

Keweenaw County

Northern Pike

Gratiot Lake

Keweenaw County

Hg Analysis:

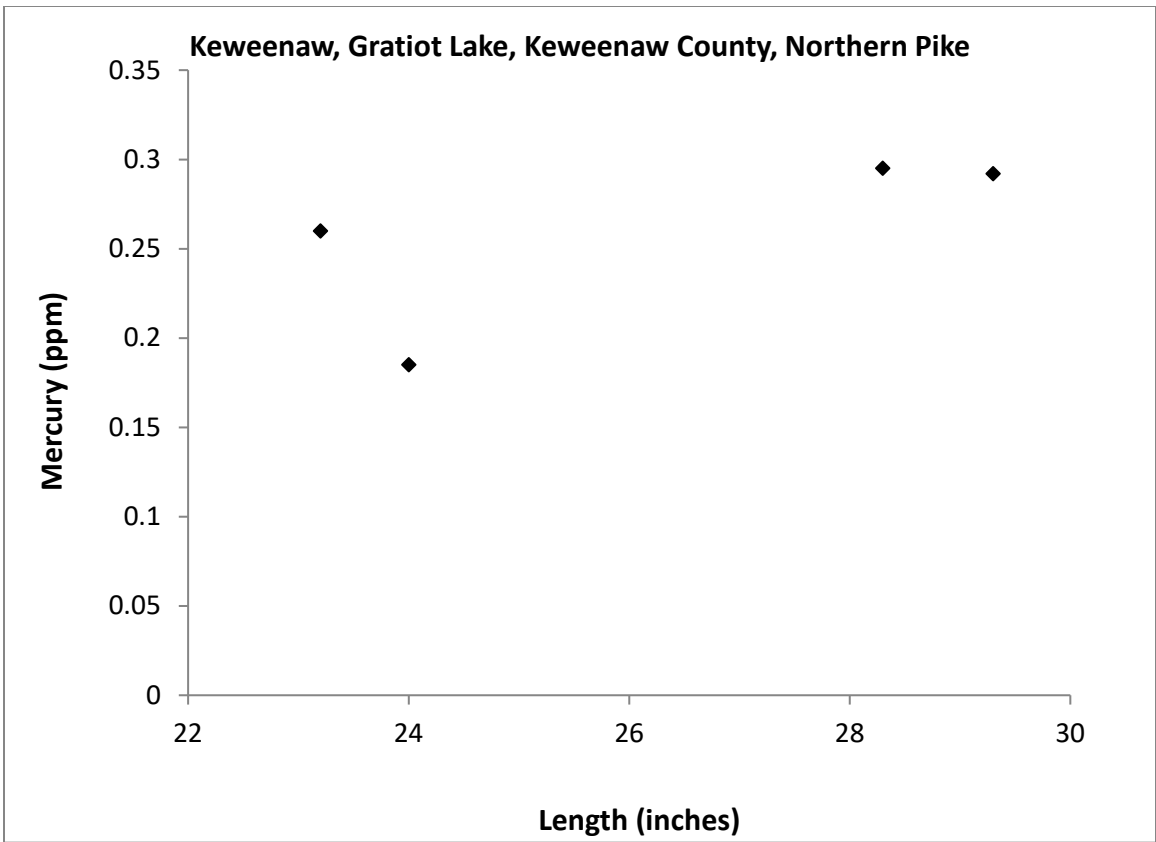
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2005	2005	4	23.2	24	24	29.3
Datasets available:		2005				
Chemical	Sample Size (All)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	4	0.26	0.19	0.30	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.521	0.474				

Organics Analysis:

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

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

Recommendation: A dataset of less than five data points for a given chemical, species and waterbody is considered insufficient for evaluation using the standard evaluation method. Statewide guidelines apply: 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.



Rock Bass

Gratiot Lake

Keweenaw County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	1987	9	4.9	NA	4.9	7.5
Datasets available: 1987						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	9	0.12	0.1	0.17	0.14	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.666	0.686				

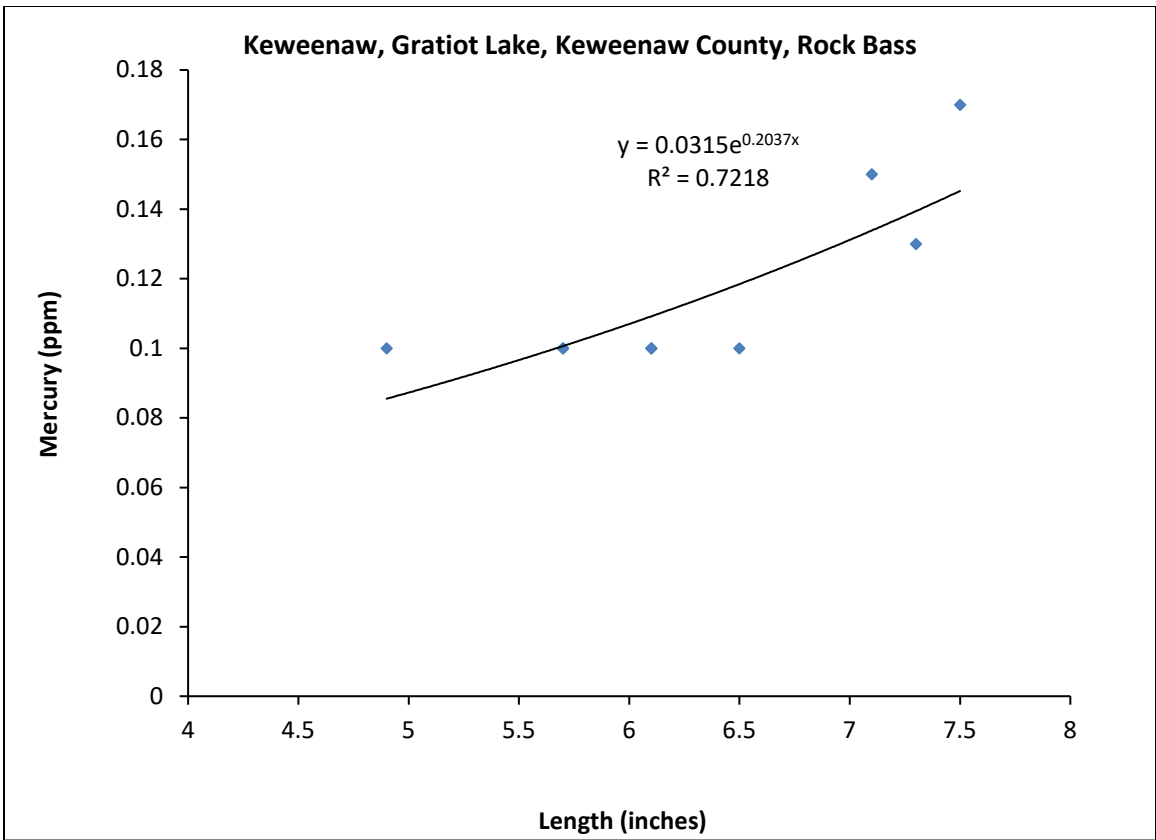
Organics Analysis:

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

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

Recommendation: No one should eat more than 8 meals per month of Gratiot Lake rock bass smaller than 6 inches or more than 4 meals per month of those fish larger than 6 inches due to mercury.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
4	0.07	12
5	0.09	12
6	0.11	8
7	0.13	4
8	0.16	4
9	0.20	4
10	0.24	4
<i>Shaded area denotes extrapolated estimates</i>		



Smallmouth Bass

Gratiot Lake

Keweenaw County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	2005	8	9.1	14	14.1	16.4
Datasets available: 1987, 2005						
Chemical	Sample Size (All)*	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	8	0.16	0.10	0.37	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.590	0.599				

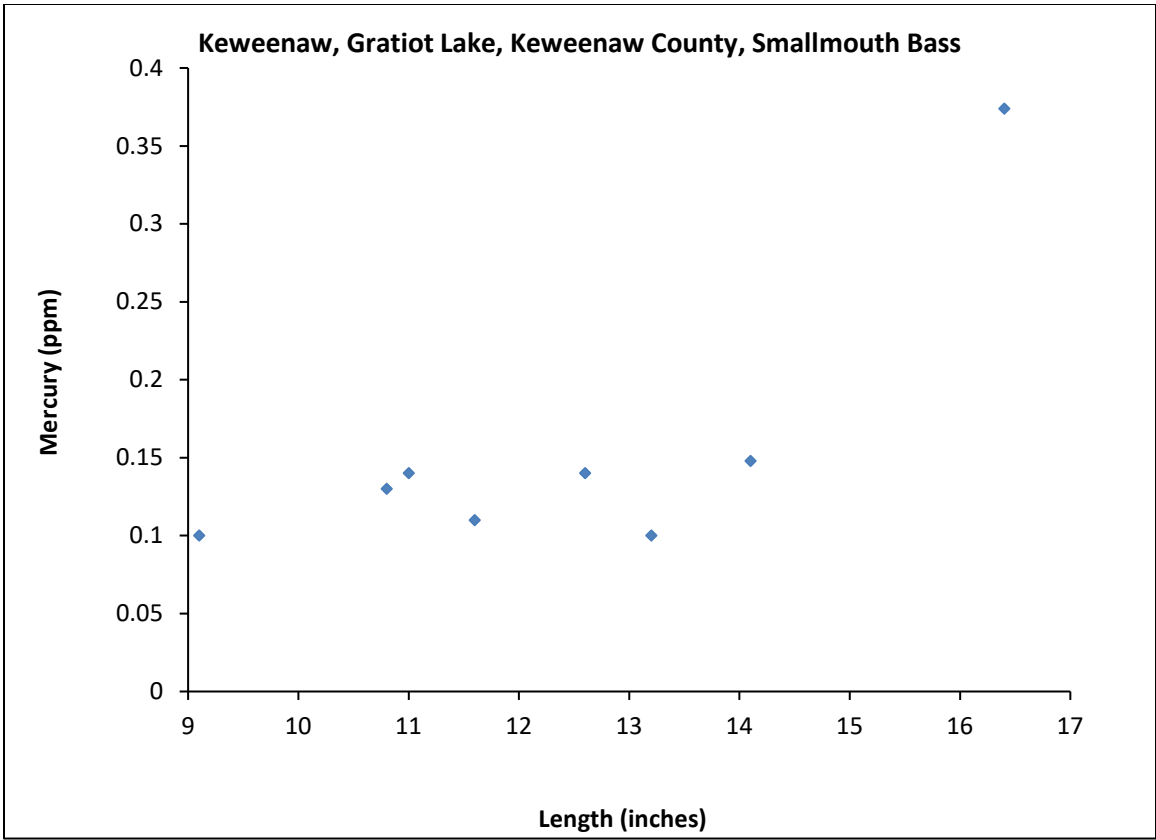
Organics Analysis:

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

* - 2 legal size fish in dataset

Existing Advisory: Gratiot Lake smallmouth bass are covered under the statewide mercury advisory.

Recommendation: The size range of fish in this sample set is limited. The statewide guidelines apply: No one should eat more than 2 meals per month of Gratiot Lake 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.



Walleye

Gratiot Lake

Keweenaw County

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	3	13	15	15.1	23.2		
Datasets available:		2005						
Chemical	Sample Size (All)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category		
Mercury	3	0.52	0.15	1.254	--	--		
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		
--	--	--	--	--	--	--		
Datasets available:		--						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category		
PCB	0	--	--	--	--	--		
DDT	0	--	--	--	--	--		
Chlordane	0	--	--	--	--	--		
Toxaphene	0	--	--	--	--	--		
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
PCB	--	--						
DDT	--	--						
Chlordane	--	--						
Toxaphene	--	--						
						Final meal category based on UCL:		--

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

Recommendation: A dataset of less than five data points for a given chemical, species and waterbody is considered insufficient for evaluation using the standard evaluation method. Statewide guidelines apply: No one should eat more than 2 meals per month of walleye smaller than 20 inches or more than 1 meal per month of walleye larger than 20 inches.

Smallmouth Bass

Lake Fannie Hooe

Keweenaw County

Hg & Se Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Size Range of All Samples	
Earliest	Most Recent				Min	Max
2007	2007	7	11.1	14	11.1	14
Datasets available: 2007						
Chemical	Sample Size (All)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	7*	0.44	0.21	0.66	0.57	1
Selenium	7*	0.530	0.410	0.730	0.640	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.708	0.598				
Selenium	0.021	0.018				

Organics Analysis:

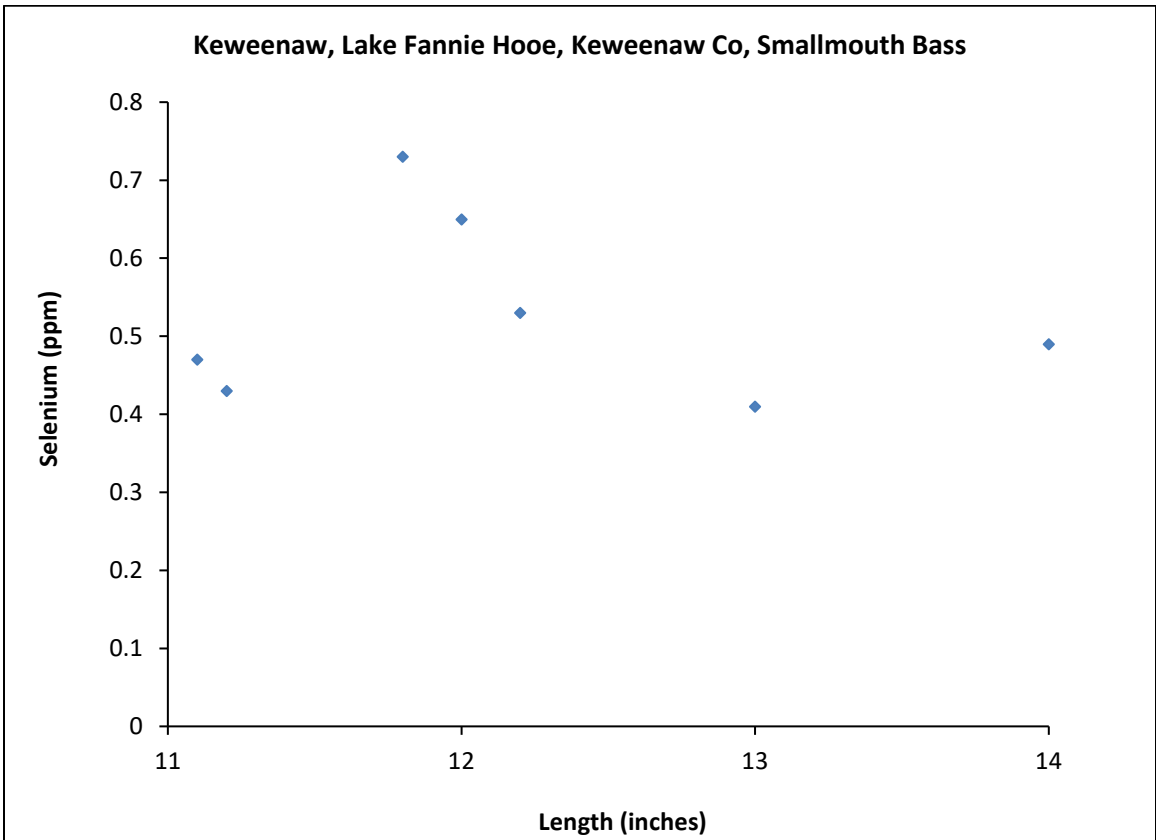
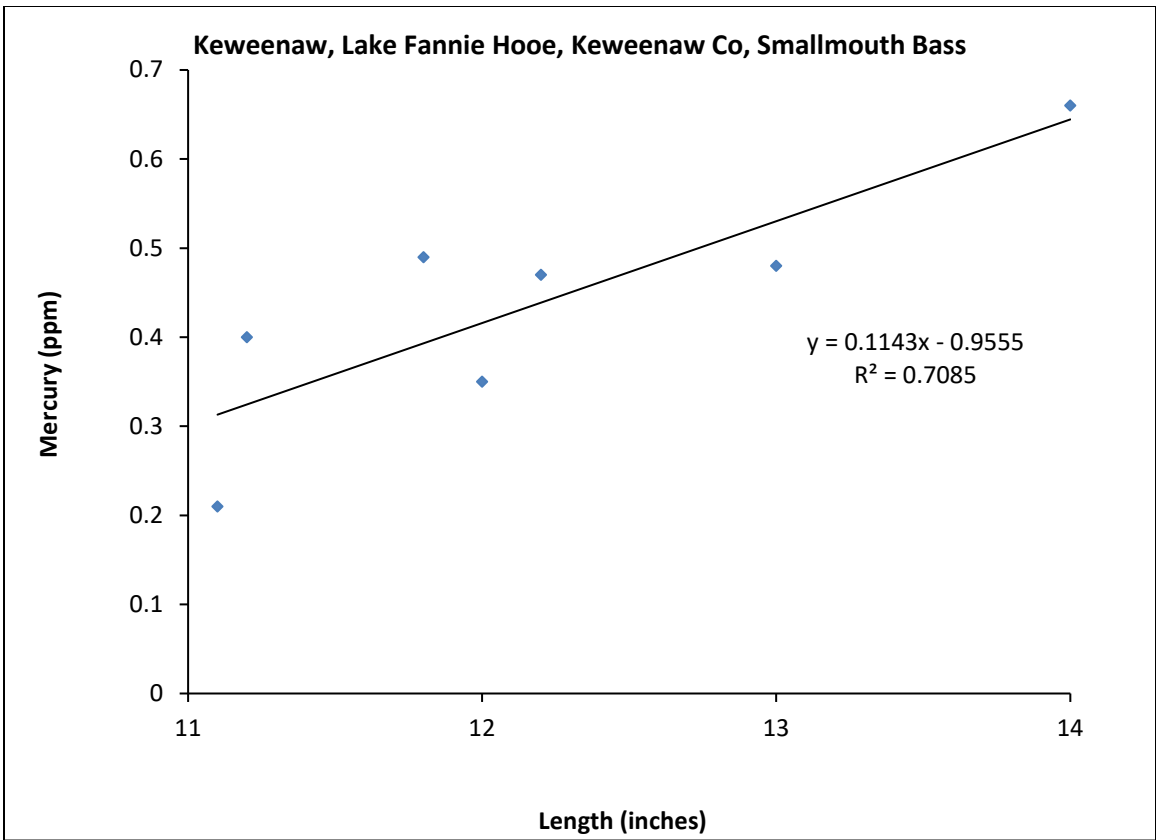
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Size Range of All Samples	
Earliest	Most Recent				Min	Max
--	--	--	--	--	--	--
Datasets available: --						
Chemical	Sample Size (All)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0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

* - 1 legal size fish in dataset

Existing Advisory: Lake Fannie Hooe smallmouth bass are covered under the statewide mercury advisory.

Recommendation: No one should eat more than 1 meal per month of 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 the fish was limited.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
11	0.30	2
12	0.42	2
13	0.53	1
14	0.64	1
15	0.76	1
<i>Shaded area denotes extrapolated estimates</i>		



Smallmouth Bass

Lake Medora

Keweenaw County

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	2018	15	13.1	14.0	13.8	17.0
Datasets available: 2004, 2018						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	14	0.628	0.450	0.840	0.689	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.019	0.026				

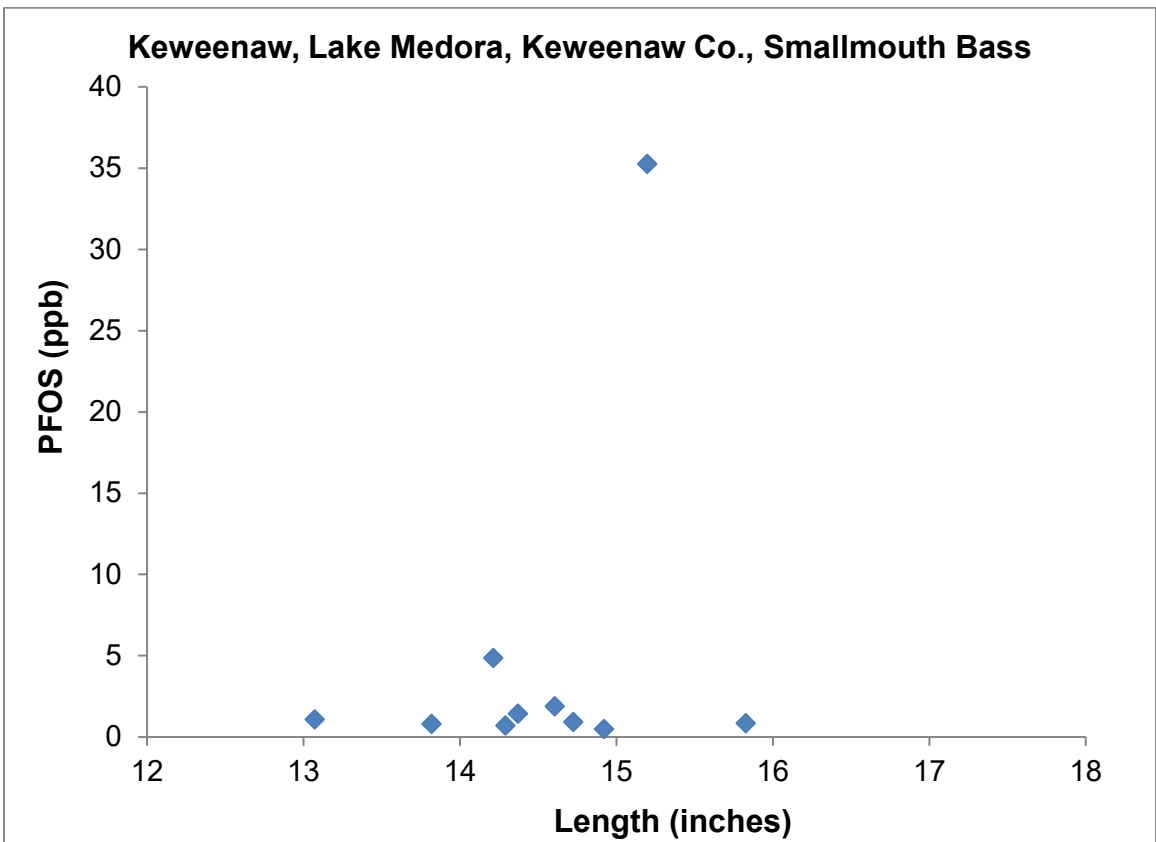
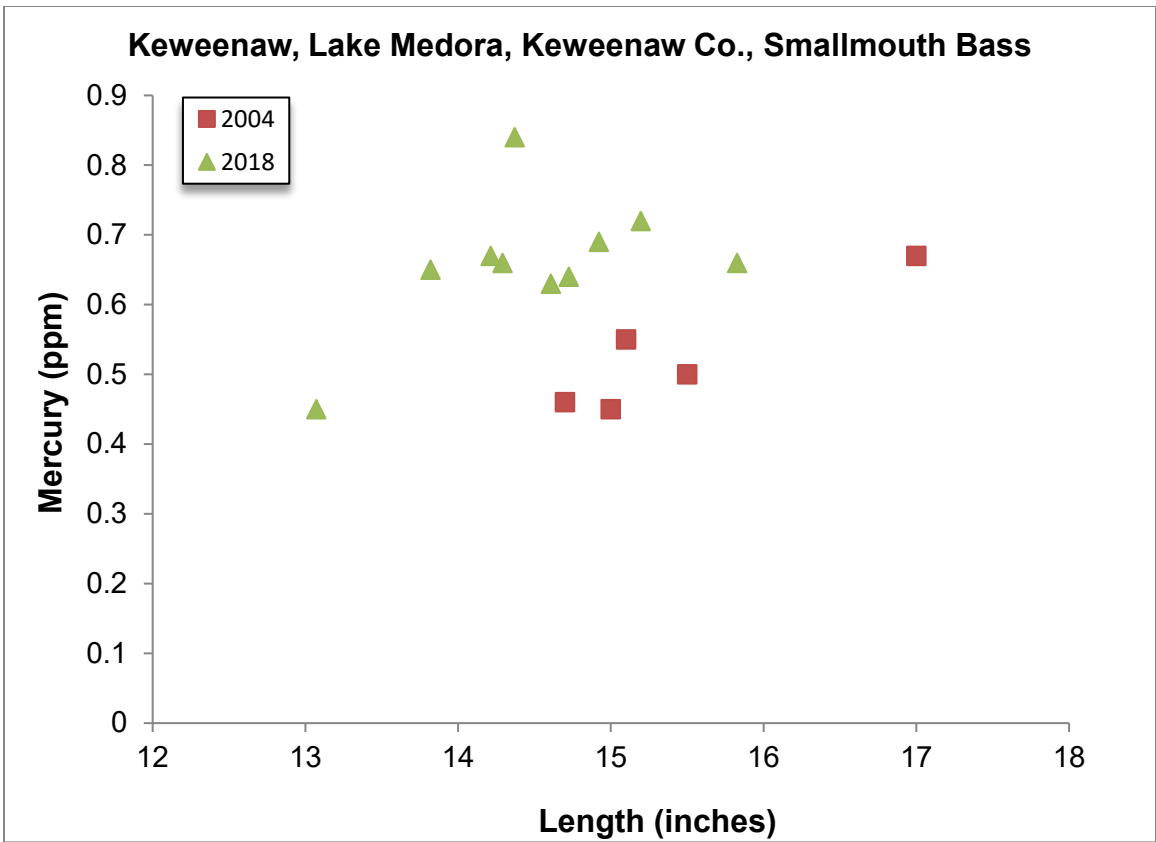
Organics Analysis:

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	13.1	14.0	13.8	15.8
Datasets available: 2018						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	9	ND	--	--	--	16
DDT	9	ND	--	--	--	16
Chlordane	9	ND	--	--	--	16
Toxaphene	9	ND	--	--	--	--
PFOS	10*	4.8 ppb	0.5 ppb	35.3 ppb	12.5 ppb	12
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.093	0.035	Final meal category based on UCL:			1

*One sub-legal sized fish was used in the PFOS analysis as there has not been a significant correlation between fish size and PFOS observed in the statewide dataset.

Existing MDHHS Advisory: No one should eat more than 1 meal per month of largemouth or smallmouth bass from Lake Medora in Keweenaw County smaller than 18 inches or more than 6 meals per year of these fish larger than 18 inches due to mercury. The statewide length break was applied as the size range of the fish was limited.

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



Walleye

Lake Medora

Keweenaw County

Hg Analysis:

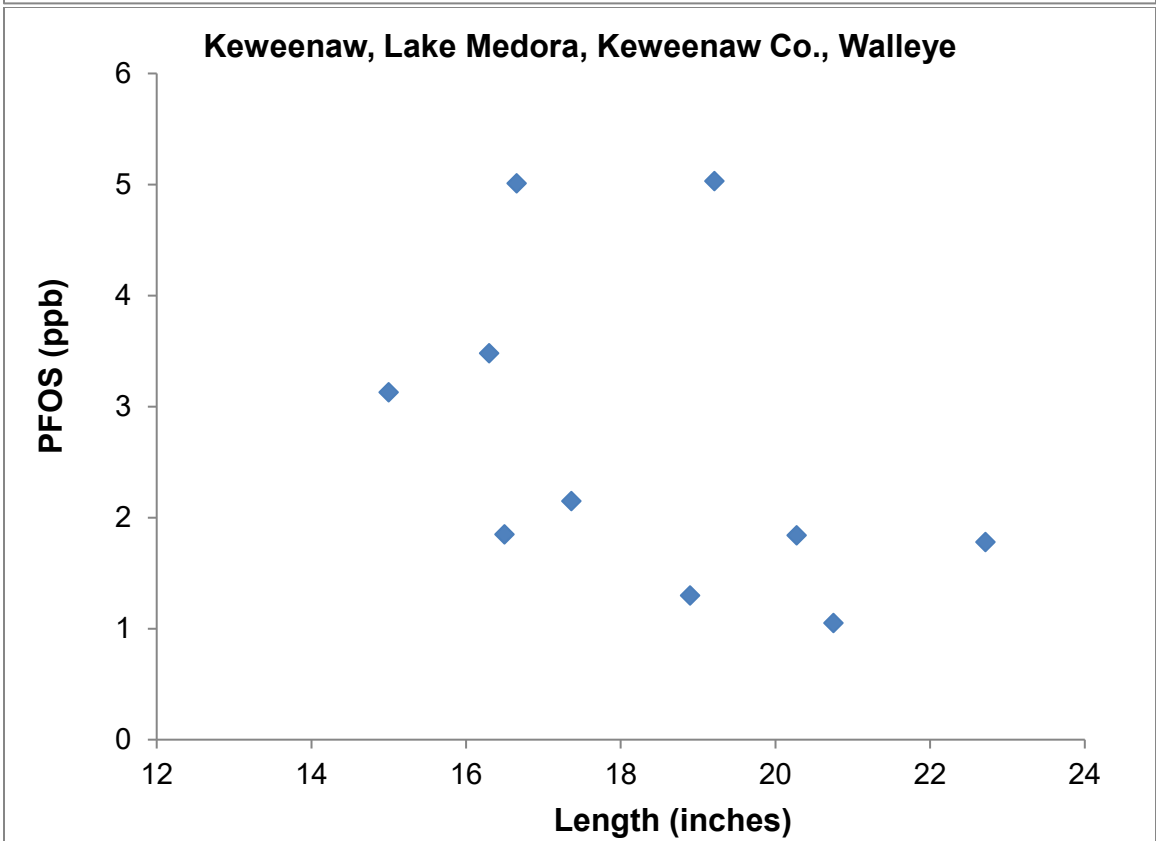
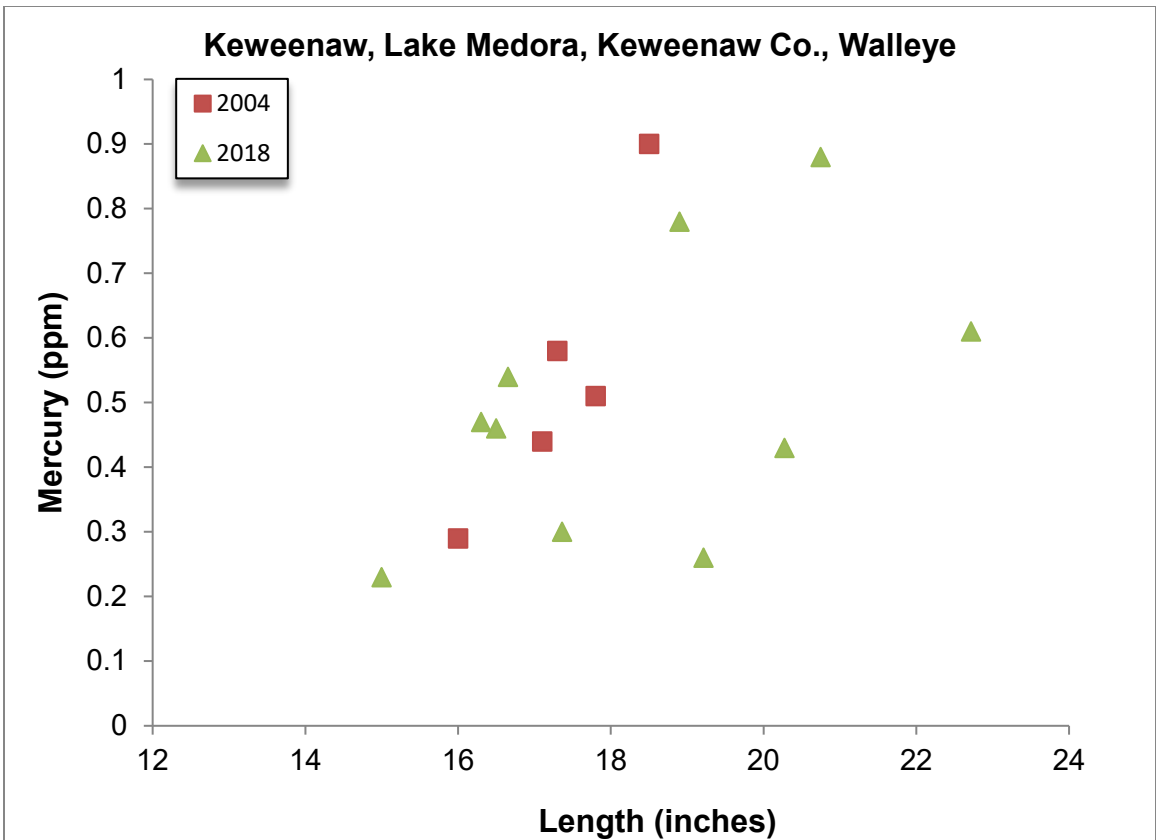
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		Meal Category
Earliest	Most Recent				Min	Max	
2004	2018	15	15.0	15.0	15.0	22.7	
Datasets available: 2004, 2018							
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category	
Mercury	15	0.512	0.230	0.900	0.629	1	
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.238	0.237					

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		Meal Category
Earliest	Most Recent				Min	Max	
2018	2018	10	15.0	15.0	15.0	22.7	
Datasets available: 2018							
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category	
PCB	10	ND	--	--	--	16	
DDT	10	0.001	<0.001	0.001	0.001	16	
Chlordane	10	ND	--	--	--	16	
Toxaphene	10	ND	--	--	--	--	
PFOS	10	2.7 ppb	1.1 ppb	5.0 ppb	3.7 ppb	16	
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	0.177	0.249					
Final meal category based on UCL:							1

Existing MDHHS Advisory: No one should eat more than 1 meal per month of walleye from Lake Medora in Keweenaw County smaller than 20 inches or more than 6 meals per year of these fish larger than 20 inches due to mercury. The statewide length break was applied as the size range of the fish was limited.

Recommendation: No change to the advisory is warranted.



Lake Trout

**Siskiwit Lake
Isle Royale**

Keweenaw County

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	2002	40	16.9	15	16.9	25.6
Datasets available: 1987, 1993, 1996, 2002						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	40	0.35	0.11	0.6	0.39	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.081	0.131				

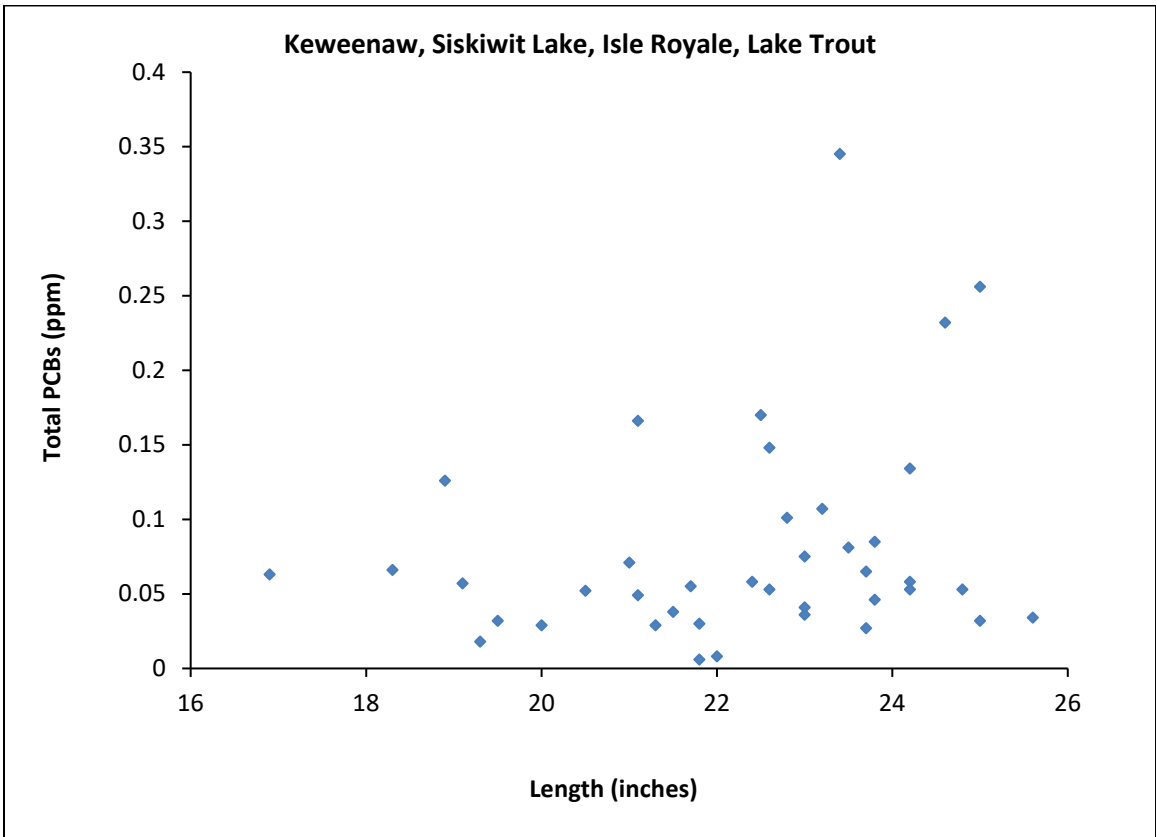
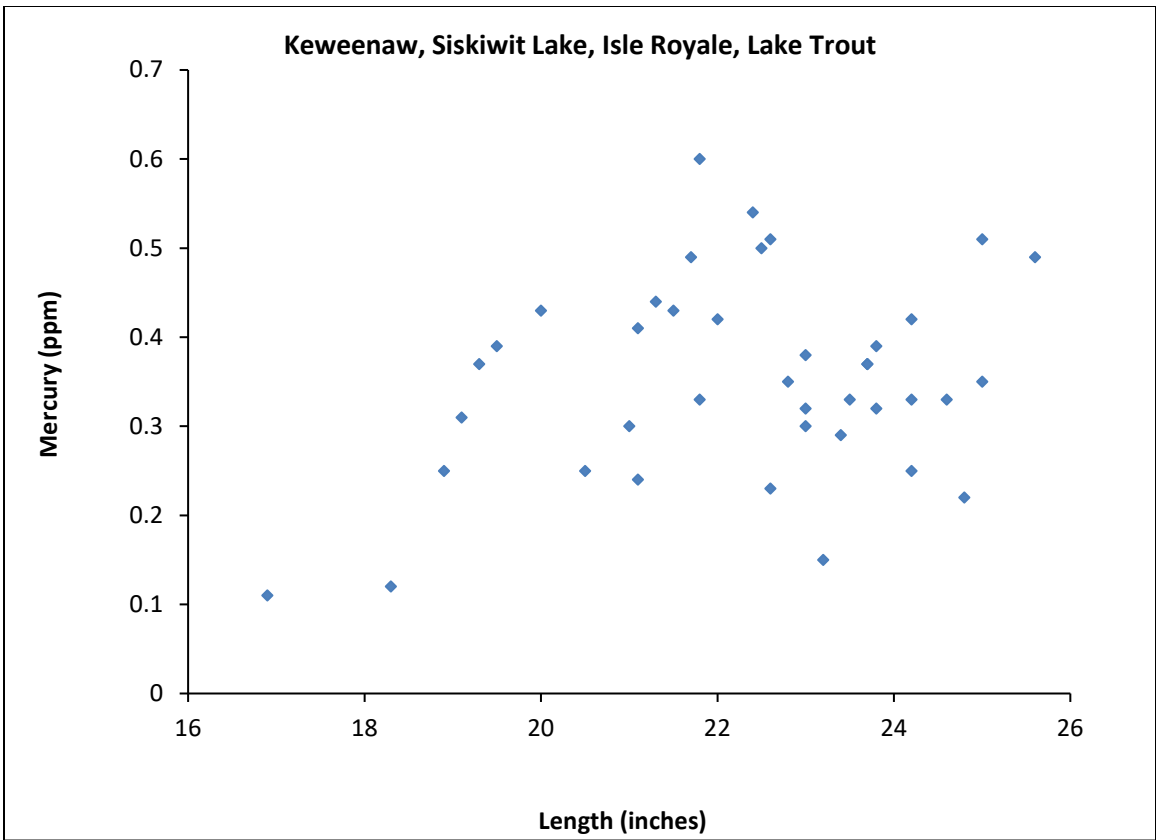
Organics Analysis:

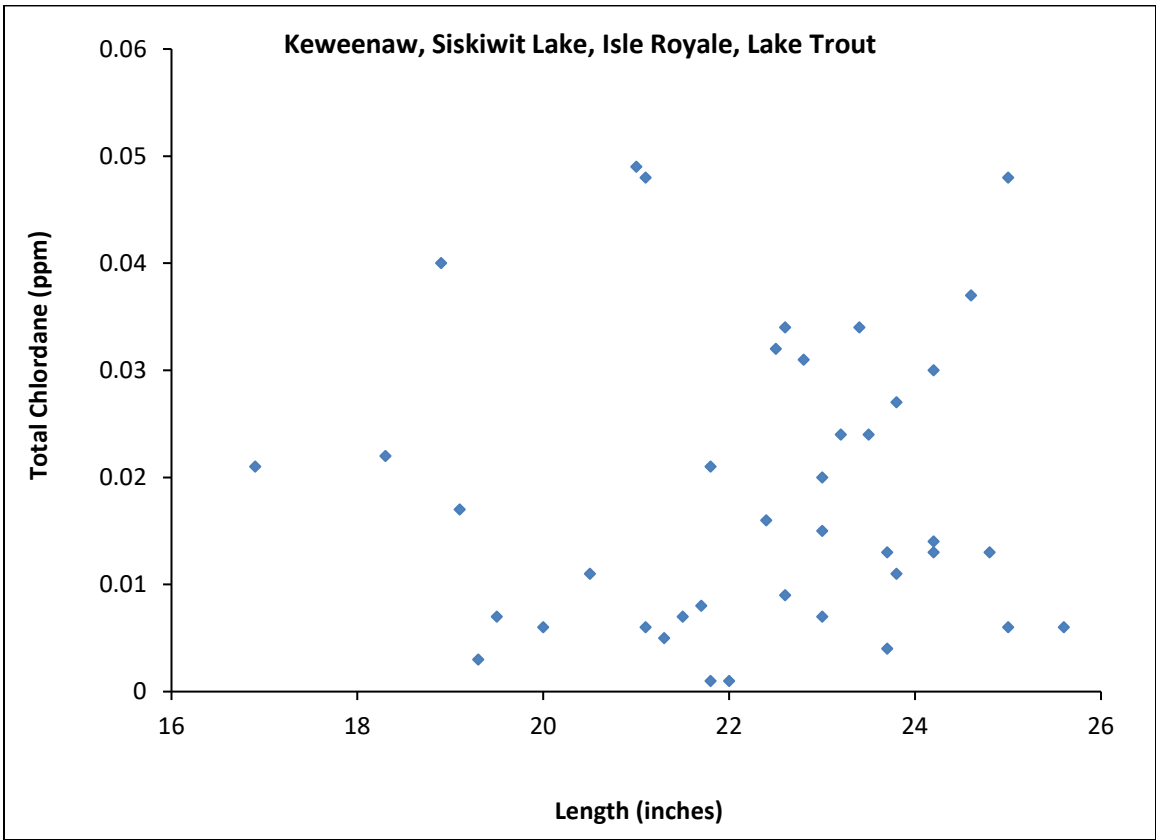
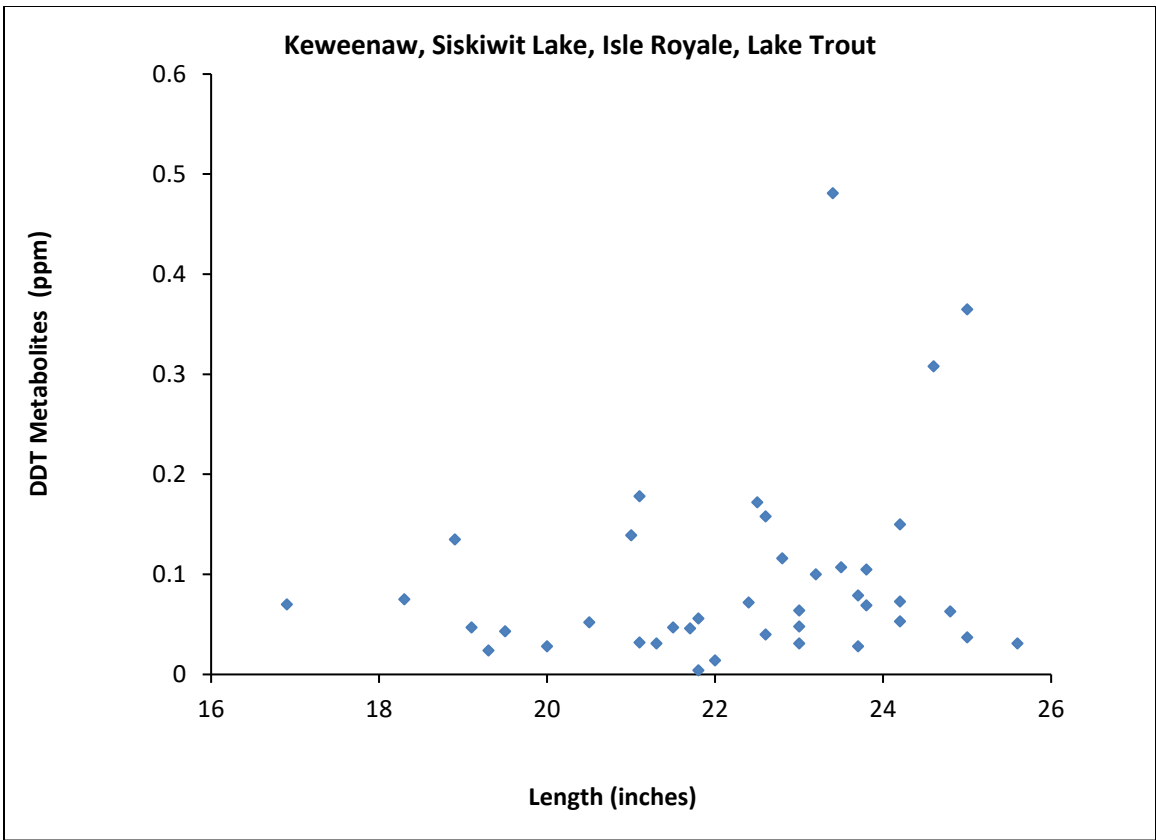
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2002	2002	10	19.3	15	19.3	25
Datasets available: 1987, 1993, 1996, 2002						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.039	0.006	0.17	0.07	2
DDT	10	0.043	0.004	0.172	0.08	8
Chlordane	10	0.007	0.001	0.032	0.01	--
Toxaphene	10	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.055	0.038				
DDT	0.064	0.042				
Chlordane	0.002	0.005				
Toxaphene	--	--				
Final meal category based on UCL:						2

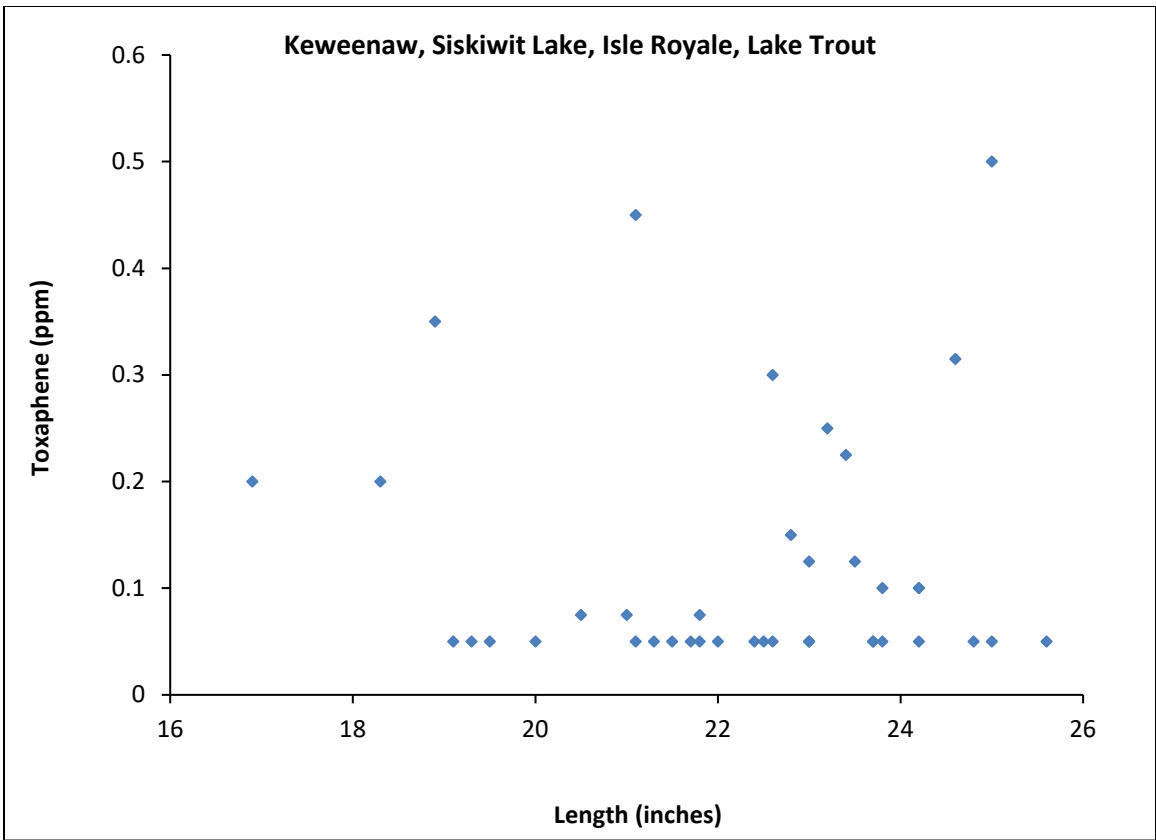
Existing Advisory: Women and children should not eat more than one meal per week of Siskiwit Lake lake trout over 22 inches due to PCBs.

Recommendation: No one should eat more than 2 meals per month of Siskiwit Lake lake trout due to mercury and PCBs.

Note: Hg meal category the same with only 2002 dataset and with all three datasets.







Lake Whitefish

Siskiwit Lake
Isle Royale

Keweenaw County

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	3	19.5	na	19.5	20.5
Datasets available: 1993						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	3	0.12	0.08	0.17	--	--
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	3	19.5	na	19.5	20.5
Datasets available: 1993						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	3	0.10	0.04	0.17	--	--
DDT	3	0.12	0.03	0.29	--	--
Chlordane	3	0.02	0.007	0.05	--	--
Toxaphene	3	0.11	0.05	0.22	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						--

Existing Advisory: Women and children should eat no more than one meal per week of Siskiwit Lake lake whitefish of any size due to PCBs.

Recommendation: Data is insufficient to determine a waterbody-species guideline for whitefish from Siskiwit Lake.

Note: There is no statewide guidance for lake whitefish from inland lakes. Based on the maximum Hg concentration the meal category would be 4 meals per month; maximum PCB concentration discounted for age of data would cause a 1 meal per month recommendation. A 2 meal per month recommendation tracks well with advice for lake trout from this lake.

Northern Pike

Siskiwit Lake
Isle Royale

Keweenaw County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of All Samples	
Earliest	Most Recent				Min	Max
1993	1993	3	20.5	24	20.5	24.5
Datasets available: 1993						
Chemical	Sample Size (All)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	3	0.13	0.11	0.14	--	--
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	3	20.5	24	20.5	24.5
Datasets available: 1993						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	3	ND	--	--	--	--
DDT	3	0.004	0.004	0.005	--	--
Chlordane	3	ND	--	--	--	--
Toxaphene	3	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						--

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

Recommendation: A dataset of less than five data points for a given chemical, species and waterbody is considered insufficient for evaluation using the standard evaluation method. Statewide guidelines apply: 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.

Yellow Perch

Thayers Lake

Keweenaw County

Hg Analysis:

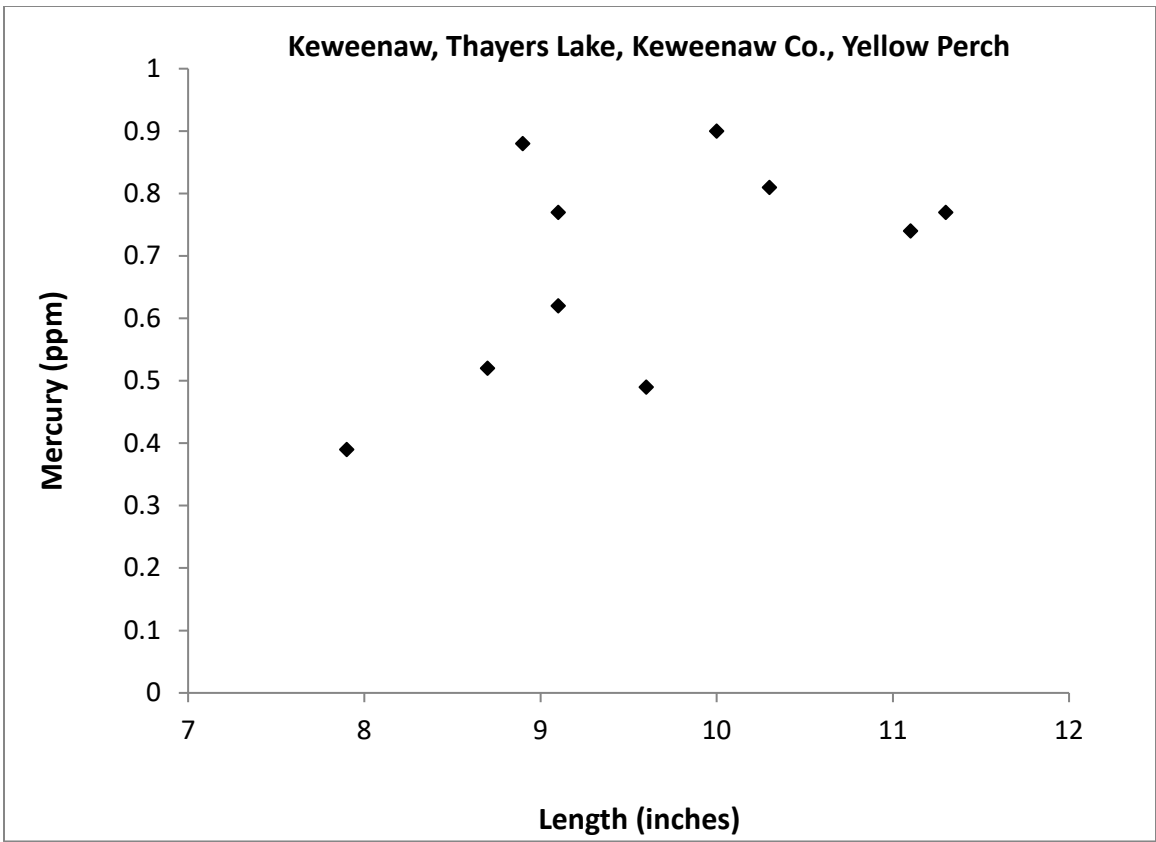
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Size Range of All Samples	
Earliest	Most Recent				Min	Max
2010	2010	10	7.9	na	7.9	11.3
Datasets available: 2010						
Chemical	Sample Size (All)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.69	0.39	0.90	0.81	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.285	0.330				

Organics Analysis:

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

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

Recommendation: No one should eat more than 1 meal per month of Thayers Lake yellow perch due to mercury.



Luce County

Northern Pike

Belle Lake

Luce County

Hg Analysis:

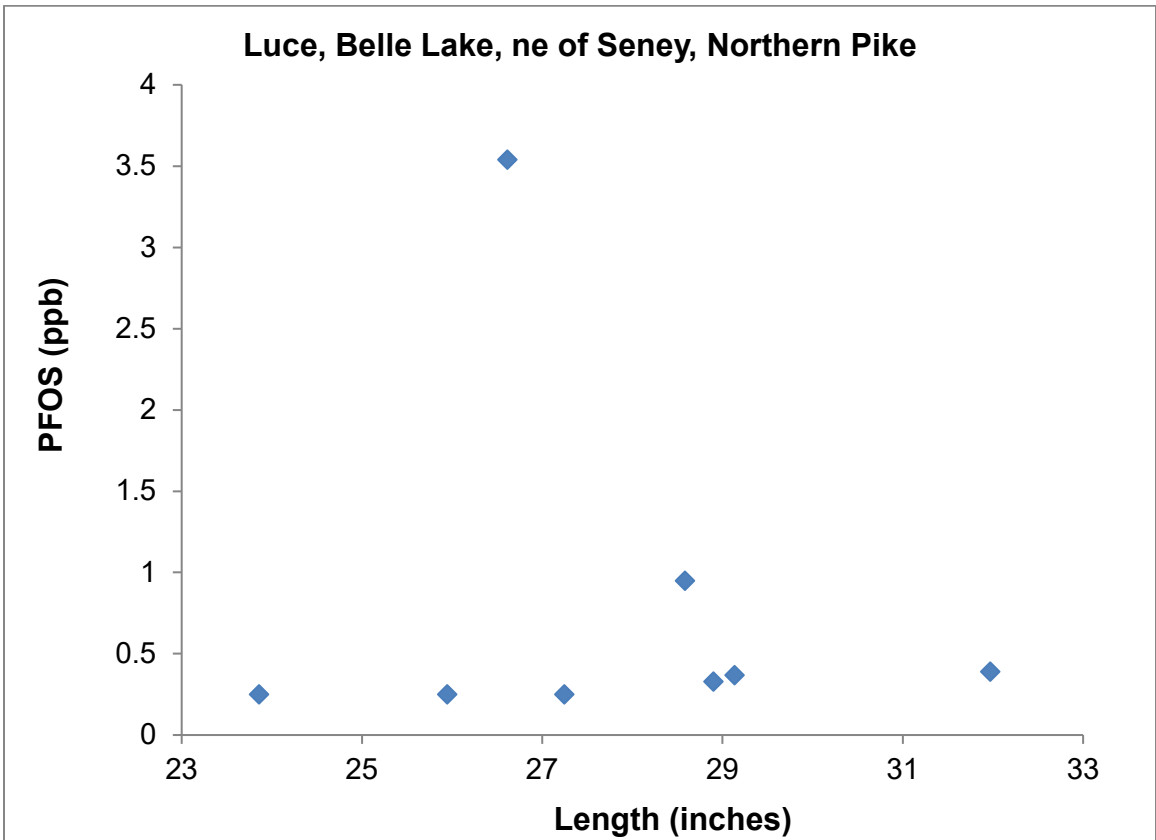
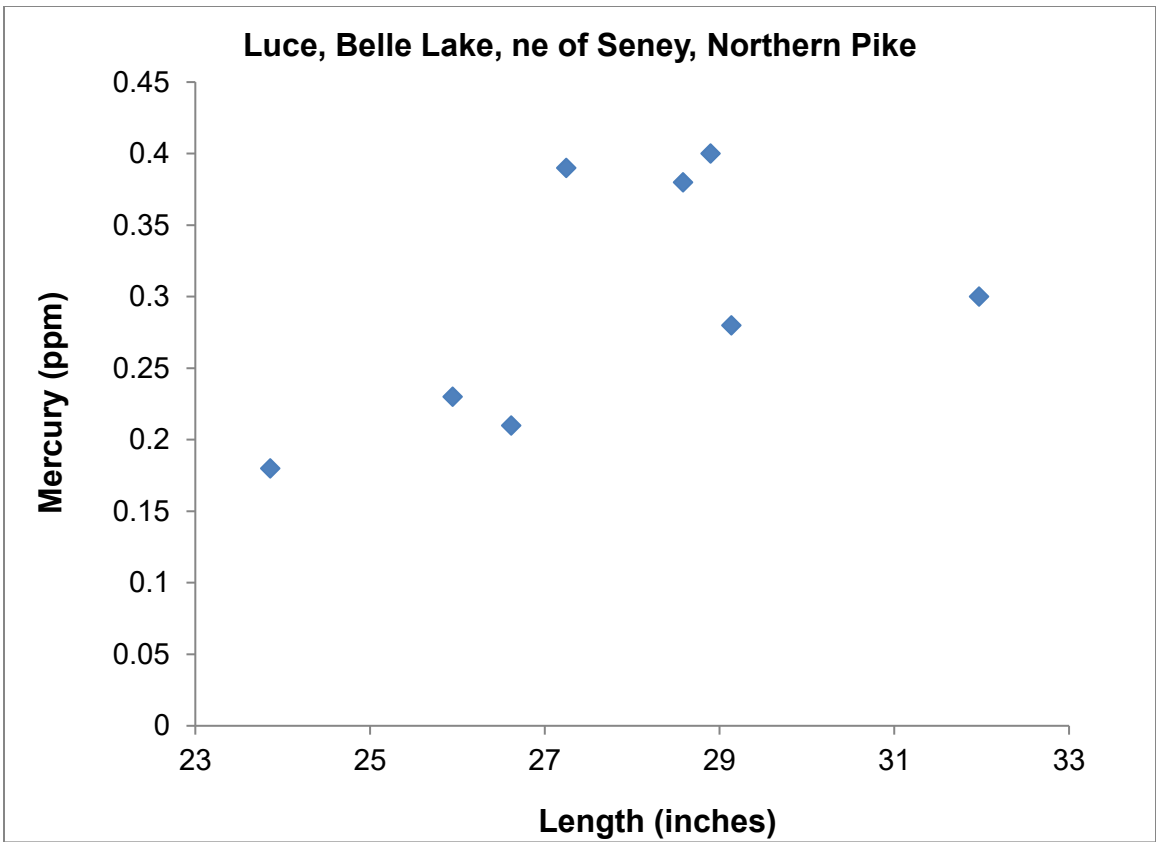
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2018	2018	8	23.9	24.0	23.9	32.0
Datasets available: 2018						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	8	0.296	0.180	0.400	0.368	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.298	0.375				

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	8	23.9	24.0	23.9	32.0
Datasets available: 2018						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	8	ND	--	--	--	16
DDT	8	0.001	<0.001	0.001	0.001	16
Chlordane	8	ND	--	--	--	16
Toxaphene	8	ND	--	--	--	--
PFOS	8	0.8 ppb	<0.25 ppb	3.5 ppb	1.7 ppb	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.016	0.002				
Final meal category based on UCL:						2

Existing MDHHS Advisory: Northern pike from Belle Lake in Luce County are currently covered under the statewide mercury guidance. No one should eat more than 2 meals per month of northern pike smaller than 30 inches or no more than 1 meal per month of these fish larger than 30 inches.

Recommendation: No one should eat more than 2 meals per month of northern pike smaller than 30 inches from Belle Lake in Luce County or no more than 1 meal per month of these fish larger than 30 inches due to mercury. Statewide length break applied due to limited sample size of fish larger than 30 inches.



Yellow Perch

Blind Sucker Flooding

Luce County

Hg Analysis:

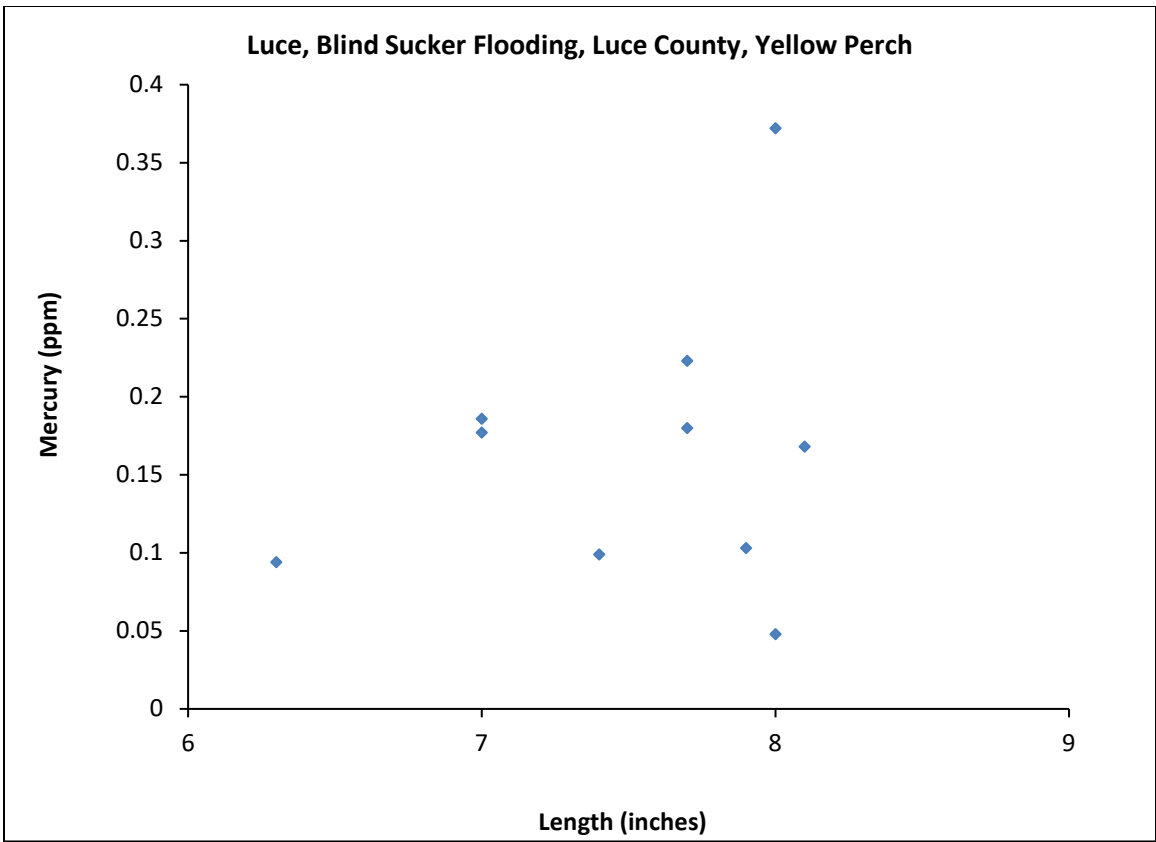
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2007	2007	10	6.3	na	6.3	8.1
Datasets available: 2007						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95% (ppm)	Meal Category
Mercury	10	0.16	0.05	0.37	0.23	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.056	0.013				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	--	--	--	--	--
Datasets available: --						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95% (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:						4

Existing Advisory: Blind Sucker Flooding yellow perch are covered under the statewide mercury consumption advisory.

Recommendation: No one should eat more than 4 meals per month of Blind Sucker Flooding yellow perch due to mercury.



Northern Pike

Bodi Lake

Luce County

Hg & Se Analysis:

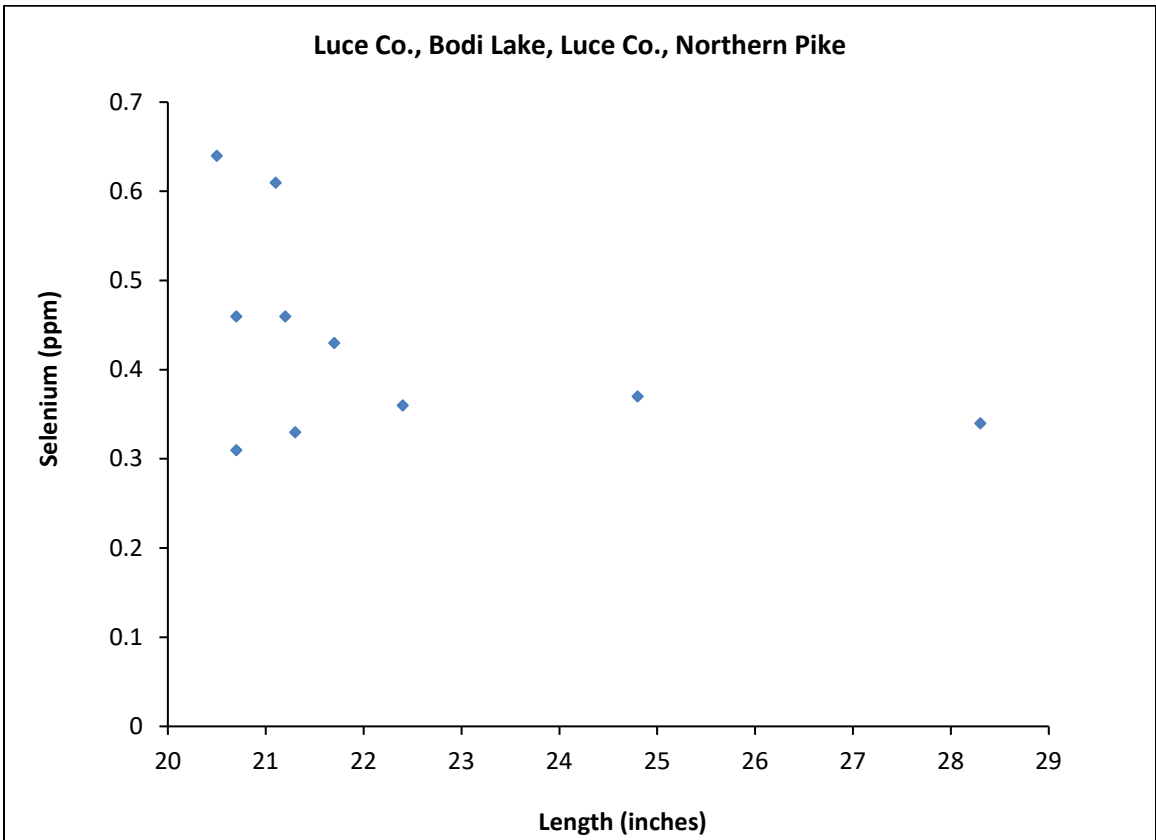
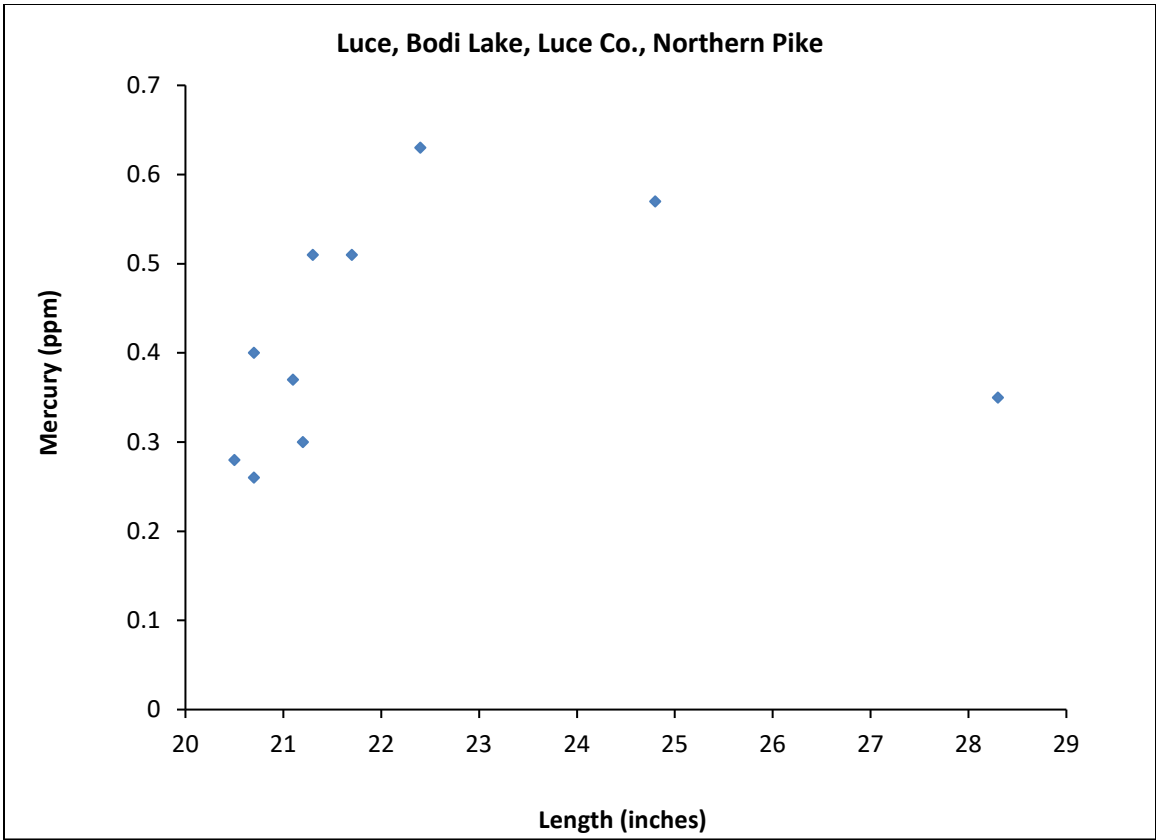
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Size Range of All Samples	
Earliest	Most Recent				Min	Max
2009	2009	10	20.5	24	20.5	28.3
Datasets available: 2009						
Chemical	Sample Size (All)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95% (ppm)	Meal Category
Mercury	10	0.42	0.26	0.63	0.51	2
Selenium	10	0.43	0.31	0.64	0.51	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.039	0.046				
Selenium	0.179	0.176				

Organics Analysis:

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

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

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



Brown Bullhead

Muskallonge Lake

Luce County

Hg Analysis:

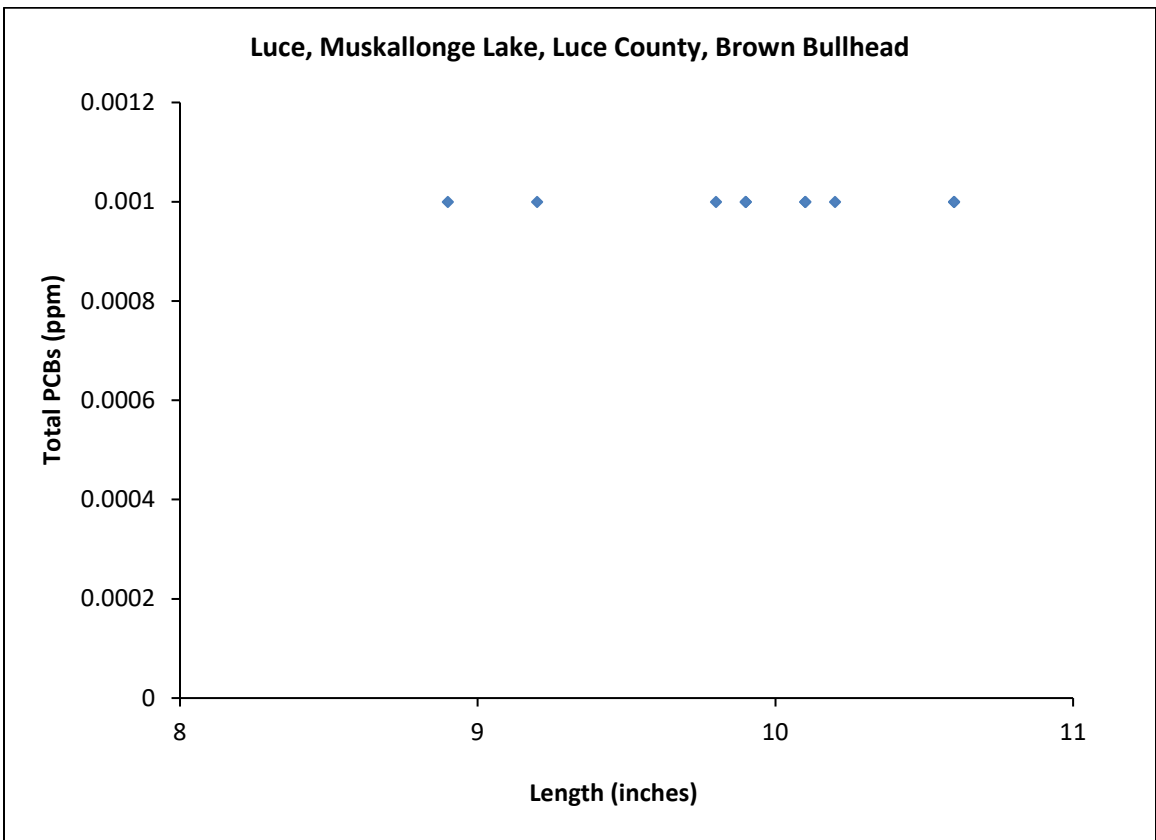
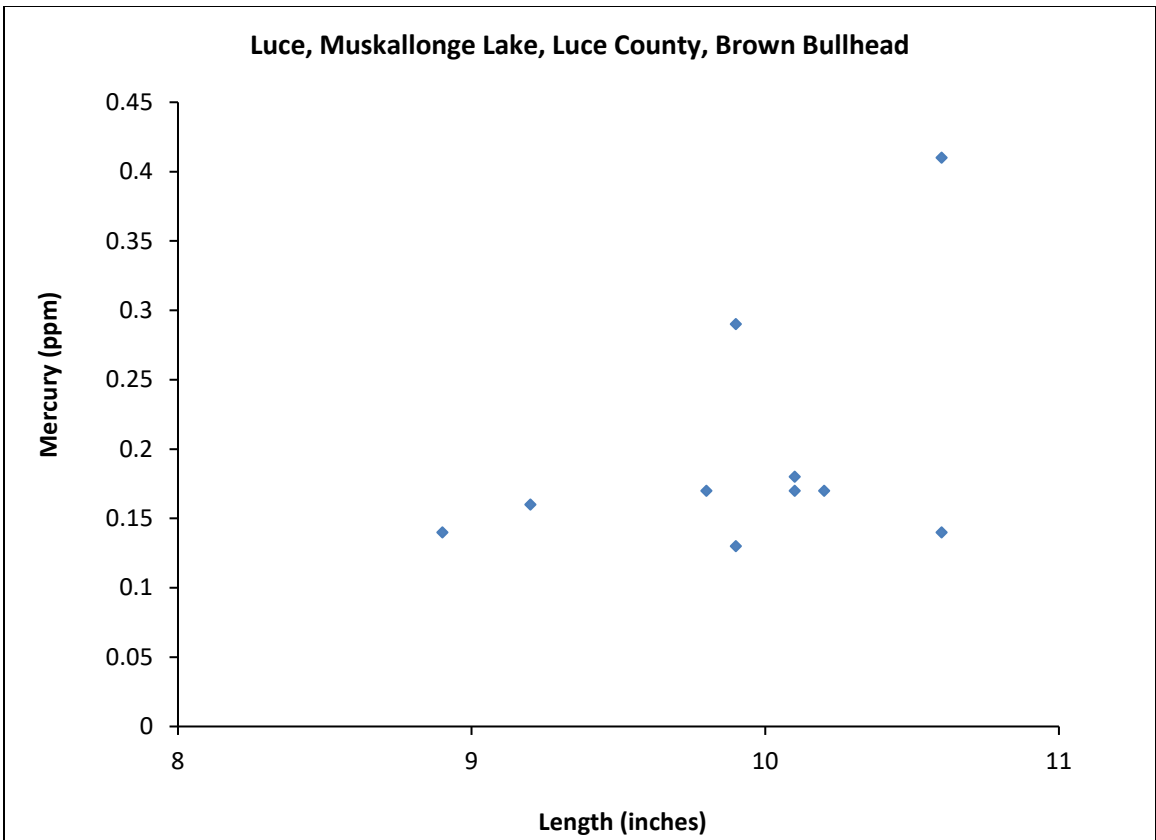
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2002	2002	10	8.9	na	8.9	10.6
Datasets available: 2002						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95% (ppm)	Meal Category
Mercury	10	0.20	0.13	0.41	0.26	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.175	0.163				

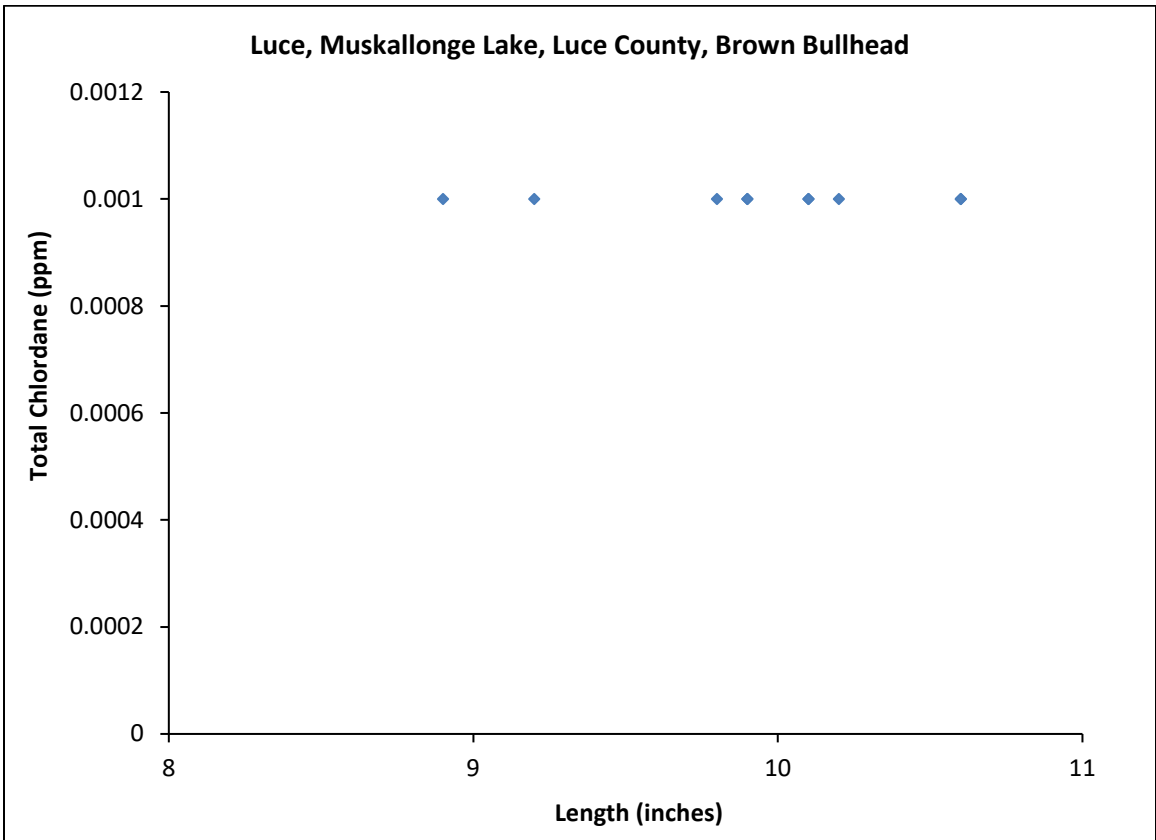
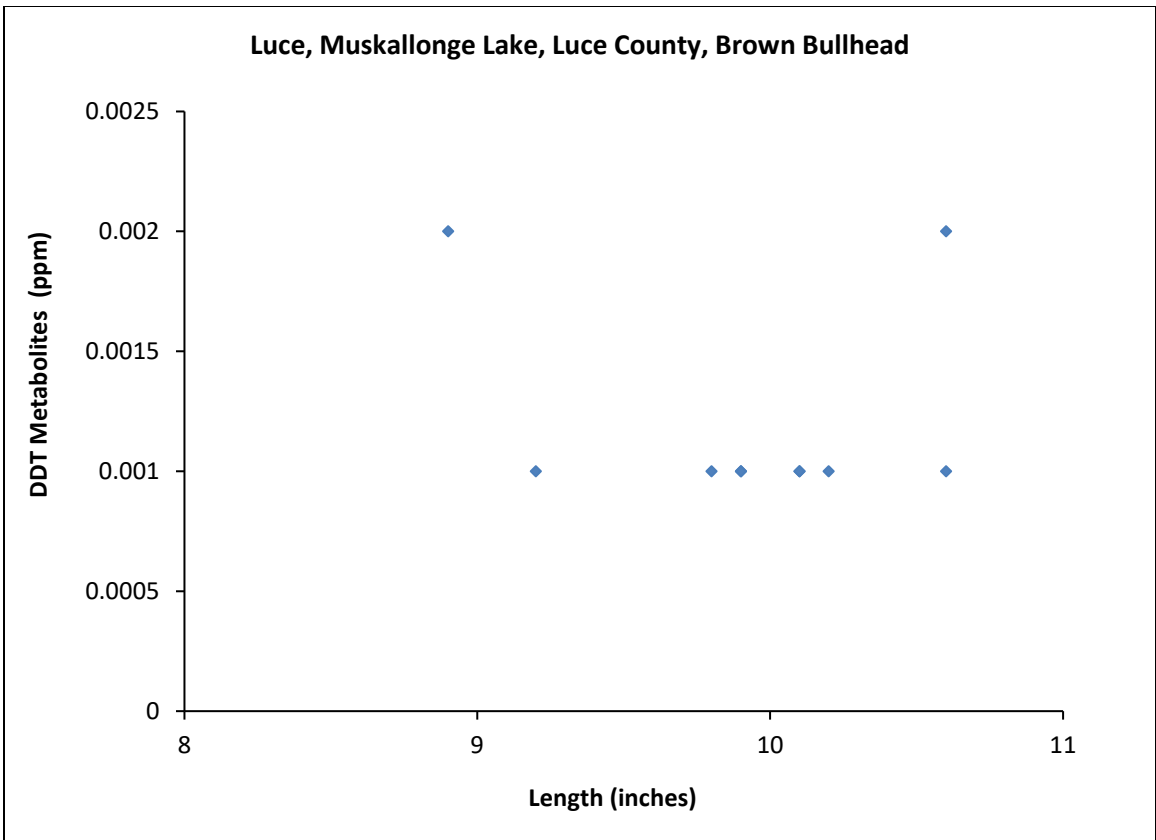
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2002	2002	10	8.9	na	8.9	10.6
Datasets available: 2002						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95% (ppm)	Meal Category
PCB	10	0.001	0.001	0.001	0.001	16
DDT	10	0.001	0.001	0.002	0.002	16
Chlordane	10	0.001	0.001	0.001	0.001	--
Toxaphene	10	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.000	--				
DDT	0.031	0.031				
Chlordane	0.000	--				
Toxaphene	--	--				
Final meal category based on UCL:						4

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

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





Northern Pike

Muskallonge Lake

Luce County

Hg Analysis:

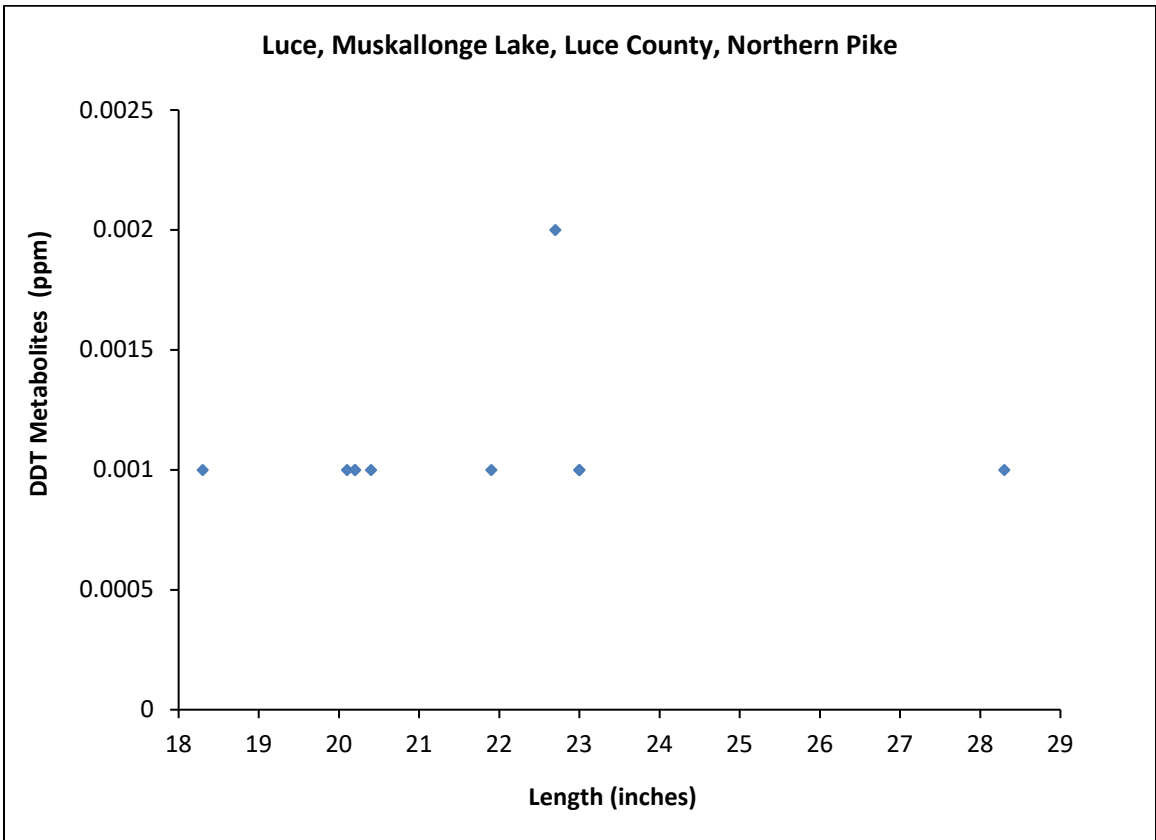
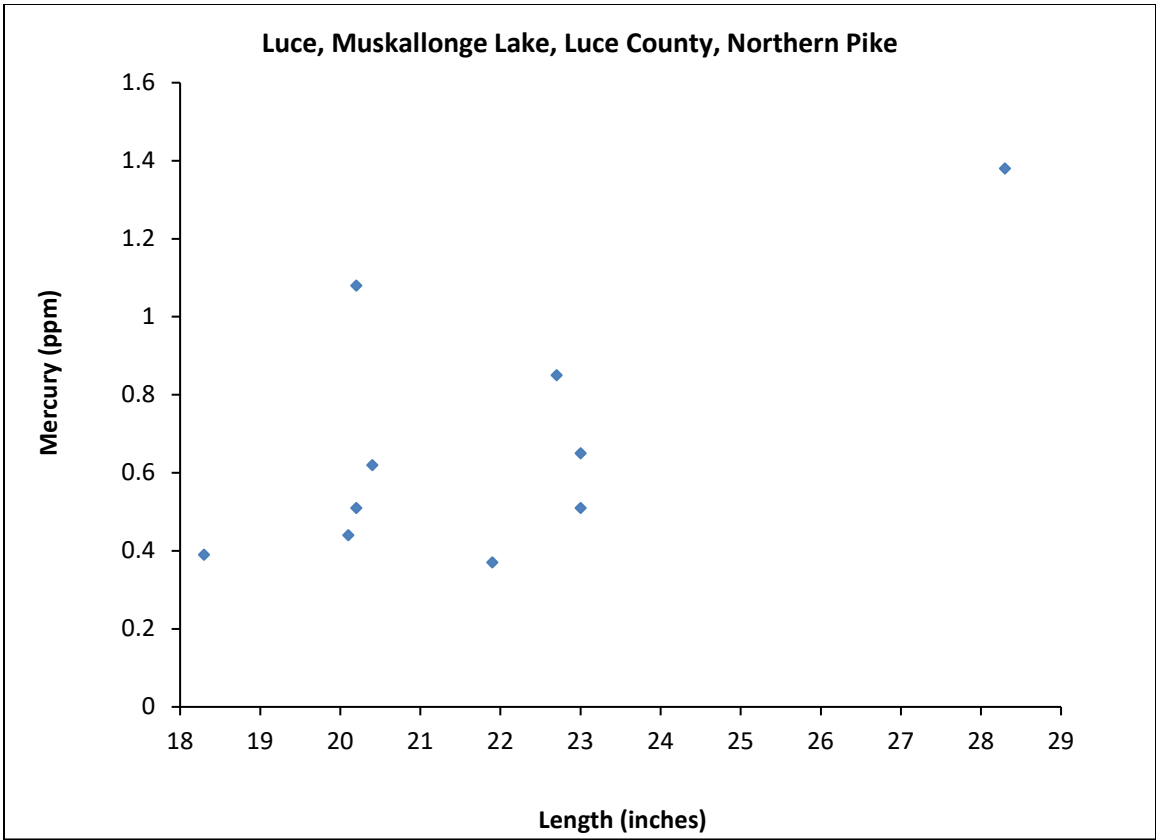
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Size Range of All Samples	
Earliest	Most Recent				Min	Max
2002	2002	10	18.3	na*	18.3	28.3
Datasets available: 2002						
Chemical	Sample Size (All)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95% (ppm)	Meal Category
Mercury	10	0.68	0.37	1.38	0.92	1
Chemical	Linear Regression	Exponential Regression	* - there is no minimum size on Muskallonge Lake northern pike			
	R ²	R ²				
Mercury	0.465	0.403				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Size Range of All Samples	
Earliest	Most Recent				Min	Max
2002	2002	10	18.3	na*	18.3	28.3
Datasets available: 2002						
Chemical	Sample Size (All)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95% (ppm)	Meal Category
PCB	10	ND	--	--	--	--
DDT	10	0.001	0.001	0.002	0.001	16
Chlordane	10	ND	--	--	--	--
Toxaphene	10	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression	* - there is no minimum size on Muskallonge Lake northern pike			
	R ²	R ²				
PCB	--	--				
DDT	0.013	0.013				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						1

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

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



Walleye

Muskallonge Lake

Luce County

Hg & Se 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	15.4	15	15.4	21.1
Datasets available: 2008						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95% (ppm)	Meal Category
Mercury	10	0.747	0.300	1.500	1.060	1
Selenium	9	0.513	0.280	0.670	0.630	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.805	0.799				
Selenium	0.363	0.437				

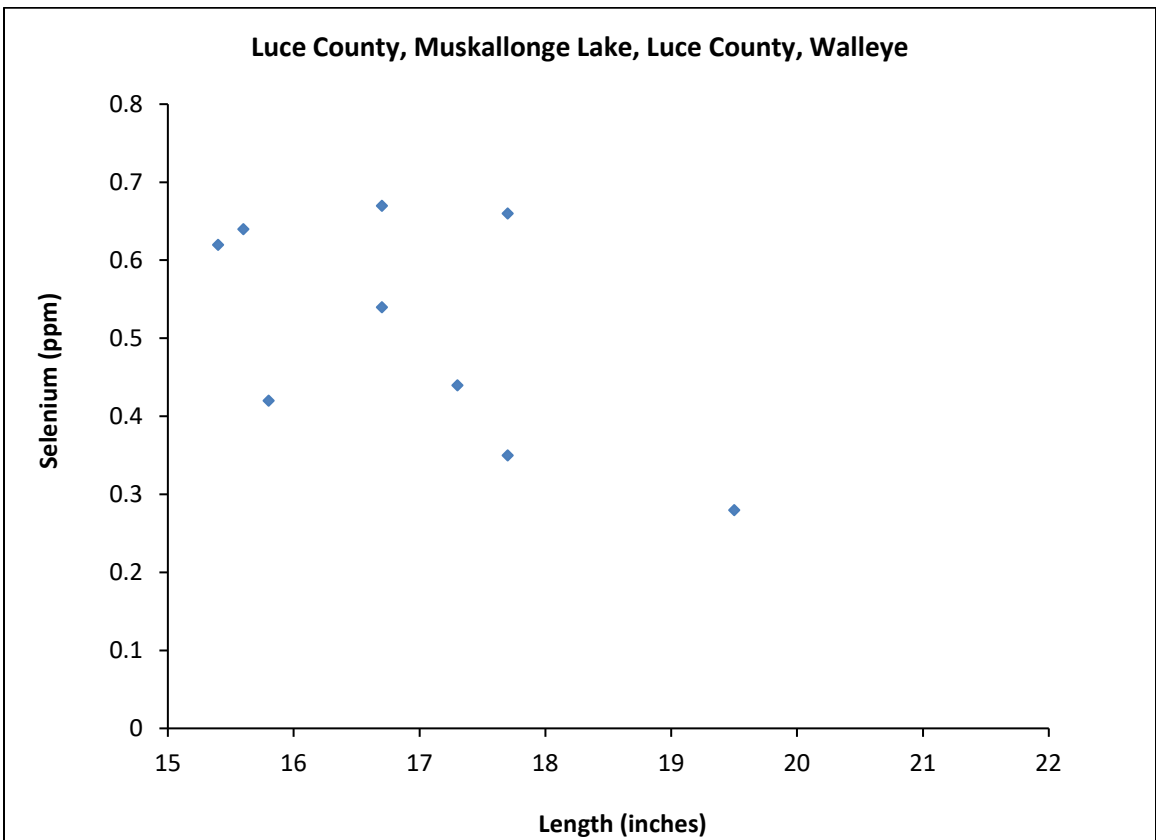
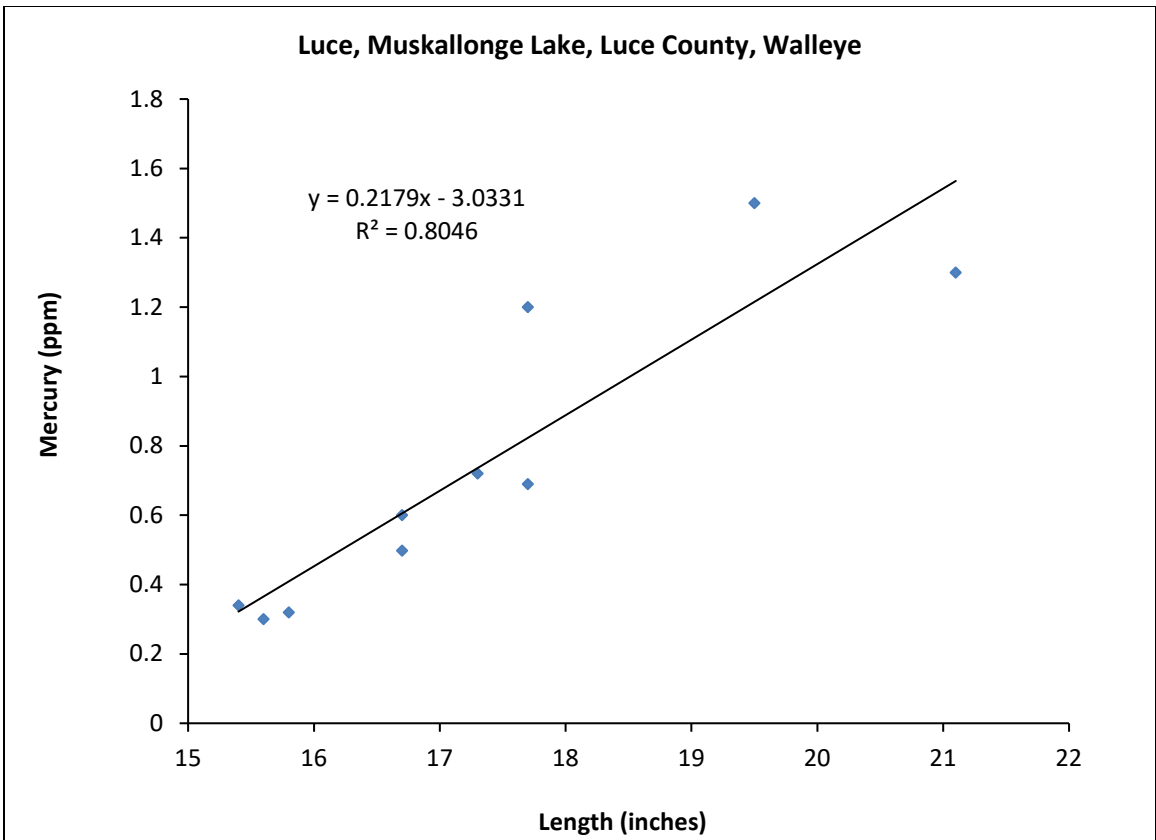
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	0				
Datasets available: --						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95% (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: Muskallonge Lake walleye are covered under the statewide mercury consumption advisory.

Recommendation: No one should eat more than 1 meal per month of Muskallonge Lake walleye smaller than 20 inches or more than 6 meals per year of those fish larger than 20 inches due to mercury. The statewide length break was applied as the size range of the fish was limited.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
15	0.24	4
16	0.45	2
18	0.89	1
20	1.32	0.5
22	1.76	0.5
24	2.20	0.5
26	2.63	0
<i>Shaded area denotes extrapolated estimates</i>		



Northern Pike

North Manistique Lake

Luce County

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	31.9	24	31.9	--		
Datasets available:		1989						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95% (ppm)	Meal Category		
Mercury	1	0.27	--	--	--	--		
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		
--	--	--	--	--	--	--		
Datasets available:		--						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95% (ppm)	Meal Category		
PCB	0	--	--	--	--	--		
DDT	0	--	--	--	--	--		
Chlordane	0	--	--	--	--	--		
Toxaphene	0	--	--	--	--	--		
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
PCB	--	--						
DDT	--	--						
Chlordane	--	--						
Toxaphene	--	--						
						Final meal category based on UCL:		--

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

Recommendation: A dataset of less than five data points for a given chemical, species and waterbody is considered insufficient for evaluation using the standard evaluation method. Statewide guidelines apply: 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.

Walleye

North Manistique Lake

Luce County

Hg Analysis:

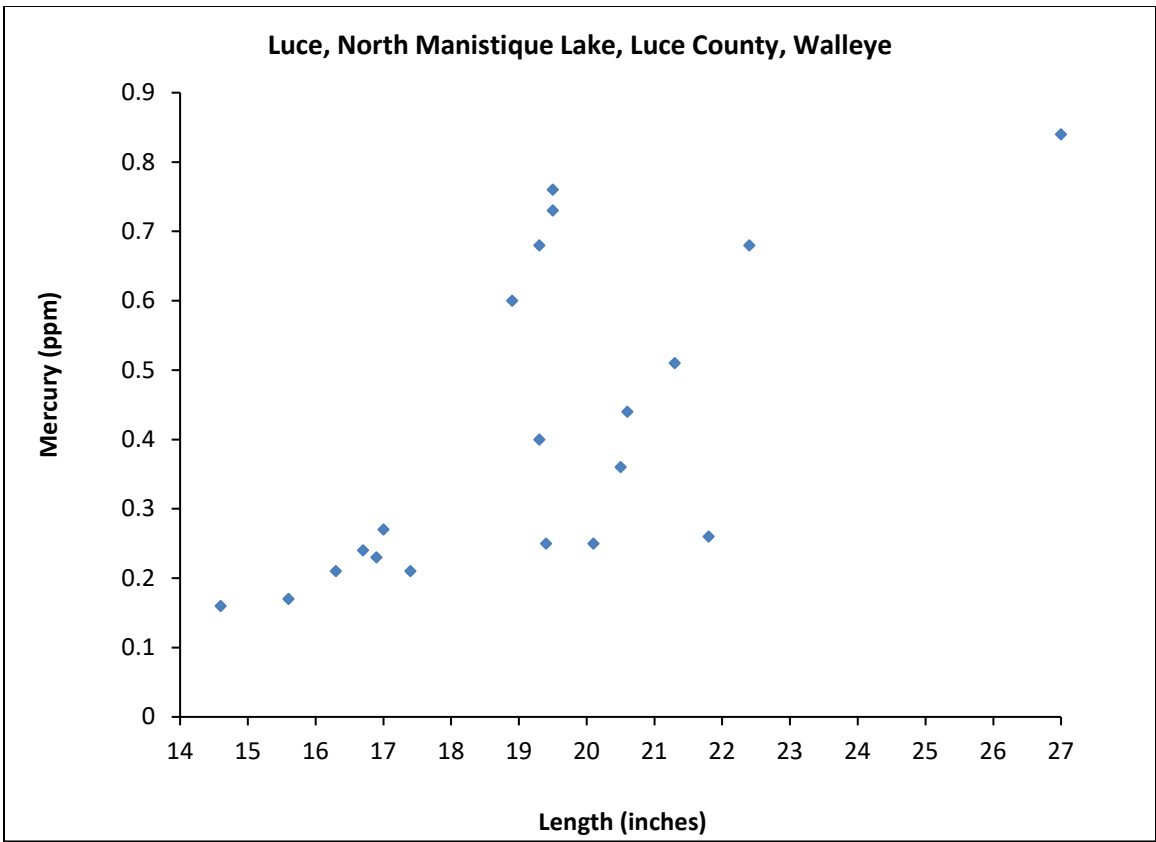
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	2003	20	14.6	15	14.6	27
Datasets available: 1989, 2003						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95% (ppm)	Meal Category
Mercury	20	0.41	0.16	0.84	0.52	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.459	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
--	--	--	--	--	--	--
Datasets available: --						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95% (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:						2

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

Recommendation: No one should eat more than 2 meals per month of North Manistique Lake walleye due to mercury.



Hg Analysis:

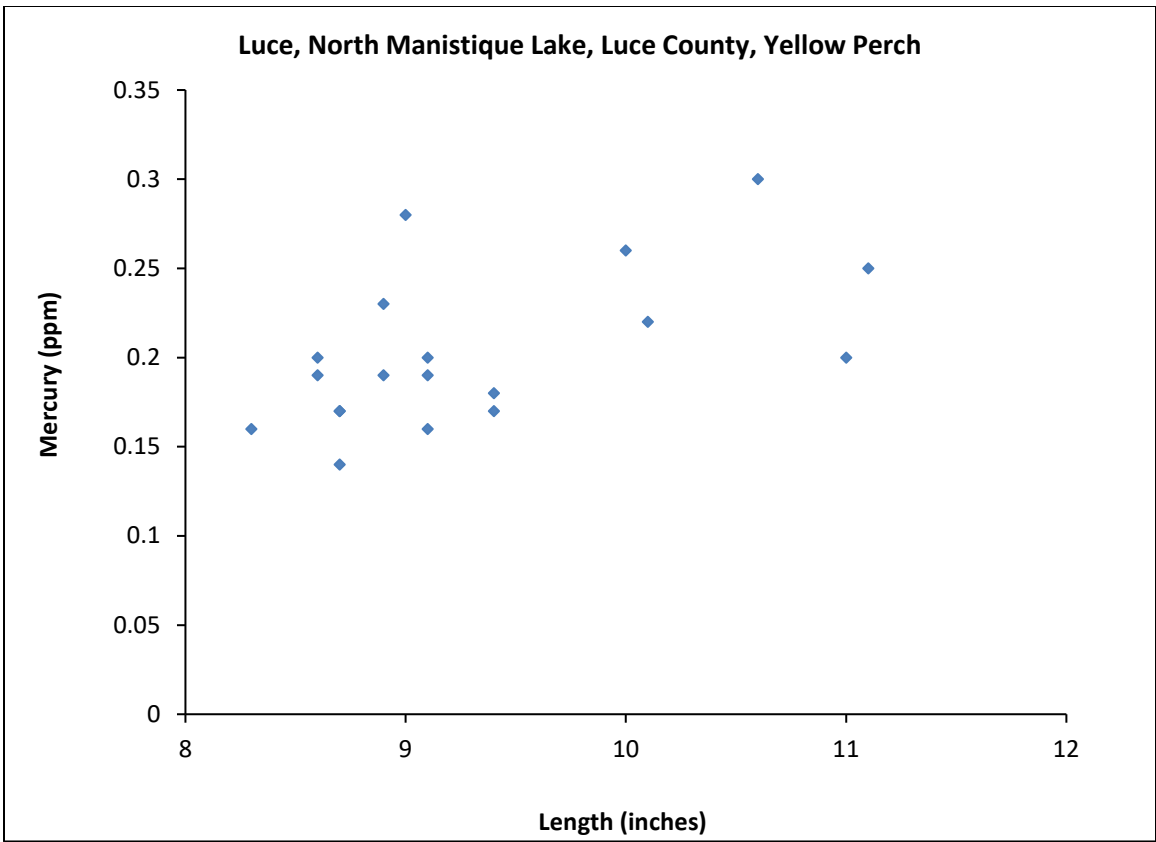
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	2003	20	8.3	na	8.3	11.1
Datasets available: 1989, 2003						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95% (ppm)	Meal Category
Mercury	20	0.04	0.13	0.30	0.22	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.388	0.407				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	--	--	--	--	--
Datasets available: --						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95% (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:						4

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

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



Rock Bass

Pike Lake

Luce County

Hg Analysis:

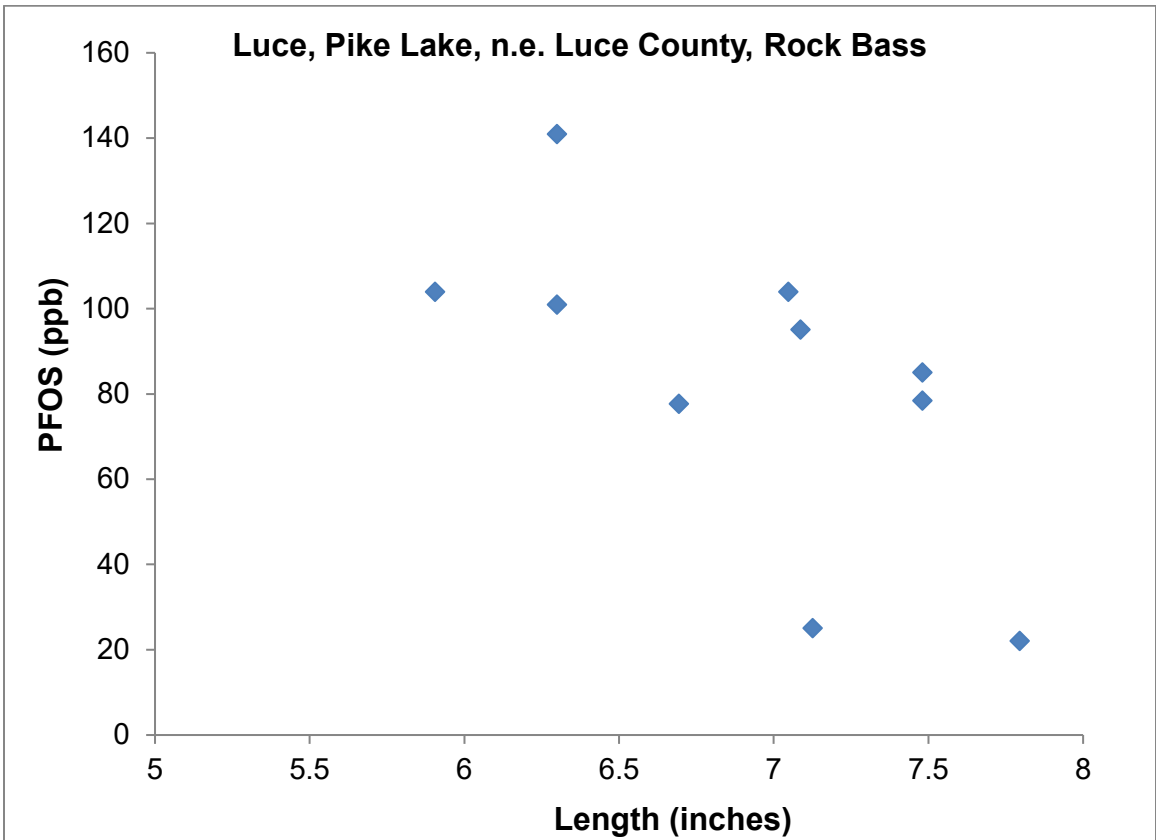
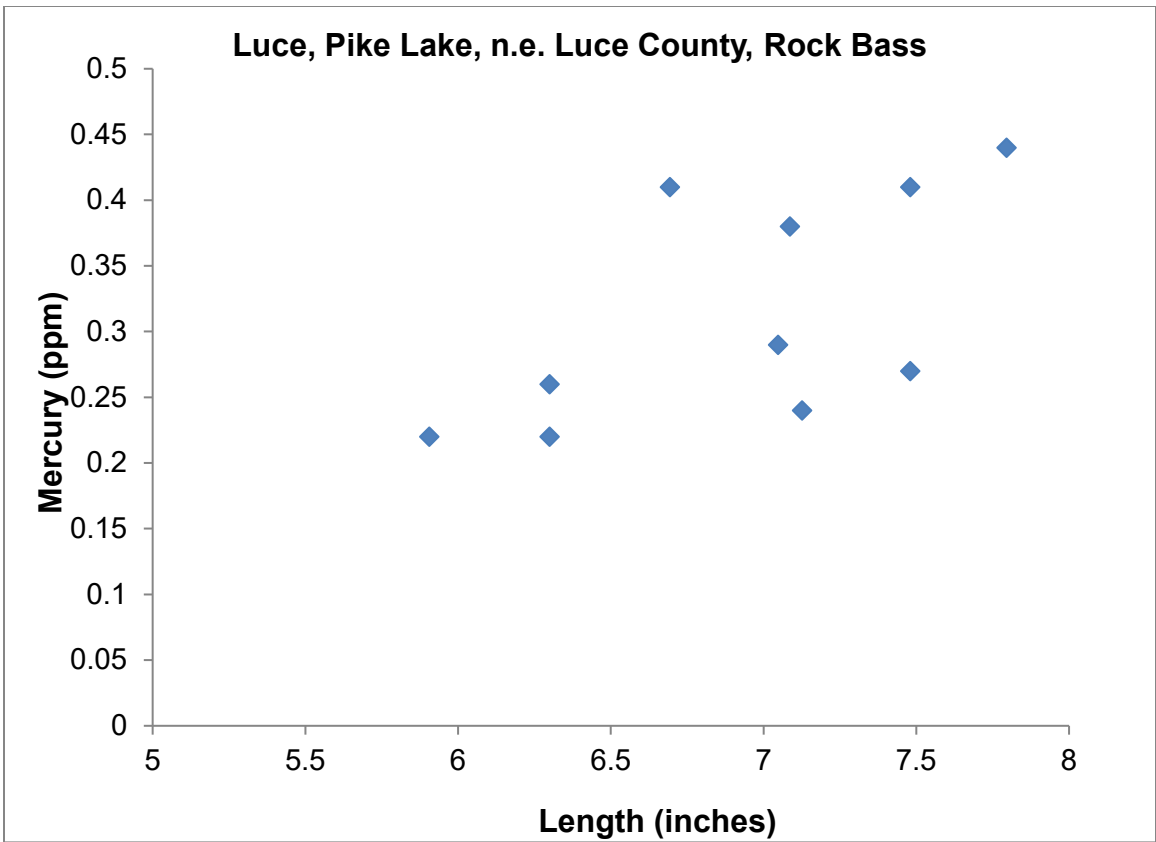
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent					
2020	2020	10	5.9	NA	5.9	7.8
Datasets available:		2020				
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.314	0.220	0.440	0.376	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.395	0.417				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent					
2020	2020	10	5.9	NA	5.9	7.8
Datasets available:		2020				
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	--	--	--	--	--	--
DDT	--	--	--	--	--	--
Chlordane	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--
PFOS	10	83.4 ppb	22.1 ppb	141 ppb	109.3 ppb	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.423	0.359	Final meal category based on UCL:		1	

Existing MDHHS Advisory: Rock bass from Pike Lake in Luce County are currently covered under the statewide mercury guidance. No one should eat more than four meals per month of rock bass of any size due to mercury.

