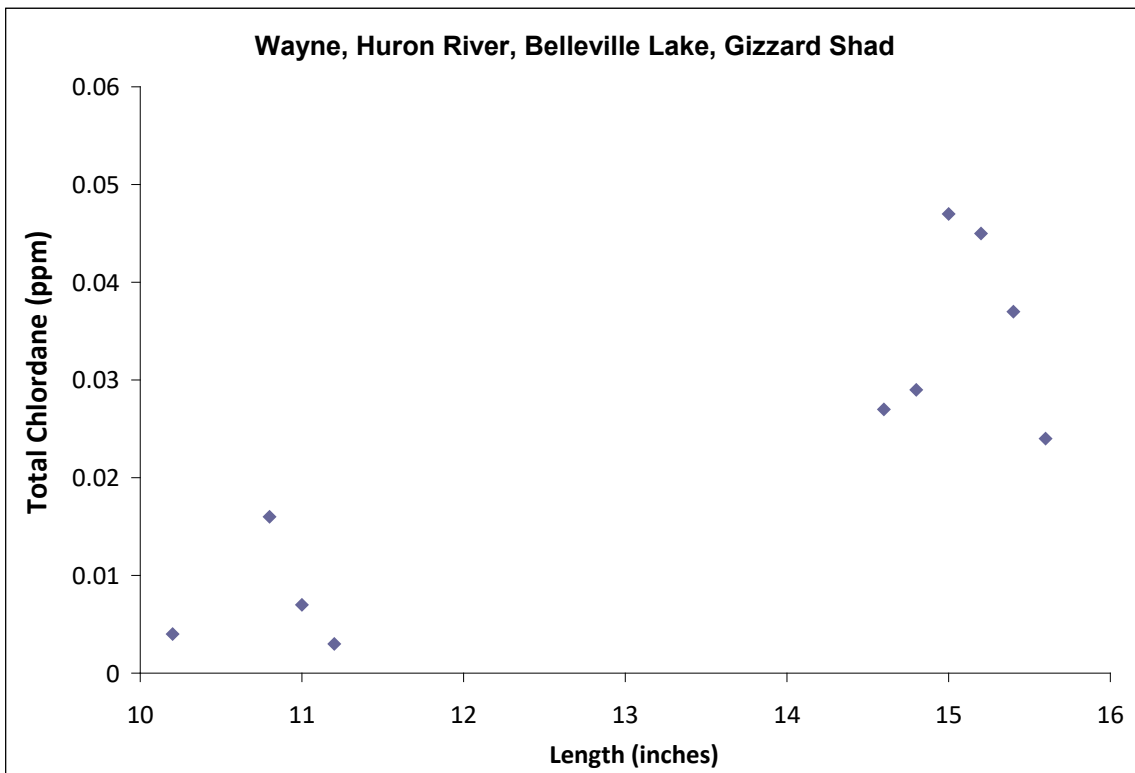
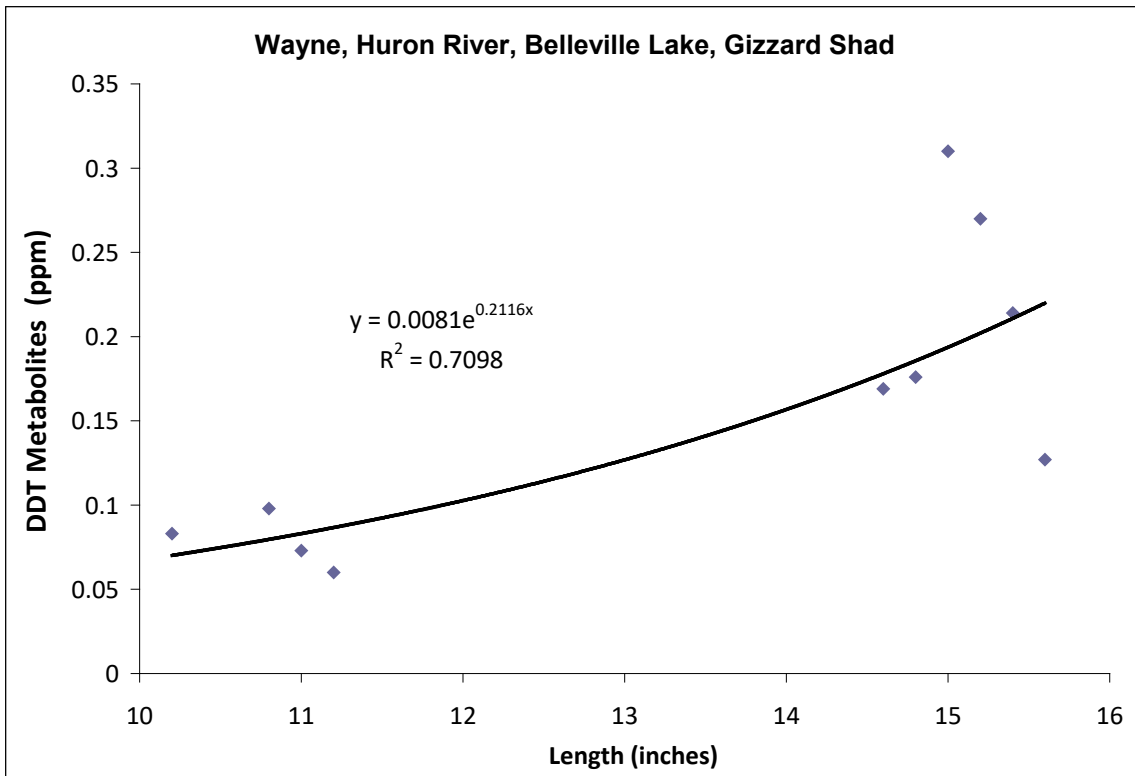
Existing Advisory: Sensitive populations should not eat these fish. Healthy adults should limit consumption of Belleville Lake gizzard shad to no more than 1 or 2 meals per year due to PCBs. DDT and mercury would cause advisories. Belleville Lake has legacy contamination from a point source for PCBs.

Recommendation: There is a Do Not Eat advisory for all fish species from this section of the Huron River due to PFOS.

Length (Inches)	PCB Regression Estimate (ppm)	Meal Category
8	0.169	1
10	0.255	0.5
12	0.385	0.5
14	0.581	Limited
16	0.876	Limited
18	1.322	Limited
20	1.995	Limited
22	3.010	0
24	4.542	0

Shaded area denotes extrapolated estimates





Smallmouth Bass

**Belleville Lake
Huron River**

Wayne County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2018	2021	20	11.9	14.0	13.8	16.3
Datasets available: 2018, 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	11	0.136	0.088	0.190	0.159	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.132	0.151				

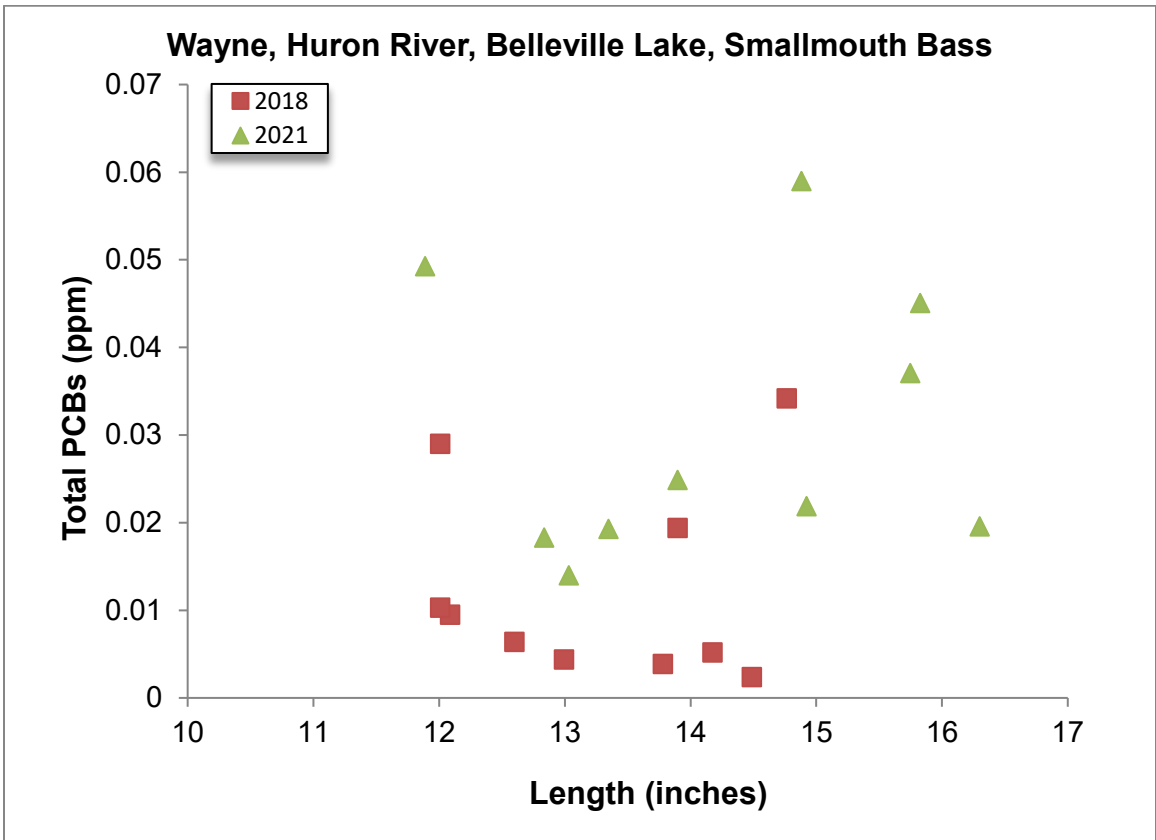
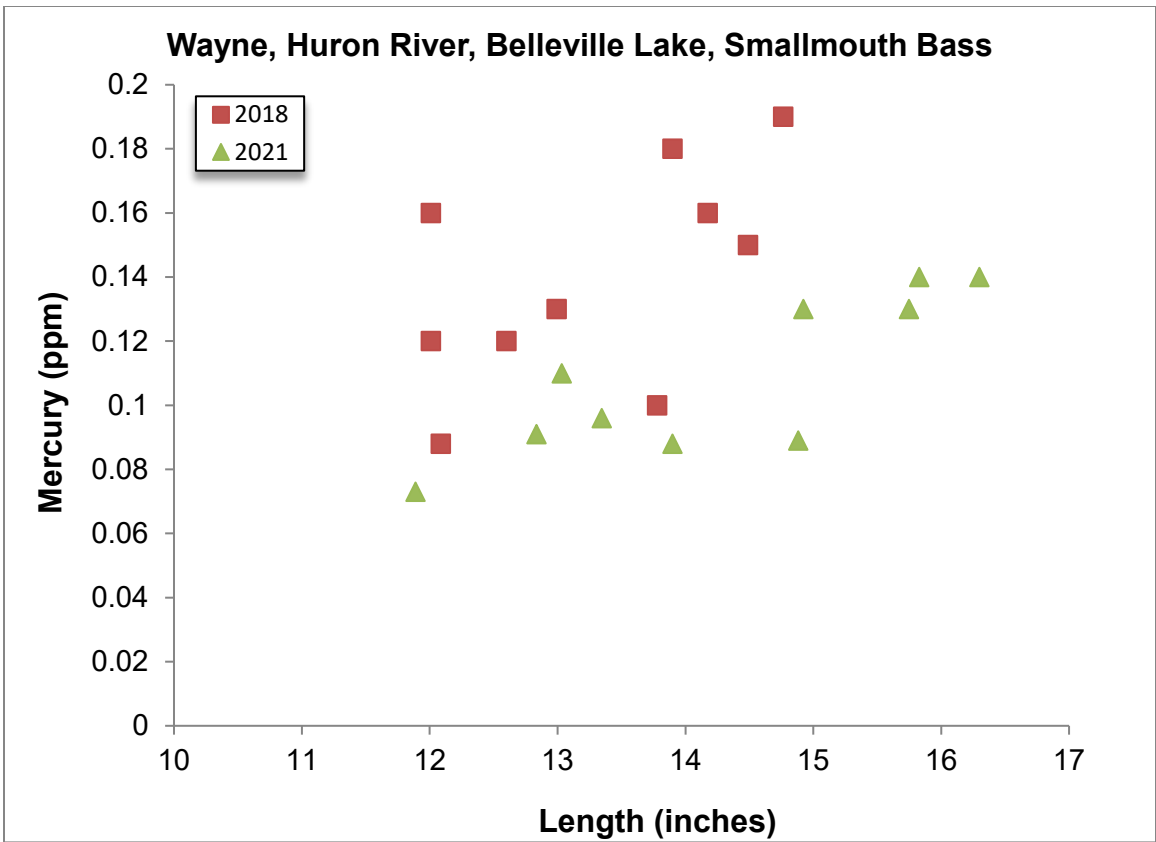
Organics Analysis:

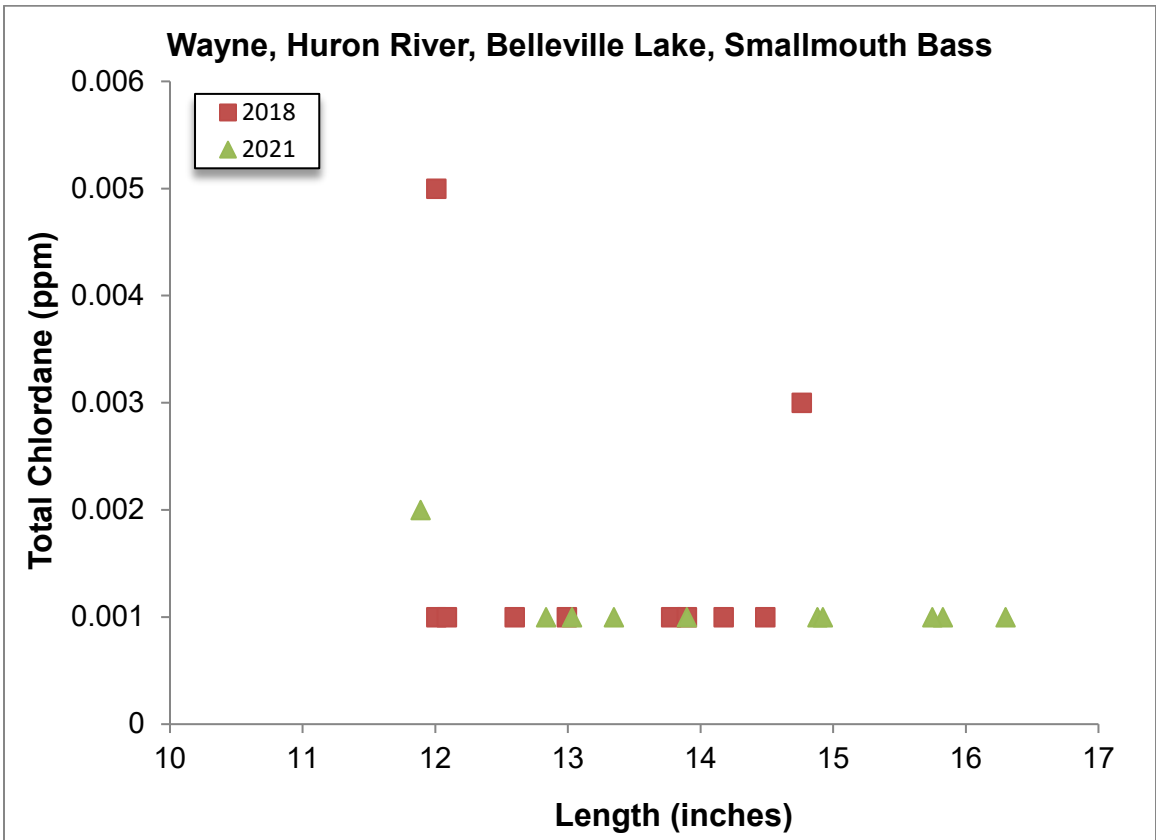
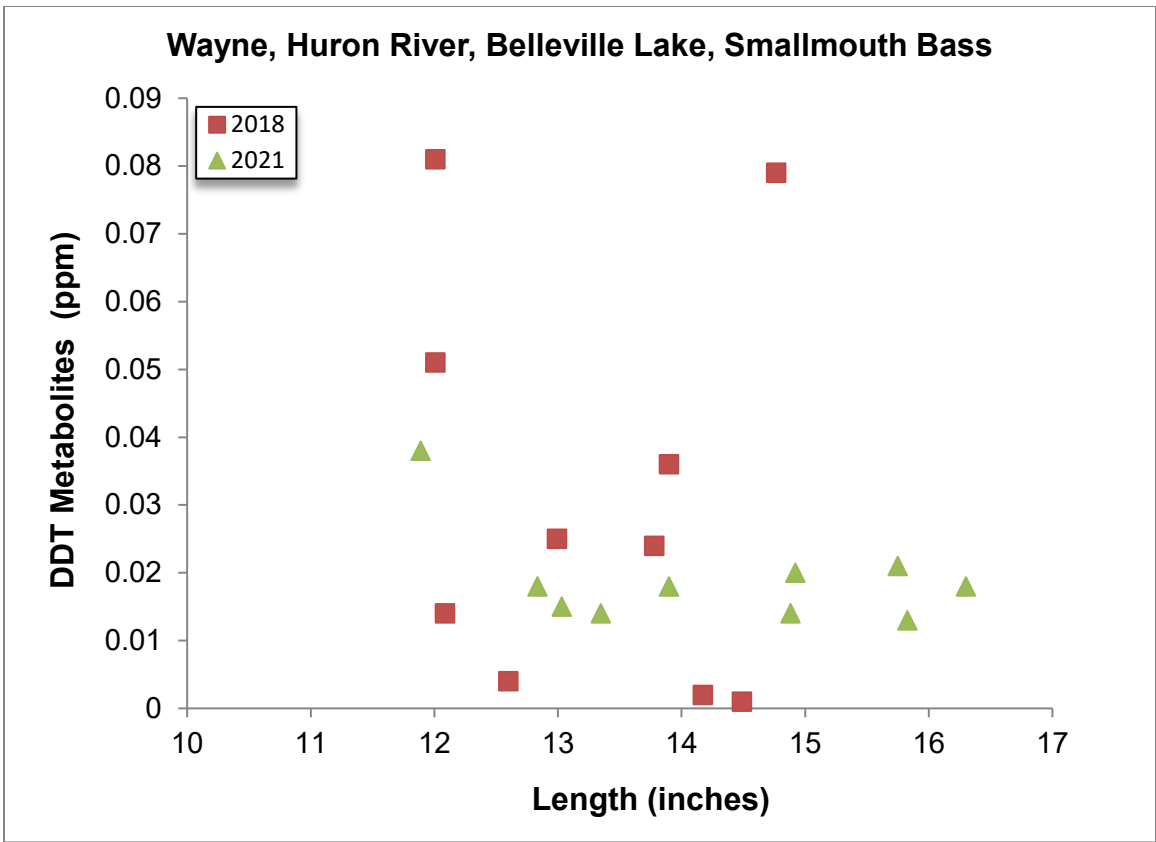
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2018	2021	20	11.9	14.0	13.8	16.3
Datasets available: 2018, 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	11	0.025	0.002	0.059	0.037	4
DDT	11	0.022	<0.001	0.079	0.037	16
Chlordane	11	0.001	<0.001	0.003	0.002	16
Toxaphene	11	ND	--	--	--	--
PFOS	20*	48.6 ppb	16.7 ppb	89 ppb	57.8 ppb	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.088	0.056				
DDT	0.067	0.040				
Chlordane	0.075	0.072				
Toxaphene	--	--				
PFOS	0.025	0.001				
Final meal category based on UCL:						2

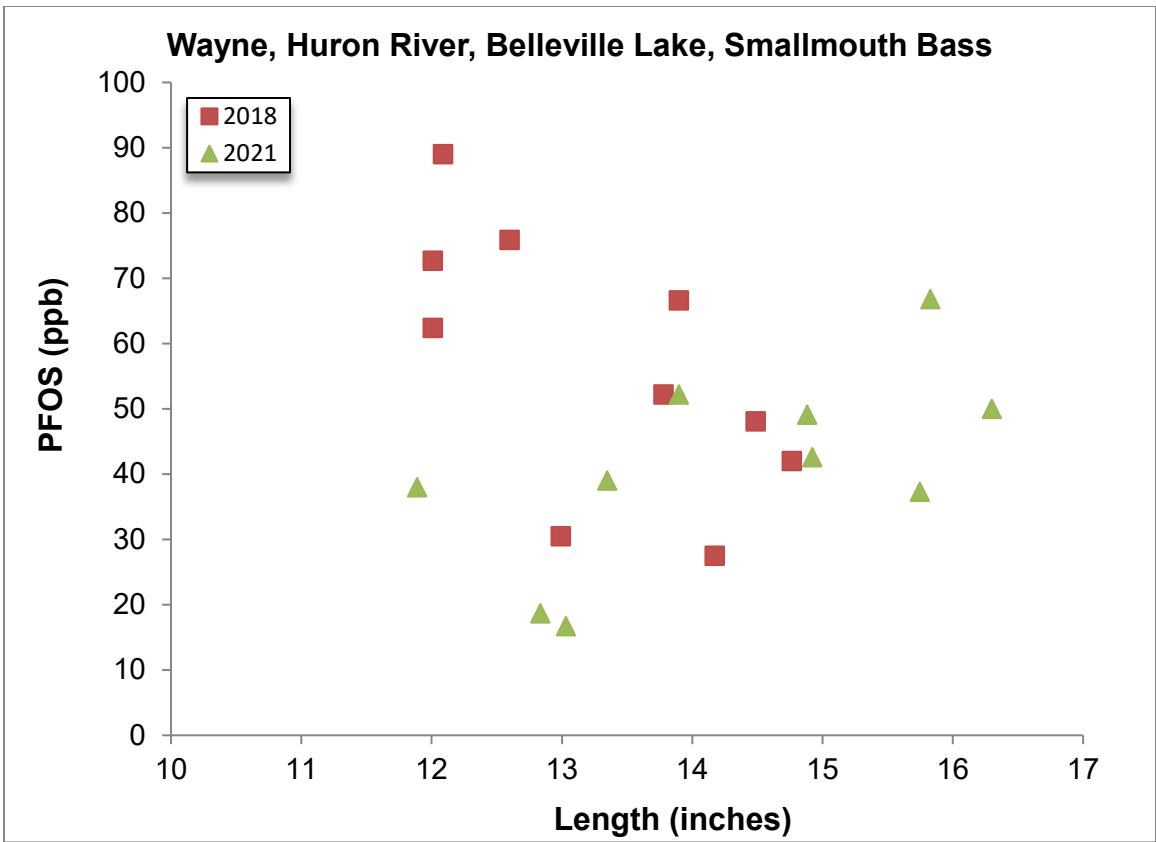
* Sublegal sized fish used in the analysis as no correlation has been observed between fish size and PFOS concentration in the statewide dataset.

Existing MDHHS Advisory: There is a Do Not Eat advisory for all fish species from this section of the Huron River due to PFOS.

Recommendation: No change to the advisory is recommended. MDHHS will continue to evaluate PFOS concentrations in fish throughout the Huron River to determine whether the existing Do Not Eat advisory for all species from this section of the river is appropriate.







Rock Bass

**Belleville Lake
Huron River**

Wayne County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2021	2021	8	6.8	NA	6.8	9.7
Datasets available: 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	8	0.083	0.061	0.120	0.099	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.632	0.608				

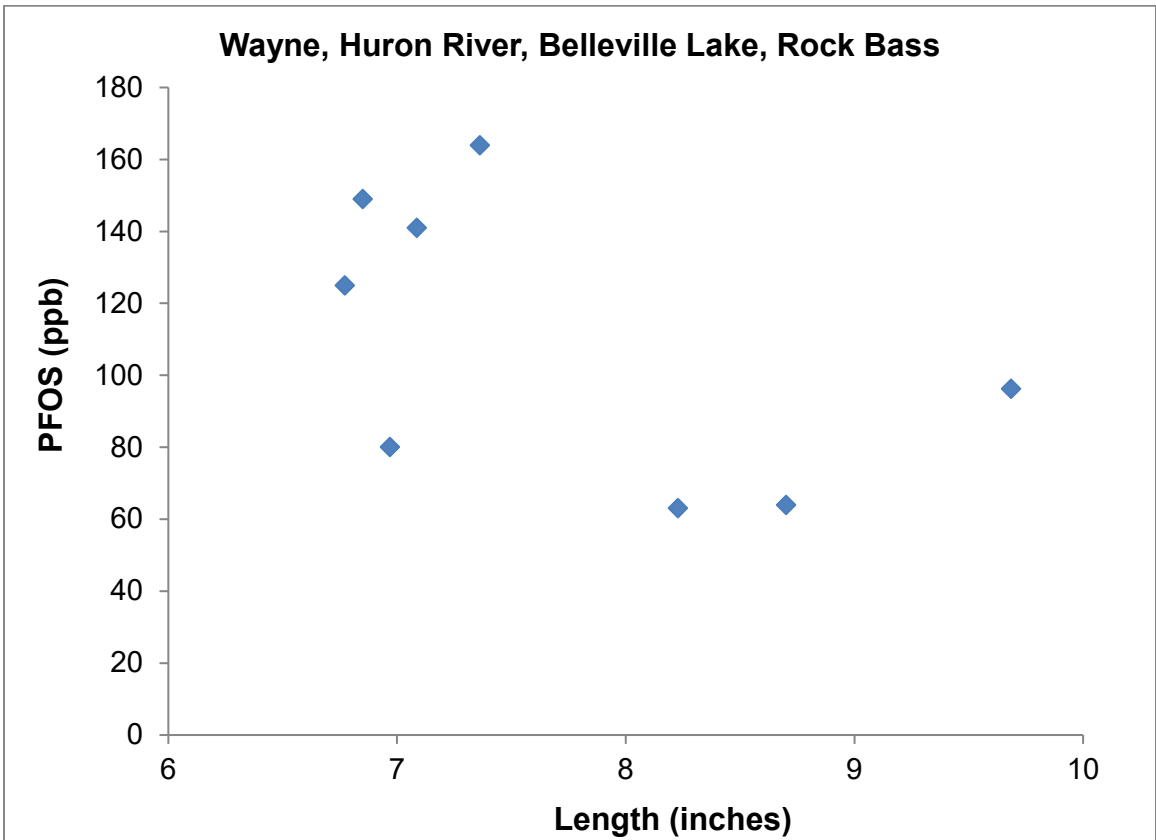
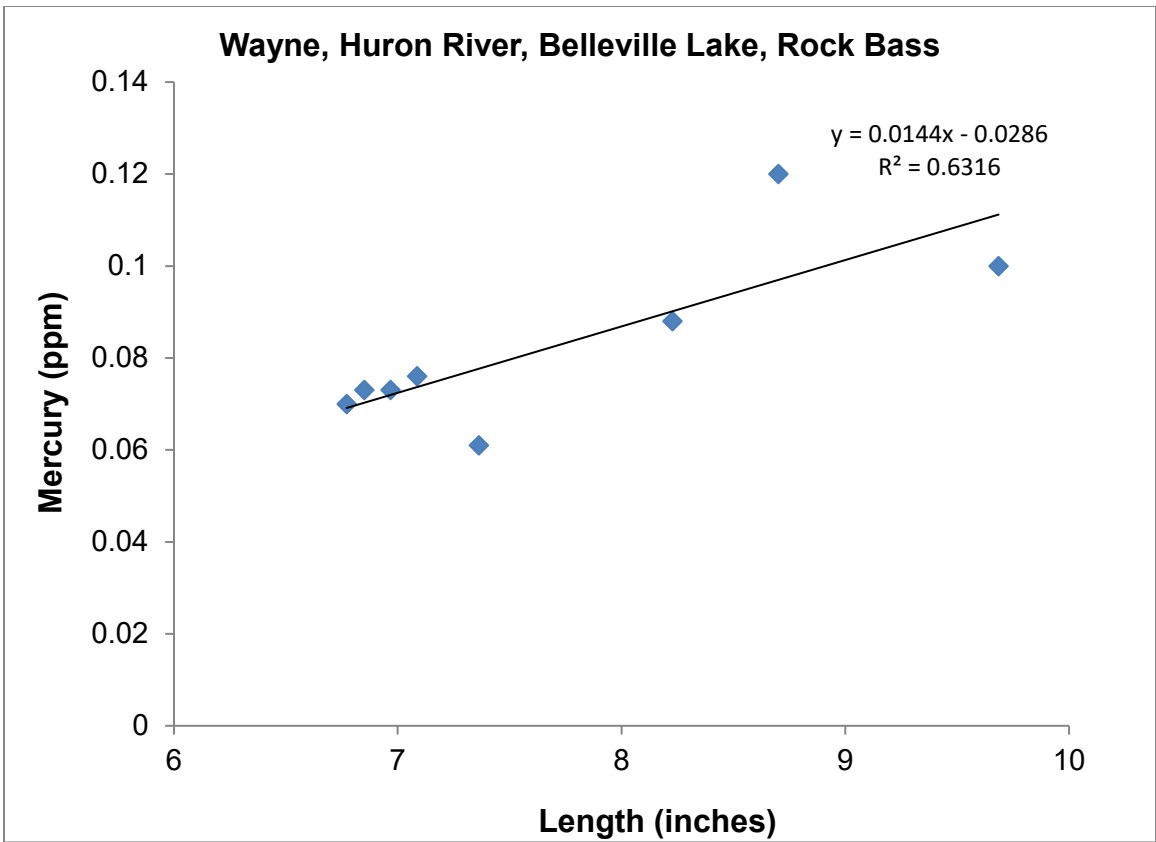
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2021	2021	8	6.8	NA	6.8	9.7
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	8	110.3 ppb	63.1 ppb	164.0 ppb	143.5 ppb	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.298	0.292				
Final meal category based on UCL:						1

Existing MDHHS Advisory: There is a Do Not Eat advisory for all fish species from this section of the Huron River due to PFOS.

Recommendation: No change to the advisory is recommended. MDHHS will continue to evaluate PFOS concentrations in fish throughout the Huron River to determine whether the existing Do Not Eat advisory for all species from this section of the river is appropriate. Additional rock bass should be collected to determine if PFOS concentrations remain below the Do Not Eat advisory threshold.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
5	0.043	16
6	0.068	16
7	0.072	12
8	0.087	12
9	0.101	8
10	0.115	8
<i>Shaded area denotes extrapolated estimates</i>		



Walleye

**Belleville Lake
Huron River**

Wayne County

Hg Analysis:

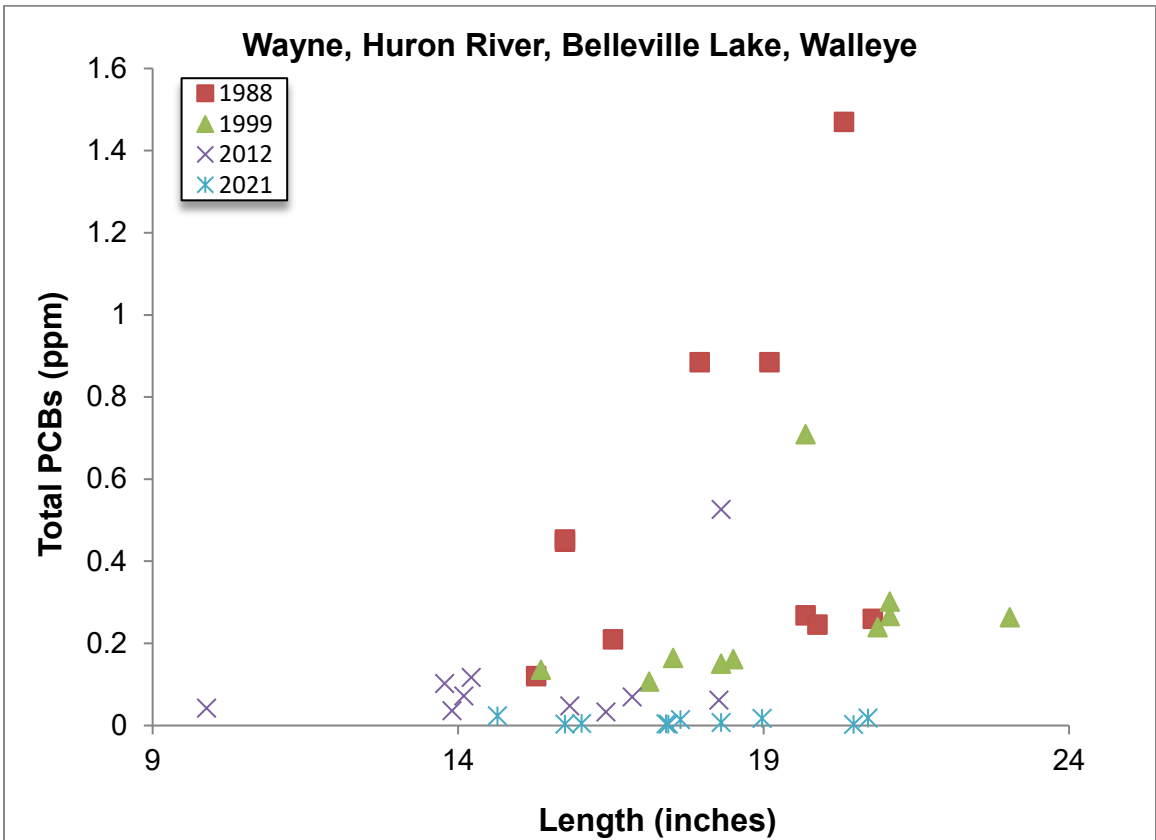
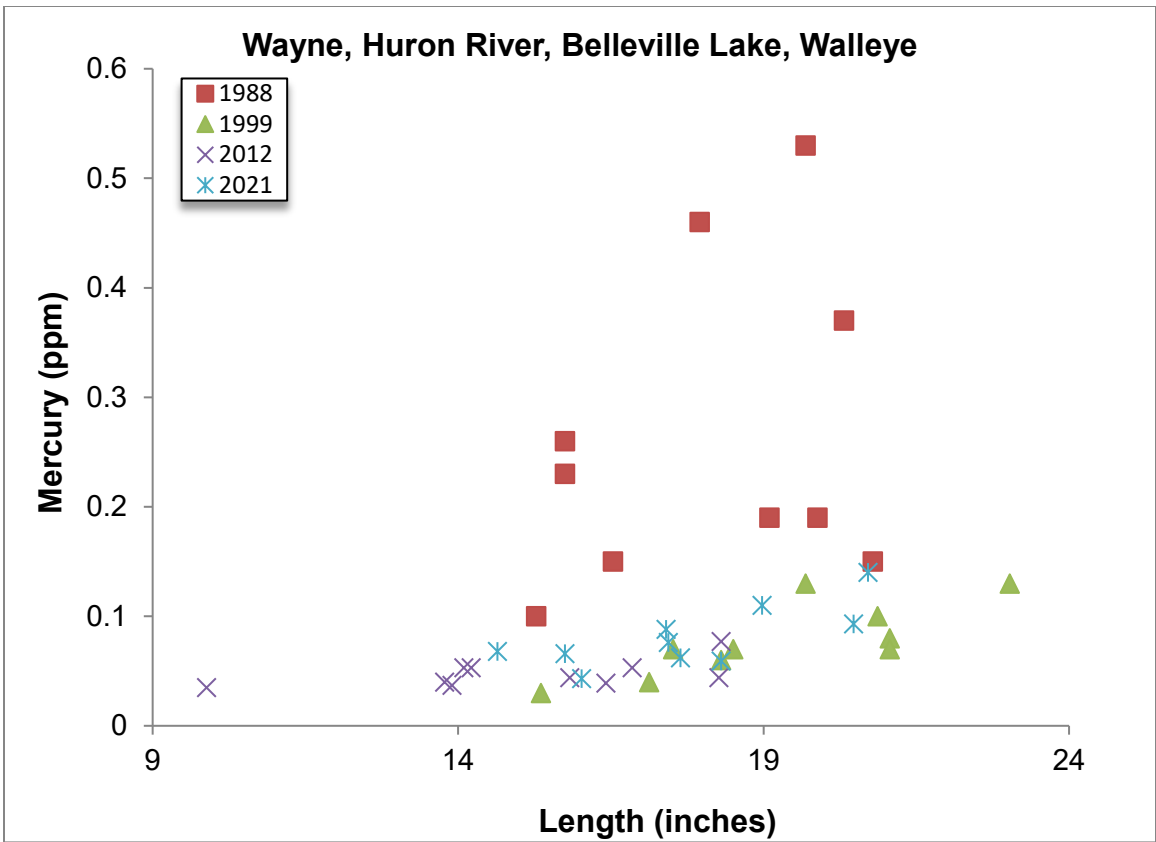
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1988	2021	40	9.9	15.0	14.6	23.0
Datasets available: 1988, 1999, 2012, 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	35	0.128	0.030	0.530	0.168	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.100	0.233				

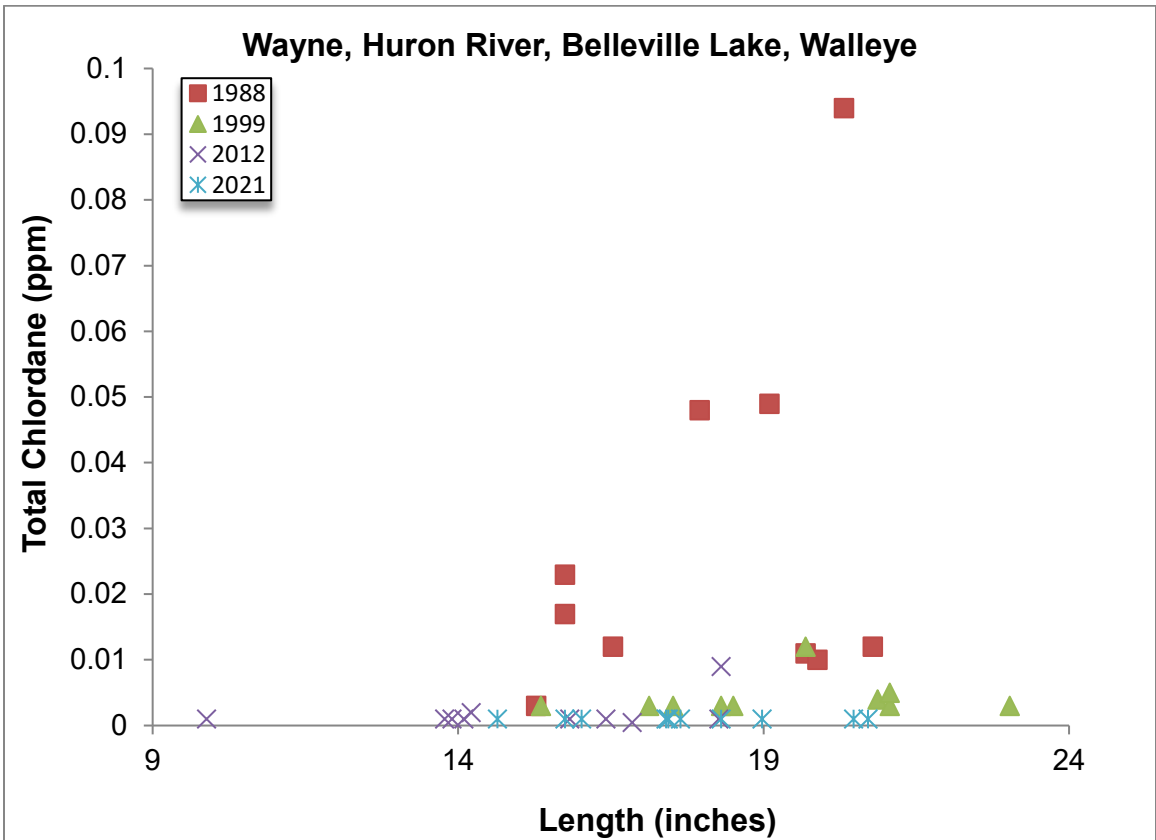
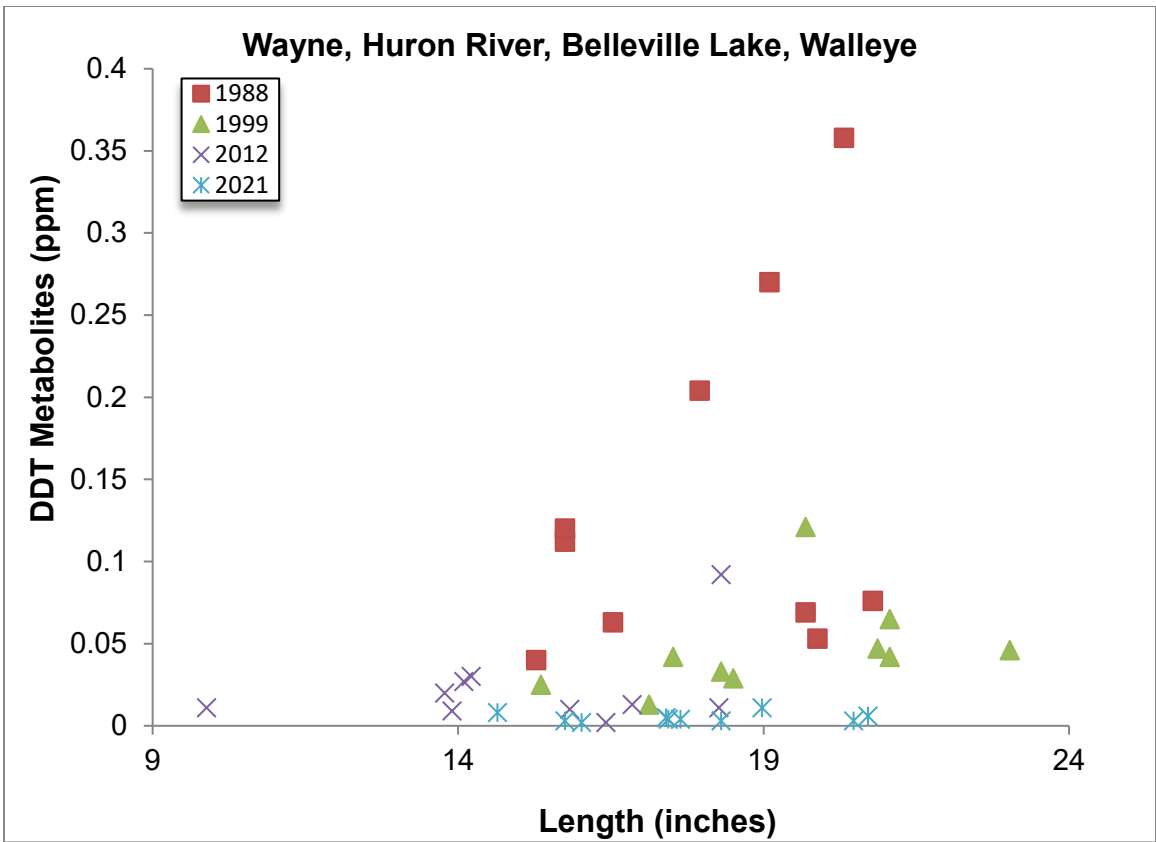
Organics Analysis:

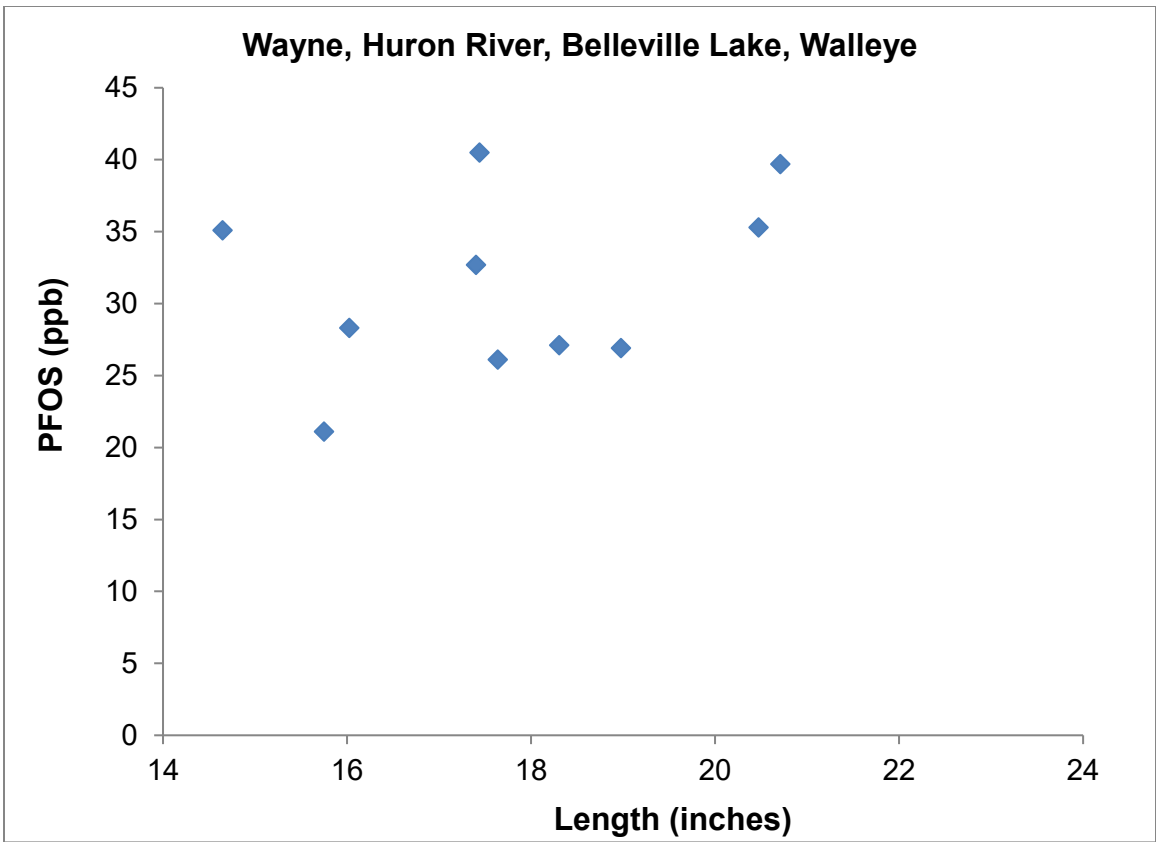
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2021	20	9.9	15.0	14.6	20.7
Datasets available: No PFOS: 1988, 1999, 2012; With PFOS: 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	15	0.056	0.003	0.527	0.129	1
DDT	15	0.012	0.002	0.092	0.024	16
Chlordane	15	0.002	<0.001	0.009	0.003	16
Toxaphene	15	ND	--	--	--	--
PFOS	10	31.3 ppb	21.1 ppb	40.5 ppb	35.8 ppb	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.009	0.002				
DDT	0.014	0.014				
Chlordane	0.017	0.022				
Toxaphene	--	--				
PFOS	0.120	0.123				
Final meal category based on UCL:						1

Existing MDHHS Advisory: There is a Do Not Eat advisory for all fish species from this section of the Huron River due to PFOS.

Recommendation: No change to the advisory is recommended. MDHHS will continue to evaluate PFOS concentrations in fish throughout the Huron River to determine whether the existing Do Not Eat advisory for all species from this section of the river is appropriate. Additional walleye should be collected to determine if PFOS concentrations remain below the Do Not Eat advisory threshold.







White Sucker

**Belleville Lake
Huron River**

Wayne County

Hg Analysis:

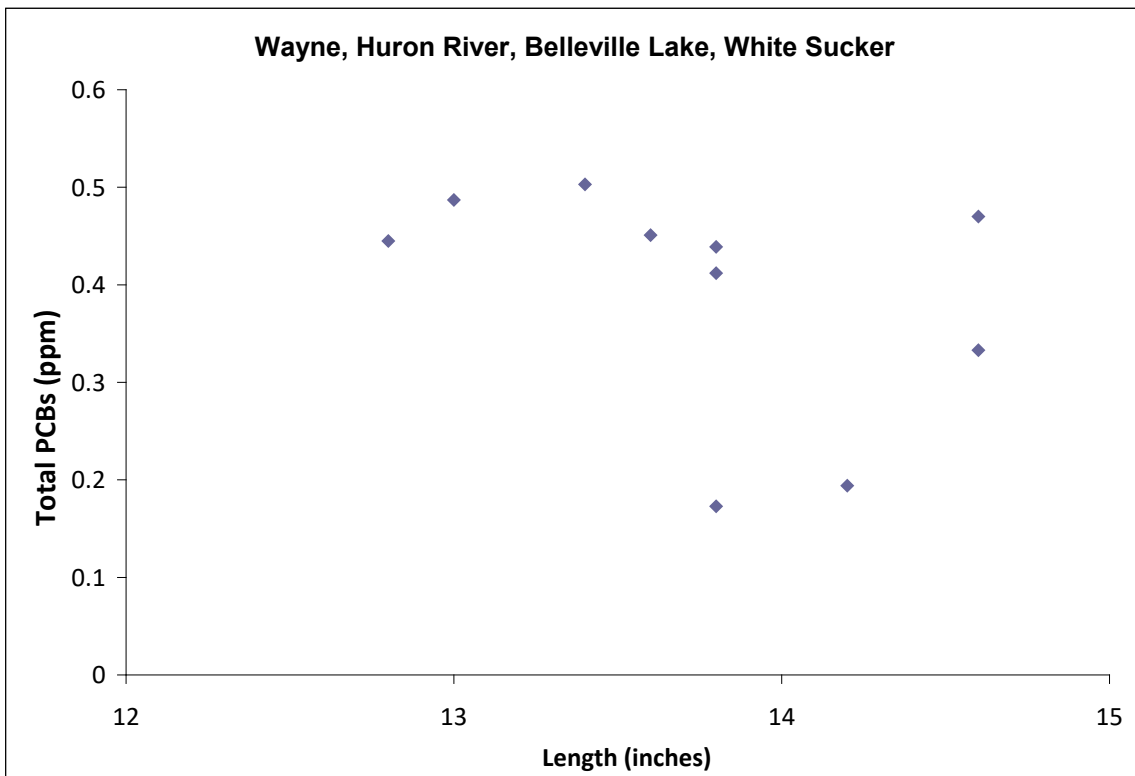
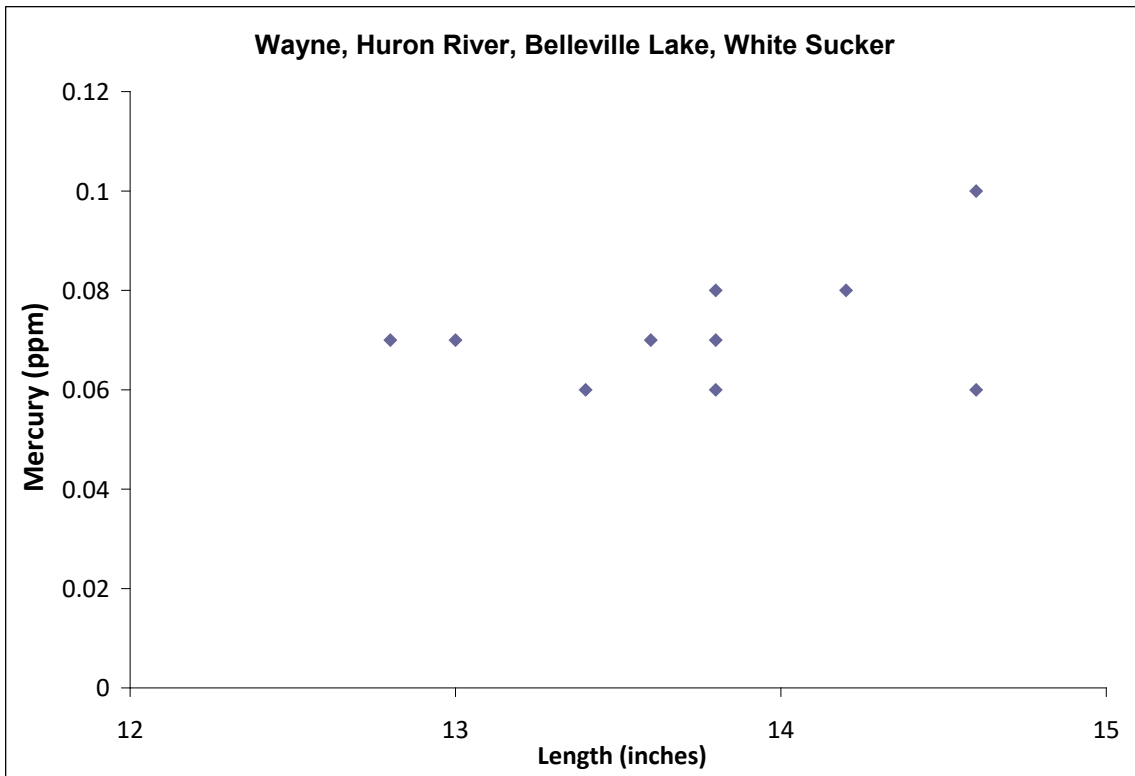
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1999	1999	10	12.8	na	12.8	14.6
Datasets available: 1999						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	10	0.072		0.080		12
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.139	0.106				

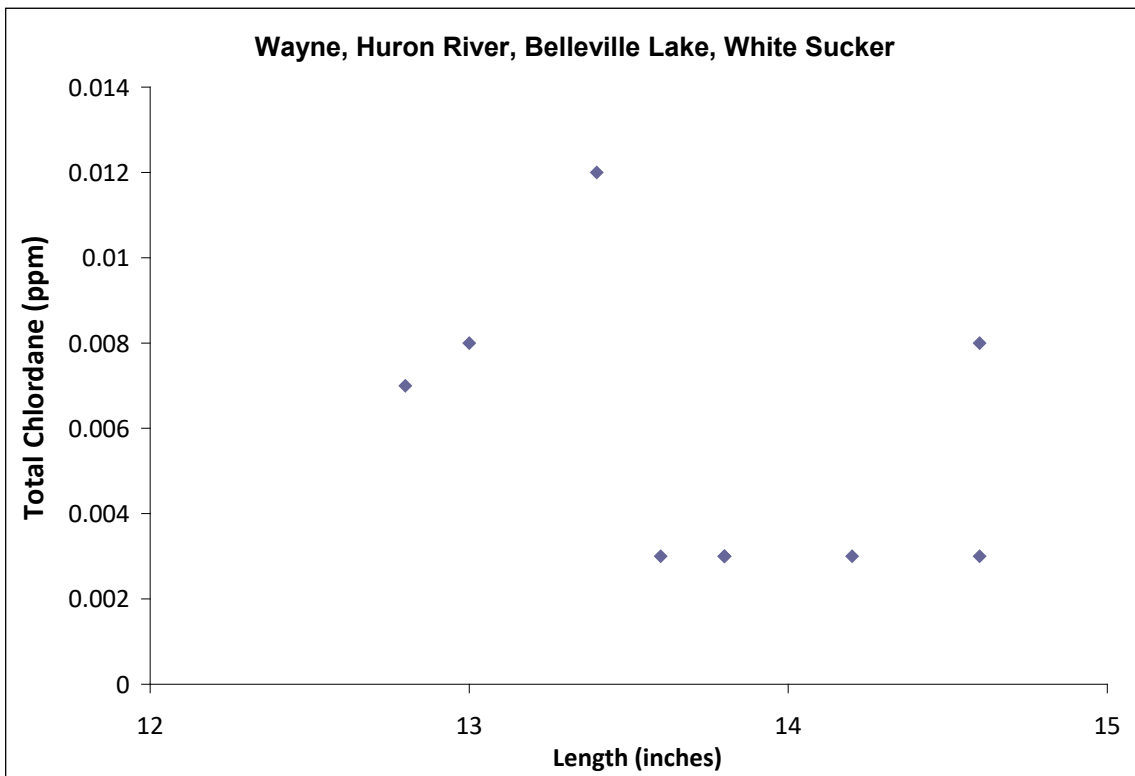
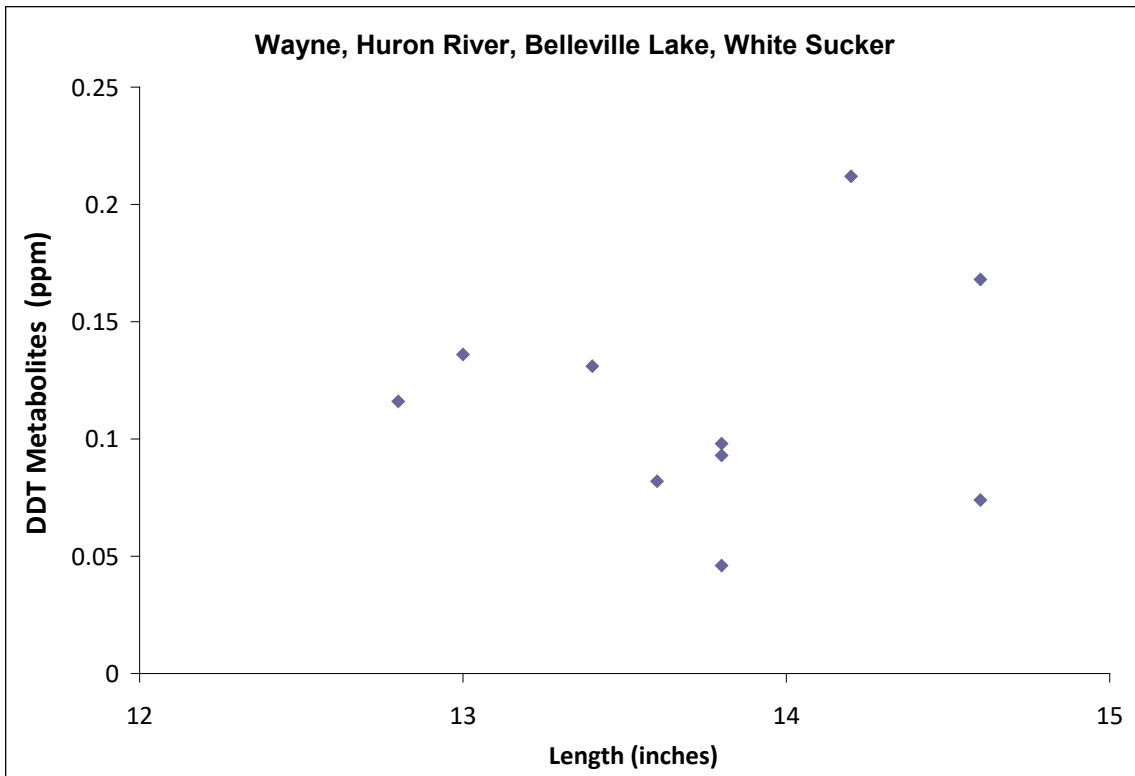
Organics Analysis:

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	12.8	na	12.8	14.6
Datasets available: 1999						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	10	0.391		0.480		Limited
DDT	10	0.116		0.150		12
Chlordane	10	0.005		0.010		--
Toxaphene	10	ND		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.150	0.118				
DDT	0.014	0.000				
Chlordane	0.145	0.166				
Toxaphene	--	--		Final meal category based on UCL: Limited		

Existing Advisory: Sensitive populations should not eat these fish. Healthy adults should limit consumption of Belleville Lake white sucker to no more than 1 or 2 meals per year due to PCBs. DDT and mercury would cause advisories. Belleville Lake has legacy contamination from a point source for PCBs.

Recommendation: There is a Do Not Eat advisory for all fish species from this section of the Huron River due to PFOS.





Hg Analysis:

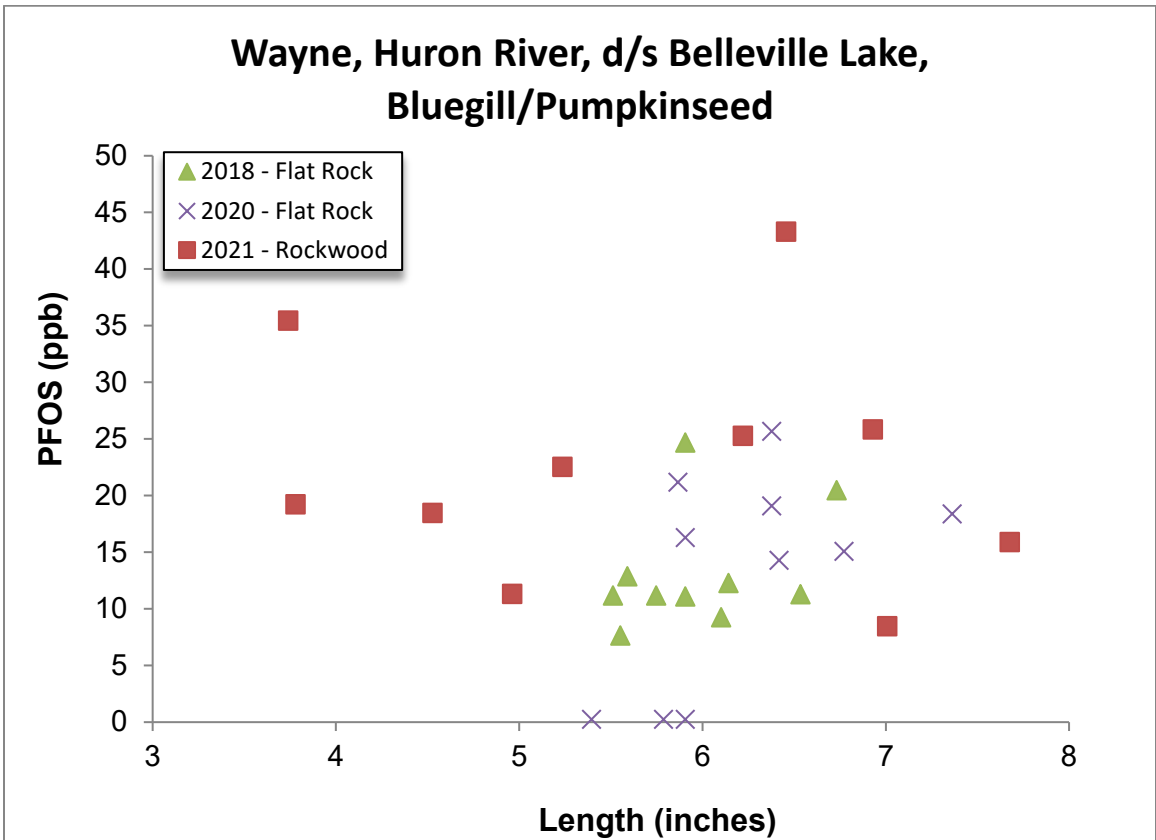
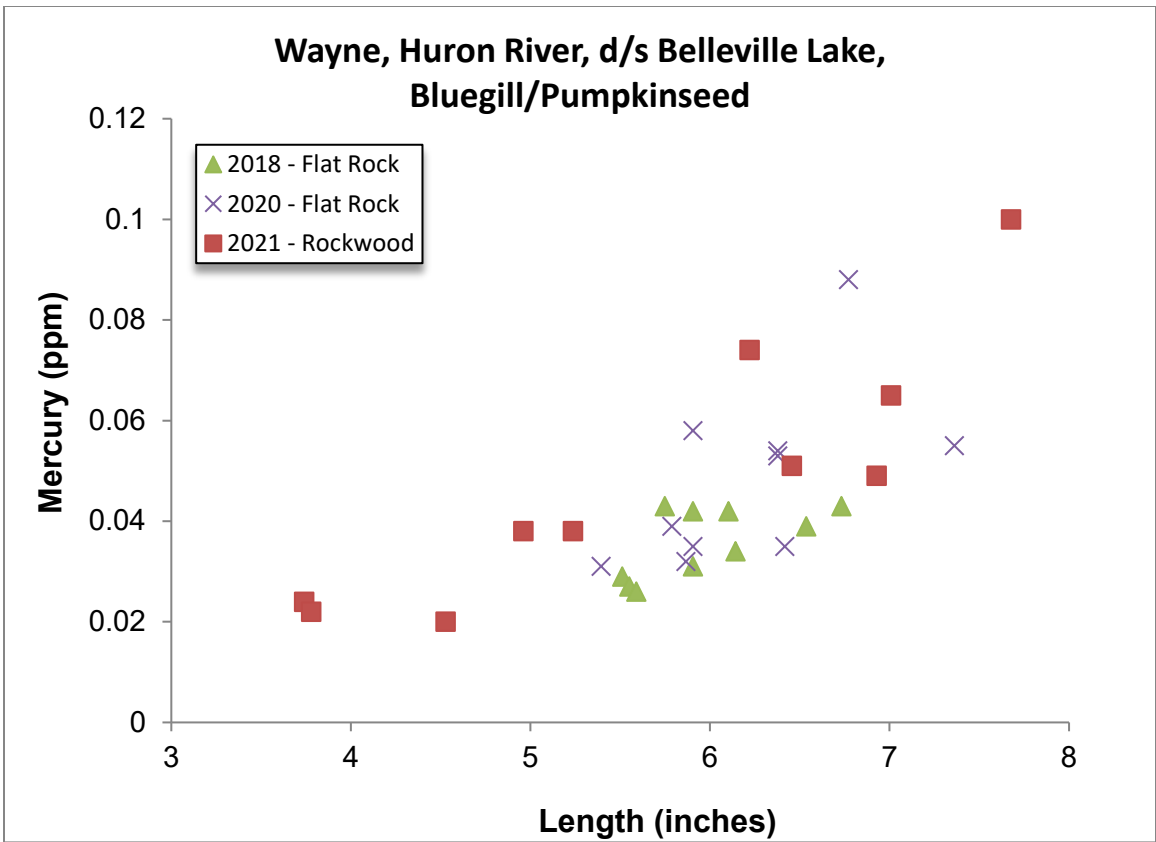
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2018	2021	30	3.7	NA	3.7	7.7
Datasets available: 2018, 2020, 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	30	0.044	0.020	0.100	0.051	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.513	0.582				

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	30	3.7	NA	3.7	7.7
Datasets available: 2018, 2020, 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	30	16.3 ppb	<0.25 ppb	43.3 ppb	19.9 ppb	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.002	0.004				
Final meal category based on UCL:						4

Existing MDHHS Advisory: No one should eat more than 8 meals per month of bluegill or sunfish of any size from the Huron River downstream of where the river crosses I-275, including the Flat Rock impoundment, due to PFOS.

Recommendation: No one should eat more than 4 meals per month of bluegill or sunfish of any size from the Huron River downstream of where the river crosses I-275 due to PFOS.



Common Carp

**Huron River
Downstream of Belleville Dam**

Wayne County

Hg Analysis:

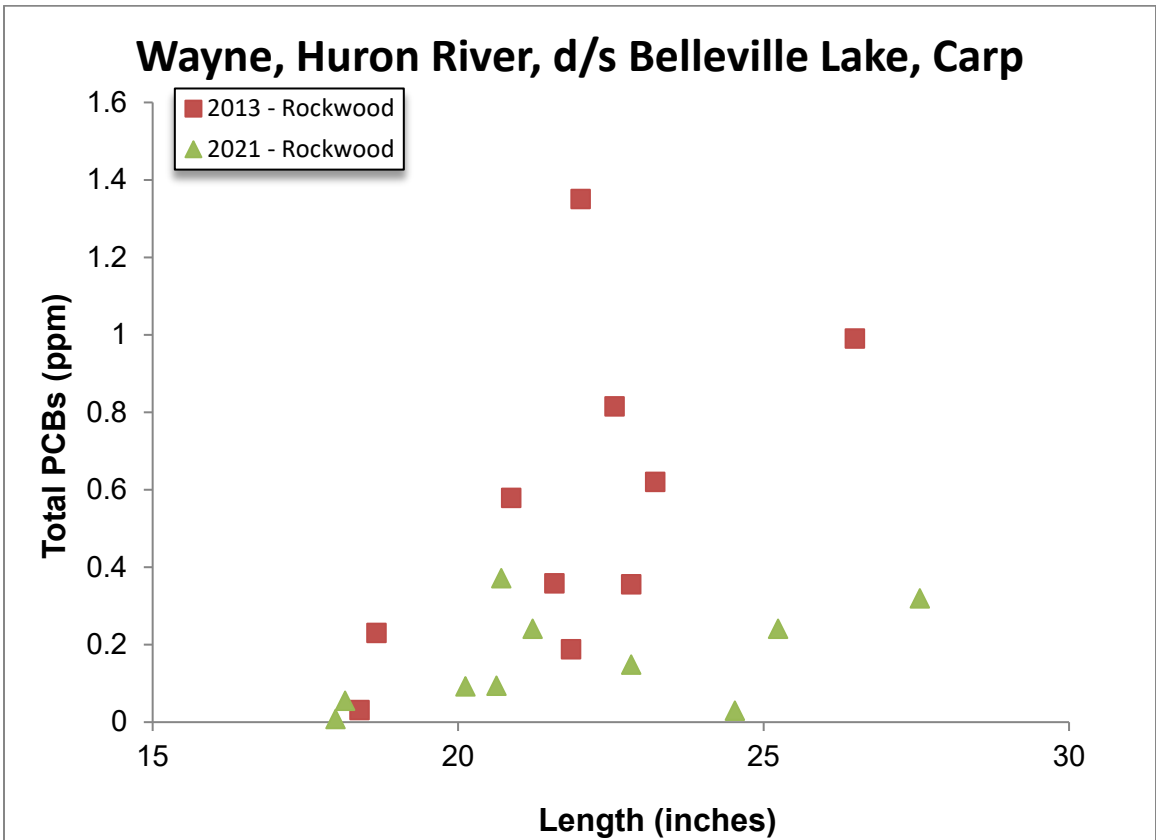
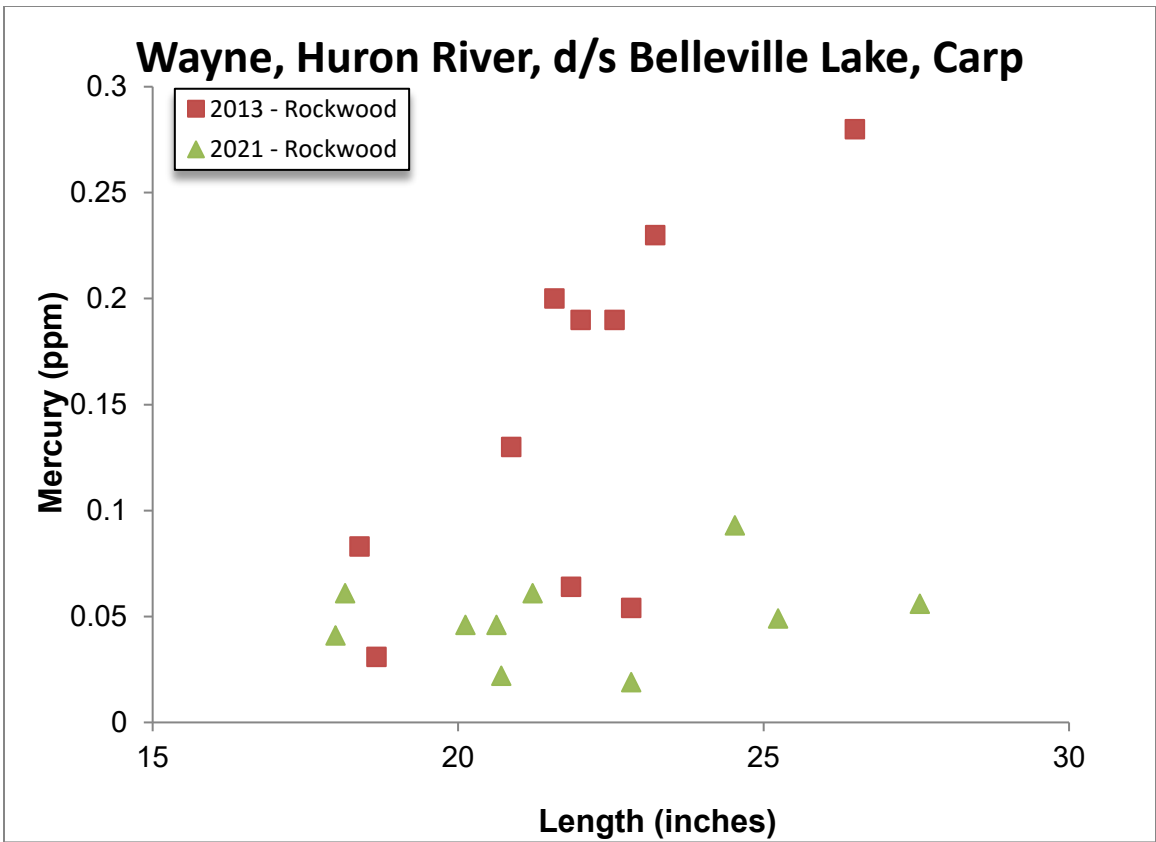
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2013	2021	20	18.0	NA	18.0	27.6
Datasets available: 2013, 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	20	0.097	0.019	0.280	0.134	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.126	0.582				

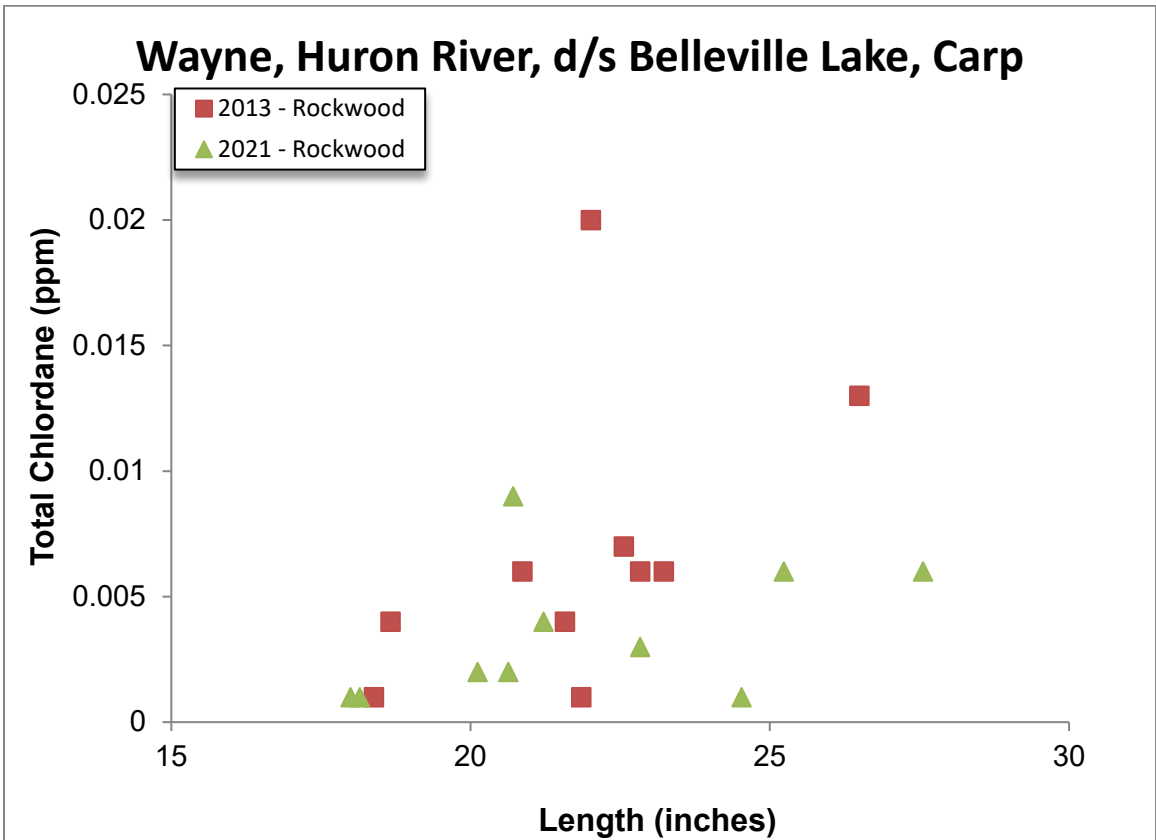
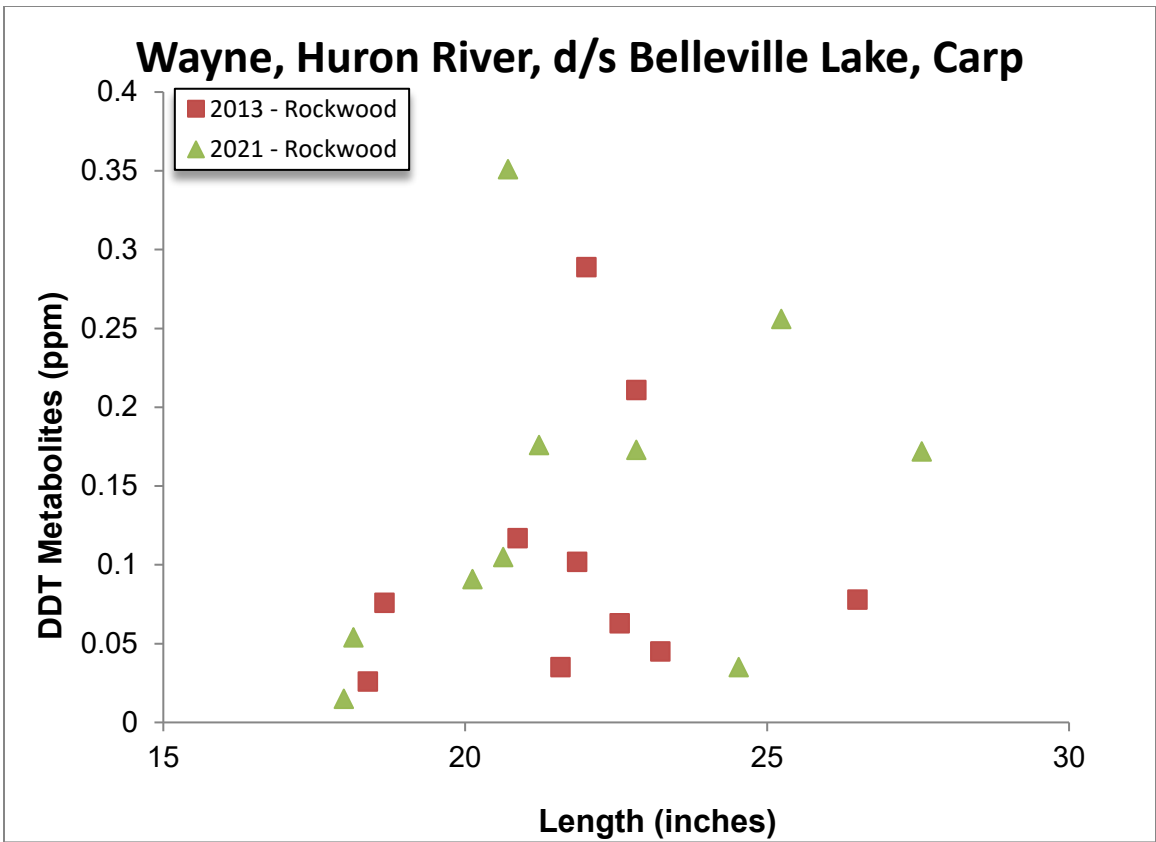
Organics Analysis:

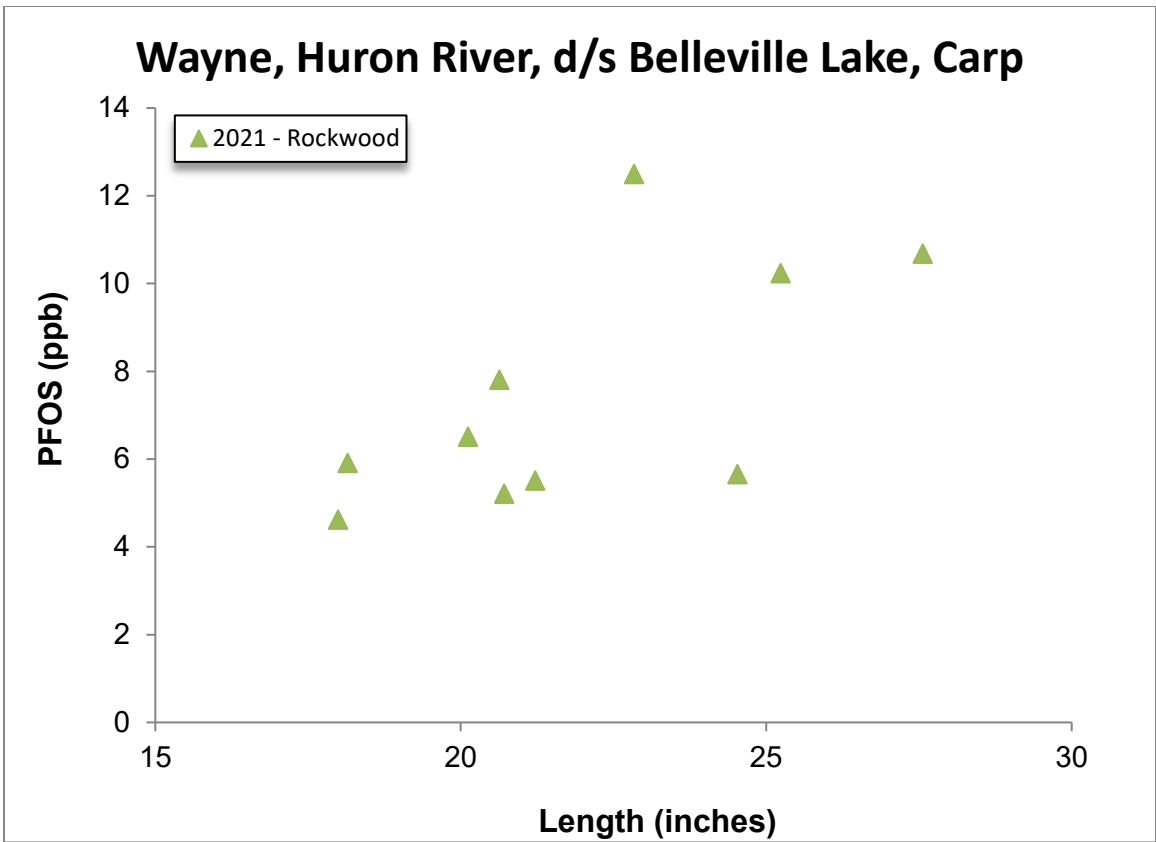
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2013	2021	20	18.0	NA	18.0	27.6
Datasets available: 2013 (No PFOS), 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	20	0.356	0.008	1.351	0.523	Limited
DDT	20	0.124	0.015	0.351	0.168	8
Chlordane	20	0.005	0.001	0.020	0.007	16
Toxaphene	20	ND	--	--	--	--
PFOS	10	7.5 ppb	4.6 ppb	12.5 ppb	9.4 ppb	12
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.139	0.237				
DDT	0.070	0.136				
Chlordane	0.147	0.239				
Toxaphene	--	--				
PFOS	0.422	0.443				
Final meal category based on UCL:						Limited

Existing MDHHS Advisory: Sensitive populations should not eat these fish. Healthy adults should not eat more than 1 or 2 meals per year of carp smaller than 28 inches from the Huron River downstream of where the river crosses I-275, including the Flat Rock impoundment, due to PCBs and dioxins. No one should eat these fish larger than 28 inches.

Recommendation: No change to the advisory is recommended. Larger fish will need to be analyzed to relax the existing Do Not Eat advisory for carp larger than 28 inches.







**Largemouth Bass
Smallmouth Bass**

**Huron River
Downstream of Belleville Dam**

Wayne County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2013	2021	38	10.7	14.0	13.7	18.3	
Datasets available: 2013, 2018, 2020, 2021							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	26	0.183		0.086	0.340	0.211	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.450	0.422					

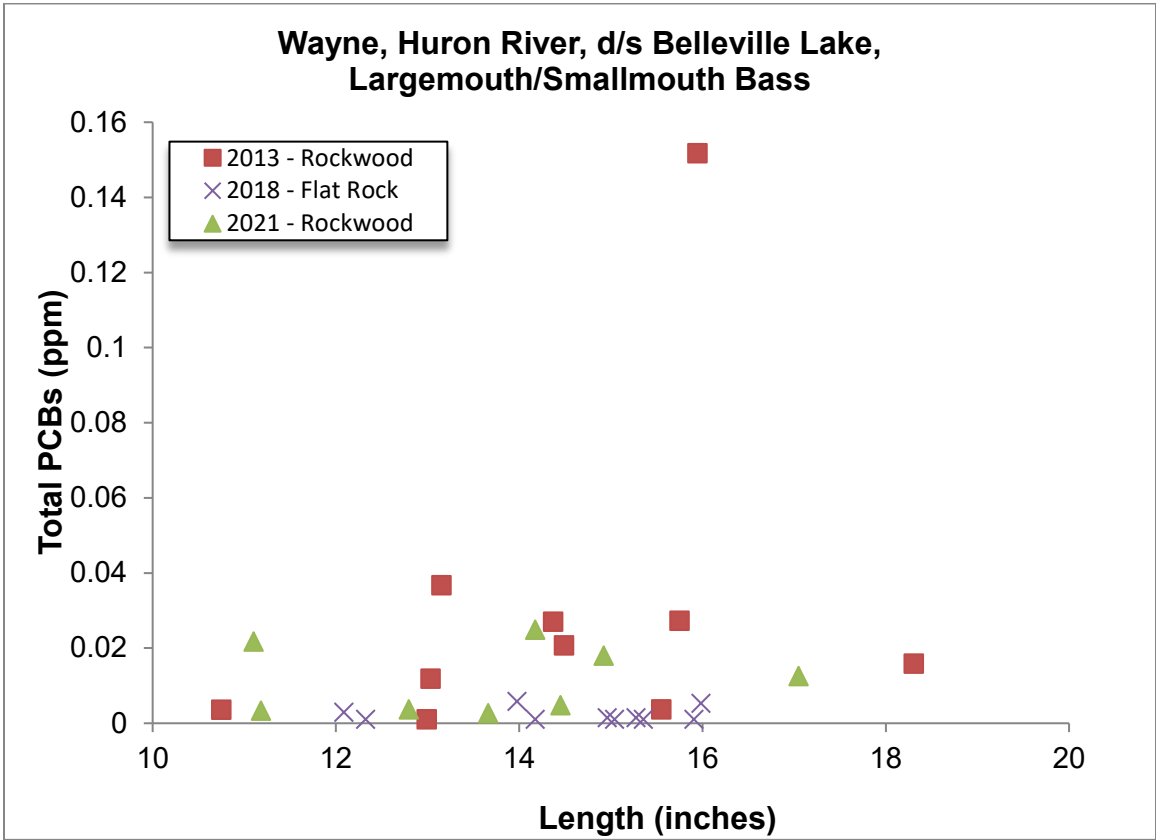
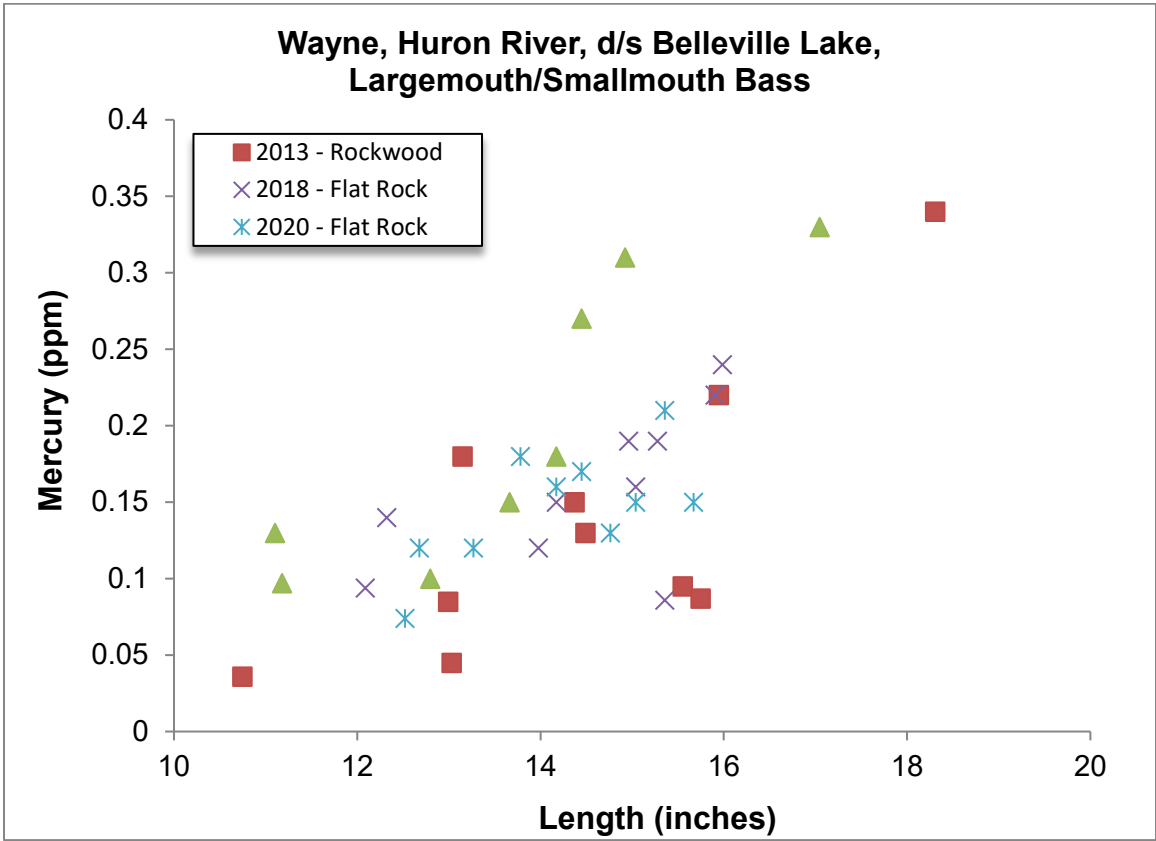
Organics Analysis:

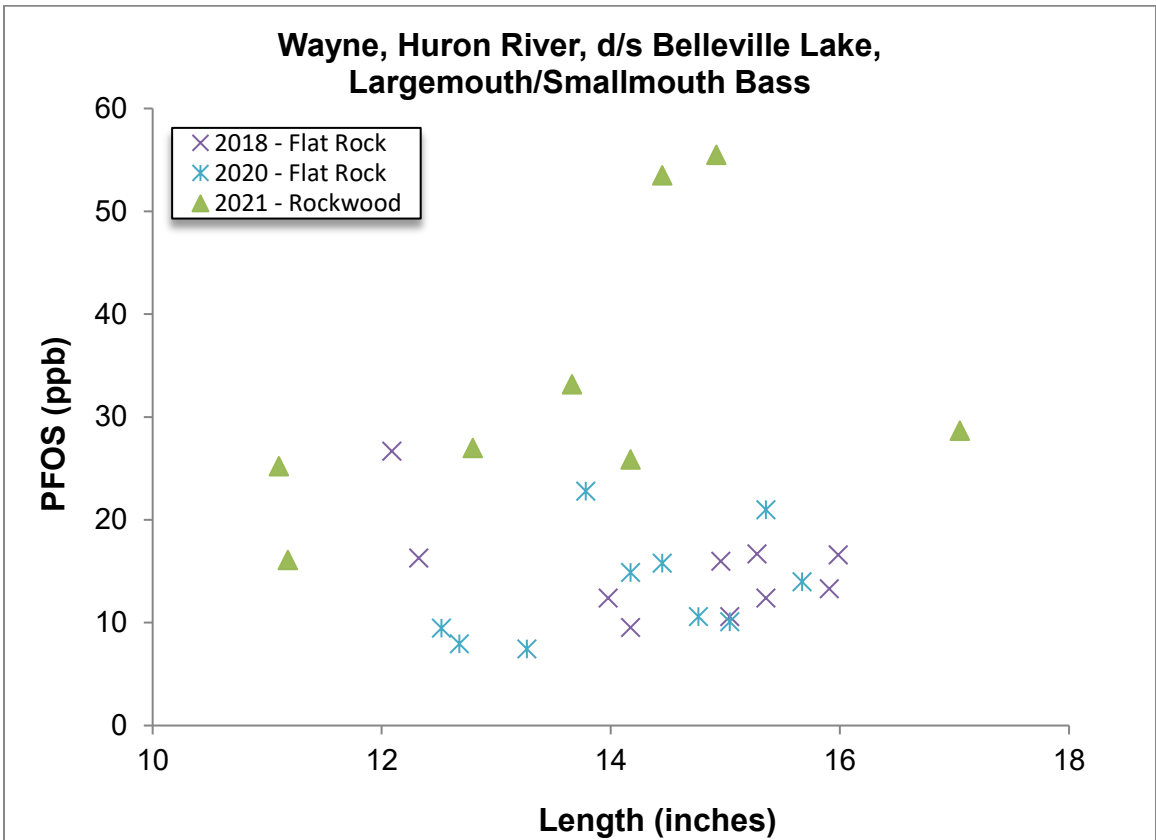
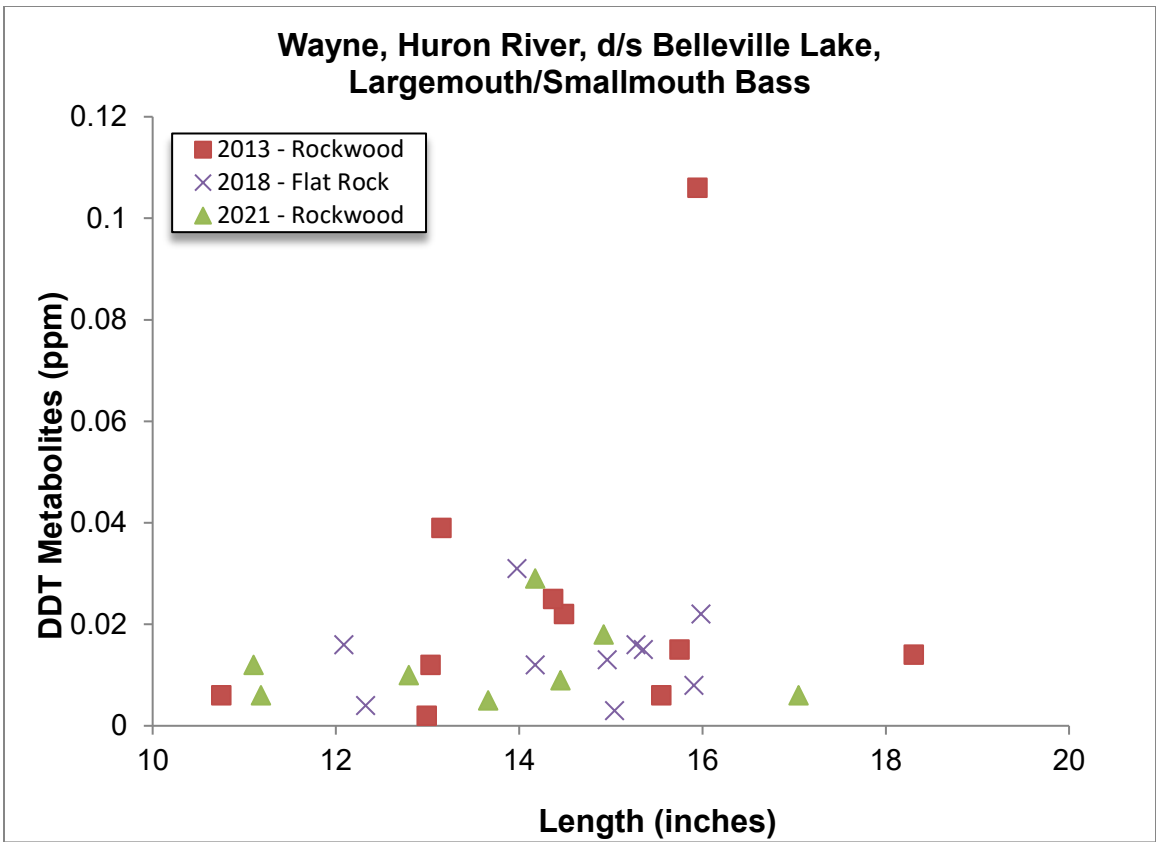
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2013	2021	38	10.7	14.0	13.7	18.3	
Datasets available: 2013 (No PFOS), 2018, 2020 (No PCB/Organics), 2021							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	19	0.017		< 0.001	0.152	0.034	4
DDT	19	0.020		0.003	0.106	0.031	16
Chlordane	19	0.001		< 0.001	0.001	0.001	16
Toxaphene	19	ND		--	--	--	--
PFOS	28*	19.6 ppb		7.5 ppb	55.5 ppb	26.3 ppb	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.039	0.024					
DDT	0.043	0.056					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	0.001	0.001					
Final meal category based on UCL:							4

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

Existing MDHHS Advisory: No one should eat more than 4 meals per month of largemouth and smallmouth bass of any size from the Huron River downstream of where the river crosses I-275, including the Flat Rock impoundment, due to mercury and PCBs. PFOS would cause a less restrictive advisory.

Recommendation: No one should eat more than 4 meals per month of largemouth and smallmouth bass of any size from the Huron River downstream of where the river crosses I-275, including the Flat Rock impoundment, due to mercury, PCBs, and PFOS.





Rock Bass

**Huron River
downstream of Belleville Dam**

Wayne County

Hg Analysis:

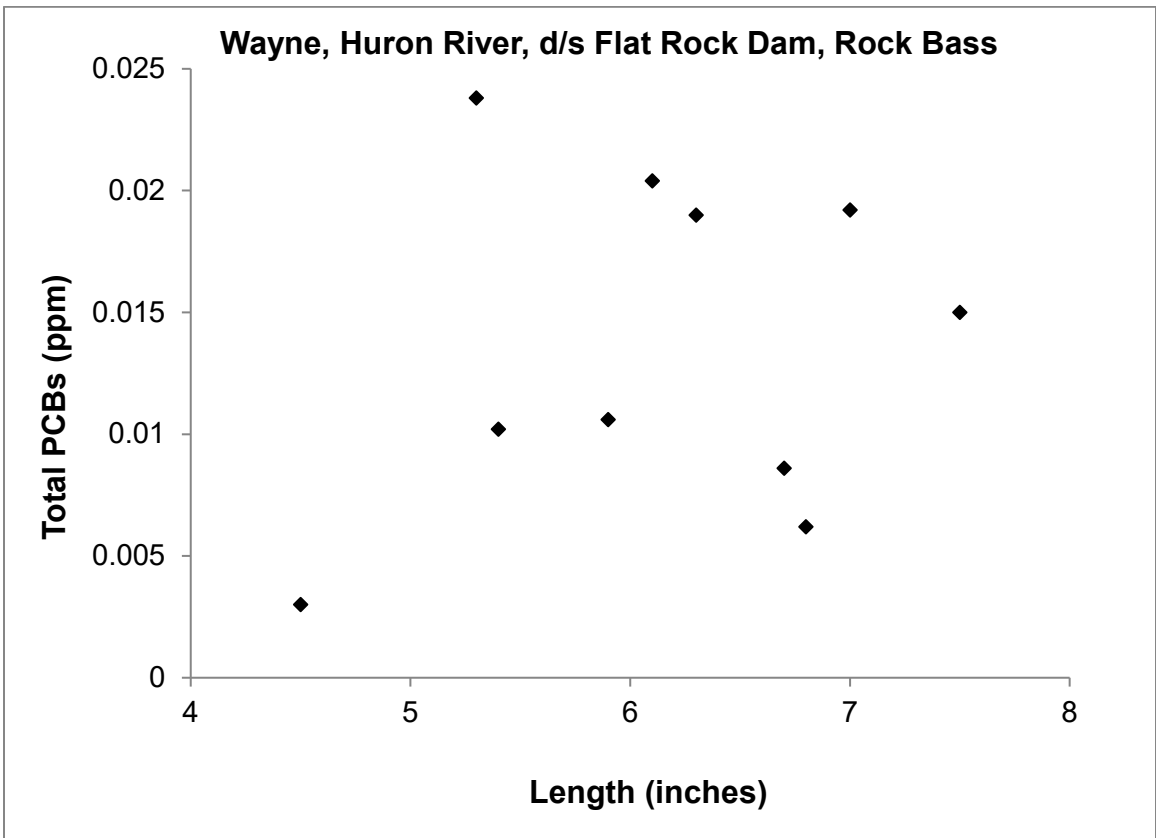
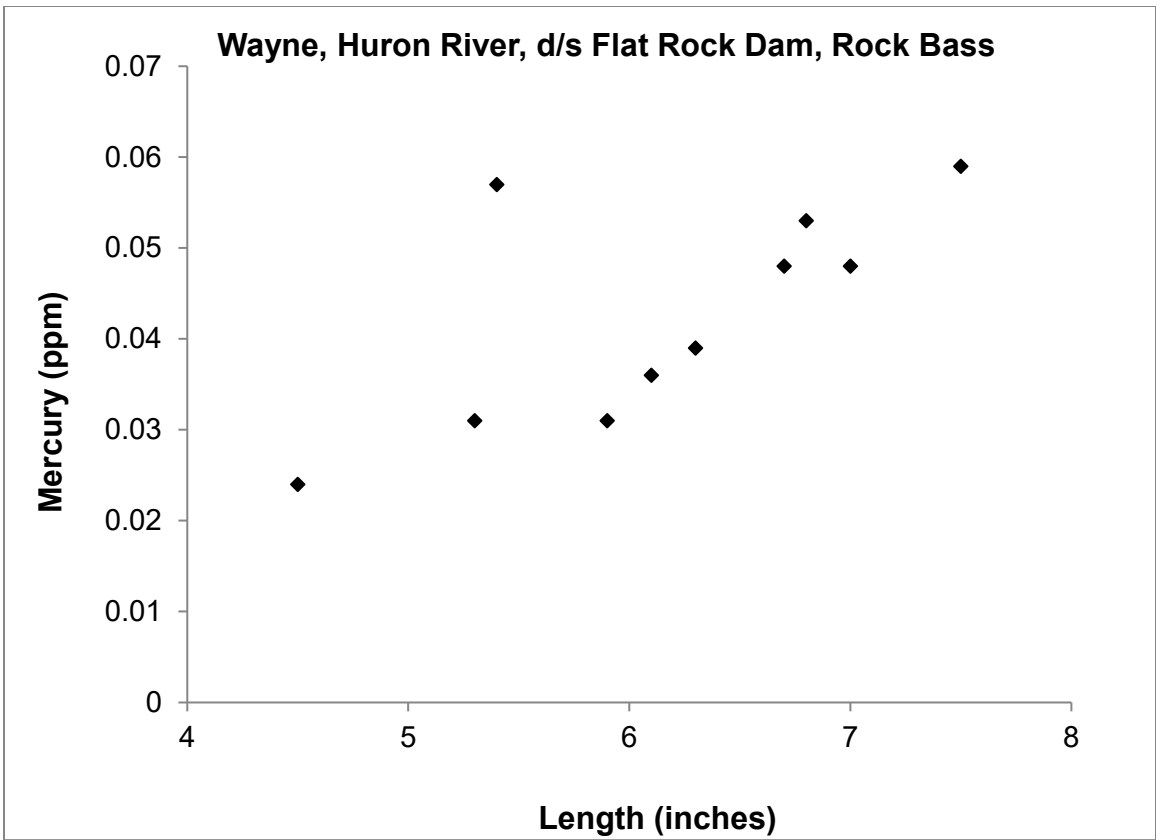
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2013	2013	10	4.5	na	4.5	7.5	
Datasets available: 2013							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.04		0.02	0.06	0.05	16
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.490	0.550					

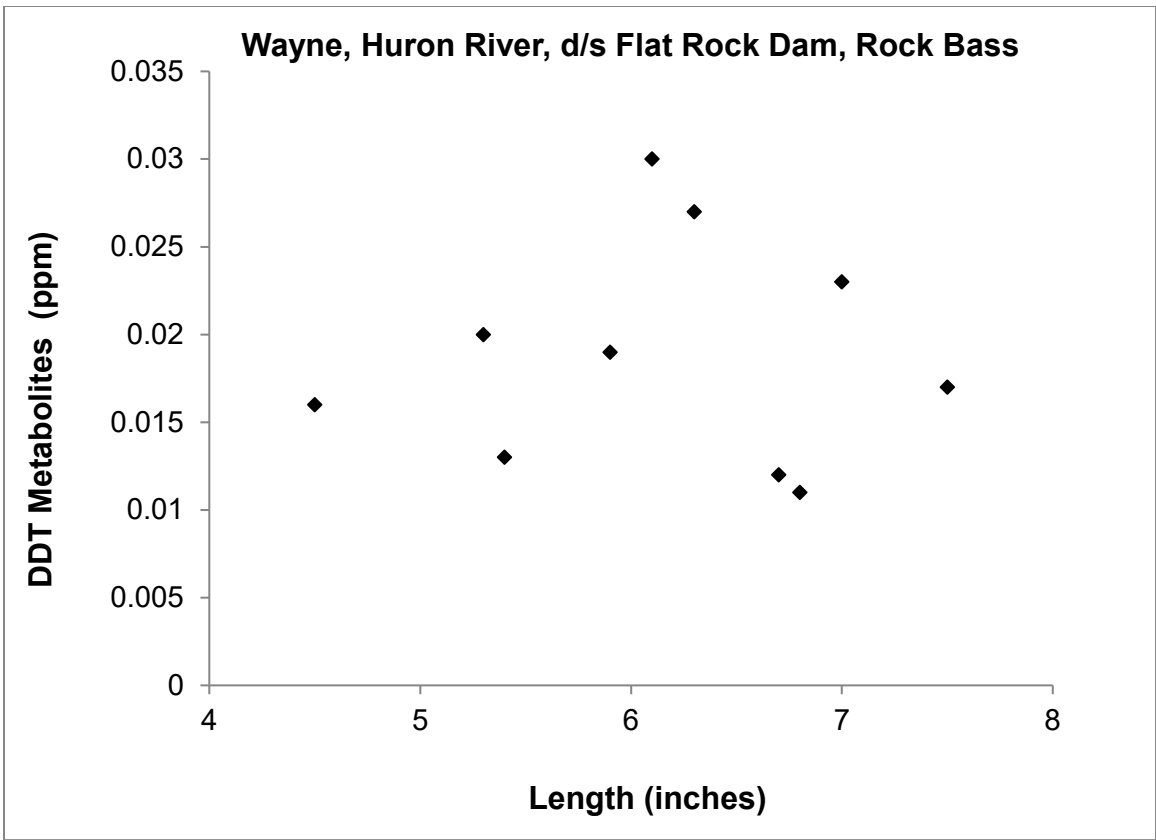
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2013	2013	10	4.5	na	4.5	7.5	
Datasets available: 2013							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.01		0.003	0.02	0.02	12
DDT	10	0.02		0.01	0.03	0.02	16
Chlordane	10	ND					
Toxaphene	10	ND					
TEQ	0	--					
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.044	0.144					
DDT	0.000	0.000					
Chlordane	--	--					
Toxaphene	--	--					
TEQ	--	--					
Final meal category based on UCL:							12

Existing Advisory: No one should eat more than 12 meals per month of rock bass from the Huron River downstream of the Flat Rock dam due to PCBs.

Recommendation: There is a Do Not Eat advisory for rock bass from this section of the Huron River due to PFOS. Note: Although the Do Not Eat advisory was relaxed for other species of fish from this section of the Huron River, the advisory for rock bass was maintained due to a lack of PFOS data for these fish and preliminary findings from other waterbodies suggesting that rock bass tend to contain higher levels of PFOS compared to other fish species.





Channel Catfish

**Flat Rock Impoundment
Huron River**

Wayne County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2017	2017	10	18.3	12	18.3	25
Datasets available: 2017						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.18	0.05	0.54	0.30	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.051	0.018				

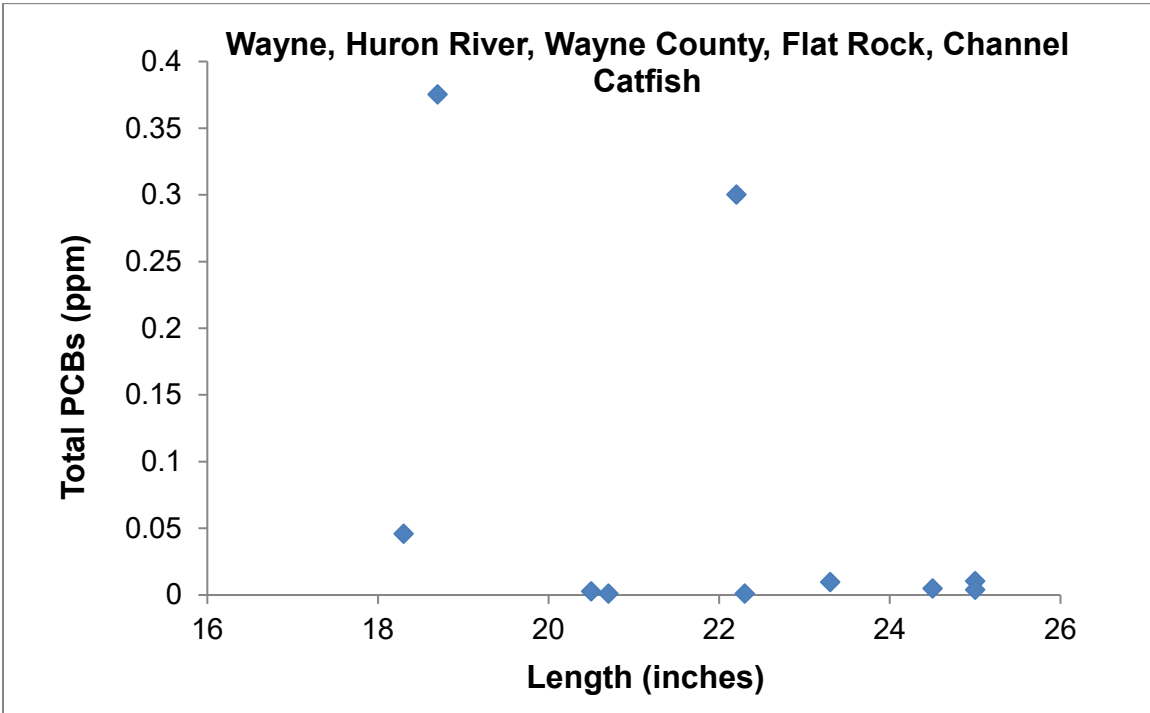
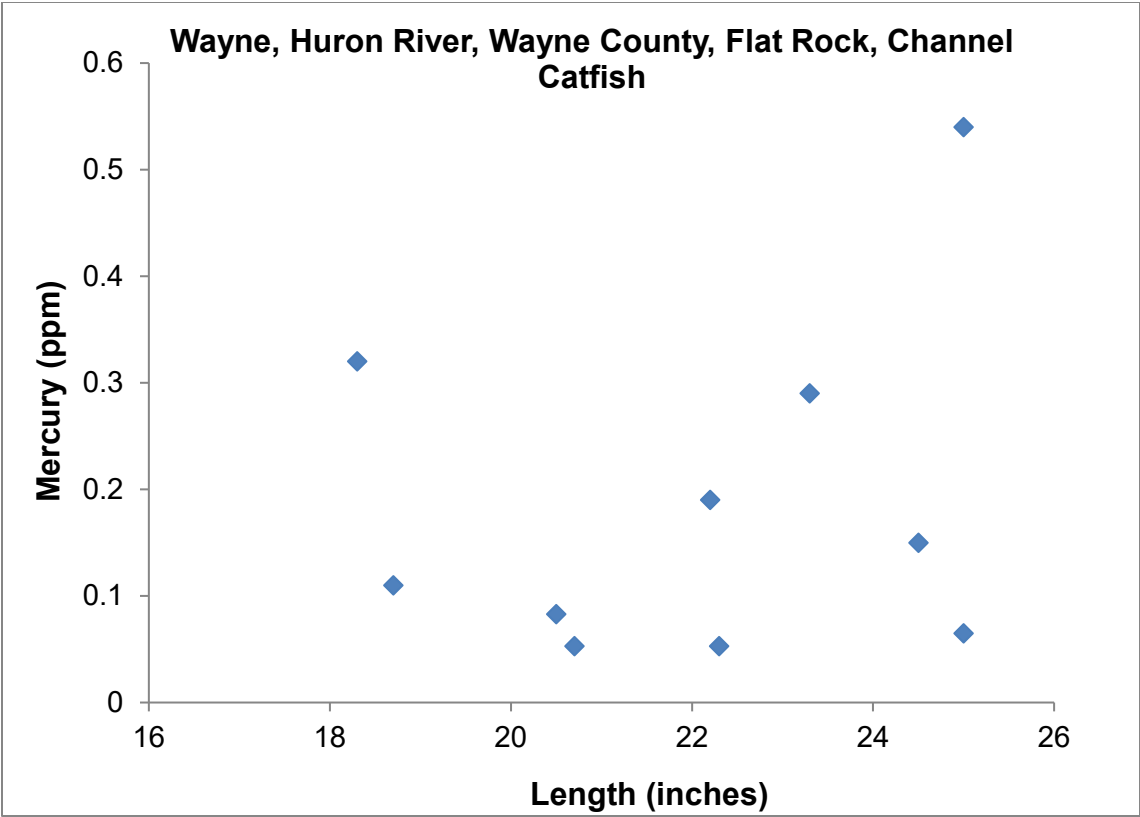
Organics Analysis:

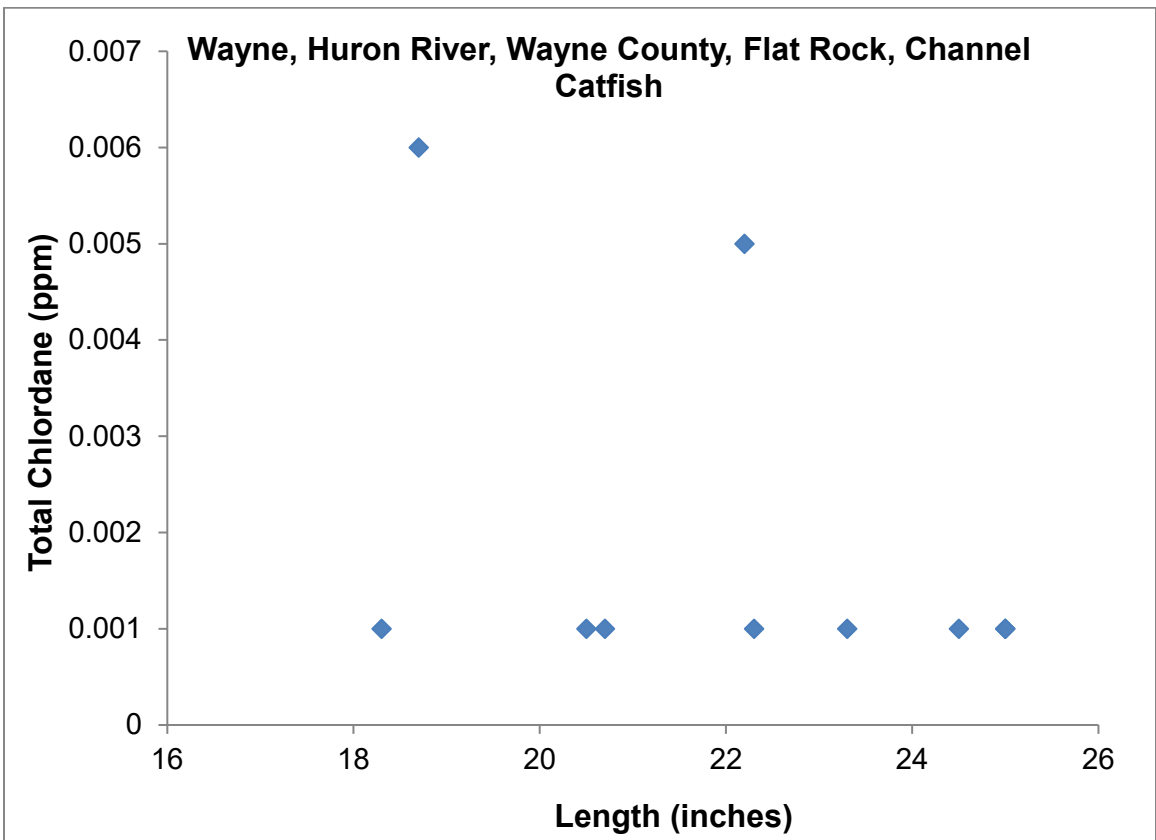
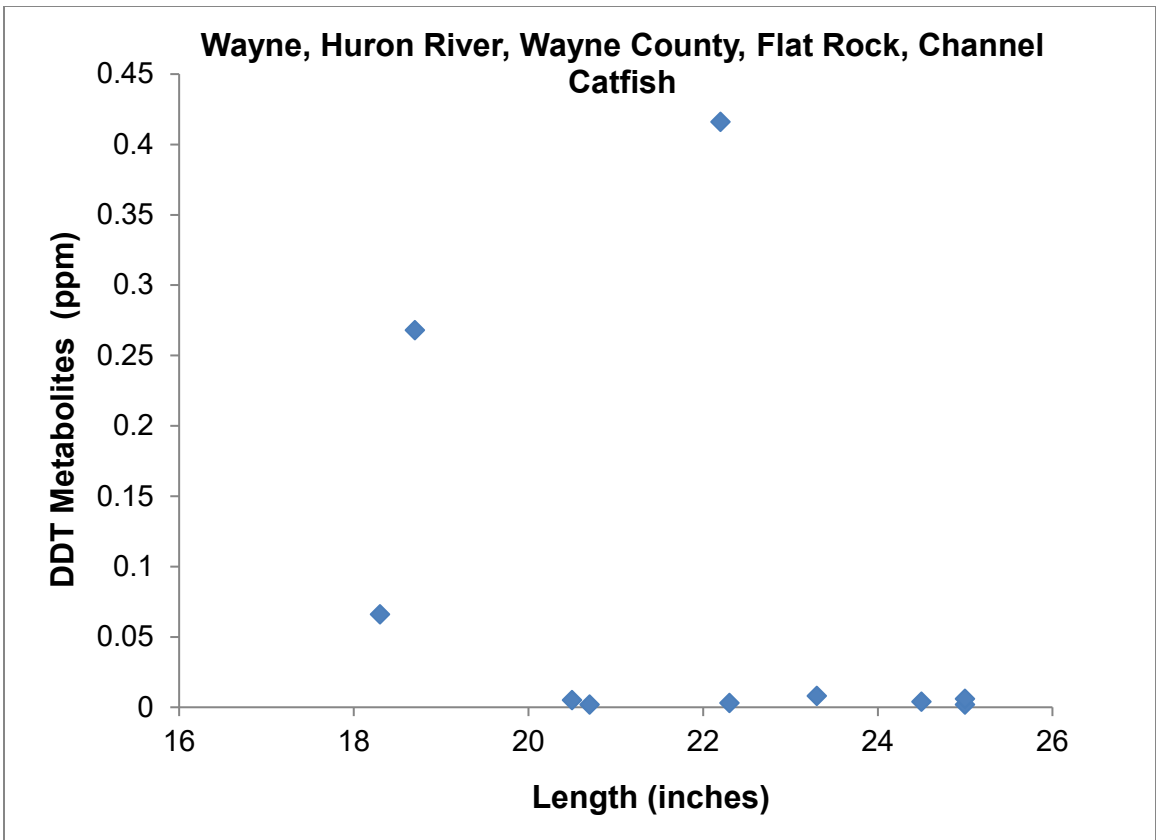
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2017	2017	10	18.3	12	18.3	25
Datasets available: 2017						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.076	0.001	0.375	0.176	1
DDT	10	0.078	0.002	0.416	0.182	8
Chlordane	10	0.002	0.001	0.006	0.003	--
Toxaphene	10	ND	< 0.05	< 0.05	< 0.05	--
PFOS	10	6 ppb	2 ppb	22 ppb	11 ppb	12
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.182	0.135				
DDT	0.107	0.277				
Chlordane	0.145	0.131				
Toxaphene	--	--				
PFOS	0.258	0.236				
Final meal category based on UCL:						1

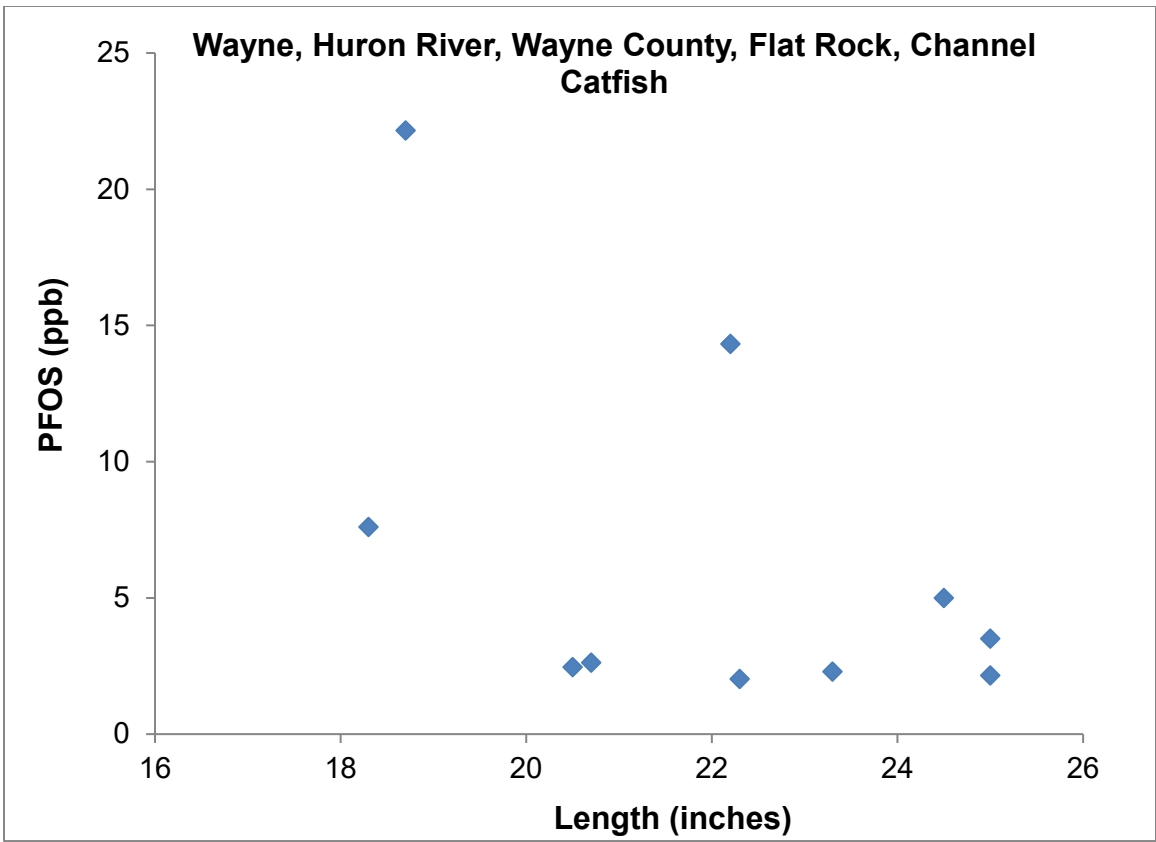
Existing MDHHS Advisory: No one should eat fish of any species or size from the Huron River and its impoundments due to PFOS.

Recommendation: No one should eat more than 1 meal per month of channel catfish of any size from the Huron River downstream of where the river crosses I-275, including the Flat Rock impoundment, due to PCBs, Mercury, DDT, and PFOS would cause less-restrictive advisories.

