MI/DEQ/WB-06/092

Great Lakes Connecting Channels
Data Evaluation and Trend Analysis Report

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Contract Number: 071B1001643

Report Date: September 18, 2006

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SUMMARY

The Michigan Department of Environmental Quality (MDEQ) has conducted monitoring to determine the ambient water quality conditions in Michigan's portion of the Connecting Channels of the Great Lakes since 1969 in the Detroit River, and since 1998 in the St. Clair and St. Marys Rivers. The monitoring was designed to document water quality, calculate loading rates and determine water quality trends over time.

This document presents a summary of the temporal trends and spatial comparisons in the water quality of Michigan's Connecting Channels, and updates a report written by Great Lakes Environmental Center and Limno-Tech, Inc. (GLEC and LTI, 2005). The analysis of contaminants was conducted for the Detroit River (1992 to 2004), St. Clair River (1998 to 2004) and St. Marys River (1998 to 2004). Contaminants included: nutrients, other conventional pollutants, base/neutral organics, volatile organics, mercury (Hg), trace metals, polychlorinated biphenyls (PCBs) and dichlorodiphenyltrichloroethane (DDT). The data analysis focused on spatial comparisons, temporal trends, statistical analysis and loading comparisons between the upstream and downstream locations of the rivers.

A brief summary of observed temporal trends and spatial comparisons is presented below.

Detroit River

The recent temporal trends and spatial comparisons (1992 to 2004) in monitored water quality parameters observed in the Detroit River are summarized in Table S-1 below. Nutrient concentrations in the Detroit River have dropped significantly since the late 1960s, with an order-of-magnitude decline in total phosphorus concentrations from a high of 0.13 mg/L in 1969. Data collected between 1992 and 2004 indicate seasonal fluctuations in phosphorus and nitrogen parameters, with an increasing trend in total phosphorus concentration. Ammonia (NH_3) and nitrite (NO_2) concentrations were significantly greater at the downstream station, and nitrate (NO_3) was significantly lower at the downstream location.

Analysis of Detroit River metals data was restricted to data obtained between 1998 and 2004, due to comparability concerns with data obtained prior to this period. Detroit River metals data indicate a decreasing concentration trend for lead (Pb) and an increasing concentration trend for Hg, with some apparent seasonal fluctuations. Elevated concentrations of all other metals monitored (cadmium (Cd), chromium (Cr), copper (Cu), Hg, Pb, nickel (Ni) and zinc (Zn)) in late 1999 were measured in upstream samples. In general, statistically significant differences ($p<0.05$) between upstream and downstream concentrations were not apparent, with the exception of Hg, which was significantly higher at the upstream station.

Conventional parameters, including chloride (Cl) and potassium (K), increased in the Detroit River between 1992 and 2004. Cl concentrations were greater at the downstream station. Total suspended solids (TSS) concentrations and turbidity were significantly less at the downstream location than at the upstream location. However, turbidity in the Detroit River has increased overall since 1992.

Dissolved oxygen (DO) in the Detroit River varied between 6.1 and 16.1 mg/L, with a strong seasonal variation. Concentrations of DO were 55 to 120% of the temperature-adjusted saturation concentration, and were significantly greater at the upstream station.

Table S-1. Summary of Temporal Trends and Spatial Comparisons for Water Quality Parameters in the Detroit River.

Parameter	Trend with time	Change from Upstream to Downstream
Alkalinity		
Ammonia		+
Cadmium		
Calcium		
Chloride	+	+
Chromium		
Conductivity	+	+
Copper		
DDT		
Dissolved Oxygen		-
Dissolved Solids		
Hardness		
Lead	-	
Magnesium		
Mercury	+	-
Nickel		
Nitrate		-
Nitrite		+
Orthophosphate		
PCB		+
pH		-
Potassium	+	
Sodium		-
Sulfate		
Suspended Solids		-
Temperature	+	
TKN		
TOC		
Total phosphorus	+	
Turbidity	+	-
Zinc		
Note: Trend with time indicated if multiple regression identifies time trend as significant at the 95% confidence level. Significant upstream-downstream change is indicated by paired *t*-testing at the 95% confidence level. Increase denoted by "+", decrease by "-" and no significant change by blank (" ").		

St. Clair River

The recent (1998 to 2004) temporal trends and spatial comparisons in monitored water quality parameters observed in the St. Clair River are summarized in Table S-2. Total phosphorus concentrations have declined from concentrations measured in the 1980s. Recent data indicate no trend in most nutrient parameters, with the exception of an increasing trend in NH_3 and total Kjeldahl nitrogen (TKN) concentrations. All nutrient concentrations, except TKN, were significantly higher at the downstream station. Seasonal fluctuations in concentration were apparent in most of the nutrient parameters.

Table S-2. Summary of Temporal Trends and Spatial Comparisons for Water Quality Parameters in the St. Clair River.

Parameter	Trend with time	Change from Upstream to Downstream
Alkalinity		
Ammonia	+	+
Cadmium		+
Calcium		
Chloride	+	+
Chromium	-	+
Conductivity	+	+
Copper		+
DDT		
Dissolved Oxygen		
Dissolved Solids	+	+
Hardness	+	
Lead	+	+
Magnesium	+	
Mercury		
Nickel	-	+
Nitrate		+
Nitrite		+
Orthophosphate		+
PCB	-	
pH		+
Potassium	+	
Sodium		
Sulfate		
Suspended Solids		+
Temperature		+
TKN	+	
TOC		
Total phosphorus		+
Turbidity	-	+
Zinc	+	+

Note: Trend with time indicated if multiple regression identifies time trend as significant at the 95% confidence level. Significant upstream-downstream change is indicated by paired *t*-testing at the 95% confidence level. Increase denoted by "+", decrease by "-" and no significant change by blank (" ").

There was a definite increase (similar to the Detroit River) in most metals concentrations analyzed in the St. Clair River in the latter part of 1999. Metals concentrations generally decreased in 2000, and then were variable between 2001 and 2004. The elevated metals concentrations measured throughout the study appear to be related to elevated TSS concentrations. Pb and Zn concentrations had an increasing trend with time, and Cr and Ni concentrations decreased over time. All of the metals concentrations except Hg were greater at the downstream station.

Conventional parameters, including Cl, magnesium (Mg), K and dissolved solids (TDS), had an increasing trend between 1998 and 2004 in the St. Clair River. Cl concentrations were significantly greater at the downstream station. Turbidity had a decreasing trend with time and was significantly greater at the downstream station.

DO in the St. Clair River ranged between 7.4 and 13.4 mg/L, primarily due to seasonal fluctuations. No statistically significant difference between upstream and downstream concentrations was observed.

St. Marys River

The recent (1998 to 2004) temporal trends and spatial comparisons in monitored water quality parameters observed in the St. Marys River are summarized in Table S-3 below. Nutrient concentrations in the St. Marys River showed strong seasonal fluctuations; NH_3, NO_3 and NO_2 concentrations exhibited increasing trends in the 1998 to 2004 period. Total phosphorus, orthophosphate and NO_2 concentrations were significantly greater at the downstream sampling station, while NO_3 was significantly less at the downstream location.

Cd, Cr and Ni concentrations exhibited a decreasing concentration trend with time, while Zn concentrations showed an increasing trend with time. Cr, Cu, Pb and Ni concentrations were greater at the downstream station. Hg concentrations measured in 1999 were elevated in comparison to those measured in 1998 and from 2000 to 2004. The elevated 1999 Hg concentrations (~10 ng/L) at the upstream and downstream stations in the St. Marys River were similar to those observed at the downstream location in the St Clair River in 1999. In contrast with the St. Clair (and Detroit) River, however, none of the other metals monitored in the St. Marys River exhibited increases in 1999.

Mg and K, both conventional parameters, showed a decreasing and increasing trend with time, respectively. Turbidity and concentrations of Mg, calcium, TDS and TSS were significantly greater at the downstream station in the St. Marys River.

DO in the St. Marys River varied seasonally between 6.2 and 16.5 mg/L, similar to the downstream rivers (St. Clair and Detroit). There was no trend in DO concentrations during the period considered.

All Rivers

Total PCB concentrations exceeded the applicable Rule 57 water quality value in 59 of the 60 samples collected at all Connecting Channel locations, and total DDT concentrations exceeded the applicable Rule 57 water quality value in 13 of the 24 samples collected at all Connecting Channel locations. Hg exceeded the applicable Rule 57 water quality value in 101 of 245 samples collected at all Connecting Channel locations. Concentrations of the other trace metals (Cd, Cr, Cu, Pb, Ni and Zn) met the applicable Rule 57 water quality values at all Connecting Channel locations. Base/neutral and volatile organic compounds were largely not detected above the quantification level.

Table S-3. Summary of Temporal Trends and Spatial Comparisons for Water Quality Parameters in the St. Marys River.

Parameter	Trend with time	Change from Upstream to Downstream
Alkalinity		
Ammonia	+	
Cadmium	-	
Calcium		+
Chloride		
Chromium	-	+
Conductivity		+
Copper		+
DDT		
Dissolved Oxygen		
Dissolved Solids		+
Hardness		+
Lead		+
Magnesium	-	+
Mercury		
Nickel	-	+
Nitrate	+	-
Nitrite	+	+
Orthophosphate		+
PCB		
pH	-	
Potassium	+	
Sodium		
Sulfate		
Suspended Solids		+
Temperature		+
TKN		
TOC	+	
Total phosphorus		+
Turbidity		+
Zinc	+	

Note: Trend with time indicated if multiple regression identifies time trend as significant at the 95% confidence level. Significant upstream-downstream change is indicated by paired *t*-testing at the 95% confidence level. Increase denoted by “+”, decrease by “-“ and no significant change by blank (“ “).

1. INTRODUCTION

Comprehensive, viable water quality monitoring programs are essential to providing the MDEQ a means by which to assess overall water quality throughout Michigan and determine if it has improved, degraded or remained unchanged. Such programs provide the MDEQ with a sound basis for decision making and prioritizing its efforts as an agency. One such water quality monitoring program is the Michigan Water Chemistry Monitoring Project (WCMP).

In June 1998, the MDEQ, Water Bureau (WB), initiated the WCMP using part of a $500,000 appropriation by the state Legislature. This program was a first step towards improving water quality monitoring in Michigan since funding reductions imposed in the mid-1990s resulted in severely restricted monitoring capabilities. Technological advances in affordable, low-concentration analytical techniques then available to the WCMP also made it possible to assess Michigan's surface waters for key contaminants, such as Hg and PCBs, at environmentally relevant levels.

The WCMP is an important component of the statewide surface water quality monitoring activities outlined in the January 1997 report prepared by the MDEQ, WB, and the MDEQ, Land and Water Management Division, entitled, "A Strategic Environmental Quality Monitoring Program for Michigan's Surface Waters" (Strategy). The WCMP incorporates the goals of the Strategy, which are:

1. Assess the current status and condition of individual waters of the state and determine whether standards are being met;
2. Measure temporal and spatial trends in the quality of Michigan's surface waters;
3. Provide data to support MDEQ water quality programs and evaluate their effectiveness; and
4. Detect new and emerging water quality problems.

As initiated in 1998, the WCMP called for routine annual water chemistry monitoring at the Great Lakes Connecting Channels, Saginaw Bay, Grand Traverse Bay and selected Michigan stream tributaries to the Great Lakes. With the November 1998 passage of the Clean Michigan Initiative, a substantial increase in annual funding became available for statewide surface water quality monitoring beginning in 2000. The study design of the WCMP was subsequently modified and expanded to help ensure implementation of statewide water chemistry monitoring activities capable of more fully realizing the goals set forth in the Strategy.

Michigan's Great Lakes Connecting Channels (i.e., the Detroit River, St. Clair River and St. Marys River) are important locations for water chemistry monitoring efforts because they serve as conduits for direct water quality impacts between the Great Lakes. They also represent large watersheds subject to intense pressures from commercial and industrial activities. And as is true of many large watersheds, the Great Lakes connecting channels are affected by a variety of land uses, point and nonpoint sources of pollution, and geological and other natural influences. As part of the WCMP, a total of six stations - one at the headwaters and mouth of each of the Connecting Channels - are monitored monthly each year during the open-water season.

This report presents, summarizes and discusses results from water chemistry monitoring efforts undertaken at the Great Lakes Connecting Channels beginning in 1998 as part of the WCMP. Where data comparability criteria are met, historical water chemistry data collected by the MDEQ at the Detroit River during 1992 through 1997 are also incorporated. (Similar historical datasets are not available for the St. Clair or St. Marys Rivers). Data summaries include analyses of temporal trends and spatial comparisons, an evaluation of longitudinal profiles of estimated contaminant loading rates and comparisons of contaminant concentrations with Michigan Rule 57 water quality values.

2. DESCRIPTION OF AVAILABLE DATA

The Detroit River has been monitored for the longest period of the three Connecting Channels. A report summarizing the data collected from 1969 to 1991 was published in 1993 (MDNR, 1993). Data from 1992 to 2003 for the Detroit River, and from 1998 to 2003 for the St. Clair and St. Marys Rivers, were summarized in 2005 (GLEC and LTI, 2005). Data from 2004 were provided by MDEQ (C. Aiello, personal communication). The parameters included in the current report are: phosphorus, nitrogen, Cl, TSS, TDS, temperature, conductivity, DO, pH, turbidity, alkalinity, total organic carbon (TOC), sulfate, hardness, calcium, sulfide, total cyanide (CN) and Mg. The metals data include: Cd, Cu, Cr, Pb, Hg, Ni and Zn. In each of the rivers, PCB data are available for 1998 to 2003; DDT data were available in 1998 and 1999. Also included are base/neutral organics and volatile organics data for 1999 to 2004. All of the monitored data are included in Appendix A.

For the purpose of this study, the data collected at the sampling stations listed below were used. The sampling station locations are shown in Figures 2-1 to 2-3. Samples were collected at additional stations along the upstream and downstream Detroit River transects, during the period from 1992 to 1997. Starting in 1998, only one station was sampled at each upstream and downstream location. Therefore, for the purpose of data comparison over the study period, only the data at these two stations (listed below) in the Detroit River were used in the statistical evaluations.

Station 820414 – Upstream Detroit River
Station 820017 – Downstream Detroit River
Station 740376 – Upstream St. Clair River
Station 740016 – Downstream St. Clair River
Station 170139 – Upstream St. Marys River
Station 170140 – Downstream St. Marys River

The current structure of MDEQ’s statewide water chemistry monitoring activities, including those performed on Michigan's Great Lakes Connecting Channels, is described in the Surface Water Quality Assessment Section’s Procedure #58 (available upon request from MDEQ). Descriptions of the field procedures used to collect and handle the Connecting Channels water samples are provided in the document entitled “Water Chemistry Monitoring Project: Sample Collection and Handling Procedures for Selected Parameters” (available upon request from MDEQ). The methods of chemical analysis employed for analytes sampled at the Connecting Channels are described in a separate report (Aiello, 2006).

Samples were generally collected on a monthly basis from the Detroit, St. Clair and St. Marys Rivers during the period from April to November each year. Tables 2-1 to 2-5 show the available data for each river for the period of interest. Due to high analytical costs, DDT and PCB were monitored in the Connecting Channels on a more limited basis than for the other water quality parameters. DDT and PCB analyses were conducted by MDEQ for surveillance purposes only, and thus were not intended to generate the quantity of data necessary for extensive statistical analysis or comprehensive loading estimates.

Table 2-1. Monthly Monitoring Frequency for Conventional Parameters – Detroit River 1992-2004.

Year	April	May	June	July	August	September	October	November
1992*		X		X	X	X	X	
1993*		X		X	X	X	X	
1994*		X		X	X	X	X	
1995*		X		X	X	X	X	
1996**		X						
1997*			X		X		X	
1998 †			X	X		X	X	X
1999 †	X	X	X	X	X	X	X	X
2000 †	X	X		X	X	X	X	X
2001 †	X	X	X	X	X	X	X	X
2002 †	X	X	X	X	X	X	X	X
2003 †		X	X	X	X	X	X	X#
2004 †	X	X	X	X	X	X	X	X

* Data available for conventional parameters at four upstream stations (000002, 820059, 820061, 820414) and seven downstream stations (000024, 000027, 000029, 820011, 820014, 820016, 820017).

** Only one data point available (5/21/1996) for all 4 upstream and 7 downstream stations.

† Data available at only one upstream (820414) and one downstream (820017) station.

\# Data available only at the downstream (820017) station.

Table 2-2. Monthly Monitoring Frequencies for Metals - Detroit River 1992-2004.

Year	April	May	June	July	August	September	October	November
1992*		X		X	X	X	X	
1993*		X		X	X	X	X	
1994*		X		X	X	X	X	
1995*		X		X	X	X	X	
1996								
1997								
1998†			X	X		X	X	X
1999†	X	X	X	X	X	X	X	X
2000†				X	X	X	X	X
2001 †	X	X	X	X	X	X	X	X
2002 †	X	X	X	X	X	X	X	X
2003 †		X	X	X	X	X	X	X#
2004	X	X	X	X	X	X	X	X

* Data available for conventional parameters at four upstream stations (000002, 820059, 820061, 820414) and seven downstream stations (000024, 000027, 000029, 820011, 820014, 820016, 820017).

† Data available only at one upstream (820414) and one downstream (820017) station. Samples were collected, handled and analyzed in accordance with ultra-clean techniques.

\# Data available only at the downstream (820017) station.

Table 2-3. Availability of PCB Data at the Upstream (820414) and Downstream (820017) Stations - Detroit River 1998-2003.

Year	April	May	June	July	August	September	October	November
1998			X			X		
1999	X		X		X	X		
2000						X*	X†	
2001						X		
2002						X		
2003					X			

* Data available only at the upstream (820414) station.
† Data available only at the downstream (820017) station.

Table 2-4. Monthly Monitoring Frequencies for Conventional Parameters and Metals - St. Clair River 1998-2004.

Year	April	May	June	July	August	September	October	November
1998			X	X	X*	X†	X	X
1999	X	X	X	X	X	X	X	X
2000	X	X		X	X	X	X	X
2001	X	X	X	X	X	X	X	X
2002	X	X	X	X	X	X	X	X
2003		X	X	X	X	X	X	X†
2004	X	X	X	X	X	X	X	X

* Data available only at the upstream (740376) station.
† Data available only at the downstream (740016) station.

Table 2-5. Monthly Monitoring Frequencies for Conventional Parameters and Metals - St. Marys River 1998-2004.

Year	April	May	June	July	August	September	October	November
1998			X	X		X	X	X
1999	X	X	X	X	X	X	X	X
2000	X	X		X	X	X	X	X
2001		X	X	X	X	X	X	
2002		X	X	X	X	X	X	
2003		X	X	X	X	X	X	
2004		X*	X	X	X	X	X	X

* Data available only at the downstream (170140) station.

Table 2-6 shows the availability of flow data for each Connecting Channel, during the yearly sampling period from April to November. Connecting Channels flow data were obtained from several sources. Detroit River daily flow data for 1992 to 1998 were provided by MDEQ (R. Lundgren, personal communication). Between 1999 and 2000, flow data for the Detroit, St. Clair and St. Marys Rivers were obtained from the United States Geological Survey (USGS) (T. Behrendt, personal communication). From 2001 to 2004, flow data for all three rivers were obtained from the Army Corps of Engineers (ACOE) (J. Koschik, personal communication). Prior to 2001, the upstream and downstream pollutant loads were provided by the USGS (USGS, 2001). Pollutant loads from 2001 to 2004 were calculated by USGS and were provided by MDEQ (C. Aiello, personal communication). The loads were calculated using data from the sampling stations listed above and the available flow data, using Beale's Ratio Estimator.

Table 2-6. Years that Flow Measurements were Available on the Upstream and Downstream Locations of the Connecting Channels.

	Detroit River	**St. Clair River**	**St. Marys River**
Upstream	1998-2004	1998-2004	1998-2004
Downstream	1991-2004	1998-2004	1998-2004

3. STATISTICAL EVALUATION

The Great Lakes Connecting Channels data were statistically evaluated to assess spatial and temporal trends. Specifically, the following evaluations were conducted:

1. Qualitative comparison between data collected at upstream and downstream sampling locations in each channel. Time series plots were prepared for each parameter at each location. Quantification limits are shown as a solid red line on each plot.

2. The Connecting Channels data were compared to existing monitoring and surveillance data for these rivers to qualitatively assess long term trends. This included historical data for the Detroit River, which was available on an annual basis as far back as 1969 (MDNR,1993). Data from the Upper Great Lakes Connecting Channels (UGLCC) study (Environment Canada and US Environmental Protection Agency, 1988) was also considered in this qualitative evaluation. A similar set of water quality parameters were measured at comparable stations in each of the Connecting Channels during the UGLCC study.

3. A Student's two-tailed paired *t*-test was performed to determine if the upstream and downstream concentrations in each connecting channel were significantly different. These tests were performed at the 95% level of significance. Because the goal was to test for differences in individual parameters, the error rate was not adjusted to account for the multiple tests being performed.

4. Regression analysis was conducted to investigate whether the measured parameter concentrations were dependent on factors such as flow, location (upstream vs. downstream) and season. The regression analysis was also used to identify possible temporal trends in parameter concentrations at each location. The regression model for those factors in which significant dependence was revealed was plotted as a grey line on the concentration time series graphs for each of the respective parameters.

   The lines depicting the regression model simulated results had three "shapes" (Figure 3-1). A significant dependence of the concentration data on season is pictured in Figure 3-1A; concentrations increase and decrease in direct relation to the time of the year during which samples were collected. Figure 3-1B shows a significant dependence of the concentration data on channel flow; measured concentrations increase and decrease corresponding to changes in channel flow. A long term increasing trend in the concentration data is dipicted in Figure 3-1C. Figure 3-1D depicts no trend in the concentration data; the regression model indicated no dependence of the concentration data on any factor, including flow, season and time. Dependence of the concentration data on more than one factor (ex. flow and time) results in a combination of the line "shapes" (increasing line showing correspondance with channel flow).

Estimated values using the regression model were also compared with the measured values and are plotted in Appendix B for all parameters. The figures in Appendix B showing the parameter concentration versus year for measured and estimated values give an indication of how well the regression model was able to predict concentrations at a given location across sampling years. For a given year, the closer the measured and estimated values are to one another, the better the regression model was able to predict concentrations at a given location. The figures in Appendix B showing estimated versus measured parameter concentrations give an indication of how well the regression model was able to predict concentrations at a given location. In general, the closer the data are to the diagonal line (one-to-one line), the better the regression model fits the data.

5. The calculated loads provided by USGS were qualitatively compared to assess spatial and temporal trends. The mean loading data along with the 95% confidence interval half-width were used to generate plots for comparison of upstream and downstream loads for each channel.

For purposes of the statistical evaluations, all non-detectable concentrations were estimated as one-half of the quantification limit. The metals data collected in the Detroit River prior to 1998 were not included in the trend analysis because the application of ultra-clean sampling techniques and low detection level analytical methods did not begin until 1998. For volatile organics, base/neutral organics, sulfide and CN, concentrations were below the quantification limits in more than 99% of the samples collected from 1999 to 2004. Therefore, these parameters were also excluded from the trend analysis. For completeness, the data are included in Appendix C.

The general statistical model for the linear regression including terms for flow, year, location and seasonality can be expressed as follows:

$$\begin{aligned}[concentration] = {} & \beta_0 + \beta_1(flow) + \beta_2(year) + \beta_3\sin(2\pi t^*) + \beta_4\cos(2\pi t^*) + \beta_5(location) + \\ & \beta_6(location * flow) + \beta_7(location * year) + \varepsilon\end{aligned}$$

A summary of terms is as follows:

β_0 :	Intercept term
$\beta_1(flow)$:	Dependence on channel flow rate
$\beta_2(year)$:	Long-term trending
$\beta_3\sin(2\pi t^*) + \beta_4\cos(2\pi t^*)$:	Seasonality terms (where *t** is a fractional year = Julian day/365)
$\beta_5(location)$:	Term to test for differences in intercept between upstream/downstream sampling locations. Here location is an indicator variable =0 (upstream); =1 (downstream).
$\beta_6(location * flow)$:	Term to test for differences in flow rate dependence between upstream/downstream sampling locations.

$\beta_7(location * year)$: Term to test for differences in long-term trending between upstream/downstream sampling locations.

ε: Random error component (unexplained variability)

The complete model was fit to the data using standard multiple linear regression techniques, and individual term *p*-values were then used to select statistically significant terms at the 95% confidence level (p<0.05). The regression procedure assumes that, following regression, statistical model residuals are normally distributed, independent and random. For all fits prepared in this report, histograms of model residuals were prepared to allow a visual assessment of normality, and appropriate data transformations were applied where required.

In addition, a representative group of constituents in which strong time trending was identified (suggesting the possibility of serial correlation or non-independent residuals) was tested using the Durbin-Watson test for serial correlation. Results generally indicated indeterminate or marginal results, suggesting that serial correlation is not likely to be a significant problem in the analysis of the data available to date. As more data becomes available in upcoming years, it may be necessary to test more rigorously for the presence of serial correlation.

4. DETROIT RIVER

The Detroit River connects Lake St. Clair with Lake Erie and is the most downstream Connecting Channel in this study (Figure 2-3). The flow in the Detroit River is complex, due to numerous islands and channels, particularly in the lower half of the river. Flow is also affected by fluctuating water levels in Lake Erie. Figure 4-1 shows the complete flow record from 1991 to 2004 in the Detroit River. The flow in the Detroit River generally increased between 1991 and 1997, and declined between 1998 and 2000. The flow has remained relatively constant between 2000 and 2004. Declining flows in the Connecting Channels between 1998 and 2000 were a response to the drop in water levels of the Great Lakes. The flow ranged from approximately 3,600 to 7,100 m^3/sec at the mouth of the river between 1998 and 2004, and averaged approximately 5,150 m^3/sec during this same period.

4.1 TEMPORAL TRENDS AND SPATIAL COMPARISONS

Summary statistics for all water quality parameters measured in 2004 in the Detroit River are presented in Tables 4-1 (upstream station) and 4-2 (downstream station). The individual data are also presented in Table A-1 (downstream station) and Table A-2 (upstream station) in Appendix A.

The following sections of this report present data available for the Detroit River and relevant analyses performed on the data. Where sufficient data exist, multiple regression and paired t-testing techniques are used to identify trends affecting the data. Concentration and loading data are plotted for upstream and downstream sampling locations in Figures 4-2 through 4-48. The concentration plots also depict regression model-simulated data and laboratory detection limits, where available. In general, available concentration data span the period from 1992 through 2004. For the heavy metals (Cd, Cr, Cu, Pb, Hg, Nil and Zn), data prior to 1998 are not included in the evaluations because of high detection limits. Loading data are only available for 1998 through 2004.

Phosphorus

Concentrations and Loading. Phosphorus data include total phosphorus concentrations and loads, and orthophosphate concentrations for upstream and downstream sampling stations between the period of 1992 to 2004. Upstream and downstream total phosphorus concentrations are shown in Figure 4-2. Over this period, total phosphorus concentrations generally are observed in the range of 0.003 to 0.020 mg/L upstream (average 0.016 mg/L, maximum 0.064 mg/L) and 0.004 to 0.026 mg/L downstream (average 0.015 mg/L, maximum 0.034 mg/L).

The available annual total phosphorus load estimates for the upstream and downstream locations are shown in Figure 4-3 for 1998 to 2004. Phosphorus loads average 2,767 metric tons per year (MT/yr) upstream and 2,386 MT/yr downstream. Qualitative assessment of loading data, as presented in Figure 4-3, does not show any clearly observable trends with time.

Figure 4-4 shows the orthophosphate concentration data for the upstream and downstream locations. At the upstream station, the reported values generally ranged between 0.001 and 0.012 mg/L (average 0.004 mg/L, maximum 0.021 mg/L). Downstream values ranged from 0.001 to 0.014 mg/L (average 0.005 mg/L).

Table 4-1. Summary of Water Quality in the Detroit River Measured Upstream (Station 820414) in 2004.

Parameter	number of measure-ments	mean	median	range
Temperature (Celcius)	8	16.0	16.5	7.7-22.1
Turbidity (NTU)	8	8.0	4.6	2.0-24.0
Field Conductivity (μmho/cm)	8	220	218	211-232
Lab Conductivity (μmho/cm)	8	223	222	215-243
Field Dissolved Oxygen (mg/l)	8	9.6	9.6	8.1-11.9
Lab Dissolved Oxygen (mg/l)	2	9.1	9.1	8.7-9.5
Field pH	8	7.8	7.7	7.3-8.4
Lab pH	8	8.3	8.3	8.1-8.6
Alkalinity (mg/l)	8	75	75	72-79
Total Dissolved Solids (mg/l)	8	145	140	140-160
Total Suspended Solids (mg/l)	8	9.8	6.0	2.0-30.0
Ammonia (mg/l)	8	0.017	0.013	0.004-0.030
Nitrite (mg/l)	8	0.006	0.006	0.004-0.009
Nitrate (mg/l)	8	0.39	0.37	0.25-0.67
Total Kjeldahl Nitrogen (mg/l)	8	0.36	0.23	0.15-1.41
Total Phosphorus (mg/l)	8	0.020	0.012	0.009-0.059
Total Orthophosphate (mg/l)	8	0.004	0.003	0.001-0.013
Total Organic Carbon (mg/L)	8	2.1	2.1	1.8-2.9
Sulfate (mg/l)	8	13.9	14.0	12.0-16.0
Hardness (mg/l)	8	100	99	92-107
Calcium (mg/l)	8	27.6	27.6	24.9-29.3
Magnesium (mg/l)	8	7.5	7.5	7.2-8.1
Chloride (mg/l)	8	6.8	6.5	6.0-9.0
Sodium (mg/l)	8	4.2	3.9	2.6-5.8
Potassium (mg/l)	8	1.0	1.0	1.0-1.3
Cadmium (μg/l)	8	0.010	0.009	0.005-0.020
Chromium (μg/l)	8	0.358	0.294	0.154-0.879
Copper (μg/l)	8	0.832	0.708	0.601-1.45
Nickel (μg/l)	8	1.145	0.909	0.756-1.88
Lead (μg/l)	8	0.364	0.233	0.117-1.00
Zinc (μg/l)	8	1.715	1.175	0.710-3.95
Mercury (ng/l)	8	4.884	3.035	1.27-13.23

Multiple Regression. Multiple regression of total phosphorus data indicates seasonality in the data, as evidenced by the statistically significant paired terms of β_3 sin(2πt*)+β_4 cos(2πt*). A statistically significant β_2 (year) term indicates an increasing temporal trend in the data. A statistically significant β_6 (loc*flow) term indicates that observed increases in concentration with flow are more significant at the upstream station than at the downstream station, possibly associated with upstream runoff.

Regression of orthophosphate data indicates a dependency of concentration on channel flow rate (statistically significant β_1 (flow) term), and a dependency on location (statistically significant β_5 (location) term) that can be observed by slightly higher downstream concentrations. While a difference between locations is not indicated in the multiple regression analysis, the regression accounts for differences in flow rate, time and season, which are not accounted for in the *t*-test analysis. An insignificant β_2 (year) term indicates no temporal trend in the data.

T-testing. Paired t-testing of the 1992 through 2004 data shows no significant difference between the upstream and downstream values for both total phosphorus (p=0.5532, 72 pairs) and orthophosphate (p=0.0828, 57 pairs).

Table 4-2. Summary of Water Quality in the Detroit River Measured Downstream (Station 820017) in 2004.

Parameter	number of measure-ments	mean	median	range
Temperature (Celcius)	8	16.5	17.2	8.5-22.5
Turbidity (NTU)	8	4.7	4.3	2.8-9.4
Field Conductivity (μmho/cm)	8	225	221	218-245
Lab Conductivity (μmho/cm)	8	228	229	217-239
Field Dissolved Oxygen (mg/l)	8	9.5	9.0	8.5-11.8
Lab Dissolved Oxygen (mg/l)	3	8.9	8.9	8.6-9.2
Field pH	8	7.6	7.6	6.9-8.3
Lab pH	8	8.2	8.2	8.0-8.5
Alkalinity (mg/l)	8	75	76	70-81
Total Dissolved Solids (mg/l)	8	149	150	140-160
Total Suspended Solids (mg/l)	8	5.9	5.0	2.0-14.0
Ammonia (mg/l)	8	0.041	0.038	0.031-0.055
Nitrite (mg/l)	8	0.007	0.008	0.005-0.011
Nitrate (mg/l)	8	0.36	0.35	0.25-0.47
Total Kjeldahl Nitrogen (mg/l)	8	0.32	0.30	0.18-0.70
Total Phosphorus (mg/l)	8	0.016	0.017	0.011-0.020
Total Orthophosphate (mg/l)	8	0.003	0.003	0.001-0.006
Total Organic Carbon (mg/L)	8	2.6	2.4	1.8-4.9
Sulfate (mg/l)	8	13.9	14.0	12.0-16.0
Hardness (mg/l)	8	100	99	98-104
Calcium (mg/l)	8	27.5	27.4	26.7-28.8
Magnesium (mg/l)	8	7.6	7.6	7.3-7.8
Chloride (mg/l)	8	8.0	8.0	6.0-9.0
Sodium (mg/l)	8	4.8	4.7	4.2-5.7
Potassium (mg/l)	8	1.1	1.1	1.0-1.4
Cadmium (μg/l)	8	0.010	0.010	0.008-0.013
Chromium (μg/l)	8	0.289	0.286	0.200-0.399
Copper (μg/l)	8	0.793	0.779	0.677-0.911
Nickel (μg/l)	8	1.09	0.97	0.90-1.76
Lead (μg/l)	8	0.272	0.257	0.216-0.406
Zinc (μg/l)	8	1.95	1.80	1.14-2.97
Mercury (ng/l)	8	1.99	1.88	0.99-3.95

Nitrogen

Concentrations and Loading. Concentration data for TKN, NO_3, NO_2, NO_2+NO_3 and NH_4 are presented in Figures 4-5 to 4-9 for both upstream and downstream locations sampled during the period of 1992 to 2004. Estimated loads for TKN and NO_3 are available from 1998 to 2004 and are shown in Figures 4-10 and 4-11, respectively.

Upstream concentrations generally range from 0.1 to 0.4 mg/L for TKN (average 0.2 mg/L), 0.2 to 0.8 mg/L for both NO_3 and NO_2+NO_3 (average 0.4 mg/L for both), 0.002 to 0.009 mg/L for NO_2 (average 0.005 mg/L) and 0.004 to 0.034 mg/L for NH_4 (average 0.016 mg/L). Downstream concentrations generally range from 0.1 to 0.3 mg/L for TKN (average 0.2 mg/L), 0.2 to 0.7 mg/L for both NO_3 and NO_2+NO_3 (average 0.3 and 0.4 mg/L, respectively), 0.003 to 0.020 mg/L for NO_2 (average 0.009 mg/L) and 0.01 to 0.07 mg/L for NH_4 (average 0.04 mg/L). Excursions above these ranges occur for TKN in 2004 (upstream and downstream), NO_3 and NO_2+NO_3 in 2001 (upstream), NO_2 in 1995 (downstream) and with NH_4 in 1995, 1998 and 2001 (downstream).

Average TKN loads are 35,977 MT/yr upstream and 38,485 MT/yr downstream. Average NO_3 loads are 48,292 MT/yr upstream and 54,272 MT/yr downstream. Loading data do not appear to show any clear trend with time for TKN and NO_3. TKN average loads for 2004 are higher than for previous years at both upstream and downstream locations; however, the load variability is also greater.

Multiple Regression. Multiple regression results for the NH_4, NO_2, NO_3 and NO_2+NO_3 data sets indicate statistically significant seasonal fluctuation in all four parameters. Additional statistically significant terms included β_1 (flow) and β_6 (loc*flow) for NH_4, and β_6 (loc*flow) for NO_2. The β_1 (flow) term shows a dependence on channel flow rate, and the β_6 (loc*flow) term shows that observed increases in concentration with flow are more significant at the upstream station than at the downstream station. Multiple regression of TKN concentration data indicates statistical significance of the β_6 (loc*flow) term only. Insignificant β_2 (year) terms indicate no temporal trends in any of the nitrogen data.

T-testing. Paired t-testing results show significant differences in concentrations between locations for NO_3 ($p=0.0315$, $n=72$ pairs), NO_2 ($p<0.0001$, $n=72$ pairs) and NH_4 ($p<0.0001$, $n=72$ pairs). Downstream NO_3 concentrations are slightly lower than upstream, while downstream NO_2 and NH_4 concentrations are slightly higher. There are no indications of significant differences between sampling locations for TKN ($p=0.7714$, $n=50$ pairs) and NO_2+NO_3 ($p=0.0583$, $n=72$ pairs).

Chloride

Concentrations and Loading. Cl concentrations from 1992 to 2004 range between 5 and 11 mg/L (average 7 mg/L) for both the upstream and downstream sampling locations (Figure 4-12). Figure 4-13 shows that the average annual Cl loads for 1998 to 2004 are about 1.1×10^6 metric tons (MT) upstream and 1.3×10^6 MT downstream, with no apparent trending.

Multiple Regression. Multiple regression of the Cl data indicates statistically significant seasonal fluctuation (β_3 sin(2πt*)+β_4 cos(2πt*)terms) and statistically significant evidence (β_2 (year) term) of an increasing long term trend in the data from both the upstream and downstream stations. A statistically significant β_7 (loc*year) term indicates that observed upward long term trending may be more significant at the upstream station than at the downstream station.

T-testing. Paired t-testing shows a significant difference between the upstream and downstream values of Cl ($p<0.0001$, n=72 pairs), with higher concentrations at the downstream location.

Suspended Solids

Concentrations and Loading. Figure 4-14 shows TSS data collected between 1992 and 2004. The majority of measured concentrations at the downstream location are relatively low (range 2 to 16 mg/L, average 6 mg/L, standard deviation 5 mg/L). At the upstream sampling station, most TSS concentrations fall within the same range, but with greater variability (average 9.9 mg/L, standard deviation 15 mg/L). Several elevated concentrations (23 to 89 mg/L) are observed upstream, while one downstream measurement was 34 mg/L in 2001.

Estimated loading rates for the 1998 to 2004 period are presented in Figure 4-15. Although the loading rates in the period considered do not change significantly (average 1.8×10^6 MT/yr upstream and 1.1×10^6 MT/yr downstream), both the magnitude and variability of the TSS loads are significantly larger at the upstream sampling location.

Multiple Regression. Regression of TSS data indicates dependence of concentration on seasonal fluctuations at both sampling locations. An insignificant β_2 (year) term indicates no temporal trend in the TSS data.

T-testing. Paired t-testing indicates a significant difference in TSS concentration between the upstream and downstream concentrations ($p=0.0235$, n=72 pairs), with the upstream concentrations being higher overall.

Cadmium

Concentrations and Loading. Cd concentrations from 1998 to 2004 are shown in Figure 4-16. Reported values range from 0 to 0.04 µg/L; however, most of the reported concentrations are below the laboratory quantification levels. Average reported values are 9 µg/L upstream and 8 µg/L downstream. Estimated loads depicted on Figure 4-17 average 1.4 MT/yr upstream and 1.3 MT/yr downstream. There is no clear indication of trend in the loading data.

Multiple Regression. Statistically significant terms from the multiple regression of Cd data indicate seasonal fluctuations in concentration and dependence on channel flow rate (statistically significant β1(flow) term). An insignificant β_2 (year) term indicates no temporal trend in the Cd data.

T-testing. Paired t-testing between the upstream and downstream locations does not show significantly different concentrations (p=0.1795, 47 pairs).

Chromium

Concentrations and Loading. Cr concentrations are shown in Figure 4-18 for the period of 1998 to 2004. Reported concentrations typically vary between 0.06 and 1.2 µg/L for both the upstream (average 0.5 µg/L) and downstream (average 0.4 µg/L) locations, with upstream values ranging up to 1.9 µg/L in late 1999, 1.6 µg/L in 2001 and 1.4 µg/L in 2003. Estimated Cr loads average 79 MT/yr upstream and 61 MT/yr downstream, and show a decline from 1998 to 2000 with no clear trend indicated during the remainder of the period for both locations (Figure 4-19).

Multiple Regression. Multiple regression analysis indicates that observed fluctuations in Cr concentrations follow a seasonal cycle, as indicated by statistically significant seasonality terms in the regression. In addition, a statistically significant β_1 (flow) term shows a dependence on channel flow rate. An insignificant β_2 (year) term indicates no temporal trend in the Cr data.

T-testing. Paired t-testing does not show a significant difference in upstream and downstream Cr concentrations (p=0.0626, 47 pairs).

Copper

Concentrations and Loading. Cu concentrations are shown in Figure 4-20 for the period of 1998 to 2004. Concentrations of Cu are generally between 0.5 and 1.7 µg/L for both stations (upstream and downstream averages are 0.8 µg/L). Higher concentrations are observed upstream in November 1999 (2.4 µg/L), May 2001 (2.1 µg/L) and May 2003 (1.9 µg/L). Total phosphorus, TSS and other metals concentrations are elevated in the same samples. Loading data average 136 MT/yr upstream and 127 MT/yr downstream, and show no clear indication of trend at either the upstream or downstream locations (Figure 4-21).

Multiple Regression. Multiple regression of Cu concentration data from 1998 to 2004 provides no evidence of dependence on any factors, including flow, season or location. An insignificant β_2 (year) term indicates no temporal trend in the Cu data.

T-testing. The paired *t*-test does not show any significant difference in the upstream and downstream Cu concentrations (p=0.2886, 47 pairs).

Lead

Concentrations and Loading. Pb concentrations are shown in Figure 4-22 for the period of 1998 to 2004. Pb concentrations are generally between 0.1 and 0.5 µg/L at both upstream (average 0.4 µg/L) and downstream (average 0.3 µg/L) locations. Similar to Cu, Pb concentrations are elevated in upstream samples for November 1998 (1.3 µg/L), November 1999 (1.9 µg/L), May 2001 (1.5 µg/L) and May 2003 (1.7 µg/L), while concentrations are elevated downstream in October 2001 (1.3 µg/L).

Pb loads average 60 MT/yr upstream and 43 MT/yr downstream. There appears to be no significant changes in the estimated loads between 1998 and 2004 (Figure 4-23).

Multiple Regression. Multiple regression shows that concentrations are dependent upon the season of the year, with a long term trend of decreasing concentrations.

T-testing. Paired t-testing indicates that Pb concentrations between the upstream and downstream locations are not significantly different (p=0.0682, 47 pairs).

Mercury

Concentrations and Loading. Hg concentrations are shown in Figure 4-24. For the period of 1998 to 2004, most Hg concentrations are between 0.8 and 13 ng/L. Average concentrations are 7 ng/L upstream and 2 ng/L downstream. Concentrations are higher at the upstream location, rising as high as 35 ng/L in six samples from November 1998, July, August and November 1999, May 2001 and May 2003. Four of the six highest upstream Hg concentrations are in samples that correlated with elevated TSS and other metals concentrations.

Calculated Hg loads are also higher and more variable at the upstream sampling location, averaging 1.1 MT/yr versus 0.37 MT/yr downstream (Figure 4-25). There are no clear temporal trends in the data.

Multiple Regression. Multiple regression of the Hg concentrations shows an increasing long term trend at both the upstream and downstream stations. Statistically significant β_6 (loc*flow) and β_7 (loc*year) terms indicate that increases in concentration with flow and upward long term trending may be more significant at the upstream station than at the downstream station.

T-testing. Paired t-testing indicates that the upstream Hg concentrations are significantly higher than concentrations downstream (p=0.0005, 47 pairs).

Nickel

Concentrations and Loading. Figures 4-26 and 4-27 show total Ni concentrations and loading, respectively, in the upstream and downstream locations of the river for the period of 1998 to 2004. Ni concentrations vary from 0.7 µg/L to 3 µg/L at the upstream station (average 1.2 µg/L) and from 0.7 µg/L to 2.3 µg/L downstream (average 1.2 µg/L). Loads average 204 MT/yr upstream and 191 MT/yr downstream. At both locations, lower and more uniform loading occurs since 2000.

Multiple Regression. Regression analysis indicates some seasonal fluctuation in the data. Additional significant dependencies were not observed, and there was no temporal trend in the Ni data.

T-testing. Paired t-testing does not indicate any significant difference in the upstream and downstream locations (p=0.1897, 47 pairs).

Zinc

Concentrations and Loading. Zn concentrations are shown in Figure 4-28 for the period of 1998 to 2004. Detected concentrations are in the range of 0.3 to 6 µg/L, with the exception of a downstream sample from October 2000 (25 µg/L). Average concentrations are 1.5 µg/L upstream and 1.9 µg/L downstream. Estimated loading rates averaging 227 MT/yr upstream and 273 MT/yr downstream do not change significantly during the monitoring period, with the exception of higher and more variable loads prior to 2001 (Figure 4-29).

Multiple Regression. Regression analysis indicates some seasonal fluctuation in the data, slightly lower downstream concentrations, and a decreasing long term trend.

T-testing. Paired t-testing indicates no significant difference between upstream and downstream Zn concentrations (p=0.6060, 47 pairs).

PCB

Concentrations and Loading. Figures 4-30 and 4-31 show the total PCB concentrations and loading rates for the upstream and downstream locations, respectively. Concentrations are higher overall at the downstream location. From 1999 through 2003, only a single PCB concentration measurement was collected each year at the upstream and downstream locations of the Detroit River. PCB sampling at the Detroit River was discontinued after 2003.

Loading estimates are available for 1998 and 1999, averaging 0.12 MT/yr upstream and 0.64 MT/yr downstream. These loading estimates demonstrate that a large quantity of PCBs enter the Detroit River between the upstream and downstream monitoring locations.

Multiple Regression. Multiple regression analysis for the 1998 and 1999 data shows a dependence of concentration on location, with higher concentrations occurring downstream. An insignificant β_2 (year) term indicates no temporal trend in the PCB data.

T-testing. Paired t-testing indicates that PCB concentrations are significantly higher downstream (p=0.0039, n=10 pairs).

DDT

Concentrations and Loading. Figure 4-32 shows total DDT concentrations from 1998 through 2000. DDT was not analyzed after 2000. Reported concentrations appear generally higher at the downstream location; however, t-testing indicates no significant difference in concentration at the two monitoring locations (p=0.0884, n=7 pairs). Loading estimates for DDT are not available.

Temperature

Plots of temperature at the upstream and downstream sampling locations are shown in Figure 4-33. Temperatures typically vary between 3 and 25 degrees Celsius over the 1992 to 2004 period, with an expected observable seasonal pattern to the variation. Average temperatures are 16.8 degrees Celsius upstream and 16.6 degrees Celsius downstream.

Multiple Regression. Multiple regression analysis confirms the strong seasonal dependency of the temperature data, with peak temperatures indicated in early August, and minimum temperatures in early February. Analysis also indicates an upward trend in temperature over the time period considered.

T-testing. Comparison of upstream values and downstream values indicates no significant difference in temperatures (p=0.0619, n=71 pairs).

Turbidity

Concentrations. Figure 4-34 shows the variation in turbidity measurements at the upstream and downstream locations from 1992 to 2004. Turbidity generally varies between 0.5 and 10 Nephelometric Turbidity Units (NTU), with average concentrations of 4.9 NTU upstream and 3.4 NTU downstream. Concentrations as high as 31 NTU are observed, mostly upstream, during the spring and fall. These higher concentrations are presumably associated with normal seasonal precipitation events.

Multiple Regression. Multiple regression analysis indicates some seasonal dependence and upward long term trending in turbidity.

T-testing. Comparison of upstream and downstream turbidity data indicates a statistically significant difference (p=0.0476, n=69 pairs), with higher upstream turbidities.

Dissolved Oxygen

Concentrations. Field measured values for DO generally range between 7 and 14 mg/L at both the upstream (average 9.6 mg/L) and downstream (average 9.4 mg/L) sampling stations (Figure 4-35). There is obvious seasonal fluctuation in the DO concentrations at both locations. The seasonal DO fluctuation reflects the variation of the saturation concentration of DO with temperature. Field DO data were checked by periodically obtaining a laboratory DO sample; the two sets of results corroborated well.

Multiple Regression. Regression analysis confirms that the observed fluctuations have a seasonal pattern, with strong statistical significance indicated by the model's seasonality terms. No other significant dependencies were observed in the field data, while the laboratory data set also shows a dependency on location. Insignificant β_2 (year) terms indicate no temporal trend in the DO data.

T-testing. Paired t-testing of field and laboratory DO data indicates a significant difference between the upstream and downstream locations (field DO p<0.0001, n=65 pairs; lab DO p=0.0032, n=9 pairs). While the observed difference is statistically significant, the actual measured decrease in downstream DO is small (e.g., difference between the upstream and downstream field DO means is 0.2 mg/L).

Conductivity

Conductivity values determined in the laboratory (Figure 4-36) and in the field (Figure 4-37) indicate good consistency, with values between 207 and 272 µmhos/cm for the laboratory measurements (averages are 222 µmhos/cm upstream and 226 µmhos/cm downstream), and between 177 and 298 µmhos/cm for the field measurements (averages are 215 µmhos/cm upstream and 219 µmhos/cm downstream).

Multiple Regression. Multiple regression of the field conductivity measurements shows a positive trend in concentration over time and a dependence on flow rate. The laboratory conductivity regression also shows a positive trend over time and a seasonal fluctuation.

T-testing. The conductivity t-test p-values for both field (p=0.0237, n=64 pairs) and laboratory (p=0.0017, n=72 pairs) measurements indicate statistically significant differences between upstream and downstream locations. However, the difference between upstream and downstream mean conductivity values is small (a difference of 4 mg/L for both field and laboratory data).

pH

Field and laboratory measurements of pH are shown in Figures 4-38 and 4-39, respectively. All pH values fall within the range of 7.0 to 8.7, with some seasonal variation. Field and laboratory measurements typically agree to within about 0.5 pH units.

Multiple Regression. Multiple regression of field and laboratory pH measurements provides evidence that observed variability for both parameter sets can be attributed to seasonal fluctuations. Statistically significant β_1 (flow) and β_6 (loc*flow) terms for the laboratory measurements indicate that observed fluctuations in pH are dependent on flow and are more significant at the upstream station than at the downstream station**.** Insignificant β_2 (year) terms indicate no temporal trends in the field and laboratory pH data.

T-testing. The paired t-test shows a statistically significant difference in the upstream and downstream pH values, with p<0.0001, n=62 (field) and p<0.0001, n=57 (lab). Downstream pH was slightly lower in both datasets; however the mean differences for both datasets were only about 0.1 s.u.

Alkalinity

Concentrations. Alkalinity measurements are shown in Figure 4-40. Alkalinity values generally range between 65 and 85 mg/L, with some seasonal variation.

Multiple Regression. Multiple regression of the alkalinity data indicate a significant seasonal fluctuation and no long term temporal trend.

T-testing. The paired t-test shows no statistical difference in alkalinity between the upstream and downstream sampling stations (p=0.7106, n=57 pairs).

Total Dissolved Solids

Concentrations. Concentrations of TDS at the upstream and downstream locations for the period 1992 through 2004 are shown in Figure 4-41. Nearly all TDS concentrations are between 135 and 170 mg/L, with the exception of an elevated value in 1995 at the upstream location and in 1996 at the downstream location.

Multiple Regression. Multiple regression results of the TDS concentration data show a significant seasonal fluctuation. An insignificant β_2 (year) term indicates no temporal trend in the TDS data.

T-testing. The paired t-test shows no statistical difference in TDS concentrations between the upstream and downstream sampling stations (p=0.1714, n=72 pairs).

Total Organic Carbon

Concentrations. TOC concentrations at the upstream and downstream stations generally vary between 1.5 and 3.0 mg/L between 1998 and 2004 (Figure 4-42); however, two concentrations above 3.0 mg/L are apparent at the upstream location in 2003 and at the downstream station in 2004.

Multiple Regression. Multiple regression results show a significant seasonal ($\beta_3 \sin(2\pi t^*)+\beta_4 \cos(2\pi t^*)$ terms) pattern in the data and no long term trend.

T-testing. The paired t-test shows no statistical difference in TOC concentrations between the upstream and downstream sampling stations (p=0.3804, n=49 pairs).

Hardness

Hardness values for the period 1992 through 2004 at the upstream and downstream stations are shown in Figure 4-43. Hardness values are very consistent in the time period considered; nearly all values range between 90 and 110 mg/L. One hardness value in 2001 at the upstream location is 119 mg/L. Seasonality in the data is apparent.

Multiple Regression. Multiple regression results indicate a dependence on channel flow rate and a significant seasonality (($\beta_3 \sin(2\pi t^*)+\beta_4 \cos(2\pi t^*)$) term. An insignificant β_2 (year) term indicates no temporal trend in the hardness data.

T-testing. Paired t-testing results show no significant difference in hardness values between the upstream and downstream sampling locations (p=0.1335, n=72 pairs).

Calcium

Concentrations. Calcium concentrations at the upstream and downstream stations generally range between 23 and 30 mg/L (Figure 4-44). Two concentrations at the upstream sampling location exceed 30 mg/L.

Multiple Regression. Multiple regression results show a dependence on channel flow rate and no long term trend in the data.

T-testing. The paired t-test shows no significant difference in calcium concentrations between the upstream and downstream sampling locations ($p=0.3218$, $n=72$ pairs).

Magnesium

Concentrations. Mg concentrations at the upstream and downstream locations for the period 1992 through 2004 are shown in Figure 4-45. Concentrations of Mg generally range between 7 and 8 mg/L. The Mg concentration data at the upstream location are more variable than those at the downstream location.

Multiple Regression. The multiple regression results indicate a dependence on channel flow rate and a seasonal pattern to the data. An insignificant β_2 (year) term indicates no temporal trend in the Mg data.

T-testing. The paired t-test shows no significant difference in Mg concentrations between the upstream and downstream sampling locations ($p=0.0844$, $n=72$ pairs).

Sulfate

Concentrations. Concentrations of sulfate for the upstream and downstream sampling locations for the period 1998 through 2004 are shown in Figure 4-46. Sulfate concentrations range between 10 and 16 mg/L, with several concentrations above and below this range in the time period considered.

Multiple Regression. Multiple regression results show no significant terms, including long term trending.

T-testing. Paired t-test results indicate no significant difference in sulfate concentrations between the upstream and downstream sampling locations ($p=0.9045$, $n=42$ pairs).

Potassium

Concentrations. Concentrations of K at the upstream and downstream locations for the period 1992 through 2004 are shown in Figure 4-47. K concentrations are almost always near 1 mg/L; however, in 2003 elevated concentrations are observed at the upstream location (5.0 mg/L) and at the downstream location (3.3 mg/L). No K data are available between 1994 and 2000.

Multiple Regression. Multiple regression results indicate a dependency on channel flow rate, a dependency on location and a significant long term increasing trend in the K concentration data.

T-testing. Paired t-test results show no significant difference between the upstream and the downstream sampling locations for the period 1992 through 2004 ($p=0.7551$, $n=28$ pairs).

Sodium

Concentrations. Concentrations of sodium at the upstream and downstream sampling locations for the period 2001 through 2004 are presented in Figure 4-48. Sodium concentrations range between 3 and 6 mg/L, with a few exceptions. Seasonality in the data is apparent.

Multiple Regression. Multiple regression results indicate a significant seasonality and β_7 (location*year) term. An insignificant β_2 (year) term indicates no temporal trend in the sodium data.

T-testing. Paired t-test results indicate a significant difference in sodium concentrations between the upstream and downstream sampling locations ($p=0.0006$, $n=26$ pairs); concentrations upstream were greater than those measured downstream.

5. ST. CLAIR RIVER

The St. Clair River connects Lake Huron to Lake St. Clair (Figure 2-2). Figure 5-1 shows a trend of declining flow during the period from 1998 to 2000, and a relatively constant flow between 2000 and 2004, similar to the trend observed in the Detroit River. The mean flow for the seven years of the study period was approximately 4,750 m^3/sec, and ranged from 2,782 to 5,960 m^3/sec.

5.1 TEMPORAL TRENDS AND SPATIAL COMPARISONS

Summary statistics for all water quality parameters measured in 2004 in the St. Clair River are presented in Tables 5-1 (upstream station) and 5-2 (downstream station). The individual data are also presented in Table A-3 (downstream station) and Table A-4 (upstream station) in Appendix A.

The following sections of this report present data available for the Saint Clair River and relevant analyses performed on the data. Where sufficient data exist, multiple regression and paired t-testing techniques are used to identify trends affecting the data. Concentration and loading data are plotted for upstream and downstream sampling locations on Figures 5-2 through 5-47. The concentration plots also depict regression model-simulated data and laboratory detection limits, where available. The available concentration and loading data span the period from 1998 through 2004.

Phosphorus

Concentrations and Loading. Plots of total phosphorus concentration measured from 1998 to 2004 are presented in Figure 5-2. Total phosphorus concentrations range from 0.001 to 0.014 mg/L upstream (average 0.006 mg/L), and from 0.001 to 0.025 mg/L downstream (average 0.009 mg/L). Concentrations appear to be higher at the downstream location, as are the estimated loads presented in Figure 5-3. Phosphorus loads average 966 metric tons per year (MT/yr) upstream and 1,375 MT/yr downstream. Qualitative assessment of loading data does not show any clearly observable trends with time.

Figure 5-4 presents plots of total orthophosphate at the upstream and downstream sampling stations. Total orthophosphate concentrations are generally in the range of 0.001 to 0.010 mg/L, with average concentrations of 0.002 mg/L upstream and 0.003 mg/L downstream.

Multiple Regression. Regression of the total phosphorus data shows statistically significant dependence on season, a dependence on flow at the upstream station and a difference in long term trending between the sampling location. Orthophosphate data show statistically significant regression terms associated with dependence of concentration on location, a dependence on channel flow rate at the upstream station and a difference in long term trending between the sampling locations. Insignificant β_2 (year) terms indicate no temporal trend in the phosphorus data.

T-testing. Paired t-testing indicates a statistically significant difference in upstream and downstream concentrations of total phosphorus (p<0.0001, n=50 pairs), with higher concentrations downstream than upstream. Orthophosphate concentrations are also significantly different between upstream and downstream (p=0.0018, n=50 pairs), with higher concentrations observed downstream.

Table 5-1. Summary of Water Quality in the St. Clair River Measured Upstream (Station 740376) in 2004.

Parameter	number of measure-ments	mean	median	range
Temperature (Celcius)	8	14.6	15.7	5.3-20.9
Turbidity (NTU)	8	0.6	0.2	0.2-3.7
Field Conductivity (μmho/cm)	8	211	211	202-233
Lab Conductivity (μmho/cm)	8	215	215	210-221
Field Dissolved Oxygen (mg/l)	8	10.6	10.3	9.4-13.2
Lab Dissolved Oxygen (mg/l)	1	11.8	11.8	11.8-11.8
Field pH	8	7.8	7.8	7.3-8.3
Lab pH	8	8.3	8.3	8.2-8.6
Alkalinity (mg/l)	8	72	71	67-78
Total Dissolved Solids (mg/l)	8	140	140	140-140
Total Suspended Solids (mg/l)	8	3.0	2.0	2.0-10.0
Ammonia (mg/l)	8	0.009	0.009	0.006-0.010
Nitrite (mg/l)	8	0.004	0.003	0.003-0.005
Nitrate (mg/l)	8	0.35	0.34	0.29-0.49
Total Kjeldahl Nitrogen (mg/l)	8	0.22	0.24	0.17-0.28
Total Phosphorus (mg/l)	8	0.006	0.005	0.004-0.012
Total Orthophosphate (mg/l)	8	0.001	0.001	0.001-0.002
Total Organic Carbon (mg/L)	8	2.3	2.2	1.6-3.3
Sulfate (mg/l)	8	13.1	13.0	12.0-14.0
Hardness (mg/l)	8	96	97	92-99
Calcium (mg/l)	8	26.3	26.3	25.2-27.7
Magnesium (mg/l)	8	7.3	7.3	7.0-7.6
Chloride (mg/l)	8	6.4	6.0	6.0-8.0
Sodium (mg/l)	8	3.9	3.9	2.8-5.2
Potassium (mg/l)	8	1.1	1.1	0.9-1.2
Cadmium (μg/l)	8	0.005	0.005	0.005-0.006
Chromium (μg/l)	8	0.107	0.098	0.050-0.147
Copper (μg/l)	8	0.452	0.422	0.348-0.586
Nickel (μg/l)	8	0.737	0.661	0.605-1.28
Lead (μg/l)	8	0.038	0.024	0.021-0.101
Zinc (μg/l)	8	0.763	0.740	0.200-1.26
Mercury (ng/l)	8	0.379	0.450	0.15-0.57

Nitrogen

Concentrations and Loading. Concentration data for TKN, NO_3, NO_2 and NH_4 are plotted for both locations in Figures 5-5 to 5-8. The majority of nitrogen in the system exists as NO_3, with concentrations generally between 0.25 and 0.50 mg/L. General ranges for the other nitrogen fractions are: TKN at 0.1 to 0.35 mg/L, NO_2 at 0.002 to

0.007 mg/L and NH_4 at 0.002 to 0.02 mg/L. Estimated loads are available for TKN and NO_3 for the years 2001 through 2004, as shown in Figures 5-9 And 5-10, respectively. Average TKN loads are 29,646 MT/yr upstream and 29,176 MT/yr downstream. Average NO_3 loads are 36,024 MT/yr upstream and 49,654 MT/yr downstream.

Table 5-2. Summary of Water Quality in the St. Clair River Measured Downstream (Station 740016) in 2004.

Parameter	number of measure-ments	mean	median	range
Temperature (Celcius)	8	15.1	15.7	7.7-21.0
Turbidity (NTU)	8	2.4	2.8	1.9-4.8
Field Conductivity (μmho/cm)	8	216	214	207-238
Lab Conductivity (μmho/cm)	8	219	218	214-229
Field Dissolved Oxygen (mg/l)	8	10.4	10.1	9.4-12.7
Lab Dissolved Oxygen (mg/l)	2	10.8	10.8	10.0-11.6
Field pH	8	7.8	7.8	7.3-8.4
Lab pH	8	8.3	8.3	8.1-8.6
Alkalinity (mg/l)	8	73	72	69-79
Total Dissolved Solids (mg/l)	8	141	140	140-150
Total Suspended Solids (mg/l)	8	4.1	3.0	2.0-9.0
Ammonia (mg/l)	8	0.014	0.015	0.007-0.019
Nitrite (mg/l)	8	0.004	0.005	0.003-0.007
Nitrate (mg/l)	8	0.36	0.34	0.29-0.55
Total Kjeldahl Nitrogen (mg/l)	8	0.29	0.23	0.16-0.51
Total Phosphorus (mg/l)	8	0.011	0.010	0.007-0.018
Total Orthophosphate (mg/l)	8	0.002	0.002	0.001-0.005
Total Organic Carbon (mg/L)	8	2.6	2.3	1.6-5.3
Sulfate (mg/l)	8	13.4	13.5	12.0-14.0
Hardness (mg/l)	8	98	98.5	93-104
Calcium (mg/l)	8	27.0	26.9	25.4-29.2
Magnesium (mg/l)	8	7.4	7.4	7.2-7.6
Chloride (mg/l)	8	6.6	6.5	6.0-8.0
Sodium (mg/l)	8	4.2	4.2	2.9-5.9
Potassium (mg/l)	8	1.0	1.0	1.0-1.2
Cadmium (μg/l)	8	0.007	0	0.006-0.010
Chromium (μg/l)	8	0.210	0.188	0.145-0.328
Copper (μg/l)	8	0.648	0.608	0.517-0.783
Nickel (μg/l)	8	0.932	0.840	0.743-1.40
Lead (μg/l)	8	0.113	0.102	0.070-0.197
Zinc (μg/l)	8	1.42	1.17	0.720-2.66
Mercury (ng/l)	8	0.518	0.510	0.260-0.870

Multiple Regression. Multiple regression analyses of the four available nitrogen parameters (NO_2, NO_3, NH_4 and TKN) indicate statistically significant seasonal fluctuations. In addition, NO_2, NO_3 and TKN show dependencies on channel flow rate, while NO_2 and NH_4 show differences in long term trending between the upstream and downstream locations. Furthermore, NH_4 regression results for year ($\beta 2$ term) and location ($\beta 5$ term) provide statistically significant evidence of an increasing long-term trend in the concentration data at the downstream station, while TKN regression results show an increasing long-term trend in the data from both the upstream and downstream stations.

T-testing. Paired t-testing for differences between the two locations indicate a significant difference for NO_3 (p=0.0368, n=50 pairs), NO_2 (p<0.0001, n=50 pairs) and NH_4 (p<0.0001, n=50 pairs); nitrogen concentrations were greater at the downstream location. A statistically significant difference between upstream and downstream concentrations is not indicated for TKN (p=0.2058, n=50 pairs).

Chloride

Concentrations and Loading. Cl concentrations are presented in Figure 5-11. Nearly constant Cl concentrations of 6 mg/L are observed at both upstream and downstream locations, with slightly more fluctuation in the data after 2000. The Cl loads are shown in Figure 5-12, with no evident trends. Cl loads average 936,443 MT/yr upstream and 980,813 MT/yr downstream.

Multiple Regression. Regression analysis indicates a positive long term trend at both stations, with no dependence on any other factors.

T-testing. The t-test indicates a significant difference (p=0.0306, n=50 pairs) between locations, with elevated concentrations at the downstream location.

Suspended Solids

Concentrations and Loading. TSS concentrations are presented in Figure 5-13. Concentrations are generally between 2 and 10 mg/L, with higher concentrations (12 to 29 mg/L) observed at the downstream location in November 1999, April 2000 and April 2002. The elevated TSS concentrations observed in 1999 appear to coincide with elevated concentrations in most of the metals considered in this investigation. Figure 5-14 shows estimated TSS loads averaging 487,901 MT/yr upstream and 643,012 MT/yr downstream, with no clear trend over time.

Multiple Regression. Multiple regression of TSS concentration data from 1998 to 2004 provides no evidence of dependence on any factors, including flow, season or location. An insignificant β_2 (year) term indicates no temporal trend in the TSS data.

T-testing. The paired t-test results indicate that there is a significant difference between upstream and downstream TSS concentrations (p=0.0103, n=50 pairs), with higher concentrations observed downstream.

Cadmium

Concentrations and Loading. Figure 5-15 shows the Cd concentrations at the upstream and downstream locations. Cd concentrations during 1998 to 2004 range from 0 to 0.02 µg/L. Increased concentrations within this range that are similar to observed increases for most of the other metals are noted in November 1999 (upstream and downstream) and April 2002 (downstream only). Cd loads are presented in Figure 5-16, showing average annual loading of 0.61 MT/yr upstream and 0.87 MT/yr downstream.

Multiple Regression. Regression analysis indicates seasonal fluctuations in the Cd concentration data along with statistically significant higher concentrations at the downstream station. An insignificant β_2 (year) term indicates no temporal trend in the Cd data.

T-testing. Paired t-testing indicates there is a significant difference (p=0.0265, n=48 pairs) in concentrations at the two sampling locations; downstream concentrations of Cd are greater than those measured at the upstream station.

Chromium

Concentrations and Loading. Cr concentrations are plotted in Figure 5-17. Concentrations range from 0.001 to greater than 1 µg/L, with lower Cr concentrations observed after 1999. Average concentrations are 0.2 µg/L upstream and 0.3 µg/L downstream. Higher 1999 upstream and downstream concentrations and higher downstream April 2002 concentrations coincide with observations for most of the other metals. Estimated loads (Figure 5-18) average 39 MT/yr upstream and 52 MT/yr downstream.

Multiple Regression. Regression analysis indicates dependence of the Cr concentration data on flow, with increased concentrations detected with increased flow, possibly related to runoff. There is also a strong seasonal variation in the data and a statistically significant long term trend of decreasing concentrations indicated by the β_2 (year) term in the regression analysis. A statistically significant β_7 (loc*year) term indicates that observed long term trending may be more significant at the upstream station than at the downstream station.

T-testing. The paired t-test indicates a significant difference (p<0.0001, n=48 pairs) in upstream and downstream concentrations, with higher concentrations reported at the downstream station.

Copper

Concentrations and Loading. Cu concentrations are plotted in Figure 5-19. Cu concentrations generally range between 0.3 and 0.8 µg/L, with average concentrations of 0.05 µg/L upstream and 0.06 µg/L downstream. A more substantial rise in concentration was observed in November 1999 and in April 2002, similar to changes observed for most other metals. Estimated Cu loads average 71 MT/yr upstream and 91 MT/yr downstream, as shown in Figure 5-20.

Multiple Regression. Multiple regression of the Cu data indicates a seasonal variation in the data and an indication that any long term trending is more significant at the upstream station than at the downstream station, as evidenced by statistically significant paired tems $\beta_3 \sin(2\pi t^*)+\beta_4 \cos(2\pi t^*)$ and the β_7 (loc*year) term, respectively. An insignificant β_2 (year) term indicates no temporal trend in the Cu data.

T-testing. The paired t-test shows significant difference in the upstream and downstream concentrations (p<0.0001, n=48 pairs), with higher concentrations downstream.

Lead

Concentrations and Loading. Figure 5-21 shows plots of Pb concentrations for the 1998 to 2004 period. The majority of concentrations reported at both the upstream and downstream sampling locations are less than 0.2 µg/L, with average concentrations of 0.04 µg/L upstream and 0.11 µg/L downstream. Higher concentrations up to 0.6 µg/L are observed in late 1999 and early 2002, similar to those observed for Cu, Cr, Ni and Cd. Estimated loads for the period average 6 MT/yr upstream and 16 MT/yr downstream, as shown in Figure 5-22.

Multiple Regression. Regression analysis of the Pb concentration data indicates a significant dependence on location, as noted by higher downstream values, and a statistically significant long term trend of increasing concentrations. A statistically significant β_7 (loc*year) term indicates that observed upward long term trending is more significant at the upstream station than at the downstream station.

T-testing. The paired t-test indicates a statistically significant difference (p<0.0001, n=48 pairs) in upstream and downstream Pb concentrations, with higher downstream concentrations.

Mercury

Concentrations and Loading. Figure 5-23 shows the Hg concentrations for the 1998 to 2004 period. Hg concentrations are considerably higher and more variable in 1999, at both the upstream and downstream sampling locations. The variation in Hg concentrations do not appear to be correlated with the variations seen for the other metals, or for TSS data. Hg concentrations range from 0.2 to 9.5 ng/L, with all concentrations below 2 ng/L after 1999.

Estimated Hg loads for 1998 to 2004 are shown in Figure 5-24. Loads are similar at upstream and downstream stations, averaging 0.15 MT/yr upstream and 0.18 MT/yr downstream.

Multiple Regression. Regression analysis of Hg concentrations indicates a statistically significant dependence on season and location, with slightly higher downstream concentrations observed. In addition, the upstream concentrations have a dependency on channel flow rate as evidenced by a statistically significant β_6 (loc*year) term. An insignificant β_2 (year) term indicates no temporal trend in the Hg data.

T-testing. Unlike the multiple regression analysis, the paired t-testing does not show a significant difference in concentrations between the two sampling locations (p=0.4097, n=47 pairs); however, the regression accounts for differences in flow rate, time and season, which are not accounted for in the *t*-test analysis.

Nickel

Concentrations and Loading. Ni concentrations are plotted in Figure 5-25 and vary from 0.6 to 2 µg/L. As observed in the Cu, Cr, Pb and Cd data, a significant increase in Ni concentration is observed in the late 1999 and April 2002 data.

Figure 5-26 shows estimated Ni loads for the period, indicating a generally decreasing trend from 1999 to 2000, with fairly constant loads thereafter. Average loads are 140 MT/yr upstream and 159 MT/yr downstream.

Multiple Regression. Regression analysis indicates a statistically significant dependence on flow, with increased concentrations associated with increased flow, possibly related to runoff. In addition, the analysis indicates seasonal fluctuation in the data with a long term downward trending in concentration that has evidence of being more significant at the upstream station.

T-testing. The paired t-test results show a significant difference in Ni concentrations between the upstream and downstream location (p<0.0001, n=48 pairs), with higher concentrations at the downstream location.

Zinc

Concentrations and Loading. The Zn concentrations at the upstream and downstream locations are shown in Figure 5-27. Zn concentrations generally range from 0.05 to 1.3 µg/L upstream (average 0.5 µg/L), while most concentrations downstream are within the range of 0.2 to 1.7 µg/L (average 1 µg/L). However, Zn concentrations are much higher (greater than 3 µg/L) for three downstream samples from 1998, 2000 and 2002 and one upstream sample from 2001. The elevated concentrations in late 1999 and early 2002 are consistent with elevated concentrations observed for most other metals at these times.

Estimated loadings (Figure 5-28) show significant variability and uncertainty at the downstream sampling location prior to 2001. Average loads are 75 MT/yr upstream and 147 MT/yr downstream.

Multiple Regression. Regression analysis of the Zn concentration data suggests a long term upward trend in concentration with some seasonal variation in the data. A statistically significant β_7 (loc*year) term indicates that observed upward long term trending may be more significant at the upstream station.

T-testing. T-testing also indicates a statistically significant difference in upstream and downstream concentrations (p=0.0026, n=48 pairs), with concentrations being more elevated downstream.

PCB

Concentrations. Figure 5-29 shows the PCB concentrations found at the upstream and downstream locations. PCBs were analyzed in a very limited number of samples for surveillance purposes only. Total PCB concentrations range from 0.2 to 1.3 ng/L upstream, and 0.17 to 0.9 ng/L downstream. There is one unusually high result (244.3 ng/L) upstream in November 2001. PCB sampling in the St. Clair River was discontinued after 2003.

Multiple Regression. Multiple regression analysis of the limited PCB data indicates a statistically significant dependence on seasonality and a long term trend of decreasing PCB concentrations.

T-testing. The paired t-test results do not show a significant difference in concentrations between the upstream and downstream sampling locations (p=0.3424, n=10 pairs).

DDT

Concentrations and Loading. Figure 5-30 shows total DDT concentrations from 1998 through 2000. DDT was not analyzed after 2000. Reported concentrations appear generally higher at the downstream location; however, insufficient data were available to perform t-testing to confirm this observation. Loading estimates for DDT are not available.

Temperature

Temperature data are plotted in Figure 5-31. As expected, the data show a strong seasonality effect and similar temperatures at the upstream and downstream locations. Temperature varies between 2 and 25 degrees Celsius during the yearly cycles from May to November.

Multiple Regression. Multiple regression analysis of the temperature data indicates statistically significant seasonal variability. Peak temperatures in the dataset are observed in early August, and minimum temperatures occur in early February. Analysis also indicates some dependency on channel flow rate. An insignificant β_2 (year) term indicates no temporal trend in the temperature data.

T-testing. Paired t-testing indicates a statistically significant difference between the upstream and downstream temperatures (p=0.0053, n=49 pairs), with increased temperatures at the downstream location.

Turbidity

The turbidity measurements at the upstream and downstream locations are shown in Figure 5-32. Turbidity measurements are higher and more variable at the downstream location. Concentrations range between 0.2 and 9.5 NTU upstream and 0.2 and 12 NTU downstream.

Multiple Regression. Multiple regression analysis of the turbidity data indicates a statistically significant dependence on flow. The regression analysis also indicates a significant long term downward trend in concentration and a significant difference between the upstream and downstream locations. A statistically significant β_7 (loc*year) term indicates that the observed long term trending may be more significant at the downstream station.

T-testing. Paired t-testing also indicates a statistically significant difference in upstream and downstream turbidity measurements (p<0.0001, n=47 pairs), with higher downstream average values observed.

Dissolved Oxygen

Measured field and laboratory DO values are reported in Figures 5-33 and 5-34, respectively. The values in both datasets range between 7 and 13.5 mg/L, and vary seasonally according to the saturation concentration of DO. On average, the laboratory data (obtained as a check on the field data) agreed with the field data by within 1 mg/L, though the maximum difference was 6 mg/L.

Multiple Regression. Multiple regression analysis of the field and laboratory DO data indicates a statistically significant seasonal variability and also a significant dependence on channel flow rate. An insignificant β_2 (year) term indicates no temporal trend in the DO data.

T-testing. Paired t-testing indicates no statistically significant difference between upstream and downstream DO values in the field or laboratory data sets. Estimated *p* values for the field and laboratory data are p=0.2717 (n=45 pairs) and p=0.0522 (n=14 pairs), respectively.

Conductivity

Plots of field and laboratory conductivity measurements are shown in Figure 5-35 and 5-36, respectively. The plots show high consistency between field and laboratory measurements, with less variability in the laboratory results. The field data range between 175 and 240 µmhos/cm, while the laboratory data range between 205 and 230 µmhos/cm.

Multiple Regression. Multiple regression of the field and laboratory conductivity data indicates a statistically significant dependence on seasonality. The laboratory conductivity measurements also show an increasing long term trend.

T-testing. *T*-testing of conductivity data indicates there is a statistically significant difference between the upstream and downstream sampling stations for both the field (p=0.0109, n=48 pairs) and laboratory (p=0.0222, n=50 pairs) data sets. Downstream concentrations are higher for both sets of data.

pH

Measured field and laboratory pH values are depicted on Figures 5-37 and 5-38, respectively. The values in both datasets range between 6.8 and 8.9. In general, the laboratory data show less variability.

Multiple Regression. Multiple regression analysis of the laboratory pH data indicates a dependence on channel flow rate with seasonal variability. There were no significant relationships resulting for the field data. Insignificant β_2 (year) terms indicate no temporal trend in the pH data.

T-testing. Paired t-testing indicates no statistically significant difference between upstream and downstream measurements in the field data (p=0.4253, n=48 pairs). However, the laboratory t-testing results indicate there is a difference between locations (p=0.0010, n=50 pairs), with higher pH values observed downstream.

Total Dissolved Solids

Concentrations. TDS concentrations for the period 1998 through 2004 at the upstream and downstream stations are depicted in Figure 5-39. With few exceptions, concentrations are almost always near 140 mg/L.

Multiple Regression. Multiple regression of the TDS data indicates a significant long term increasing trend. A significant β_7 (loc*year) term indicates that observed long term trending may be more significant at the upstream station than at the downstream station.

T-testing. Paired t-testing indicates that there is a significant difference in TDS concentrations between the upstream and downstream stations (p=0.0090, n=50 pairs); TDS concentrations were greater at the downstream location.

Total Organic Carbon

Concentrations. TOC concentrations are generally between 1 and 3 mg/L for the period between 1998 and 2004 at both the upstream and downstream stations (Figure 5-40).

Multiple Regression. Multiple regression of the TOC data shows no dependence on channel flow, seasonality or location. Additionally, an insignificant β_2 (year) term indicates no temporal trend in the TOC data.

T-testing. Paired t-testing indicates that there is no significant difference in TOC concentrations between the upstream and downstream locations (p=0.4315, n=50 pairs).

Hardness

Concentrations. Hardness values for the period 1998 through 2004 at the upstream and downstream locations are provided in Figure 5-41. Values are very consistent over the time period considered, ranging between 87 and 107 mg/L at both stations.

Multiple Regression. Multiple regression of the hardness data shows a statistically significant increasing trend with time and no dependence on channel flow, season or location.

T-testing. Paired t-testing indicates no statistical difference between the upstream and downstream sampling stations (p=0.1711, n=50 pairs).

Calcium

Concentrations. Calcium concentrations at the upstream and downstream locations are very consistent in the time period considered; values range between 23 and 29 mg/L (Figure 5-42).

Multiple Regression. Multiple regression of the calcium concentration data indicates a dependence on channel flow rate and no significant trend with time over the time period considered.

T-testing. Paired t-test results show no significant difference between upstream and downstream calcium concentrations (p=0.2069, n=50 pairs).

Magnesium

Concentrations. Concentrations of Mg at the upstream and downstream locations for the period 1998 through 2004 are depicted in Figure 5-43. Mg concentrations at both sampling locations have varied little over the time period considered; nearly all concentrations are between 7 and 8 mg/L.

Multiple Regression. Multiple regression of the Mg concentration data indicates a long term increasing trend in the data, with no dependence on any other factor.

T-testing. Paired t-testing shows no significant difference in Mg concentrations between the upstream and downstream sampling stations (p=0.1406, n=50 pairs).

Alkalinity

Alkalinity values at the upstream and downstream stations range between 65 and 80 mg/L for the period 2001 through 2004 (Figure 5-44). There is little difference in alkalinity values between the upstream and downstream locations.

Multiple Regression. Multiple regression of the alkalinity data indicates no dependence on channel flow, seasonality or location. Additionally, an insignificant β_2 (year) term indicates no temporal trend in the alkalinity data.

T-testing. Paired t-testing indicates no significant difference in alkalinity values between the upstream and downstream sampling locations (p=0.1219, n=30 pairs).

Sulfate

Concentrations. Concentrations of sulfate for the period 1998 through 2004 at the upstream and downstream sampling locations are provided in Figure 5-45. Sulfate concentrations are generally between 10 and 20 mg/L.

Multiple Regression. Multiple regression of the sulfate concentration data indicates no dependence on channel flow, seasonality or location. Additionally, an insignificant β_2 (year) term indicates no temporal trend in the sulfate concentration data.

T-testing. Paired t-testing of the sulfate concentration data shows no significant difference between the upstream and downstream location (p=0.2633, n=50 pairs).

Potassium

Concentrations. Concentrations of K at the upstream and downstream locations for the period 2001 through 2004 are shown in Figure 5-46. K concentrations generally range between 0.5 and 1.5 mg/L throughout the period considered.

Multiple Regression. Multiple regression of the K concentration data indicates a long term increasing trend with no dependence on any other factors including channel flow rate, seasonality or location.

T-testing. Paired t-testing of the K data shows no significant difference between the upstream and downstream concentrations (p=0.2574, n=27 pairs).

Sodium

Concentrations. Sodium concentrations at the upstream and downstream sampling locations for the period 2001 through 2004 are depicted in Figure 5-47. Sodium concentrations generally range between 2 and 6 mg/L.

Multiple Regression. Multiple regression of the sodium concentration data indicates no dependence on any factors including channel flow rate, seasonality or location. An insignificant β_2 (year) term indicates no temporal trend in the sodium data.

T-testing. Paired t-testing results show no significant difference in sodium concentrations between the upstream and downstream sampling locations (p=0.0597, n=27 pairs).

6. ST. MARYS RIVER

The St. Marys River connects Lake Superior and Lake Huron (Figure 2-1). St. Marys River flow is regulated by controlling works (hydropower plants, navigation locks and a dam) at Sault St. Marie. Figure 6-1 shows the flow in the St. Marys River from 1998 to 2004, indicating significant flow variation over this period but no downward trend, as was apparent in the St. Clair and Detroit Rivers. The mean flow for the seven years of record (1998 to 2004) was approximately 1,920 m^3/sec, and ranged from a minimum of 855 m^3/sec to a maximum of 2,724 m^3/sec.

6.1 TEMPORAL TRENDS AND SPATIAL COMPARISONS

Summary statistics for water quality parameters in 2004 in the St. Marys River are presented in Tables 6-1 (upstream station) and 6-2 (downstream station). The individual data are also presented in Table A-5 (downstream station) and Table A-6 (upstream station) in Appendix A.

The following sections of this report present data available for the St. Marys River and relevant analyses performed on the data. Where sufficient data exist, multiple regression and paired t-testing techniques are used to identify trends affecting the data. Concentration and loading data are plotted for upstream and downstream sampling locations on Figures 6-2 through 6-47. The concentration plots also depict regression model-simulated data and laboratory detection limits, where available. The available concentration and loading data span the period from 1998 through 2004.

Phosphorus

Concentrations and Loading. Plots of total phosphorus for the 1998 to 2004 period are presented in Figure 6-2. The data indicate high variability in phosphorus concentrations, and slightly higher concentrations at the downstream sampling location. Observed values at the two locations range between 0 and 0.018 mg/L, with average concentrations of 0.006 mg/L upstream and 0.009 mg/L downstream. Estimated loads, presented in Figure 6-3, are also higher at the downstream location. Total phosphorus loads average 356 metric tons per year (MT/yr) upstream and 586 MT/yr downstream.

Plots of total orthophosphate concentrations are shown in Figure 6-4. Similar to total phosphorus, concentrations of orthophosphate are variable and appear to increase at the downstream location. Observed values at the two locations range between 0.001 and 0.015 mg/L, with average concentrations of 0.002 mg/L upstream and 0.005 mg/L downstream.

Multiple Regression. The multiple regression analysis of the 1998 to 2004 data indicates that total phosphorus concentration has a significant dependency on location, with higher values observed at the downstream station. An insignificant β_2 (year) term indicates no temporal trend in the total phosphorus data.

Regression analysis of total orthophosphorus data indicates no long term trend in the data and no dependence of flow, season or location.

Table 6-1. Summary of Water Quality in the St. Marys River Measured Upstream (Station 170139) in 2004.

Parameter	number of measure-ments	mean	median	range
Temperature (Celcius)	6	13.0	13.2	6.2-16.9
Turbidity (NTU)	6	0.6	0.2	0.2-2.8
Field Conductivity (μmho/cm)	6	94	94	91-98
Lab Conductivity (μmho/cm)	6	99	100	98-101
Field Dissolved Oxygen (mg/l)	6	11.5	10.9	9.6-16.5
Lab Dissolved Oxygen (mg/l)	3	11.0	11.2	10.2-11.6
Field pH	6	7.5	7.5	7.1-7.8
Lab pH	6	8.0	8.0	7.9-8.2
Alkalinity (mg/l)	6	44	43	35-59
Total Dissolved Solids (mg/l)	6	62	60	60-70
Total Suspended Solids (mg/l)	6	2.7	2.0	2.0-6.0
Ammonia (mg/l)	6	0.007	0.006	0.004-0.01
Nitrite (mg/l)	6	0.003	0.003	0.002-0.005
Nitrate (mg/l)	6	0.30	0.31	0.28-0.31
Total Kjeldahl Nitrogen (mg/l)	6	0.20	0.21	0.13-0.26
Total Phosphorus (mg/l)	6	0.008	0.008	0.005-0.010
Total Orthophosphate (mg/l)	6	0.002	0.002	0.001-0.003
Total Organic Carbon (mg/L)	6	2.3	2.3	1.8-2.8
Sulfate (mg/l)	6	2.7	3.0	1.0-4.0
Hardness (mg/l)	6	46	46	44-47
Calcium (mg/l)	6	13.9	14.0	13.2-14.2
Magnesium (mg/l)	6	2.7	2.7	2.5-2.8
Chloride (mg/l)	6	2.0	2.0	2.0-2.0
Sodium (mg/l)	6	1.2	1.2	1.2-1.2
Potassium (mg/l)	6	0.6	0.7	0.5-0.8
Cadmium (μg/l)	6	0.009	0	0.008-0.010
Chromium (μg/l)	6	0.092	0.086	0.032-0.157
Copper (μg/l)	6	0.856	0.878	0.744-0.917
Nickel (μg/l)	6	0.306	0.312	0.241-0.383
Lead (μg/l)	6	0.041	0.039	0.030-0.061
Zinc (μg/l)	6	1.445	1.265	0.300-3.00
Mercury (ng/l)	6	0.332	0.305	0.190-0.500

T-Testing. Paired t-testing shows that both total phosphorus and orthophosphate concentrations at the upstream and downstream locations were significantly different for the period between 1998 and 2004 ($p<0.0001$, $n=40$ for both parameters). Concentrations of both parameters are higher at the downstream location relative to upstream levels.

Nitrogen

Concentrations and Loading. The concentrations of TKN, NO_3, NO_2, and NH_4 for the upstream and downstream locations are plotted in Figures 6-5 to 6-8, respectively. Nitrogen in the system exists primarily as NO_3 (0.25 to 0.35 mg/L) and TKN (0.06 to 0.46 mg/L), with significantly lower concentrations of NO_2 (0.001 to

0.023 mg/L) and NH_4 (0.001 to 0.013 mg/L). Concentrations of NH_4 are higher in 2003 and 2004 compared to previous years, and maximum concentration spikes of TKN and NO_2 are observed downstream in June 2004.

Estimated loads are available for TKN and NO_3 from 2001 to 2004, and are shown in Figures 6-9 and 6-10, respectively. TKN loads at both the upstream and downstream stations range from approximately 7,000 to 15,000 MT/year and appear to be increasing over time. TKN loads average 9,926 MT/yr upstream and 10,331 MT/yr downstream. NO_3 loads range between 18,300 to 21,400 MT/year at both locations with no clear trend observed. NO_3 loads average 20,095 MT/yr upstream and 19,826 MT/yr downstream.

Table 6-2. Summary of Water Quality in the St. Marys River Measured Downstream (Station 170140) in 2004.

Parameter	number of measure-ments	mean	median	range
Temperature (Celcius)	7	13.6	12.9	7.9-18.9
Turbidity (NTU)	7	4.2	3.3	2.3-7.7
Field Conductivity (μmho/cm)	7	96	96	90-100
Lab Conductivity (μmho/cm)	7	101	100	99-103
Field Dissolved Oxygen (mg/l)	7	10.2	10.1	9.0-11.2
Lab Dissolved Oxygen (mg/l)	4	10.3	10.0	9.5-11.5
Field pH	7	7.5	7.6	7.2-7.8
Lab pH	7	7.9	7.9	7.8-8.2
Alkalinity (mg/l)	7	41	43	35-46
Total Dissolved Solids (mg/l)	7	64	60	60-70
Total Suspended Solids (mg/l)	7	3.9	4.0	2.0-8.0
Ammonia (mg/l)	7	0.006	0.007	0.003-0.011
Nitrite (mg/l)	7	0.007	0.004	0.003-0.023
Nitrate (mg/l)	7	0.30	0.30	0.29-0.32
Total Kjeldahl Nitrogen (mg/l)	7	0.22	0.17	0.14-0.46
Total Phosphorus (mg/l)	7	0.010	0.009	0.008-0.014
Total Orthophosphate (mg/l)	7	0.006	0.005	0.002-0.014
Total Organic Carbon (mg/L)	7	2.3	2.1	1.8-3.3
Sulfate (mg/l)	7	2.4	2.0	2.0-3.0
Hardness (mg/l)	7	47	47	45-48
Calcium (mg/l)	7	14.0	14.1	13.4-14.5
Magnesium (mg/l)	7	2.8	2.8	2.6-2.9
Chloride (mg/l)	7	1.9	2.0	1.0-2.0
Sodium (mg/l)	7	1.7	1.6	1.2-2.5
Potassium (mg/l)	7	0.7	0.6	0.5-1.2
Cadmium (μg/l)	7	0.010	0.010	0.009-0.013
Chromium (μg/l)	7	0.388	0.359	0.198-0.596
Copper (μg/l)	7	0.974	0.986	0.794-1.10
Nickel (μg/l)	7	0.462	0.432	0.312-0.581
Lead (μg/l)	7	0.121	0.097	0.073-0.179
Zinc (μg/l)	7	1.199	1.000	0.490-2.01
Mercury (ng/l)	7	0.499	0.400	0.300-0.950

Multiple Regression. Multiple regression analyses of the nitrogen parameters indicate statistically significant seasonal fluctuation in all four parameters. In addition, $NO_{3,}$ NO_2 and NH_4 show statistically significant increasing trends over the 1998 to 2004 period. An insignificant β_2 (year) term indicates no temporal trend in the TKN data.

T-Testing. Paired t-testing between the two sampling locations show that there is a significant difference in NO_3 ($p=0.0291$, n=40 pairs) and NO_2 ($p=0.0321$, n=40 pairs) concentrations, but not in TKN ($p=0.2446$, n=40 pairs) or NH_4 ($p=0.9359$, n=40 pairs). Concentrations of NO_3 appear lower downstream, while those for NO_2 appear higher downstream.

Chloride

Concentrations and Loading. Cl concentrations are reported as 2 mg/L for a majority of the sampling events at both locations (Figure 6-11). Slightly more variability in concentration can be observed in 2002 and 2003. The average Cl loads are 109,827 MT/yr upstream and 123,729 MT/yr downstream (Figure 6-12).

Multiple Regression. Multiple regression analysis of the Cl data indicates no significant dependence on any of the parameters considered. An insignificant β_2 (year) term indicates no temporal trend in the Cl data.

T-Testing. The paired t-test analysis does not show a significant difference in concentrations between the upstream and downstream sampling locations ($p=0.9376$, n=40 pairs).

Suspended Solids

Concentrations and Loading. Figure 6-13 shows plots of measured TSS concentrations at the upstream and downstream locations. TSS concentrations appear to be higher and more variable at the downstream location. The range of TSS concentrations upstream is 2 to 7 mg/L (average 2.9 mg/L), while the downstream concentrations range from 2 to 18 mg/L (average 4.7 mg/L). Estimated TSS loads are between 107,000 and 430,000 MT/year with generally higher loads at the downstream location (Figure 6-14). TSS loads average 186,460 MT/yr upstream and 296,932 MT/yr downstream.

Multiple Regression. Multiple regression results show a statistically significant difference in upstream and downstream concentrations, swith higher concentrations at the downstream monitoring location. An insignificant β_2 (year) term indicates no temporal trend in the TSS data.

T-Testing. As indicated in the regression analysis, t-test results ($p=0.0006$, n=40 pairs) verified significantly higher TSS at the downstream location.

Cadmium

Concentrations and Loading. Figure 6-15 shows Cd concentration data at the upstream and downstream locations. Cd concentrations are low at both stations, with most measurements below the reported quantification levels. The range of Cd concentrations is 0 to 0.02 µg/L, with an average concentration of 0.008 µg/L. Concentrations drop in 2003 at both sampling locations. Cd loads, plotted in Figure 6-16, average 0.47 MT/yr upstream and 0.50 MT/yr downstream, with a notable drop to 0.03 MT/yr at both stations in 2003.

Multiple Regression. Regression of the Cd data indicates a statistically significant decreasing long term trend, with no dependence on any other variables.

T-Testing. Paired t-testing indicates no significant difference between upstream and downstream concentrations (p=0.3369, n=39 pairs).

Chromium

Concentrations and Loading. Figure 6-17 plots total Cr concentrations measured at the upstream and downstream locations. Cr concentrations range from 0 to 1 µg/L. Concentrations at the downstream station are typically higher than observed at the upstream station. Estimated Cr loads average 11 MT/yr upstream and 25 MT/yr downstream (Figure 6-18).

Multiple Regression. Regression of the Cr data indicates significant seasonal dependence, a decrease in concentration with time and a dependence on flow at the upstream station.

T-Testing. Paired t-testing indicates significantly higher concentrations at the downstream station (p=0.0004, n=39 pairs), in agreement with the multiple regression analysis.

Copper

Concentrations and Loading. Figure 6-19 shows total Cu concentration data for the upstream and downstream locations. Observed concentrations at both stations are typically between 0.8 and 1.4 µg/L. Cu loads, plotted in Figure 6-20, are between 40 and 70 MT/year with an increasing trend during the period of record. Average loads are 54 MT/yr upstream and 61 MT/yr downstream.

Multiple Regression. Regression of the Cu data indicates that concentration is dependent upon channel flow rate at the upstream station. An insignificant β_2 (year) term indicates no temporal trend in the Cu data.

T-Testing. Paired t-testing indicates a significant difference between upstream and downstream concentrations (p=0.0267, n=39 pairs), with higher concentrations downstream.

Lead

Concentrations and Loading. Figure 6-21 shows plots of Pb concentrations at the upstream and downstream locations. Pb concentrations are highly variable, with concentrations ranging between 0.01 µg/L and 0.24 µg/L. Except for the year 2002, concentrations are higher at the downstream location. Pb loads, plotted in Figure 6-22, are between 1 and 9 MT/year with higher loads observed at the downstream location. Average loads are 2.6 MT/yr upstream and 6.8 MT/yr downstream.

Multiple Regression. Regression of the Pb data indicates slightly higher concentrations at the downstream station, and no other statistically significant dependencies. An insignificant β_2 (year) term indicates no temporal trend in the Pb data.

T-Testing. Paired t-testing indicates significantly higher downstream concentrations (p=0.0008, n=39 pairs), in agreement with the multiple regression analysis.

Mercury

Concentrations and Loading. Total Hg concentrations are plotted in Figure 6-23. The data show generally low concentrations (<2 ng/L) at both locations, with the exception of higher, more variable concentrations in 1999. The trend in Hg concentrations in 1999 is the same at both the upstream and downstream locations, with the highest values (13 to 14 ng/L) observed in May, followed by declining concentrations through the rest of the year. Reasons for the change in Hg concentrations during 1999 are unclear, and are not accompanied by comparable changes in any of the other metals considered. Elevated Hg concentrations are, however, also observed in the St. Clair River during the same time period. Hg loadings for the St. Marys River, plotted in Figure 6-24, average 0.053 MT/yr upstream and 0.079 MT/yr downstream. The loads are both higher and more variable in 1999 than in the other years considered, at both upstream and downstream locations.

Multiple Regression. Multiple regression of Hg concentration data from 1998 to 2004 provides no evidence of dependence on any factors, including flow, season or location. An insignificant β_2 (year) term indicates no temporal trend in the Hg data.

T-Testing. Paired t-testing indicates no significant difference between upstream and downstream concentrations (p=0.1012, n=39 pairs).

Nickel

Concentrations and Loading. Total Ni concentrations measured at the upstream and downstream locations of the St. Marys River are plotted in Figure 6-25. Observed concentrations at both stations are between 0.1 and 1.0 µg/L. Ni loads, plotted in Figure 6-26, are between approximately 20 and 40 MT/year, with higher loads downstream. Loads average 24 MT/yr upstream and 32 MT/yr downstream.

Multiple Regression. Regression of the Ni data indicates slightly higher concentrations at the downstream station, as well as a significant downward long term trend in the Ni concentration.

T-Testing. Paired t-testing indicates significantly higher downstream concentrations (p=0.0023, n=39 pairs), in agreement with the multiple regression analysis.

Zinc

Concentrations and Loading. Figure 6-27 shows plots of Zn concentrations at the upstream and downstream locations. Observed concentrations are variable, ranging overall between 0.1 and 3 µg/L. At the upstream station, concentrations tend to range to maximum levels during 2002 and 2004. Downstream concentrations generally range from 0.2 µg/L to 1.9 µg/L. Zn loads, plotted in Figure 6-28, are between 13 and 122 MT/year, averaging 37 MT/yr upstream and 58 MT/yr downstream.

Multiple Regression. Regression of the Zn data indicates the presence of an upward long term trend in concentration.

T-Testing. Paired t-testing indicates no statistically significant difference between upstream and downstream concentrations (p=0.4403, n=39 pairs).

PCB

Concentrations. Figure 6-29 shows total PCB concentrations for the St. Marys River. PCBs were analyzed in a limited number of samples for surveillance purposes only. Total PCB concentrations range from 0 to 0.7 ng/L at both the upstream and downstream locations. One higher value of 2.25 ng/L is observed downstream in August 2002. PCB sampling at the St. Marys River was discontinued after 2003.

Multiple Regression. Multiple regression analysis of the PCB data indicates no significant dependence on any of the parameters considered. An insignificant β_2 (year) term indicates no temporal trend in the PCB data.

T-Testing. Paired t-testing does not indicate a difference in PCB concentrations between upstream and downstream locations (p=0.4678, n=10 pairs).

DDT

Figure 6-30 shows total DDT concentrations measured in the St. Marys River in 1998 and 1999. DDT analysis was discontinued in 2000. Total DDT is detected in three of the eight samples, at concentrations ranging from 0.035 to 0.046 ng/L.

Temperature

Figure 6-31 shows the temporal variation in temperature, which varies between 4 and 23 degrees Celsius between May and November of the monitored years.

Multiple Regression. Regression of the temperature data indicates an expected strong dependence on seasonality, and no other significant dependencies. The statistical model predicts peak temperatures in early August, and minimum temperatures in early February. An insignificant β_2 (year) term indicates no temporal trend in the temperature data.

T-Testing. Paired t-testing indicates there is a significant difference between upstream and downstream temperatures (p=0.03414, n=40 pairs), with higher downstream temperatures.

Turbidity

Figure 6-32 shows measured turbidities at the upstream and downstream locations. Turbidity at the downstream station appears to be significantly higher, with a range of 2.2 to 7.7 NTU, as compared with 0.2 to 5.7 at the upstream location.

Multiple Regression. Regression of the turbidity data shows seasonal variability in the concentrations and dependence on channel flow rate, which is more significant at the downstream station. An insignificant β_2 (year) term indicates no temporal trend in the turbidity data.

T-Testing. Paired t-testing results show a significant difference between upstream and downstream turbidity ($p<0.0001$, $n=31$ pairs), with higher downstream values observed.

Dissolved Oxygen

Figures 6-33 and 6-34 show plots of field and laboratory DO measurements, respectively, at the upstream and downstream locations. Field and laboratory DO measurements are similar. DO typically varies between 8 and 14 mg/L, and exhibits clear seasonal fluctuation.

Multiple Regression. Regression of the field and laboratory DO data indicates strong seasonality, confirming the visually apparent seasonal fluctuation. Regression analysis of field data also indicates a dependence on location, with slightly higher upstream concentrations. An insignificant β_2 (year) term indicates no temporal trend in the DO data.

T-Testing. Paired t-testing indicates no statistically significant difference between upstream and downstream measurements, for either the field or laboratory data ($p=0.1303$, $n=39$ pairs; $p=0.2897$, $n=10$ pairs, respectively).

Conductivity

Figures 6-35 and 6-36 show plots of field and laboratory conductivity, respectively, at the upstream and downstream locations. Conductivity values are more variable in the field measurements (76 to 111 µmhos/cm) than in laboratory measurements (96 to 114 µmhos/cm).

Multiple Regression. Regression analysis of the field conductivity data indicates a statistically significant dependence on channel flow rate. Analysis of laboratory conductivity data indicates a dependency on location, with downstream values that are higher than upstream values. Insignificant β_2 (year) terms indicate no temporal trends in the conductivity data.

T-Testing. Paired t-testing indicates a statistically significant difference between upstream and downstream measurements for both field and laboratory data ($p<0.0001$, $n=39$ pairs; $p<0.0001$, $n=40$ pairs, respectively). Downstream values were higher.

pH

Figures 6-37 and 6-38 show the temporal variation in field and laboratory pH measurements, respectively. *V*alues range between 6.9 and 8.4 standard pH units, with slightly less variability in the laboratory measurements.

Multiple Regression. Regression analysis of the field pH data indicates a statistically significant dependence on channel flow rate with a downward long term trend in values. Analysis of laboratory pH data indicates a seasonal variation in the values and no long term trend.

T-Testing. The paired t-test results show no significant difference in the upstream and downstream pH for field or laboratory values (p=0.9983, n=37 pairs; p=0.4809, n=40 pairs, respectively).

Total Dissolved Solids

Concentrations of TDS at the upstream and downstream sampling locations for the period 1998 through 2004 are provided in Figure 6-39. With few exceptions, concentrations of TDS are routinely between 60 and 70 mg/L.

Multiple Regression. Regression analysis of the TDS data indicates no significant dependence on any factor, including flow, season or location. An insignificant β_2 (year) term indicates no temporal trend in the TDS data.

T-Testing. The paired t-tests show a significant difference in TDS concentration between the upstream and downstream locations (p<0.0001, n=40 pairs); concentrations upstream were less than those measured downstream.

Total Organic Carbon

Concentrations. Concentrations of TOC generally vary between 1.5 and 3.0 mg/L at both sampling locations (Figure 6-40).

Multiple Regression. Regression analysis of the TOC data indicate no dependence on flow, season or location, and an increasing long term trend.

T-Testing. Paired t-testing shows no significant difference between the upstream and downstream TOC concentrations (p=0.8488, n=40 pairs).

Hardness

Hardness values measured at the upstream and downstream sampling locations for the period 1998 through 2004 are presented in Figure 6-41. Hardness values are very consistent over the time period considered; values are between 40 and 50 mg/L.

Multiple Regression. Multiple regression of the hardness values indicates a dependence on channel flow and location. An insignificant β_2 (year) term indicates no temporal trend in the hardness data.

T-Testing. Paired t-testing indicates that hardness values are higher at the downstream location when compared to the upstream location ($p<0.0001$, $n=40$ pairs).

Calcium

Concentrations. Calcium concentrations measured at the upstream and downstream locations for the period 1998 through 2004 are presented in Figure 6-42. During this period, concentrations normally range between 12 and 14 mg/L, with few exceptions.

Multiple Regression. Multiple regression analysis of the calcium data indicates a significant dependence on channel flow rate and location, and no long term trend.

T-Testing. Paired t-test results indicate a significant difference between upstream and downstream calcium concentrations ($p<0.0001$, $n=40$ pairs); concentrations downstream were higher than those measured upstream.

Magnesium

Concentrations. Mg concentrations at the upstream and downstream locations for the period 1998 through 2004 were very consistent (Figure 6-43); concentrations range between 2.5 and 3.5 mg/L.

Multiple Regression. Multiple regression of the Mg data indicates dependence on channel flow rate and location. A significant β_2 (year) term indicates a long term decreasing trend in concentration.

T-Testing. Paired t-testing shows a significant difference in Mg concentrations between the upstream and downstream sampling stations ($p=0.0010$, $n=40$ pairs), with higher concentrations observed downstream.

Alkalinity

Alkalinity values measured for the period 2001 through 2004 at the upstream and downstream locations are presented in Figure 6-44. Values generally range between 33 and 50 mg/L.

Multiple Regression. Multiple regression of the alkalinity data shows no dependence on flow, season or location. An insignificant β_2 (year) term indicates no long term trend in the alkalinity data.

T-Testing. Paired t-testing of the alkalinity data indicates no significant difference in values between the upstream and downstream stations ($p=0.6030$, $n=22$ pairs).

Sulfate

Concentrations. Sulfate concentrations measured during the period 1998 through 2004 at the upstream and downstream sampling locations are presented in Figure 6-45. Many concentrations are at or below the quantification limit of 2.0 mg/L; most other concentrations range between 3 and 5 mg/L.

Multiple Regression. Multiple regression of the sulfate concentration data indicates no dependence on any factors, including channel flow rate, season or location. An insignificant β_2 (year) term indicates no long term trend in the sulfate concentration data.

T-Testing. Paired t-testing of the sulfate concentration data shows no significant difference between the upstream and downstream sampling locations (p=0.8751, n=40 pairs).

Potassium

Concentrations. K concentrations at the upstream and downstream locations for the period 2001 through 2004 are presented in Figure 6-46. Nearly all concentrations are between 0.5 and 1.0 mg/L.

Multiple Regression. Multiple regression of the K data indicates no dependence on any factors, including channel flow rate, season or location. A significant β_2 (year) term indicates a long term increasing trend in the K concentration data.

***T-Testing*.** Paired t-testing shows no significant difference in K concentrations between the two stations (p=0.9197, n=20 pairs).

Sodium

Concentrations. Sodium concentrations for the period 2001 through 2004 at the upstream and downstream sampling locations are presented in Figure 6-47. Concentrations range between 0.5 and 2.5 mg/L, with few exceptions.

Multiple Regression. Multiple regression results indicate no dependence on any factors, including channel flow rate, season or location. An insignificant β_2 (year) term indicates no long term trend in the sodium data.

T-Testing. Paired t-tests show no significant difference in sodium concentrations between the upstream and downstream sampling locations (p=0.7221, n=20 pairs).

7. LONGITUDINAL PROFILES

Loads for each river system were estimated by USGS using Beale's unbiased estimator method. Figures 7-1 to 7-13 show the calculated loads for all sampling locations for the years 1998 to 2004, starting at the upstream end of the St. Marys River and progressing downstream to the mouth of the Detroit River. These plots can be used to identify where significant loading gains and/or losses occur in the Connecting Channels considered in this study.

Chloride

Longitudinal plots of Cl indicate a dramatic increase in the Cl content of Lake Huron, as indicated by the increase in loading from the downstream portion of the St. Marys River to the upstream station on the St. Clair River (Figure 7-1). Estimated loads continue to increase downstream, with the highest recorded loads at the downstream Detroit River sampling location. Loads at a given sampling location remained relatively constant between years.

Cadmium

Cd (Figure 7-2) shows a general increase from the upstream end of the St. Marys River to the upstream end of the Detroit River. There is some evidence of a dilution effect from Lake Erie in the Detroit River, with decreases in the Cd load in 1998, 1999 and 2003. This effect is less apparent when examining 2000 to 2002 data.

Chromium

The longitudinal plots show a large increase in the Cr load across Lake Huron in 1998 and 1999 (Figure 7-3). From 2000 to 2004, the increase across Lake Huron is much smaller or non-existent. From the upstream end of the St. Clair River to the upstream end of the Detroit River, there is a general increase in the Cr load for all seven years. The downstream Detroit River station shows signs of dilution from Lake Erie during all years.

Copper

The longitudinal plots for Cu (Figure 7-4) show increases in Cu loading across Lake Huron and Lake St. Clair. Little change in Cu load is observed within the St. Marys, St. Clair and Detroit Rivers between upstream and downstream stations, or between years. Cu load tends to increase progressively from the upper end of the St. Marys River to the lower end of the Detroit River.

Lead

Pb loads (Figure 7-5) increase from the upstream end of the St. Marys River to the downstream end of the St. Clair River. The longitudinal plots show a large increase in Pb load across Lake St. Clair, with an increased load at the upstream end of the Detroit River. In the Detroit River, a decrease in the Pb load from upstream to downstream is observed in all years, likely a dilution effect from Lake Erie.

Mercury

The longitudinal plots of the Hg load (Figure 7-6) indicate a relatively constant load from the upstream end of the St. Marys River to the downstream end of the St. Clair River. A dramatic increase in Hg load across Lake St. Clair is evident as indicated by the load gains from the downstream portion of St. Clair River to the upstream end of the Detroit River. Hg loadings in the Detroit River declined from upstream to downstream each year, indicating a dilution effect from Lake Erie. The most elevated Hg loads at each station were always in 1999.

Nickel

Longitudinal plots of Ni (Figure 7-7) indicate a dramatic input of Ni to Lake Huron, as indicated by the load gains from the downstream portion of St. Marys River to the upper station on the St. Clair River. Estimated loads continue to increase to the downstream station on the Detroit River. At all locations, Ni loads are shown to decrease between 1998 and 2000, and then remain relatively constant from 2000 to 2004.

Zinc

The longitudinal plots of Zn (Figure 7-8) show the load to be generally increasing throughout the Connecting Channels, from the upstream end of the St. Marys River to the downstream end of the Detroit River. There is a slight increase in Zn load in the St. Clair River.

Total Phosphorus

A general increase in the phosphorus load is shown from the upstream end of the St. Marys River to the upstream end of the Detroit River (Figure 7-9). In the Detroit River, total phosphorus loads have remained relatively unchanged across all sampling years.

PCB

The longitudinal plots of PCB (Figure 7-10) indicate that the load remains relatively low from the upstream end of the St. Marys River to the upstream end of the Detroit River in the two years where loads were calculated (1998 and 1999). However, a large increase in the PCB load is shown across the length of the Detroit River for both years.

Total Suspended Solids

A general increase in the TSS load is shown from the upstream end of the St. Marys River to the upstream end of the Detroit River (Figure 7-11). There is evidence of a decrease in the TSS load in the Detroit River, possibly due to the dilution effects of Lake Erie.

Nitrate

NO_3 loads generally increase from the upstream St. Marys River station to the upstream station on the Detroit River (Figure 7-12). There is an increase in NO_3 load across Lake Huron. When considered individually, NO_3 load remains relatively constant in all three Connecting Channels.

Total Kjeldahl Nitrogen

TKN loads increase from the upstream station in the St. Marys River to the downstream station in the Detroit River (Figure 7-13). Loads remain relatively constant between the upstream and downstream station in each individual river. There is evidence of an increase in TKN loads in Lake Huron and in Lake St. Clair.

8. COMPARISON OF DATA WITH MICHIGAN RULE 57 WATER QUALITY VALUES

Data obtained for total Hg, Cd, Cr, Cu, Ni, Pb, Zn, PCB, DDT, base/neutral organics and volatile organics (methyl tert-butyl ether (MTBE) and BTEX (benzene, toluene, ethylbenzene and xylene)) were compared with applicable Rule 57 water quality values. These values were developed in accordance with the Part 4 Michigan Water Quality Standards promulgated pursuant to Part 31 of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended.

For total Hg and DDT, the applicable Rule 57 water quality value is the wildlife value (WV); for total Cd, Cr, Cu, Ni, Pb and Zn, the applicable Rule 57 water quality value is the final chronic value (FCV); and for total PCB, the applicable Rule 57 water quality value is the human cancer value (HCV). The FCVs for Cd, Cr, Cu, Ni, Pb and Zn are hardness dependent and were calculated for each Connecting Channel station using river-specific hardness data. Measured ambient Cd, Cr, Cu, Ni, Pb and Zn concentrations are for total metal, whereas the FCVs for these trace metals are expressed as dissolved metal. For this reason, a direct comparison between ambient Cd, Cr, Cu, Ni, Pb and Zn concentrations and Rule 57 water quality values cannot be made. This is not an important consideration when the ambient concentration meets the applicable Rule 57 water quality value; however, when it exceeds this value, the available data cannot show whether the ambient concentration of metal in the dissolved fraction exceeds the Rule 57 water quality value. More sophisticated monitoring would be necessary to resolve an ambiguity of this nature, and caution must be exercised when drawing conclusions from the available data.

For MTBE and BTEX, the applicable Rule 57 water quality value is either the HCV or FCV (see Table 8-1). For base/neutral organics, the applicable Rule 57 water quality value differs among the 28 of 50 chemicals in this category for which these values have been developed. Base/neutral organics analyzed are listed in Table 8-2, along with their analytical quantification levels and, where available, their Rule 57 water quality values.

Table 8-1. BTEX and MTBE, and Their Analytical Quantification Levels and Michigan Rule 57 Water Quality Values.

BTEX/MTBE	Quantification Level (ug/L)	R. 57 Water Quality Value (ug/L)
Benzene	1.0	HCV = 12
Toluene	1.0	FCV = 140
Ethylbenzene	1.0	FCV = 18
m- & p-Xylene	2.0	FCV = 35*
o-Xylene	1.0	
Methyl tert butyl ether	5.0	HCV = 100

* = Value applies to total xylene (total xylene = m- & p- xylene + o-xylene).

Analytical results obtained for volatile organics (MTBE and BTEX) are provided in Appendix C. A total of 76 samples collected between 1999 and 2004 were analyzed for these contaminants; only one benzene sample contained a concentration above analytical quantification (2.6 ug/L). This sample was collected at the upstream Detroit River in 1999. All MTBE and BTEX sample concentrations met applicable Rule 57 water quality values, shown for each contaminant in Table 8-1.

Analytical results obtained for base/neutral organics are provided in Appendix C. Group 3 of Table 8-2 identifies the base/neutral organics for which no Rule 57 water quality values have been developed; all sample analyses for contaminants in this group showed concentrations below analytical quantification. Group 2 of Table 8-2 shows the base/neutral organics (2-methylnapthalene, bis(2-chloroethyl)ether, carbazole, dibenzofuran, hexachlorobenzene, hexachlorobutadiene and hexachlorocyclopentadiene) for which Rule 57 water quality values have been developed, but whose quantification levels are above these Rule 57 water quality values. All sample analyses for contaminants in this group showed concentrations below analytical quantification; a definitive comparison against Rule 57 water quality values cannot be made for these contaminants. Group 1 of Table 8-2 shows the base/neutral organics for which Rule 57 water quality values have been developed, and whose quantification levels are below these Rule 57 water quality values. Three of these contaminants were found in concentrations above analytical quantification. Diethylphthalate was intermittently detected in samples collected from all Connecting Channel locations between 1999 and 2004, with concentrations ranging from 1.1 to 4.5 µg/L. Diethylphthalate was not detected in samples collected in 2002 and 2003. Di-n-butylphthalate was detected in one sample collected downstream in the St. Clair River in 1999. Bis(2-ethylhexyl)phthalate was detected in two samples collected downstream in the St. Marys River in 1999, and one sample upstream in the St. Clair River in 1999. Of these, none exceeded applicable Rule 57 water quality values.

Analytical results obtained for Cd, Cr, Cu, Pb, Ni, Hg and Zn are provided in Tables A1 to A6 of Appendix A. Metal sample concentrations are compared with applicable Rule 57 water quality values in Table 8-3. Also shown in this table are the mean and range of concentrations, and the exceedance rate for each contaminant. Only sample concentrations obtained for Hg were found to exceed the applicable Rule 57 water quality value. Results showed that total Hg exceeded the Hg Rule 57 water quality value of 1.3 ng/L in 101 of 275 samples analyzed between 1999 and 2004.

Analytical results for total DDT and PCB are provided in Tables A1 to A6 of Appendix A. Samples were analyzed for DDT in 1998 and 1999; samples were analyzed for PCB from 1998 to 2003. Table 8-4 shows the mean and range of concentrations, and the exceedance rate for each contaminant. DDT concentrations exceeded the Rule 57 water quality value of 0.011 ng/L in 13 of 24 samples analyzed. The actual number of samples exceeding the water quality value may be higher, however, because the quantification limits for DDT and its metabolites DDD and DDE (0.082, 0.082 and 0.05 ng/L, respectively) are all greater than the Rule 57 water quality value. Total PCB concentrations exceeded the PCB Rule 57 water quality value of 0.026 ng/L in 59 of 60 samples analyzed. In 2001, one total PCB concentration at the upstream station in the St. Clair River was exceptionally elevated (244.27 ng/L).

Table 8-2. Base/Neutral Organics Analyzed for the Connecting Channels, and Their Analytical Quantification Levels and Michigan Rule 57 Water Quality Values.

Analyte	Quantification Level (ug/L)	R. 57 Water Quality Value (ug/L)
Group 1: Quantification Level Below R. 57 Water Quality Value		
1,2,4-Trichlorobenzene	2.0	FCV = 30
1,2-Dichlorobenzene	1.0	FCV = 13
1,3-Dichlorobenzene	1.0	FCV = 28
1,4-Dichlorobenzene	1.0	FCV = 16
Acenaphthylene	1.0	FCV = 7.2*
Acenapthene	1.0	FCV = 38
Anthracene	1.0	FCV = 2.8*
Bis(2-chloroisopropyl)ether	1.0	HCV = 6
Bis(2-ethylhexyl)phthalate	2.0	HCV = 25
Butyl benzyl phthalate	1.0	HNV = 6.9
Chrysene	1.0	HCV = 1.5*
Diethyl phthalate	1.0	FCV = 110
Di-n-butyl phthalate	1.0	FCV = 9.7
Fluoranthene	1.0	FCV = 1.6
Fluorene	1.0	FCV = 12
Hexachloroethane	1.0	HCV = 5.3
Isophorone	1.0	HCV = 310
Naphthalene	1.0	FCV = 13
Nitrobenzene	2.0	HCV = 4.7
Phenanthrene	1.0	FCV = 2.4
Pyrene	1.0	FCV = 2.5*
Group 2: Quantification Level Above R. 57 Water Quality Value		
2-Methylnaphthalene	5.0	FCV = 4.8*
Bis(2-chloroethyl)ether	1.0	HCV = 0.79
Carbazole	10	FCV = 4
Dibenzofuran	5.0	FCV = 4
Hexachlorobenzene	2.0	WV = 0.0003
Hexachlorobutadiene	2.0	WV = 0.053
Hexachlorocyclopentadiene	10	FCV = 0.07*
Group 3: No R. 57 Water Quality Value Currently Developed		
2,4-Dinitrotoluene	5.0	
2,6-Dinitrotoluene	5.0	
2-Chloronaphthalene	2.0	
2-Nitroaniline	20	
3-Nitroaniline	20	
4-Bromophenyl phenylether	2.0	
4-Chlorophenyl phenylether	1.0	
4-Nitroaniline	20	
Azobenzene	2.0	
Benzo(a)anthracene	1.0	
Benzo(a)pyrene	2.0	
Benzo(b)fluoranthene	2.0	
Benzo(g,h,i)perylene	2.0	
Benzo(k)fluoranthene	2.0	
Bis(2-chloroethoxy)methane	2.0	

Table 8-2 (cont'd.). Base/Neutral Organics Analyzed for the Connecting Channels, and Their Analytical Quantification Levels and Michigan Rule 57 Water Quality Values.

Analyte	Quantification Level (ug/L)	R. 57 Water Quality Value (ug/L)
Di-n-octyl phthalate	2.0	
Indeno(1,2,3-cd)pyrene	2.0	
N-Nitrosodimethylamine	5.0	
N-Nitrosodi-n-propylamine	2.0	
N-Nitrosodiphenylamine	2.0	

FCV = Final Chronic Value.

HCV = Human Cancer Value (Drinking Water).

HNV = Human Non-Cancer Value (Drinking Water).

WV = Wildlife Value.

* = Value shown is an estimate based on available data.

Table 8-3. Rule 57 Water Quality Values, Mean and Range of Concentrations, and Exceedance Rates for Mercury and Selected Trace Metal Water Quality Indicators.

STORET ID	Location	Cd ug/L	Cr ug/L	Cu ug/L	Pb ug/L	Hg ng/L	Ni ug/L	Zn ug/L
Detection Level (1998-1999/2000-May 31, 2002/June 1, 2002-2004) *		0.0098/0.01/ 0.011	0.027/0.02/ 0.057	0.18/0.01/ 0.03	0.0054/0.005/ 0.0041	0.13/0.1/ 0.14	0.023/0.09/ 0.093	0.056/0.04/ 0.13
Quantification Level (1998-1999/2000-May 31, 2002/June 1, 2002-2004) *		0.031/0.03/ 0.037	0.086/0.06/ 0.19	0.57/0.04/ 0.1	0.017/0.015/ 0.014	0.41/0.3/ 0.45	0.073/0.09/ 0.31	0.18/0.13/ 0.43
	All Locations							
Range of Concentrations		0 - 0.300	0 - 1.88	0.220 - 2.40	0.006 - 1.89	0 - 35.29	0.010 - 2.99	0.053 - 25.2
	St. Marys River							
Mean Concentration		0.008	0.307	0.927	0.077	1.18	0.459	0.792
Range of Concentrations		0 - 0.020	0 - 0.932	0.690 - 1.43	0.012 - 0.240	0.120 - 14.17	0.166 - 0.992	0.128 - 3.00
170139	**St. Marys River (upstream)**							
Rule 57 Water Quality Value		1.3	39	4.6	4.4	1.3	30	61
Mean Concentration		0.008	0.188	0.867	0.042	1.03	0.393	0.641
Range of Concentrations		0 - 0.015	0 - 0.932	0.69 - 1.17	0.012 - 0.152	0.150 - 14.17	0.166 - 0.872	0.128 - 3.00
Exceedance Rate		0%	0%	0%	0%	12%	0%	0%
170140	**St. Marys River (downstream)**							
Rule 57 Water Quality Value		1.2	40	44.7	4.5	1.3	27	62
Mean Concentration		0.008	0.424	0.987	0.110	1.32	0.524	0.941
Range of Concentrations		0 - 0.020	0.124 - 0.912	0.794 - 1.43	0.025 - 0.240	0.120 - 13.07	0.286 - 0.992	0.185 - 2.60
Exceedance Rate		0%	0%	0%	0%	17%	0%	0%
	St. Clair River							
Mean Concentration		0.005	0.281	0.527	0.322	1.15	0.711	0.750
Range of Concentrations		0 - 0.020	0 - 1.28	0.220 - 1.03	0.006 - 1.46	0 - 9.57	0.010 - 2.03	0.053 - 3.91

Table 8-3. Rule 57 Water Quality Values, Mean and Range of Concentrations, and Exceedance Rates for Mercury and Selected Trace Metal Water Quality Indicators.

STORET ID	Location	Cd ug/L	Cr ug/L	Cu ug/L	Pb ug/L	Hg ng/L	Ni ug/L	Zn ug/L
740376	**St. Clair River (upstream)**							
Rule 57 Water Quality Value		2.2	72	8.6	9.8	1.3	50	114
Mean Concentration		0.004	0.239	0.451	0.274	1.07	0.655	0.48533
Range of Concentrations		0 - 0.020	0 - 1.05	0.220 - 0.782	0.006 - 0.850	0 - 9.30	0.010 - 2.00	0.053 - 3.06
Exceedance Rate		0%	0%	0%	0%	17%	0%	0%
740016	**St. Clair River (downstream)**							
Rule 57 Water Quality Value		2.2	73	8.8	10	1.3	51	116
Mean Concentration		0.006	0.321	0.599	0.368	1.23	0.765	0.959
Range of Concentrations		0 - 0.019	0.012 - 1.28	0.380 - 1.03	0.030 - 1.46	0.190 - 9.57	0.054 - 2.03	0.239 - 3.91
Exceedance Rate		0%	0%	0%	0%	19%	0%	0%
	Detroit River							
Mean Concentration		0.009	0.431	0.804	0.323	4.63	1.19	1.73
Range of Concentrations		0 - 0.300	0.064 - 1.88	0.500 - 2.40	0.088 - 1.89	0.520 - 35.29	0.720 - 2.99	0.340 - 25.2
820414	**Detroit River (upstream)**							
Rule 57 Water Quality Value		2.2	74	9.0	10	1.3	52	118
Mean Concentration		0.009	0.481	0.841	0.382	7.02	1.237	1.527
Range of Concentrations		0 - 0.039	0.064 - 1.88	0.500 - 2.40	0.088 - 1.89	0.820 - 35.29	0.720 - 2.99	0.340 - 5.63
Exceedance Rate		0%	0%	0%	0%	85%	0%	0%
820017	**Detroit River (downstream)**							
Rule 57 Water Quality Value		2.2	74	9.0	10	1.3	52	118
Mean Concentration		0.008	0.384	0.771	0.267	2.39	1.151	1.927
Range of Concentrations		0 - 0.300	0.081 - 1.17	0.520 - 1.69	0.114 - 1.29	0.520 - 10.99	0.762 - 2.31	0.540 - 25.2
Exceedance Rate		0%	0%	0%	0%	64.0%	0%	0%

* Detection and quantification levels were changed in 2000 and 2002 due to a different laboratory analyzing trace metals and analytical instrumentation changes.

Table 8-4. Rule 57 Water Quality Values, Mean and Range of Concentrations, and Exceedance Rates for Total DDT and PCB.

STORET ID	Location	total DDT * ng/L	total PCB ng/L
Rule 57 Water Quality Value		0.011	0.026
	All Locations		
Mean Concentration		0.0703	4.98
Range of Concentrations		0 - 0.370	0 - 244.27
Exceedance Rate		54%	98.3%
	St. Marys River		
Mean Concentration		0.0156	0.4688
Range of Concentrations		0 - 0.0460	0 - 2.251
Exceedance Rate		38%	95%
170139	**St. Marys River (upstream)**		
Mean Concentration		0.0203	0.3938
Range of Concentrations		0 - 0.0460	0.1842 - 0.6992
Exceedance Rate		50%	100%
170140	**St. Marys River (downstream)**		
Mean Concentration		0.0110	0.5439
Range of Concentrations		0 - 0.0440	0 - 2.251
Exceedance Rate		25%	90%
	St. Clair River		
Mean Concentration		0.0145	12.75
Range of Concentrations		0 - 0.0840	0.1757 - 244.27
Exceedance Rate		25%	100%
740376	**St. Clair River (upstream)**		
Mean Concentration		0.00	24.97
Range of Concentrations		0.00 - 0.00	0.2090 - 244.27
Exceedance Rate		0%	100%
740016	**St. Clair River (downstream)**		
Mean Concentration		0.0290	0.5308
Range of Concentrations		0 - 0.0840	0.1757 - 0.8831
Exceedance Rate		50%	100%
	Detroit River		
Mean Concentration		0.181	1.731
Range of Concentrations		0.0150 - 0.370	0.2460 - 6.088
Exceedance Rate		100%	100%
820414	**Detroit River (upstream)**		
Mean Concentration		0.0658	0.6610
Range of Concentrations		0.0150 - 0.119	0.2460 - 1.432
Exceedance Rate		100%	100%
820017	**Detroit River (downstream)**		
Mean Concentration		0.296	2.800
Range of Concentrations		0.182 - 0.370	0.3741 - 6.088
Exceedance Rate		100%	100%

* Parameter has quantification level above its Rule 57 water quality value.

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FIGURES

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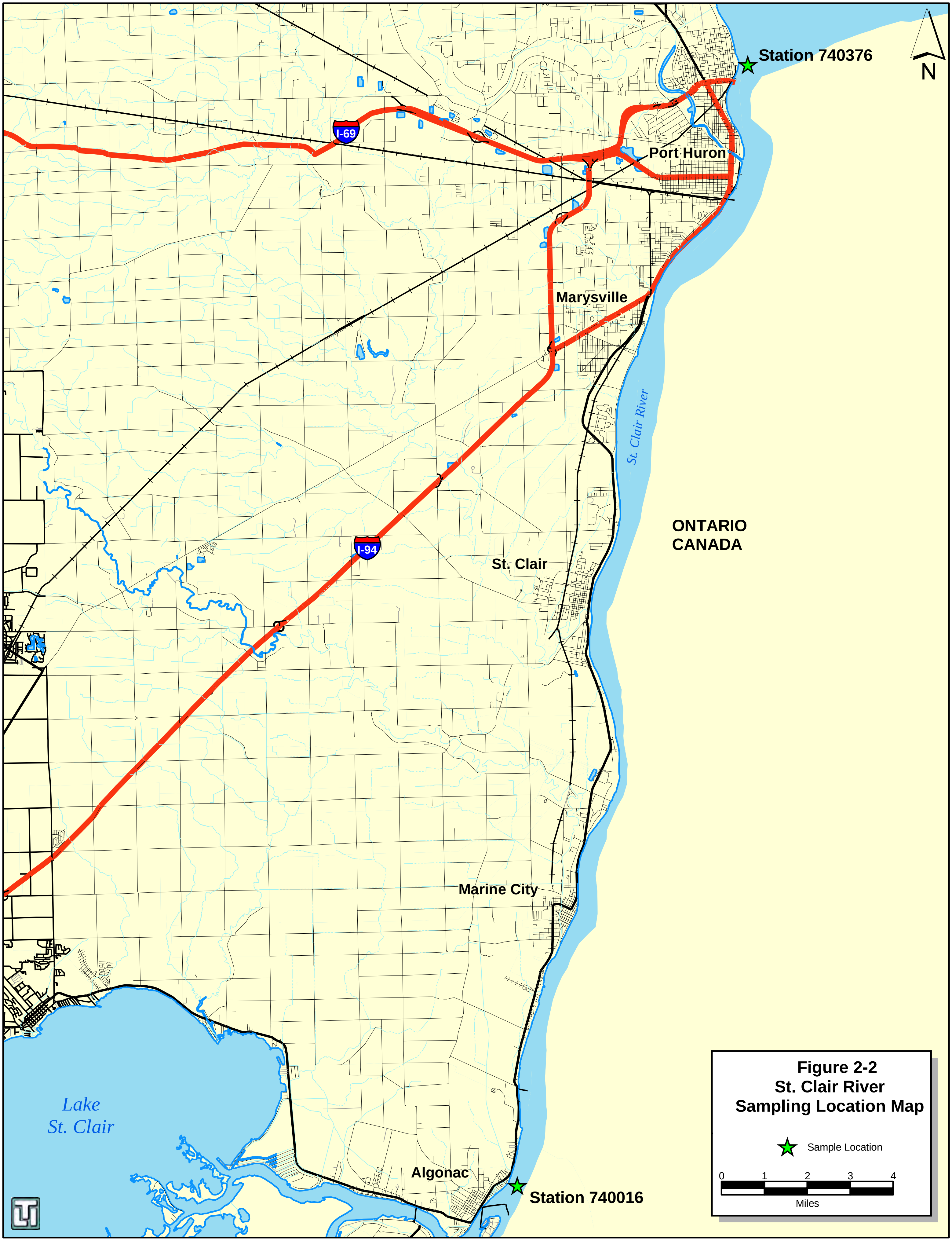

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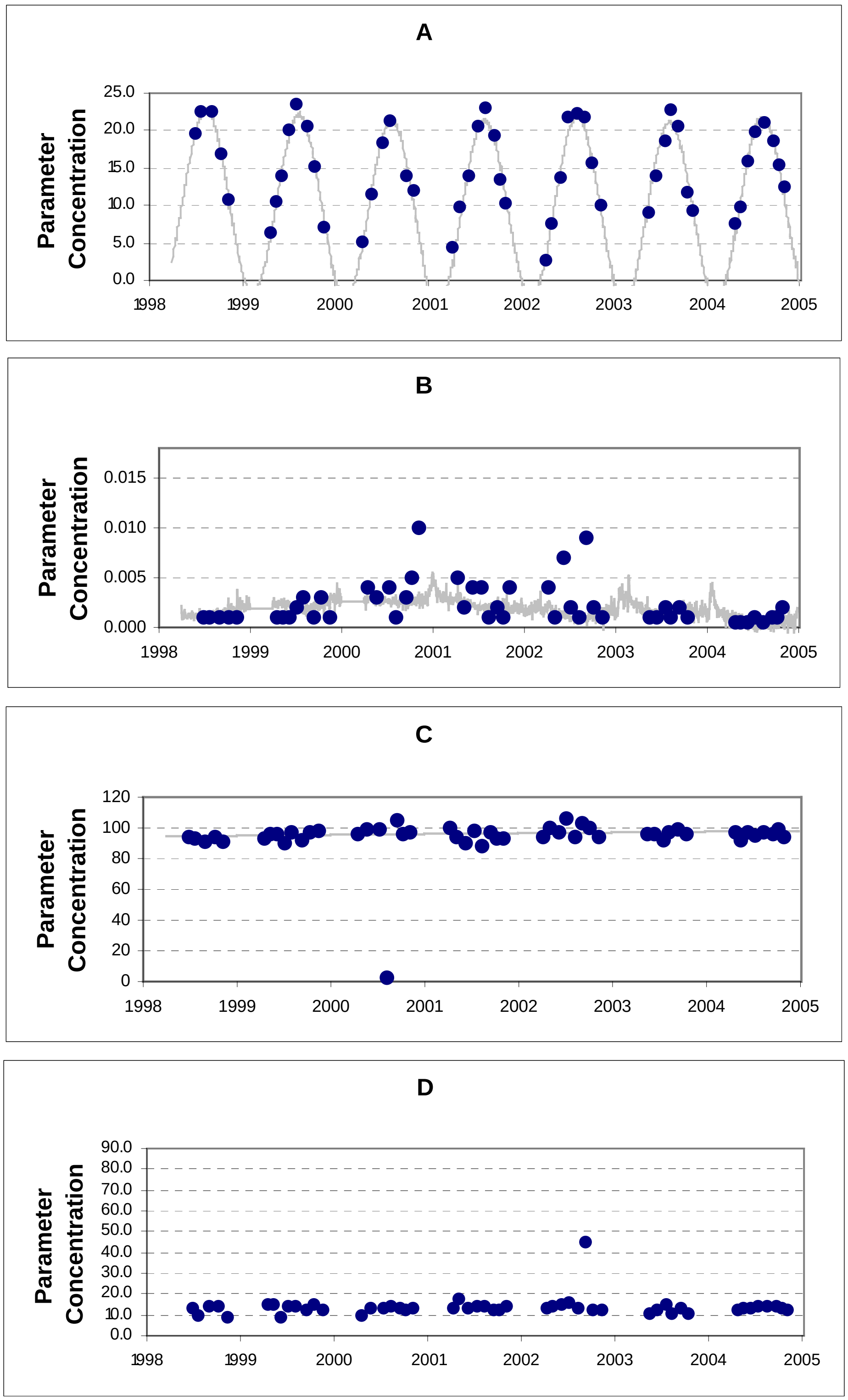


Figure 3-1. Regression Model Plots Depicting Dependence of Concentration Data on Season (A), Channel Flow (B), Time (C) and No Dependence on Any Factors (D).

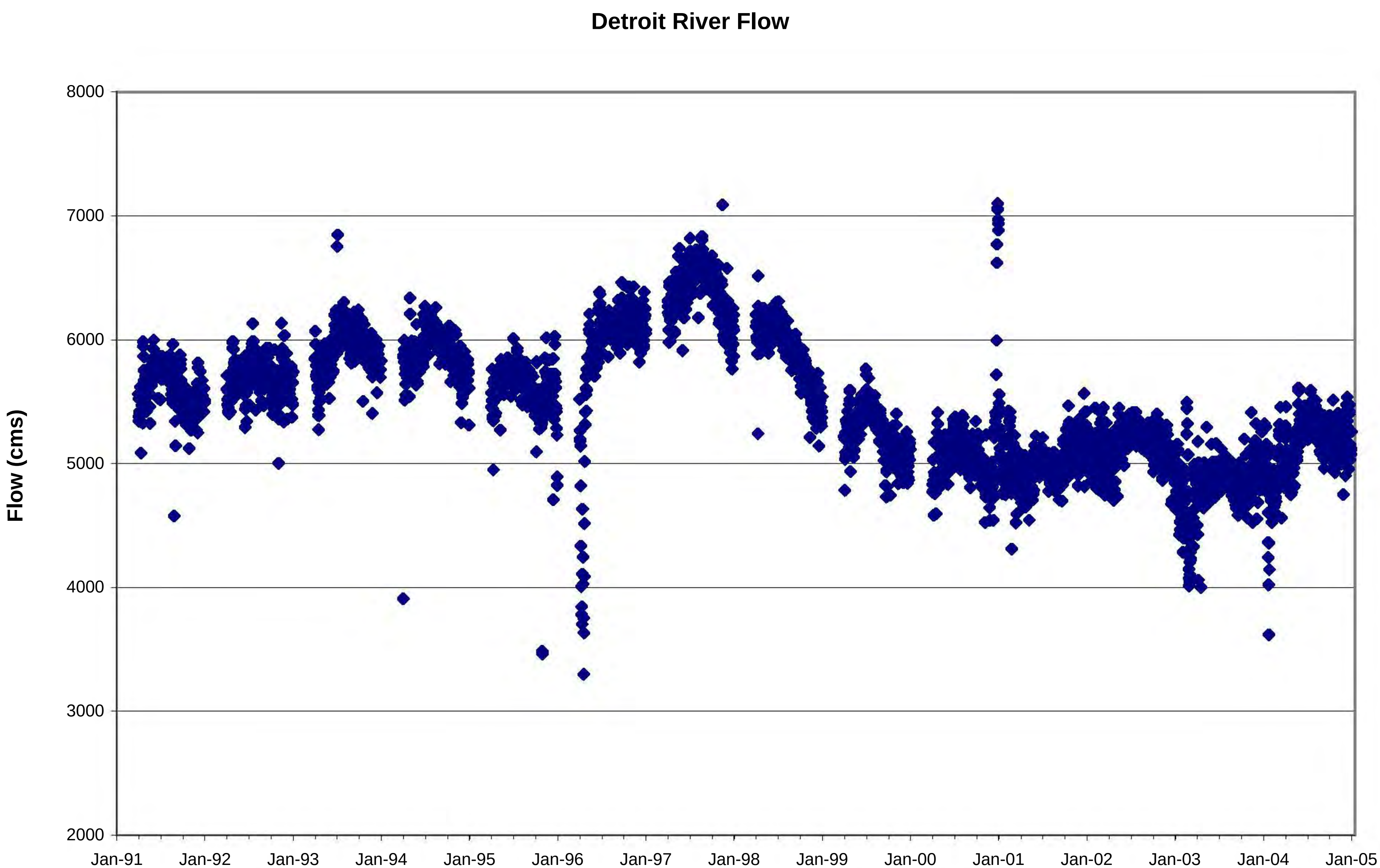


Figure 4-1. Detroit River Flow

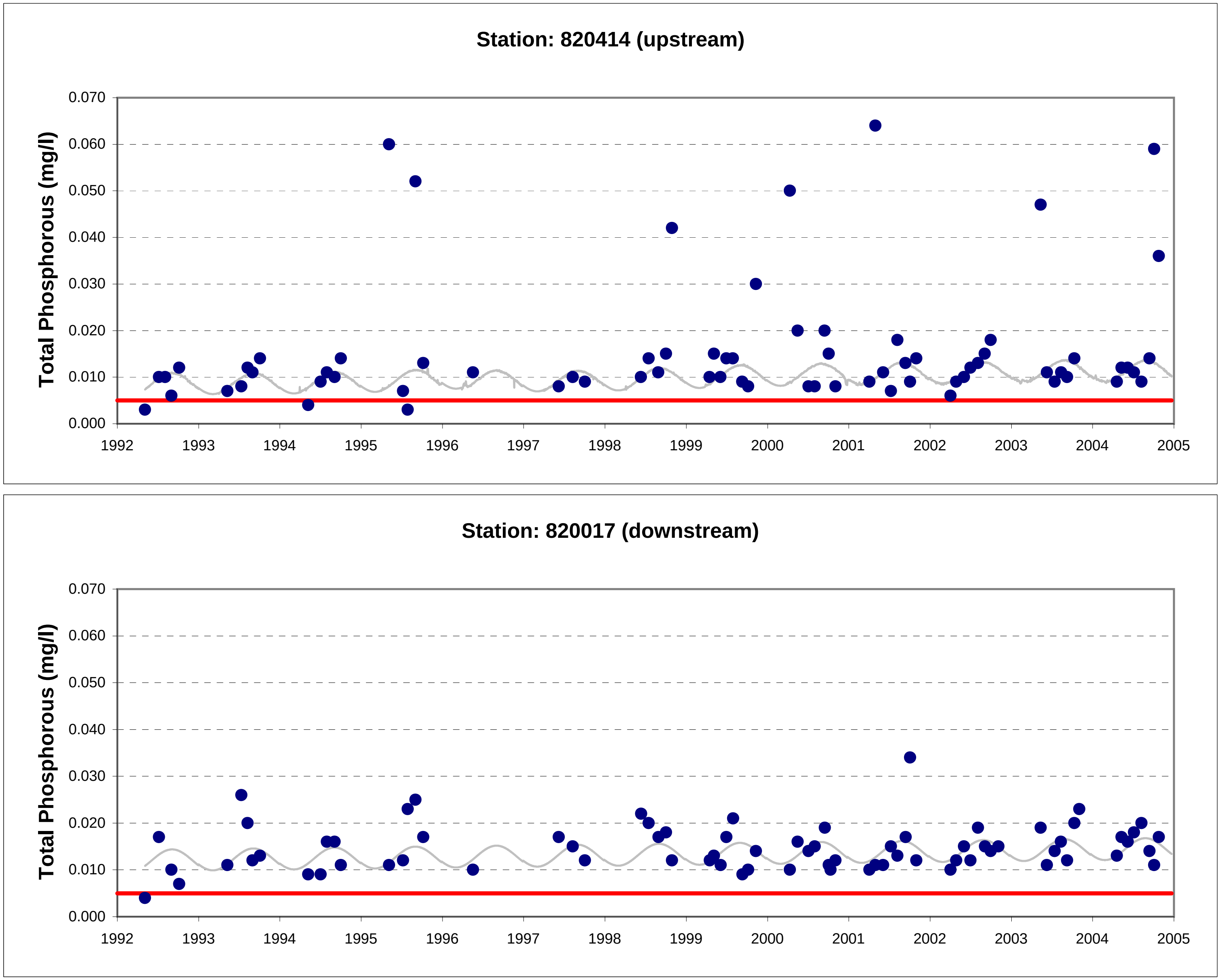
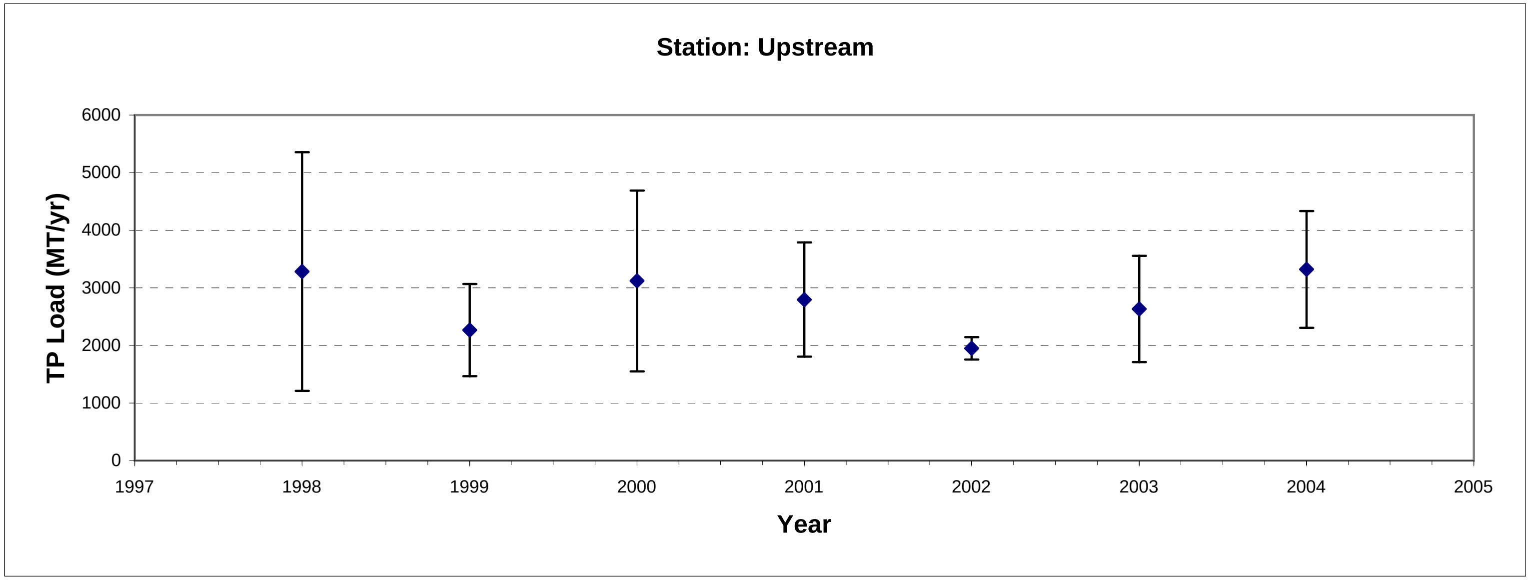


Figure 4-2. Detroit River - Total Phosphorus Concentration Time Series, 1992-2004. Grey Line is Regression Model. Red Line is Quantification Limit.



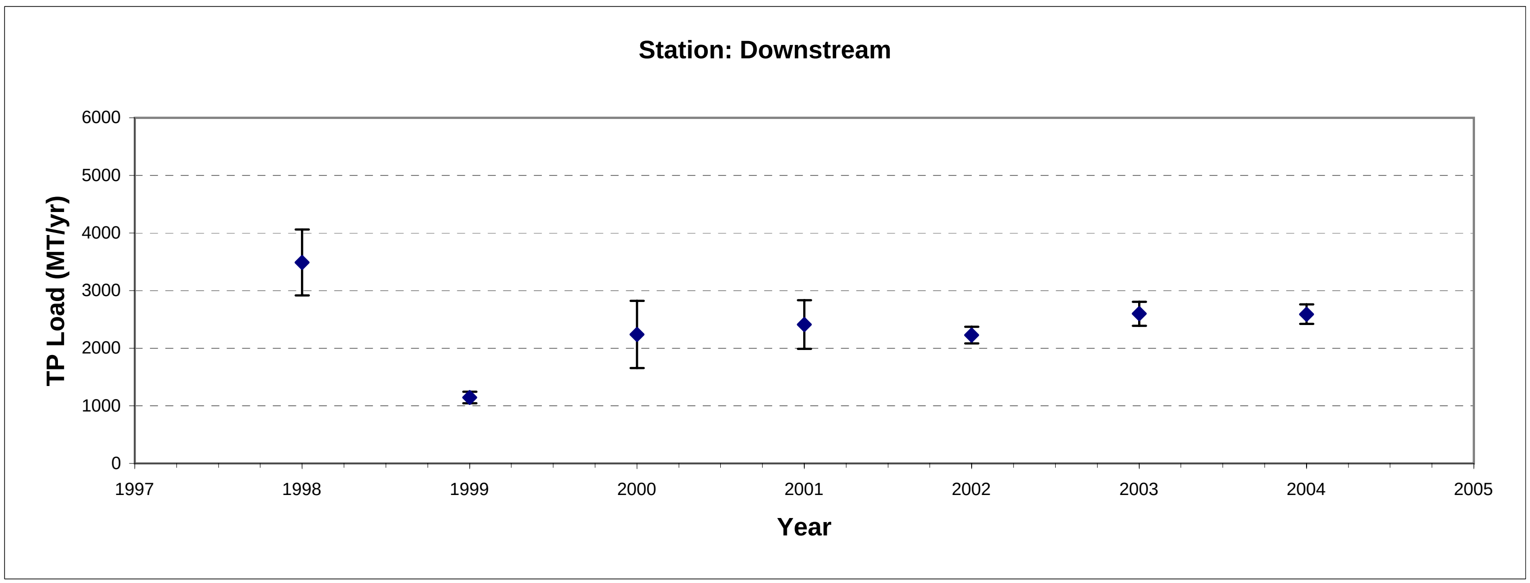
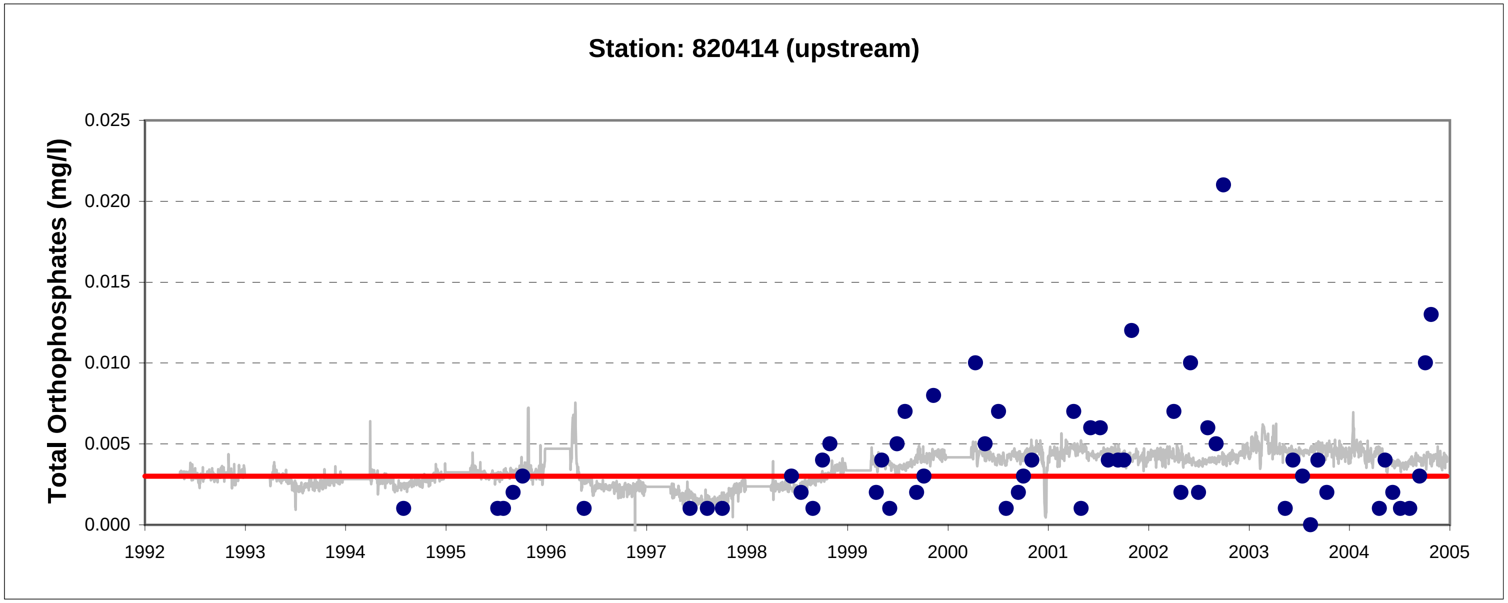


Figure 4-3. Temporal Variation in Total Phosphorus Load in the Detroit River. Diamonds are Means and Bars are 95% Confidence Intervals.



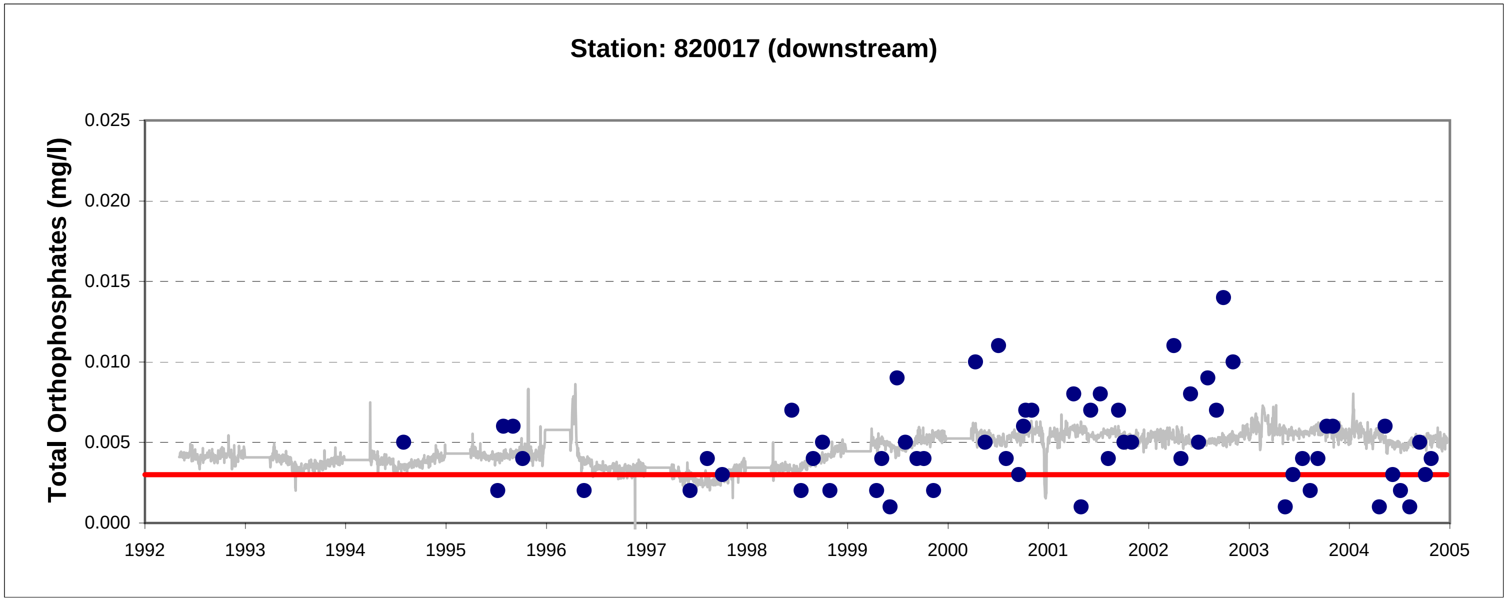
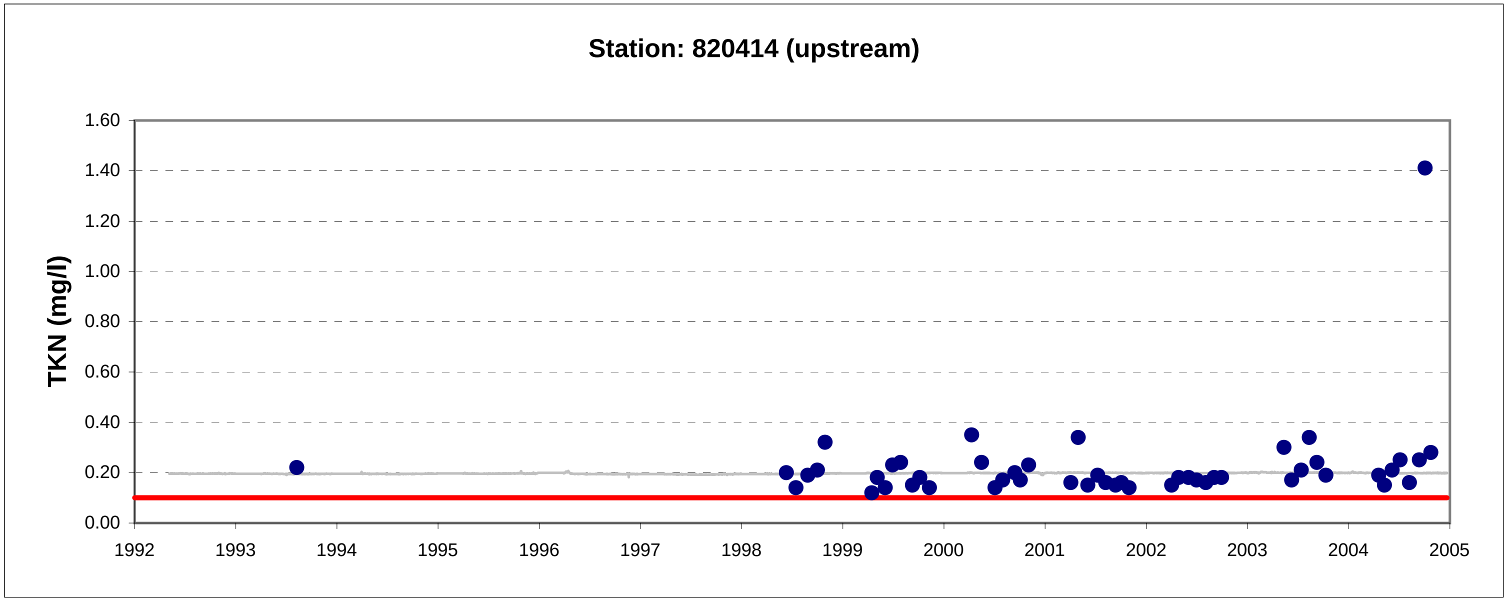


Figure 4-4. Detroit River - Orthophosphate Concentration Time Series, 1992-2004. Grey Line is Regression Model. Red Line is Quantification Limit.



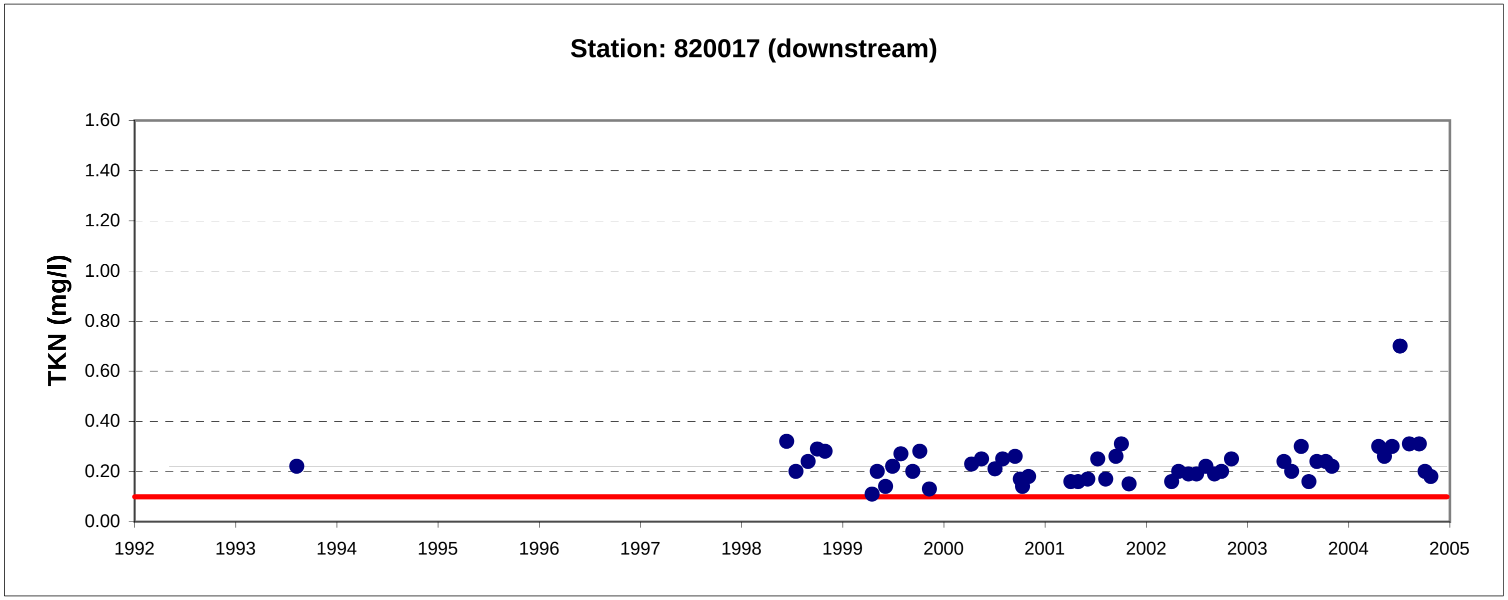
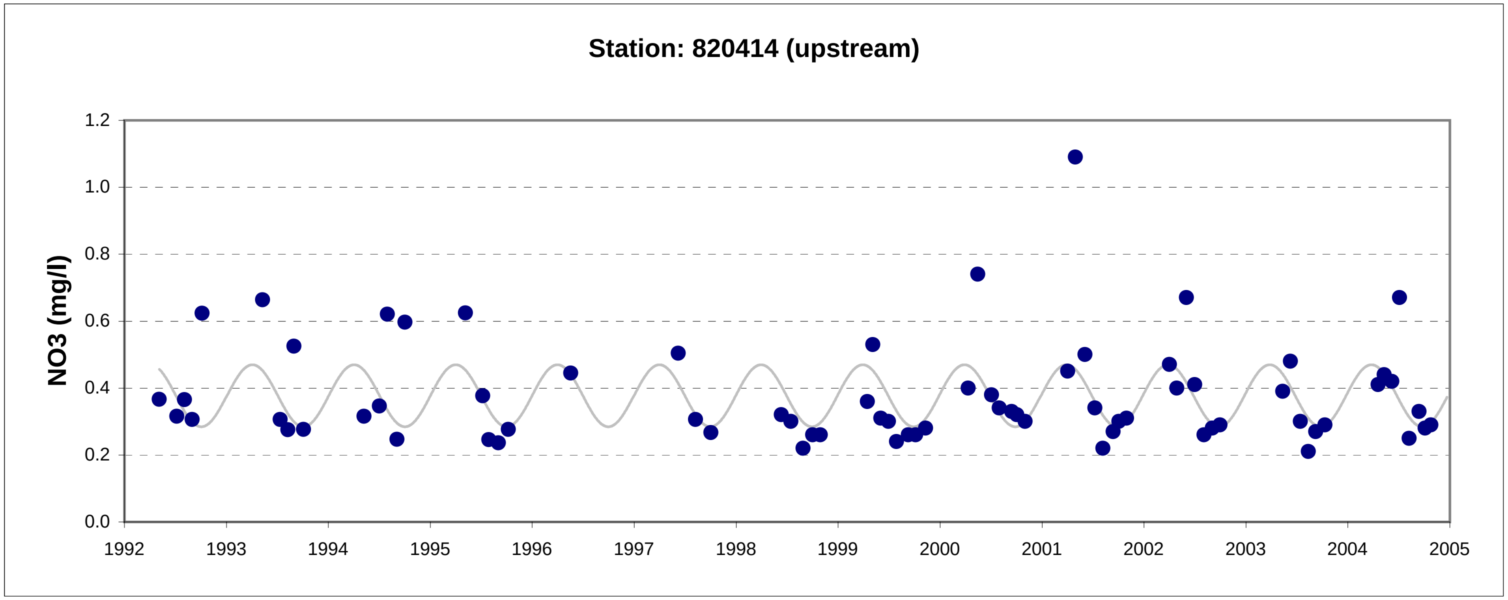


Figure 4-5. Detroit River - TKN Concentration Time Series, 1992-2004. Grey Line is Regression Model. Red Line is Quantification Limit.



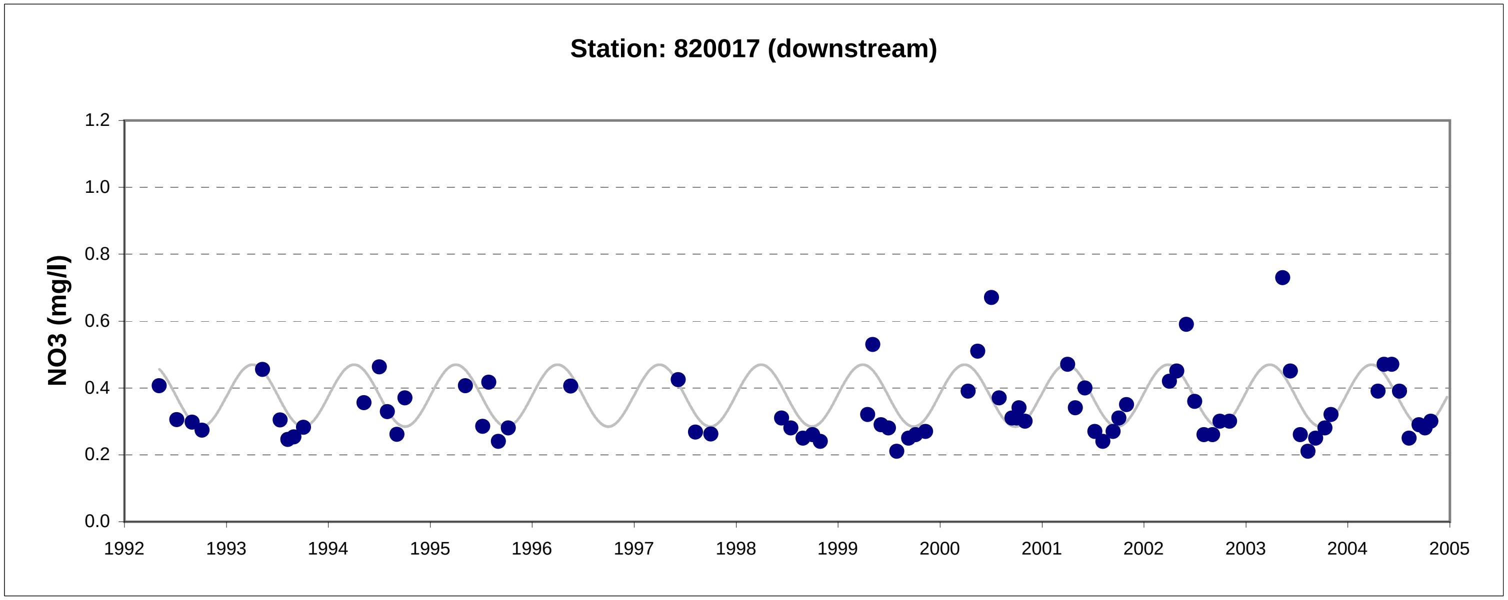
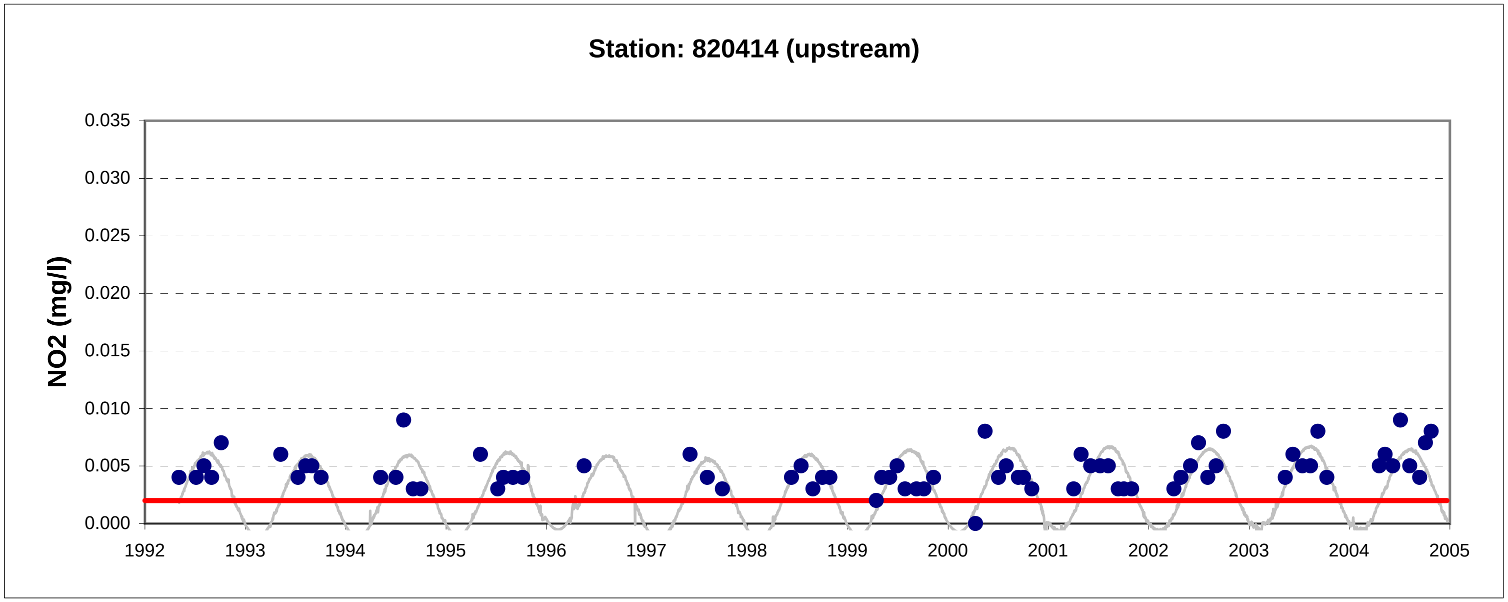


Figure 4-6. Detroit River - NO3 Concentration Time Series, 1992-2004. Grey Line is Regression Model.



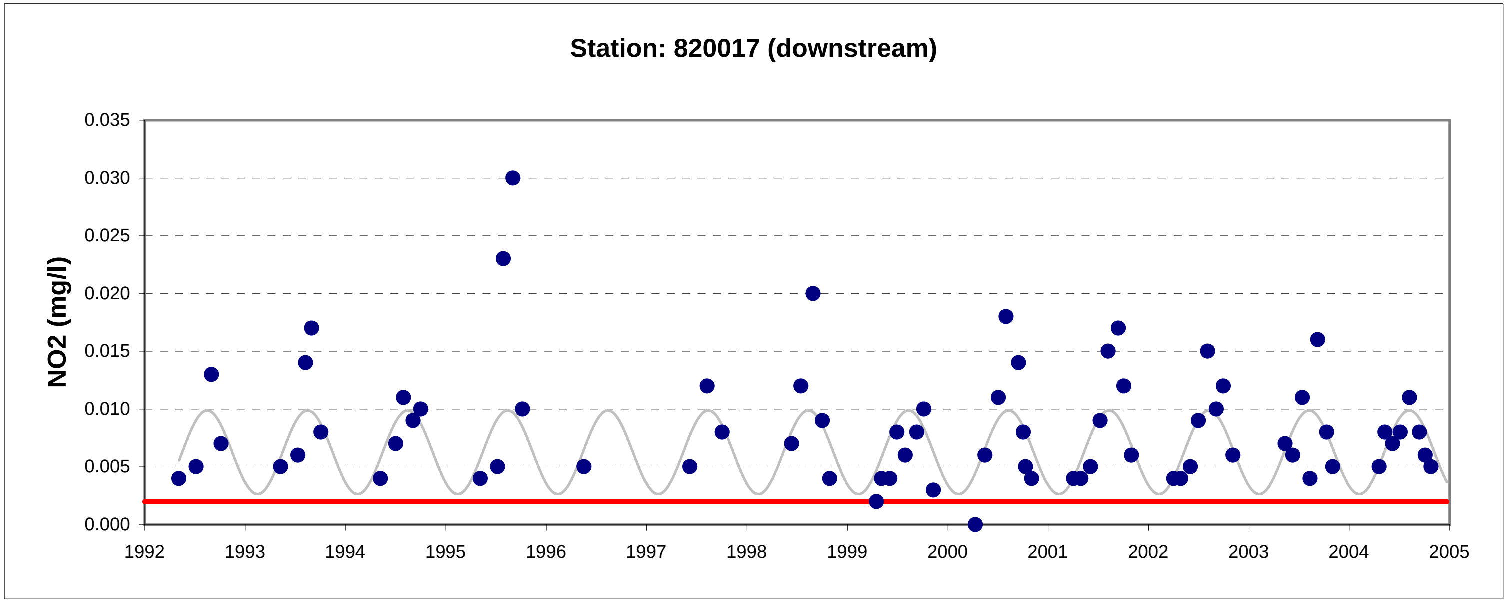


Figure 4-7. Detroit River - NO2 Concentration Time Series, 1992-2004. Greya Line is Regression Model. Red Line is Quantification Limit.

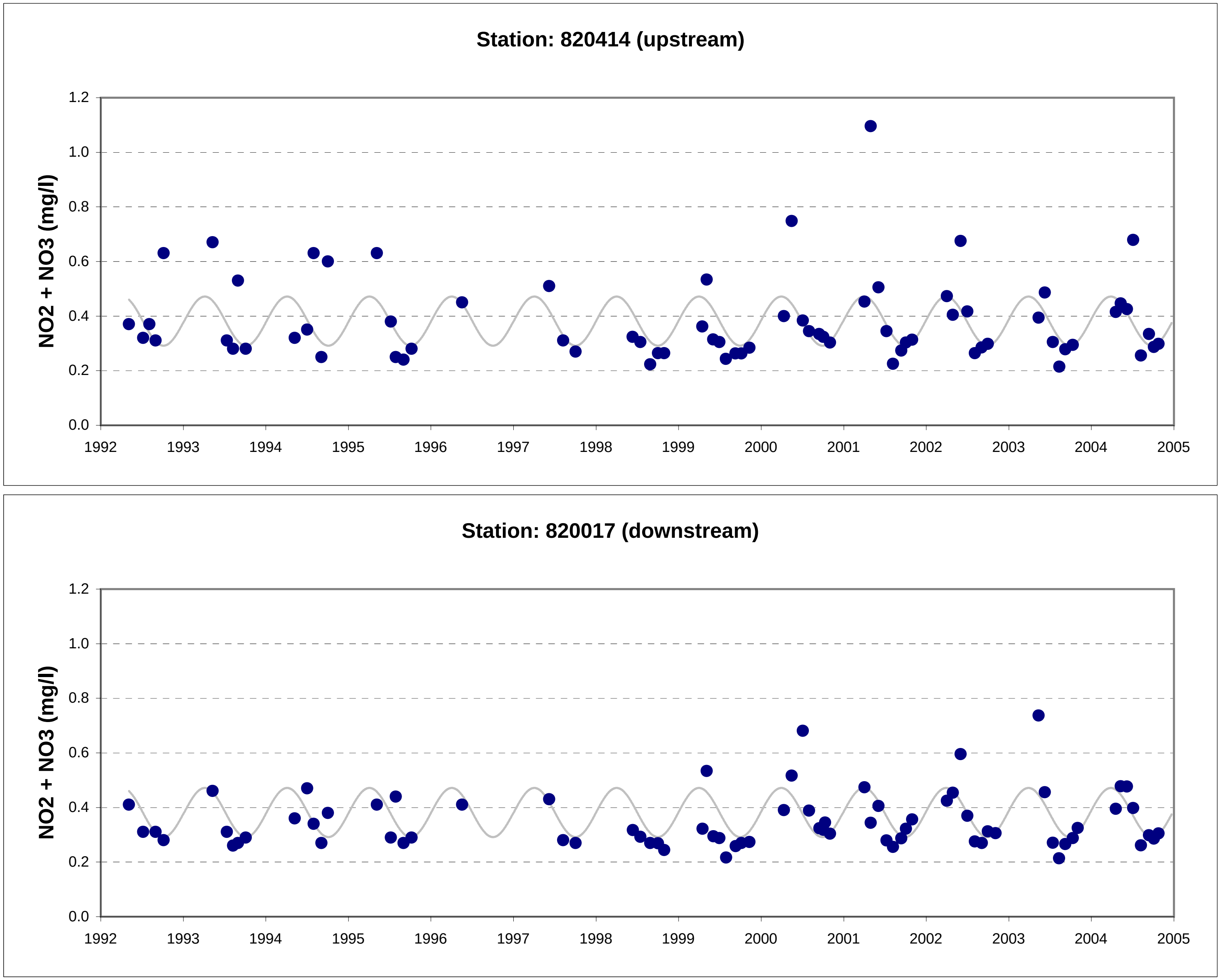
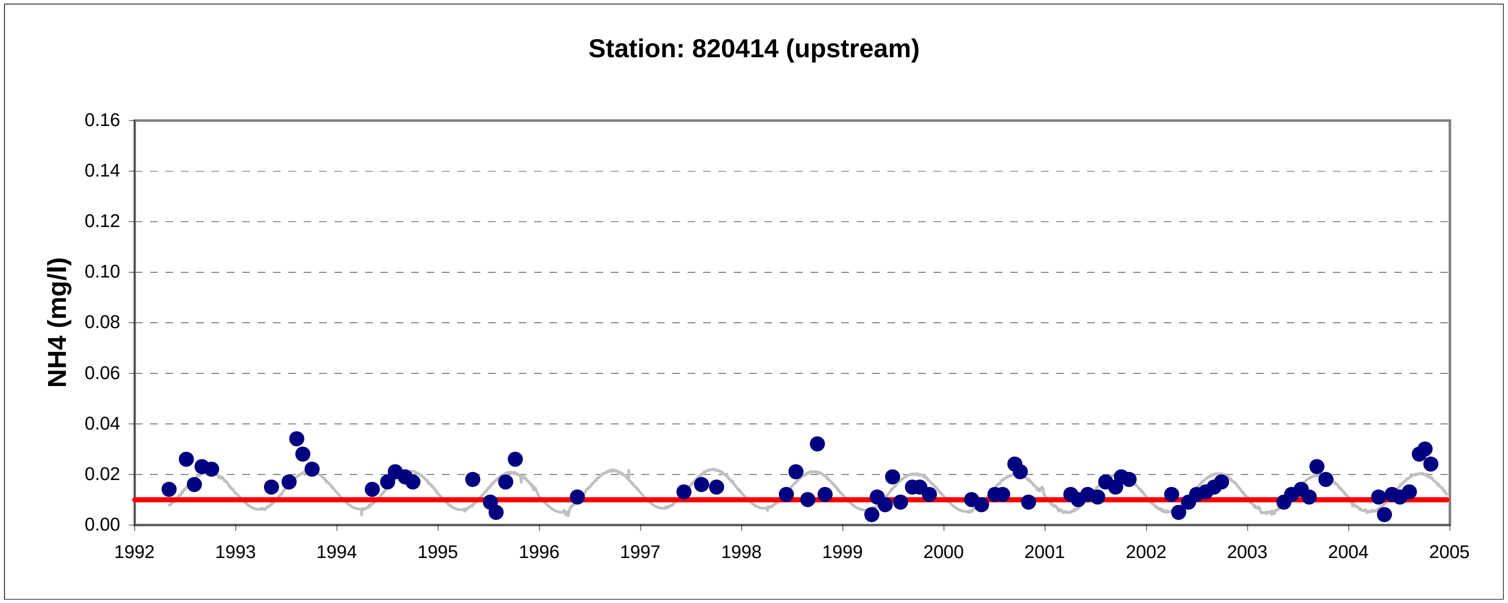


Figure 4-8. Detroit River - NO2+NO3 Concentration Time Series, 1992-2004. Grey Line is Regression Model.



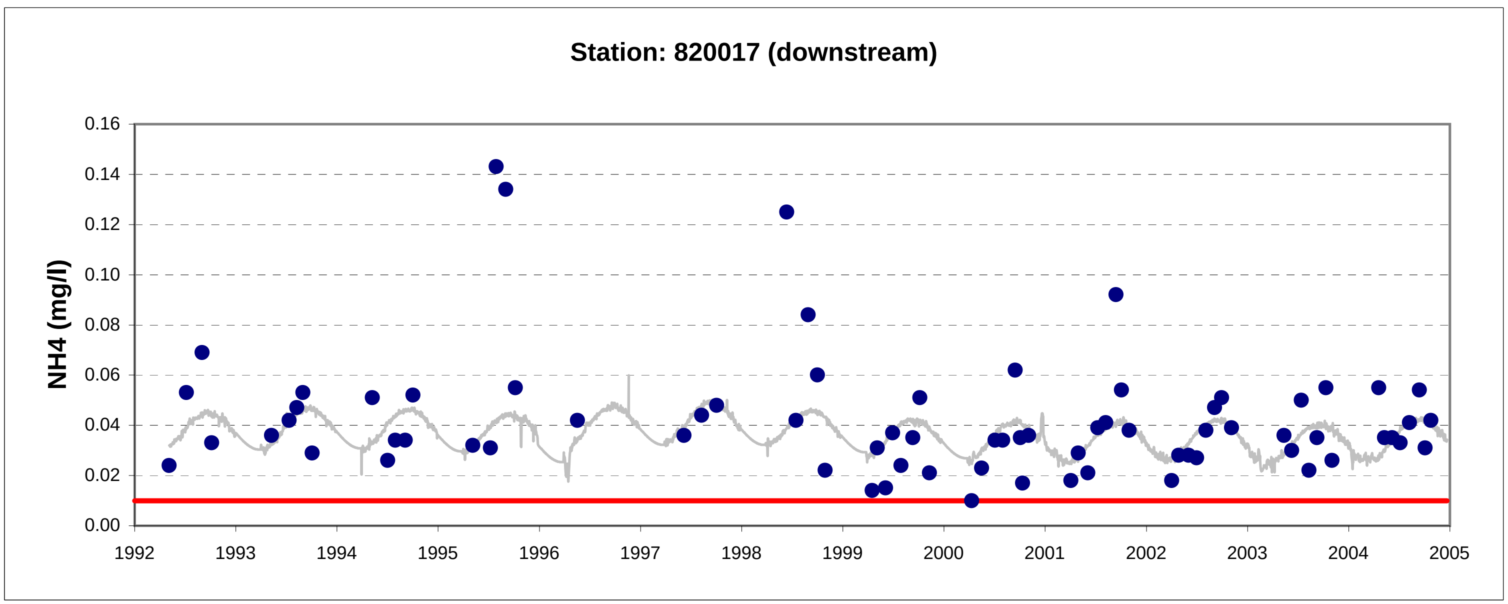
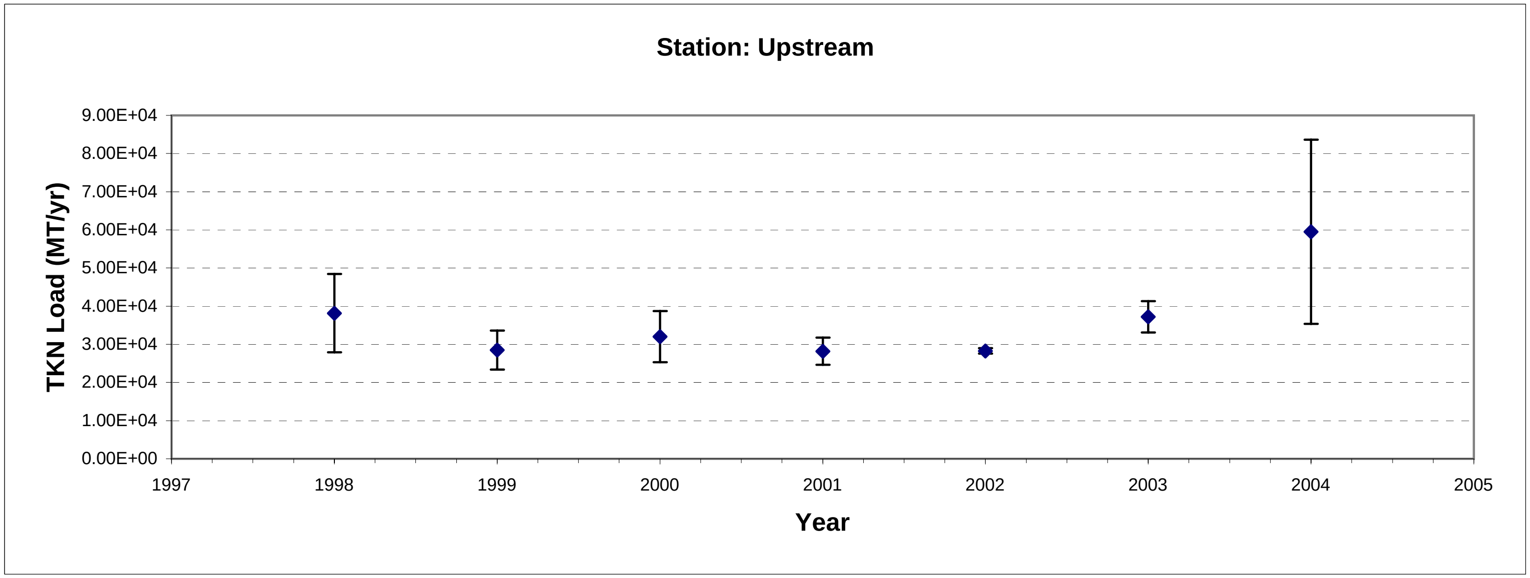


Figure 4-9. Detroit River - NH4 Concentration Time Series, 1992-2004. Grey Line is Regression Model. Red Line is Quantification Limit.



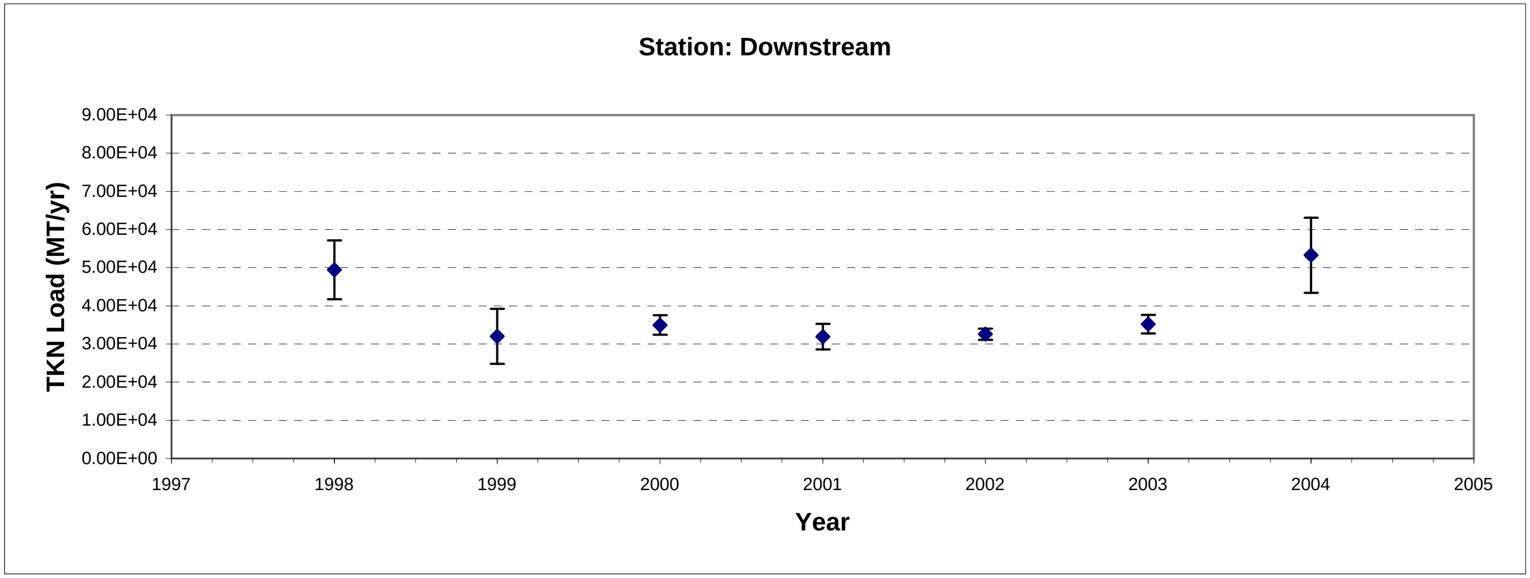


Figure 4-10. Temporal Variation in TKN Load in the Detroit River. Diamonds are Means and Bars are 95% Confidence Intervals.

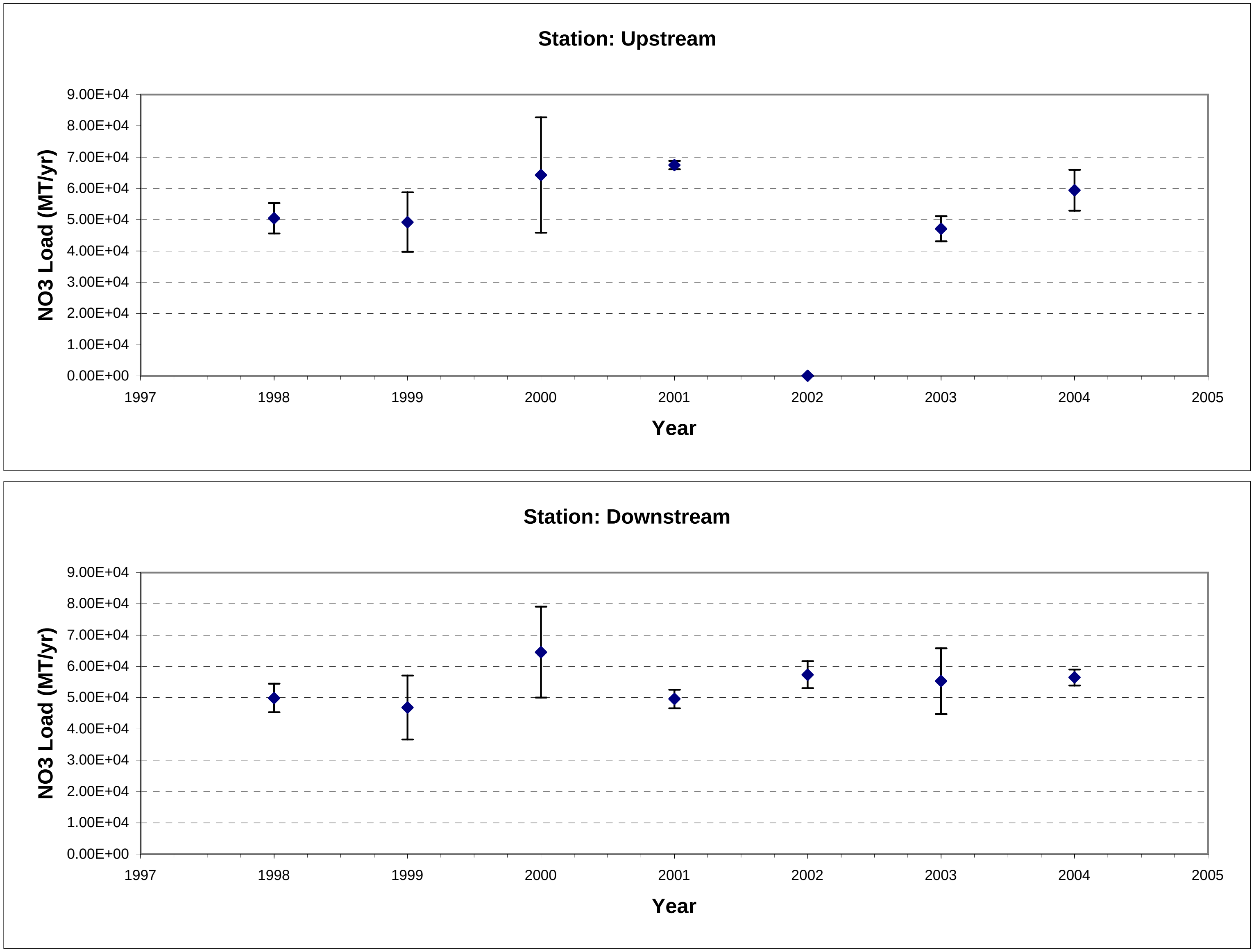
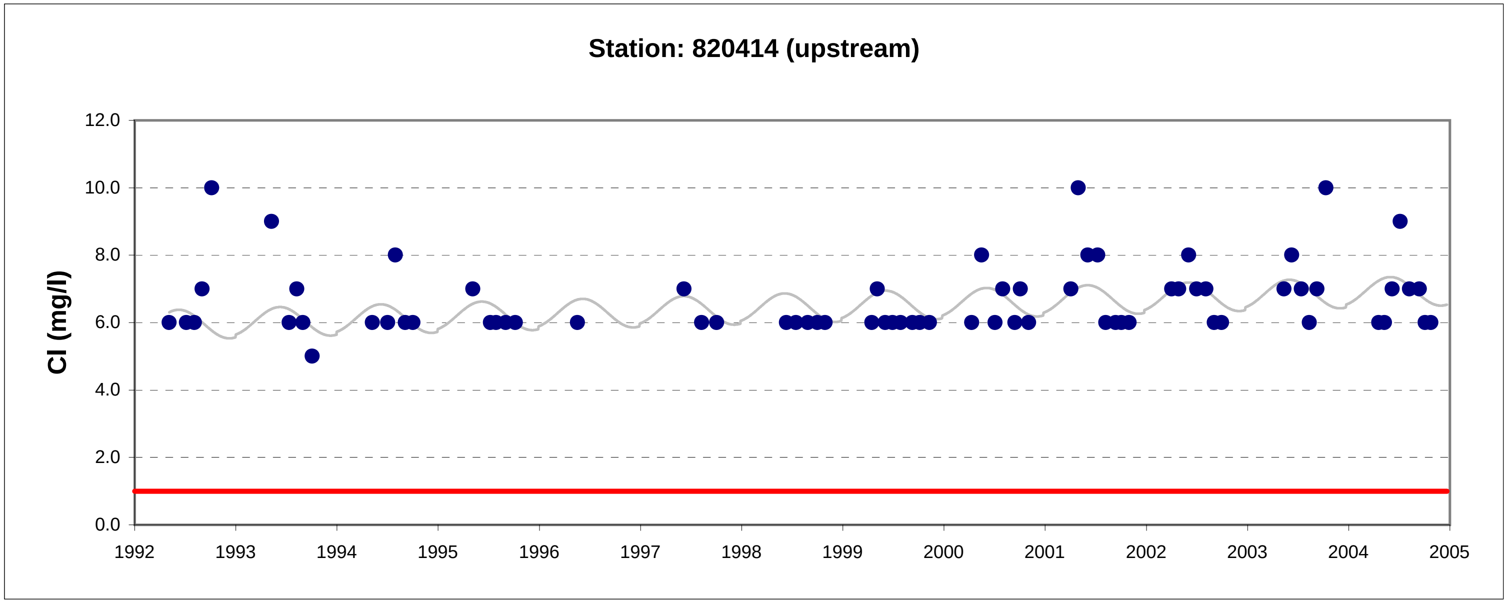


Figure 4-11. Temporal Variation in NO_3 Load in the Detroit River. Diamonds are Means and Bars are 95% Confidence Intervals.



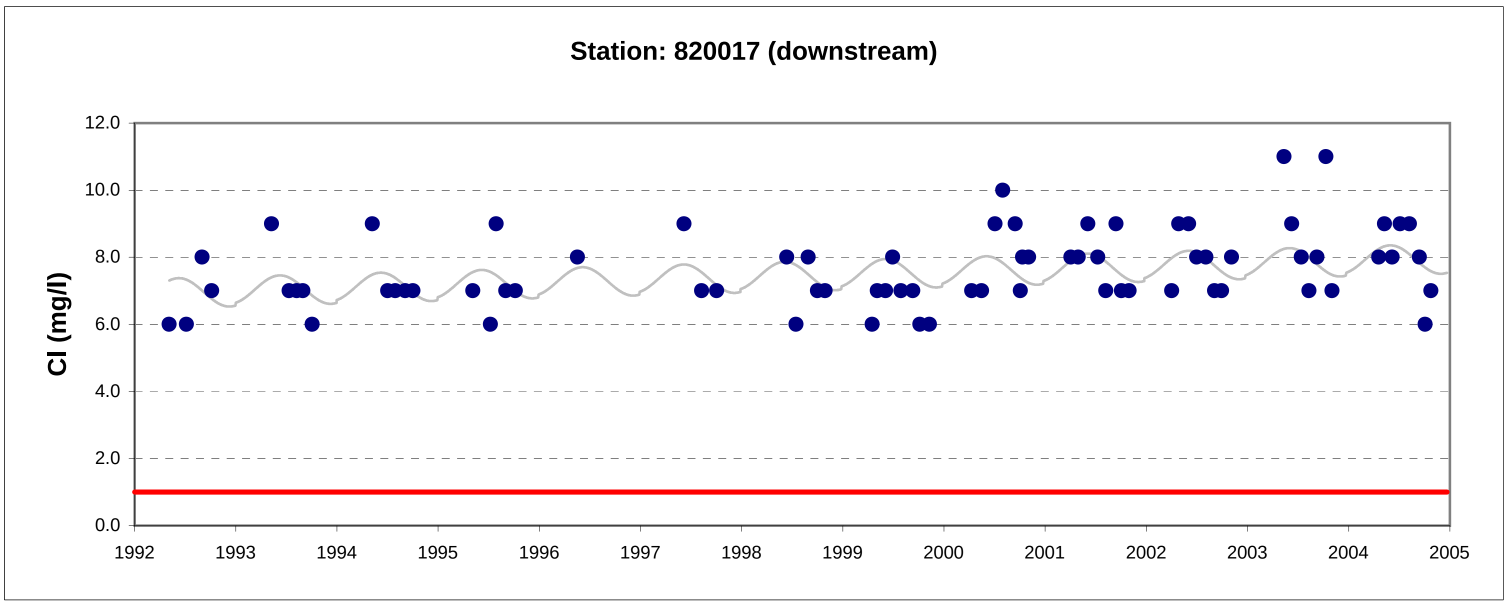
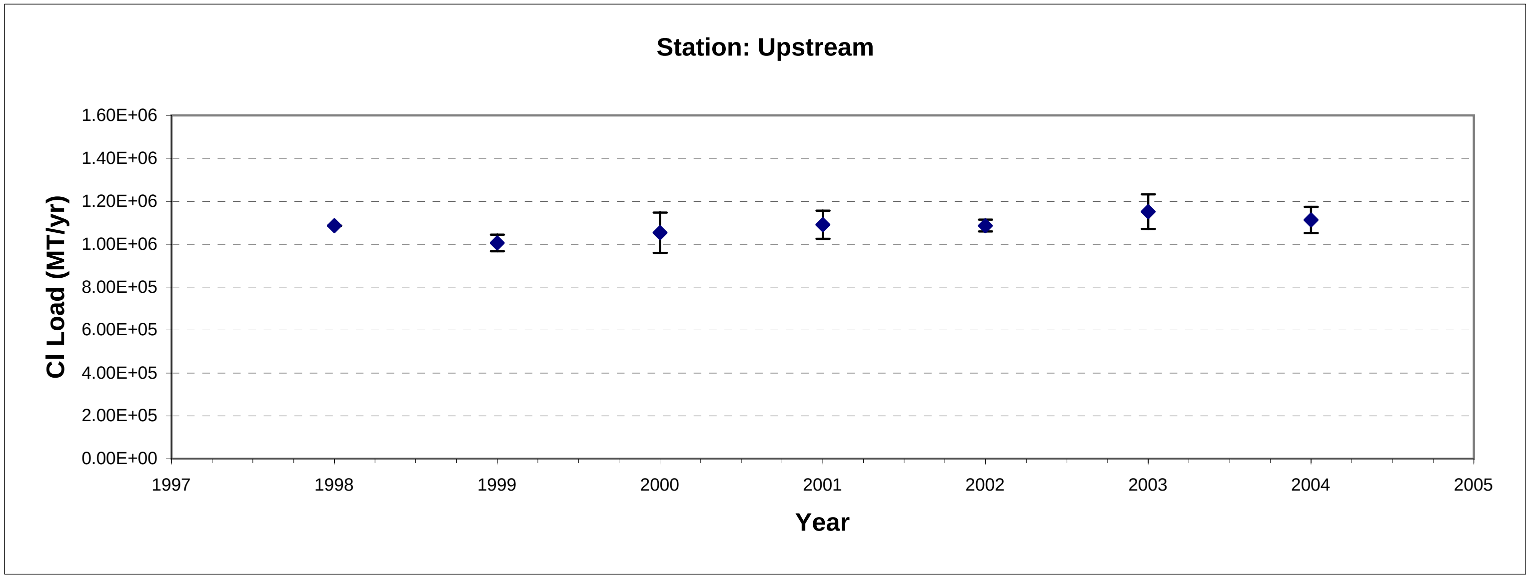


Figure 4-12. Detroit River - Chloride Concentration Time Series, 1992-2004. Grey Line is regression Model. Red Line is Quantification Limit.



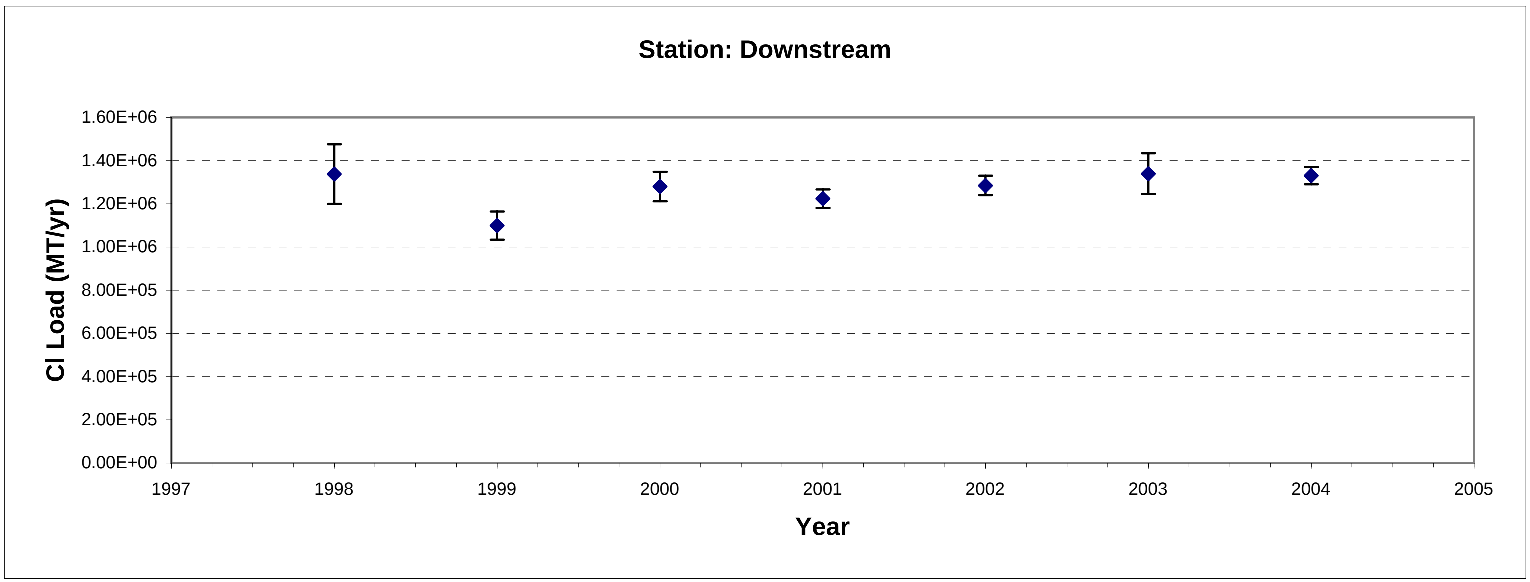
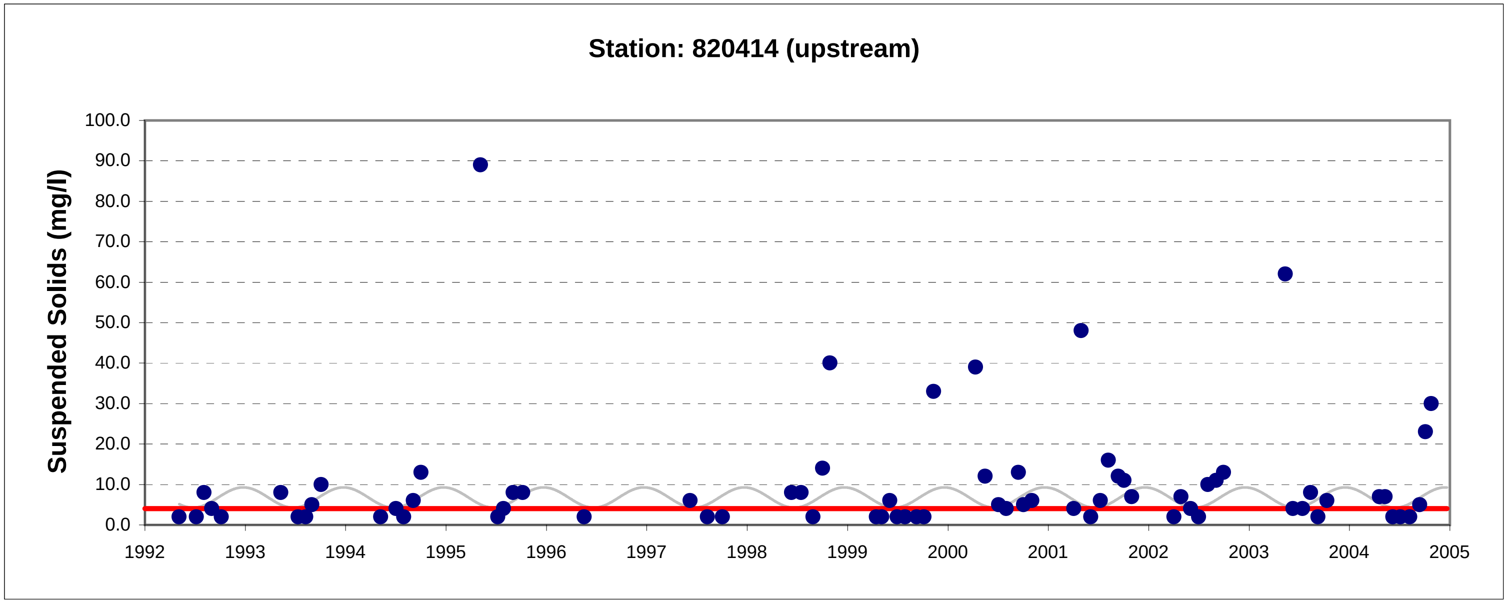


Figure 4-13. Temporal Variation in Chloride Load in the Detroit River. Diamonds are Means and Bars are 95% Confidence Intervals.



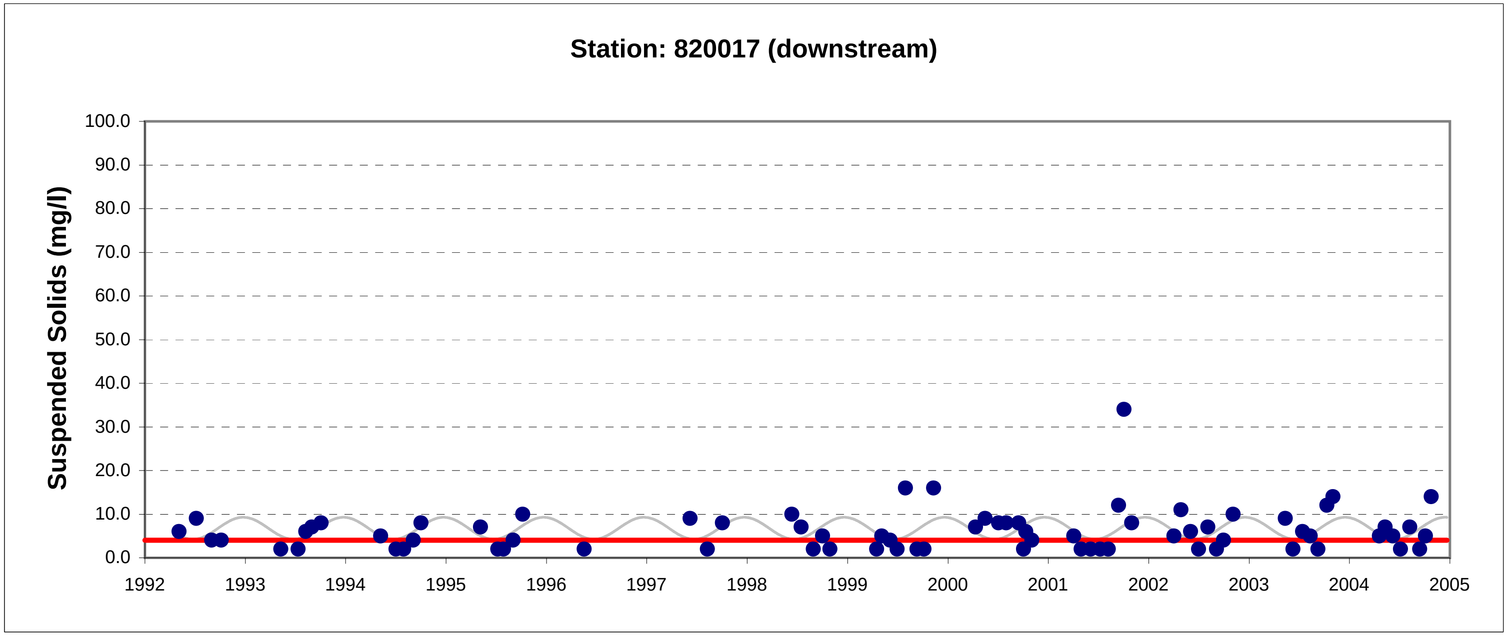


Figure 4-14. Detroit River - TSS Concentration Time Series, 1992-2004. Grey Line is Regression Model. Red Line is Quantification Limit.