Recommendation: No one should eat more than 1 meal per month of rock bass of any size from Pike Lake in Luce County due to PFOS. Mercury causes less restrictive advice.



Walleye

Pike Lake

Luce County

Hg Analysis:

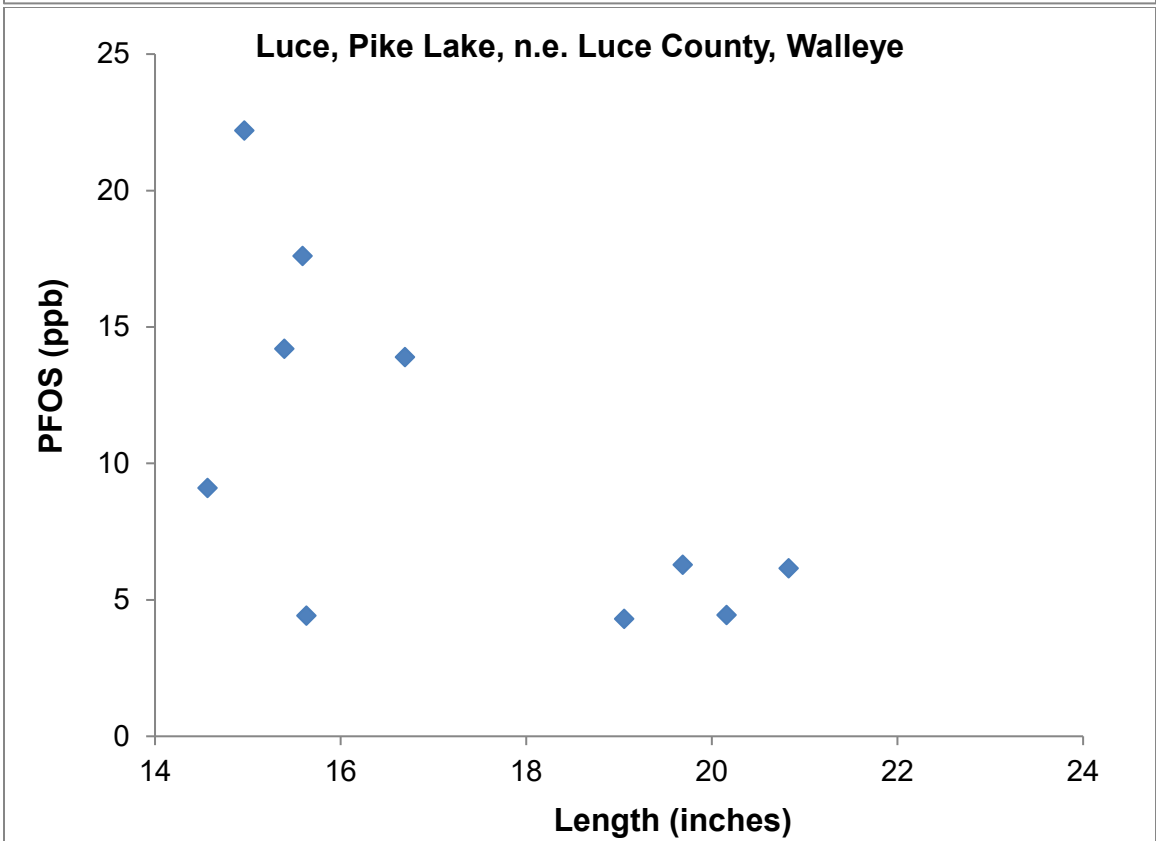
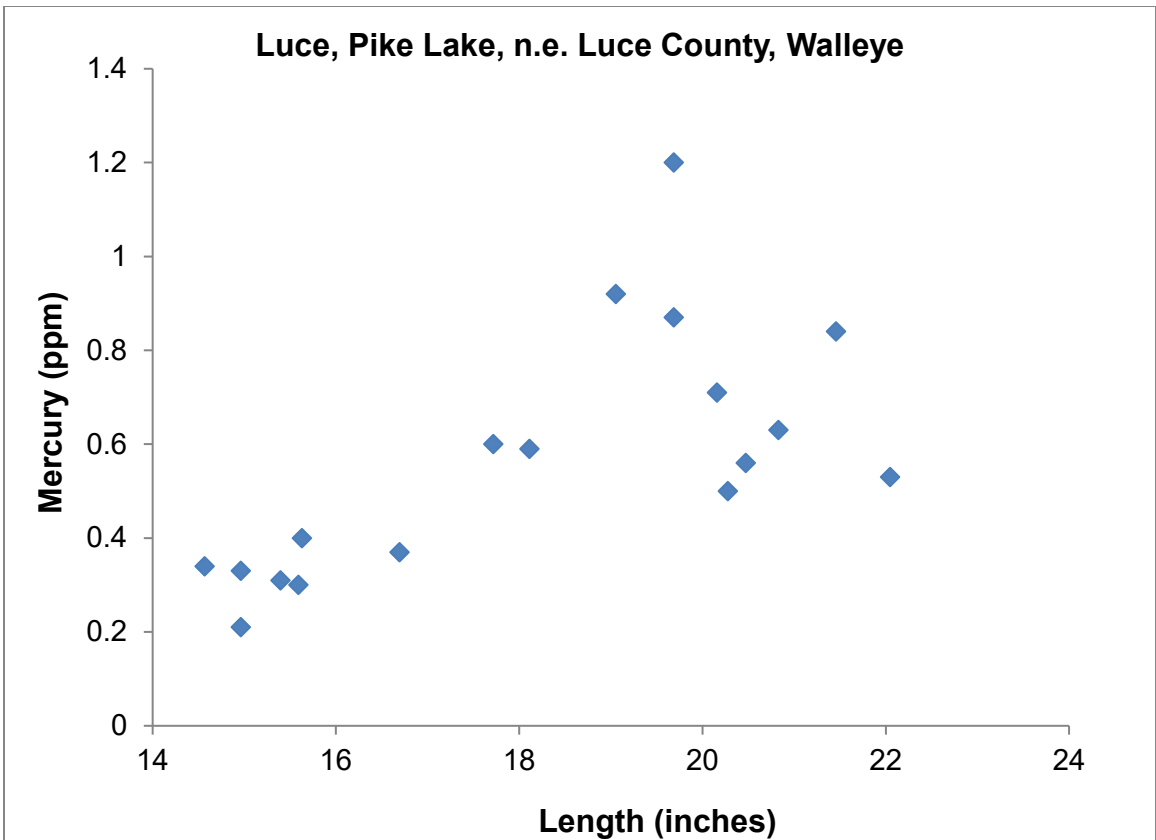
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent					
1989	2020	18	14.6	15	14.6	22.0
Datasets available: 1989, 2020						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	18	0.567	0.210	1.200	0.697	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.457	0.586				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent					
2020	2020	10	14.6	15	14.6	20.8
Datasets available: 1989, 2020						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	--	--	--	--	--	--
DDT	--	--	--	--	--	--
Chlordane	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--
PFOS	10	10.3 ppb	4.3 ppb	22.2 ppb	14.8 ppb	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.413	0.425				
Final meal category based on UCL:						1

Existing MDHHS Advisory: No one should eat more than one meal per month of walleye of any size from Pike Lake in Luce County due to mercury.

Recommendation: No change to the advisory is recommended. PFOS should be added as a contaminant that causes a less restrictive advisory in this species from Pike Lake.



Yellow Perch

Pike Lake

Luce County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent						
2020	2020	7	6.4	NA	6.4	10.5	
Datasets available: 2020							
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category	
Mercury	7	0.279	0.140	0.610	0.448	2	
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.850	0.845					

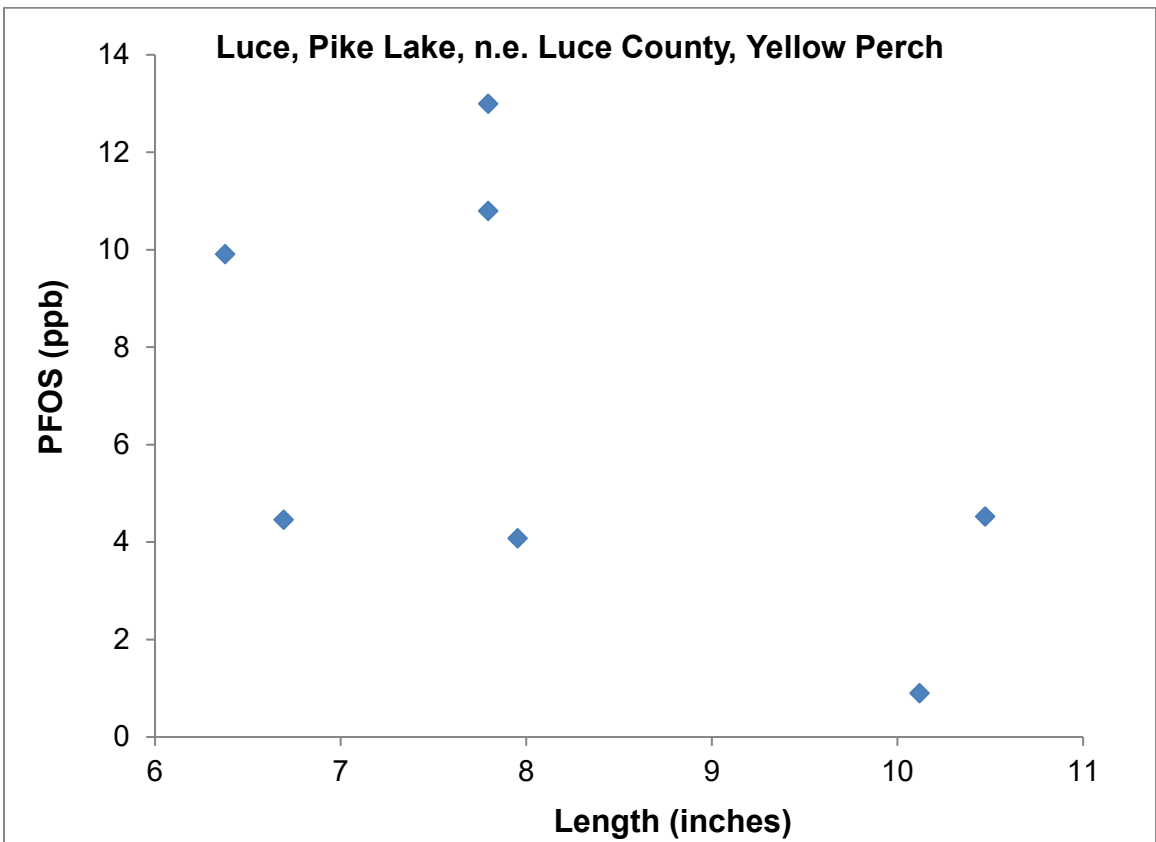
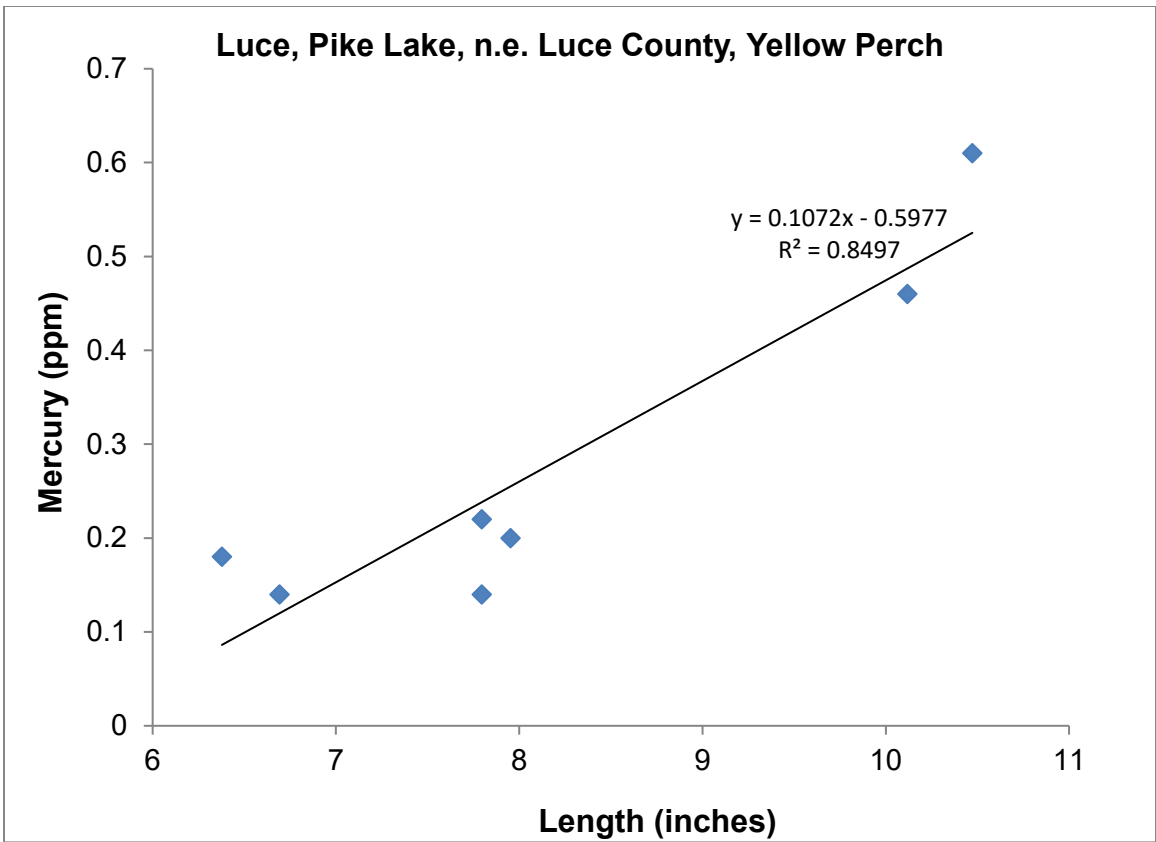
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent						
2020	2020	7	6.4	NA	6.4	10.5	
Datasets available: 2020							
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category	
PCB	--	--	--	--	--	--	
DDT	--	--	--	--	--	--	
Chlordane	--	--	--	--	--	--	
Toxaphene	--	--	--	--	--	--	
PFOS	7	6.8 ppb	0.9 ppb	13.0 ppb	10.9 ppb	12	
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	0.281	0.371					
Final meal category based on UCL:							2

Existing MDHHS Advisory: Yellow perch from Pike Lake are currently covered under the statewide mercury guidance. No one should eat more than four meals per month of yellow perch of any size due to mercury.

Recommendation: No one should eat more than 1 meal per month of yellow perch from Pike Lake in Luce County larger than 10 inches or no more than 2 meals per month of yellow perch smaller than 10 inches due to mercury. PFOS causes a less restrictive advisory.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
7	0.153	4
8	0.260	4
9	0.367	2
10	0.474	2
11	0.582	1
12	0.689	1
13	0.796	1
<i>Shaded area denotes extrapolated estimates</i>		



Walleye

Pretty Lake

Luce County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2004	2004	5	16.5	15	16.5	23.5
Datasets available: 2004						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95% (ppm)	Meal Category
Mercury	5	0.48	0.24	0.72	0.83	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.918	0.946				

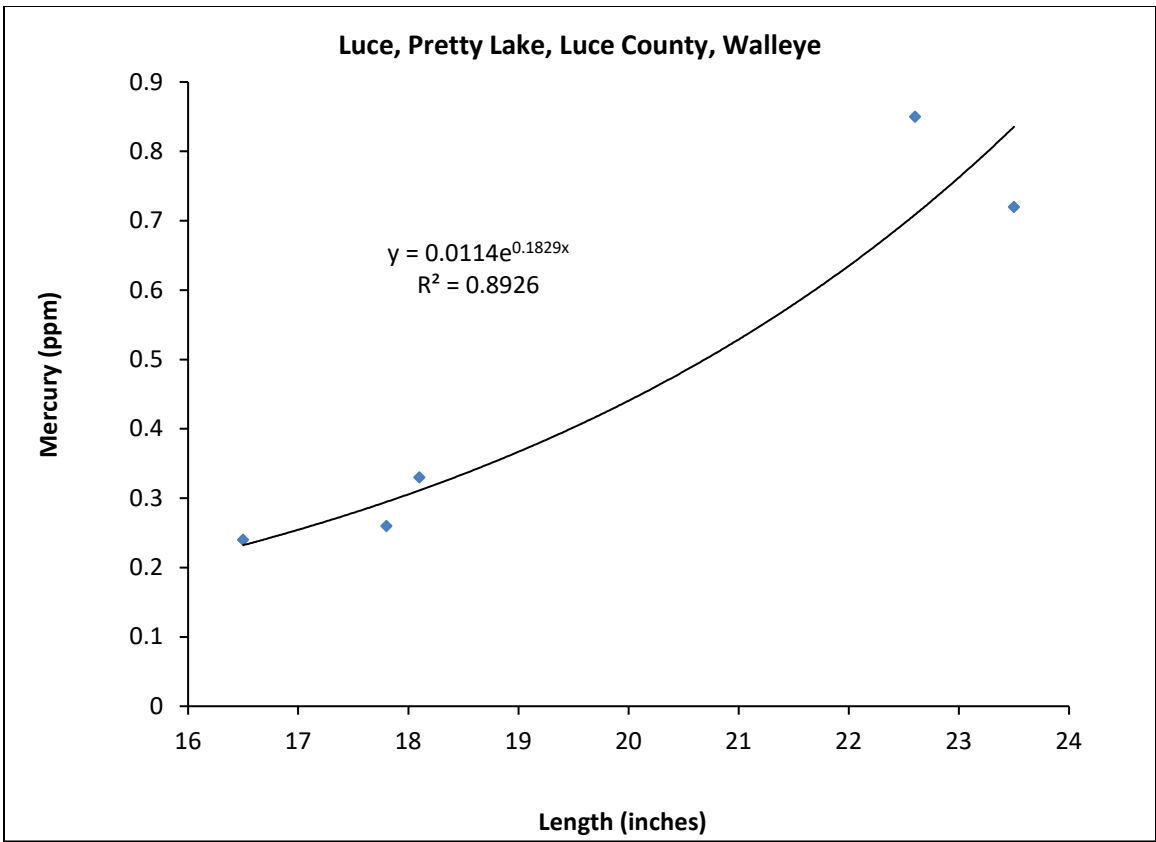
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	--	--	--	--	--
Datasets available: --						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95% (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: Pretty Lake walleye are covered under the statewide mercury consumption advisory.

Recommendation: No one should eat more than 2 meals per month of Pretty Lake walleye smaller than 20 inches or more than 1 meal per month of those fish larger than 20 inches due to mercury.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
15	0.18	4
16	0.21	4
17	0.26	4
18	0.31	2
19	0.37	2
20	0.44	2
21	0.53	1
22	0.64	1
23	0.76	1
<i>Shaded area denotes extrapolated estimates</i>		



Northern Pike

**Tahquamenon River
Dollarville / Slater Landing**

Luce County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Size Range of All Samples	
Earliest	Most Recent				Min	Max
1988	1988	6	14	24	14	25
Datasets available: 1988						
Chemical	Sample Size (All)*	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95% (ppm)	Meal Category
Mercury	6	0.51	0.29	0.80	0.70	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.176	0.310				

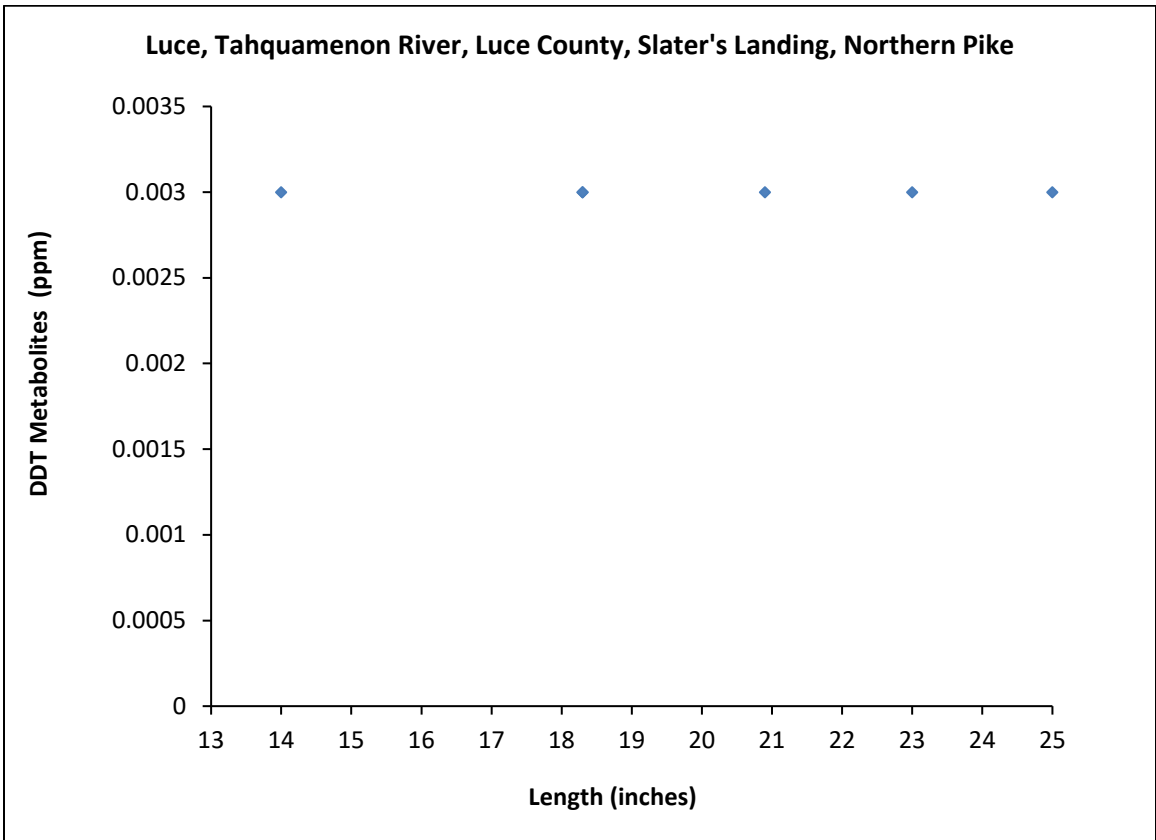
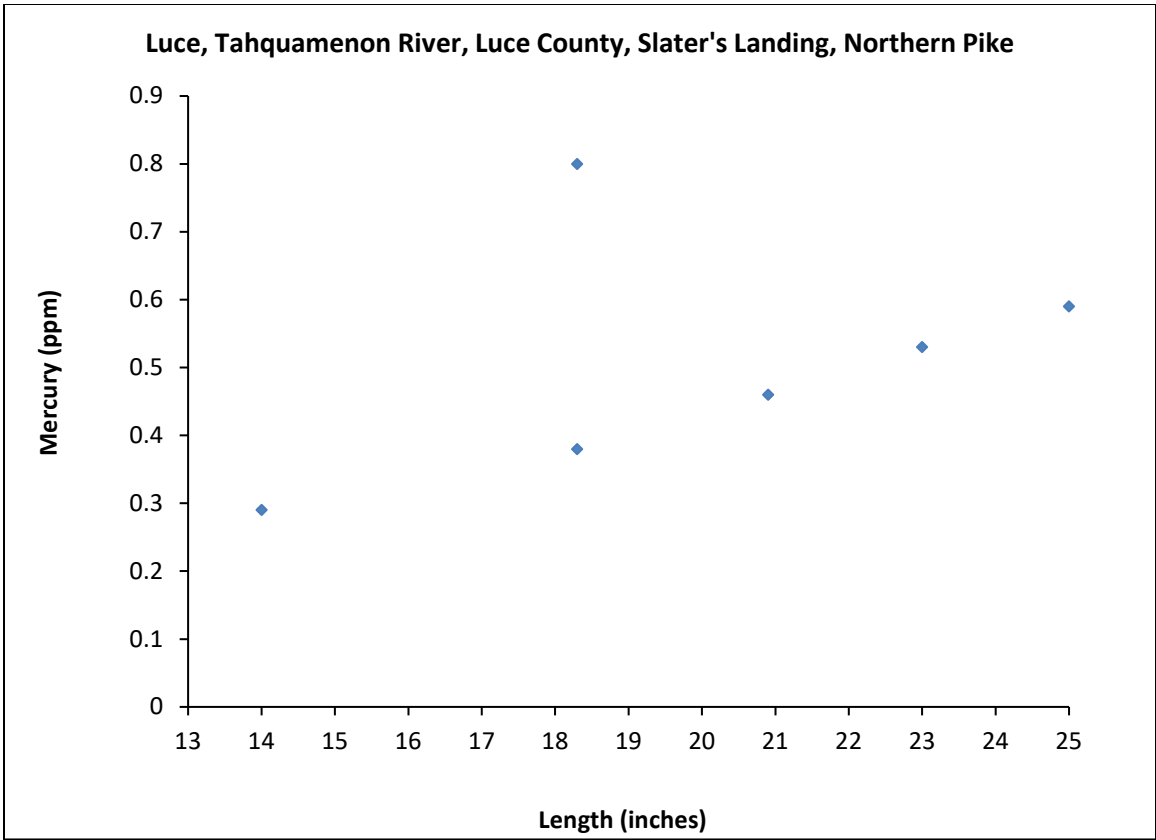
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Size Range of All Samples	
Earliest	Most Recent				Min	Max
1988	1988	6	14	24	14	25
Datasets available: 1988						
Chemical	Sample Size (All)*	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95% (ppm)	Meal Category
PCB	6	ND	--	--	--	--
DDT	6	0.003	0.003	0.003	0.003	16
Chlordane	6	ND	--	--	--	--
Toxaphene	6	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						1

* - one legal size fish in the dataset

Existing Advisory: There are no current consumption advisories for Tahquamenon River northern pike.

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



Walleye

**Tahquamenon River
Dollarville / Slater Landing**

Luce County

Hg Analysis:

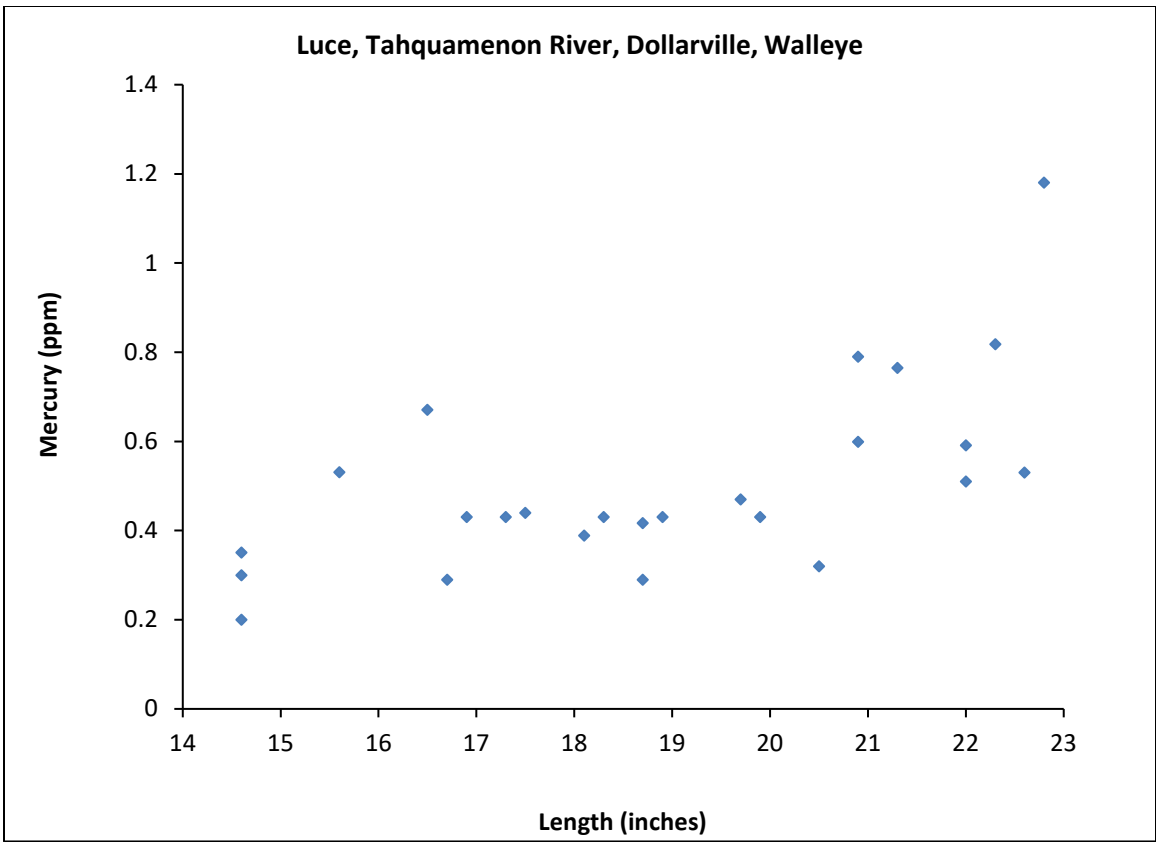
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples			
Earliest	Most Recent				Min	Max		
1988	2005	30	11	15	14.6	22.8		
Datasets available: 1988, 1998, 2005								
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95% (ppm)	Meal Category	
Mercury	25	0.50		0.20	1.18	0.59	1	
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
Mercury	0.400	0.401						

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	14.6	15	14.6	22.8		
Datasets available: 1988, 1998, 2005								
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95% (ppm)	Meal Category	
PCB	10	ND		--	--	--	--	
DDT	10	ND		--	--	--	--	
Chlordane	10	ND		--	--	--	--	
Toxaphene	10	ND		--	--	--	--	
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
PCB	--	--						
DDT	--	--						
Chlordane	--	--						
Toxaphene	--	--						
Final meal category based on UCL:							1	

Existing Advisory: Women and children should eat no more than one meal per month of Tahquamenon River walleye due to mercury.

Recommendation: No one should eat more than 1 meal per month of Tahquamenon River walleye due to mercury.



White Sucker

**Tahquamenon River
Dollarville / Slater Landing**

Luce County

Hg Analysis:

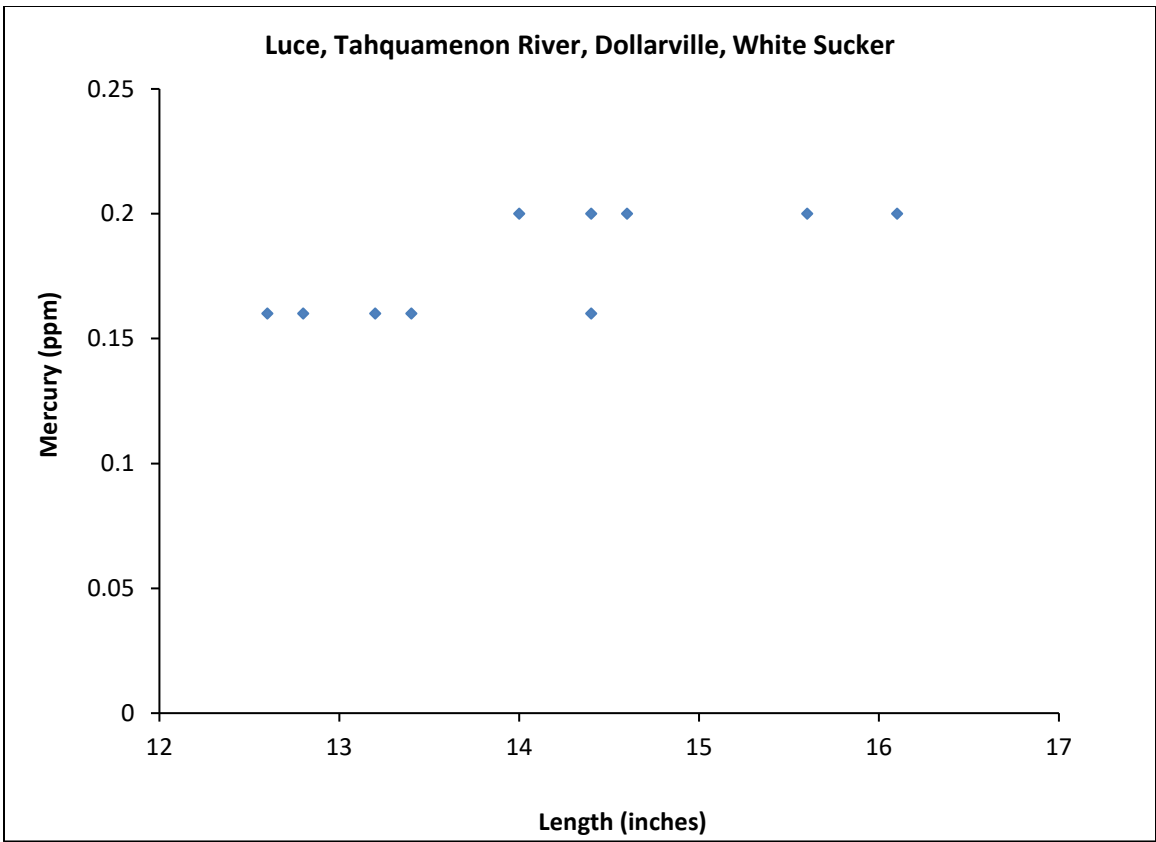
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1998	1998	10	12.6	na	12.6	16.1
Datasets available: 1998						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95% (ppm)	Meal Category
Mercury	10	0.18	0.16	0.20	0.20	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.578	0.578				

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	12.6	na	12.6	16.1
Datasets available: 1998						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95% (ppm)	Meal Category
PCB	10	ND	--	--	--	--
DDT	10	ND	--	--	--	--
Chlordane	10	ND	--	--	--	--
Toxaphene	10	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						4

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

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



Yellow Perch

**Tahquamenon River
Dollarville / Slater Landing**

Luce County

Hg Analysis:

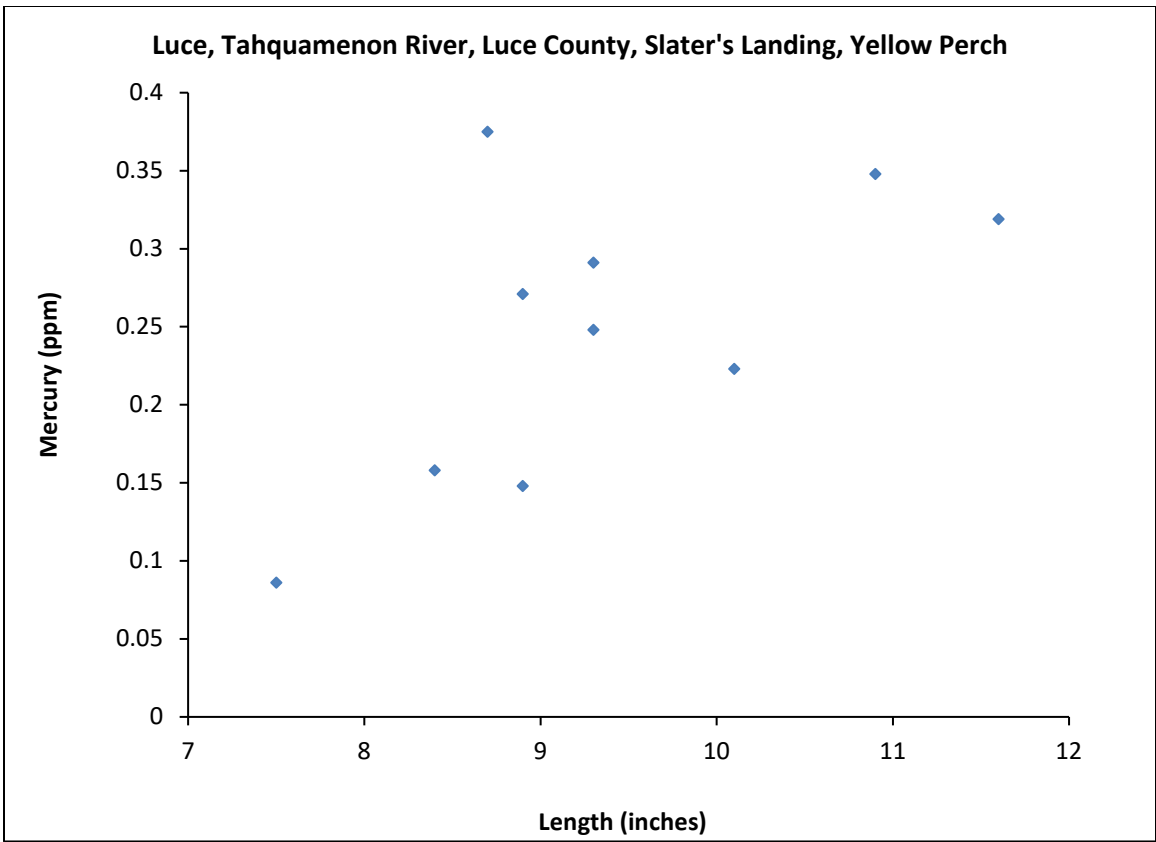
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2005	2005	10	7.5	na	7.5	11.6
Datasets available: 2005						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95% (ppm)	Meal Category
Mercury	10	0.25	0.09	0.38	0.31	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.385	0.439				

Organics Analysis:

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

Existing Advisory: Tahquamenon River yellow perch are covered by the statewide mercury consumption advisory.

Recommendation: No one should eat more than 2 meals per month of Tahquamenon River yellow perch due to mercury.



Splake

Tank Lake

Luce County

Hg Analysis:

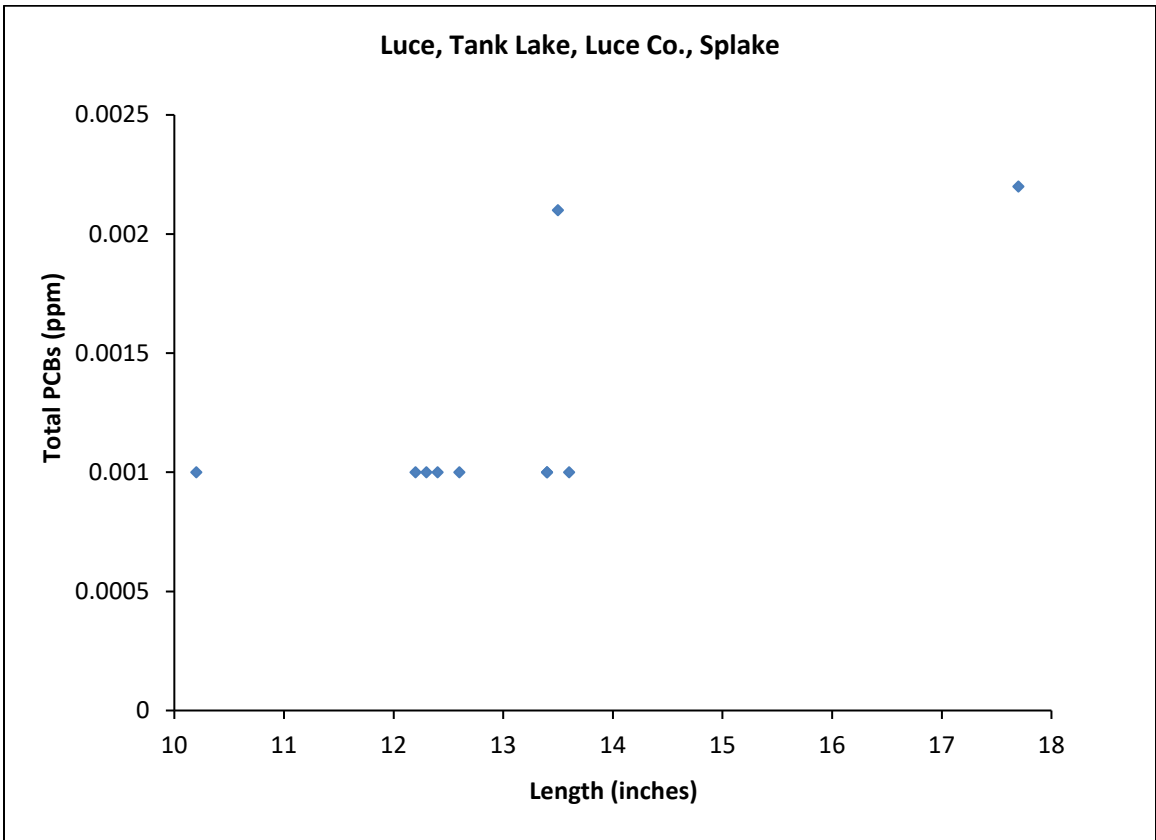
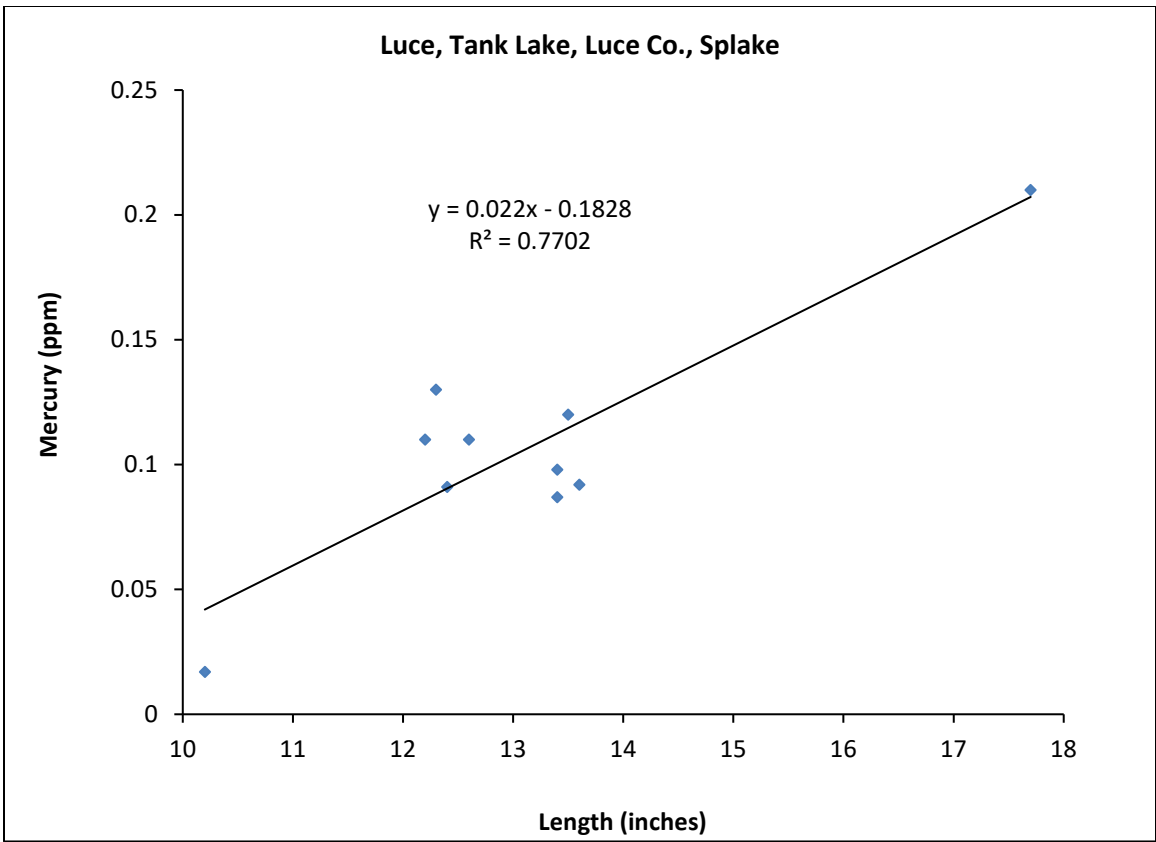
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		Meal Category
Earliest	Most Recent				Min	Max	
2008	2008	10	10.2	8	10.2	17.7	
Datasets available: 2008							
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95% (ppm)	Meal Category	
Mercury	10	0.11	0.02	0.21	0.14	4	
Chemical	Linear Regression	Exponential Regression	The regression slope is driven by one relatively large fish and one small fish and was not used to set the recommendation.				
	R ²	R ²					
Mercury	0.770	0.559					

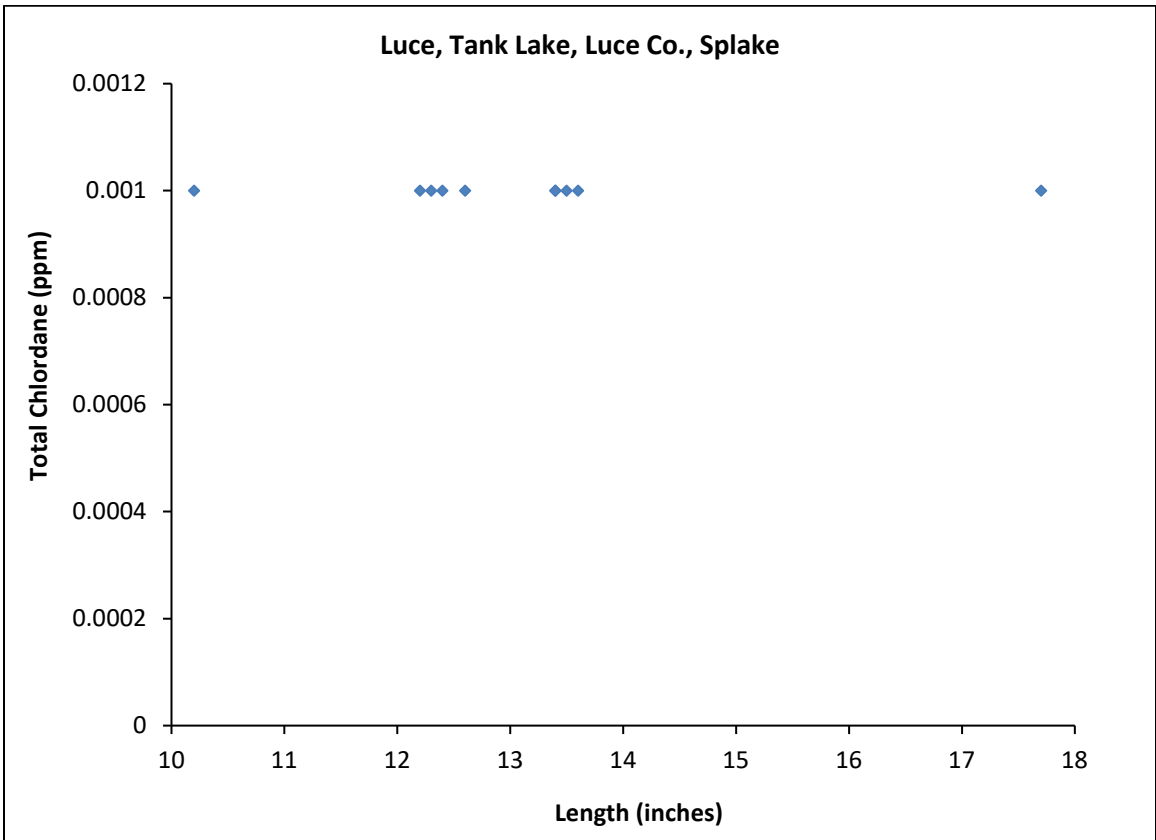
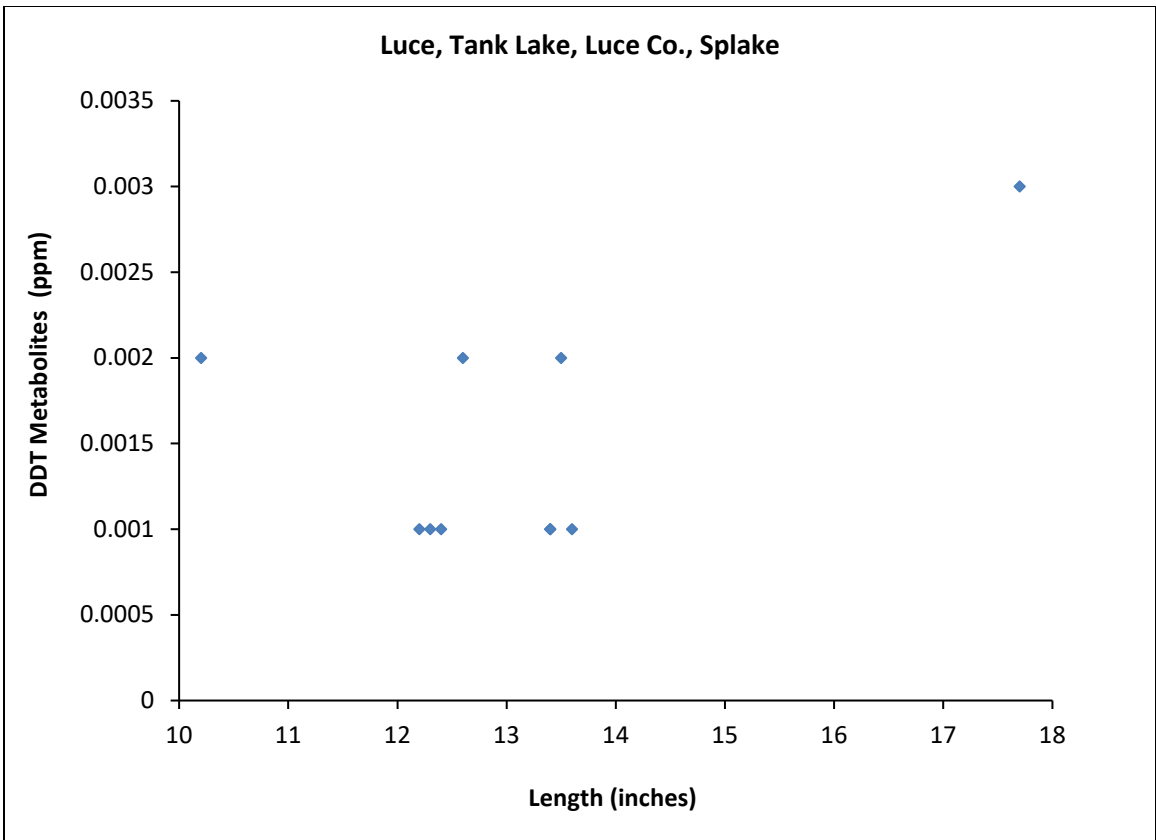
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		Meal Category
Earliest	Most Recent				Min	Max	
2008	2008	10	10.2	8	10.2	17.7	
Datasets available: 2008							
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95% (ppm)	Meal Category	
PCB	10	0.001	0.001	0.002	0.002	16	
DDT	10	0.002	0.001	0.003	0.002	16	
Chlordane	10	0.001	0.001	0.001	0.001	--	
Toxaphene	10	ND	--	--	--	--	
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.506	0.496					
DDT	0.252	0.156					
Chlordane	0.000	--					
Toxaphene	--	--					
Final meal category based on UCL:						4	

Existing Advisory: There are no current consumption advisories for Tank Lake splake.

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





Northern Pike

Twin Lake

Luce County

Hg & Se Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Size Range of All Samples	
Earliest	Most Recent				Min	Max
2009	2009	10	19.1	24	19.1	24.5
Datasets available: 2009						
Chemical	Sample Size (All)*	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95% (ppm)	Meal Category
Mercury	10	0.91	0.62	1.50	1.10	1
Selenium	10	0.26	0.20	0.42	0.32	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.417	0.471				
Selenium	0.299	0.339				

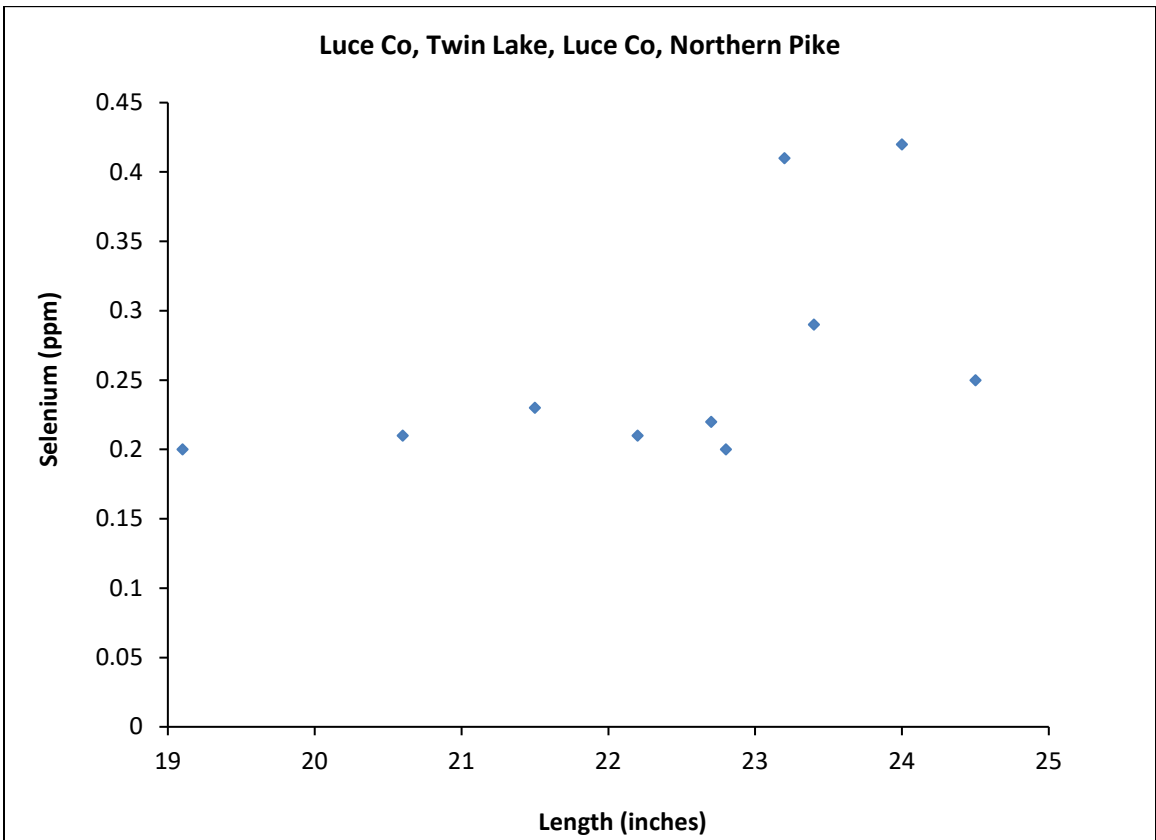
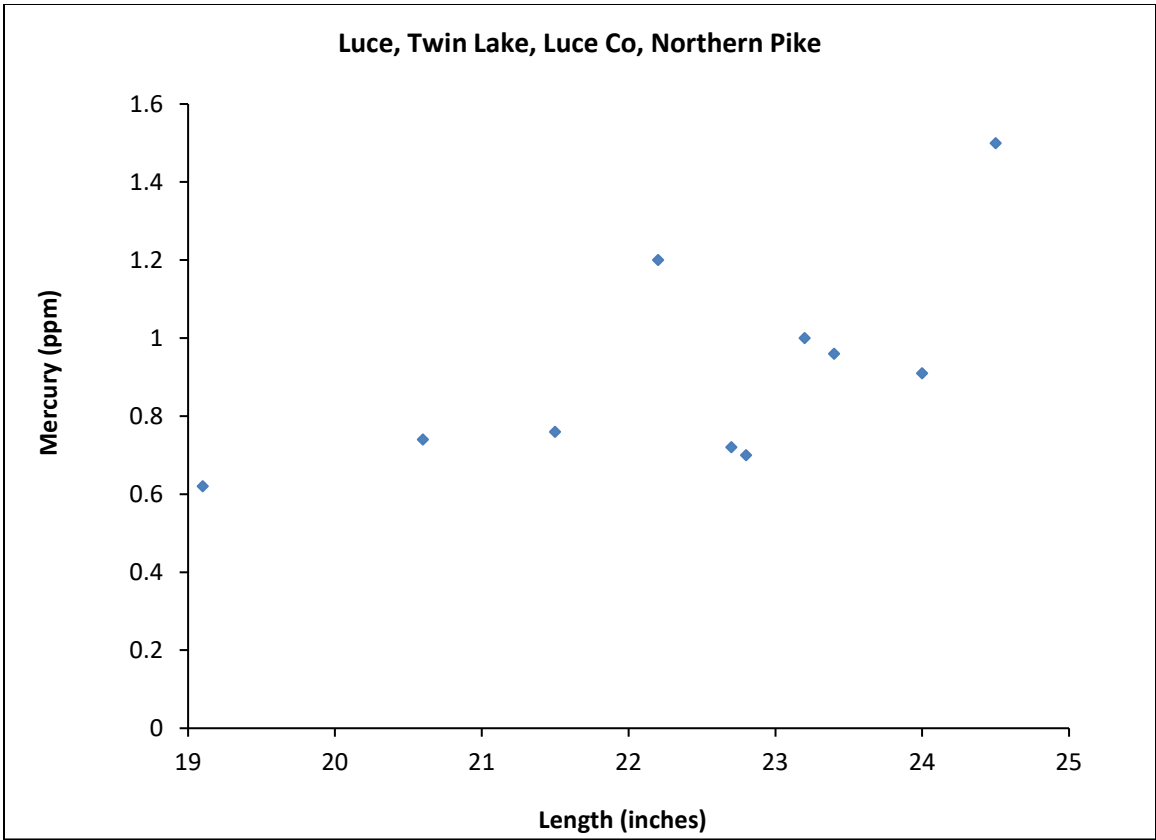
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Size Range of All Samples	
Earliest	Most Recent				Min	Max
--	--	--	--	--	--	--
Datasets available: --						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95% (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

* - 2 fish of legal size

Existing Advisory: Twin Lake northern pike are covered by the statewide mercury consumption advisory.

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



Mackinac County

Rock Bass

Brevoort Lake

Mackinac County

Hg Analysis:

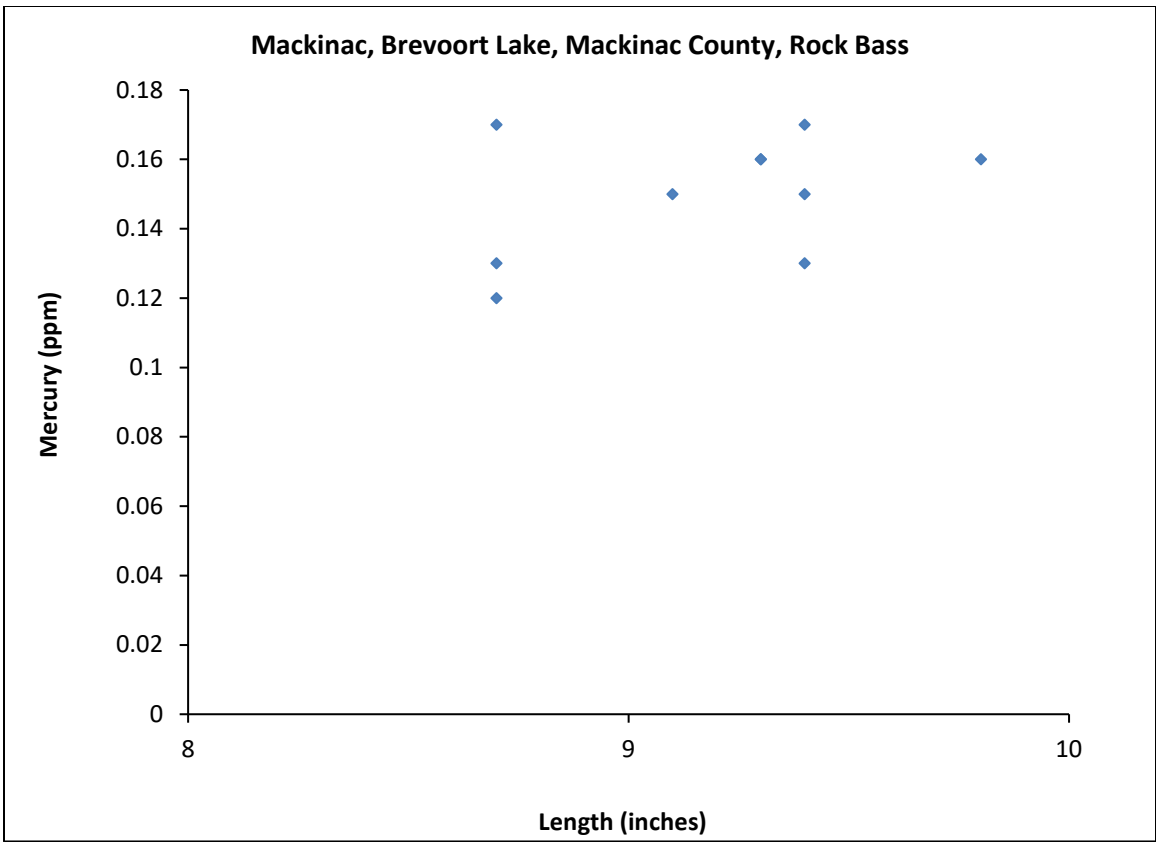
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	1989	10	8.7	na	8.7	9.8
Datasets available: 1989						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.15	0.12	0.17	0.16	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.150	0.166				

Organics Analysis:

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

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

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



Walleye

Brevoort Lake

Mackinac County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	1989	10	15	15	20.1	
Datasets available: 1989						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.25	0.20	0.32	0.28	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.688	0.719				

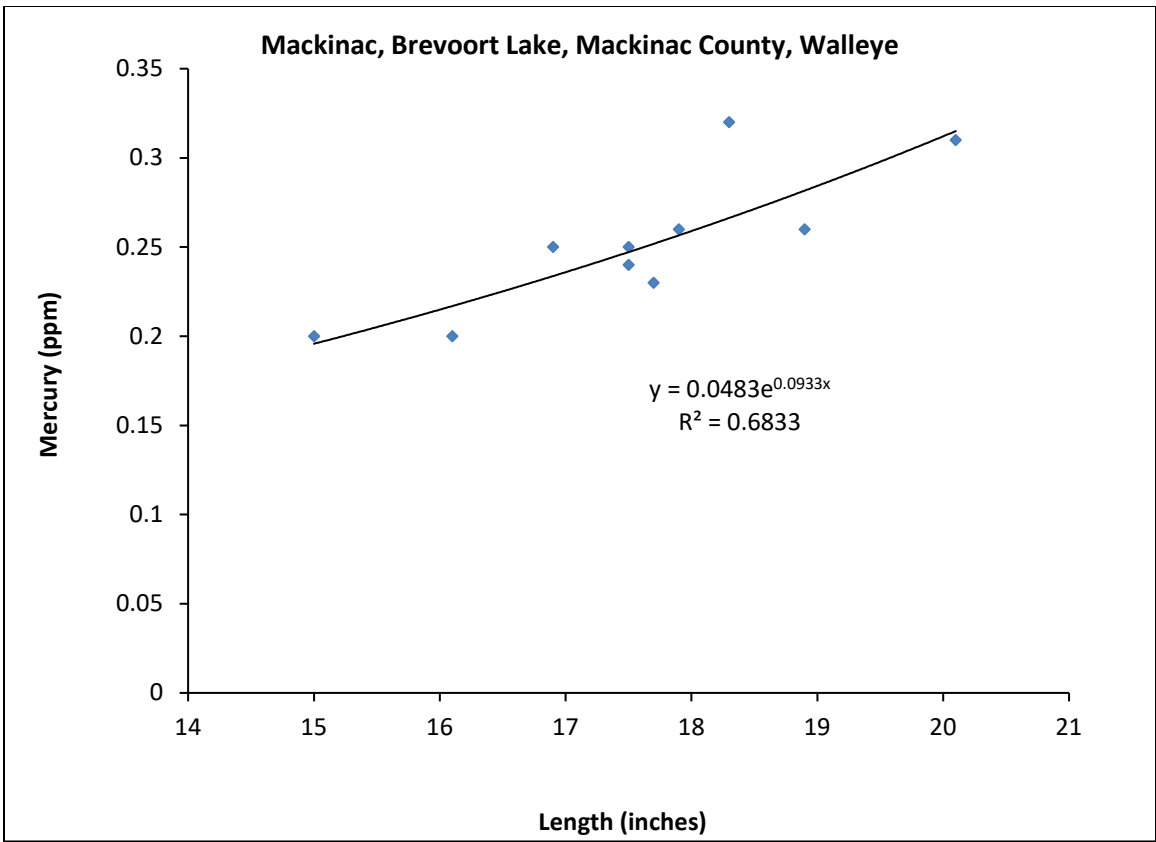
Organics Analysis:

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

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

Recommendation: No one should eat more than 4 meals per month of Brevoort Lake walleye smaller than 18 inches or more than 2 meals per month of those fish larger than 18 inches due to mercury.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
15	0.196	4
16	0.215	4
18	0.259	4
20	0.312	2
22	0.376	2
24	0.453	2
26	0.546	1
<i>Shaded area denotes extrapolated estimates</i>		



Walleye

Manistique Lake

Mackinac County

Hg Analysis:

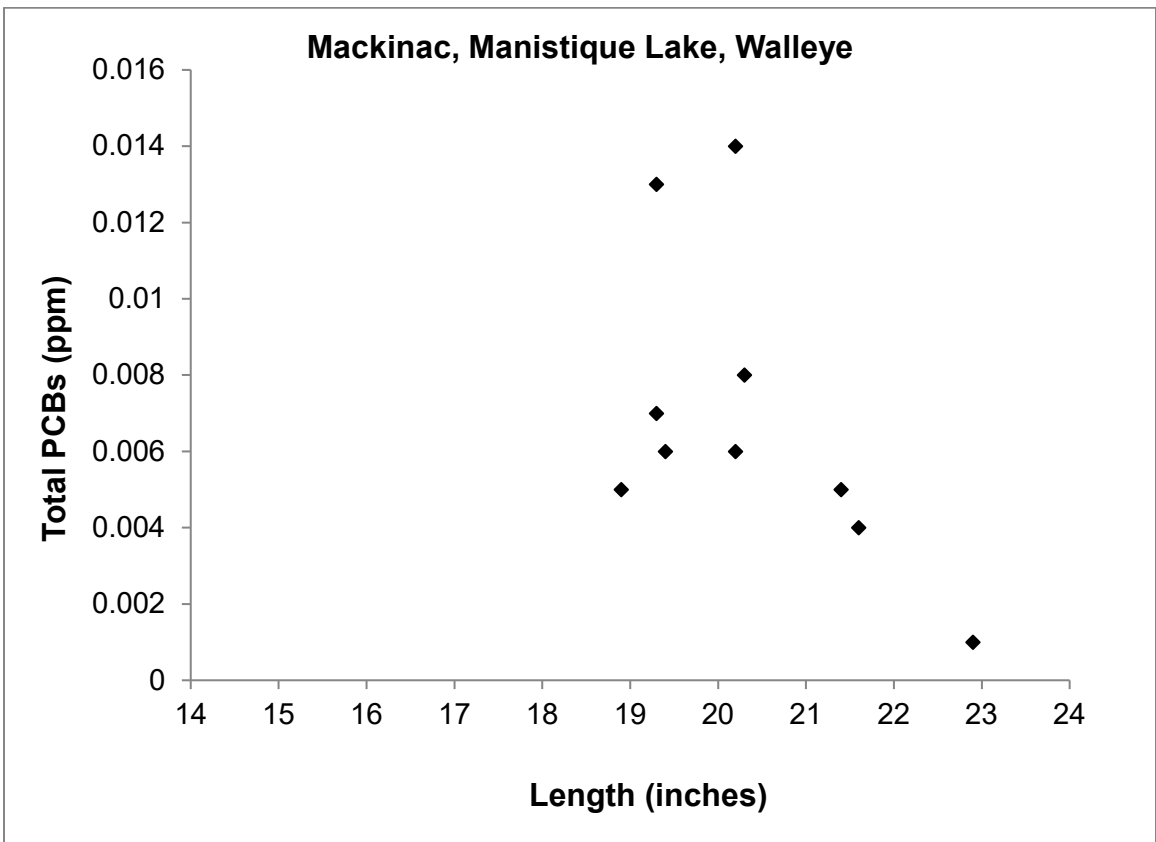
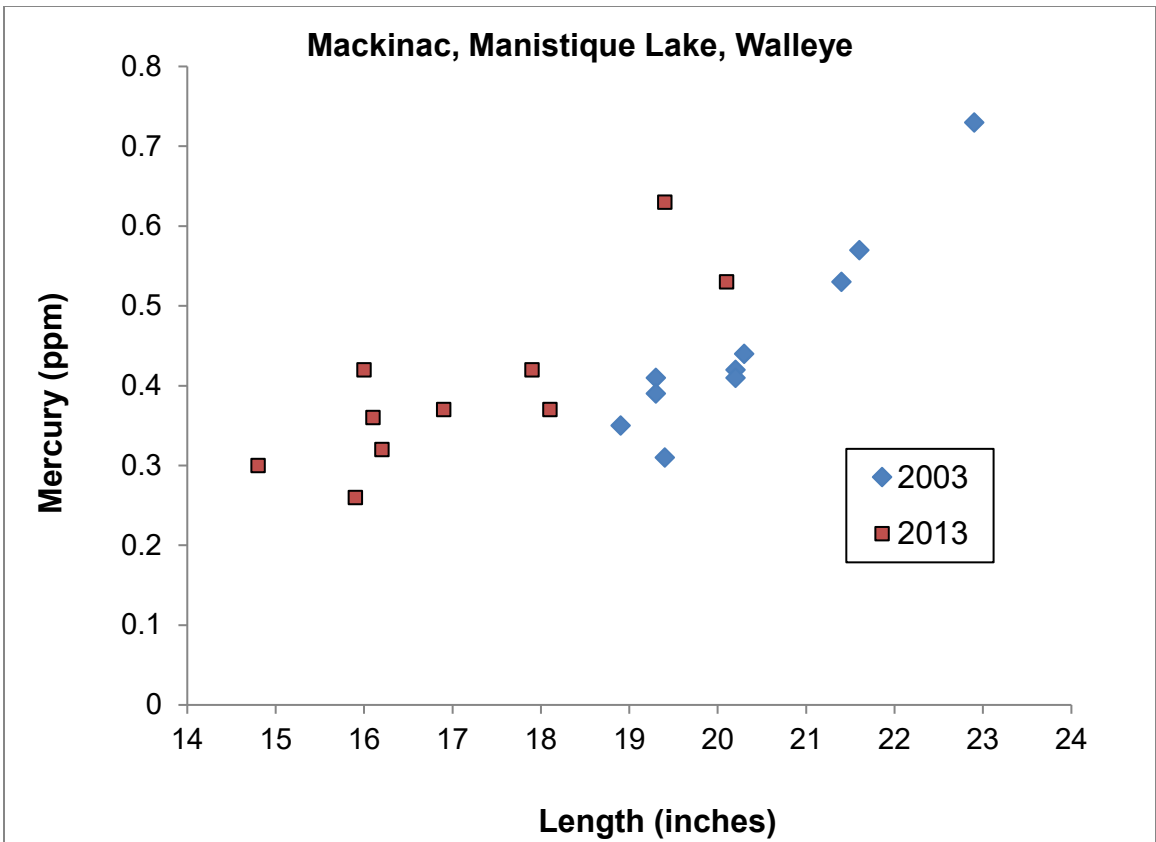
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2003	2013	20	14.8	15	14.8	22.9
Datasets available: 2003, 2013						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	20	0.43	0.26	0.73	0.48	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.560	0.580				

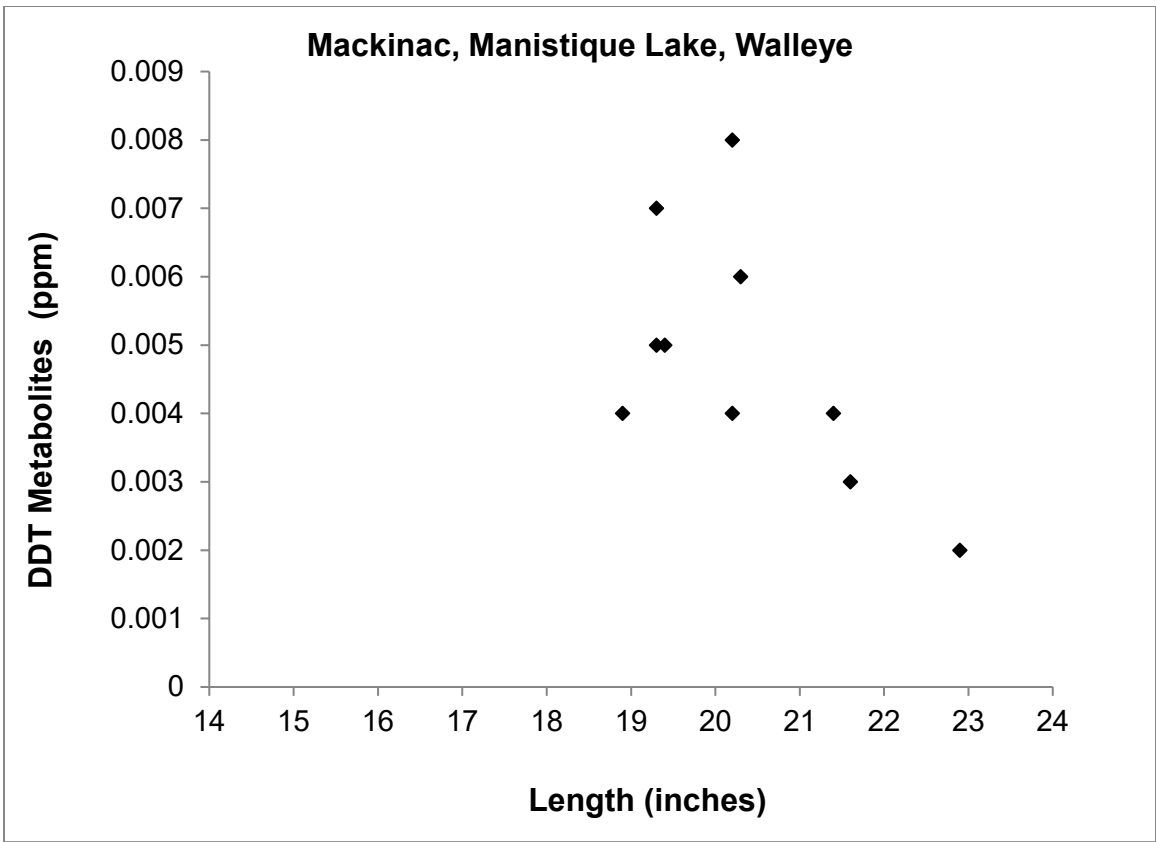
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2003	2003	10	10	15	18.9	22.9
Datasets available: 2003						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.007	0.001	0.014	0.010	16
DDT	10	0.005	0.002	0.008	0.010	16
Chlordane	10	0.001	0.001	0.001	0.001	--
Toxaphene	10	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.297	0.536				
DDT	0.349	0.501				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						2

Existing Advisory: No one should eat more than 2 meals per month of Manistique Lake walleye smaller than 20 inches or more than 1 meal per month of those fish larger than 20 inches due to mercury.

Recommendation: No change is recommended.





Walleye

Milakokia Lake

Mackinac County

Hg Analysis:

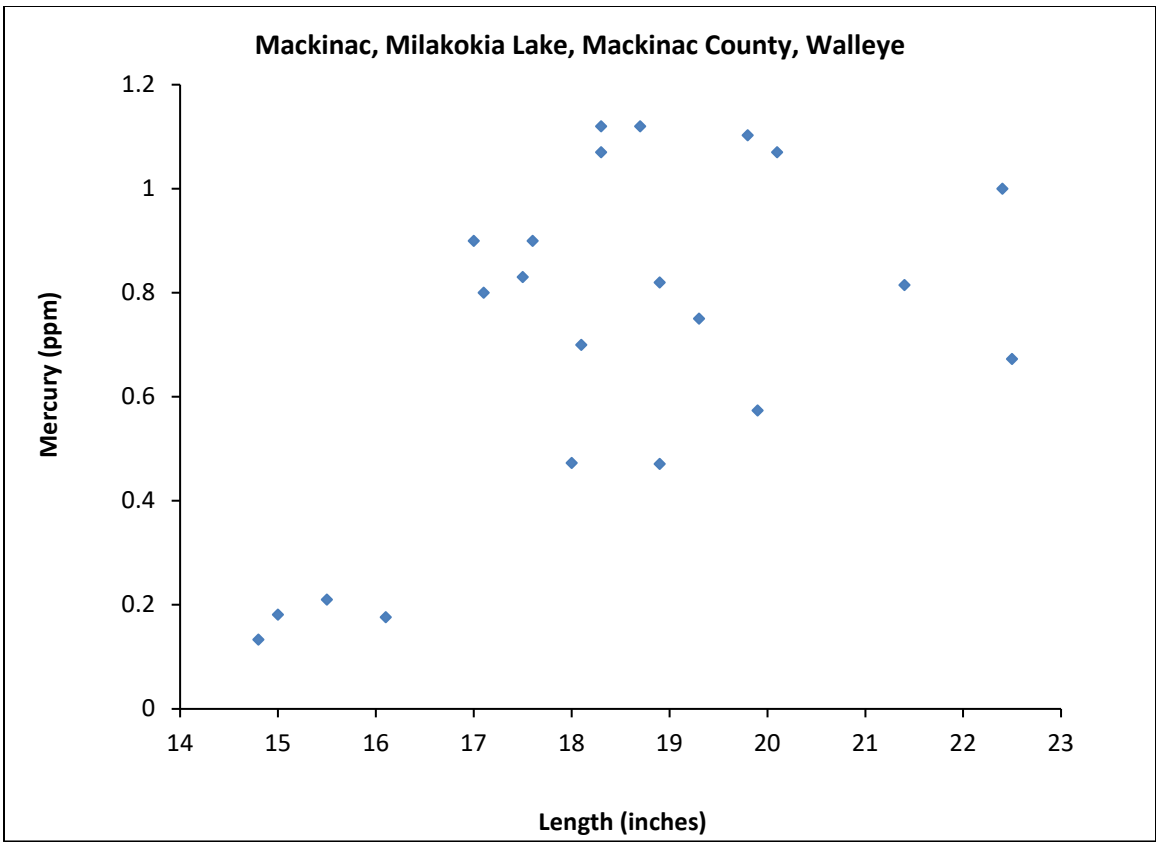
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1985	2007	22	14.8	15	14.8	22.5
Datasets available: 1985, 1994, 2007						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	22	0.72	0.13	1.12	0.87	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.329	0.429				

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: Milakokia Lake walleye are covered under the statewide mercury consumption advisory.

Recommendation: No one should eat more than 1 meal per month of Milakokia Lake walleye less than 20 inches or 6 meals per year of those greater than 20 inches due to mercury. Statewide length break applied as the length range of fish was limited.



White Sucker

Milakokia Lake

Mackinac County

Hg Analysis:

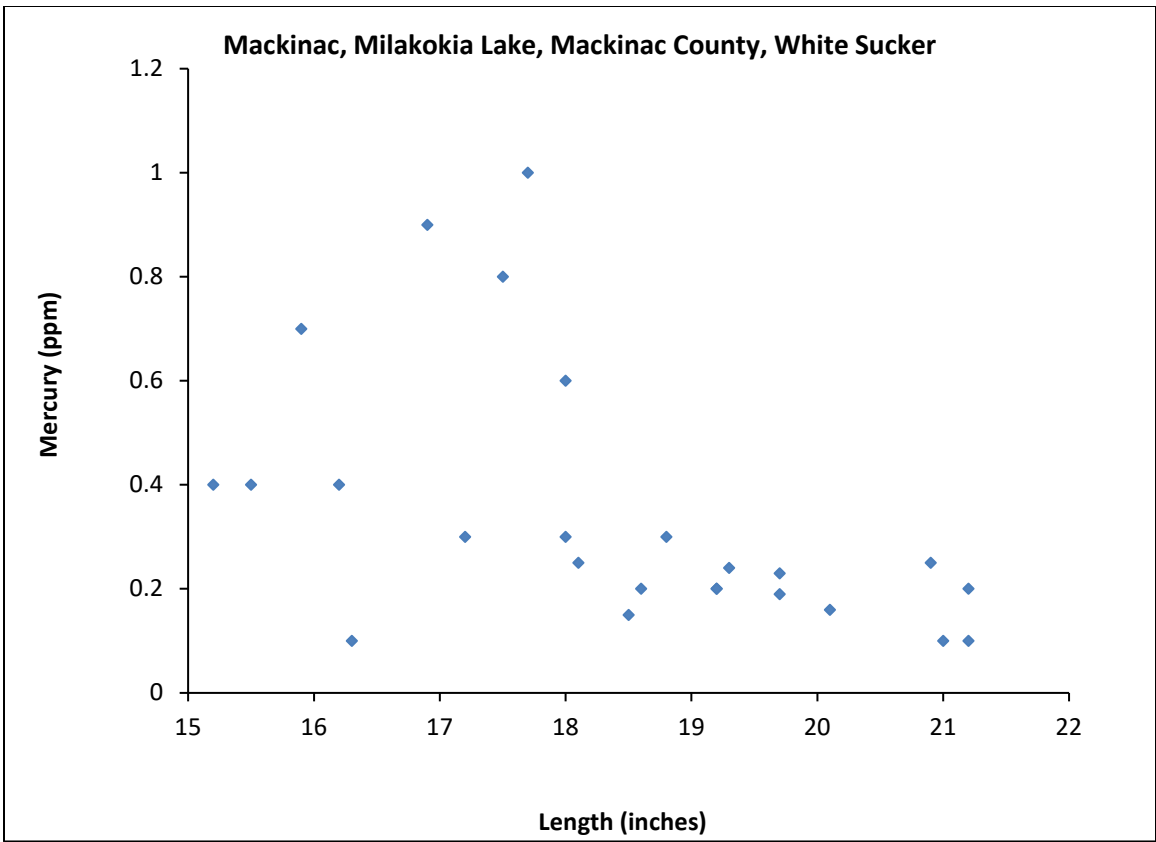
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1985	1994	25	15.2	na	15.2	21.2
Datasets available: 1985, 1994						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	25	0.35	0.10	1.00	0.45	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.259	0.332				

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:						2

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

Recommendation: No one should eat more than 2 meals per month of Milakokia Lake sucker 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
1994	1994	1	15.7	na	15.7	15.7
Datasets available: 1994						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	1	0.57	0.570	0.57	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

Organics Analysis:

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

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

Recommendation: A dataset of less than five data points for a given chemical, species and waterbody is considered insufficient for evaluation using the standard evaluation method. Statewide guidelines apply: No one should eat more than 4 meals per month of Milakokia lake yellow perch due to mercury.

Northern Pike

Millecoquins Lake

Mackinac County

Hg Analysis:

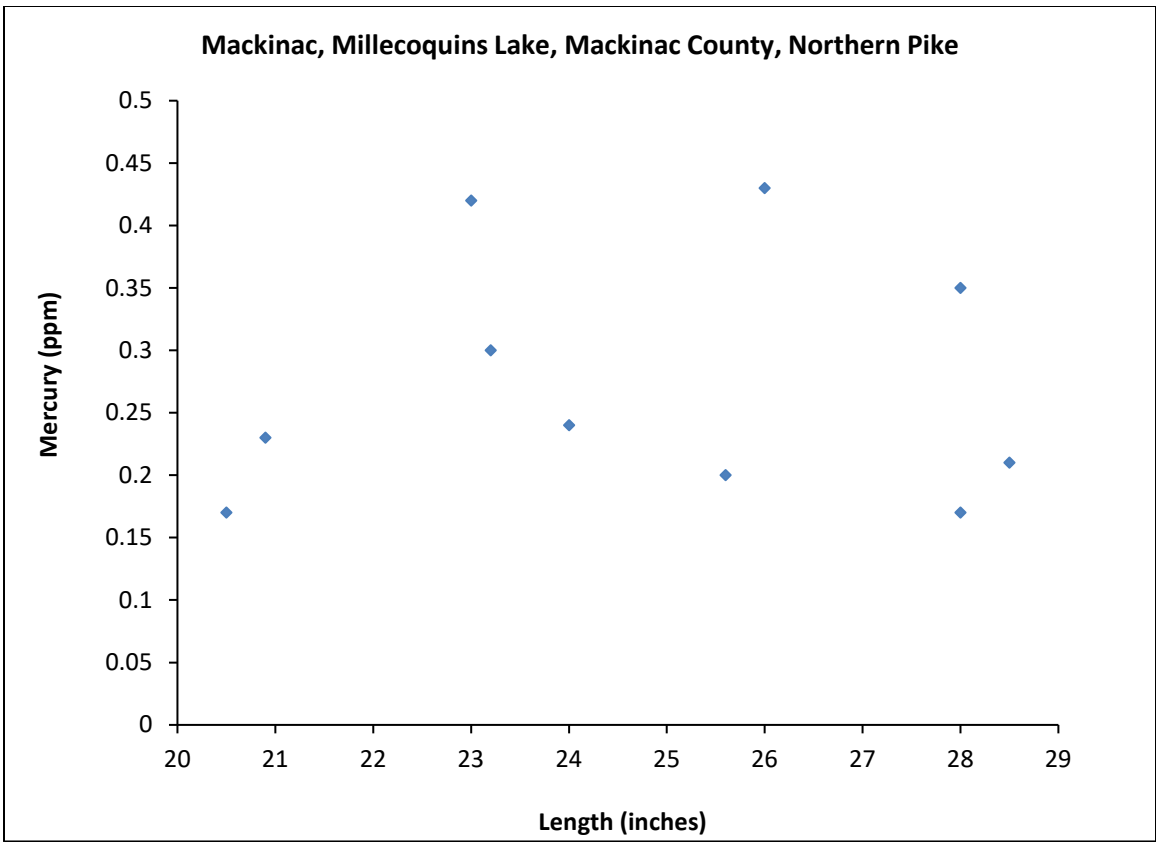
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	1989	10	20.5	na*	24	28.5
Datasets available: 1989						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.27	0.17	0.43	0.34	2
Chemical	Linear Regression	Exponential Regression	* - there is no minimum size limit for northern pike from this lake			
	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
--	--	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:						2

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

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



Rock Bass

Millecoquins Lake

Mackinac County

Hg Analysis:

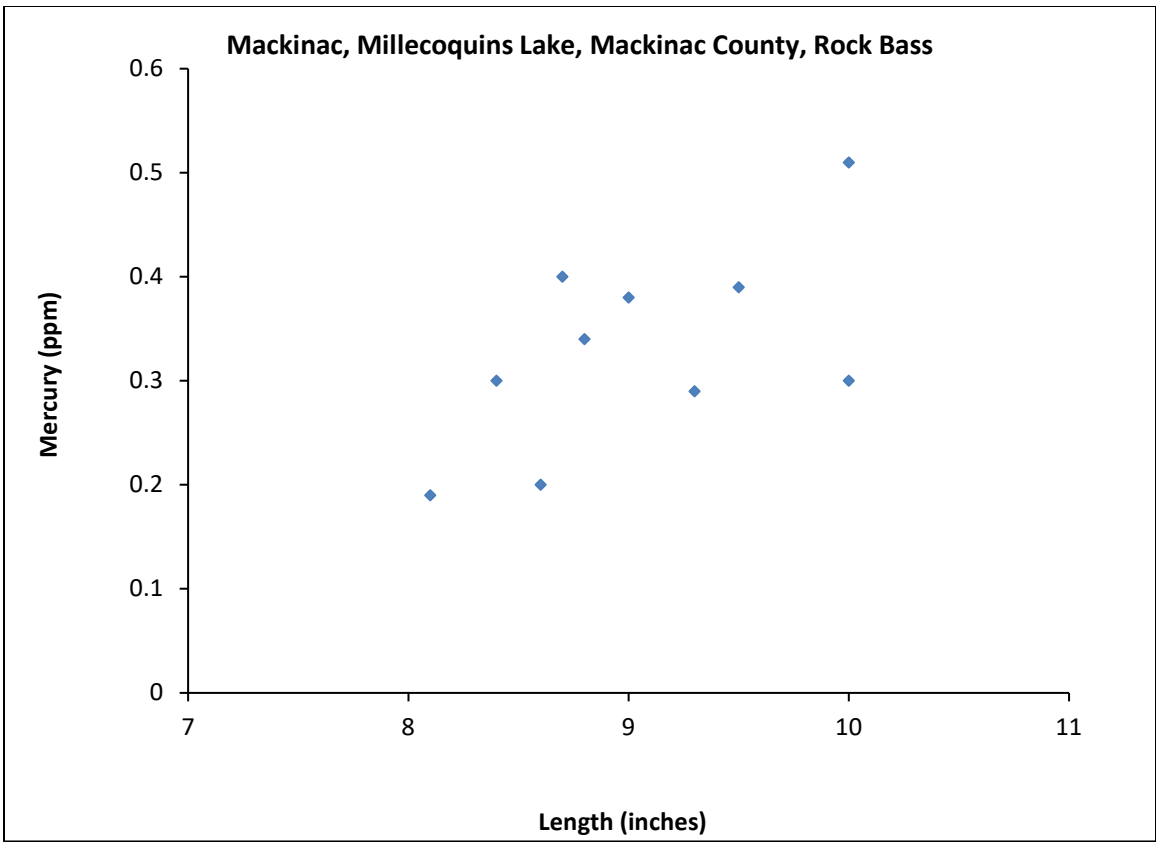
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2006	2006	10	8.1	na	8.1	10
Datasets available: 2006						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.33	0.19	0.51	0.40	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.368	0.371				

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:						2

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

Recommendation: No one should eat more than 2 meals per month of Millecoquins Lake rock bass due to mercury.



Walleye

Millecoquins Lake

Mackinac County

Hg Analysis:

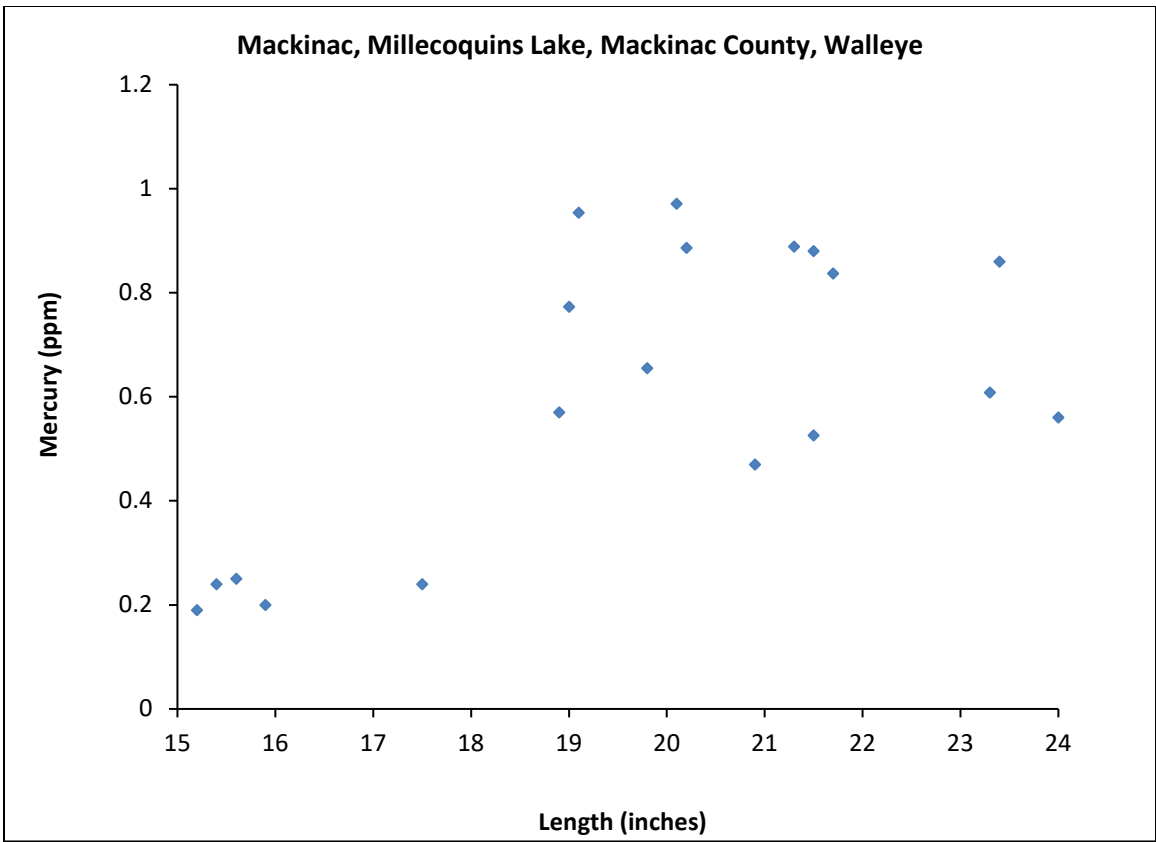
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	2006	19	15.2	15	15.2	24
Datasets available: 1989, 2006						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	19	0.61	0.19	0.97	0.74	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.435	0.561				

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: Millecoquins Lake walleye are covered under the statewide mercury consumption advisory.

Recommendation: No one should eat more than 1 meal per month of Millecoquins Lake walleye due to mercury.



Walleye

South Manistique Lake

Mackinac County

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	13.6	15	14.6	23.6
Datasets available: 1988						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	9	0.30	0.12	0.66	0.42	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.701	0.814				

Organics Analysis:

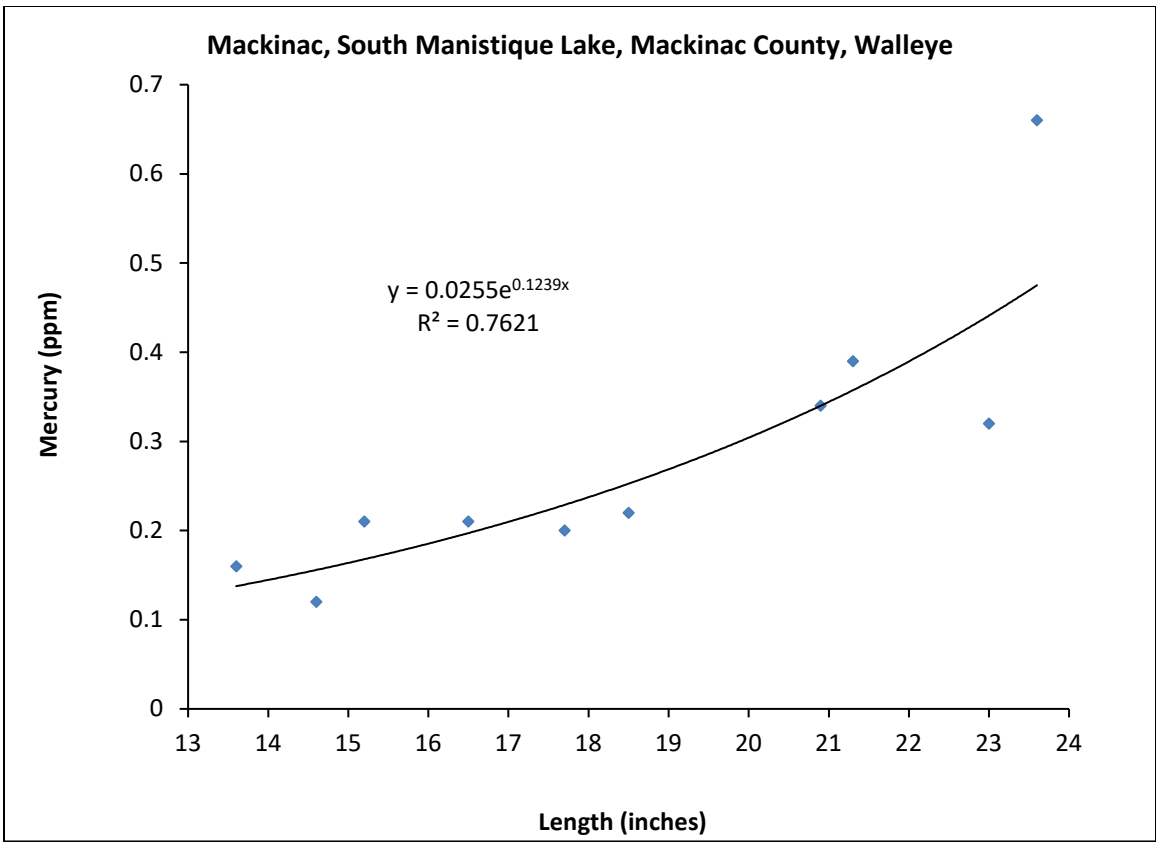
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	0				
Datasets available: --						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0	--	--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

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

Recommendation: No one should eat more than 4 meals per month of South Manistique Lake walleye smaller than 20 inches or more than 2 meals per week of those fish larger than 20 inches due to mercury.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
15	0.16	4
16	0.19	4
18	0.24	4
20	0.30	2
22	0.39	2
24	0.50	2
26	0.64	1
28	0.82	1

Shaded area denotes extrapolated estimates



Rock Bass

South Manistique Lake

Mackinac County

Hg Analysis:

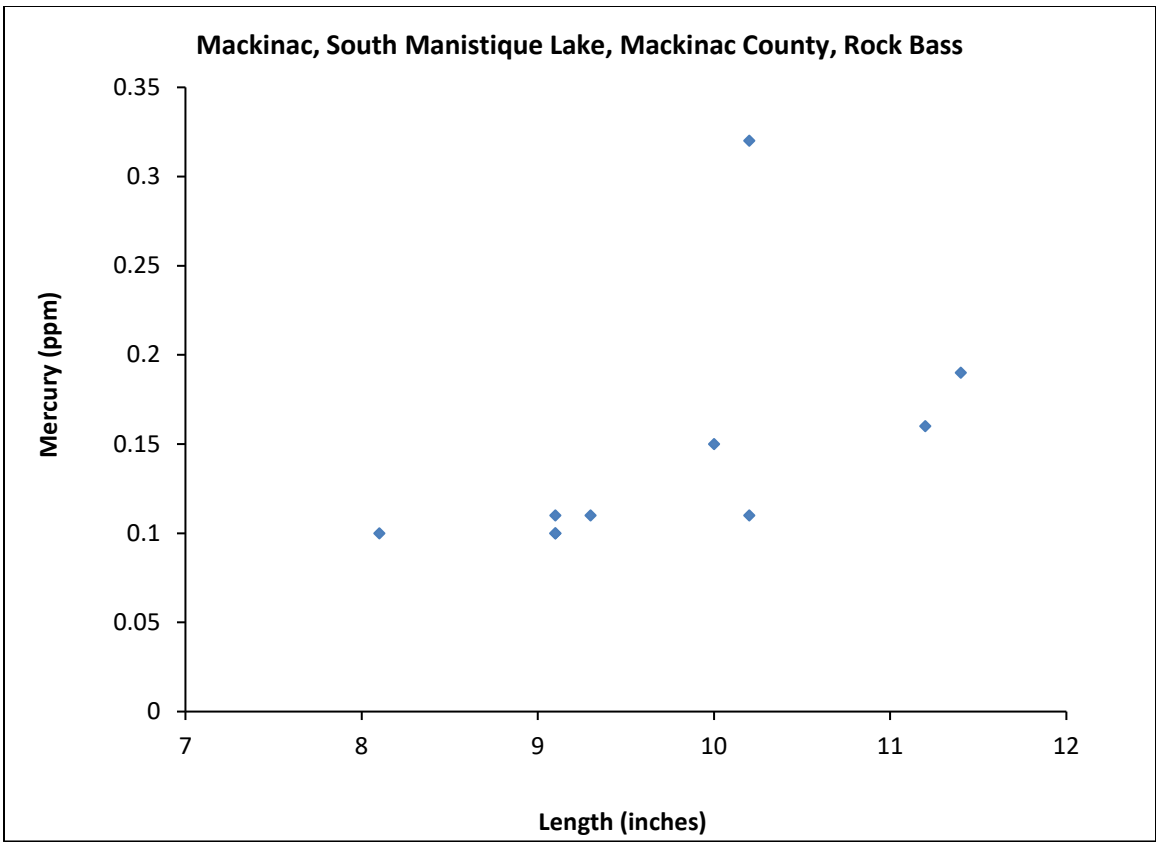
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1988	1988	10	8.1	na	8.1	11.4
Datasets available: 1988						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.14	0.10	0.32	0.19	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.272	0.409				

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:						4

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

Recommendation: no one should eat more than 4 meals per month of South Manistique Lake rock bass due to mercury.



Manistique River Schoolcraft County

Carp

**Manistique River
d/s Manistique Papers Dam**

Schoolcraft County

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	2012	45	20.5	na	20.5	31.1	
Datasets available: 1985, 1986, 2004, 2008, 2012							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	45	0.30		0.10	0.75	0.34	2
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.134	0.190					

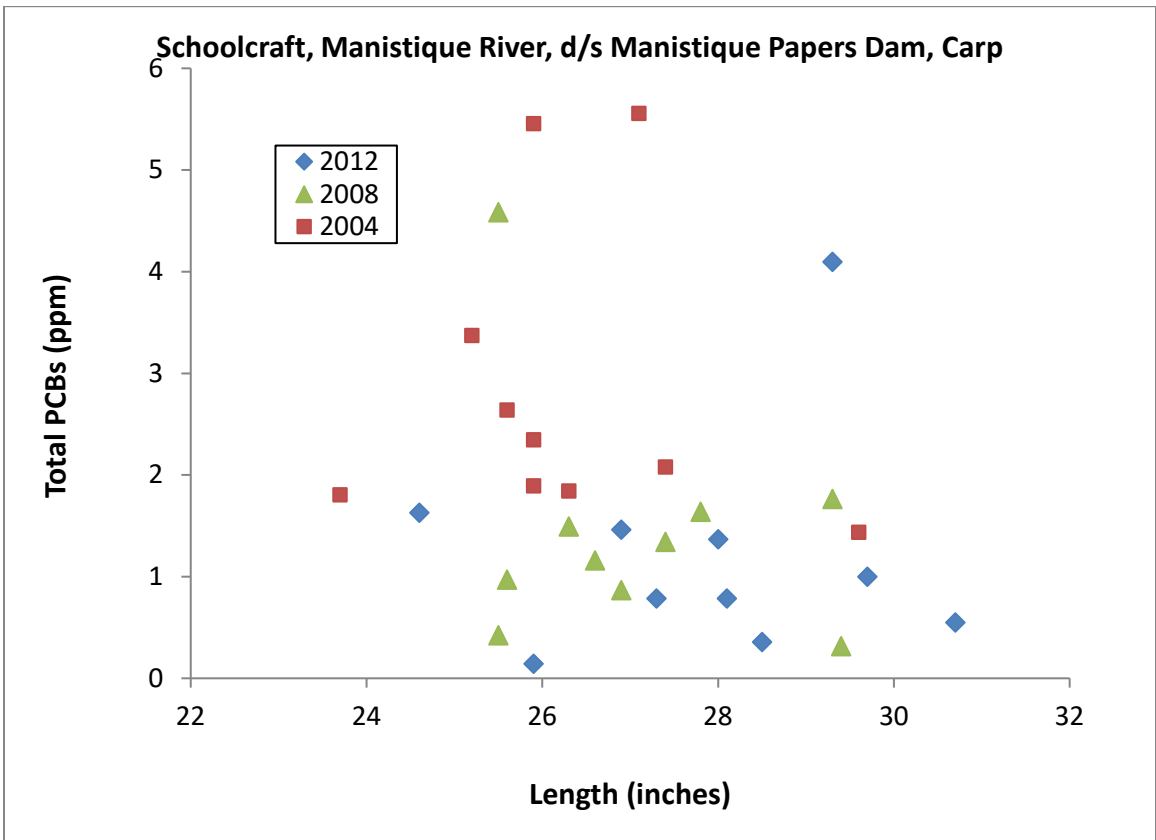
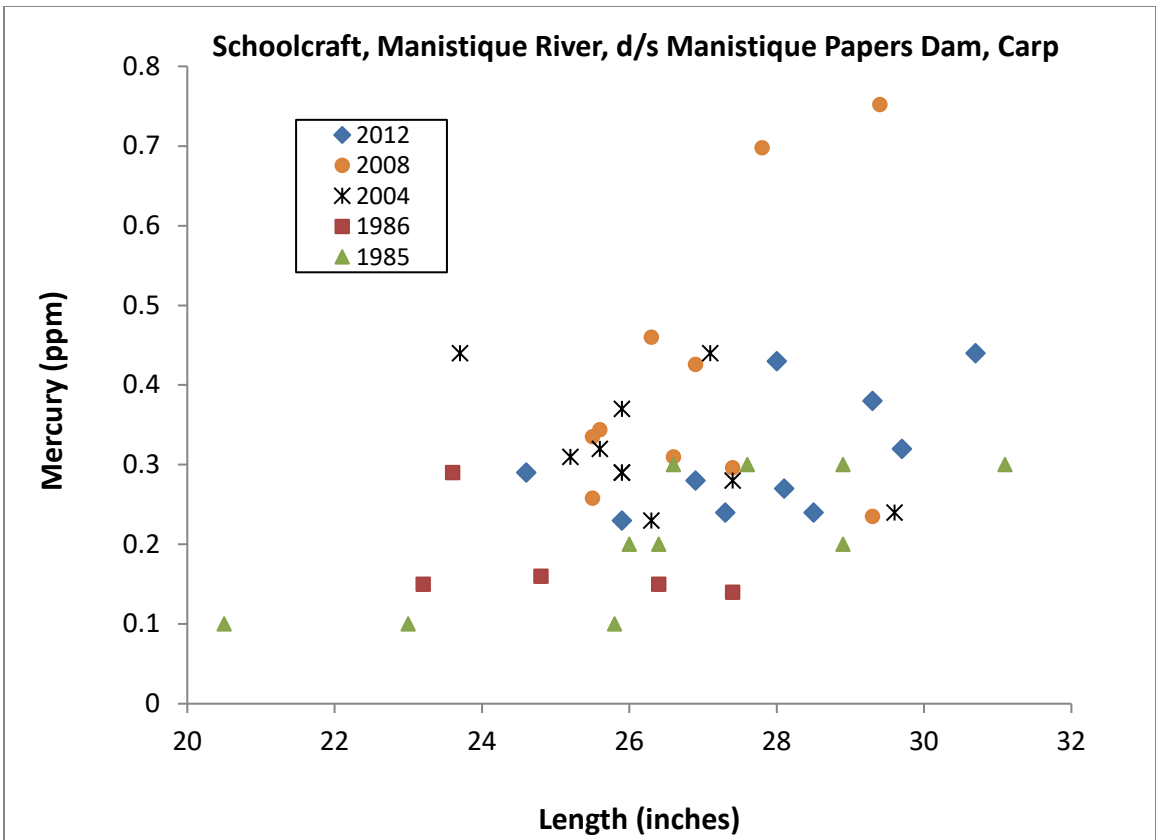
Organics Analysis:

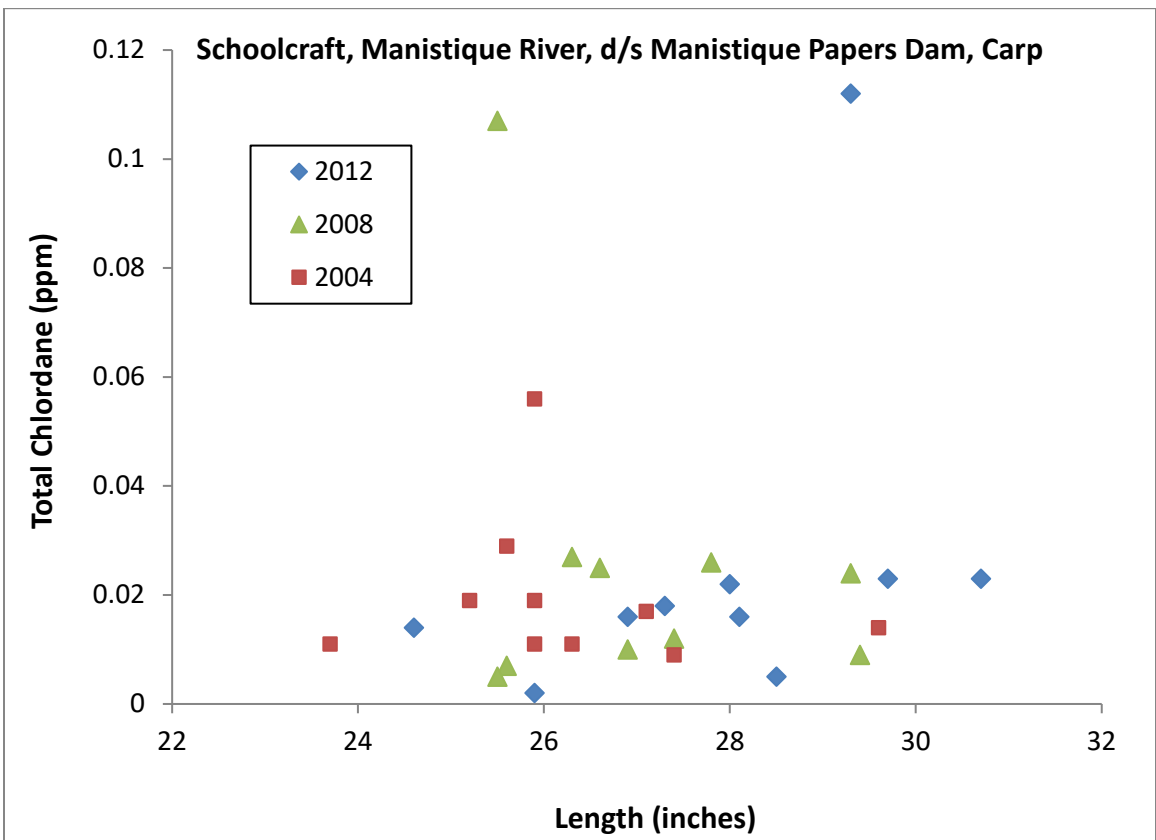
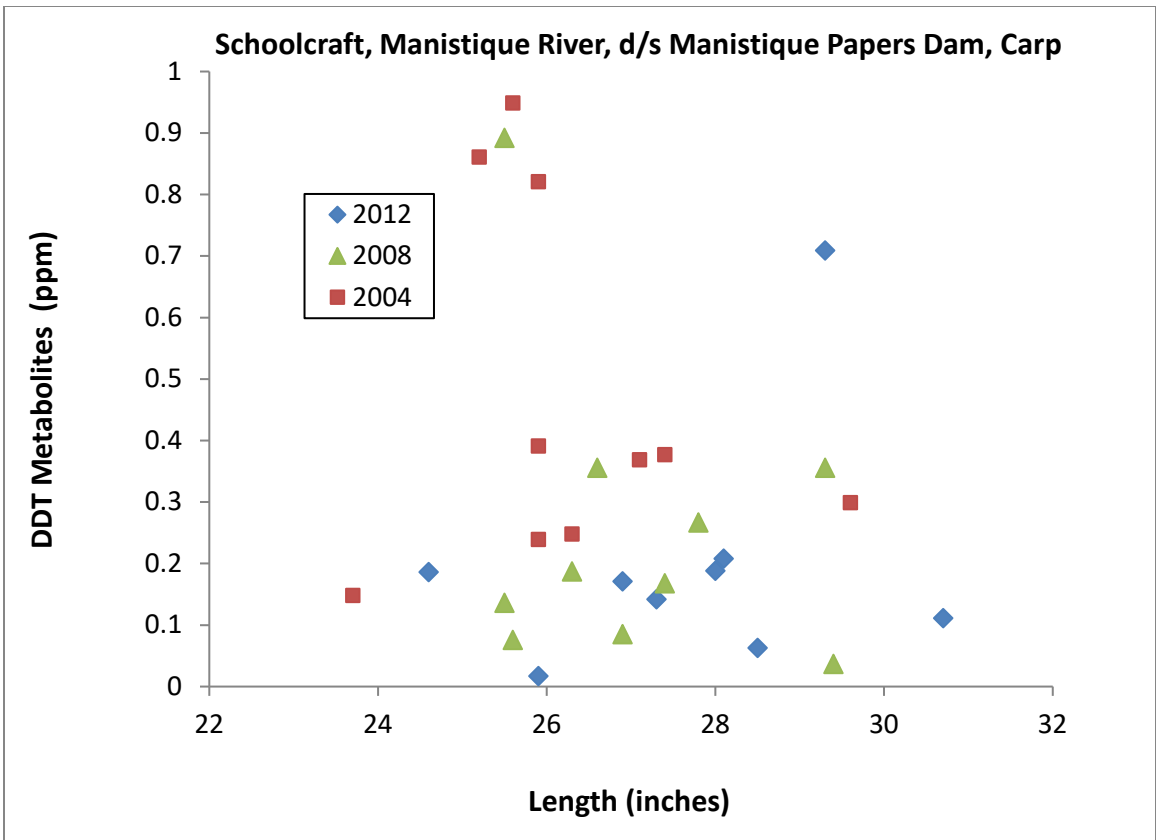
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2004	2012	30	23.7	na	23.7	30.7	
Datasets available: 1985, 1986, 2004, 2008, 2012							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	30	1.84		0.14	5.56	2.38	Limited
DDT	29	0.31		0.02	0.95	0.42	1
Chlordane	30	0.02		0.002	0.11	0.03	--
Toxaphene	30	ND		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.057	0.062					
DDT	0.041	0.020					
Chlordane	0.006	0.022					
Toxaphene	--	--					
Final meal category based on UCL:							Limited*

Existing Advisory: No one should eat carp of any size from the Manistique River downstream of Manistique Papers dam due to PCBs. Mercury and DDT would cause advisories.