Note: This area of the Huron River was previously covered by the Do Not Eat advisory for the Huron River. Michigan Fish Consumption Advisory Program (MFCAP) guidance normally requires two years of data showing decreasing contaminant levels before a guideline can be relaxed. Although channel catfish have only one year of data showing decreased PFOS levels, two years of PFOS data were collected for both bluegill and largemouth/smallmouth bass from the Flat Rock Impoundment showing decreased PFOS levels. This data helped to justify the decision to relax the Do Not Eat advisory for channel catfish from the Huron River downstream of I-275.







Black Crappie

**Ford Lake
Huron River**

Washtenaw County

Hg Analysis:

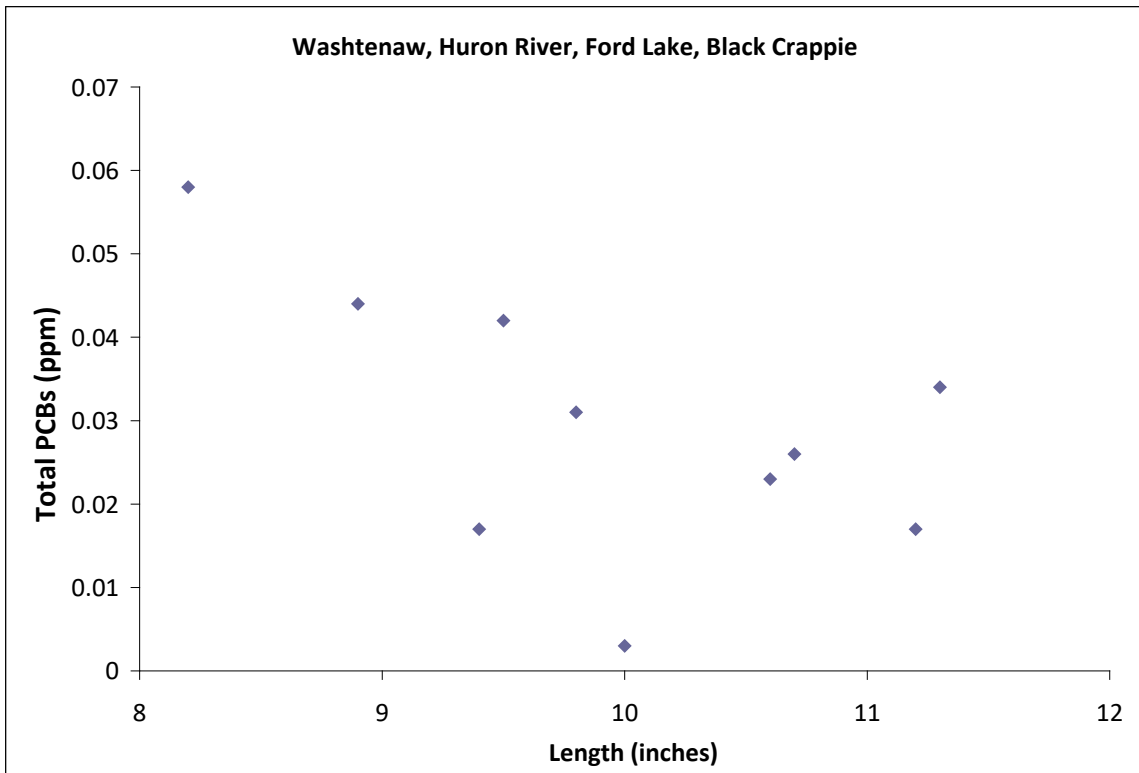
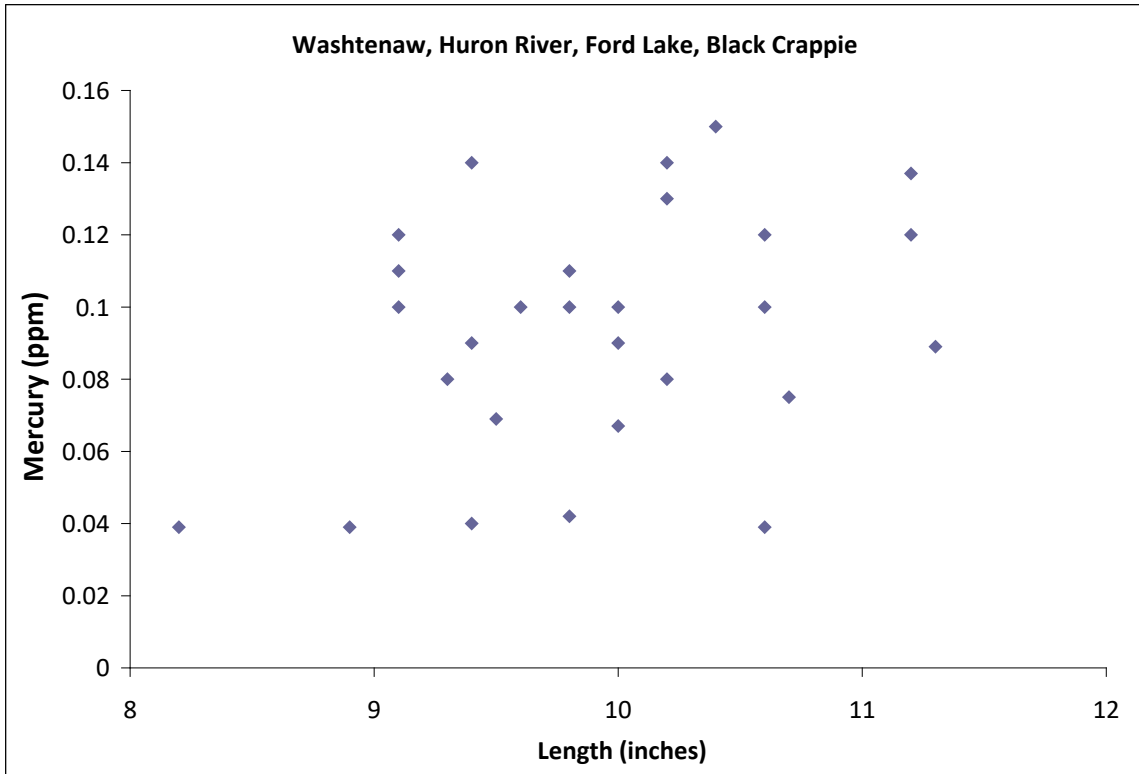
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	2006	28	8.2	na	8.2	11.3
Datasets available: 1989, 1999, 2006						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	28	0.093			0.110	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.119	0.127				

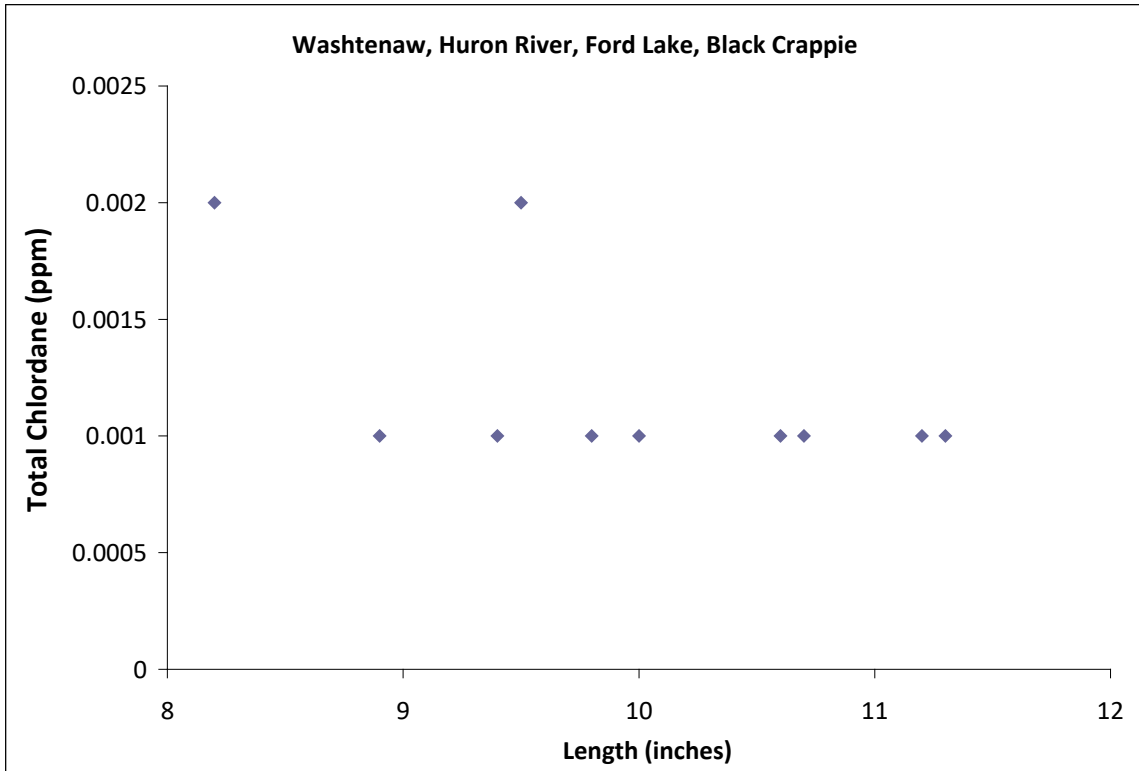
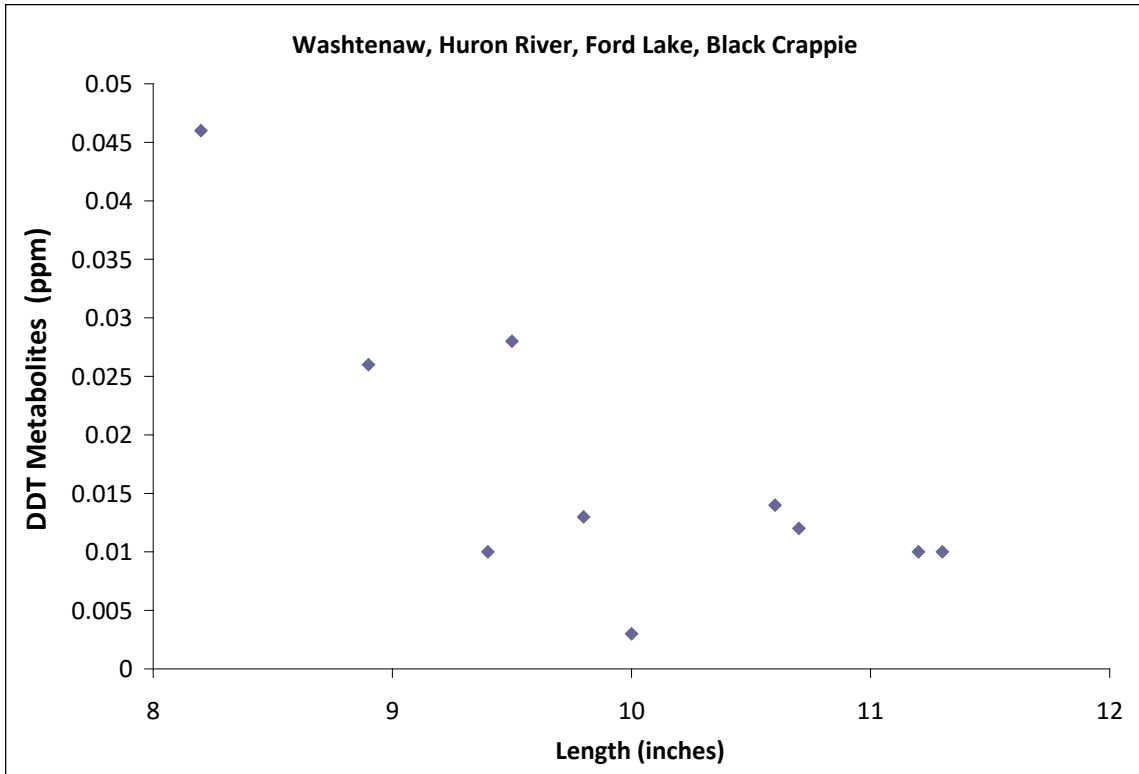
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2006	2006	10	8.2	na	8.2	11.3
Datasets available: 2006						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	10	0.030			0.040	4
DDT	10	0.017		0.030	16	
Chlordane	10	0.001		0.000	--	
Toxaphene	10	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.325	0.095				
DDT	0.559	0.337				
Chlordane	0.340	0.340				
Toxaphene	--	--				
Final meal category based on UCL:					4	

Existing Advisory: No one should eat more than 4 meals per month of Ford Lake crappie due to PCBs. Mercury would cause advisories.

Recommendation: There is a Do Not Eat advisory for all fish species for this section of the Huron River due to PFOS.





Hg Analysis:

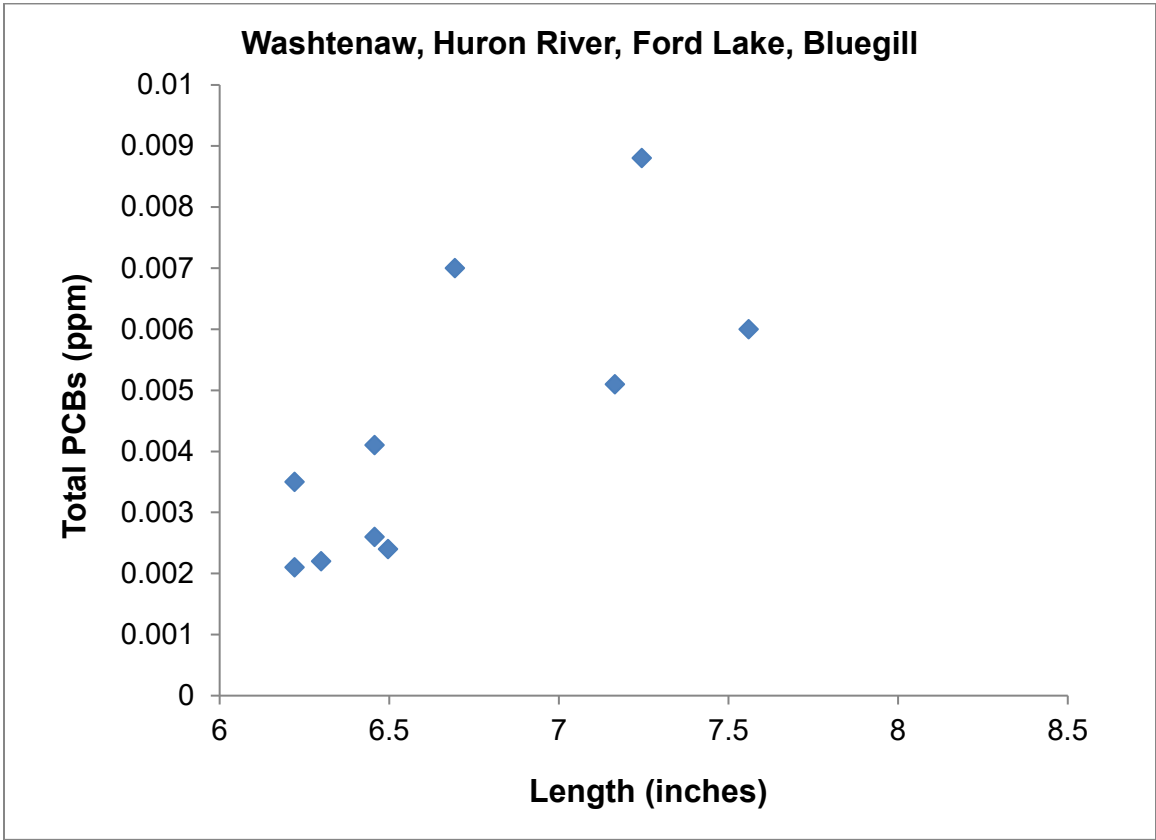
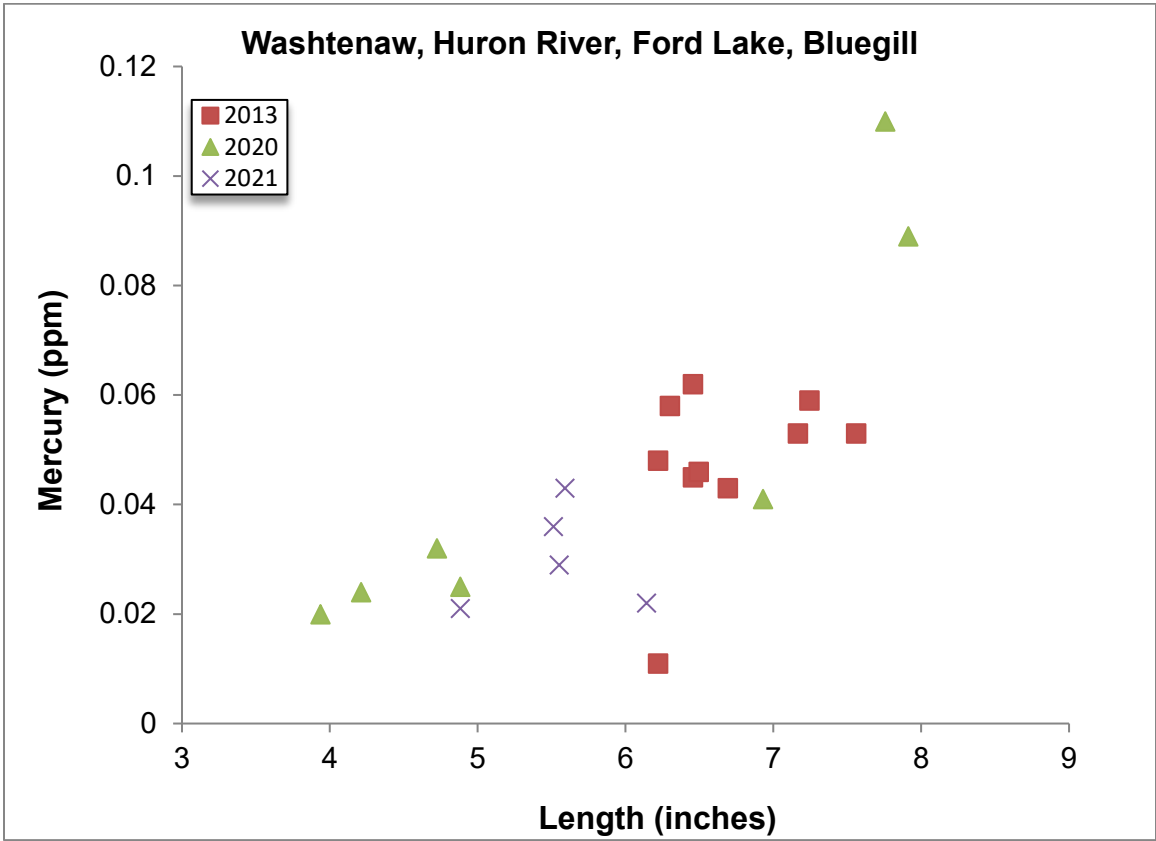
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2013	2021	22	3.9	NA	3.9	7.9
Datasets available: 2013, 2020, 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	22	0.044	0.011	0.110	0.054	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.559	0.508				

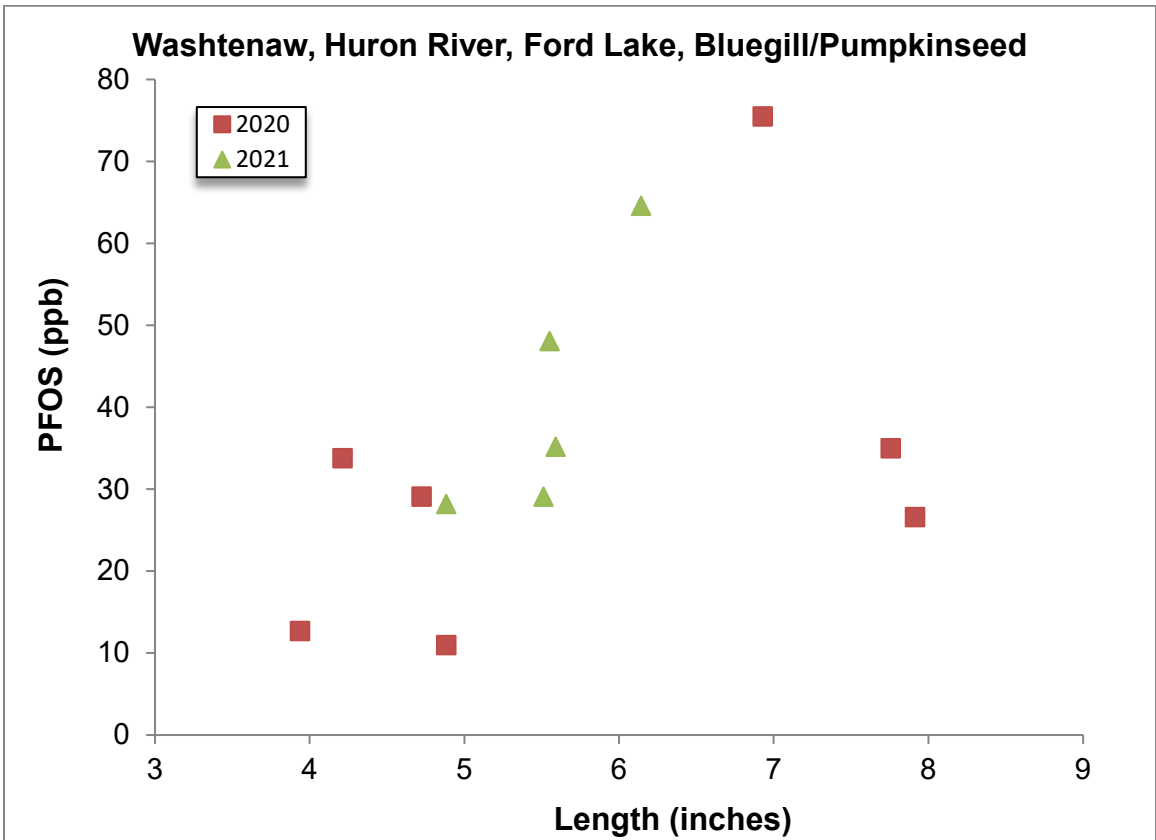
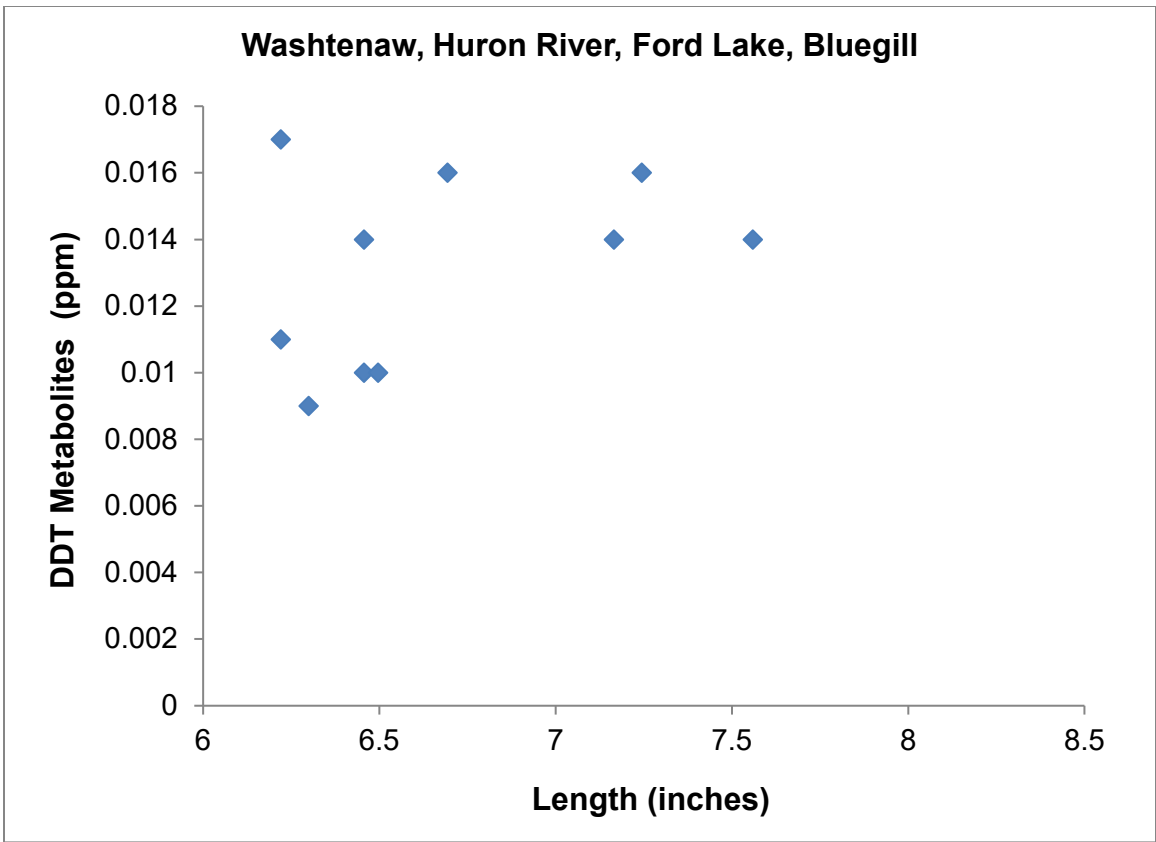
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2013	2021	22	3.9	NA	3.9	7.9
Datasets available: 2013 (No PFOS), 2020 (Only PFOS), 2021 (Only PFOS)						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.004	0.002	0.009	0.006	16
DDT	10	0.013	0.009	0.017	0.015	16
Chlordane	10	ND	--	--	--	16
Toxaphene	10	ND	--	--	--	--
PFOS	12	35.7 ppb	11.0 ppb	75.5 ppb	47.8 ppb	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.570	0.595				
DDT	0.145	0.171				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.184	0.213				
Final meal category based on UCL:						2

Existing MDHHS Advisory: There is a Do Not Eat advisory for all fish species for this section of the Huron River due to PFOS.

Recommendation: No change to the advisory is recommended. MDHHS will continue to evaluate PFOS concentrations in fish throughout the Huron River to determine whether the existing Do Not Eat advisory for all species from this section of the river is appropriate.





Brown Bullhead

**Ford Lake
Huron River**

Washtenaw County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	0	--	--	--	--
Datasets available:						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL	Meal Category
Mercury	0	NA			--	--
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
1983	1983	5	na	na	Na	na
Datasets available: 1983						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL	Meal Category
PCB	5	ND			--	--
DDT	5	0.048			--	--
Chlordane	5	ND			--	--
Toxaphene	5	ND			--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						8

Existing Advisory: Dataset is limited based on age of data. Dataset is not used to provide a recommendation.

Recommendation: There is a Do Not Eat advisory for all fish species for this section of the Huron River due to PFOS.

Carp

**Ford Lake
Huron River**

Washtenaw County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1992	2013	39	10.3	na	10.3	30.6
Datasets available: 1992, 1999, 2006, 2013						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	39	0.20	0.02	0.40	0.23	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.520	0.723				

Organics Analysis:

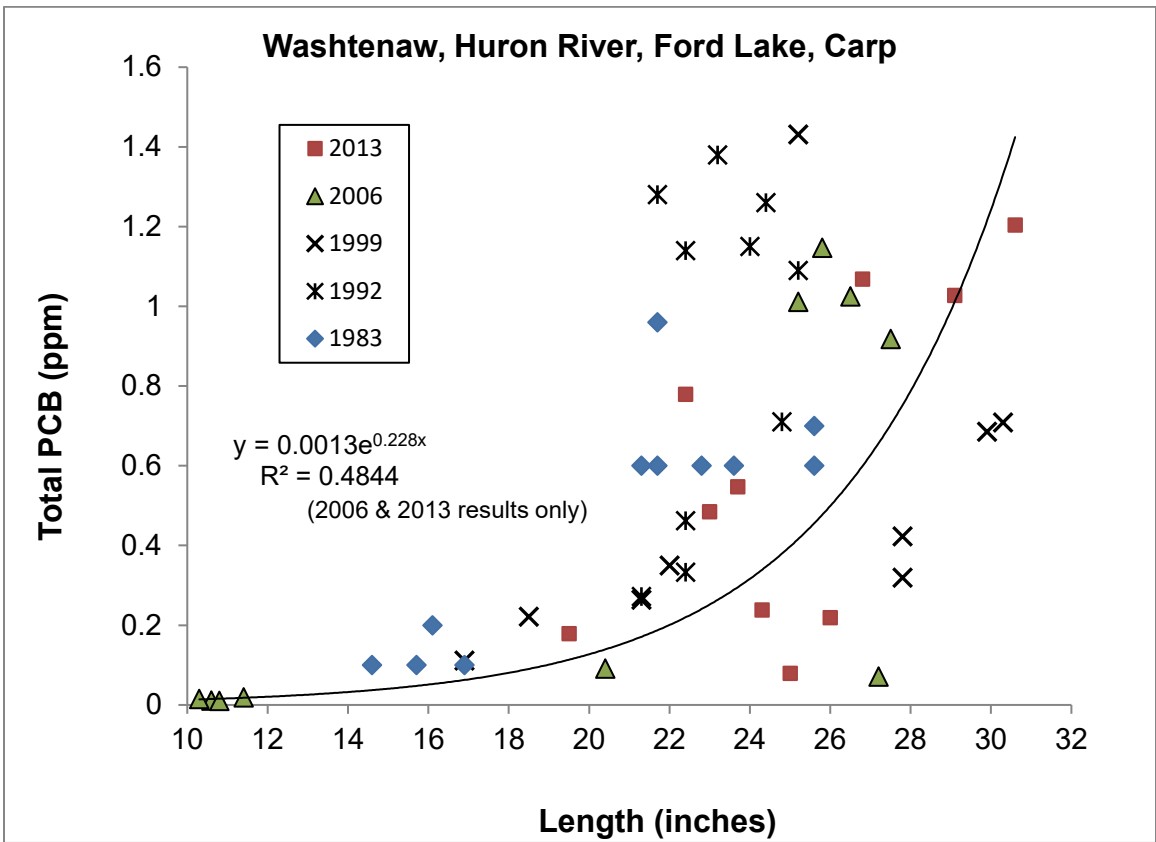
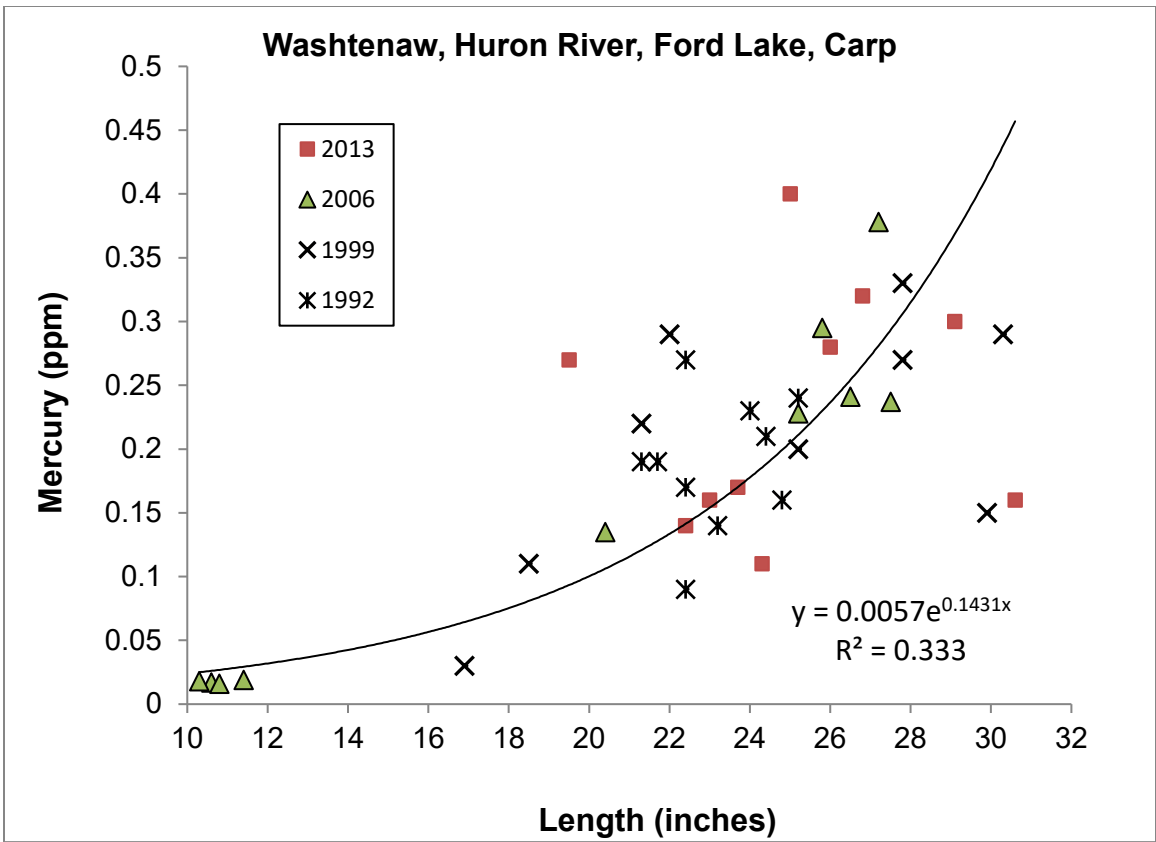
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2006	2013	20	10.3	na	10.3	30.6
Datasets available: 1983, 1992, 1999, 2006, 2013						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	20	0.507	0.01	1.2042	0.723	Limited
DDT	20	0.374	0.012	0.951	0.524	2
Chlordane	20	0.033	0.001	0.225	0.057	--
Toxaphene	20	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.486	0.750				
DDT	0.460	0.680				
Chlordane	0.164	0.503				
Toxaphene	--	--				
Final meal category based on UCL:						Limited

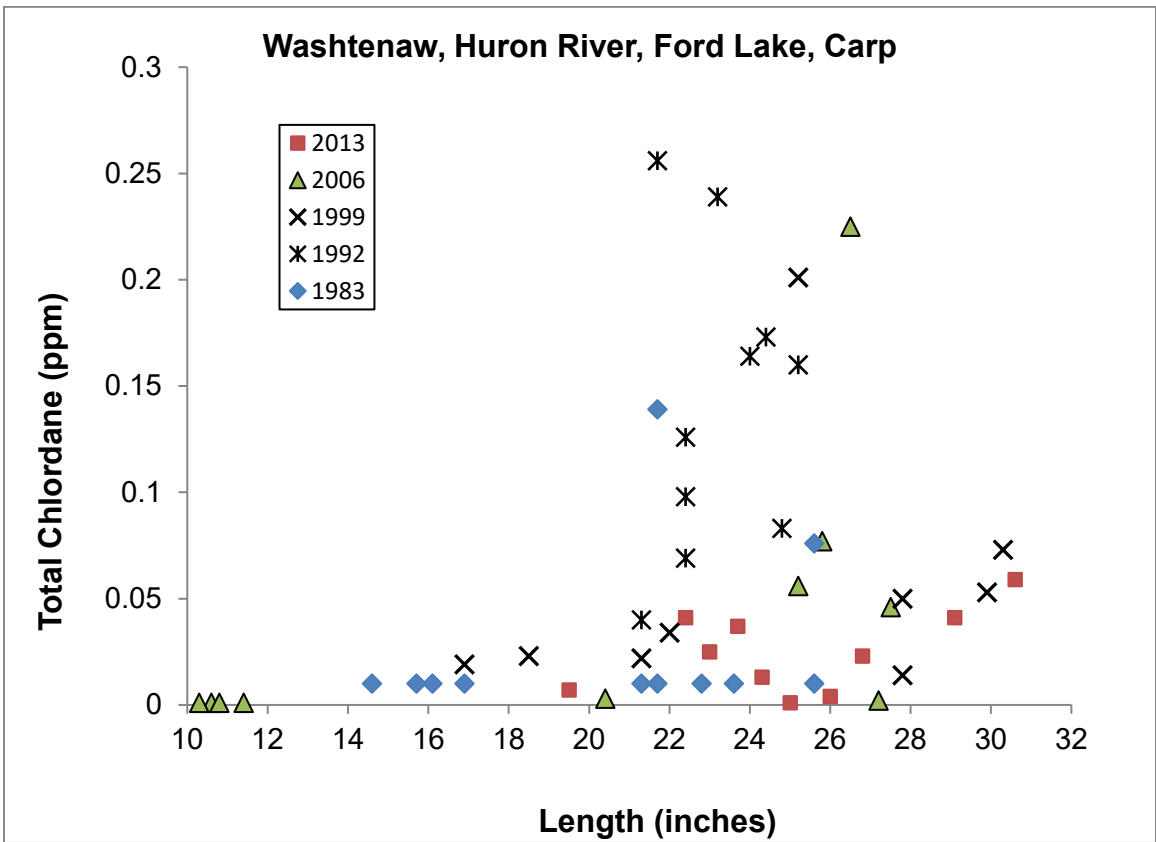
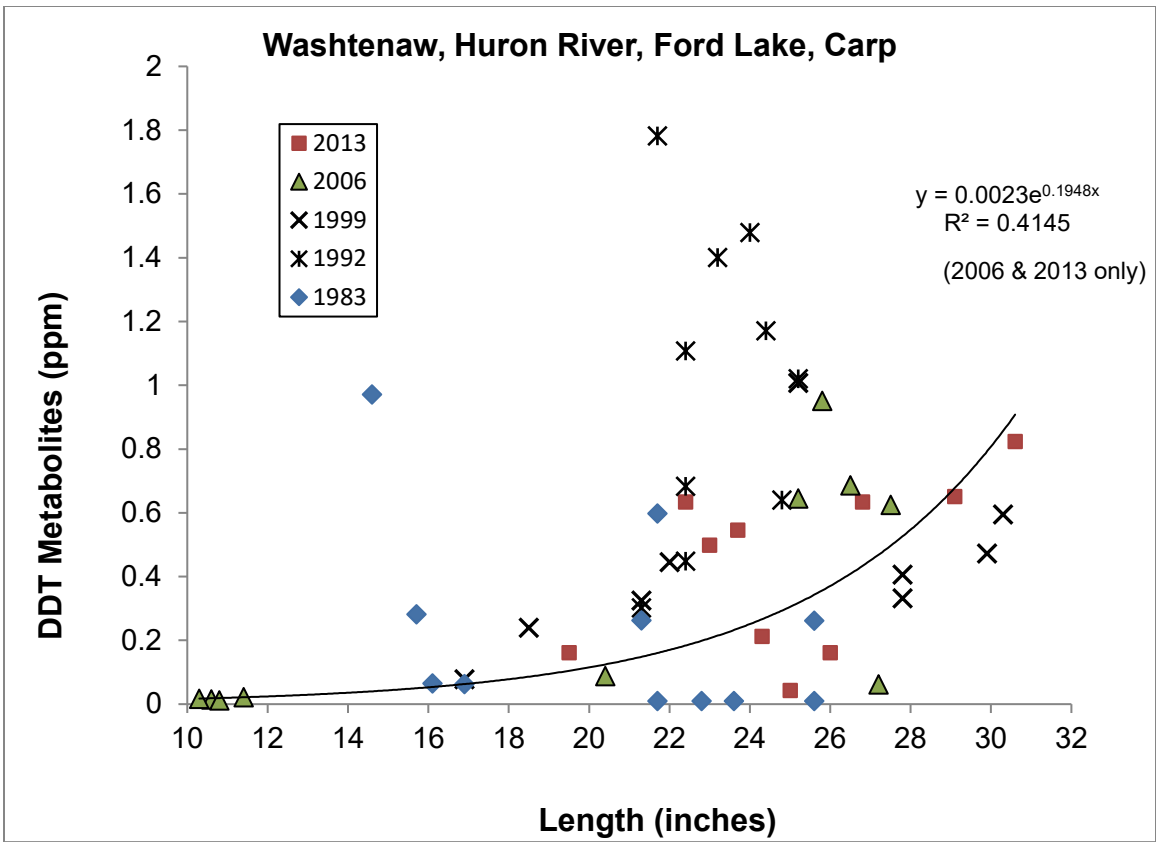
Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category	PCB Regression Equation Estimate (ppm)	Meal Category	DDT Regression Equation Estimate (ppm)	Meal Category
10	0.02	16	0.01	16	0.02	16
12	0.03	16	0.02	12	0.02	16
14	0.04	16	0.03	8	0.04	16
16	0.06	16	0.05	4	0.05	16
18	0.07	16	0.08	2	0.08	16
20	0.1	8	0.12	1	0.11	16
22	0.13	8	0.2	1	0.17	8
24	0.18	4	0.31	0.5	0.25	4
26	0.24	4	0.49	Limited	0.36	4
28	0.31	2	0.77	Limited	0.54	2
30	0.42	2	1.21	Limited	0.79	2
32	0.56	1	1.92	Limited	1.17	1

Shaded area denotes extrapolated estimates

Existing Advisory: No one should eat more than 1 meal per month of Ford Lake carp less than 22 inches in length. Sensitive populations should not eat Ford Lake Carp over 22 inches. Healthy adults should limit consumption to no more than 1 or 2 meals per year of Ford Lake carp larger than 22 inches due to PCBs. Mercury and DDT would cause advisories.

Recommendation: There is a Do Not Eat advisory for all fish species for this section of the Huron River due to PFOS.





Channel Catfish

**Ford Lake
Huron River**

Washtenaw County

Hg Analysis:

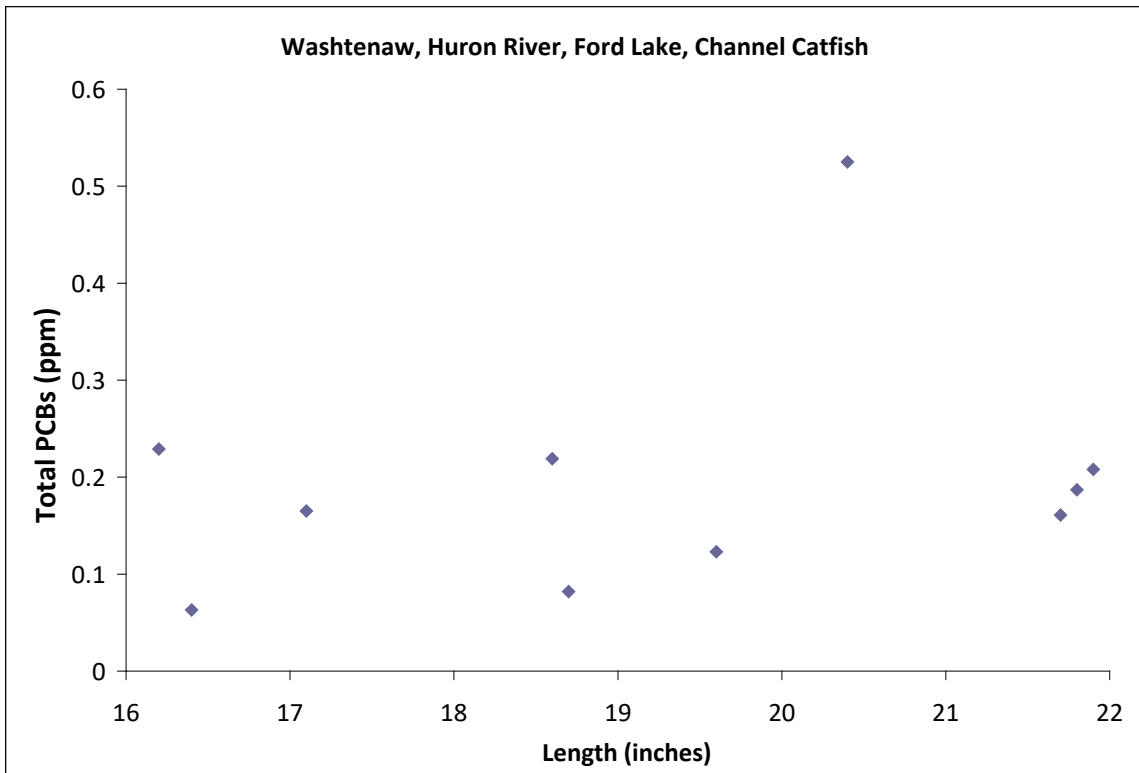
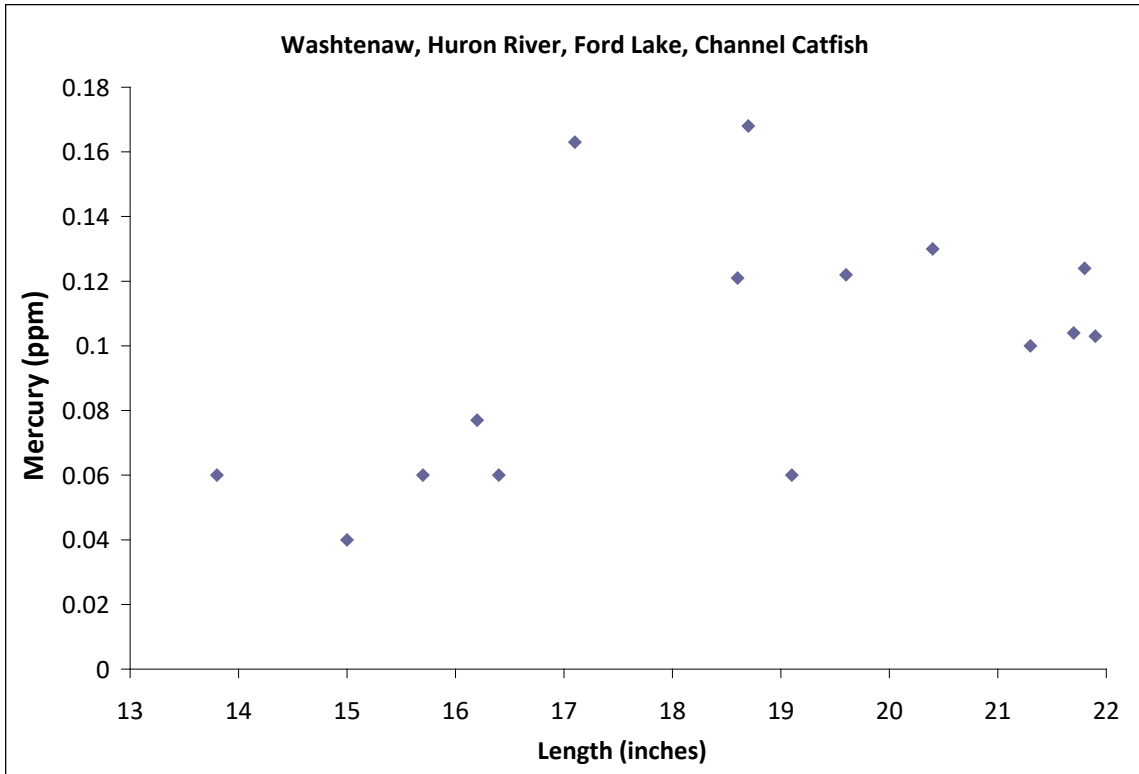
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1999	2006	15	13.8	12	13.8	21.9
Datasets available: 1999, 2006						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	15	0.099			0.120	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.251	0.355				

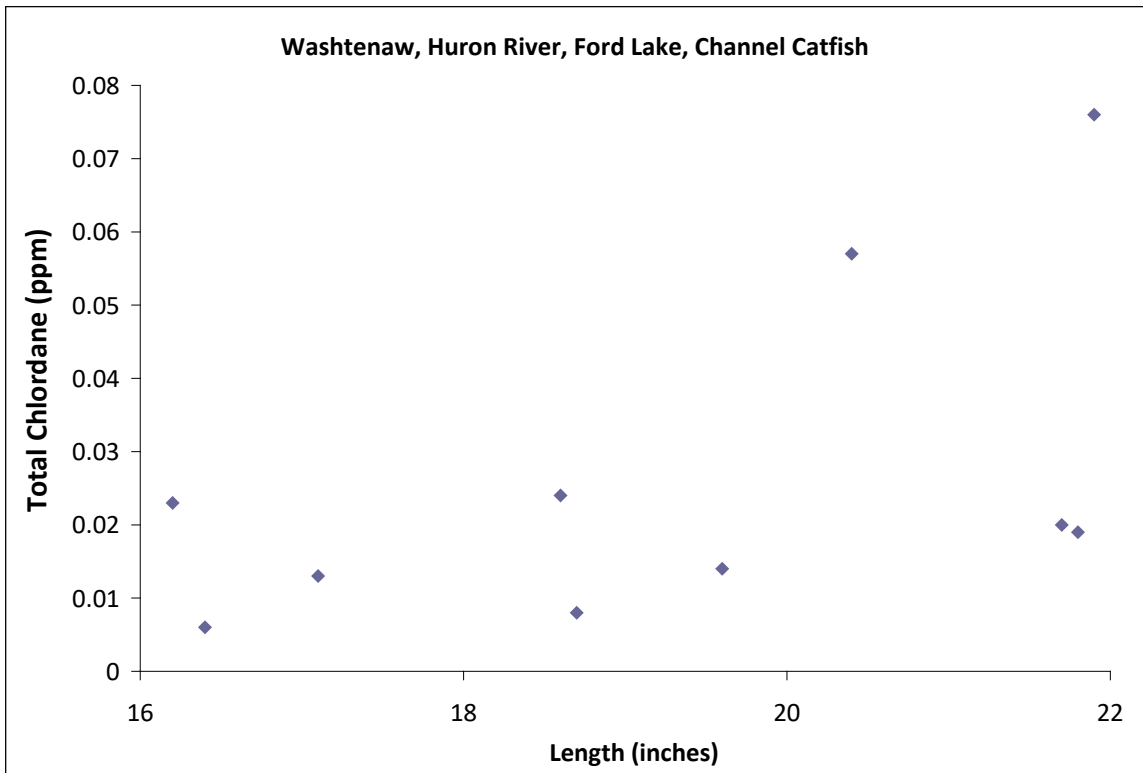
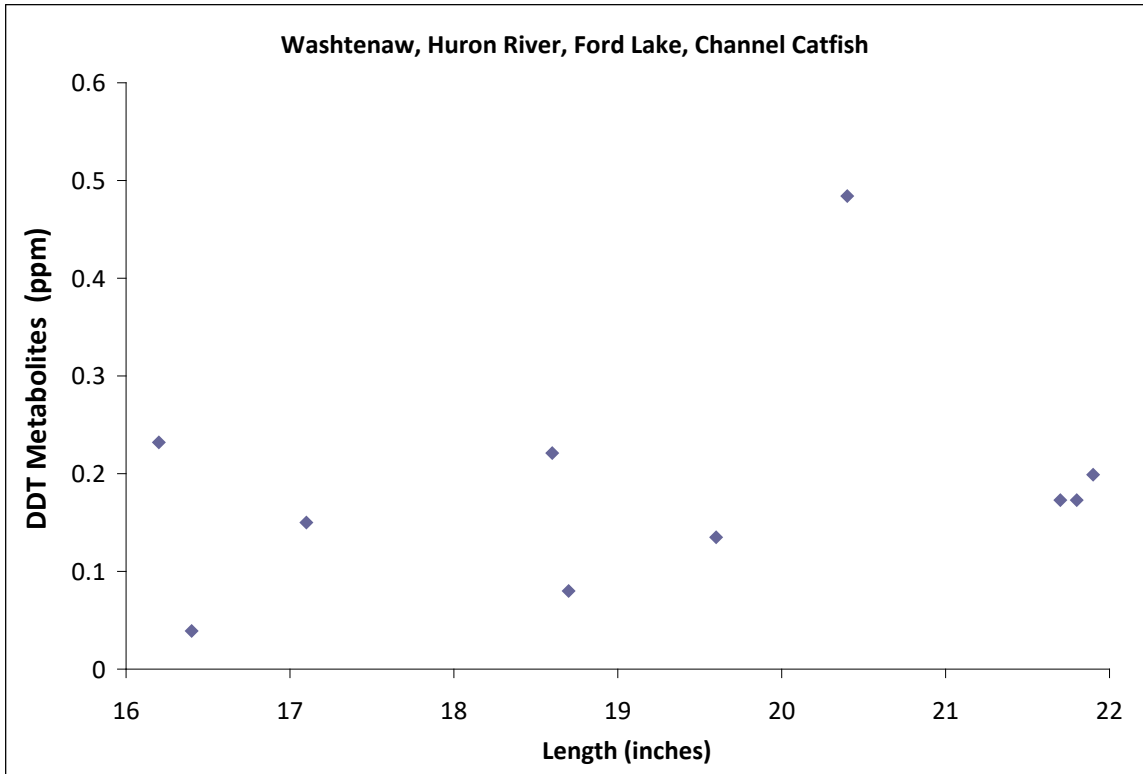
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2006	2006	10	16.2	12	16.2	21.9
Datasets available: 2006						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	10	0.196			0.290	0.5
DDT	10	0.189		0.270	4	
Chlordane	10	0.026		0.040	--	
Toxaphene	10	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.069	0.121				
DDT	0.083	0.164				
Chlordane	0.279	0.320				
Toxaphene	--	--				
Final meal category based on UCL:					0.5	

Existing Advisory: No one should eat more than 6 meals per year of Ford Lake channel catfish due to PCBs. Mercury and DDT would cause advisories.

Recommendation: There is a Do Not Eat advisory for all fish species for this section of the Huron River due to PFOS.





Largemouth/Smallmouth Bass

Ford Lake Huron River

Washtenaw County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples			
Earliest	Most Recent				Min	Max		
2013	2021	30	10.6	14.0	14.0	18.1		
Datasets available: 2013, 2020, 2021								
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category	
Mercury	18	0.216		0.110	0.720	0.285	2	
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
Mercury	0.465	0.595						

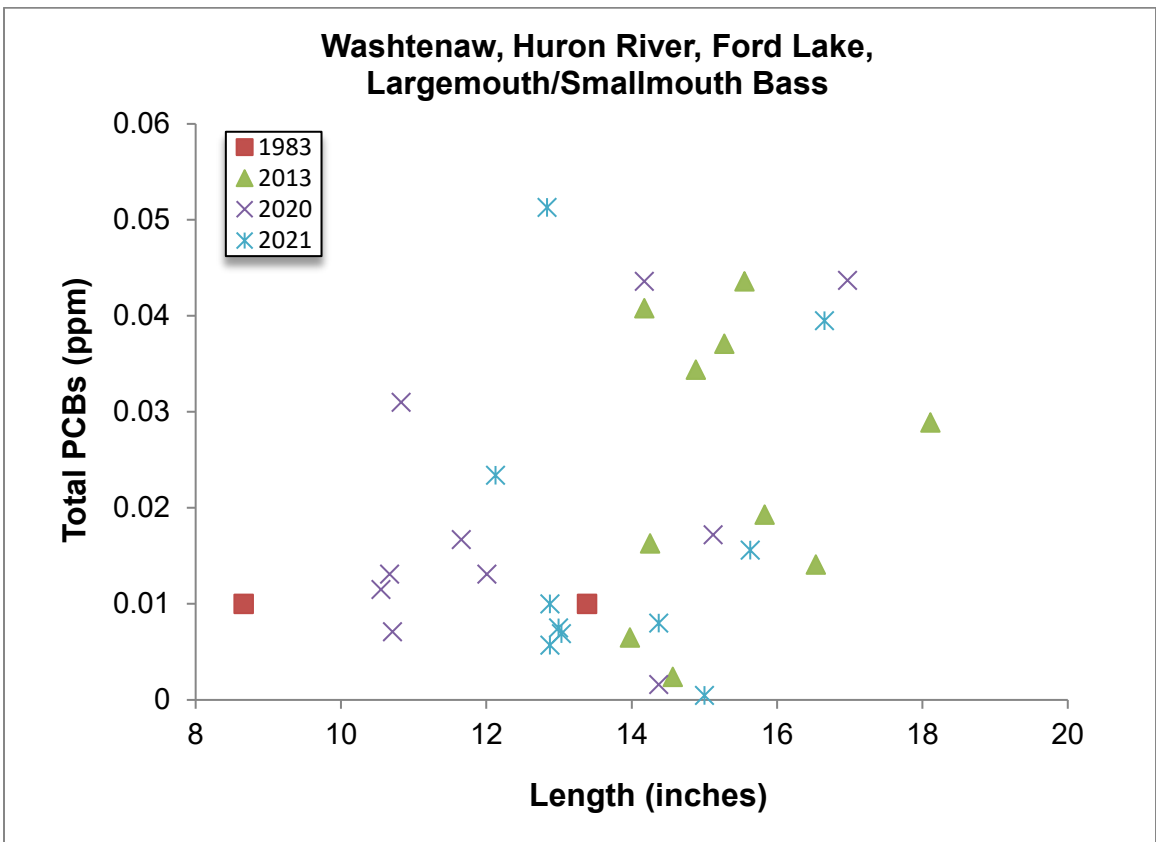
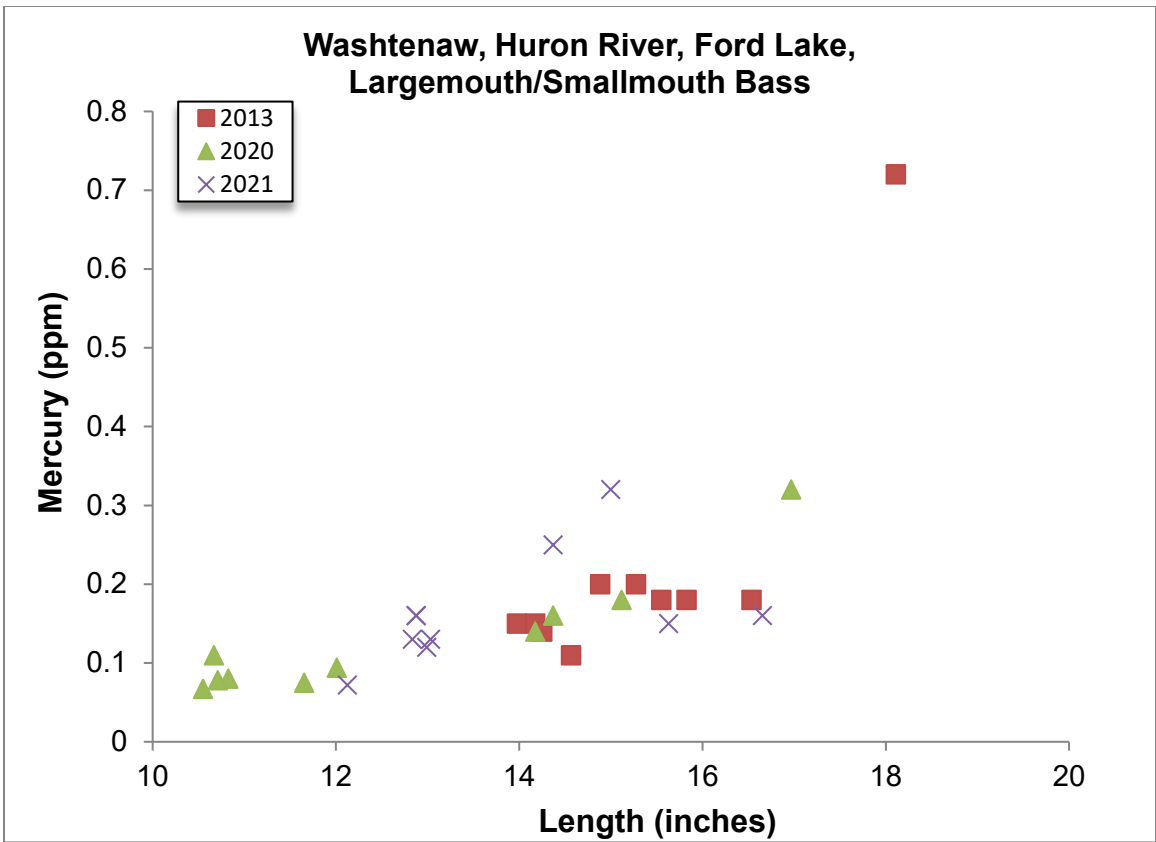
Organics Analysis:

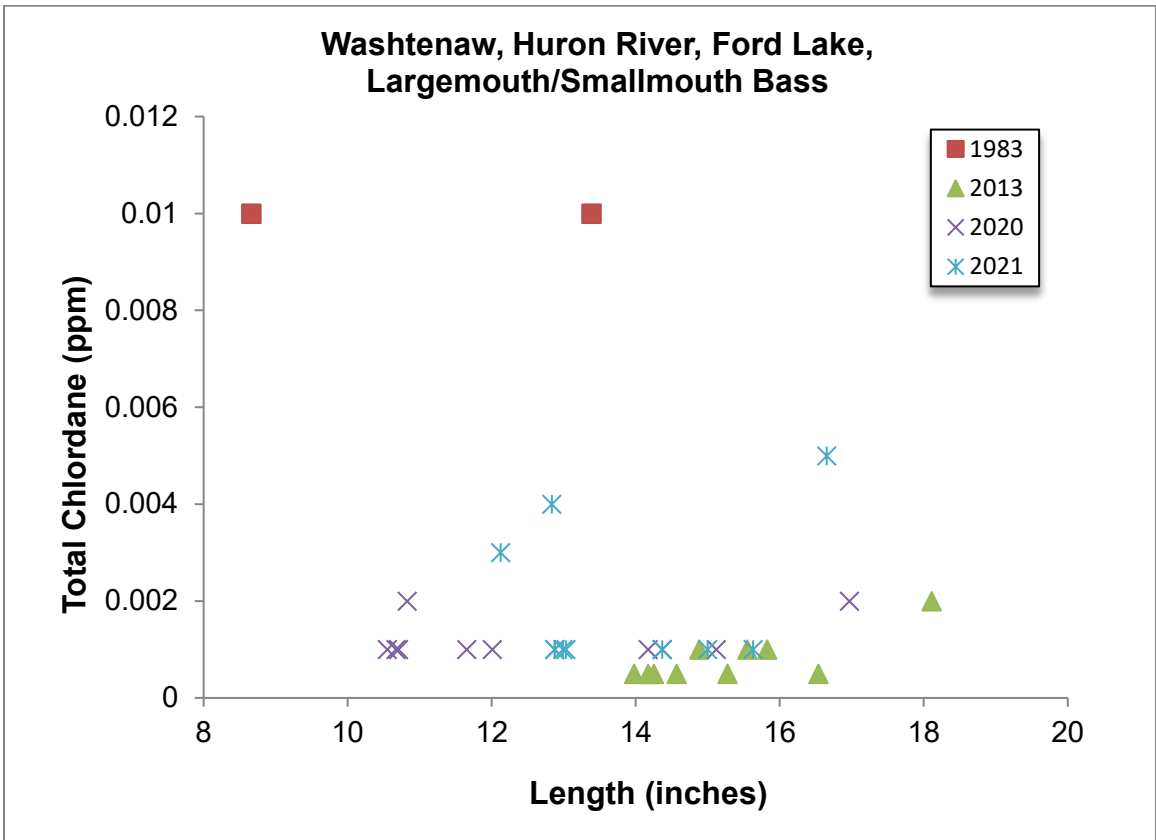
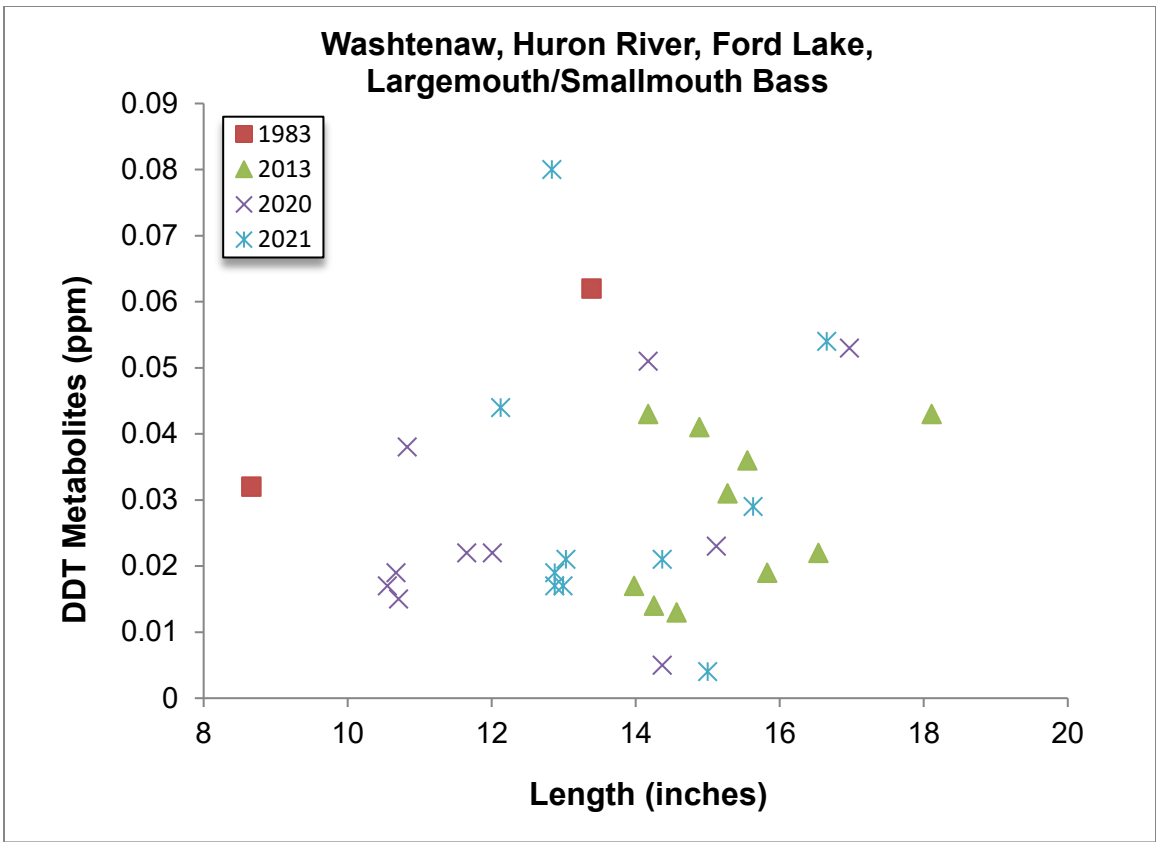
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples				
Earliest	Most Recent				Min	Max			
2013	2021	22	10.6	14.0	14.0	18.1			
Datasets available: 1983 (No PFOS), 2013 (No PFOS), 2020, 2021									
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category		
PCB	18	0.023		<0.001	0.044	0.031	4		
DDT	18	0.029		0.004	0.054	0.037	16		
Chlordane	18	0.001		<0.001	0.005	0.002	16		
Toxaphene	18	ND		--	--	--	--		
PFOS	20*	43.4 ppb		12.8 ppb	108 ppb	54.7 ppb	2		
Chemical	Linear Regression	Exponential Regression							
	R ²	R ²							
PCB	0.104	0.027							
DDT	0.024	0.010							
Chlordane	0.073	0.054							
Toxaphene	--	--							
PFOS	0.350	0.321	Final meal category based on UCL:				2		

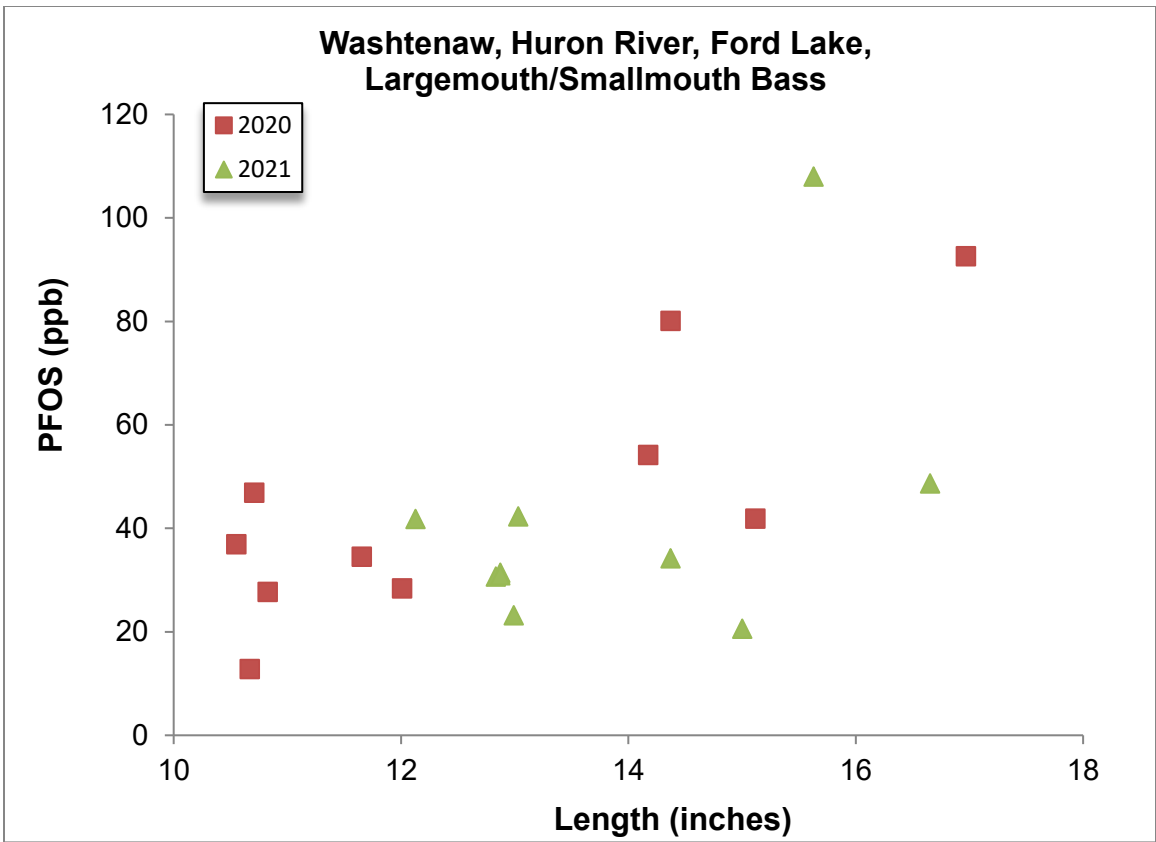
*Sub-legal sized fish used in the PFOS analysis as no significant correlation between fish size and PFOS has been observed in the statewide dataset.

Existing MDHHS Advisory: There is a Do Not Eat advisory for all fish species for this section of the Huron River due to PFOS.

Recommendation: No change to the advisory is recommended. MDHHS will continue to evaluate PFOS concentrations in fish throughout the Huron River to determine whether the existing Do Not Eat advisory for all species from this section of the river is appropriate.







Hg Analysis:

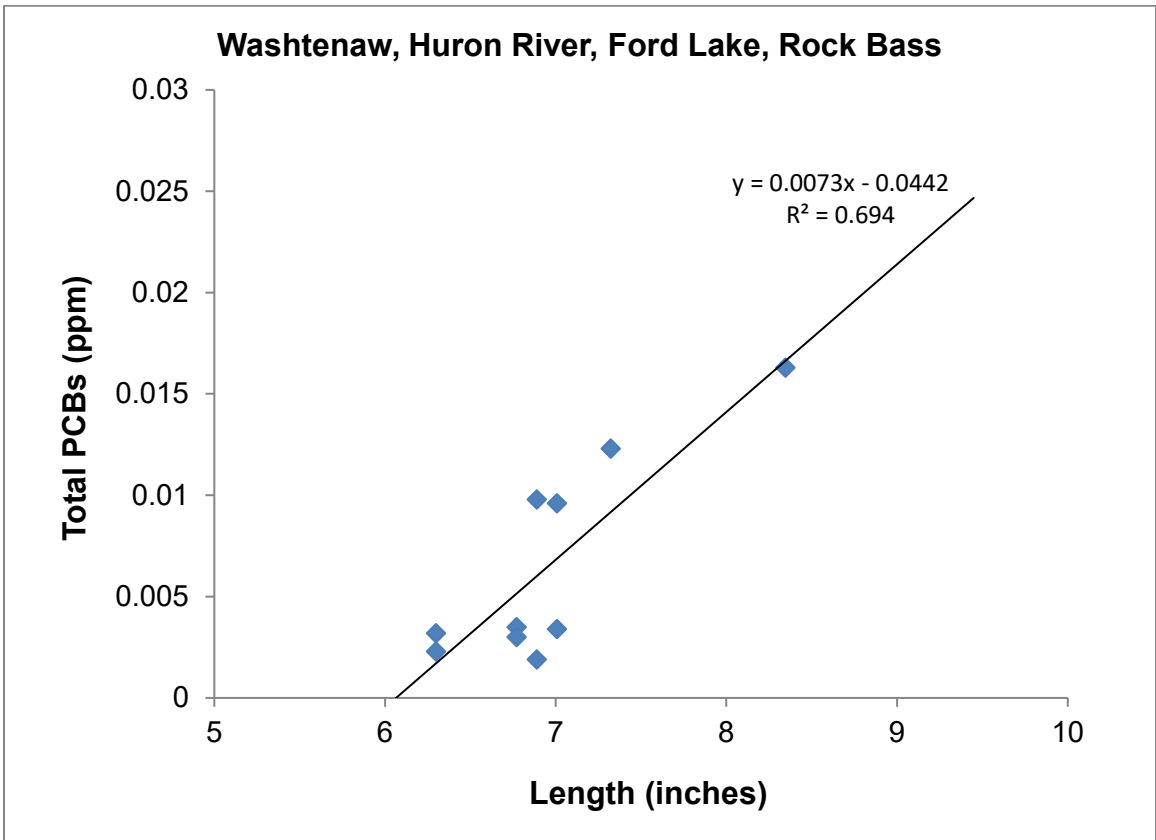
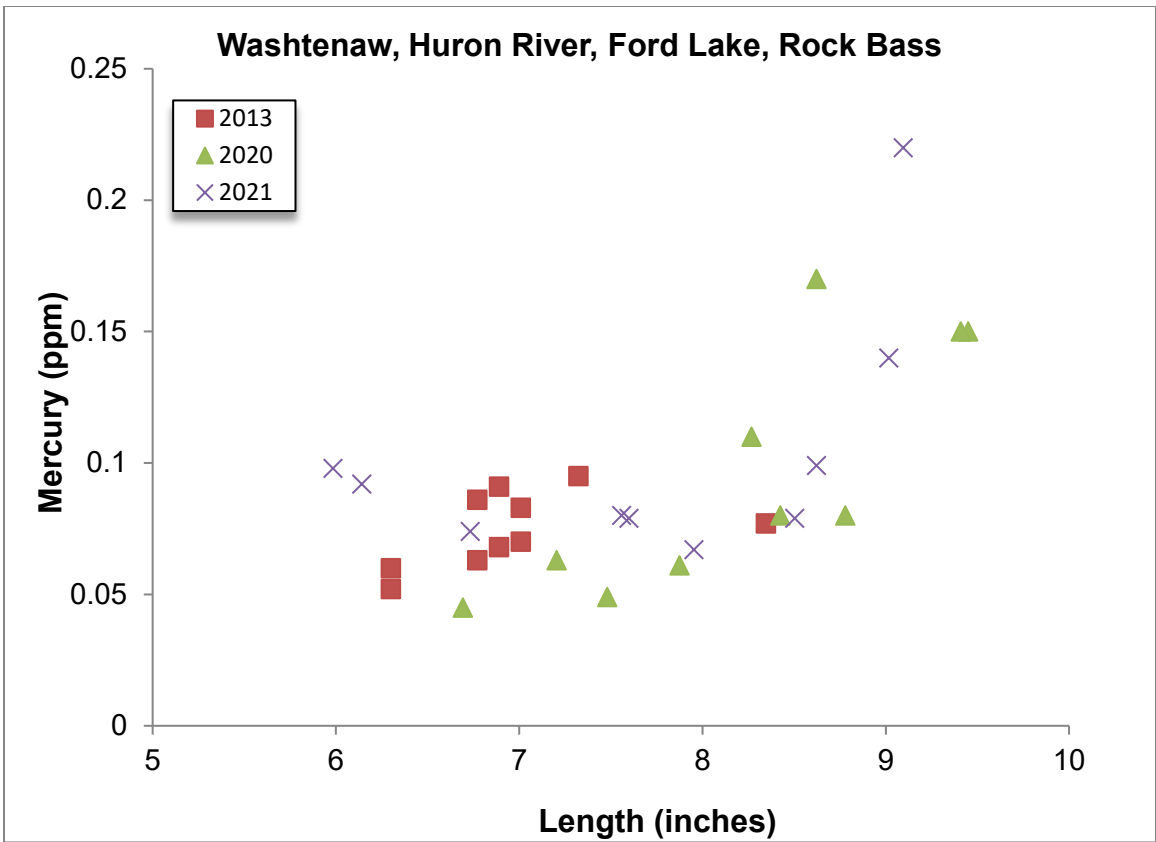
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2013	2021	30	6.0	NA	6.0	9.4
Datasets available: 2013, 2020, 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	30	0.091	0.045	0.220	0.106	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.400	0.397				

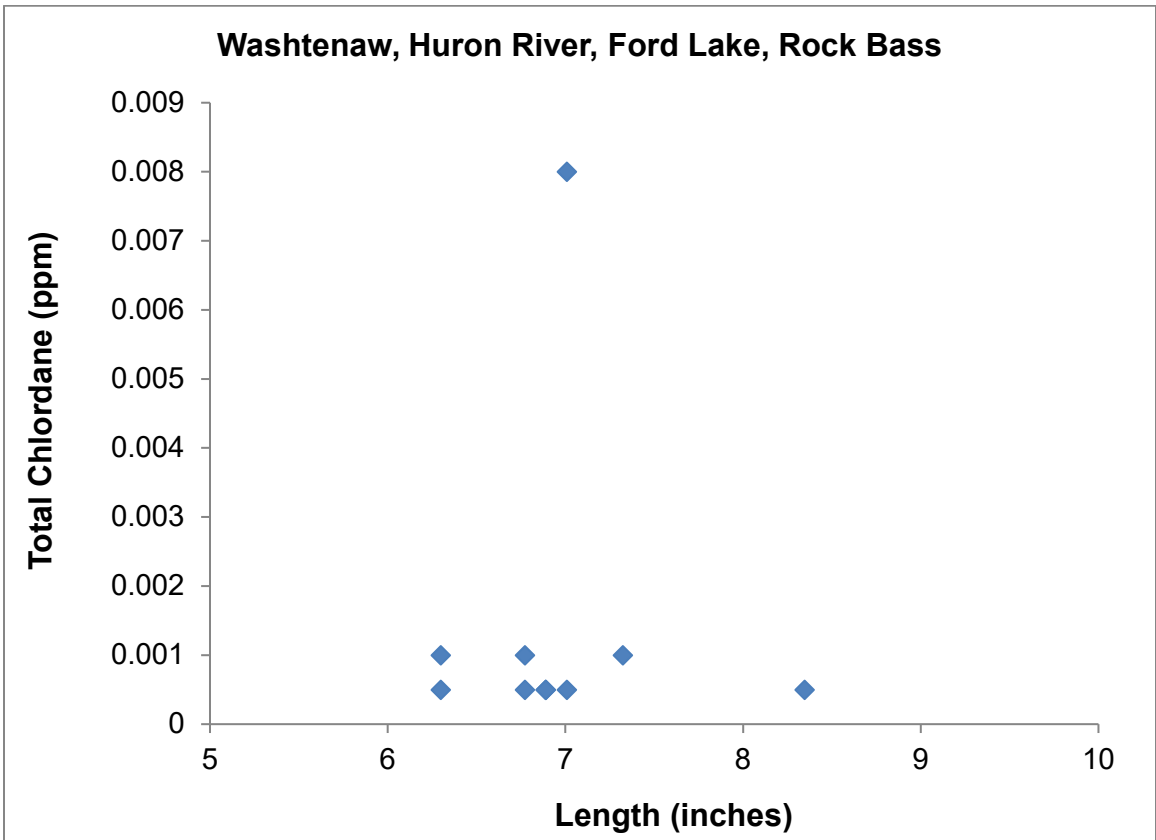
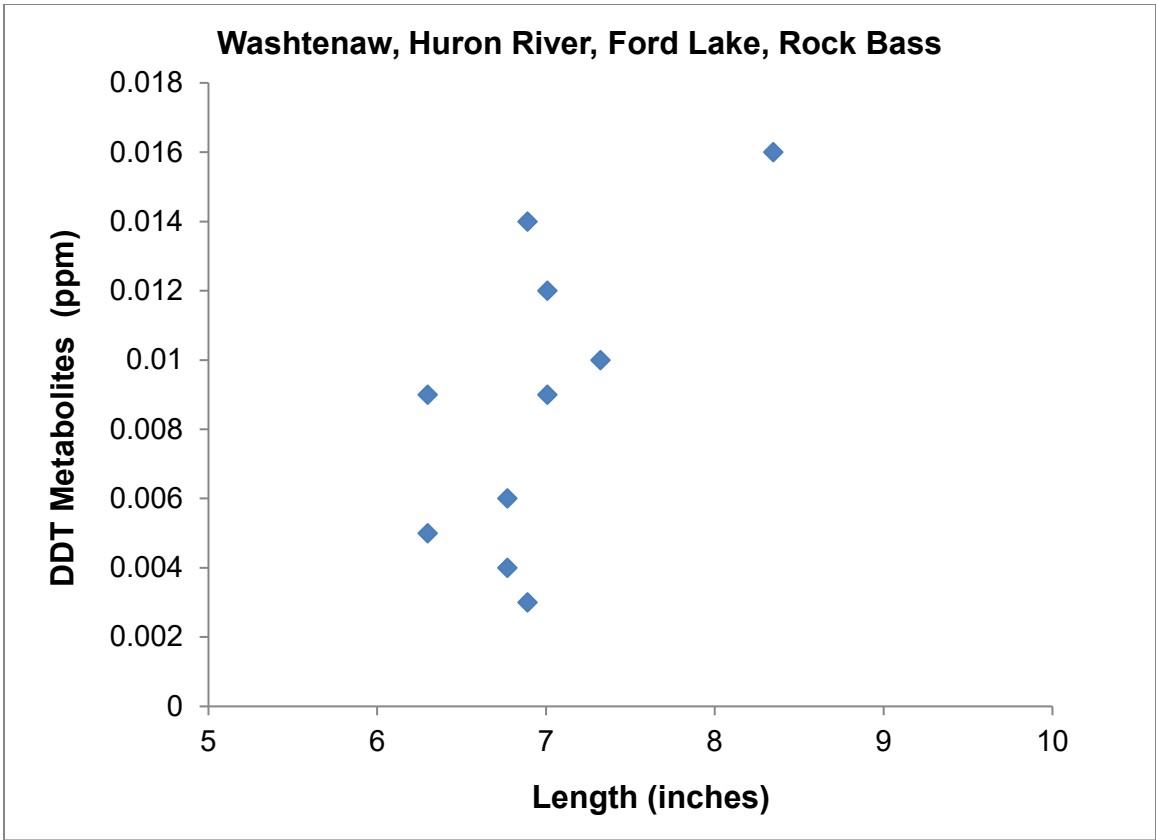
Organics Analysis:

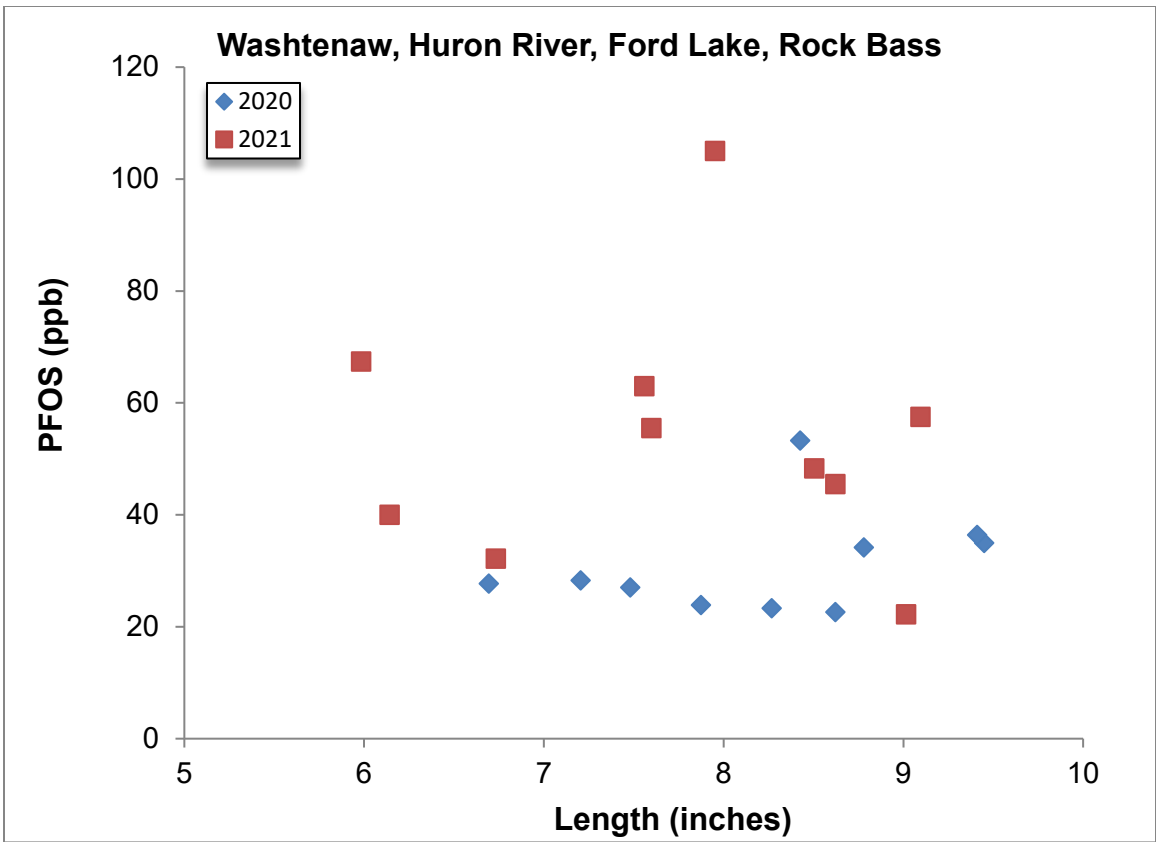
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2013	2021	30	6.0	NA	6.0	9.4
Datasets available: 2013 (No PFOS), 2020 (Only PFOS), 2021 (Only PFOS)						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.007	0.002	0.016	0.010	16
DDT	10	0.009	0.003	0.016	0.012	16
Chlordane	10	0.001	<0.001	0.008	0.003	16
Toxaphene	10	ND	--	--	--	--
PFOS	20	42.4 ppb	22.2 ppb	105.0 ppb	52.0 ppb	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.694	0.546				
DDT	0.408	0.275				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.014	0.014				
Final meal category based on UCL:						2

Existing MDHHS Advisory: There is a Do Not Eat advisory for all fish species for this section of the Huron River due to PFOS.

Recommendation: No change to the advisory is recommended. MDHHS will continue to evaluate PFOS concentrations in fish throughout the Huron River to determine whether the existing Do Not Eat advisory for all species from this section of the river is appropriate.







Walleye

**Ford Lake
Huron River**

Washtenaw County

Hg Analysis:

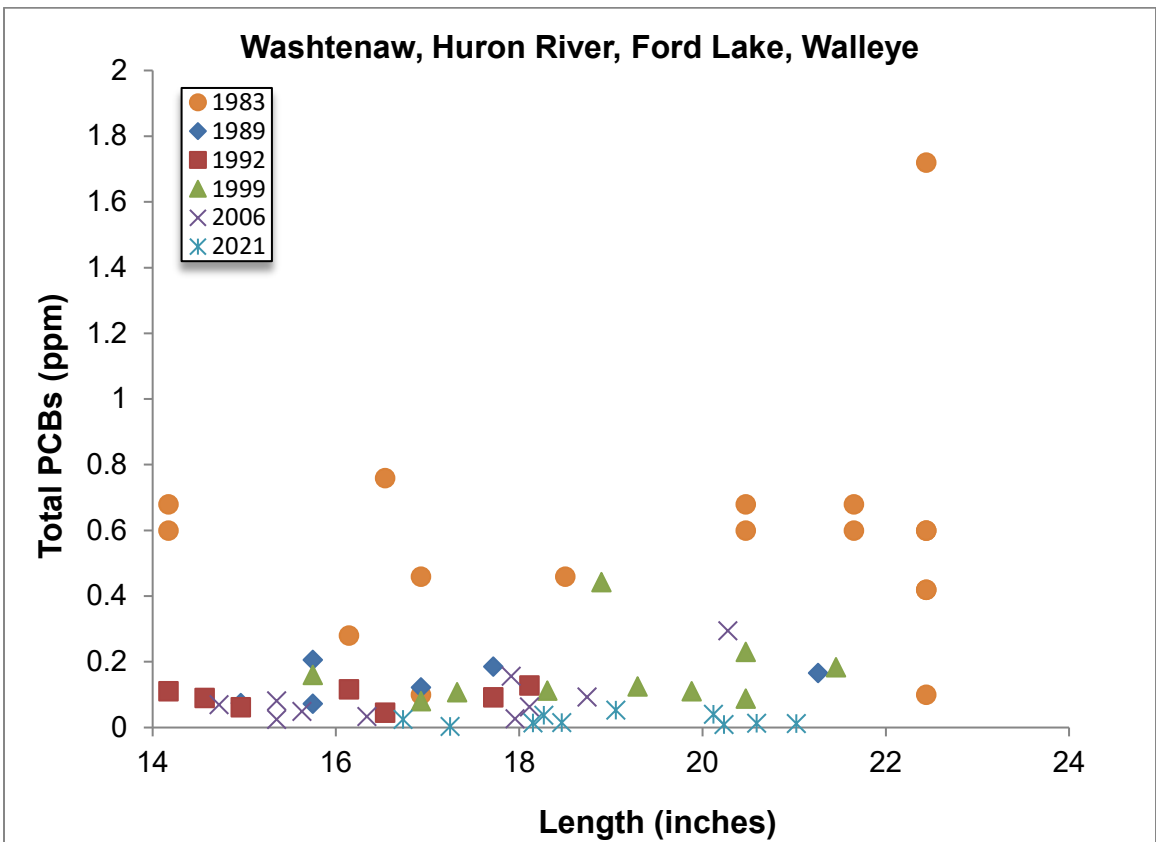
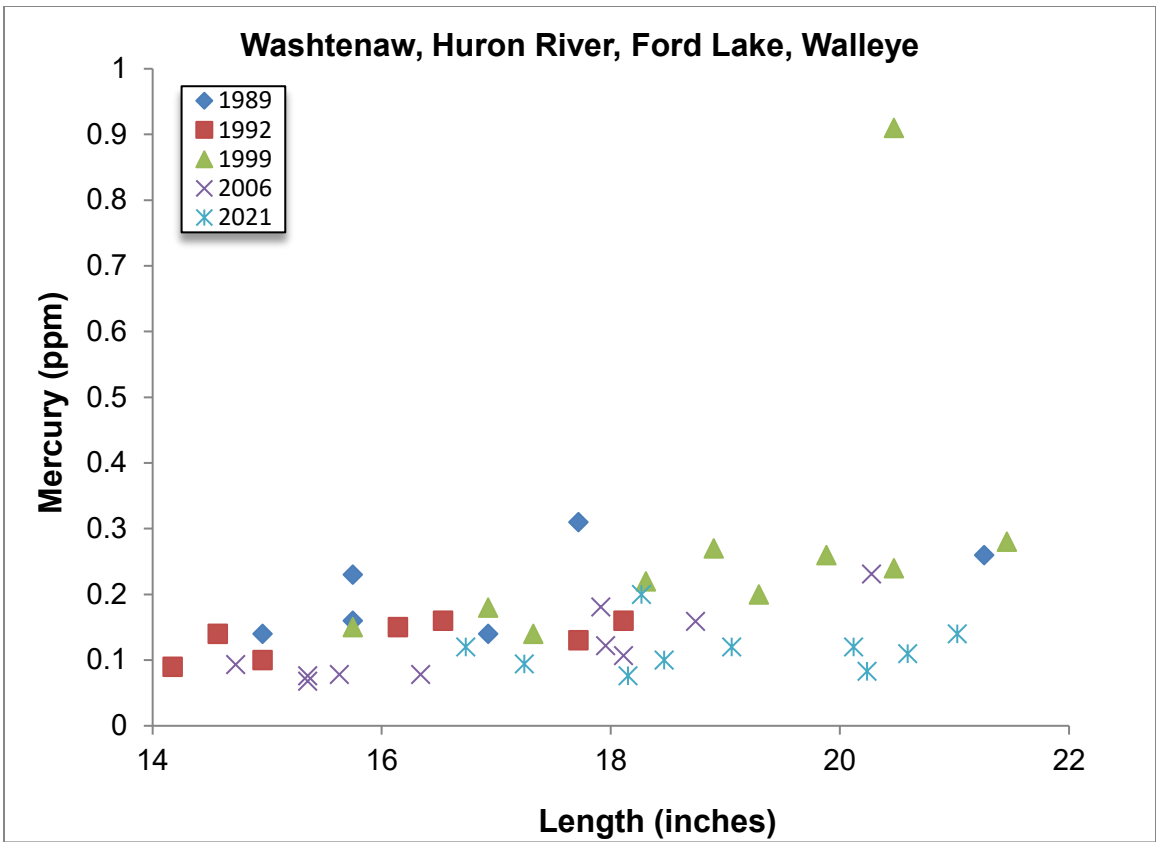
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1989	2021	43	14.2	15.0	14.6	22.4	
Datasets available: 1989, 1992, 1999, 2006, 2021							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	42	0.173		0.068	0.910	0.215	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.157	0.224					

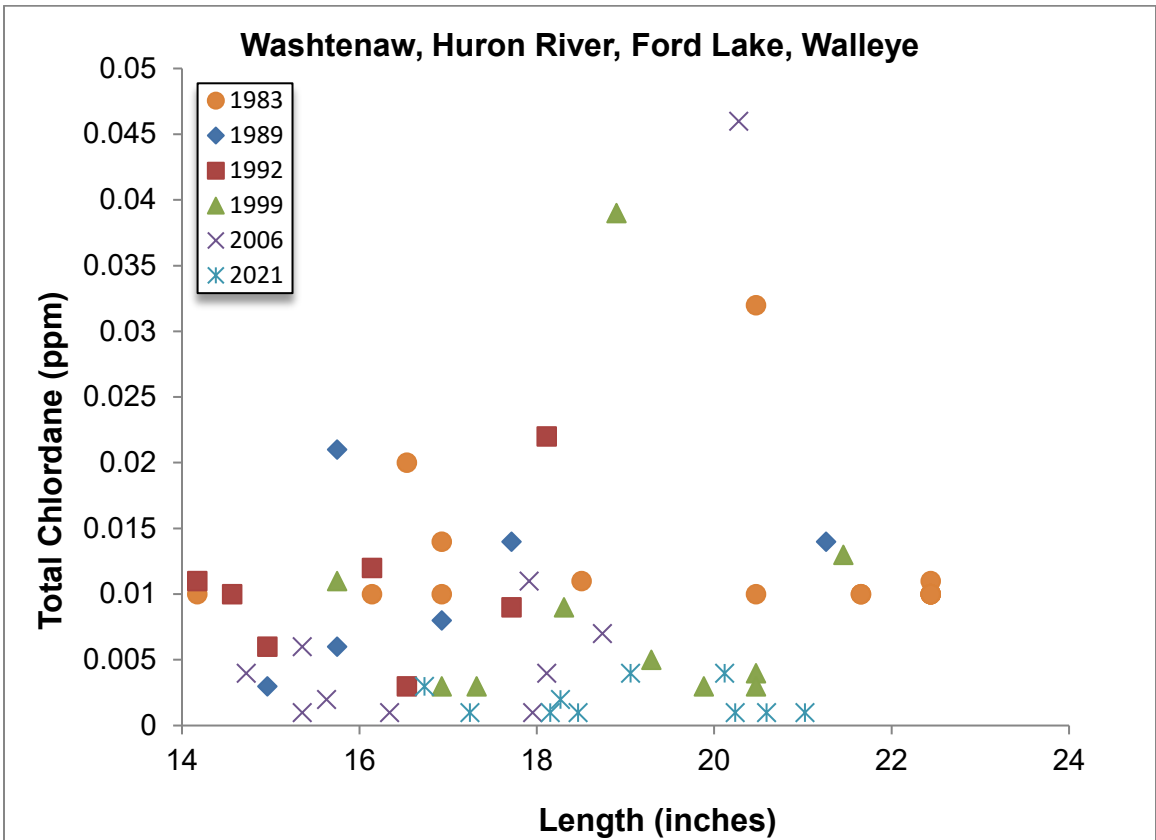
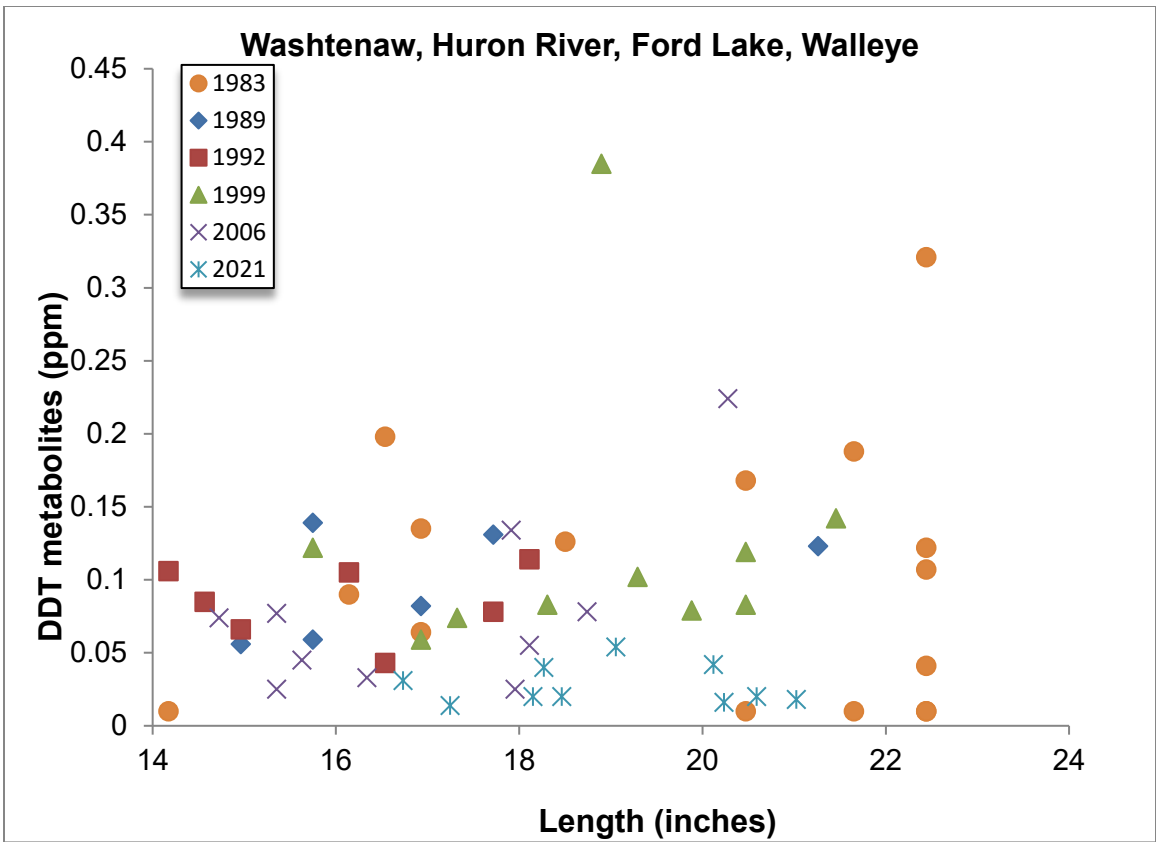
Organics Analysis:

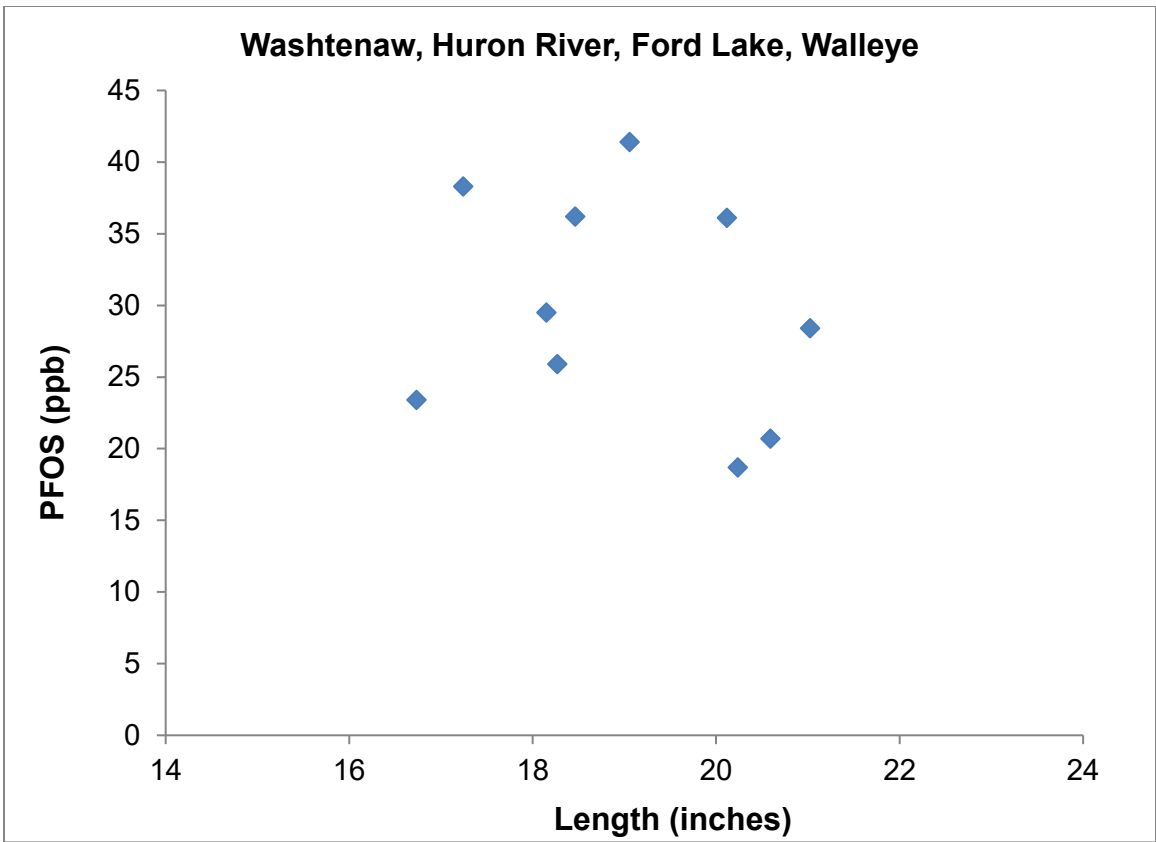
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2006	2021	20	14.7	15.0	14.7	21.0	
Datasets available: No PFOS: 1983, 1989, 1992, 1999, 2006; With PFOS: 2021							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	20	0.056		0.004	0.295	0.087	2
DDT	20	0.052		0.014	0.224	0.076	16
Chlordane	20	0.005		<0.001	0.046	0.010	16
Toxaphene	20	ND		--	--	--	--
PFOS	10	29.9 ppb		18.7 ppb	41.4 ppb	35.5 ppb	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.115	0.056					
DDT	0.019	0.002					
Chlordane	0.020	0.014					
Toxaphene	--	--					
PFOS	0.055	0.065					
Final meal category based on UCL:							2

Existing MDHHS Advisory: There is a Do Not Eat advisory for all fish species for this section of the Huron River due to PFOS.

Recommendation: No change to the advisory is recommended. MDHHS will continue to evaluate PFOS concentrations in fish throughout the Huron River to determine whether the existing Do Not Eat advisory for all species from this section of the river is appropriate.







White Sucker

**Ford Lake
Huron River**

Washtenaw County

Hg Analysis:

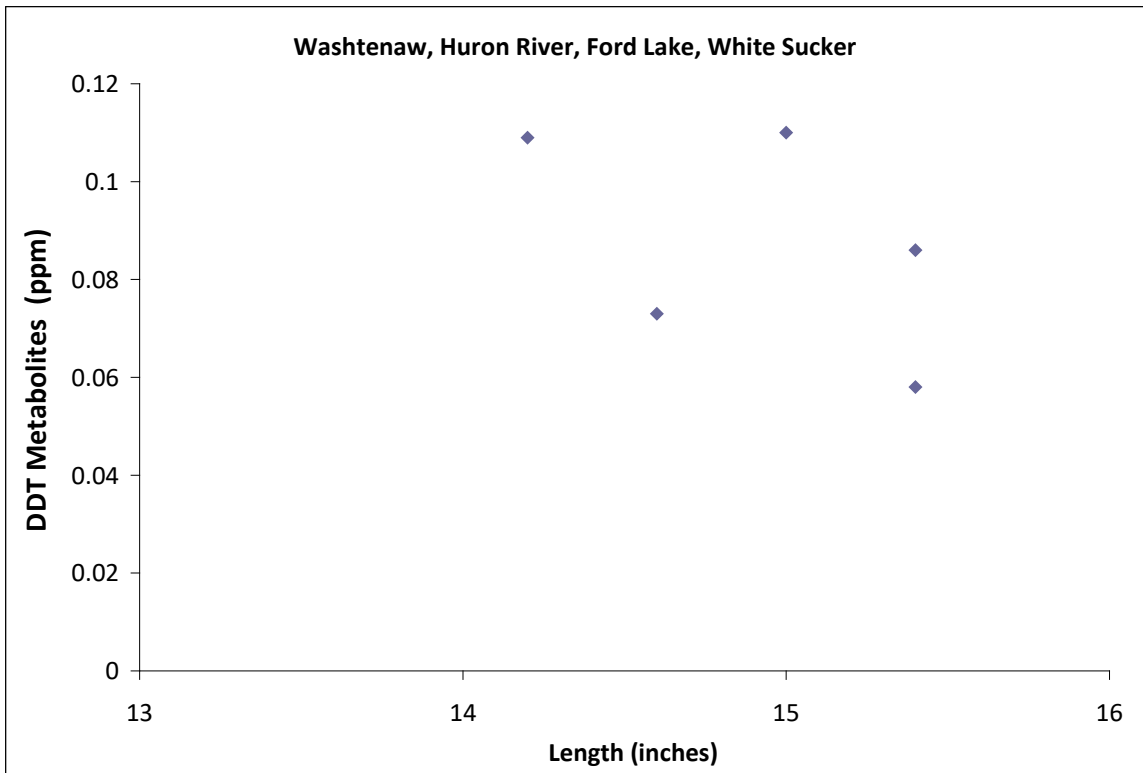
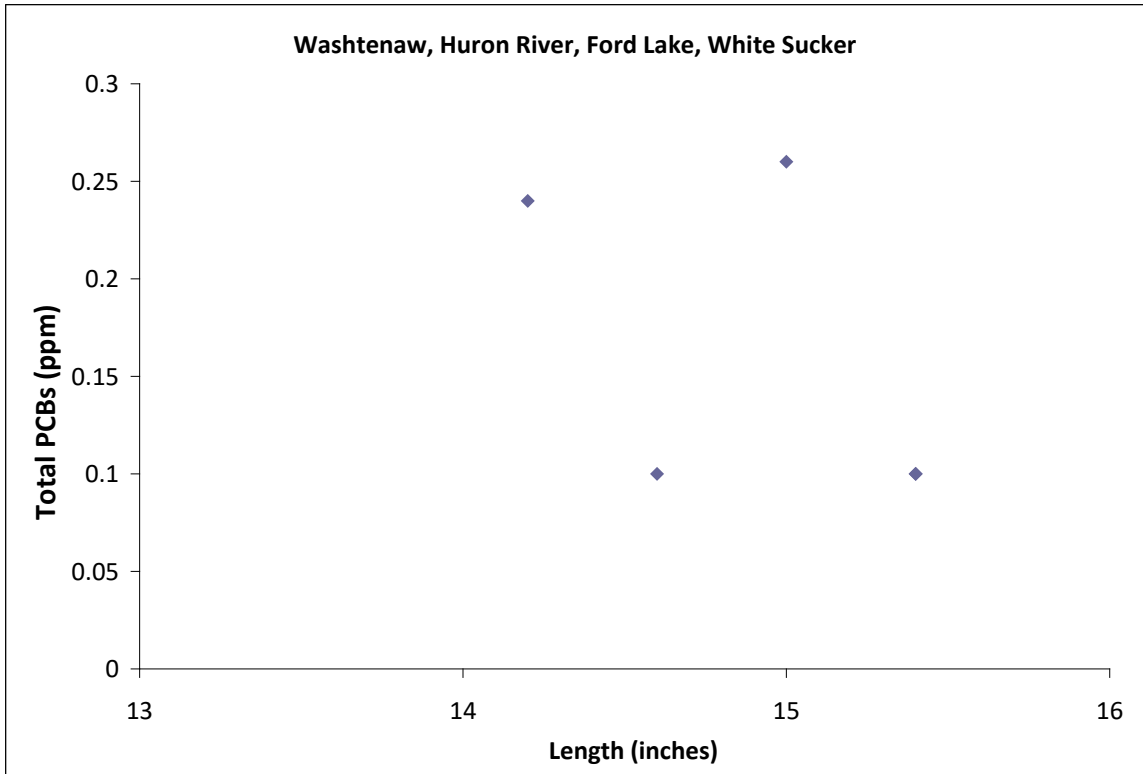
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
		0				
Datasets available:						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL	Meal Category
Mercury	0	--			--	--
Chemical	Linear Regression	Exponential Regression				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

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1983	1983	5	14.2	na	14.2	15.4
Datasets available: 1983						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL	Meal Category
PCB	5	0.160			0.260	0.5
DDT	5	0.087			0.120	12
Chlordane	5	ND			--	--
Toxaphene	5	ND			--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.262	0.279				
DDT	0.256	0.255				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						0.5*

Existing Advisory: No one should eat more than 2 meals per month of Ford Lake white sucker due to PCBs. Dataset is limited due to the age of the data. *Based on EGLE’s Fish Contaminant Monitoring Program, PCB and DDT concentrations ≥15 years old are expected to have declined to a concentration that would allow a less restrictive meal category. Upon management review, the recommendation was set to two meal categories less restrictive based on PCBs.

Recommendation: There is a Do Not Eat advisory for all fish species for this section of the Huron River due to PFOS.



Carp

**Geddes Pond
Huron River**

Washtenaw County

Hg Analysis:

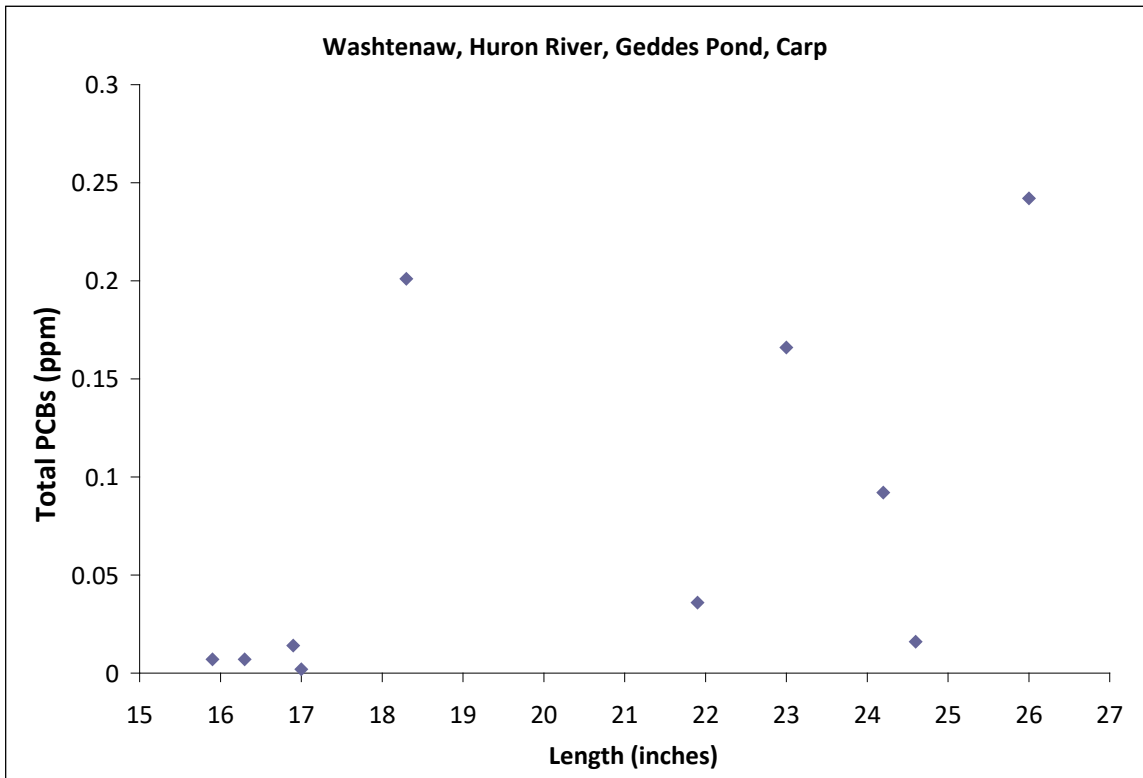
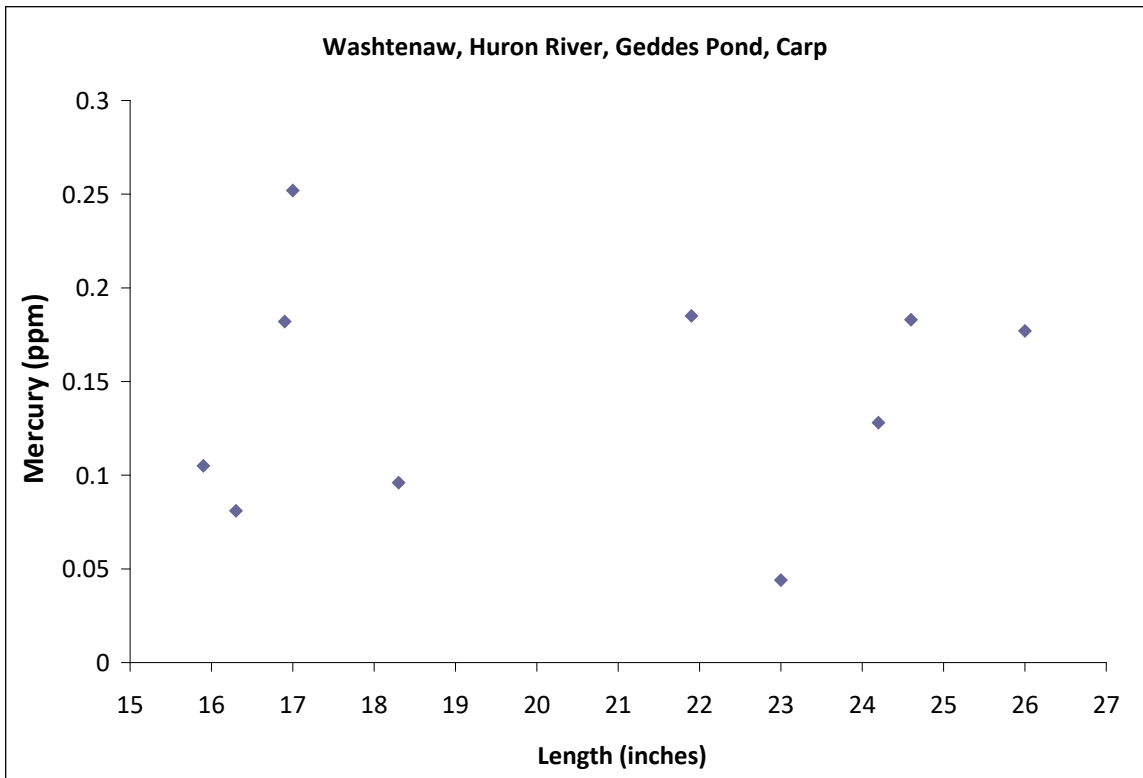
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2008	2008	10	15.9	na	15.9	26
Datasets available: 2008						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	10	0.143			0.190	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.003	0.003				

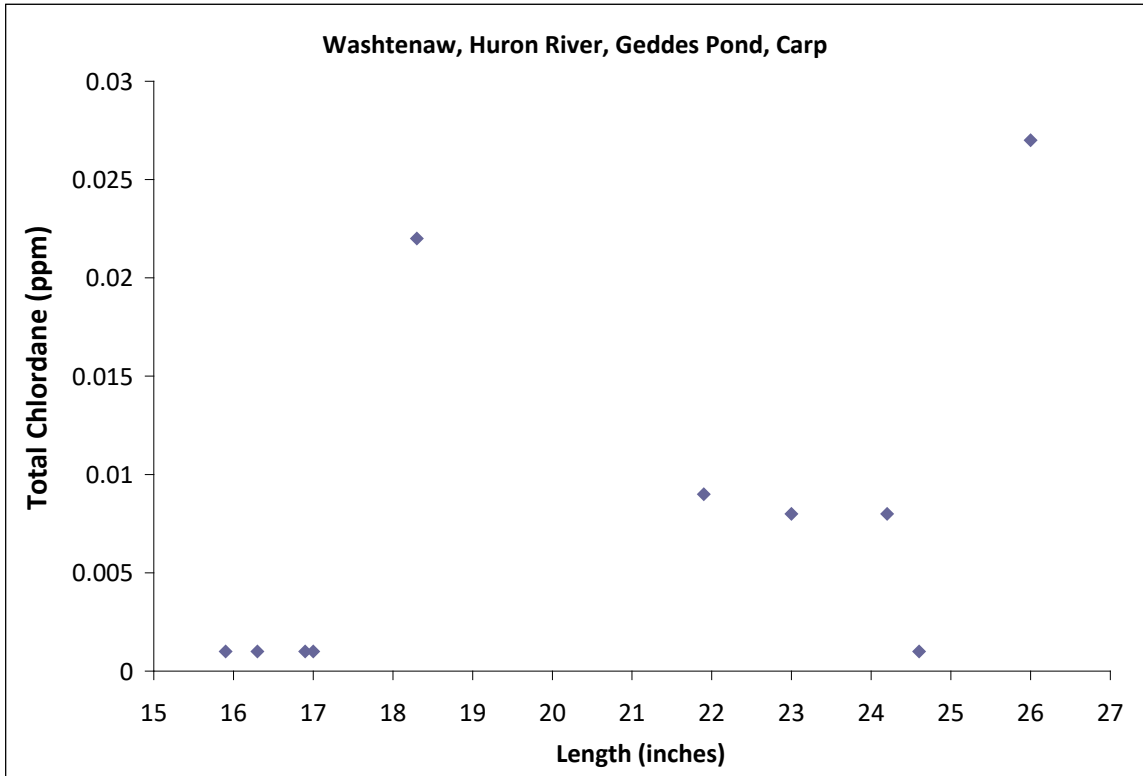
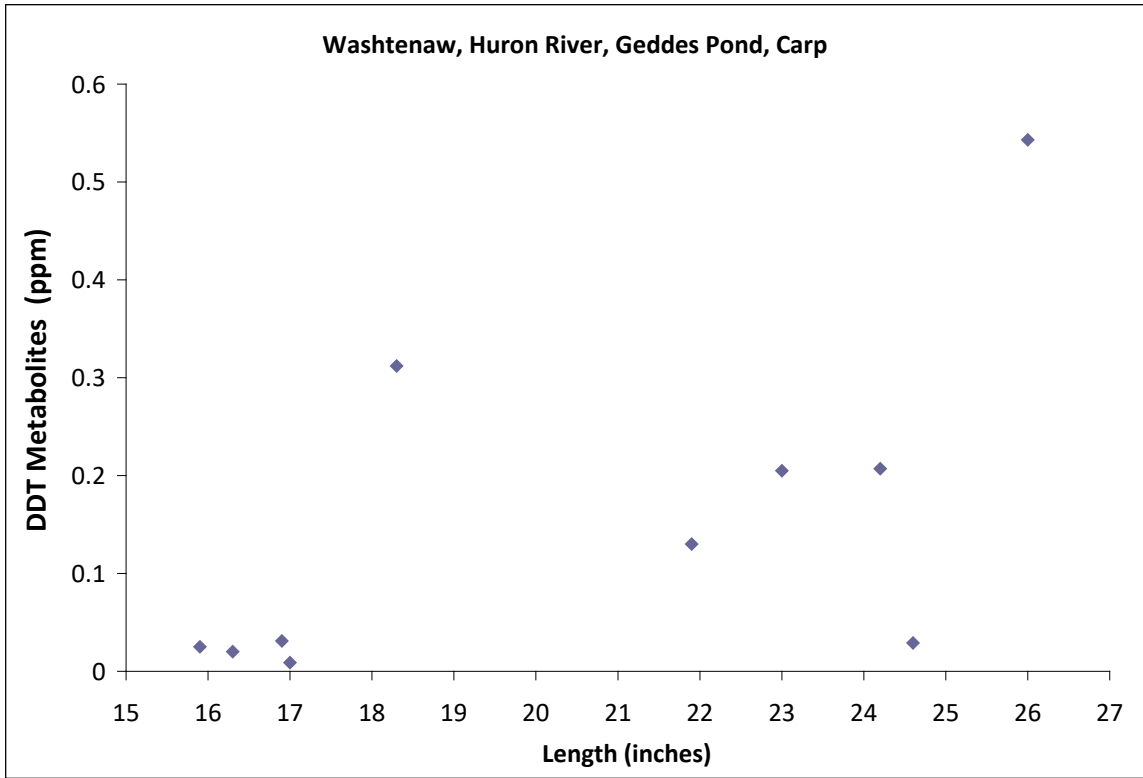
Organics Analysis:

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	15.9	na	15.9	26
Datasets available: 2008						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	10	0.078			0.140	1
DDT	10	0.151		0.270	4	
Chlordane	10	0.008		0.010	--	
Toxaphene	10	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.282	0.433				
DDT	0.365	0.429				
Chlordane	0.225	0.333				
Toxaphene	--	--				
Final meal category based on UCL:					1	

Existing Advisory: No one should eat more than 1 meal per month of Geddes Pond carp due to PCBs. Mercury and DDT would cause advisories.

Recommendation: There is a Do Not Eat advisory for all fish species for this section of the Huron River due to PFOS.