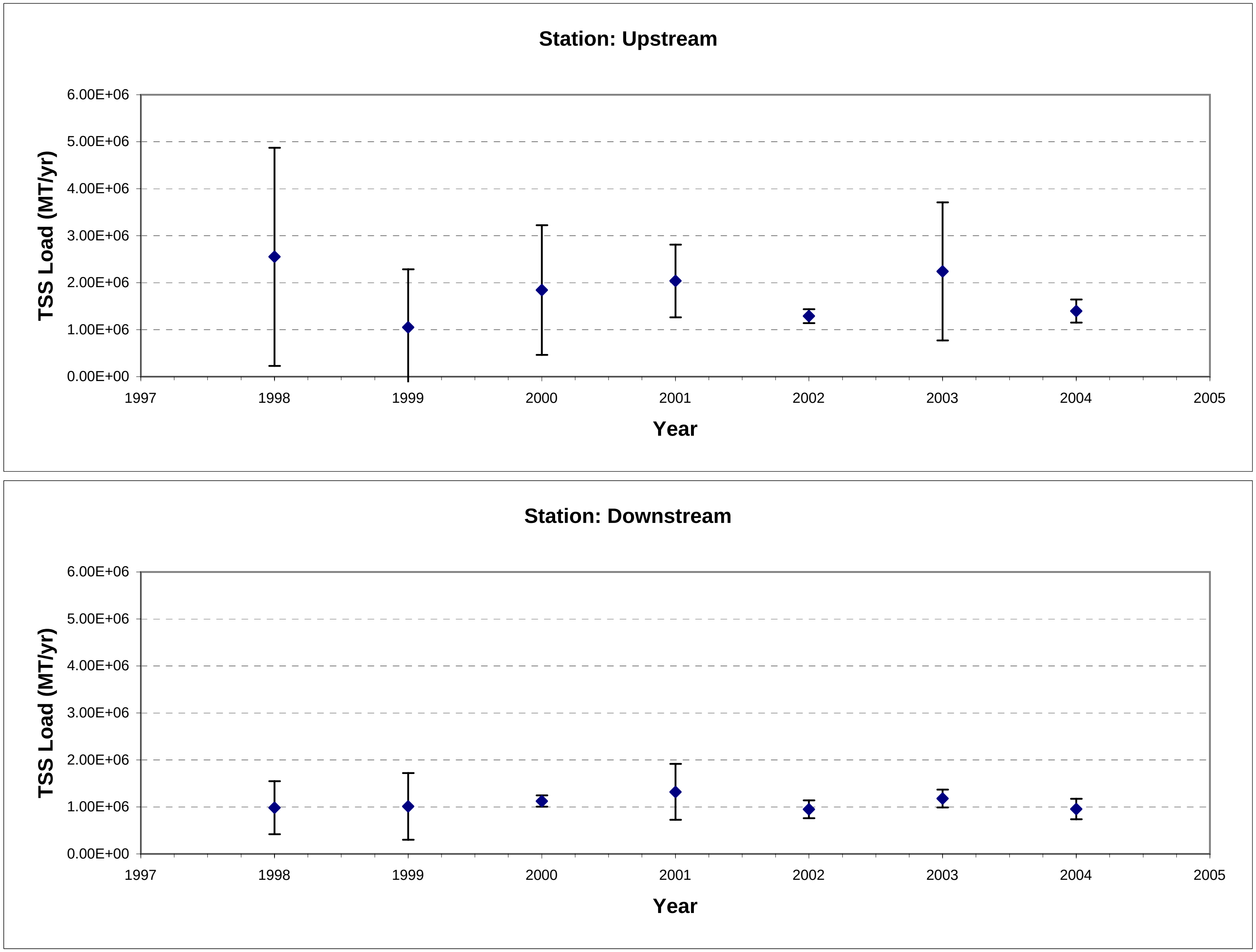


Figure 4-15. Temporal Variation in TSS Load in the Detroit River. Diamonds are Means and Bars are 95% Confidence Intervals.

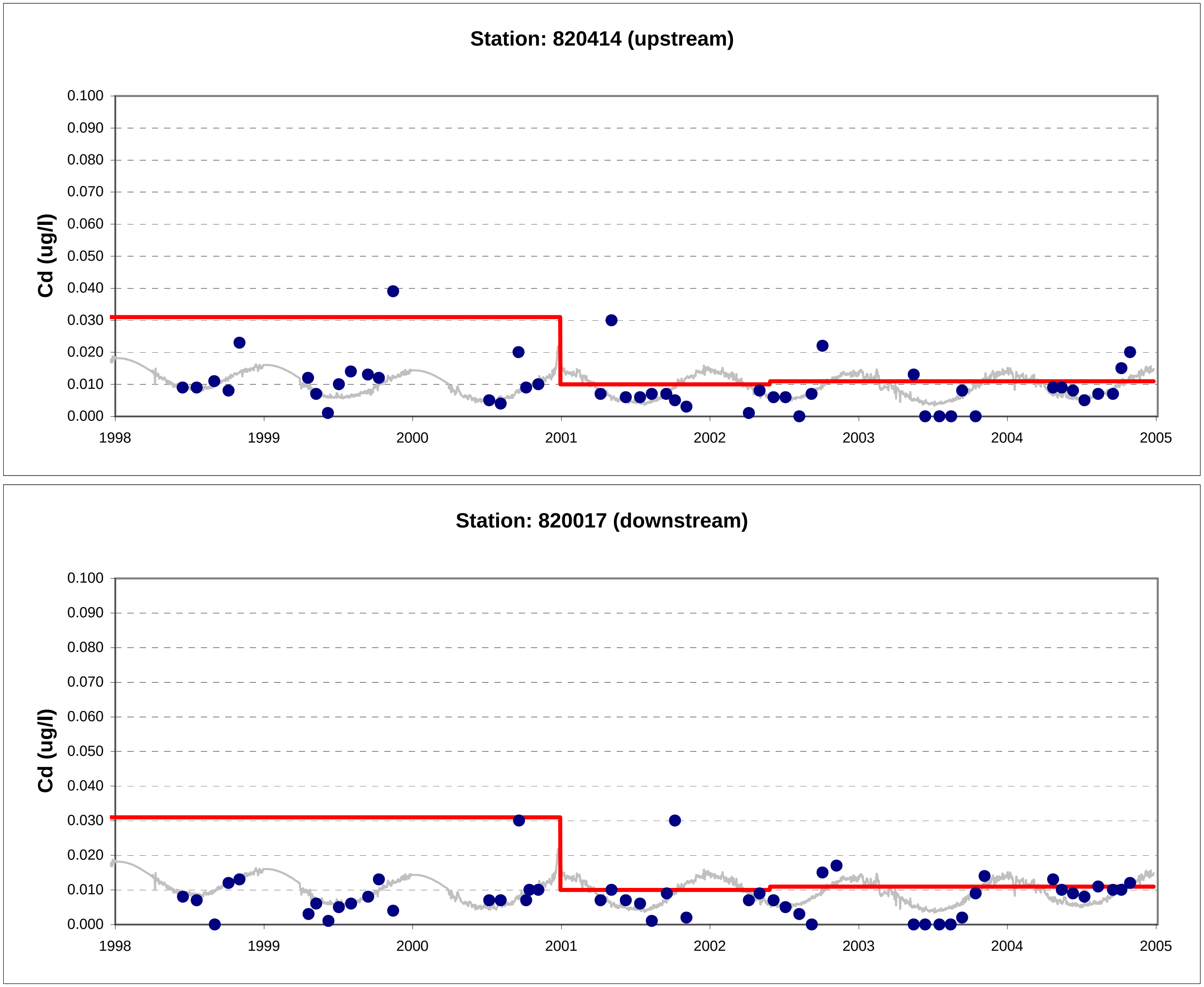
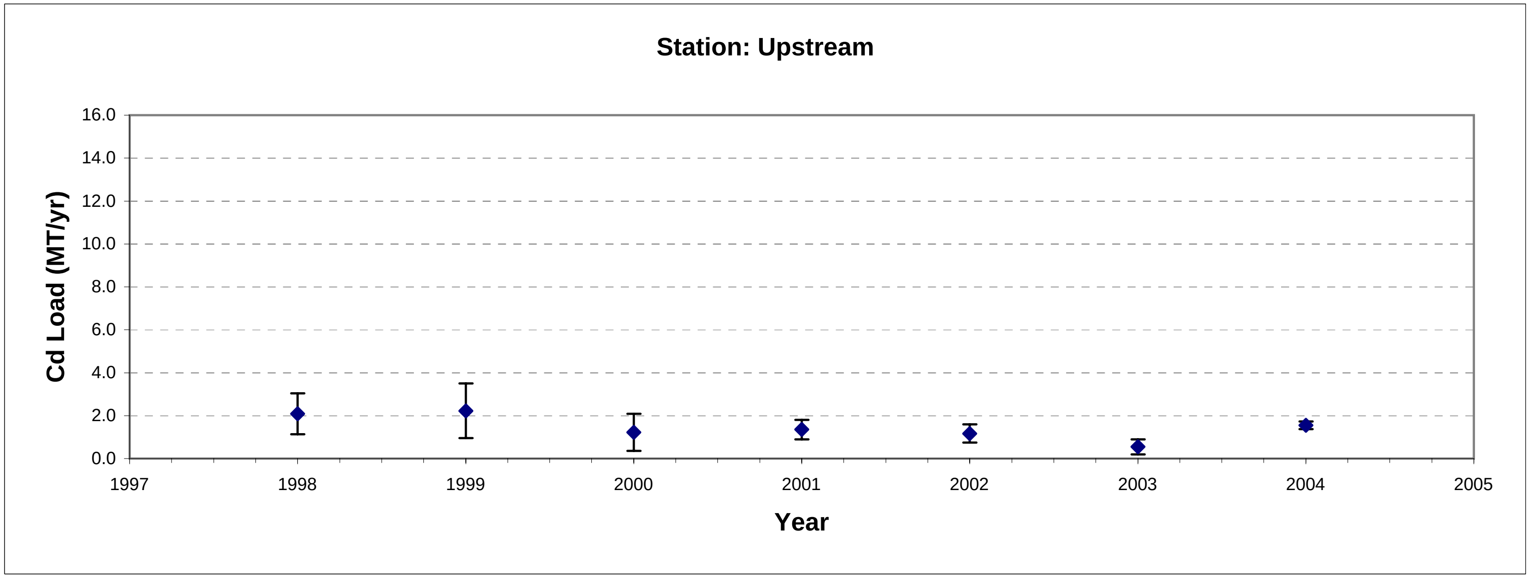


Figure 4-16. Detroit River - Cadmium Concentration Time Series, 1998-2004. Grey Line is Regression Model. Red Line is Quantification Limit.



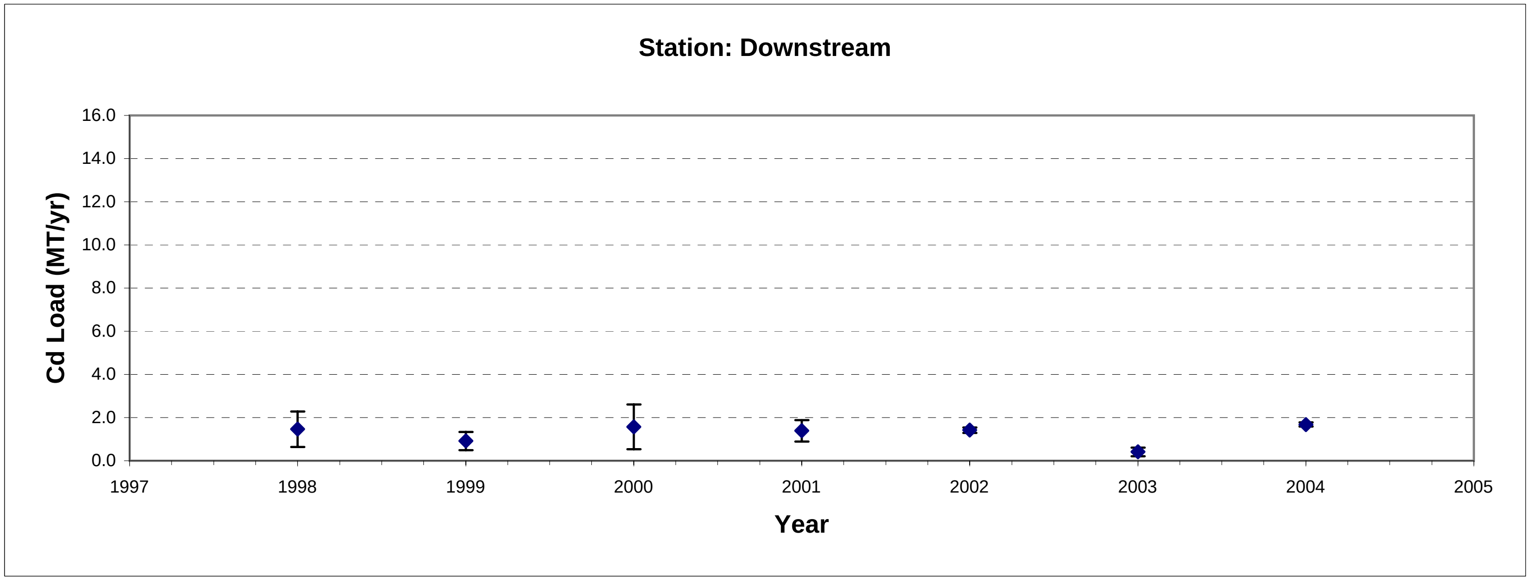
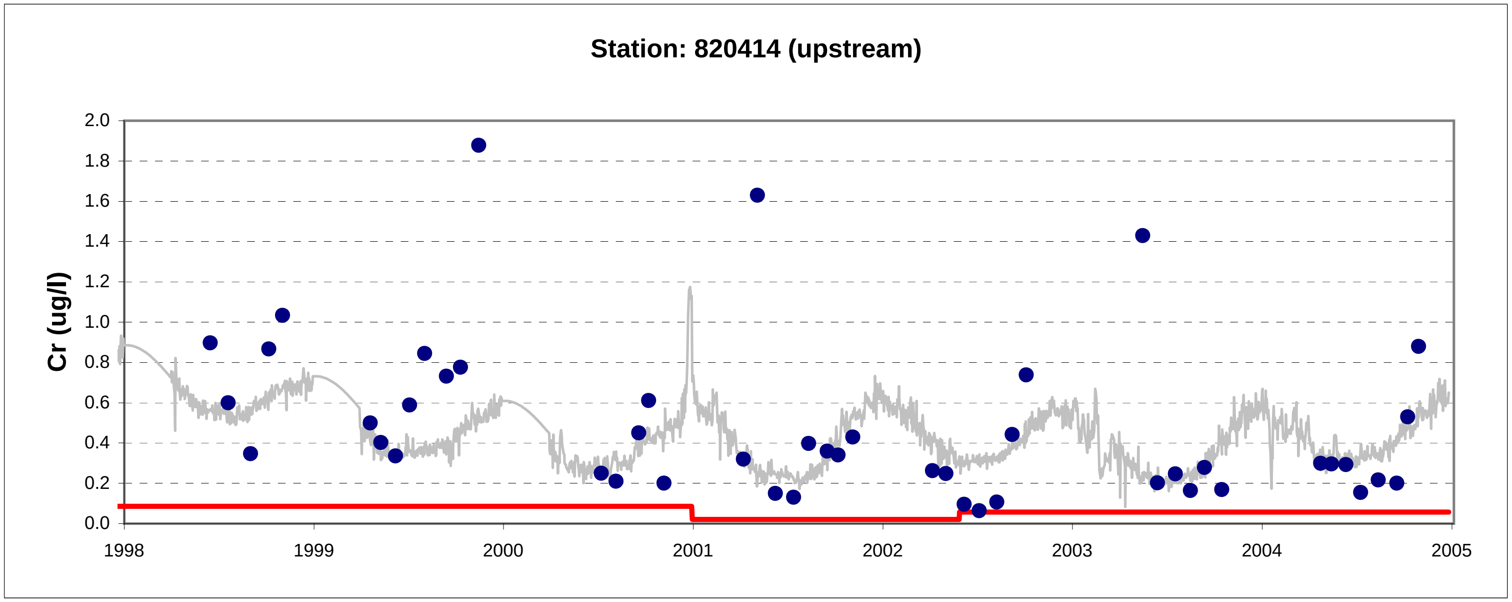


Figure 4-17. Temporal Variation in Cadmium Load in the Detroit River. Diamonds are Means and Bars are 95% Confidence Intervals.



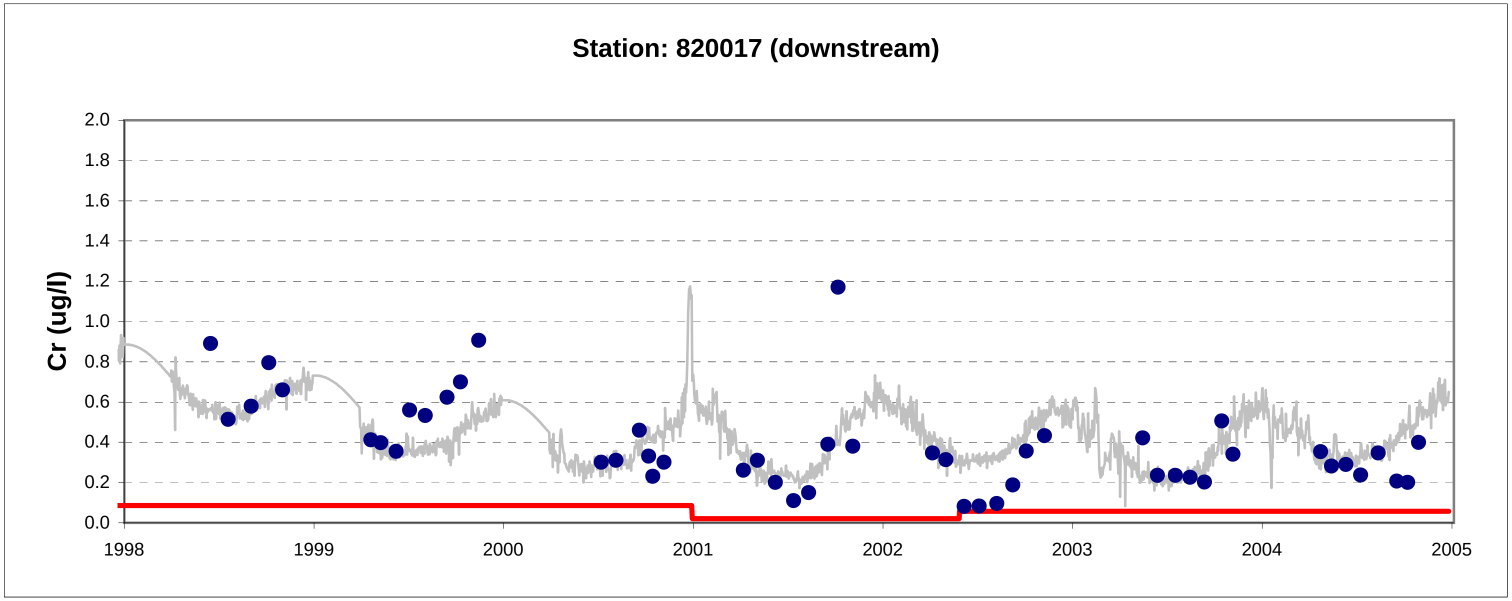
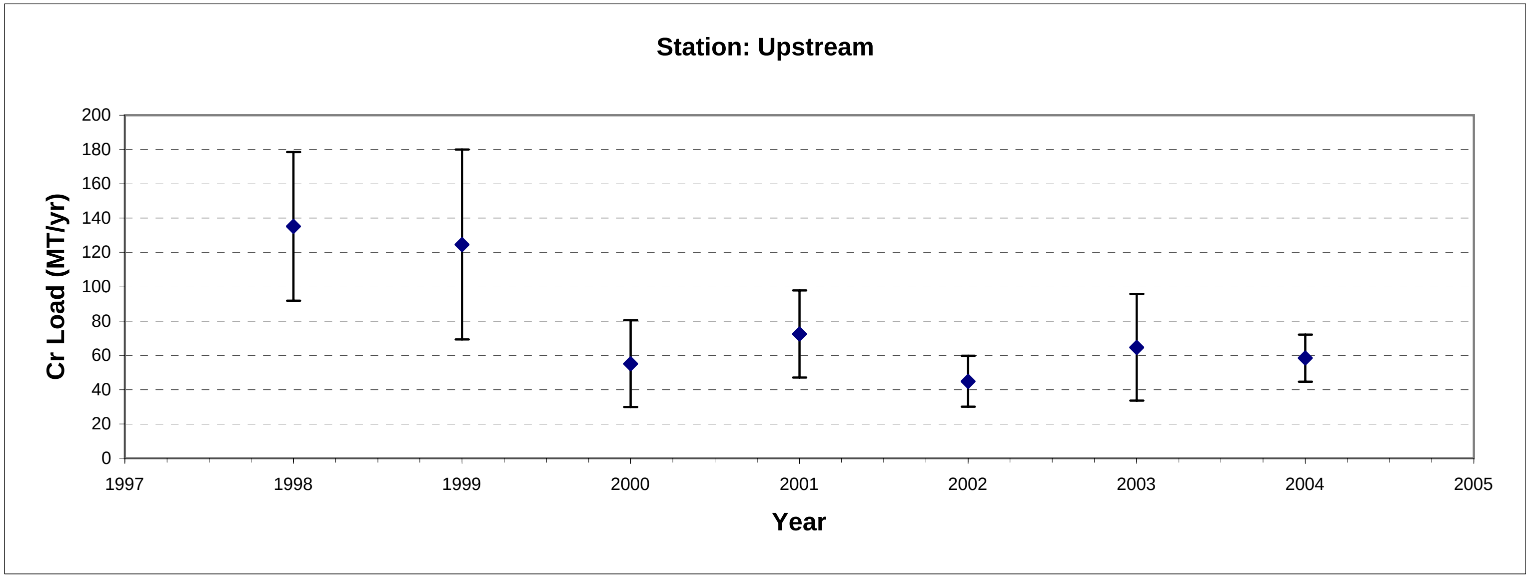


Figure 4-18. Detroit River - Chromium Concentration Time Series, 1998-2004. Grey Line is Regression Model. Red Line is Quantification Limit.



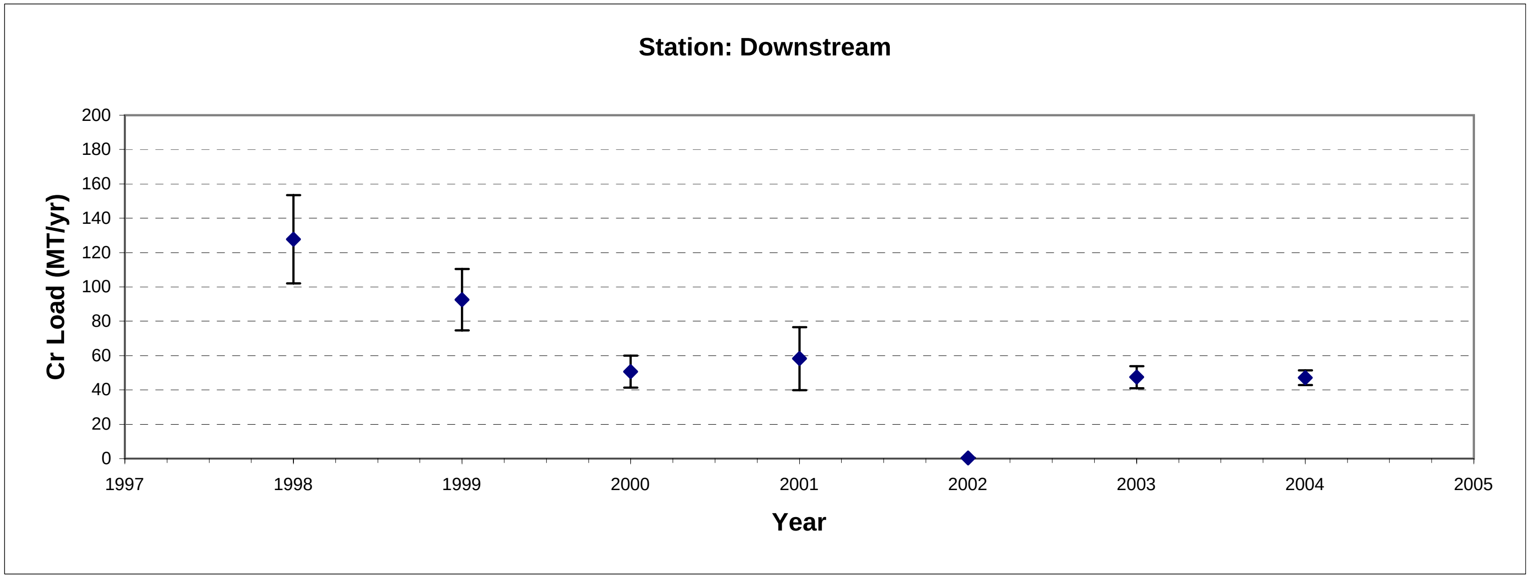


Figure 4-19. Temporal Variation in Chromium Load in the Detroit River.
Diamonds are Means and Bars are 95% Confidence Intervals.

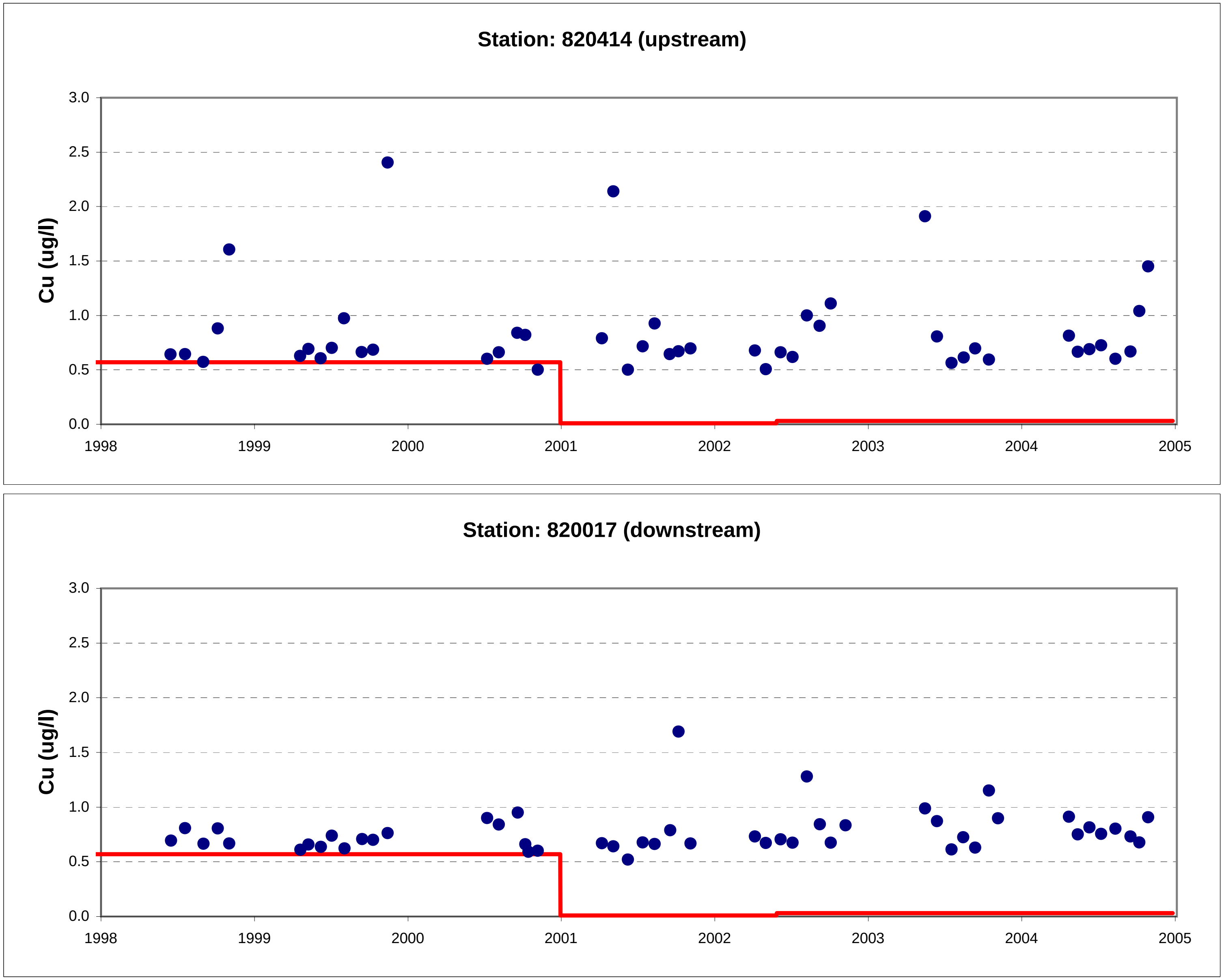


Figure 4-20. Detroit River - Copper Concentration Time Series, 1998-2004. Red Line is Quantification Limit.

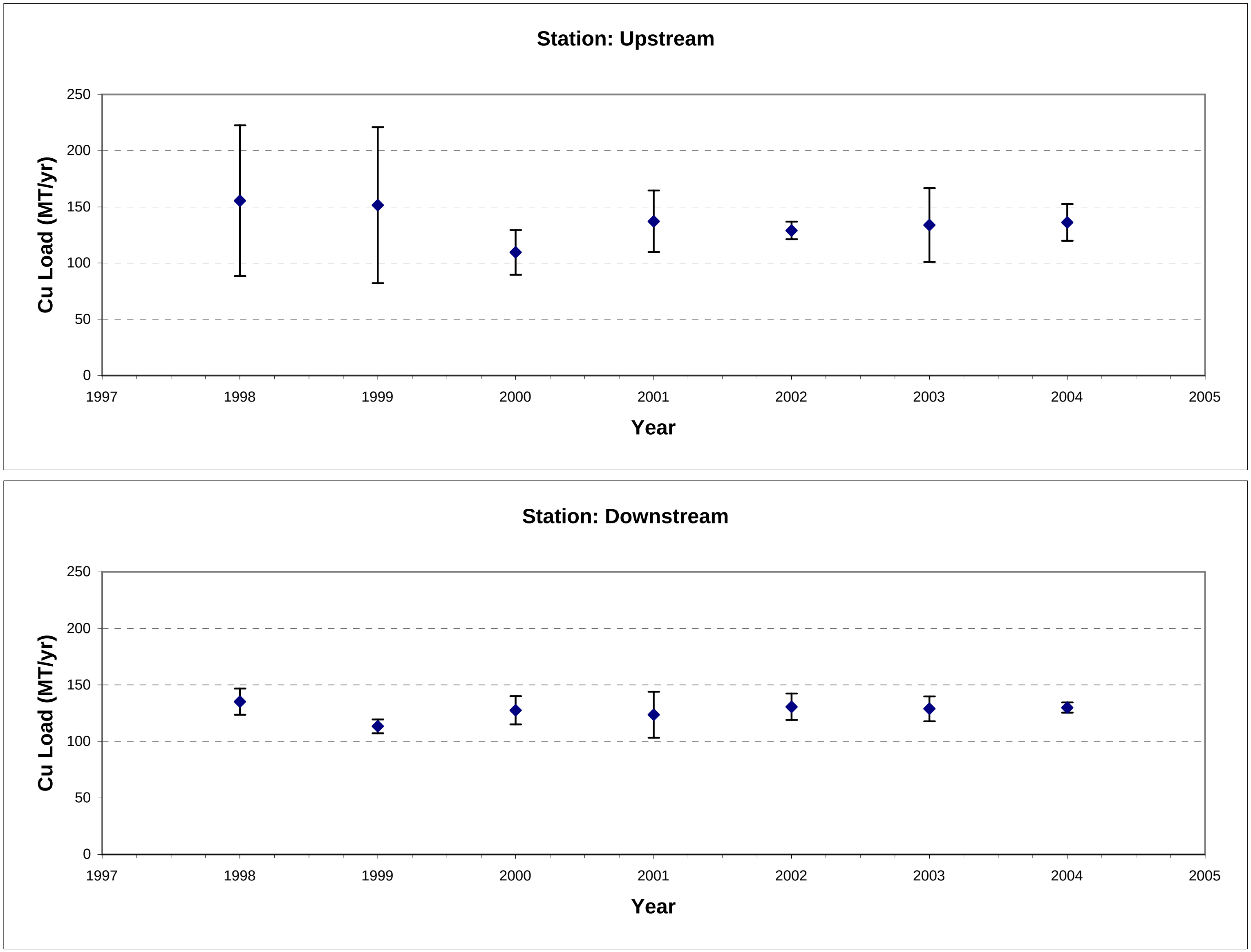
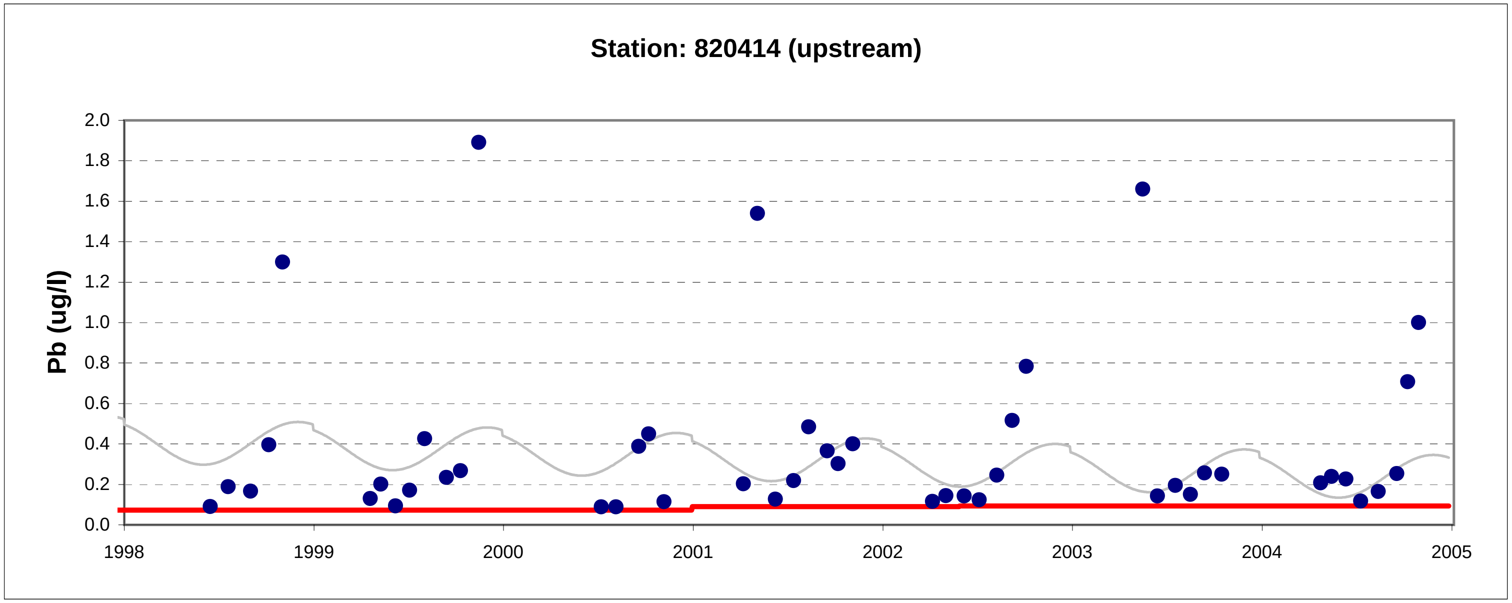


**Figure 4-21. Temporal Variation in Copper Load in the Detroit River.
Diamonds are Means and Bars are 95% Confidence Intervals.**



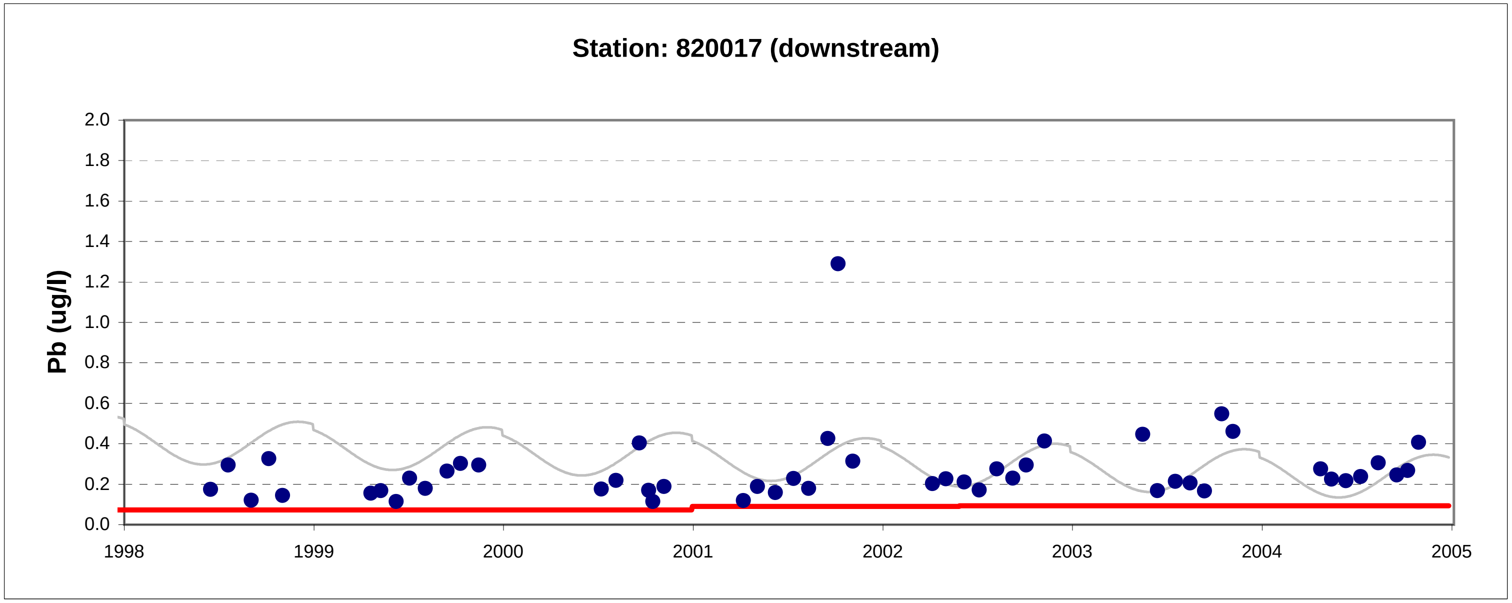


Figure 4-22. Detroit River - Lead Concentration Time Series, 1998-2004. Grey Line is Regression Model. Red Line is Quantification Limit.

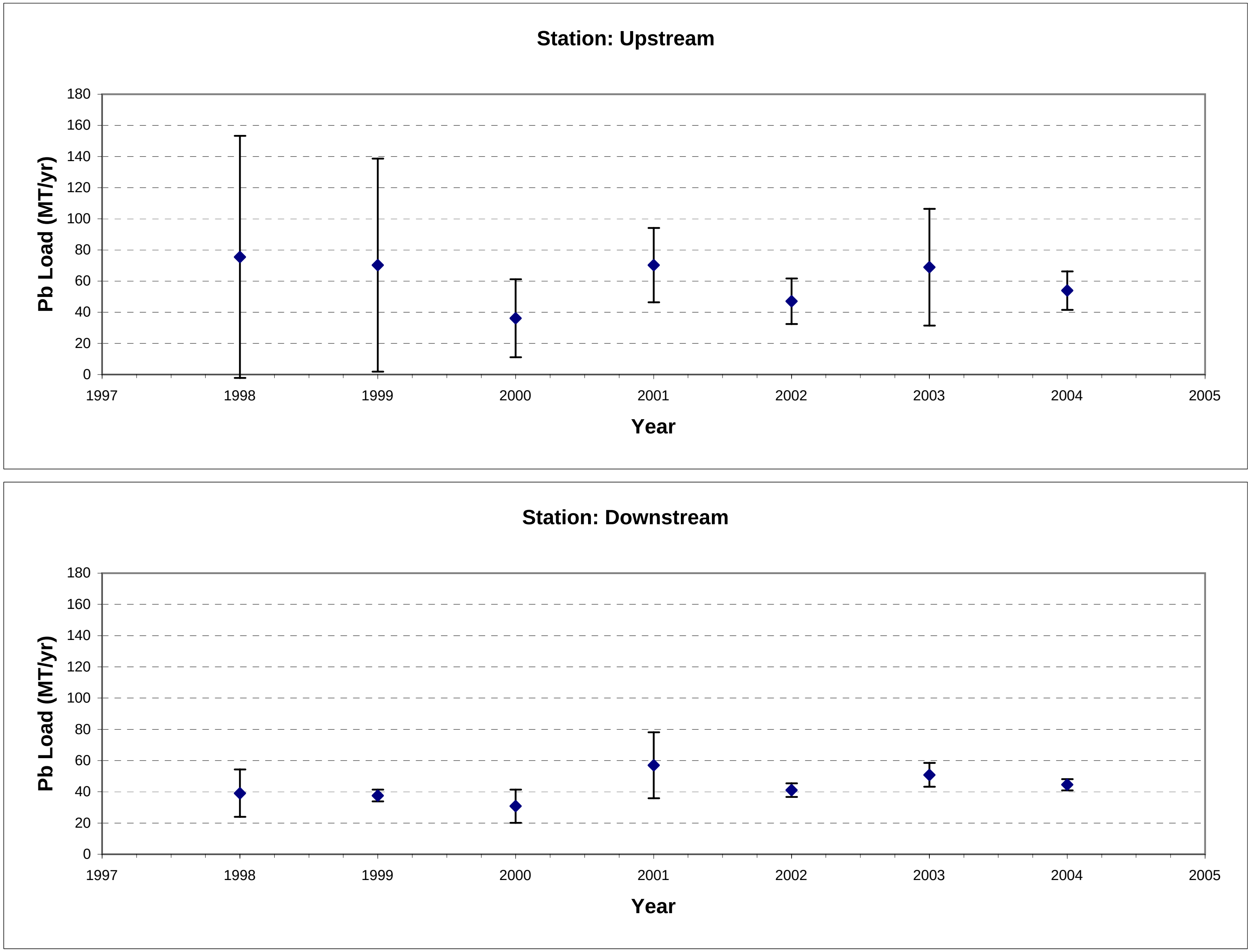
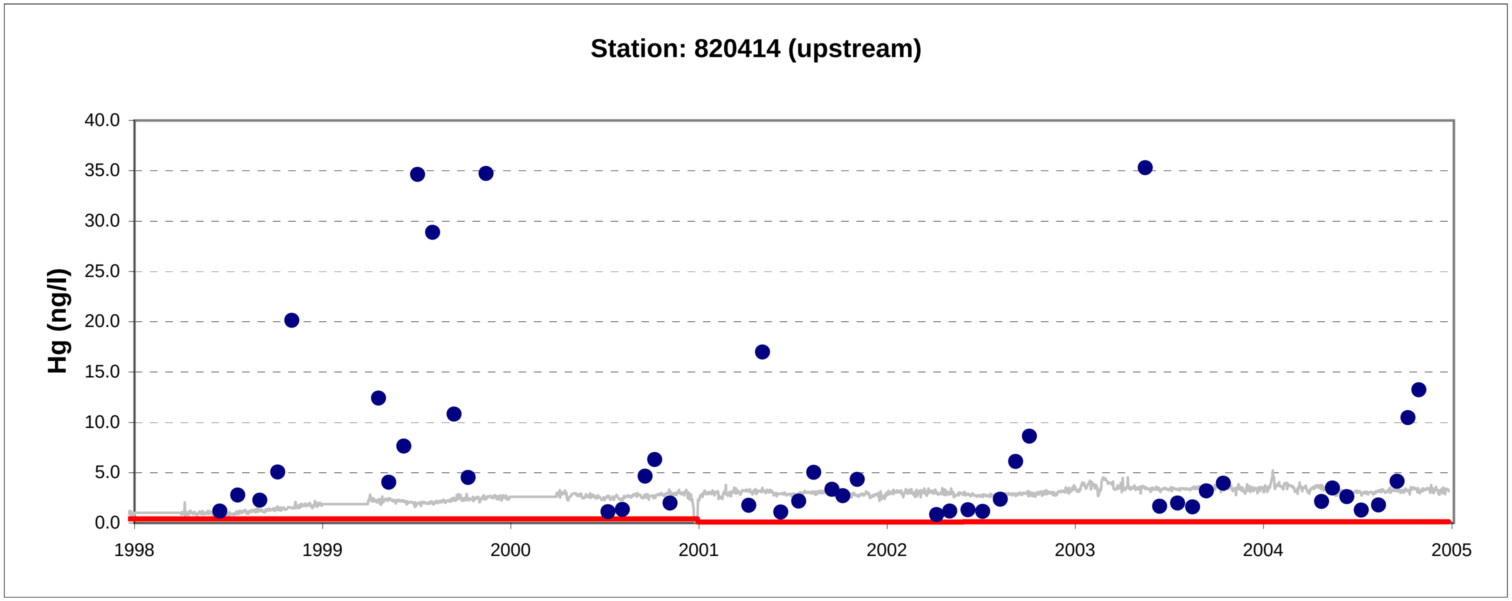


Figure 4-23. Temporal Variation in Lead Load in the Detroit River. Diamonds are Means and Bars are 95% Confidence Intervals.



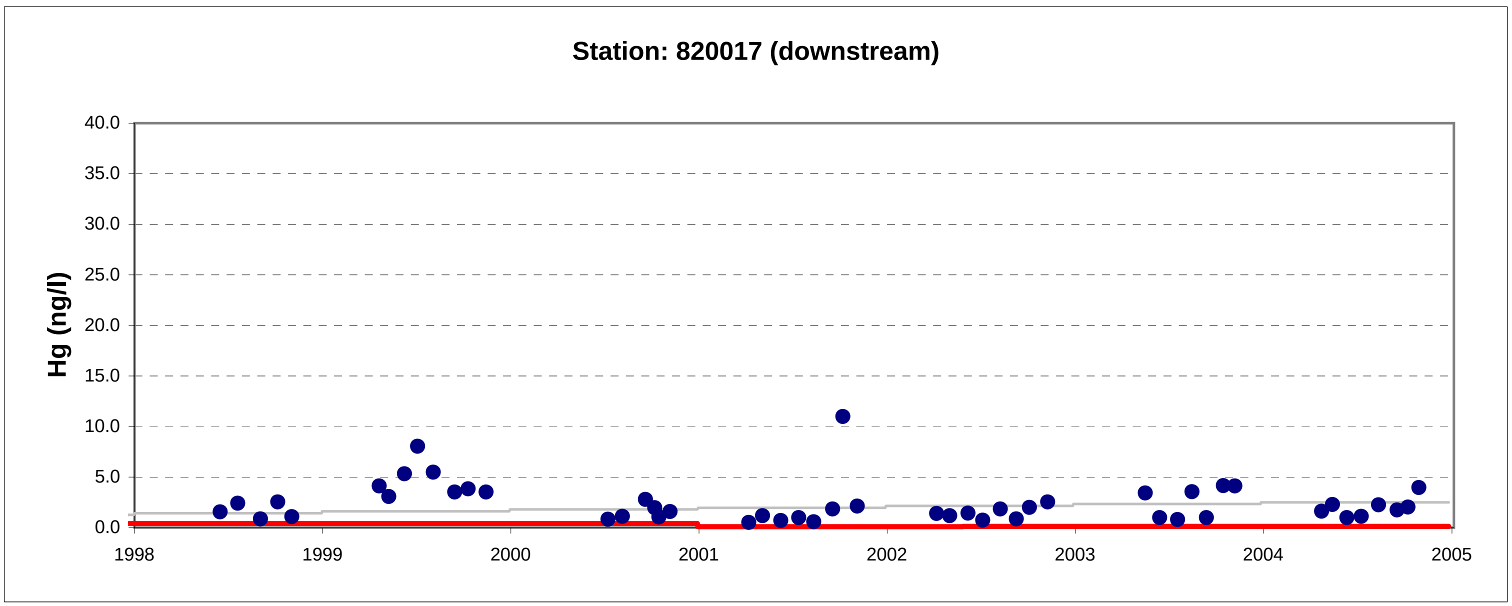
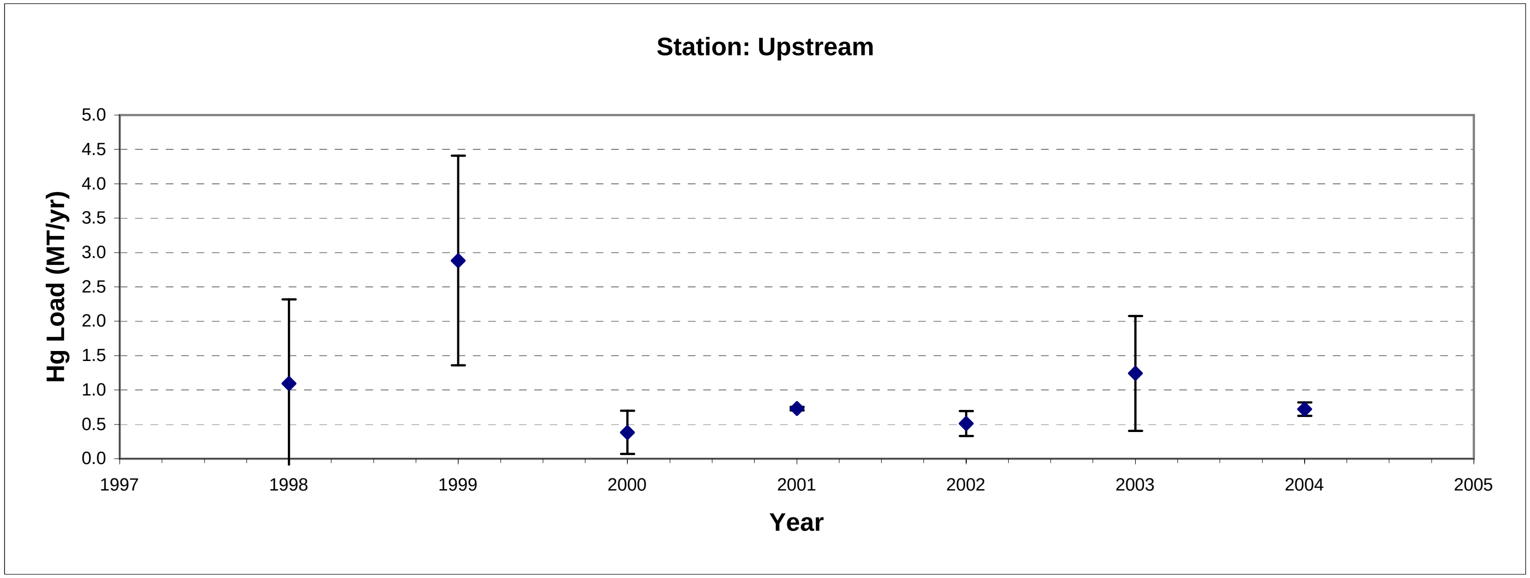


Figure 4-24. Detroit River - Mercury Concentration Time Series, 1998-2004. Grey Line is Regression Model. Red Line is Quantification Limit.



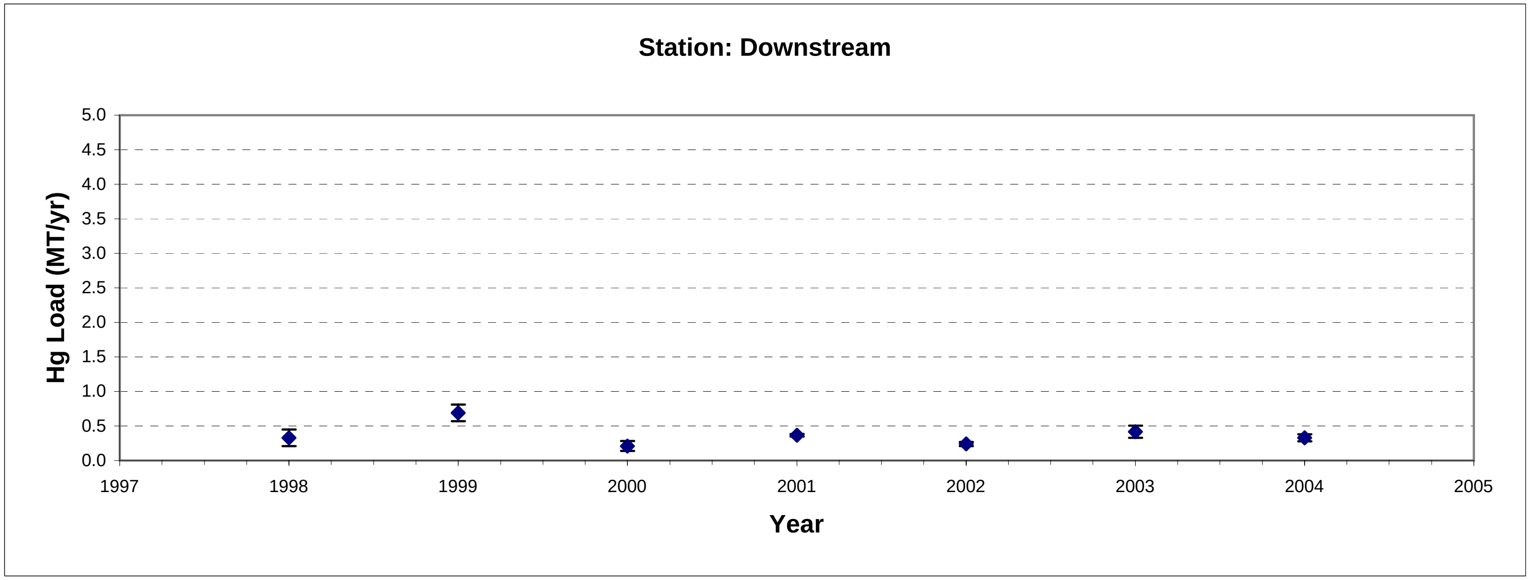
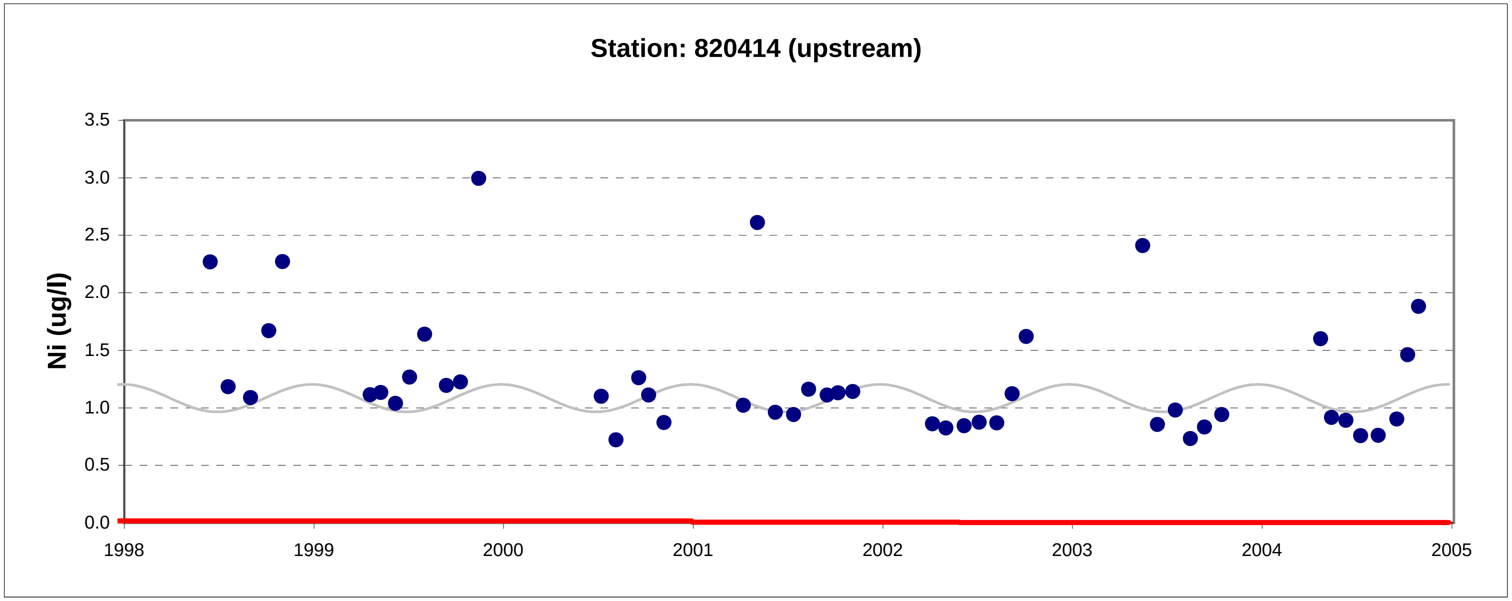


Figure 4-25. Temporal Variation in Mercury Load in the Detroit River. Diamonds are Means and Bars are 95% Confidence Intervals.



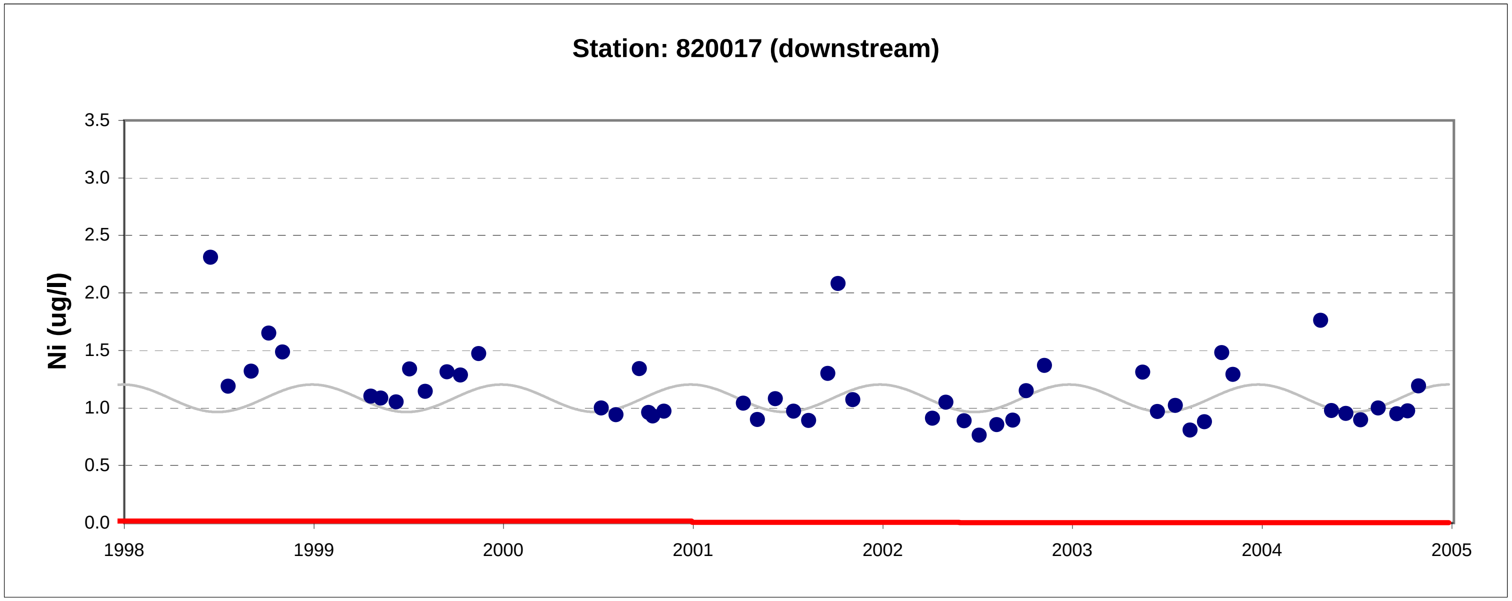
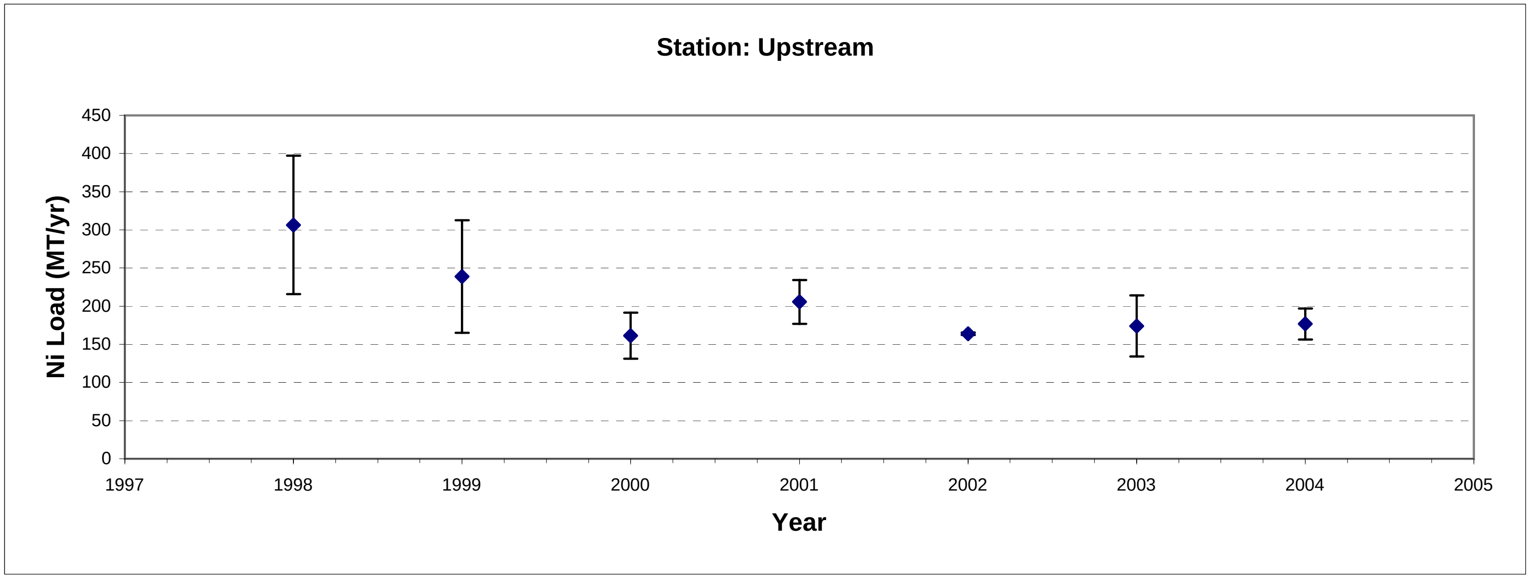


Figure 4-26. Detroit River - Nickel Concentration Time Series, 1998-2004. Grey Line is Regression Model. Red Line is Quantification Limit.



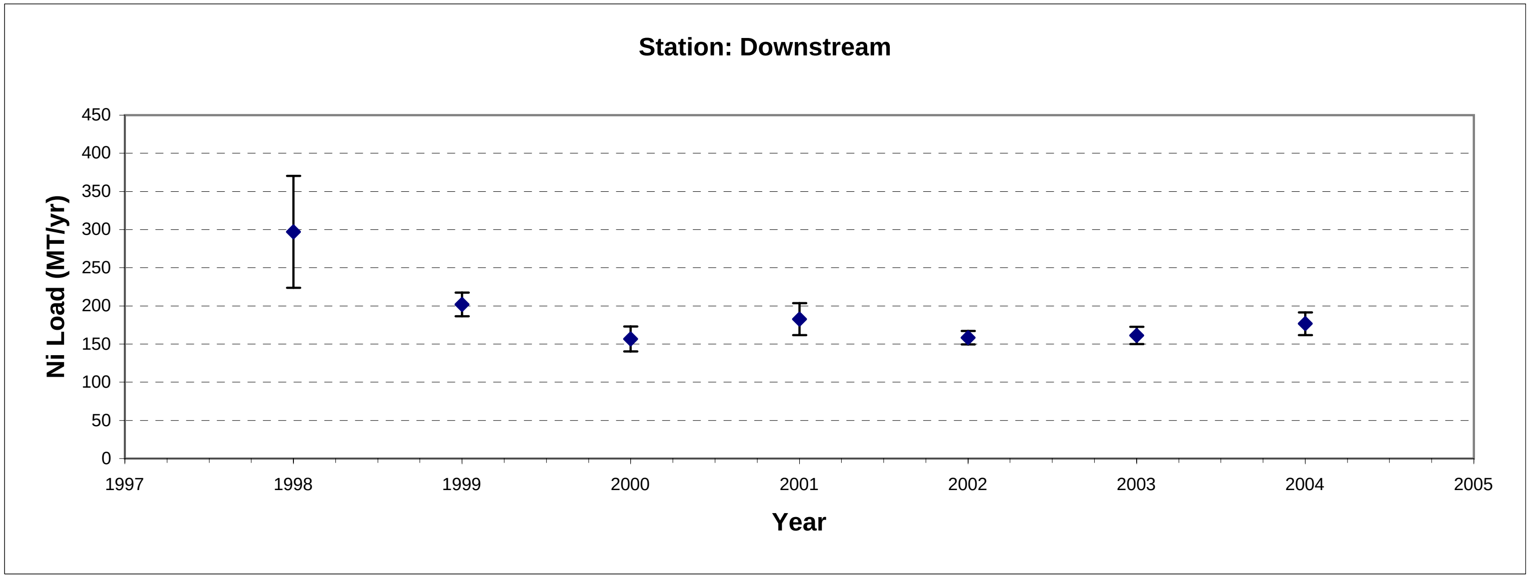
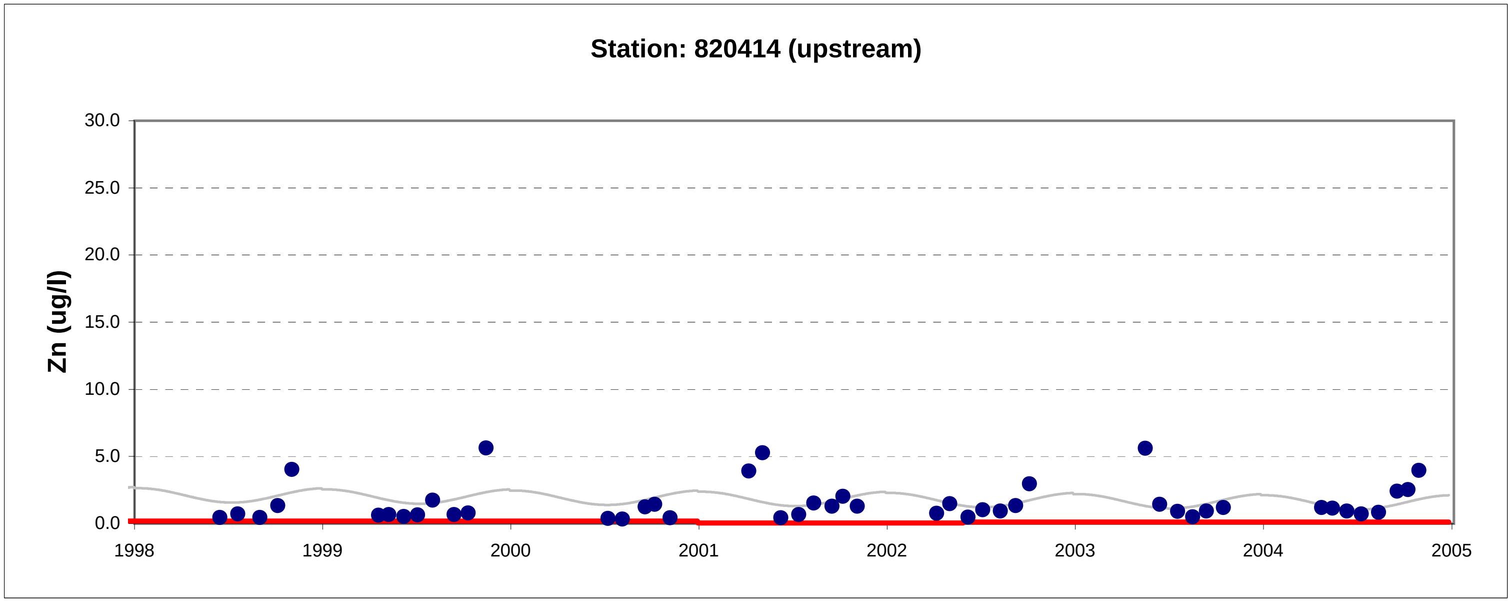


Figure 4-27. Temporal Variation in Nickel Load in the Detroit River. Diamonds are Means and Bars are 95% Confidence Intervals.



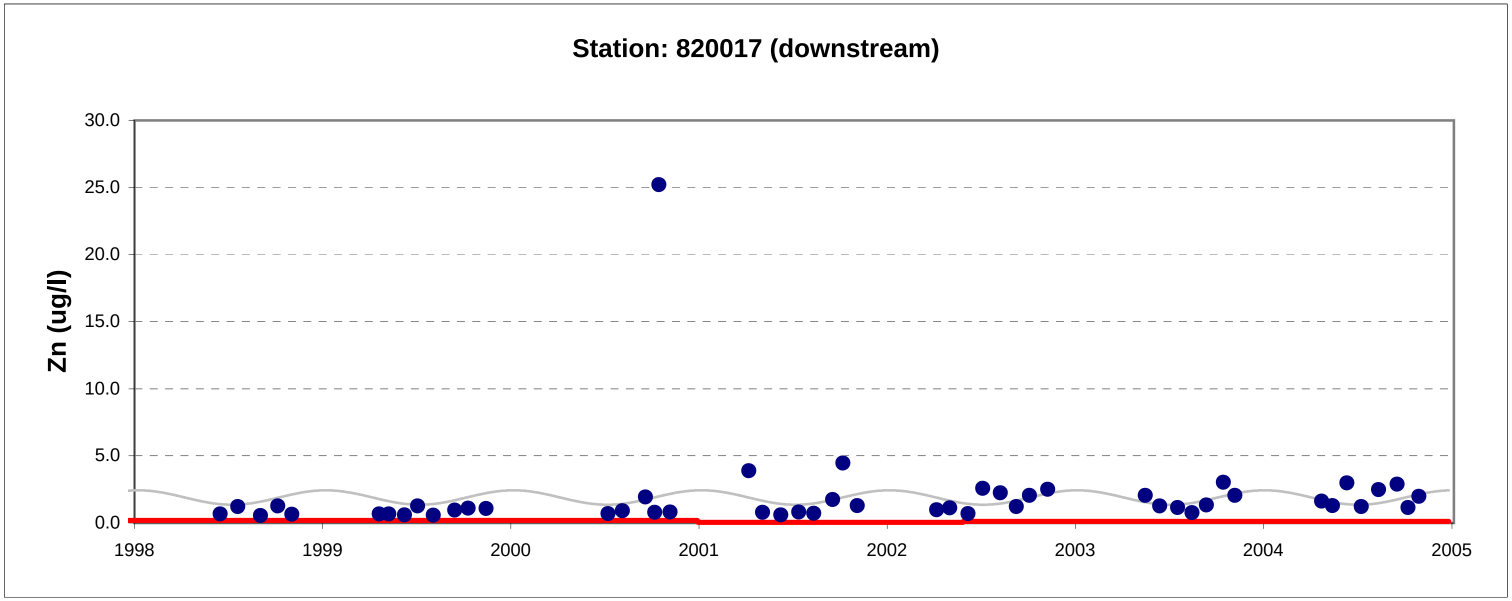
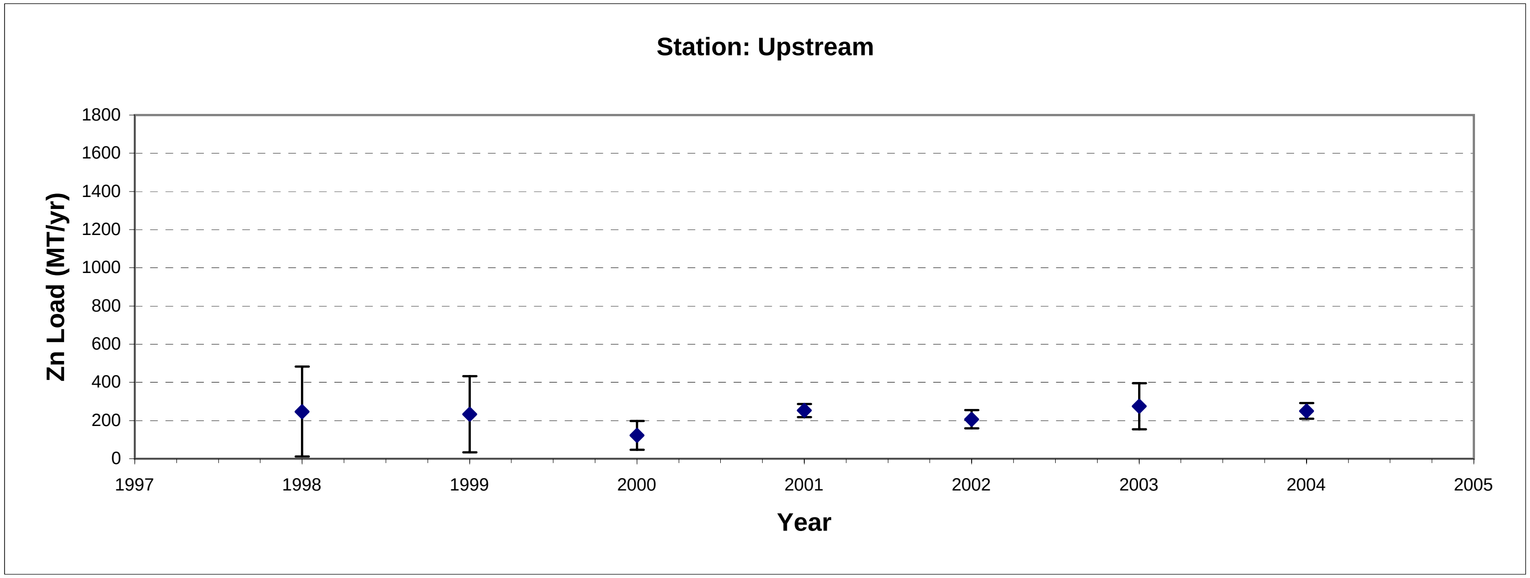


Figure 4-28. Detroit River - Zinc Concentration Time Series, 1998-2004. Grey Line is Regression Model. Red Line is Quantification Limit.



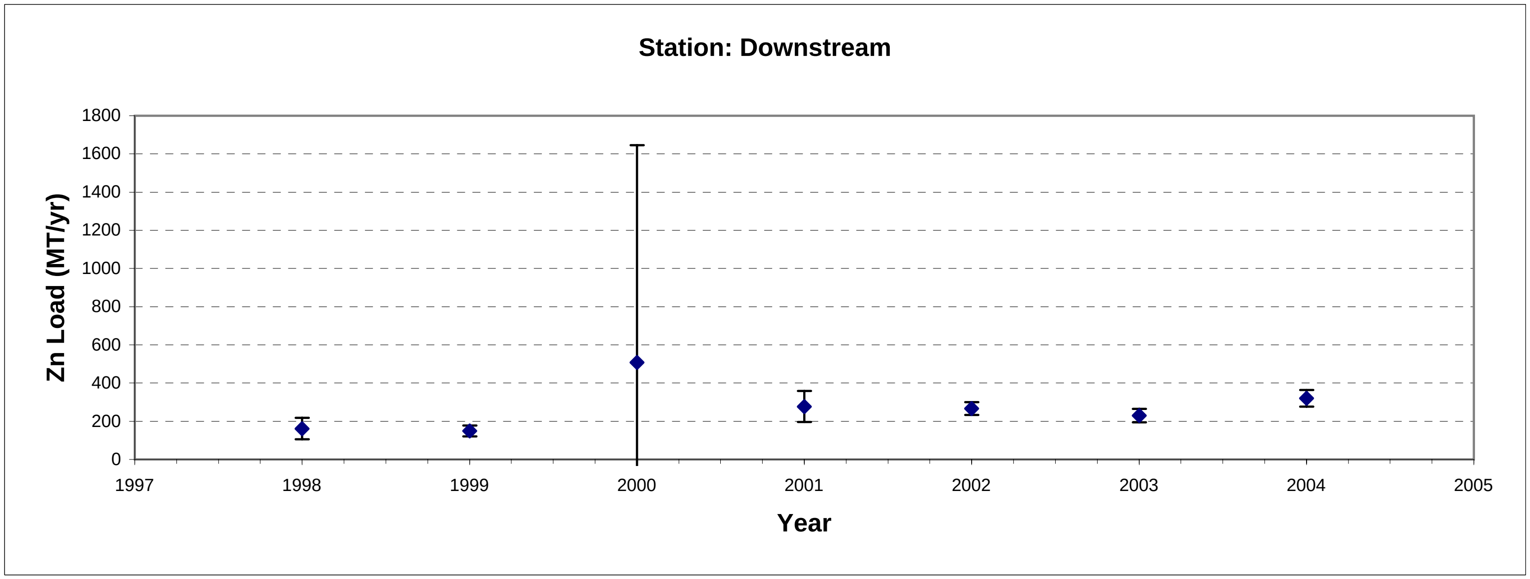
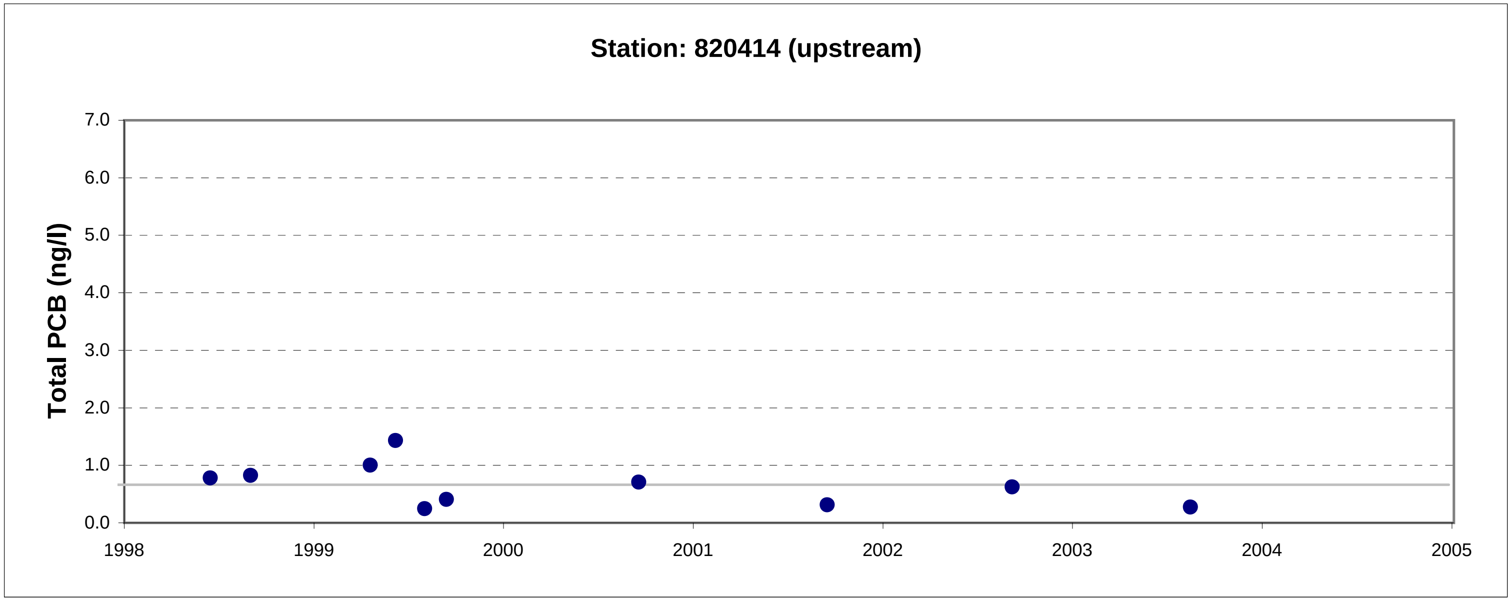


Figure 4-29. Temporal Variation in Zinc Load in the Detroit River. Diamonds are Means and Bars are 95% Confidence Intervals.



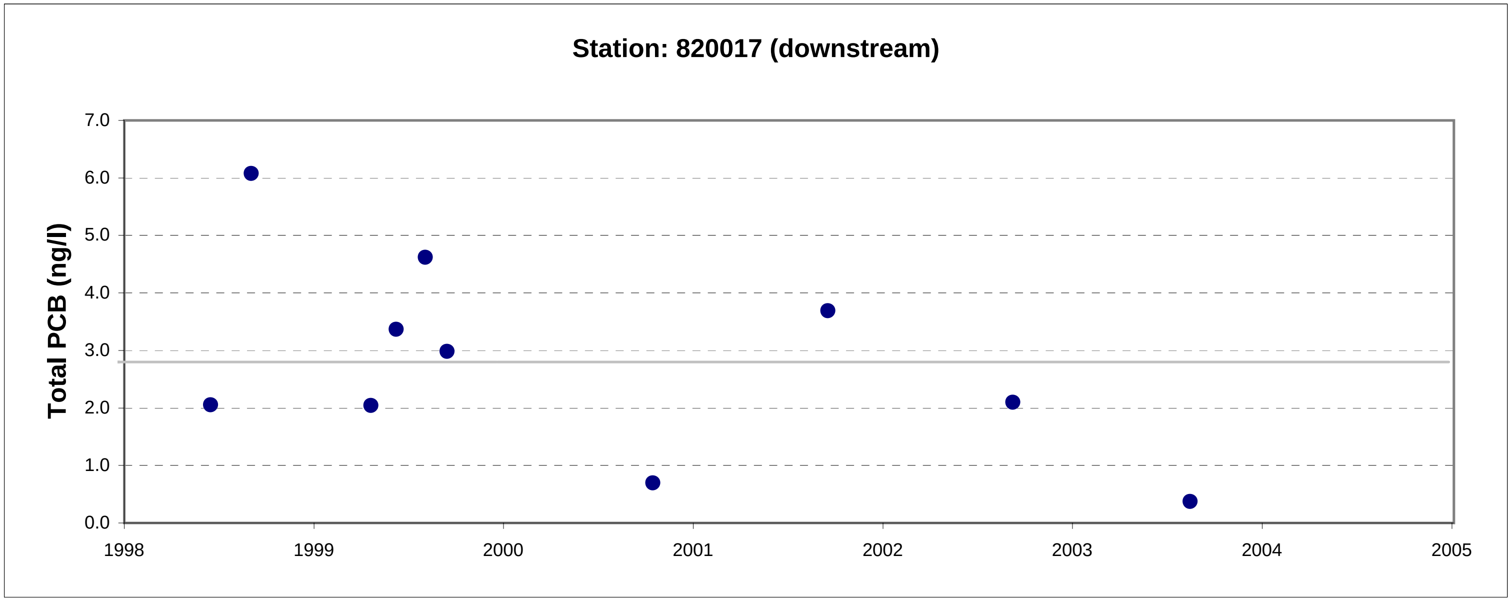
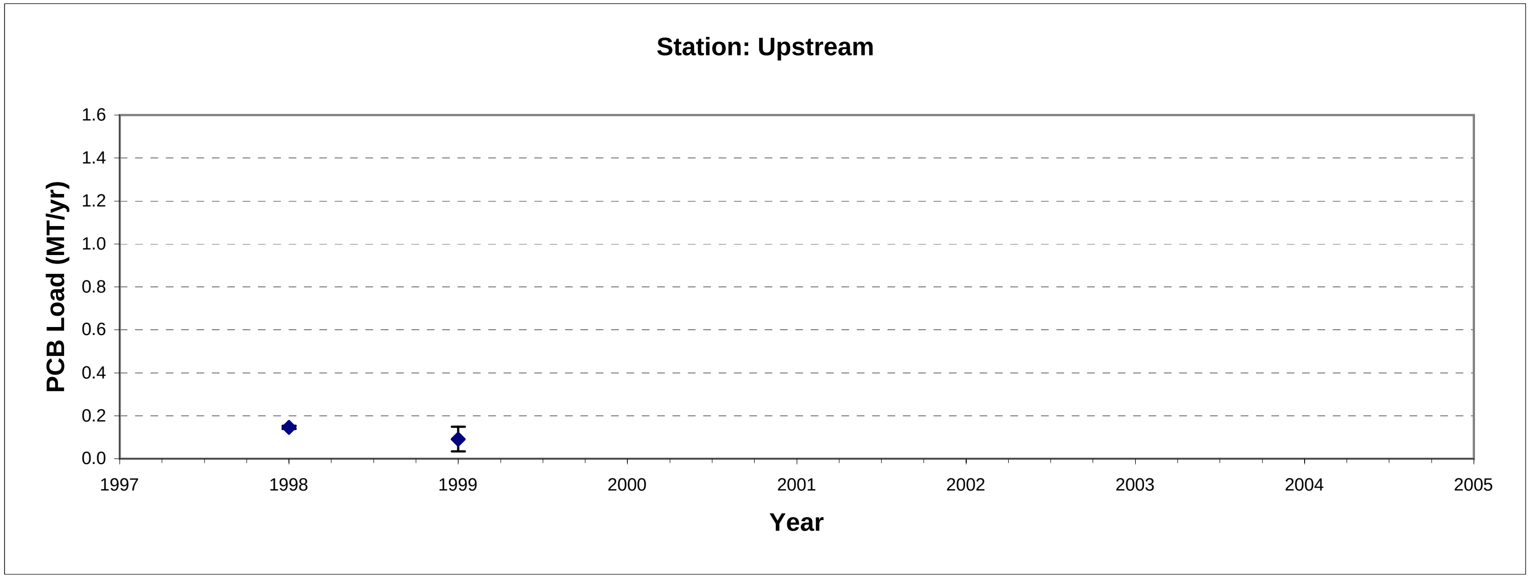


Figure 4-30. Detroit River - PCB Concentration Time Series, 1998-2004. Grey Line is Regression Model.



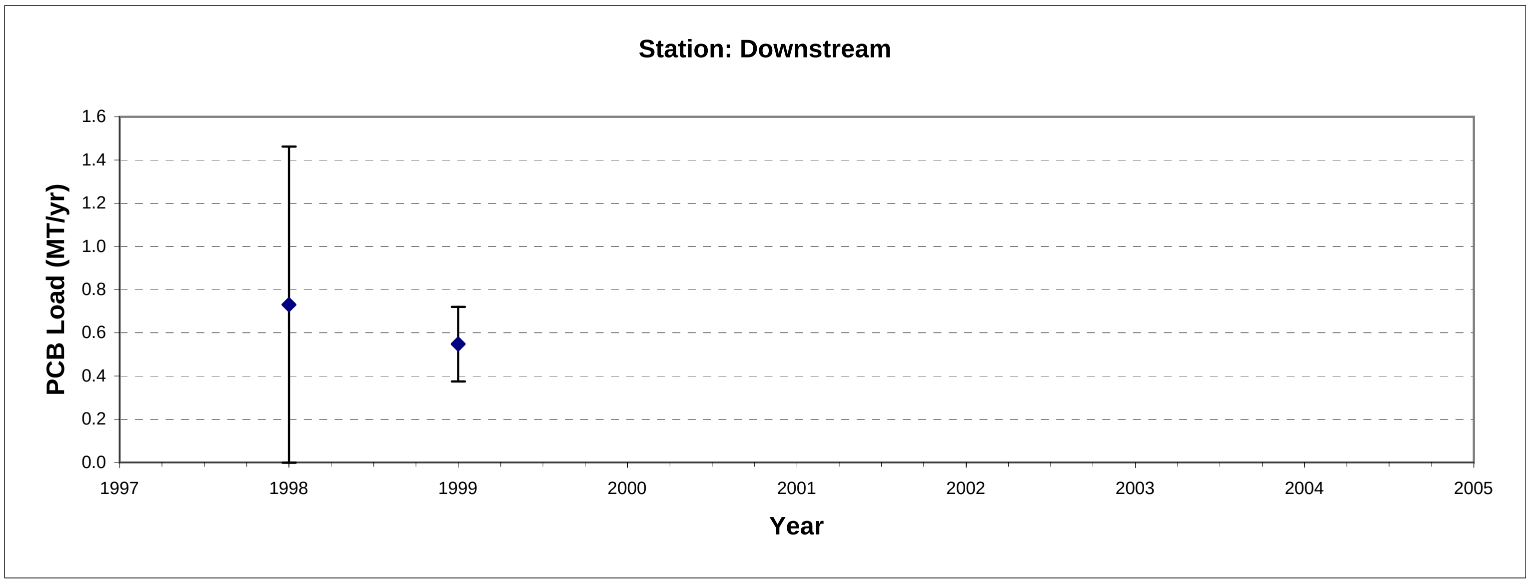
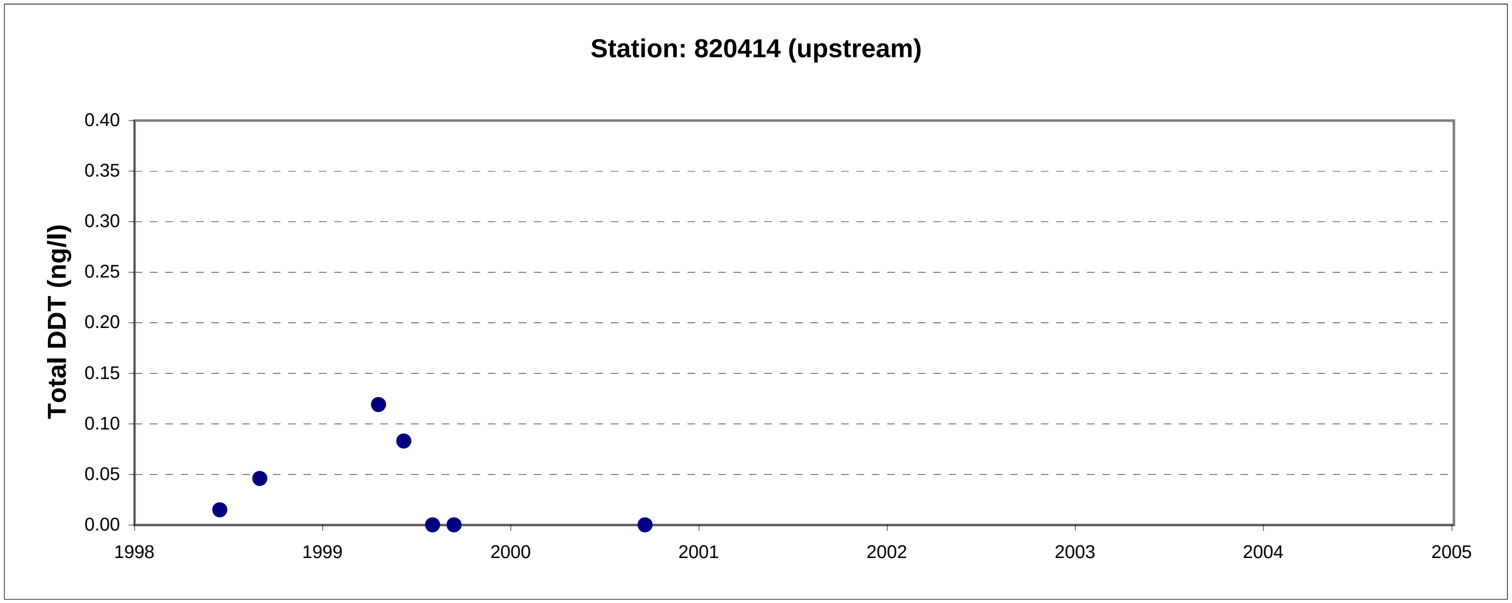


Figure 4-31. Temporal Variation in PCB Load in the Detroit River. Diamonds are Means and Bars are 95% Confidence Intervals.



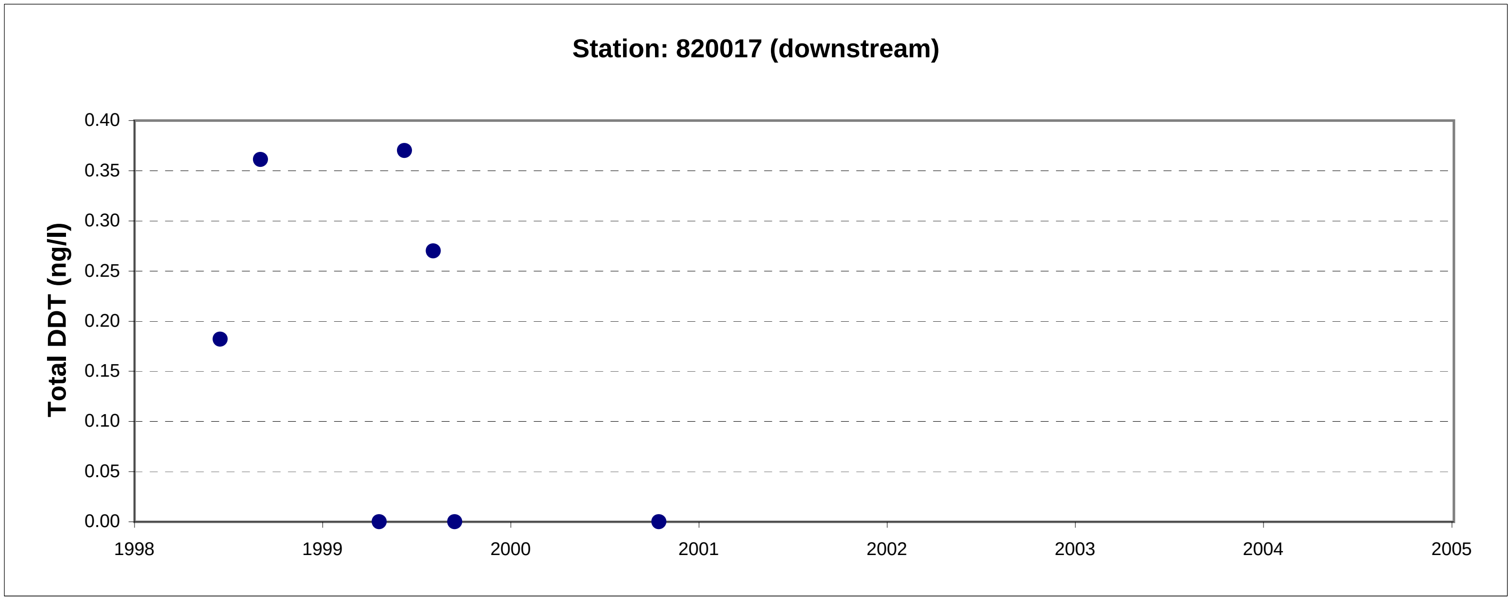
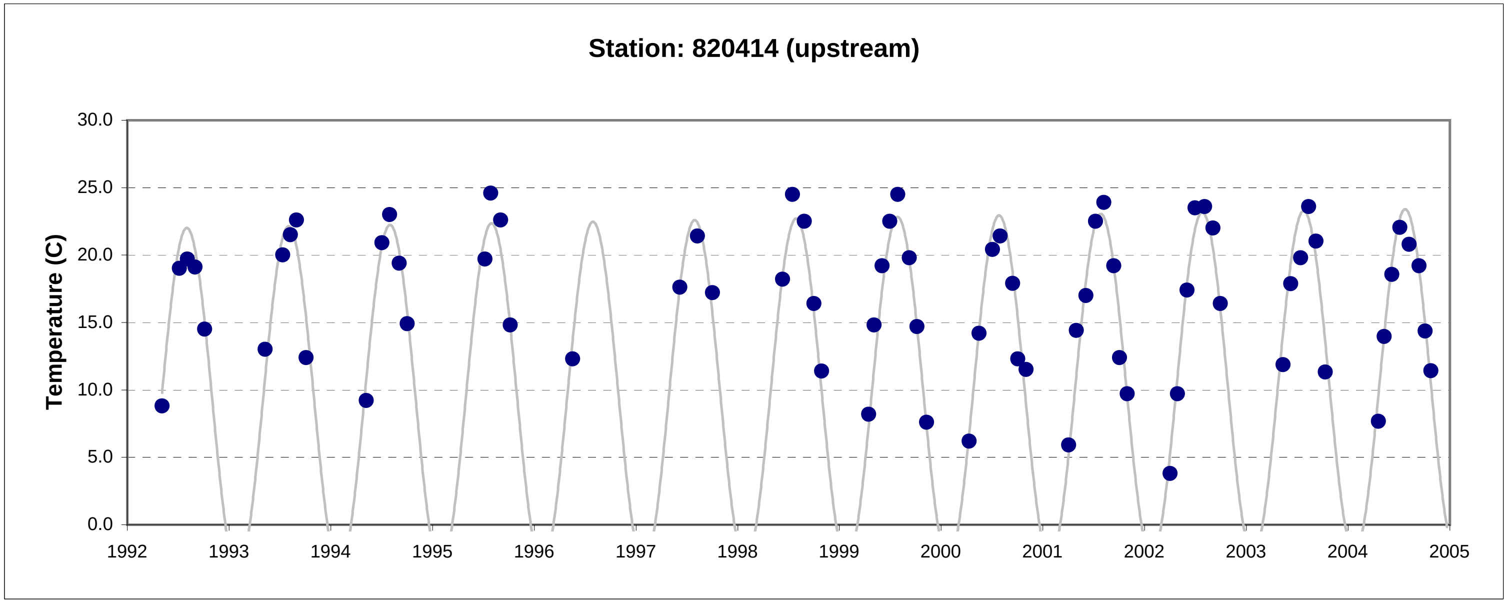


Figure 4-32. Detroit River - DDT Concentration Time Series, 1998-2004.



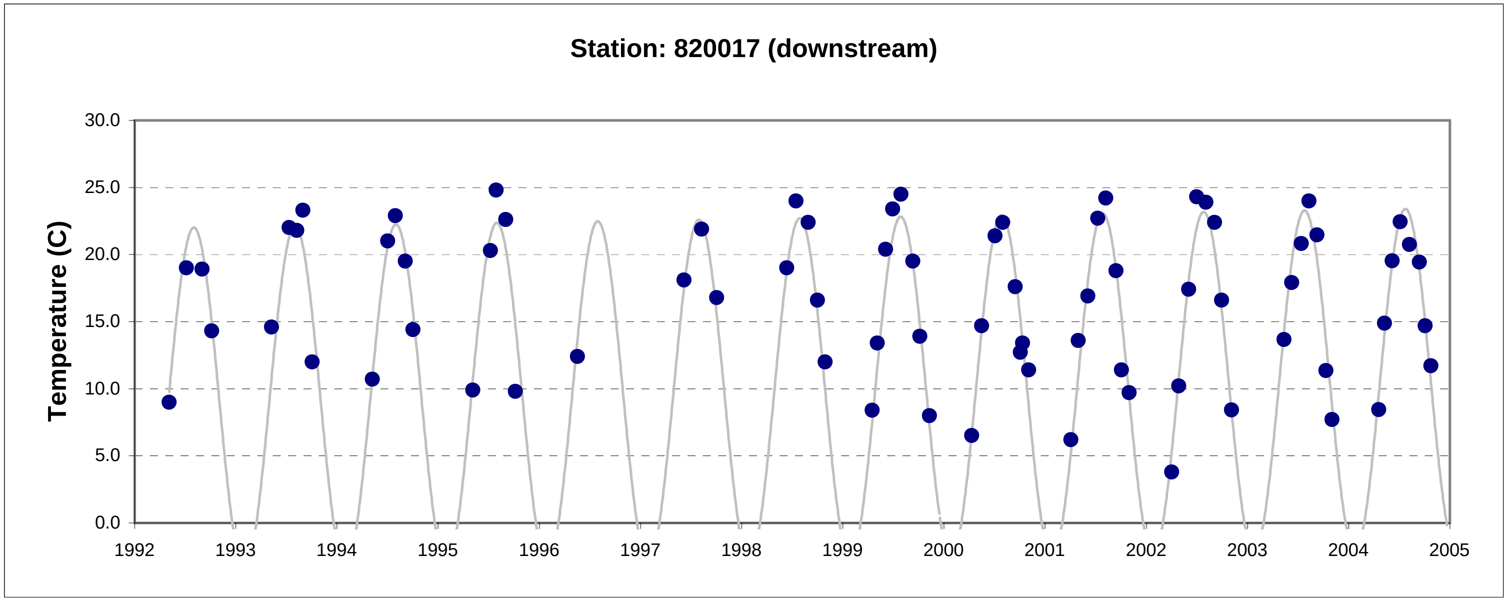
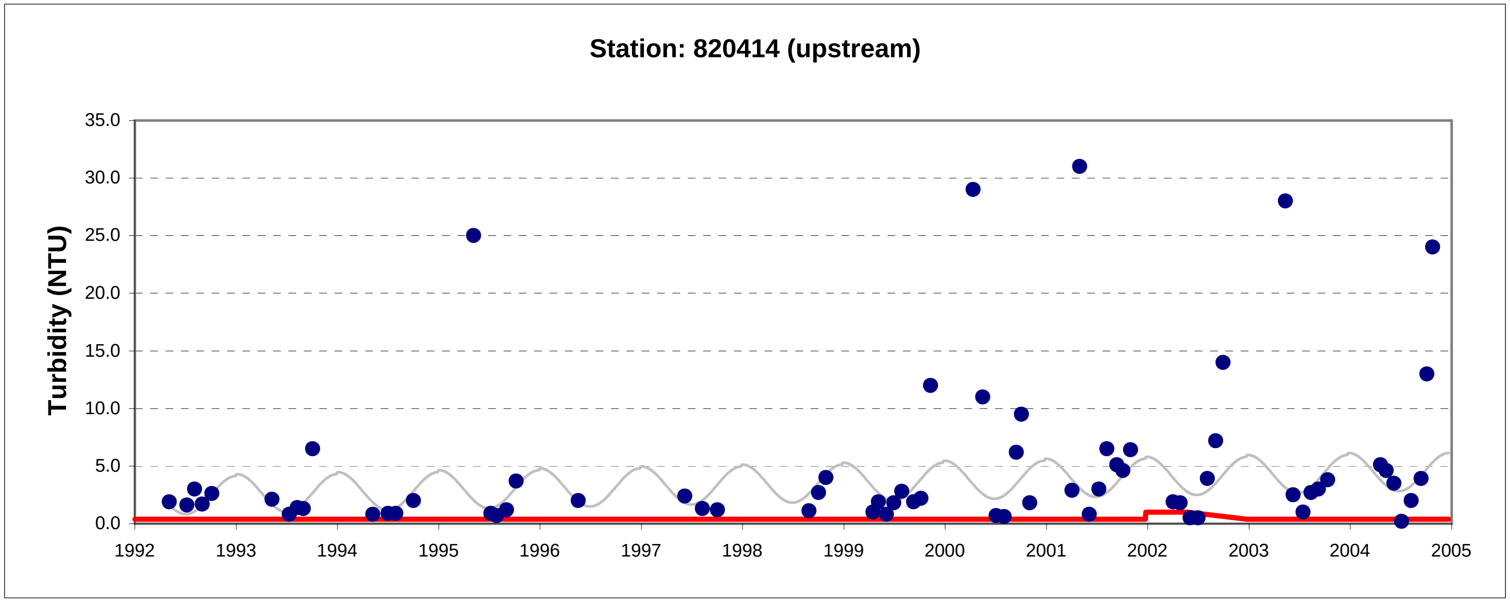


Figure 4-33. Detroit River - Temperature Time Series, 1992-2004. Grey Line is Regression Model.



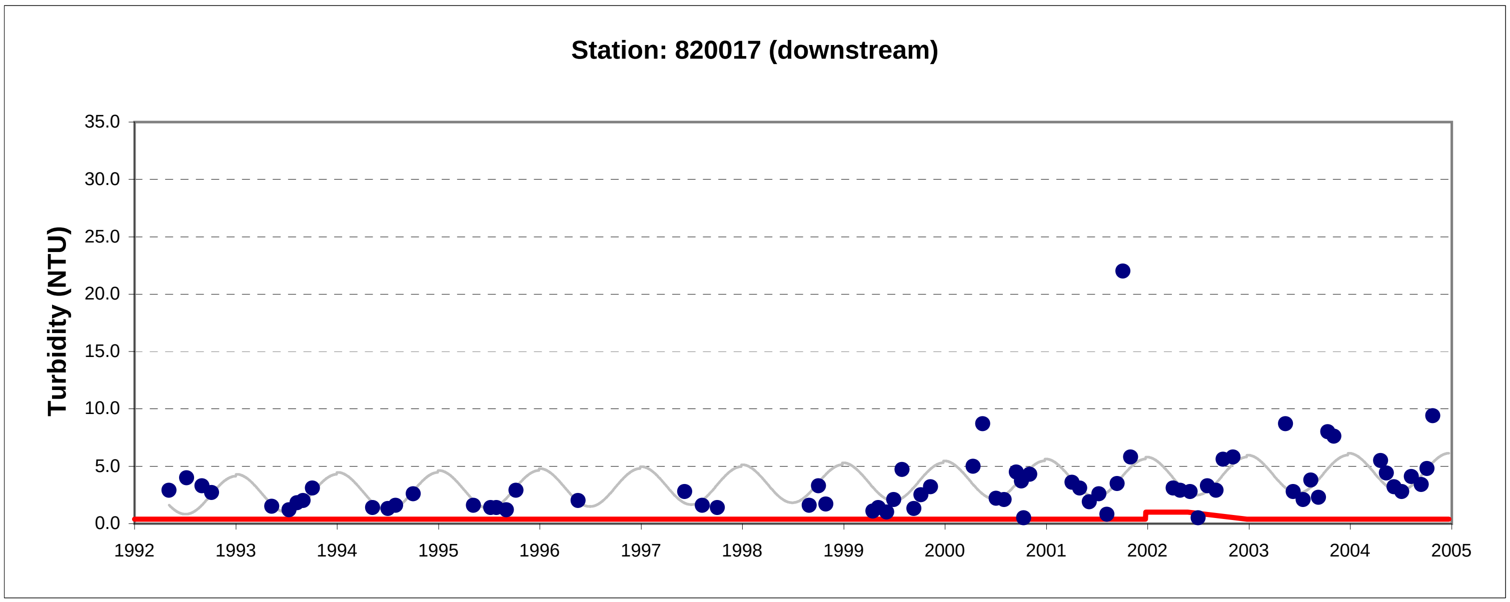
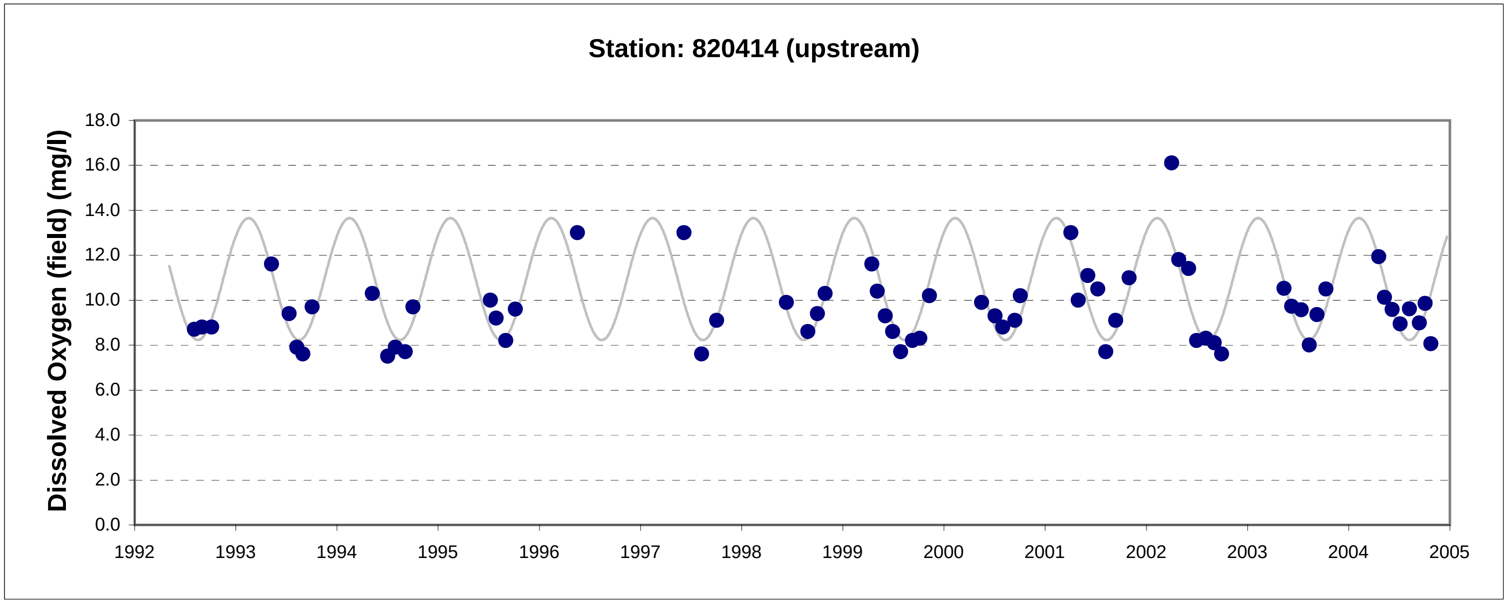


Figure 4-34. Detroit River - Turbidity Time Series, 1992-2004. Grey Line is Regression Model. Red Line is Quantification Limit.



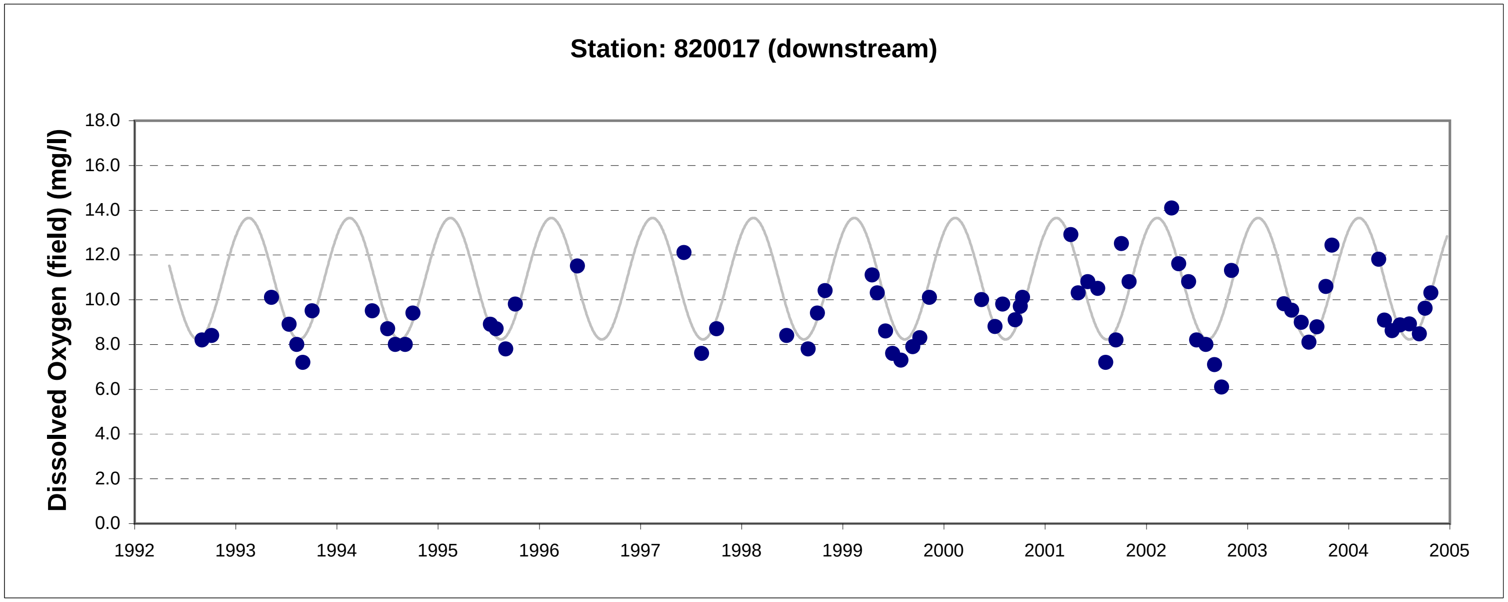
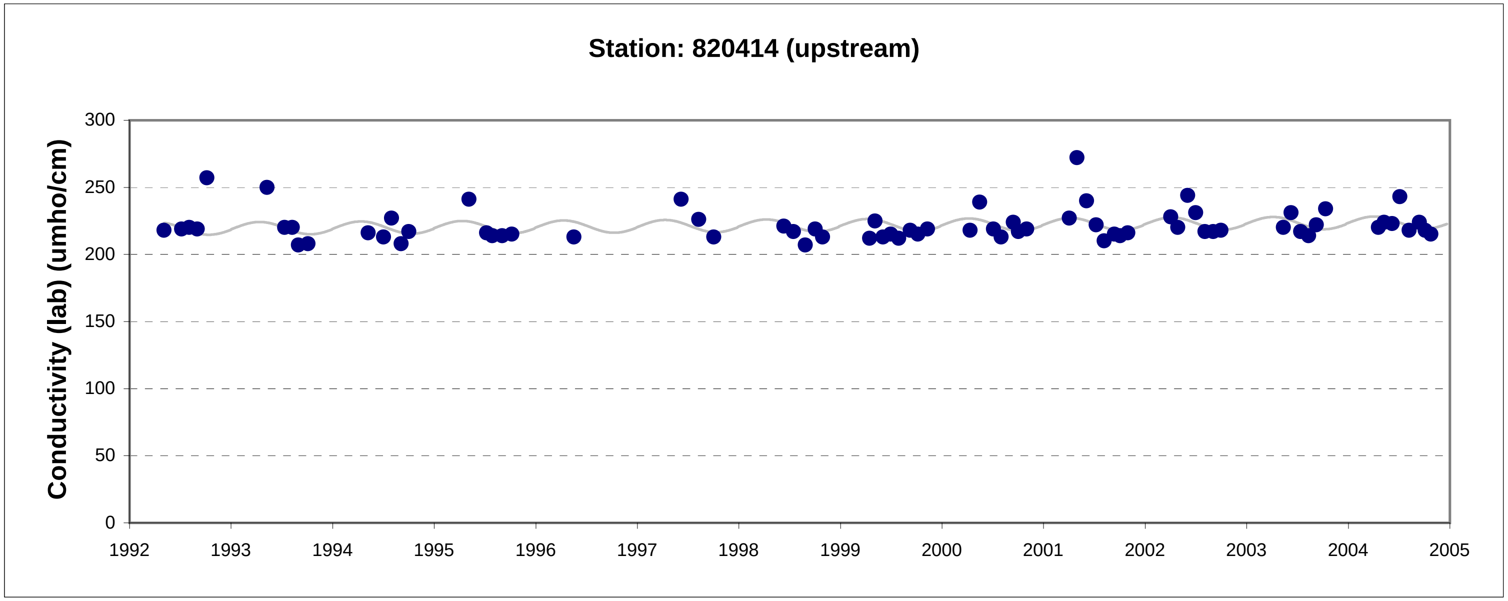


Figure 4-35. Detroit River - Dissolved Oxygen (Field) Time Series, 1992-2004. Grey Line is Regression Model.



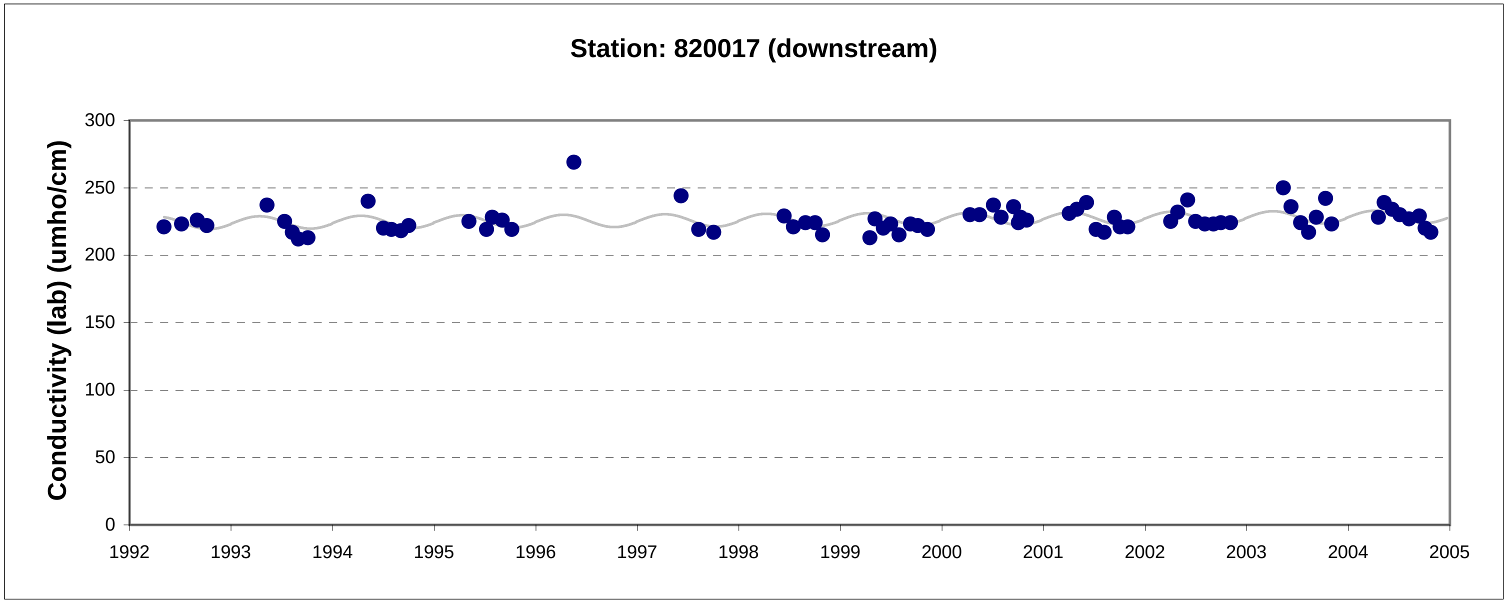
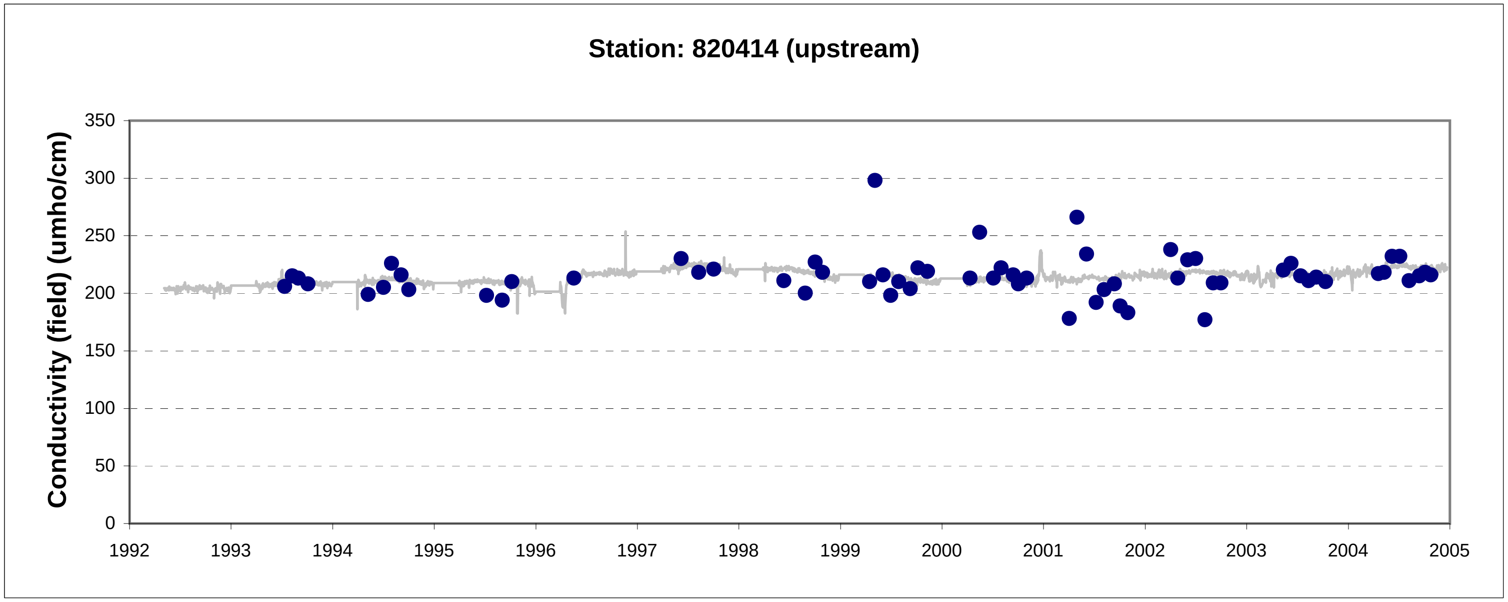


Figure 4-36. Detroit River - Conductivity (Lab) Time Series, 1992-2004. Grey Line is Regression Model.



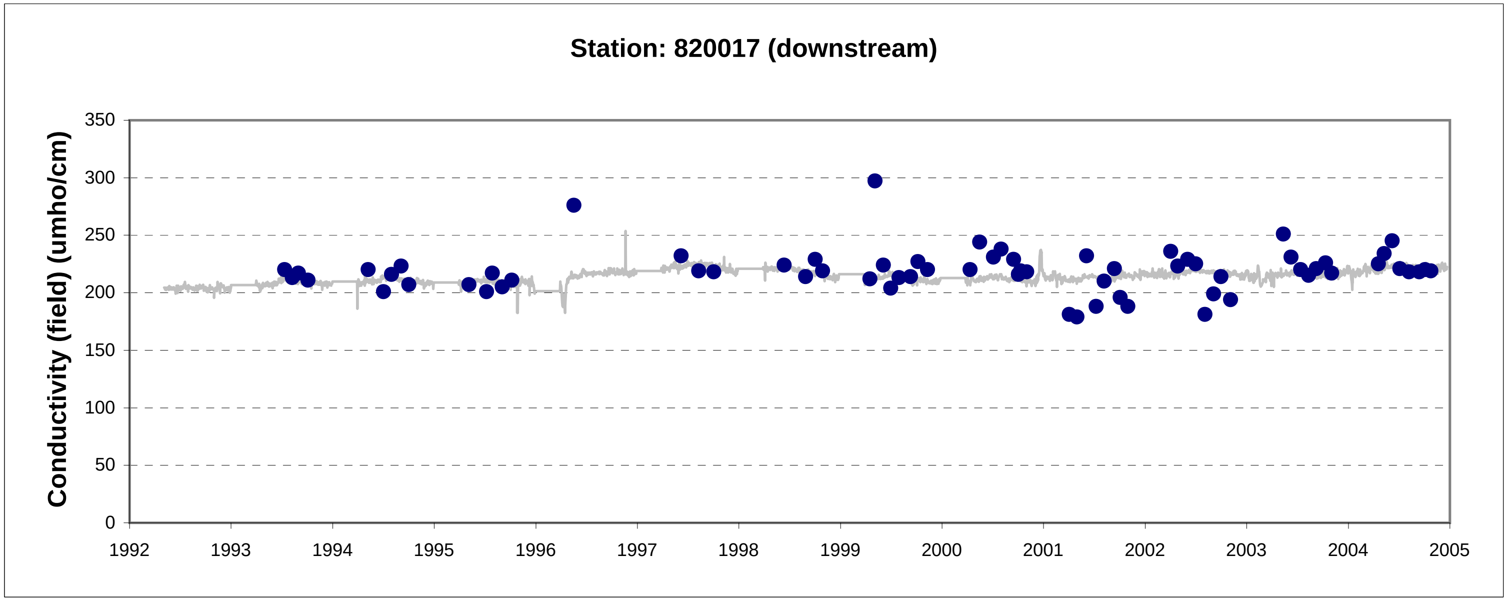
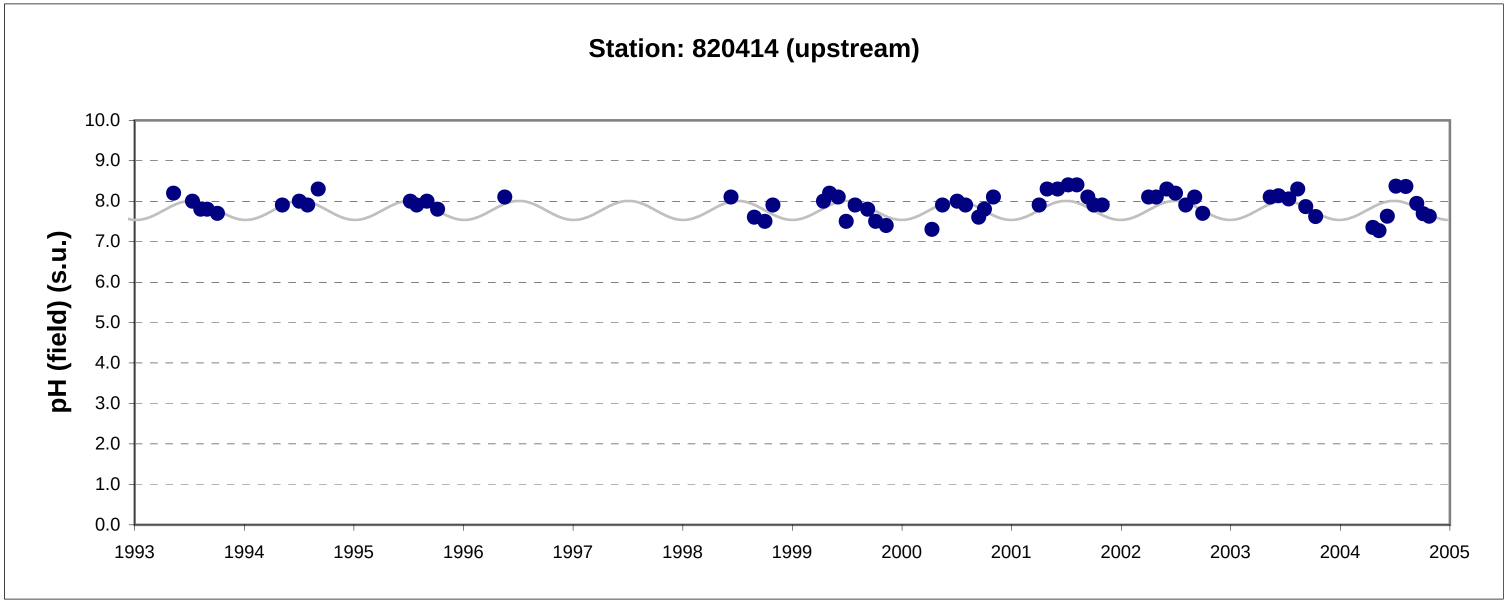


Figure 4-37. Detroit River - Conductivity (Field) Time Series, 1992-2004. Grey Line is Regression Model.



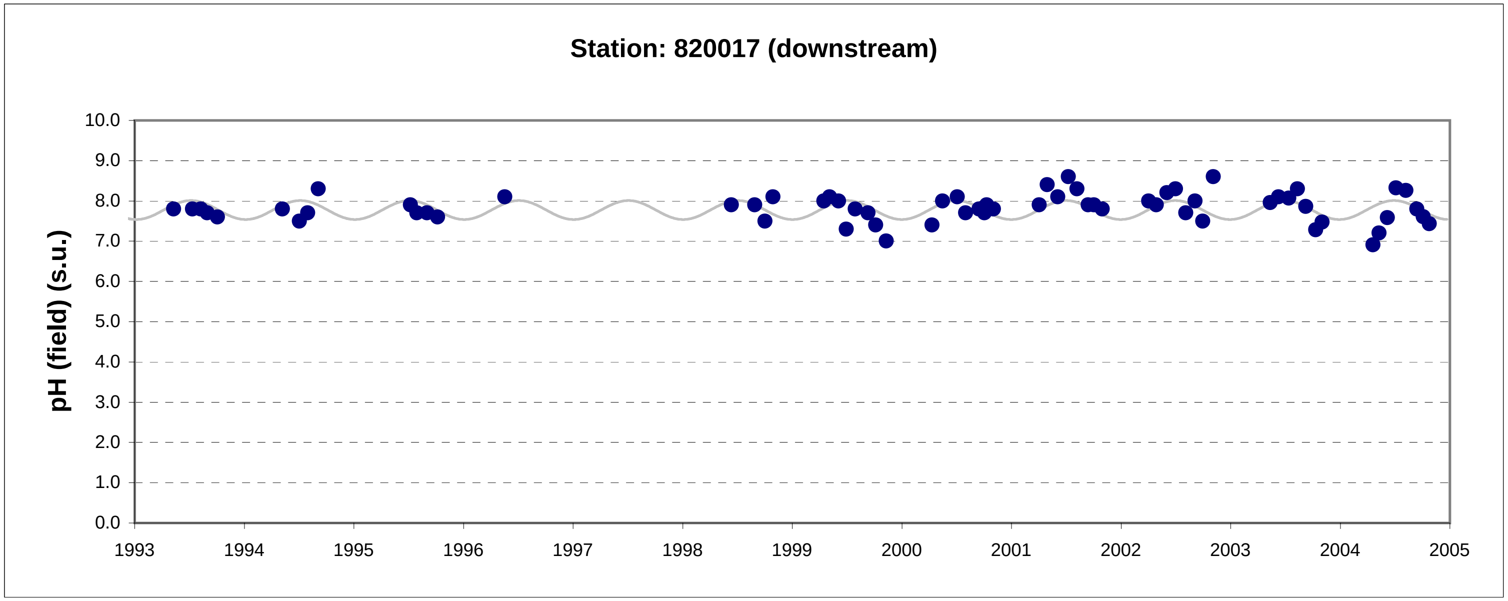
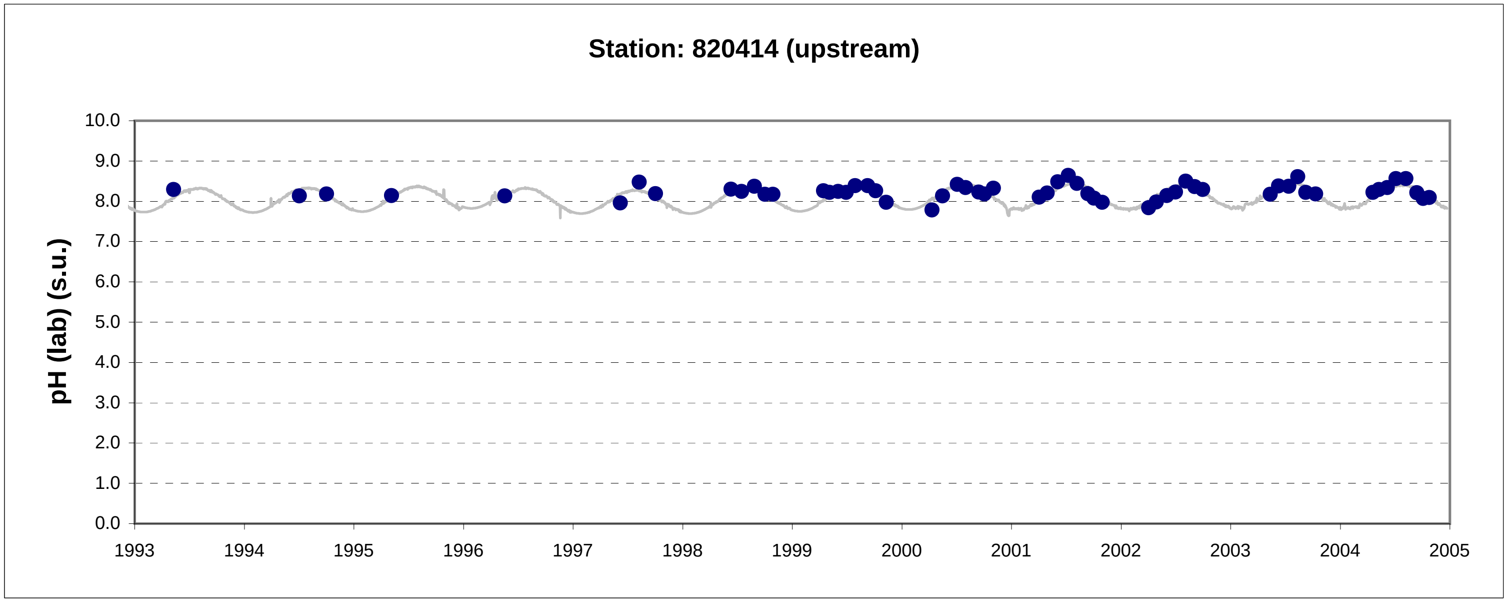


Figure 4-38. Detroit River - pH (Field) Time Series, 1992-2004. Grey Line is Regression Model.



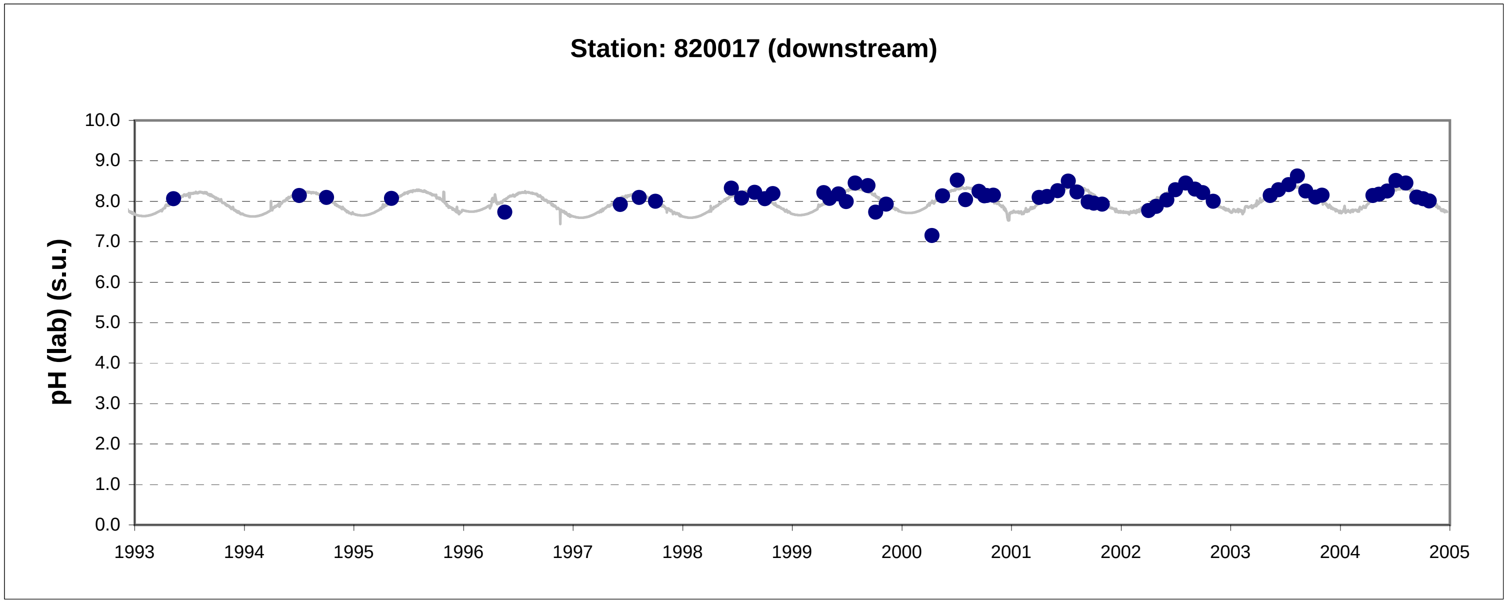
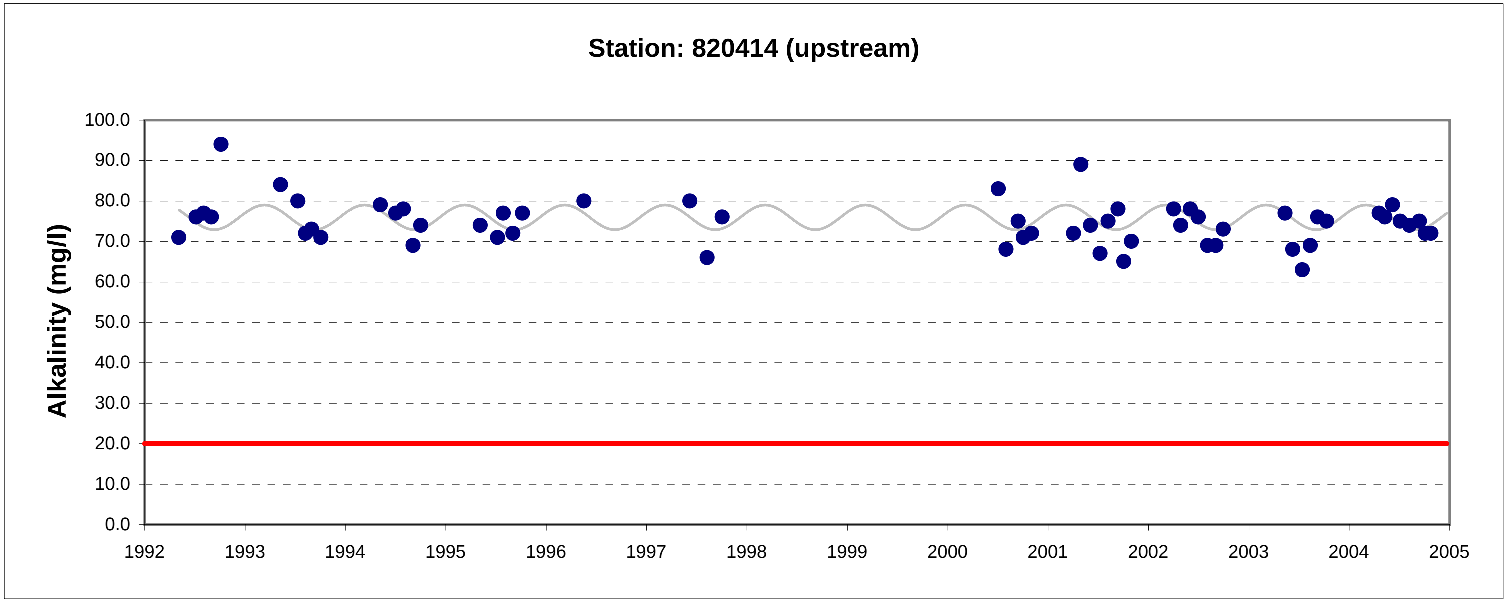


Figure 4-39. Detroit River - pH (Lab) Time Series, 1992-2004. Grey Line is Regression Model.



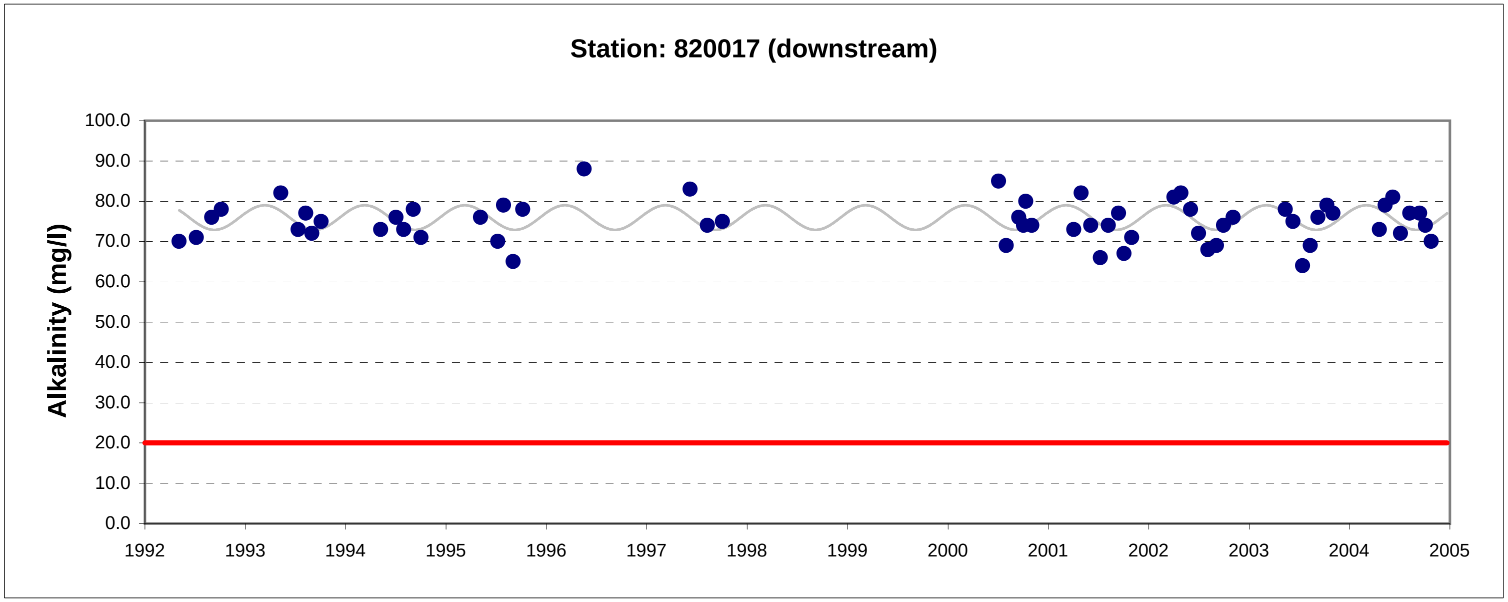
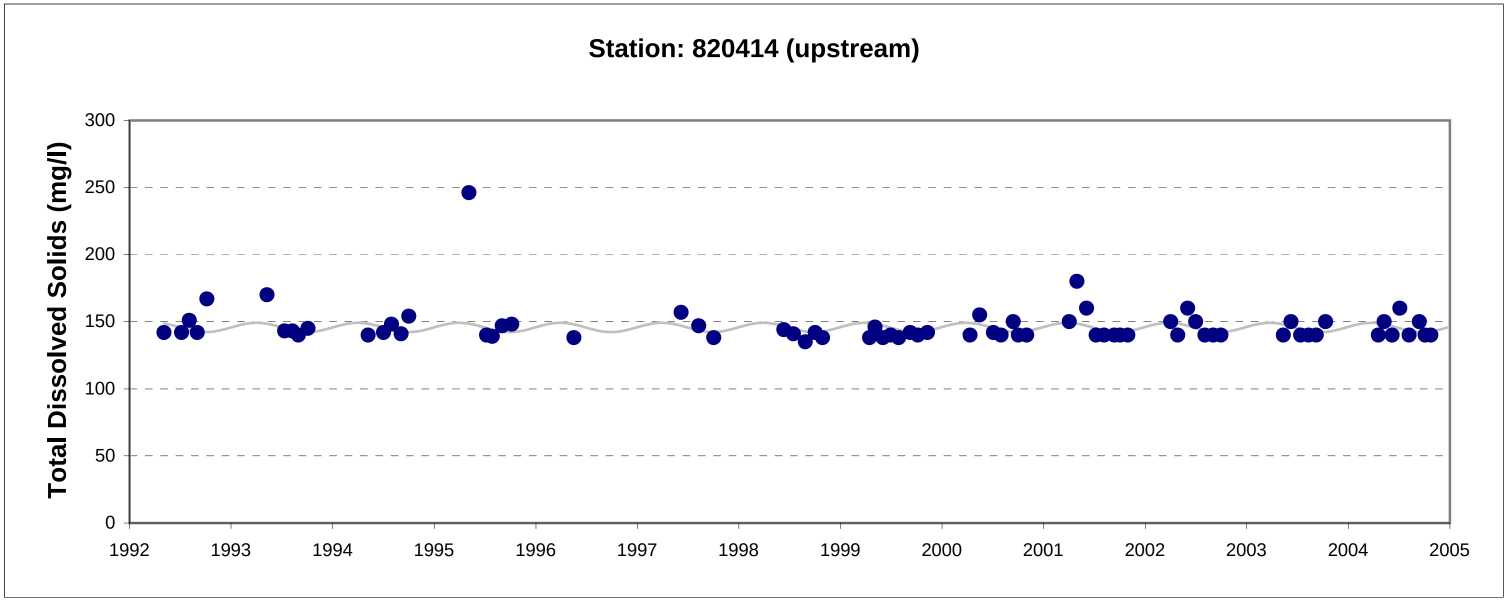


Figure 4-40. Detroit River - Alkalinity Time Series, 1992-2004. Grey Line is Regression Model. Red Line is Quantification Limit.



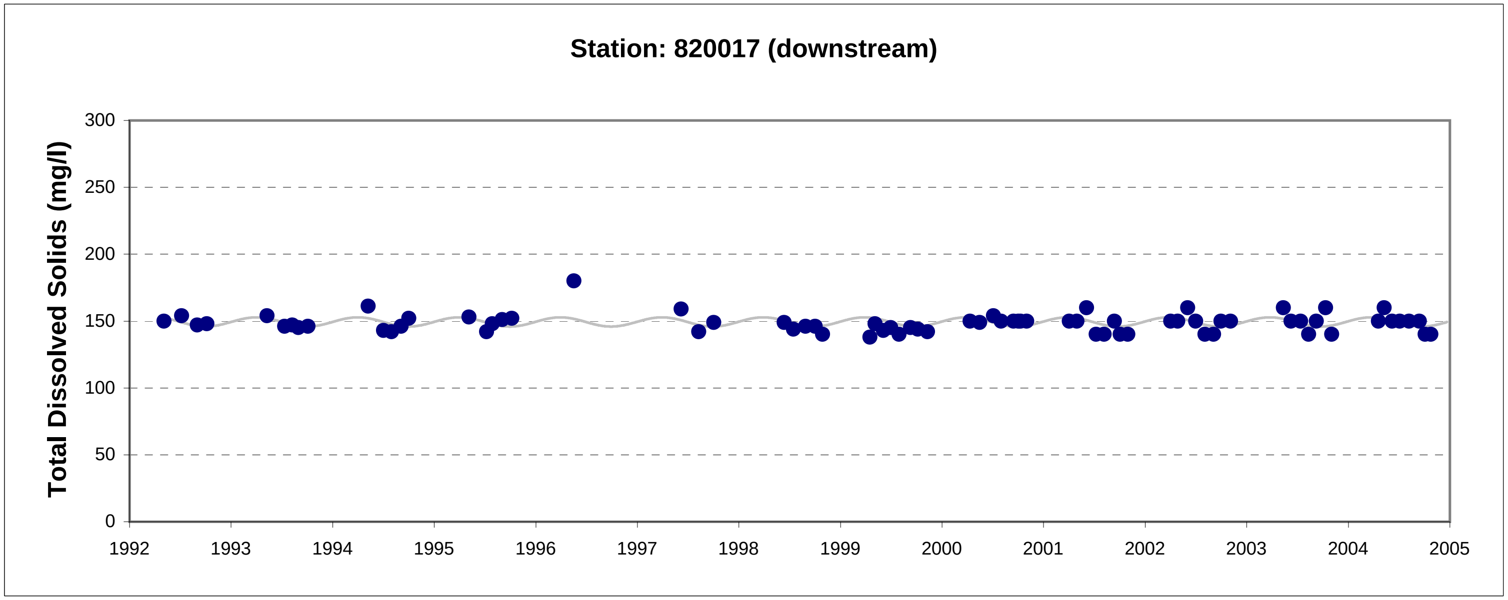
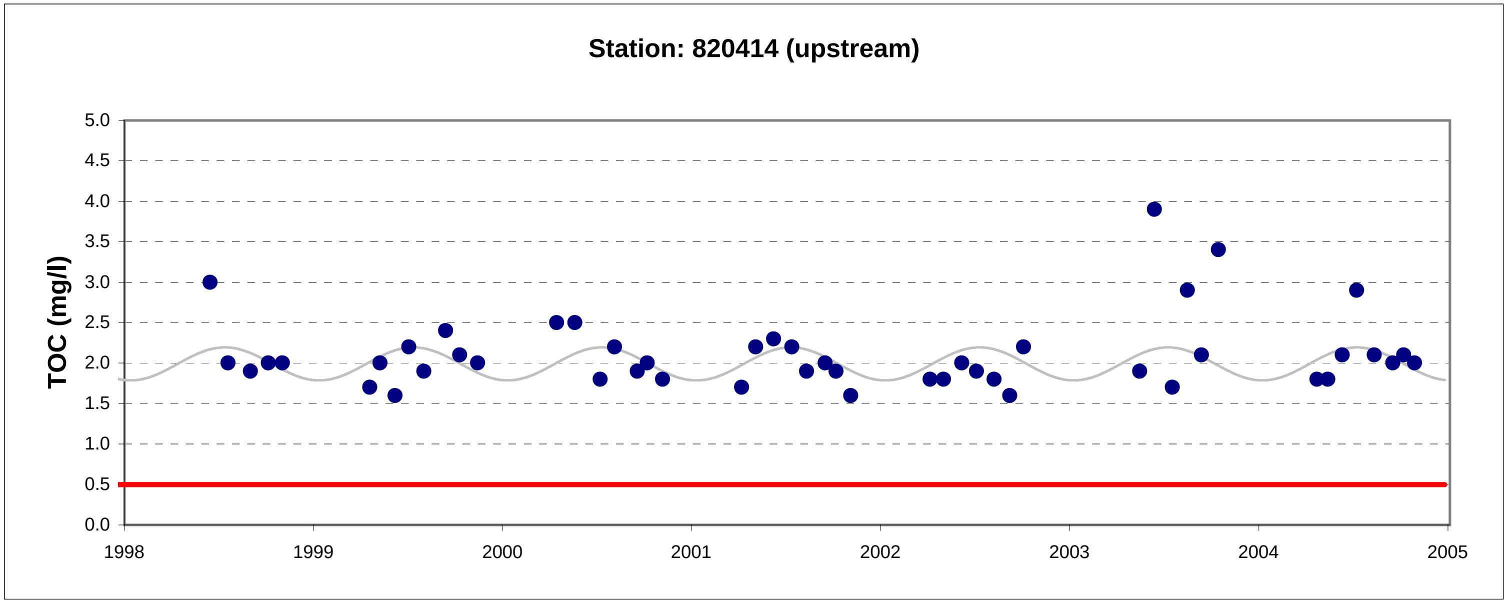


Figure 4-41. Detroit River - TDS Concentration Time Series, 1992-2004. Grey Line is Regression Model.



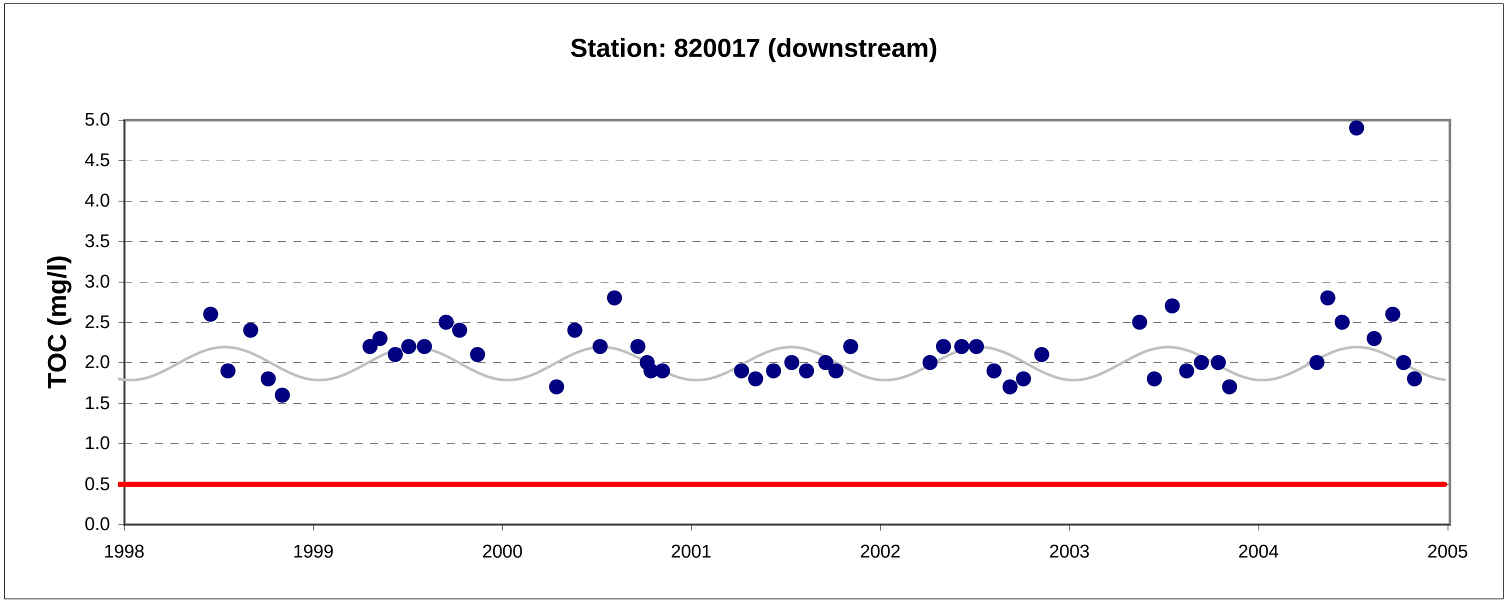
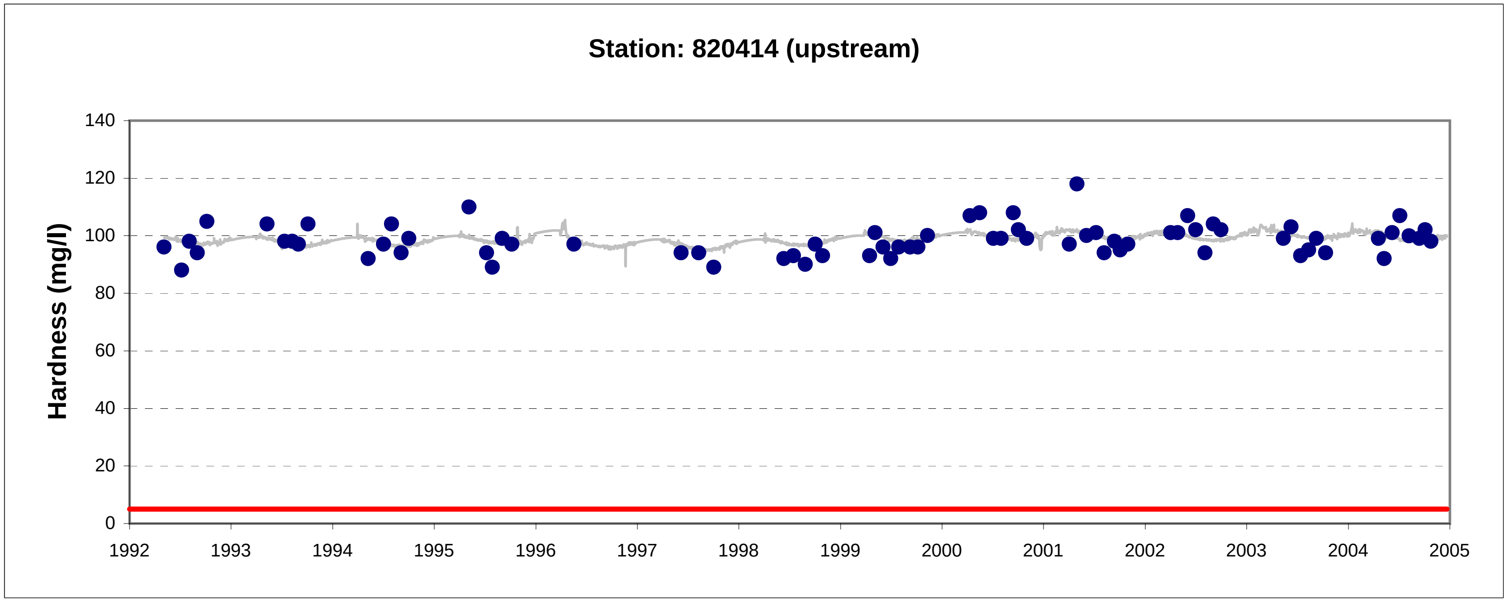


Figure 4-42. Detroit River - TOC Concentration Time Series, 1998-2004. Grey Line is Regression Model. Red Line is Quantification Limit.



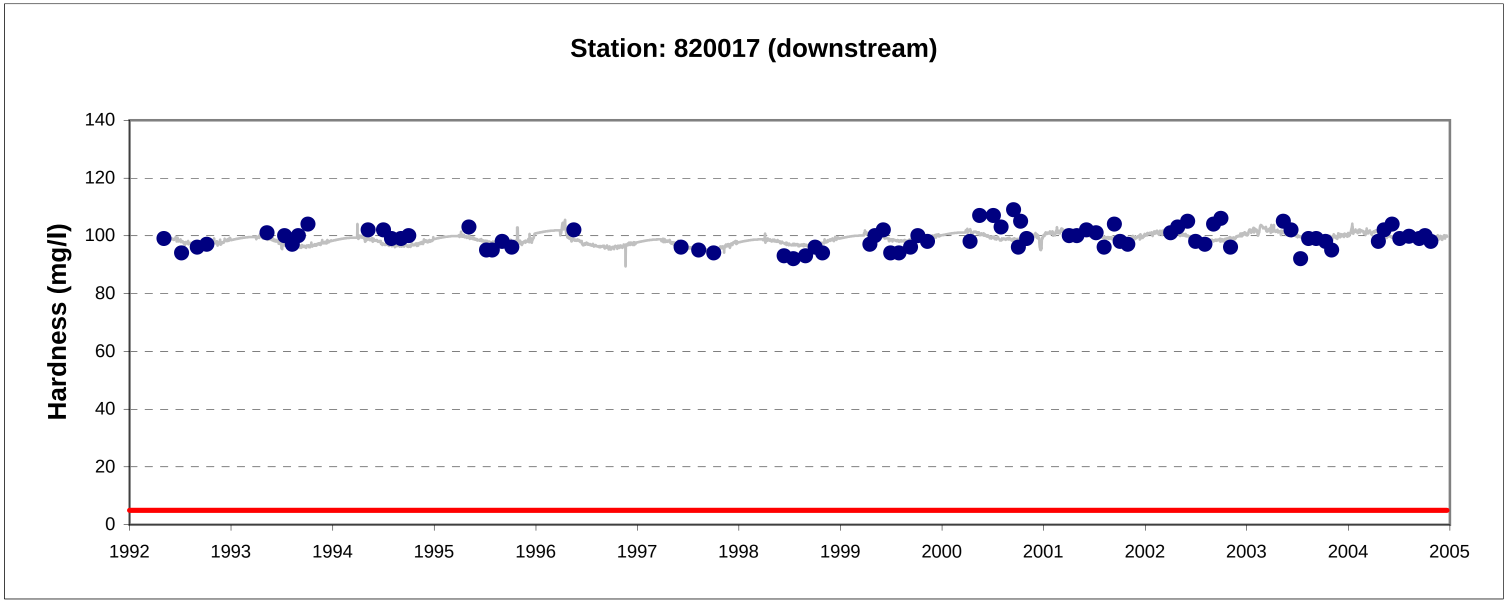
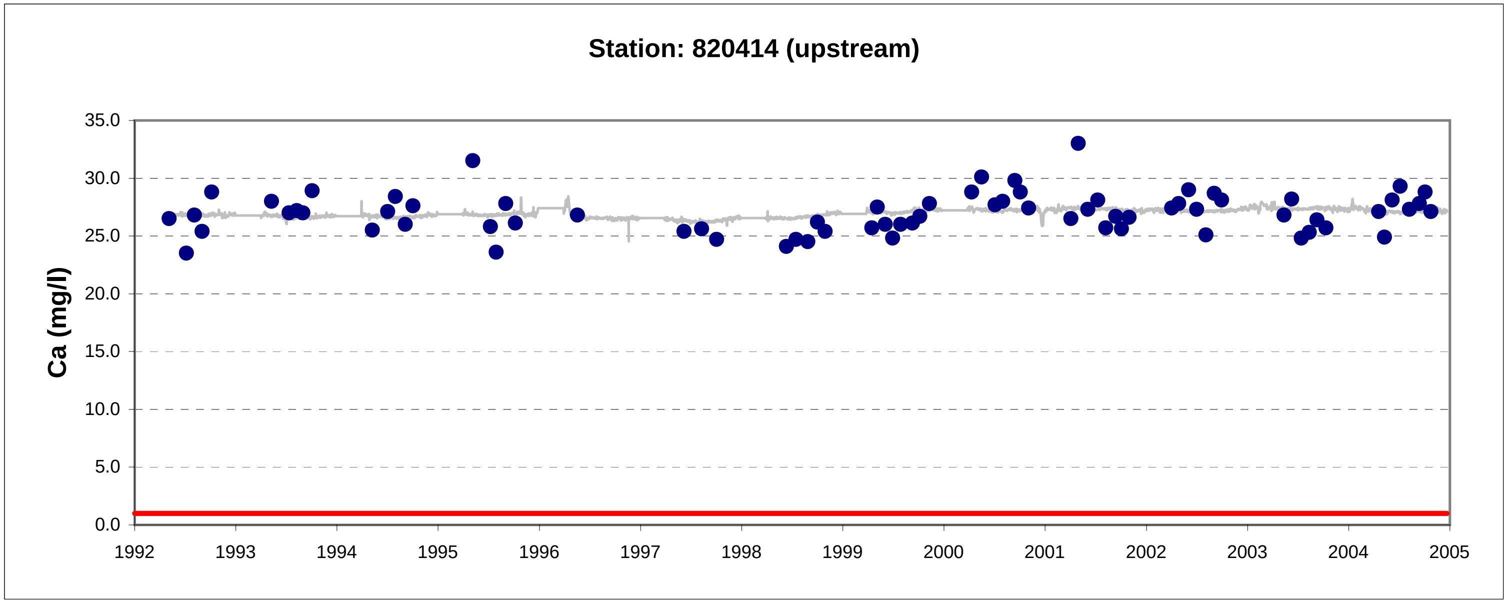


Figure 4-43. Detroit River - Hardness Time Series, 1992-2004. Grey Line is Regression Model. Red Line is Quantification Limit.



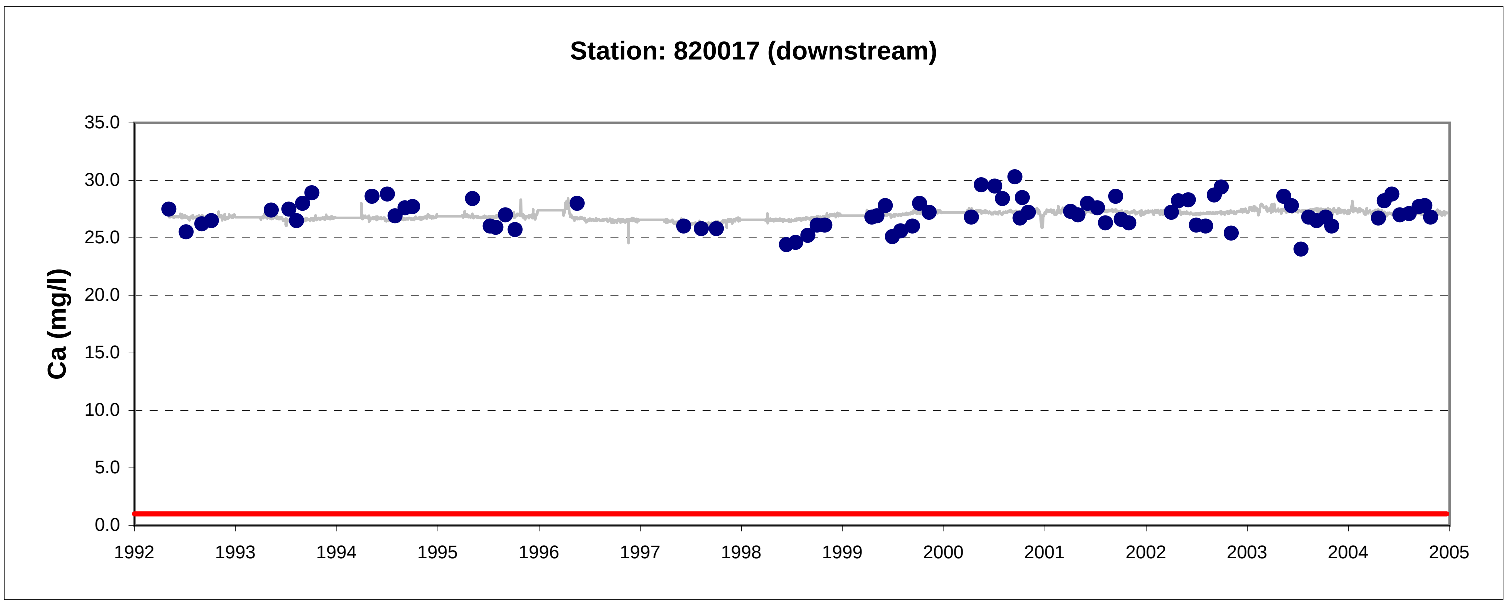
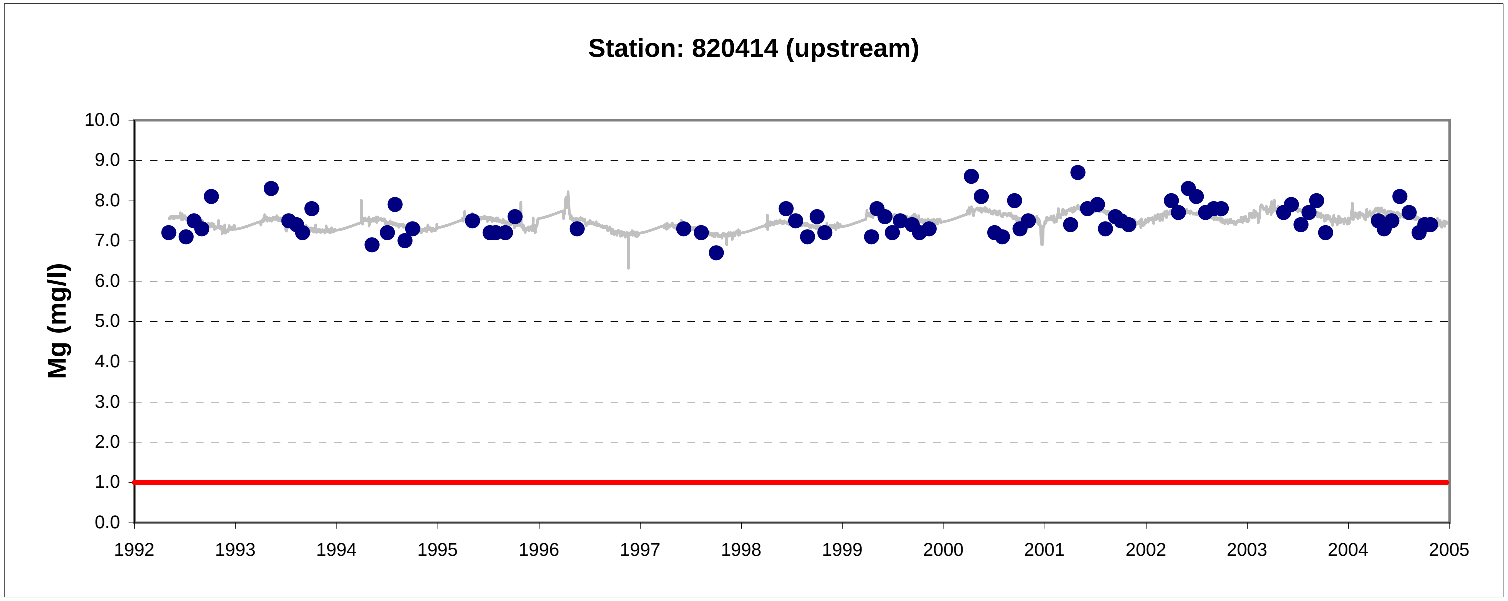


Figure 4-44. Detroit River - Calcium Concentration Time Series, 1992-2004. Grey Line is Regression Model. Red Line is Quantification Limit.



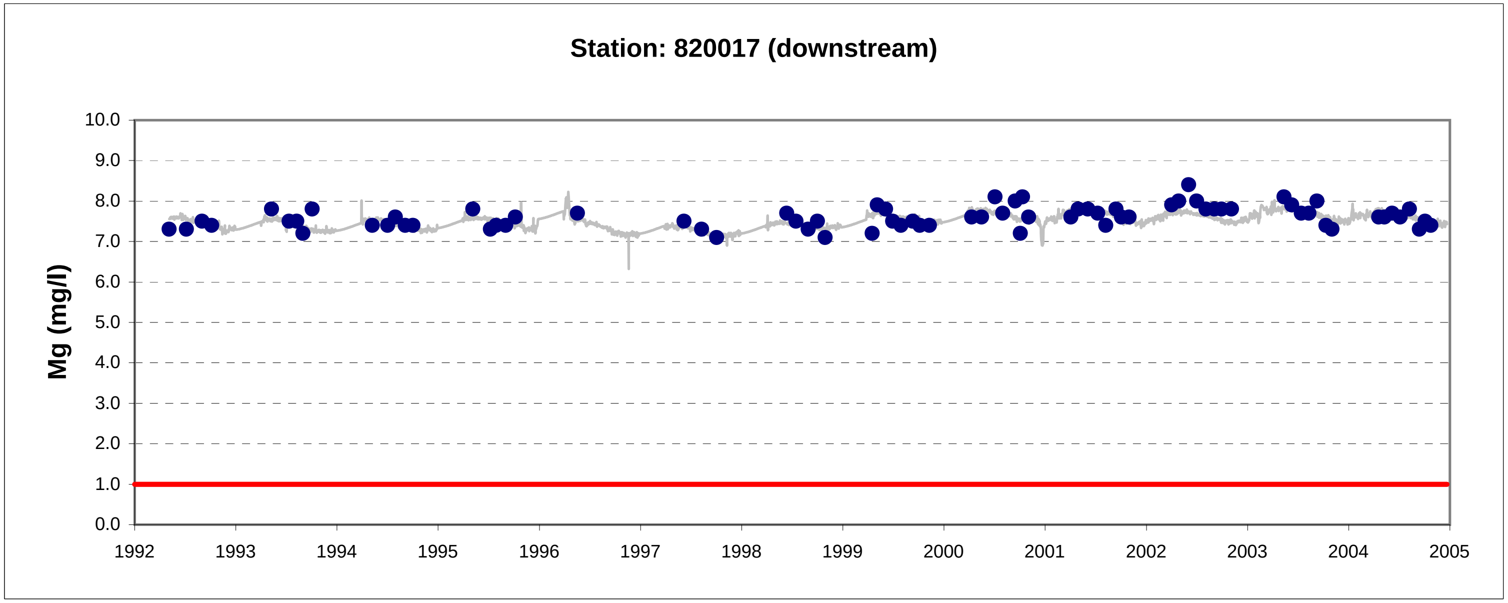
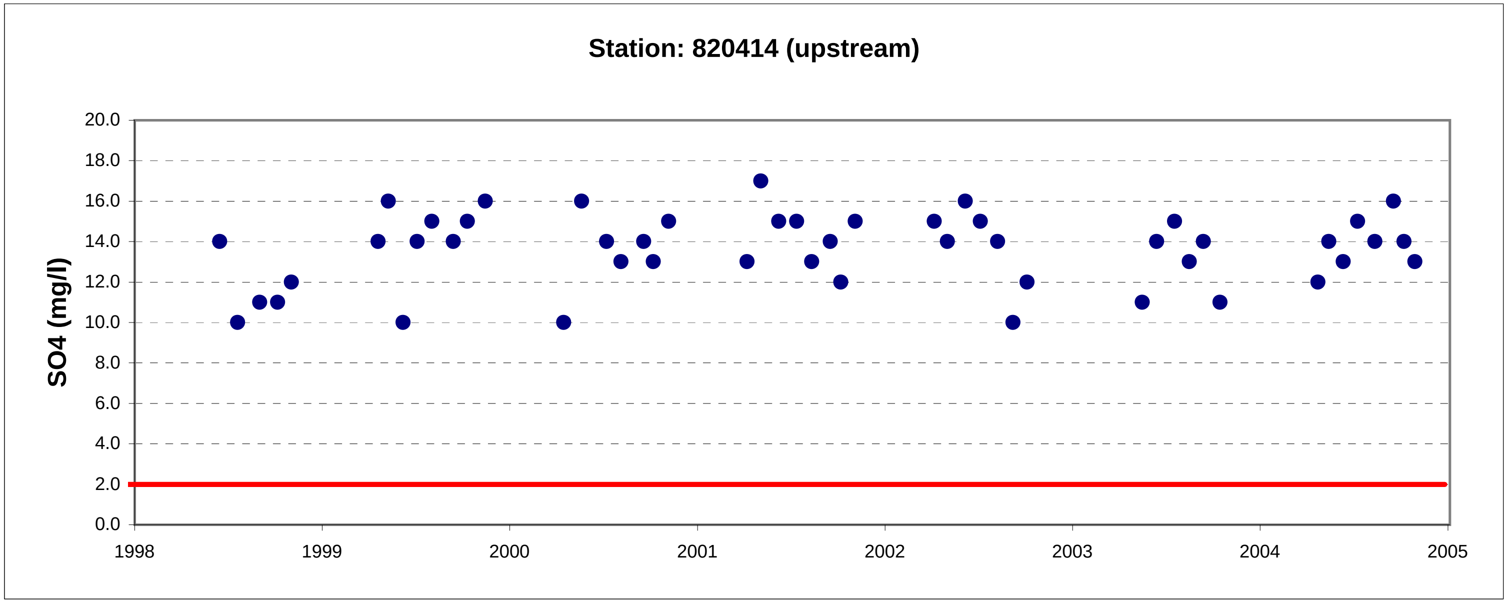


Figure 4-45. Detroit River - Magnesium Concentration Time Series, 1992-2004. Grey Line is Regression Model. Red Line is Quantification Limit.



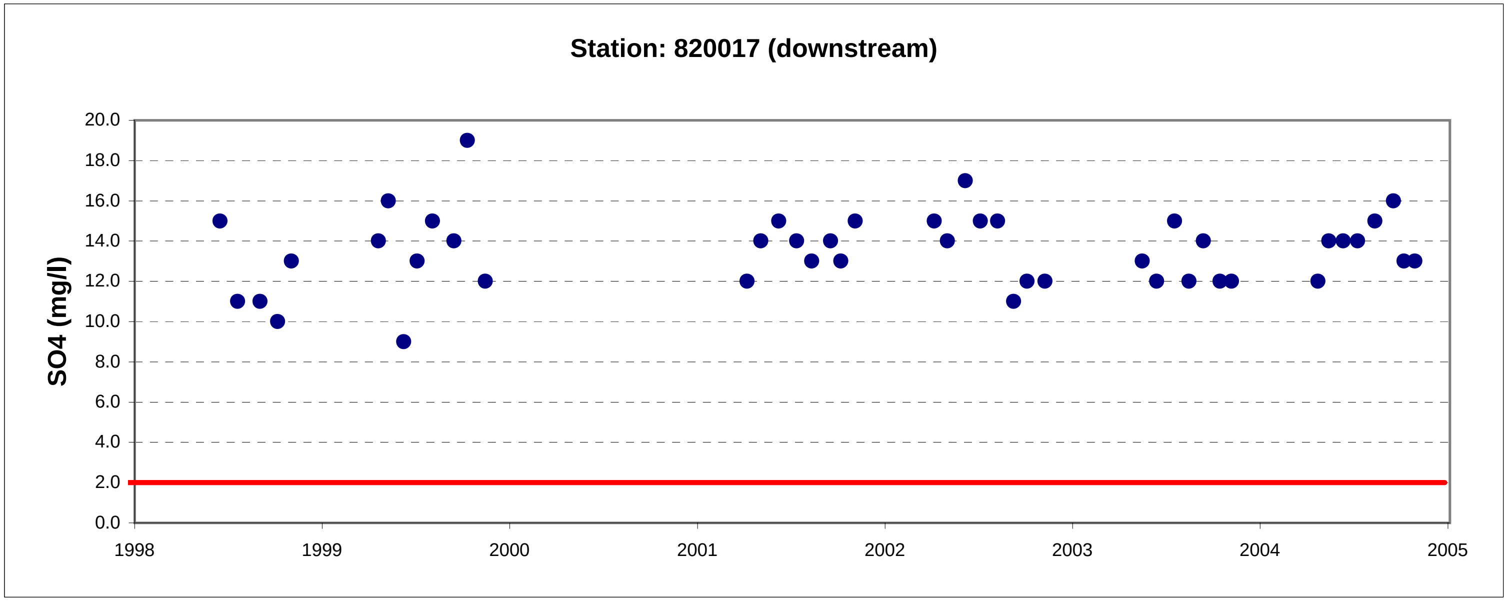
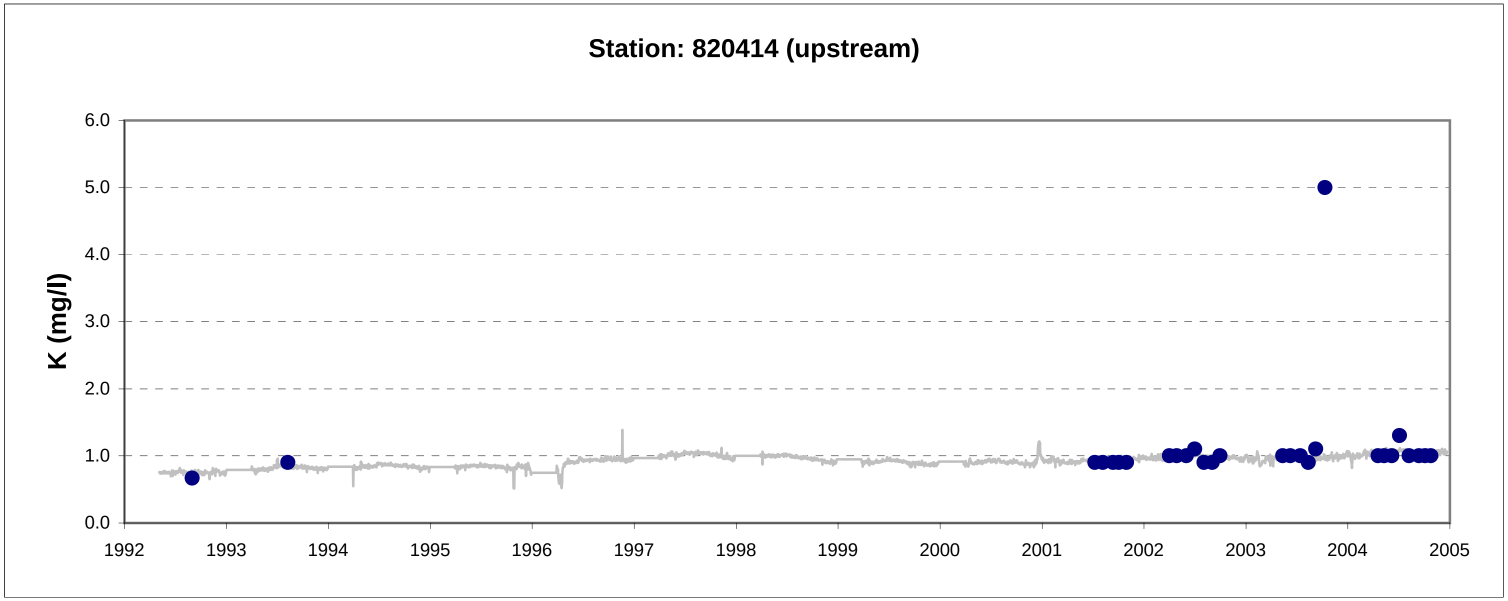


Figure 4-46. Detroit River - SO4 Concentration Time Series, 1998-2004. Red Line is Quantification Limit.



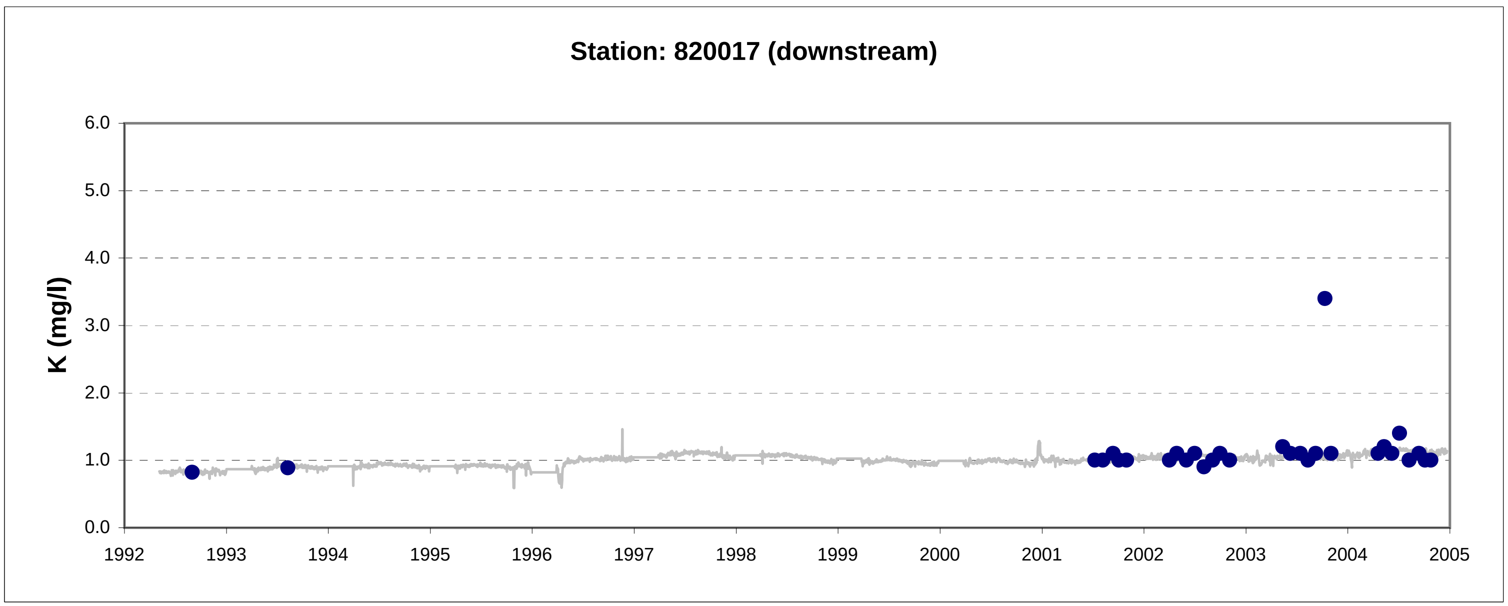
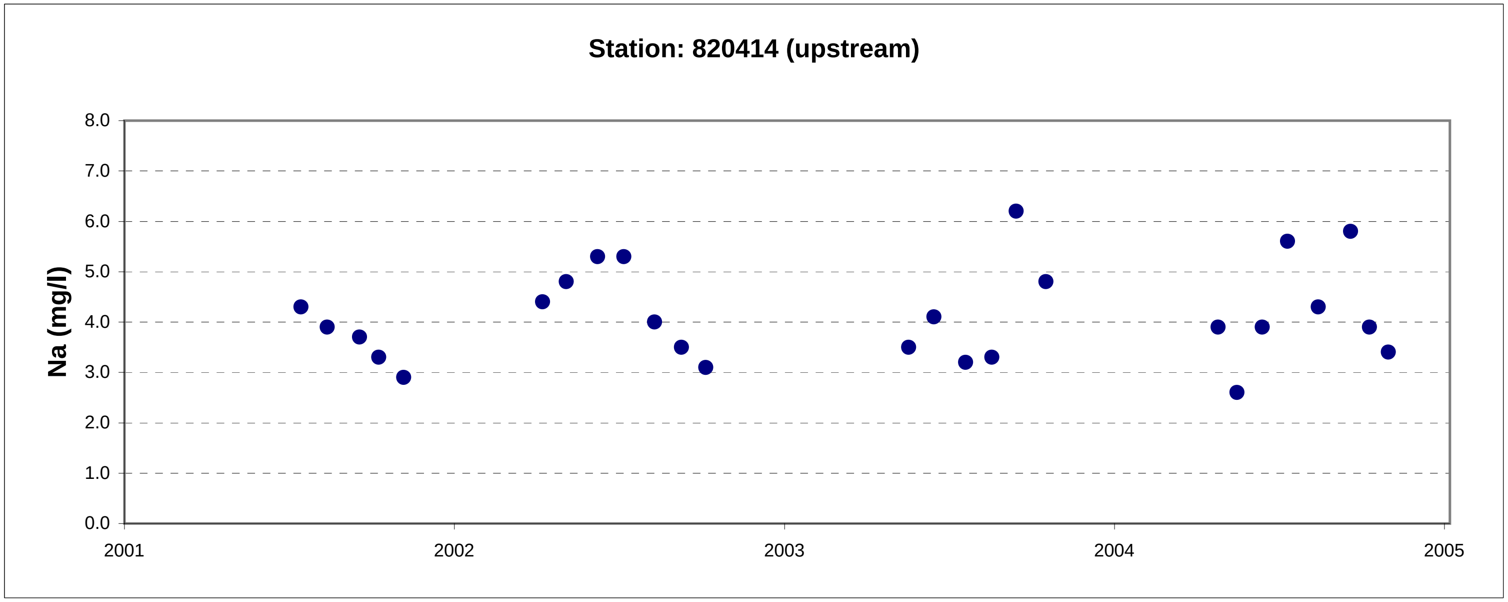


Figure 4-47. Detroit River - Potassium Concentration Time Series, 1992-2004. Grey Line is Regression Model.



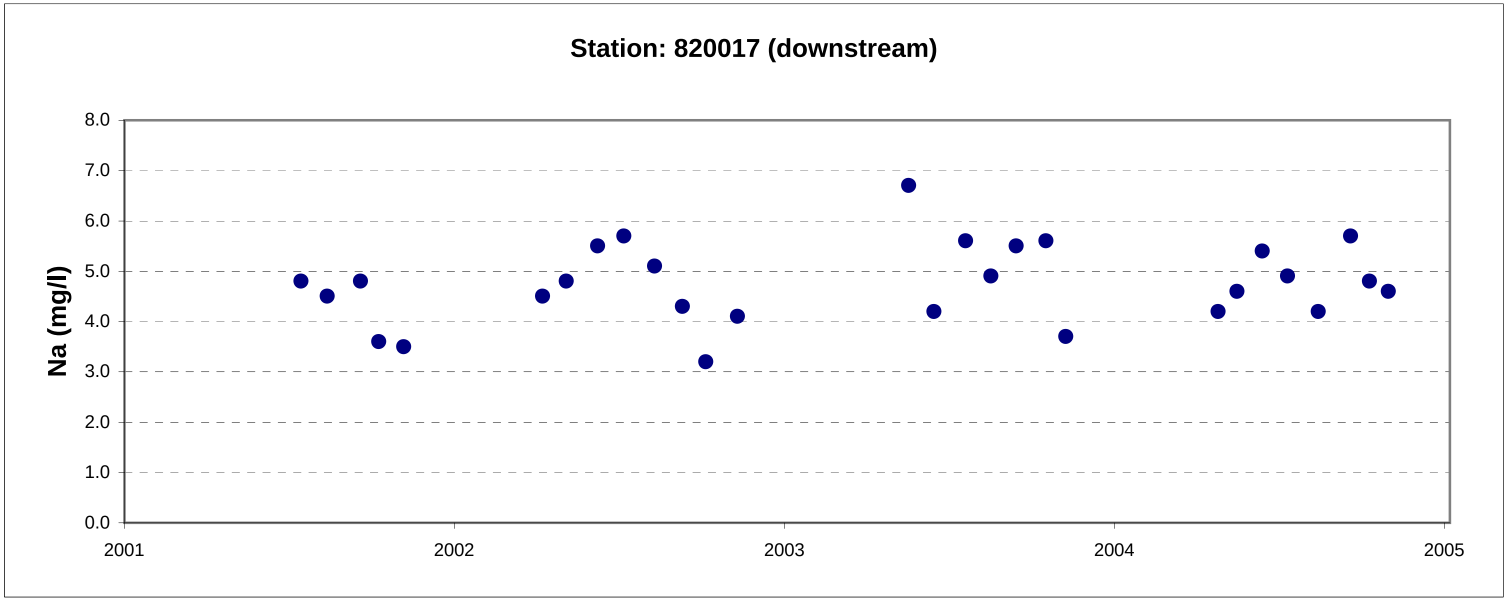


Figure 4-48. Detroit River - Sodium Concentration Time Series, 2001-2004.

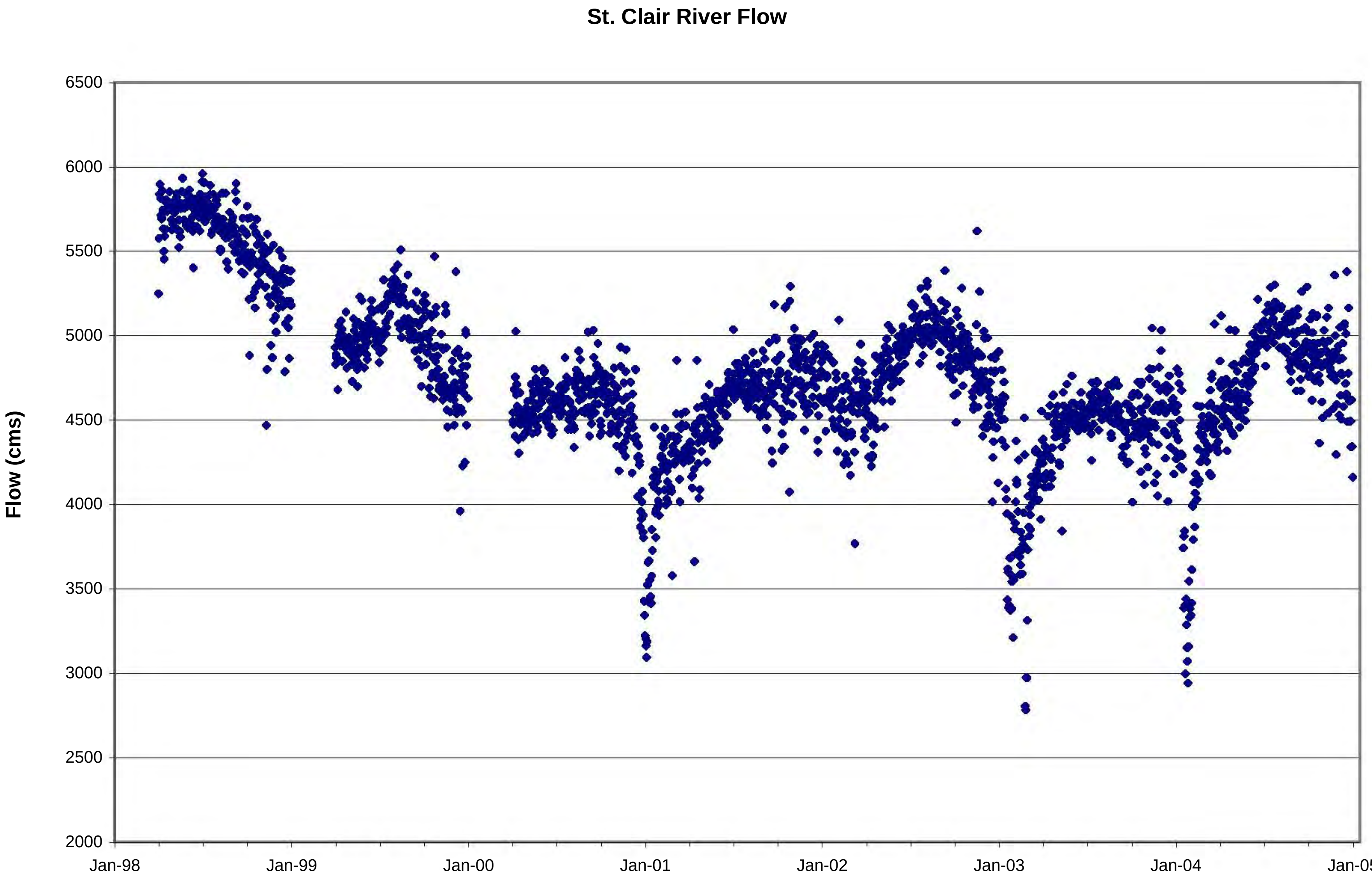


Figure 5-1. St. Clair River Flow

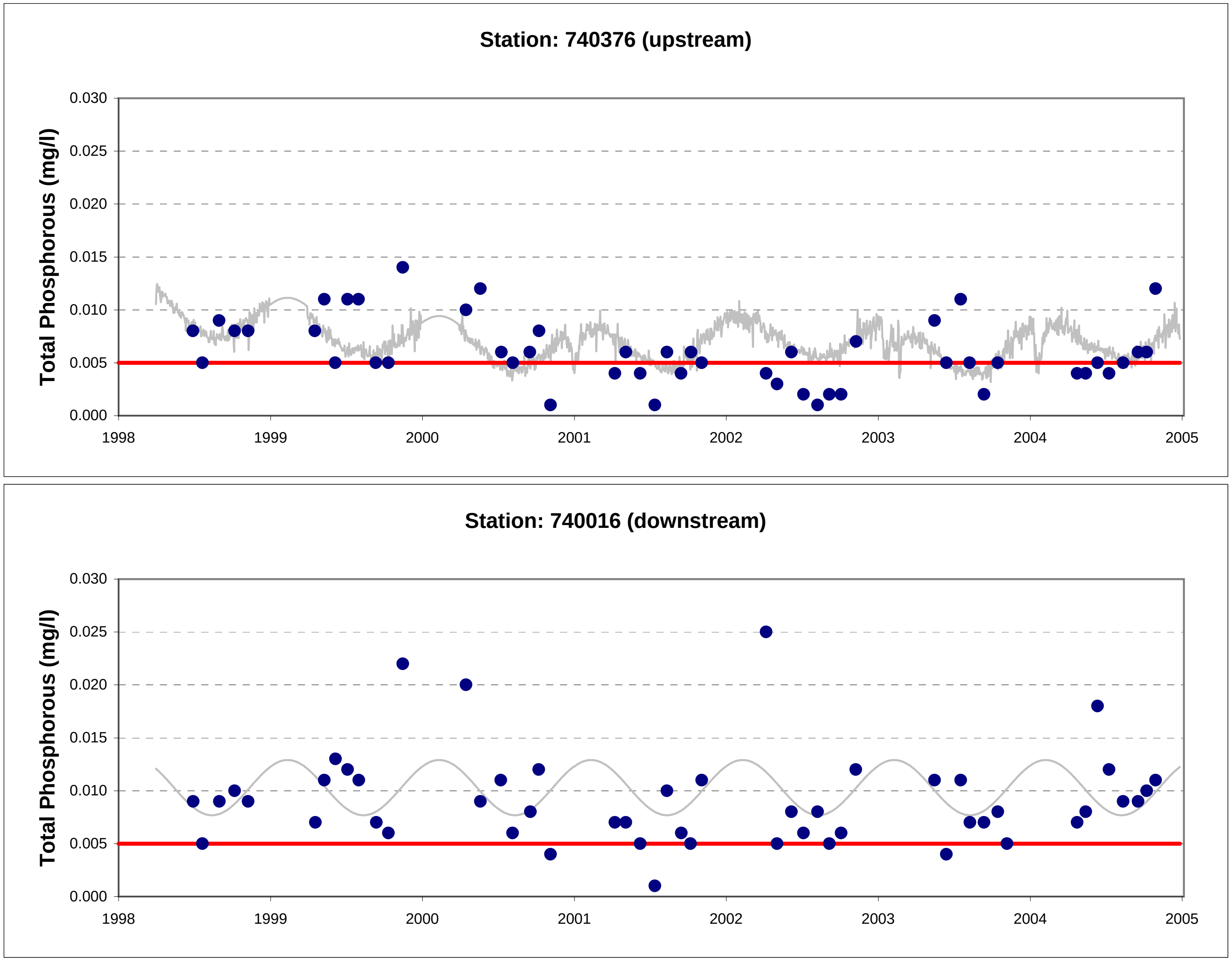


Figure 5-2. St. Clair River - Total Phosphorus Concentration Time Series, 1998-2004.
Grey Line is Regression Model. Red Line is Quantification Limit.

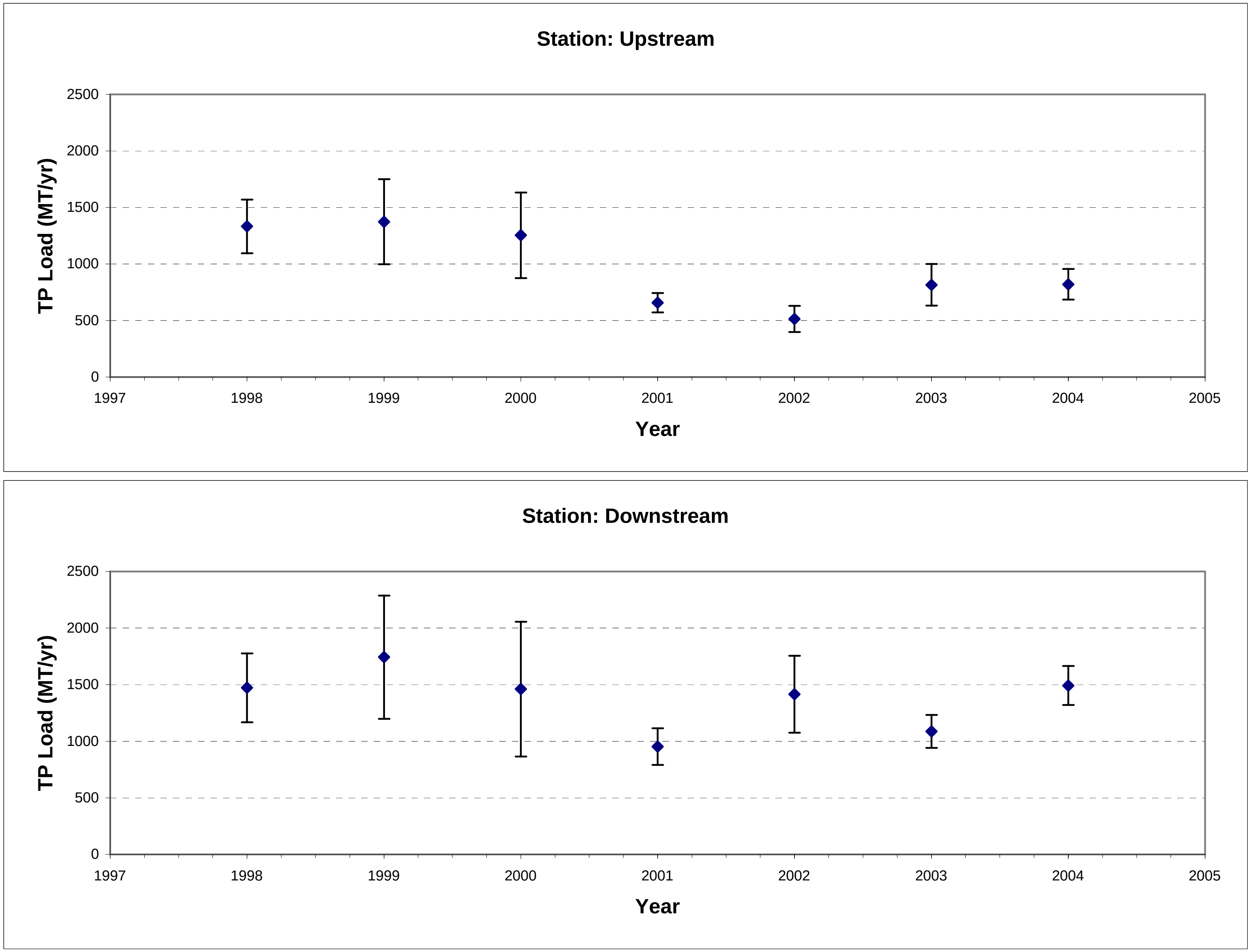
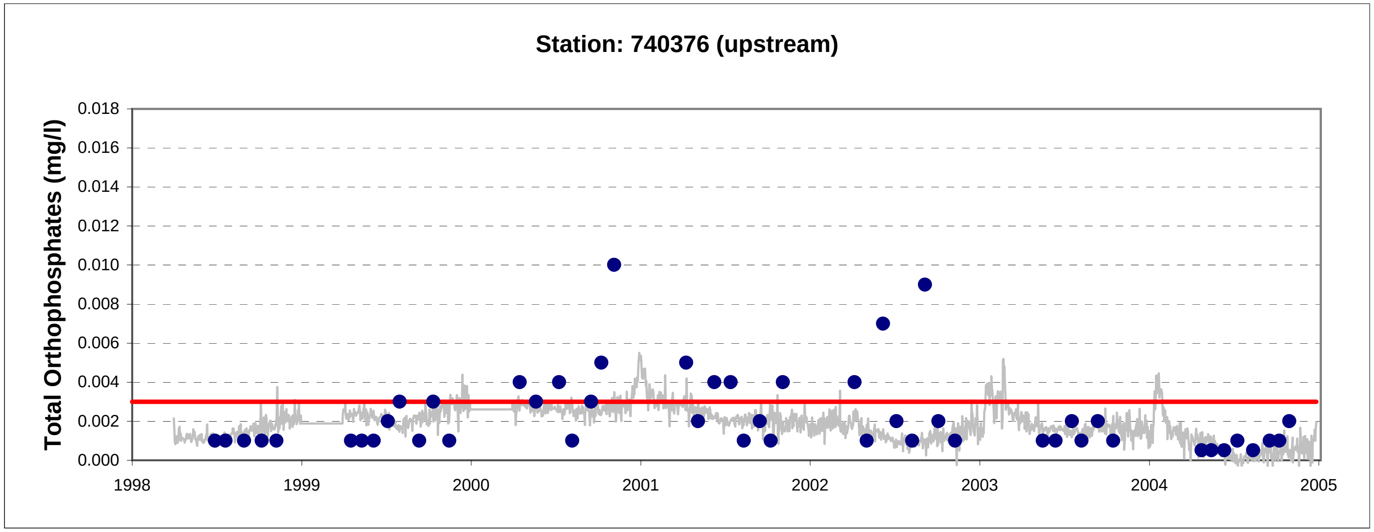


Figure 5-3. Temporal Variation in Total Phosphorus Load in the St. Clair River. Diamonds are Means and Bars are 95% Confidence Intervals.



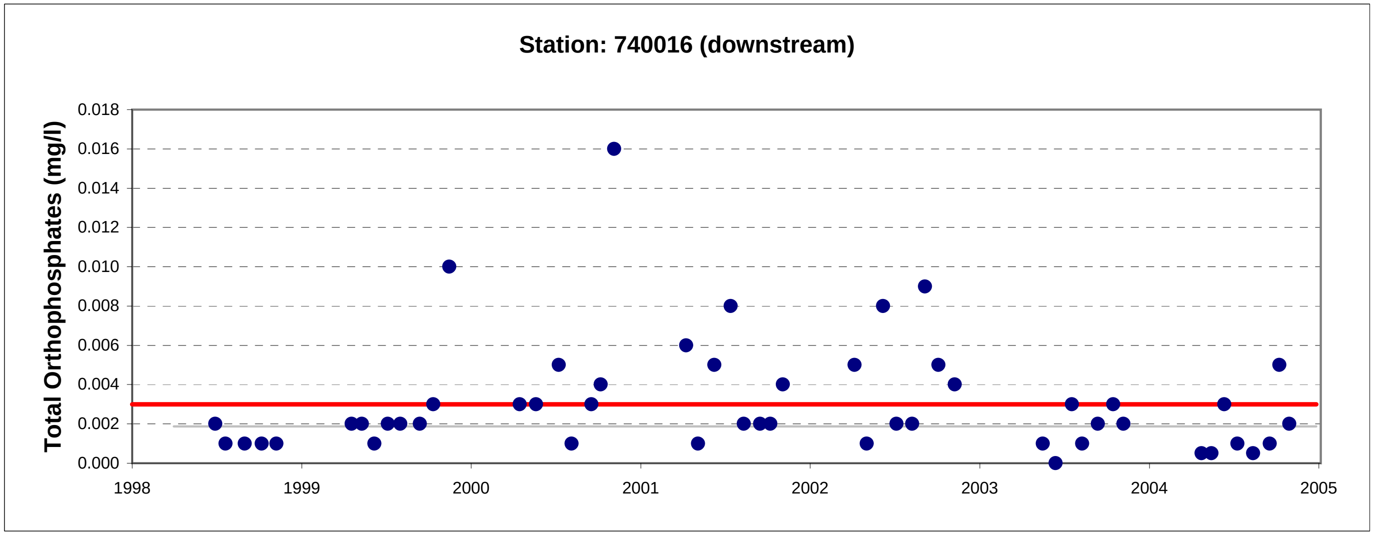
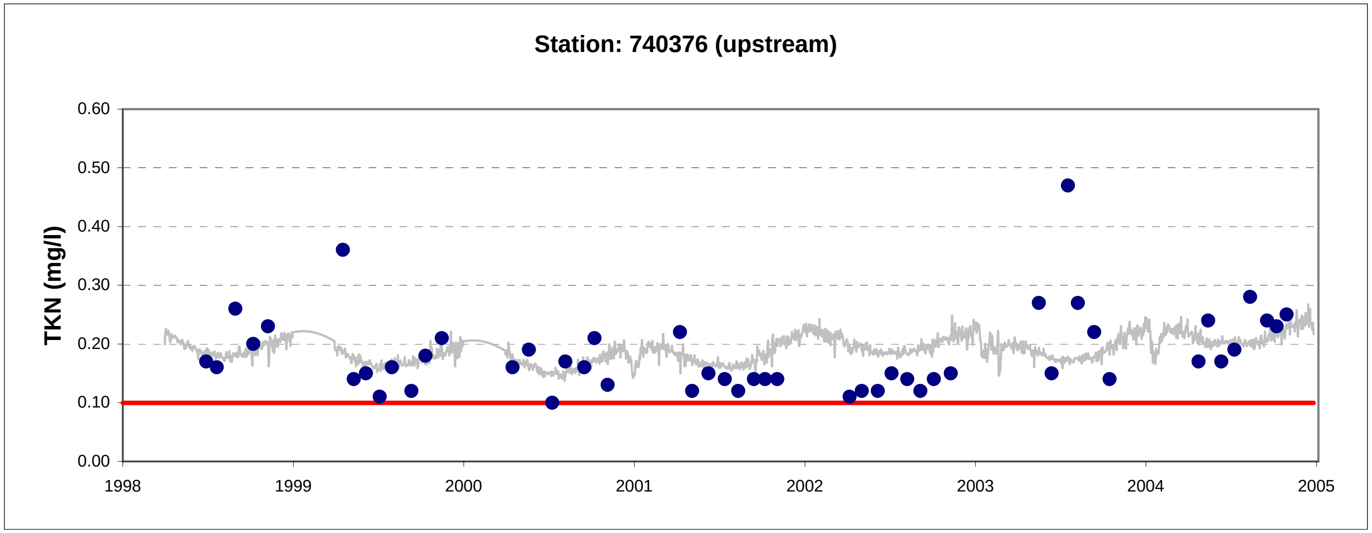


Figure 5-4. St. Clair River - Total Orthophosphate Concentration Time Series, 1998-2004. Grey Line is Regression Model. Red Line is Quantification Limit.