Recommendation: No change.

*Uncertainty due to uncontrolled sources and yet to be determined remediation actions is the basis for continuing the no consumption advisory for everyone.





Channel Catfish

**Manistique River
d/s Manistique Papers Dam**

Schoolcraft County

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	15.6	12	15.6	21.7
Datasets available: 1988						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	9	0.21	0.10	0.27	0.26	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.901	0.848				

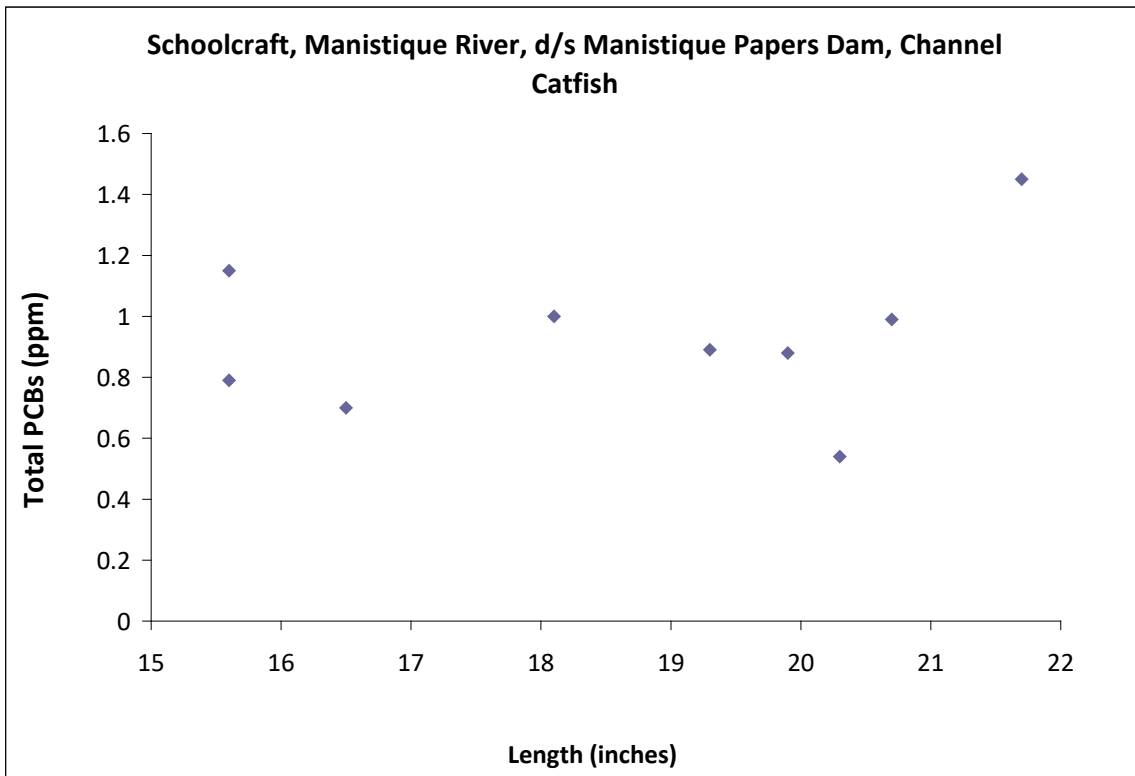
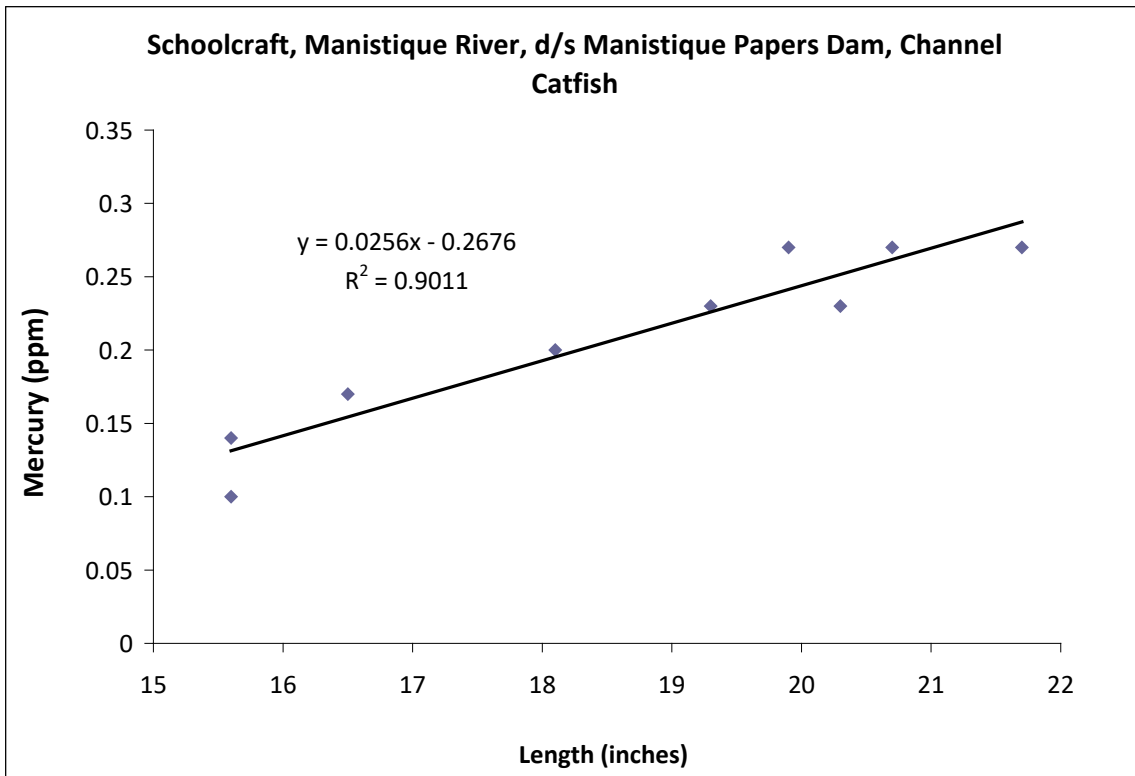
Organics Analysis:

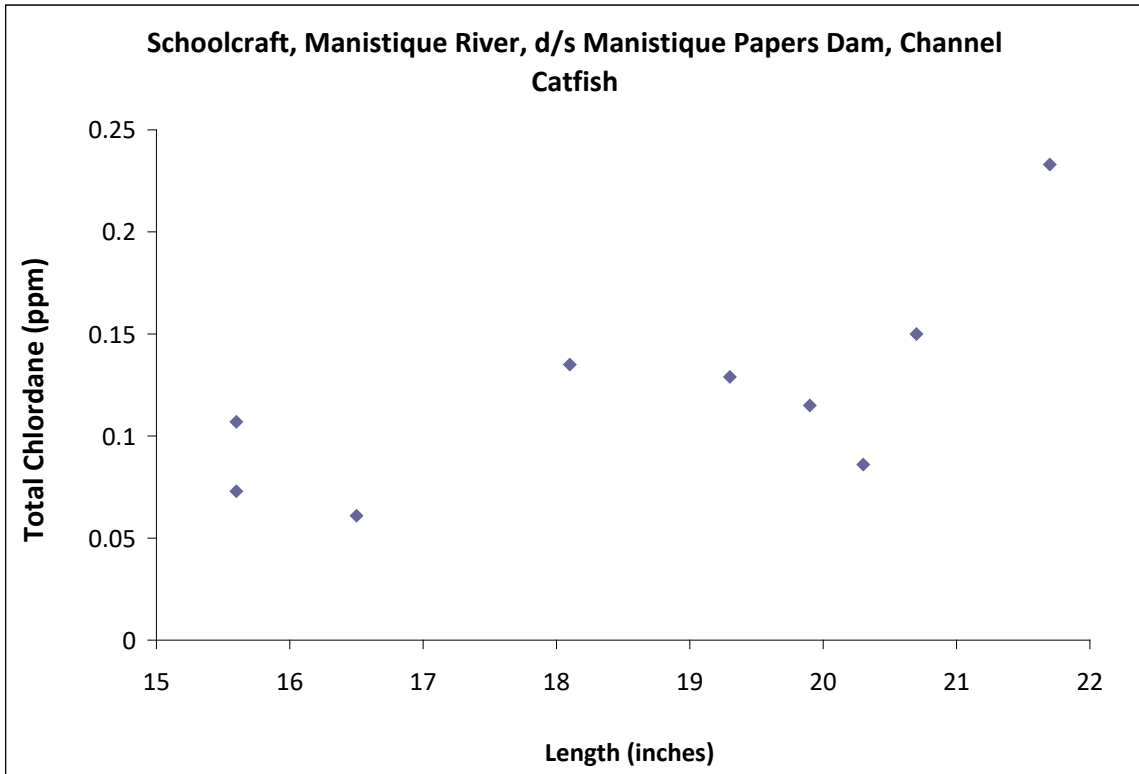
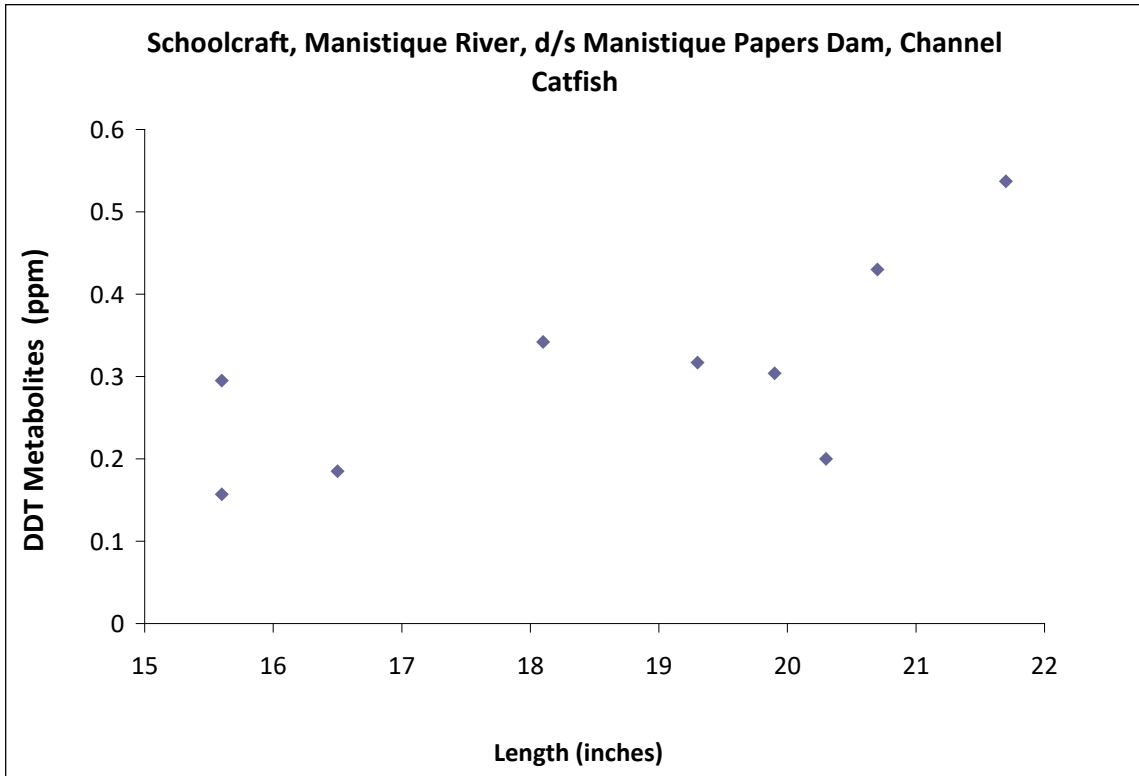
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1988	1988	9	15.6	12	15.6	21.7
Datasets available: 1988						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	9	0.93	0.54	1.45	1.13	Limited
DDT	9	0.31	0.16	0.54	0.40	4
Chlordane	9	0.12	0.06	0.23	0.16	--
Toxaphene	9	0.30	0.15	0.70	0.42	0.5
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.061	0.030				
DDT	0.466	0.444				
Chlordane	0.484	0.492				
Toxaphene	0.441	0.490				
Final meal category based on UCL:						Limited

Existing Advisory: Women and children should eat no more than one meal per month of channel catfish from the Manistique River downstream of Manistique Papers dam between less than 18 inches in length and no more than six meals per year of channel catfish greater than 18 inches in length due to elevated concentrations of PCBs.

Length (Inches)	Hg Regression Concentration Estimate (ppm)	Meal Category
12	0.0396	16
14	0.0908	8
16	0.142	4
18	0.1932	4
20	0.2444	4
22	0.2956	2

Recommendation: Sensitive populations should not eat any catfish from the Manistique River downstream of the Manistique Papers dam due to PCBs. Healthy adults should limit consumption to 1 or 2 meals per year of catfish from the Manistique River downstream of the Manistique Papers dam. Mercury, DDT and toxaphene would cause advisories. This dataset is limited due to the age of the data, however, this water has legacy contamination of PCBs and requires new data to relax this guideline.





Largemouth Bass

**Manistique River
d/s Manistique Papers Dam**

Schoolcraft County

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	--	14		
Datasets available: 1985						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	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
1985	1985	1	14.2	14	14.2	14.2
Datasets available: 1985						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	1	0.72	--	--	--	--
DDT	1	0.18	--	--	--	--
Chlordane	1	0.06	--	--	--	--
Toxaphene	1	0.12	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						--

Existing Advisory: Largemouth bass from the Manistique River downstream of Manistique Papers dam are not covered by a consumption advisory.

Recommendation: This dataset is limited due to sample size and age of the data, and cannot be used to provide a recommendation. See smallmouth bass recommendation: No one should eat more than 1 meal per month of largemouth or smallmouth bass from the Manistique River downstream of Manistique Papers dam due to elevated concentrations of PCBs.

Pumpkinseed

**Manistique River
d/s Manistique Papers Dam**

Schoolcraft County

Hg Analysis:

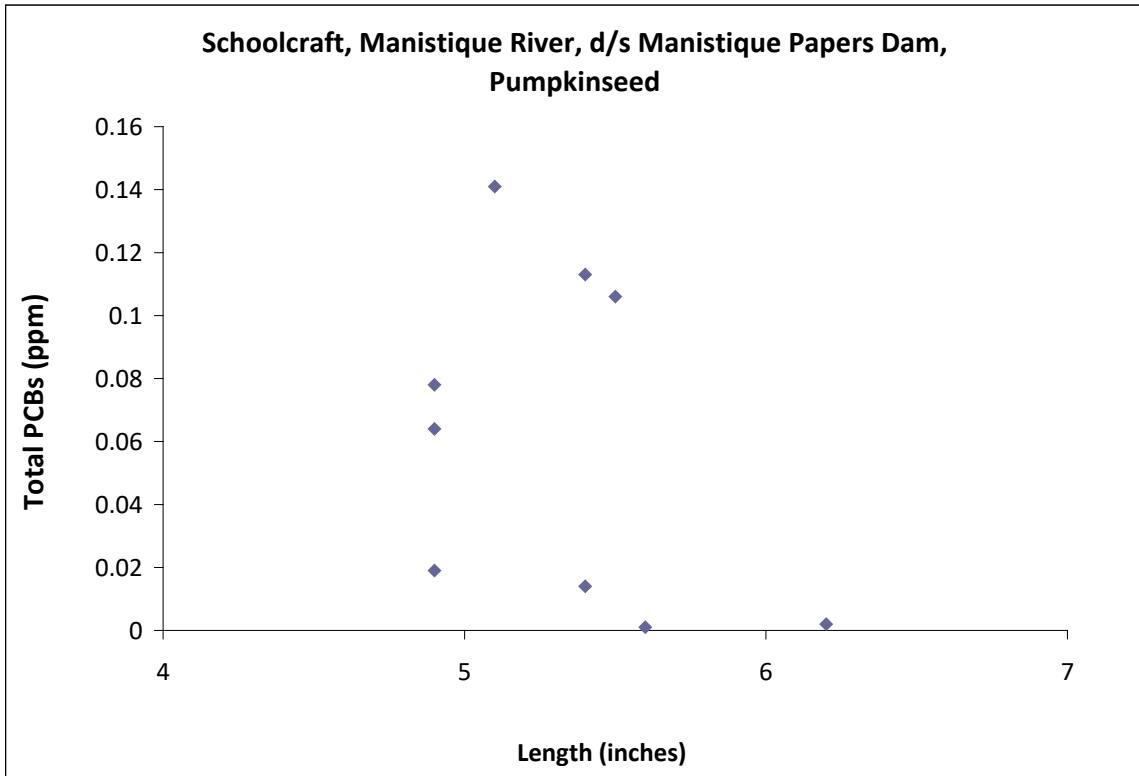
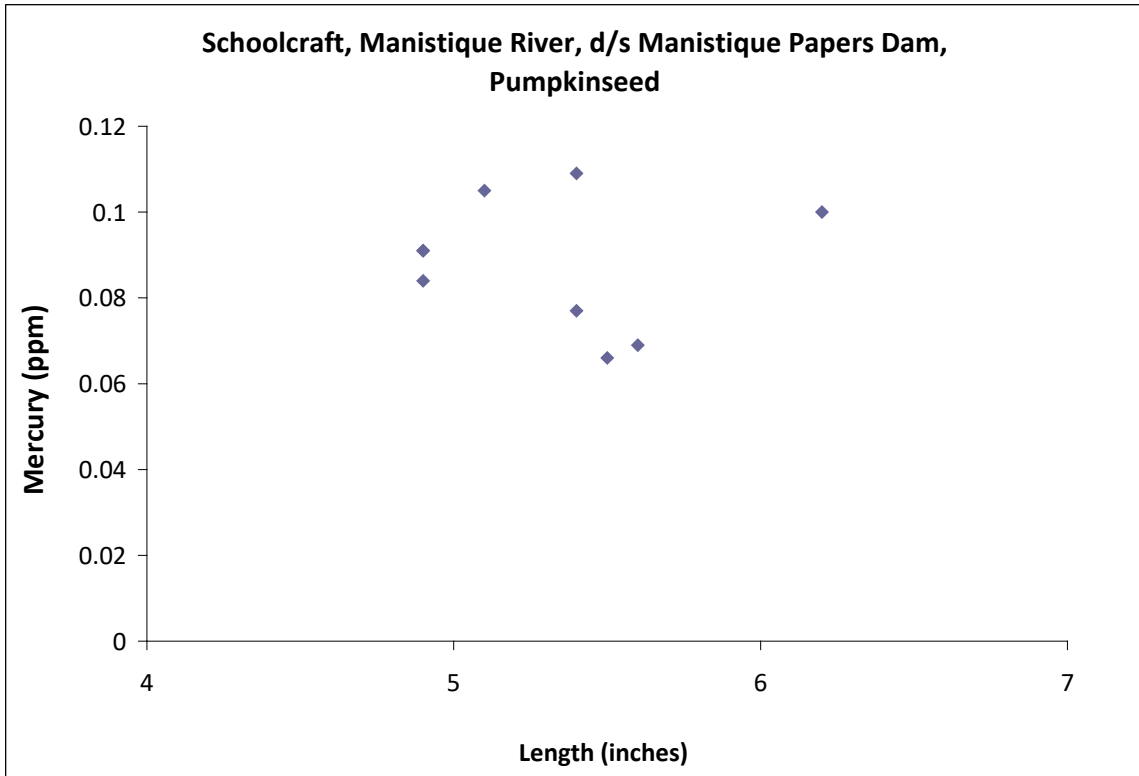
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2008	2008	9	4.9	na	4.9	6.2
Datasets available: 2008						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	9	0.088	0.07	0.11	0.10	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.002	0.006				

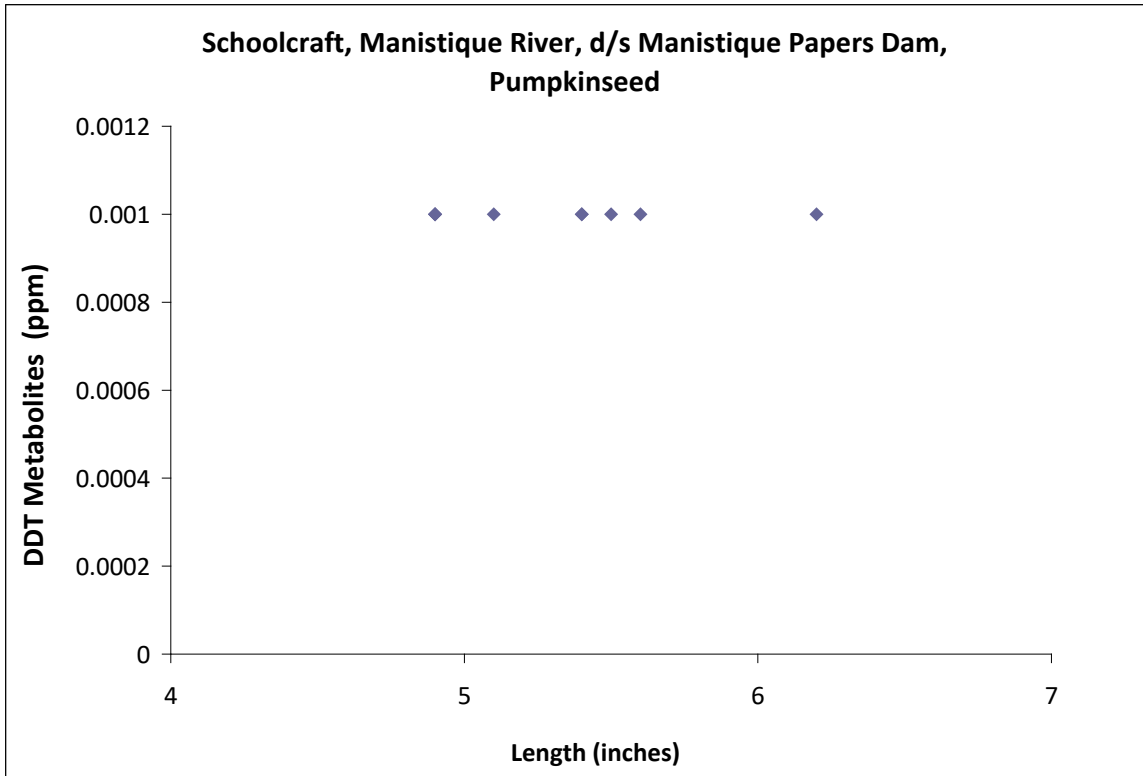
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2008	2008	9	4.9	na	4.9	6.2
Datasets available: 2008						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	9	0.060	0.001	0.14	0.100	2
DDT	9	ND	--	--	--	16
Chlordane	9	ND	--	--	--	--
Toxaphene	9	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.142	0.392				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						2

Existing Advisory: Pumpkinseed from the Manistique River downstream of the Manistique Papers dam are not covered by a consumption advisory.

Recommendation: No one should eat more than 2 meals per month of pumpkinseed from the Manistique River downstream of the Manistique Papers dam due to elevated concentrations of PCBs. Mercury would cause an advisory.





Redhorse and White Sucker

**Manistique River
d/s Manistique Papers Dam**

Schoolcraft County

Hg Analysis:

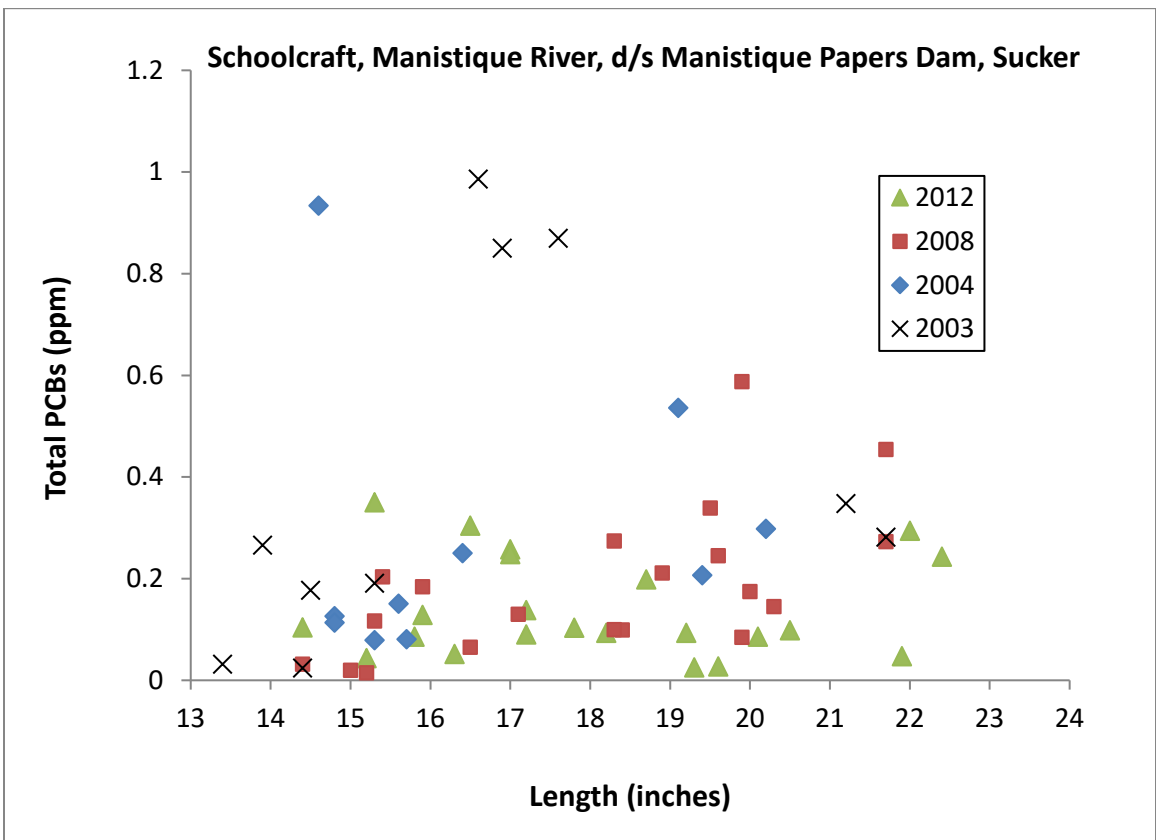
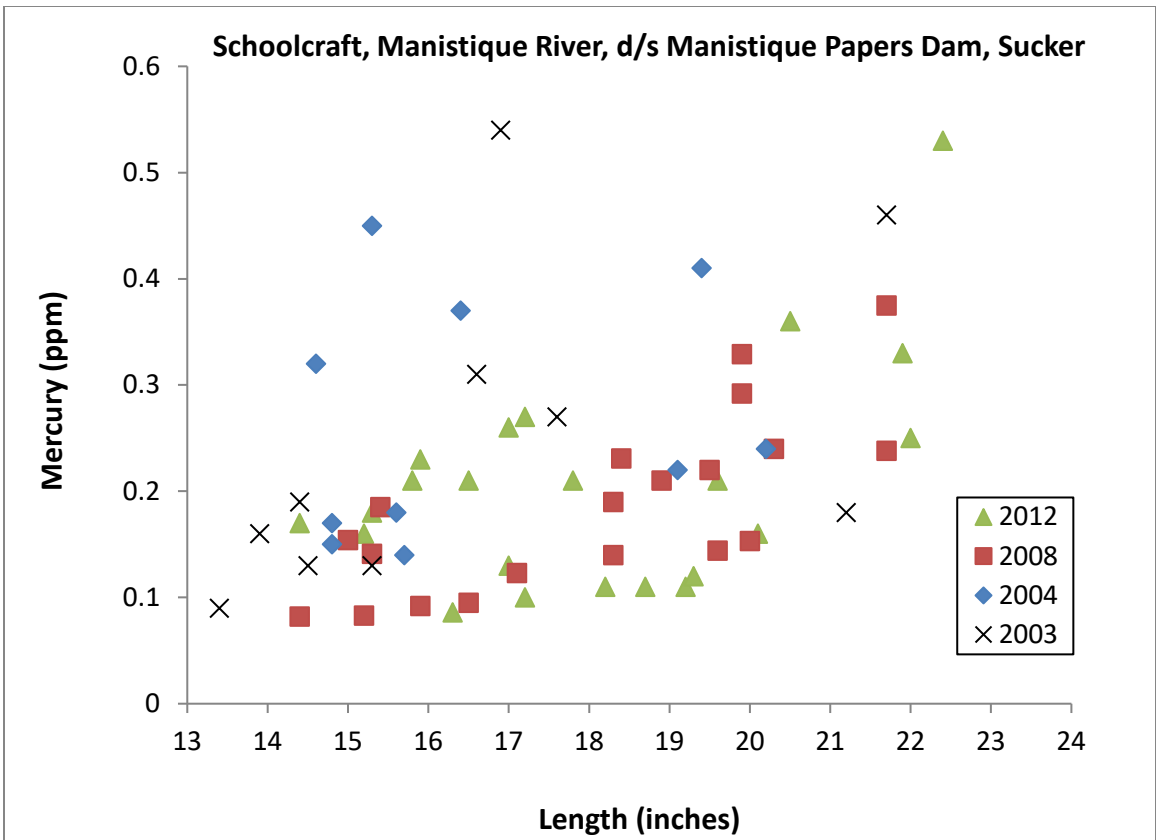
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2003	2012	62	14.4	na	13.4	22.4
Datasets available: 2003, 2004, 2008, 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	62	0.22	0.08	0.54	0.24	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.168	0.186				

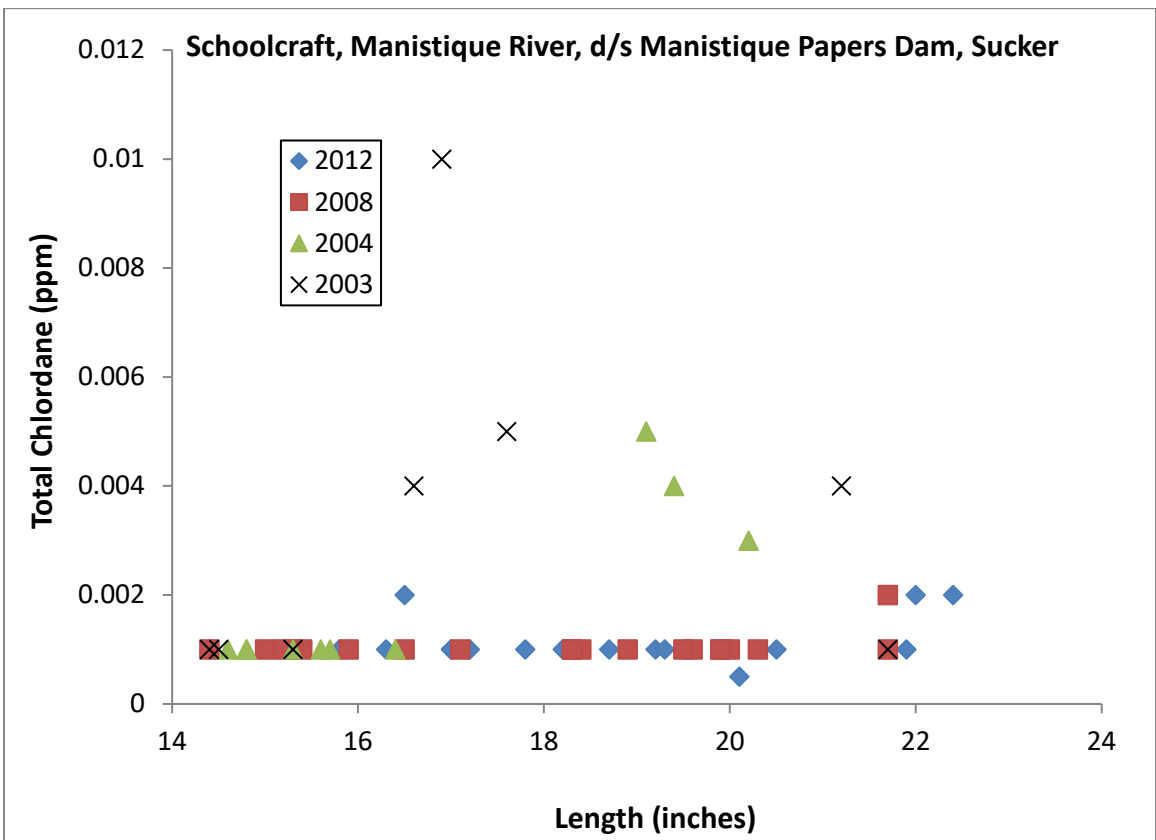
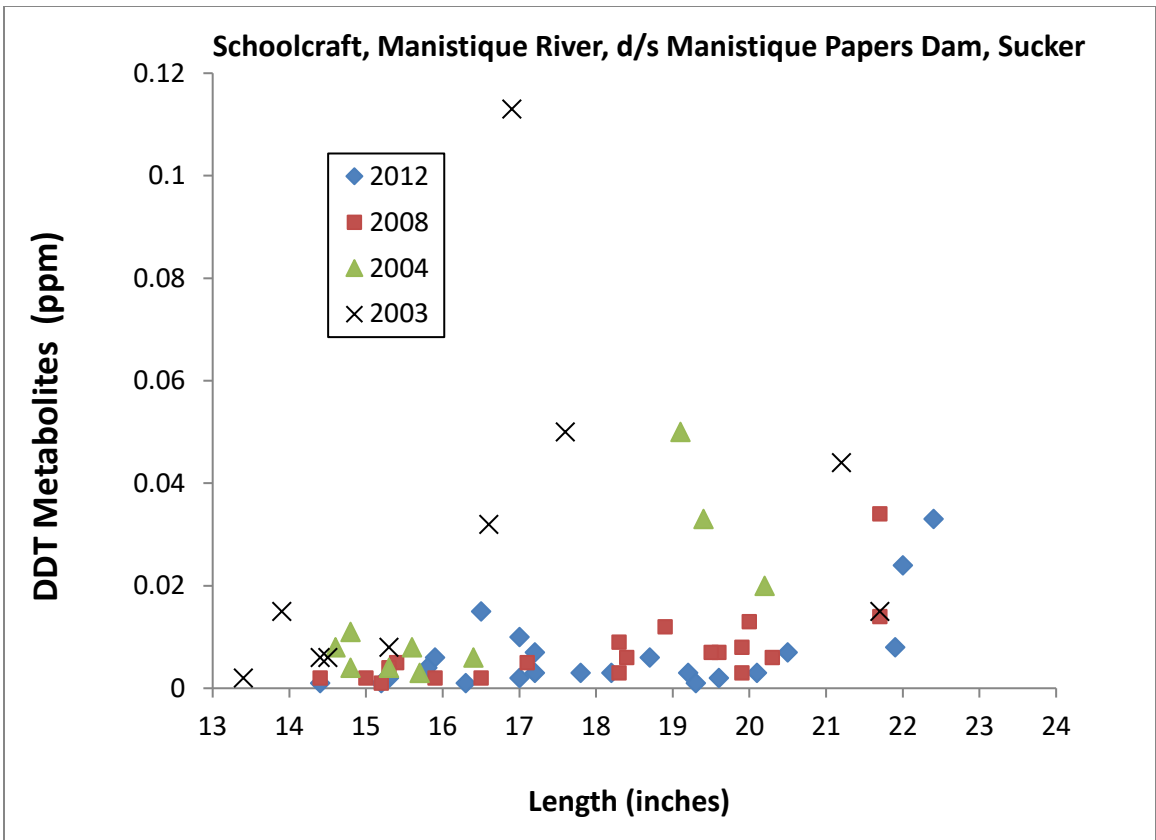
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2003	2012	52	14.4	na	13.4	22.4
Datasets available: 1984, 2003, 2004, 2008, 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	62	0.22	0.02	0.99	0.23	0.5
DDT	62	0.01	0.001	0.11	0.01	16
Chlordane	62	0.002	0.00051	0.01	0.001	--
Toxaphene	--	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.011	0.064				
DDT	0.062	0.176				
Chlordane	0.018	0.045				
Toxaphene	--	--				
Final meal category based on UCL:						0.5

Existing Advisory: No one should eat more than 6 meals per year of suckers from the Manistique River downstream of the Manistique Papers dam due to elevated levels of PCBs. Mercury would cause an advisory.

Recommendation: No change.





Hg Analysis:

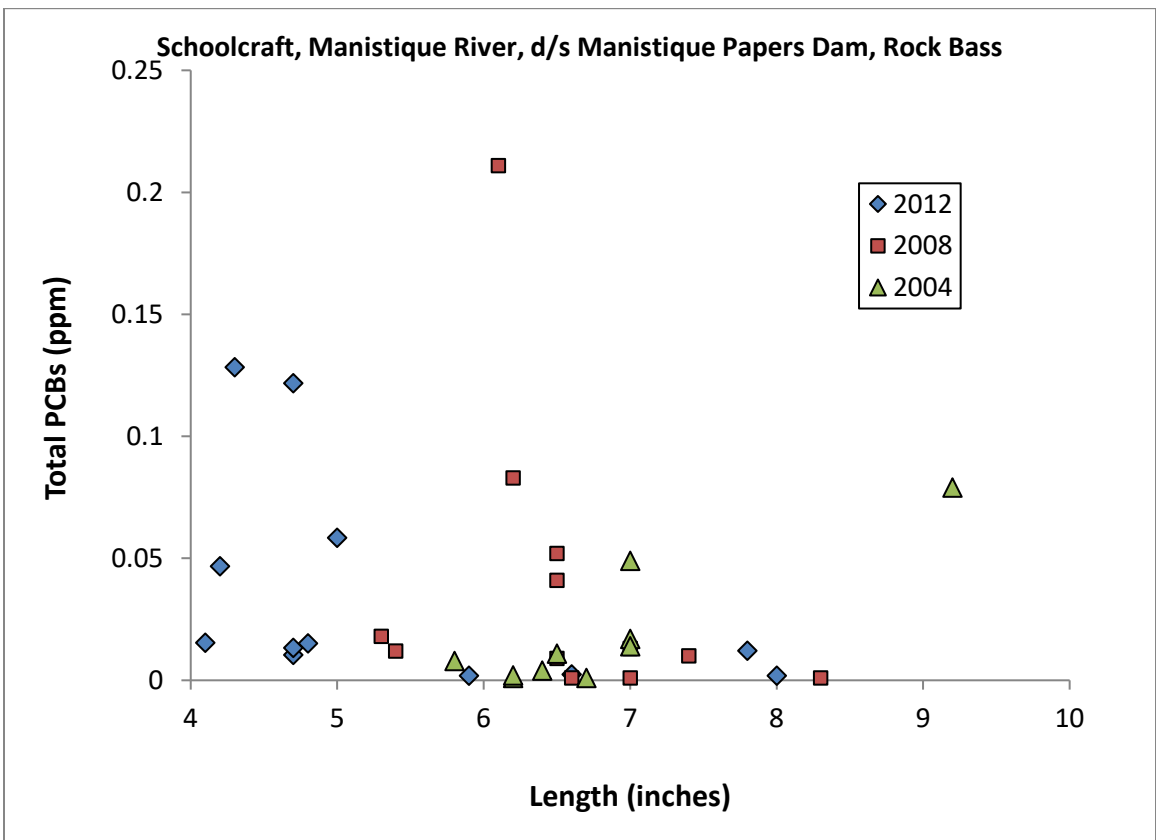
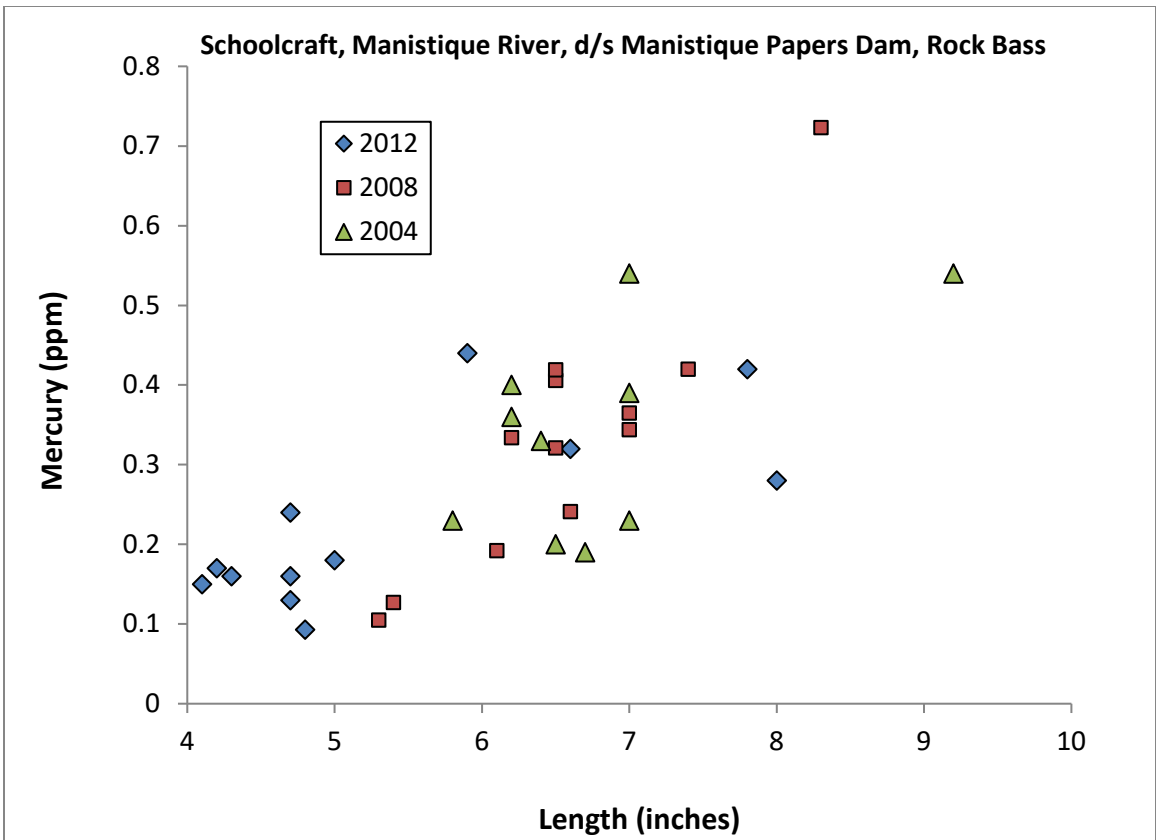
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2004	2012	34	4.1	na	4.1	9.2
Datasets available: 2004, 2008, 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	34	0.30	0.09	0.72	0.35	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.563	0.575				

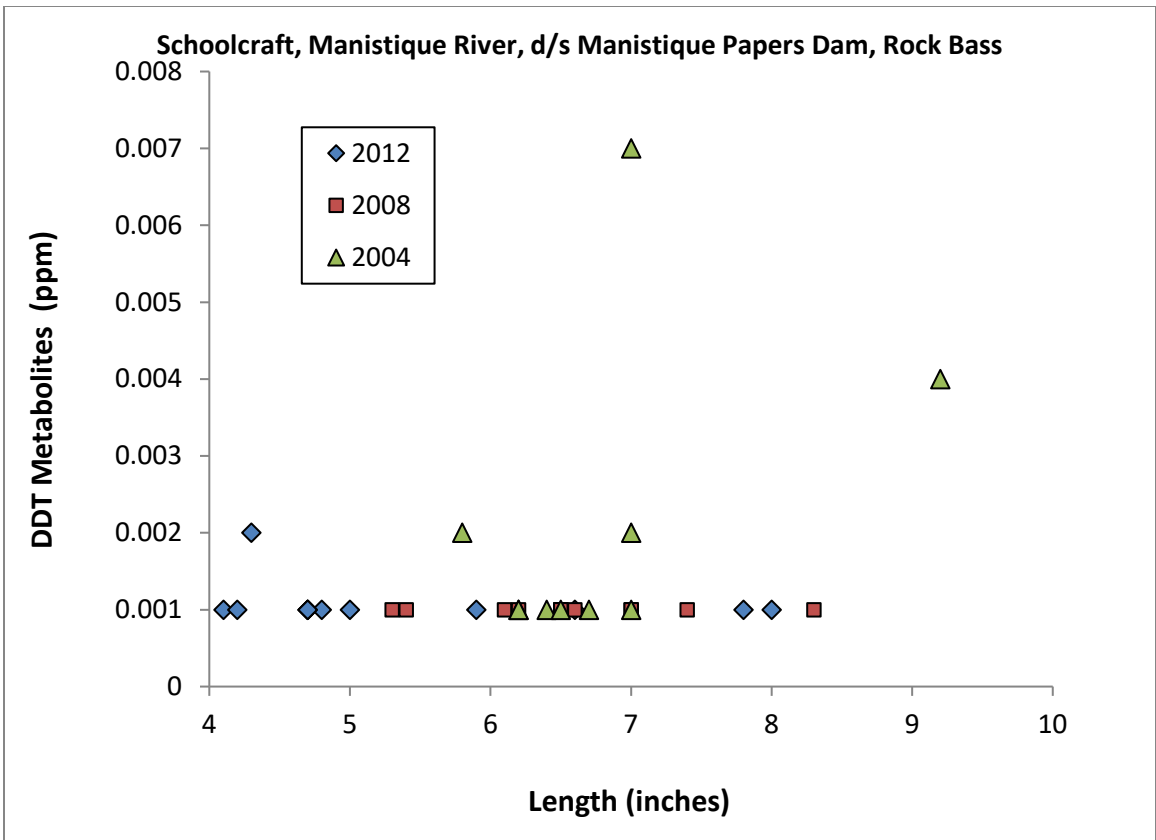
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2004	2012	34	4.1	na	4.1	9.2
Datasets available: 2004, 2008, 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	34	0.03	0.001	0.21	0.05	4
DDT	34	0.001	0.001	0.01	0.001	16
Chlordane	34	ND	--	--	--	--
Toxaphene	34	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.040	0.092				
DDT	0.068	0.068				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						2

Existing Advisory: No one should eat more than 2 meals per month of rock bass from the Manistique River downstream of the Manistique Papers Dam due to mercury. PCBs would cause an advisory.

Recommendation: No change.





Smallmouth Bass

**Manistique River
d/s Manistique Papers Dam**

Schoolcraft County

Hg Analysis:

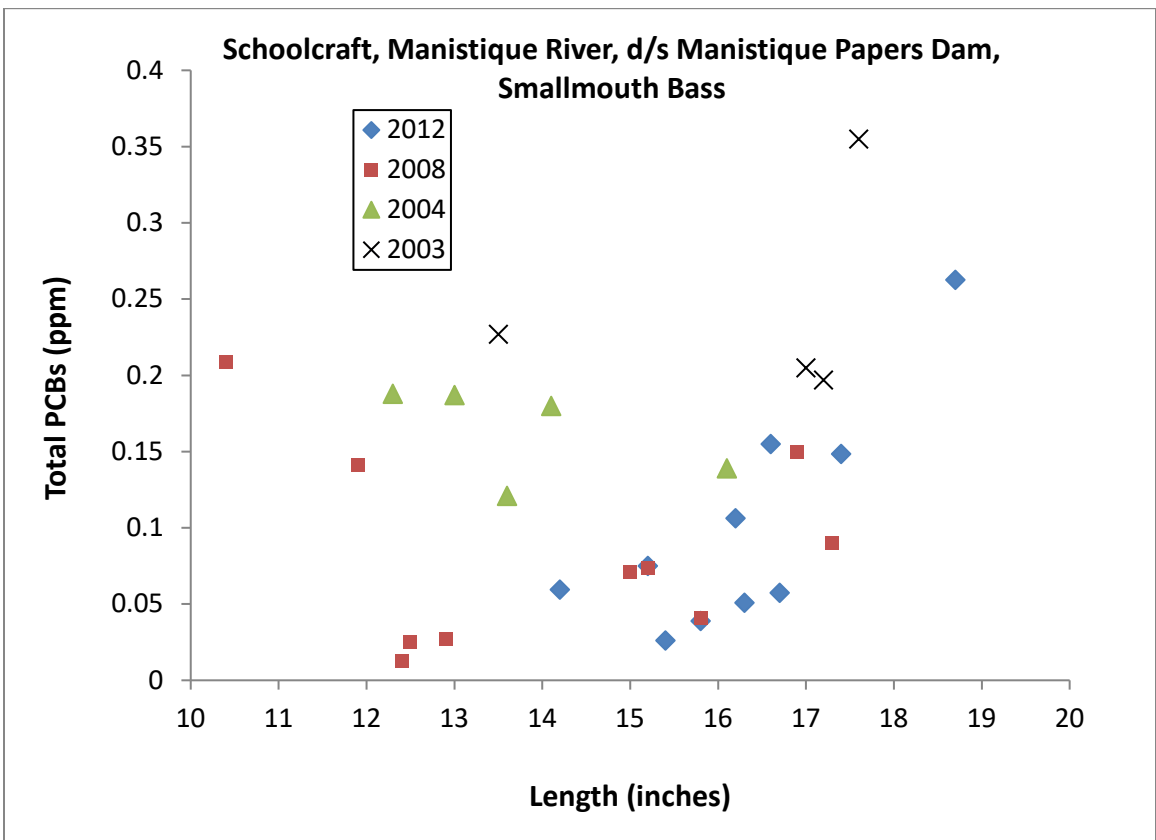
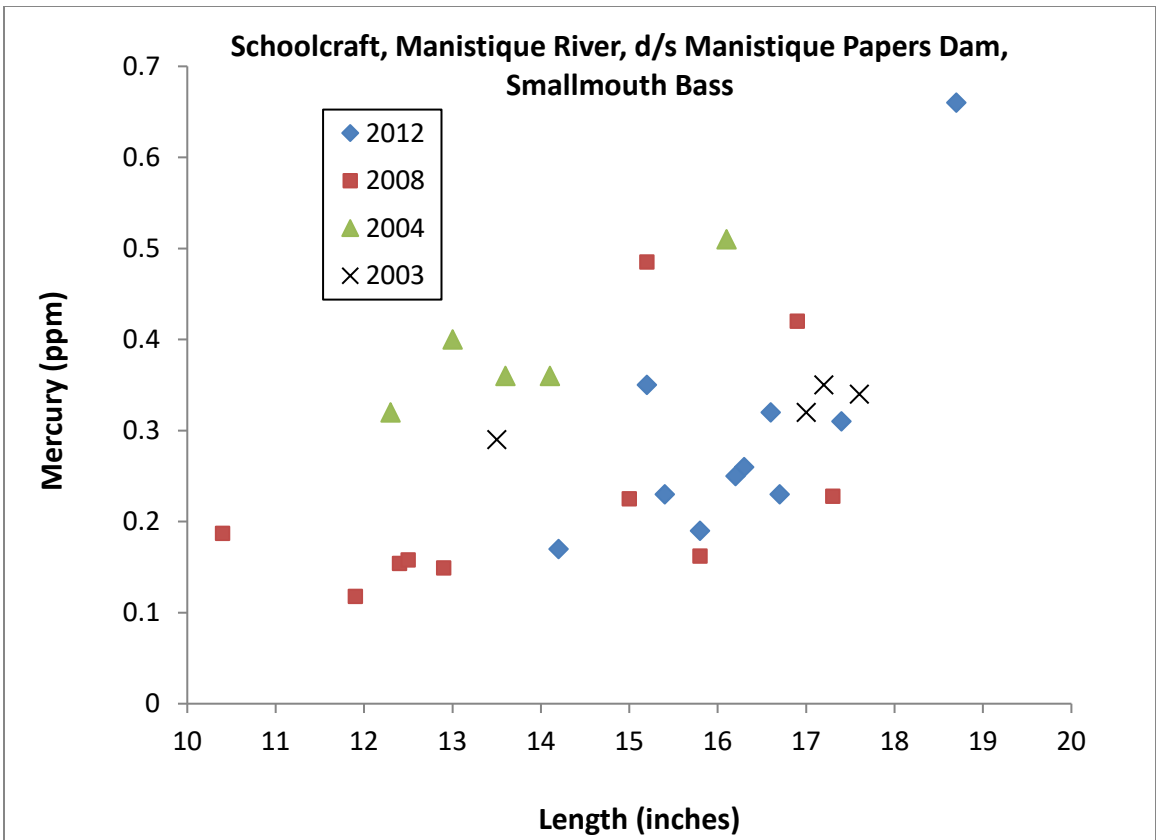
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2003	2012	29	10.4	14	13.5	18.7
Datasets available: 2003, 2004, 2008, 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	22	0.32	0.16	0.66	0.37	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.224	0.256				

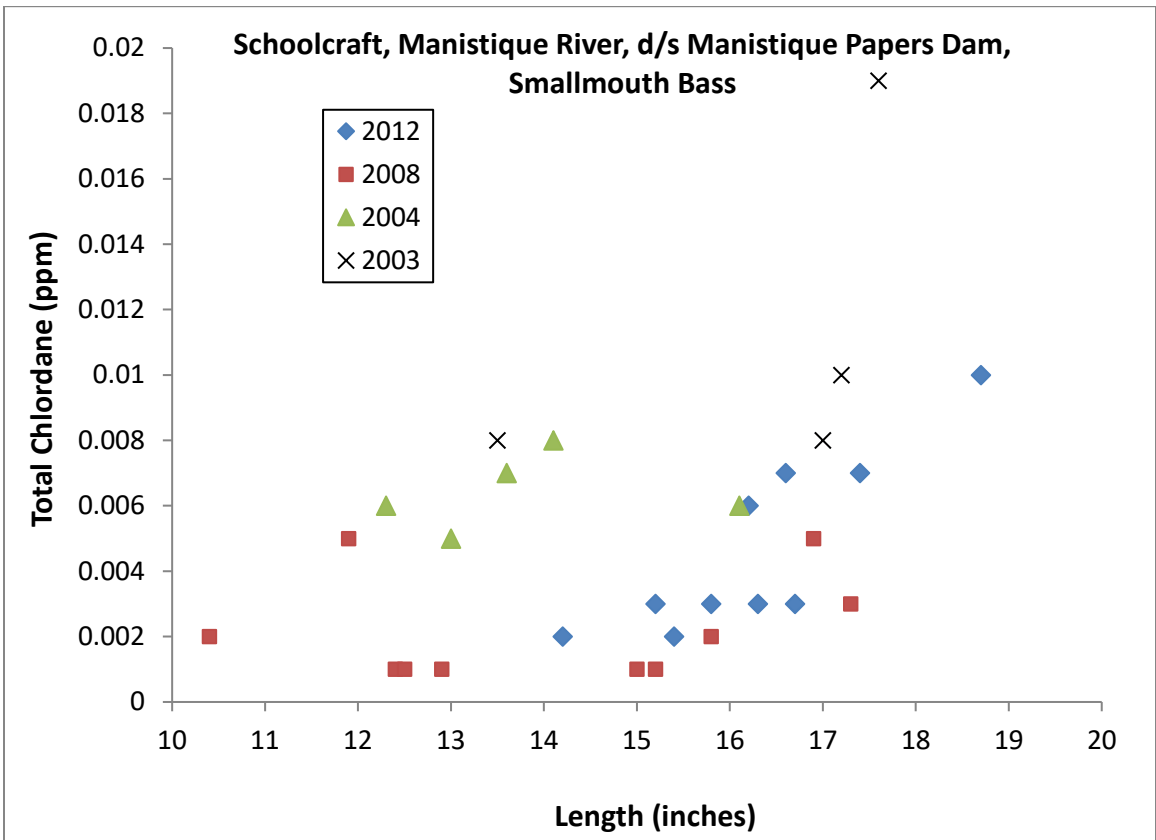
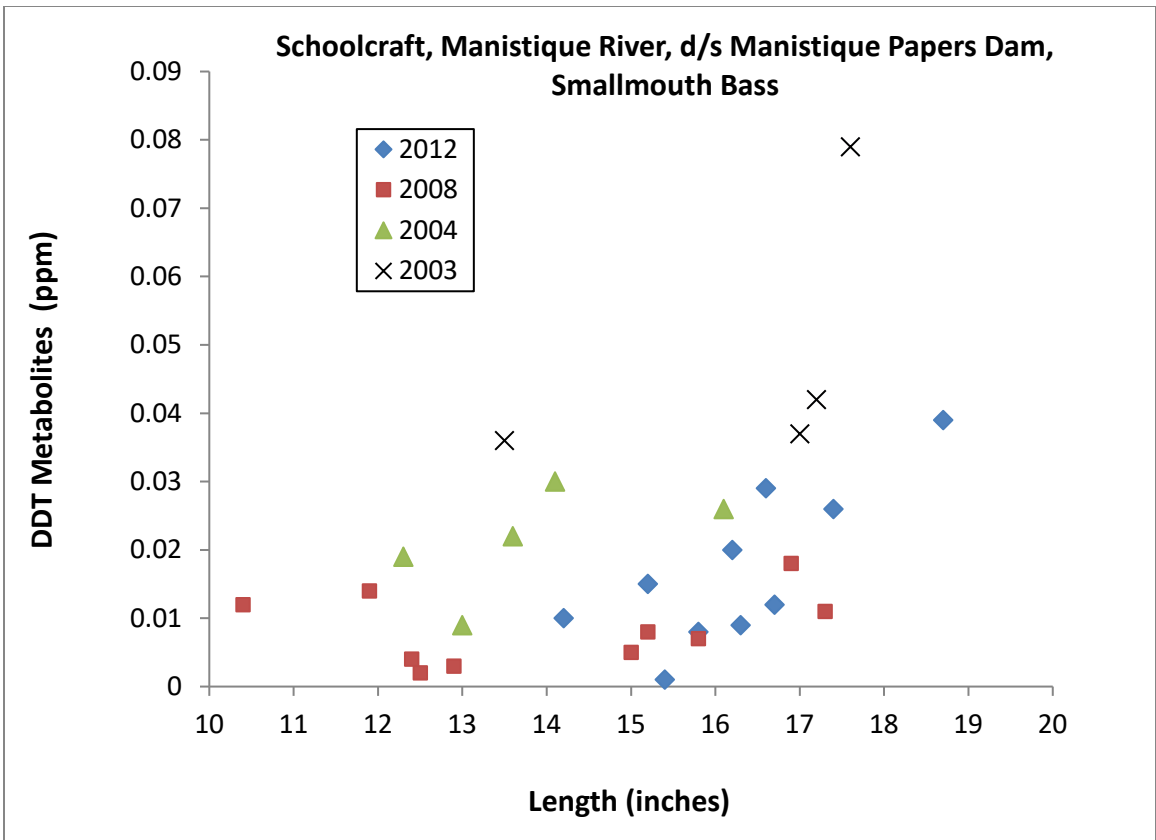
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2003	2012	29	10.4	14	13.5	18.7
Datasets available: 2003, 2004, 2008, 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	22	0.13	0.026	0.36	0.17	1
DDT	22	0.02	0.001	0.08	0.03	16
Chlordane	22	0.01	0.001	0.02	0.01	--
Toxaphene	22	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.039	0.053				
DDT	0.206	0.167				
Chlordane	0.186	0.189				
Toxaphene	--	--				
Final meal category based on UCL:						1

Existing Advisory: No one should eat more than 1 meal per month of largemouth or smallmouth bass from the Manistique River downstream of Manistique Papers dam due to elevated concentrations of PCBs. Mercury would cause an advisory.

Recommendation: No change.





Walleye

**Manistique River
d/s Manistique Papers Dam**

Schoolcraft County

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	2012	45	12.7	15	14.9	28.4
Datasets available: 1986, 2003, 2004, 2007, 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	37	0.38	0.07	0.96	0.44	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.685	0.723				

Organics Analysis:

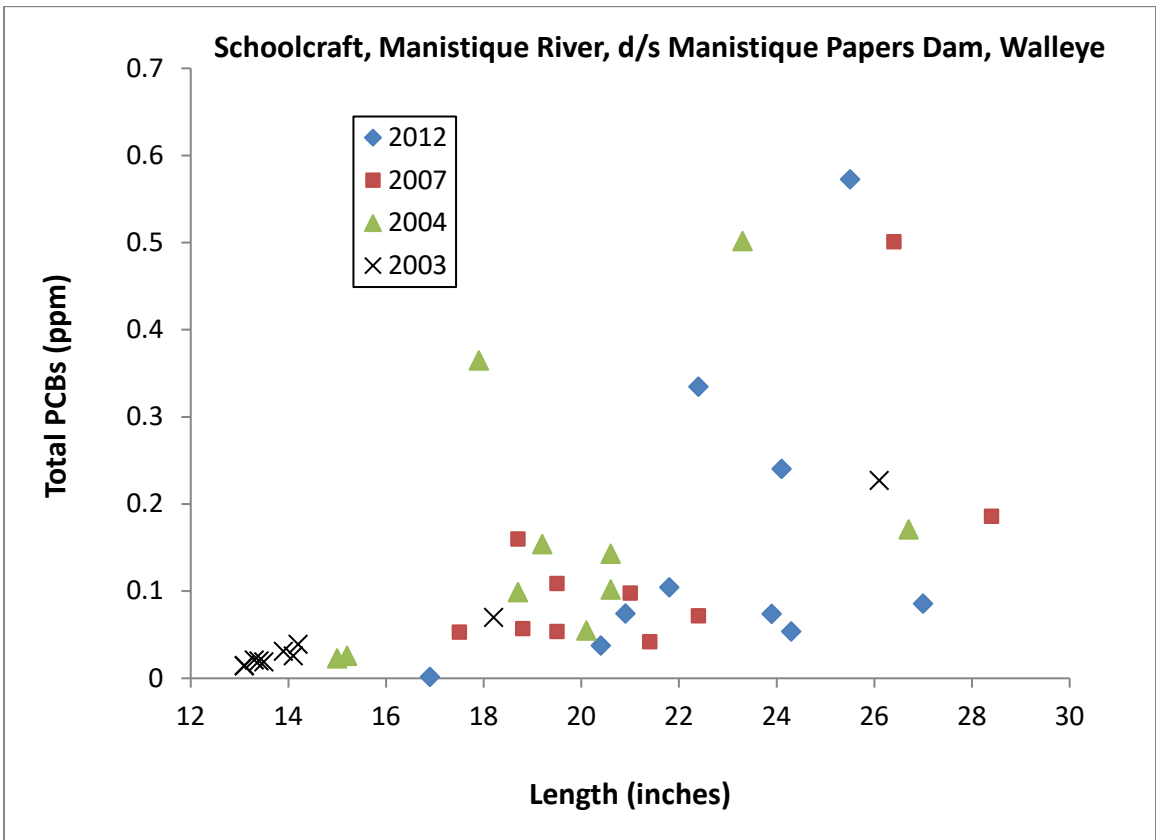
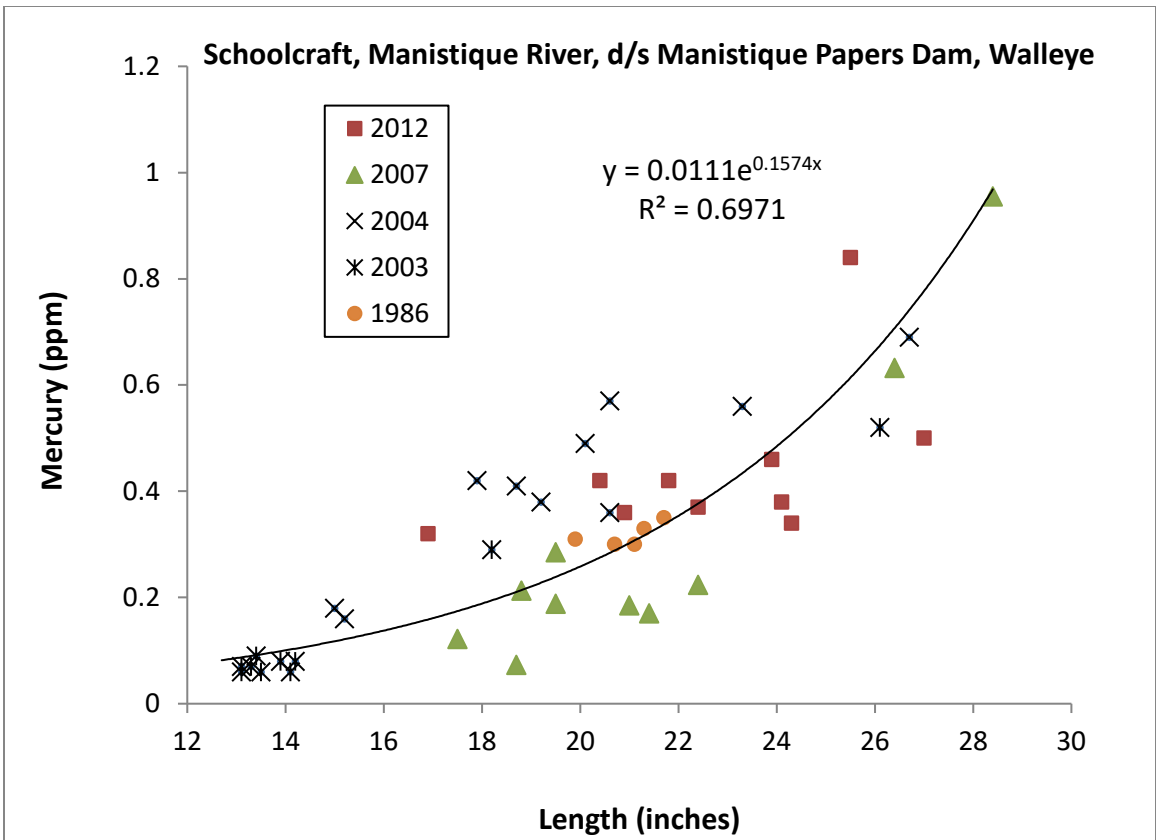
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2003	2012	40	13.1	15	15	28.4
Datasets available: 1984, 1985, 1986, 2003, 2004, 2007, 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	32	0.15	0.002	0.57	0.21	1
DDT	32	0.05	0.001	0.20	0.07	16
Chlordane	32	0.01	0.001	0.06	0.02	--
Toxaphene	32	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.319	0.488				
DDT	0.227	0.357				
Chlordane	0.293	0.551				
Toxaphene	--	--				
Final meal category based on UCL:						1

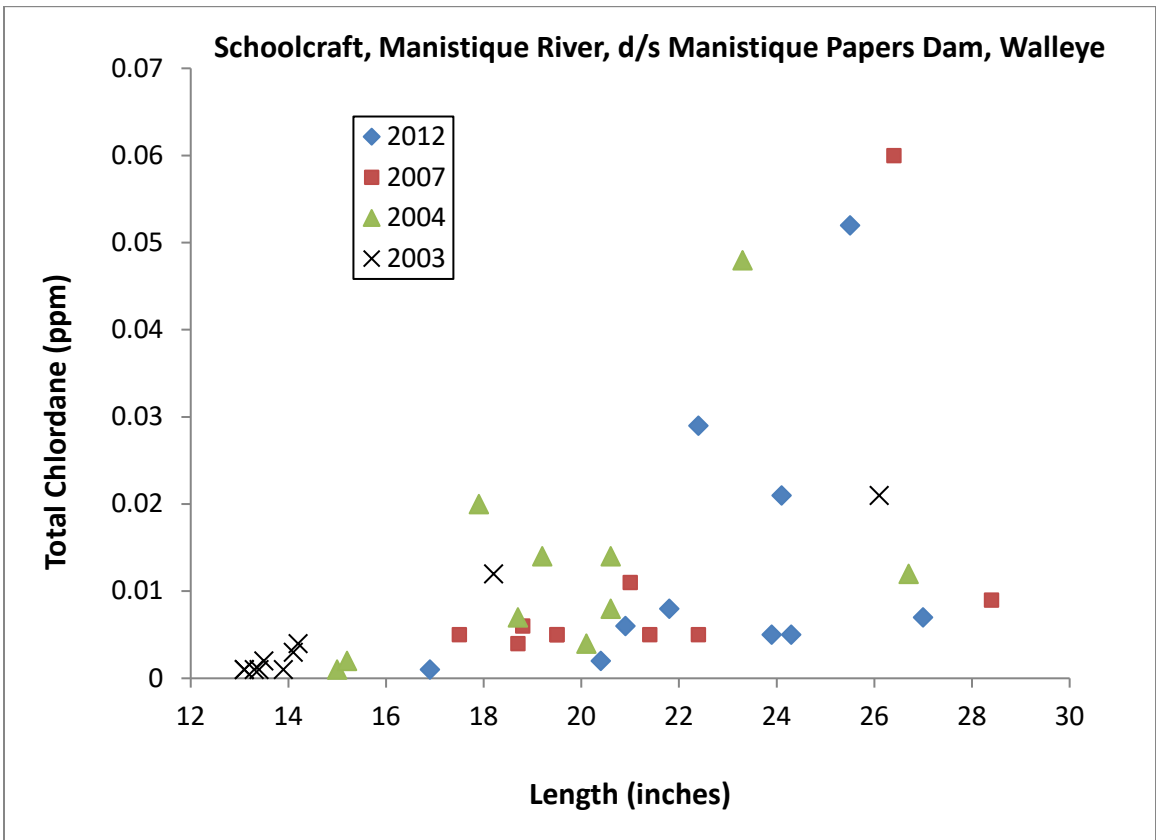
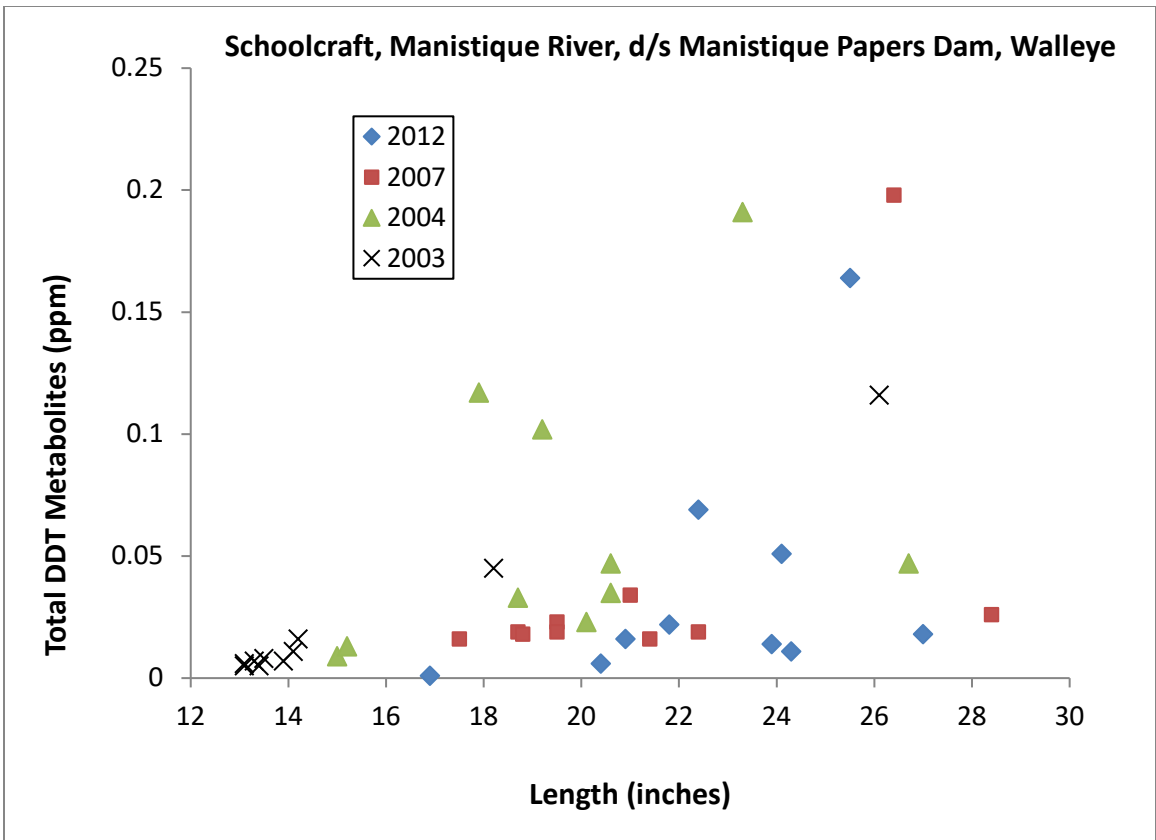
Existing Advisory: No one should eat more than 2 meals per month of walleye less than 20 inches due to mercury and PCBs and no more than 6 meals per year of walleye larger than 20 inches due to elevated levels of PCBs. Mercury would cause an advisory.

Recommendation: No one should eat more than 1 meal per month of walleye due to elevated levels of PCBs. Mercury would cause an advisory.

Note: Evaluating PCBs for only 2007 & 2012 did not improve regression equation or lead to relaxed PCB advice.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
14	0.1	8
16	0.14	4
18	0.19	4
20	0.26	4
22	0.35	2
24	0.49	2
26	0.66	1
28	0.91	1
30	1.25	0.5
<i>Shaded area denotes extrapolated estimates</i>		





Northern Pike

**Manistique River
Upstream of Manistique Dam**

Schoolcraft County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	1987	2	24.4	24	24.4	28.1
Datasets available:		1987				
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	2	0.76	0.60	0.91	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	1987	2	24.4	24	24.4	28.1
Datasets available:		1987				
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	2	ND	--	--	--	--
DDT	2	ND	--	--	--	--
Chlordane	2	ND	--	--	--	--
Toxaphene	2	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						--

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

Recommendation: A dataset of less than five data points for a given chemical, species and waterbody is considered insufficient for evaluation using the standard evaluation method. The statewide advice due to mercury applies to northern pike from the Manistique River upstream of the Manistique Dam: 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.

Redhorse Sucker

**Manistique River
Upstream of Manistique Dam**

Schoolcraft County

Hg Analysis:

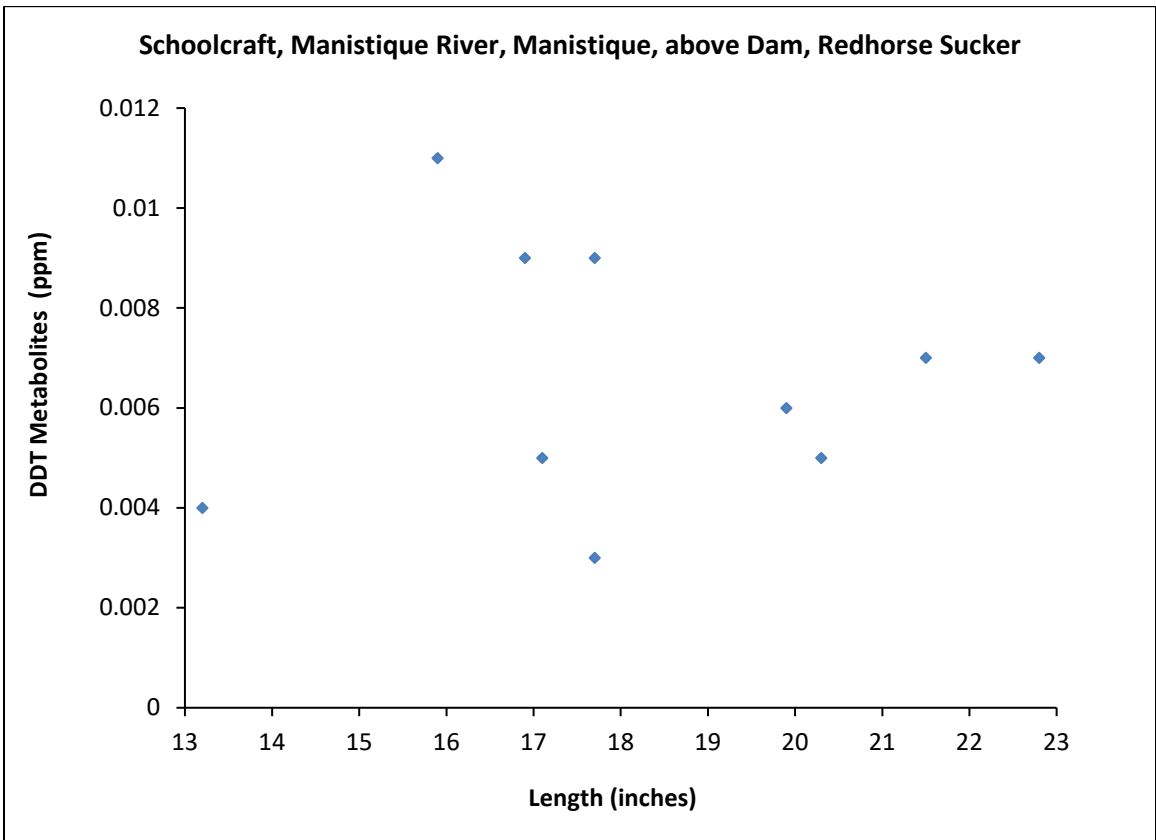
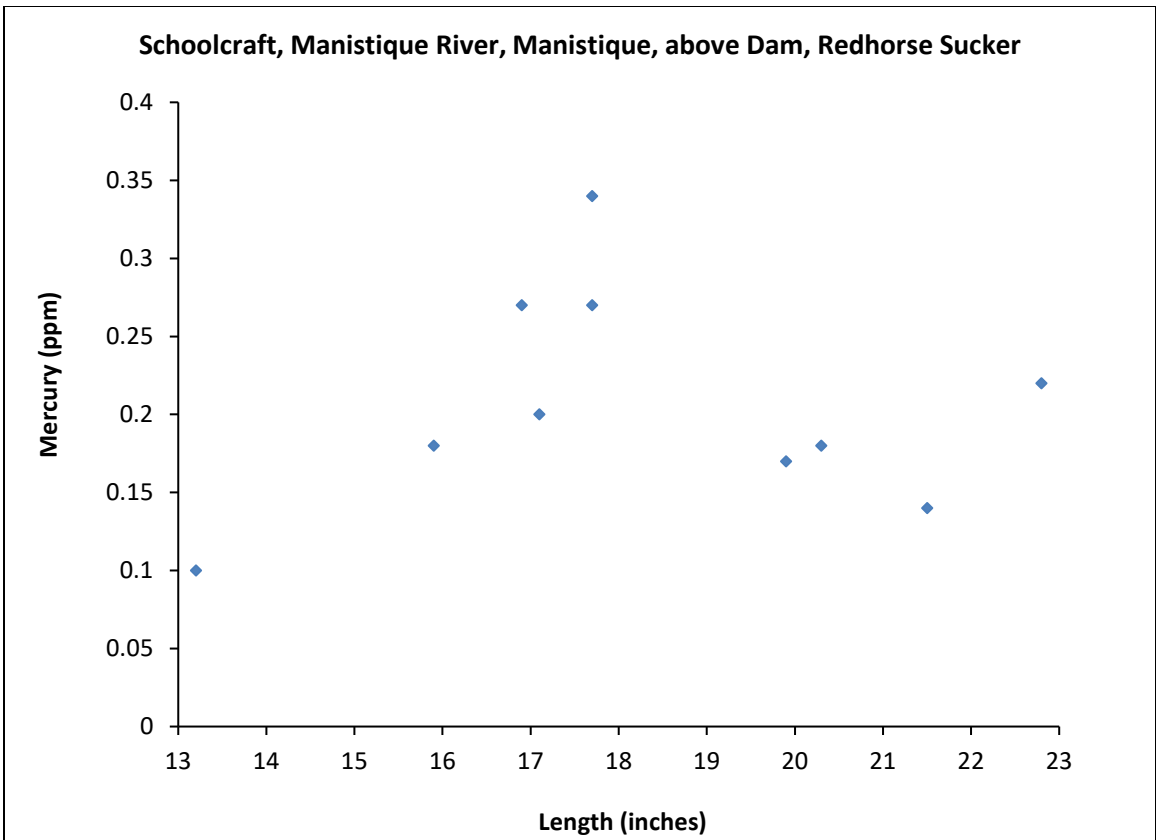
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	1987	10	13.2	na	13.2	22.8
Datasets available: 1987						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.21	0.10	0.34	0.26	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.006	0.035				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	1987	10	13.2	NA	13.2	22.8
Datasets available: 1987						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	ND	--	--	--	--
DDT	10	0.007	0.003	0.011	0.010	16
Chlordane	10	ND	--	--	--	--
Toxaphene	10	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	0.000	0.015				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						4

Existing Advisory: There are no current consumption advisories for redhorse sucker from the Manistique River upstream of the Manistique Dam.

Recommendation: No one should eat more than 4 meals per month of sucker from the Manistique River upstream of the Manistique Dam due to mercury.



Marquette County

Northern Pike

Big Shag Lake

Marquette County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2001	2001	10	22.1	na*	22.1	34.6	
Datasets available: 2001							
Chemical	Sample Size (All)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.61		0.39	1.35	0.82	1
Chemical	Linear Regression	Exponential Regression		*There is no minimum size limit for Big Shag Lake (Marquette Co) northern pike.			
	R ²	R ²					
Mercury	0.899	0.874					

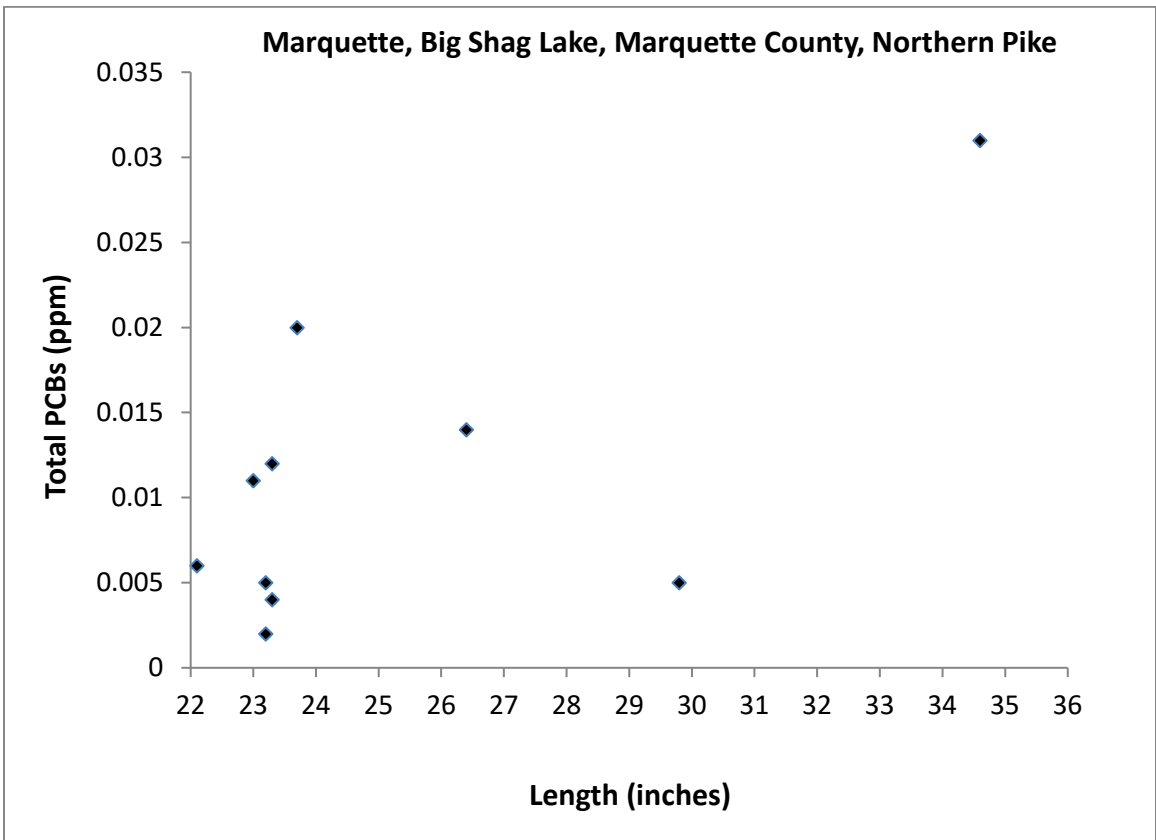
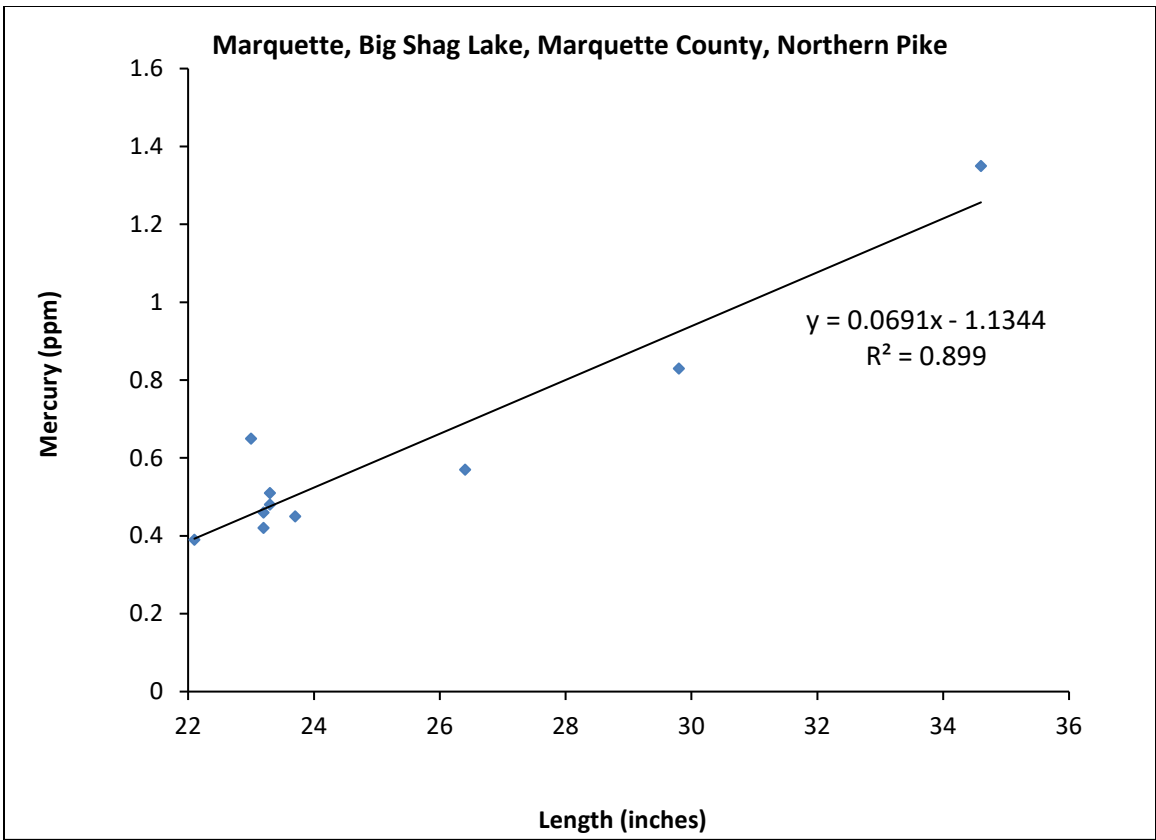
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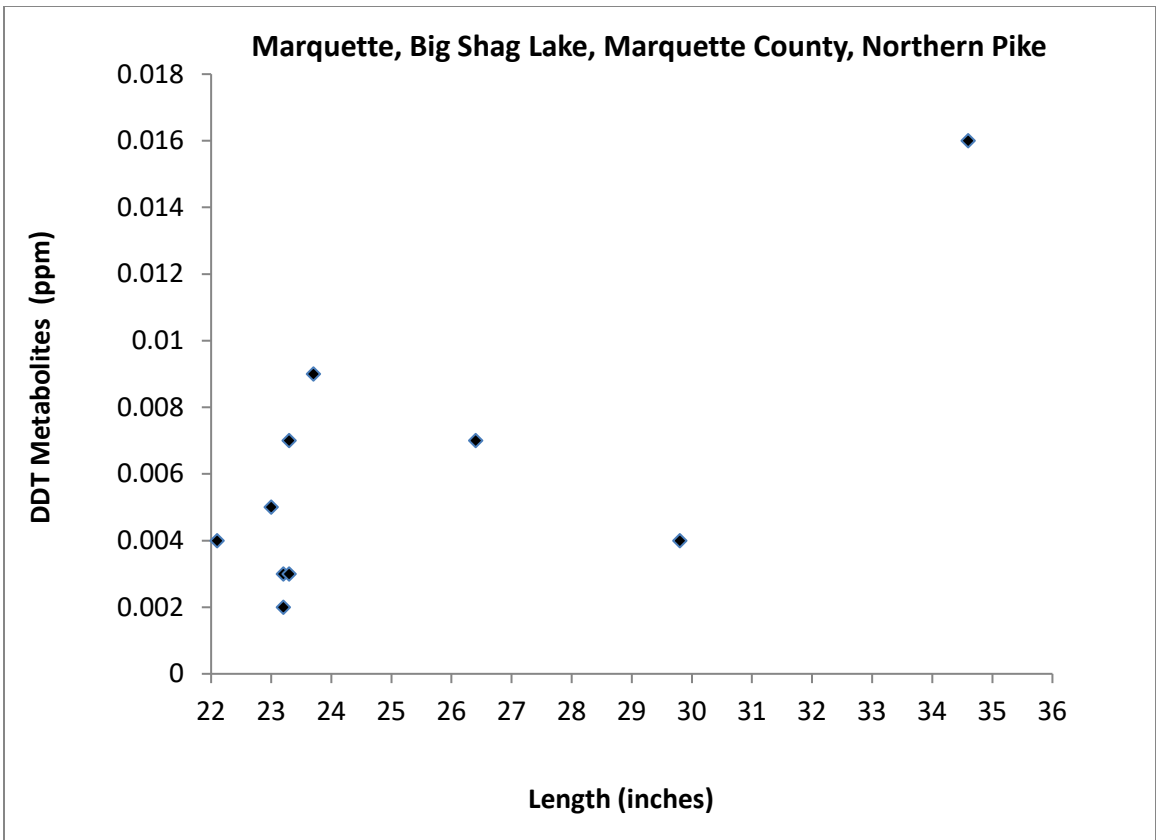
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2001	2001	10	22.1	na*	22.1	34.6	
Datasets available: 2001							
Chemical	Sample Size (All)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.01		0.002	0.03	0.02	12
DDT	10	0.006		0.002	0.02	0.01	16
Chlordane	10	ND		--	--	--	--
Toxaphene	10	ND		--	--	--	--
Chemical	Linear Regression	Exponential Regression		*There is no minimum size limit for Big Shag Lake (Marquette Co) northern pike.			
	R ²	R ²					
PCB	0.419	0.232					
DDT	0.527	0.366					
Chlordane	--	--					
Toxaphene	--	--					
Final meal category based on UCL:							1

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

Recommendation: No one should eat more than 2 meals per month of Big Shag Lake northern pike smaller than 24 inches, more than 1 meal per month of those fish from 24 to 34 inches or 6 meals per year of fish larger than 34 inches due to mercury. PCBs would cause an advisory.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
22	0.39	2
24	0.52	2
26	0.66	1
28	0.80	1
30	0.94	1
32	1.08	1
34	1.22	0.5
36	1.35	0.5
38	1.49	0.5
<i>Shaded area denotes extrapolated estimates</i>		





Brook Trout

**Carp Creek
u/s Deer Lake**

Marquette County

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	6.8	8	7.8	10.3
Datasets available: 2005						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	5	0.37	0.20	0.56	0.53	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.644	0.617				

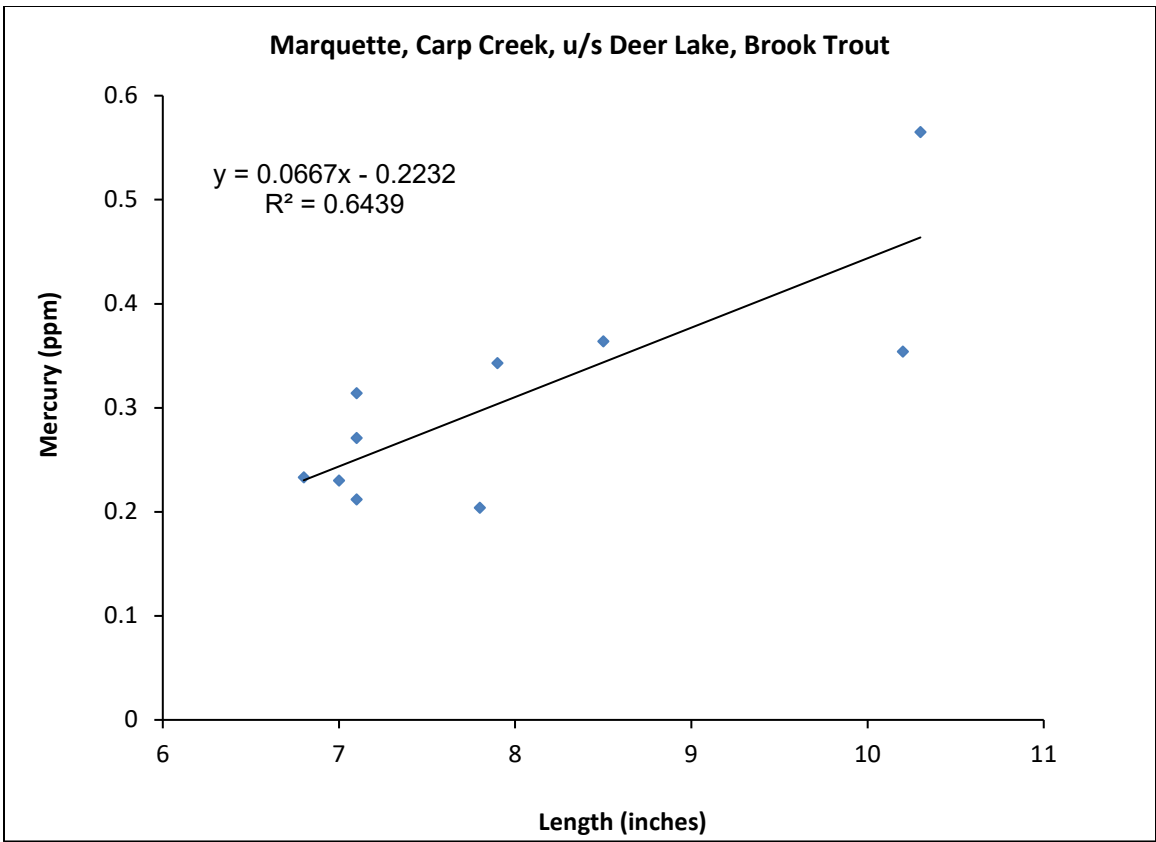
Organics Analysis:

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

Existing Advisory: Women and children should not eat more than 1 meal per week of Carp Creek brook trout smaller than 10 inches and no more than 1 meal per month of those fish larger than 10 inches due to mercury.

Recommendation: No one should eat more than 2 meals per month of Carp Creek brook trout smaller than 10 inches and no more than 1 meal per month of those fish larger than 10 inches due to mercury. Size break based on maximum measured length rounded to nearest whole number.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
8	0.310	2
9	0.377	2
10	0.444	2
11	0.511	2
12	0.577	1
13	0.644	1
14	0.711	1
<i>Shaded area denotes extrapolated estimates</i>		



Brook Trout

**Carp River
d/s Deer Lake**

Marquette County

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	2021	42	6.5	10*	9.6	14.1	
Datasets available: 1993, 1999, 2004, 2021							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	18	0.199		0.095	0.320	0.230	4
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.048	0.030					

Organics Analysis:

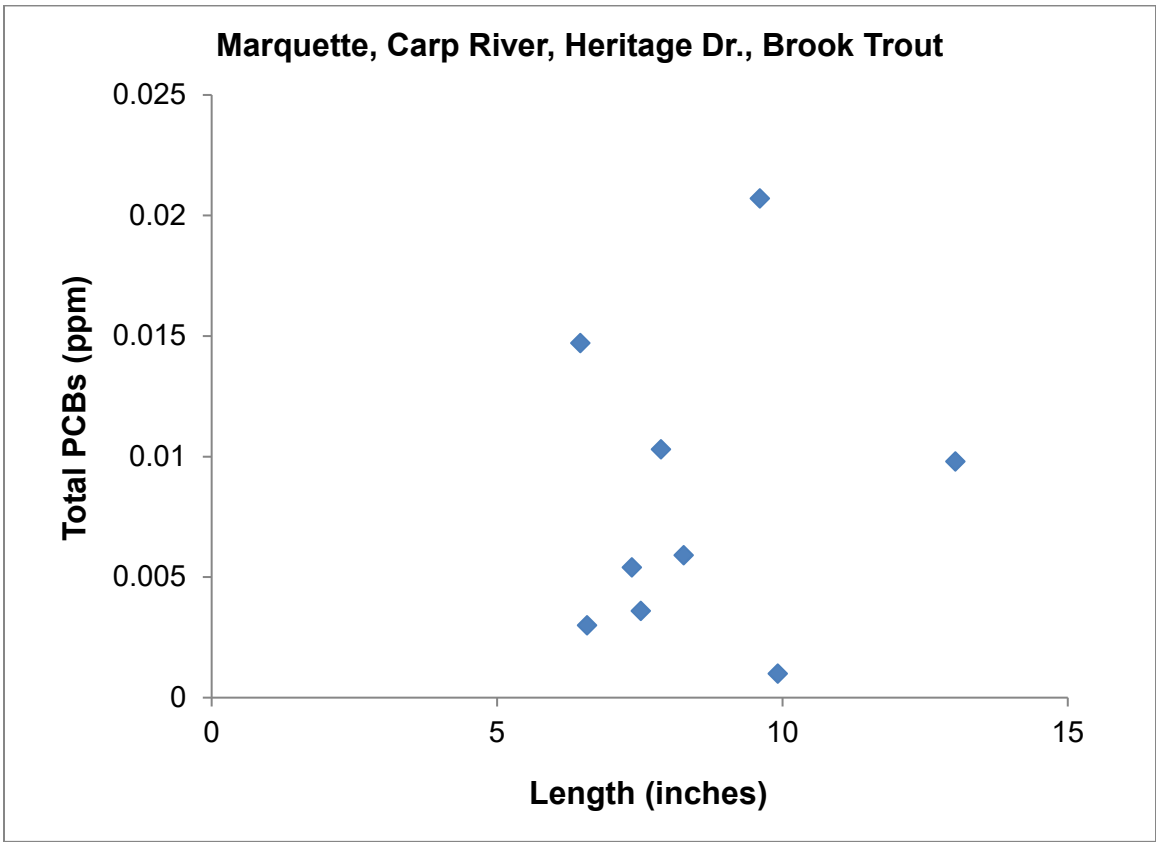
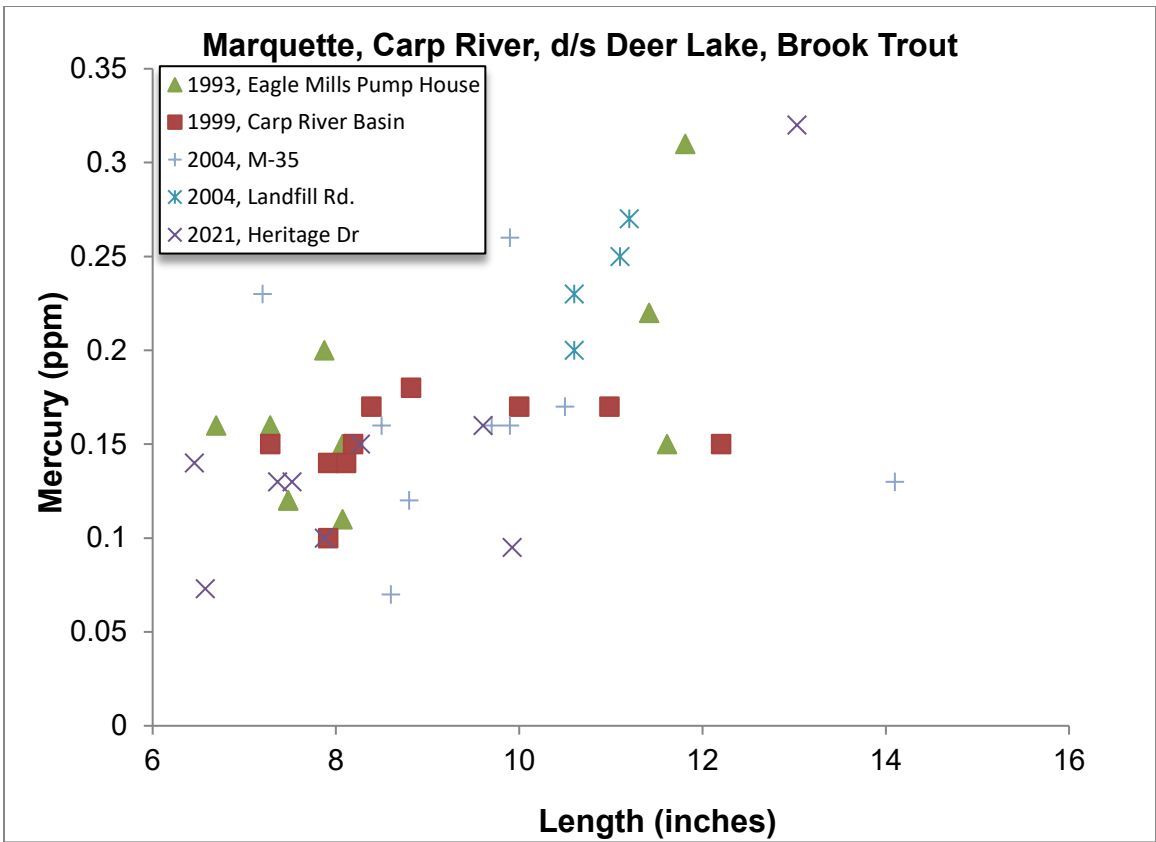
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2021	2021	9	6.5	10*	6.5	13.0	
Datasets available: 2021							
Chemical	Sample Size (All [^])	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	9	0.008		<0.001	0.021	0.013	12
DDT	9	0.001		<0.001	0.002	0.002	16
Chlordane	9	0.001		<0.001	0.001	0.001	16
Toxaphene	9	ND		--	--	--	--
PFOS	9	13.5 ppb		6.0 ppb	20.0 ppb	16.9 ppb	8
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.019	0.003					
DDT	0.017	0.017					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	0.012	0.004					
Final meal category based on UCL:							4

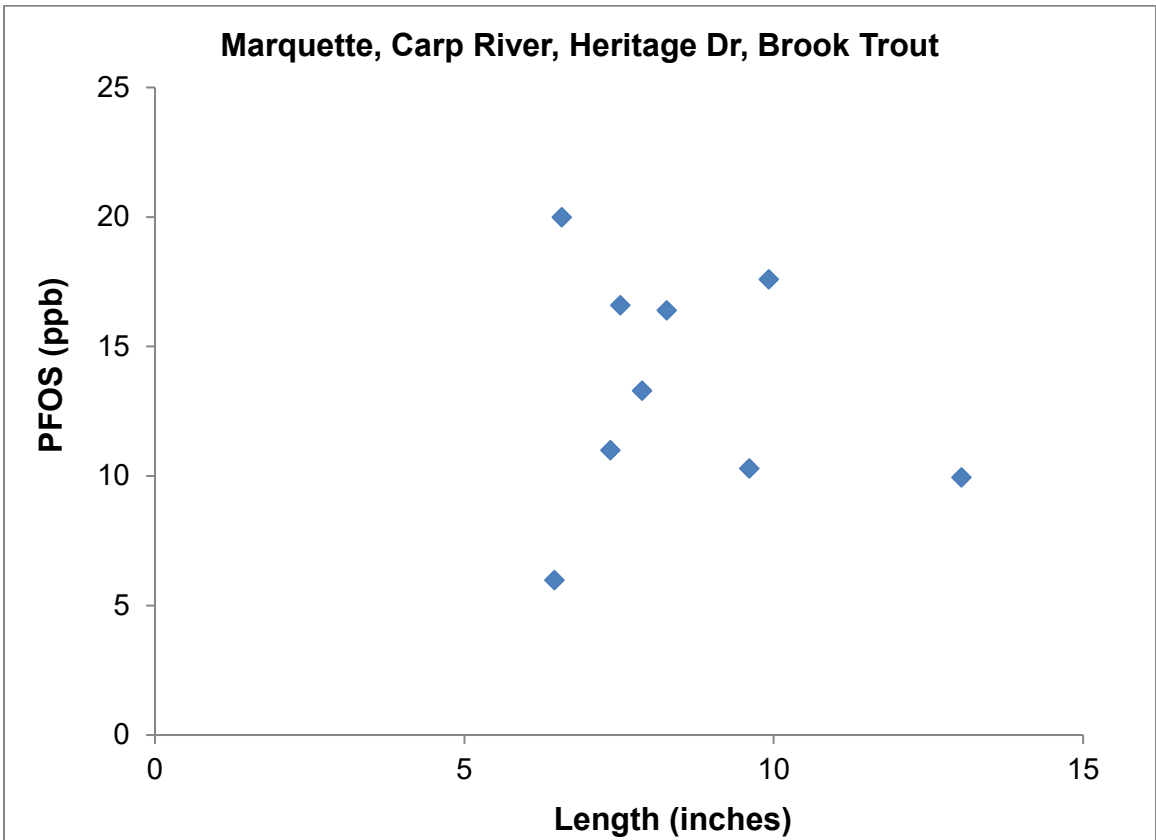
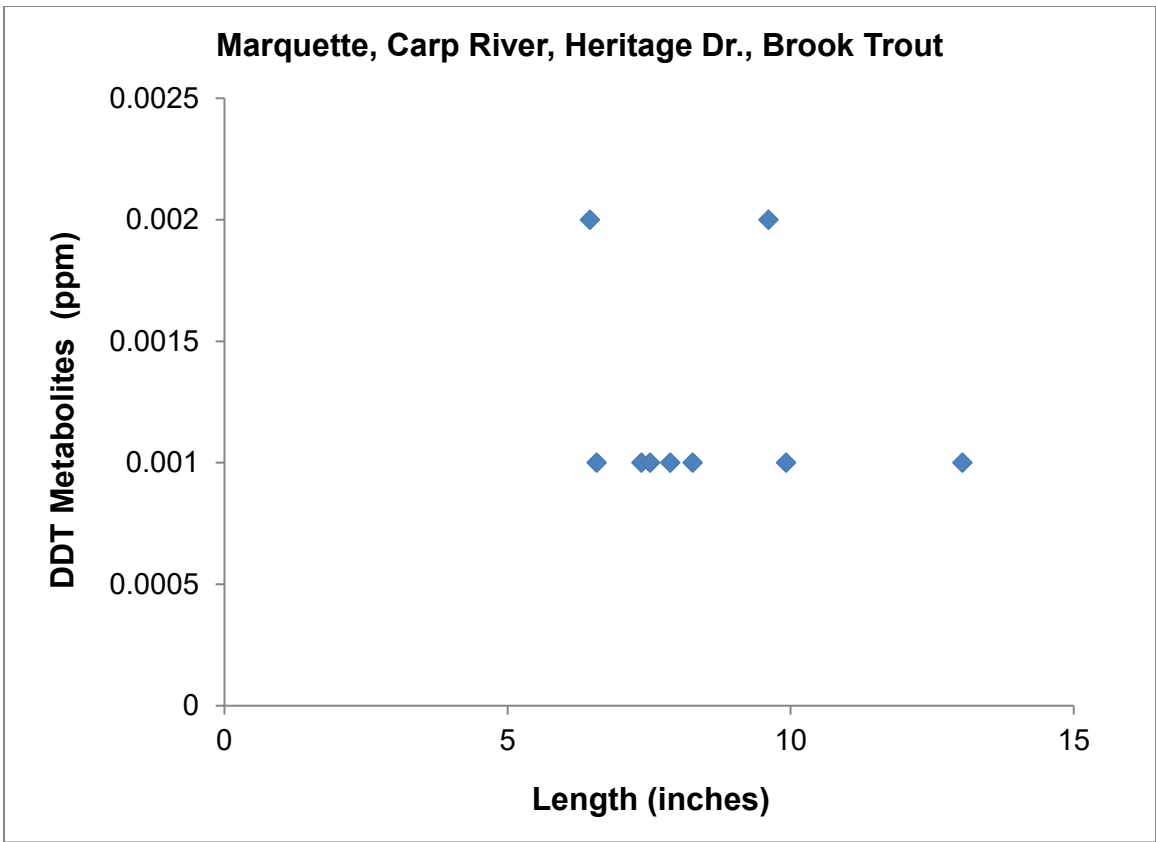
* The downstream portion of the Carp River is designated as a Type 3 trout stream with a 15-inch minimum size limit. The rest of the Carp River downstream of Deer Lake is Type 2 with a 10-inch minimum size limit. The 10 inch size limit was used for this analysis.

[^] Only 3 legal sized fish were collected; therefore, sub-legal sized individuals were used in the analysis.

Existing MDHHS Advisory: No one should eat more than 4 meals per month of brook trout of any size from the Carp River downstream of Deer Lake due to mercury.

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





Northern Pike

**Carp River
Carp River Basin, Eagle Mills**

Marquette County

Hg Analysis:

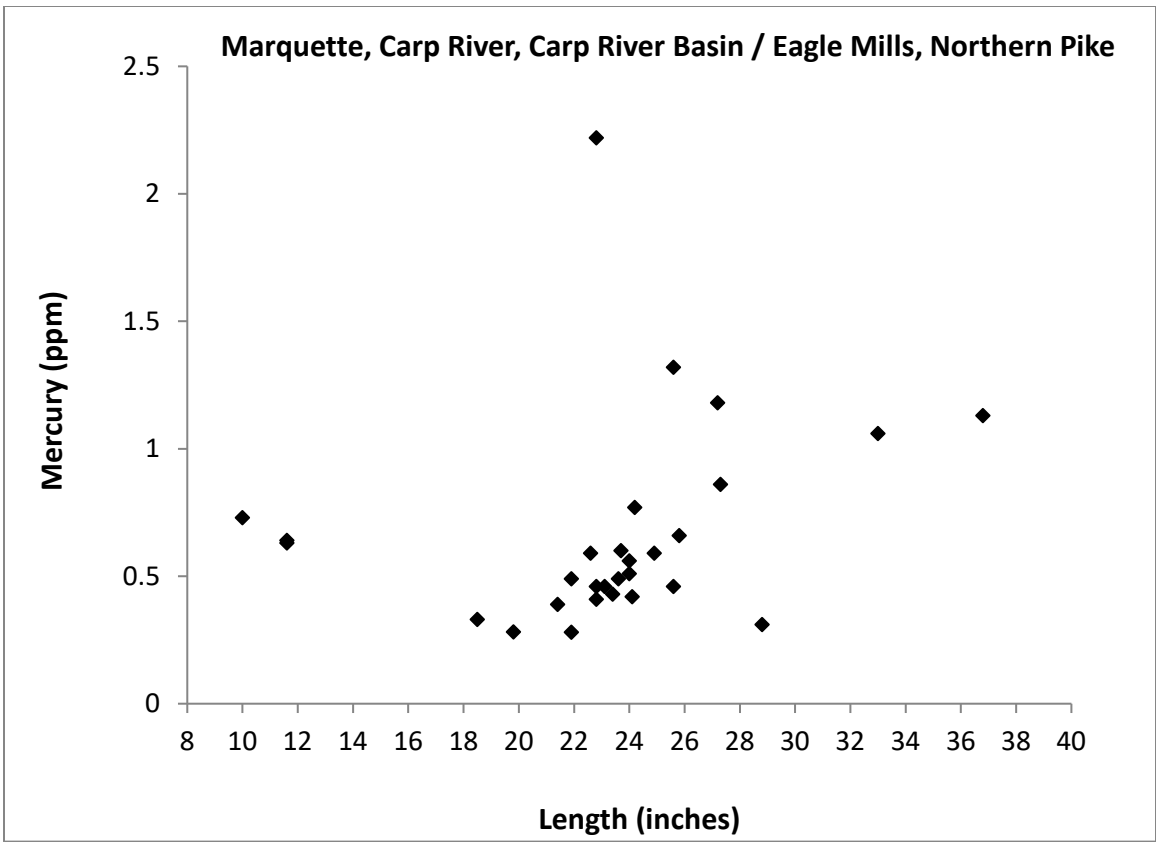
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1988	2011	29	10	24	23.6	36.8
Datasets available: 1988, 1999, 2011						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	15	0.73	0.31	1.32	0.90	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.058	0.064				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	--	--	--	--	--
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: Women and children should not eat more than 1 meal per month of Carp River northern pike due to mercury.