Largemouth Bass

**Hubbell Pond
Huron River**

Oakland County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent						
2018	2018	10	13.0	14	14.3	19.7	
Datasets available: 2018							
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category	
Mercury	8	0.350	0.220	0.590	0.442	2	
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.782	0.045					

Organics Analysis:

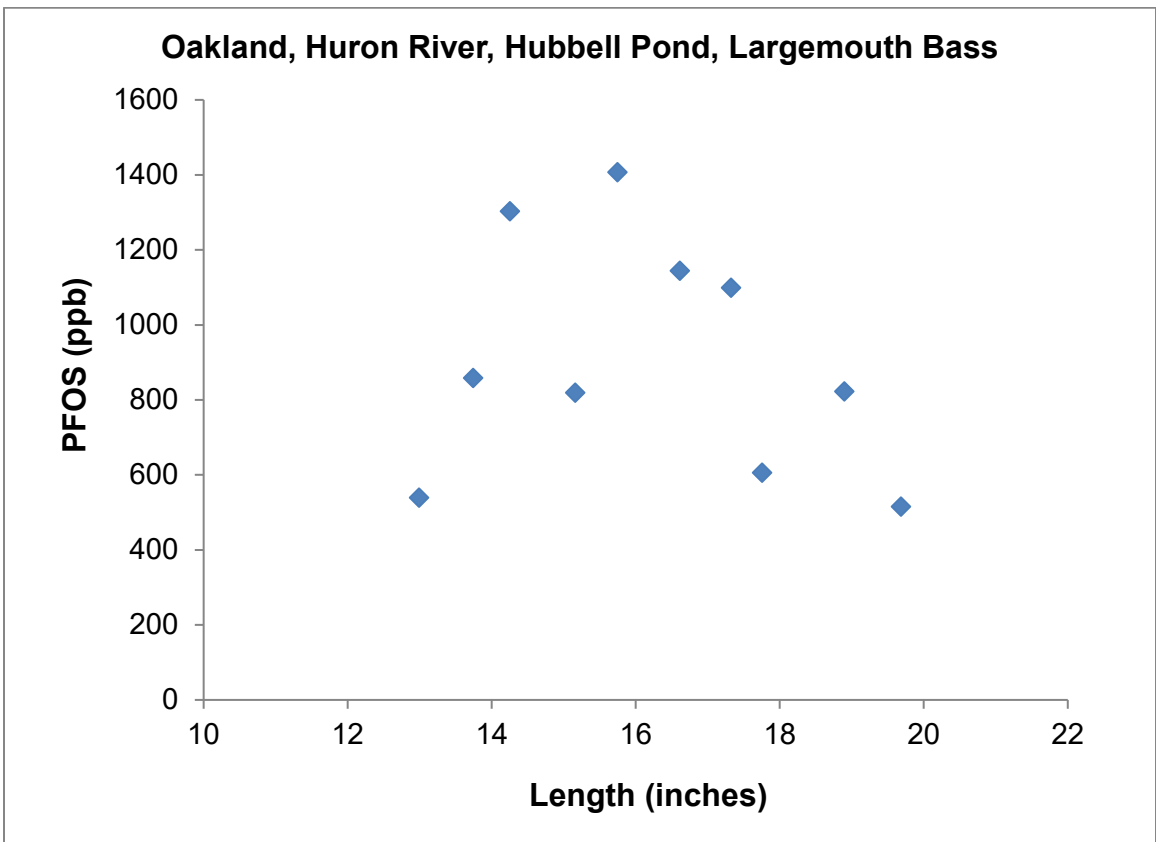
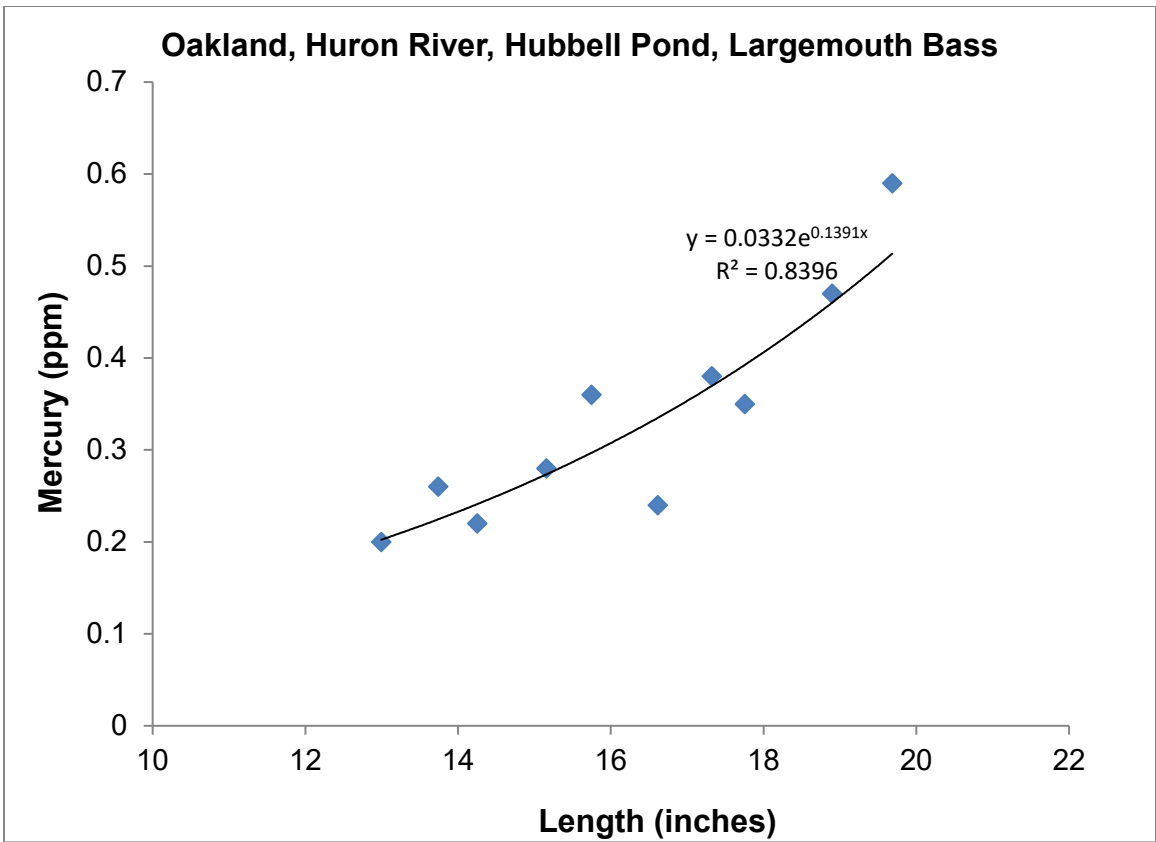
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent						
2018	2018	10	13.0	14	13.0	19.7	
Datasets available: 2018							
Chemical	Sample Size (All*)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category	
PCB	0	--	--	--	--	--	--
DDT	0	--	--	--	--	--	--
Chlordane	0	--	--	--	--	--	--
Toxaphene	0	--	--	--	--	--	--
PFOS	10	912 ppb	516 ppb	1408 ppb	1138 ppb	0	
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	0.046	0.045					
Final meal category based on UCL:						0	

* Because no length relationship has been observed in the statewide dataset, sub-legal individuals were used in the analysis

Existing MDHHS Advisory: There is a Do Not Eat advisory for all fish species for this section of the Huron River due to PFOS.

Recommendation: No change to the advisory is recommended. MDHHS will continue to evaluate PFOS concentrations in fish throughout the Huron River to determine whether the existing Do Not Eat advisory for all species from this section of the river is appropriate.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
14	0.233	4
15	0.267	4
16	0.307	2
17	0.353	2
18	0.406	2
19	0.467	2



Black Crappie

**Kent Lake
Huron River**

Oakland County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2017	2017	10	7.1	na	7.1	12.1
Datasets available: 1990, 2004, 2017						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.11	0.06	0.16	0.14	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.753	0.797				

Organics Analysis:

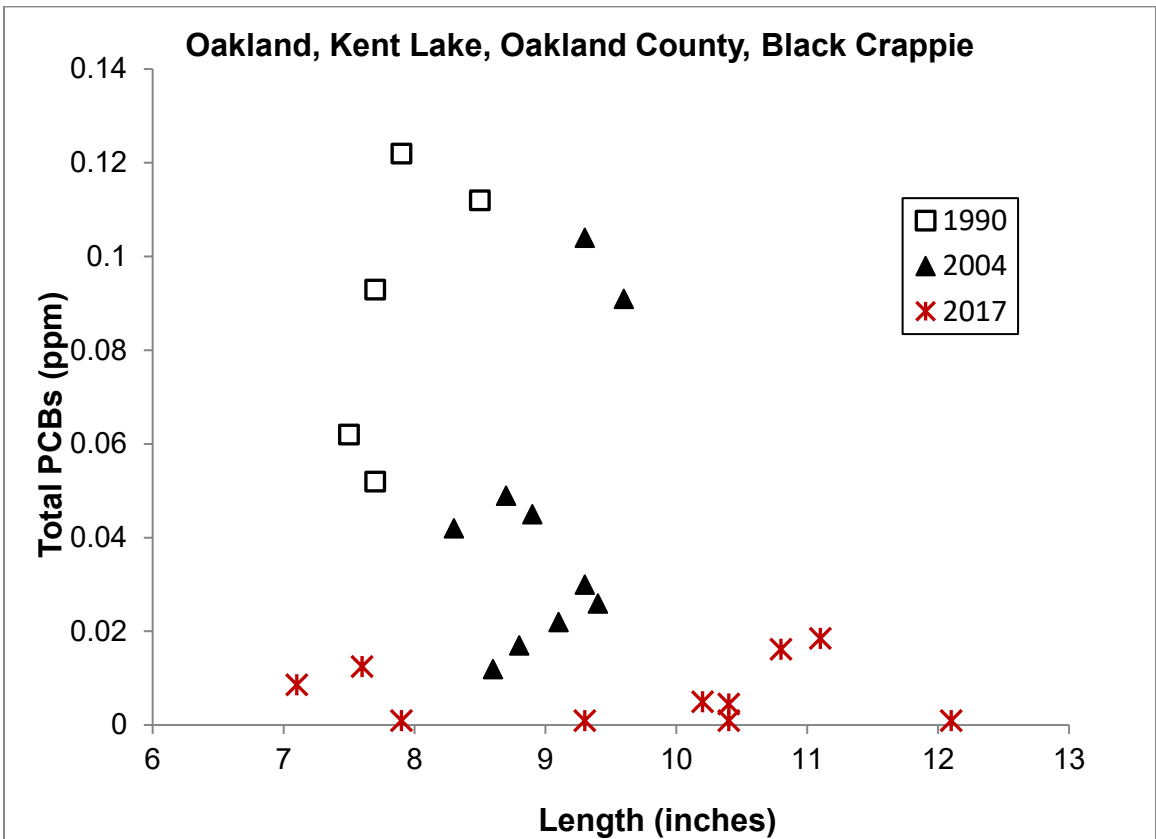
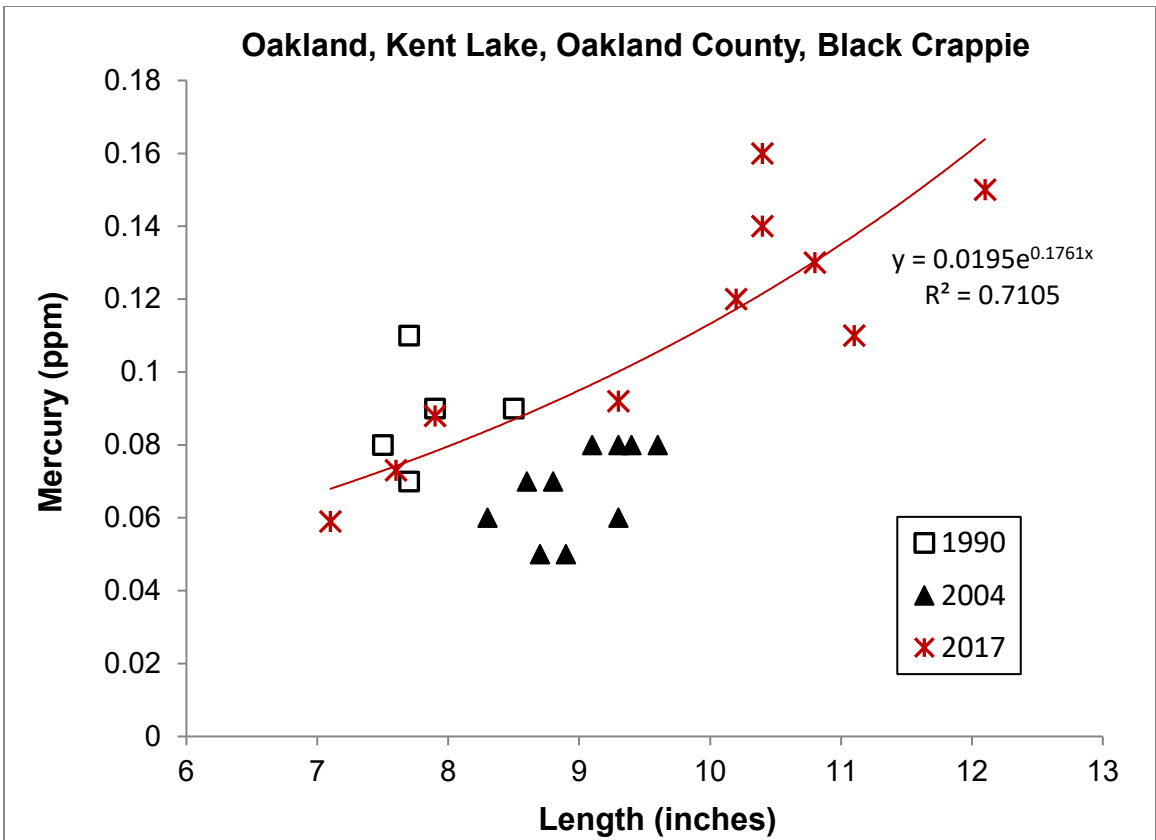
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2017	2017	10	7.1	na	7.1	12.1
Datasets available: 1990, 2004, 2017						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.007	0.001	0.02	0.01	12
DDT	10	0.009	0.003	0.02	0.01	16
Chlordane	10	ND	< 0.001	< 0.001	--	--
Toxaphene	10	ND	< 0.05	< 0.05	--	--
PFOS	10	1029 ppb	871 ppb	1378 ppb	1134 ppb	0
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.001	0.009				
DDT	0.047	0.009				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.002	0.001				
Final meal category based on UCL:						0

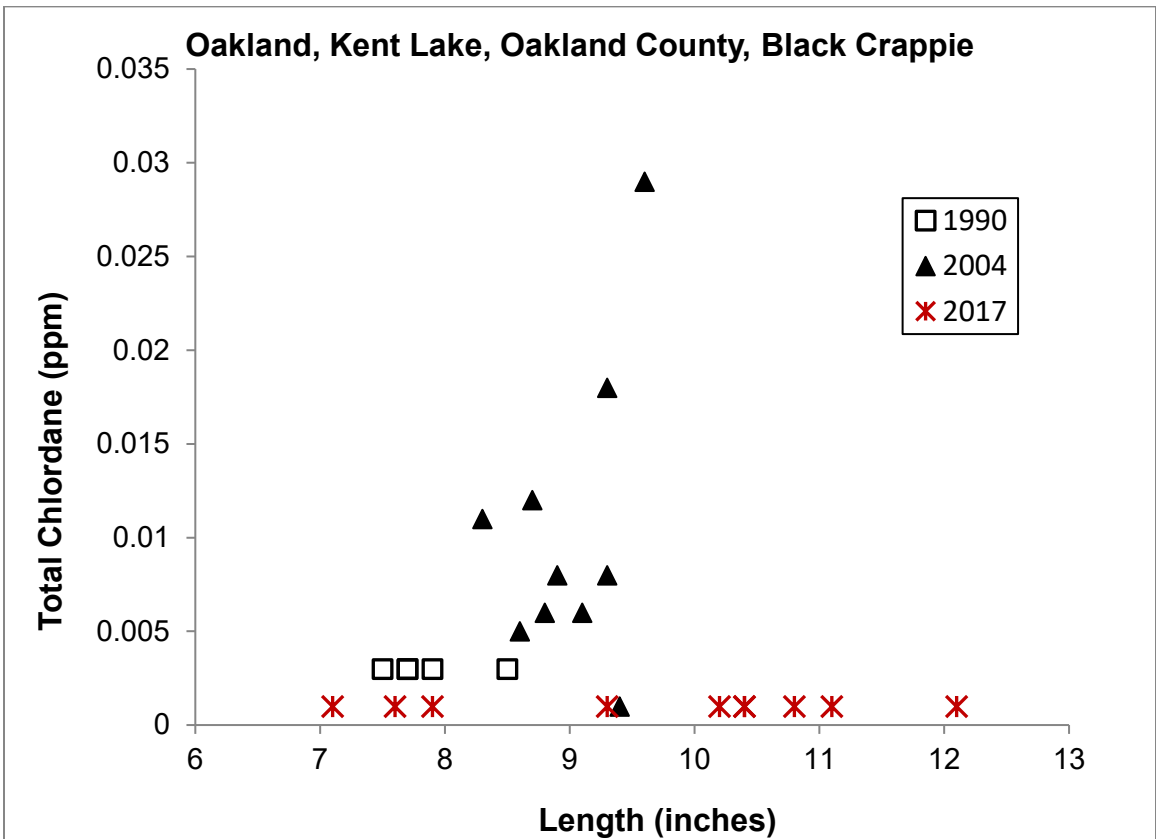
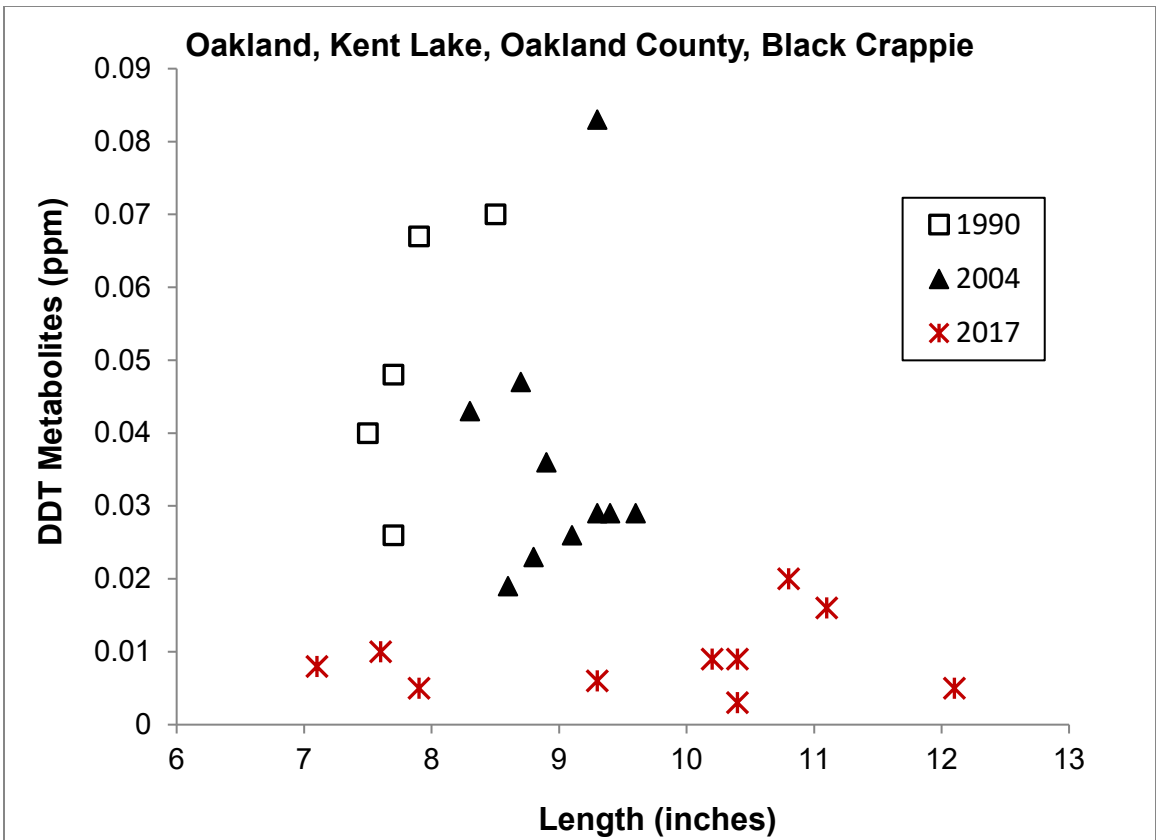
Existing MDHHS Advisory: No one should eat more than 2 meals per month of Kent Lake black crappie due to PCBs. Mercury would cause an advisory.

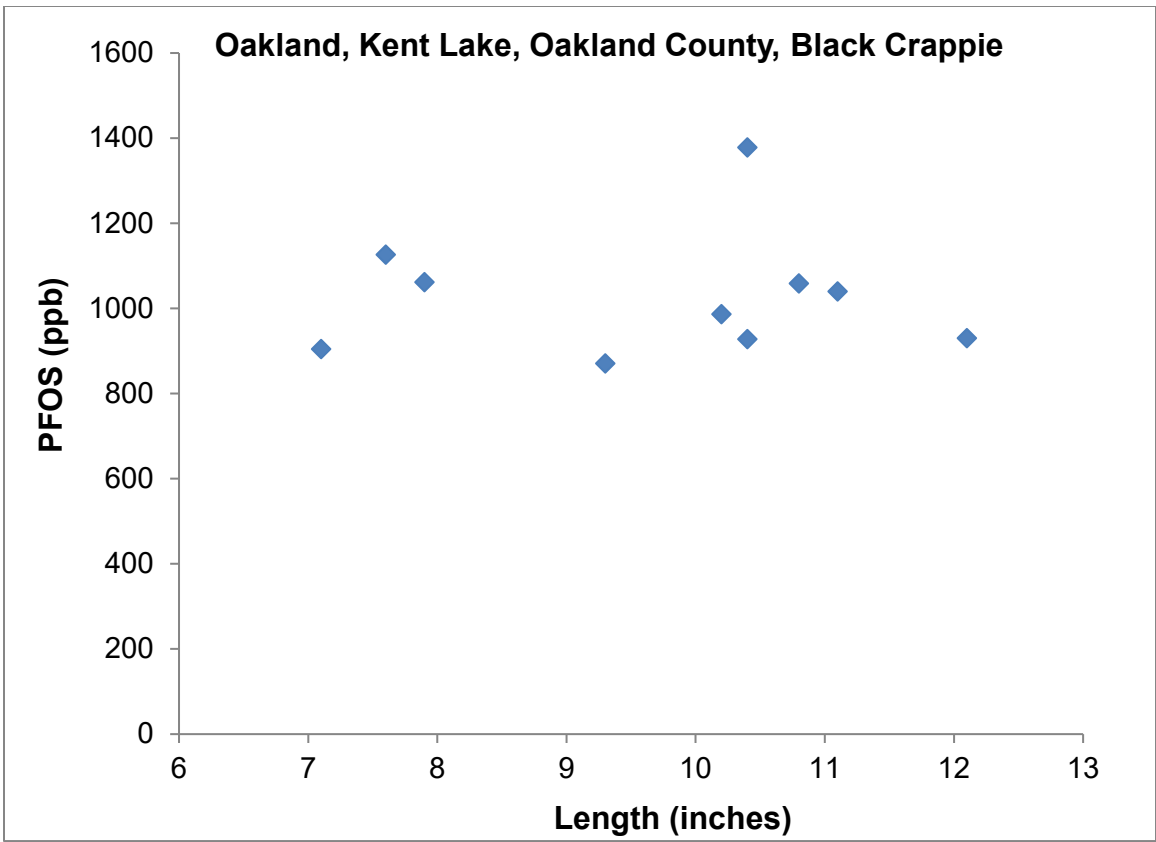
Recommendation: There is a Do Not Eat advisory for all fish species for this section of the Huron River due to PFOS.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
5	0.05	16
6	0.06	16
7	0.07	16
8	0.08	12
9	0.1	8
10	0.11	8
11	0.14	4
12	0.16	4
14	0.23	4

Shaded area denotes extrapolated estimates







**Bluegill and
Pumpkinseed**

**Kent Lake
Huron River**

Oakland County

Hg Analysis:

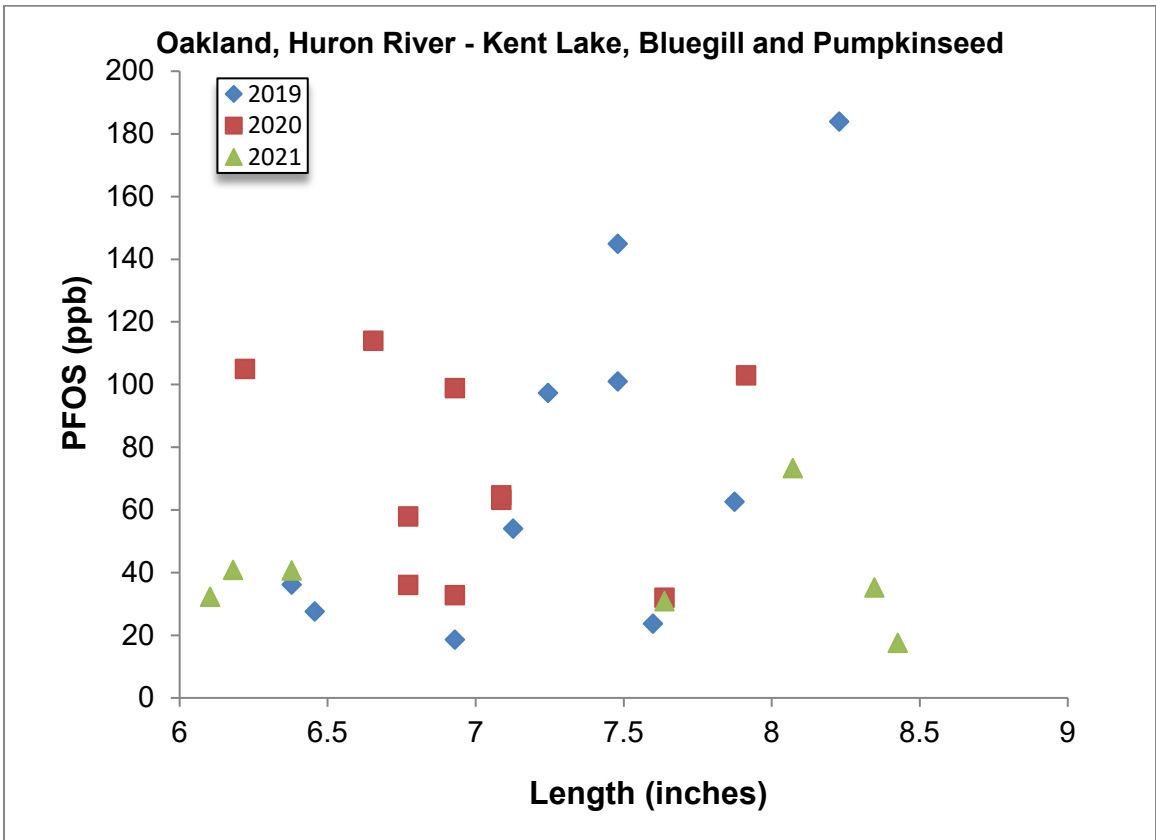
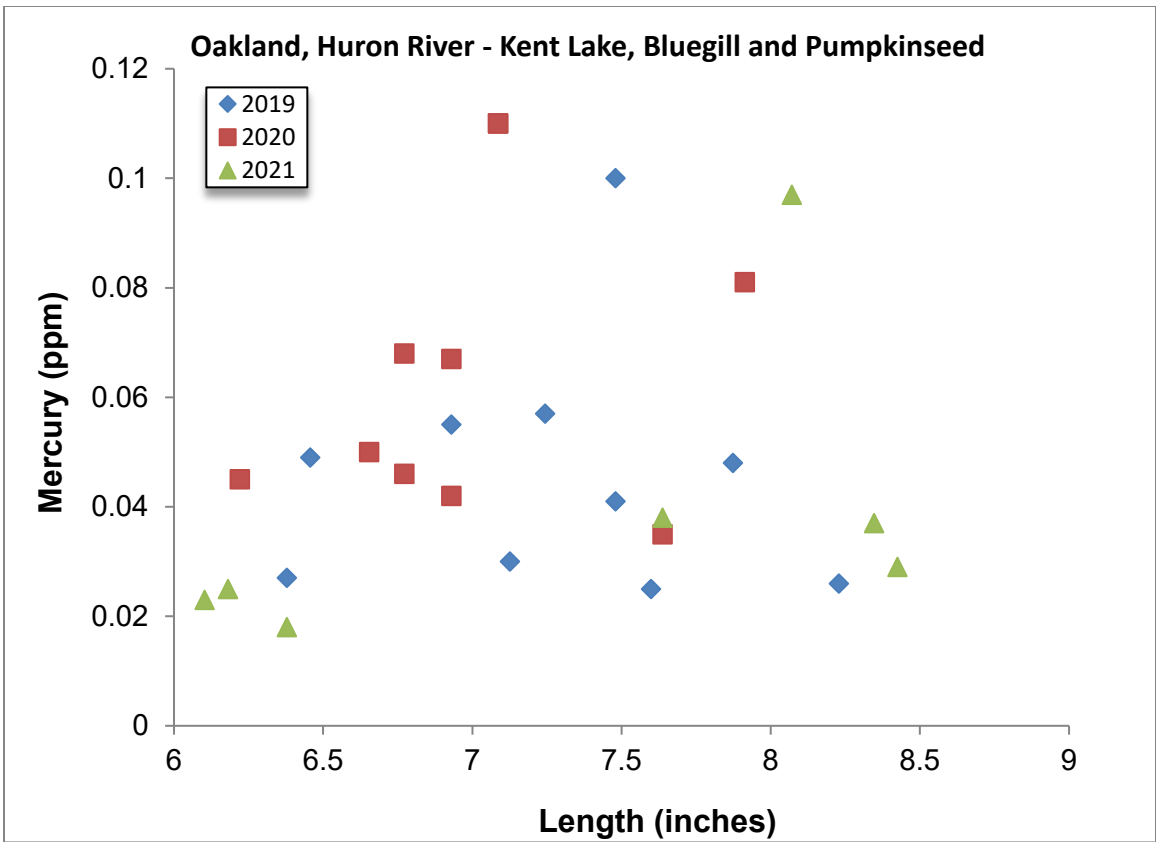
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent						
2019	2021	30	5.7	NA	5.7	8.4	
Datasets available: 2019, 2020, 2021							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	30	0.049		0.018	0.110	0.059	16
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.056	0.067					

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent						
2019	2021	20	5.7	NA	5.7	8.4	
Datasets available: 2019, 2020, 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	30	62.2 ppb		17.6 ppb	184 ppb	77.2 ppb	1
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	0.054	0.015					
Final meal category based on UCL:							1

Existing MDHHS Advisory: There is a Do Not Eat advisory for all fish species for this section of the Huron River due to PFOS.

Recommendation: No change to the advisory is recommended. MDHHS will continue to evaluate PFOS concentrations in fish throughout the Huron River to determine whether the existing Do Not Eat advisory for all species from this section of the river is appropriate.



Carp

**Kent Lake
Huron River**

Oakland County

Hg Analysis:

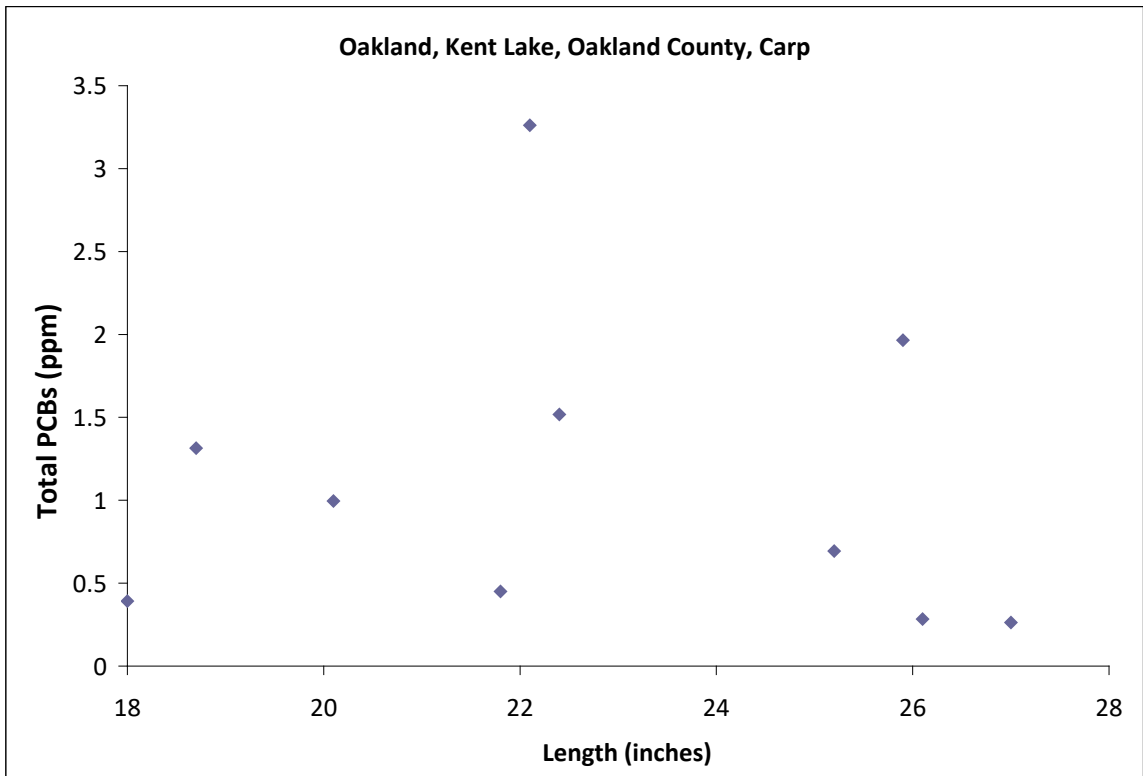
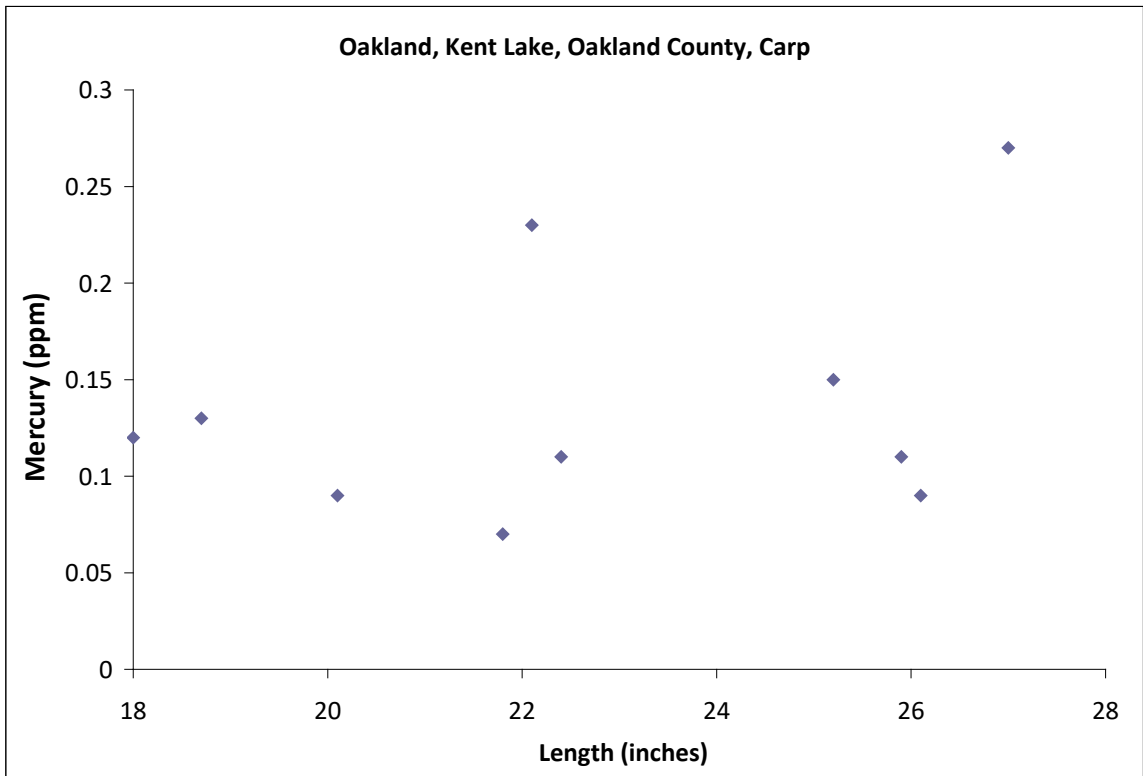
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1998	1998	10	18	na	18	27
Datasets available: 1998						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	10	0.137		0.180	4	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.105	0.075				

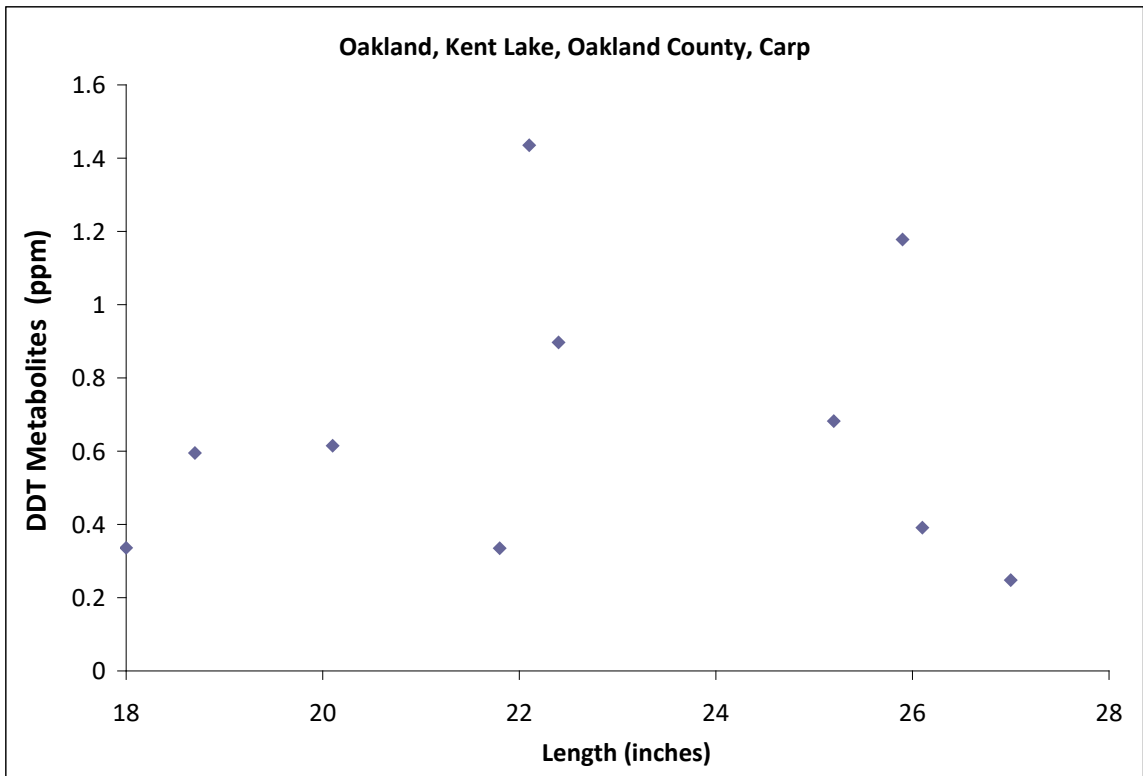
Organics Analysis:

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	18	na	18	27
Datasets available: 1998						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	10	1.114		1.790	Limited	
DDT	10	0.671		0.950	1	
Chlordane	10	ND		--	--	
Toxaphene	10	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.010	0.049				
DDT	0.004	0.000				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:					Limited	

Existing Advisory: Sensitive populations should not eat these fish. Healthy adults should limit consumption to 1 or 2 meals per year of Kent Lake carp due to PCBs. Mercury and DDT would cause advisories.

Recommendation: There is a Do Not Eat advisory for all fish species for this section of the Huron River due to PFOS.





**Largemouth and
Smallmouth Bass**

**Kent Lake
Huron River**

Oakland County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent					
1990	2021	63	11.4	14	13.5	19.9
Datasets available: 1990, 1998, 2017, 2019, 2020, 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	55	0.230	0.070	0.630	0.263	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.336	0.248				

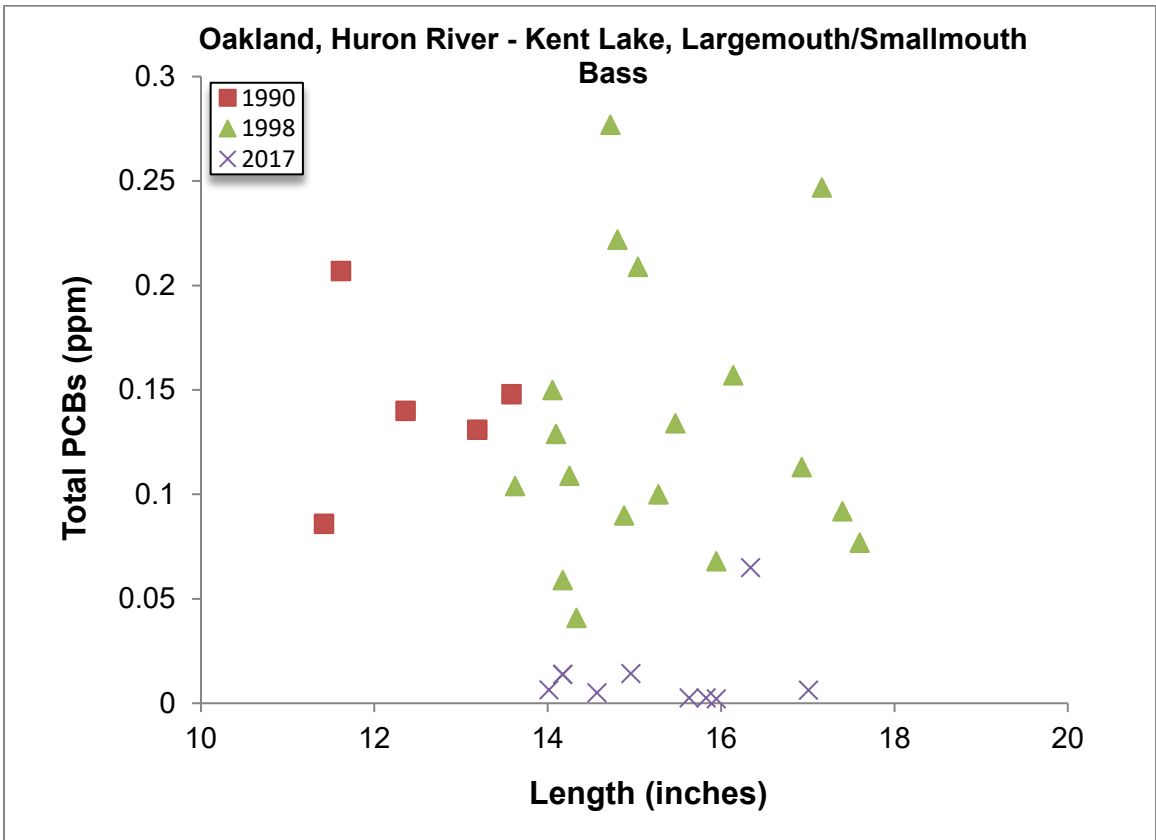
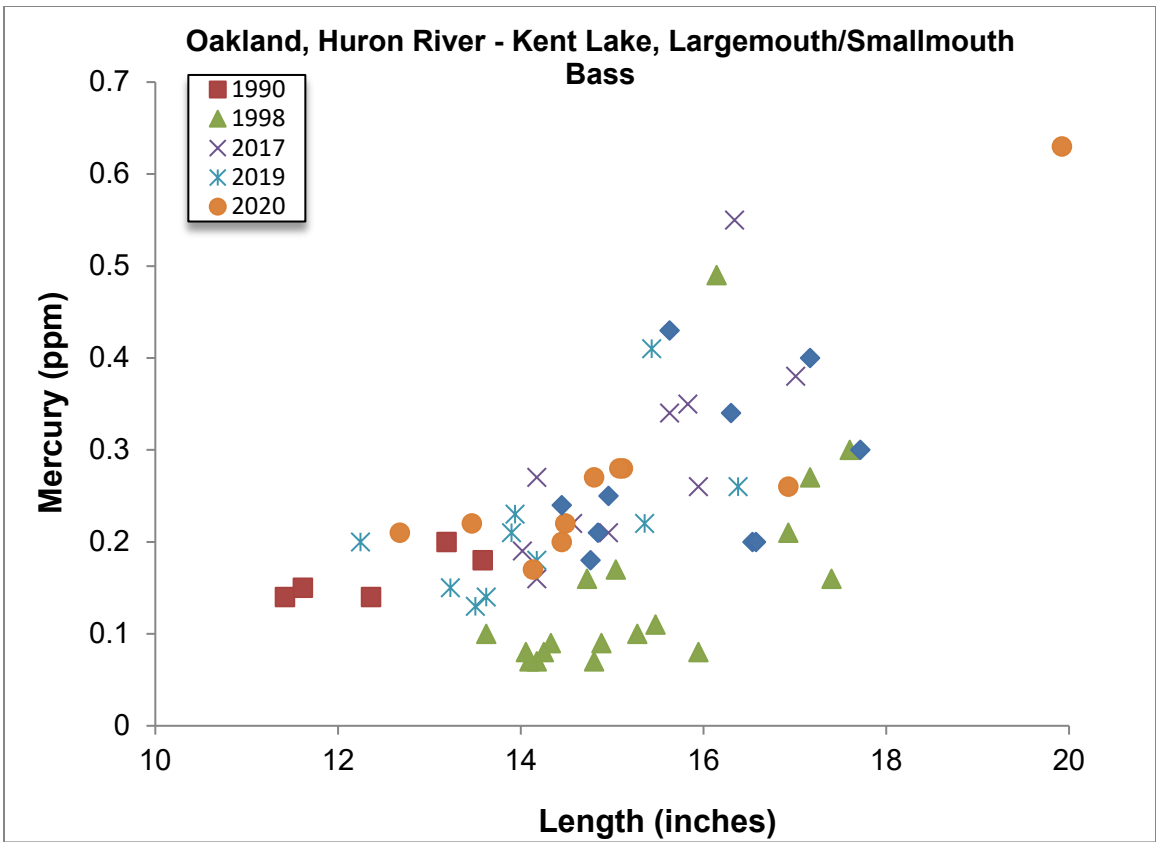
Organics Analysis:

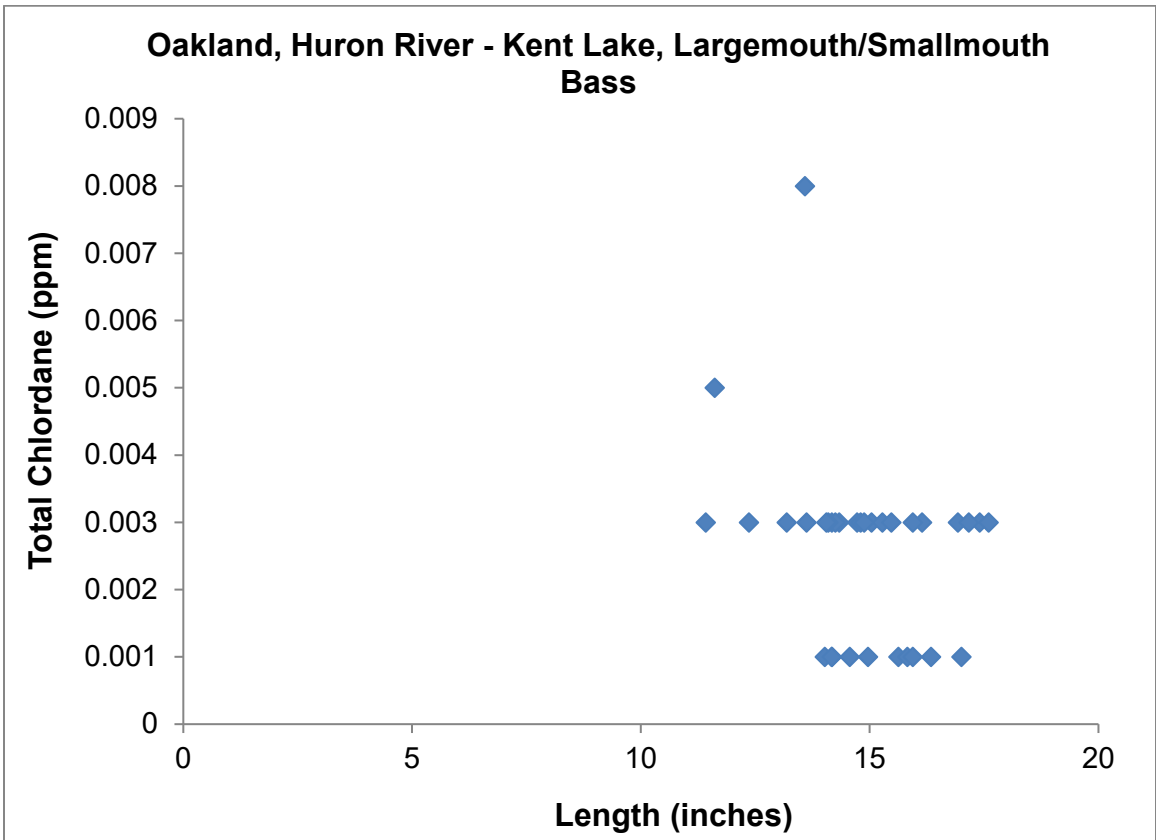
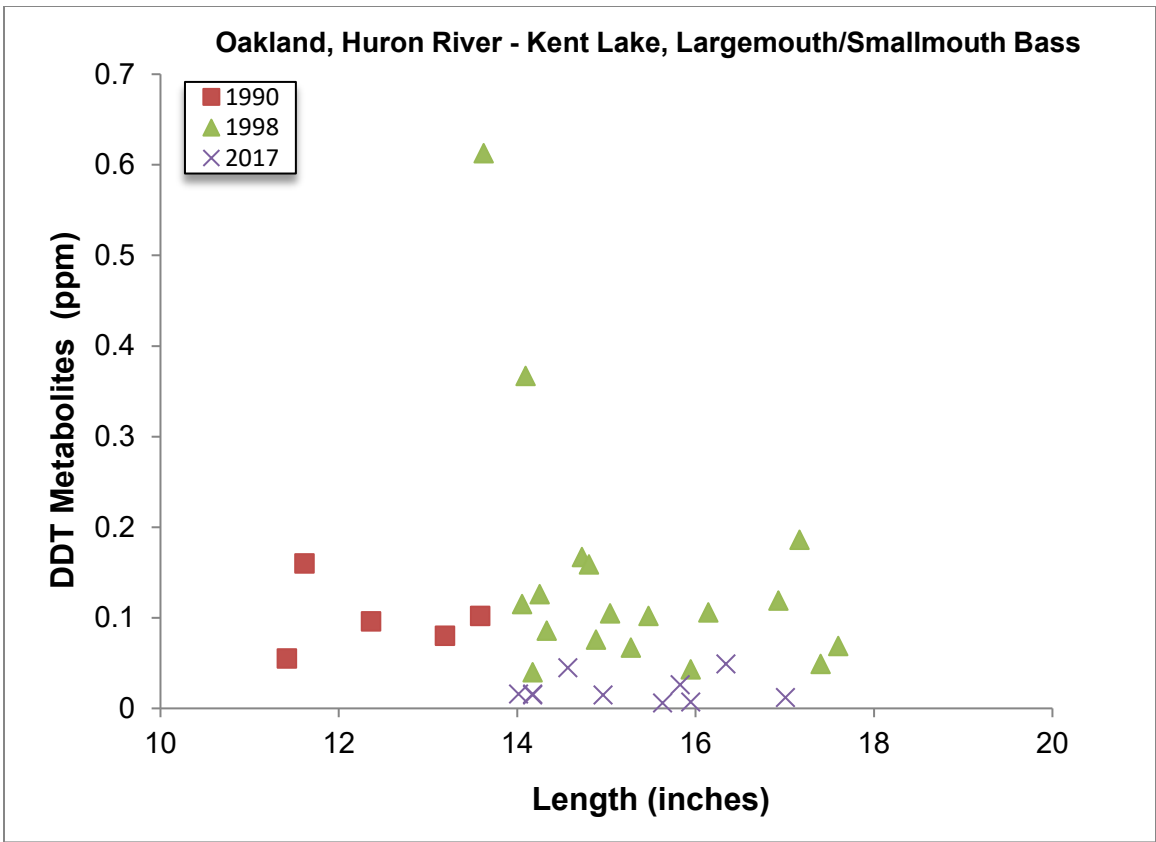
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent					
1990	2021	53	11.4	14	13.5	19.9
Datasets available: No PFOS: 1990, 1998; With PFOS: 2017; Only PFOS: 2019, 2020, 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	29	0.092	0.002	0.277	0.122	1
DDT	29	0.100	0.006	0.613	0.147	12
Chlordane	29	0.002	<0.001	0.008	0.003	16
Toxaphene	7	ND	--	--	--	--
PFOS*	40	608 ppb	73.7 ppb	1998 ppb	783 ppb	0
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.018	0.032				
DDT	0.043	0.048				
Chlordane	0.090	0.066				
Toxaphene	--	--				
PFOS	0.001	0.018				
Final meal category based on UCL:						0

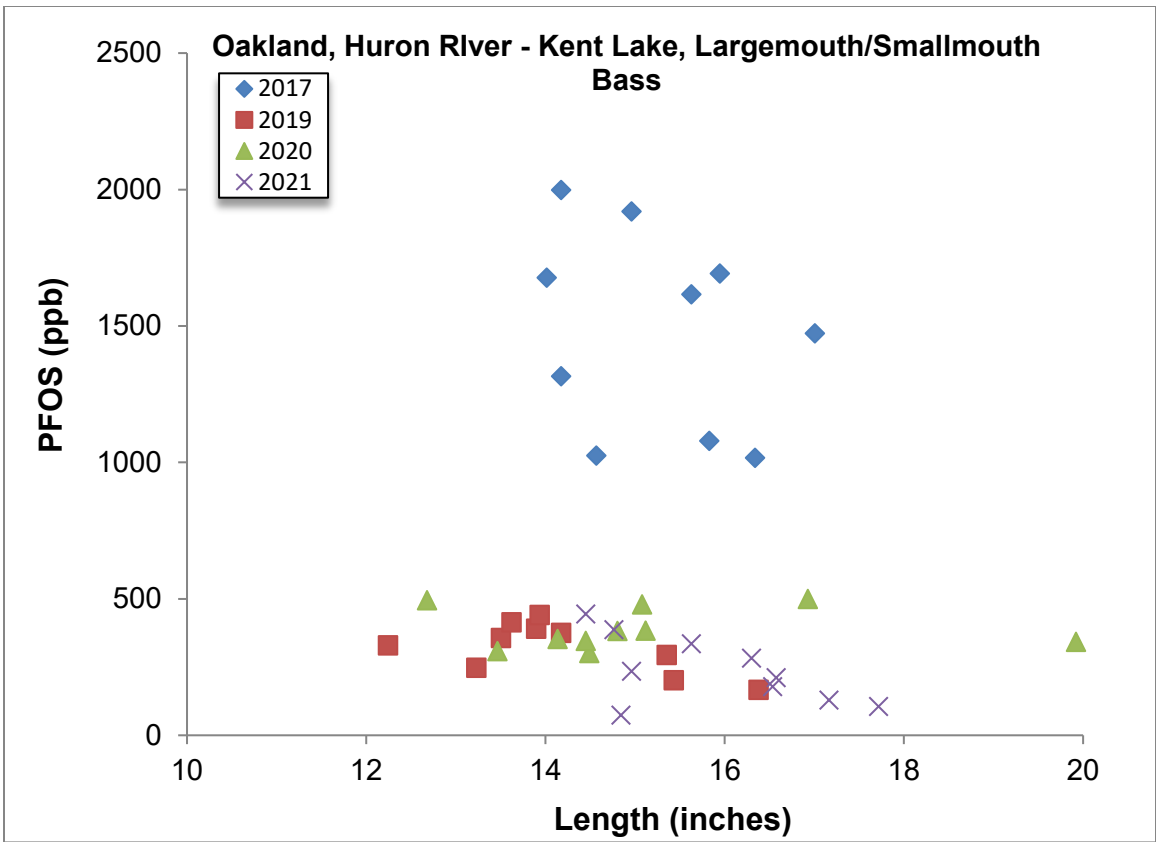
* Sub-legal sized fish were used in the PFOS analysis as no correlation with fish length has been observed in the statewide dataset.

Existing MDHHS Advisory: No one should eat any fish from Kent Lake due to PFOS. PCBs and Mercury also cause less-restrictive advisories.

Recommendation: No change is recommended. Mercury and PCBs would also cause an advisory. Regular sampling should continue to monitor possible continued reductions in PFOS concentrations.







Rock Bass

**Kent Lake
Huron River**

Oakland County

Hg Analysis:

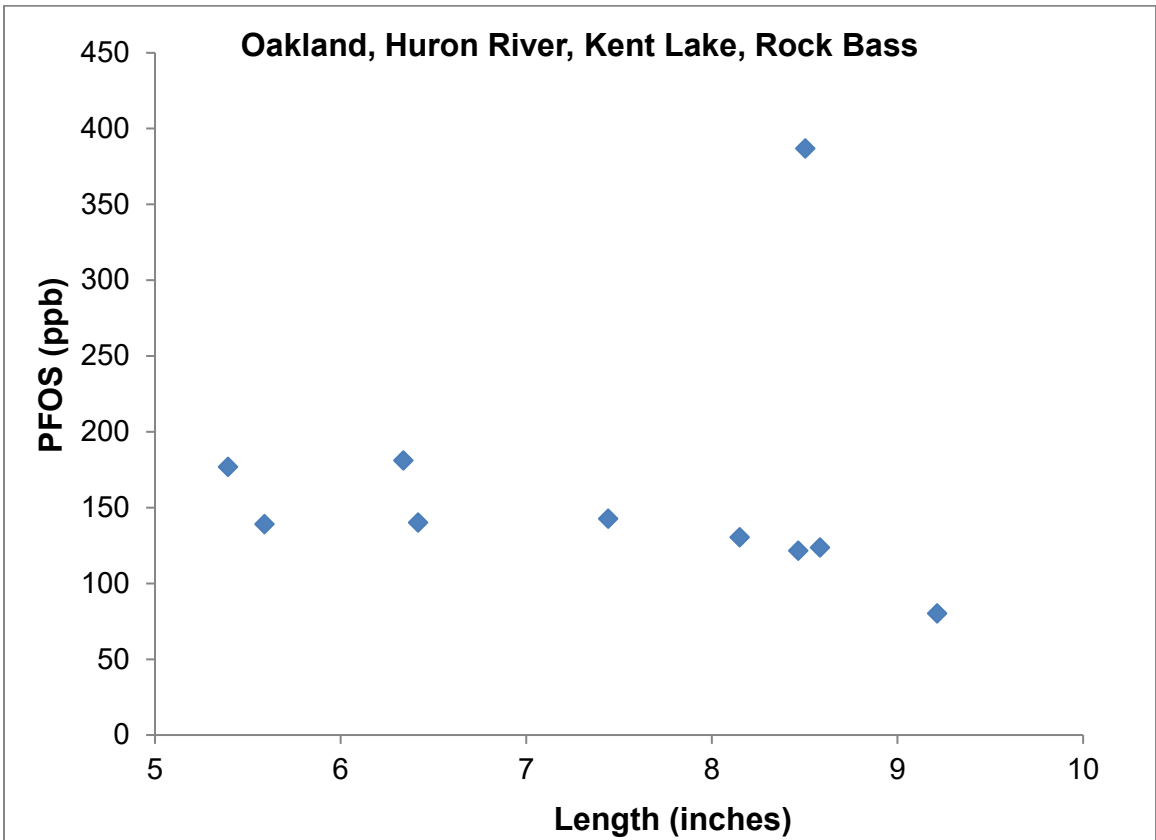
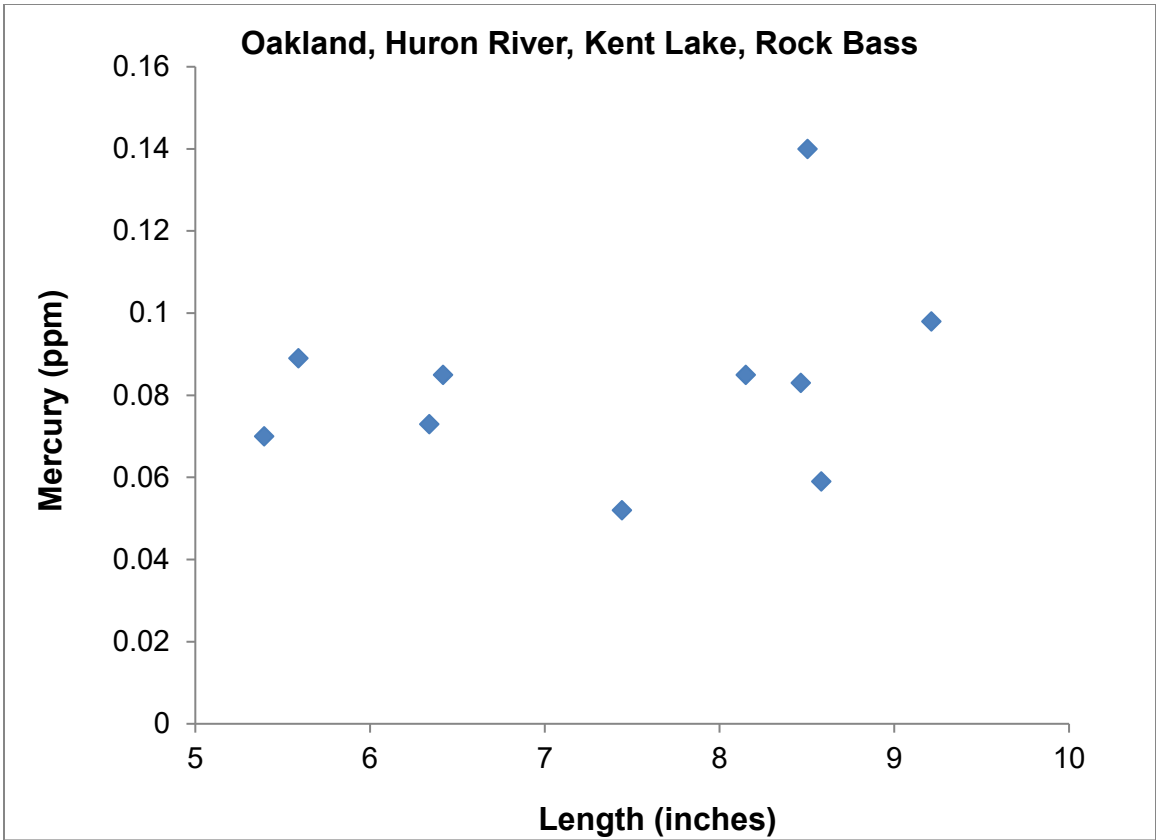
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples				
Earliest	Most Recent								
2021	2021	10	5.4	NA	5.4	9.2			
Datasets available:		2021							
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category			
Mercury	10	0.083	0.052	0.140	0.101	8			
Chemical	Linear Regression	Exponential Regression							
	R ²	R ²							
Mercury	0.081	0.056							

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples				
Earliest	Most Recent								
2021	2021	10	5.4	NA	5.4	9.2			
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	162.4 ppb	80.3 ppb	387.0 ppb	222.4	0.5			
Chemical	Linear Regression	Exponential Regression							
	R ²	R ²							
PCB	--	--							
DDT	--	--							
Chlordane	--	--							
Toxaphene	--	--							
PFOS	0.000	0.038	Final meal category based on UCL:				0.5		

Existing MDHHS Advisory: There is a Do Not Eat advisory for all fish species for this section of the Huron River due to PFOS.

Recommendation: No change to the advisory is recommended. MDHHS will continue to evaluate PFOS concentrations in fish throughout the Huron River to determine whether the existing Do Not Eat advisory for all species from this section of the river is appropriate.



Walleye

**Kent Lake
Huron River**

Oakland County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1990	2004	20	15.5	15	15.5	25
Datasets available: 1990, 2004						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	20	0.222		0.260	4	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.746	0.707				

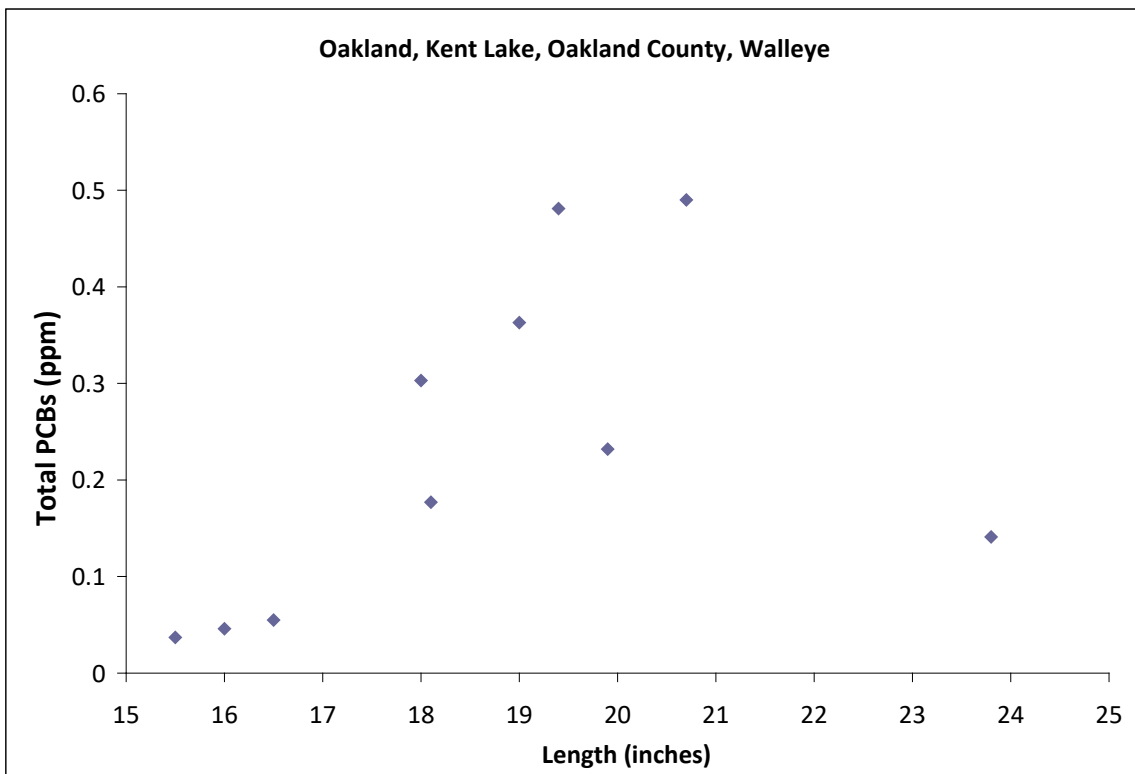
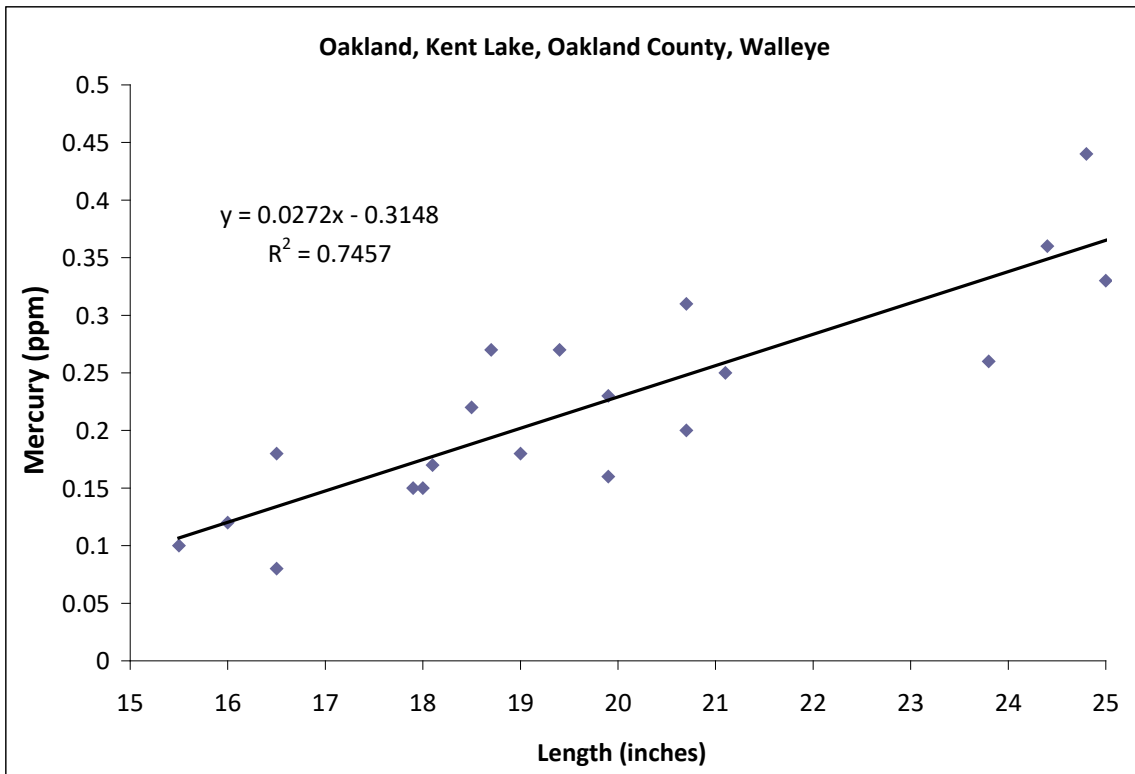
Organics Analysis:

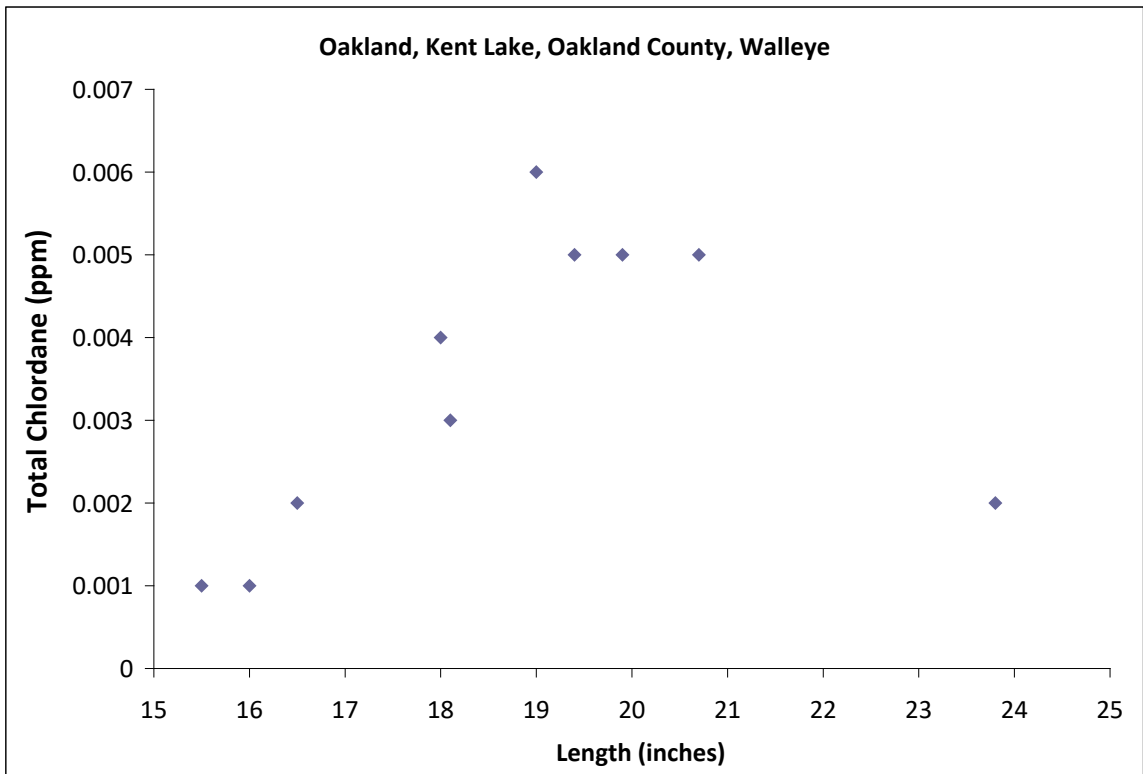
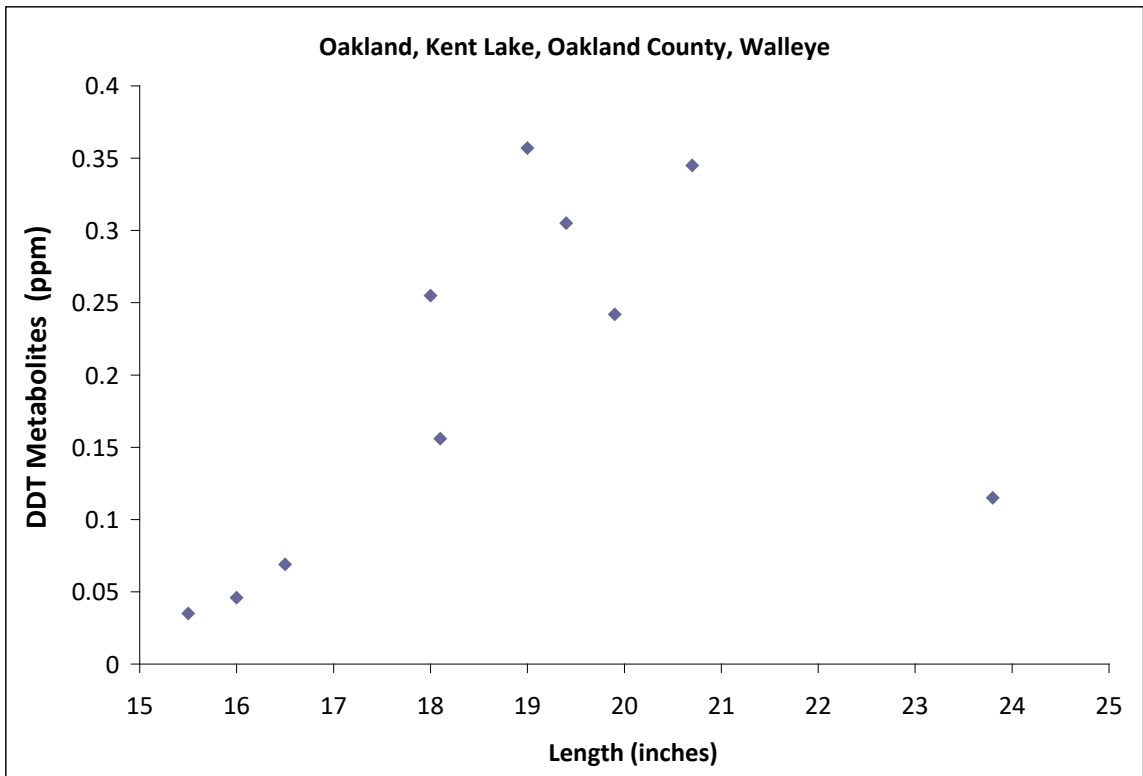
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2004	2004	10	15.5	15	15.5	23.8
Datasets available: 1998, 2004						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	10	0.233		0.360	0.5	
DDT	10	0.193		0.280	4	
Chlordane	10	0.003		0.005	--	
Toxaphene	10	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.212	0.356				
DDT	0.204	0.318				
Chlordane	0.171	0.237				
Toxaphene						
Final meal category based on UCL:					0.5	

Existing Advisory: No one should eat more than 6 meals per year of Kent Lake walleye due to PCBs. Mercury and DDT would cause advisories.

Recommendation: There is a Do Not Eat advisory for all fish species for this section of the Huron River due to PFOS.

Length (Inches)	Hg Regression Estimate (ppm)	Meal Category
15	0.093	8
16	0.120	8
18	0.175	4
20	0.229	4
22	0.284	2
24	0.338	2
26	0.392	2
28	0.447	2
30	0.501	2
<i>Shaded area denotes extrapolated estimates</i>		





Bluegill

**Ore Lake
Huron River**

Livingston 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	5.9	NA	5.9	8.6
Datasets available: 2019						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.087	0.044	0.160	0.118	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.711	0.597				

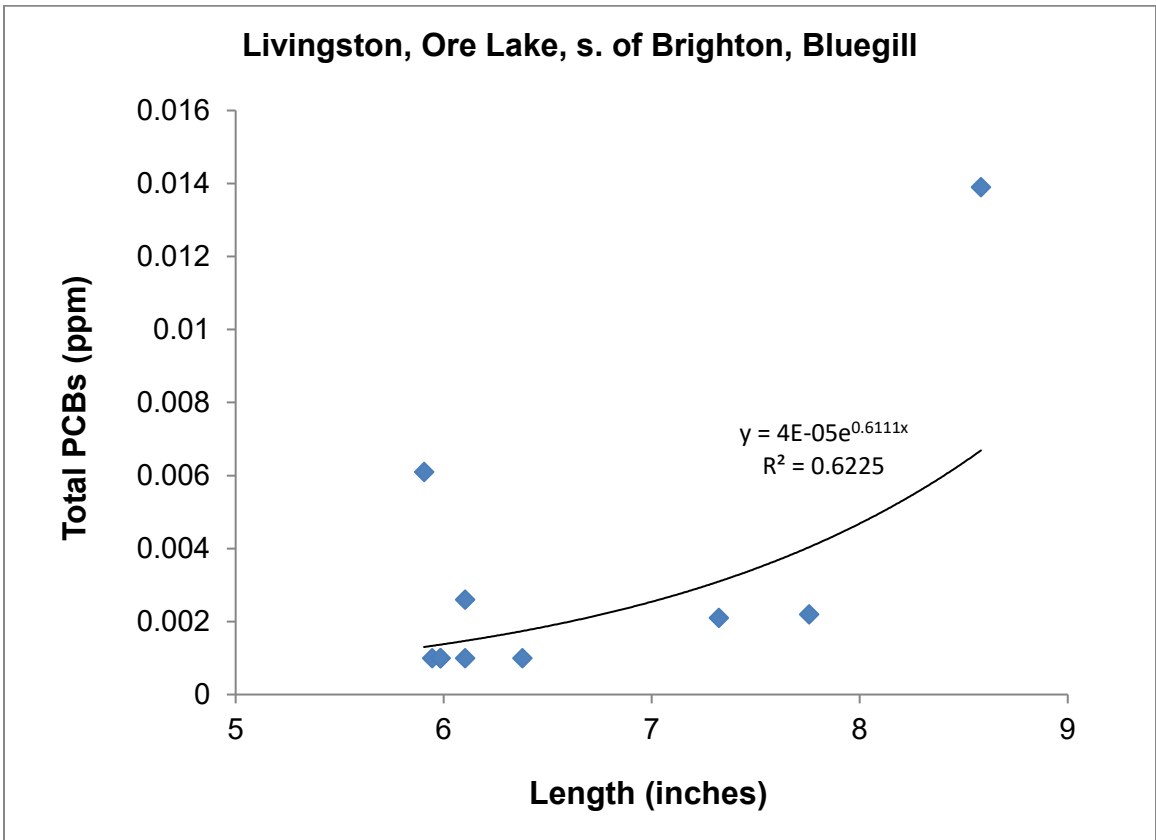
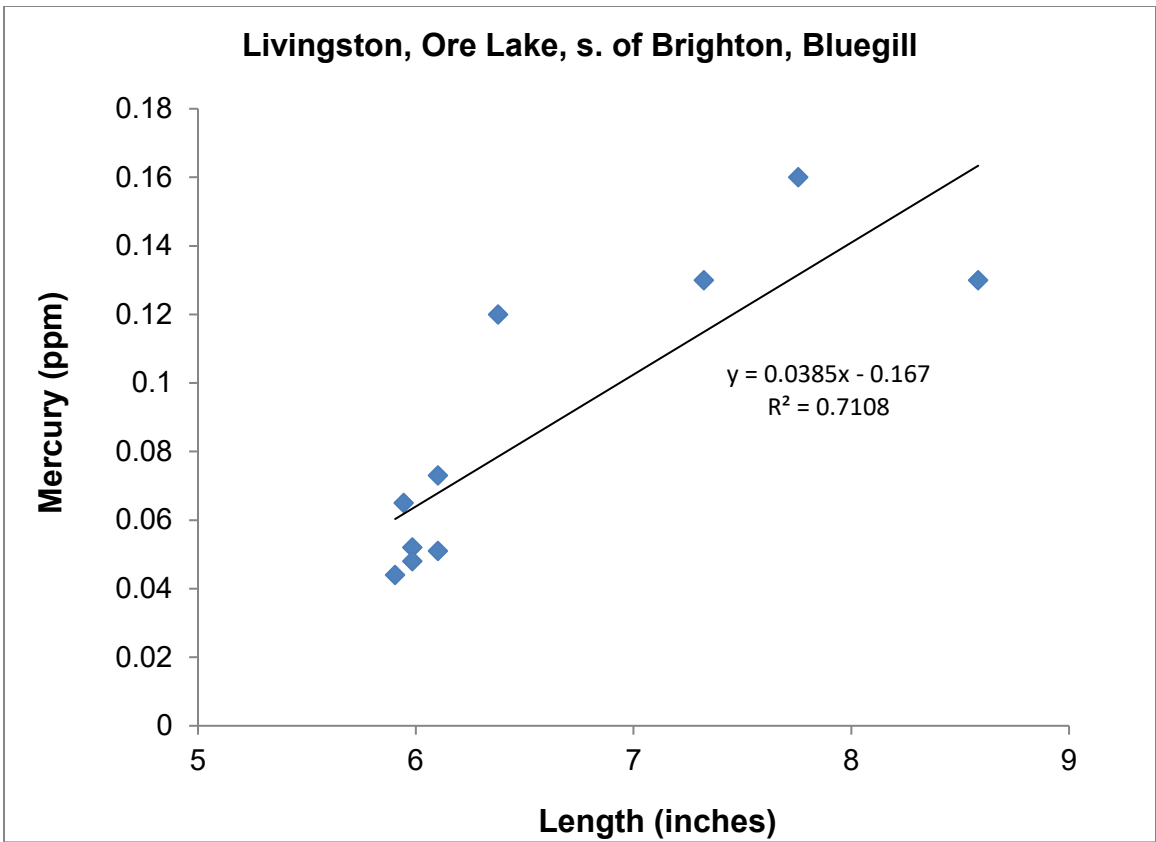
Organics Analysis:

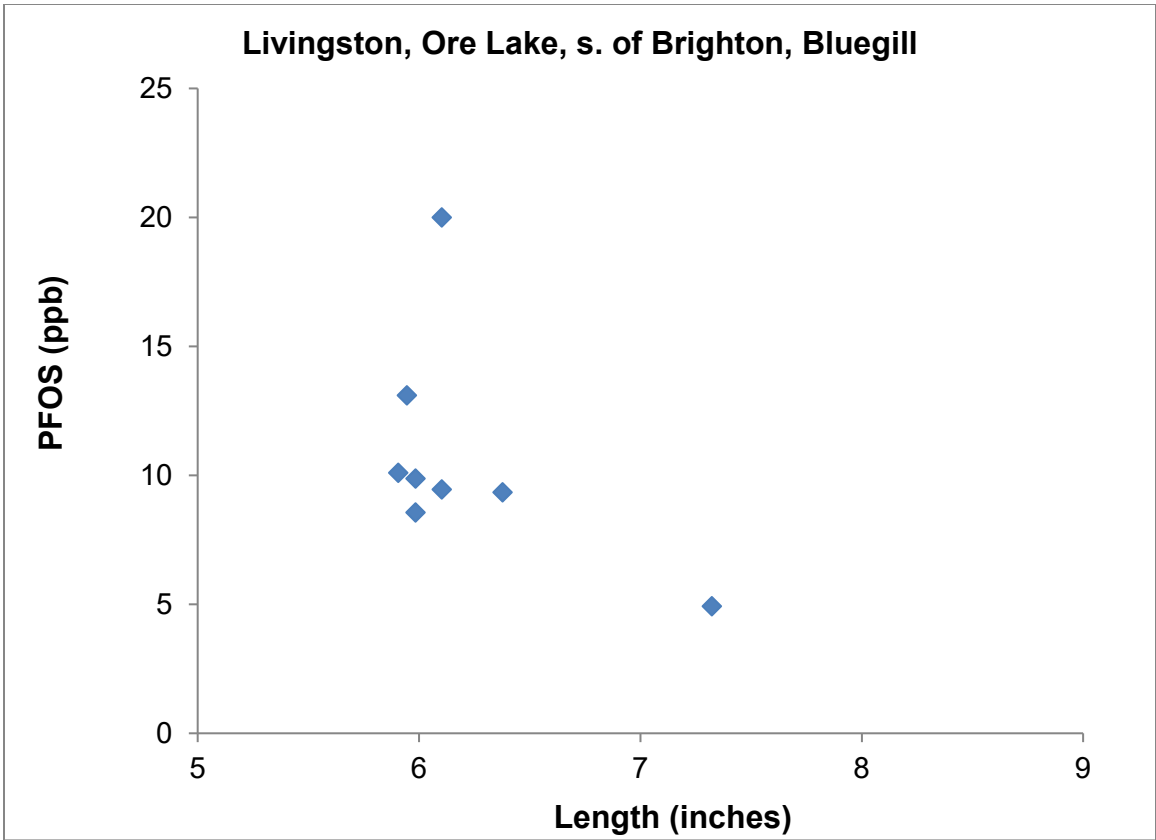
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent					
2019	2019	10	5.9	NA	5.9	8.6
Datasets available: 2019						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.003	< 0.001	0.014	0.006	16
DDT	10	ND	--	--	--	16
Chlordane	10	ND	--	--	--	--
Toxaphene	10	ND	--	--	--	--
PFOS	8*	10.7 ppb	4.9 ppb	20 ppb	14.3 ppb	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.453	0.623				
DDT	NA	NA				
Chlordane	NA	NA				
Toxaphene	NA	NA				
PFOS	0.255	0.485				
Final meal category based on UCL:						8

*Two samples in 2019 were unable to be run for PFOS analysis

Existing MDHHS Advisory: There is a Do Not Eat advisory for all fish species for this section of the Huron River due to PFOS.

Recommendation: No change to the advisory is recommended. MDHHS will continue to evaluate PFOS concentrations in fish throughout the Huron River to determine whether the existing Do Not Eat advisory for all species from this section of the river is appropriate. Additional bluegill as well as a predator species should be collected to determine if PFOS concentrations are below the Do Not Eat advisory threshold.





Bluegill

**Portage Lake
Huron River**

**Washtenaw & Livingston
Counties**

Hg Analysis:

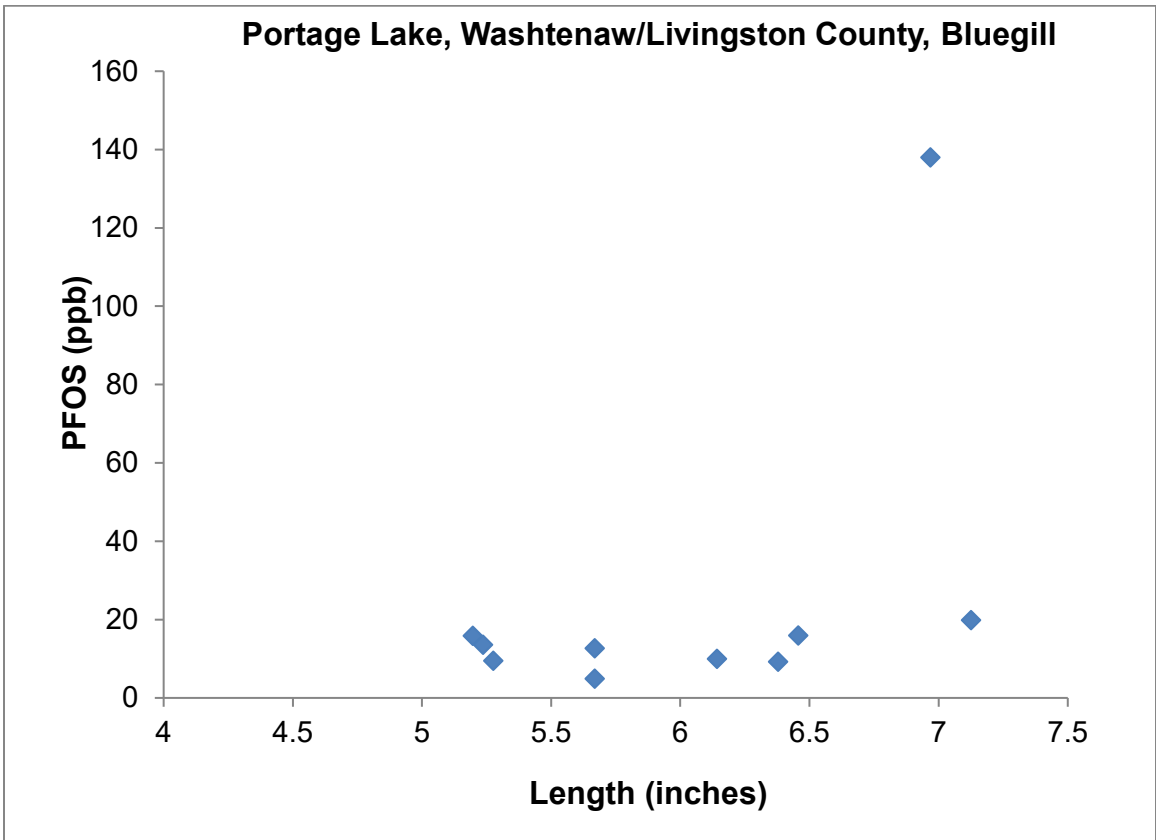
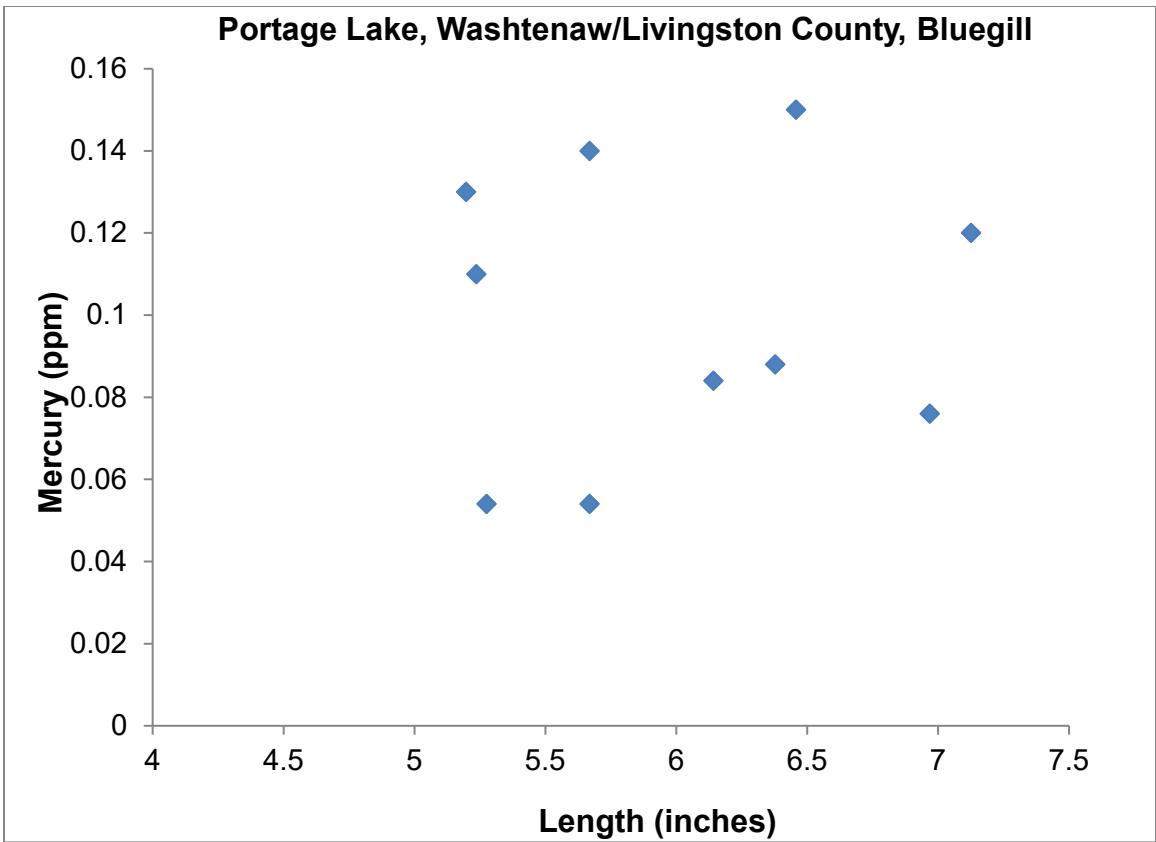
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples			
Earliest	Most Recent							
2018	2018	10	5.2	NA	5.2	7.1		
Datasets available:		2018						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category		
Mercury	10	0.101	0.054	0.150	0.125	8		
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
Mercury	0.007	0.017						

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples				
Earliest	Most Recent								
2018	2018	10	5.2	NA	5.2	7.1			
Datasets available:		2018							
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category			
PCB	0	--	--	--	--	--			
DDT	0	--	--	--	--	--			
Chlordane	0	--	--	--	--	--			
Toxaphene	0	--	--	--	--	--			
PFOS	10	25.0 ppb	5.0 ppb	138.0 ppb	53.6 ppb	2			
Chemical	Linear Regression	Exponential Regression							
	R ²	R ²							
PCB	--	--							
DDT	--	--							
Chlordane	--	--							
Toxaphene	--	--							
PFOS	0.257	0.295	Final meal category based on UCL:				2		

Existing MDHHS Advisory: There is a Do Not Eat advisory for all fish species for this section of the Huron River due to PFOS.

Recommendation: No change to the advisory is recommended. MDHHS will continue to evaluate PFOS concentrations in fish throughout the Huron River to determine whether the existing Do Not Eat advisory for all species from this section of the river is appropriate. Additional fish should be collected to determine if PFOS concentrations have declined from Portage Lake. Given the highly variable concentrations of PFOS in these fish, EGLE believes that contaminated fish may be entering Portage Lake from the Huron River. Mercury would cause an advisory.



Carp

**Portage Lake
Huron River**

Livingston County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2009	2009	6	21.6	na	21.6	32.1
Datasets available: 2009						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	6	0.156		0.290	2	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.413	0.635				

Organics Analysis:

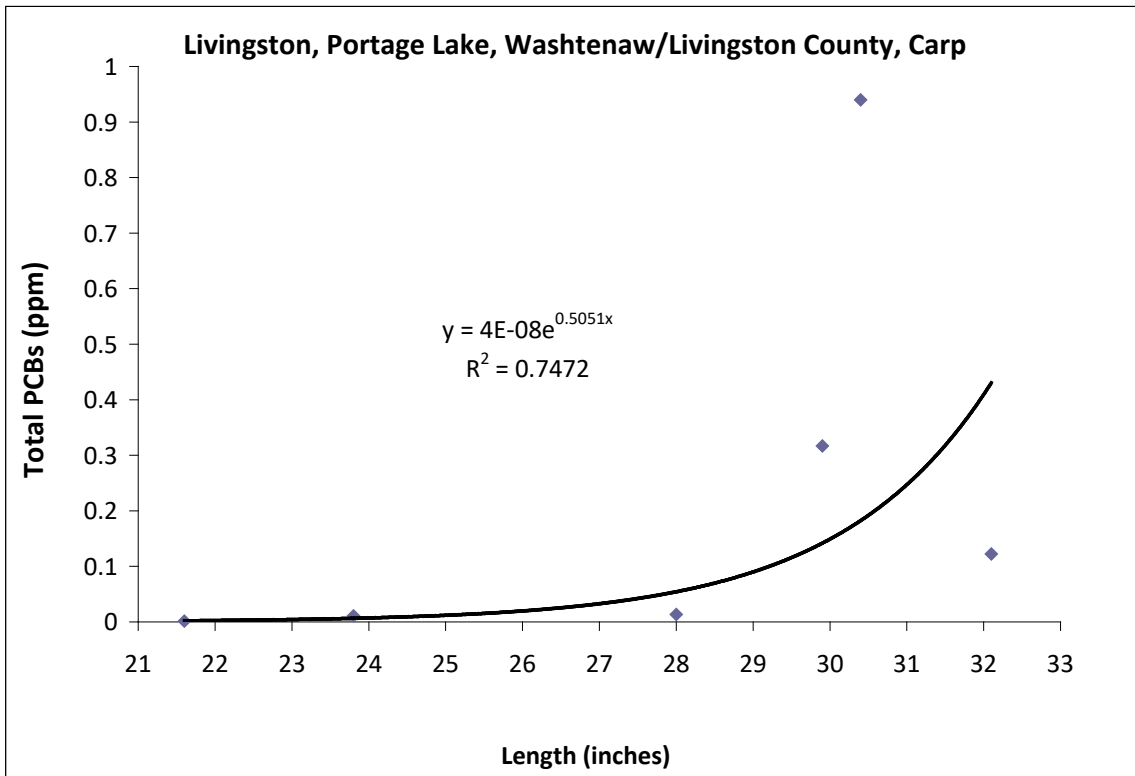
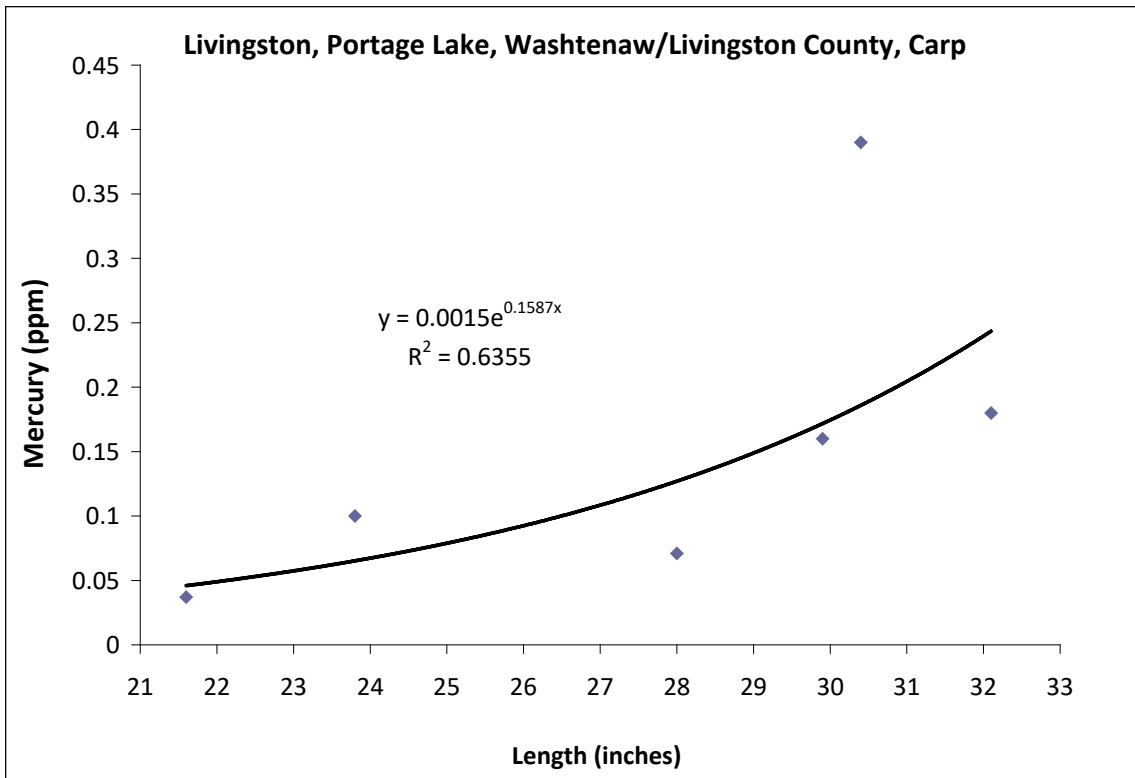
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2009	2009	6	21.6	na	21.6	32.1
Datasets available: 2009						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	6	0.234		0.620	Limited	
DDT	6	0.165		0.430	4	
Chlordane	6	0.008		0.010	--	
Toxaphene	6	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.259	0.747				
DDT	0.266	0.733				
Chlordane	0.286	0.197				
Toxaphene						
Final meal category based on UCL:					Limited	

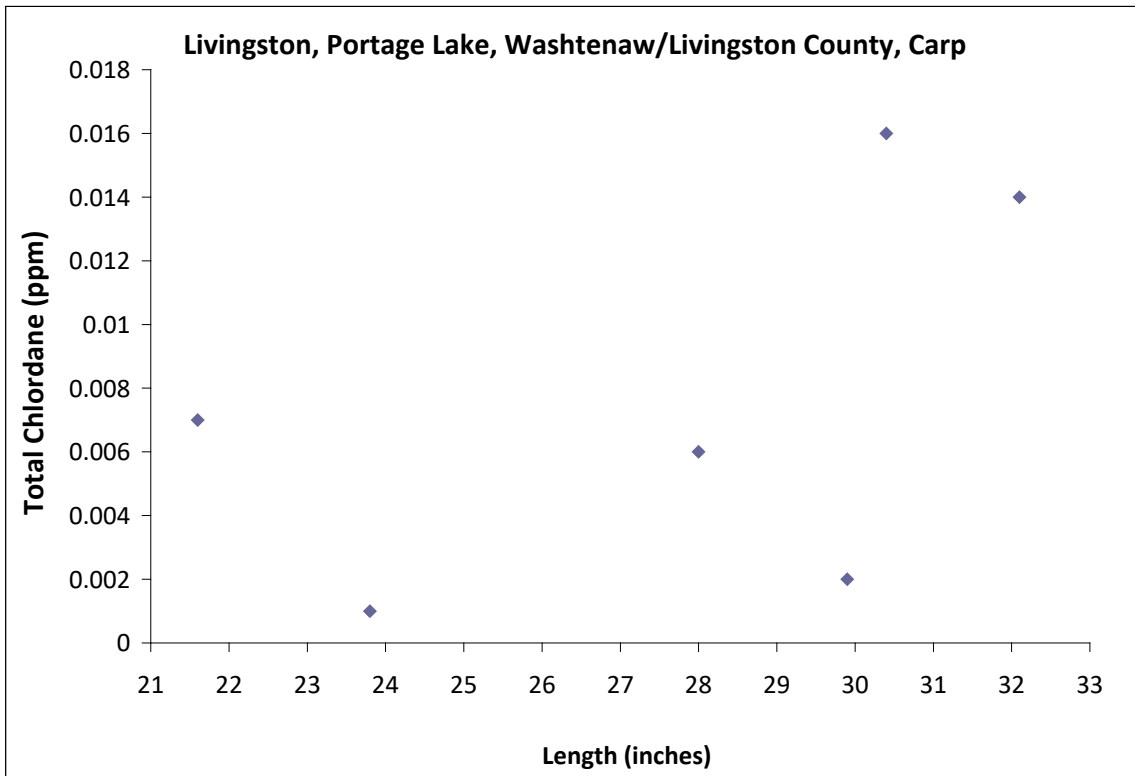
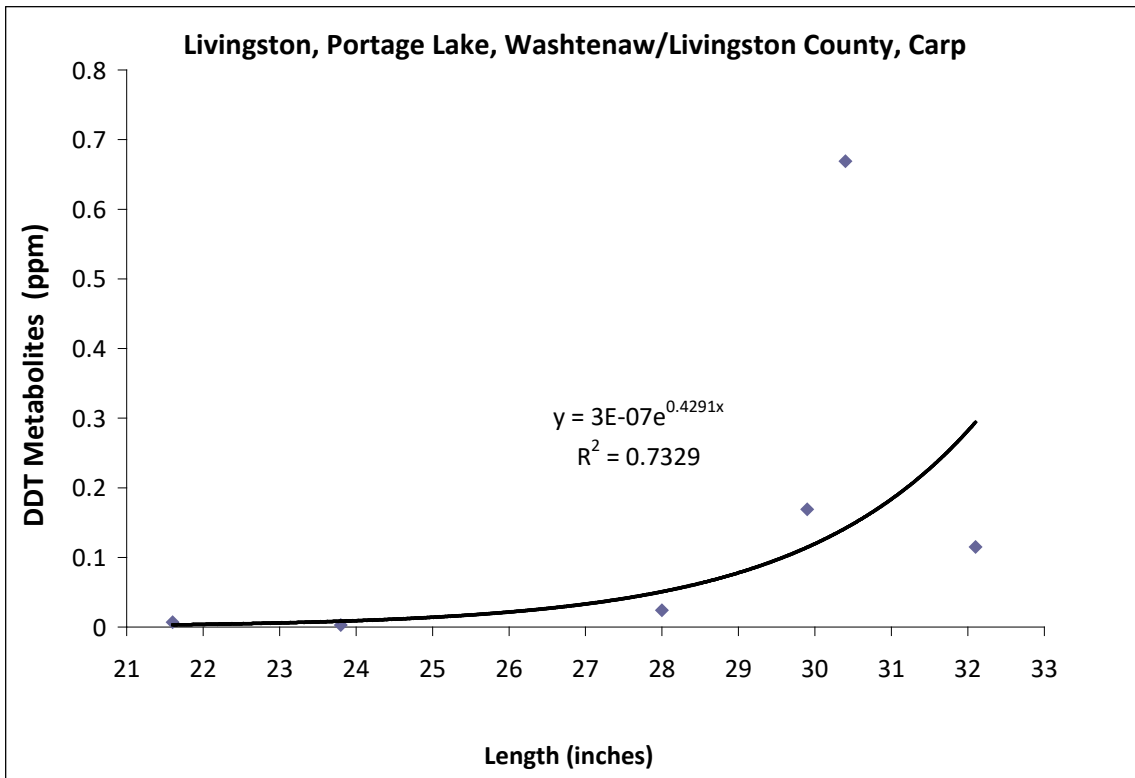
Length (Inches)	PCB Regression Estimate (ppm)	Meal Category
20	0.001	16
22	0.003	16
24	0.007	16
26	0.020	8
28	0.055	2
30	0.152	1
32	0.418	0.5
34	1.149	0
36	3.156	0
<i>Shaded area denotes extrapolated estimates</i>		

Length (Inches)	Hg Regression Estimate (ppm)	Meal Category
20	0.036	16
22	0.049	16
24	0.068	16
26	0.093	8
28	0.128	8
30	0.175	4
32	0.241	4
34	0.331	2
36	0.454	2
<i>Shaded area denotes extrapolated estimates</i>		

Existing Advisory: No one should eat more than 16 meals per month of Portage Lake carp less than 24 inches due to PCBs and mercury, 2 meals per month from 24 to 28 inches due to PCBs, or more than 6 meals per year of carp longer than 28 inches due to of PCBs. DDT would cause an advisory.

Recommendation: There is a Do Not Eat advisory for all fish species for this section of the Huron River due to PFOS.





Largemouth Bass

**Portage Lake
Huron River**

Livingston County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	1989	1	12	14	12	12
Datasets available: 1989						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		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
1989	1989	1	12	14	12	12
Datasets available: 1989						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	1	ND		--		--
DDT	1	0.005		--		--
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: This dataset is limited by small sample size, age of the datum, and sub-legal sample length. Therefore, Portage Lake largemouth bass are covered under the statewide advisory due to mercury: No one should eat more than 2 meals per month of largemouth or smallmouth bass smaller than 18 inches, or no more than 1 meal per month of those fish larger than 18 inches.

Recommendation: There is a Do Not Eat advisory for all fish species for this section of the Huron River due to PFOS.

Walleye

**Portage Lake
Huron River**

Livingston County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	2009	17	13.8	15	14.6	24.6
Datasets available: 1989, 2009						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	12	0.619		0.870	1	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.861	0.880				

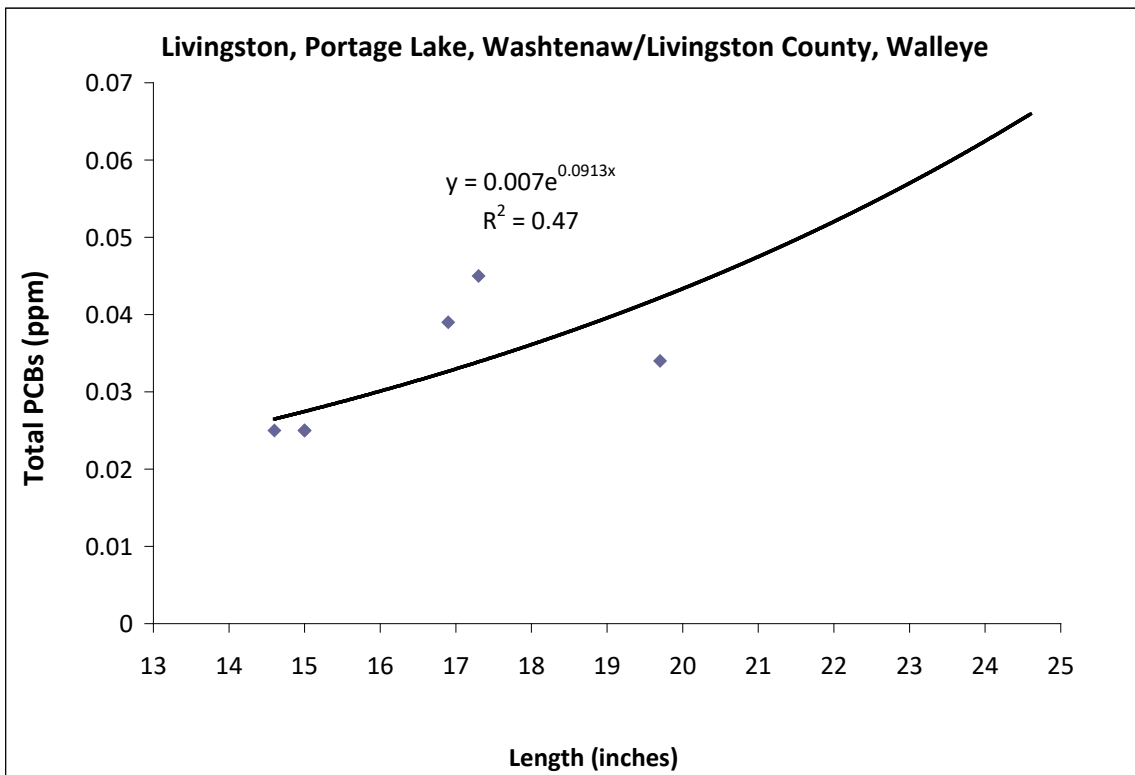
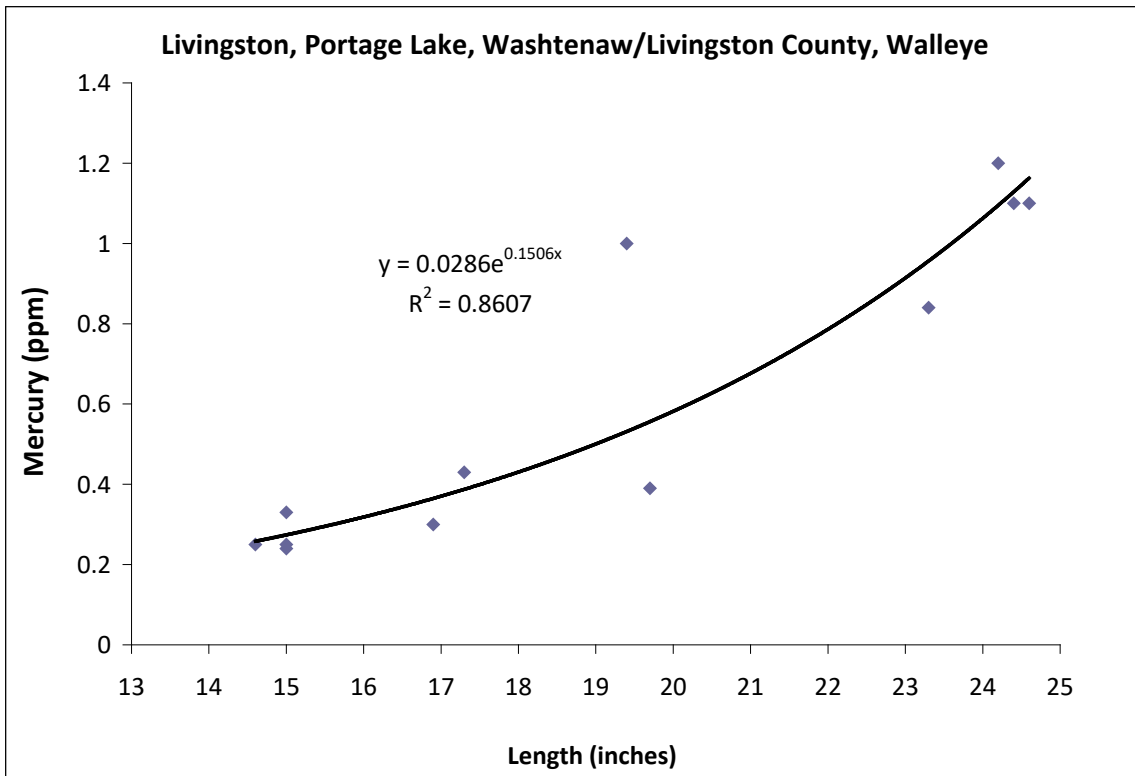
Organics Analysis:

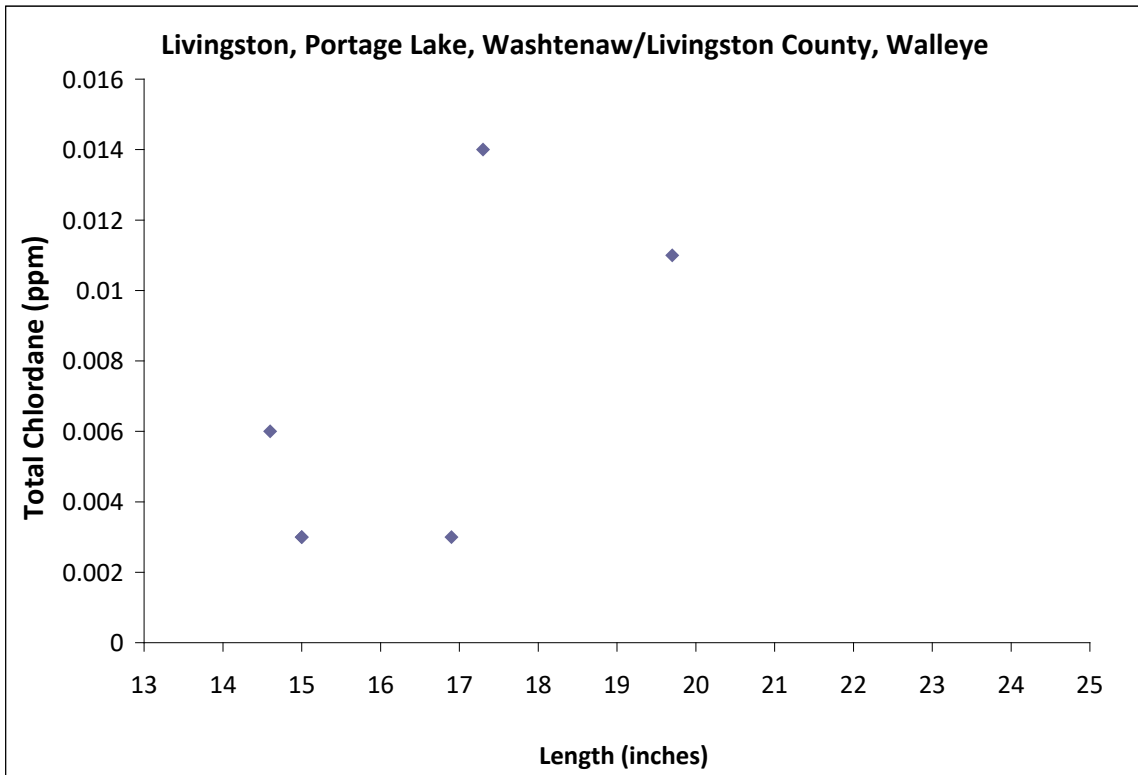
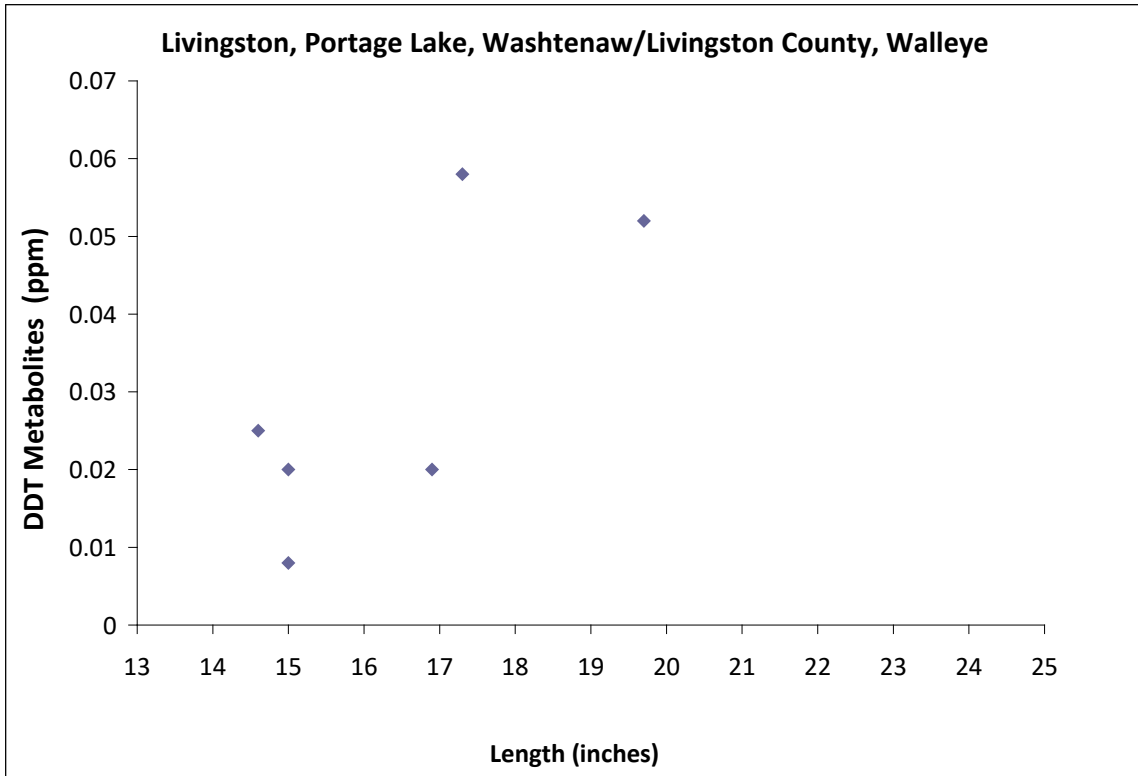
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	1989	10	13.8	15	14.6	19.7
Datasets available: 1989						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	6	0.032		0.040	4	
DDT	6	0.031		0.050	16	
Chlordane	6	0.007		0.010	--	
Toxaphene	6	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.557	0.606				
DDT	0.625	0.522				
Chlordane	0.555	0.552				
Toxaphene						
Final meal category based on UCL:						1

Existing Advisory: No one should eat more than 2 meals per month of Portage Lake walleye smaller than 18 inches and no more than 1 meal per month of walleye larger than 18 inches due to mercury.

Recommendation: There is a Do Not Eat advisory for all fish species for this section of the Huron River due to PFOS.

Length (Inches)	Hg Regression Estimate (ppm)	Meal Category
15	0.274	2
16	0.318	2
18	0.430	2
20	0.581	1
22	0.786	1
24	1.062	1
26	1.435	0.5
28	1.940	0.5
30	2.621	0
<i>Shaded area denotes extrapolated estimates</i>		





Hg Analysis:

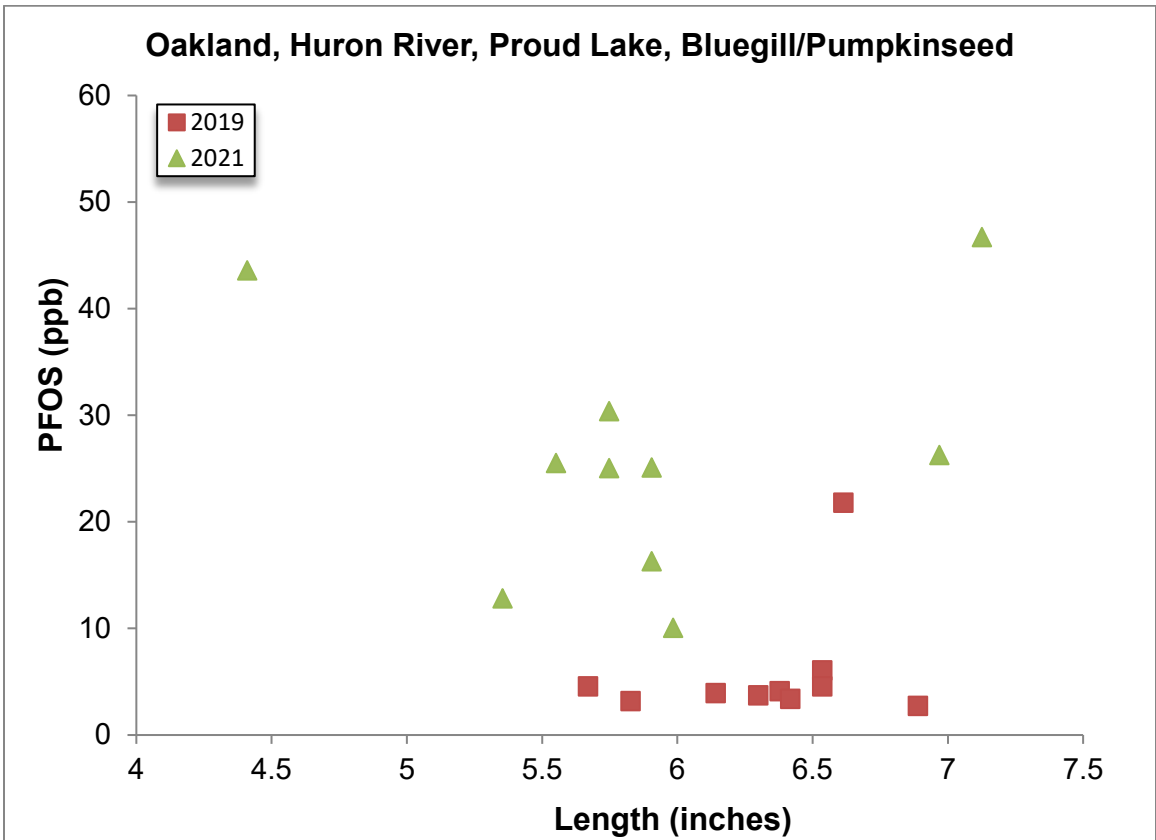
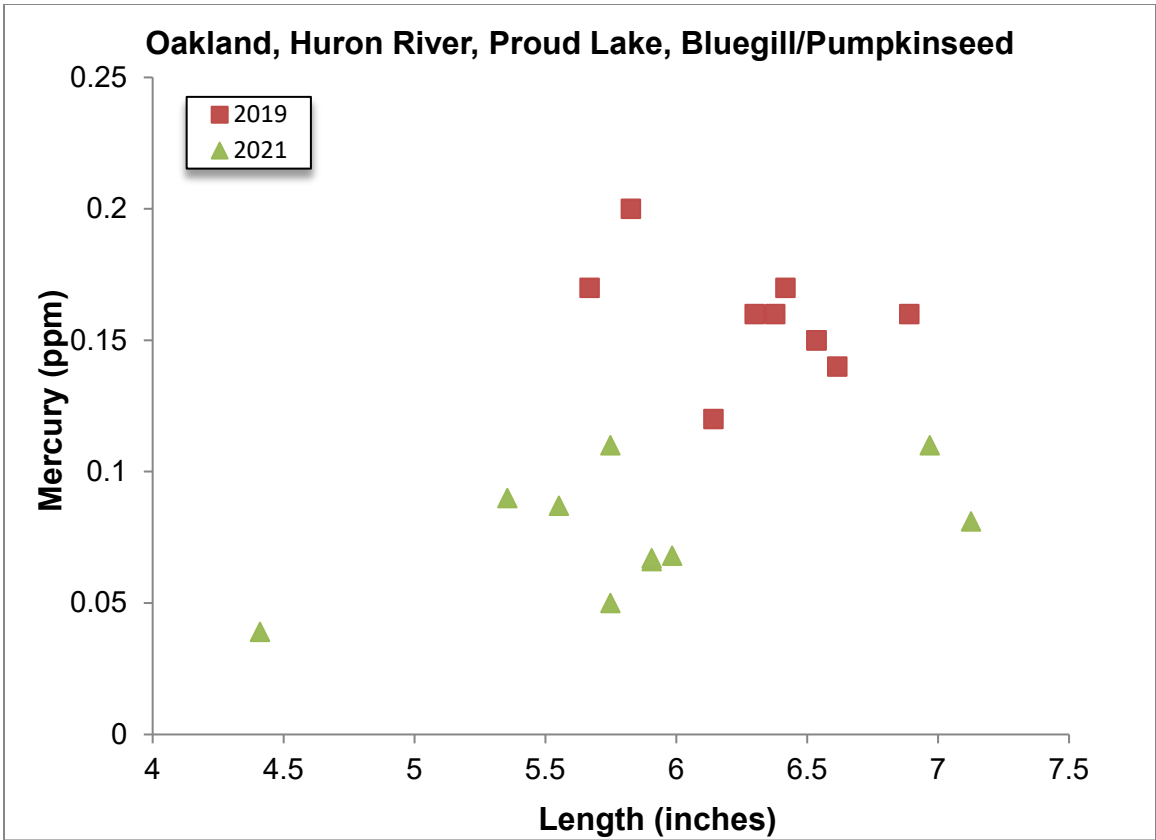
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2019	2021	20	4.4	NA	4.4	7.1
Datasets available: 2019, 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	20	0.117	0.039	0.200	0.139	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.186	0.276				

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	2022	20	4.4	NA	4.4	7.1
Datasets available: 2019, 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	16.0 ppb	2.7 ppb	46.7 ppb	22.5 ppb	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.049	0.069				
Final meal category based on UCL:						4

Existing MDHHS Advisory: No one should eat more than 4 meals per month of bluegill or sunfish of any size from Proud Lake in Oakland County due to mercury.