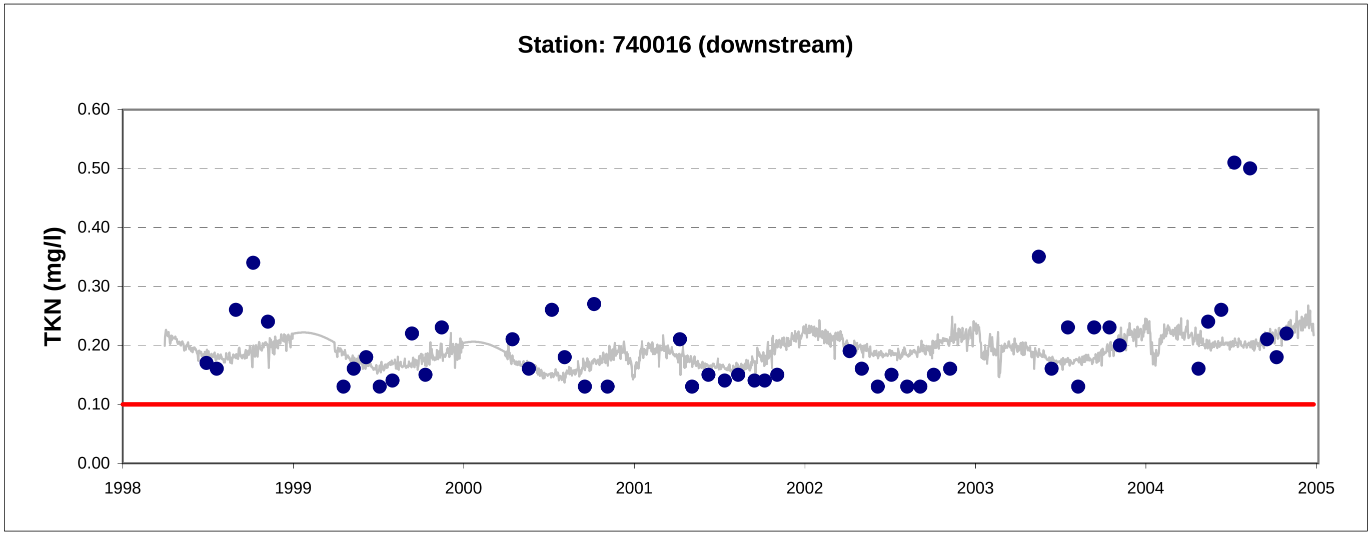
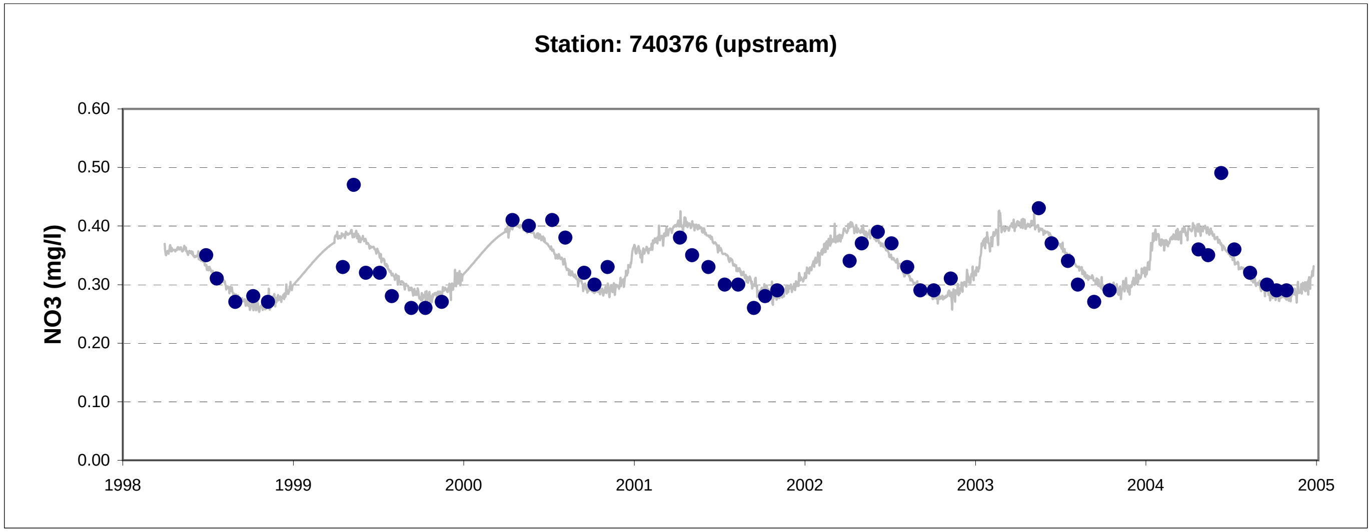


Figure 5-5. St. Clair River - TKN Concentration Time Series, 1998-2004.
Grey Line is Regression Model. Red Line is Quantification Limit.



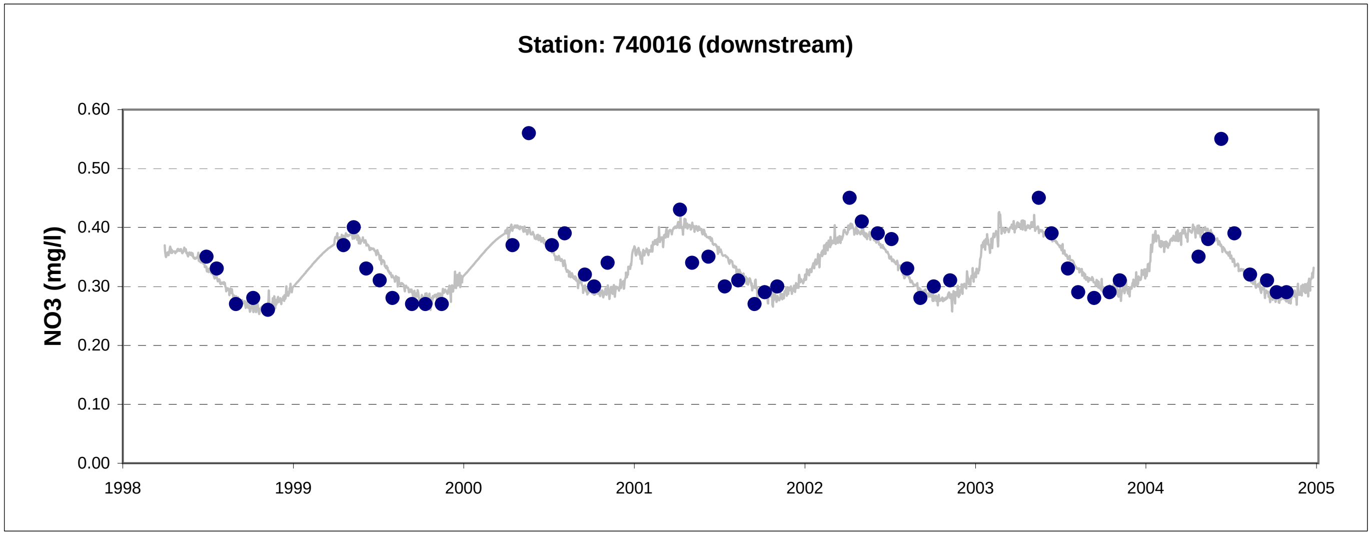


Figure 5-6. St. Clair River - NO3 Concentration Time Series, 1998-2004.
Grey Line is Regression Model.

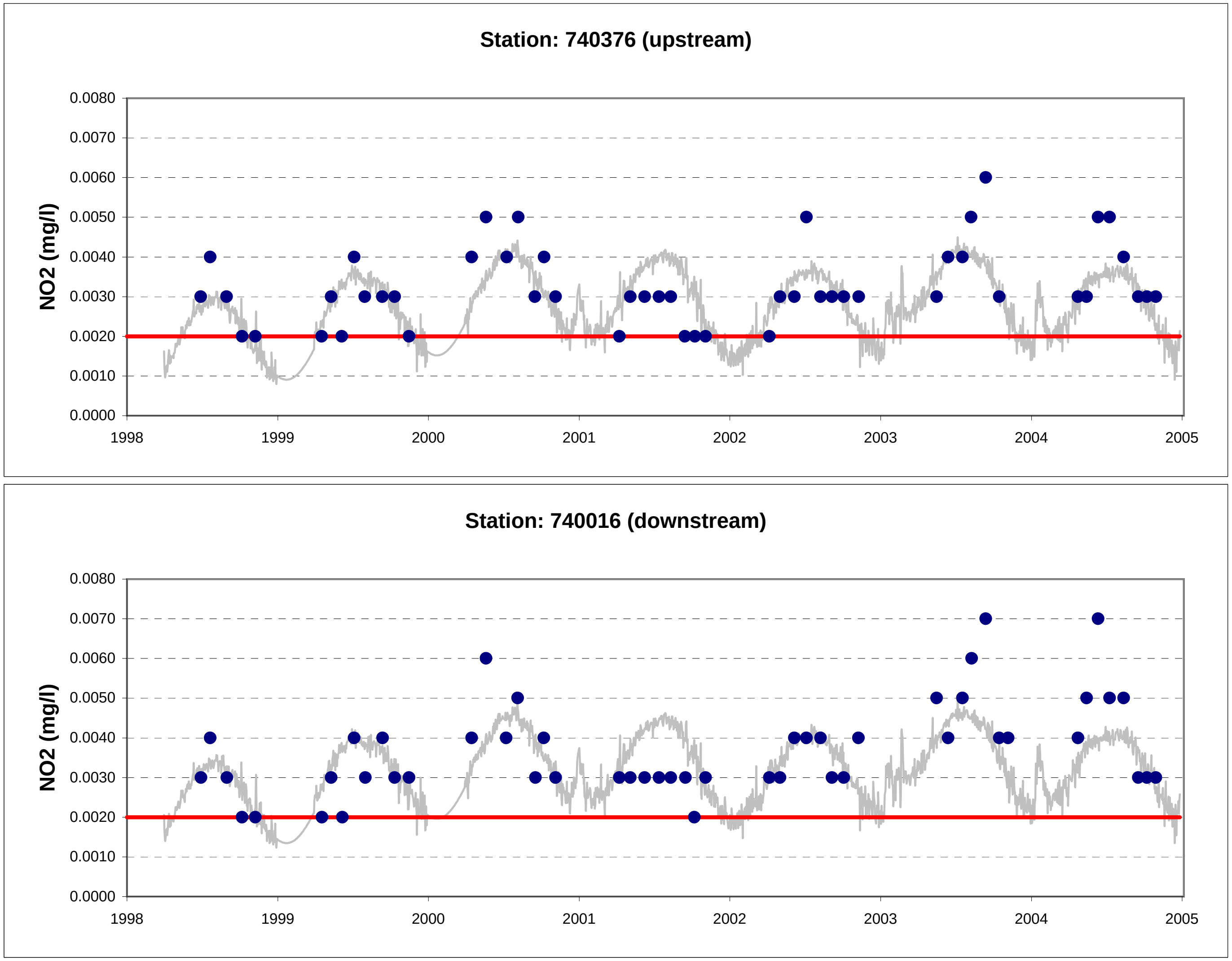


Figure 5-7. St. Clair River - NO2 Concentration Time Series, 1998-2004.
Grey Line is Regression Model. Red Line is Quantification Limit.

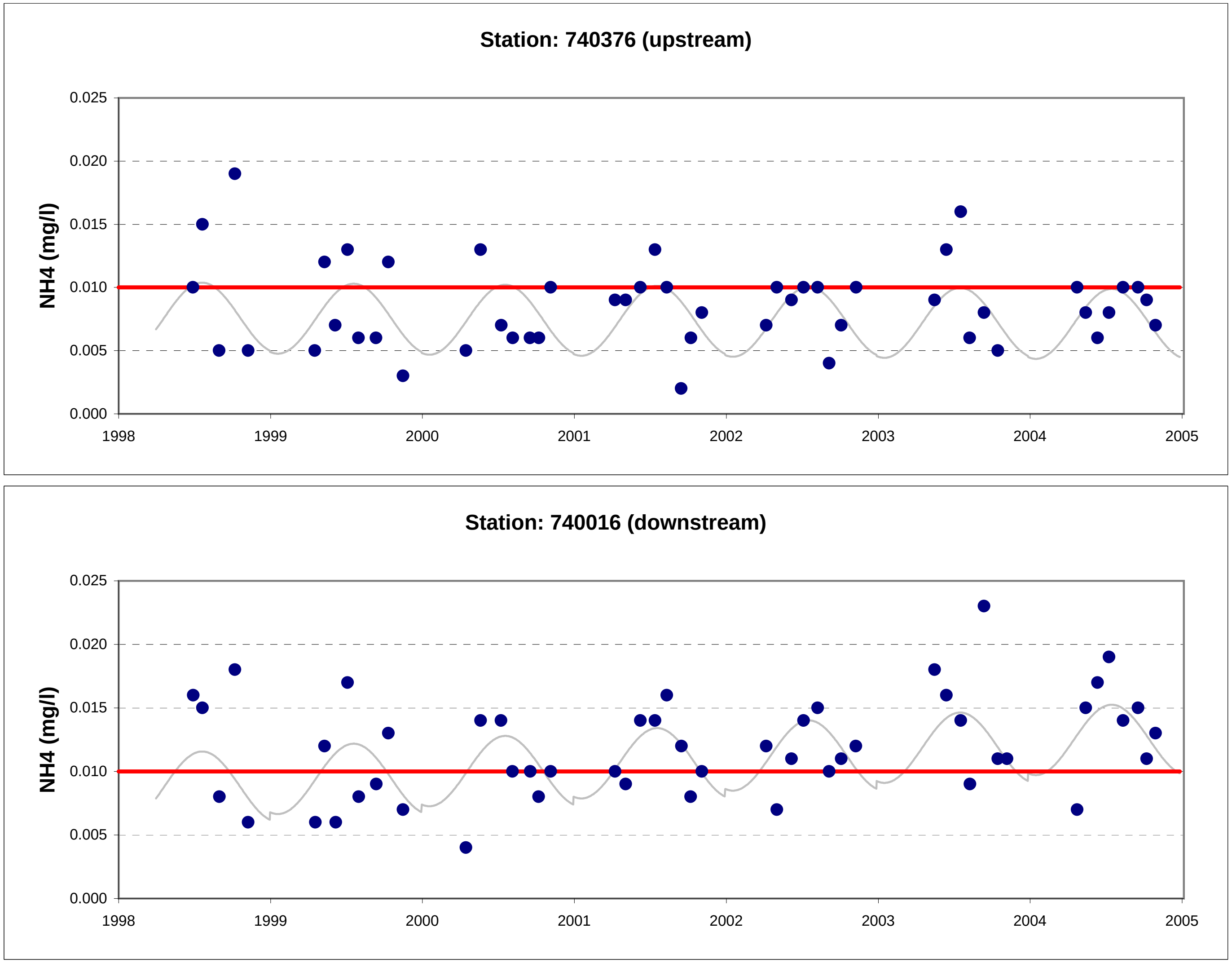
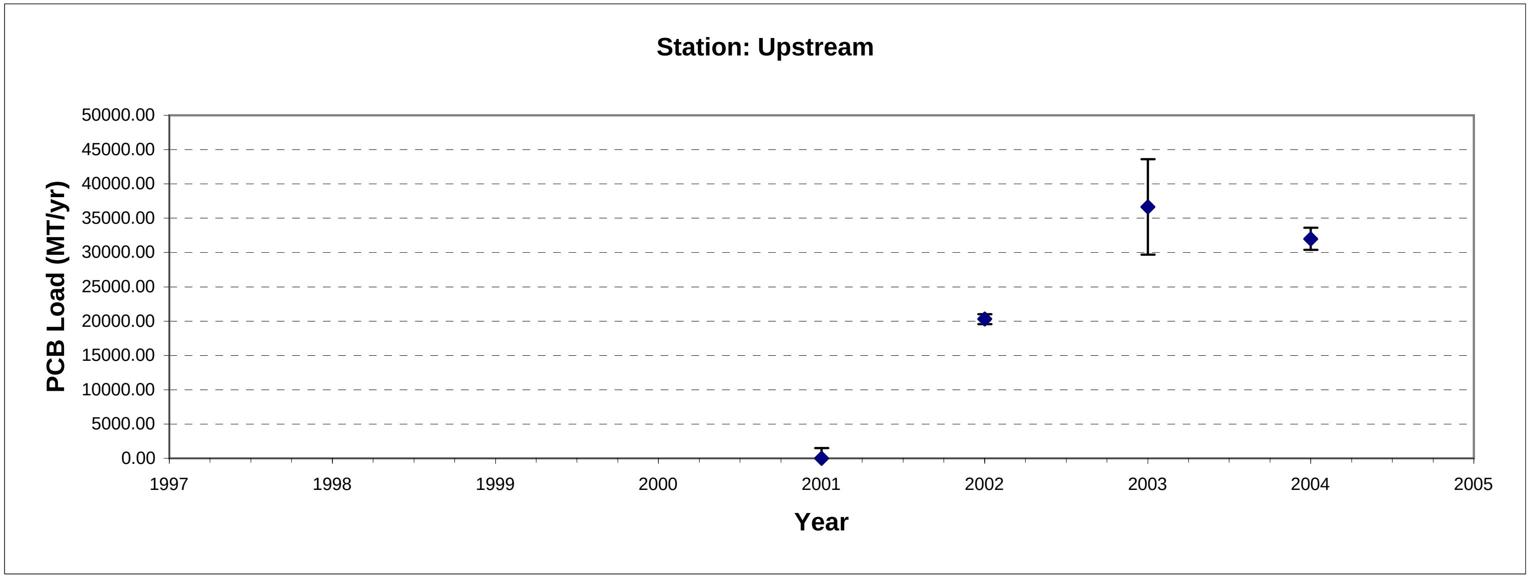


**Figure 5-8. St. Clair River - NH4 Concentration Time Series, 1998-2004.
Grey Line is Regression Model. Red Line is Quantification Limit.**



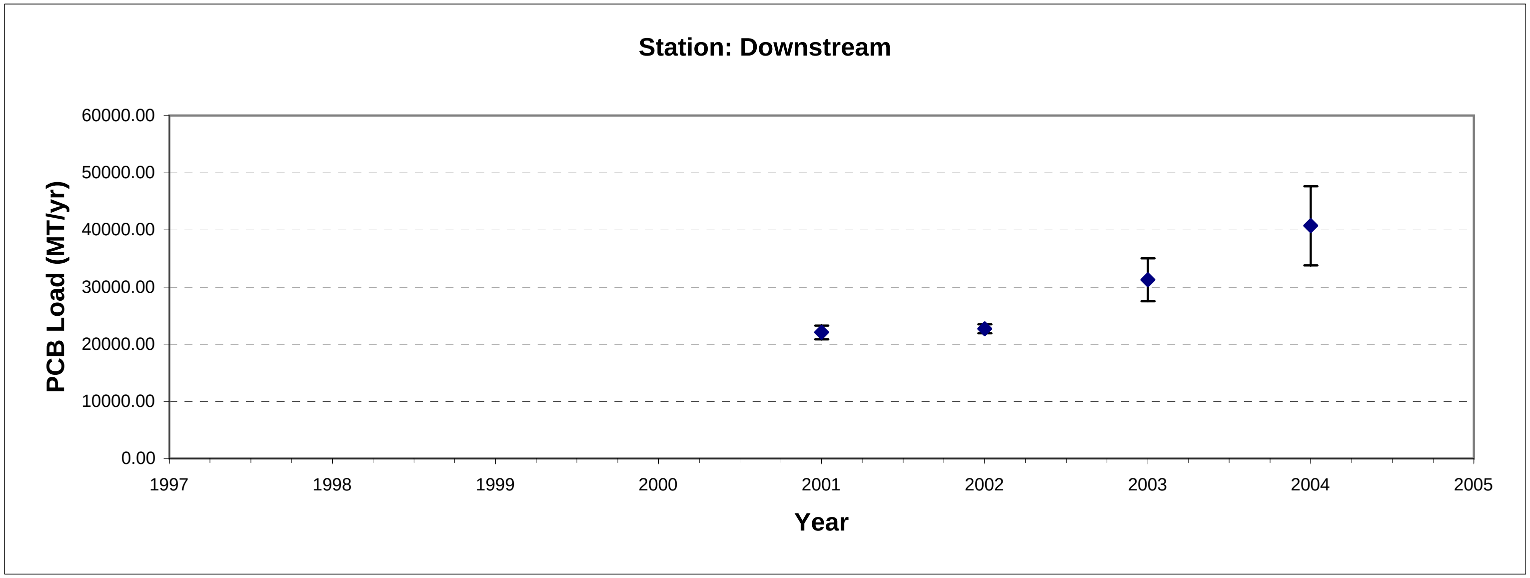
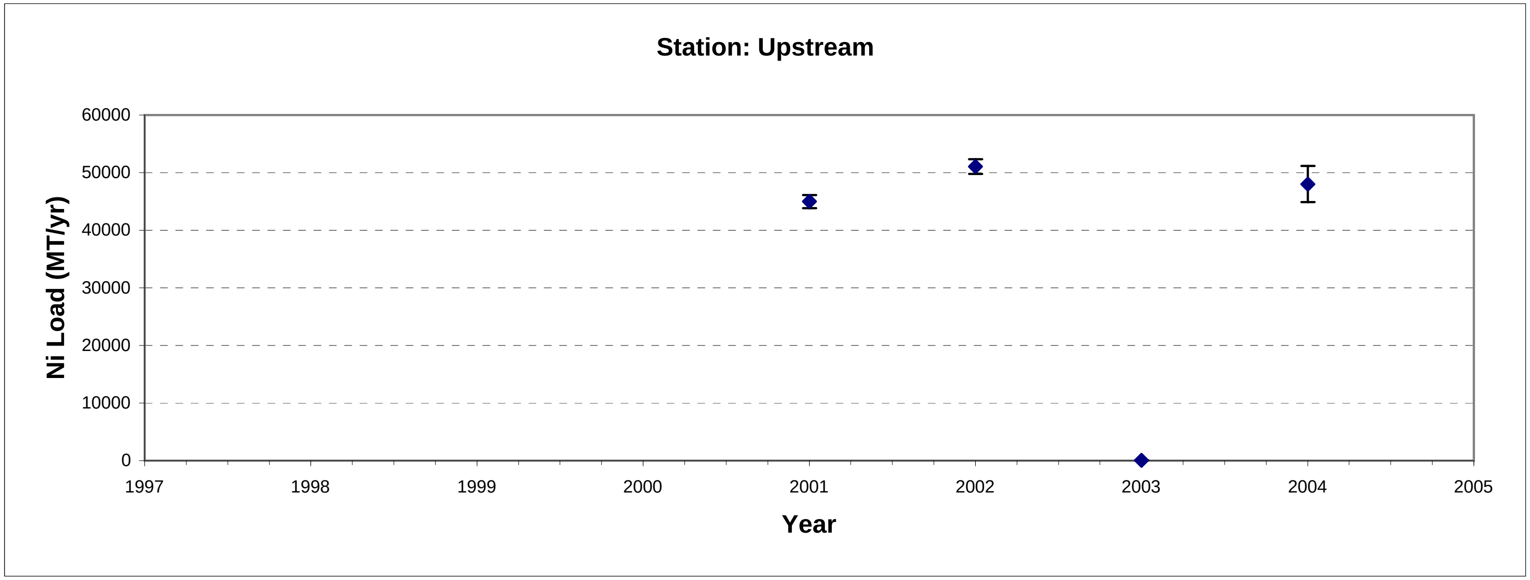


Figure 5-9. Temporal Variation in TKN Load in the St. Clair River.
Diamonds are Means and Bars are 95% Confidence Intervals.



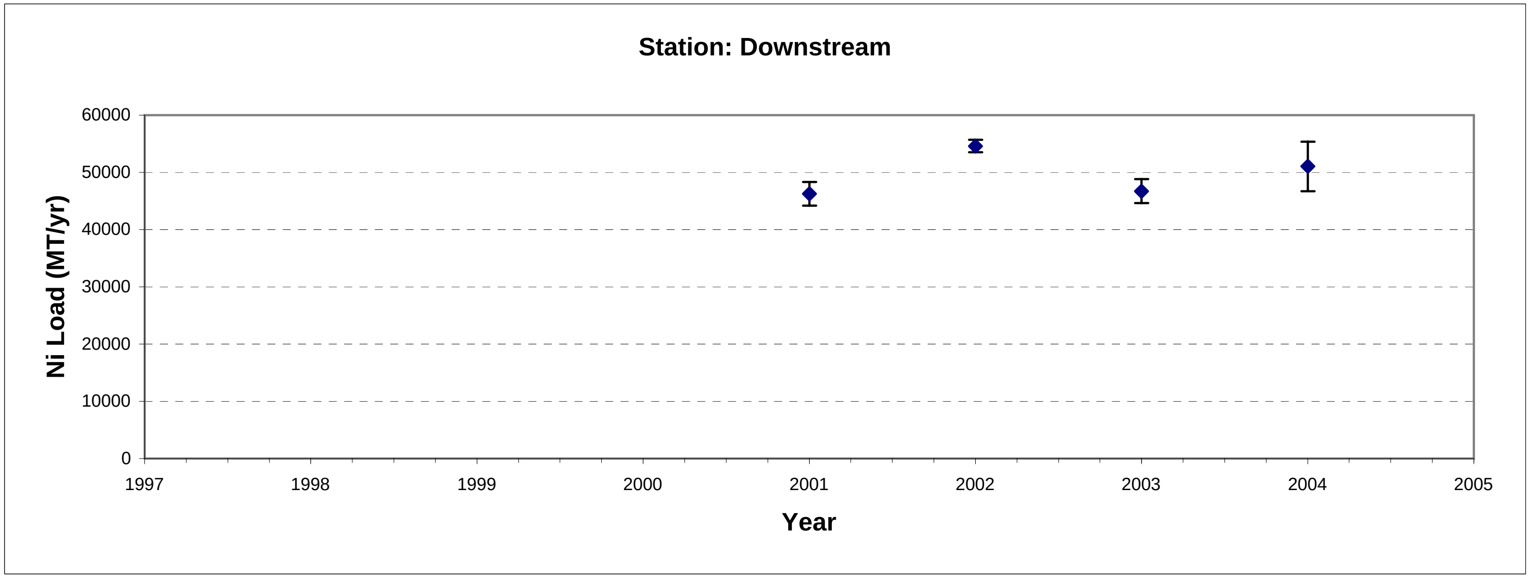
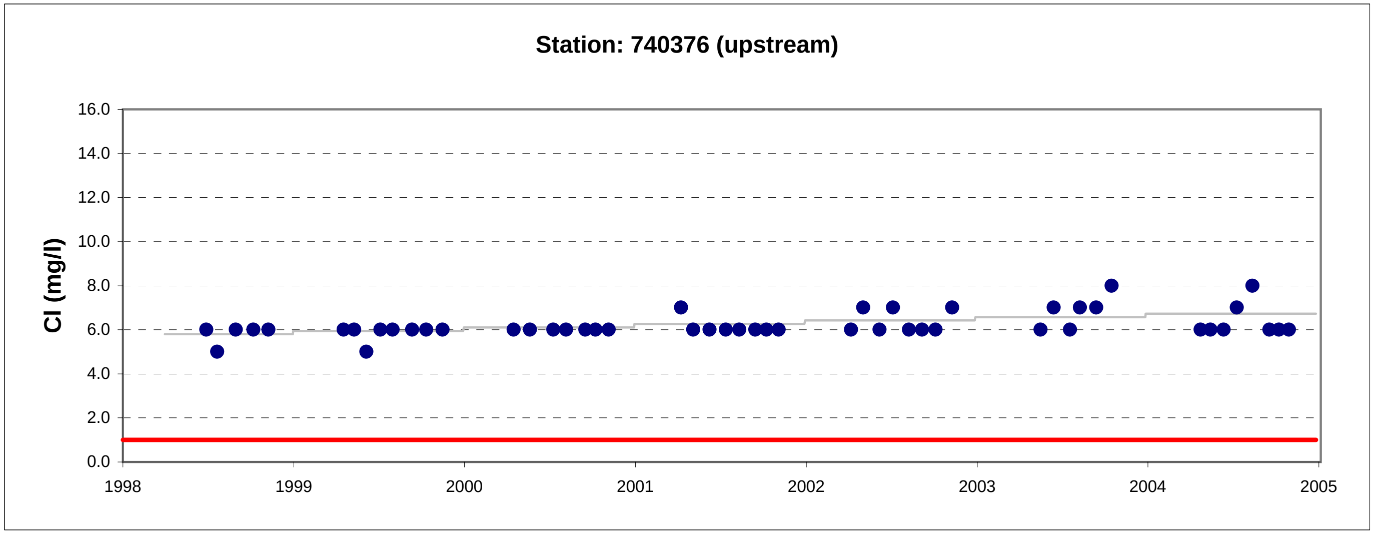


Figure 5-10. Temporal Variation in NO_3 Load in the St. Clair River. Diamonds are Means and Bars are 95% Confidence Intervals.



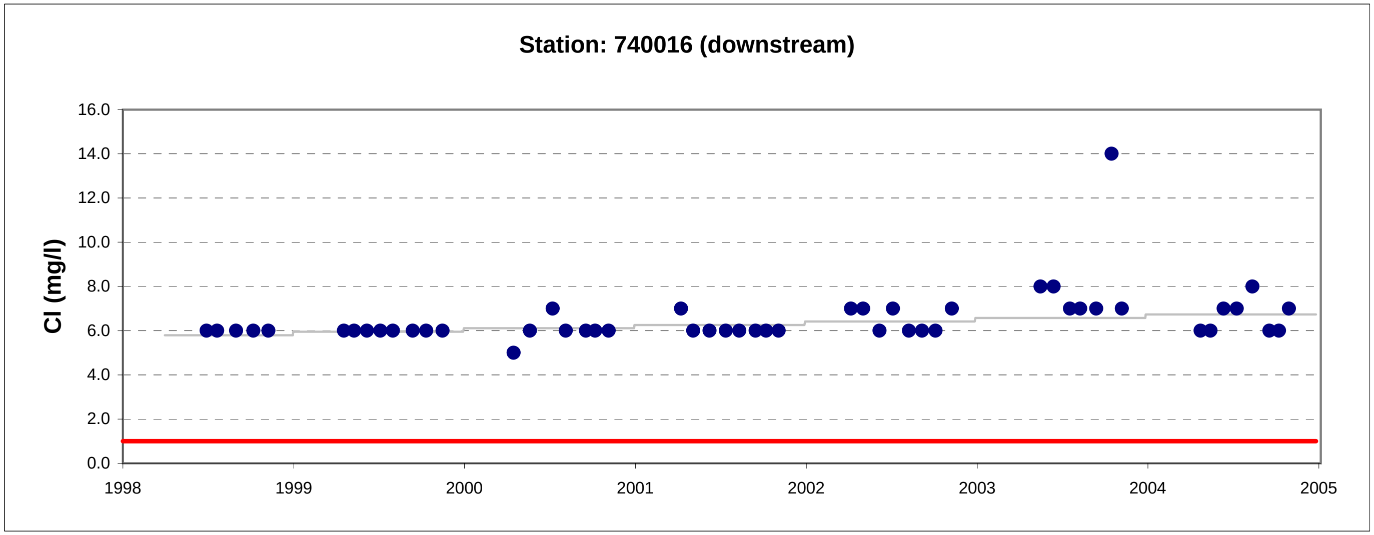
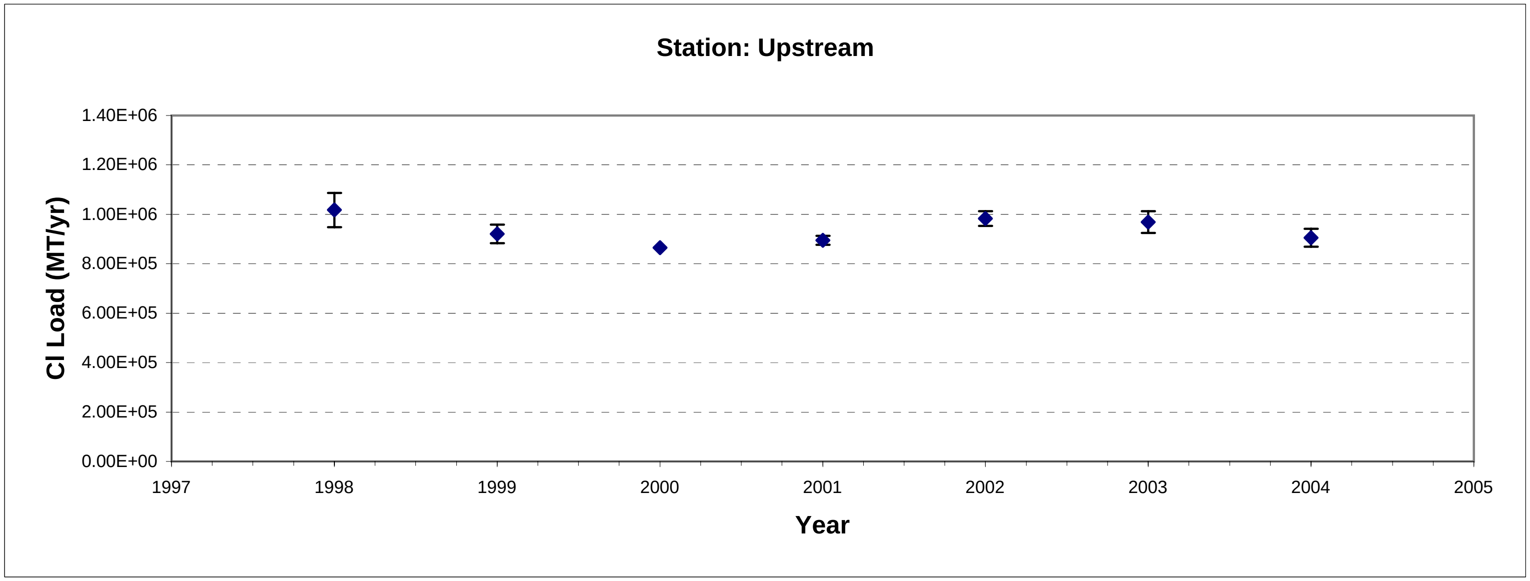


Figure 5-11. St. Clair River - Chloride Concentration Time Series, 1998-2004. Grey Line is Regression Model. Red Line is Quantification Limit.



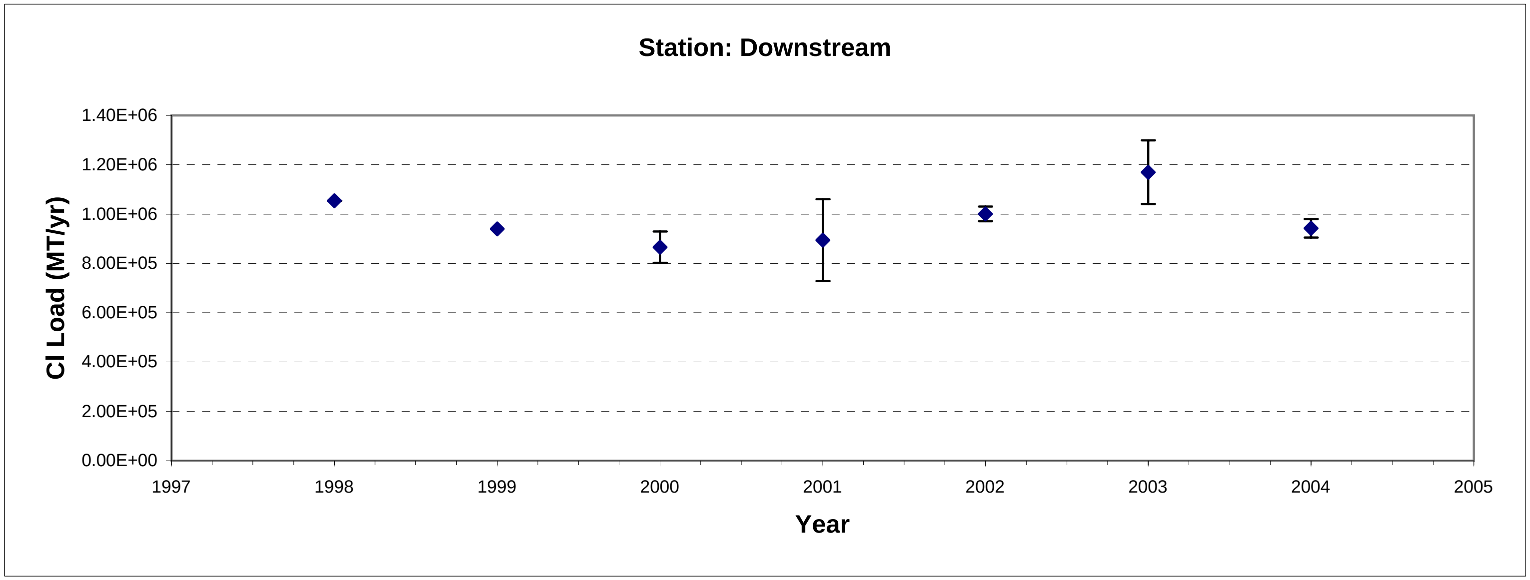


Figure 5-12. Temporal Variation in Chloride Load in the St. Clair River. Diamonds are Means and Bars are 95% Confidence Intervals.

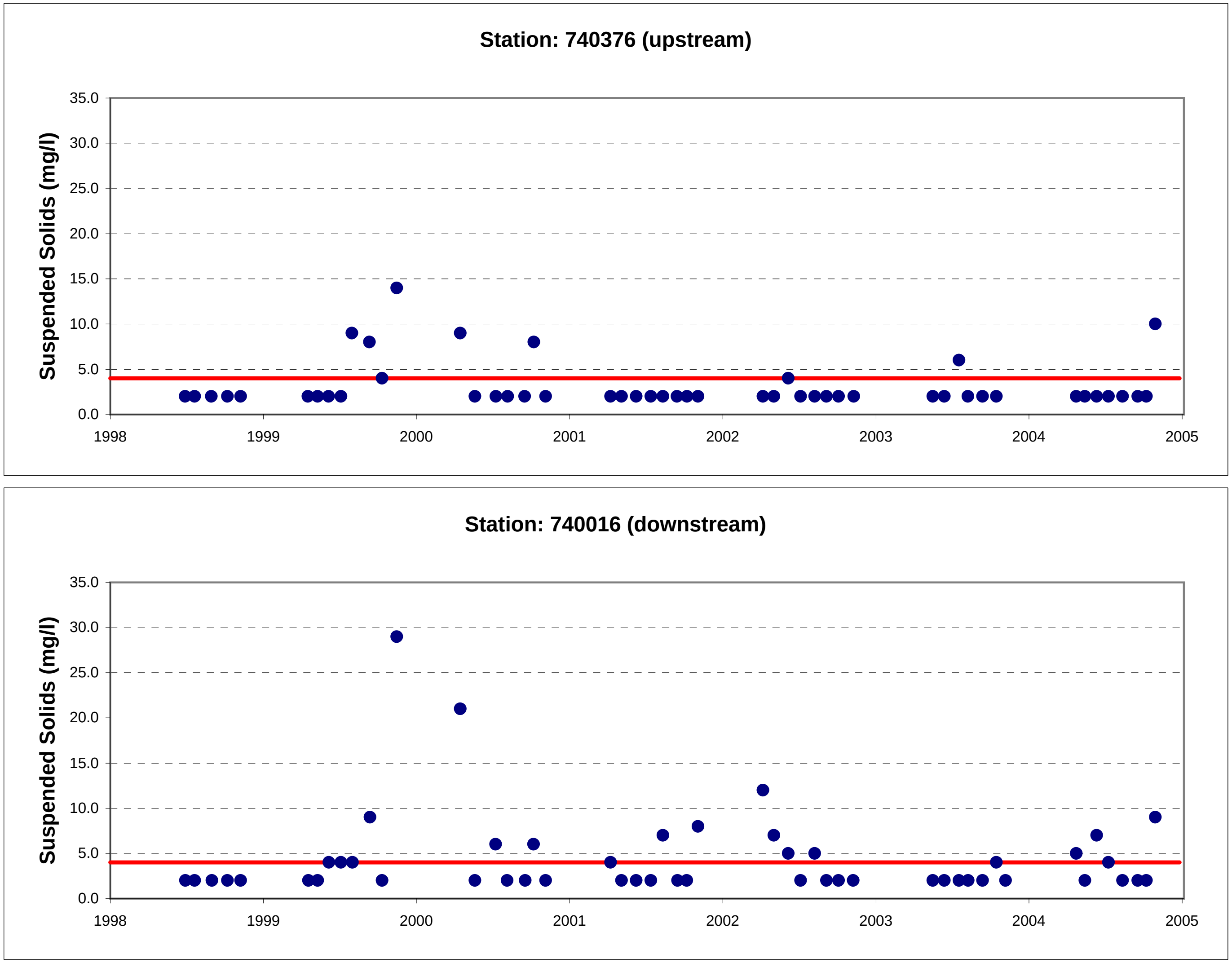
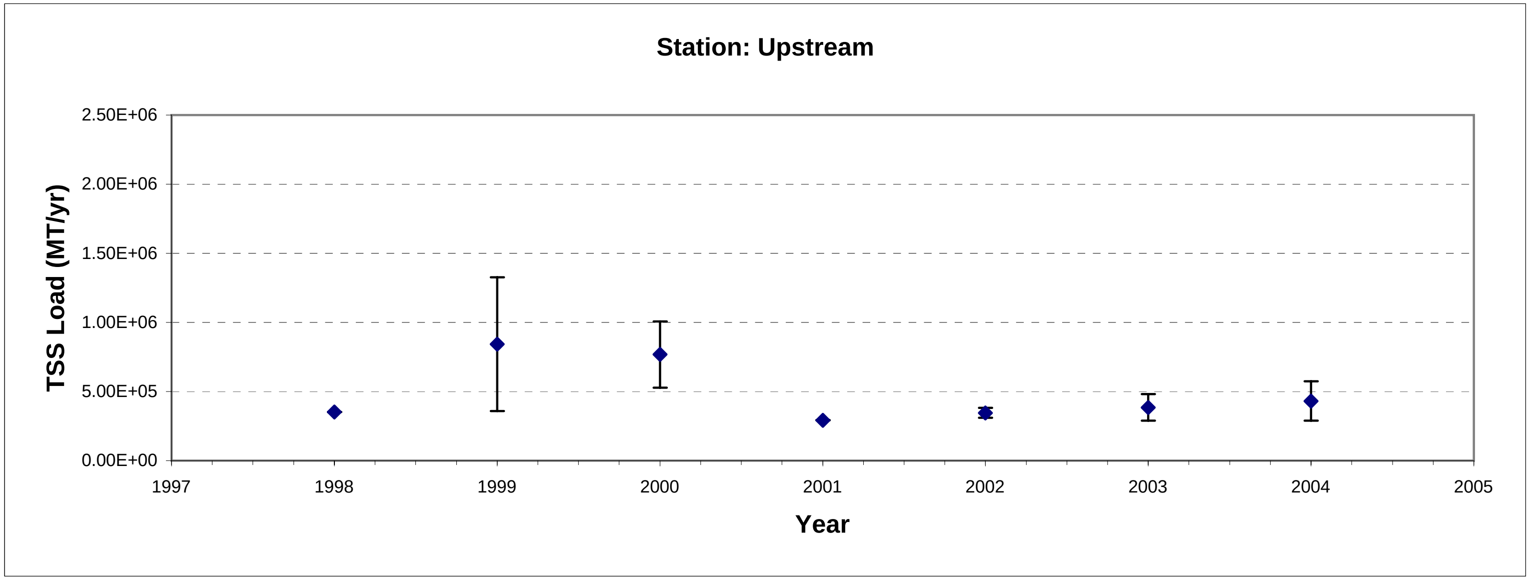


**Figure 5-13. St. Clair River - TSS Concentration Time Series, 1998-2004.
Red Line is Quantification Limit.**



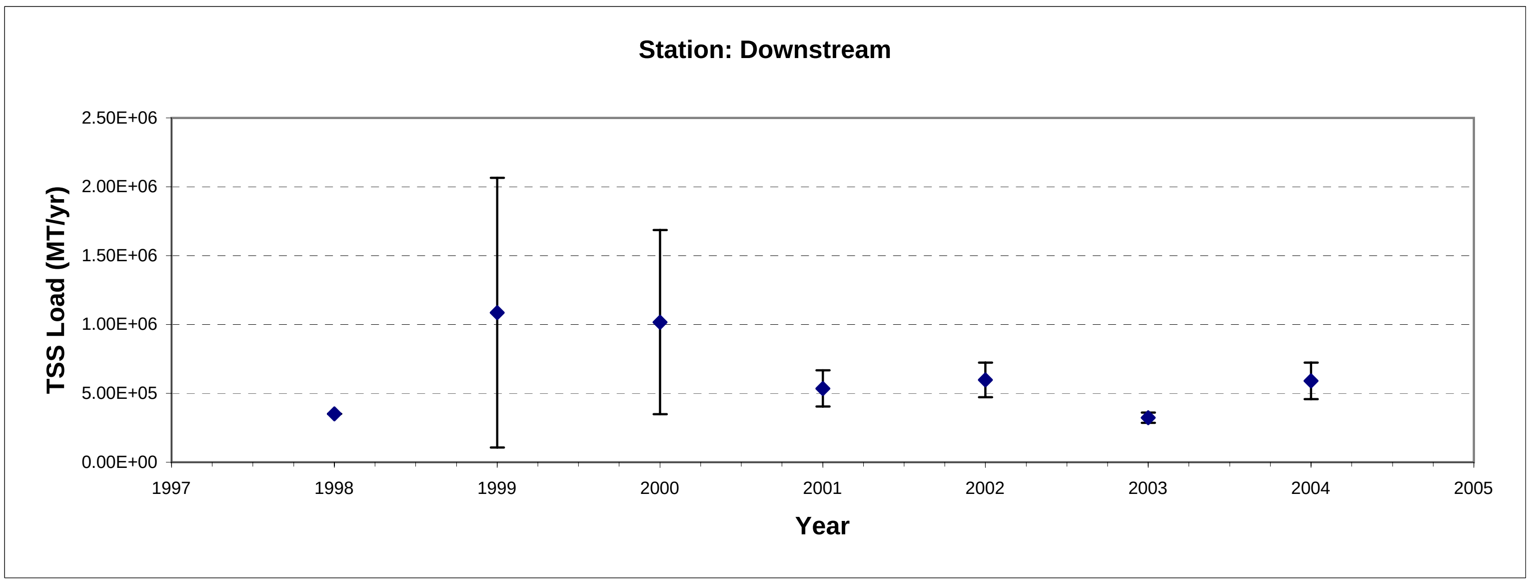
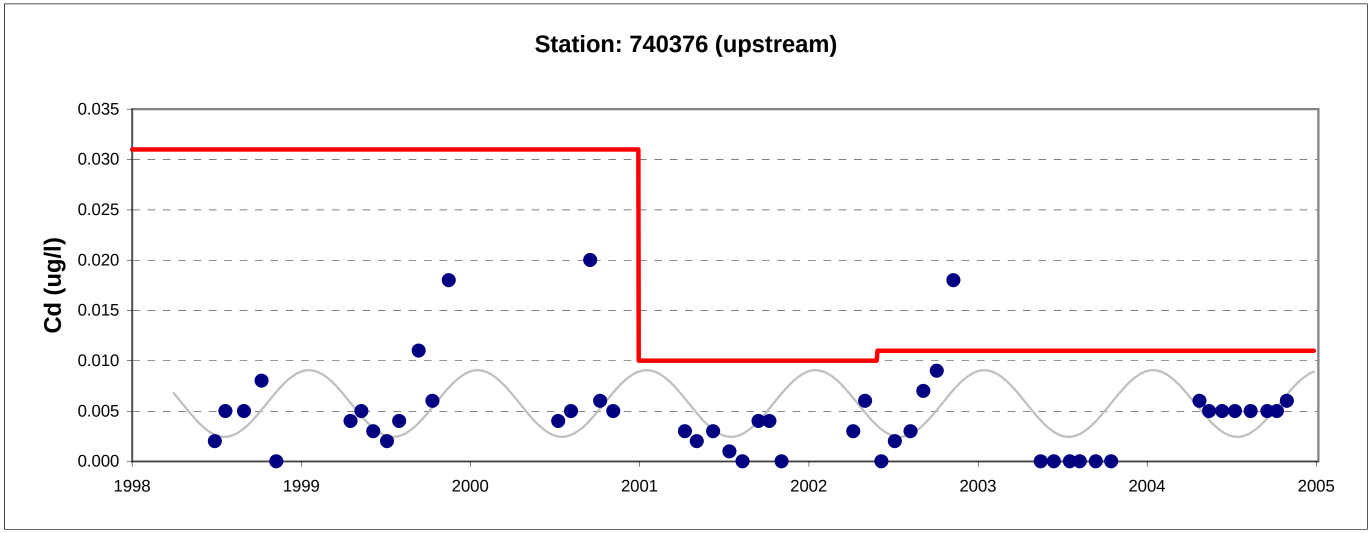


Figure 5-14. Temporal Variation in TSS Load in the St. Clair River. Diamonds are Means and Bars are 95% Confidence Intervals.



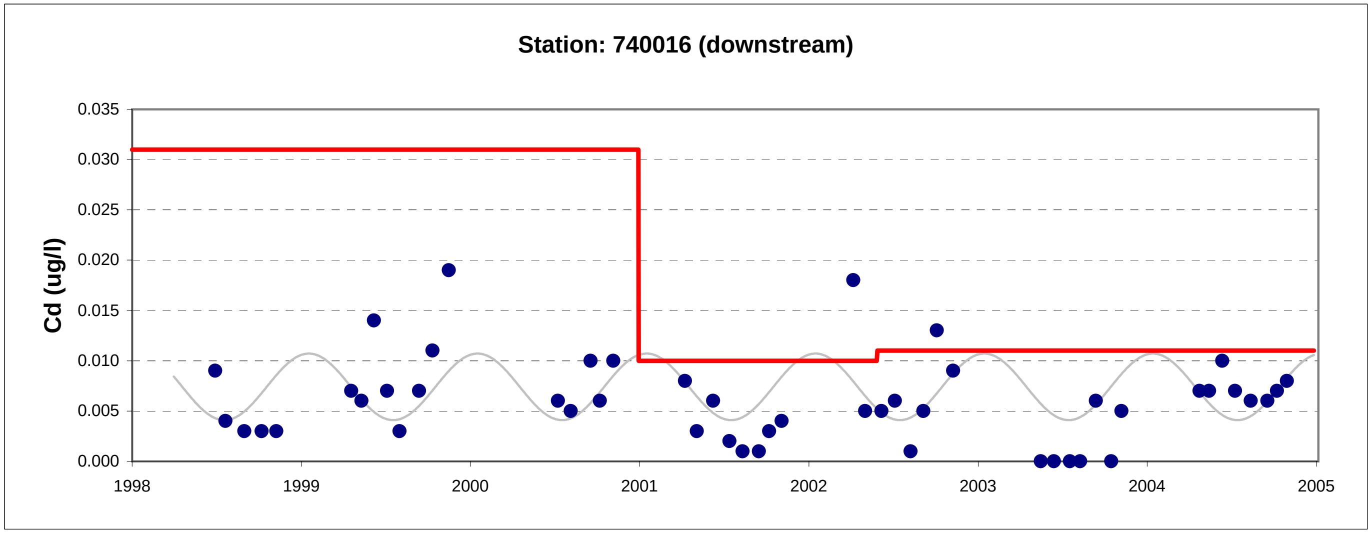


Figure 5-15. St. Clair River - Cadmium Concentration Time Series, 1998-2004. Grey Line is Regression Model. Red Line is Quantification Limit.

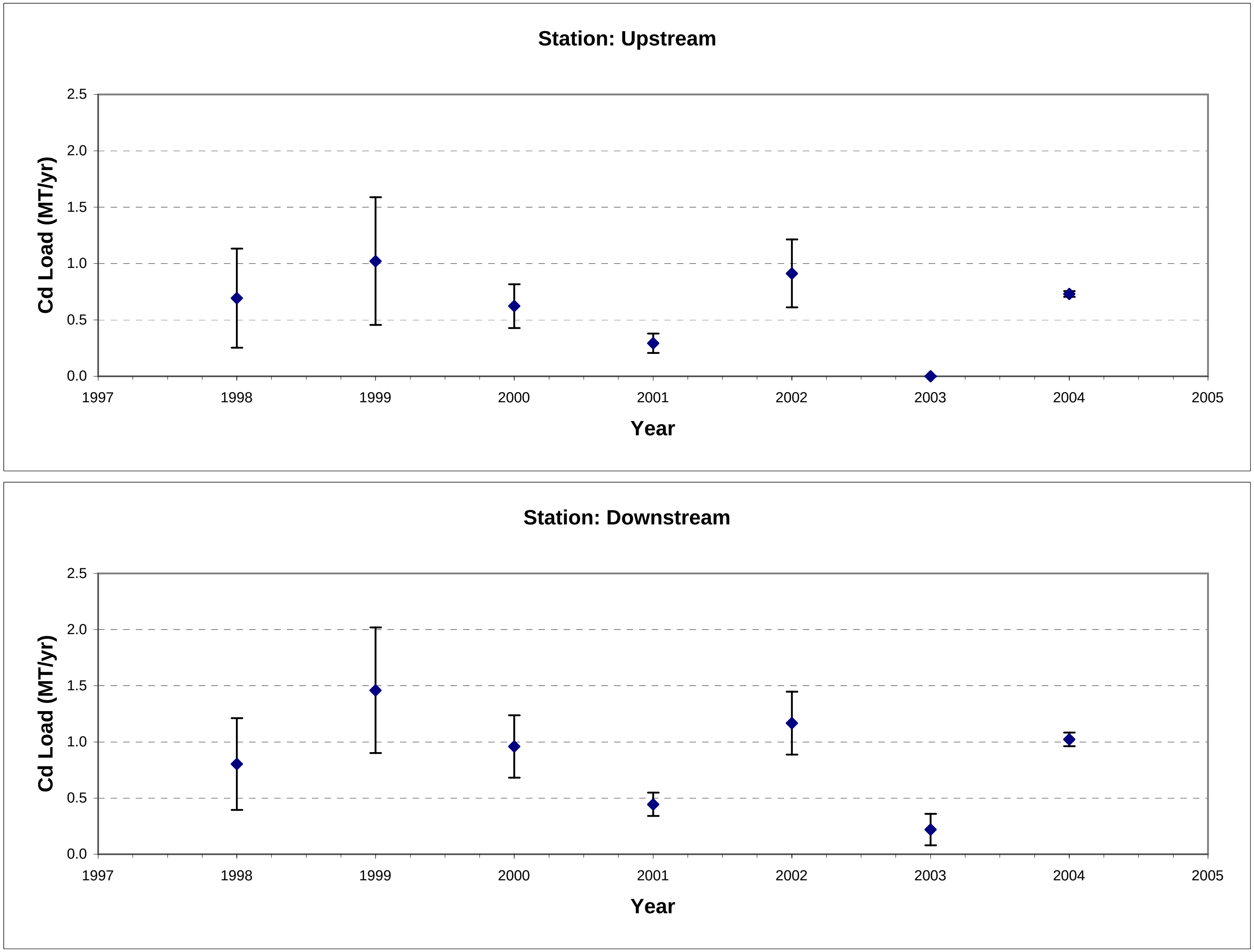


Figure 5-16. Temporal Variation in Cadmium Load in the St. Clair River. Diamonds are Means and Bars are 95% Confidence Intervals.

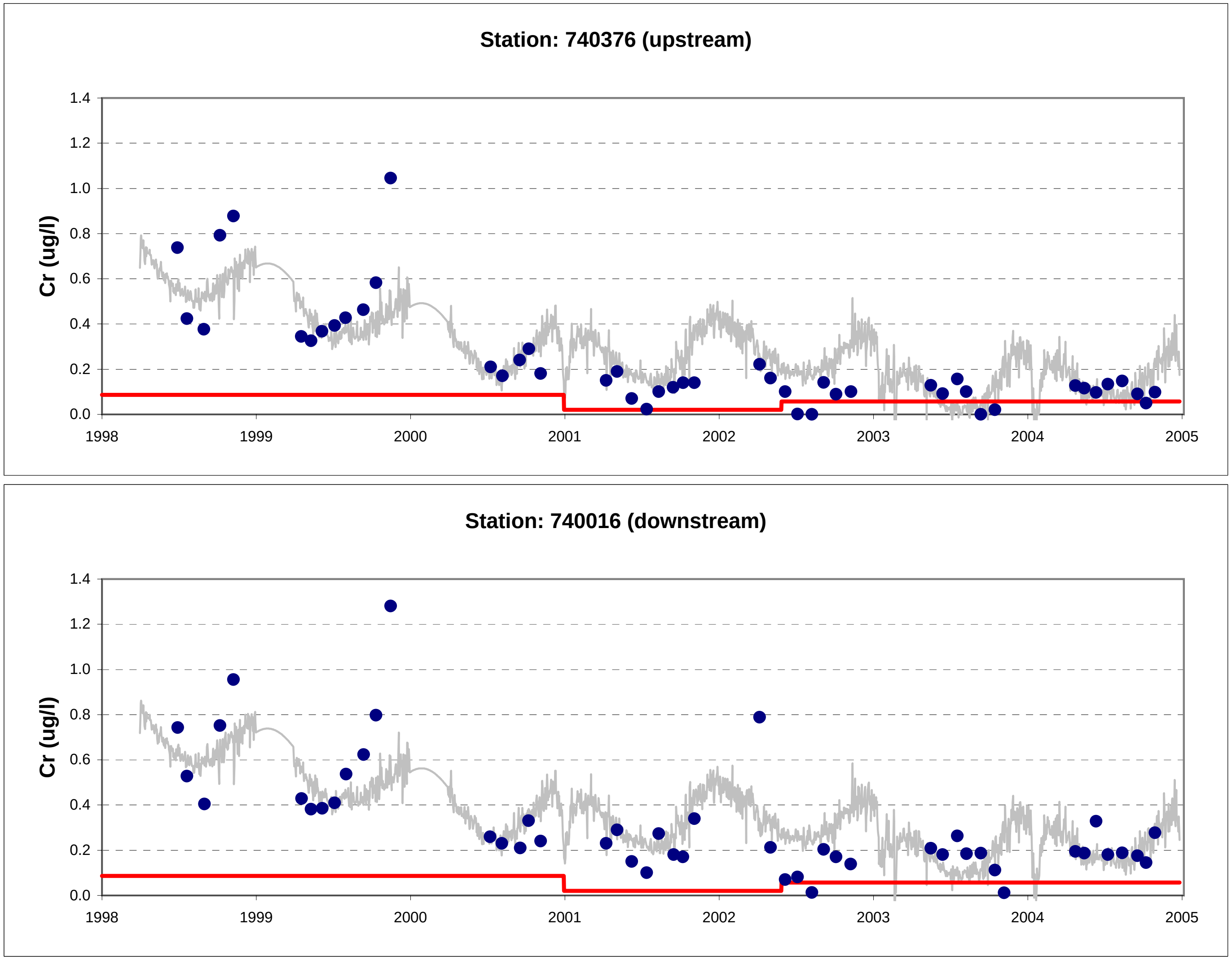
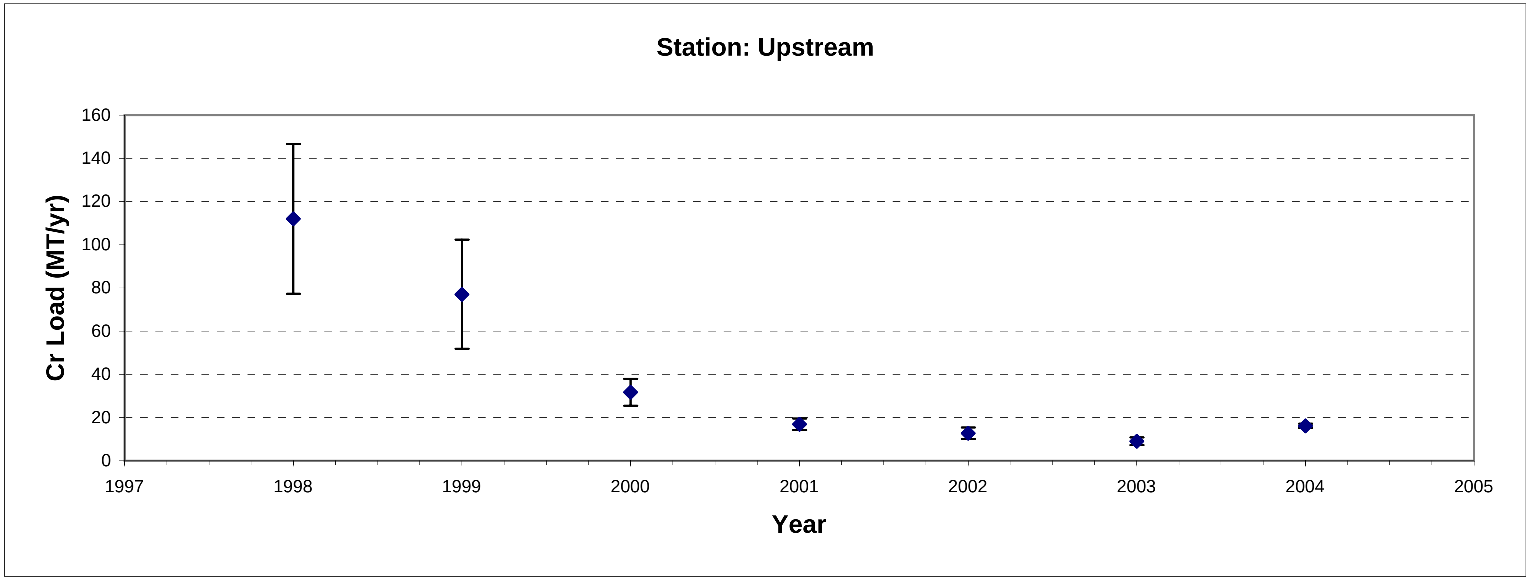


Figure 5-17. St. Clair River - Chromium Concentration Time Series, 1998-2004. Grey Line is Regression Model. Red Line is Quantification Limit.



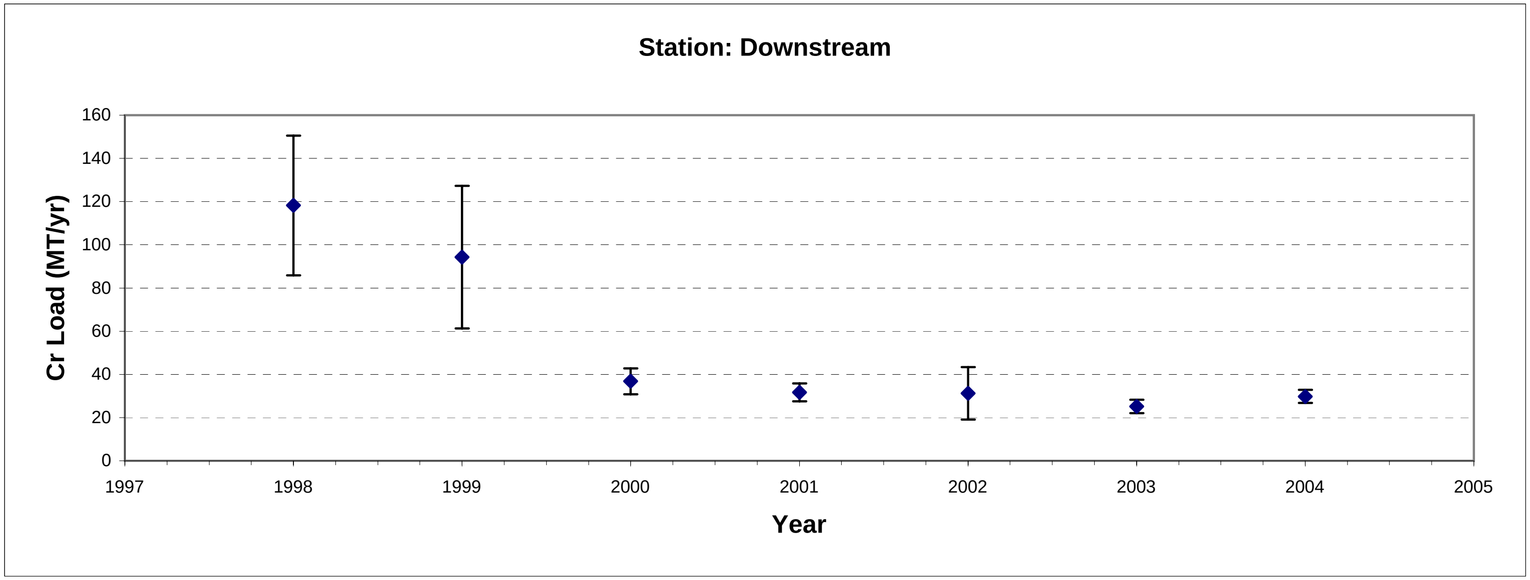


Figure 5-18. Temporal Variation in Chromium Load in the St. Clair River. Diamonds are Means and Bars are 95% Confidence Intervals.

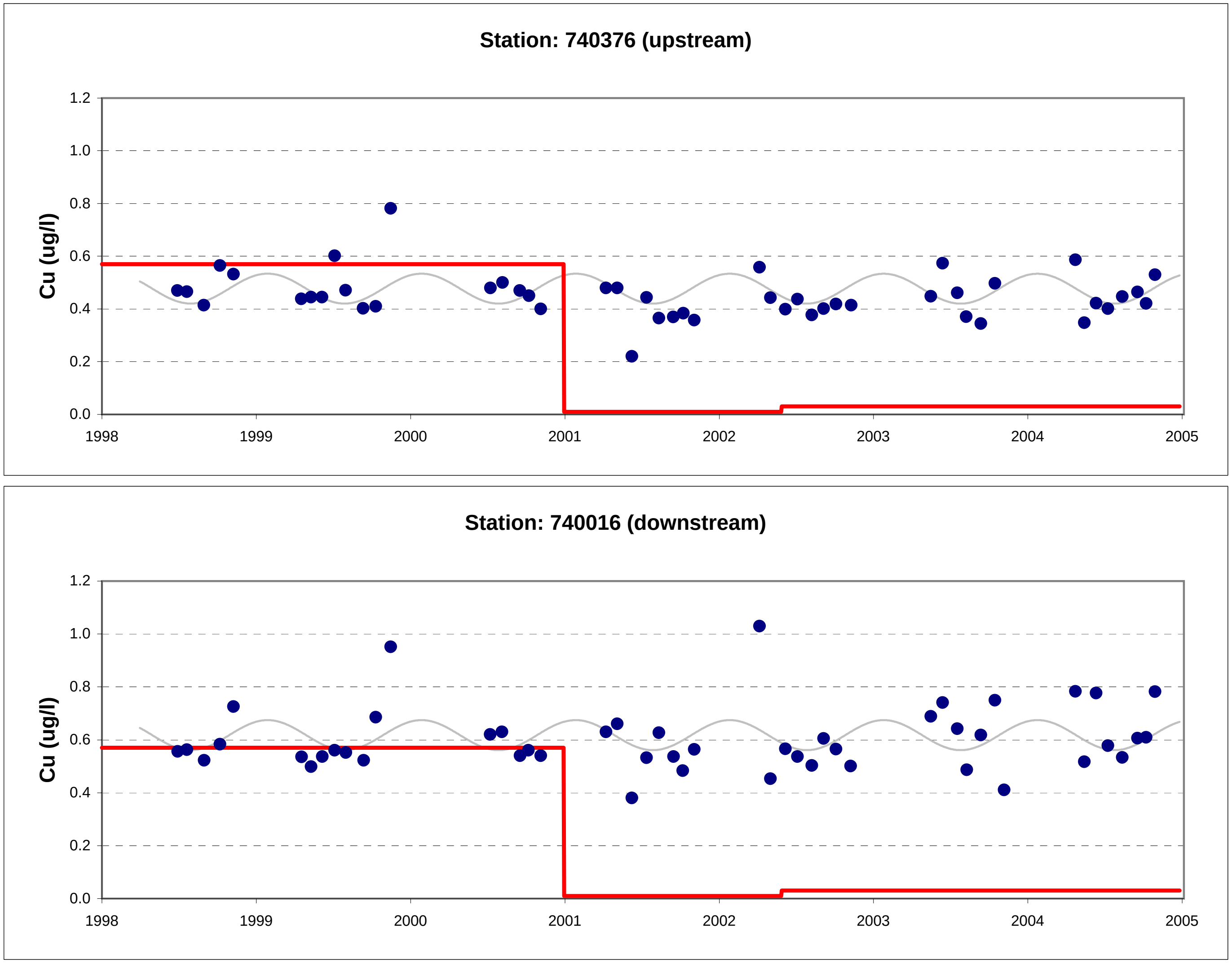


Figure 5-19. St. Clair River - Copper Concentration Time Series, 1998-2004.
Grey Line is Regression Model. Red Line is Quantification Limit.

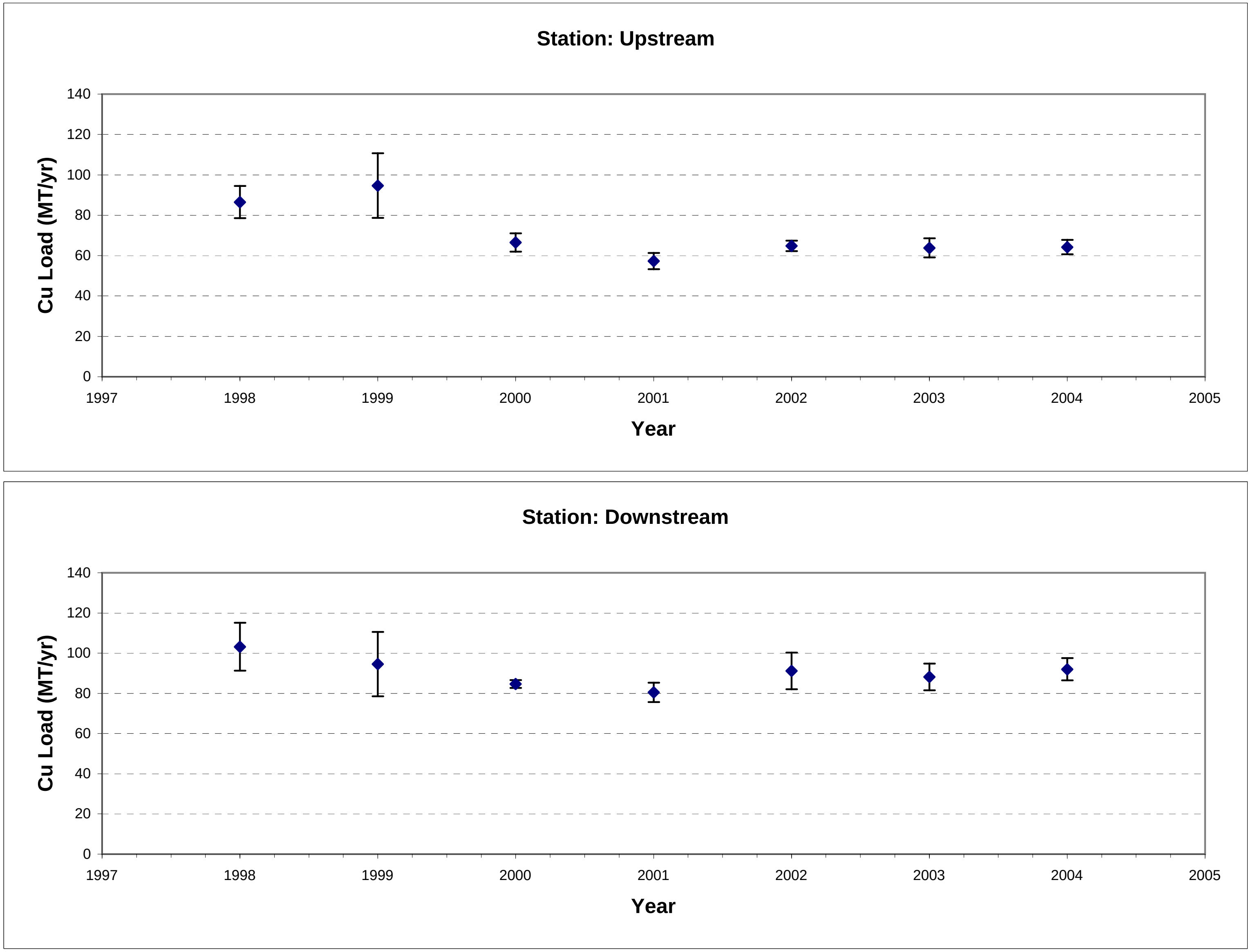
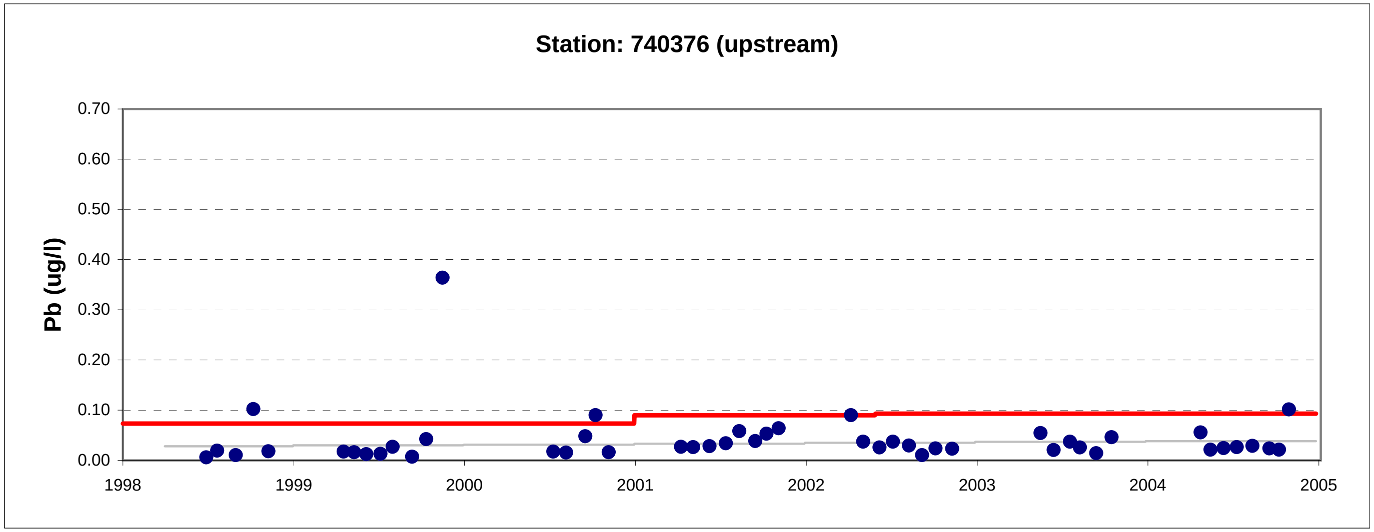


Figure 5-20. Temporal Variation in Copper Load in the St. Clair River. Diamonds are Means and Bars are 95% Confidence Intervals.



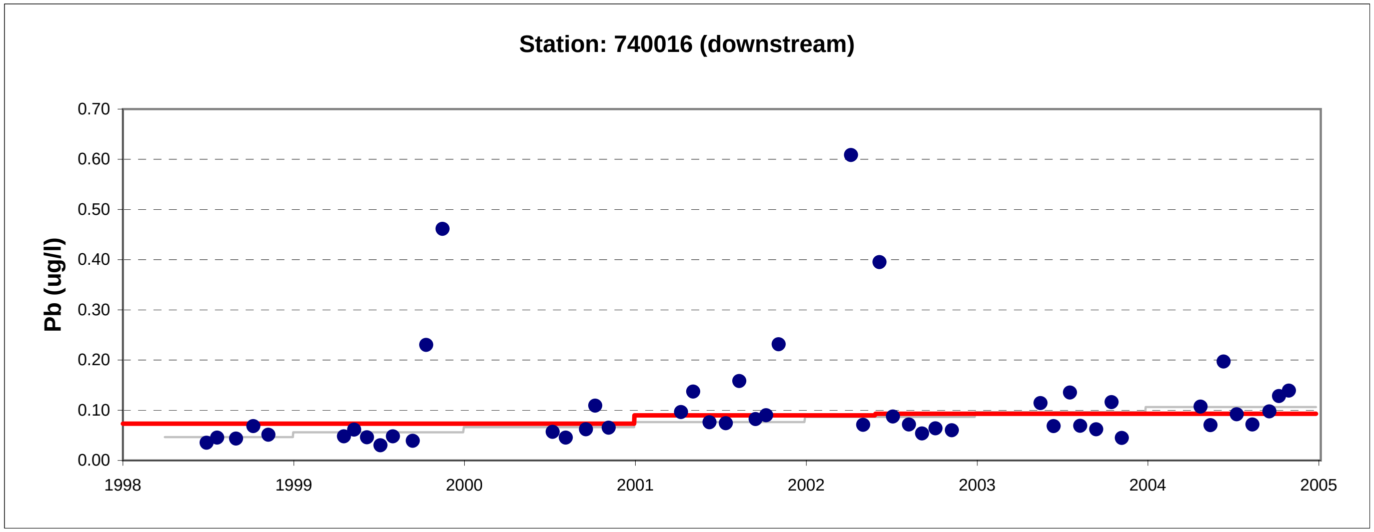
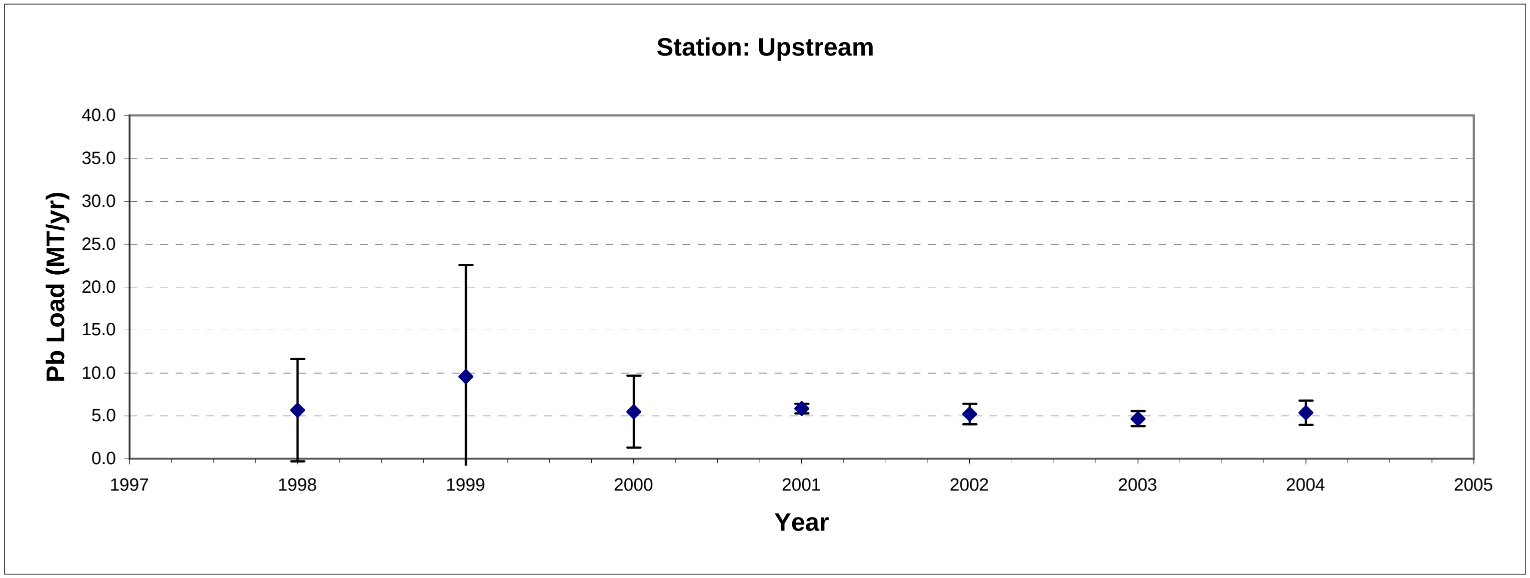


Figure 5-21. St. Clair River - Lead Concentration Time Series, 1998-2004. Grey Line is Regression Model. Red Line is Quantification Limit.



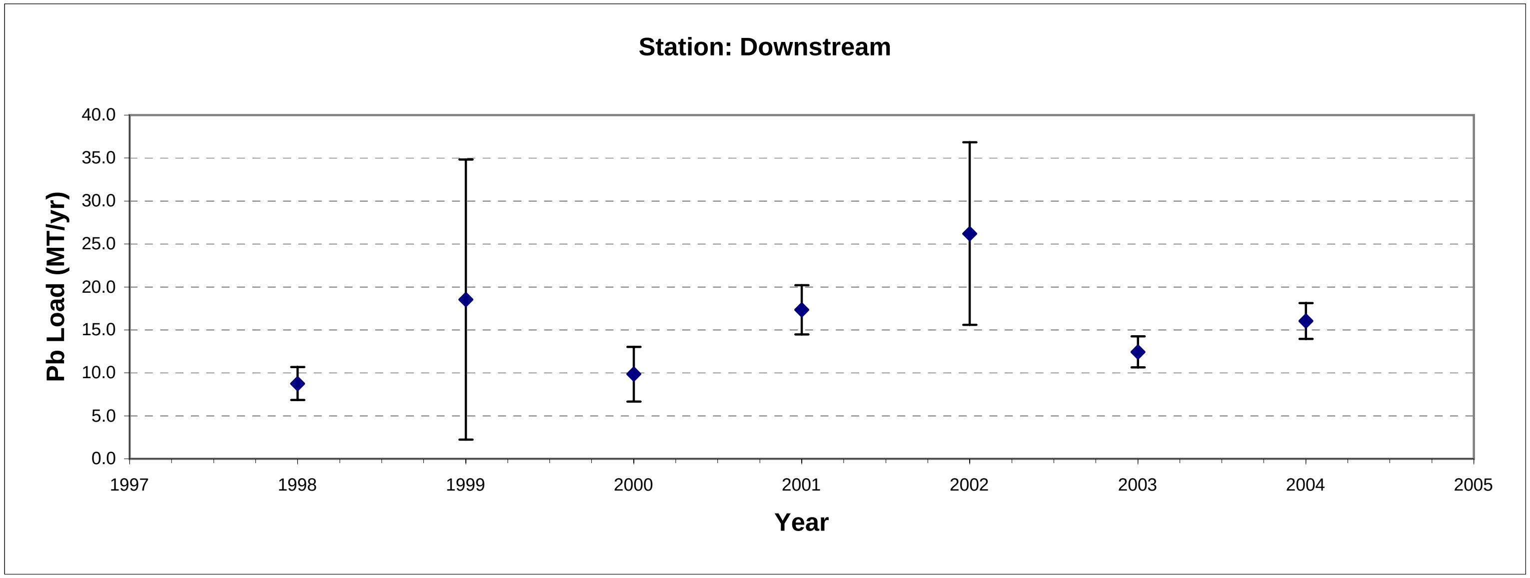
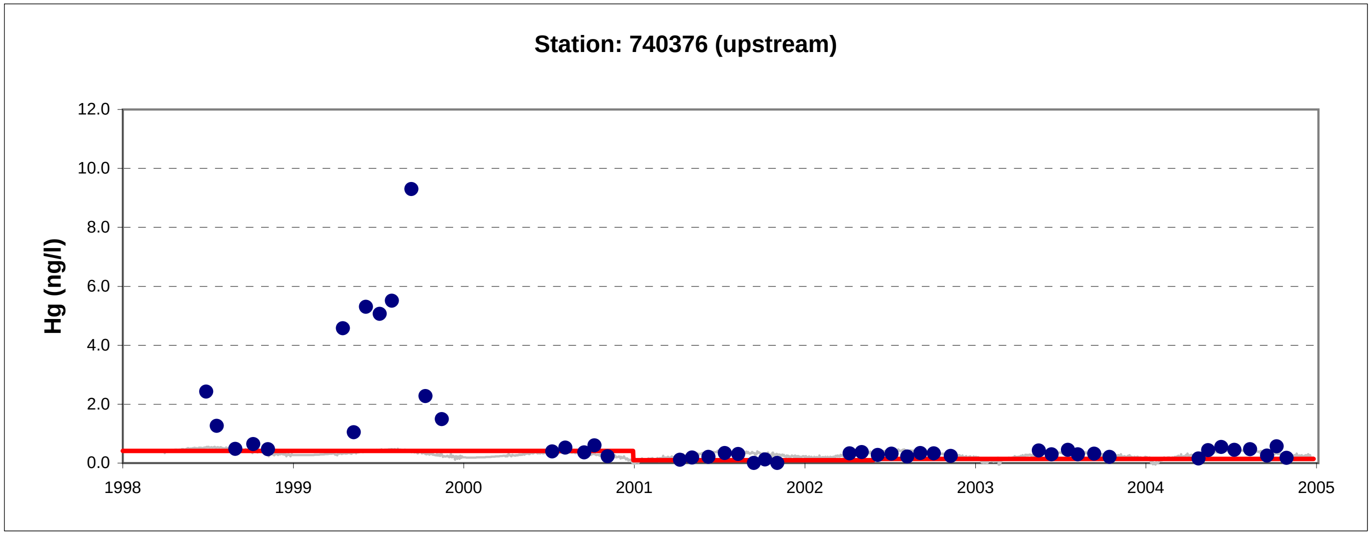


Figure 5-22. Temporal Variation in Lead Load in the St. Clair River. Diamonds are Means and Bars are 95% Confidence Intervals.



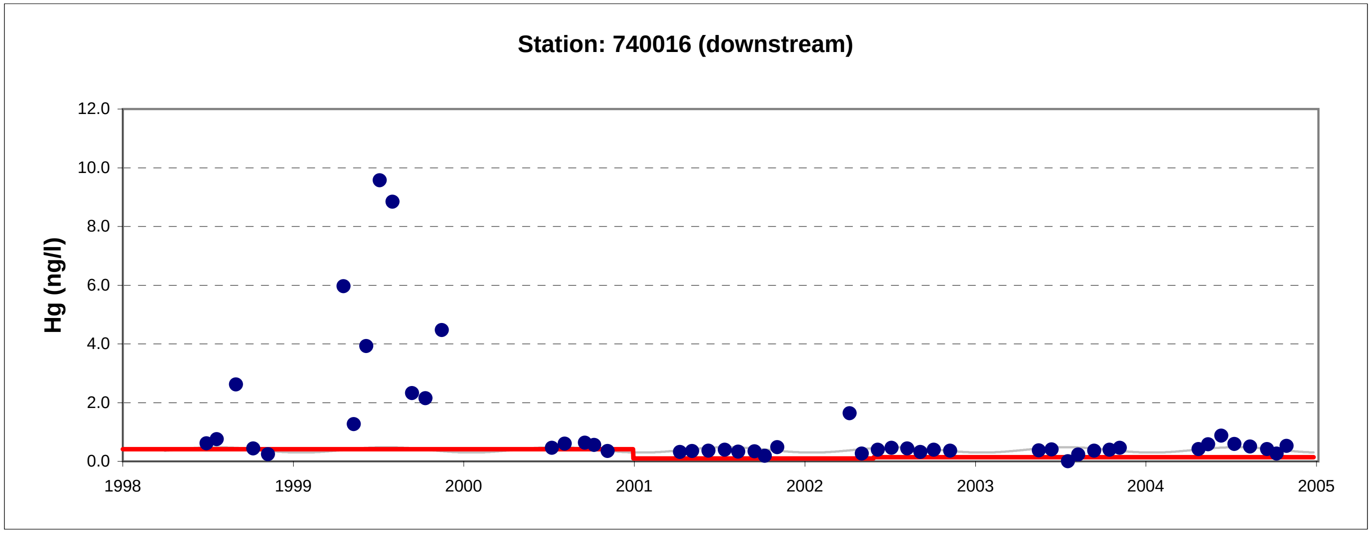


Figure 5-23. St. Clair River - Mercury Concentration Time Series, 1998-2004.
Grey Line is Regression Model. Red Line is Quantification Limit.

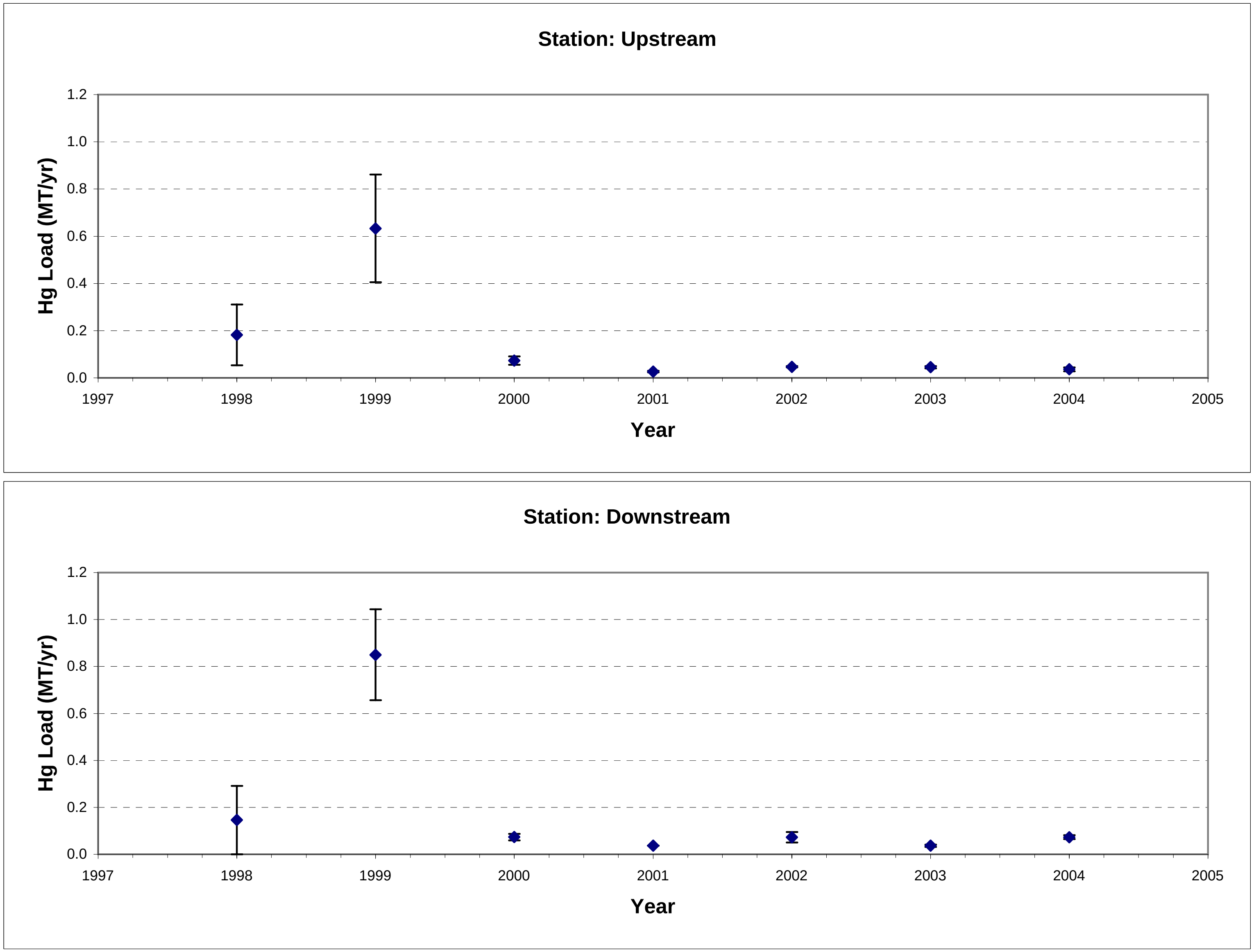
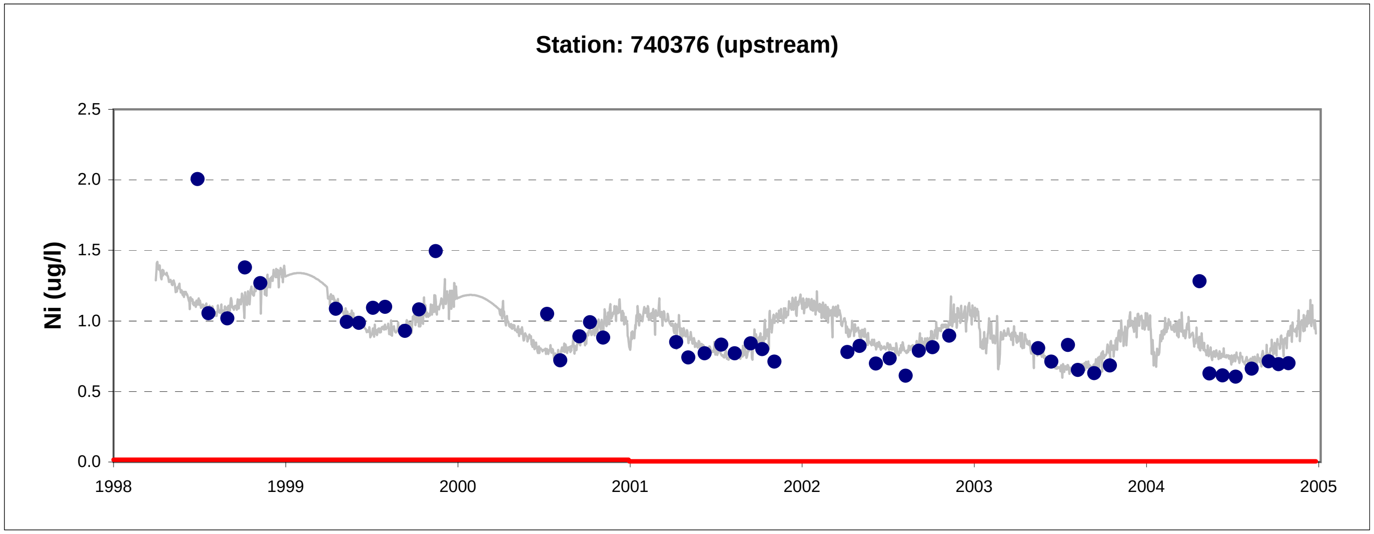


Figure 5-24. Temporal Variation in Mercury Load in the St. Clair River. Diamonds are Means and Bars are 95% Confidence Intervals.



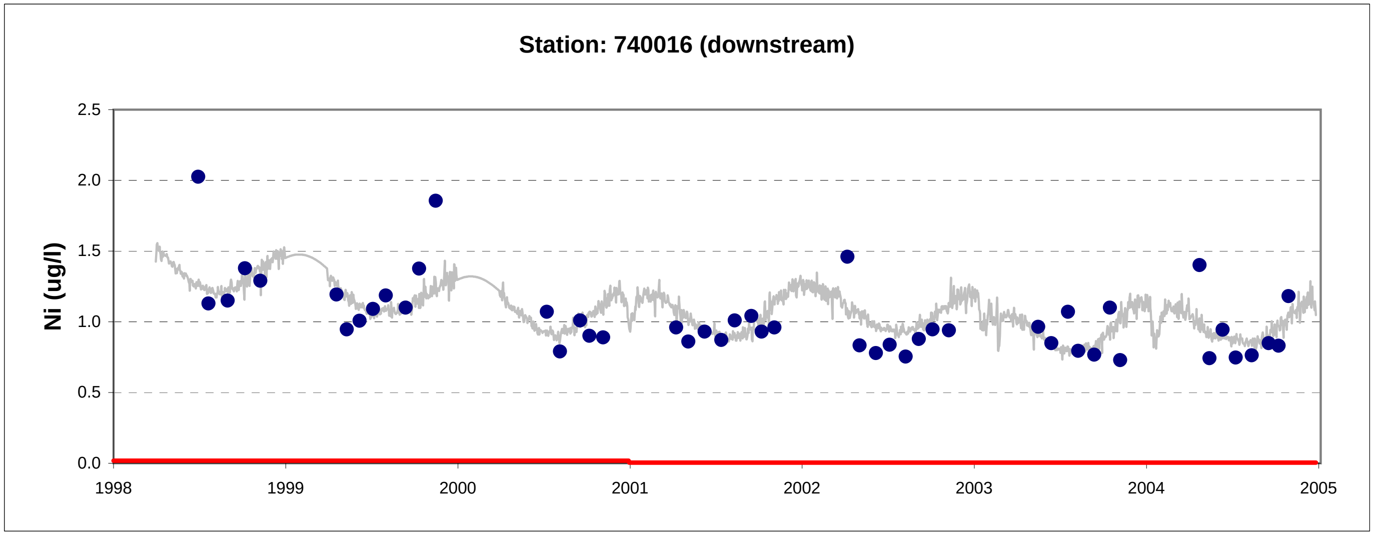
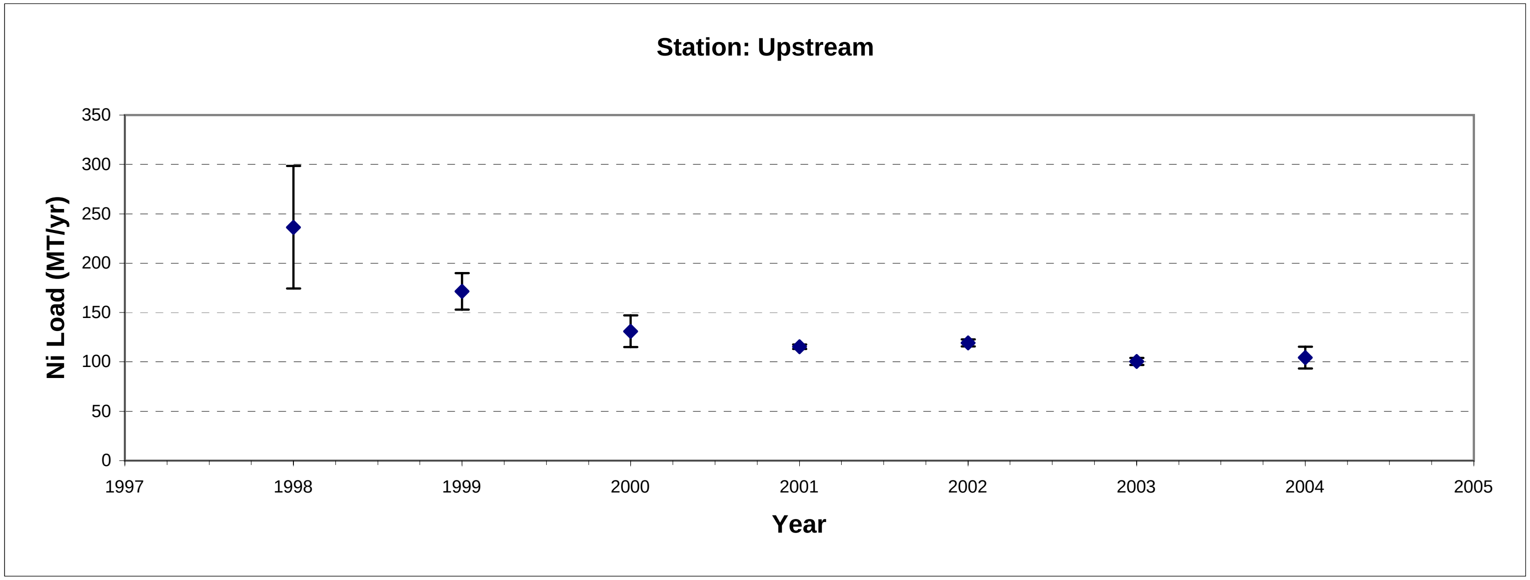


Figure 5-25. St. Clair River - Nickel Concentration Time Series, 1998-2004. Grey Line is Regression Model. Red Line is Quantification Limit.



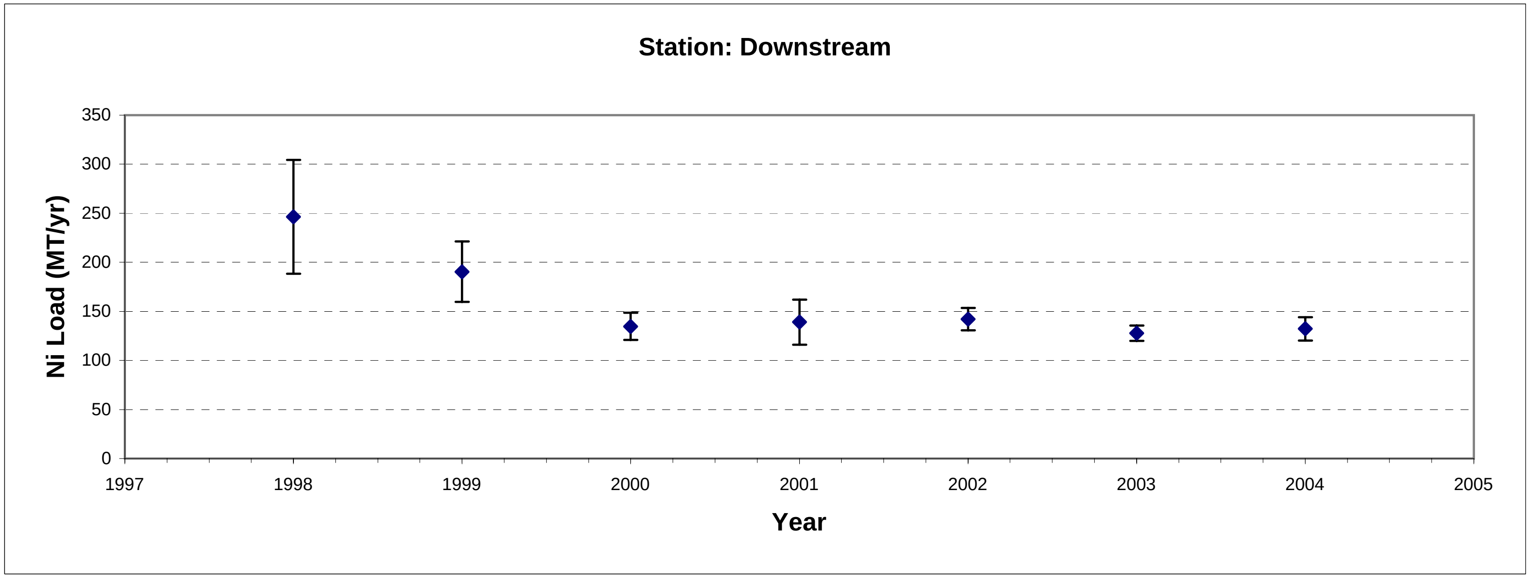
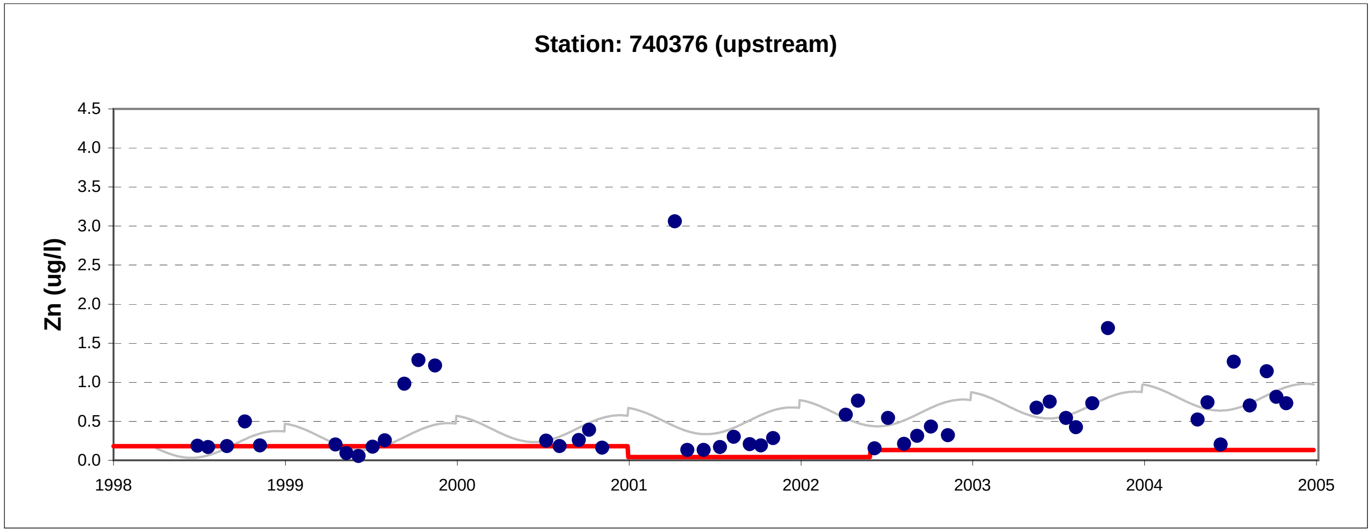


Figure 5-26. Temporal Variation in Nickel Load in the St. Clair River. Diamonds are Means and Bars are 95% Confidence Intervals.



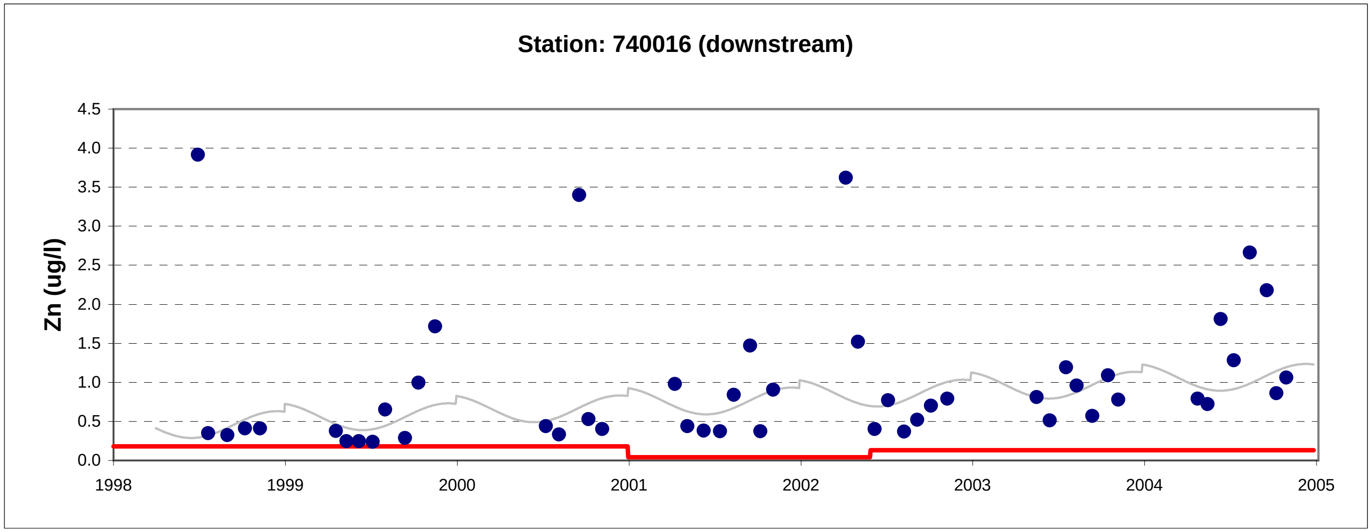


Figure 5-27. St. Clair River - Zinc Concentration Time Series, 1998-2004.
Grey Line is Regression Model. Red Line is Quantification Limit.

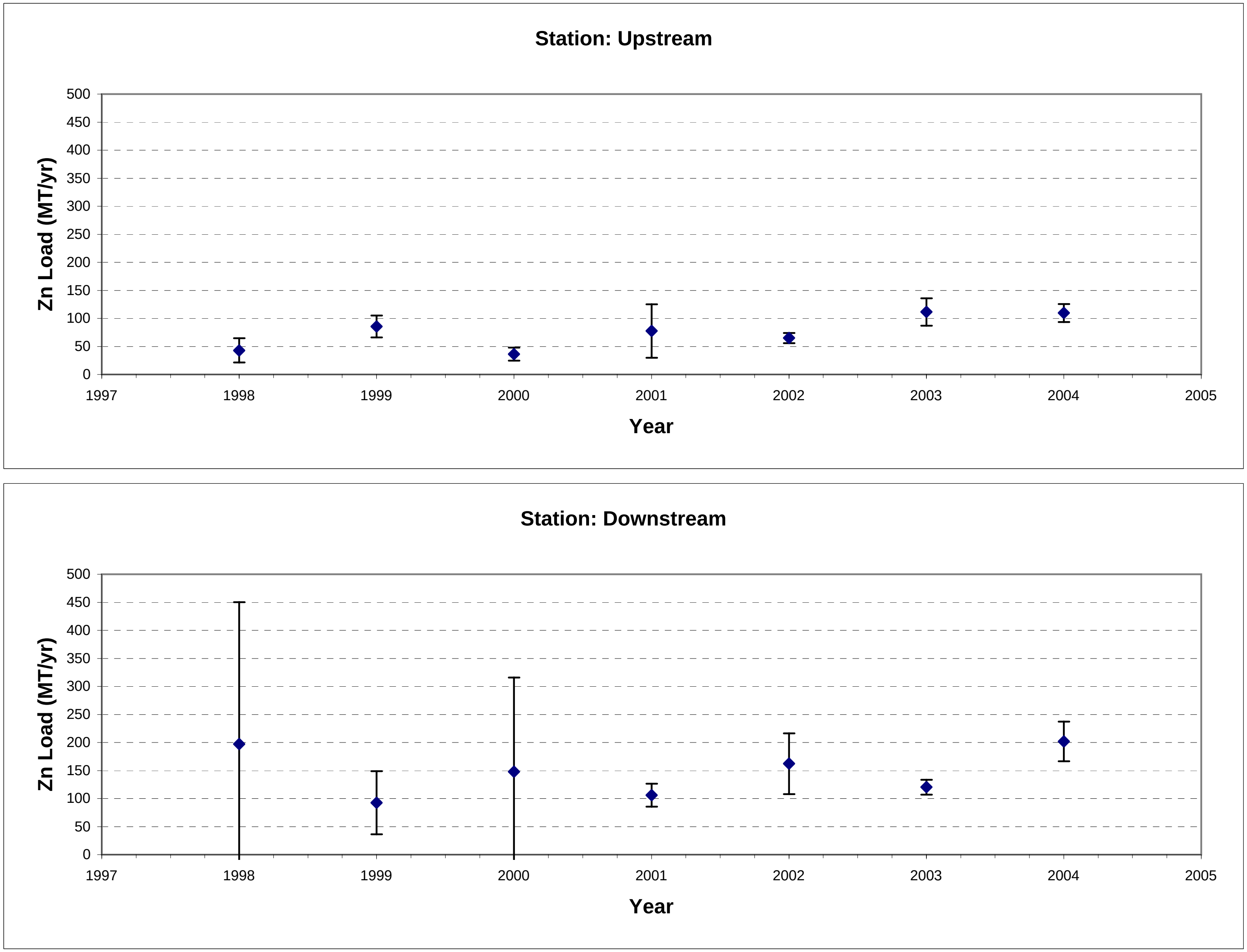


Figure 5-28. Temporal Variation in Zinc Load in the St. Clair River. Diamonds are Means and Bars are 95% Confidence Intervals.

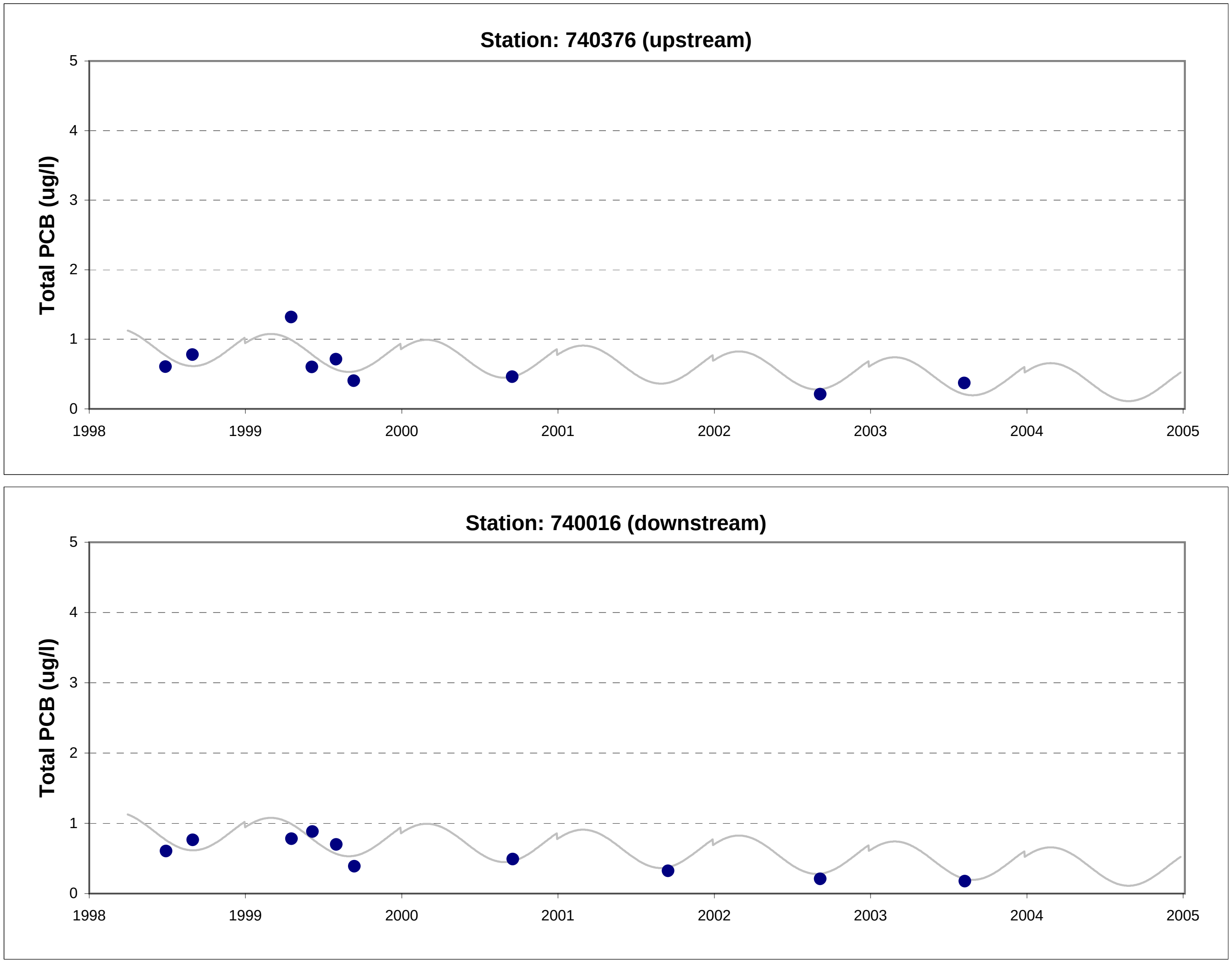
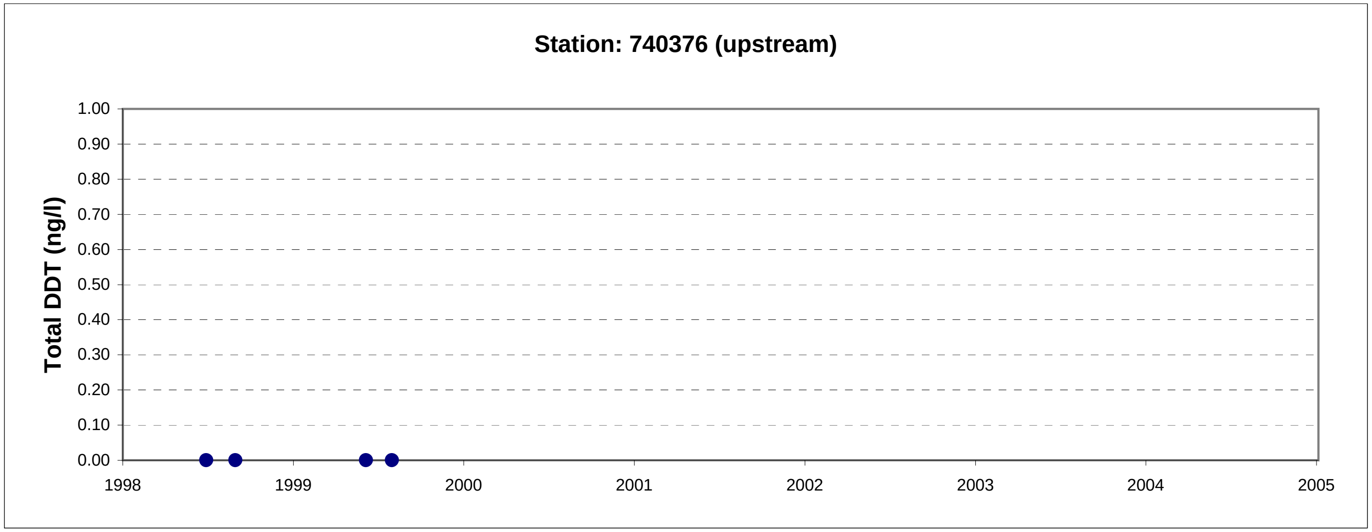


Figure 5-29. St. Clair River - PCB Concentration Time Series, 1998-2004.
Grey Line is Regression Model.



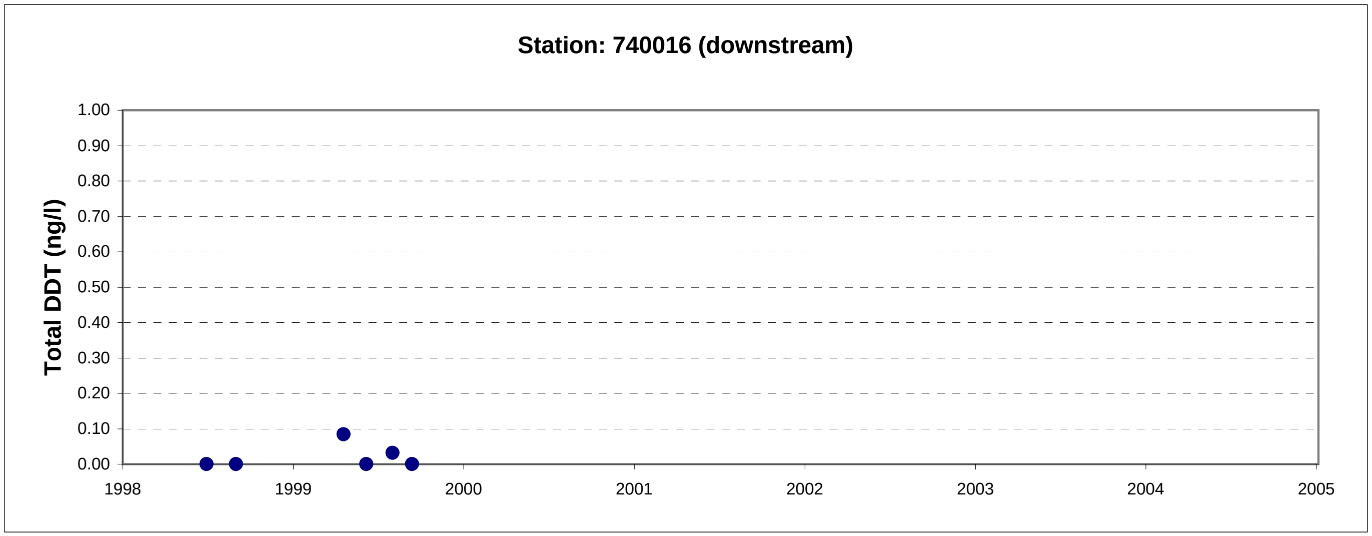
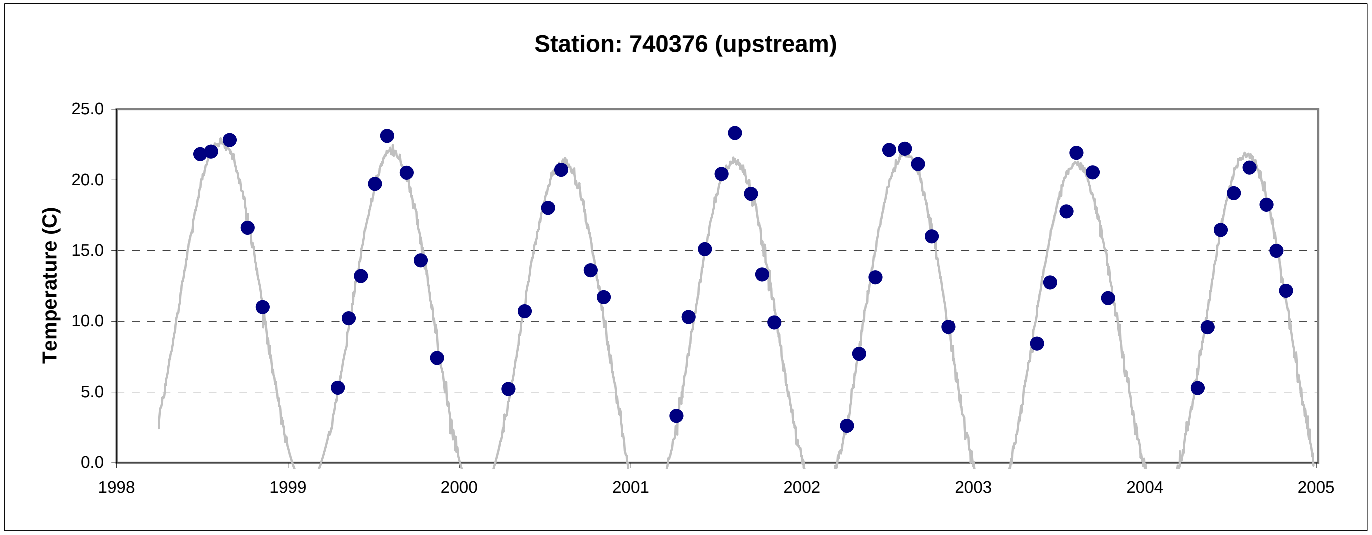


Figure 5-30. St. Clair River - DDT Concentration Time Series, 1998-2004.



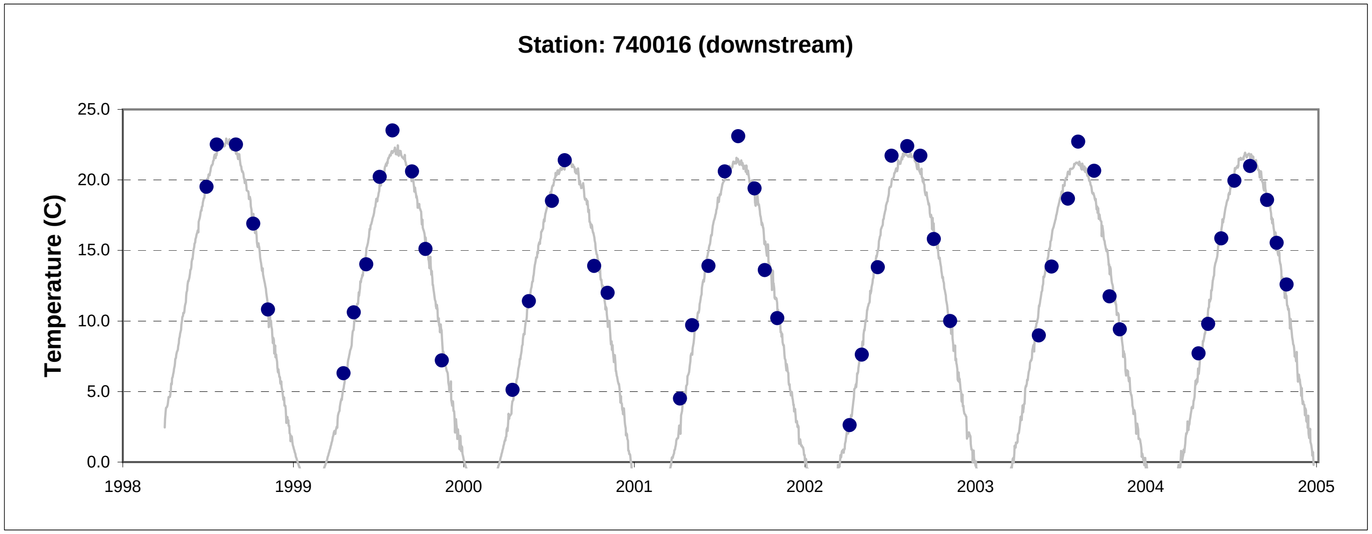
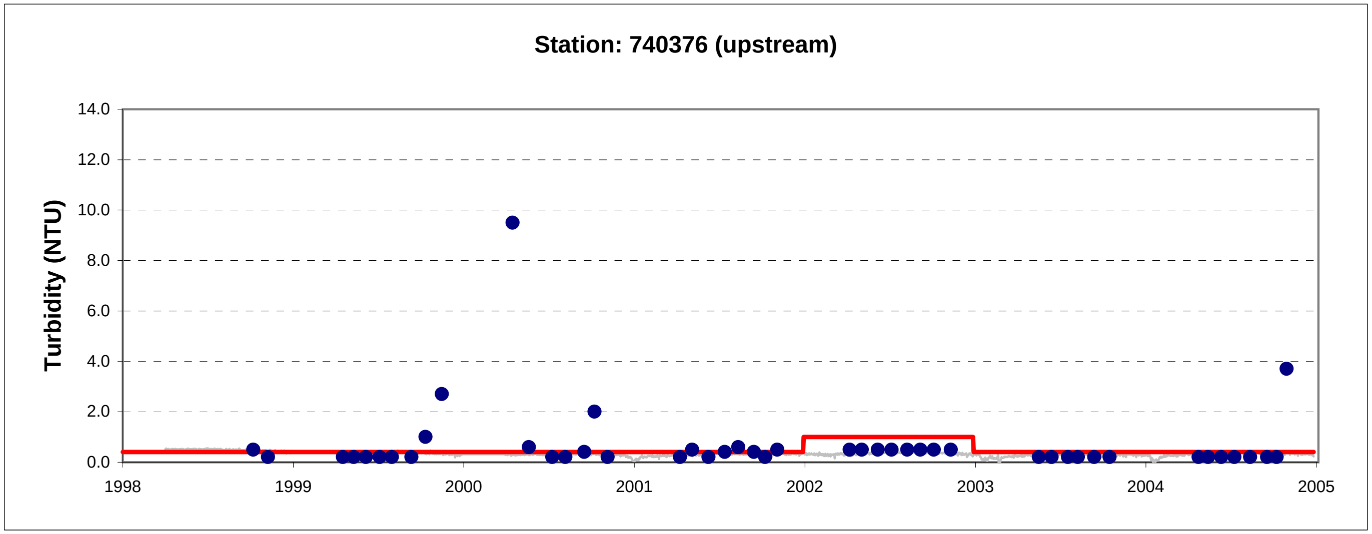


Figure 5-31. St. Clair River - Temperature Time Series, 1998-2004.
Grey Line is Regression Model.



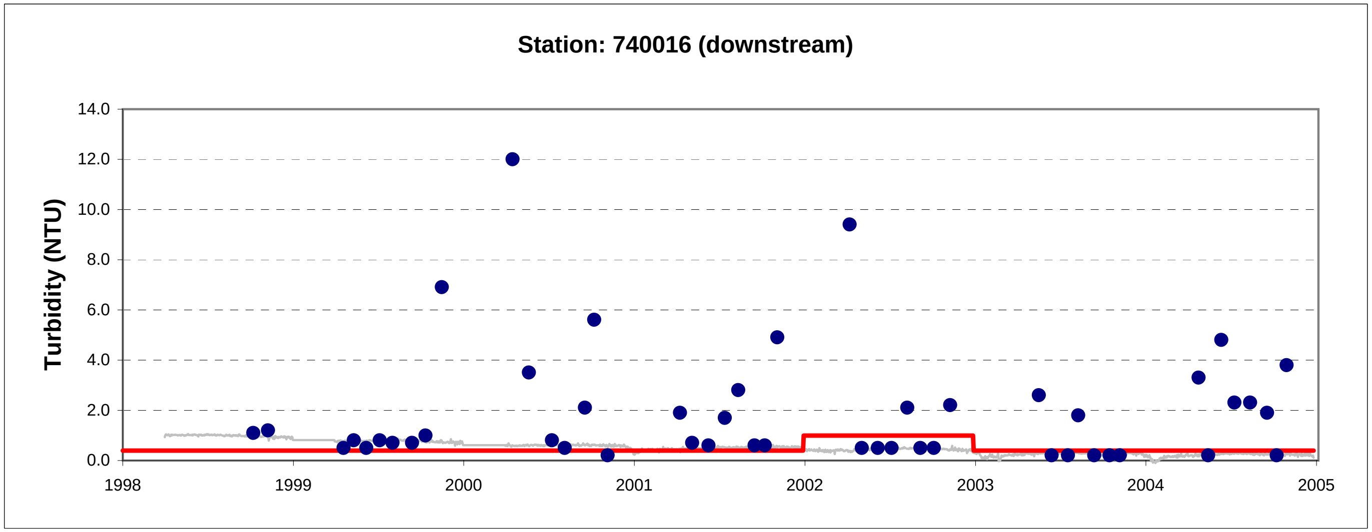
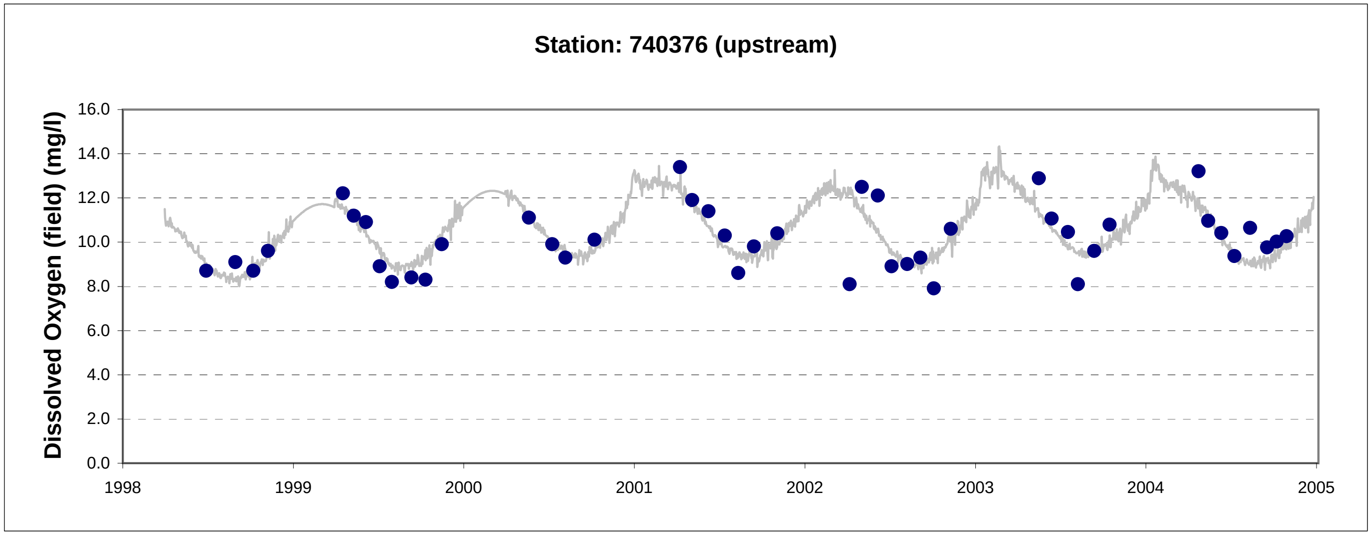


**Figure 5-32. St. Clair River - Turbidity Time Series, 1998-2004.
Grey Line is Regression Model. Red Line is Quantification Limit.**



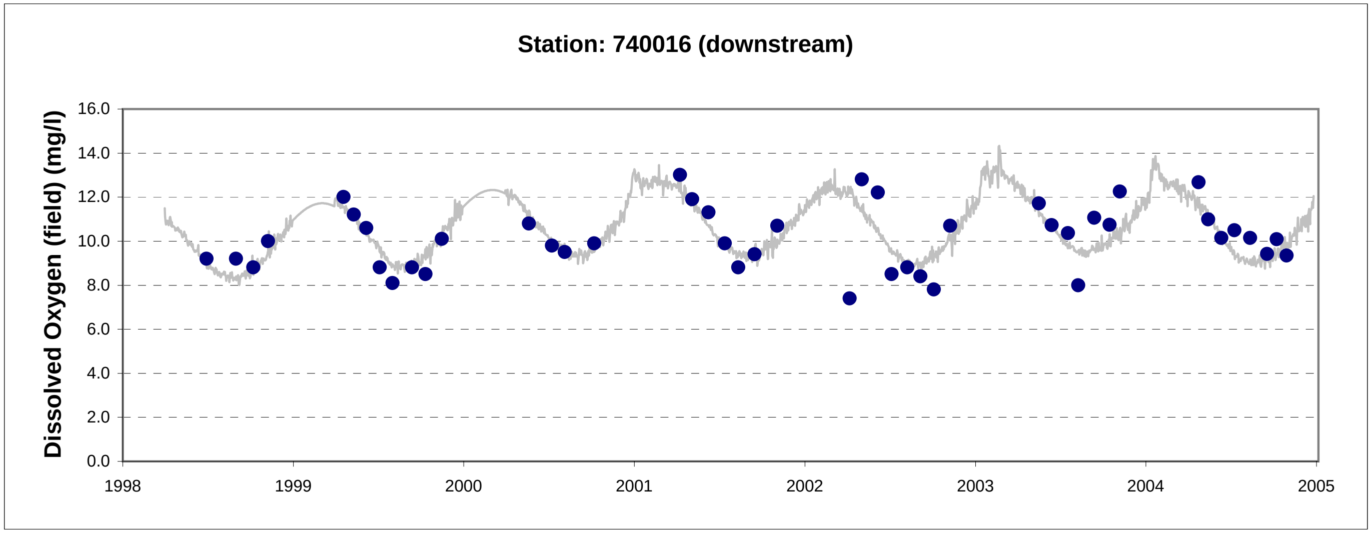


Figure 5-33. St. Clair River - Dissolved Oxygen (Field) Time Series, 1998-2004. Grey Line is Regression Model.

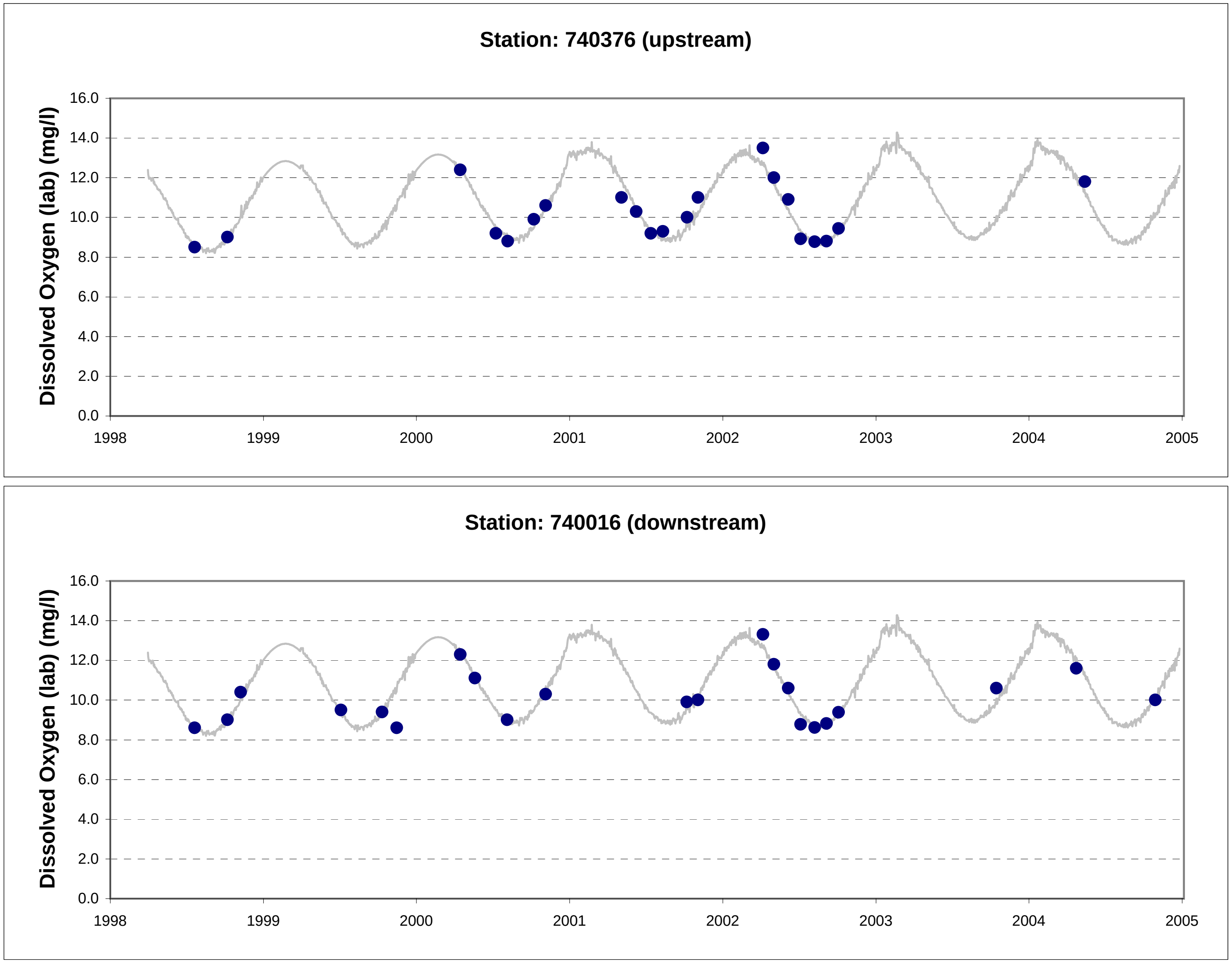
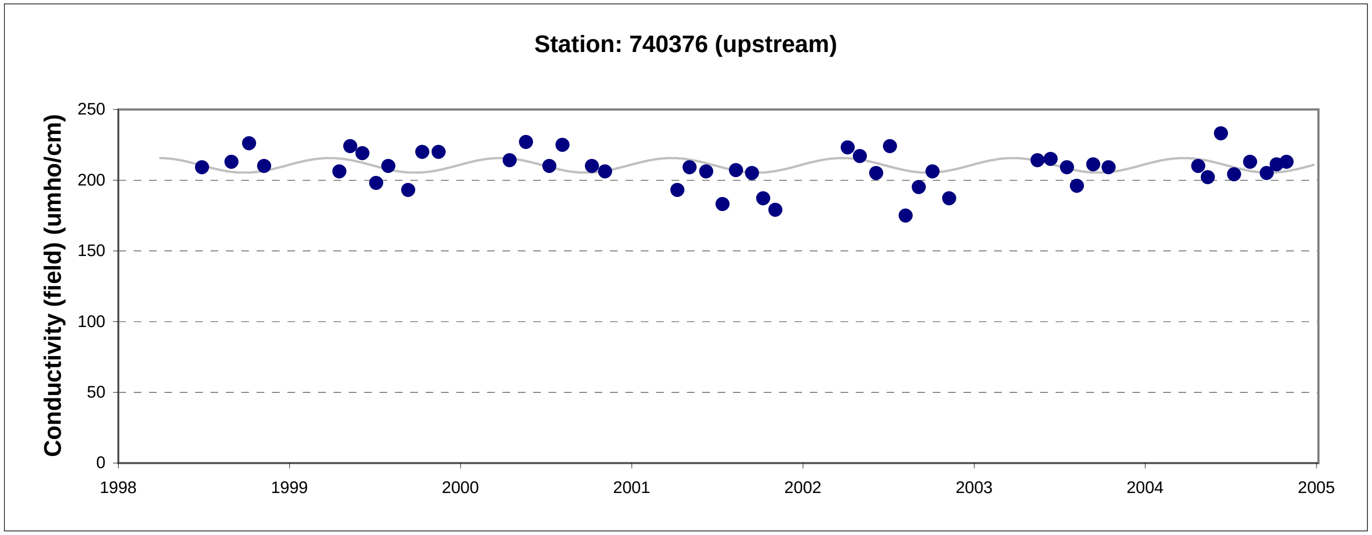


Figure 5-34. St. Clair River - Dissolved Oxygen (Lab) Time Series, 1998-2004. Grey Line is Regression Model.



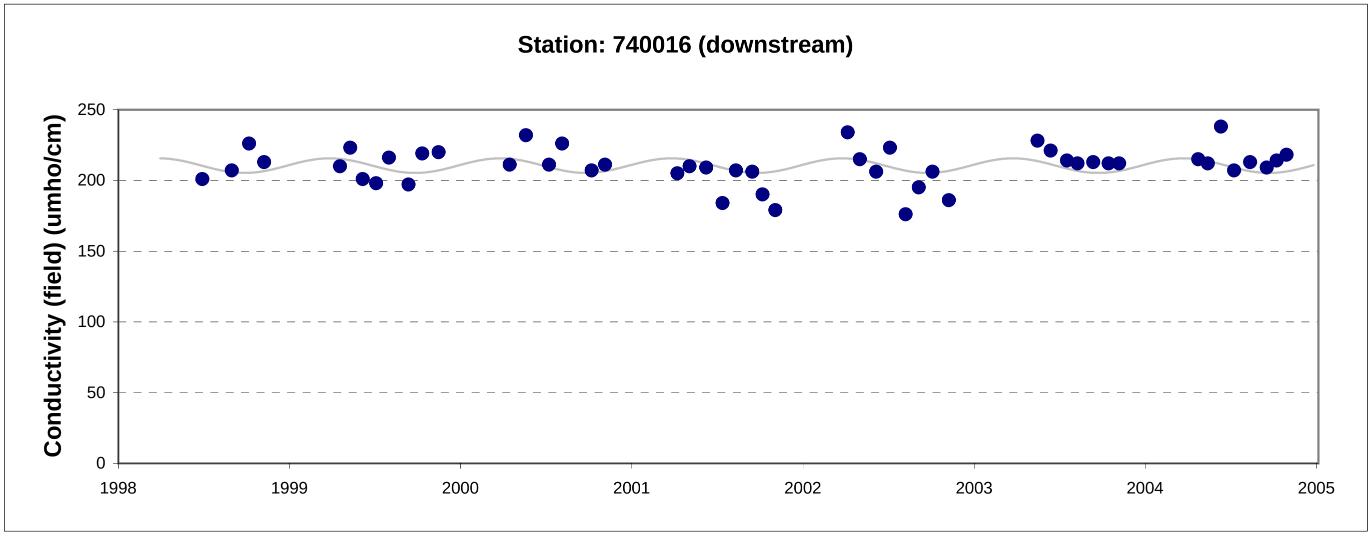
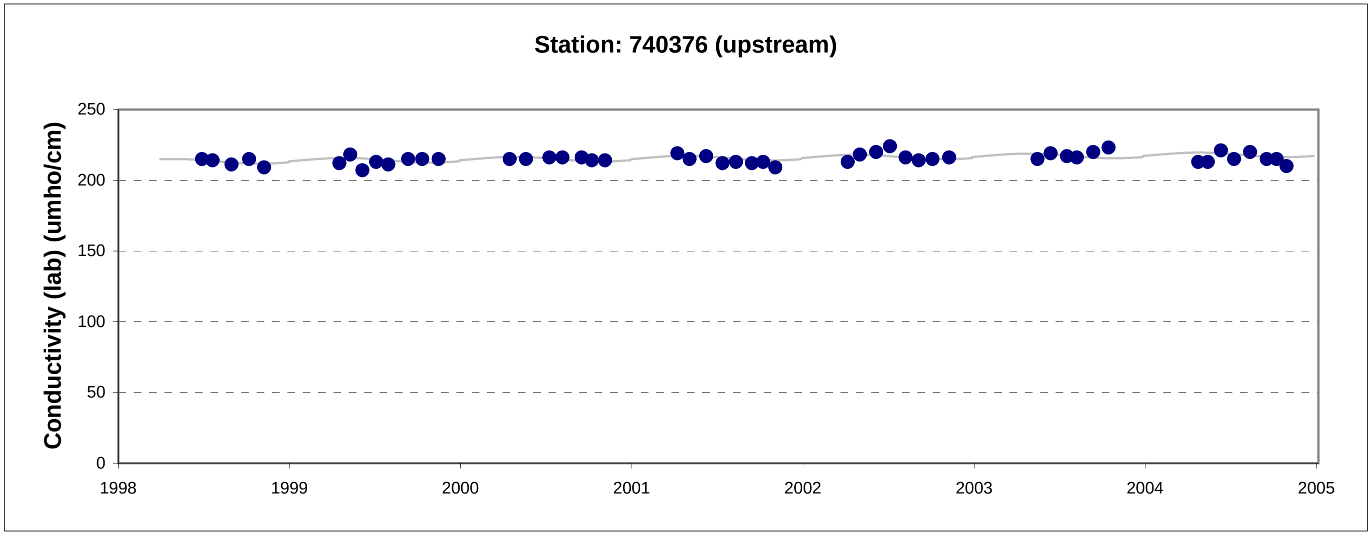


Figure 5-35. St. Clair River - Conductivity (Field) Time Series, 1998-2004.
Grey Line is Regression Model.



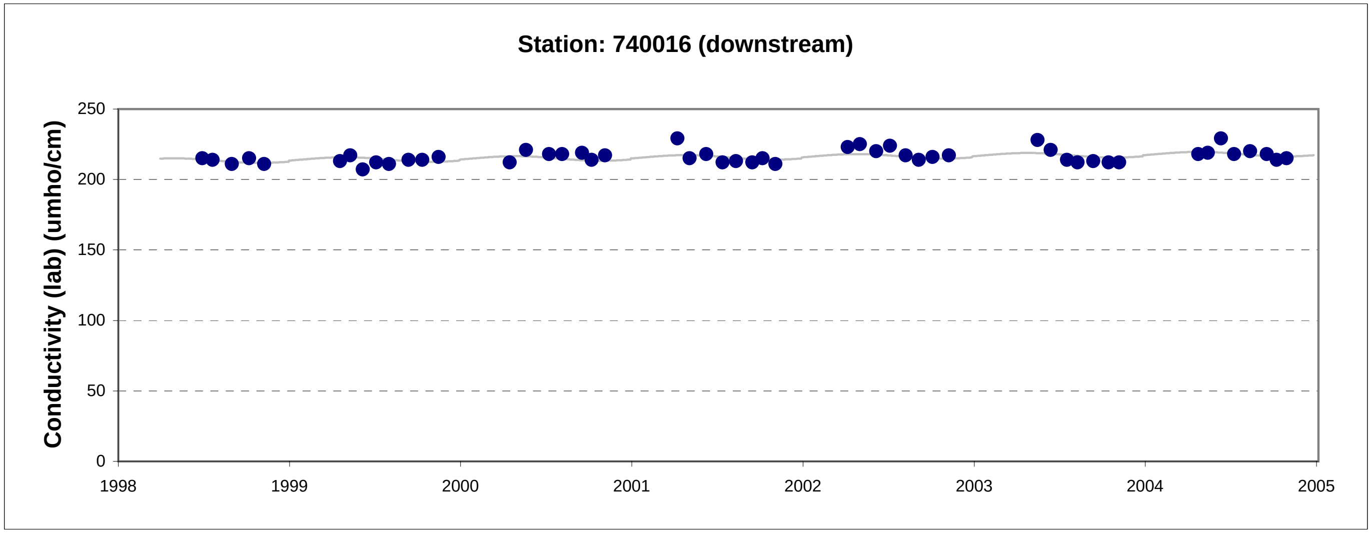
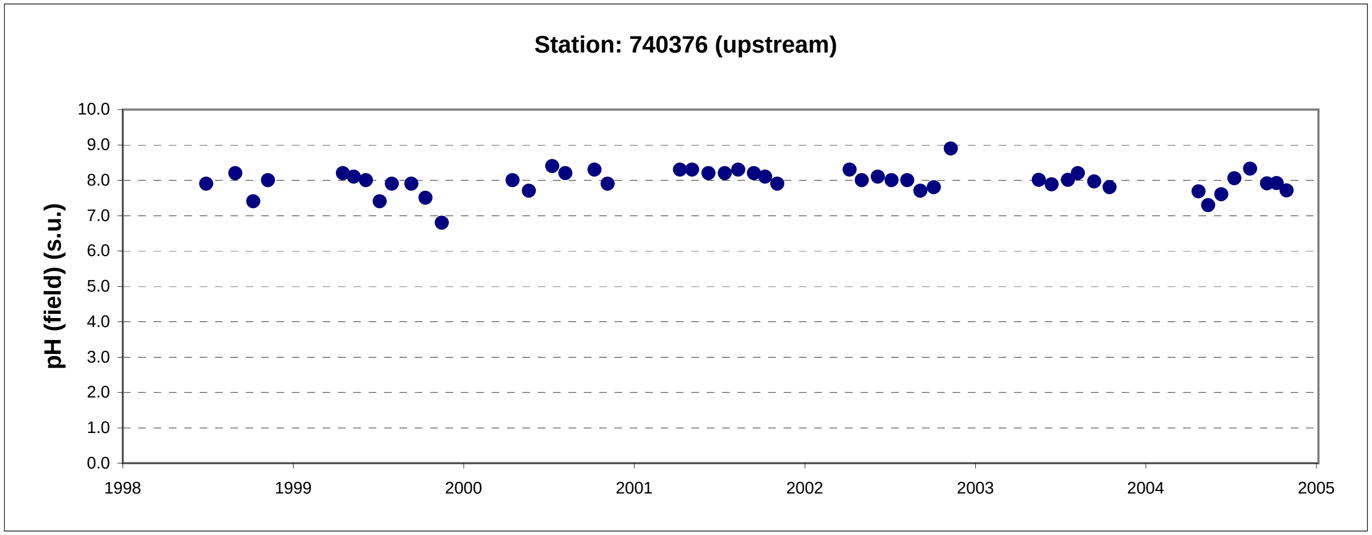


Figure 5-36. St. Clair River - Conductivity (Lab) Time Series, 1998-2004. Grey Line is Regression Model.



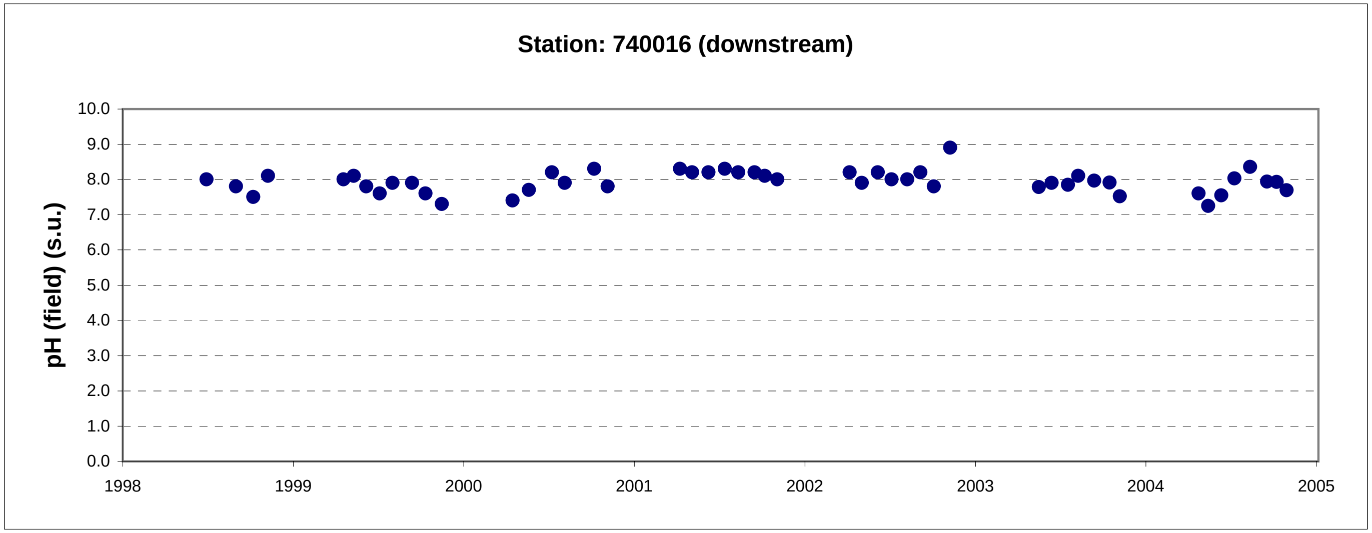
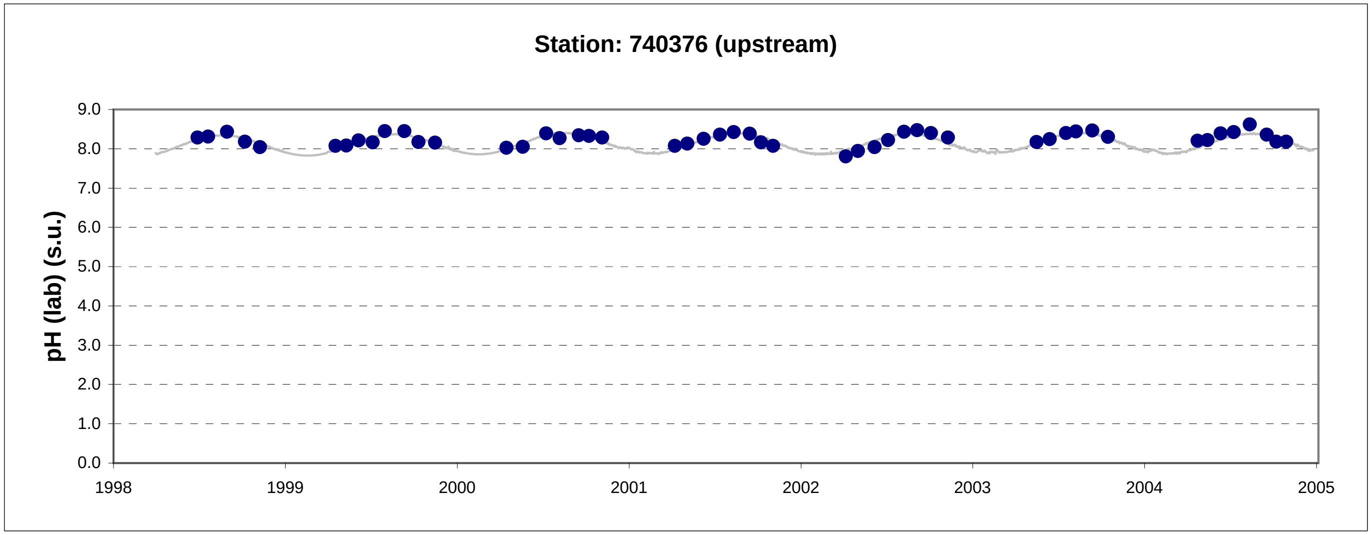


Figure 5-37. St. Clair River - pH (Field) Time Series, 1998-2004.



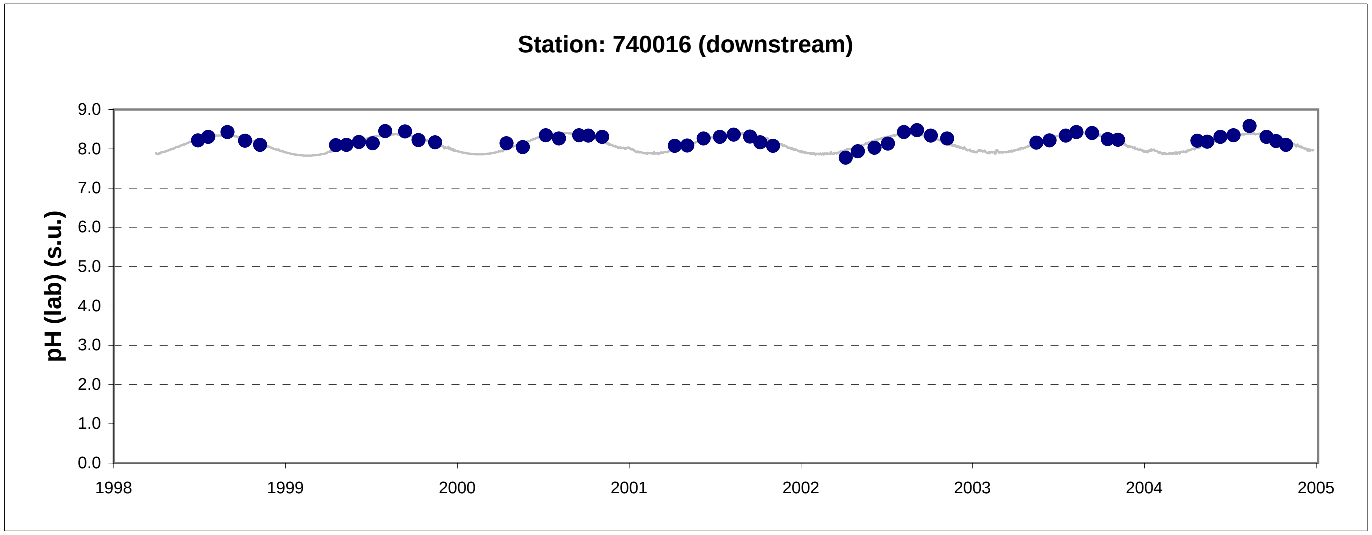
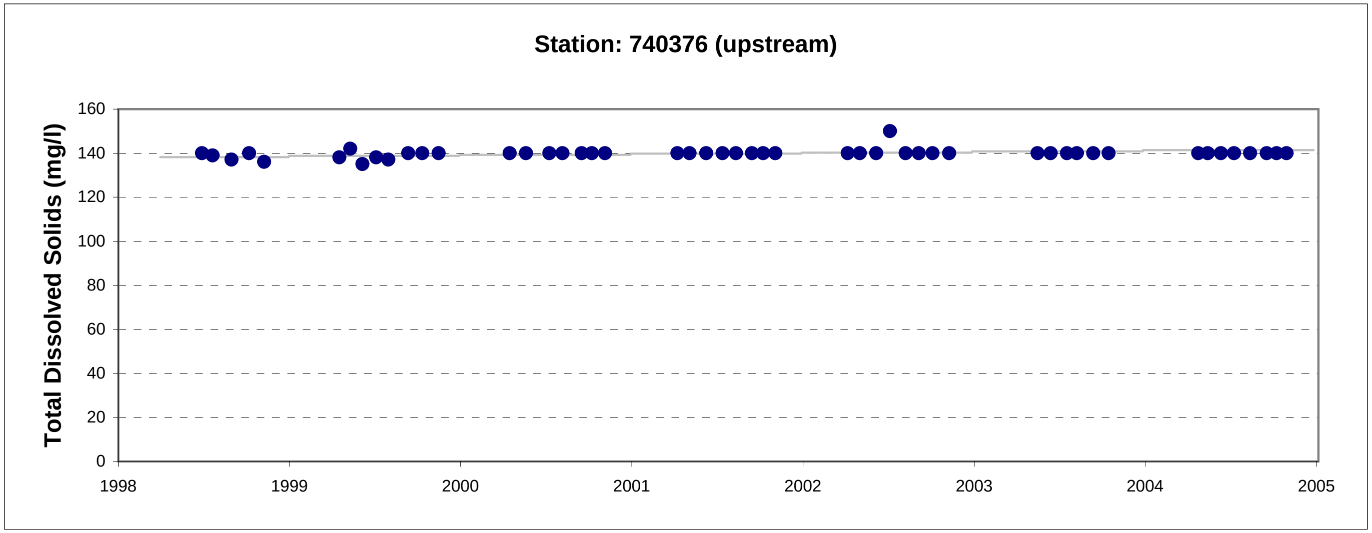


Figure 5-38. St. Clair River - pH (Lab) Time Series, 1998-2004. Grey Line is Regression Model.



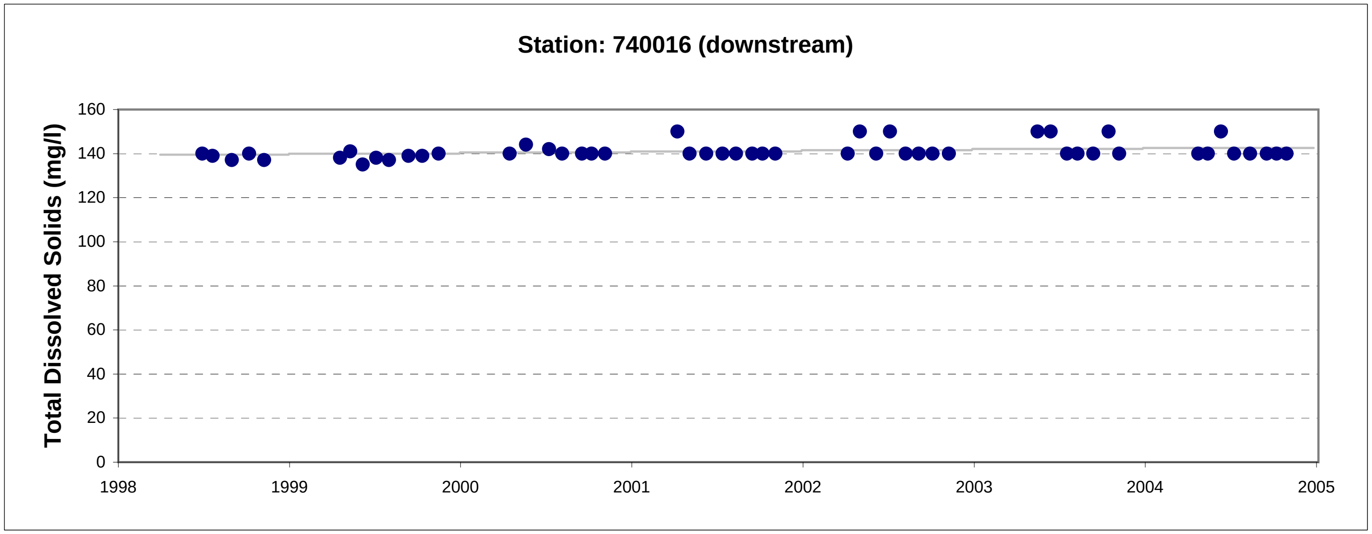
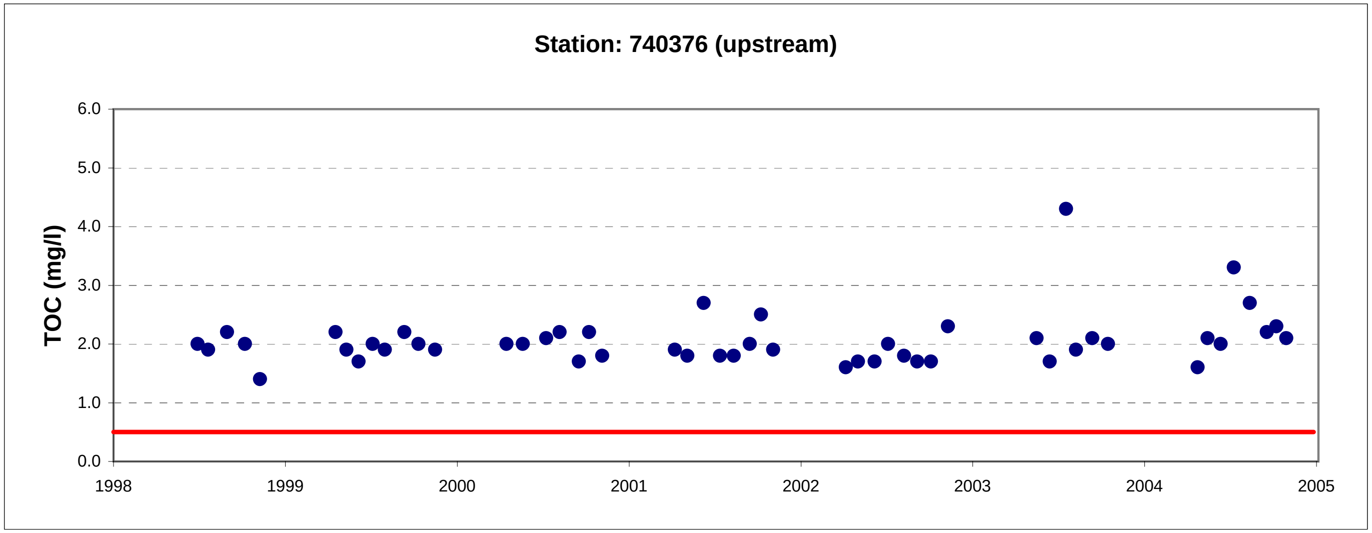


**Figure 5-39. St. Clair River - TDS Concentration Time Series, 1998-2004.
Grey Line is Regression Model.**



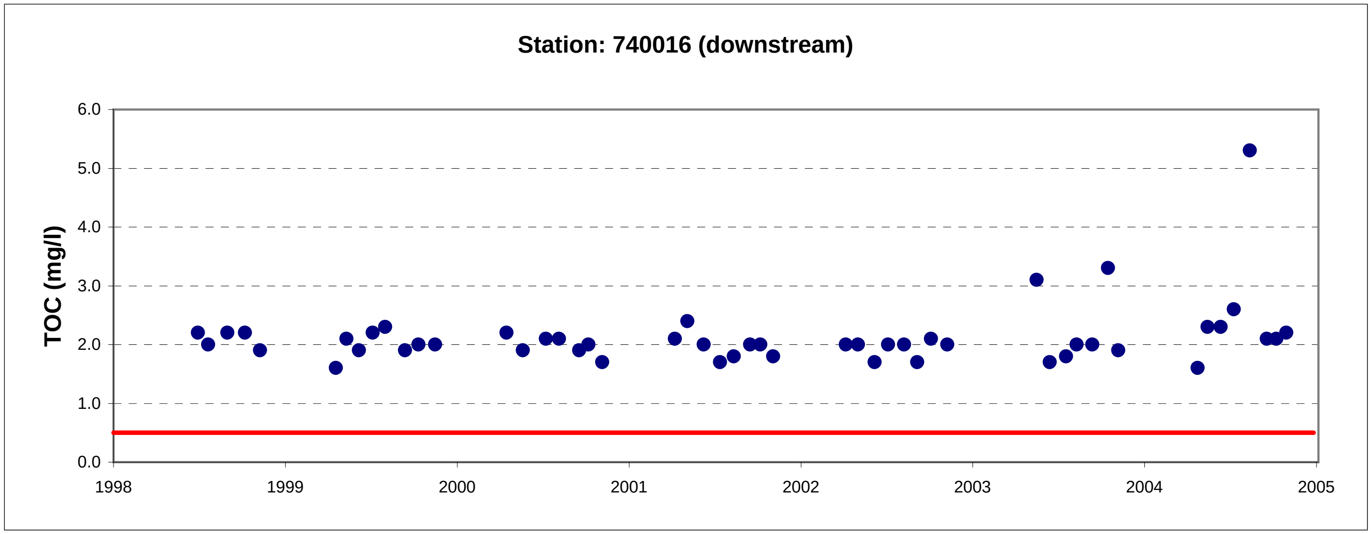
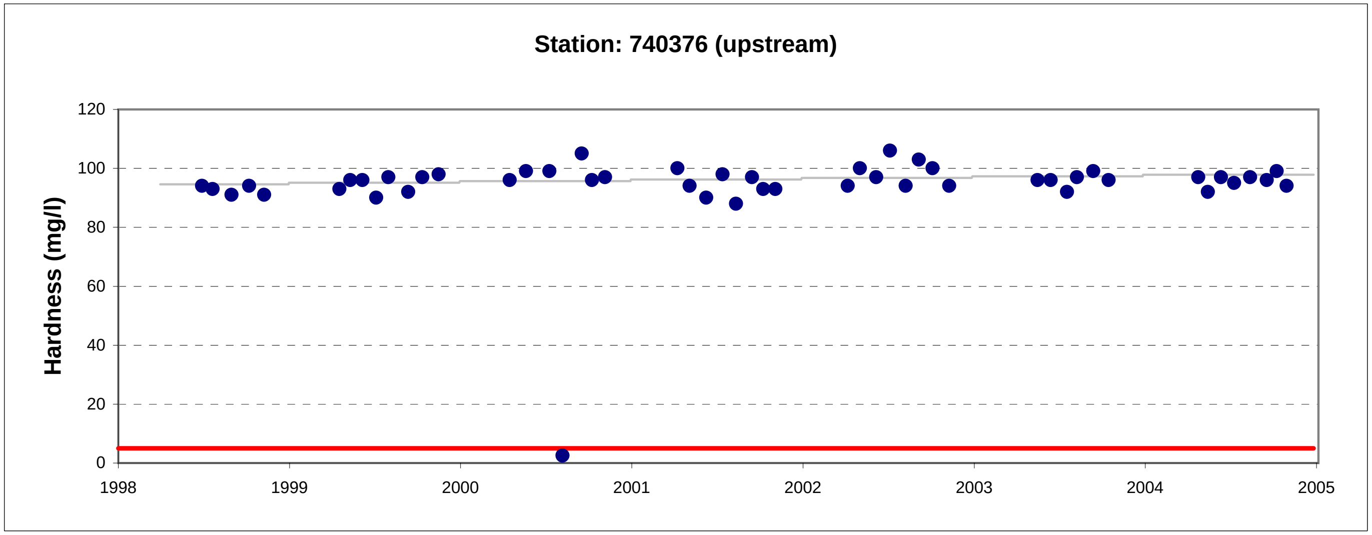


**Figure 5-40. St. Clair River - TOC Concentration Time Series, 1998-2004.
Red Line is Quantification Limit.**



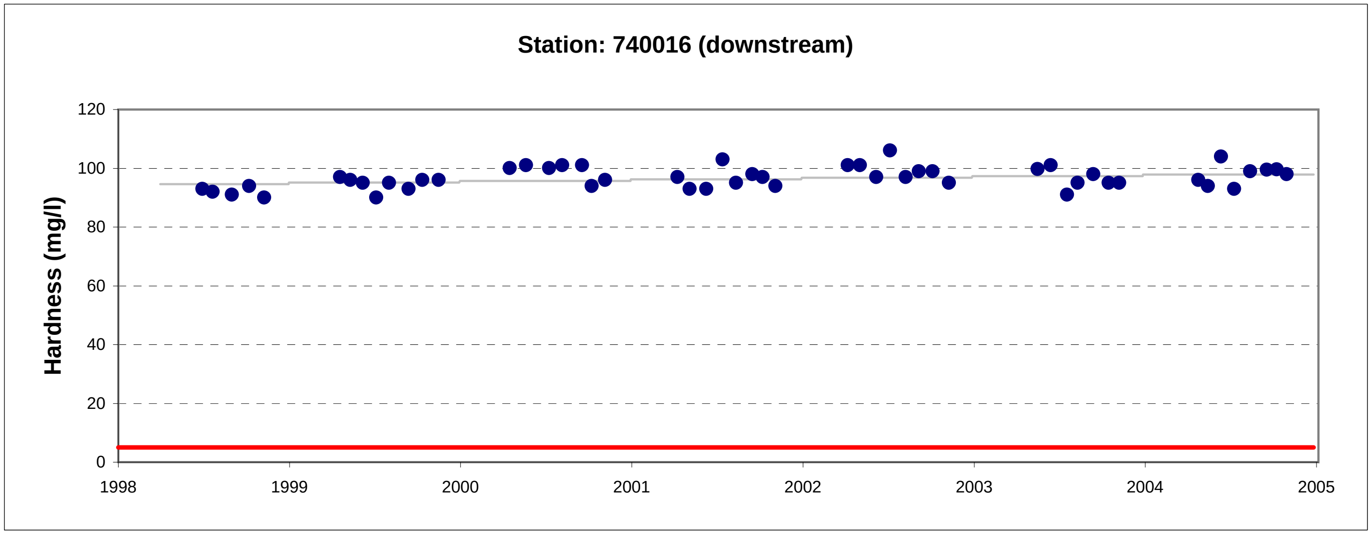


Figure 5-41. St. Clair River - Hardness Time Series, 1998-2004.
Grey Line is Regression Model. Red Line is Quantification Limit.

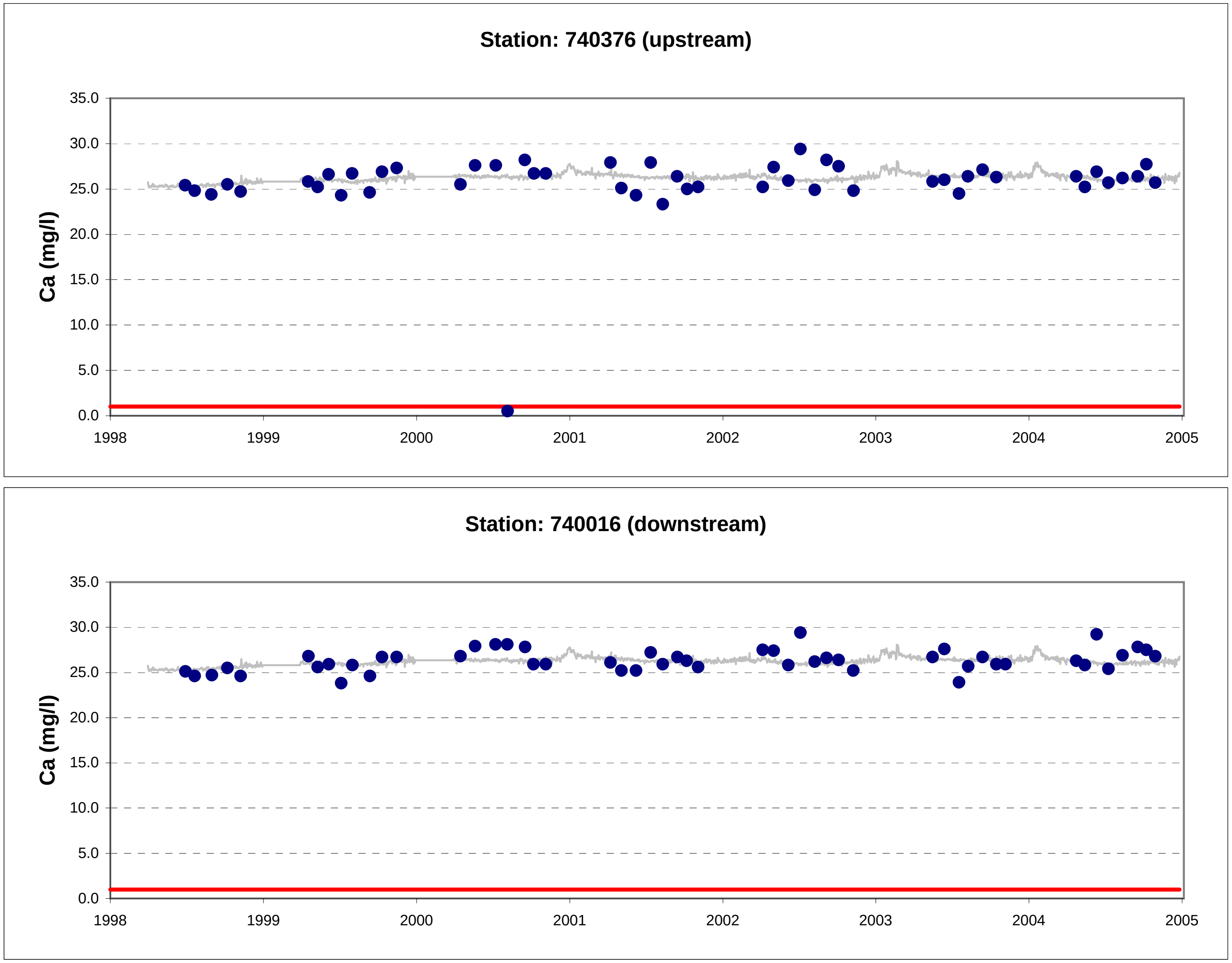
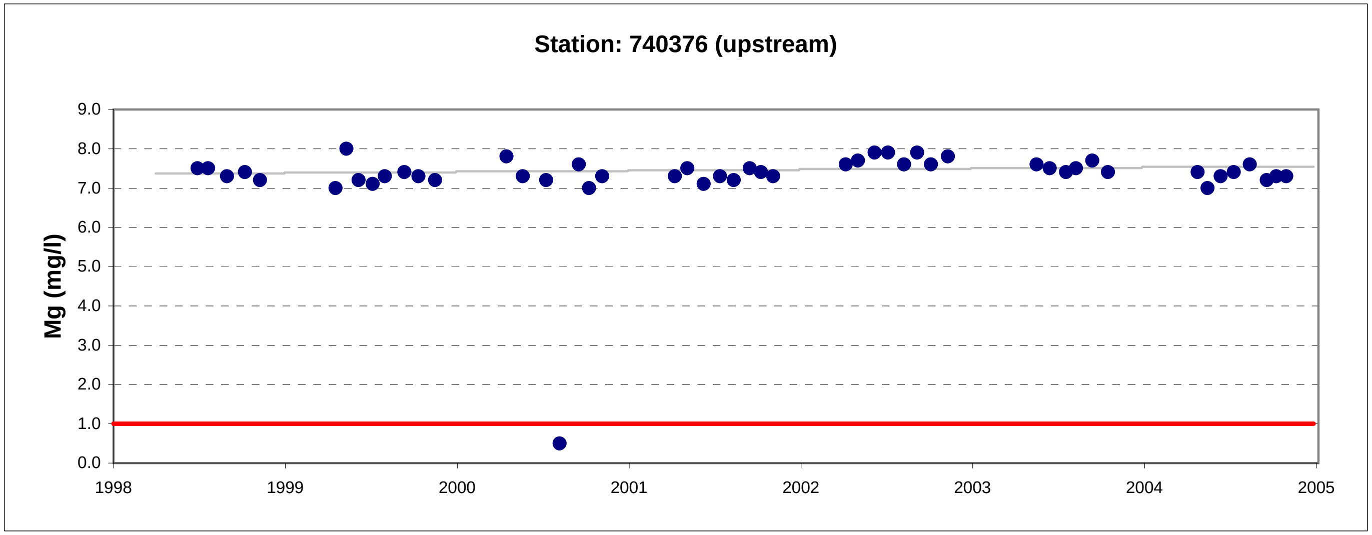


Figure 5-42. St. Clair River - Calcium Concentration Time Series, 1998-2004.
Grey Line is Regression Model. Red Line is Quantification Limit.



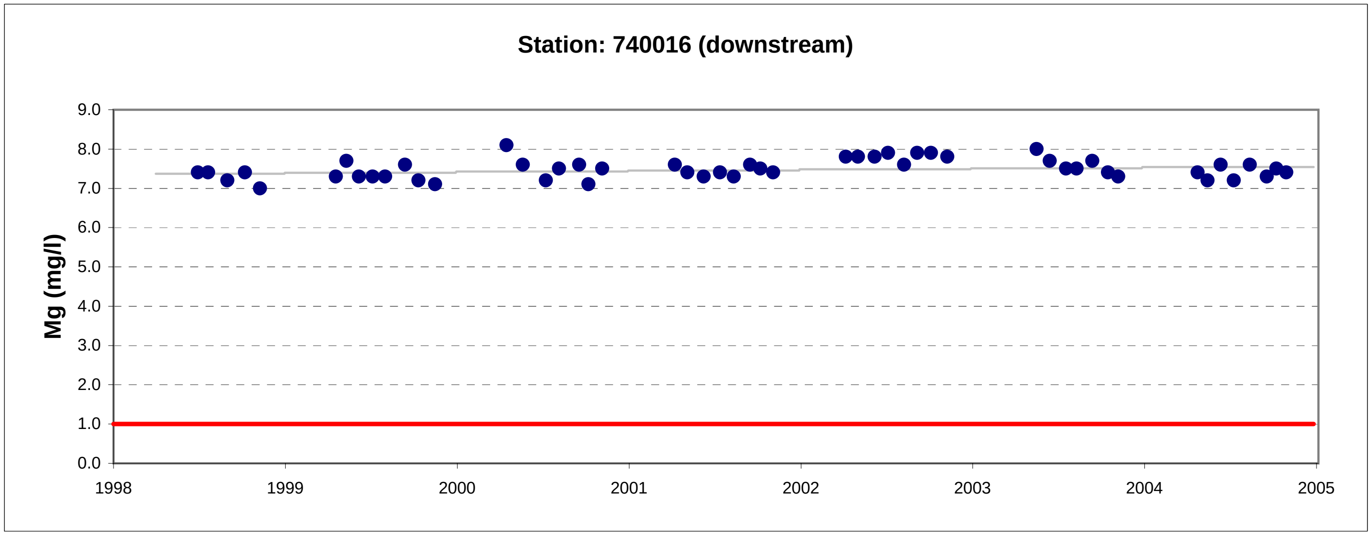
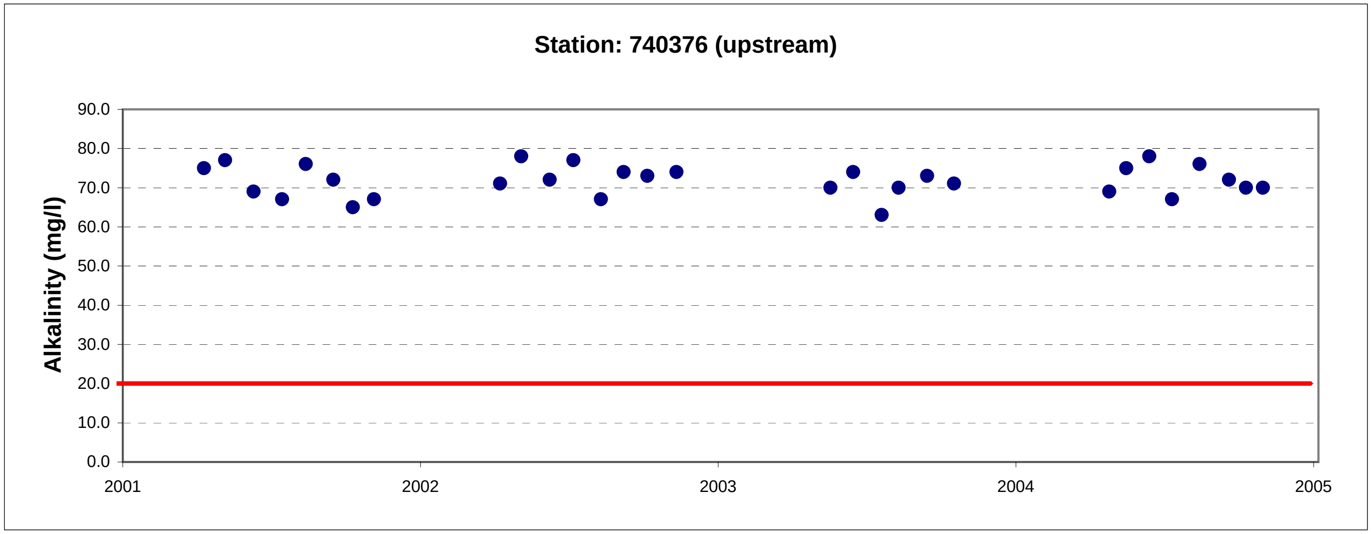


Figure 5-43. St. Clair River - Magnesium Concentration Time Series, 1998-2004. Grey Line is Regression Model. Red Line is Quantification Limit.



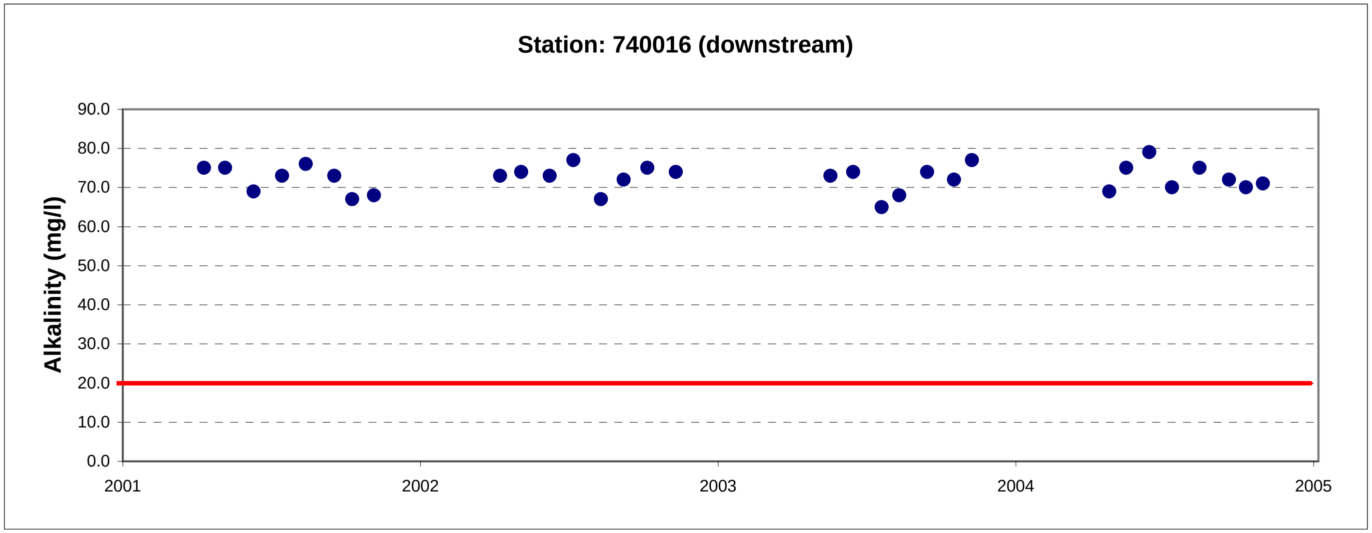
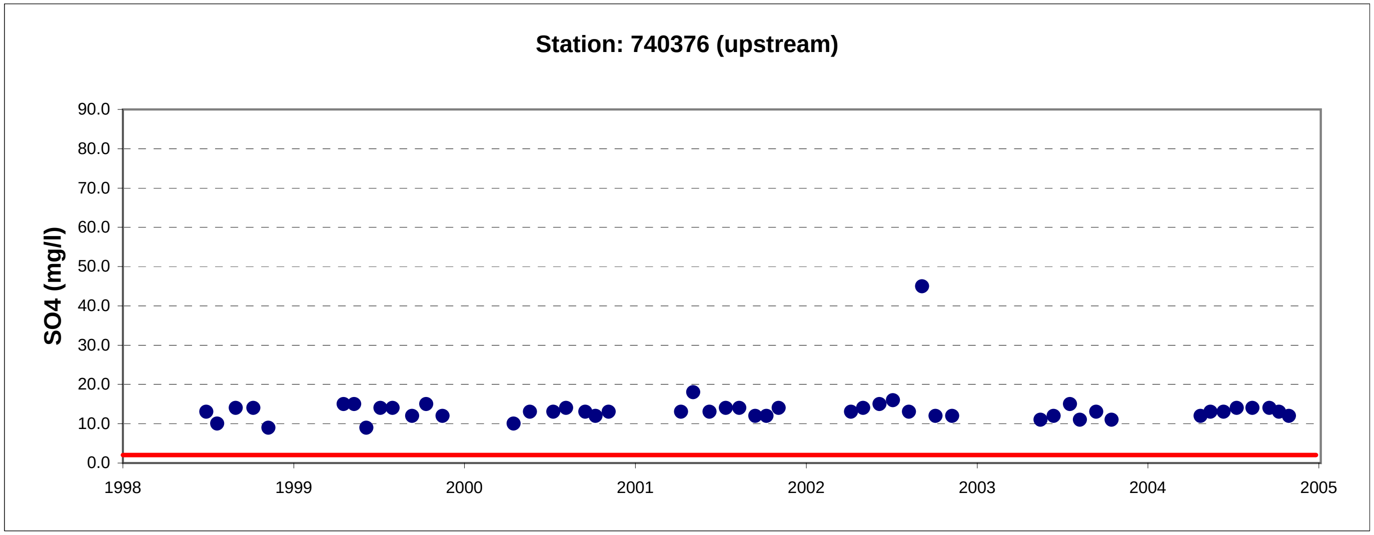


Figure 5-44. St. Clair River - Alkalinity Time Series, 2001-2004.
Red Line is Quantification Limit.



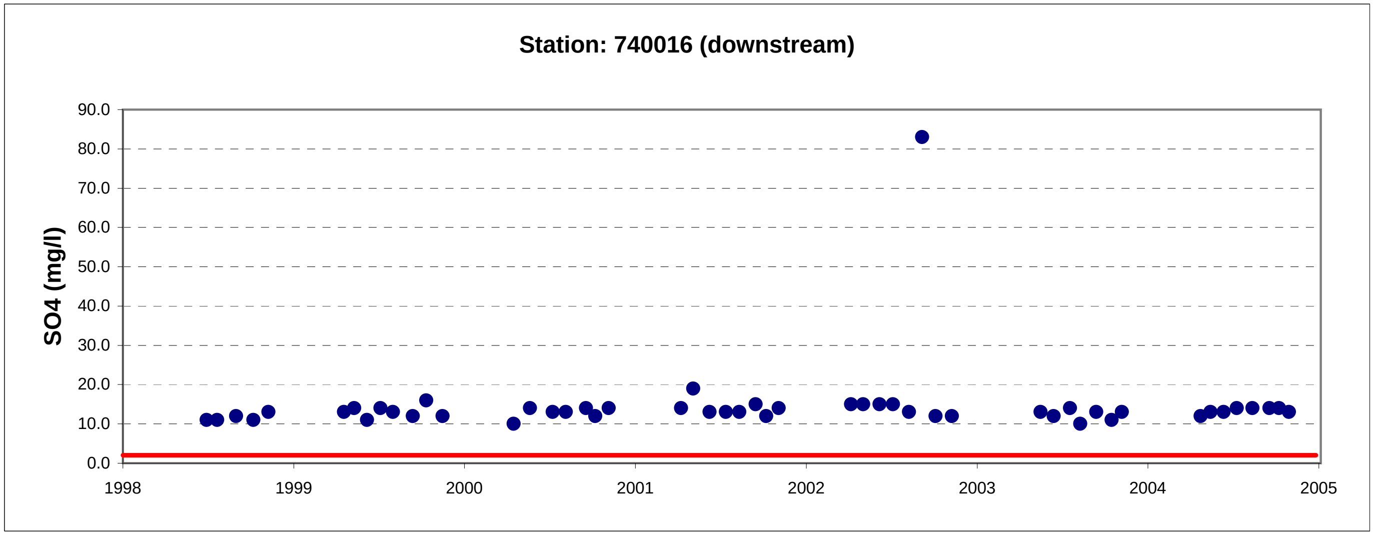
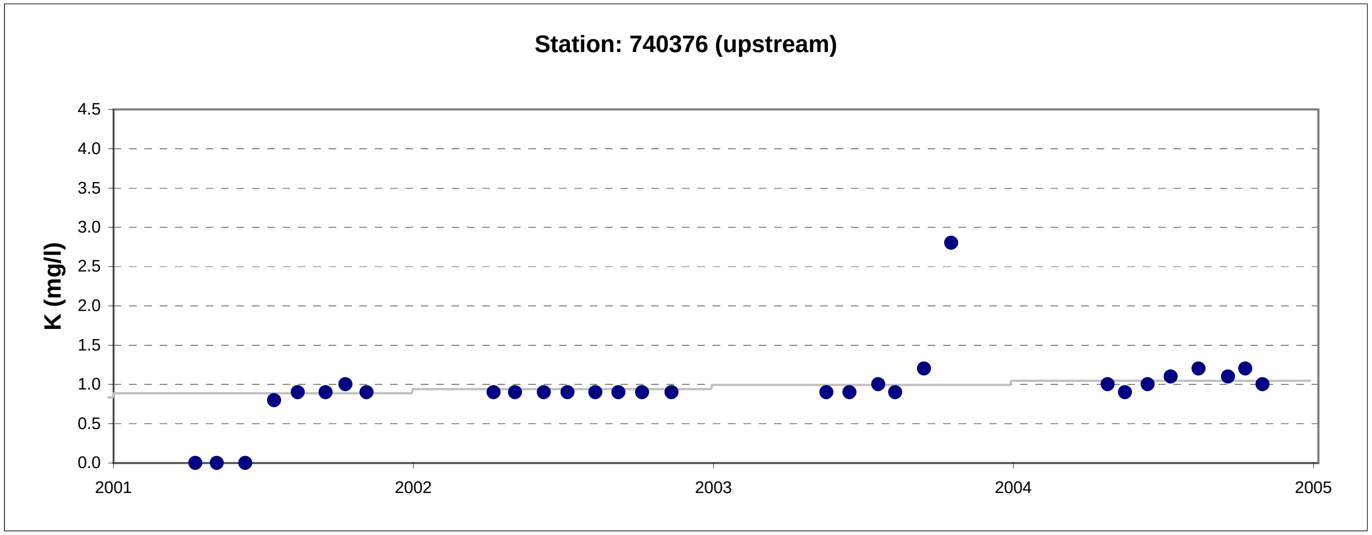


Figure 5-45. St. Clair River - SO4 Concentration Time Series, 1998-2004. Red Line is Quantification Limit.



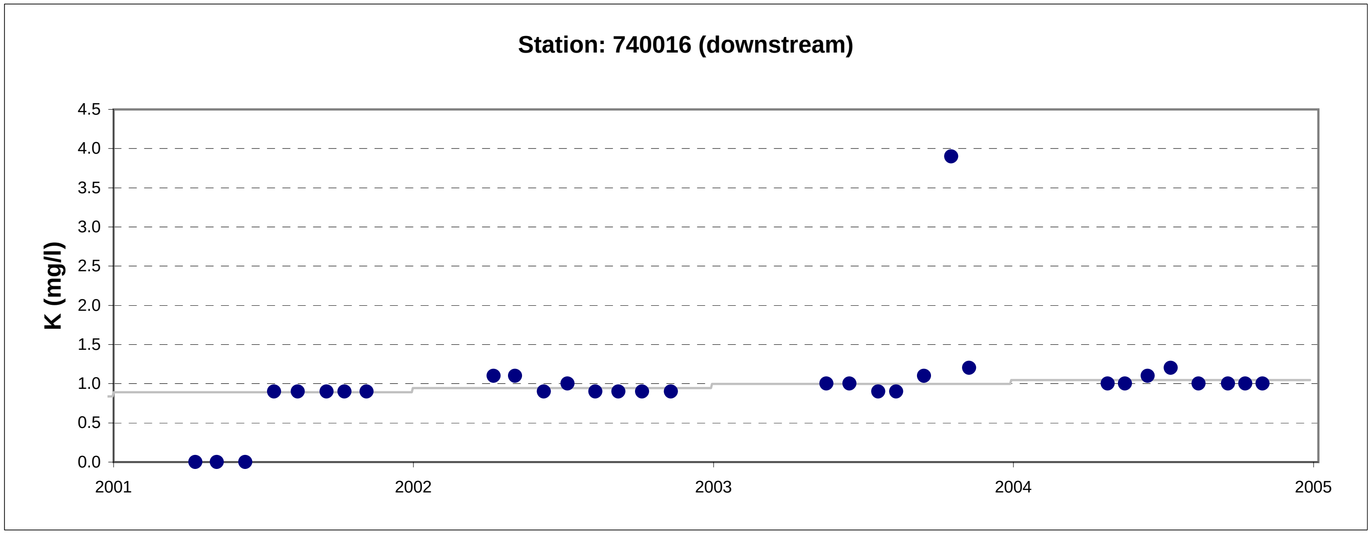


Figure 5-46. St. Clair River - Potassium Concentration Time Series, 2001-2004.
Grey Line is Regression Model.

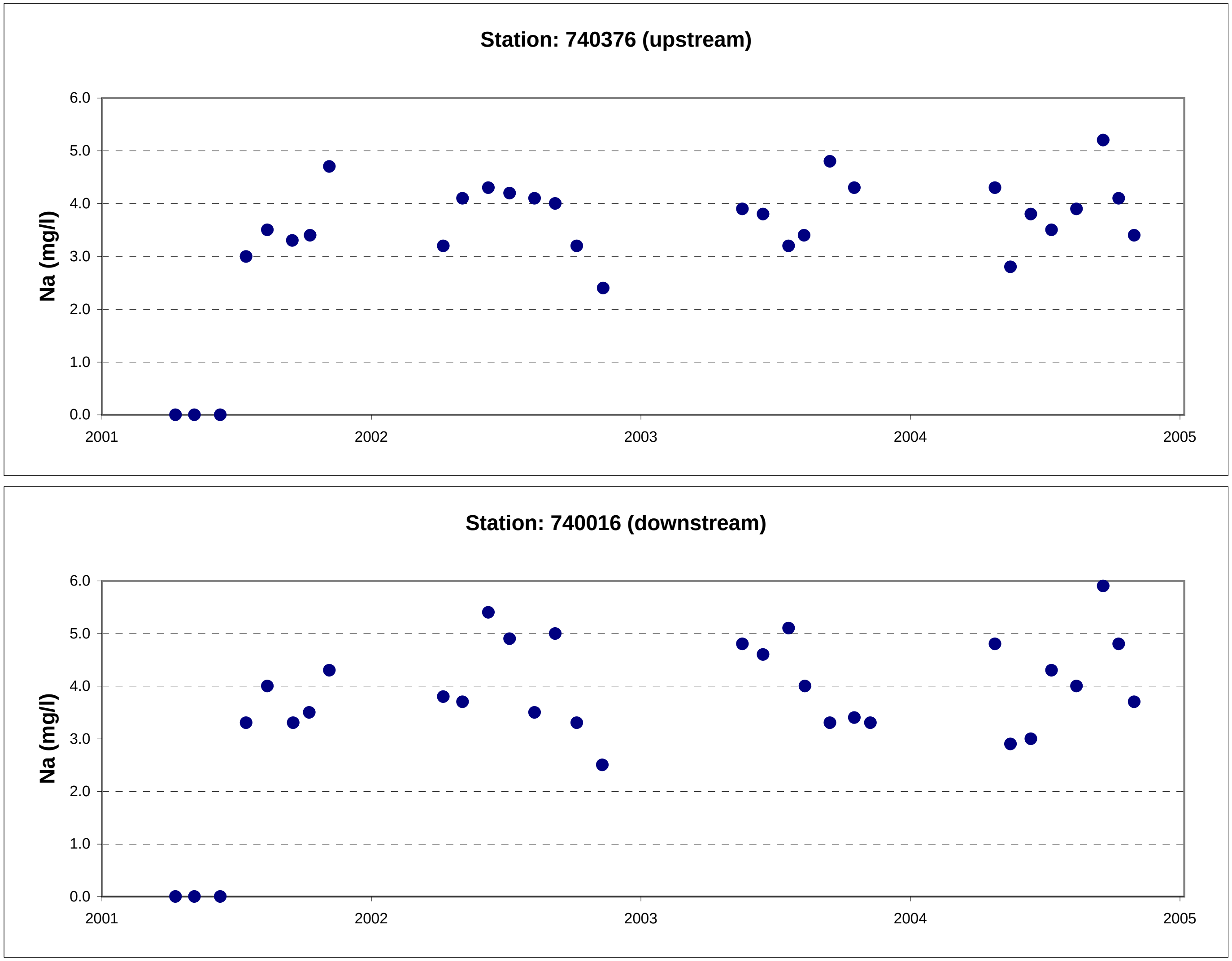


Figure 5-47. St. Clair River - Sodium Concentration Time Series, 2001-2004.

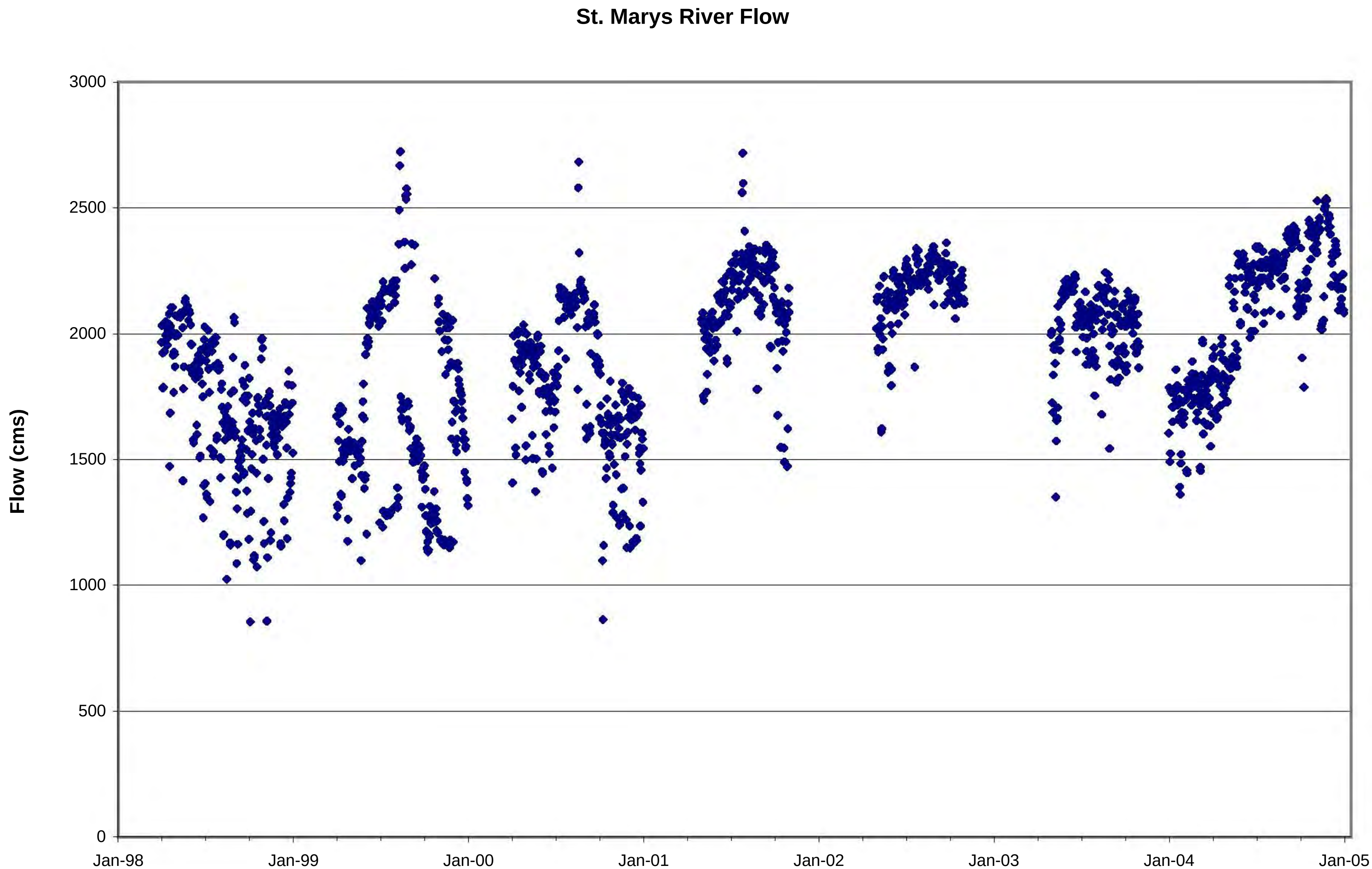
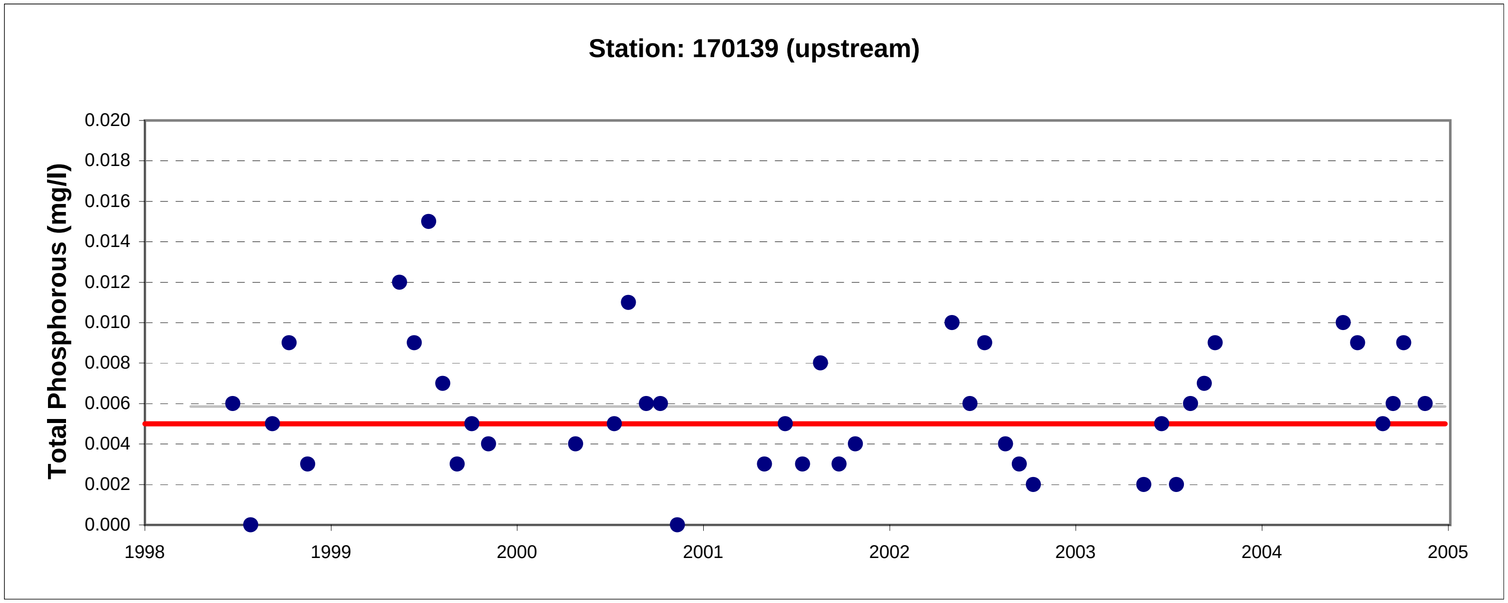


Figure 6-1. St. Marys River Flow



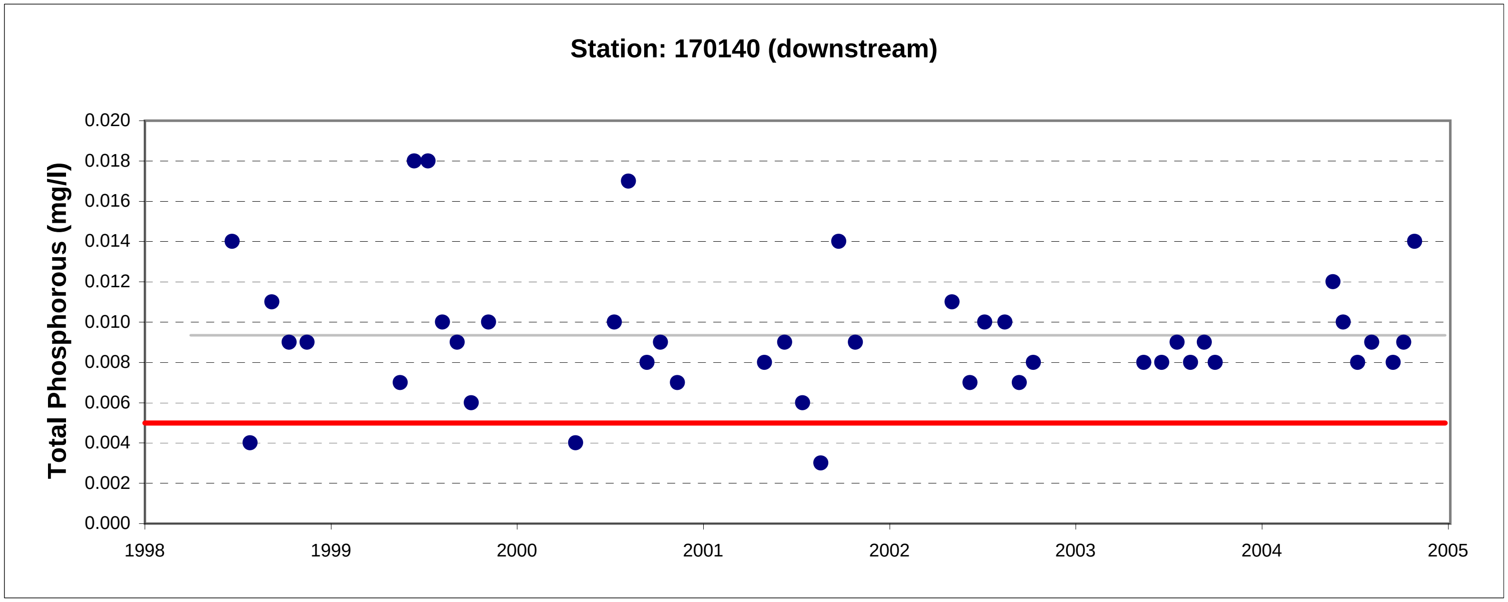


Figure 6-2. St. Marys River - Total Phosphorus Concentration Time Series, 1998-2004. Grey Line is Regression Model. Red Line is Quantification Limit.