Recommendation: No one should eat more than 1 meal per month of Carp River northern pike less than 30 inches or 6 meals per year of those fish over 30 inches due to mercury. Statewide length break applied.



Walleye

**Carp River
Carp River Basin**

Marquette County

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	2	19.1	15	19.1	19.8
Datasets available: 2011						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	2	0.50	0.45	0.56	--	--
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
--	--	--	--	--	--	--
Datasets available: --						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						--

Existing Advisory: Carp River walleye are covered under an “all other species” do not eat advisory due to mercury.

Recommendation: A dataset of less than five data points for a given chemical, species and waterbody is considered insufficient for evaluation. The statewide guidelines apply.

White Sucker

**Carp River
d/s Deer Lake**

Marquette County

Hg Analysis:

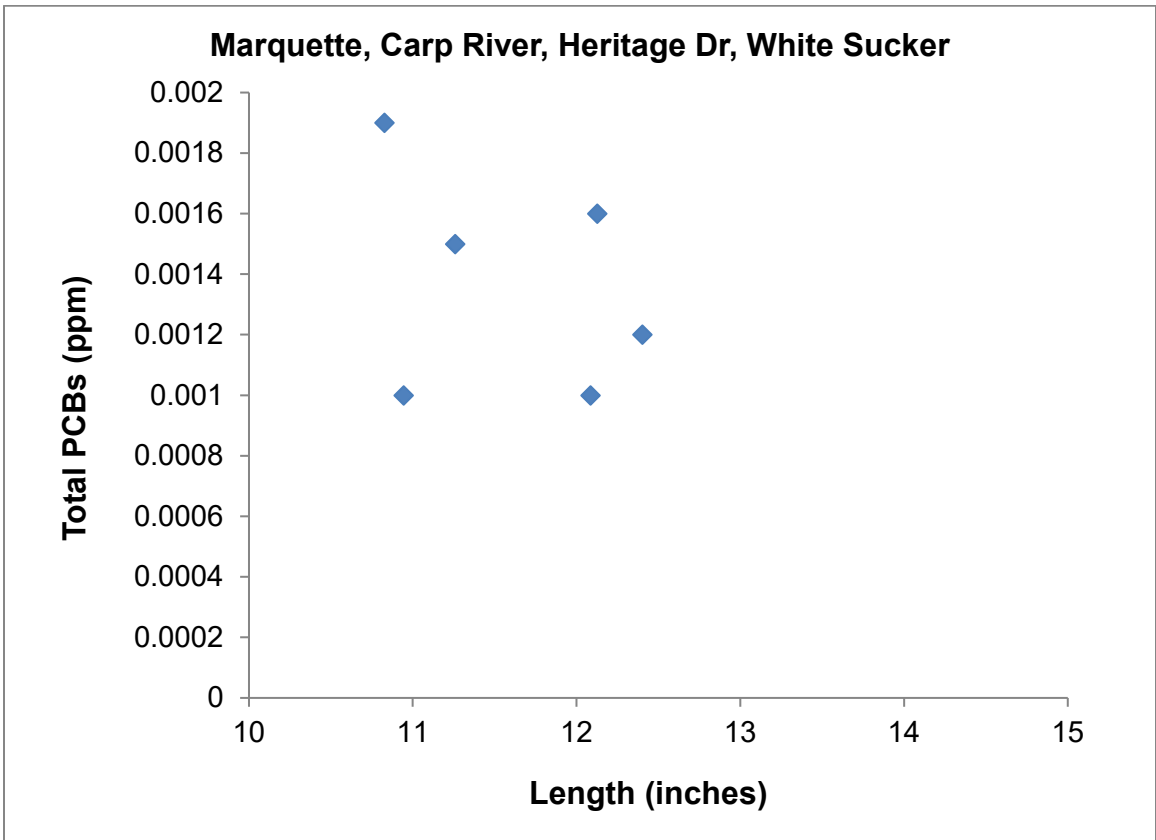
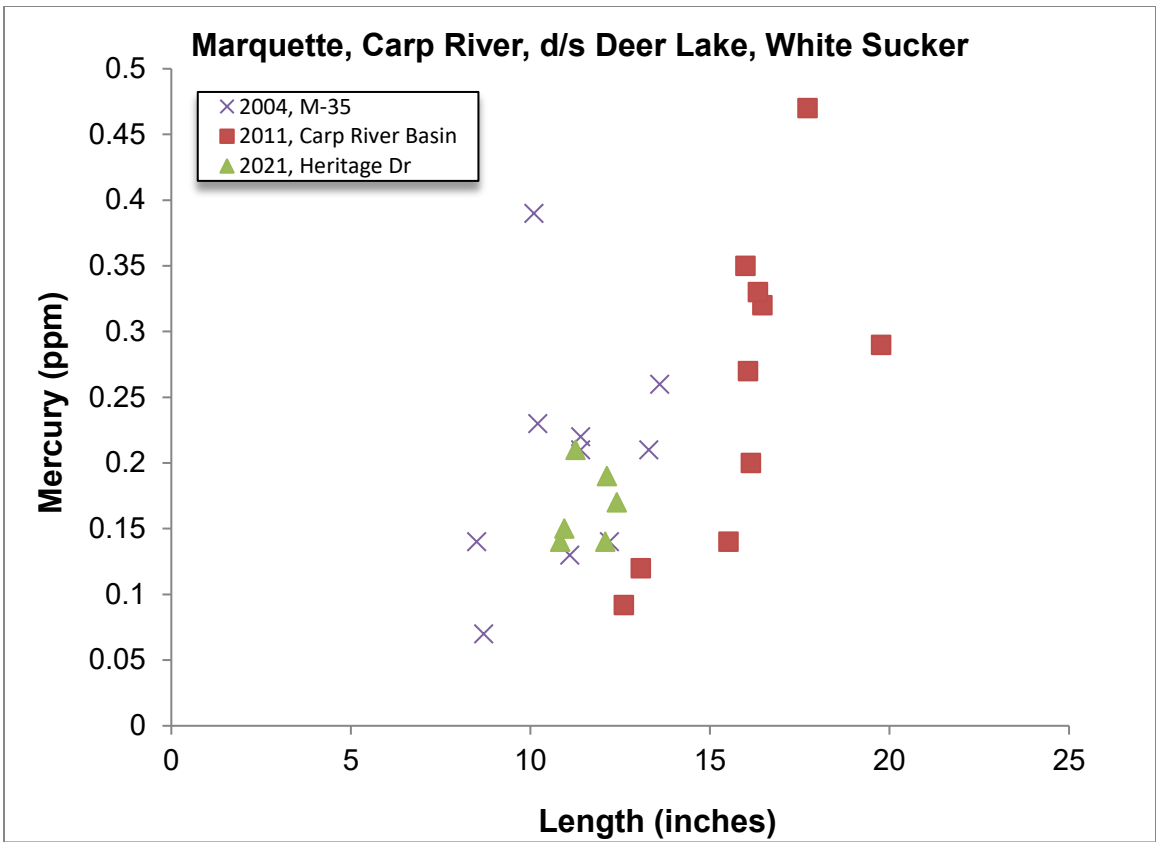
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2004	2021	26	8.5	NA	8.5	19.8
Datasets available: 2004, 2011, 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	26	0.215	0.070	0.470	0.254	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.317	0.322				

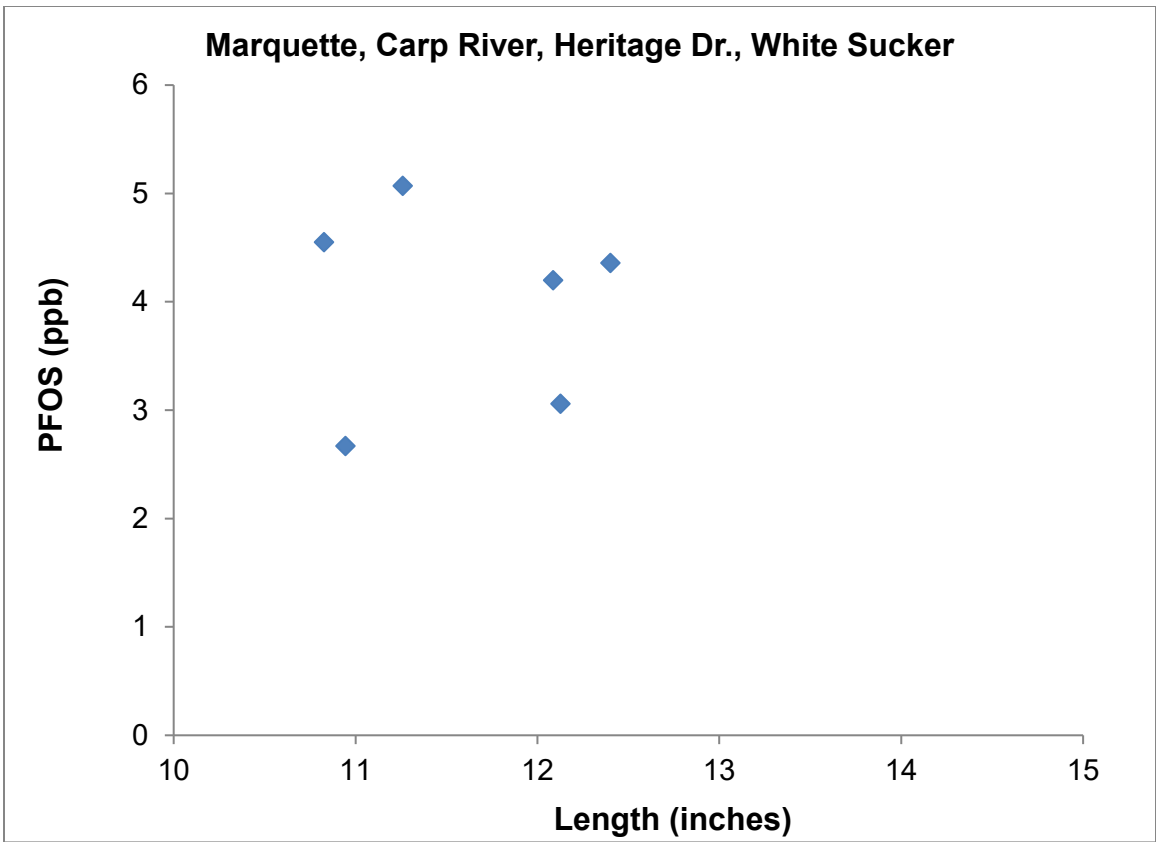
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2021	2021	6	10.8	NA	10.8	12.4
Datasets available: 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	6	0.001	<0.001	0.002	0.002	16
DDT	6	ND	--	--	--	--
Chlordane	6	ND	--	--	--	--
Toxaphene	6	ND	--	--	--	--
PFOS	6	4.0 ppb	2.7 ppb	5.1 ppb	5.0 ppb	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.019	0.003				
DDT	0.017	0.017				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.012	0.004				
Final meal category based on UCL:						4

Existing MDHHS Advisory: No one should eat more than 2 meals per month of suckers of any size from the Carp River downstream of Deer Lake due to mercury.

Recommendation: No change to the advisory is recommended. A second year of data is needed to relax the advisory.





Yellow Perch

**Carp River
M-35 / Carp River Basin**

Marquette County

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	2011	2	7.9	na	7.9	8.0
Datasets available: 1984, 2011						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	2	0.56	0.13	1	--	--
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
--	--	--	--	--	--	--
Datasets available: --						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						--

Existing Advisory: Carp River yellow perch are covered under an “all other species” do not eat advisory due to mercury.

Recommendation: A dataset of less than five data points for a given chemical, species and waterbody is considered insufficient for evaluation. Statewide guidelines apply.

Northern Pike

**Dead River
Forestville Basin**

Marquette County

Hg Analysis:

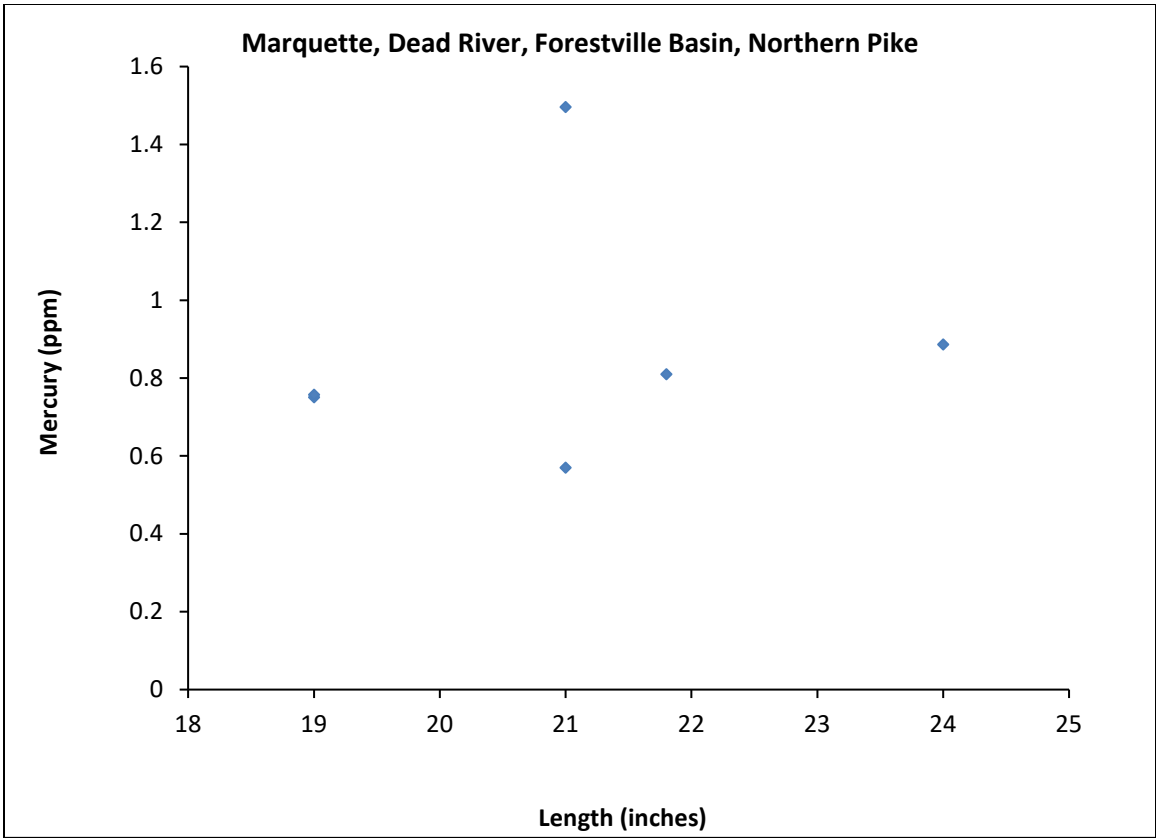
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of All Samples		
Earliest	Most Recent				Min	Max	
2005	2005	6	19	24	19	24	
Datasets available: 2005							
Chemical	Sample Size (All)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	6	0.88		0.57	1.496	1.21	0.5
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.024	0.035					

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
--	--	--	--	--	--	--	
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:							0.5

Existing Advisory: Dead River at Forestville Basin northern pike are covered under the statewide mercury advisory.

Recommendation: No one should eat more than 6 meals per month of Dead River (including the Silver Lake Basin, Hoist Basin [aka Dead River Storage Basin], McClure Basin, Forestville Basin, and Tourist Park Basin) northern pike smaller than 30 inches due to mercury. No one should eat fish larger than 30 inches. The statewide length break was applied. Consideration was given to setting the length break to the maximum measured length, however, the UCL is 1.21 ppm, leaving a sufficient concentration range for fish between 24 and 30 inches before reaching the do not eat meal category.



Smallmouth Bass

**Dead River
Silver Lake to mouth**

Marquette County

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	27	12.2	14.0	13.6	18.5	
Datasets available: 1996, 1997, 2015, 2020							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	22	0.918		0.420	1.400	1.038	1
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.492	0.459					

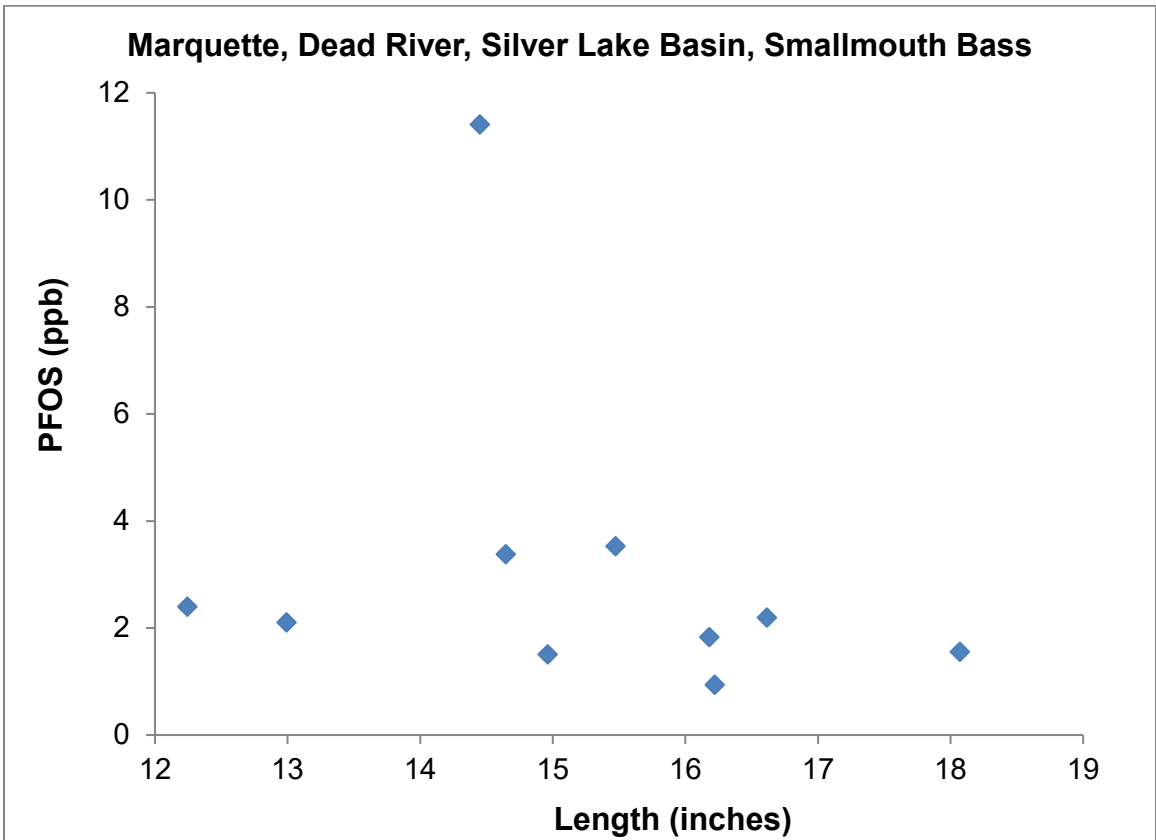
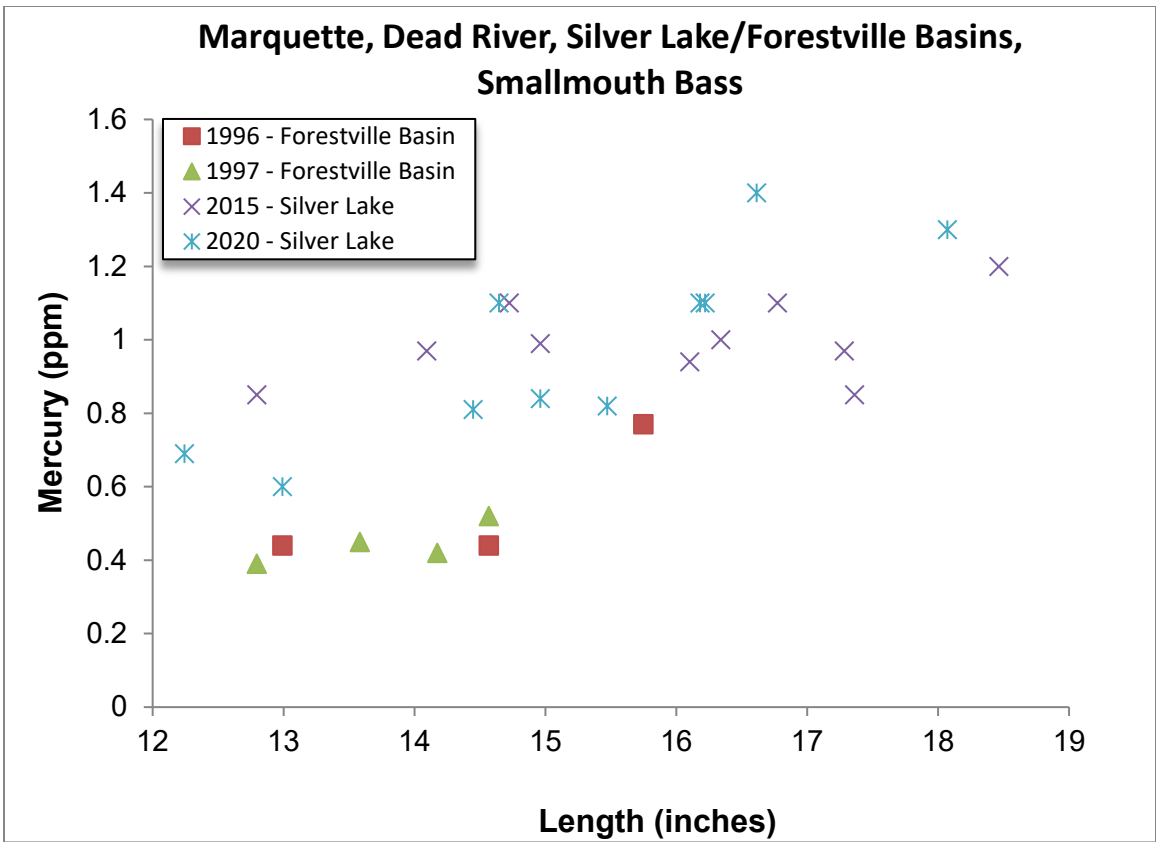
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2020	2020	10	12.2	14.0	12.2	18.5	
Datasets available: 2020							
Chemical	Sample Size (Legal)	Mean (ppm)		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--		--	--	--	--
DDT	0	--		--	--	--	--
Chlordane	0	--		--	--	--	--
Toxaphene	0	--		--	--	--	--
PFOS	10*	3.1 ppb		0.9 ppb	11.4 ppb	5.3 ppb	16
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
PFOS	0.052	0.108					
Final meal category based on UCL:							1

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

Existing MDHHS Advisory: No one should eat more than 1 meal per month of Dead River (including the Silver Lake Basin, Hoist Basin [aka Dead River Storage Basin], McClure Basin, Forestville Basin, and Tourist Park Basin) 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.

Recommendation: No change to the advisory is recommended.



Walleye

**Dead River
Hoist and Forestville Basins**

Marquette County

Hg Analysis:

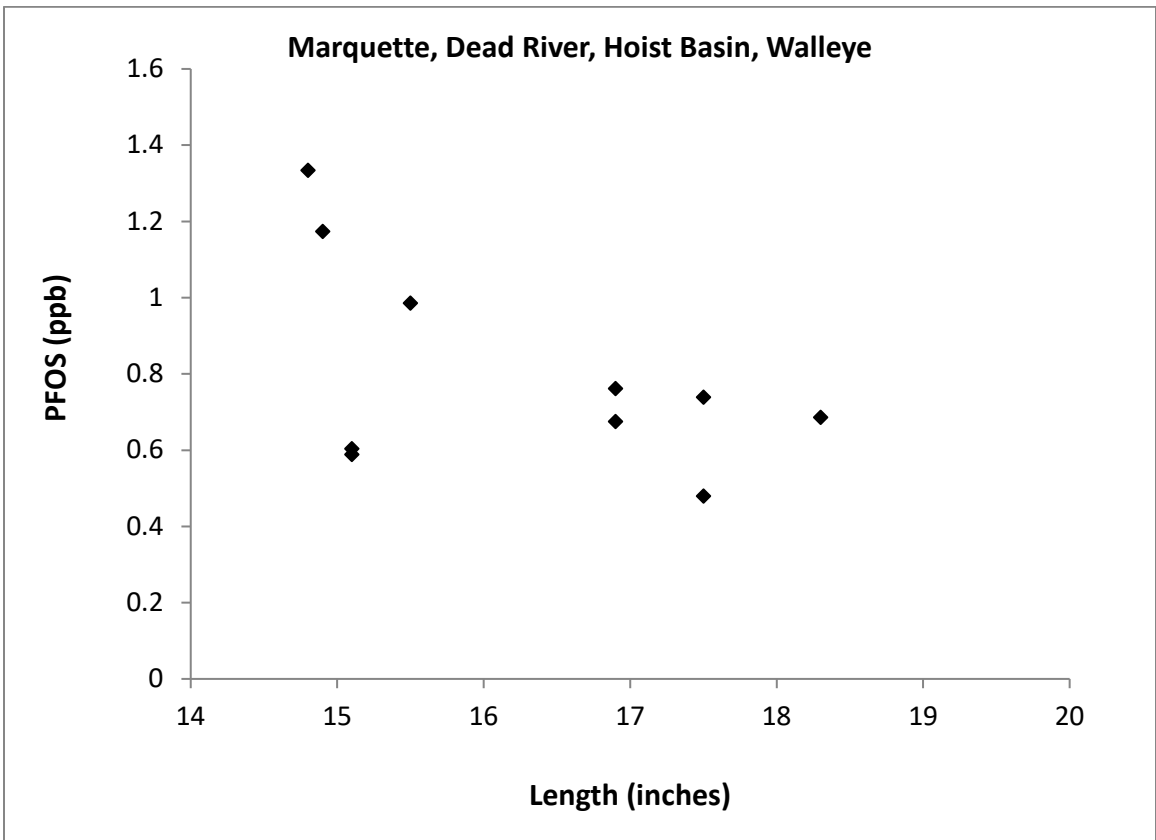
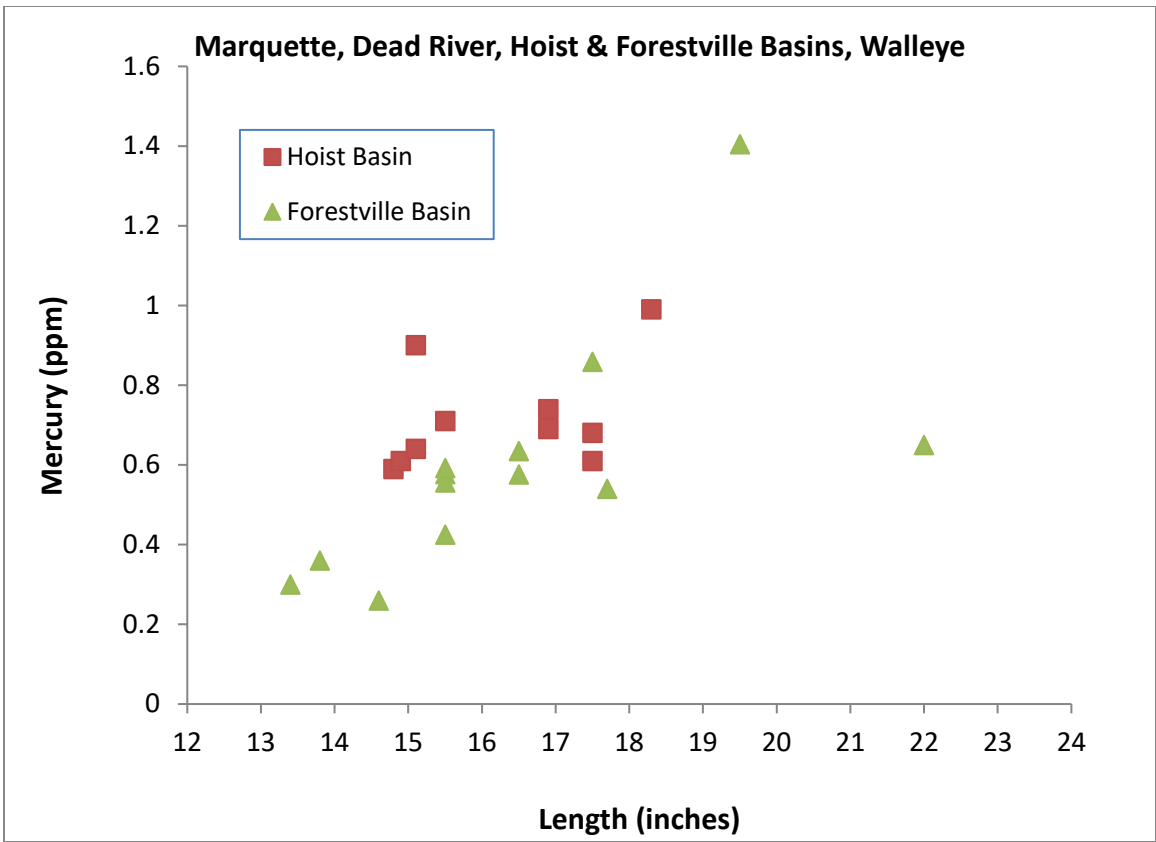
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1996	2012	23	13.4	15	14.6	22.0
Datasets available: 1996, 1997, 2005, 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	21	0.68	0.26	1.40	0.78	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.330	0.351				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	10	14.8	15	14.8	18.3
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	--	--	--	--	--	--
DDT	--	--	--	--	--	--
Chlordane	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--
PFOS	10	0.80 ppb	0.48 ppb	1.33 ppb	1.0 ppb	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.300	0.264				
Final meal category based on UCL:						1

Existing Advisory: Dead River Hoist Basin walleye are covered under the statewide mercury advisory. No one should eat more than 1 meal per month of Dead River Forestville Basin walleye under 20 inches or more than 6 meals per year of fish over 20 inches due to mercury.

Recommendation: No one should eat more than 1 meal per month of walleye from the Dead River (including the Silver Lake Basin, Hoist Basin [aka Dead River Storage Basin], McClure Basin, Forestville Basin, and Tourist Park Basin) less than 20 inches or more than 6 meals per year of those fish over 20 inches due to mercury. The statewide length break was applied as the size range of the fish was limited.



Brown Bullhead

Deer Lake

Marquette County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	1987	2	na	na	--	--
Datasets available: 1987						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	2	1.20	1.0	1.40	--	--
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
--	--	--	--	--	--	--
Datasets available: --						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						--

Existing Advisory: No one should eat any fish from Deer Lake due to elevated concentrations of mercury.

Recommendation: No one should eat Deer Lake bullhead due to mercury (waterbody wide advisory).

Note: Deer Lake has known to have fish that are highly contaminated with mercury, which requires a waterbody wide advisory of no consumption of the fish unless analytical filet data support a less restrictive guideline. .

Northern Pike

Deer Lake

Marquette County

Hg & Se Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2001	2011	26	20.9	24	23.8	41.6
Datasets available: 1984, '87, '88, '93, '97, '98, '99, 2001, '03, '08, '11						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	21	1.85	0.41	5.5	2.56	0
Selenium	5	0.322	0.27	0.38	0.37	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.769	0.800				
Selenium	0.015	0.022				

Organics Analysis:

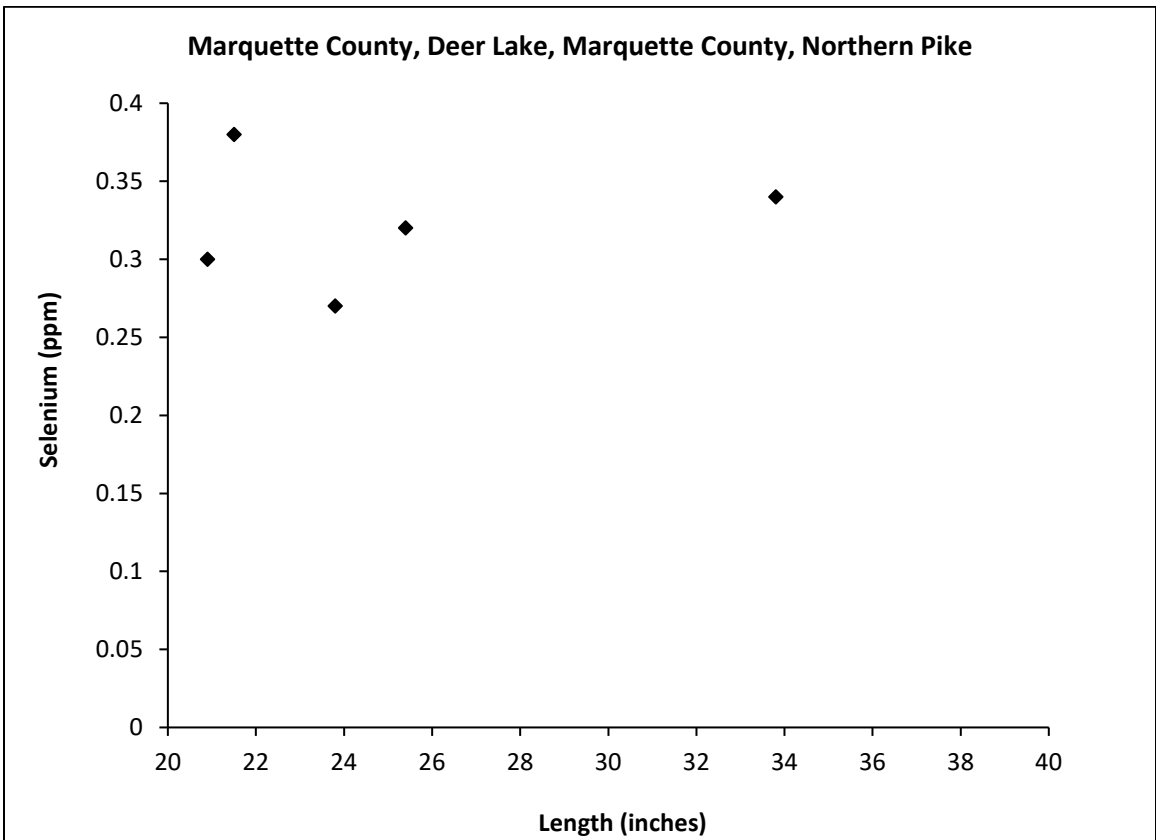
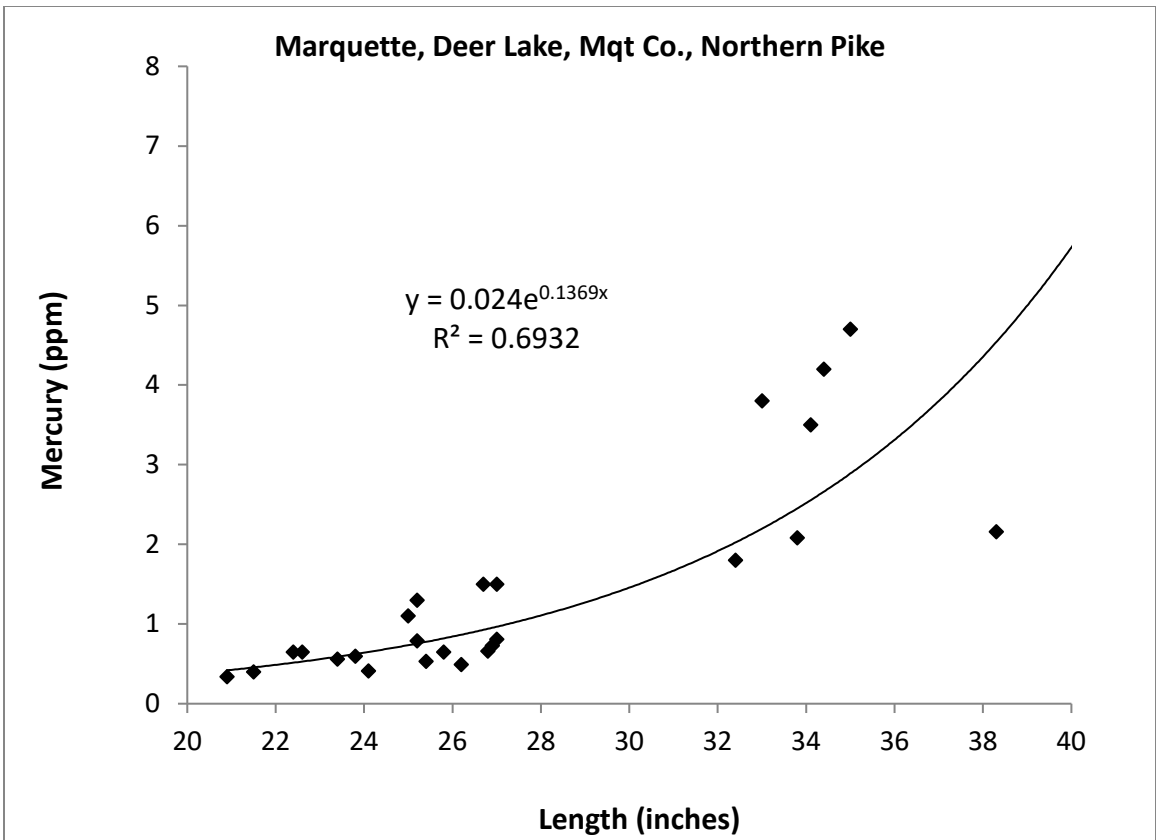
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	--	--	--	--	--
Datasets available: --						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT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

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
24	0.64	1
26	0.84	1
28	1.11	0.5
30	1.46	0.5
32	1.92	0.5
34	2.52	0
36	3.32	0
40	5.73	0
42	7.54	0
<i>Shaded area denotes extrapolated estimates</i>		

Existing Advisory: No one should eat any fish from Deer Lake due to elevated concentrations of mercury.

Recommendation: No one should eat more than 6 meals per year of Deer Lake northern pike less than 32 inches due to mercury. No one should eat any Deer Lake northern pike larger than 32 inches.

Note: Deer Lake has known to have fish that are highly contaminated with mercury, which requires a waterbody wide advisory of no consumption of the fish unless analytical file data support a less restrictive guideline. .



Walleye

Deer Lake

Marquette County

Hg & Se Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2001	2011	50	13.7	15	14.6	23
Datasets available: 1990, '93, '96, '97, '98, '99, 2001, '03, '08, '11						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	46	0.83	0.20	1.60	0.95	1
Selenium	18	0.47	0.38	0.58	0.50	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.691	0.701				
Selenium	0.089	0.079				

Organics Analysis:

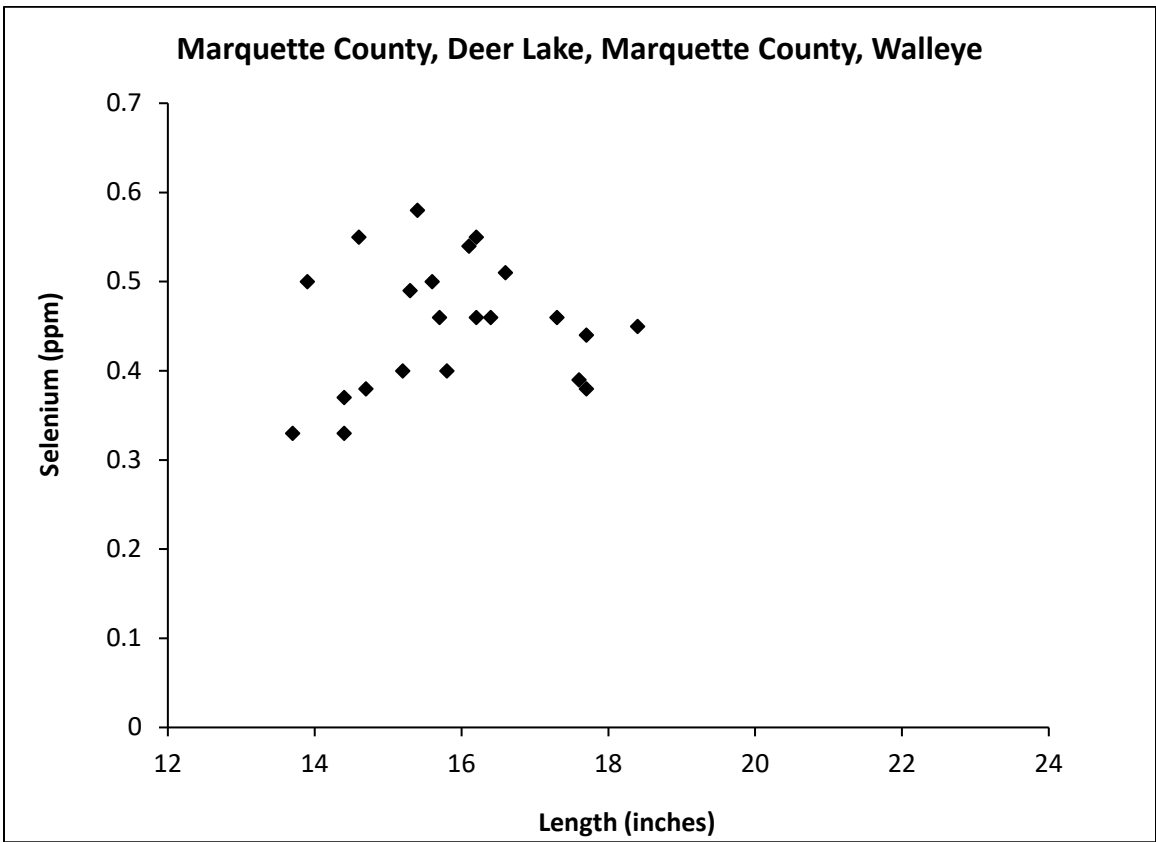
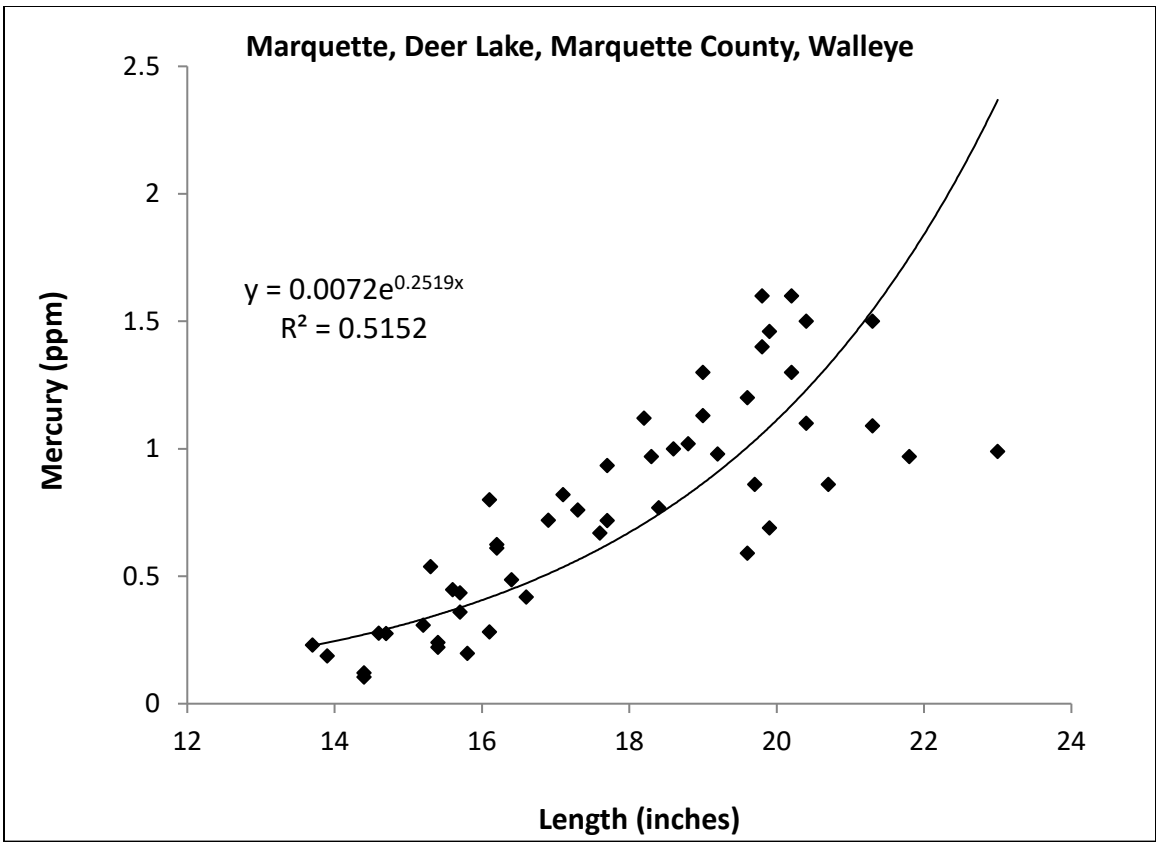
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	--	--	--	--	--
Datasets available: --						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT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

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
14	0.24	4
16	0.41	2
18	0.67	1
20	1.11	0.5
22	1.84	0.5
24	3.04	0
26	5.03	0
28	8.33	0
<i>Shaded area denotes extrapolated estimates</i>		

Existing Advisory: No one should eat any fish from Deer Lake due to elevated concentrations of mercury.

Recommendation: No one should eat more than 6 meals per year of Deer Lake walleye smaller than 22 inches due to mercury. No one should eat any Deer Lake walleye larger than 22 inches.

Note: Deer Lake has known to have fish that are highly contaminated with mercury, which requires a waterbody wide advisory of no consumption of the fish unless analytical filet data support a less restrictive guideline.



White Sucker

**Deer Lake &
Carp Creek u/s Deer Lake**

Marquette County

Hg & Se Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2005	2011	27	7.5	na	7.5	21.5
Datasets available: 2005, 2010, 2011						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	27	0.28	0.06	0.70	0.34	2
Selenium	10	ND	--	--	--	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.393	0.325				
Selenium	--	--				

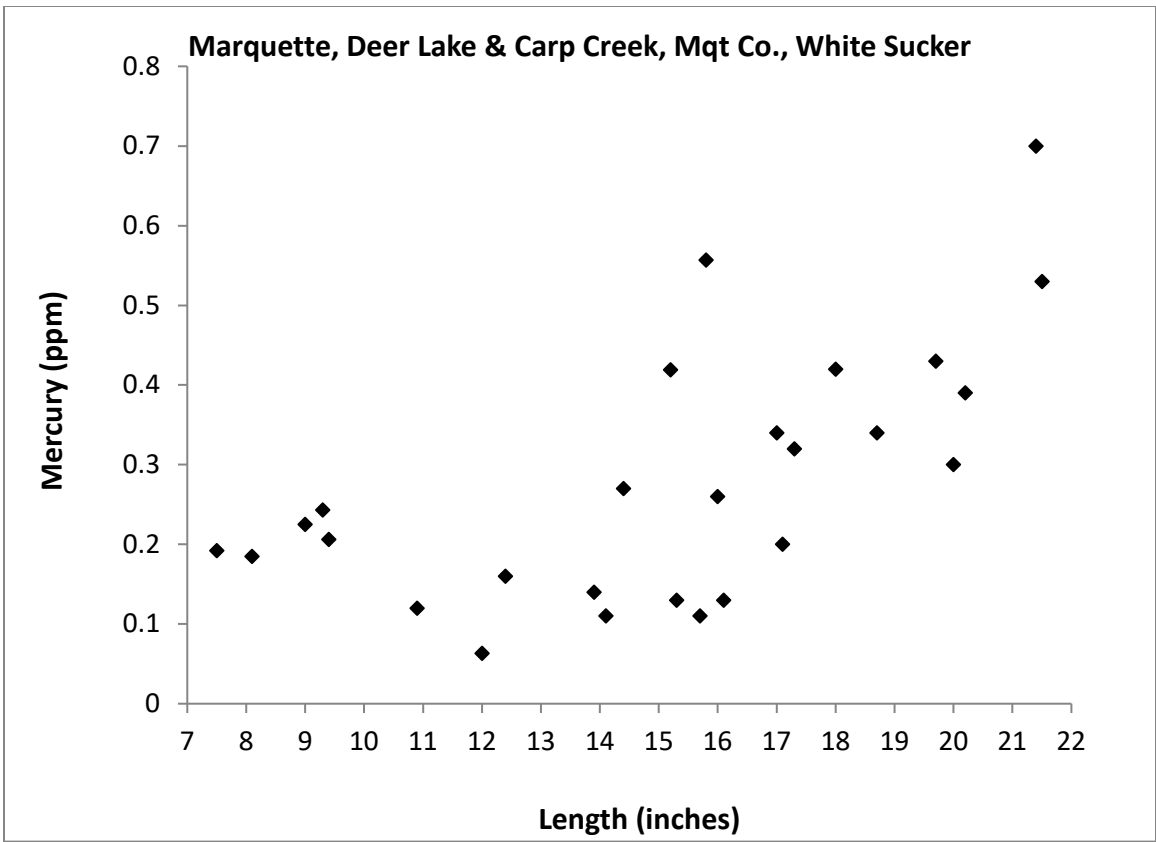
Organics Analysis:

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

Existing Advisory: No one should eat white sucker larger than 10 inches due to mercury.

Recommendation: No one should eat more than 2 meals per month of sucker from Deer Lake or Carp Creek due to mercury.

Note: Deer Lake has known to have fish that are highly contaminated with mercury, which requires a waterbody wide advisory of no consumption of the fish unless analytical filet data support a less restrictive guideline.



Yellow Perch

Deer Lake

Marquette County

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	2011	41	8.5	na	8.5	14.0
Datasets available: 1984, '88, '97, '98, '99, 2001, '10, '11						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	41	0.40	0.14	0.93	0.47	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.588	0.593				

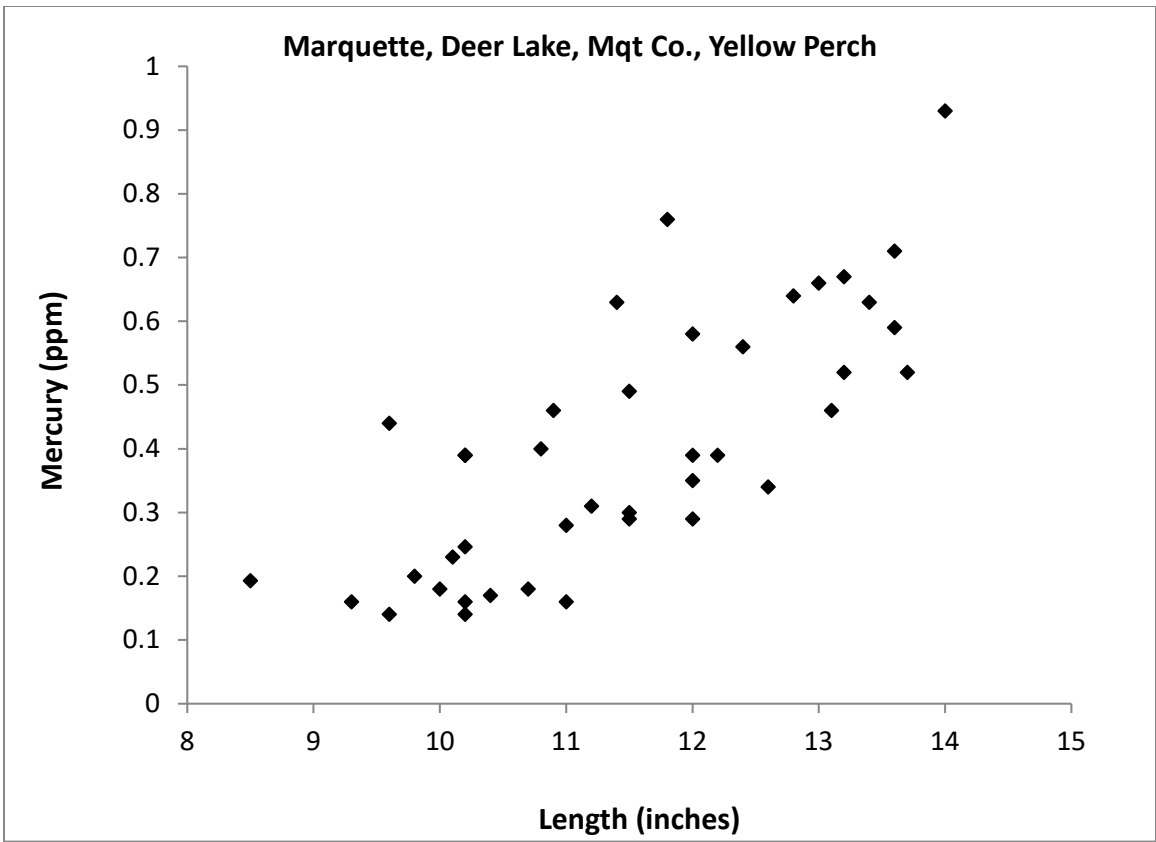
Organics Analysis:

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

Existing Advisory: No one should eat any fish from Deer Lake due to elevated concentrations of mercury.

Recommendation: No one should eat more than 2 meals per month of Deer Lake yellow perch due to mercury.

Note: Deer Lake has known to have fish that are highly contaminated with mercury, which requires a waterbody wide advisory of no consumption of the fish unless analytical file data support a less restrictive guideline. .



Northern Pike

East Bass Lake

Marquette County

Hg Analysis:

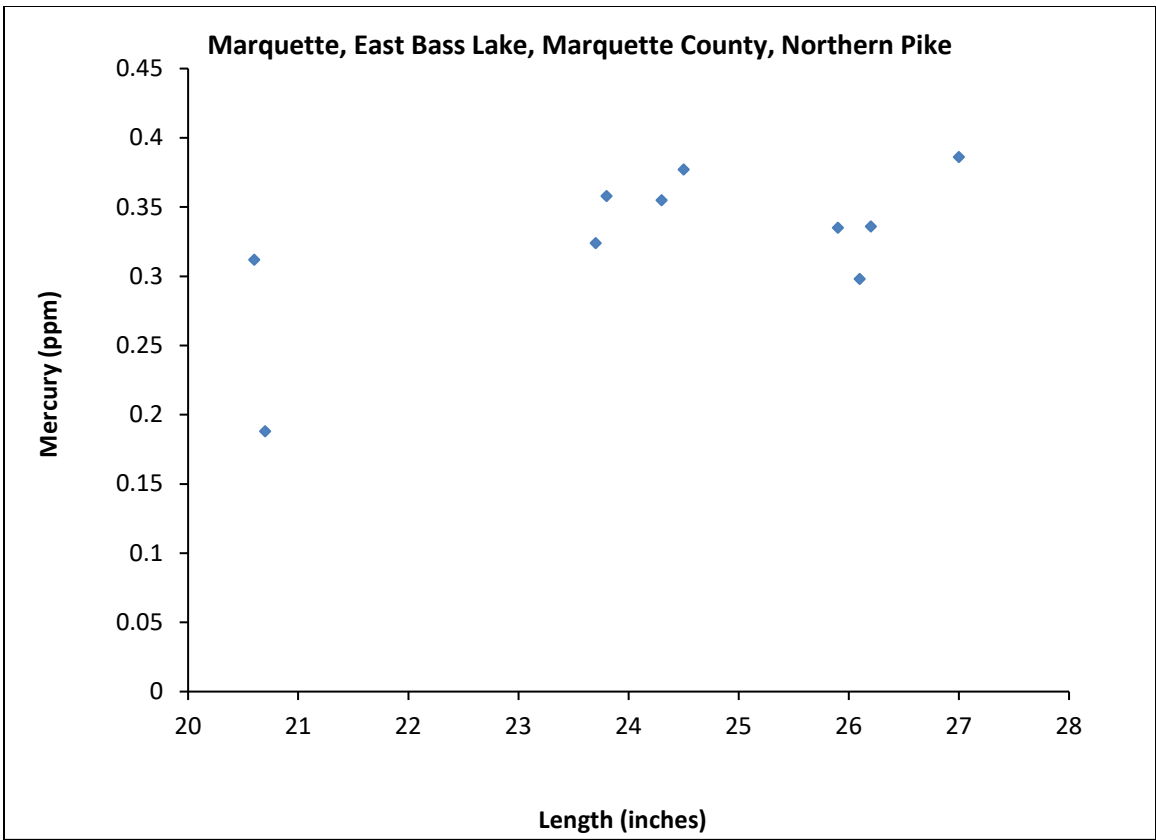
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples			
Earliest	Most Recent				Min	Max		
2007	2007	10	20.6	na*	20.6	27		
Datasets available: 2007								
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category		
Mercury	10	0.33	0.19	0.39	0.37	2		
Chemical	Linear Regression	Exponential Regression	*There is no size limit for East Bass Lake (Marquette County) northern pike.					
	R ²	R ²						
Mercury	0.382	0.382						

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples			
Earliest	Most Recent				Min	Max		
--	--	--	--	--	--	--		
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	*There is no size limit for East Bass Lake (Marquette County) northern pike.					
	R ²	R ²						
PCB	--	--						
DDT	--	--						
Chlordane	--	--						
Toxaphene	--	--						
						Final meal category based on UCL:		2

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

Recommendation: No one should eat more than 2 meals per month of East Bass Lake northern pike due to mercury.



Northern Pike

Engman Lake

Marquette County

Hg & Se 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	11.5	na*	11.5	24.2
Datasets available: 2006						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.38	0.53	0.82	0.56	1
Selenium	10	0.647	0.540	0.790	0.710	16
Chemical	Linear Regression	Exponential Regression	*There is no size limit for Engman Lake (Marquette County) northern pike.			
	R ²	R ²				
Mercury	0.671	0.600				
Selenium	0.003	0.002				

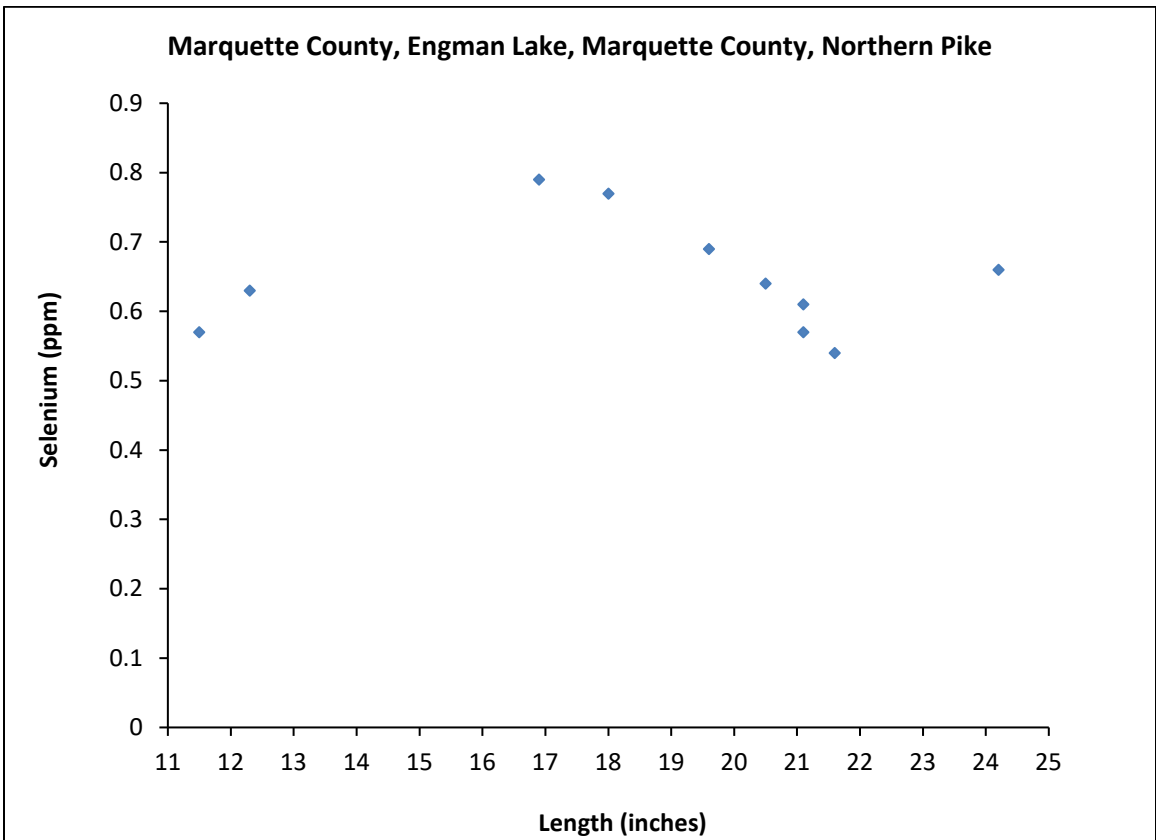
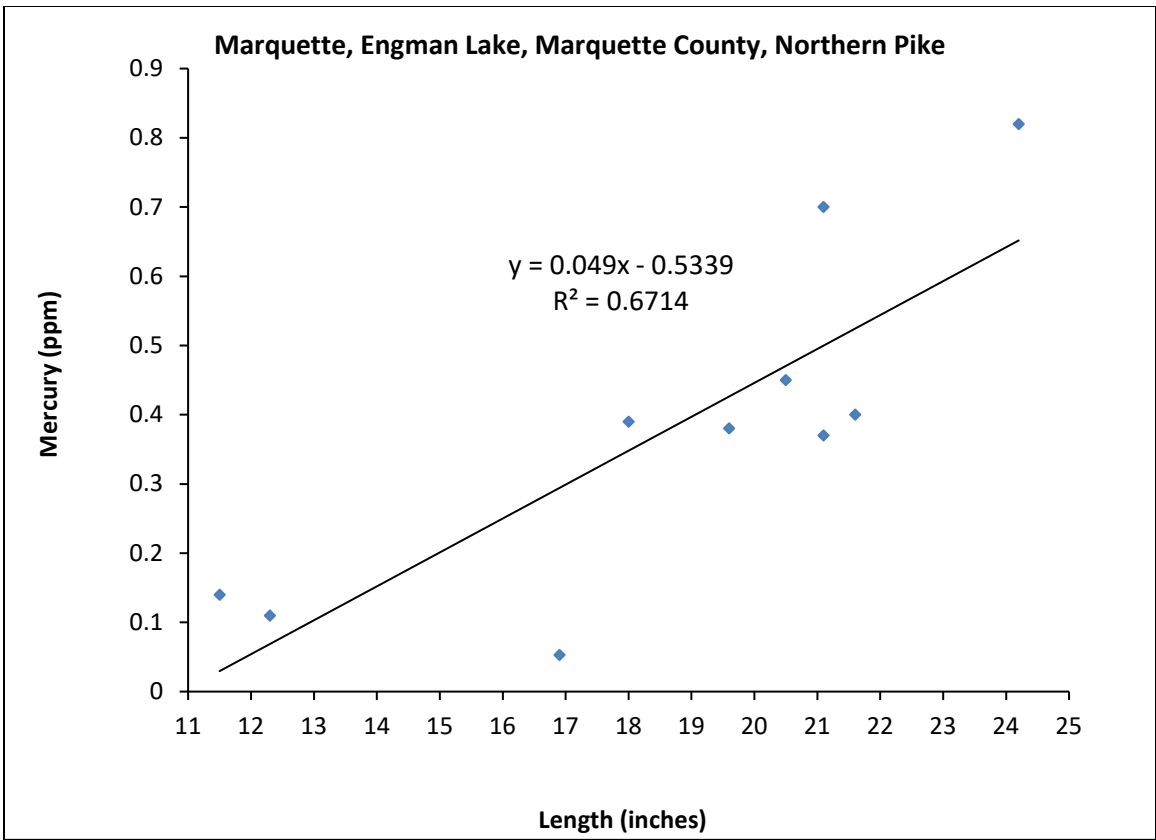
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2006	2006	10	11.5	na*	24.2	24.2
Datasets available: 2006						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	ND	--	--	--	--
DDT	10	ND	--	--	--	--
Chlordane	10	ND	--	--	--	--
Toxaphene	10	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression	*There is no size limit for Engman Lake (Marquette County) northern pike.			
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						1

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

Recommendation: No one should eat more than 1 meal per month of Engman Lake northern pike smaller than 30 inches or more than 6 meals per year of those fish larger than 30 inches due to mercury. Statewide length break applied.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
24	0.64	1
26	0.74	1
28	0.84	1
30	0.94	1
32	1.03	1
34	1.13	0.5
36	1.23	0.5
<i>Shaded area denotes extrapolated estimates</i>		



Walleye

**Escanaba River
Cataract Basin**

Marquette County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples			
Earliest	Most Recent				Min	Max		
2004	2004	10	15.3	15	15.3	21.7		
Datasets available: 2004								
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category		
Mercury	10	0.63	0.28	1.83	0.97	1		
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
Mercury	0.322	0.346						

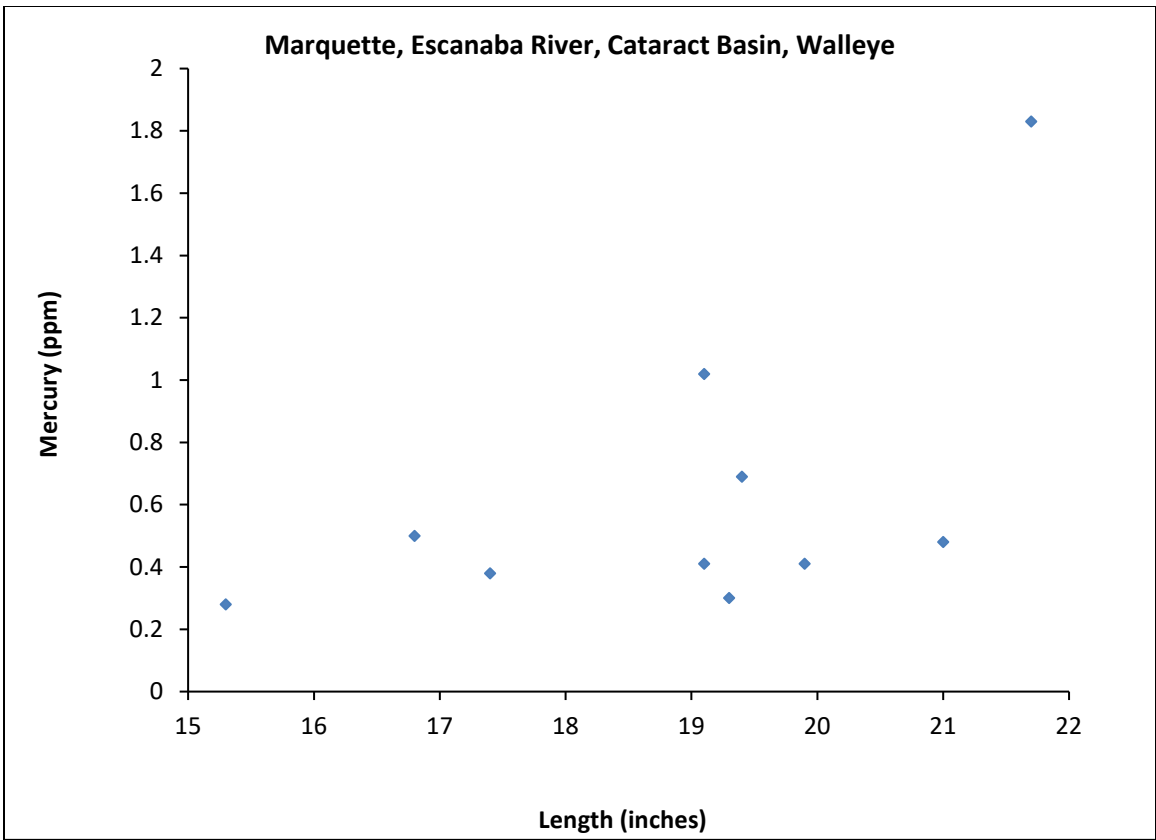
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples			
Earliest	Most Recent				Min	Max		
--	--	--	--	--	--	--		
Datasets available: --								
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category		
PCB	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: Escanaba River at Cataract Basin walleye are covered under the statewide mercury advisory.

Recommendation: No one should eat more than 1 meal per month of Cataract Basin walleye smaller than 20 inches or more than 6 meals per year of those fish larger than 20 inches due to mercury. The statewide length break was applied.

Note: The size range of fish in this sample set is limited. Advice is 1 step more restrictive than the statewide advisory for walleye.



Black Crappie

**Escanaba River
Greenwood Reservoir**

Marquette County

Hg Analysis:

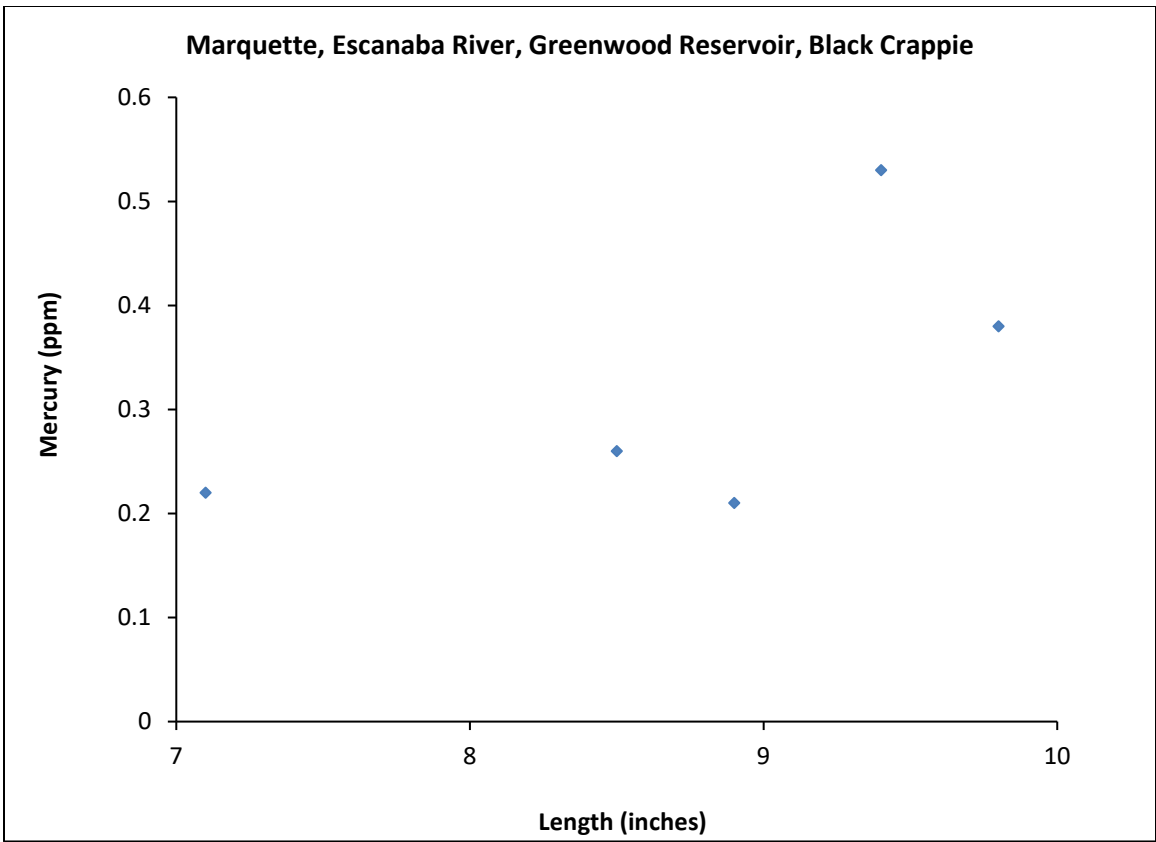
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1992	1992	5	7.1	na	7.1	9.8
Datasets available: 1992						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	5	0.32	0.21	0.53	0.49	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.414	0.458				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1992	1992	5	7.1	na	7.1	9.8
Datasets available: 1992						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	5	ND	--	--	--	--
DDT	5	ND	--	--	--	--
Chlordane	5	ND	--	--	--	--
Toxaphene	5	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						2

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

Recommendation: No one should eat more than 2 meals per month of Greenwood Reservoir crappie due to mercury.



Largemouth Bass

**Escanaba River
Greenwood Reservoir**

Marquette County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Size Range of All Samples	
Earliest	Most Recent				Min	Max
1992	1992	4	12.2	14	12.2	14.2
Datasets available: 1992						
Chemical	Sample Size (All)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	4	0.69	0.61	0.83	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Size Range of All Samples	
Earliest	Most Recent				Min	Max
1992	1992	4	12.2	14	12.2	14.2
Datasets available: 1992						
Chemical	Sample Size (All)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	4	ND	--	--	--	--
DDT	4	0.003	0.003	0.003	--	--
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: Greenwood Reservoir largemouth bass are covered under the statewide mercury consumption advisory.

Recommendation: No one should eat more than 1 meal per month of Greenwood Reservoir largemouth or smallmouth bass smaller than 18 inches or more than 6 meals per year of those fish larger than 18 inches.

Note: A dataset of less than five data points for a given chemical, species and waterbody is considered insufficient for evaluation using the standard evaluation method. The mean mercury concentration compared to the FCSV is one meal per month. Northern pike from the same waterbody were highly contaminated with mercury. The guideline is set to one meal category more restrictive than the statewide guidelines.

Northern Pike

**Escanaba River
Greenwood Reservoir**

Marquette County

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	1999	29	20.7	24	23.6	41.5
Datasets available: 1992, 1999						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	17	1.37	0.49	2.45	1.65	0.5
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.814	0.764				

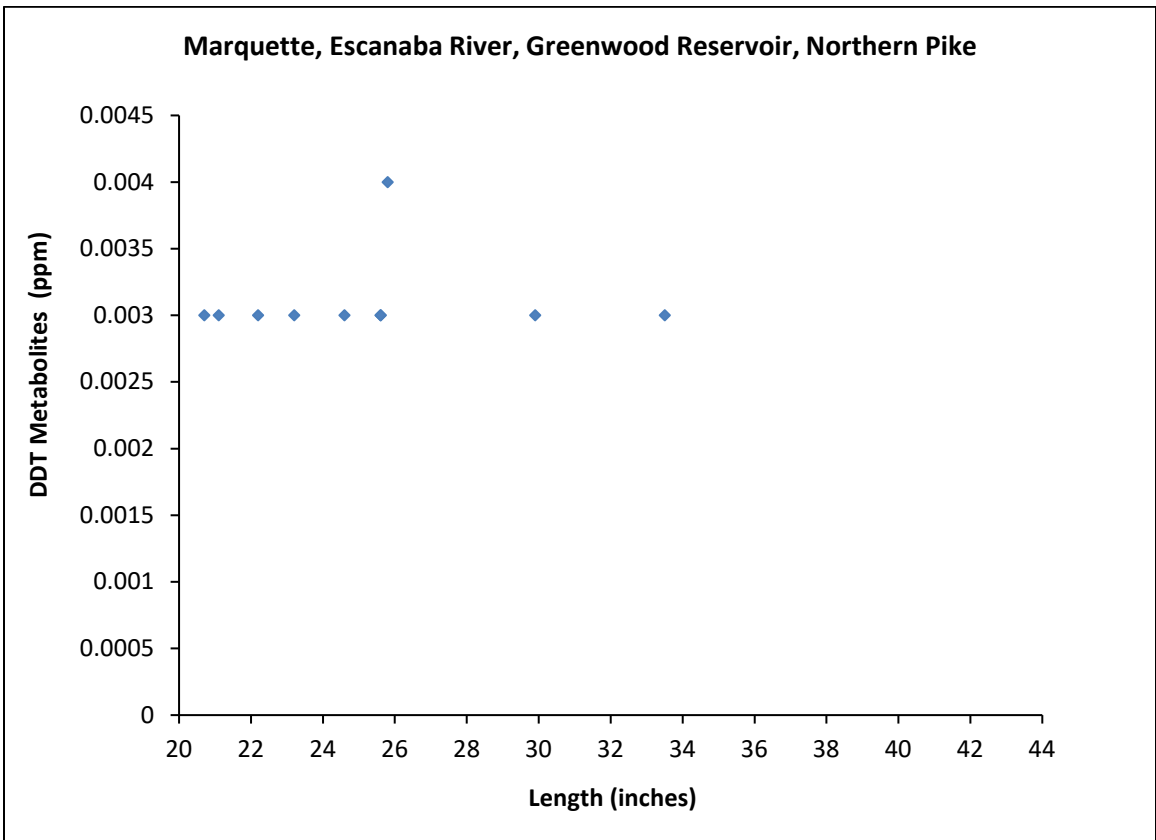
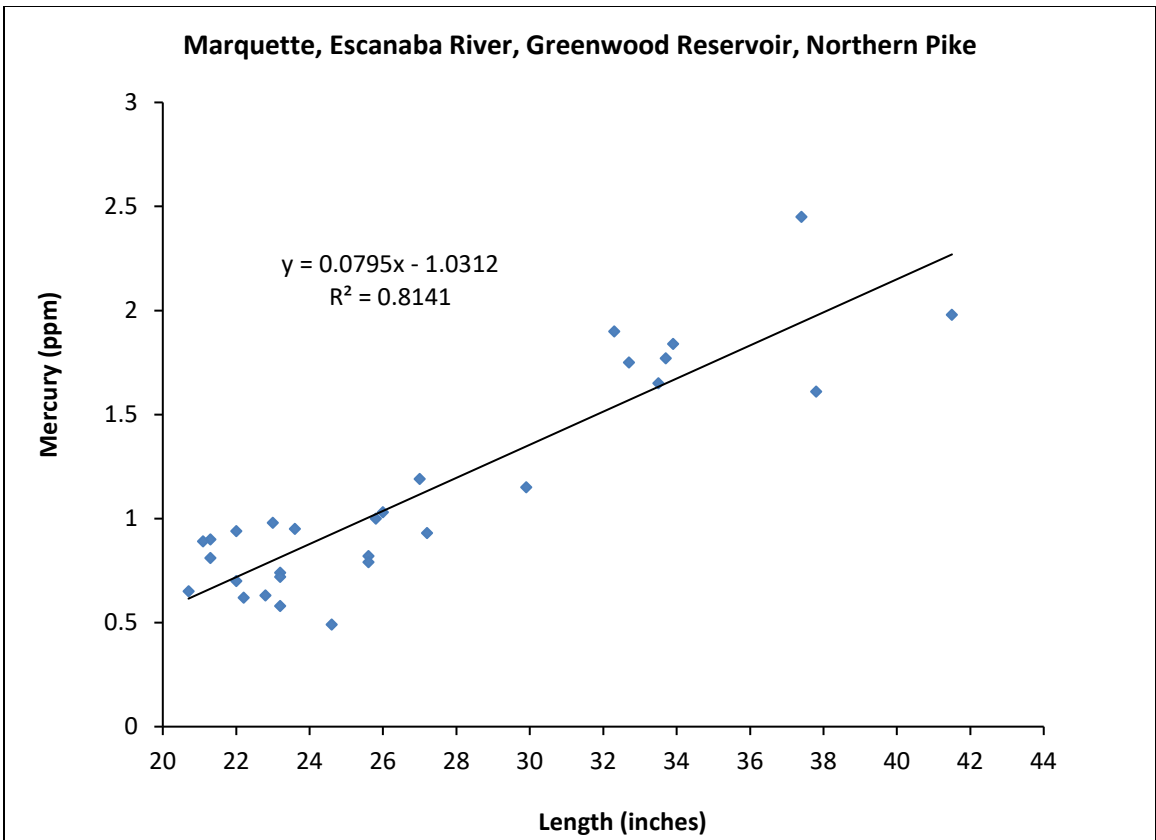
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1992	1999	29	20.7	24	23.6	41.5
Datasets available: 1992, 1999						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	6	ND	--	--	--	--
DDT	6	0.003	0.003	0.04	0.004	16
Chlordane	6	ND	--	--	--	--
Toxaphene	6	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						0.5

Existing Advisory: Women and children should not eat more than 1 meal per month of Greenwood Reservoir northern pike smaller than 30 inches in length and should not eat any of those fish larger than 30 inches due to mercury.

Recommendation: No one should eat more than 6 meals per year of Greenwood Reservoir northern pike due to mercury.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
24	0.877	1
26	1.036	1
28	1.195	0.5
30	1.354	0.5
32	1.513	0.5
34	1.672	0.5
36	1.831	0.5
38	1.990	0.5
40	2.149	0.5
<i>Shaded area denotes extrapolated estimates</i>		



Brook Trout

**Escanaba River
Upper River and Tributaries***

Marquette County

Se Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of All Samples	
Earliest	Most Recent				Min	Max
2010	2010	50	6.3	8	7.9	10.4
Datasets available: 2010						
Chemical	Sample Size (All)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Selenium	23	6.9	2.10	13.10	8.14	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Selenium	0.087	0.097				

Organics Analysis:

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

* samples collected from Goose Lake inlet, Goose Lake outlet, Green Creek, Escanaba River, Warner Creek

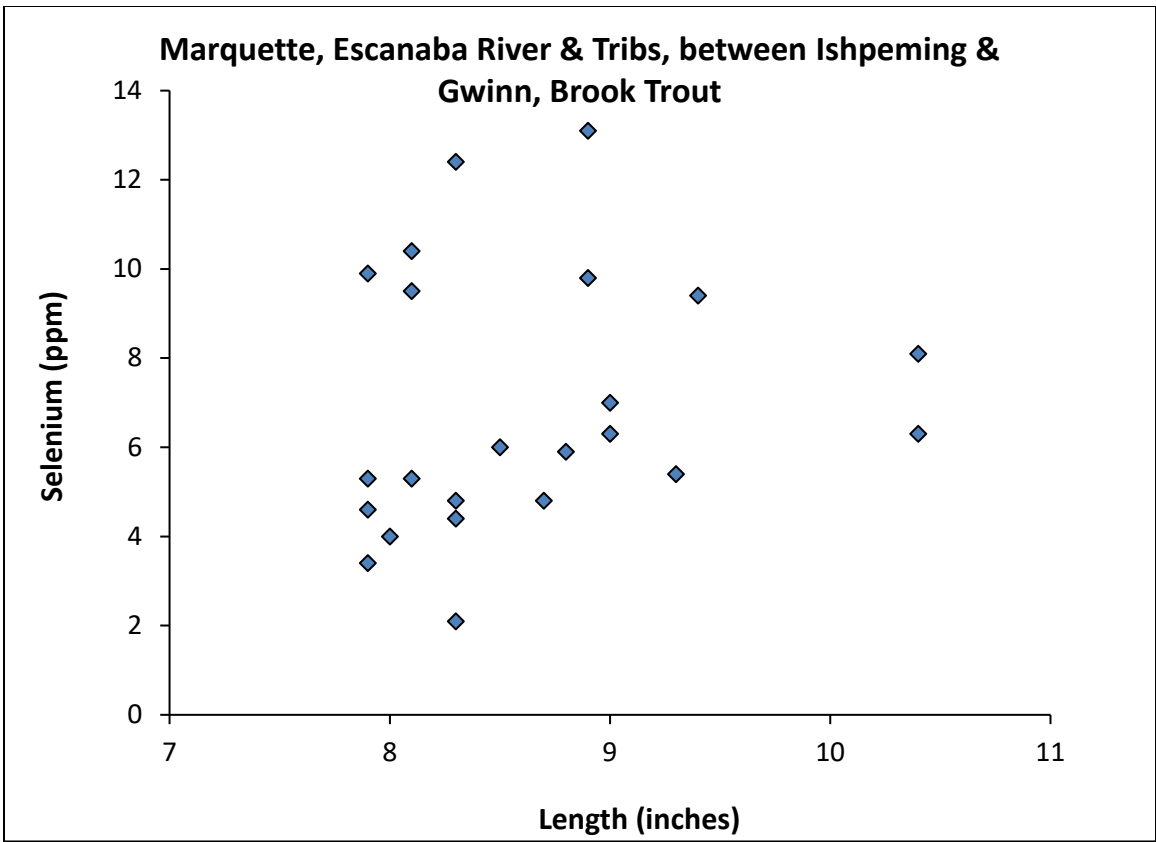
Existing Advisory: No one should eat more than 1 meal per week of brook trout from select reaches of the East Branch and Middle Branch Escanaba River and select tributaries to those river reaches.

Recommendation: No one should eat more than 4 meals per month of brook trout or white suckers[^] from the East Branch Escanaba River upstream of Gwinn¹, the Middle Branch Escanaba River from the Cataract Dam downstream to Gwinn, and Green Creek from the Empire Tailings dam to the Middle Branch Escanaba River due to selenium.

¹ including Warner Creek, Goose Lake Inlet and Outlet, Schweitzer Creek, Ely Creek, and smaller tributaries

[^] White sucker are included because whole suckers and whole brook trout were analyzed for selenium from these waters and found to have similar levels of contamination (DEQ Selenium Monitoring Work Group 2009, MI/DEQ/WB-09/038). Suckers have been found to be able to have elevated filelet selenium concentrations (see Goose Lake).

Note: samples were collected and analyzed by Cleveland Cliffs Iron (CCI) and found acceptable by DEQ (now EGLE) because the methods were not complicated and Se concentration in fillets is not sensitive to processing.



Largemouth Bass

Fish Lake

Marquette County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of All Samples	
Earliest	Most Recent				Min	Max
1988	1988	2	13	14	13	13
Datasets available: 1988						
Chemical	Sample Size (All)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	2	0.26	0.2	0.32	--	--
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
1988	1988	2	13	14	13	13
Datasets available: 1988						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	na	--	--	--	--
DDT	0	na	--	--	--	--
Chlordane	0	na	--	--	--	--
Toxaphene	0	na	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						--

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

Recommendation: A dataset of less than five data points for a given chemical, species and waterbody is considered insufficient for evaluation using the standard evaluation method. The statewide guidelines apply: No one should eat more than 2 meals per month of legal size largemouth or smallmouth bass smaller than 18 inches or more than 1 meal per month of those fish larger than 18 inches.

Northern Pike

Fish Lake

Marquette County

Hg & Se 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	10	18.5	24	24	34.9
Datasets available: 1988, 2009						
Chemical	Sample Size (All)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	5	0.912	0.450	1.900	1.620	0.5
Selenium	5	0.760	0.600	0.970	0.930	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.828	0.906				
Selenium	0.210	0.217				

Organics Analysis:

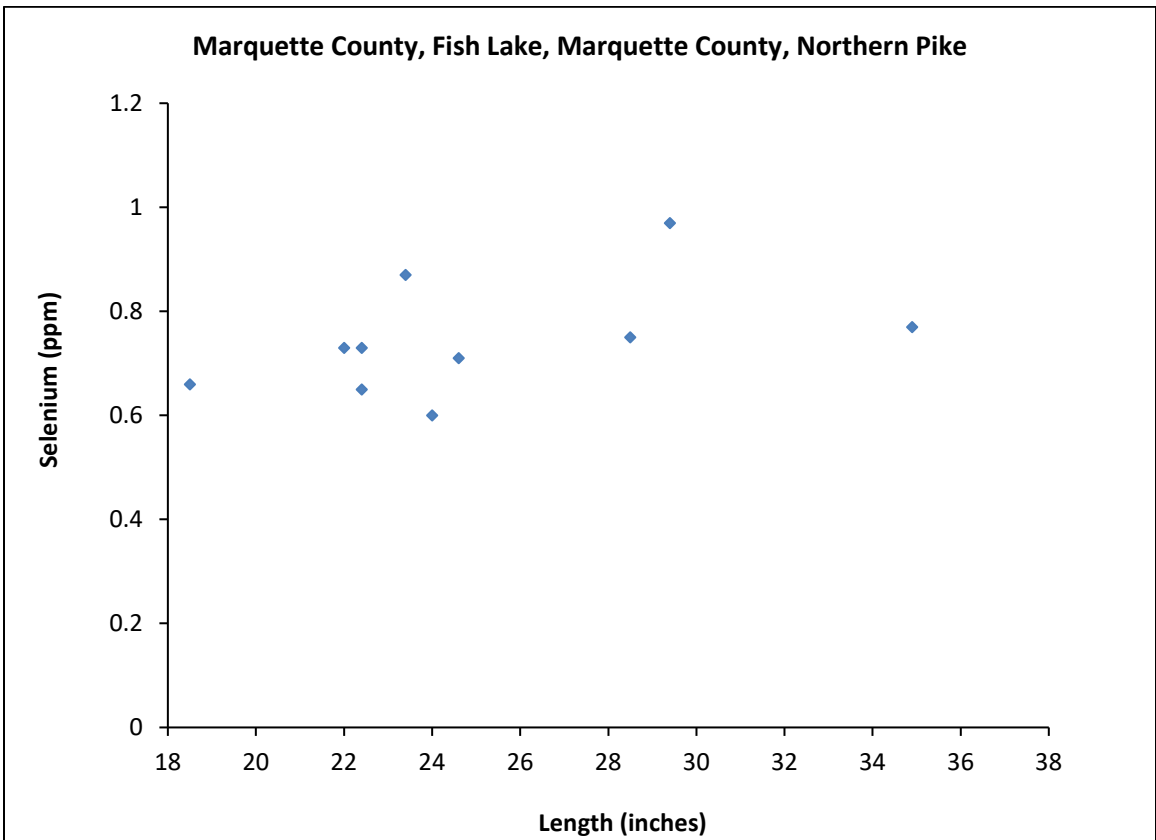
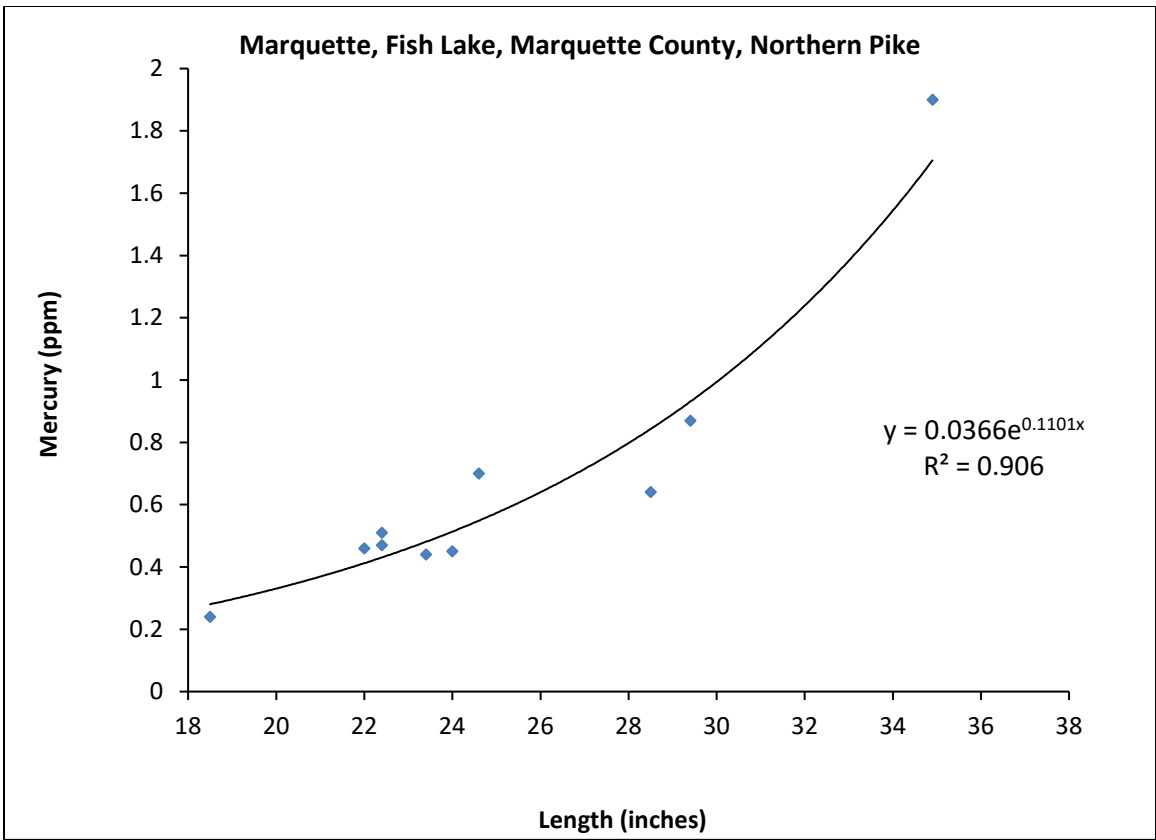
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2009	2009	10	18.5	24	24	34.9
Datasets available: 2009						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	na	--	--	--	--
DDT	0	na	--	--	--	--
Chlordane	0	na	--	--	--	--
Toxaphene	0	na	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB						
DDT						
Chlordane						
Toxaphene						
Final meal category based on UCL:						0.5

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
24	0.51	2
26	0.64	1
28	0.80	1
30	1.00	1
32	1.24	0.5
34	1.55	0.5
36	1.93	0.5
38	2.40	0
40	2.99	0
<i>Shaded area denotes extrapolated estimates</i>		

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

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

Note: Mercury concentrations in fish collected in 1988 were slightly lower than in fish collected in 2009; advice reflects possibility that fish tissue mercury is increasing in this lake.



Sunfish

Fish Lake

Marquette County

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	2	7.5	na	7.5	7.9
Datasets available: 1988						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	2	--	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
--	--	0				
Datasets available: --						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						--

Existing Advisory: Fish Lake sunfish have no existing advisory.

Recommendation: A dataset of less than five data points for a given chemical, species and waterbody is considered insufficient for evaluation using the standard evaluation method. The statewide advice due to mercury applies to Fish Lake sunfish: No one should eat more than 8 meals per month of sunfish from inland waters.

Yellow Perch

Fish Lake

Marquette County

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		9.1	na	9.1	10
Datasets available: 1988						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	4	0.29	0.13	0.6	--	--
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
--	--	--	--	--	--	--
Datasets available: --						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB						
DDT						
Chlordane						
Toxaphene						
Final meal category based on UCL:						--

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

Recommendation: A dataset of less than five data points for a given chemical, species and waterbody is considered insufficient for evaluation using the standard evaluation method. The statewide guidelines apply: No one should eat more than 4 meals per month of yellow perch from inland waters.

Northern Pike

Goose Lake

Marquette County

Hg Analysis:

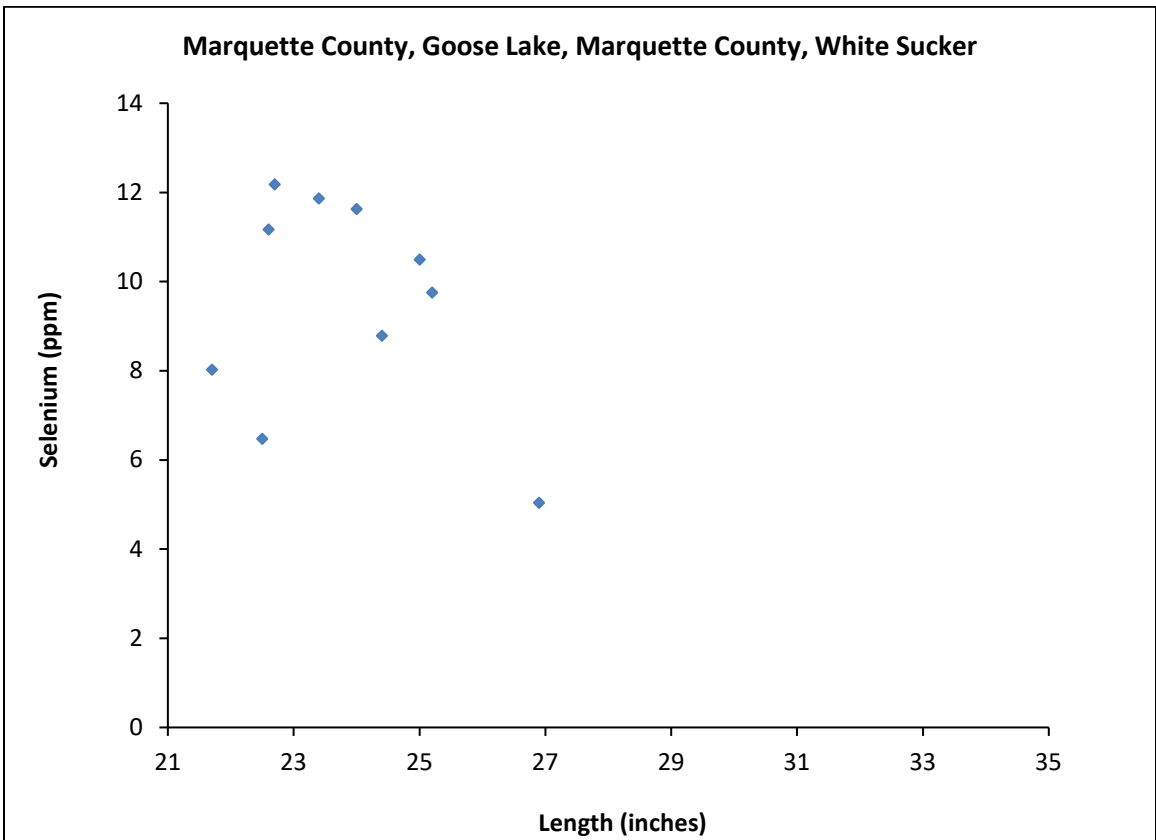
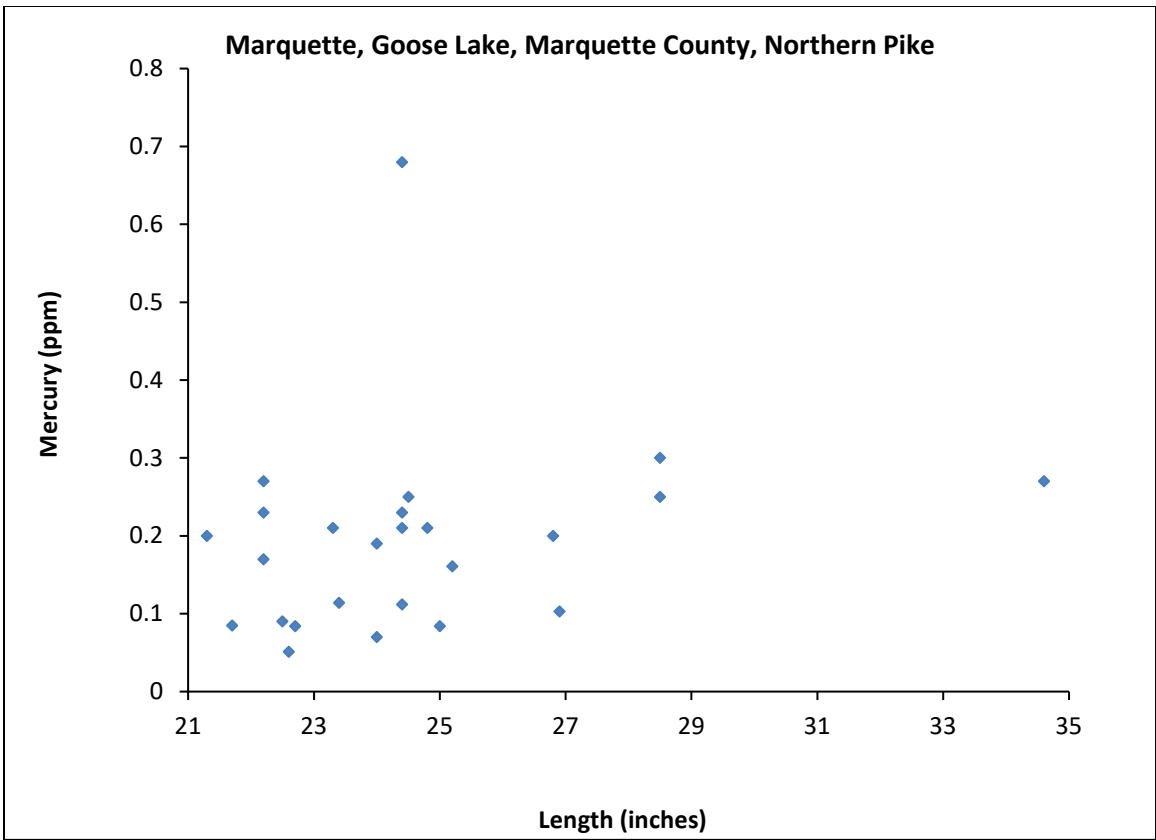
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1988	2008	25	21.3	24	24	34.6
Datasets available: 1988, 2001, 2008						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	15	0.22	0.07	0.68	0.30	2
Selenium	5	9.1	5.04	11.63	12.27	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.054	0.098				
Selenium	0.106	0.134				

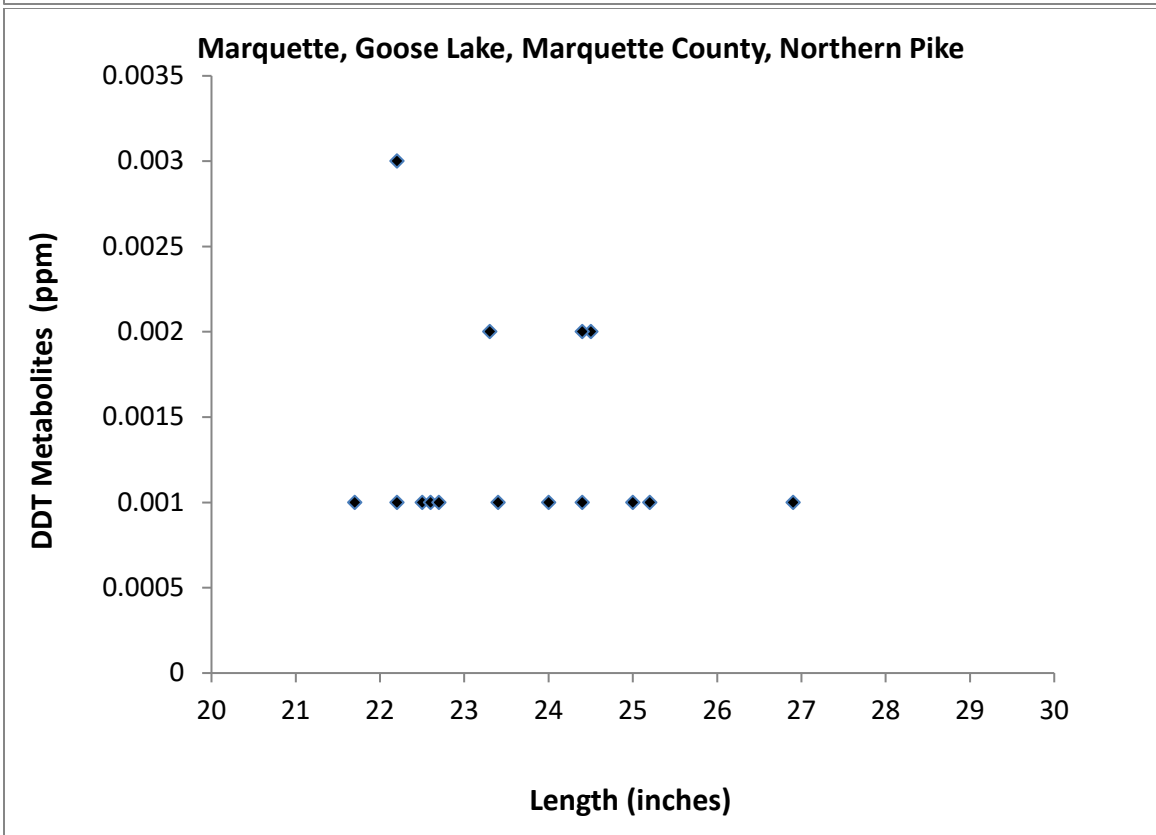
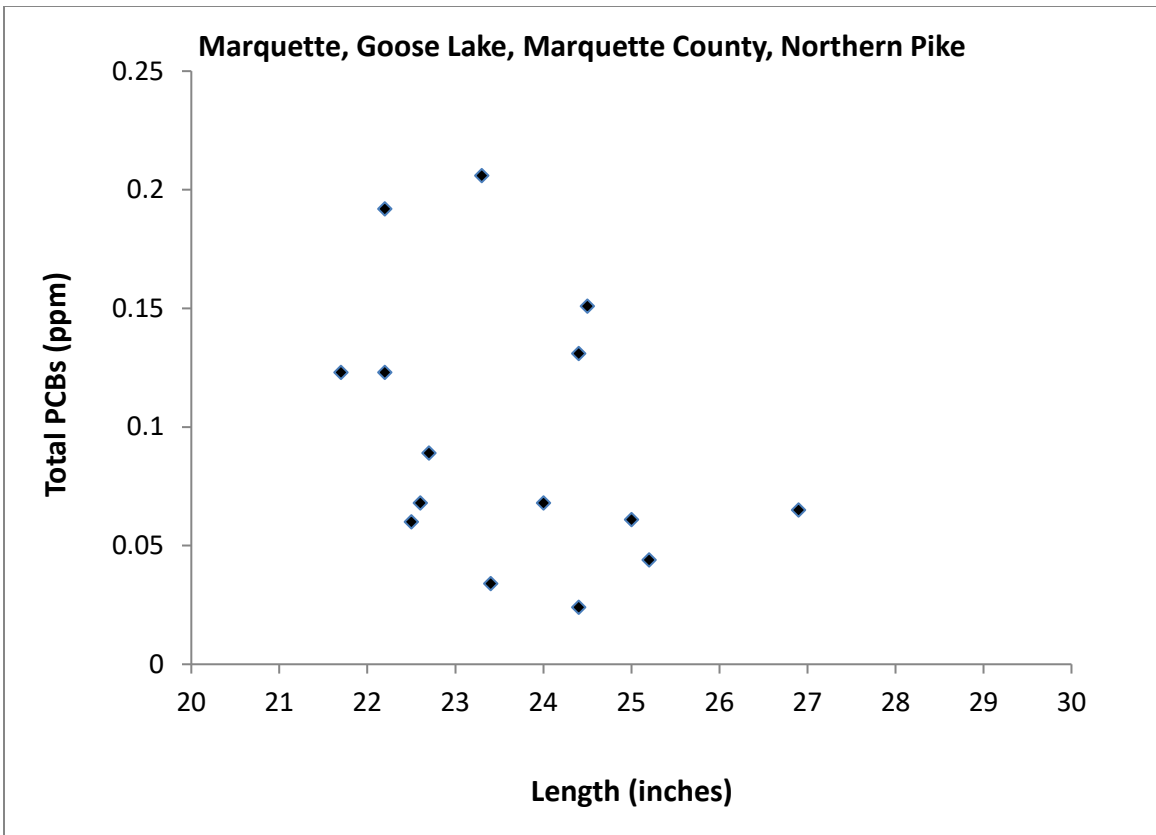
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2001	2008	15	21.3	24	24	34.6
Datasets available: 1988, 2001, 2008						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	7	0.08	0.024	0.151	0.12	1
DDT	7	0.001	0.001	0.002	0.002	16
Chlordane	7	ND	--	--	--	--
Toxaphene	7	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.126	0.129				
DDT	0.020	0.011				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						1

Existing Advisory: Women and children should not eat more than 1 meal per month of Goose Lake northern pike due to PCBs and selenium.

Recommendation: No one should eat more than 1 meal per month of Goose Lake northern pike due to PCBs. Mercury and selenium would cause advisories.





Walleye

Goose Lake

Marquette County

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	2001	16	14	15	14.6	19.7
Datasets available: 1988, 2001						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	12	0.19	0.11	0.23	0.21	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.027	0.21				

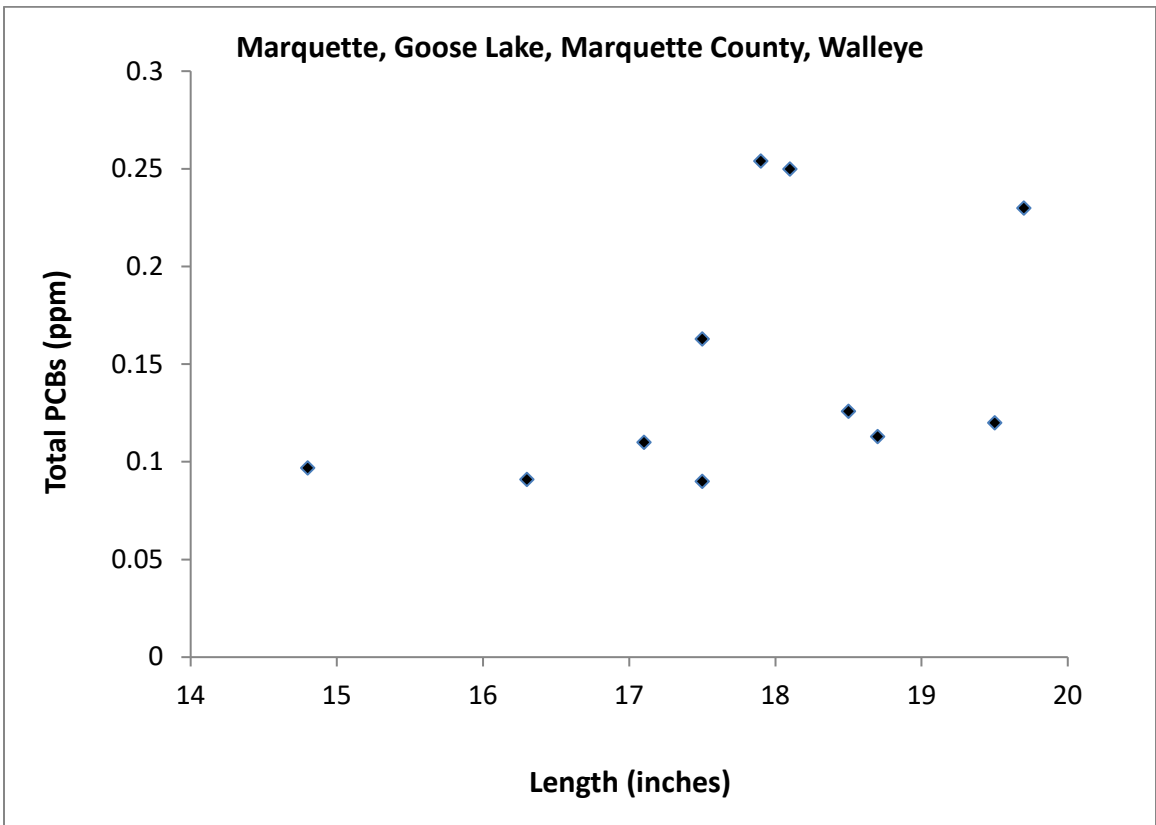
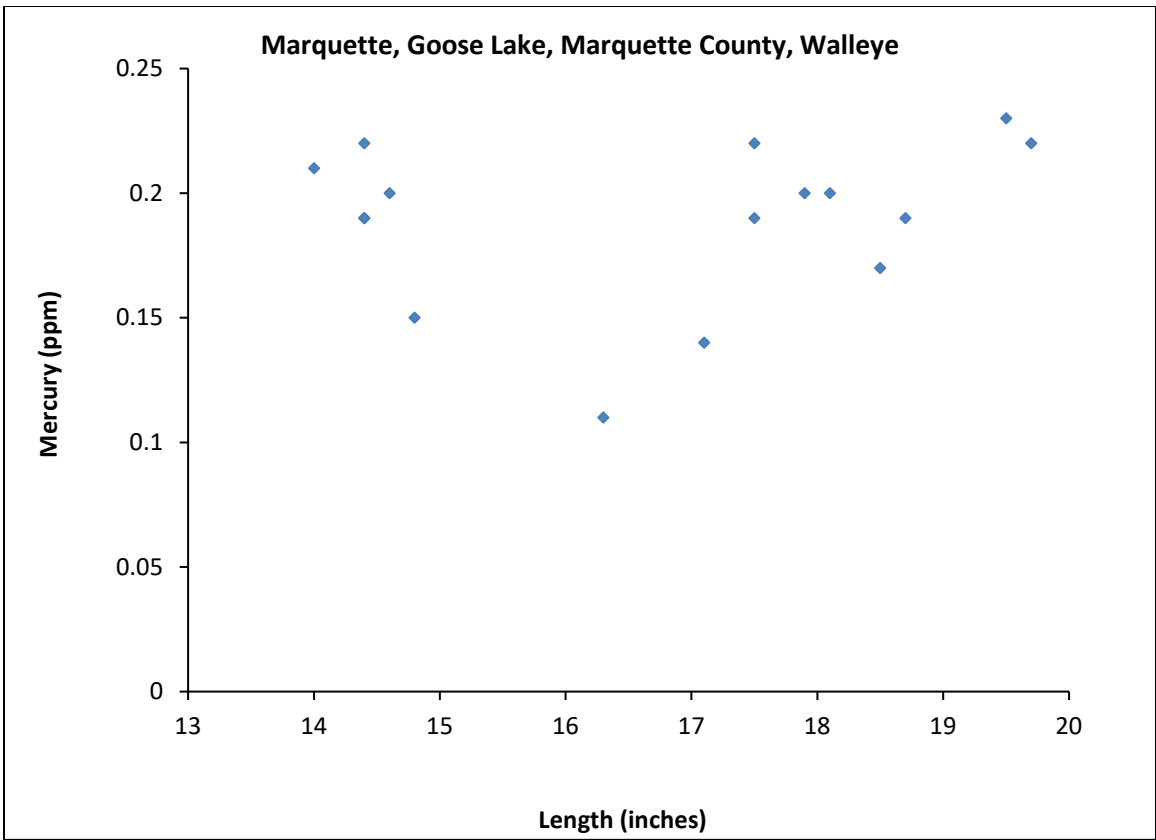
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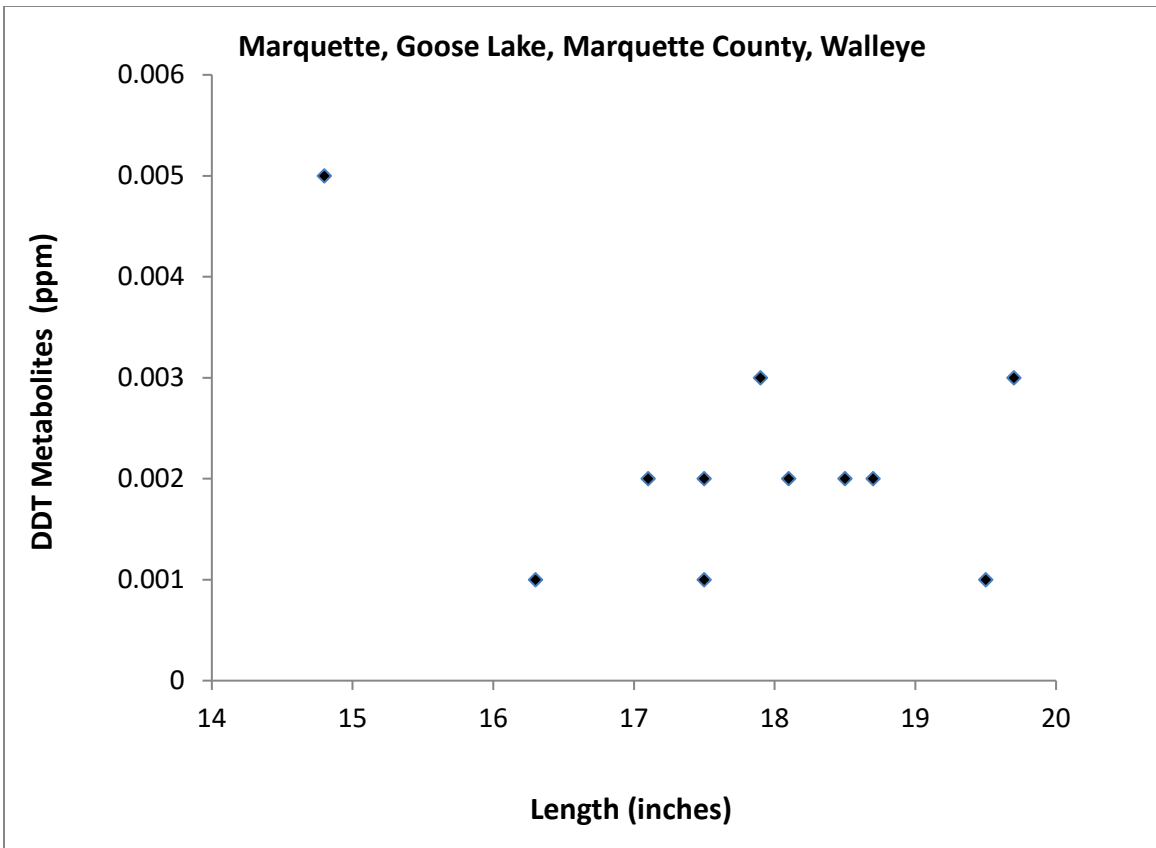
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2001	2001	11	14.8	15	14.8	19.7
Datasets available: 1988, 2001						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	11	0.15	0.09	0.25	0.19	1
DDT	11	0.002	0.001	0.005	0.003	16
Chlordane	11	ND	--	--	--	--
Toxaphene	11	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.396	0.491				
DDT	0.283	0.251				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						1

Existing Advisory: Women and children should eat no more than 1 meal per week of Goose Lake walleye due to PCBs.