Recommendation: No one should eat more than 4 meals per month of bluegill or sunfish of any size from Proud Lake in Oakland County due to PFOS and mercury.



Carp

**Proud Lake
Huron River**

Oakland County

Hg Analysis:

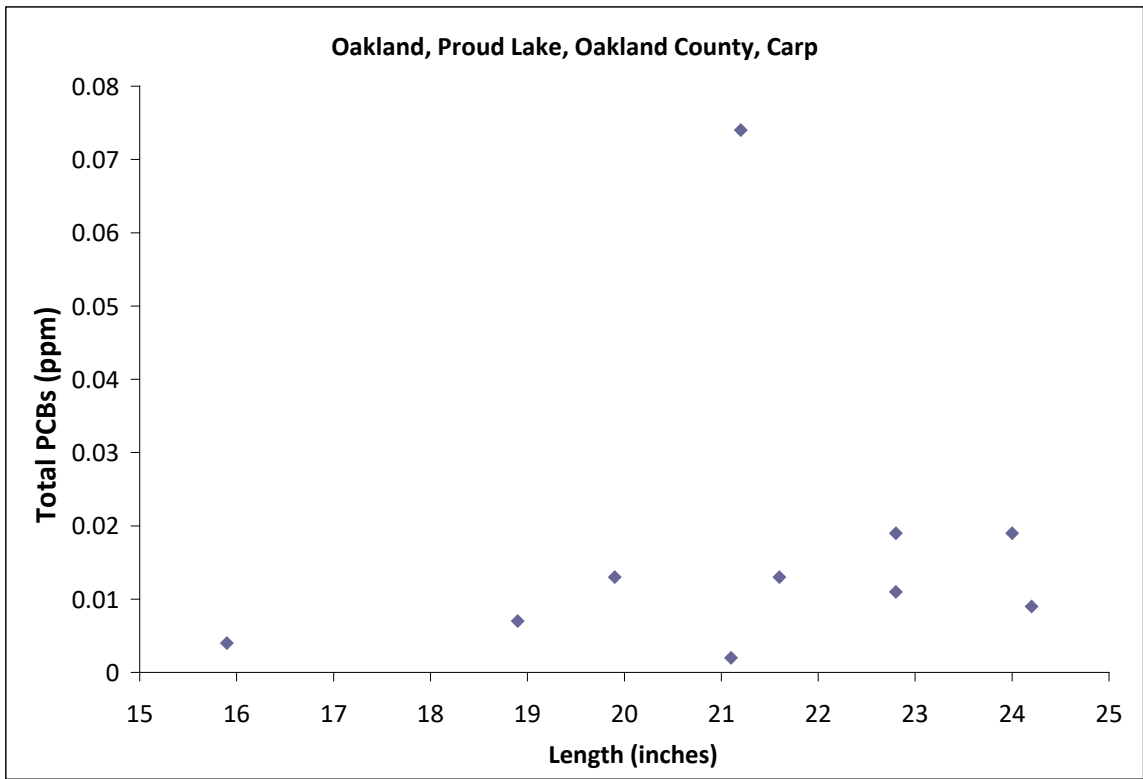
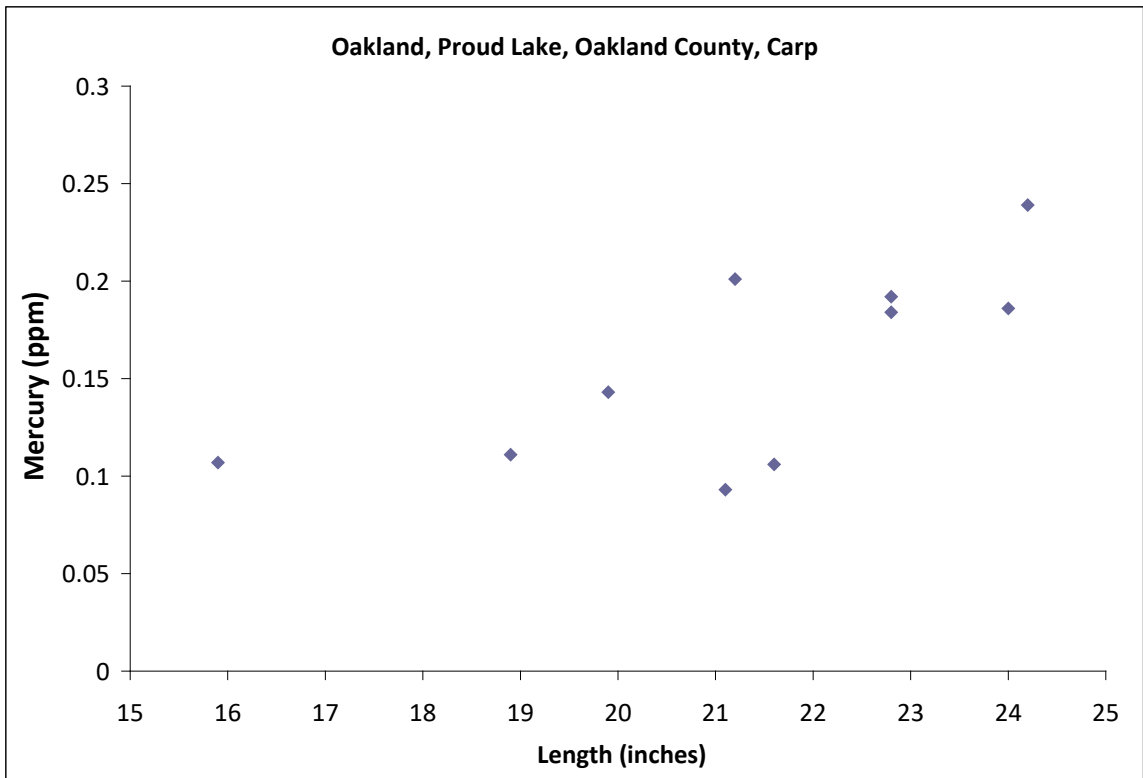
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2006	2006	10	15.9	na	15.9	24.2
Datasets available: 2006						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	10	0.156		0.190		4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.490	0.466				

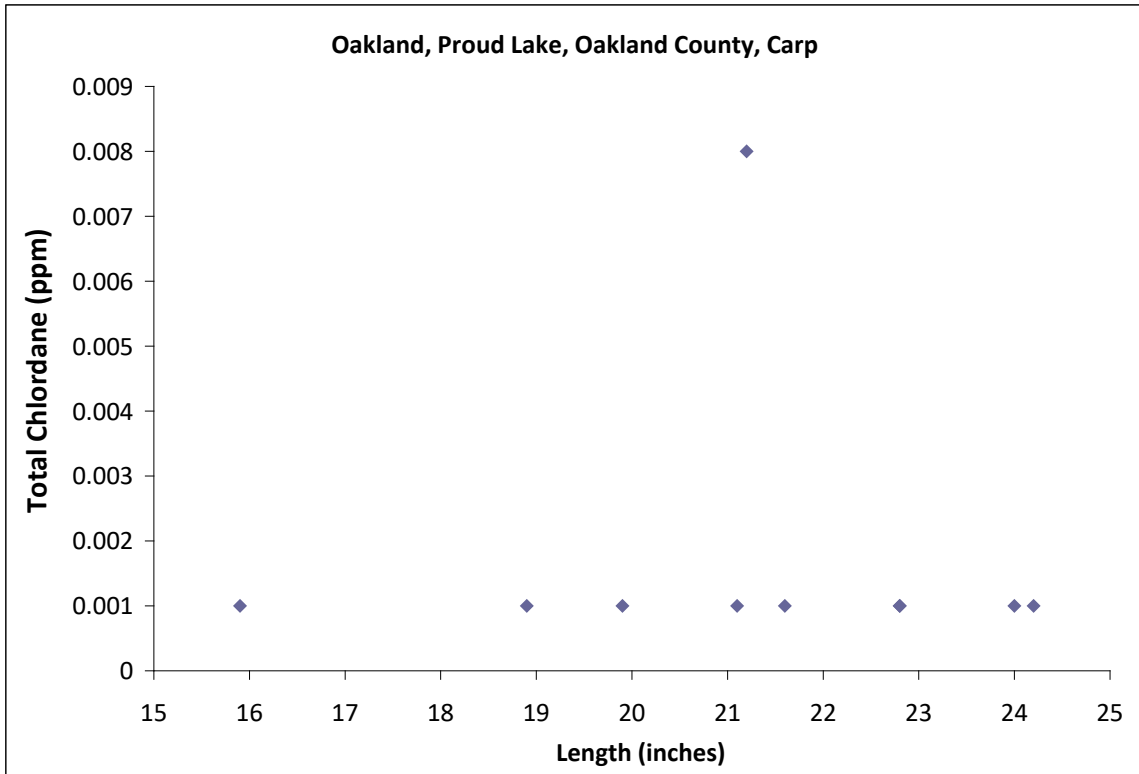
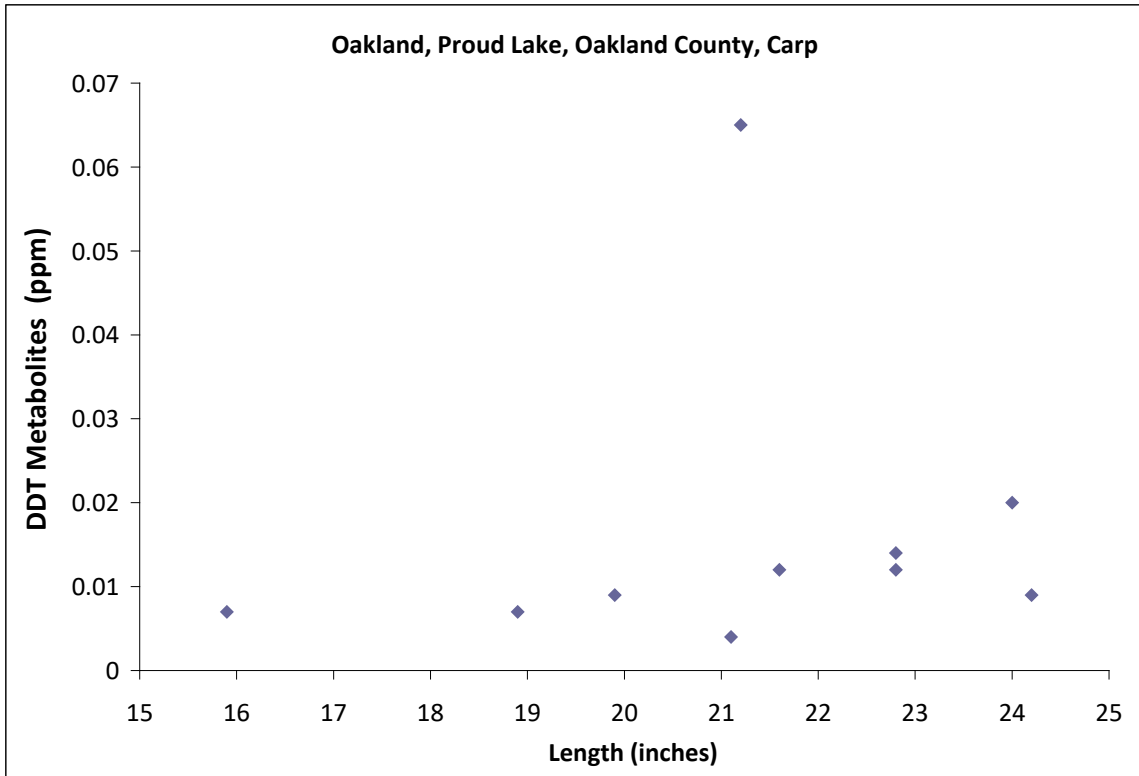
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2006	2006	10	15.9	na	15.9	24.2
Datasets available: 2006						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	10	0.017		0.030		8
DDT	10	0.016		0.030		16
Chlordane	10	0.002		0.003		--
Toxaphene	10	ND		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.023	0.140				
DDT	0.020	0.101				
Chlordane	0.000	0.000				
Toxaphene	--	--		Final meal category based on UCL:		4

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

Recommendation: No one should eat more than 4 meals per month of Proud Lake carp due to mercury. PCBs cause an advisory.





**Largemouth and
Smallmouth Bass**

**Proud Lake
Huron River**

Oakland County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2006	2021	29	10.4	14.0	13.7	18.7	
Datasets available: 2006, 2019, 2021							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	20	0.574		0.360	0.829	0.638	1
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.648	0.709					

Organics Analysis:

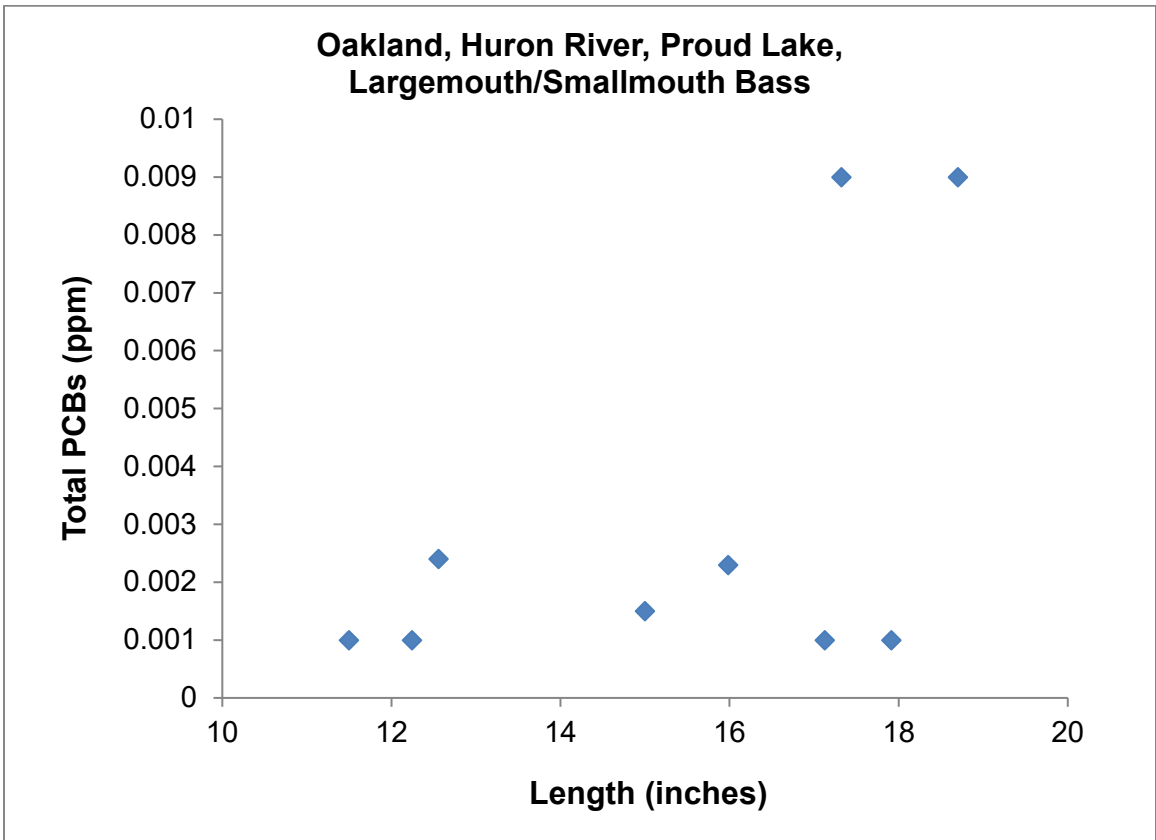
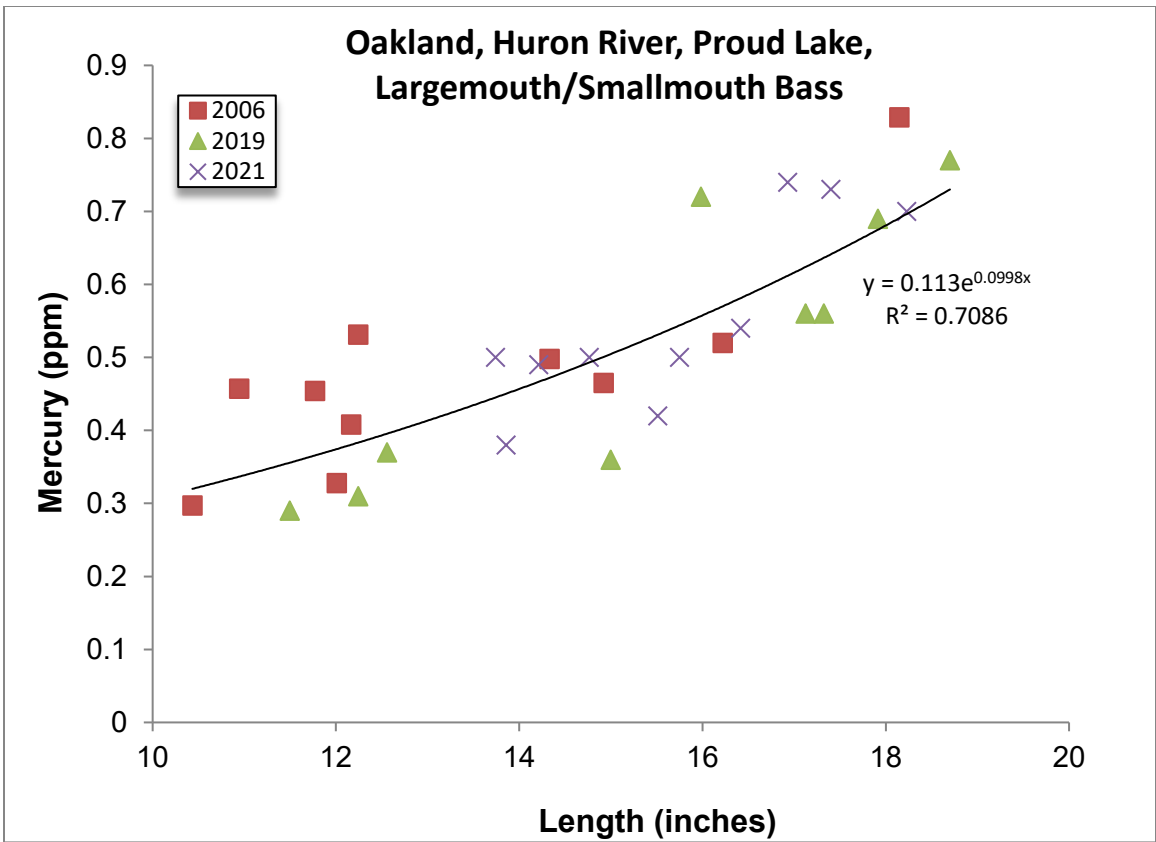
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2019	2021	19	11.5	14.0	13.7	18.7	
Datasets available: 2019, 2021 (only PFOS)							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	6	0.004		<0.001	0.009	0.008	16
DDT	6	0.002		<0.001	0.005	0.004	16
Chlordane	6	ND		--	--	--	16
Toxaphene	6	ND		--	--	--	--
PFOS	19*	30.7 ppb		2.6 ppb	307.0 ppb	63.5 ppb	2
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.275	0.162					
DDT	0.115	0.132					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	0.190	0.087					
Final meal category based on UCL:							1

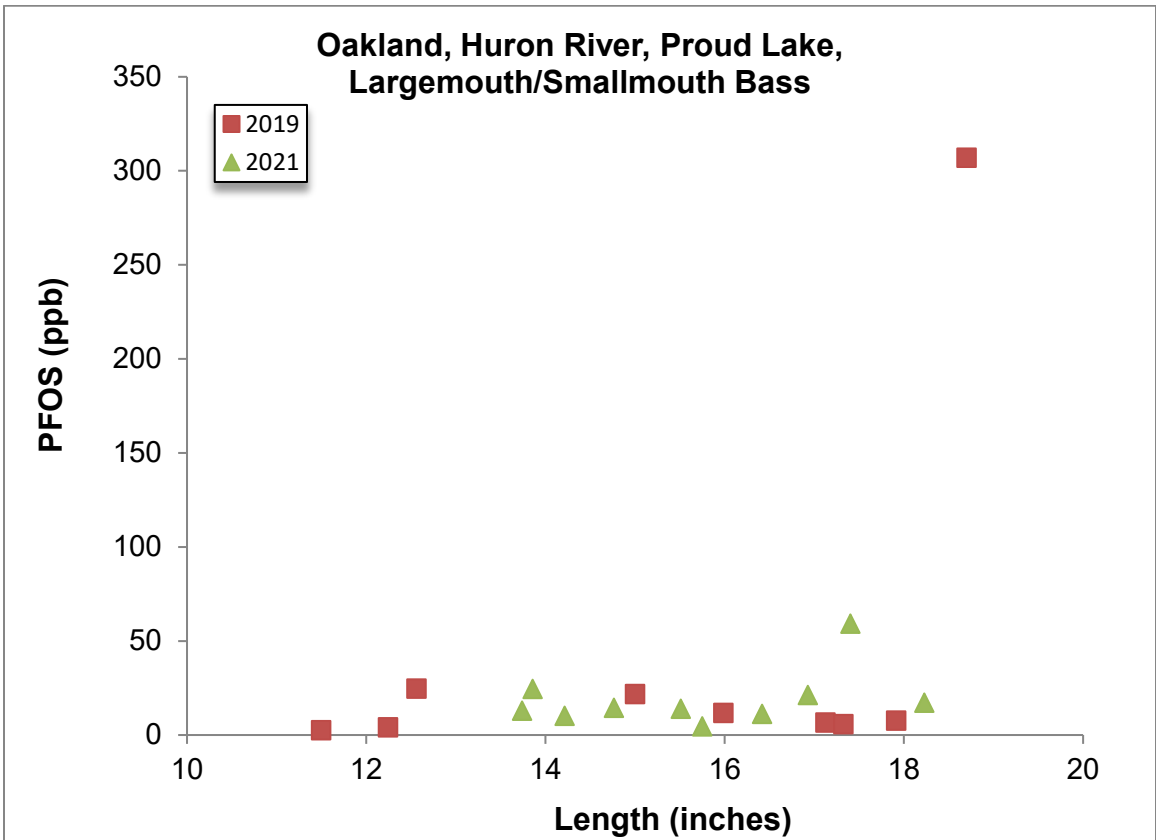
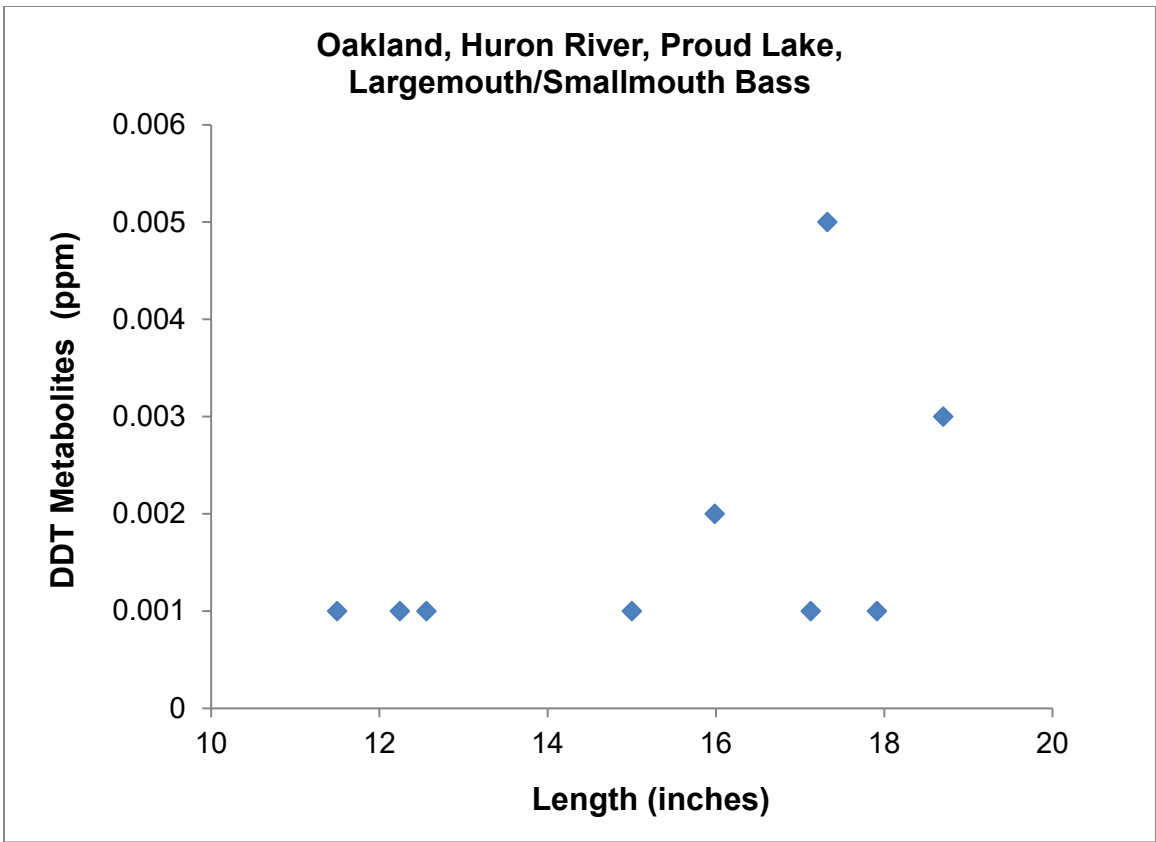
*Sublegal sized fish used in the analysis as no correlation between fish size and PFOS concentration has been observed in the statewide dataset.

Existing MDHHS Advisory: No one should eat more than 6 meals per year of largemouth or smallmouth bass of any size from Proud Lake due to PFOS.

Recommendation: No change to the advisory is warranted. Additional fish should be collected to determine if PFOS concentrations in Proud Lake bass species warrant relaxed advice.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
12	0.374	2
14	0.457	2
16	0.558	1
18	0.681	1
20	0.832	1
22	1.015	1
<i>Shaded area denotes extrapolated estimates</i>		





Rock Bass

**Proud Lake
Huron River**

Oakland County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2019	2019	10	5.2	na	5.2	8.8
Datasets available: 2019						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.22	0.13	0.44	0.29	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.604	0.624				

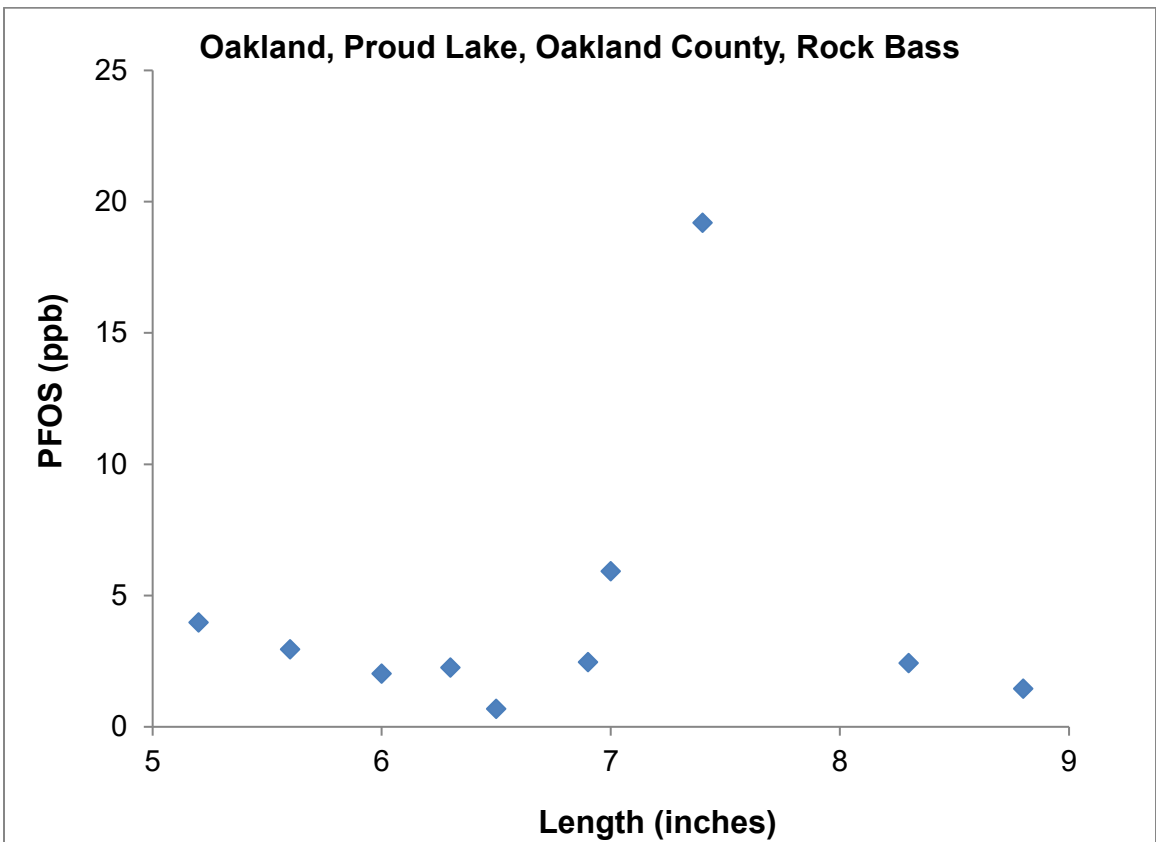
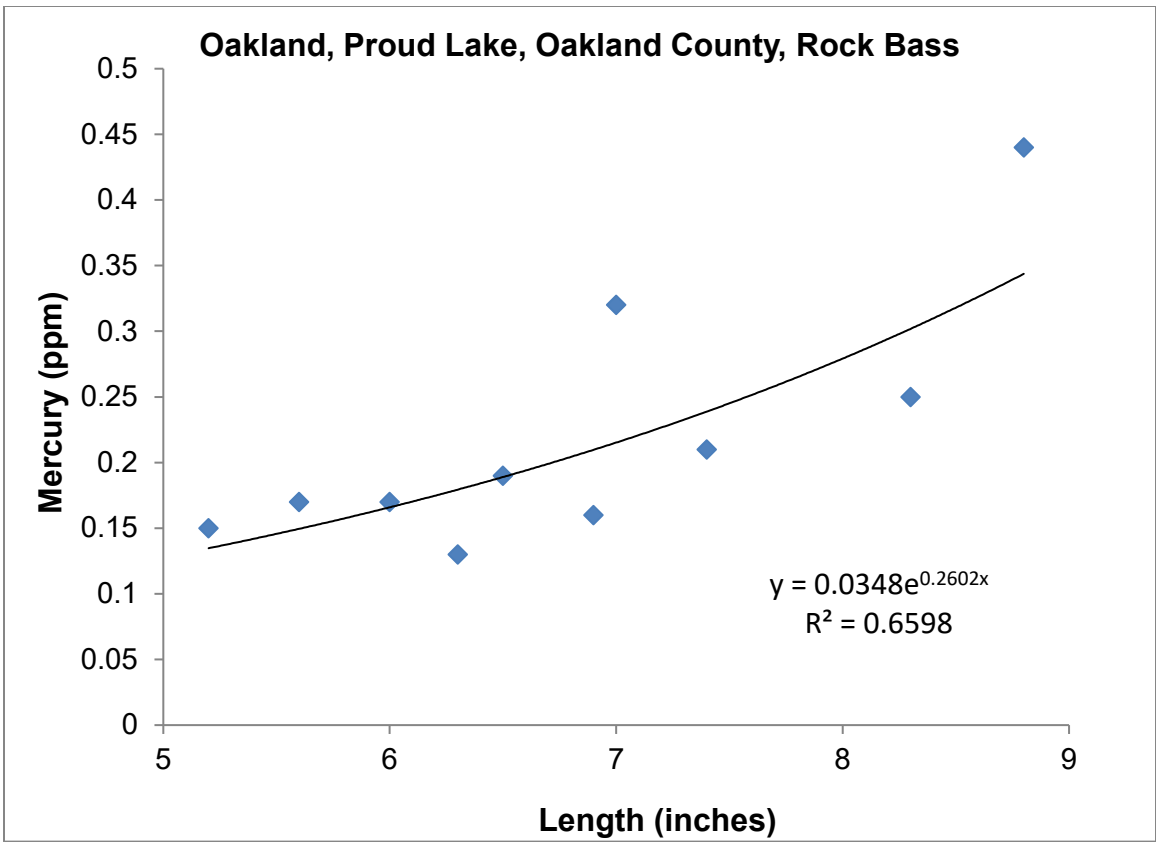
Organics Analysis:

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	8.8
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	0.7 ppb	19 ppb	8 ppb	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS			Final meal category based on UCL:			2

Existing MDHHS Advisory: Proud Lake rock bass are covered by the statewide advisory due to mercury: No one should eat more than 4 meals per month of rock bass of any size.

Recommendation: No one should eat more than 4 meals per month of Proud Lake rock bass less than 7 inches or more than 2 meals per month of those fish larger than 7 inches due to mercury.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
5	0.13	8
6	0.17	4
7	0.22	4
8	0.28	2
9	0.36	2
10	0.47	2
<i>Shaded area denotes extrapolated estimates</i>		



Lapeer County

**Largemouth
and Smallmouth Bass
Hg Analysis:**

Lake Minnewanna

Lapeer County

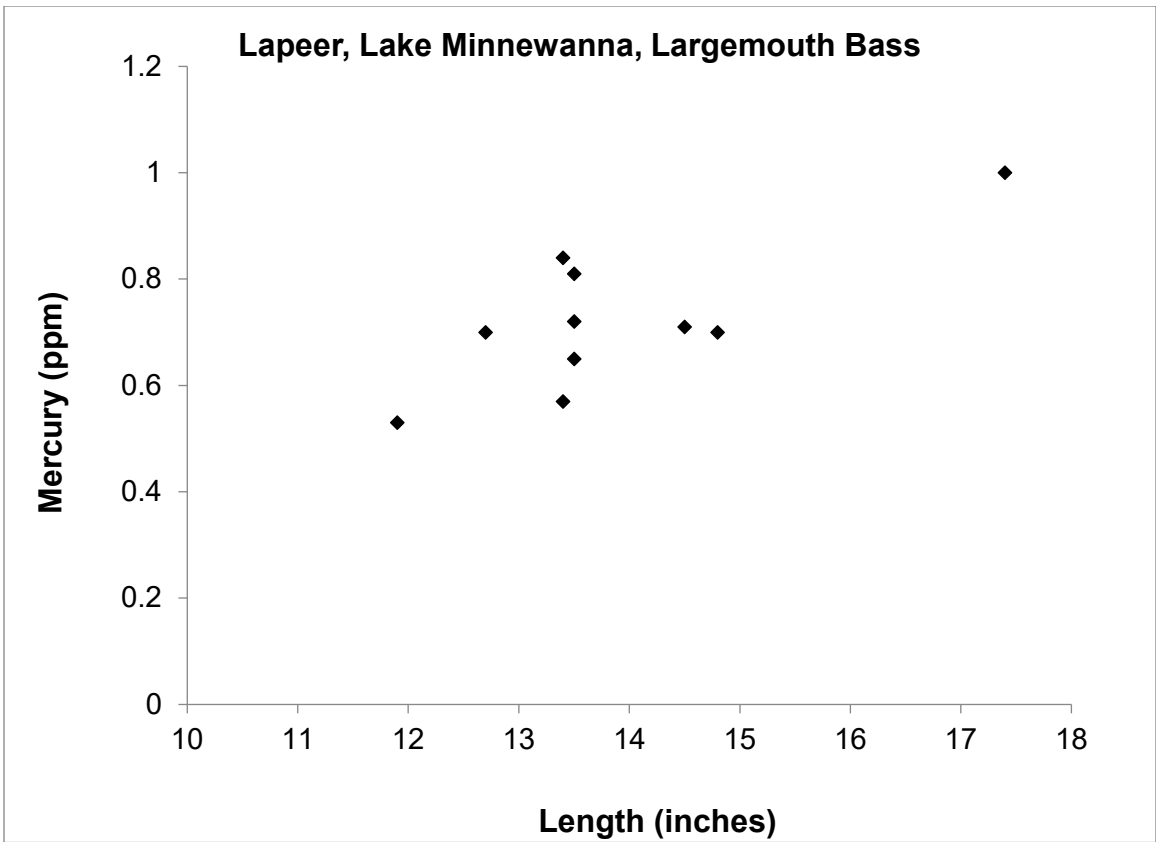
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		Meal Category
Earliest	Most Recent				Min	Max	
2013	2013	10	11.9	14	13.5	17.4	
Datasets available: 2013							
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category	
Mercury	6	0.77	0.65	1.0	0.90	1	
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.572	0.531					

Organics Analysis:

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

Existing Advisory: Lake Minnewanna largemouth and smallmouth bass are covered under the Statewide Guidelines. No one should eat more than 2 meals per month of largemouth or smallmouth bass under 18 inches or more than 1 meal per month of those fish over 18 inches in length.

Recommendation: No one should eat more than 1 meal per month of largemouth or smallmouth bass from Lake Minnewanna under 18 inches or more than 6 meals per year of those fish over 18 inches in length due to mercury. The statewide length break was applied as the size range of fish was limited.



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	14.8	na	14.8	33.1
Datasets available: 2011						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.11	0.03	0.21	0.14	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.648	0.792				

Organics Analysis:

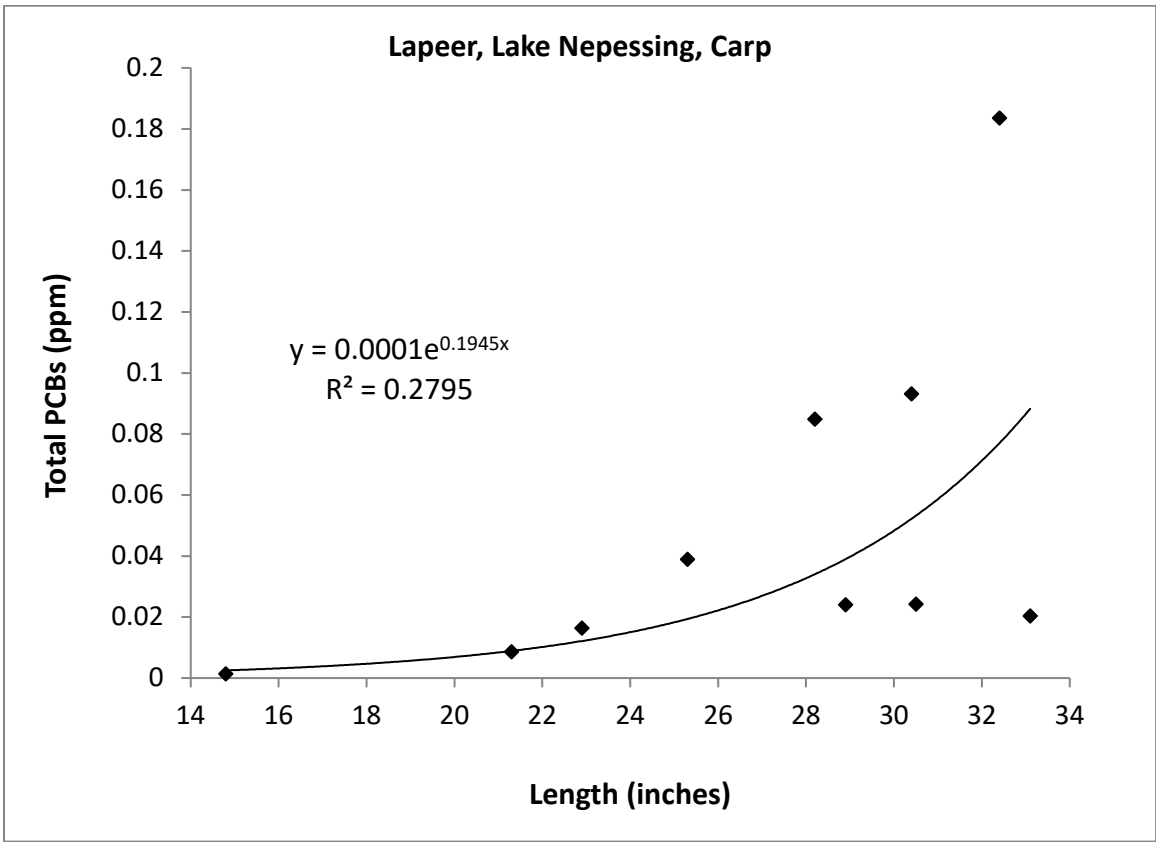
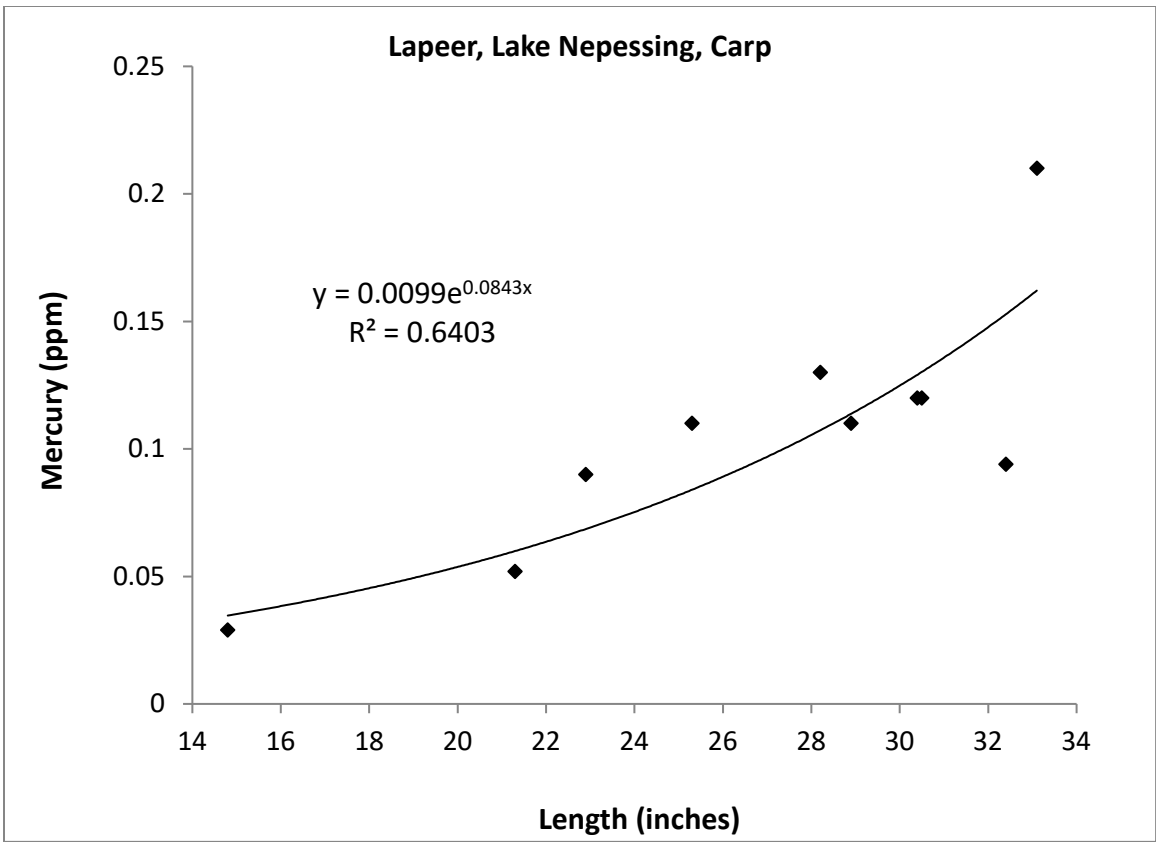
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2011	2011	10	14.8	na	14.8	33.1
Datasets available: 2011						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.05	0.001	0.18	0.09	2
DDT	10	0.09	0.006	0.29	0.15	12
Chlordane	10	0.003	0.0005	0.01	0.01	--
Toxaphene	10	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.294	0.656				
DDT	0.251	0.446				
Chlordane	0.172	0.149				
Toxaphene	--	--				
Final meal category based on UCL:						2

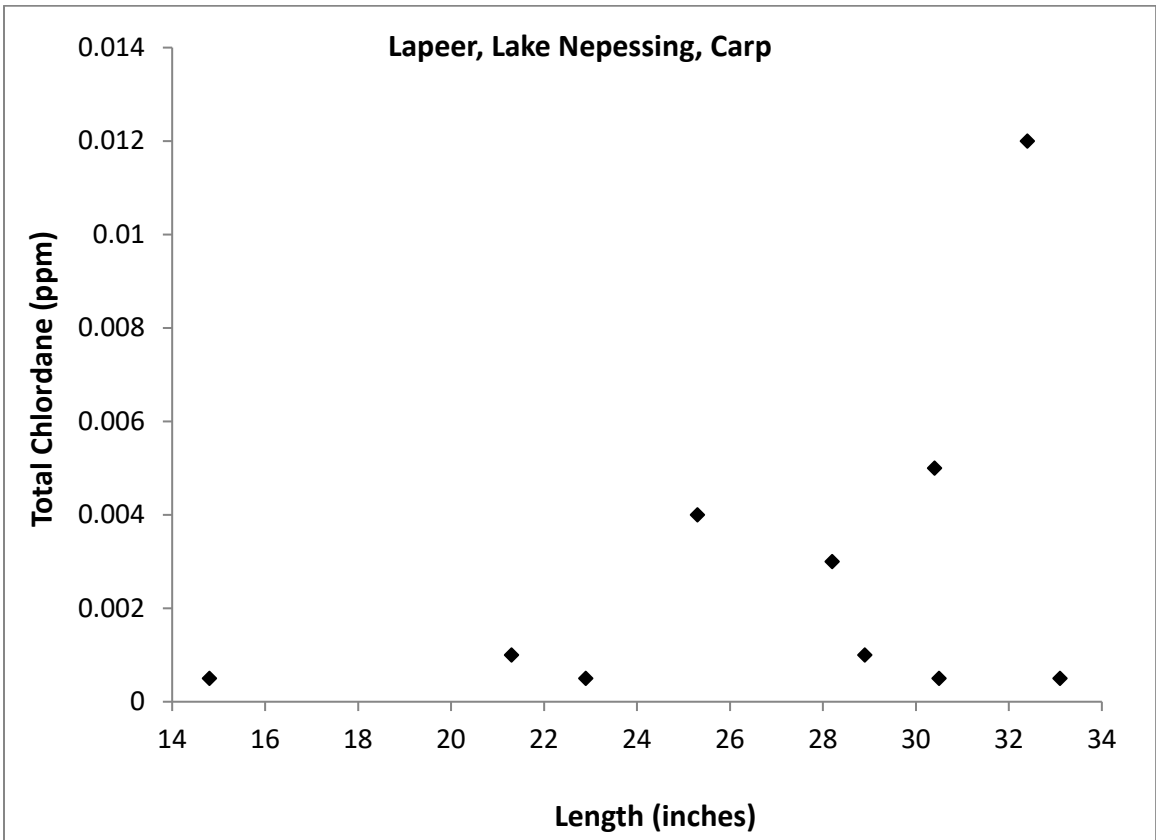
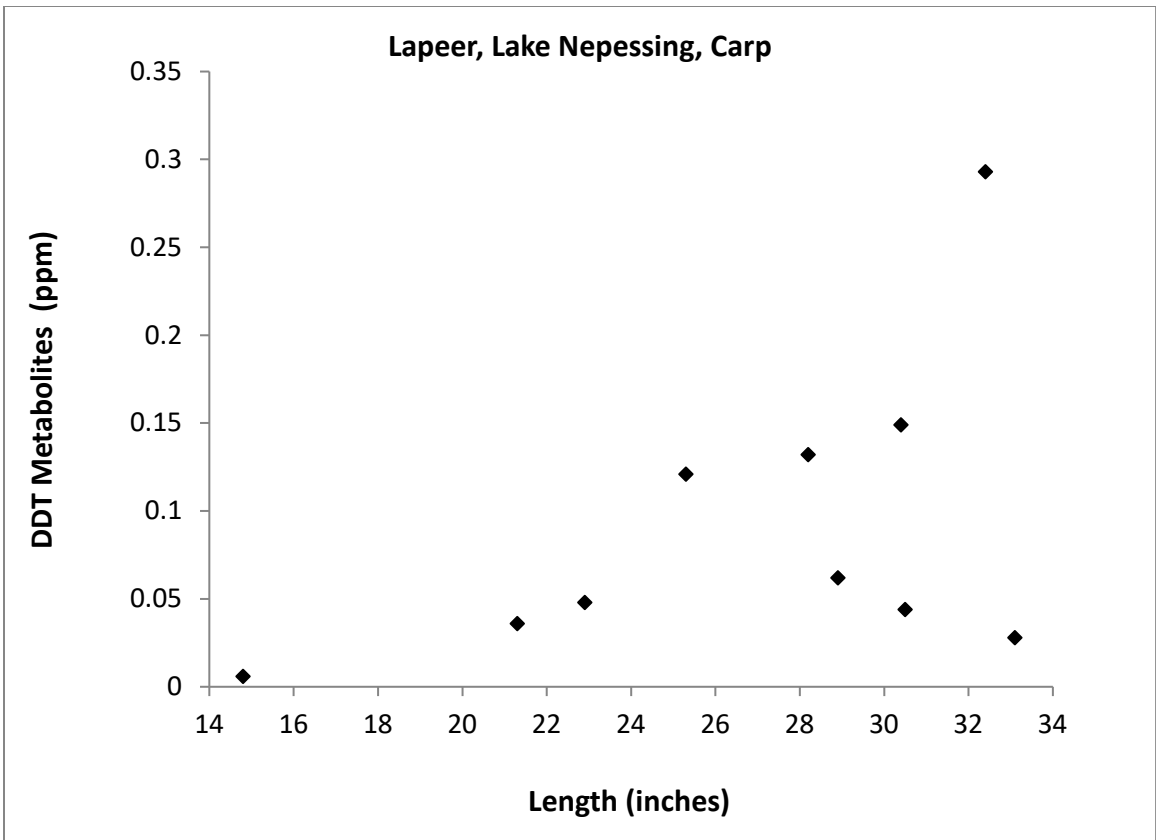
Existing Advisory: Lake Nepessing carp are not covered by an advisory.

Recommendation: No one should eat more than 8 meals per month of Lake Nepessing carp smaller than 32 inches or more than 2 meals per month of those fish larger than 32 inches due to PCBs and mercury. DDT would cause an advisory.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category	PCB Regression Equation Estimate (ppm)	Meal Category
20	0.05	16	0.005	16
22	0.06	16	0.007	16
24	0.07	16	0.011	16
26	0.09	12	0.016	12
28	0.1	8	0.023	12
30	0.12	8	0.034	8
32	0.15	4	0.05	4
34	0.17	4	0.07	2
36	0.21	4	0.11	2

Shaded area denotes extrapolated estimates





Largemouth Bass

Lake Nepessing

Lapeer County

Hg Analysis:

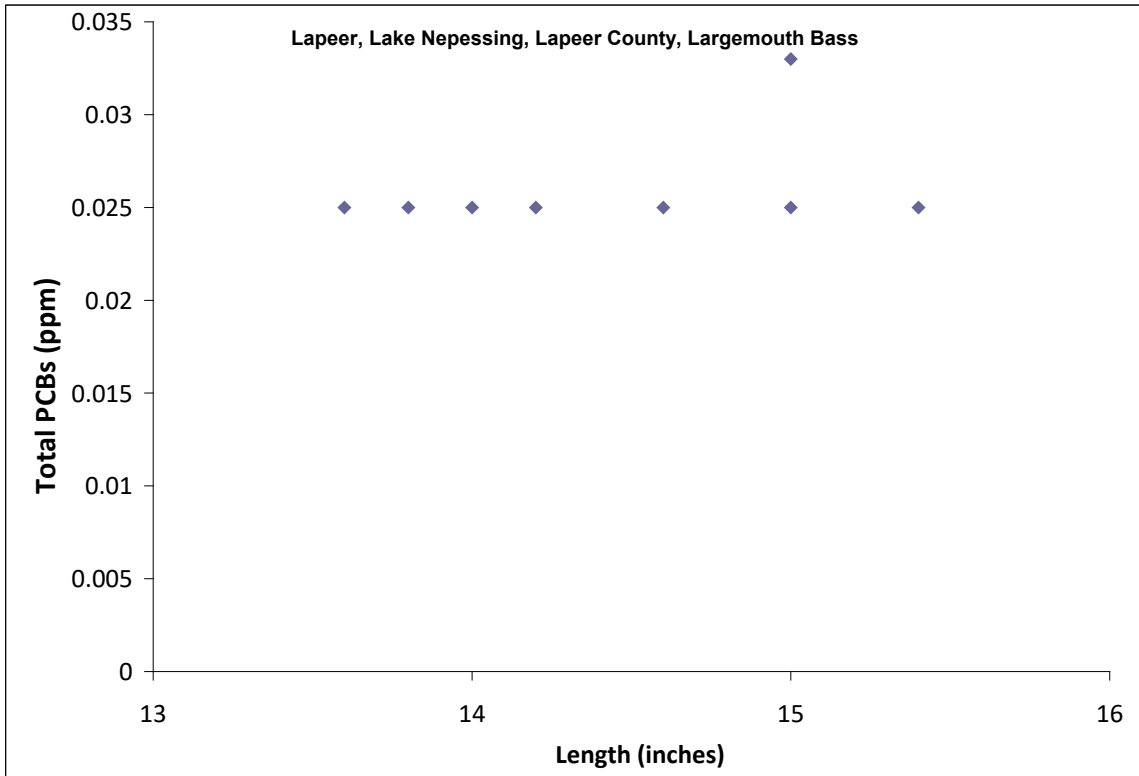
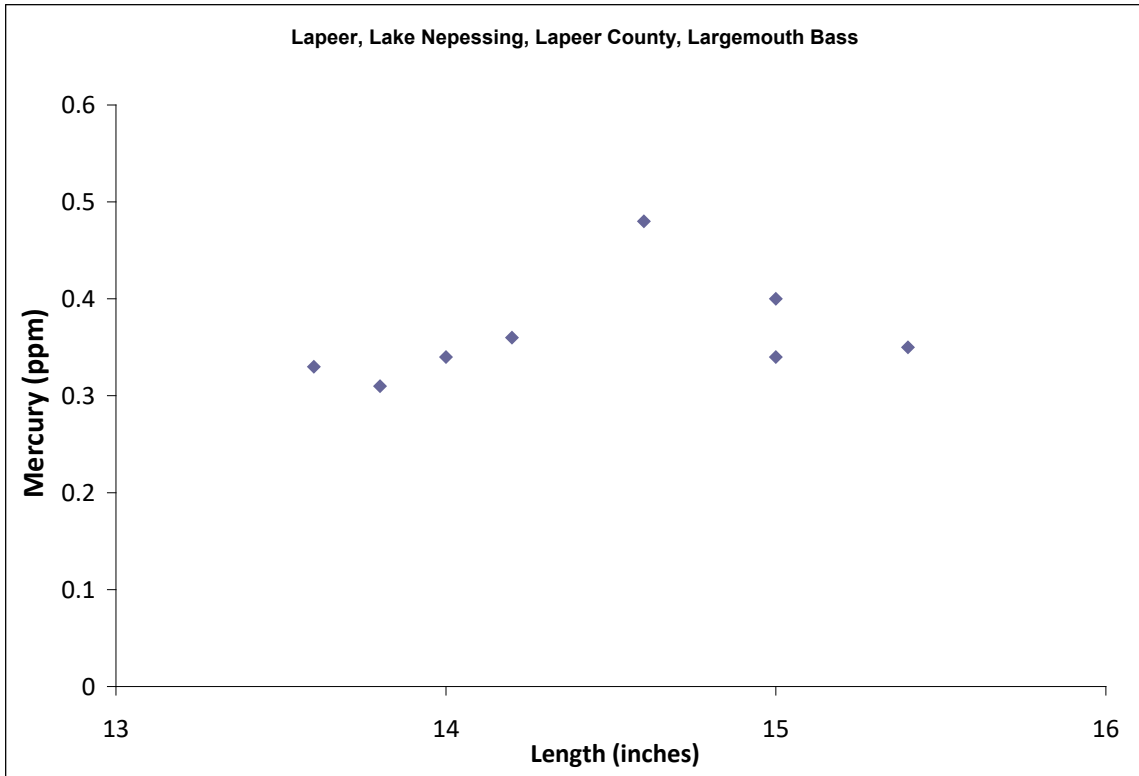
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1997	1997	10	12.2	14	13.6	15.4
Datasets available: 1997						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	8	0.364			0.410	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.425	0.500				

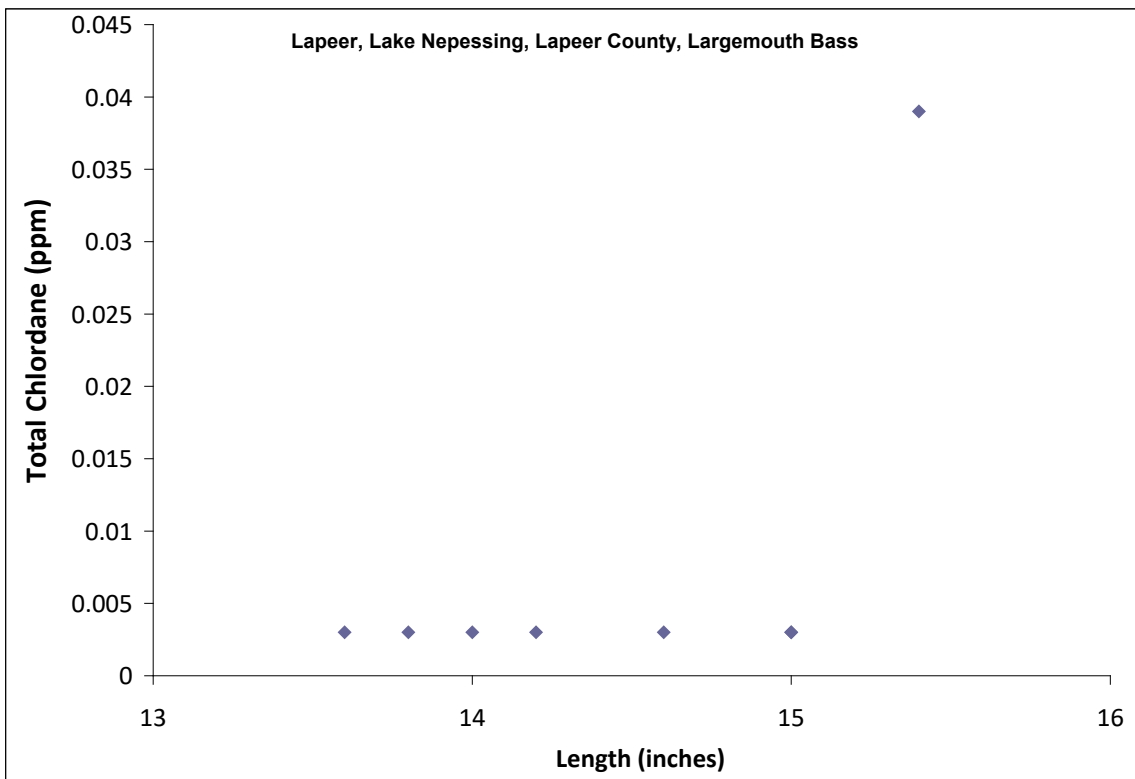
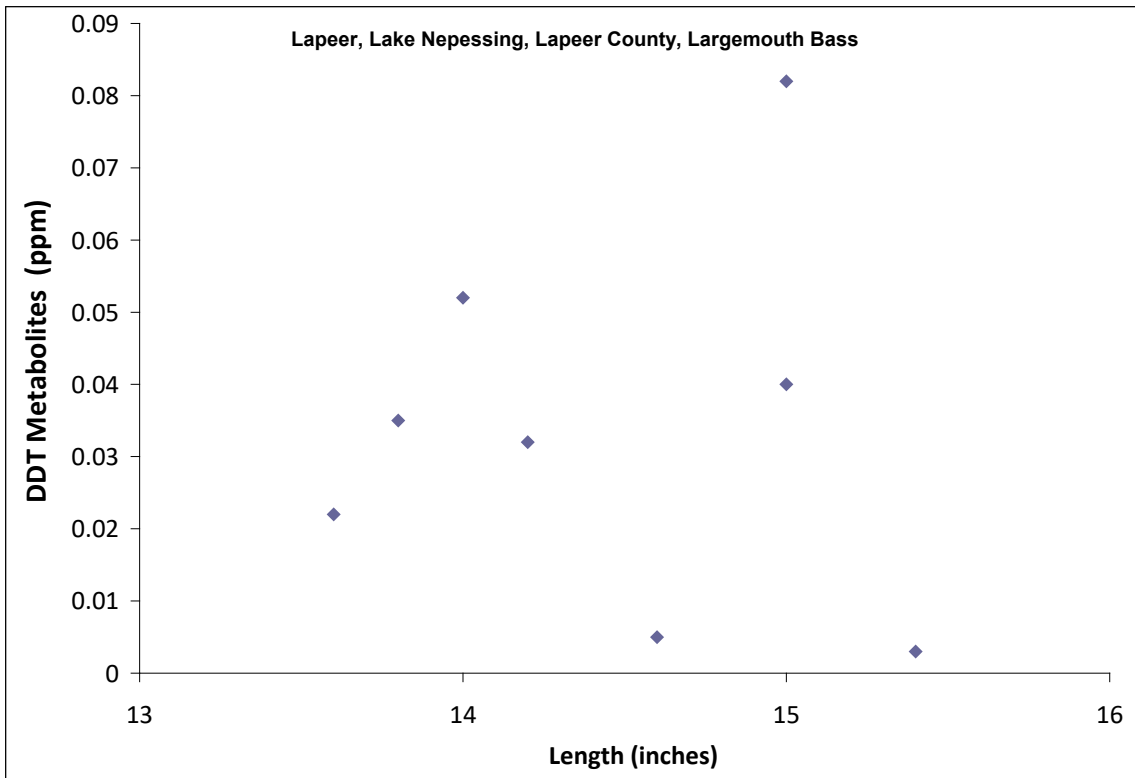
Organics Analysis:

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	12.2	14	13.6	15.4
Datasets available: 1997						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	8	0.026			0.030	8
DDT	8	0.034		0.060	16	
Chlordane	8	0.008		0.020	--	
Toxaphene	8	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.108	0.108				
DDT	0.004	0.132				
Chlordane	0.222	0.222				
Toxaphene						
Final meal category based on UCL:					2	

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

Recommendation: No one should eat more than 2 meals per month of Lake Nepessing largemouth bass less than 18 inches or 1 meal per month of Lake Nepessing largemouth bass greater than 18 inches due to mercury. This guideline matches the statewide guidelines.





**Bluegill & Pumpkinseed
Hg Analysis:**

Lake Pleasant

Lapeer County

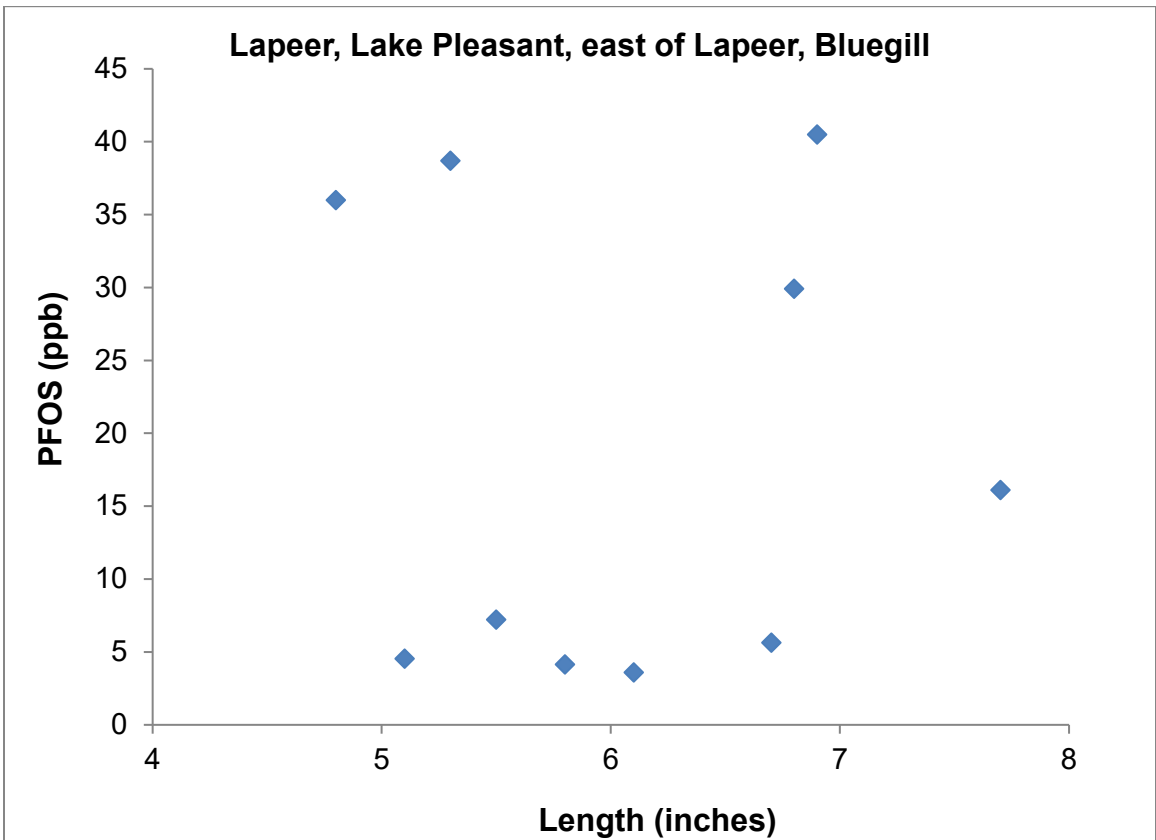
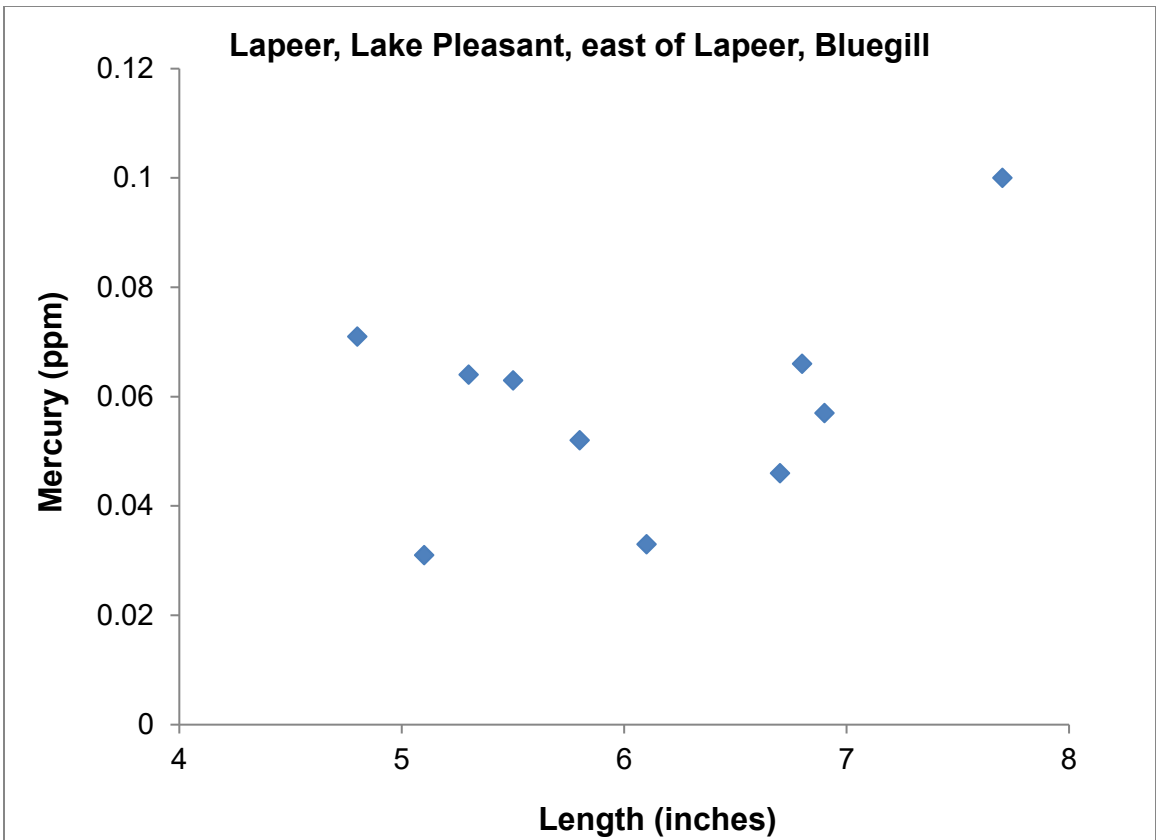
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2018	2018	10	4.8	na	4.8	7.7
Datasets available: 2018						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.06	0.03	0.10	0.07	12
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.169	0.128				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2018	2018	10	4.8	na	4.8	7.7
Datasets available: 2018						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
PFOS	10	19 ppb	4 ppb	40 ppb	30 ppb	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.000	0.010				
Final meal category based on UCL:						4

Existing MDHHS Advisory: 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 Lake Pleasant bluegill or sunfish due to PFOS. Mercury would cause an advisory.



Largemouth Bass

Lake Pleasant

Lapeer 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	9	9.7	14	14.3	17.9
Datasets available: 2018						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	4	0.54	0.32	0.81	0.92	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.848	0.926				

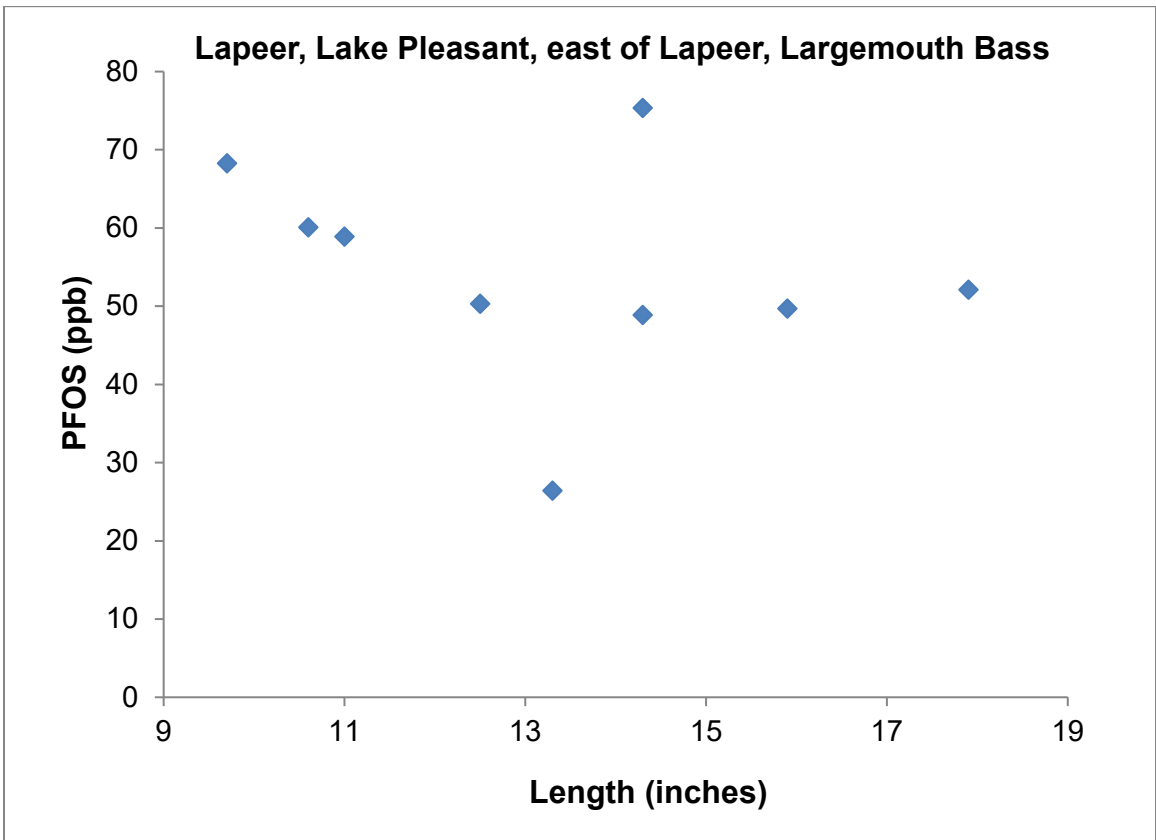
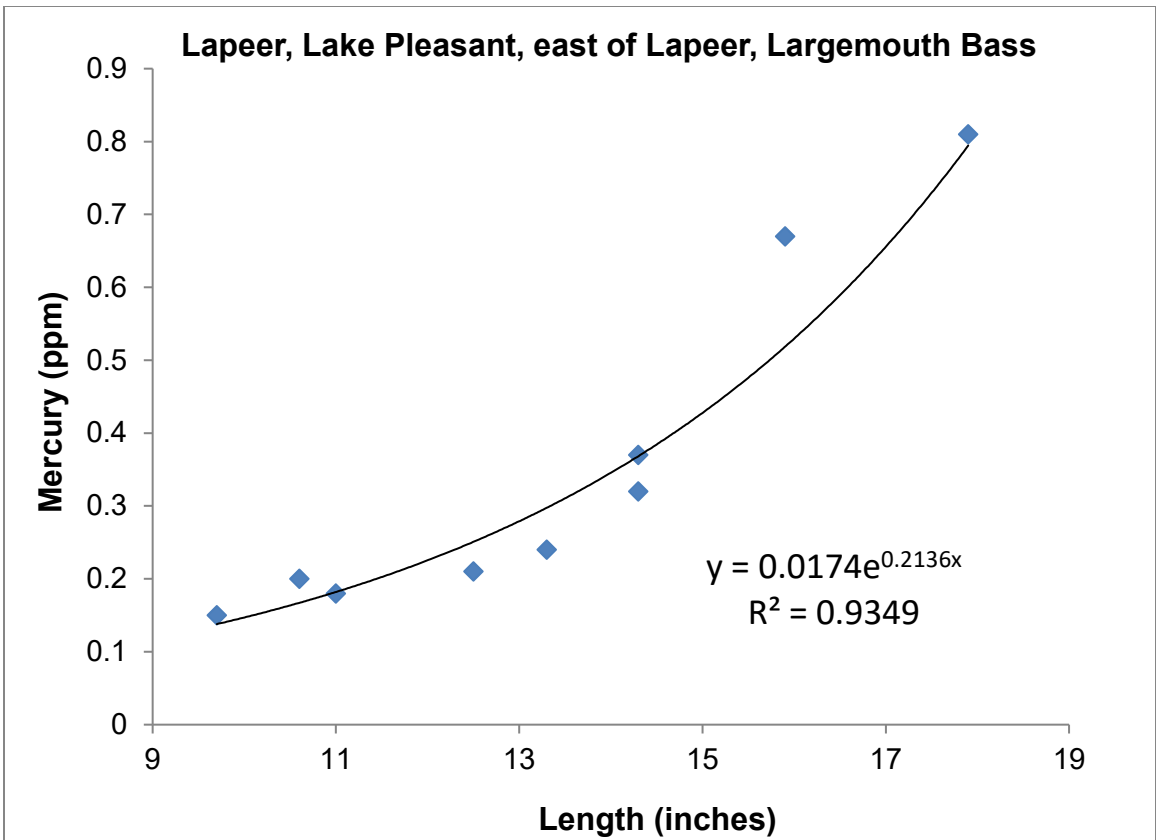
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2018	2018	9	9.7	14	14.3	17.9
Datasets available: 2018						
Chemical	Sample Size (All)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
PFOS	9	54 ppb	26 ppb	75 ppb	65 ppb	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.073	0.051				
Final meal category based on UCL:						1

Existing MDHHS Advisory: Lake Pleasant largemouth bass are covered by the statewide advisory due to mercury: No one should eat more than 2 meals per month of largemouth bass 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 Lake Pleasant largemouth bass or smallmouth bass smaller than 18 inches or no more than 6 meals per year of those fish larger than 18 inches due to mercury. The statewide length break was applied as the size range of the fish was limited. PFOS would cause an advisory.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
10	0.15	4
12	0.23	4
14	0.35	2
16	0.53	2
18	0.81	1
20	1.25	0.5
<i>Shaded area denotes extrapolated estimates</i>		



Lenawee County

Carp

Adrian Lake

Lenawee County

Hg Analysis:

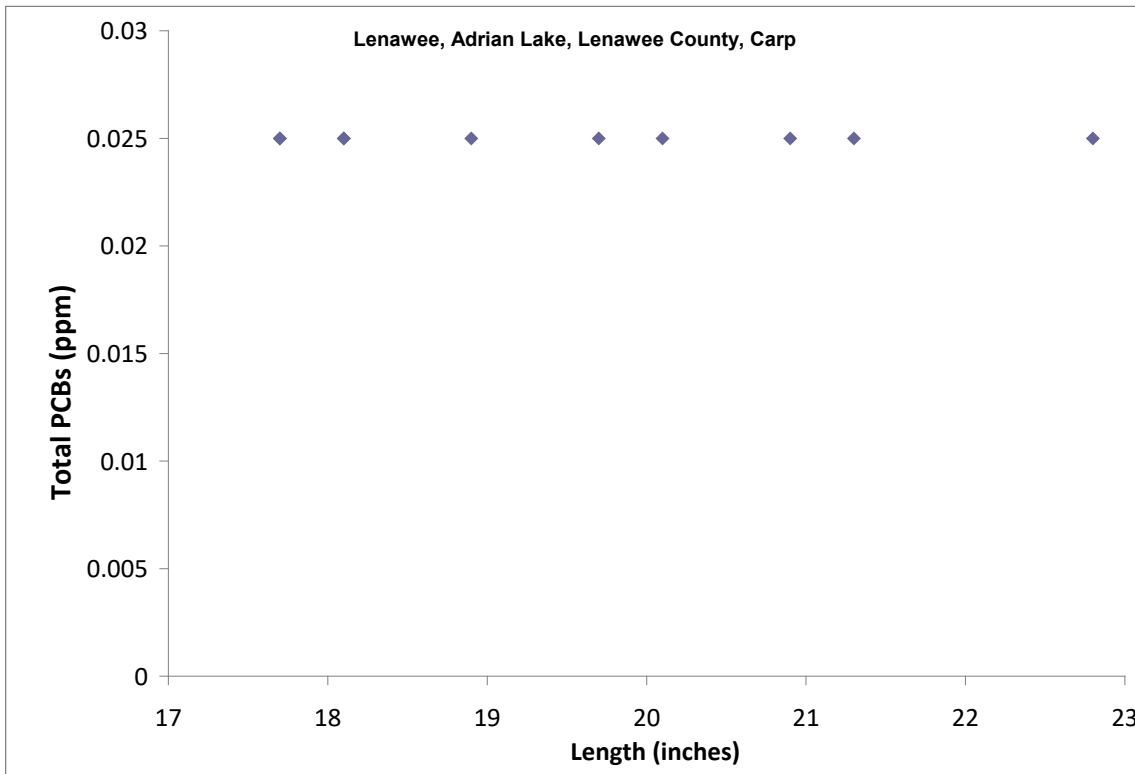
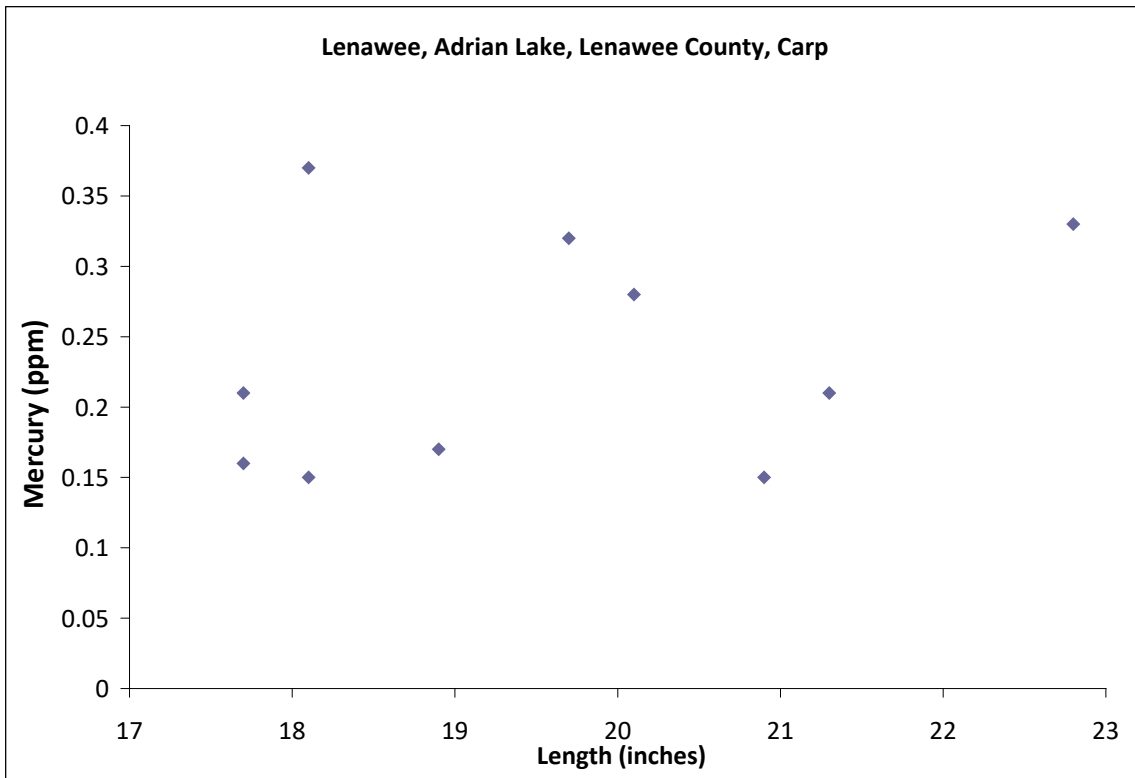
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1990	1990	10	17.7	na	17.7	22.8
Datasets available: 1990						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	10	0.235		0.290		2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.069	0.081				

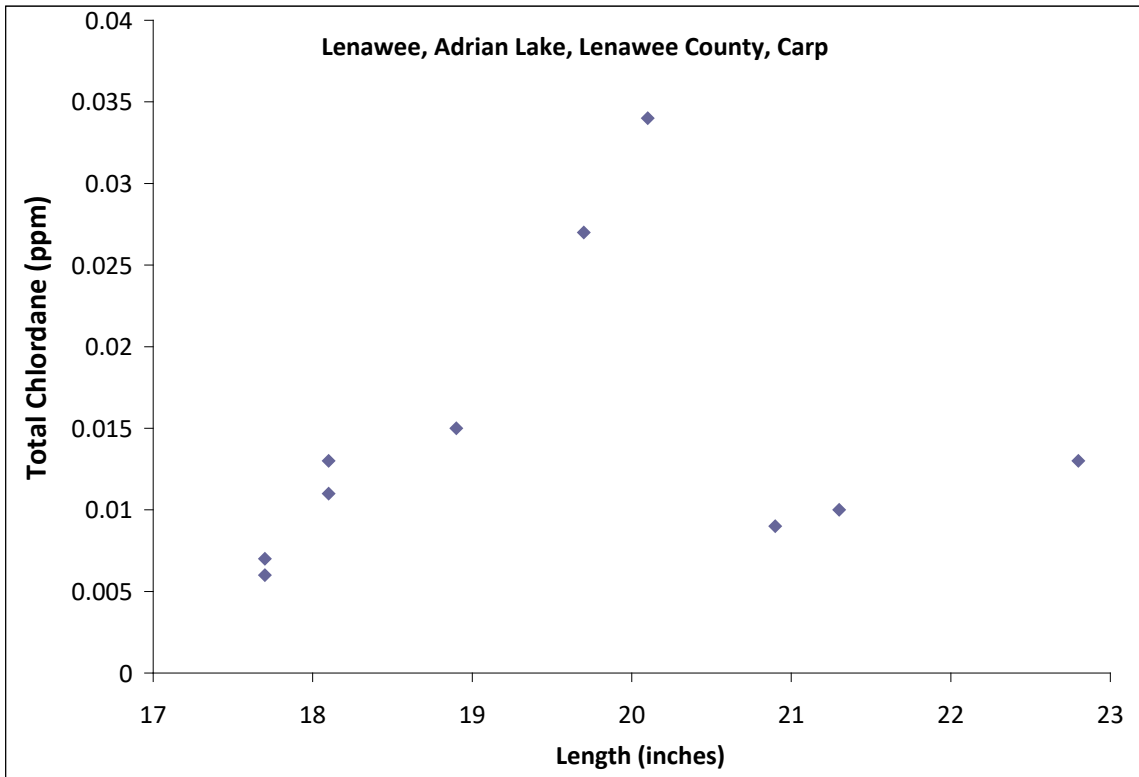
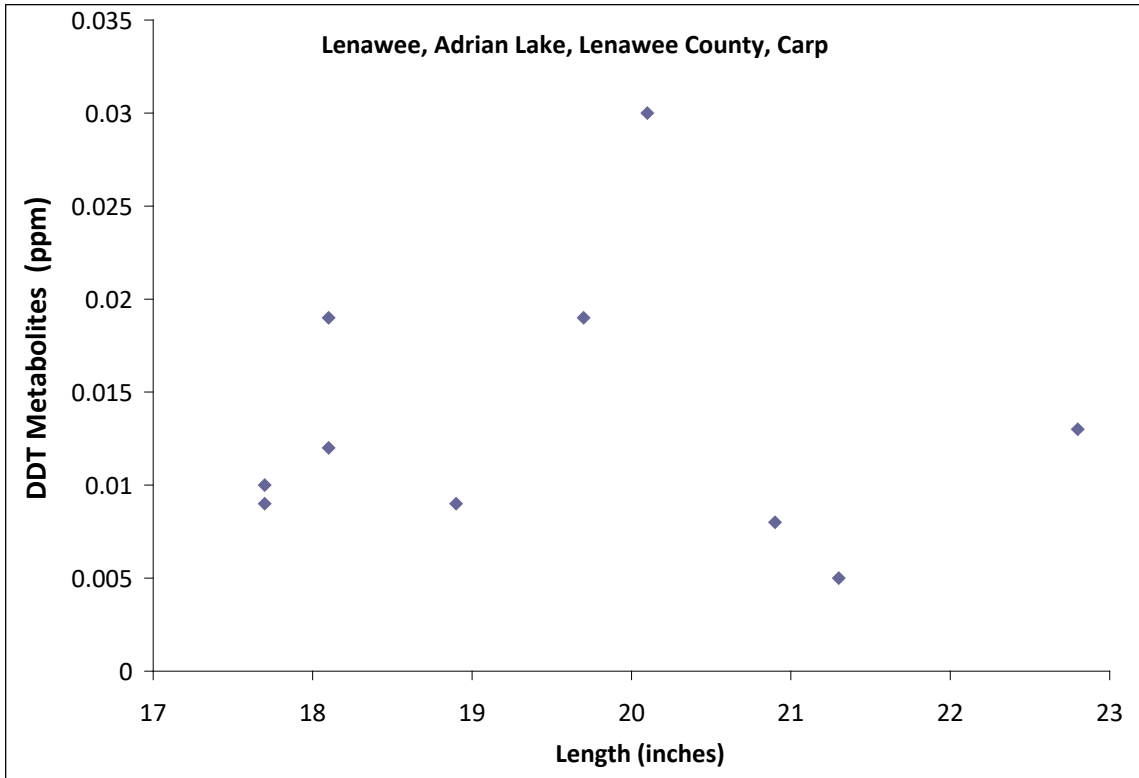
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1990	1990	10	17.7	na	17.7	22.8
Datasets available: 1990						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	10	ND		--		--
DDT	10	0.013		0.020		16
Chlordane	10	0.015		0.020		--
Toxaphene	10	ND		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB						
DDT	0.000	0.011				
Chlordane	0.042	0.079				
Toxaphene						
Final meal category based on UCL:						2

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

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





Largemouth Bass

Lake Adrian

Lenawee County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2018	2018	10	14.4	14	14.4	20.7
Datasets available: 2018						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.39	0.19	0.85	0.56	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.761	0.698				

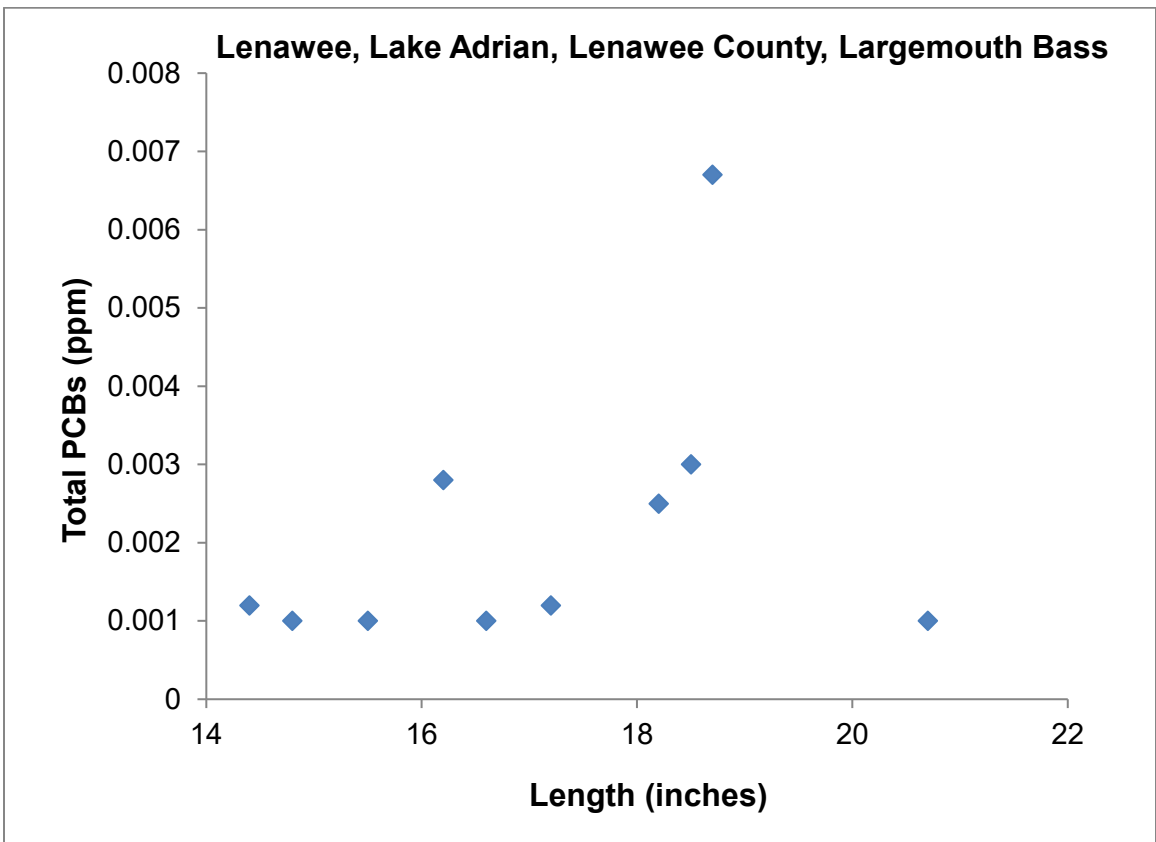
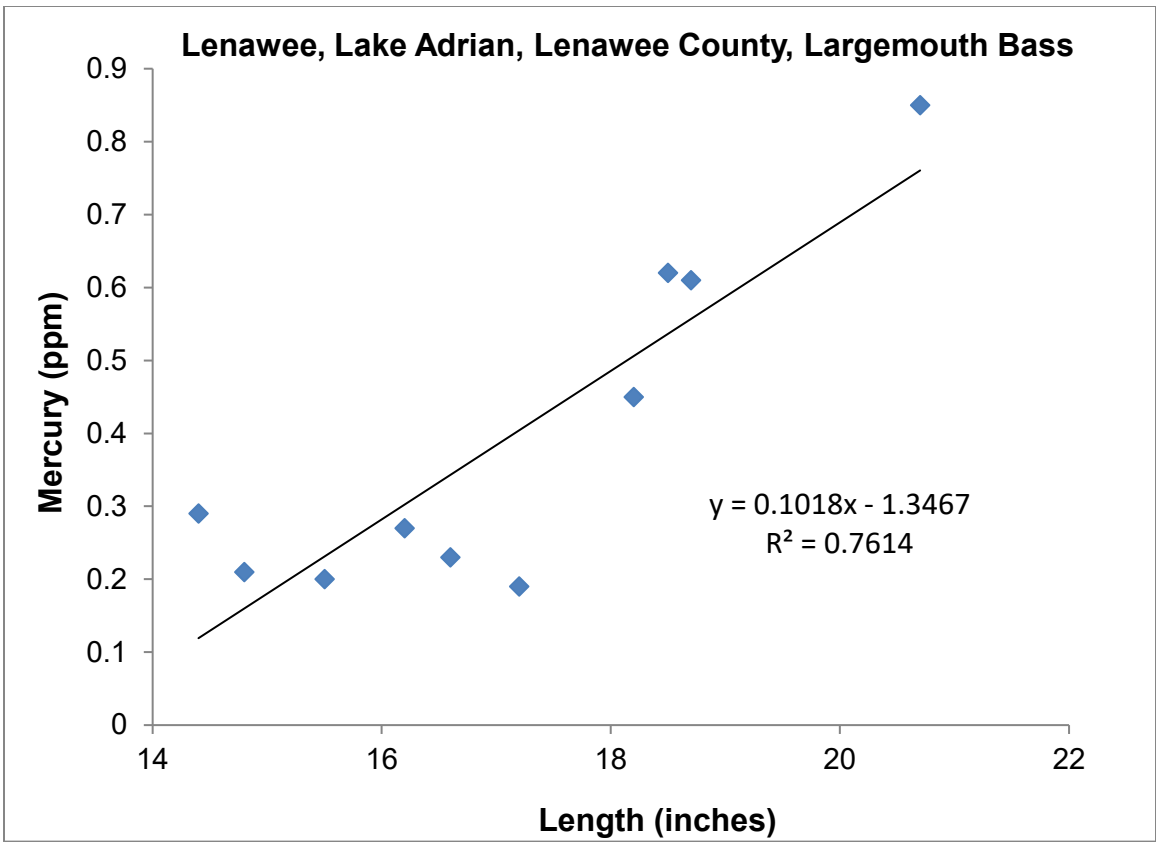
Organics Analysis:

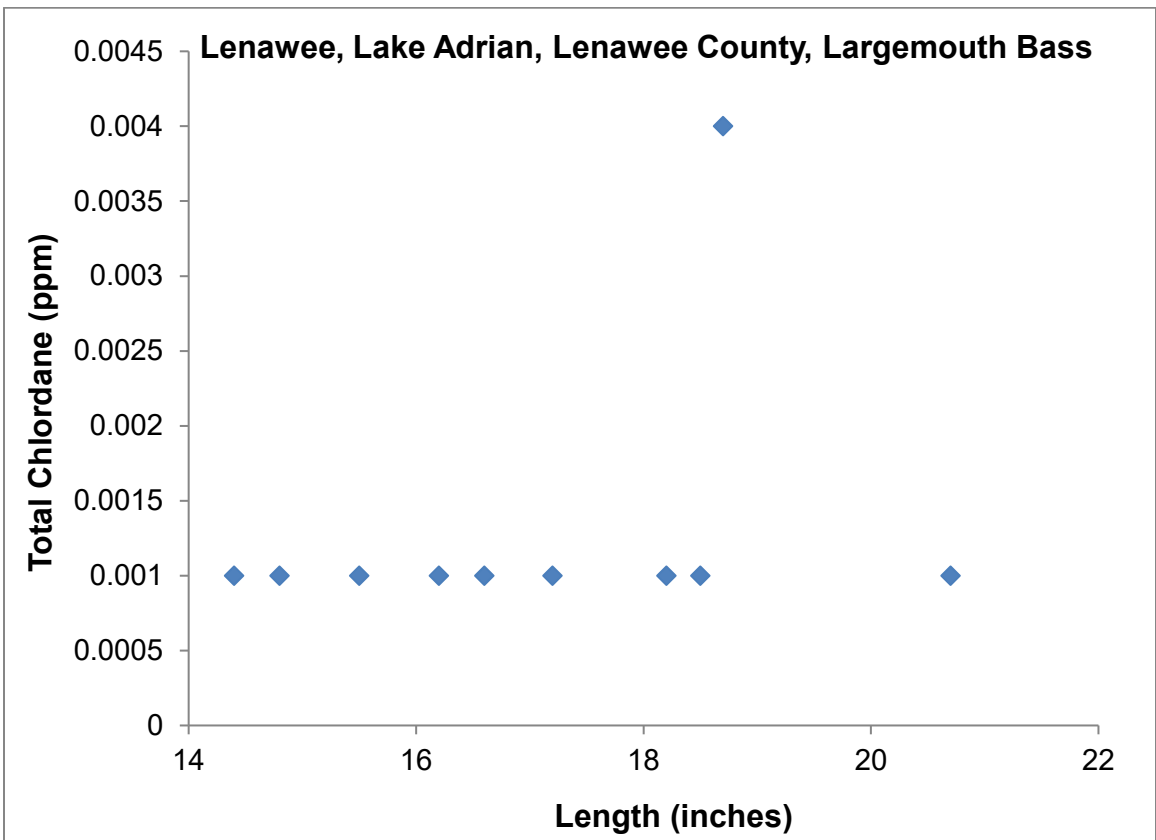
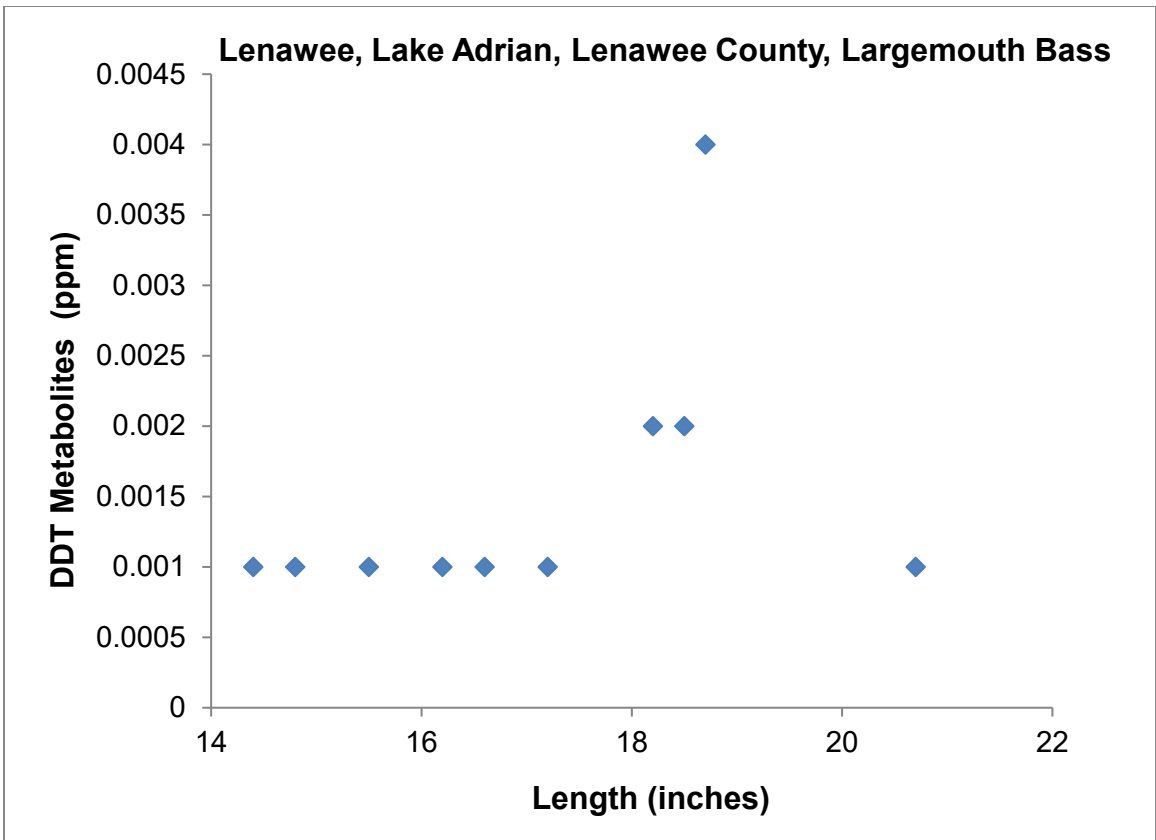
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2018	2018	10	14.4	14	14.4	20.7
Datasets available: 2018						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.002	< 0.001	0.007	0.003	16
DDT	10	0.002	< 0.001	0.004	0.002	16
Chlordane	10	0.001	< 0.001	0.004	0.002	--
Toxaphene	10	ND	< 0.05	< 0.05	--	--
PFOS	10	6 ppb	3 ppb	8 ppb	7 ppb	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.134	0.133				
DDT	0.185	0.218				
Chlordane	0.084	0.084				
Toxaphene	--	--				
PFOS	0.292	0.334				
Final meal category based on UCL:						1

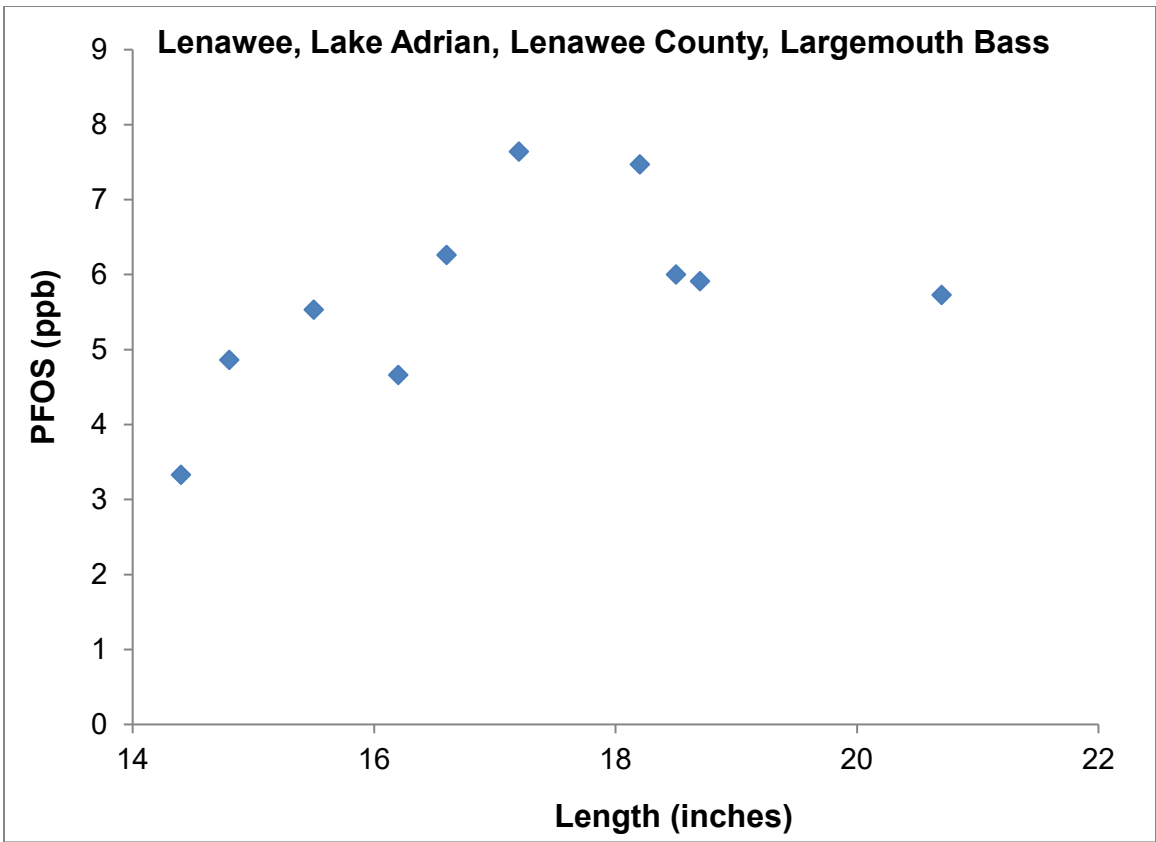
Existing MDHHS Advisory: Lake Adrian largemouth and smallmouth bass are covered by the statewide advisory due to mercury: No one should eat more than 2 meals per month of largemouth or smallmouth bass smaller than 18 inches or more than 1 meal per month of those fish larger than 18 inches.

Recommendation: No one should eat more than 2 meals per month of Lake Adrian largemouth bass or smallmouth bass smaller than 18 inches or more than 1 meal per month of those fish larger than 18 inches due to mercury.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
14	0.08	12
15	0.18	4
16	0.28	2
17	0.38	2
18	0.49	2
19	0.59	1
20	0.69	1
21	0.79	1
<i>Shaded area denotes extrapolated estimates</i>		







Northern Pike

Adrian Lake

Lenawee County

Hg Analysis:

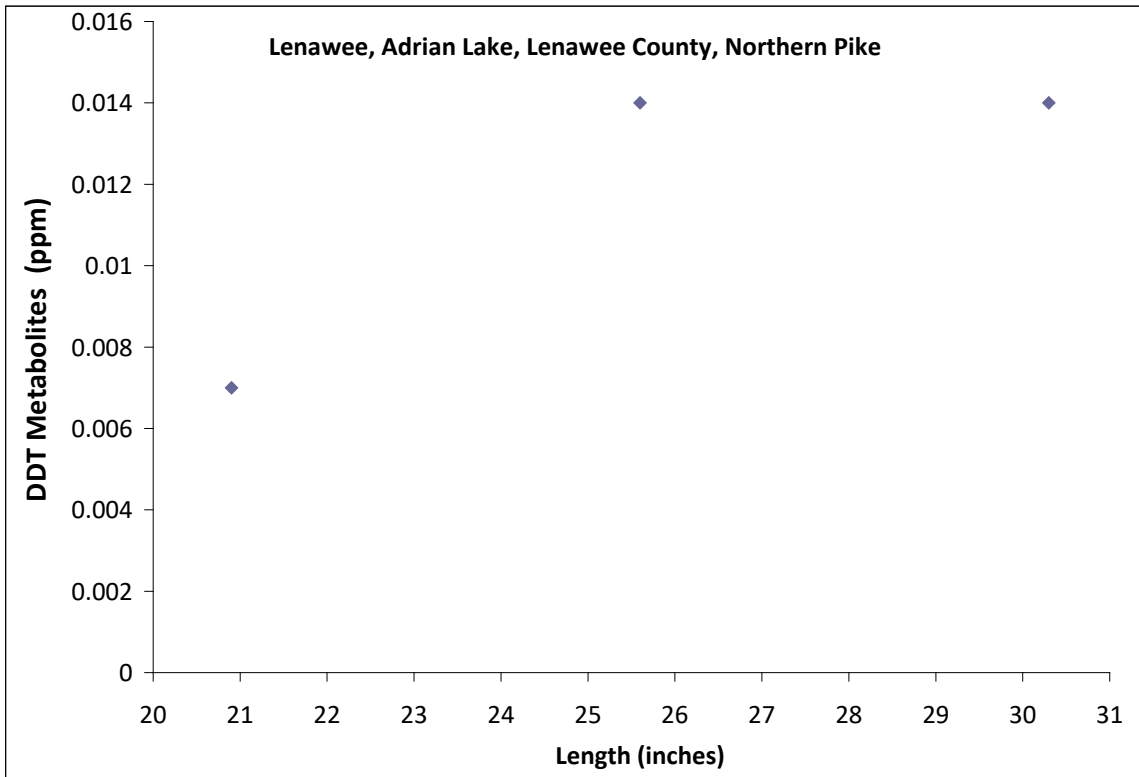
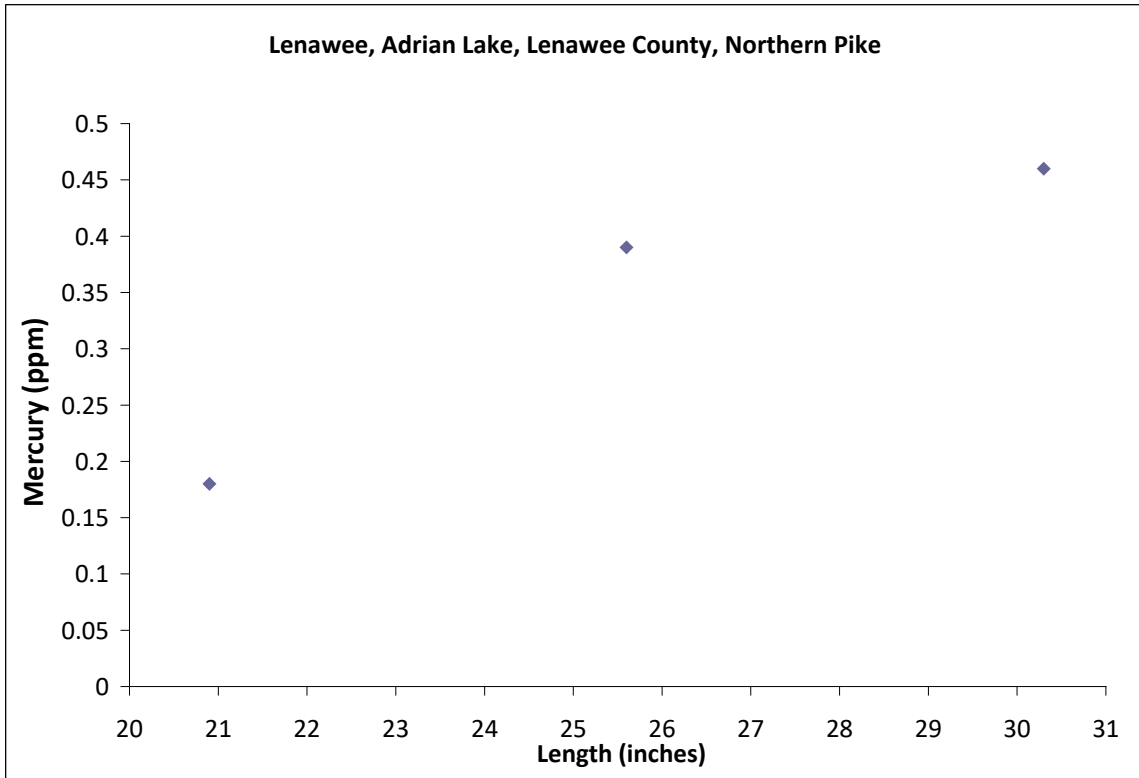
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1990	1990	3	20.9	24	25.6	30.3
Datasets available: 1990						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	2	0.425		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

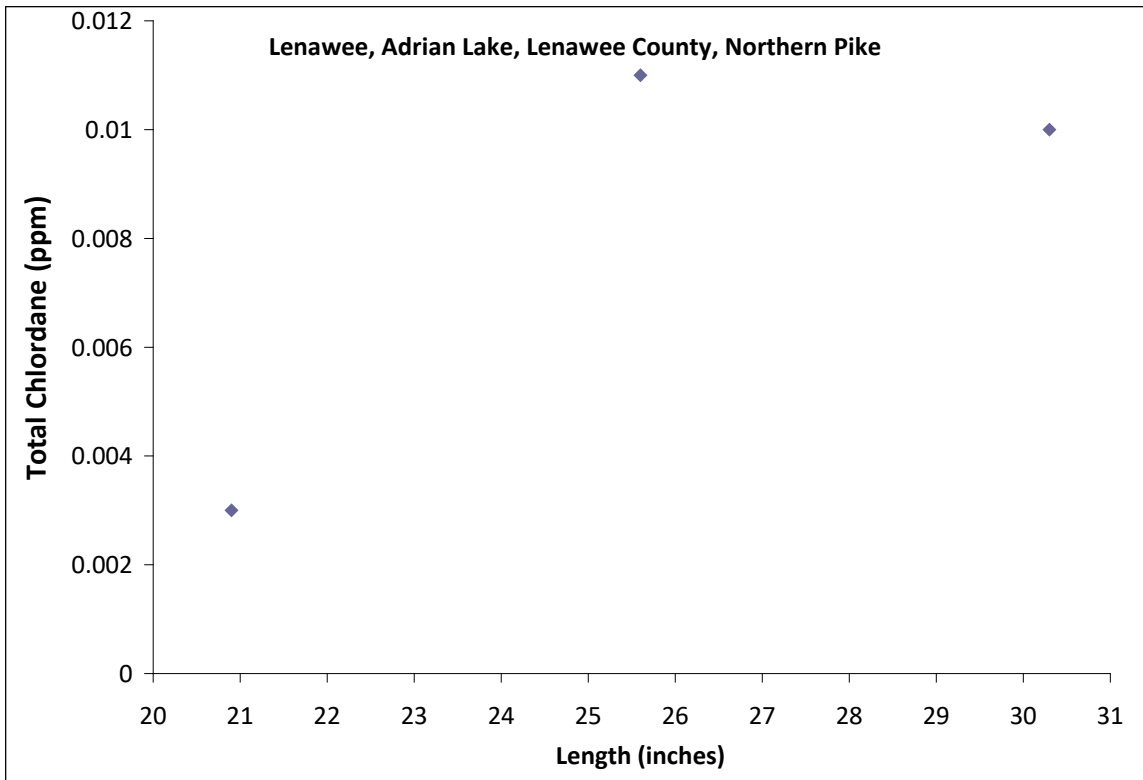
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1990	1990	3	20.9	24	25.6	30.3
Datasets available: 1990						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	2	ND		--	--	
DDT	2	0.014		--	--	
Chlordane	2	0.011		--	--	
Toxaphene	2	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene						
Final meal category based on UCL:						--

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

Recommendation: Statewide guidelines would apply to Adrian Lake northern pike.





Carp

Black Creek

Lenawee County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1991	1991	5	18.5	na	18.5	28
Datasets available: 1991						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	5	0.232		0.350	2	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.702	0.795				

Organics Analysis:

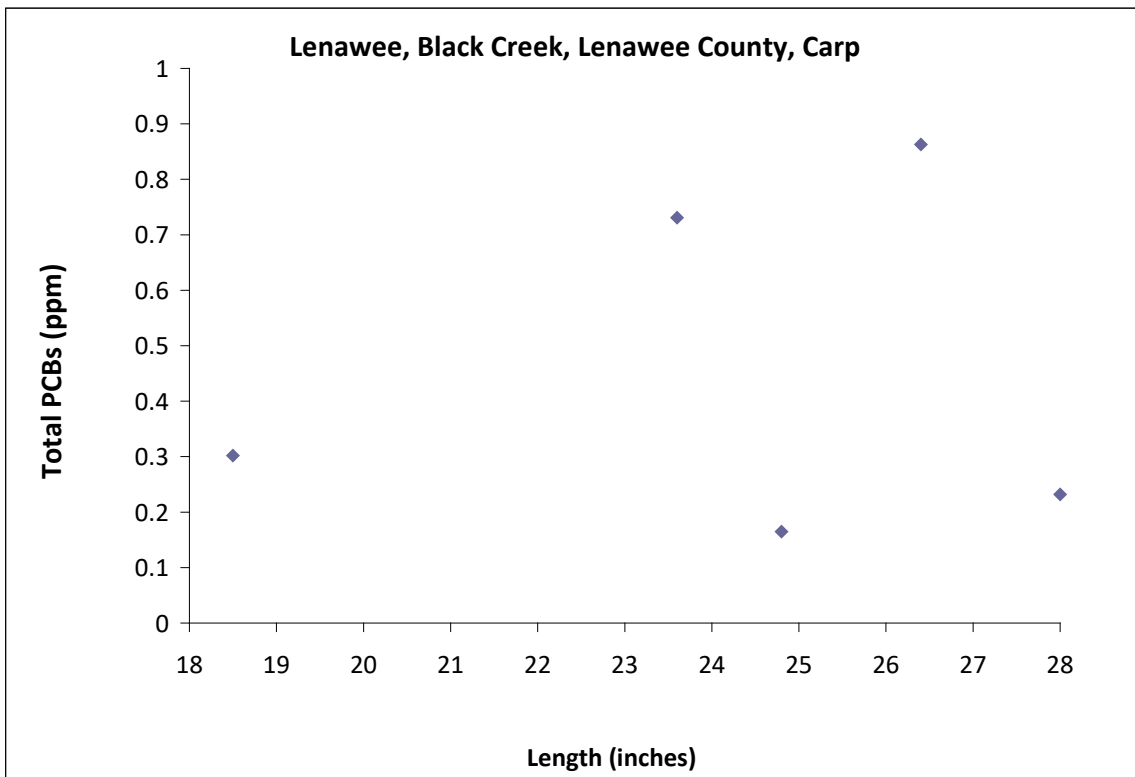
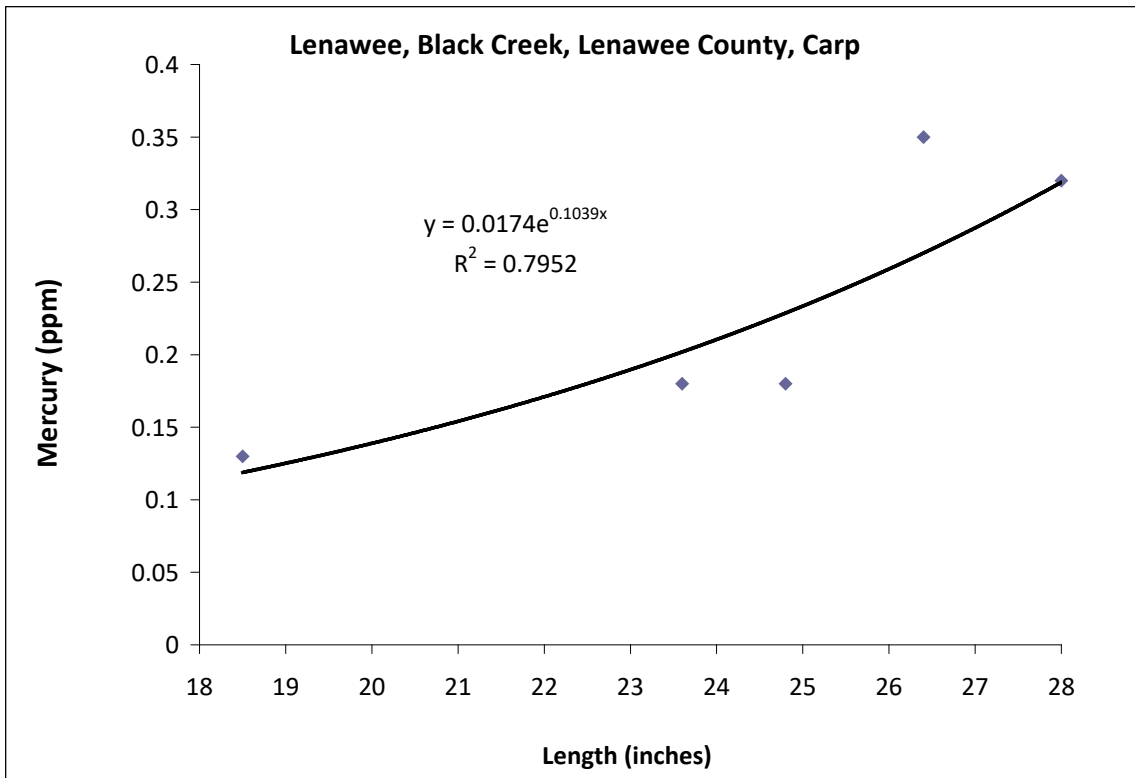
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1991	1991	5	18.5	na	18.5	28
Datasets available: 1991						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	5	0.459		0.850	Limited	
DDT	5	0.068		0.110	4	
Chlordane	5	0.030		0.050	--	
Toxaphene	5	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.016	0.001				
DDT	0.249	0.416				
Chlordane	0.074	0.086				
Toxaphene						
Final meal category based on UCL:					Limited	

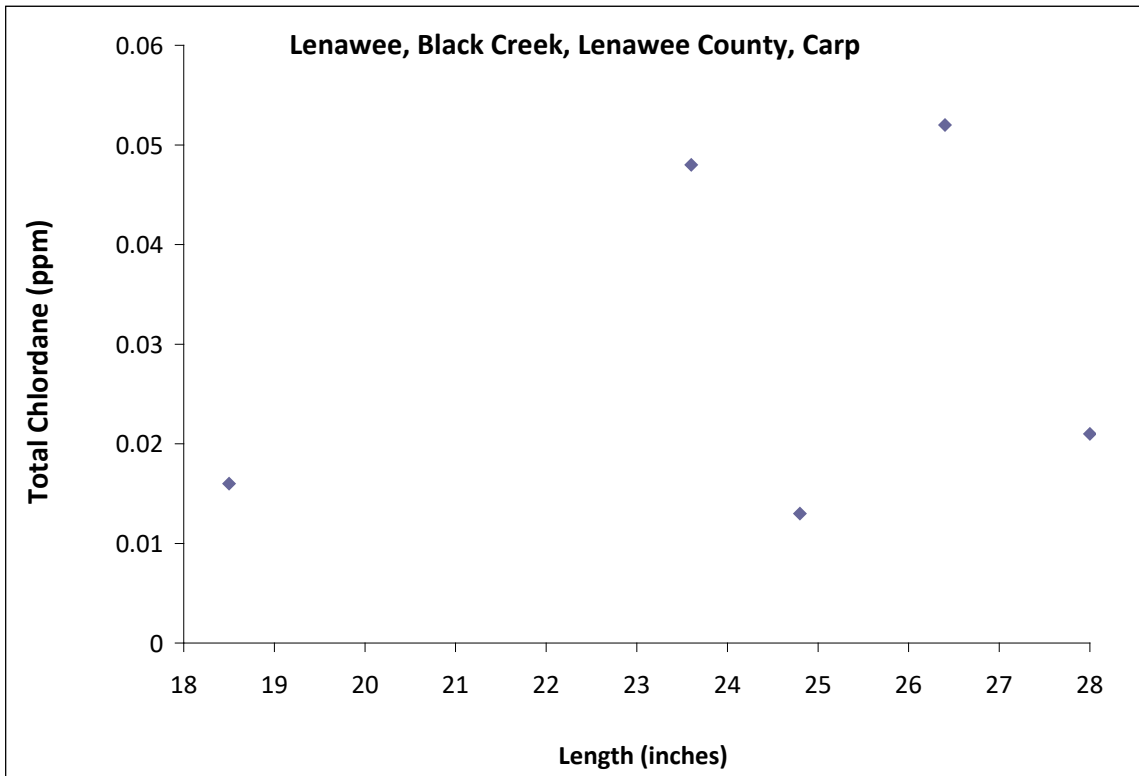
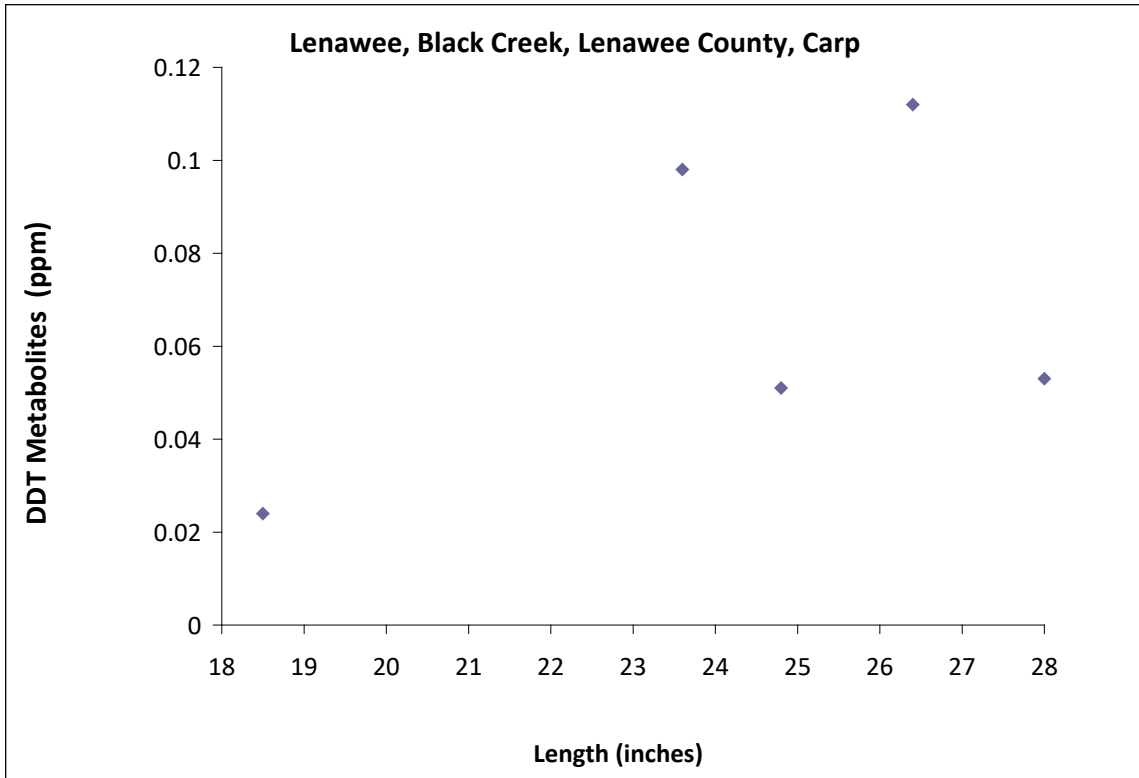
Existing Advisory: Women and children should eat no more than one meal per month of Black Creek carp of any size due to elevated levels of PCBs.