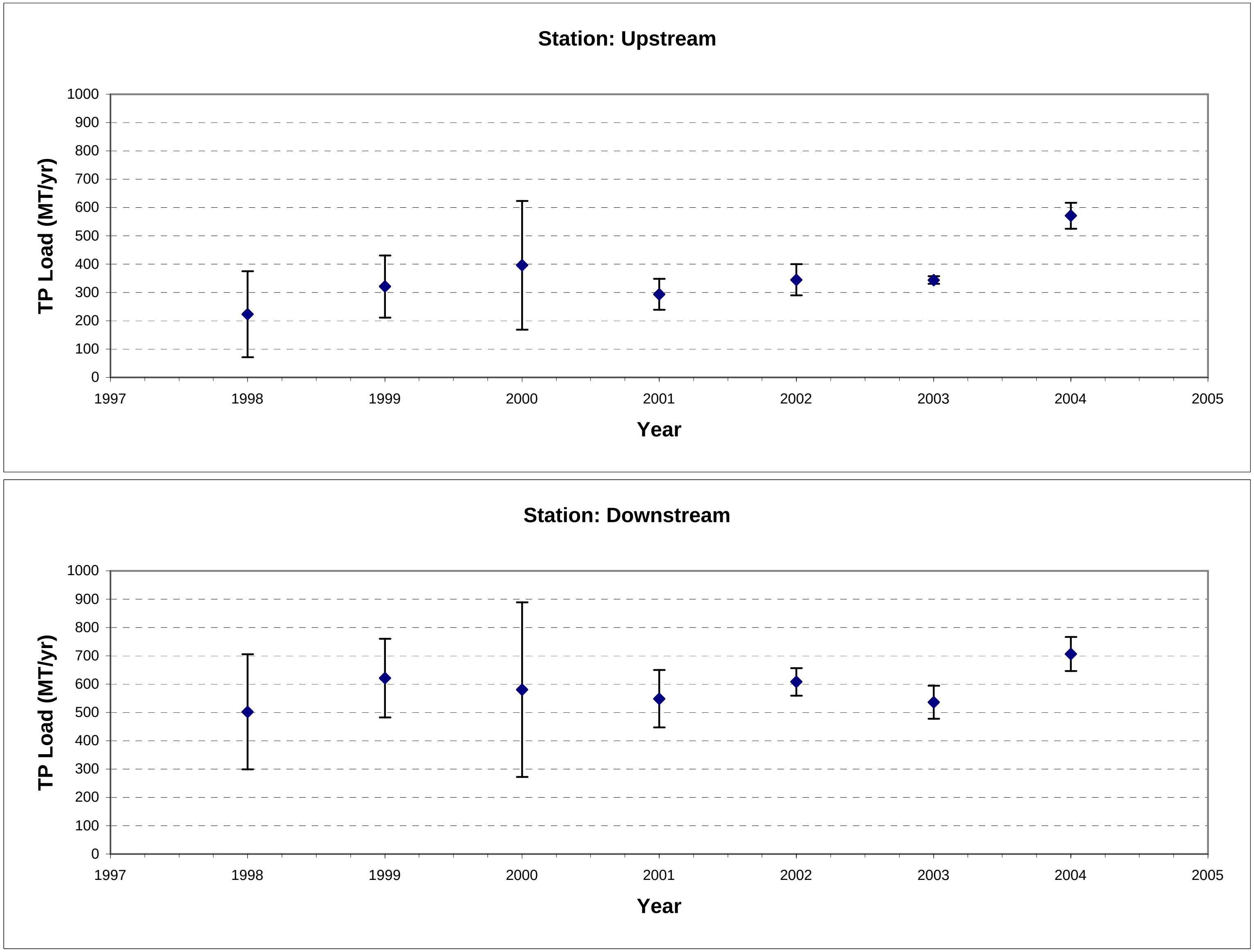
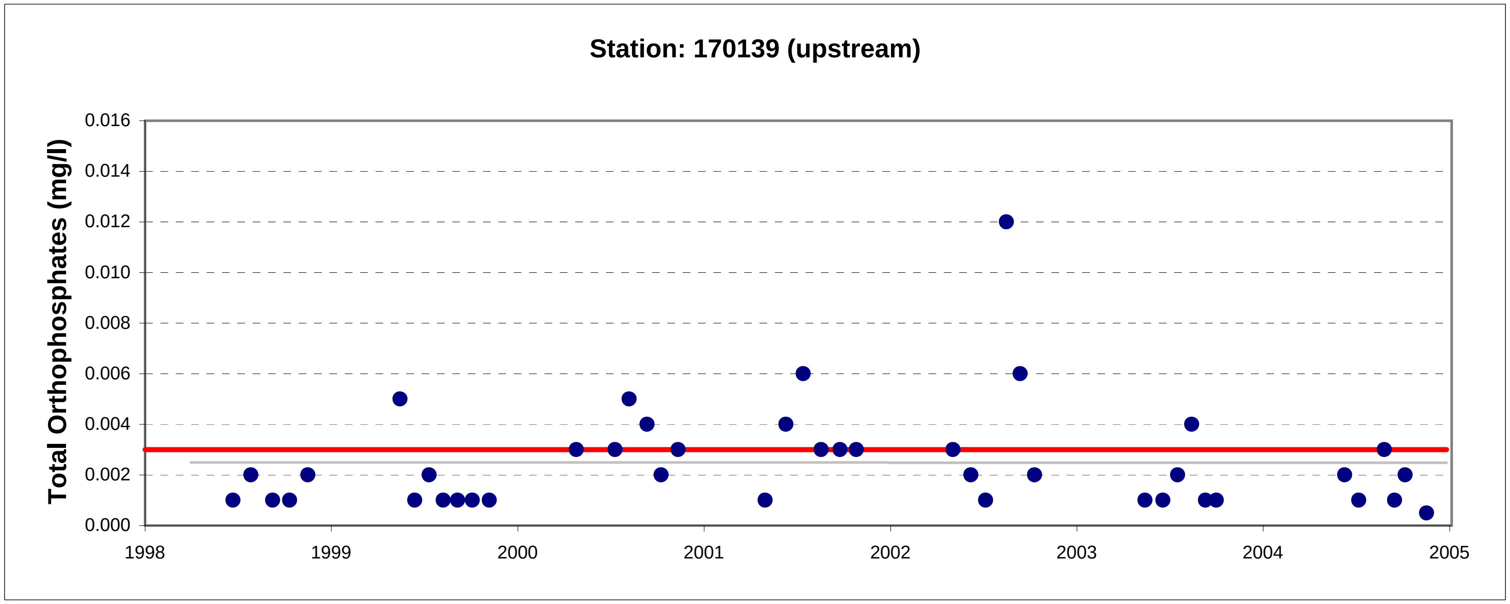


Figure 6-3. Temporal Variation in Total Phosphorus Load in the St. Marys River. Diamonds are Means and Bars are 95% Confidence Intervals.



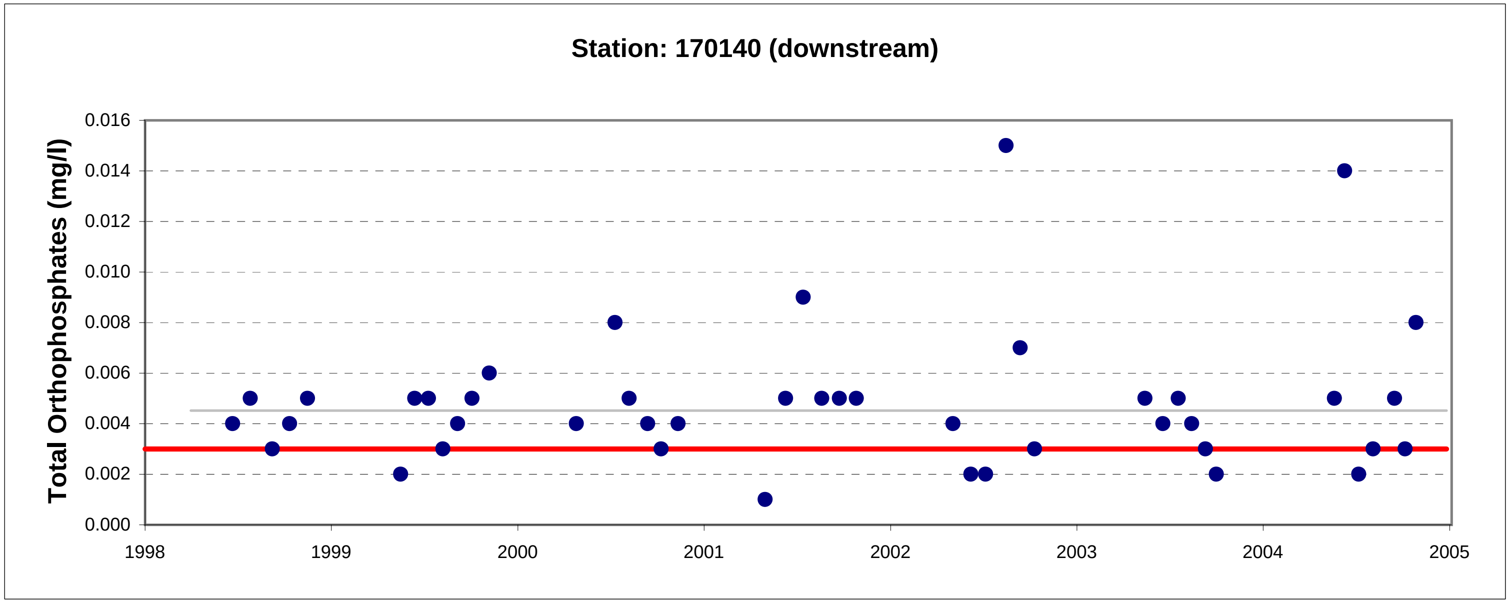


Figure 6-4. St. Marys River - Orthophosphate Concentration Time Series, 1998-2004. Grey Line is Regression Model. Red Line is Quantification Limit.

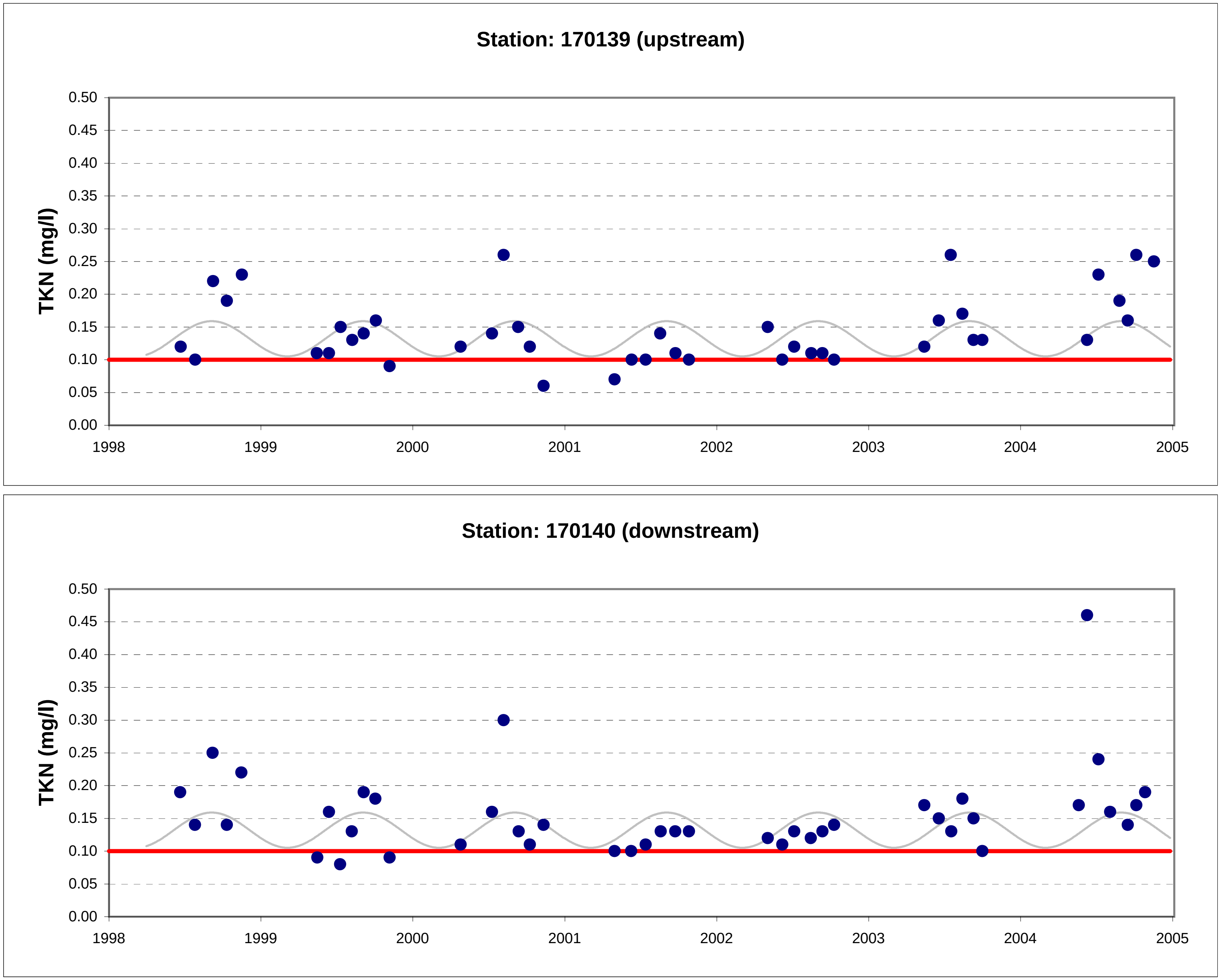
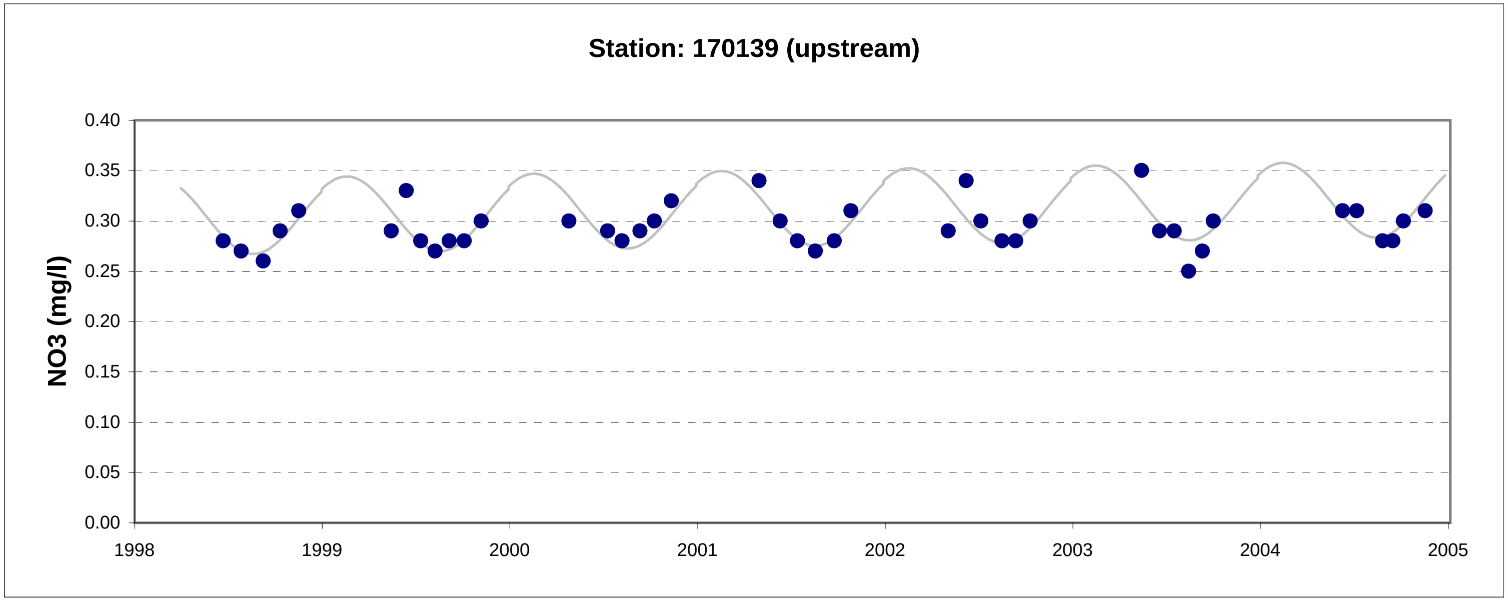


Figure 6-5. St. Marys River - TKN Concentration Time Series, 1998-2004. Grey Line is regression Model. Red Line is Quantification Limit.



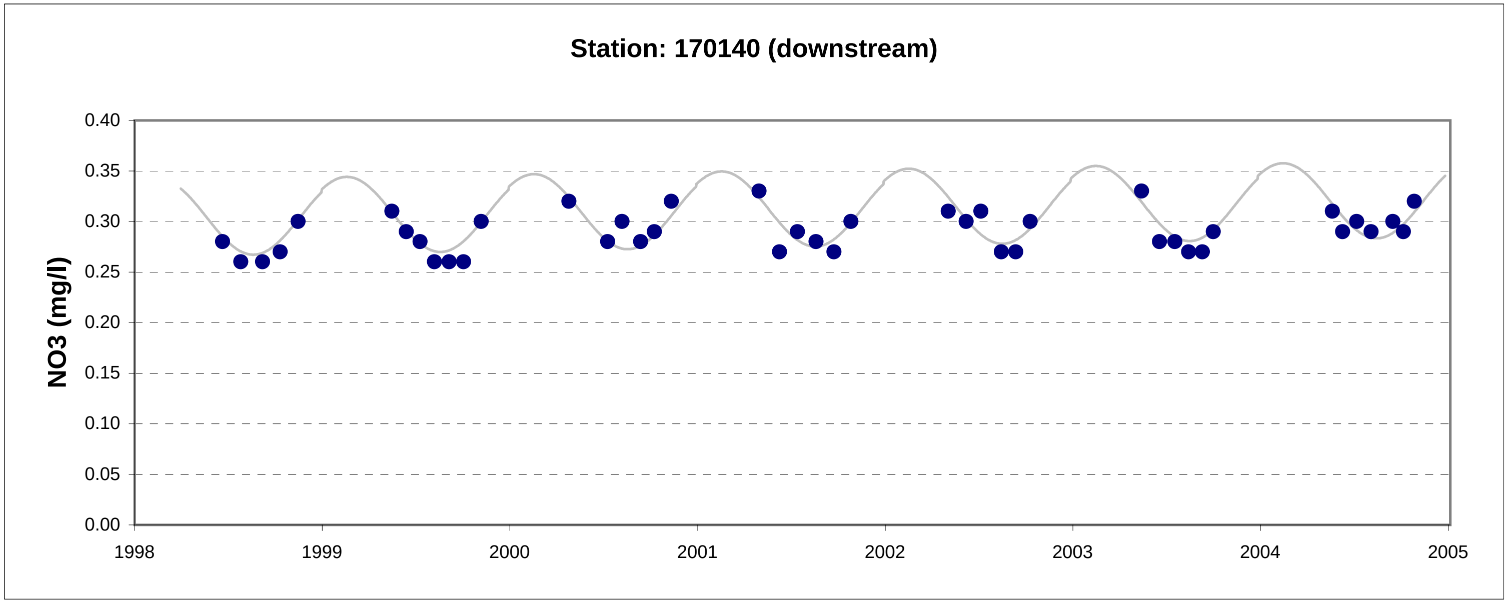
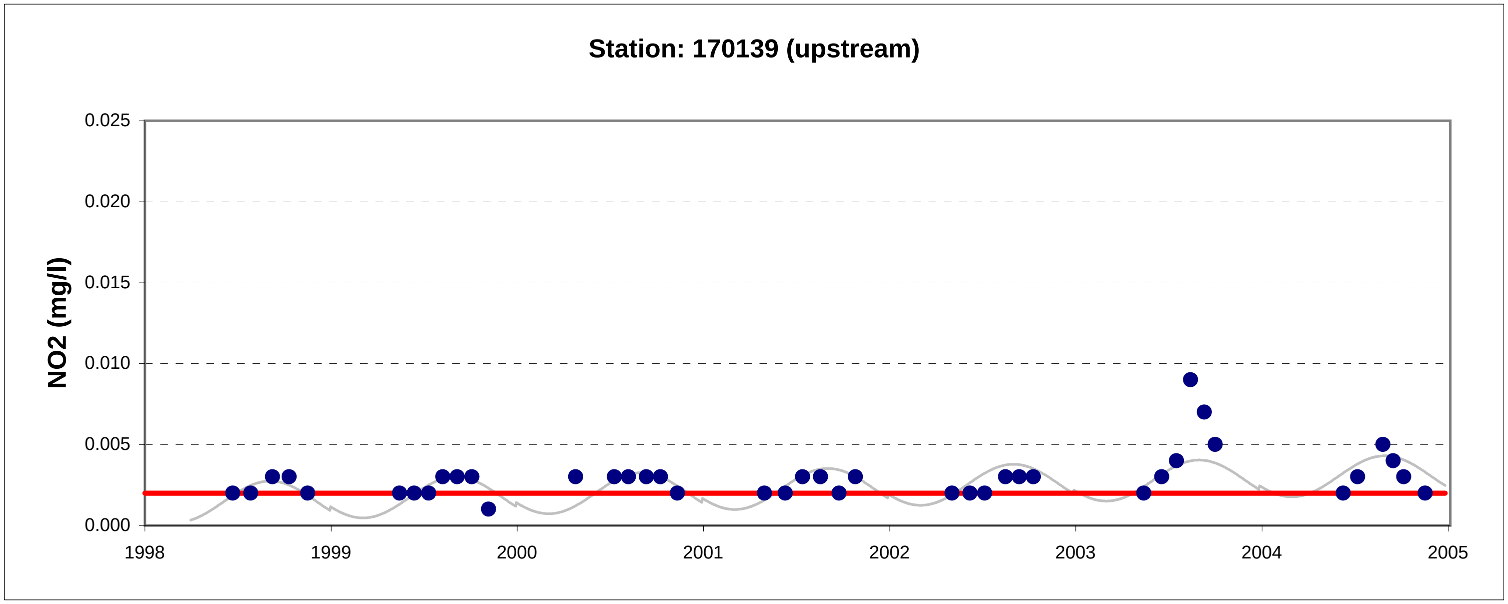


Figure 6-6. St. Marys River - NO3 Concentration Time Series, 1998-2004.
Grey Line is Regression Model.



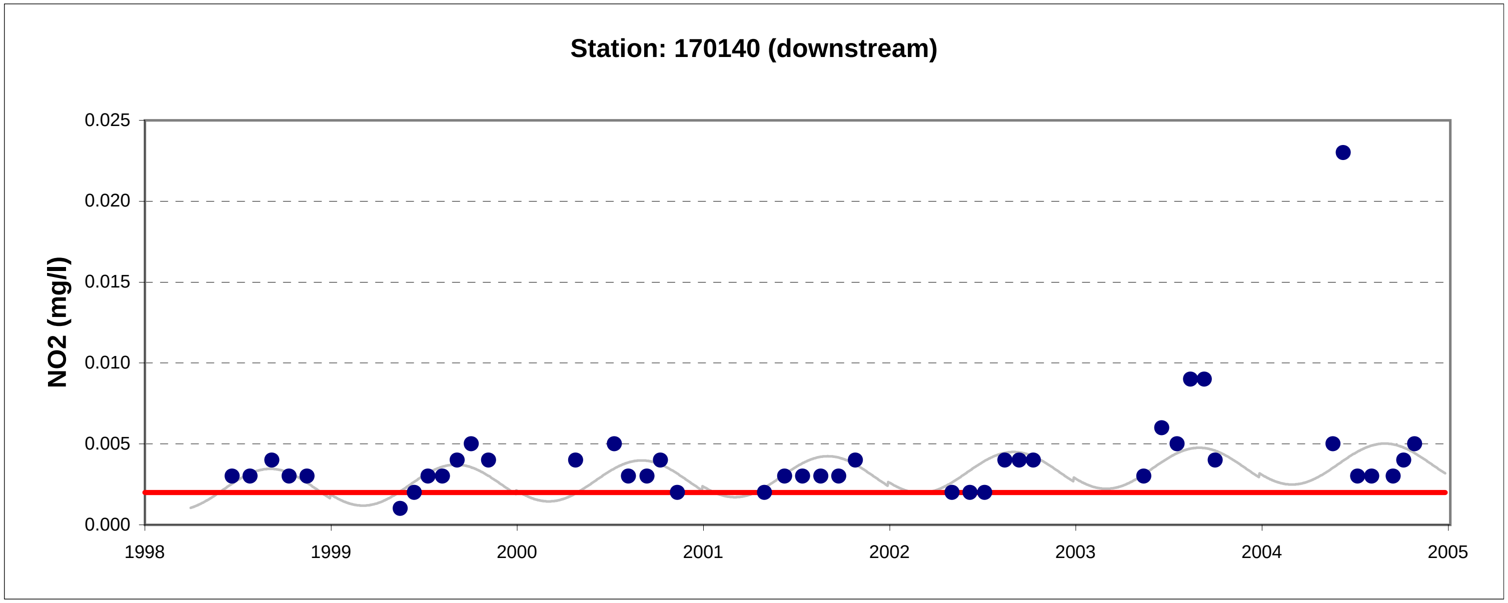
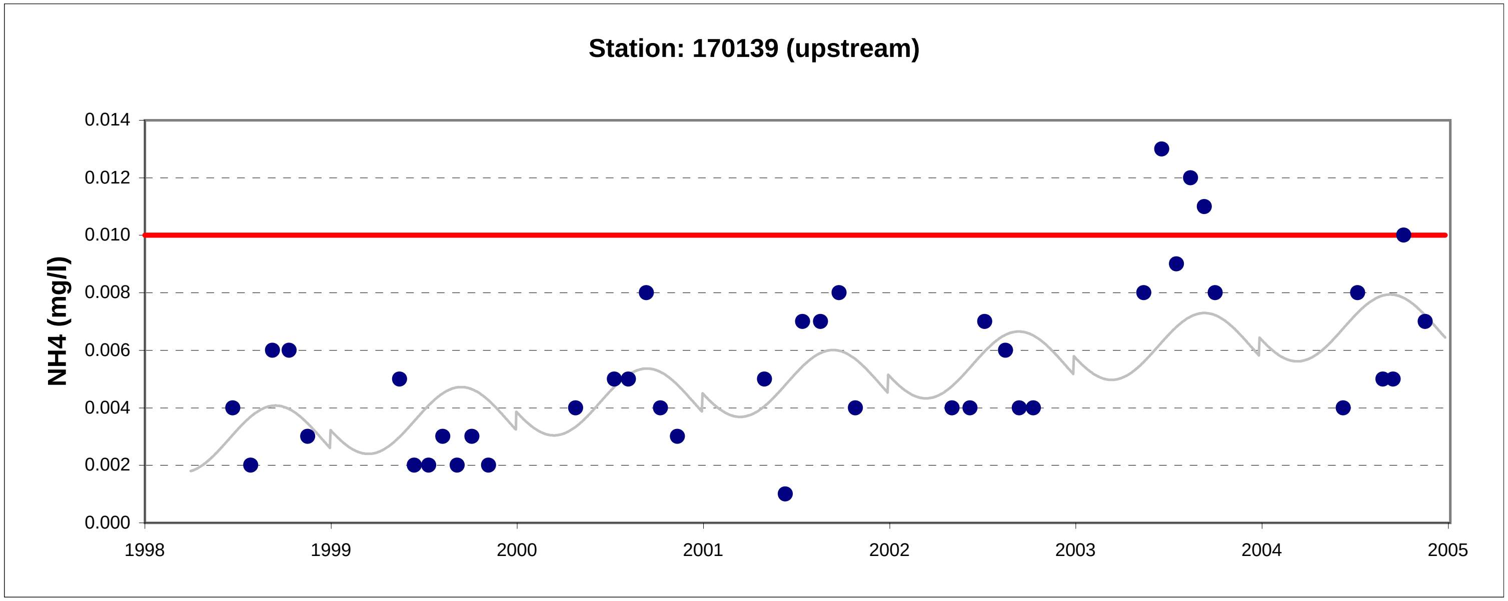


Figure 6-7. St. Marys River - NO2 Concentration Time Series, 1998-2004.
Grey Line is Regression Model. Red Line is Quantification Limit.



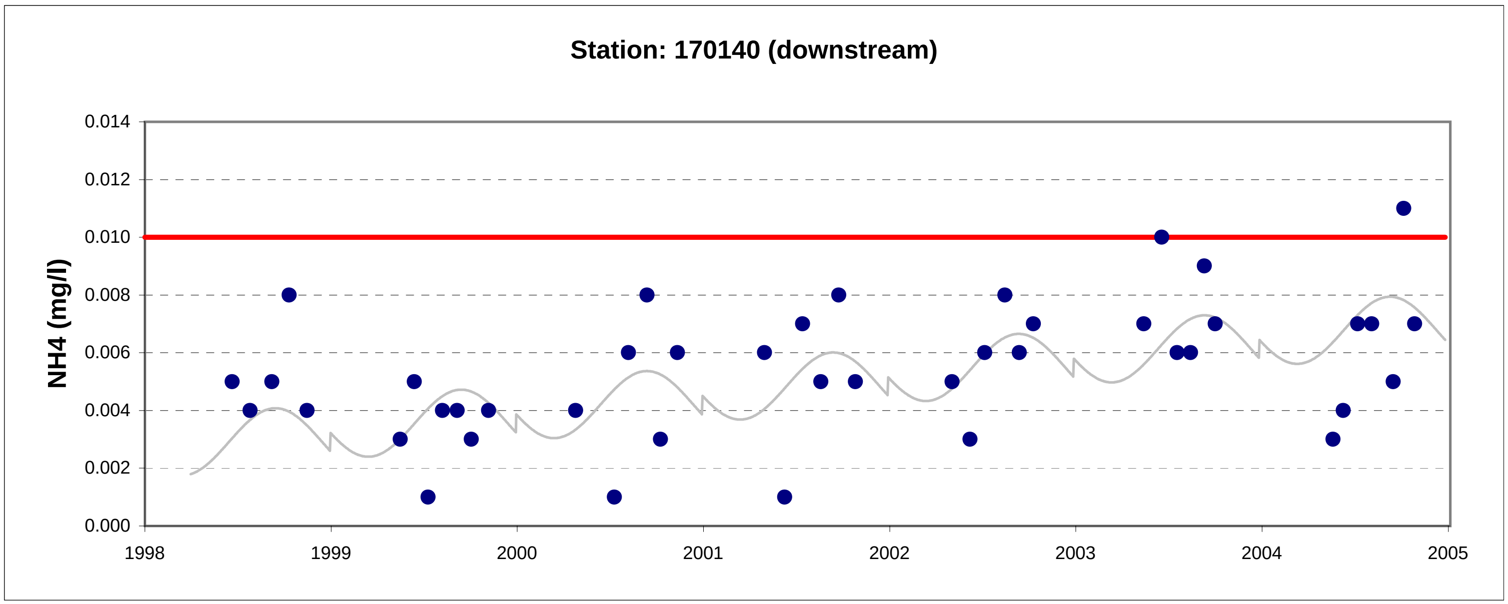


Figure 6-8. St. Marys River - NH4 Concentration Time Series, 1998-2004.
Grey Line is Regression Model. Red Line is Quantification Limit.

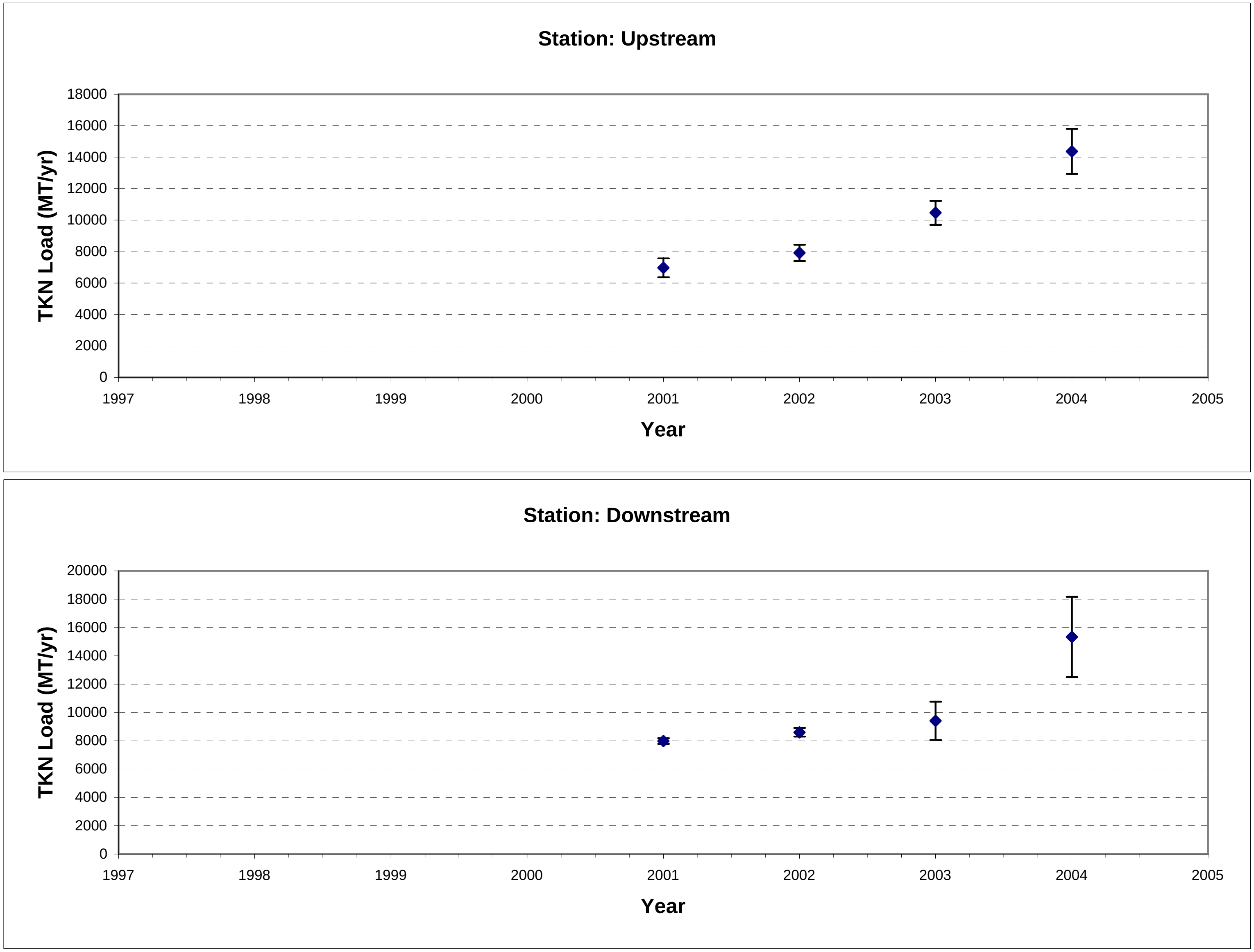


Figure 6-9. Temporal Variation in TKN Load in the St. Marys River. Diamonds are Means and Bars are 95% Confidence Intervals.

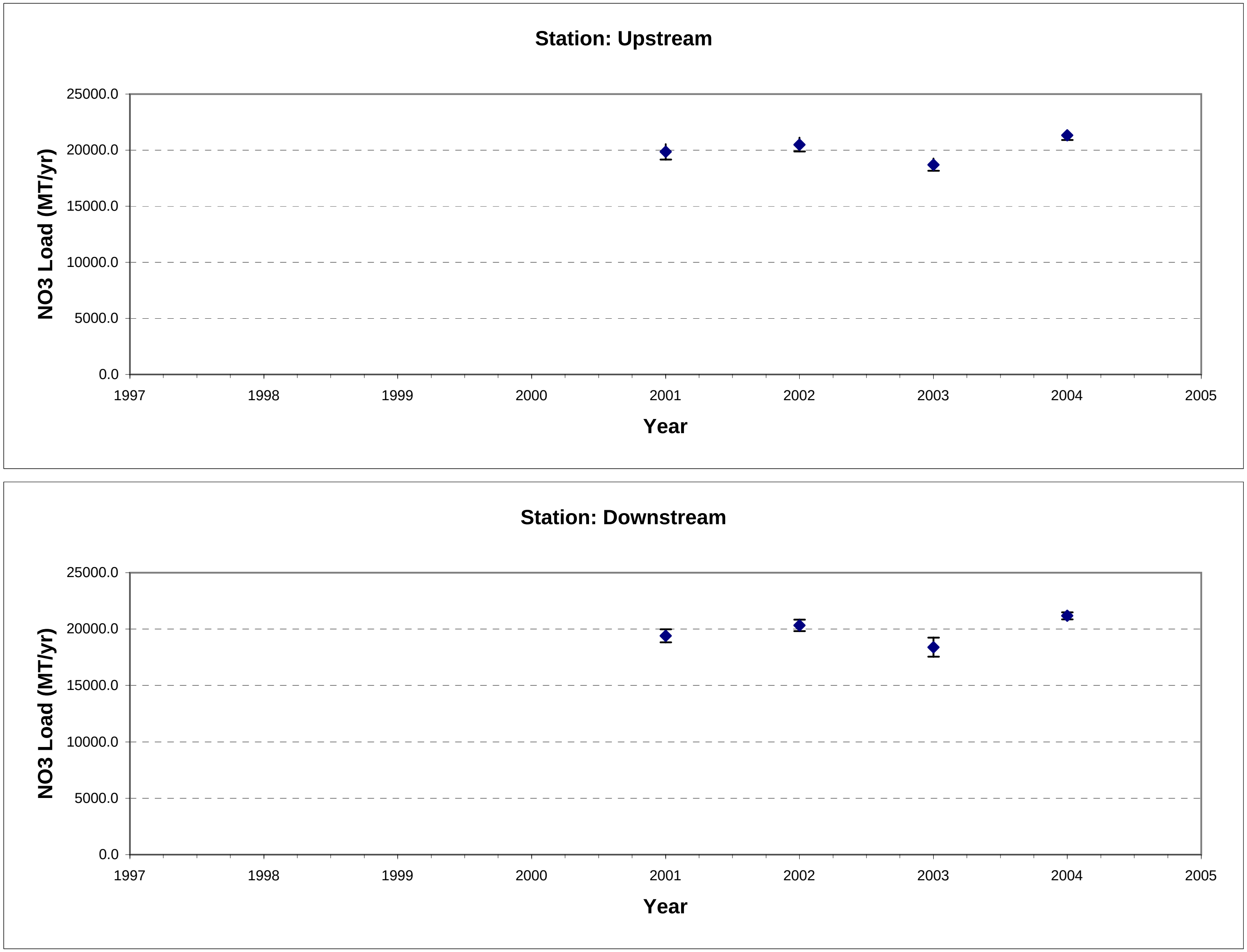
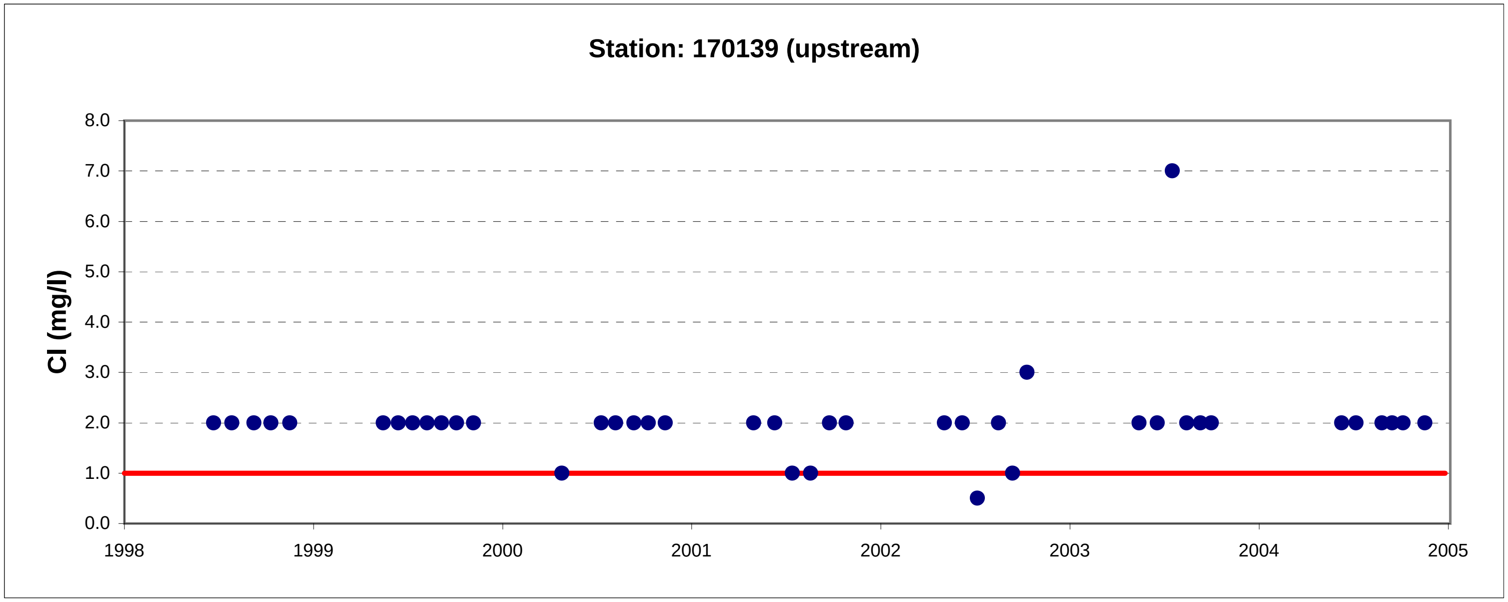


Figure 6-10. Temporal Variation in NO_3 Load in the St. Marys River. Diamonds are Means and Bars are 95% Confidence Intervals.



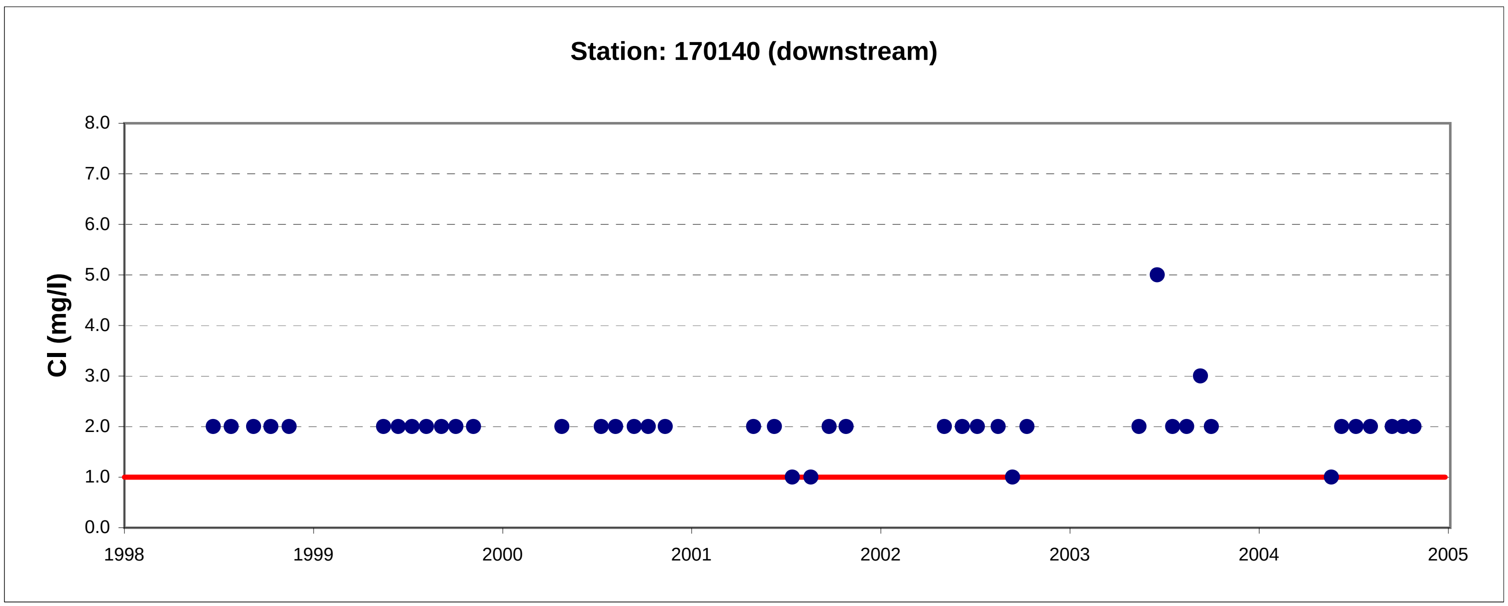


Figure 6-11. St. Marys River - Chloride Concentration Time Series, 1998-2004.
Red Line is Quantification Limit.

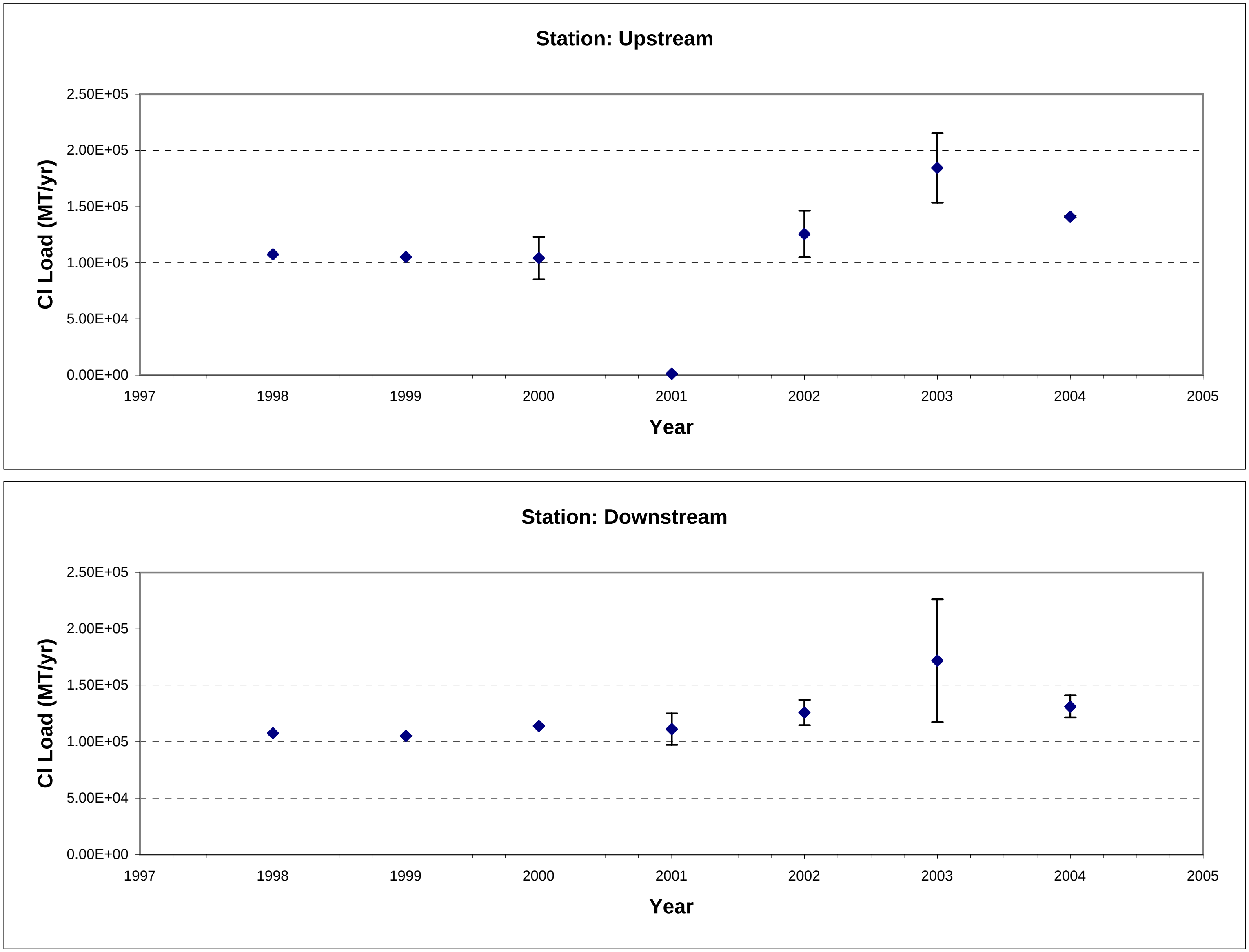
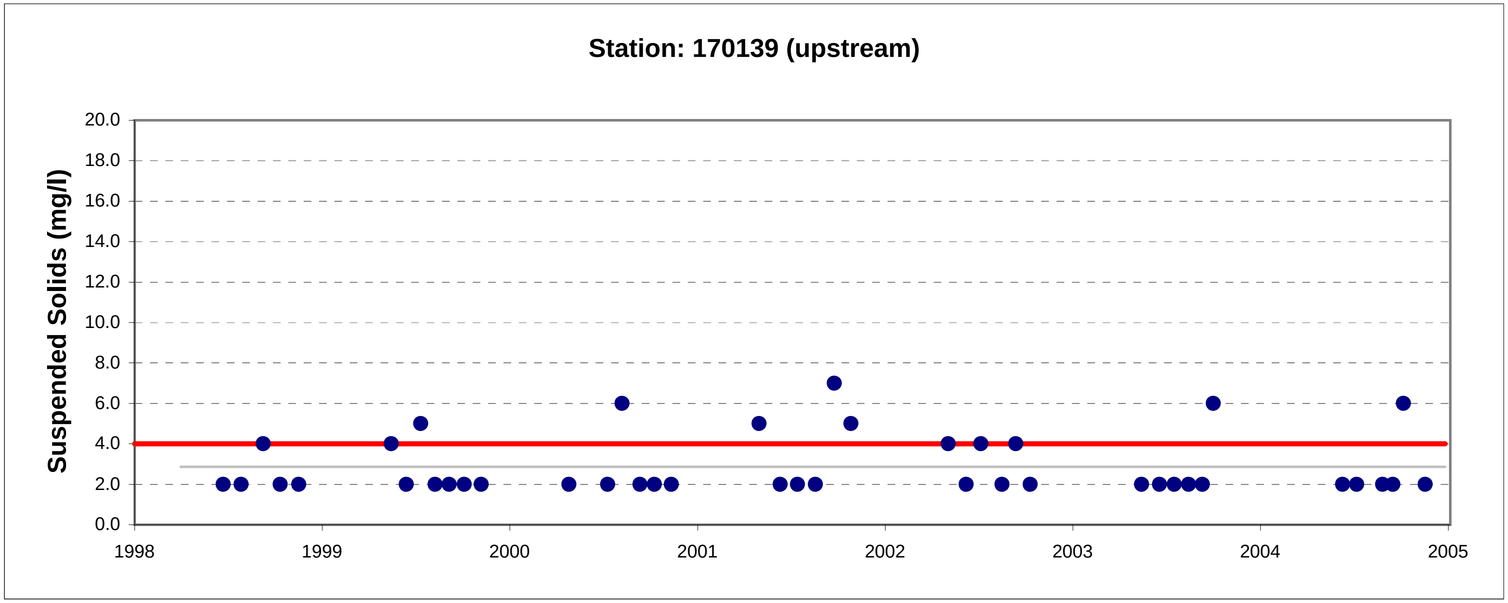


Figure 6-12. Temporal Variation in Chloride Load in the St. Marys River.
Diamonds are Means and Bars are 95% Confidence Intervals.



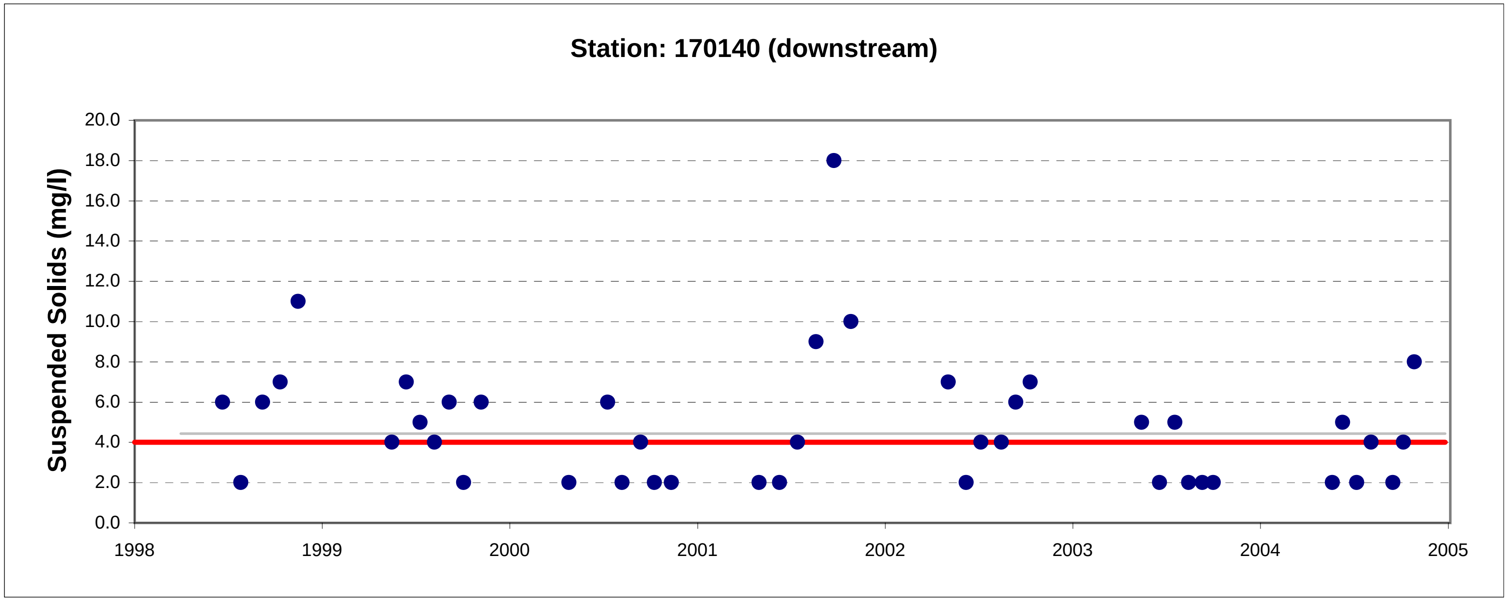


Figure 6-13. St. Marys River - TSS Concentration Time Series, 1998-2004.
Grey Line is Regression Model. Red Line is Quantification Limit.

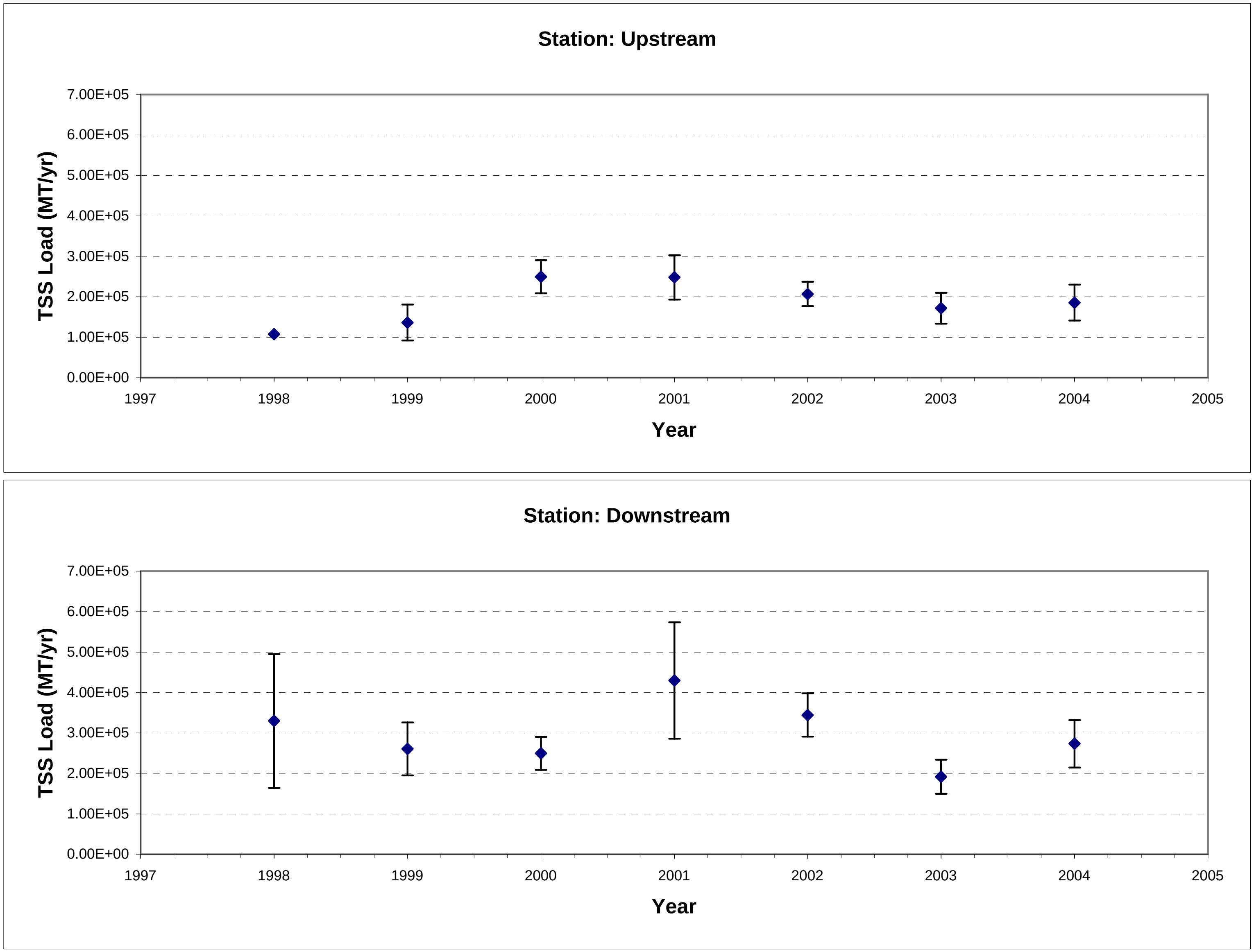
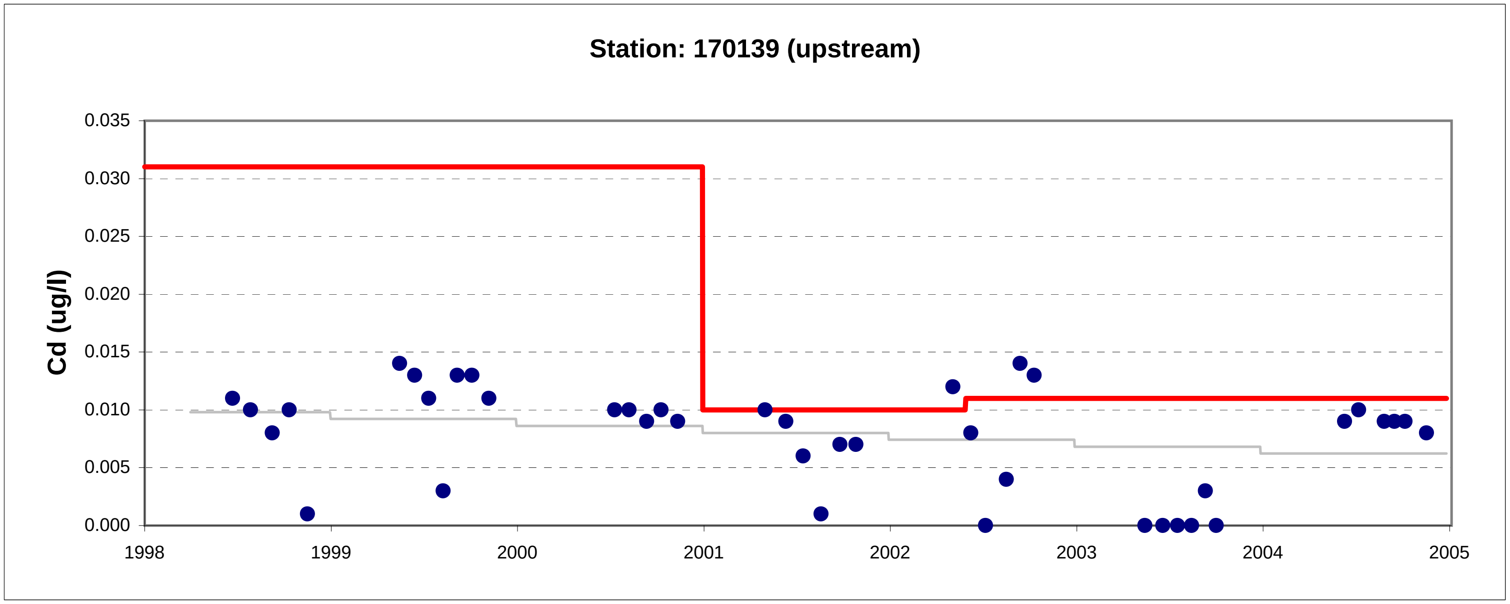


Figure 6-14. Temporal Variation in TSS Load in the St. Marys River. Diamonds are Means and Bars are 95% Confidence Intervals.



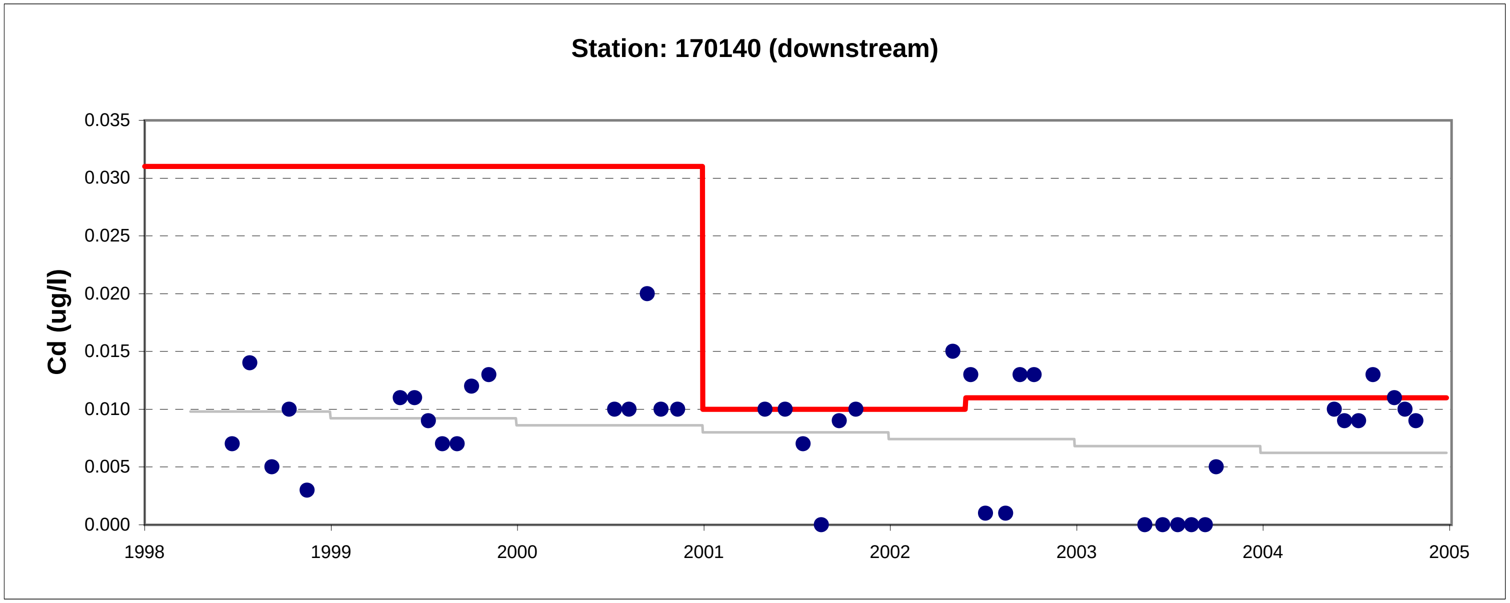


Figure 6-15. St. Marys River - Cadmium Concentration Time Series, 1998-2004. Grey Line is Regression Model. Red Line is Quantification Limit.

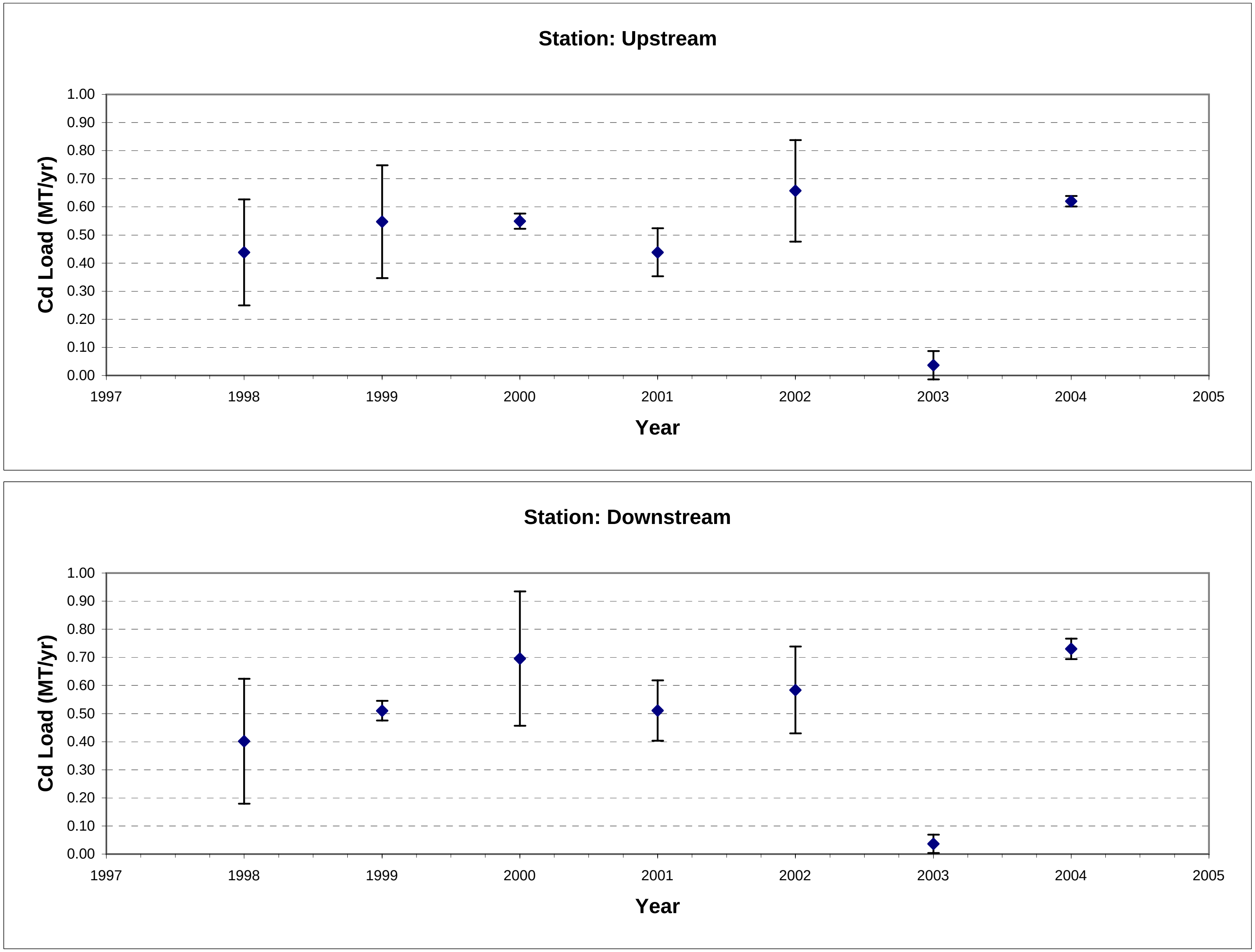
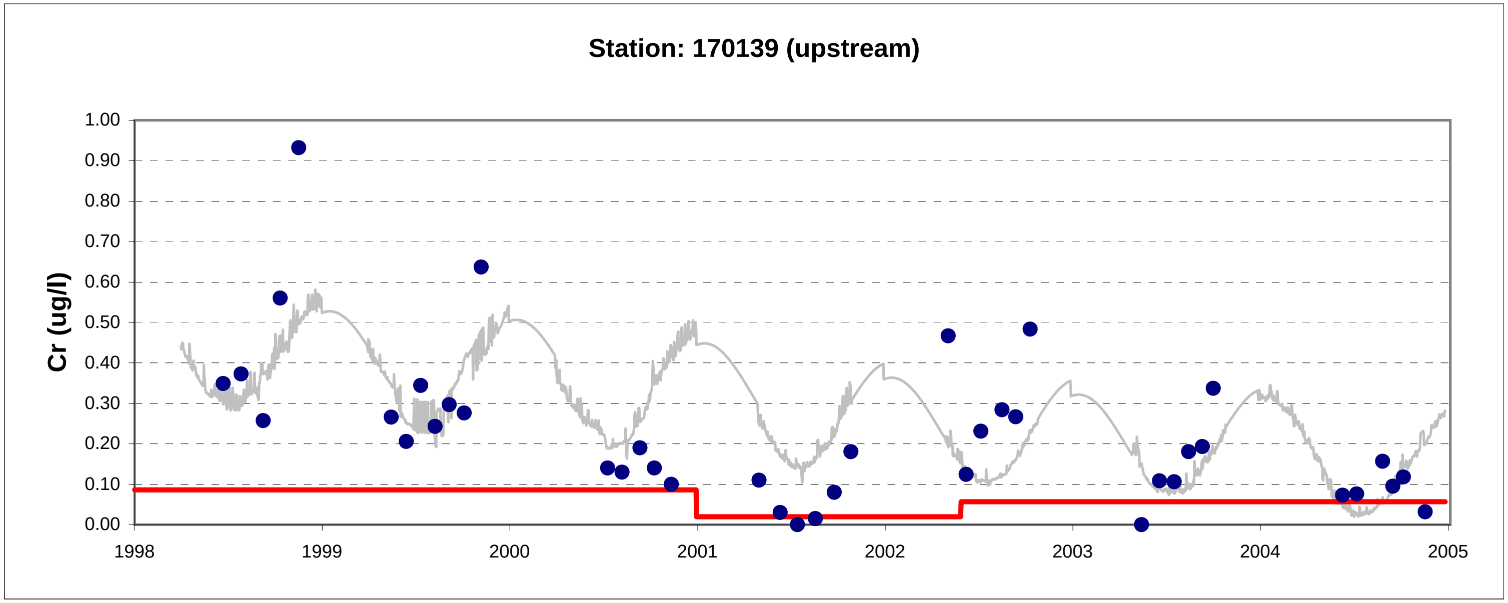


Figure 6-16. Temporal Variation in Cadmium Load in the St. Marys River. Diamonds are Means and Bars are 95% Confidence Intervals.



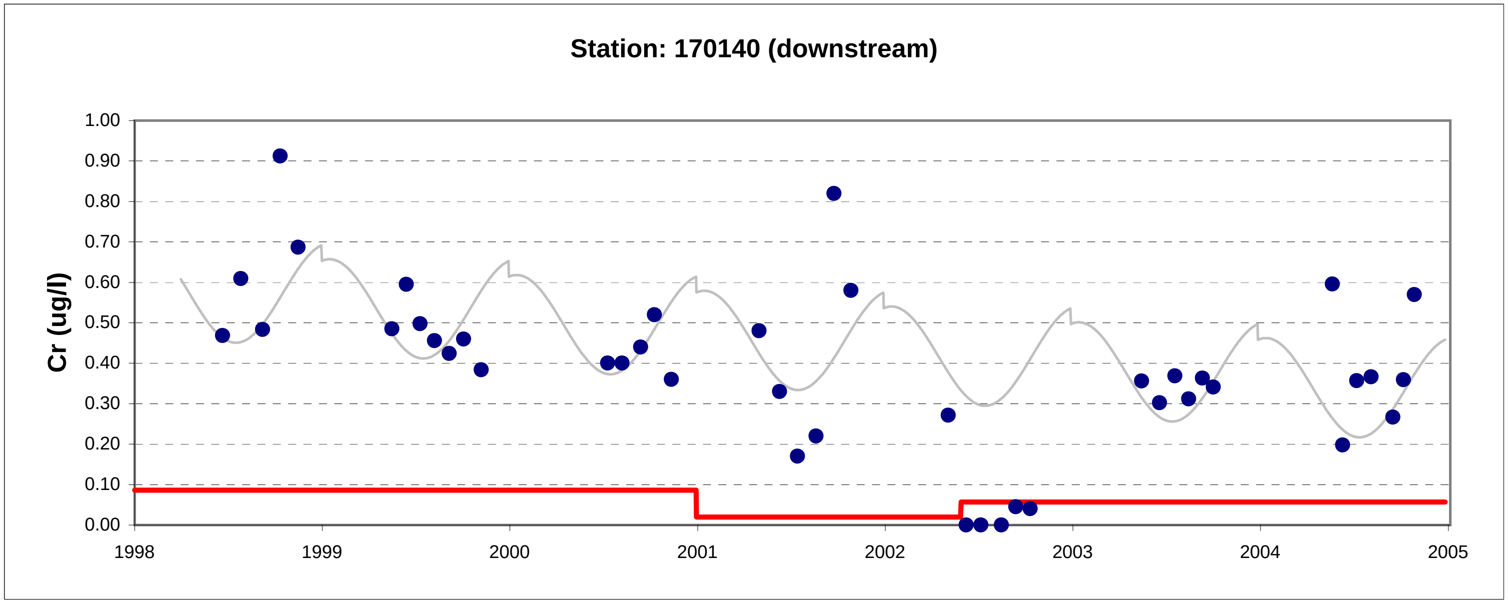
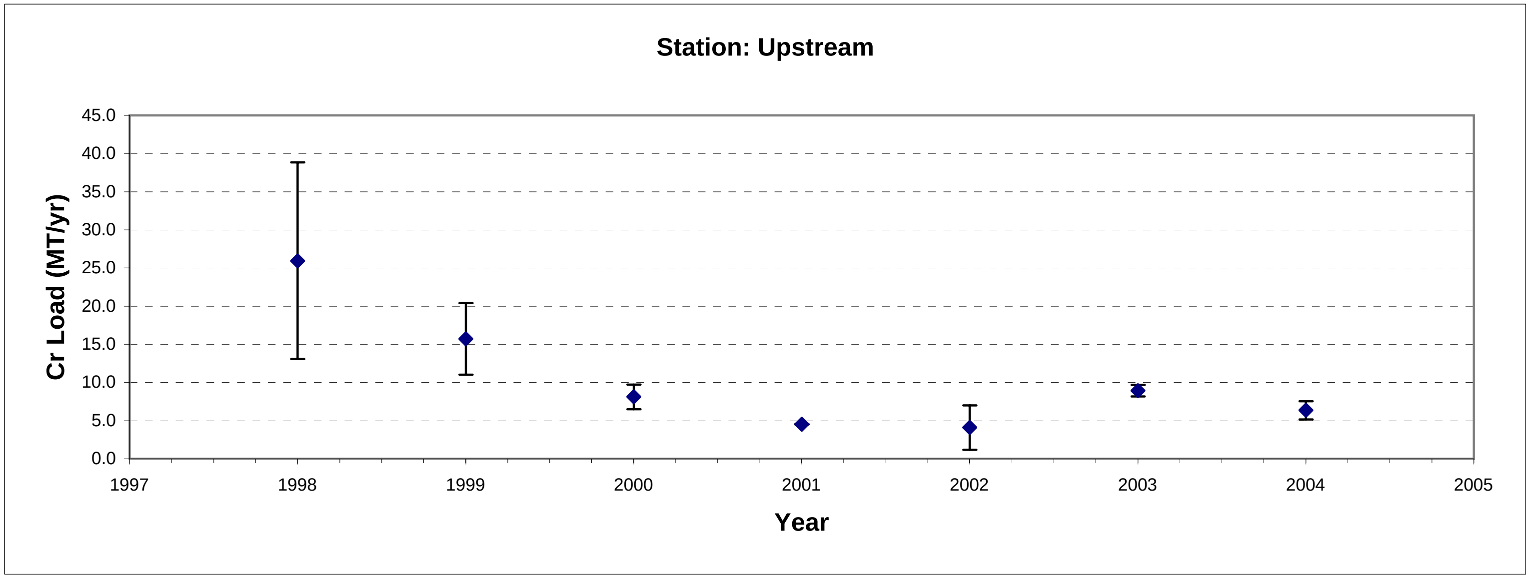


Figure 6-17. St. Marys River - Chromium Concentration Time Series, 1998-2004.
Grey Line is Regression Model. Red Line is Quantification Limit.



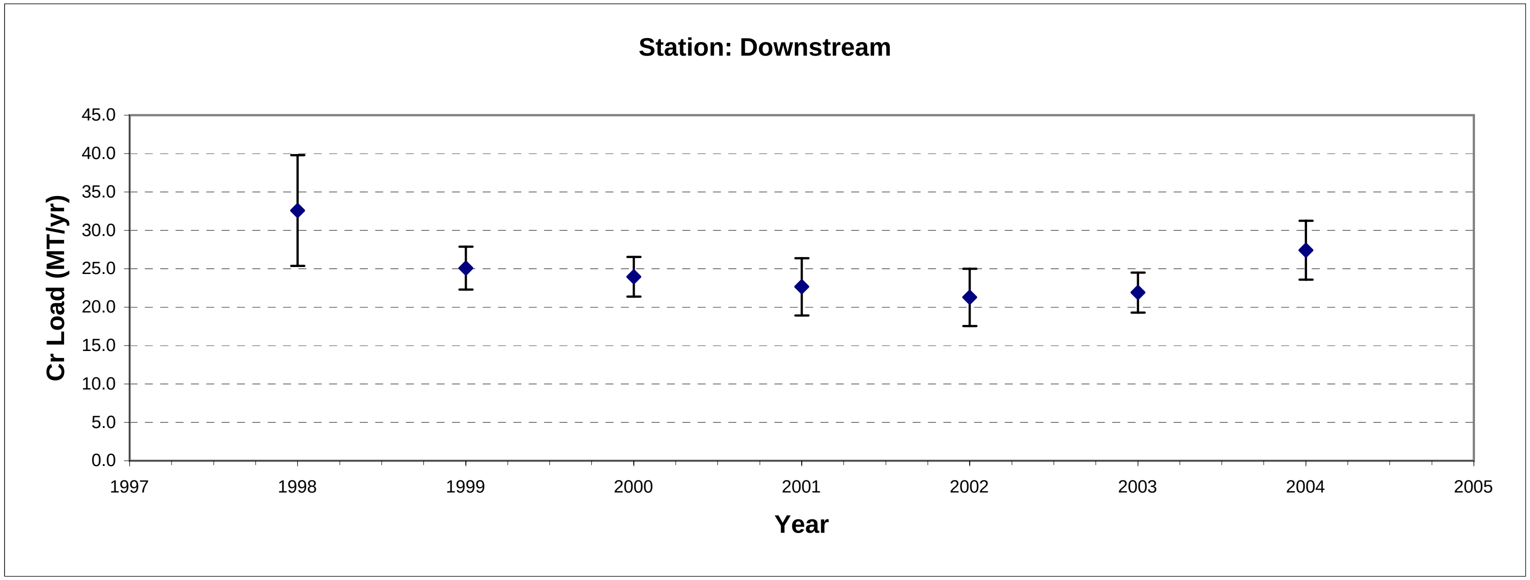
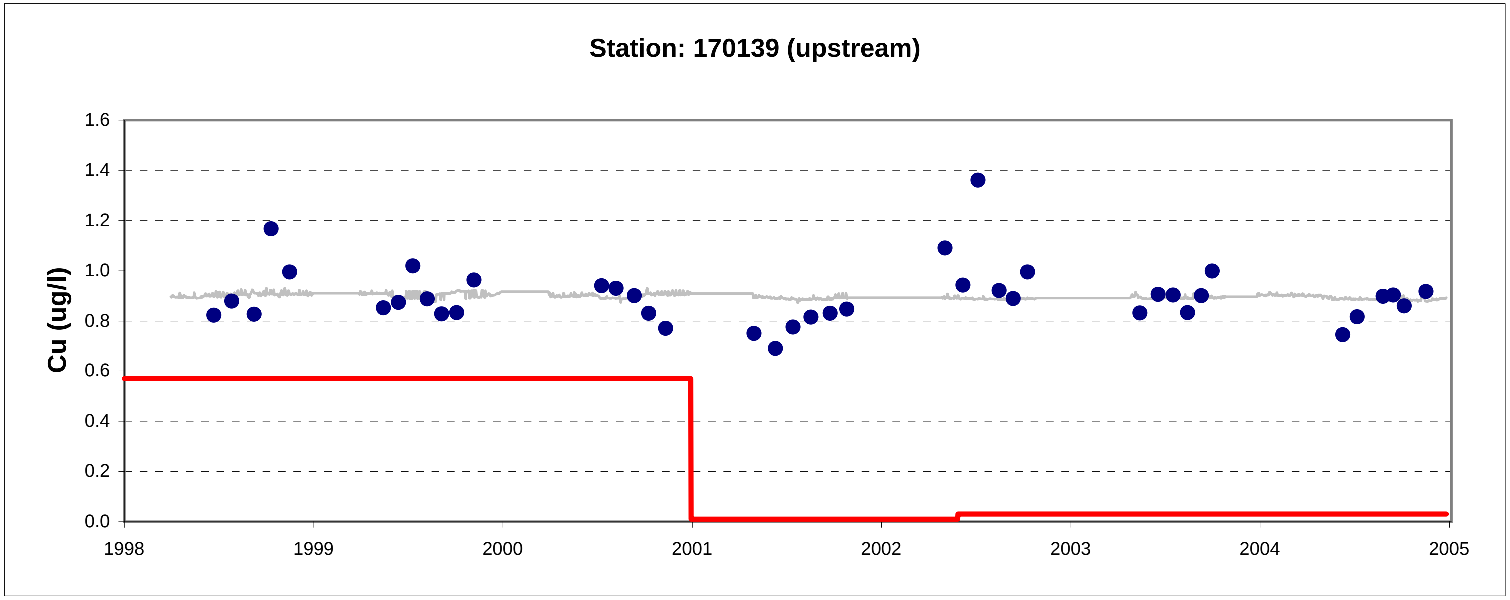


Figure 6-18. Temporal Variation in Chromium Load in the St. Marys River. Diamonds are Means and Bars are 95% Confidence Intervals.



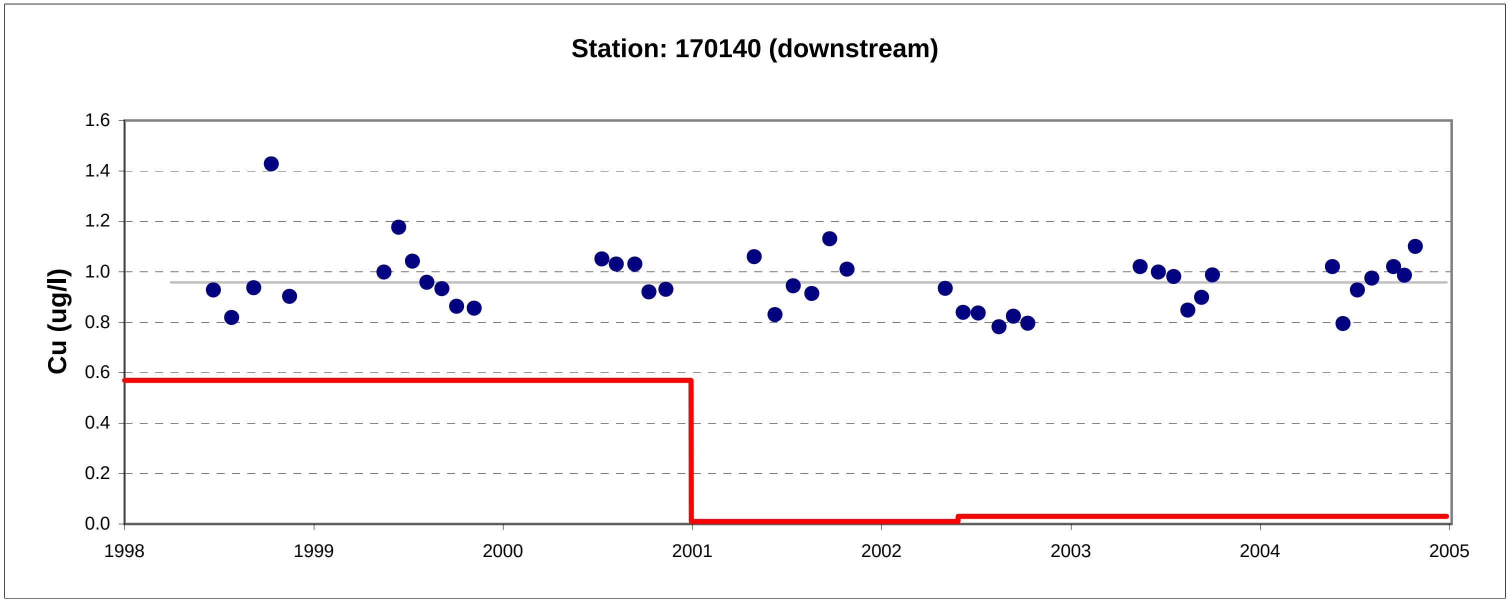
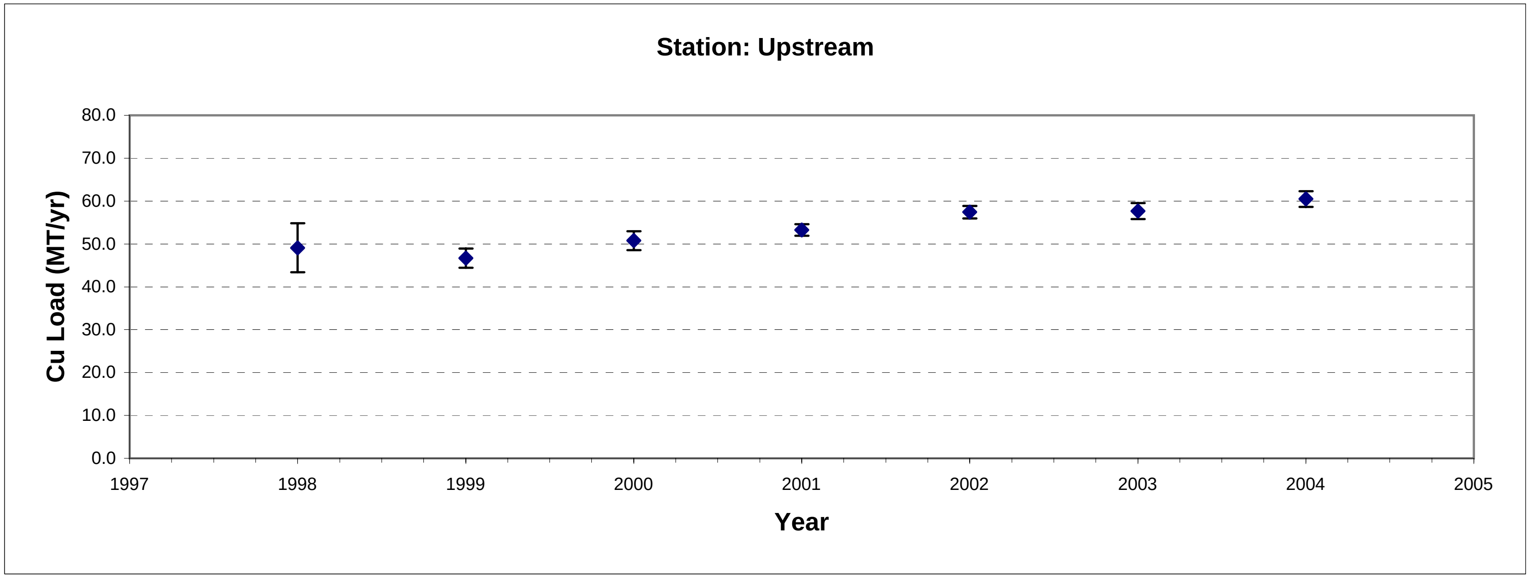


Figure 6-19. St. Marys River - Copper Concentration Time Series, 1998-2004.
Grey Line is Regression Model. Red Line is Quantification Limit.



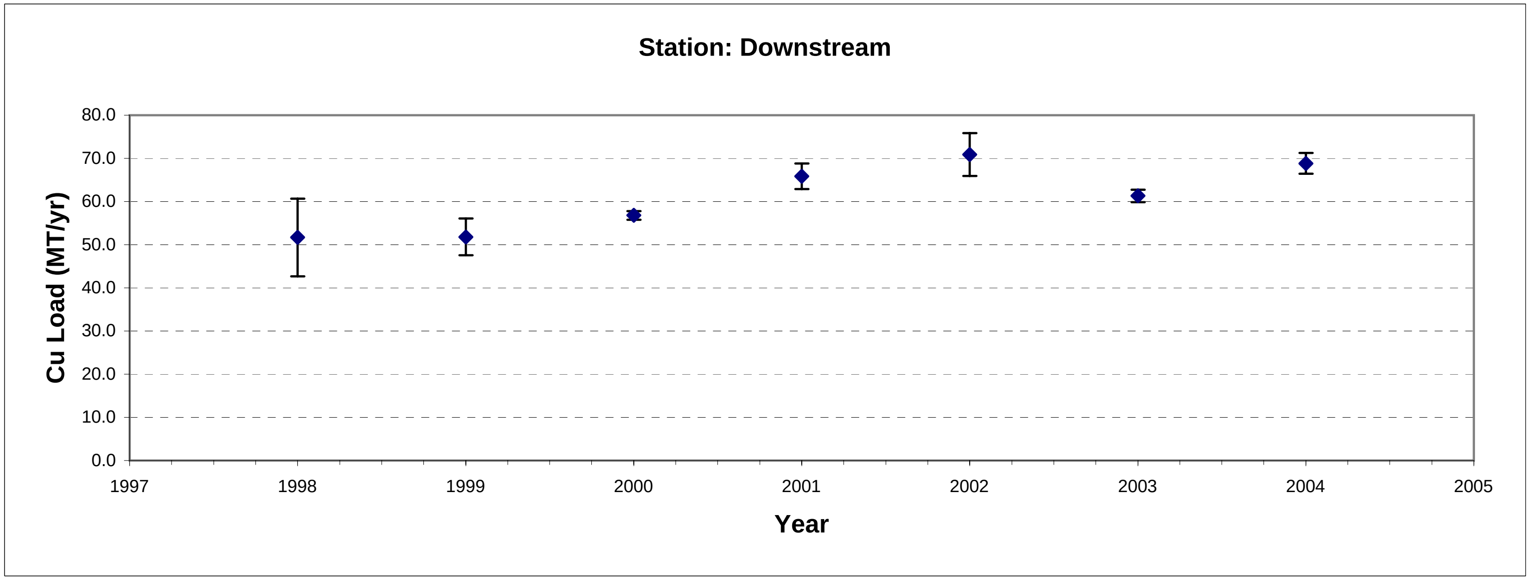
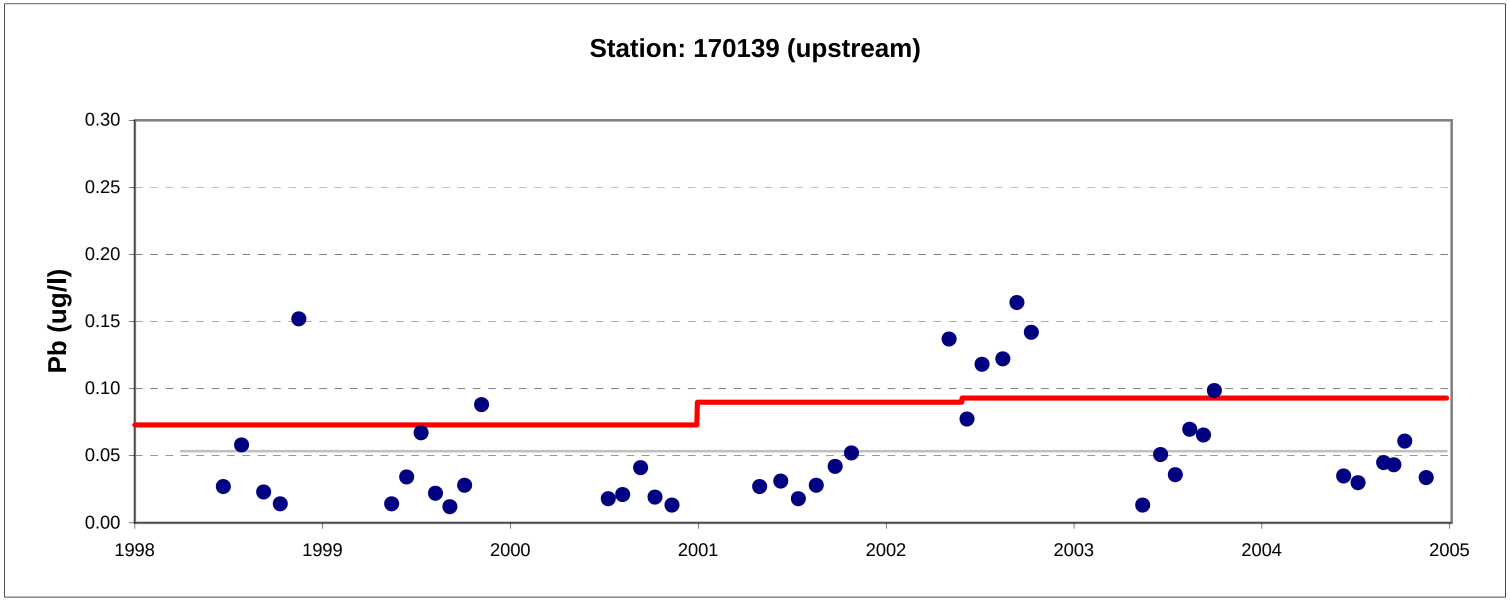


Figure 6-20. Temporal Variation in Copper Load in the St. Marys River. Diamonds are Means and Bars are 95% Confidence Intervals.



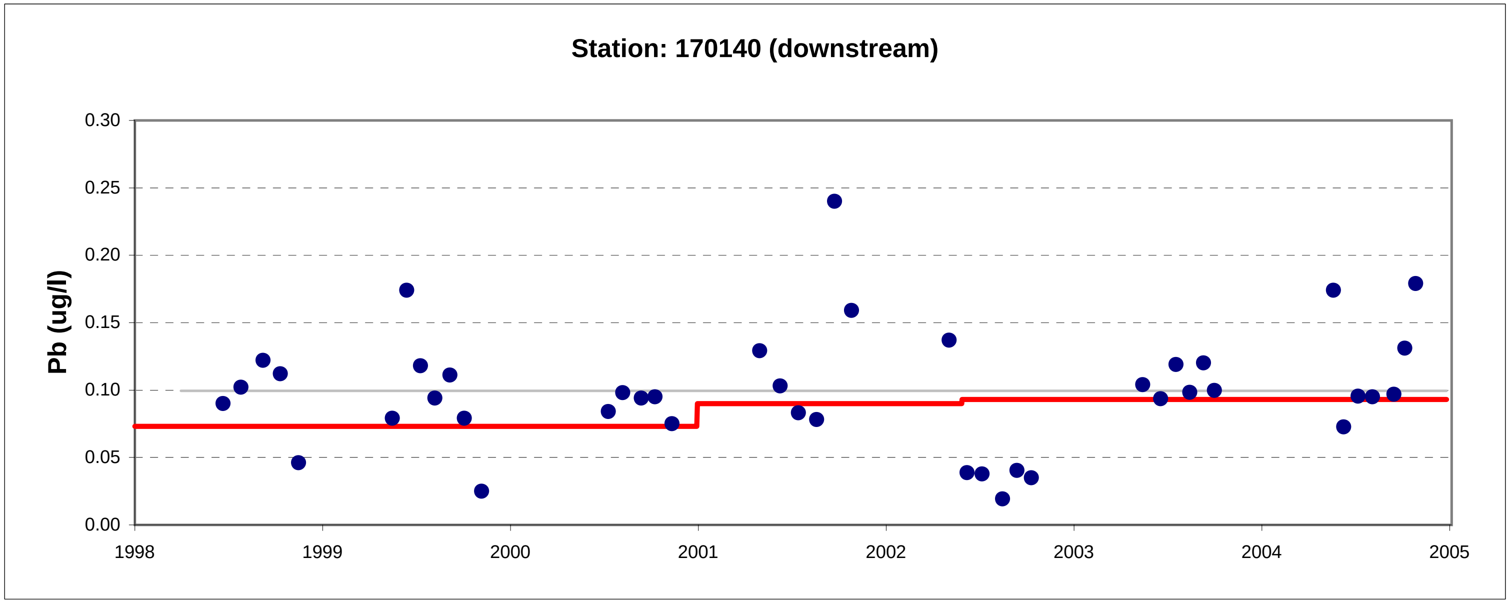
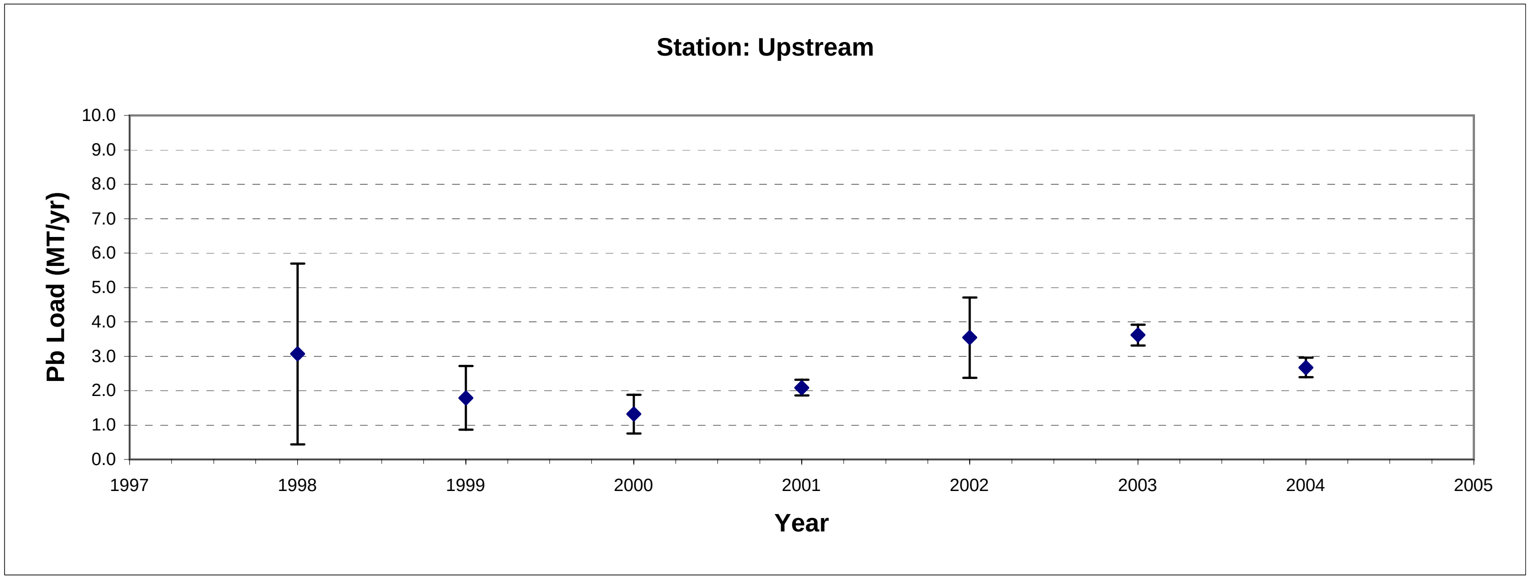


Figure 6-21. St. Marys River - Lead Concentration Time Series, 1998-2004.
Grey Line is Regression Model. Red Line is Quantification Limit.



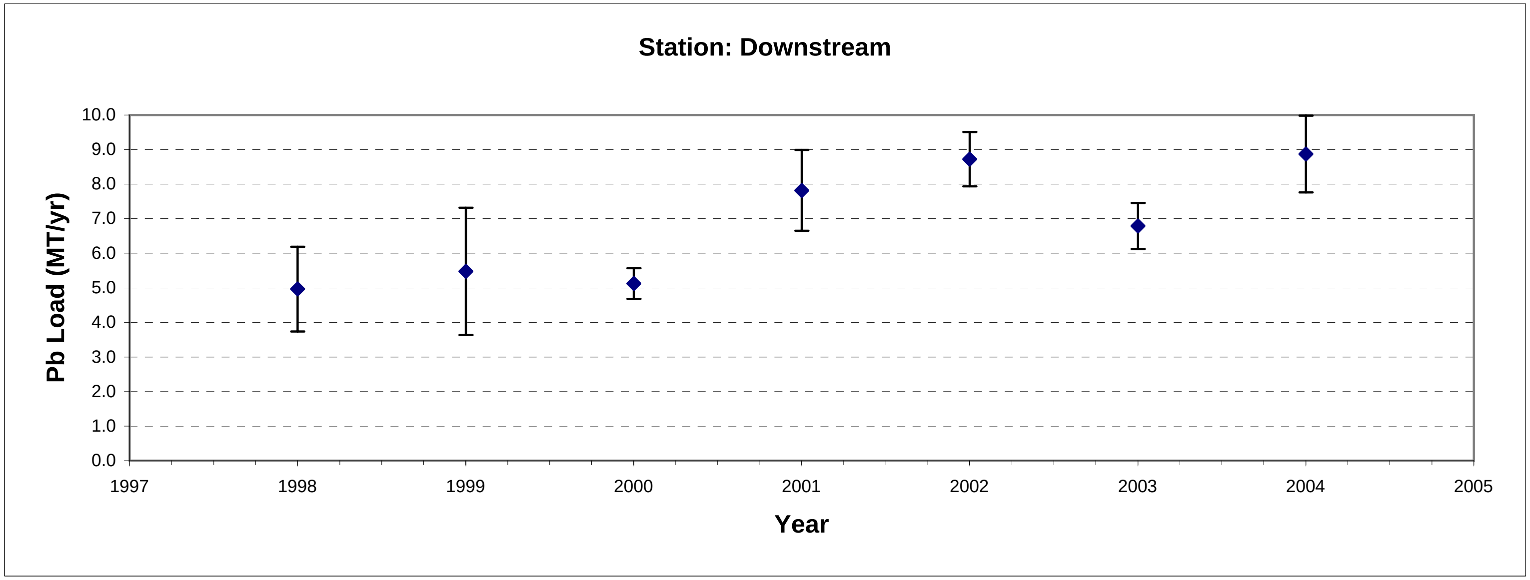
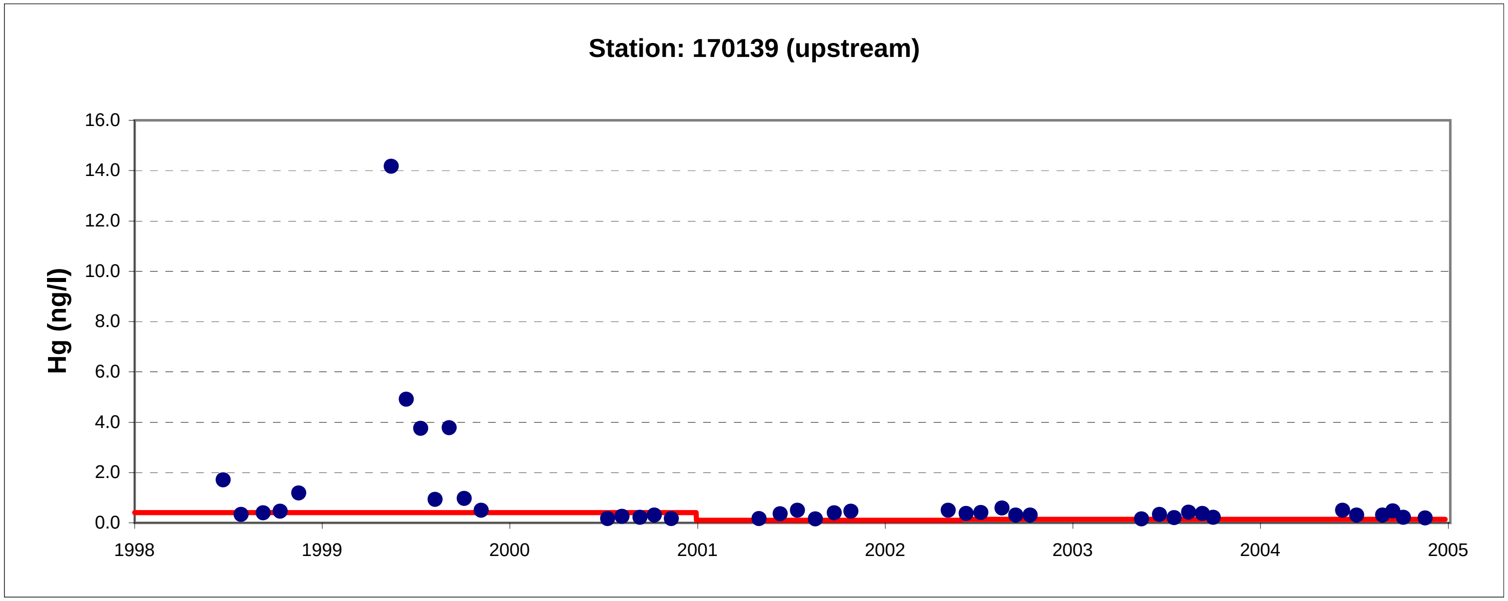


Figure 6-22. Temporal Variation in Lead Load in the St. Marys River. Diamonds are Means and Bars are 95% Confidence Intervals.



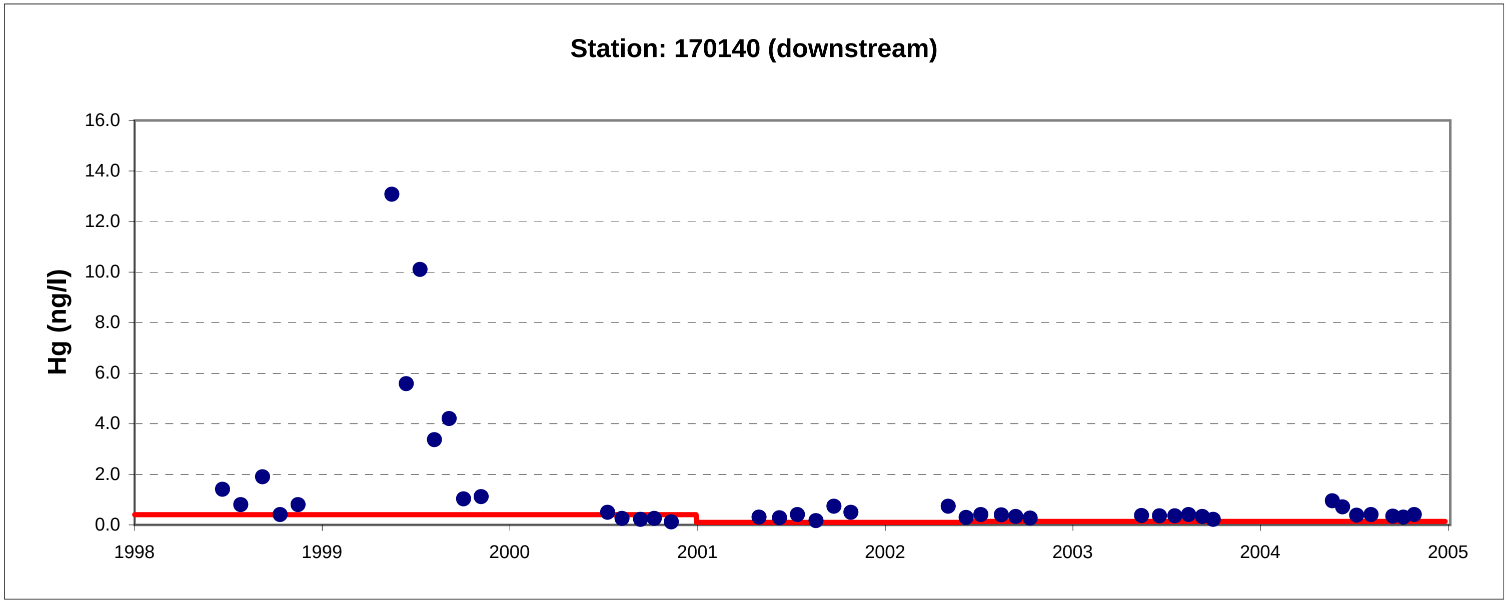


Figure 6-23. St. Marys River - Mercury Concentration Time Series, 1998-2004. Red Line is Quantification Limit.

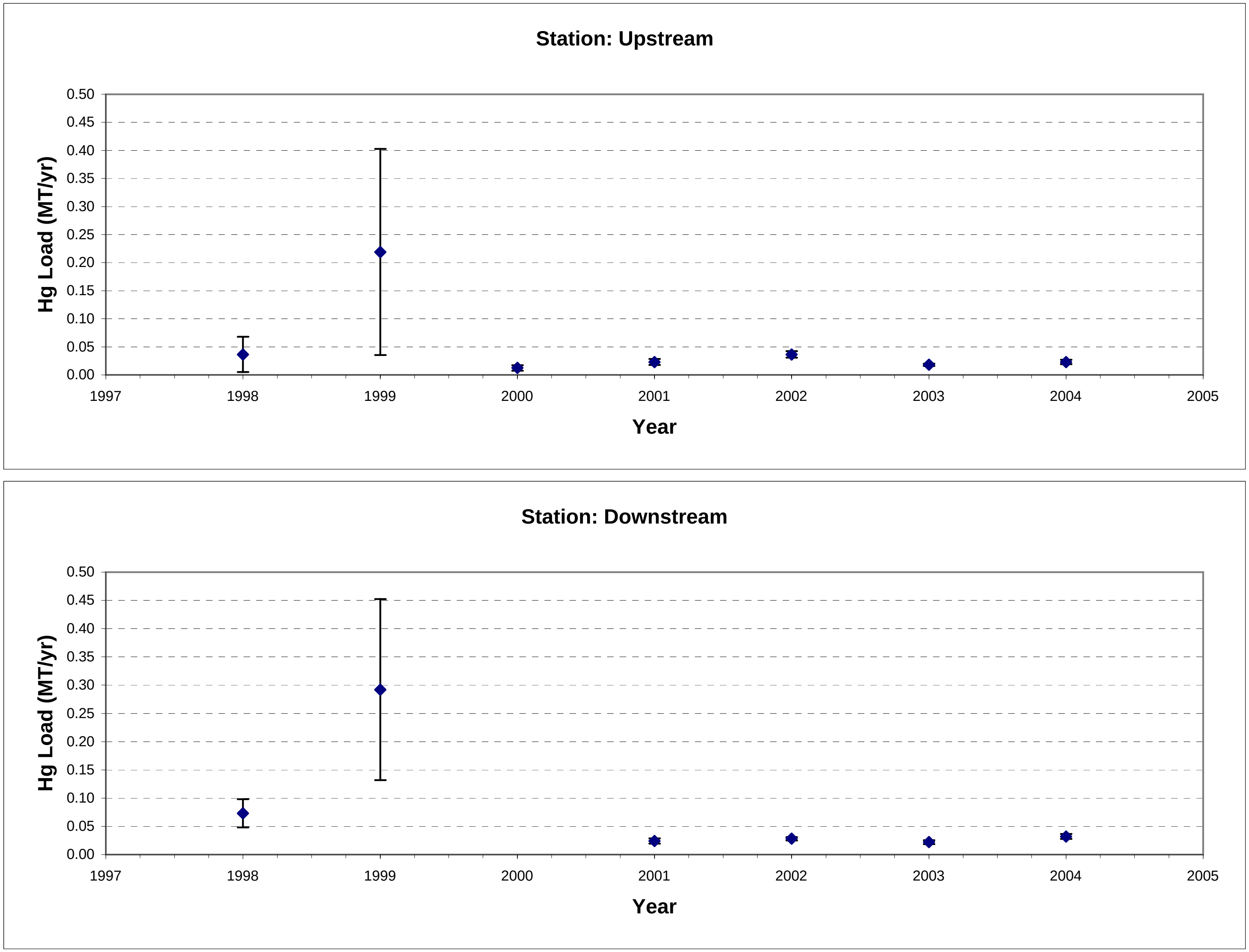
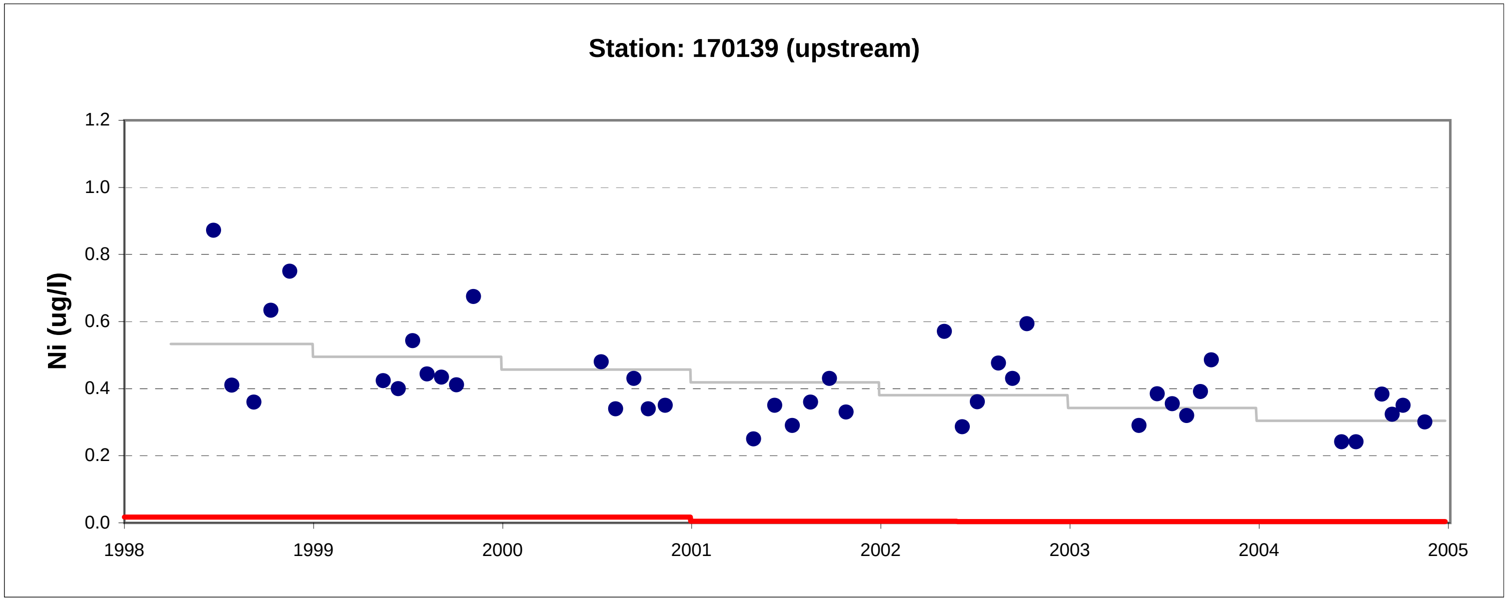


Figure 6-24. Temporal Variation in Mercury Load in the St. Marys River. Diamonds are Means and Bars are 95% Confidence Intervals.



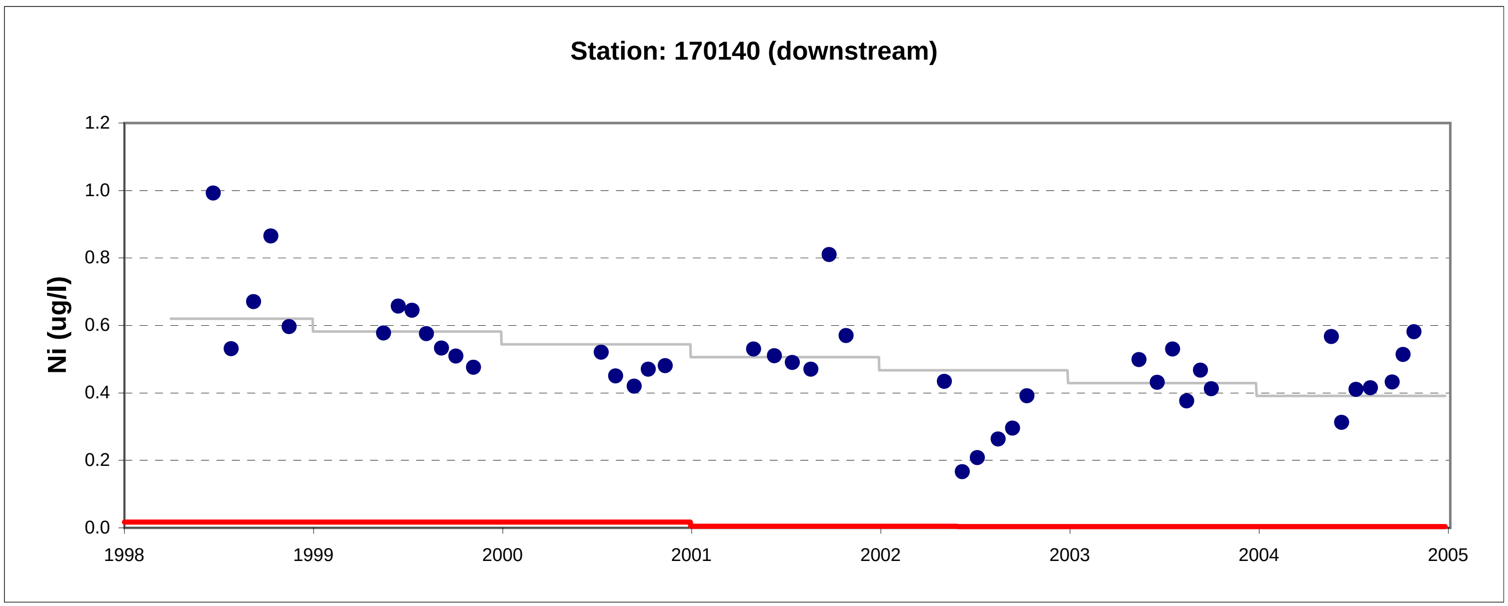
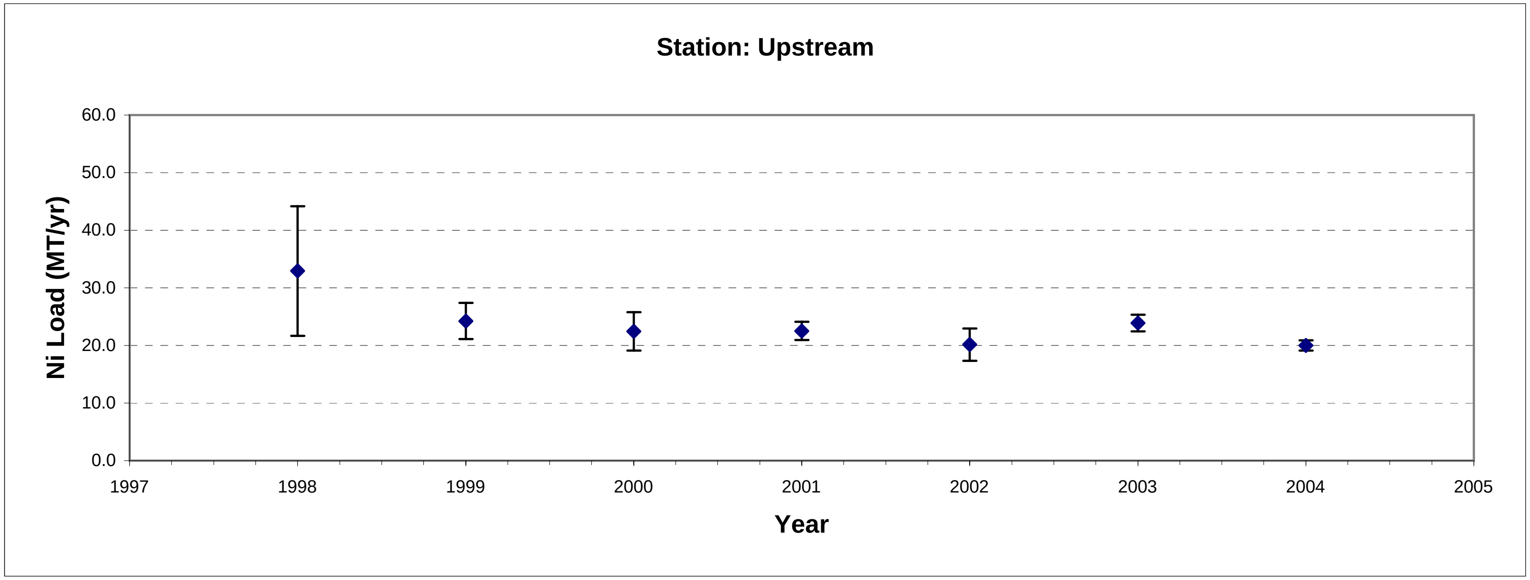


Figure 6-25. St. Marys River - Nickel Concentration Time Series, 1998-2004.
Grey Line is Regression Model. Red Line is Quantification Limit.



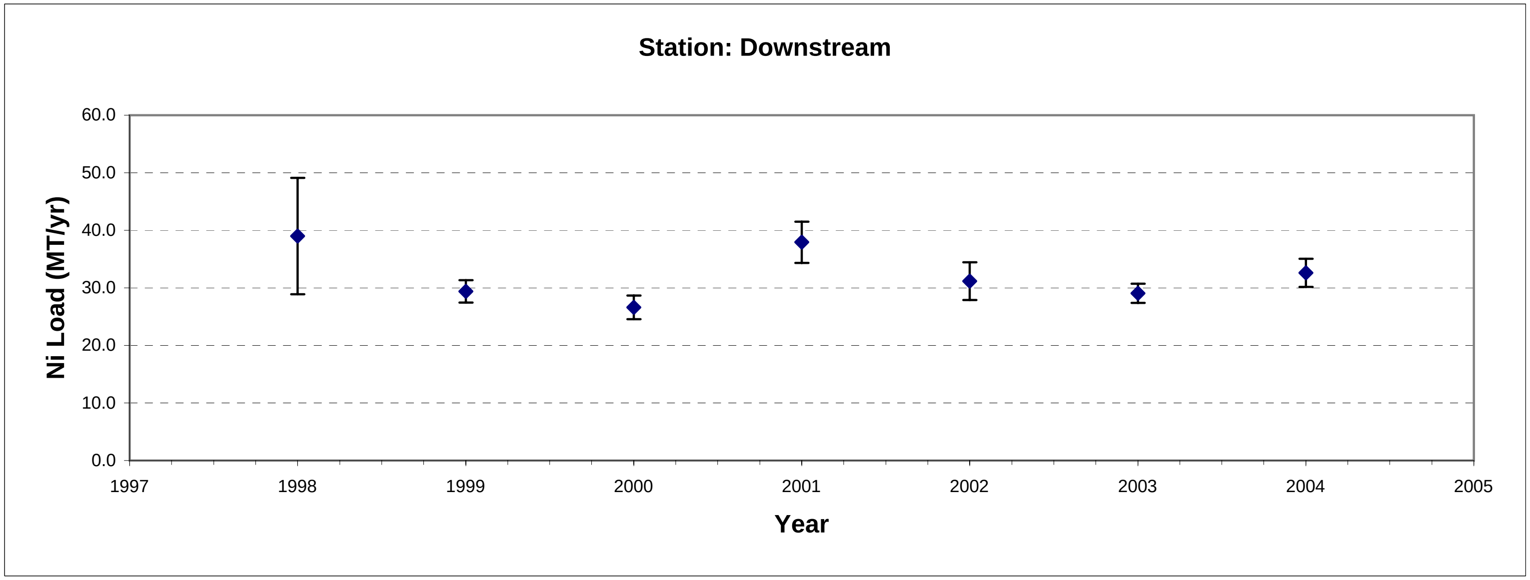
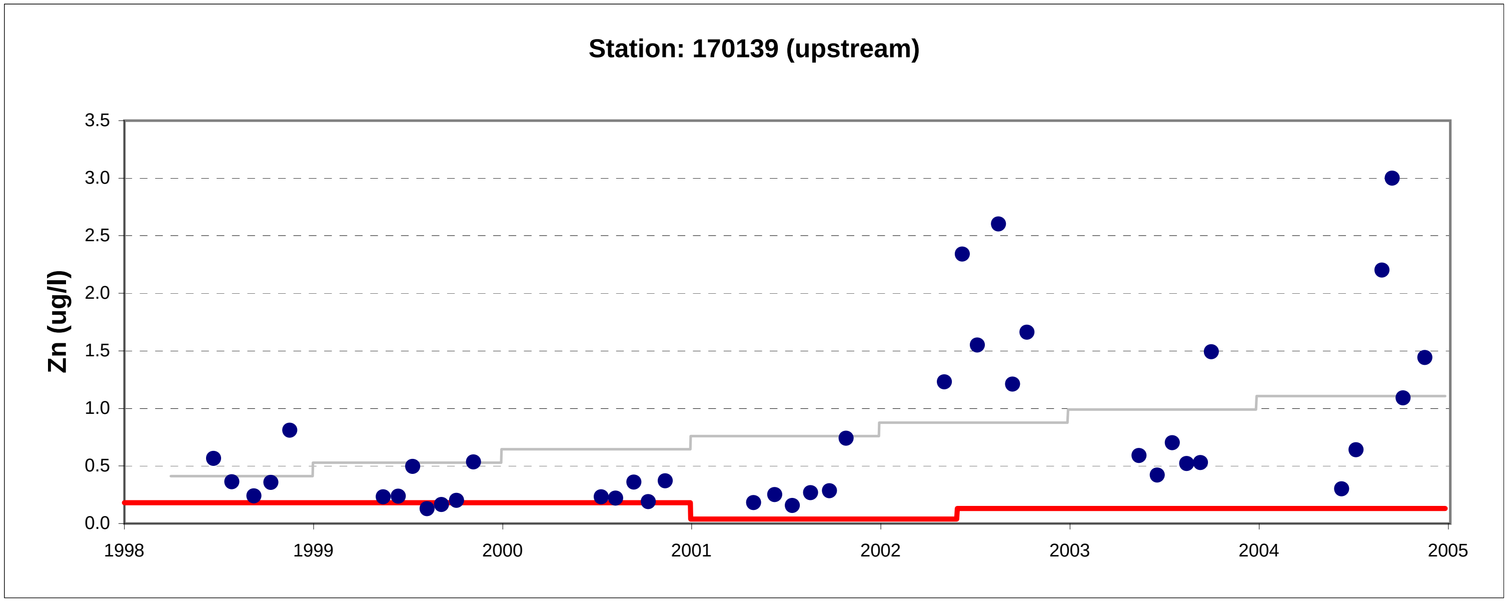


Figure 6-26. Temporal Variation in Nickel Load in the St. Marys River. Diamonds are Means and Bars are 95% Confidence Intervals.



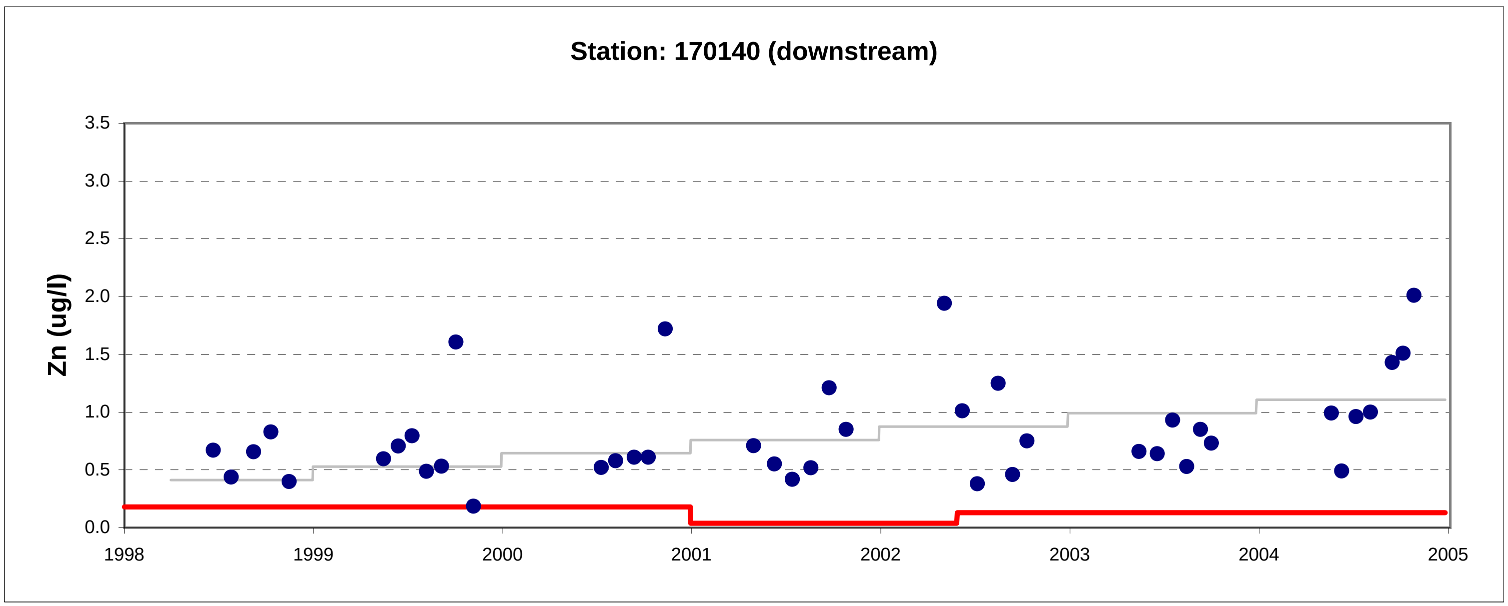
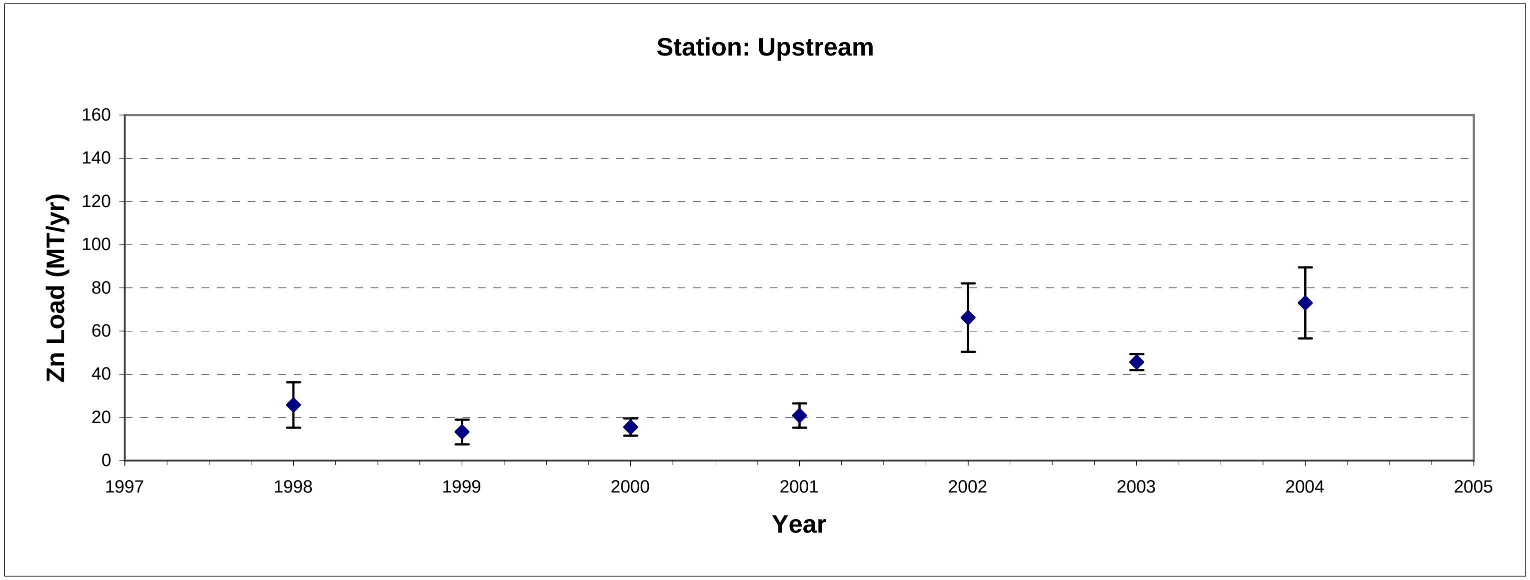


Figure 6-27. St. Marys River - Zinc Concentration Time Series, 1998-2004.
Grey Line is Regression Model. Red Line is Quantification Limit.



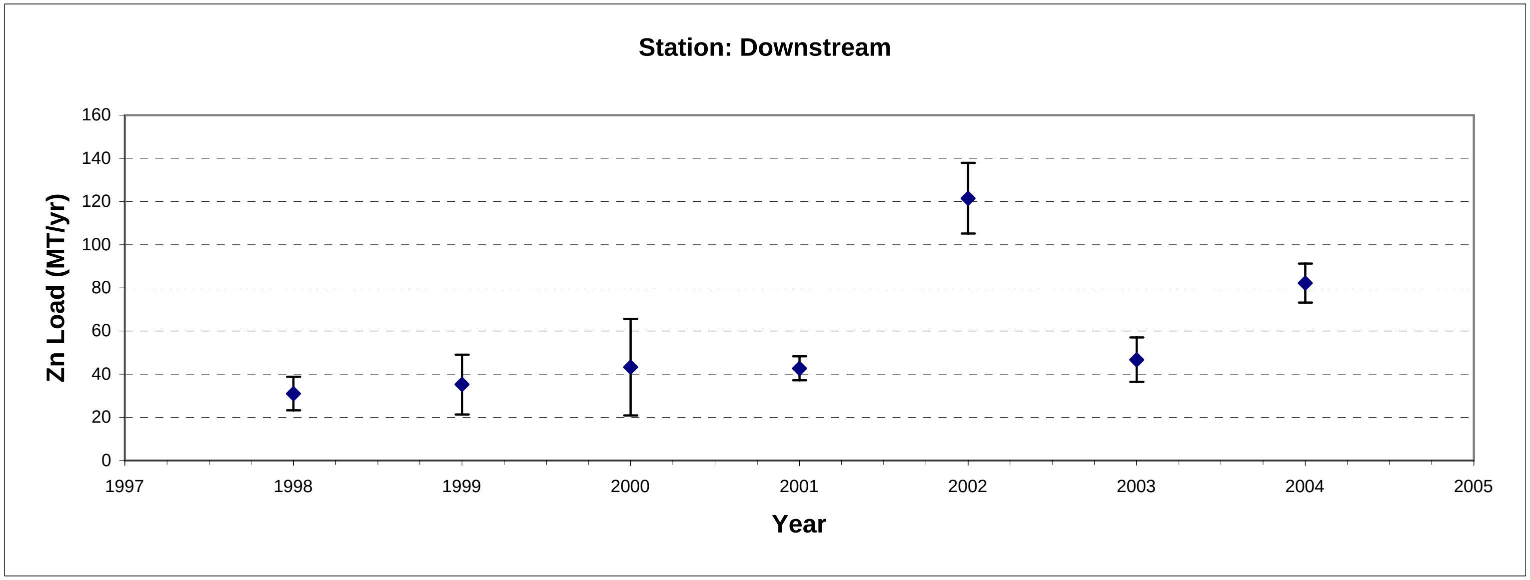
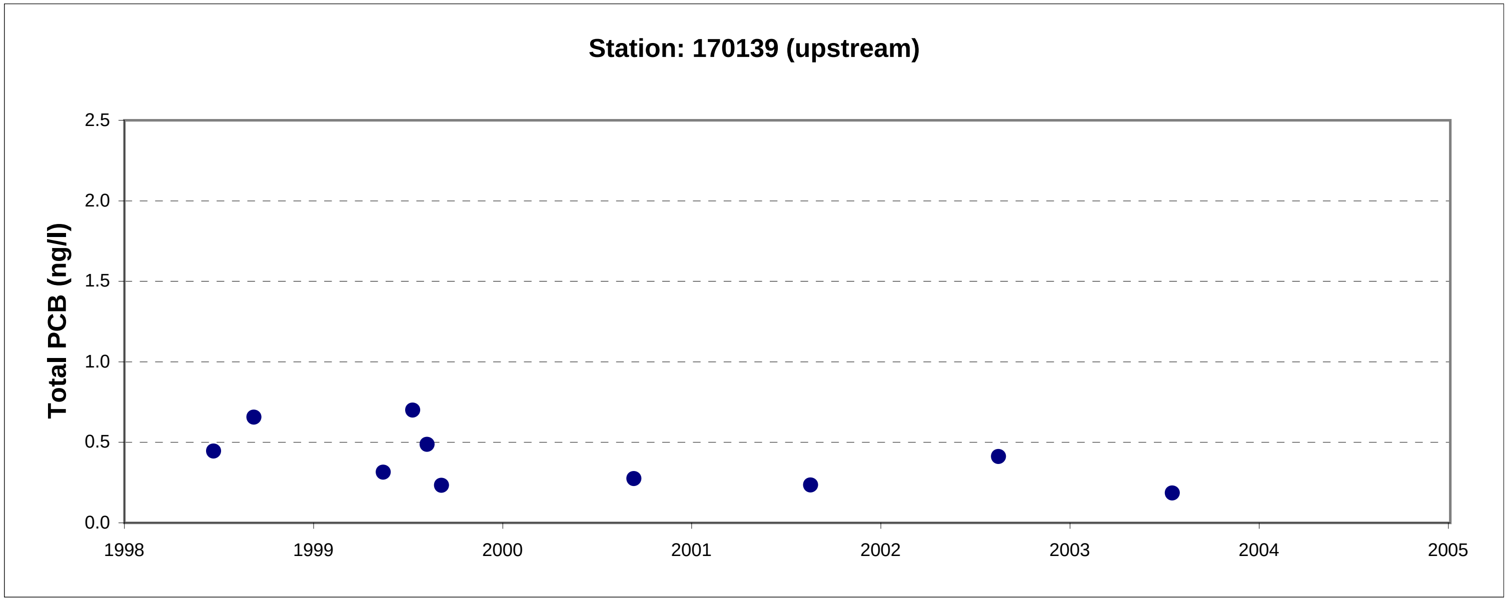


Figure 6-28. Temporal Variation in Zinc Load in the St. Marys River. Diamonds are Means and Bars are 95% Confidence Intervals.



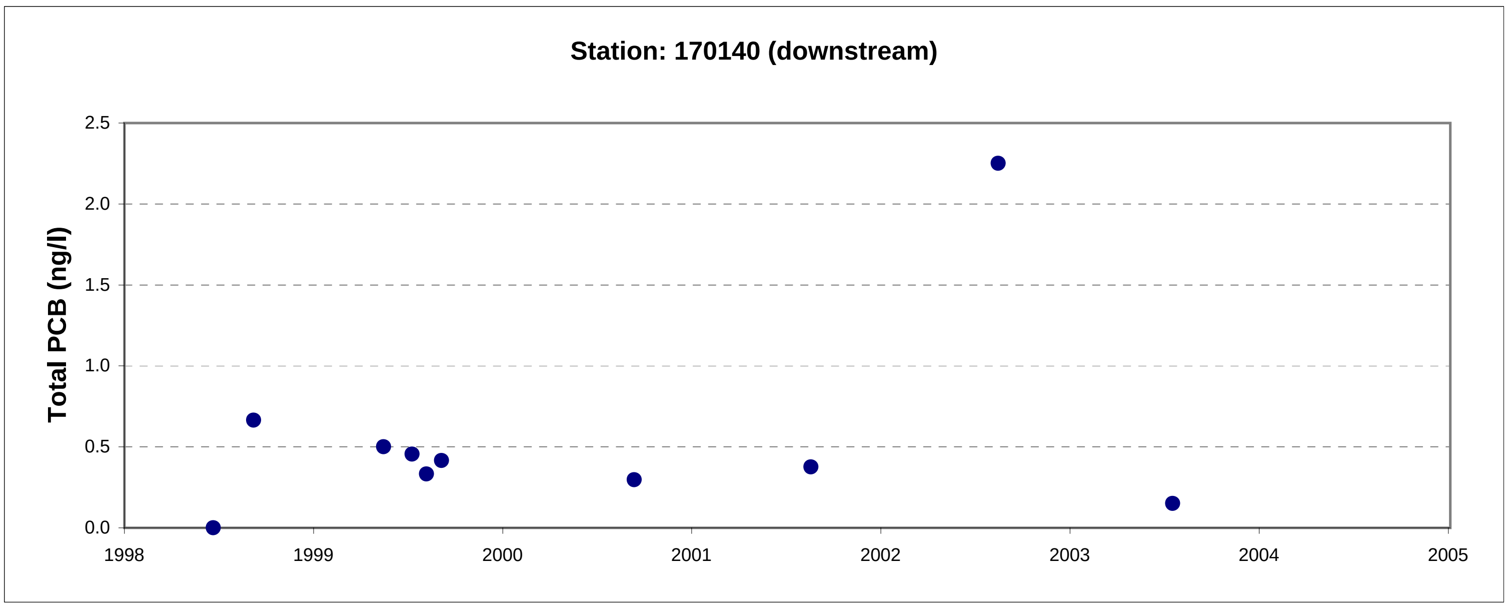
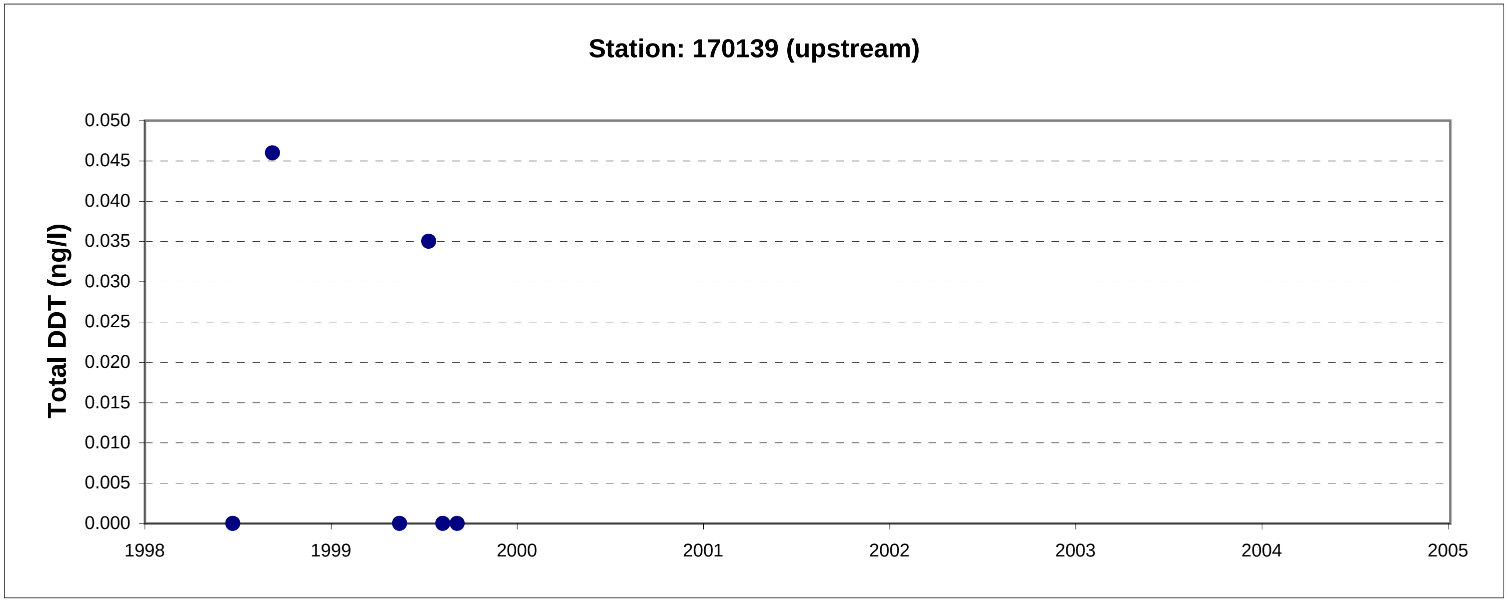


Figure 6-29. St. Marys River - PCB Concentration Time Series, 1998-2004.



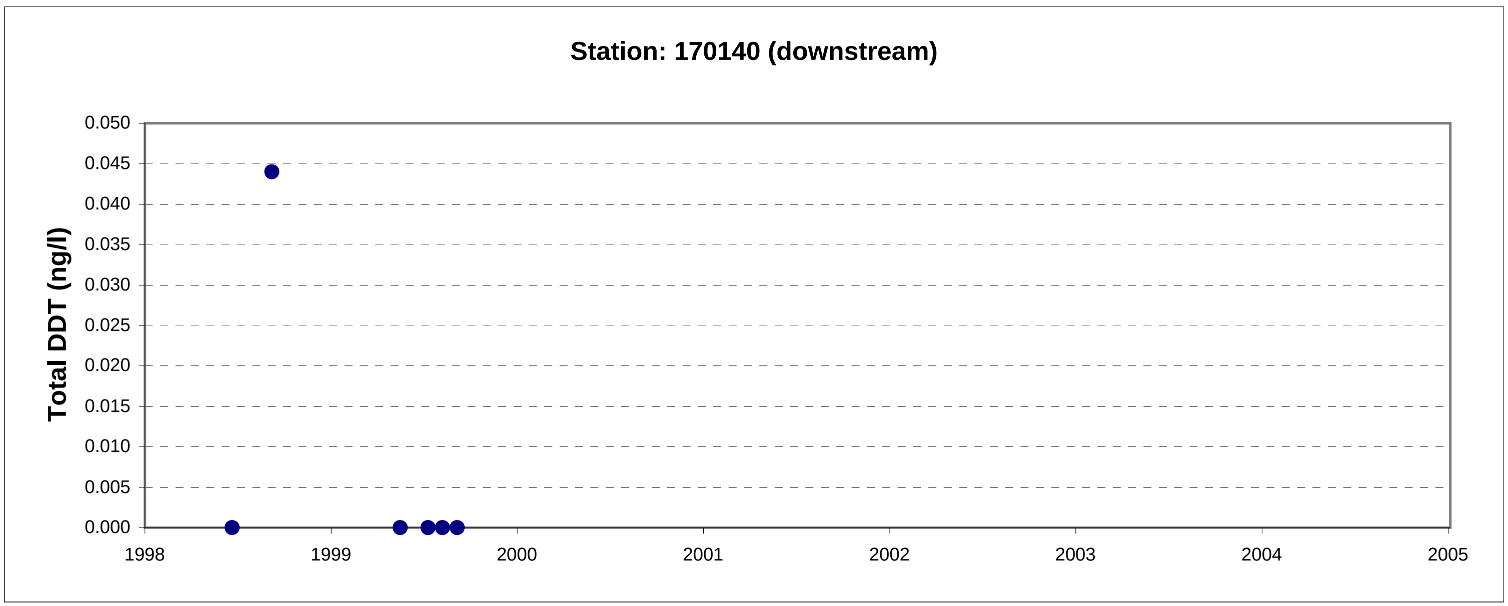
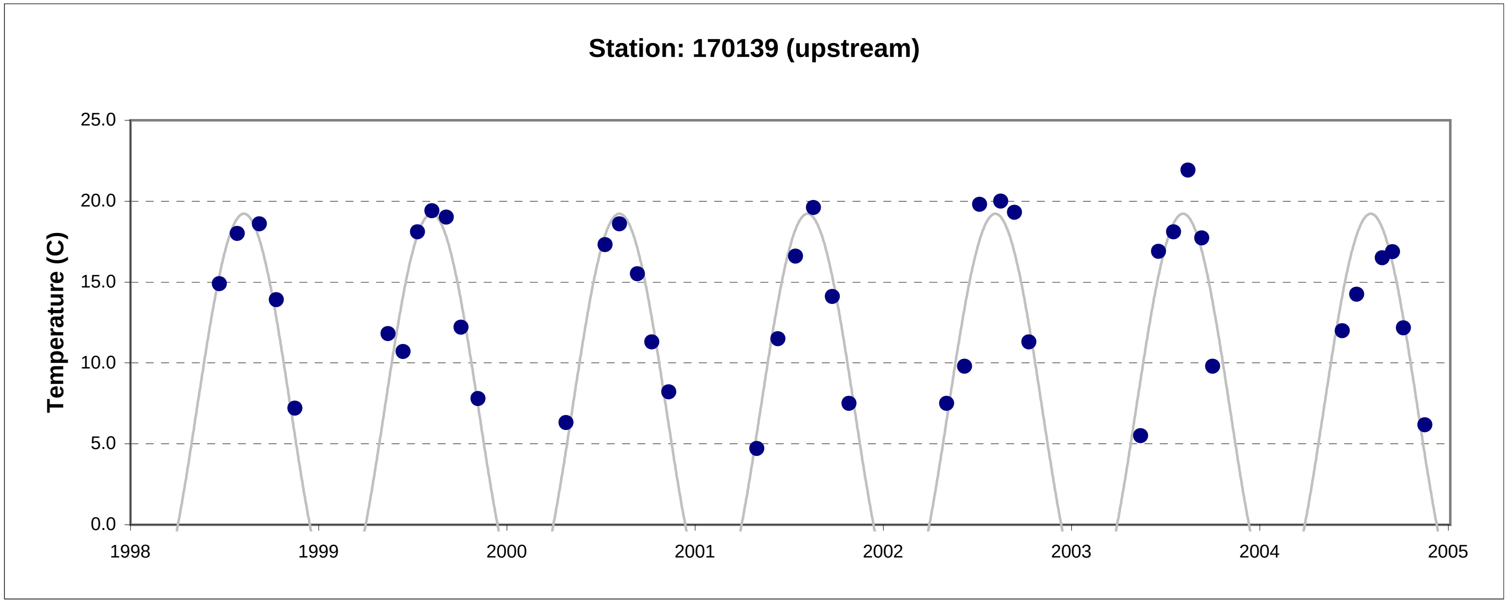


Figure 6-30. St. Marys River - DDT Concentration Time Series, 1998-2004.



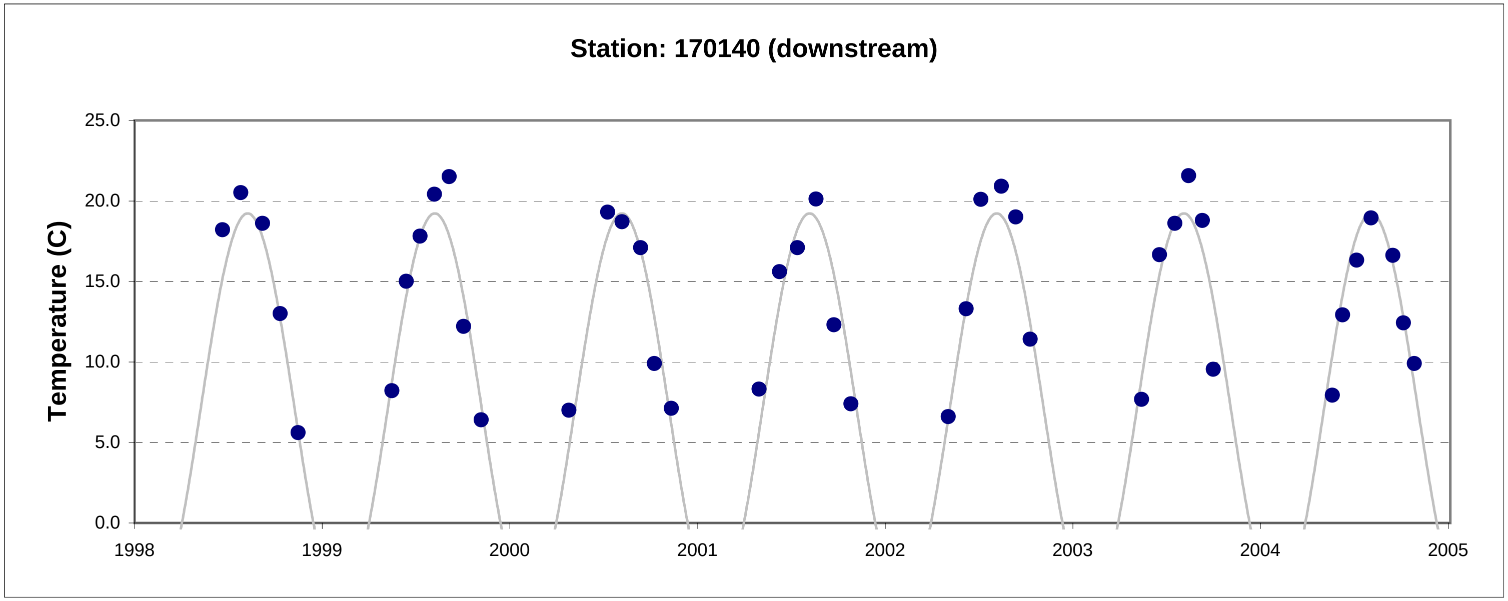
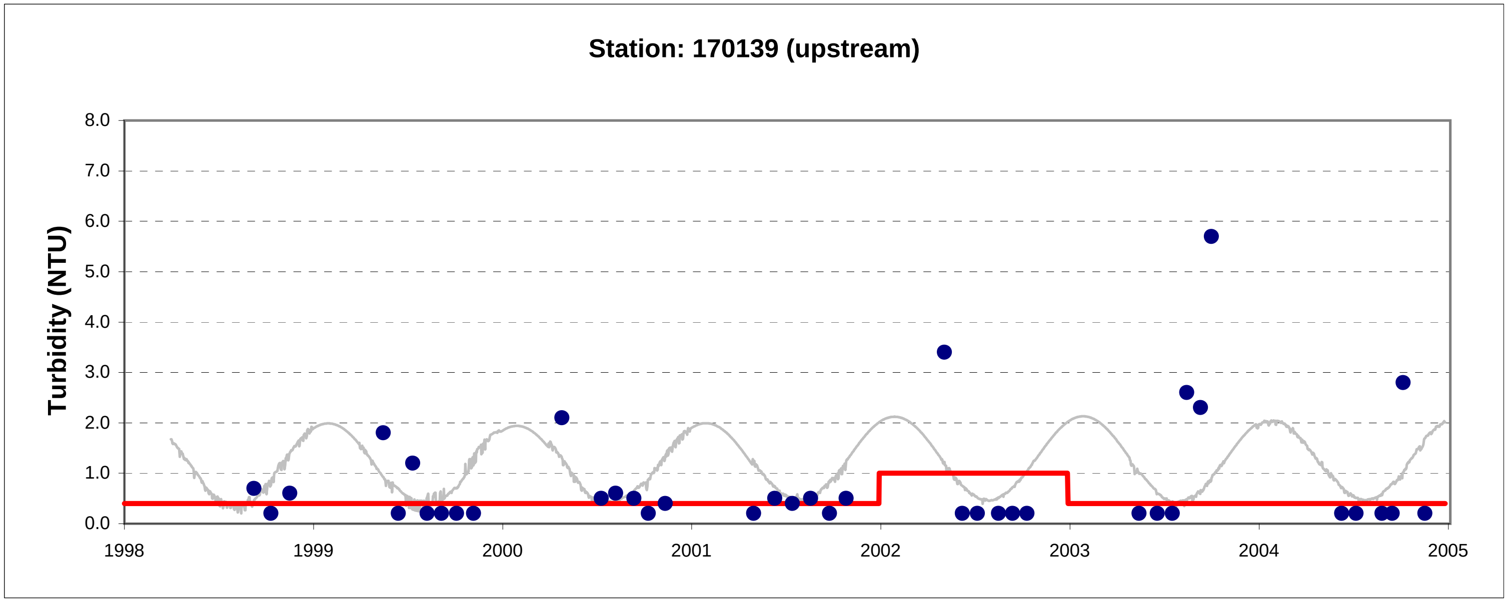


Figure 6-31. St. Marys River - Temperature Time Series, 1998-2004.
Grey Line is Regression Model.



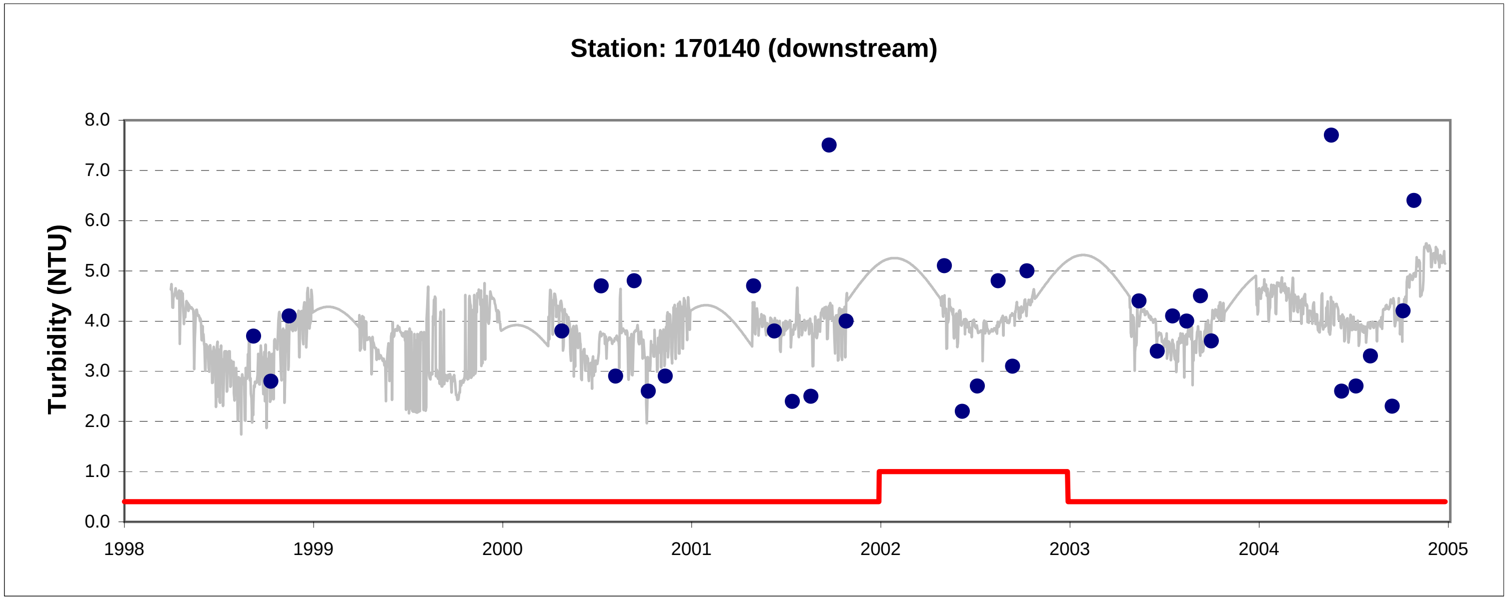
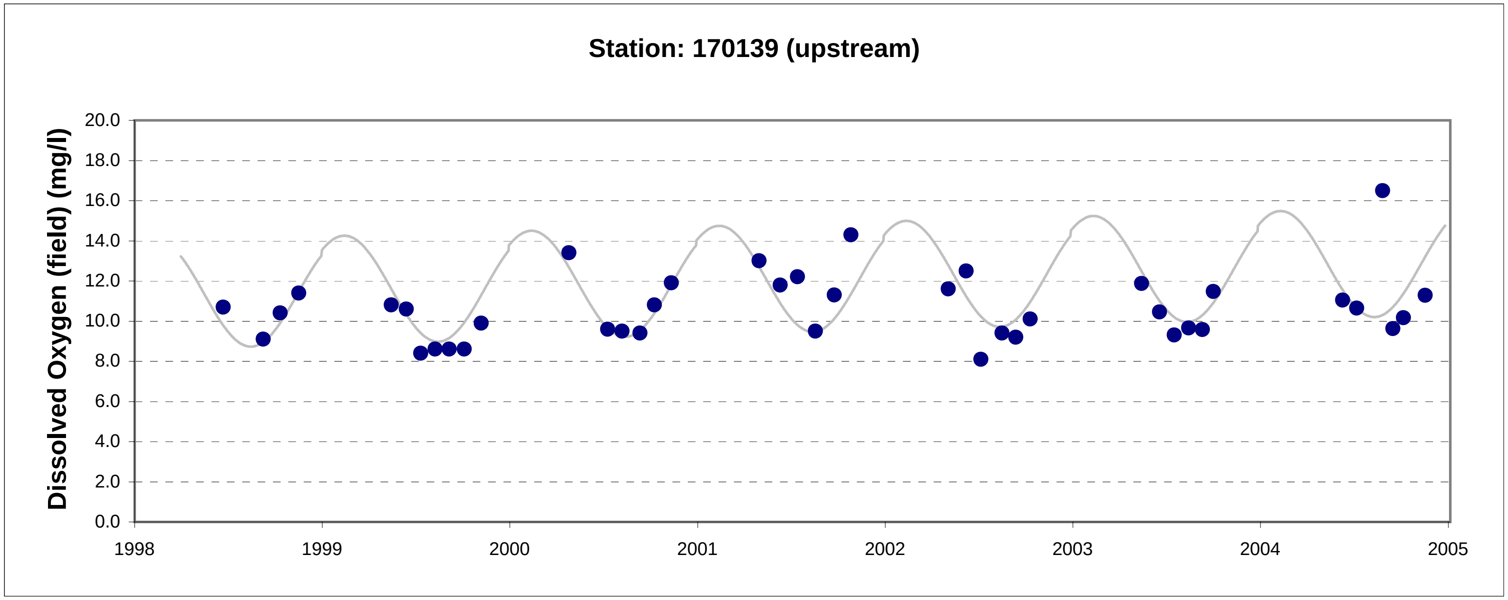


Figure 6-32. St. Marys River - Turbidity Time Series, 1998-2004. Grey Line is Regression Model. Red Line is Quantification Limit.



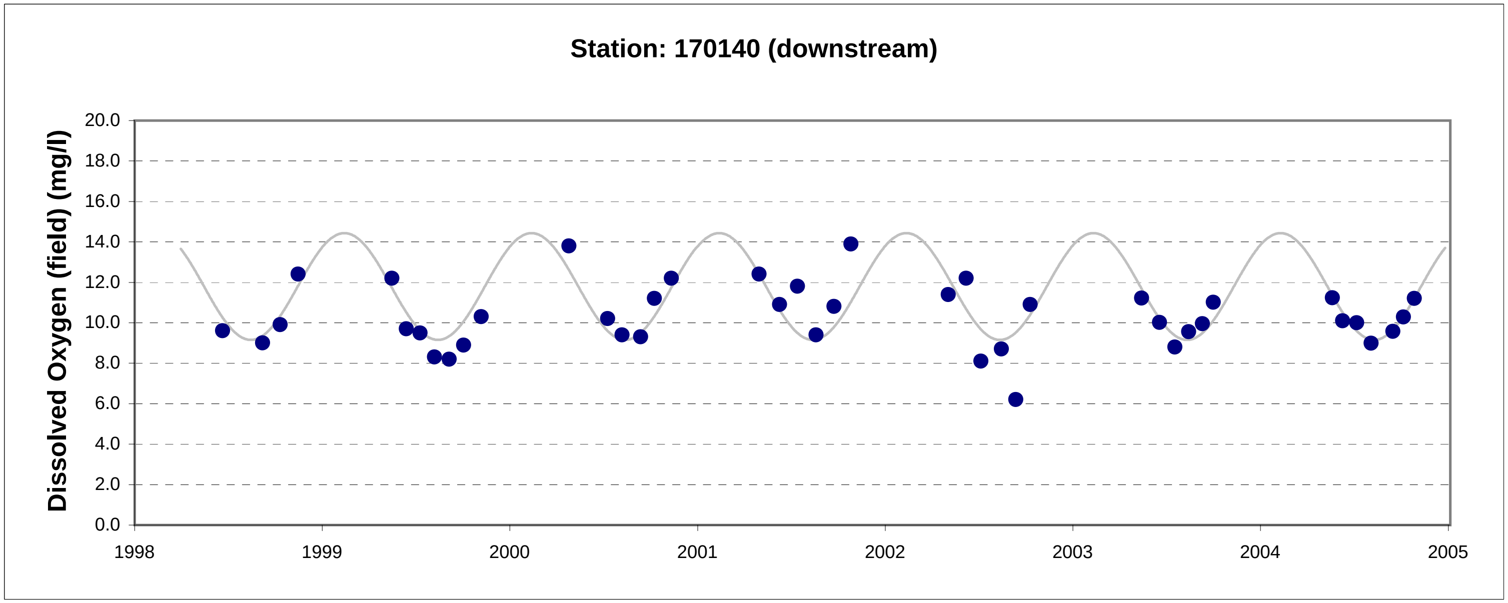
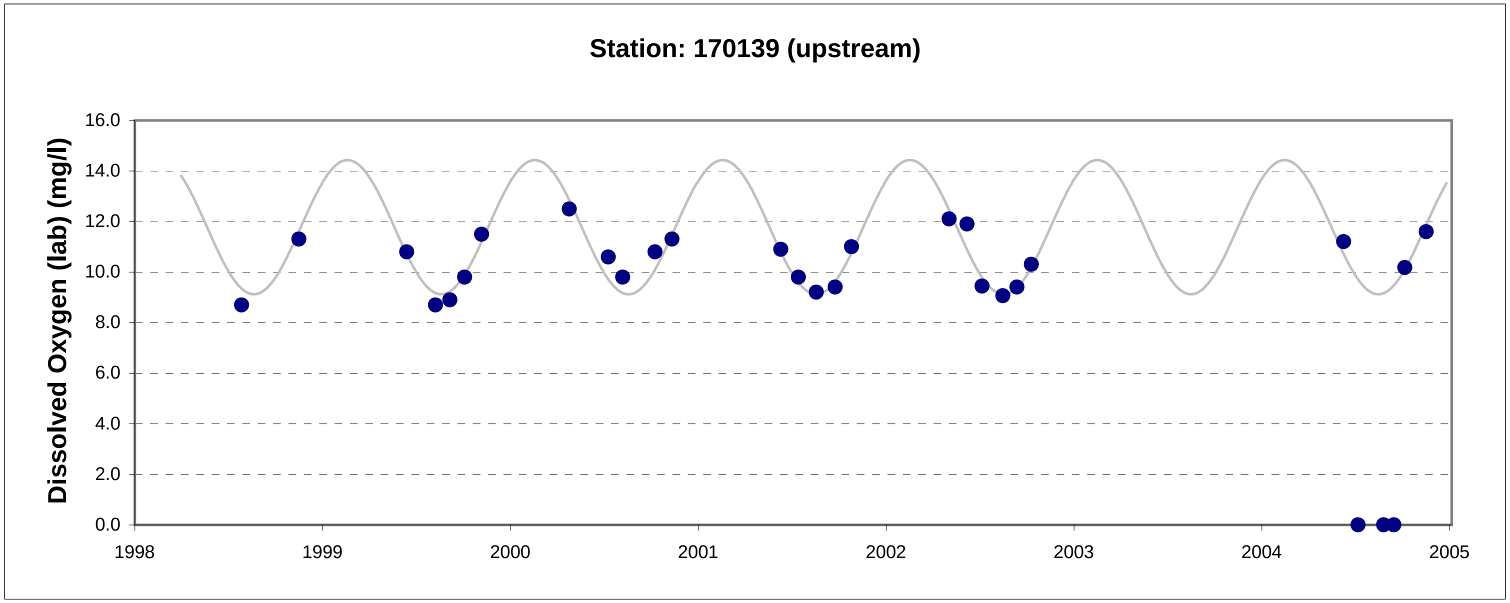


Figure 6-33. St. Marys River - Dissolved Oxygen (Field) Time Series, 1998-2004.
Grey Line is Regression Model.



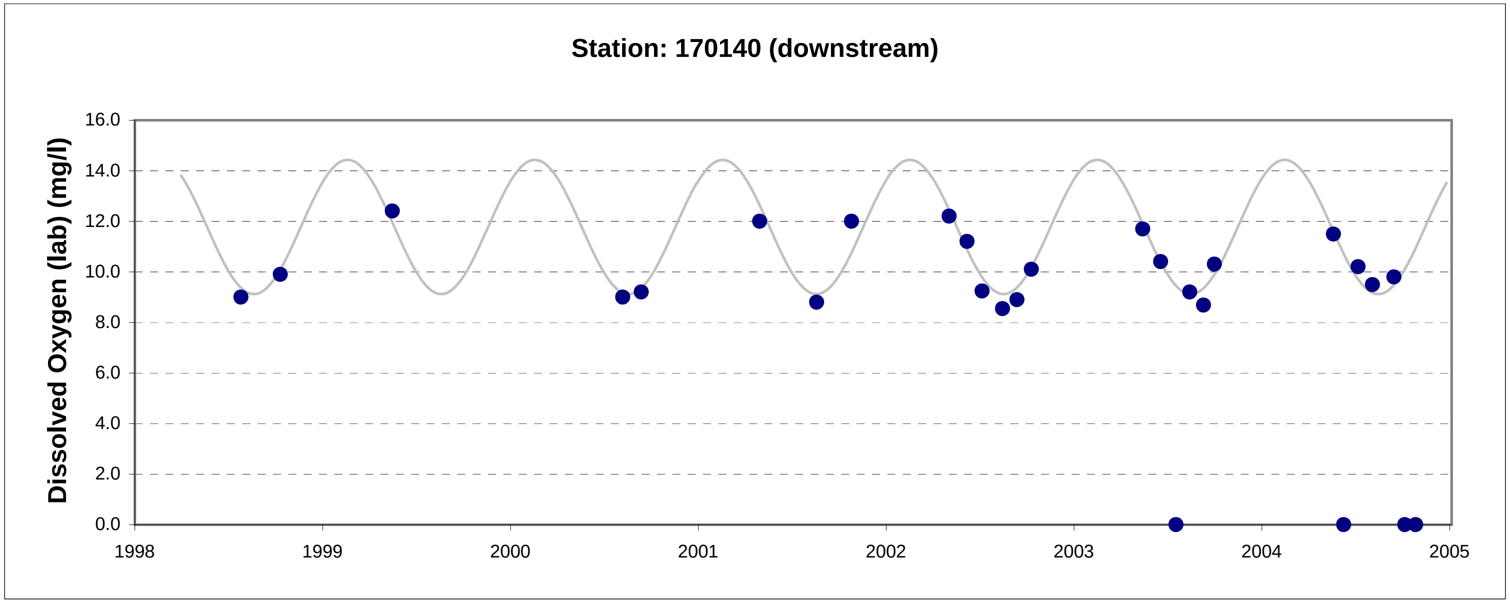
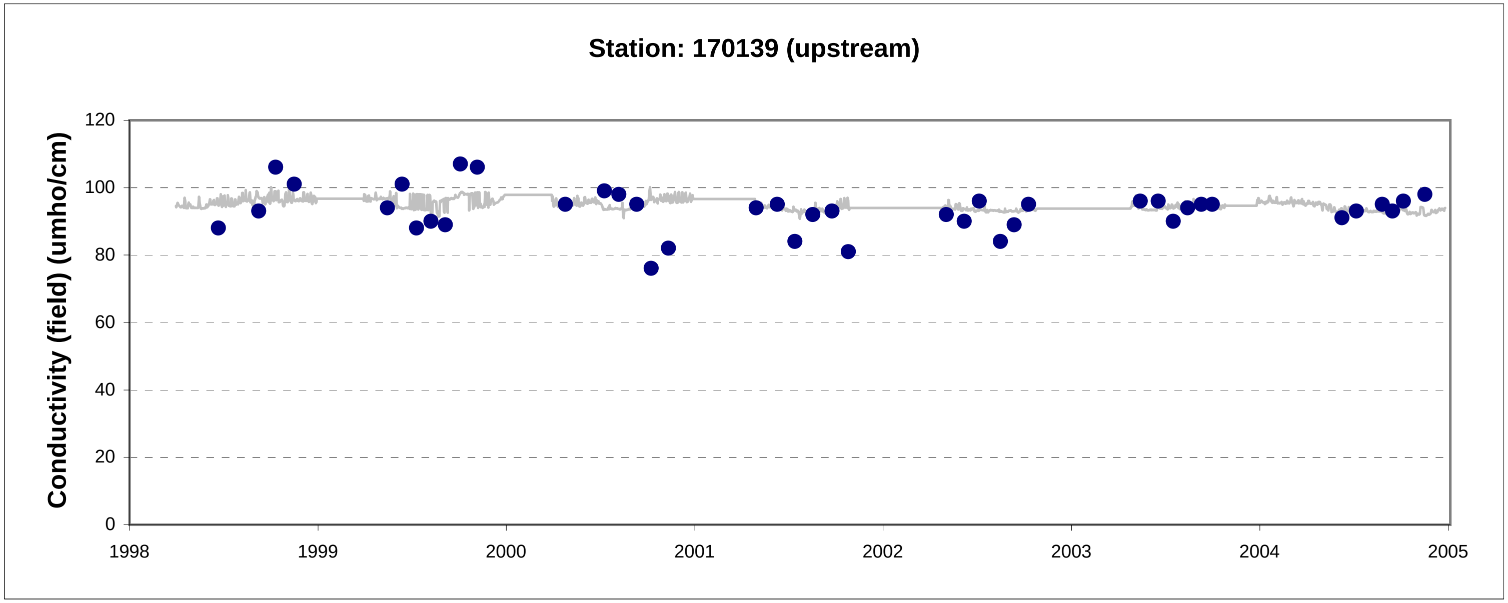


Figure 6-34. St. Marys River - Dissolved Oxygen (Lab) Time Series, 1998-2004.
Grey Line is Regression Model.



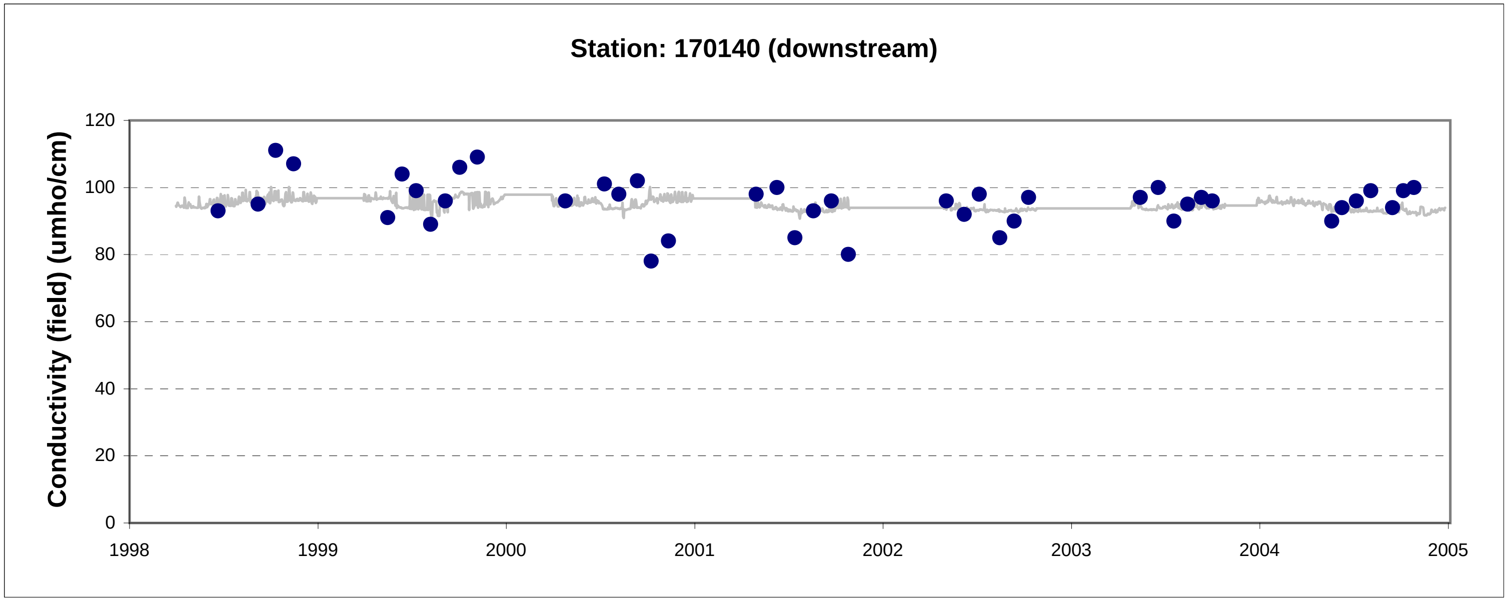
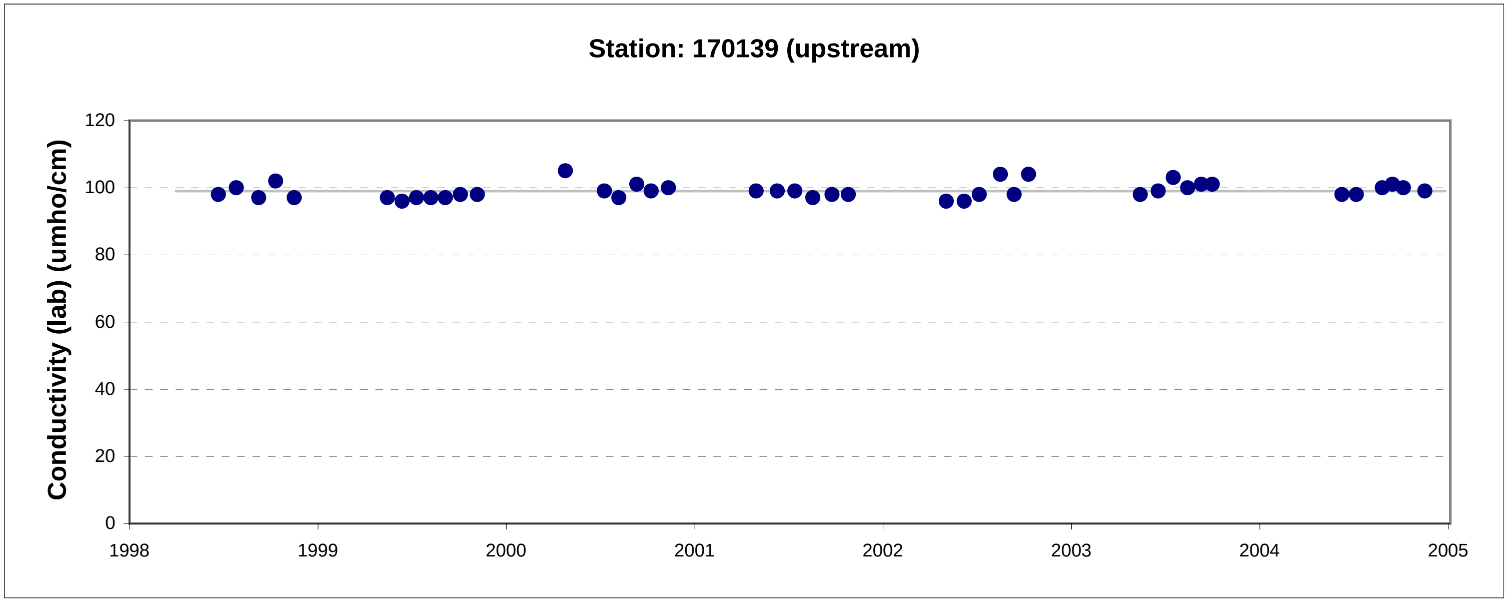


**Figure 6-35. St. Marys River - Conductivity (Field) Time Series, 1998-2004.
Grey Line is Regression Model.**



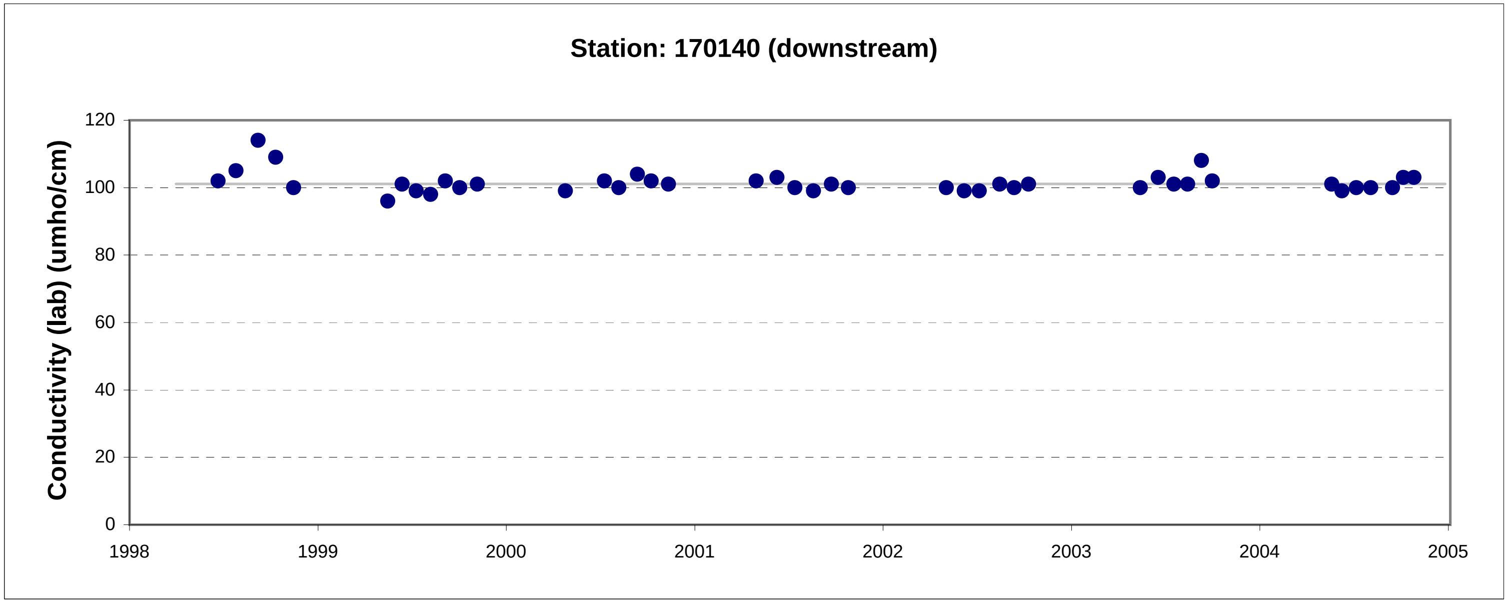
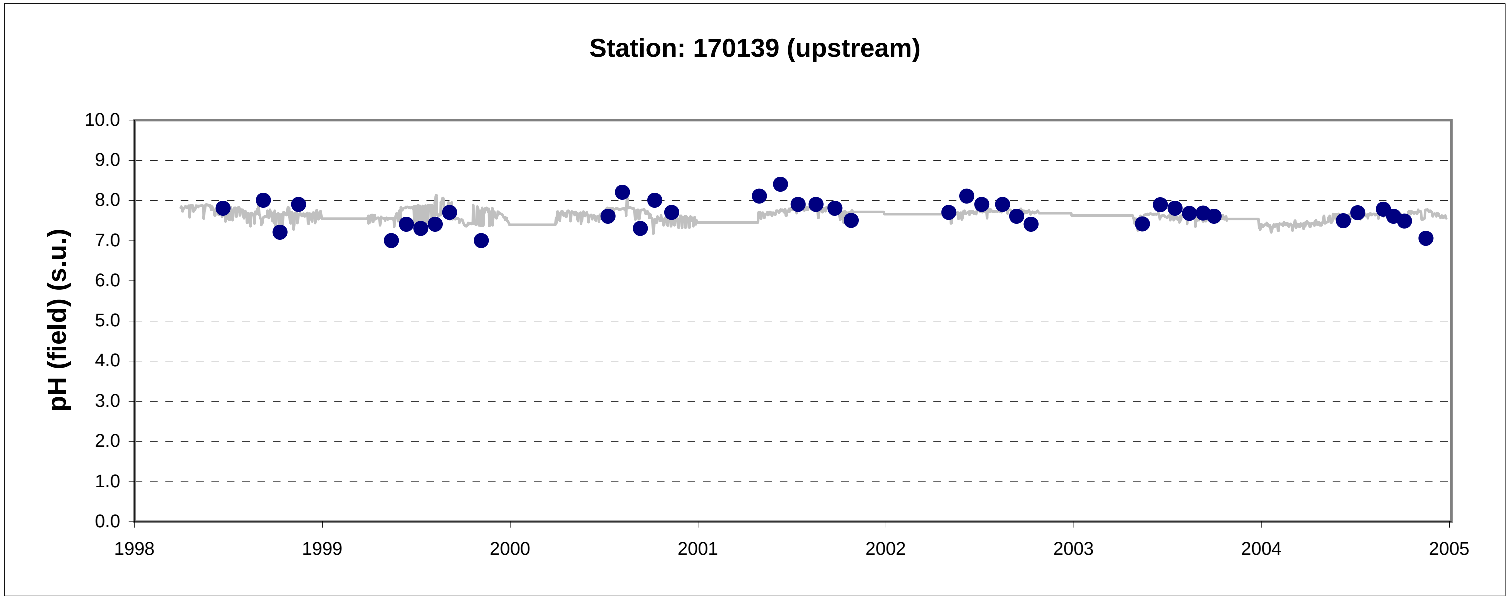


Figure 6-36. St. Marys River - Conductivity (Lab) Time Series, 1998-2004.
Grey Line is Regression Model.



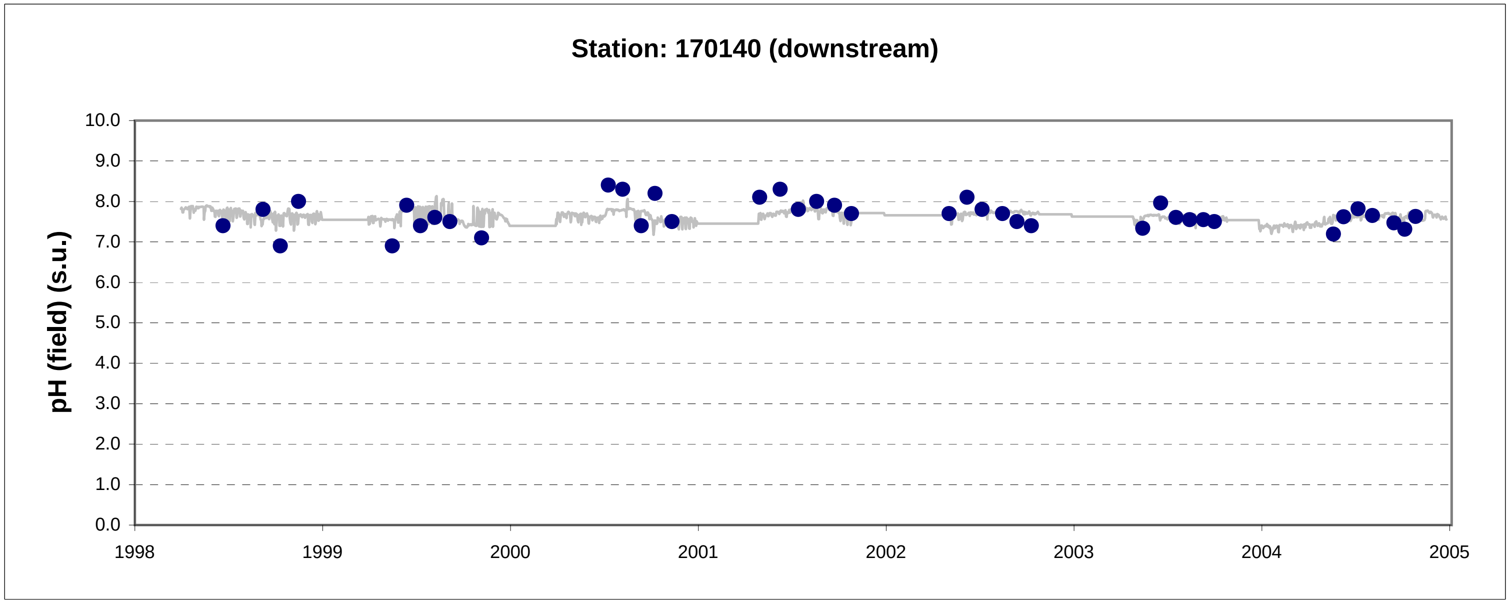
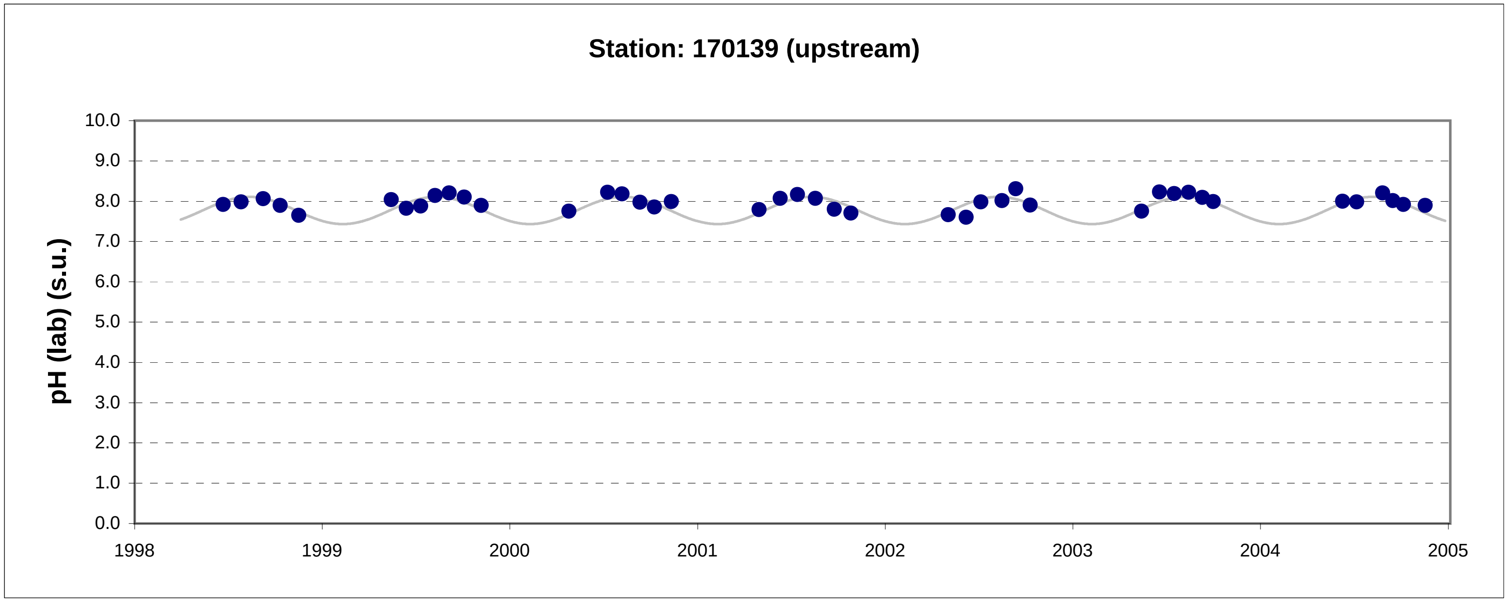


Figure 6-37. St. Marys River - pH (Field) Time Series, 1998-2004.
Grey Line is Regression Model.



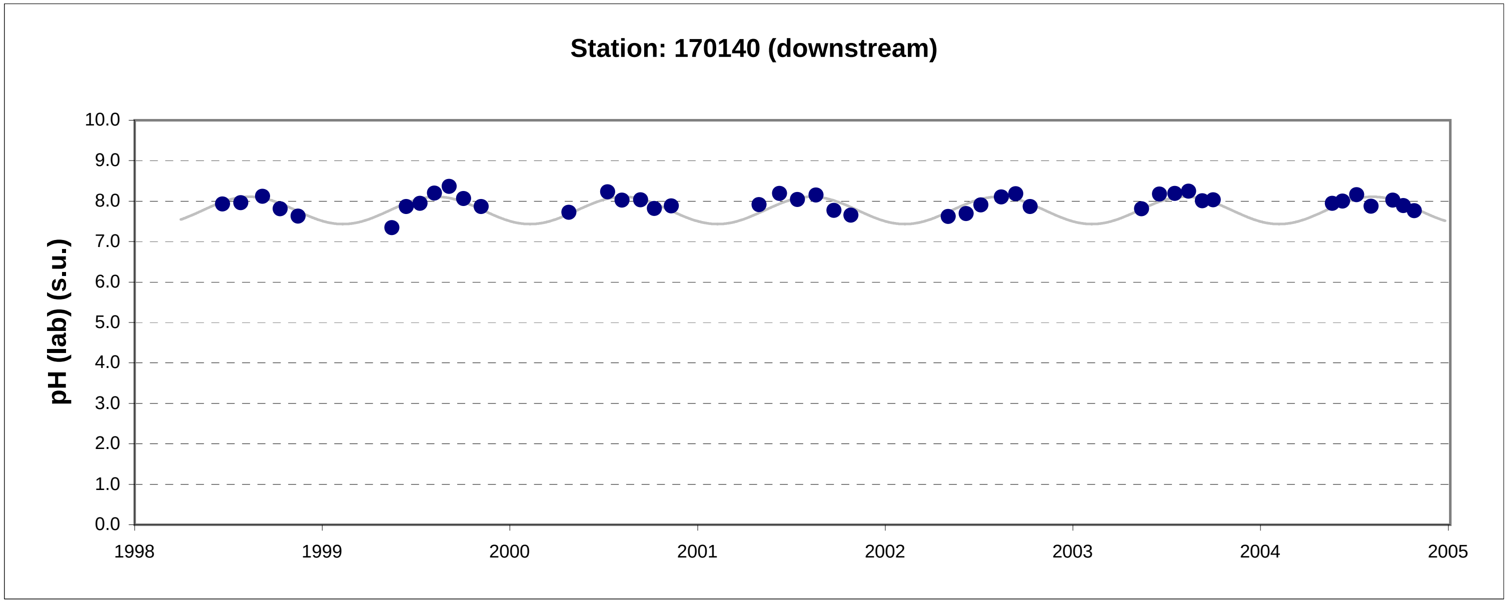
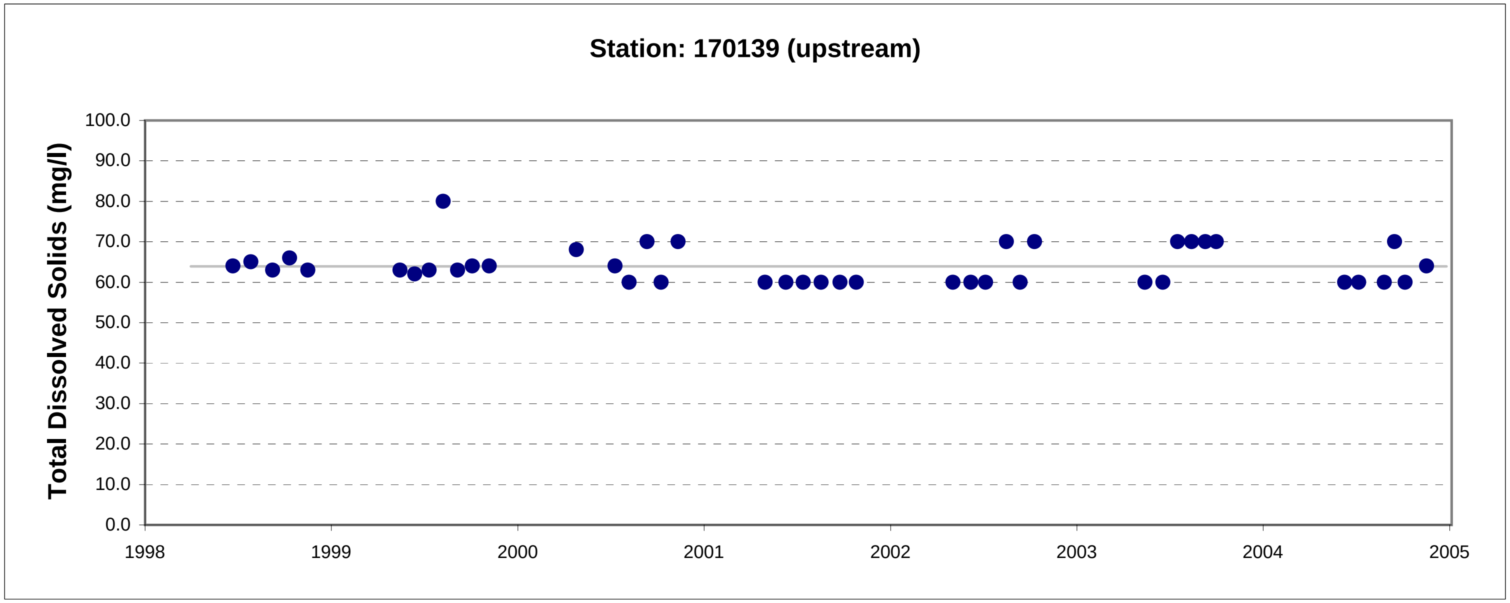


Figure 6-38. St. Marys River - pH (Lab) Time Series, 1998-2004.
Grey Line is Regression Model.



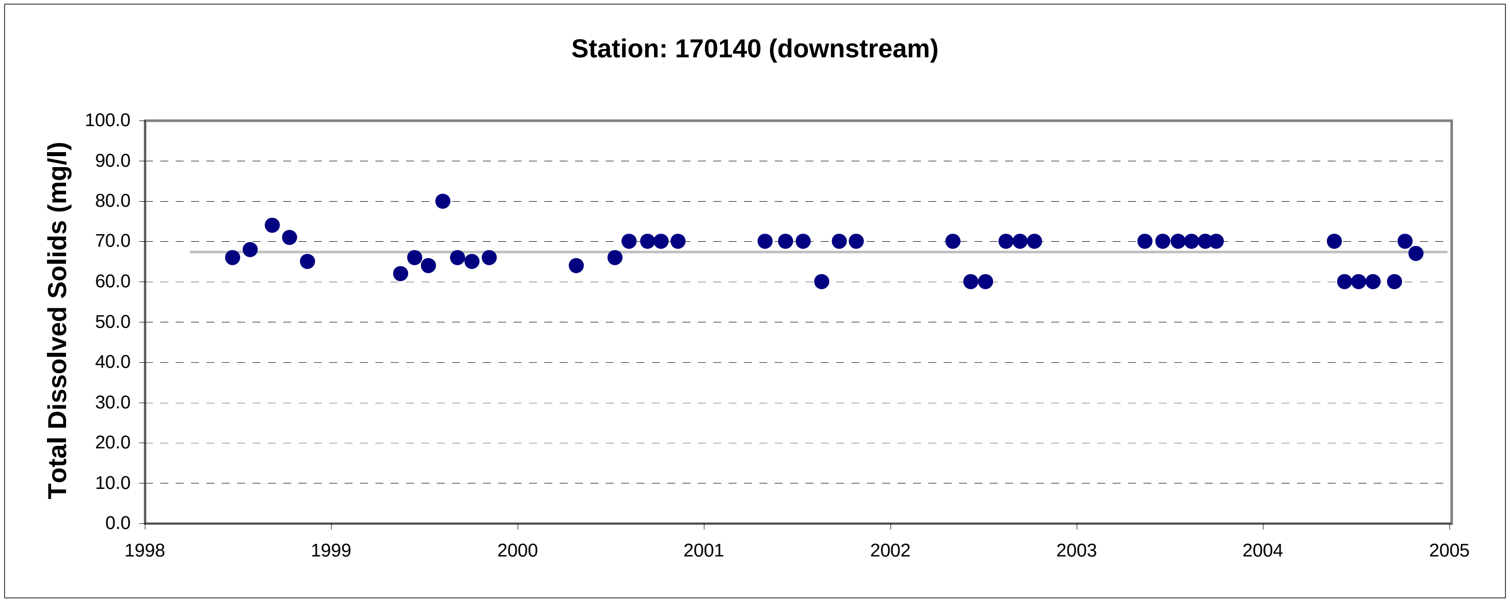


Figure 6-39. St. Marys River - TDS Concentration Time Series, 1998-2004.
Grey Line is Regression Model.

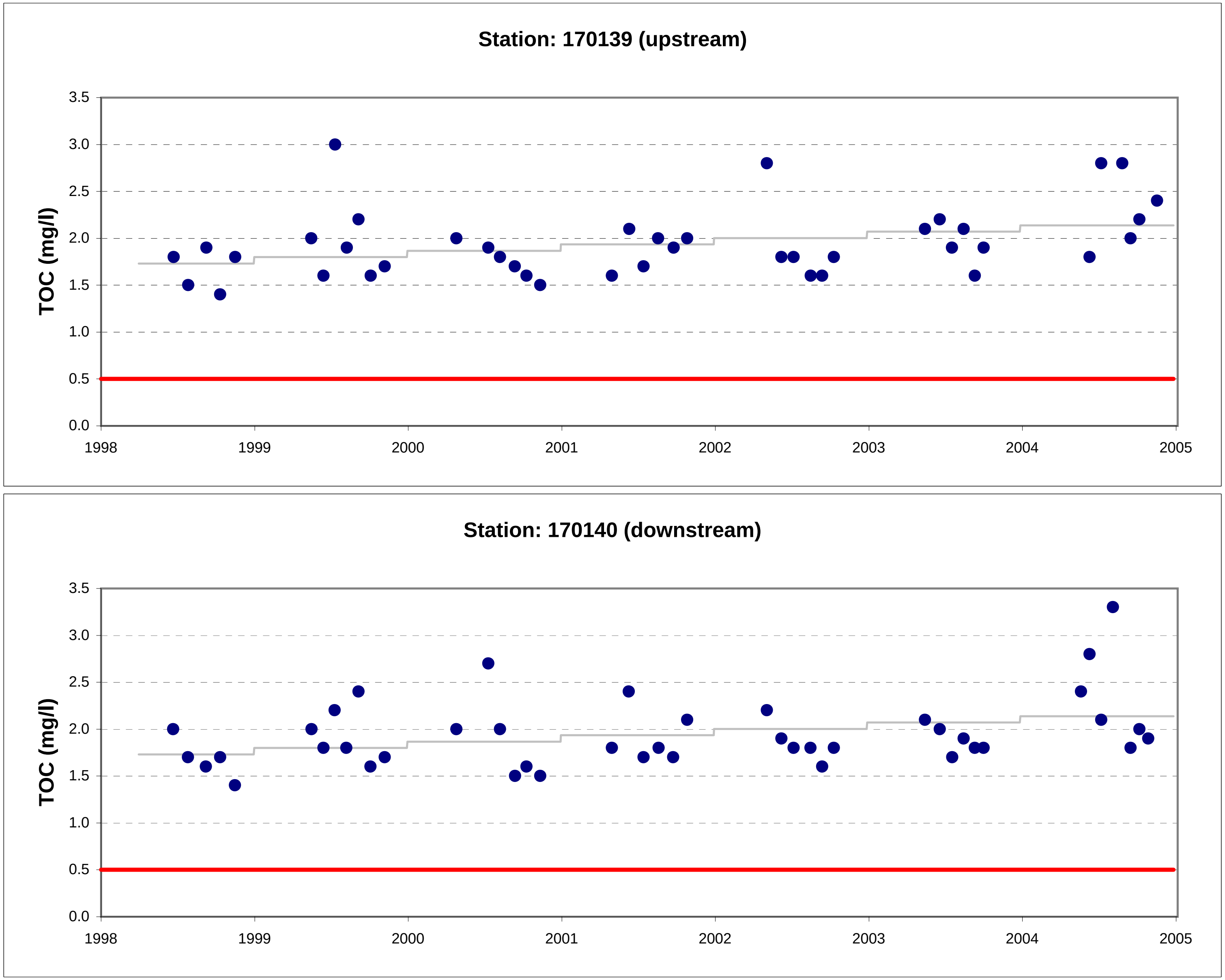
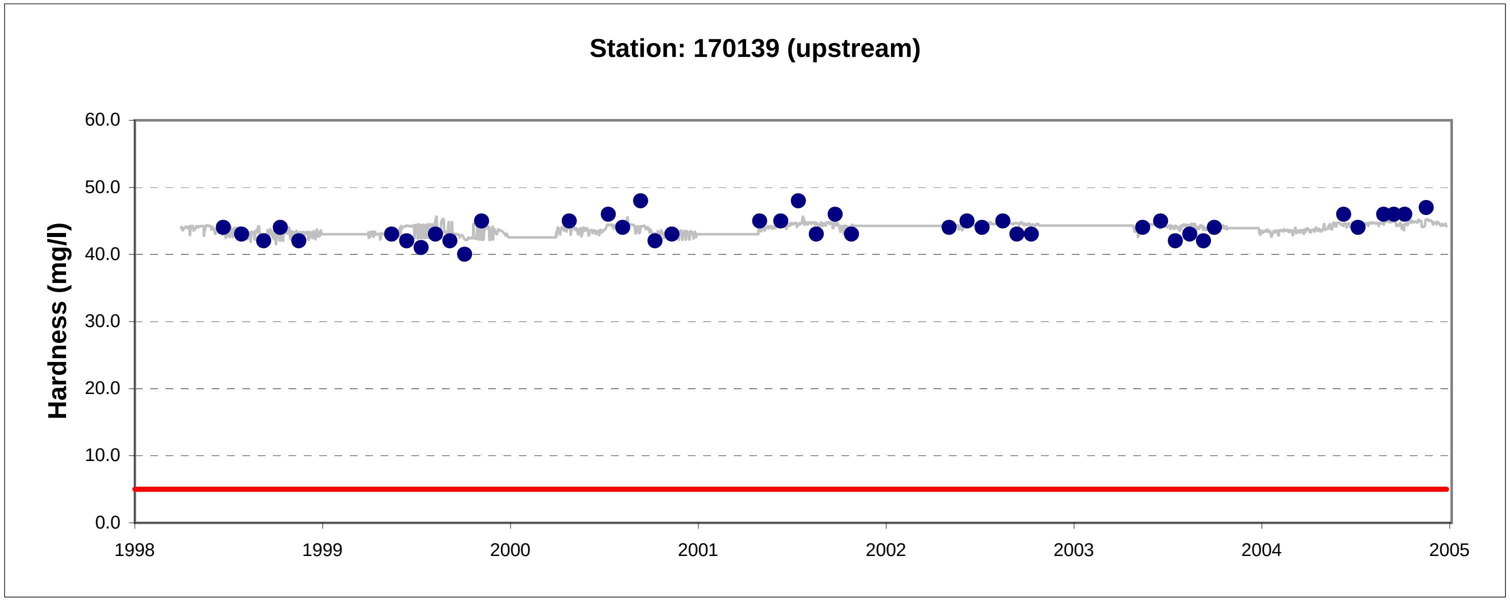


Figure 6-40. St. Marys River - TOC Concentration Time Series, 1998-2004.
Grey Line is Regression Model. Red Line is Quantification Limit.



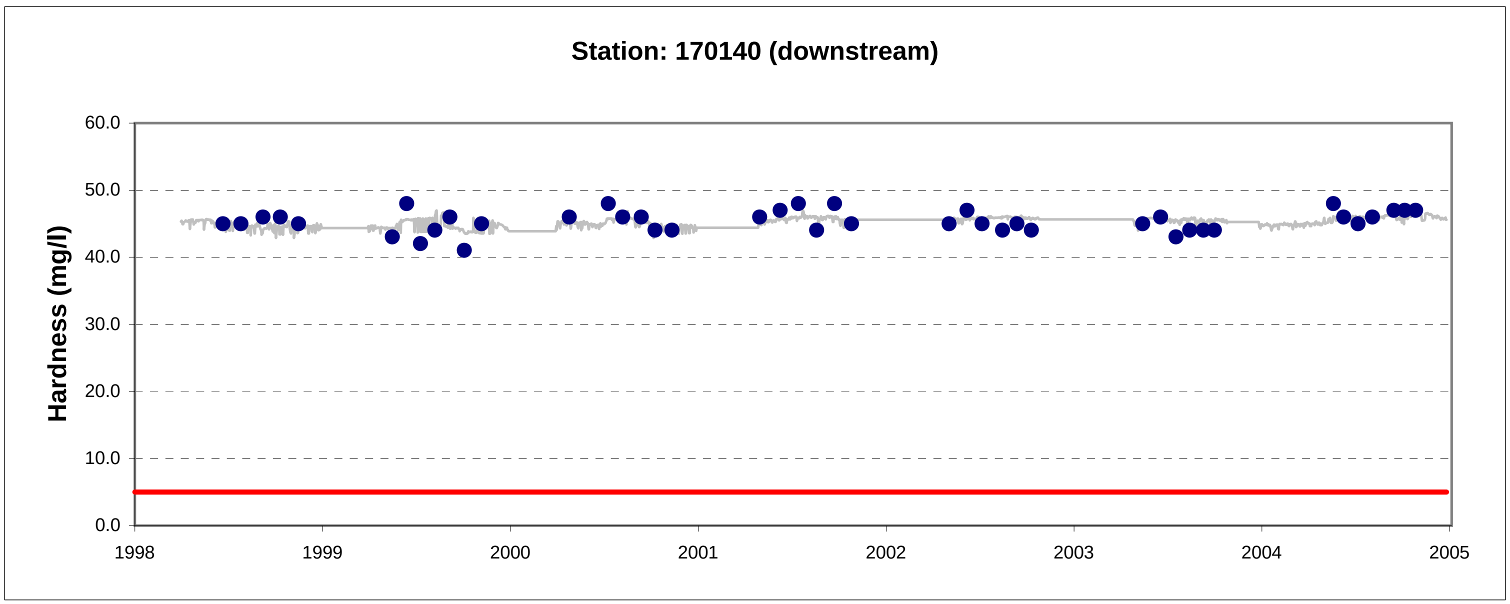
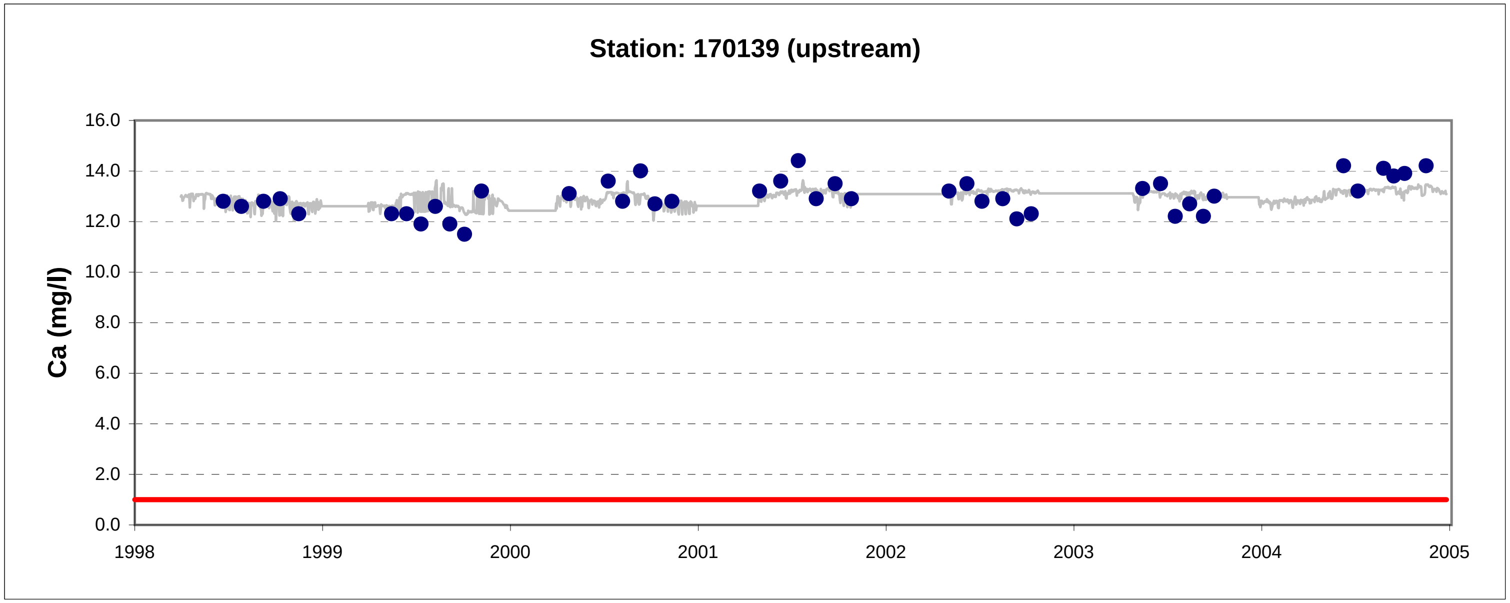


Figure 6-41. St. Marys River - Hardness Time Series, 1998-2004.
Grey Line is Regression Model. Red Line is Quantification Limit.