Recommendation: No one should eat more than 1 meal per month of Goose Lake walleye due to PCBs. Mercury would cause and advisory.

Note: same meal categories with 1988+2001 data as with 2001 data alone





Hg Analysis:

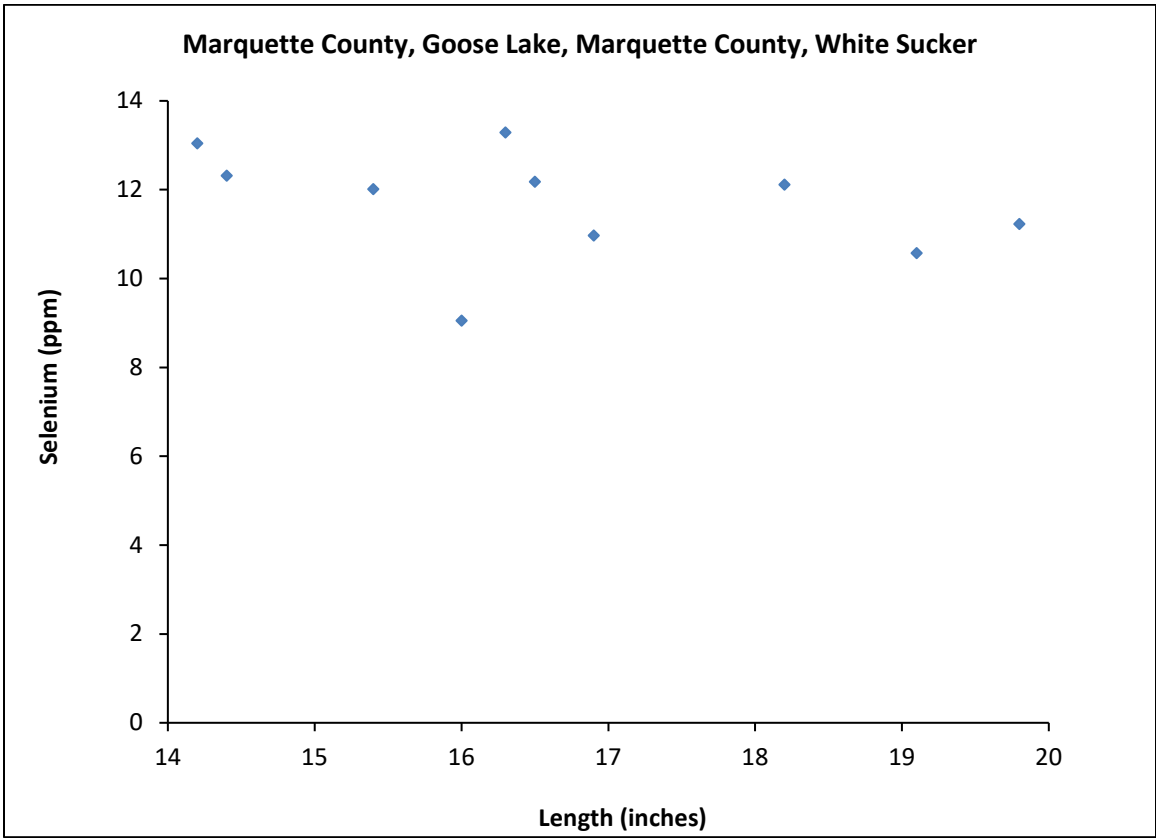
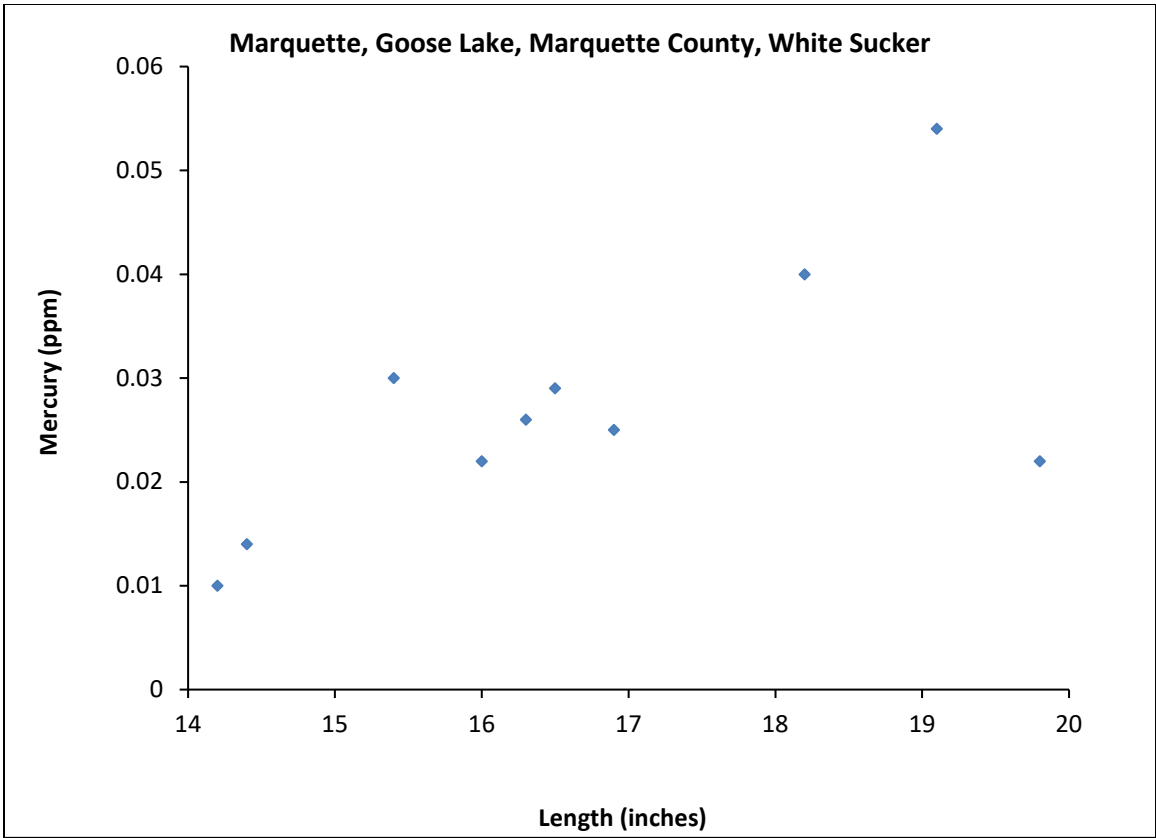
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2008	2008	10	14.2	na	14.2	19.8
Datasets available: 2008						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.03	0.01	0.05	0.04	16
Selenium	10	11.68	9.06	13.29	12.58	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.439	0.476				
Selenium	0.134	0.111				

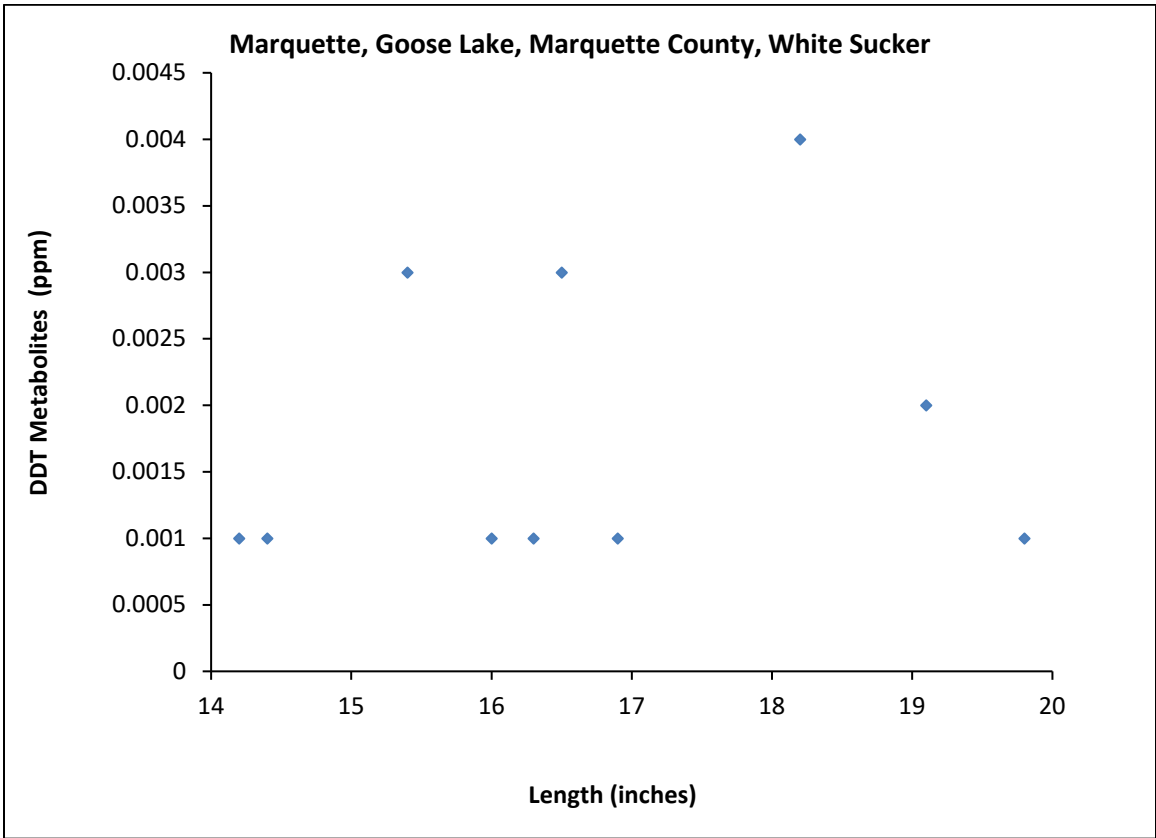
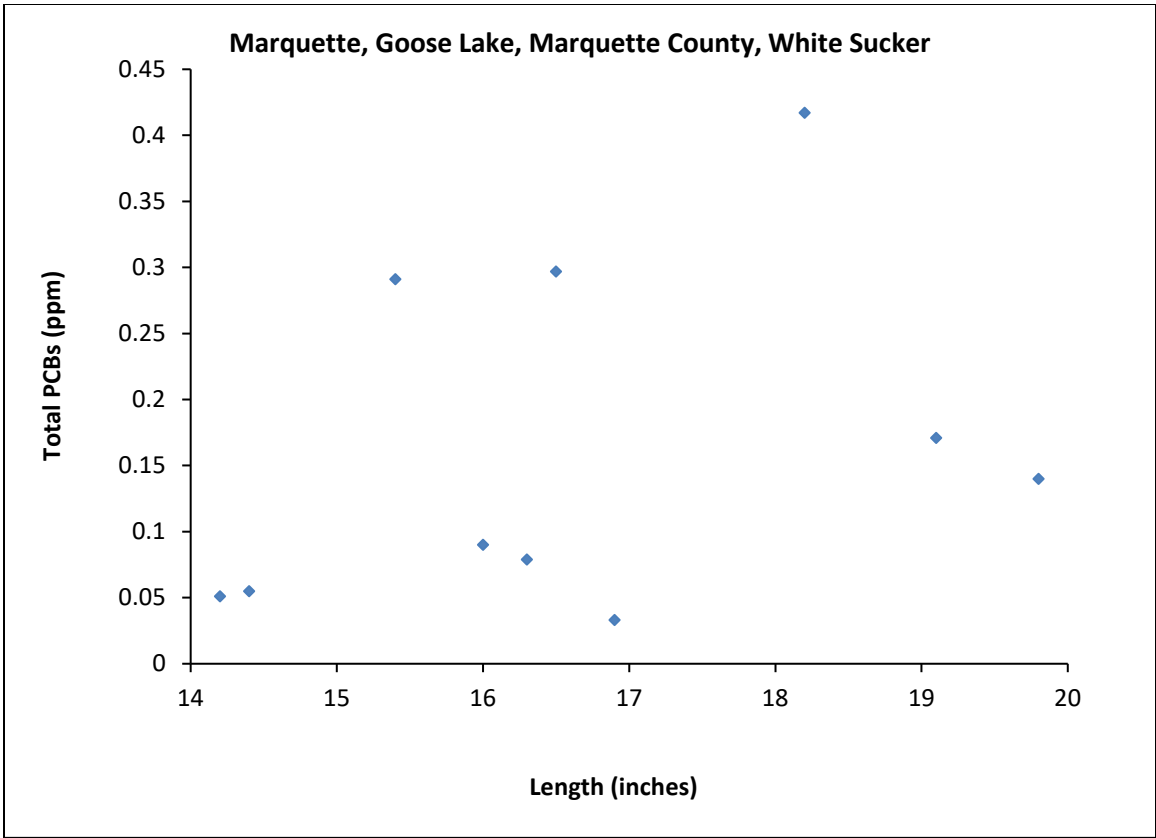
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2008	2008	10	14.2	na	14.2	19.8
Datasets available: 2008						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.16	0.03	0.42	0.26	0.5
DDT	10	0.002	0.001	0.004	0.00	16
Chlordane	10	ND	--	--	--	--
Toxaphene	10	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.108	0.168				
DDT	0.045	0.050				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						0.5

Existing Advisory: Women and children should not eat more than 1 meal per month of Goose Lake white sucker of any size due to PCBs and selenium.

Recommendation: No one should eat more than 6 meals per year of Goose Lake sucker due to PCBs. Selenium would cause an advisory.





Yellow Perch

Goose Lake

Marquette County

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	2001	15	9.1	na	9.1	14.1
Datasets available: 1988, 2001						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	15	0.17	0.07	0.4	0.24	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.345	0.393				

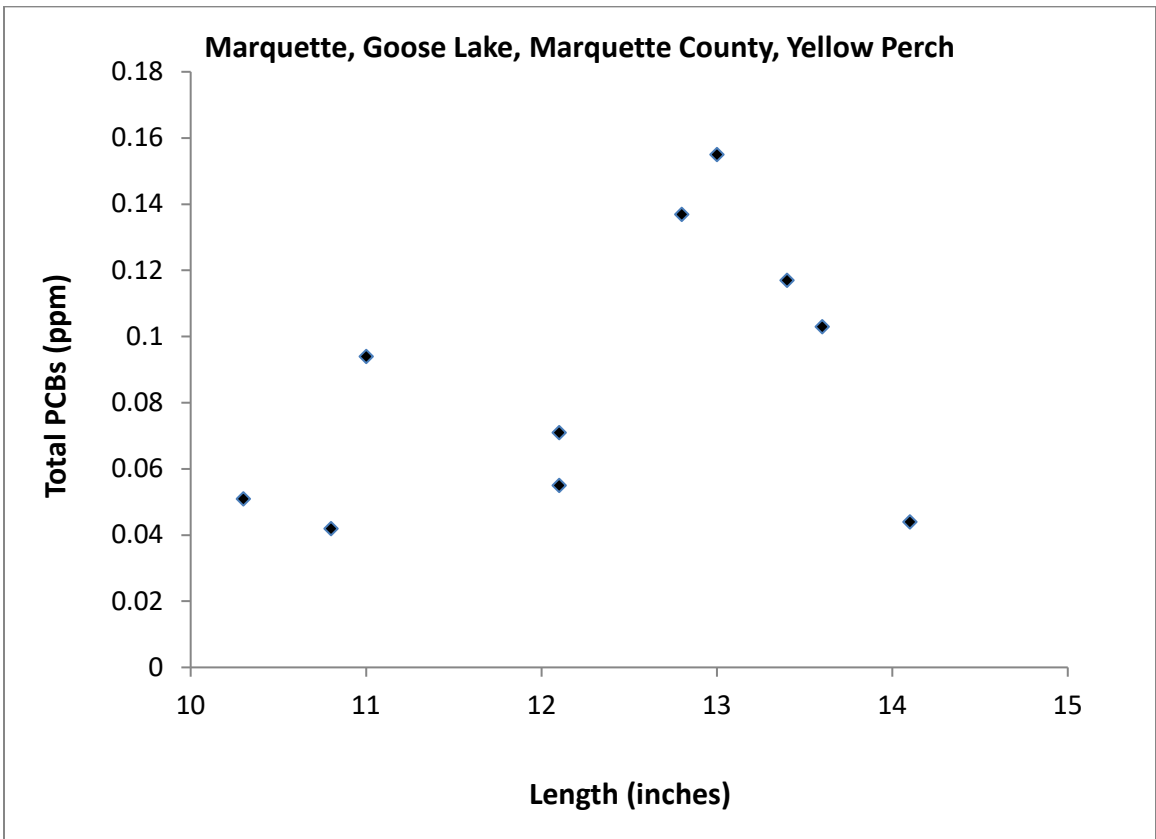
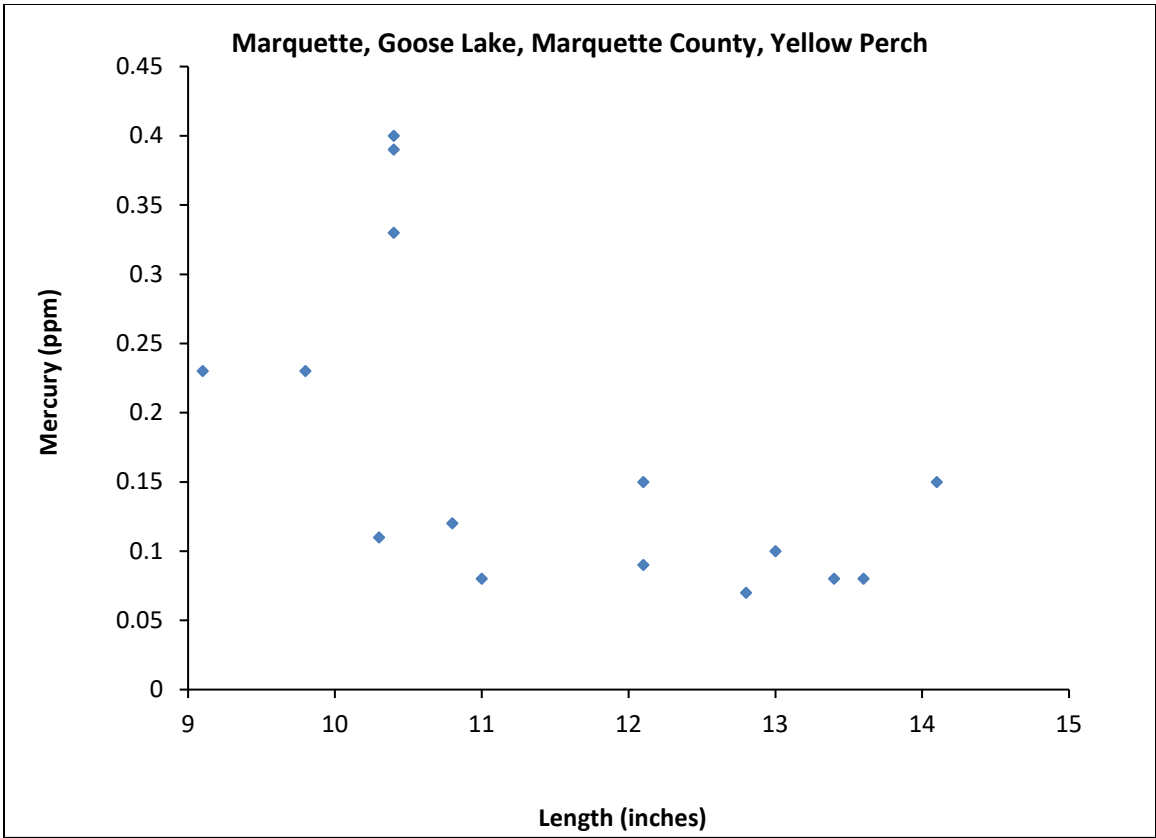
Organics Analysis:

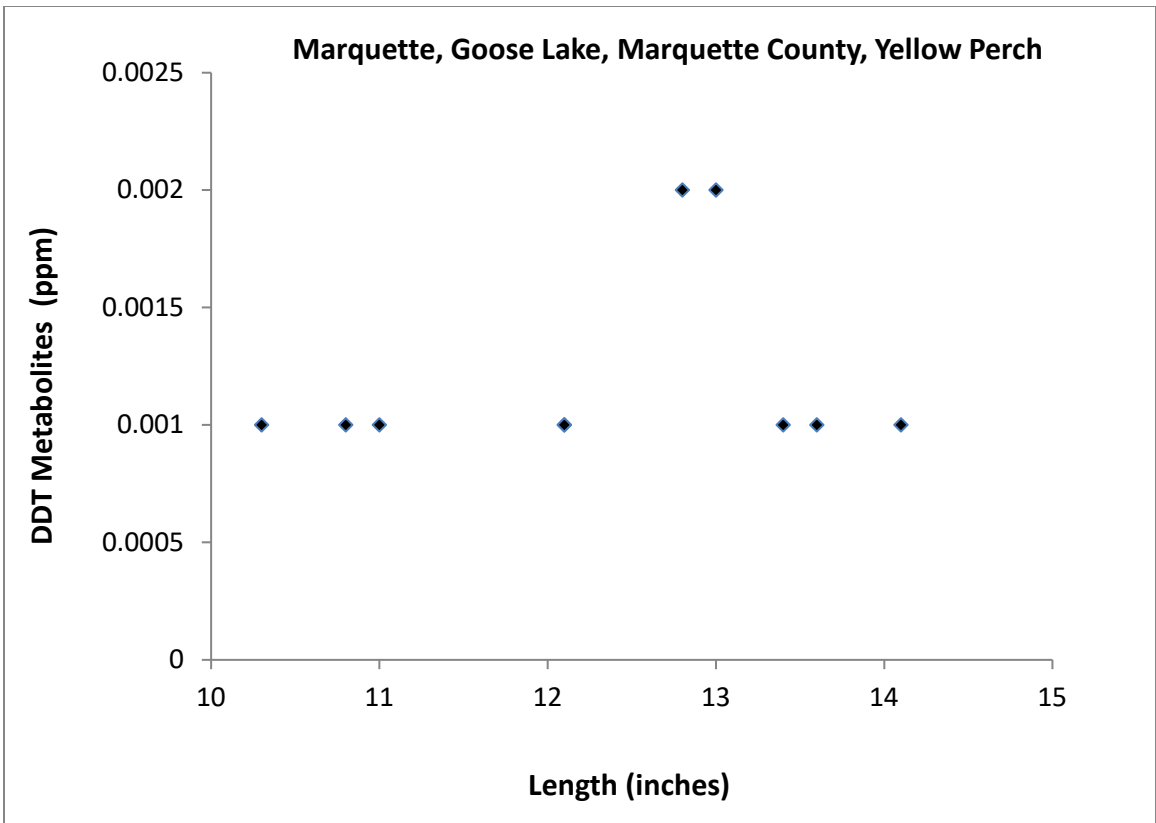
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2001	2001	15	9.1	na	9.1	14.1
Datasets available: 1988, 2001						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.09	0.04	0.16	0.12	1
DDT	10	0.001	0.001	0.002	0.002	16
Chlordane	10	ND	--	--	--	--
Toxaphene	10	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.162	0.150				
DDT	0.056	0.056				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						1

Existing Advisory: Women and children should eat no more than 1 meal per week of Goose Lake yellow perch under 18 inches due to PCBs.

Recommendation: No one should eat more than 1 meal per month Goose Lake yellow perch due to PCBs. Mercury would cause an advisory.

Note: same meal category – 1988+2001 and 2001 data alone





Brook Trout

Halfway Creek

Marquette County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent					
2020	2020	10	7.2	8.0	7.8	10.0
Datasets available: 2020						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	9	0.154	0.078	0.280	0.201	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.104	0.261				

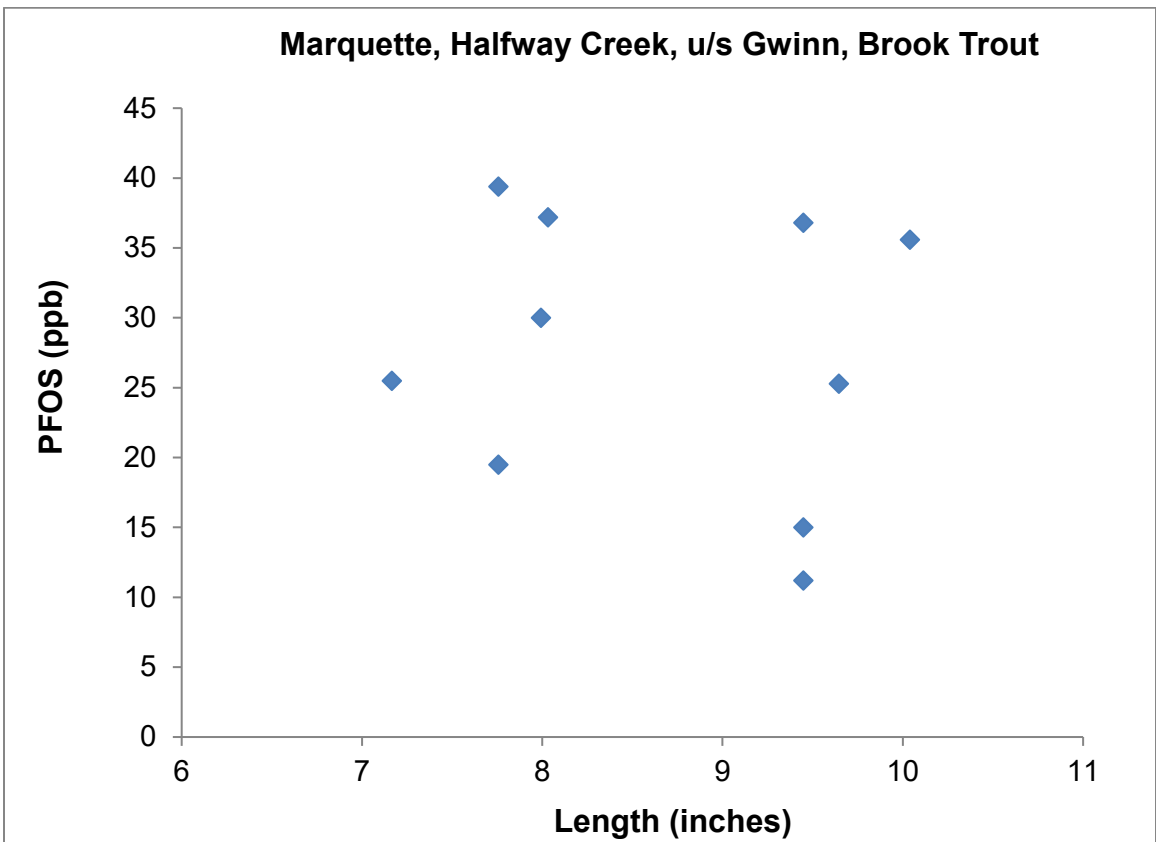
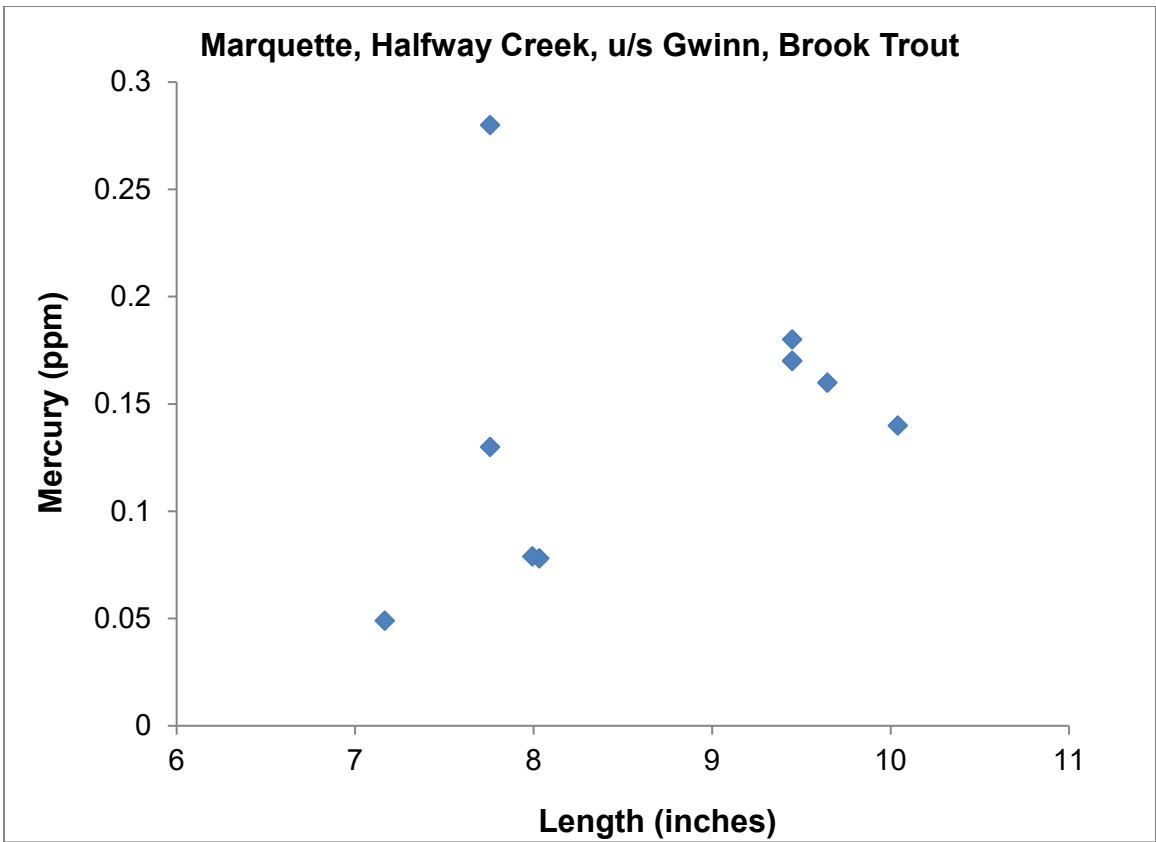
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent					
2020	2020	10	7.2	8.0	7.2	10.0
Datasets available: 2020						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	--	--	--	--	--	--
DDT	--	--	--	--	--	--
Chlordane	--	--	--	--	--	--
Toxaphene	--	--	--	--	--	--
PFOS	10*	27.6 ppb	11.2 ppb	39.4 ppb	34.7 ppb	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
PFOS	0.056	0.030	Final meal category based on UCL:			4

*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.

Existing MDHHS Advisory: Brook trout from Halfway Creek in Marquette County are not currently covered under a consumption advisory.

Recommendation: No one should eat more than four meals per month of brook trout of any size from Halfway Creek in Marquette County due to PFOS and mercury.



Northern Pike

Johnson Lake

Marquette County

Hg Analysis:

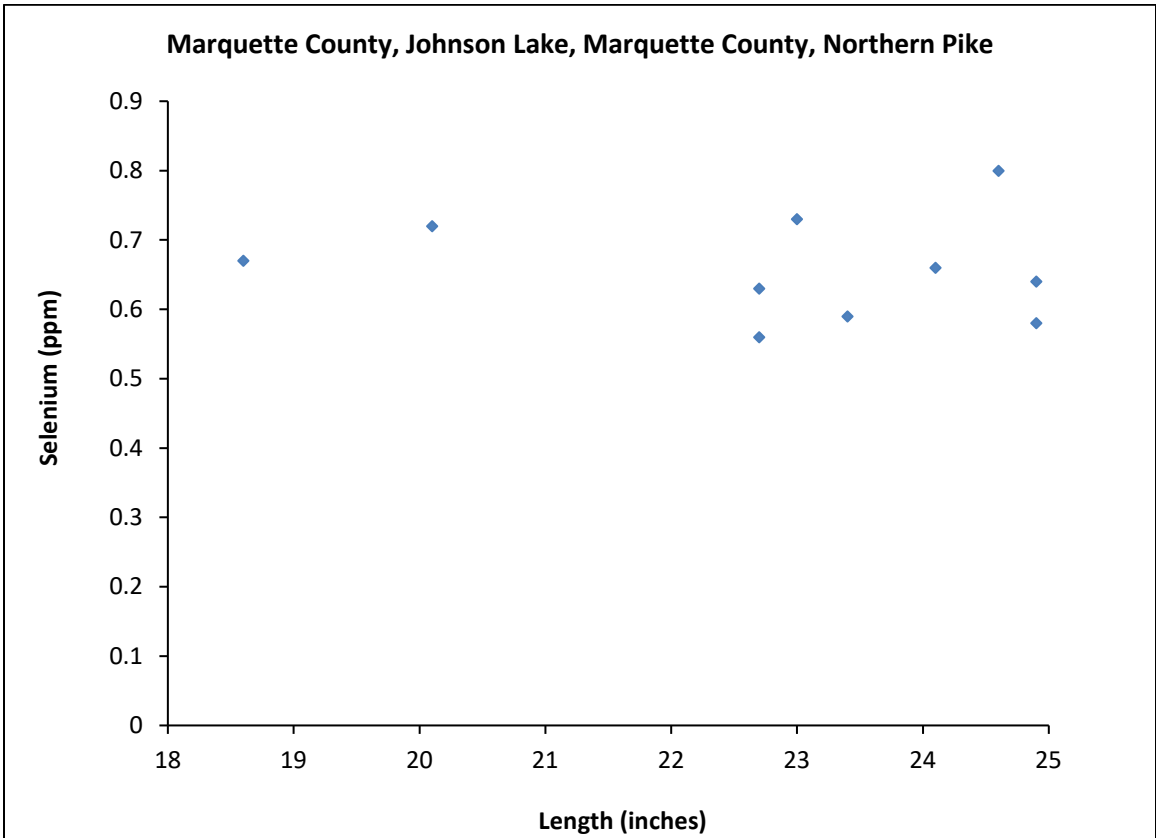
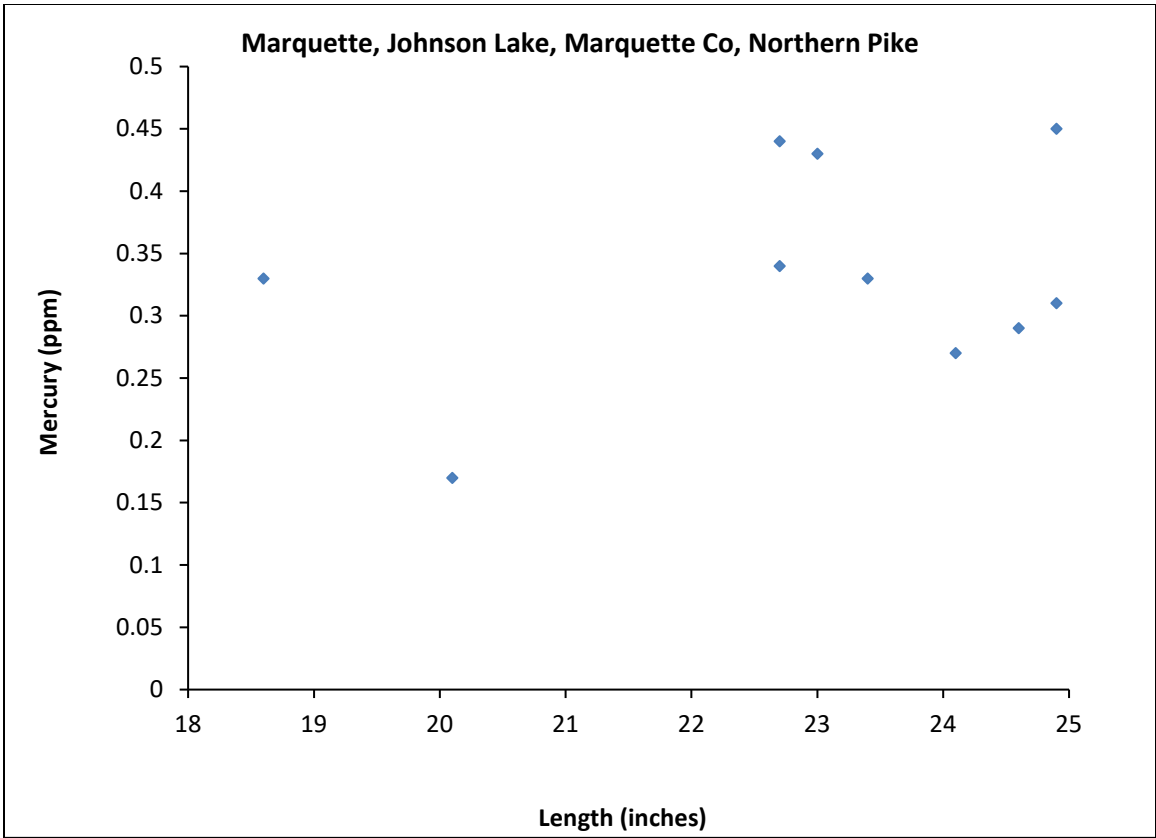
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Size Range of All Samples	
Earliest	Most Recent				Min	Max
2008	2008	10	18.6	24	18.6	24.9
Datasets available: 2008						
Chemical	Sample Size	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	4	0.33	0.27	0.45	--	--
Selenium	4	0.66	0.56	0.80	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.093	0.118				
Selenium	0.015	0.021				

Organics Analysis:

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

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

Recommendation: A dataset of less than five legal length data points for a given chemical, species and waterbody is considered insufficient for evaluation using the standard evaluation method. The statewide guidelines apply to Johnson Lake northern pike: 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.



Lake Herring

Lake Independence

Marquette County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples			
Earliest	Most Recent				Min	Max		
1995	1995	1	14.6	na	--	--		
Datasets available: 1995								
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category		
Mercury	1	--	--	0.2	--	--		
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		
--	--	--	--	--	--	--		
Datasets available: --								
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category		
PCB	0	na	--	--	--	--		
DDT	0	na	--	--	--	--		
Chlordane	0	na	--	--	--	--		
Toxaphene	0	na	--	--	--	--		
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
PCB	--	--						
DDT	--	--						
Chlordane	--	--						
Toxaphene	--	--						
						Final meal category based on UCL:		--

Existing Advisory: Lake Independence lake herring have no existing advisory.

Recommendation: There are insufficient data to develop specific advice for Lake Independence lake herring.

Northern Pike

Lake Independence

Marquette County

Hg Analysis:

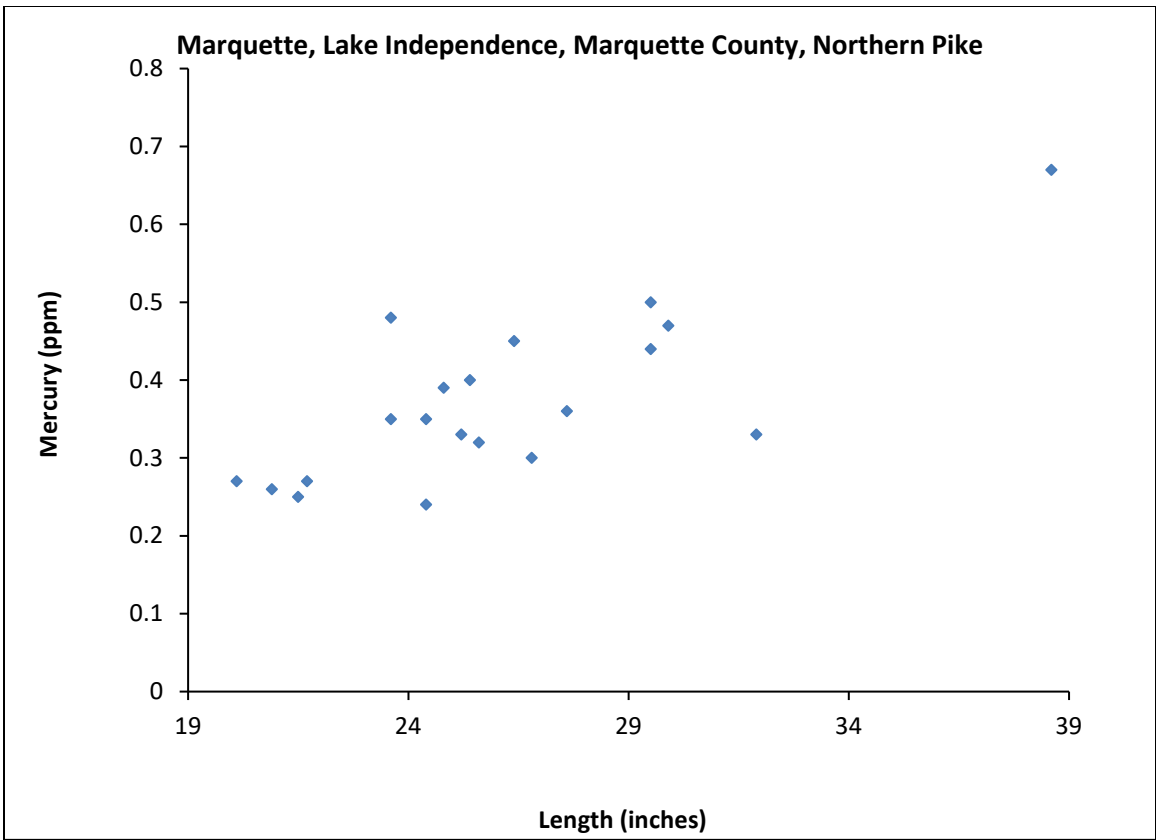
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	1995	20	20.1	24	23.6	38.6
Datasets available: 1989, 1995						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	16	0.4	0.24	0.67	0.45	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.592	0.547				

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:						2

Existing Advisory: Women and children should not eat more than 1 meal per month of Lake Independence northern pike over 30 inches due to mercury.

Recommendation: No one should eat more than 1 meal per month of Lake Independence northern pike larger than 30 inches or more than 2 meals per month of northern pike smaller than 30 inches in length due to mercury. Statewide length break was applied. Sample size above 30 inches is limited and concentrations are increasing with length.



Hg Analysis:

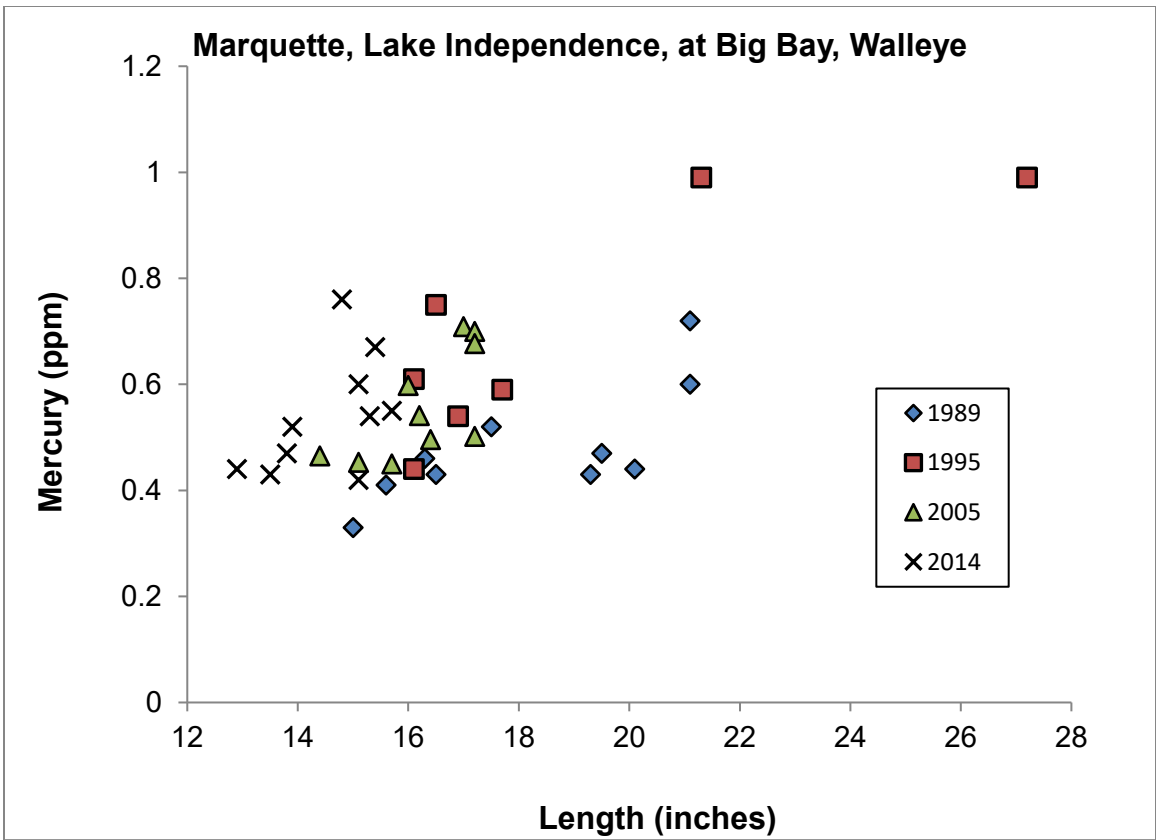
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	2014	37	12.9	15	14.8	27.2
Datasets available: 1989, 1995, 2005, 2014						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	32	0.58	0.33	0.99	0.63	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.340	0.284				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	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: No one should eat more than 1 meal per month of Lake Independence walleye due to mercury.

Recommendation: No change is recommended.



Northern Pike

Lake Le Vasseur

Marquette County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2002	2002	10	21.5	24	23.6	32.5
Datasets available: 2002						
Chemical	Sample Size (All)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	1.41	0.89	2.7	1.77	0.5
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.705	0.555				

Organics Analysis:

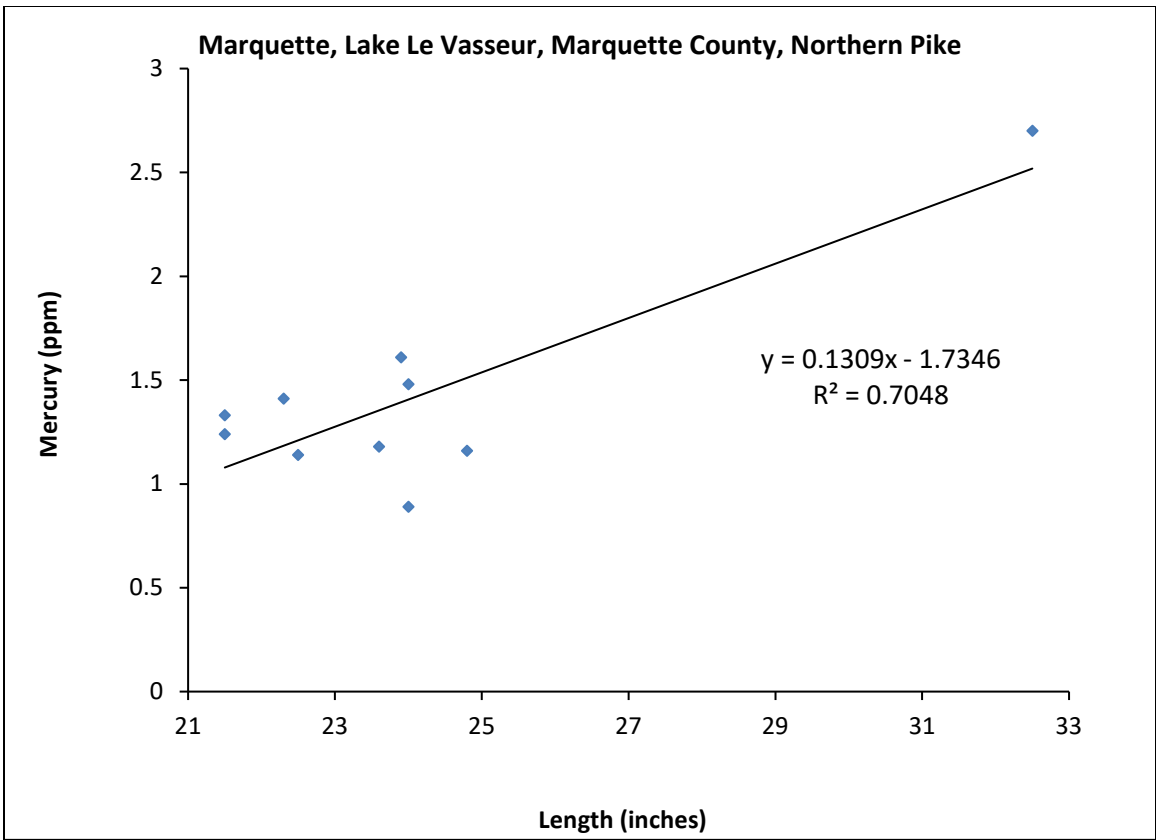
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	--	--	--	--	--
Datasets available: --						
Chemical	Sample Size (All)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						0.5

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
24	1.41	0.5
26	1.67	0.5
28	1.93	0.5
30	2.19	0.5
32	2.45	0
34	2.72	0
36	2.98	0
38	3.24	0
40	3.50	0
<i>Shaded area denotes extrapolated estimates</i>		

Existing Advisory: Women and children should not eat more than 1 meal per month of Lake Le Vasseur northern pike smaller than 26 inches and should not eat any of those fish over 26 inches.

Recommendation: No one should eat more than 6 meals per year of Lake Le Vasseur northern pike smaller than 30 inches and should not eat any of those fish larger than 30 inches due to mercury.

Note: one point for drives the regression but the resulting line and advice based on the line is matches the use of one more category restrictive meal advice for larger fish.



Lake Herring

Lake Michigamme

Marquette County

Hg Analysis:

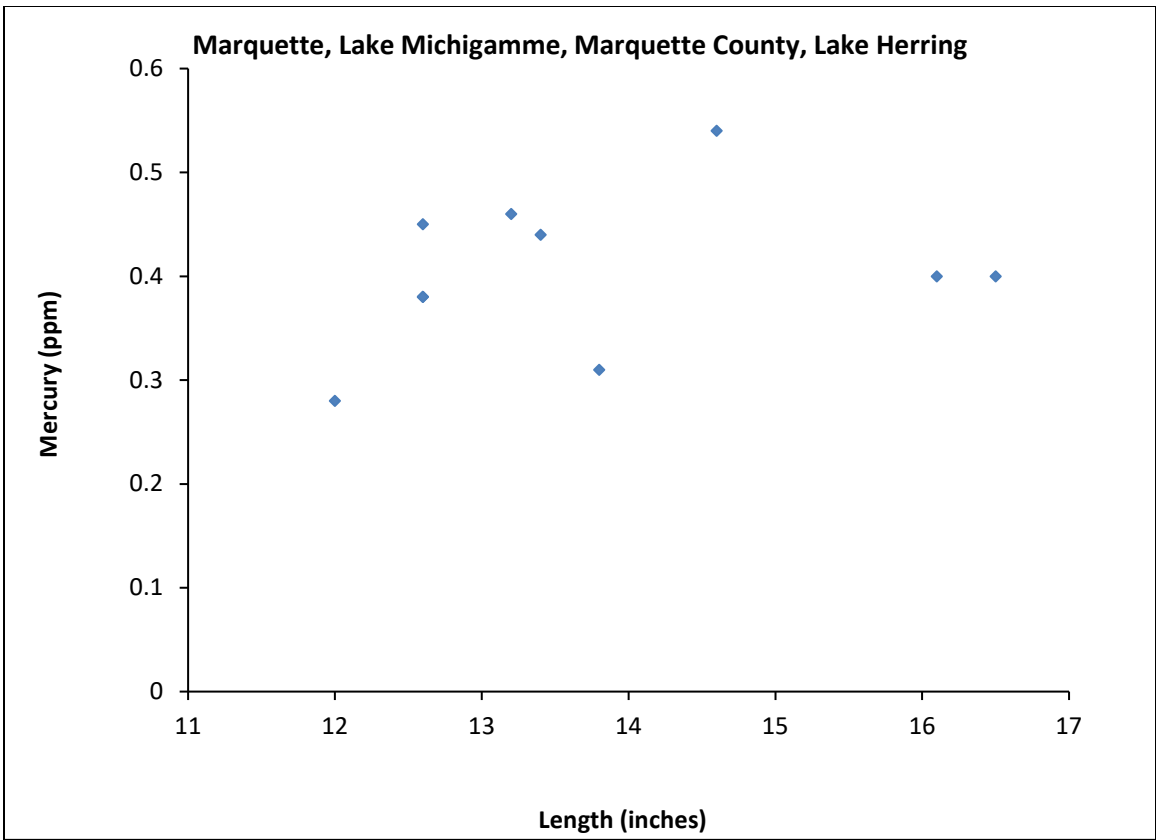
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1997	1997	10	12	na	12	16.5
Datasets available: 1997						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.40	0.28	0.54	0.46	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.066	0.078				

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:						2

Existing Advisory: Lake Michigamme lake herring have no existing advisory.

Recommendation: No one should eat more than 2 meals per month of Lake Michigamme lake herring due to mercury.



Northern Pike

Lake Michigamme

Marquette County

Hg Analysis:

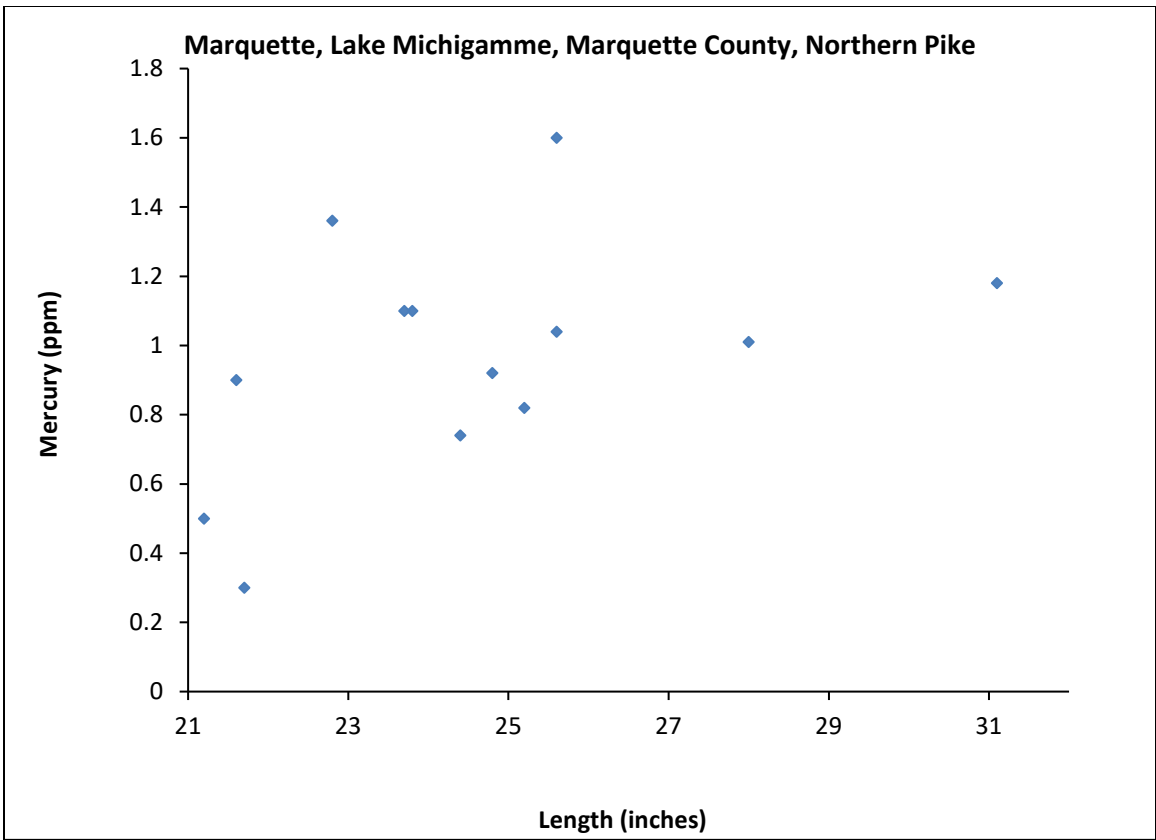
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1984	1997	13	21.2	24	23.7	31.1
Datasets available: 1984, 1997						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	9	1.06	0.74	1.6	1.25	0.5
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.199	0.235				

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:						0.5

Existing Advisory: Women and children should not eat more than 1 meal per month of Lake Michigamme northern pike.

Recommendation: No one should eat more than 6 meals per year of Lake Michigamme northern pike smaller than 30 inches and no one should eat any of those fish larger than 30 inches due to mercury. The statewide length break was applied as sample size was limited over 30 inches.



Rock Bass

Lake Michigamme

Marquette County

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	2006	14	7.4	na	7.4	11
Datasets available: 1984, 2006						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	14	0.69	0.2	1.2	0.83	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.251	0.219				

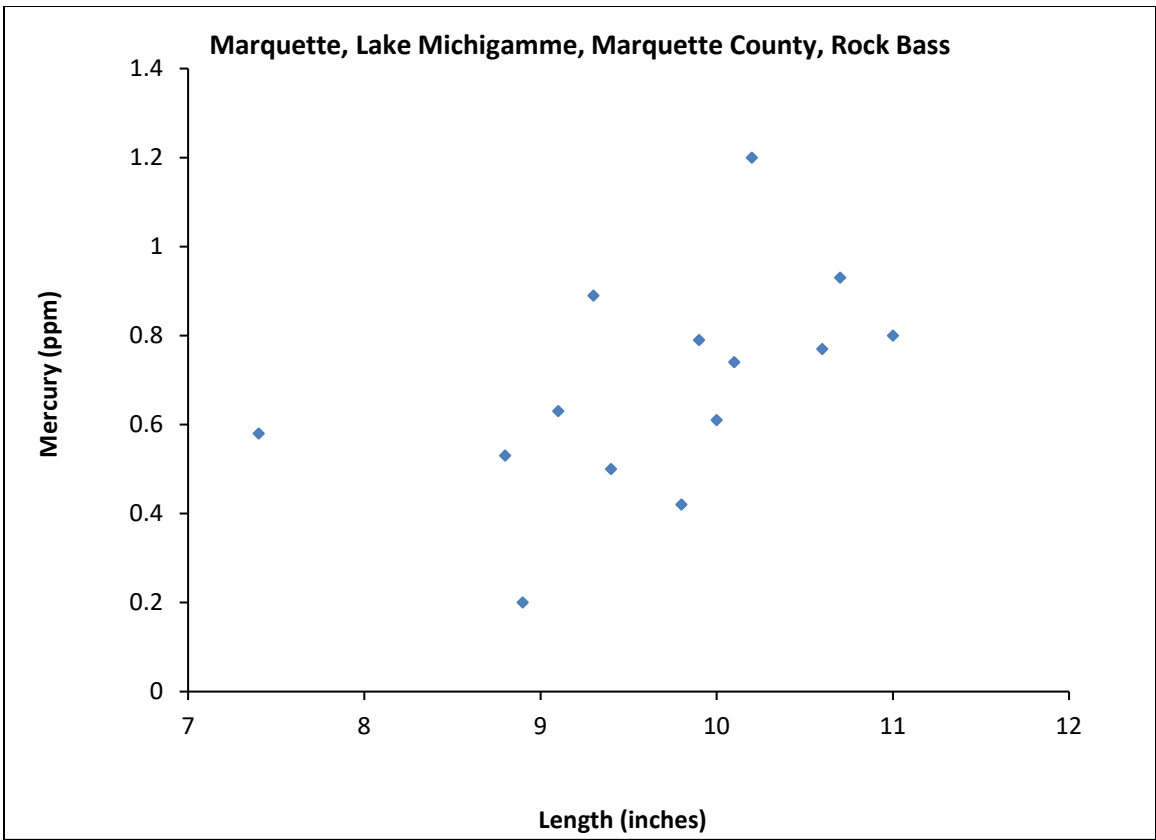
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	--	--	--	--	--
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: Lake Michigamme rock bass are covered under the statewide mercury advisory.

Recommendation: No one should eat more than 1 meal per month of Lake Michigamme rock bass due to mercury.

Note: almost identical values with 1984+2006 or only 2006 data



Walleye

Lake Michigamme

Marquette County

Hg Analysis:

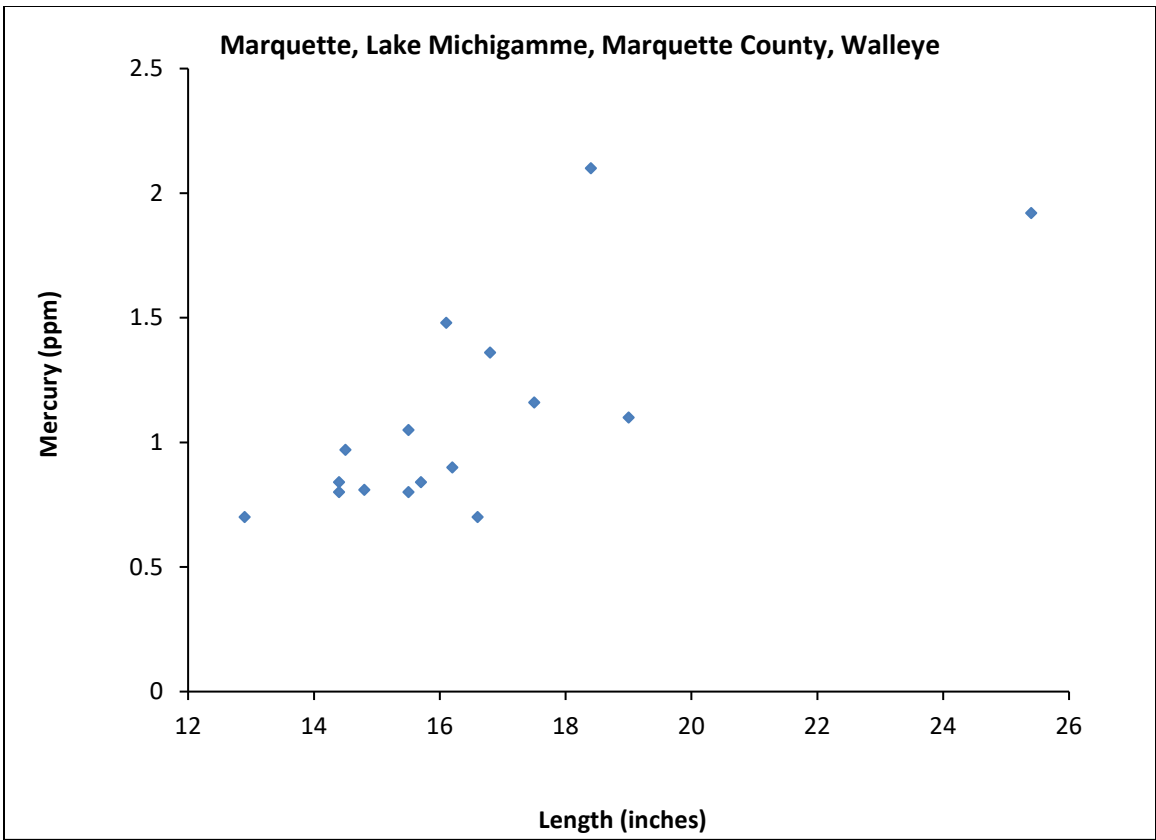
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1984	2006	16	12.9	15	14.5	25.4
Datasets available: 1984, 2006						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	13	1.17	0.7	2.1	1.43	0.5
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.531	0.519				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	--	--	--	--	--
Datasets available: --						
Chemical	Sample Size (All)	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:						0.5

Existing Advisory: Women and children should not eat more than 1 meal per month of Lake Michigamme walleye under 18 inches and should not eat any walleye over 18 inches due to mercury.

Recommendation: No one should eat more than 6 meals per year of Lake Michigamme walleye smaller than 20 inches or eat any walleye over 20 inches due to mercury. The statewide length break was applied as sample size was limited over 20 inches.



White Sucker

Lake Michigamme

Marquette County

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	1997	15	14	na	14	20.5
Datasets available: 1984, 1997						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	15	0.34	0.1	0.69	0.45	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.748	0.815				

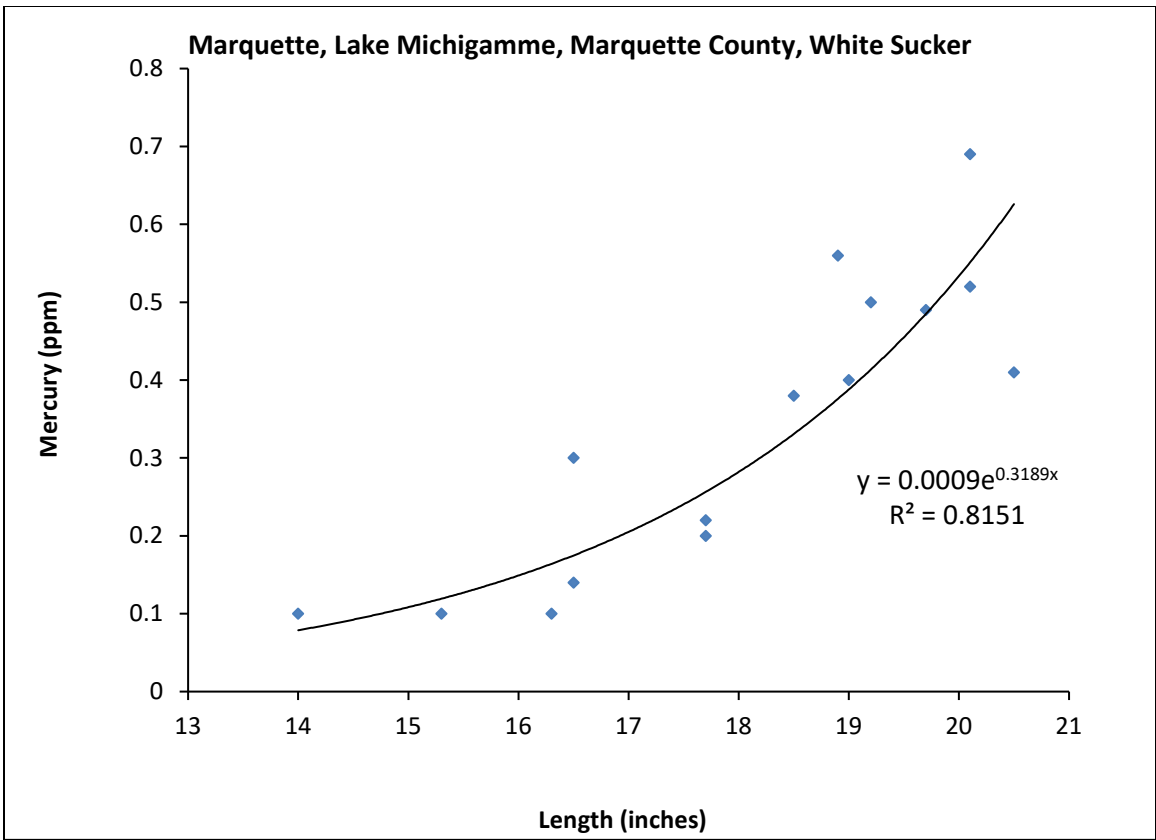
Organics Analysis:

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:						2

Existing Advisory: Women and children should not eat more than 1 meal per month of Lake Michigamme suckers over 18 inches.

Recommendation: No one should eat more than 4 meals per month of Lake Michigamme sucker smaller than 18 inches or more than 2 meals per month of those fish larger than 18 inches due to mercury.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
12	0.04	16
14	0.08	12
16	0.15	4
18	0.28	2
20	0.53	2
22	1.00	1
24	1.90	0.5
26	3.59	0
28	6.79	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
1984	1984	4	7.3	na	7.3	12.1
Datasets available: 1984						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	4	0.48	0.2	0.9	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

Organics Analysis:

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

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

Recommendation: A dataset of less than five data points for a given chemical, species and waterbody is considered insufficient for evaluation using the standard evaluation method. No one should eat more than 2 meals per month of Lake Michigamme yellow perch due to mercury.

Note: Guideline is one meal category more restrictive than statewide guideline based on the available data and consideration of the walleye and northern pike mercury concentrations resulting in a guideline more restrictive than the statewide guideline.

Walleye

Little Lake

Marquette County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2002	2002	10	15.6	15	15.6	20.8
Datasets available: 2002						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.26	0.17	0.36	0.31	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.653	0.639				

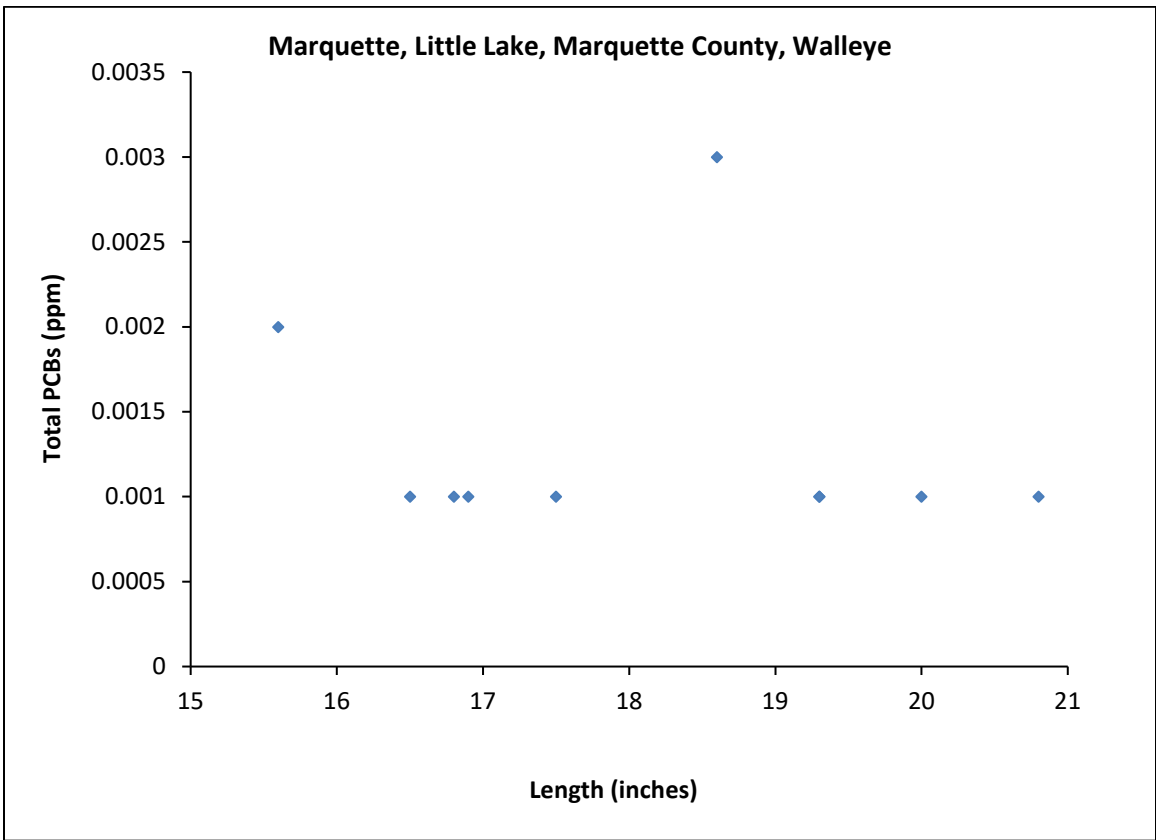
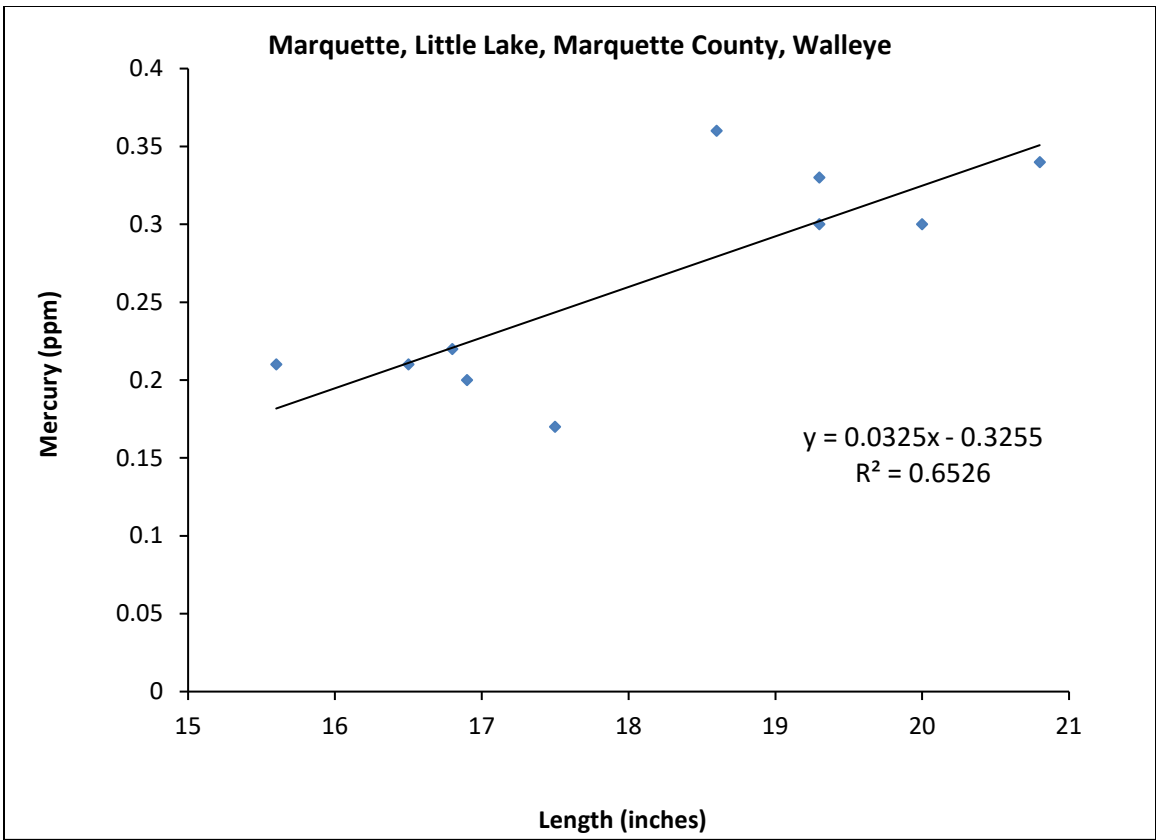
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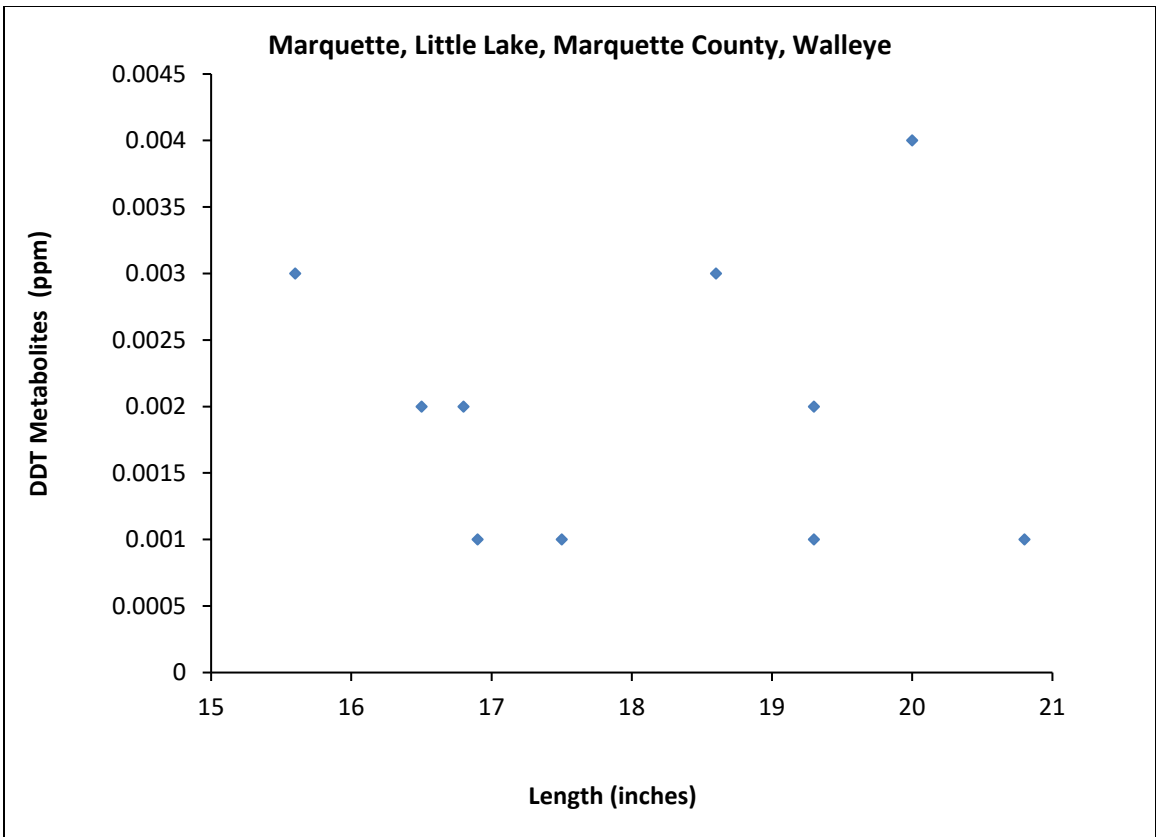
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2002	2002	10	15.6	15	15.6	20.8
Datasets available: 2002						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.001	0.001	0.003	0.002	16
DDT	10	0.002	0.001	0.004	0.003	16
Chlordane	10	ND	--	--	--	--
Toxaphene	10	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.023	0.043				
DDT	0.000	0.012				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						2

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

Recommendation: No one should eat more than 4 meals per month of Little Lake walleye smaller than 18 inches or more than 2 meals per month of those fish larger than 18 inches due to mercury.

Length (Inches)	Regression Equation Estimate (ppm)	Meal Category
15	0.16	4
16	0.19	4
18	0.26	4
20	0.32	2
22	0.39	2
24	0.45	2
26	0.52	2
28	0.58	1
30	0.65	1
<i>Shaded area denotes extrapolated estimates</i>		





Lake Whitefish

Perch Lake

Marquette County

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	1	15.2	na	--	15.2
Datasets available: 1984						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	1	--	--	0.3	--	--
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
--	--	--	--	--	--	--
Datasets available: --						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						--

Existing Advisory: Perch Lake lake whitefish have no existing advisory.

Recommendation: There are insufficient data available to develop specific advice for Perch Lake lake whitefish.

**Longnose Sucker
White Sucker
Hg Analysis:**

Perch Lake

Marquette County

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1984	1984	3	18.4	na	18.4	21.1
Datasets available: 1984						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	3	0.4	0.3	0.5	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

Organics Analysis:

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

Existing Advisory: Perch Lake suckers have no existing advisory.

Recommendation: A dataset of less than five data points for a given chemical, species and waterbody is considered insufficient for evaluation using the standard evaluation method. The statewide advice due to mercury applies to Perch Lake sucker: No one should eat more than 8 meals per month of sucker from inland waters.

Northern Pike

Perch Lake

Marquette County

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	6	17.8	24	23.6	26.5
Datasets available: 1984						
Chemical	Sample Size (All)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	6	0.43	0.3	0.6	0.54	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.293	0.242				

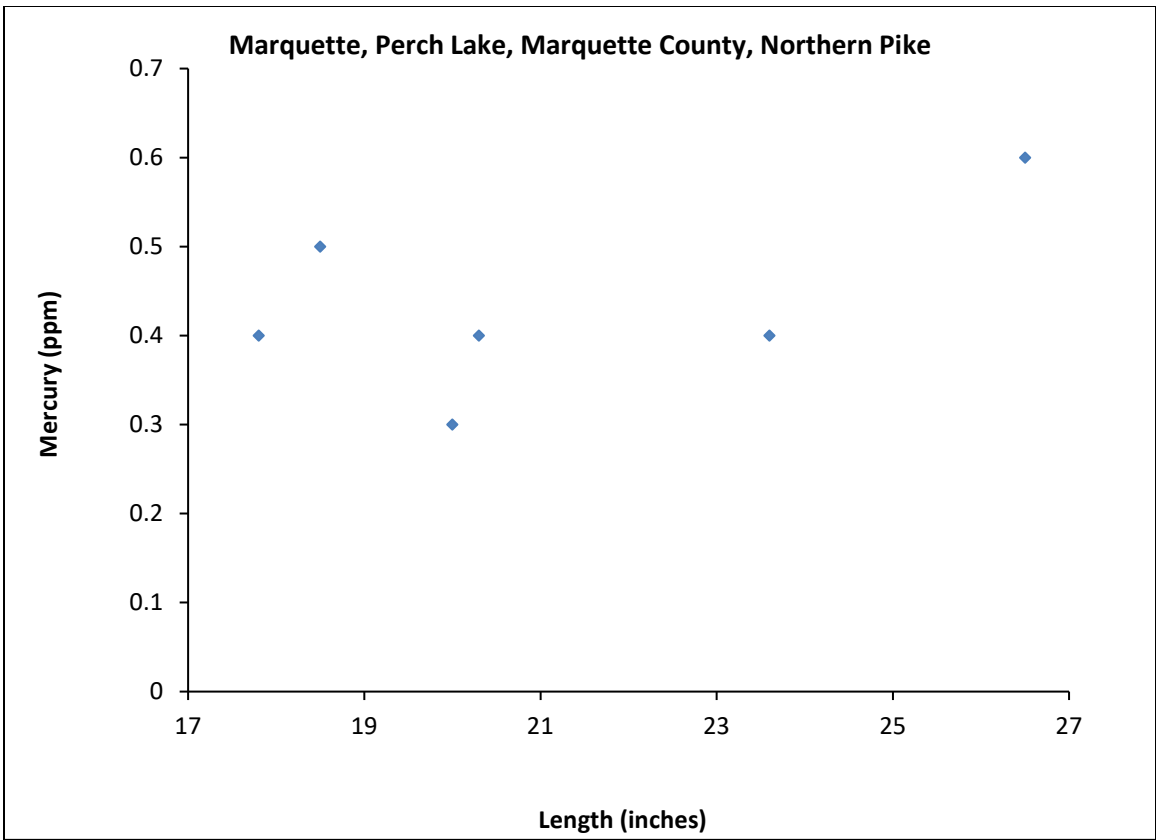
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	--	--	--	--	--
Datasets available: --						
Chemical	Sample Size (All)	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: Perch Lake northern pike are covered under the statewide mercury advisory.

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

Note: Advice is one step more restrictive than statewide advice for the species based on elevated mercury concentrations measured in sub-legal samples.



Rock Bass

Perch Lake

Marquette County

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	1	8.2	na	--	8.2
Datasets available: 1984						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	1	--	--	0.4	--	--
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
--	--	--	--	--	--	--
Datasets available: --						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						--

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

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

Smallmouth Bass

Perch Lake

Marquette County

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	1	12.1	14	--	--		
Datasets available:		1984						
Chemical	Sample Size (All)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category		
Mercury	1	--	--	0.1	--	--		
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		
--	--	--	--	--	--	--		
Datasets available:		--						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category		
PCB	0	--	--	--	--	--		
DDT	0	--	--	--	--	--		
Chlordane	0	--	--	--	--	--		
Toxaphene	0	--	--	--	--	--		
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
PCB	--	--						
DDT	--	--						
Chlordane	--	--						
Toxaphene	--	--						
						Final meal category based on UCL:		--

Existing Advisory: Perch Lake smallmouth bass are covered under the statewide mercury advisory.

Recommendation: A dataset of less than five data points for a given chemical, species and waterbody is considered insufficient for evaluation using the standard evaluation method. The statewide guidelines apply: 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.

Yellow Perch

Perch Lake

Marquette County

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	4	10.8	na	10.8	11.8
Datasets available: 1984						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	4	0.33	0.2	0.4	--	--
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
--	--	--	--	--	--	--
Datasets available: --						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						--

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

Recommendation: A dataset of less than five data points for a given chemical, species and waterbody is considered insufficient for evaluation using the standard evaluation method. The statewide guidelines apply: No one should eat more than 4 meals per month of yellow perch from inland waters.

Largemouth Bass

**Round Lake
Champion Township**

Marquette County

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	12.6	14	14.6	15.7
Datasets available: 2005						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	8	1.0	0.783	1.232	1.13	0.5
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.336	0.371				

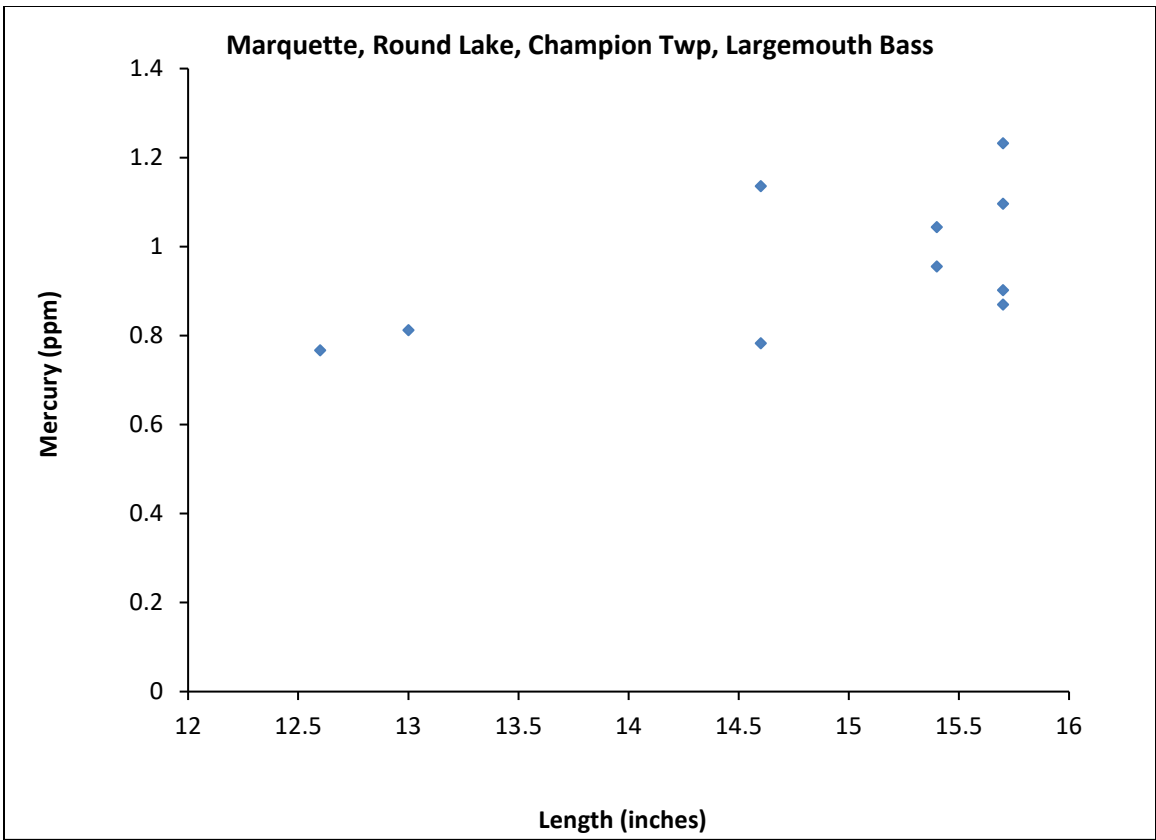
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	--	--	--	--	--
Datasets available: --						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	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:						0.5

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

Recommendation: No one should eat more than 6 meals per month of Round Lake largemouth or smallmouth bass smaller than 18 inches due to mercury. No one should eat any of those fish larger than 18 inches. Statewide length break applied.

Note: The size range of fish in this sample set is limited.



Northern Pike

**Schweitzer Creek
Schweitzer Reservoir**

Marquette County

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	10	17.5	24	24.2	30.3
Datasets available: 1992, 2008						
Chemical	Sample Size (All)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.47	0.12	0.81	0.64	1
Selenium	4	1.98	1.70	2.40	2.45	12
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.780	0.662				
Selenium	--	--				

Organics Analysis:

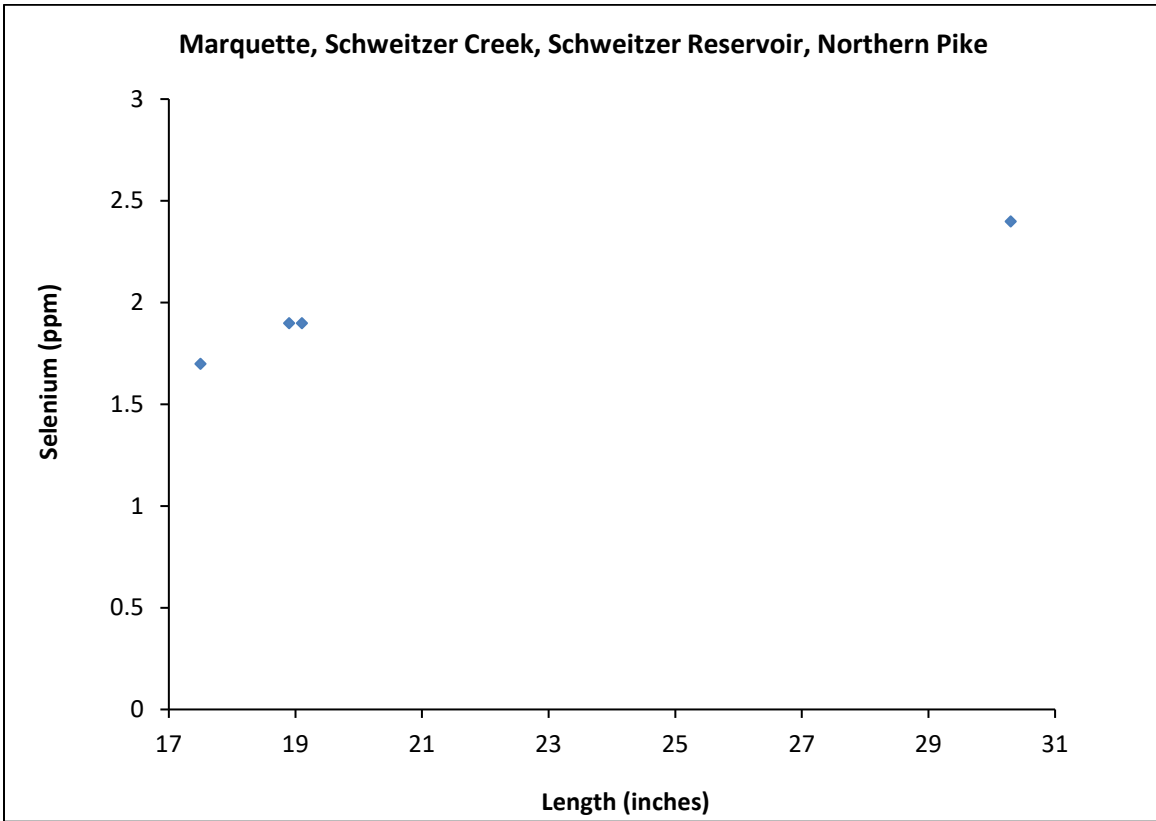
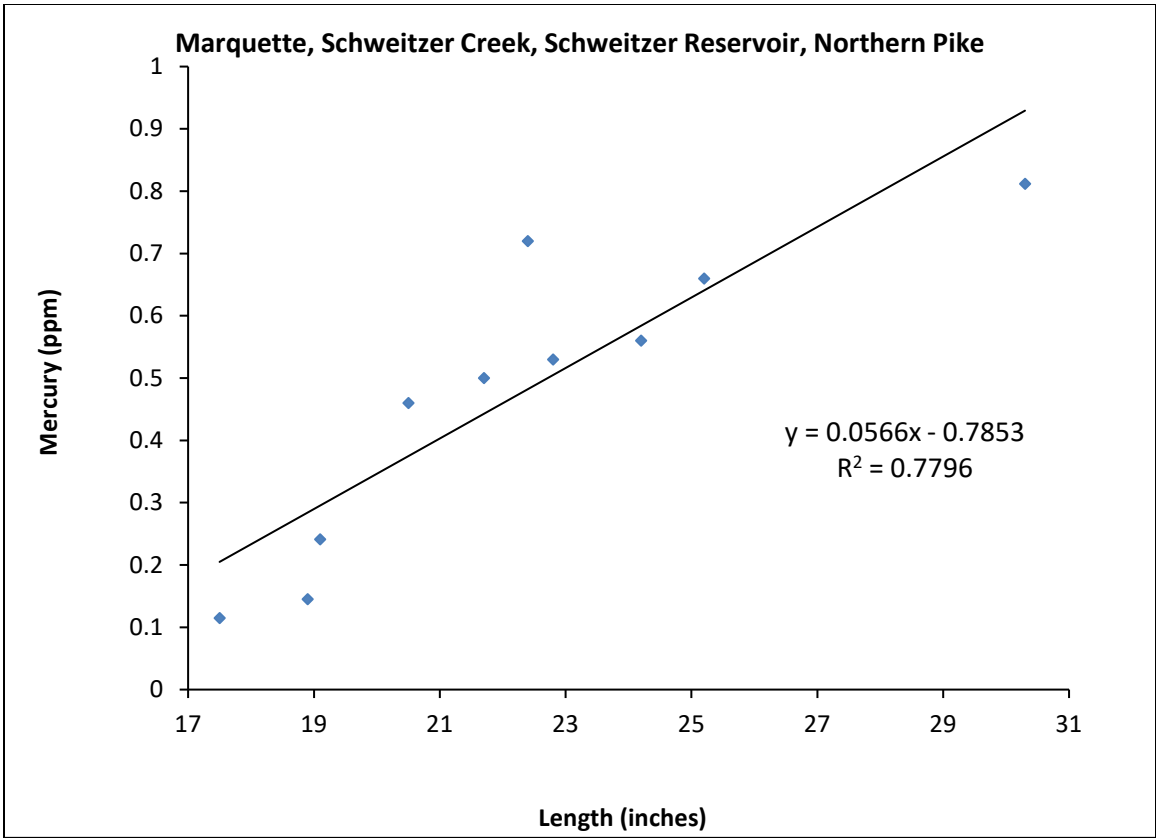
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1992	2008	6	20.5	24	24.2	25.2
Datasets available: 1992, 2008						
Chemical	Sample Size (All)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	6	ND	--	--	--	--
DDT	6	ND	--	--	--	--
Chlordane	6	ND	--	--	--	--
Toxaphene	6	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						1

Existing Advisory: Northern pike from Schweitzer Reservoir are covered under the statewide mercury advisory.

Recommendation: No one should eat more than 1 meal per month of Schweitzer Reservoir northern pike smaller than 30 inches or more than 6 meals per year of those fish larger than 30 inches due to mercury. Statewide length break applied. Limited sample size exists over 30 inches. Selenium would cause an advisory.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
24	0.57	1
26	0.69	1
28	0.80	1
30	0.91	1
32	1.03	1
34	1.14	0.5
36	1.25	0.5
38	1.37	0.5
40	1.48	0.5

Shaded area denotes extrapolated estimates



Walleye

**Schweitzer Creek
Schweitzer Reservoir**

Marquette County

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	17.3	15	--	--
Datasets available: 1992						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	1	--	--	0.56	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

Organics Analysis:

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

Existing Advisory: Schweitzer Reservoir walleye are covered under the statewide mercury advisory.

Recommendation: A dataset of less than five data points for a given chemical, species and waterbody is considered insufficient for evaluation using the standard evaluation method. The statewide guideline applies: No one should eat more than 1 meal per month of walleye larger than 20 inches or more than 2 meals per month of walleye smaller than 20 inches.

Brook Trout

Silver Lead Creek

Marquette County

Hg Analysis:

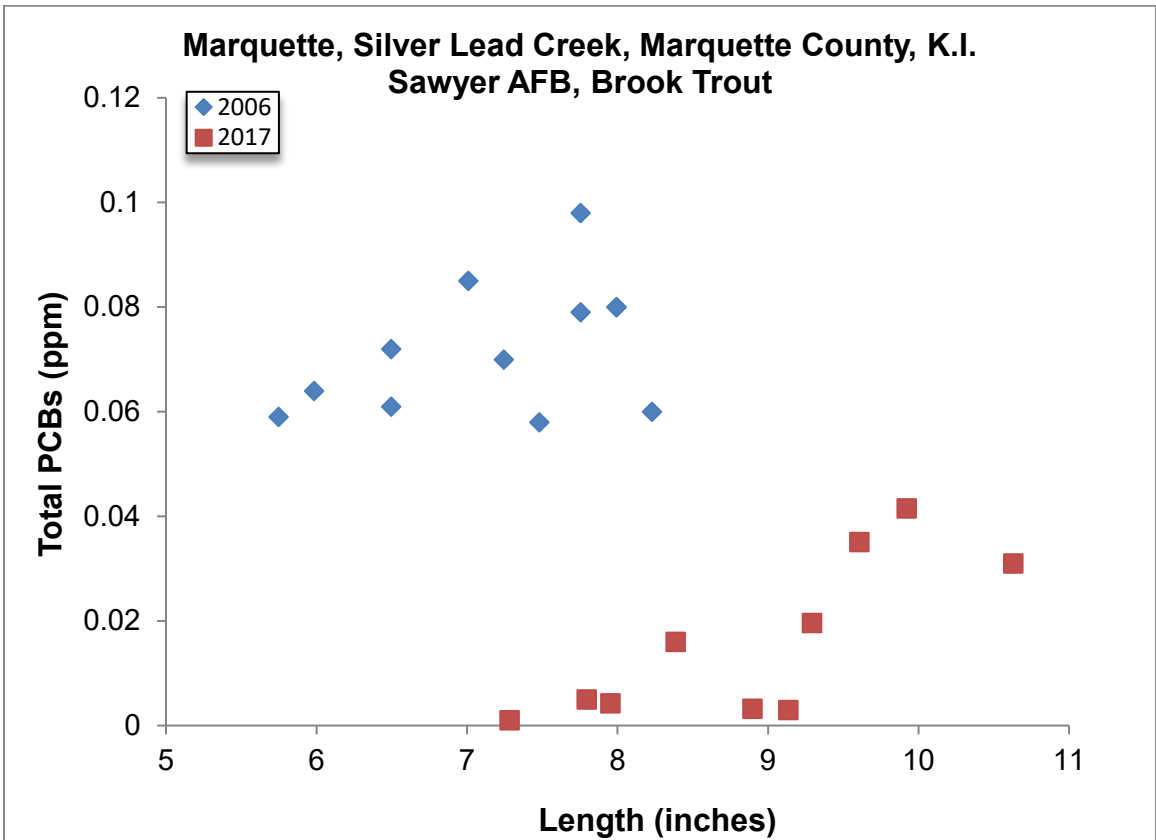
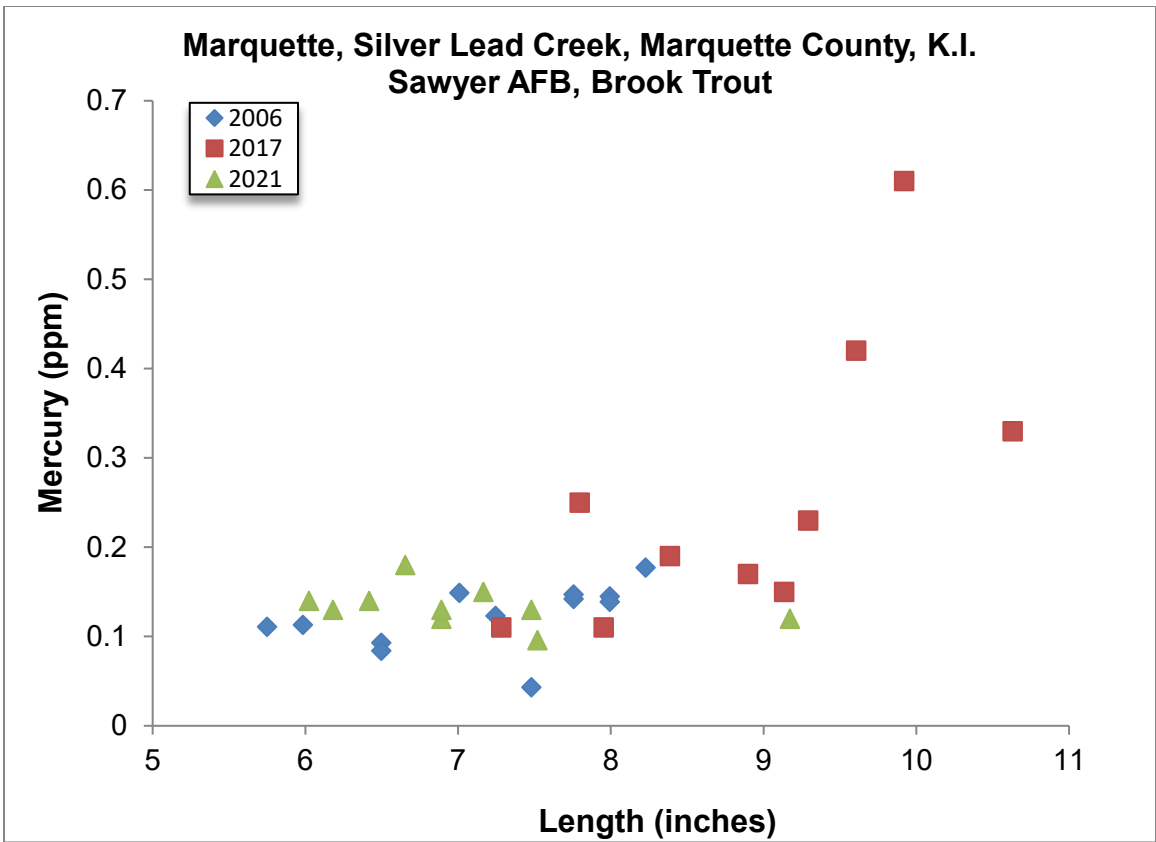
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2006	2021	32	5.7	7.0	6.5	10.6
Datasets available: 2006, 2017, 2021						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	27	0.175	0.043	0.610	0.221	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.468	0.462				

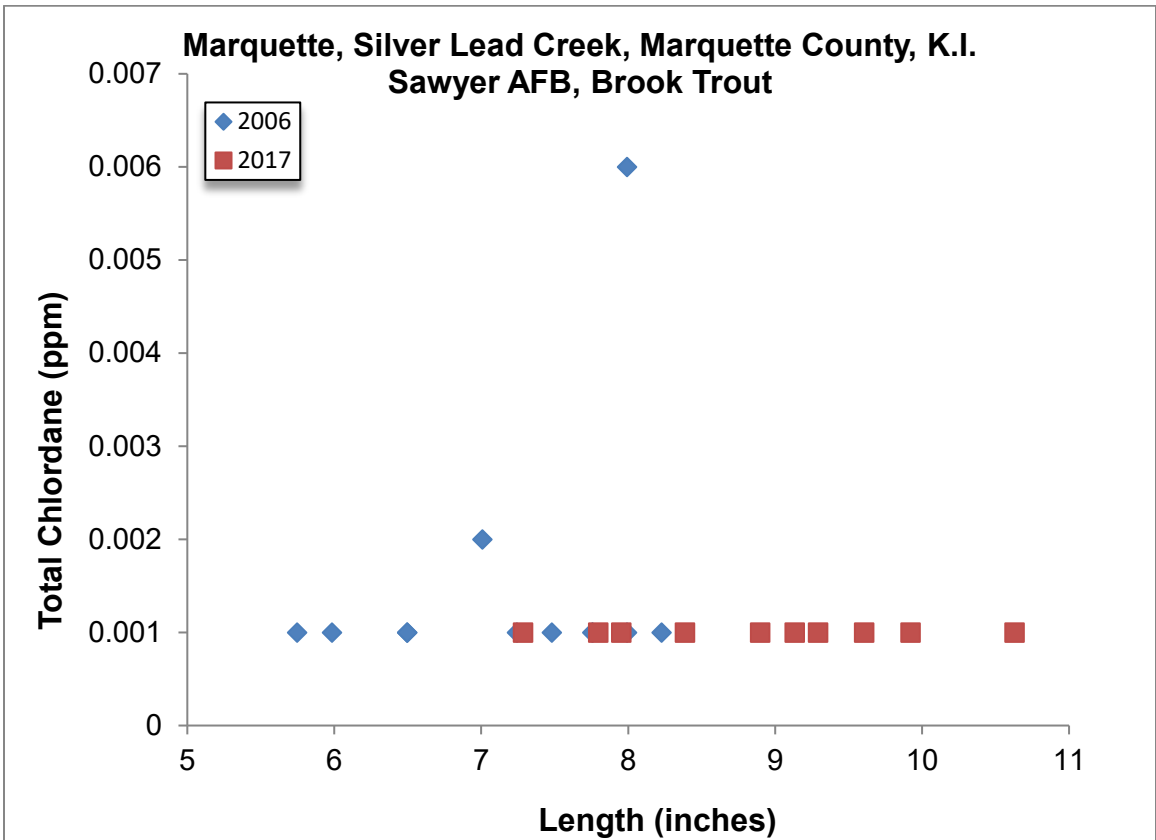
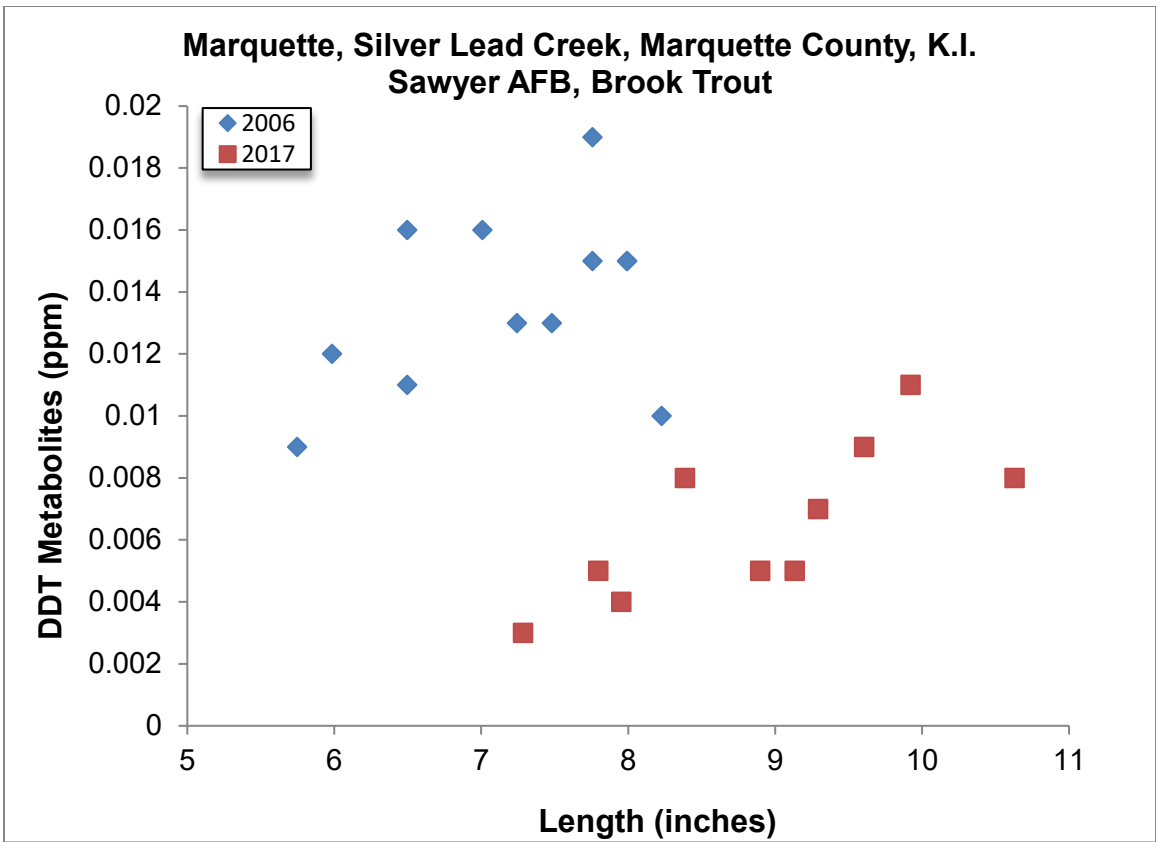
Organics Analysis:

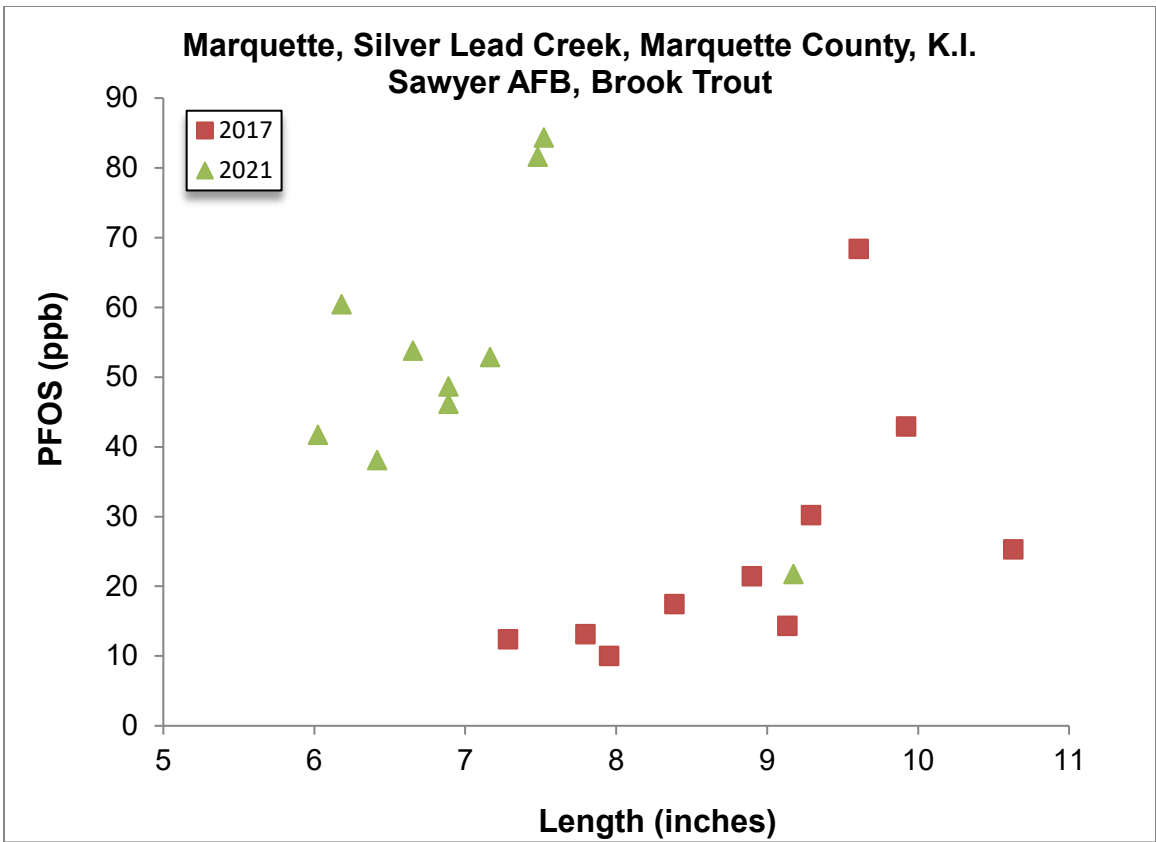
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2006	2021	32	5.7	7.0	6.5	10.6
Datasets available: 2006 (No PFOS), 2017, 2021 (Only PFOS)						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	20	0.045	<0.001	0.098	0.061	2
DDT	20	0.010	0.003	0.019	0.013	16
Chlordane	20	0.001	<0.001	0.006	0.002	16
Toxaphene	20	ND	--	--	--	--
PFOS	20	39.3 ppb	10.0 ppb	84.4 ppb	50.0 ppb	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.189	0.070				
DDT	0.105	0.071				
Chlordane	0.001	0.003				
Toxaphene	--	--				
PFOS	0.091	0.083				
Final meal category based on UCL:						2

Existing MDHHS Advisory: No one should eat more than 2 meals per month of brook trout of any size from Silver Lead Creek in Marquette County due to PCBs and PFOS.