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

Length (Inches)	Regression Equation Estimate (ppm)	Meal Category
16	0.092	8
18	0.113	8
20	0.139	4
22	0.171	4
24	0.211	4
26	0.259	4
28	0.319	2
30	0.393	2
32	0.484	2

Shaded area denotes extrapolated estimates





Carp

Lake Hudson

Lenawee County

Hg Analysis:

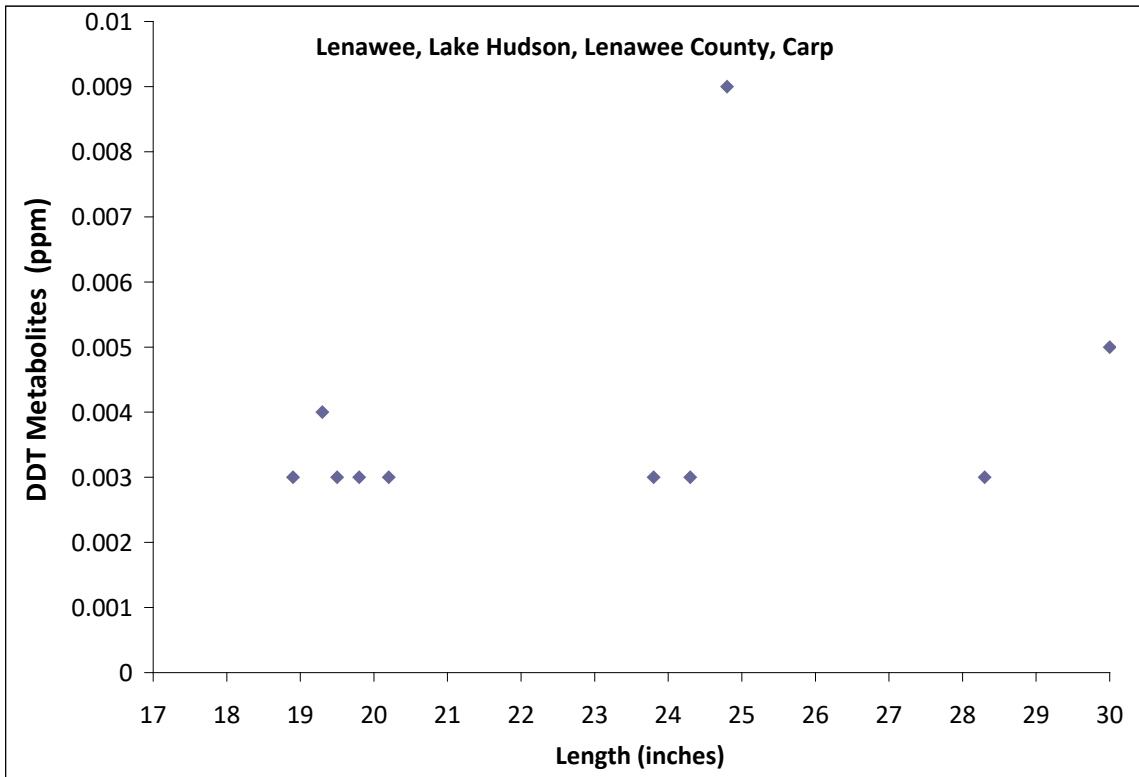
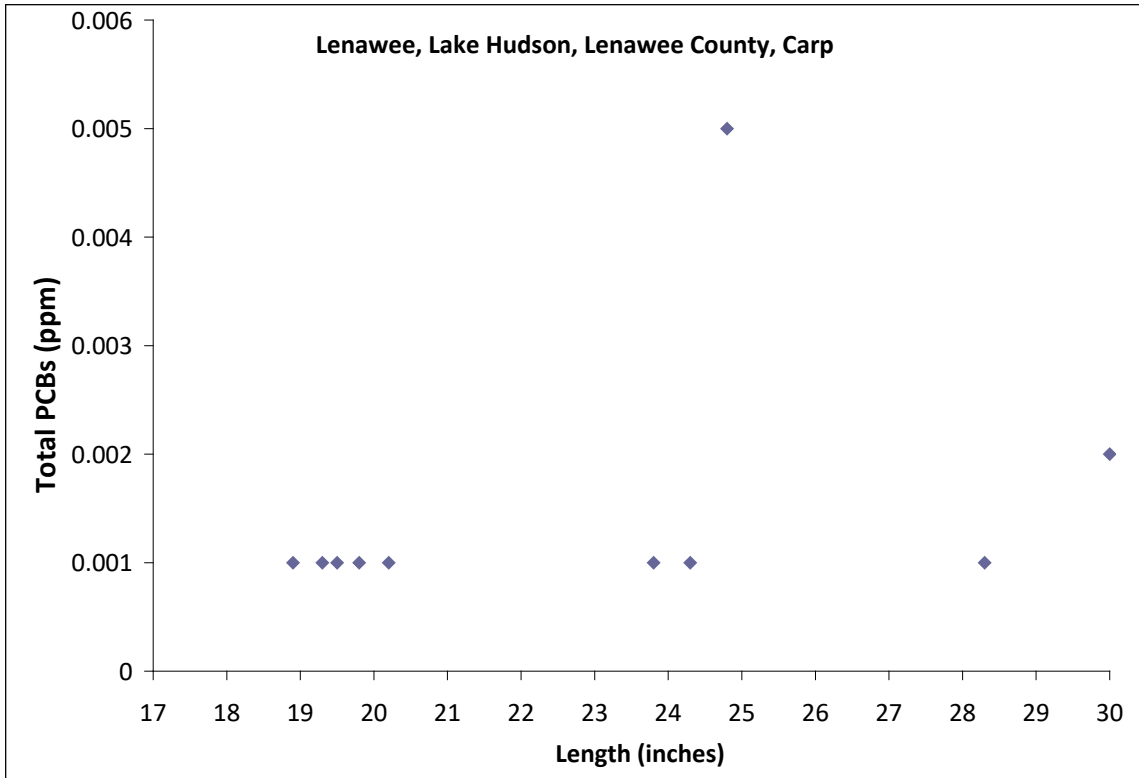
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	2000	15	17	na	17	30
Datasets available: 1989, 2000						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	15	0.209		0.320	2	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.585	0.437				

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	18.9	na	18.9	30
Datasets available: 2000						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	10	0.002		0.002	16	
DDT	10	0.004		0.010	16	
Chlordane	10	ND		--	--	
Toxaphene	10	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.105	0.176				
DDT	0.103	0.129				
Chlordane						
Toxaphene						
Final meal category based on UCL:					2	

Existing Advisory: There are no consumption advisories on Lake Hudson carp.

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



Largemouth Bass

Lake Hudson

Lenawee County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2000	2000	6	12.2	14	14.2	17.2
Datasets available: 2000						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	4	0.2925			--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.596	0.776				

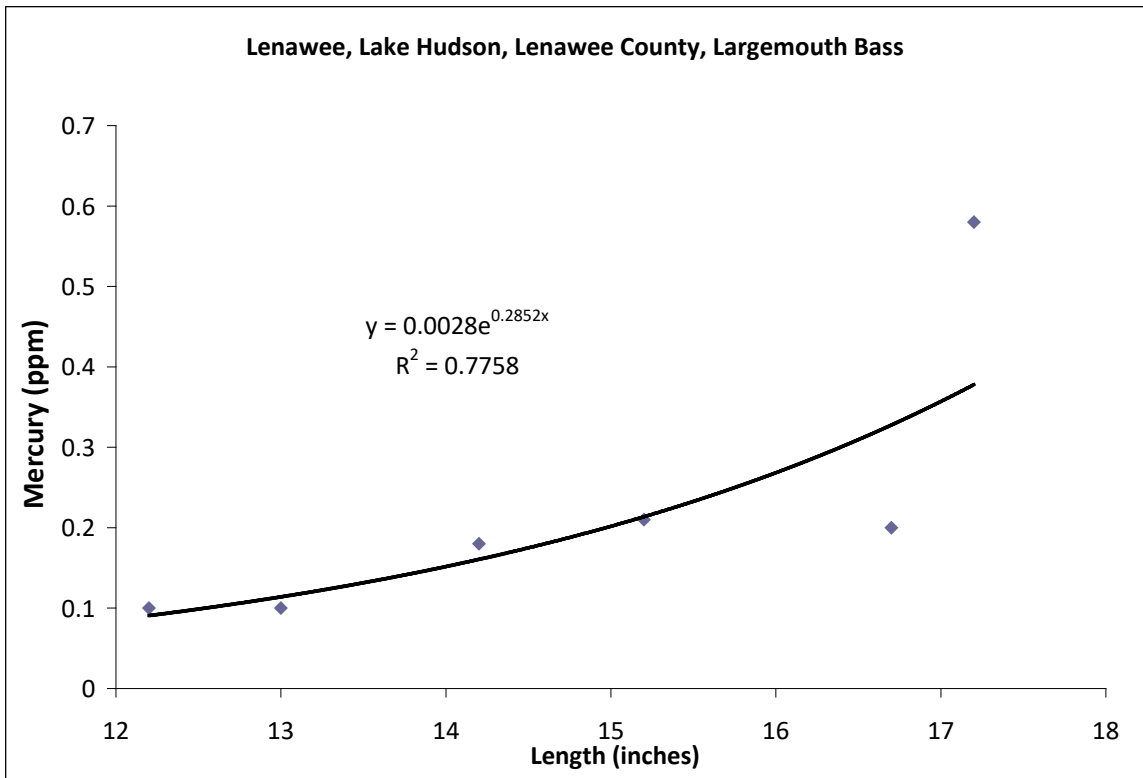
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2000	2000	6	12.2	14	14.2	17.2
Datasets available: 2000						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	4	ND			--	--
DDT	4	ND		--	--	
Chlordane	4	ND		--	--	
Toxaphene	4	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:					--	

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

Recommendation: No should eat more than 2 meals per month of Lake Hudson largemouth bass that are less than 18 inches in length, or more than 1 meal per month greater than 18 inches in length. Recommendation is the same as the statewide guidelines and is supported by the regression results.

Length (Inches)	Regression Equation Estimate (ppm)	Meal Category
14	0.152	4
16	0.268	4
18	0.475	2
20	0.840	1
22	1.486	0.5
24	2.629	0
26	4.651	0
28	8.227	0
30	14.554	0
<i>Shaded area denotes extrapolated estimates</i>		



Muskellunge

Lake Hudson

Lenawee County

Hg Analysis:

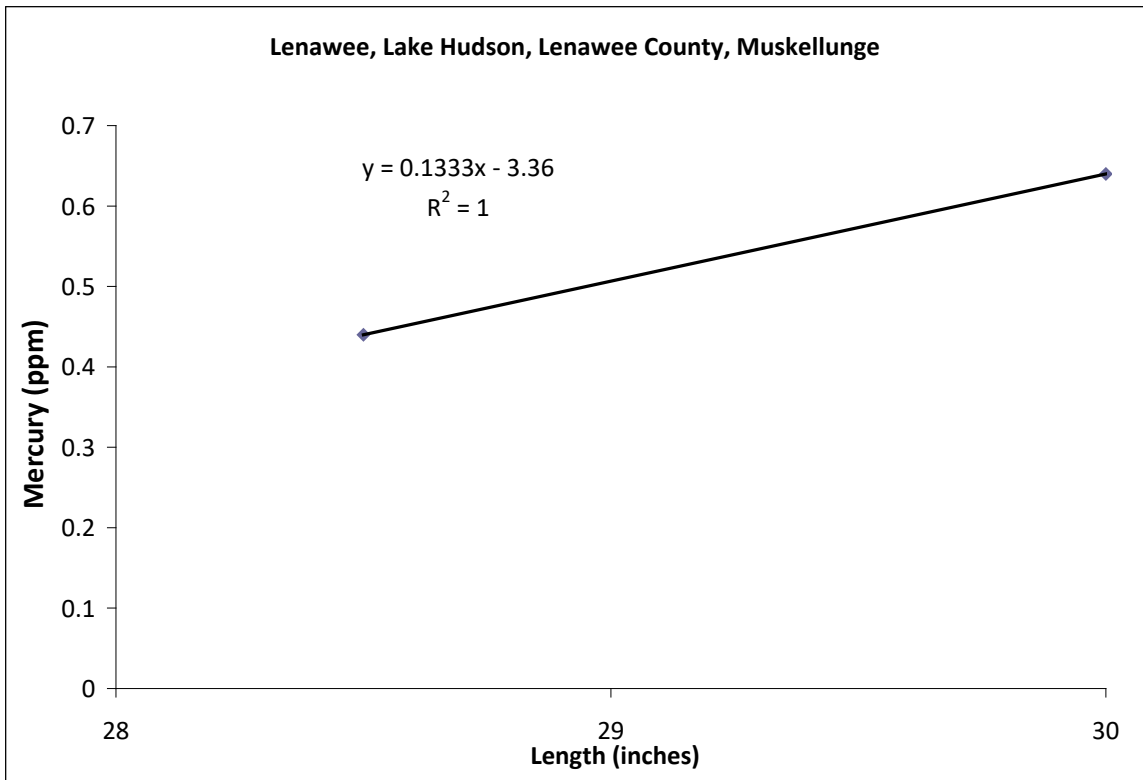
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	1989	2	28.5	42	na	na
Datasets available:		1989				
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	0	--		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	1989	0	na	42	na	na
Datasets available:		1989				
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	0	--		--	--	
DDT	0	--		--	--	
Chlordane	0	--		--	--	
Toxaphene	0	--		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:					--	

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

Recommendation: Statewide mercury advisory would apply to Lake Hudson muskellunge.



Northern Pike

Lake Hudson

Lenawee County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	1989	4	24	24	29	
Datasets available: 1989						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	4	0.5525		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.958	0.961				

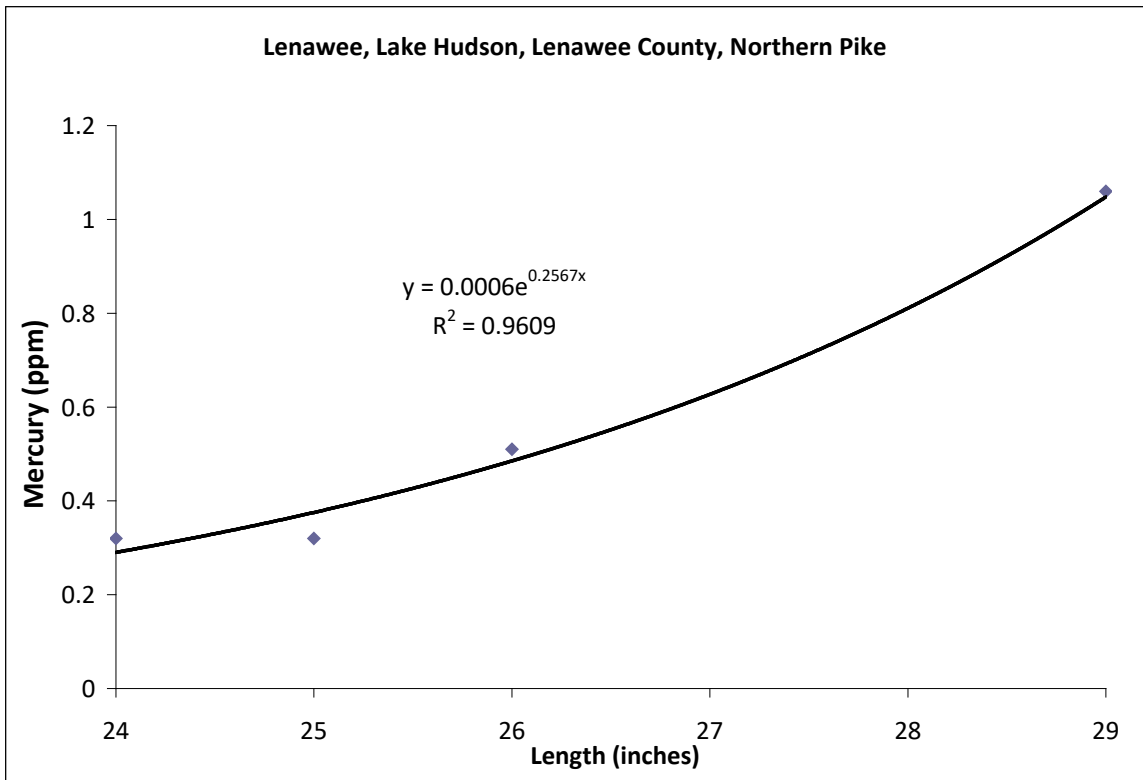
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	1989	0	24	24	29	
Datasets available: 1989						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		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:						--

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

Recommendation: Statewide mercury advisory would apply to Lake Hudson northern pike. Dataset is limited by sample size.

Length (Inches)	Regression Equation Estimate (ppm)	Meal Category
24	0.284	2
26	0.475	2
28	0.794	1
30	1.326	0.5
32	2.216	0
34	3.703	0
36	6.188	0
38	10.340	0
40	17.278	0
<i>Shaded area denotes extrapolated estimates</i>		



Walleye

Sand Lake

Lenawee County

Hg Analysis:

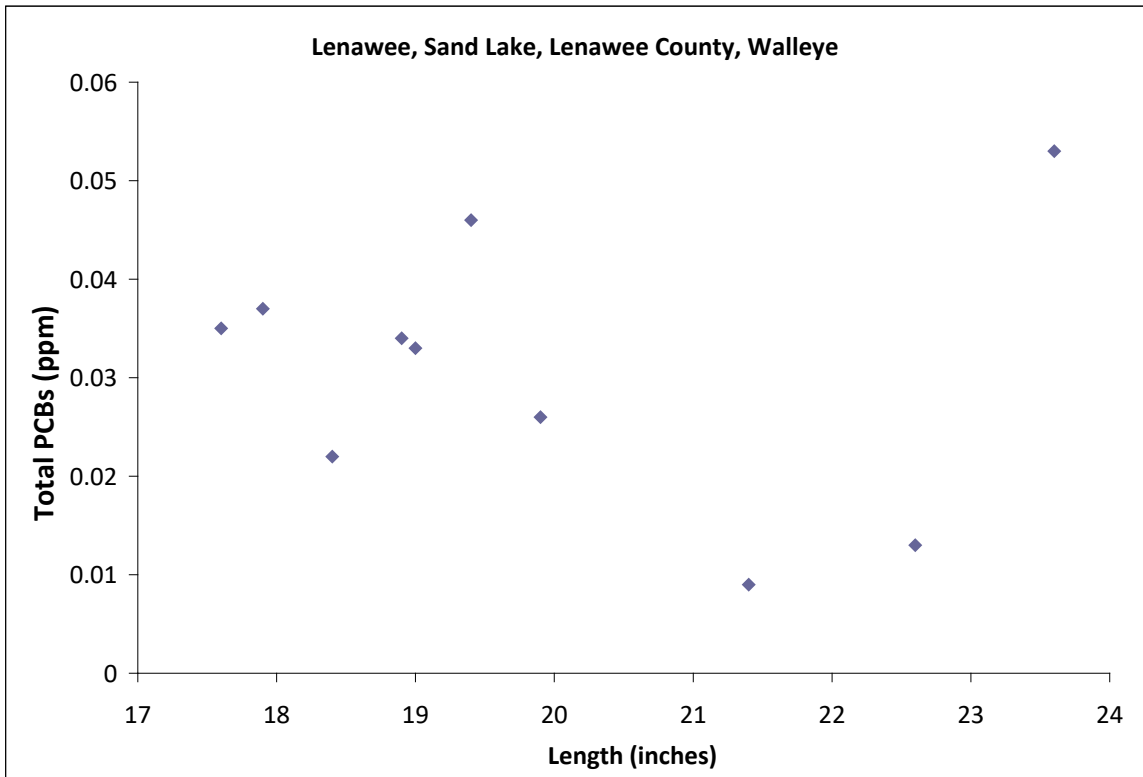
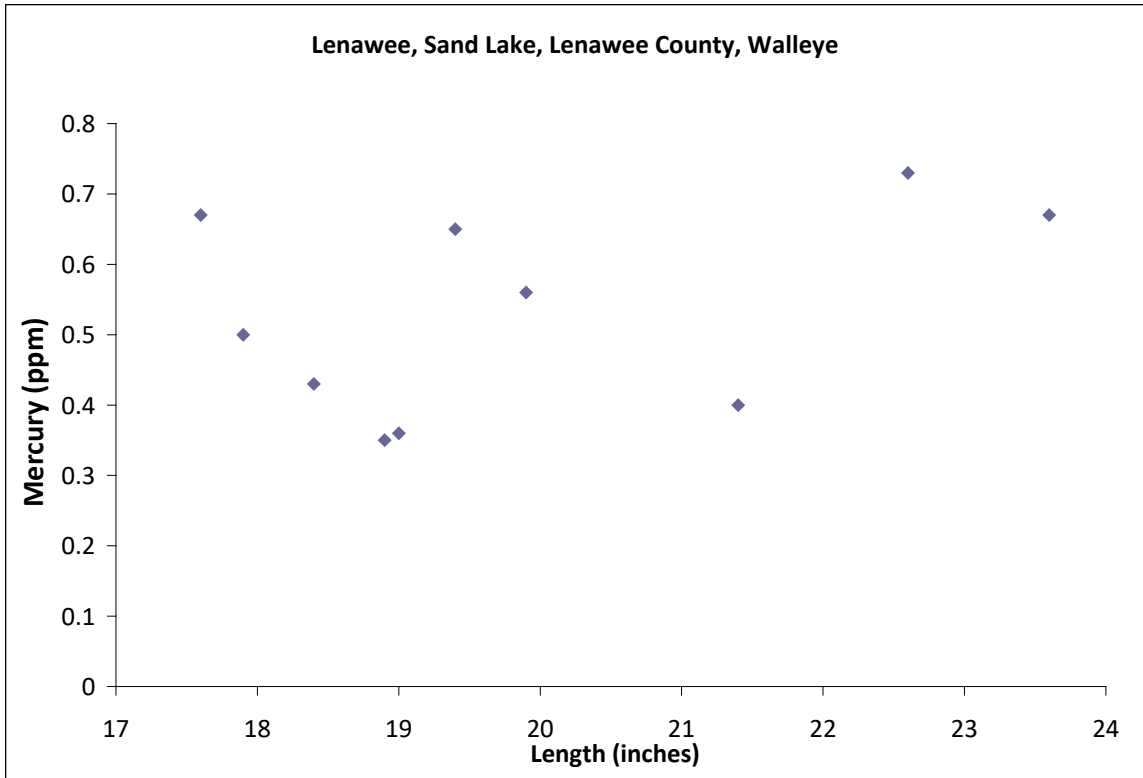
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2003	2003	10	17.6	15	17.6	23.6
Datasets available: 2003						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	10	0.532		0.630	1	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.155	0.134				

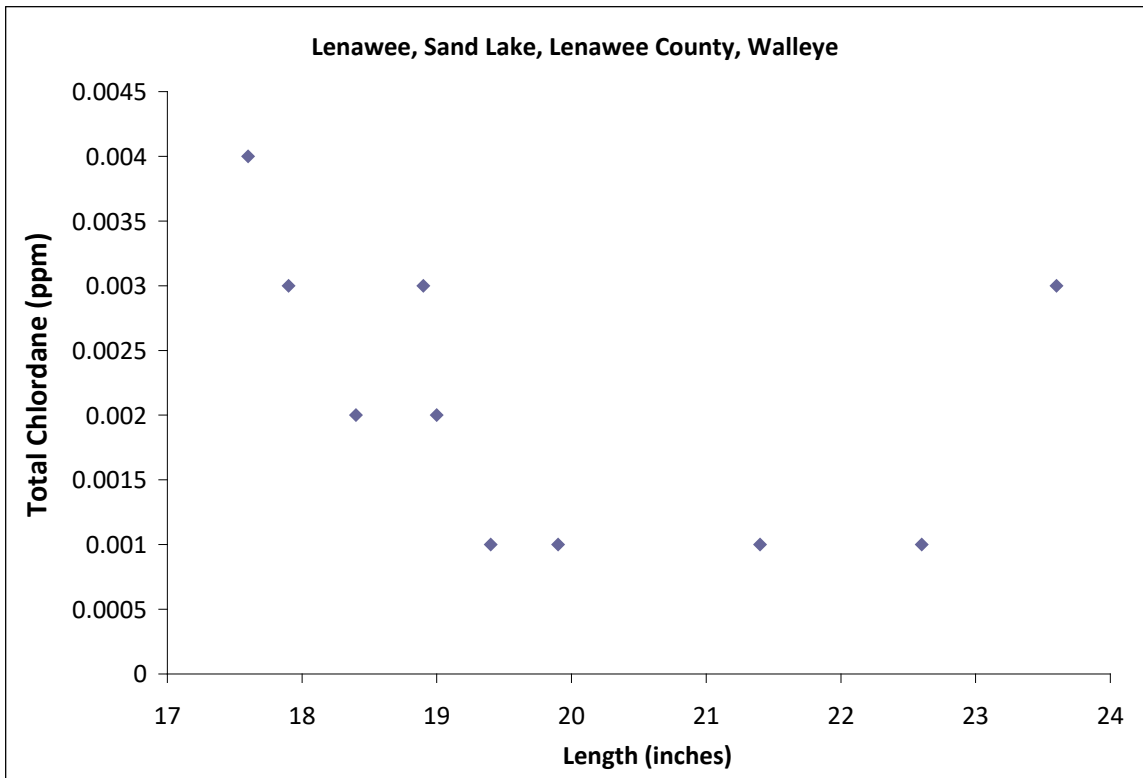
Organics Analysis:

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	17.6	15	17.6	23.6
Datasets available: 2003						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	10	0.031		0.040	4	
DDT	10	0.016		0.020	16	
Chlordane	10	0.002		0.000	--	
Toxaphene	10	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.007	0.072				
DDT	0.036	0.122				
Chlordane	0.143	0.147				
Toxaphene						
Final meal category based on UCL:					1	

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

Recommendation: No one should eat more than 1 meal per month of Sand Lake walleye due to mercury. PCBs would cause an advisory.





Black Crappie

Wamplers Lake

Lenawee County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	1989	5	9.4	na	9.4	11.2
Datasets available: 1989						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	5	0.282			0.410	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.917	0.857				

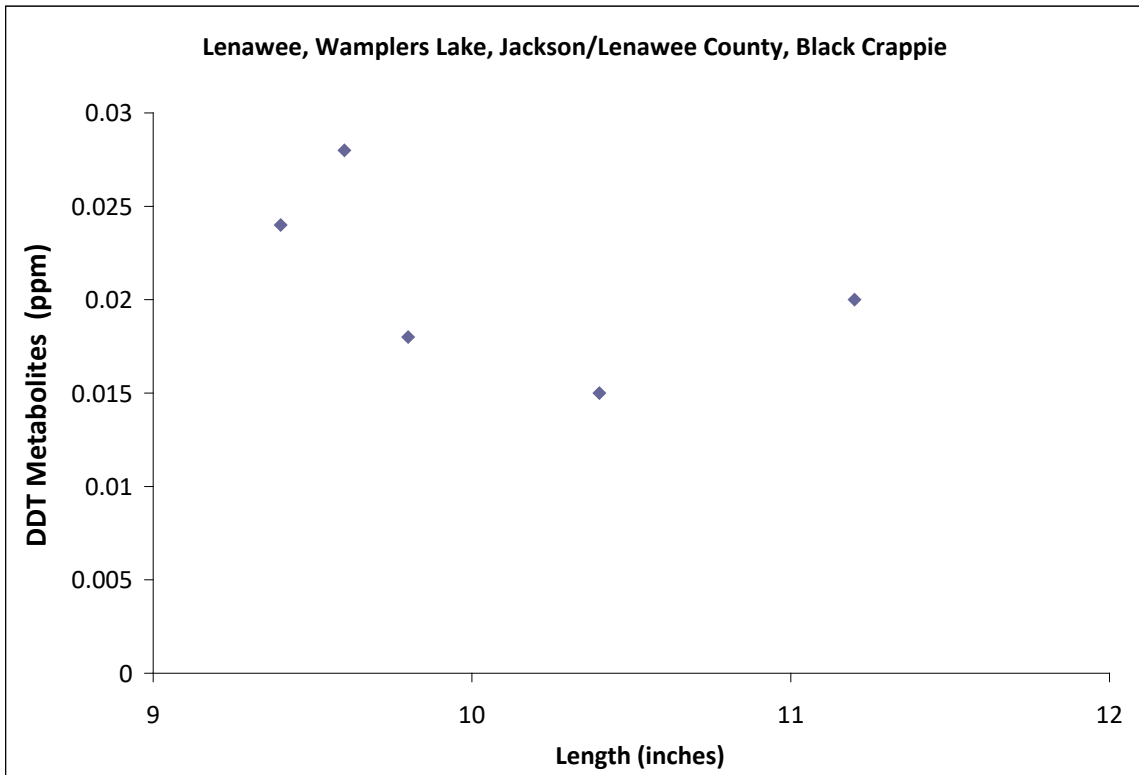
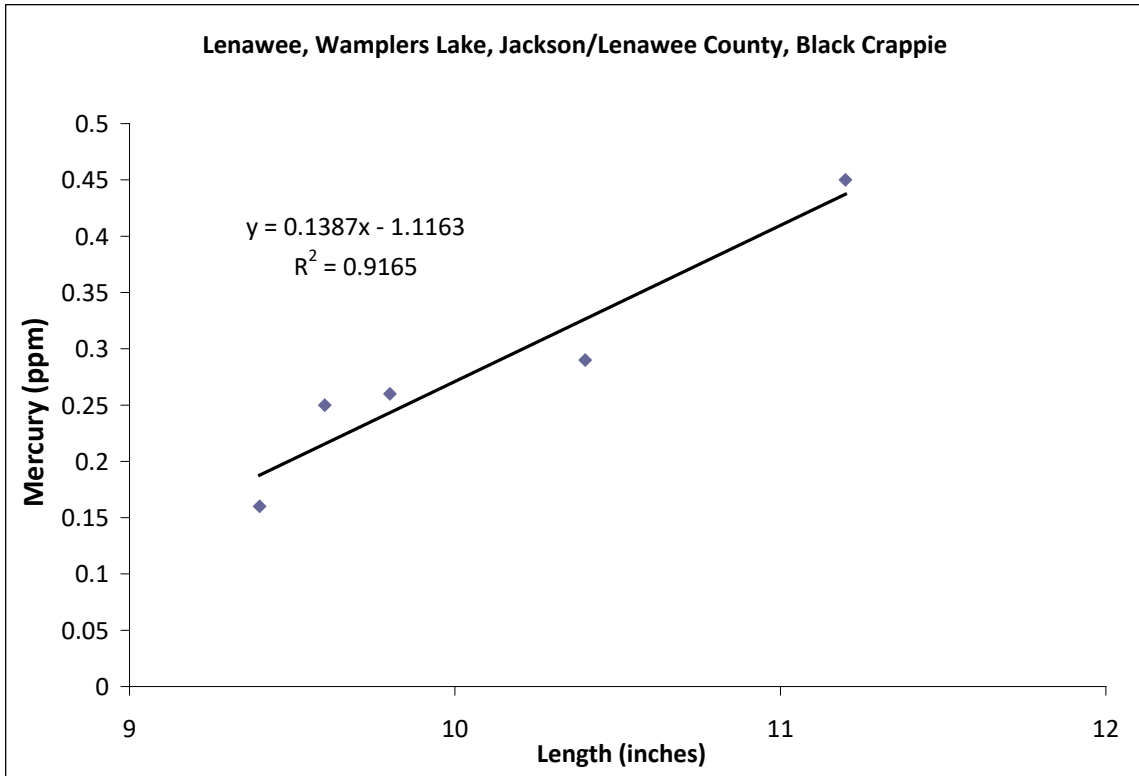
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	1989	5	9.4	na	9.4	11.2
Datasets available: 1989						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	5	ND			--	--
DDT	5	0.021		0.030	16	
Chlordane	5	ND		--	--	
Toxaphene	5	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB						
DDT	0.261	0.240				
Chlordane						
Toxaphene						
Final meal category based on UCL:					2	

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

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

Length (Inches)	Hg Regression Estimate (ppm)	Meal Category
8	0	16
9	0.13	4
10	0.27	2
11	0.41	2
12	0.55	1
13	0.69	1
14	0.82	1
<i>Shaded area denotes extrapolated estimates</i>		



Largemouth Bass

Wamplers Lake

Lenawee County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	1994	13	11.8	14	14.2	20.3
Datasets available: 1989, 1994						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	5	0.209			0.830	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.824	0.701				

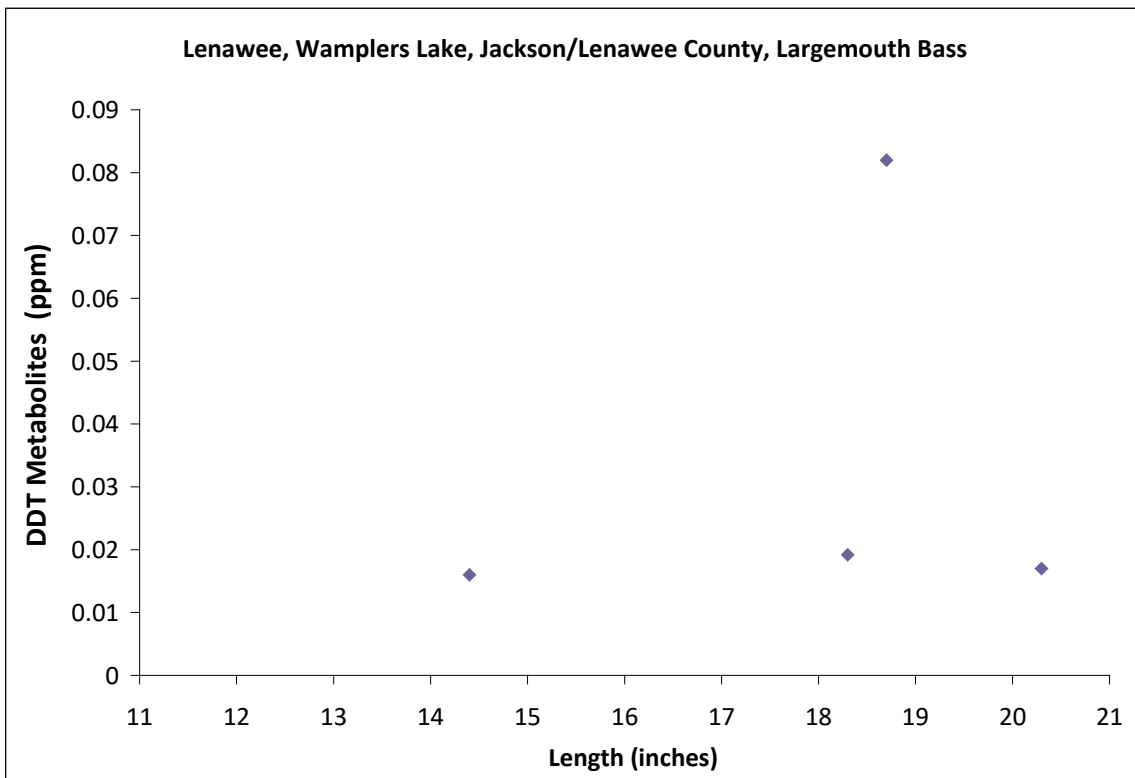
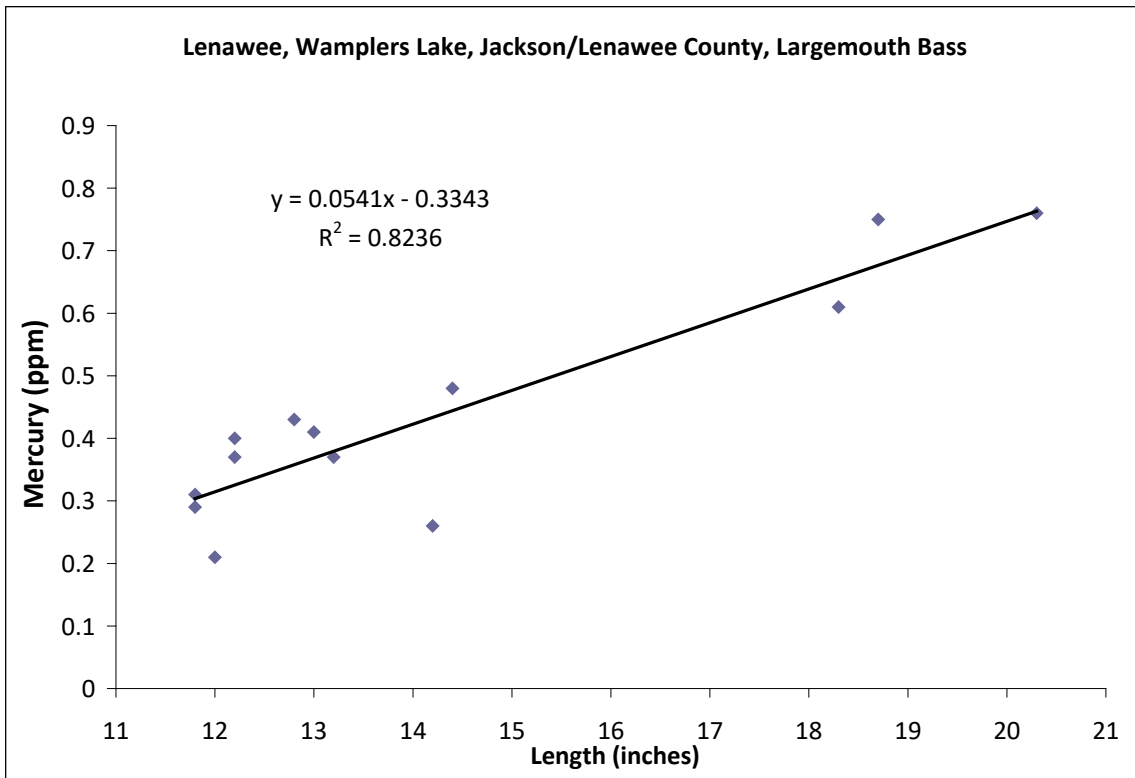
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	1989	8	12	14	14.4	20.3
Datasets available: 1989						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	4	ND			--	--
DDT	4	0.034		--	--	
Chlordane	4	ND		--	--	
Toxaphene	4	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	0.199	0.228				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						1

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

Recommendation: No one should eat more than 1 meal per month of Wamplers Lake largemouth bass less than 20 inches or 6 meals per year of Wamplers Lake largemouth bass greater than 20 inches due to mercury. Based on EGLE's Fish Contaminant Monitoring Program (FCMP), temporal changes in mercury concentrations are waterbody specific in Michigan. The EGLE FCMP finds that mercury concentration in fish are either staying the same or increasing. Recommendation based on regression analysis.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
14	0.42	2
16	0.53	1
18	0.64	1
20	0.75	1
22	0.86	1
24	0.96	1
26	1.07	0.5
28	1.18	0.5
30	1.29	0.5
<i>Shaded area denotes extrapolated estimates</i>		



Northern Pike

Wamplers Lake

Lenawee County

Hg Analysis:

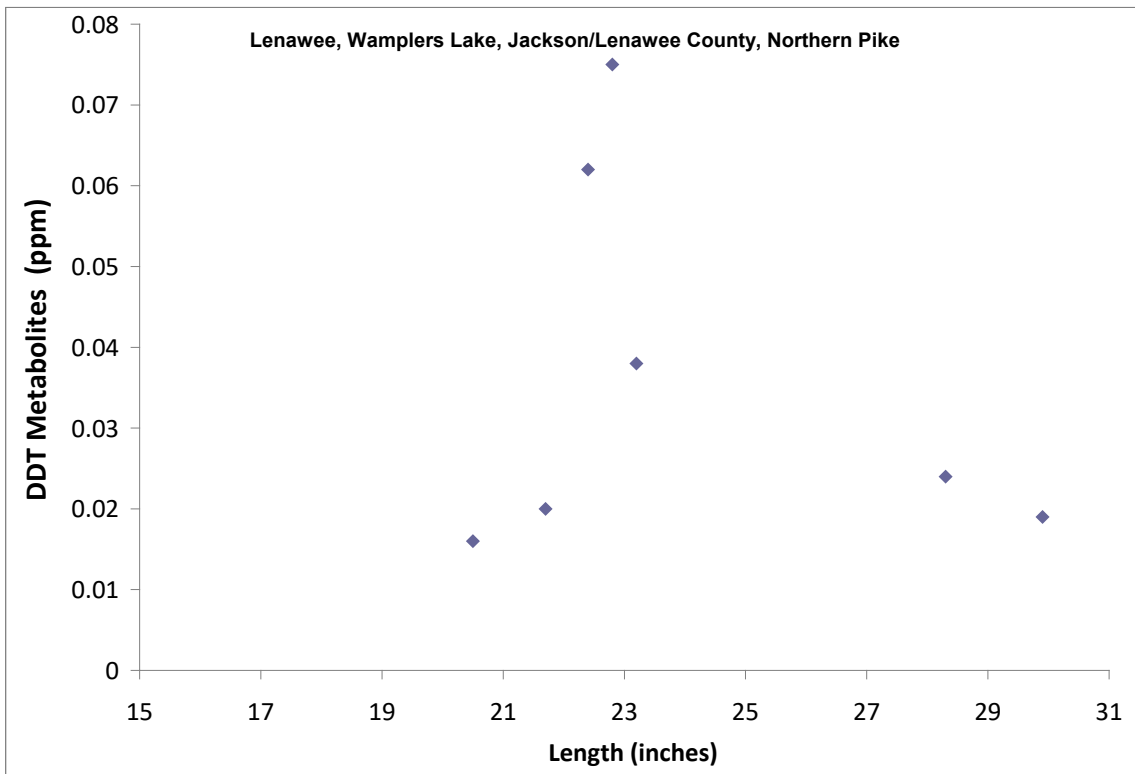
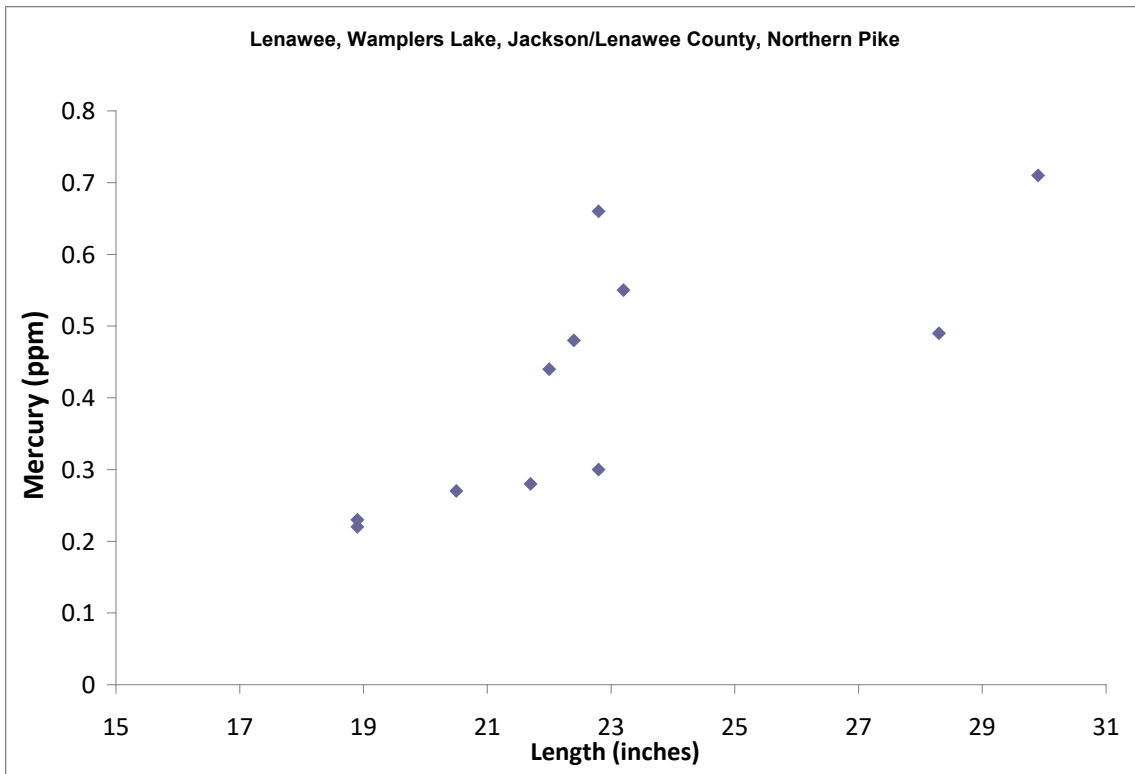
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	1994	11	18.9	24	28.3	29.9
Datasets available: 1989, 1994						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	2	0.6			--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.563	0.569				

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	7	20.5	24	28.3	29.9
Datasets available: 1989						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	2	ND			--	--
DDT	2	0.022		--	--	
Chlordane	2	ND		--	--	
Toxaphene	2	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB						
DDT	0.027	0.027				
Chlordane						
Toxaphene						
Final meal category based on UCL:					--	

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

Recommendation: Statewide mercury advisory applies to Wamplers Lake northern pike.



Livingston County

Bluegill

Bass Lake

Livingston County

Hg Analysis:

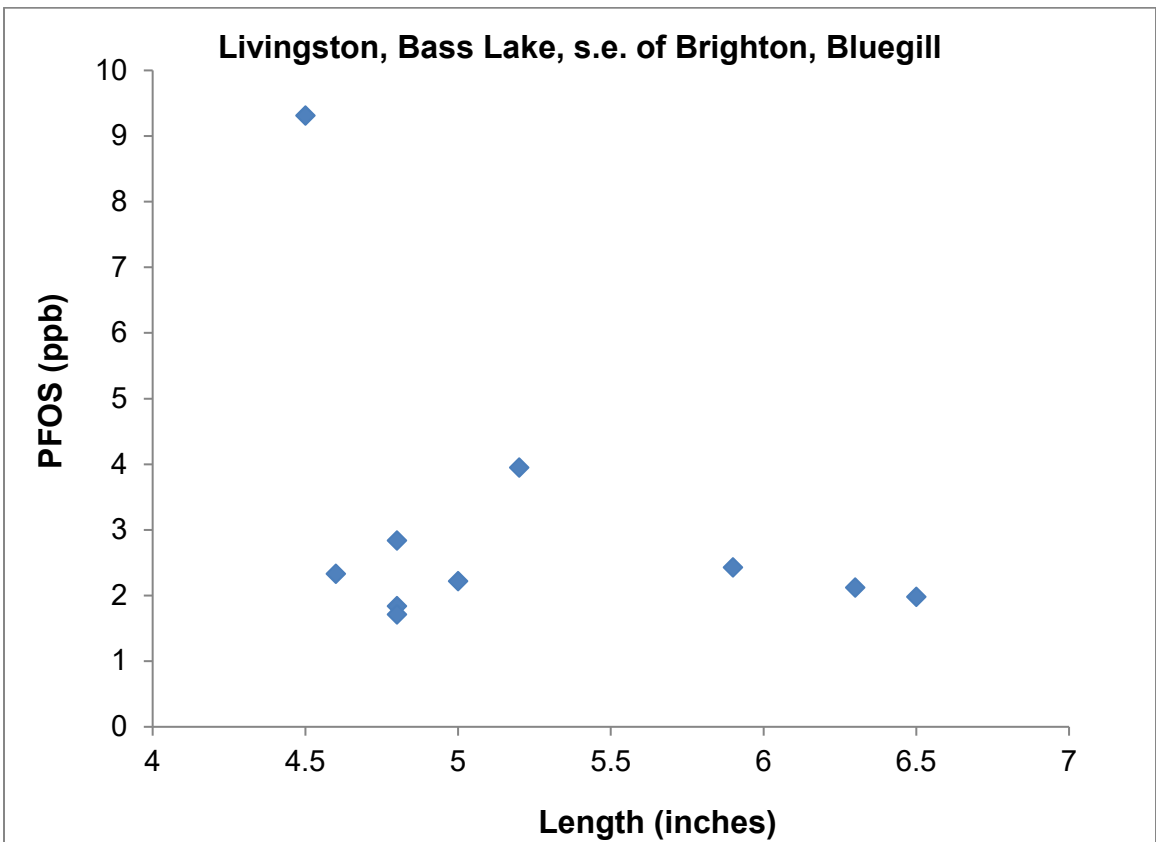
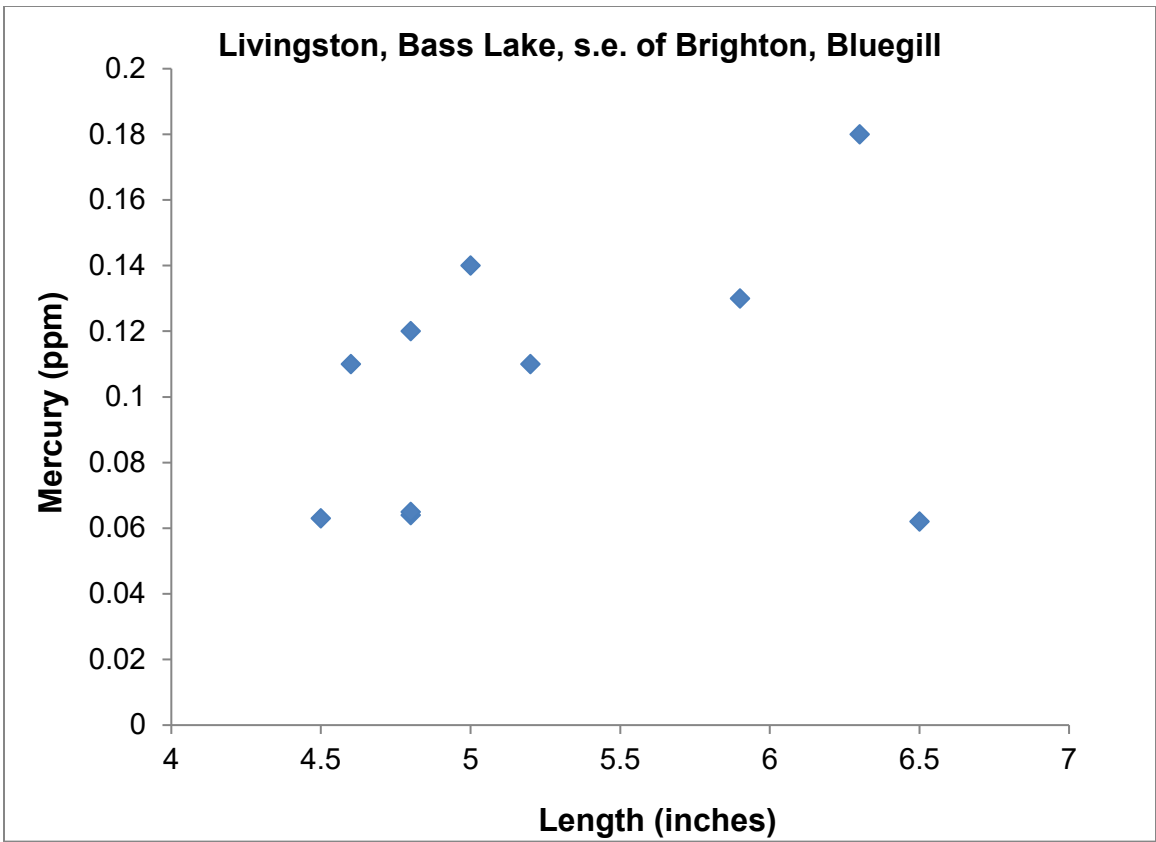
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2019	2019	10	4.5	na	4.5	6.5
Datasets available: 2019						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.10	0.06	0.18	0.13	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.117	0.073				

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	4.5	na	4.5	6.5
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	3 ppb	2 ppb	9 ppb	5 ppb	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.138	0.125				
Final meal category based on UCL:						4

Existing MDHHS Advisory: Bass 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 4 meals per month of Bass Lake bluegill or pumpkinseed sunfish of any size due to mercury.



Bluegill

Bennett Lake

Livingston County

Hg Analysis:

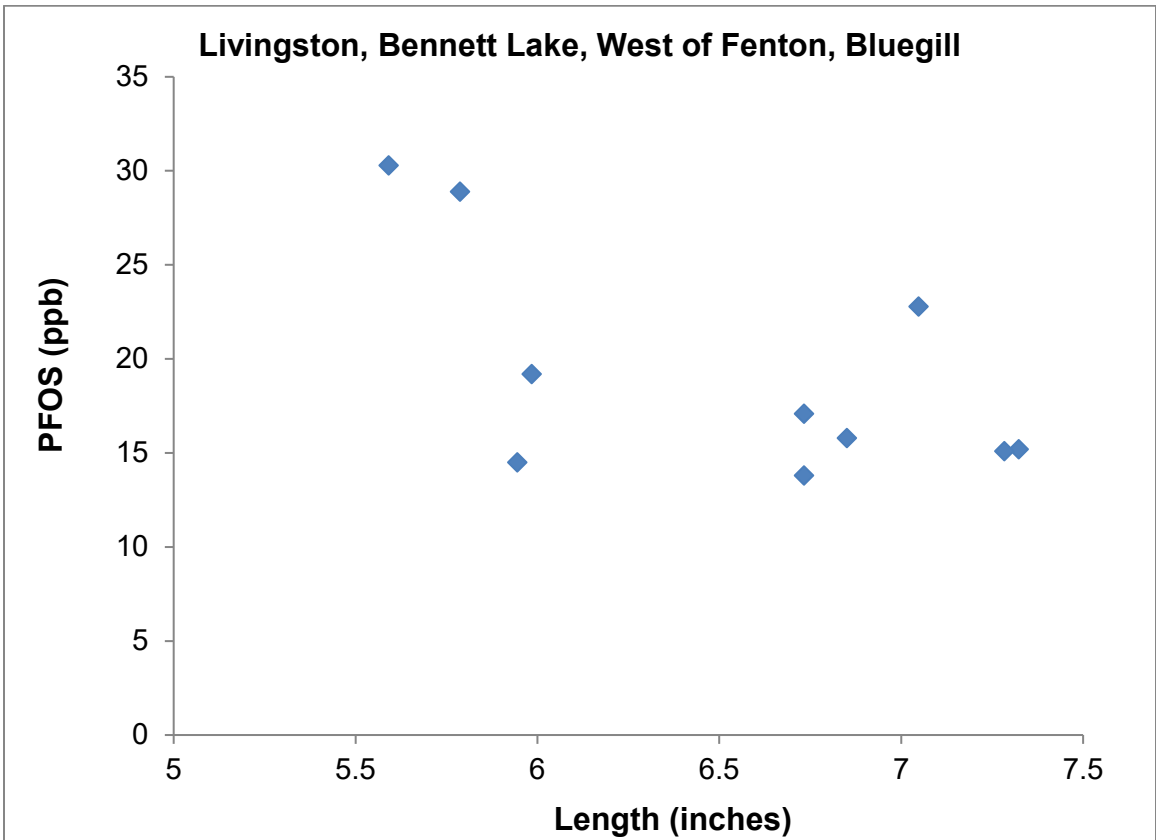
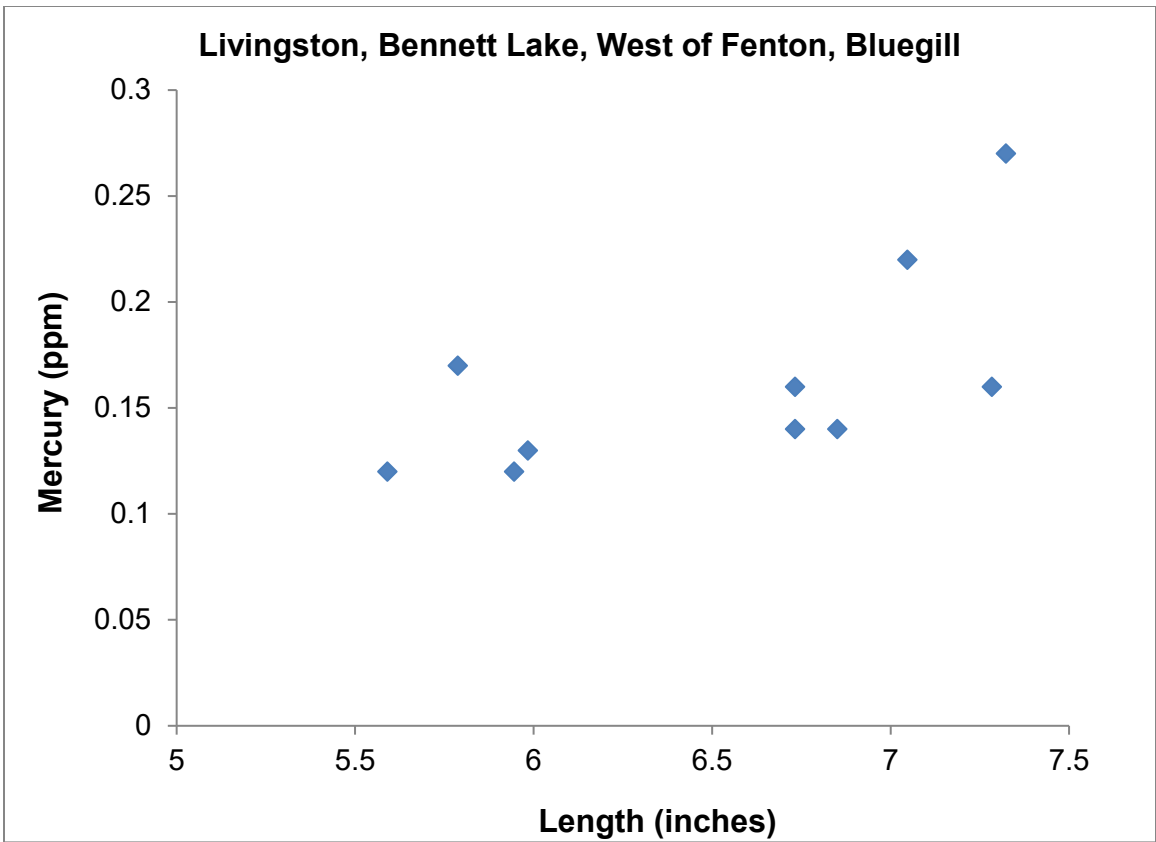
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2019	2019	10	5.6	NA	5.6	7.3
Datasets available: 2019						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.163	0.120	0.270	0.197	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.412	0.447				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2019	2019	10	5.6	NA	5.6	7.3
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	19.3 ppb	13.8 ppb	30.3 ppb	23.6 ppb	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.390	0.360				
Final meal category based on UCL:						4

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

Recommendation: No one should eat more than 4 meals per month of bluegill or sunfish of any size from Bennett Lake in Livingston County due to PFOS and mercury.



Largemouth Bass

Bennett Lake

Livingston County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2019	2019	9	11.9	14.0	13.9	15.4
Datasets available: 2019						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	5	0.408	0.250	0.570	0.562	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.453	0.483				

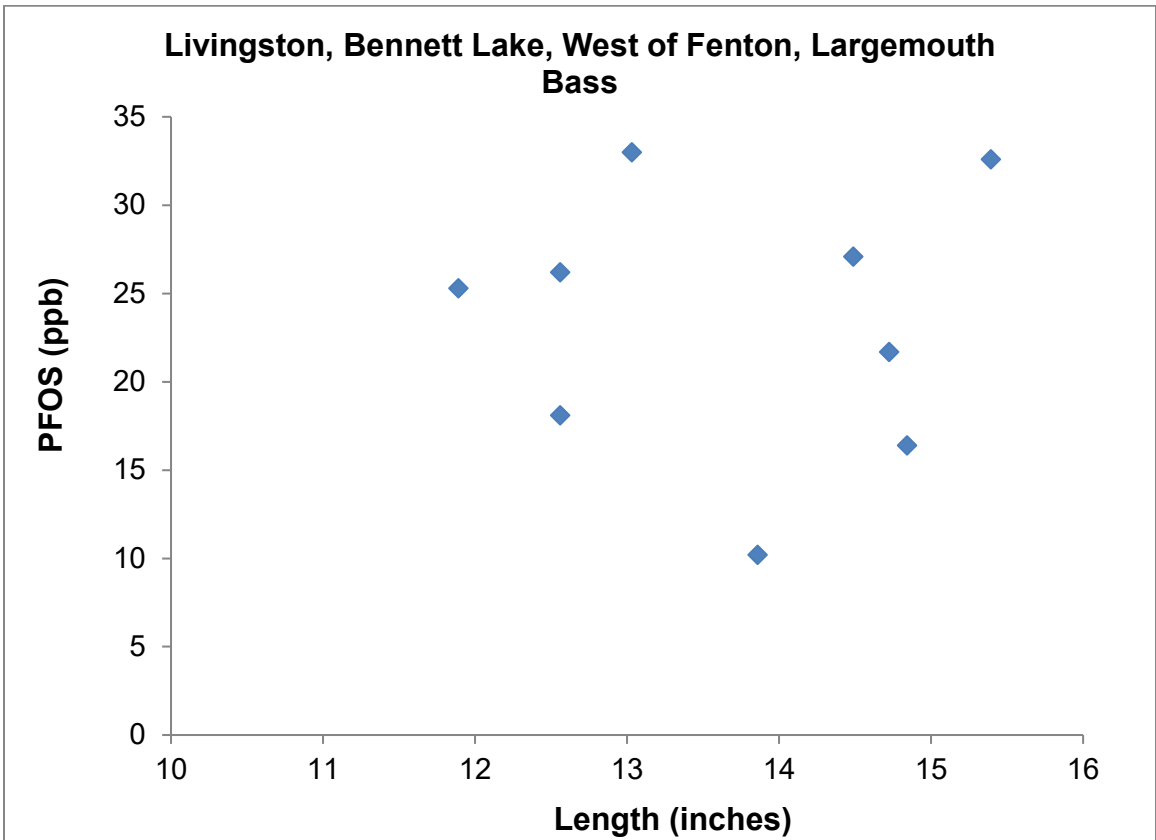
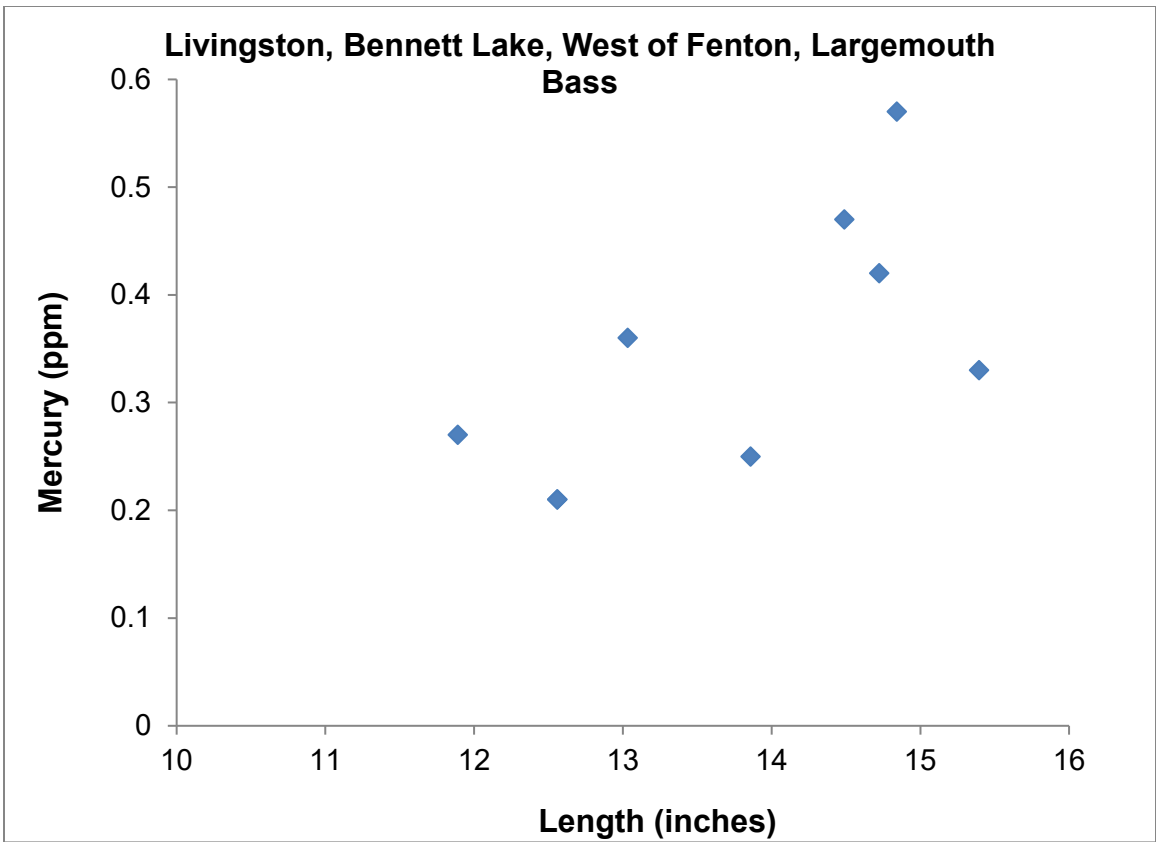
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2019	2019	9	11.9	14.0	11.9	15.4
Datasets available: 2019						
Chemical	Sample Size (All*)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
PFOS	9	23.4 ppb	10.2 ppb	33.0 ppb	29.2 ppb	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.000	0.001	Final meal category based on UCL:			1

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

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

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



Largemouth Bass

Bishop Lake

Livingston County

Hg Analysis:

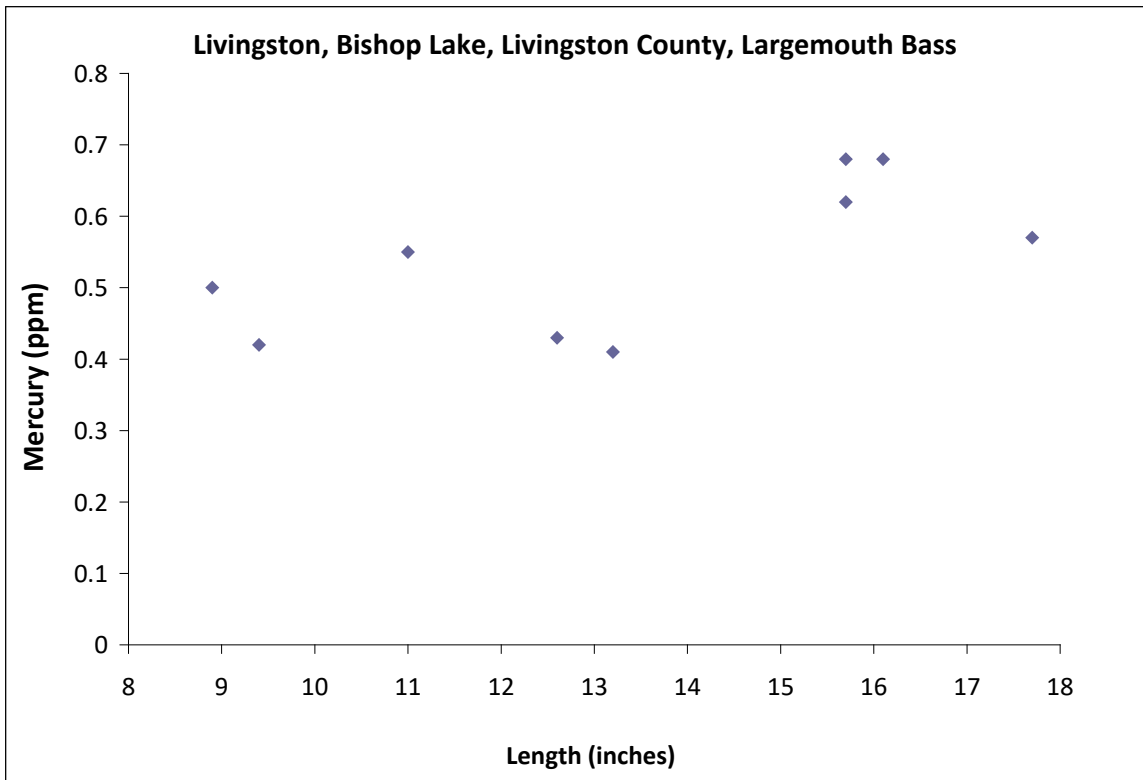
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	1989	9	8.9	14	15.7	17.7
Datasets available: 1987, 1989						
Chemical	Sample Size (All)	Mean (ppm)		95%UCL	Meal Category	
Mercury	9	0.54			0.620	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.429	0.412				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	1989	3	12.6	14	15.7	15.7
Datasets available: 1987, 1989						
Chemical	Sample Size (All)	Mean (ppm)		95%UCL	Meal Category	
PCB	3	ND			--	--
DDT	3	0.006		--	--	
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:					1	

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

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



Northern Pike

Bishop Lake

Livingston County

Hg Analysis:

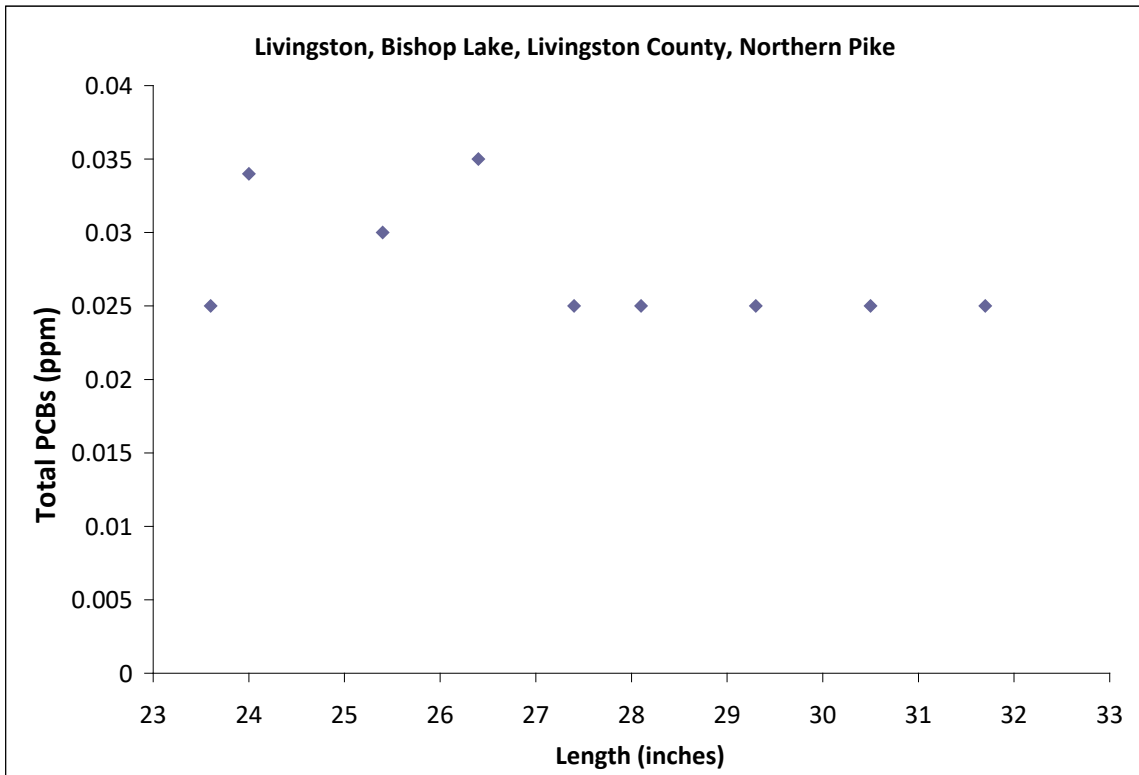
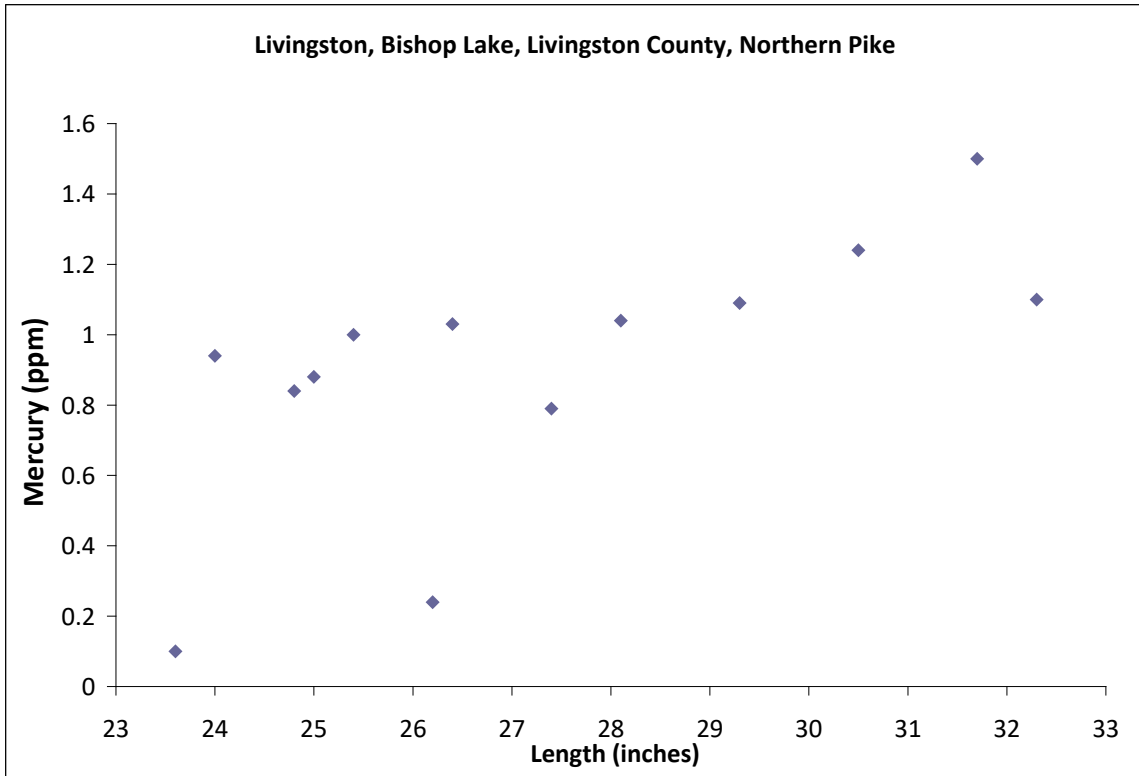
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	1989	14	22.4	24	23.6	32.3
Datasets available: 1987, 1989						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	13	0.907		1.130	0.5	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.399	0.231				

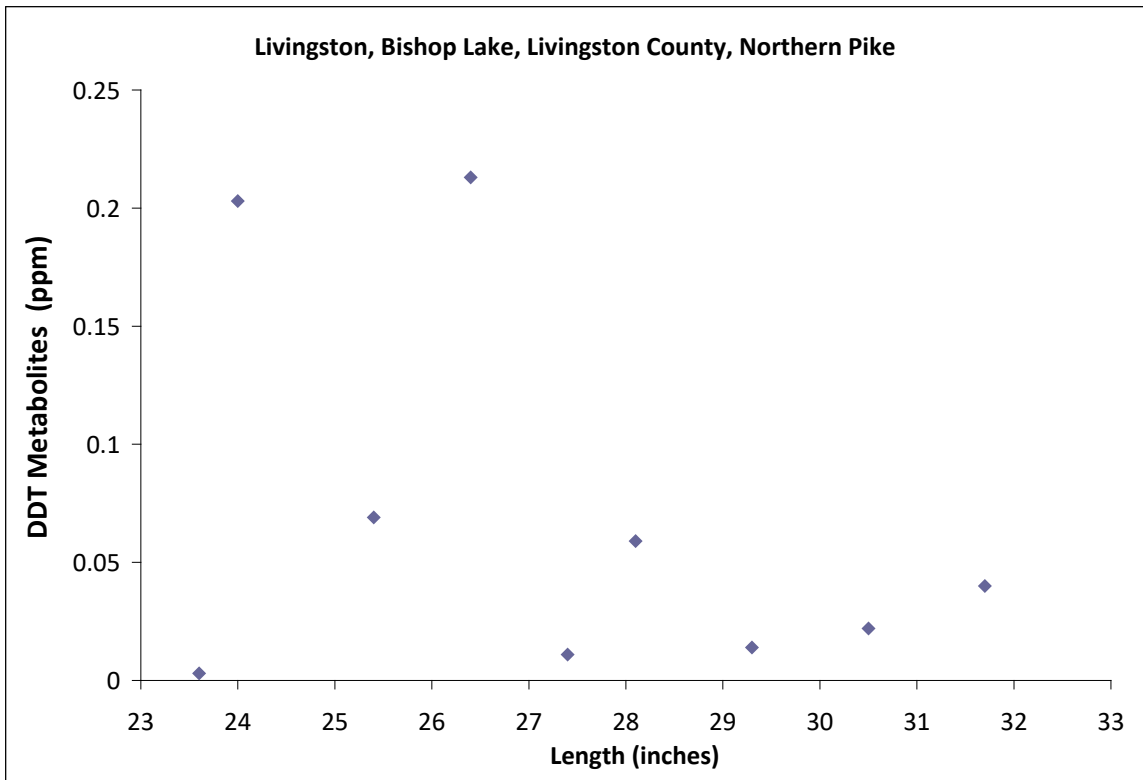
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	1989	10	22.4	24	23.6	31.7
Datasets available: 1987, 1989						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	9	0.028		0.030	8	
DDT	9	0.070		0.130	16	
Chlordane	9	ND		--	--	
Toxaphene	9	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.115	0.117				
DDT	0.149	0.029				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:					0.5	

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

Recommendation: No one should eat more than 6 meals per year of Bishop Lake northern pike due to mercury. Based on EGLE’s Fish Contaminant Monitoring Program (FCMP), temporal changes in mercury concentrations are waterbody specific in Michigan. The EGLE FCMP finds that mercury concentration in fish are either staying the same or increasing.





Largemouth Bass

Chenango Lake

Livingston County

Hg Analysis:

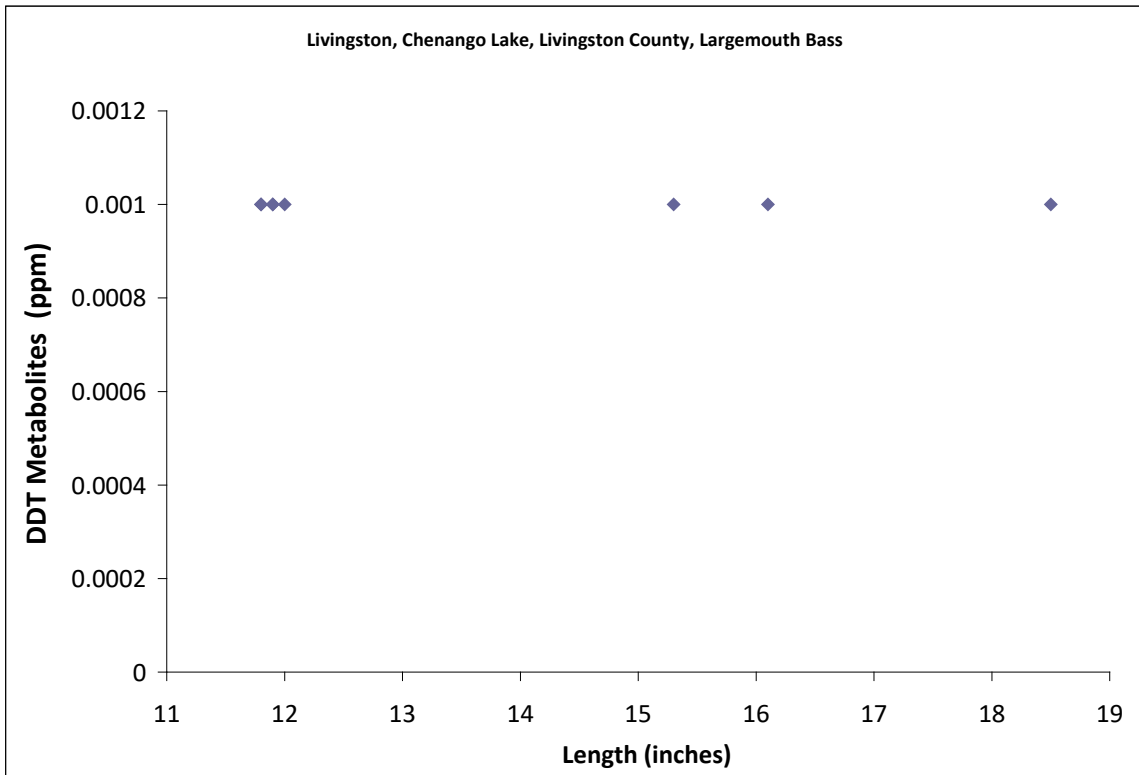
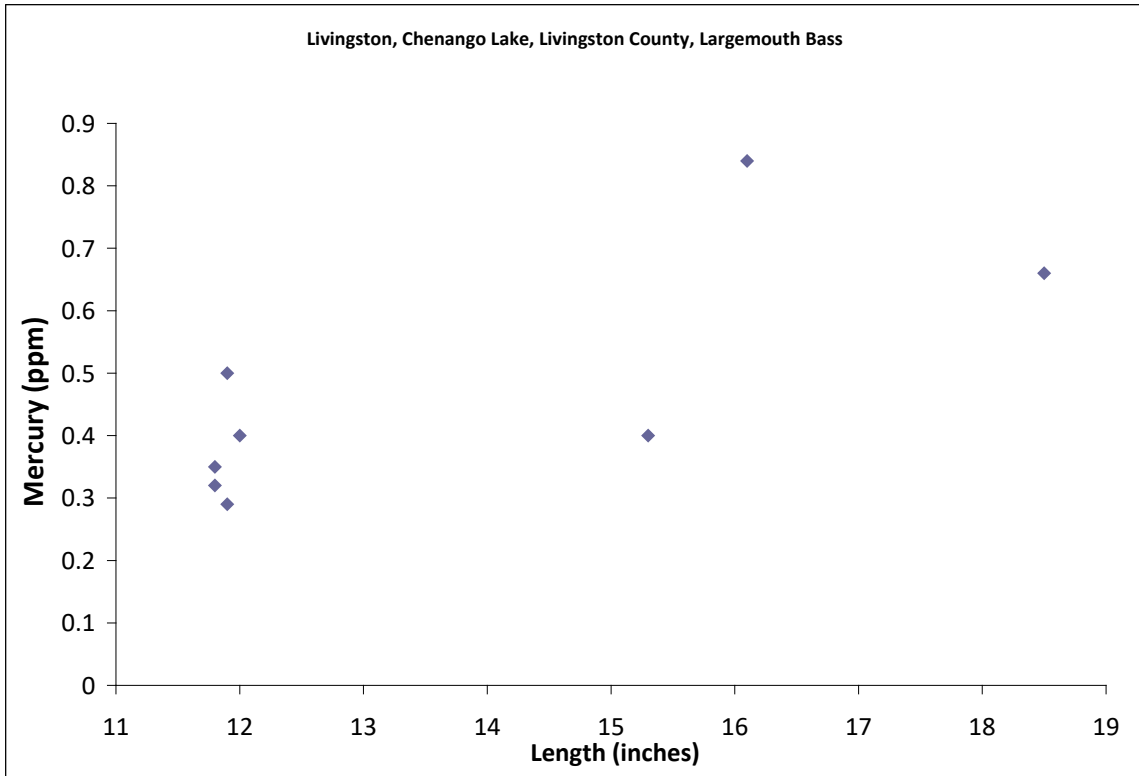
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2003	2003	8	11.8	14	16.1	18.5
Datasets available: 2003						
Chemical	Sample Size (All)	Mean (ppm)	95%UCL		Meal Category	
Mercury	8	0.47	0.63		1	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.553	0.567				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2003	2003	8	11.8	14	16.1	18.5
Datasets available: 2003						
Chemical	Sample Size (All)	Mean (ppm)	95%UCL		Meal Category	
PCB	8	ND	--		--	
DDT	8	0.001	0.001		16	
Chlordane	8	ND	--		--	
Toxaphene	8	ND	--		--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:					1	

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

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



Yellow Bullhead

Chenango Lake

Livingston County

Hg Analysis:

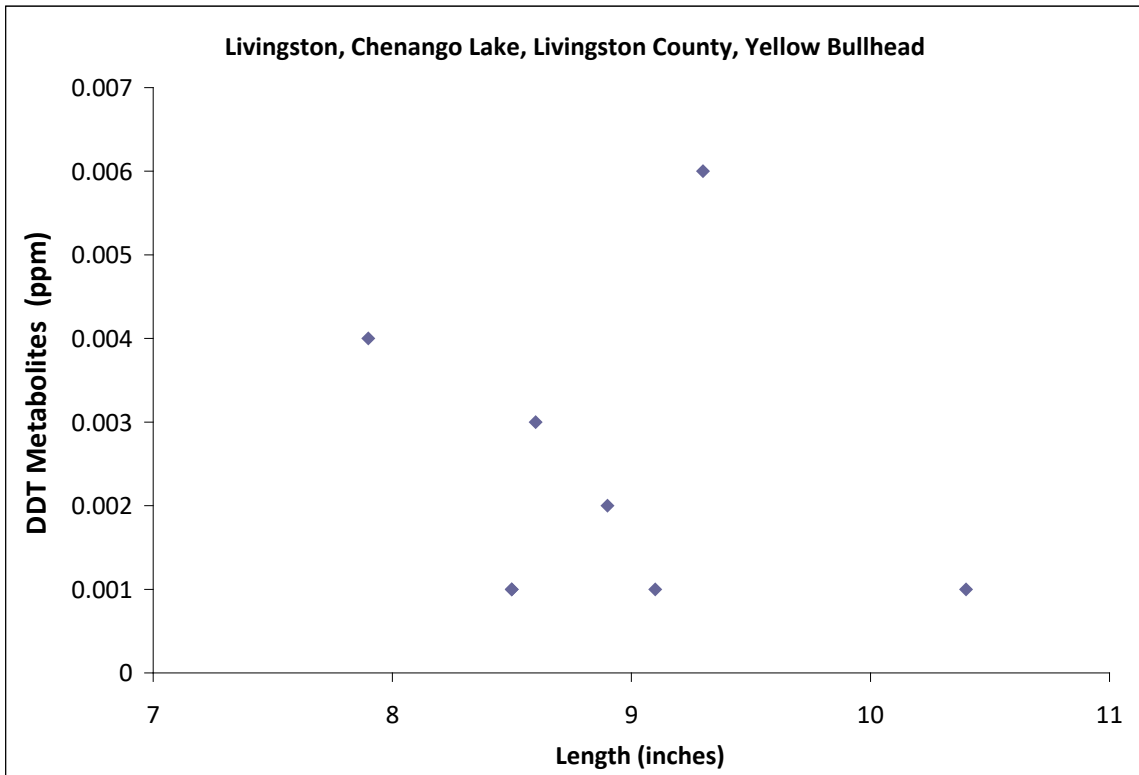
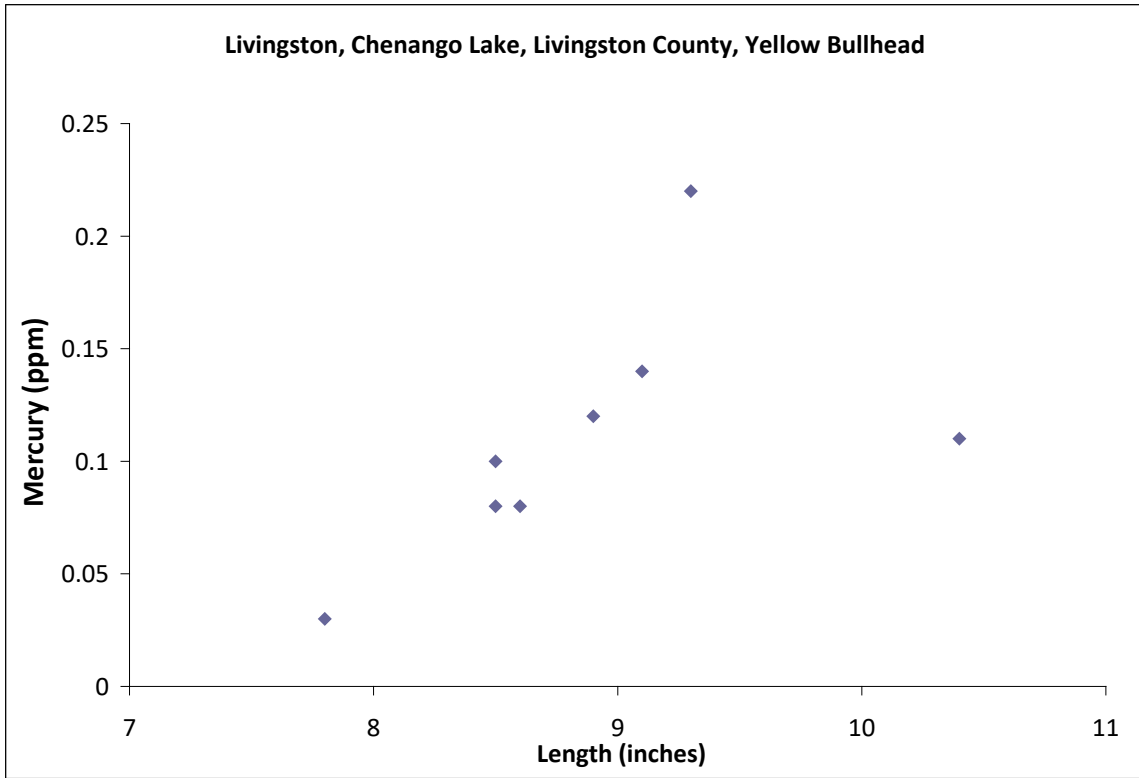
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2003	2003	8	7.8	na	7.8	10.4
Datasets available: 2003						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	8	0.110		0.160	4	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.305	0.425				

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	8	7.8	na	7.8	10.4
Datasets available: 2003						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	8	ND		--	--	
DDT	8	0.002		0.004	16	
Chlordane	8	ND		--	--	
Toxaphene	8	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB						
DDT	0.028	0.069				
Chlordane						
Toxaphene						
Final meal category based on UCL:					4	

Existing Advisory: Chenango Lake yellow bullhead are not covered by an advisory.

Recommendation: No one should eat more than 4 meals per month of Chenango Lake bullhead due to mercury.



**Bluegill and
Pumpkinseed
Hg Analysis:**

Earl Lake

Livingston County

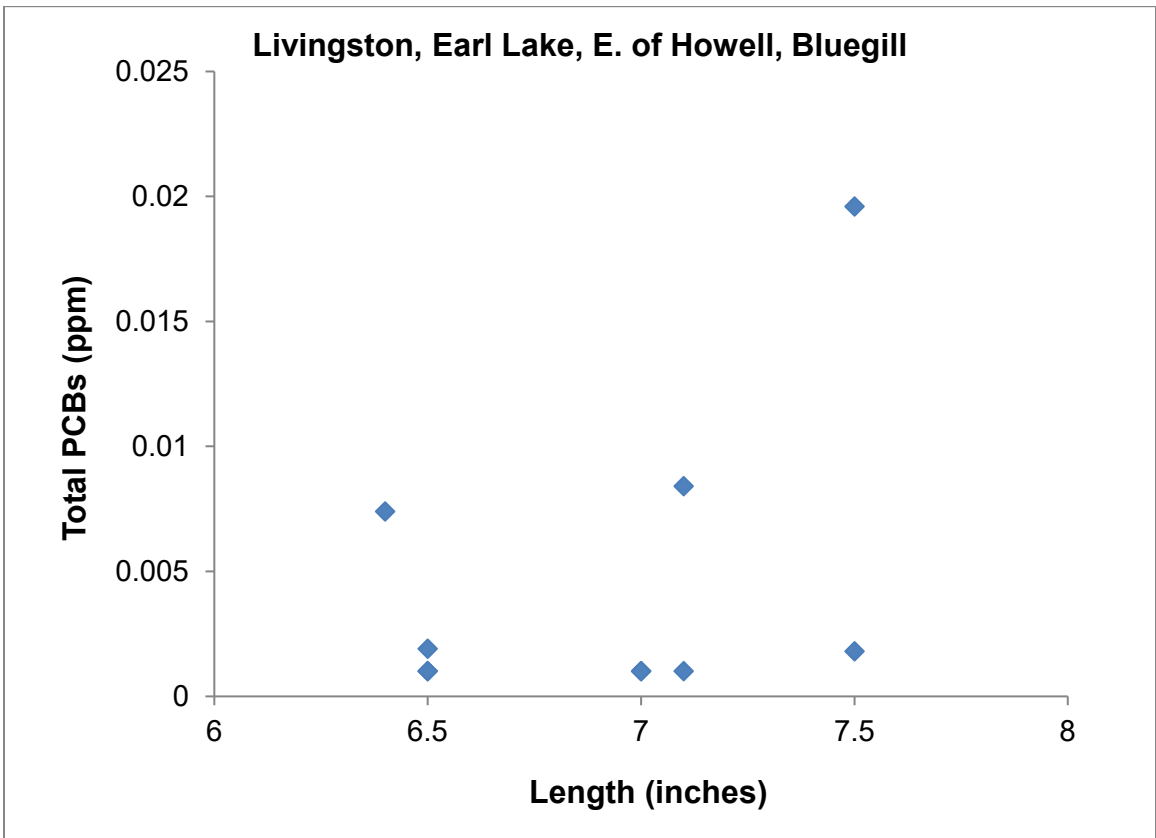
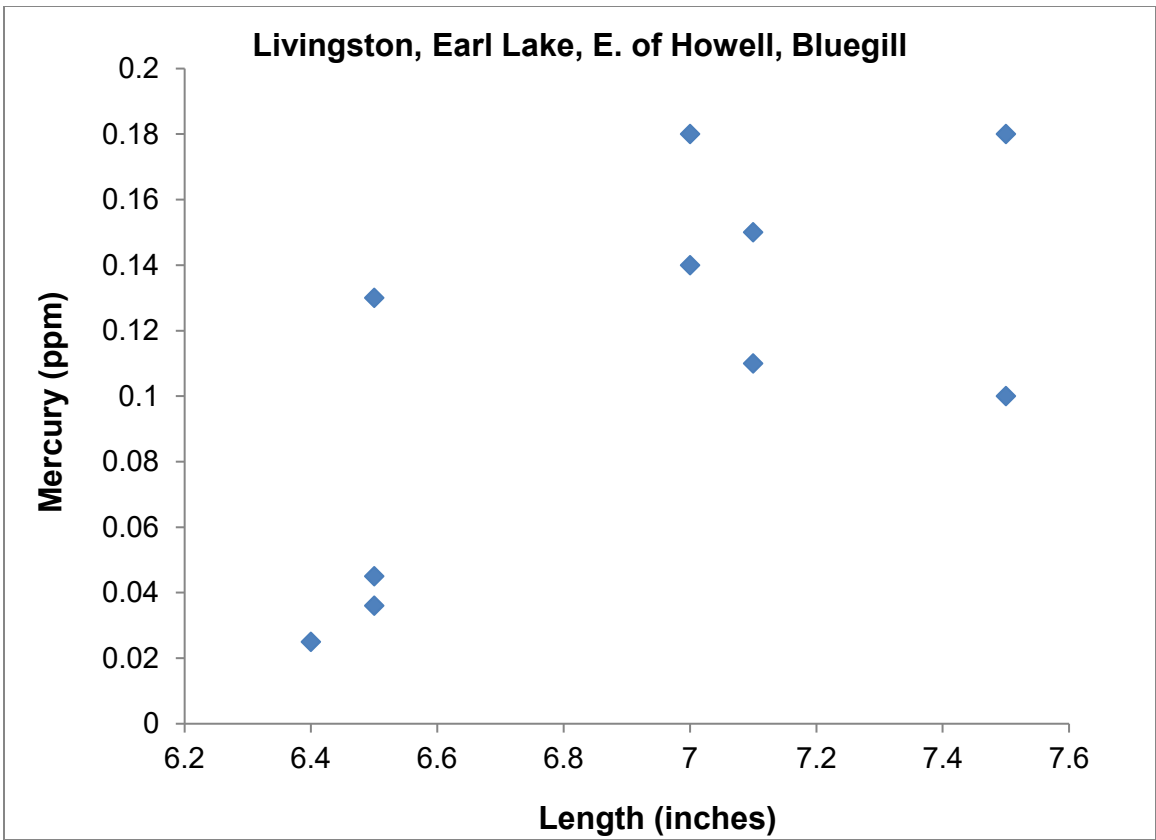
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2018	2018	10	6.4	na	6.4	7.5
Datasets available: 2018						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.11	0.03	0.18	0.15	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.451	0.495				

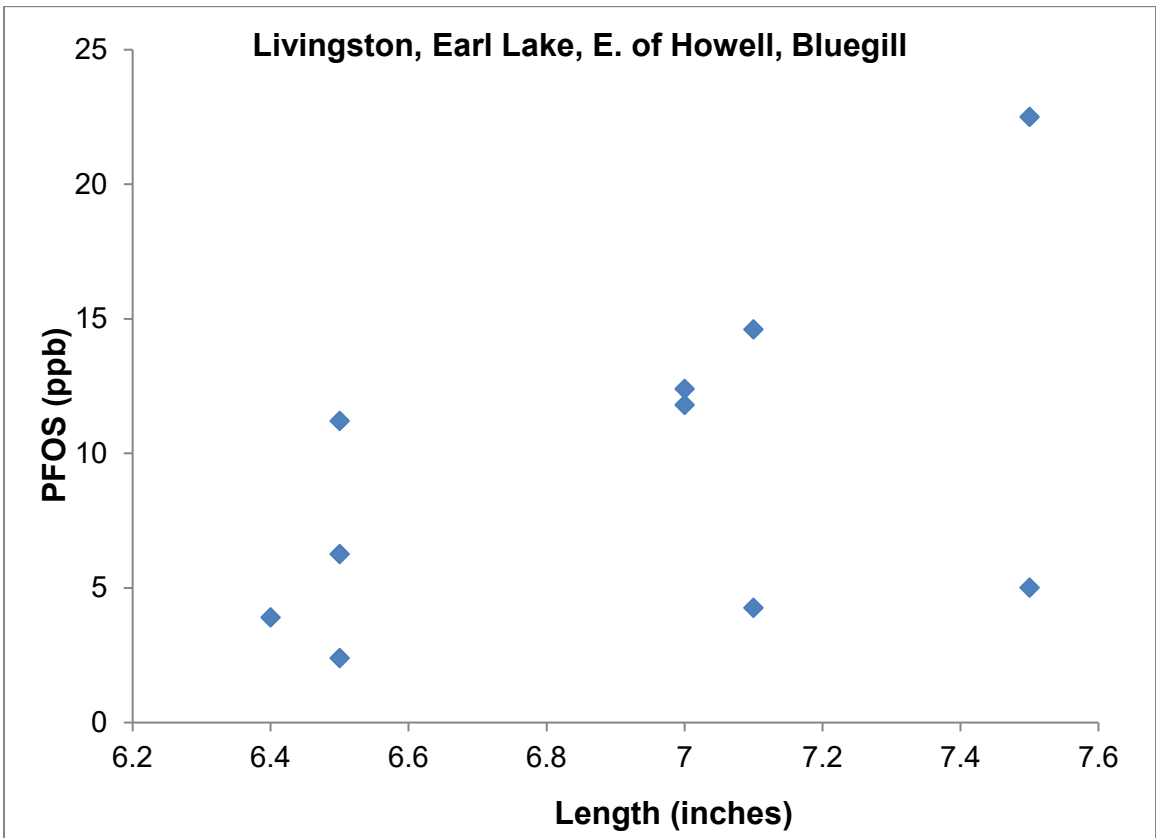
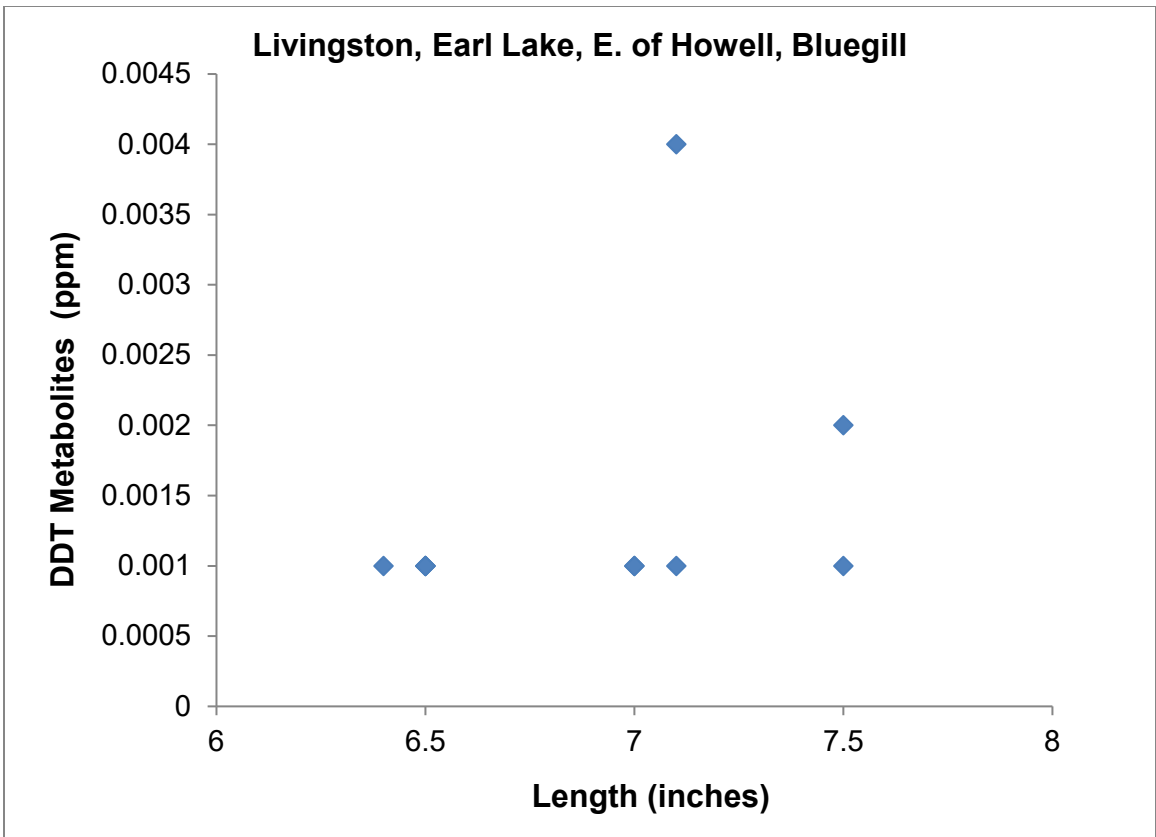
Organics Analysis:

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	6.4	na	6.4	7.5
Datasets available: 2018						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.004	< 0.001	0.02	0.009	16
DDT	10	0.001	< 0.001	0.004	0.002	16
Chlordane	10	ND	< 0.001	< 0.001	--	--
Toxaphene	10	ND	--	--	--	--
PFOS	10	9 ppb	2 ppb	22 ppb	14 ppb	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.168	0.086				
DDT	0.103	0.148				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.258	0.215				
Final meal category based on UCL:						4

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

Recommendation: No one should eat more than 4 meals per month of Earl Lake bluegill or sunfish of any size due to mercury. PFOS would cause an advisory.





Carp

Earl Lake

Livingston County

Hg Analysis:

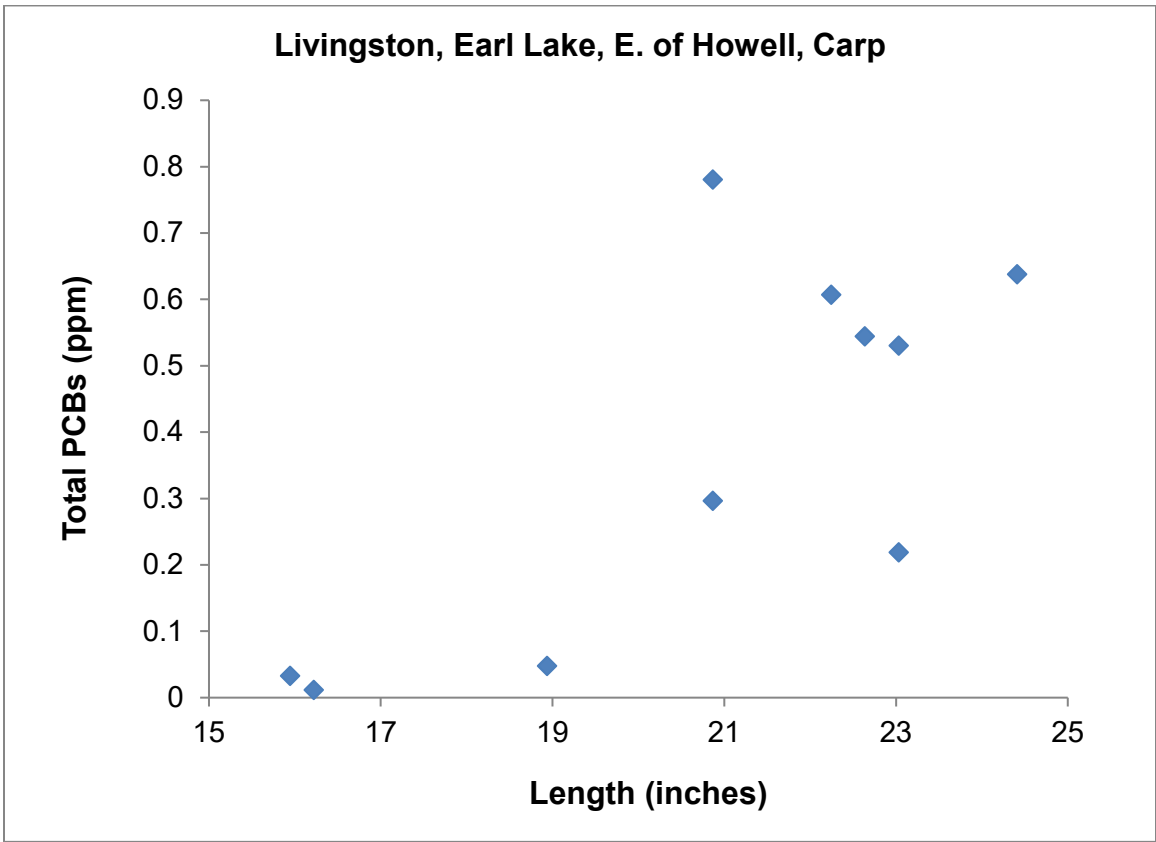
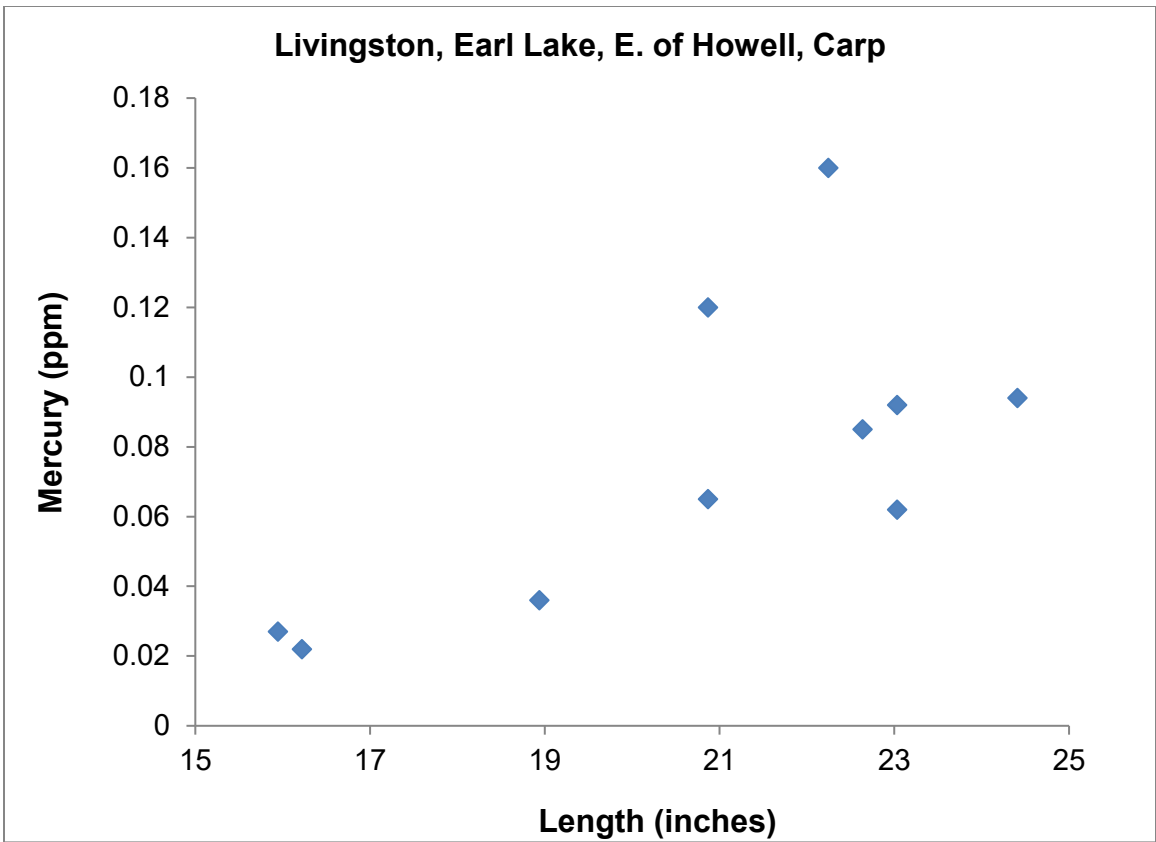
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent					
2018	2018	10	15.9	NA	15.9	24.4
Datasets available: 2018						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.076	0.022	0.160	0.107	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.458	0.367				

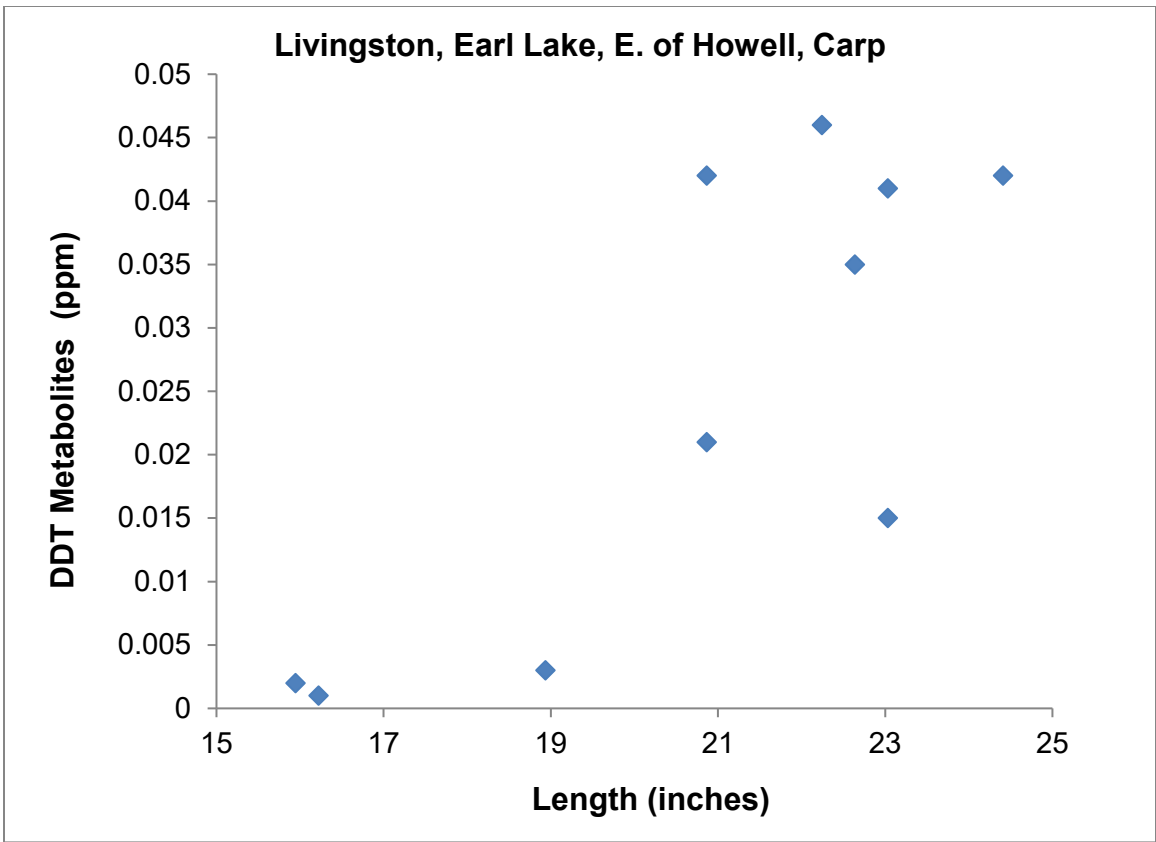
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent					
2018	2018	10	15.9	NA	15.9	24.4
Datasets available: 2018						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.371	0.012	0.781	0.574	Limited
DDT	10	0.025	0.001	0.046	0.038	16
Chlordane	10	0.001	<0.001	0.003	0.002	16
Toxaphene	10	ND	--	--	--	--
PFOS	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.554	0.353				
DDT	0.535	0.453				
Chlordane	0.000	0.000				
Toxaphene	NA	NA				
PFOS	NA	NA				
Final meal category based on UCL:						Limited

Existing MDHHS Advisory: Carp from Earl Lake in Livingston County are currently under the statewide PCB guidance. No one should eat more than two meals per month of carp of any size due to PCBs.

Recommendation: Sensitive populations should not eat these fish. Healthy adults should limit consumption of these fish to no more than 1 or 2 meals per year due to PCBs. Mercury causes less restrictive guidance.





Bluegill

Fish Lake

Livingston County

Hg Analysis:

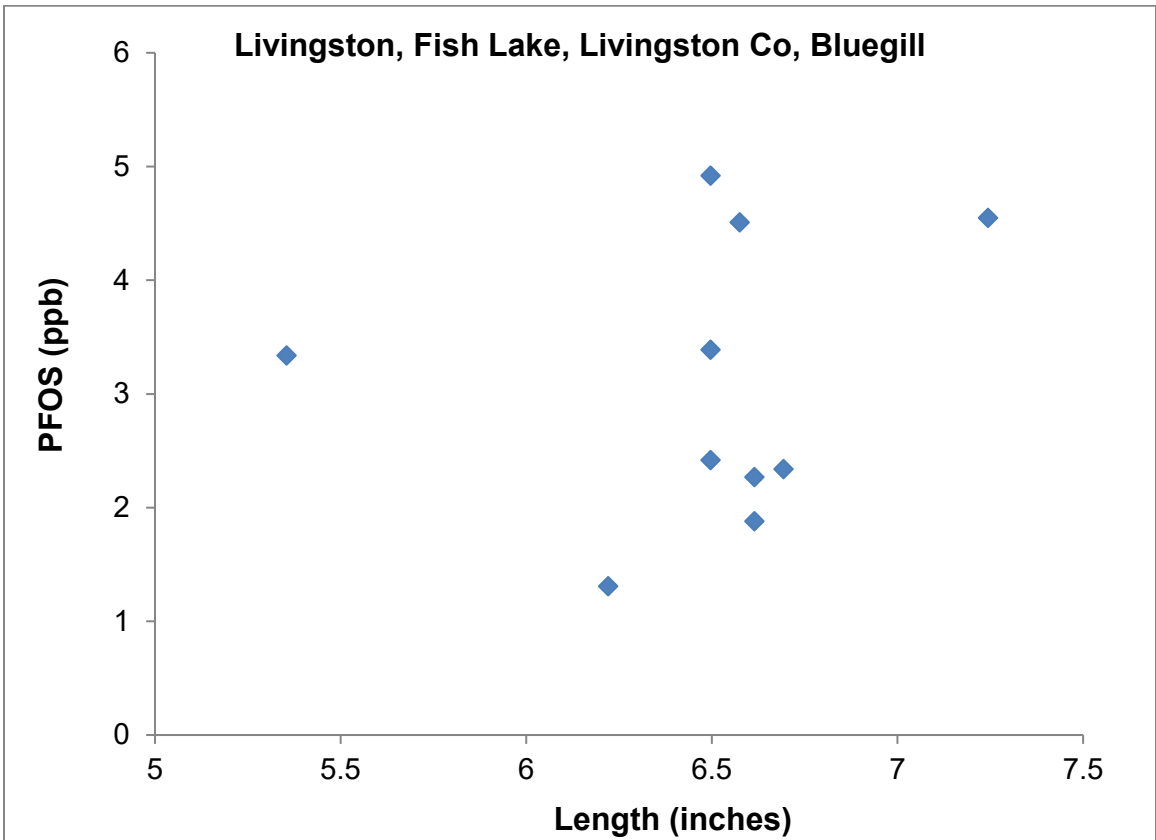
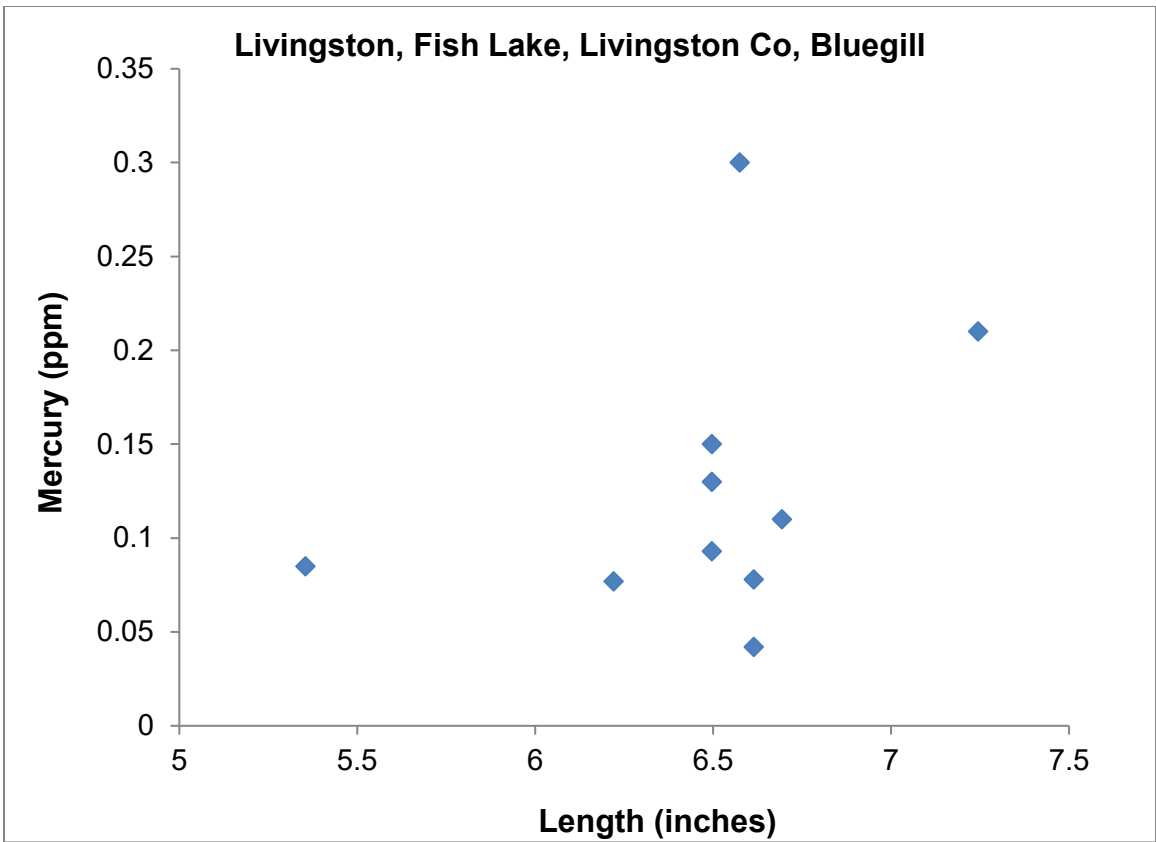
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2021	2021	10	5.4	NA	5.4	7.2
Datasets available: 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.128	0.042	0.300	0.182	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.132	0.114				

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	5.4	NA	5.4	7.2
Datasets available: 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	--	--	--	--	--	--
DDT	--	--	--	--	--	--
Chlordane	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--
PFOS	10	3.1 ppb	1.3 ppb	4.9 ppb	4.0 ppb	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.037	0.028				
Final meal category based on UCL:						4

Existing MDHHS Advisory: Bluegill and sunfish from Fish Lake in Livingston County are currently covered under the statewide mercury advisory. 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 Fish Lake in Livingston County due to mercury.