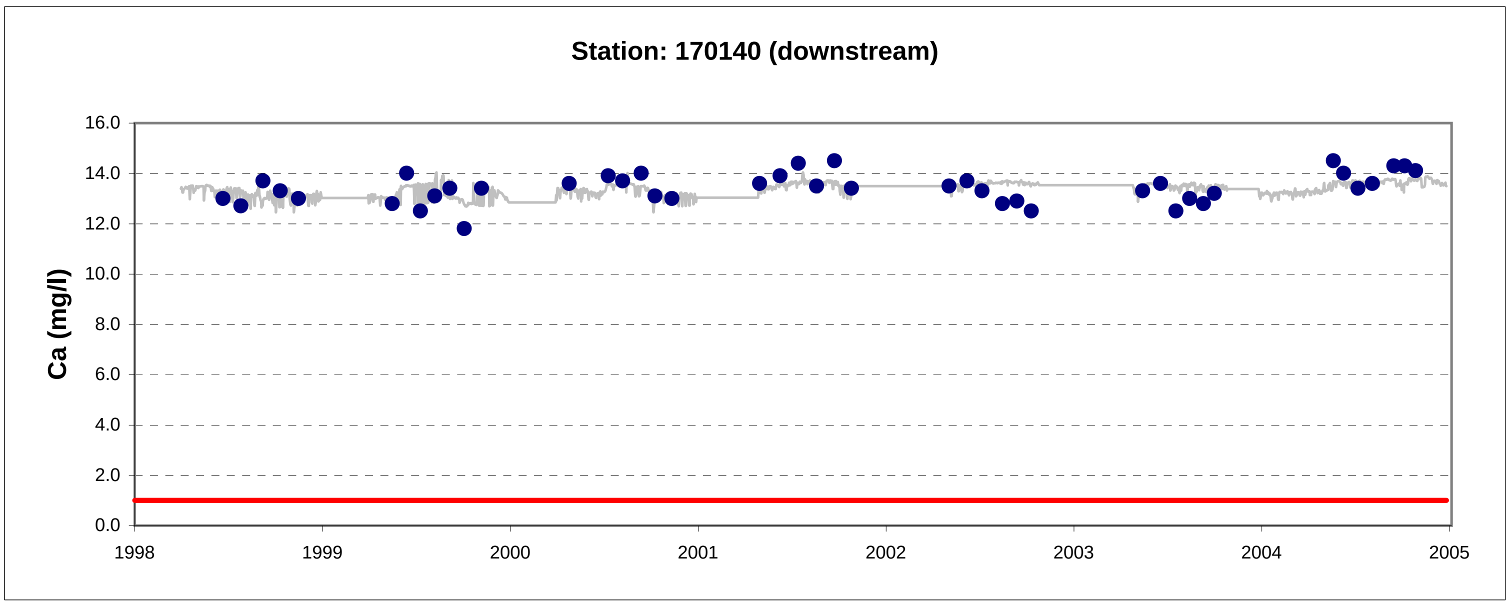
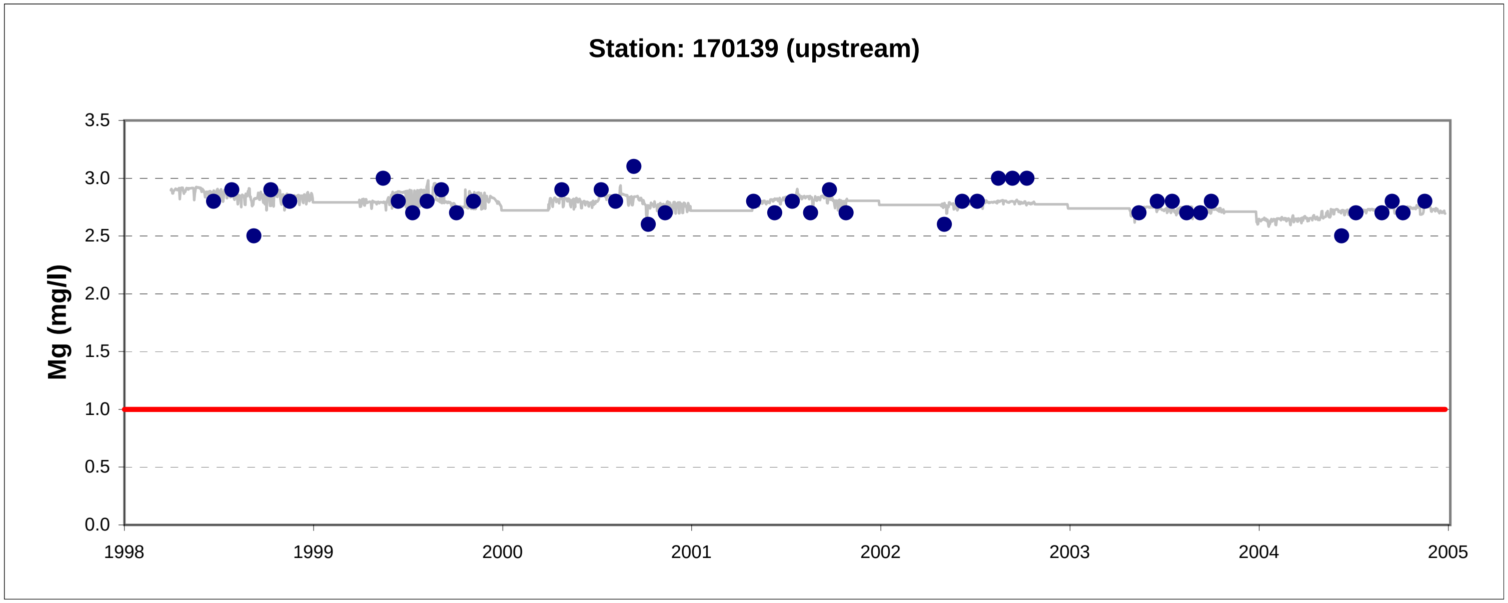


Figure 6-42. St. Marys River - Calcium Concentration Time Series, 1998-2004.
Grey Line is Regression Model. Red Line is Quantification Limit.



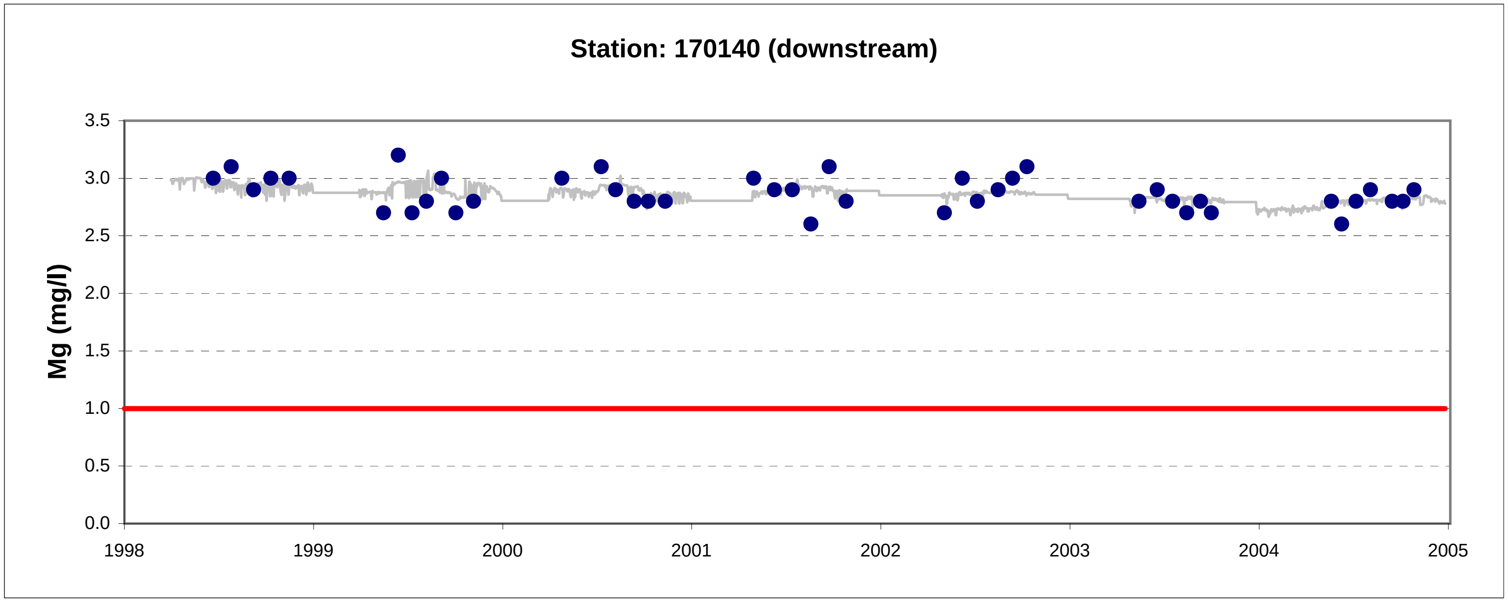
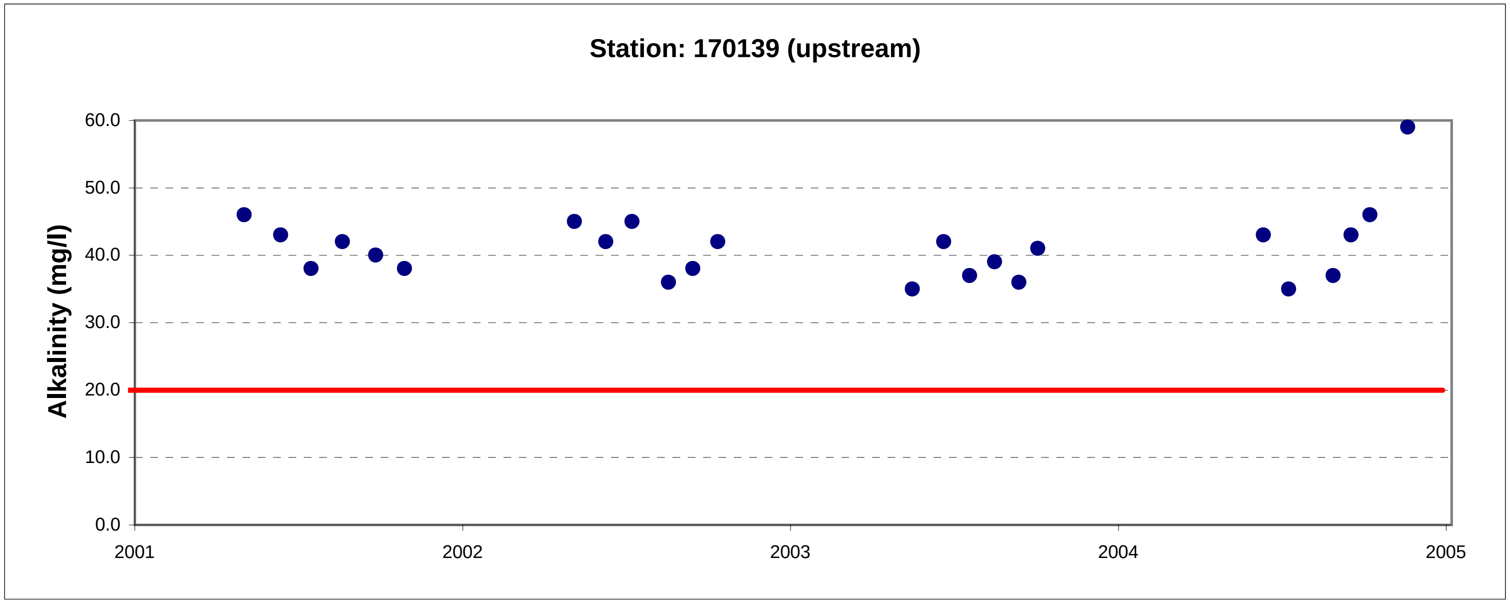


Figure 6-43. St. Marys River - Magnesium Concentration Time Series, 1998-2004.
Grey Line is Regression Model. Red Line is Quantification Limit.



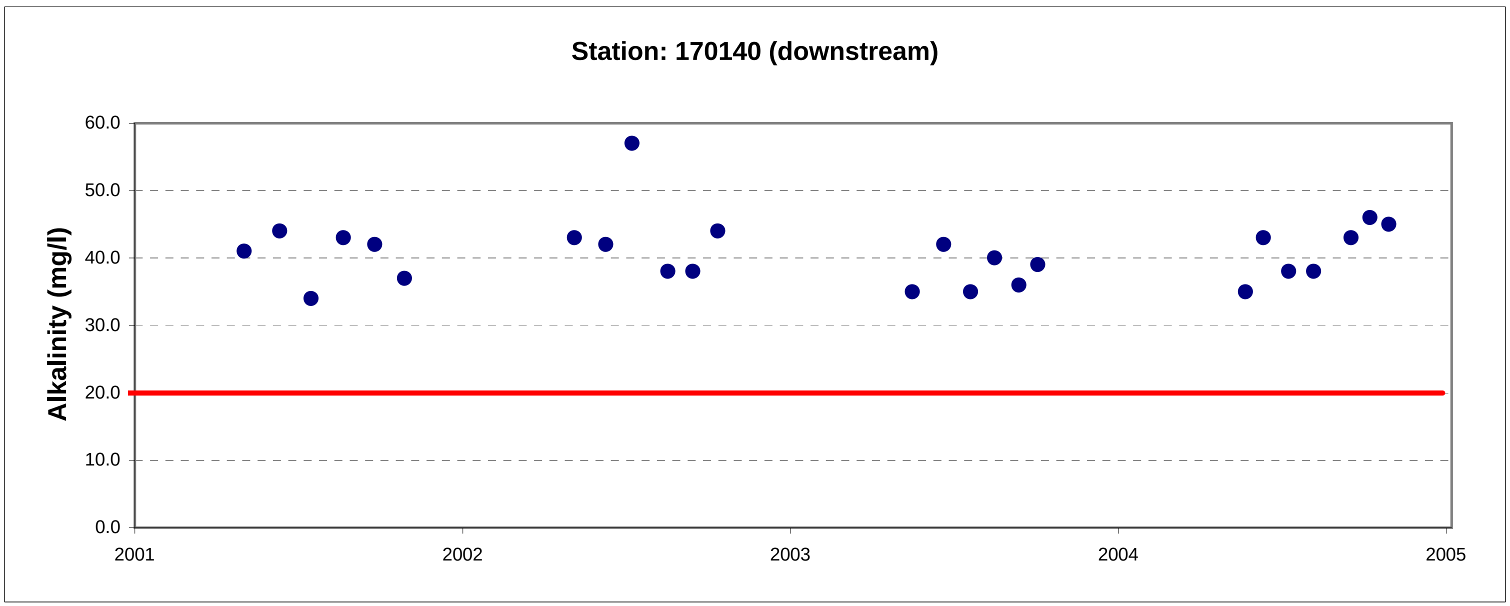
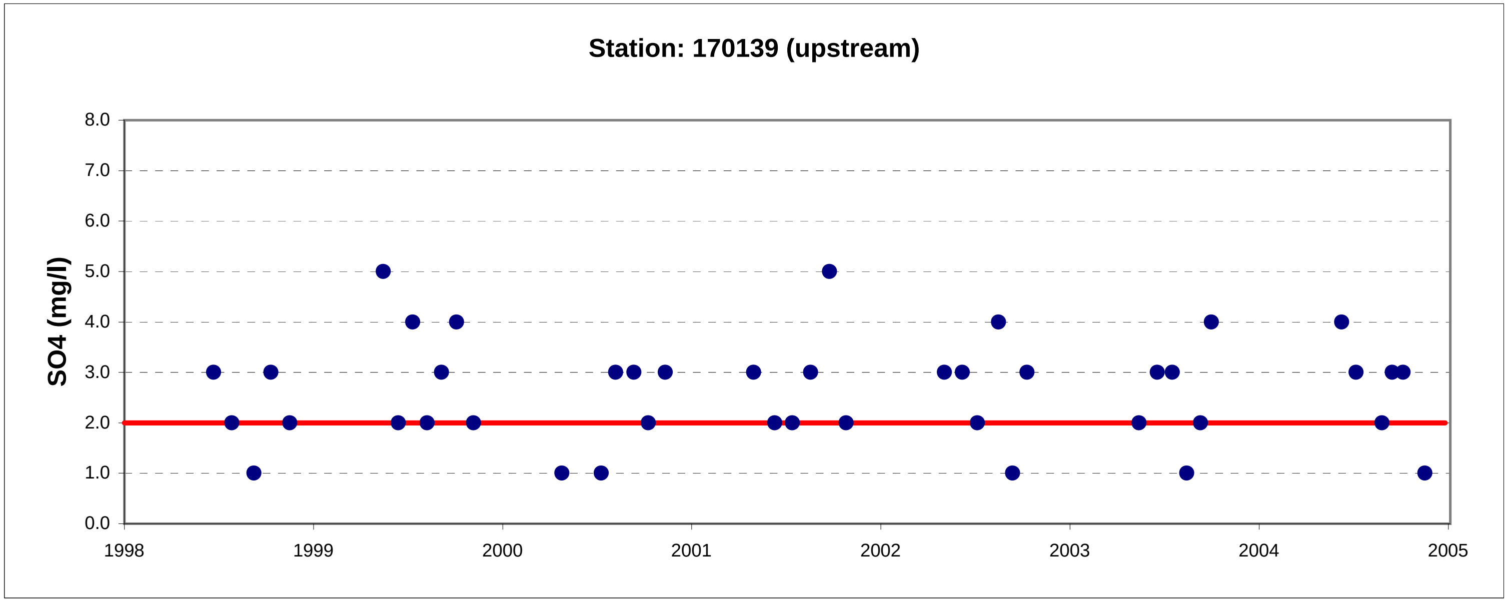


Figure 6-44. St. Marys River - Alkalinity Time Series, 2001-2004.
Red Line is Quantification Limit.



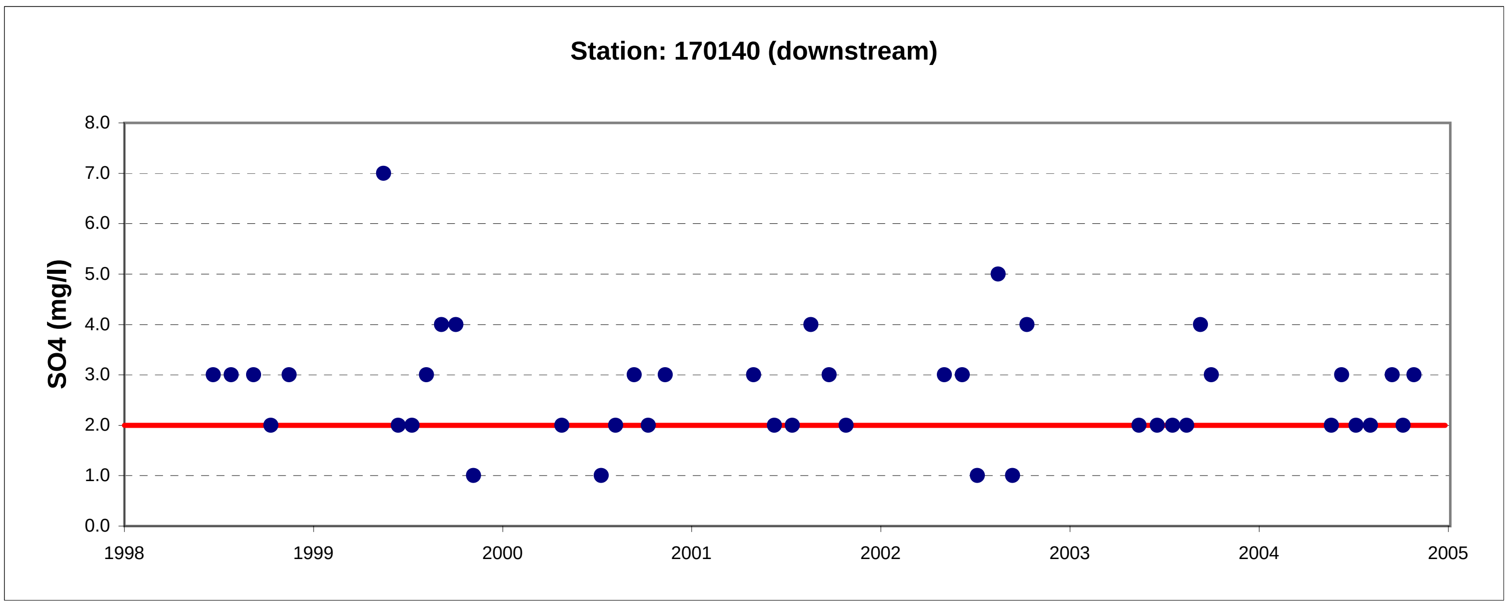
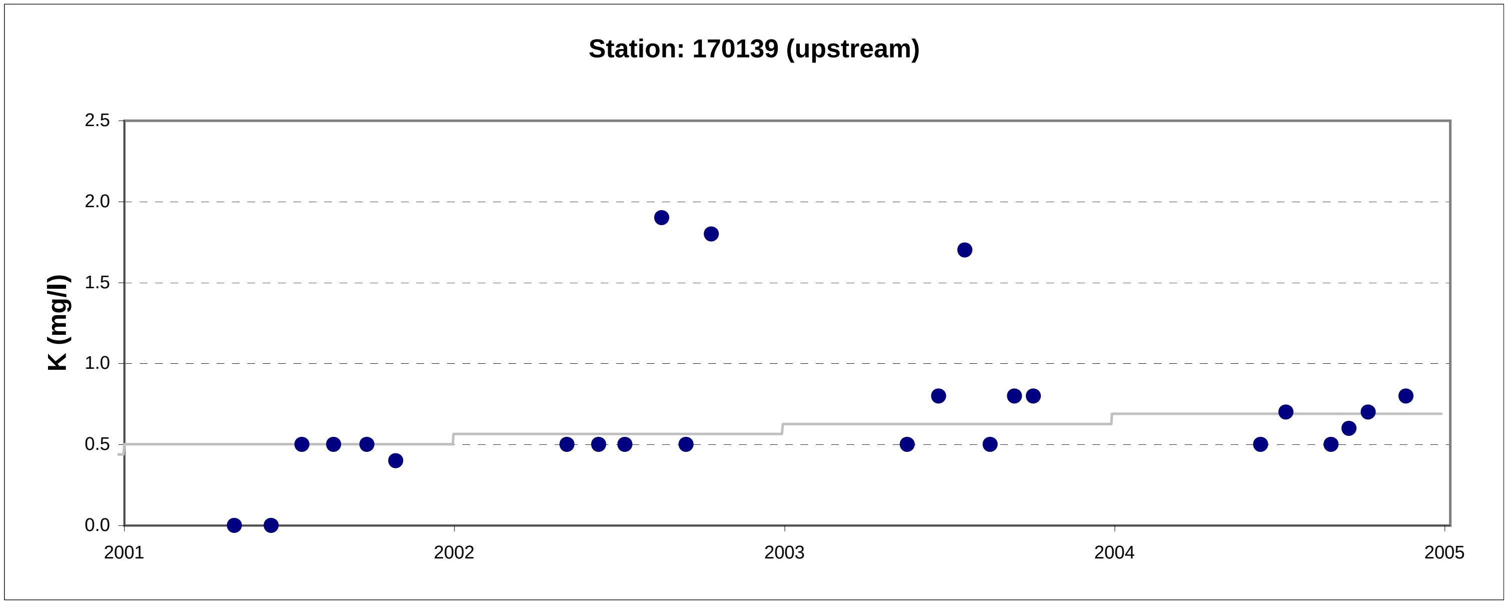


Figure 6-45. St. Marys River - SO_4 Concentration Time Series, 1998-2004. Red Line is Quantification Limit.



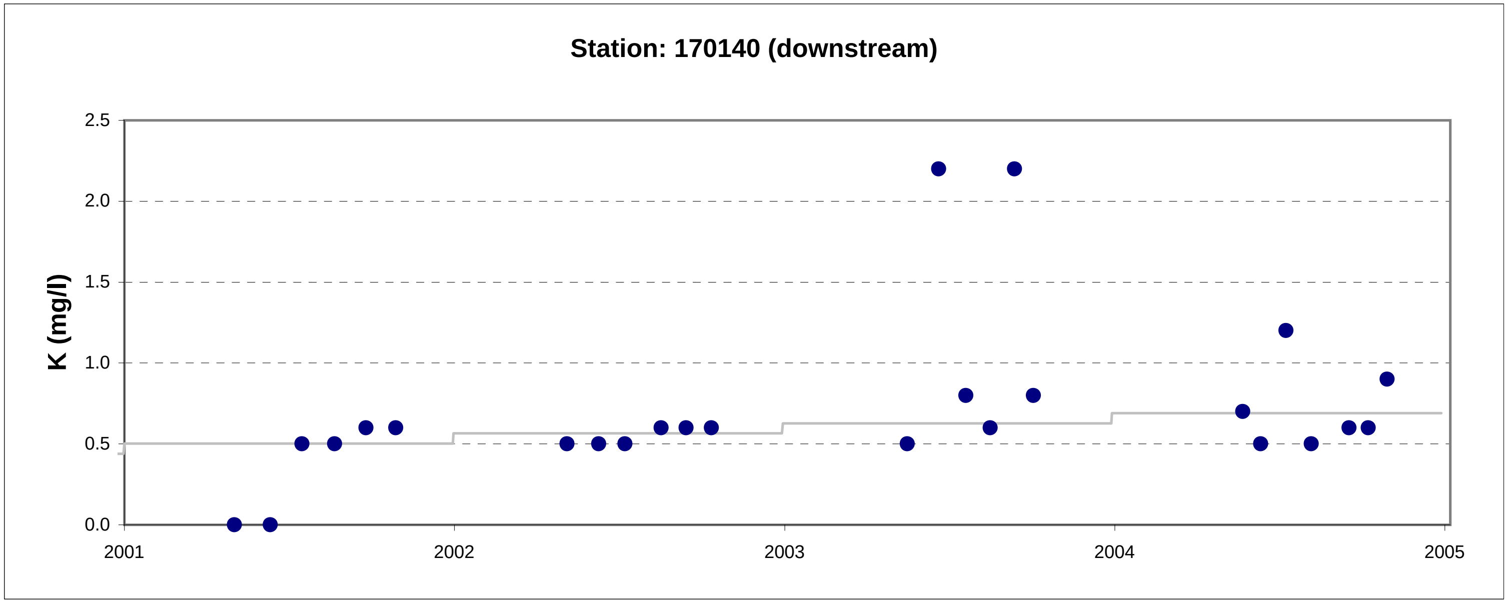
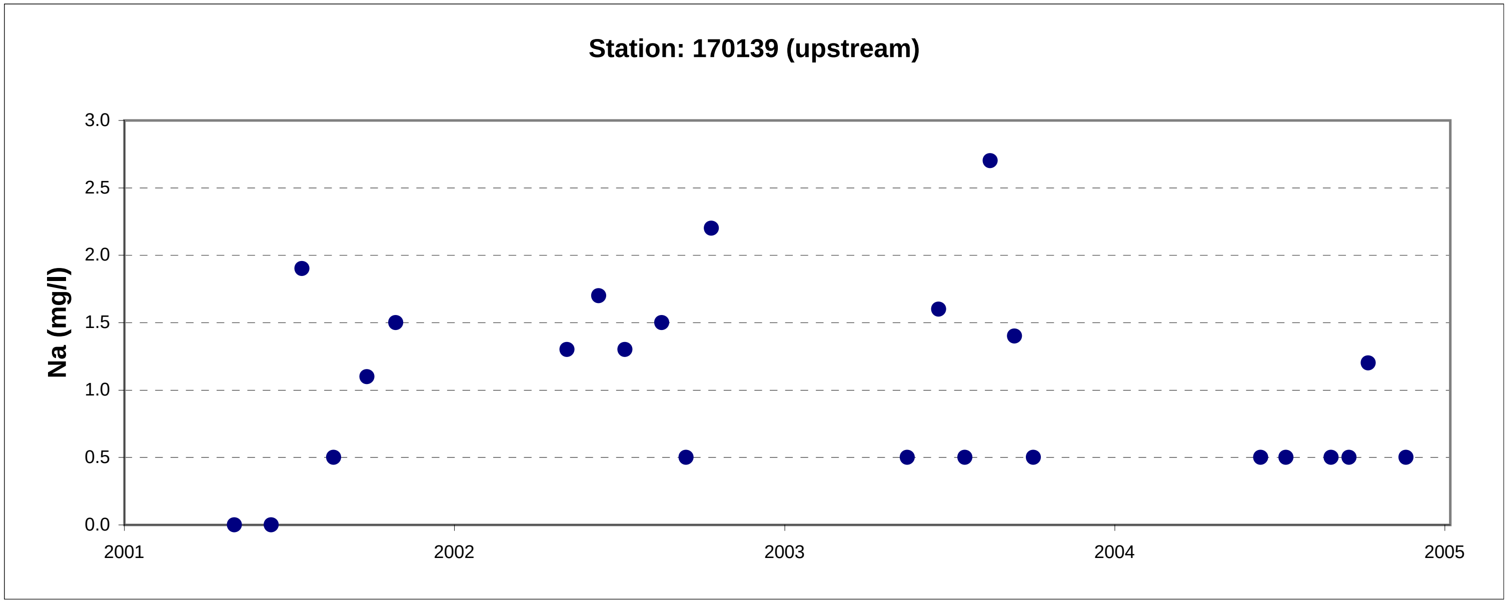


Figure 6-46. St. Marys River - Potassium Concentration Time Series, 2001-2004. Grey Line is Regression Model.



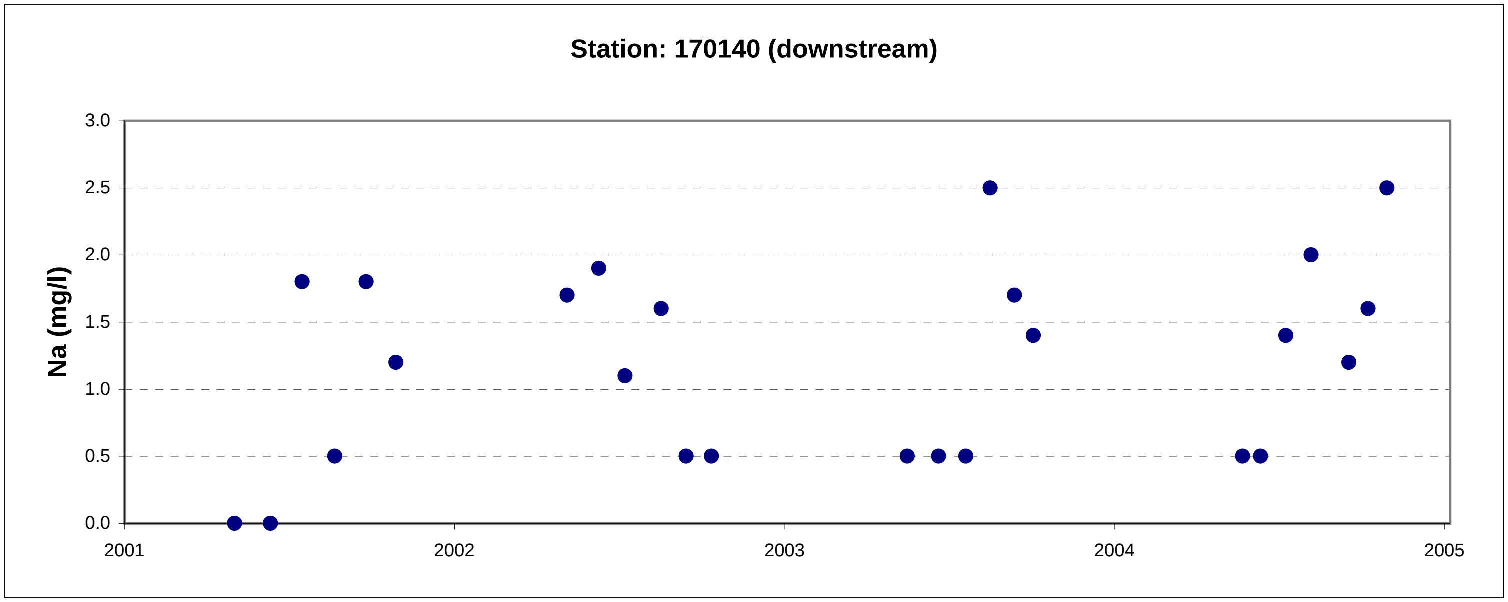


Figure 6-47. St. Marys River - Sodium Concentration Time Series, 2001-2004.

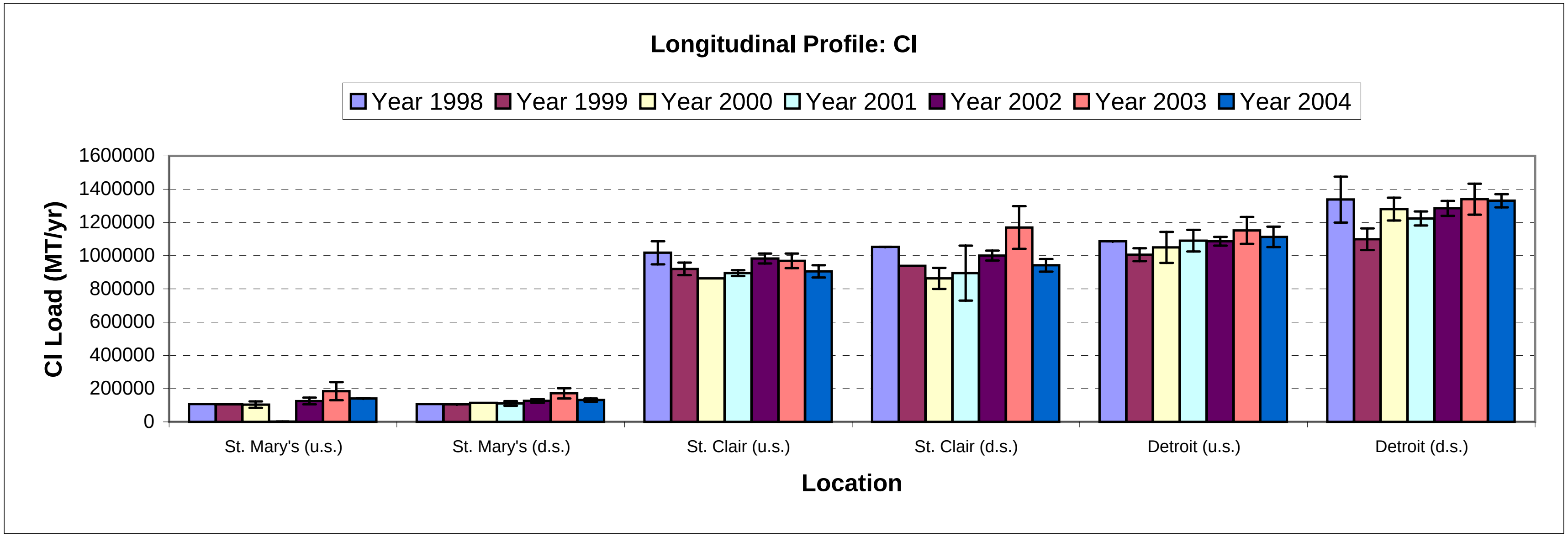


Figure 7-1. Longitudinal Profile of Chloride Load, 1998-2004.

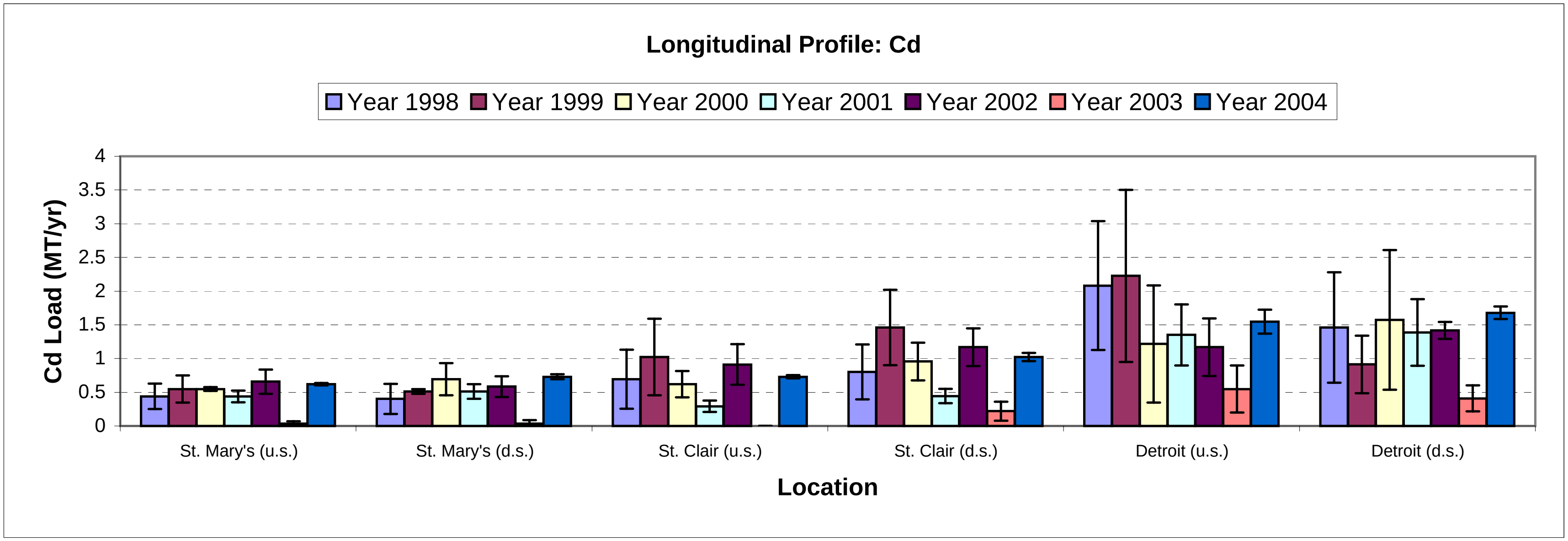


Figure 7-2. Longitudinal Profile of Cadmium Load, 1998-2004.

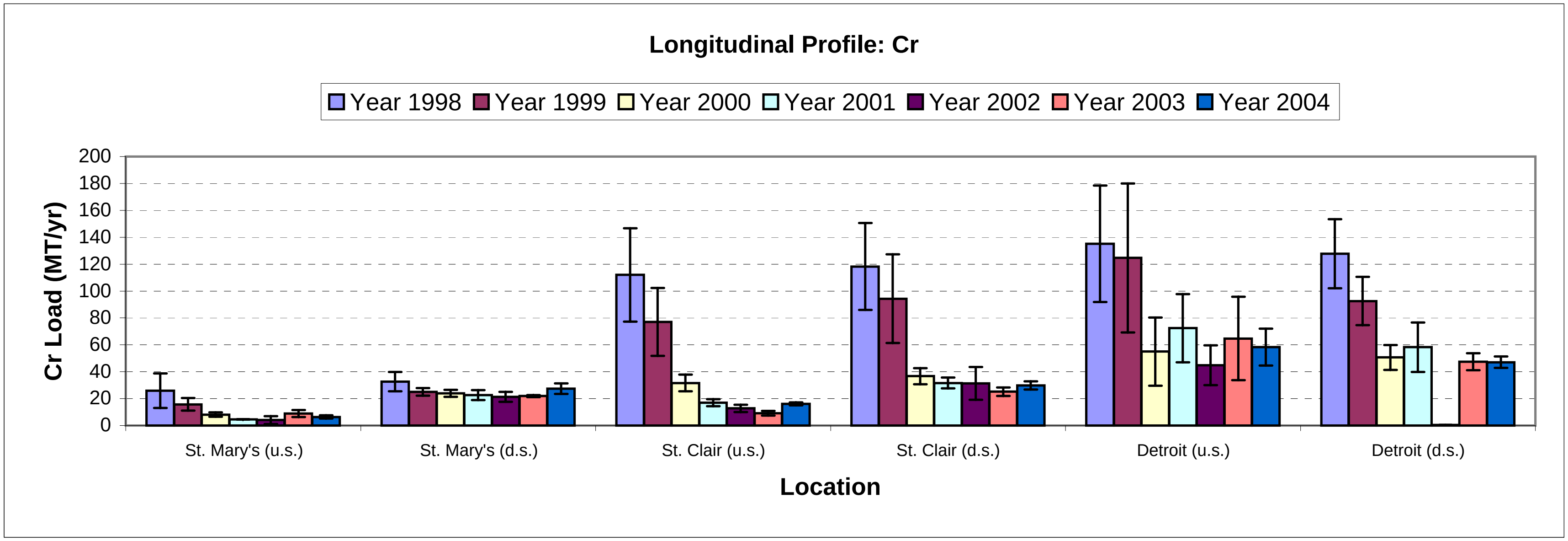


Figure 7-3. Longitudinal Profile of Chromium Load, 1998-2004.

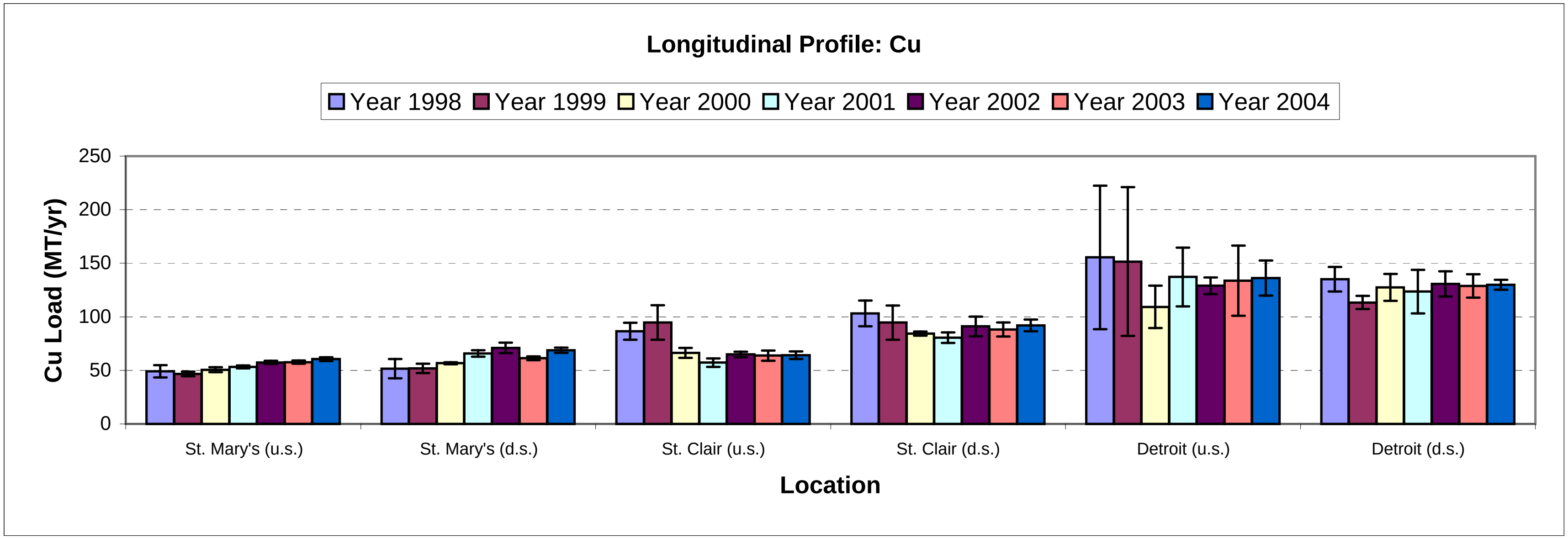


Figure 7-4. Longitudinal Profile of Copper Load, 1998-2004.

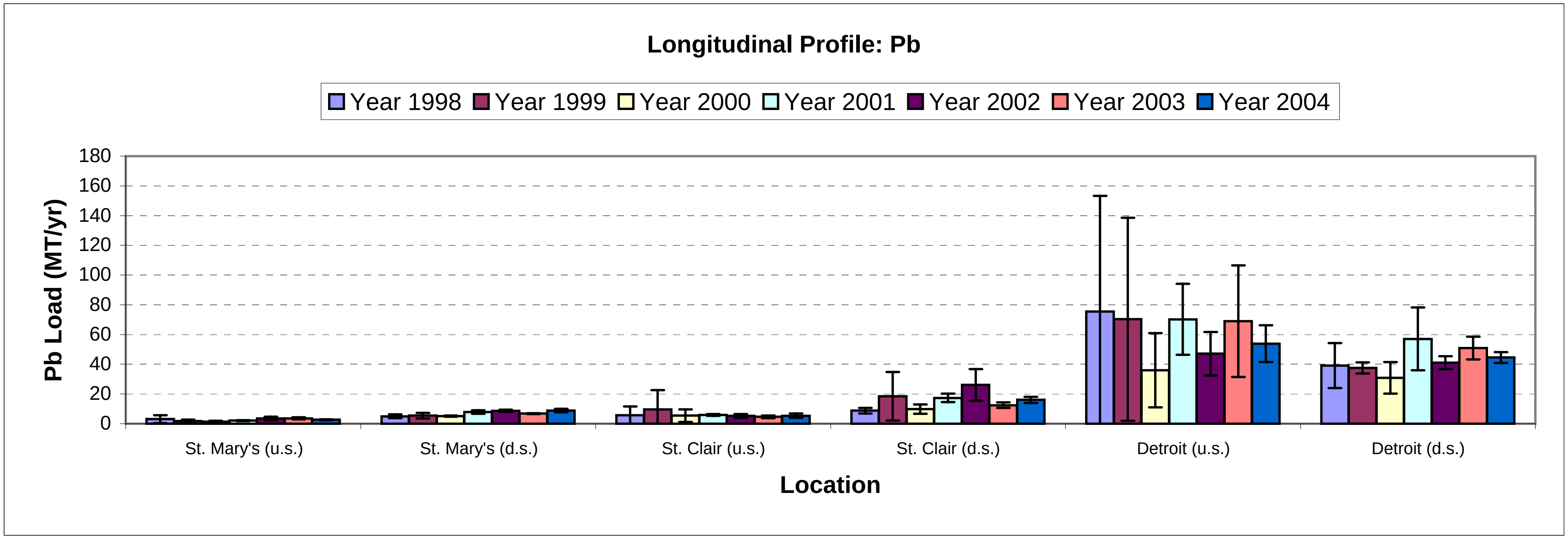


Figure 7-5. Longitudinal Profile of Lead Load, 1998-2004.

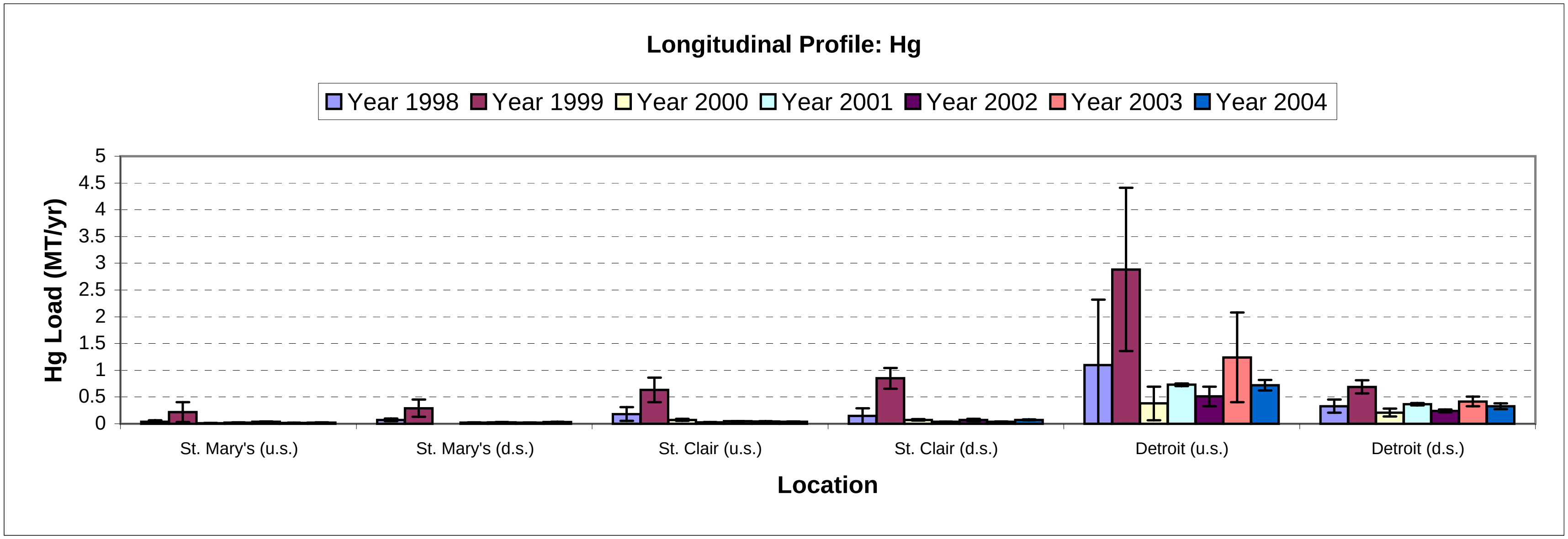


Figure 7-6. Longitudinal Profile of Mercury Load, 1998-2004.

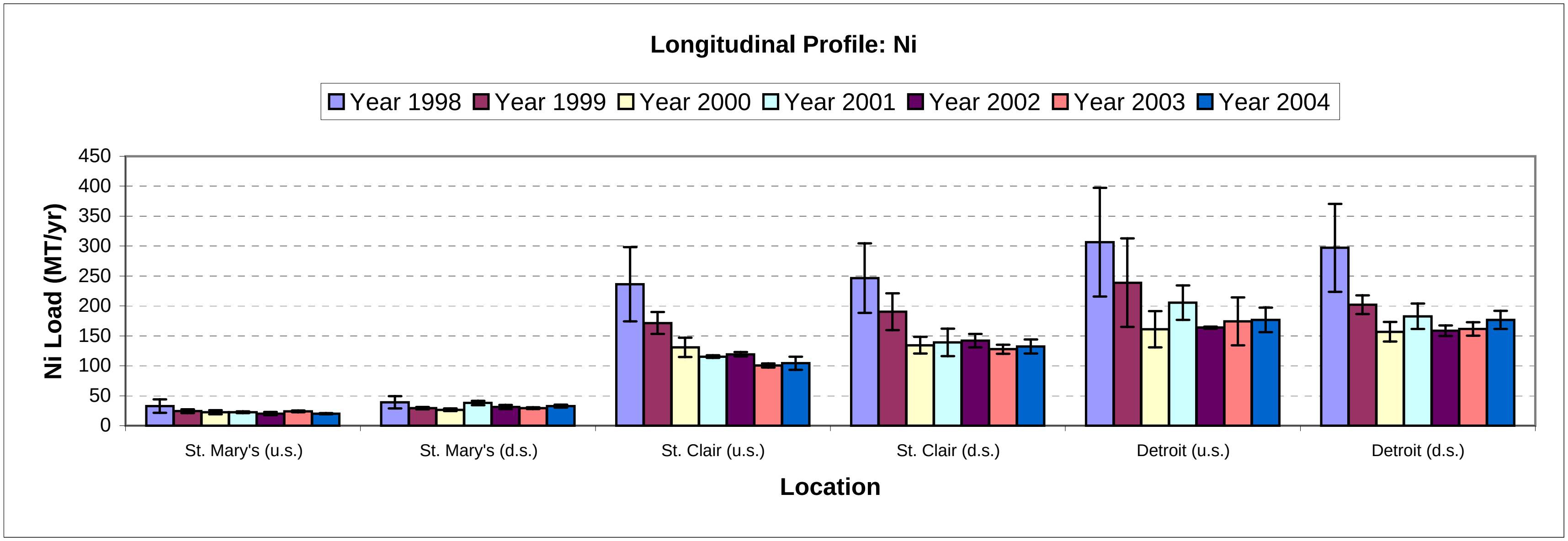


Figure 7-7. Longitudinal Profile of Nickel Load, 1998-2004.

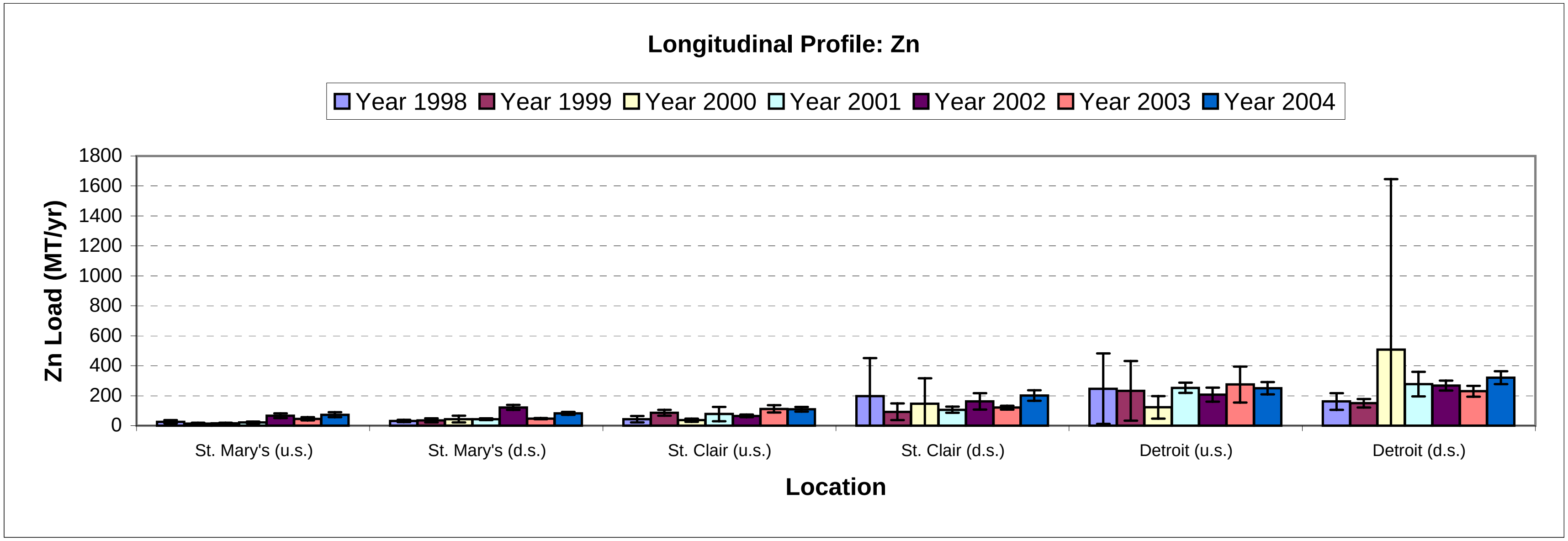


Figure 7-8. Longitudinal Profile of Zinc Load, 1998-2004.

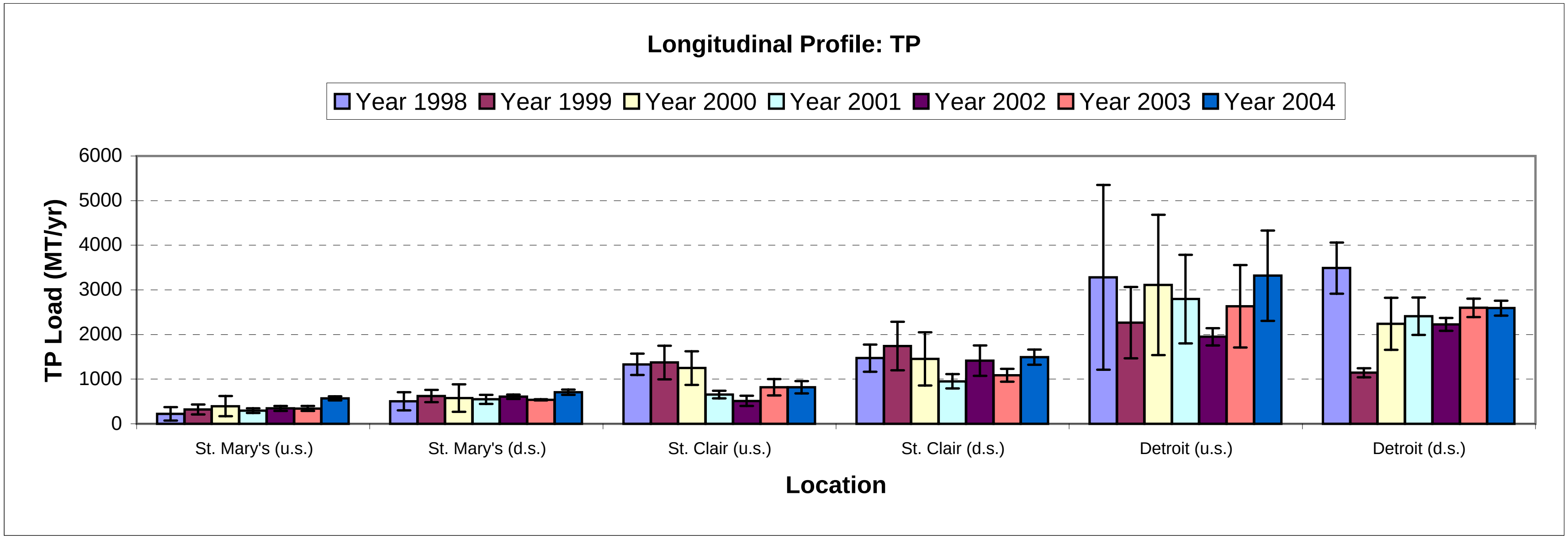


Figure 7.9. Logitudinal Profile of Total Phosphorus Load, 1998-2004.

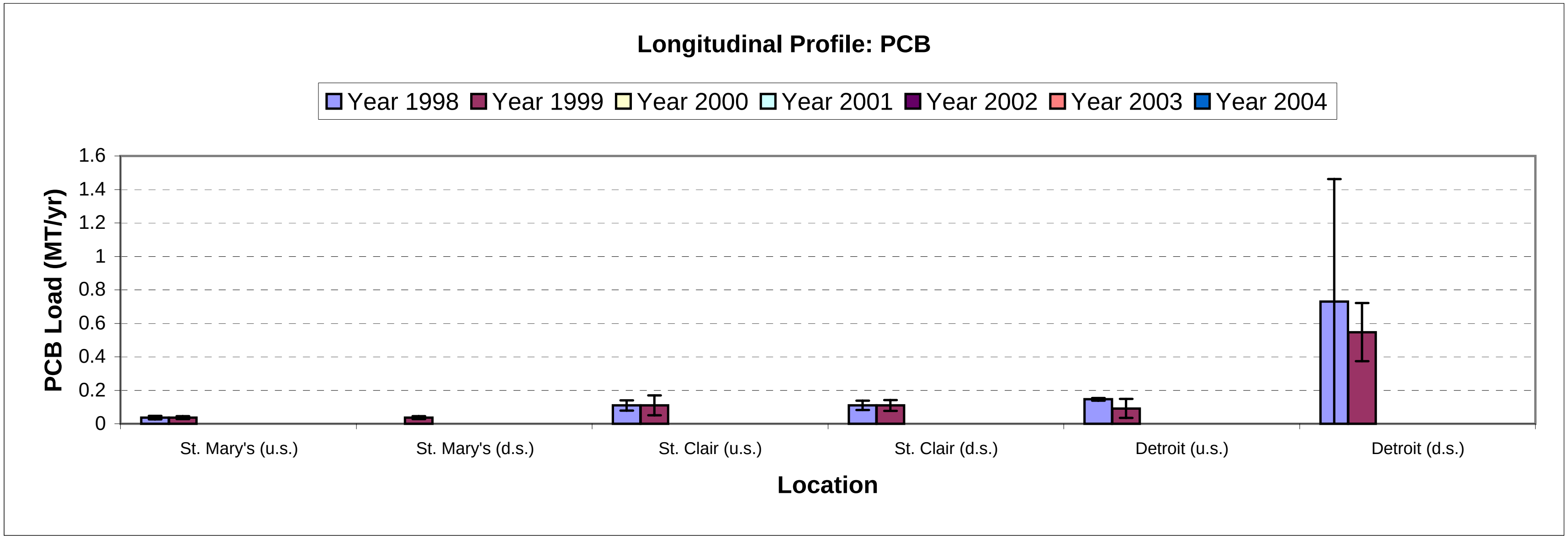


Figure 7-10. Longitudinal Profile of PCB Load, 1998-2004.

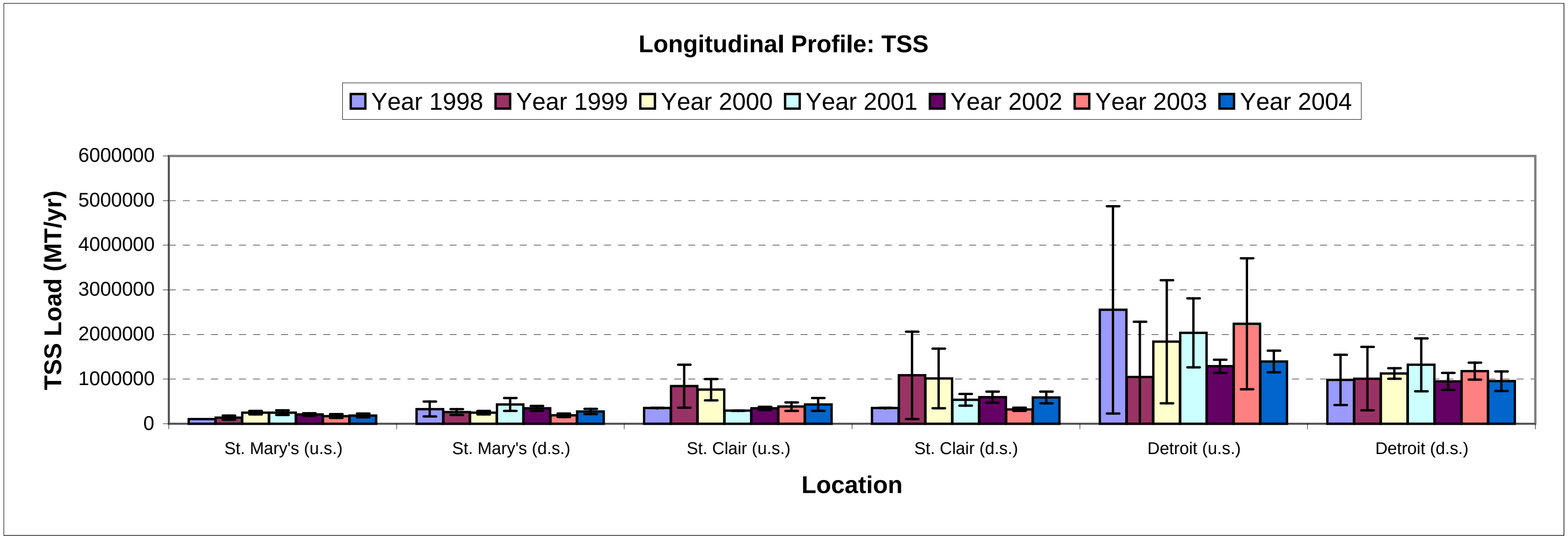


Figure 7-11. Longitudinal Profile of Total Suspended Solids Load, 1998-2004.

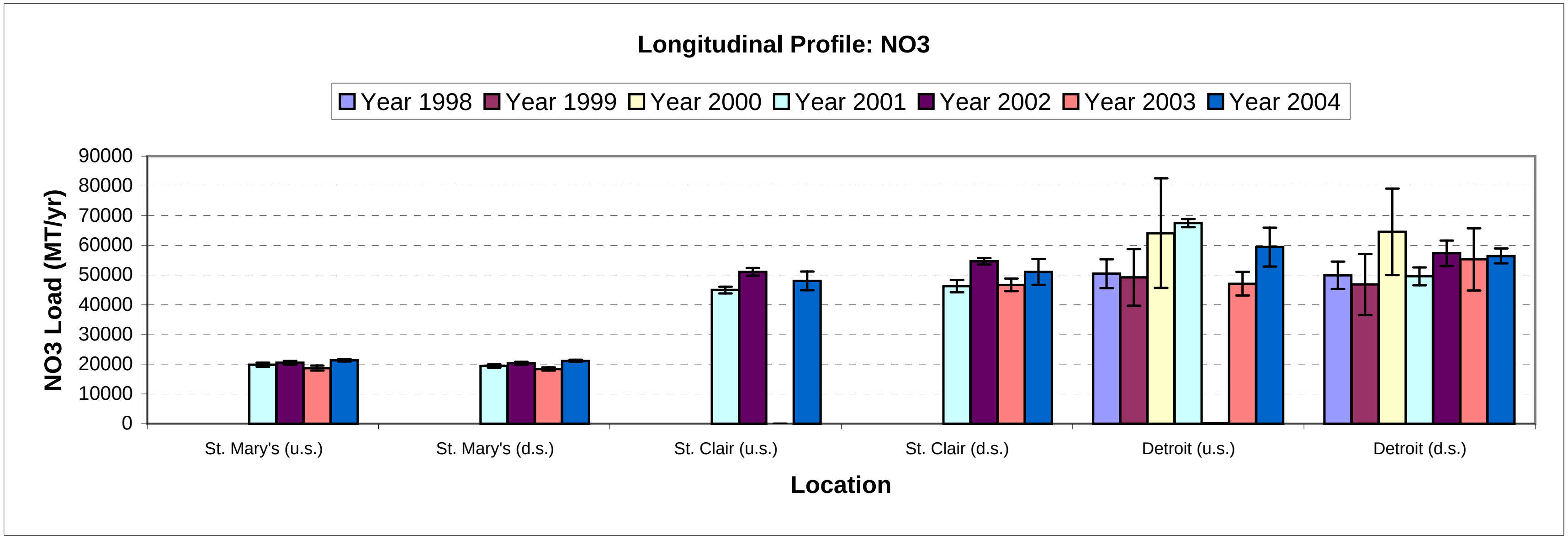


Figure 7-12. Longitudinal Profile of Nitrate Load, 1998-2004.

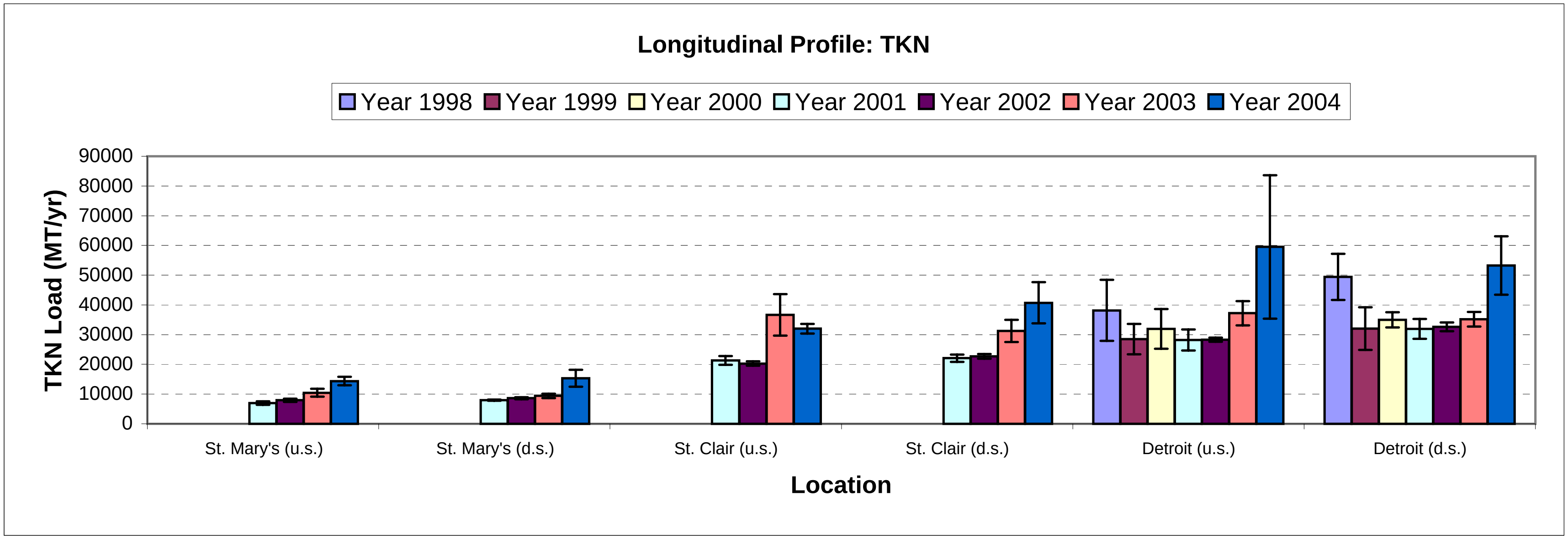


Figure 7-13. Longitudinal Profile of TKN Load, 1998-2004.

Appendix A
Connecting Channels Data

TABLE A-1. Water Quality Data - Detroit River Downstream Station.

Station	Date	Temp (Celsius)	Turbidity (NTU)		Field Cond. (umol/cm)	Lab Cond. (umol/cm)	Field DO (mg/l)	Lab DO (mg/l)		Field pH
820017	5/5/1992	9.0	2.9			221				
820017	7/7/1992	19.0	4			223				
820017	9/1/1992	18.9	3.3			226	8.2			
820017	10/6/1992	14.3	2.7			222	8.4			
820017	5/11/1993	14.6	1.5			237	10.1			7.8
820017	7/13/1993	22.0	1.2		220	225	8.9			7.8
820017	8/10/1993	21.8	1.8		213	217	8			7.8
820017	9/1/1993	23.3	2		217	212	7.2			7.7
820017	10/5/1993	12.0	3.1		211	213	9.5			7.6
820017	5/10/1994	10.7	1.4		220	240	9.5			7.8
820017	7/5/1994	21.0	1.3		201	220	8.7			7.5
820017	8/2/1994	22.9	1.6		216	219	8			7.7
820017	9/6/1994	19.5			223	218	8			8.3
820017	10/4/1994	14.4	2.6		207	222	9.4			
820017	5/9/1995	9.9	1.6		207	225				
820017	7/11/1995	20.3	1.4		201	219	8.9			7.9
820017	8/1/1995	24.8	1.4		217	228	8.7			7.7
820017	9/5/1995	22.6	1.2		205	226	7.8			7.7
820017	10/10/1995	9.8	2.9		211	219	9.8			7.6
820017	5/21/1996	12.4	2		276	269	11.5			8.1
820017	6/11/1997	18.1	2.8		232	244	12.1			
820017	8/13/1997	21.9	1.6		219	219	7.6			
820017	10/7/1997	16.8	1.4		218	217	8.7			
820017	6/17/1998	19.0			224	229	8.4			7.9
820017	7/21/1998	24.0				221		7.5		
820017	9/3/1998	22.4	1.60		214	224	7.8			7.9
820017	10/7/1998	16.6	3.30		229	224	9.4	8.9		7.5
820017	11/3/1998	12.0	1.70		219	215	10.4	10.3		8.1
820017	4/22/1999	8.4	1.1	HT	212	213	11.1	11.4		8.0
820017	5/11/1999	13.4	1.4		297	227	10.3			8.1
820017	6/10/1999	20.4	1		224	220	8.6	9.10		8.0
820017	7/6/1999	23.4	2.1	HT	204	223	7.6			7.3
820017	8/5/1999	24.5	4.7		213	215	7.3	7.80		7.8
820017	9/16/1999	19.5	1.3		214	223	7.9	8.60		7.7
820017	10/12/1999	13.9	2.5		227	222	8.3			7.4
820017	11/16/1999	8	3.2		220	219	10.1			7.0
820017	4/17/2000	6.5	5		220	230		12.0		7.4
820017	5/22/2000	14.7	8.7		244	230	10			8
820017	7/10/2000	21.4	2.2		231	237	8.8			8.1
820017	8/7/2000	22.4	2.1		238	228	9.8	8.7		7.7
820017	9/21/2000	17.6	4.5		229	236	9.1	9.3		7.8
820017	10/9/2000	12.7	3.7	HT	216	224	9.7			7.7
820017	10/17/2000	13.4	0.5		219	228	10.1			7.9
820017	11/8/2000	11.4	4.3		218	226		10.1		7.8
820017	4/10/2001	6.2	3.6		181	231	12.9			7.9
820017	5/7/2001	13.6	3.1		179	234	10.3			8.4
820017	6/11/2001	16.9	1.9		232	239	10.8			8.1
820017	7/16/2001	22.7	2.6		188	219	10.5			8.6
820017	8/14/2001	24.2	0.8		210	217	7.2	7.9		8.3
820017	9/20/2001	18.8	3.5		221	228	8.2	8.1		7.9
820017	10/10/2001	11.4	22		196	221	12.5	9.4	HT	7.9
820017	11/7/2001	9.7	5.8		188	221	10.8			7.8
820017	4/10/2002	3.8	3.1		236	225	14.1			8
820017	5/6/2002	10.2	2.9		223	232	11.6			7.9
820017	6/10/2002	17.4	2.8		229	241	10.8	9.6		8.2
820017	7/9/2002	24.3	0.5	K	225	225	8.2	8.56		8.3
820017	8/12/2002	23.9	3.3		181	223	8	7.9		7.7
820017	9/12/2002	22.4	2.9		199	223	7.1	7.74		8
820017	10/8/2002	16.6	5.6		214	224	6.1	8.68		7.5
820017	11/12/2002	8.43	5.8		194	224	11.3	10.7		8.6
820017	5/21/2003	13.67	8.7		251	250	9.81			7.96
820017	6/18/2003	17.91	2.8		231	236	9.53			8.1
820017	7/23/2003	20.82	2.1		220	224	8.99	8.3		8.07
820017	8/20/2003	24	3.8		215	217	8.1			8.3
820017	9/17/2003	21.46	2.3		221	228	8.79	7.84		7.86
820017	10/20/2003	11.35	8		226	242	10.59			7.28
820017	11/11/2003	7.7	7.6		217	223	12.44	10.8		7.47
820017	4/28/2004	8.45	5.5		225	228	11.81			6.91
820017	5/19/2004	14.89	4.4		234	239	9.08			7.2

TABLE A-1. Water Quality Data - Detroit River Downstream Station.

Station	Date	Temp (Celsius)	Turbidity (NTU)	Field Cond. (umol/cm)	Lab Cond. (umol/cm)	Field DO (mg/l)	Lab DO (mg/l)		Field pH
820017	6/16/2004	19.53	3.2	245	234	8.61			7.58
820017	7/14/2004	22.45	2.8	221	230	8.87	8.6	HT	8.32
820017	8/17/2004	20.75	4.1	218	227	8.91	8.9		8.26
820017	9/22/2004	19.43	3.4	218	229	8.47			7.8
820017	10/13/2004	14.68	4.8	220	220	9.62	9.16		7.61
820017	11/3/2004	11.72	9.4	219	217	10.3			7.43

ND	Observed result was below the quantification level.
A	Value reported is the mean of two or more determinations.
HT	Recommended laboratory holding time was exceeded before analysis.
K	Observed result was below the level of quantitation shown.
T	Value reported is less than the quantification level.
SLRS	SLRS control exceeded quality control criteria.
MBQC	Method blank exceeded level of detection.
CCV	Continuing calibration standard exceeded quality control criteria.
LCQC	Laboratory control exceeded quality control criteria.
MS	Matrix spike exceeded quality control criteria.
MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.
W	Observed result was below the lowest normally reportable value shown.

TABLE A-1. Water Quality Data - Detroit River Downstream Station.

Station	Date	Lab pH		Alkalinity (mg/l)		Total Dissolved Solids (mg/l)		Suspended Solids (mg/l)		Ammonia (mg/l)	
820017	5/5/1992			70		150	C	6		0.024	
820017	7/7/1992			71		154	C	9		0.053	
820017	9/1/1992			76		147	C	4		0.069	
820017	10/6/1992			78		148	C	4		0.033	
820017	5/11/1993	8.06		82		154	C	4	K	0.036	
820017	7/13/1993			73		146	C	4	K	0.042	
820017	8/10/1993			77		147	C	6		0.047	
820017	9/1/1993			72		145	C	7	A	0.053	
820017	10/5/1993			75		146	C	8		0.029	
820017	5/10/1994			73		161		5	Q	0.051	
820017	7/5/1994	8.14		76		143		4	K	0.026	
820017	8/2/1994			73		142		4	K	0.034	
820017	9/6/1994			78		146		4		0.034	
820017	10/4/1994	8.09		71		152		8		0.052	
820017	5/9/1995	8.07		76		153		7		0.032	
820017	7/11/1995			70		142		4	K	0.031	
820017	8/1/1995			79		148		4	K	0.143	
820017	9/5/1995			65		151		4		0.134	
820017	10/10/1995			78		152		10	A	0.055	
820017	5/21/1996	7.7		88		180		4	K	0.042	
820017	6/11/1997	7.92		83		159		9		0.036	
820017	8/13/1997	8.1	QC	74		142		4	K	0.044	
820017	10/7/1997	8.0		75		149		8		0.048	
820017	6/17/1998	8.3				149		10	HT	0.125	
820017	7/21/1998	8.1				144		7		0.042	
820017	9/3/1998	8.2				146		4	K	0.084	HT
820017	10/7/1998	8.1				146		5		0.060	
820017	11/3/1998	8.2				140		4	K	0.022	
820017	4/22/1999	8.2				138	C	4	K	0.014	
820017	5/11/1999	8.1				148	C	5		0.031	
820017	6/10/1999	8.2				143	C	4		0.015	
820017	7/6/1999	8.0				145	C	4	K	0.037	
820017	8/5/1999	8.5				140	C	16		0.024	
820017	9/16/1999	8.4				145	C	4	K	0.035	
820017	10/12/1999	7.7				144	C	4	K	0.051	
820017	11/16/1999	7.9				142	C	16		0.021	
820017	4/17/2000	7.15				150		7		0.01	
820017	5/22/2000	8.13				149		9		0.023	
820017	7/10/2000	8.52		85		154		8		0.034	
820017	8/7/2000	8.04		69	HT	150		8		0.034	
820017	9/21/2000	8.24		76		150		8		0.062	HT
820017	10/9/2000	8.13		74		150		4	K	0.035	HT
820017	10/17/2000	8.14		80		150		6		0.017	HT
820017	11/8/2000	8.15		74		150		4		0.036	
820017	4/10/2001	8.09		73		150		5		0.018	
820017	5/7/2001	8.12		82		150		2	K	0.029	
820017	6/11/2001	8.26		74		160		2	K	0.021	
820017	7/16/2001	8.5		66		140		2	K	0.039	
820017	8/14/2001	8.23		74		140		2	K	0.041	
820017	9/20/2001	7.98		77		150		12		0.092	
820017	10/10/2001	7.95		67		140		34		0.054	
820017	11/7/2001	7.93		71		140		8		0.038	
820017	4/10/2002	7.77		81		150		5		0.018	
820017	5/6/2002	7.87		82		150		11		0.028	
820017	6/10/2002	8.03		78		160		6		0.028	
820017	7/9/2002	8.28		72		150		2	K	0.027	
820017	8/12/2002	8.45		68		140		7		0.038	
820017	9/12/2002	8.3		69		140		2	K	0.047	
820017	10/8/2002	8.21		74		150		4		0.051	
820017	11/12/2002	8		76		150		10		0.039	
820017	5/21/2003	8.14		78		160		9		0.036	
820017	6/18/2003	8.28		75		150			ND	0.03	
820017	7/23/2003	8.41		64		150		6		0.05	
820017	8/20/2003	8.62		69		140		5		0.022	
820017	9/17/2003	8.25		76		150			ND	0.035	
820017	10/20/2003	8.1		79		160		12		0.055	
820017	11/11/2003	8.15		77		140		14		0.026	
820017	4/28/2004	8.14		73		150		5		0.055	
820017	5/19/2004	8.17		79		160		7		0.035	

TABLE A-1. Water Quality Data - Detroit River Downstream Station.

Station	Date	Lab pH	Alkalinity (mg/l)	Total Dissolved Solids (mg/l)	Suspended Solids (mg/l)	Ammonia (mg/l)
820017	6/16/2004	8.25	81	150	5	0.035
820017	7/14/2004	8.51	72	150	ND	0.033
820017	8/17/2004	8.45	77	150	7	0.041
820017	9/22/2004	8.1	77	150	ND	0.054
820017	10/13/2004	8.06	74	140	5	0.031
820017	11/3/2004	8.01	70	140	14	0.042

ND	Observed result was below the quantification level.
A	Value reported is the mean of two or more determinations.
HT	Recommended laboratory holding time was exceeded before analysis.
K	Observed result was below the level of quantitation shown.
T	Value reported is less than the quantification level.
SLRS	SLRS control exceeded quality control criteria.
MBQC	Method blank exceeded level of detection.
CCV	Continuing calibration standard exceeded quality control criteria.
LCQC	Laboratory control exceeded quality control criteria.
MS	Matrix spike exceeded quality control criteria.
MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.
W	Observed result was below the lowest normally reportable value shown.

TABLE A-1. Water Quality Data - Detroit River Downstream Station.

Station	Date	Nitrite (mg/l)		Nitrate (mg/l)		TKN (mg/l)		NO2+NO3 (mg/l)	Total Phosphorus (mg/l)	
820017	5/5/1992	0.004		0.406	C			0.410	0.004	T
820017	7/7/1992	0.005		0.305	C			0.310	0.017	
820017	9/1/1992	0.013		0.297	C			0.310	0.010	
820017	10/6/1992	0.007		0.273	C			0.280	0.007	
820017	5/11/1993	0.005		0.455	C			0.460	0.011	
820017	7/13/1993	0.006		0.304	C			0.310	0.026	
820017	8/10/1993	0.014		0.246	C	0.220		0.260	0.020	
820017	9/1/1993	0.017		0.253	C			0.270	0.012	
820017	10/5/1993	0.008		0.282				0.290	0.013	
820017	5/10/1994	0.004		0.356	C			0.360	0.009	
820017	7/5/1994	0.007		0.463	C			0.470	0.009	
820017	8/2/1994	0.011		0.329	C			0.340	0.016	
820017	9/6/1994	0.009		0.261	C			0.270	0.016	
820017	10/4/1994	0.010		0.370	C			0.380	0.011	
820017	5/9/1995	0.004		0.406	C			0.410	0.011	
820017	7/11/1995	0.005		0.285	C			0.290	0.012	
820017	8/1/1995	0.023		0.417	C			0.440	0.023	
820017	9/5/1995	0.030		0.240	C			0.270	0.025	
820017	10/10/1995	0.010		0.280	C			0.290	0.017	
820017	5/21/1996	0.005		0.405	C			0.410	0.010	
820017	6/11/1997	0.005		0.425	C			0.430	0.017	
820017	8/13/1997	0.012		0.268	C			0.280	0.015	
820017	10/7/1997	0.008		0.262	C			0.270	0.012	
820017	6/17/1998	0.007		0.310		0.320		0.317	0.022	
820017	7/21/1998	0.012		0.280		0.200		0.292	0.020	
820017	9/3/1998	0.020		0.250	HT	0.240	HT	0.270	0.017	HT
820017	10/7/1998	0.009		0.260		0.290		0.269	0.018	
820017	11/3/1998	0.004		0.240		0.280	HT	0.244	0.012	HT
820017	4/22/1999	0.002		0.320	C	0.110		0.322	0.012	
820017	5/11/1999	0.004		0.530	C	0.200		0.534	0.013	
820017	6/10/1999	0.004		0.290	C	0.140		0.294	0.011	
820017	7/6/1999	0.008		0.280	C	0.220		0.288	0.017	
820017	8/5/1999	0.006		0.210	C	0.270		0.216	0.021	
820017	9/16/1999	0.008		0.250	C	0.200		0.258	0.009	
820017	10/12/1999	0.010		0.260	C	0.280		0.270	0.010	
820017	11/16/1999	0.003		0.270	C	0.130		0.273	0.014	
820017	4/17/2000			0.39	C	0.23			0.01	
820017	5/22/2000	0.006	HT	0.51	HT	0.25			0.016	
820017	7/10/2000	0.011		0.67	C	0.21			0.014	
820017	8/7/2000	0.018		0.37		0.25			0.015	
820017	9/21/2000	0.014		0.31	HT	0.26	HT		0.019	HT
820017	10/9/2000	0.008	HT	0.31	HT	0.17	HT		0.011	HT
820017	10/17/2000	0.005		0.34	HT	0.14	HT		0.01	HT
820017	11/8/2000	0.004		0.3	C	0.18			0.012	
820017	4/10/2001	0.004		0.47	C	0.16			0.01	
820017	5/7/2001	0.004		0.34	C	0.16			0.011	
820017	6/11/2001	0.005		0.4	C	0.17			0.011	
820017	7/16/2001	0.009		0.27	C	0.25			0.015	
820017	8/14/2001	0.015		0.24	C	0.17			0.013	
820017	9/20/2001	0.017		0.27	C	0.26			0.017	
820017	10/10/2001	0.012		0.31	C	0.31			0.034	
820017	11/7/2001	0.006		0.35	C	0.15			0.012	
820017	4/10/2002	0.004		0.42	C	0.16			0.01	
820017	5/6/2002	0.004		0.45	C	0.2			0.012	
820017	6/10/2002	0.005		0.59	C	0.19			0.015	
820017	7/9/2002	0.009		0.36	C	0.19			0.012	
820017	8/12/2002	0.015		0.26	C	0.22			0.019	
820017	9/12/2002	0.01		0.26	C	0.19			0.015	
820017	10/8/2002	0.012		0.3	C	0.2			0.014	
820017	11/12/2002	0.006		0.3	C	0.25			0.015	
820017	5/21/2003	0.007	T	0.73		0.24			0.019	
820017	6/18/2003	0.006		0.45		0.2			0.011	
820017	7/23/2003	0.011		0.26		0.3			0.014	
820017	8/20/2003	0.004		0.21		0.16			0.016	
820017	9/17/2003	0.016		0.25		0.24			0.012	
820017	10/20/2003	0.008		0.28		0.24			0.02	
820017	11/11/2003	0.005		0.32		0.22			0.023	
820017	4/28/2004	0.005		0.39		0.3	HT		0.013	HT
820017	5/19/2004	0.008		0.47		0.26			0.017	

TABLE A-1. Water Quality Data - Detroit River Downstream Station.

Station	Date	Nitrite (mg/l)	Nitrate (mg/l)	TKN (mg/l)	NO2+NO3 (mg/l)	Total Phosphorus (mg/l)
820017	6/16/2004	0.007	0.47	0.3		0.016
820017	7/14/2004	0.008	0.39	0.7		0.018
820017	8/17/2004	0.011	0.25	0.31		0.02
820017	9/22/2004	0.008	0.29	0.31		0.014
820017	10/13/2004	0.006	0.28	0.2		0.011
820017	11/3/2004	0.005	0.3	0.18		0.017

ND	Observed result was below the quantification level.
A	Value reported is the mean of two or more determinations.
HT	Recommended laboratory holding time was exceeded before analysis.
K	Observed result was below the level of quantitation shown.
T	Value reported is less than the quantification level.
SLRS	SLRS control exceeded quality control criteria.
MBQC	Method blank exceeded level of detection.
CCV	Continuing calibration standard exceeded quality control criteria.
LCQC	Laboratory control exceeded quality control criteria.
MS	Matrix spike exceeded quality control criteria.
MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.
W	Observed result was below the lowest normally reportable value shown.

TABLE A-1. Water Quality Data - Detroit River Downstream Station.

Station	Date	Total Orthophoshate (mg/l)		TOC (mg/l)	Sulfate (mg/l)	Hardness (mg/l)	Calcium (mg/l)	Magnesium (mg/l)
820017	5/5/1992					99	27.5	7.3
820017	7/7/1992					94	25.5	7.3
820017	9/1/1992					96	26.2	7.5
820017	10/6/1992					97	26.5	7.4
820017	5/11/1993					101	27.4	7.8
820017	7/13/1993					100	27.5	7.5
820017	8/10/1993					97	26.5	7.5
820017	9/1/1993					100	28	7.2
820017	10/5/1993					104	28.9	7.8
820017	5/10/1994					102	28.6	7.4
820017	7/5/1994					102	28.8	7.4
820017	8/2/1994	0.005				99	27	7.6
820017	9/6/1994					99	27.6	7.4
820017	10/4/1994					100	27.7	7.4
820017	5/9/1995					103	28.4	7.8
820017	7/11/1995	0.002	T			95	26	7.3
820017	8/1/1995	0.006				95	25.9	7.4
820017	9/5/1995	0.006				98	27	7.4
820017	10/10/1995	0.004				96	25.7	7.6
820017	5/21/1996	0.002	T			102	28	7.7
820017	6/11/1997	0.002	T			96	26	7.5
820017	8/13/1997	0.004				95	25.8	7.3
820017	10/7/1997	0.003				94	25.8	7.1
820017	6/17/1998	0.007		2.6	15	93	24.4	7.70
820017	7/21/1998	0.002		1.9	11	92	24.6	7.50
820017	9/3/1998	0.004		2.4	11	93	25.2	7.30
820017	10/7/1998	0.005		1.8	10	96	26.1	7.50
820017	11/3/1998	0.002		1.6	13	94	26.1	7.10
820017	4/22/1999	0.002	T	2.20	14.0	97	26.8	7.20
820017	5/11/1999	0.004		2.30	16.0	100	26.9	7.90
820017	6/10/1999	0.001	T	2.10	9.00	102	27.8	7.80
820017	7/6/1999	0.009		2.20	13.0	94	25.1	7.50
820017	8/5/1999	0.005		2.20	15.0	94	25.6	7.40
820017	9/16/1999	0.004		2.50	14.0	96	26	7.50
820017	10/12/1999	0.004		2.40	19.0	100	28	7.40
820017	11/16/1999	0.002	T	2.10	12.0	98	27.2	7.40
820017	4/17/2000	0.01		1.7		98	26.8	7.6
820017	5/22/2000	0.005		2.4		107	29.6	7.6
820017	7/10/2000	0.011		2.2		107	29.5	8.1
820017	8/7/2000	0.004		2.8		103	28.4	7.7
820017	9/21/2000	0.003	HT	2.2		109	30.3	8
820017	10/9/2000	0.006		2		96	26.7	7.2
820017	10/17/2000	0.007	HT	1.9		105	28.5	8.1
820017	11/8/2000	0.007		1.9		99	27.2	7.6
820017	4/10/2001	0.008	HT	1.9	12	100	27.3	7.6
820017	5/7/2001	0.001	T	1.8	14	100	27	7.8
820017	6/11/2001	0.007		1.9	15	102	28	7.8
820017	7/16/2001	0.008		2	14	101	27.6	7.7
820017	8/14/2001	0.004		1.9	13	96	26.3	7.4
820017	9/20/2001	0.007		2	14	104	28.6	7.8
820017	10/10/2001	0.005		1.9	13	98	26.6	7.6
820017	11/7/2001	0.005		2.2	15	97	26.3	7.6
820017	4/10/2002	0.011		2	15	101	27.2	7.9
820017	5/6/2002	0.004	HT	2.2	14	103	28.2	8
820017	6/10/2002	0.008		2.2	17	105	28.3	8.4
820017	7/9/2002	0.005		2.2	15	98	26.1	8
820017	8/12/2002	0.009		1.9	15	97	26	7.8
820017	9/12/2002	0.007		1.7	11	104	28.7	7.8
820017	10/8/2002	0.014		1.8	12	106	29.4	7.8
820017	11/12/2002	0.01		2.1	12	96	25.4	7.8
820017	5/21/2003	0.001	T	2.5	13	105	28.6	8.1
820017	6/18/2003	0.003		1.8	12	102	27.8	7.9
820017	7/23/2003	0.004		2.7	15	92	24	7.7
820017	8/20/2003	0.002	T	1.9	12	99	26.8	7.7
820017	9/17/2003	0.004		2	14	99	26.5	8
820017	10/20/2003	0.006		2	12	98	26.8	7.4
820017	11/11/2003	0.006		1.7	12	95	26	7.3
820017	4/28/2004	0.001	T	2	12	98	26.7	7.6
820017	5/19/2004	0.006		2.8	14	102	28.2	7.6

TABLE A-1. Water Quality Data - Detroit River Downstream Station.

Station	Date	Total Orthophoshate (mg/l)		TOC (mg/l)	Sulfate (mg/l)	Hardness (mg/l)	Calcium (mg/l)	Magnesium (mg/l)
820017	6/16/2004	0.003		2.5	14	104	28.8	7.7
820017	7/14/2004	0.002	T	4.9	14	99	27	7.6
820017	8/17/2004	0.001	T	2.3	15	99.8	27.1	7.8
820017	9/22/2004	0.005		2.6	16	99	27.7	7.3
820017	10/13/2004	0.003		2	13	100	27.8	7.5
820017	11/3/2004	0.004		1.8	13	98	26.8	7.4

ND	Observed result was below the quantification level.
A	Value reported is the mean of two or more determinations.
HT	Recommended laboratory holding time was exceeded before analysis.
K	Observed result was below the level of quantitation shown.
T	Value reported is less than the quantification level.
SLRS	SLRS control exceeded quality control criteria.
MBQC	Method blank exceeded level of detection.
CCV	Continuing calibration standard exceeded quality control criteria.
LCQC	Laboratory control exceeded quality control criteria.
MS	Matrix spike exceeded quality control criteria.
MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.
W	Observed result was below the lowest normally reportable value shown.

TABLE A-1. Water Quality Data - Detroit River Downstream Station.

Station	Date	Potassium (mg/l)	Chloride (mg/l)	Sodium (mg/L)	Sulfide (mg/L)		Cadmium (ug/l)		Chromium (ug/L)	
820017	5/5/1992		6				0.2	K	1	K
820017	7/7/1992		6				0.2	K	1	K
820017	9/1/1992	0.82	8				0.2	K	1	K
820017	10/6/1992		7				0.2	K	1	K
820017	5/11/1993		9				0.2	K	1	K
820017	7/13/1993		7				0.2	K	1	K
820017	8/10/1993	0.89	7				0.2	K	1	K
820017	9/1/1993		7				0.2	K	1	K
820017	10/5/1993		6				0.2	K	1	K
820017	5/10/1994		9				0.2	K	1	K
820017	7/5/1994		7				0.2	K	1	K
820017	8/2/1994		7				0.2	K	1	K
820017	9/6/1994		7				0.2	K	1	K
820017	10/4/1994		7				0.2	K	1	K
820017	5/9/1995		7				0.2	K	1	K
820017	7/11/1995		6				0.2	K	1	K
820017	8/1/1995		9				0.2	K	1	K
820017	9/5/1995		7				0.2	K	1.1	
820017	10/10/1995		7				0.2	K	1	K
820017	5/21/1996		8							
820017	6/11/1997		9							
820017	8/13/1997		7							
820017	10/7/1997		7							
820017	6/17/1998		8				0.008		0.89	
820017	7/21/1998		6				0.007		0.513	
820017	9/3/1998		8						0.578	
820017	10/7/1998		7				0.012		0.795	
820017	11/3/1998		7				0.013		0.66	
820017	4/22/1999		6				0.003		0.412	
820017	5/11/1999		7				0.006		0.397	
820017	6/10/1999		7				0.001		0.355	
820017	7/6/1999		8				0.005		0.56	
820017	8/5/1999		7				0.006		0.533	
820017	9/16/1999		7				0.008		0.623	
820017	10/12/1999		6				0.013		0.7	
820017	11/16/1999		6				0.004		0.906	
820017	4/17/2000		7							
820017	5/22/2000		7							
820017	7/10/2000		9				0.007		0.3	CCB
820017	8/7/2000		10				0.007		0.31	
820017	9/21/2000		9				0.03		0.46	
820017	10/9/2000		7				0.007		0.33	
820017	10/17/2000		8				0.01		0.23	
820017	11/8/2000		8				0.01		0.3	
820017	4/10/2001		8		0.01	K	0.007		0.26	
820017	5/7/2001		8		0.01	K	0.01		0.31	
820017	6/11/2001		9		0.01	K	0.007		0.2	
820017	7/16/2001	1	8	4.8	0.01	K HT	0.006		0.11	
820017	8/14/2001	1	7	4.5	0.01	K	0.001		0.15	MBQC
820017	9/20/2001	1.1	9	4.8	0.01	K	0.009		0.39	
820017	10/10/2001	1	7	3.6	0.01	K	0.03		1.17	
820017	11/7/2001	1	7	3.5	0.01	K	0.002		0.38	
820017	4/10/2002	1	7	4.5	0.01	K	0.007		0.346	
820017	5/6/2002	1.1	9	4.8	0.01	K	0.009		0.313	
820017	6/10/2002	1	9	5.5	0.01	K	0.007		0.081	
820017	7/9/2002	1.1	8	5.7	0.01	K	0.005		0.083	
820017	8/12/2002	0.9	8	5.1	0.01	K	0.003		0.096	
820017	9/12/2002	1	7	4.3	0.01	K	0		0.187	
820017	10/8/2002	1.1	7	3.2	0.01	K	0.015		0.356	
820017	11/12/2002	1	8	4.1	0.01	K	0.017		0.432	
820017	5/21/2003	1.2	11	6.7		ND	0		0.422	ISQC
820017	6/18/2003	1.1	9	4.2			0		0.235	
820017	7/23/2003	1.1	8	5.6			0		0.235	
820017	8/20/2003	1	7	4.9			0		0.226	
820017	9/17/2003	1.1	8	5.5			0.002		0.202	
820017	10/20/2003	3.4	11	5.6			0.009		0.506	
820017	11/11/2003	1.1	7	3.7			0.014		0.34	
820017	4/28/2004	1.1	8	4.2			0.013		0.353	
820017	5/19/2004	1.2	9	4.6			0.01		0.282	

TABLE A-1. Water Quality Data - Detroit River Downstream Station.

Station	Date	Potassium (mg/l)	Chloride (mg/l)	Sodium (mg/L)	Sulfide (mg/L)	Cadmium (ug/l)	Chromium (ug/L)
820017	6/16/2004	1.1	8	5.4		0.009	0.29
820017	7/14/2004	1.4	9	4.9		0.008	0.237
820017	8/17/2004	1	9	4.2		0.011	0.346
820017	9/22/2004	1.1	8	5.7		0.01	0.206
820017	10/13/2004	1	6	4.8		0.01	0.2
820017	11/3/2004	1	7	4.6		0.012	0.399

ND	Observed result was below the quantification level.
A	Value reported is the mean of two or more determinations.
HT	Recommended laboratory holding time was exceeded before analysis.
K	Observed result was below the level of quantitation shown.
T	Value reported is less than the quantification level.
SLRS	SLRS control exceeded quality control criteria.
MBQC	Method blank exceeded level of detection.
CCV	Continuing calibration standard exceeded quality control criteria.
LCQC	Laboratory control exceeded quality control criteria.
MS	Matrix spike exceeded quality control criteria.
MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.
W	Observed result was below the lowest normally reportable value shown.

TABLE A-1. Water Quality Data - Detroit River Downstream Station.

Station	Date	Copper (ug/L)		Lead (ug/L)		Nickel (ug/L)		Zinc (ug/L)		Mercury (ng/L)	
820017	5/5/1992	1		1	K	2	K	6.6		0.2	K
820017	7/7/1992	2.3		1	K	2	K	4	K	0.2	K
820017	9/1/1992	1.2		1.2		2	K	4	K	0.2	K
820017	10/6/1992	1	K	1	K	2	K	4	K	0.2	K
820017	5/11/1993	1.3		1	K	2	K	4	K	0.2	K
820017	7/13/1993	1.6		1	K	2	K	4	K	0.2	K
820017	8/10/1993	1.8		1	K	2	K	6		0.2	K
820017	9/1/1993	1	K	1	K	2	K	4	K	0.2	K
820017	10/5/1993	1	K	1	K	2	K	4	K	0.2	K
820017	5/10/1994	1	K	1	K	2	K	17		0.2	K
820017	7/5/1994	1	K	1	K	2	K	4	K	0.2	K
820017	8/2/1994	1	K	1	K	2	K	5		0.2	K
820017	9/6/1994	1	K	1	K	2	K	5		0.2	K
820017	10/4/1994	1	K	1	K	2	K	4	K	0.2	K
820017	5/9/1995	1	K	1	K	2	K	4	K	0.2	K
820017	7/11/1995	1	K	1	K	2	K	15		0.2	K
820017	8/1/1995	1	K	1	K	2	K	4	K	0.2	K
820017	9/5/1995	1	K	1	K	2	K	10		0.2	K
820017	10/10/1995	1	K	1	K	2	K	4	K	0.2	K
820017	5/21/1996										
820017	6/11/1997										
820017	8/13/1997										
820017	10/7/1997										
820017	6/17/1998	0.693		0.174		2.31		0.678		1.55	
820017	7/21/1998	0.807		0.294		1.19		1.21		2.41	
820017	9/3/1998	0.665		0.12		1.32		0.54		0.846	
820017	10/7/1998	0.805		0.326		1.65		1.27		2.52	
820017	11/3/1998	0.667		0.144		1.49		0.637		1.09	
820017	4/22/1999	0.611		0.155		1.10		0.671		4.12	
820017	5/11/1999	0.657		0.167		1.09		0.668		3.08	
820017	6/10/1999	0.637		0.114		1.05		0.608		5.30	
820017	7/6/1999	0.738		0.229		1.34		1.27		8.05	
820017	8/5/1999	0.622		0.179		1.14		0.58		5.47	
820017	9/16/1999	0.707		0.264		1.31		0.948		3.51	
820017	10/12/1999	0.701		0.302		1.29		1.09		3.82	
820017	11/16/1999	0.762		0.294		1.47		1.08		3.50	
820017	4/17/2000										
820017	5/22/2000										
820017	7/10/2000	0.9		0.176		1		0.68		0.83	
820017	8/7/2000	0.84		0.218		0.94		0.9	SLRS	1.11	
820017	9/21/2000	0.95		0.403		1.34		1.93		2.78	
820017	10/9/2000	0.66		0.169		0.96		0.78		1.95	
820017	10/17/2000	0.59		0.114		0.93		25.2		1.05	
820017	11/8/2000	0.6		0.189		0.97		0.8		1.59	
820017	4/10/2001	0.67		0.118		1.04		3.88		0.52	
820017	5/7/2001	0.64		0.188		0.9		0.78		1.18	BSQC
820017	6/11/2001	0.52		0.159		1.08		0.59		0.69	
820017	7/16/2001	0.676		0.228		0.97		0.806		0.98	
820017	8/14/2001	0.661		0.179		0.89		0.708		0.58	
820017	9/20/2001	0.789		0.425		1.3		1.74		1.84	
820017	10/10/2001	1.69		1.29		2.08		4.46		10.99	
820017	11/7/2001	0.668		0.313		1.07		1.28		2.12	
820017	4/10/2002	0.731		0.203		0.909		0.97		1.4	
820017	5/6/2002	0.672		0.226		1.05		1.13	LCQC	1.18	
820017	6/10/2002	0.705		0.21		0.887		0.69		1.41	
820017	7/9/2002	0.674		0.171		0.762		2.57		0.73	
820017	8/12/2002	1.28		0.276		0.854		2.24		1.82	
820017	9/12/2002	0.842	CCB	0.229		0.893		1.21		0.87	MS
820017	10/8/2002	0.675		0.295		1.15		2.06		1.98	
820017	11/12/2002	0.834		0.413		1.37		2.5		2.52	
820017	5/21/2003	0.987		0.446		1.31		2.04	LCQC	3.43	
820017	6/18/2003	0.87	ICB, MBQC, LCQC	0.167		0.967		1.26		0.99	
820017	7/23/2003	0.612		0.213		1.02		1.15		0.8	
820017	8/20/2003	0.724		0.205		0.806		0.76		3.55	
820017	9/17/2003	0.629		0.166		0.878		1.34		0.99	
820017	10/20/2003	1.15	CCB	0.548		1.48		3.02		4.15	BSQC
820017	11/11/2003	0.897		0.461		1.29		2.06	MBQC	4.11	
820017	4/28/2004	0.911		0.276		1.76		1.62		1.6	
820017	5/19/2004	0.749		0.224		0.976		1.29	CCV	2.29	

TABLE A-1. Water Quality Data - Detroit River Downstream Station.

Station	Date	Copper (ug/L)		Lead (ug/L)		Nickel (ug/L)		Zinc (ug/L)		Mercury (ng/L)	
820017	6/16/2004	0.814		0.216		0.952		2.97		0.99	
820017	7/14/2004	0.755		0.237		0.896		1.22		1.1	MSD
820017	8/17/2004	0.803		0.305		1		2.48	MBQC	2.25	
820017	9/22/2004	0.731		0.246		0.949		2.89		1.74	
820017	10/13/2004	0.677		0.268		0.973		1.14		2.01	
820017	11/3/2004	0.906		0.406		1.19		1.98	CCV	3.95	

ND	Observed result was below the quantification level.
A	Value reported is the mean of two or more determinations.
HT	Recommended laboratory holding time was exceeded before analysis.
K	Observed result was below the level of quantitation shown.
T	Value reported is less than the quantification level.
SLRS	SLRS control exceeded quality control criteria.
MBQC	Method blank exceeded level of detection.
CCV	Continuing calibration standard exceeded quality control criteria.
LCQC	Laboratory control exceeded quality control criteria.
MS	Matrix spike exceeded quality control criteria.
MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.
W	Observed result was below the lowest normally reportable value shown.

TABLE A-1. Water Quality Data - Detroit River Downstream Station.

Station	Date	Total DDT (ng/L)	Total PCB (ng/L)	Total CN (mg/L)
820017	5/5/1992			
820017	7/7/1992			
820017	9/1/1992			
820017	10/6/1992			
820017	5/11/1993			
820017	7/13/1993			
820017	8/10/1993			
820017	9/1/1993			
820017	10/5/1993			
820017	5/10/1994			
820017	7/5/1994			
820017	8/2/1994			
820017	9/6/1994			
820017	10/4/1994			
820017	5/9/1995			
820017	7/11/1995			
820017	8/1/1995			
820017	9/5/1995			
820017	10/10/1995			
820017	5/21/1996			
820017	6/11/1997			
820017	8/13/1997			
820017	10/7/1997			
820017	6/17/1998	0.182	2.056	
820017	7/21/1998			
820017	9/3/1998	0.361	6.079	
820017	10/7/1998			
820017	11/3/1998			
820017	4/22/1999		2.040	
820017	5/11/1999			
820017	6/10/1999	0.370	3.369	
820017	7/6/1999			
820017	8/5/1999	0.270	4.620	
820017	9/16/1999		2.981	
820017	10/12/1999			
820017	11/16/1999			
820017	4/17/2000			
820017	5/22/2000			
820017	7/10/2000			
820017	8/7/2000			
820017	9/21/2000			
820017	10/9/2000			
820017	10/17/2000		0.696	
820017	11/8/2000			
820017	4/10/2001			
820017	5/7/2001			
820017	6/11/2001			
820017	7/16/2001			
820017	8/14/2001			
820017	9/20/2001		3.691	
820017	10/10/2001			
820017	11/7/2001			
820017	4/10/2002			
820017	5/6/2002			
820017	6/10/2002			
820017	7/9/2002			
820017	8/12/2002			
820017	9/12/2002		2.097	
820017	10/8/2002			
820017	11/12/2002			
820017	5/21/2003			ND
820017	6/18/2003			
820017	7/23/2003			
820017	8/20/2003		0.374	
820017	9/17/2003			
820017	10/20/2003			
820017	11/11/2003			
820017	4/28/2004			ND
820017	5/19/2004			

TABLE A-1. Water Quality Data - Detroit River Downstream Station.

Station	Date	Total DDT (ng/L)	Total PCB (ng/L)	Total CN (mg/L)
820017	6/16/2004			
820017	7/14/2004			
820017	8/17/2004			
820017	9/22/2004			
820017	10/13/2004			
820017	11/3/2004			

ND	Observed result was below the quantification level.
A	Value reported is the mean of two or more determinations.
HT	Recommended laboratory holding time was exceeded before analysis.
K	Observed result was below the level of quantitation shown.
T	Value reported is less than the quantification level.
SLRS	SLRS control exceeded quality control criteria.
MBQC	Method blank exceeded level of detection.
CCV	Continuing calibration standard exceeded quality control criteria.
LCQC	Laboratory control exceeded quality control criteria.
MS	Matrix spike exceeded quality control criteria.
MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.
W	Observed result was below the lowest normally reportable value shown.

TABLE A-2. Water Quality Data - Detroit River Upstream Station

Station	Date	Temp (Celsius)	Turbidity (NTU)		Field Conductivity (umol/cm)	Lab Conductivity (umol/cm)	Field DO (mg/l)
820414	5/5/1992	8.8	1.9			218	
820414	7/7/1992	19.0	1.6			219	
820414	8/4/1992	19.7	3			220	8.7
820414	9/1/1992	19.1	1.7			219	8.8
820414	10/6/1992	14.5	2.6			257	8.8
820414	5/11/1993	13.0	2.1			250	11.6
820414	7/13/1993	20.0	0.8		206	220	9.4
820414	8/10/1993	21.5	1.4		215	220	7.9
820414	9/1/1993	22.6	1.3		213	207	7.6
820414	10/5/1993	12.4	6.5		208	208	9.7
820414	5/10/1994	9.2	0.8		199	216	10.3
820414	7/5/1994	20.9	0.9		205	213	7.5
820414	8/2/1994	23.0	0.9		226	227	7.9
820414	9/6/1994	19.4			216	208	7.7
820414	10/4/1994	14.9	2		203	217	9.7
820414	5/9/1995		25			241	
820414	7/11/1995	19.7	0.90		198	216	10
820414	8/1/1995	24.6	0.7			214	9.2
820414	9/5/1995	22.6	1.2		194	214	8.2
820414	10/10/1995	14.8	3.7		210	215	9.6
820414	5/21/1996	12.3	2		213	213	13
820414	6/11/1997	17.6	2.4		230	241	13
820414	8/13/1997	21.4	1.3		218	226	7.6
820414	10/7/1997	17.2	1.2		221	213	9.10
820414	6/16/1998	18.2			211	221	9.9
820414	7/21/1998	24.5				217	
820414	9/2/1998	22.5	1.1		200	207	8.6
820414	10/7/1998	16.4	2.7		227	219	9.4
820414	11/3/1998	11.4	4.0		218	213	10.3
820414	4/21/1999	8.2	1	HT	210	212	11.6
820414	5/11/1999	14.8	1.9		298	225	10.4
820414	6/9/1999	19.2	0.8		216	213	9.30
820414	7/6/1999	22.5	1.8	HT	198	215	8.60
820414	8/4/1999	24.5	2.8		210	212	7.70
820414	9/15/1999	19.8	1.9		204	218	8.20
820414	10/12/1999	14.7	2.2		222	215	8.30
820414	11/16/1999	7.6	12		219	219	10.2
820414	4/17/2000	6.2	29	HT	213	218	
820414	5/22/2000	14.2	11		253	239	9.9
820414	7/10/2000	20.4	0.7		213	219	9.3
820414	8/7/2000	21.4	0.6		222	213	8.8
820414	9/20/2000	17.9	6.2		216	224	9.1
820414	10/9/2000	12.3	9.5		208	217	10.2
820414	11/8/2000	11.5	1.8		213	219	
820414	4/10/2001	5.9	2.9		178	227	13
820414	5/7/2001	14.4	31		266	272	10
820414	6/11/2001	17	0.8		234	240	11.1
820414	7/16/2001	22.5	3		192	222	10.5
820414	8/14/2001	23.9	6.5		203	210	7.7
820414	9/19/2001	19.2	5.1		208	215	9.1
820414	10/10/2001	12.4	4.6		189	214	
820414	11/7/2001	9.7	6.4		183	216	11
820414	4/10/2002	3.8	1.9		238	228	16.1
820414	5/6/2002	9.7	1.8		213	220	11.8
820414	6/10/2002	17.4	0.5	K	229	244	11.4
820414	7/9/2002	23.5	0.5	K	230	231	8.2
820414	8/12/2002	23.6	3.9		177	217	8.3
820414	9/11/2002	22	7.2		209	217	8.1
820414	10/8/2002	16.4	14		209	218	7.6
820414	5/21/2003	11.86	28		220	220	10.53
820414	6/18/2003	17.87	2.5		226	231	9.73
820414	7/23/2003	19.8	1		215	217	9.57
820414	8/21/2003	23.6	2.7		211	214	8
820414	9/17/2003	21.04	3		214	222	9.36
820414	10/20/2003	11.32	3.8		210	234	10.5
820414	4/28/2004	7.66	5.1		217	220	11.93
820414	5/19/2004	13.96	4.6		218	224	10.12
820414	6/16/2004	18.55	3.5		232	223	9.58
820414	7/14/2004	22.05		ND	232	243	8.94

TABLE A-2. Water Quality Data - Detroit River Upstream Station

Station	Date	Temp (Celsius)	Turbidity (NTU)	Field Conductivity (umol/cm)	Lab Conductivity (umol/cm)	Field DO (mg/l)
820414	8/17/2004	20.79	2	211	218	9.61
820414	9/22/2004	19.2	3.9	215	224	8.99
820414	10/13/2004	14.37	13	218	218	9.85
820414	11/3/2004	11.42	24	216	215	8.06

ND	Observed result was below the quantification level.
A	Value reported is the mean of two or more determinations.
HT	Recommended laboratory holding time was exceeded before analysis.
K	Observed result was below the level of quantitation shown.
T	Value reported is less than the quantification level.
SLRS	SLRS control exceeded quality control criteria.
MBQC	Method blank exceeded level of detection.
CCV	Continuing calibration standard exceeded quality control criteria.
LCQC	Laboratory control exceeded quality control criteria.
MS	Matrix spike exceeded quality control criteria.
MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.
W	Observed result was below the lowest normally reportable value shown.

TABLE A-2. Water Quality Data - Detroit River Upstream Station

Station	Date	Lab DO (mg/l)		Field pH	Lab pH		Alkalinity (mg/l)		Total Dissolved Solids (mg/l)		Suspended Solids (mg/l)	
820414	5/5/1992						71		142	C	4	K
820414	7/7/1992						76		142	C	4	K
820414	8/4/1992						77		151	C	8	
820414	9/1/1992						76		142	C	4	
820414	10/6/1992						94		167	C	4	K
820414	5/11/1993			8.2	8.29		84		170	C	8	
820414	7/13/1993			8			80		143	C	4	K
820414	8/10/1993			7.8			72		143	C	4	K
820414	9/1/1993			7.8			73		140	C	5	
820414	10/5/1993			7.7			71		145	C	10	
820414	5/10/1994			7.9			79		140		4	K
820414	7/5/1994			8.0	8.13		77		142		4	
820414	8/2/1994			7.9			78		148		4	K
820414	9/6/1994			8.3			69		141		6	
820414	10/4/1994				8.18		74		154		13	
820414	5/9/1995				8.14		74		246		89	
820414	7/11/1995			8			71		140		4	K
820414	8/1/1995			7.9			77		139		4	
820414	9/5/1995			8			72		147		8	A
820414	10/10/1995			7.8			77		148		8	A
820414	5/21/1996			8.1	8.13		80		138		4	K
820414	6/11/1997				7.96		80		157		6	
820414	8/13/1997				8.5	Q	66		147		4	K
820414	10/7/1997				8.2		76		138		4	K
820414	6/16/1998			8.1	8.3				144		8	HT
820414	7/21/1998		8.4		8.2				141		8	A
820414	9/2/1998			7.6	8.4				135		4	K
820414	10/7/1998			7.5	8.2				142		14	
820414	11/3/1998			7.9	8.2				138		40	
820414	4/21/1999			8.00	8.26				138	C	4	K
820414	5/11/1999			8.20	8.22				146	C	4	K
820414	6/9/1999			8.10	8.24				138	C	6	
820414	7/6/1999			7.50	8.22				140	C	4	K
820414	8/4/1999			7.90	8.39				138	C	4	K
820414	9/15/1999			7.80	8.39				142	C	4	K
820414	10/12/1999			7.50	8.26				140	C	4	K
820414	11/16/1999			7.40	7.97				142	C	33	
820414	4/17/2000		12.3	7.3	7.78				140		39	
820414	5/22/2000			7.9	8.13				155		12	
820414	7/10/2000			8	8.42		83		142		5	
820414	8/7/2000		9.6	7.9	8.34		68	HT	140		4	
820414	9/20/2000			7.6	8.23		75		150		13	
820414	10/9/2000			7.8	8.18		71		140		5	
820414	11/8/2000		10.5	8.1	8.32		72		140		6	
820414	4/10/2001			7.9	8.1		72		150		4	A
820414	5/7/2001			8.3	8.2		89		180		48	
820414	6/11/2001			8.3	8.48		74		160		2	K
820414	7/16/2001			8.4	8.64		67		140		6	
820414	8/14/2001			8.4	8.44		75		140		16	
820414	9/19/2001			8.1	8.19		78		140		12	
820414	10/10/2001	10	HT	7.9	8.08		65		140		11	
820414	11/7/2001			7.9	7.97		70		140		7	
820414	4/10/2002	13		8.1	7.84		78		150		2	K
820414	5/6/2002	11.3		8.1	7.98		74		140		7	
820414	6/10/2002	9.92		8.3	8.14		78		160		4	
820414	7/9/2002	8.52		8.2	8.23		76		150		2	K
820414	8/12/2002			7.9	8.5		69		140		10	
820414	9/11/2002	8.24		8.1	8.36		69		140		11	
820414	10/8/2002	8.8		7.7	8.29		73		140		13	
820414	5/21/2003			8.1	8.17		77		140		62	
820414	6/18/2003			8.13	8.38		68		150		4	
820414	7/23/2003			8.05	8.37		63		140		4	
820414	8/21/2003			8.3	8.61		69		140		8	
820414	9/17/2003			7.86	8.22		76		140			ND
820414	10/20/2003			7.62	8.18	H	75		150		6	
820414	4/28/2004			7.35	8.22		77		140		7	
820414	5/19/2004			7.27	8.29		76		150		7	
820414	6/16/2004	9.5	HT	7.63	8.34		79		140			ND
820414	7/14/2004			8.37	8.56		75		160			ND

TABLE A-2. Water Quality Data - Detroit River Upstream Station

Station	Date	Lab DO (mg/l)	Field pH	Lab pH	Alkalinity (mg/l)	Total Dissolved Solids (mg/l)	Suspended Solids (mg/l)
820414	8/17/2004		8.36	8.56	74	140	ND
820414	9/22/2004	8.66	7.94	8.21	75	150	5
820414	10/13/2004		7.69	8.07	72	140	23
820414	11/3/2004		7.63	8.09	72	140	30

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HT	Recommended laboratory holding time was exceeded before analysis.
K	Observed result was below the level of quantitation shown.
T	Value reported is less than the quantification level.
SLRS	SLRS control exceeded quality control criteria.
MBQC	Method blank exceeded level of detection.
CCV	Continuing calibration standard exceeded quality control criteria.
LCQC	Laboratory control exceeded quality control criteria.
MS	Matrix spike exceeded quality control criteria.
MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.
W	Observed result was below the lowest normally reportable value shown.

TABLE A-2. Water Quality Data - Detroit River Upstream Station

Station	Date	Ammonia (mg/l)		Nitrite (mg/l)		Nitrate (mg/l)		TKN (mg/l)	
820414	5/5/1992	0.014		0.004		0.366	C		
820414	7/7/1992	0.026		0.004		0.316	C		
820414	8/4/1992	0.016		0.005		0.365	C		
820414	9/1/1992	0.023		0.004		0.306	C		
820414	10/6/1992	0.022		0.007		0.623	C		
820414	5/11/1993	0.015		0.006		0.664	C		
820414	7/13/1993	0.017		0.004		0.306	C		
820414	8/10/1993	0.034		0.005		0.275	C	0.220	
820414	9/1/1993	0.028		0.005		0.525	C		
820414	10/5/1993	0.022		0.004		0.276			
820414	5/10/1994	0.014		0.004		0.316	C		
820414	7/5/1994	0.017		0.004		0.346	C		
820414	8/2/1994	0.021		0.009		0.621	C		
820414	9/6/1994	0.019		0.003		0.247	C		
820414	10/4/1994	0.017		0.003		0.597	C		
820414	5/9/1995	0.018		0.006		0.624	C		
820414	7/11/1995	0.009	T	0.003		0.377	C		
820414	8/1/1995	0.005	T	0.004		0.246	C		
820414	9/5/1995	0.017		0.004		0.236	C		
820414	10/10/1995	0.026		0.004		0.276	C		
820414	5/21/1996	0.011		0.005		0.445	C		
820414	6/11/1997	0.013		0.006		0.504	C		
820414	8/13/1997	0.016		0.004		0.306	C		
820414	10/7/1997	0.015		0.003		0.267	C		
820414	6/16/1998	0.012		0.004		0.320		0.200	
820414	7/21/1998	0.021		0.005		0.300		0.140	
820414	9/2/1998	0.010	HT	0.003		0.220	HT	0.190	HT
820414	10/7/1998	0.032		0.004		0.260		0.210	
820414	11/3/1998	0.012		0.004		0.260		0.320	HT
820414	4/21/1999	0.004	T	0.002		0.360	C	0.120	
820414	5/11/1999	0.011		0.004		0.530	C	0.180	
820414	6/9/1999	0.008	T	0.004		0.310	C	0.140	
820414	7/6/1999	0.019		0.005		0.300	C	0.230	
820414	8/4/1999	0.009	T	0.003		0.240	C	0.240	
820414	9/15/1999	0.015		0.003		0.260	C	0.150	
820414	10/12/1999	0.015		0.003		0.260	C	0.180	
820414	11/16/1999	0.012		0.004		0.280	C	0.140	
820414	4/17/2000	0.01	T			0.4	C	0.35	
820414	5/22/2000	0.008	T	0.008	HT	0.74	C HT	0.24	
820414	7/10/2000	0.012		0.004		0.38	C	0.14	
820414	8/7/2000	0.012		0.005		0.34		0.17	
820414	9/20/2000	0.024	HT	0.004		0.33	C HT	0.2	HT
820414	10/9/2000	0.021	HT	0.004	HT	0.32	C HT	0.17	HT
820414	11/8/2000	0.009	T	0.003		0.3	C	0.23	
820414	4/10/2001	0.012		0.003		0.45	C	0.16	
820414	5/7/2001	0.01		0.006		1.09	C	0.34	
820414	6/11/2001	0.012		0.005		0.5	C	0.15	
820414	7/16/2001	0.011		0.005		0.34	C	0.19	
820414	8/14/2001	0.017		0.005		0.22	C	0.16	
820414	9/19/2001	0.015		0.003		0.27	C	0.15	
820414	10/10/2001	0.019		0.003		0.3	C	0.16	
820414	11/7/2001	0.018		0.003		0.31	C	0.14	
820414	4/10/2002	0.012		0.003		0.47	C	0.15	
820414	5/6/2002	0.005	T	0.004		0.4	C	0.18	
820414	6/10/2002	0.009	T	0.005		0.67	C	0.18	
820414	7/9/2002	0.012		0.007		0.41	C	0.17	
820414	8/12/2002	0.013		0.004		0.26	C	0.16	
820414	9/11/2002	0.015		0.005		0.28	C	0.18	
820414	10/8/2002	0.017		0.008		0.29	C	0.18	
820414	5/21/2003	0.009	T	0.004	T	0.39		0.3	
820414	6/18/2003	0.012		0.006		0.48		0.17	
820414	7/23/2003	0.014		0.005		0.3		0.21	
820414	8/21/2003	0.011		0.005		0.21		0.34	
820414	9/17/2003	0.023		0.008		0.27		0.24	
820414	10/20/2003	0.018		0.004		0.29		0.19	
820414	4/28/2004	0.011		0.005		0.41		0.19	HT
820414	5/19/2004	0.004	T	0.006		0.44		0.15	
820414	6/16/2004	0.012		0.005		0.42		0.21	
820414	7/14/2004	0.011		0.009		0.67		0.25	

TABLE A-2. Water Quality Data - Detroit River Upstream Station

Station	Date	Ammonia (mg/l)	Nitrite (mg/l)		Nitrate (mg/l)	TKN (mg/l)
820414	8/17/2004	0.013	0.005		0.25	0.16
820414	9/22/2004	0.028	0.004		0.33	0.25
820414	10/13/2004	0.03	0.007		0.28	1.41
820414	11/3/2004	0.024	0.008	PI	0.29	0.28

ND	Observed result was below the quantification level.
A	Value reported is the mean of two or more determinations.
HT	Recommended laboratory holding time was exceeded before analysis.
K	Observed result was below the level of quantitation shown.
T	Value reported is less than the quantification level.
SLRS	SLRS control exceeded quality control criteria.
MBQC	Method blank exceeded level of detection.
CCV	Continuing calibration standard exceeded quality control criteria.
LCQC	Laboratory control exceeded quality control criteria.
MS	Matrix spike exceeded quality control criteria.
MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory re
C	Value calculated from other independent parameters.
W	Observed result was below the lowest normally reportable value shown.

TABLE A-2. Water Quality Data - Detroit River Upstream Station

Station	Date	NO2+NO3 (mg/l)	Total Phosphorus (mg/l)		Total Orthophosphate (mg/l)		TOC (mg/l)	Sulfate (mg/l)		Hardness (mg/l)	
820414	5/5/1992	0.370	0.003							96	
820414	7/7/1992	0.320	0.010							88	
820414	8/4/1992	0.370	0.010							98	
820414	9/1/1992	0.310	0.006							94	
820414	10/6/1992	0.630	0.012							105	
820414	5/11/1993	0.670	0.007							104	
820414	7/13/1993	0.310	0.008							98	
820414	8/10/1993	0.280	0.012							98	
820414	9/1/1993	0.530	0.011							97	
820414	10/5/1993	0.280	0.014							104	
820414	5/10/1994	0.320	0.004	T						92	
820414	7/5/1994	0.350	0.009							97	
820414	8/2/1994	0.630	0.011		0.001	T				104	
820414	9/6/1994	0.250	0.010							94	
820414	10/4/1994	0.600	0.014							99	
820414	5/9/1995	0.630	0.060							110	
820414	7/11/1995	0.380	0.007		0.001	W				94	
820414	8/1/1995	0.250	0.003	T	0.001	W				89	
820414	9/5/1995	0.240	0.052		0.002	T				99	
820414	10/10/1995	0.280	0.013		0.003					97	
820414	5/21/1996	0.450	0.011		0.001	T				97	
820414	6/11/1997	0.510	0.008		0.001	T				94	
820414	8/13/1997	0.310	0.010		0.001	T				94	
820414	10/7/1997	0.270	0.009		0.001	T				89	
820414	6/16/1998	0.324	0.010		0.003		3	14	HT	92	HT
820414	7/21/1998	0.305	0.014		0.002		2	10		93	A
820414	9/2/1998	0.223	0.011	HT	0.001		1.9	11		90	
820414	10/7/1998	0.264	0.015		0.004		2	11		97	
820414	11/3/1998	0.264	0.042	HT	0.005		2	12		93	
820414	4/21/1999	0.362	0.010		0.002	T	1.70	14		93	
820414	5/11/1999	0.534	0.015		0.004		2.00	16		101	
820414	6/9/1999	0.314	0.010		0.001	T	1.60	10		96	
820414	7/6/1999	0.305	0.014		0.005		2.20	14		92	
820414	8/4/1999	0.243	0.014		0.007		1.90	15		96	
820414	9/15/1999	0.263	0.009		0.002	T	2.40	14		96	
820414	10/12/1999	0.263	0.008		0.003		2.10	15		96	
820414	11/16/1999	0.284	0.030		0.008		2.00	16		100	
820414	4/17/2000		0.05		0.01		2.5	10		107	
820414	5/22/2000		0.02		0.005		2.5	16		108	
820414	7/10/2000		0.008		0.007		1.8	14		99	
820414	8/7/2000		0.008		0.001	T	2.2	13		99	
820414	9/20/2000		0.02	HT	0.002	T HT	1.9	14		108	
820414	10/9/2000		0.015	HT	0.003		2	13		102	
820414	11/8/2000		0.008		0.004		1.8	15		99	
820414	4/10/2001		0.009		0.007	HT	1.7	13		97	
820414	5/7/2001		0.064		0.001	W	2.2	17		118	
820414	6/11/2001		0.011		0.006		2.3	15		100	
820414	7/16/2001		0.007		0.006		2.2	15		101	
820414	8/14/2001		0.018		0.004		1.9	13		94	
820414	9/19/2001		0.013		0.004		2	14		98	
820414	10/10/2001		0.009		0.004		1.9	12		95	
820414	11/7/2001		0.014		0.012		1.6	15		97	
820414	4/10/2002		0.006		0.007		1.8	15		101	
820414	5/6/2002		0.009		0.002	T HT	1.8	14		101	
820414	6/10/2002		0.01		0.01		2	16		107	
820414	7/9/2002		0.012		0.002		1.9	15		102	
820414	8/12/2002		0.013		0.006		1.8	14		94	
820414	9/11/2002		0.015		0.005		1.6	10		104	
820414	10/8/2002		0.018		0.021		2.2	12		102	
820414	5/21/2003		0.047		0.001	T	1.9	11		99	
820414	6/18/2003		0.011		0.004		3.9	14		103	
820414	7/23/2003		0.009		0.003		1.7	15		93	
820414	8/21/2003		0.011			W ND	2.9	13		95	
820414	9/17/2003		0.01		0.004		2.1	14		99	
820414	10/20/2003		0.014		0.002	T	3.4	11		94	
820414	4/28/2004		0.009	HT	0.001	T	1.8	12		99	
820414	5/19/2004		0.012		0.004		1.8	14		92	
820414	6/16/2004		0.012		0.002	T	2.1	13		101	
820414	7/14/2004		0.011		0.001	T	2.9	15		107	

TABLE A-2. Water Quality Data - Detroit River Upstream Station

Station	Date	NO2+NO3 (mg/l)	Total Phosphorus (mg/l)	Total Orthophosphate (mg/l)	TOC (mg/l)	Sulfate (mg/l)	Hardness (mg/l)
820414	8/17/2004		0.009	0.001 T	2.1	14	99.9
820414	9/22/2004		0.014	0.003	2	16	99
820414	10/13/2004		0.059	0.01	2.1	14	102
820414	11/3/2004		0.036	0.013	2	13	98

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K	Observed result was below the level of quantitation shown.
T	Value reported is less than the quantification level.
SLRS	SLRS control exceeded quality control criteria.
MBQC	Method blank exceeded level of detection.
CCV	Continuing calibration standard exceeded quality control criteria.
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MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.
W	Observed result was below the lowest normally reportable value shown.

TABLE A-2. Water Quality Data - Detroit River Upstream Station

Station	Date	Calcium (mg/l)	Magnesium (mg/l)	Potassium (mg/l)		Chloride (mg/l)	Sodium (mg/L)	Sulfide (mg/L)	
820414	5/5/1992	26.5	7.2			6			
820414	7/7/1992	23.5	7.1			6			
820414	8/4/1992	26.8	7.5			6			
820414	9/1/1992	25.4	7.3	0.67		7			
820414	10/6/1992	28.8	8.1			10			
820414	5/11/1993	28	8.3			9			
820414	7/13/1993	27	7.5			6			
820414	8/10/1993	27.2	7.4	0.9		7			
820414	9/1/1993	27	7.2			6			
820414	10/5/1993	28.9	7.8			5			
820414	5/10/1994	25.5	6.9			6			
820414	7/5/1994	27.1	7.2			6			
820414	8/2/1994	28.4	7.9			8			
820414	9/6/1994	26	7			6			
820414	10/4/1994	27.6	7.3			6			
820414	5/9/1995	31.5	7.5			7			
820414	7/11/1995	25.8	7.2			6			
820414	8/1/1995	23.6	7.2			6			
820414	9/5/1995	27.8	7.2			6			
820414	10/10/1995	26.1	7.60			6			
820414	5/21/1996	26.8	7.3			6			
820414	6/11/1997	25.4	7.3			7			
820414	8/13/1997	25.6	7.2			6			
820414	10/7/1997	24.7	6.7			6			
820414	6/16/1998	24.1	7.80			6			
820414	7/21/1998	24.7	7.50			6			
820414	9/2/1998	24.5	7.10			6			
820414	10/7/1998	26.2	7.60			6			
820414	11/3/1998	25.4	7.20			6			
820414	4/21/1999	25.7	7.10			6			
820414	5/11/1999	27.5	7.80			7			
820414	6/9/1999	26	7.60			6			
820414	7/6/1999	24.8	7.20			6			
820414	8/4/1999	26	7.50			6			
820414	9/15/1999	26.1	7.40			6			
820414	10/12/1999	26.7	7.20			6			
820414	11/16/1999	27.8	7.30			6			
820414	4/17/2000	28.8	8.6			6			
820414	5/22/2000	30.1	8.1			8			
820414	7/10/2000	27.7	7.2			6			
820414	8/7/2000	28	7.1			7			
820414	9/20/2000	29.8	8			6			
820414	10/9/2000	28.8	7.3			7			
820414	11/8/2000	27.4	7.5			6			
820414	4/10/2001	26.5	7.4			7		0.01	K
820414	5/7/2001	33	8.7			10		0.01	K PI
820414	6/11/2001	27.3	7.8			8		0.01	K
820414	7/16/2001	28.1	7.9	0.9		8	4.3	0.01	K HT
820414	8/14/2001	25.7	7.3	0.9		6	3.9	0.01	K
820414	9/19/2001	26.7	7.6	0.9		6	3.7	0.01	K
820414	10/10/2001	25.6	7.5	0.9		6	3.3	0.01	K
820414	11/7/2001	26.6	7.4	0.9		6	2.9	0.01	K
820414	4/10/2002	27.4	8	1		7	4.4	0.01	K
820414	5/6/2002	27.8	7.7	1		7	4.8	0.01	K
820414	6/10/2002	29	8.3	1		8	5.3	0.01	K
820414	7/9/2002	27.3	8.1	1.1		7	5.3	0.01	K
820414	8/12/2002	25.1	7.7	0.9		7	4	0.01	K
820414	9/11/2002	28.7	7.8	0.9		6	3.5	0.01	K
820414	10/8/2002	28.1	7.8	1		6	3.1	0.01	K
820414	5/21/2003	26.8	7.7	1		7	3.5		ND
820414	6/18/2003	28.2	7.9	1		8	4.1		
820414	7/23/2003	24.8	7.4	1		7	3.2		
820414	8/21/2003	25.3	7.7	0.9		6	3.3		
820414	9/17/2003	26.4	8	1.1		7	6.2		
820414	10/20/2003	25.7	7.2	5	D	10	4.8		
820414	4/28/2004	27.1	7.5	1		6	3.9		
820414	5/19/2004	24.9	7.3	1		6	2.6		
820414	6/16/2004	28.1	7.5	1		7	3.9		
820414	7/14/2004	29.3	8.1	1.3		9	5.6		

TABLE A-2. Water Quality Data - Detroit River Upstream Station

Station	Date	Calcium (mg/l)	Magnesium (mg/l)	Potassium (mg/l)	Chloride (mg/l)	Sodium (mg/L)	Sulfide (mg/L)
820414	8/17/2004	27.3	7.7	1	7	4.3	
820414	9/22/2004	27.8	7.2	1	7	5.8	
820414	10/13/2004	28.8	7.4	1	6	3.9	
820414	11/3/2004	27.1	7.4	1	6	3.4	

ND	Observed result was below the quantification level.
A	Value reported is the mean of two or more determinations.
HT	Recommended laboratory holding time was exceeded before analysis.
K	Observed result was below the level of quantitation shown.
T	Value reported is less than the quantification level.
SLRS	SLRS control exceeded quality control criteria.
MBQC	Method blank exceeded level of detection.
CCV	Continuing calibration standard exceeded quality control criteria.
LCQC	Laboratory control exceeded quality control criteria.
MS	Matrix spike exceeded quality control criteria.
MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.
W	Observed result was below the lowest normally reportable value shown.

TABLE A-2. Water Quality Data - Detroit River Upstream Station

Station	Date	Cadmium (ug/L)		Chromium (ug/L)		Copper (ug/L)		Lead (ug/L)		Nickel (ug/L)		Zinc (ug/L)	
820414	5/5/1992	0.2	K	1	K	1	K	1	K	2	K	2	K
820414	7/7/1992	0.2	K	1	K	1.5		1	K	2	K	2	K
820414	8/4/1992	0.2	K	1	K	1.4		1	K	2	K	5.6	
820414	9/1/1992	0.2	K	1	K	1.3		1	K	2	K	4.8	
820414	10/6/1992	0.2	K	1	K	1.1		1	K	2	K	2	K
820414	5/11/1993	0.2	K	1	K	1.5		1	K	2	K	2	K
820414	7/13/1993	0.2	K	1	K	1.4		1	K	2	K	2	K
820414	8/10/1993	0.2	K	1	K	1	K	1	K	2	K	2	K
820414	9/1/1993	0.2	K	1	K	1	K	1	K	2	K	2	K
820414	10/5/1993	0.2	K	1	K	1	K	1	K	2	K	2	K
820414	5/10/1994	0.2	K	1	K	1	K	1	K	2	K	2	K
820414	7/5/1994	0.2	K	1	K	1	K	1.3		2	K	7	
820414	8/2/1994	0.2	K	1	K	1	K	1	K	2	K	2	K
820414	9/6/1994	0.2	K	1	K	1	K	1	K	2	K	2	K
820414	10/4/1994	0.2	K	1	K	1	K	1	K	2	K	2	K
820414	5/9/1995	0.2	K	1	K	1	K	1	K	2	K	6	
820414	7/11/1995	0.2	K	1	K	1	K	1	K	2	K	7.7	
820414	8/1/1995	0.2	K	1	K	1	K	1	K	2	K	2	K
820414	9/5/1995	0.2	K	1	K	1	K	1	K	2	K	8	
820414	10/10/1995	0.2	K	1	K	1	K	1	K	2	K	6.6	
820414	5/21/1996												
820414	6/11/1997												
820414	8/13/1997												
820414	10/7/1997												
820414	6/16/1998	0.009		0.897		0.641		0.09		2.27		0.460	
820414	7/21/1998	0.009		0.599		0.644		0.189		1.18		0.709	
820414	9/2/1998	0.011		0.347		0.572		0.166		1.09		0.450	
820414	10/7/1998	0.008		0.866		0.879		0.395		1.67		1.32	
820414	11/3/1998	0.023		1.03		1.61		1.30		2.27		4.03	
820414	4/21/1999	0.012		0.500		0.626		0.129		1.11		0.616	
820414	5/11/1999	0.007		0.402		0.692		0.201		1.13		0.666	
820414	6/9/1999	0.001		0.336		0.606		0.094		1.04		0.525	
820414	7/6/1999	0.010		0.589		0.701		0.171		1.27		0.655	
820414	8/4/1999	0.014		0.844		0.974		0.425		1.64		1.75	
820414	9/15/1999	0.013		0.732		0.664		0.234		1.19		0.666	
820414	10/12/1999	0.012		0.776		0.685		0.268		1.22		0.787	
820414	11/16/1999	0.039		1.88		2.40		1.89		2.99		5.63	
820414	4/17/2000												
820414	5/22/2000												
820414	7/10/2000	0.005		0.25	CCB	0.6		0.088		1.1		0.38	
820414	8/7/2000	0.004		0.21		0.66		0.089		0.72		0.34	SLRS
820414	9/20/2000	0.02		0.45		0.84		0.387		1.26		1.25	
820414	10/9/2000	0.009		0.61		0.82		0.45		1.11		1.44	
820414	11/8/2000	0.01		0.2		0.5		0.114		0.87		0.42	
820414	4/10/2001	0.007		0.32		0.79		0.203		1.02		3.91	
820414	5/7/2001	0.03		1.63		2.14		1.54		2.61		5.28	
820414	6/11/2001	0.006		0.15		0.5		0.127		0.96		0.44	
820414	7/16/2001	0.006		0.13		0.716		0.218		0.94		0.672	
820414	8/14/2001	0.007		0.398	MBQC	0.925		0.484		1.16		1.53	
820414	9/19/2001	0.007		0.36		0.644		0.365		1.11		1.28	
820414	10/10/2001	0.005		0.34		0.669		0.302		1.13		2.03	
820414	11/7/2001	0.003		0.43		0.697		0.401		1.14		1.28	
820414	4/10/2002	0.001		0.262		0.677		0.116		0.859		0.77	
820414	5/6/2002	0.008		0.248		0.506		0.144		0.824		1.48	LCQC
820414	6/10/2002	0.006		0.096		0.661		0.143		0.842		0.47	
820414	7/9/2002	0.006		0.064		0.617		0.123		0.873		1.02	
820414	8/12/2002	0		0.107		1		0.246		0.869		0.93	
820414	9/11/2002	0.007		0.442		0.904	CCB	0.516		1.12		1.33	
820414	10/8/2002	0.022		0.737		1.11		0.784		1.62		2.96	
820414	5/21/2003	0.013		1.43	ISQC	1.91		1.66		2.41		5.61	LCQC
820414	6/18/2003	0		0.202		0.807	MBQC	0.143		0.854		1.43	
820414	7/23/2003	0		0.247		0.562		0.195		0.978		0.91	
820414	8/21/2003	0		0.164		0.613		0.151		0.731		0.49	
820414	9/17/2003	0.008		0.279		0.697		0.257		0.833		0.94	
820414	10/20/2003	0		0.168		0.594	CCB	0.25		0.939		1.2	
820414	4/28/2004	0.009		0.299		0.813		0.207		1.6		1.2	
820414	5/19/2004	0.009		0.295		0.665		0.239		0.916		1.15	CCV
820414	6/16/2004	0.008		0.292		0.69		0.226		0.889		0.94	
820414	7/14/2004	0.005		0.154		0.726		0.117		0.756		0.71	

TABLE A-2. Water Quality Data - Detroit River Upstream Station

Station	Date	Cadmium (ug/L)	Chromium (ug/L)	Copper (ug/L)	Lead (ug/L)	Nickel (ug/L)	Zinc (ug/L)	
820414	8/17/2004	0.007	0.217	0.601	0.165	0.759	0.84	MBQC
820414	9/22/2004	0.007	0.2	0.667	0.253	0.901	2.41	
820414	10/13/2004	0.015	0.53	1.04	0.707	1.46	2.52	
820414	11/3/2004	0.02	0.879	1.45	1	1.88	3.95	CCV

ND	Observed result was below the quantification level.
A	Value reported is the mean of two or more determinations.
HT	Recommended laboratory holding time was exceeded before analysis.
K	Observed result was below the level of quantitation shown.
T	Value reported is less than the quantification level.
SLRS	SLRS control exceeded quality control criteria.
MBQC	Method blank exceeded level of detection.
CCV	Continuing calibration standard exceeded quality control criteria.
LCQC	Laboratory control exceeded quality control criteria.
MS	Matrix spike exceeded quality control criteria.
MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.
W	Observed result was below the lowest normally reportable value shown.

TABLE A-2. Water Quality Data - Detroit River Upstream Station

Station	Date	Mercury (ng/L)		Total DDT (ng/L)	Total PCB (ng/L)	Total CN (mg/L)
820414	5/5/1992	0.2	K			
820414	7/7/1992	0.2	K			
820414	8/4/1992	0.2	K			
820414	9/1/1992	0.2	K			
820414	10/6/1992	0.2	K			
820414	5/11/1993	0.2	K			
820414	7/13/1993	0.2	K			
820414	8/10/1993	0.2	K			
820414	9/1/1993	0.2	K			
820414	10/5/1993	0.2	K			
820414	5/10/1994	0.2	K			
820414	7/5/1994	0.2	K			
820414	8/2/1994	0.2	K			
820414	9/6/1994	0.2	K			
820414	10/4/1994	0.2	K			
820414	5/9/1995	0.2	K			
820414	7/11/1995	0.2	K			
820414	8/1/1995	0.2	K			
820414	9/5/1995	0.2	K			
820414	10/10/1995	0.2	K			
820414	5/21/1996					
820414	6/11/1997					
820414	8/13/1997					
820414	10/7/1997					
820414	6/16/1998	1.16		0.015	0.781	
820414	7/21/1998	2.75				
820414	9/2/1998	2.26		0.046	0.824	
820414	10/7/1998	5.06				
820414	11/3/1998	20.1				
820414	4/21/1999	12.4		0.119	1.00	
820414	5/11/1999	4.02				
820414	6/9/1999	7.62		0.083	1.43	
820414	7/6/1999	34.6				
820414	8/4/1999	28.9			0.246	
820414	9/15/1999	10.8			0.404	
820414	10/12/1999	4.5				
820414	11/16/1999	34.7				
820414	4/17/2000					
820414	5/22/2000					
820414	7/10/2000	1.1				
820414	8/7/2000	1.33				
820414	9/20/2000	4.63			0.707	
820414	10/9/2000	6.28				
820414	11/8/2000	1.97				
820414	4/10/2001	1.74				
820414	5/7/2001	16.97	BSQC			
820414	6/11/2001	1.09				
820414	7/16/2001	2.15				
820414	8/14/2001	5.03				
820414	9/19/2001	3.35			0.312	
820414	10/10/2001	2.7				
820414	11/7/2001	4.32				
820414	4/10/2002	0.82				
820414	5/6/2002	1.18				
820414	6/10/2002	1.31				
820414	7/9/2002	1.14				
820414	8/12/2002	2.35				
820414	9/11/2002	6.09	MS		0.625	
820414	10/8/2002	8.61				
820414	5/21/2003	35.29				ND
820414	6/18/2003	1.65				
820414	7/23/2003	1.97				
820414	8/21/2003	1.59			0.273	
820414	9/17/2003	3.19				
820414	10/20/2003	3.93	BSQC			
820414	4/28/2004	2.12				ND
820414	5/19/2004	3.45				
820414	6/16/2004	2.62				
820414	7/14/2004	1.27	MSD			

TABLE A-2. Water Quality Data - Detroit River Upstream Station

Station	Date	Mercury (ng/L)	Total DDT (ng/L)	Total PCB (ng/L)	Total CN (mg/L)
820414	8/17/2004	1.78			
820414	9/22/2004	4.13			
820414	10/13/2004	10.47			
820414	11/3/2004	13.23			

ND	Observed result was below the quantification level.
A	Value reported is the mean of two or more determinations.
HT	Recommended laboratory holding time was exceeded before analysis.
K	Observed result was below the level of quantitation shown.
T	Value reported is less than the quantification level.
SLRS	SLRS control exceeded quality control criteria.
MBQC	Method blank exceeded level of detection.
CCV	Continuing calibration standard exceeded quality control criteria.
LCQC	Laboratory control exceeded quality control criteria.
MS	Matrix spike exceeded quality control criteria.
MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.
W	Observed result was below the lowest normally reportable value shown.

TABLE A-3. Water Quality Data - St. Clair River Downstream Station.

STORET ID	Collection Date	Water Temperature (C)	Turbidity (NTU)		Conductivity (Lab) (umho/cm)	Conductivity (Field) (umho/cm)	Dissolved Oxygen (Lab) (mg/l)	
740016	6/30/1998	19.5		NA	215	201		
740016	7/22/1998	22.5		NA	214		8.6	
740016	9/1/1998	22.5		NA	211	207		
740016	10/8/1998	16.9	1.1		215	226	9	
740016	11/9/1998	10.8	1.2		211	213	10.4	
740016	4/20/1999	6.3	0.5	HT	213	210		
740016	5/12/1999	10.6	0.8		217	223		
740016	6/8/1999	14	0.5		207	201		
740016	7/7/1999	20.2	0.8	HT	212	198	9.5	
740016	8/3/1999	23.5	0.7		211	216		
740016	9/14/1999	20.6	0.7		214	197		
740016	10/13/1999	15.1	1.0		214	219	9.4	
740016	11/17/1999	7.2	6.9		216	220	8.6	
740016	4/17/2000	5.1	12.0	HT	212	211	12.3	
740016	5/22/2000	11.4	3.5		221	232	11.1	
740016	7/10/2000	18.5	0.8		218	211		
740016	8/7/2000	21.4	0.5		218	226	9	
740016	9/19/2000		2.1		219			
740016	10/9/2000	13.9	5.6		214	207		
740016	11/7/2000	12	0.4	K	217	211	10.3	
740016	4/11/2001	4.5	1.9		229	205		
740016	5/7/2001	9.7	0.7		215	210		
740016	6/11/2001	13.9	0.6		218	209		
740016	7/16/2001	20.6	1.7		212	184		
740016	8/14/2001	23.1	2.8		213	207		
740016	9/18/2001	19.4	0.6		212	206		
740016	10/10/2001	13.6	0.6		215	190	9.9	HT
740016	11/6/2001	10.2	4.9		211	179	10	
740016	4/10/2002	2.6	9.4		223	234	13.3	
740016	5/6/2002	7.6	0.5	K	225	215	11.8	
740016	6/10/2002	13.8	0.5	K	220	206	10.6	
740016	7/9/2002	21.7	0.5	K	224	223	8.78	
740016	8/12/2002	22.4	2.1		217	176	8.62	
740016	9/9/2002	21.7	0.5	K	214	195	8.82	
740016	10/8/2002	15.8	0.5	K	216	206	9.38	
740016	11/12/2002	9.99	2.2		217	186		
740016	5/21/2003	8.97	2.6		229	228		
740016	6/18/2003	13.86		ND	226	221		
740016	7/23/2003	18.66		ND	218	214		
740016	8/14/2003	22.7	1.8		217	212		
740016	9/17/2003	20.65		ND	219	213		
740016	10/20/2003	11.73		ND	229	212	10.6	
740016	11/11/2003	9.41		ND	218	212		

TABLE A-3. Water Quality Data - St. Clair River Downstream Station.

STORET ID	Collection Date	Water Temperature (C)	Turbidity (NTU)		Conductivity (Lab) (umho/cm)	Conductivity (Field) (umho/cm)	Dissolved Oxygen (Lab) (mg/l)	
740016	4/28/2004	7.7	3.3		218	215	11.6	HT
740016	5/19/2004	9.79		ND	219	212		
740016	6/16/2004	15.86	4.8		229	238		
740016	7/14/2004	19.94	2.3		218	207		
740016	8/17/2004	20.99	2.3		220	213		
740016	9/22/2004	18.57	1.9		218	209		
740016	10/13/2004	15.52		ND	214	214		
740016	11/3/2004	12.57	3.8		215	218	10	

ND	Observed result was below the quantification level.
A	Value reported is the mean of two or more determinations.
HT	Recommended laboratory holding time was exceeded before analysis.
K	Observed result was below the level of quantitation shown.
T	Value reported is less than the quantification level.
SLRS	SLRS control exceeded quality control criteria.
MBQC	Method blank exceeded level of detection.
CCV	Continuing calibration standard exceeded quality control criteria.
LCQC	Laboratory control exceeded quality control criteria.
MS	Matrix spike exceeded quality control criteria.
MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.

TABLE A-3. Water Quality Data - St. Clair River Downstream Station.

STORET ID	Collection Date	Dissolved Oxygen (Field) (mg/l)	pH (Lab)		pH (Field)	Total Dissolved Solids (mg/l)		Total Suspended Solids (mg/l)		Total Ammonia (mg/l)		Total Nitrite (mg/l)	
740016	6/30/1998	9.2	8.21	HT	8	140		4	K	0.016		0.003	
740016	7/22/1998		8.3		NA	139		4	K	0.015		0.004	
740016	9/1/1998	9.2	8.42		7.8	137		4	K	0.008	HT	0.003	
740016	10/8/1998	8.8	8.2		7.5	140		4	K	0.018		0.002	
740016	11/9/1998	10	8.1		8.1	137		4	K	0.006		0.002	
740016	4/20/1999	12	8.09		8.0	138	C	4	K	0.006	T	0.002	
740016	5/12/1999	11.2	8.1		8.1	141	C	4	K	0.012		0.003	
740016	6/8/1999	10.6	8.17		7.8	135	C	4		0.006	T	0.002	
740016	7/7/1999	8.8	8.14		7.6	138	C	4		0.017		0.004	
740016	8/3/1999	8.1	8.45		7.9	137	C	4		0.008	T	0.003	
740016	9/14/1999	8.8	8.44		7.9	139	C	9		0.009	T	0.004	
740016	10/13/1999	8.5	8.22		7.6	139	C	4	K	0.013		0.003	
740016	11/17/1999	10.1	8.16		7.3	140	C	29		0.007	T	0.003	
740016	4/17/2000		8.14		7.4	140		21		0.004	T	0.004	
740016	5/22/2000	10.8	8.04		7.7	144		4	K	0.014		0.006	HT
740016	7/10/2000	9.8	8.34		8.2	142		6		0.014		0.004	
740016	8/7/2000	9.5	8.26		7.9	140		4	K	0.01		0.005	
740016	9/19/2000		8.34			140		4	K	0.01	HT	0.003	
740016	10/9/2000	9.9	8.33		8.3	140		6		0.008	T HT	0.004	HT
740016	11/7/2000		8.3		7.8	140		4	K	0.01		0.003	
740016	4/11/2001	13	8.07		8.3	150		4		0.01		0.003	
740016	5/7/2001	11.9	8.08		8.2	140		2	K	0.009	T	0.003	
740016	6/11/2001	11.3	8.26		8.2	140		2	K	0.014		0.003	
740016	7/16/2001	9.9	8.3		8.3	140		2	K	0.014		0.003	
740016	8/14/2001	8.8	8.36		8.2	140		7		0.016		0.003	
740016	9/18/2001	9.4	8.31		8.2	140		2	K	0.012		0.003	
740016	10/10/2001		8.16		8.1	140		2	K	0.008	T	0.002	
740016	11/6/2001	10.7	8.07		8	140		8		0.01		0.003	
740016	4/10/2002	7.4	7.77		8.2	140		12		0.012		0.003	
740016	5/6/2002	12.8	7.93		7.9	150		7		0.007	T	0.003	
740016	6/10/2002	12.2	8.02		8.2	140		5		0.011		0.004	
740016	7/9/2002	8.5	8.13		8	150		2	K	0.014		0.004	
740016	8/12/2002	8.8	8.42		8	140		5		0.015		0.004	
740016	9/9/2002	8.4	8.47	HT	8.2	140		2	K	0.01		0.003	
740016	10/8/2002	7.8	8.33		7.8	140		2	K	0.011		0.003	
740016	11/12/2002	10.7	8.26		8.9	140		2	K	0.012		0.004	
740016	5/21/2003	11.72	8.15		7.78	150			ND	0.018		0.005	T
740016	6/18/2003	10.72	8.21		7.9	150			ND	0.016		0.004	
740016	7/23/2003	10.36	8.33		7.85	140			ND	0.014		0.005	
740016	8/14/2003	8	8.42	H	8.1	140			ND	0.009	T	0.006	H
740016	9/17/2003	11.06	8.4		7.97	140			ND	0.023		0.007	
740016	10/20/2003	10.74	8.24		7.91	150		4		0.011		0.004	
740016	11/11/2003	12.25	8.23		7.52	140			ND	0.011		0.004	

TABLE A-3. Water Quality Data - St. Clair River Downstream Station.

STORET ID	Collection Date	Dissolved Oxygen (Field) (mg/l)	pH (Lab)	pH (Field)	Total Dissolved Solids (mg/l)	Total Suspended Solids (mg/l)		Total Ammonia (mg/l)		Total Nitrite (mg/l)	
740016	4/28/2004	12.67	8.2	7.6	140	5		0.007	T	0.004	
740016	5/19/2004	10.99	8.18	7.25	140		ND	0.015		0.005	
740016	6/16/2004	10.14	8.3	7.55	150	7		0.017		0.007	
740016	7/14/2004	10.49	8.34	8.03	140	4		0.019		0.005	
740016	8/17/2004	10.14	8.58	8.36	140		ND	0.014		0.005	
740016	9/22/2004	9.42	8.3	7.94	140		ND	0.015		0.003	
740016	10/13/2004	10.08	8.19	7.93	140		ND	0.011		0.003	
740016	11/3/2004	9.35	8.1	7.69	140	9		0.013		0.003	PI

ND	Observed result was below the quantification level.
A	Value reported is the mean of two or more determinations.
HT	Recommended laboratory holding time was exceeded before analysis.
K	Observed result was below the level of quantitation shown.
T	Value reported is less than the quantification level.
SLRS	SLRS control exceeded quality control criteria.
MBQC	Method blank exceeded level of detection.
CCV	Continuing calibration standard exceeded quality control criteria.
LCQC	Laboratory control exceeded quality control criteria.
MS	Matrix spike exceeded quality control criteria.
MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.

TABLE A-3. Water Quality Data - St. Clair River Downstream Station.

STORET ID	Collection Date	Total Nitrate (mg/l)		Total Kjeldahl Nitrogen (mg/l)		Total Phosphorus (mg/l)		Total Ortho Phosphate (mg/l)		Total Organic Carbon (mg/l)	Total Sulfate (mg/l)	Hardness Ca_2CO_3 (mg/l)		Alkalinity Ca2CO3 (mg/l)
740016	6/30/1998	0.35		0.17		0.009		0.002		2.2	11	93		
740016	7/22/1998	0.33		0.16		0.005		0.001		2	11	92		
740016	9/1/1998	0.27	HT	0.26	HT	0.009	HT	0.001		2.2	12	91		
740016	10/8/1998	0.28		0.34		0.01		0.001		2.2	11	94		
740016	11/9/1998	0.260		0.240	HT	0.009	HT	0.001		1.90	13	90		
740016	4/20/1999	0.37	C	0.13		0.007		0.002	T	1.6	13	97	C	
740016	5/12/1999	0.4	C	0.16		0.011		0.002	T	2.1	14	96	C	
740016	6/8/1999	0.33	C	0.18		0.013		0.001	W	1.9	11	95	C	
740016	7/7/1999	0.31	C	0.13		0.012		0.002	T	2.2	14	90	C	
740016	8/3/1999	0.28	C	0.14		0.011		0.002	T	2.3	13	95	C	
740016	9/14/1999	0.27	C	0.22		0.007		0.002	T	1.9	12	93	C	
740016	10/13/1999	0.27	C	0.15		0.006		0.003		2	16	96	C	
740016	11/17/1999	0.27	C	0.23		0.022		0.01		2	12	96	C	
740016	4/17/2000	0.37	C	0.21		0.02		0.003		2.2	10	100		
740016	5/22/2000	0.56	C HT	0.16		0.009		0.003		1.9	14	101		
740016	7/10/2000	0.37	C	0.26		0.011		0.005		2.1	13	100		
740016	8/7/2000	0.39		0.18		0.006		0.001	T	2.1	13	101		
740016	9/19/2000	0.32	C HT	0.13		0.008		0.003		1.9	14	101		
740016	10/9/2000	0.3	C HT	0.27	HT	0.012	HT	0.004		2	12	94		
740016	11/7/2000	0.34	C	0.13		0.004	T	0.016		1.7	14	96		
740016	4/11/2001	0.43	C	0.21		0.007		0.006		2.1	14	97		75
740016	5/7/2001	0.34	C	0.13		0.007		0.001	W	2.4	19	93		75
740016	6/11/2001	0.35	C	0.15		0.005		0.005		2	13	93		69
740016	7/16/2001	0.3	C	0.14		0.001	T	0.008		1.7	13	103		73
740016	8/14/2001	0.31	C	0.15		0.01		0.002	T	1.8	13	95		76
740016	9/18/2001	0.27	C	0.14		0.006		0.002	T	2	15	98		73
740016	10/10/2001	0.29	C	0.14		0.005		0.002	T	2	12	97		67
740016	11/6/2001	0.3	C	0.15		0.011		0.004		1.8	14	94		68
740016	4/10/2002	0.45	C	0.19		0.025		0.005		2	15	101		73
740016	5/6/2002	0.41	C	0.16		0.005		0.001	T HT	2	15	101		74
740016	6/10/2002	0.39	C	0.13		0.008		0.008		1.7	15	97		73
740016	7/9/2002	0.38	C	0.15		0.006		0.002		2	15	106		77
740016	8/12/2002	0.33	C	0.13		0.008		0.002	T	2	13	97		67
740016	9/9/2002	0.28	C	0.13		0.005		0.009		1.7	83	99		72
740016	10/8/2002	0.3	C	0.15		0.006		0.005		2.1	12	99		75
740016	11/12/2002	0.31	C	0.16		0.012		0.004		2	12	95		74
740016	5/21/2003	0.45		0.35		0.011		0.001	T	3.1	13	99.7		73
740016	6/18/2003	0.39		0.16		0.004	T		W ND	1.7	12	101		74
740016	7/23/2003	0.33		0.23		0.011		0.003		1.8	14	91		65
740016	8/14/2003	0.29		0.13		0.007		0.001	T H	2	10	95		68
740016	9/17/2003	0.28		0.23		0.007		0.002	T	2	13	98		74
740016	10/20/2003	0.29		0.23		0.008		0.003		3.3	11	95		72
740016	11/11/2003	0.31		0.2		0.005		0.002	T	1.9	13	95		77

TABLE A-3. Water Quality Data - St. Clair River Downstream Station.

STORET ID	Collection Date	Total Nitrate (mg/l)	Total Kjeldahl Nitrogen (mg/l)	Total Phosphorus (mg/l)	Total Ortho Phosphate (mg/l)	Total Organic Carbon (mg/l)	Total Sulfate (mg/l)	Hardness Ca_2CO_3 (mg/l)	Alkalinity Ca2CO3 (mg/l)
740016	4/28/2004	0.35	0.16 HT	0.007 HT	ND W	1.6	12	96	69
740016	5/19/2004	0.38	0.24	0.008	ND W	2.3	13	94	75
740016	6/16/2004	0.55	0.26	0.018	0.003	2.3	13	104	79
740016	7/14/2004	0.39	0.51	0.012	0.001 T	2.6	14	93	70
740016	8/17/2004	0.32	0.5	0.009	ND W	5.3	14	99	75
740016	9/22/2004	0.31	0.21	0.009	0.001 T	2.1	14	99.5	72
740016	10/13/2004	0.29	0.18	0.01	0.005	2.1	14	99.6	70
740016	11/3/2004	0.29	0.22	0.011	0.002 T PI	2.2	13	98	71

ND Observed result was below the quantification level.
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HT Recommended laboratory holding time was exceeded before analysis.
K Observed result was below the level of quantitation shown.
T Value reported is less than the quantification level.
SLRS SLRS control exceeded quality control criteria.
MBQC Method blank exceeded level of detection.
CCV Continuing calibration standard exceeded quality control criteria.
LCQC Laboratory control exceeded quality control criteria.
MS Matrix spike exceeded quality control criteria.
MSD Matrix spike duplicate exceeded quality control criteria.
CCB Continuing calibration blank exceeded level of detection.
BSQC Batch spike exceeded quality control criteria.
ICB Initial calibration blank exceeded level of detection.
ISQC Internal standard exceeded quality control criteria.
PI Possible interference may have affected the accuracy of the laboratory result.
C Value calculated from other independent parameters.
W Observed result was below the lowest normally reportable value shown.

TABLE A-3. Water Quality Data - St. Clair River Downstream Station.

STORET ID	Collection Date	Total Calcium (mg/l)	Total Magnesium (mg/l)	Total Potassium (mg/L)	Total Chloride (mg/l)	Total Sodium (mg/L)	Total Sulfide (mg/L)		Cadmium (ug/l)
740016	6/30/1998	25.1	7.4		6				0.009
740016	7/22/1998	24.6	7.4		6				0.004
740016	9/1/1998	24.7	7.2		6				0.003
740016	10/8/1998	25.5	7.4		6				0.003
740016	11/9/1998	24.6	7		6				0.003
740016	4/20/1999	26.8	7.3		6				0.007
740016	5/12/1999	25.6	7.7		6				0.006
740016	6/8/1999	25.9	7.3		6				0.014
740016	7/7/1999	23.8	7.3		6				0.007
740016	8/3/1999	25.8	7.3		6				0.003
740016	9/14/1999	24.6	7.6		6				0.007
740016	10/13/1999	26.7	7.2		6				0.011
740016	11/17/1999	26.7	7.1		6				0.019
740016	4/17/2000	26.8	8.1		5				
740016	5/22/2000	27.9	7.6		6				
740016	7/10/2000	28.1	7.2		7				0.006
740016	8/7/2000	28.1	7.5		6				0.005
740016	9/19/2000	27.8	7.6		6				0.01
740016	10/9/2000	25.9	7.1		6				0.006
740016	11/7/2000	25.9	7.5		6				0.01
740016	4/11/2001	26.1	7.6		7		0.01	K	0.008
740016	5/7/2001	25.2	7.4		6		0.01	K	0.003
740016	6/11/2001	25.2	7.3		6		0.01	K	0.006
740016	7/16/2001	27.2	7.4	0.9	6	3.3	0.01	K HT	0.002
740016	8/14/2001	25.9	7.3	0.9	6	4	0.01	K	0.001
740016	9/18/2001	26.7	7.6	0.9	6	3.3	0.01	K	0.001
740016	10/10/2001	26.3	7.5	0.9	6	3.5	0.01	K	0.003
740016	11/6/2001	25.6	7.4	0.9	6	4.3	0.01	K	0.004
740016	4/10/2002	27.5	7.8	1.1	7	3.8	0.01	K	0.018
740016	5/6/2002	27.4	7.8	1.1	7	3.7	0.01	K	0.005
740016	6/10/2002	25.8	7.8	0.9	6	5.4	0.01	K	0.005
740016	7/9/2002	29.4	7.9	1	7	4.9	0.01	K	0.006
740016	8/12/2002	26.2	7.6	0.9	6	3.5	0.01	K	0.001
740016	9/9/2002	26.6	7.9	0.9	6	5	0.01	K	0.005
740016	10/8/2002	26.4	7.9	0.9	6	3.3	0.01	K	0.013
740016	11/12/2002	25.2	7.8	0.9	7	2.5	0.01	K	0.009
740016	5/21/2003	26.7	8	1	8	4.8		ND	0
740016	6/18/2003	27.6	7.7	1	8	4.6			0
740016	7/23/2003	23.9	7.5	0.9	7	5.1			0
740016	8/14/2003	25.7	7.5	0.9	7	4			0
740016	9/17/2003	26.7	7.7	1.1	7	3.3			0.006
740016	10/20/2003	25.9	7.4	3.9	14	3.4			0
740016	11/11/2003	25.9	7.3	1.2	7	3.3			0.005

TABLE A-3. Water Quality Data - St. Clair River Downstream Station.

STORET ID	Collection Date	Total Calcium (mg/l)	Total Magnesium (mg/l)	Total Potassium (mg/L)	Total Chloride (mg/l)	Total Sodium (mg/L)	Total Sulfide (mg/L)	Cadmium (ug/l)
740016	4/28/2004	26.3	7.4	1	6	4.8		0.007
740016	5/19/2004	25.8	7.2	1	6	2.9		0.007
740016	6/16/2004	29.2	7.6	1.1	7	3		0.01
740016	7/14/2004	25.4	7.2	1.2	7	4.3		0.007
740016	8/17/2004	26.9	7.6	1	8	4		0.006
740016	9/22/2004	27.8	7.3	1	6	5.9		0.006
740016	10/13/2004	27.5	7.5	1	6	4.8		0.007
740016	11/3/2004	26.8	7.4	1	7	3.7		0.008

ND Observed result was below the quantification level.
A Value reported is the mean of two or more determinations.
HT Recommended laboratory holding time was exceeded before analysis.
K Observed result was below the level of quantitation shown.
T Value reported is less than the quantification level.
SLRS SLRS control exceeded quality control criteria.
MBQC Method blank exceeded level of detection.
CCV Continuing calibration standard exceeded quality control criteria.
LCQC Laboratory control exceeded quality control criteria.
MS Matrix spike exceeded quality control criteria.
MSD Matrix spike duplicate exceeded quality control criteria.
CCB Continuing calibration blank exceeded level of detection.
BSQC Batch spike exceeded quality control criteria.
ICB Initial calibration blank exceeded level of detection.
ISQC Internal standard exceeded quality control criteria.
PI Possible interference may have affected the accuracy of the laboratory result.
C Value calculated from other independent parameters.
W Observed result was below the lowest normally reportable value shown.

TABLE A-3. Water Quality Data - St. Clair River Downstream Station.

STORET ID	Collection Date	Chromium (ug/l)		Copper (ug/l)		Nickel (ug/l)	Lead (ug/l)	Zinc (ug/l)	
740016	6/30/1998	0.742		0.556		2.03	0.035	3.914	
740016	7/22/1998	0.528		0.562		1.13	0.045	0.348	
740016	9/1/1998	0.404		0.522		1.15	0.043	0.322	
740016	10/8/1998	0.751		0.583		1.38	0.068	0.409	
740016	11/9/1998	0.955		0.725		1.29	0.051	0.41	
740016	4/20/1999	0.428		0.535		1.19	0.048	0.376	
740016	5/12/1999	0.382		0.499		0.946	0.061	0.245	
740016	6/8/1999	0.385		0.537		1.01	0.046	0.247	
740016	7/7/1999	0.409		0.560		1.09	0.03	0.239	
740016	8/3/1999	0.537		0.552		1.19	0.048	0.653	
740016	9/14/1999	0.623		0.522		1.10	0.039	0.286	
740016	10/13/1999	0.797		0.685		1.38	0.23	0.995	
740016	11/17/1999	1.28		0.951		1.86	0.461	1.717	
740016	4/17/2000								
740016	5/22/2000								
740016	7/10/2000	0.26	CCB	0.62		1.07	0.057	0.44	
740016	8/7/2000	0.23		0.63		0.79	0.045	0.33	SLRS
740016	9/19/2000	0.21		0.54		1.01	0.062	3.4	
740016	10/9/2000	0.33		0.56		0.9	0.109	0.53	
740016	11/7/2000	0.24		0.54		0.89	0.065	0.4	
740016	4/11/2001	0.23		0.63		0.096	0.96	0.98	
740016	5/7/2001	0.29		0.66		0.137	0.86	0.44	
740016	6/11/2001	0.15		0.38		0.076	0.93	0.38	
740016	7/16/2001	0.1		0.532		0.074	0.87	0.373	
740016	8/14/2001	0.274	MBQC	0.627		0.158	1.01	0.841	
740016	9/18/2001	0.18		0.536		0.082	1.04	1.47	
740016	10/10/2001	0.17		0.483		0.09	0.93	0.374	
740016	11/6/2001	0.34		0.564		0.231	0.96	0.905	
740016	4/10/2002	0.788		1.03		0.608	1.46	3.62	
740016	5/6/2002	0.212		0.453		0.0706	0.832	1.52	LCQC
740016	6/10/2002	0.07		0.566		0.395	0.778	0.4	
740016	7/9/2002	0.081		0.537		0.0875	0.838	0.77	
740016	8/12/2002	0.013		0.503		0.0711	0.754	0.37	
740016	9/9/2002	0.204		0.605		0.0538	0.878	0.52	
740016	10/8/2002	0.171		0.565		0.0638	0.946	0.7	
740016	11/12/2002	0.139		0.501		0.0601	0.938	0.79	
740016	5/21/2003	0.209	ISQC	0.688		0.964	0.114	0.81	LCQC
740016	6/18/2003	0.18		0.741	ICB, MBQC, LCQC	0.849	0.0684	0.51	
740016	7/23/2003	0.263		0.642		1.07	0.135	1.19	
740016	8/14/2003	0.184		0.486		0.795	0.069	0.96	
740016	9/17/2003	0.187		0.618		0.766	0.062	0.57	
740016	10/20/2003	0.112		0.749	CCB	1.1	0.116	1.09	
740016	11/11/2003	0.012		0.41		0.729	0.0447	0.776	MBQC

TABLE A-3. Water Quality Data - St. Clair River Downstream Station.

STORET ID	Collection Date	Chromium (ug/l)	Copper (ug/l)		Nickel (ug/l)	Lead (ug/l)	Zinc (ug/l)	
740016	4/28/2004	0.195	0.783		1.4	0.107	0.79	
740016	5/19/2004	0.187	0.517		0.743	0.0702	0.72	CCV
740016	6/16/2004	0.328	0.777		0.944	0.197	1.81	
740016	7/14/2004	0.181	0.578		0.746	0.0916	1.28	
740016	8/17/2004	0.188	0.533		0.762	0.0714	2.66	MBQC
740016	9/22/2004	0.176	0.606		0.849	0.0974	2.18	
740016	10/13/2004	0.145	0.609		0.83	0.128	0.86	
740016	11/3/2004	0.277	0.782	MBQC	1.18	0.139	1.06	CCB

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HT	Recommended laboratory holding time was exceeded before analysis.
K	Observed result was below the level of quantitation shown.
T	Value reported is less than the quantification level.
SLRS	SLRS control exceeded quality control criteria.
MBQC	Method blank exceeded level of detection.
CCV	Continuing calibration standard exceeded quality control criteria.
LCQC	Laboratory control exceeded quality control criteria.
MS	Matrix spike exceeded quality control criteria.
MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.
W	Observed result was below the lowest normally reportable value shown.

TABLE A-3. Water Quality Data - St. Clair River Downstream Station.

STORET ID	Collection Date	Mercury (ng/L)		Total PCB (ng/L)	Total DDT (ng/L)	Total Cyanide (mg/L)
740016	6/30/1998	0.606		0.602	0	
740016	7/22/1998	0.757				
740016	9/1/1998	2.616		0.764	0	
740016	10/8/1998	0.431				
740016	11/9/1998	0.241				
740016	4/20/1999	5.97		0.778	0.0840	
740016	5/12/1999	1.26				
740016	6/8/1999	3.93		0.883		
740016	7/7/1999	9.57				
740016	8/3/1999	8.84		0.696	0.0320	
740016	9/14/1999	2.32		0.387		
740016	10/13/1999	2.15				
740016	11/17/1999	4.47				
740016	4/17/2000					
740016	5/22/2000					
740016	7/10/2000	0.46				
740016	8/7/2000	0.6				
740016	9/19/2000	0.63	MSD	0.491		
740016	10/9/2000	0.56				
740016	11/7/2000	0.35				
740016	4/11/2001	0.32				
740016	5/7/2001	0.35	BSQC			
740016	6/11/2001	0.36				
740016	7/16/2001	0.39				
740016	8/14/2001	0.33				
740016	9/18/2001	0.34		0.323		
740016	10/10/2001	0.19				
740016	11/6/2001	0.48				
740016	4/10/2002	1.63				
740016	5/6/2002	0.26				
740016	6/10/2002	0.39				
740016	7/9/2002	0.46				
740016	8/12/2002	0.44				
740016	9/9/2002	0.32	MS	0.207		
740016	10/8/2002	0.39				
740016	11/12/2002	0.36				
740016	5/21/2003	0.37				ND
740016	6/18/2003	0.4				
740016	7/23/2003					
740016	8/14/2003	0.23		0.175		
740016	9/17/2003	0.36				
740016	10/20/2003	0.39	BSQC			
740016	11/11/2003	0.46				

TABLE A-3. Water Quality Data - St. Clair River Downstream Station.

STORET ID	Collection Date	Mercury (ng/L)		Total PCB (ng/L)	Total DDT (ng/L)	Total Cyanide (mg/L)
740016	4/28/2004	0.41				ND
740016	5/19/2004	0.58				
740016	6/16/2004	0.87				
740016	7/14/2004	0.59	MSD			
740016	8/17/2004	0.5				
740016	9/22/2004	0.41				
740016	10/13/2004	0.26				
740016	11/3/2004	0.52				

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A	Value reported is the mean of two or more determinations.
HT	Recommended laboratory holding time was exceeded before analysis.
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LCQC	Laboratory control exceeded quality control criteria.
MS	Matrix spike exceeded quality control criteria.
MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.
W	Observed result was below the lowest normally reportable value shown.

TABLE A-4. Water Quality Data - St. Clair River Upstream Station.

STORET ID	Collection Date	Water Temperature (C)	Turbidity (NTU)		Conductivity (Lab) (umho/cm)	Conductivity (Field) (umho/cm)	Dissolved Oxygen (Lab) (mg/l)	
740376	6/29/1998	21.8		NA	215	209		
740376	7/22/1998	22		NA	214		8.5	
740376	8/31/1998	22.8		NA	211	213		
740376	10/8/1998	16.6	0.5		215	226	9	
740376	11/9/1998	11	0.4	K	209	210		
740376	4/19/1999	5.3	0.4	K HT	212	206		
740376	5/12/1999	10.2	0.4	K	218	224		
740376	6/7/1999	13.2	0.4	K HT	207	219		
740376	7/7/1999	19.7	0.4	K HT	213	198		
740376	8/2/1999	23.1	0.4	K	211	210		
740376	9/13/1999	20.5	0.4	K	215	193		
740376	10/13/1999	14.3	1.0		215	220		
740376	11/17/1999	7.4	2.7		215	220		
740376	4/17/2000	5.2	9.5	HT	215	214	12.4	
740376	5/22/2000	10.7	0.6		215	227		
740376	7/11/2000	18	0.4	K	216	210	9.2	
740376	8/8/2000	20.7	0.4	K	216	225	8.8	
740376	9/18/2000		0.4	HT	216			
740376	10/10/2000	13.6	2.0		214	210	9.9	
740376	11/7/2000	11.7	0.4	K	214	206	10.6	
740376	4/11/2001	3.3	0.4	K	219	193		
740376	5/7/2001	10.3	0.5		215	209	11	
740376	6/11/2001	15.1	0.4	K	217	206	10.3	
740376	7/16/2001	20.4	0.4		212	183	9.2	HT
740376	8/14/2001	23.3	0.6		213	207	9.3	
740376	9/17/2001	19	0.4		212	205		
740376	10/11/2001	13.3	0.5	K	213	187	10	HT
740376	11/6/2001	9.9	0.5		209	179	11	
740376	4/10/2002	2.6	0.5	K	213	223	13.5	
740376	5/6/2002	7.7	0.5	K	218	217	12	
740376	6/10/2002	13.1	0.5	K	220	205	10.9	
740376	7/9/2002	22.1	0.5	K	224	224	8.92	
740376	8/12/2002	22.2	0.5	K	216	175	8.78	
740376	9/9/2002	21.1	0.5	K	214	195	8.8	HT
740376	10/8/2002	16	0.5	K	215	206	9.44	
740376	11/13/2002	9.59	0.5	K	216	187		
740376	5/21/2003	8.41		ND	215	214		
740376	6/18/2003	12.73		ND	219	215		
740376	7/23/2003	17.77		ND	217	209		
740376	8/13/2003	21.9		ND	216	196		
740376	9/17/2003	20.52		ND	220	211		
740376	10/20/2003	11.63		ND	223	209		

TABLE A-4. Water Quality Data - St. Clair River Upstream Station.

STORET ID	Collection Date	Water Temperature (C)	Turbidity (NTU)	Conductivity (Lab) (umho/cm)	Conductivity (Field) (umho/cm)	Dissolved Oxygen (Lab) (mg/l)
740376	4/28/2004	5.27	ND	213	210	
740376	5/19/2004	9.57	ND	213	202	11.8 HT
740376	6/16/2004	16.45	ND	221	233	
740376	7/14/2004	19.05	ND	215	204	
740376	8/17/2004	20.87	ND	220	213	
740376	9/22/2004	18.24	ND	215	205	
740376	10/13/2004	14.97	ND	215	211	
740376	11/3/2004	12.14	ND	210	213	

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A	Value reported is the mean of two or more determinations.
HT	Recommended laboratory holding time was exceeded before analysis.
K	Observed result was below the level of quantitation shown.
T	Value reported is less than the quantification level.
SLRS	SLRS control exceeded quality control criteria.
MBQC	Method blank exceeded level of detection.
CCV	Continuing calibration standard exceeded quality control criteria.
LCQC	Laboratory control exceeded quality control criteria.
MS	Matrix spike exceeded quality control criteria.
MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.
W	Observed result was below the lowest normally reportable value shown.

TABLE A-4. Water Quality Data - St. Clair River Upstream Station.

STORET ID	Collection Date	Dissolved Oxygen (Field) (mg/l)	pH (Lab)		pH (Field)	Total Dissolved Solids (mg/l)		Total Suspended Solids (mg/l)		Total Ammonia (mg/l)	
740376	6/29/1998	8.7	8.28	HT	7.9	140		4	K	0.01	
740376	7/22/1998		8.31			139		4	K	0.015	ST
740376	8/31/1998	9.1	8.43		8.2	137		4	K	0.005	HT
740376	10/8/1998	8.7	8.18		7.4	140		4	K	0.019	
740376	11/9/1998	9.6	8.04		8	136		4	K	0.005	
740376	4/19/1999	12.2	8.07		8.2	138	C	4	K	0.005	T
740376	5/12/1999	11.2	8.08		8.1	142	C	4	K	0.012	
740376	6/7/1999	10.9	8.21		8	135	C	4	K	0.007	T
740376	7/7/1999	8.9	8.16		7.4	138	C	4	K	0.013	
740376	8/2/1999	8.2	8.45		7.9	137	C	9		0.006	T
740376	9/13/1999	8.4	8.45		7.9	140	C	8		0.006	T
740376	10/13/1999	8.3	8.17		7.5	140	C	4		0.012	
740376	11/17/1999	9.9	8.15		6.8	140	C	14		0.003	T
740376	4/17/2000		8.02		8	140		9		0.005	T
740376	5/22/2000	11.1	8.05		7.7	140		4	K	0.013	
740376	7/11/2000	9.9	8.39		8.4	140		4	K	0.007	T
740376	8/8/2000	9.3	8.27		8.2	140		4	K	0.006	T
740376	9/18/2000		8.34			140		4	K	0.006	T HT
740376	10/10/2000	10.1	8.32		8.3	140		8		0.006	T HT
740376	11/7/2000		8.28		7.9	140		4	K	0.01	
740376	4/11/2001	13.4	8.07		8.3	140		2	K	0.009	T
740376	5/7/2001	11.9	8.13		8.3	140		2	K	0.009	T
740376	6/11/2001	11.4	8.25		8.2	140		2	K	0.01	
740376	7/16/2001	10.3	8.36		8.2	140		2	K	0.013	
740376	8/14/2001	8.6	8.42		8.3	140		2	K	0.01	
740376	9/17/2001	9.8	8.38		8.2	140		2	K	0.002	T
740376	10/11/2001		8.16		8.1	140		2	K	0.006	T
740376	11/6/2001	10.4	8.07		7.9	140		2	K	0.008	T
740376	4/10/2002	8.1	7.8		8.3	140		2	K	0.007	T
740376	5/6/2002	12.5	7.94		8	140		2	K	0.01	
740376	6/10/2002	12.1	8.04		8.1	140		4		0.009	T
740376	7/9/2002	8.9	8.22		8	150		2	K	0.01	
740376	8/12/2002	9	8.43		8	140		2	K	0.01	
740376	9/9/2002	9.3	8.47	HT	7.7	140		2	K	0.004	T
740376	10/8/2002	7.9	8.4		7.8	140		2	K	0.007	T
740376	11/13/2002	10.6	8.28		8.9	140		2	K	0.01	
740376	5/21/2003	12.89	8.17		8.01	140			ND	0.009	T
740376	6/18/2003	11.06	8.24		7.88	140			ND	0.013	
740376	7/23/2003	10.46	8.4		8.01	140		6		0.016	
740376	8/13/2003	8.1	8.44	H	8.2	140			ND	0.006	T
740376	9/17/2003	9.6	8.46		7.96	140			ND	0.008	T
740376	10/20/2003	10.79	8.3		7.8	140			ND	0.005	T

TABLE A-4. Water Quality Data - St. Clair River Upstream Station.

STORET ID	Collection Date	Dissolved Oxygen (Field) (mg/l)	pH (Lab)	pH (Field)	Total Dissolved Solids (mg/l)	Total Suspended Solids (mg/l)	Total Ammonia (mg/l)	
740376	4/28/2004	13.21	8.2	7.68	140	ND	0.01	
740376	5/19/2004	10.96	8.22	7.29	140	ND	0.008	T
740376	6/16/2004	10.41	8.39	7.6	140	ND	0.006	T
740376	7/14/2004	9.37	8.42	8.05	140	ND	0.008	T
740376	8/17/2004	10.64	8.62	8.33	140	ND	0.01	
740376	9/22/2004	9.76	8.36	7.91	140	ND	0.01	
740376	10/13/2004	10.02	8.18	7.92	140	ND	0.009	T
740376	11/3/2004	10.27	8.18	7.71	140	10	0.007	T

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K	Observed result was below the level of quantitation shown.
T	Value reported is less than the quantification level.
SLRS	SLRS control exceeded quality control criteria.
MBQC	Method blank exceeded level of detection.
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BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.
W	Observed result was below the lowest normally reportable value shown.

TABLE A-4. Water Quality Data - St. Clair River Upstream Station.

STORET ID	Collection Date	Total Nitrite (mg/l)		Total Nitrate (mg/l)		Total Kjeldahl Nitrogen (mg/l)		Total Phosphorus (mg/l)		Total Ortho Phosphate (mg/l)	
740376	6/29/1998	0.003		0.35		0.17		0.008		0.001	
740376	7/22/1998	0.004		0.31	ST	0.16		0.005		0.001	
740376	8/31/1998	0.003		0.27	HT	0.26	HT	0.009	HT	0.001	HT
740376	10/8/1998	0.002		0.28		0.2		0.008		0.001	
740376	11/9/1998	0.002		0.27		0.23	HT	0.008	HT	0.001	
740376	4/19/1999	0.002		0.33	C	0.36		0.008		0.001	T
740376	5/12/1999	0.003		0.47	C	0.14		0.011		0.001	T
740376	6/7/1999	0.002		0.32	C	0.15		0.005		0.001	W
740376	7/7/1999	0.004		0.32	C	0.11		0.011		0.002	T
740376	8/2/1999	0.003	HT	0.28	C HT	0.16		0.011		0.003	HT
740376	9/13/1999	0.003		0.26	C	0.12		0.005		0.001	T
740376	10/13/1999	0.003		0.26	C	0.18		0.005		0.003	
740376	11/17/1999	0.002		0.27	C	0.21		0.014		0.001	T
740376	4/17/2000	0.004		0.41	C	0.16		0.01		0.004	T
740376	5/22/2000	0.005	HT	0.4	C HT	0.19		0.012		0.003	
740376	7/11/2000	0.004		0.41	C	0.1		0.006		0.004	
740376	8/8/2000	0.005		0.38		0.17		0.005		0.001	W
740376	9/18/2000	0.003		0.32	C HT	0.16		0.006		0.003	
740376	10/10/2000	0.004	HT	0.3	C HT	0.21	HT	0.008	HT	0.005	
740376	11/7/2000	0.003		0.33	C	0.13		0.001	T	0.01	
740376	4/11/2001	0.002		0.38	C	0.22		0.004	T	0.005	
740376	5/7/2001	0.003		0.35	C	0.12		0.006		0.002	T
740376	6/11/2001	0.003		0.33	C	0.15		0.004	T	0.004	
740376	7/16/2001	0.003		0.3	C	0.14		0.001	T	0.004	
740376	8/14/2001	0.003		0.3	C	0.12		0.006		0.001	T
740376	9/17/2001	0.002		0.26	C	0.14		0.004	T	0.002	T
740376	10/11/2001	0.002		0.28	C	0.14		0.006		0.001	T
740376	11/6/2001	0.002		0.29	C	0.14		0.005		0.004	
740376	4/10/2002	0.002		0.34	C	0.11		0.004		0.004	
740376	5/6/2002	0.003		0.37	C	0.12		0.003	T	0.001	T HT
740376	6/10/2002	0.003		0.39	C	0.12		0.006		0.007	
740376	7/9/2002	0.005		0.37	C	0.15		0.002		0.002	
740376	8/12/2002	0.003		0.33	C	0.14		0.001	W	0.001	W
740376	9/9/2002	0.003		0.29	C	0.12		0.002	T	0.009	
740376	10/8/2002	0.003		0.29	C	0.14		0.002	T	0.002	T
740376	11/13/2002	0.003		0.31	C	0.15		0.007		0.001	T
740376	5/21/2003	0.003	T	0.43		0.27		0.009	T	0.001	W T
740376	6/18/2003	0.004		0.37		0.15		0.005		0.001	T
740376	7/23/2003	0.004		0.34		0.47		0.011		0.002	T
740376	8/13/2003	0.005	H	0.3		0.27		0.005		0.001	T H
740376	9/17/2003	0.006		0.27		0.22		0.002	W	0.002	T
740376	10/20/2003	0.003		0.29		0.14		0.005		0.001	T

TABLE A-4. Water Quality Data - St. Clair River Upstream Station.

STORET ID	Collection Date	Total Nitrite (mg/l)	Total Nitrate (mg/l)	Total Kjeldahl Nitrogen (mg/l)		Total Phosphorus (mg/l)		Total Ortho Phosphate (mg/l)	
740376	4/28/2004	0.003	0.36	0.17	HT	0.004	T HT		ND W
740376	5/19/2004	0.003	0.35	0.24		0.004	T		ND W
740376	6/16/2004	0.005	0.49	0.17		0.005			ND W
740376	7/14/2004	0.005	0.36	0.19		0.004	T	0.001	T
740376	8/17/2004	0.004	0.32	0.28		0.005			ND W
740376	9/22/2004	0.003	0.3	0.24		0.006		0.001	T
740376	10/13/2004	0.003	0.29	0.23		0.006		0.001	T
740376	11/3/2004	0.03	0.29	0.25		0.012		0.002	T

ND	Observed result was below the quantification level.
A	Value reported is the mean of two or more determinations.
HT	Recommended laboratory holding time was exceeded before analysis.
K	Observed result was below the level of quantitation shown.
T	Value reported is less than the quantification level.
SLRS	SLRS control exceeded quality control criteria.
MBQC	Method blank exceeded level of detection.
CCV	Continuing calibration standard exceeded quality control criteria.
LCQC	Laboratory control exceeded quality control criteria.
MS	Matrix spike exceeded quality control criteria.
MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.
W	Observed result was below the lowest normally reportable value shown.

TABLE A-4. Water Quality Data - St. Clair River Upstream Station.

STORET ID	Collection Date	Total Organic Carbon (mg/l)		Total Sulfate (mg/l)	Hardness Ca_2CO_3 (mg/l)		Alkalinity Ca2CO3 (mg/l)	Total Calcium (mg/l)	
740376	6/29/1998	2		13	94			25.4	
740376	7/22/1998	1.9	ST	10	93			24.8	
740376	8/31/1998	2.2		14	91			24.4	
740376	10/8/1998	2		14	94			25.5	
740376	11/9/1998	1.4		9	91			24.7	
740376	4/19/1999	2.2		15	93	C		25.8	
740376	5/12/1999	1.9		15	96	C		25.2	
740376	6/7/1999	1.7		9	96	C		26.6	
740376	7/7/1999	2		14	90	C		24.3	
740376	8/2/1999	1.9		14	97	C		26.7	
740376	9/13/1999	2.2		12	92	C		24.6	
740376	10/13/1999	2		15	97	C		26.9	
740376	11/17/1999	1.9		12	98	C		27.3	
740376	4/17/2000	2		10	96			25.5	
740376	5/22/2000	2		13	99			27.6	
740376	7/11/2000	2.1		13	99			27.6	
740376	8/8/2000	2.2		14	5	K		1	K
740376	9/18/2000	1.7		13	105			28.2	
740376	10/10/2000	2.2		12	96			26.7	
740376	11/7/2000	1.8		13	97			26.7	
740376	4/11/2001	1.9		13	100		75	27.9	
740376	5/7/2001	1.8		18	94		77	25.1	
740376	6/11/2001	2.7		13	90		69	24.3	
740376	7/16/2001	1.8		14	98		67	27.9	
740376	8/14/2001	1.8		14	88		76	23.3	
740376	9/17/2001	2		12	97		72	26.4	
740376	10/11/2001	2.5		12	93		65	25	
740376	11/6/2001	1.9		14	93		67	25.2	
740376	4/10/2002	1.6		13	94		71	25.2	
740376	5/6/2002	1.7		14	100		78	27.4	
740376	6/10/2002	1.7		15	97		72	25.9	
740376	7/9/2002	2		16	106		77	29.4	
740376	8/12/2002	1.8		13	94		67	24.9	
740376	9/9/2002	1.7		45	103		74	28.2	
740376	10/8/2002	1.7		12	100		73	27.5	
740376	11/13/2002	2.3		12	94		74	24.8	
740376	5/21/2003	2.1		11	96		70	25.8	
740376	6/18/2003	1.7		12	96		74	26	
740376	7/23/2003	4.3		15	92		63	24.5	
740376	8/13/2003	1.9		11	97		70	26.4	
740376	9/17/2003	2.1		13	99		73	27.1	
740376	10/20/2003	2		11	96		71	26.3	

TABLE A-4. Water Quality Data - St. Clair River Upstream Station.

STORET ID	Collection Date	Total Organic Carbon (mg/l)	Total Sulfate (mg/l)	Hardness Ca_2CO_3 (mg/l)	Alkalinity Ca2CO3 (mg/l)	Total Calcium (mg/l)
740376	4/28/2004	1.6	12	97	69	26.4
740376	5/19/2004	2.1	13	92	75	25.2
740376	6/16/2004	2	13	97	78	26.9
740376	7/14/2004	3.3	14	95	67	25.7
740376	8/17/2004	2.7	14	97	76	26.2
740376	9/22/2004	2.2	14	96	72	26.4
740376	10/13/2004	2.3	13	99	70	27.7
740376	11/3/2004	2.1	12	94	70	25.7

ND	Observed result was below the quantification level.
A	Value reported is the mean of two or more determinations.
HT	Recommended laboratory holding time was exceeded before analysis.
K	Observed result was below the level of quantitation shown.
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MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.
W	Observed result was below the lowest normally reportable value shown.

TABLE A-4. Water Quality Data - St. Clair River Upstream Station.

STORET ID	Collection Date	Total Magnesium (mg/l)		Total Potassium (mg/L)	Total Chloride (mg/l)	Total Sodium (mg/L)	Total Sulfide (mg/L)		Cadmium (ug/l)
740376	6/29/1998	7.5			6				0.002
740376	7/22/1998	7.5			5				0.005
740376	8/31/1998	7.3			6				0.005
740376	10/8/1998	7.4			6				0.008
740376	11/9/1998	7.2			6				
740376	4/19/1999	7			6				0.004
740376	5/12/1999	8			6				0.005
740376	6/7/1999	7.2			5				0.003
740376	7/7/1999	7.1			6				0.002
740376	8/2/1999	7.3			6				0.004
740376	9/13/1999	7.4			6				0.011
740376	10/13/1999	7.3			6				0.006
740376	11/17/1999	7.2			6				0.018
740376	4/17/2000	7.8			6				
740376	5/22/2000	7.3			6				
740376	7/11/2000	7.2			6				0.004
740376	8/8/2000	1	K		6				0.005
740376	9/18/2000	7.6			6				0.02
740376	10/10/2000	7			6				0.006
740376	11/7/2000	7.3			6				0.005
740376	4/11/2001	7.3			7		0.01	K	0.003
740376	5/7/2001	7.5			6		0.01	K	0.002
740376	6/11/2001	7.1			6		0.01	K	0.003
740376	7/16/2001	7.3		0.8	6	3	0.01	K HT	0.001
740376	8/14/2001	7.2		0.9	6	3.5	0.01	K	0
740376	9/17/2001	7.5		0.9	6	3.3	0.01	K	0.004
740376	10/11/2001	7.4		1	6	3.4	0.01	K	0.004
740376	11/6/2001	7.3		0.9	6	4.7	0.01	K	0
740376	4/10/2002	7.6		0.9	6	3.2	0.01	K	0.003
740376	5/6/2002	7.7		0.9	7	4.1	0.01	K	0.006
740376	6/10/2002	7.9		0.9	6	4.3	0.01	K	0
740376	7/9/2002	7.9		0.9	7	4.2	0.01	K	0.002
740376	8/12/2002	7.6		0.9	6	4.1	0.01	K	0.003
740376	9/9/2002	7.9		0.9	6	4	0.01	K	0.007
740376	10/8/2002	7.6		0.9	6	3.2	0.01	K	0.009
740376	11/13/2002	7.8		0.9	7	2.4			
740376	5/21/2003	7.6		0.9	6	3.9		ND	0
740376	6/18/2003	7.5		0.9	7	3.8			0
740376	7/23/2003	7.4		1	6	3.2			0
740376	8/13/2003	7.5		0.9	7	3.4			0
740376	9/17/2003	7.7		1.2	7	4.8			0
740376	10/20/2003	7.4		2.8	8	4.3			0

TABLE A-4. Water Quality Data - St. Clair River Upstream Station.

STORET ID	Collection Date	Total Magnesium (mg/l)	Total Potassium (mg/L)	Total Chloride (mg/l)	Total Sodium (mg/L)	Total Sulfide (mg/L)	Cadmium (ug/l)
740376	4/28/2004	7.4	1	6	4.3		0.006
740376	5/19/2004	7	0.9	6	2.8		0.005
740376	6/16/2004	7.3	1	6	3.8		0.005
740376	7/14/2004	7.4	1.1	7	3.5		0.005
740376	8/17/2004	7.6	1.2	8	3.9		0.005
740376	9/22/2004	7.2	1.1	6	5.2		0.005
740376	10/13/2004	7.3	1.2	6	4.1		0.005
740376	11/3/2004	7.3	1	6	3.4		0.006

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T	Value reported is less than the quantification level.
SLRS	SLRS control exceeded quality control criteria.
MBQC	Method blank exceeded level of detection.
CCV	Continuing calibration standard exceeded quality control criteria.
LCQC	Laboratory control exceeded quality control criteria.
MS	Matrix spike exceeded quality control criteria.
MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.
W	Observed result was below the lowest normally reportable value shown.

TABLE A-4. Water Quality Data - St. Clair River Upstream Station.

STORET ID	Collection Date	Chromium (ug/l)		Copper (ug/l)		Nickel (ug/l)	Lead (ug/l)
740376	6/29/1998	0.738		0.470		2.00	0.006
740376	7/22/1998	0.423		0.465		1.05	0.019
740376	8/31/1998	0.376		0.414		1.02	0.01
740376	10/8/1998	0.792		0.565		1.38	0.102
740376	11/9/1998	0.878		0.532		1.27	0.018
740376	4/19/1999	0.345		0.438		1.09	0.017
740376	5/12/1999	0.326		0.445		0.993	0.016
740376	6/7/1999	0.367		0.445		0.986	0.012
740376	7/7/1999	0.393		0.602		1.09	0.013
740376	8/2/1999	0.427		0.471		1.10	0.027
740376	9/13/1999	0.463		0.402		0.928	0.007
740376	10/13/1999	0.583		0.410		1.08	0.042
740376	11/17/1999	1.05		0.782		1.50	0.364
740376	4/17/2000						
740376	5/22/2000						
740376	7/11/2000	0.21	CCB	0.48		1.05	0.017
740376	8/8/2000	0.17		0.5	CCB	0.72	0.015
740376	9/18/2000	0.24		0.47		0.89	0.048
740376	10/10/2000	0.29		0.45		0.99	0.09
740376	11/7/2000	0.18		0.4		0.88	0.016
740376	4/11/2001	0.15		0.48		0.027	0.85
740376	5/7/2001	0.19		0.48		0.026	0.74
740376	6/11/2001	0.07		0.22		0.028	0.77
740376	7/16/2001	0.023		0.444		0.034	0.83
740376	8/14/2001	0.101	MBQC	0.365		0.058	0.77
740376	9/17/2001	0.12		0.37		0.038	0.84
740376	10/11/2001	0.14		0.384		0.053	0.8
740376	11/6/2001	0.14		0.357		0.064	0.71
740376	4/10/2002	0.221		0.558		0.0896	0.778
740376	5/6/2002	0.16		0.443		0.0368	0.821
740376	6/10/2002	0.101		0.399		0.0252	0.697
740376	7/9/2002	0.001		0.437		0.0371	0.734
740376	8/12/2002	0		0.377		0.029	0.61
740376	9/9/2002	0.141		0.401		0.0103	0.788
740376	10/8/2002	0.089		0.419		0.0235	0.813
740376	11/13/2002						
740376	5/21/2003	0.128	ISQC	0.448		0.806	0.0543
740376	6/18/2003	0.091		0.573	ICB, MBQC, LCQC	0.711	0.0203
740376	7/23/2003	0.157		0.461		0.829	0.0372
740376	8/13/2003	0.101		0.371		0.652	0.0253
740376	9/17/2003	0		0.344	CCB	0.629	0.0139
740376	10/20/2003	0.02		0.497	CCB	0.684	0.0458

TABLE A-4. Water Quality Data - St. Clair River Upstream Station.

STORET ID	Collection Date	Chromium (ug/l)	Copper (ug/l)	Nickel (ug/l)	Lead (ug/l)
740376	4/28/2004	0.127	0.586	1.28	0.0554
740376	5/19/2004	0.116	0.348	0.626	0.021
740376	6/16/2004	0.097	0.422	0.614	0.0241
740376	7/14/2004	0.134	0.401	0.605	0.0258
740376	8/17/2004	0.147	0.447	0.661	0.0284
740376	9/22/2004	0.09	0.464	0.714	0.0236
740376	10/13/2004	0.05	0.421	0.692	0.0211
740376	11/3/2004	0.098	0.53	0.7	0.101

ND	Observed result was below the quantification level.
A	Value reported is the mean of two or more determinations.
HT	Recommended laboratory holding time was exceeded before analysis.
K	Observed result was below the level of quantitation shown.
T	Value reported is less than the quantification level.
SLRS	SLRS control exceeded quality control criteria.
MBQC	Method blank exceeded level of detection.
CCV	Continuing calibration standard exceeded quality control criteria.
LCQC	Laboratory control exceeded quality control criteria.
MS	Matrix spike exceeded quality control criteria.
MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.
W	Observed result was below the lowest normally reportable value shown.

TABLE A-4. Water Quality Data - St. Clair River Upstream Station.

STORET ID	Collection Date	Zinc (ug/L)		Mercury (ng/L)		Total PCB (ng/L)	Total DDT (ng/L)	Total Cyanide (mg/L)
740376	6/29/1998	0.185		2.42		0.604	0	
740376	7/22/1998	0.168		1.26				
740376	8/31/1998	0.181		0.483		0.781	0	
740376	10/8/1998	0.495		0.644				
740376	11/9/1998	0.19		0.472				
740376	4/19/1999	0.200		4.57		1.318		
740376	5/12/1999	0.089		1.04				
740376	6/7/1999	0.053		5.30		0.601	0	
740376	7/7/1999	0.170		5.06				
740376	8/2/1999	0.252		5.51		0.715	0	
740376	9/13/1999	0.978		9.30		0.402		
740376	10/13/1999	1.28		2.27				
740376	11/17/1999	1.21		1.49				
740376	4/17/2000							
740376	5/22/2000							
740376	7/11/2000	0.25		0.39				
740376	8/8/2000	0.18	SLRS	0.52				
740376	9/18/2000	0.26		0.36	MSD	0.463		
740376	10/10/2000	0.39		0.6				
740376	11/7/2000	0.16		0.23				
740376	4/11/2001	3.06		0.11				
740376	5/7/2001	0.13		0.19	BSQC			
740376	6/11/2001	0.13		0.21				
740376	7/16/2001	0.166		0.34				
740376	8/14/2001	0.297		0.3				
740376	9/17/2001	0.206		0		244.272		
740376	10/11/2001	0.187		0.12				
740376	11/6/2001	0.282		0				
740376	4/10/2002	0.58		0.33				
740376	5/6/2002	0.76	LCQC	0.37				
740376	6/10/2002	0.15		0.27				
740376	7/9/2002	0.54		0.32				
740376	8/12/2002	0.21		0.22				
740376	9/9/2002	0.31		0.34	MS	0.208		
740376	10/8/2002	0.43		0.33				
740376	11/13/2002							
740376	5/21/2003	0.67	LCQC	0.42				ND
740376	6/18/2003	0.75		0.29				
740376	7/23/2003	0.54		0.45				
740376	8/13/2003	0.42		0.29		0.370		
740376	9/17/2003	0.73		0.31				
740376	10/20/2003	1.69		0.21	BSQC			

TABLE A-4. Water Quality Data - St. Clair River Upstream Station.

STORET ID	Collection Date	Zinc (ug/L)		Mercury (ng/L)		Total PCB (ng/L)	Total DDT (ng/L)	Total Cyanide (mg/L)
740376	4/28/2004	0.52		0.15				ND
740376	5/19/2004	0.74	CCV	0.43				
740376	6/16/2004	0.2		0.54				
740376	7/14/2004	1.26		0.45	MSD			
740376	8/17/2004	0.7	MBQC	0.47				
740376	9/22/2004	1.14		0.25				
740376	10/13/2004	0.81		0.57				
740376	11/3/2004	0.73	CCV	0.17				

ND	Observed result was below the quantification level.
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LCQC	Laboratory control exceeded quality control criteria.
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MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.
W	Observed result was below the lowest normally reportable value shown.

TABLE A-5. Water Quality Data - St. Mary's River Downstream Station.

STORET ID	Collection Date	Water Temperature (C)	Turbidity (NTU)		Conductivity (Lab) (umho/cm)	Conductivity (Field) (umho/cm)	Dissolved Oxygen (Lab) (mg/l)		Dissolved Oxygen (Field) (mg/l)
170140	6/22/1998	18.2		NA	102	93			9.6
170140	7/27/1998	20.5		NA	105		9		
170140	9/8/1998	18.6	3.7		114	95			9
170140	10/12/1998	13	2.8		109	111	9.9		9.9
170140	11/16/1998	5.6	4.1		100	107			12.4
170140	5/18/1999	8.2			96	91	12.4		12.2
170140	6/15/1999	15			101	104			9.7
170140	7/12/1999	17.8			99	99			9.5
170140	8/9/1999	20.4			98	89			8.3
170140	9/7/1999	21.5			102	96			8.2
170140	10/5/1999	12.2			100	106			8.9
170140	11/8/1999	6.4			101	109			10.3
170140	4/27/2000	7	3.8		99	96			13.8
170140	7/12/2000	19.3	4.7		102	101			10.2
170140	8/9/2000	18.7	2.9	QC	100	98	9		9.4
170140	9/14/2000	17.1	4.8		104	102	9.2		9.3
170140	10/11/2000	9.9	2.6		102	78			11.2
170140	11/13/2000	7.12	2.9		101	84			12.2
170140	5/3/2001	8.3	4.7		102	98	12		12.4
170140	6/12/2001	15.6	3.8	HT	103	100			10.9
170140	7/17/2001	17.1	2.4		100	85			11.8
170140	8/22/2001	20.11	2.5		99	93	8.8		9.4
170140	9/26/2001	12.3	7.5	HT	101	96			10.8
170140	10/29/2001	7.4	4		100	80	12	HT	13.9
170140	5/7/2002	6.6	5.1		100	96	12.2		11.4
170140	6/11/2002	13.3	2.2		99	92	11.2		12.2
170140	7/10/2002	20.1	2.7		99	98	9.24		8.1
170140	8/19/2002	20.9	4.8		101	85	8.54		8.7
170140	9/16/2002	19	3.1		100	90	8.9		6.2
170140	10/14/2002	11.4	5		101	97	10.1		10.9
170140	5/19/2003	7.68	4.4		100	97	11.7		11.22
170140	6/23/2003	16.65	3.4		103	100	10.4		10.02
170140	7/23/2003	18.6	4.1		101	90			8.8
170140	8/19/2003	21.56	4		101	95	9.2		9.56
170140	9/15/2003	18.78	4.5		108	97	8.68		9.96
170140	10/6/2003	9.53	3.6		102	96	10.3		11.02

TABLE A-5. Water Quality Data - St. Mary's River Downstream Station.