Recommendation: No change to the advisory is recommended.







Species
Largemouth Bass

Water Body – Location
Ski-kwe zaag’igan
SW of Republic
(46.298, -88.064)

County
Marquette

Table 1: Edible portion chemistry data sets available. Check marks indicate the chemical was analyzed in that data set. Non-bolded check marks indicate those data were retired and not used in the analysis.

Year	Sample Size (N)	Min Length (in)	Max Length (in)	Legal Size (in)	Hg	PCBs	DDT	Chlordane	Toxaphene	PFOS	TEQ
1993	10	7.5	13.0	14.0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Table 2: Chemical analysis summary. NA = Not analyzed; ND = Non-detect; Conc. = Concentration; ppm = parts per million; ppb = parts per billion; ppt = parts per trillion; Sub-legal? = if checked, sub-legal sized fish were used in the chemical specific analysis; UCL = Upper Confidence Limit

Chemical	N	Sub-legal ?	Min Length (in)	Max Length (in)	Conc. Unit	Mean Conc.	Min Conc.	Max Conc.	95% UCL Conc.	Meal Category
Mercury	10	<input checked="" type="checkbox"/>	7.5	13.0	ppm	0.206	0.120	0.320	0.252	4
PCB	10	<input checked="" type="checkbox"/>	7.5	13.0	ppm	ND	--	--	--	--
DDT	10	<input checked="" type="checkbox"/>	7.5	13.0	ppm	0.004	<0.003	0.009	0.006	16
Chlordane	10	<input checked="" type="checkbox"/>	7.5	13.0	ppm	ND	--	--	--	--
Toxaphene	10	<input checked="" type="checkbox"/>	7.5	13.0	ppm	ND	--	--	--	--
TEQ	0	<input type="checkbox"/>	--	--	ppt	--	--	--	--	--
PFOS	0	<input type="checkbox"/>	--	--	ppb	--	--	--	--	--

Table 3: Final meal category and basis for recommendation.

Final Meal Category	Basis	Chemical Driver
4	UCL	Hg

Table 4: Regression analysis. R² = Coefficient of Determination for the regression analysis. R² ≥ 0.6 considered a significant correlation. -- indicates the R² was not calculated due to insufficient sample size and/or non-detectable concentrations.

Chemical	Linear R ²	Exponential R ²
Mercury	0.584	0.501
PCBs	--	--
DDT	0.525	0.506
Chlordane	--	--
Toxaphene	--	--
TEQ	--	--
PFOS	--	--

Existing MDHHS Advisory: Largemouth and smallmouth bass from Ski-kwe zaag’igan in Marquette County are covered under the statewide mercury guideline. No one should eat more than 2 meals per month of these species smaller than 18 inches or no more than 1 meal per month of these fish larger than 18 inches.

Recommendation: No change is recommended. All fish used in the analysis were sub-legal sized. Therefore, the statewide guidelines apply for largemouth and smallmouth bass from Ski-kwe zaag’igan in Marquette County.

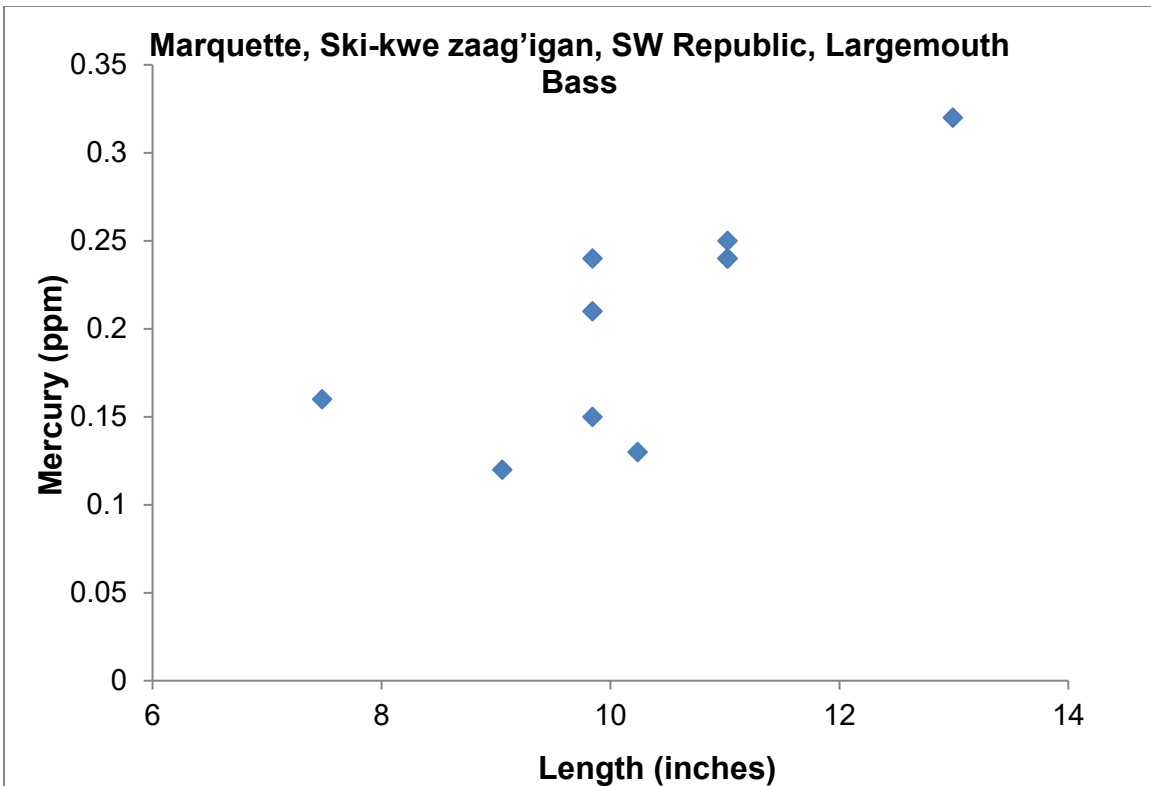


Figure 1. Relationship between fish length and mercury concentration in the edible portion of the fish.

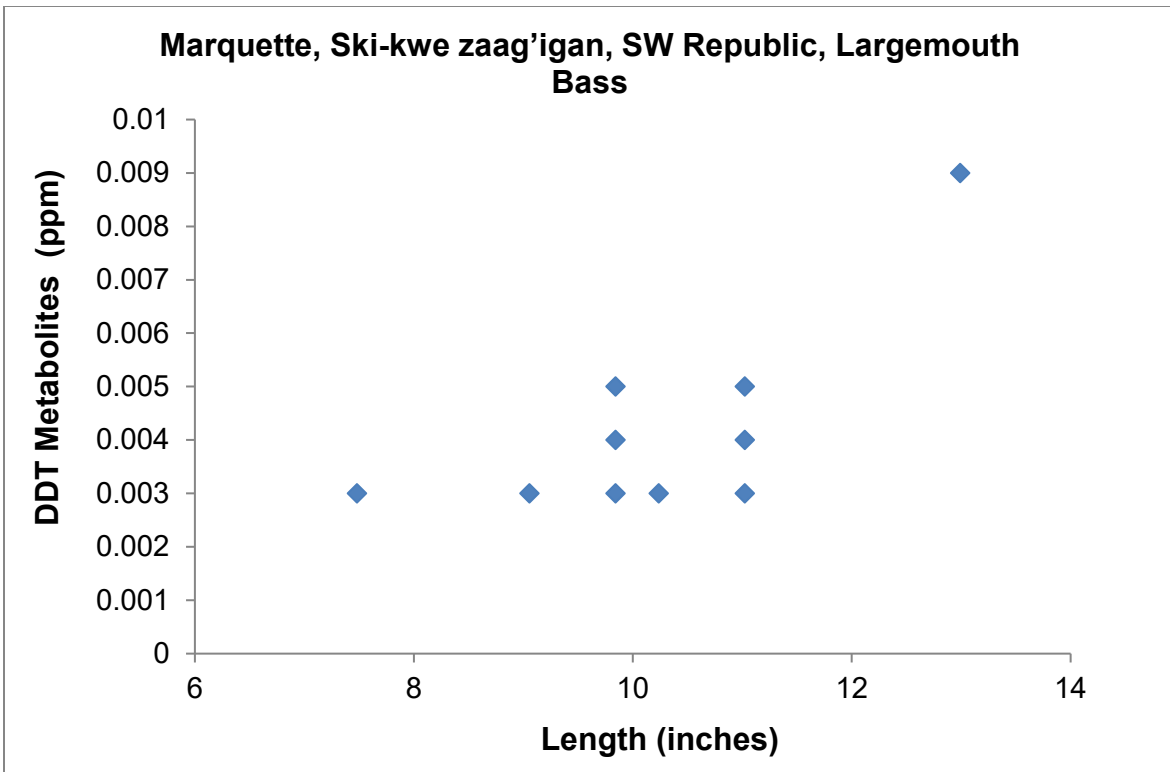


Figure 2. Relationship between fish length and total DDT concentration in the edible portion of the fish.

Species
Northern Pike

Water Body – Location
Ski-kwe zaag’igan
SW of Republic
(46.298, -88.064)

County
Marquette

Table 5: Edible portion chemistry data sets available. Check marks indicate the chemical was analyzed in that data set. Non-bolded check marks indicate those data were retired and not used in the analysis.

Year	Sample Size (N)	Min Length (in)	Max Length (in)	Legal Size (in)	Hg	PCBs	DDT	Chlordane	Toxaphene	PFOS	TEQ
2015	10	24.5	35.2	24.0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Table 6: Chemical analysis summary. NA = Not analyzed; ND = Non-detect; Conc. = Concentration; ppm = parts per million; ppb = parts per billion; ppt = parts per trillion; Sub-legal? = if checked, sub-legal sized fish were used in the chemical specific analysis; UCL = Upper Confidence Limit

Chemical	N	Sub-legal ?	Min Length (in)	Max Length (in)	Conc. Unit	Mean Conc.	Min Conc.	Max Conc.	95% UCL Conc.	Meal Category
Mercury	10	<input type="checkbox"/>	24.5	35.2	ppm	0.318	0.180	0.660	0.429	2
PCB	0	<input type="checkbox"/>	--	--	ppm	--	--	--	--	--
DDT	0	<input type="checkbox"/>	--	--	ppm	--	--	--	--	--
Chlordane	0	<input type="checkbox"/>	--	--	ppm	--	--	--	--	--
Toxaphene	0	<input type="checkbox"/>	--	--	ppm	--	--	--	--	--
TEQ	0	<input type="checkbox"/>	--	--	ppt	--	--	--	--	--
PFOS	0	<input type="checkbox"/>	--	--	ppb	--	--	--	--	--

Table 7: Final meal category and basis for recommendation.

Final Meal Category	Basis	Chemical Driver
2	UCL	Hg

Table 8: Regression analysis. R² = Coefficient of Determination for the regression analysis. R² ≥ 0.6 considered a significant correlation. -- indicates the R² was not calculated due to insufficient sample size and/or non-detectable concentrations.

Chemical	Linear R ²	Exponential R ²	Length (Inches)	Hg Regression Estimate (ppm)	Meal Category
Mercury	0.784	0.819	24	0.194	4
PCBs	--	--	26	0.236	4
DDT	--	--	28	0.288	2
Chlordane	--	--	30	0.350	2
Toxaphene	--	--	32	0.426	2
TEQ	--	--	34	0.519	2
PFOS	--	--	36	0.631	1
			38	0.768	1

Shaded area denotes extrapolated estimates

Existing MDHHS Advisory: Northern Pike from Ski-kwe zaag'igan in Marquette County are currently covered under the statewide mercury guidance. No one should eat more than 2 meals per month of northern pike smaller than 30 inches or no more than 1 meal per month of these fish larger than 30 inches.

Recommendation: No one should eat more than 2 meals per month of northern pike smaller than 30 inches from Ski-kwe zaag'igan in Marquette County due to mercury or no more than 1 meal per month of these fish larger than 30 inches due to mercury. Statewide length break applied due to limited number of fish over 30 inches in the analysis.

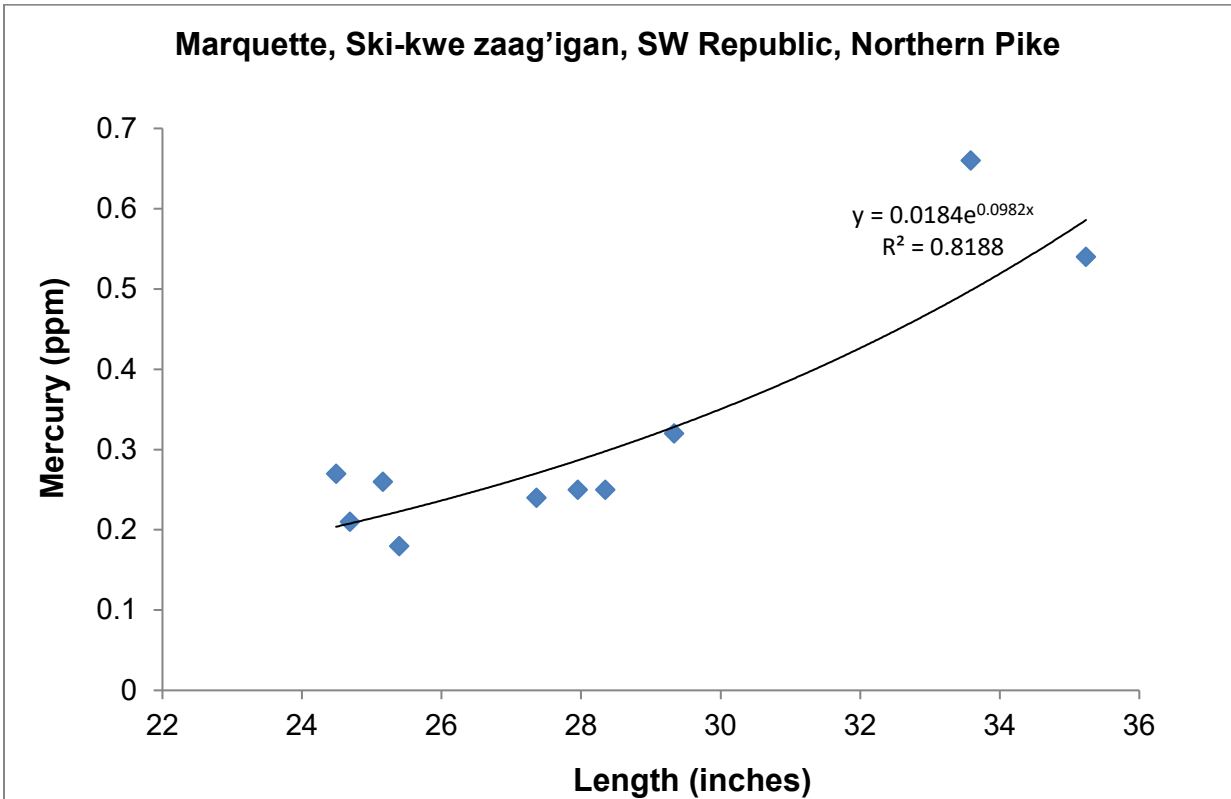


Figure 2. Relationship between fish length and mercury concentration in the edible portion of the fish.

Species
Rainbow Trout

Water Body – Location
Ski-kwe zaag’igan
SW of Republic
(46.298, -88.064)

County
Marquette

Table 9: Edible portion chemistry data sets available. Check marks indicate the chemical was analyzed in that data set. Non-bolded check marks indicate those data were retired and not used in the analysis.

Year	Sample Size (N)	Min Length (in)	Max Length (in)	Legal Size (in)	Hg	PCBs	DDT	Chlordane	Toxaphene	PFOS	TEQ
1989	8	13.8	15.4	12.0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Table 10: Chemical analysis summary. NA = Not analyzed; ND = Non-detect; Conc. = Concentration; ppm = parts per million; ppb = parts per billion; ppt = parts per trillion; Sub-legal? = if checked, sub-legal sized fish were used in the chemical specific analysis; UCL = Upper Confidence Limit

Chemical	N	Sub-legal ?	Min Length (in)	Max Length (in)	Conc. Unit	Mean Conc.	Min Conc.	Max Conc.	95% UCL Conc.	Meal Category
Mercury	8	<input type="checkbox"/>	13.8	15.4	ppm	0.120	0.090	0.140	0.133	4
PCB	0	<input type="checkbox"/>	--	--	ppm	--	--	--	--	--
DDT	0	<input type="checkbox"/>	--	--	ppm	--	--	--	--	--
Chlordane	0	<input type="checkbox"/>	--	--	ppm	--	--	--	--	--
Toxaphene	0	<input type="checkbox"/>	--	--	ppm	--	--	--	--	--
TEQ	0	<input type="checkbox"/>	--	--	ppt	--	--	--	--	--
PFOS	0	<input type="checkbox"/>	--	--	ppb	--	--	--	--	--

Table 11: Final meal category and basis for recommendation.

Final Meal Category	Basis	Chemical Driver
4	UCL	Hg

Table 12: Regression analysis. R² = Coefficient of Determination for the regression analysis. R² ≥ 0.6 considered a significant correlation. -- indicates the R² was not calculated due to insufficient sample size and/or non-detectable concentrations.

Chemical	Linear R ²	Exponential R ²
Mercury	0.293	0.246
PCBs	--	--
DDT	--	--
Chlordane	--	--
Toxaphene	--	--
TEQ	--	--
PFOS	--	--

Existing MDHHS Advisory: Rainbow trout from Ski-kwe zaag’igan in Marquette County are not currently covered under any guideline.

Recommendation: No one should eat more than 4 meals per month of rainbow trout of any size from Ski-kwe zaag’igan in Marquette County due to mercury.

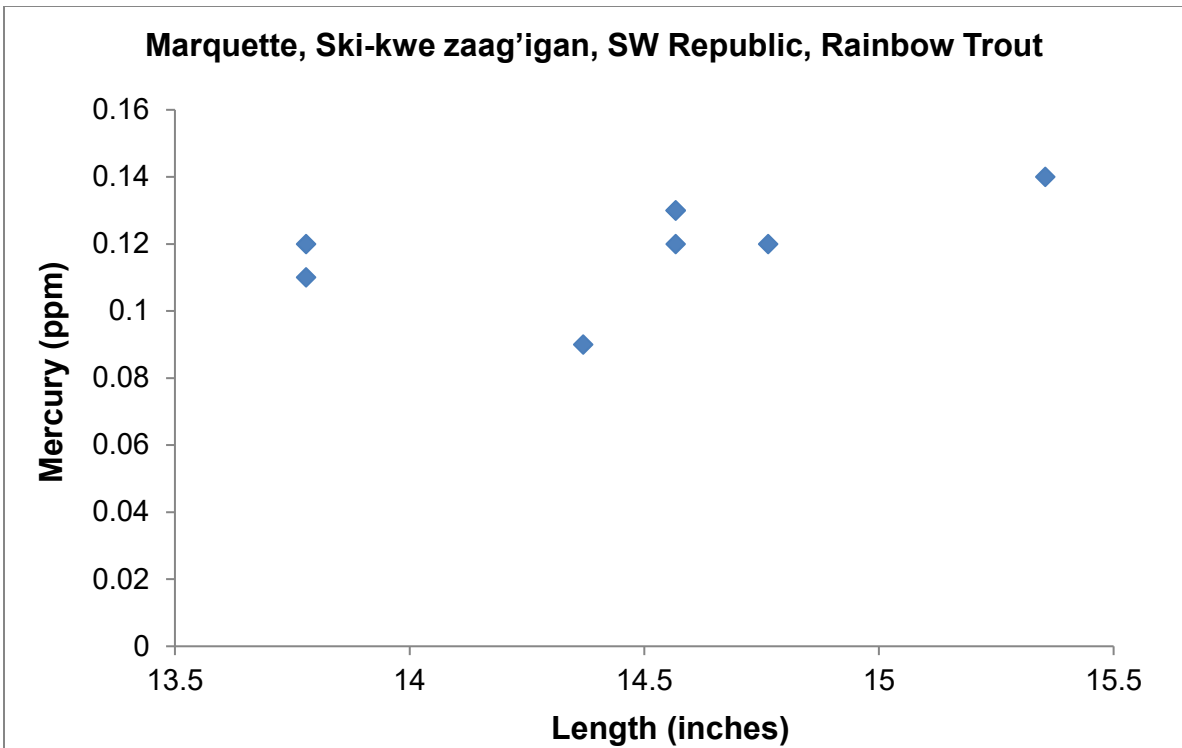


Figure 3. Relationship between fish length and mercury concentration in the edible portion of the fish.

**Species
Splake**

**Water Body – Location
Ski-kwe zaag’igan
SW of Republic
(46.298, -88.064)**

**County
Marquette**

Table 13: Edible portion chemistry data sets available. Check marks indicate the chemical was analyzed in that data set. Non-bolded check marks indicate those data were retired and not used in the analysis.

Year	Sample Size (N)	Min Length (in)	Max Length (in)	Legal Size (in)	Hg	PCBs	DDT	Chlordane	Toxaphene	PFOS	TEQ
1989	9	13.2	28.9	12.0	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Table 14: Chemical analysis summary. NA = Not analyzed; ND = Non-detect; Conc. = Concentration; ppm = parts per million; ppb = parts per billion; ppt = parts per trillion; Sub-legal? = if checked, sub-legal sized fish were used in the chemical specific analysis; UCL = Upper Confidence Limit

Chemical	N	Sub-legal ?	Min Length (in)	Max Length (in)	Conc. Unit	Mean Conc.	Min Conc.	Max Conc.	95% UCL Conc.	Meal Category
Mercury	9	<input type="checkbox"/>	13.2	28.9	ppm	0.143	0.090	0.420	0.225	4
PCB	0	<input type="checkbox"/>	--	--	ppm	--	--	--	--	--
DDT	0	<input type="checkbox"/>	--	--	ppm	--	--	--	--	--
Chlordane	0	<input type="checkbox"/>	--	--	ppm	--	--	--	--	--
Toxaphene	0	<input type="checkbox"/>	--	--	ppm	--	--	--	--	--
TEQ	0	<input type="checkbox"/>	--	--	ppt	--	--	--	--	--
PFOS	0	<input type="checkbox"/>	--	--	ppb	--	--	--	--	--

Table 15: Final meal category and basis for recommendation.

Final Meal Category	Basis	Chemical Driver
4	UCL	Hg

Table 16: Regression analysis. R² = Coefficient of Determination for the regression analysis. R² ≥ 0.6 considered a significant correlation. -- indicates the R² was not calculated due to insufficient sample size and/or non-detectable concentrations.

Chemical	Linear R ²	Exponential R ²
Mercury	0.481	0.381
PCBs	--	--
DDT	--	--
Chlordane	--	--
Toxaphene	--	--
TEQ	--	--
PFOS	--	--

Existing MDHHS Advisory: Splake from Ski-kwe zaag’igan in Marquette County are not currently covered under any guideline.

Recommendation: No one should eat more than 4 meals per month of splake of any size from Ski-kwe zaag’igan in Marquette County due to mercury.

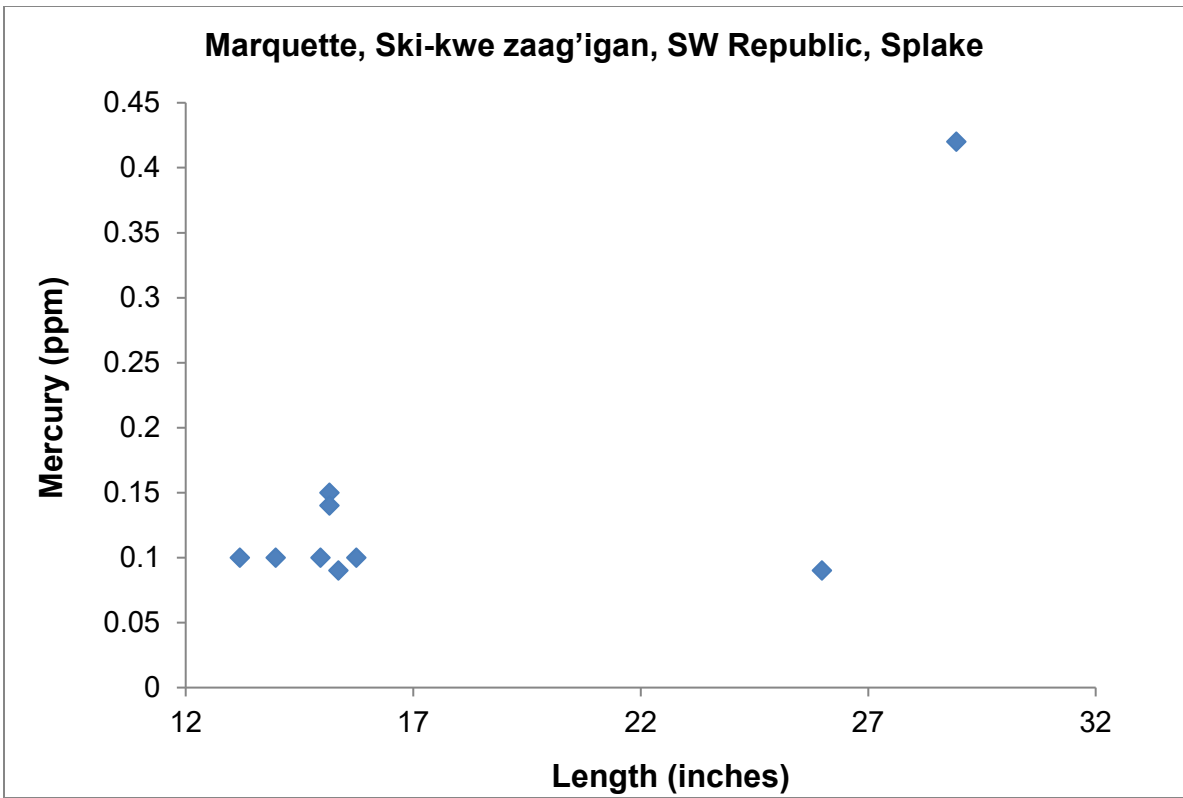


Figure 4. Relationship between fish length and mercury concentration in the edible portion of the fish.

Species
White Sucker

Water Body – Location
Ski-kwe zaag’igan
SW of Republic
(46.298, -88.064)

County
Marquette

Table 17: Edible portion chemistry data sets available. Check marks indicate the chemical was analyzed in that data set. Non-bolded check marks indicate those data were retired and not used in the analysis.

Year	Sample Size (N)	Min Length (in)	Max Length (in)	Legal Size (in)	Hg	PCBs	DDT	Chlordane	Toxaphene	PFOS	TEQ
1993	10	14.2	18.5	NA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Table 18: Chemical analysis summary. NA = Not analyzed; ND = Non-detect; Conc. = Concentration; ppm = parts per million; ppb = parts per billion; ppt = parts per trillion; Sub-legal? = if checked, sub-legal sized fish were used in the chemical specific analysis; UCL = Upper Confidence Limit

Chemical	N	Sub-legal ?	Min Length (in)	Max Length (in)	Conc. Unit	Mean Conc.	Min Conc.	Max Conc.	95% UCL Conc.	Meal Category
Mercury	10	<input type="checkbox"/>	14.2	18.5	ppm	0.084	0.020	0.220	0.135	4
PCB	10	<input type="checkbox"/>	14.2	18.5	ppm	0.025	<0.025	0.025	0.025	8
DDT	10	<input type="checkbox"/>	14.2	18.5	ppm	0.007	<0.003	0.019	0.010	16
Chlordane	10	<input type="checkbox"/>	14.2	18.5	ppm	ND	--	--	--	--
Toxaphene	10	<input type="checkbox"/>	14.2	18.5	ppm	ND	--	--	--	--
TEQ	0	<input type="checkbox"/>	--	--	ppt	--	--	--	--	--
PFOS	0	<input type="checkbox"/>	--	--	ppb	--	--	--	--	--

Table 19: Final meal category and basis for recommendation.

Final Meal Category	Basis	Chemical Driver
4	UCL	Hg

Table 20: Regression analysis. R² = Coefficient of Determination for the regression analysis. R² ≥ 0.6 considered a significant correlation. -- indicates the R² was not calculated due to insufficient sample size and/or non-detectable concentrations.

Chemical	Linear R ²	Exponential R ²
Mercury	0.370	0.487
PCBs	0.000	0.00
DDT	0.400	0.444
Chlordane	--	--
Toxaphene	--	--
TEQ	--	--
PFOS	--	--

Existing MDHHS Advisory: Suckers from Ski-kwe zaag’igan in Marquette County are covered under the statewide mercury guideline. No one should eat more than 8 meals per month of suckers of any size.

Recommendation: No one should eat more than 4 meals per month of suckers of any size from Ski-kwe zaag’igan in Marquette County due to mercury. PCBs cause less restrictive advice.

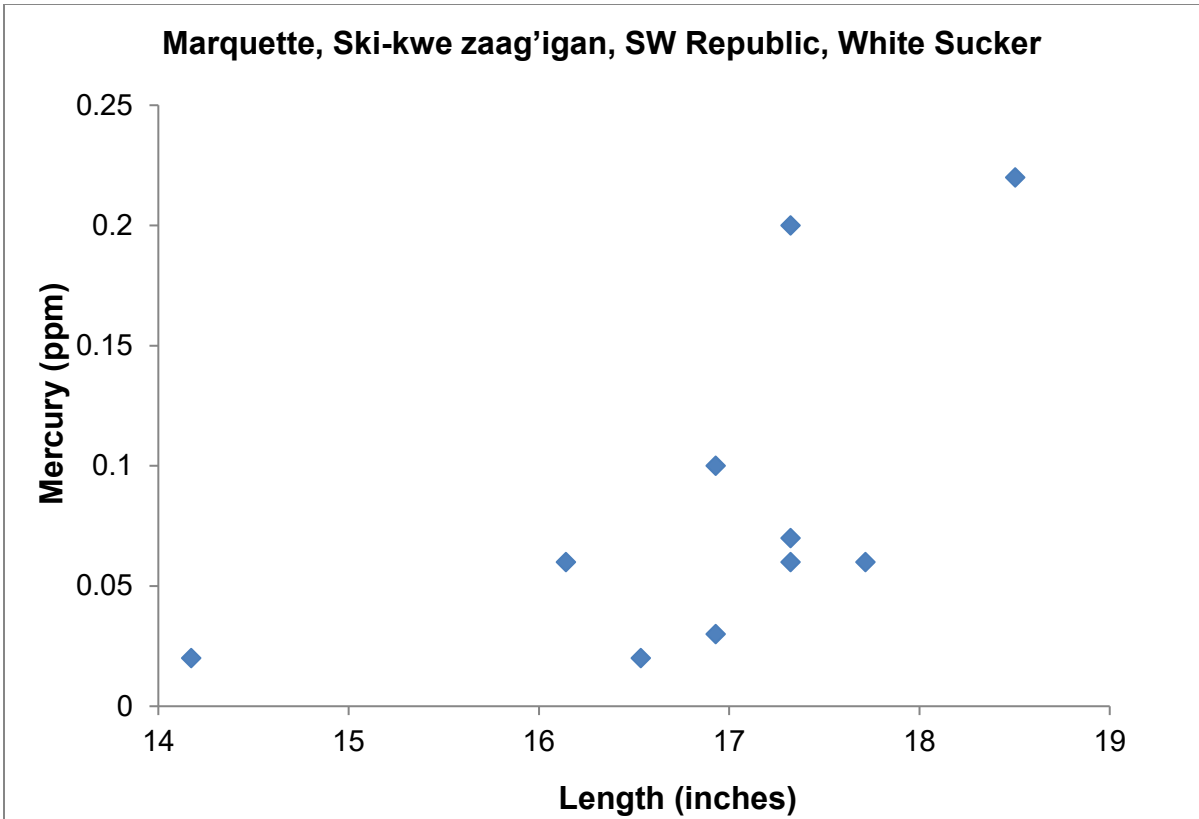


Figure 5. Relationship between fish length and mercury concentration in the edible portion of the fish.

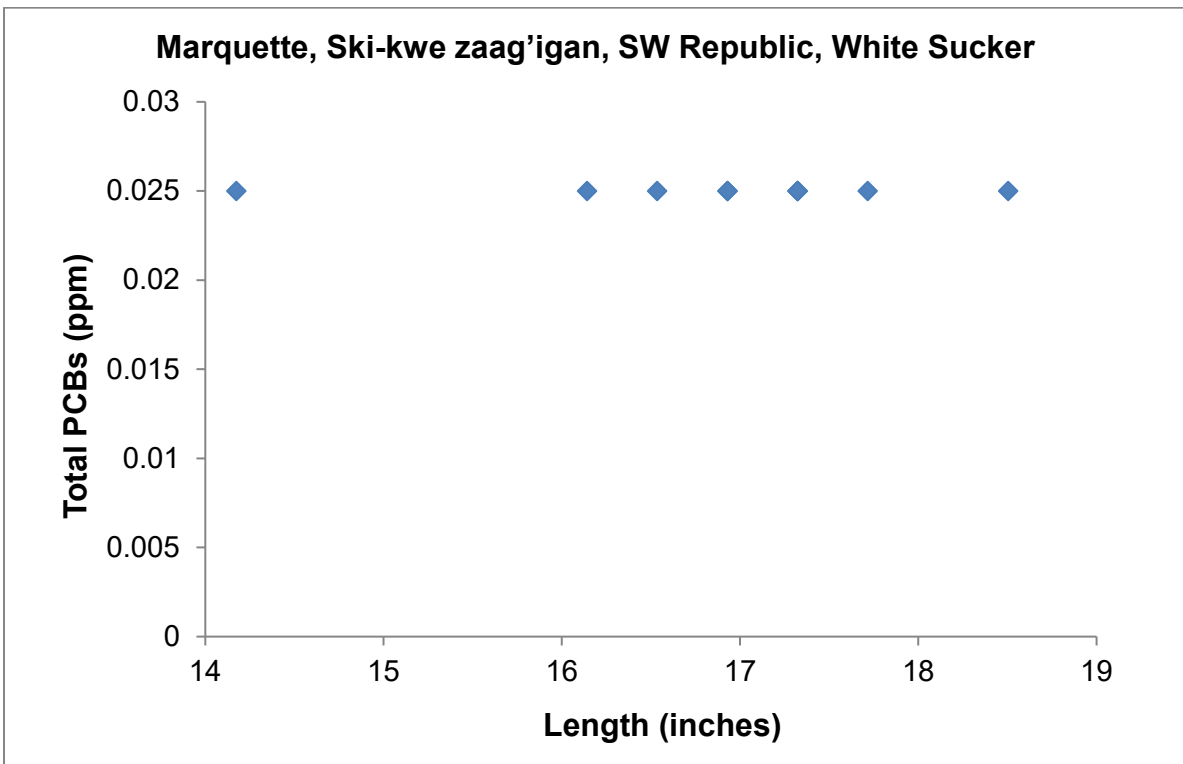


Figure 2. Relationship between fish length and total PCB concentration in the edible portion of the fish.

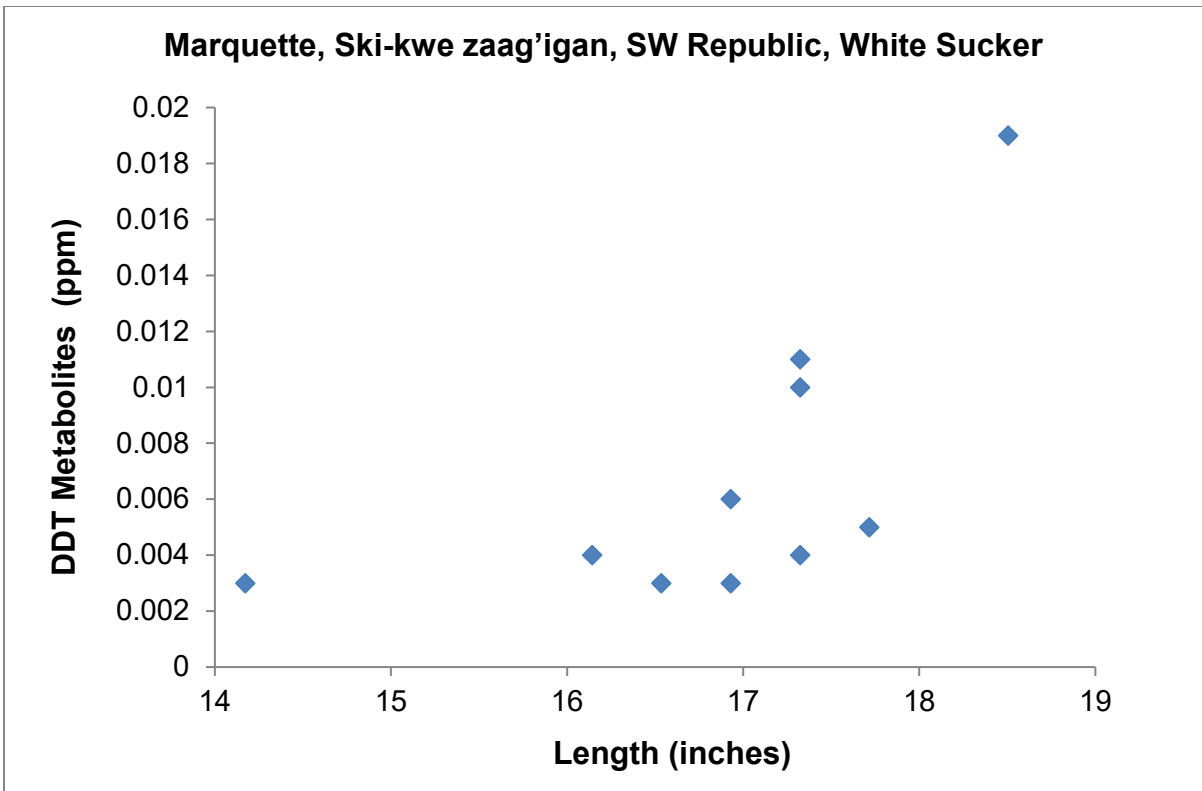


Figure 3. Relationship between fish length and total DDT concentration in the edible portion of the fish.

Species
Yellow Perch

Water Body – Location
Ski-kwe zaag’igan
SW of Republic
(46.298, -88.064)

County
Marquette

Table 21: Edible portion chemistry data sets available. Check marks indicate the chemical was analyzed in that data set. Non-bolded check marks indicate those data were retired and not used in the analysis.

Year	Sample Size (N)	Min Length (in)	Max Length (in)	Legal Size (in)	Hg	PCBs	DDT	Chlordane	Toxaphene	PFOS	TEQ
1989	5	9.0	10.8	NA	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Table 22: Chemical analysis summary. NA = Not analyzed; ND = Non-detect; Conc. = Concentration; ppm = parts per million; ppb = parts per billion; ppt = parts per trillion; Sub-legal? = if checked, sub-legal sized fish were used in the chemical specific analysis; UCL = Upper Confidence Limit

Chemical	N	Sub-legal ?	Min Length (in)	Max Length (in)	Conc. Unit	Mean Conc.	Min Conc.	Max Conc.	95% UCL Conc.	Meal Category
Mercury	10	<input checked="" type="checkbox"/>	9.0	10.8	ppm	0.152	0.130	0.170	0.170	4
PCB	0	<input type="checkbox"/>	--	--	ppm	--	--	--	--	--
DDT	0	<input type="checkbox"/>	--	--	ppm	--	--	--	--	--
Chlordane	0	<input type="checkbox"/>	--	--	ppm	--	--	--	--	--
Toxaphene	0	<input type="checkbox"/>	--	--	ppm	--	--	--	--	--
TEQ	0	<input type="checkbox"/>	--	--	ppt	--	--	--	--	--
PFOS	0	<input type="checkbox"/>	--	--	ppb	--	--	--	--	--

Table 23: Final meal category and basis for recommendation.

Final Meal Category	Basis	Chemical Driver
4	UCL	Hg

Table 24: Regression analysis. R² = Coefficient of Determination for the regression analysis. R² ≥ 0.6 considered a significant correlation. -- indicates the R² was not calculated due to insufficient sample size and/or non-detectable concentrations.

Chemical	Linear R ²	Exponential R ²
Mercury	0.763	0.819
PCBs	--	--
DDT	--	--
Chlordane	--	--
Toxaphene	--	--
TEQ	--	--
PFOS	--	--

Existing MDHHS Advisory: Yellow perch from Ski-kwe zaag'igan in Marquette County are covered under the statewide mercury guideline. No one should eat more than 4 meals per month of this species of any size.

Recommendation: No one should eat more than 4 meals per month of yellow perch of any size from Ski-kwe zaag'igan in Marquette County due to mercury.

Note: While there was a significant negative correlation between fish size and mercury concentration, it is not recommended to implement a size-based advisory unless additional data are available providing a biological reason for the negative correlation. The negative correlation for this dataset is likely due to the limited sample size.

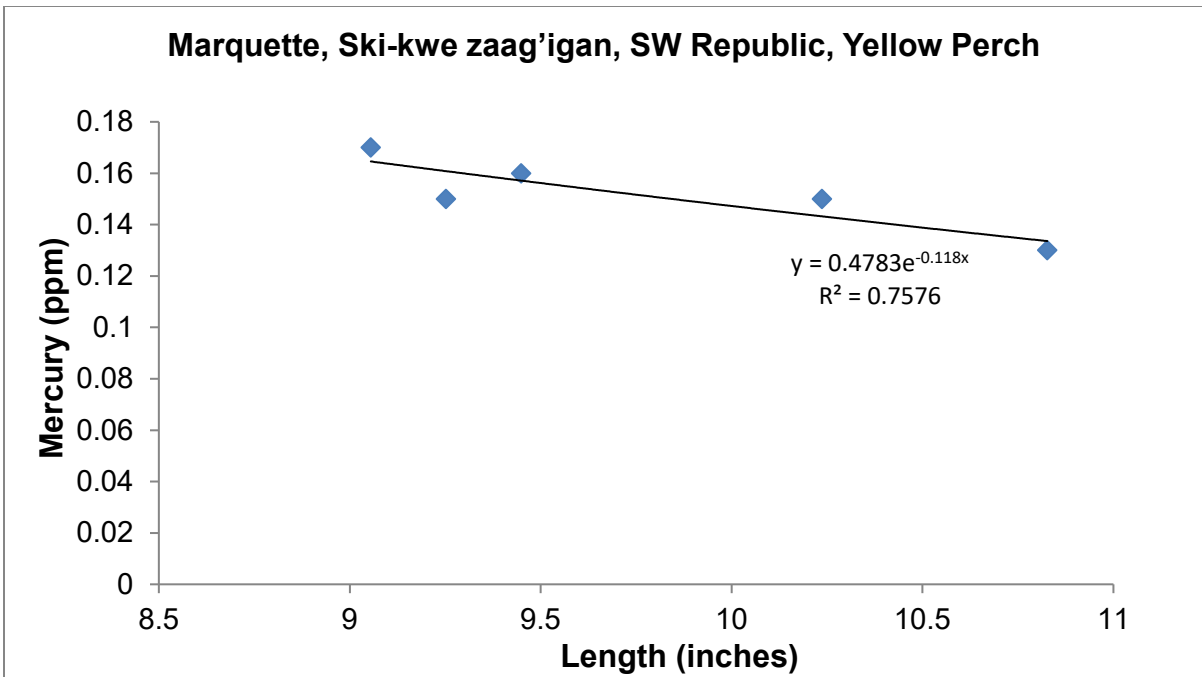


Figure 6. Relationship between fish length and mercury concentration in the edible portion of the fish.

Splake

Sporley Lake

Marquette County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of All Samples	
Earliest	Most Recent				Min	Max
2004	2004	10	12	15	12	13.5
Datasets available: 2004						
Chemical	Sample Size (All)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.16	0.14	0.19	0.18	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.082	0.093				

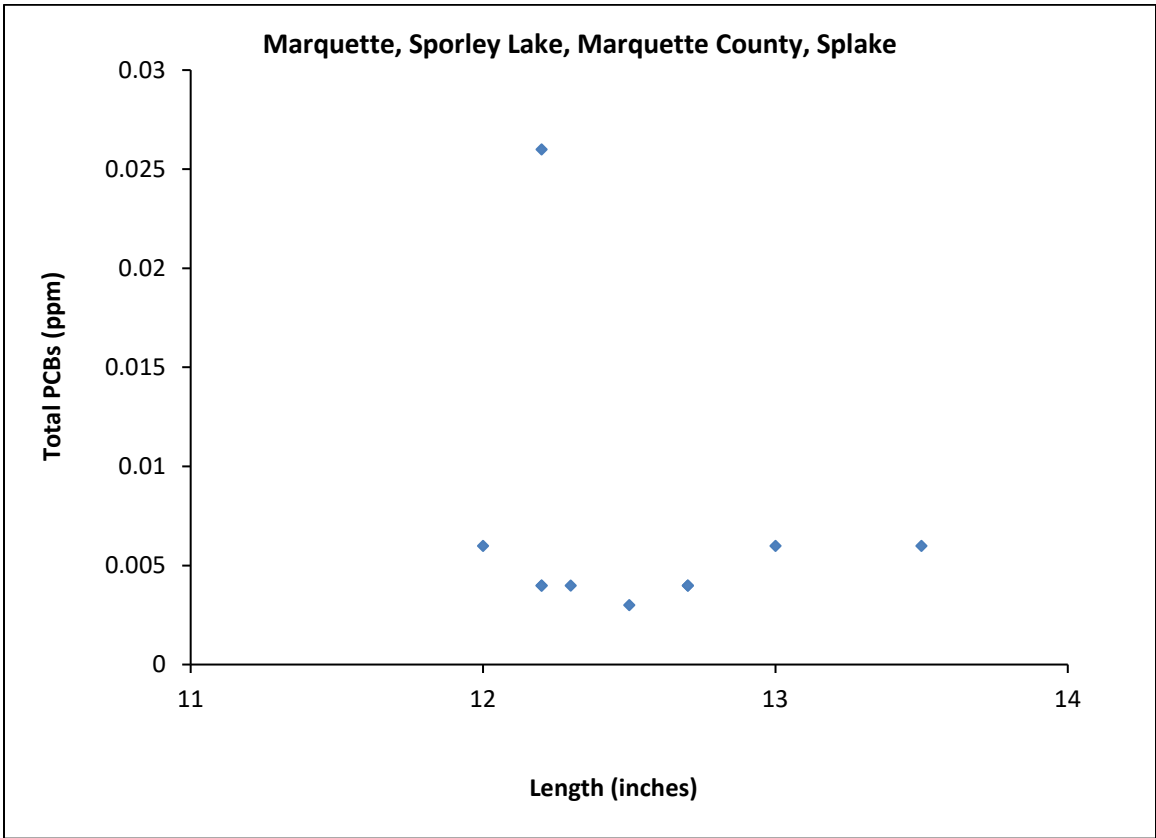
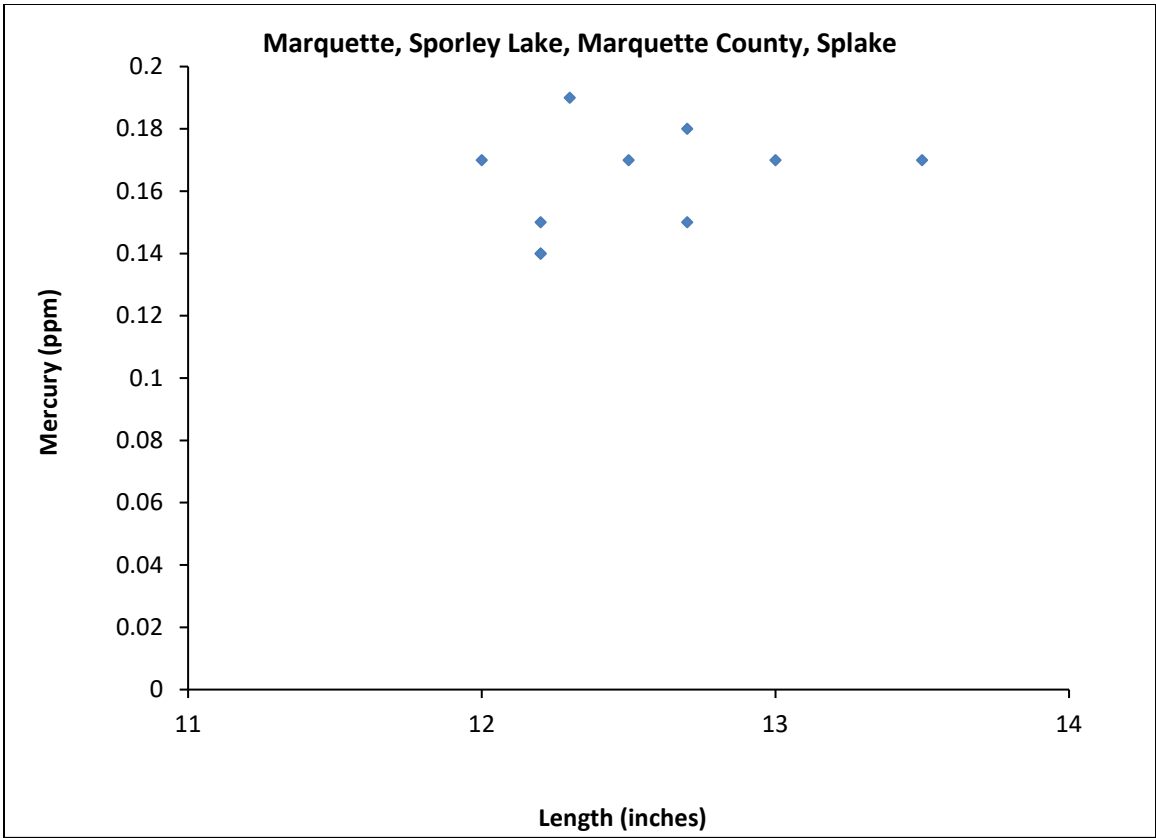
Organics Analysis:

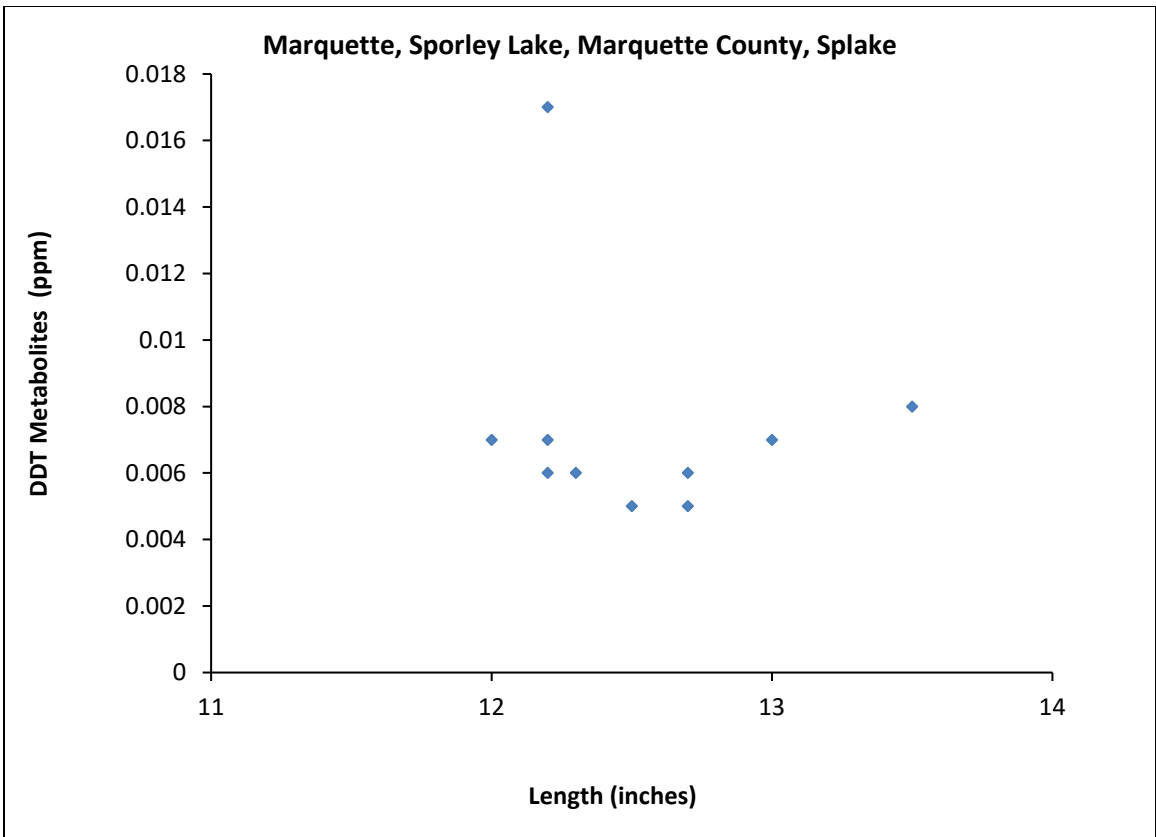
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2004	2004	10	12	15	12	13.5
Datasets available: 2004						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.007	0.003	0.026	0.01	16
DDT	10	0.007	0.005	0.017	0.01	16
Chlordane	10	ND	--	--	--	--
Toxaphene	10	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.037	0.009				
DDT	0.024	0.011				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						4*

Existing Advisory: Sporley Lake splake are not covered by an advisory.

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

*Note: *The advice is one step more restrictive than indicated by the evaluation since all fish samples were smaller than the legal size limit.*





White Sucker

Sporley Lake

Marquette County

Hg Analysis:

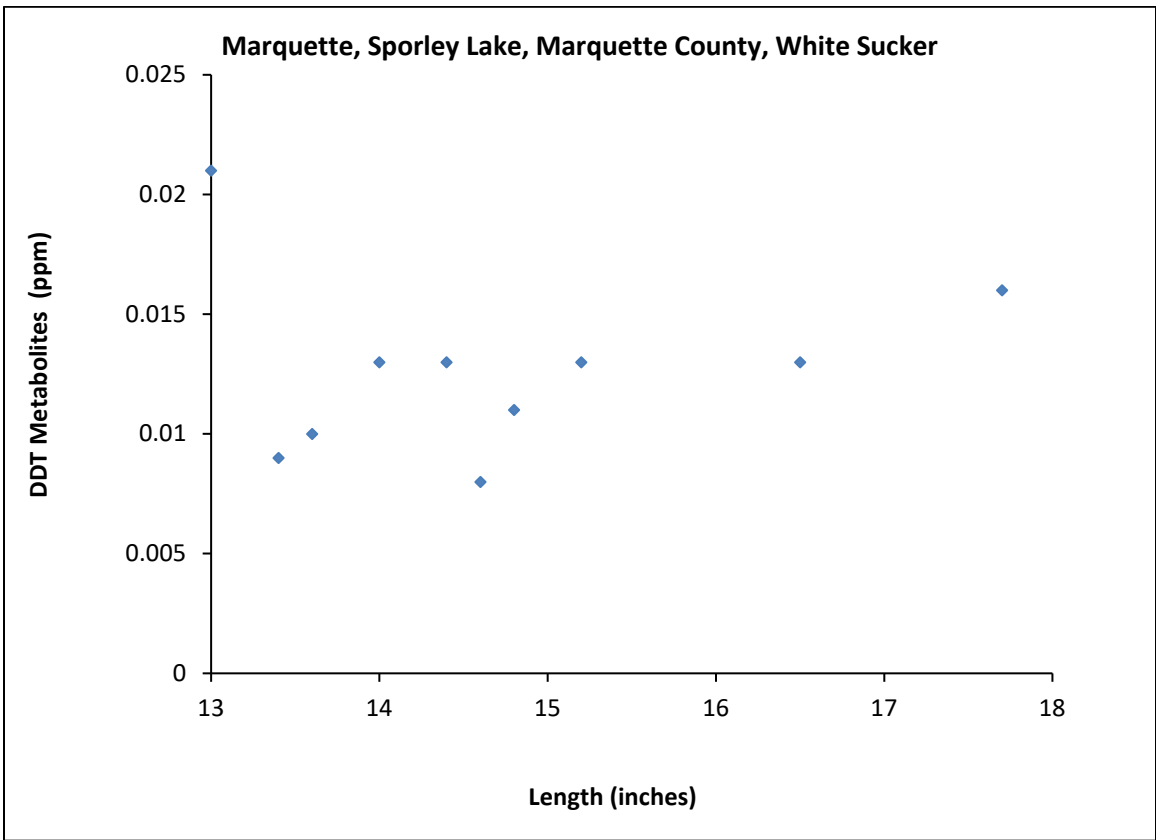
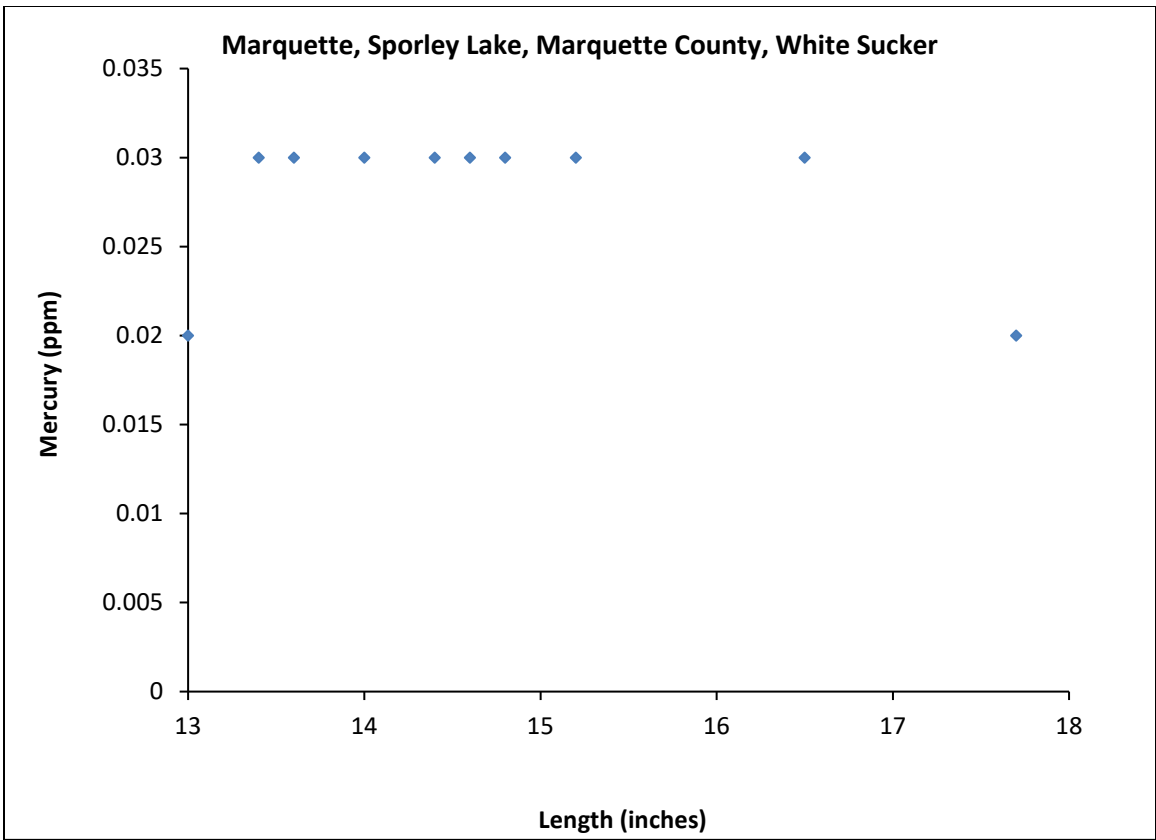
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1993	1993	10	13	na	13	17.7
Datasets available: 1993						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.03	0.02	0.03	0.03	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.053	0.053				

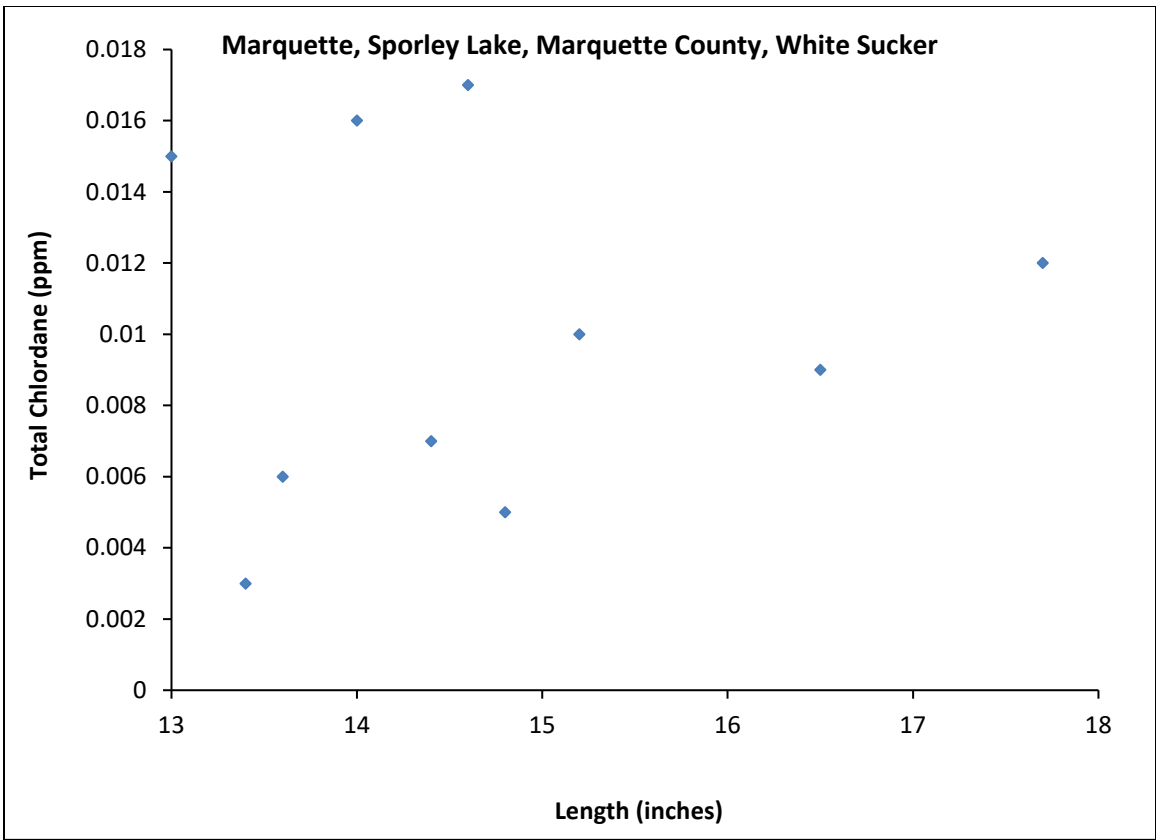
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1993	1993	10	13	na	13	17.7
Datasets available: 1993						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	ND	--	--	--	--
DDT	10	0.01	0.008	0.021	0.02	16
Chlordane	10	0.01	0.003	0.017	0.01	--
Toxaphene	10	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	0.008	0.029				
Chlordane	0.005	0.040				
Toxaphene	--	--				
Final meal category based on UCL:						16

Existing Advisory: Sporley Lake sucker are not covered by an advisory.

Recommendation: No consumption advisory is needed for Sporley Lake sucker.





Smallmouth Bass

Teal Lake

Marquette County

Hg Analysis:

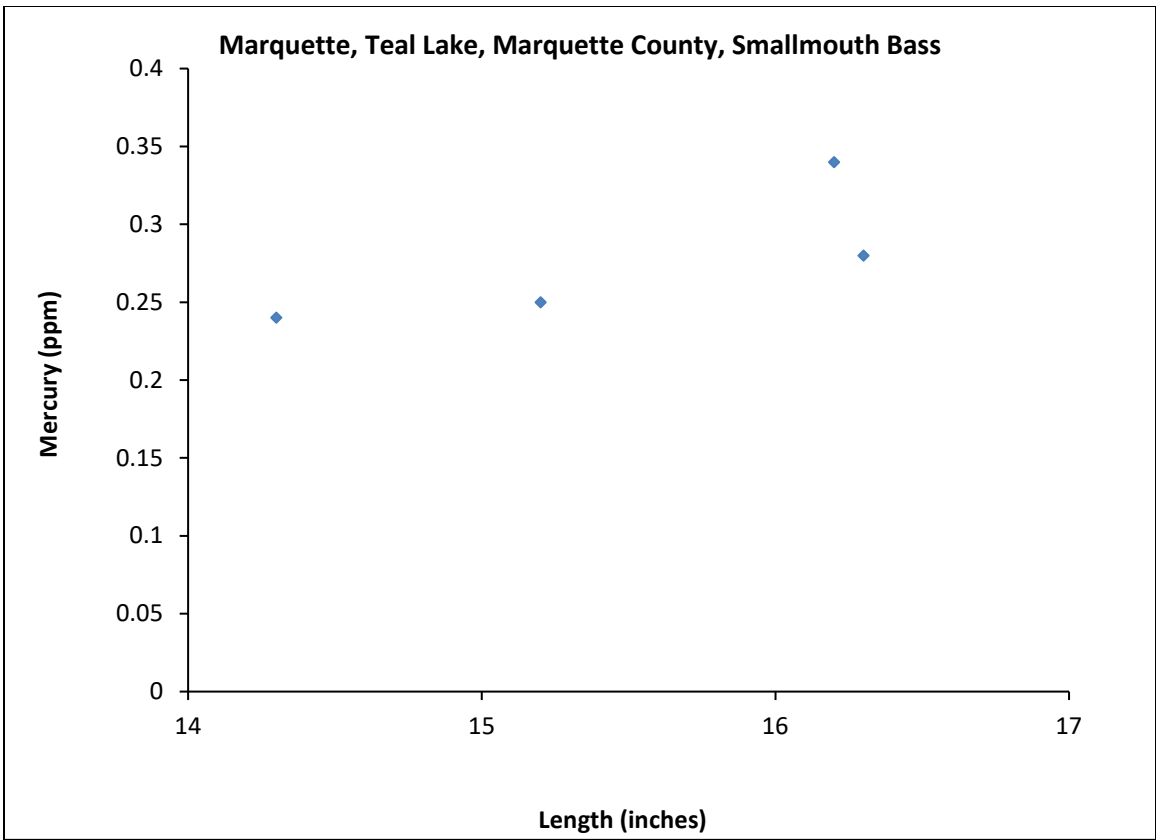
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2004	2004	4	14.3	14	14.3	16.3
Datasets available: 2004						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	4	0.28	0.24	0.34	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.607	0.649				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	--	--	--	--	--
Datasets available: --						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	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: Women and children should eat no more than 1 meal per month of Teal Lake smallmouth bass over 18 inches and no more than 1 meal per week of smallmouth bass under 18 inches due to mercury.

Recommendation: A dataset of less than five data points for a given chemical, species and waterbody is considered insufficient for evaluation using the standard evaluation method. The statewide guideline applies: 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.



Walleye

Teal Lake

Marquette County

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	2005	18	13.2	15	15	26.3
Datasets available: 2004, 2005						
Chemical	Sample Size (All)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	17	0.32	0.13	1.12	0.45	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.792	0.817				

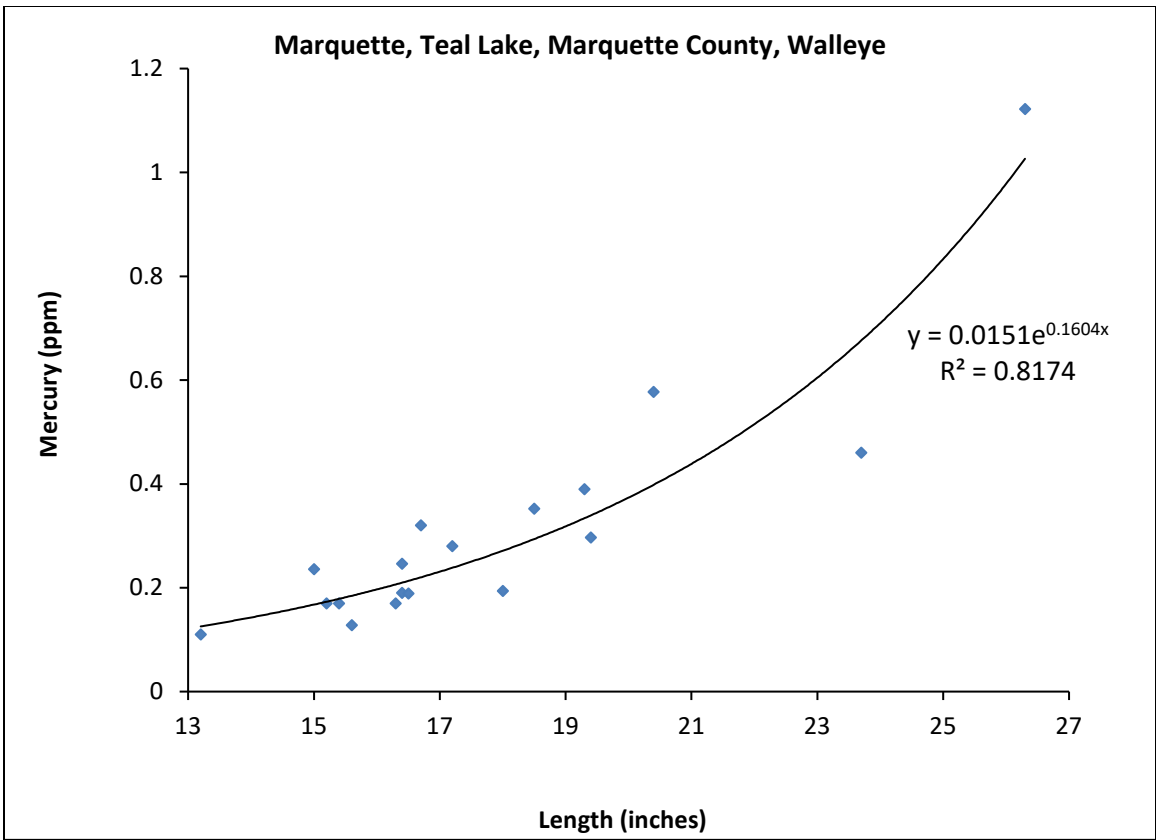
Organics Analysis:

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

Existing Advisory: Women and children should eat no more than 1 meal per month of Teal Lake walleye larger than 18 inches and no more than 1 meal per week of walleye smaller than 18 inches due to mercury.

Recommendation: No one should eat more than 4 meals per month of Teal Lake walleye smaller than 18 inches, more than 2 meals per month of those fish between 18 and 24 inches, or more than 1 meal per month of those fish larger than 24 inches due to mercury.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
15	0.17	4
16	0.20	4
18	0.27	2
20	0.37	2
22	0.51	2
24	0.71	1
26	0.98	1
28	1.35	0.5
30	1.86	0.5
<i>Shaded area denotes extrapolated estimates</i>		



Menominee County

Northern Pike

Shakey Lakes

Menominee County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Size Range of All Samples	
Earliest	Most Recent				Min	Max
2007	2007	10	19.3	24	19.3	27.6
Datasets available: 2007						
Chemical	Sample Size (All)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10^	0.61	0.30	0.86	0.73	1
Selenium	10^	0.15	0.13	0.18	0.16	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.272	0.224				
Selenium	0.198	0.206				

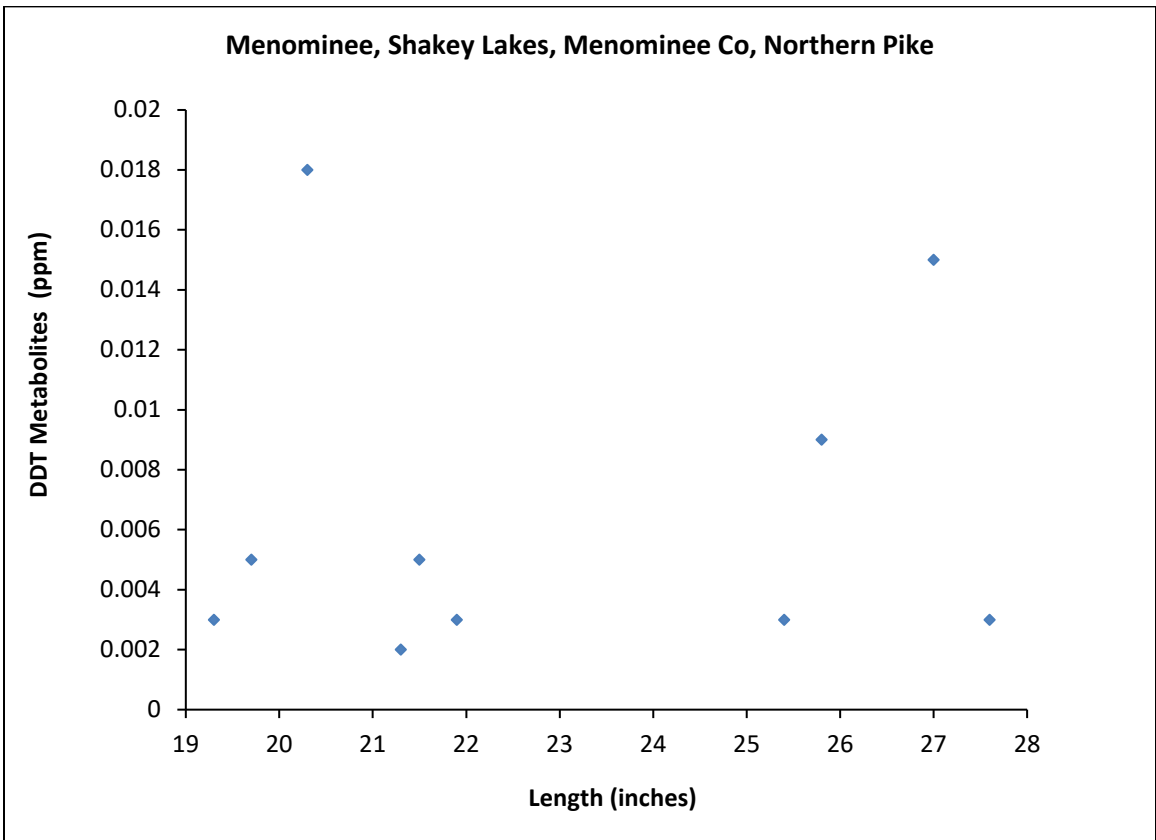
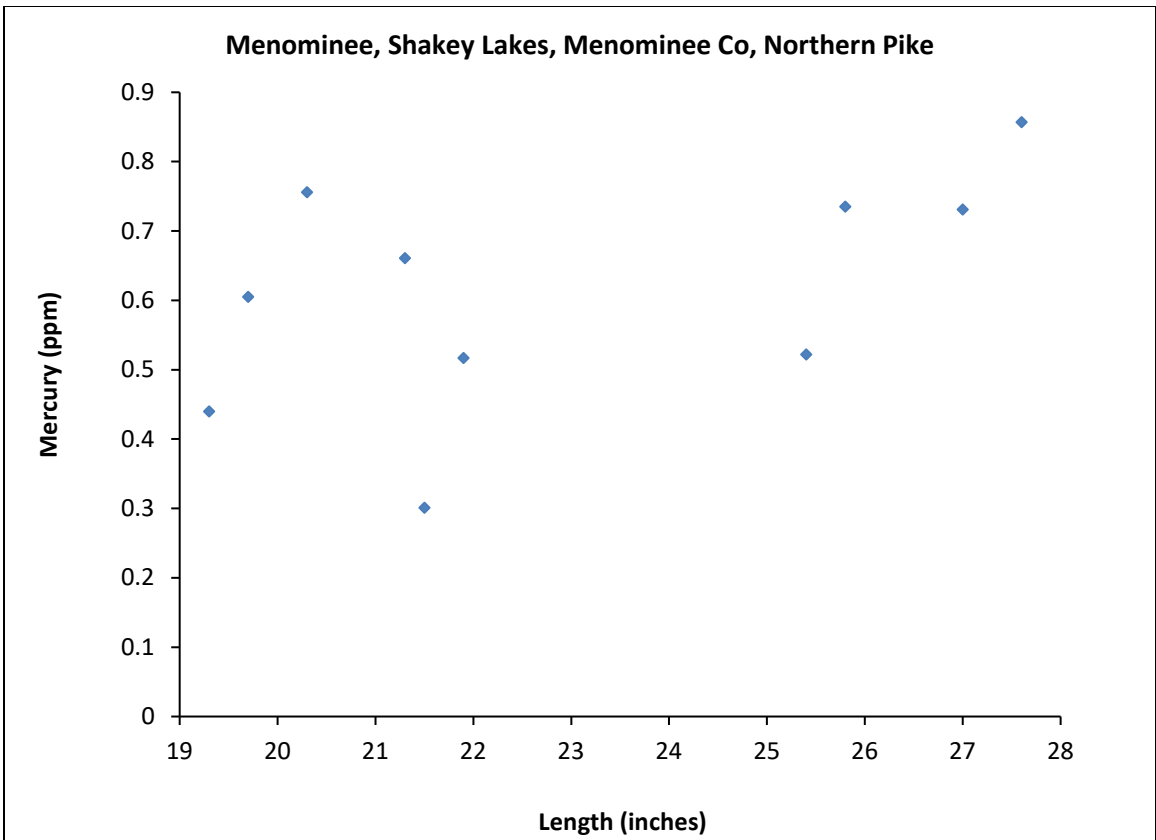
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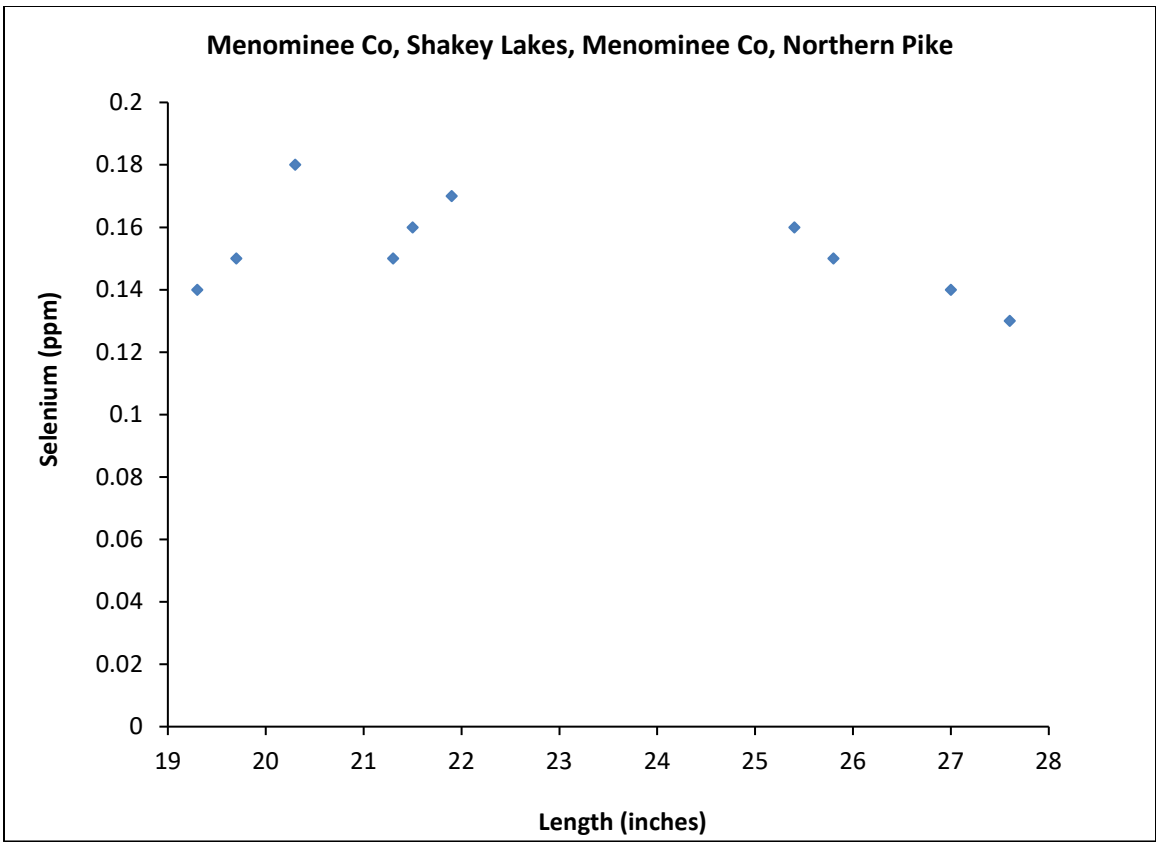
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Size Range of All Samples	
Earliest	Most Recent				Min	Max
2007	2007	10	19.3	24	19.3	27.6
Datasets available: 2007						
Chemical	Sample Size (All)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10^	ND	--	--	--	--
DDT	10^	0.007	0.002	0.02	0.01	16
Chlordane	10^	ND	--	--	--	--
Toxaphene	10^	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	0.012	0.020				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						1

^sublegal length fish included.

Existing Advisory: Shakey Lakes northern pike are covered under the statewide mercury consumption advisory.

Recommendation: No one should eat more than 1 meal per month of Shakey Lakes northern pike smaller than 30 inches or more than 6 meals per year of those fish larger than 30 inches. The dataset is limited due to the sublegal length fish.





Menominee River Dickinson, Iron, and Menominee Counties

Rock Bass

**Menominee River
Upstream of Twin Falls Dam**

**Dickinson &
Iron 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
1984	1984	2	7.6	na	7.6	8.8
Datasets available: 1984						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	2	0.25	0.20	0.30	--	--
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
--	--	--	--	--	--	--
Datasets available: --						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						--

Existing Advisory: Rock bass from Menominee River impoundments are covered by the statewide mercury advisory.

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

Walleye

**Menominee River
Badwater Lake/Upstream Twin Falls Dam**

**Dickinson & Iron
Counties**

Hg Analysis:

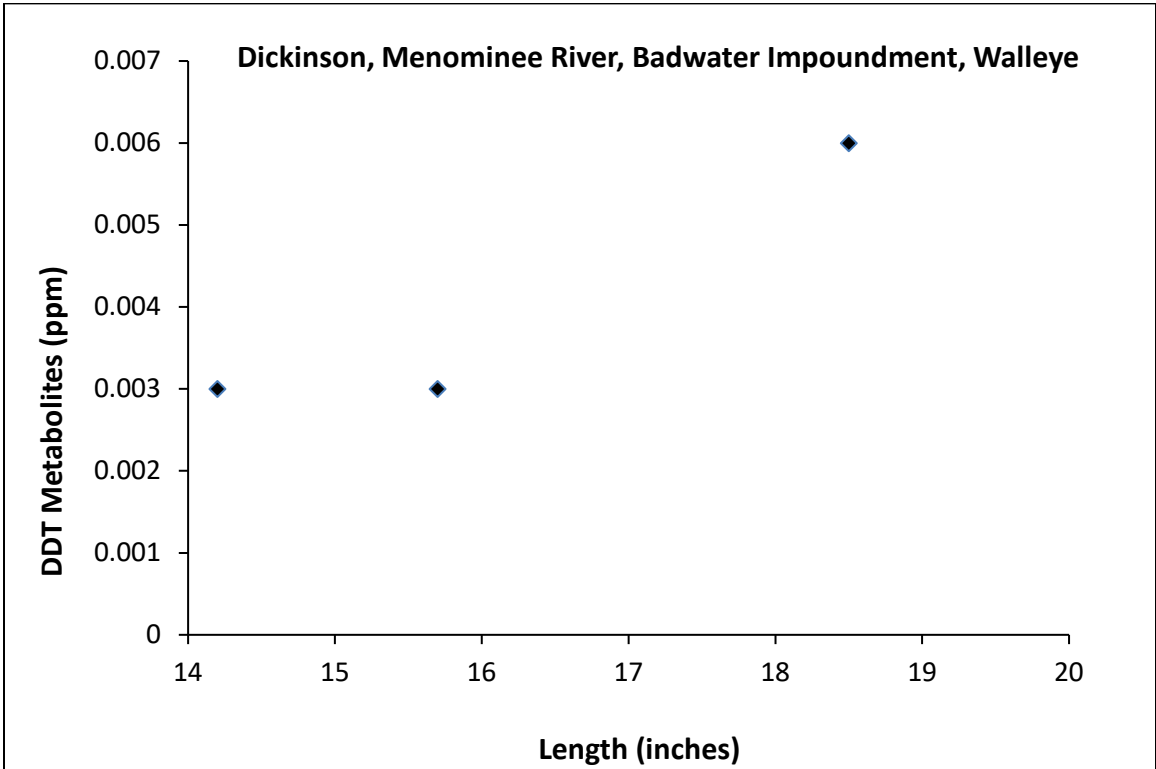
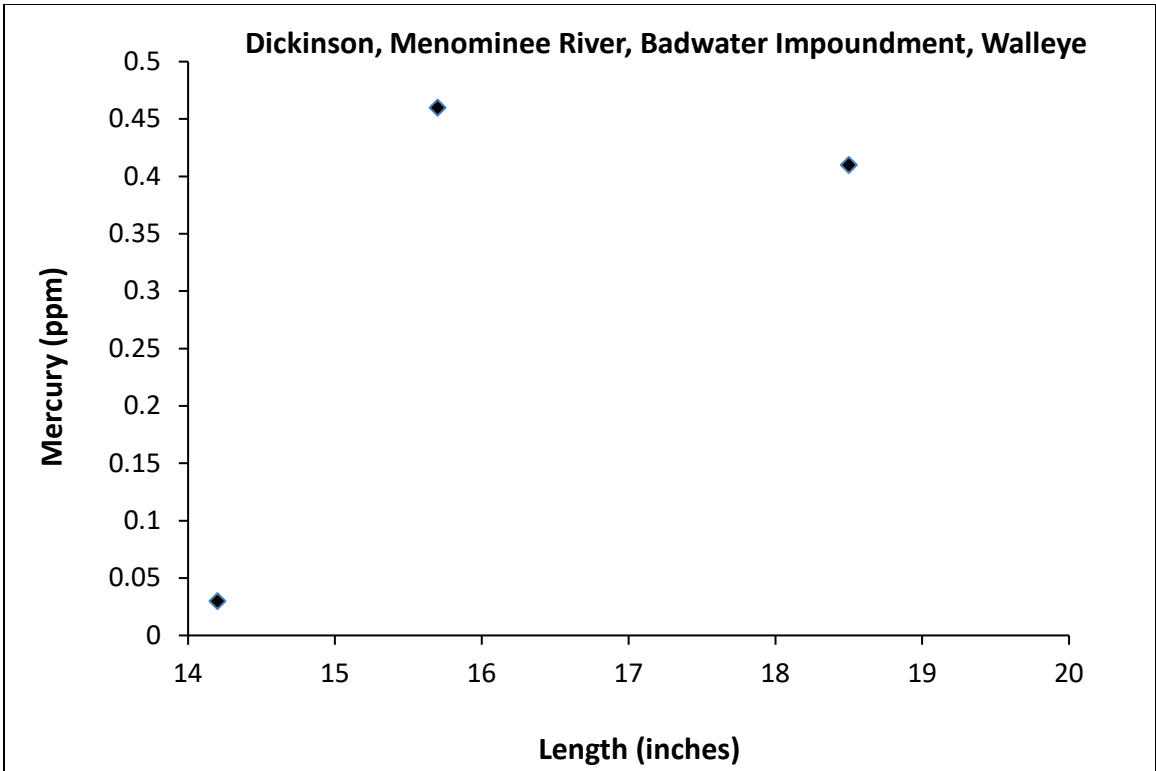
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1992	1992	3	14.2	15	15.7	18.5	
Datasets available: 1992							
Chemical	Sample Size (All)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	3	0.30		0.03	0.46	0.88	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	--	--					

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1992	1992	3	14.2	15	15.7	18.5	
Datasets available: 1992							
Chemical	Sample Size (All)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	3	ND		≤ 0.025	≤ 0.025	≤ 0.025	--
DDT	3	0.004		≤ 0.003	0.006	0.01	--
Chlordane	3	ND		≤ 0.003	≤ 0.003	≤ 0.003	--
Toxaphene	3	ND		≤ 0.05	≤ 0.05	≤ 0.05	--
TEQ	0	--		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	--	--					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
TEQ	--	--					
Final meal category based on UCL:							--

Existing Advisory: Walleye from the Menominee River upstream of the Twin Falls Dam, including Badwater Lake and the Twin Falls Flowage, are covered by the statewide advisory.

Recommendation: A dataset of less than five data points for a given chemical, species and waterbody is considered insufficient for evaluation using the standard evaluation method. The statewide advice due to mercury applies to walleye from the Menominee River upstream of the Twin Falls Dam, including Badwater Lake and the Twin Falls Flowage. No one should eat more than 2 meals per month of legal size walleye smaller than 20 inches or more than 1 meal per month of those fish larger than 20 inches.



**Largemouth and
Smallmouth Bass
Hg Analysis:**

**Menominee River
Twin Falls Flowage/Badwater Lake**

Dickinson County

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	13.5	14	13.5	16.7
Datasets available: 2014						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.51	0.26	0.68	0.59	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.615	0.563				

Organics Analysis:

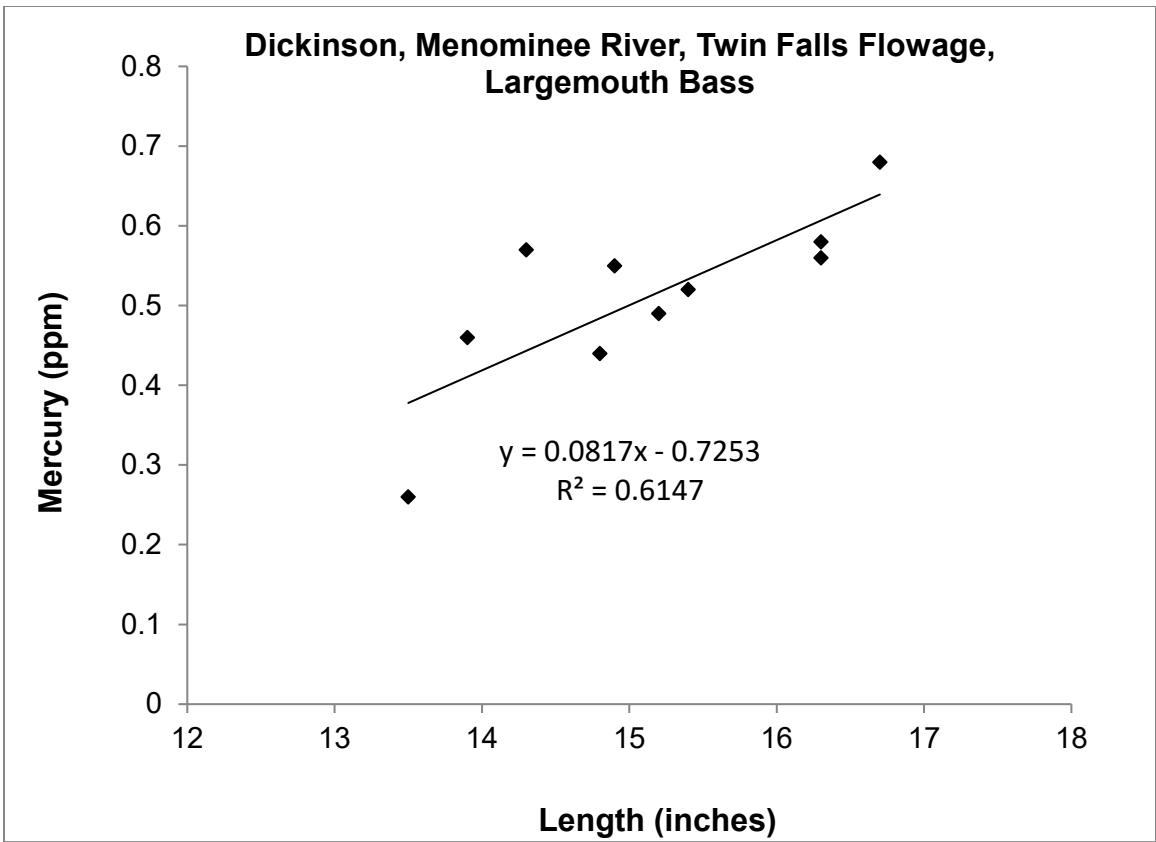
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	0	--	--	--	--
Datasets available:						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	--	--	--	--	--	--
DDT	--	--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

Existing Advisory: Twin Falls Flowage largemouth bass are covered by the statewide 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 due to mercury.

Recommendation: No one should eat more than 1 meal per month of Twin Falls Flowage/Badwater 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 since the size range of fish was limited.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
14	0.42	2
15	0.5	2
16	0.58	1
17	0.66	1
18	0.75	1
20	0.91	1
22	1.07	1
24	1.24	0.5

Shaded area denotes extrapolated estimates



Northern Pike

**Menominee River
Twin Falls Flowage/Badwater Lake**

Dickinson County

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	18.5	24	25.2	26.2		
Datasets available: 2014								
Chemical	Sample Size (All)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category	
Mercury	10	0.74		0.38	1.5	1.0	1	
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
Mercury	0.336	0.402						

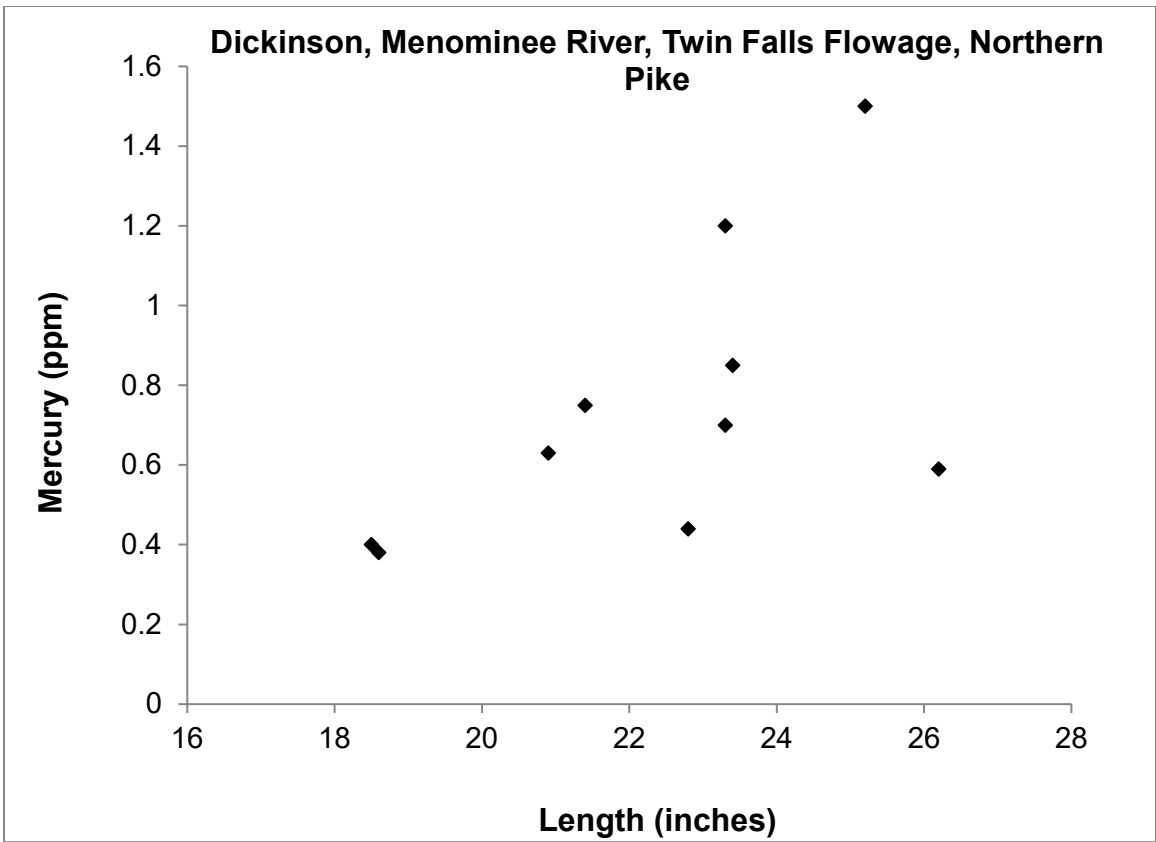
Organics Analysis:

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

Existing Advisory: Twin Falls Flowage/Badwater Lake northern pike are covered by the statewide advisory: No one should eat more than 2 meals per month of northern pike smaller than 30 inches or more than 1 meal per month of those fish larger than 30 inches due to mercury.

Recommendation: No one should eat more than 1 meal per month of Twin Falls Flowage/Badwater Lake northern pike smaller than 30 inches or more than 6 meals per year of those fish larger than 30 inches due to mercury.

Note: The size range of fish in this sample set is limited. The statewide length break was applied.



Carp

**Menominee River
Between Twin Falls & Upper Scott Dams**

**Dickinson &
Menominee 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	1997	18	20.1	na	20.1	33.8
Datasets available: 1989, '91, '92, '96, '97						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	18	0.54	0.07	0.82	0.63	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.433	0.496				

Organics Analysis:

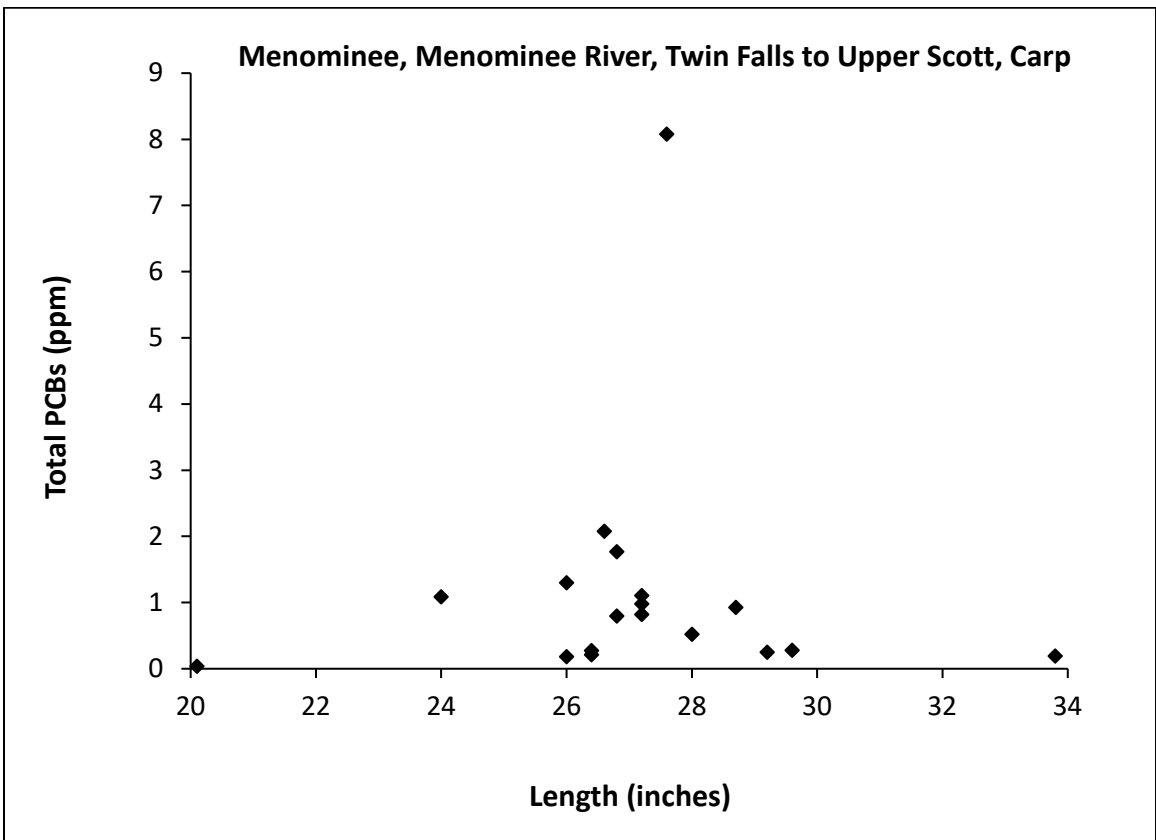
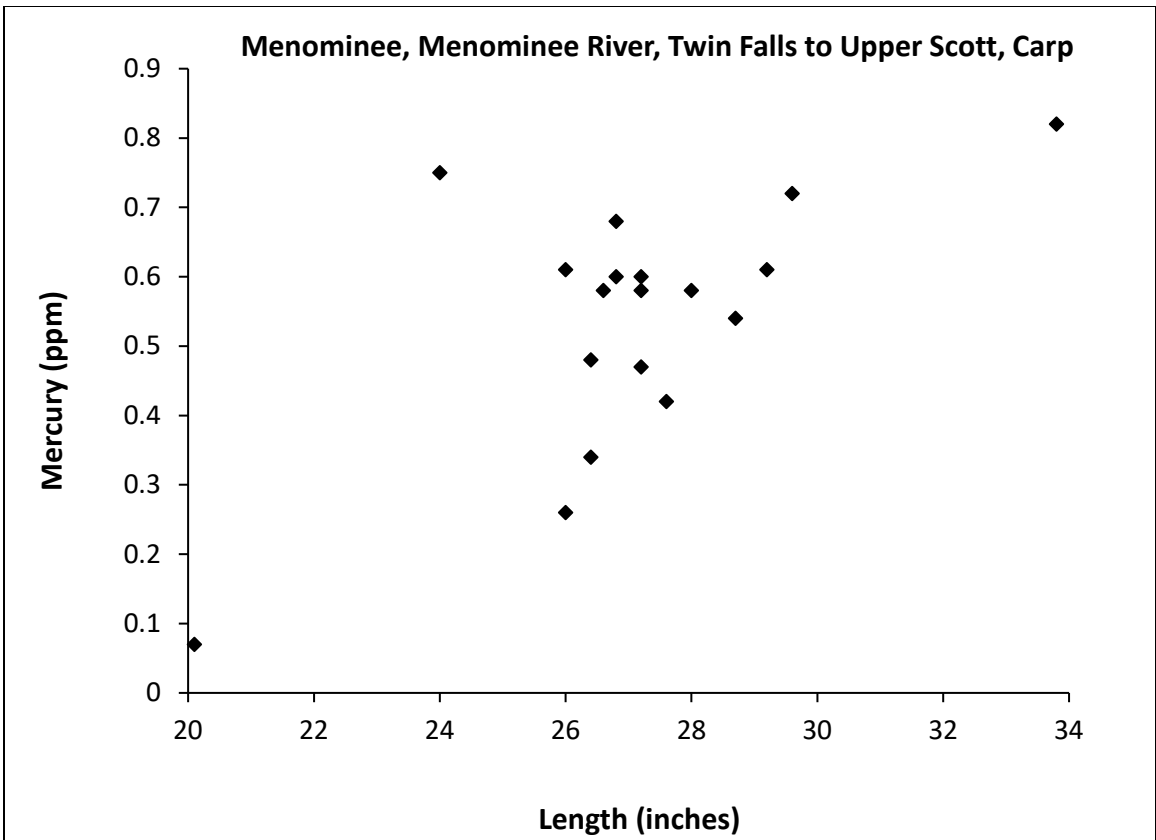
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1989	1997	18	20.1	na	20.1	33.8
Datasets available: 1989, '91, '92, '96, '97						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	18	1.162	0.04	8.08	2.07	Limited
DDT	18	0.056	0.007	0.22	0.08	16
Chlordane	18	0.003	0.003	0.006	0.004	--
Toxaphene	18	ND	--	--	--	--
TEQ*	14	4.6	1.6	12.8	6.8	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.000	0.026				
DDT	0.001	0.003				
Chlordane	0.003	0.003				
Toxaphene	--	--				
TEQ*	0.042	0.060				
Final meal category based on UCL:						Limited

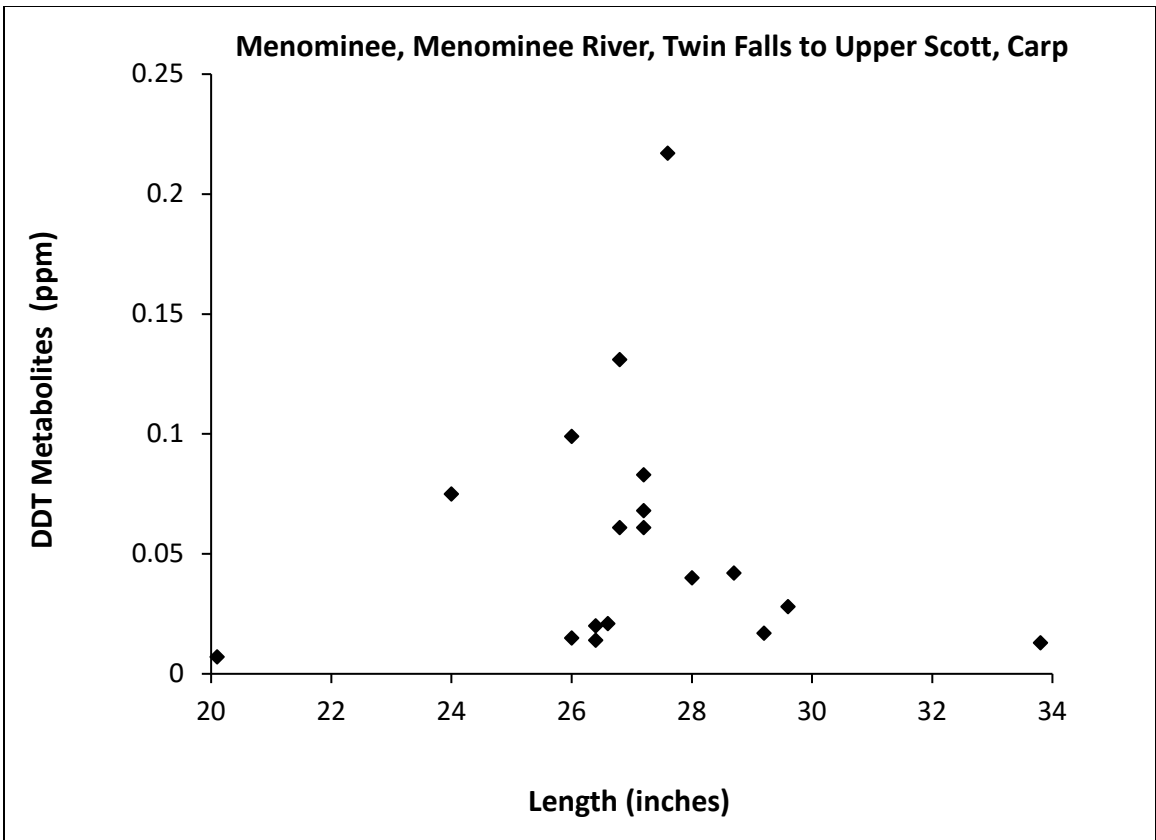
* - 2005 TEF; dl-PCBs not included

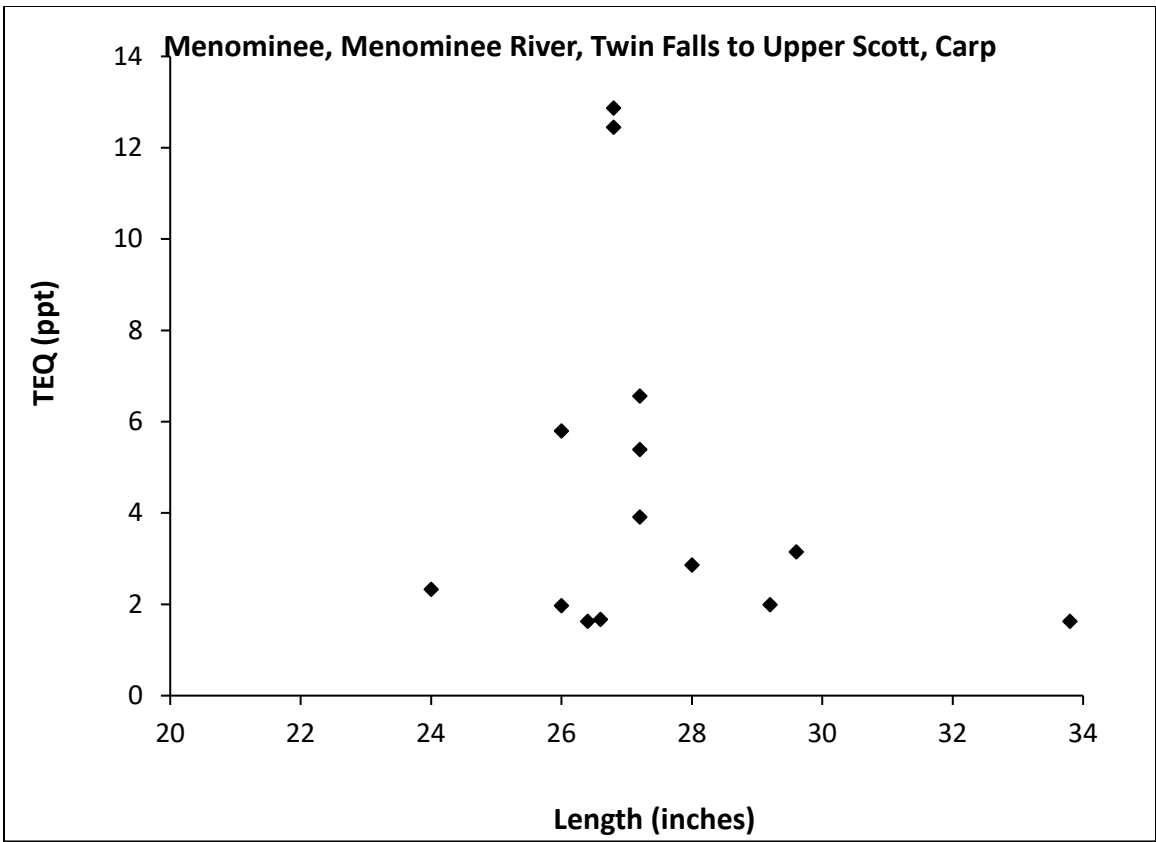
Existing Advisory: Women and children should not eat more than 1 meal per month of carp from the Menominee River between Quinnesec and the Menominee (Lower Scott) Dam smaller than 30 inches or more than 6 meals per year of those fish larger than 30 inches due to mercury and PCBs.

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 Menominee River between the Twin Falls and Upper Scott (Park Mill) dams due to PCBs. Mercury and dioxins would cause advisories.

Note: All data were included in the evaluation despite age; only 4 samples were collected after 1991.