Carp

Hoisington Lake

Livingston County

Hg Analysis:

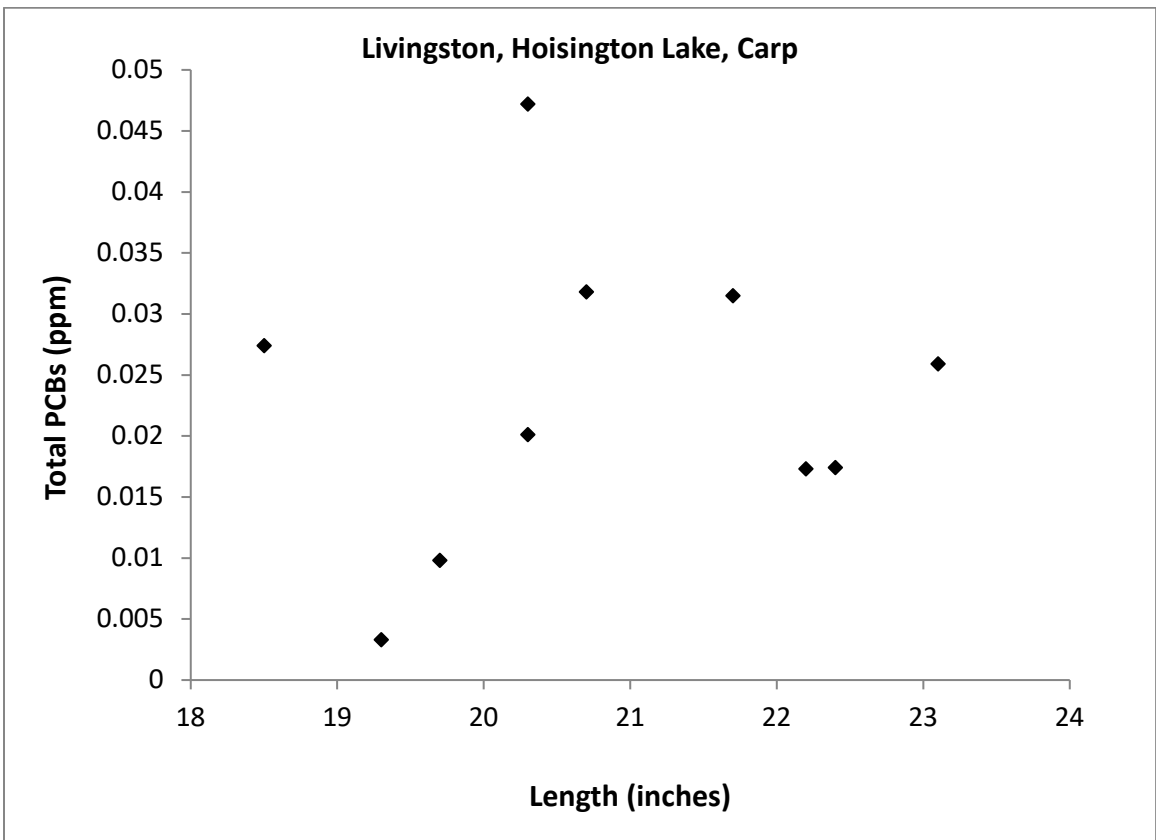
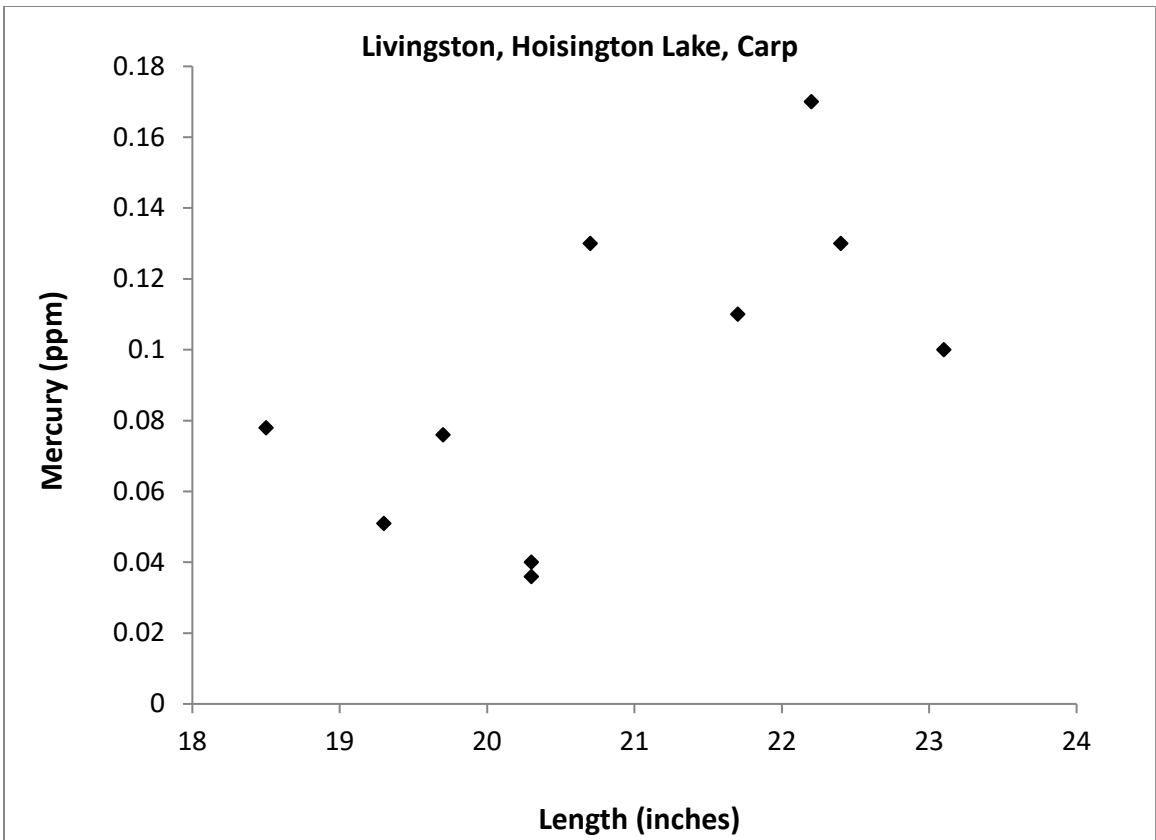
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2010	2010	10	18.5	na	18.5	23.1
Datasets available: 2010						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.09	0.04	0.17	0.12	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.389	0.339				

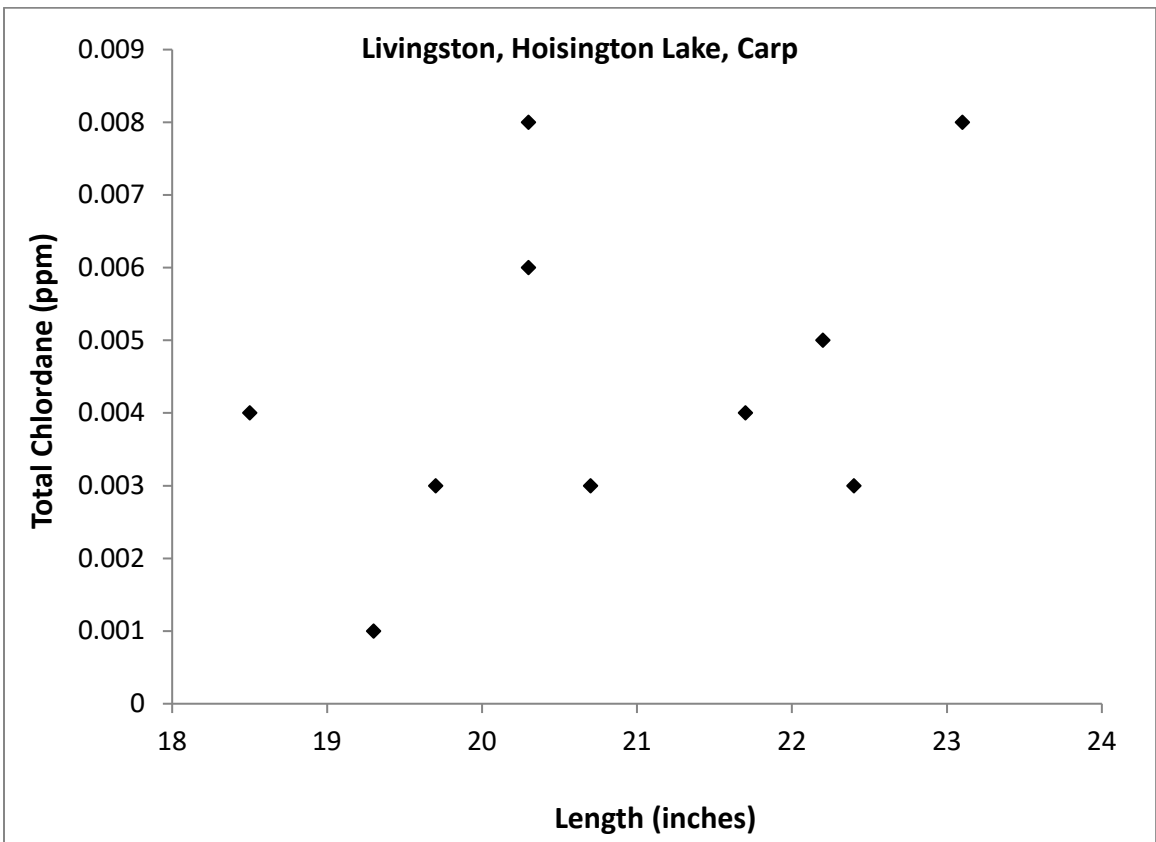
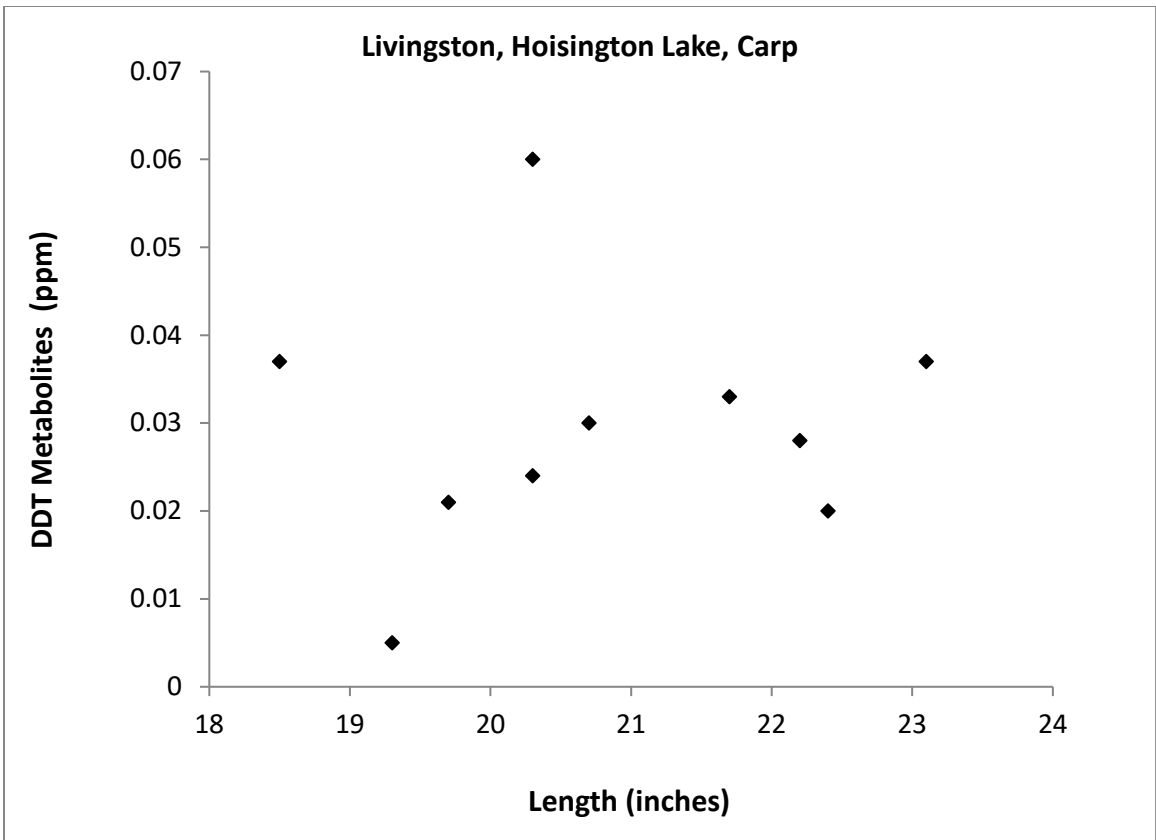
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2010	2010	10	18.5	na	18.5	23.1
Datasets available: 2010						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.02	0.003	0.05	0.03	8
DDT	10	0.03	0.005	0.06	0.04	16
Chlordane	10	0.005	0.001	0.008	0.006	--
Toxaphene	10	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.014	0.081				
DDT	0.010	0.064				
Chlordane	0.146	0.167				
Toxaphene	--	--				
Final meal category based on UCL:						8

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

Recommendation: No one should eat more than 8 meals per month of Hoisington Lake carp due to mercury and PCBs.





Largemouth Bass

Hoisington Lake

Livingston County

Hg Analysis:

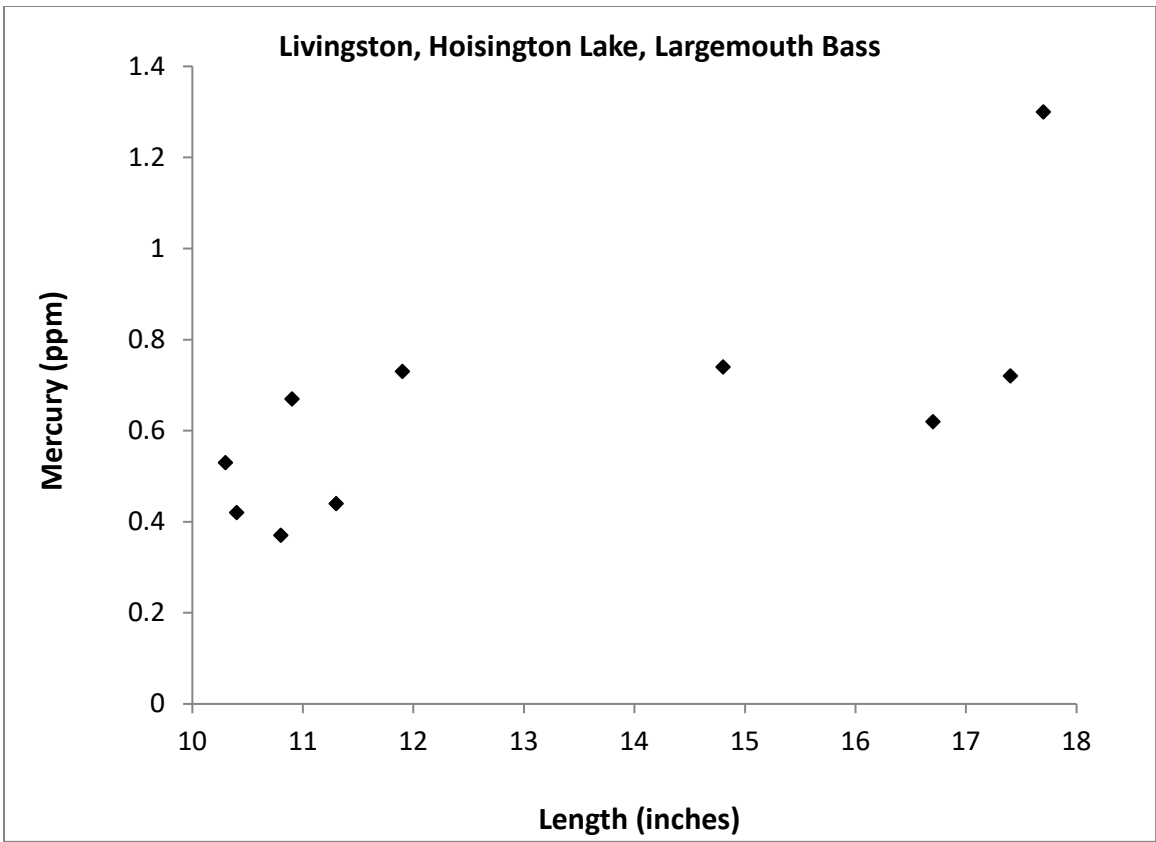
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2010	2010	10	10.3	14	14.8	17.7
Datasets available: 2010						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.65	0.37	1.30	0.84	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.495	0.522				

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:						1

Existing Advisory: Hoisington Lake largemouth and smallmouth bass are covered by the statewide mercury advisory.

Recommendation: No one should eat more than 1 meal per month of Hoisington Lake largemouth or smallmouth bass less than 18 inches or 6 meals per year of those larger than 18 inches due to mercury.



Black Crappie

Moraine Lake

Livingston County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2018	2018	10	7.1	na	7.1	9.1
Datasets available: 2018						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.05	0.03	0.09	0.06	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.803	0.762				

Organics Analysis:

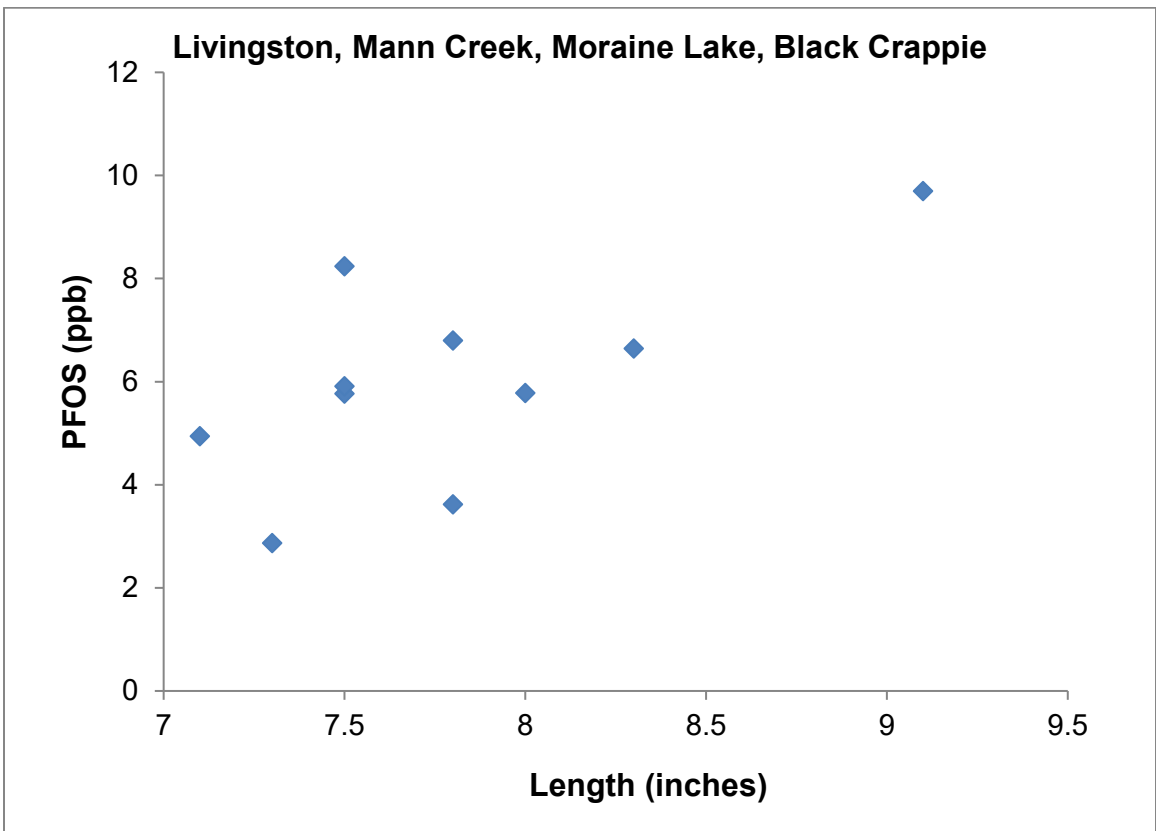
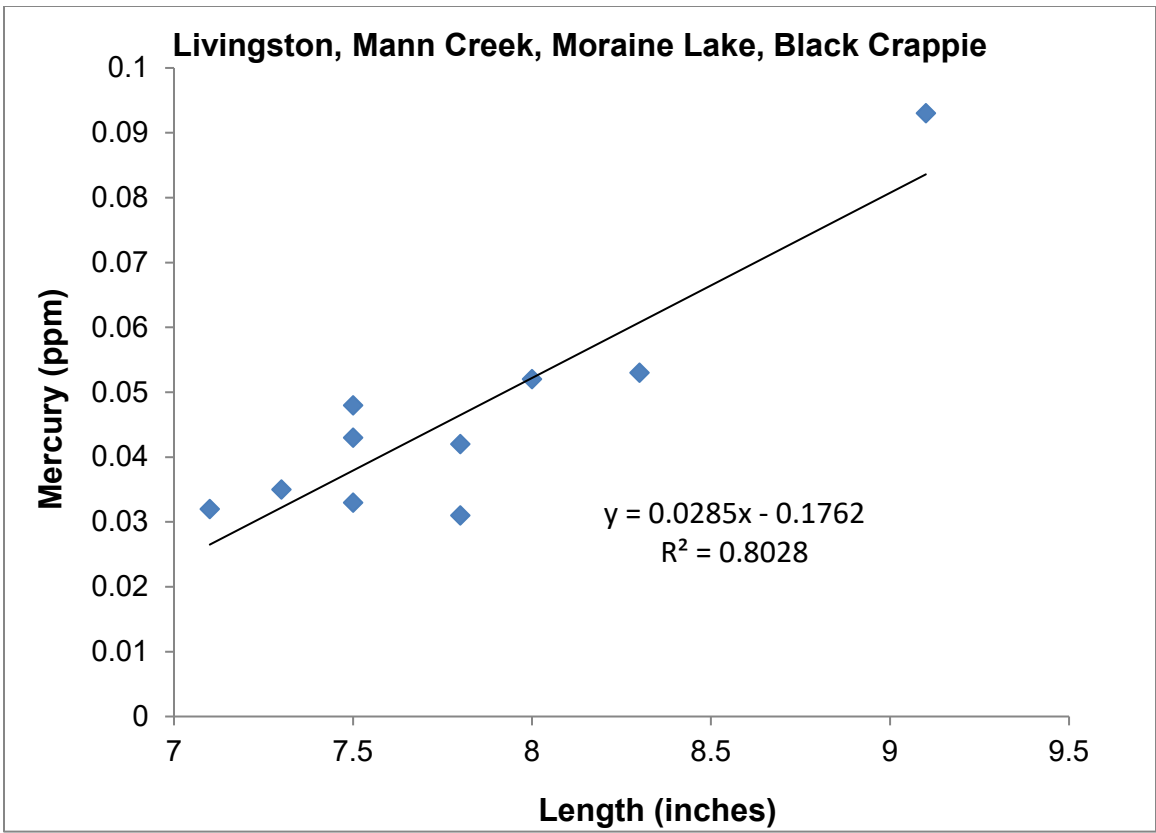
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2018	2018	10	7.1	na	7.1	9.1
Datasets available: 2018						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
PFOS	10	6 ppb	3 ppb	10 ppb	7 ppb	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.427	0.338				
Final meal category based on UCL:						16

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

Recommendation: No one should eat more than 16 meals per month of Moraine Lake black or white crappie smaller than 8 inches due to PFOS and mercury or more than 8 meals per month of fish larger than 8 inches due to mercury. The size break and meal category are based on professional judgement due to the limited number of large fish in the sample.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
7	0.02	16
8	0.05	16
9	0.08	12
10	0.11	8
11	0.14	4
<i>Shaded area denotes extrapolated estimates</i>		

Note: Bluegill collected at the same time also had low mercury and PFOS concentrations.



Bluegill

Moraine Lake

Livingston County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2018	2018	10	5	na	5	6.2
Datasets available: 2018						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.04	0.03	0.08	0.05	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.065	0.050				

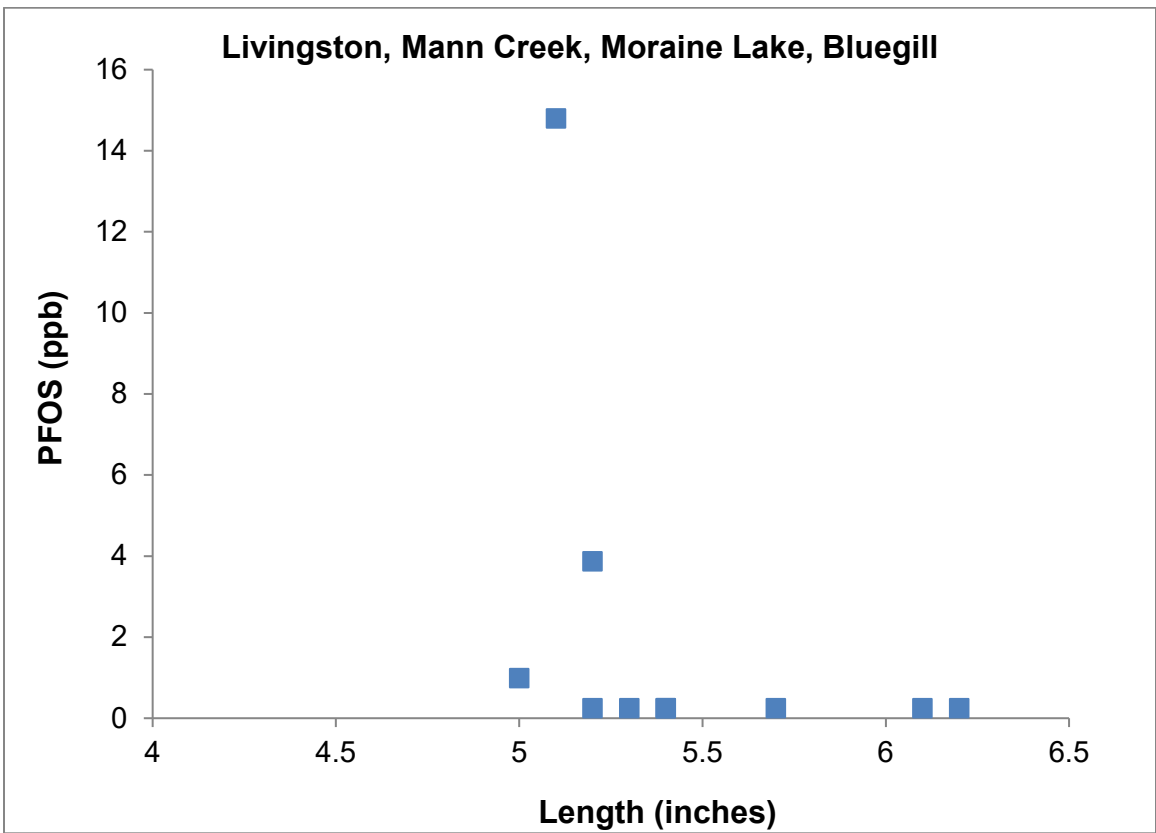
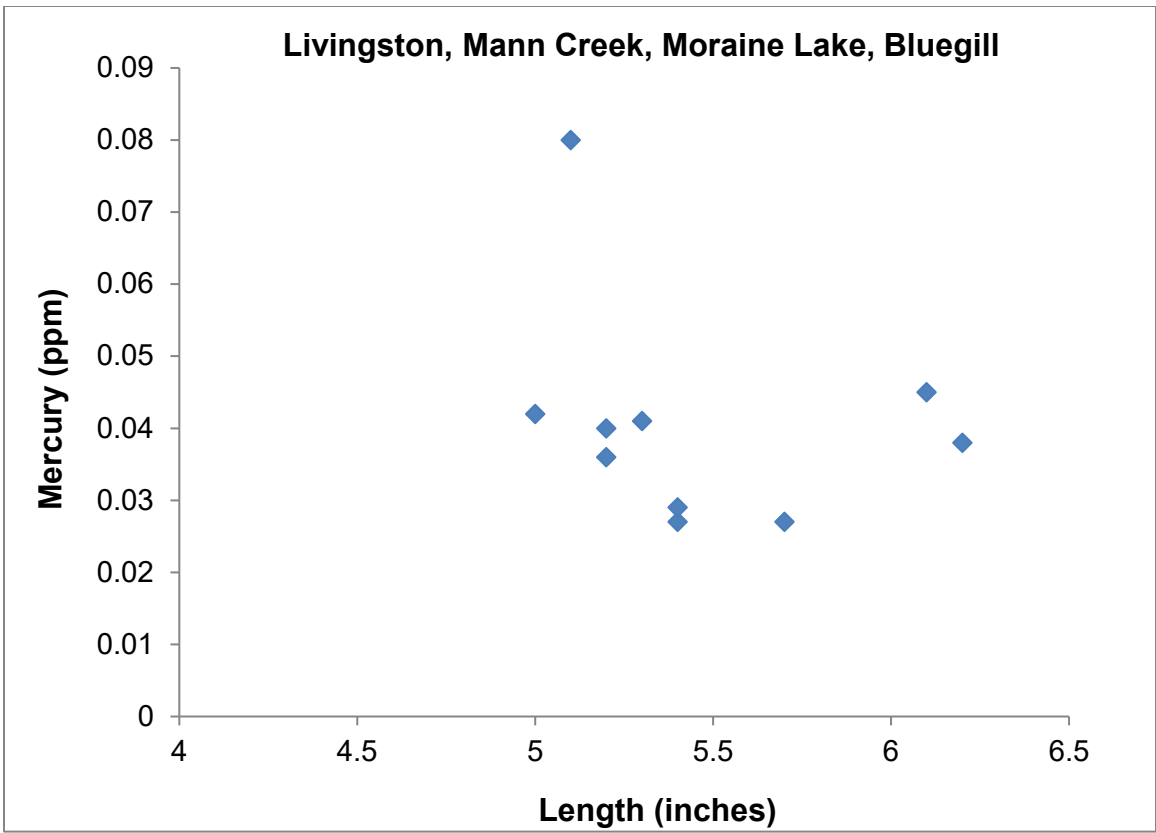
Organics Analysis:

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	6.2
Datasets available: 2018						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
PFOS	10	2 ppb	< 0.25 ppb	15 ppb	5 ppb	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.147	0.269				
Final meal category based on UCL:						16

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

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

Note: Black crappie collected at the same time also had low mercury and PFOS concentrations.



**Largemouth and
Smallmouth Bass**

Moraine Lake

Livingston County

Hg Analysis:

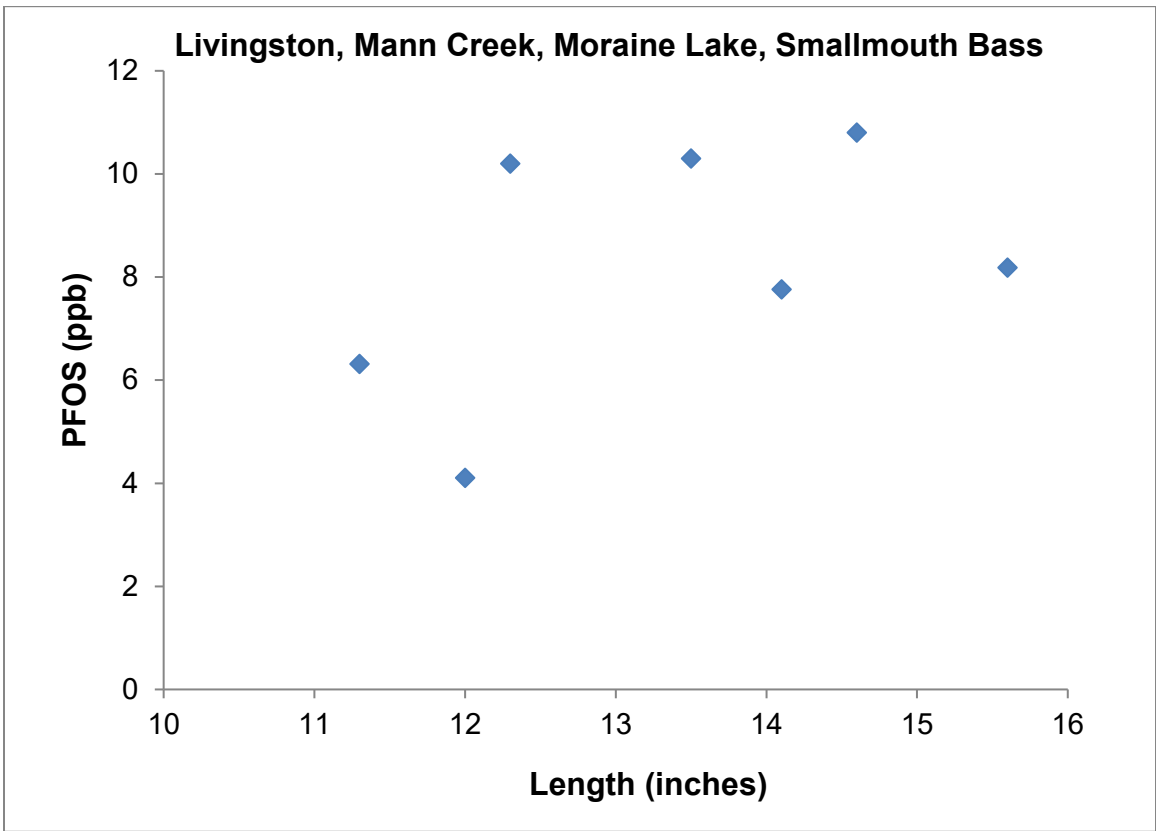
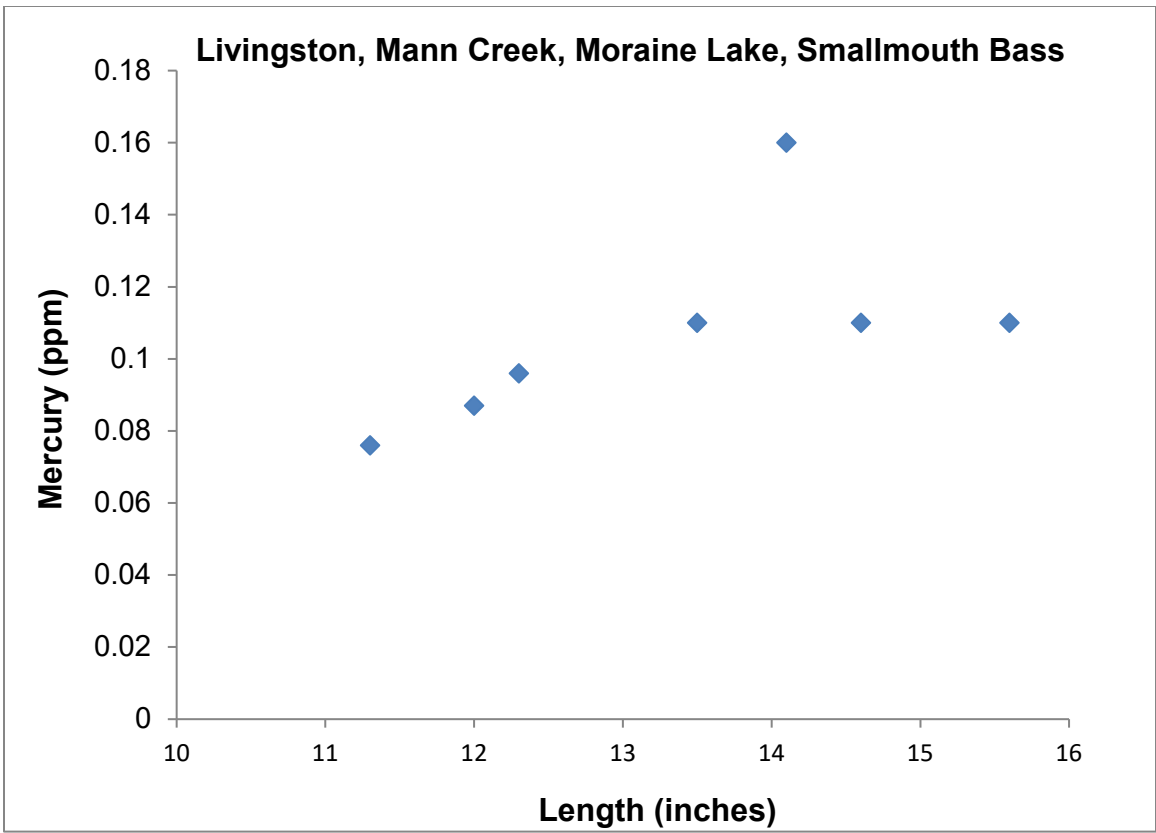
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2018	2018	7	11.3	14	11.3	15.6
Datasets available: 2018						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	4	0.12	0.11	0.16	0.16	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.377	0.471				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2018	2018	7	11.3	14	11.3	15.6
Datasets available: 2018						
Chemical	Sample Size (All)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
PFOS	7	8 ppb	4 ppb	11 ppb	10 ppb	12
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.215	0.241				
Final meal category based on UCL:						4

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

Recommendation: No change is recommended. MDHHS requires a minimum of five legal size fish samples to evaluate the need for waterbody specific fish consumption advisories. PFOS levels correspond to an advisory for Moraine Lake largemouth and smallmouth bass that would be less restrictive than the statewide advice due to mercury.



Northern Pike

Moraine Lake

Livingston County

Hg Analysis:

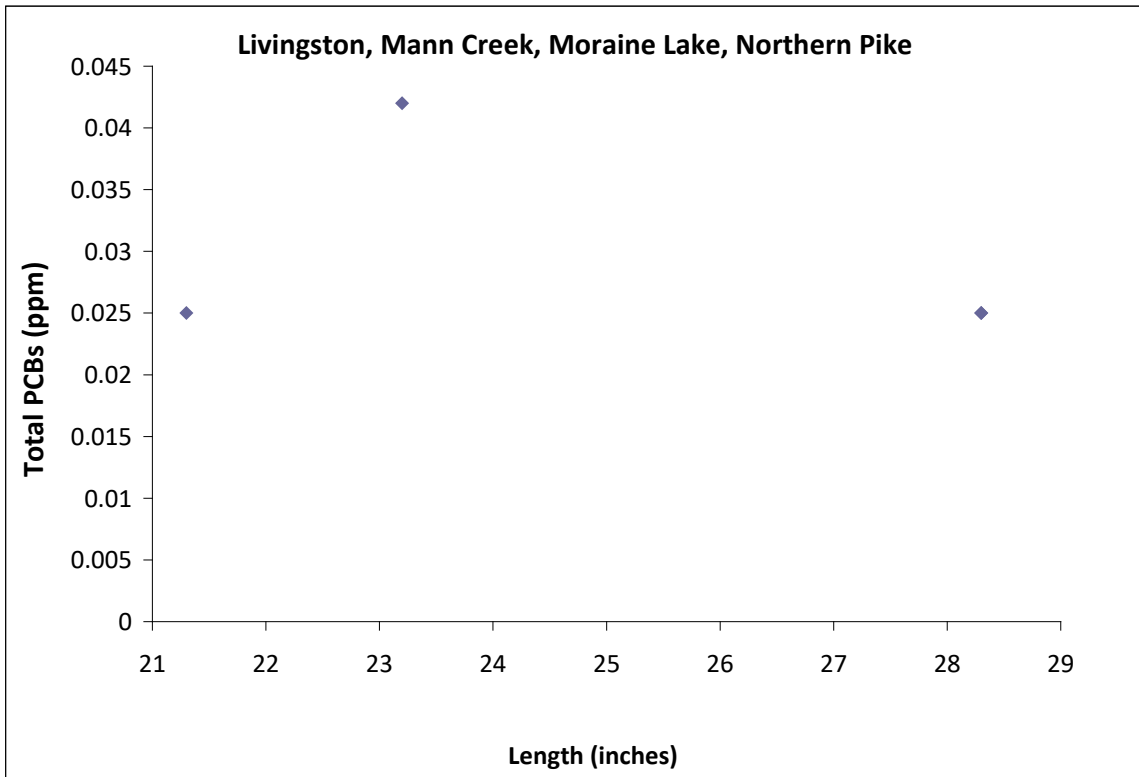
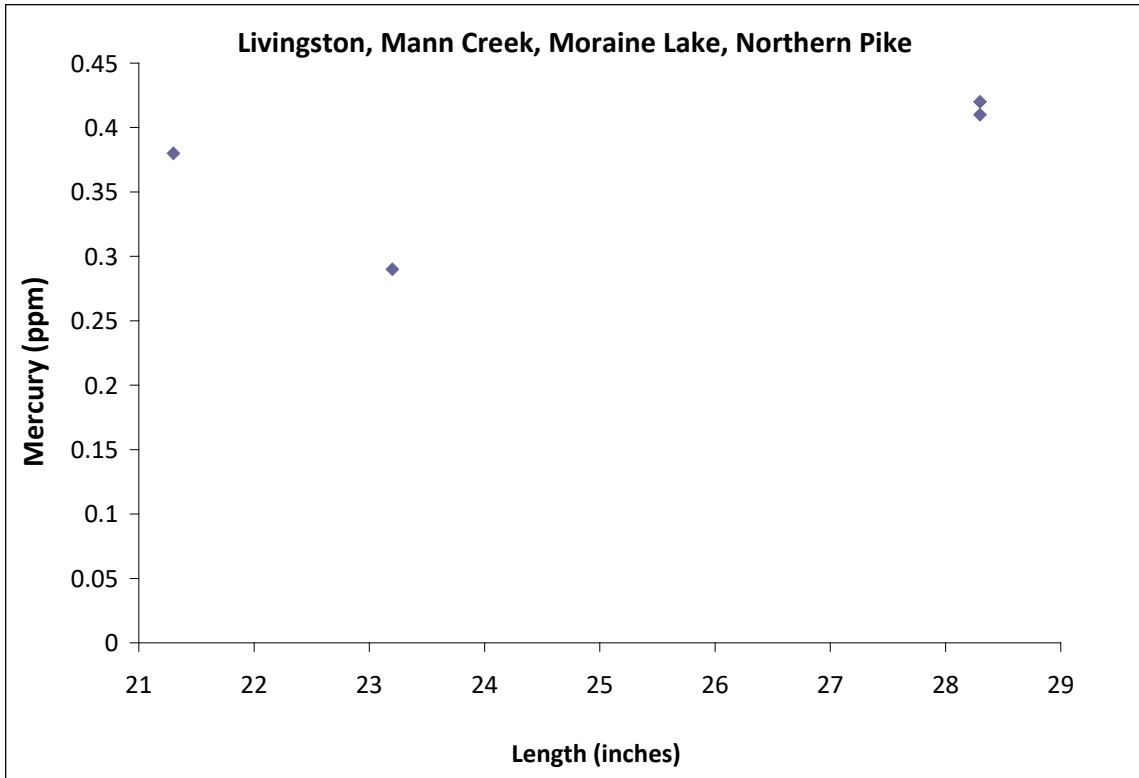
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1992	1992	4	21.3	24	28.3	28.3
Datasets available:		1992				
Chemical	Sample Size (All)	Mean (ppm)	95%UCL		Meal Category	
Mercury	4	0.375	--		--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.394	0.359				

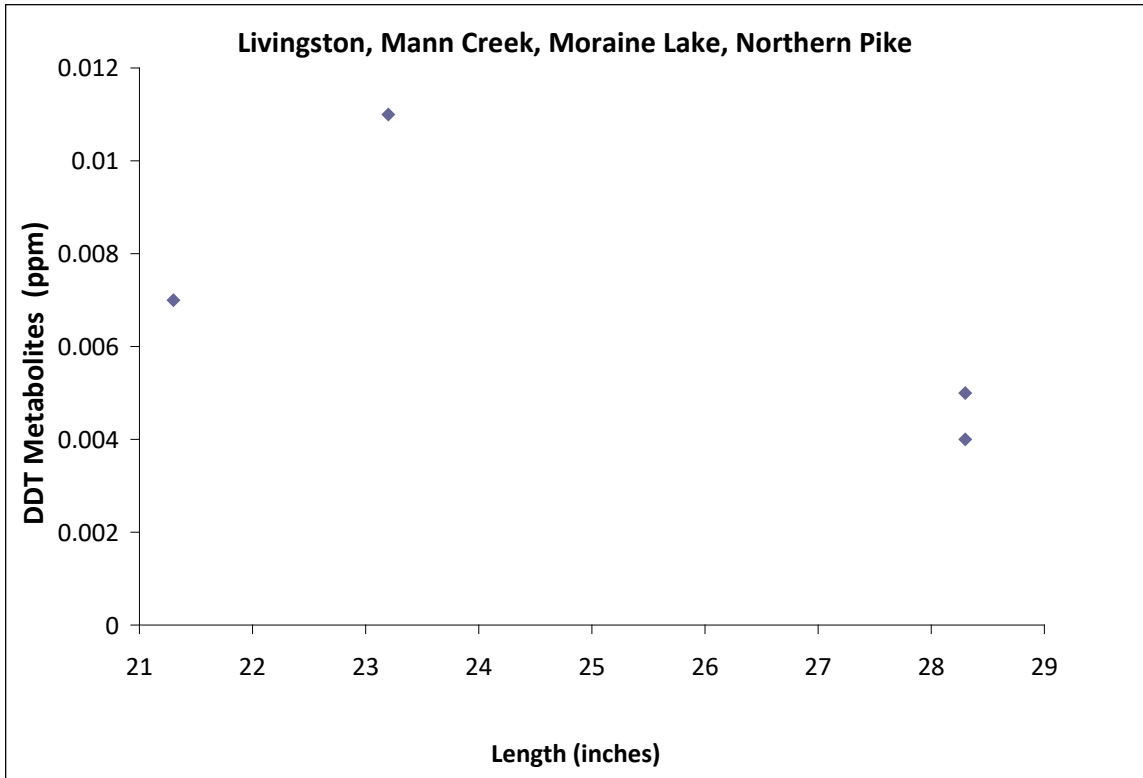
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1992	1992	4	21.3	24	28.3	28.3
Datasets available:		1992				
Chemical	Sample Size (All)	Mean (ppm)	95%UCL		Meal Category	
PCB	4	0.029	--		--	
DDT	4	0.007	--		--	
Chlordane	4	ND	--		--	
Toxaphene	4	ND	--		--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.149	0.149				
DDT	0.497	0.596				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:					---	

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

Recommendation: Statewide advisory would apply to Moraine Lake northern pike. This dataset is limited by small sample size and age of the data.





Carp

Patterson Lake

Livingston County

Hg Analysis:

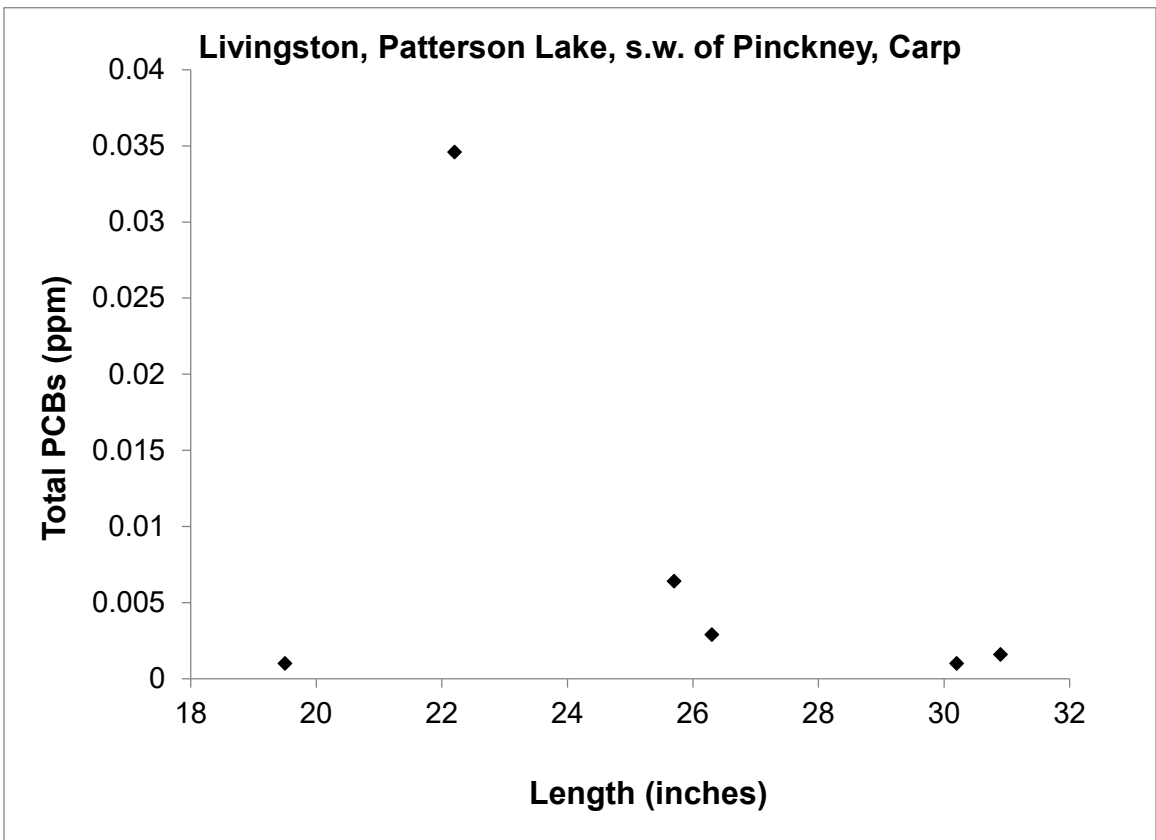
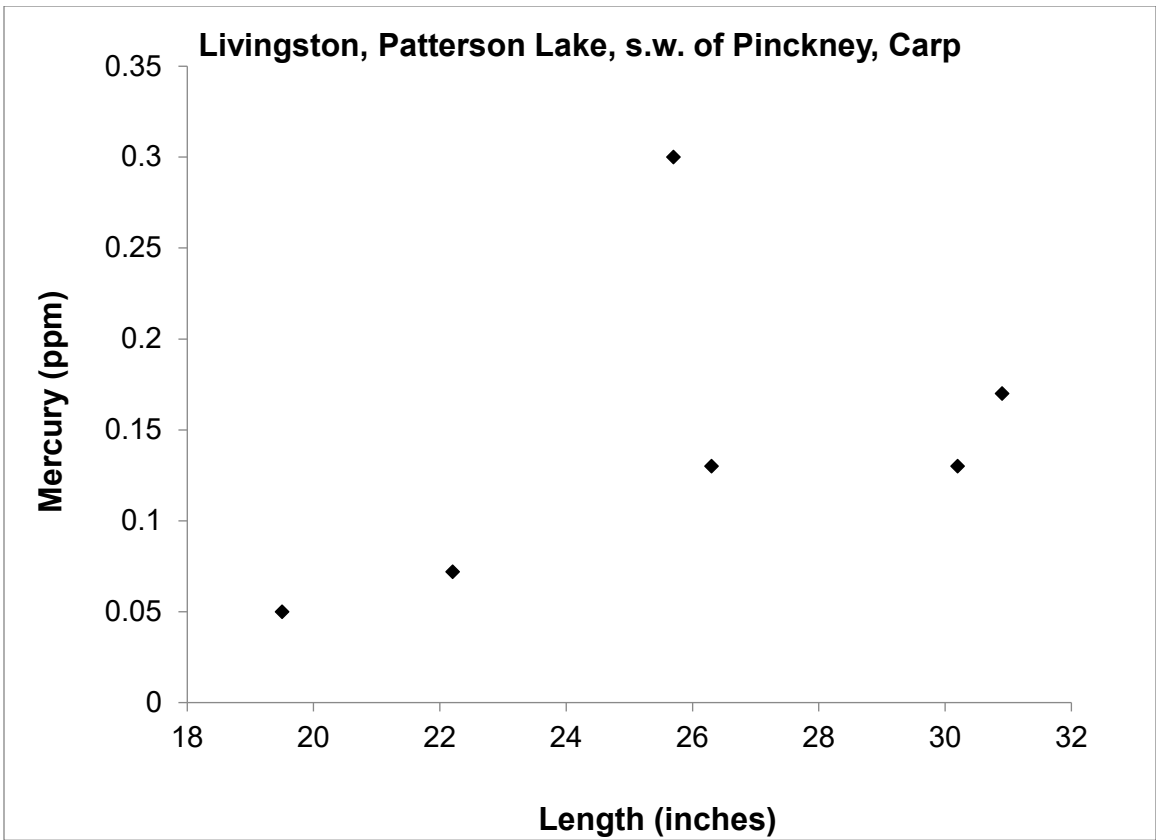
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2014	2014	6	19.5	na	19.5	30.9	
Datasets available: 2014							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	9	0.14		0.05	0.30	0.24	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.209	0.452					

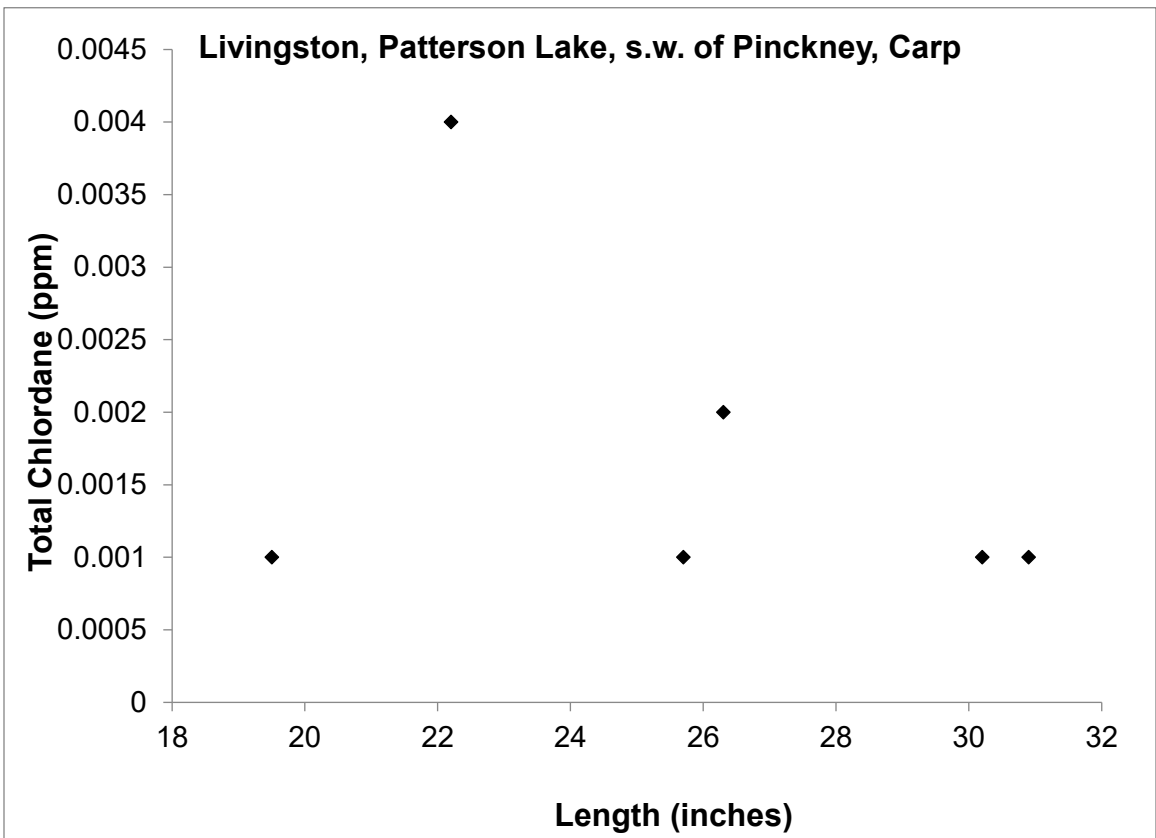
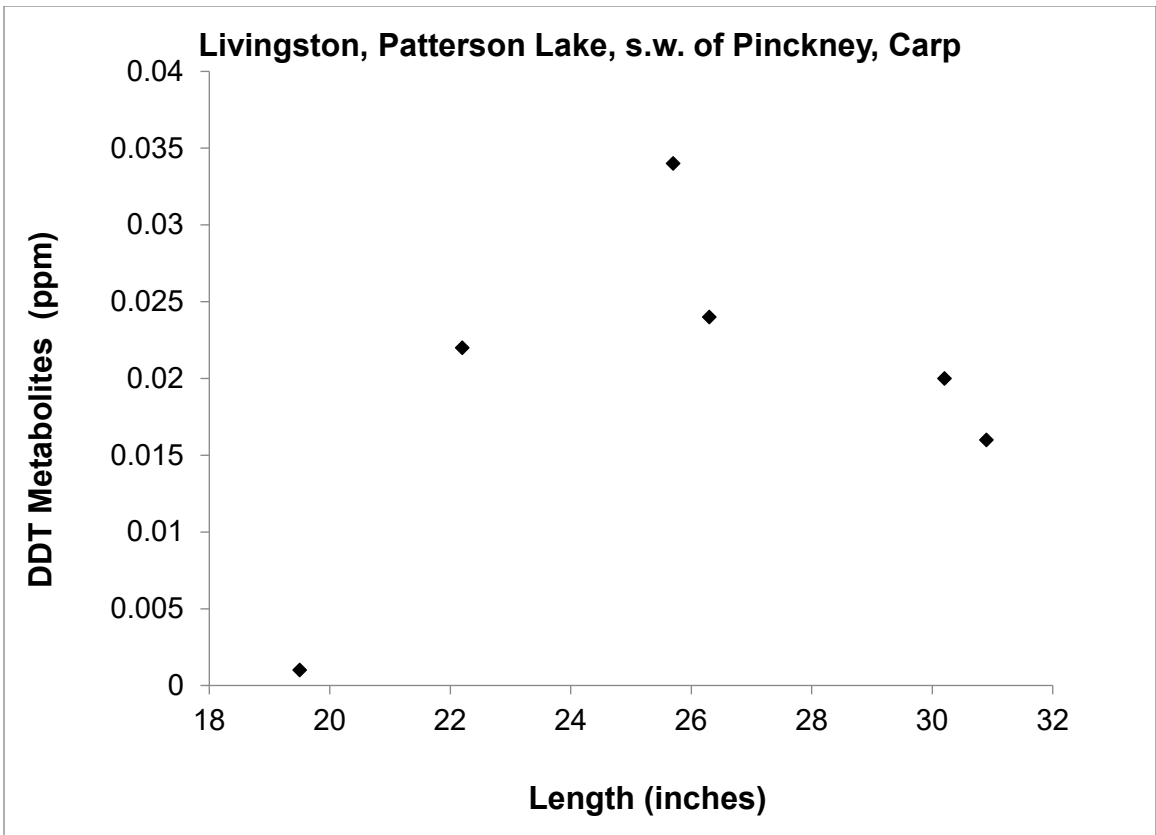
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2014	2014	6	19.5	na	19.5	30.9	
Datasets available: 2014							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	6	0.008		0.001	0.0346	0.022	8
DDT	6	0.020		0.001	0.034	0.031	16
Chlordane	6	0.002		0.001	0.004	0.003	--
Toxaphene	6	ND		--	--	--	--
TEQ	0	--		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.161	0.109					
DDT	0.148	0.369					
Chlordane	0.147	0.130					
Toxaphene	--	--					
TEQ	--	--					
Final meal category based on UCL:							4

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

Recommendation: No one should eat more than 4 meals per month of Patterson Lake carp due to mercury. PCBs would cause an advisory.





Largemouth Bass

Patterson Lake

Livingston County

Hg Analysis:

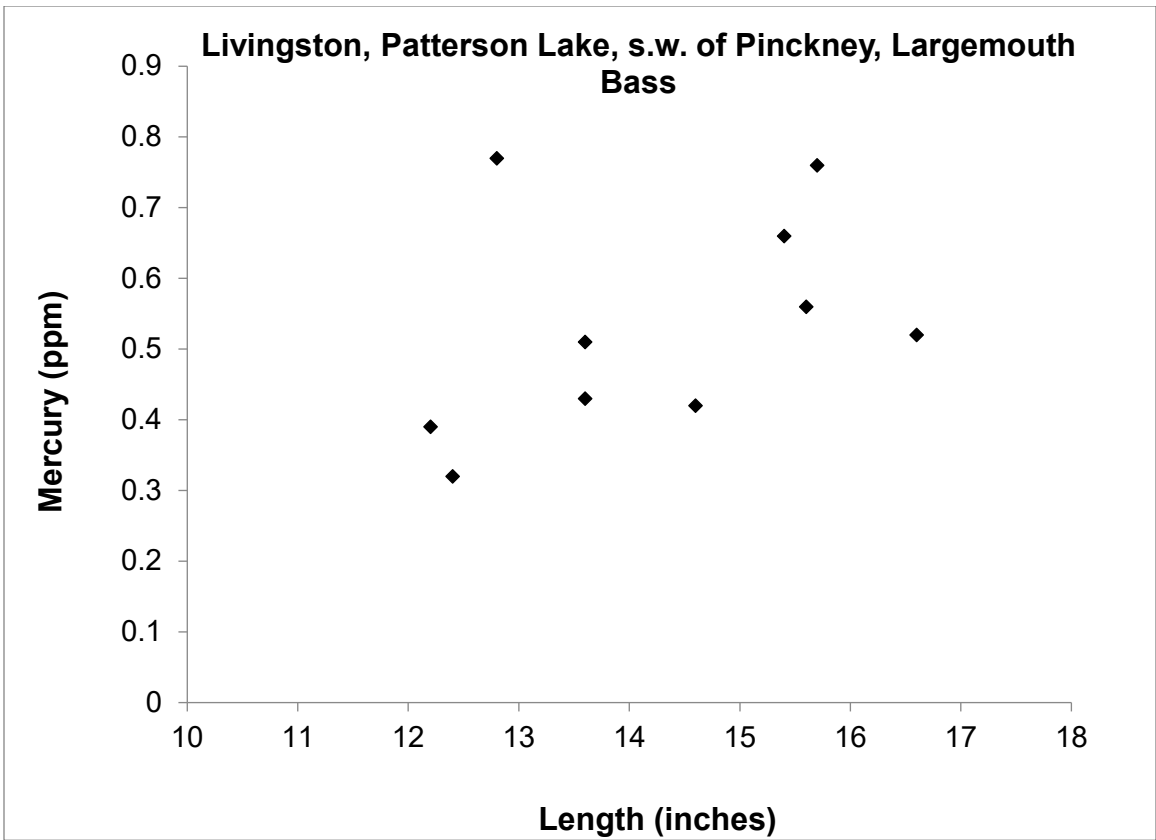
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples			
Earliest	Most Recent				Min	Max		
2014	2014	10	12.2	14	13.6	16.6		
Datasets available:		2014						
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category	
Mercury	7	0.55		0.42	0.76	0.66	1	
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
Mercury	0.163	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		
--	--	0	--	--	--	--		
Datasets available:		--						
Chemical	Sample Size (Legal)	Mean		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:							1	

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

Recommendation: No one should eat more than 1 meal per month of Patterson Lake largemouth or smallmouth bass smaller than 18 inches or more than 6 meals per year of those fish larger than 18 inches due to mercury. The statewide length break was applied as the size range of fish was limited.



Carp

Red Cedar River

Livingston County

Hg Analysis:

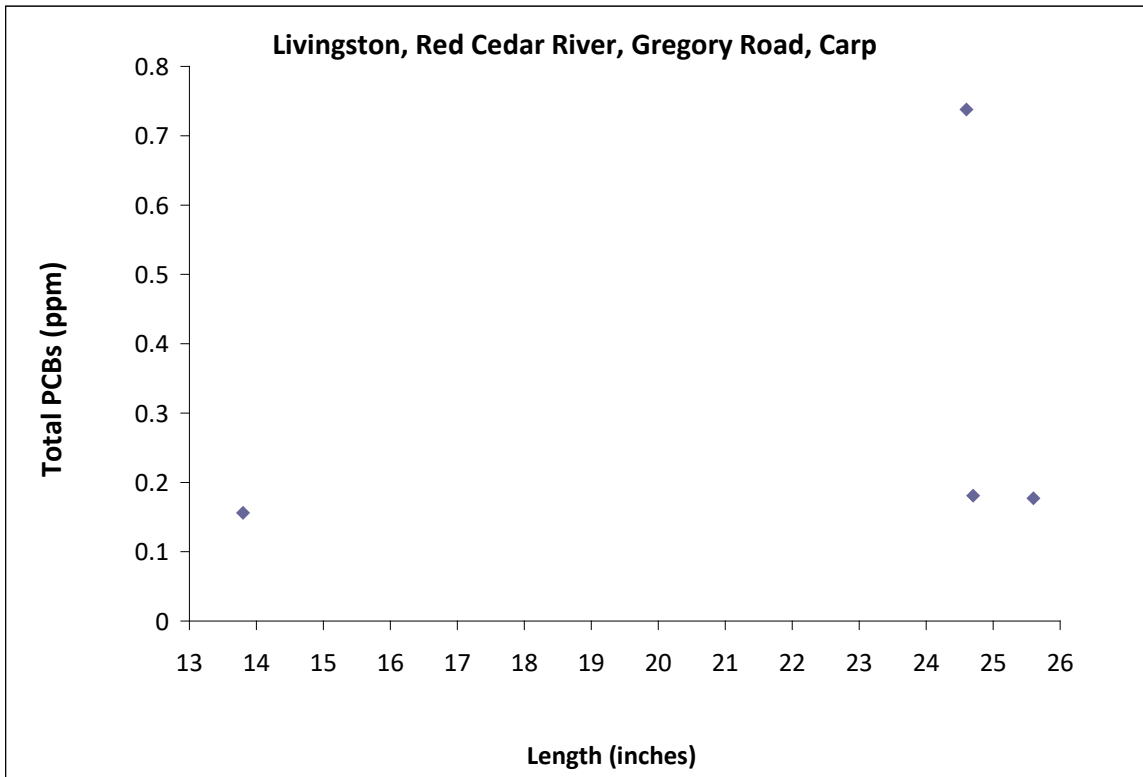
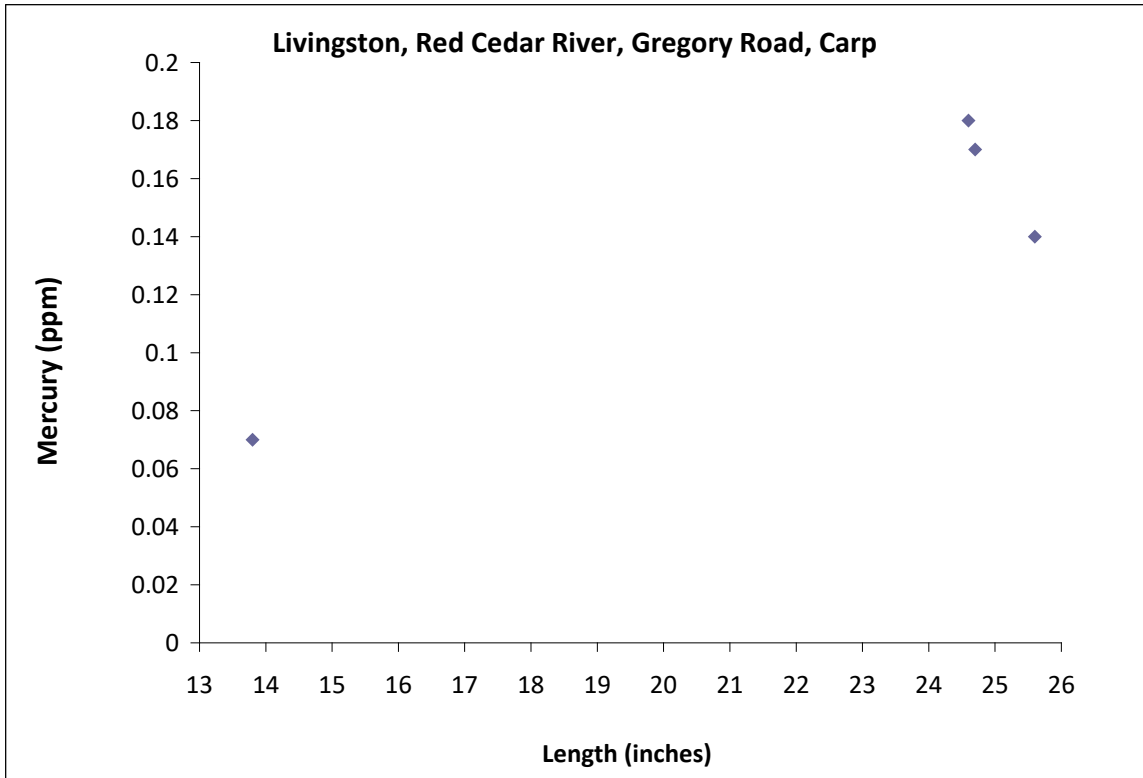
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1991	1991	4	13.8	na	13.8	25.6
Datasets available: 1991						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	4	0.140		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.827	0.895		<i>Regression not appropriate (sample size)</i>		

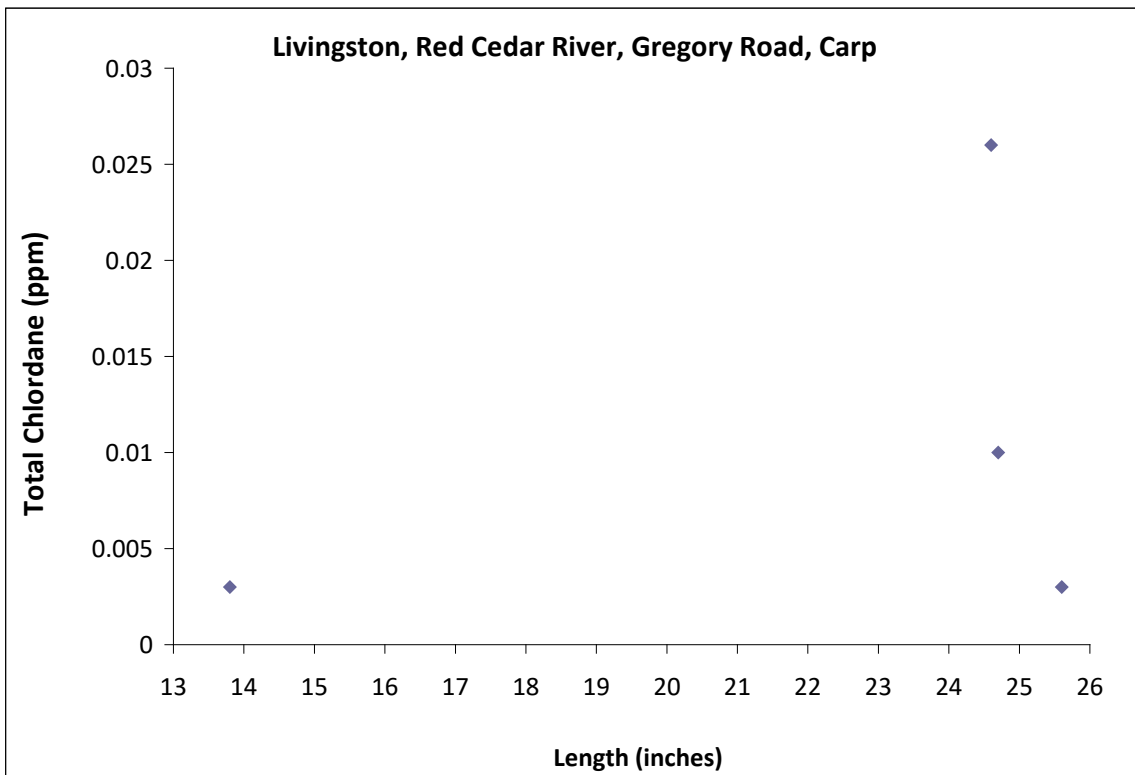
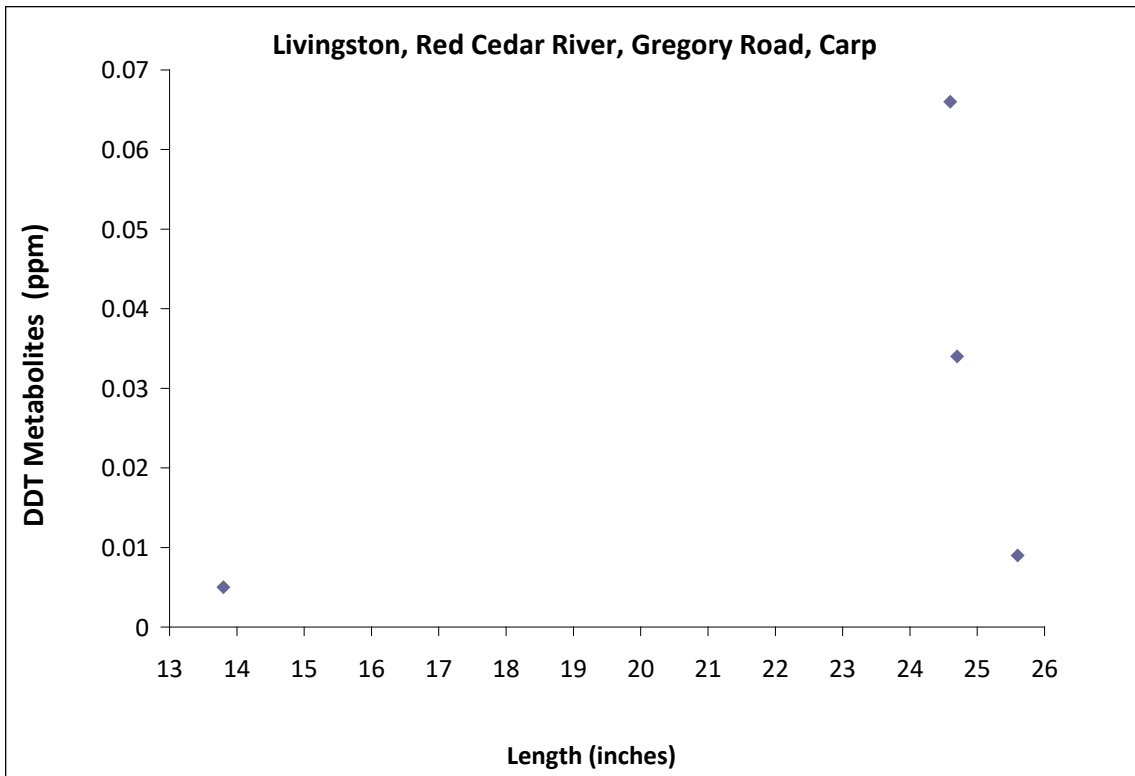
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1991	1991	4	13.8	na	13.8	25.6
Datasets available: 1991						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	4	0.313		--		--
DDT	4	0.029		--		--
Chlordane	4	0.011		--		--
Toxaphene	4	ND		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.105	0.138				
DDT	0.247	0.433				
Chlordane	0.162	0.222				
Toxaphene	--	--		Final meal category based on UCL:		--

Existing Advisory: Red Cedar River carp (Livingston County) are not covered by an advisory.

Recommendation: Statewide guidelines apply to Red Cedar River carp. This dataset is limited by small sample size and age of the data.





Northern Pike

Red Cedar River

Livingston County

Hg Analysis:

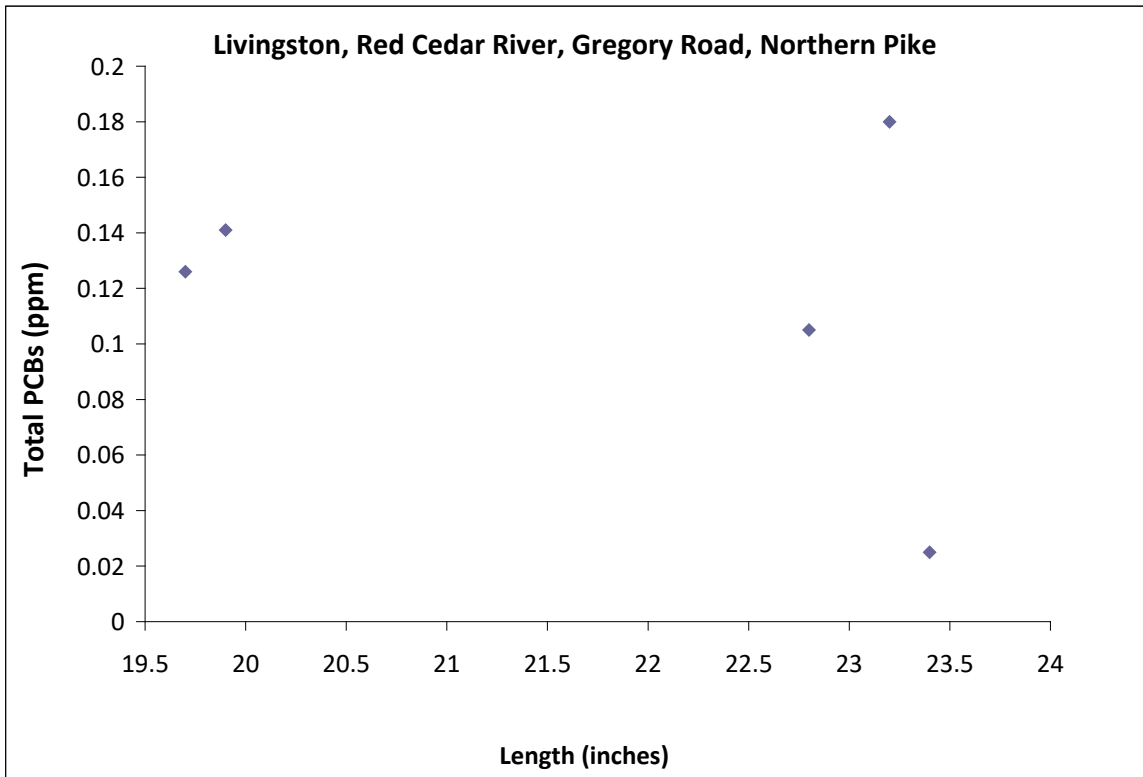
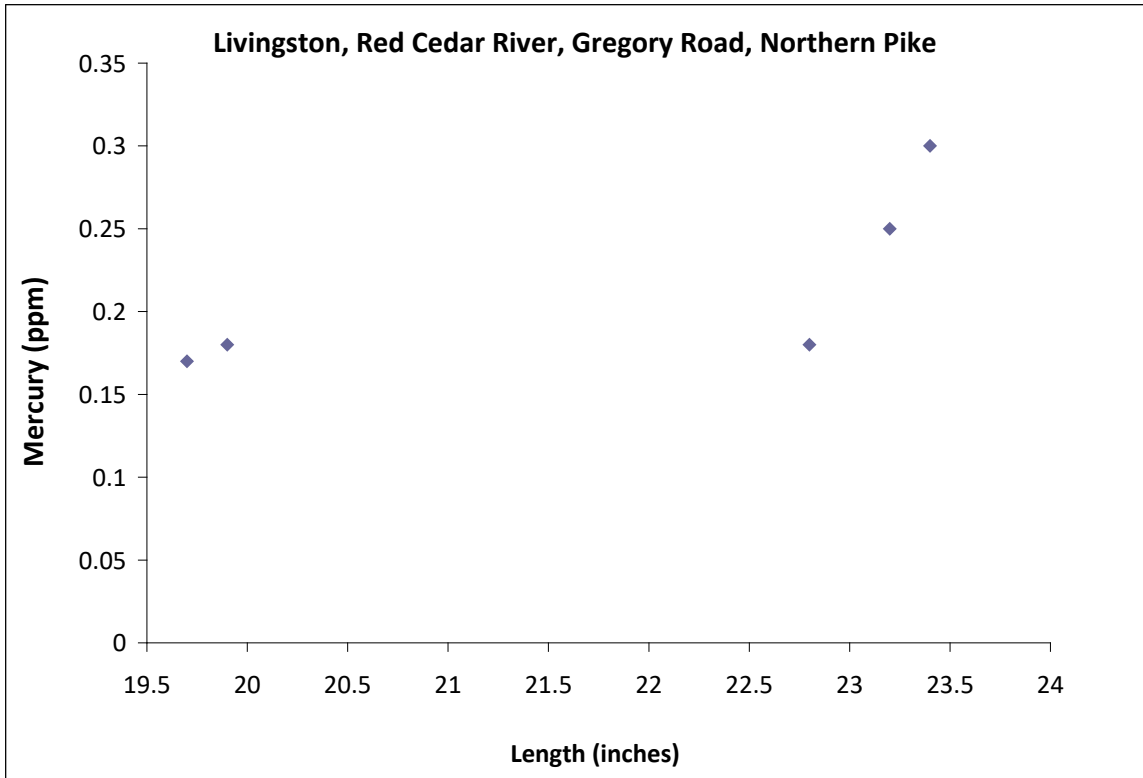
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1991	1991	5	19.7	24	na	na
Datasets available: 1991						
Chemical	Sample Size (Sub-Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	5	0.216		0.290	2	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.553	0.577				

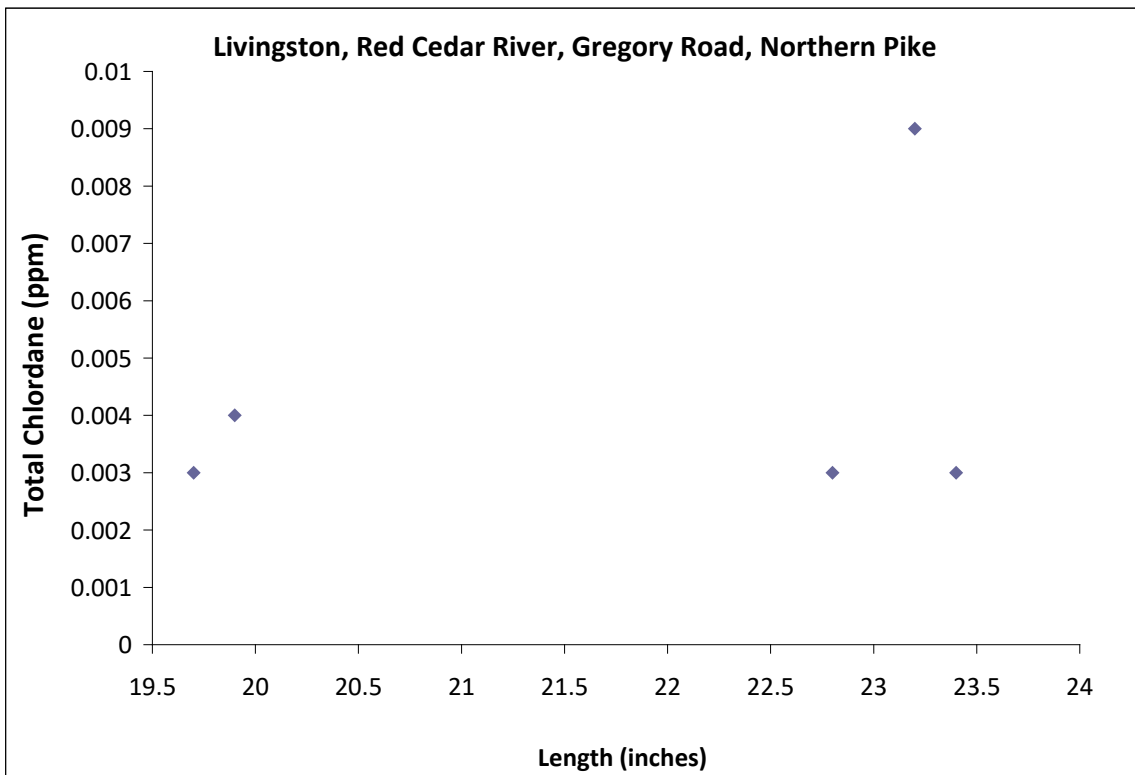
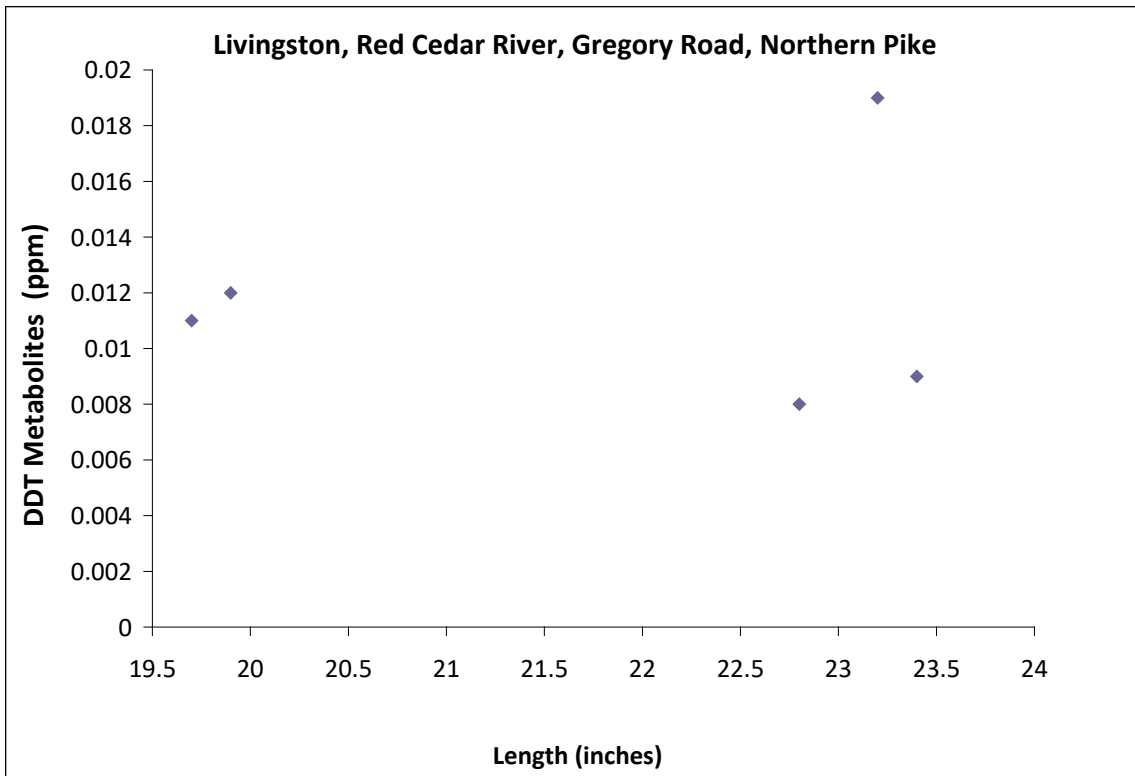
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1991	1991	5	19.7	24	na	na
Datasets available: 1991						
Chemical	Sample Size (Sub-Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	5	0.115		0.190	1	
DDT	5	0.012		0.020	16	
Chlordane	5	0.004		0.010	--	
Toxaphene	5	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.103	0.187				
DDT	0.009	0.000				
Chlordane	0.115	0.080				
Toxaphene						
Final meal category based on UCL:					1	

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

Recommendation: The statewide guidelines apply to the Red Cedar River northern pike. This dataset is limited by age of the data and sub-legal lengths. Based on EGLE’s Fish Contaminant Monitoring Program, PCB concentrations ≥ 15 years old are expected to have declined resulting in mercury being the cause of the advisory. Because of the inclusion of sub-legal lengths and the advisory is based on mercury. Statewide guidelines apply.





**Bluegill and
Pumpkinseed**

Sandy Bottom Lake

Livingston County

Hg Analysis:

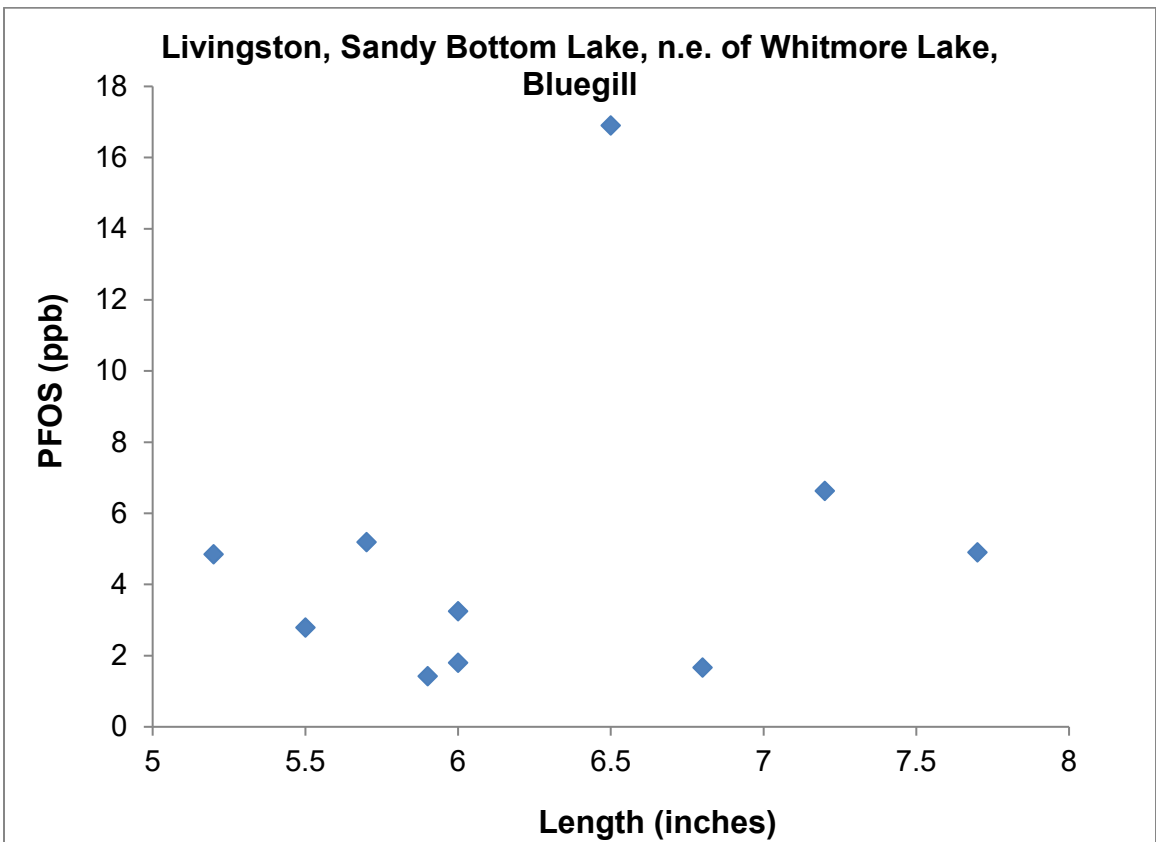
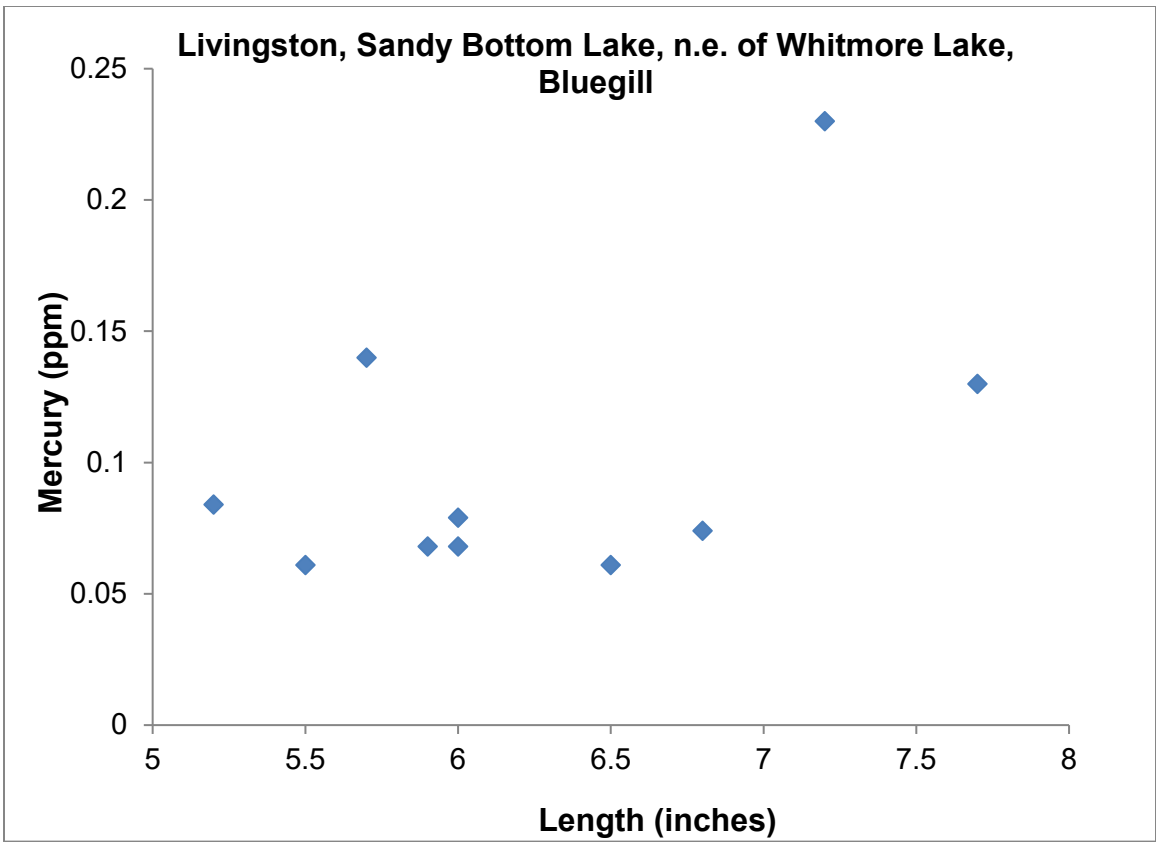
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2019	2019	10	5.2	na	5.2	7.7
Datasets available: 2019						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.10	0.06	0.23	0.14	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.254	0.246				

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	7.7
Datasets available: 2019						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
PFOS	10	5 ppb	1 ppb	17 ppb	8 ppb	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.044	0.050				
Final meal category based on UCL:						4

Existing MDHHS Advisory: Sandy 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 4 meals per month of Sandy Bottom Lake bluegill or pumpkinseed sunfish of any size due to mercury.



Bluegill

**Sloan Lake
Mann Creek**

Livingston County

Hg Analysis:

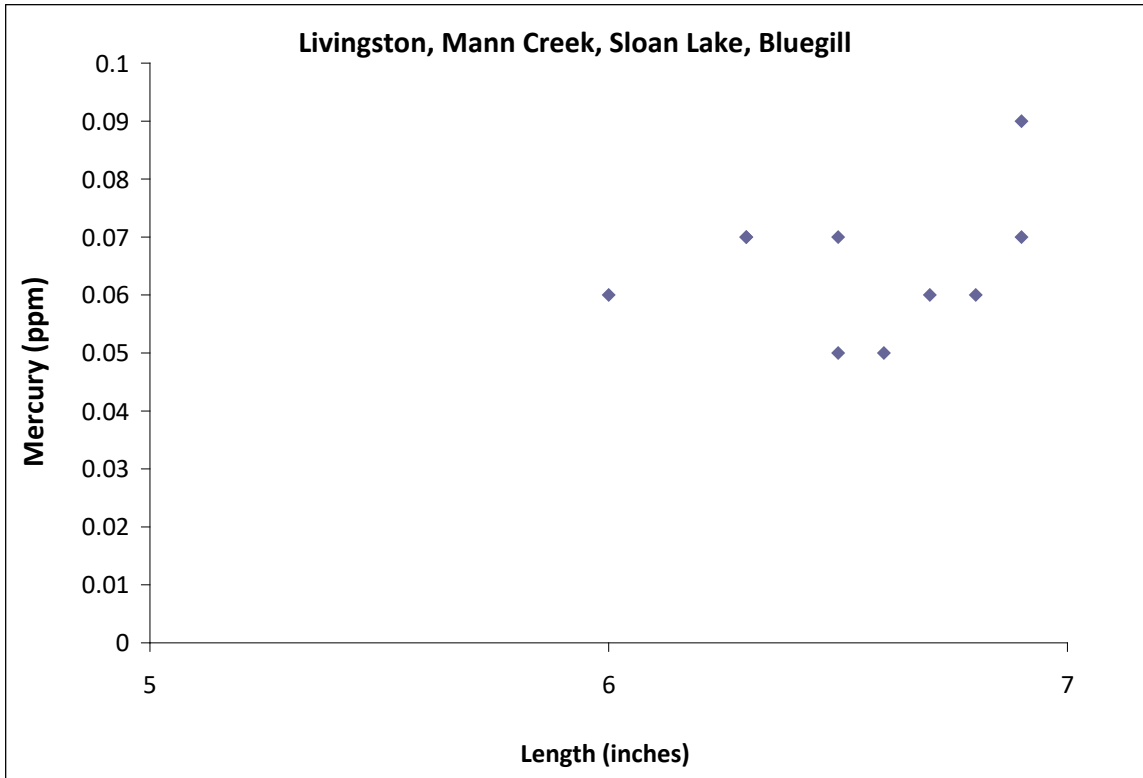
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1994	1994	10	6	na	6	6.9
Datasets available: 1994						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	10	0.065		0.070	16	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.076	0.057				

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: 1994						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	0	--		--	--	
DDT	0	--		--	--	
Chlordane	0	--		--	--	
Toxaphene	0	--		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:					16	

Existing Advisory: Sloan Lake (Mann Creek) bluegill are not covered by an advisory.

Recommendation: A consumption advisory is not needed for Sloan Lake bluegill. This dataset is limited due to the age of the data. Based on EGLE’s Fish Contaminant Monitoring Program (FCMP), temporal changes in mercury concentrations are waterbody specific in Michigan. The EGLE FCMP finds that mercury concentration in fish are either staying the same or increasing. The recommendation is based on the available mercury dataset.



Northern Pike

**Sloan Lake
Mann Creek**

Livingston County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1992	1994	6	24.6	24	24.6	33.1
Datasets available: 1992, 1994						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL	Meal Category
Mercury	6	0.340			0.530	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.702	0.742				

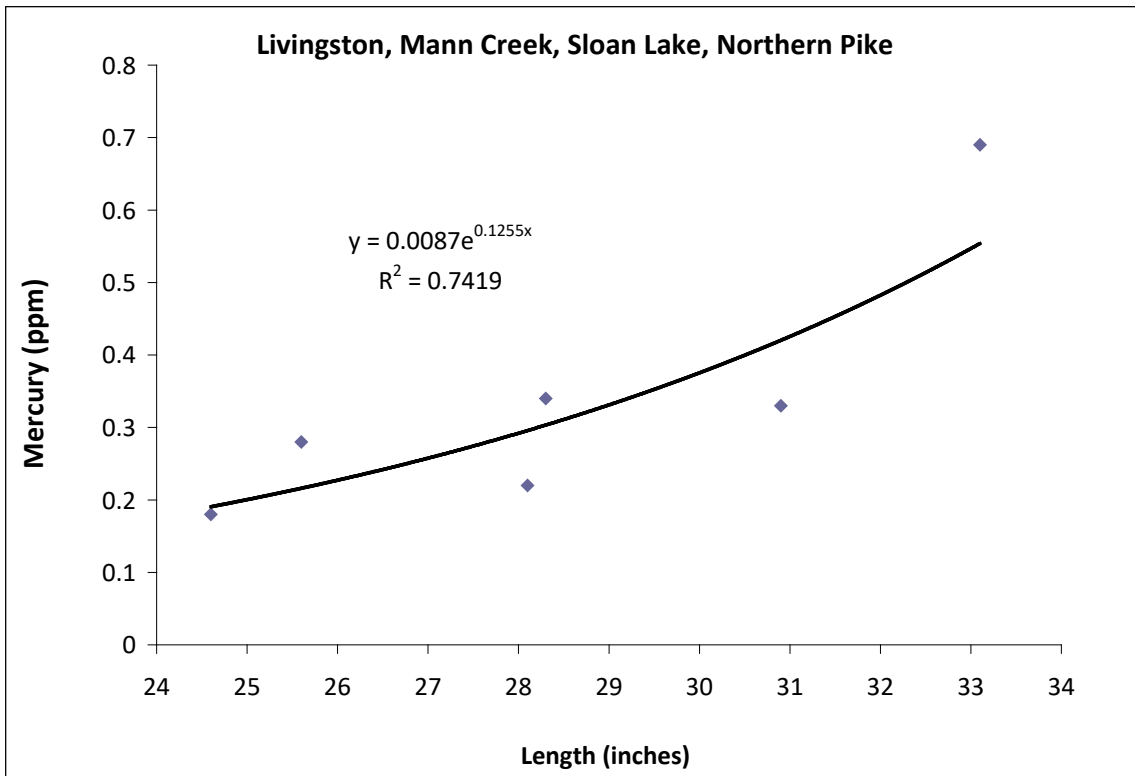
Organics Analysis:

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	33.1	24	33.1	33.1
Datasets available: 1992						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL	Meal Category
PCB	1	0.036			--	--
DDT	1	0.007			--	--
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:						2

Existing Advisory: Sloan Lake (Mann Creek) northern pike are covered under the statewide mercury advisory.

Recommendation: No one should eat more than 2 meals per month of Sloan Lake northern pike under 32 inches or 1 meal per month over 32 inches due to mercury. This dataset is limited due to the age of the data. Based on EGLE's Fish Contaminant Monitoring Program, Hg concentrations are either expected to be the same or increasing in fish throughout Michigan waters.

Length (Inches)	Hg Regression Estimate (ppm)	Meal Category
24	0.177	4
26	0.227	4
28	0.292	2
30	0.376	2
32	0.483	2
34	0.620	1
36	0.797	1
38	1.025	1
40	1.317	0.5
<i>Shaded area denotes extrapolated estimates</i>		



Black Crappie

Thompson Lake

Livingston County

Hg Analysis:

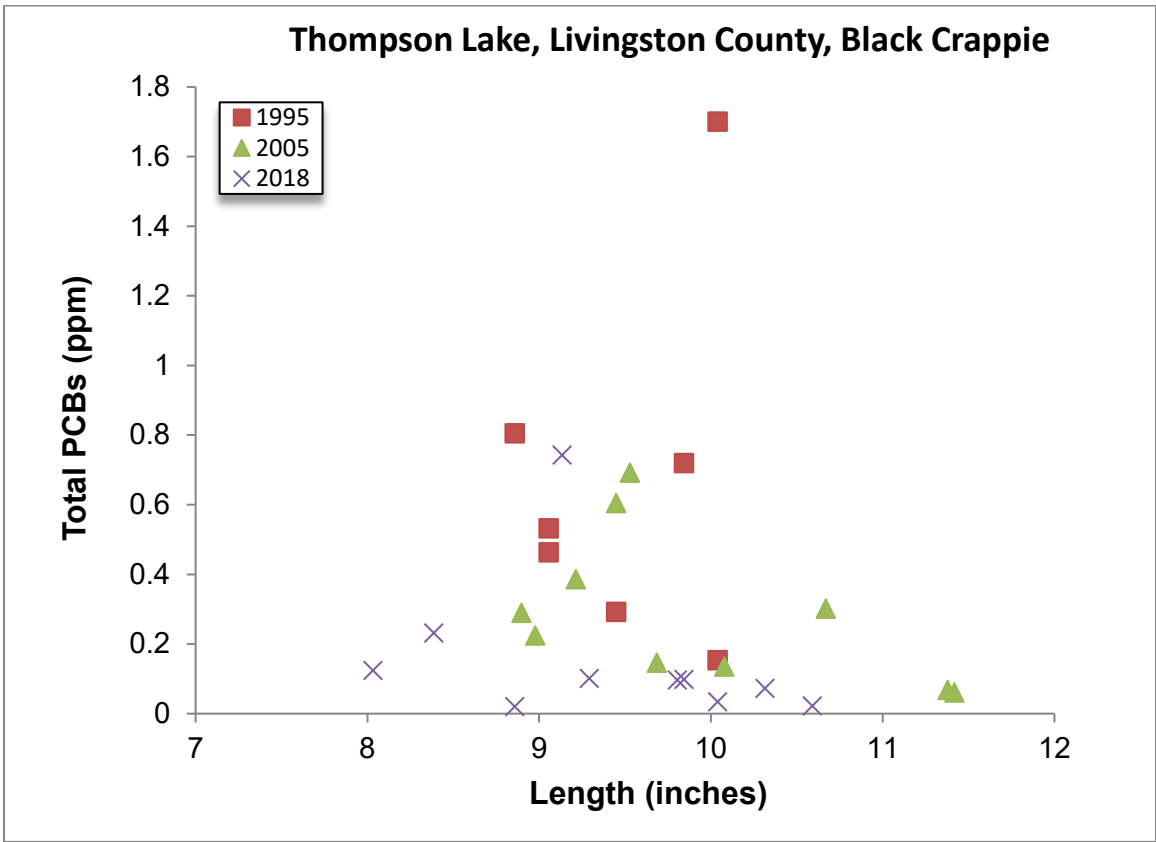
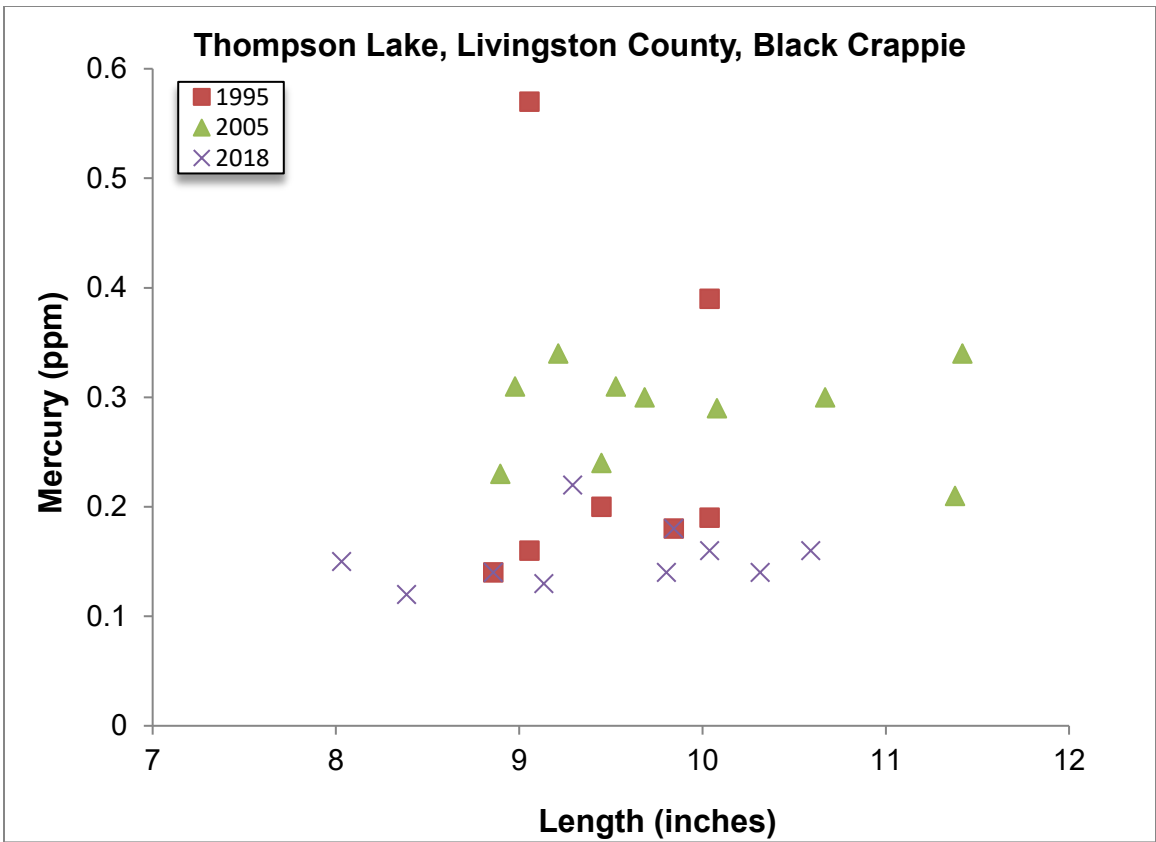
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples			
Earliest	Most Recent							
1995	2018	27	8.0	NA	8.0	11.4		
Datasets available: 1995, 2005, 2018								
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category	
Mercury	27	0.231		0.120	0.570	0.272	2	
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
Mercury	0.022	0.052						

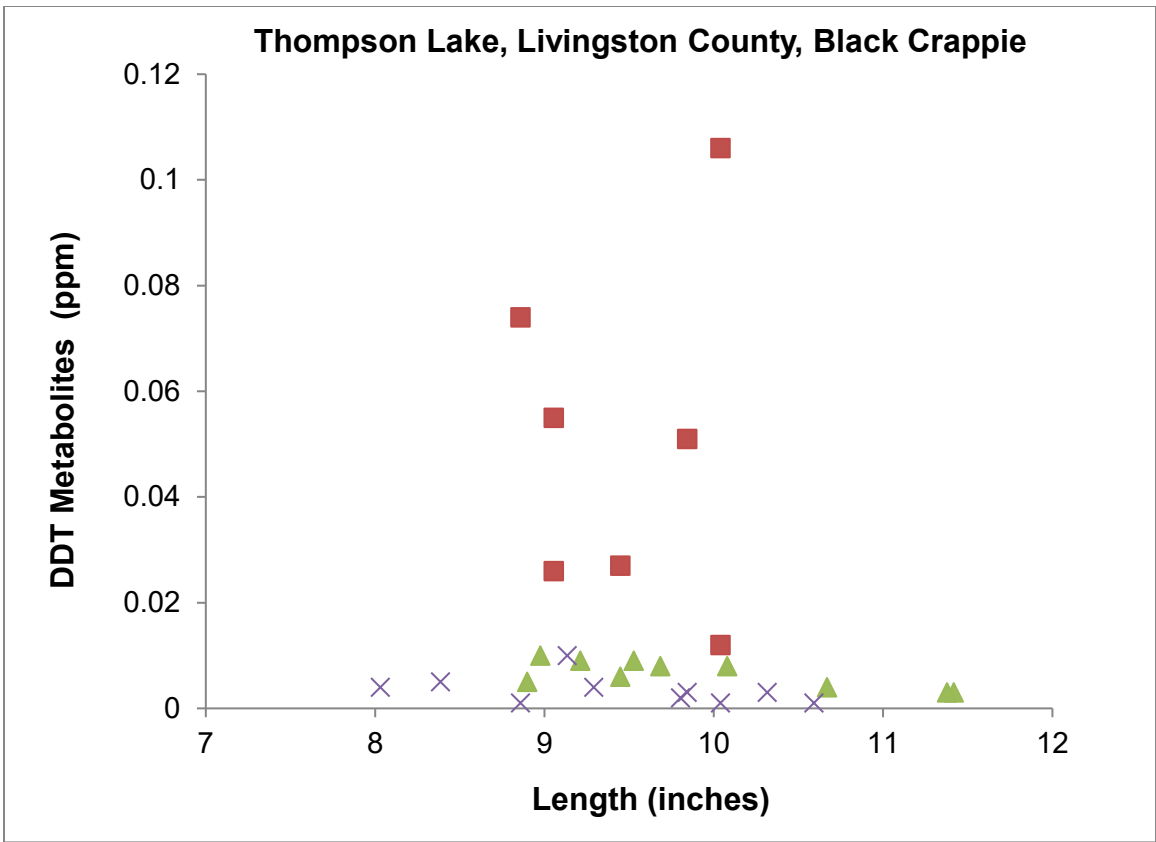
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples			
Earliest	Most Recent							
2005	2018	20	8.0	NA	8.0	11.4		
Datasets available: 1995, 2005, 2018								
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category	
PCB	20	0.222		0.020	0.742	0.326	0.5	
DDT	20	0.005		<0.001	0.010	0.006	16	
Chlordane	20	ND		--	--	--	--	
Toxaphene	20	ND		--	--	--	--	
PFOS	0	--		--	--	--	--	
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
PCB	0.083	0.118						
DDT	0.110	0.089						
Chlordane	NA	NA						
Toxaphene	NA	NA						
PFOS	--	--						
Final meal category based on UCL:							0.5	

Existing MDHHS Advisory: Black and white crappie of any size from Thompson Lake in Livingston County are under a limited consumption advisory.

Recommendation: No one should eat more than 6 meals per year of black or white crappie of any size from Thompson Lake in Livingston county due to PCBs. Mercury causes a less restrictive advisory. Note: This recommendation relaxes this current advisory as data collected from two years (2005 and 2018) suggest that PCB concentrations have decreased since the first sampling of Black Crappie in 1995.





Common Carp

Thompson Lake

Livingston County

Hg Analysis:

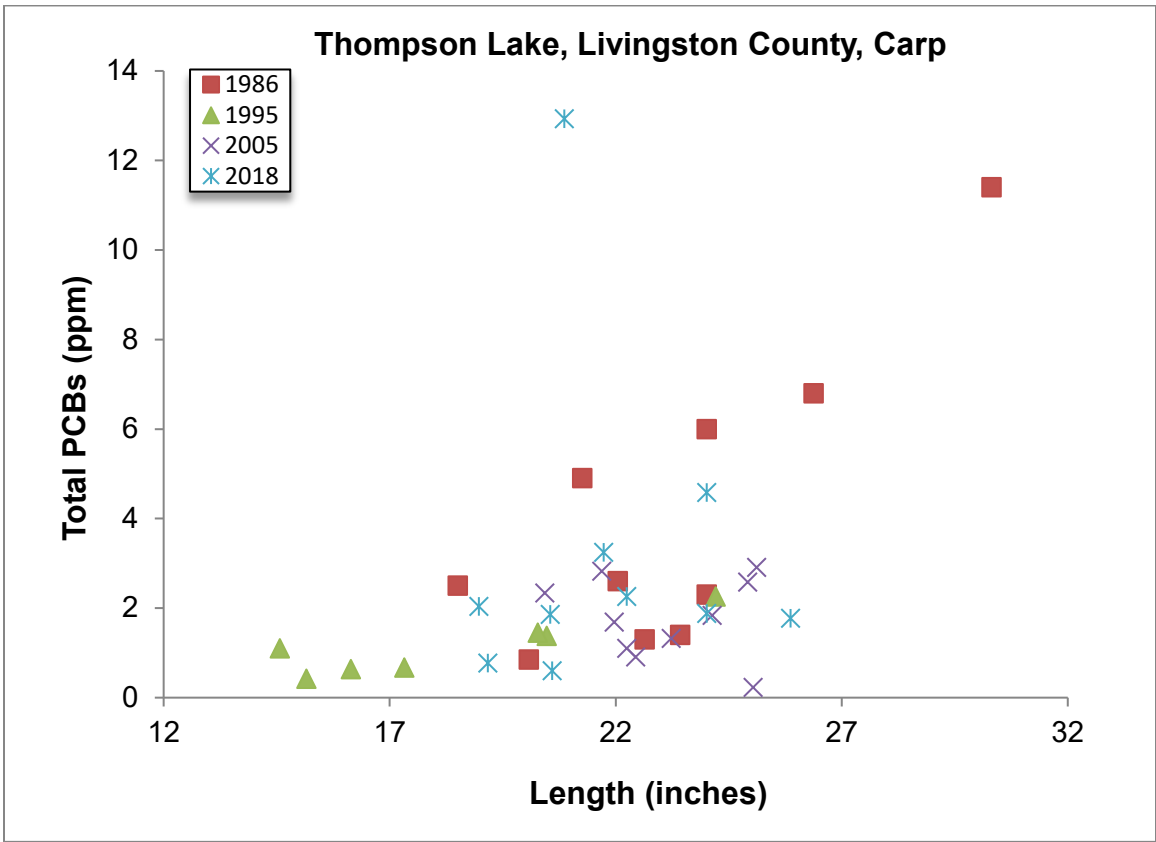
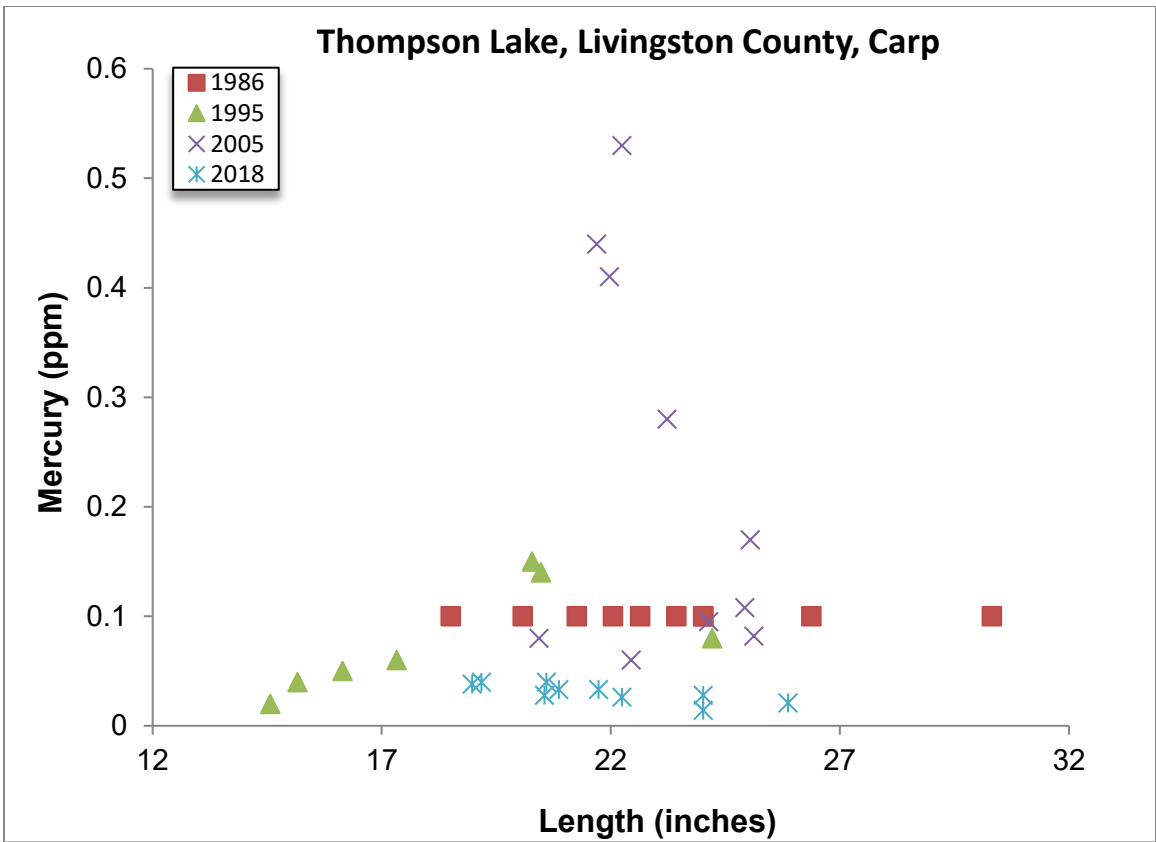
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent						
1986	2018	37	14.6	NA	14.6	30.3	
Datasets available: 1986, 1995, 2005, 2018							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	37	0.111		0.014	0.530	0.150	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.016	0.048					

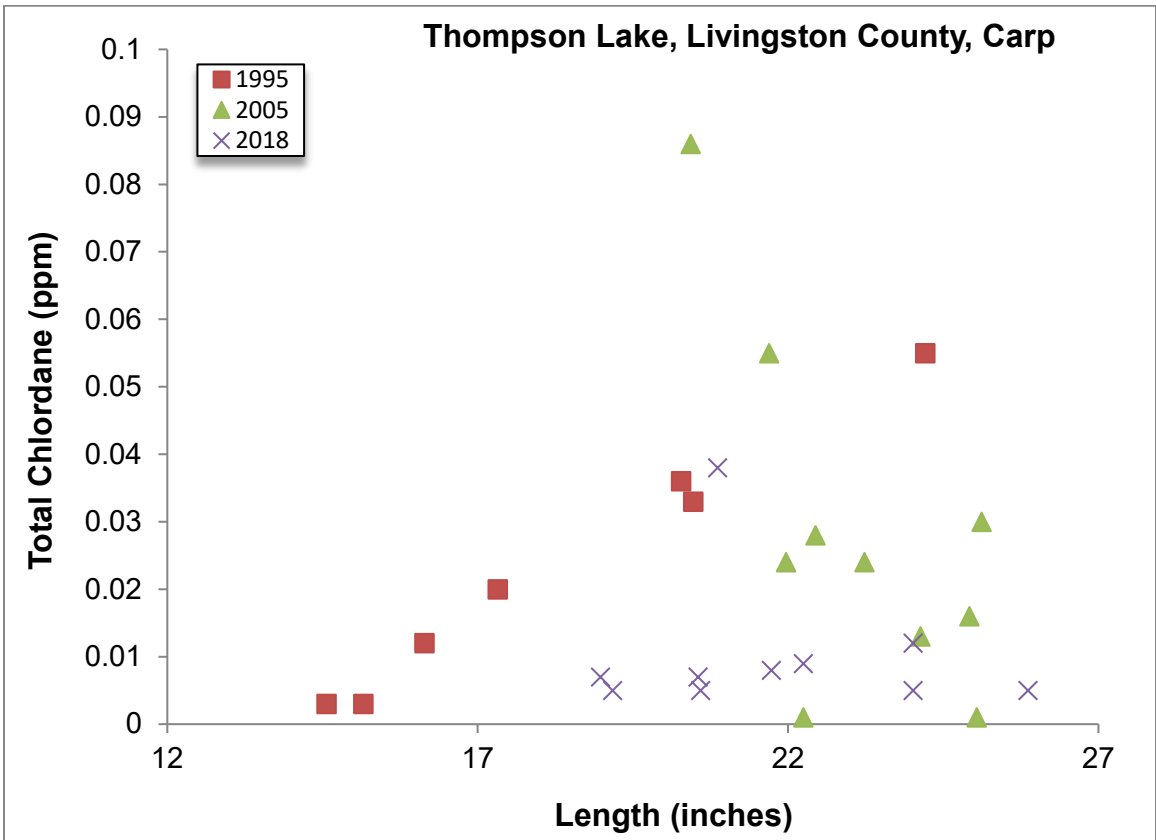
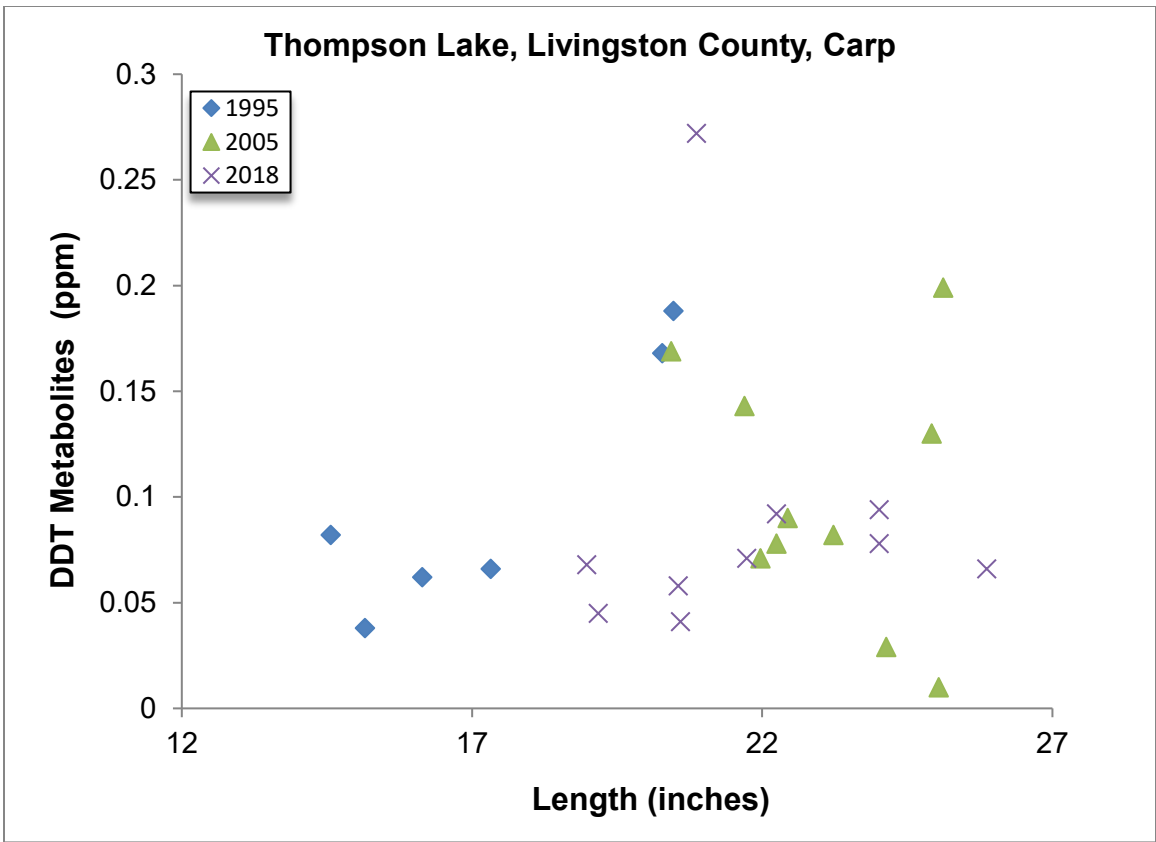
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent						
2005	2018	20	19.0	NA	19.0	25.9	
Datasets available: 1986, 1995, 2005, 2018							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	20	2.48		0.228	12.932	3.728	0
DDT	20	0.094		0.010	0.272	0.123	12
Chlordane	20	0.019		<0.001	0.086	0.029	16
Toxaphene	20	ND		--	--	--	--
PFOS	0	--		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.012	0.118					
DDT	0.002	0.089					
Chlordane	0.037	0.018					
Toxaphene	NA	NA					
PFOS	--	--					
Final meal category based on UCL:							0

Existing MDHHS Advisory: Carp of any size from Thompson Lake in Livingston County are under a limited consumption advisory.