STORET ID	Collection Date	Water Temperature (C)	Turbidity (NTU)	Conductivity (Lab) (umho/cm)	Conductivity (Field) (umho/cm)	Dissolved Oxygen (Lab) (mg/l)		Dissolved Oxygen (Field) (mg/l)
170140	5/25/2004	7.92	7.7	101	90	11.5	HT	11.24
170140	6/14/2004	12.92	2.6	99	94			10.1
170140	7/12/2004	16.31	2.7	100	96	10.2	HT	10
170140	8/9/2004	18.94	3.3	100	99	9.5	HT	8.99
170140	9/20/2004	16.62	2.3	100	94	9.8		9.58
170140	10/11/2004	12.42	4.2	103	99			10.29
170140	11/1/2004	9.89	6.4	103	100			11.2

ND	Observed result was below the quantification level.
A	Value reported is the mean of two or more determinations.
HT	Recommended laboratory holding time was exceeded before analysis.
K	Observed result was below the level of quantitation shown.
T	Value reported is less than the quantification level.
SLRS	SLRS control exceeded quality control criteria.
MBQC	Method blank exceeded level of detection.
CCV	Continuing calibration standard exceeded quality control criteria.
LCQC	Laboratory control exceeded quality control criteria.
MS	Matrix spike exceeded quality control criteria.
MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.
W	Observed result was below the lowest normally reportable value shown.

TABLE A-5. Water Quality Data - St. Mary's River Downstream Station.

STORET ID	Collection Date	pH (Field)	pH (Lab)		Total Dissolved Solids		Total Suspended Solids		Total Ammonia (mg/l)		Total Nitrite (mg/l)		Total Nitrate (mg/l)		Total Kjeldahl Nitrogen (mg/l)	
170140	6/22/1998	7.4	7.93		66		6		0.005		0.003		0.28		0.19	
170140	7/27/1998		7.96		68		4	K	0.004		0.003		0.26		0.14	
170140	9/8/1998	7.8	8.12		74		6		0.005	HT	0.004		0.26	HT	0.25	HT
170140	10/12/1998	6.9	7.81		71		7		0.008		0.003		0.27		0.14	
170140	11/16/1998	8	7.63		65		11		0.004		0.003		0.3		0.22	
170140	5/18/1999	6.9	7.34		62	C	4		0.003	T	0.001	W	0.31	C	0.09	
170140	6/15/1999	7.9	7.86		66	C	7		0.005	T	0.002		0.29	C	0.16	
170140	7/12/1999	7.4	7.94		64	C	5	HT	0.001	W	0.003		0.28	C	0.08	T
170140	8/9/1999	7.6	8.2		80	C	4		0.004	T	0.003		0.26	C	0.13	
170140	9/7/1999	7.5	8.36		66	C	6	HT	0.004	T	0.004		0.26	C	0.19	
170140	10/5/1999		8.06		65	C	4	K	0.003	T	0.005		0.26	C	0.18	
170140	11/8/1999	7.1	7.86		66	C	6		0.004	T	0.004		0.3	C	0.09	T
170140	4/27/2000		7.72	HT	64		4	K	0.004	T	0.004	T HT	0.32	C HT	0.11	
170140	7/12/2000	8.4	8.23		66		6		0.001	T	0.005		0.28	C	0.16	
170140	8/9/2000	8.3	8.02		70		4	K	0.006	T	0.003		0.3	C	0.3	
170140	9/14/2000	7.4	8.03		70		4	A	0.008	T HT	0.003		0.28	C HT	0.13	HT
170140	10/11/2000	8.2	7.82		70		4	K	0.003	T HT	0.004	HT	0.29	C HT	0.11	HT
170140	11/13/2000	7.5	7.88		70		4	K	0.006	T	0.002		0.32	C	0.14	
170140	5/3/2001	8.1	7.91		70		2	K	0.006	T	0.002		0.33	C	0.1	
170140	6/12/2001	8.3	8.19	HT	70		2	K	0.001	T	0.003		0.27	C	0.1	
170140	7/17/2001	7.8	8.04	HT	70		4		0.007	T	0.003		0.29	C	0.11	
170140	8/22/2001	8	8.15		60		9		0.005	T	0.003		0.28	C	0.13	
170140	9/26/2001	7.9	7.77		70		18		0.008	T	0.003		0.27	C	0.13	
170140	10/29/2001	7.7	7.65		70		10		0.005	T	0.004		0.3	C	0.13	
170140	5/7/2002	7.7	7.62	HT	70		7		0.005	T	0.002		0.31	C	0.12	
170140	6/11/2002	8.1	7.69		60		2	K	0.003	T	0.002		0.3	C	0.11	
170140	7/10/2002	7.8	7.9	HT	60		4		0.006	T	0.002		0.31	C	0.13	
170140	8/19/2002	7.7	8.1		70		4		0.008	T	0.004		0.27	C	0.12	HT
170140	9/16/2002	7.5	8.18		70		6		0.006	T	0.004		0.27	C	0.13	
170140	10/14/2002	7.4	7.86		70		7		0.007	T	0.004		0.3	C	0.14	
170140	5/19/2003	7.33	7.81		70		5		0.007	T	0.33		0.003		0.17	
170140	6/23/2003	7.96	8.17		70			ND	0.01		0.28		0.006		0.15	
170140	7/23/2003	7.6	8.19		70		5		0.006	T	0.28		0.005		0.13	
170140	8/19/2003	7.55	8.24		70			ND	0.006	T	0.27		0.009		0.18	
170140	9/15/2003	7.55	8.01	H	70			ND	0.009	T	0.27		0.009		0.15	
170140	10/6/2003	7.5	8.03		70			ND	0.007	T	0.29		0.004	T	0.1	

TABLE A-5. Water Quality Data - St. Mary's River Downstream Station.

STORET ID	Collection Date	pH (Field)	pH (Lab)		Total Dissolved Solids	Total Suspended Solids		Total Ammonia (mg/l)		Total Nitrite (mg/l)		Total Nitrate (mg/l)	Total Kjeldahl Nitrogen (mg/l)
170140	5/25/2004	7.19	7.94		70		ND	0.003	T	0.005		0.31	0.17
170140	6/14/2004	7.62	8	HT	60	5		0.004	T	0.023	HT	0.29	0.46
170140	7/12/2004	7.82	8.16		60		ND	0.007	T	0.003		0.3	0.24
170140	8/9/2004	7.65	7.87		60	4		0.007	T	0.003		0.29	0.16
170140	9/20/2004	7.47	8.02		60		ND	0.005	T	0.003		0.3	0.14
170140	10/11/2004	7.31	7.89		70	4		0.011		0.004		0.29	0.17
170140	11/1/2004	7.63	7.76		67	8		0.007	T	0.005		0.32	0.19

ND	Observed result was below the quantification level.
A	Value reported is the mean of two or more determinations.
HT	Recommended laboratory holding time was exceeded before analysis.
K	Observed result was below the level of quantitation shown.
T	Value reported is less than the quantification level.
SLRS	SLRS control exceeded quality control criteria.
MBQC	Method blank exceeded level of detection.
CCV	Continuing calibration standard exceeded quality control criteria.
LCQC	Laboratory control exceeded quality control criteria.
MS	Matrix spike exceeded quality control criteria.
MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.
W	Observed result was below the lowest normally reportable value shown.

TABLE A-5. Water Quality Data - St. Mary's River Downstream Station.

STORET ID	Collection Date	Total Phosphorus (mg/l)		Total Ortho Phosphate (mg/l)		Total Organic Carbon (mg/l)	Total Sulfate (mg/l)		Hardness Ca2CO3 (mg/l)		Alkalinity Ca2CO3 (mg/l)
170140	6/22/1998	0.014		0.004		2	3		45		
170140	7/27/1998	0.004		0.005		1.7	3		45		
170140	9/8/1998	0.011	HT	0.003		1.6	3		46		
170140	10/12/1998	0.009		0.004		1.7	2		46		
170140	11/16/1998	0.009		0.005		1.4	3		45		
170140	5/18/1999	0.007		0.002	T	2	7		43	C	
170140	6/15/1999	0.018		0.005		1.8	2		48	C	
170140	7/12/1999	0.018		0.005		2.2	2		42	C	
170140	8/9/1999	0.01		0.003		1.8	3		44	C	
170140	9/7/1999	0.009		0.004		2.4	4		46	C	
170140	10/5/1999	0.006		0.005		1.6	4		41	C	
170140	11/8/1999	0.01		0.006		1.7	2	K	45	C	
170140	4/27/2000	0.004	T	0.004	HT	2	2		46		
170140	7/12/2000	0.01		0.008		2.7	2	K	48		
170140	8/9/2000	0.017		0.005		2	2		46		
170140	9/14/2000	0.008	HT	0.004		1.5	3		46		
170140	10/11/2000	0.009	HT	0.003	HT	1.6	2		44		
170140	11/13/2000	0.007		0.004		1.5	3		44		
170140	5/3/2001	0.008		0.001	W HT	1.8	3		46		41
170140	6/12/2001	0.009		0.005	HT	2.4	2		47		44
170140	7/17/2001	0.006		0.009		1.7	2		48		34
170140	8/22/2001	0.003	T	0.005		1.8	4		44		43
170140	9/26/2001	0.014		0.005		1.7	3		48		42
170140	10/29/2001	0.009		0.005		2.1	2		45		37
170140	5/7/2002	0.011		0.004		2.2	3		45		43
170140	6/11/2002	0.007		0.002		1.9	3		47		42
170140	7/10/2002	0.01		0.002	T HT	1.8	1	K	45		57
170140	8/19/2002	0.01	HT	0.015		1.8	5		44		38
170140	9/16/2002	0.007		0.007		1.6	1	K	45		38
170140	10/14/2002	0.008		0.003	HT	1.8	4		44		44
170140	5/19/2003	0.008		0.005		2.1	2		45		35
170140	6/23/2003	0.008		0.004		2	2		46		42
170140	7/23/2003	0.009		0.005		1.7	2		43		35
170140	8/19/2003	0.008		0.004		1.9	2		44		40
170140	9/15/2003	0.009		0.003		1.8	4		44		36
170140	10/6/2003	0.008		0.002	T	1.8	3		44		39

TABLE A-5. Water Quality Data - St. Mary's River Downstream Station.

STORET ID	Collection Date	Total Phosphorus (mg/l)	Total Ortho Phosphate (mg/l)		Total Organic Carbon (mg/l)	Total Sulfate (mg/l)	Hardness Ca2CO3 (mg/l)	Alkalinity Ca2CO3 (mg/l)
170140	5/25/2004	0.012	0.005		2.4	2	48	35
170140	6/14/2004	0.01	0.014	HT	2.8	3	46	43
170140	7/12/2004	0.008	0.002	T	2.1	2	45	38
170140	8/9/2004	0.009	0.003		3.3	2	46	38
170140	9/20/2004	0.008	0.005		1.8	3	47	43
170140	10/11/2004	0.009	0.003		2	2	47	46
170140	11/1/2004	0.014	0.008		1.9	3	47	45

ND	Observed result was below the quantification level.
A	Value reported is the mean of two or more determinations.
HT	Recommended laboratory holding time was exceeded before analysis.
K	Observed result was below the level of quantitation shown.
T	Value reported is less than the quantification level.
SLRS	SLRS control exceeded quality control criteria.
MBQC	Method blank exceeded level of detection.
CCV	Continuing calibration standard exceeded quality control criteria.
LCQC	Laboratory control exceeded quality control criteria.
MS	Matrix spike exceeded quality control criteria.
MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.
W	Observed result was below the lowest normally reportable value shown.

TABLE A-5. Water Quality Data - St. Mary's River Downstream Station.

STORET ID	Collection Date	Total Calcium (mg/l)	Total Magnesium (mg/l)	Total Potassium (mg/L)	Total Chloride (mg/l)	Total Sodium (mg/l)	Total Sulfide (mg/L)
170140	6/22/1998	13	3		2		
170140	7/27/1998	12.7	3.1		2		
170140	9/8/1998	13.7	2.9		2		
170140	10/12/1998	13.3	3		2		
170140	11/16/1998	13	3		2		
170140	5/18/1999	12.8	2.7		2		
170140	6/15/1999	14	3.2		2		
170140	7/12/1999	12.5	2.7		2		
170140	8/9/1999	13.1	2.8		2		
170140	9/7/1999	13.4	3		2		
170140	10/5/1999	11.8	2.7		2		
170140	11/8/1999	13.4	2.8		2		
170140	4/27/2000	13.6	3		2		
170140	7/12/2000	13.9	3.1		2		
170140	8/9/2000	13.7	2.9		2		
170140	9/14/2000	14	2.8		2		
170140	10/11/2000	13.1	2.8		2		
170140	11/13/2000	13	2.8		2		
170140	5/3/2001	13.6	3		2		0.01 K
170140	6/12/2001	13.9	2.9		2		0.01 K
170140	7/17/2001	14.4	2.9	0.5	1	1.8	0.01 K
170140	8/22/2001	13.5	2.6	0.5	1	0.5 K	0.01 K
170140	9/26/2001	14.5	3.1	0.6	2	1.8	0.01 K PI
170140	10/29/2001	13.4	2.8	0.6	2	1.2	0.01 K
170140	5/7/2002	13.5	2.7	0.5	2	1.7	0.01 K
170140	6/11/2002	13.7	3	0.5	2	1.9	0.01 K
170140	7/10/2002	13.3	2.8	0.5	2	1.1	0.01 K
170140	8/19/2002	12.8	2.9	0.6	2	1.6	0.01 K
170140	9/16/2002	12.9	3	0.6	1	0.5 K	0.01 K
170140	10/14/2002	12.5	3.1	0.6	2	0.5 K	0.01 K
170140	5/19/2003	13.3	2.8	0.5	2	ND	ND
170140	6/23/2003	13.6	2.9	2.2	5	ND	
170140	7/23/2003	12.5	2.8	0.8	2	ND	
170140	8/19/2003	13	2.7	0.6	2	2.5	
170140	9/15/2003	12.8	2.8	2.2	3	1.7	
170140	10/6/2003	13.2	2.7	0.8	2	1.4	

TABLE A-5. Water Quality Data - St. Mary's River Downstream Station.

STORET ID	Collection Date	Total Calcium (mg/l)	Total Magnesium (mg/l)	Total Potassium (mg/L)	Total Chloride (mg/l)	Total Sodium (mg/l)	Total Sulfide (mg/L)
170140	5/25/2004	14.5	2.8	0.7	1	ND	
170140	6/14/2004	14	2.6	0.5	2	ND	
170140	7/12/2004	13.4	2.8	1.2	2	1.4	
170140	8/9/2004	13.6	2.9	0.5	2	2	
170140	9/20/2004	14.3	2.8	0.6	2	1.2	
170140	10/11/2004	14.3	2.8	0.6	2	1.6	
170140	11/1/2004	14.1	2.9	0.9	2	2.5	

ND	Observed result was below the quantification level.
A	Value reported is the mean of two or more determinations.
HT	Recommended laboratory holding time was exceeded before analysis.
K	Observed result was below the level of quantitation shown.
T	Value reported is less than the quantification level.
SLRS	SLRS control exceeded quality control criteria.
MBQC	Method blank exceeded level of detection.
CCV	Continuing calibration standard exceeded quality control criteria.
LCQC	Laboratory control exceeded quality control criteria.
MS	Matrix spike exceeded quality control criteria.
MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory
C	Value calculated from other independent parameters.
W	Observed result was below the lowest normally reportable value show

TABLE A-5. Water Quality Data - St. Mary's River Downstream Station.

STORET ID	Collection Date	Cadmium (ug/l)	Chromium (ug/l)		Copper (ug/l)		Nickel (ug/l)		Lead (ug/l)
170140	6/22/1998	0.007	0.468		0.927		0.992		0.09
170140	7/27/1998	0.014	0.609		0.819		0.531		0.102
170140	9/8/1998	0.005	0.483		0.937		0.67		0.122
170140	10/12/1998	0.01	0.912		1.427		0.865		0.112
170140	11/16/1998	0.003	0.687		0.902		0.596		0.046
170140	5/18/1999	0.011	0.485		0.998		0.577		0.079
170140	6/15/1999	0.011	0.595		1.176		0.657		0.174
170140	7/12/1999	0.009	0.498		1.042		0.645		0.118
170140	8/9/1999	0.007	0.456		0.958		0.575		0.094
170140	9/7/1999	0.007	0.424		0.932		0.533		0.111
170140	10/5/1999	0.012	0.46		0.863		0.509		0.079
170140	11/8/1999	0.013	0.384		0.855		0.476		0.025
170140	4/27/2000								
170140	7/12/2000	0.01	0.4	CCB	1.05		0.52		0.084
170140	8/9/2000	0.01	0.4		1.03		0.45		0.098
170140	9/14/2000	0.02	0.44		1.03		0.42	ELOD	0.094
170140	10/11/2000	0.01	0.52		0.92		0.47		0.095
170140	11/13/2000	0.01	0.36		0.93		0.48		0.075
170140	5/3/2001	0.01	0.48		1.06		0.53		0.129
170140	6/12/2001	0.01	0.33		0.83		0.51		0.103
170140	7/17/2001	0.007	0.17		0.944		0.49		0.083
170140	8/22/2001	0	0.22	MBQC	0.913		0.47		0.078
170140	9/26/2001	0.009	0.82		1.13		0.81		0.24
170140	10/29/2001	0.01	0.58		1.01		0.57		0.159
170140	5/7/2002	0.012	0.467		1.09		0.57		0.137
170140	6/11/2002	0.008	0.124		0.942		0.286		0.0772
170140	7/10/2002	0	0.231		1.36		0.361		0.118
170140	8/19/2002	0.004	0.284		0.92		0.476		0.122
170140	9/16/2002	0.014	0.267		0.888		0.43		0.164
170140	10/14/2002	0.013	0.483		0.994		0.593		0.142
170140	5/19/2003	0	0.356	ISQC	1.02		0.498		0.104
170140	6/23/2003	0	0.302		0.999	ICB, MBQC, LCQC	0.431		0.0934
170140	7/23/2003	0	0.369		0.981		0.53		0.119
170140	8/19/2003	0	0.312		0.848		0.376		0.0982
170140	9/15/2003	0	0.363		0.898		0.467		0.12
170140	10/6/2003	0.005	0.341		0.987		0.412		0.0998

TABLE A-5. Water Quality Data - St. Mary's River Downstream Station.

STORET ID	Collection Date	Cadmium (ug/l)	Chromium (ug/l)	Copper (ug/l)	Nickel (ug/l)	Lead (ug/l)
170140	5/25/2004	0.01	0.596	1.02	0.567	0.174
170140	6/14/2004	0.009	0.198	0.794	0.312	0.0727
170140	7/12/2004	0.009	0.357	0.927	0.41	0.0954
170140	8/9/2004	0.013	0.366	0.974	0.415	0.095
170140	9/20/2004	0.011	0.267	1.02	0.432	0.0969
170140	10/11/2004	0.01	0.359	0.986	0.514	0.131
170140	11/1/2004	0.009	0.57	1.1	0.581	0.179

ND	Observed result was below the quantification level.
A	Value reported is the mean of two or more determinations.
HT	Recommended laboratory holding time was exceeded before analysis.
K	Observed result was below the level of quantitation shown.
T	Value reported is less than the quantification level.
SLRS	SLRS control exceeded quality control criteria.
MBQC	Method blank exceeded level of detection.
CCV	Continuing calibration standard exceeded quality control criteria.
LCQC	Laboratory control exceeded quality control criteria.
MS	Matrix spike exceeded quality control criteria.
MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.
W	Observed result was below the lowest normally reportable value shown.

TABLE A-5. Water Quality Data - St. Mary's River Downstream Station.

STORET ID	Collection Date	Zinc (ug/l)		Mercury (ng/L)	Total PCB (ng/L)	Total DDT (ng/L)	Total Cyanide (mg/L)
170140	6/22/1998	0.671		1.407	0	0	
170140	7/27/1998	0.437		0.796			
170140	9/8/1998	0.656		1.90	0.665	0.044	
170140	10/12/1998	0.827		0.409			
170140	11/16/1998	0.398		0.798			
170140	5/18/1999	0.594		13.1	0.500	0	
170140	6/15/1999	0.706		5.587			
170140	7/12/1999	0.796		10.1	0.454	0	
170140	8/9/1999	0.486		3.36	0.332		
170140	9/7/1999	0.532		4.21	0.415		
170140	10/5/1999	1.607		1.03			
170140	11/8/1999	0.185		1.12			
170140	4/27/2000						
170140	7/12/2000	0.52		0.49			
170140	8/9/2000	0.58	SLRS	0.25			
170140	9/14/2000	0.61		0.21	0.296		
170140	10/11/2000	0.61		0.25			
170140	11/13/2000	1.72		0.12			
170140	5/3/2001	0.71		0.3			
170140	6/12/2001	0.55		0.28			
170140	7/17/2001	0.418		0.41			
170140	8/22/2001	0.518		0.17	0.375		
170140	9/26/2001	1.21		0.73			
170140	10/29/2001	0.85		0.49			
170140	5/7/2002	1.23	LCQC	0.49			
170140	6/11/2002	2.34		0.37			
170140	7/10/2002	1.55		0.41			
170140	8/19/2002	2.6		0.59	2.251		
170140	9/16/2002	1.21		0.3			
170140	10/14/2002	1.66		0.31			
170140	5/19/2003	0.66	LCQC	0.37			ND
170140	6/23/2003	0.64		0.36	0.149		
170140	7/23/2003	0.93		0.35			
170140	8/19/2003	0.53		0.4			
170140	9/15/2003	0.85		0.33			
170140	10/6/2003	0.73		0.21			

TABLE A-5. Water Quality Data - St. Mary's River Downstream Station.

STORET ID	Collection Date	Zinc (ug/l)		Mercury (ng/L)		Total PCB (ng/L)	Total DDT (ng/L)	Total Cyanide (mg/L)
170140	5/25/2004	0.99		0.95				ND
170140	6/14/2004	0.49		0.71				
170140	7/12/2004	0.96		0.38	MSD			
170140	8/9/2004	1	MBQC	0.4				
170140	9/20/2004	1.43		0.34				
170140	10/11/2004	1.51		0.3				
170140	11/1/2004	2.01	CCV	0.41				

ND	Observed result was below the quantification level.
A	Value reported is the mean of two or more determinations.
HT	Recommended laboratory holding time was exceeded before analysis.
K	Observed result was below the level of quantitation shown.
T	Value reported is less than the quantification level.
SLRS	SLRS control exceeded quality control criteria.
MBQC	Method blank exceeded level of detection.
CCV	Continuing calibration standard exceeded quality control criteria.
LCQC	Laboratory control exceeded quality control criteria.
MS	Matrix spike exceeded quality control criteria.
MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.
W	Observed result was below the lowest normally reportable value shown.

TABLE A-6. Water Quality Data - St. Mary's River Upstream Station.

STORET ID	Collection Date	Water Temperature (C)	Turbidity (NTU)		Conductivity (Lab) (umho/cm)	Conductivity (Field) (umho/cm)	Dissolved Oxygen (Lab) (mg/l)	
170139	6/23/1998	14.9		NA	98	88		
170139	7/28/1998	18		NA	100		8.7	
170139	9/9/1998	18.6	0.7		97	93		
170139	10/12/1998	13.9	0.4	K	102	106		
170139	11/17/1998	7.2	0.6		97	101	11.3	
170139	5/17/1999	11.8	1.8		97	94		
170139	6/15/1999	10.7	0.4	K HT	96	101	10.8	
170139	7/13/1999	18.1	1.2		97	88		
170139	8/10/1999	19.4	0.4	K	97	90	8.7	
170139	9/7/1999	19	0.4	K	97	89	8.9	
170139	10/6/1999	12.2	0.4	K	98	107	9.8	
170139	11/8/1999	7.8	0.4	K	98	106	11.5	
170139	4/27/2000	6.3	2.1		105	95	12.5	
170139	7/12/2000	17.3	0.5		99	99	10.6	
170139	8/9/2000	18.6	0.6	QC	97	98	9.8	
170139	9/13/2000	15.5	0.5		101	95		
170139	10/11/2000	11.3	0.4	K	99	76	10.8	
170139	11/13/2000	8.2	0.4		100	82	11.3	
170139	5/3/2001	4.7	0.5	K	99	94		
170139	6/13/2001	11.5	0.5	HT	99	95	10.9	
170139	7/17/2001	16.6	0.4		99	84	9.8	
170139	8/21/2001	19.6	0.5		97	92	9.2	HT
170139	9/27/2001	14.1	0.5	K HT	98	93	9.4	
170139	10/29/2001	7.5	0.5		98	81	11	
170139	5/7/2002	7.5	3.4		96	92	12.1	
170139	6/11/2002	9.8	0.5	K	96	90	11.9	
170139	7/10/2002	19.8	0.5	K	98	96	9.44	
170139	8/20/2002	20	0.5	K	104	84	9.06	
170139	9/16/2002	19.3	0.5	K	98	89	9.4	
170139	10/14/2002	11.3	0.5	K	104	95	10.3	
170139	5/19/2003	5.5		ND	98	96		
170139	6/23/2003	16.9		ND	99	96		
170139	7/22/2003	18.1		ND	103	90		
170139	8/19/2003	21.91	2.6		100	94		
170139	9/15/2003	17.73	2.3		101	95		
170139	10/6/2003	9.8	5.7		101	95		

TABLE A-6. Water Quality Data - St. Mary's River Upstream Station.

STORET ID	Collection Date	Water Temperature (C)	Turbidity (NTU)		Conductivity (Lab) (umho/cm)	Conductivity (Field) (umho/cm)	Dissolved Oxygen (Lab) (mg/l)	
170139	6/14/2004	11.99		ND	98	91	11.2	HT
170139	7/12/2004	14.24		ND	98	93		
170139	8/31/2004	16.49		ND	100	95		
170139	9/20/2004	16.88		ND	101	93		
170139	10/11/2004	12.17	2.8		100	96	10.18	
170139	11/22/2004	6.17		ND	99	98	11.6	

ND	Observed result was below the quantification level.
A	Value reported is the mean of two or more determinations.
HT	Recommended laboratory holding time was exceeded before analysis.
K	Observed result was below the level of quantitation shown.
T	Value reported is less than the quantification level.
SLRS	SLRS control exceeded quality control criteria.
MBQC	Method blank exceeded level of detection.
CCV	Continuing calibration standard exceeded quality control criteria.
LCQC	Laboratory control exceeded quality control criteria.
MS	Matrix spike exceeded quality control criteria.
MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.
W	Observed result was below the lowest normally reportable value shown.

TABLE A-6. Water Quality Data - St. Mary's River Upstream Station.

STORET ID	Collection Date	Dissolved Oxygen (Field) (mg/l)	pH (Field)	pH (Lab)		Total Dissolved Solids (mg/l)		Total Suspended Solids (mg/l)		Total Ammonia (mg/l)	
170139	6/23/1998	10.7	7.8	7.92		64		4	K	0.004	
170139	7/28/1998			7.98		65		4	K	0.002	
170139	9/9/1998	9.1	8	8.06		63		4	A,K	0.006	HT
170139	10/12/1998	10.4	7.2	7.89		66		4	K	0.006	
170139	11/17/1998	11.4	7.9	7.65		63		4	K	0.003	
170139	5/17/1999	10.8	7	8.04		63	C	4		0.005	T
170139	6/15/1999	10.6	7.4	7.82		62	C	4	K	0.002	T
170139	7/13/1999	8.4	7.3	7.88		63	C	5		0.002	T
170139	8/10/1999	8.6	7.4	8.14		80	C	4	K	0.003	T
170139	9/7/1999	8.6	7.7	8.2		63	C	4	K	0.002	T
170139	10/6/1999	8.6		8.1		64	C	4	K	0.003	T
170139	11/8/1999	9.9	7	7.89		64	C	4	K	0.002	T
170139	4/27/2000	13.4		7.75	HT	68		4	K	0.004	W
170139	7/12/2000	9.6	7.6	8.22		64		4	K	0.005	T
170139	8/9/2000	9.5	8.2	8.18		60		6		0.005	T
170139	9/13/2000	9.4	7.3	7.97		70		4	K	0.008	T HT
170139	10/11/2000	10.8	8	7.85		60		4	K	0.004	T HT
170139	11/13/2000	11.9	7.7	7.99		70		4	K	0.003	T
170139	5/3/2001	13	8.1	7.79		60		5		0.005	T
170139	6/13/2001	11.8	8.4	8.07		60		2	K	0.001	T
170139	7/17/2001	12.2	7.9	8.16	HT	60		2	K	0.007	T
170139	8/21/2001	9.5	7.9	8.07	HT	60		2	K	0.007	T
170139	9/27/2001	11.3	7.8	7.8		60		7		0.008	T
170139	10/29/2001	14.3	7.5	7.7		60		5		0.004	T
170139	5/7/2002	11.6	7.7	7.66	HT	60		4		0.004	T
170139	6/11/2002	12.5	8.1	7.6		60		2	K	0.004	T
170139	7/10/2002	8.1	7.9	7.98	HT	60		4		0.007	T
170139	8/20/2002	9.4	7.9	8.01		70		2	K	0.006	T
170139	9/16/2002	9.2	7.6	8.31		60		4		0.004	T
170139	10/14/2002	10.1	7.4	7.9		70		2	K	0.004	T
170139	5/19/2003	11.87	7.41	7.75		60			ND	0.008	T
170139	6/23/2003	10.46	7.89	8.23		60			ND	0.013	
170139	7/22/2003	9.3	7.8	8.19		70			ND	0.009	T
170139	8/19/2003	9.65	7.67	8.22		70			ND	0.012	
170139	9/15/2003	9.57	7.68	8.09	H	70			ND	0.011	
170139	10/6/2003	11.48	7.6	7.99		70		6		0.008	T

TABLE A-6. Water Quality Data - St. Mary's River Upstream Station.

STORET ID	Collection Date	Dissolved Oxygen (Field) (mg/l)	pH (Field)	pH (Lab)		Total Dissolved Solids (mg/l)	Total Suspended Solids (mg/l)		Total Ammonia (mg/l)	
170139	6/14/2004	11.05	7.49	8	HT	60		ND	0.004	T
170139	7/12/2004	10.65	7.69	7.98		60		ND	0.008	T
170139	8/31/2004	16.49	7.78	8.2		60		ND	0.005	T
170139	9/20/2004	9.63	7.6	8.01		70		ND	0.005	T
170139	10/11/2004	10.17	7.48	7.92		60	6		0.01	
170139	11/22/2004	11.28	7.05	7.89		60		ND	0.007	T

ND	Observed result was below the quantification level.
A	Value reported is the mean of two or more determinations.
HT	Recommended laboratory holding time was exceeded before analysis.
K	Observed result was below the level of quantitation shown.
T	Value reported is less than the quantification level.
SLRS	SLRS control exceeded quality control criteria.
MBQC	Method blank exceeded level of detection.
CCV	Continuing calibration standard exceeded quality control criteria.
LCQC	Laboratory control exceeded quality control criteria.
MS	Matrix spike exceeded quality control criteria.
MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.
W	Observed result was below the lowest normally reportable value shown.

TABLE A-6. Water Quality Data - St. Mary's River Upstream Station.

STORET ID	Collection Date	Total Nitrite (mg/l)		Total Nitrate (mg/l)		Total Kjeldahl Nitrogen (mg/l)		Total Phosphorus (mg/l)	
170139	6/23/1998	0.002		0.28		0.12		0.006	
170139	7/28/1998	0.002		0.27		0.1		0.00	
170139	9/9/1998	0.003		0.26	HT	0.22	HT	0.005	HT
170139	10/12/1998	0.003		0.29		0.19		0.009	
170139	11/17/1998	0.002		0.31		0.23		0.003	
170139	5/17/1999	0.002		0.29	C	0.11		0.012	
170139	6/15/1999	0.002		0.33	C	0.11		0.009	
170139	7/13/1999	0.002		0.28	C	0.15		0.015	
170139	8/10/1999	0.003		0.27	C	0.13		0.007	
170139	9/7/1999	0.003		0.28	C	0.14		0.003	T
170139	10/6/1999	0.003		0.28	C	0.16		0.005	
170139	11/8/1999	0.001	T	0.3	C	0.09	T	0.004	T
170139	4/27/2000	0.003	T HT	0.3	C HT	0.12		0.004	T
170139	7/12/2000	0.003		0.29	C	0.14		0.005	
170139	8/9/2000	0.003		0.28	C	0.26		0.011	
170139	9/13/2000	0.003		0.29	C HT	0.15	HT	0.006	HT
170139	10/11/2000	0.003	HT	0.3	C HT	0.12	HT	0.006	HT
170139	11/13/2000	0.002		0.32	C	0.06	T	0	W
170139	5/3/2001	0.002		0.34	C	0.07		0.003	T
170139	6/13/2001	0.002		0.3	C	0.1		0.005	
170139	7/17/2001	0.003		0.28	C	0.1		0.003	T
170139	8/21/2001	0.003		0.27	C	0.14		0.008	
170139	9/27/2001	0.002		0.28	C	0.11		0.003	T
170139	10/29/2001	0.003		0.31	C	0.1		0.004	T
170139	5/7/2002	0.002		0.29	C	0.15		0.01	
170139	6/11/2002	0.002		0.34	C	0.1		0.006	
170139	7/10/2002	0.002		0.3	C	0.12		0.009	
170139	8/20/2002	0.003		0.28	C	0.11	HT	0.004	T HT
170139	9/16/2002	0.003		0.28	C	0.11		0.003	T
170139	10/14/2002	0.003		0.3	C	0.1		0.002	T
170139	5/19/2003	0.002		0.35		0.12		0.002	W
170139	6/23/2003	0.003		0.29		0.16		0.005	
170139	7/22/2003	0.004	H	0.29		0.26		0.002	W
170139	8/19/2003	0.009		0.25		0.17		0.006	
170139	9/15/2003	0.007	PI	0.27		0.13		0.007	
170139	10/6/2003	0.005	T	0.3		0.13		0.009	T

TABLE A-6. Water Quality Data - St. Mary's River Upstream Station.

STORET ID	Collection Date	Total Nitrite (mg/l)		Total Nitrate (mg/l)	Total Kjeldahl Nitrogen (mg/l)	Total Phosphorus (mg/l)
170139	6/14/2004	0.002	HT	0.31	0.13	0.01
170139	7/12/2004	0.003		0.31	0.23	0.009
170139	8/31/2004	0.005		0.28	0.19	0.005
170139	9/20/2004	0.004		0.28	0.16	0.006
170139	10/11/2004	0.003		0.3	0.26	0.009
170139	11/22/2004	0.002		0.31	0.25	0.006

ND	Observed result was below the quantification level.
A	Value reported is the mean of two or more determinations.
HT	Recommended laboratory holding time was exceeded before analysis.
K	Observed result was below the level of quantitation shown.
T	Value reported is less than the quantification level.
SLRS	SLRS control exceeded quality control criteria.
MBQC	Method blank exceeded level of detection.
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BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.
W	Observed result was below the lowest normally reportable value shown.

TABLE A-6. Water Quality Data - St. Mary's River Upstream Station.

STORET ID	Collection Date	Total Ortho Phosphate (mg/l)		Total Organic Carbon (mg/l)	Total Sulfate (mg/l)		Hardness Ca2CO3 (mg/l)		Alkalinity Ca2CO3 (mg/l)
170139	6/23/1998	0.001		1.8	3		44		
170139	7/28/1998	0.002		1.5	2		43		
170139	9/9/1998	0.001		1.9	2	K	42		
170139	10/12/1998	0.001		1.4	3		44		
170139	11/17/1998	0.002		1.8	2		42		
170139	5/17/1999	0.005		2	5		43	C	
170139	6/15/1999	0.001	T	1.6	2		42	C	
170139	7/13/1999	0.002	T	3	4		41	C	
170139	8/10/1999	0.001	T	1.9	2		43	C	
170139	9/7/1999	0.001	T	2.2	3		42	C	
170139	10/6/1999	0.001	T	1.6	4		40	C	
170139	11/8/1999	0.001	T	1.7	2		45	C	
170139	4/27/2000	0.003	HT	2	2	K	45		
170139	7/12/2000	0.003		1.9	2	K	46		
170139	8/9/2000	0.005		1.8	3		44		
170139	9/13/2000	0.004		1.7	3		48		
170139	10/11/2000	0.002	T HT	1.6	2		42		
170139	11/13/2000	0.003		1.5	3		43		
170139	5/3/2001	0.001	T HT	1.6	3		45		46
170139	6/13/2001	0.004		2.1	2		45		43
170139	7/17/2001	0.006		1.7	2		48		38
170139	8/21/2001	0.003	T	2	3		43		42
170139	9/27/2001	0.003		1.9	5		46		40
170139	10/29/2001	0.003		2	2		43		38
170139	5/7/2002	0.003		2.8	3		44		45
170139	6/11/2002	0.002		1.8	3		45		42
170139	7/10/2002	0.001	T HT	1.8	2		44		45
170139	8/20/2002	0.012		1.6	4		45		36
170139	9/16/2002	0.006		1.6	1	K	43		38
170139	10/14/2002	0.002	T HT	1.8	3		43		42
170139	5/19/2003	0.001	T	2.1	2		44		35
170139	6/23/2003	0.001	W	2.2	3		45		42
170139	7/22/2003	0.002	T H	1.9	3		42		37
170139	8/19/2003	0.004		2.1		ND	43		39
170139	9/15/2003	0.001	W	1.6	2		42		36
170139	10/6/2003	0.001	T	1.9	4		44		41

TABLE A-6. Water Quality Data - St. Mary's River Upstream Station.

STORET ID	Collection Date	Total Ortho Phosphate (mg/l)		Total Organic Carbon (mg/l)	Total Sulfate (mg/l)		Hardness Ca2CO3 (mg/l)	Alkalinity Ca2CO3 (mg/l)
170139	6/14/2004	0.002	T HT	1.8	4		46	43
170139	7/12/2004	0.001	T	2.8	3		44	35
170139	8/31/2004	0.003		2.8	2		46	37
170139	9/20/2004	0.001	T	2	3		46	43
170139	10/11/2004	0.002	T	2.2	3		46	46
170139	11/22/2004		ND W	2.4		ND	47	59

ND	Observed result was below the quantification level.
A	Value reported is the mean of two or more determinations.
HT	Recommended laboratory holding time was exceeded before analysis.
K	Observed result was below the level of quantitation shown.
T	Value reported is less than the quantification level.
SLRS	SLRS control exceeded quality control criteria.
MBQC	Method blank exceeded level of detection.
CCV	Continuing calibration standard exceeded quality control criteria.
LCQC	Laboratory control exceeded quality control criteria.
MS	Matrix spike exceeded quality control criteria.
MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.
W	Observed result was below the lowes W

TABLE A-6. Water Quality Data - St. Mary's River Upstream Station.

STORET ID	Collection Date	Total Calcium (mg/l)	Total Magnesium (mg/l)	Total Potassium (mg/L)	Total Chloride (mg/l)		Total Sodium (mg/l)		Total Sulfide (mg/L)	
170139	6/23/1998	12.8	2.8		2					
170139	7/28/1998	12.6	2.9		2					
170139	9/9/1998	12.8	2.5		2					
170139	10/12/1998	12.9	2.9		2					
170139	11/17/1998	12.3	2.8		2					
170139	5/17/1999	12.3	3		2					
170139	6/15/1999	12.3	2.8		2					
170139	7/13/1999	11.9	2.7		2					
170139	8/10/1999	12.6	2.8		2					
170139	9/7/1999	11.9	2.9		2					
170139	10/6/1999	11.5	2.7		2					
170139	11/8/1999	13.2	2.8		2					
170139	4/27/2000	13.1	2.9		1					
170139	7/12/2000	13.6	2.9		2					
170139	8/9/2000	12.8	2.8		2					
170139	9/13/2000	14	3.1		2					
170139	10/11/2000	12.7	2.6		2					
170139	11/13/2000	12.8	2.7		2					
170139	5/3/2001	13.2	2.8		2				0.01	K
170139	6/13/2001	13.6	2.7		2				0.01	K
170139	7/17/2001	14.4	2.8	0.5	1		1.9		0.01	K
170139	8/21/2001	12.9	2.7	0.5	1		0.5	K	0.01	K
170139	9/27/2001	13.5	2.9	0.5	2		1.1		0.01	K
170139	10/29/2001	12.9	2.7	0.4	2		1.5		0.01	K
170139	5/7/2002	13.2	2.6	0.5	2		1.3		0.01	K
170139	6/11/2002	13.5	2.8	0.5	2		1.7		0.01	K
170139	7/10/2002	12.8	2.8	0.5	0.5	K	1.3		0.01	K
170139	8/20/2002	12.9	3	1.9	2		1.5		0.01	K
170139	9/16/2002	12.1	3	0.5	1		0.5	K	0.01	K
170139	10/14/2002	12.3	3	1.8	3		2.2		0.01	K
170139	5/19/2003	13.3	2.7	0.5	2			ND		ND
170139	6/23/2003	13.5	2.8	0.8	2		1.6			
170139	7/22/2003	12.2	2.8	1.7	7			ND		
170139	8/19/2003	12.7	2.7	0.5	2		2.7			
170139	9/15/2003	12.2	2.7	0.8	2		1.4			
170139	10/6/2003	13	2.8	0.8	2			ND		

TABLE A-6. Water Quality Data - St. Mary's River Upstream Station.

STORET ID	Collection Date	Total Calcium (mg/l)	Total Magnesium (mg/l)	Total Potassium (mg/L)	Total Chloride (mg/l)	Total Sodium (mg/l)	Total Sulfide (mg/L)
170139	6/14/2004	14.2	2.5	0.5	2	ND	
170139	7/12/2004	13.2	2.7	0.7	2	ND	
170139	8/31/2004	14.1	2.7	0.5	2	ND	
170139	9/20/2004	13.8	2.8	0.6	2	ND	
170139	10/11/2004	13.9	2.7	0.7	2	1.2	
170139	11/22/2004	14.2	2.8	0.8	2	ND	

ND	Observed result was below the quantification level.
A	Value reported is the mean of two or more determinations.
HT	Recommended laboratory holding time was exceeded before analysis.
K	Observed result was below the level of quantitation shown.
T	Value reported is less than the quantification level.
SLRS	SLRS control exceeded quality control criteria.
MBQC	Method blank exceeded level of detection.
CCV	Continuing calibration standard exceeded quality control criteria.
LCQC	Laboratory control exceeded quality control criteria.
MS	Matrix spike exceeded quality control criteria.
MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.
W	Observed result was below the lowest normally reportable value shown.

TABLE A-6. Water Quality Data - St. Mary's River Upstream Station.

STORET ID	Collection Date	Cadmium (ug/l)		Chromium (ug/l)		Copper (ug/l)		Nickel (ug/l)
170139	6/23/1998	0.011		0.349		0.822		0.872
170139	7/28/1998	0.01		0.373		0.879		0.41
170139	9/9/1998	0.008		0.257		0.826		0.36
170139	10/12/1998	0.01		0.56		1.17		0.633
170139	11/17/1998	0.001		0.932		0.994		0.75
170139	5/17/1999	0.014		0.266		0.851		0.424
170139	6/15/1999	0.013		0.206		0.873		0.4
170139	7/13/1999	0.011		0.344		1.019		0.543
170139	8/10/1999	0.003		0.243		0.887		0.444
170139	9/7/1999	0.013		0.297		0.828		0.434
170139	10/6/1999	0.013		0.276		0.833		0.411
170139	11/8/1999	0.011		0.637		0.962		0.674
170139	4/27/2000							
170139	7/12/2000	0.01		0.14	CCB	0.94		0.48
170139	8/9/2000	0.01		0.13		0.93		0.34
170139	9/13/2000	0.009	ELOD	0.19		0.9		0.43
170139	10/11/2000	0.01		0.14		0.83		0.34
170139	11/13/2000	0.009		0.1		0.77		0.35
170139	5/3/2001	0.01		0.11		0.75		0.25
170139	6/13/2001	0.009		0.03		0.69		0.35
170139	7/17/2001	0.006		0		0.775		0.29
170139	8/21/2001	0.001		0.015	MBQC	0.815		0.36
170139	9/27/2001	0.007		0.08		0.83		0.43
170139	10/29/2001	0.007		0.18		0.847		0.33
170139	5/7/2002	0.015		0.271		0.934		0.434
170139	6/11/2002	0.013		0		0.839		0.166
170139	7/10/2002	0.001		0		0.836		0.208
170139	8/20/2002	0.001		0		0.782		0.263
170139	9/16/2002	0.013		0.045		0.823		0.295
170139	10/14/2002	0.013		0.04		0.795		0.391
170139	5/19/2003	0		0	ISQC	0.831		0.29
170139	6/23/2003	0		0.108		0.905	ICB, MBQC, LCQC	0.384
170139	7/22/2003	0		0.106		0.903		0.355
170139	8/19/2003	0		0.18		0.833		0.32
170139	9/15/2003	0.003		0.193		0.9		0.391
170139	10/6/2003	0		0.337		0.998		0.486

TABLE A-6. Water Quality Data - St. Mary's River Upstream Station.

STORET ID	Collection Date	Cadmium (ug/l)	Chromium (ug/l)	Copper (ug/l)	Nickel (ug/l)
170139	6/14/2004	0.009	0.073	0.744	0.241
170139	7/12/2004	0.01	0.076	0.816	0.241
170139	8/31/2004	0.009	0.157	0.897	0.383
170139	9/20/2004	0.009	0.095	0.903	0.323
170139	10/11/2004	0.009	0.118	0.859	0.35
170139	11/22/2004	0.008	0.032	0.917	0.3

ND	Observed result was below the quantification level.
A	Value reported is the mean of two or more determinations.
HT	Recommended laboratory holding time was exceeded before analysis.
K	Observed result was below the level of quantitation shown.
T	Value reported is less than the quantification level.
SLRS	SLRS control exceeded quality control criteria.
MBQC	Method blank exceeded level of detection.
CCV	Continuing calibration standard exceeded quality control criteria.
LCQC	Laboratory control exceeded quality control criteria.
MS	Matrix spike exceeded quality control criteria.
MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.
W	Observed result was below the lowest normally reportable value shown.

TABLE A-6. Water Quality Data - St. Mary's River Upstream Station.

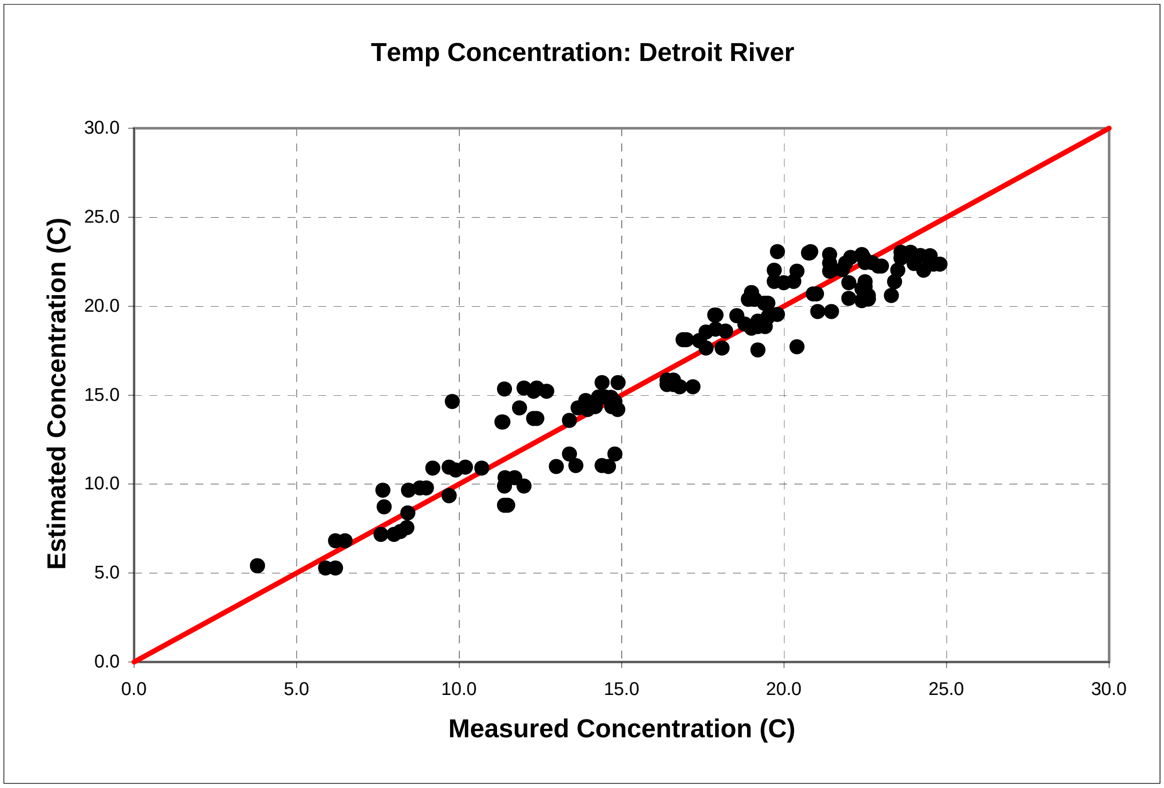
STORET ID	Collection Date	Lead (ug/l)	Zinc (ug/l)		Mercury (ng/L)	Total PCB (ng/L)	Total DDT (ng/L)	Total Cyanide (mg/L)
170139	6/23/1998	0.027	0.565		1.70	0.446	0	
170139	7/28/1998	0.058	0.363		0.334			
170139	9/9/1998	0.023	0.239		0.395	0.655	0.046	
170139	10/12/1998	0.014	0.356		0.453			
170139	11/17/1998	0.152	0.809		1.19			
170139	5/17/1999	0.014	0.23		14.2	0.315	0	
170139	6/15/1999	0.034	0.236		4.92			
170139	7/13/1999	0.067	0.495		3.75	0.699	0.035	
170139	8/10/1999	0.022	0.128		0.924	0.487		
170139	9/7/1999	0.012	0.164		3.78	0.232		
170139	10/6/1999	0.028	0.201		0.969			
170139	11/8/1999	0.088	0.535		0.491			
170139	4/27/2000							
170139	7/12/2000	0.018	0.23		0.17			
170139	8/9/2000	0.021	0.22	SLRS	0.26			
170139	9/13/2000	0.041	0.36		0.21	0.273		
170139	10/11/2000	0.019	0.19		0.3			
170139	11/13/2000	0.013	0.37		0.17			
170139	5/3/2001	0.027	0.18		0.16			
170139	6/13/2001	0.031	0.25		0.36			
170139	7/17/2001	0.018	0.155		0.49			
170139	8/21/2001	0.028	0.267		0.15	0.234		
170139	9/27/2001	0.042	0.283		0.4			
170139	10/29/2001	0.052	0.74		0.46			
170139	5/7/2002	0.137	1.94	LCQC	0.74			
170139	6/11/2002	0.0388	1.01		0.29			
170139	7/10/2002	0.0377	0.38		0.4			
170139	8/20/2002	0.0193	1.25		0.39	0.412		
170139	9/16/2002	0.0404	0.46		0.33			
170139	10/14/2002	0.035	0.75		0.27			
170139	5/19/2003	0.0131	0.59	LCQC	0.15			ND
170139	6/23/2003	0.0509	0.42		0.33			
170139	7/22/2003	0.0358	0.7		0.2	0.184		
170139	8/19/2003	0.0697	0.52		0.42			
170139	9/15/2003	0.0653	0.53		0.37			
170139	10/6/2003	0.0986	1.49		0.22			

TABLE A-6. Water Quality Data - St. Mary's River Upstream Station.

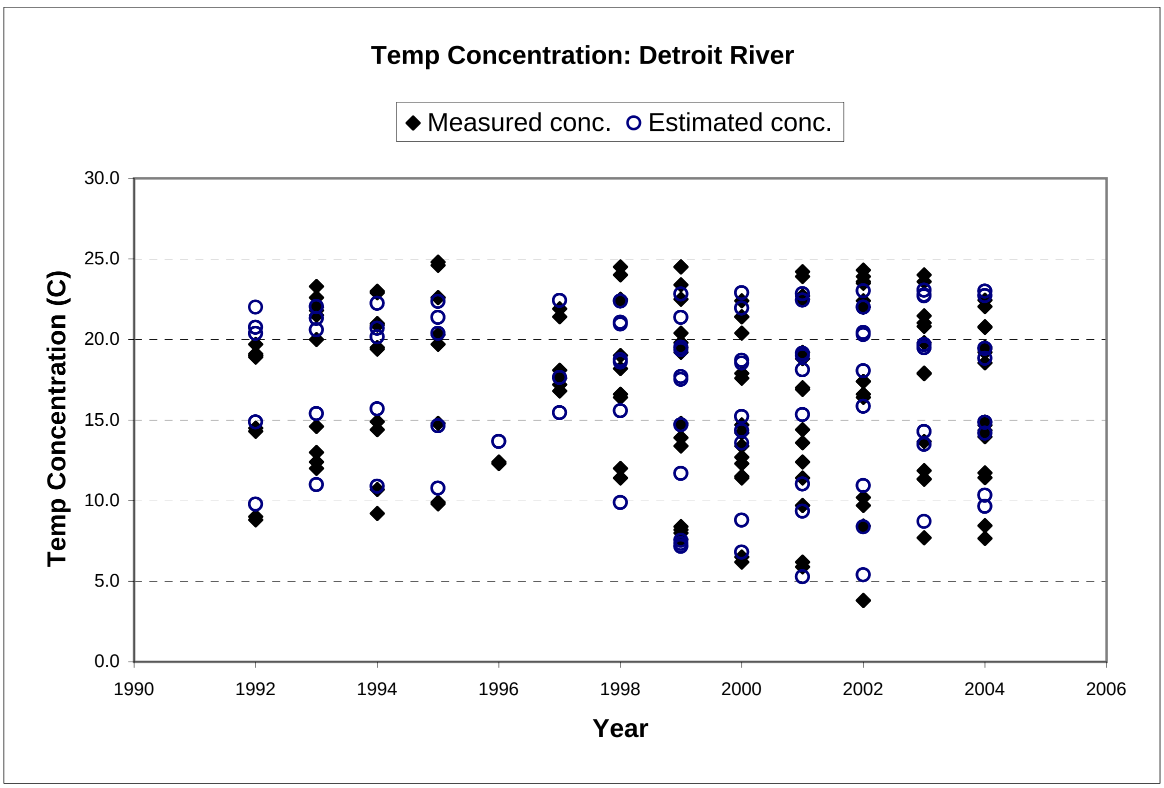
STORET ID	Collection Date	Lead (ug/l)		Zinc (ug/l)		Mercury (ng/L)		Total PCB (ng/L)	Total DDT (ng/L)	Total Cyanide (mg/L)
170139	6/14/2004	0.0347		0.3		0.5				
170139	7/12/2004	0.0297		0.64		0.3	MSD			
170139	8/31/2004	0.0449		2.2	LCQC	0.31				
170139	9/20/2004	0.0432		3		0.47				
170139	10/11/2004	0.0609		1.09		0.22				
170139	11/22/2004	0.0337		1.44		0.19				

ND	Observed result was below the quantification level.
A	Value reported is the mean of two or more determinations.
HT	Recommended laboratory holding time was exceeded before analysis.
K	Observed result was below the level of quantitation shown.
T	Value reported is less than the quantification level.
SLRS	SLRS control exceeded quality control criteria.
MBQC	Method blank exceeded level of detection.
CCV	Continuing calibration standard exceeded quality control criteria.
LCQC	Laboratory control exceeded quality control criteria.
MS	Matrix spike exceeded quality control criteria.
MSD	Matrix spike duplicate exceeded quality control criteria.
CCB	Continuing calibration blank exceeded level of detection.
BSQC	Batch spike exceeded quality control criteria.
ICB	Initial calibration blank exceeded level of detection.
ISQC	Internal standard exceeded quality control criteria.
PI	Possible interference may have affected the accuracy of the laboratory result.
C	Value calculated from other independent parameters.
W	Observed result was below the lowest normally reportable value shown.

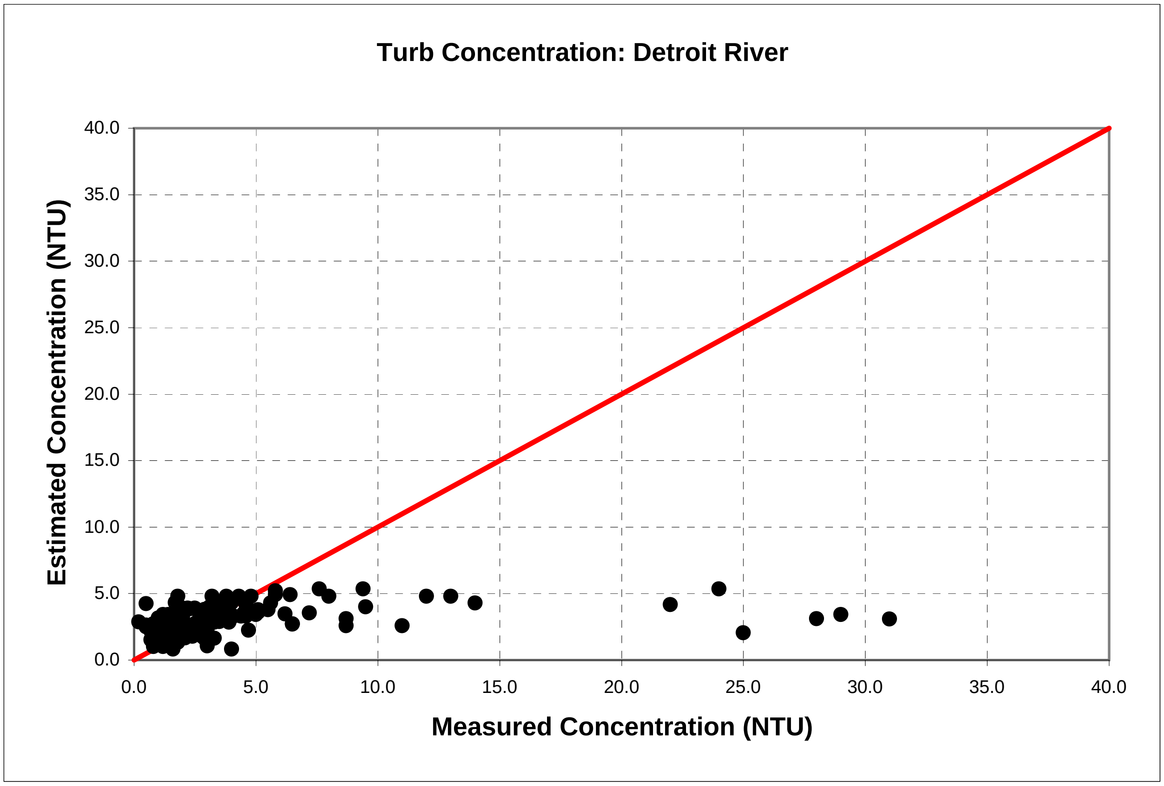
Appendix B
Multiple Regression Analysis – Estimated Values vs. Measured Values

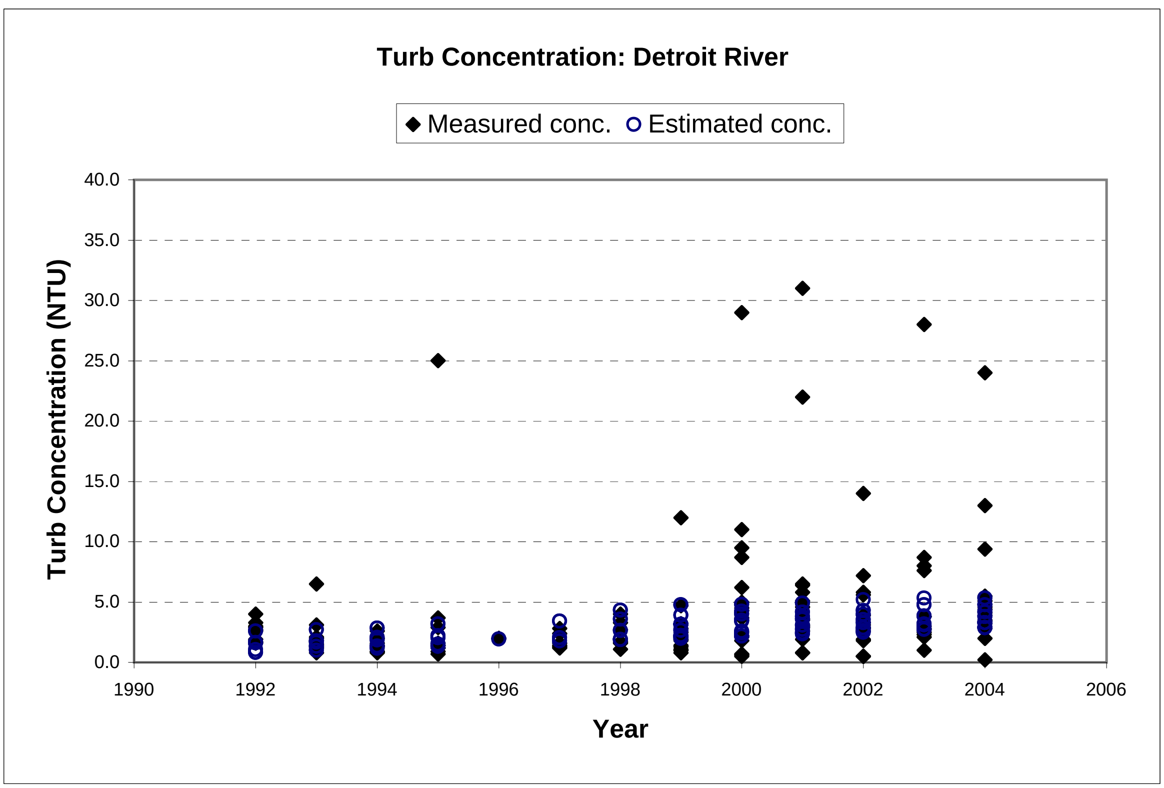


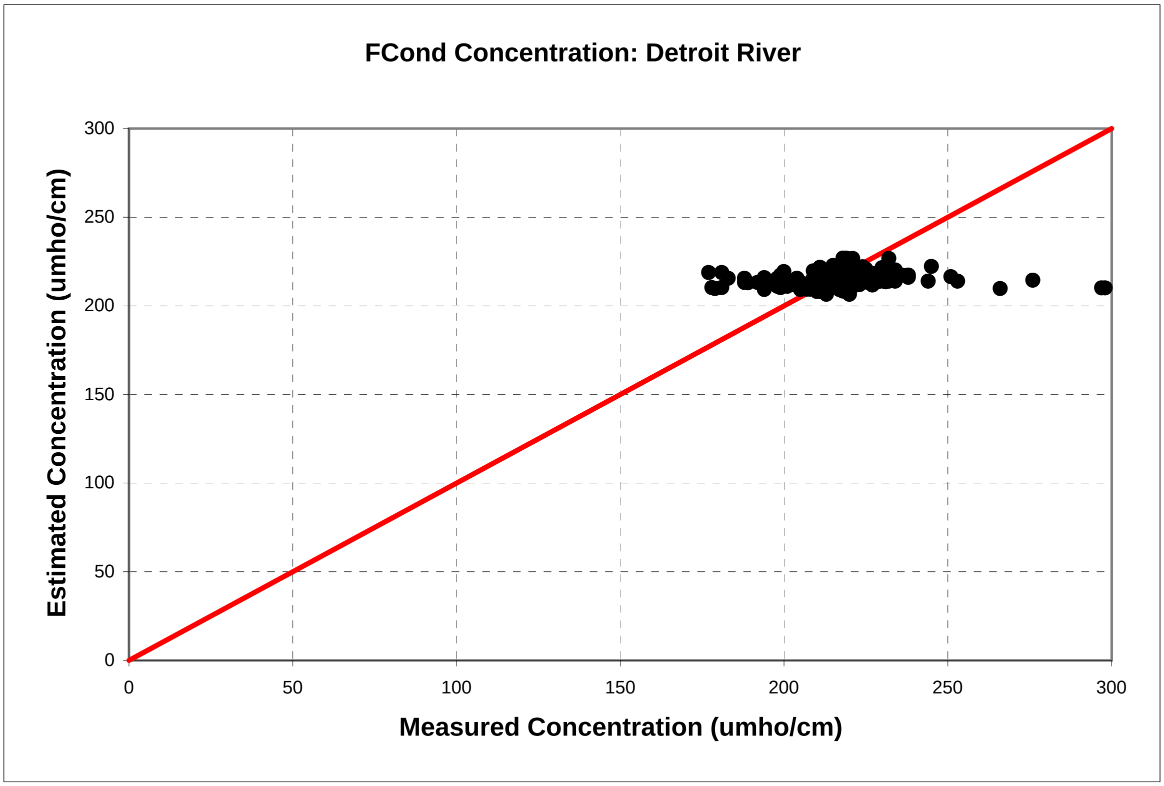
Temp Concentration: Detroit River
Estimated Concentration (C)
Measured Concentration (C)
0.0
5.0
10.0
15.0
20.0
25.0
30.0



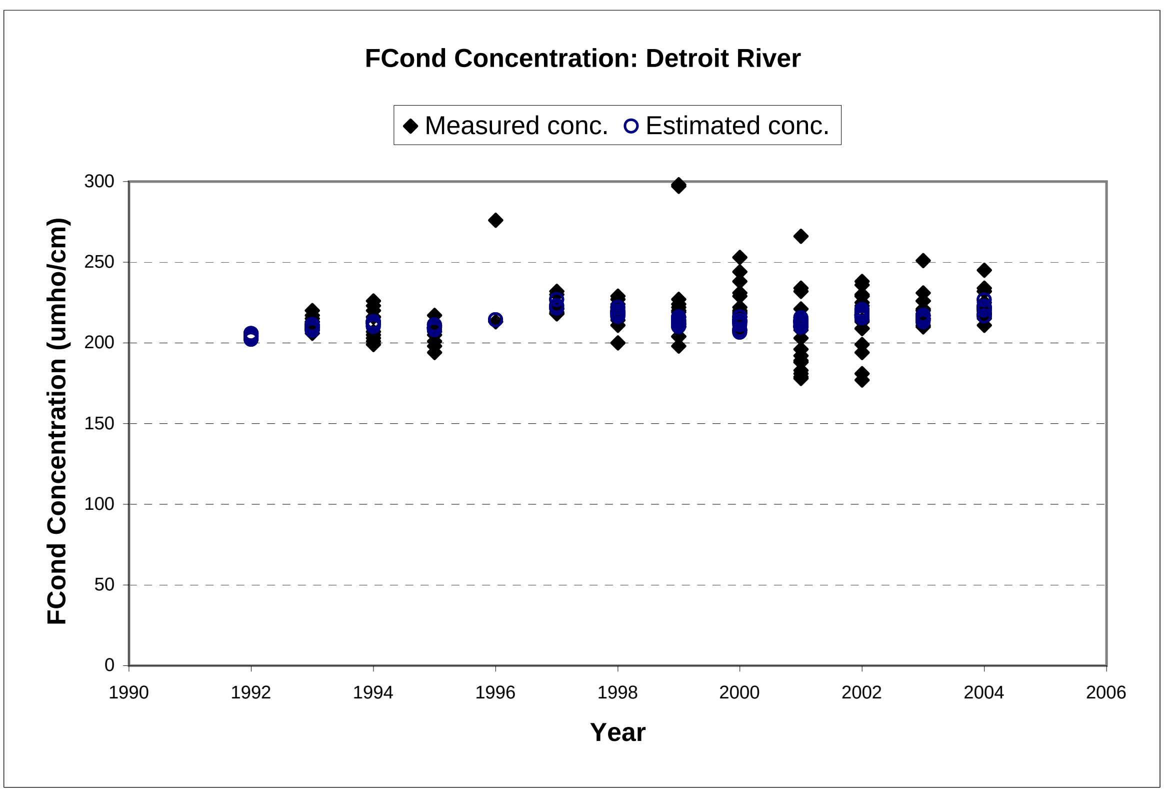
Temp Concentration: Detroit River
Measured conc.
Estimated conc.
Temp Concentration (C)
Year
0.0
5.0
10.0
15.0
20.0
25.0
30.0
1990
1992
1994
1996
1998
2000
2002
2004
2006


Turb Concentration: Detroit River
Estimated Concentration (NTU)
Measured Concentration (NTU)
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0

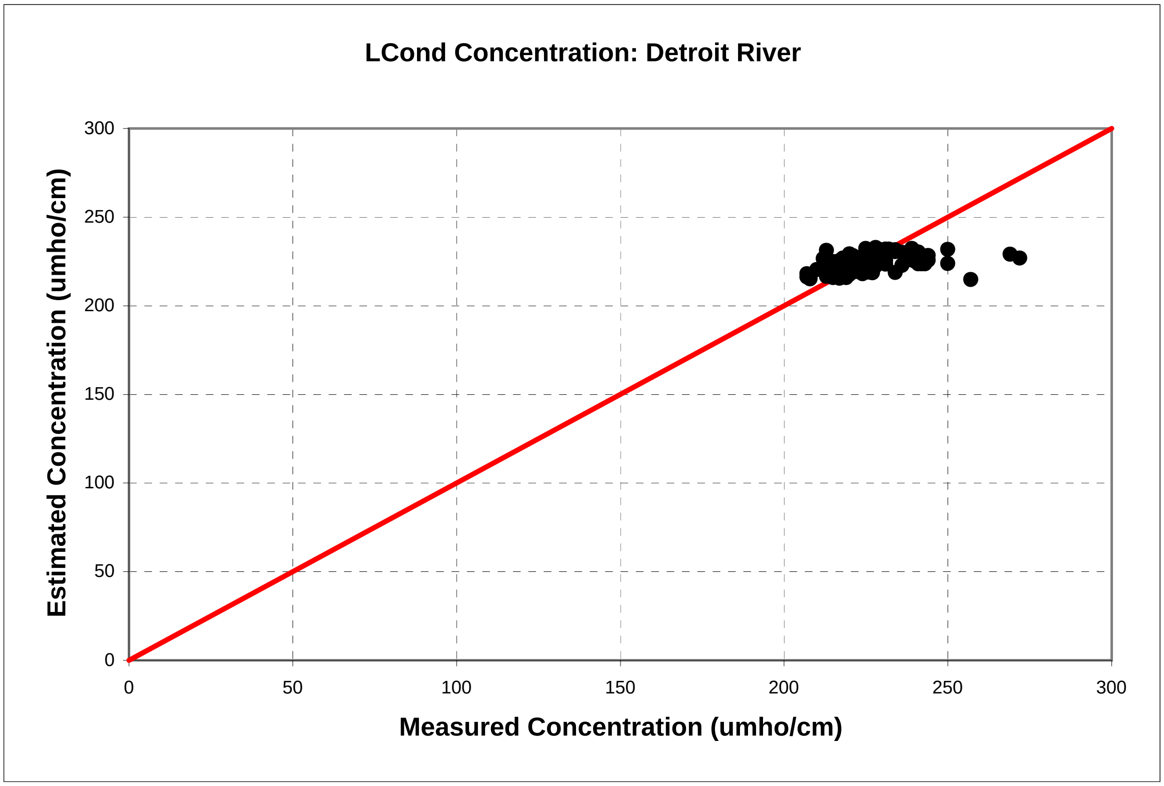

Turb Concentration: Detroit River
Measured conc.
Estimated conc.
Turb Concentration (NTU)
Year
1990
1992
1994
1996
1998
2000
2002
2004
2006

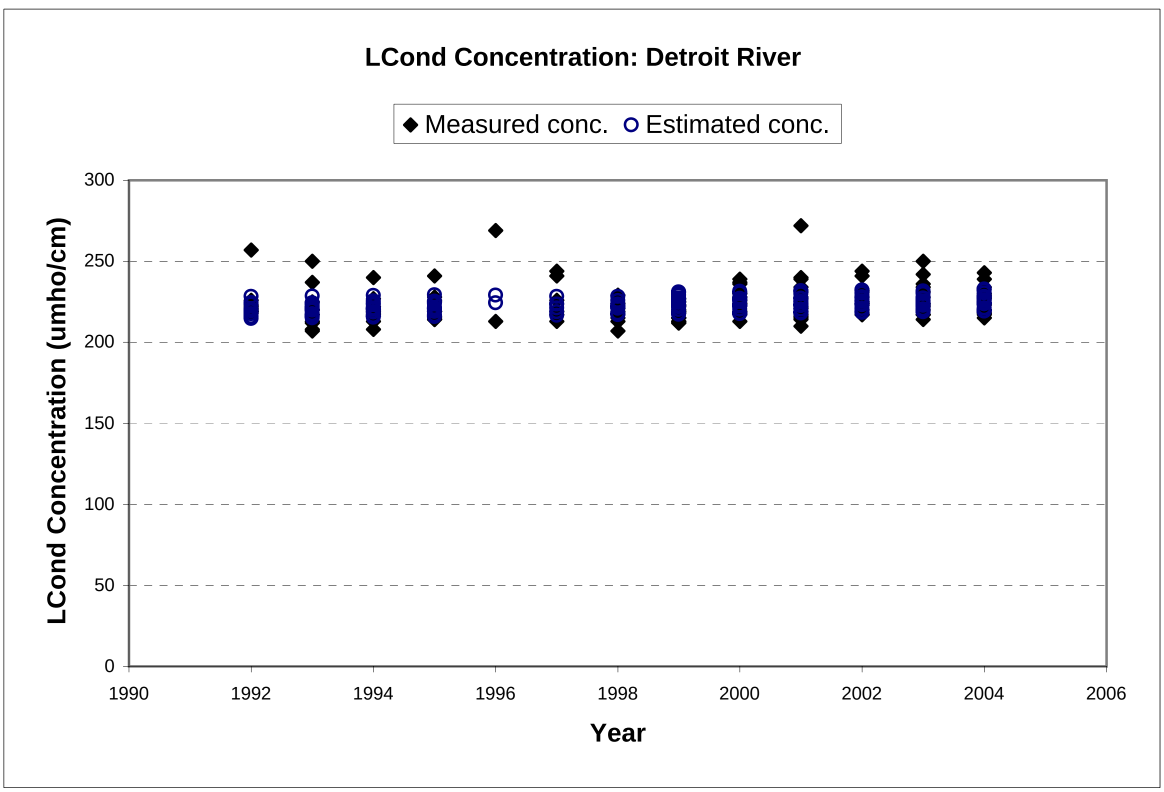


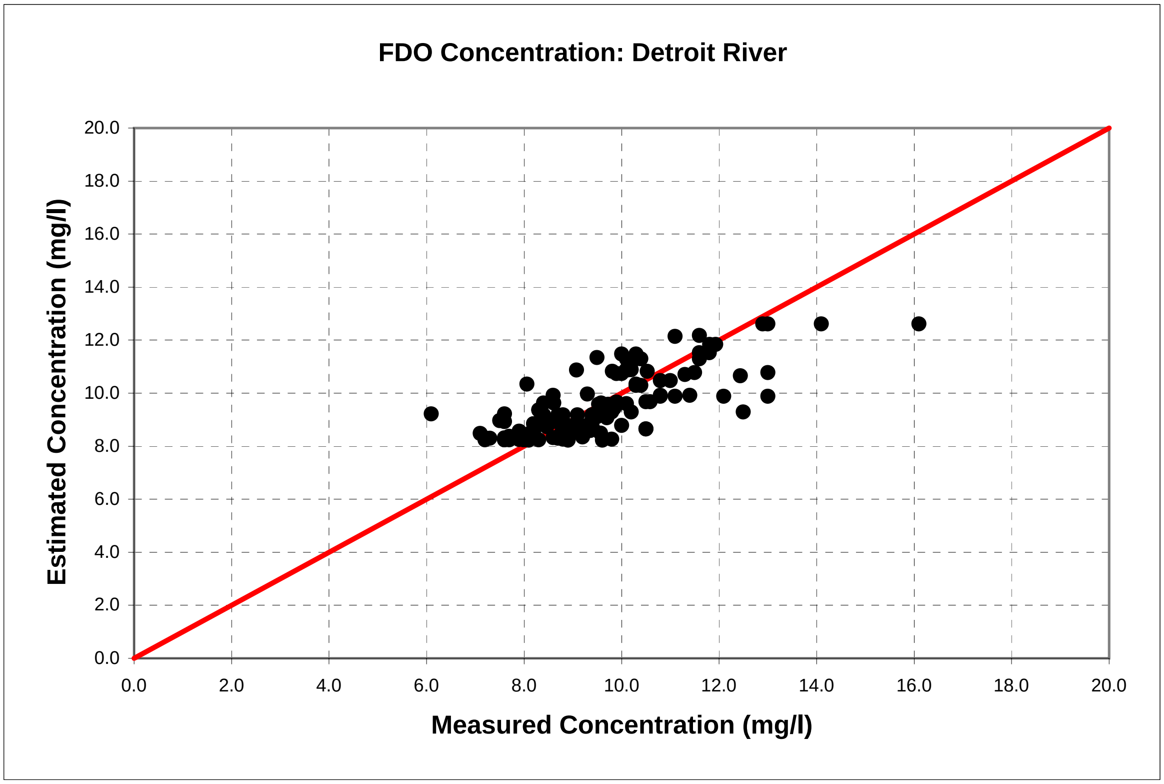
FCond Concentration: Detroit River
Estimated Concentration (umho/cm)
Measured Concentration (umho/cm)
0
50
100
150
200
250
300

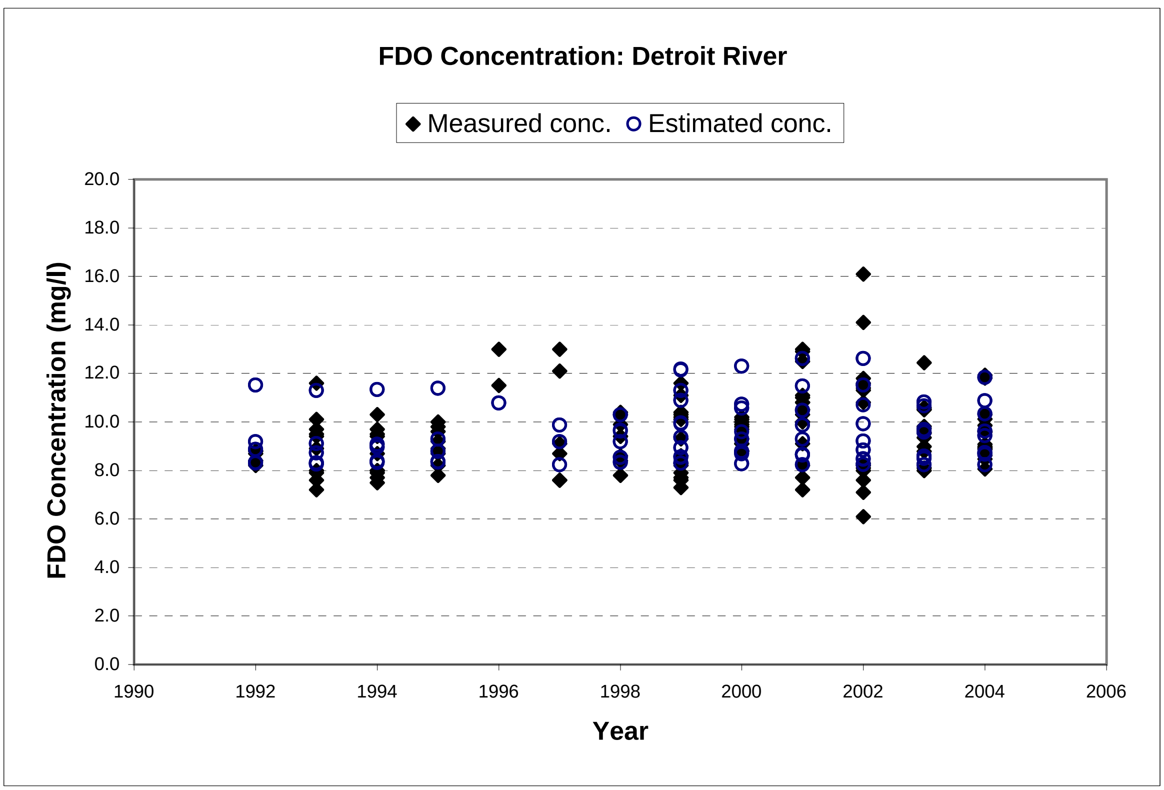


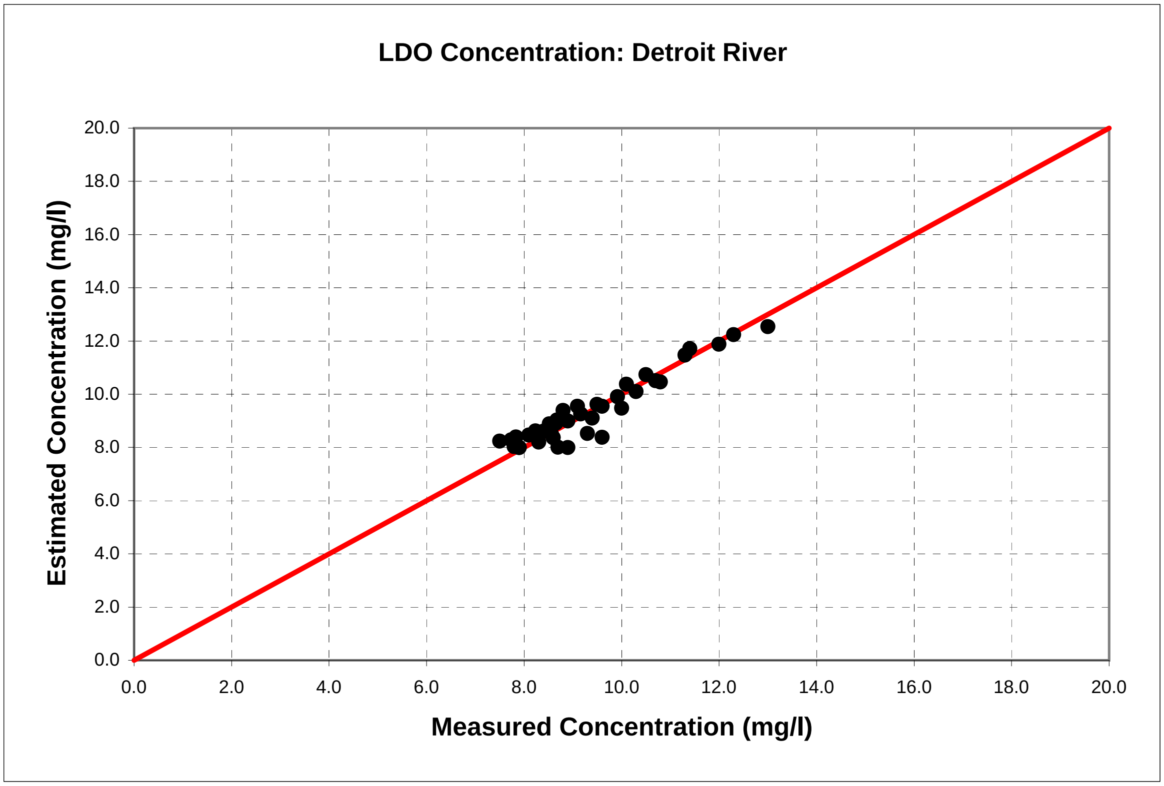
FCond Concentration: Detroit River
Measured conc.
Estimated conc.
FCond Concentration (umho/cm)
Year
0
50
100
150
200
250
300
1990
1992
1994
1996
1998
2000
2002
2004
2006


LCond Concentration: Detroit River
Estimated Concentration (umho/cm)
Measured Concentration (umho/cm)
0
50
100
150
200
250
300

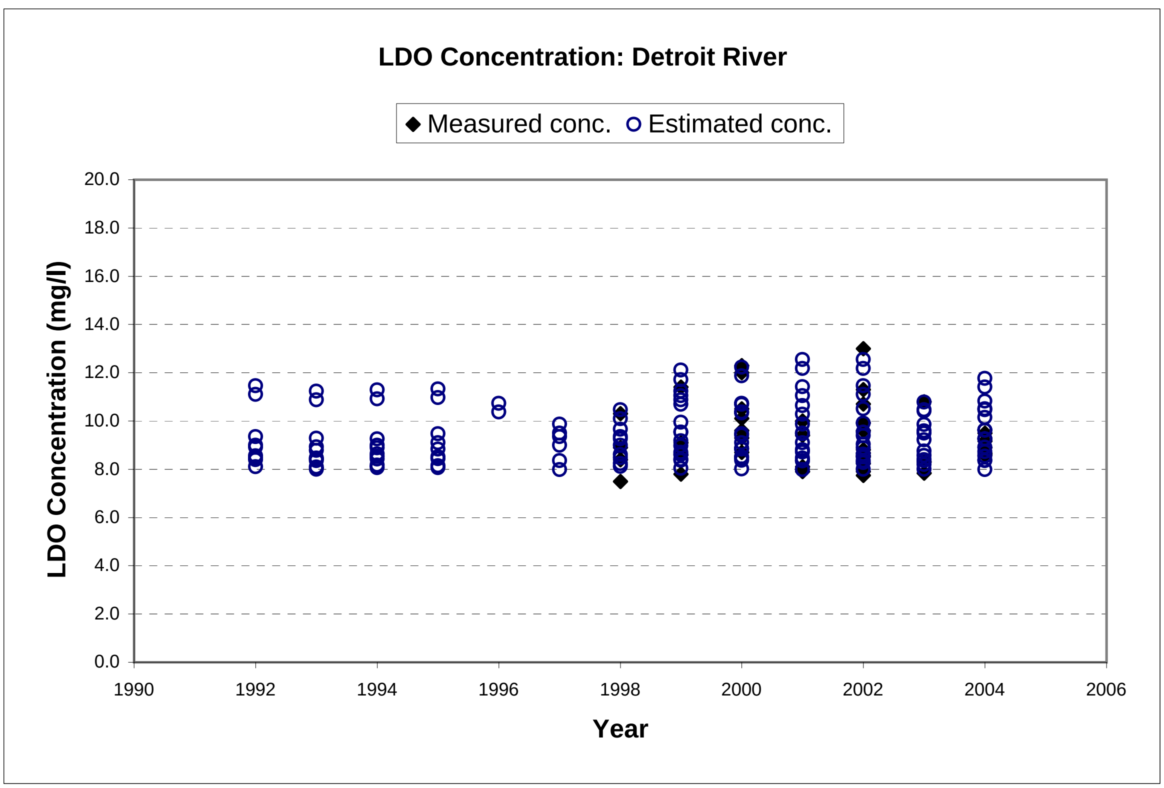

LCond Concentration: Detroit River
Measured conc.
Estimated conc.
LCond Concentration (umho/cm)
Year
0
50
100
150
200
250
300
1990
1992
1994
1996
1998
2000
2002
2004
2006


FDO Concentration: Detroit River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0

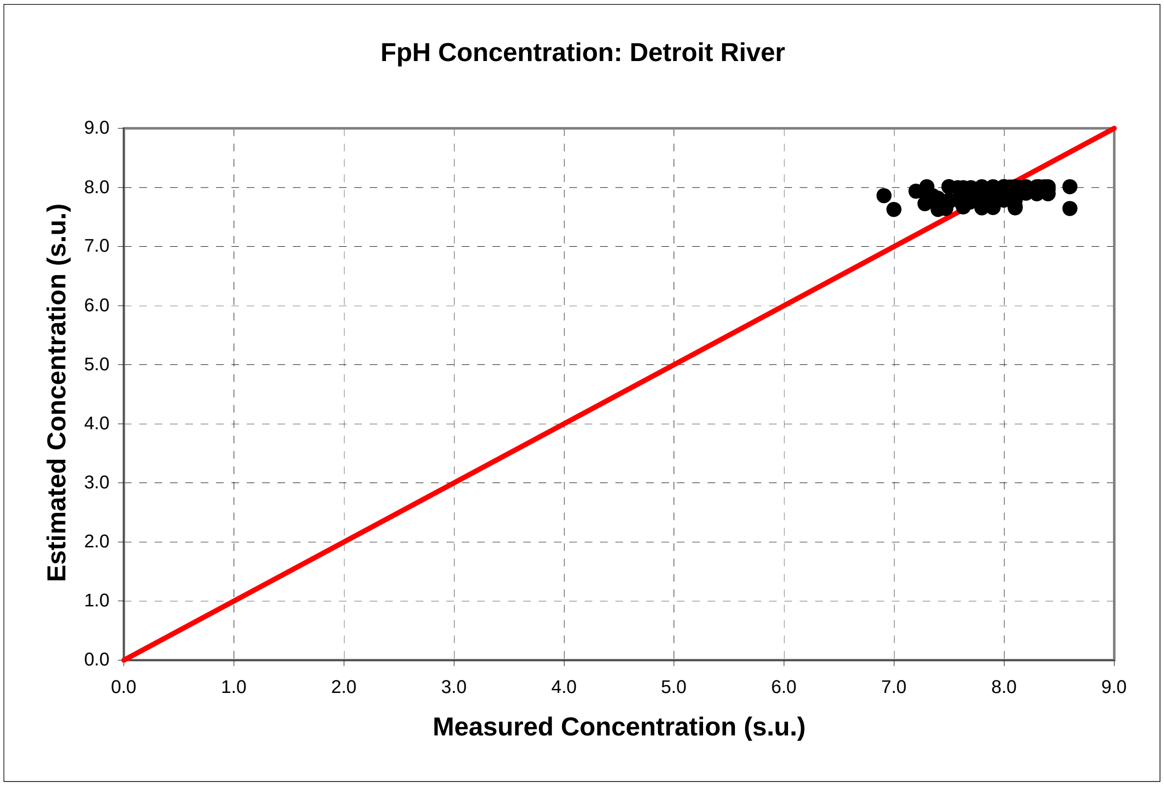

FDO Concentration: Detroit River
Measured conc.
Estimated conc.
FDO Concentration (mg/l)
Year
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
1990
1992
1994
1996
1998
2000
2002
2004
2006

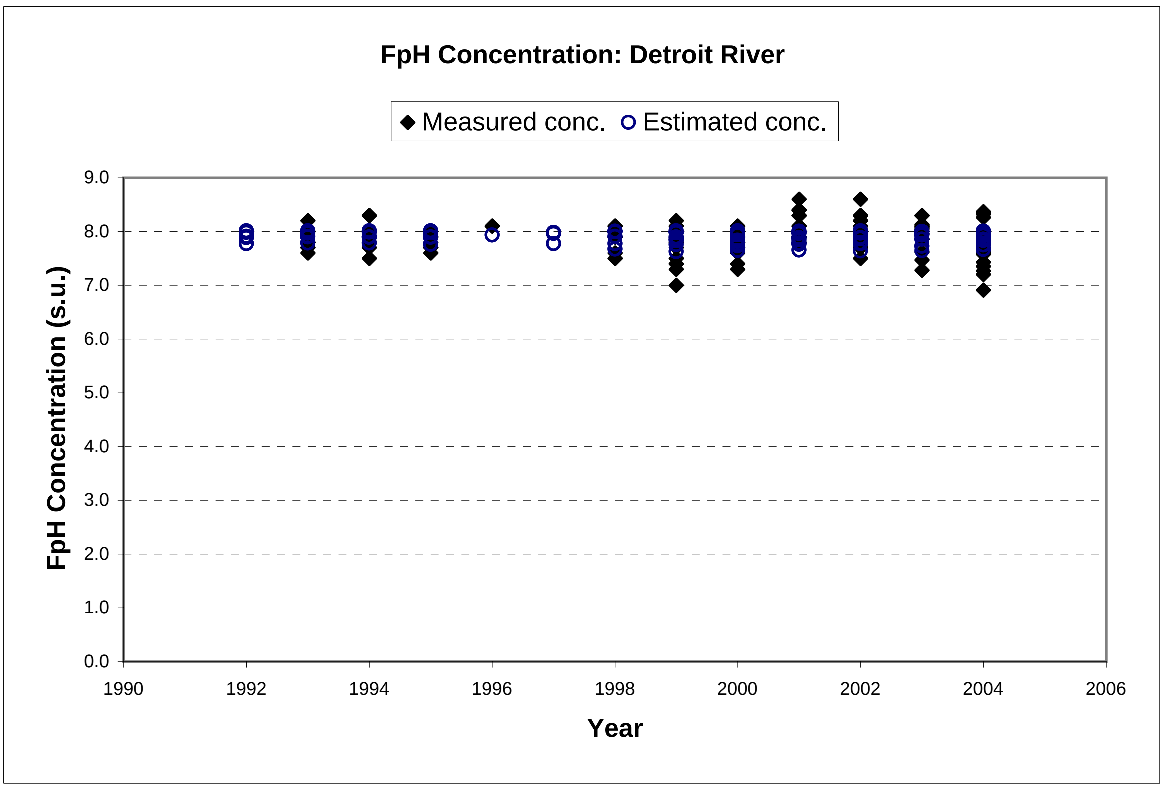


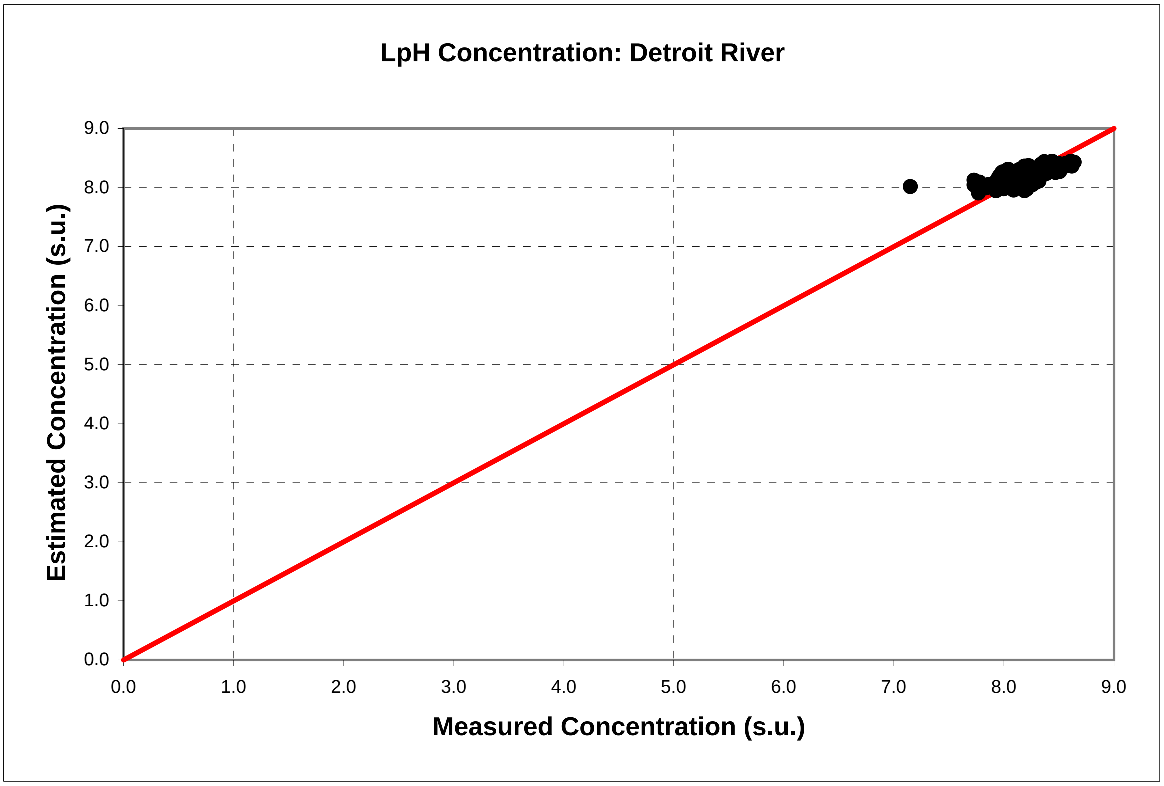
LDO Concentration: Detroit River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0



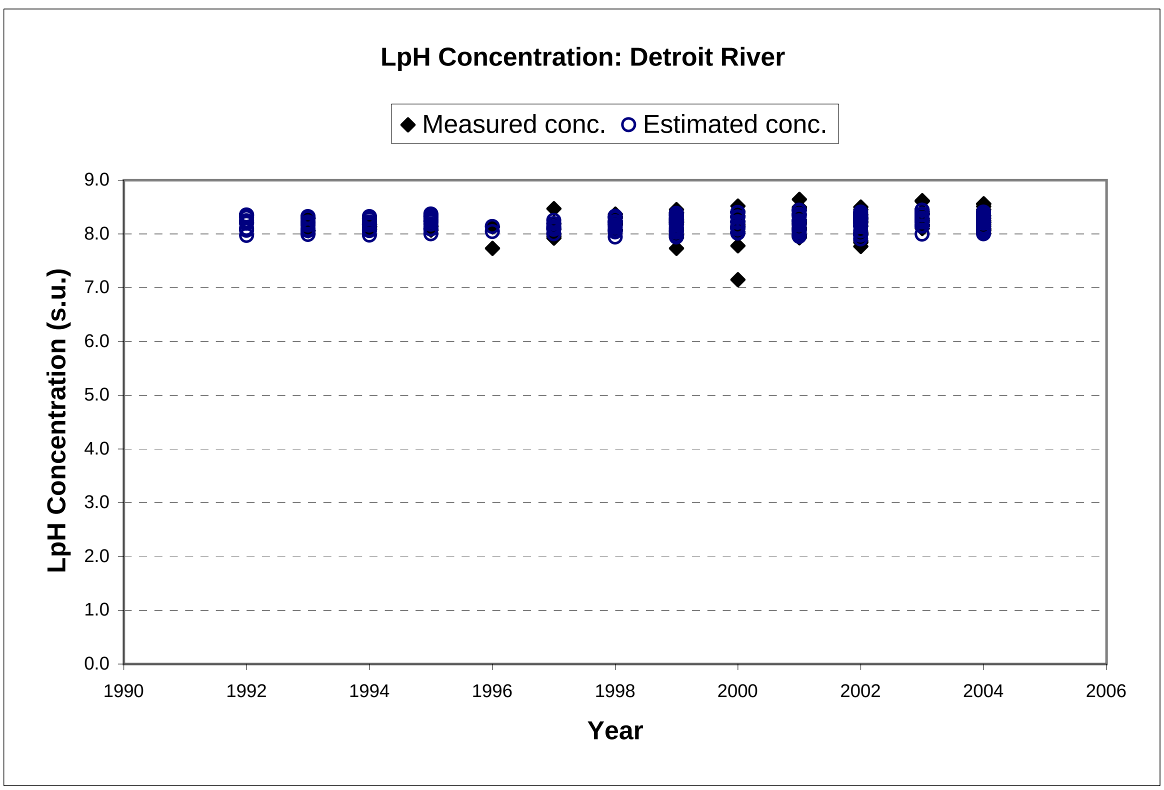
LDO Concentration: Detroit River
Measured conc.
Estimated conc.
LDO Concentration (mg/l)
Year
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
1990
1992
1994
1996
1998
2000
2002
2004
2006


FpH Concentration: Detroit River
Estimated Concentration (s.u.)
Measured Concentration (s.u.)
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0

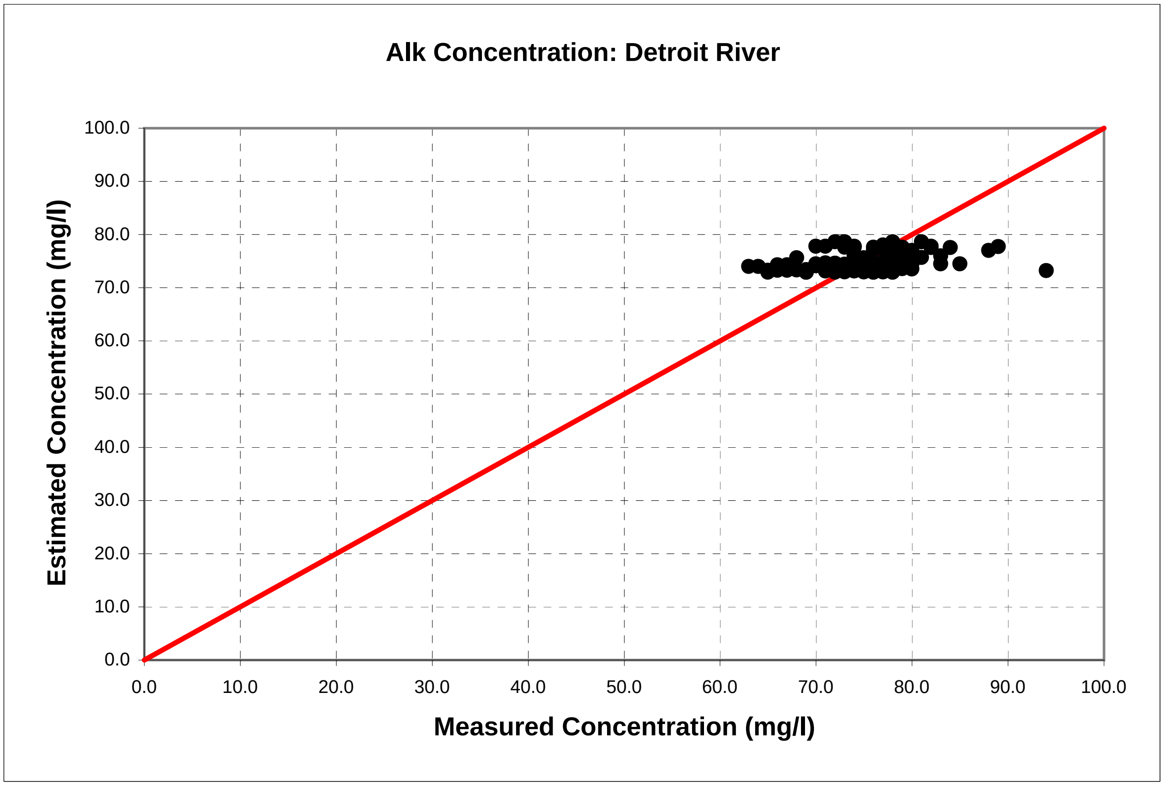

FpH Concentration: Detroit River
Measured conc.
Estimated conc.
FpH Concentration (s.u.)
Year
1990
1992
1994
1996
1998
2000
2002
2004
2006



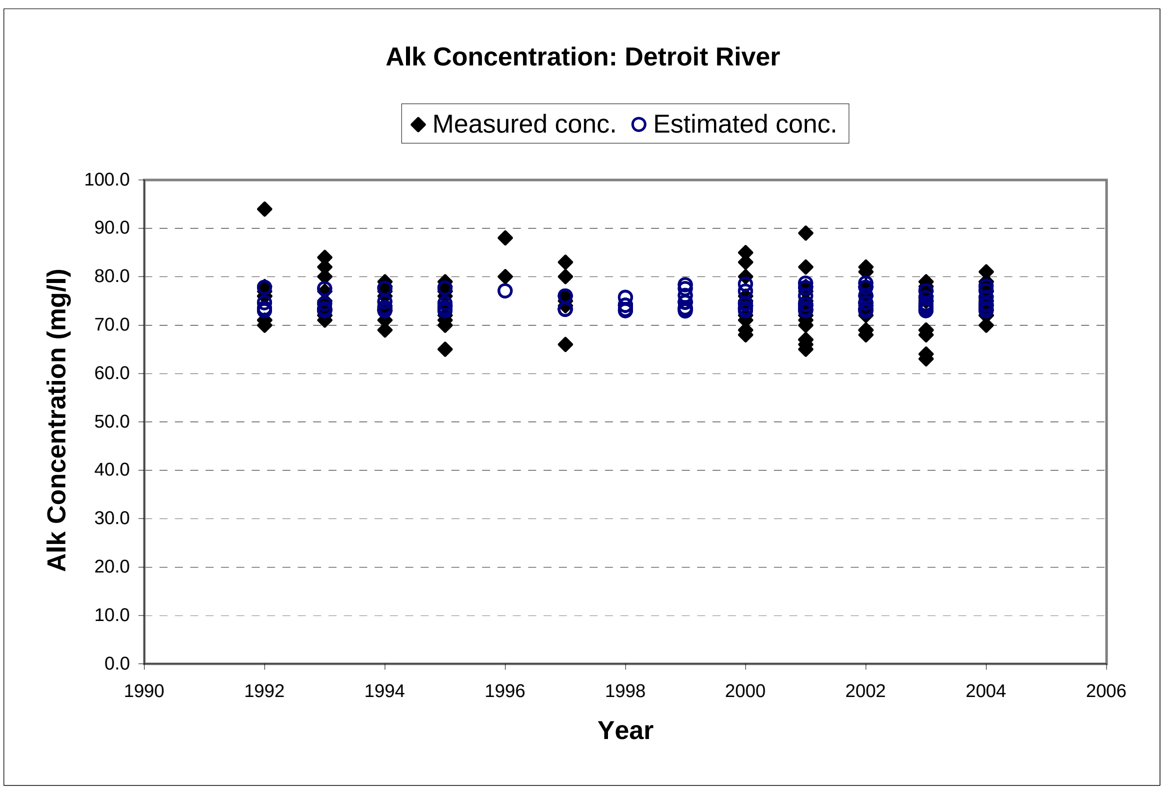
LpH Concentration: Detroit River
Estimated Concentration (s.u.)
Measured Concentration (s.u.)
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0



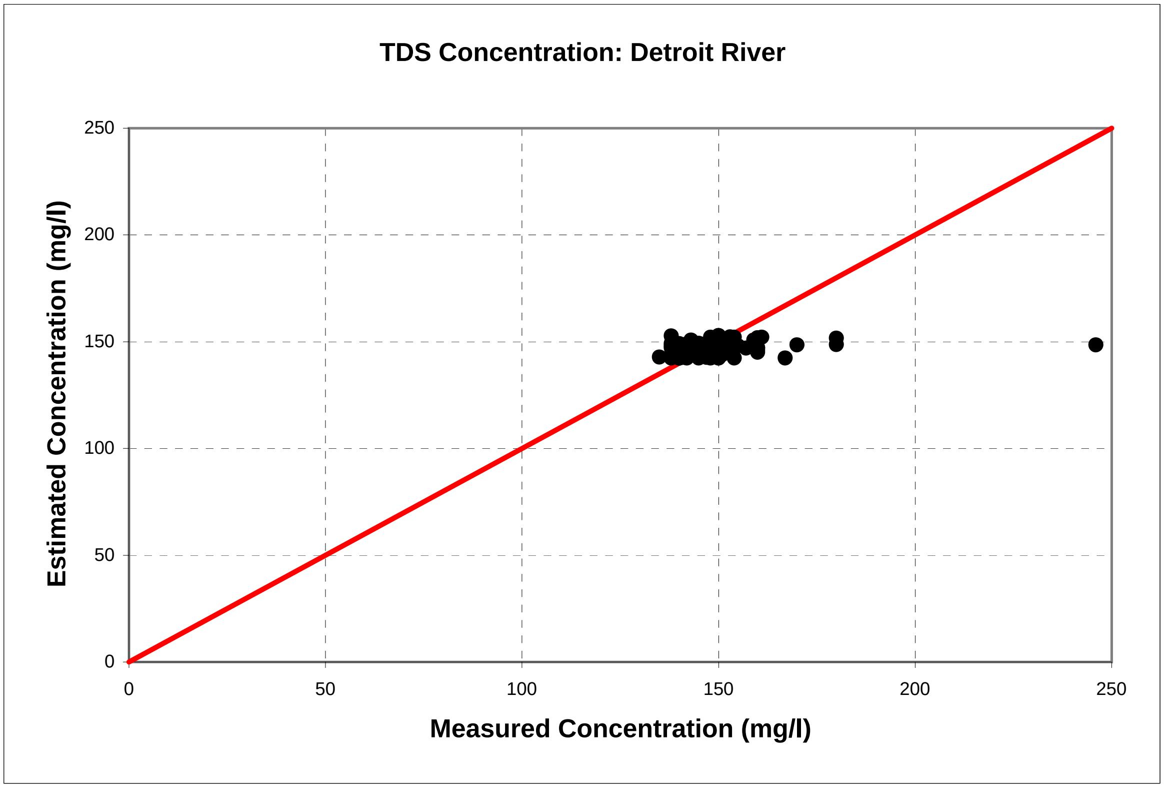
LpH Concentration: Detroit River
Measured conc.
Estimated conc.
LpH Concentration (s.u.)
Year
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
1990
1992
1994
1996
1998
2000
2002
2004
2006

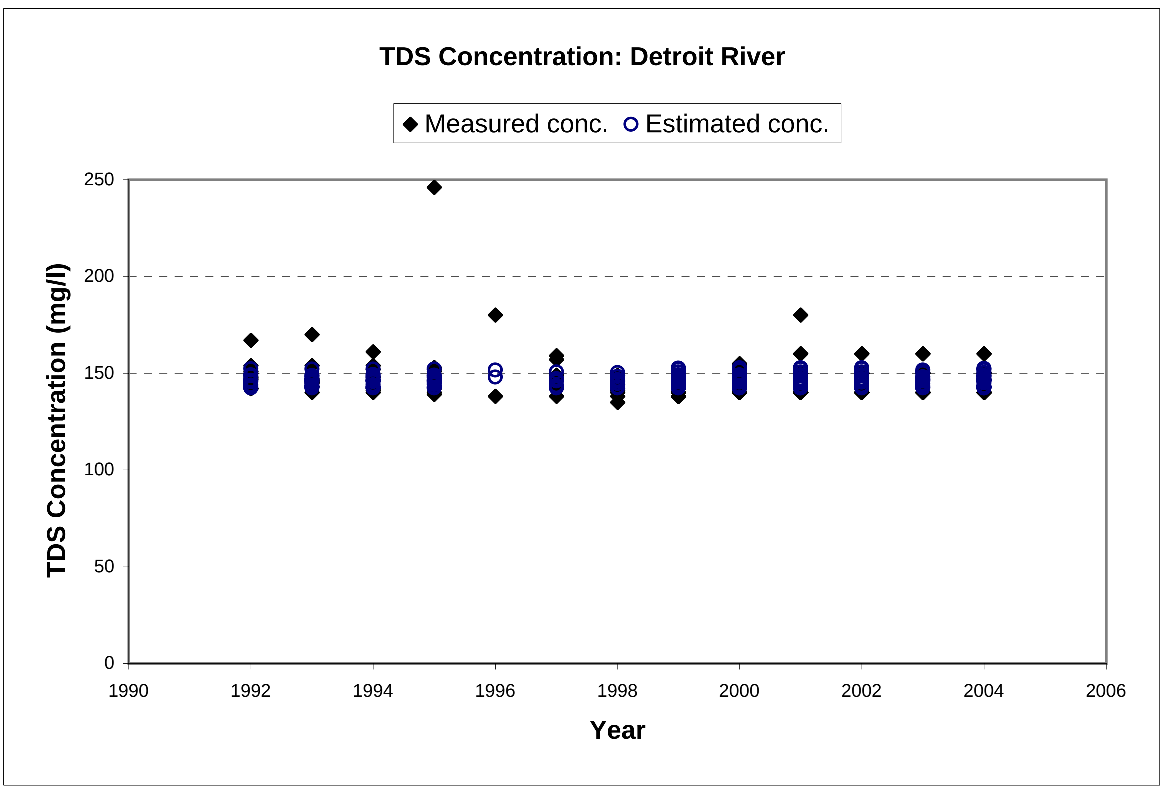


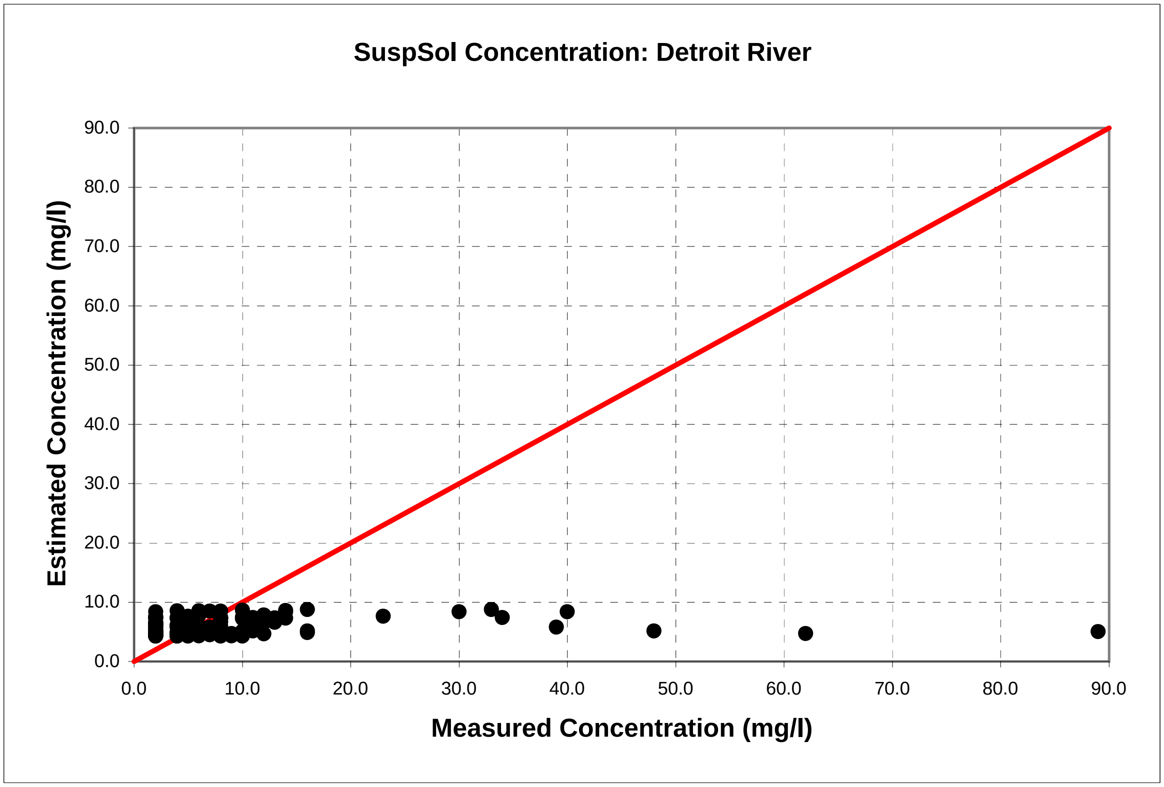
Alk Concentration: Detroit River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0
100.0

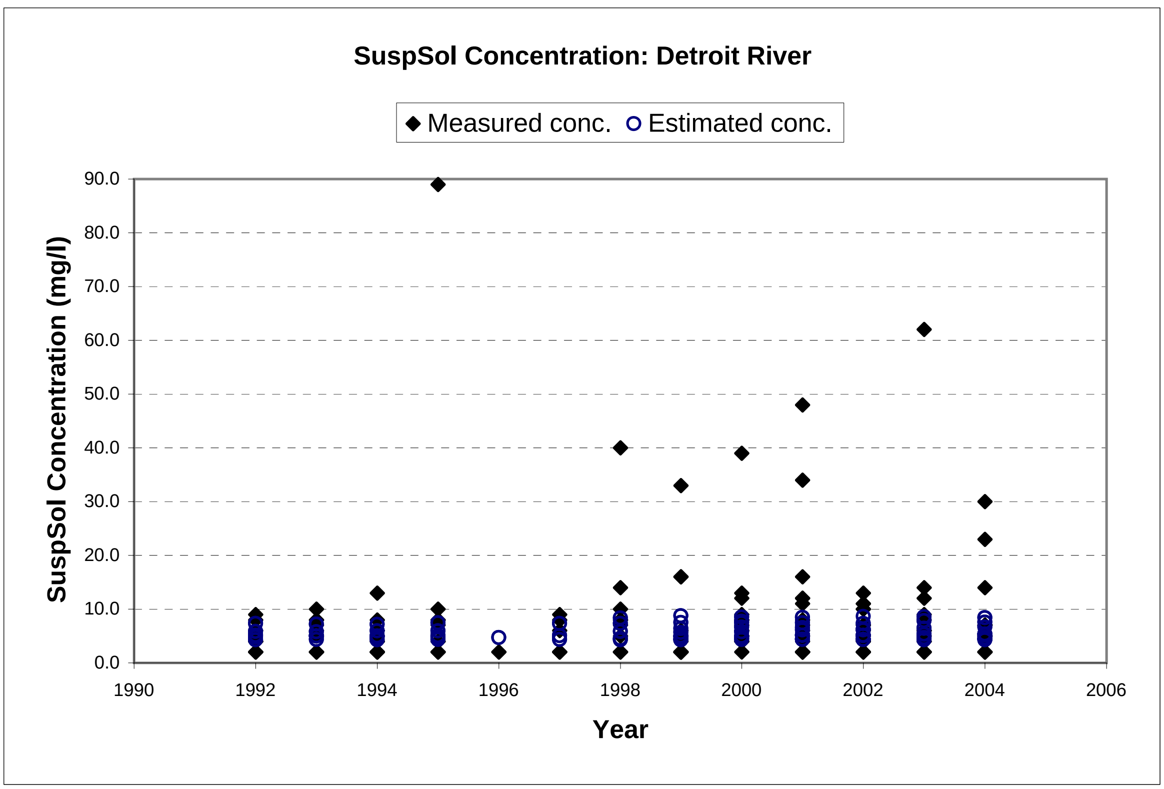


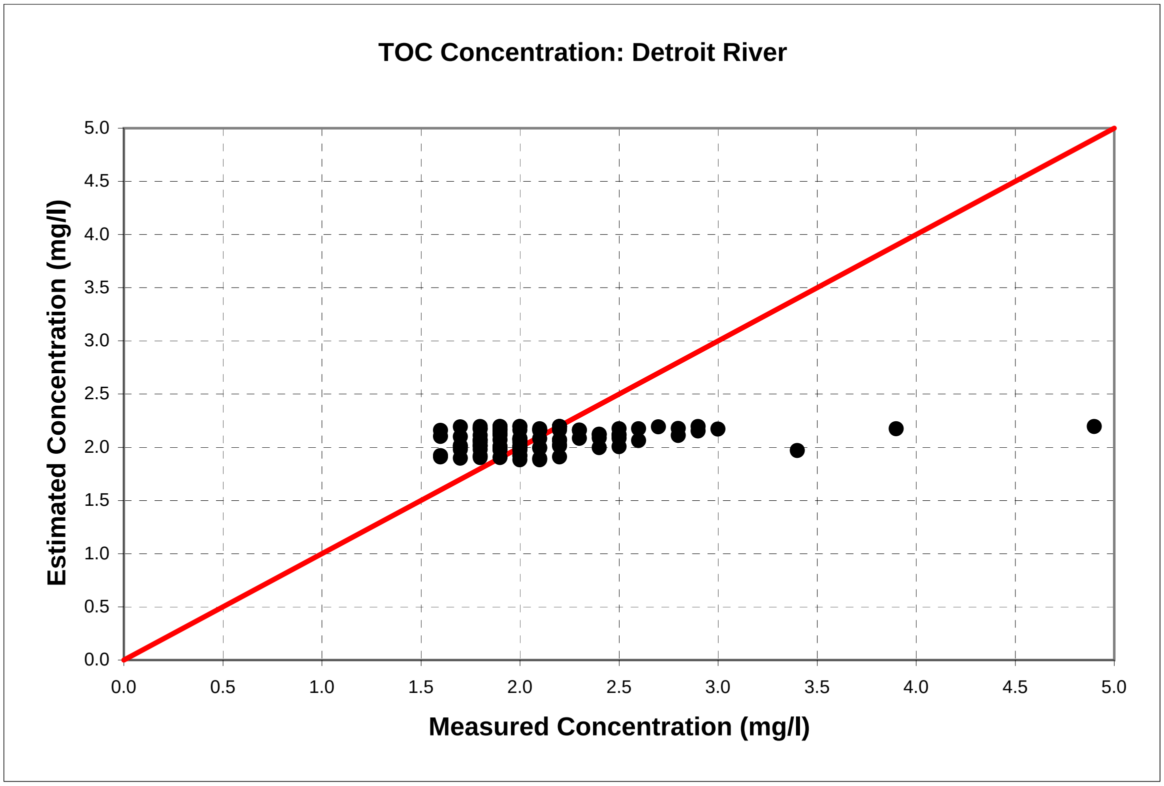
Alk Concentration: Detroit River
Measured conc.
Estimated conc.
Alk Concentration (mg/l)
Year
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0
100.0
1990
1992
1994
1996
1998
2000
2002
2004
2006

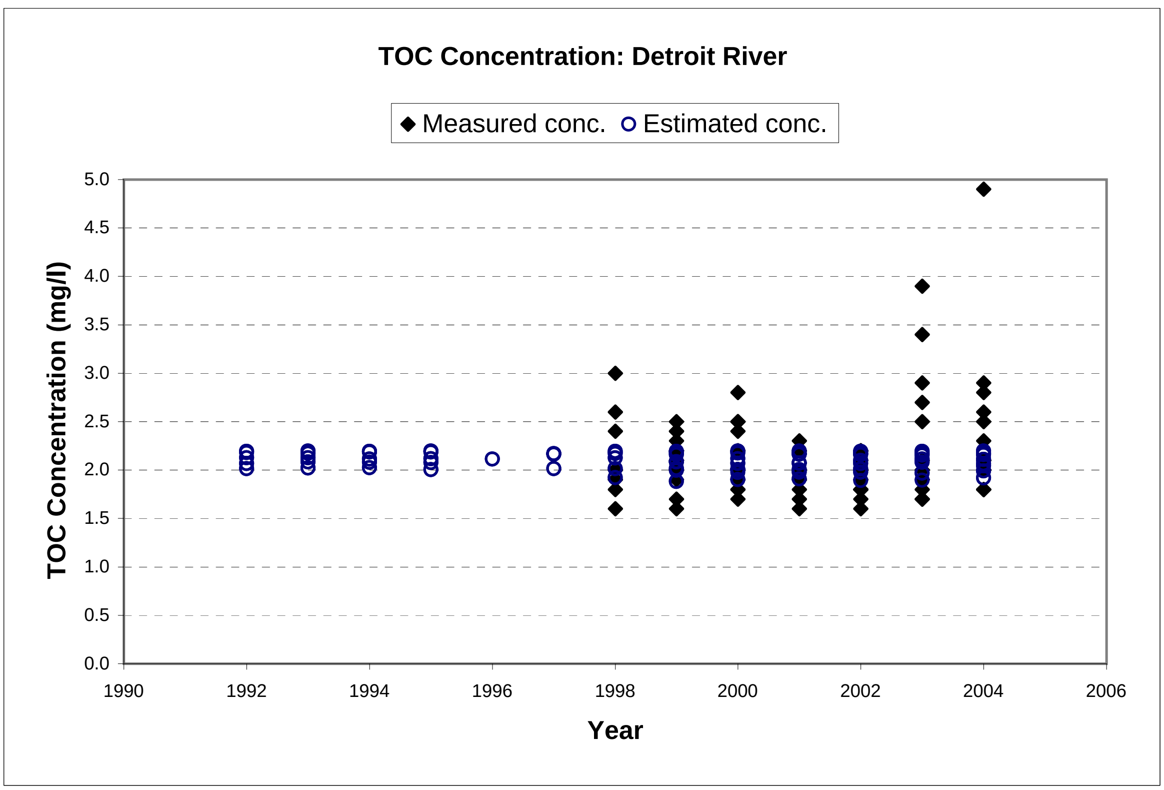

TDS Concentration: Detroit River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0
50
100
150
200
250

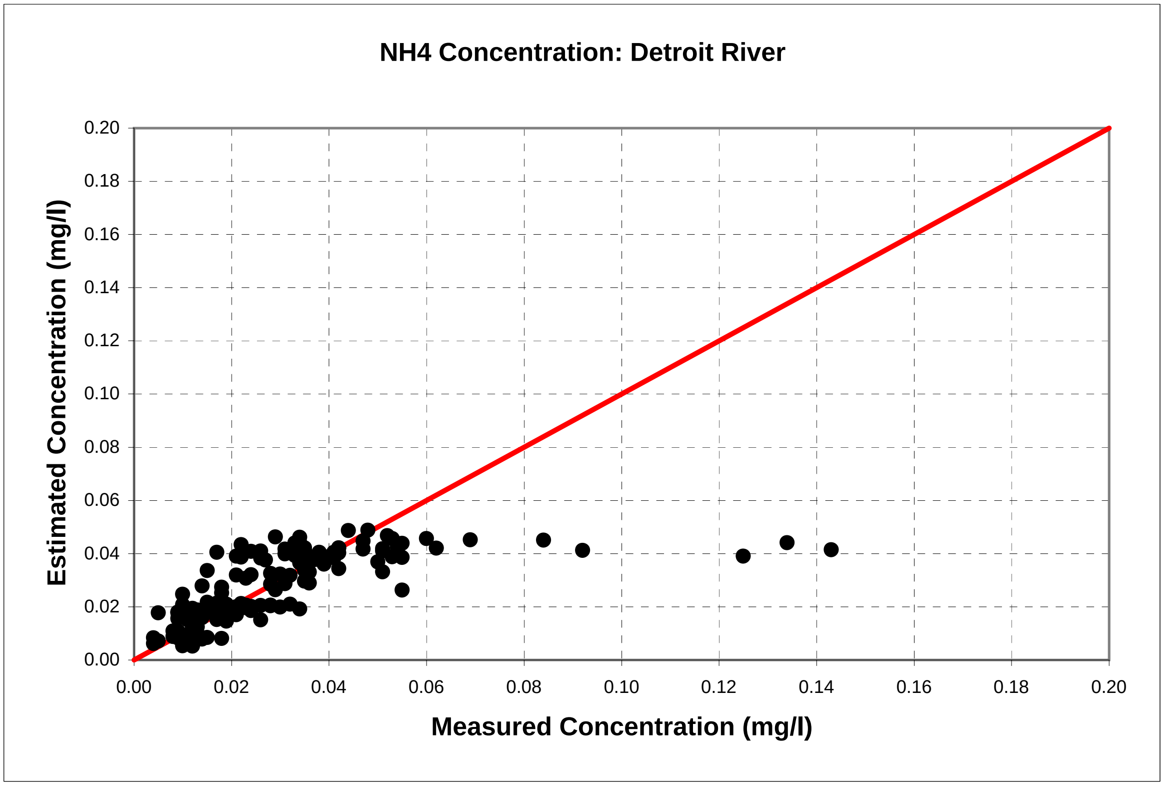

TDS Concentration: Detroit River
Measured conc.
Estimated conc.
TDS Concentration (mg/l)
Year
1990
1992
1994
1996
1998
2000
2002
2004
2006

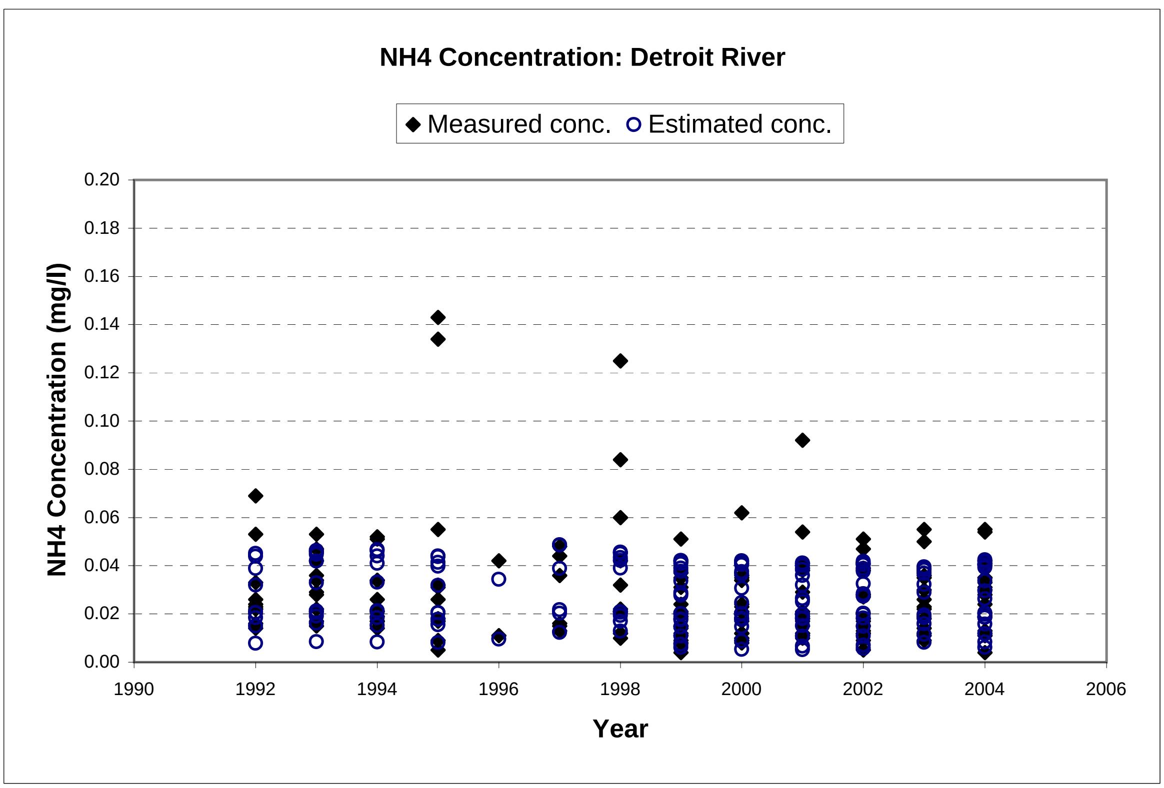

SuspSol Concentration: Detroit River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0

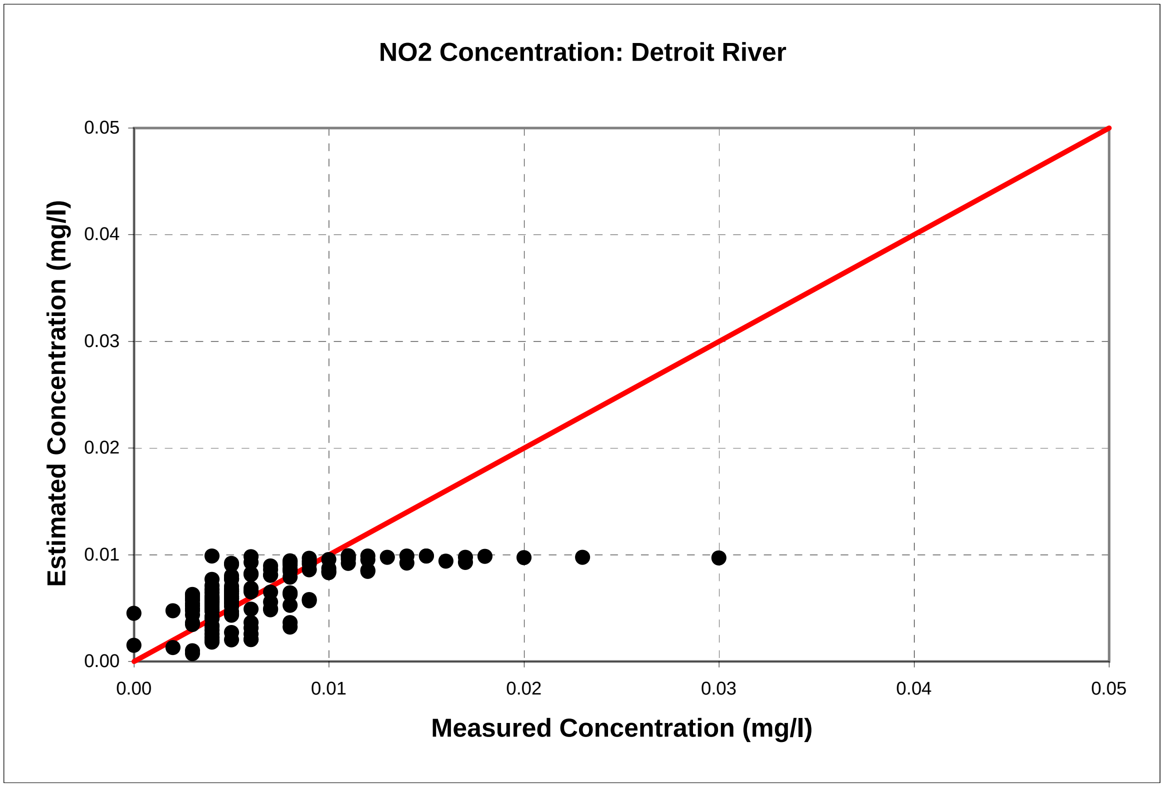

SuspSol Concentration: Detroit River
Measured conc.
Estimated conc.
SuspSol Concentration (mg/l)
Year
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0
1990
1992
1994
1996
1998
2000
2002
2004
2006

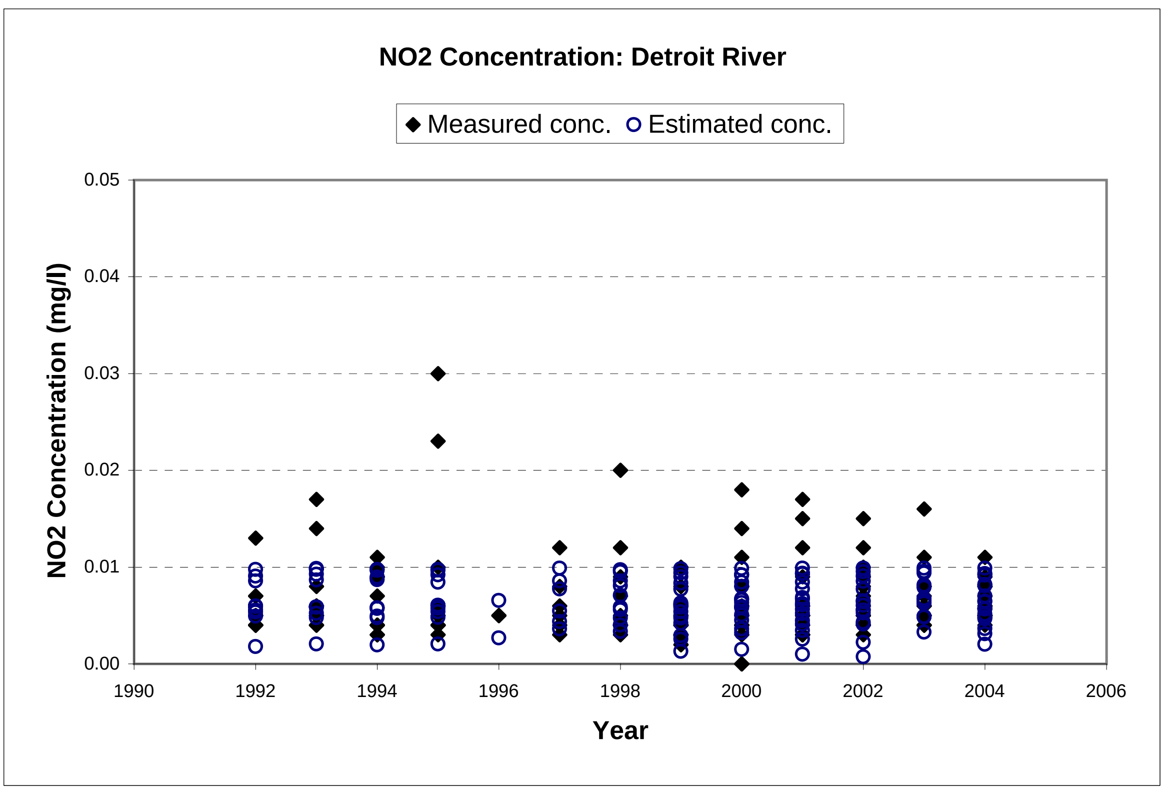

TOC Concentration: Detroit River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0

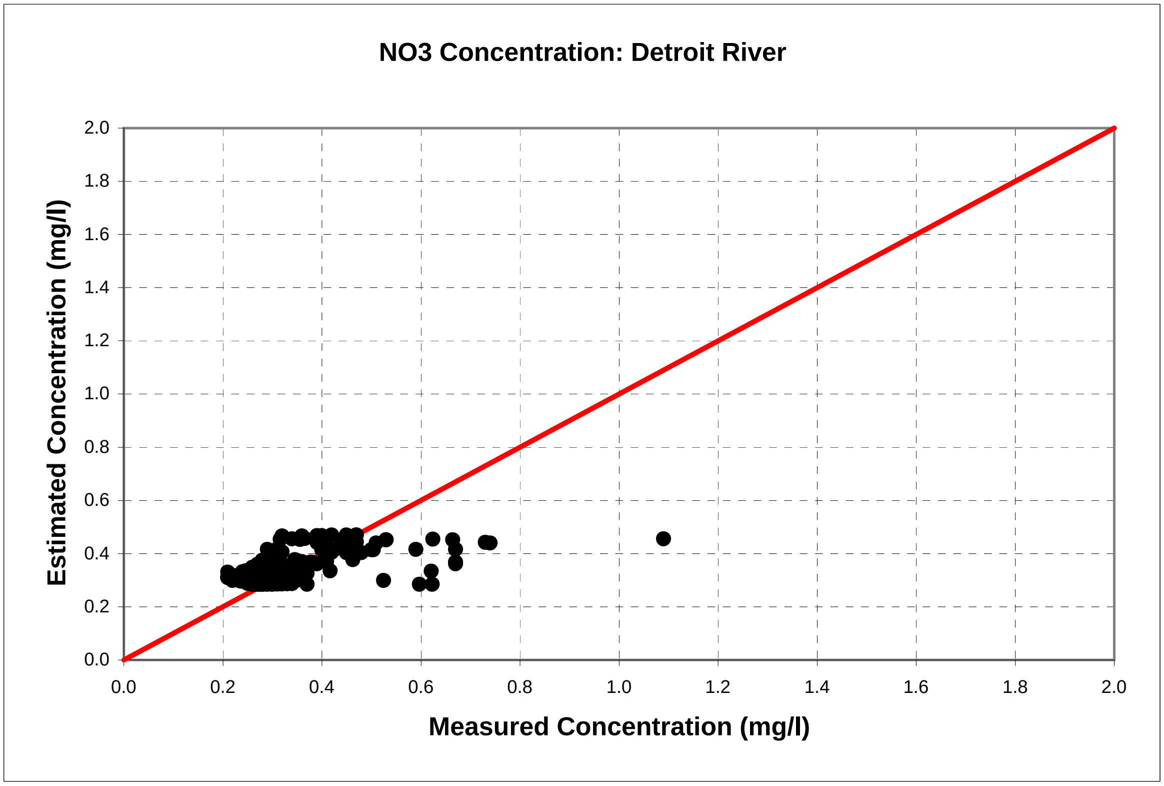

TOC Concentration: Detroit River
Measured conc.
Estimated conc.
TOC Concentration (mg/l)
Year
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1990
1992
1994
1996
1998
2000
2002
2004
2006

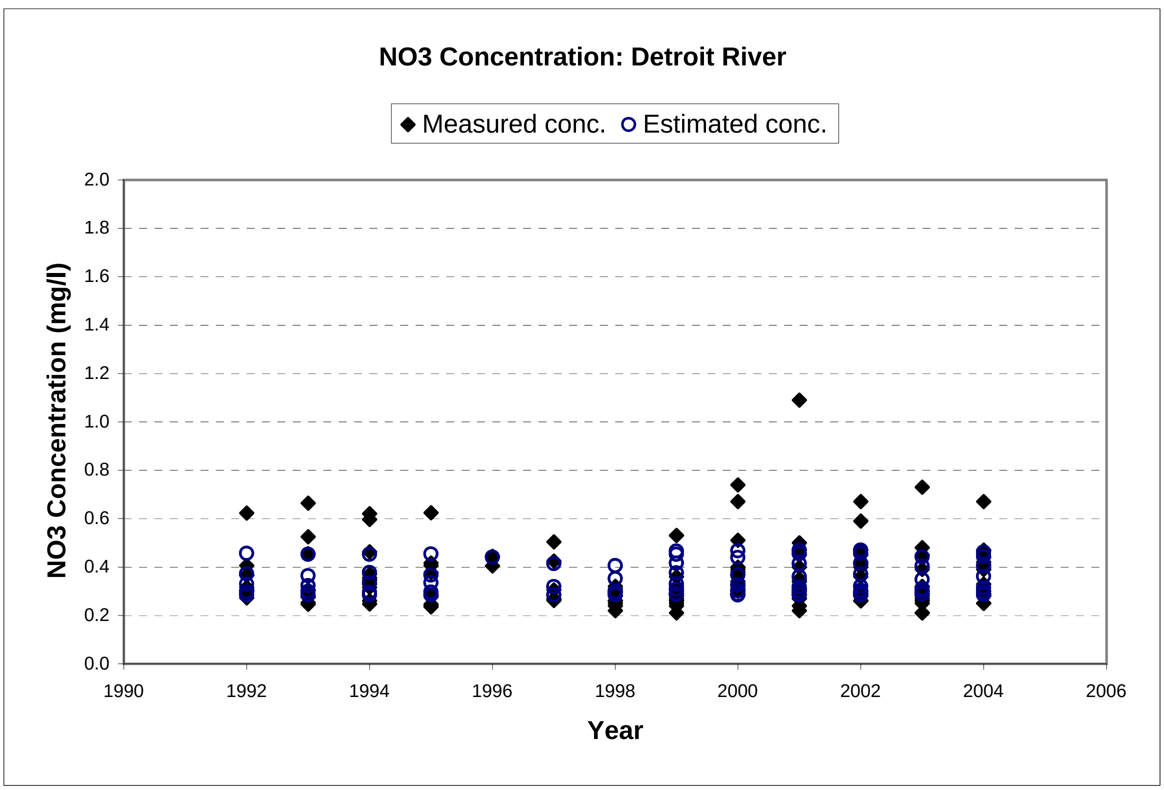

NH4 Concentration: Detroit River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
0.18
0.20

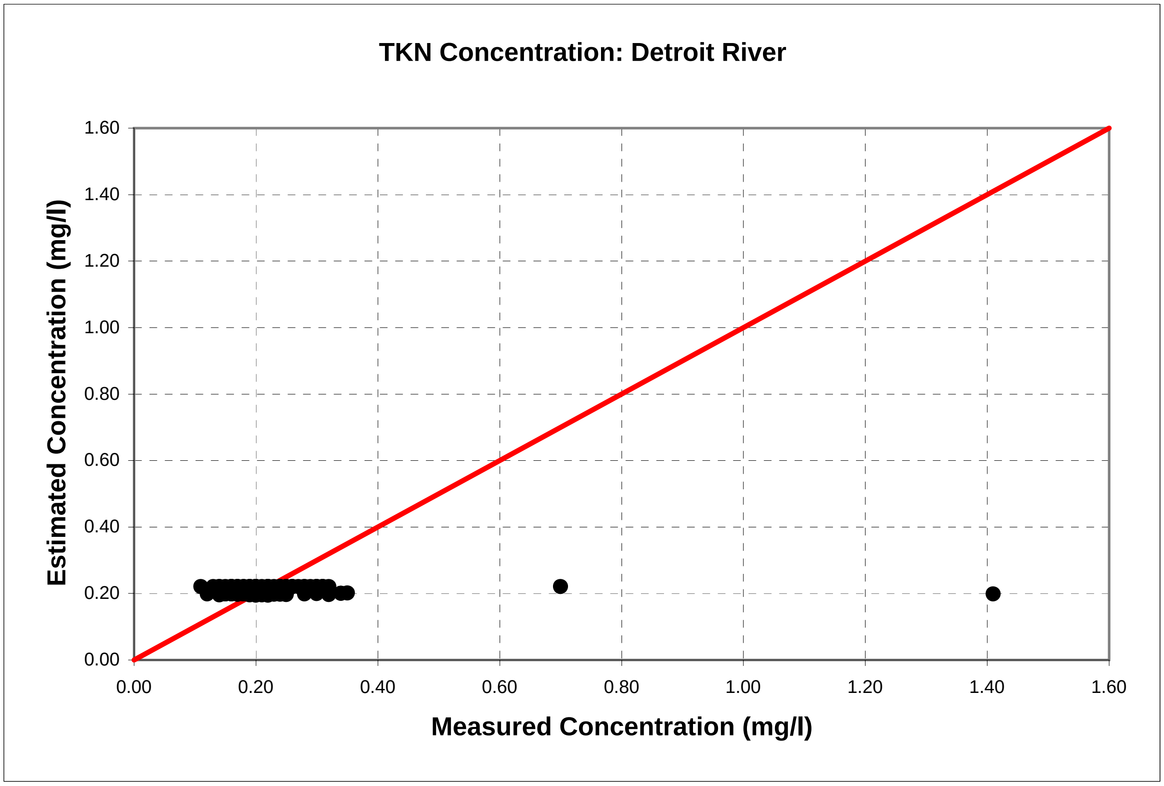

NH4 Concentration: Detroit River
Measured conc.
Estimated conc.
NH4 Concentration (mg/l)
Year
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
0.18
0.20
1990
1992
1994
1996
1998
2000
2002
2004
2006


NO2 Concentration: Detroit River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.00
0.01
0.02
0.03
0.04
0.05

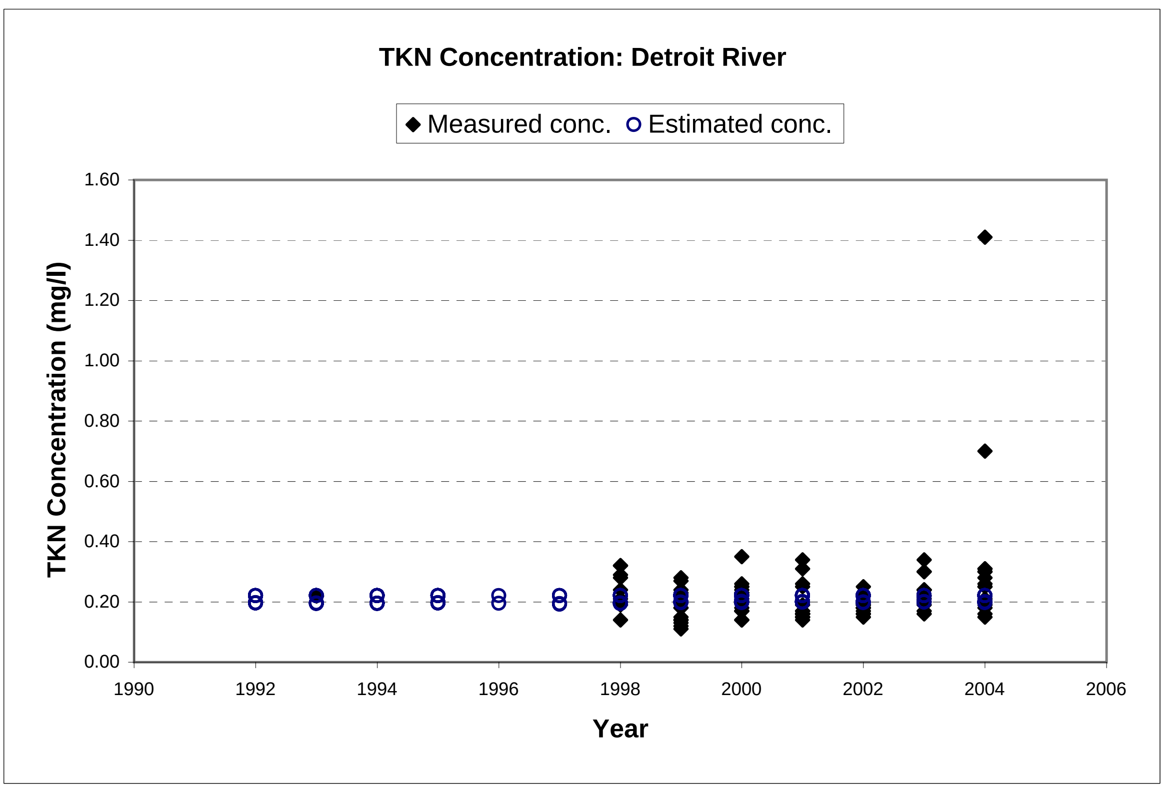

NO2 Concentration: Detroit River
Measured conc.
Estimated conc.
NO2 Concentration (mg/l)
Year
0.00
0.01
0.02
0.03
0.04
0.05
1990
1992
1994
1996
1998
2000
2002
2004
2006


NO3 Concentration: Detroit River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0

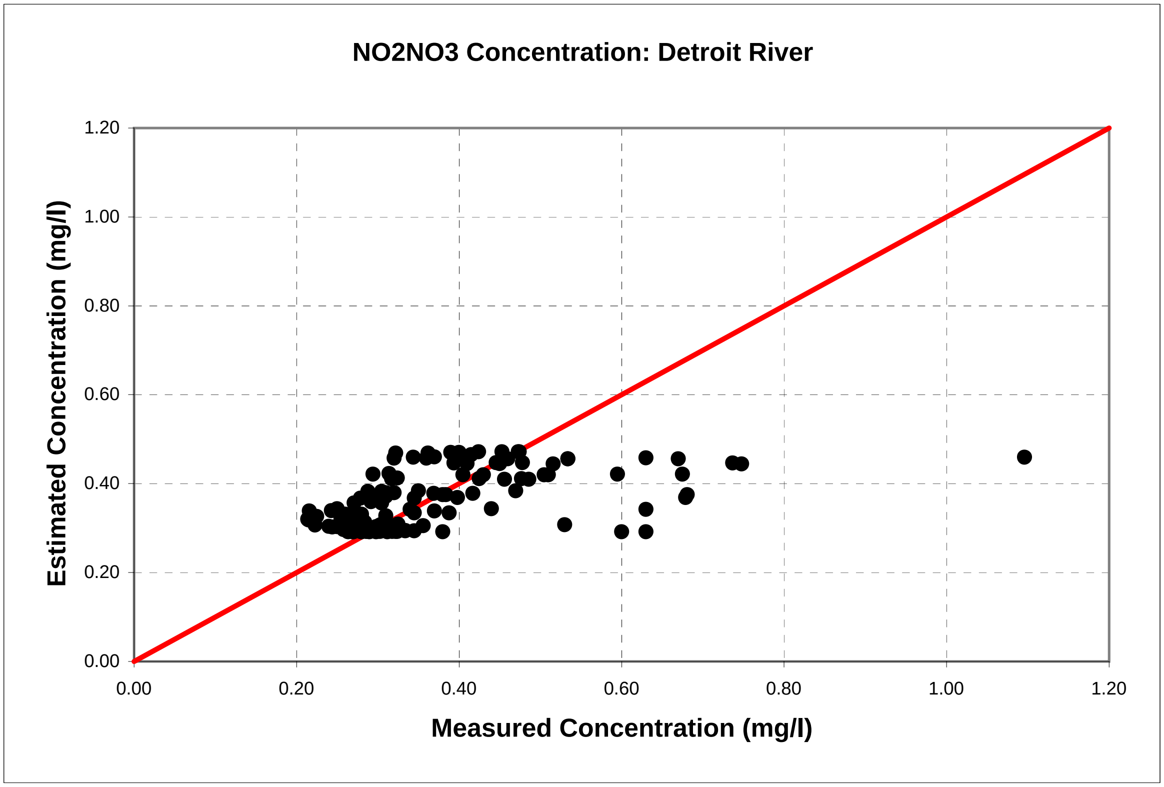

NO3 Concentration: Detroit River
Measured conc.
Estimated conc.
NO3 Concentration (mg/l)
Year
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1990
1992
1994
1996
1998
2000
2002
2004
2006

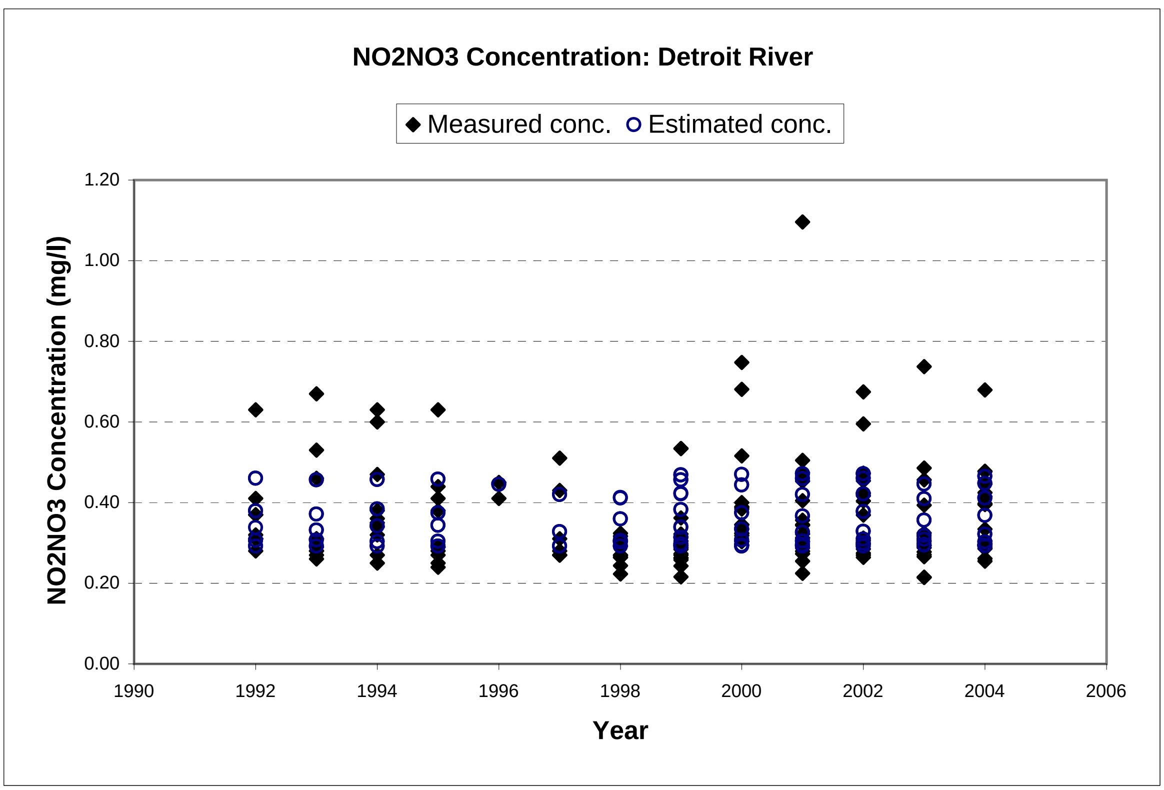


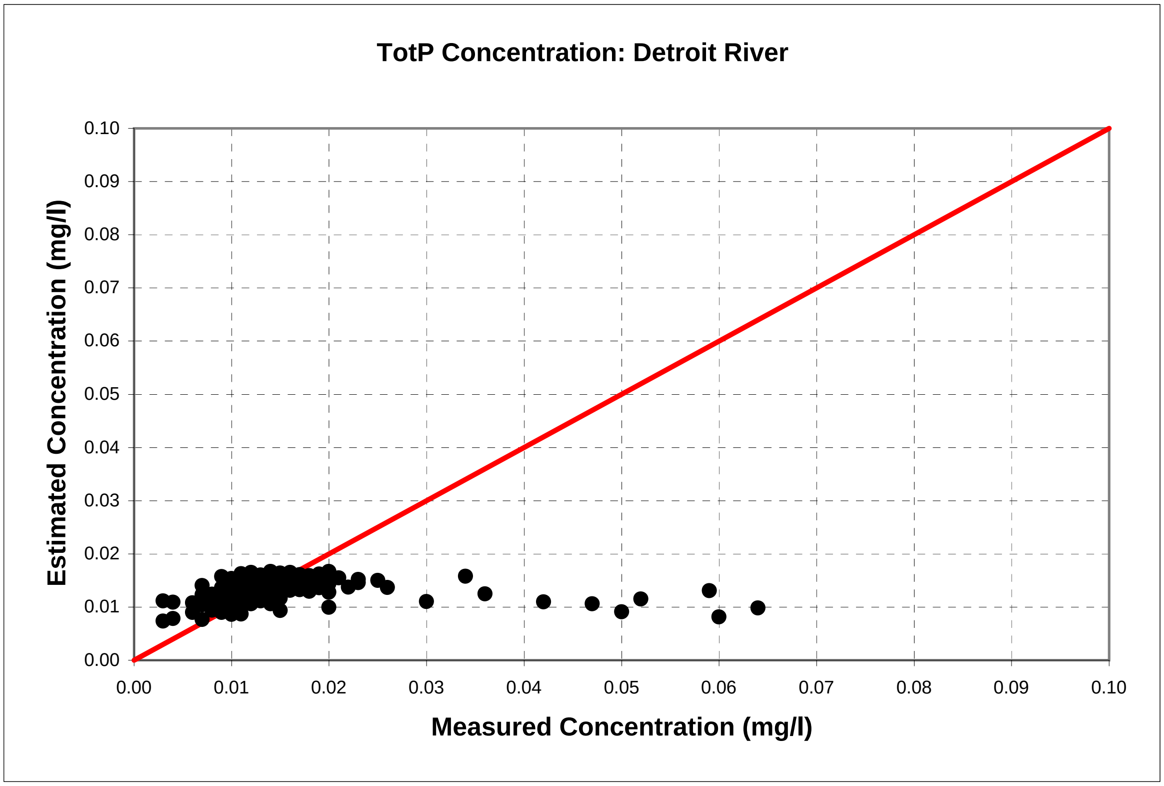
TKN Concentration: Detroit River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.00
0.20
0.40
0.60
0.80
1.00
1.20
1.40
1.60

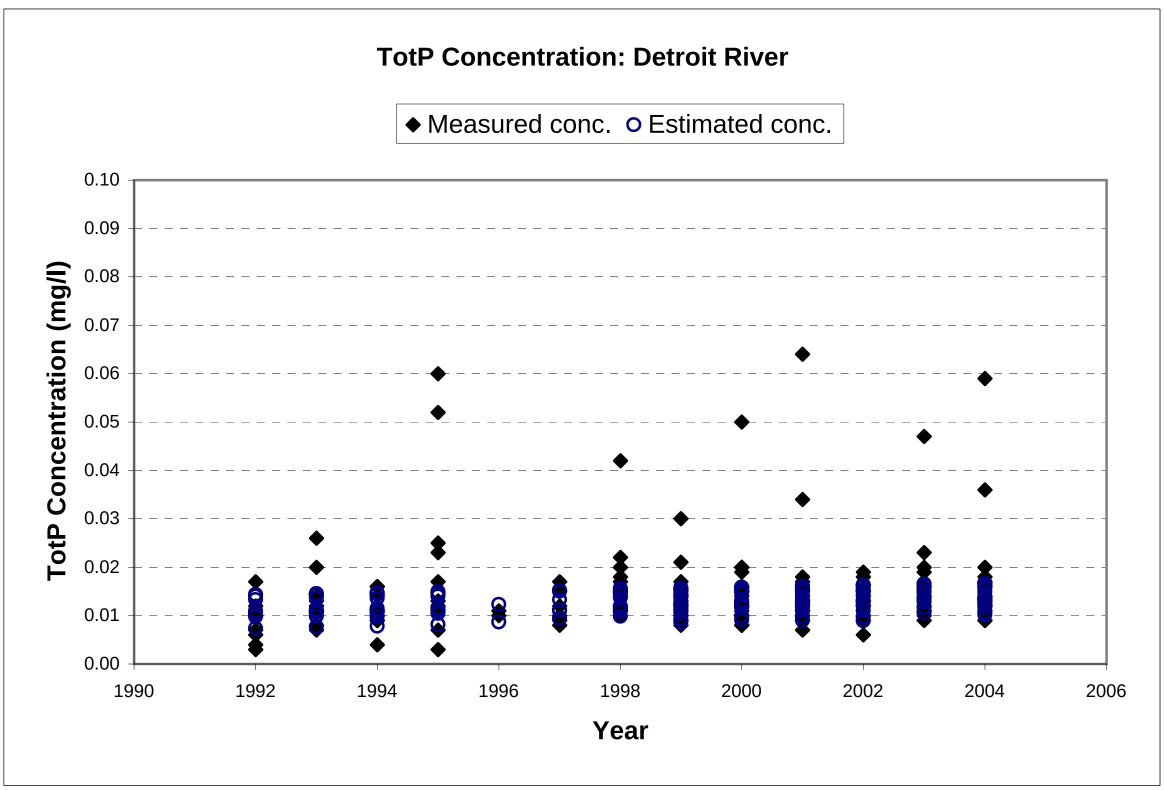


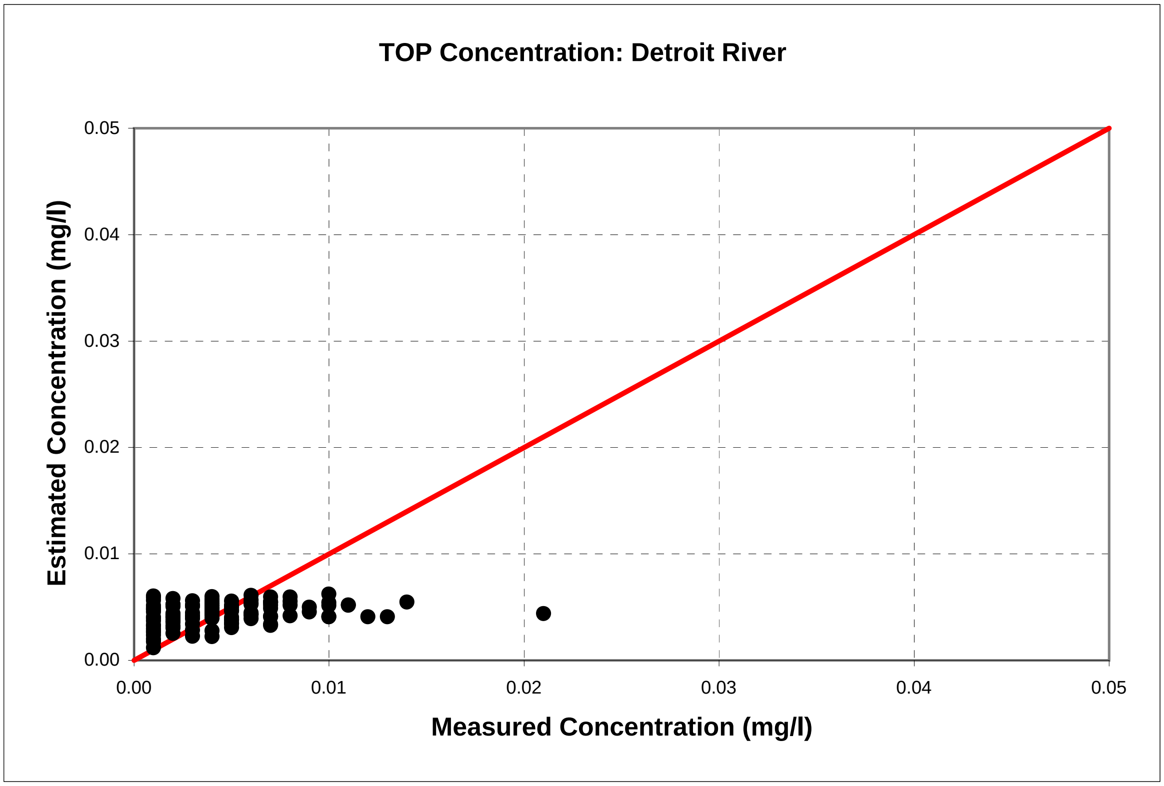
TKN Concentration: Detroit River
Measured conc.
Estimated conc.
TKN Concentration (mg/l)
Year
1990
1992
1994
1996
1998
2000
2002
2004
2006

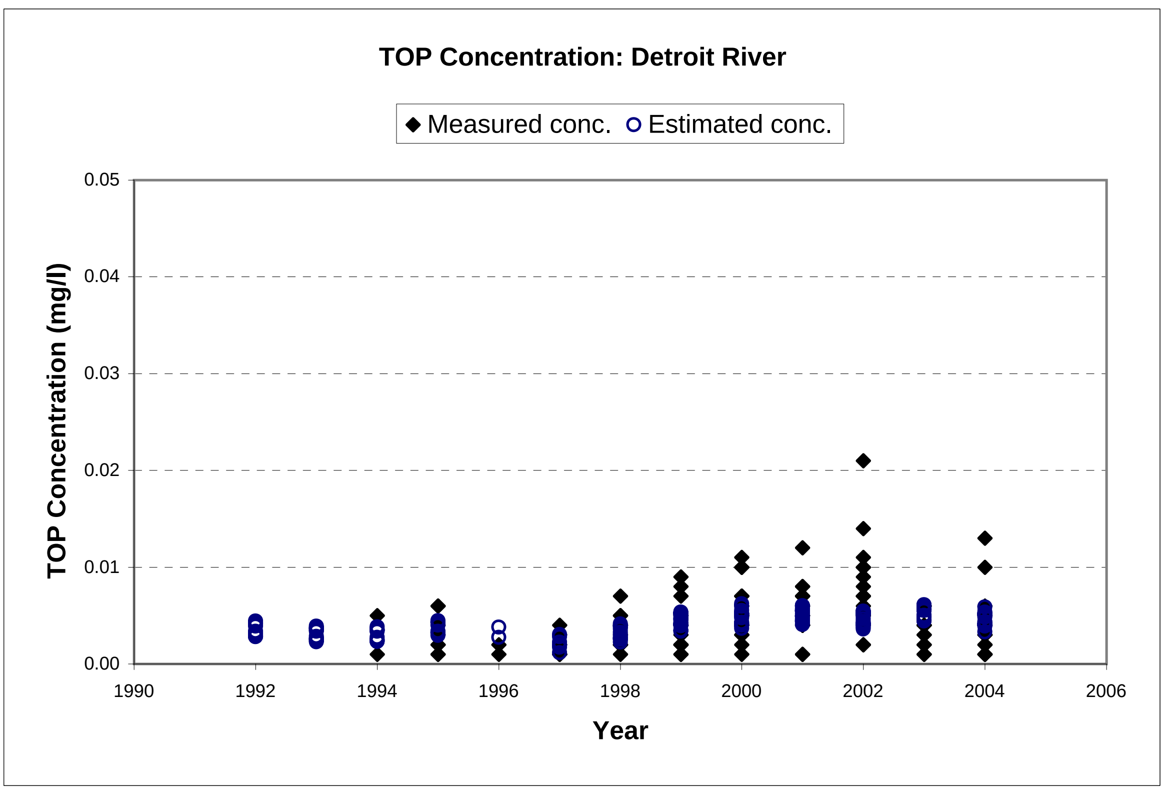

NO2NO3 Concentration: Detroit River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.00
0.20
0.40
0.60
0.80
1.00
1.20

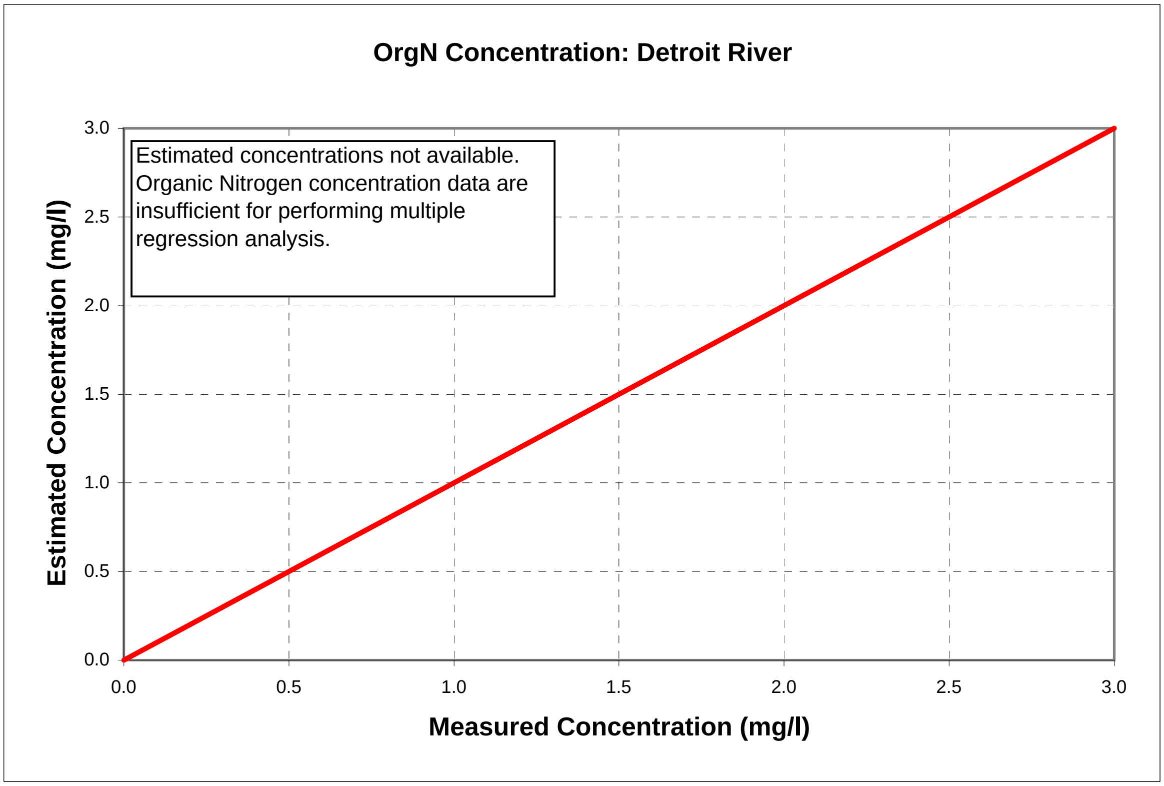

NO2NO3 Concentration: Detroit River
Measured conc.
Estimated conc.
NO2NO3 Concentration (mg/l)
Year
0.00
0.20
0.40
0.60
0.80
1.00
1.20
1990
1992
1994
1996
1998
2000
2002
2004
2006

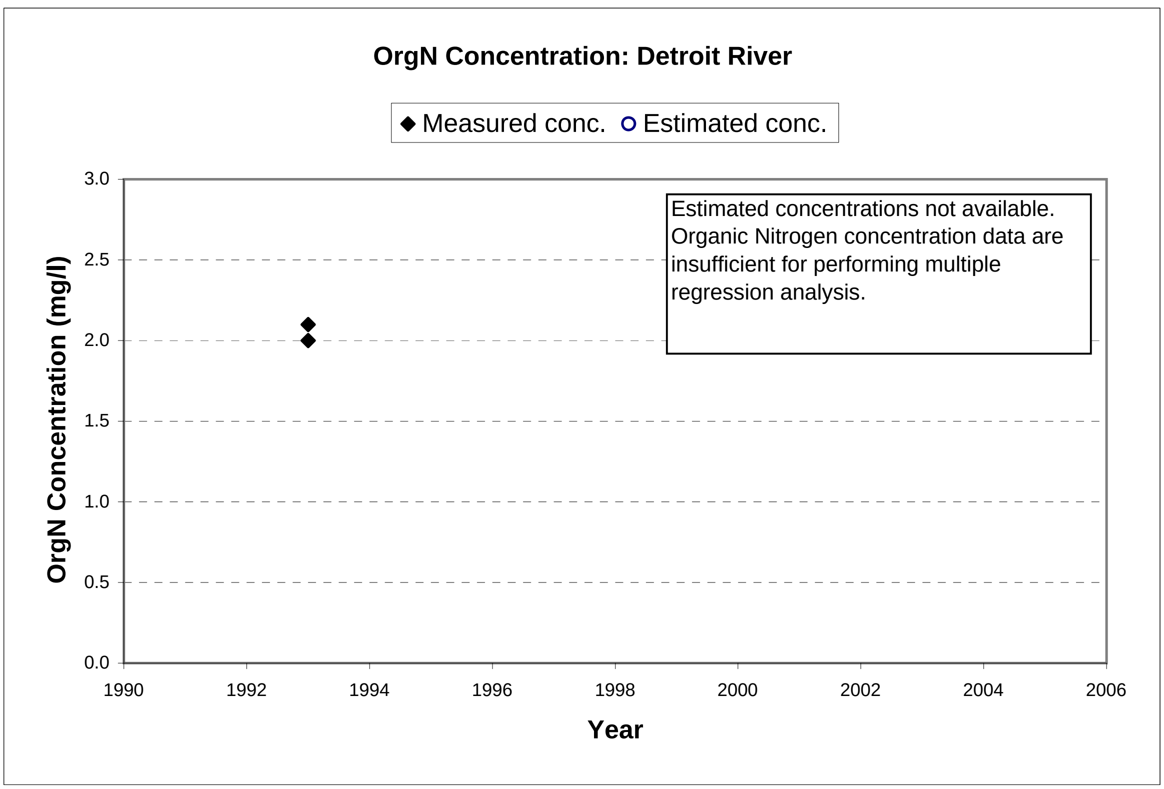

TotP Concentration: Detroit River
Estimated Concentration (mg/l)
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.10
Measured Concentration (mg/l)

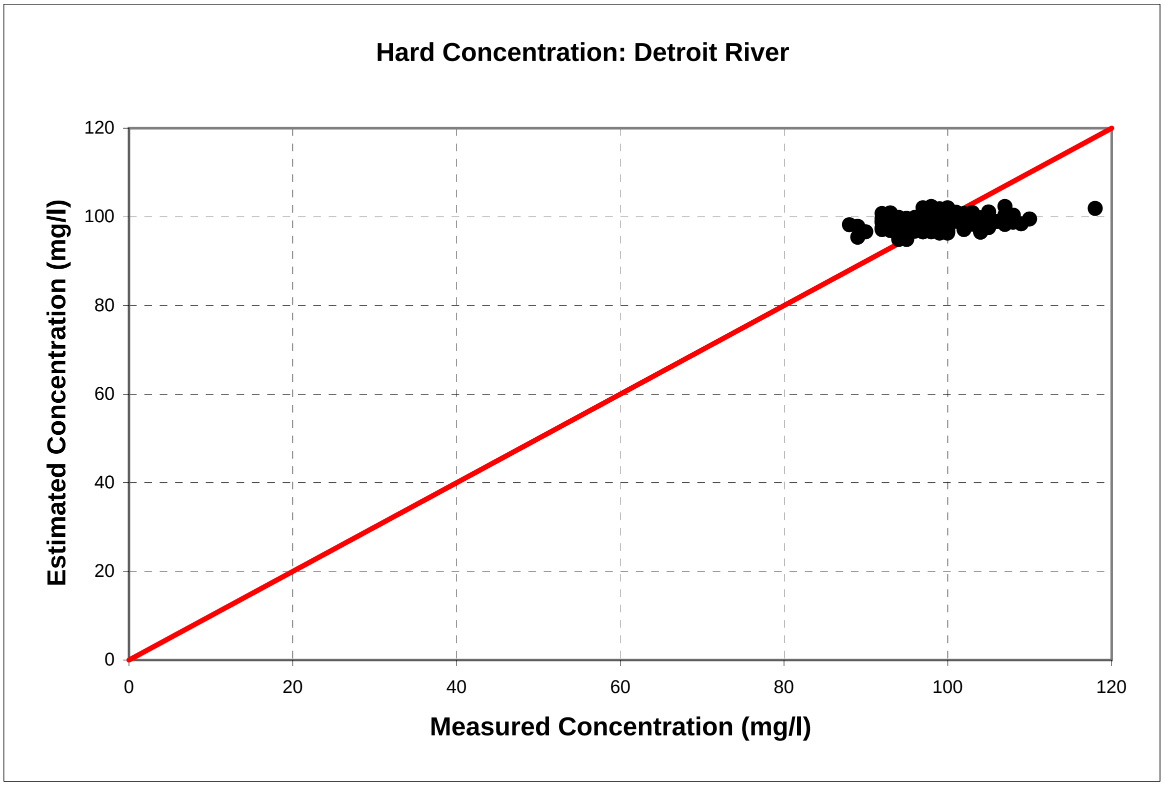

TotP Concentration: Detroit River
Measured conc.
Estimated conc.
TotP Concentration (mg/l)
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
1990
1992
1994
1996
1998
2000
2002
2004
2006
Year

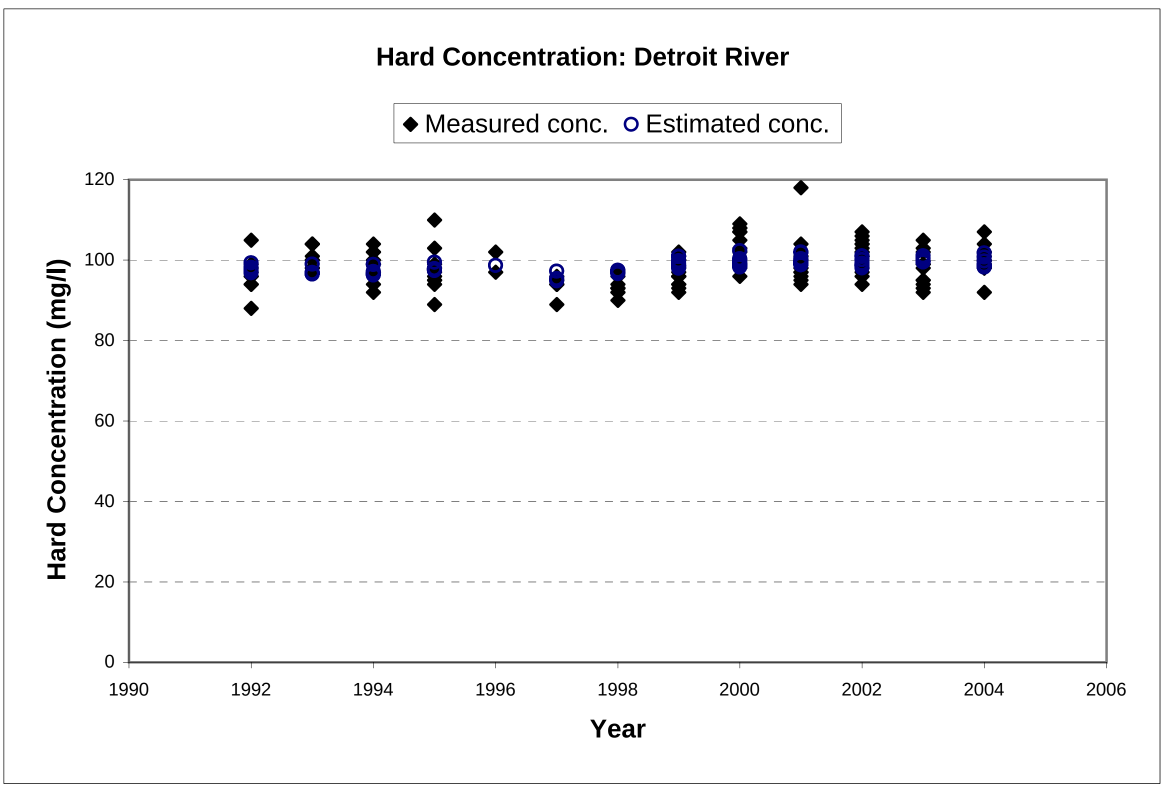

TOP Concentration: Detroit River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.00
0.01
0.02
0.03
0.04
0.05

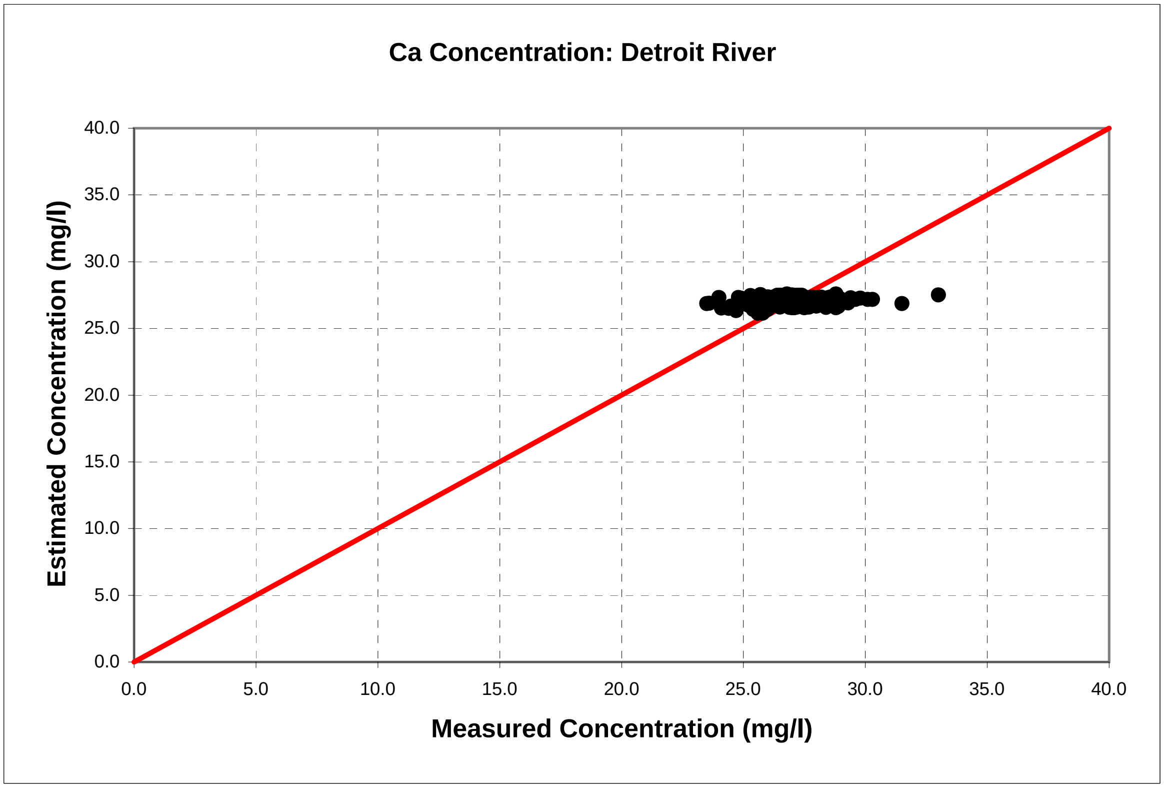

TOP Concentration: Detroit River
Measured conc.
Estimated conc.
TOP Concentration (mg/l)
Year
0.00
0.01
0.02
0.03
0.04
0.05
1990
1992
1994
1996
1998
2000
2002
2004
2006

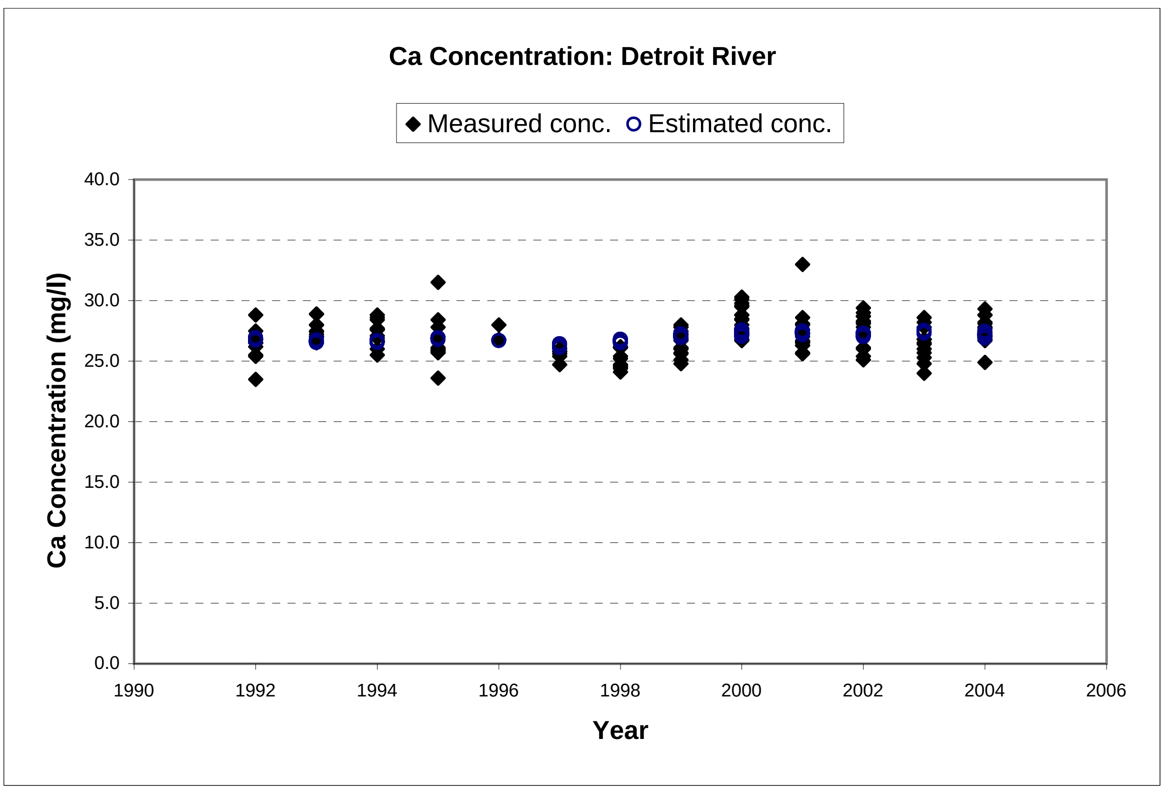

OrgN Concentration: Detroit River
Estimated concentrations not available. Organic Nitrogen concentration data are insufficient for performing multiple regression analysis.
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.0
0.5
1.0
1.5
2.0
2.5
3.0

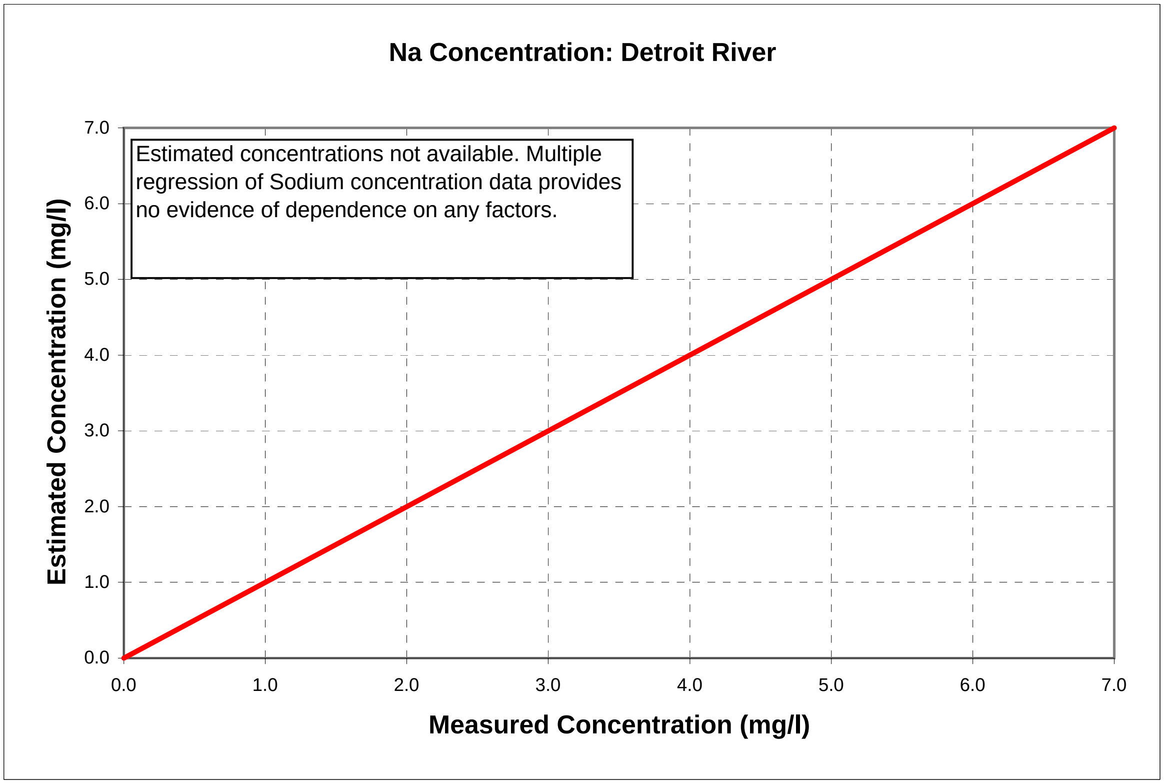

OrgN Concentration: Detroit River
Measured conc.
Estimated conc.
Estimated concentrations not available. Organic Nitrogen concentration data are insufficient for performing multiple regression analysis.
OrgN Concentration (mg/l)
Year
0.0
0.5
1.0
1.5
2.0
2.5
3.0
1990
1992
1994
1996
1998
2000
2002
2004
2006


Hard Concentration: Detroit River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0
20
40
60
80
100
120

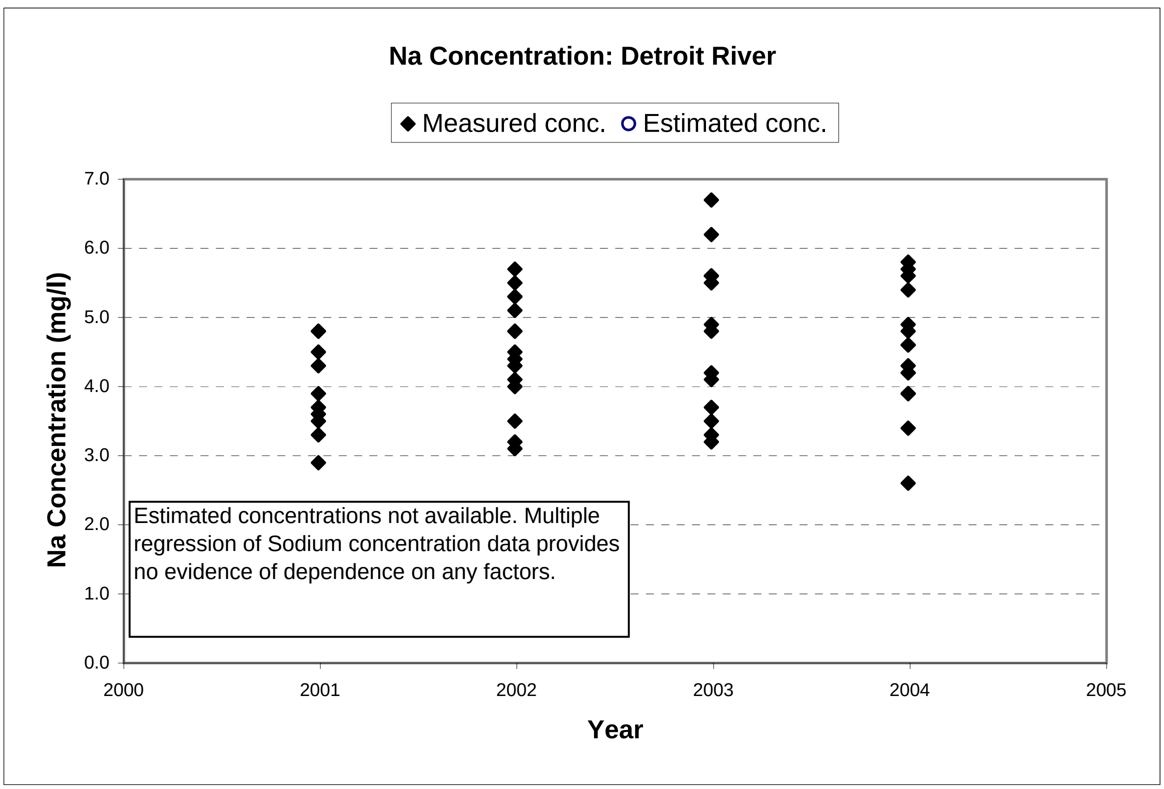

Hard Concentration: Detroit River
Measured conc.
Estimated conc.
Hard Concentration (mg/l)
Year
0
20
40
60
80
100
120
1990
1992
1994
1996
1998
2000
2002
2004
2006


Ca Concentration: Detroit River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
40.0

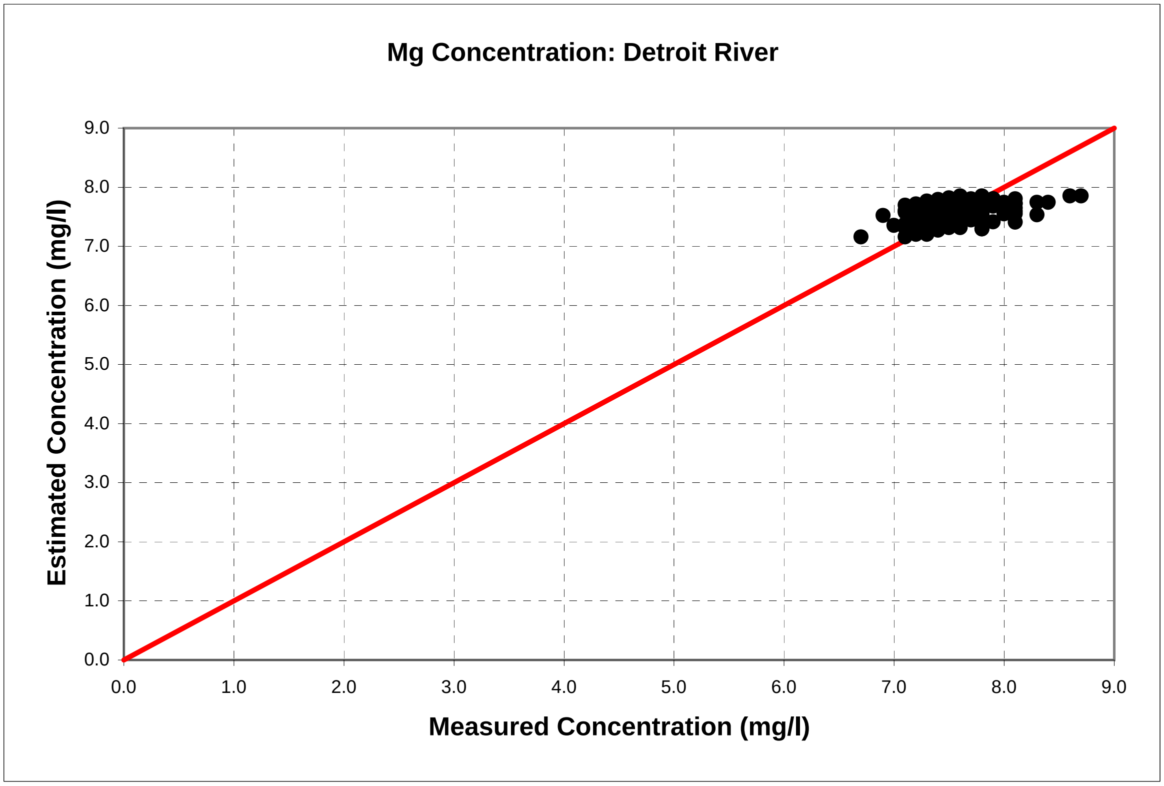

Ca Concentration: Detroit River
Measured conc.
Estimated conc.
Ca Concentration (mg/l)
Year
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
40.0
1990
1992
1994
1996
1998
2000
2002
2004
2006

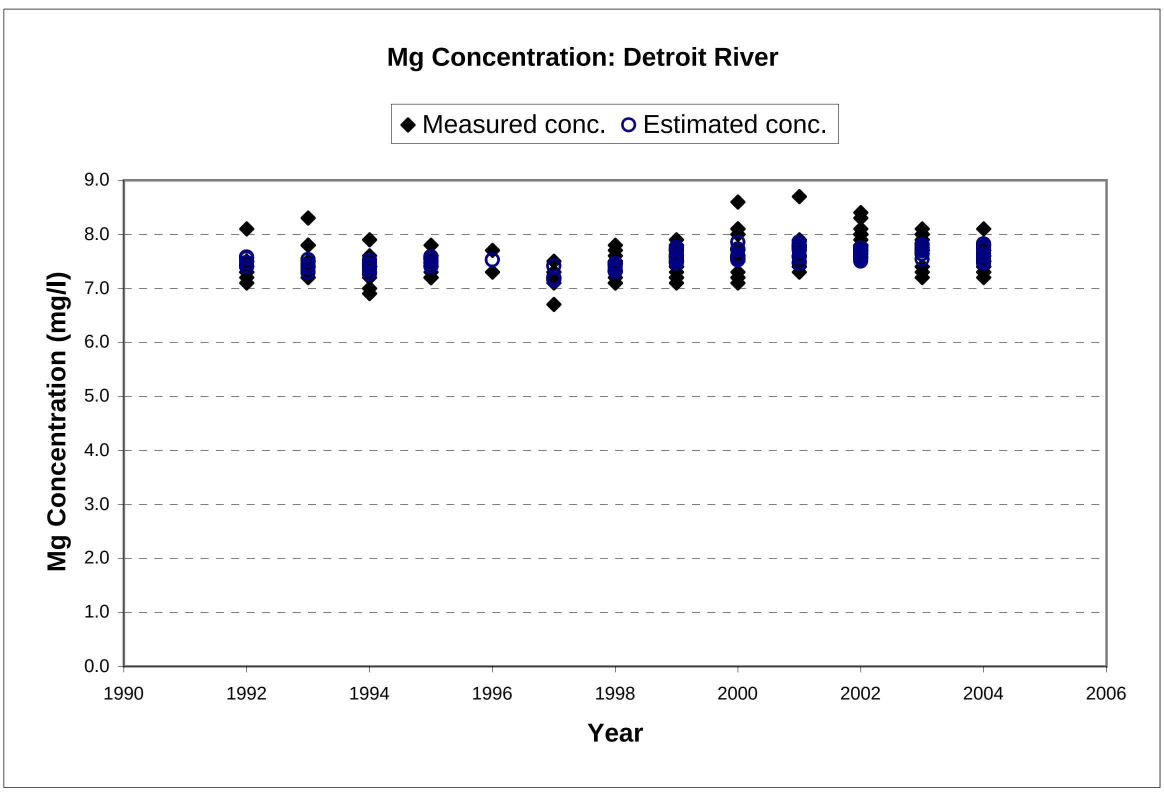


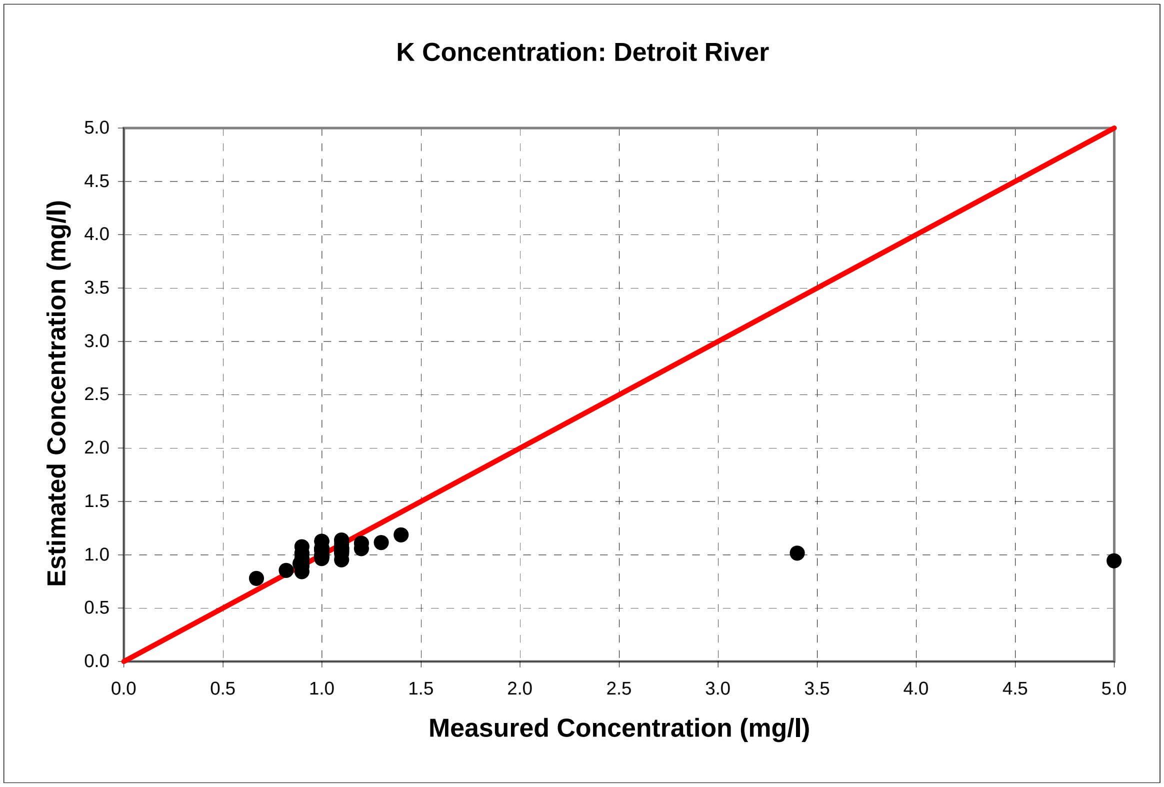
Na Concentration: Detroit River
Estimated concentrations not available. Multiple regression of Sodium concentration data provides no evidence of dependence on any factors.
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0

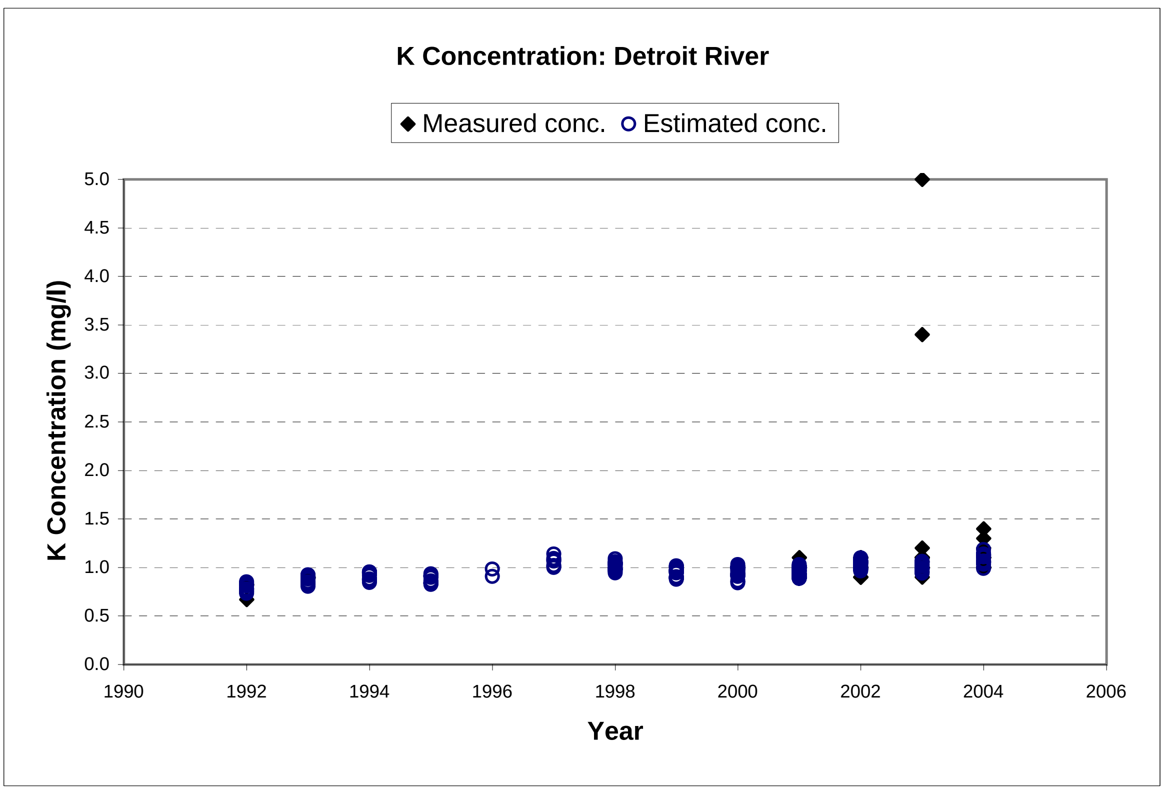


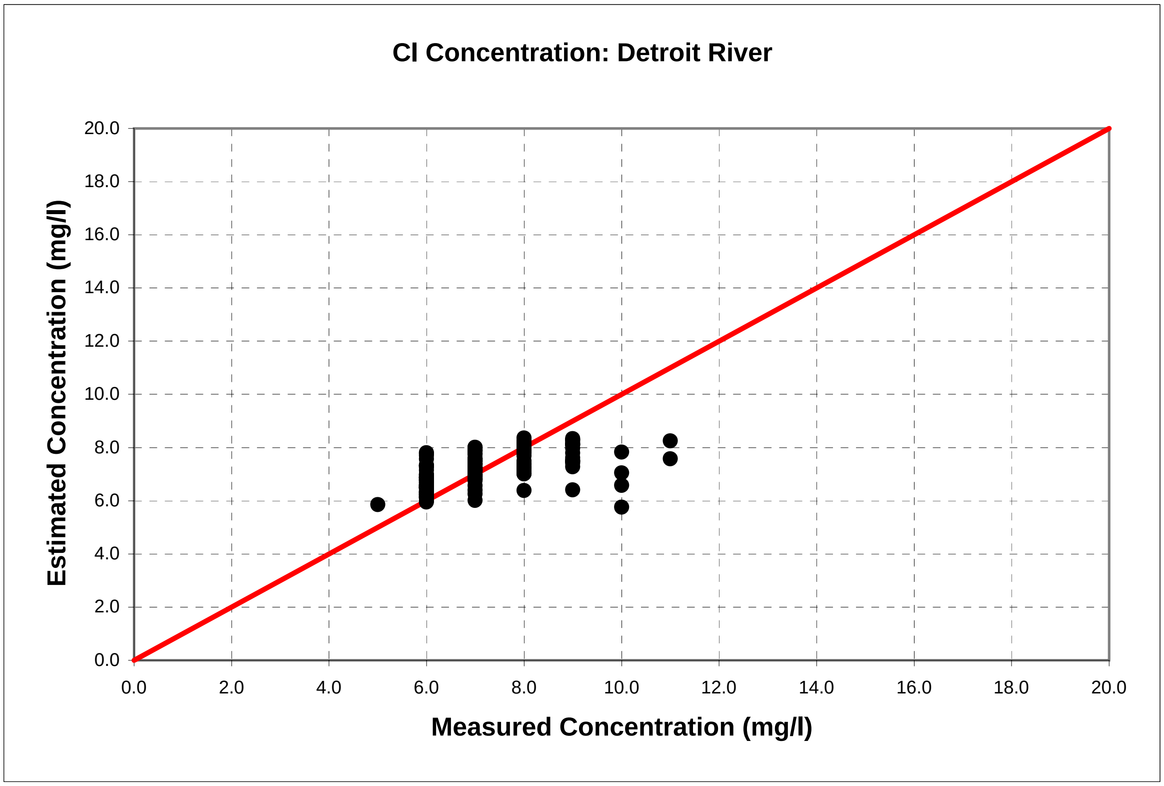
Na Concentration: Detroit River
Measured conc.
Estimated conc.
Estimated concentrations not available. Multiple regression of Sodium concentration data provides no evidence of dependence on any factors.
Na Concentration (mg/l)
Year
2000
2001
2002
2003
2004
2005

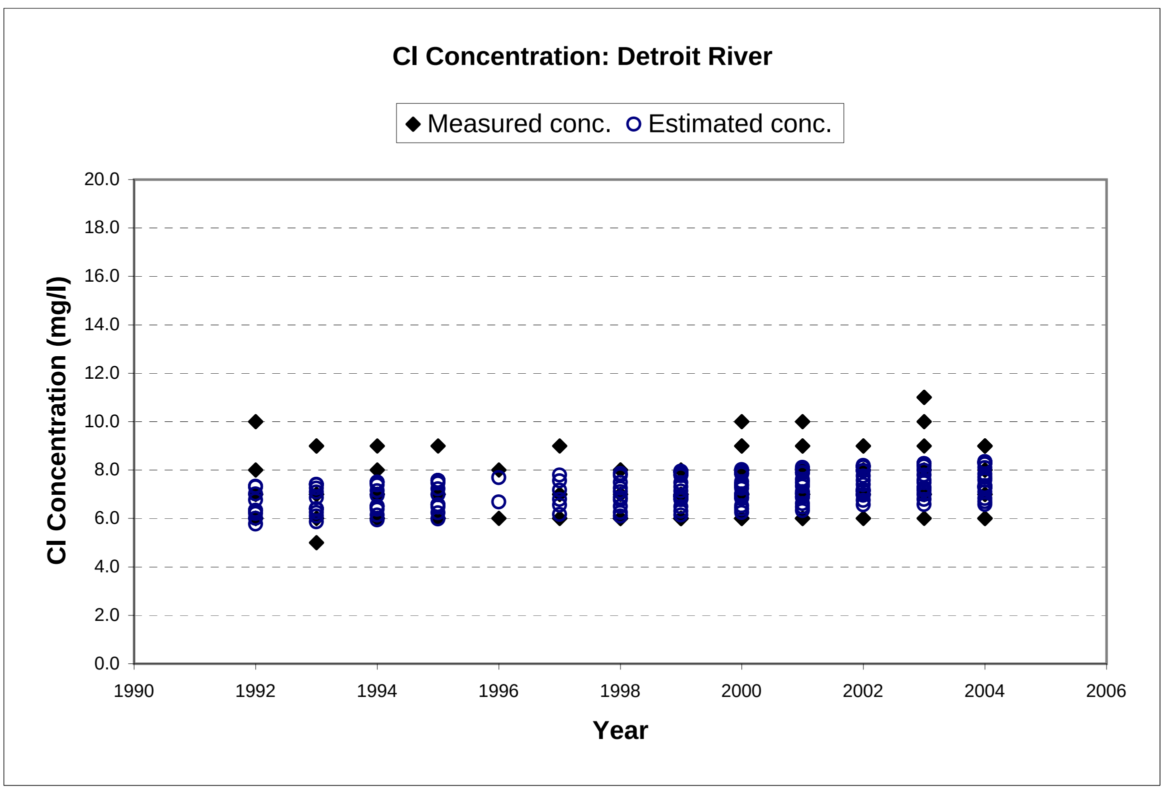

Mg Concentration: Detroit River
Estimated Concentration (mg/l)
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
Measured Concentration (mg/l)