Northern Pike

**Menominee River
Between Twin Falls & Upper Scott Dams**

**Dickinson &
Menominee Counties**

Hg Analysis:

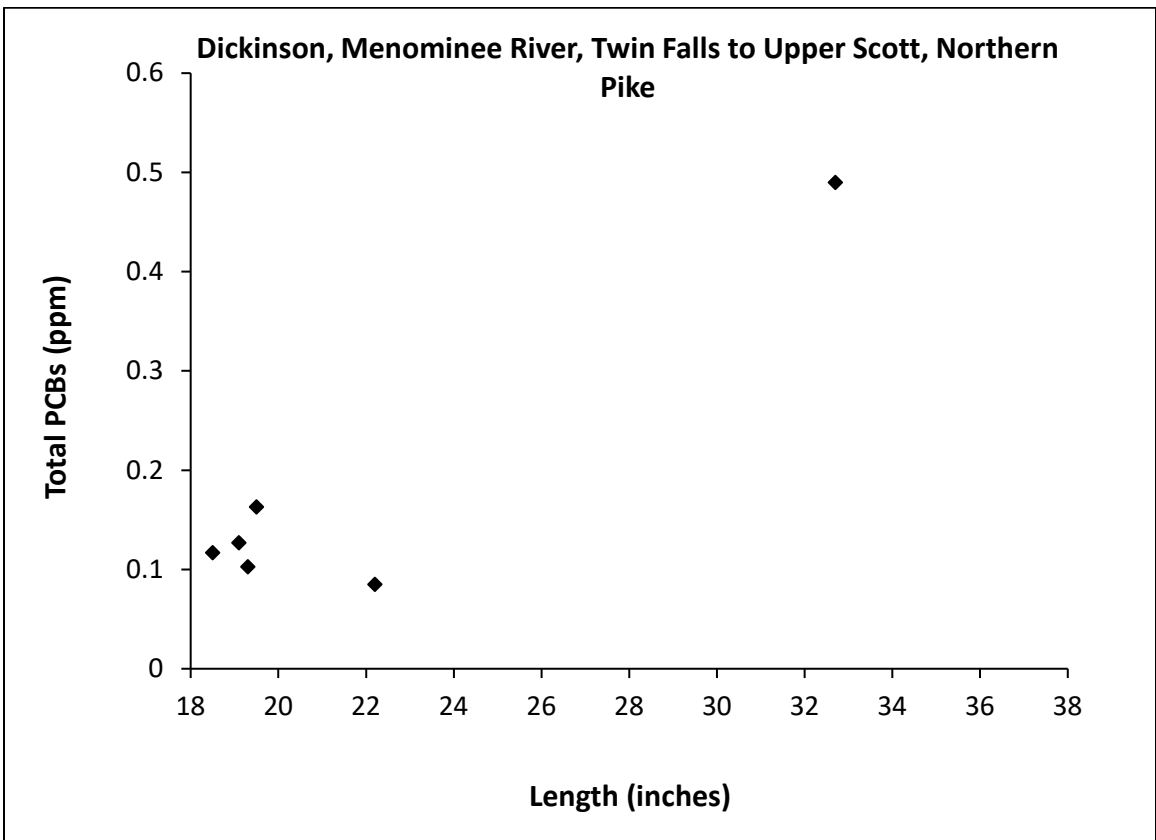
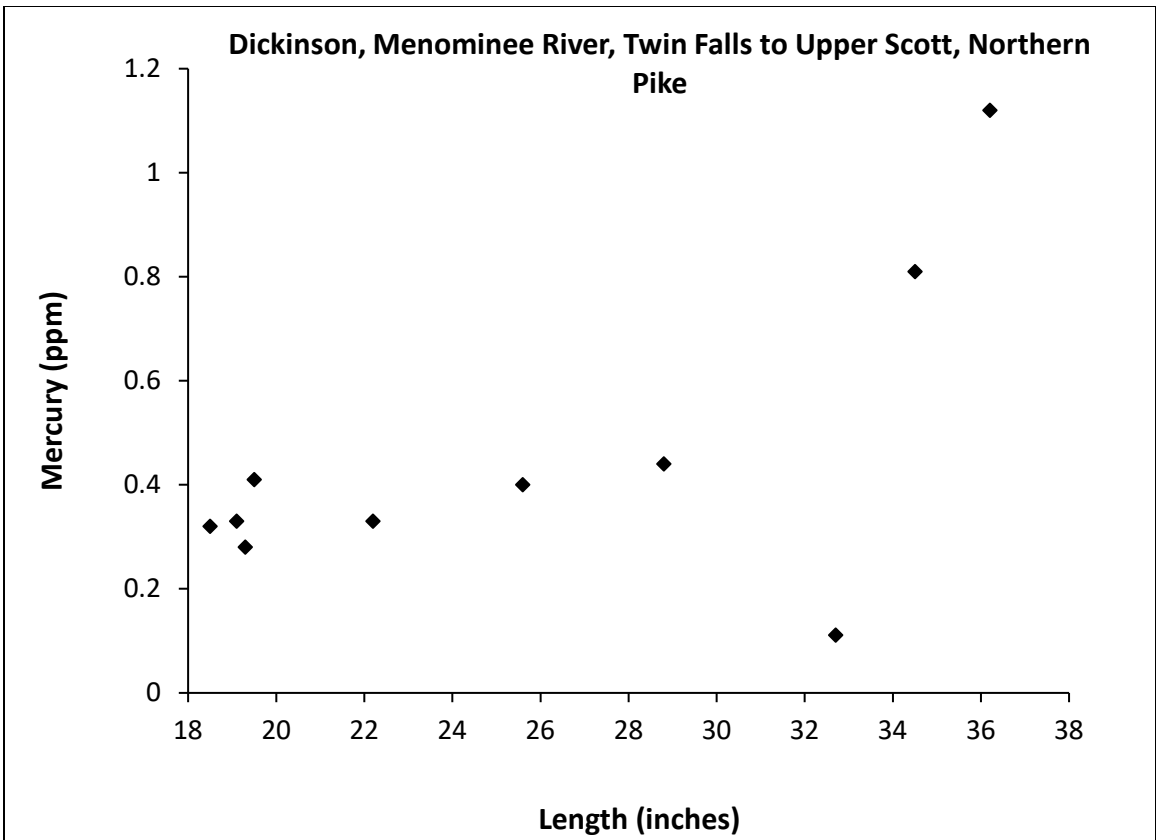
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1986	1999	10	18.5	24	25.6	36.2
Datasets available: 1986, 1988, 1999						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	5	0.58	0.11	1.12	1.06	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.381	0.131				

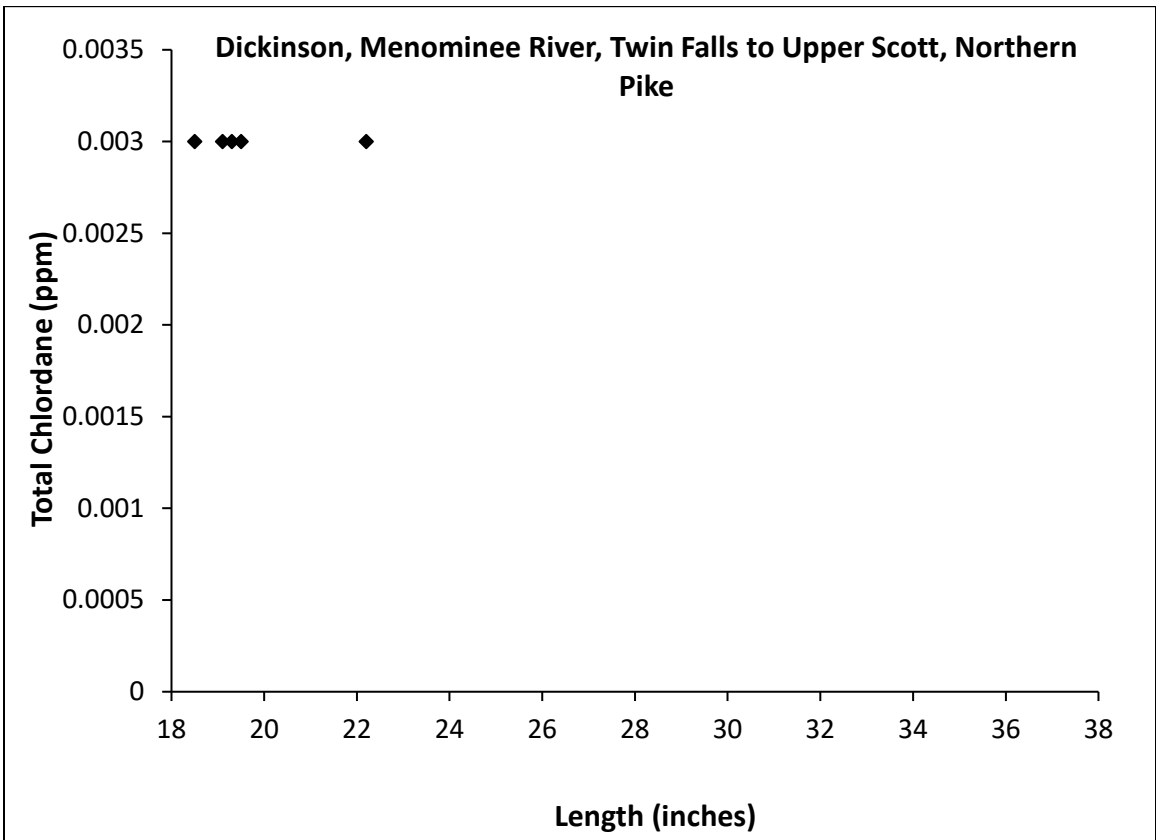
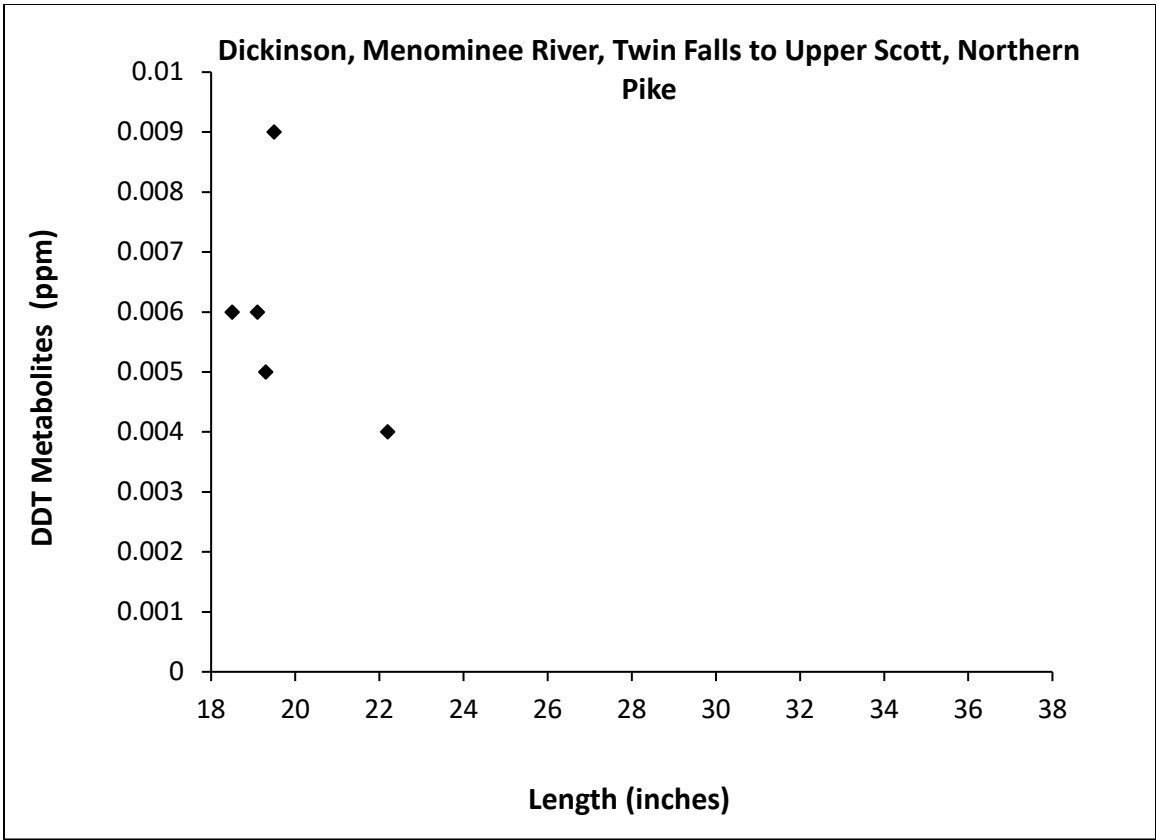
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1986	1988	6	18.5	24	32.7	32.7
Datasets available: 1986, 1988						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	1	0.49	--	--	--	--
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.877*	0.742*	* regression driven by 1 point			
DDT	0.234	0.354				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						1

Existing Advisory: Northern pike from Menominee River impoundments are covered by the statewide mercury advisory.

Recommendation: No one should eat more than 1 meal per month of northern pike from the Menominee River between the Twin Falls and Upper Scott (Park Mill) dams due to mercury.





Rock Bass

**Menominee River
Between Twin Falls & Upper Scott Dams**

**Dickinson &
Menominee Counties**

Hg Analysis:

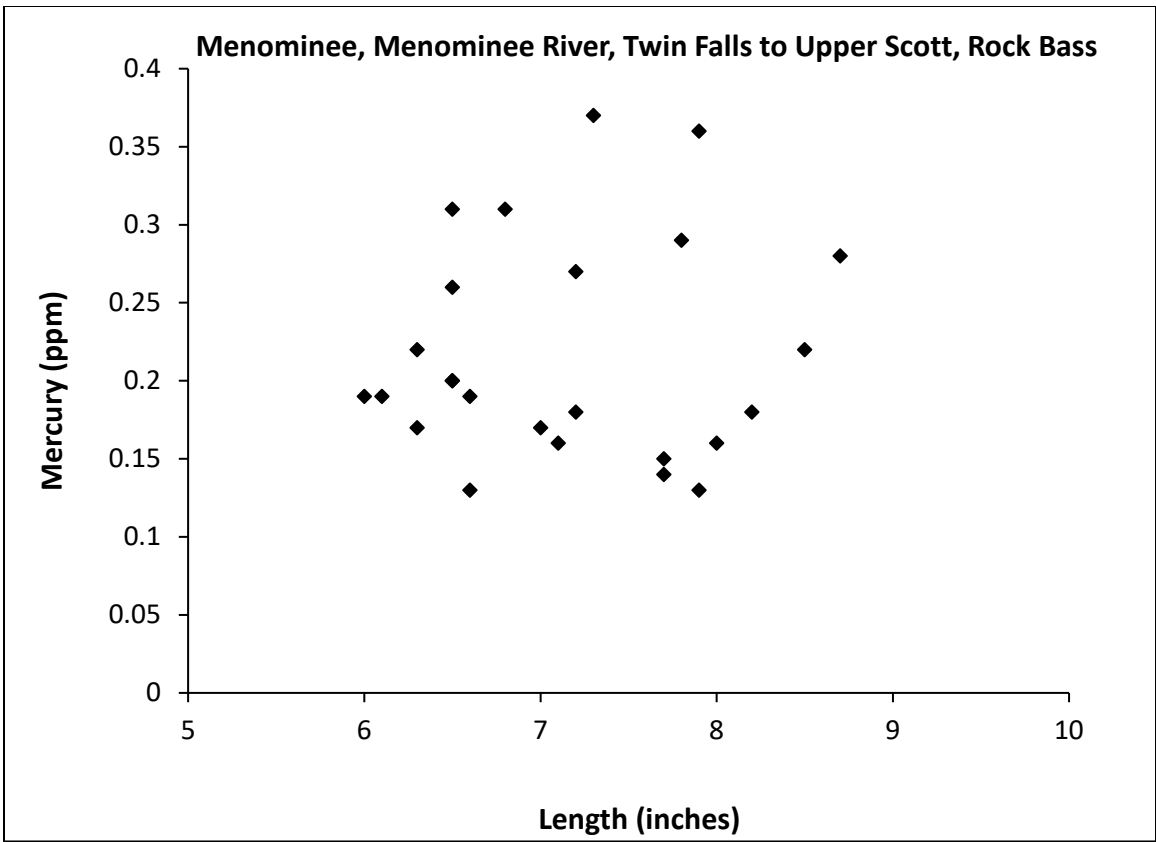
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1990	1995	25	6.0	na	6.0	8.7
Datasets available: 1990, 1995						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	25	0.22	0.13	0.37	0.25	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.008	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
--	--	--	--	--	--	--
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:						4

Existing Advisory: Rock bass from Menominee River impoundments are covered by the statewide mercury advisory.

Recommendation: No one should eat more than 4 meals per month of rock bass from the Menominee River between the Twin Falls and Upper Scott (Park Mill) dams due to mercury.



**Largemouth and
Smallmouth Bass**
Hg Analysis:

**Menominee River
Middle Reach****

**Dickinson and
Menominee Counties**

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
1986	2014	46	11.4	14	13.5	18.7	
Datasets available: 1986, 1988, 2014							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	34	0.49		0.22	0.83	0.54	1
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.495	0.490					

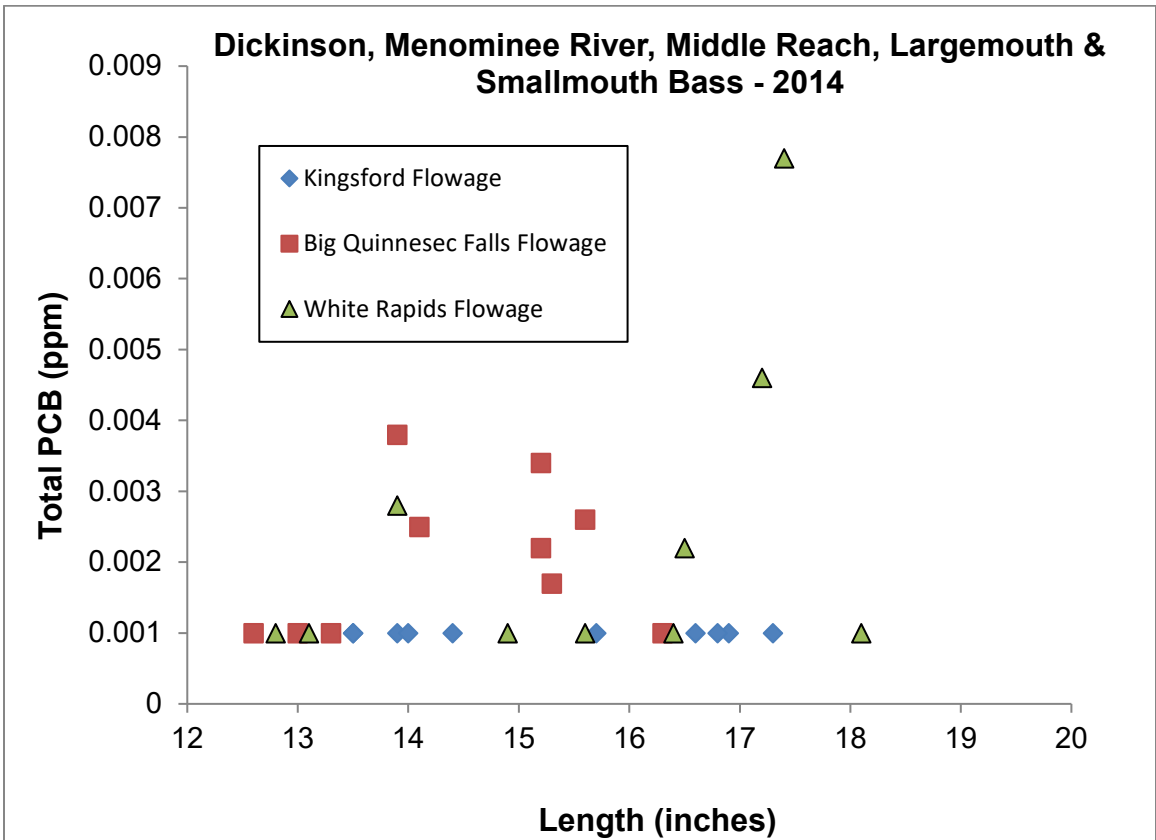
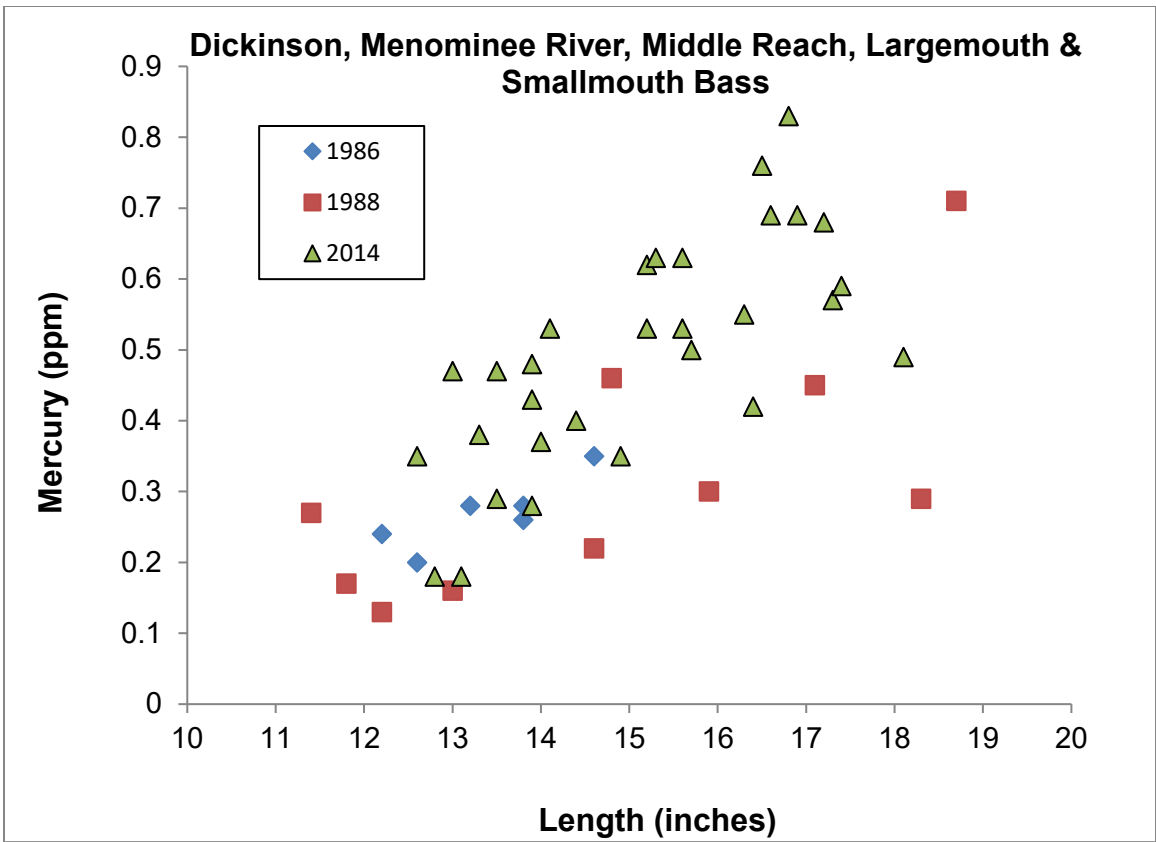
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2014	2014	30	12.6	14	13.5	18.1	
Datasets available: 1988, 2014							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	25	0.002		ND	0.008	0.003	16
DDT	25	ND		--	--	--	16
Chlordane	25	ND		--	--	--	--
Toxaphene	25	ND		--	--	--	--
TEQ	0	--		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.076	0.050					
DDT	--	--					
Chlordane	--	--					
Toxaphene	--	--					
TEQ	--	--					
Final meal category based on UCL:							1

**-includes Kingsford, Big and Little Quinnesec, Sturgeon Falls, Chalk Hill, White Rapids, Grand Rapids, and Upper Scott Dam Impoundments

Existing Advisory: No one should eat more than 1 meal per month of largemouth or smallmouth bass from the Menominee River between the Twin Falls and Upper Scott Dams due to PCBs (Two meals per month would be safe if the fish are properly cleaned and cooked).

Recommendation: No one should eat more than 1 meal per month of largemouth or smallmouth bass from the Menominee River between the Twin Falls and Upper Scott Dams due to mercury.



Walleye

**Menominee River
Middle Reach****

**Dickinson and
Menominee 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	
1986	2014	53	11	15	14.5	26.8	
Datasets available: 1986, '88, '89, '90, '91, '92, '96, 2010, 2014							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	48	0.55		0.19	1.60	0.64	1
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.450	0.455					

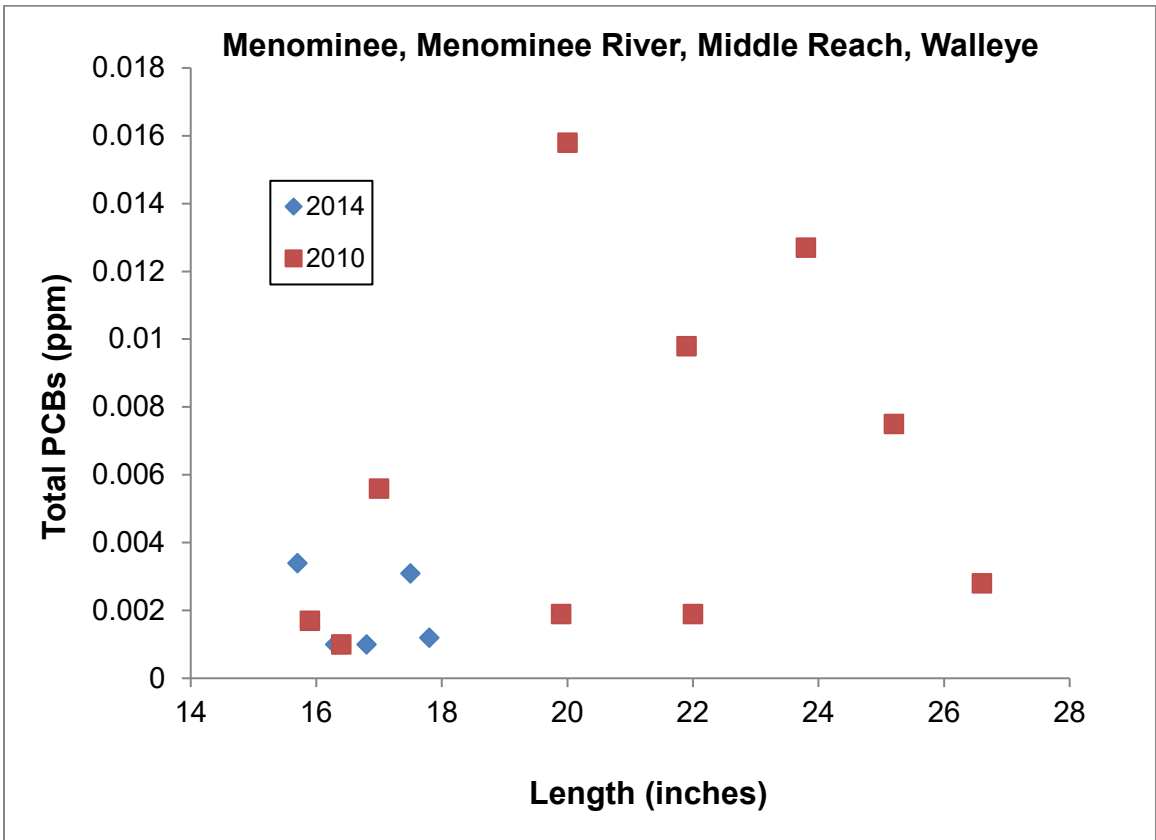
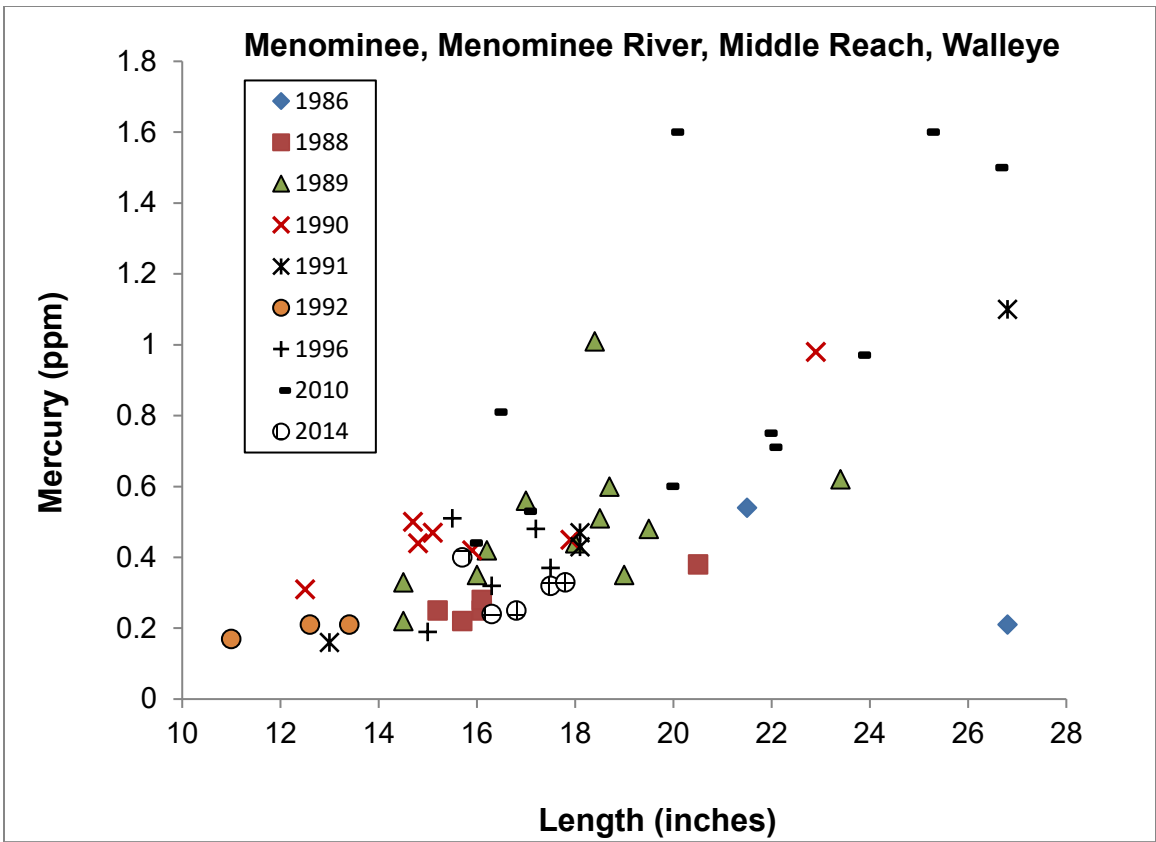
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		
Earliest	Most Recent				Min	Max	
2010	2014	42	15.7	15	15.7	26.6	
Datasets available: 1986, '88, '89, '91, '92, '96, 2010, 2014							
Chemical	Sample Size (Legal)	Mean		Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	15	0.005		0.001	0.0158	0.007	16
DDT	15	ND		--	--	--	--
Chlordane	15	ND		--	--	--	--
Toxaphene	15	ND		--	--	--	--
TEQ	0	--		--	--	--	--
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
PCB	0.188	0.264					
DDT	0.000	0.000					
Chlordane	--	--					
Toxaphene	--	--					
TEQ	--	--					
Final meal category based on UCL:							1

**-includes Kingsford, Big and Little Quinnesec, Sturgeon Falls, Chalk Hill, White Rapids, Grand Rapids, and Upper Scott Dam Impoundments

Existing Advisory: No one should eat more than 1 meal per month of walleye from the Menominee River between the Twin Falls dam and the Upper Scott Dam due to mercury.

Recommendation: No change is recommended. PCBs can be removed as a cause of advisories.



White Sucker and Redhorse Sucker
Hg Analysis:

Menominee River Middle Reach**

Dickinson and Menominee Counties

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1986	2014	74	10.2	na	10.2	25.1
Datasets available: 1986, '88, '89, '96, 2010, 2014						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	74	0.40	0.06	1.10	0.46	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.376	0.492				

Organics Analysis:

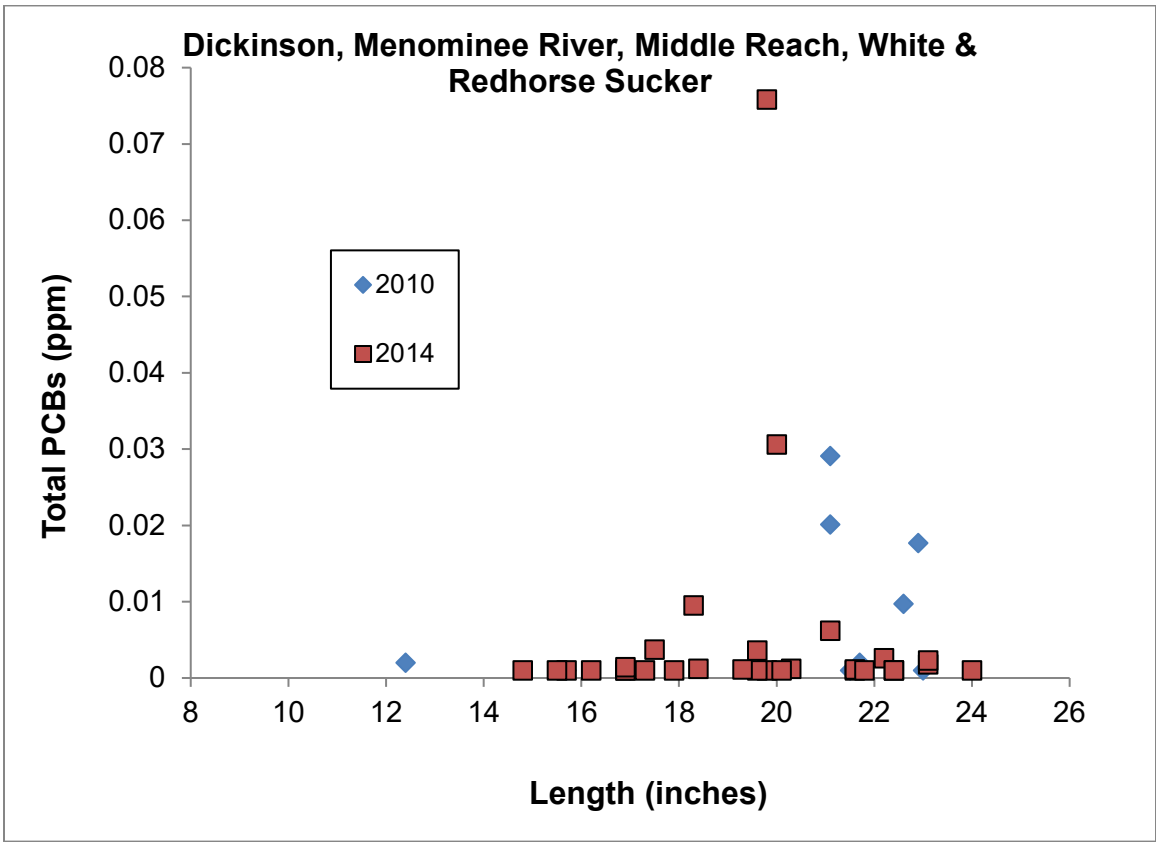
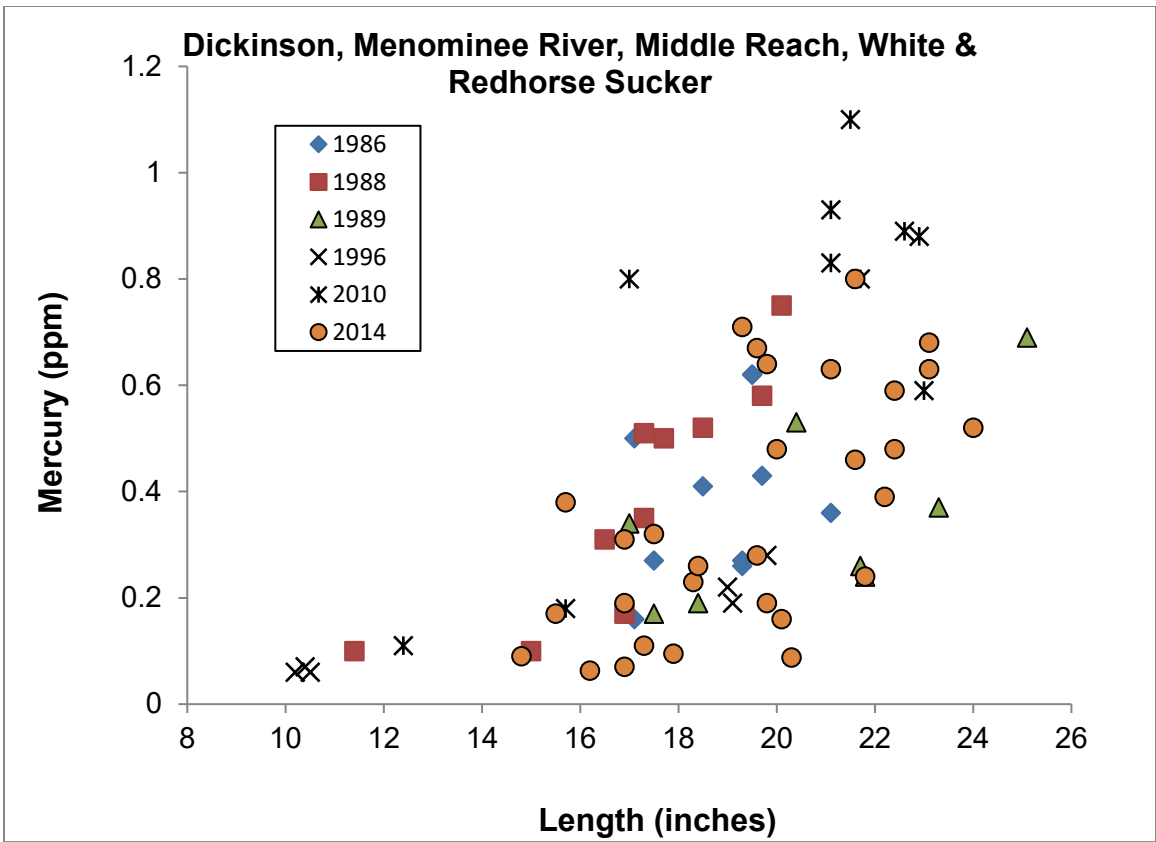
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2010	2014	40	12.4	na	12.4	24
Datasets available: 1986, '88, '89, '96, 2010, 2014						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	40	0.006	0.001	0.08	0.010	16
DDT	40	0.001	0.001	0.002	0.001	16
Chlordane	40	ND	--	--	--	--
Toxaphene	40	ND	--	--	--	--
TEQ	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.040	0.020				
DDT	0.009	0.009				
Chlordane	--	--				
Toxaphene	--	--				
TEQ	--	--				
Final meal category based on UCL:						2

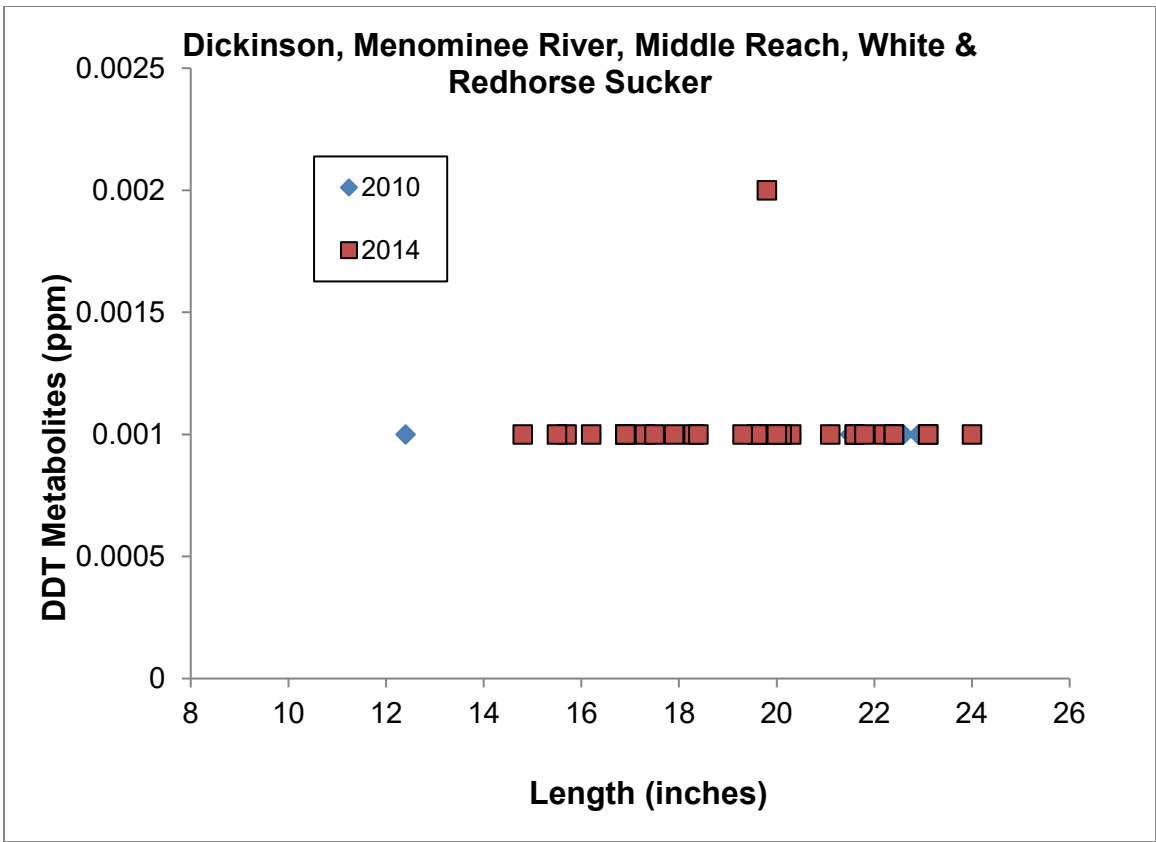
**-includes Kingsford, Big and Little Quinnesec, Sturgeon Falls, Chalk Hill, White Rapids, Grand Rapids, and Upper Scott Dam Impoundments

Existing Advisory: No one should eat more than 4 meals per month of sucker smaller than 18 inches from the Menominee River between the Twin falls and Upper Scott Dams due to PCBs and mercury, 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 sucker smaller than 18 inches from the Menominee River between the Twin falls and Upper Scott Dams or more than 1 meal per month of those fish larger than 18 inches due to mercury.

Note: Although the regression no longer shows a relationship between mercury level and length, the 95% UCL Hg concentration in 18 suckers larger than 18 inches collected in 2010 and 2014 was 0.73 ppm (1 meal per month); 95% UCL Hg in 22 suckers less than 18 inches was 0.44 ppm (2 meals per month). Additional data is needed to remove the size break.





Carp

**Menominee River
Lower Scott Flowage (Impoundment)**

Menominee County

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	2014	11	22.2	na	22.2	31.1
Datasets available: 2012, 2013, 2014						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	11	0.48	0.34	0.78	0.57	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.169	0.213				

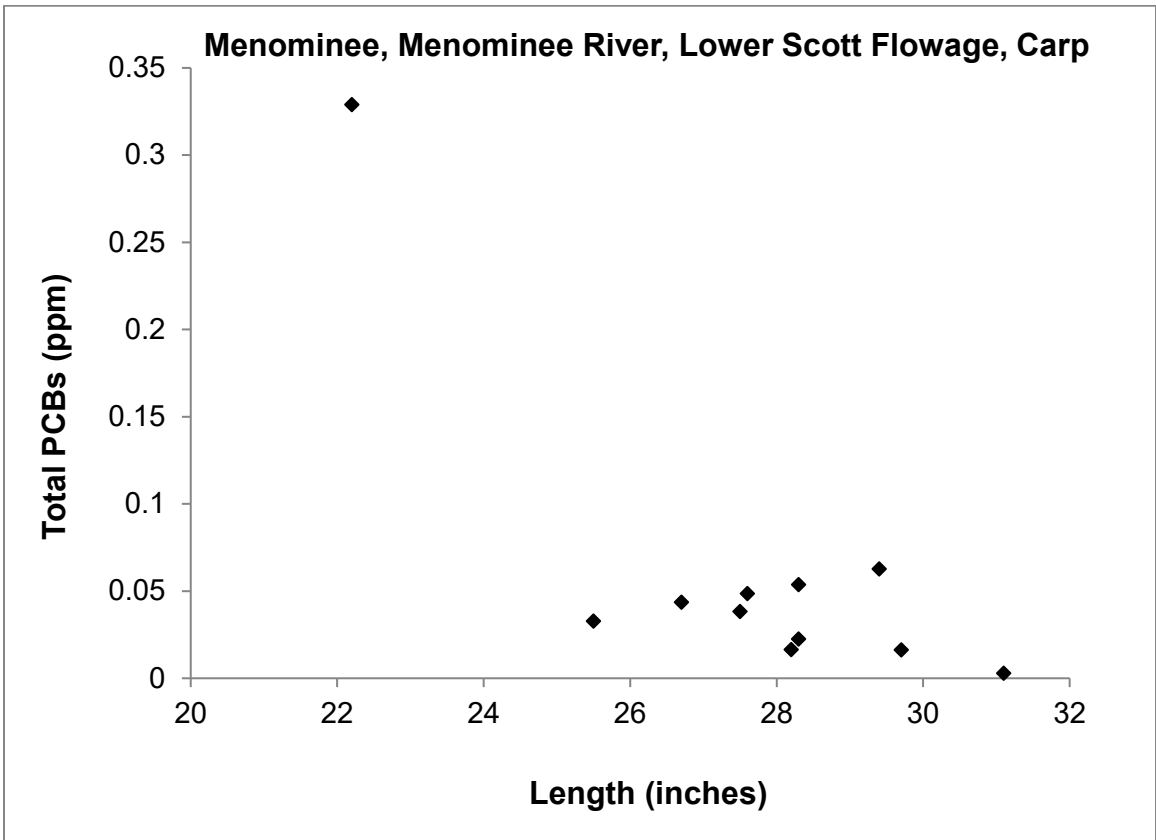
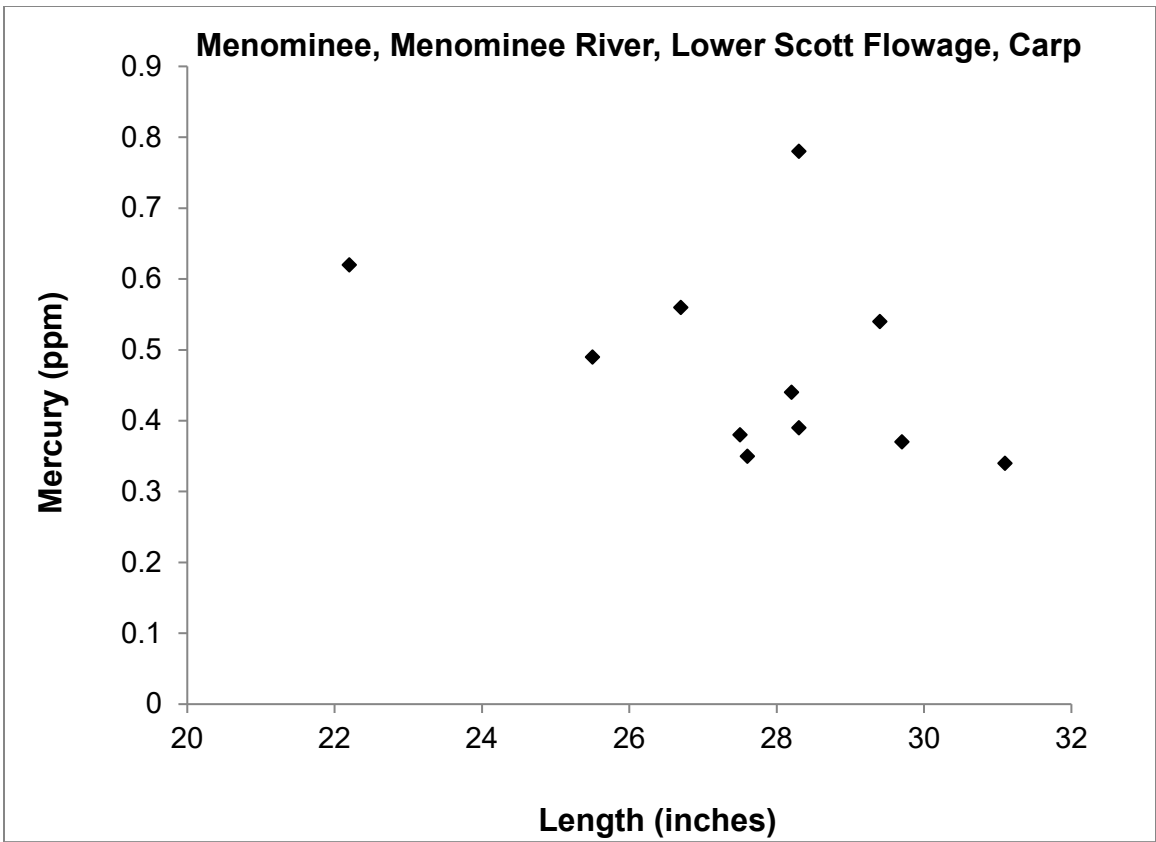
Organics Analysis:

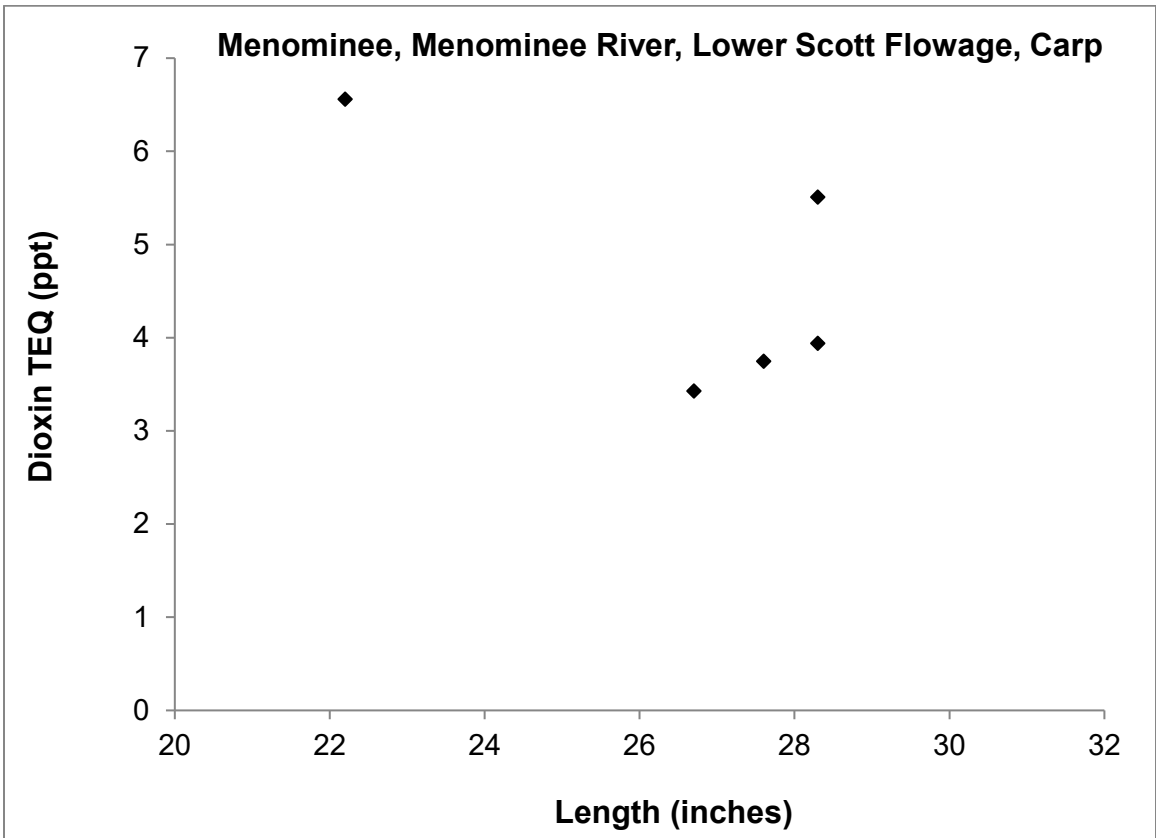
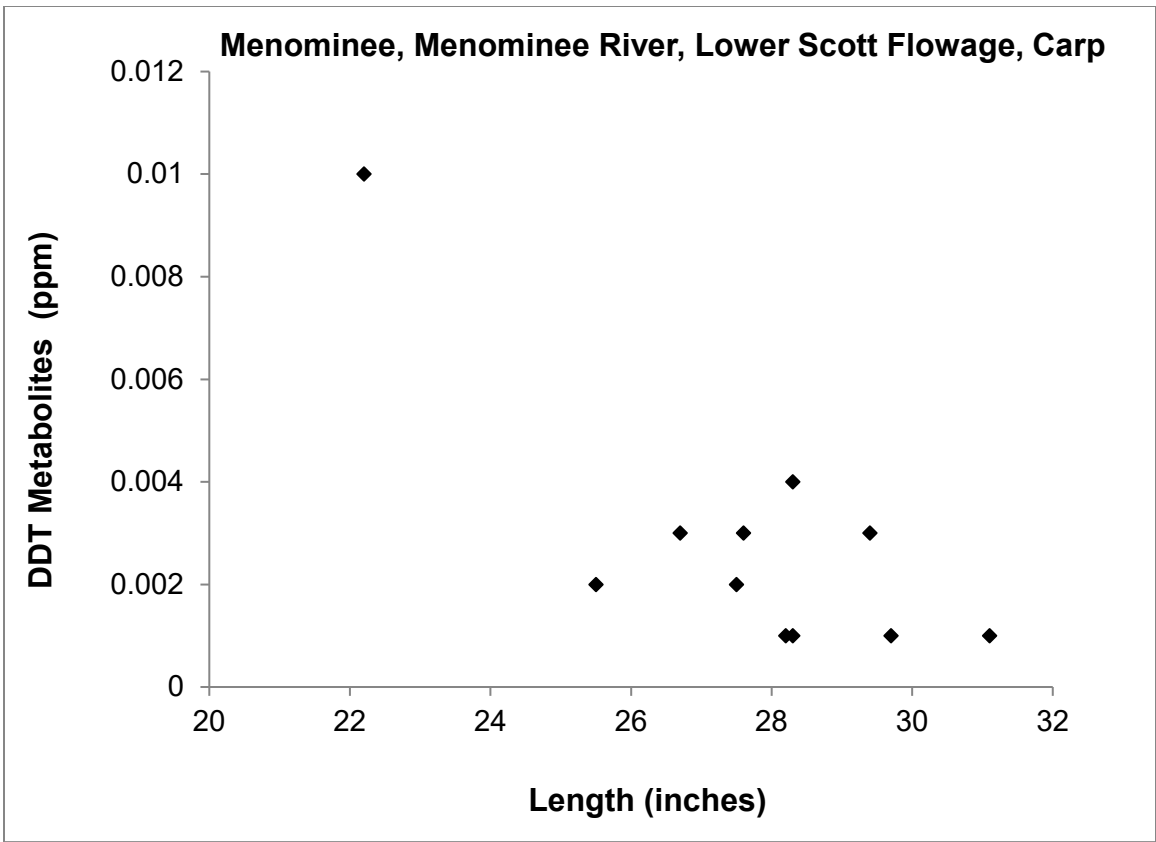
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2014	11	22.2	na	22.2	31.1
Datasets available: 2012, 2013, 2014						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	11	0.061	0.003	0.33	0.12	1
DDT	11	0.003	0.001	0.01	0.005	16
Chlordane	11	ND	--	--	--	--
Toxaphene	11	ND	--	--	--	--
TEQ*	5	4.6 ppt	3.4 ppt	6.6 ppt	6.3 ppt	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.648	0.650	(negative slope)			
DDT	0.627	0.533	(negative slope)			
Chlordane	--	--				
Toxaphene	--	--				
TEQ*	0.447	0.380				
Final meal category based on UCL:						1

* - 2005 WHO TEFs; dl-PCBs included

Existing Advisory: No one should eat more than 2 meals per month of Menominee River carp between the Menominee and Upper Scott Dam (Lower Scott Flowage), due to elevated concentrations of PCBs and mercury.

Recommendation: No one should eat more than 1 meal per month of Menominee River carp between the Menominee and Upper Scott Dam (Lower Scott Flowage), due to elevated concentrations of PCBs, dioxin, and mercury.





Redhorse Sucker

**Menominee River
Lower Scott Flowage (Impoundment)**

Menominee County

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	5	19.4	na	19.4	20.9
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	5	0.77	0.27	1.10	1.17	0.5
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.964	0.907				

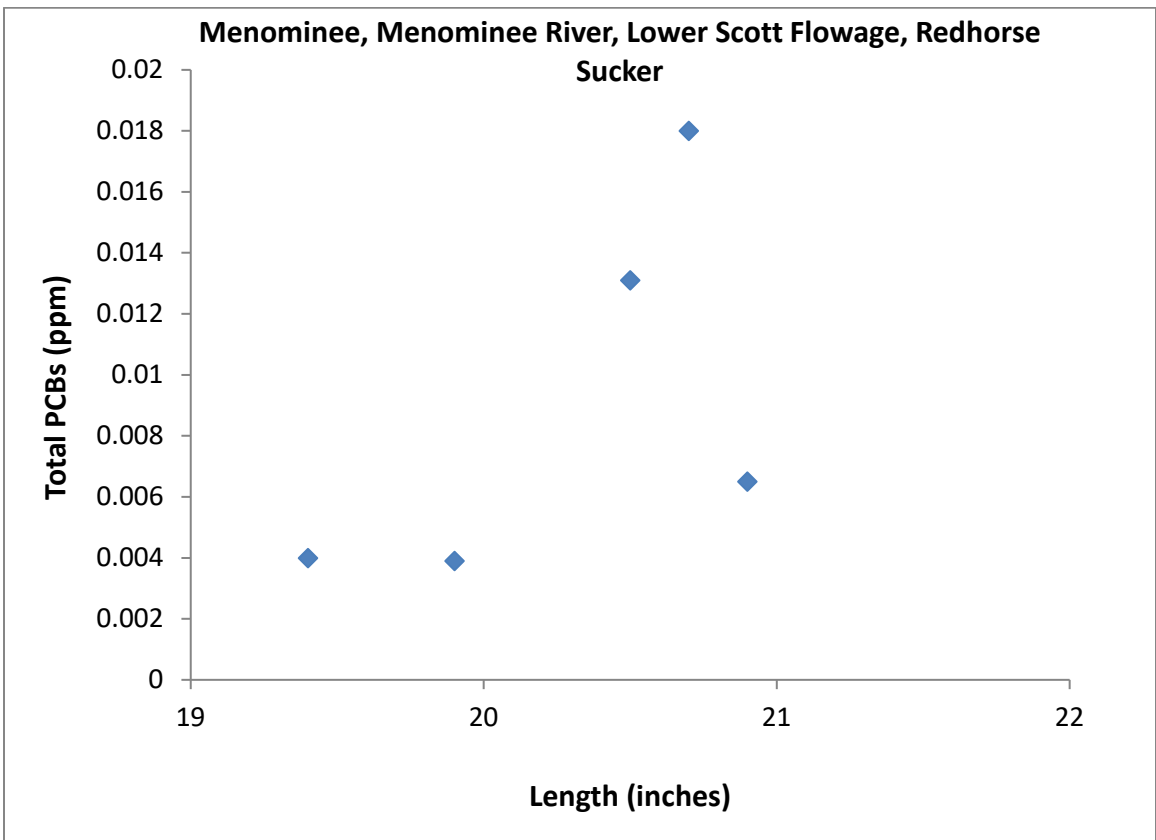
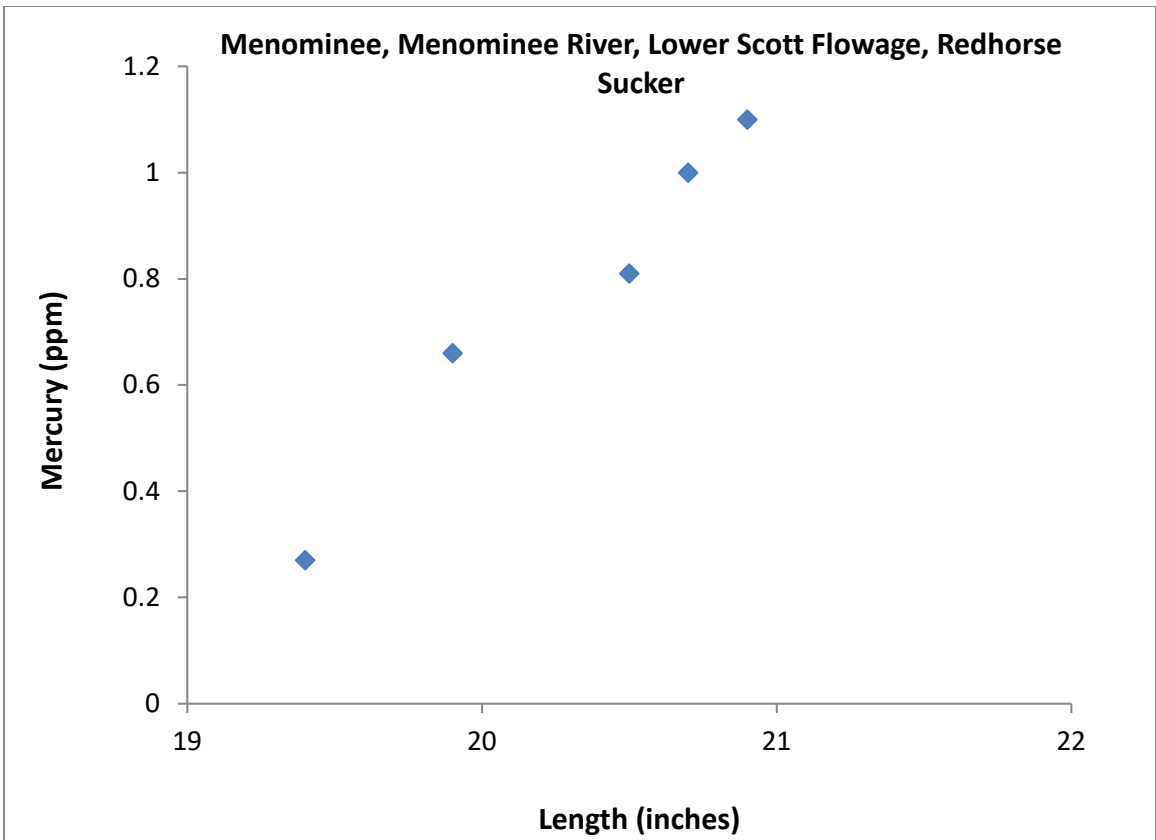
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	5	19.4	na	19.4	20.9
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	5	0.009	0.004	0.02	0.02	12
DDT	5	ND	--	--	--	--
Chlordane	5	ND	--	--	--	--
Toxaphene	5	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.379	0.493				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						0.5

Existing Advisory: Specific guidelines for Lower Scott Flowage sucker were not developed since data were not available previously.

Recommendation: No one should eat more than 6 meals per year of Menominee River sucker between the Menominee and Upper Scott Dam, including the Lower Scott Flowage, due to elevated concentrations of mercury. PCBs would cause an advisory.

Note: There was a very limited size range of fish.



Rock Bass

**Menominee River
Lower Scott Flowage (Impoundment)**

Menominee County

Hg Analysis:

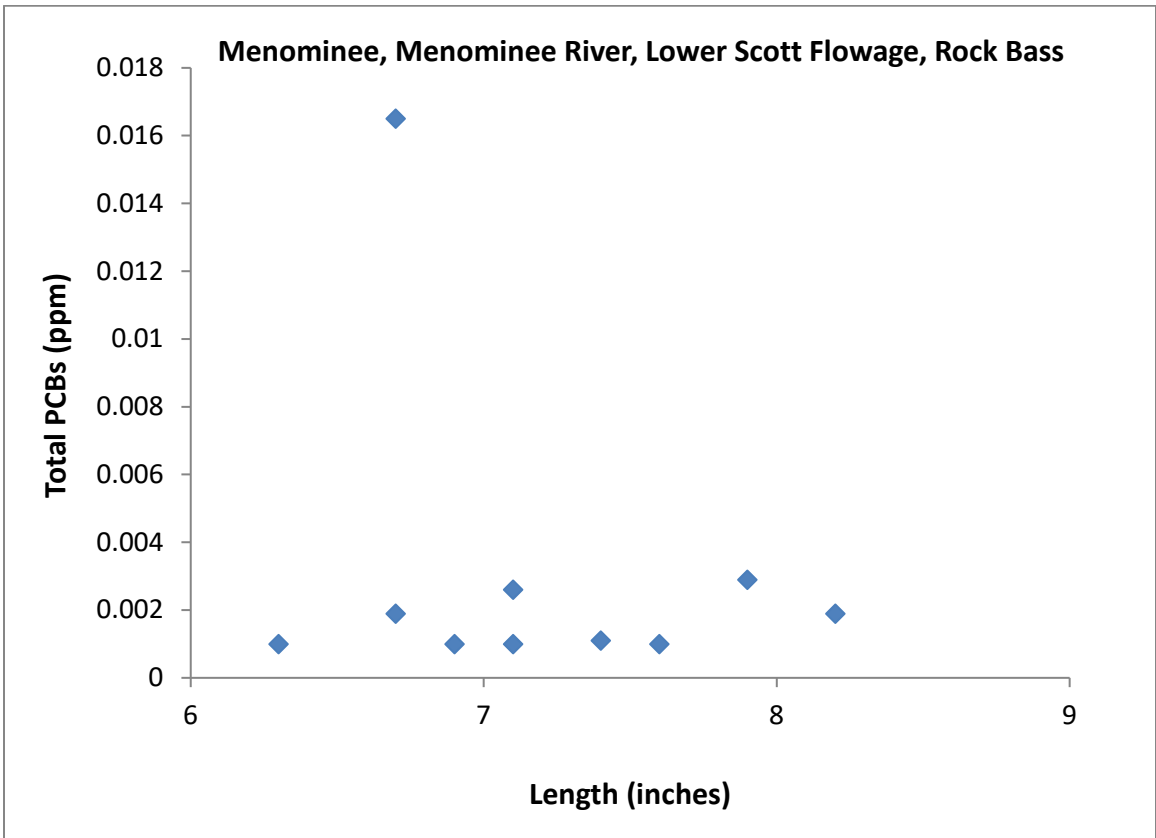
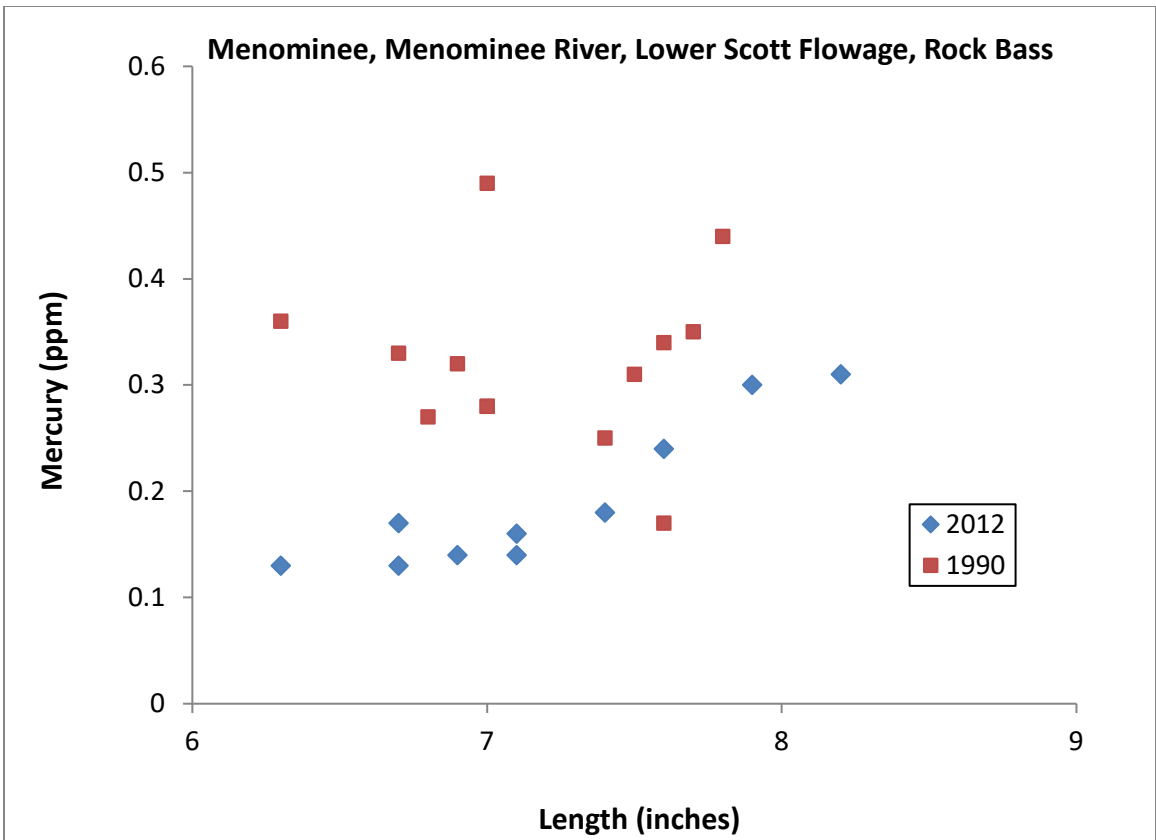
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1990	2012	23	6.3	na	6.3	8.2
Datasets available: 1990, 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	23	0.26	0.13	0.49	0.31	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.074	0.103				

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	6.3	na	6.3	8.2
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.003	0.001	0.02	0.01	16
DDT	10	ND	--	--	--	--
Chlordane	10	ND	--	--	--	--
Toxaphene	10	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.055	0.006				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						2

Existing Advisory: No one should eat more than 2 meals per month of Menominee River rock bass between the Menominee and Upper Scott Dam, including the Lower Scott Flowage (Menominee Dam Impoundment) due to mercury.

Recommendation: No change.



Smallmouth Bass

**Menominee River
Lower Scott Flowage (Impoundment)**

Menominee County

Hg Analysis:

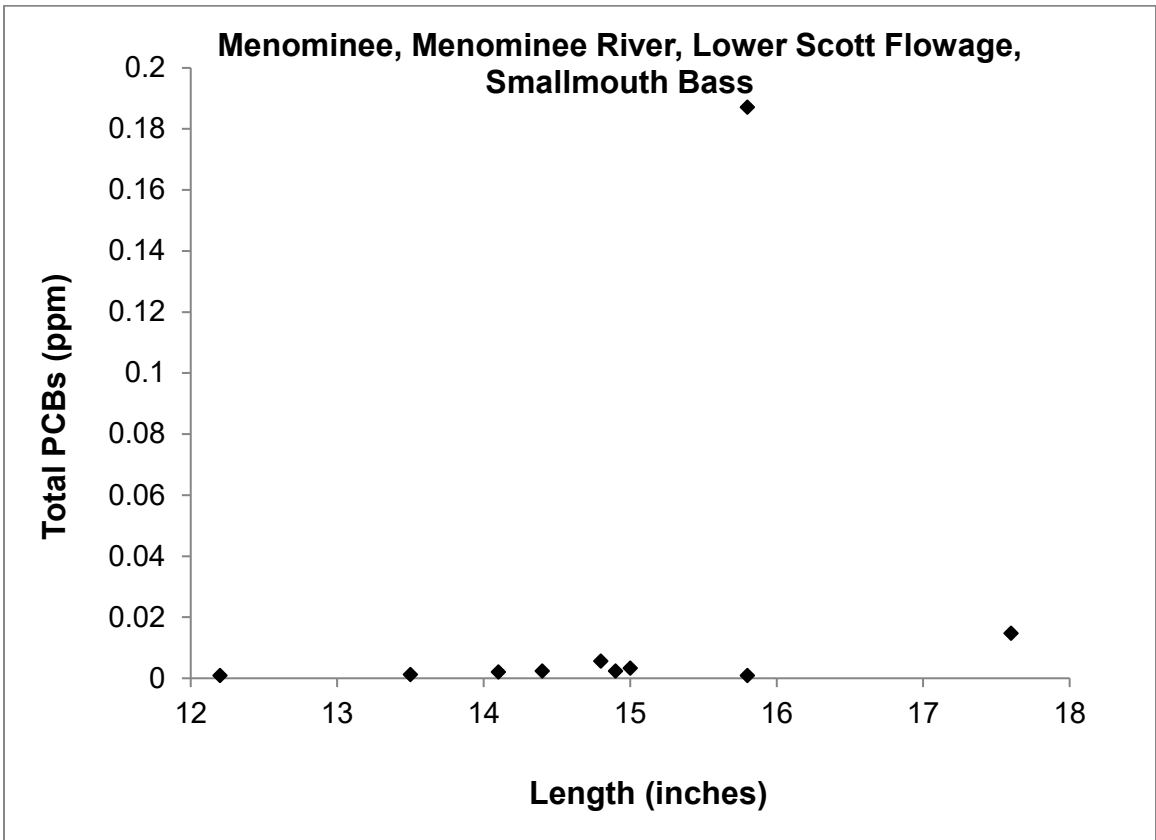
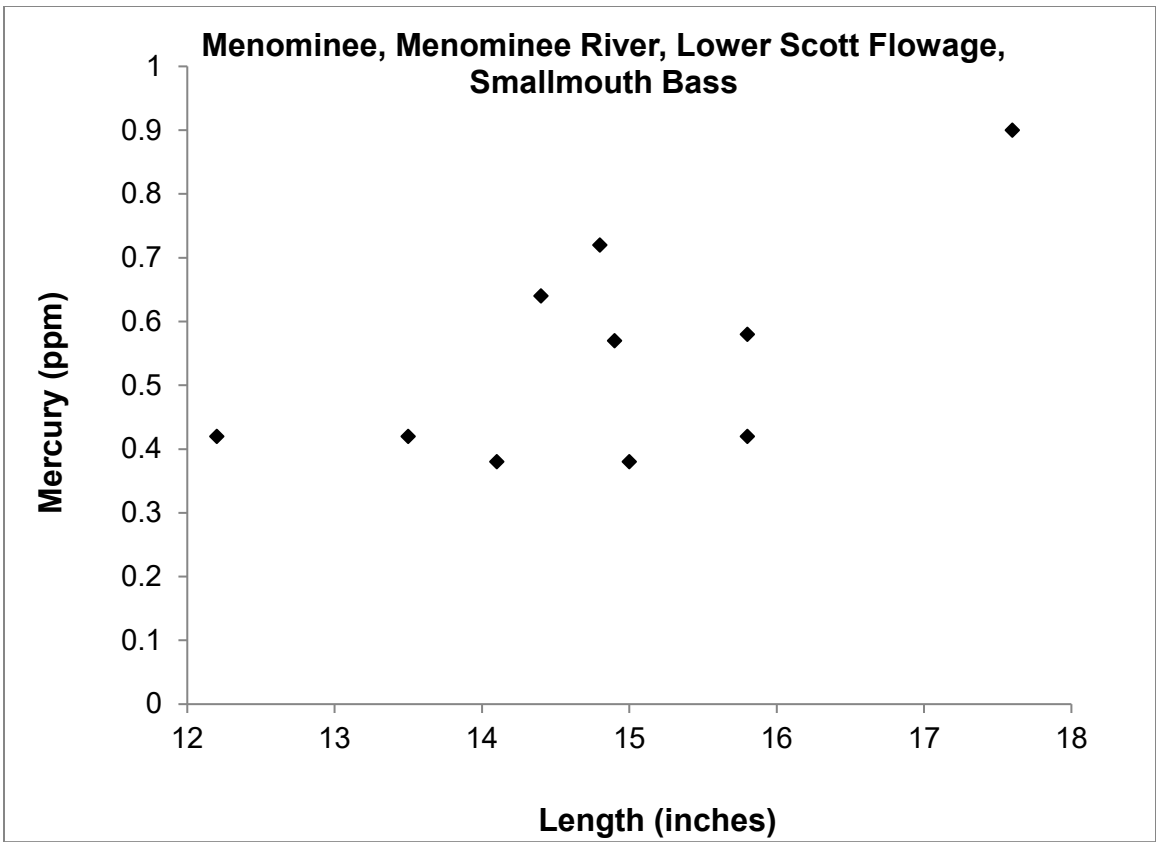
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2013	10	12.2	14	13.5	17.6
Datasets available: 2012, 2013						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	9	0.56	0.38	0.90	0.69	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.406	0.361				

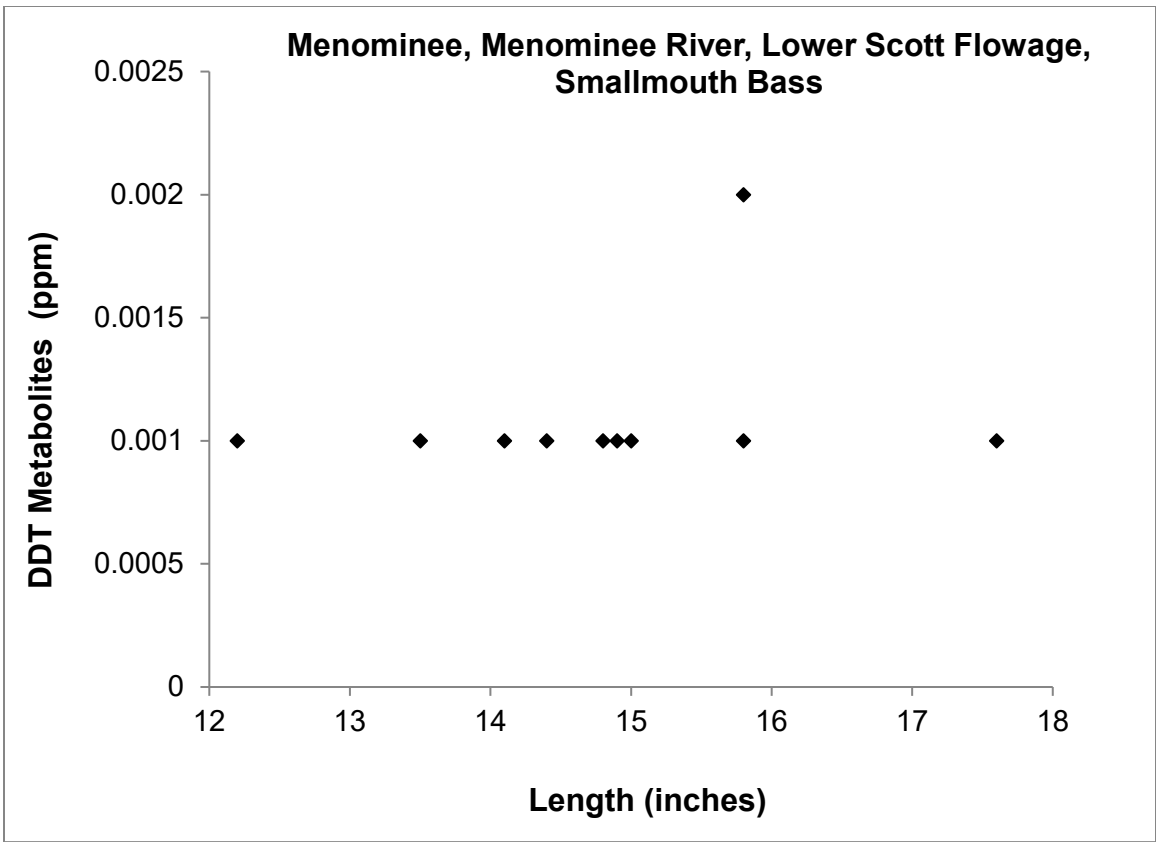
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2013	10	12.2	14	13.5	17.6
Datasets available: 2012, 2013						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	9	0.024	0.001	0.1872	0.071	2
DDT	9	0.001	0.001	0.002	0.001	16
Chlordane	9	ND	--	--	--	--
Toxaphene	9	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.085	0.321				
DDT	0.057	0.057				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						1

Existing Advisory: The statewide advice due to mercury applies to Menominee River largemouth and smallmouth bass between the Menominee and Upper Scott Dam (the Lower Scott Flowage): No one should eat more than 2 meals per month of legal size 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 legal size 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. PCBs would cause an advisory. The statewide length break was applied since the size range of fish was limited.





Walleye

**Menominee River
Lower Scott Flowage (Impoundment)**

Menominee County

Hg Analysis:

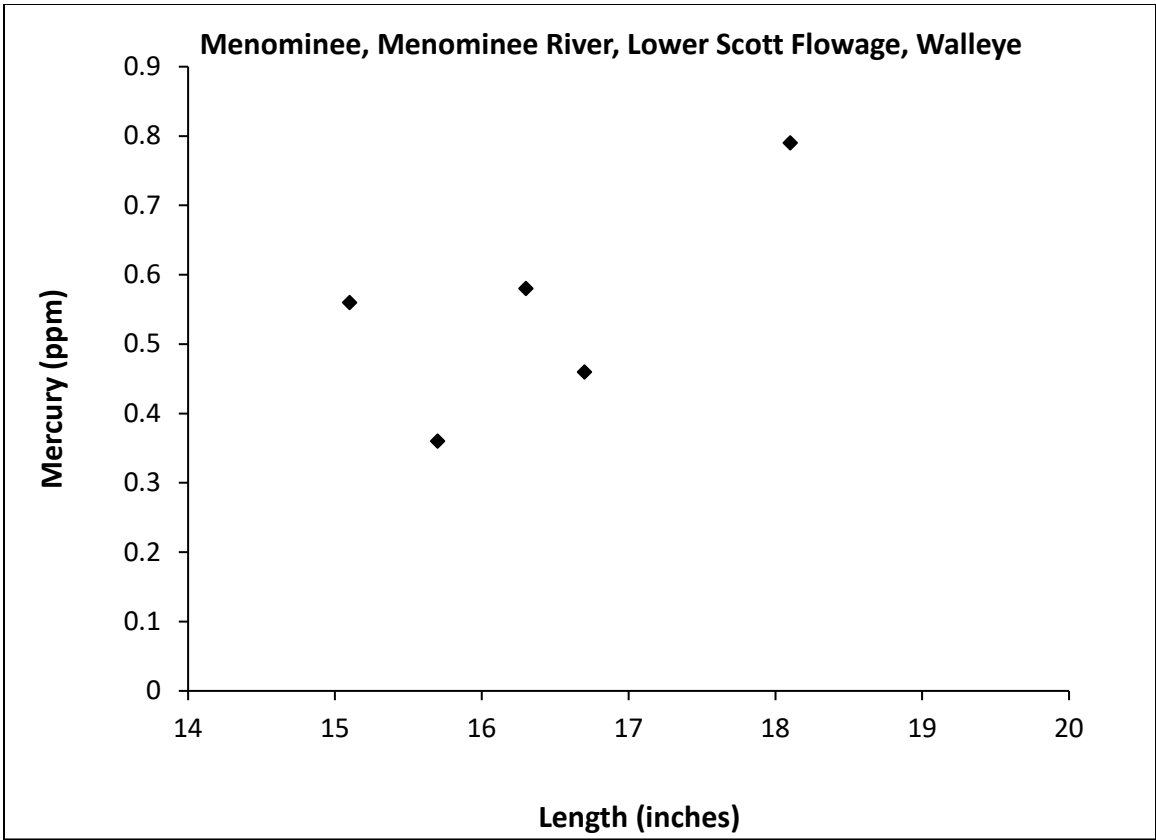
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples		Meal Category
Earliest	Most Recent				Min	Max	
1990	1990	5	15.1	15.0	15.1	18.1	
Datasets available: 1990							
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category	
Mercury	5	0.55	0.36	0.79	0.75	1	
Chemical	Linear Regression	Exponential Regression					
	R ²	R ²					
Mercury	0.467	0.389					

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	
--	--	--	--	--	--	--	
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: Women and children should not eat more than 1 meal per month of walleye from the Menominee River between Quinnesec and the Menominee (Lower Scott) Dam larger than 18 inches due to mercury and PCBs.

Recommendation: No one should eat more than 1 meal per month of walleye from the Lower Scott Flowage smaller than 20 inches or more than 6 meals per year of those fish larger than 20 inches due to mercury. Statewide length break was applied as the size range of fish was limited.



Black Crappie

Menominee River Downstream of Lower Scott Dam

Menominee County

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	7.7	na	7.7	13.6
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.14	0.09	0.27	0.19	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.808	0.842				

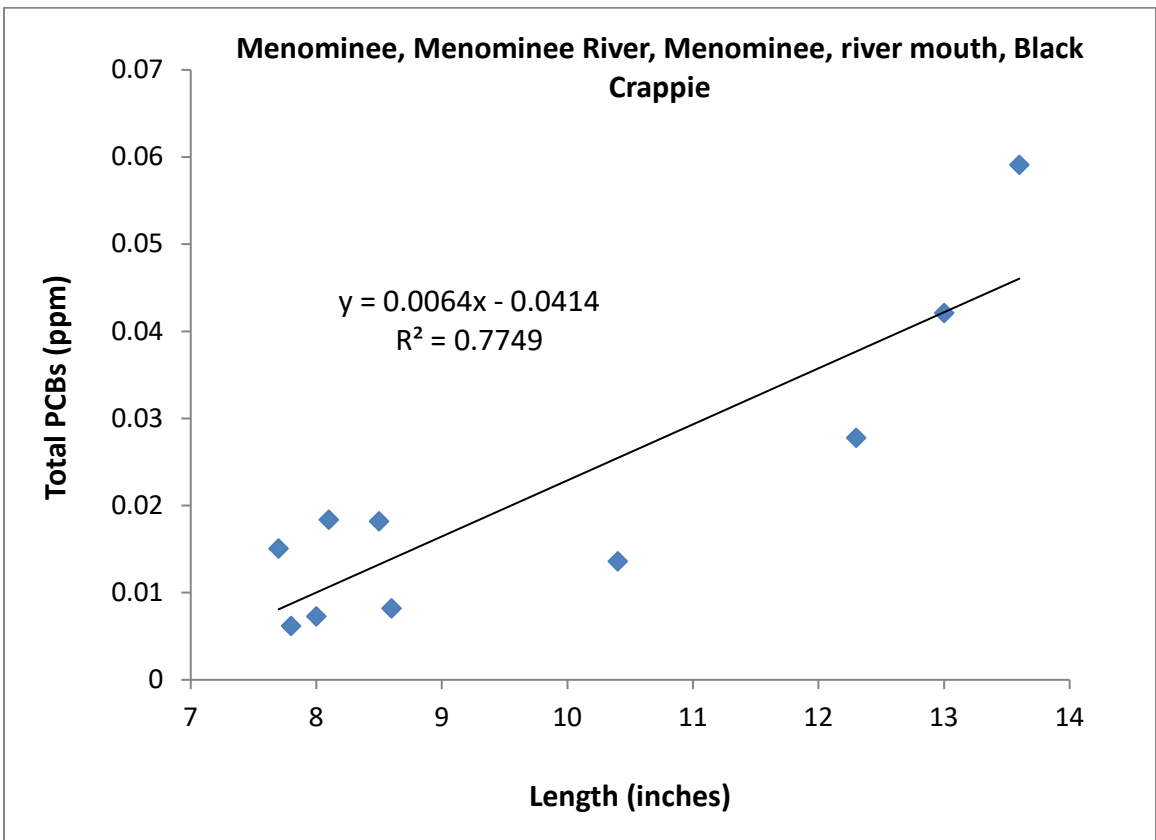
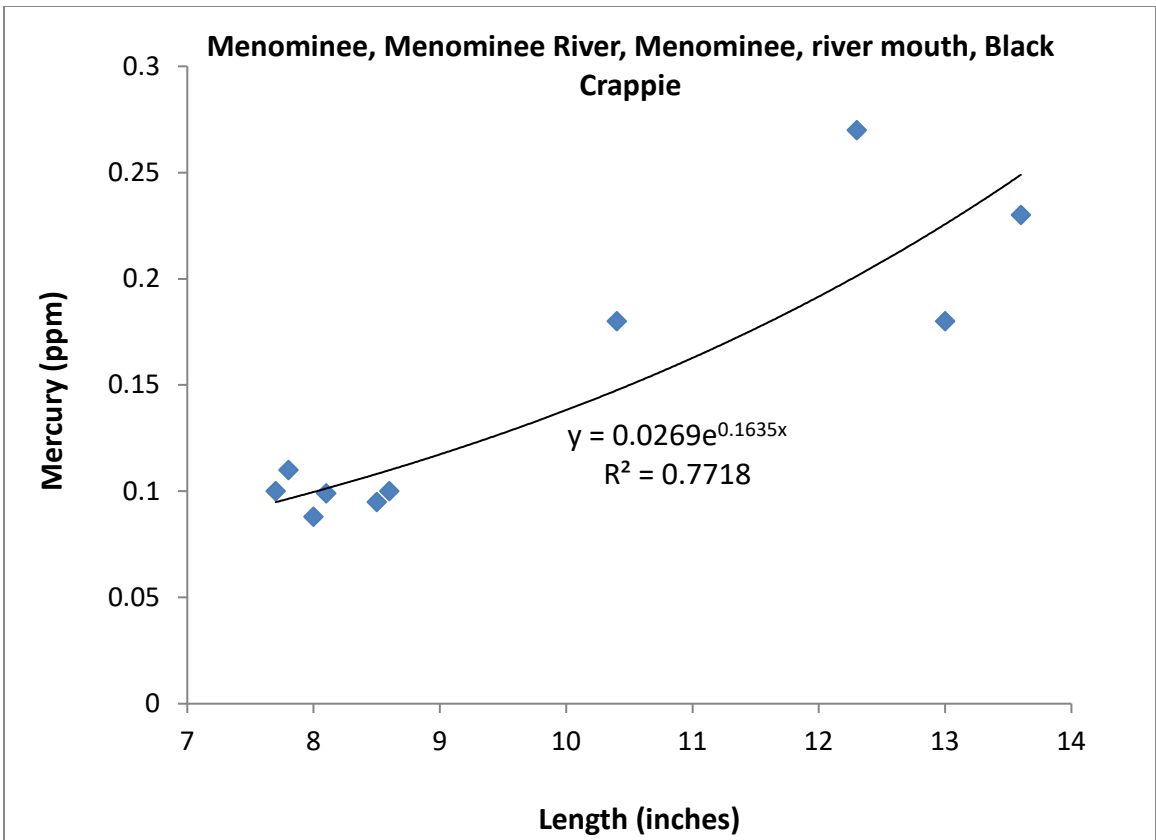
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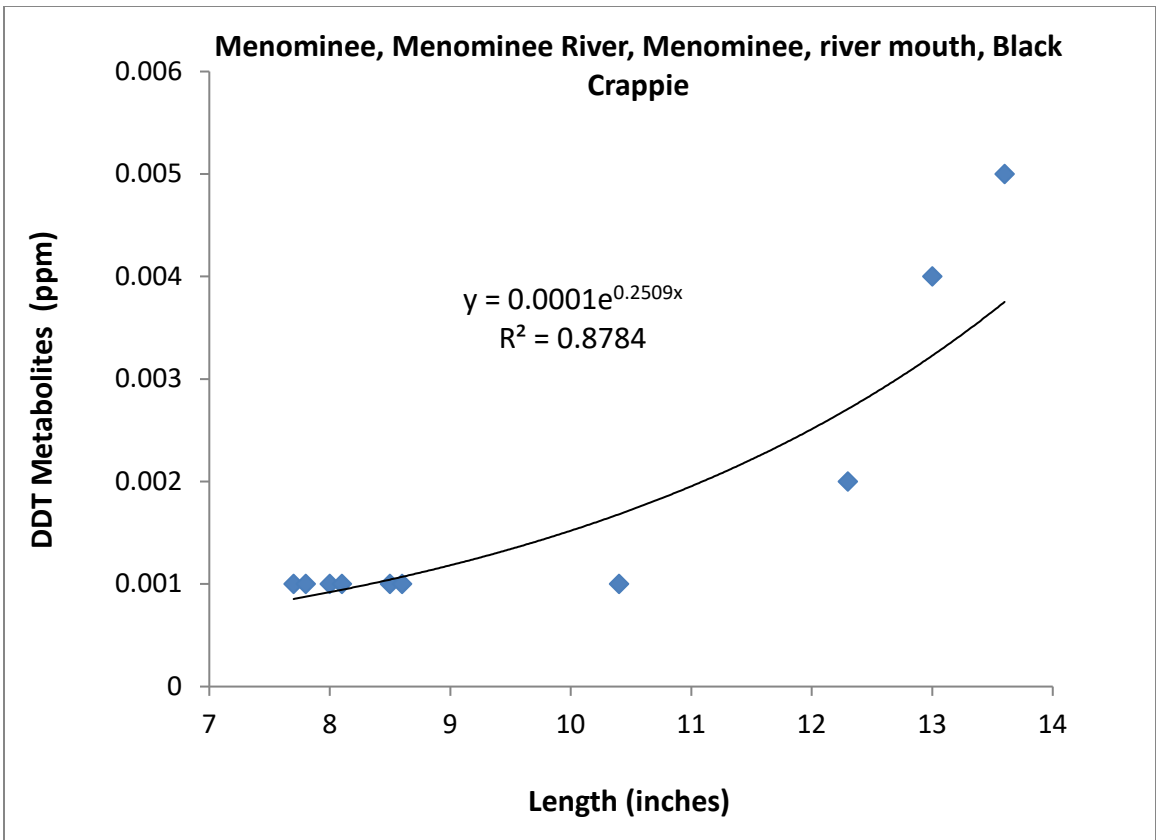
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	10	7.7	na	7.7	13.6
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.02	0.01	0.06	0.03	8
DDT	10	0.002	0.001	0.005	0.003	16
Chlordane	10	ND	--	--	--	--
Toxaphene	10	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.775	0.715				
DDT	0.777	0.849				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						4

Existing Advisory: Specific guidelines for Menominee River black or white crappie were not developed since data were not available previously.

Recommendation: No one should eat more than 8 meals per month of black or white crappie smaller than 9 inches from the Menominee River downstream of the Lower Scott (Menominee) Dam or more than 4 meals per month of those fish larger than 9 inches due to elevated concentrations of mercury. PCBs would cause an advisory.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category	PCB Regression Equation Estimate (ppm)	Meal Category
6	0.07	12	0	16
7	0.08	12	0.003	16
8	0.10	8	0.01	16
9	0.12	8	0.016	12
10	0.14	4	0.023	8
12	0.19	4	0.04	4
14	0.26	4	0.05	4
<i>Shaded area denotes extrapolated estimates</i>				





Bluegill

**Menominee River
Downstream of Lower Scott Dam**

Menominee County

Hg Analysis:

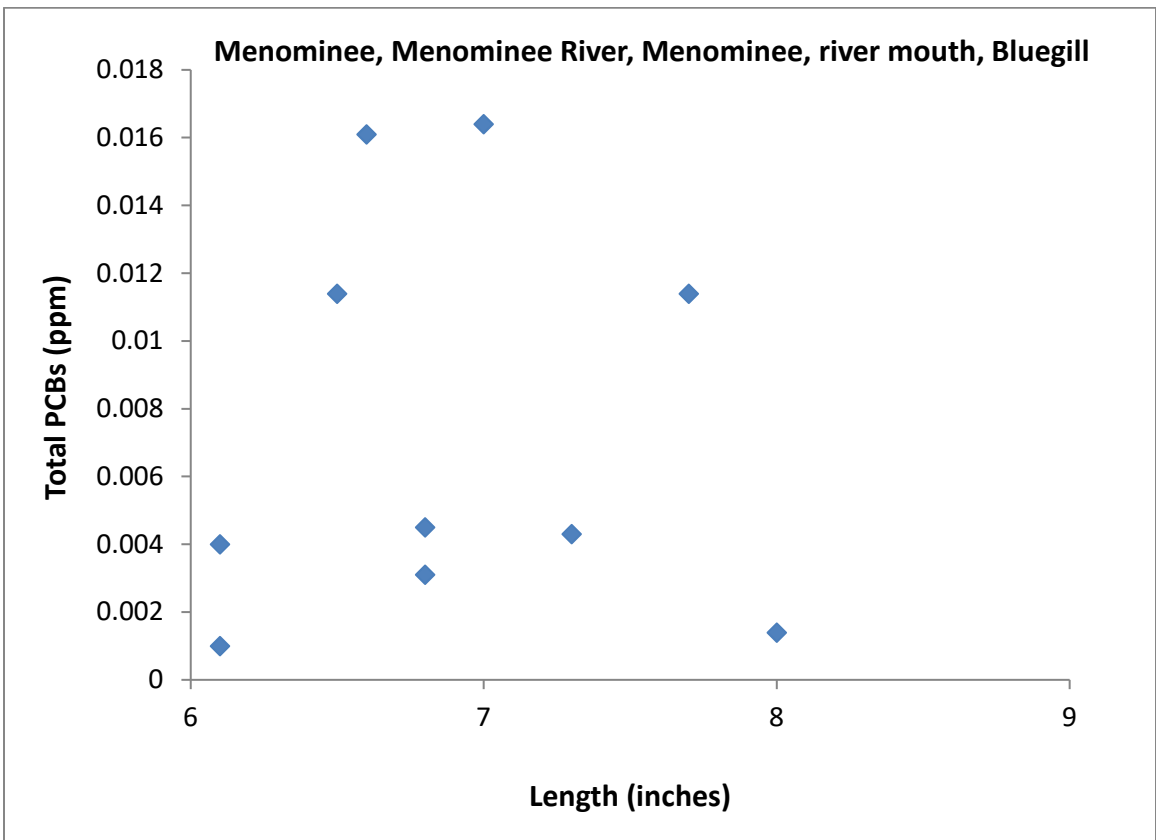
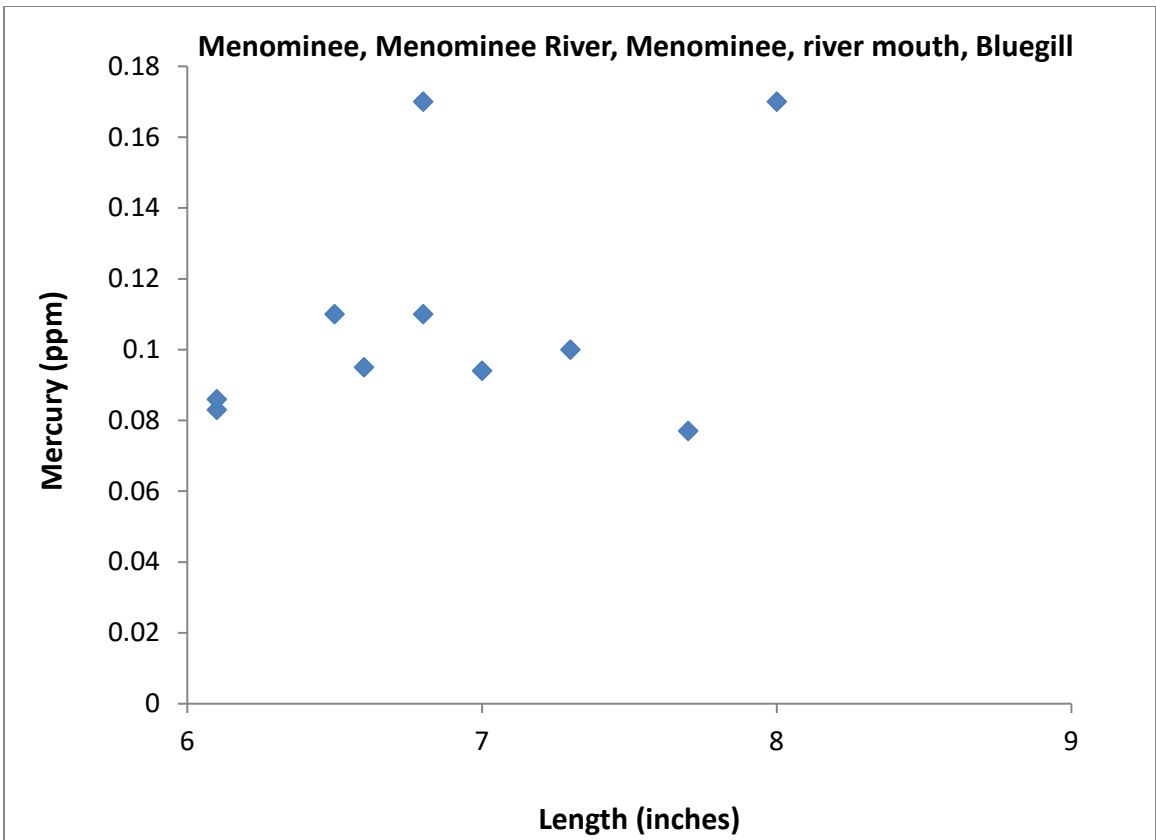
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	10	6.1	na	6.1	8
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.11	0.08	0.17	0.13	8
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.148	0.128				

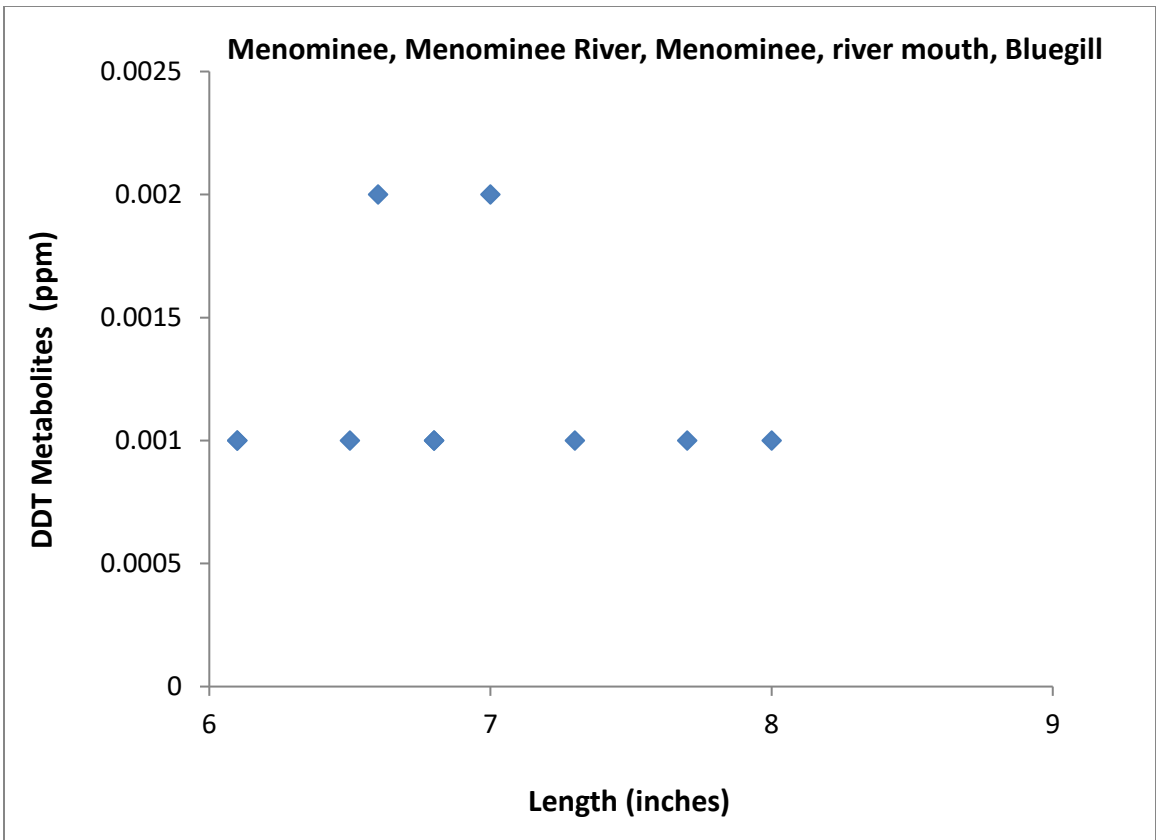
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	10	6.1	na	6.1	8
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	0.01	0.001	0.02	0.01	16
DDT	10	0.001	0.001	0.002	0.002	16
Chlordane	10	ND	--	--	--	--
Toxaphene	10	ND	--	--	--	--
Chemical	Line10ar Regression	Exponential Regression				
	R ²	R ²				
PCB	0.000	0.001				
DDT	0.006	0.006				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						8

Existing Advisory: Specific guidelines for Menominee River bluegill or sunfish were not developed since data were not available previously.

Recommendation: No one should eat more than 8 meals per month of bluegill or sunfish from the Menominee River downstream of the Lower Scott (Menominee) Dam due to elevated concentrations of mercury.





Carp

**Menominee River
D/S of Lower Scott Dam & LBDN**

Menominee County

Hg Analysis:

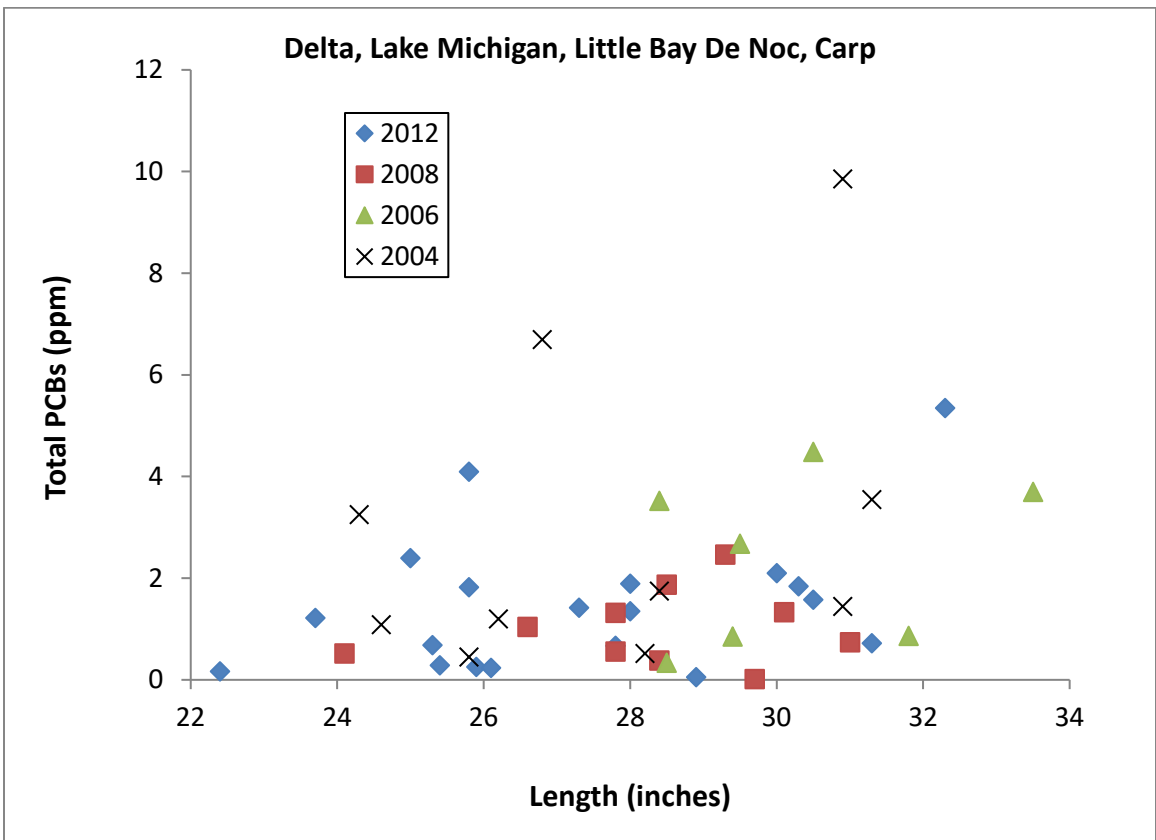
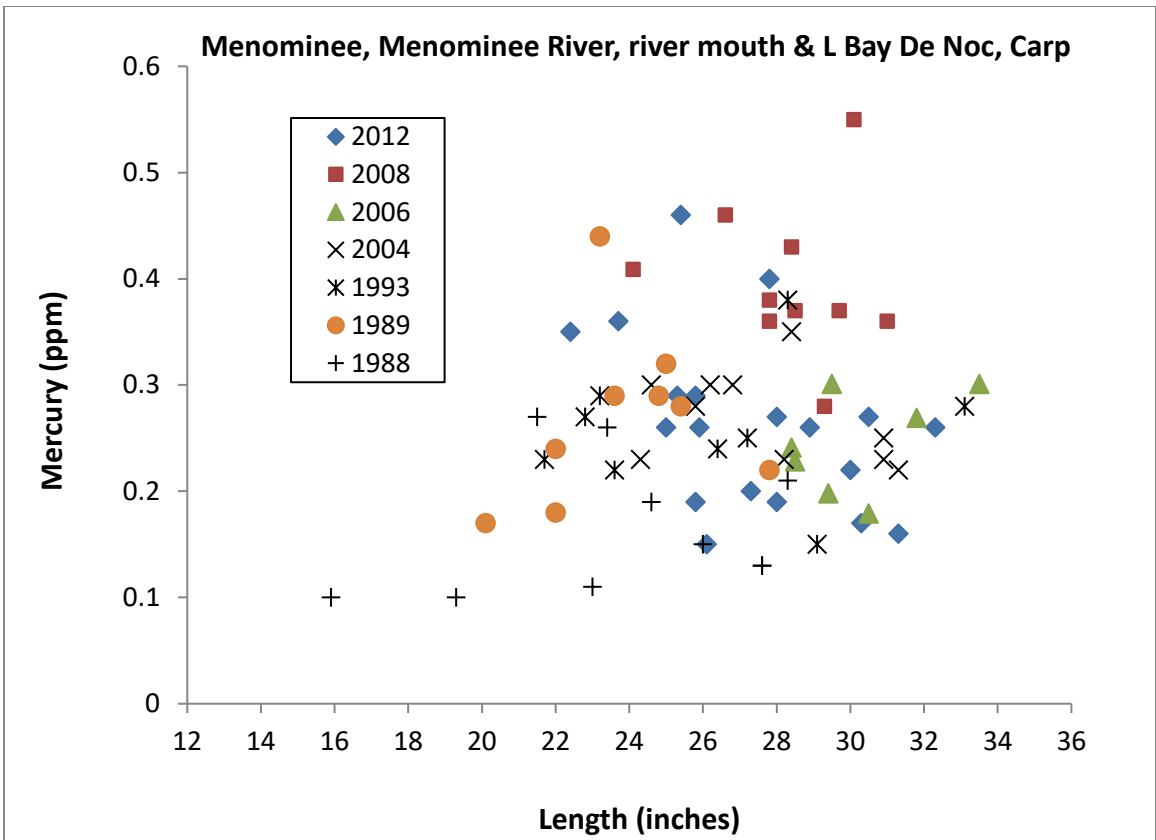
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1988	2012	84	15.9	na	15.9	34.6
Datasets available: 1988, 1989, 1993, 2000, 2004, 2006, 2008, 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	84	0.27	0.10	0.55	0.29	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.023	0.046				

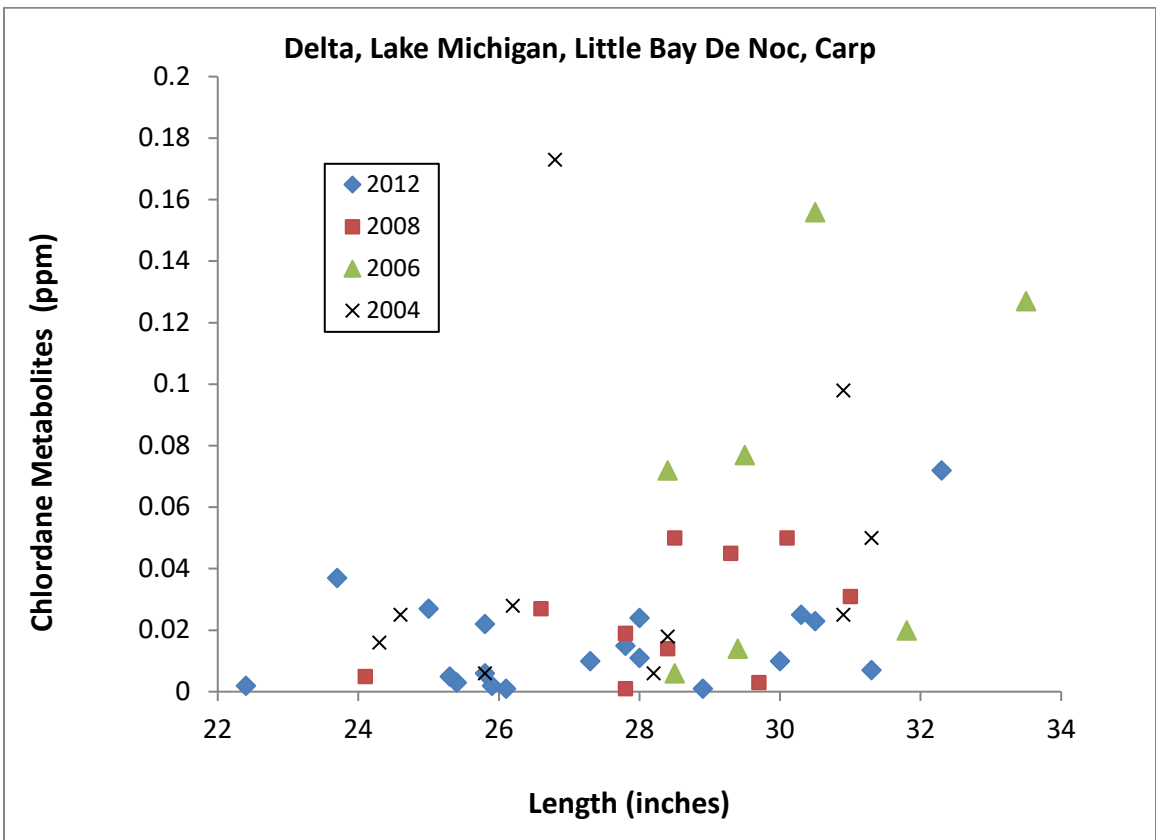
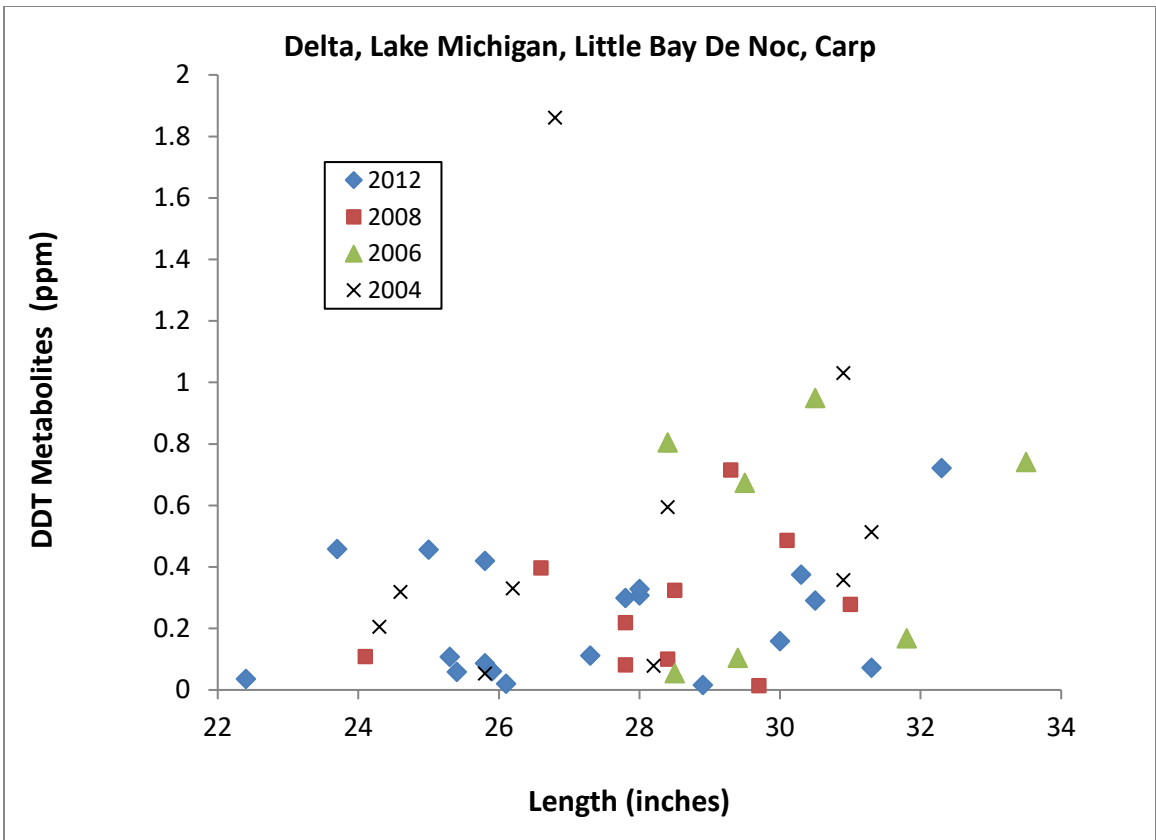
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2004	2012	46	22.4	na	22.4	33.5
Datasets available: 1988, 1989, 1993, 2000, 2004, 2006, 2008, 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	46	1.84	0.02	9.86	2.41	Limited
DDT	46	0.35	0.01	1.86	0.45	4
Chlordane	46	0.03	0.001	0.17	0.04	--
Toxaphene	46	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.088	0.060				
DDT	0.065	0.082				
Chlordane	0.137	0.172				
Toxaphene	--	--				
Final meal category based on UCL:						Limited*

Existing Advisory: No one should eat carp from the Menominee River downstream of the Menominee/Hattie Street Dam or Green Bay and Little Bay de Noc due to PCBs.