Recommendation: No one should eat any carp of any size from Thompson Lake in Livingston county due to PCBs. Mercury and DDT causes a less restrictive advisory. Note: This change in recommendation from a limited advisory to a do not eat advisory is due to an individual carp tested in 2018 with very high PCB levels.





Northern Pike

Thompson Lake

Livingston County

Hg Analysis:

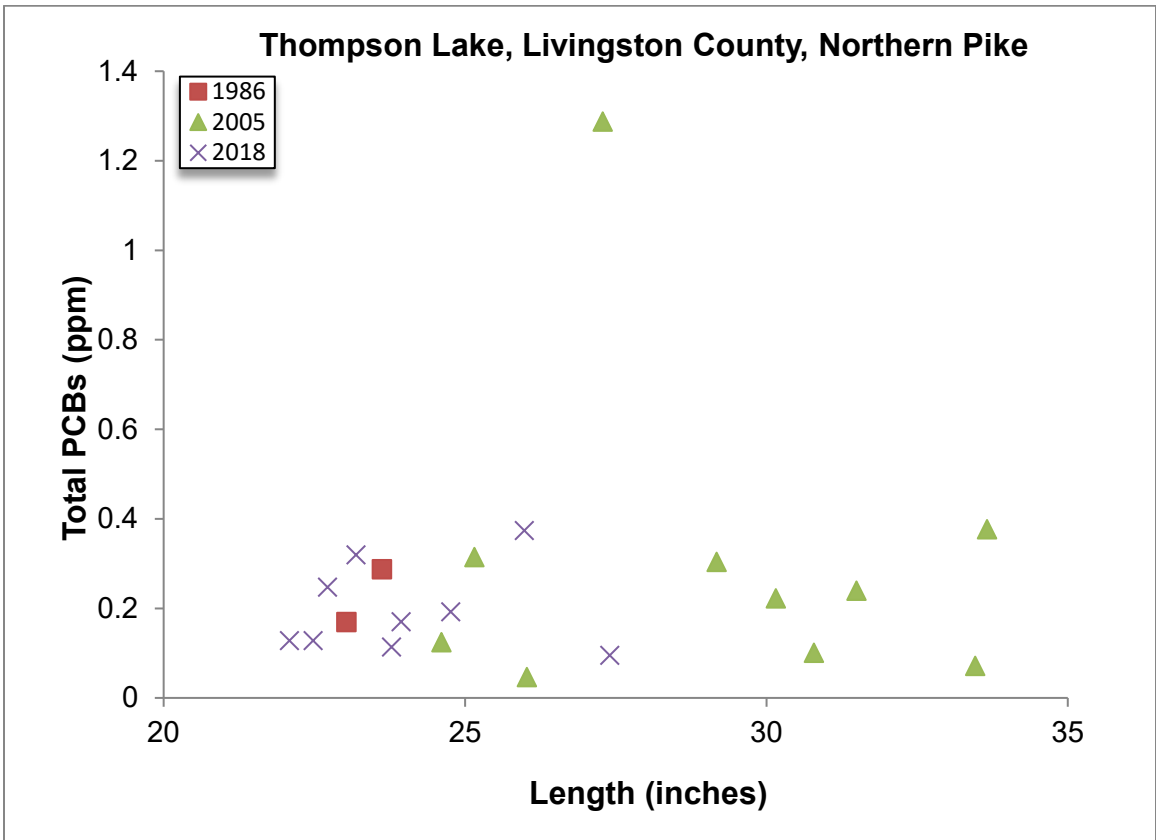
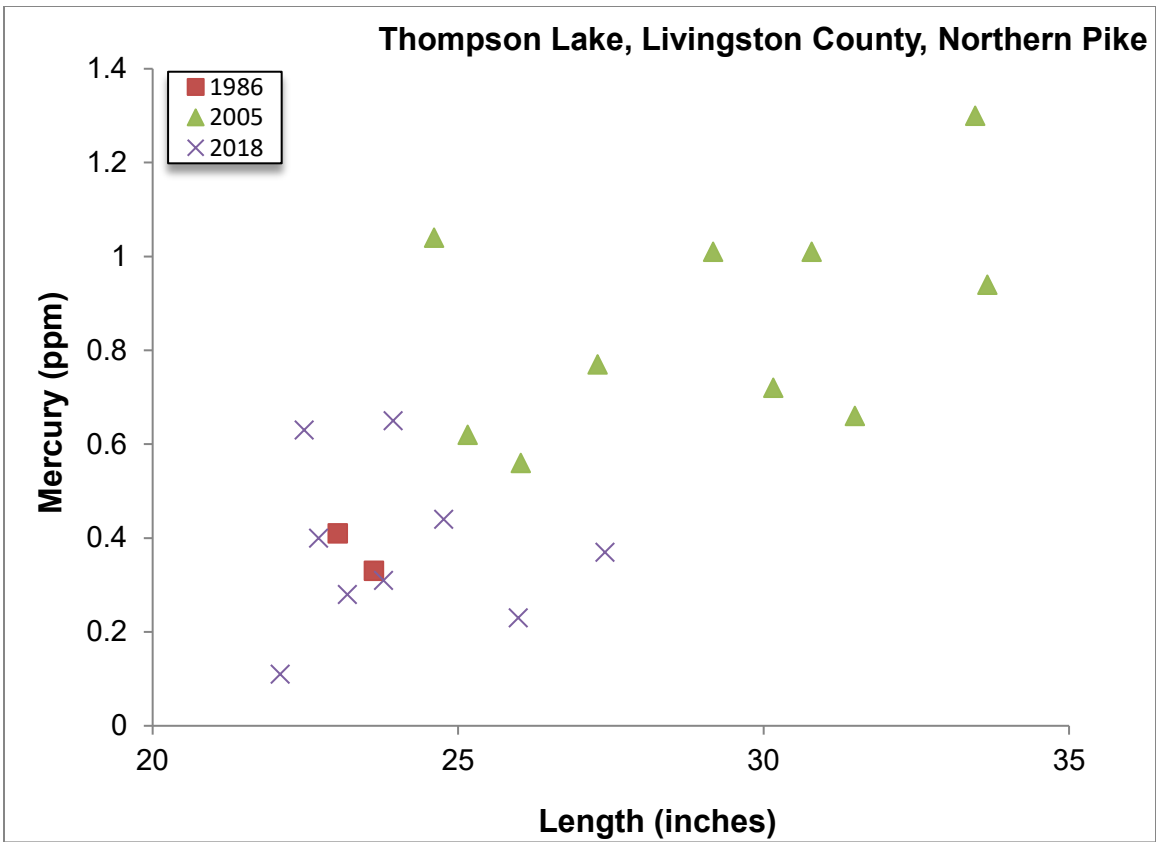
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent						
1986	2018	21	22.1	24	23.6	33.7	
Datasets available: 1986, 2005, 2018							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	16	0.685		0.230	1.300	0.850	1
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.424	0.381					

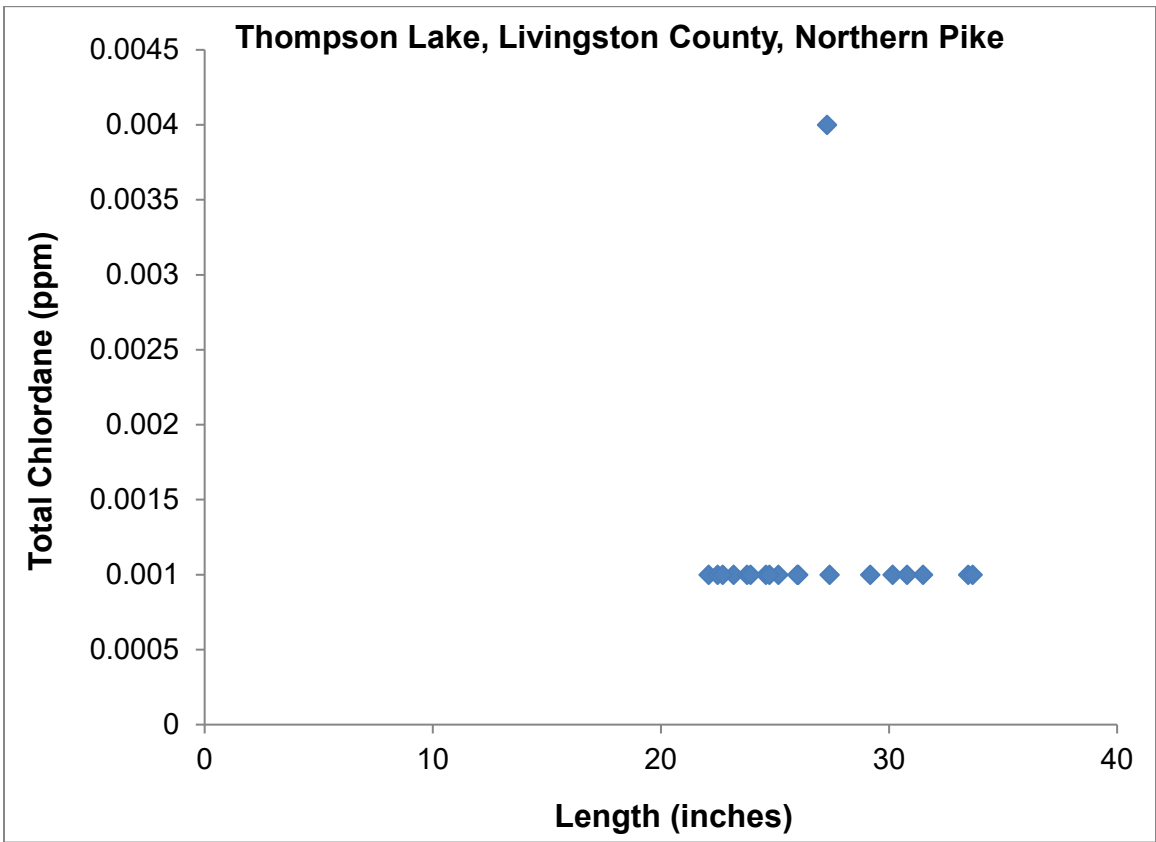
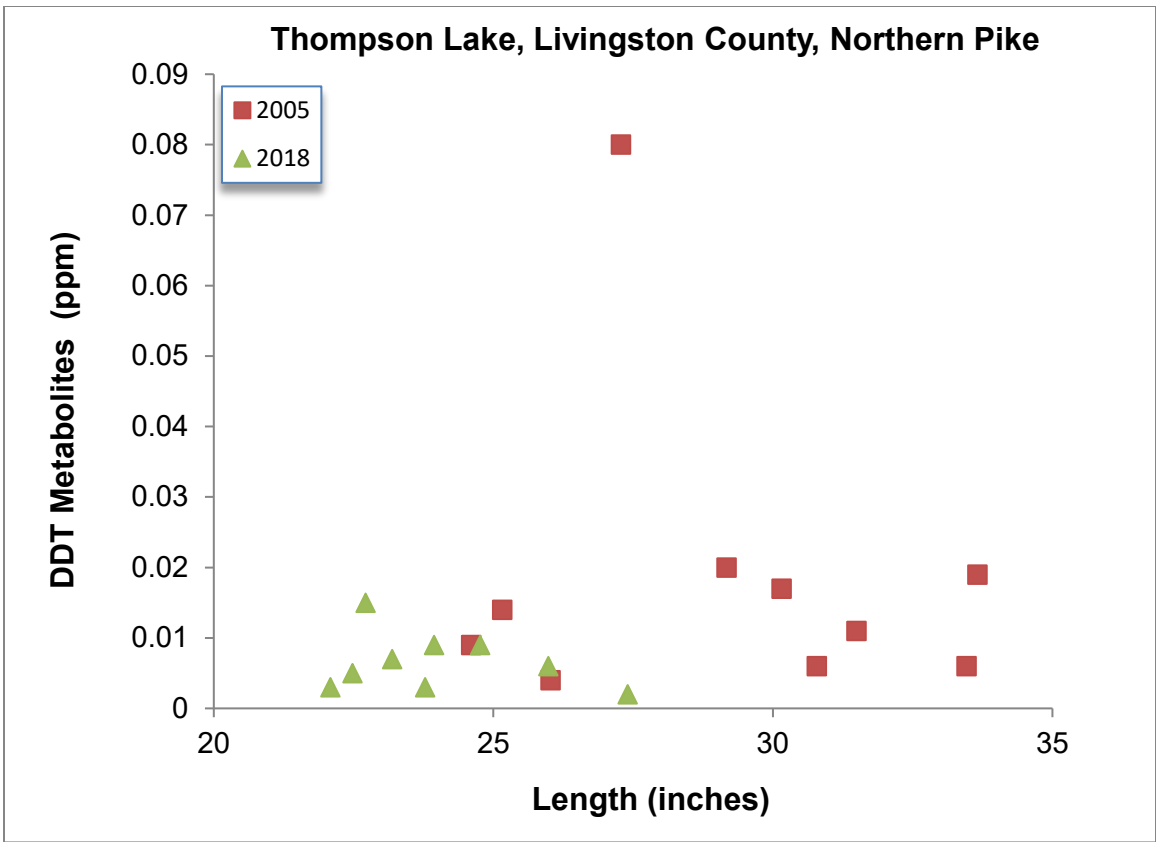
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent						
2005	2018	19	22.1	24	23.6	33.7	
Datasets available: 1986, 2005, 2018							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	15	0.269		0.047	1.288	0.436	Limited
DDT	15	0.014		0.002	0.080	0.025	16
Chlordane	15	0.001		<0.001	0.004	0.002	16
Toxaphene	15	ND		--	--	--	--
PFOS	0	--		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.005	0.002					
DDT	0.024	0.079					
Chlordane	0.001	0.001					
Toxaphene	--	--					
PFOS	--	--					
Final meal category based on UCL:							Limited

Existing MDHHS Advisory: Northern Pike of any size from Thompson Lake in Livingston County are under a limited consumption advisory.

Recommendation: No change to the recommendation is warranted. Mercury causes a less restrictive advisory. Note: This recommendation is largely driven by one individual with elevated PCBs collected in 2005. This lake should be resampled in 2023 (or thereabouts) to see if any other individuals have elevated PCBs compared to the rest of the data set.





Yellow Perch

Thompson Lake

Livingston County

Hg Analysis:

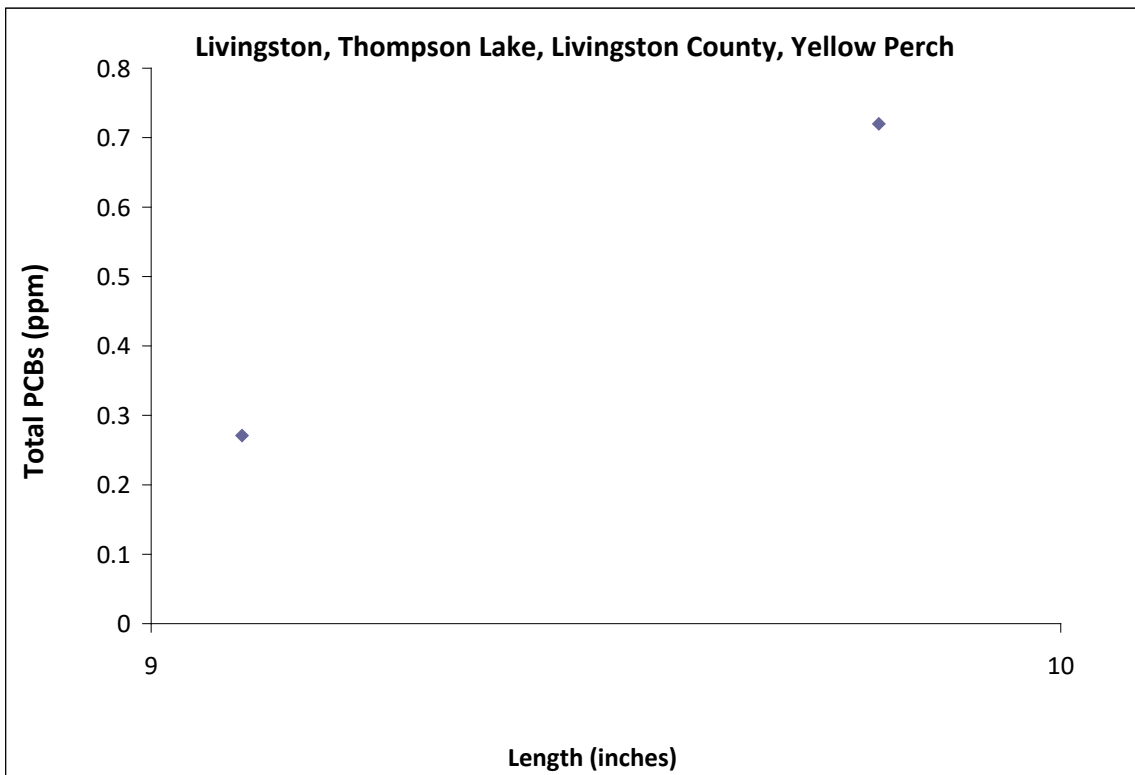
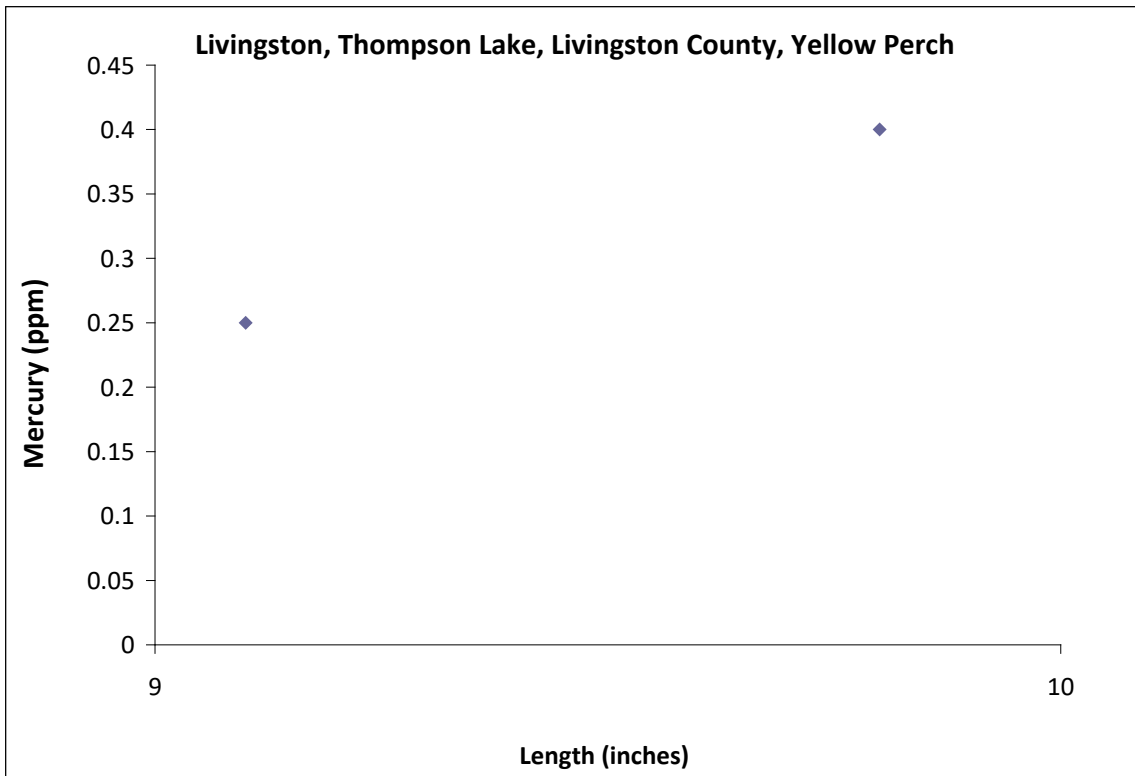
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1986	1986	2	9.1	na	9.1	9.8
Datasets available: 1986						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	2	0.325		--		--
Chemical	Linear Regression	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	2	9.1	na	9.1	9.8
Datasets available: 1986						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	2	0.496		--		--
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: Thompson Lake yellow perch over 9 inches are covered by the Statewide mercury advisory.

Recommendation: Waterbody-wide advisory of limited consumption of any species applies to South Branch Shiawassee River and include yellow perch. Thompson Lake has legacy PCB contamination that has not been remediated. This dataset is limited by age and sample size, and cannot be used to set a species specific advisory.



**Bluegill and
Pumpkinseed**

Whitmore Lake

Livingston County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2019	2019	10	7.2	na	7.2	8.9
Datasets available: 2019						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.05	0.03	0.11	0.07	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.057	0.042				

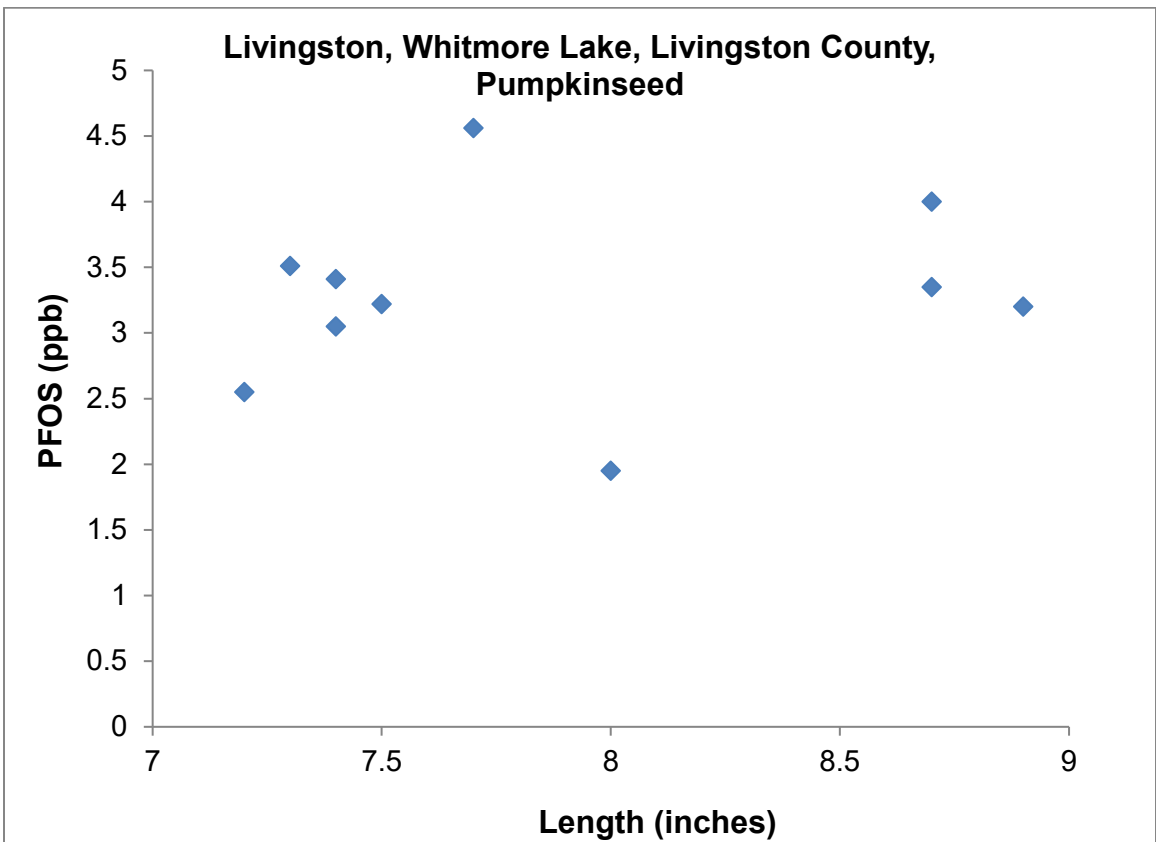
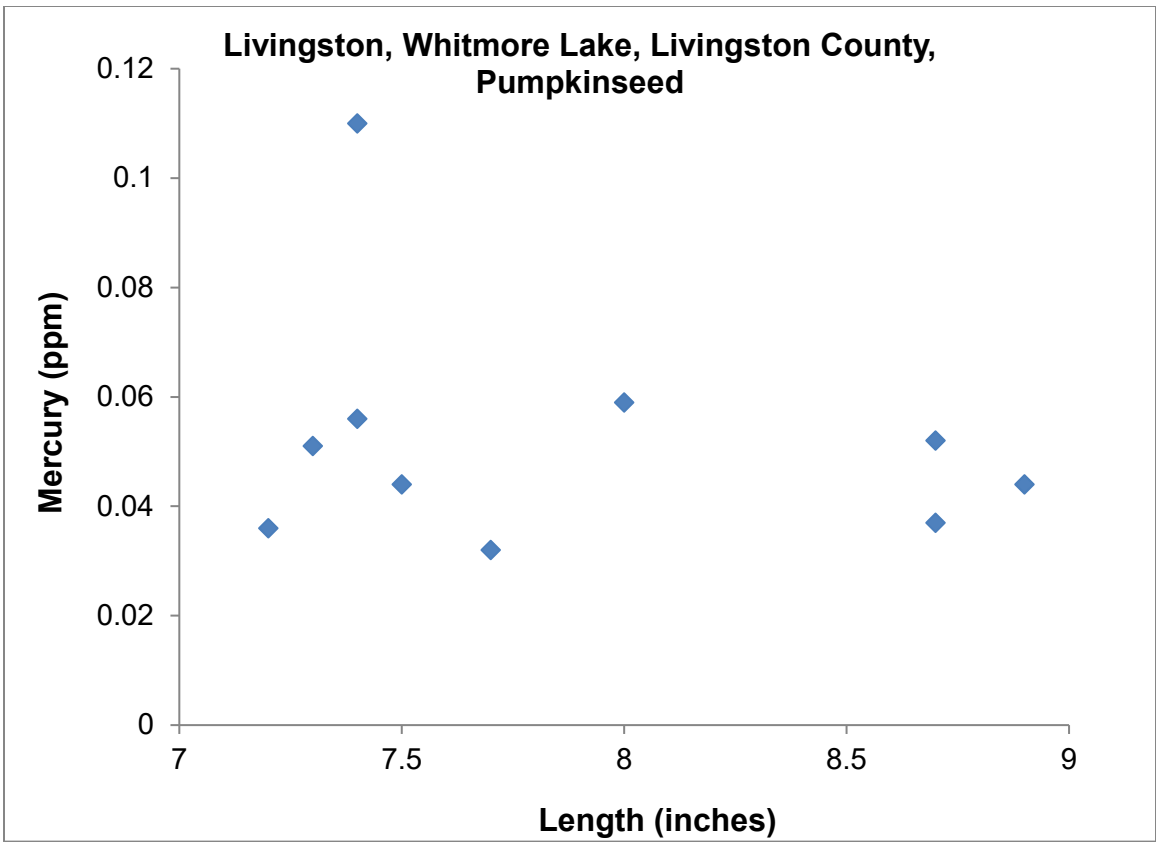
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2019	2019	10	7.2	na	7.2	8.9
Datasets available: 2019						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
PFOS	10	3 ppb	2 ppb	4.6 ppb	3.8 ppb	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.021	0.019				
Final meal category based on UCL:						16

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

Recommendation: No one should eat more than 16 meals per month of Whitmore Lake bluegill and pumpkinseed sunfish due to mercury. No other consumption guidelines are needed for Whitmore Lake bluegill or sunfish.

Note: Northern pike sampled in 2008 had higher than average mercury concentrations, however all but one bluegill/sunfish sampled in 2019 had concentrations below 0.07 ppm (the lowest MDHHS screening value).



Carp

Whitmore Lake

Livingston County

Hg Analysis:

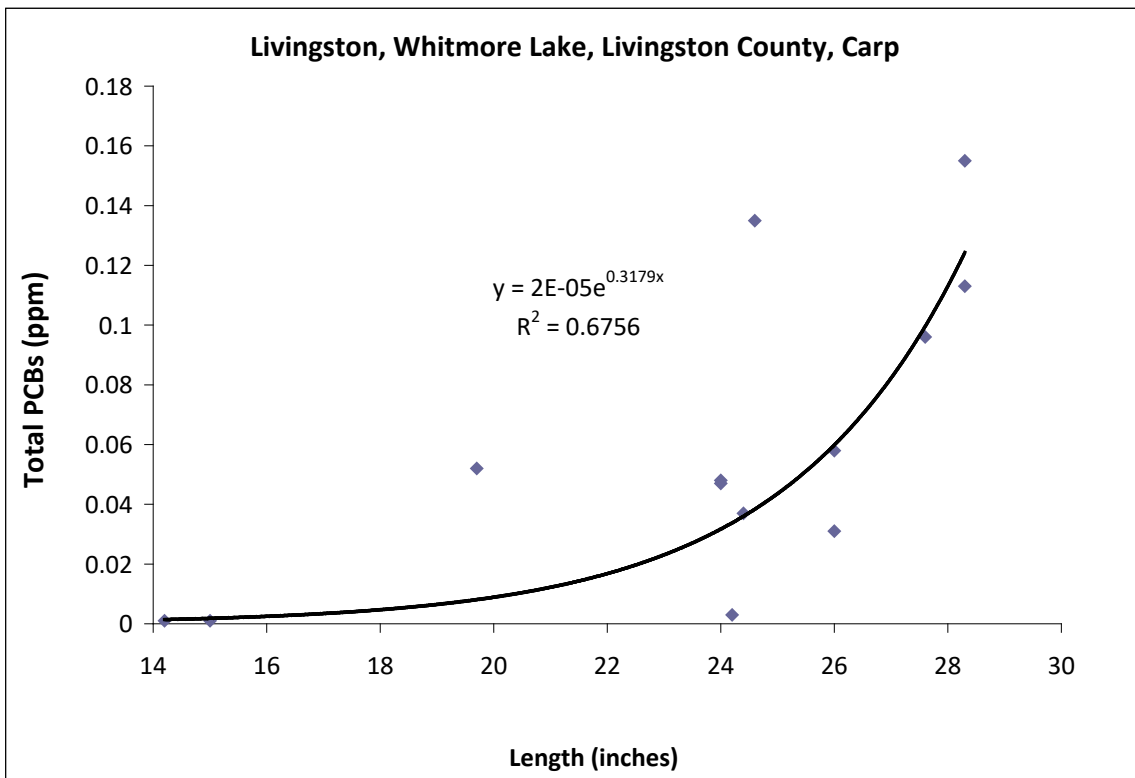
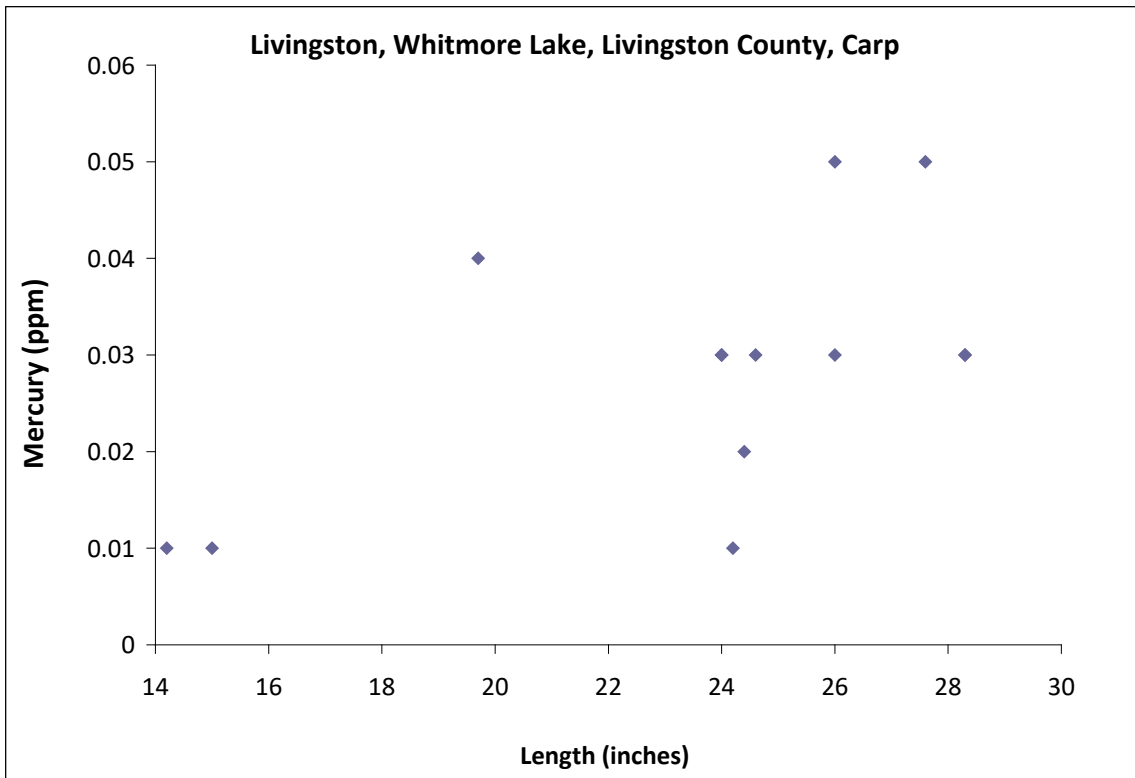
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1992	2008	13	14.2	na	14.2	28.3
Datasets available: 1992, 2008						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL	Meal Category
Mercury	13	0.028			0.040	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.336	0.437				

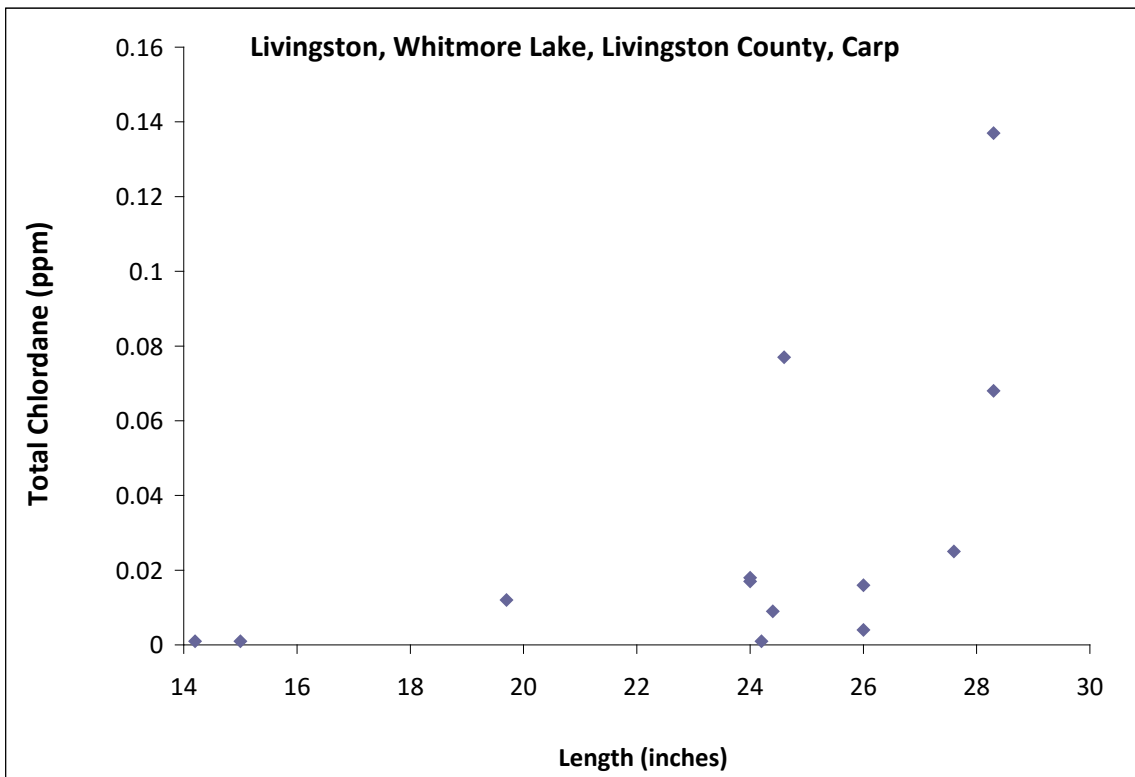
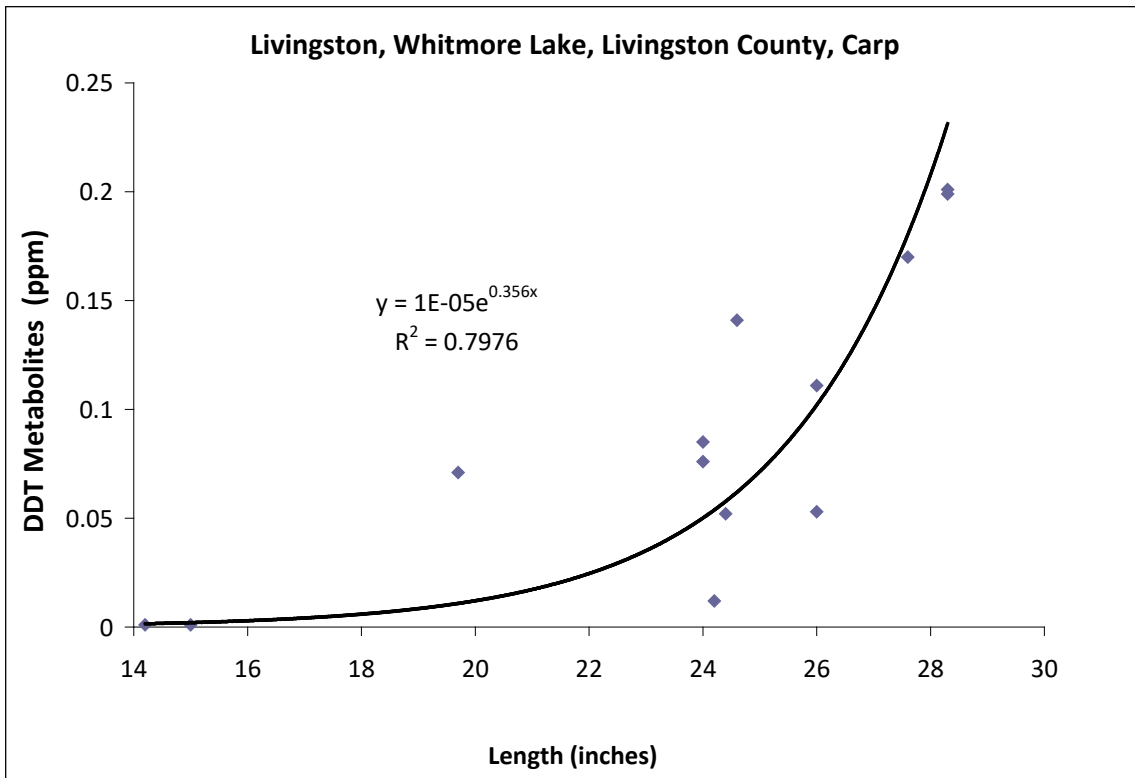
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1992	2008	13	14.2	na	14.2	28.3
Datasets available: 1992, 2008						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL	Meal Category
PCB	13	0.060			0.090	2
DDT	13	0.090			0.130	12
Chlordane	13	0.030			0.050	--
Toxaphene	13	ND			--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.453	0.676*	*significant only when the 3 2008 samples are included			
DDT	0.590	0.798				
Chlordane	0.273	0.520				
Toxaphene	--	--				
Final meal category based on UCL:						2

Existing Advisory: Due to elevated levels of PCBs, women and children should eat no more than one meal per week of Whitmore Lake carp greater than 22 inches in length.

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





Largemouth Bass

Whitmore Lake

Livingston County

Hg Analysis:

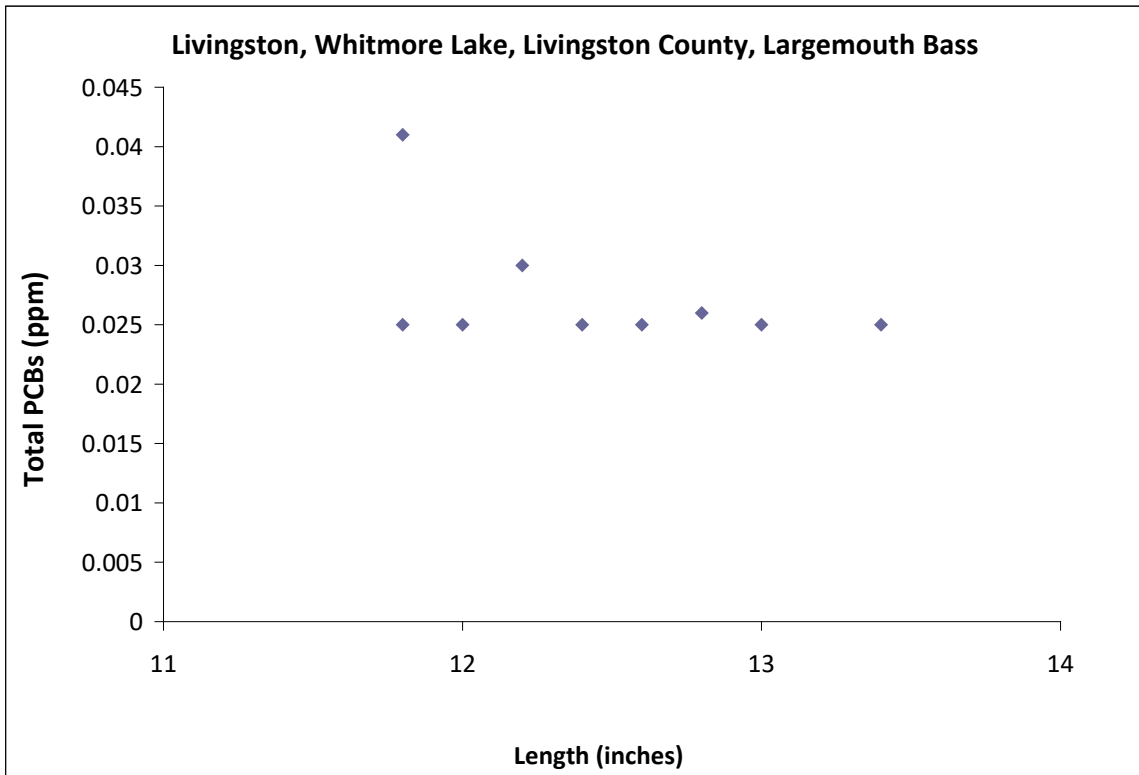
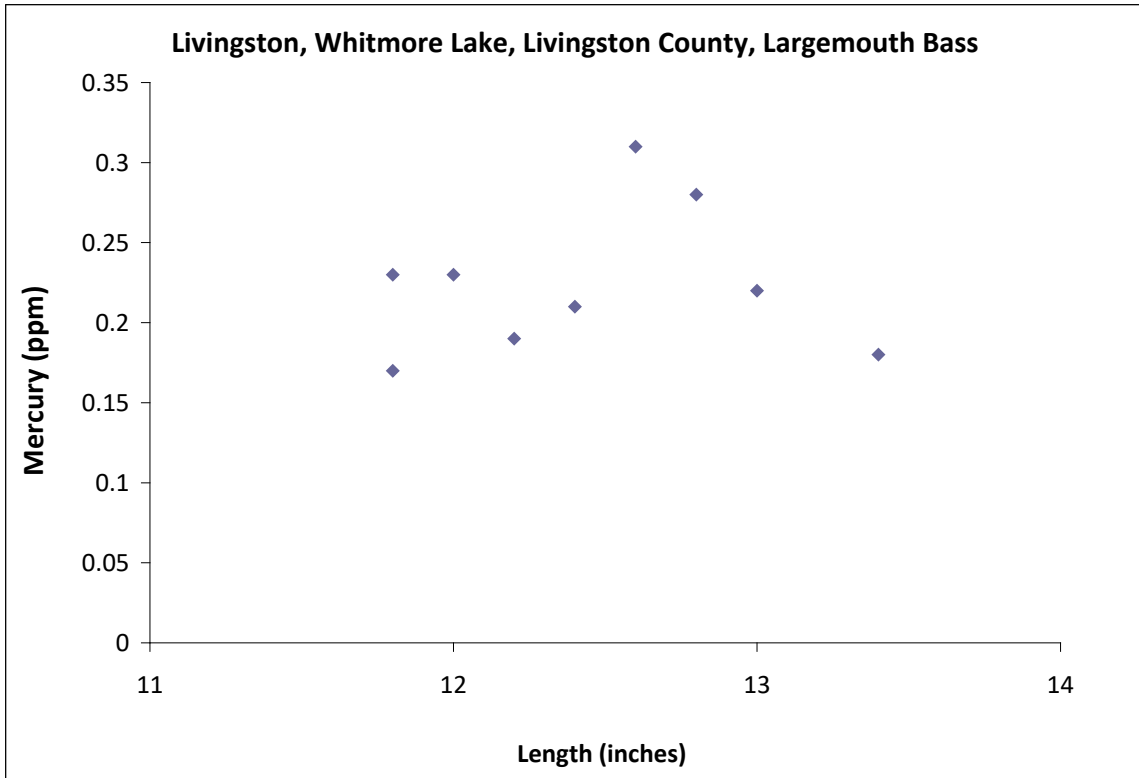
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of all Samples	
Earliest	Most Recent				Min	Max
1992	1992	9	11.8	14	11.8	13.4
Datasets available: 1992						
Chemical	Sample Size (Sub-Legal)	Mean (ppm)	95%UCL		Meal Category	
Mercury	9	0.224	0.260		4	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.017	0.014				

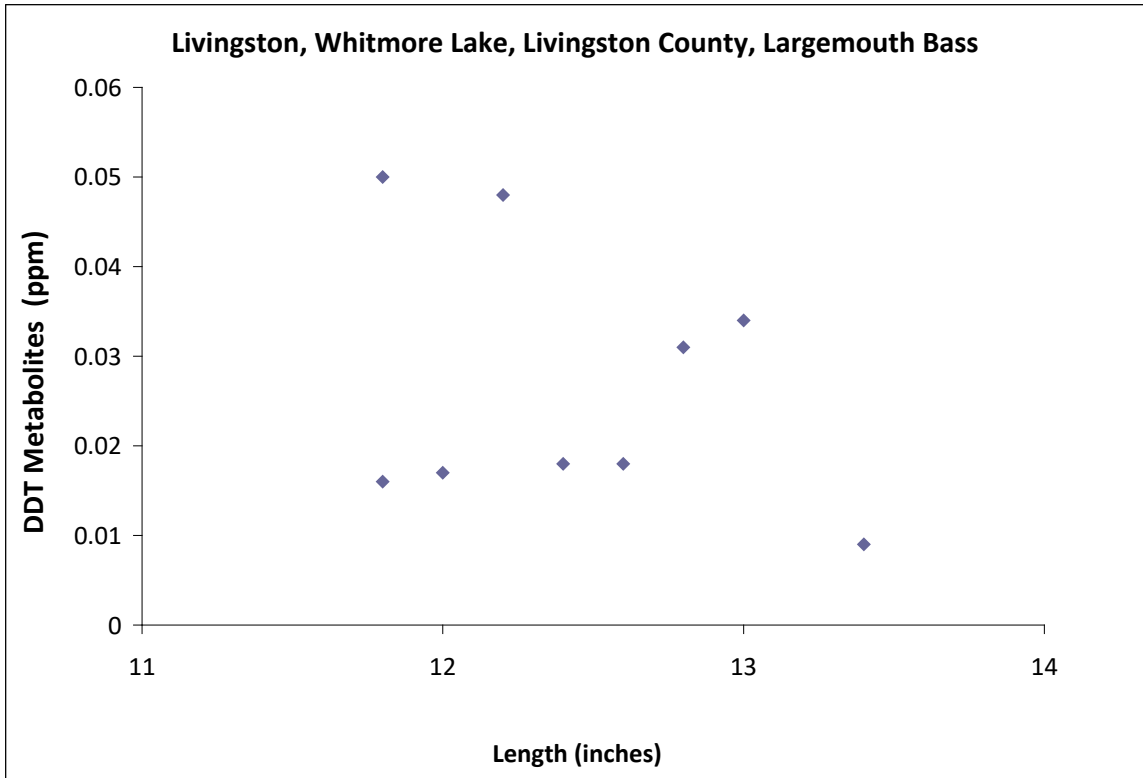
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of All Samples	
Earliest	Most Recent				Min	Max
1992	1992	9	11.8	14	11.8	13.4
Datasets available: 1992						
Chemical	Sample Size (Sub-Legal)	Mean (ppm)	95%UCL		Meal Category	
PCB	9	0.027	0.030		8	
DDT	9	0.027	0.040		12	
Chlordane	9	ND	--		--	
Toxaphene	9	ND	--		--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.453	0.676				
DDT	0.590	0.798				
Chlordane	0.273	0.520				
Toxaphene	--	--				
Final meal category based on UCL:						4

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

Recommendation: Statewide guidelines apply to Whitmore Lake largemouth bass due to mercury. This dataset is limited due to the age of the data and the use of sub-legal sizes.





Northern Pike

Whitmore Lake

Livingston County

Hg Analysis:

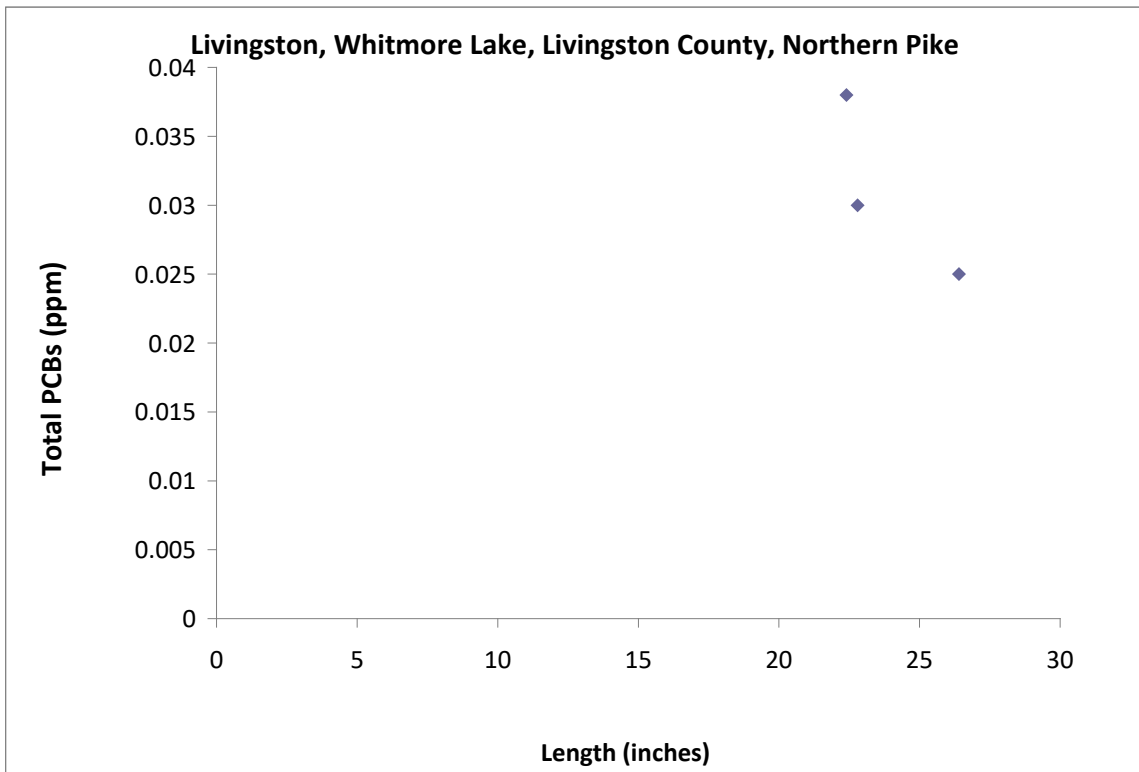
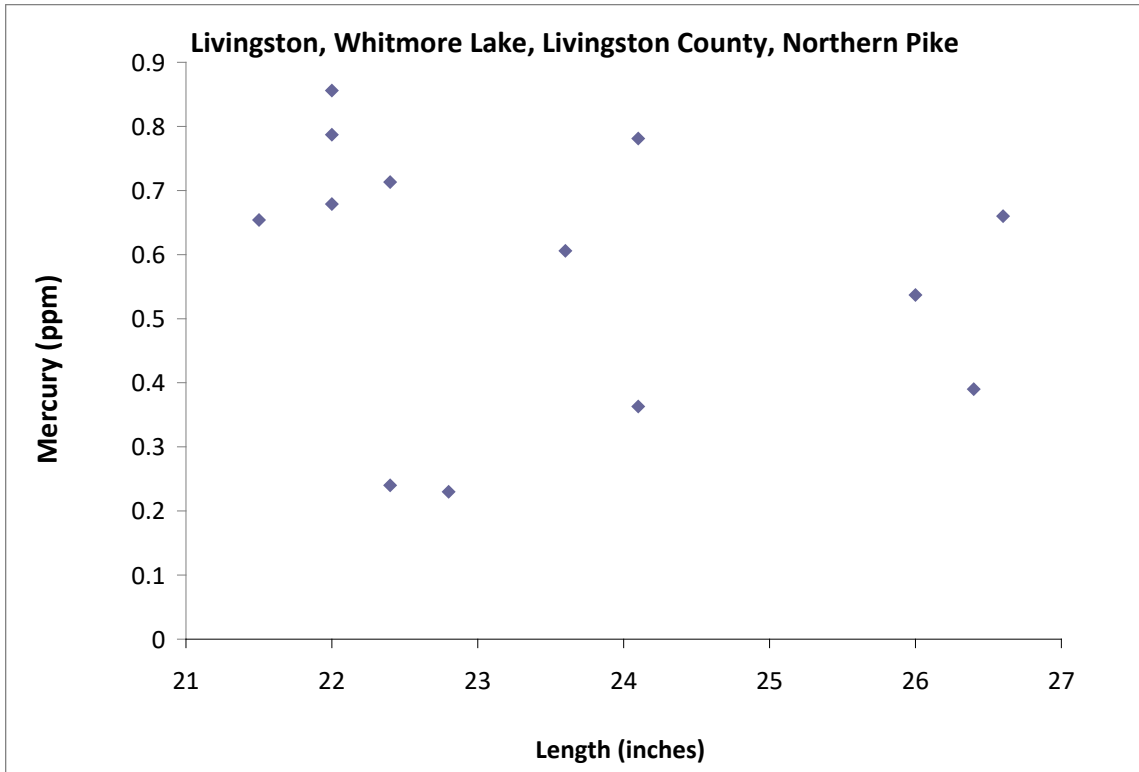
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1992	2008	13	21.5	24	23.6	26.6
Datasets available: 1992, 2008						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	6	0.556		0.720	1	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.046	0.014				

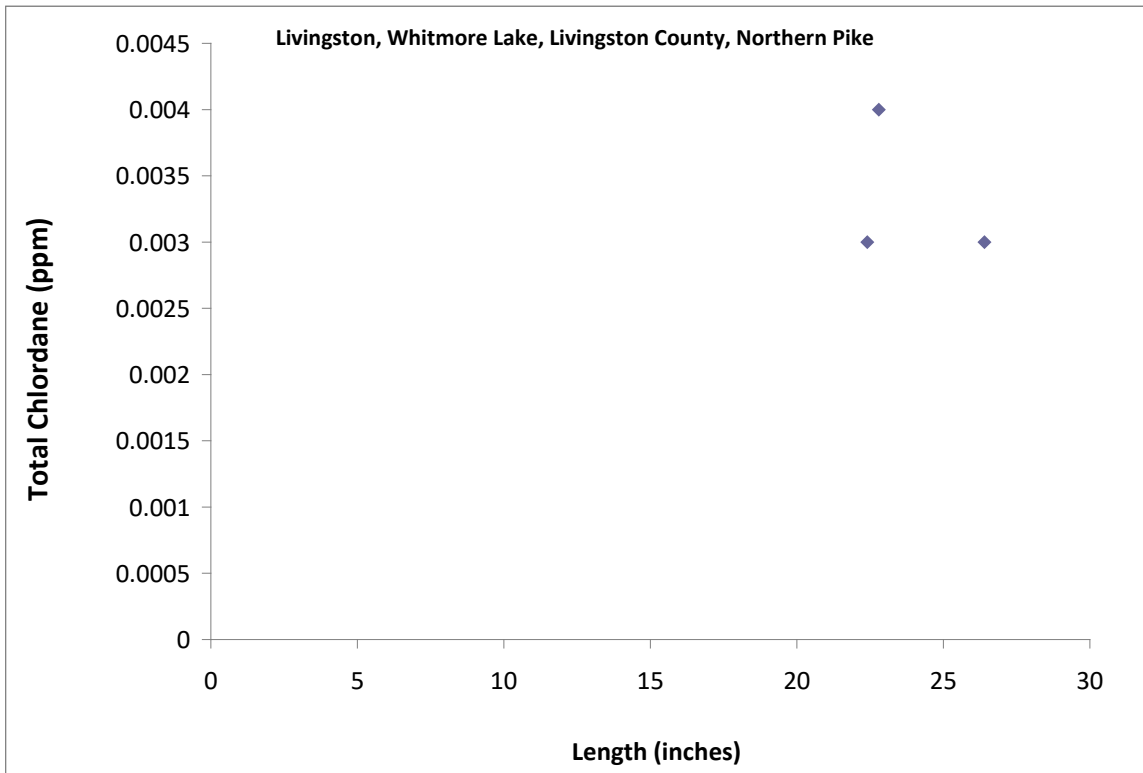
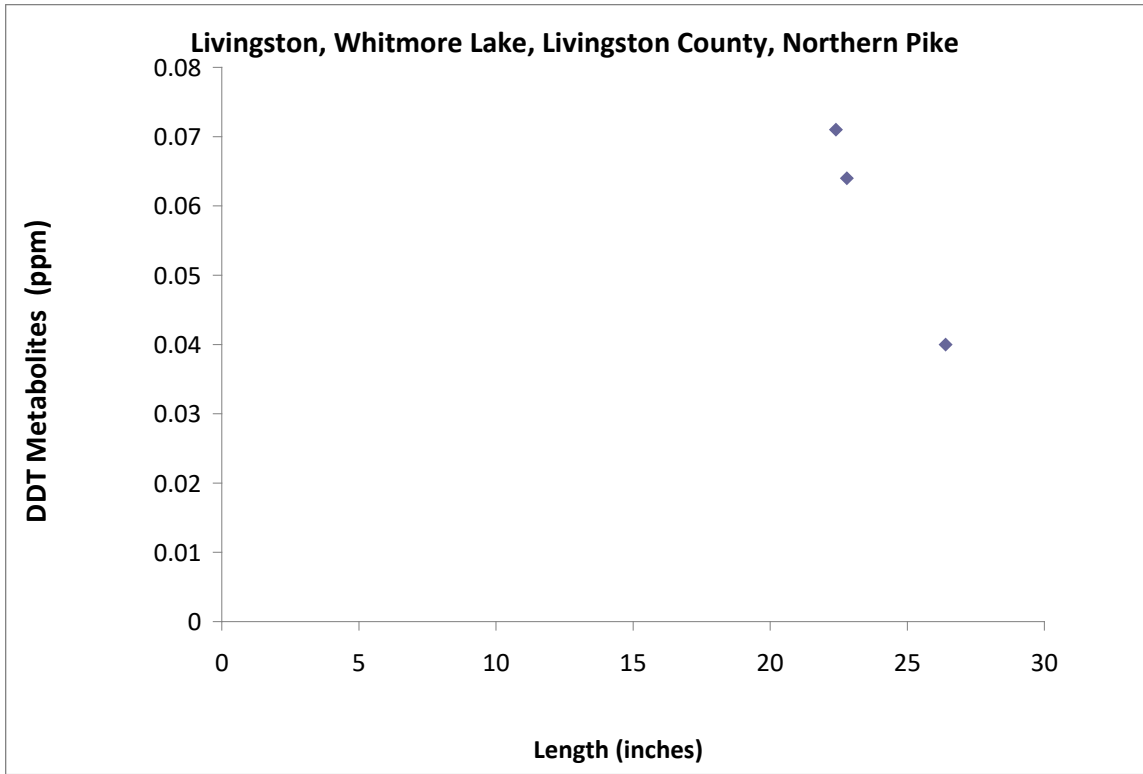
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1992	1992	3	22.4	24	26.4	26.4
Datasets available: 1992						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	1	ND		--	--	
DDT	1	0.040		--	--	
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	

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

Recommendation: No one should eat more than 1 meal per month of Whitmore Lake northern pike less than 30 inches or 6 meals per year of Whitmore Lake northern pike great than 30 inches due to mercury. Statewide guideline length break was applied.





**Bluegill and
Pumpkinseed**

Woodland Lake

Livingston County

Hg Analysis:

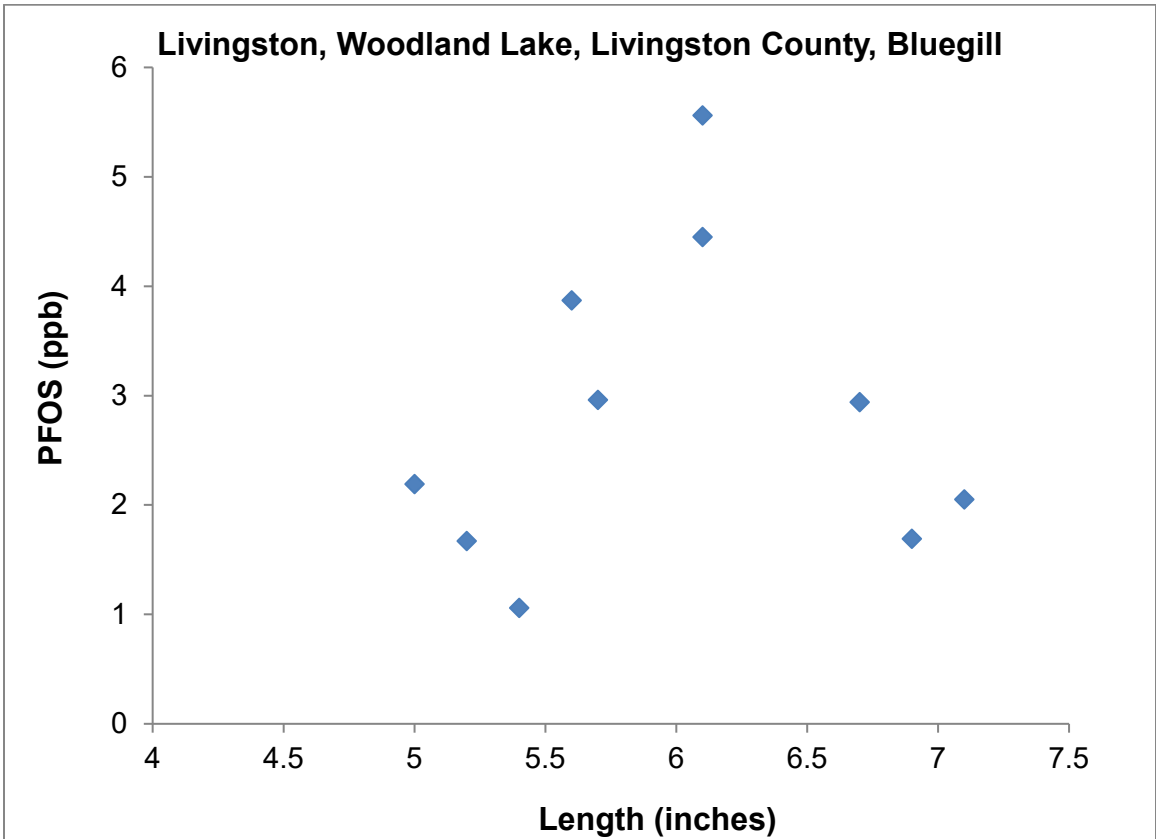
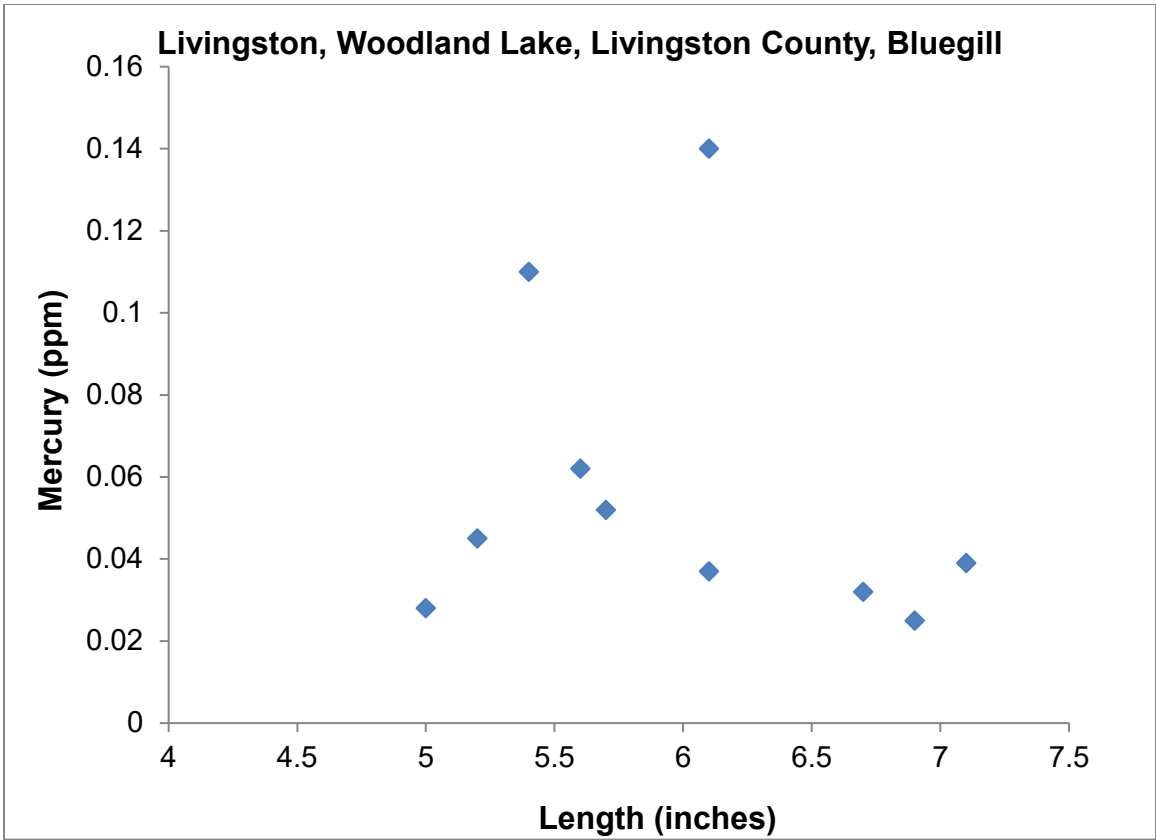
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2019	2019	10	5	na	5	7.1
Datasets available: 2019						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.06	0.02	0.14	0.08	12
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.046	0.080				

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	na	5	7.1
Datasets available: 2019						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
PFOS	10	3 ppb	1 ppb	6 ppb	4 ppb	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.008	0.017				
Final meal category based on UCL:						12

Existing MDHHS Advisory: Woodland 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 12 meals per month of Woodland Lake bluegill or pumpkinseed sunfish of any size due to mercury.



Carp

Woodland Lake

Livingston County

Hg Analysis:

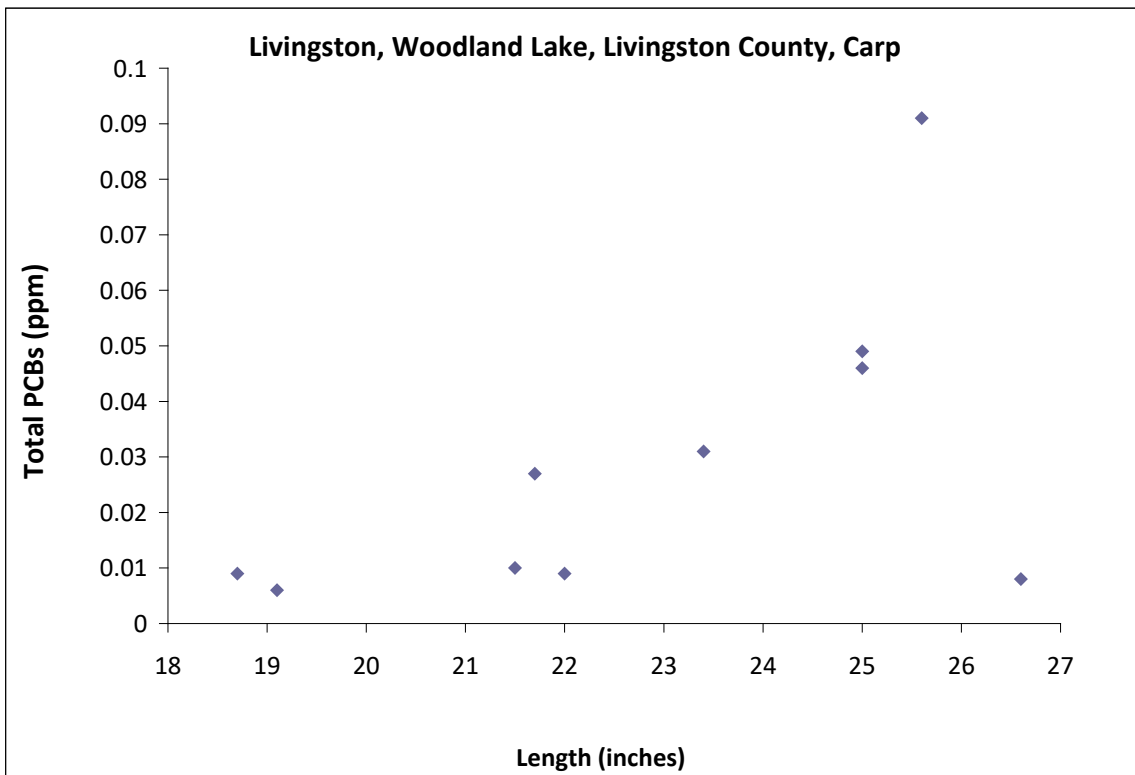
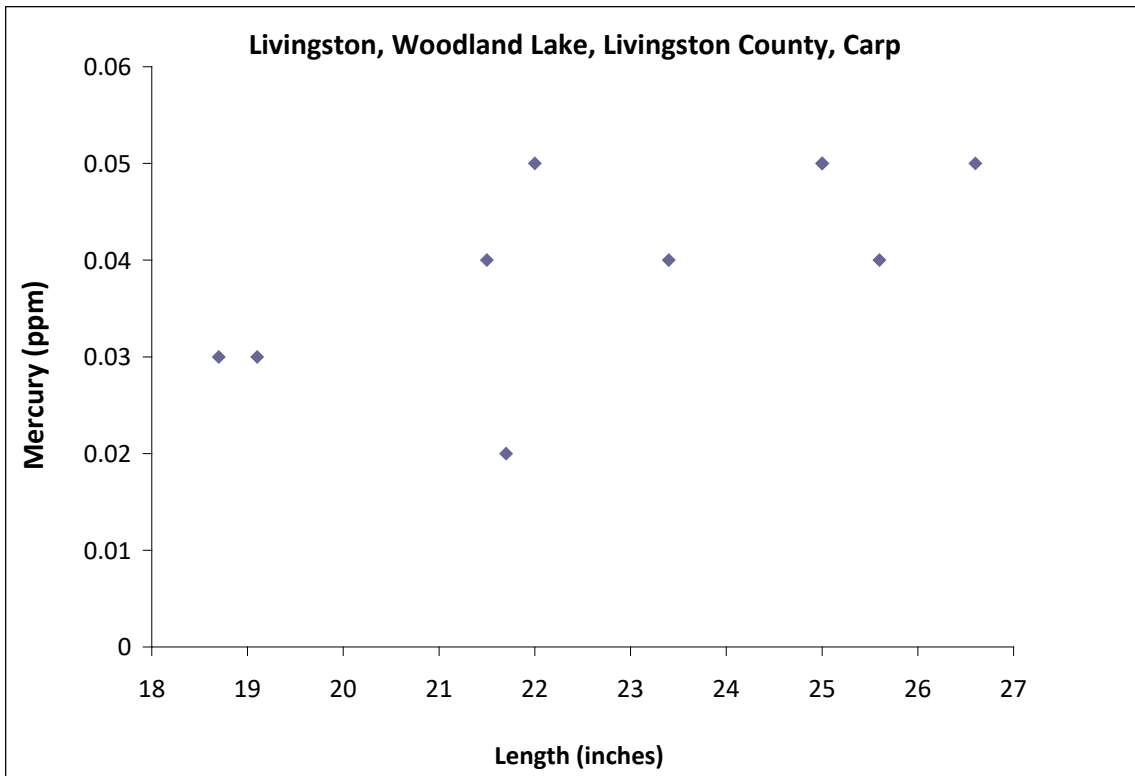
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2000	2000	10	18.7	na	18.7	26.6
Datasets available: 2000						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	10	0.040		0.050	16	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.456	0.397				

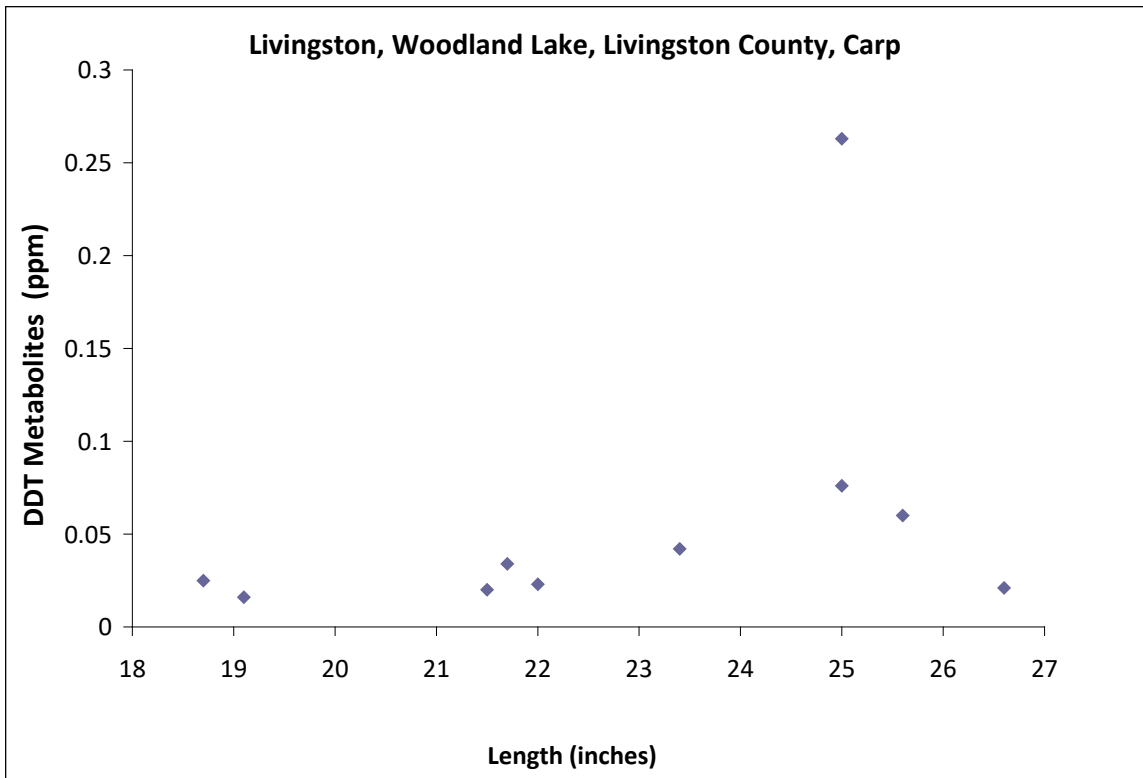
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2000	2000	10	18.7	na	18.7	26.6
Datasets available: 2000						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	10	0.029		0.050	4	
DDT	10	0.058		0.110	16	
Chlordane	10	ND		--	--	
Toxaphene	10	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.338	0.354				
DDT	0.165	0.293				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						4

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

Recommendation: No one should eat more than 4 meals per month of Woodland Lake carp due to PCBs.





Largemouth Bass

Woodland Lake

Livingston County

Hg Analysis:

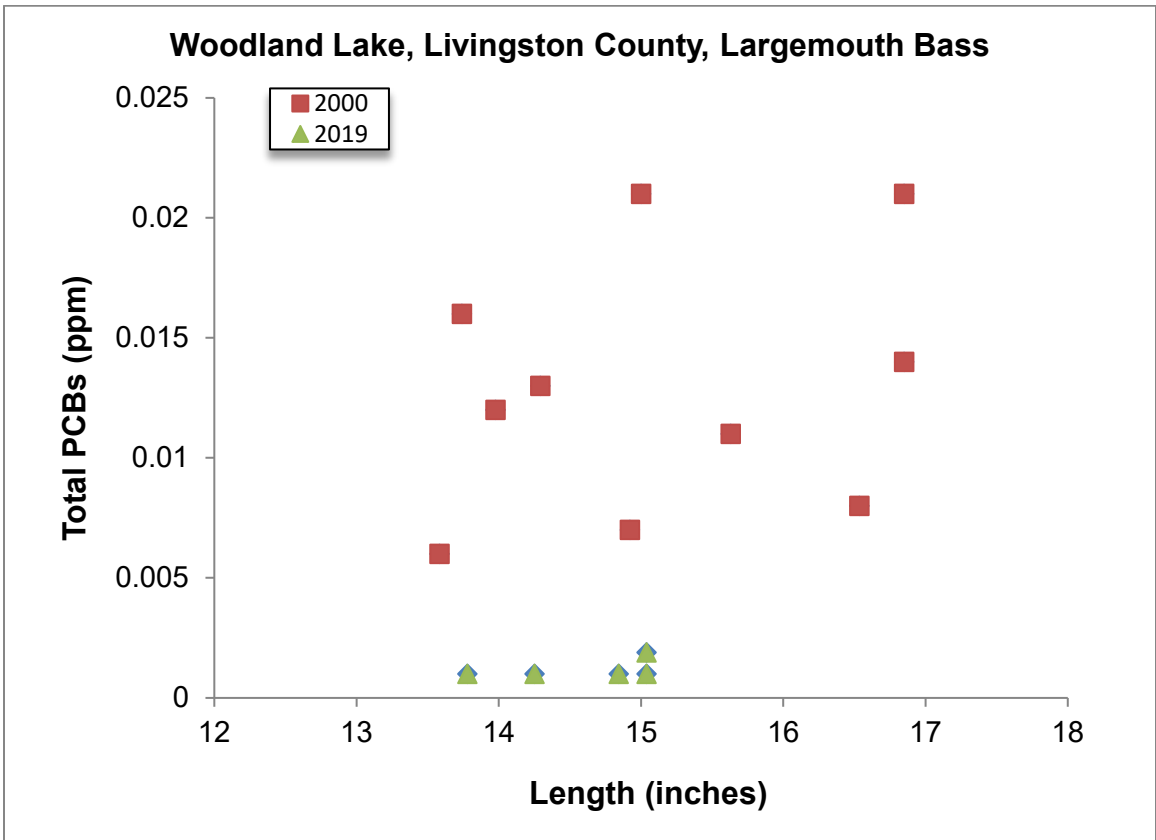
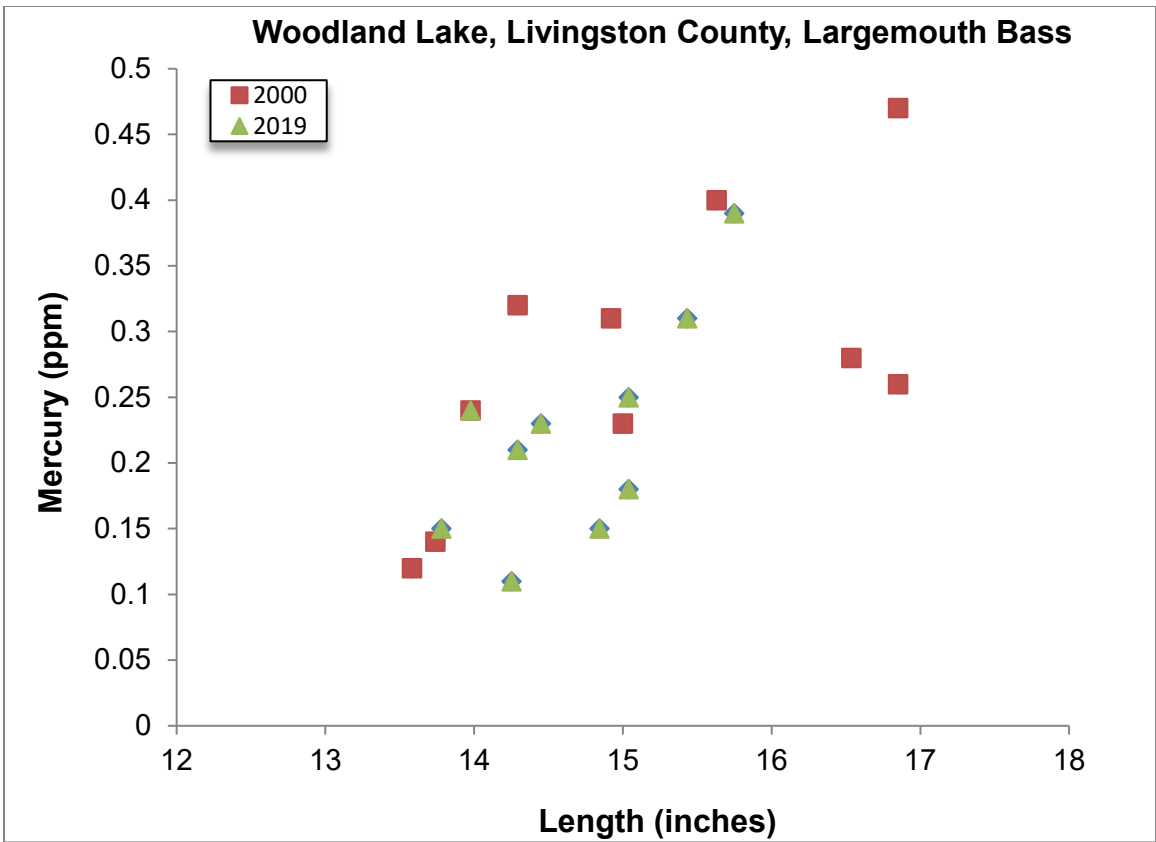
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent					
2000	2019	20	13.6	14	13.6	16.9
Datasets available: 2000, 2019						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	20	0.250	0.110	0.470	0.295	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.461	0.443				

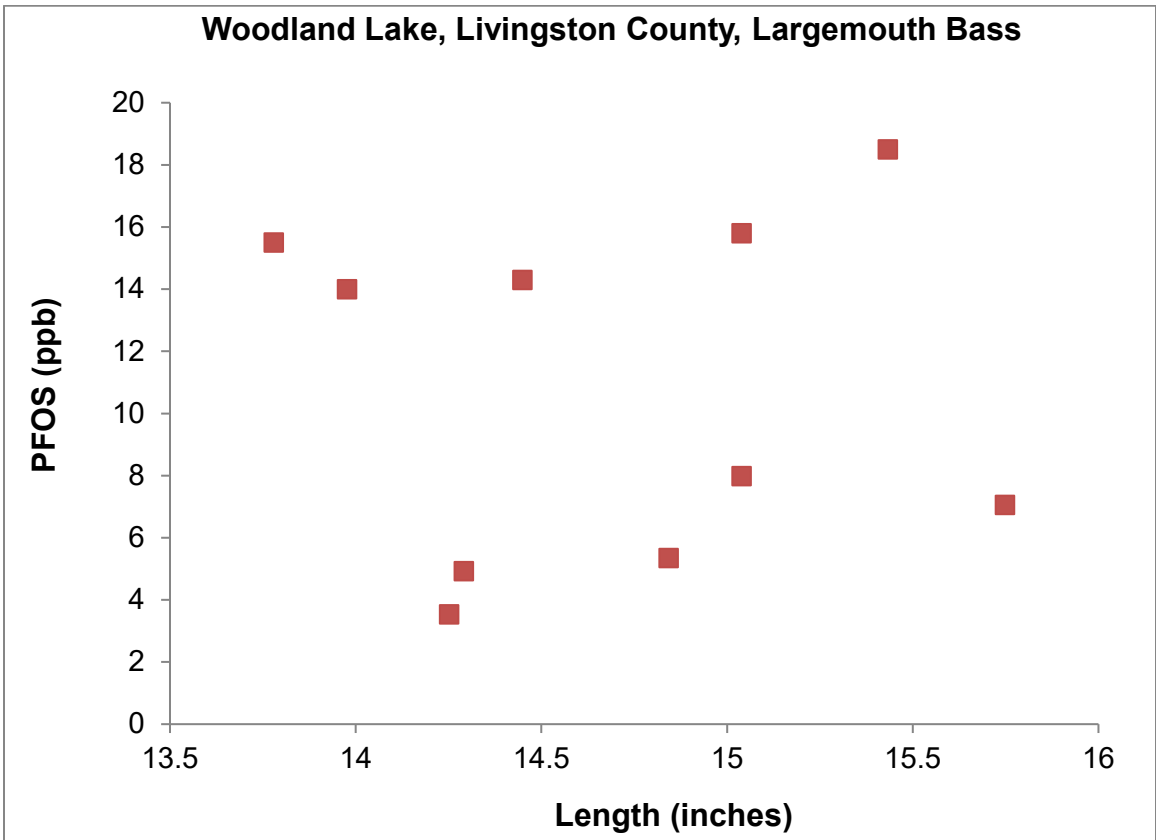
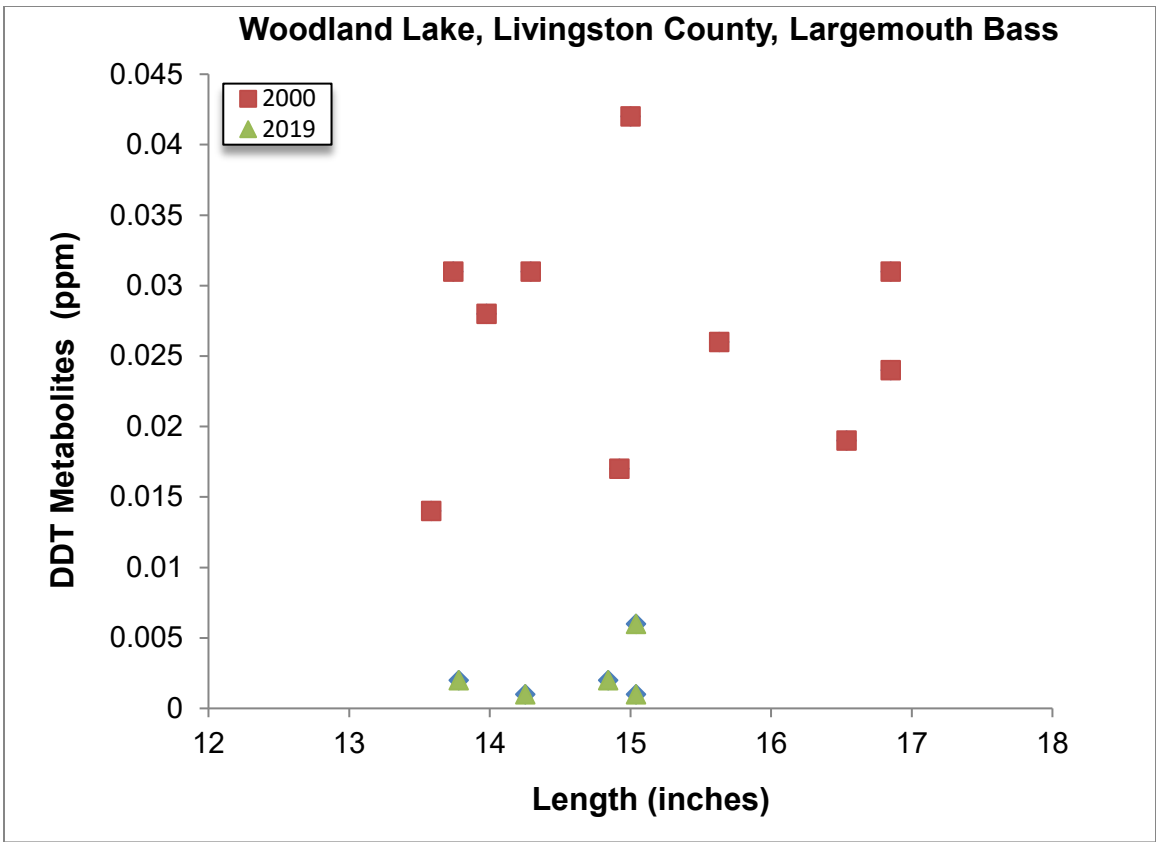
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent					
2000	2019	15	13.6	14	13.6	16.9
Datasets available: 2000 (No PFOS); 2019						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	15	0.009	<0.001	0.021	0.013	12
DDT	15	0.018	<0.001	0.042	0.026	16
Chlordane	15	ND	--	--	--	--
Toxaphene	15	ND	--	--	--	--
PFOS	10	10.7 ppb	3.5 ppb	18.5 ppb	14.6 ppb	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.367	0.367				
DDT	0.049	0.067				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.000	0.001				
Final meal category based on UCL:						2

Existing MDHHS Advisory: No one should eat more than 2 meals per month of Woodland Lake largemouth bass less than 18 inches or more than 1 meal per month of Woodland Lake largemouth bass greater than 18 inches due to mercury. The statewide length break was applied.

Recommendation: No change to the advisory is recommended. PFOS should be added to the list of contaminants that cause an advisory in this species.





Macomb County

Largemouth Bass

Clear Spring Lake

Macomb County

Hg Analysis:

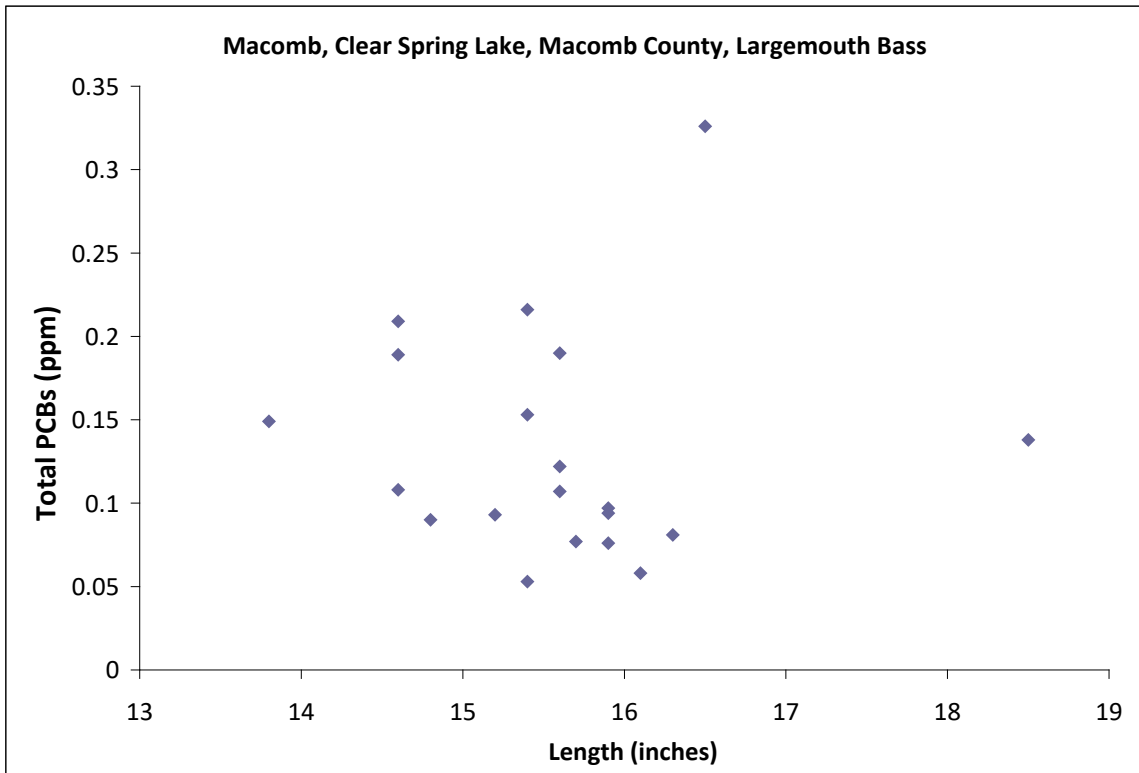
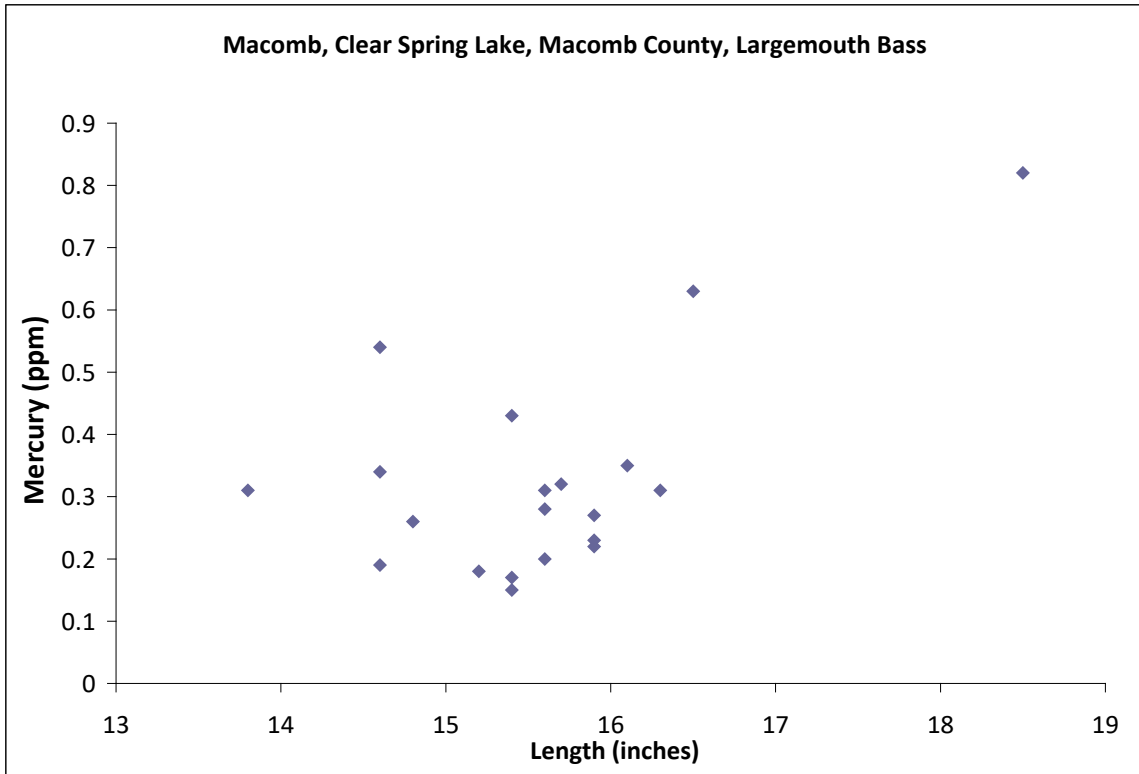
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1999	1999	20	13.8	14	13.8	18.5
Datasets available: 1999						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
Mercury	20	0.3255		0.400	2	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.319	0.207				

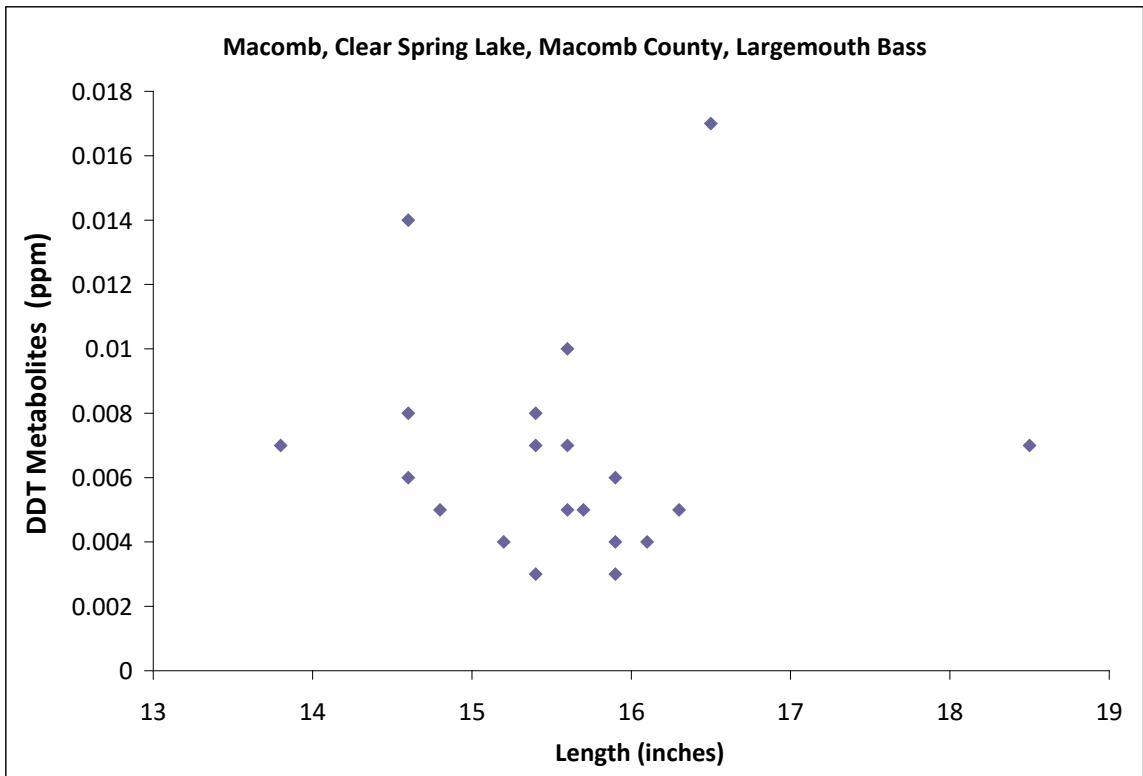
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1999	1999	20	13.8	14	13.8	18.5
Datasets available: 1999						
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL	Meal Category	
PCB	20	0.131		0.160	1	
DDT	20	0.007		0.010	16	
Chlordane	20	ND		--	--	
Toxaphene	20	ND		--	--	
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.000	0.005				
DDT	0.000	0.002				
Chlordane						
Toxaphene						
Final meal category based on UCL:					1	

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

Recommendation: No one should eat more than 1 meal per month of Clear Spring Lake largemouth bass less than 18 inches due to PCBs. No one should eat more than 1 meal per month of Clear Spring Lake largemouth bass larger than 18 inches due to PCBs and Mercury. Mercury listed as chemical causing advisory due to higher concentrations in longer lengths. .





Black Crappie

Stony Creek Lake

Macomb 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	5	10	na	10	12.5
Datasets available: 1989						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL	Meal Category
Mercury	5	0.266			0.400	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.937	0.952				

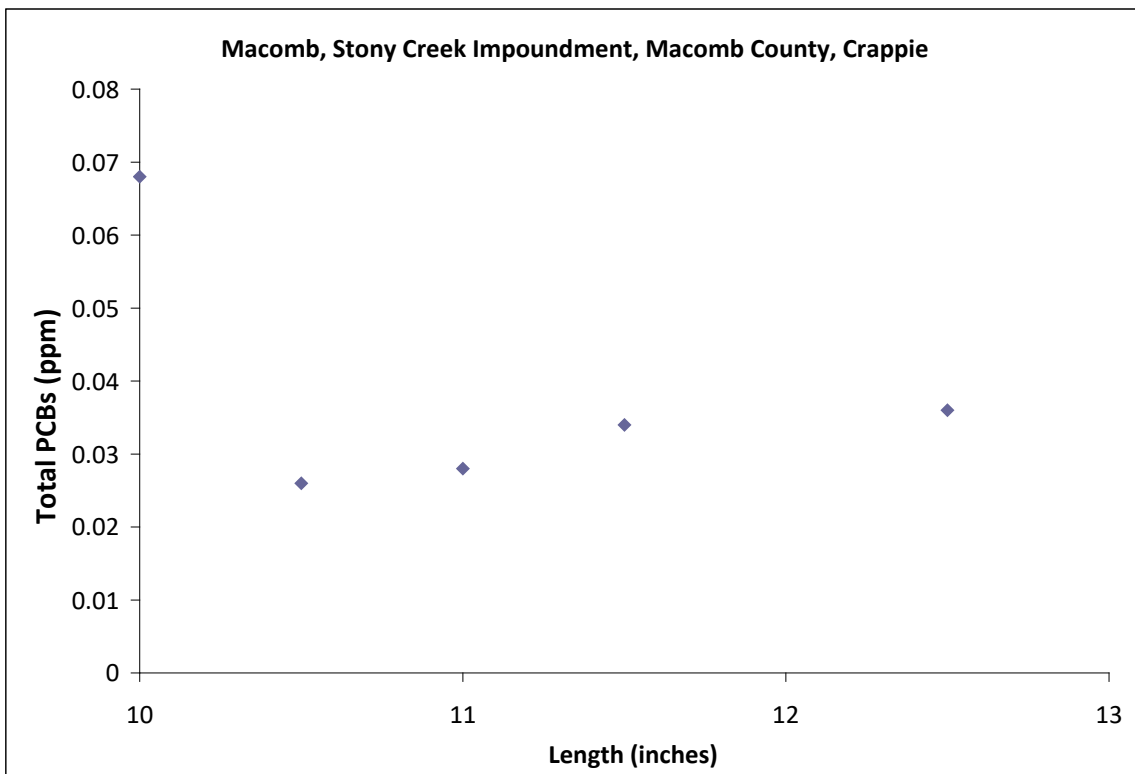
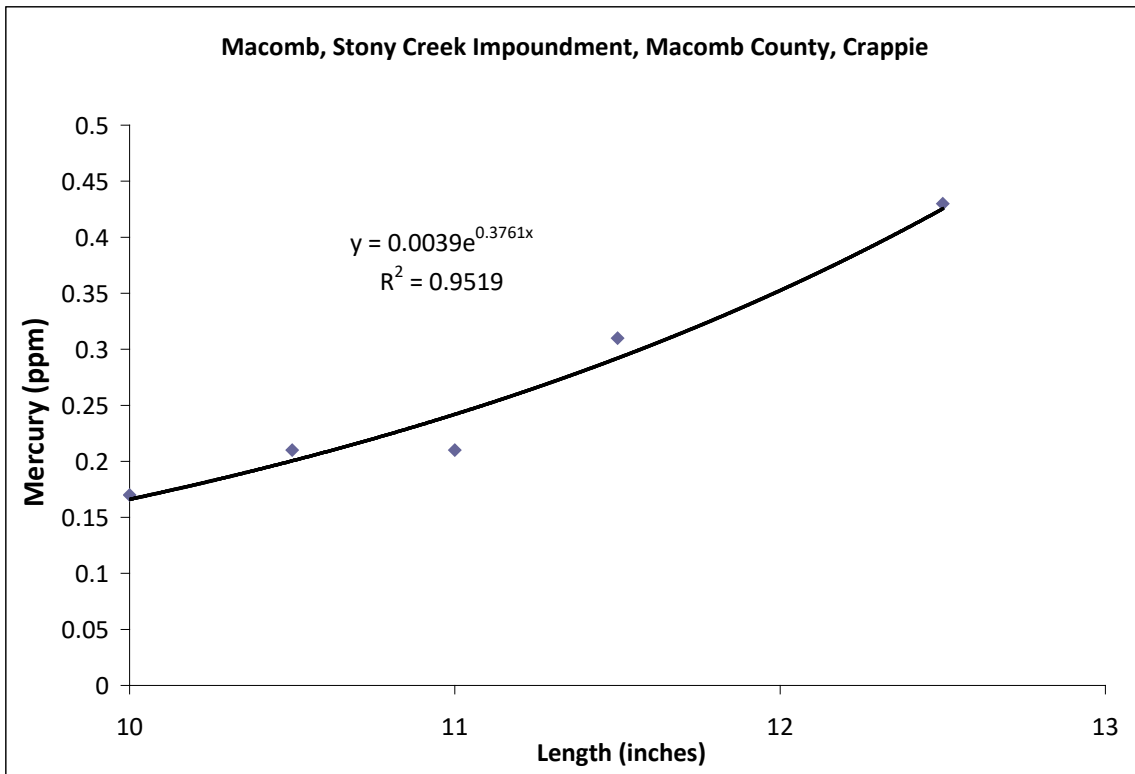
Organics Analysis:

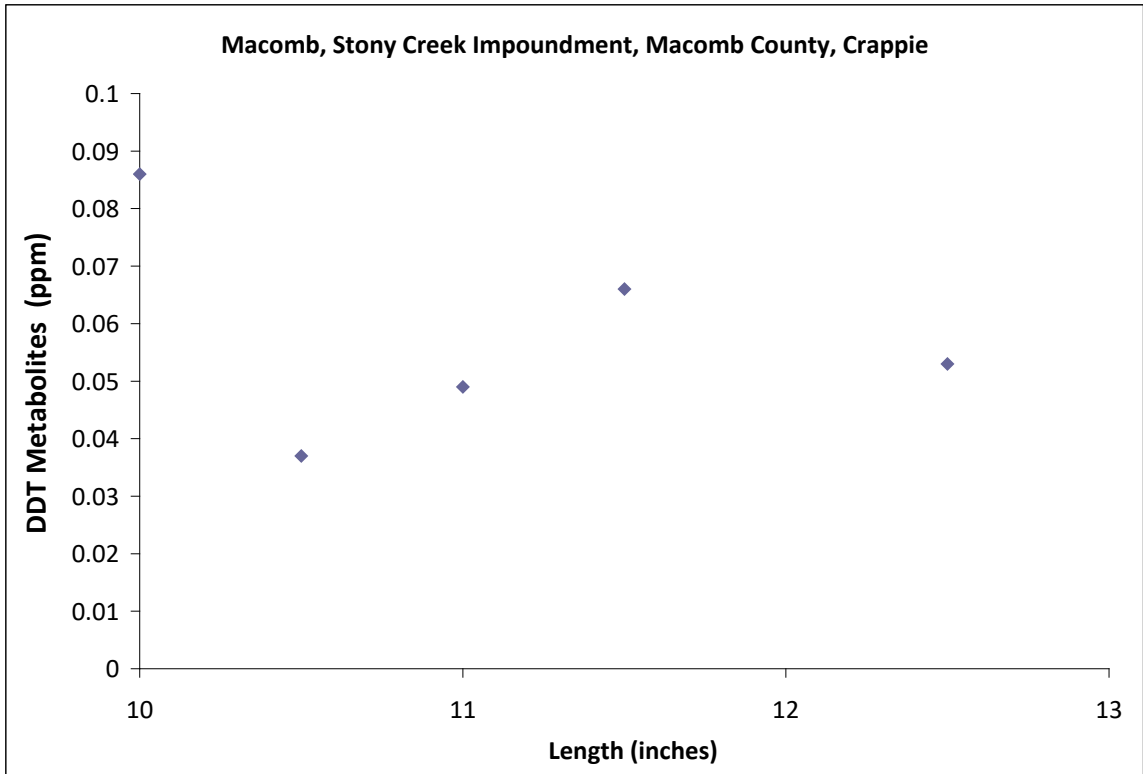
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	1989	5	10	na	10	12.5
Datasets available: 1989						
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL	Meal Category
PCB	5	0.038			0.060	2
DDT	5	0.058			0.080	16
Chlordane	5	ND			--	--
Toxaphene	5	ND			--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.198	0.118				
DDT	0.086	0.033				
Chlordane						
Toxaphene						
Final meal category based on UCL:						2

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

Recommendation: No one should eat more than 2 meals per month of Stony Creek Lake black crappie due to elevated concentrations of mercury. This dataset is limited by age of the data. Based on EGLE’s Fish Contaminant Monitoring Program, PCB and DDT concentrations ≥15 years old are expected to have declined to concentrations allowing a less restrictive advisory.