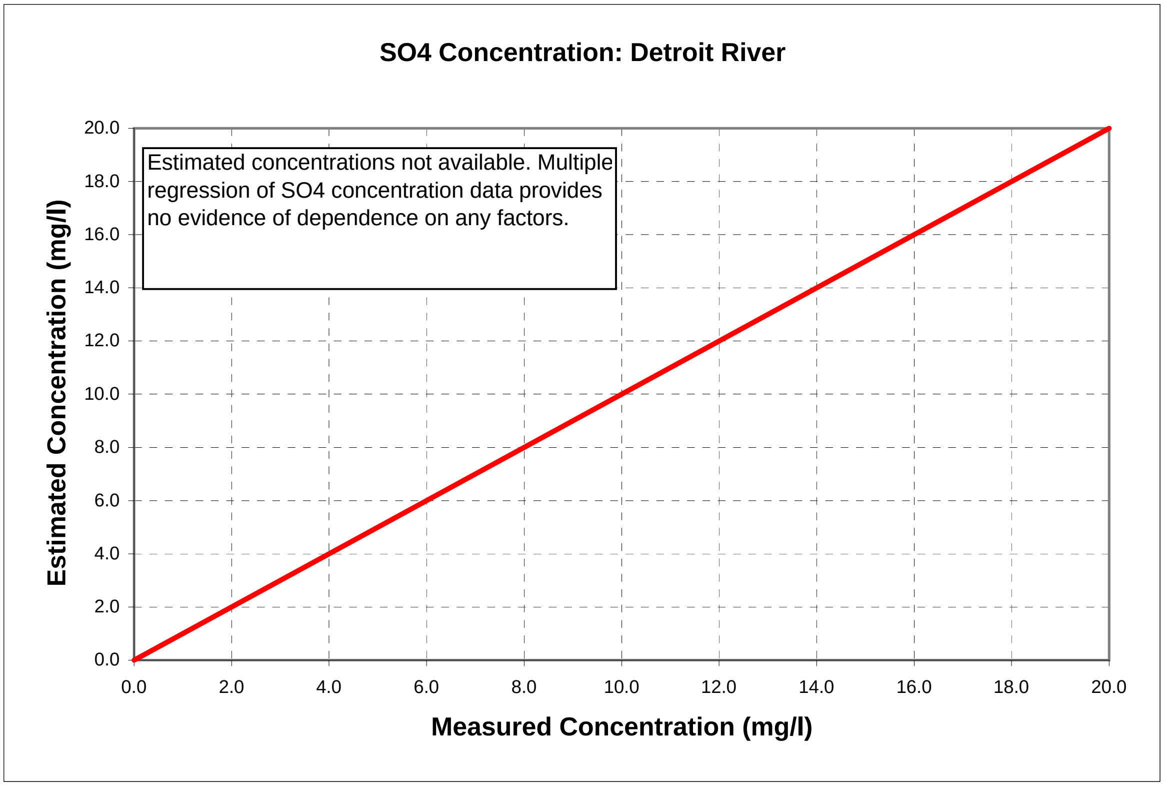

Mg Concentration: Detroit River
Measured conc.
Estimated conc.
Mg Concentration (mg/l)
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
1990
1992
1994
1996
1998
2000
2002
2004
2006
Year

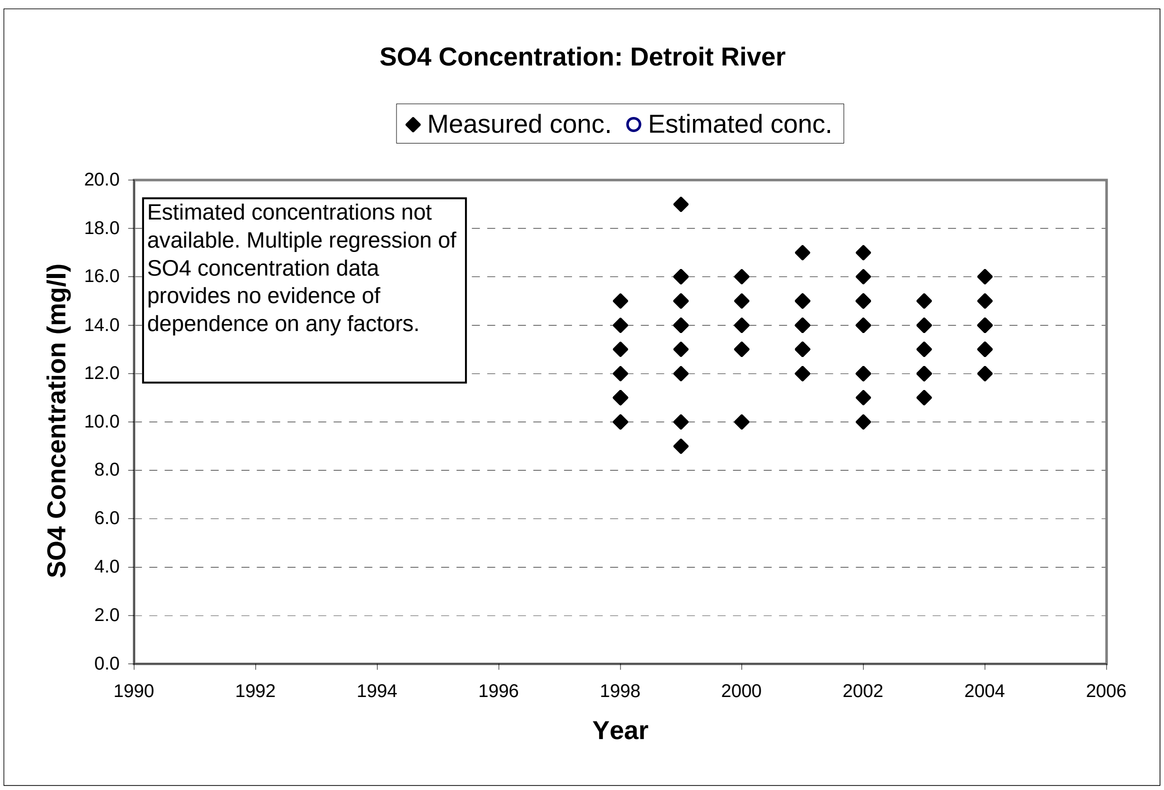

K Concentration: Detroit River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0

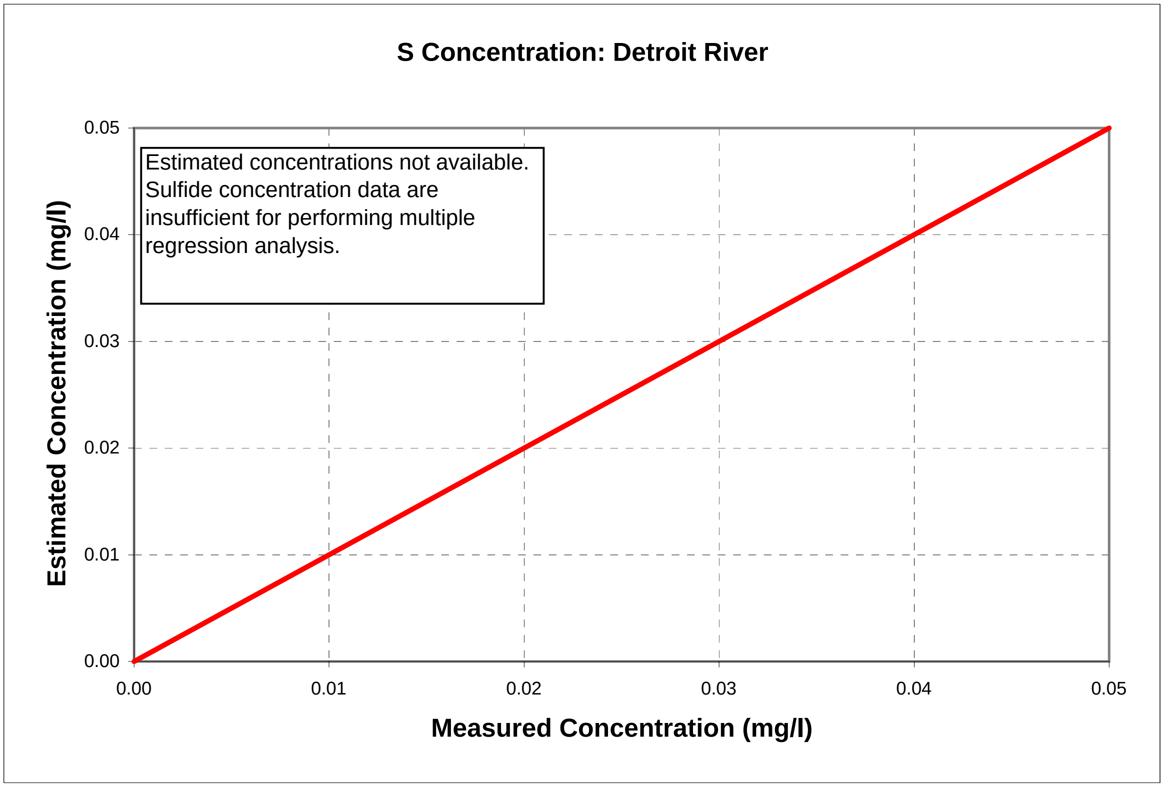

K Concentration: Detroit River
Measured conc.
Estimated conc.
K Concentration (mg/l)
Year
1990
1992
1994
1996
1998
2000
2002
2004
2006

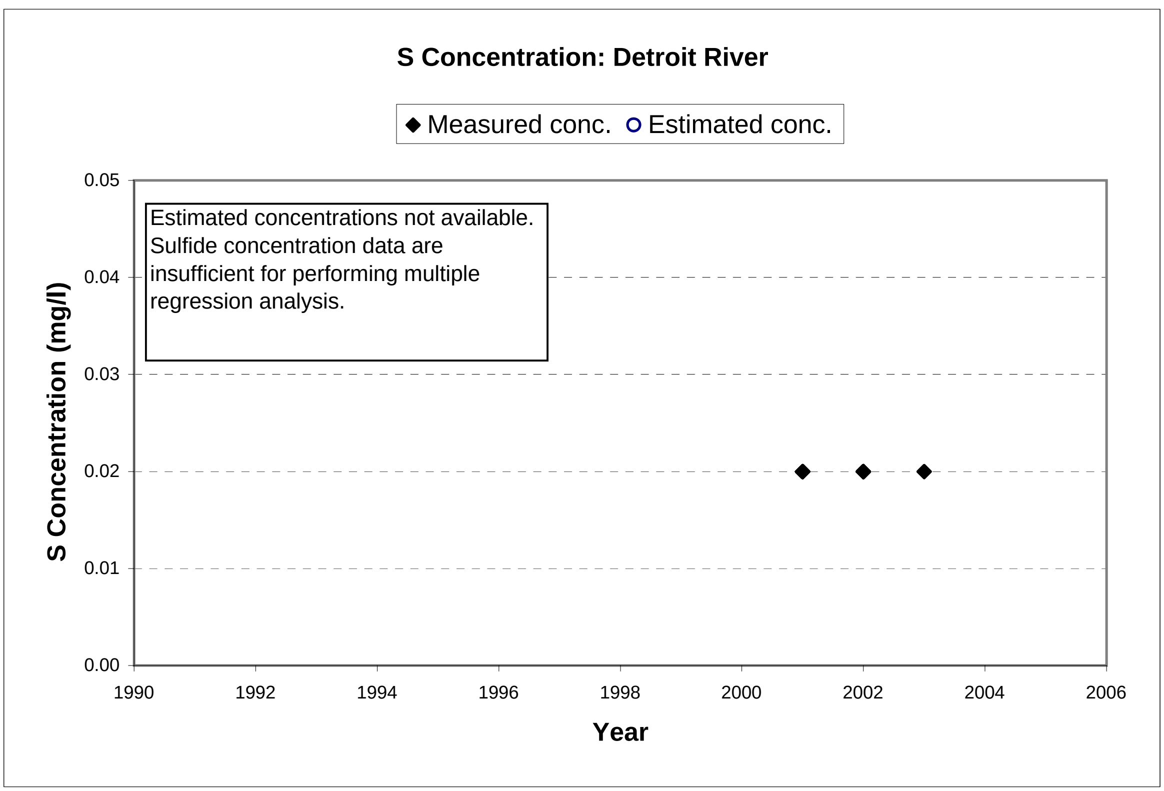

Cl Concentration: Detroit River
Estimated Concentration (mg/l)
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
0.0 2.0 4.0 6.0 8.0 10.0 12.0 14.0 16.0 18.0 20.0
Measured Concentration (mg/l)

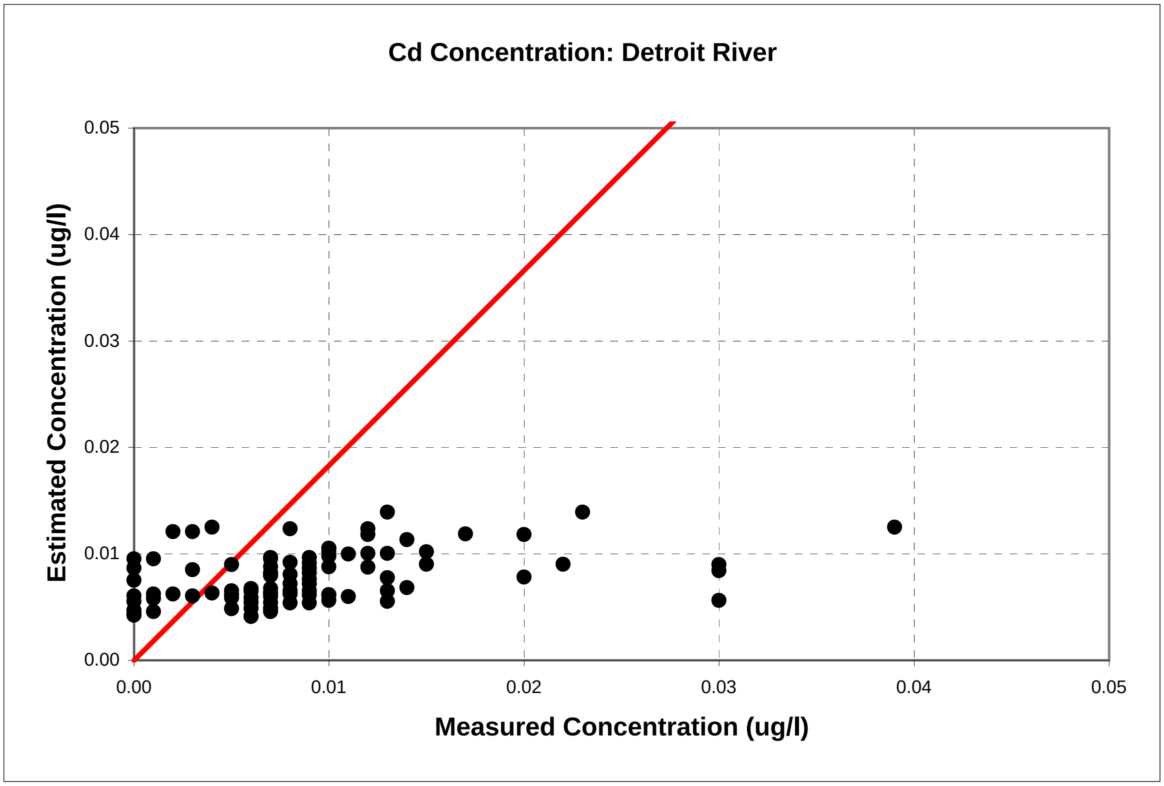

Cl Concentration: Detroit River
Measured conc.
Estimated conc.
Cl Concentration (mg/l)
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
1990 1992 1994 1996 1998 2000 2002 2004 2006
Year

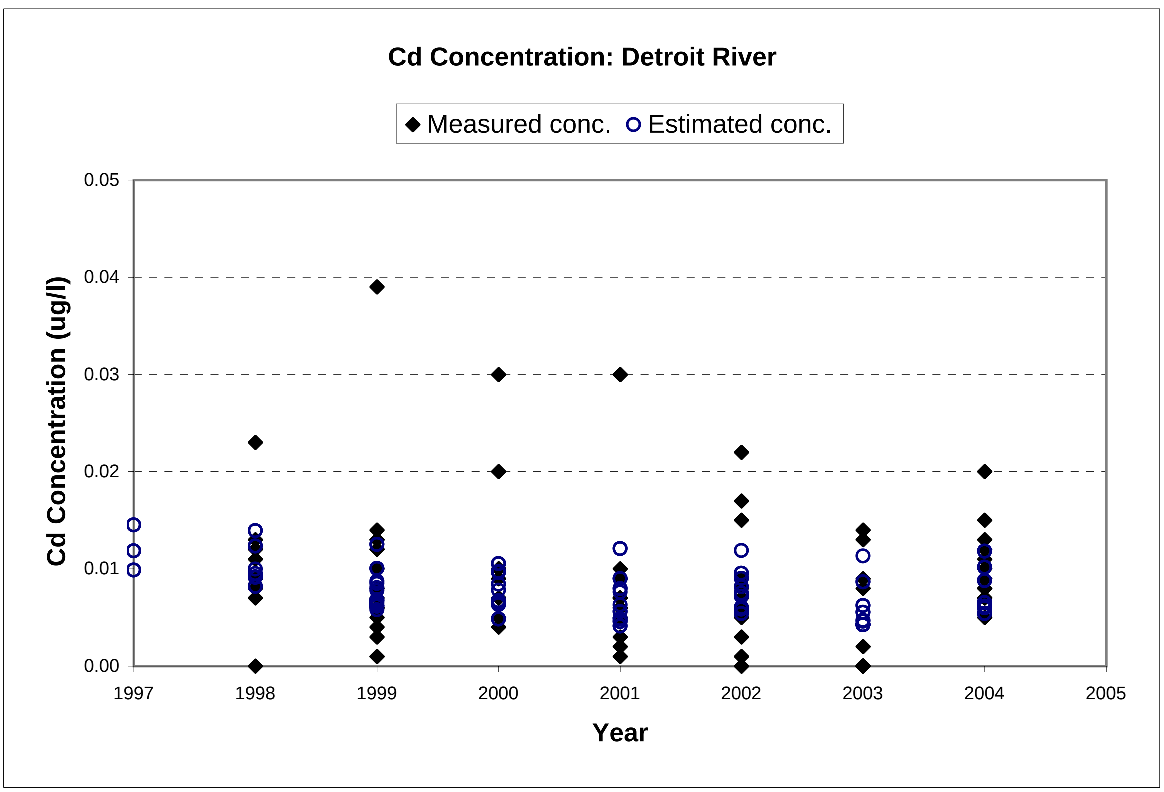

SO4 Concentration: Detroit River
Estimated concentrations not available. Multiple regression of SO4 concentration data provides no evidence of dependence on any factors.
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0

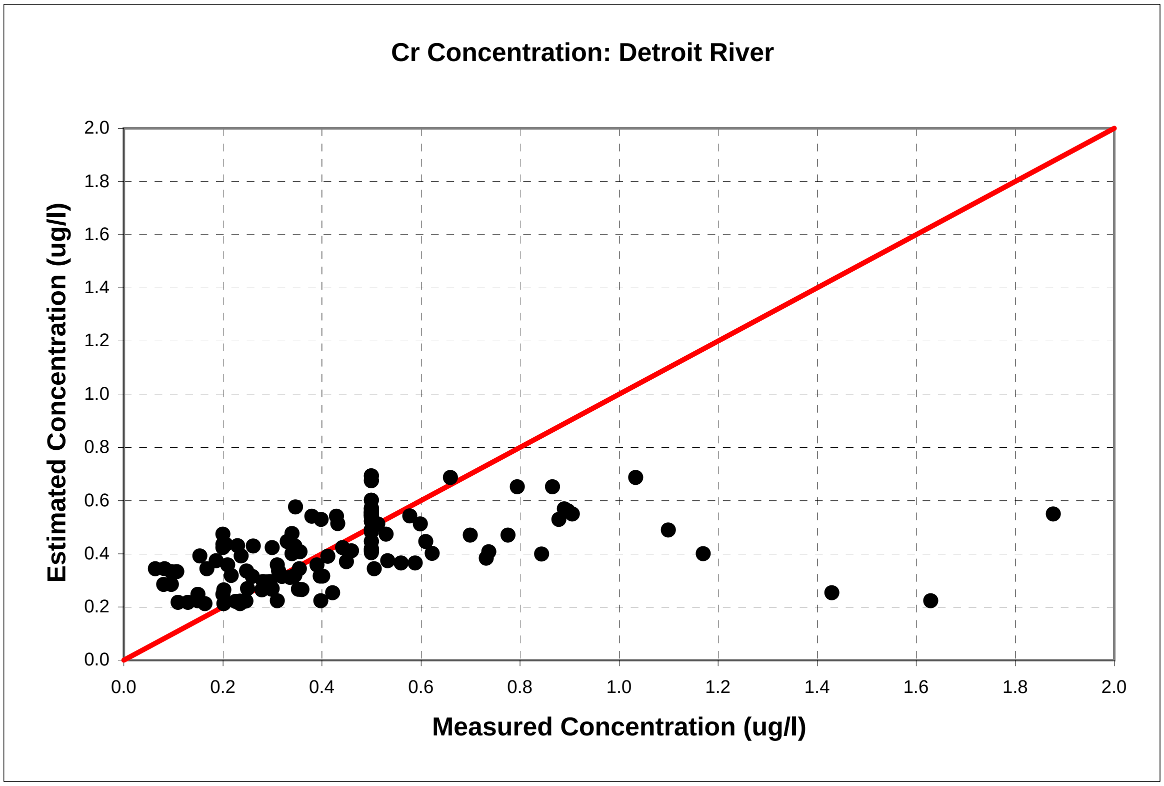

SO4 Concentration: Detroit River
Measured conc.
Estimated conc.
Estimated concentrations not available. Multiple regression of SO4 concentration data provides no evidence of dependence on any factors.
SO4 Concentration (mg/l)
Year
1990
1992
1994
1996
1998
2000
2002
2004
2006

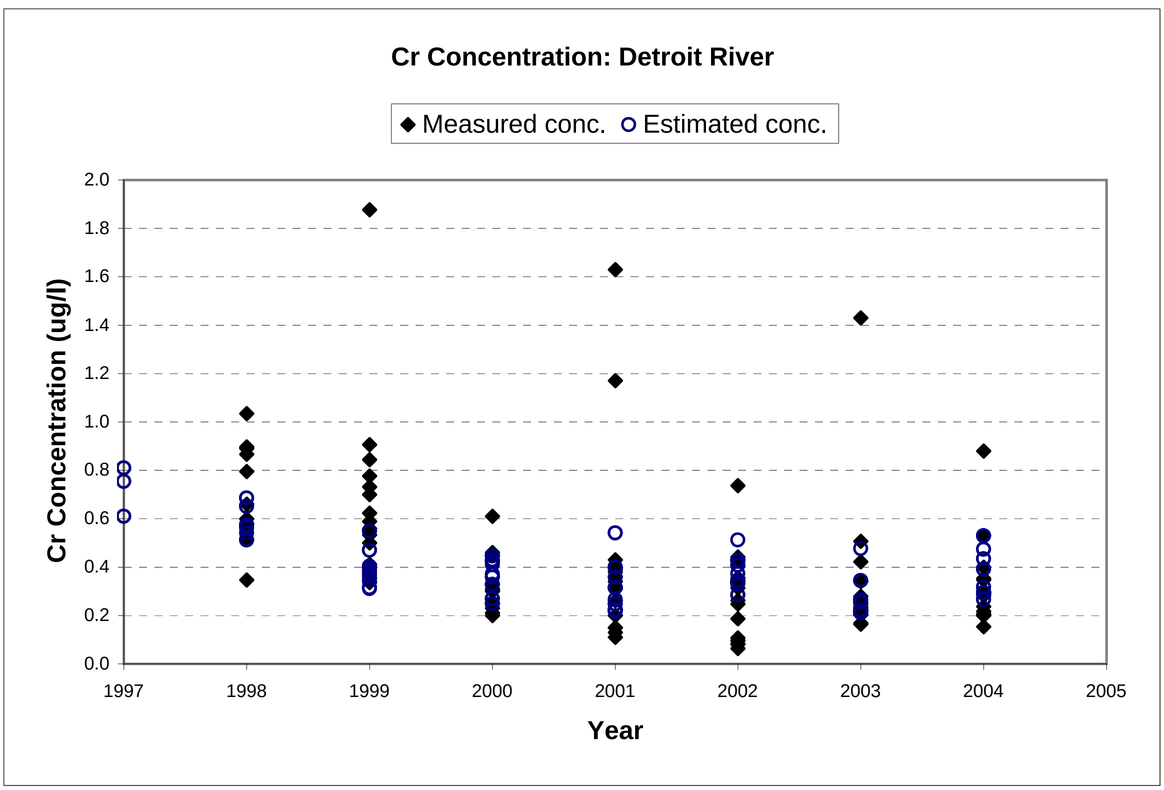

S Concentration: Detroit River
Estimated concentrations not available. Sulfide concentration data are insufficient for performing multiple regression analysis.
Estimated Concentration (mg/l)
0.05
0.04
0.03
0.02
0.01
0.00
0.00
0.01
0.02
0.03
0.04
0.05
Measured Concentration (mg/l)

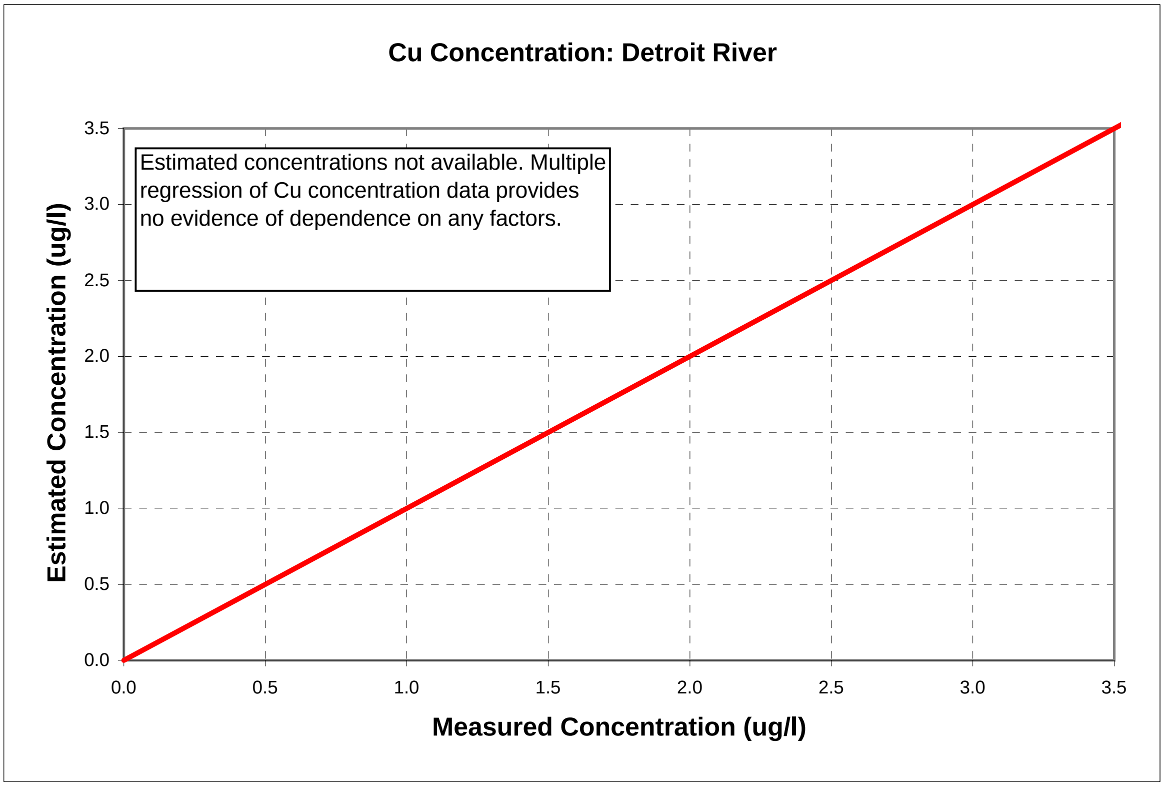

S Concentration: Detroit River
Measured conc.
Estimated conc.
Estimated concentrations not available. Sulfide concentration data are insufficient for performing multiple regression analysis.
S Concentration (mg/l)
0.05
0.04
0.03
0.02
0.01
0.00
1990
1992
1994
1996
1998
2000
2002
2004
2006
Year

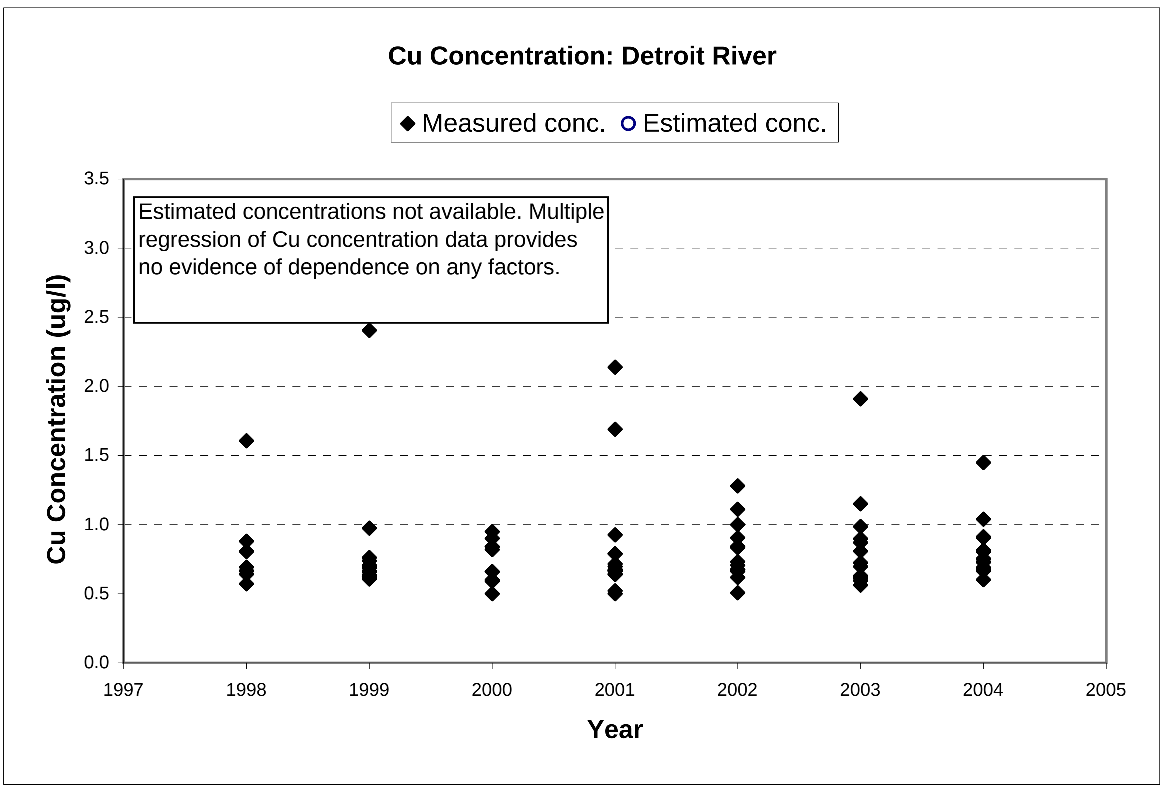

Cd Concentration: Detroit River
Estimated Concentration (ug/l)
0.05
0.04
0.03
0.02
0.01
0.00
0.00
0.01
0.02
0.03
0.04
0.05
Measured Concentration (ug/l)

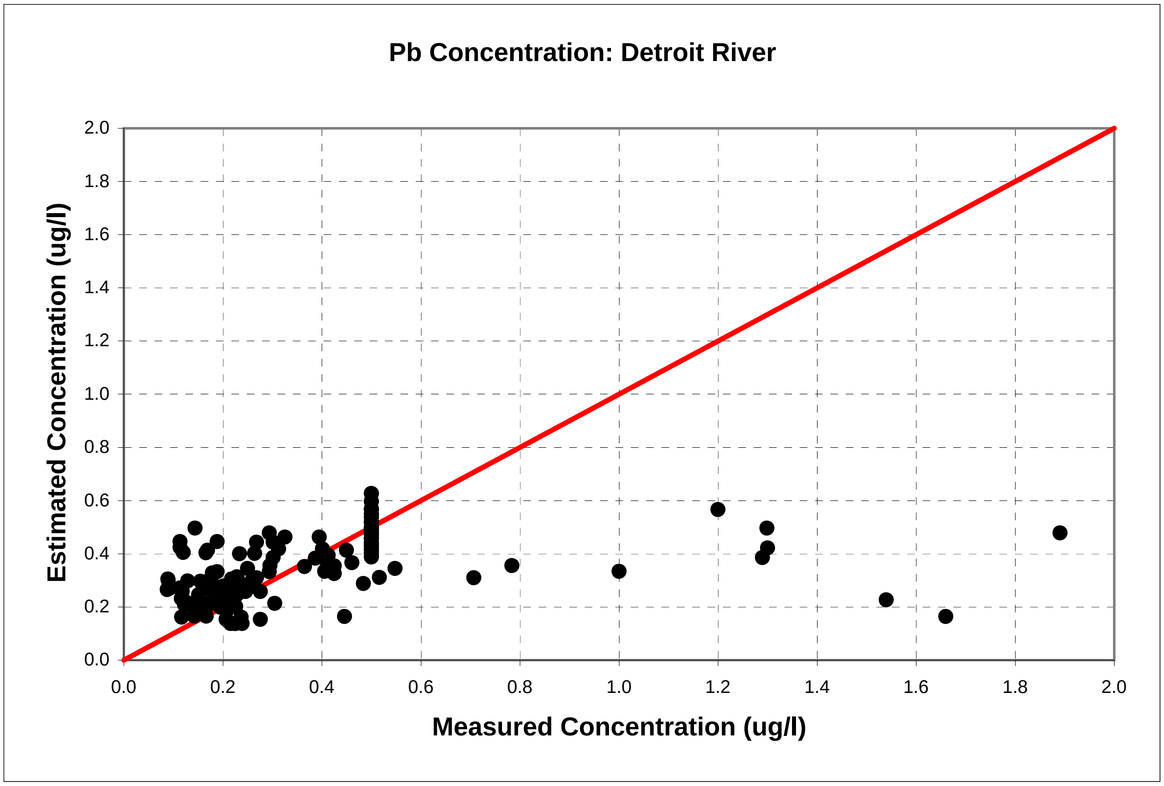

Cd Concentration: Detroit River
Measured conc.
Estimated conc.
Cd Concentration (ug/l)
0.05
0.04
0.03
0.02
0.01
0.00
1997
1998
1999
2000
2001
2002
2003
2004
2005
Year

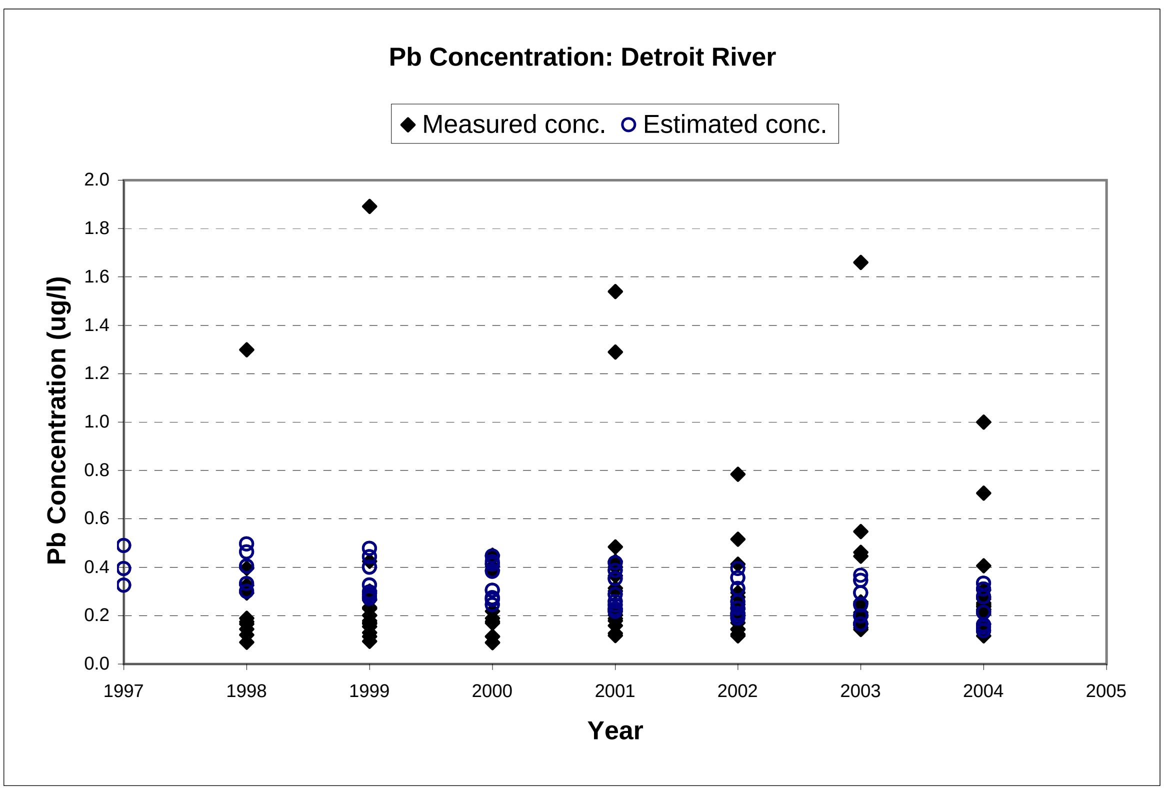

Cr Concentration: Detroit River
Estimated Concentration (ug/l)
Measured Concentration (ug/l)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0

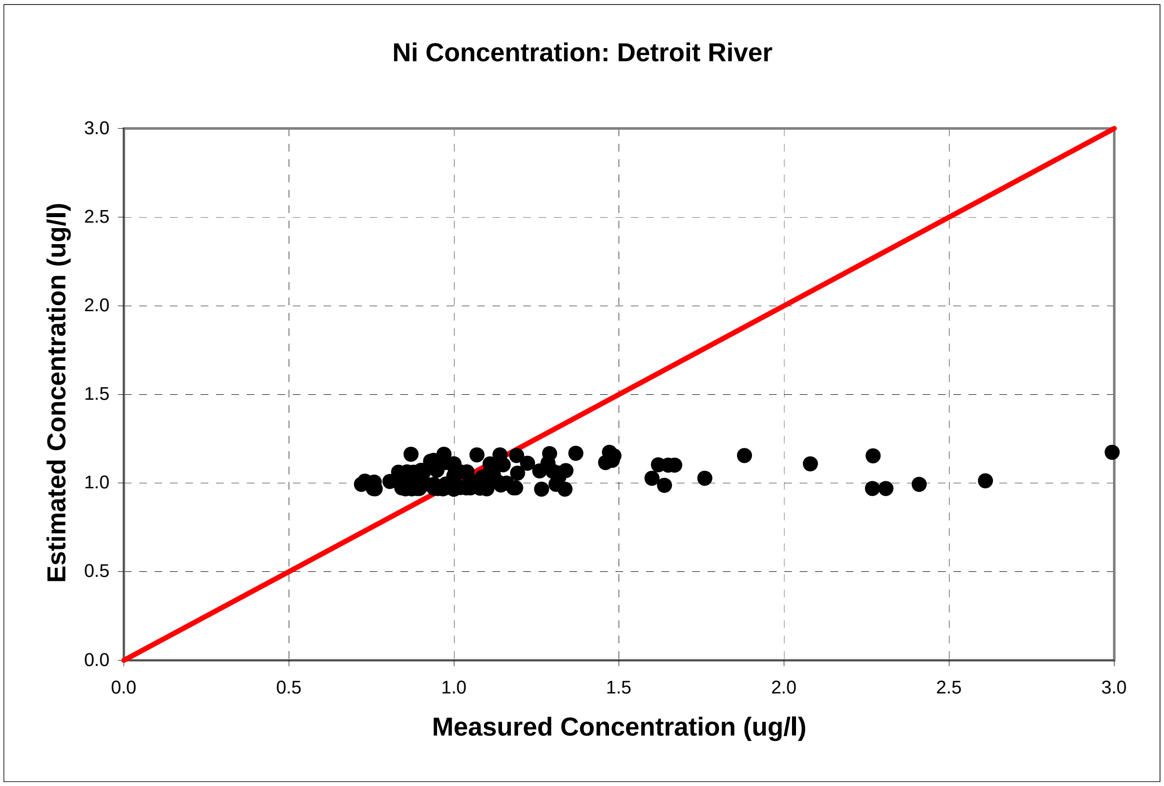

Cr Concentration: Detroit River
Measured conc.
Estimated conc.
Cr Concentration (ug/l)
Year
1997
1998
1999
2000
2001
2002
2003
2004
2005


Cu Concentration: Detroit River
Estimated concentrations not available. Multiple regression of Cu concentration data provides no evidence of dependence on any factors.
Estimated Concentration (ug/l)
Measured Concentration (ug/l)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5

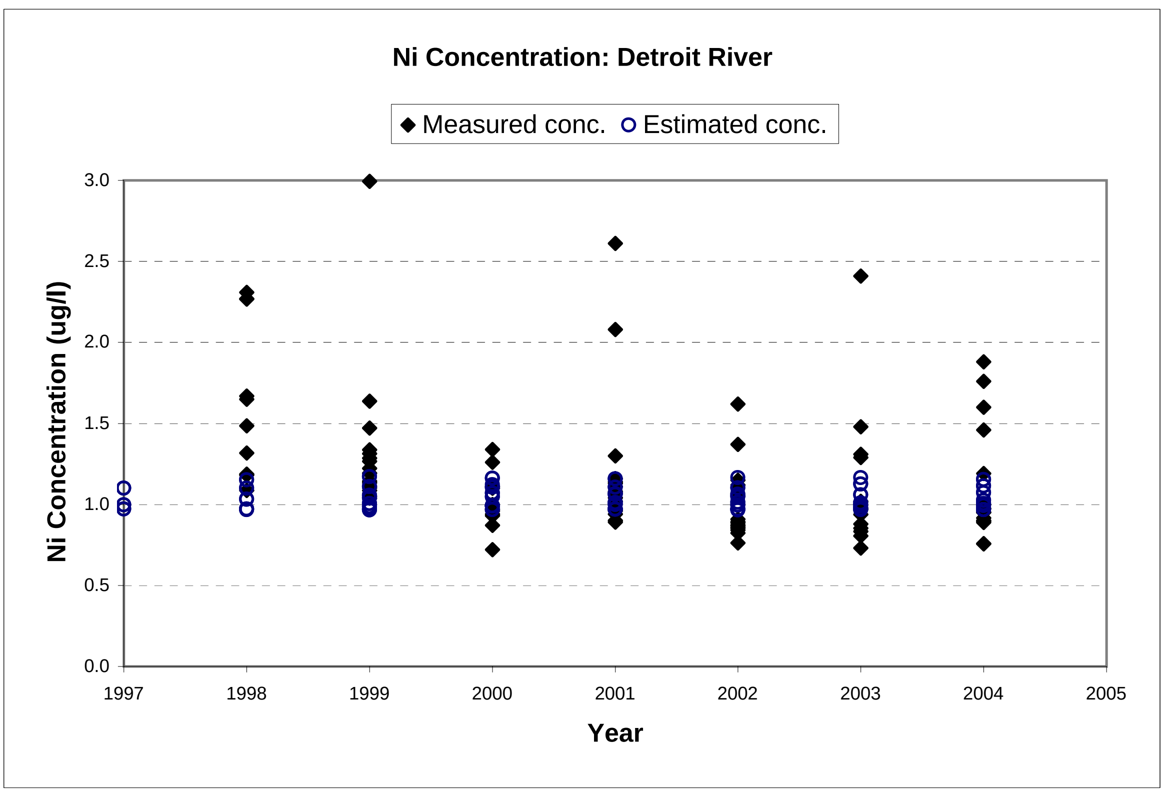

Cu Concentration: Detroit River
Measured conc.
Estimated conc.
Estimated concentrations not available. Multiple regression of Cu concentration data provides no evidence of dependence on any factors.
Cu Concentration (ug/l)
Year
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
1997
1998
1999
2000
2001
2002
2003
2004
2005


Pb Concentration: Detroit River
Estimated Concentration (ug/l)
Measured Concentration (ug/l)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0

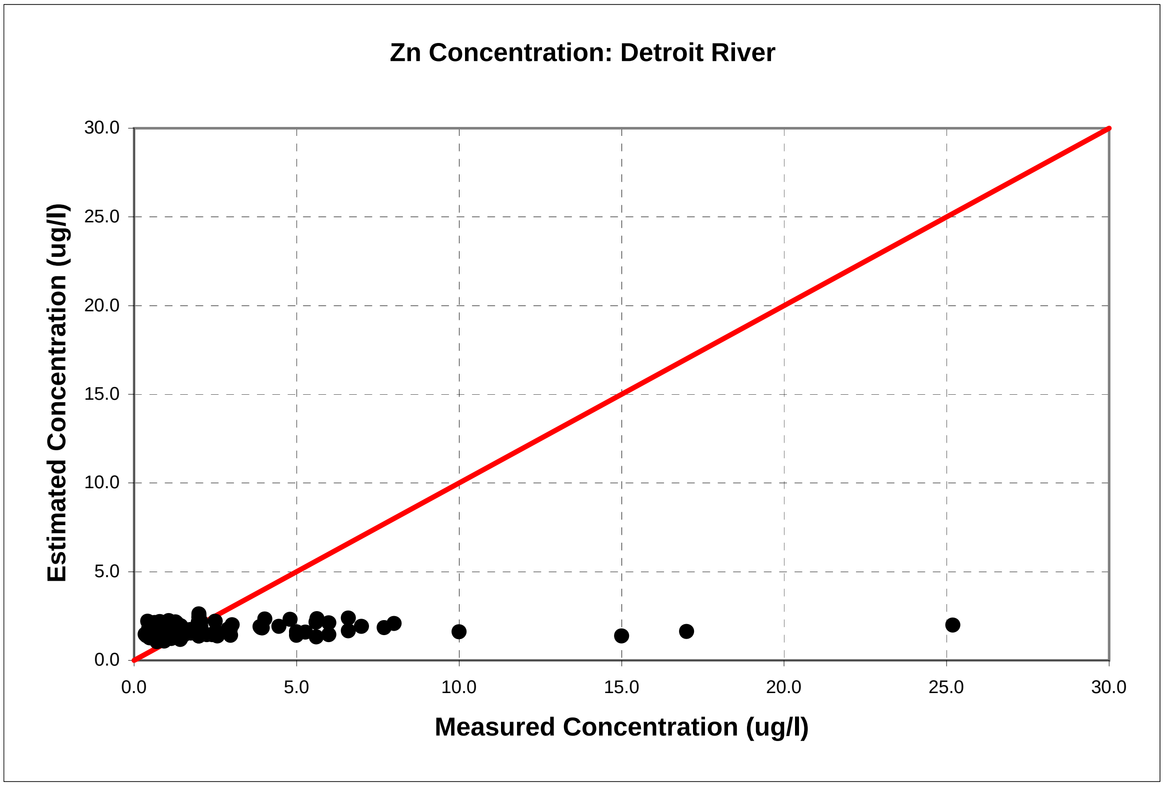

Pb Concentration: Detroit River
Measured conc.
Estimated conc.
Pb Concentration (ug/l)
Year
1997
1998
1999
2000
2001
2002
2003
2004
2005
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0



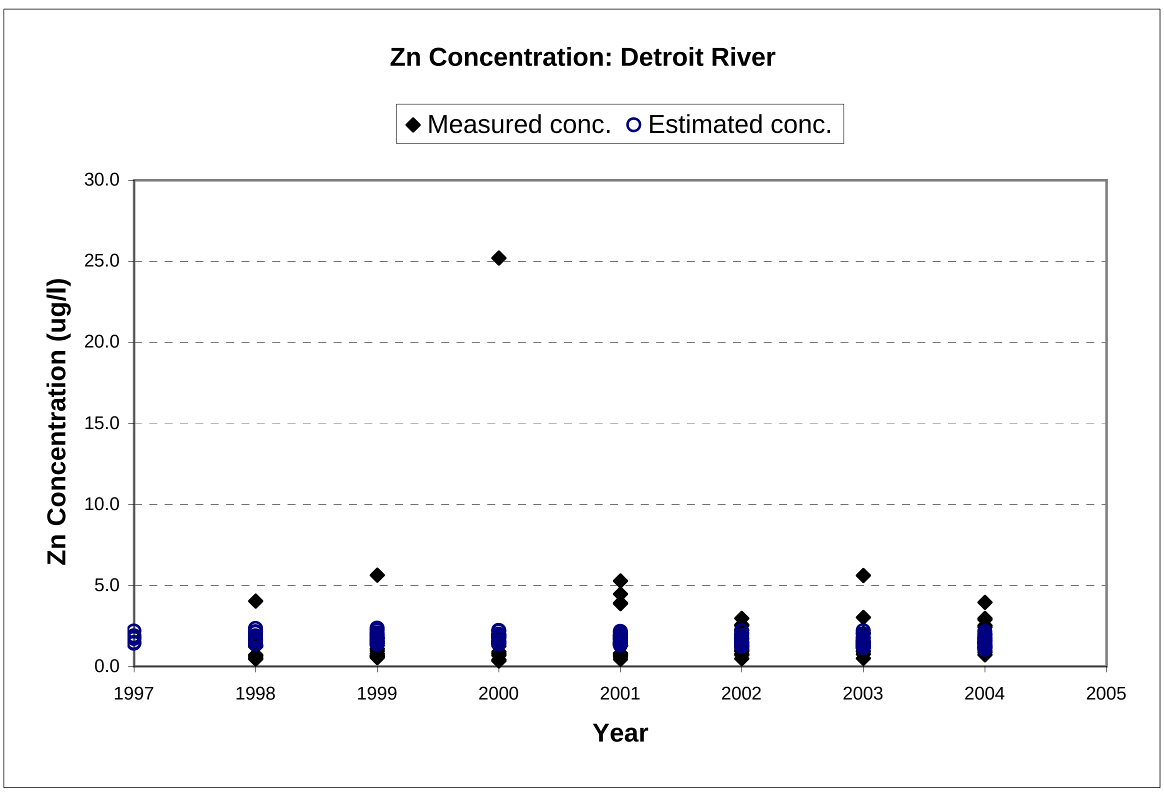
Ni Concentration: Detroit River
Estimated Concentration (ug/l)
Measured Concentration (ug/l)
0.0
0.5
1.0
1.5
2.0
2.5
3.0



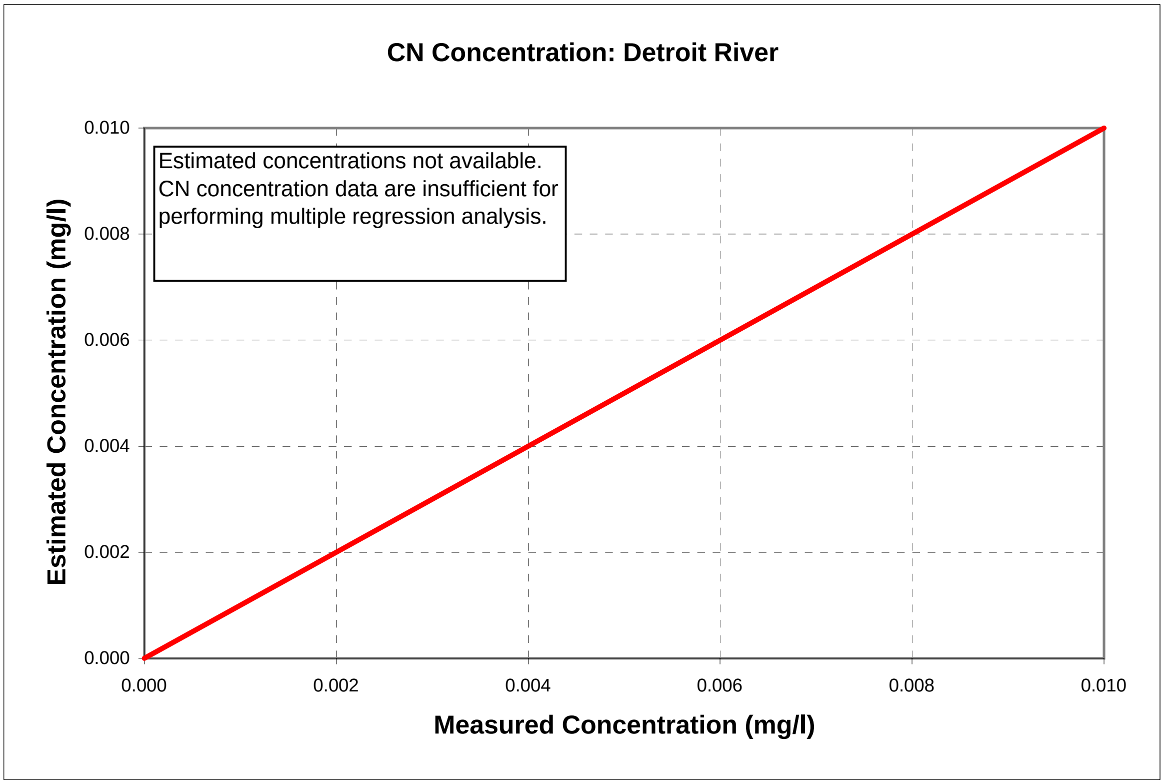
Ni Concentration: Detroit River
Measured conc.
Estimated conc.
Ni Concentration (ug/l)
Year
1997
1998
1999
2000
2001
2002
2003
2004
2005

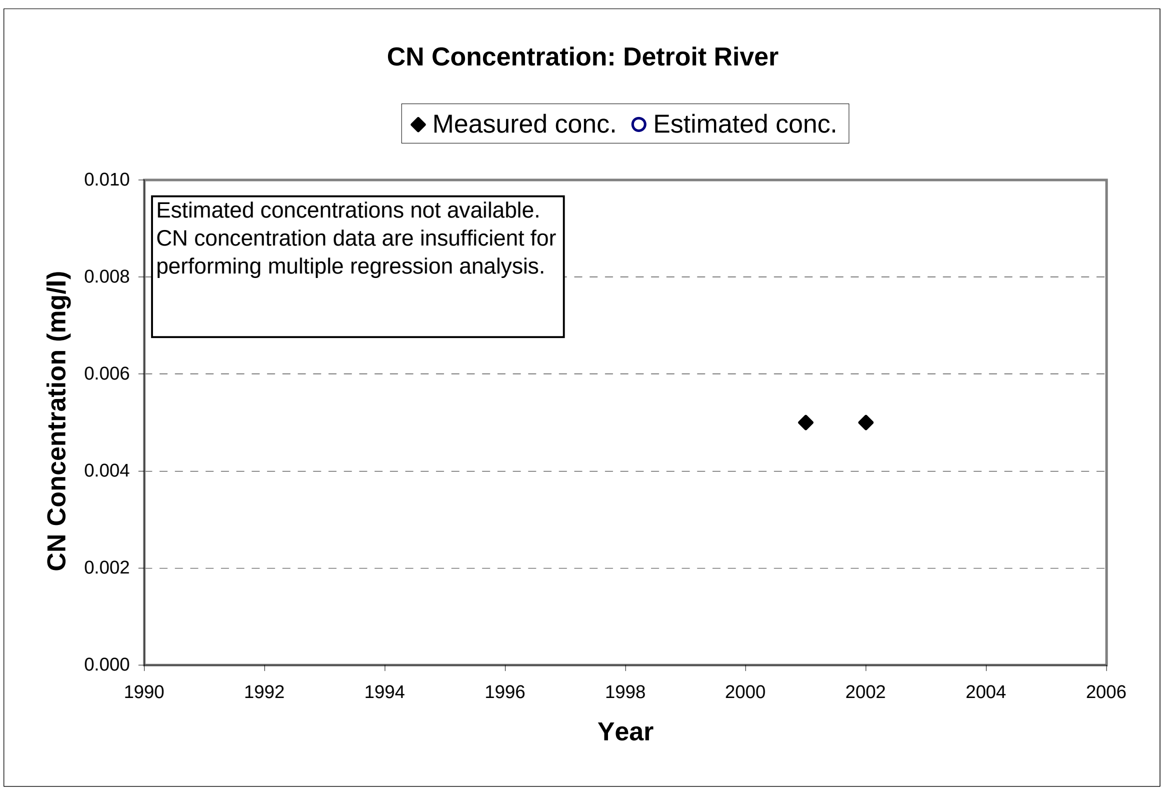


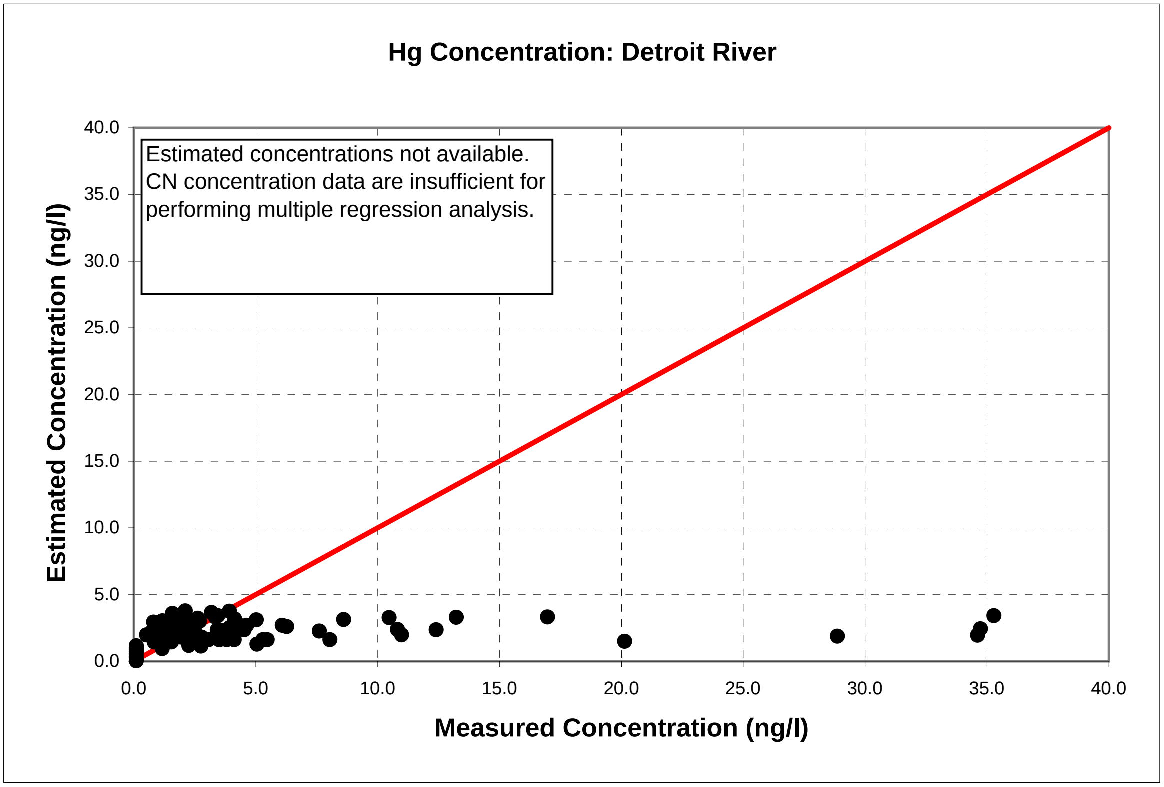
Zn Concentration: Detroit River
Estimated Concentration (ug/l)
Measured Concentration (ug/l)
0.0
5.0
10.0
15.0
20.0
25.0
30.0

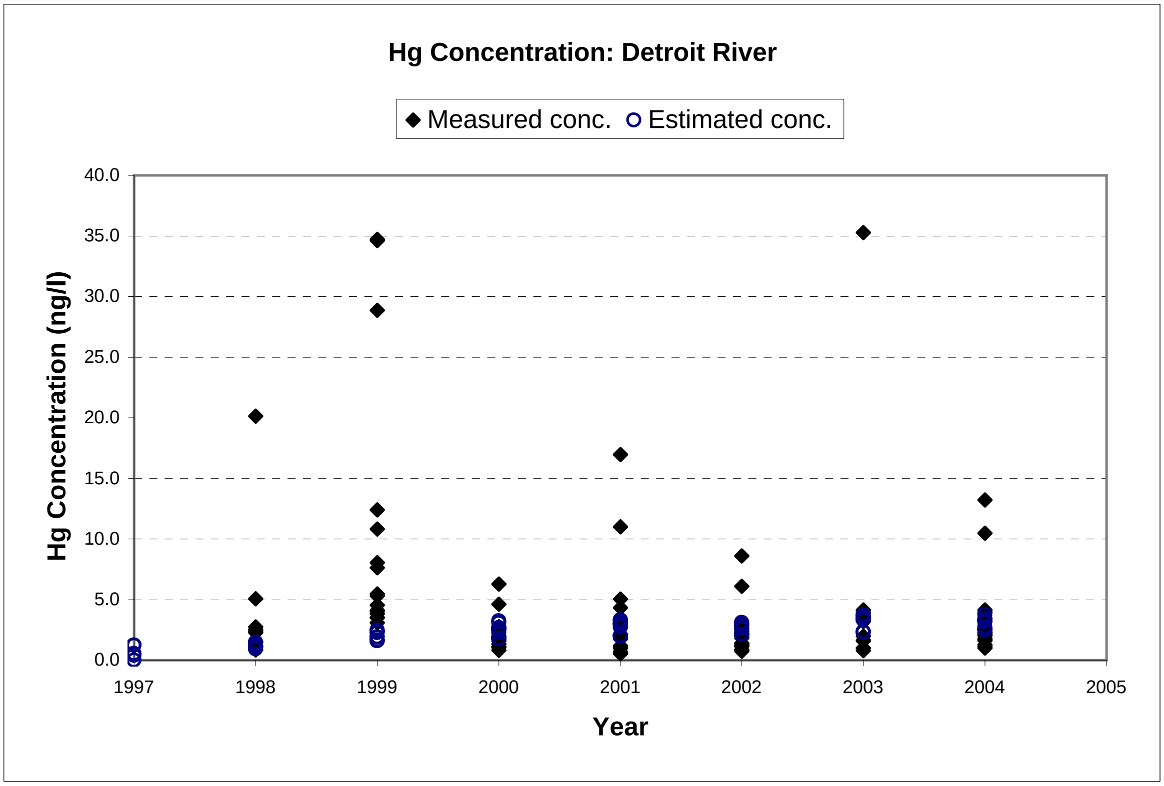


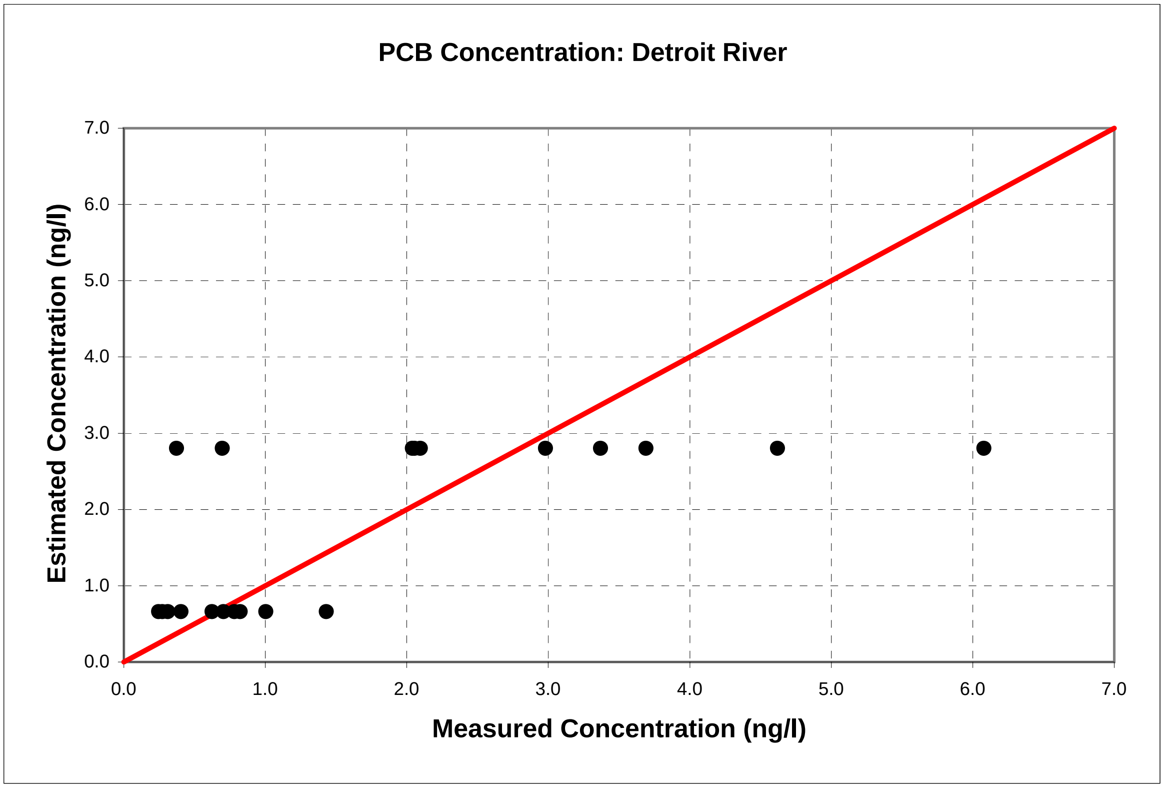
Zn Concentration: Detroit River
Measured conc.
Estimated conc.
Zn Concentration (ug/l)
0.0
5.0
10.0
15.0
20.0
25.0
30.0
1997
1998
1999
2000
2001
2002
2003
2004
2005
Year

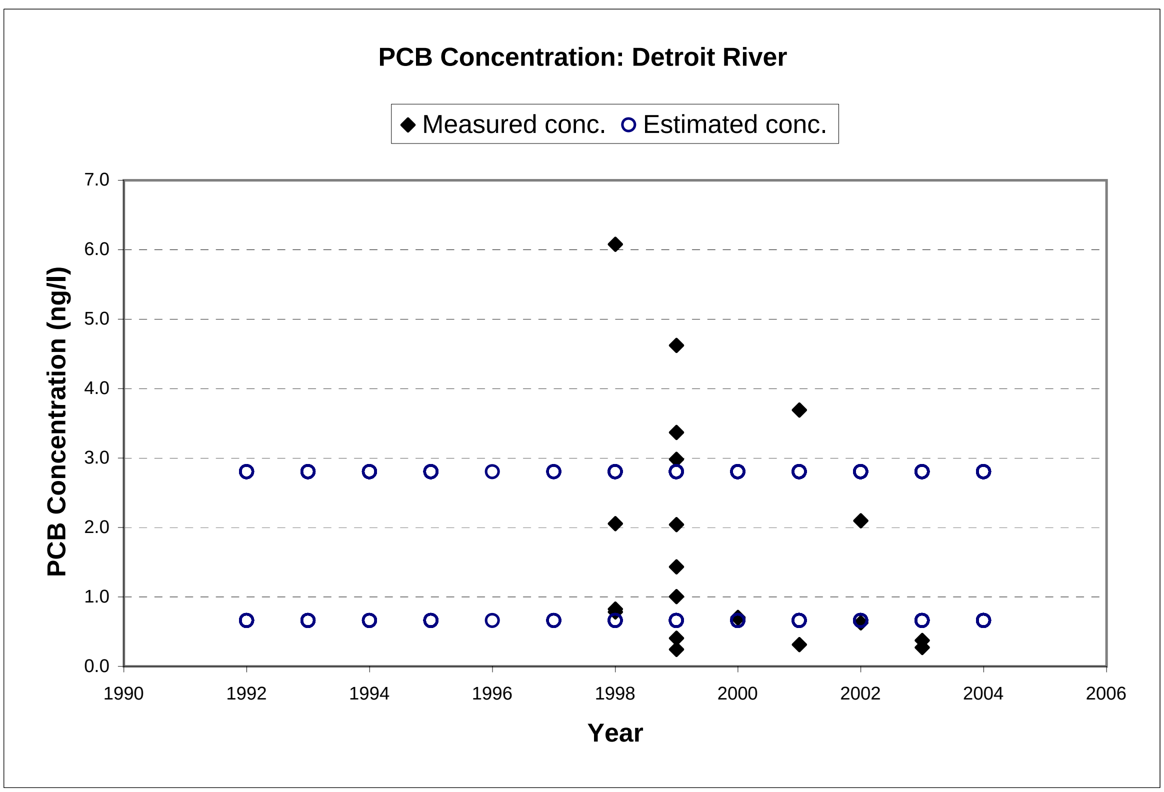

CN Concentration: Detroit River
Estimated concentrations not available.
CN concentration data are insufficient for
performing multiple regression analysis.
0.010
0.008
0.006
0.004
0.002
0.000
0.000
0.002
0.004
0.006
0.008
0.010
Estimated Concentration (mg/l)
Measured Concentration (mg/l)

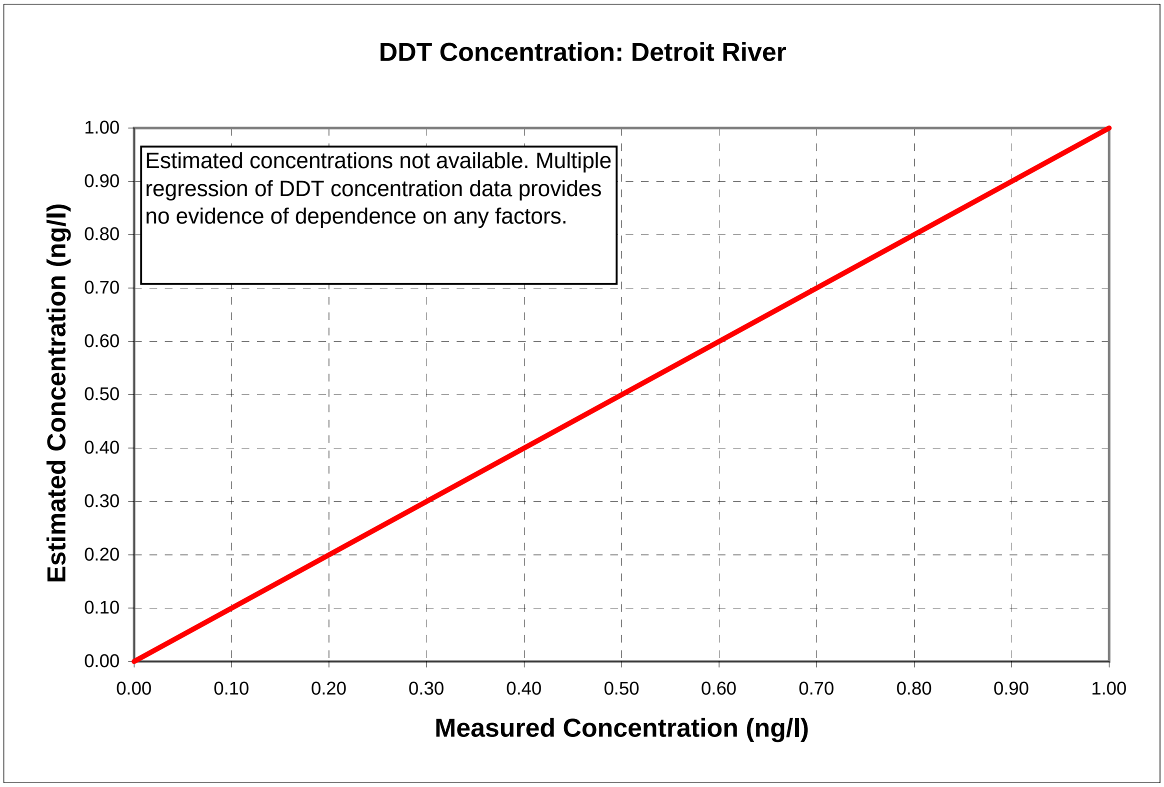

CN Concentration: Detroit River
Measured conc.
Estimated conc.
Estimated concentrations not available.
CN concentration data are insufficient for
performing multiple regression analysis.
0.010
0.008
0.006
0.004
0.002
0.000
1990
1992
1994
1996
1998
2000
2002
2004
2006
CN Concentration (mg/l)
Year

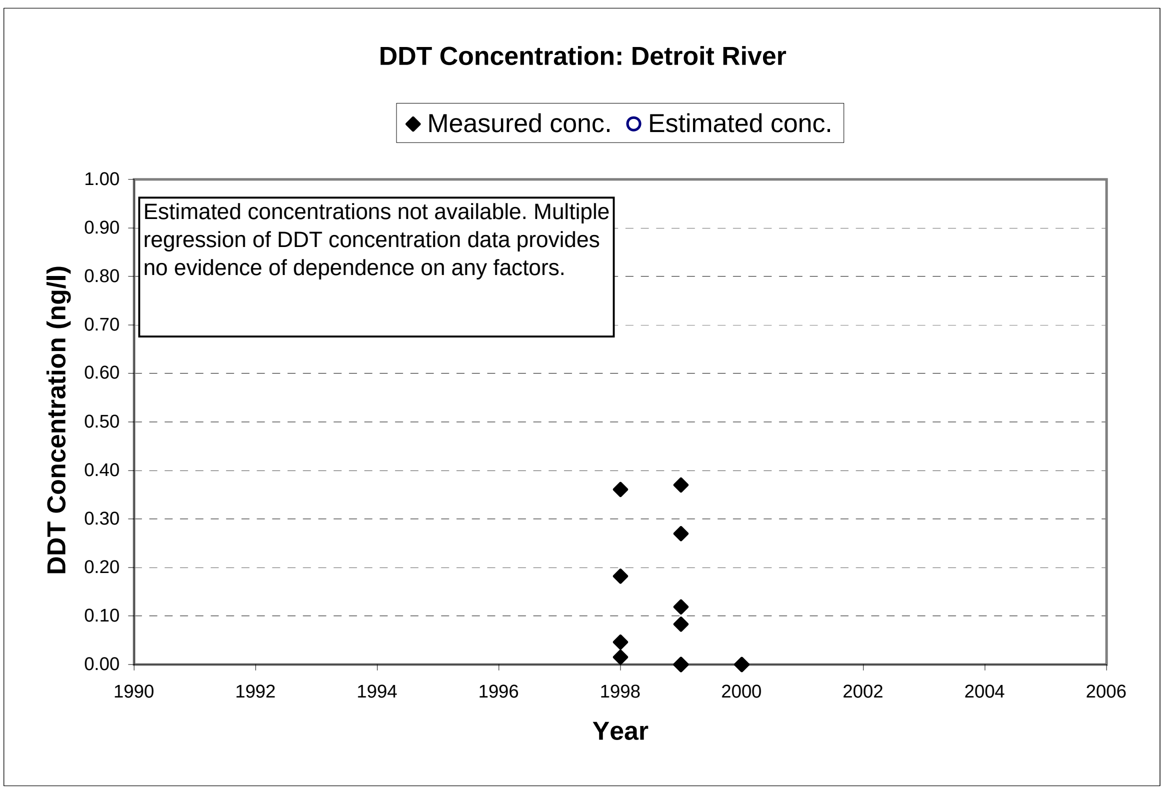

Hg Concentration: Detroit River
Estimated concentrations not available. CN concentration data are insufficient for performing multiple regression analysis.
Estimated Concentration (ng/l)
Measured Concentration (ng/l)
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
40.0

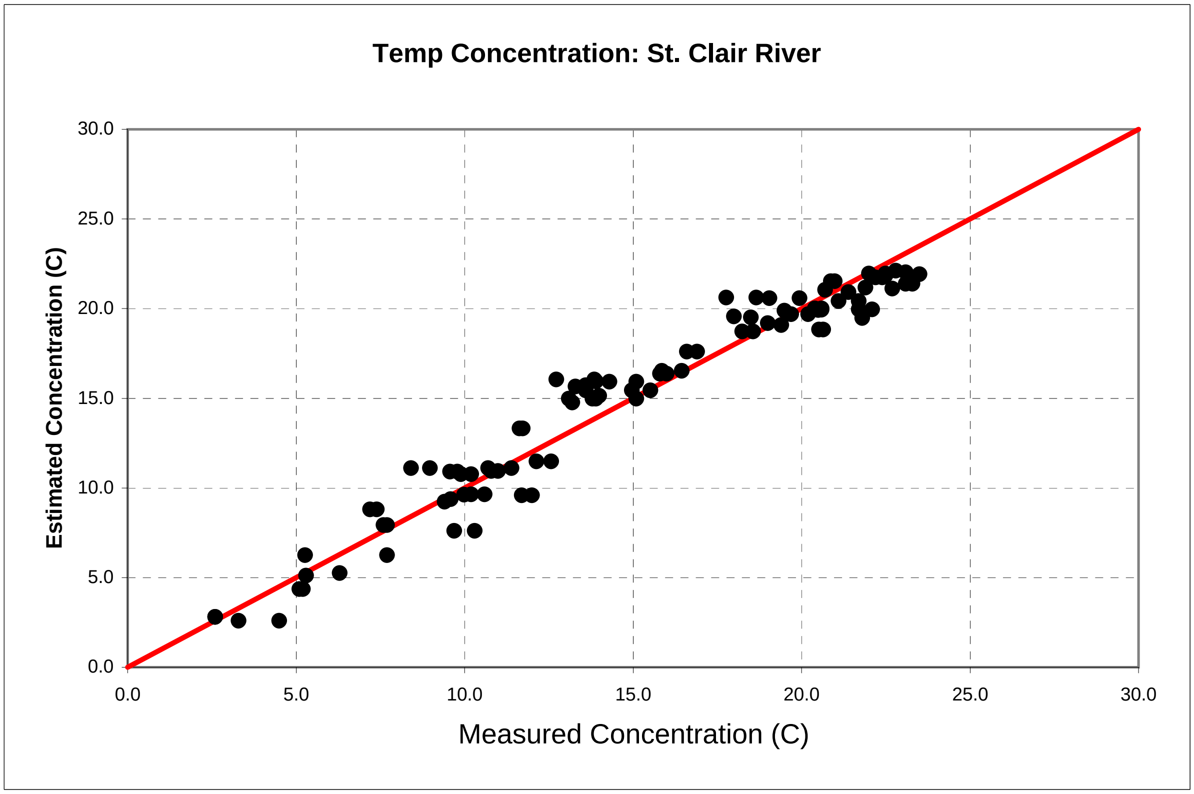

Hg Concentration: Detroit River
Measured conc.
Estimated conc.
Hg Concentration (ng/l)
Year
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
40.0
1997
1998
1999
2000
2001
2002
2003
2004
2005


PCB Concentration: Detroit River
Estimated Concentration (ng/l)
Measured Concentration (ng/l)
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0

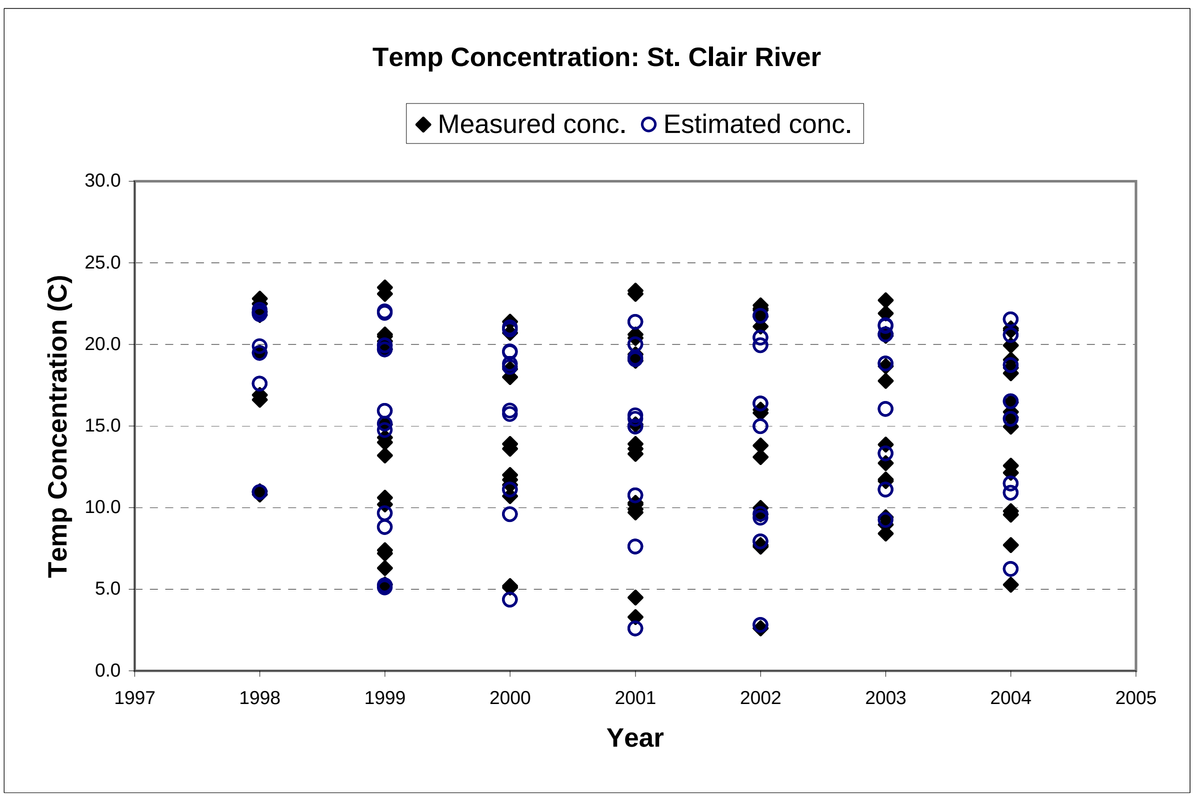

PCB Concentration: Detroit River
Measured conc.
Estimated conc.
PCB Concentration (ng/l)
Year
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
1990
1992
1994
1996
1998
2000
2002
2004
2006


DDT Concentration: Detroit River
Estimated concentrations not available. Multiple regression of DDT concentration data provides no evidence of dependence on any factors.
Estimated Concentration (ng/l)
Measured Concentration (ng/l)
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
1.00

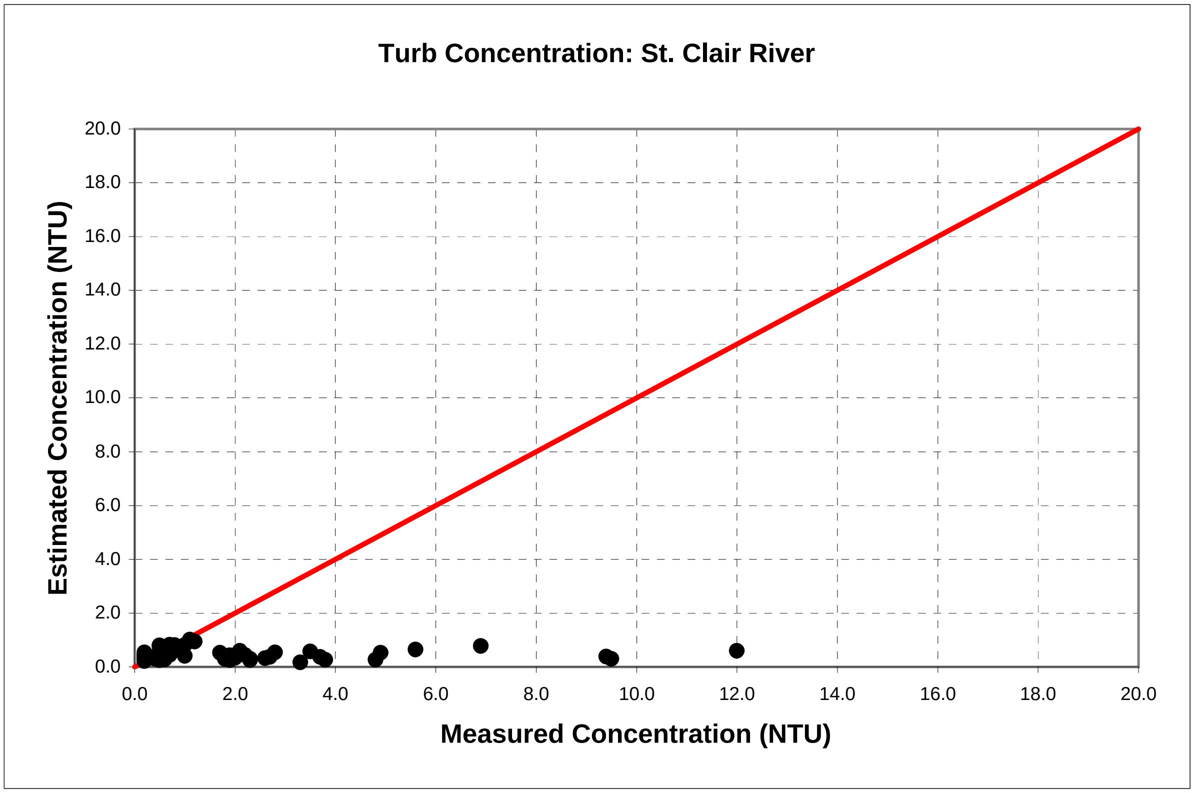

DDT Concentration: Detroit River
Measured conc.
Estimated conc.
Estimated concentrations not available. Multiple regression of DDT concentration data provides no evidence of dependence on any factors.
DDT Concentration (ng/l)
Year
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
1.00
1990
1992
1994
1996
1998
2000
2002
2004
2006

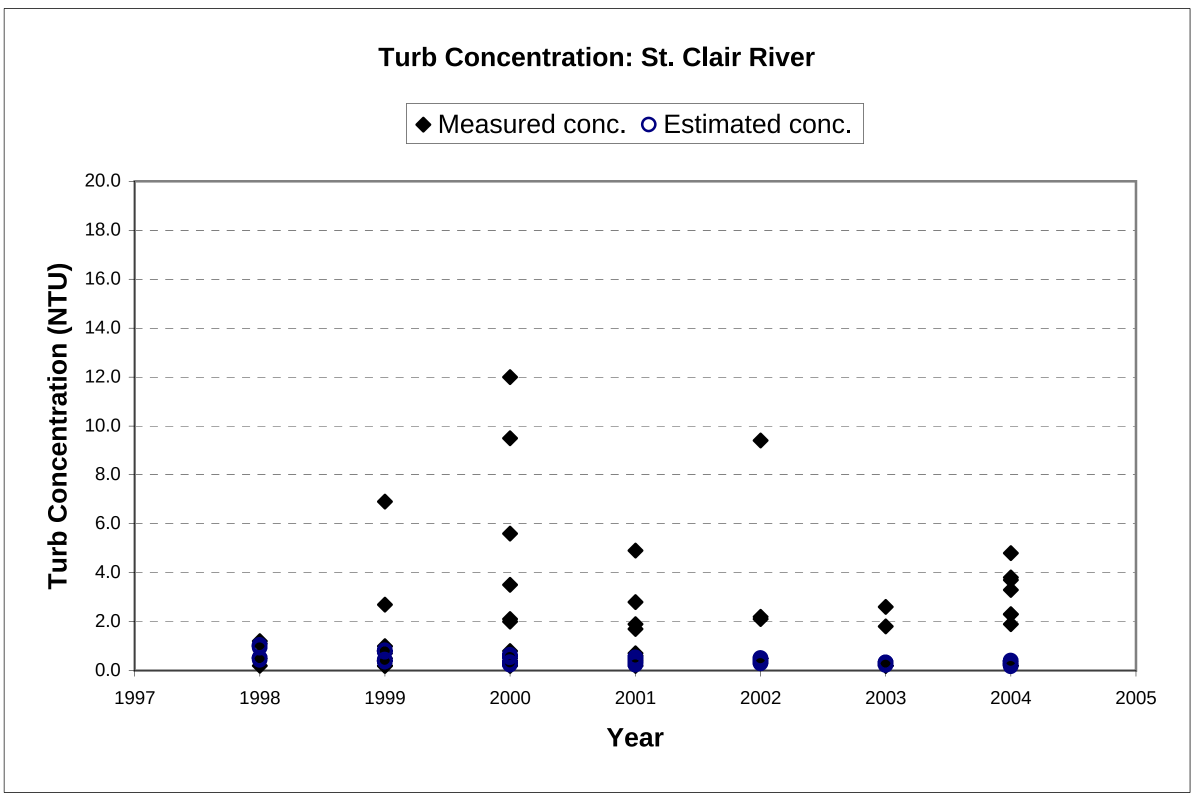


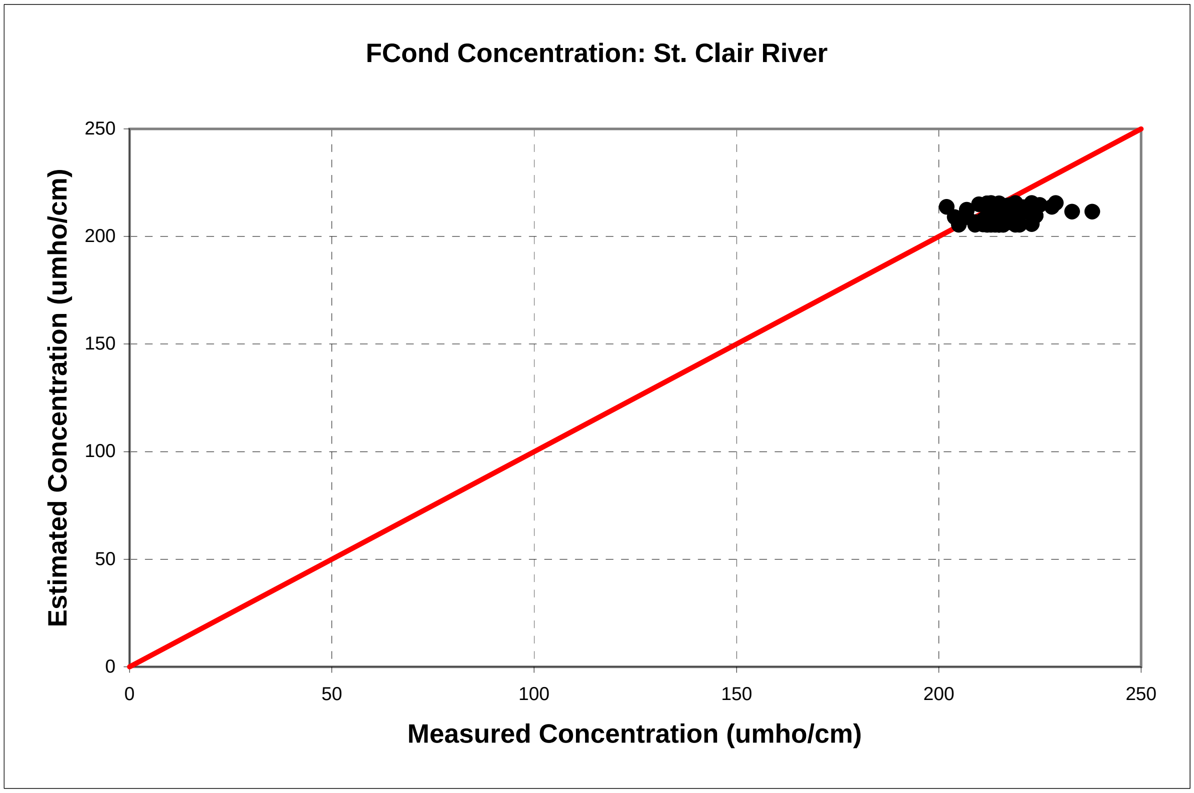
Temp Concentration: St. Clair River
Estimated Concentration (C)
Measured Concentration (C)
0.0
5.0
10.0
15.0
20.0
25.0
30.0

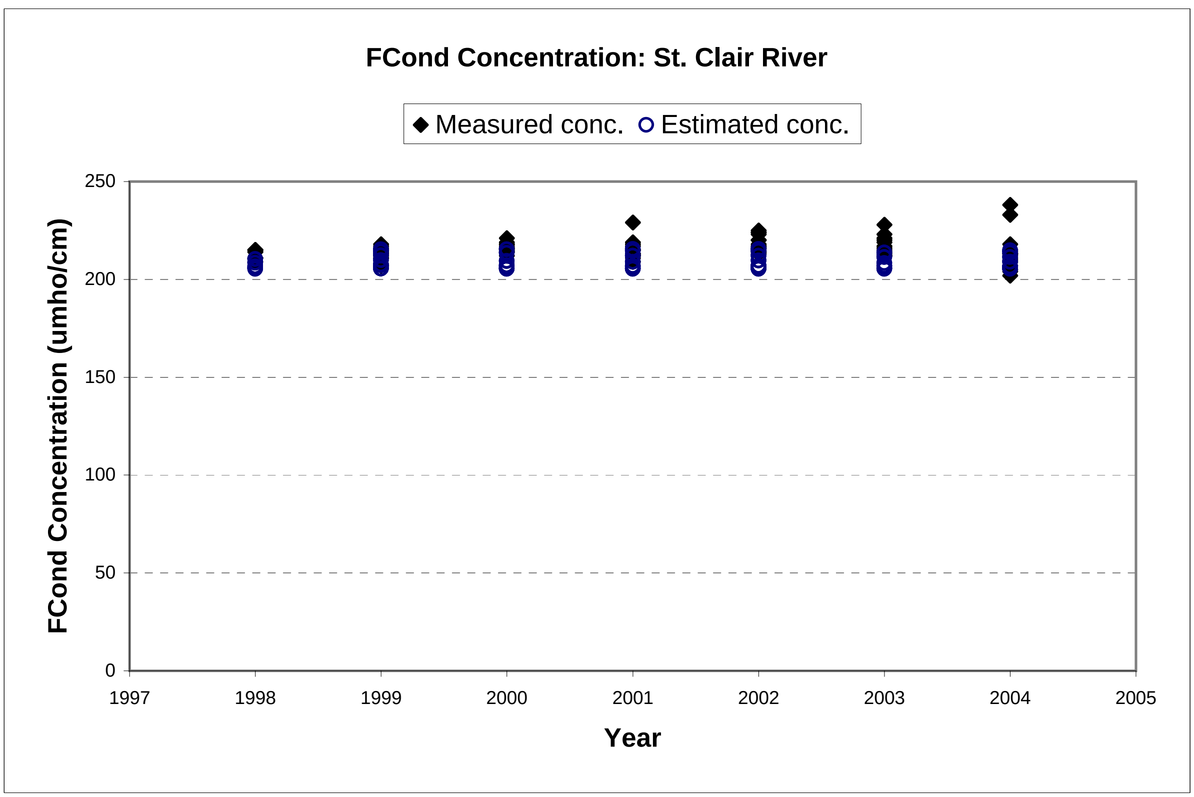


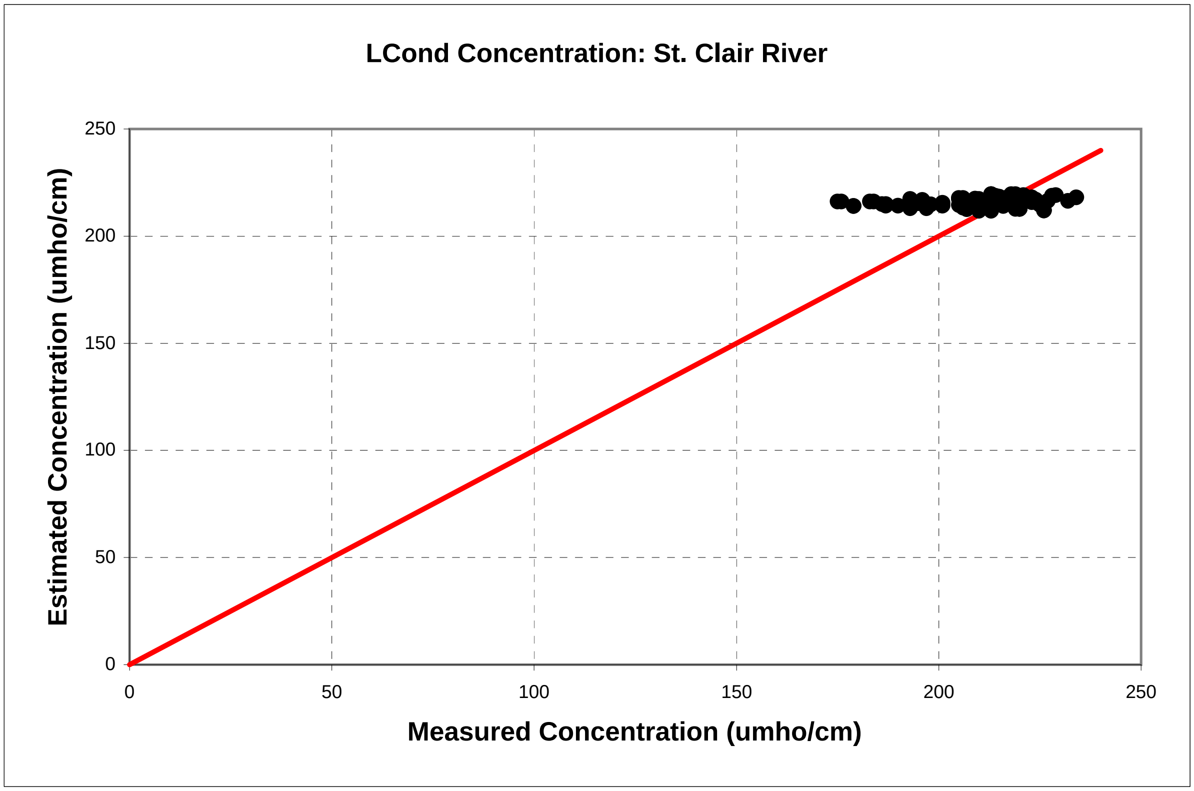
Temp Concentration: St. Clair River
Measured conc.
Estimated conc.
Temp Concentration (C)
Year
0.0
5.0
10.0
15.0
20.0
25.0
30.0
1997
1998
1999
2000
2001
2002
2003
2004
2005

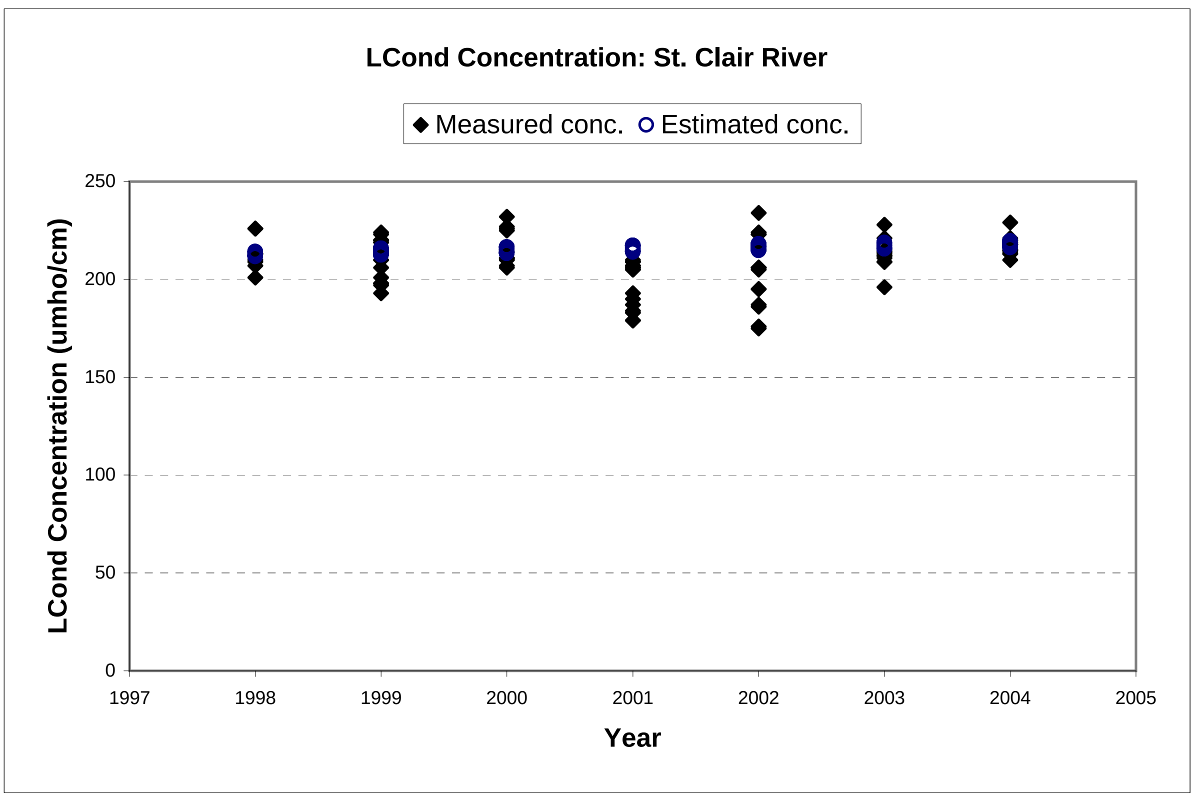

Turb Concentration: St. Clair River
Estimated Concentration (NTU)
Measured Concentration (NTU)
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0

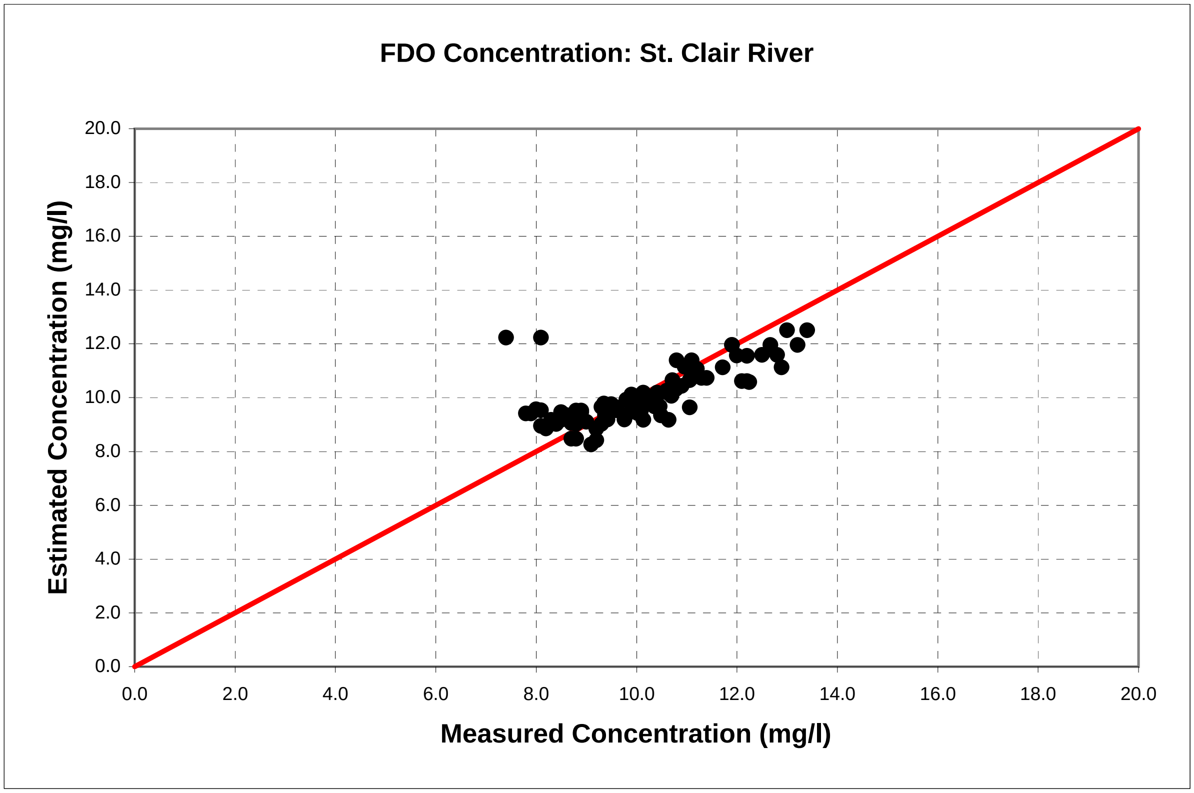

Turb Concentration: St. Clair River
Measured conc.
Estimated conc.
Turb Concentration (NTU)
Year
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
1997
1998
1999
2000
2001
2002
2003
2004
2005

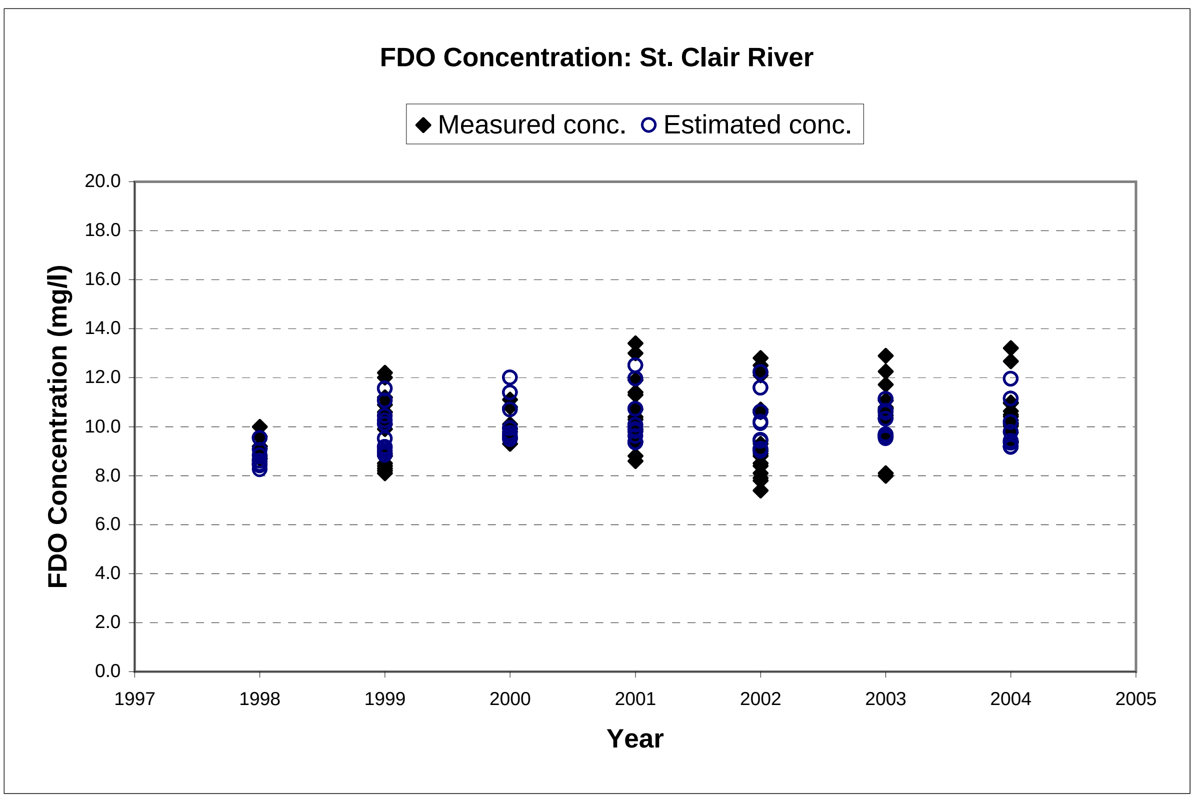

FCond Concentration: St. Clair River
Estimated Concentration (umho/cm)
0
50
100
150
200
250
Measured Concentration (umho/cm)

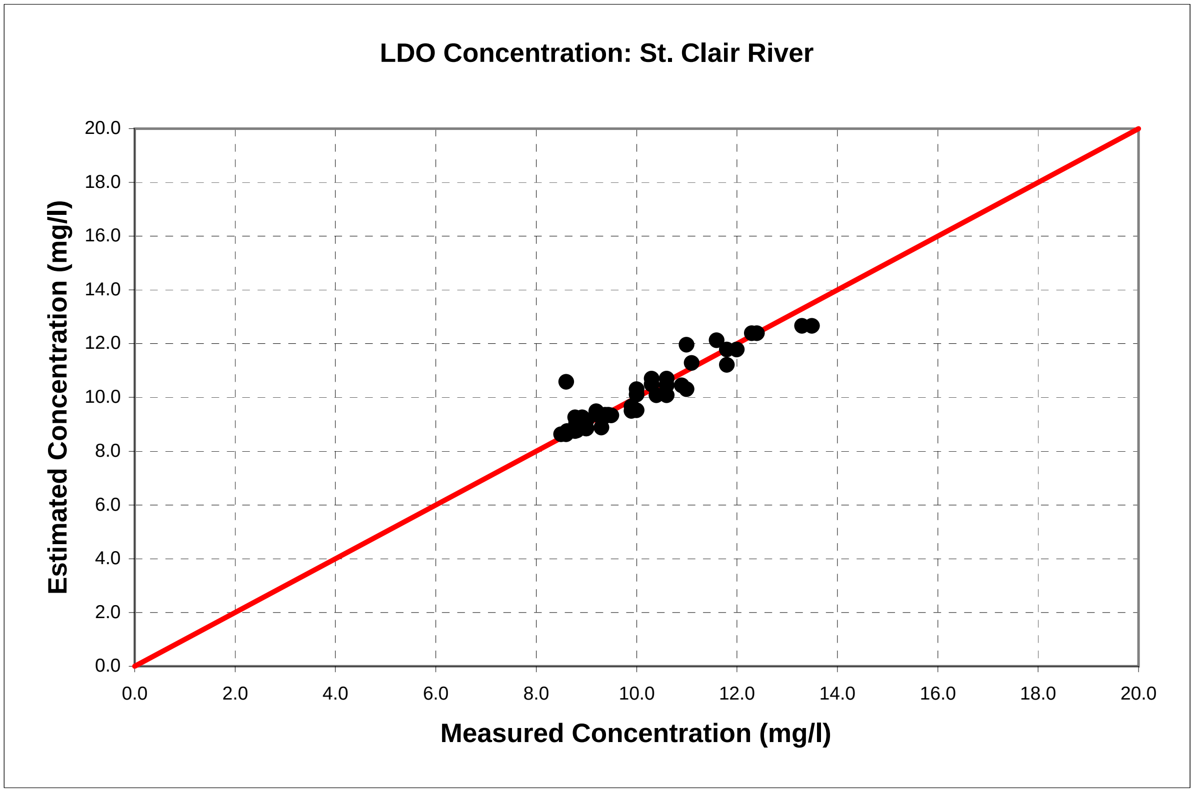

FCond Concentration: St. Clair River
Measured conc.
Estimated conc.
FCond Concentration (umho/cm)
0
50
100
150
200
250
1997
1998
1999
2000
2001
2002
2003
2004
2005
Year

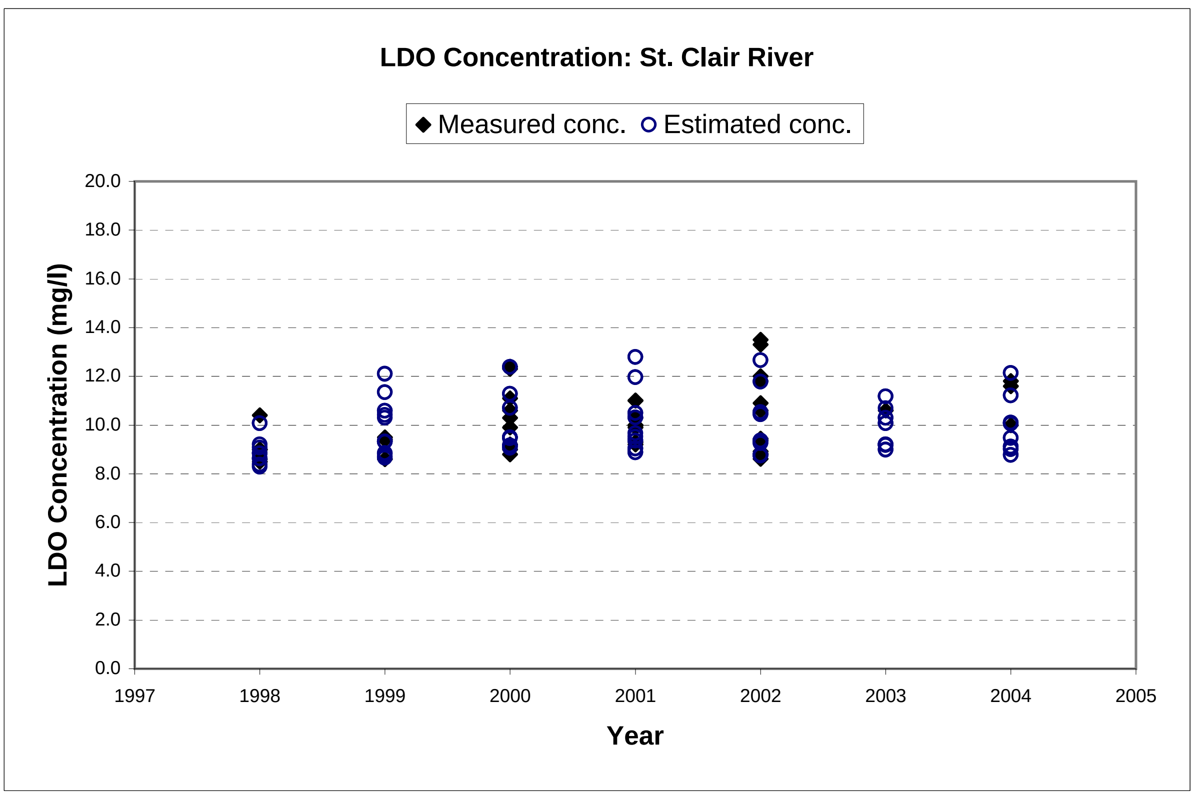

LCond Concentration: St. Clair River
Estimated Concentration (umho/cm)
Measured Concentration (umho/cm)
0
50
100
150
200
250

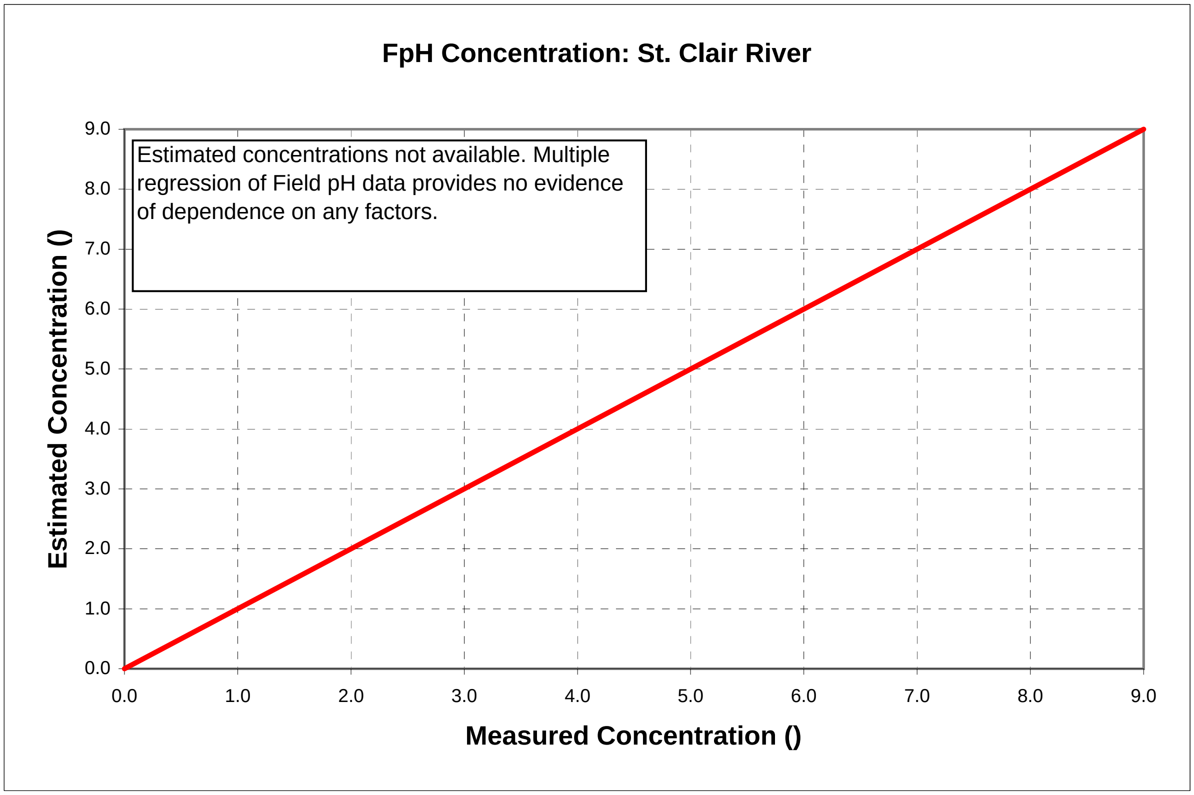

LCond Concentration: St. Clair River
Measured conc.
Estimated conc.
LCond Concentration (umho/cm)
Year
0
50
100
150
200
250
1997
1998
1999
2000
2001
2002
2003
2004
2005

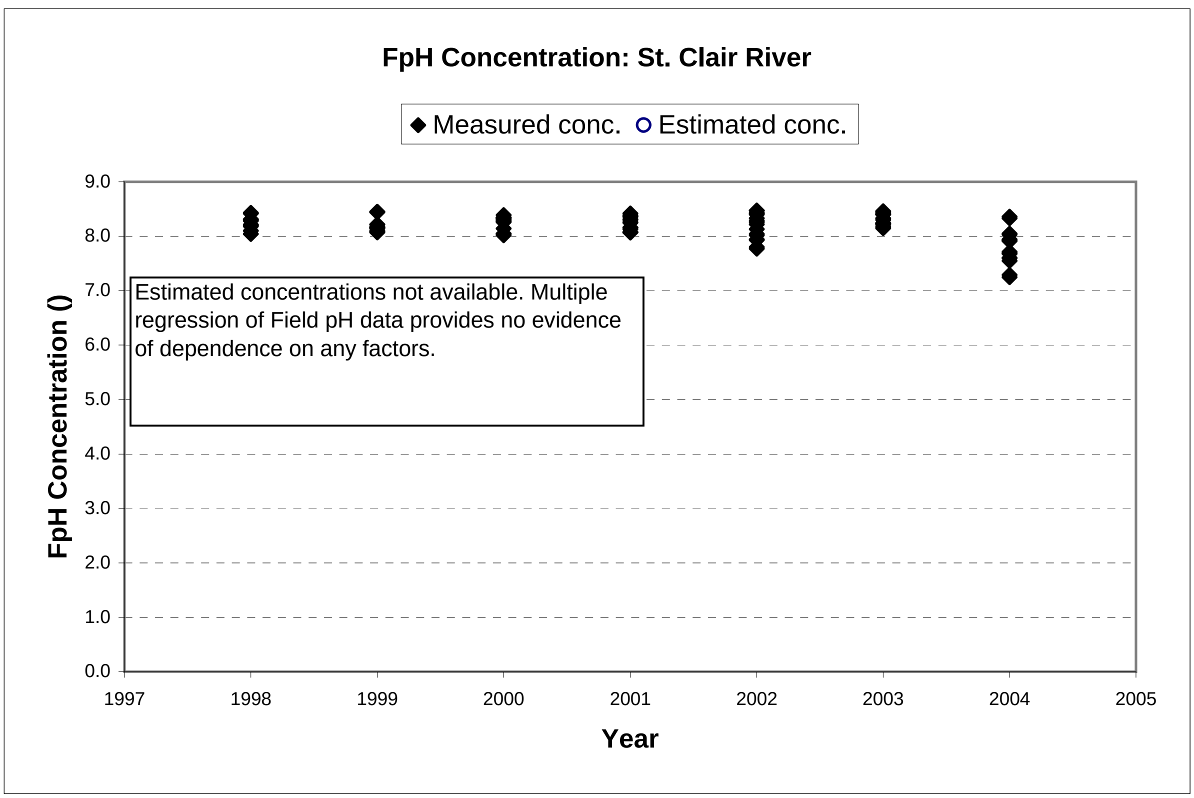

FDO Concentration: St. Clair River
Estimated Concentration (mg/l)
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
Measured Concentration (mg/l)

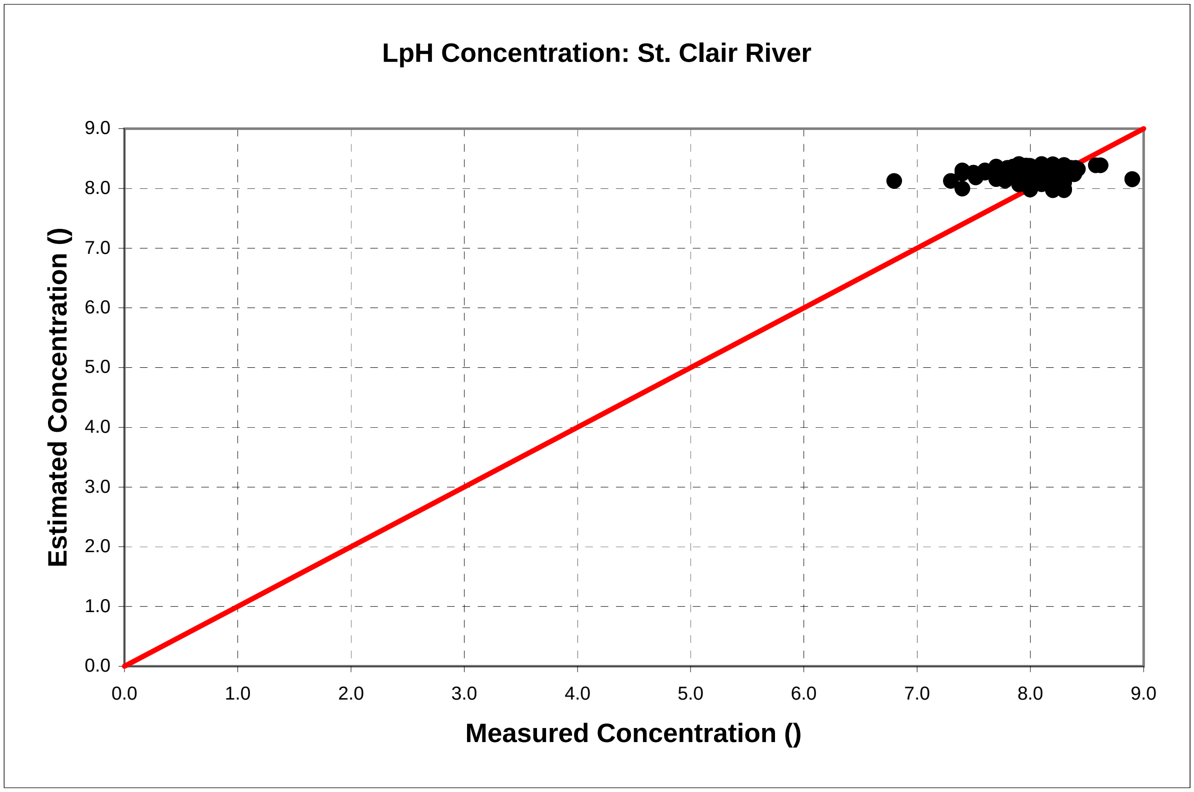

FDO Concentration: St. Clair River
Measured conc.
Estimated conc.
FDO Concentration (mg/l)
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
1997
1998
1999
2000
2001
2002
2003
2004
2005
Year


LDO Concentration: St. Clair River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0

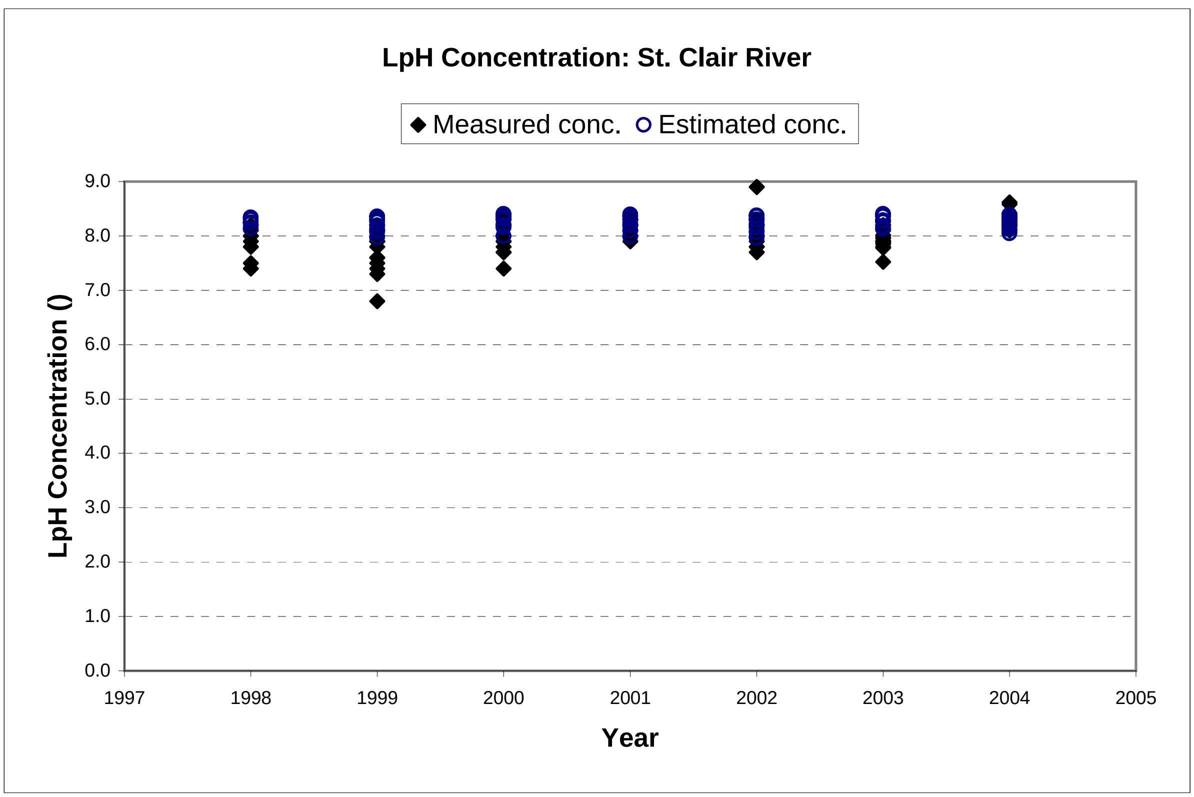

LDO Concentration: St. Clair River
Measured conc.
Estimated conc.
LDO Concentration (mg/l)
Year
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
1997
1998
1999
2000
2001
2002
2003
2004
2005


FpH Concentration: St. Clair River
Estimated concentrations not available. Multiple regression of Field pH data provides no evidence of dependence on any factors.
Estimated Concentration ()
Measured Concentration ()
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0

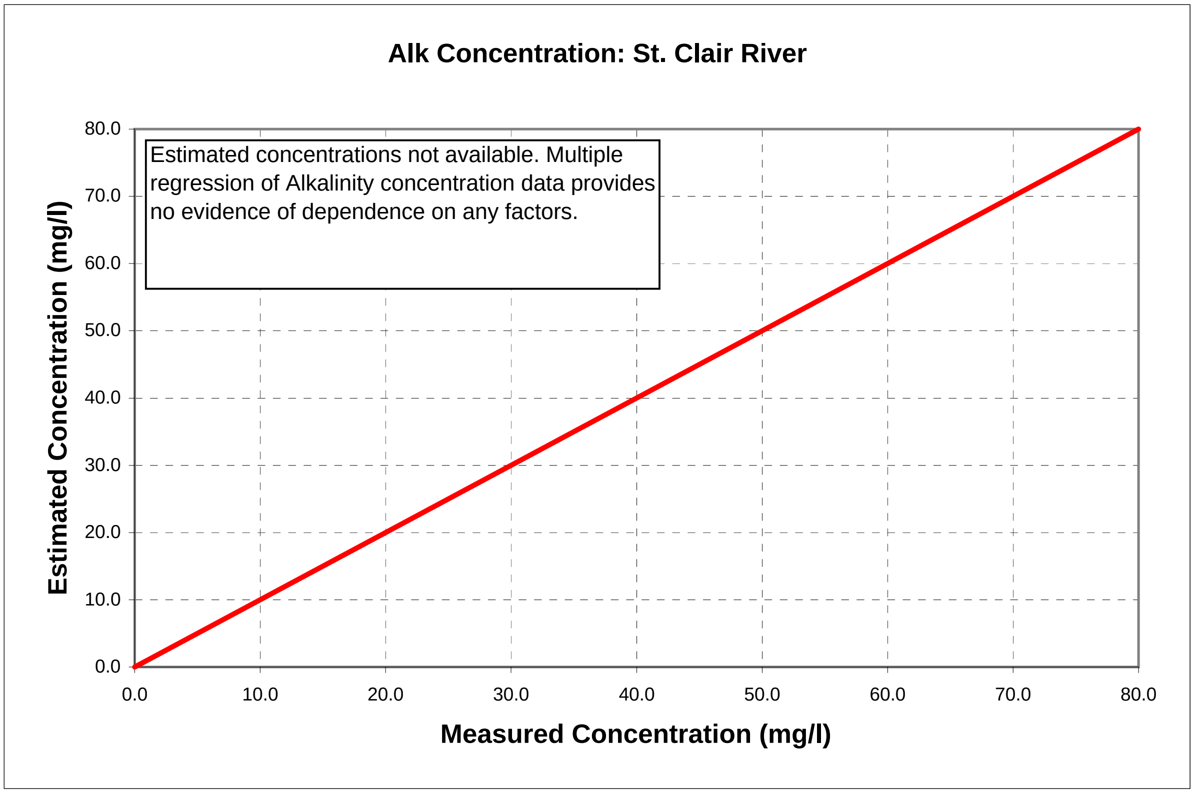

FpH Concentration: St. Clair River
Measured conc.
Estimated conc.
Estimated concentrations not available. Multiple regression of Field pH data provides no evidence of dependence on any factors.
FpH Concentration ()
Year
1997
1998
1999
2000
2001
2002
2003
2004
2005

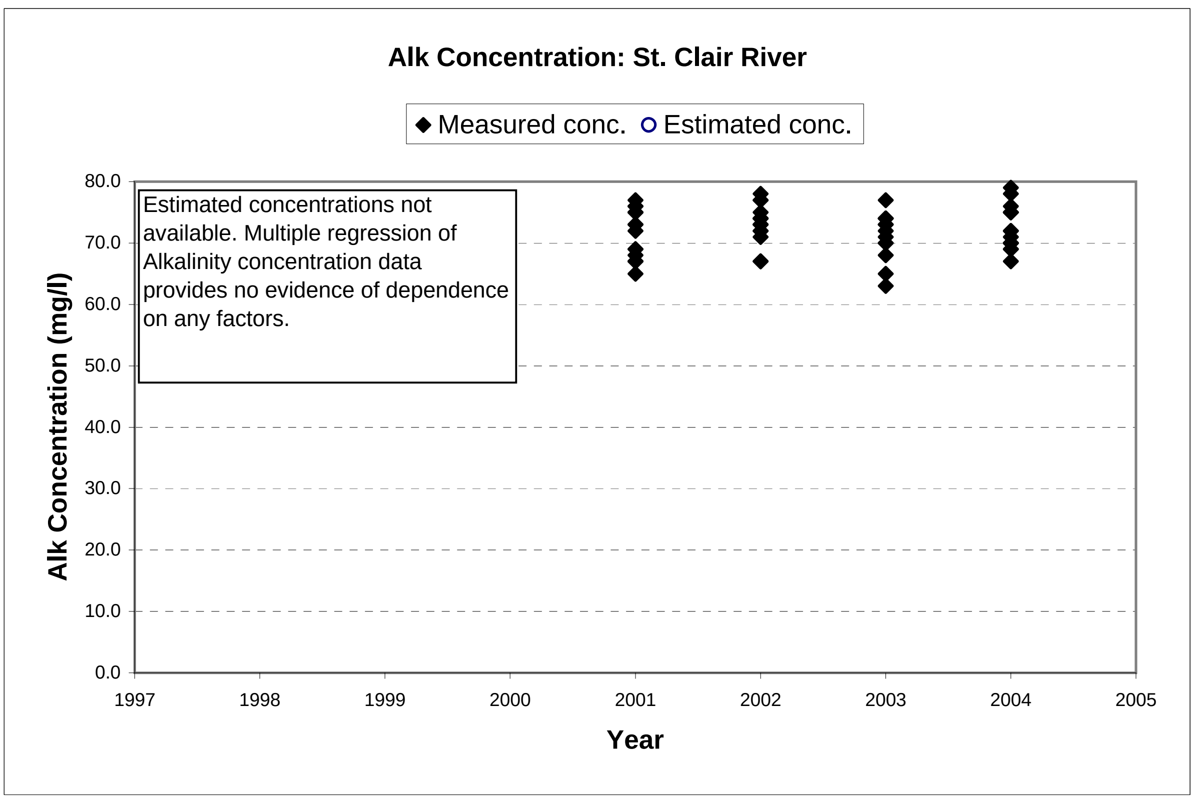


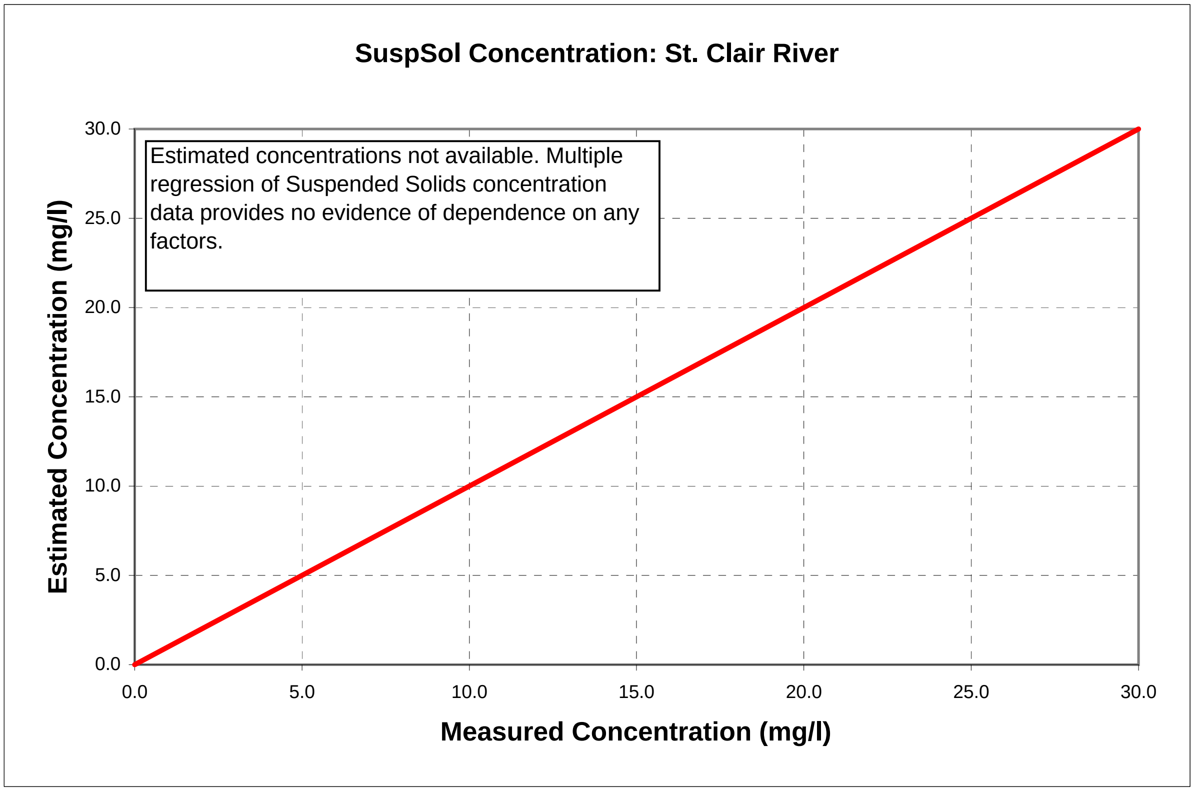
LpH Concentration: St. Clair River
Estimated Concentration ()
Measured Concentration ()
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0



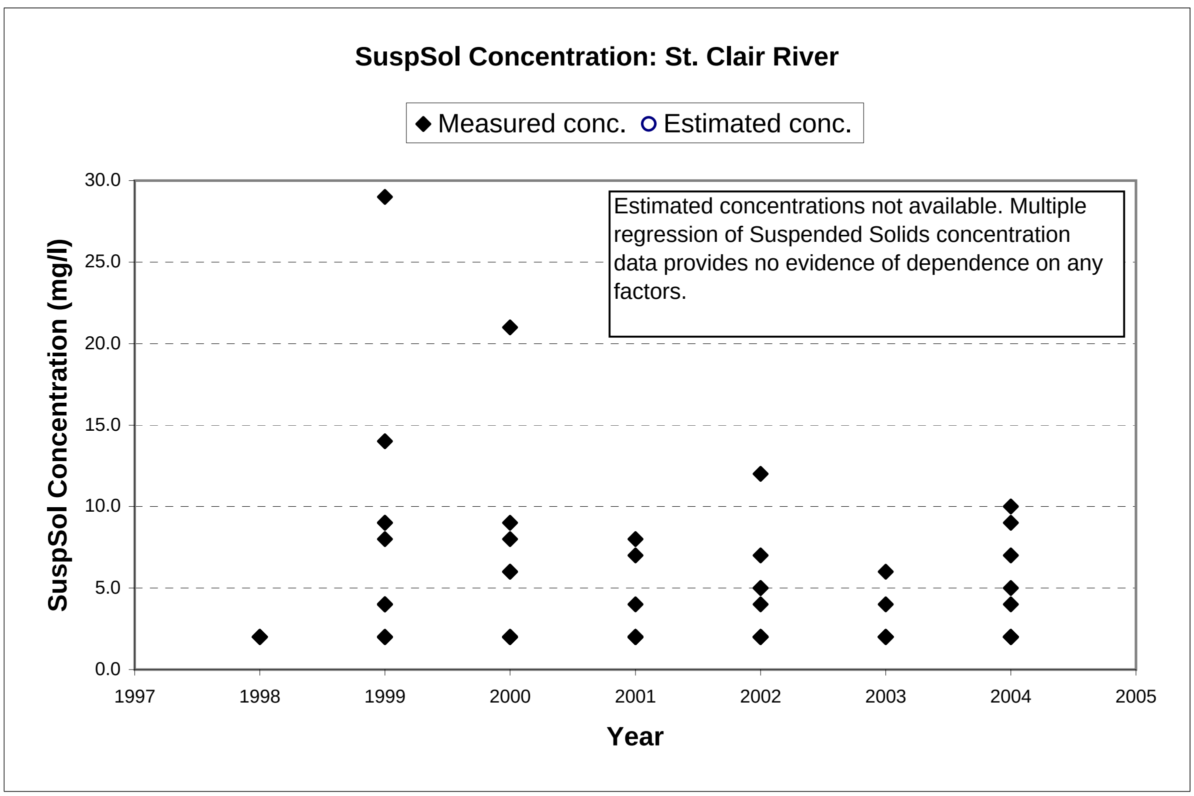
LpH Concentration: St. Clair River
Measured conc.
Estimated conc.
LpH Concentration ()
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
1997
1998
1999
2000
2001
2002
2003
2004
2005
Year


Alk Concentration: St. Clair River
Estimated concentrations not available. Multiple regression of Alkalinity concentration data provides no evidence of dependence on any factors.
Estimated Concentration (mg/l)
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
Measured Concentration (mg/l)

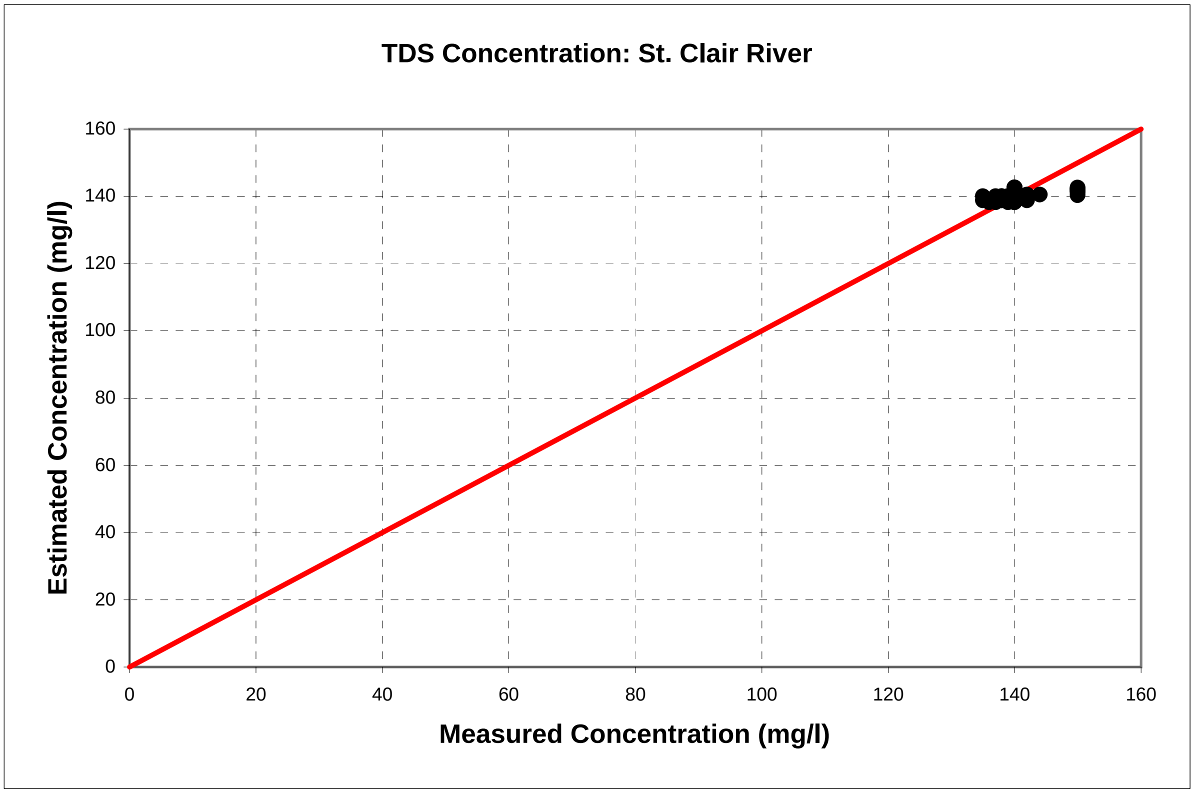

Alk Concentration: St. Clair River
Measured conc.
Estimated conc.
Estimated concentrations not available. Multiple regression of Alkalinity concentration data provides no evidence of dependence on any factors.
Alk Concentration (mg/l)
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
1997
1998
1999
2000
2001
2002
2003
2004
2005
Year

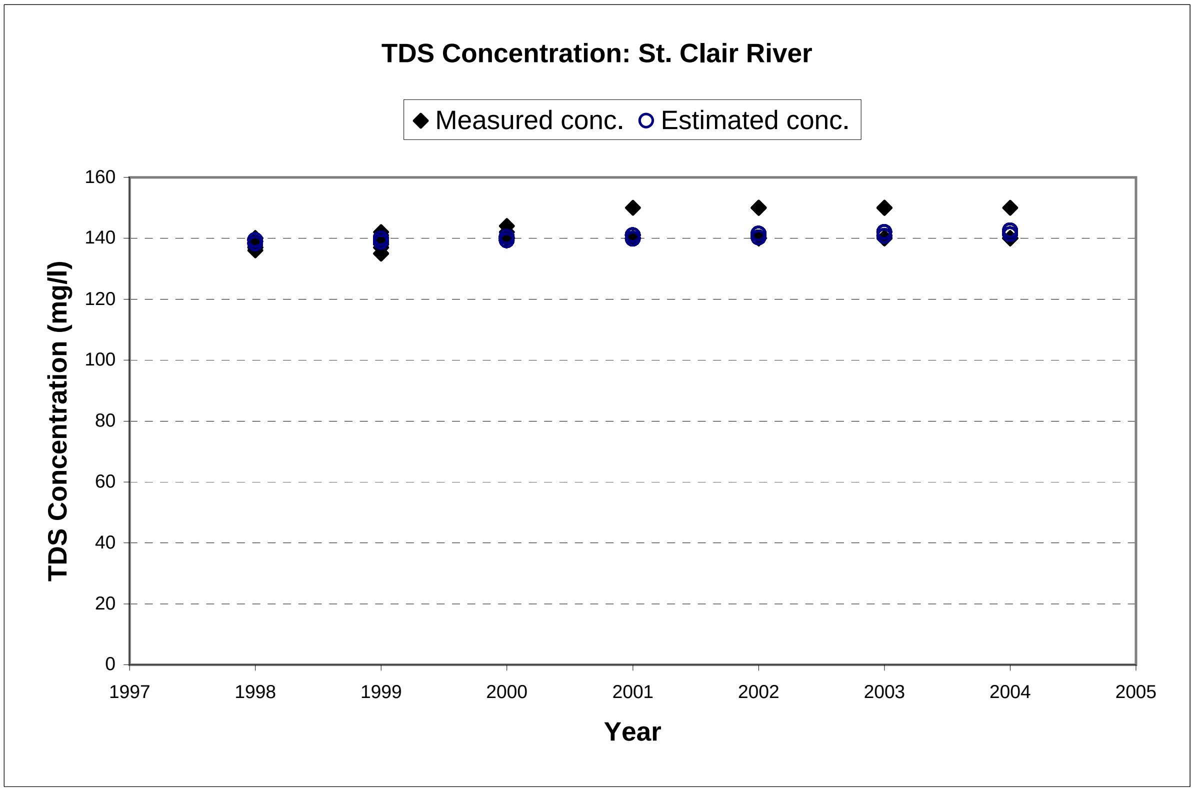


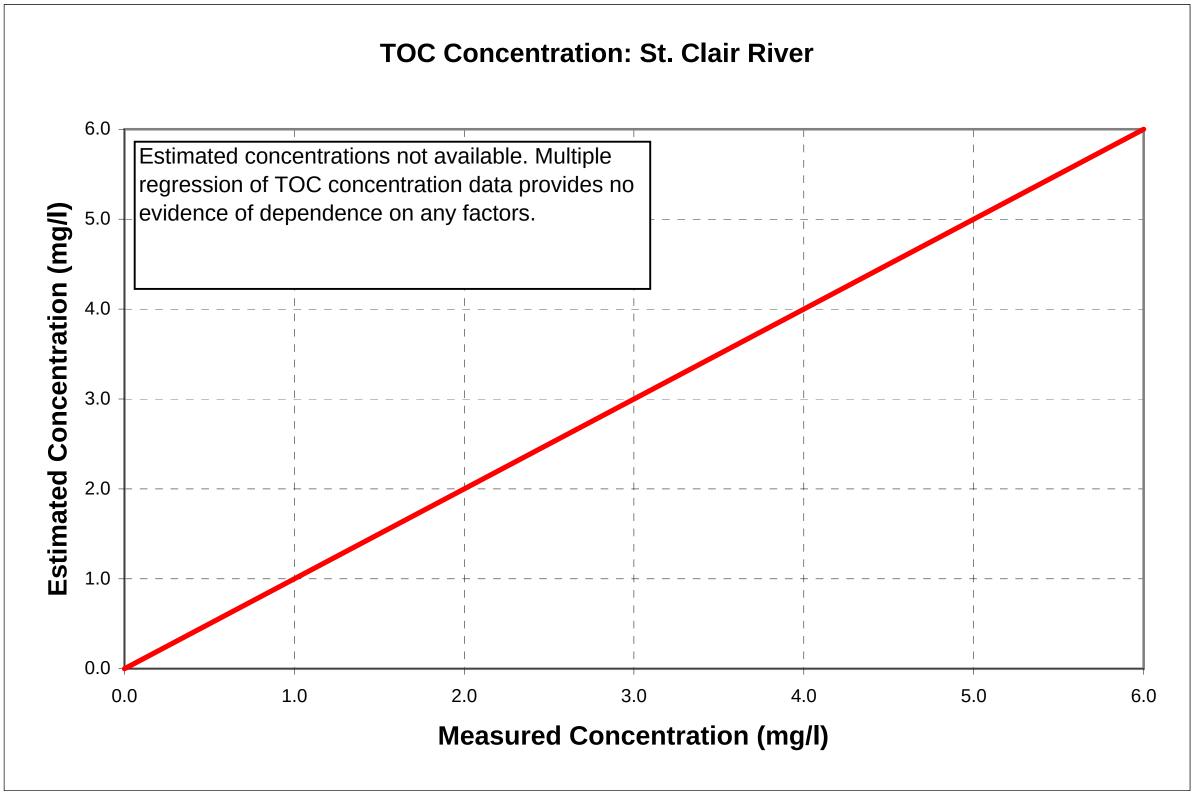
SuspSol Concentration: St. Clair River
Estimated concentrations not available. Multiple regression of Suspended Solids concentration data provides no evidence of dependence on any factors.
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
30.0
25.0
20.0
15.0
10.0
5.0
0.0



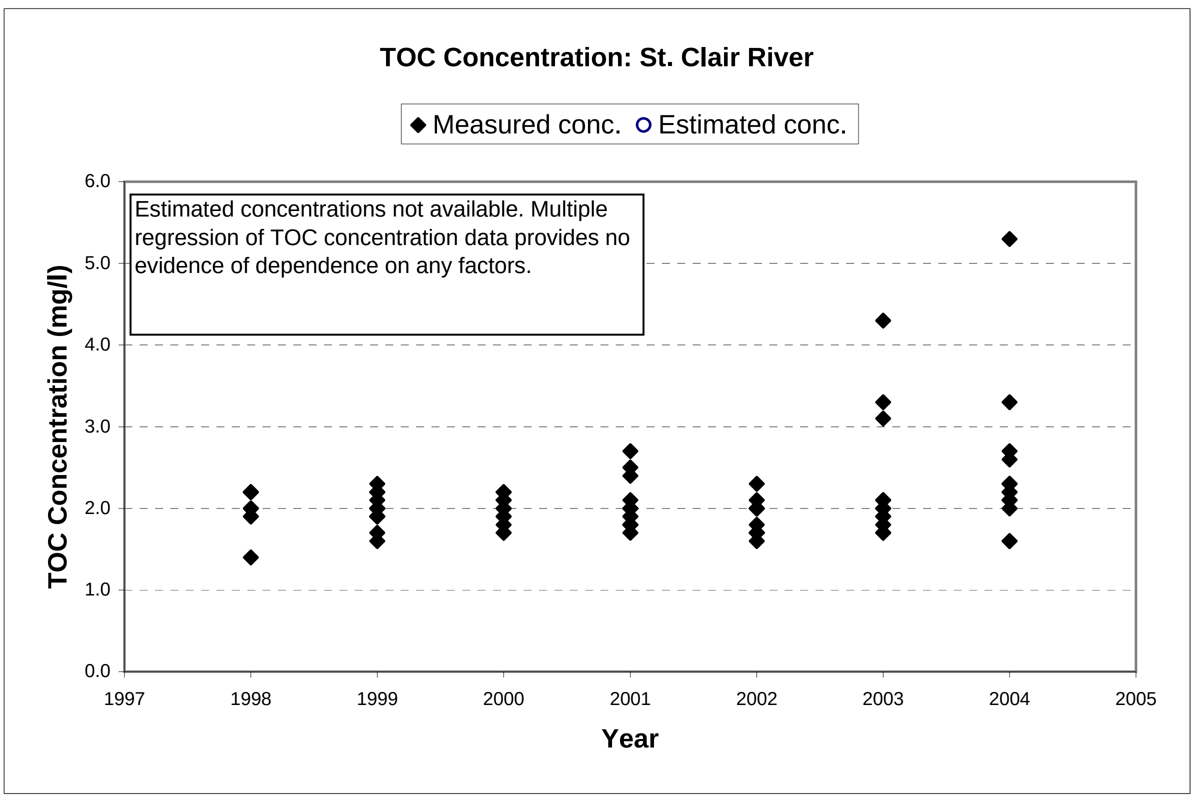
SuspSol Concentration: St. Clair River
Measured conc.
Estimated conc.
Estimated concentrations not available. Multiple regression of Suspended Solids concentration data provides no evidence of dependence on any factors.
SuspSol Concentration (mg/l)
Year
1997
1998
1999
2000
2001
2002
2003
2004
2005


TDS Concentration: St. Clair River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0
20
40
60
80
100
120
140
160

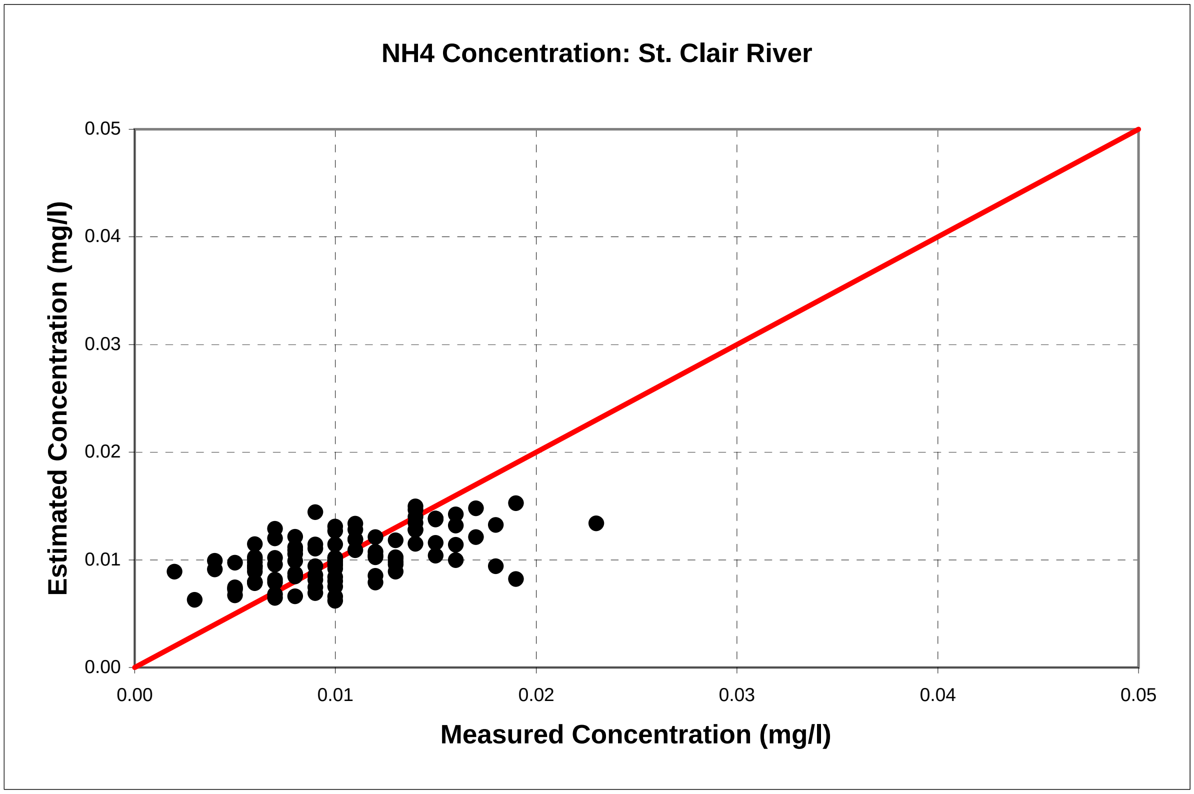

TDS Concentration: St. Clair River
Measured conc.
Estimated conc.
TDS Concentration (mg/l)
Year
0
20
40
60
80
100
120
140
160
1997
1998
1999
2000
2001
2002
2003
2004
2005

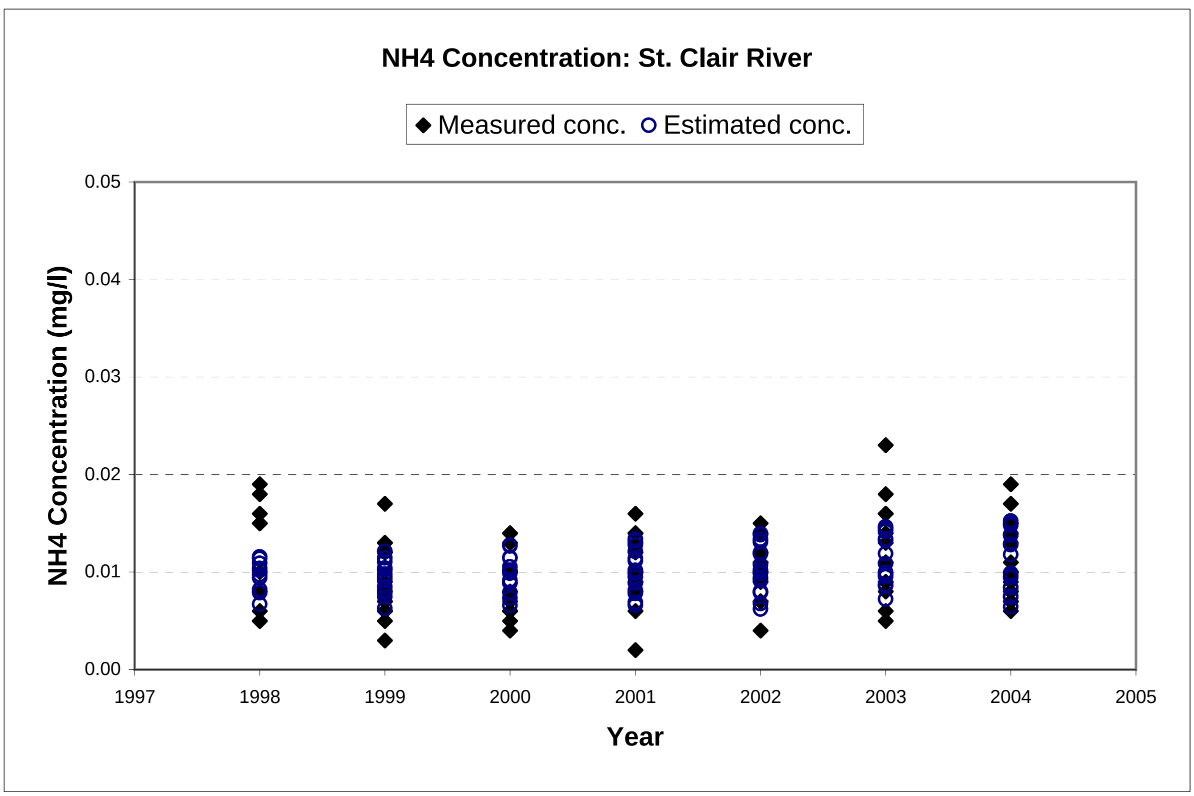


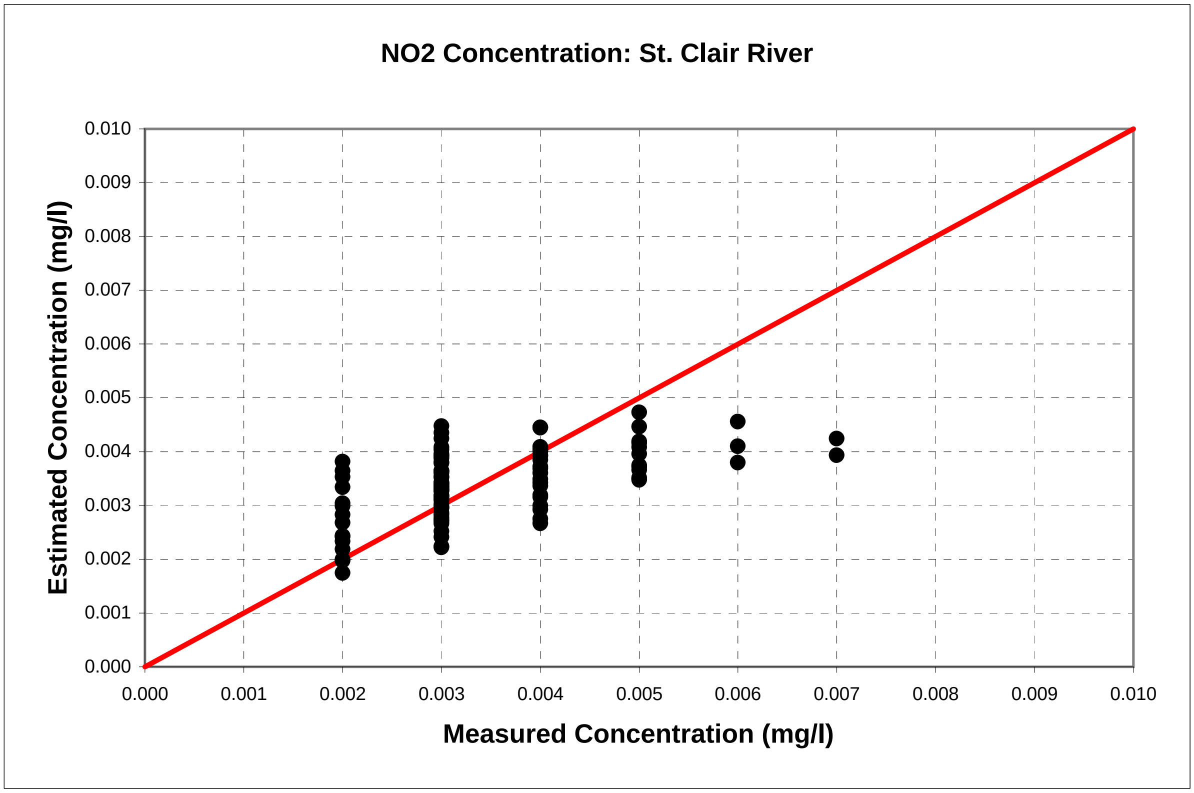
TOC Concentration: St. Clair River
Estimated concentrations not available. Multiple regression of TOC concentration data provides no evidence of dependence on any factors.
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.0
1.0
2.0
3.0
4.0
5.0
6.0

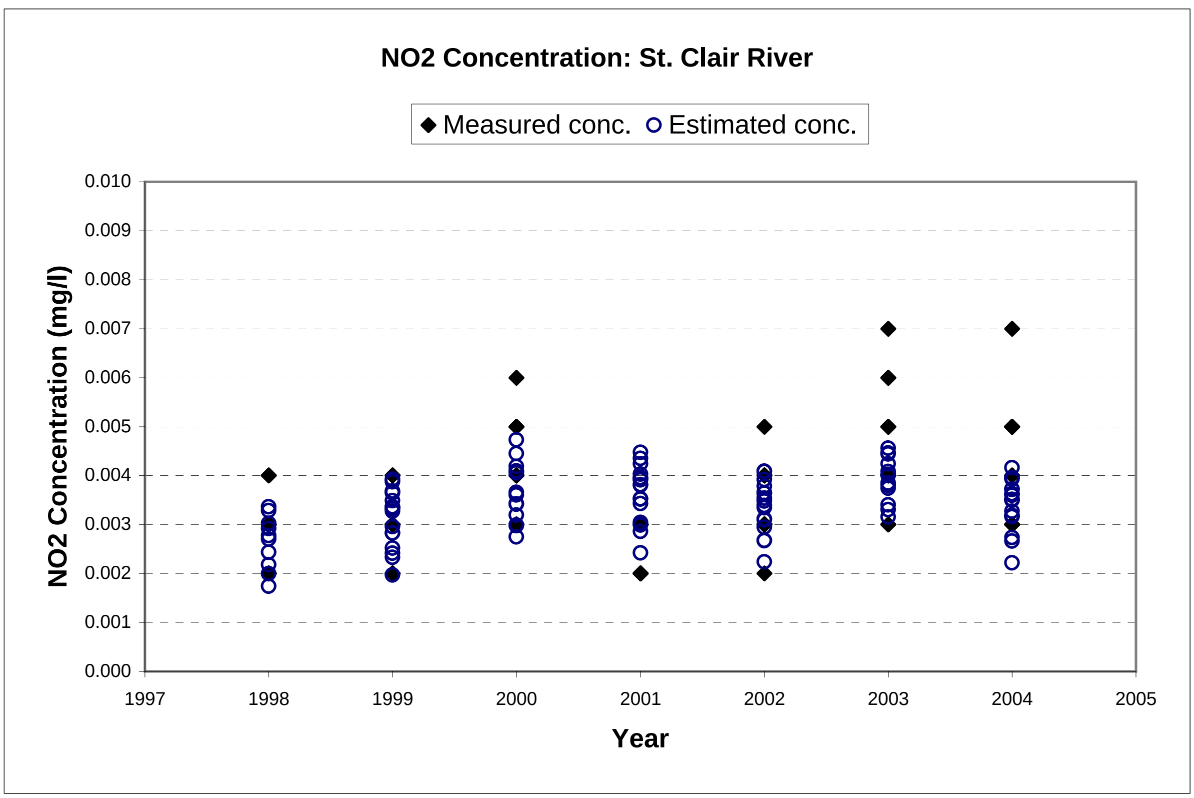


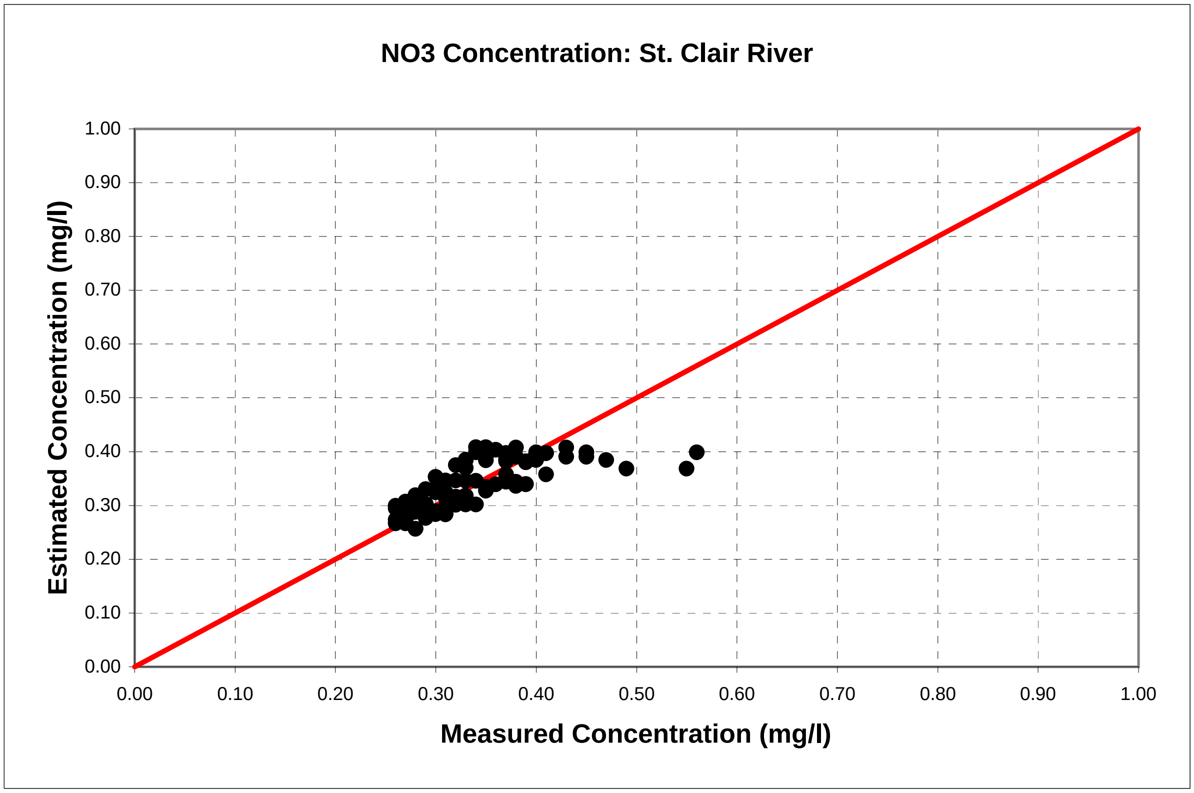
TOC Concentration: St. Clair River
Measured conc.
Estimated conc.
Estimated concentrations not available. Multiple regression of TOC concentration data provides no evidence of dependence on any factors.
TOC Concentration (mg/l)
Year
1997
1998
1999
2000
2001
2002
2003
2004
2005

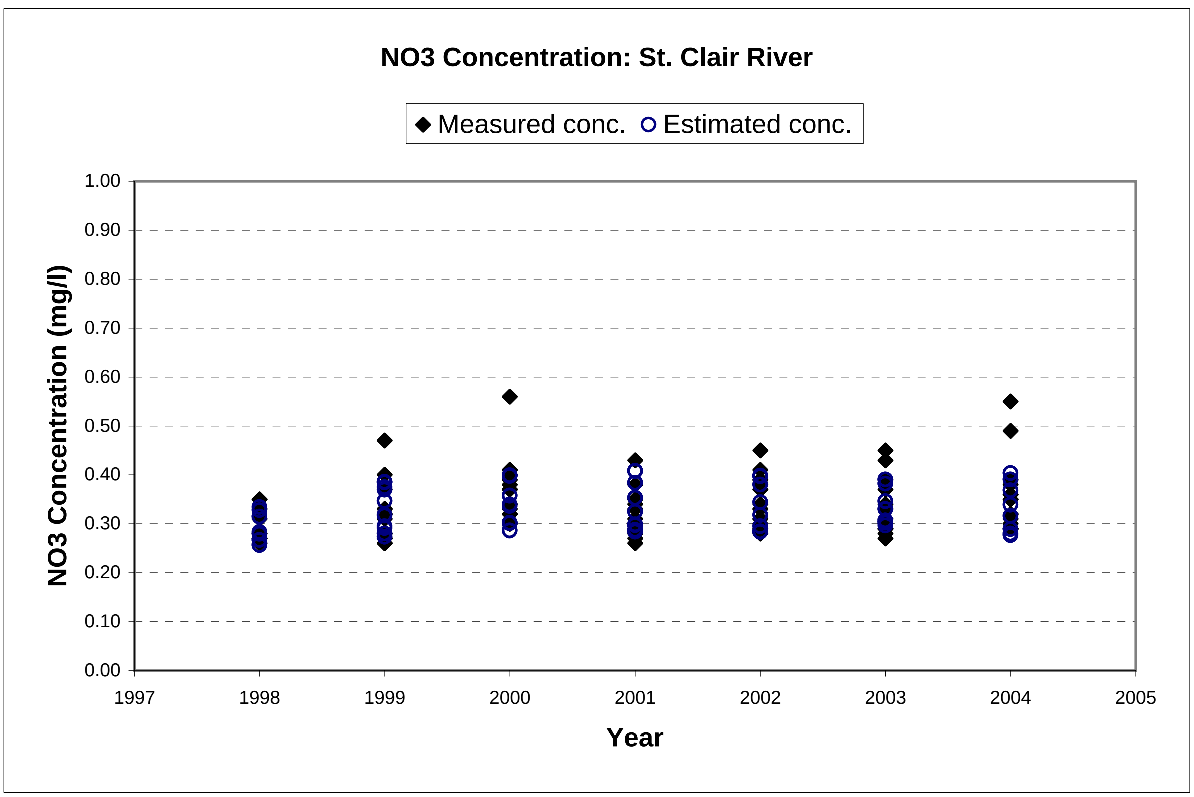

NH4 Concentration: St. Clair River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.00
0.01
0.02
0.03
0.04
0.05

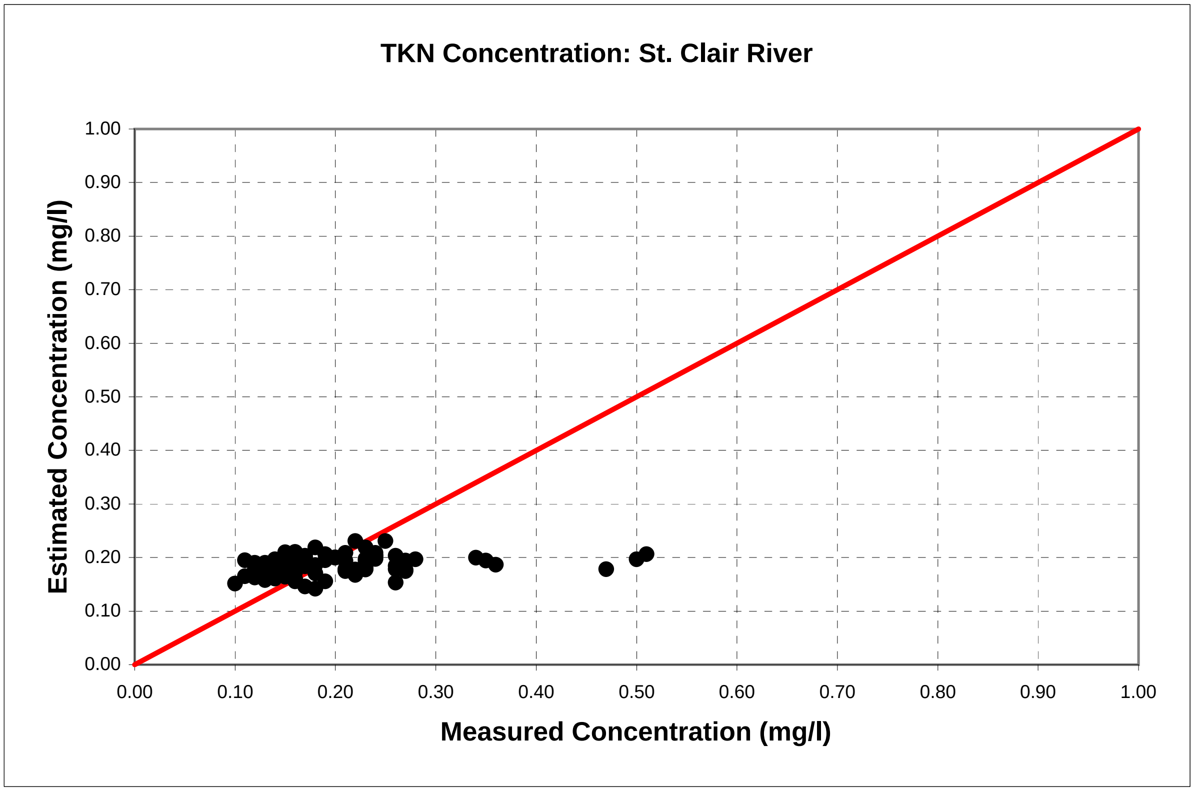

NH4 Concentration: St. Clair River
Measured conc.
Estimated conc.
NH4 Concentration (mg/l)
Year
0.00
0.01
0.02
0.03
0.04
0.05
1997
1998
1999
2000
2001
2002
2003
2004
2005


NO2 Concentration: St. Clair River
Estimated Concentration (mg/l)
0.010
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0.000
0.000
0.001
0.002
0.003
0.004
0.005
0.006
0.007
0.008
0.009
0.010
Measured Concentration (mg/l)

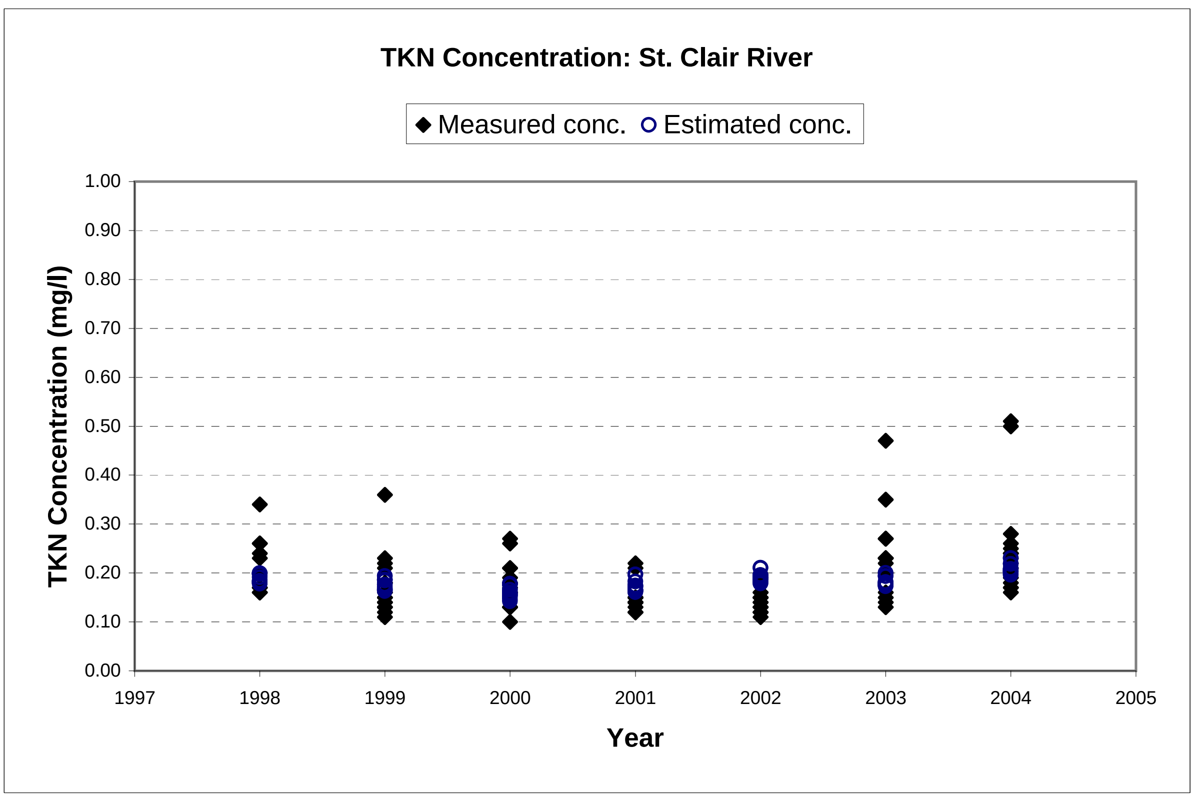

NO2 Concentration: St. Clair River
Measured conc.
Estimated conc.
NO2 Concentration (mg/l)
0.010
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0.000
1997
1998
1999
2000
2001
2002
2003
2004
2005
Year


NO3 Concentration: St. Clair River
Estimated Concentration (mg/l)
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
1.00
Measured Concentration (mg/l)

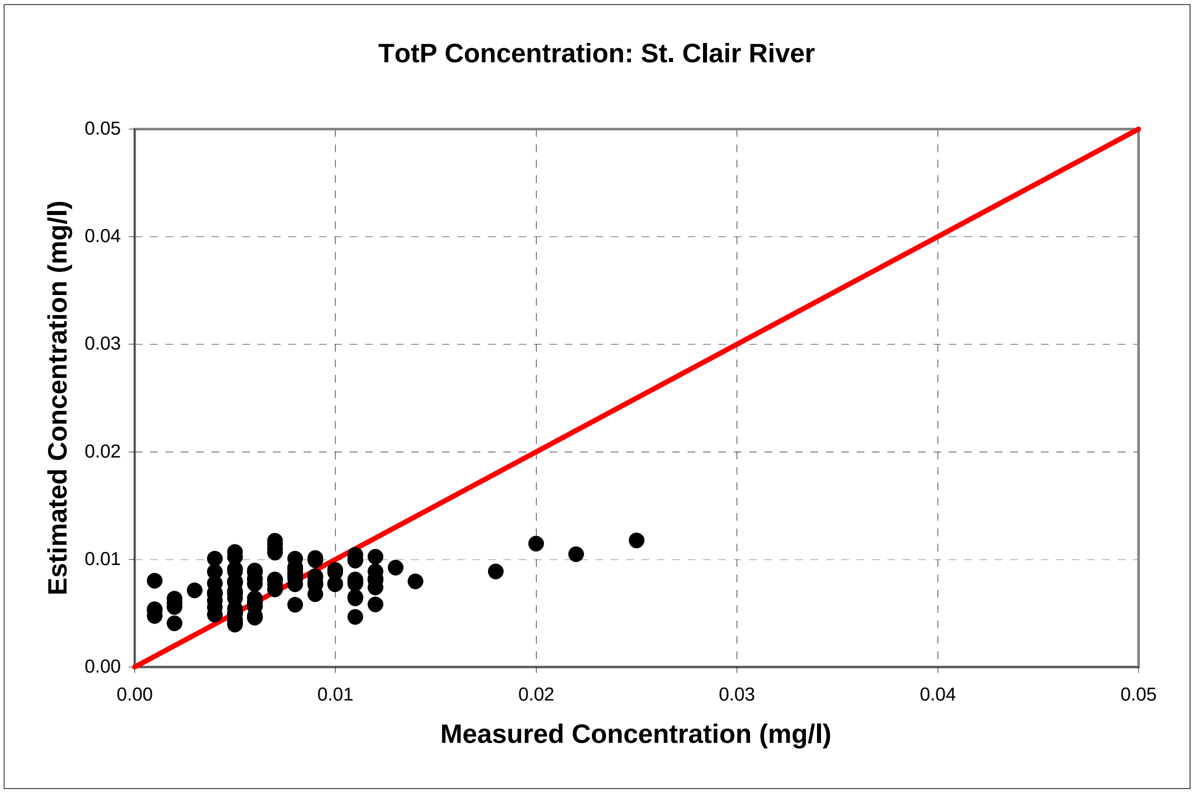

NO3 Concentration: St. Clair River
Measured conc.
Estimated conc.
NO3 Concentration (mg/l)
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
1997
1998
1999
2000
2001
2002
2003
2004
2005
Year



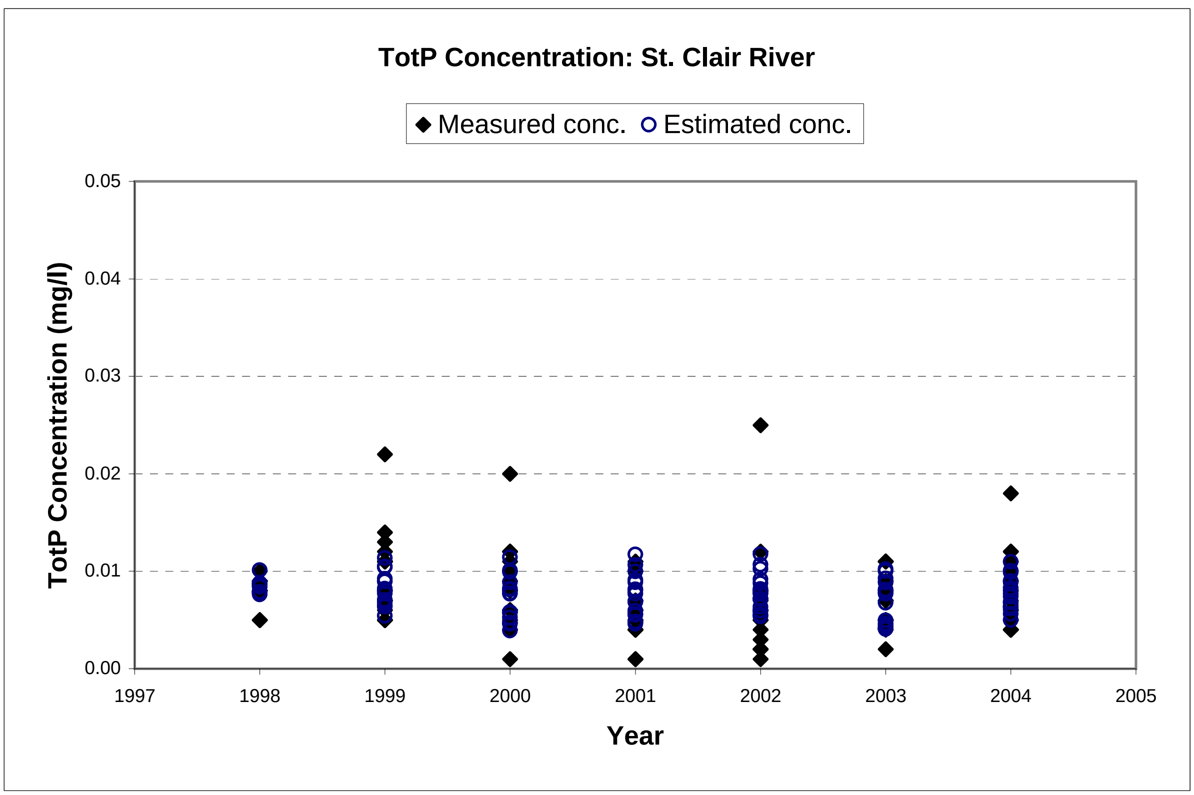
TKN Concentration: St. Clair River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
1.00



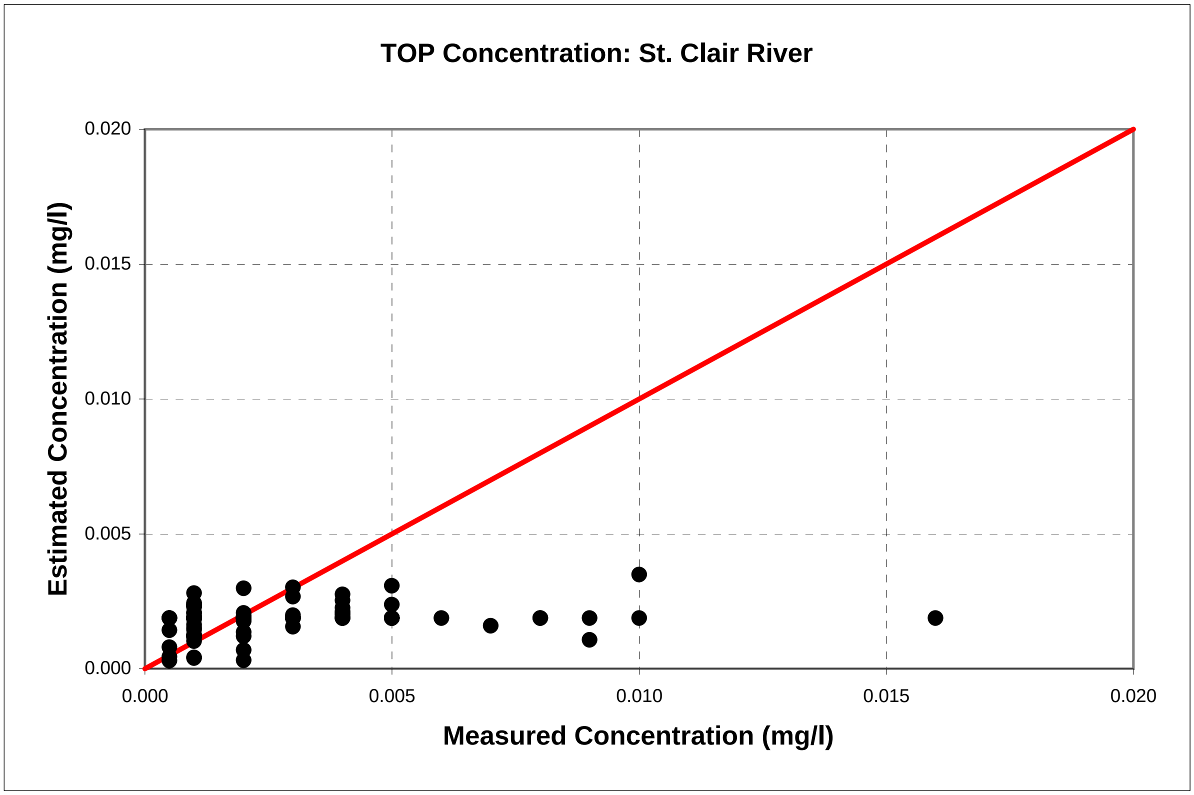
TKN Concentration: St. Clair River
Measured conc.
Estimated conc.
TKN Concentration (mg/l)
Year
1997
1998
1999
2000
2001
2002
2003
2004
2005

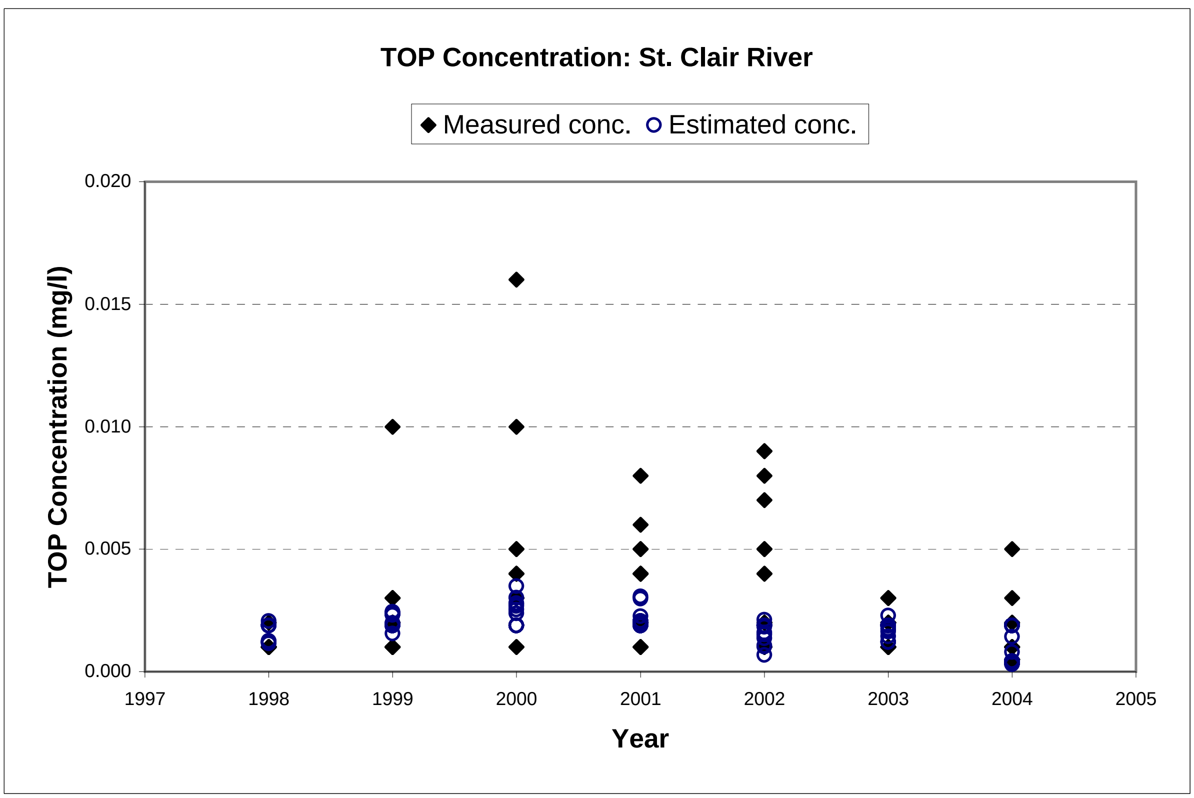


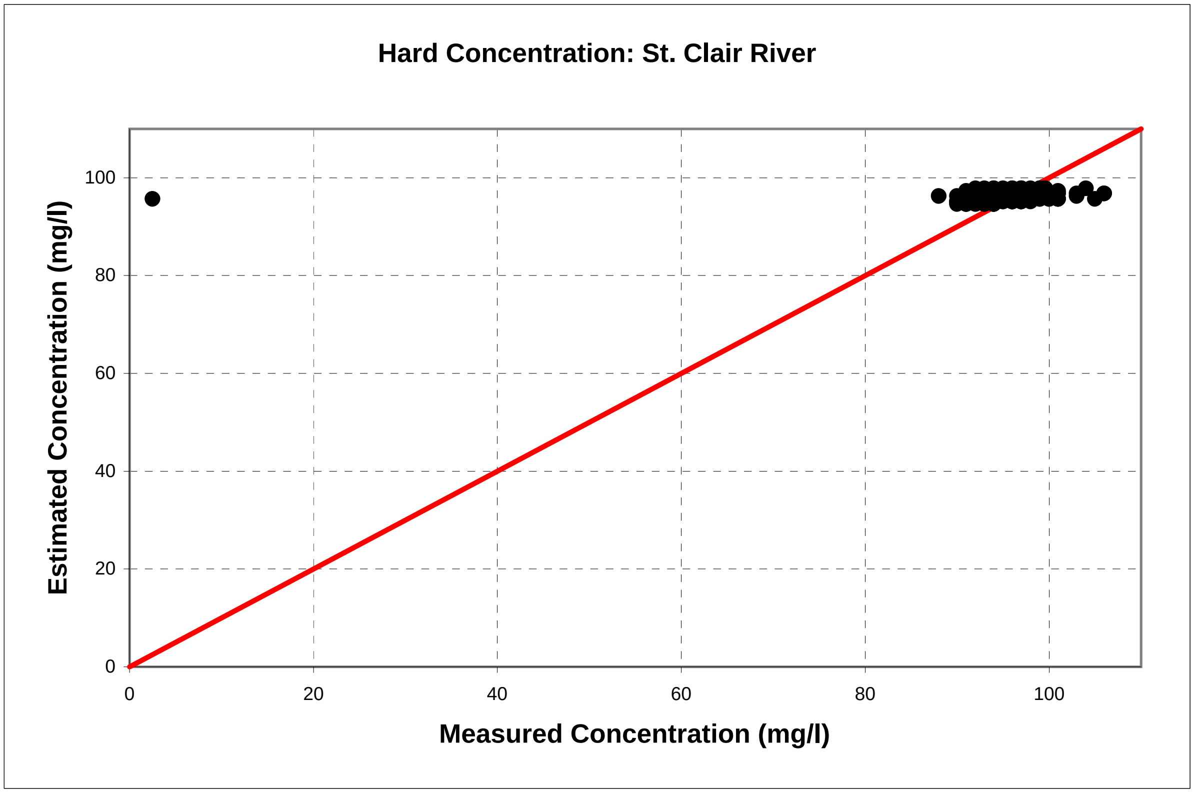
TotP Concentration: St. Clair River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.00
0.01
0.02
0.03
0.04
0.05

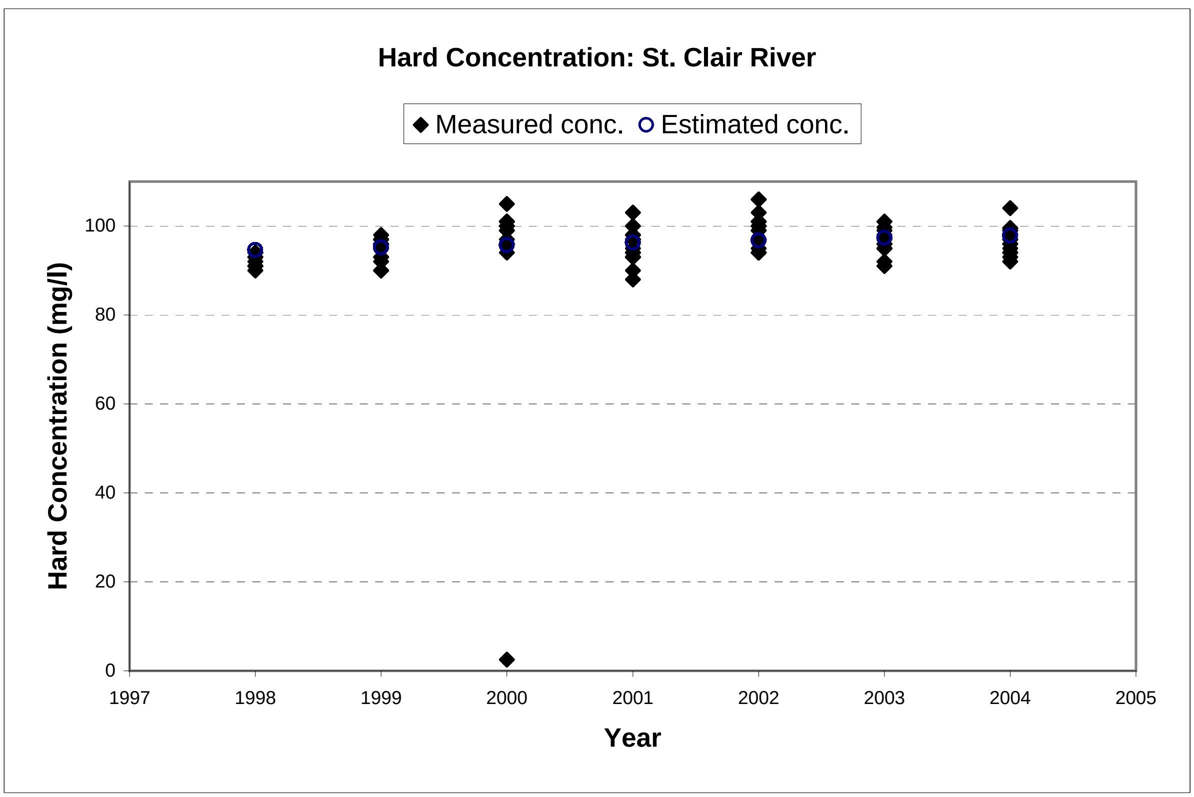


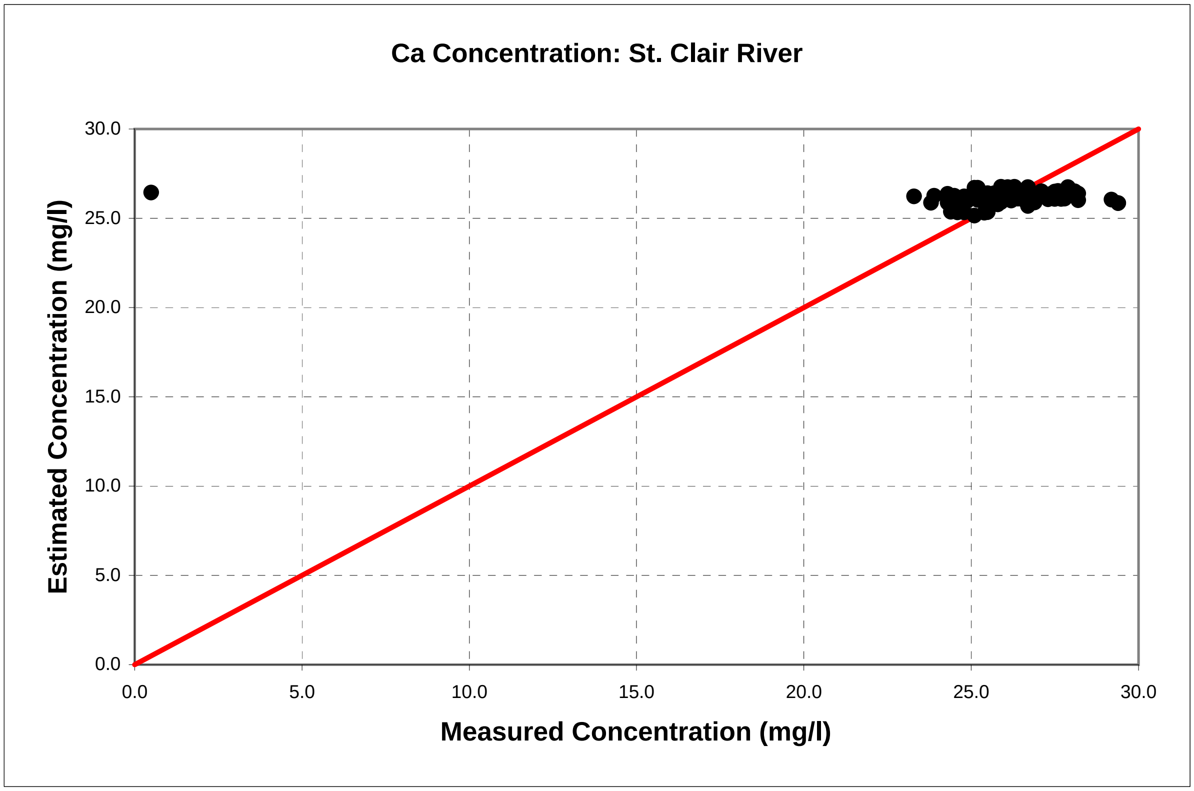
TotP Concentration: St. Clair River
Measured conc.
Estimated conc.
TotP Concentration (mg/l)
Year
0.00
0.01
0.02
0.03
0.04
0.05
1997
1998
1999
2000
2001
2002
2003
2004
2005

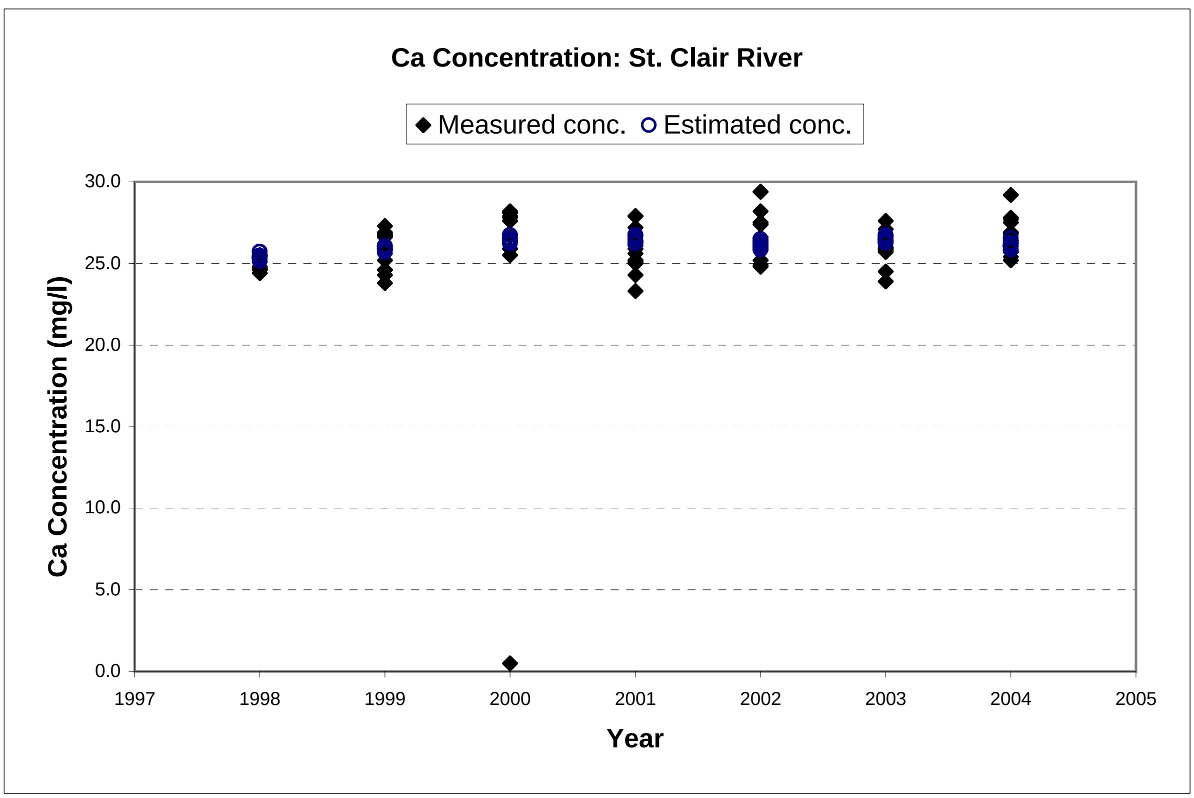

TOP Concentration: St. Clair River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.000
0.005
0.010
0.015
0.020

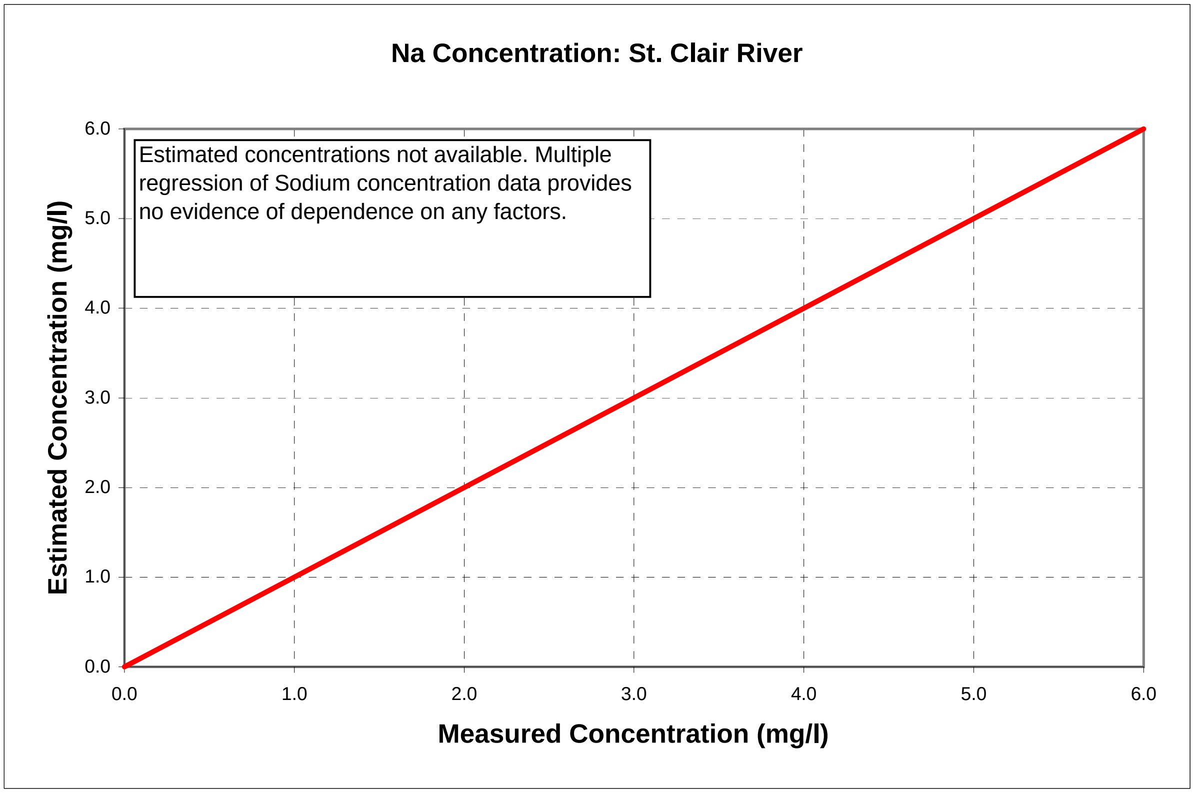

TOP Concentration: St. Clair River
Measured conc.
Estimated conc.
TOP Concentration (mg/l)
Year
0.000
0.005
0.010
0.015
0.020
1997
1998
1999
2000
2001
2002
2003
2004
2005

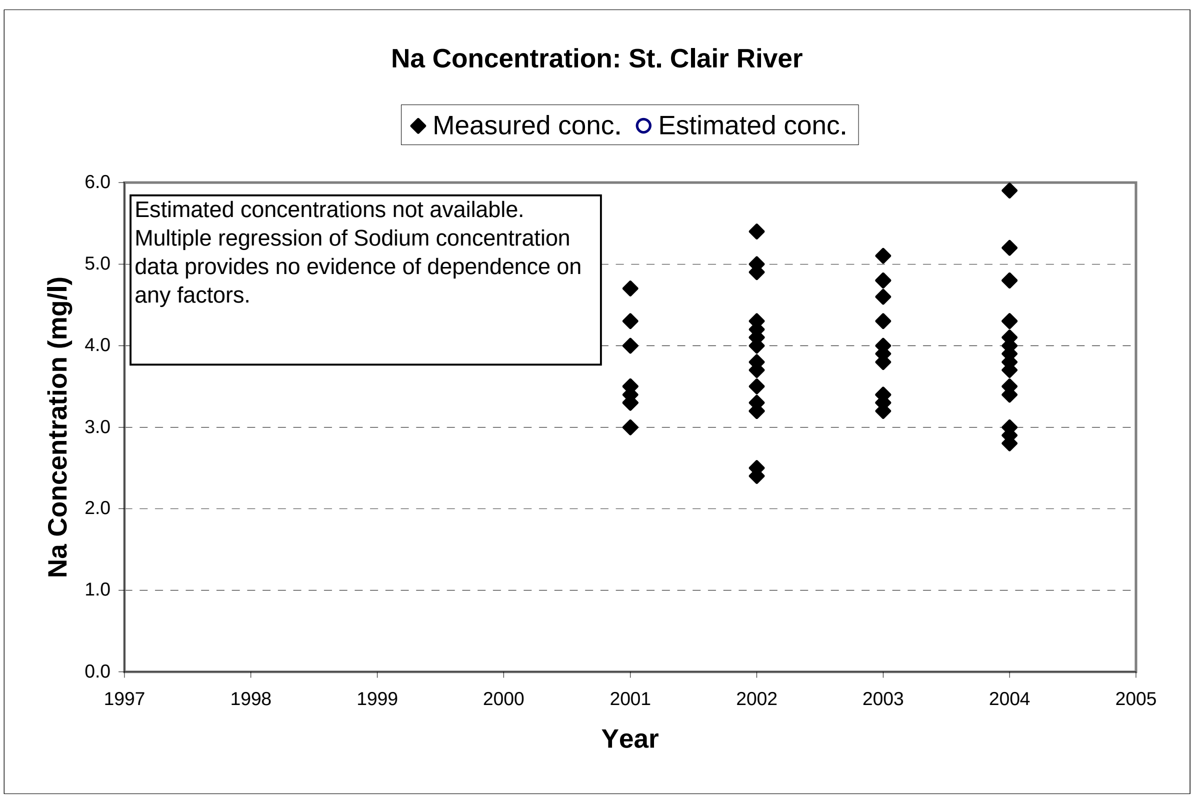

Hard Concentration: St. Clair River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0
20
40
60
80
100