Recommendation: No change. *An additional year of data is needed to relax this guideline.





Northern Pike

**Lake Michigan, Menominee River D-S of
Menominee Dam, & LBDN**

**Delta & Menominee
Counties**

Hg Analysis:

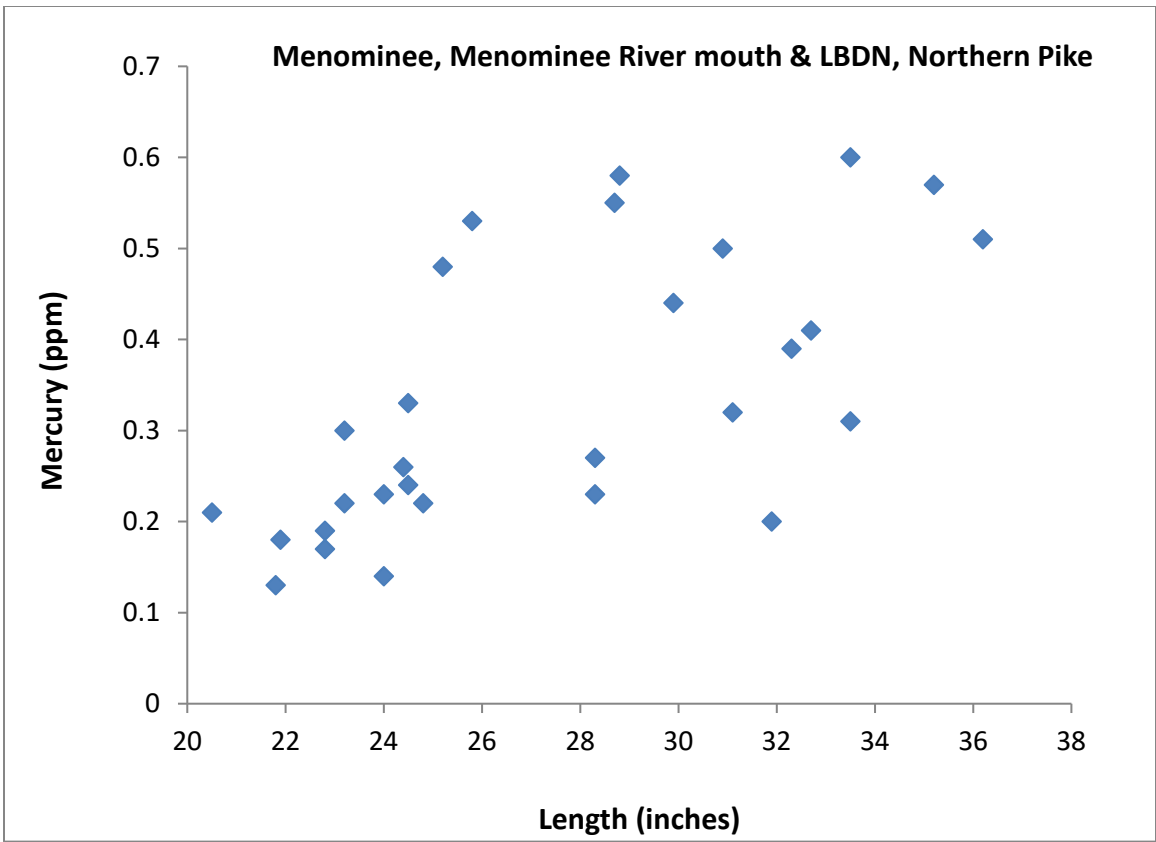
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1987	2012	29	20.5	24	24	36.2
Datasets available: 1987, 2010, 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	22	0.38	0.14	0.60	0.44	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.422	0.445				

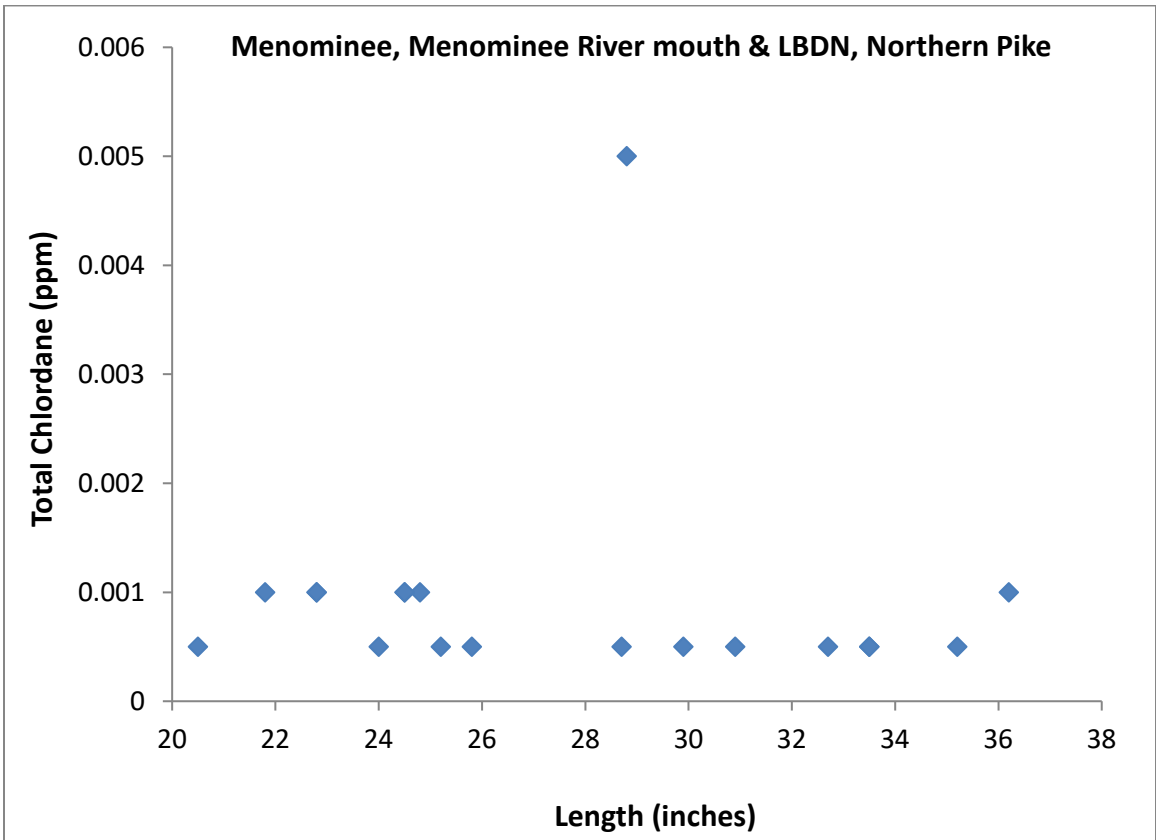
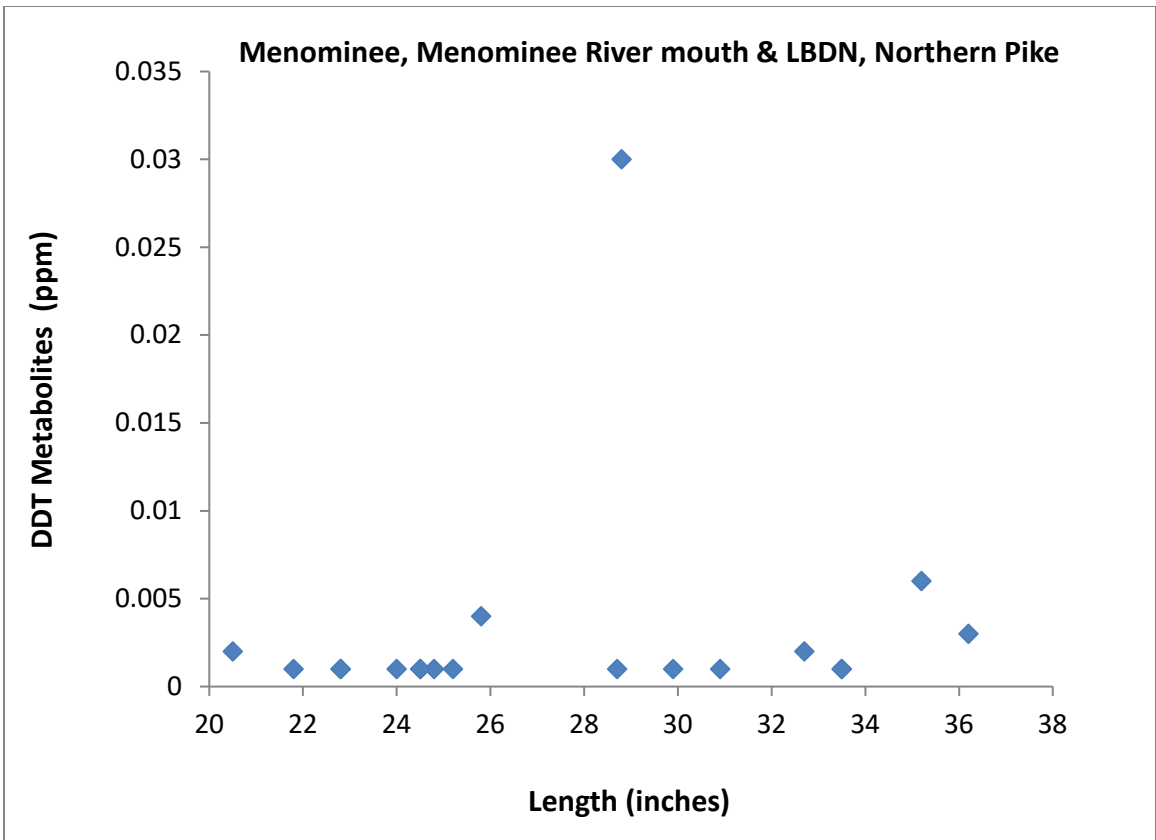
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2010	2012	19	20.5	24	24	36.2
Datasets available: 1987, 2010, 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	15	0.02	0.001	0.25	0.06	2
DDT	15	0.004	0.001	0.03	0.01	16
Chlordane	15	0.001	0.0005	0.005	0.002	--
Toxaphene	15	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.005	0.007				
DDT	0.018	0.082				
Chlordane	0.001	0.031				
Toxaphene	--	--				
Final meal category based on UCL:						2*

Existing Advisory: No one should eat more than 1 meal per month of northern pike from Green Bay, Little Bay De Noc, or the Menominee River downstream of the Menominee/Hattie Street Dam due to mercury.

Recommendation: No change. * An additional year of data is needed to relax the guideline.





Smallmouth Bass

**Menominee River
River mouth & Green Bay**

Menominee County

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	29	13.1	14	14.1	20.5
Datasets available: 1992, 2004, 2005, 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	28	0.46	0.17	0.95	0.54	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.251	0.221				

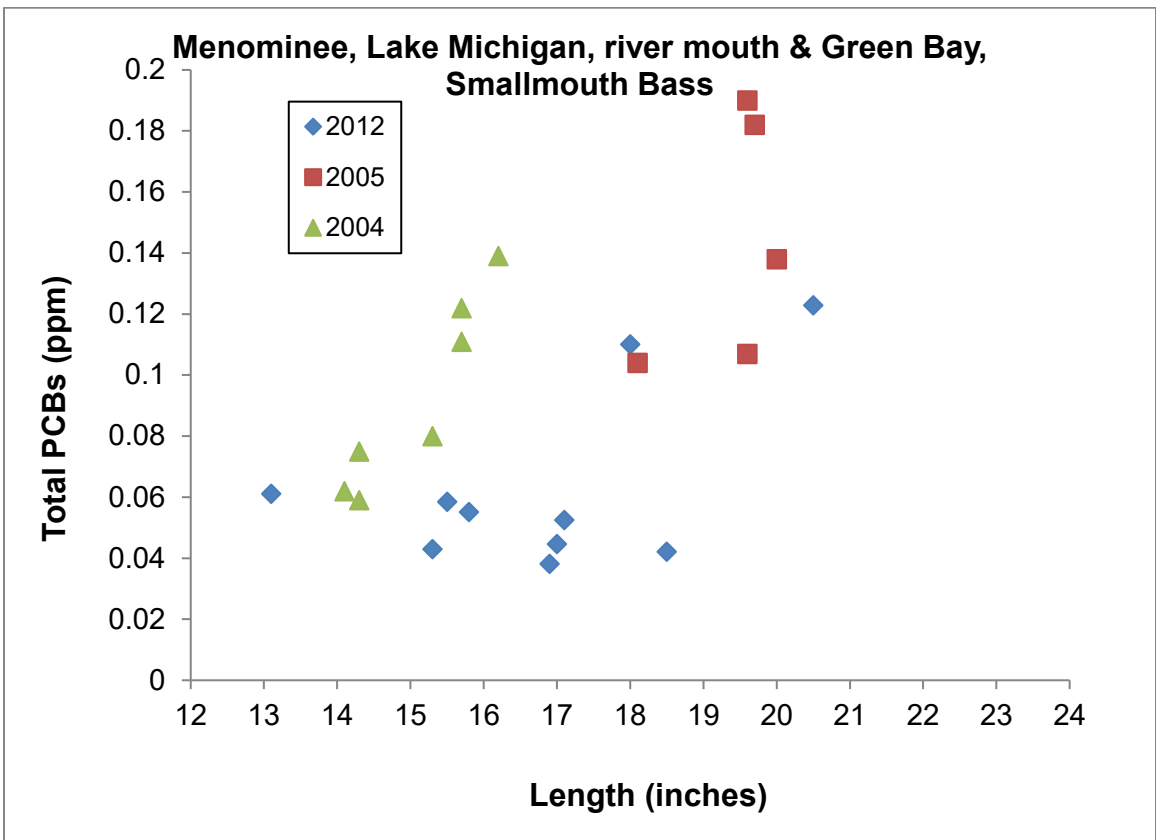
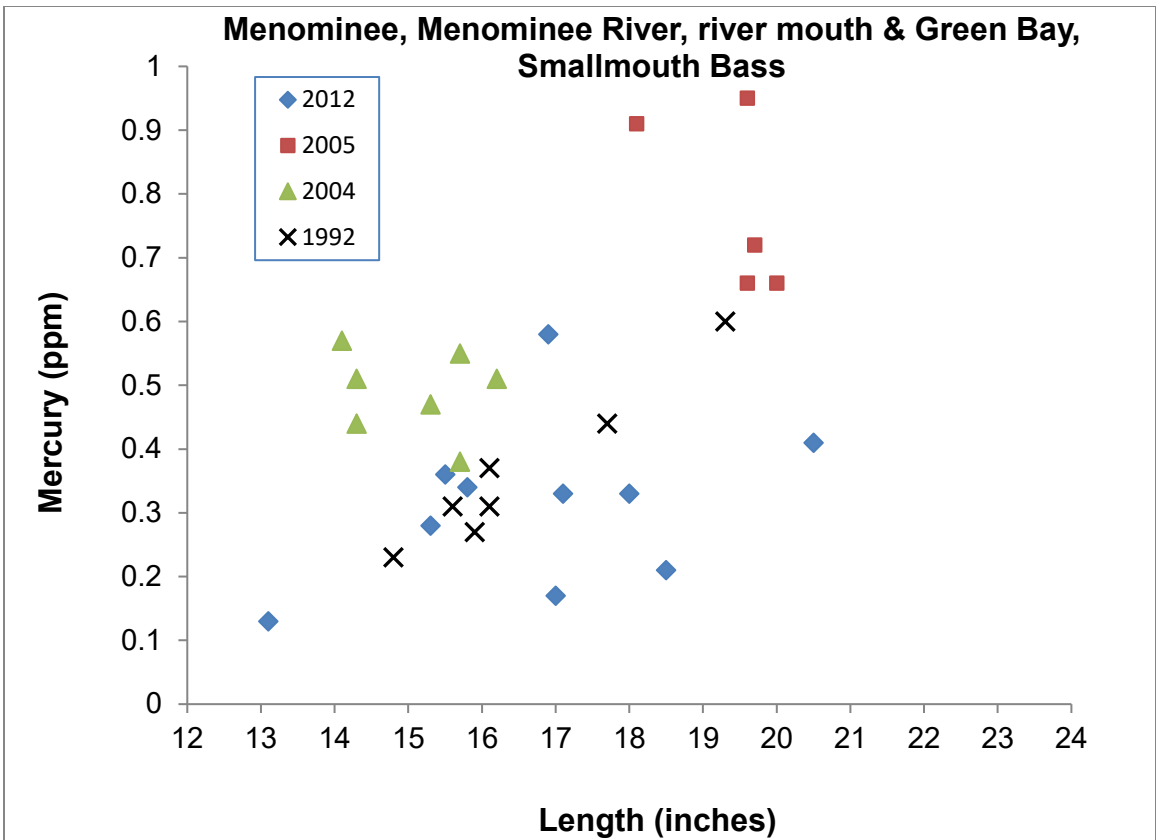
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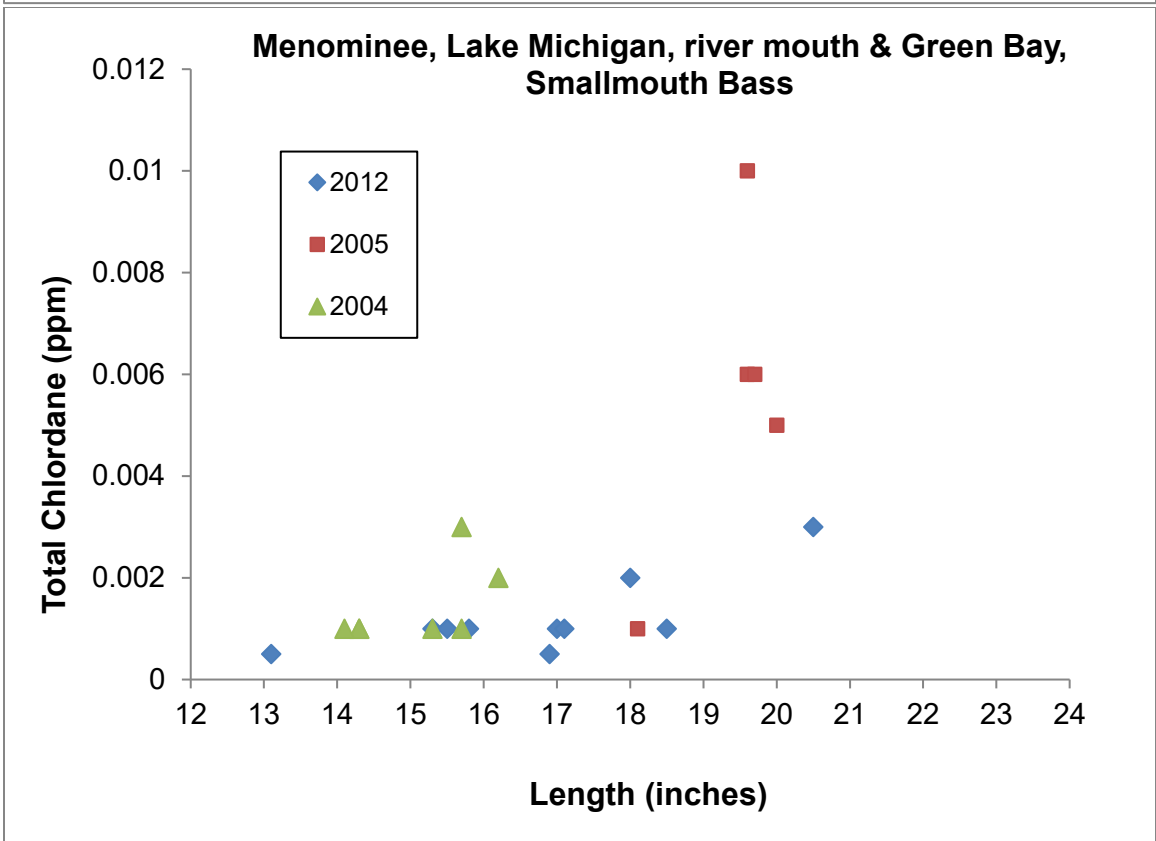
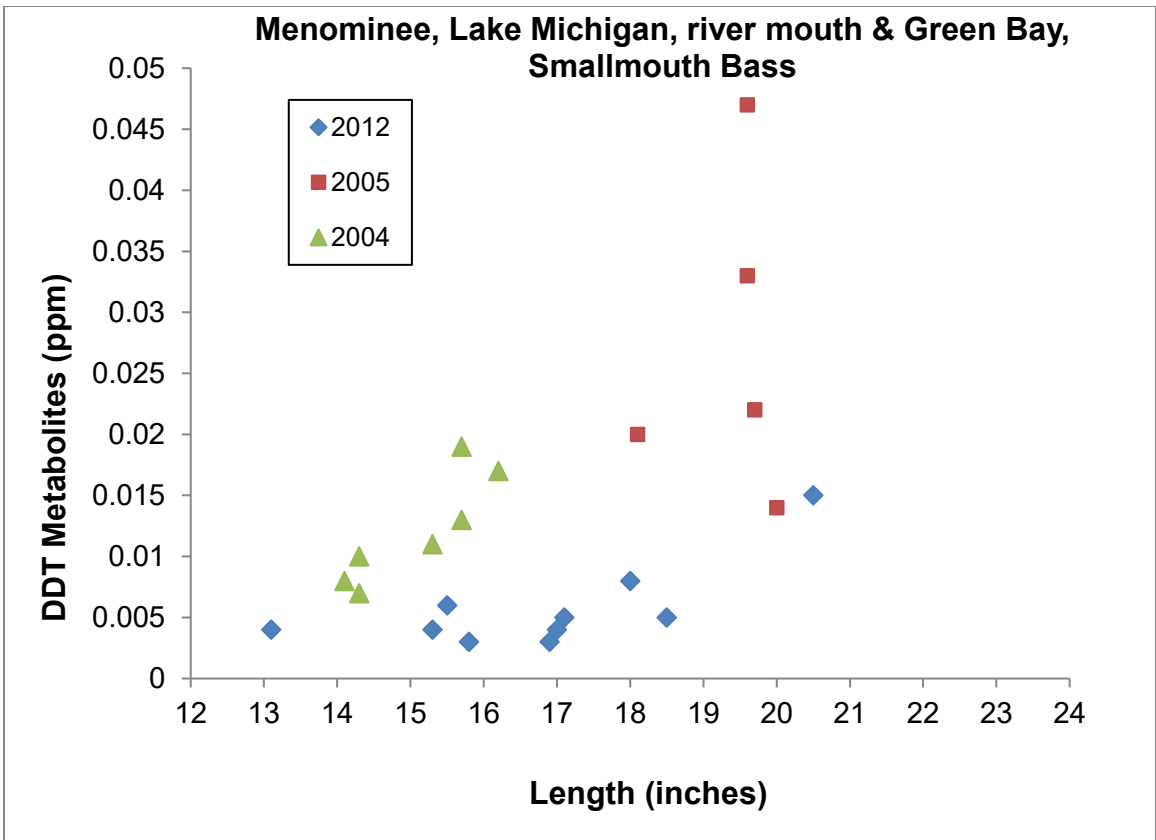
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2004	2013	22	13.1	14	14.1	20.5
Datasets available: 1992, 2004, 2005, 2012						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	21	0.09	0.04	0.19	0.11	1
DDT	21	0.01	0.003	0.05	0.02	16
Chlordane	21	0.002	0.0005	0.01	0.003	--
Toxaphene	21	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.335	0.264				
DDT	0.300	0.266				
Chlordane	0.451	0.530				
Toxaphene	--	--				
Final meal category based on UCL:						1

Existing Advisory: No one should eat more than 2 meals per month of smallmouth or largemouth bass smaller than 18 inches from Green Bay, Little Bay de Noc, or rivers tributary to those waters up to the first dam due to mercury and PCBs, or more than 1 meal per month of those fish larger than 18 inches due to mercury.

Recommendation: No one should eat more than 1 meal per month of largemouth or smallmouth bass from Green Bay or from the Menominee River up to the first dam due to mercury and PCBs.

A comparison of mercury and PCB burdens in smallmouth bass from Green Bay and Little Bay De Noc indicates that the two data sets are distinct. Separate advice should be provided for Little Bay De Noc and for Green Bay/Menominee River mouth.





Yellow Perch

**Menominee River
D-S of Menominee Dam**

Menominee County

Hg Analysis:

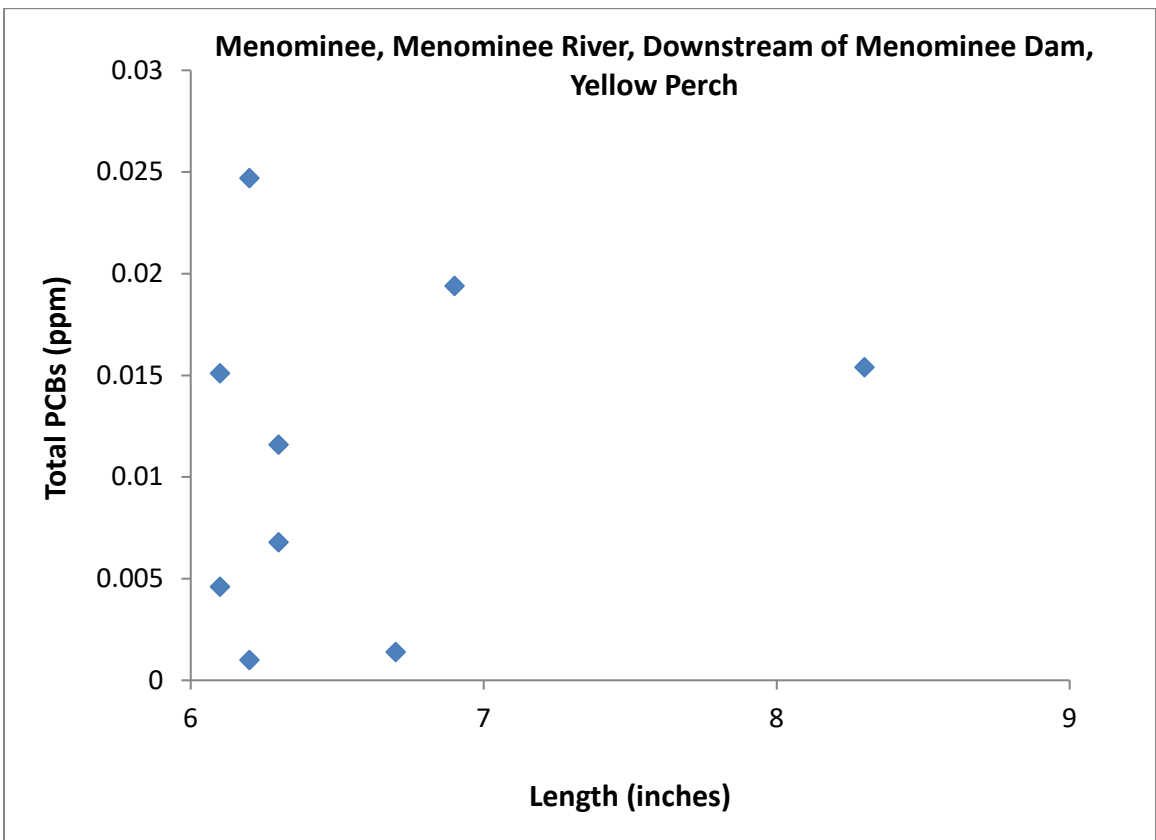
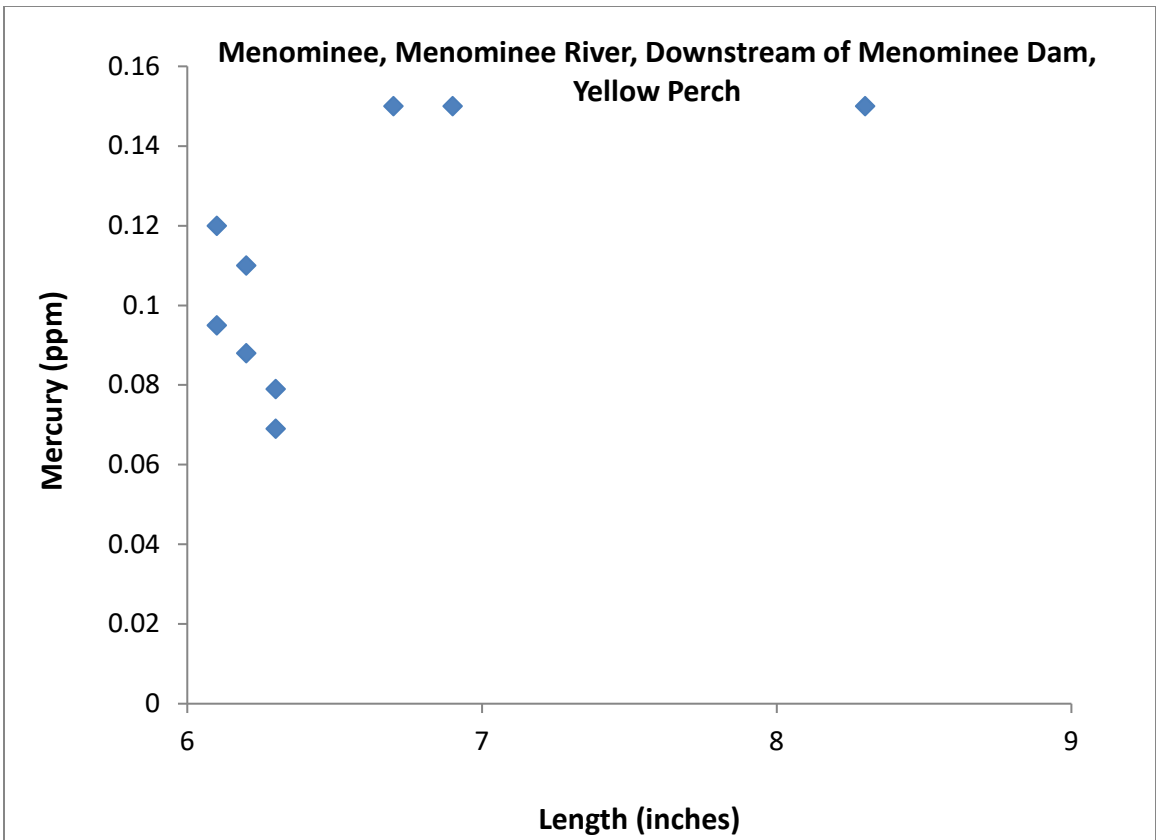
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	9	6.1	na	6.1	8.3
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	9	0.11	0.07	0.15	0.14	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.424	0.366				

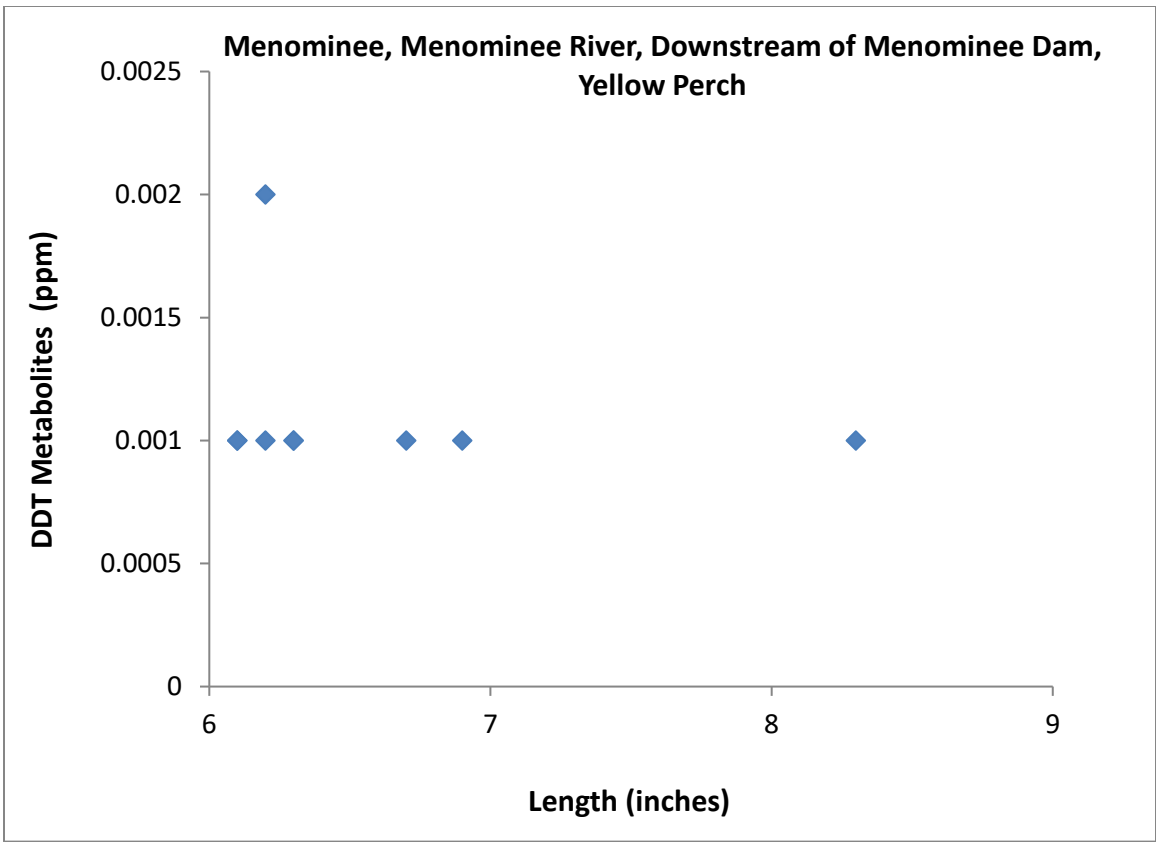
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2012	2012	9	6.1	na	6.1	8.3
Datasets available: 2012						
Chemical	Sample Size (Legal)	Mean Conc. (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	9	0.01	0.001	0.025	0.02	12
DDT	9	0.001	0.001	0.002	0.001	16
Chlordane	9	ND	--	--	--	--
Toxaphene	9	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	0.044	0.050				
DDT	0.038	0.038				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						4

Existing Advisory: Specific guidelines for Menominee River yellow perch were not developed since data were not available previously.

Recommendation: No one should eat more than 4 meals per month of yellow perch from the Menominee River downstream of the Menominee Dam due to mercury. PCBs would cause an advisory.





Michigamme River Dickinson, Iron, and Marquette Counties

Northern Pike

**Michigamme River
d-s Lake Michigamme**

**Marquette, Iron,
& Dickinson 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
1984	2014	65	13	na*	13	35.5
Datasets available: 1984, '92, '95, '98, '00, 2008, 2014						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury (all)	65	0.64	0.26	1.4	0.70	1
Mercury (>24")	15	0.80	0.34	1.4	0.98	1
Chemical	Linear Regression	Exponential Regression	* - no size limit for northern pike from impoundments in Iron County			
	R ²	R ²				
Mercury	0.164	0.129				

Organics Analysis:

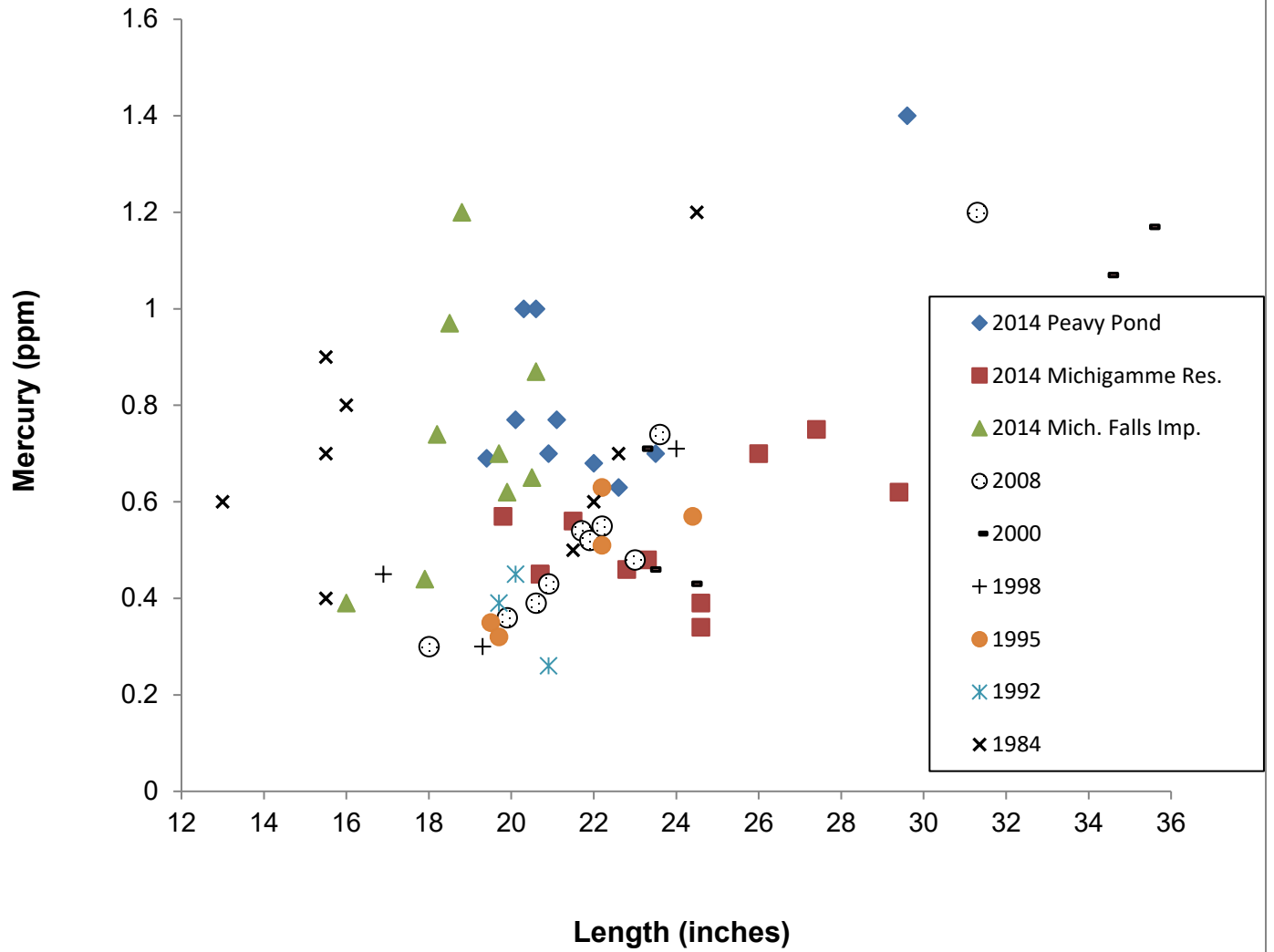
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1992	1998	4	19.7	na*	19.7	24.0
Datasets available: 1992, 1998						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	4	ND	--	--	--	--
DDT	4	ND	--	--	--	--
Chlordane	4	ND	--	--	--	--
Toxaphene	4	ND	--	--	--	--
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: No one should eat more than 1 meal per month of northern pike smaller than 24 inches from the Michigamme River downstream of Lake Michigamme or more than 6 meals per year of those fish larger than 24 inches due to mercury.

Recommendation: No change is recommended.

Note: Recommendation diverges from standard protocol of using either UCL or regression. The few samples of large fish indicate elevated Hg concentrations in those fish despite lack of good regression line. 2014 samples included additional large fish but more sampling is needed before advice is relaxed

Iron, Michigamme River, Impoundments, Northern Pike



Smallmouth Bass

**Michigamme River
d-s Lake Michigamme**

**Marquette, Iron,
& Dickinson 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
1984	1998	2	14.2	14.0	14.2	15.1
Datasets available: 1984, 1998						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	2	0.45	0.31	0.60	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

Organics Analysis:

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

Existing Advisory: Smallmouth bass from Michigamme River impoundments are covered by the statewide mercury advisory.

Recommendation: A dataset of less than five data points for a given chemical, species and waterbody is considered insufficient for evaluation using the standard evaluation method. The statewide guidelines apply. 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.

Walleye

**Michigamme River
d-s Lake Michigamme**

**Marquette, Iron,
& Dickinson Counties**

Hg Analysis:

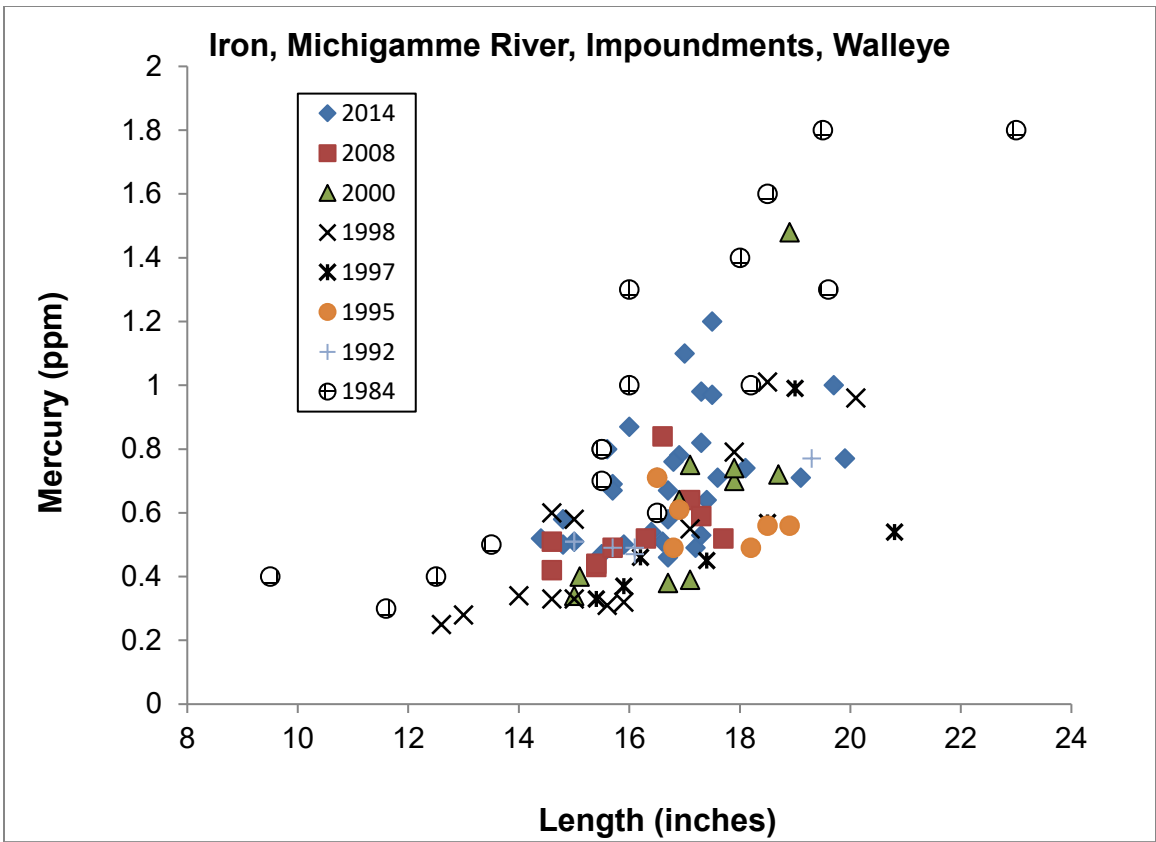
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1984	2014	99	9.5	15	14.6	23
Datasets available: 1984, '92, '95, '97, '98, 2000, 2008, 2014						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	91	0.70	0.31	1.8	0.76	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.370	0.417				

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	1998	19	14.6	15.0	14.6	20.8
Datasets available: 1992, '97, 1998						
Chemical	Sample Size (Legal)	Mean	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	19	ND	--	--	--	--
DDT	19	ND	--	--	--	--
Chlordane	19	ND	--	--	--	--
Toxaphene	19	ND	--	--	--	--
TEQ	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
TEQ	--	--				
Final meal category based on UCL:						

Existing Advisory: No one should eat more than 1 meal per month of walleye less than 20 inches or 6 meals per year of walleye longer greater than 20 inches from the Michigamme River or its impoundments downstream of Lake Michigamme due to mercury.

Recommendation: No change is recommended. An additional year of data is needed before the advice is relaxed for fish greater than 20 inches.



White Sucker

**Michigamme River
d-s Lake Michigamme**

**Marquette, Iron,
& Dickinson Counties**

Hg Analysis:

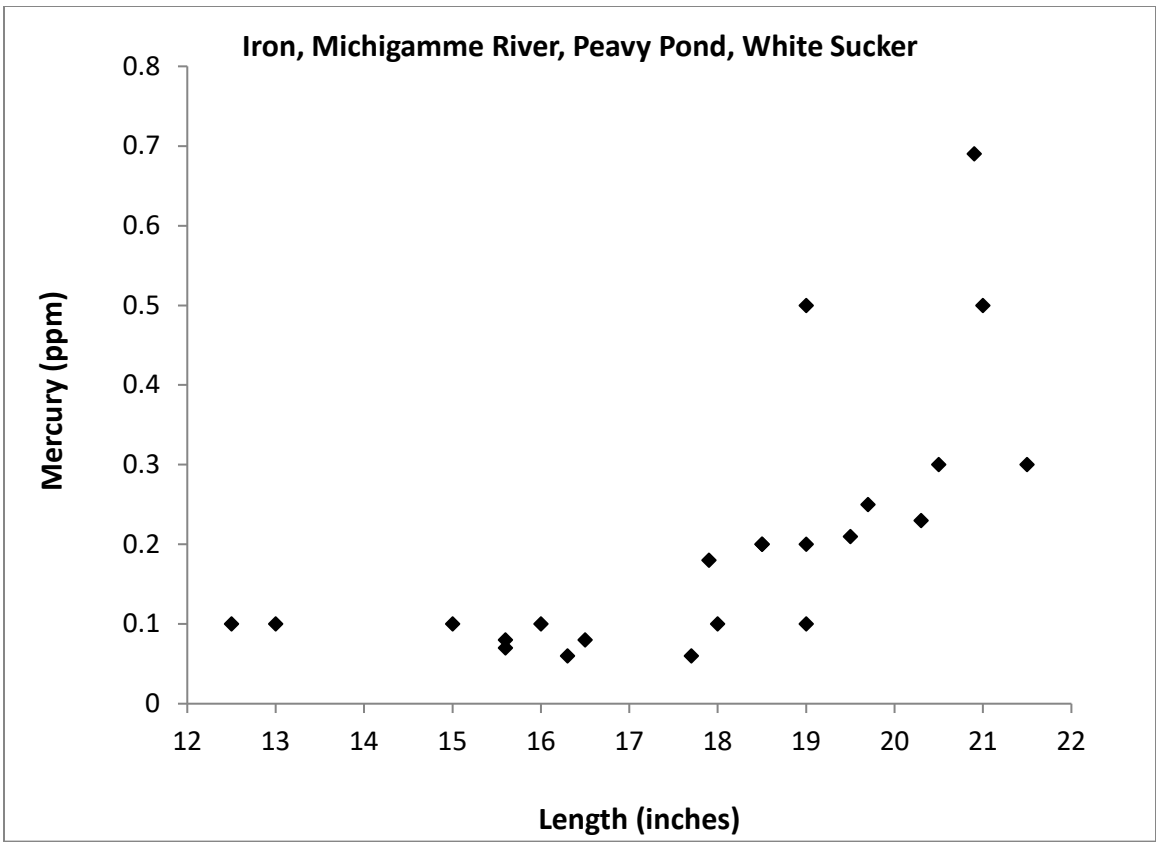
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1984	1998	23	12.5	na	12.5	21.5
Datasets available: 1984, 1998						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	23	0.20	0.06	0.69	0.28	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.442	0.548				

Organics Analysis:

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

Existing Advisory: Women and children should not eat more than 1 meal per month of sucker larger than 18 inches from the Michigamme River system due to mercury.

Recommendation: No one should eat more than 2 meals per month of white sucker from the Michigamme River or its impoundments downstream of Lake Michigamme due to mercury.



Yellow Perch

**Michigamme River
d-s Lake Michigamme**

**Marquette, Iron,
& Dickinson Counties**

Hg Analysis:

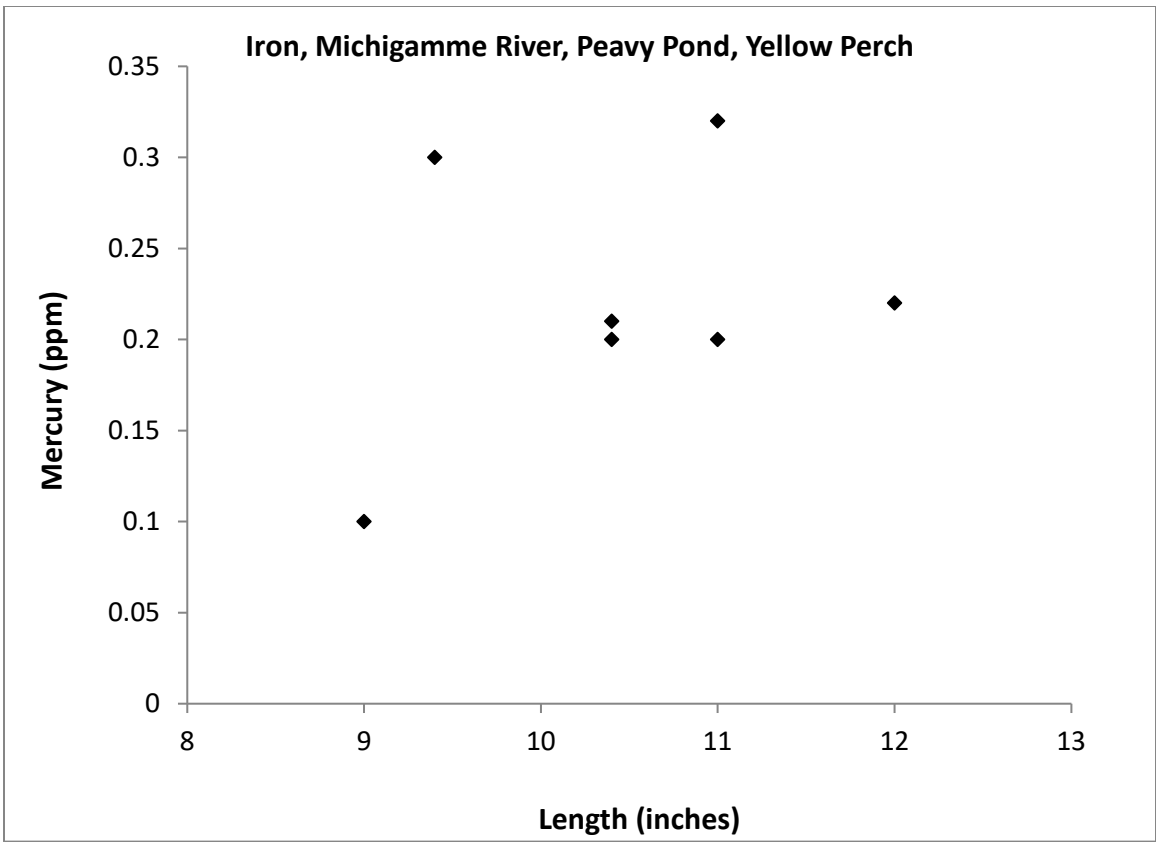
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1984	1998	7	9.0	na	9.0	12.0
Datasets available: 1984, 1998						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	7	0.22	0.10	0.32	0.29	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.093	0.179				

Organics Analysis:

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

Existing Advisory: Yellow perch from Michigamme River impoundments are covered by the statewide mercury advisory.

Recommendation: No one should eat more than 2 meals per month of yellow perch from the Michigamme River or its impoundments downstream of Lake Michigamme due to mercury.



Black Crappie

Michigamme River Michigamme Falls Impoundment d-s Lake Michigamme

Marquette, Iron, & Dickinson 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
1984	1984	4	10	na	10.0	12.6
Datasets available: 1984						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	4	0.28	0.10	0.40	--	--
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
--	--	--	--	--	--	--
Datasets available: --						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0	--	--	--	--	--
Chlordane	0	--	--	--	--	--
Toxaphene	0	--	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	--	--				
Chlordane	--	--				
Toxaphene	--	--				
Final meal category based on UCL:						--

Existing Advisory: Black crappie from Michigamme River impoundments are covered by the statewide mercury advisory.

Recommendation: A dataset of less than five data points for a given chemical, species and waterbody is considered insufficient for evaluation using the standard evaluation method. The statewide advice due to mercury applies to crappie from the Michigamme River and its impoundments downstream of Lake Michigamme: No one should eat more than 4 meals per month of crappie from inland waters.

Note: These are the only samples of the species from the Michigamme River system.

Pumpkinseed

**Michigamme River
Michigamme Falls Impoundment
d-s Lake Michigamme**

**Marquette, Iron,
& Dickinson 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
1984	1984	1	7.0	na	7.0	7.0
Datasets available: 1984						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	1	0.1	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	--	--				

Organics Analysis:

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

Existing Advisory: Pumpkinseed from the Michigamme River and its impoundments are not covered by an advisory.

Recommendation: A dataset of less than five data points for a given chemical, species and waterbody is considered insufficient for evaluation using the standard evaluation method. The statewide advice due to mercury applies to pumpkinseed and other sunfish from the Michigamme River and its impoundments: No one should eat more than 8 meals per month of sunfish from inland waters.

Burbot

**Michigamme River
Peavy Pond d-s Lake Michigamme**

**Marquette, Iron,
& Dickinson
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
1997	1997	10	19.5	na	19.5	30.0
Datasets available: 1997						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.41	0.20	0.67	0.53	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.480	0.488				

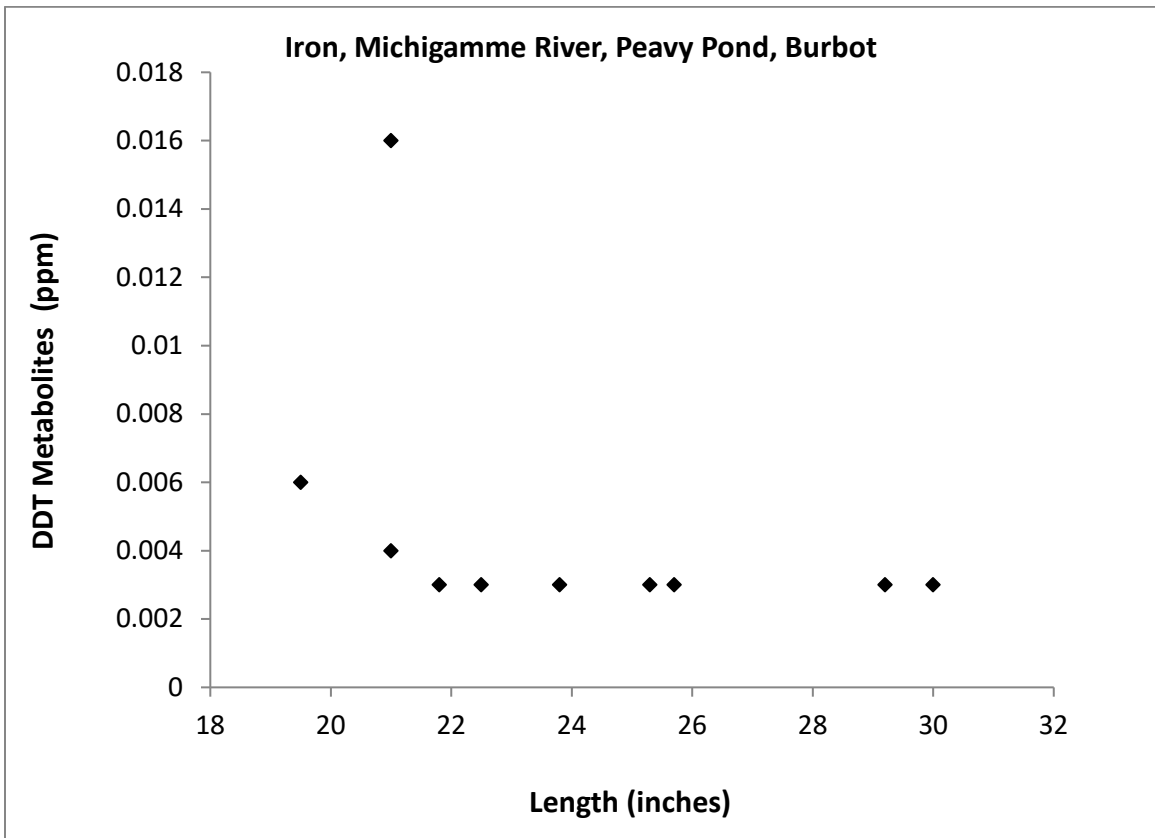
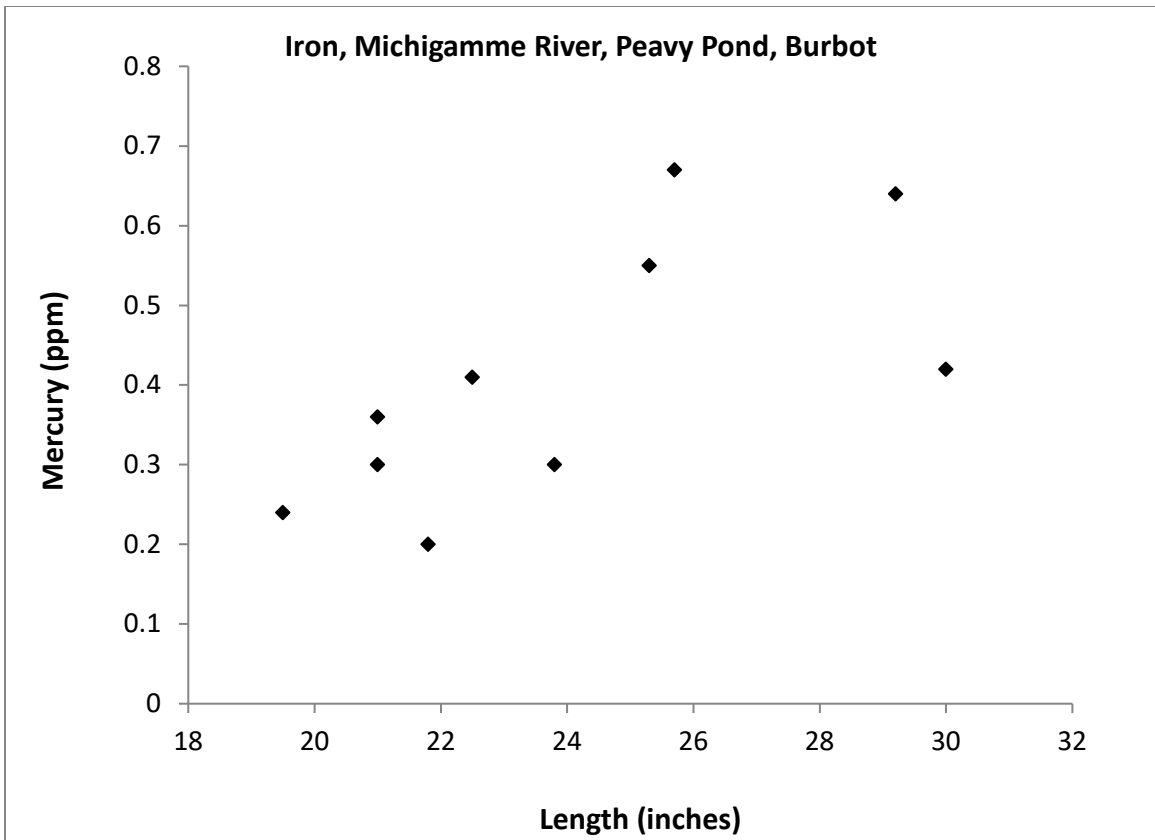
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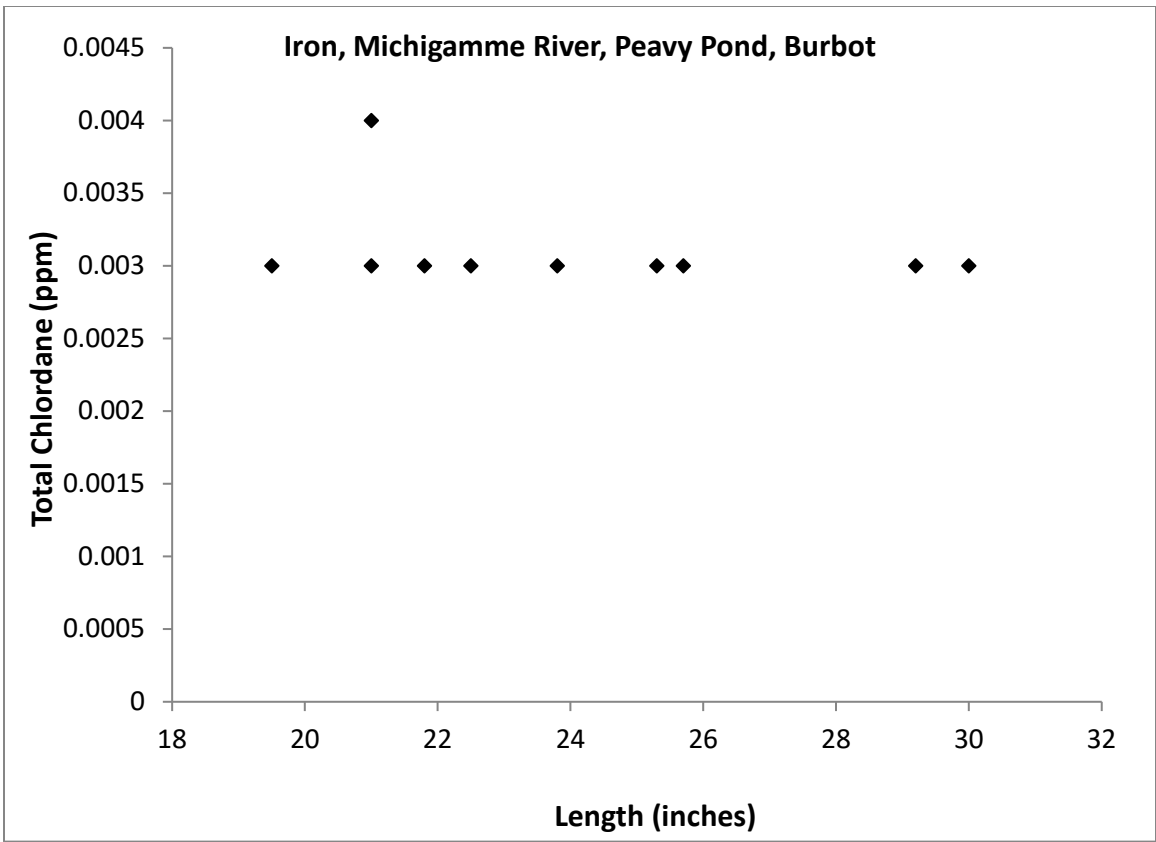
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1997	1997	10	19.5	na	19.5	30.0
Datasets available: 1997						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	10	ND	--	--	--	--
DDT	10	0.005	0.003	0.02	0.01	16
Chlordane	10	0.003	0.003	0.004	0.004	--
Toxaphene	10	ND	--	--	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
PCB	--	--				
DDT	0.179	0.267				
Chlordane	0.087	0.087				
Toxaphene	--	--				
Final meal category based on UCL:						2

Existing Advisory: Michigamme River burbot are not covered by an advisory.

Recommendation: No one should eat more than 2 meals per month of burbot from the Michigamme River or its impoundments downstream of Lake Michigamme due to mercury.

Note: Extending the advisory to Lake Michigamme should be considered since mercury levels are elevated in other species from that lake. Burbot have not been sampled there.





Lake Whitefish

**Michigamme River
Peavy Pond d-s Lake Michigamme**

**Marquette, Iron,
& Dickinson
Counties**

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1998	1998	10	15.0	na	15.0	16.5
Datasets available: 1998						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.18	0.15	0.26	0.21	4
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.338	0.302				

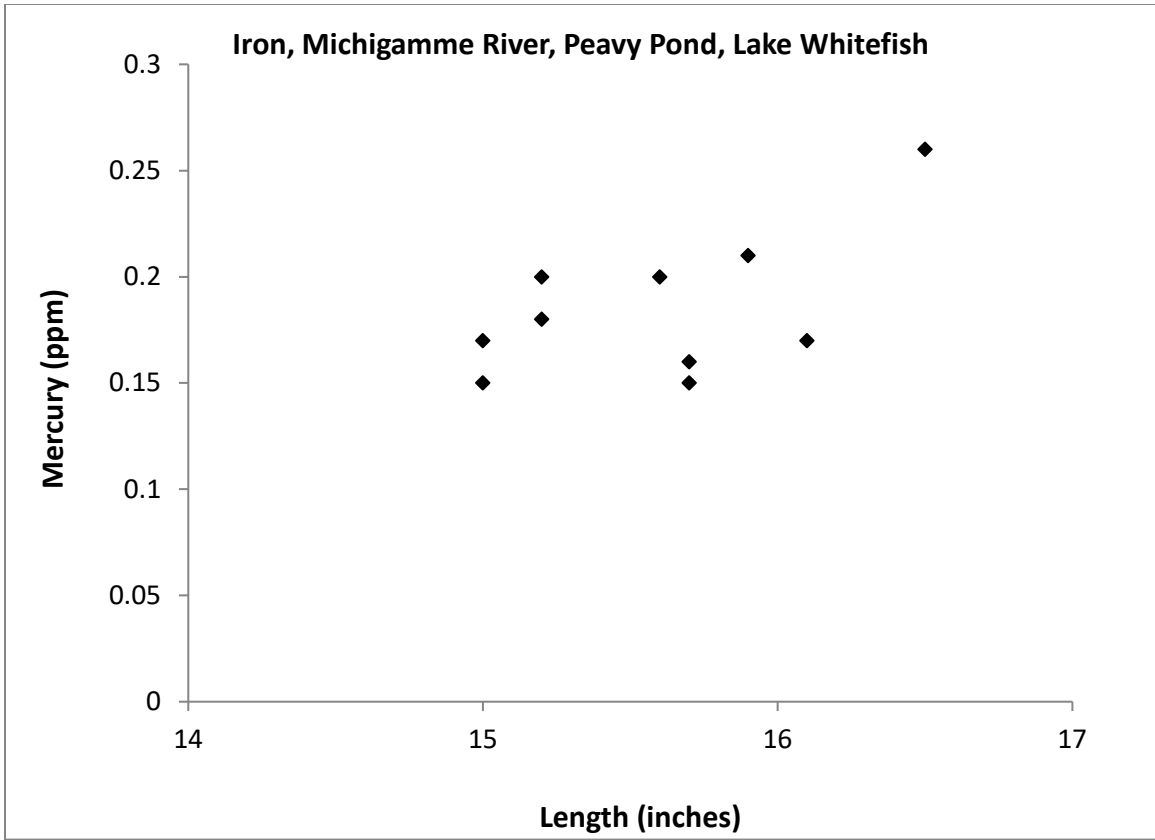
Organics Analysis:

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

Existing Advisory: Lake whitefish from the Michigamme River or its impoundments are not covered by an advisory.

Recommendation: No one should eat more than 4 meals per month of lake whitefish from the Michigamme River or its impoundments downstream of Lake Michigamme due to mercury.

Note: Extending the advisory to Lake Michigamme should be considered since mercury levels are elevated in other species from that lake. Lake whitefish have not been sampled there.



Rock Bass

**Michigamme River
Peavy Pond d-s Lake Michigamme**

**Marquette, Iron,
& Dickinson
Counties**

Hg Analysis:

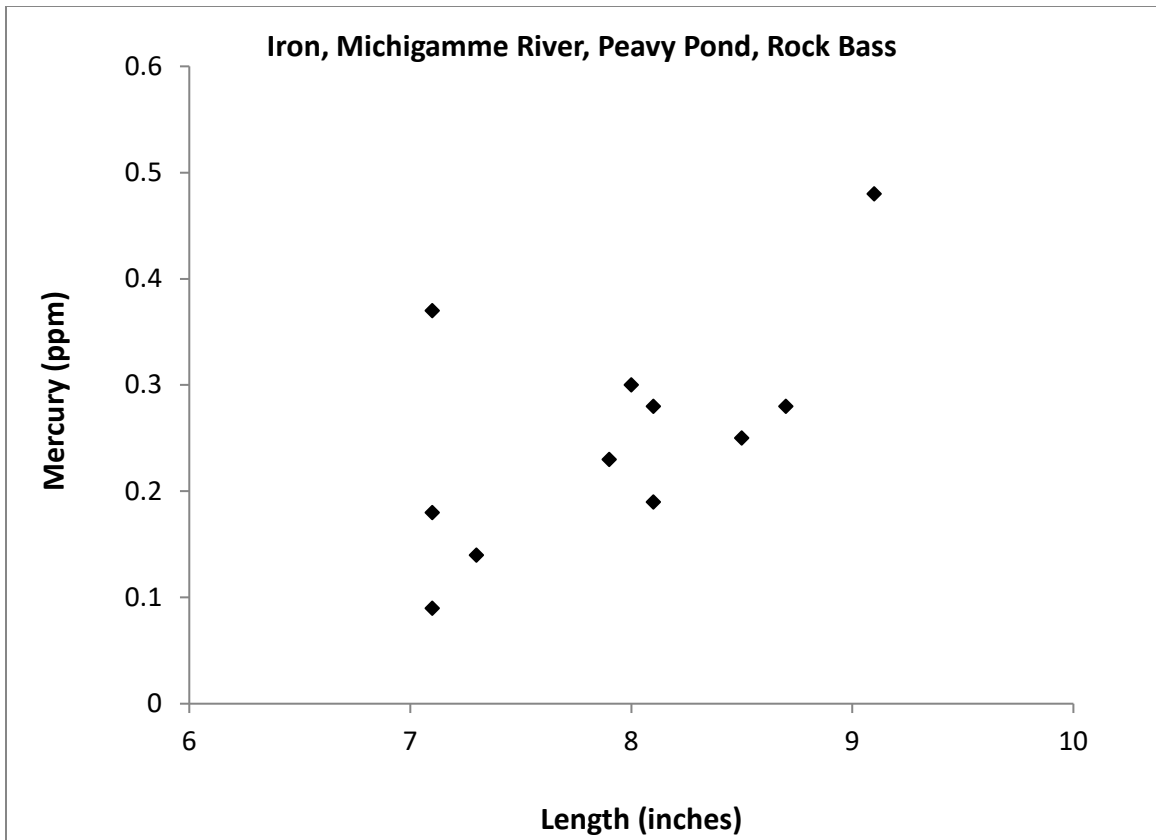
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1984	1998	11	7.1	na	7.1	9.1
Datasets available: 1984, 1998						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	11	0.25	0.09	0.48	0.33	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.361	0.381				

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:						2

Existing Advisory: Rock bass from Michigamme River impoundments are covered by the statewide mercury advisory.

Recommendation: No one should eat more than 2 meals per month of rock bass from the Michigamme River or its impoundments downstream of Lake Michigamme due to mercury.



Ontonagon County

Walleye

**Ontonagon River
Bond Falls Flowage**

Ontonagon County

Hg Analysis:

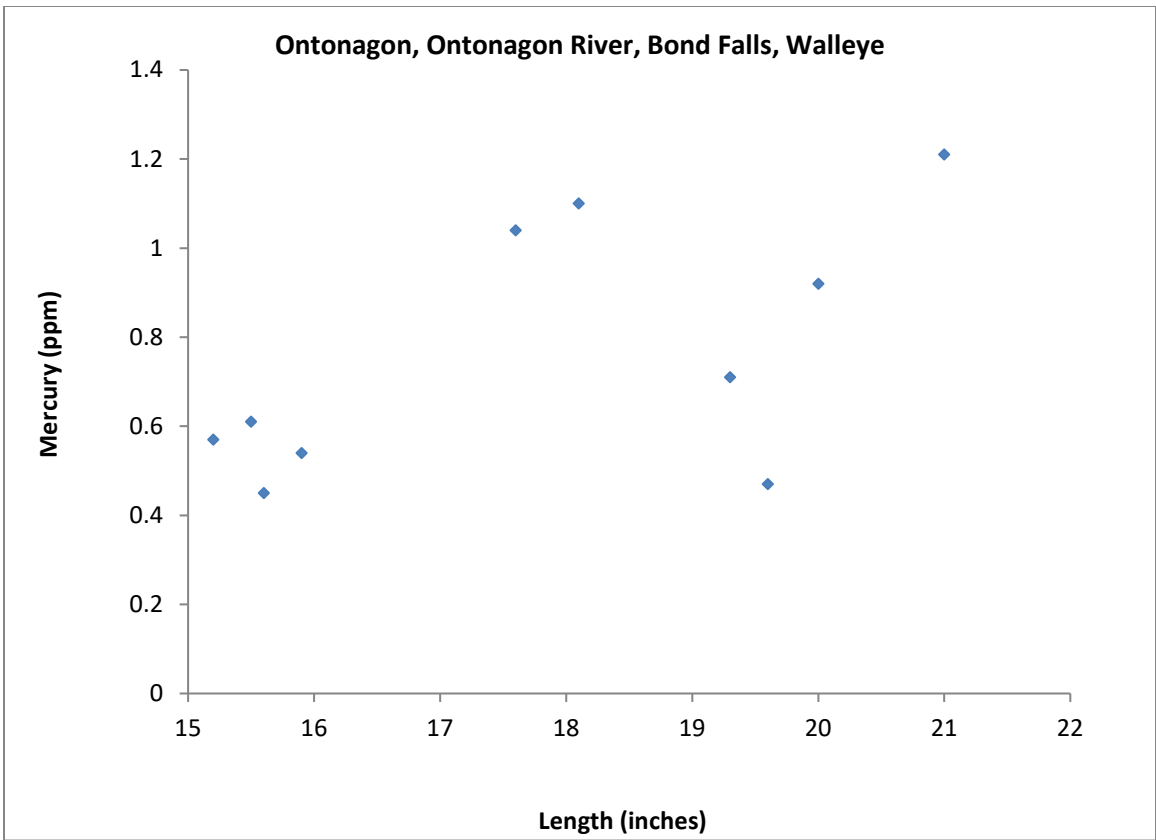
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1999	1999	10	15.2	15	15.2	21
Datasets available: 1999						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.76	0.45	1.21	0.96	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.345	0.326				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	--	--	--	--	--
Datasets available: --						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	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: Ontonagon River at Bond Falls walleye are covered under the statewide mercury advisory.

Recommendation: No one should eat more than 1 meal per month of Bond Falls Flowage walleye smaller than 20 inches or more than 6 meals per month of those fish larger than 20 inches due to mercury. The statewide length break was applied as the size range of the fish was limited.



Walleye

Sudden Lake

Ontonagon County

Hg Analysis:

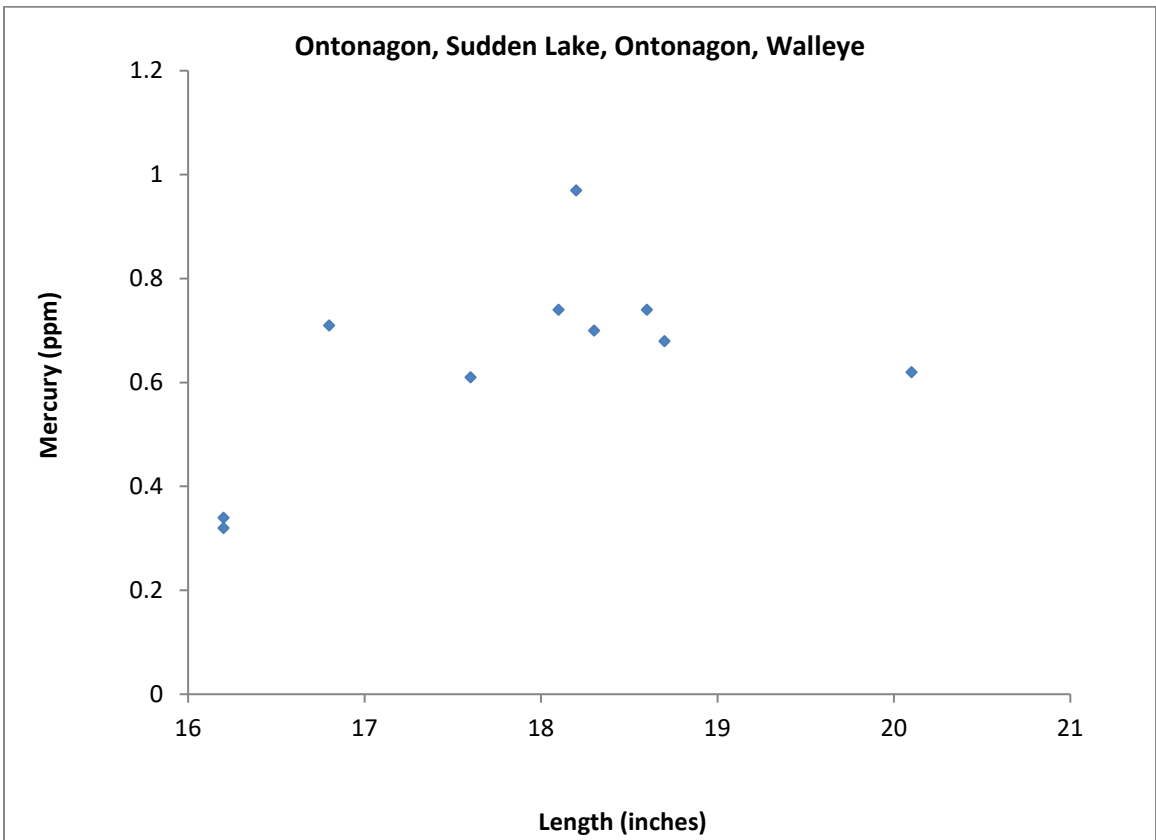
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2001	2001	10	16.2	15	16.2	20.1
Datasets available: 2001						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.64	0.32	0.97	0.78	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.318	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
--	--	--	--	--	--	--
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: Sudden Lake walleye are covered under the statewide mercury advisory.

Recommendation: No one should eat more than 1 meal per month of Sudden Lake walleye smaller than 20 inches or more than 6 meals per year of those fish larger than 20 inches due to mercury. The statewide length break was applied as the size range of the fish was limited.



Northern Pike

**Ontonagon River
Victoria Impoundment**

Ontonagon County

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	7	13.7	24	24.4	27.6
Datasets available: 1988						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	2	0.52	0.44	0.59	--	--
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.640	0.599				

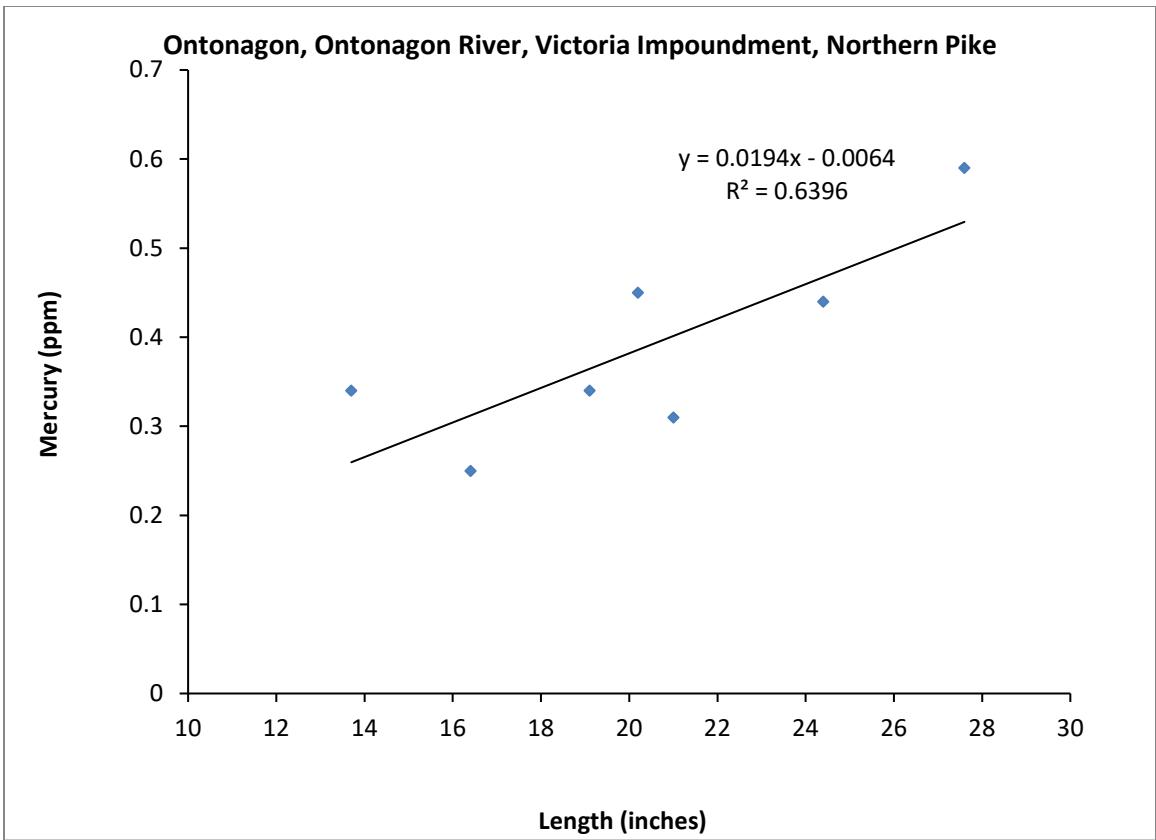
Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	--	--	--	--	--
Datasets available: --						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	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: Ontonagon River at Victoria Impoundment northern pike are covered under the statewide mercury advisory.

Recommendation: No one should eat more than 2 meals per month of Victoria Impoundment northern pike smaller than 28 inches or more than 1 meal per month of northern pike larger than 28 inches due to mercury.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
18	0.34	2
20	0.38	2
22	0.42	2
24	0.46	2
26	0.50	2
28	0.54	1
30	0.58	1
32	0.61	1
<i>Shaded area denotes extrapolated estimates</i>		



Walleye

**Ontonagon River
Victoria Impoundment**

Ontonagon County

Hg Analysis:

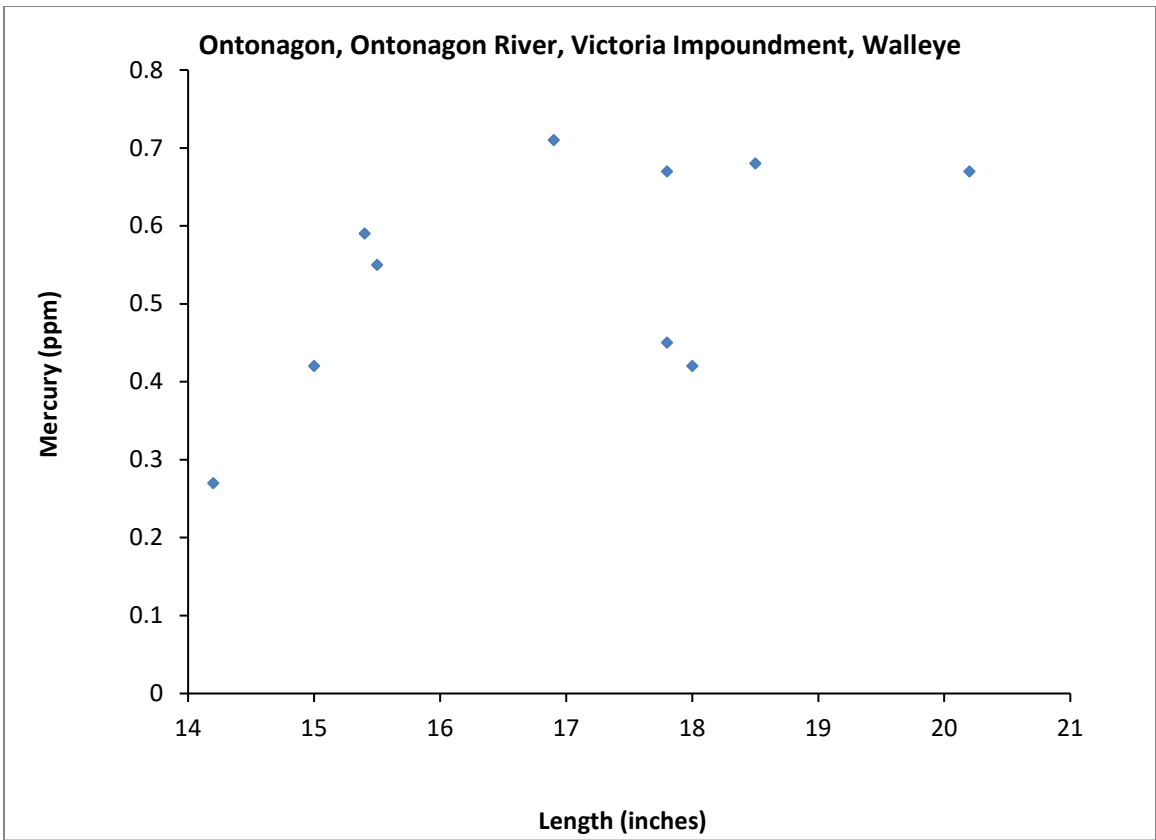
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
1988	2000	10	14.2	15	15	20.2
Datasets available: 1988, 2000						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	9	0.57	0.42	0.71	0.66	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.332	0.342				

Organics Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
--	--	--	--	--	--	--
Datasets available: --						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	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: Ontonagon River at Victoria Impoundment walleye are covered under the statewide mercury advisory.

Recommendation: No one should eat more than 1 meal per month of Victoria Impoundment walleye smaller than 20 inches or more than 6 meals per year of those fish larger than 20 inches due to mercury. The statewide length break was applied as the size range of the fish was limited.



Schoolcraft County

Walleye

Boot Lake

Schoolcraft County

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	8	18	15	18	23.5
Datasets available: 2004						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	8	0.40	0.20	0.67	0.53	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.631	0.656				

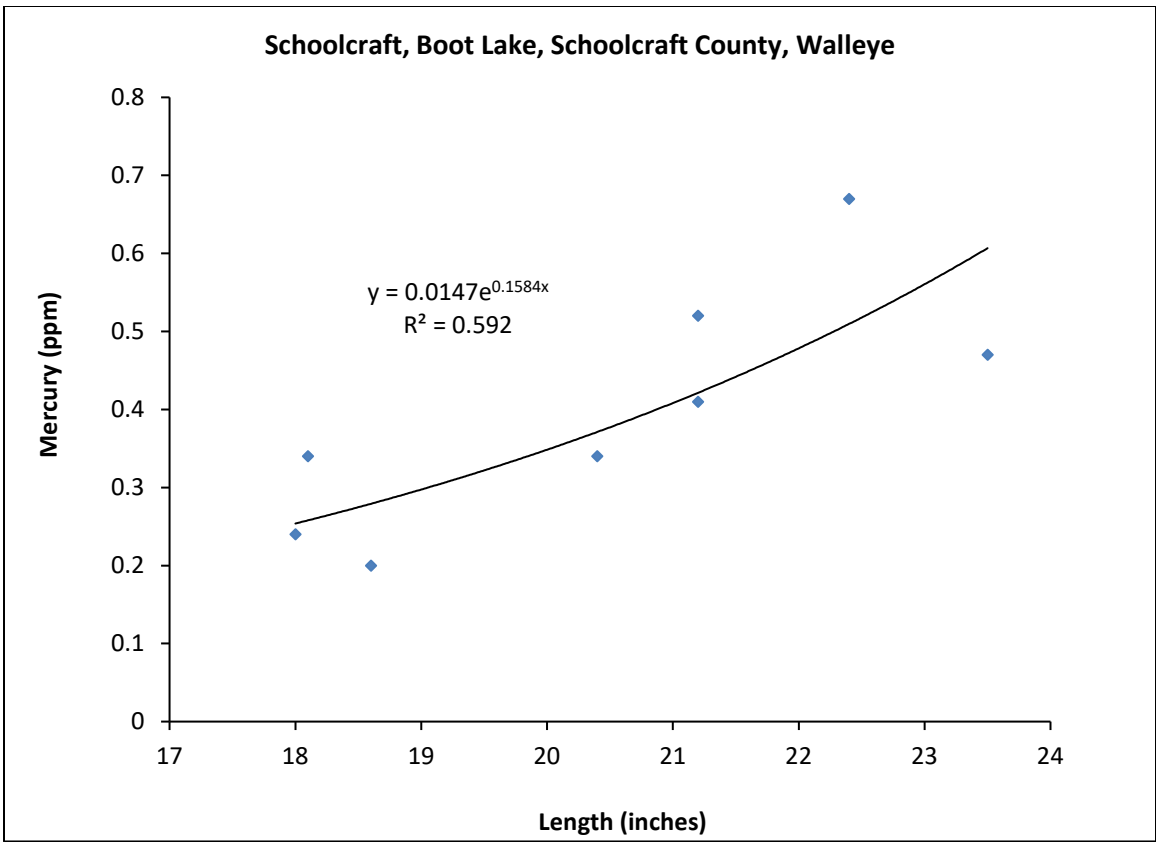
Organics Analysis:

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:						2

Existing Advisory: Women and children should not eat more than one meal per week of Boot Lake walleye smaller than 22 inches or more than one meal per month of those fish larger than 22 inches due to mercury.

Recommendation: No one should eat more than 2 meals per month of Boot Lake walleye smaller than 24 inches or more than 1 meal per month of those fish larger than 24 inches due to mercury.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
15	0.16	4
16	0.18	4
18	0.25	4
20	0.35	2
22	0.48	2
24	0.66	1
26	0.90	1
28	1.24	0.5
30	1.70	0.5
<i>Shaded area denotes extrapolated estimates</i>		



Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2007	2007	10	7.2	na	7.2	13
Datasets available: 2007						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.73	0.51	1.06	0.85	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.741	0.678				

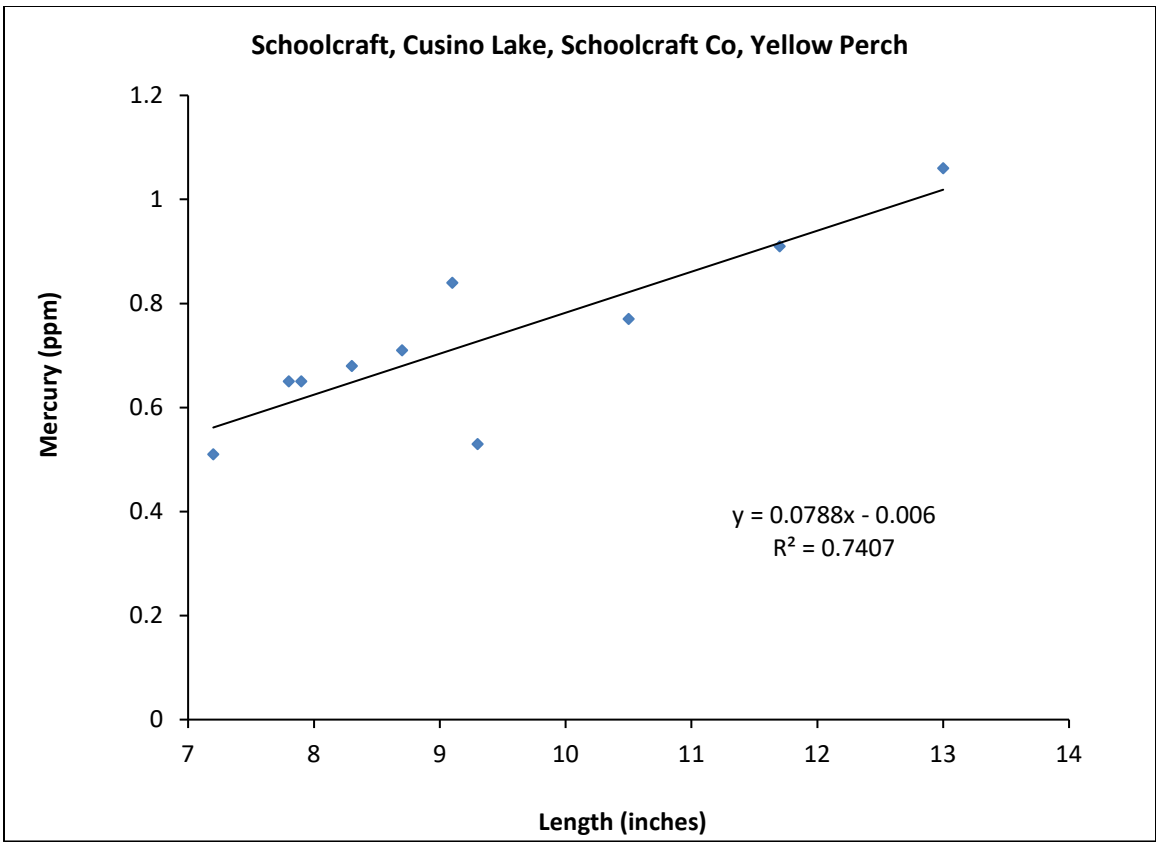
Organics Analysis:

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: Women and children should not eat more than one meal per month of Cusino Lake yellow perch due to mercury.

Recommendation: No one should eat more than 1 meal per month of Cusino Lake yellow perch due to mercury.

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
6	0.47	2
7	0.55	1
8	0.62	1
9	0.70	1
10	0.78	1
11	0.86	1
12	0.94	1
13	1.02	1
14	1.10	1
<i>Shaded area denotes extrapolated estimates</i>		



Hg & Se Analysis:

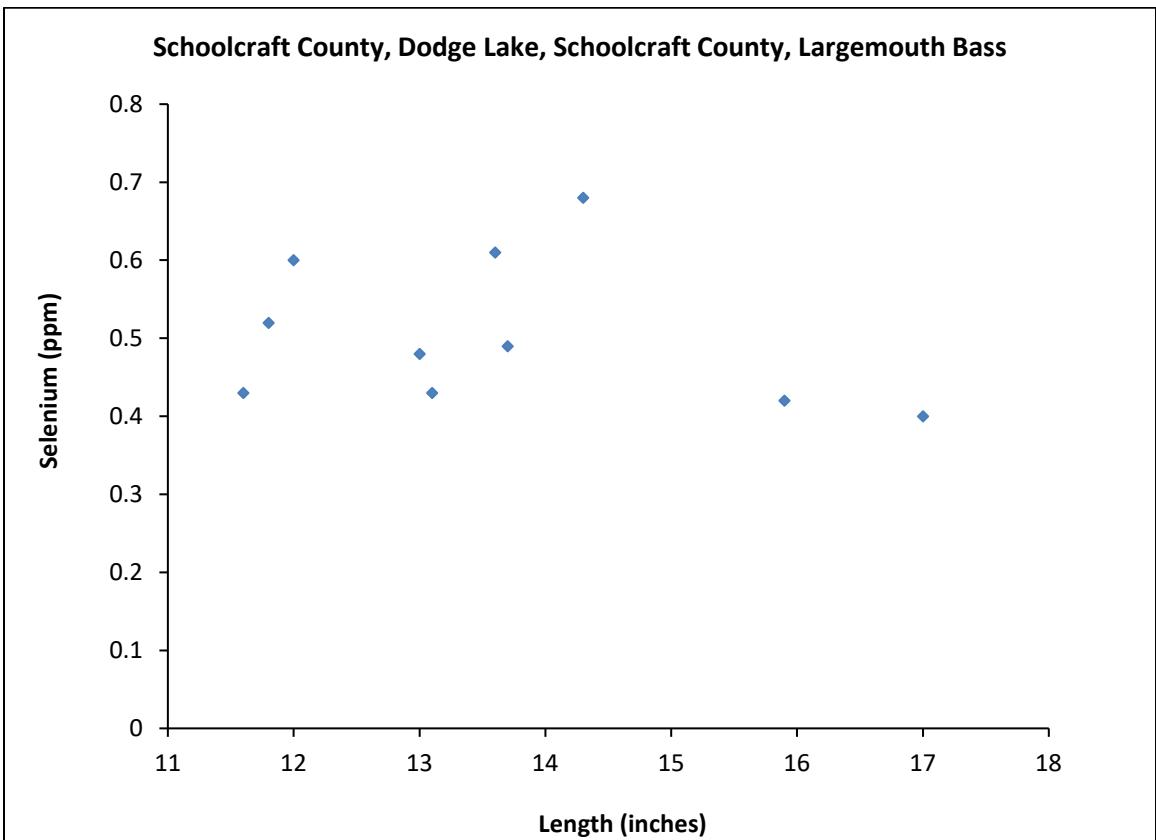
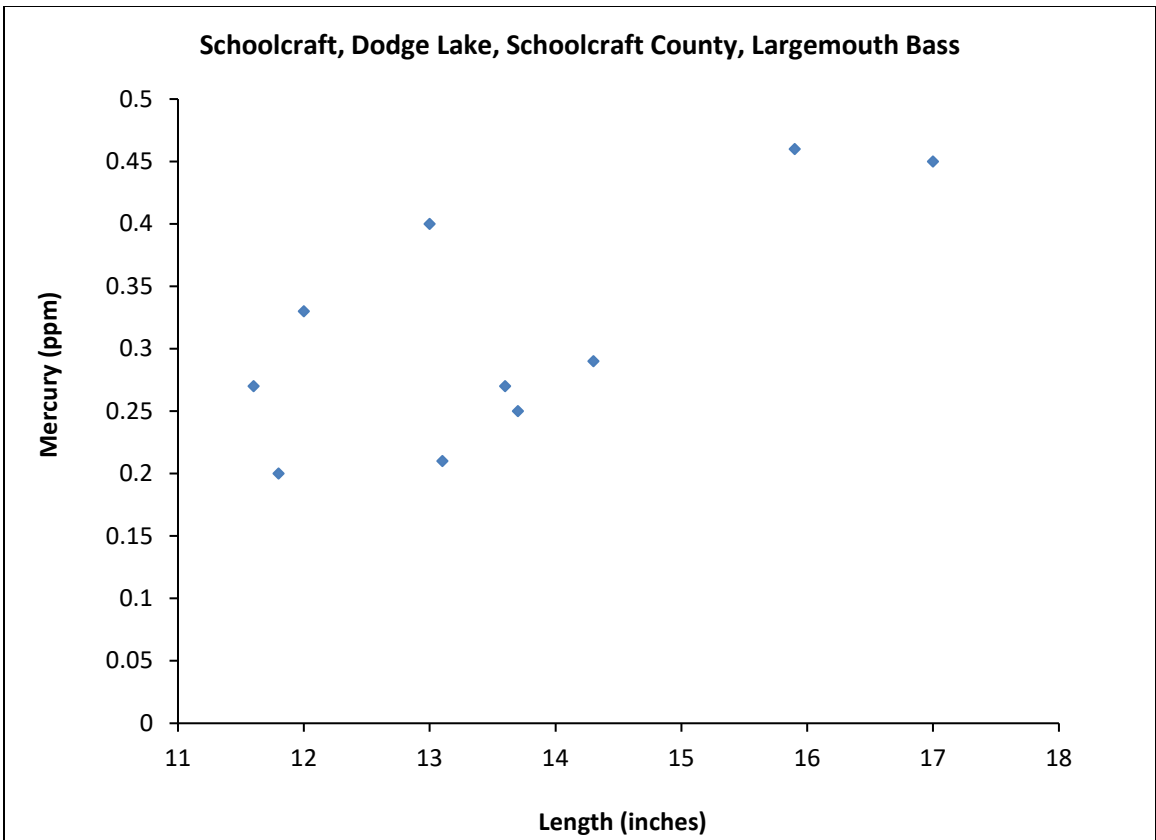
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2006	2006	10	11.6	14	13.6	17
Datasets available: 2006						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	5	0.34	0.25	0.46	0.47	2
Selenium	5	0.520	0.400	0.680	0.670	16
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.491	0.444				
Selenium	0.074	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
--	--	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:						2

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

Recommendation: No one should eat more than 2 meals per month of Dodge Lake 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. The statewide length break was applied as the size range of the fish was limited.



Northern Pike

Dodge Lake

Schoolcraft County

Hg Analysis:

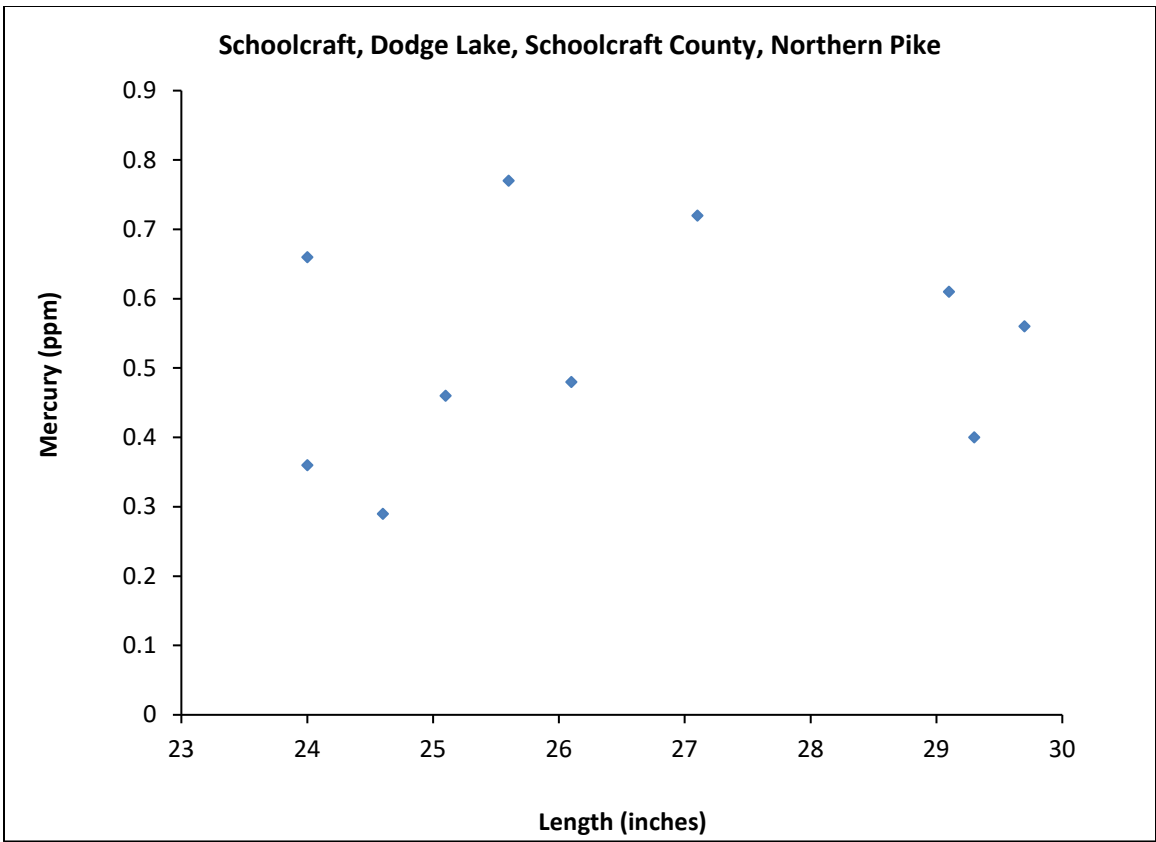
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Range of Legal Sized Samples	
Earliest	Most Recent				Min	Max
2006	2006	10	24	24	29.7	
Datasets available: 2006						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	10	0.53	0.29	0.77	0.65	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.026	0.048				

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: Dodge Lake northern pike are covered under the statewide mercury consumption advisory.

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



Northern Pike

Gulliver Lake

Schoolcraft County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Size Range of All Samples	
Earliest	Most Recent				Min	Max
1990	1990	6	19.9	24	19.9	25.6
Datasets available: 1990						
Chemical	Sample Size (All)*	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	6*	0.43	0.14	0.71	0.66	1
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.741	0.698				

Organics Analysis:

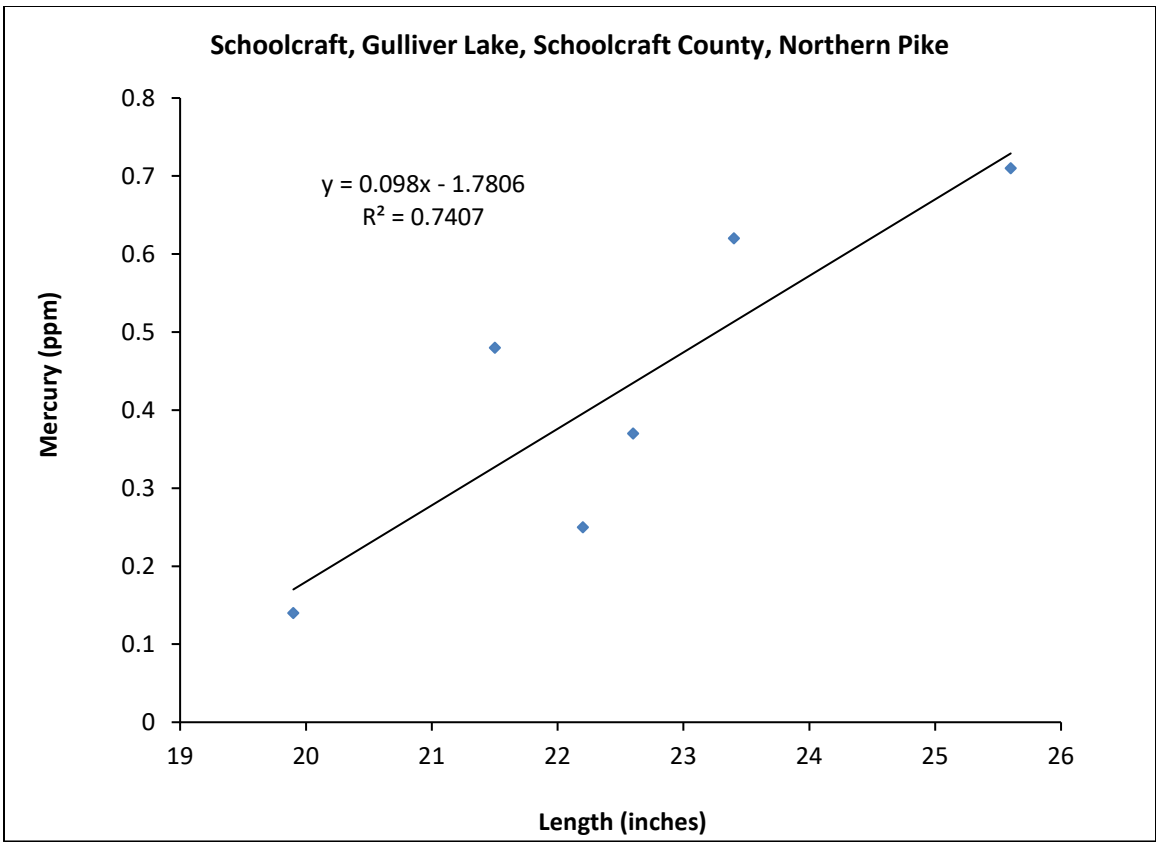
Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Size Range of All Samples	
Earliest	Most Recent				Min	Max
--	--	0				
Datasets available: --						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
PCB	0	--	--	--	--	--
DDT	0	--	--	--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

* - 1 legal sized fish

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

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

Length (Inches)	Hg Regression Equation Estimate (ppm)	Meal Category
24	0.57	1
26	0.77	1
28	0.96	1
30	1.16	0.5
32	1.36	0.5
34	1.55	0.5
36	1.75	0.5
38	1.94	0.5
<i>Shaded area denotes extrapolated estimates</i>		



Smallmouth Bass

Gulliver Lake

Schoolcraft County

Hg Analysis:

Range of Years Used		N (All)	Overall Min Length	Legal Min (Inches)	Size Range of All Samples			
Earliest	Most Recent				Min	Max		
1990	1990	2	12.2	14	12.2	16.5		
Datasets available:		1990						
Chemical	Sample Size (All)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category		
Mercury	2	0.32	0.18	0.46	--	--		
Chemical	Linear Regression	Exponential Regression						
	R ²	R ²						
Mercury	--	--						

Organics Analysis:

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

Existing Advisory: Gulliver Lake smallmouth bass are covered under the statewide mercury consumption advisory.

Recommendation: A dataset of less than five data points for a given chemical, species and waterbody is considered insufficient for evaluation using the standard evaluation method. Statewide guideline applies: 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.

Walleye

Gulliver Lake

Schoolcraft County

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	9	16.5	15	16.5	19.1
Datasets available: 1990						
Chemical	Sample Size (Legal)	Mean (ppm)	Min. Conc. (ppm)	Max Conc. (ppm)	95%UCL (ppm)	Meal Category
Mercury	9	0.26	0.21	0.31	0.30	2
Chemical	Linear Regression	Exponential Regression				
	R ²	R ²				
Mercury	0.136	0.135				

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:						2

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

Recommendation: No one should eat more than 2 meals per month of Gulliver Lake walleye smaller than 20 inches or more than 1 meal per month of those fish larger than 20 inches due to mercury. The statewide length break was applied as the size range of the fish was limited.