Length (Inches)	Regression Equation Estimate (ppm)	Meal Category
10	0.168	4
11	0.244	4
12	0.356	2
13	0.518	2
14	0.755	1
15	1.099	0.5
<i>Shaded area denotes extrapolated estimates</i>		





Carp

Stony Creek Lake

Macomb County

Hg Analysis:

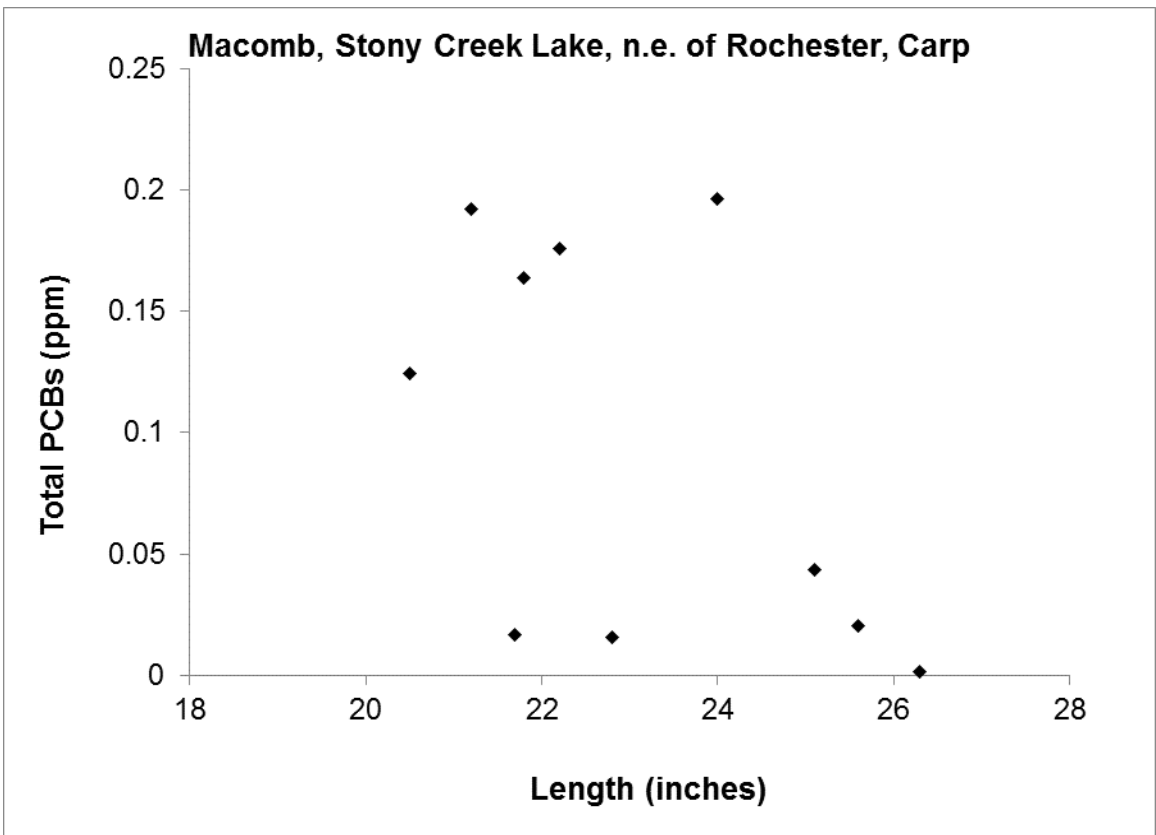
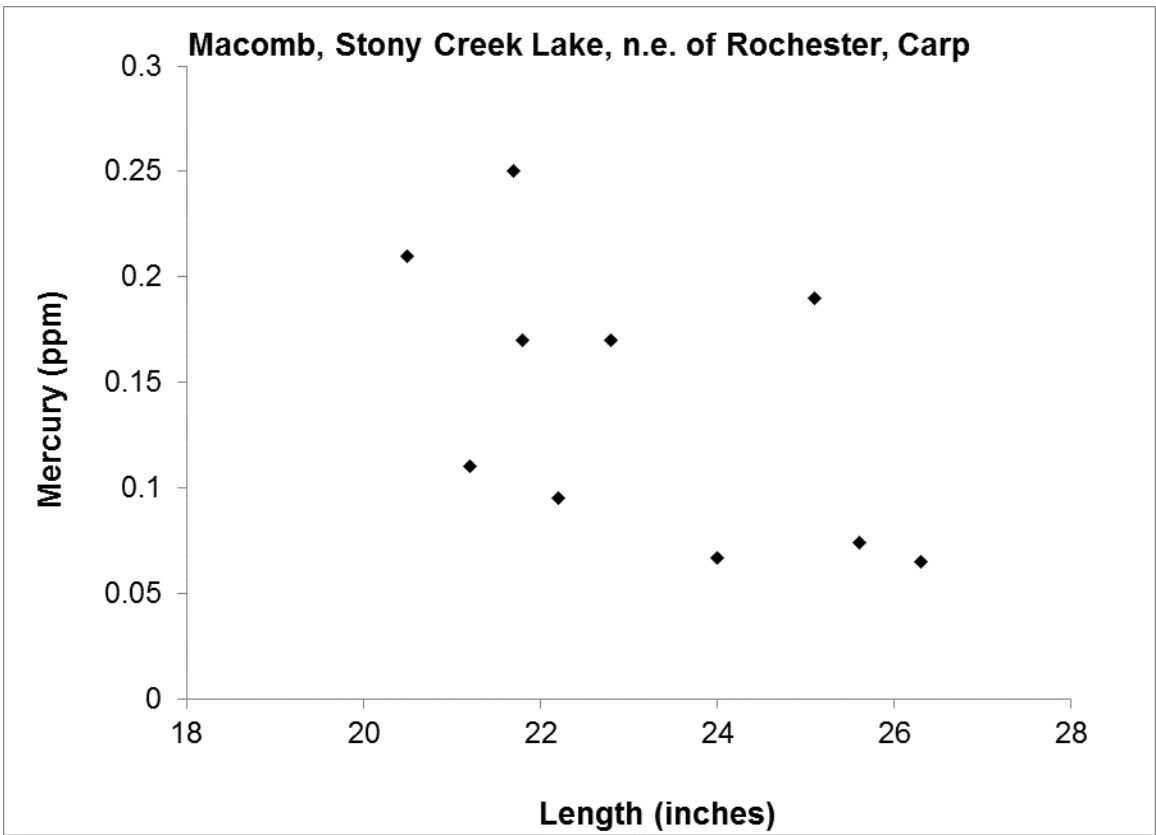
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2014	2014	10	20.5	na	20.5	26.3
Datasets available: 2014						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.14	0.06	0.25	0.19	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.302	0.357				

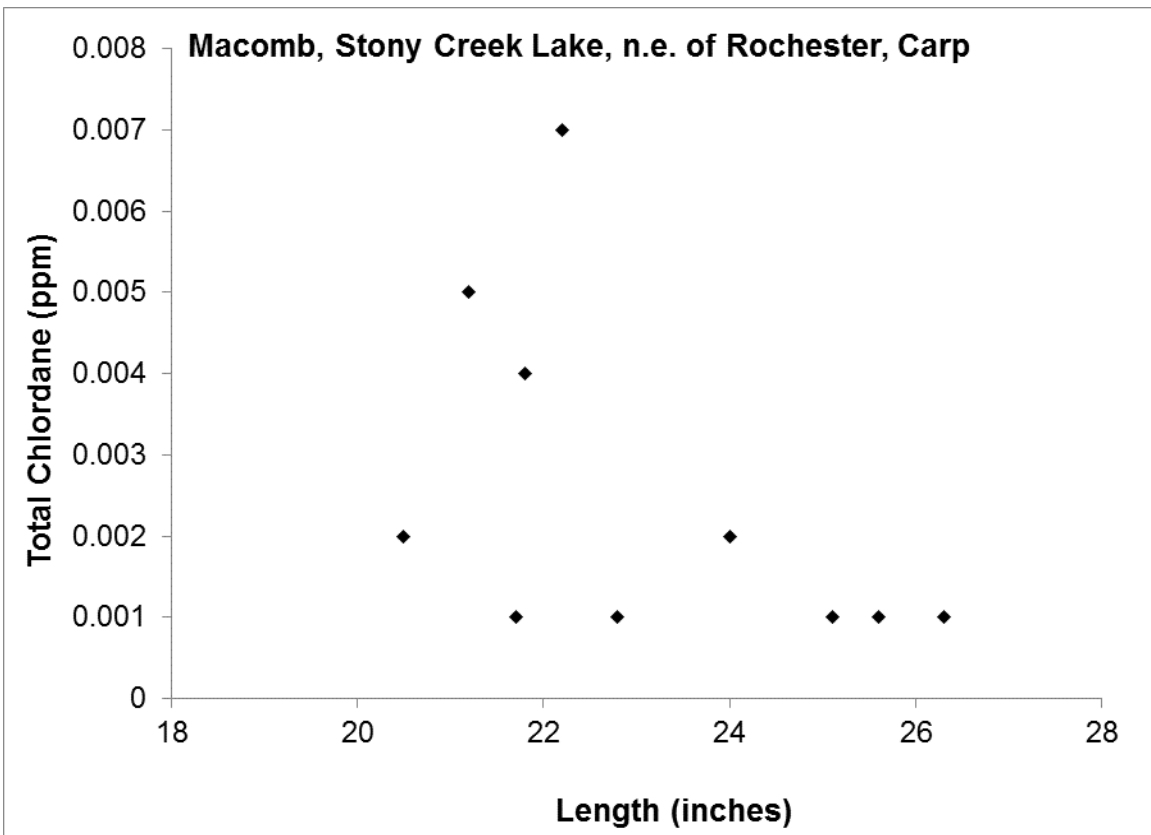
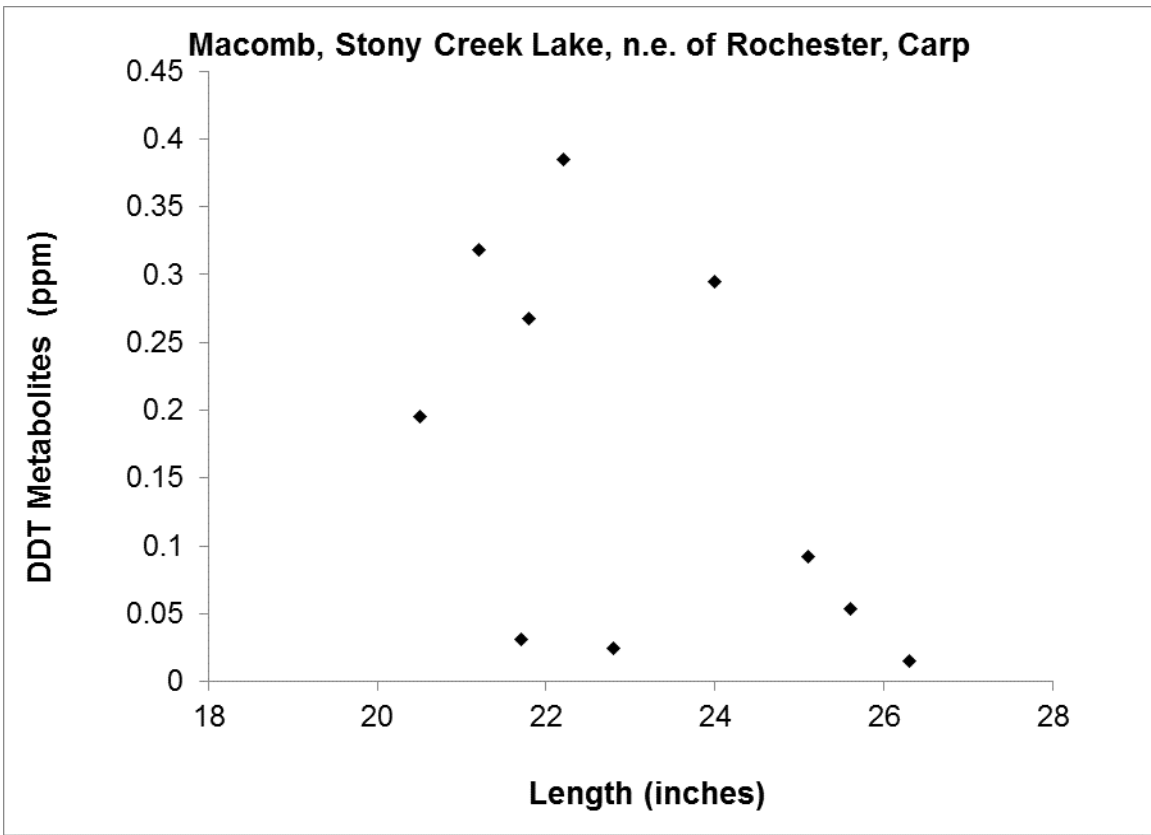
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2014	2014	10	20.5	na	20.5	26.3
Datasets available: 2014						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.095	0.001	0.20	0.15	1
DDT	10	0.168	0.02	0.38	0.27	4
Chlordane	10	0.003	0.001	0.007	0.004	--
Toxaphene	10	ND	--	--	--	--
TEQ	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.280	0.398				
DDT	0.246	0.265				
Chlordane	0.244	0.329				
Toxaphene	--	--				
TEQ	--	--				
Final meal category based on UCL:						1

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

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





Largemouth Bass

Stony Creek Lake

Macomb County

Hg Analysis:

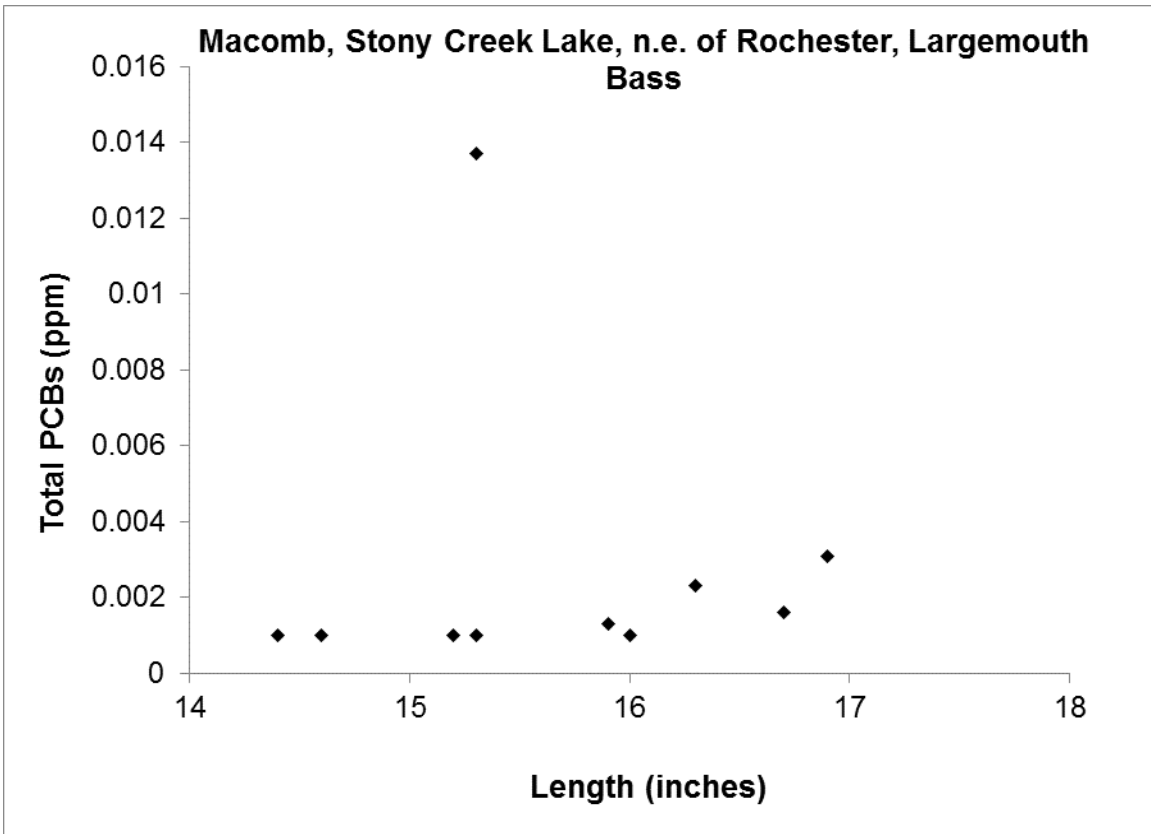
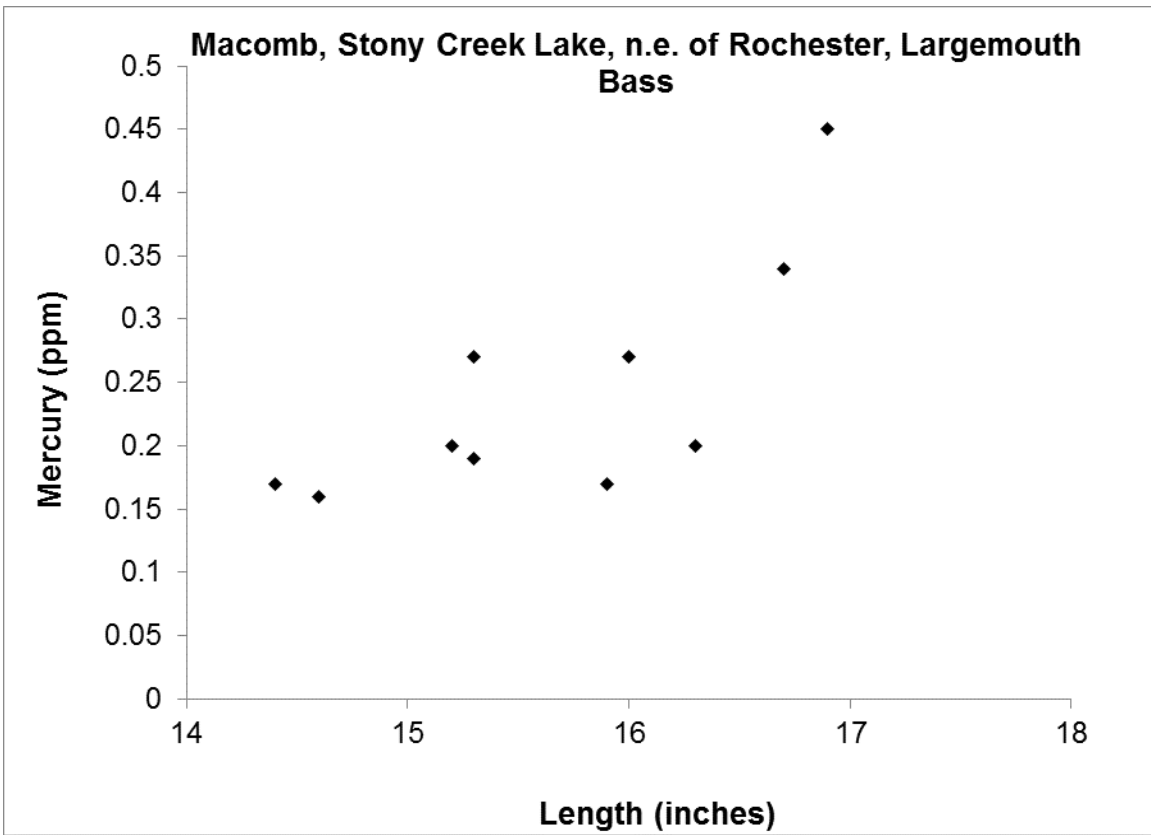
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples				
Earliest	Most Recent				Min	Max			
2014	2014	10	14.4	14	14.4	16.9			
Datasets available:		2014							
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category			
Mercury	10	0.24	0.16	0.45	0.31	2			
Chemical	Linear Regression	Exponential Regression							
	R ²	R ²							
Mercury	0.568	0.583							

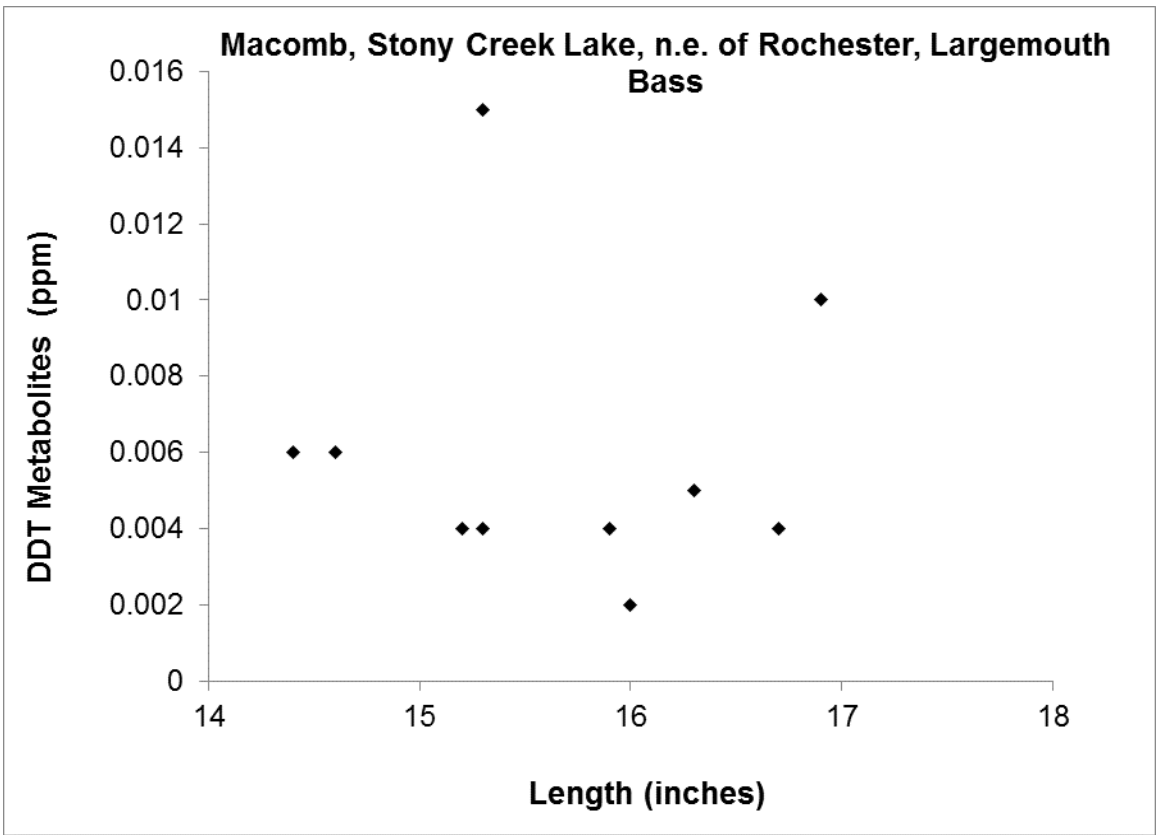
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples				
Earliest	Most Recent				Min	Max			
2014	2014	10	14.4	14	14.4	16.9			
Datasets available:		2014							
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category			
PCB	10	0.003	0.001	0.014	0.01	16			
DDT	10	0.006	0.002	0.015	0.01	16			
Chlordane	10	ND	--	--	--	--			
Toxaphene	10	ND	--	--	--	--			
TEQ	0	--	--	--	--	--			
Chemical	Linear Regression	Exponential Regression							
	R ²	R ²							
PCB	0.000	0.059							
DDT	0.002	0.008							
Chlordane	--	--							
Toxaphene	--	--							
TEQ	--	--							
Final meal category based on UCL:						2			

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

Recommendation: No one should eat more than 2 meals per month of Stony Creek Lake largemouth or smallmouth bass smaller than 18 inches or more than 1 meal per month of those fish larger than 18 inches. The statewide length break was applied as the size range of fish was limited.





Northern Pike

Stony Creek Lake

Macomb County

Hg Analysis:

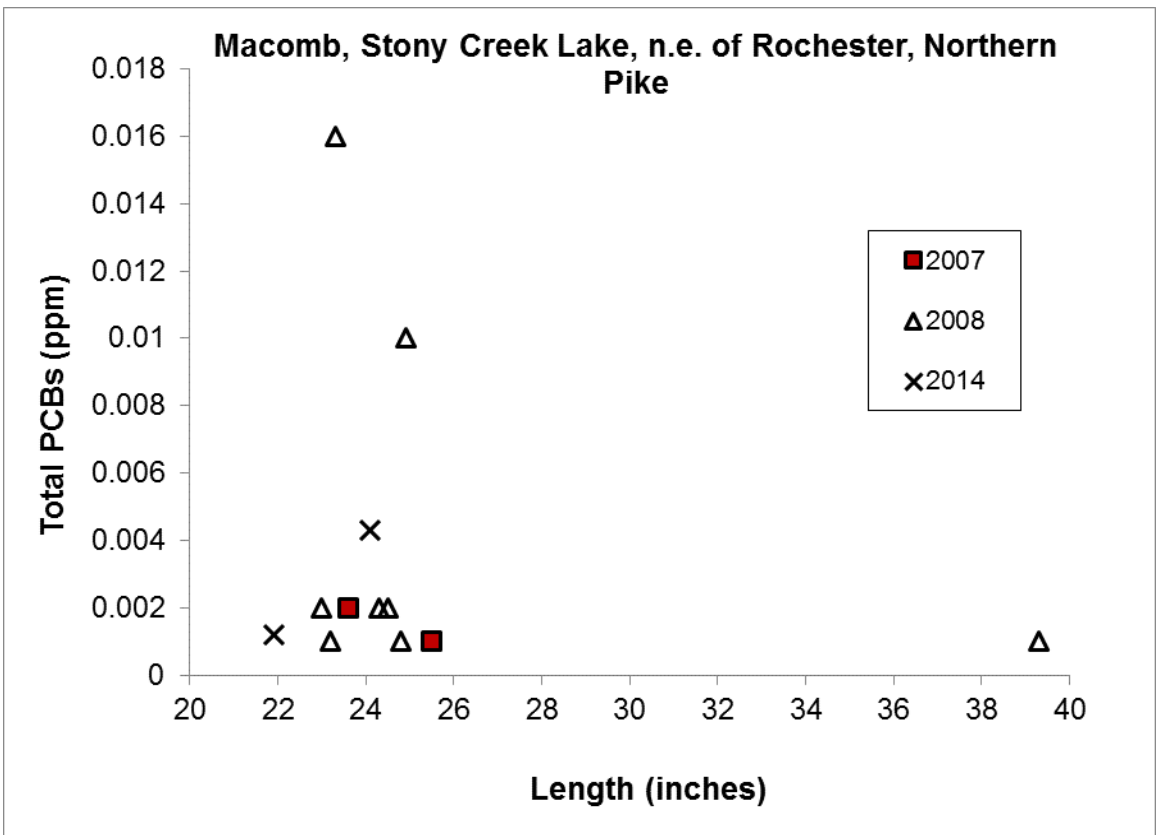
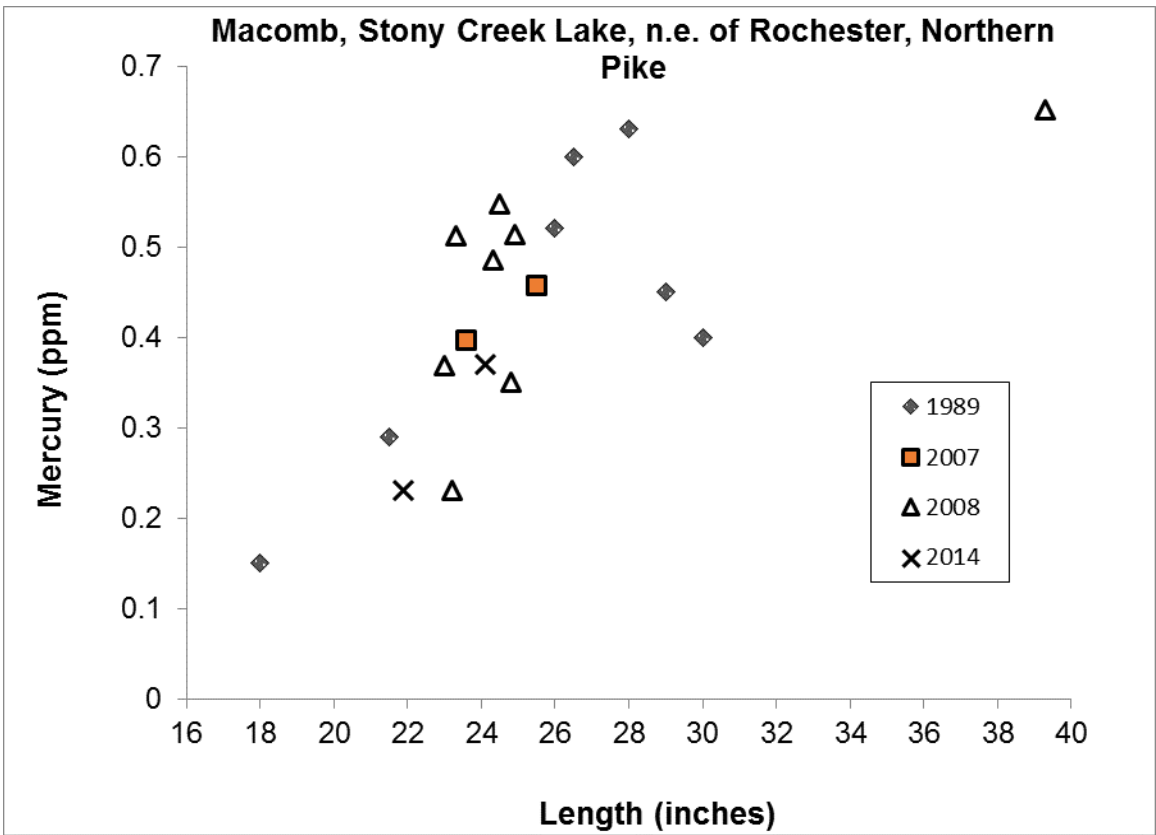
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	2014	19	18	24	23.6	39.3
Datasets available: 1989, 2007, 2008, 2014						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	13	0.49	0.35	0.65	0.55	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.468	0.436				

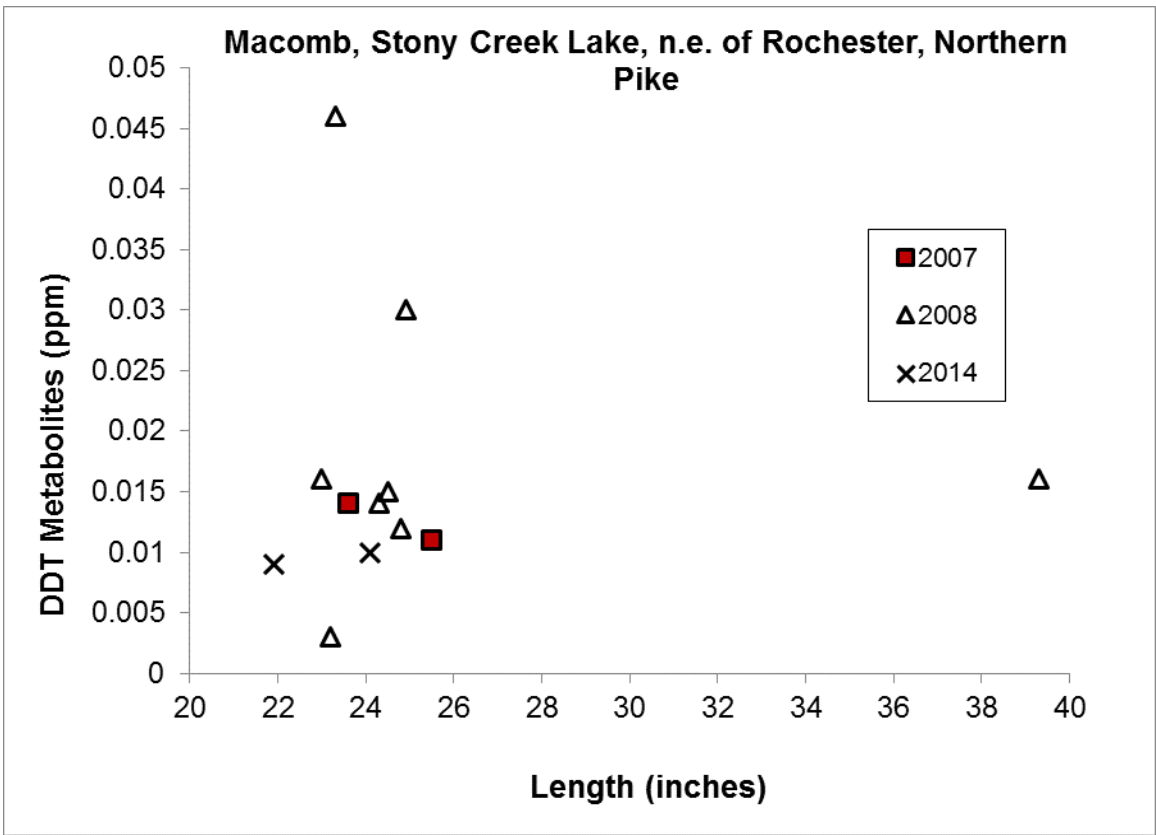
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2007	2014	12	21.9			39.3
Datasets available: 1989, 2007, 2008, 2014						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	8	0.003	0.001	0.01	0.005	16
DDT	8	0.02	0.01	0.03	0.02	16
Chlordane	8	ND	--	--	--	--
Toxaphene	8	ND	--	--	--	--
TEQ	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.031	0.065				
DDT	0.000	0.014				
Chlordane	--	--				
Toxaphene	--	--				
TEQ	--	--				
Final meal category based on UCL:						1

Existing Advisory: No one should eat more than 1 meal per month of Stony Creek Impoundment northern pike less than 30 inches or 6 meals per year of Stony Creek Impoundment northern pike greater than 30 inches due to mercury.

Recommendation: No change is recommended. The statewide length break was applied as the size range of the fish were limited.





Hg Analysis:

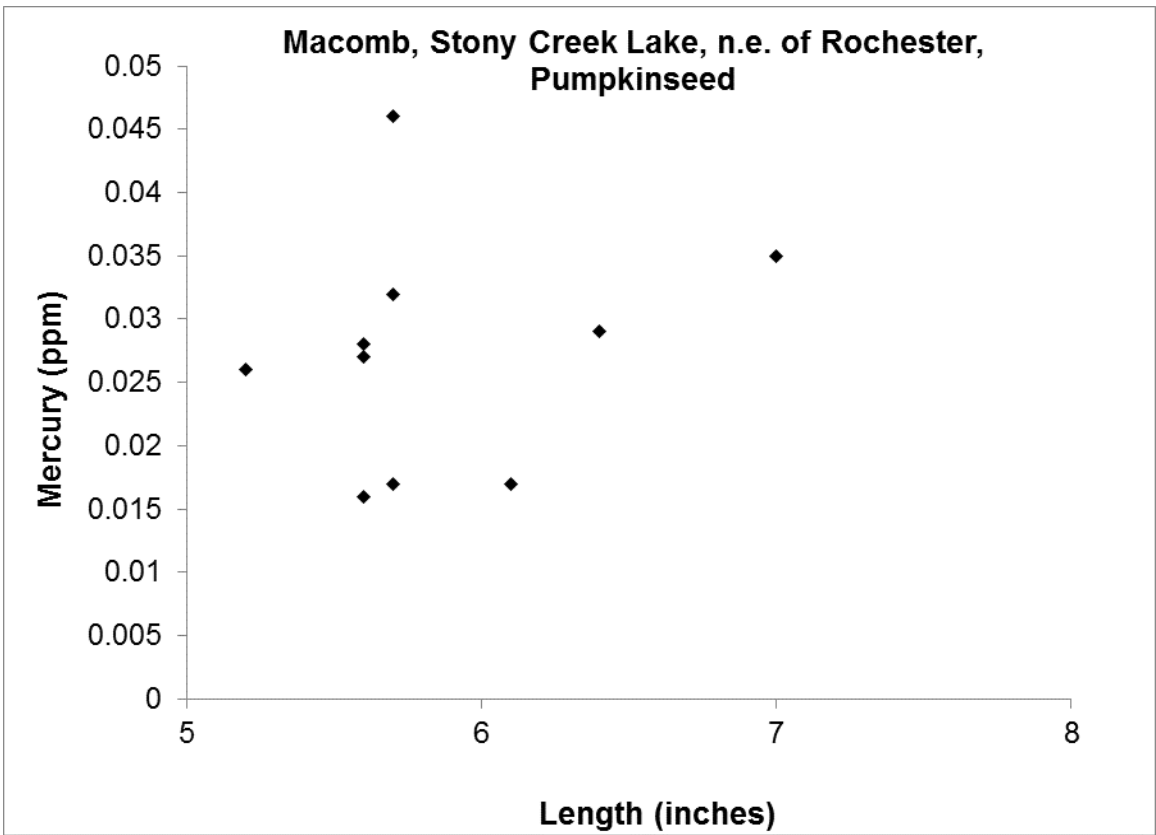
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		Meal Category
Earliest	Most Recent				Min	Max	
2014	2014	10	5.2	na	5.2	7	
Datasets available:		2014					
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)		
Mercury	10	0.03	0.02	0.05	0.03	16	
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.042	0.045					

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		Meal Category
Earliest	Most Recent				Min	Max	
2014	2014	10	5.2	na	5.2	7	
Datasets available:		2014					
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)		
PCB	10	ND	--	--	--	--	
DDT	10	ND	--	--	--	--	
Chlordane	10	ND	--	--	--	--	
Toxaphene	10	ND	--	--	--	--	
TEQ	0	--	--	--	--	--	
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
TEQ	--	--					
Final meal category based on UCL:							16

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

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



Rock Bass

Stony Creek Lake

Macomb County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent						
2014	2019	20	5.3	NA	5.3	10.6	
Datasets available: 2014, 2019							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	20	0.126		0.032	0.240	0.157	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.681	0.654					

Organics Analysis:

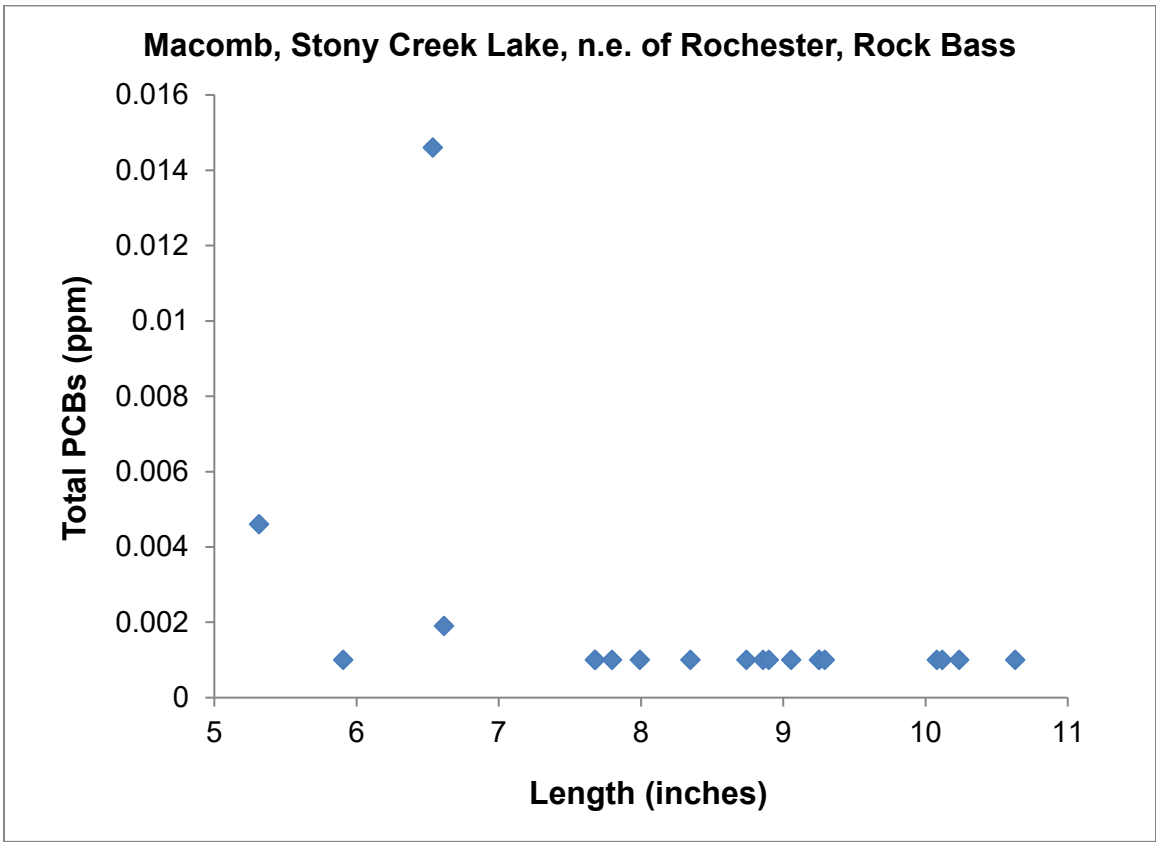
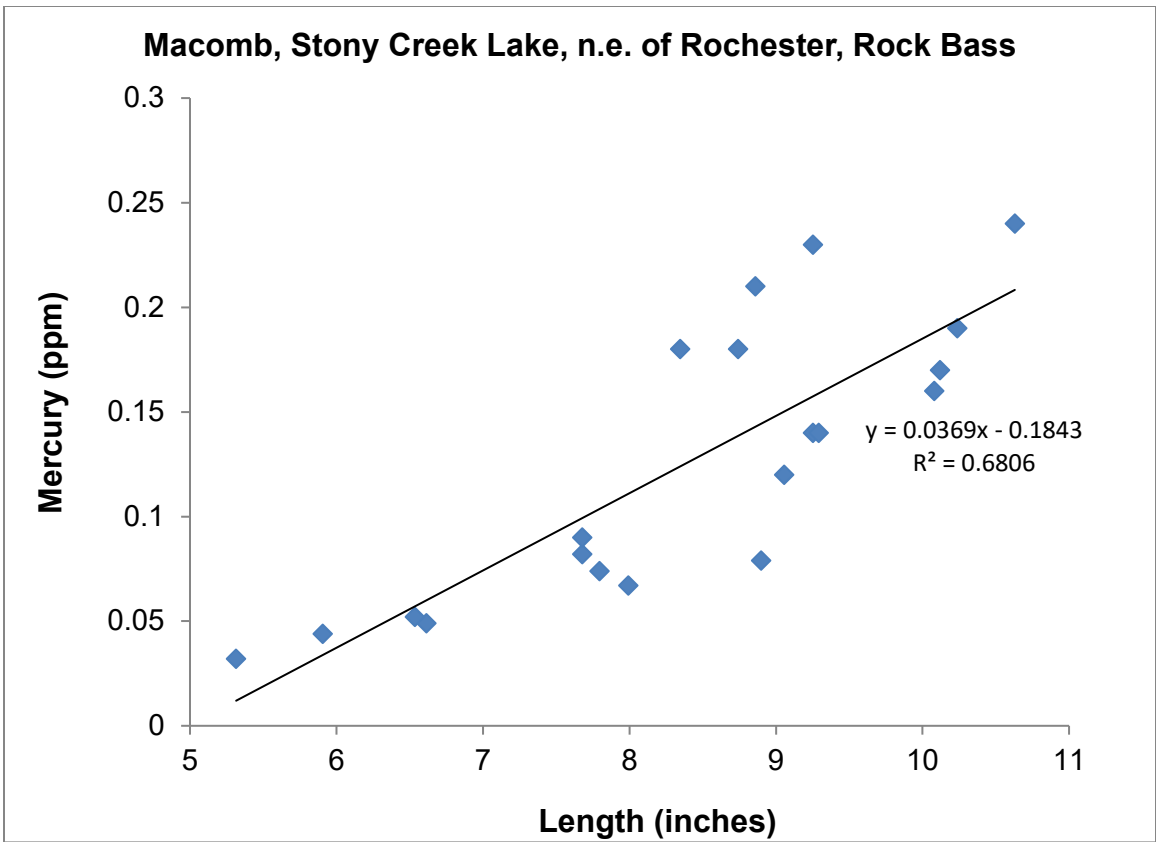
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent						
2014	2019	20	5.3	NA	5.3	10.6	
Datasets available: 2014, 2019							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	20	0.002		<0.001	0.015	0.003	16
DDT	20	0.002		<0.001	0.009	0.003	16
Chlordane	20	ND		--	--	--	--
Toxaphene	20	ND		--	--	--	--
PFOS	10	1.5 ppb		<0.25 ppb	12.7* ppb	4.3 ppb	16
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.195	0.329					
DDT	0.020	0.066					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	--	--					
Final meal category based on UCL:							2

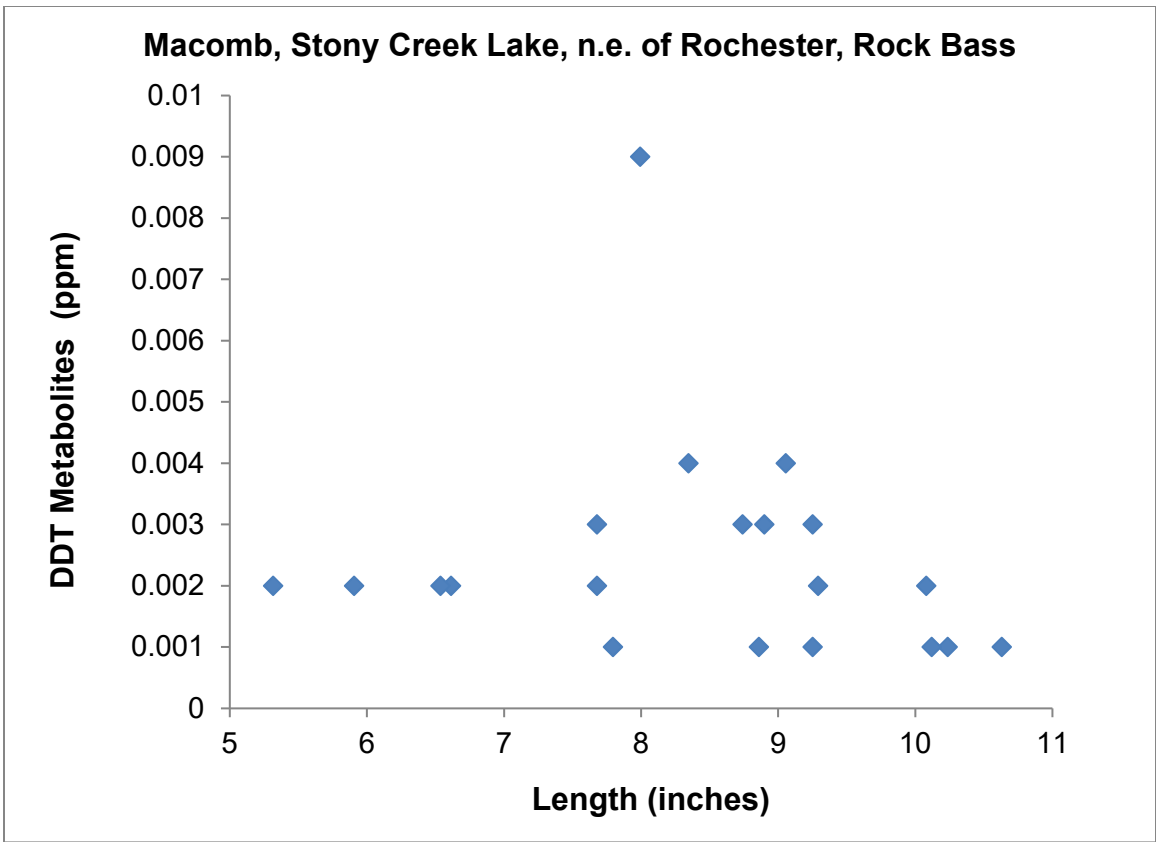
* Only one individual had detectable PFOS in the fillet.

Existing MDHHS Advisory: No one should eat more than 4 meals per month of rock bass of any size from Stony Creek Lake in Macomb County due to mercury.

Recommendation: No one should eat more than eight meals per month of rock bass less than 8 inches in size or no more than four meals per month of rock bass larger than 8 inches in size from Stony Creek Lake in Macomb County due to mercury.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
6	0.037	16
7	0.074	12
8	0.111	8
9	0.148	4
10	0.185	4
11	0.222	4
12	0.259	4
<i>Shaded area denotes extrapolated estimates</i>		





Walleye

Stony Creek Lake

Macomb County

Hg Analysis:

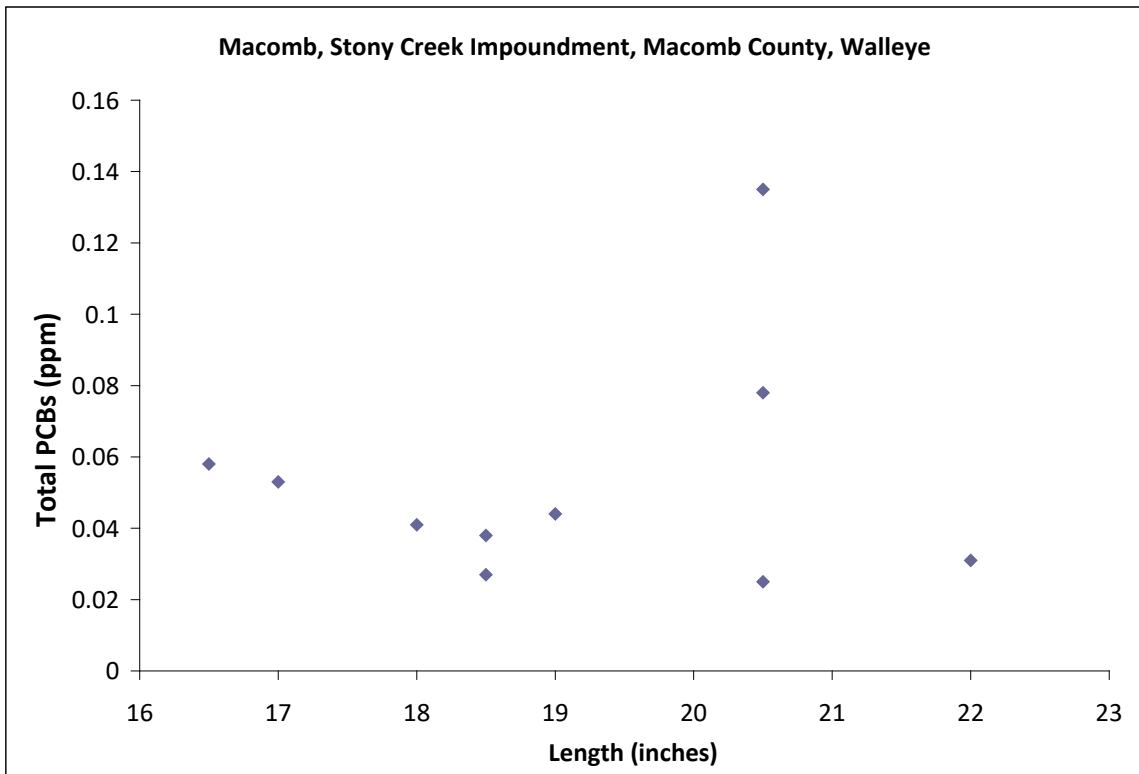
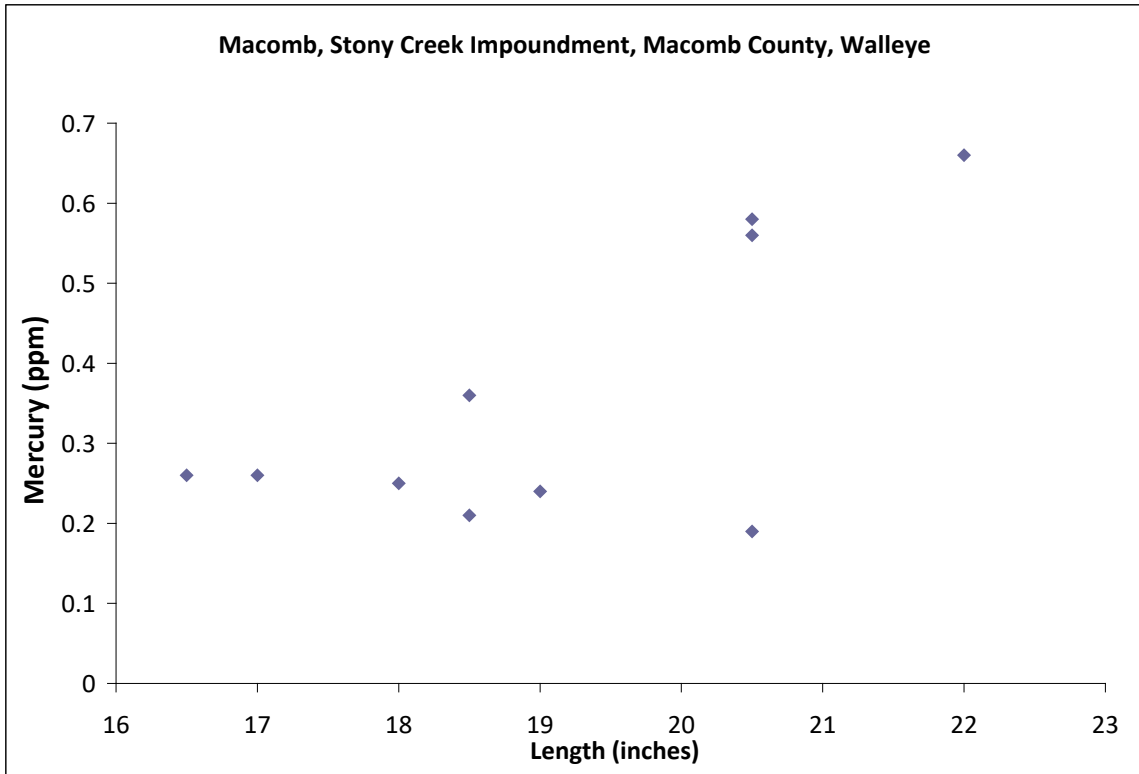
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	1989	10	16.5	15	16.5	22
Datasets available:		1989				
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	10	0.357		0.480		2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.484	0.383				

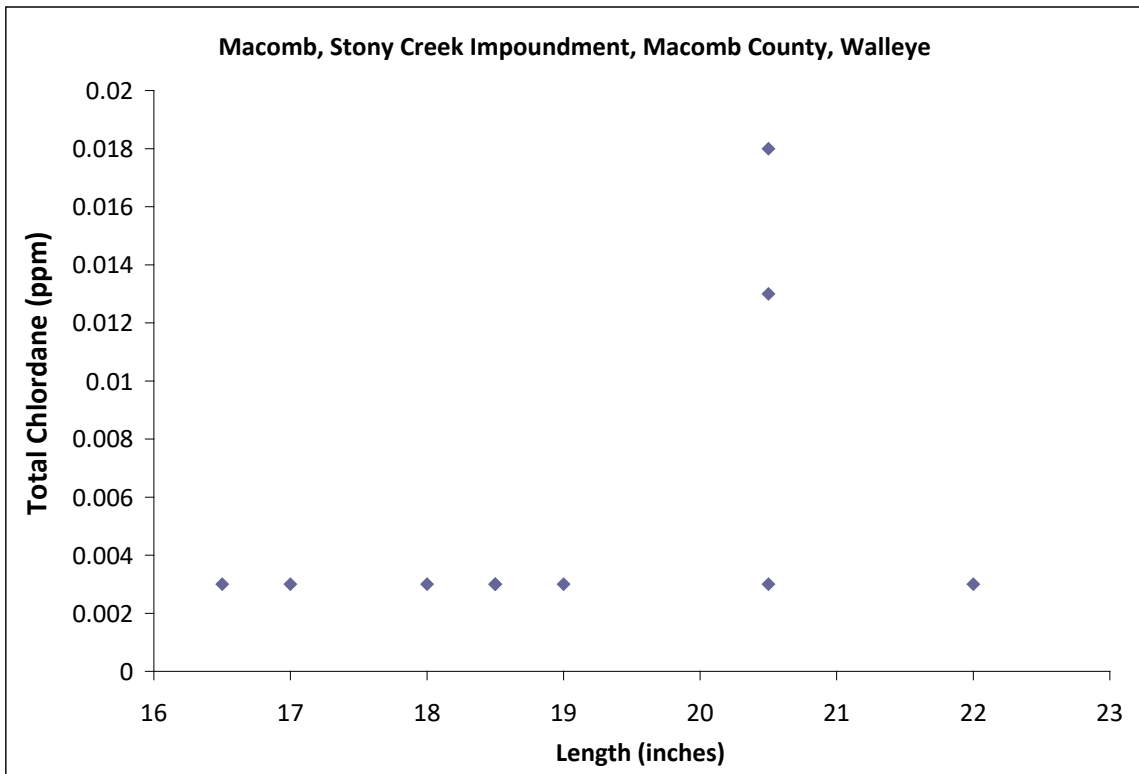
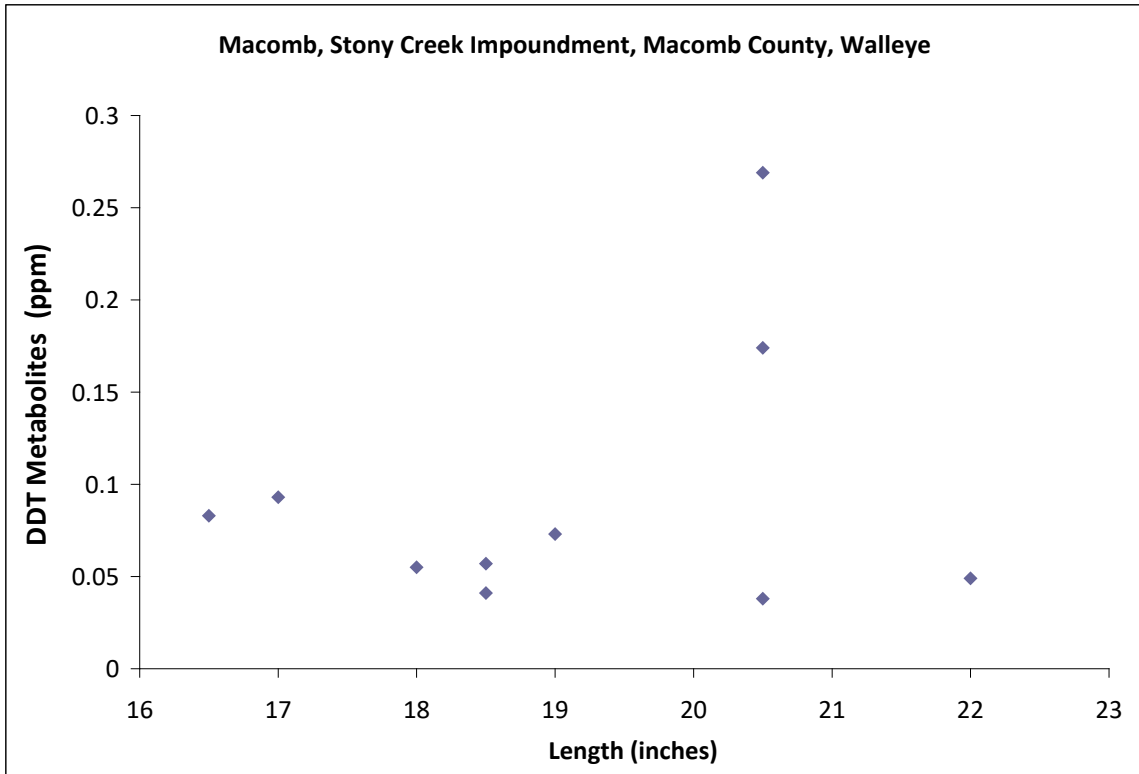
Organics Analysis:

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	16.5	15	16.5	22
Datasets available:		1989				
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	10	0.053		0.080		2
DDT	10	0.093		0.150		8
Chlordane	10	0.006		0.010		--
Toxaphene	10	ND		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.020	0.000				
DDT	0.058	0.009				
Chlordane	0.170	0.177				
Toxaphene				Final meal category based on UCL:		2

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

Recommendation: No one should eat more than 2 meals per month of Stony Lake Lake walleye less than 20 inches or 1 meal per month of Stony Creek Impoundment walleye greater than 20 inches due to mercury. This dataset is limited by age of the data. Based on EGLE’s Fish Contaminant Monitoring Program, PCB and DDT concentrations ≥15 years old are expected to have declined to concentrations allowing a less restrictive advisory for PCBs and DDT. Statewide guideline length break was applied.





Midland County

Black Crappie

Chippewa River

Midland County

Hg Analysis:

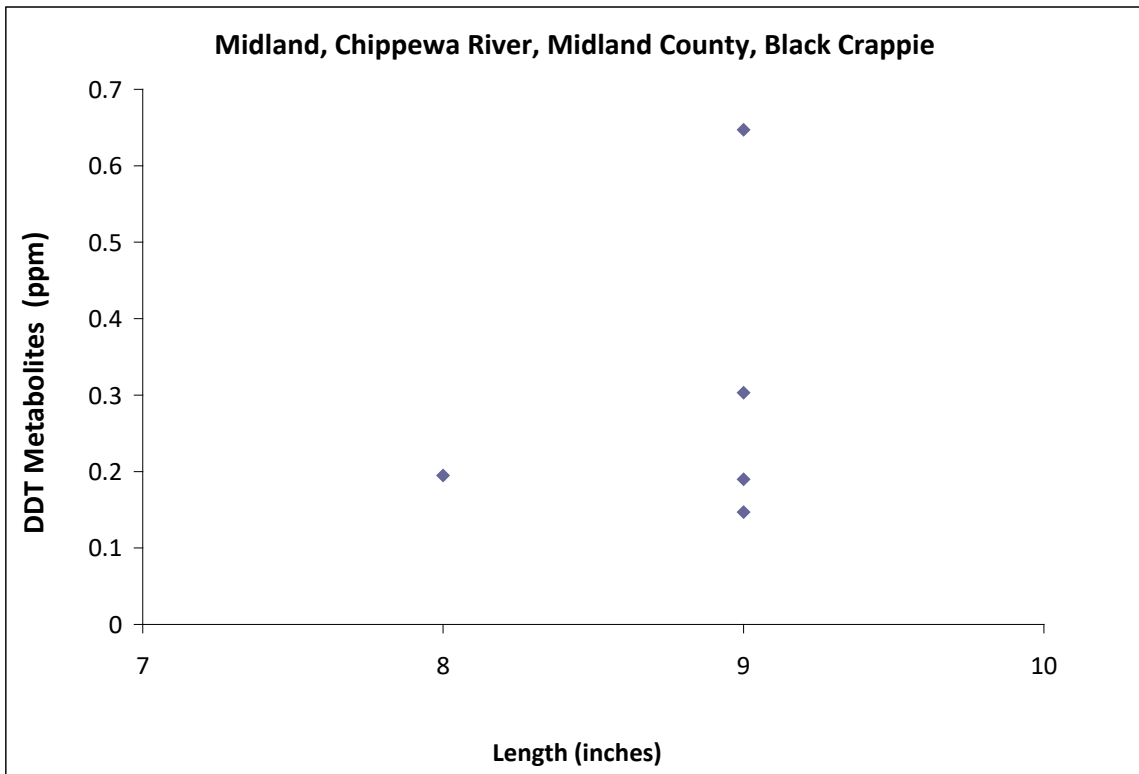
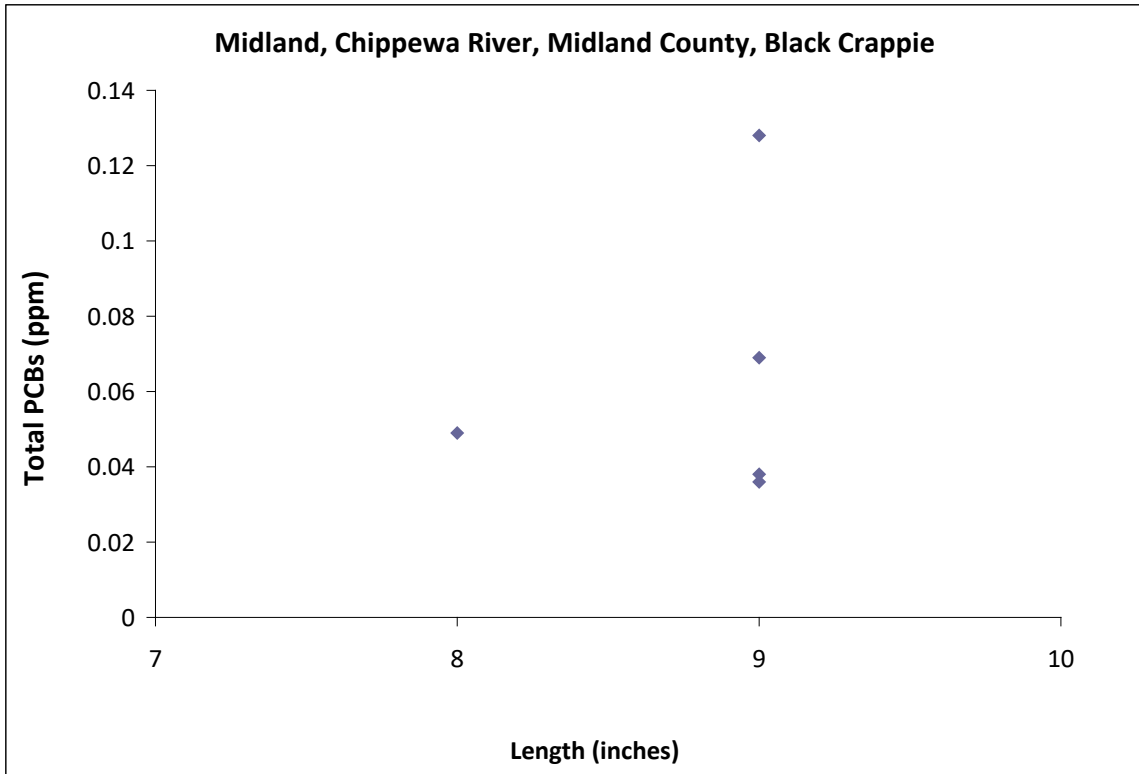
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1984	1984	0	--	na	--	--
Datasets available:		1984				
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL	Meal Category
Mercury	0	--			--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

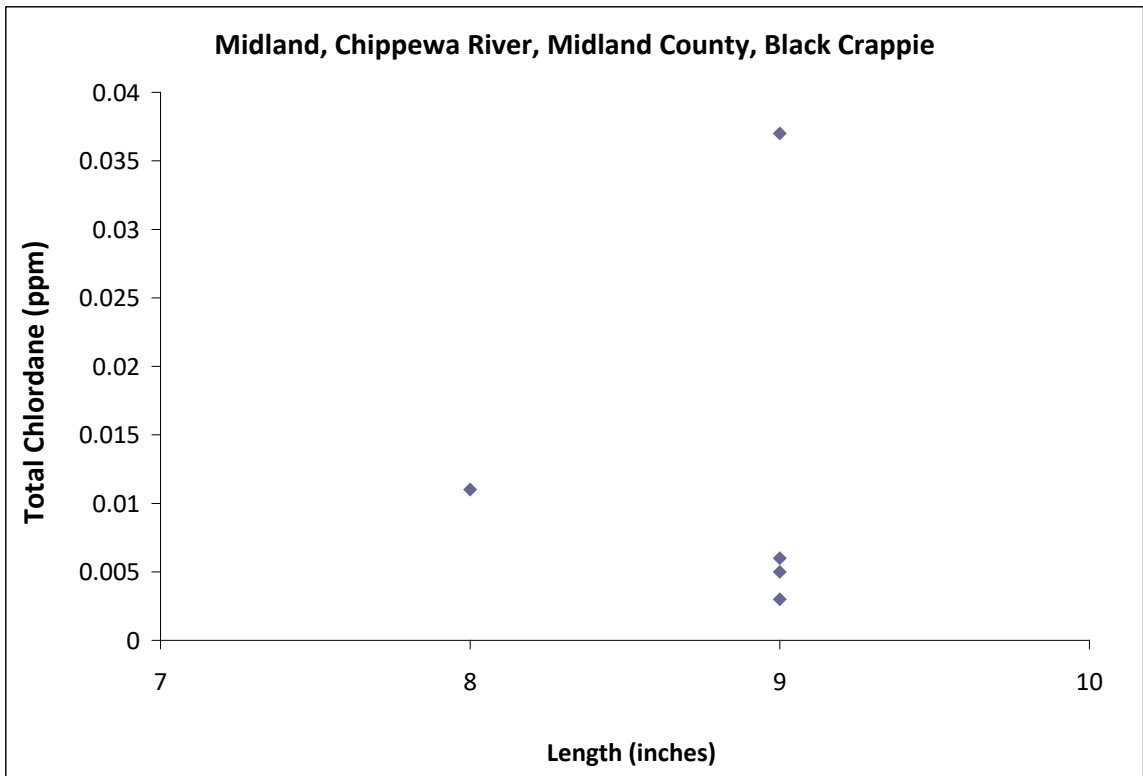
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1984	1984	5	8	na	8	9
Datasets available:		1984				
Chemical	Sample Size (Legal)	Mean (ppm)			95%UCL	Meal Category
PCB	5	0.064			0.110	2
DDT	5	0.296			0.550	0.5
Chlordane	5	0.012			0.030	--
Toxaphene	0	NA			--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.048	0.025				
DDT	0.077	0.065				
Chlordane	0.003	0.030				
Toxaphene			Final meal category based on UCL:			0.5

Existing Advisory: Chippewa River black crappie are not covered by a consumption advisory.

Recommendation: The Statewide guidelines would apply to Chippewa River black crappie. This dataset is limited due to age of the data.





Carp

Chippewa River

Midland County

Hg Analysis:

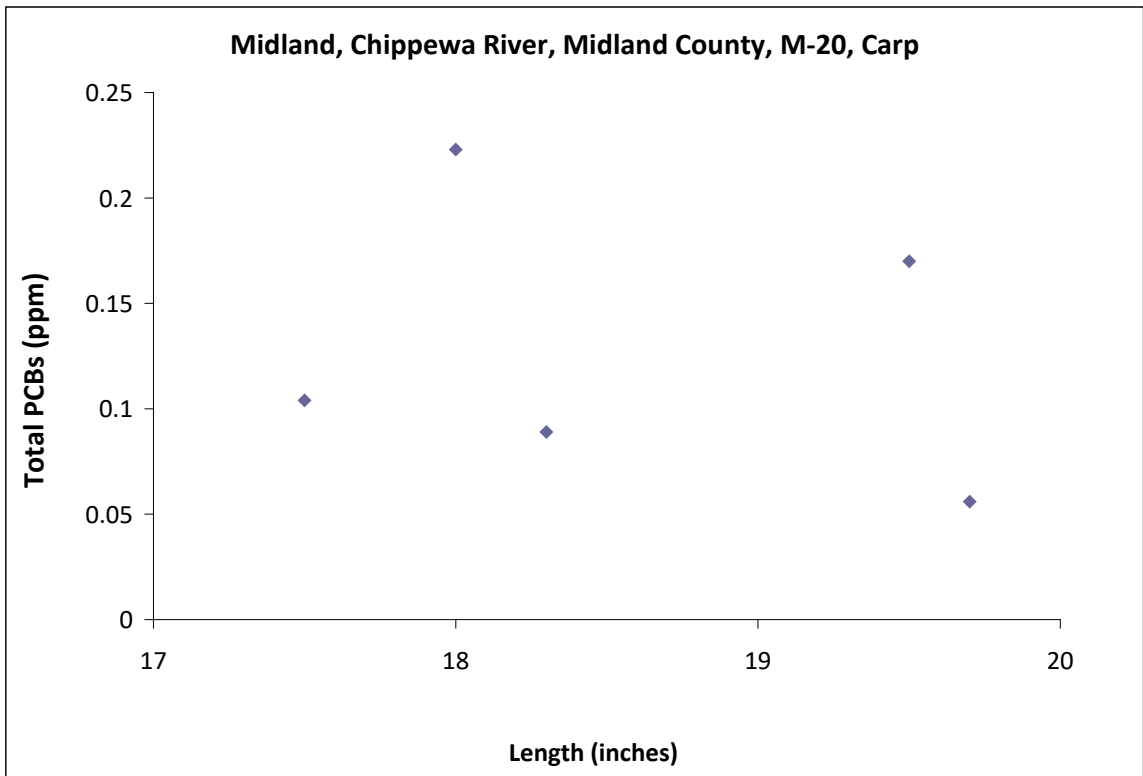
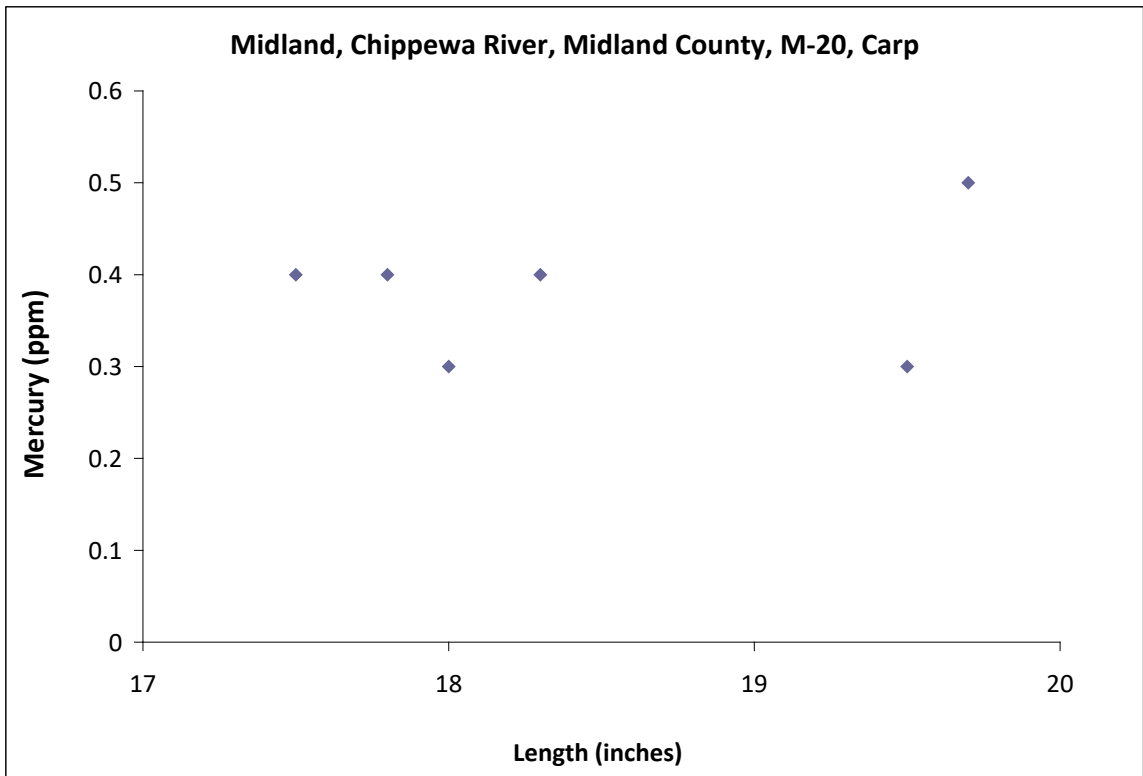
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1985	1985	6	17.5	na	17.5	19.7
Datasets available:		1985				
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	6	0.383		0.460		2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.037	0.015				

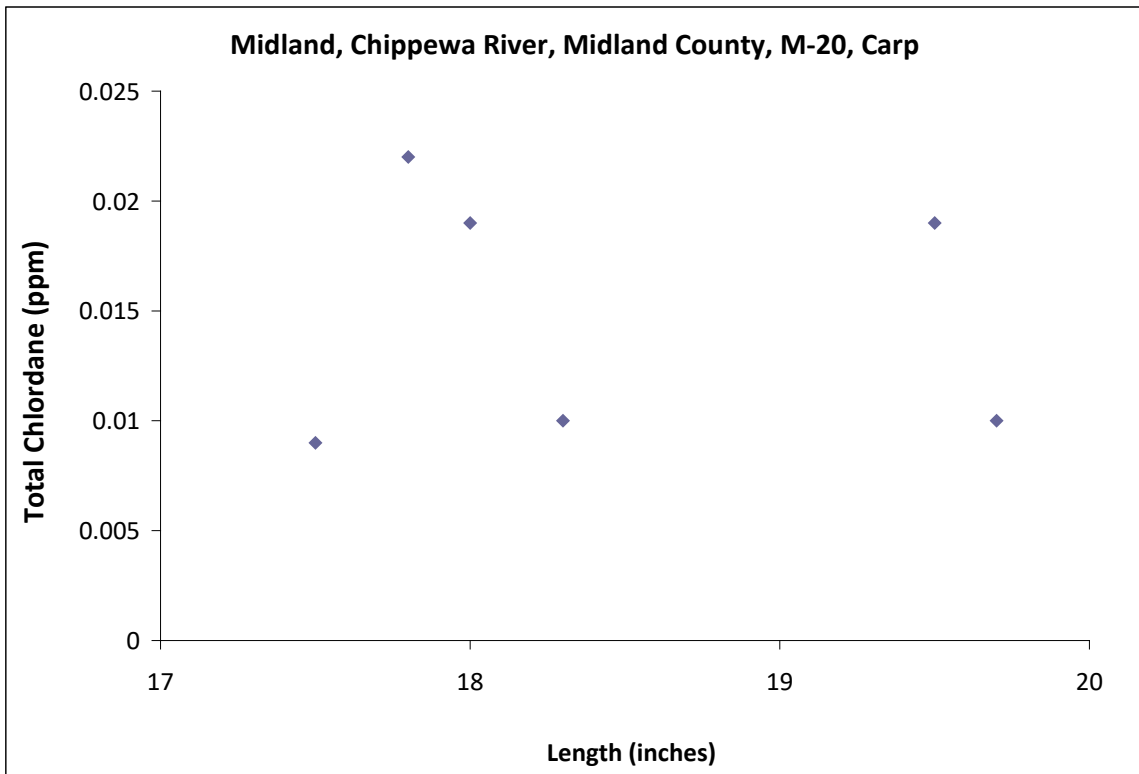
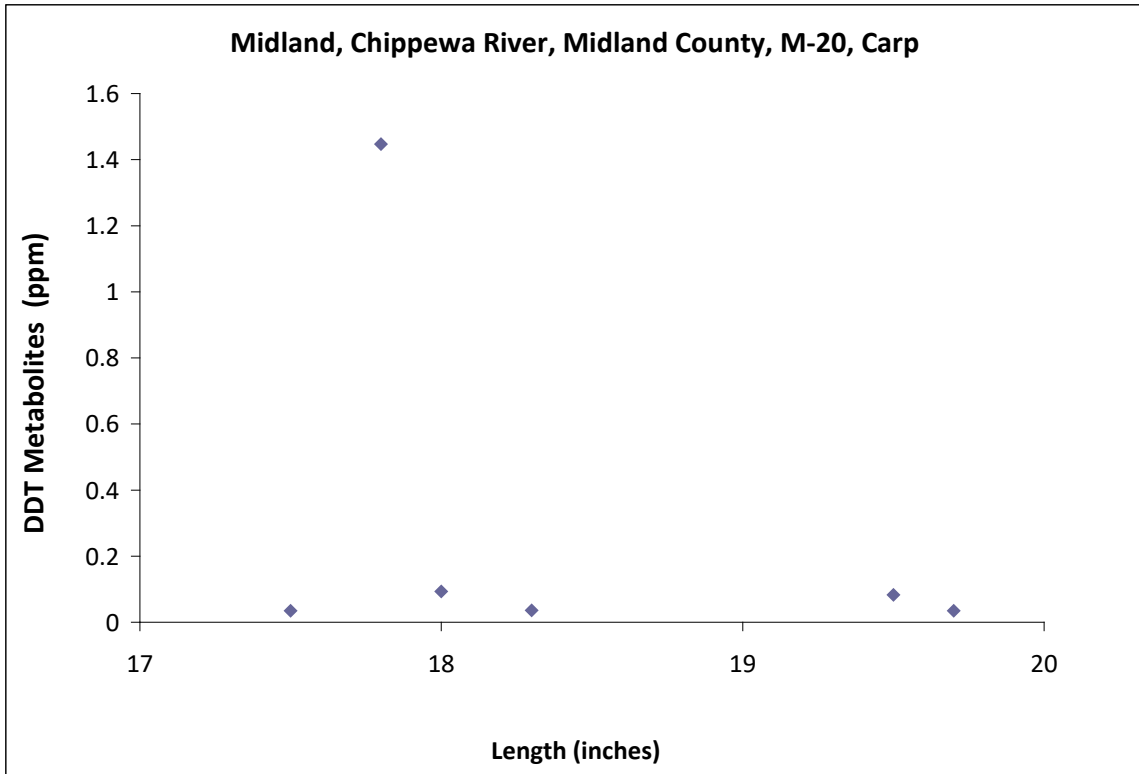
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1985	1985	6	17.5	na	17.5	19.7
Datasets available:		1985				
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	5	0.128		0.210		1
DDT	6	0.288		0.880		2
Chlordane	6	0.015		0.020		--
Toxaphene	6	ND		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.055	0.097				
DDT	0.124	0.096				
Chlordane	0.005	0.001				
Toxaphene				Final meal category based on UCL:		1*

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

Recommendation: No one should eat more than 2 meals per month of Chippewa River carp due to mercury. This dataset is limited due to the age of the data. *Based on EGLE's Fish Contaminant Monitoring Program, PCB and DDT concentrations ≥ 15 years old are expected to have declined to a concentration that allows a less restrictive meal category than determined by the standard evaluation method for PCBs and DDT.





Channel Catfish

Chippewa River

Midland County

Hg Analysis:

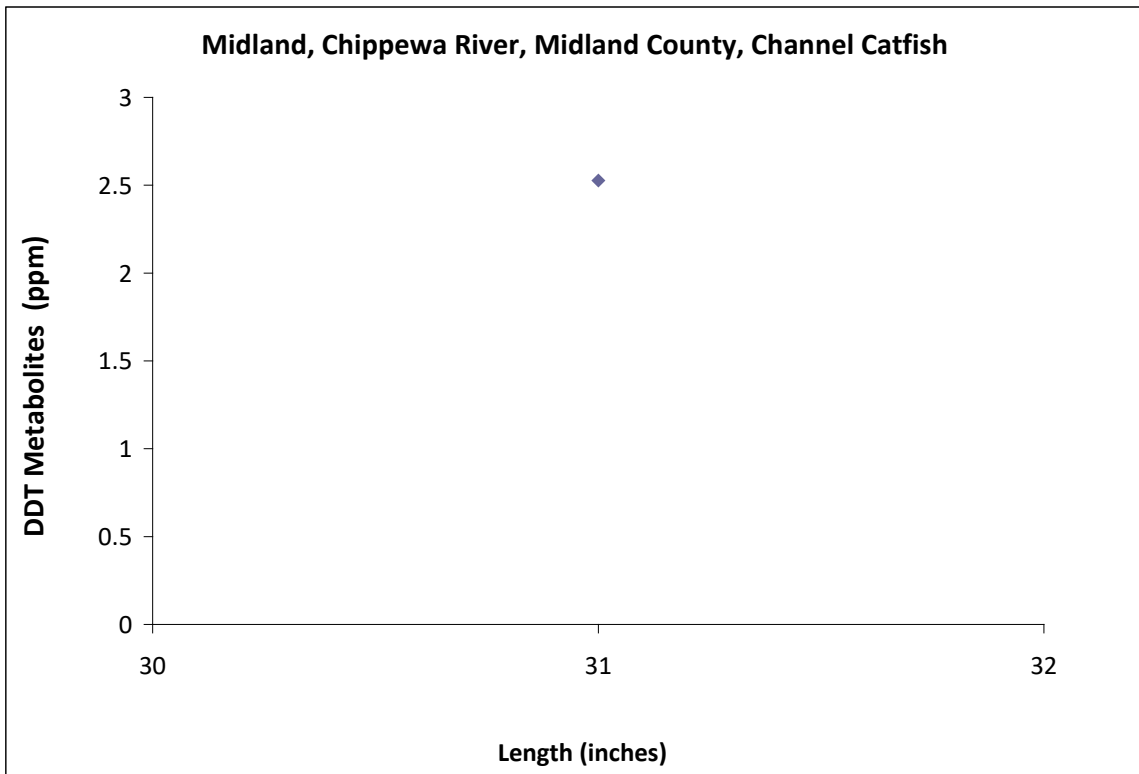
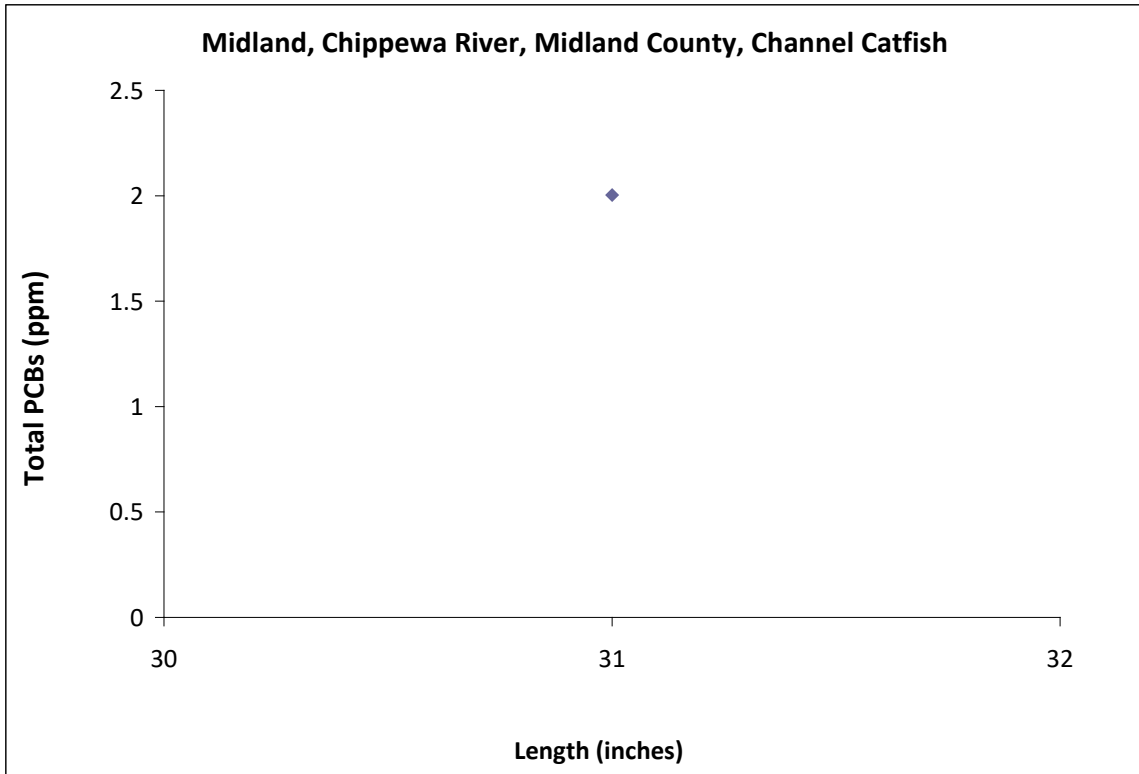
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1984	1984	0	31	12	31	31
Datasets available: 1984						
Chemical	Sample Size (Legal)	Mean (ppm)	95%UCL		Meal Category	
Mercury	0	--	--		--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

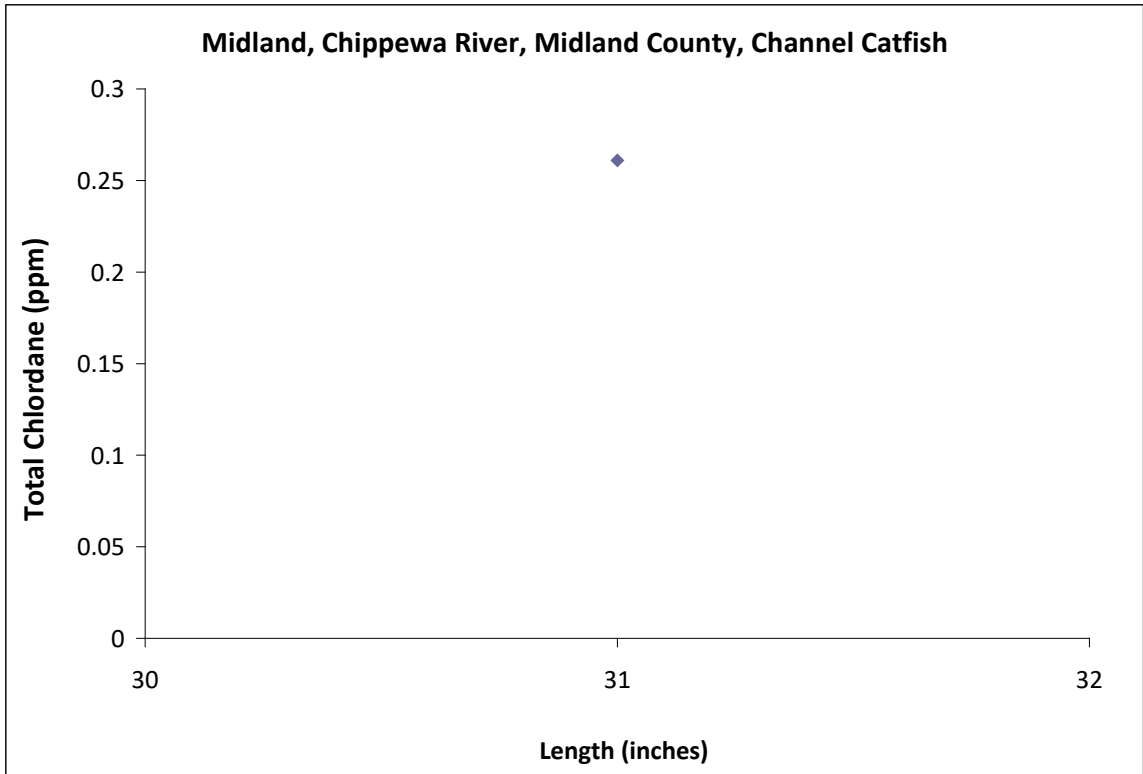
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1984	1984	1	31	12	31	31
Datasets available: 1984						
Chemical	Sample Size (Legal)	Mean (ppm)	95%UCL		Meal Category	
PCB	1	2.003	--		--	--
DDT	1	2.527	--		--	--
Chlordane	1	0.261	--		--	--
Toxaphene	0	NA	--		--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.055	0.097				
DDT	0.124	0.096				
Chlordane	0.005	0.001				
Toxaphene			Final meal category based on UCL:		--	--

Existing Advisory: Chippewa River channel catfish are not covered by an advisory.

Recommendation: Dataset is insufficient to issue a guideline. Statewide guidelines apply to Chippewa River channel catfish. This dataset is limited due to age of the data and sample size. Legacy contaminant issues elsewhere in this watershed has impacted the Chippewa River. Based on EGLE’s Fish Contaminant Monitoring Program, PCB and DDT concentrations ≥15 years old are expected to have declined.





Rock Bass

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
2015	2016	28	5.4	na	5.4	9.3
Datasets available: 2015, 2016						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	28	0.15	0.08	0.35	0.18	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.659	0.607				

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	28	5.4	na	5.4	9.3
Datasets available: 2015, 2016						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	24	ND	< 0.001	< 0.001	--	--
DDT	24	< 0.001	< 0.001	0.001	--	--
Chlordane	24	ND	< 0.001	< 0.001	--	--
Toxaphene	24	ND	< 0.05	< 0.05	--	--
TEQ*	27	0.16 ppt	< 0.001 ppt	0.38 ppt	0.20 ppt	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
TEQ*	0.000	0.040	Final meal category based on UCL:			4

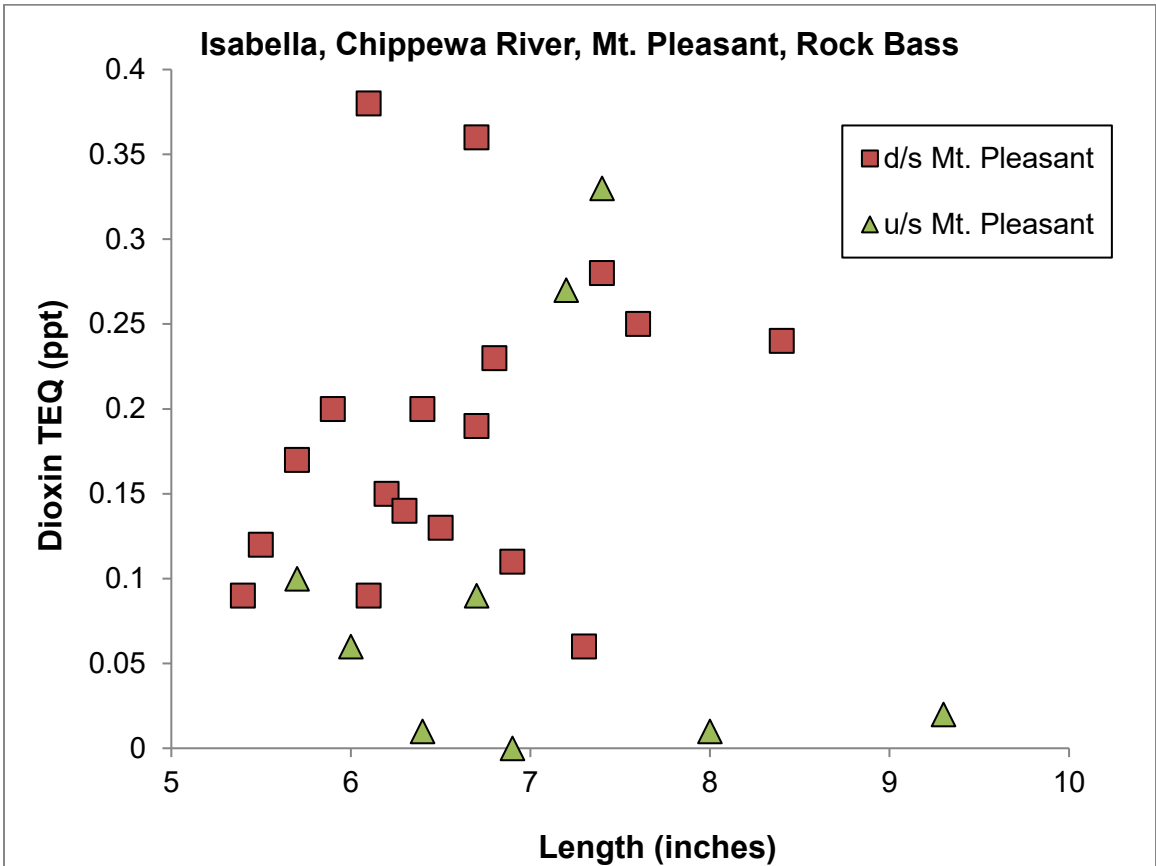
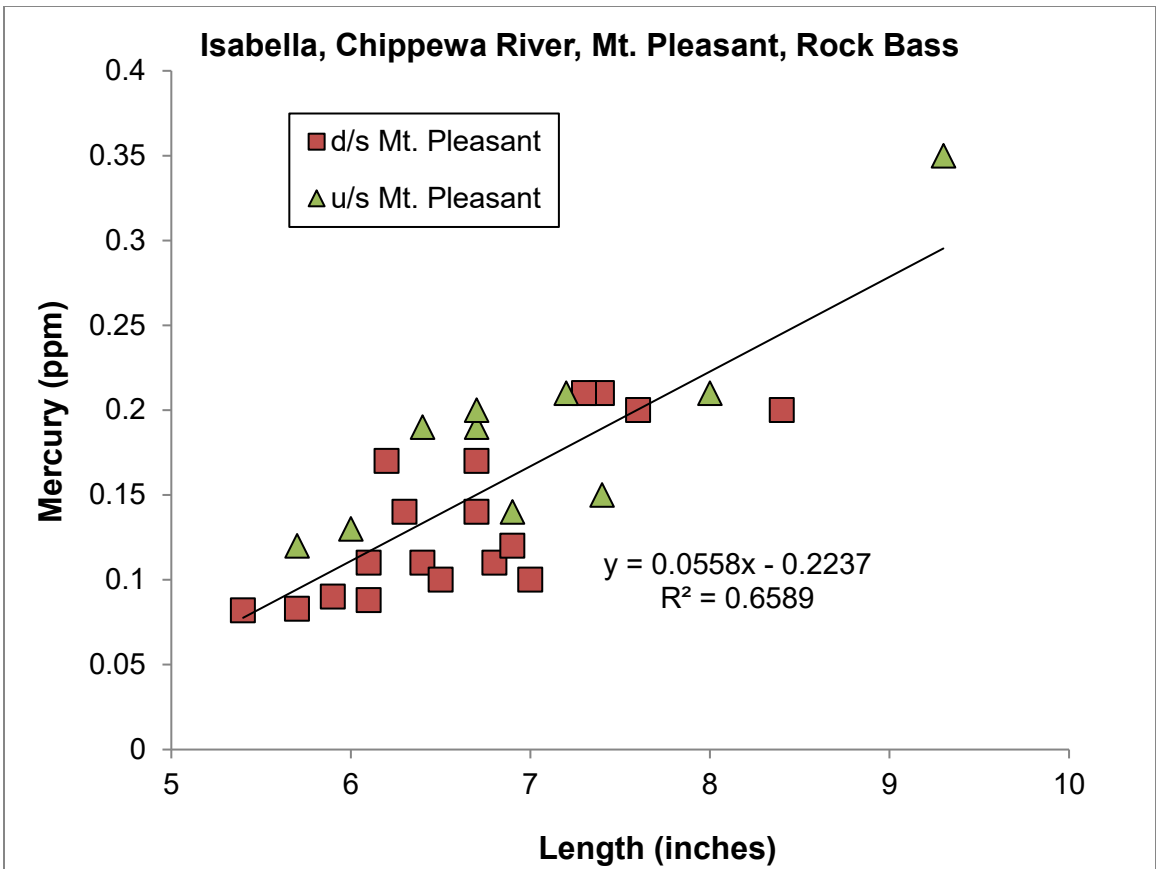
* 2005 WHO TEFs; dl-PCBs included

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

Recommendation: No change is recommended.

Note: Sampling indicates the concentrations of dioxin TEQ in rock bass downstream of Mt. Pleasant are higher than upstream, however the 95% UCL for the downstream fish alone (0.23 ppt) is below the MDHHS TEQ screening values.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
5	0.06	16
6	0.11	8
7	0.17	4
8	0.22	4
9	0.28	2
10	0.33	2
<i>Shaded area denotes extrapolated estimates</i>		



Smallmouth Bass

Chippewa River

Midland County

Hg Analysis:

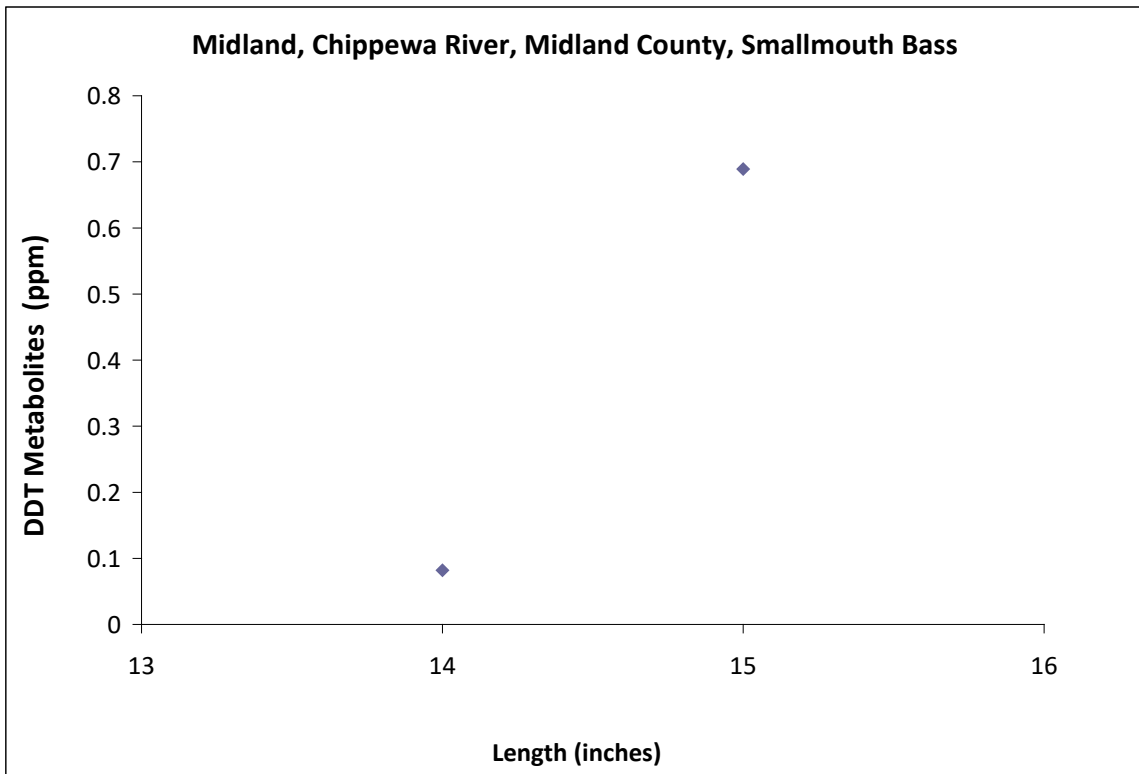
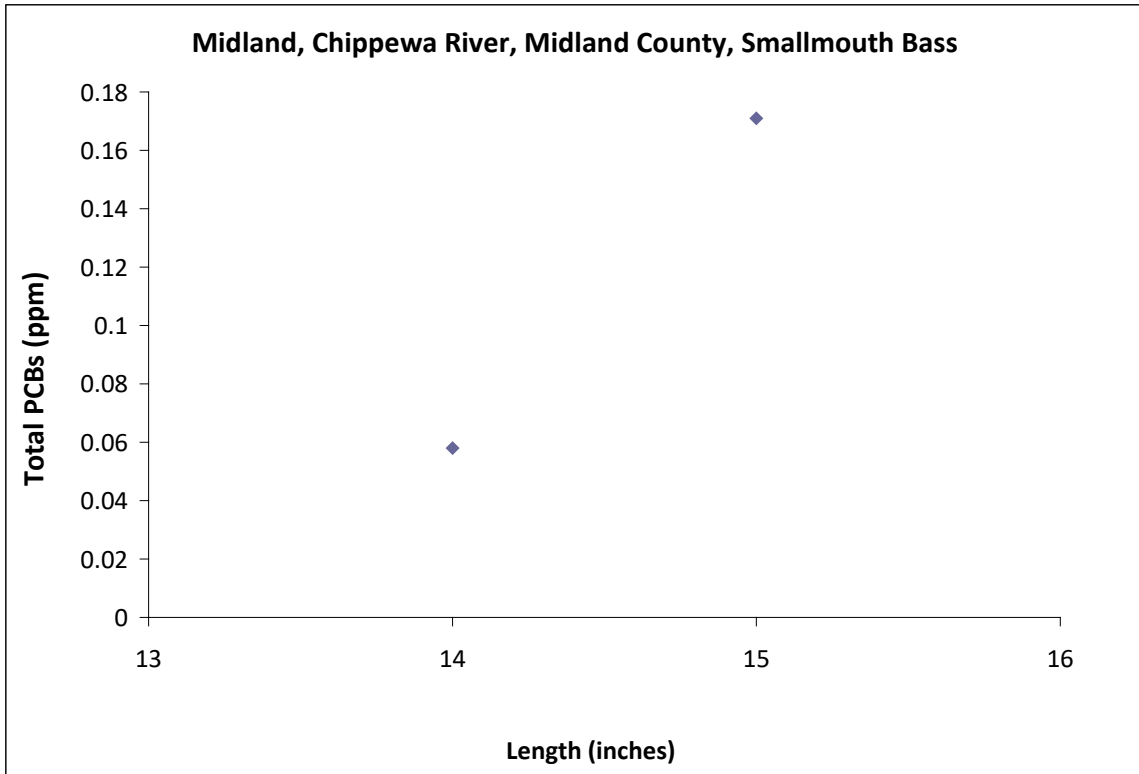
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1984	1984	0	--	14	--	--
Datasets available:		1984				
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
Mercury	0	--		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

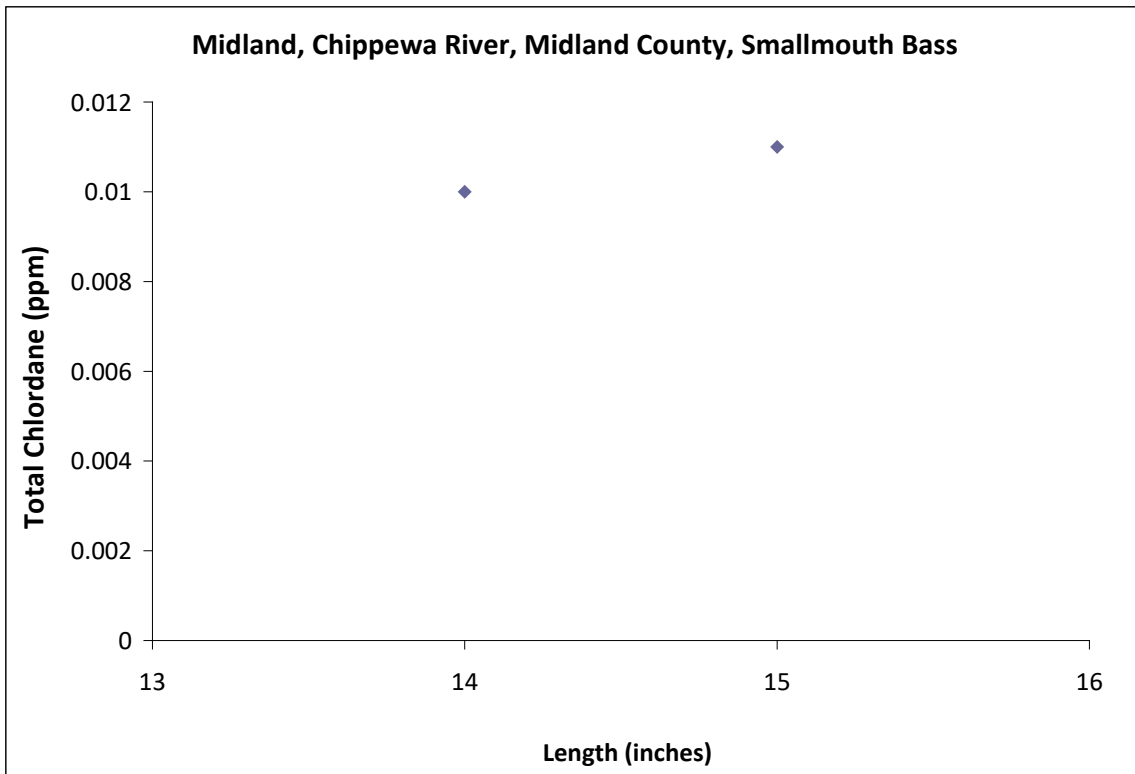
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1984	1984	2	14	14	15	
Datasets available:		1984				
Chemical	Sample Size (Legal)	Mean (ppm)		95%UCL		Meal Category
PCB	2	0.115		--		--
DDT	2	0.386		--		--
Chlordane	2	0.011		--		--
Toxaphene	0	--		--		--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						--

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

Recommendation: Statewide guidelines apply to Chippewa Rive smallmouth bass. This dataset is limited by the age of the data and sample size.





Redhorse and White Sucker

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	
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					
	R ²	R ²					
Mercury	0.563	0.615					

Organics Analysis:

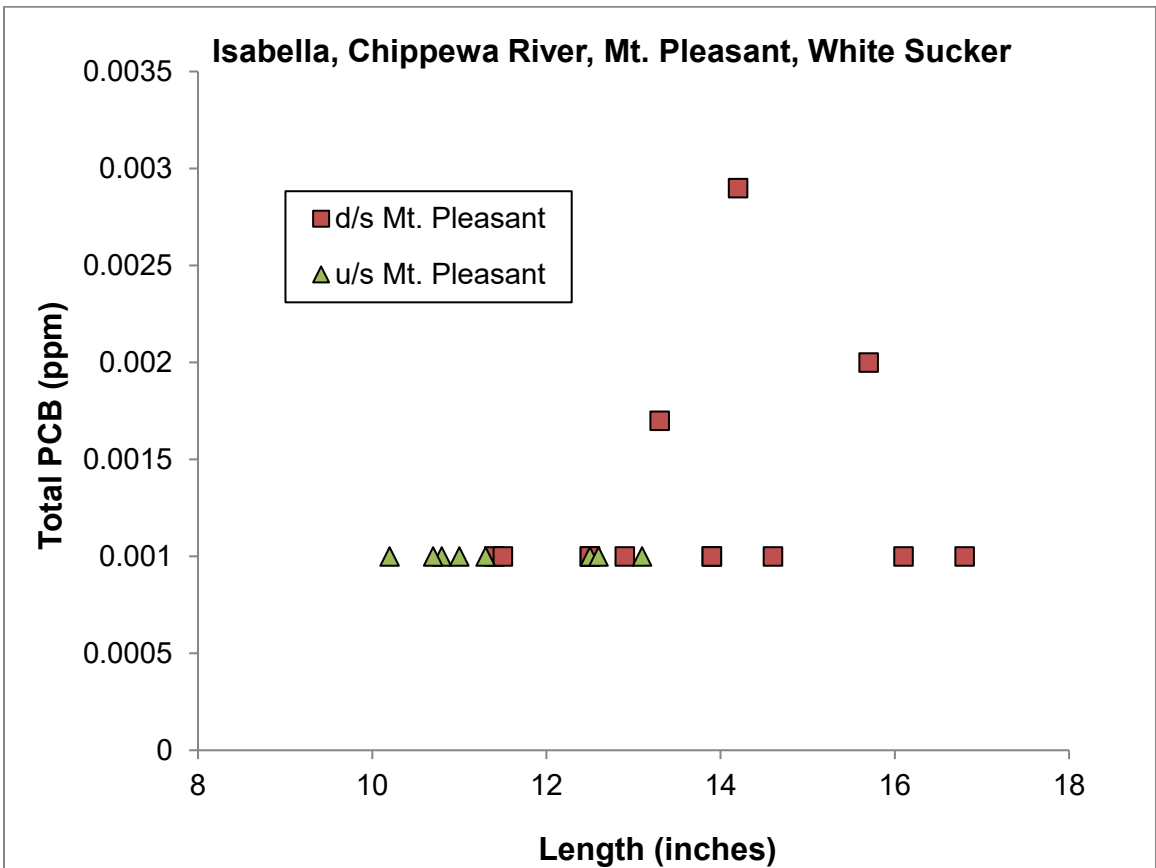
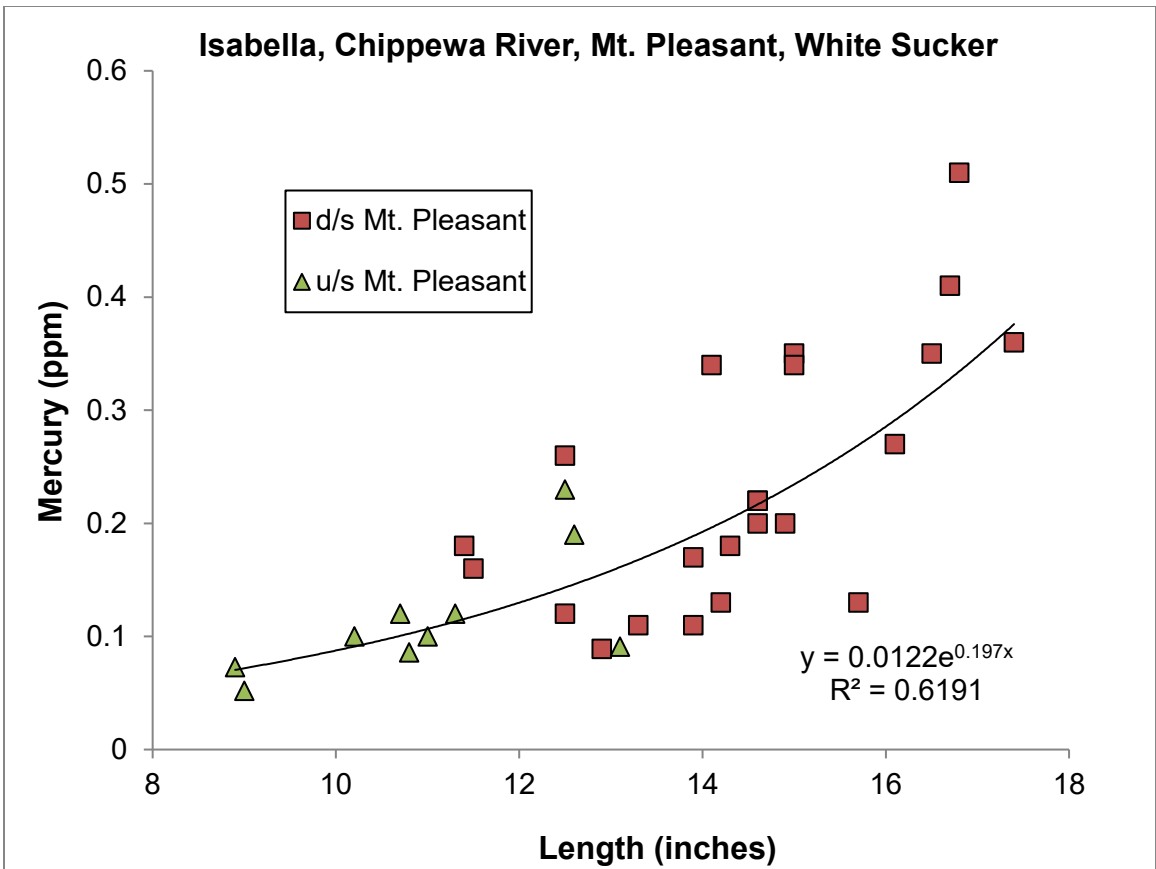
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2015	2016	21	10.2	na	10.2	16.8	
Datasets available: 1984, 2000, 2015, 2016							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal 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

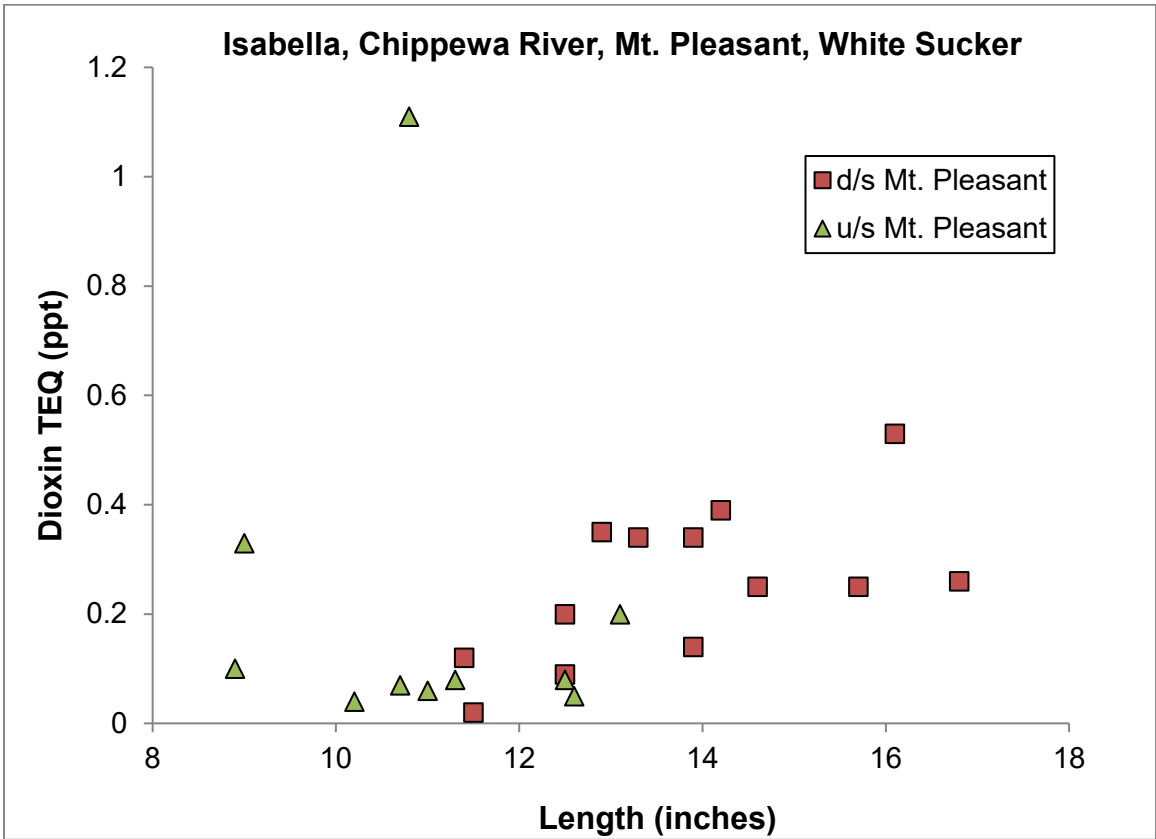
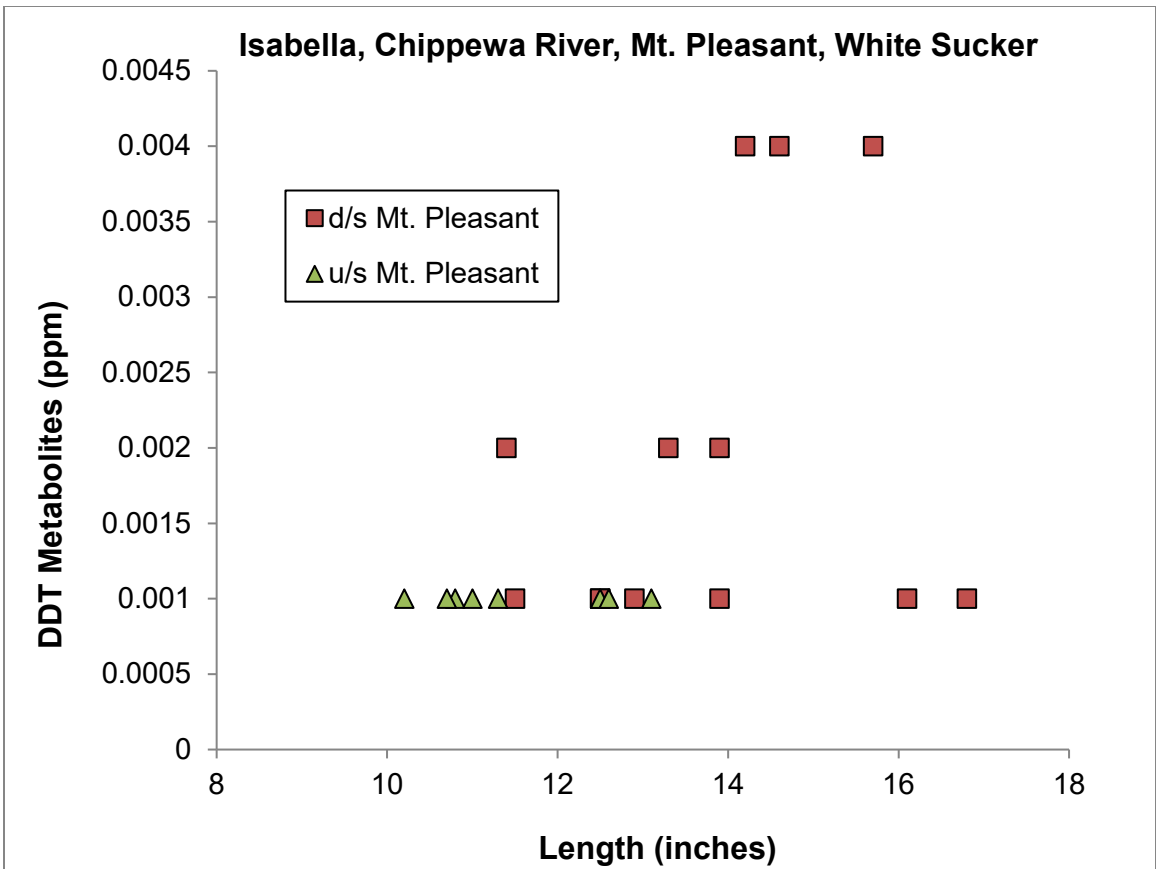
* 2005 WHO TEFs; dl-PCBs included

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>		





Monroe County

Data for certain species have been combined with Lake Erie data. See Lake Erie recommendation sheets for carp from the Ottawa River Mouth and Plum Creek, channel catfish from Plum Creek, freshwater drum from Plum Creek, largemouth and smallmouth bass from River Raisin downstream of the Monroe Dam and Ottawa River Mouth, and white bass from Plum Creek.

Black Buffalo

Plum Creek

Monroe County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1999	1999	5	16.7	na	16.7	19.5
Datasets available: 1999						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	5	0.040	--	--	0.070	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.963	0.890				

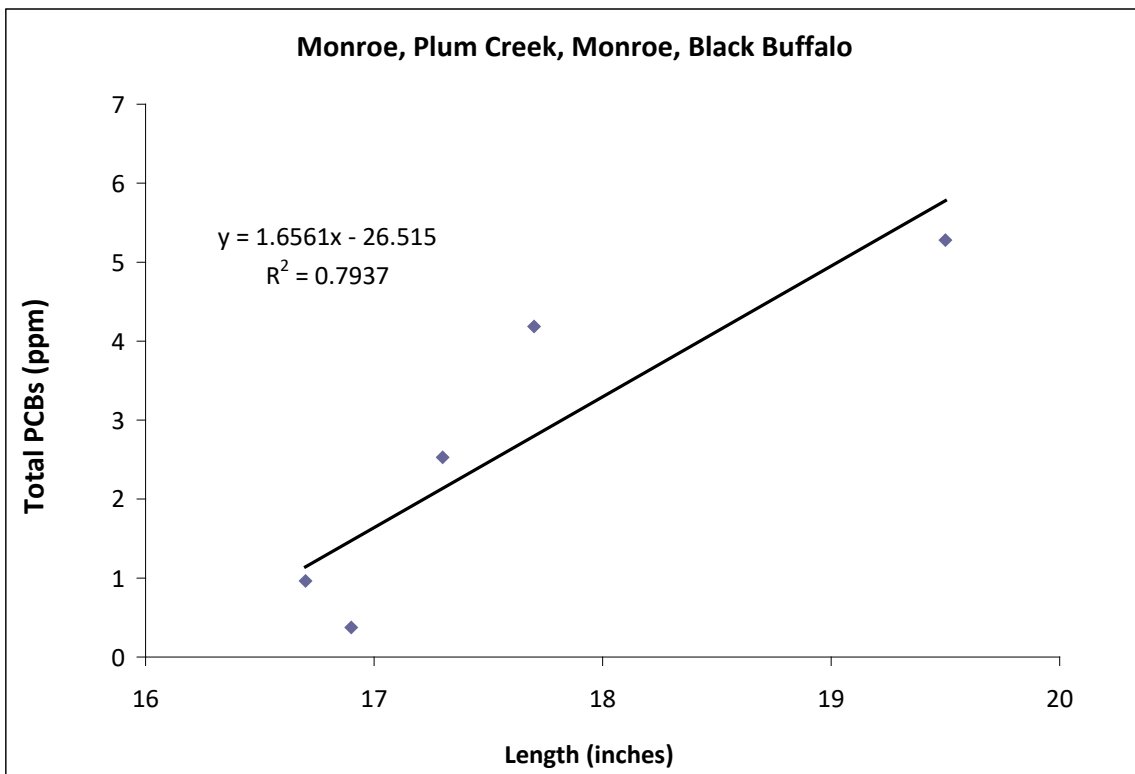
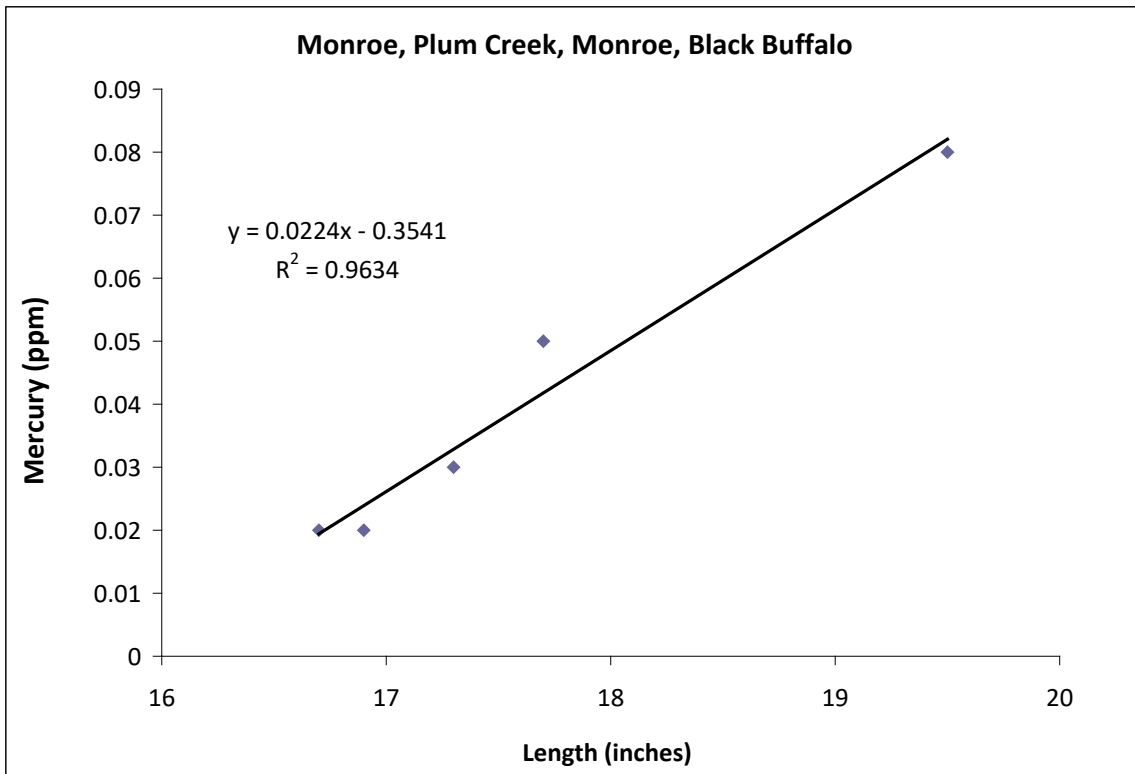
Organics Analysis:

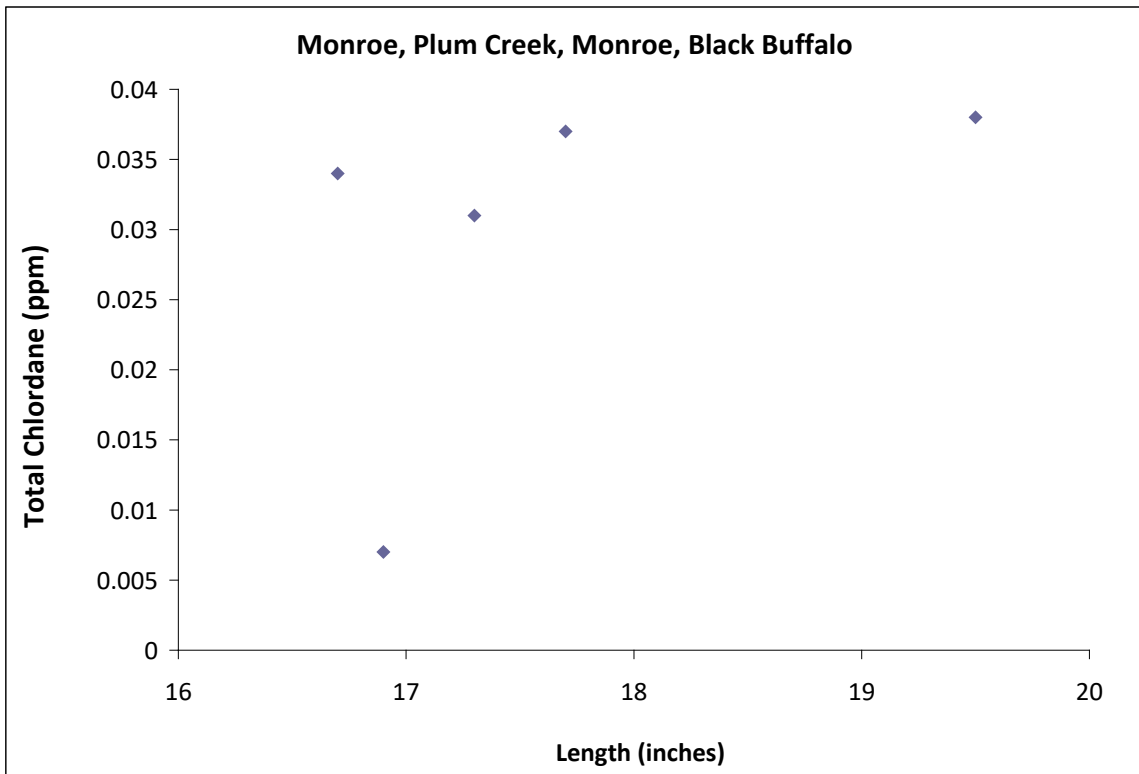
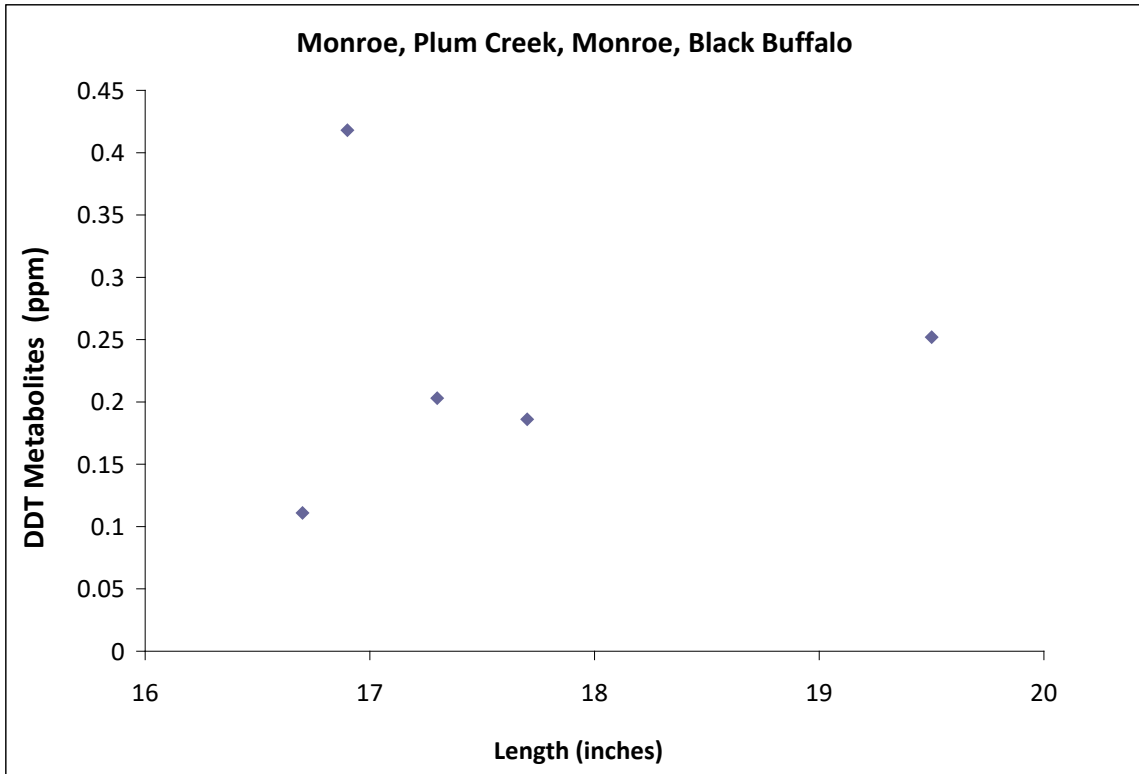
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1999	1999	5	16.7	na	16.7	19.5
Datasets available: --						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	5	2.666	--	--	5.250	0
DDT	5	0.234	--	--	0.380	4
Chlordane	5	0.029	--	--	0.050	--
Toxaphene	5	ND	--	--	--	--
TEQ*	--	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.794	0.561				
DDT	0.002	0.041				
Chlordane	0.241	0.183				
Toxaphene	--	--				
TEQ*	--	--				
Final meal category based on UCL:						0

* 2005 WHO; dl-PCBs included

Existing Advisory: Women and children should eat no more than six meals per year of River Raisin and Plum Creek black buffalo smaller than 14 inches due to PCBs. No one should eat fish larger than 14 inches.

Recommendation: Black buffalo (a species of sucker) were collected from Plum Creek in 1999 and had PCB concentrations slightly higher than the carp caught during the same sampling event. The species is very similar to carp both in food habits, behavior, and appearance. Black buffalo consumption advice should be the same as carp. See Carp guideline for these waterbodies.





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	4.9	NA	4.9	6.5
Datasets available: 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.047	0.026	0.072	0.058	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.130	0.110				

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	4.9	NA	4.9	6.5
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	30.9 ppb	10.2 ppb	62.9 ppb	42.0 ppb	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.002	0.009				
Final meal category based on UCL:						2

Existing MDHHS Advisory: Bluegill and sunfish from the Saline River downstream of the Milan Dam are currently covered under the statewide mercury guideline. No one should eat more than 8 meals per month of bluegill or sunfish of any size.

Recommendation: No one should eat more than 2 meals per month of bluegill or sunfish of any size from the Saline River downstream of the Milan Dam due to PFOS.