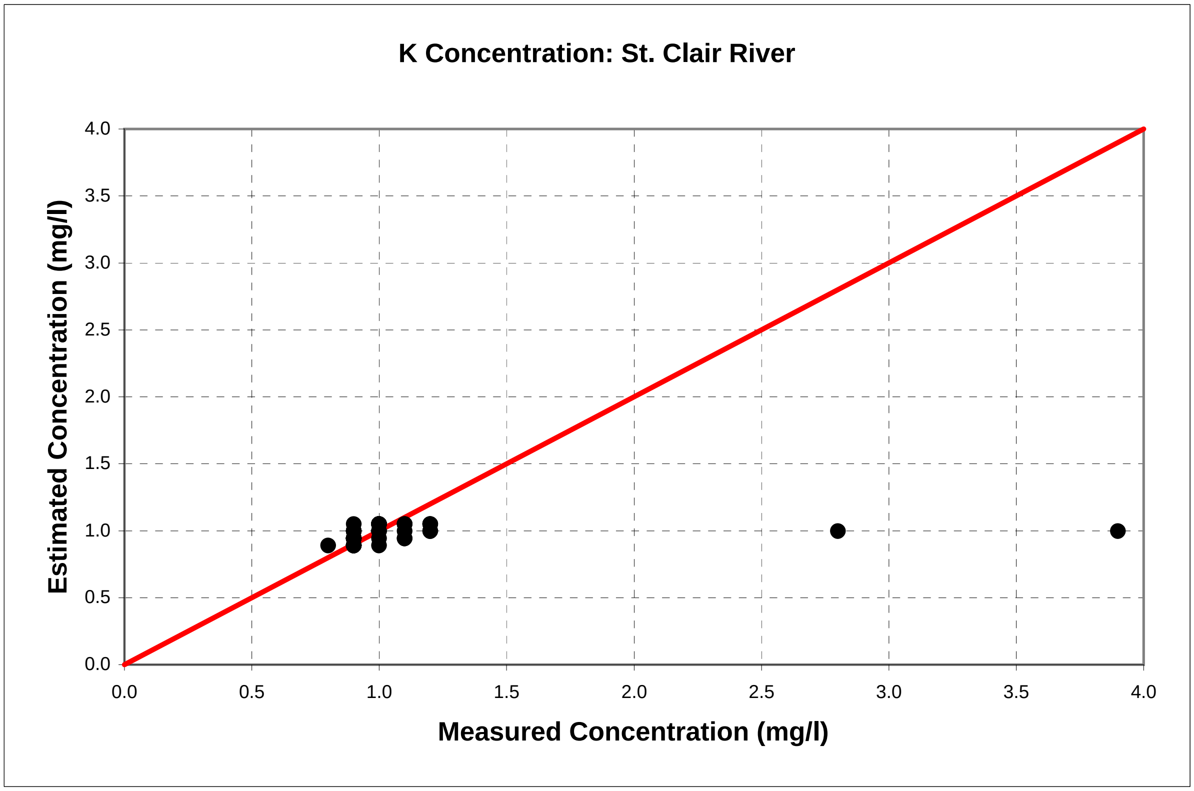

Hard Concentration: St. Clair River
Measured conc.
Estimated conc.
Hard Concentration (mg/l)
Year
0
20
40
60
80
100
1997
1998
1999
2000
2001
2002
2003
2004
2005

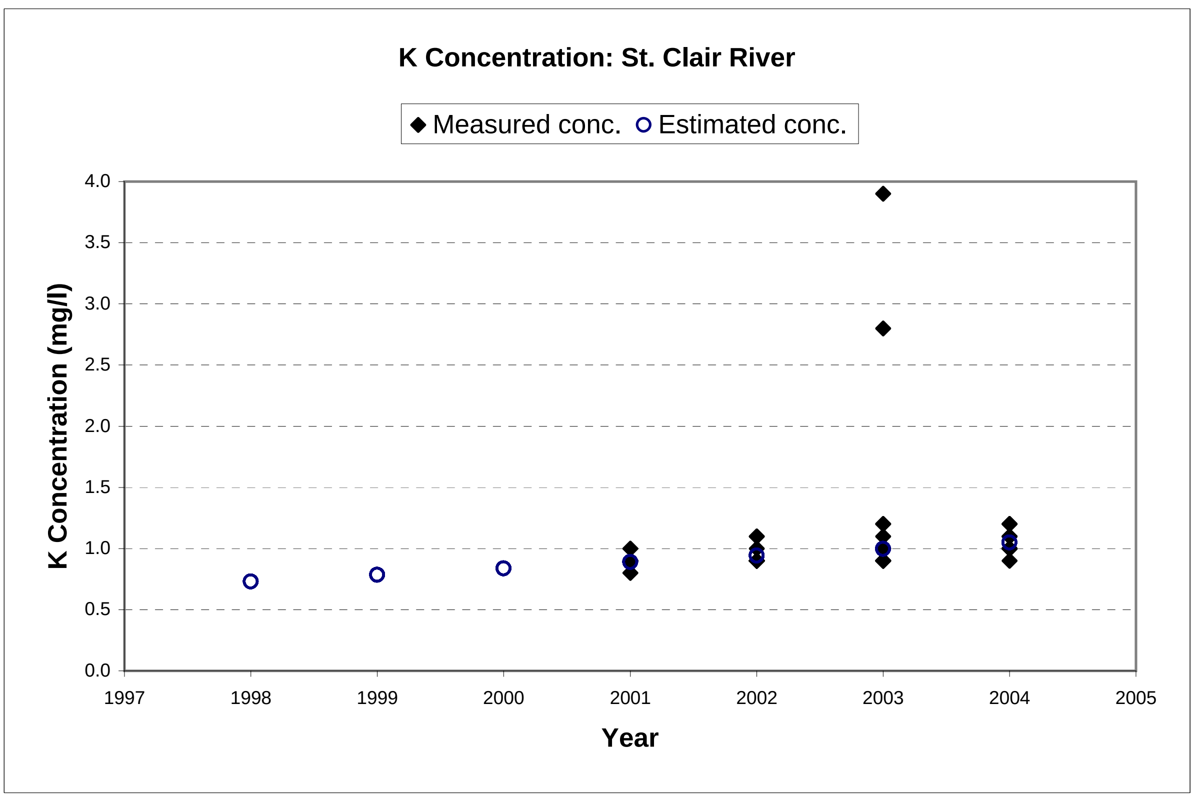

Ca Concentration: St. Clair River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.0
5.0
10.0
15.0
20.0
25.0
30.0

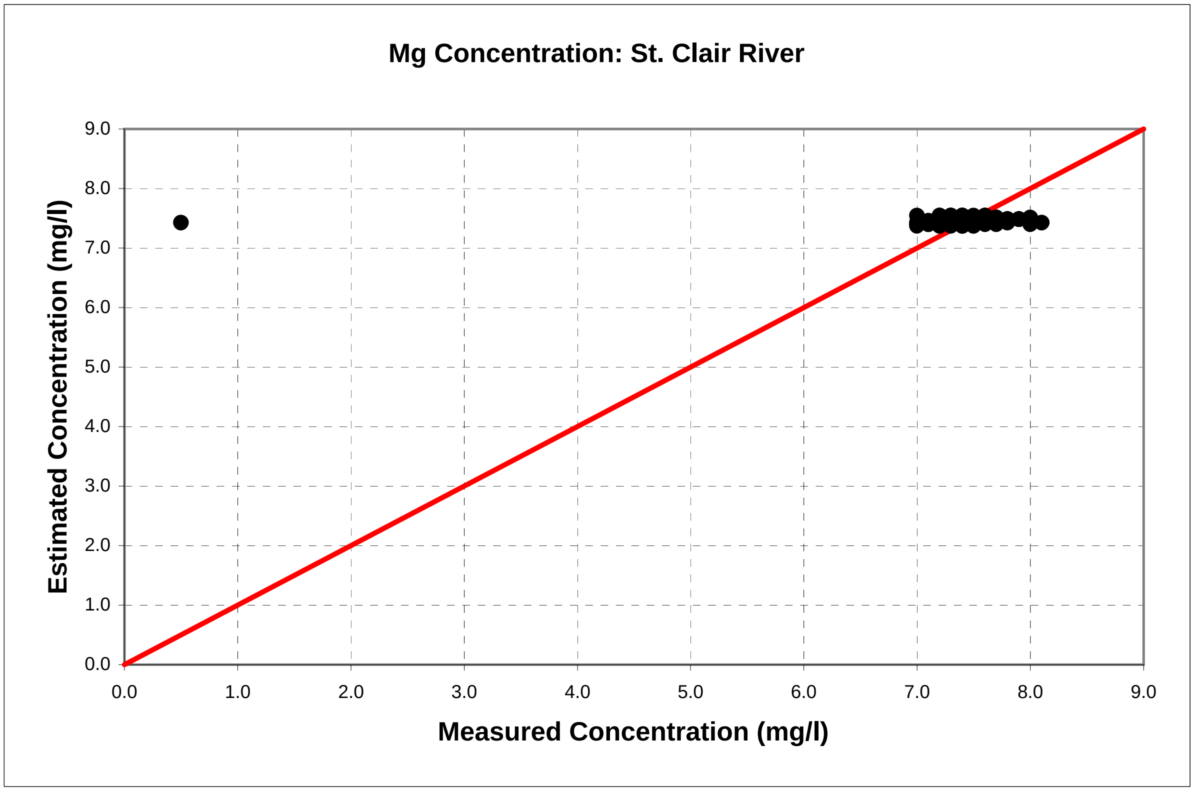

Ca Concentration: St. Clair River
Measured conc.
Estimated conc.
Ca Concentration (mg/l)
Year
0.0
5.0
10.0
15.0
20.0
25.0
30.0
1997
1998
1999
2000
2001
2002
2003
2004
2005

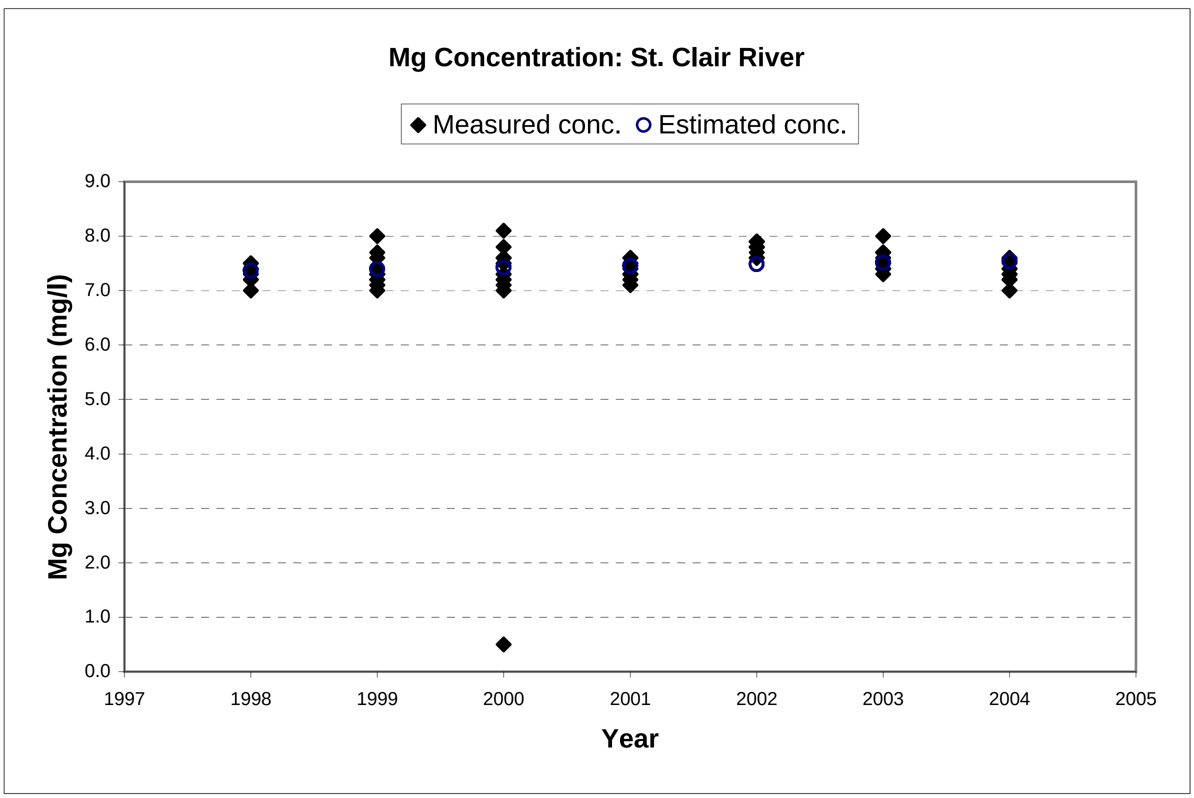

Na Concentration: St. Clair River
Estimated concentrations not available. Multiple regression of Sodium concentration data provides no evidence of dependence on any factors.
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.0
1.0
2.0
3.0
4.0
5.0
6.0

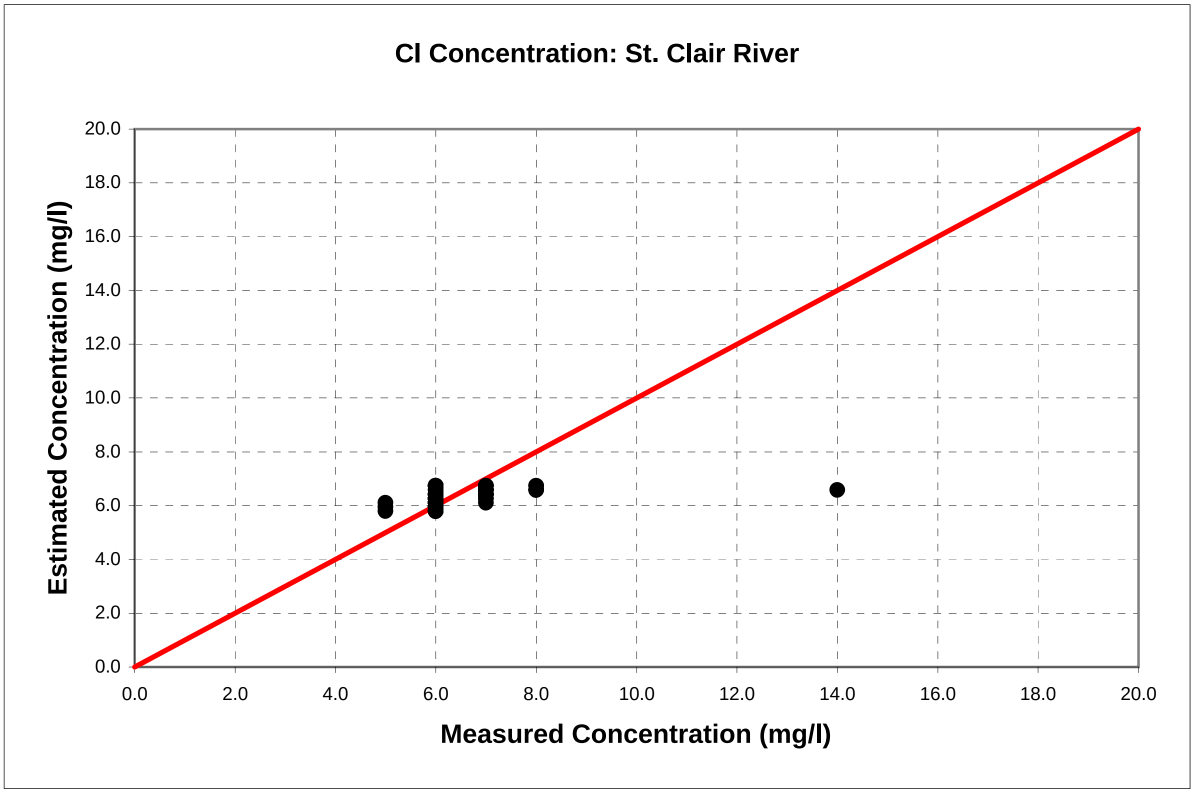

Na Concentration: St. Clair River
Measured conc.
Estimated conc.
Estimated concentrations not available. Multiple regression of Sodium concentration data provides no evidence of dependence on any factors.
Na Concentration (mg/l)
Year
0.0
1.0
2.0
3.0
4.0
5.0
6.0
1997
1998
1999
2000
2001
2002
2003
2004
2005


K Concentration: St. Clair River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0

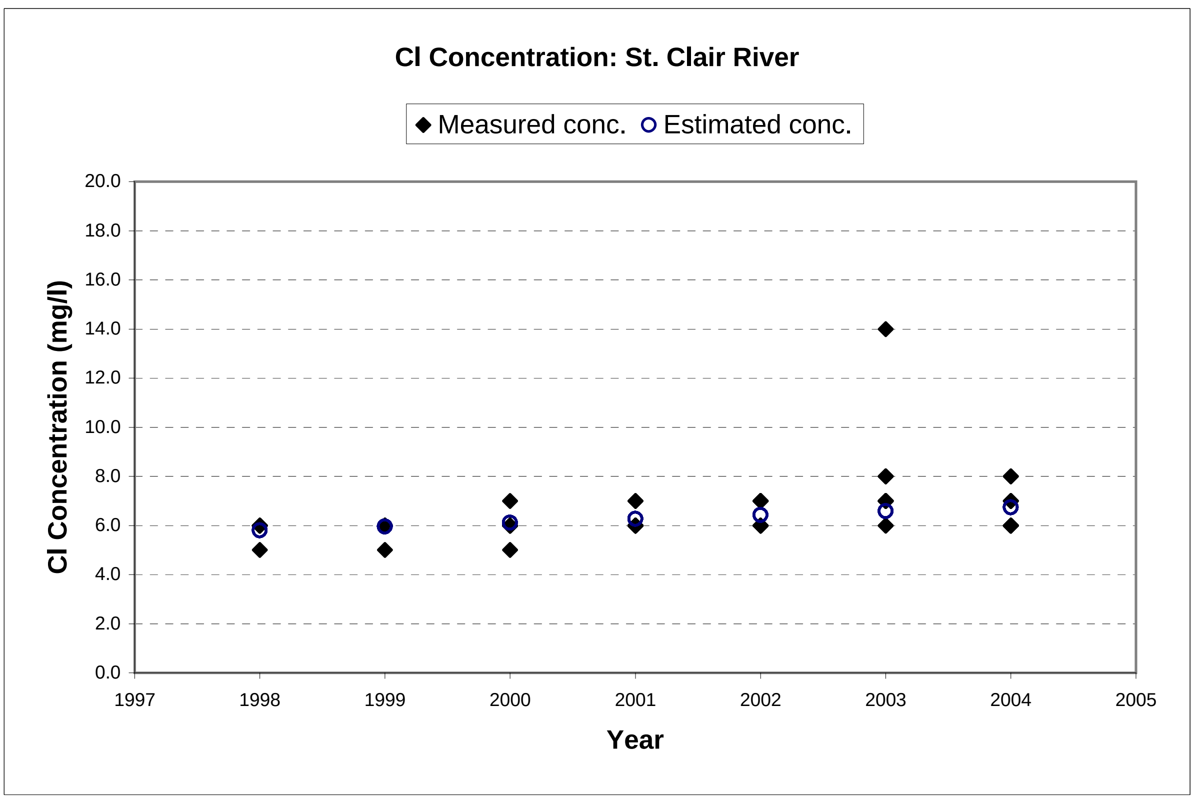

K Concentration: St. Clair River
Measured conc.
Estimated conc.
K Concentration (mg/l)
Year
1997
1998
1999
2000
2001
2002
2003
2004
2005


Mg Concentration: St. Clair River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0

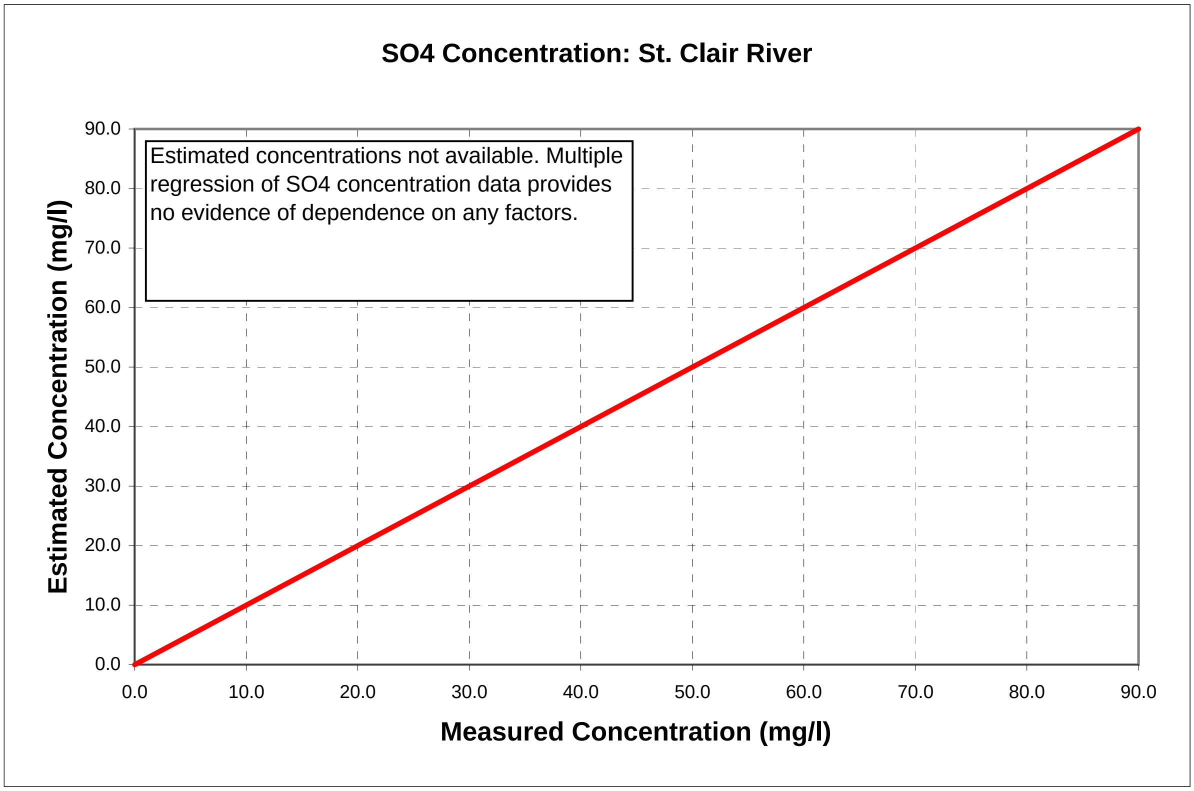

Mg Concentration: St. Clair River
Measured conc.
Estimated conc.
Mg Concentration (mg/l)
Year
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
1997
1998
1999
2000
2001
2002
2003
2004
2005

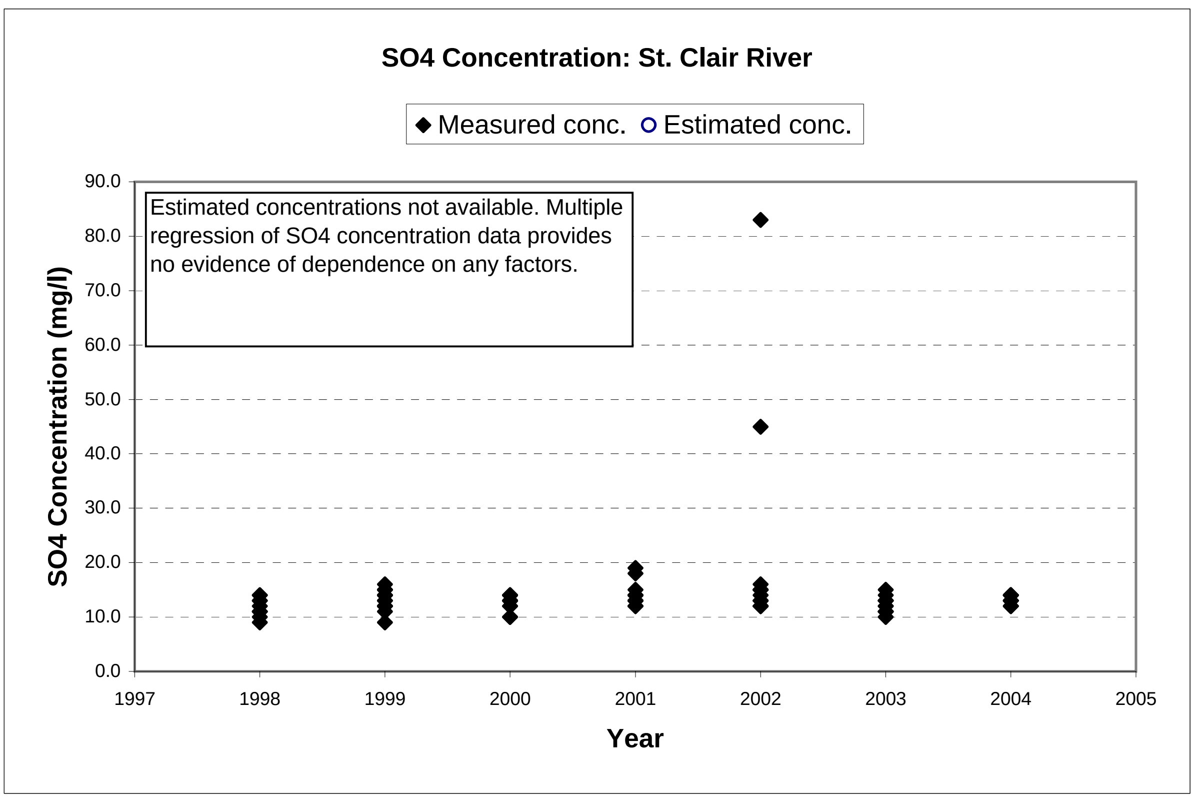


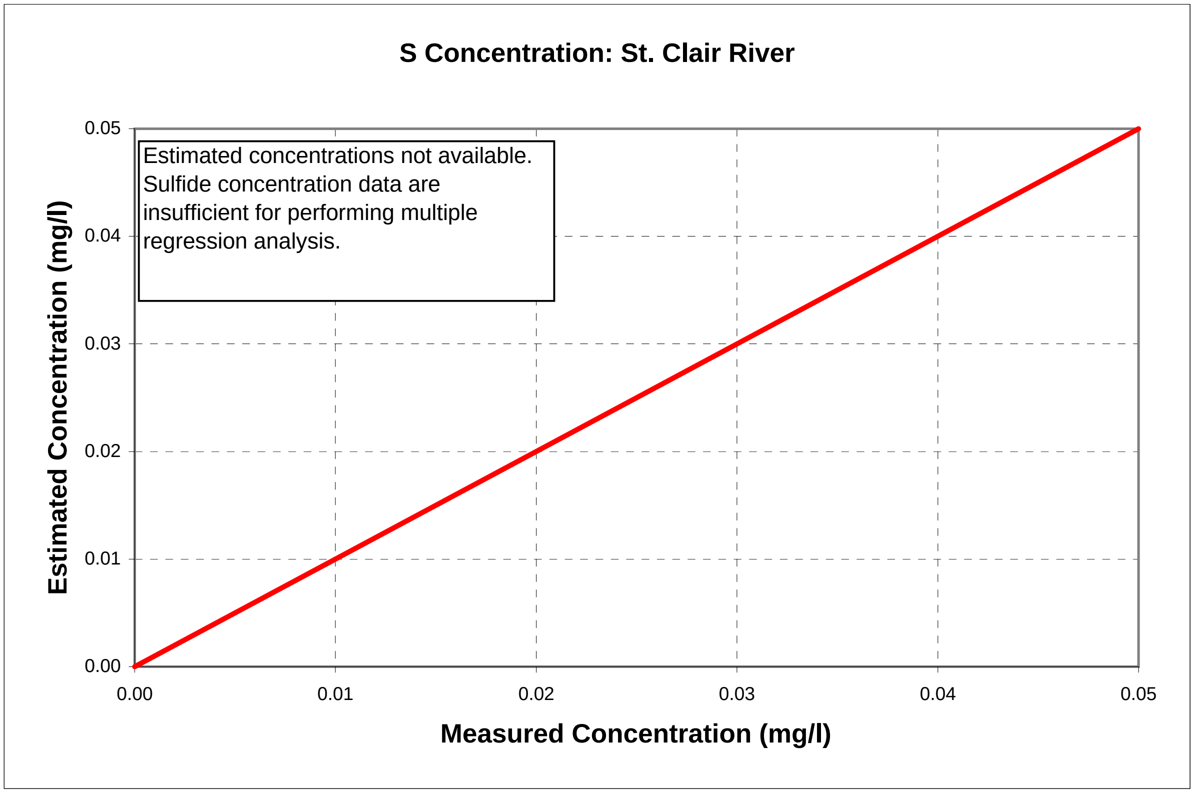
Cl Concentration: St. Clair River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0

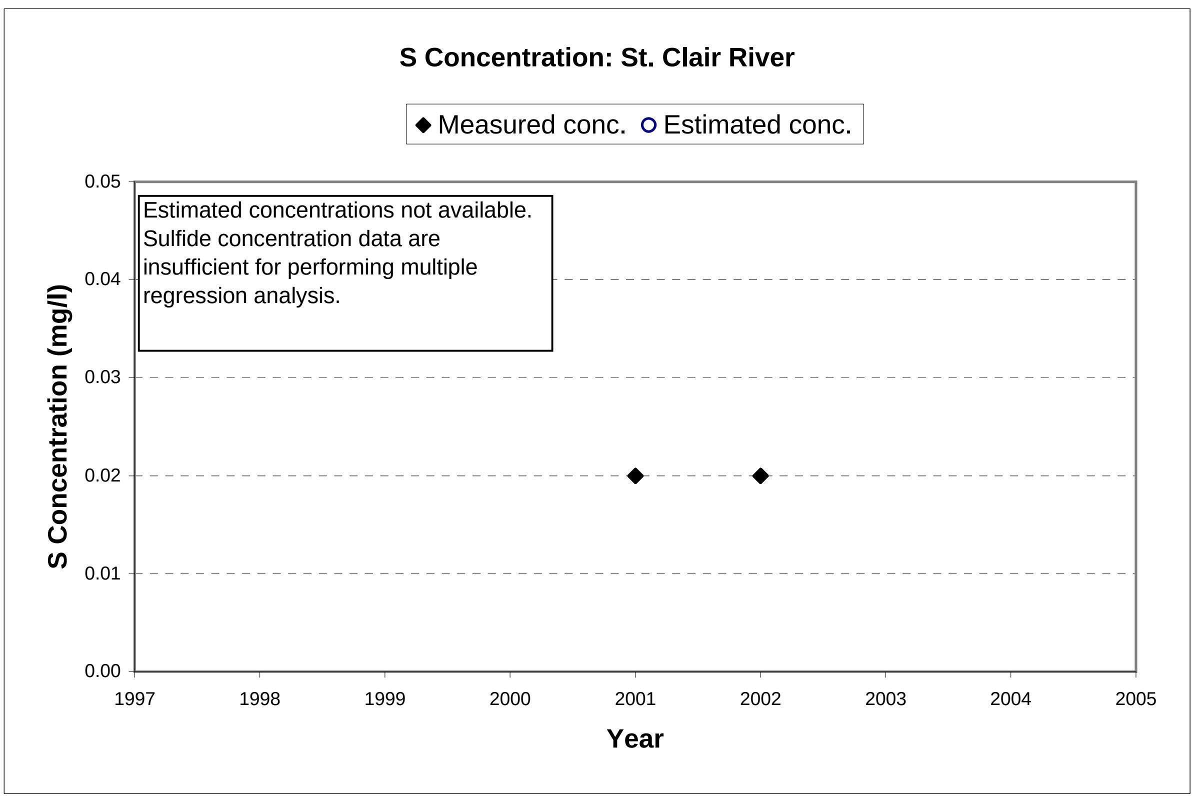


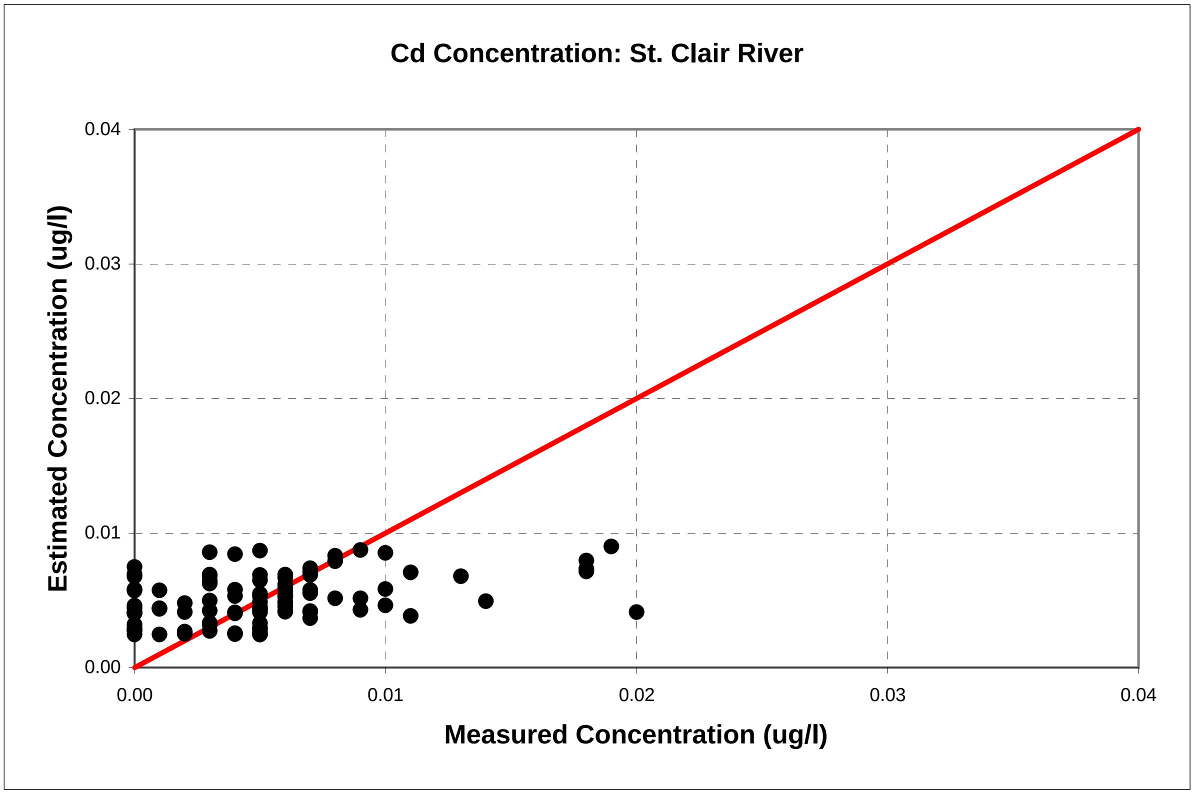
Cl Concentration: St. Clair River
Measured conc.
Estimated conc.
Cl Concentration (mg/l)
Year
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
1997
1998
1999
2000
2001
2002
2003
2004
2005


SO4 Concentration: St. Clair River
Estimated concentrations not available. Multiple regression of SO4 concentration data provides no evidence of dependence on any factors.
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0

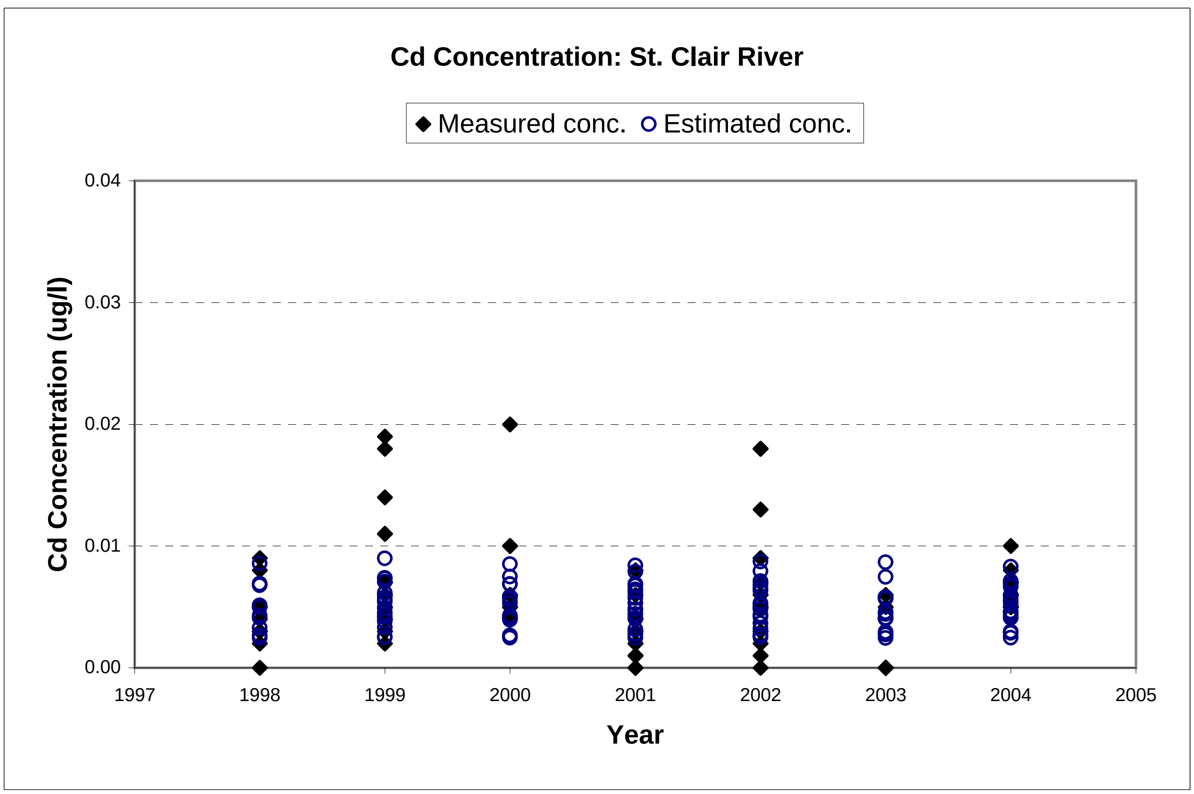

SO4 Concentration: St. Clair River
Measured conc.
Estimated conc.
Estimated concentrations not available. Multiple regression of SO4 concentration data provides no evidence of dependence on any factors.
SO4 Concentration (mg/l)
Year
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
90.0
1997
1998
1999
2000
2001
2002
2003
2004
2005


S Concentration: St. Clair River
Estimated concentrations not available. Sulfide concentration data are insufficient for performing multiple regression analysis.
Estimated Concentration (mg/l)
0.05
0.04
0.03
0.02
0.01
0.00
0.00
0.01
0.02
0.03
0.04
0.05
Measured Concentration (mg/l)

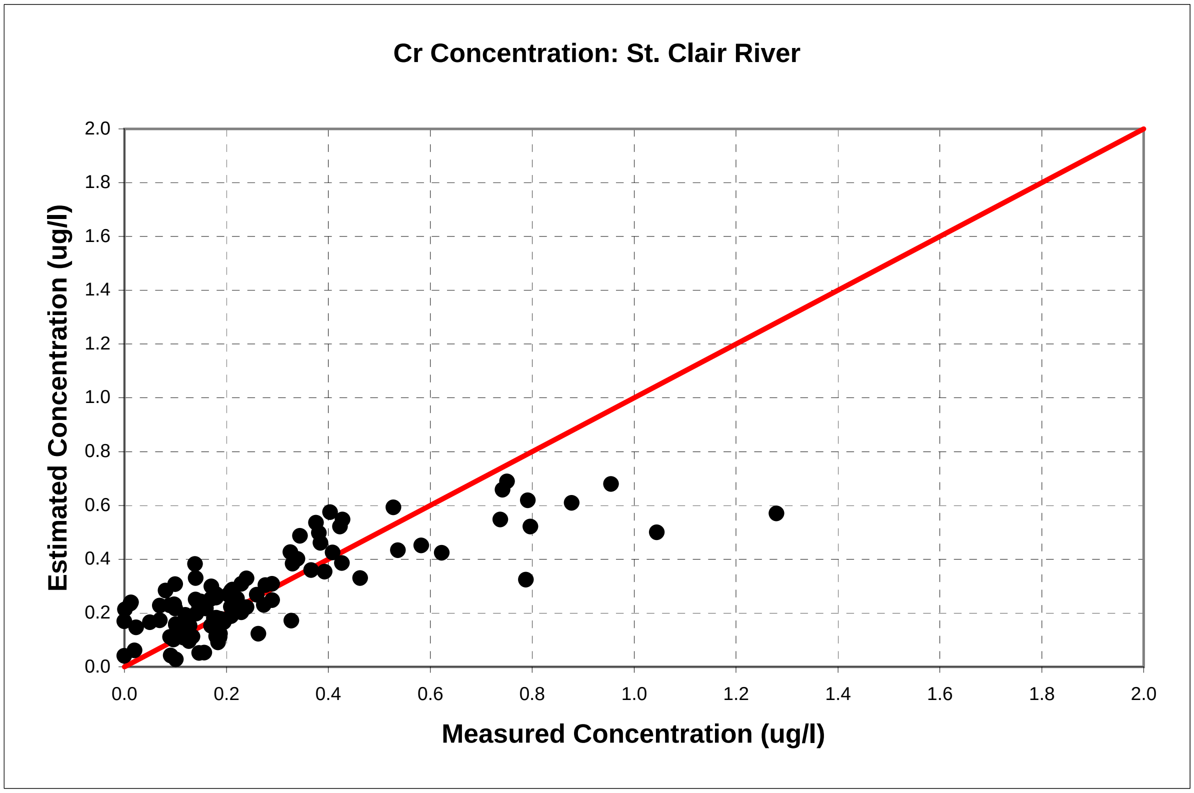

S Concentration: St. Clair River
Measured conc.
Estimated conc.
Estimated concentrations not available. Sulfide concentration data are insufficient for performing multiple regression analysis.
S Concentration (mg/l)
0.05
0.04
0.03
0.02
0.01
0.00
1997
1998
1999
2000
2001
2002
2003
2004
2005
Year

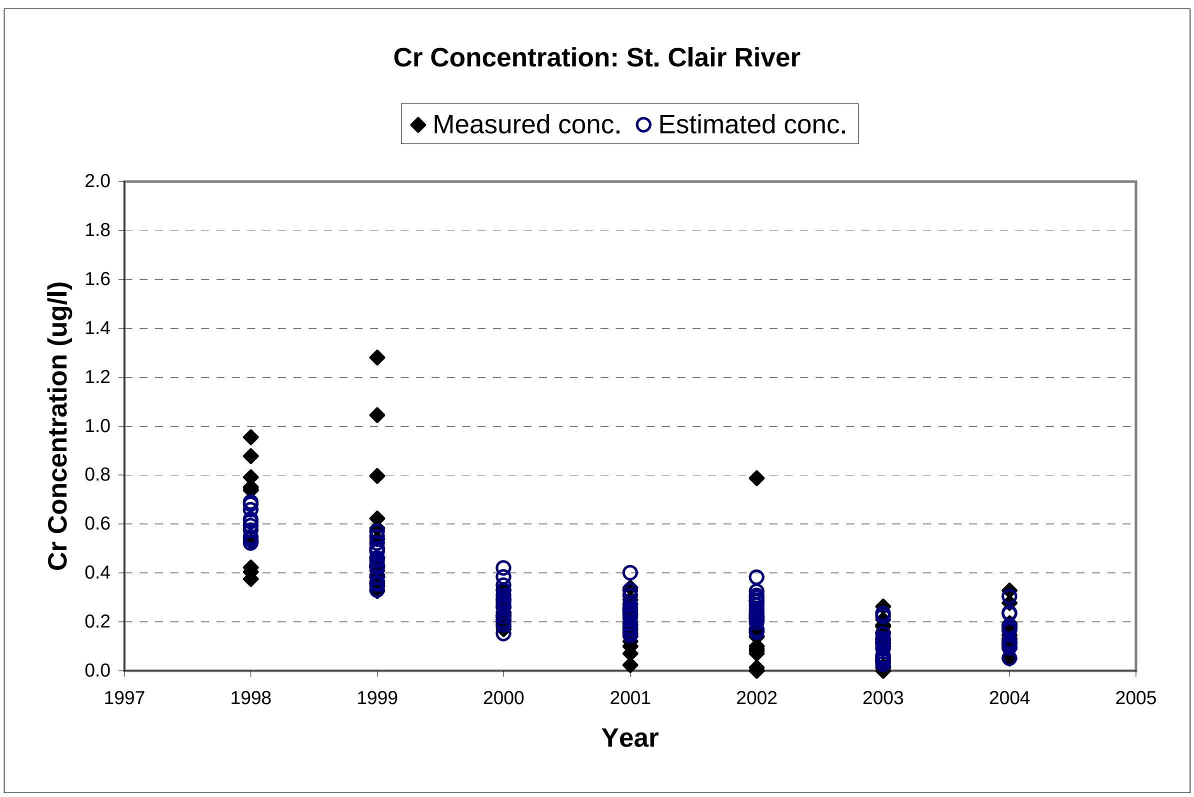


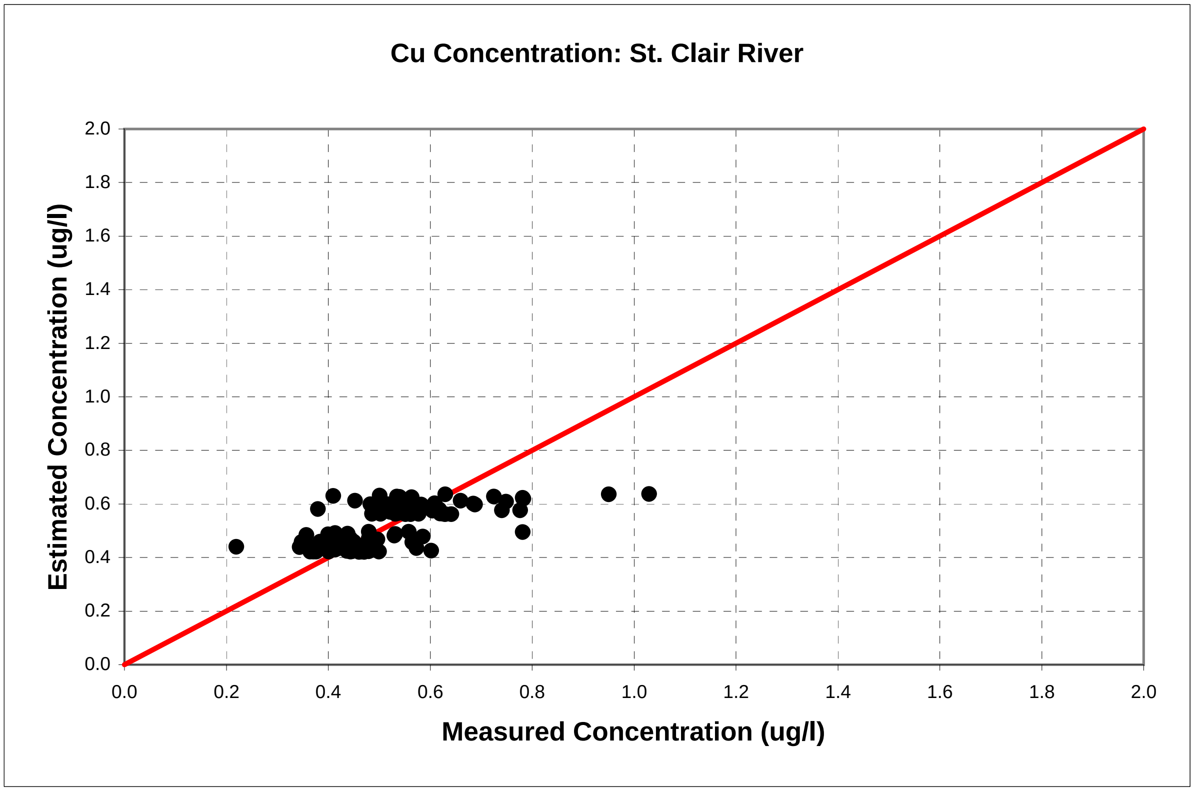
Cd Concentration: St. Clair River
Estimated Concentration (ug/l)
0.04
0.03
0.02
0.01
0.00
0.00
0.01
0.02
0.03
0.04
Measured Concentration (ug/l)

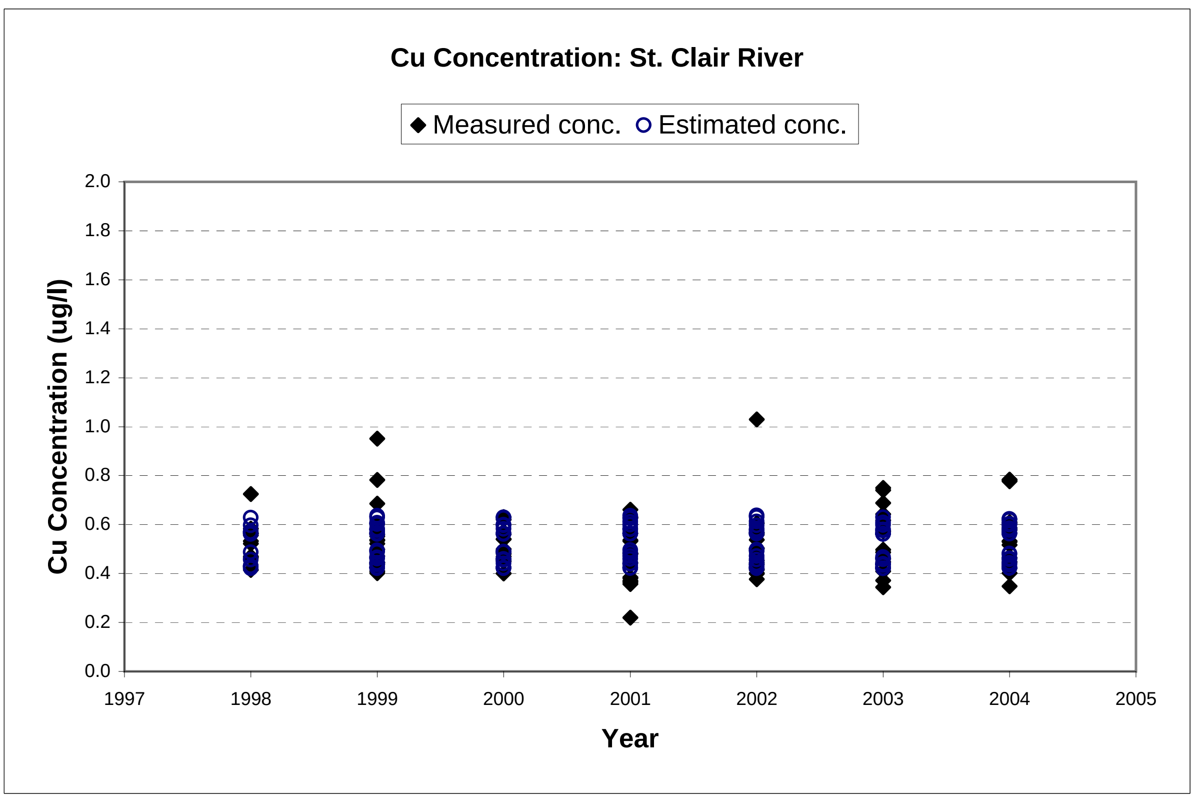


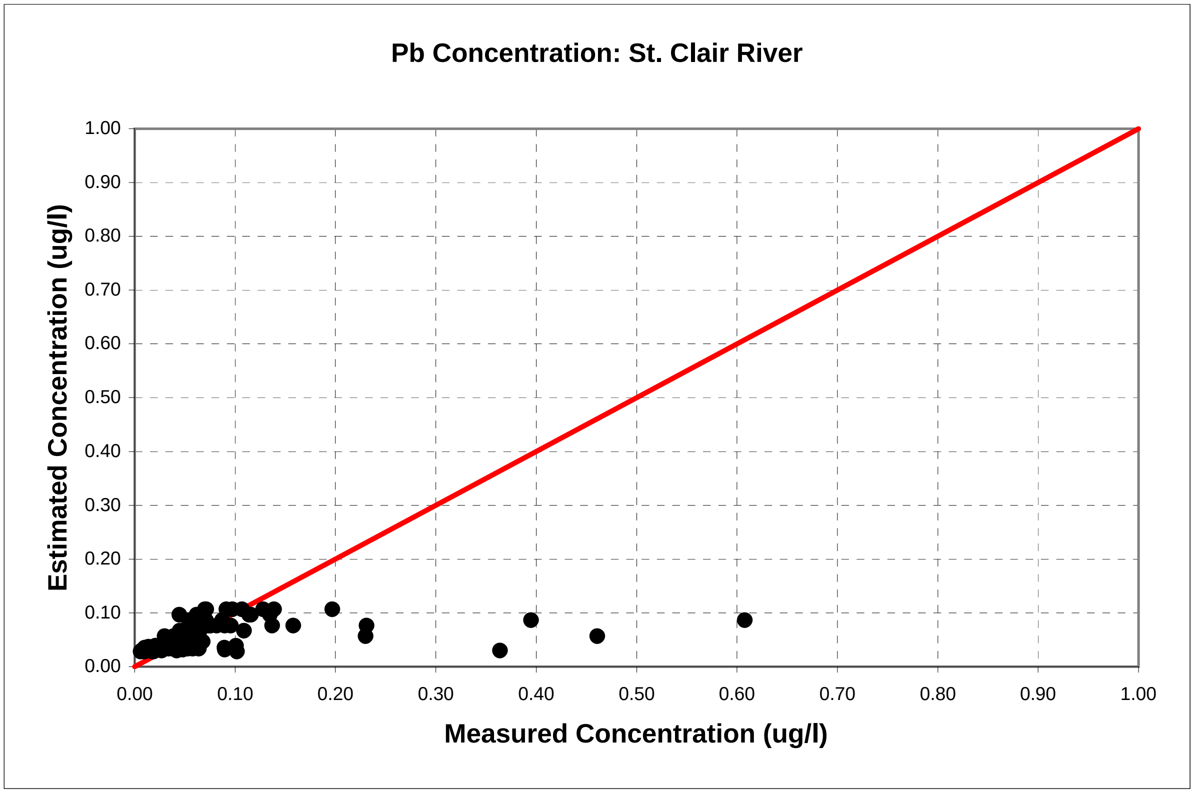
Cd Concentration: St. Clair River
Measured conc.
Estimated conc.
Cd Concentration (ug/l)
0.04
0.03
0.02
0.01
0.00
1997
1998
1999
2000
2001
2002
2003
2004
2005
Year

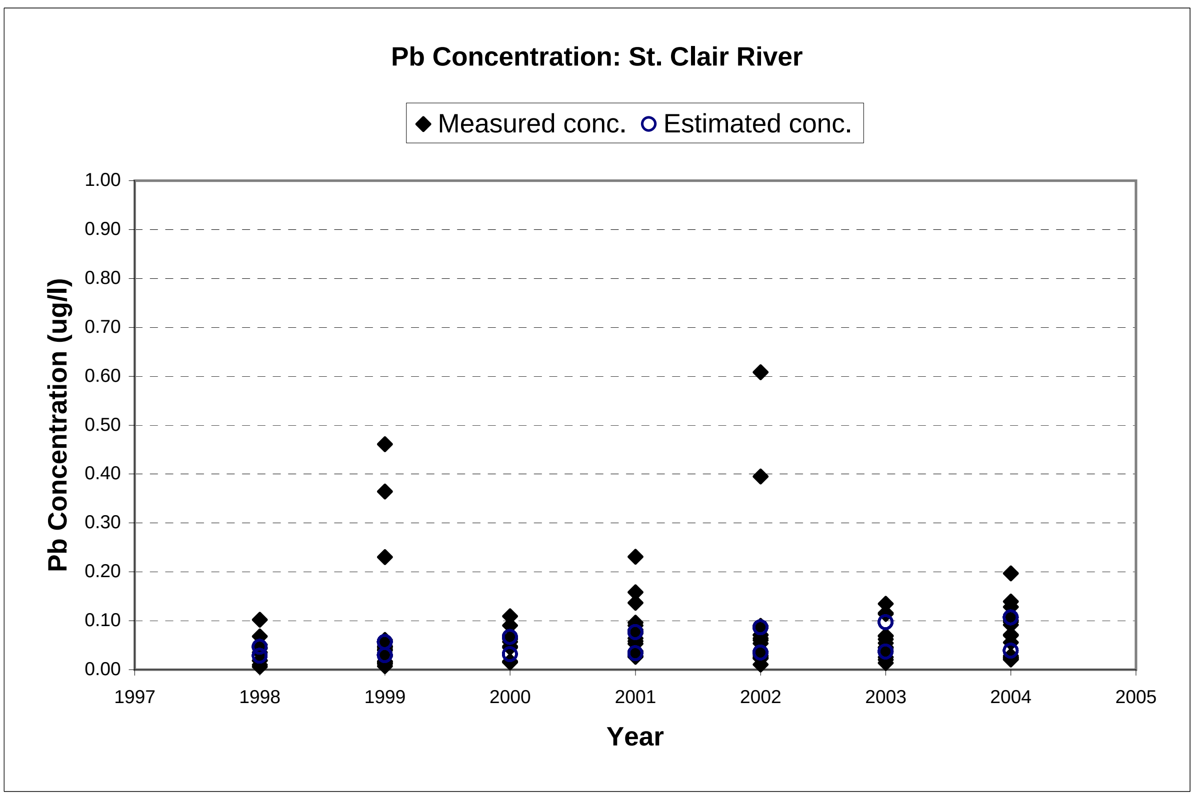

Cr Concentration: St. Clair River
Estimated Concentration (ug/l)
Measured Concentration (ug/l)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0

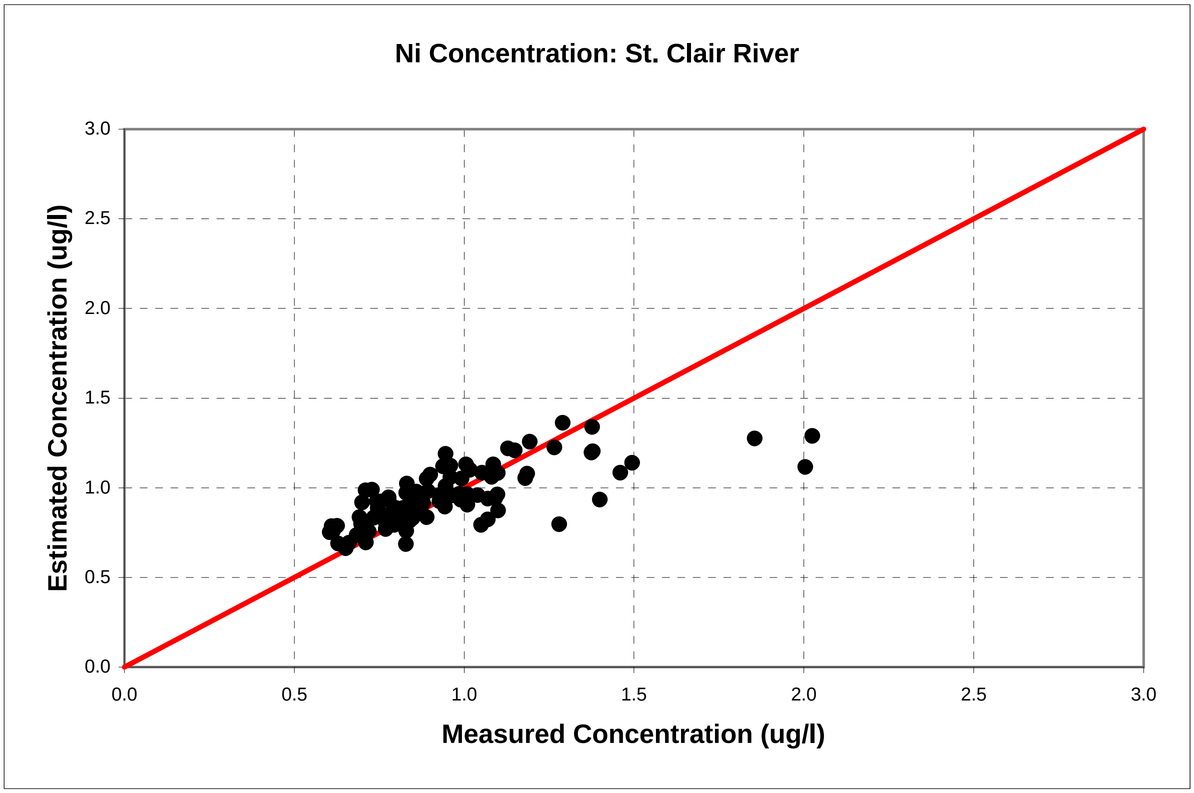

Cr Concentration: St. Clair River
Measured conc.
Estimated conc.
Cr Concentration (ug/l)
Year
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1997
1998
1999
2000
2001
2002
2003
2004
2005

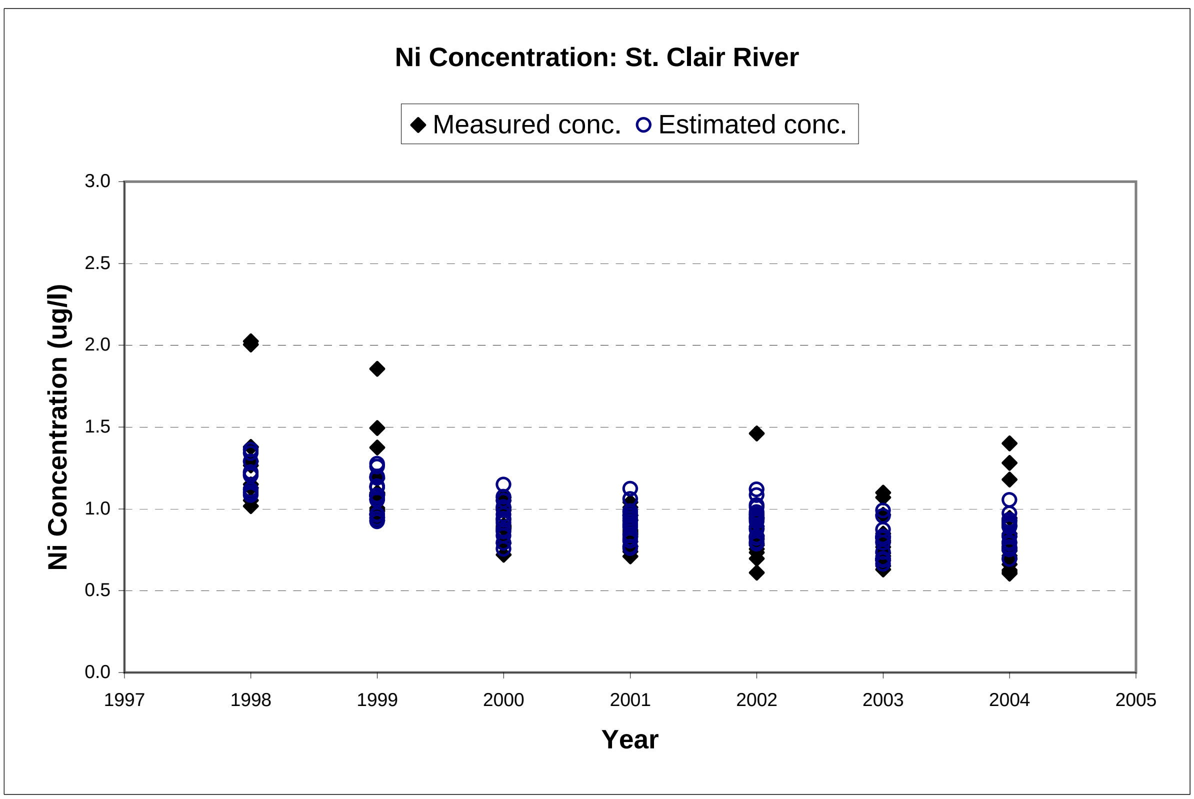

Cu Concentration: St. Clair River
Estimated Concentration (ug/l)
Measured Concentration (ug/l)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0

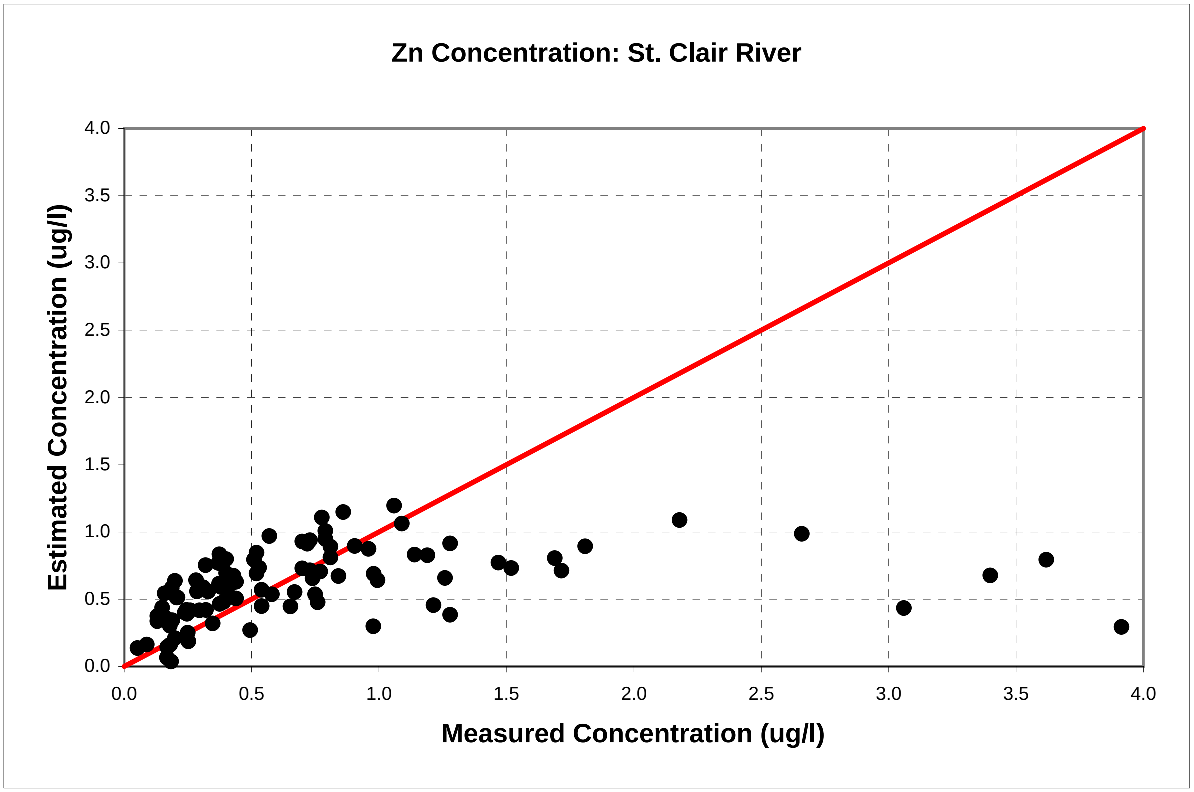

Cu Concentration: St. Clair River
Measured conc.
Estimated conc.
Cu Concentration (ug/l)
Year
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1997
1998
1999
2000
2001
2002
2003
2004
2005


Pb Concentration: St. Clair River
Estimated Concentration (ug/l)
Measured Concentration (ug/l)
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
1.00

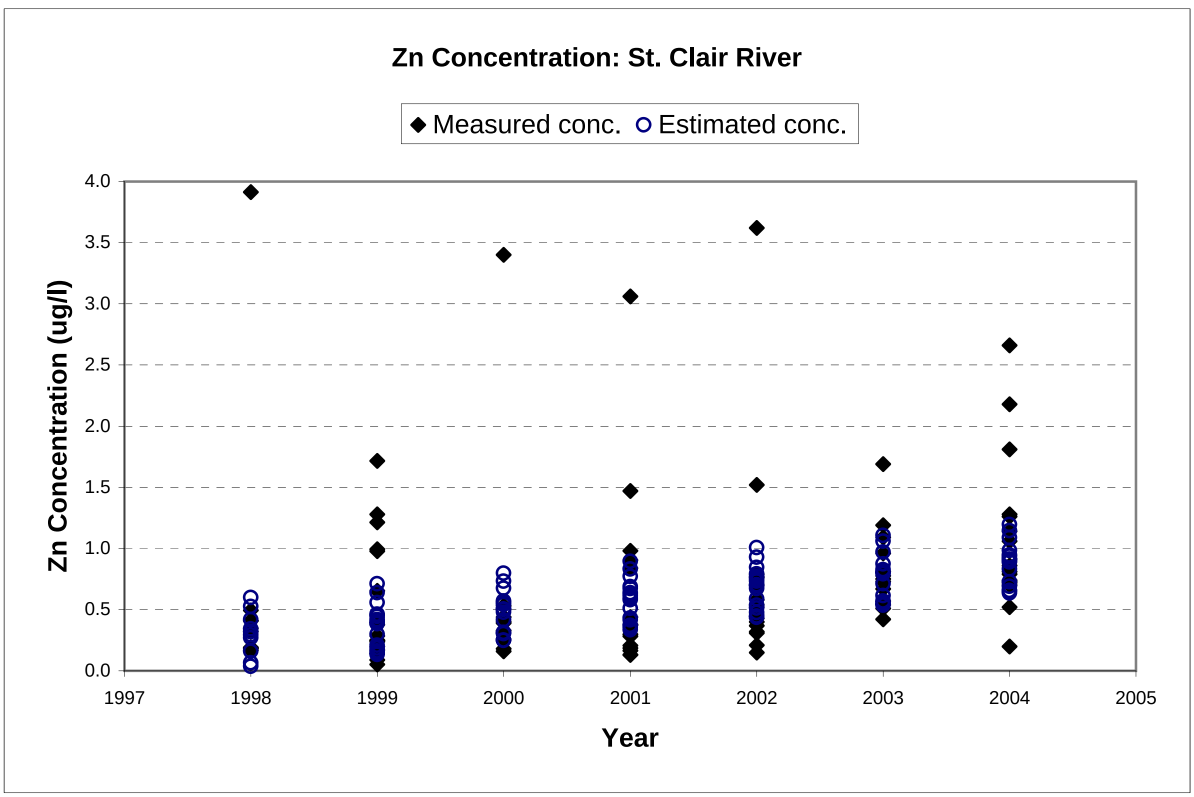

Pb Concentration: St. Clair River
Measured conc.
Estimated conc.
Pb Concentration (ug/l)
Year
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
1.00
1997
1998
1999
2000
2001
2002
2003
2004
2005


Ni Concentration: St. Clair River
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Estimated Concentration (ug/l)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
Measured Concentration (ug/l)

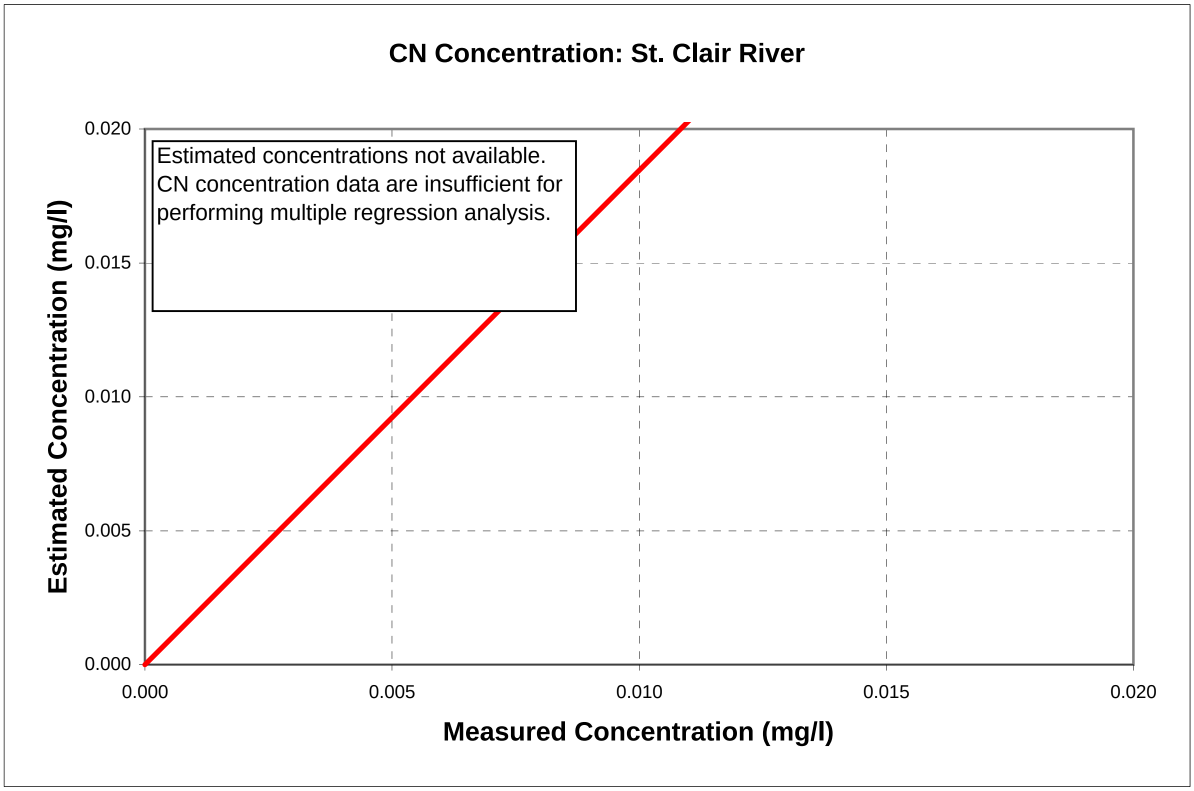

Ni Concentration: St. Clair River
Measured conc.
Estimated conc.
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Ni Concentration (ug/l)
1997
1998
1999
2000
2001
2002
2003
2004
2005
Year



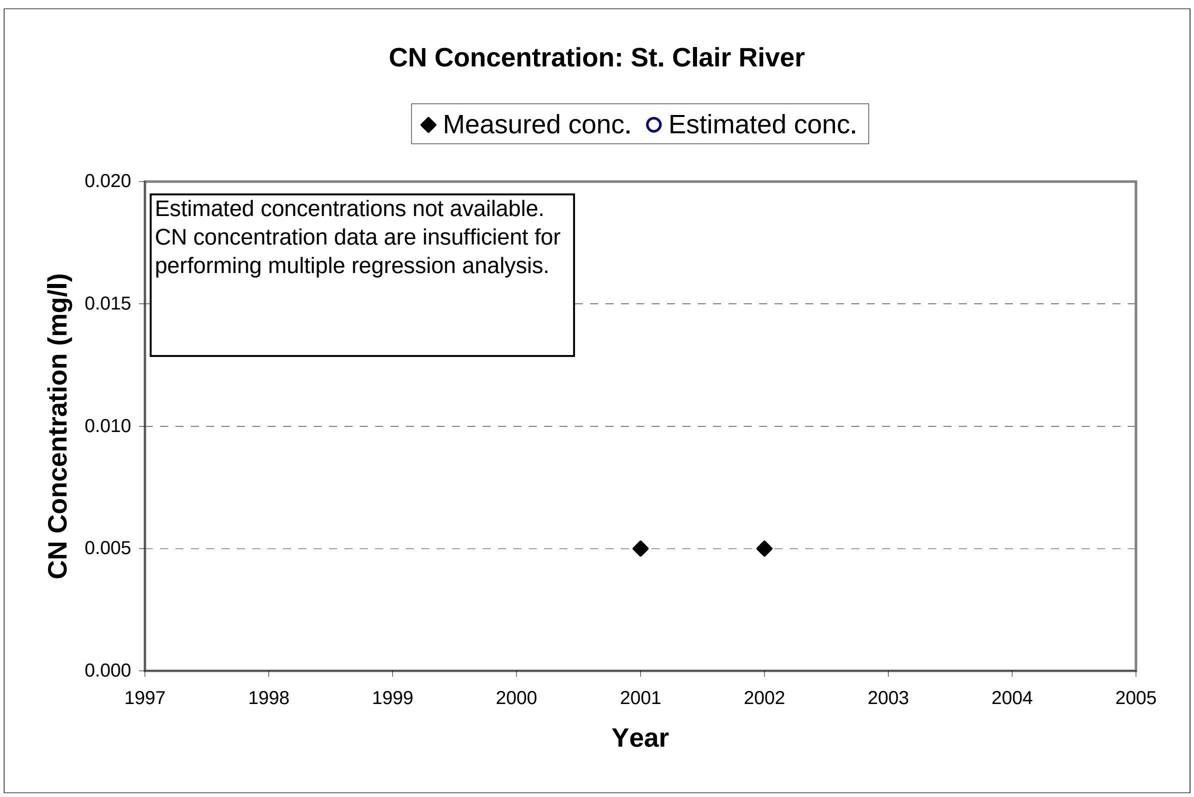
Zn Concentration: St. Clair River
Estimated Concentration (ug/l)
Measured Concentration (ug/l)
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0



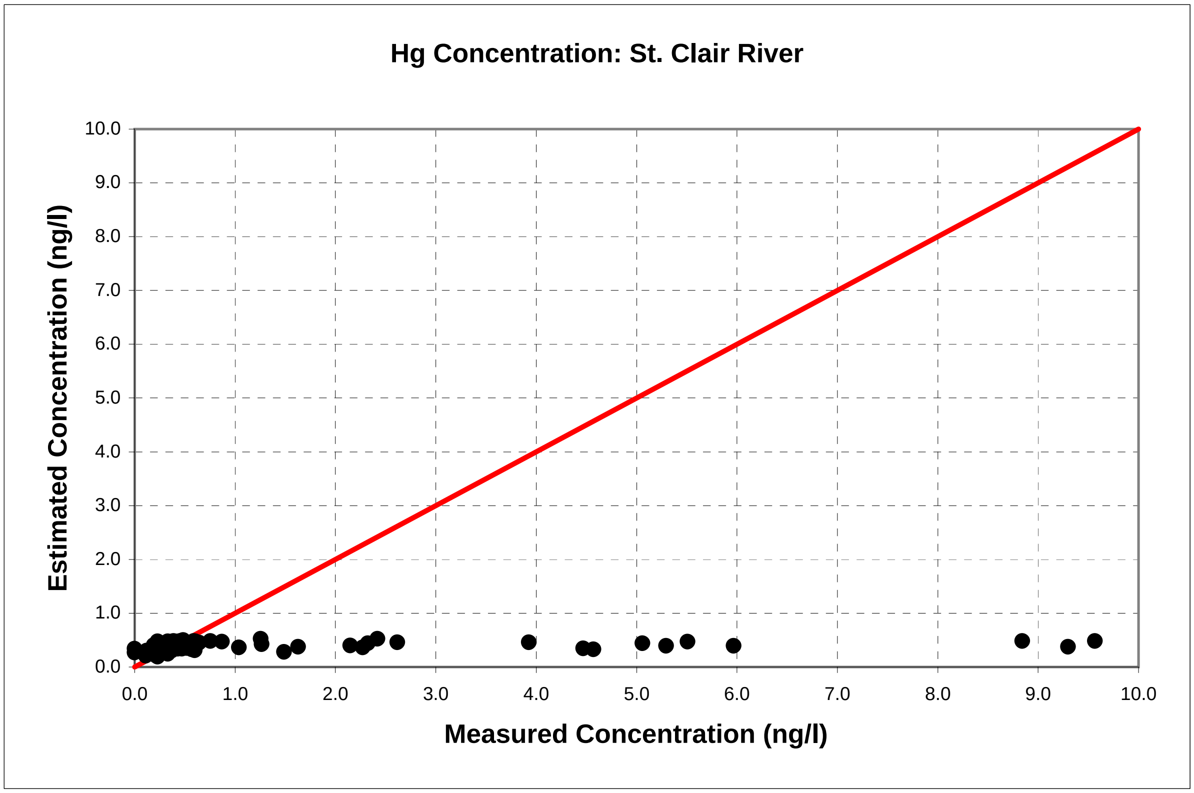
Zn Concentration: St. Clair River
Measured conc.
Estimated conc.
Zn Concentration (ug/l)
Year
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1997
1998
1999
2000
2001
2002
2003
2004
2005

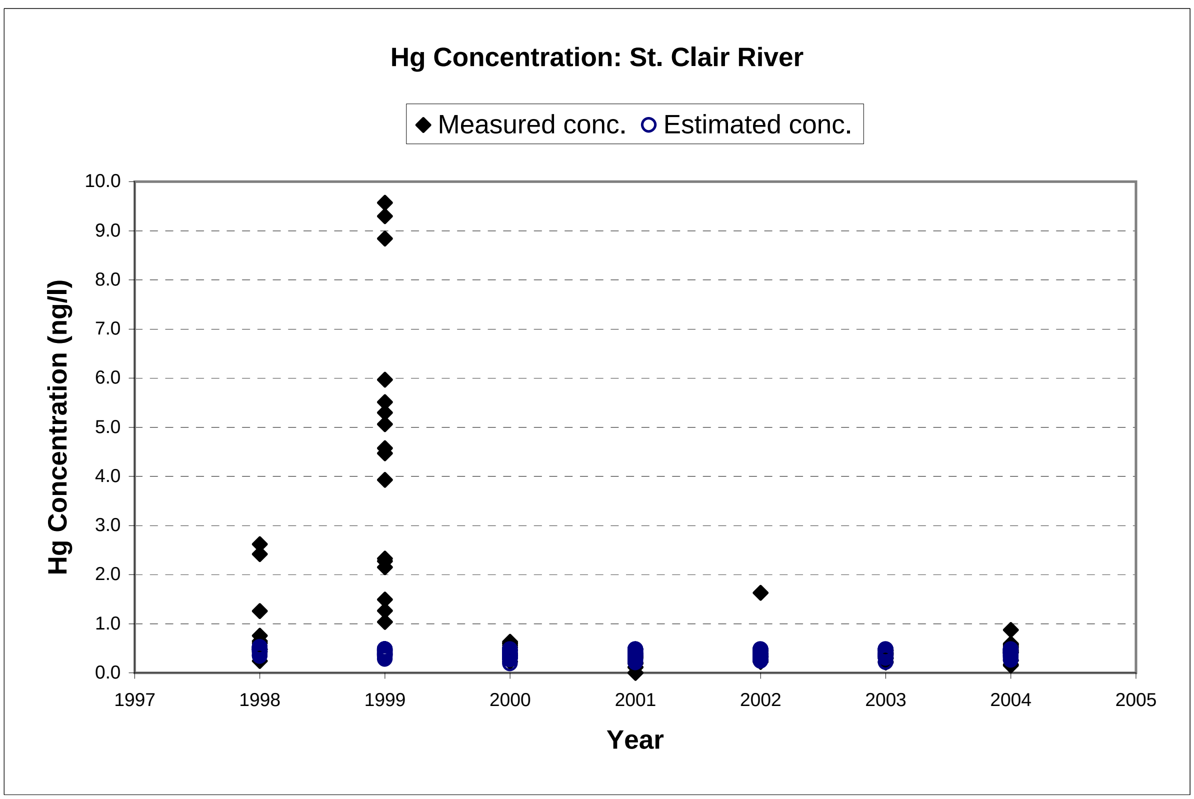


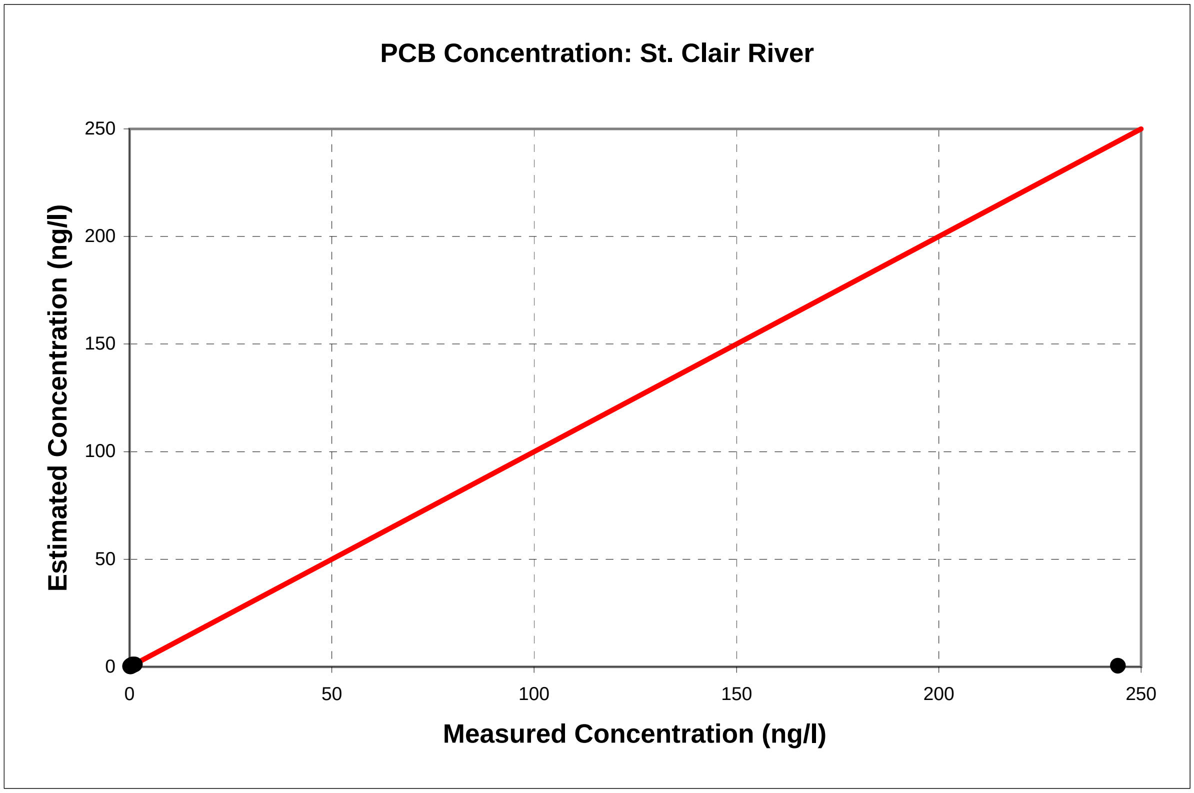
CN Concentration: St. Clair River
Estimated concentrations not available.
CN concentration data are insufficient for
performing multiple regression analysis.
0.020
0.015
0.010
0.005
0.000
0.000
0.005
0.010
0.015
0.020
Estimated Concentration (mg/l)
Measured Concentration (mg/l)



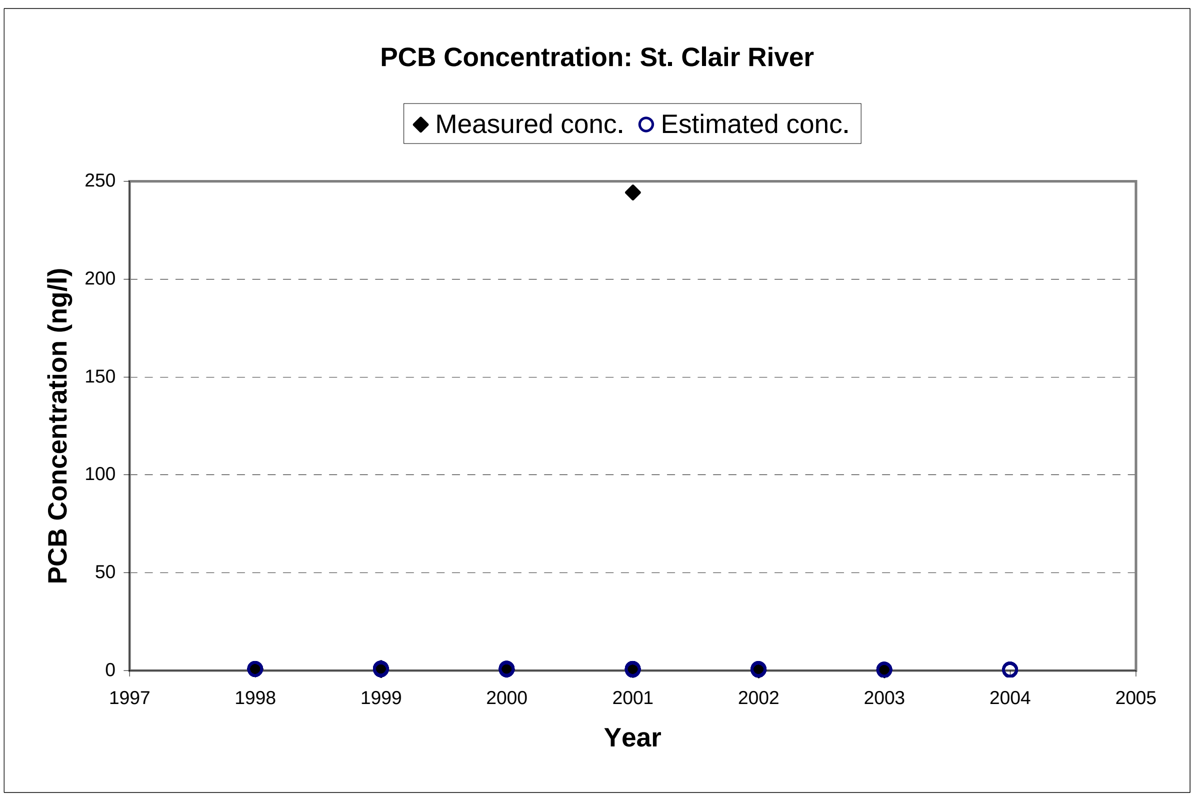
CN Concentration: St. Clair River
Measured conc.
Estimated conc.
Estimated concentrations not available.
CN concentration data are insufficient for
performing multiple regression analysis.
0.020
0.015
0.010
0.005
0.000
1997
1998
1999
2000
2001
2002
2003
2004
2005
CN Concentration (mg/l)
Year


Hg Concentration: St. Clair River
Estimated Concentration (ng/l)
Measured Concentration (ng/l)
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0

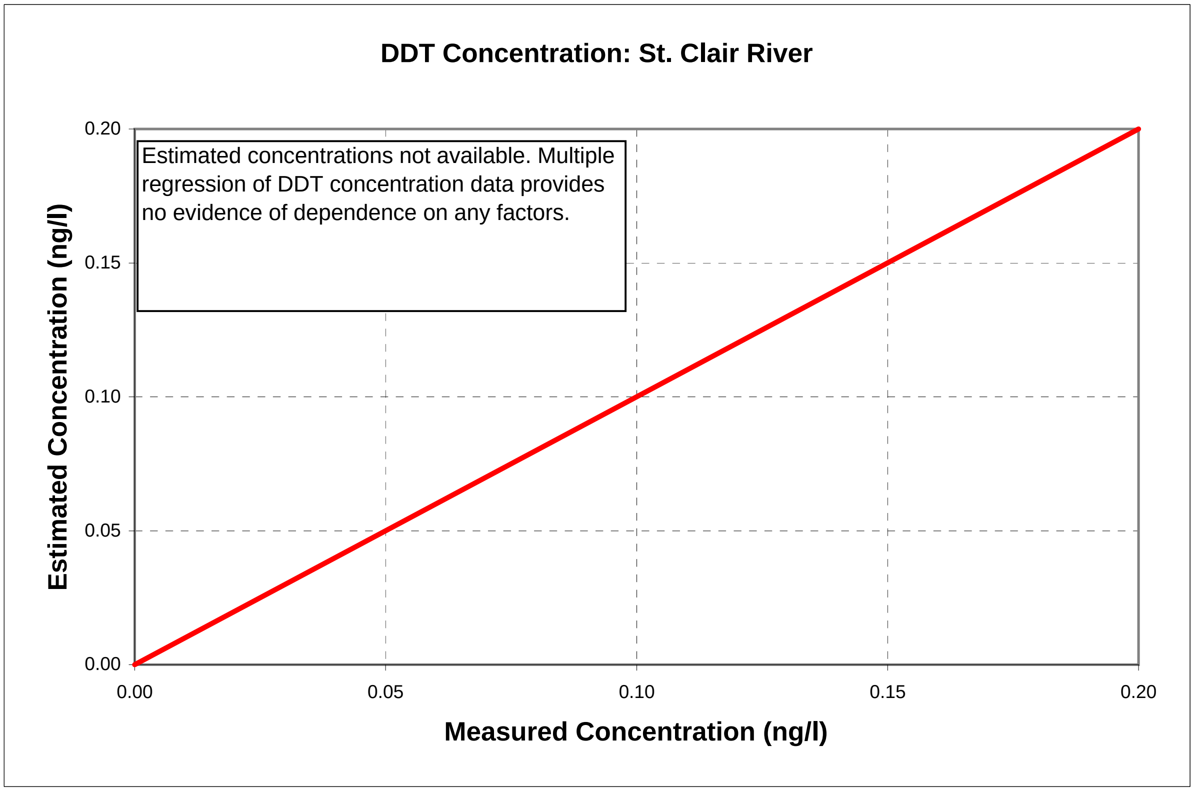

Hg Concentration: St. Clair River
Measured conc.
Estimated conc.
Hg Concentration (ng/l)
Year
1997
1998
1999
2000
2001
2002
2003
2004
2005

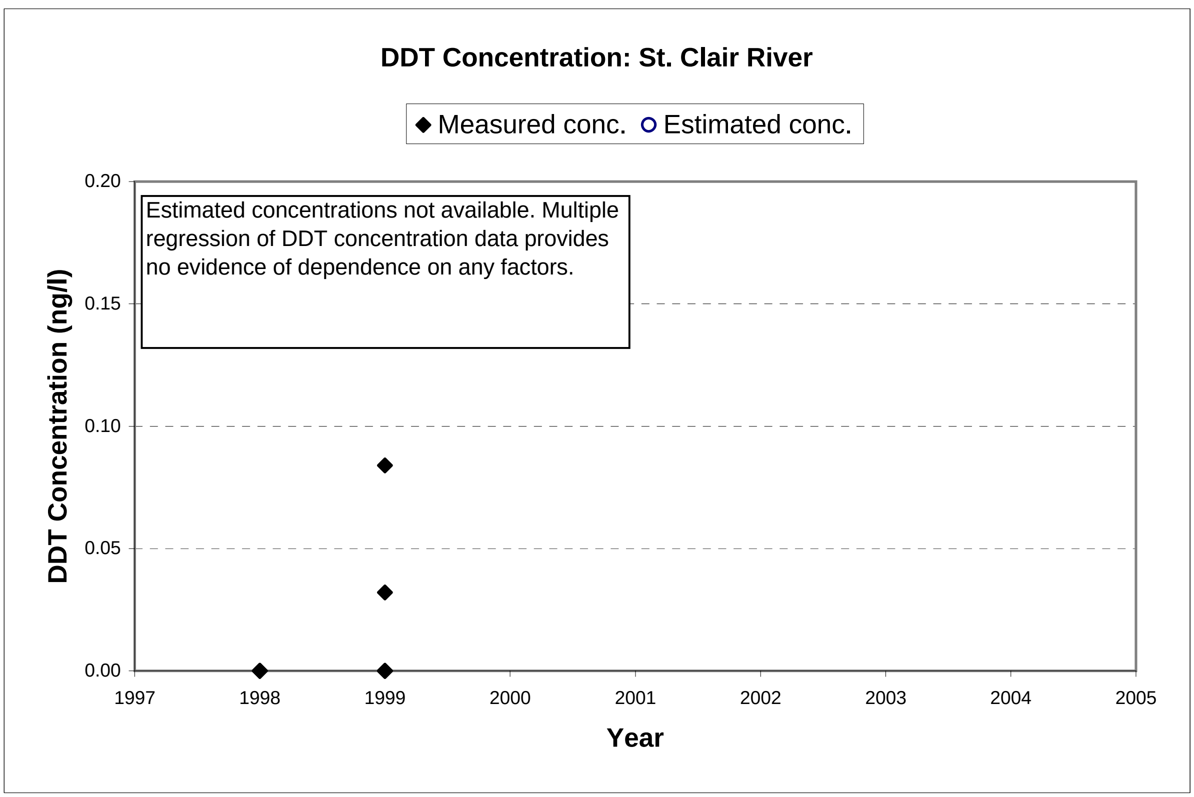


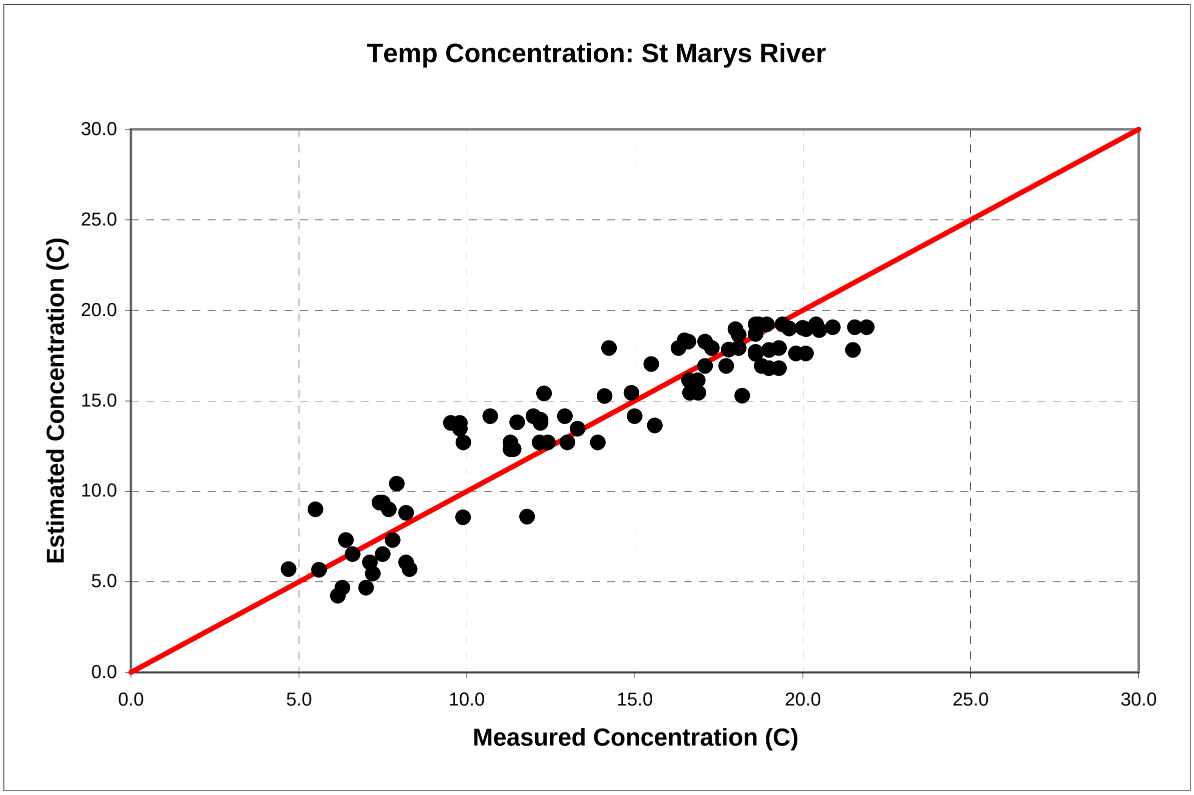
PCB Concentration: St. Clair River
Estimated Concentration (ng/l)
Measured Concentration (ng/l)
0
50
100
150
200
250

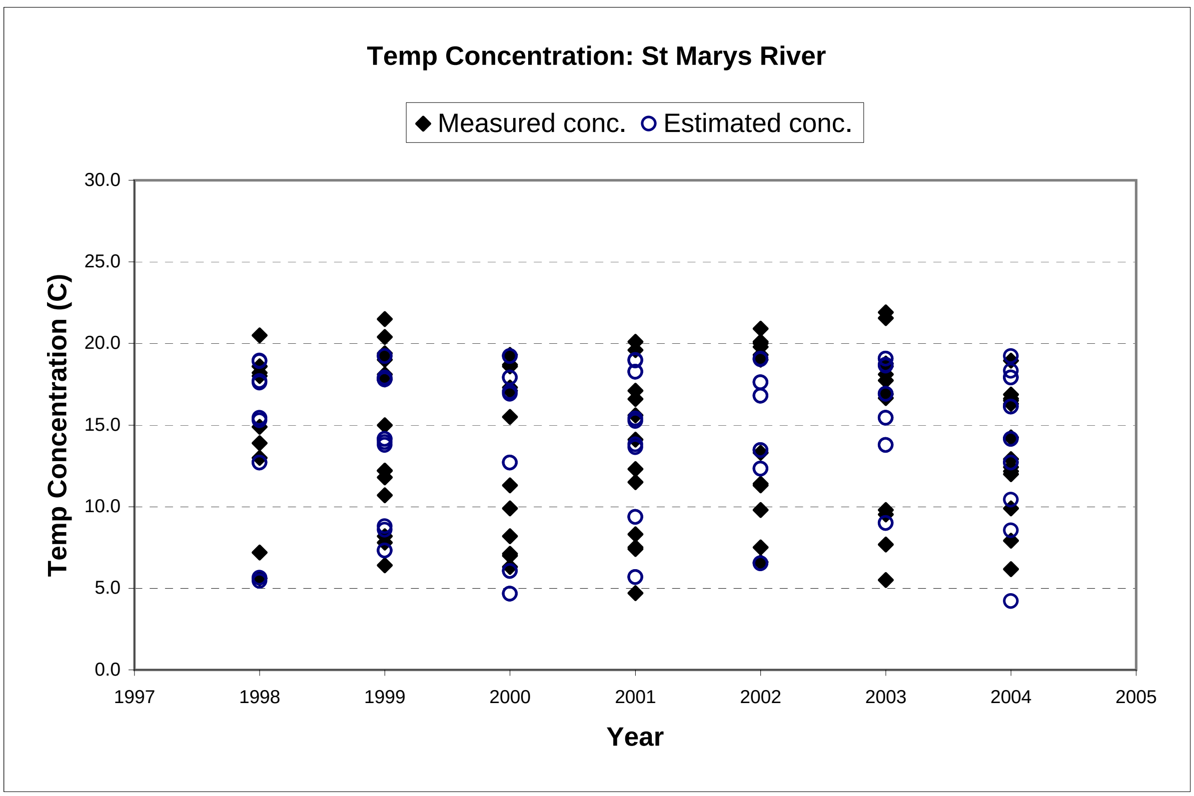


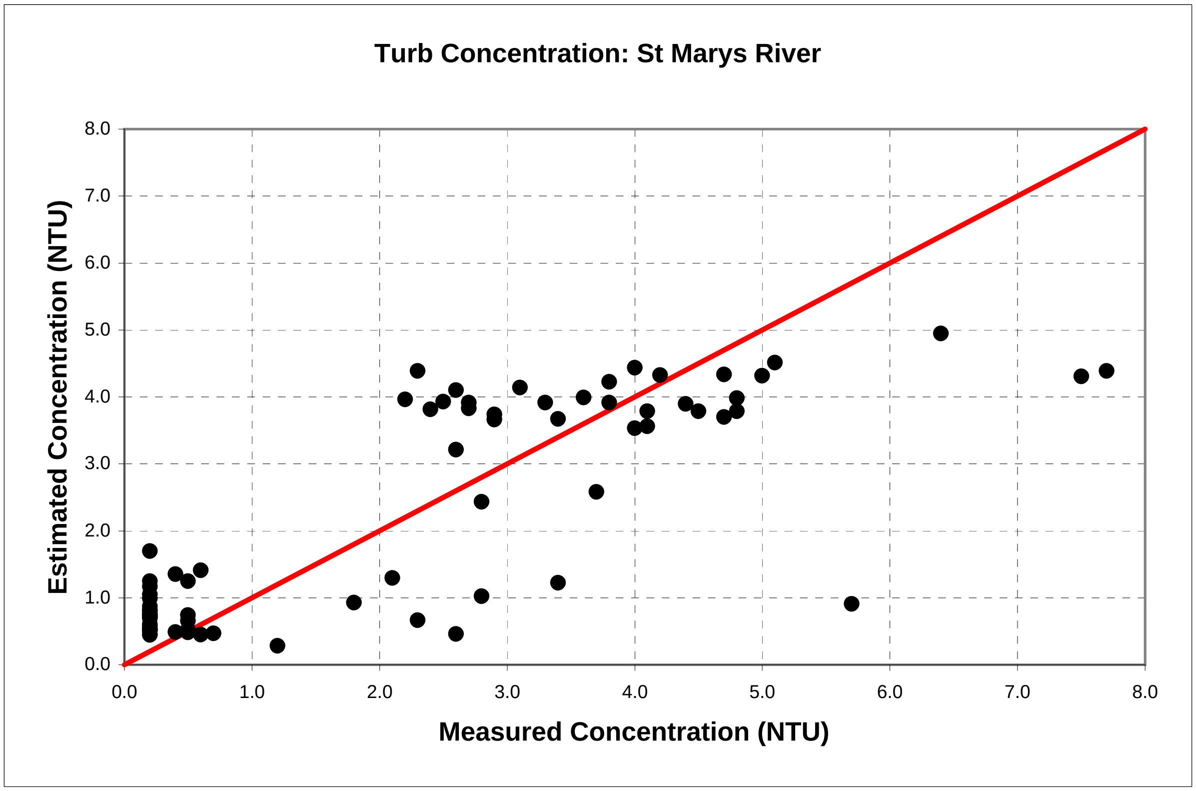
PCB Concentration: St. Clair River
Measured conc.
Estimated conc.
PCB Concentration (ng/l)
Year
0
50
100
150
200
250
1997
1998
1999
2000
2001
2002
2003
2004
2005


DDT Concentration: St. Clair River
Estimated concentrations not available. Multiple regression of DDT concentration data provides no evidence of dependence on any factors.
Estimated Concentration (ng/l)
0.20
0.15
0.10
0.05
0.00
0.00
0.05
0.10
0.15
0.20
Measured Concentration (ng/l)

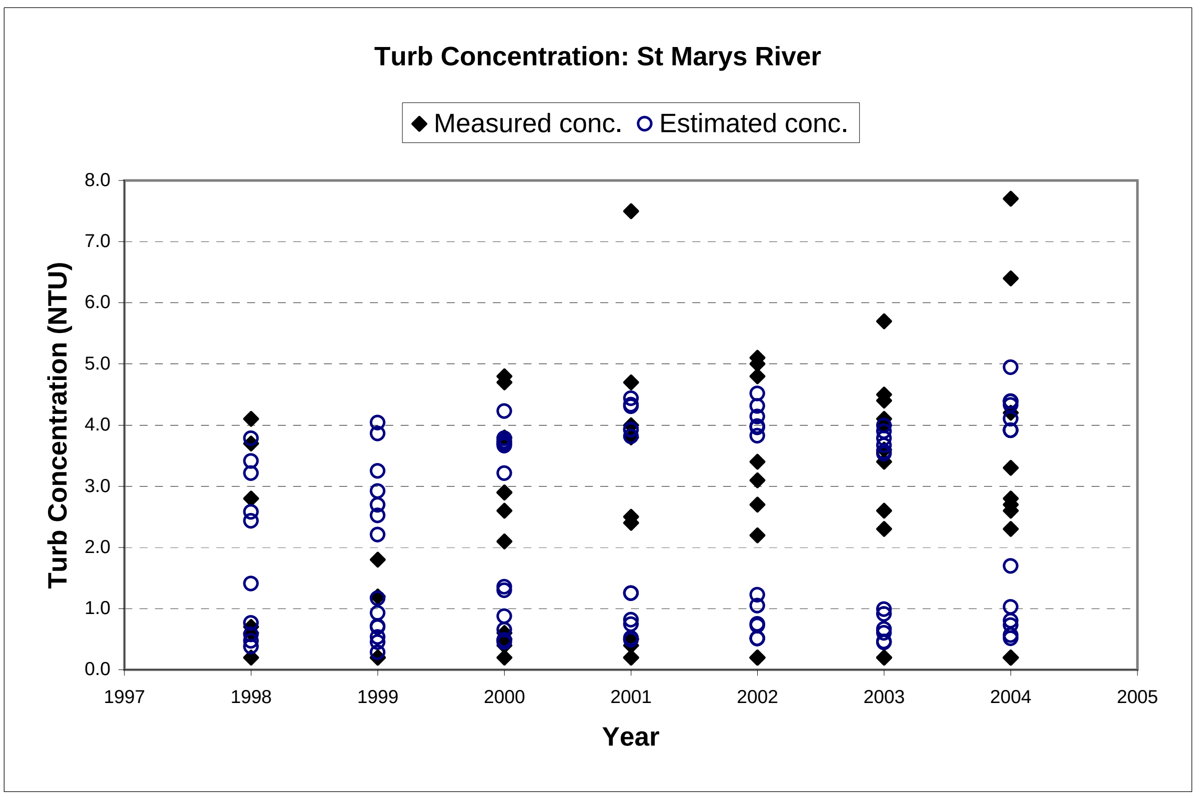

DDT Concentration: St. Clair River
Measured conc.
Estimated conc.
Estimated concentrations not available. Multiple regression of DDT concentration data provides no evidence of dependence on any factors.
DDT Concentration (ng/l)
0.20
0.15
0.10
0.05
0.00
1997
1998
1999
2000
2001
2002
2003
2004
2005
Year


Temp Concentration: St Marys River
Estimated Concentration (C)
Measured Concentration (C)
0.0
5.0
10.0
15.0
20.0
25.0
30.0

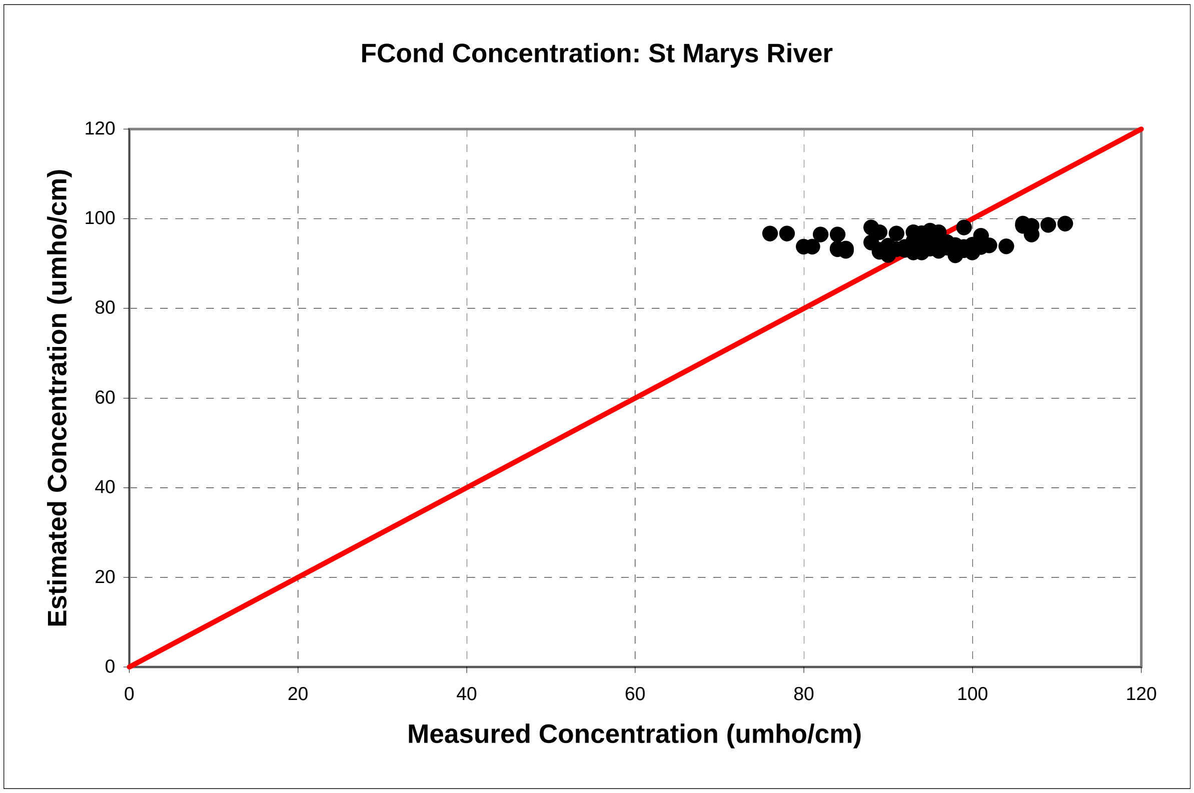

Temp Concentration: St Marys River
Measured conc.
Estimated conc.
Temp Concentration (C)
Year
0.0
5.0
10.0
15.0
20.0
25.0
30.0
1997
1998
1999
2000
2001
2002
2003
2004
2005

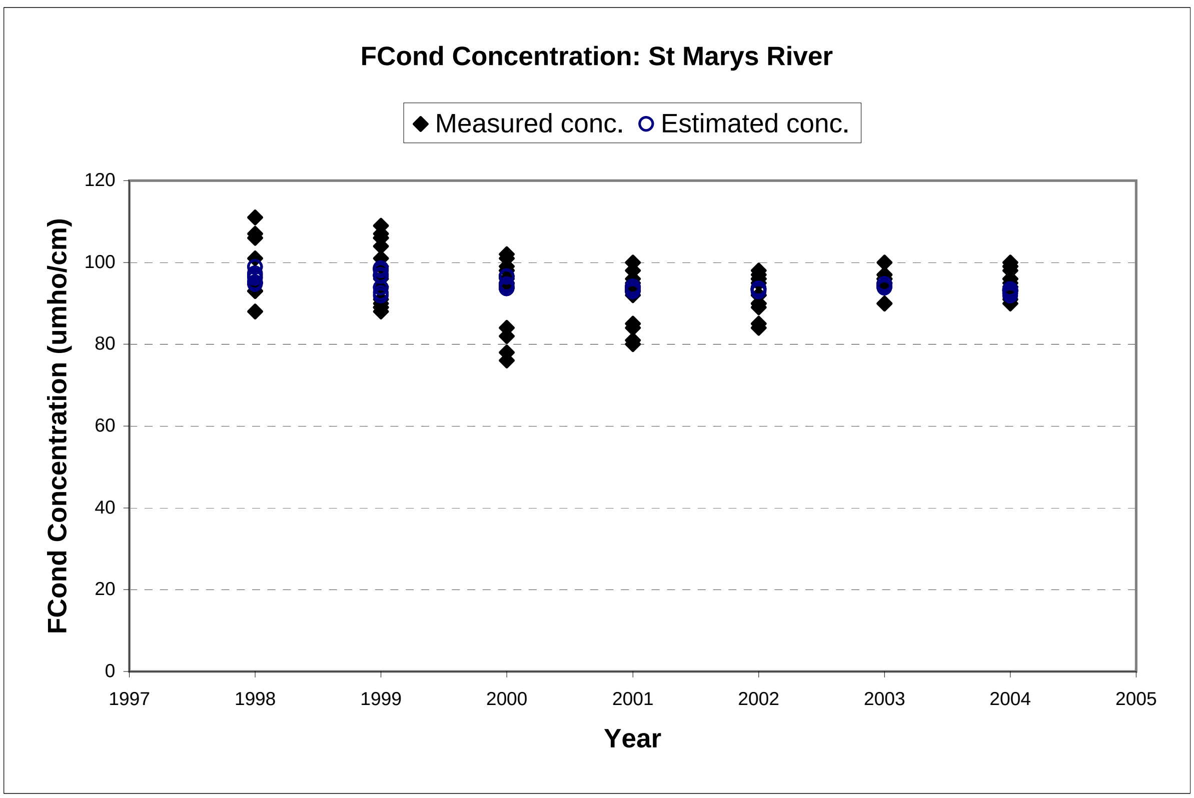


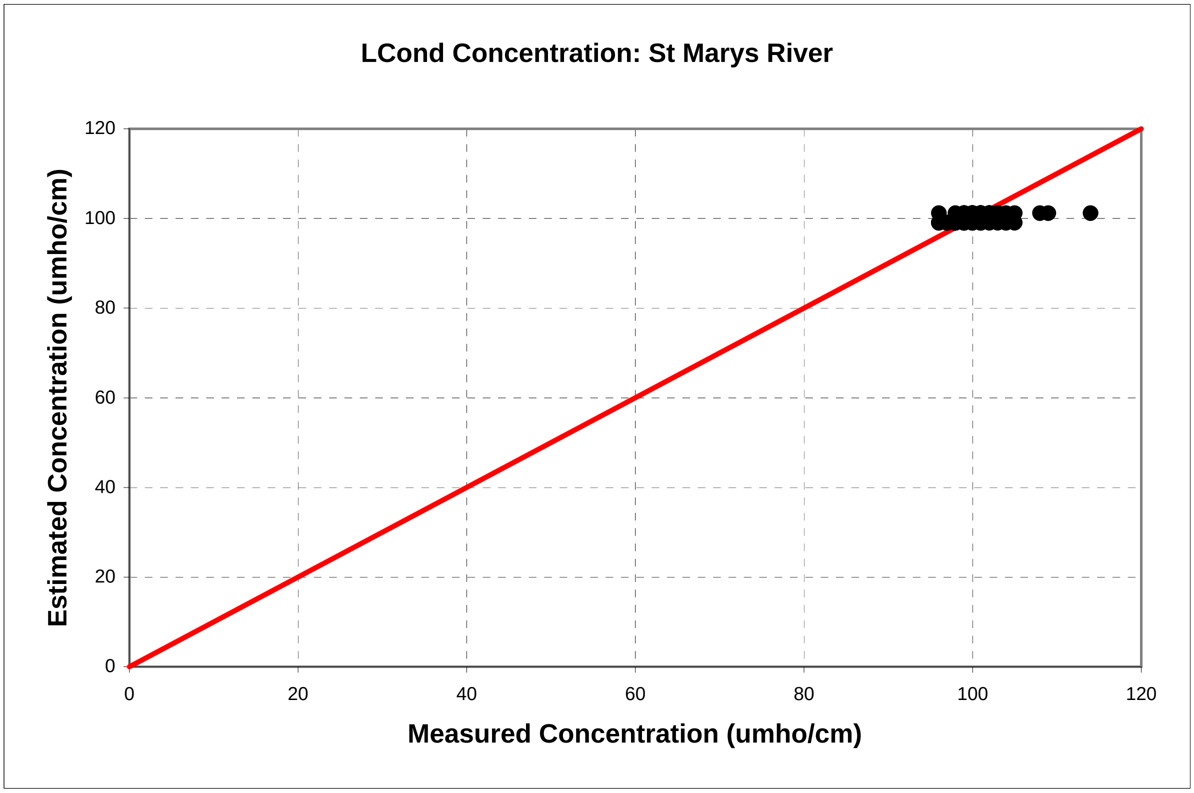
Turb Concentration: St Marys River
Estimated Concentration (NTU)
Measured Concentration (NTU)
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0

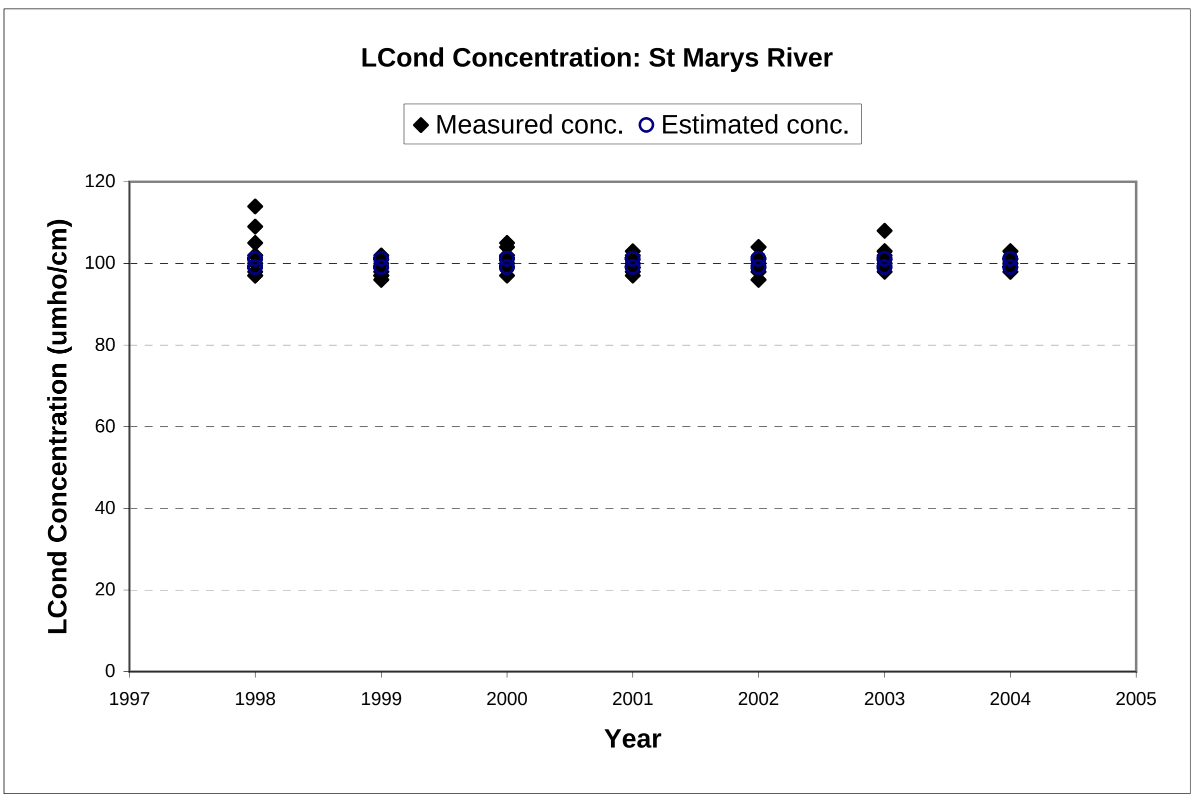


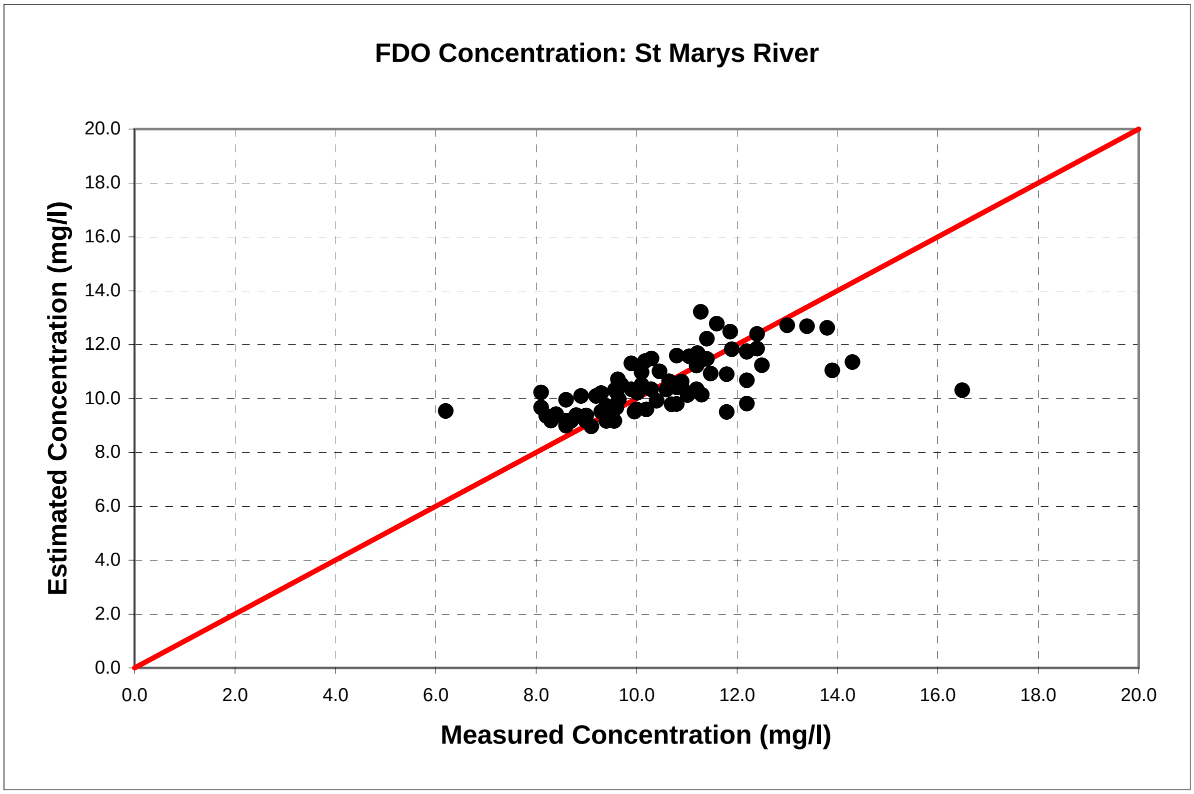
Turb Concentration: St Marys River
Measured conc.
Estimated conc.
Turb Concentration (NTU)
Year
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
1997
1998
1999
2000
2001
2002
2003
2004
2005


FCond Concentration: St Marys River
Estimated Concentration (umho/cm)
Measured Concentration (umho/cm)
0
20
40
60
80
100
120

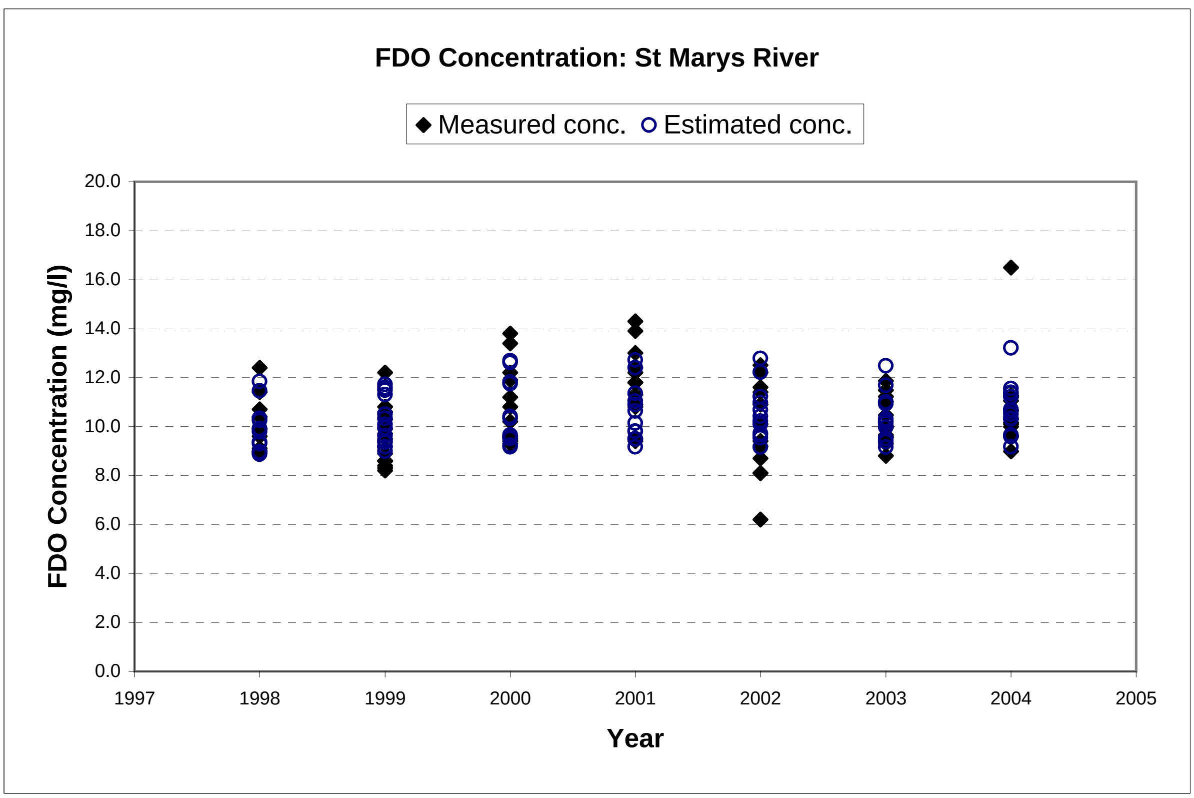

FCond Concentration: St Marys River
Measured conc.
Estimated conc.
FCond Concentration (umho/cm)
Year
0
20
40
60
80
100
120
1997
1998
1999
2000
2001
2002
2003
2004
2005


LCond Concentration: St Marys River
Estimated Concentration (umho/cm)
0
20
40
60
80
100
120
0
20
40
60
80
100
120
Measured Concentration (umho/cm)

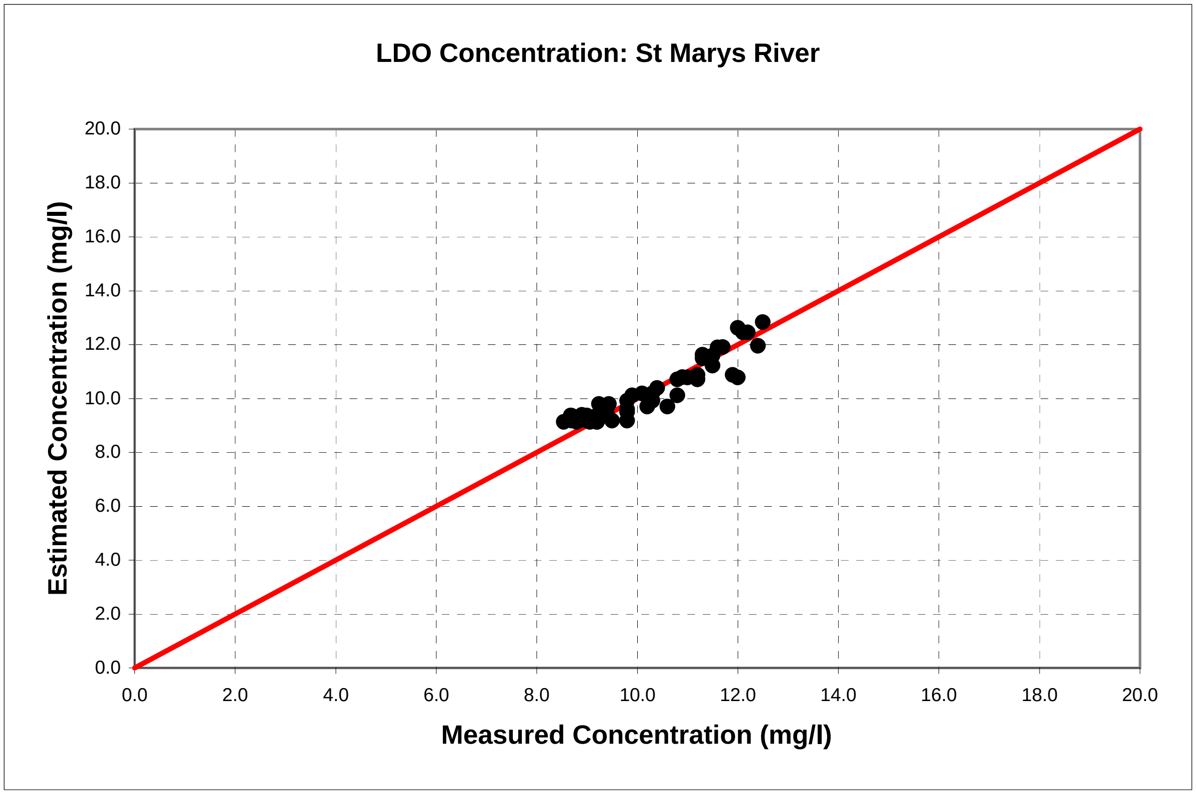

LCond Concentration: St Marys River
Measured conc.
Estimated conc.
LCond Concentration (umho/cm)
0
20
40
60
80
100
120
1997
1998
1999
2000
2001
2002
2003
2004
2005
Year



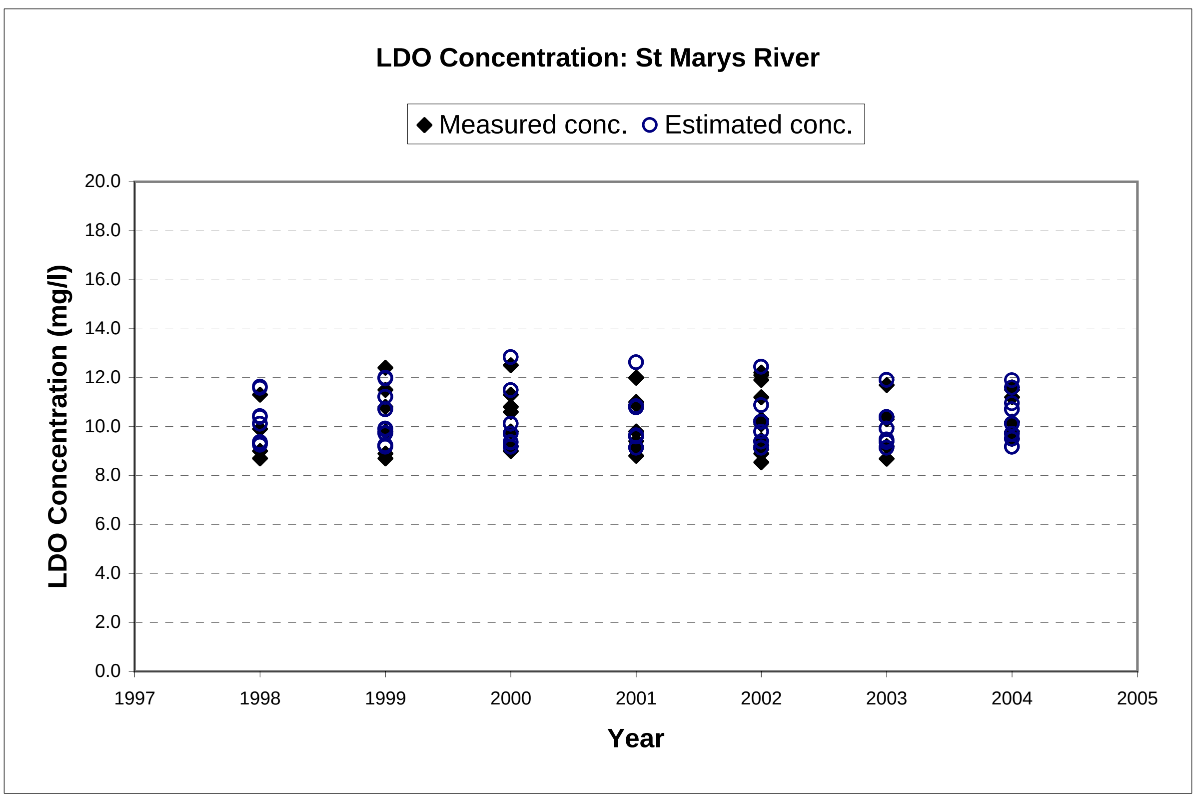
FDO Concentration: St Marys River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0



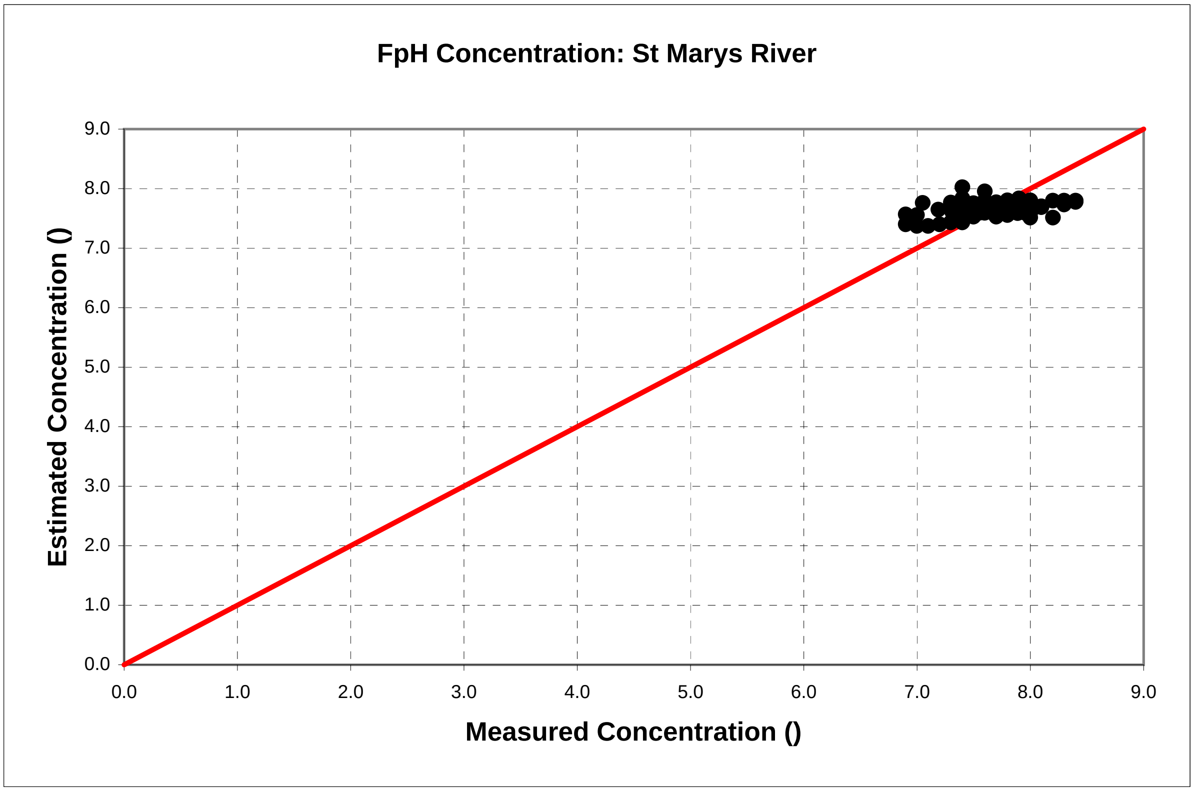
FDO Concentration: St Marys River
Measured conc.
Estimated conc.
FDO Concentration (mg/l)
Year
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
1997
1998
1999
2000
2001
2002
2003
2004
2005



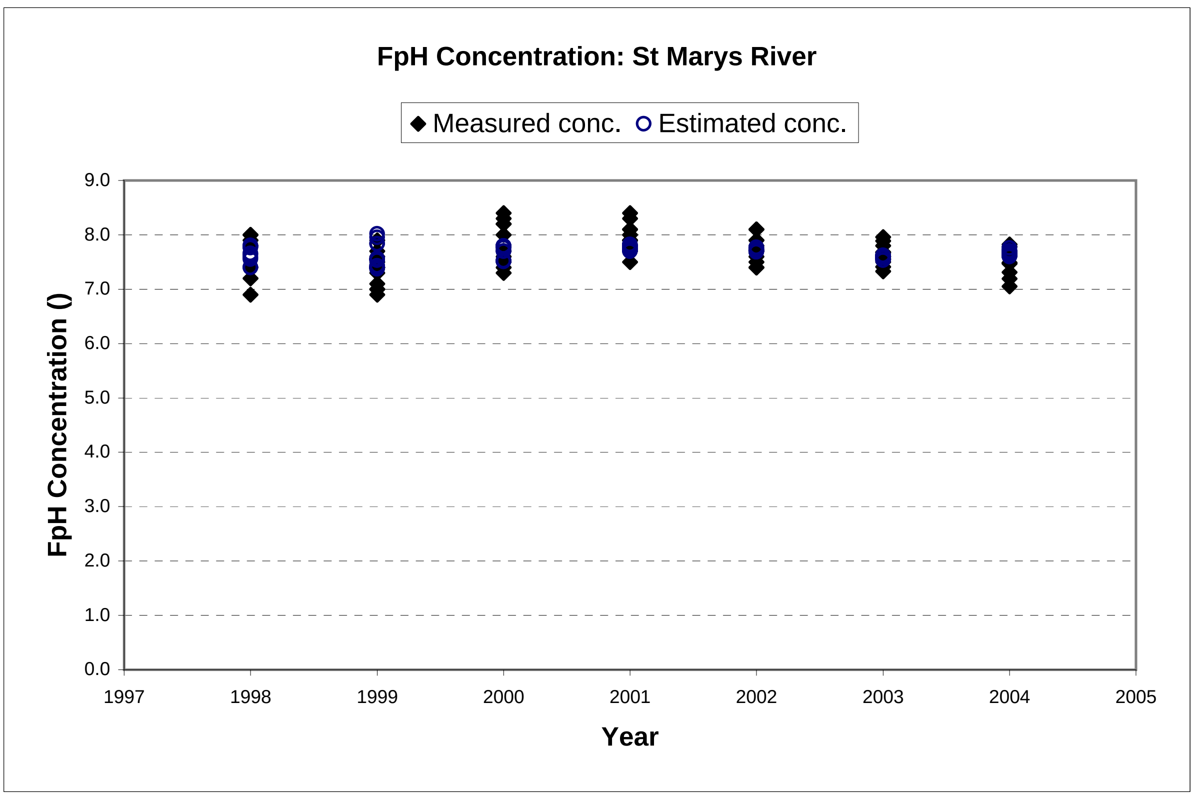
LDO Concentration: St Marys River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0



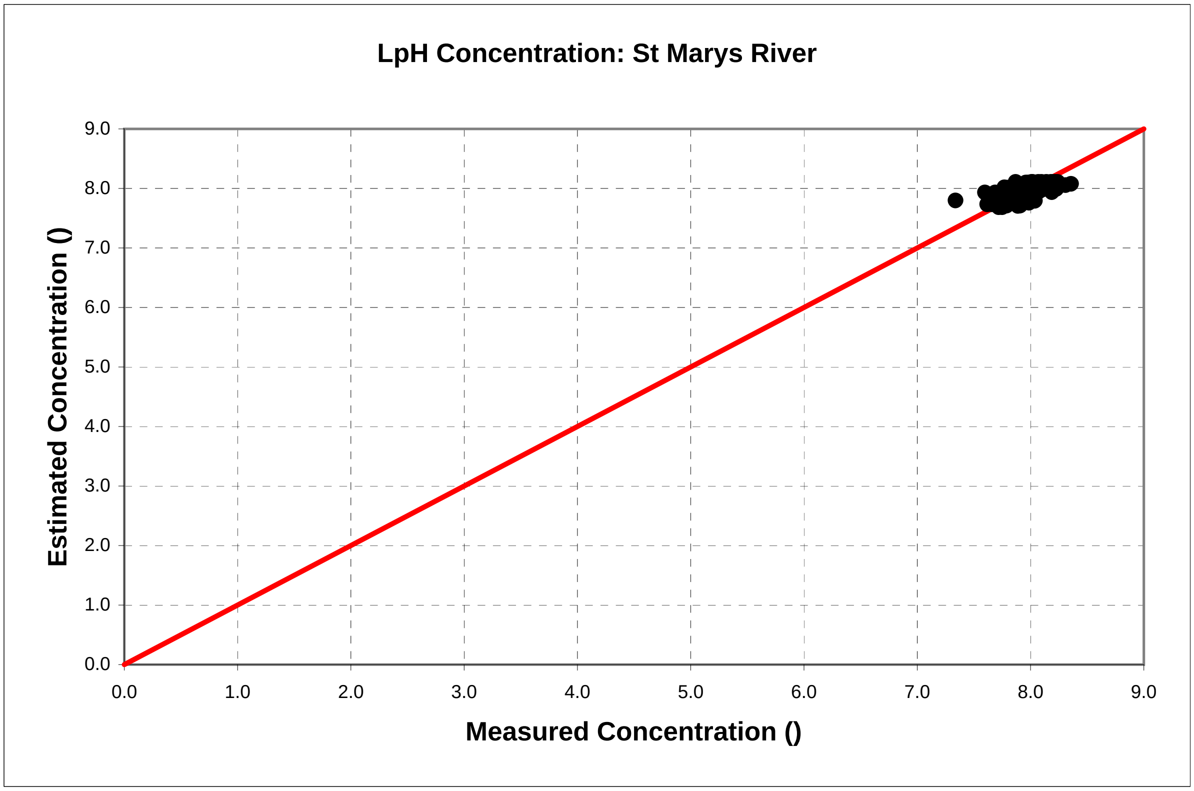
LDO Concentration: St Marys River
Measured conc.
Estimated conc.
LDO Concentration (mg/l)
Year
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
1997
1998
1999
2000
2001
2002
2003
2004
2005

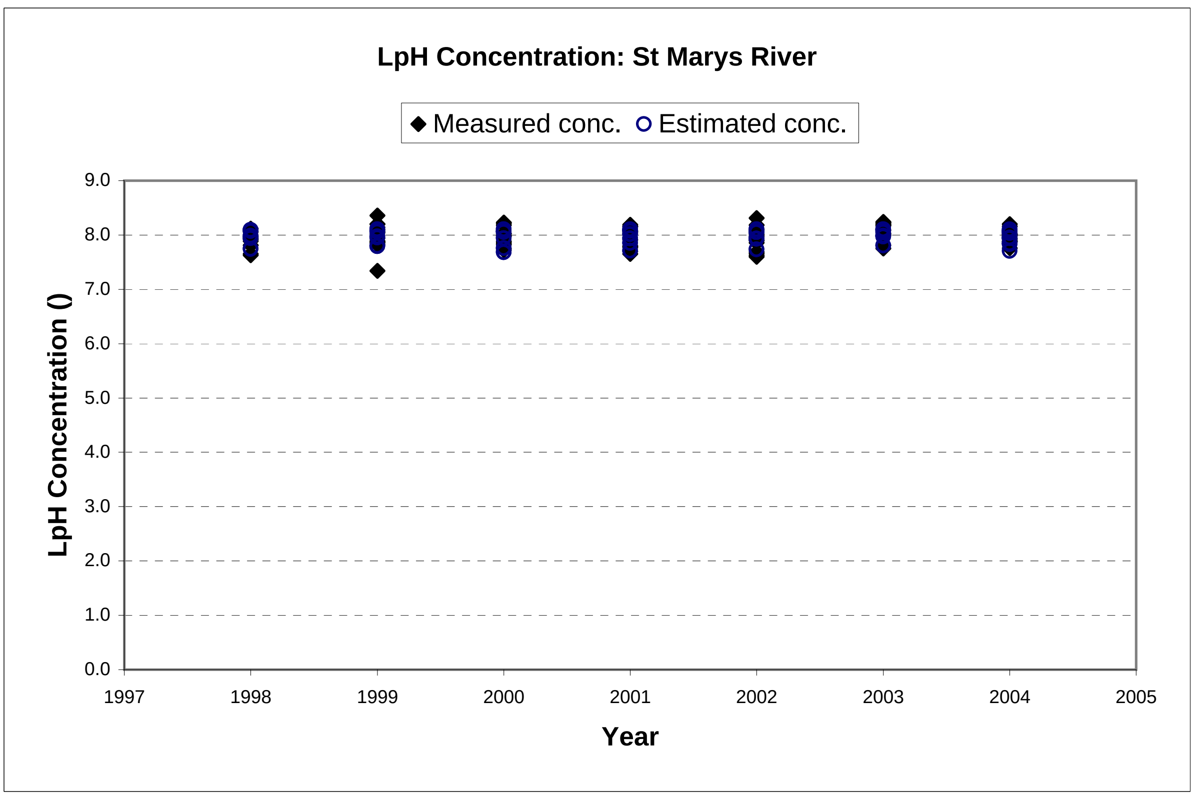


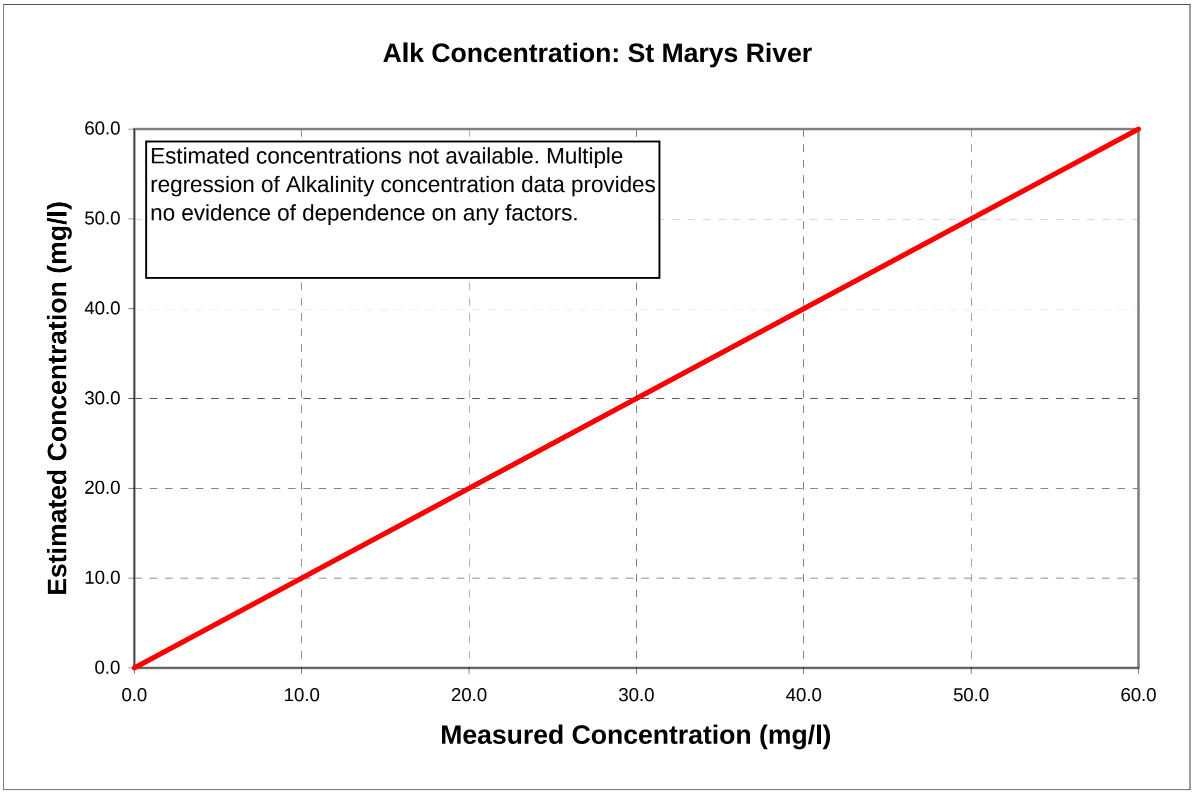
FpH Concentration: St Marys River
Estimated Concentration ()
Measured Concentration ()
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0

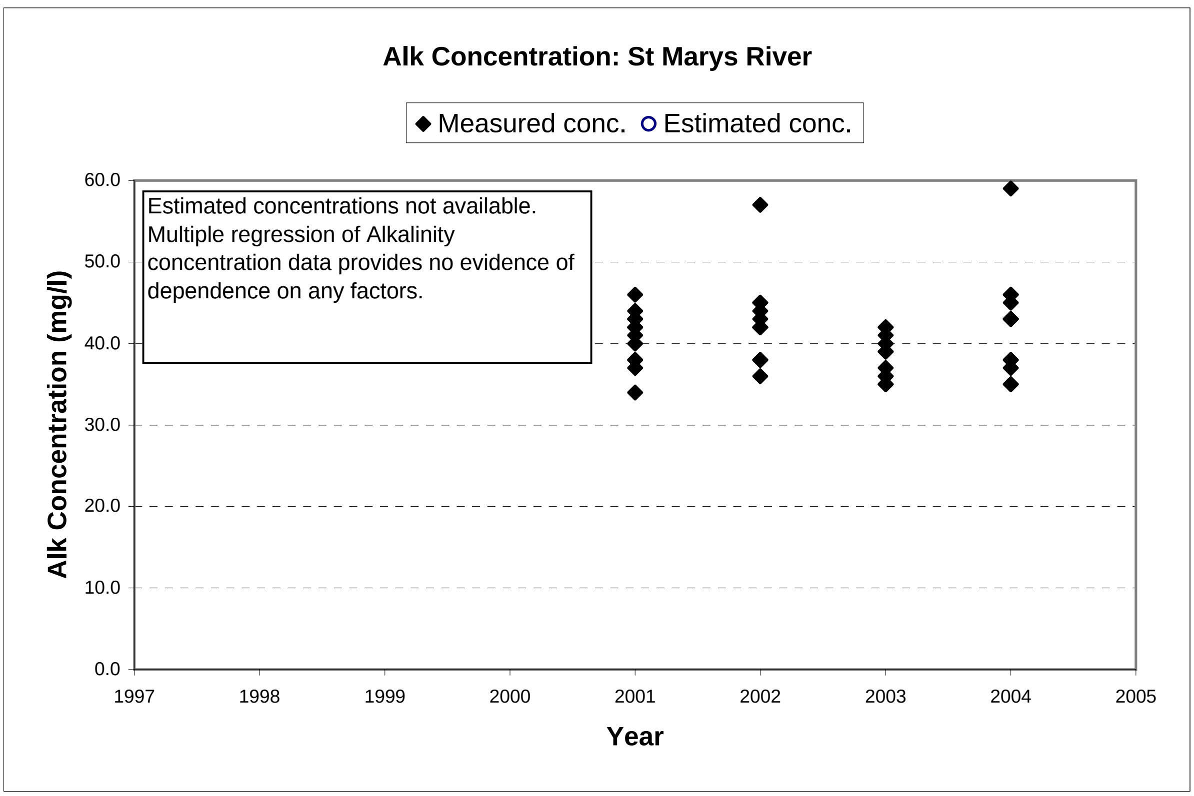


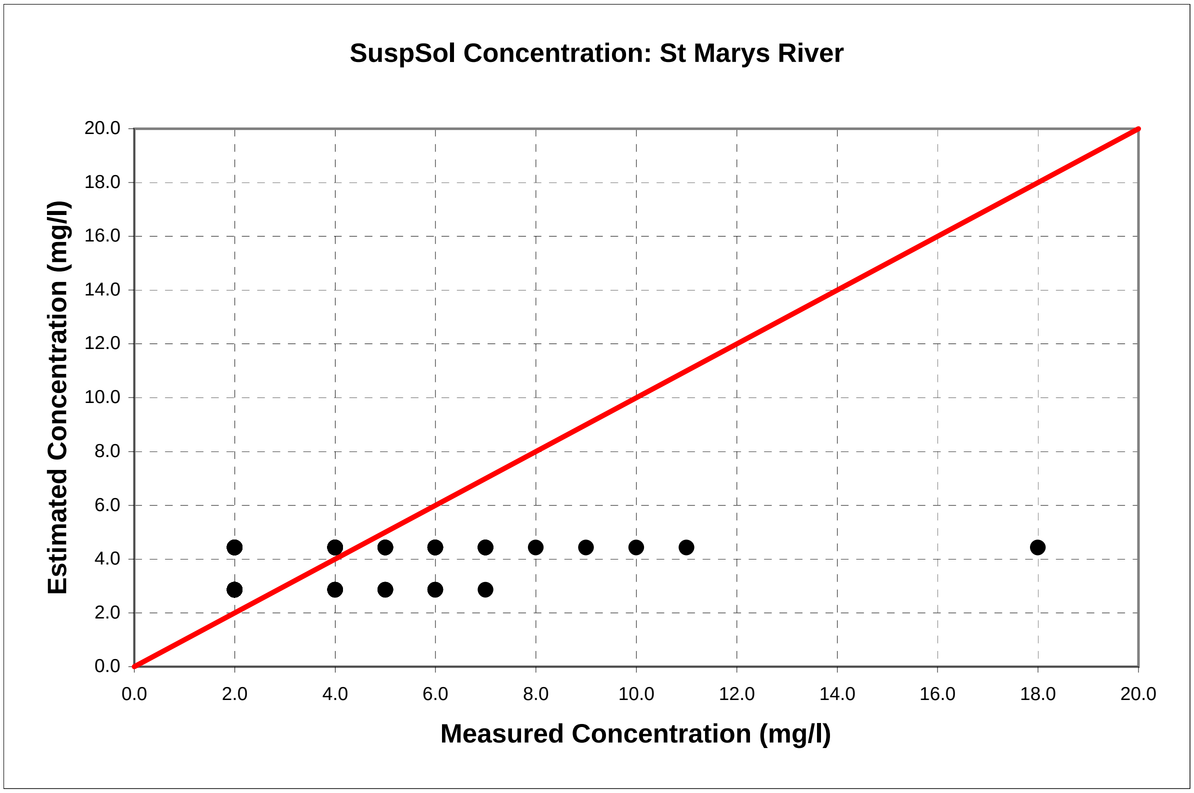
FpH Concentration: St Marys River
Measured conc.
Estimated conc.
FpH Concentration ()
Year
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
1997
1998
1999
2000
2001
2002
2003
2004
2005

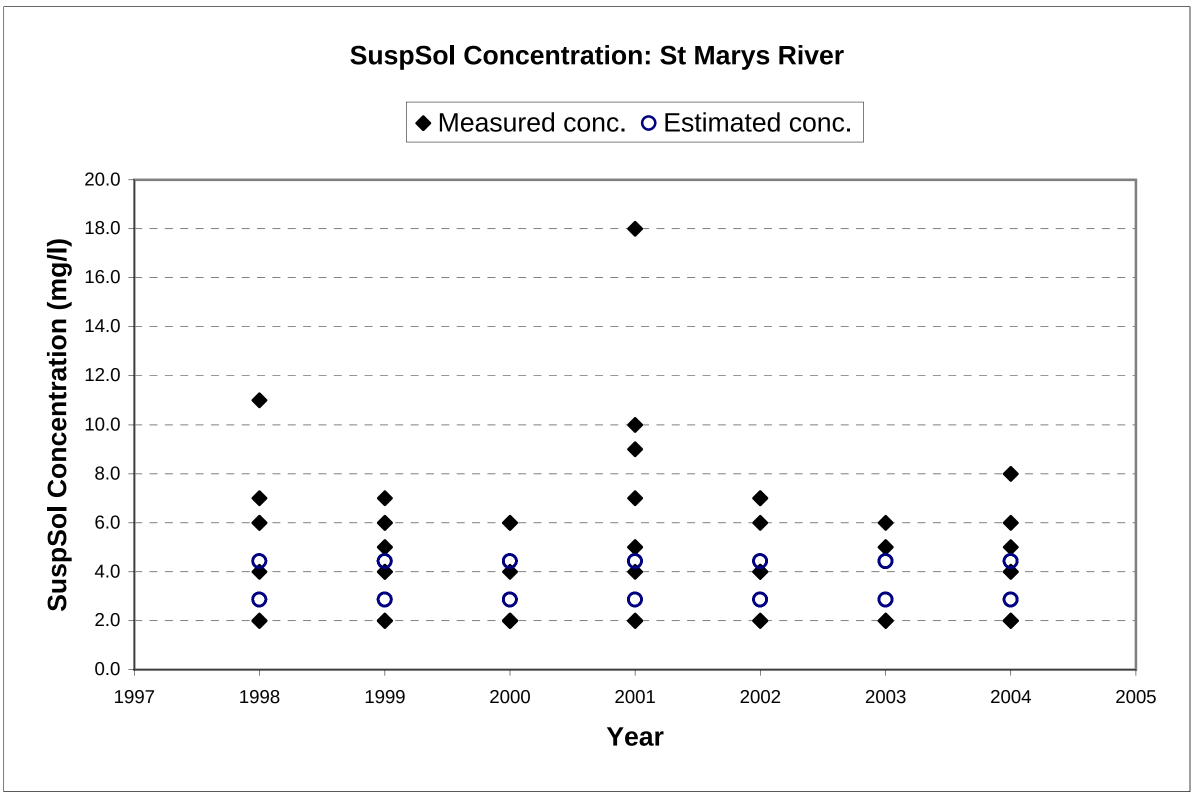

LpH Concentration: St Marys River
Estimated Concentration ()
Measured Concentration ()
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0

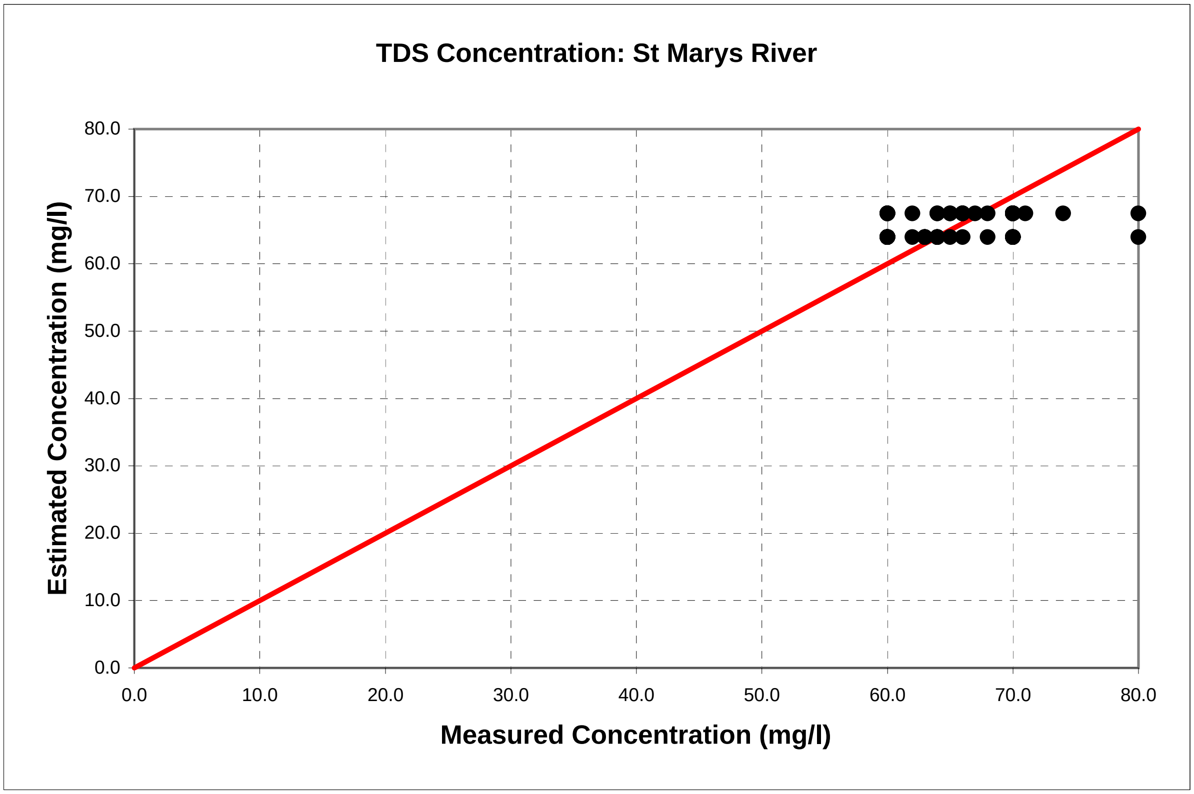

LpH Concentration: St Marys River
Measured conc.
Estimated conc.
LpH Concentration ()
Year
1997
1998
1999
2000
2001
2002
2003
2004
2005

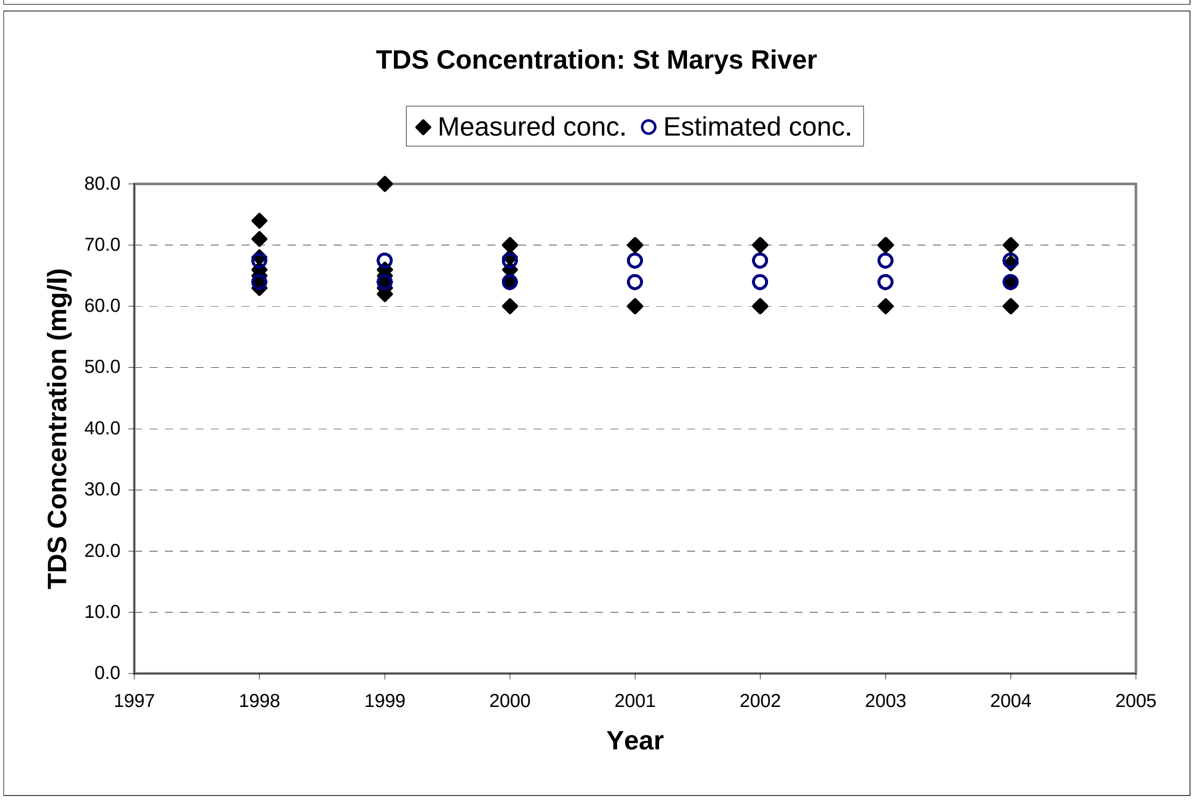

Alk Concentration: St Marys River
Estimated concentrations not available. Multiple regression of Alkalinity concentration data provides no evidence of dependence on any factors.
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.0
10.0
20.0
30.0
40.0
50.0
60.0

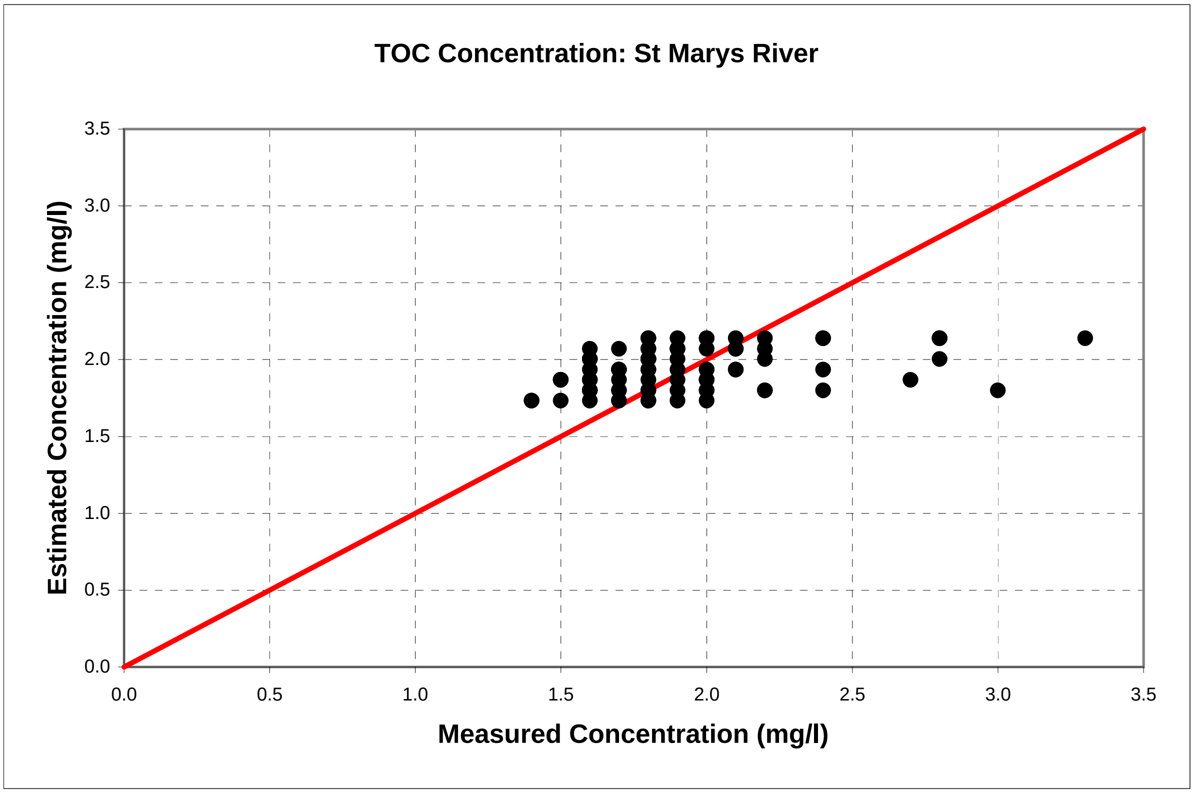

Alk Concentration: St Marys River
Measured conc.
Estimated conc.
Estimated concentrations not available. Multiple regression of Alkalinity concentration data provides no evidence of dependence on any factors.
Alk Concentration (mg/l)
Year
0.0
10.0
20.0
30.0
40.0
50.0
60.0
1997
1998
1999
2000
2001
2002
2003
2004
2005

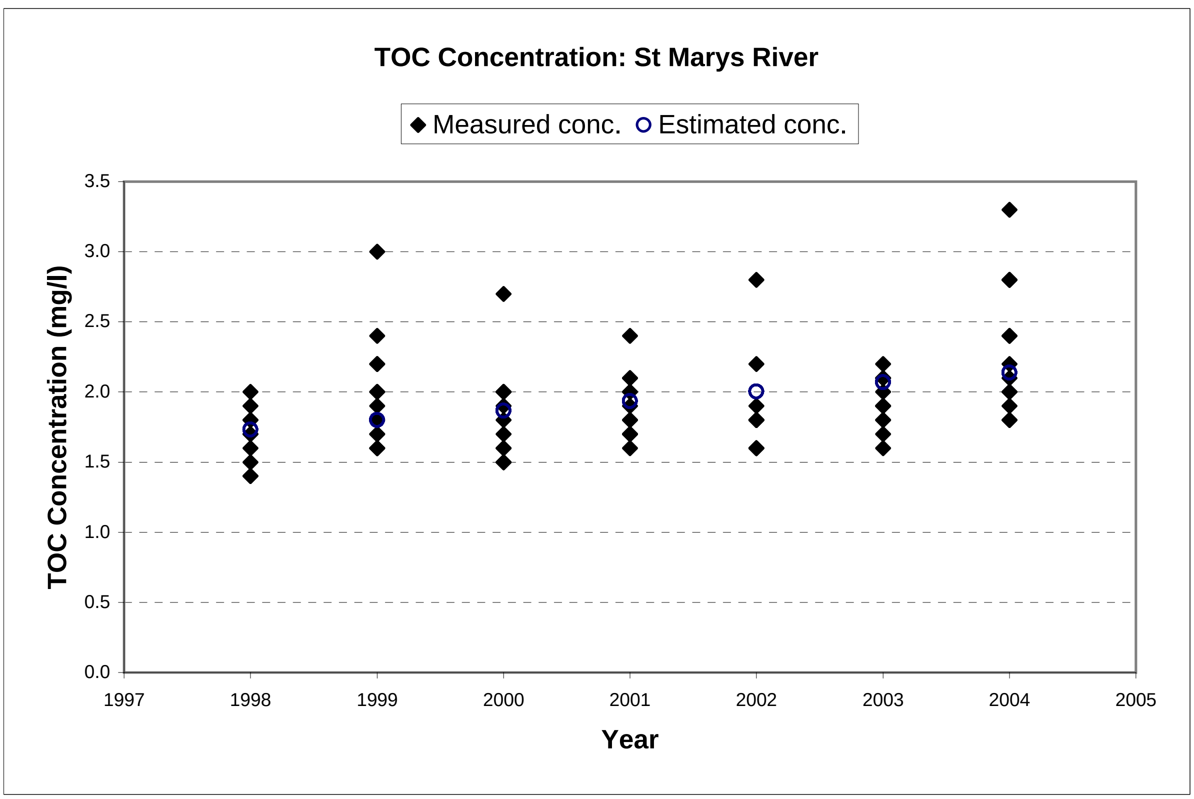

SuspSol Concentration: St Marys River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0

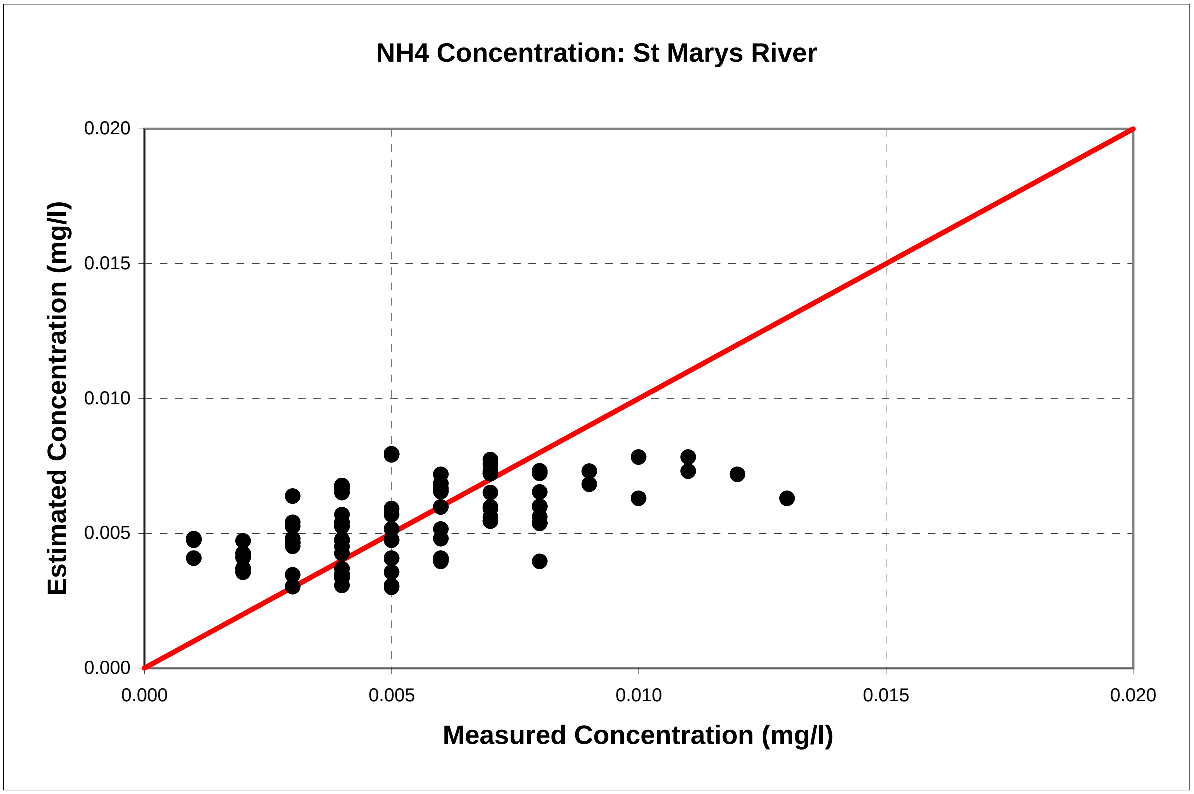

SuspSol Concentration: St Marys River
Measured conc.
Estimated conc.
SuspSol Concentration (mg/l)
Year
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
1997
1998
1999
2000
2001
2002
2003
2004
2005

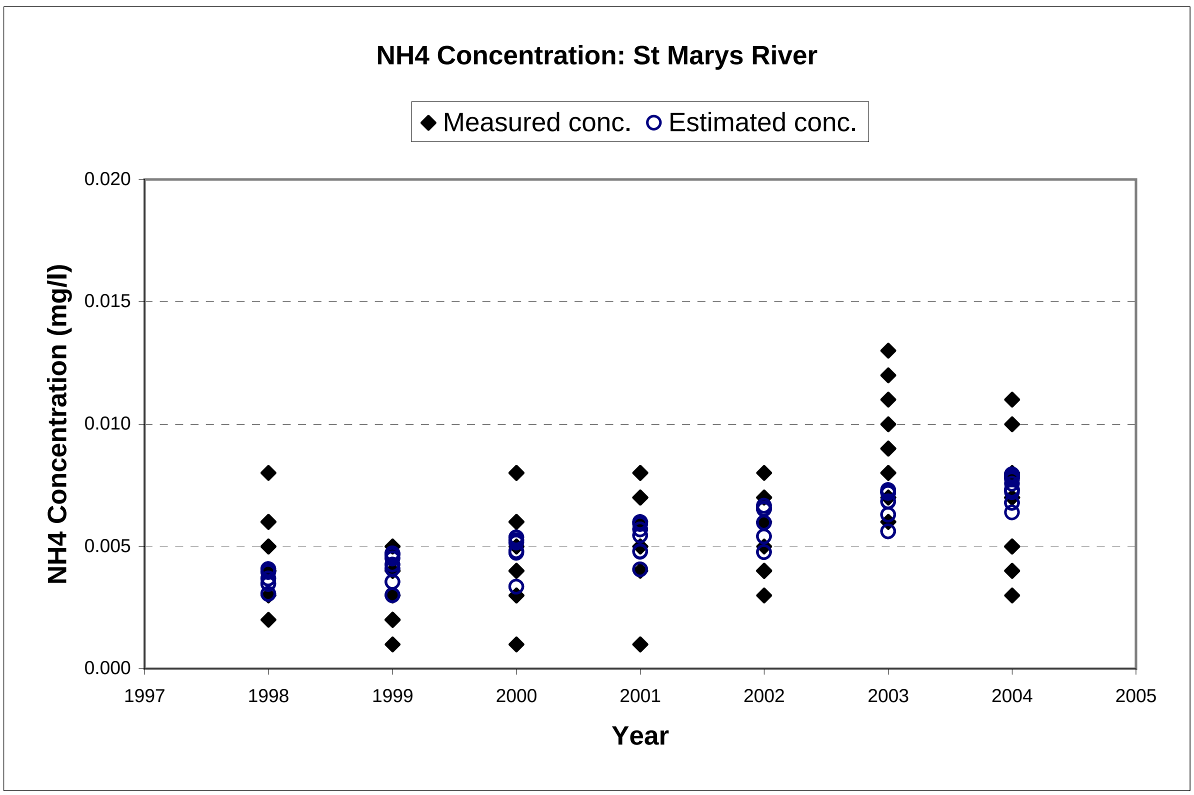

TDS Concentration: St Marys River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0

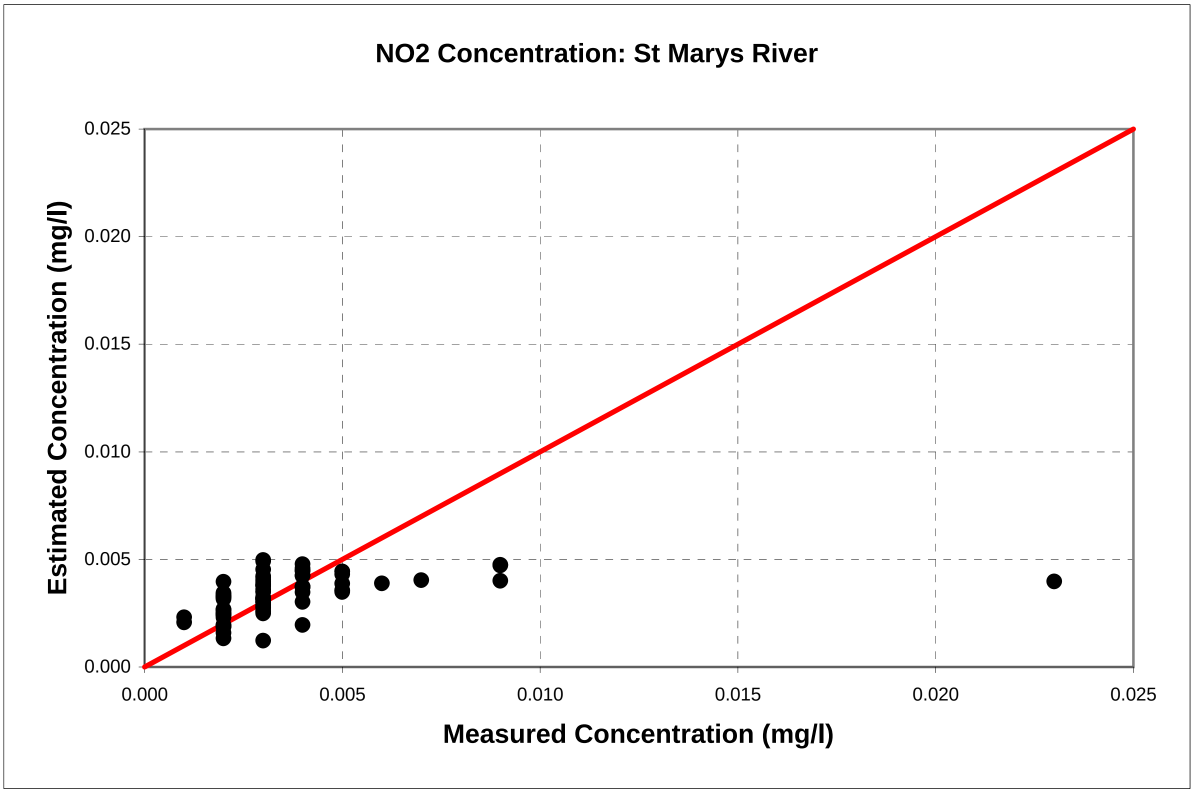

TDS Concentration: St Marys River
Measured conc.
Estimated conc.
TDS Concentration (mg/l)
Year
0.0
10.0
20.0
30.0
40.0
50.0
60.0
70.0
80.0
1997
1998
1999
2000
2001
2002
2003
2004
2005

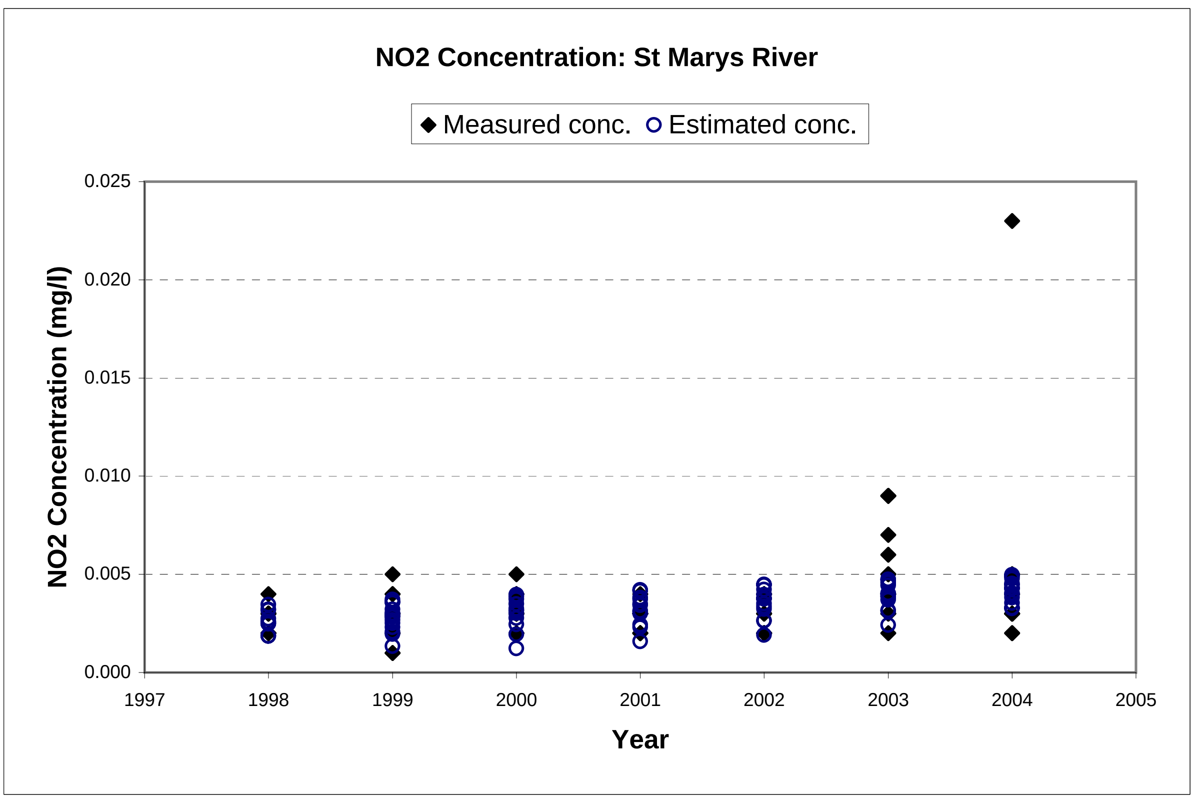

TOC Concentration: St Marys River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5

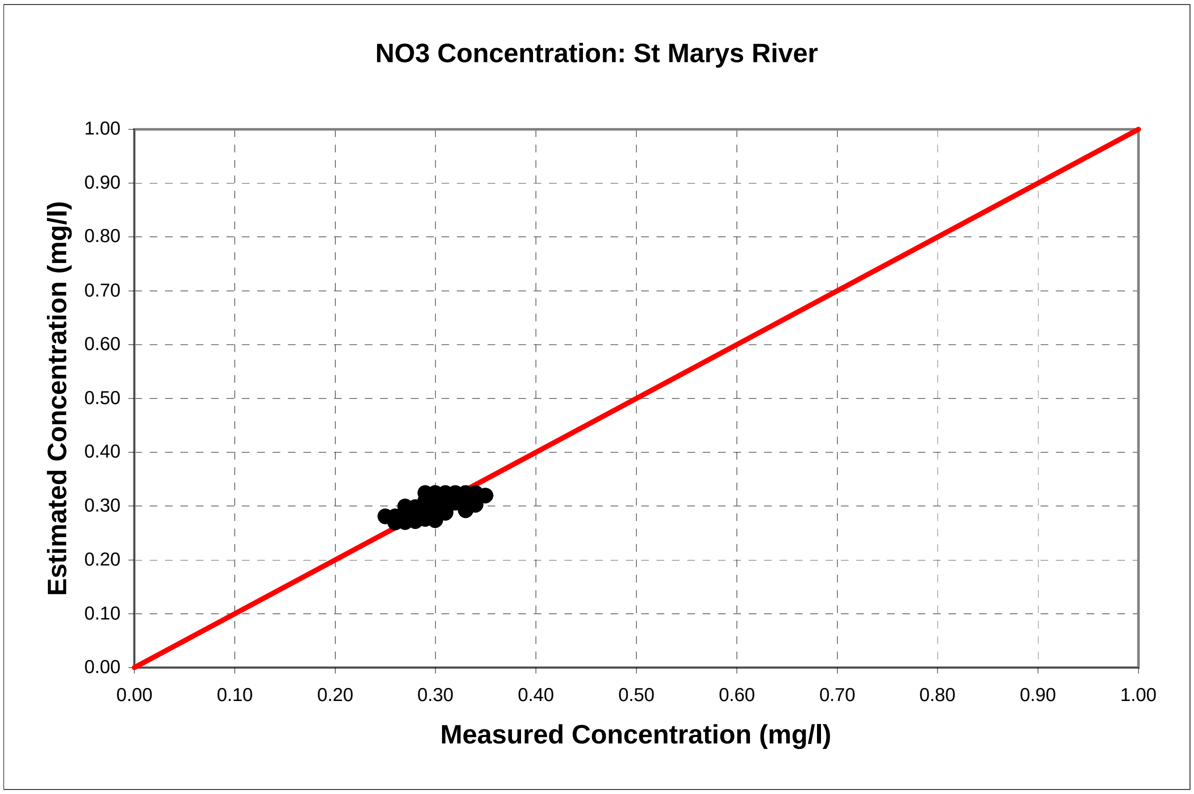

TOC Concentration: St Marys River
Measured conc.
Estimated conc.
TOC Concentration (mg/l)
Year
1997
1998
1999
2000
2001
2002
2003
2004
2005


NH4 Concentration: St Marys River
Estimated Concentration (mg/l)
0.020
0.015
0.010
0.005
0.000
0.000
0.005
0.010
0.015
0.020
Measured Concentration (mg/l)

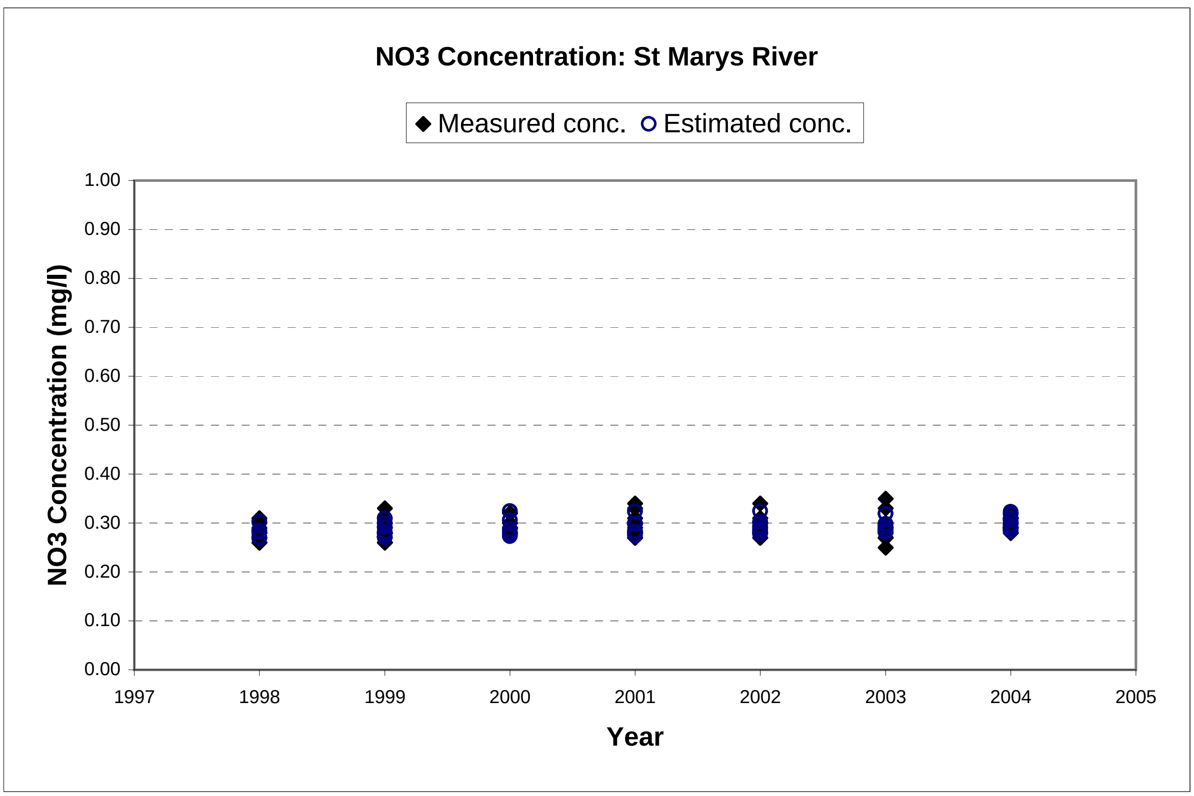

NH4 Concentration: St Marys River
Measured conc.
Estimated conc.
NH4 Concentration (mg/l)
0.020
0.015
0.010
0.005
0.000
1997
1998
1999
2000
2001
2002
2003
2004
2005
Year


NO2 Concentration: St Marys River
Estimated Concentration (mg/l)
0.025
0.020
0.015
0.010
0.005
0.000
0.000
0.005
0.010
0.015
0.020
0.025
Measured Concentration (mg/l)

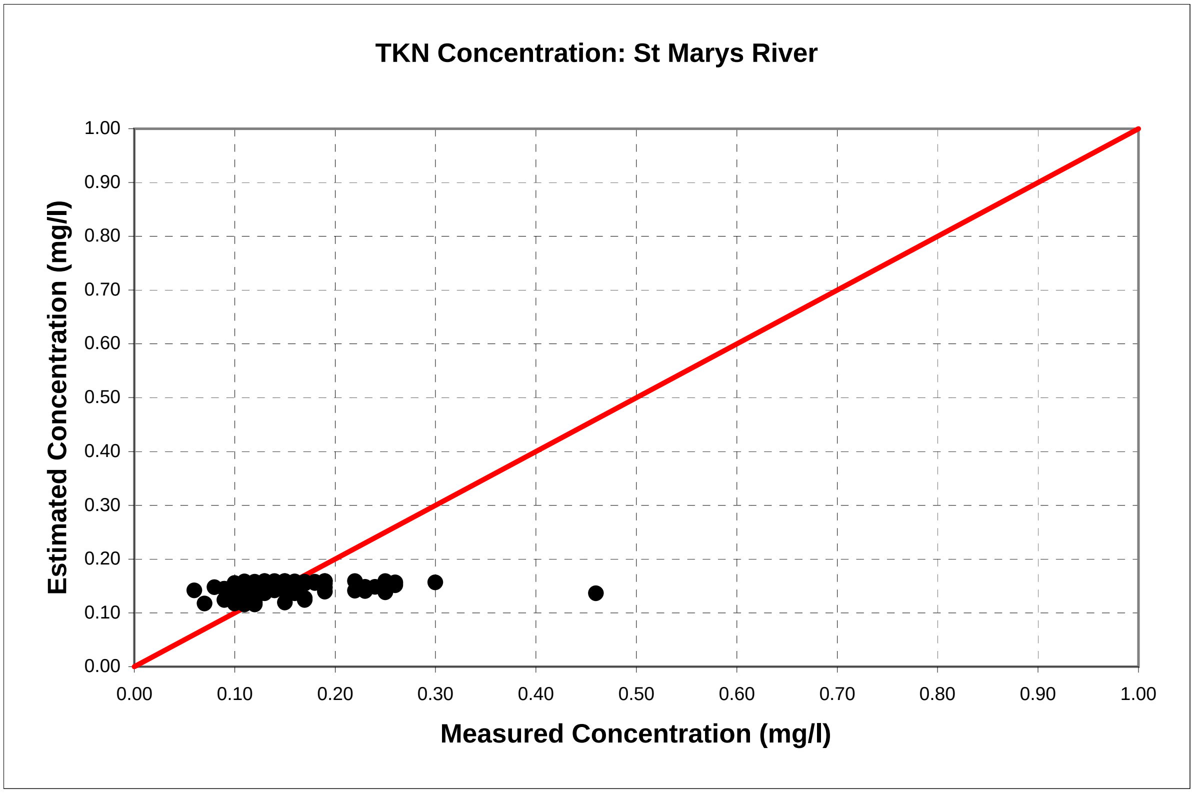

NO2 Concentration: St Marys River
Measured conc.
Estimated conc.
NO2 Concentration (mg/l)
0.025
0.020
0.015
0.010
0.005
0.000
1997
1998
1999
2000
2001
2002
2003
2004
2005
Year



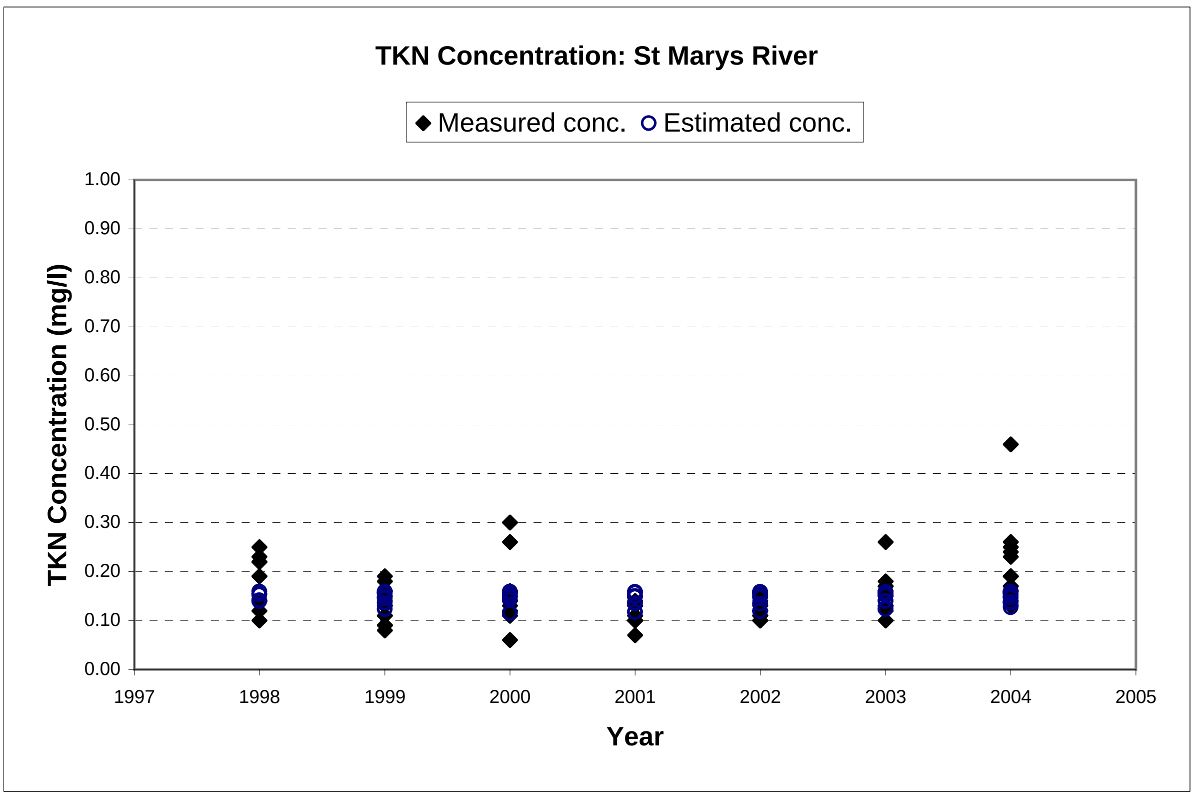
NO3 Concentration: St Marys River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
1.00



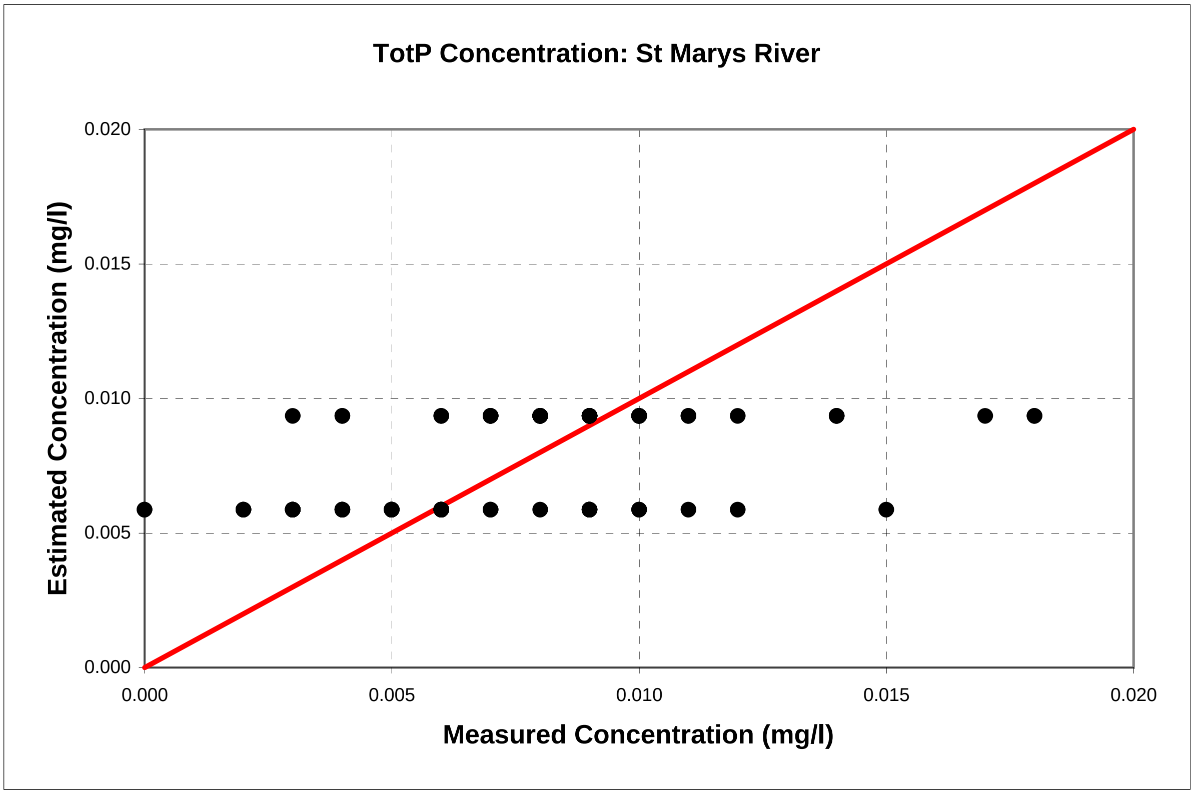
NO3 Concentration: St Marys River
Measured conc.
Estimated conc.
NO3 Concentration (mg/l)
Year
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
1.00
1997
1998
1999
2000
2001
2002
2003
2004
2005



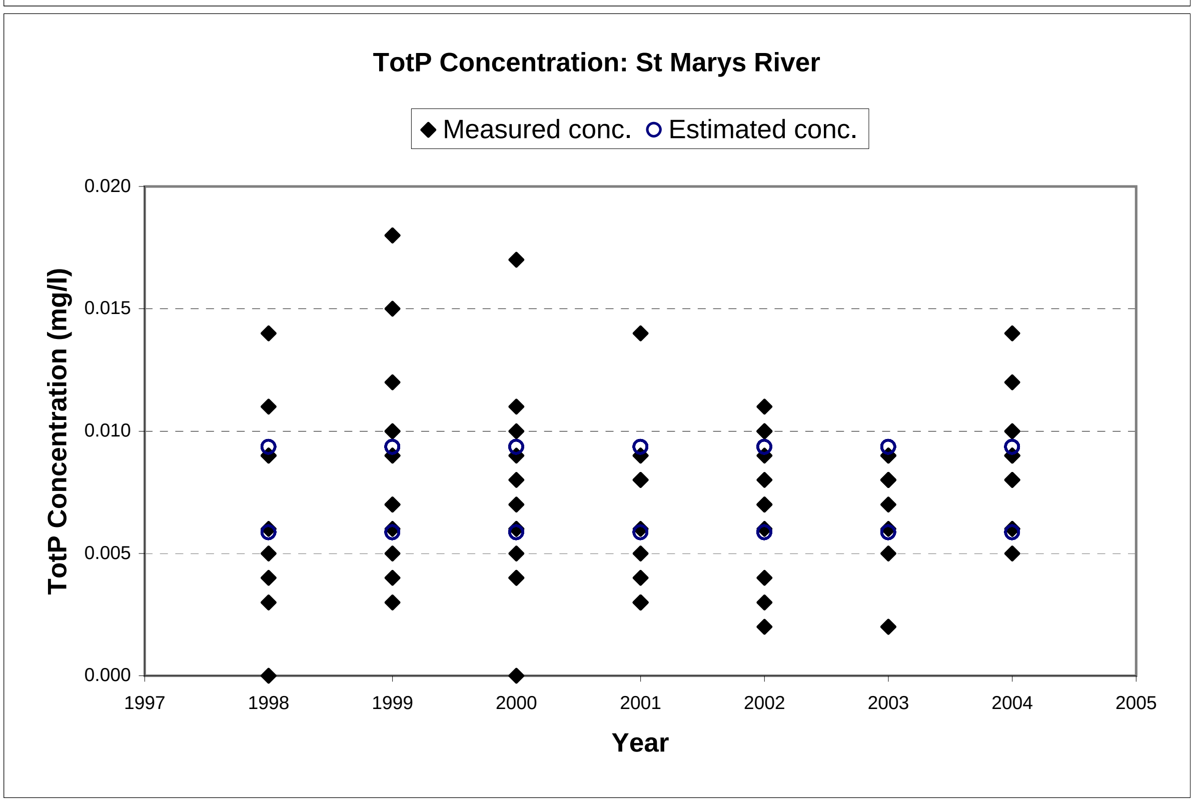
TKN Concentration: St Marys River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
1.00



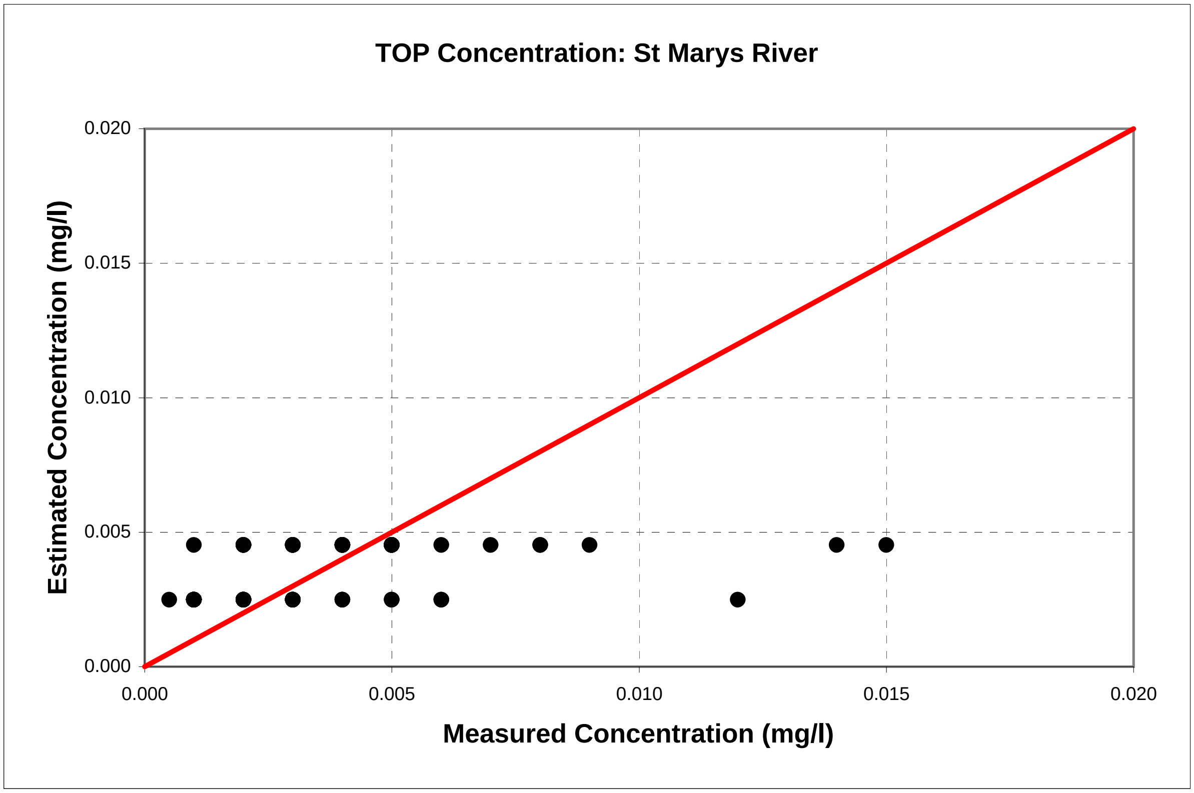
TKN Concentration: St Marys River
Measured conc.
Estimated conc.
TKN Concentration (mg/l)
Year
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
1997
1998
1999
2000
2001
2002
2003
2004
2005

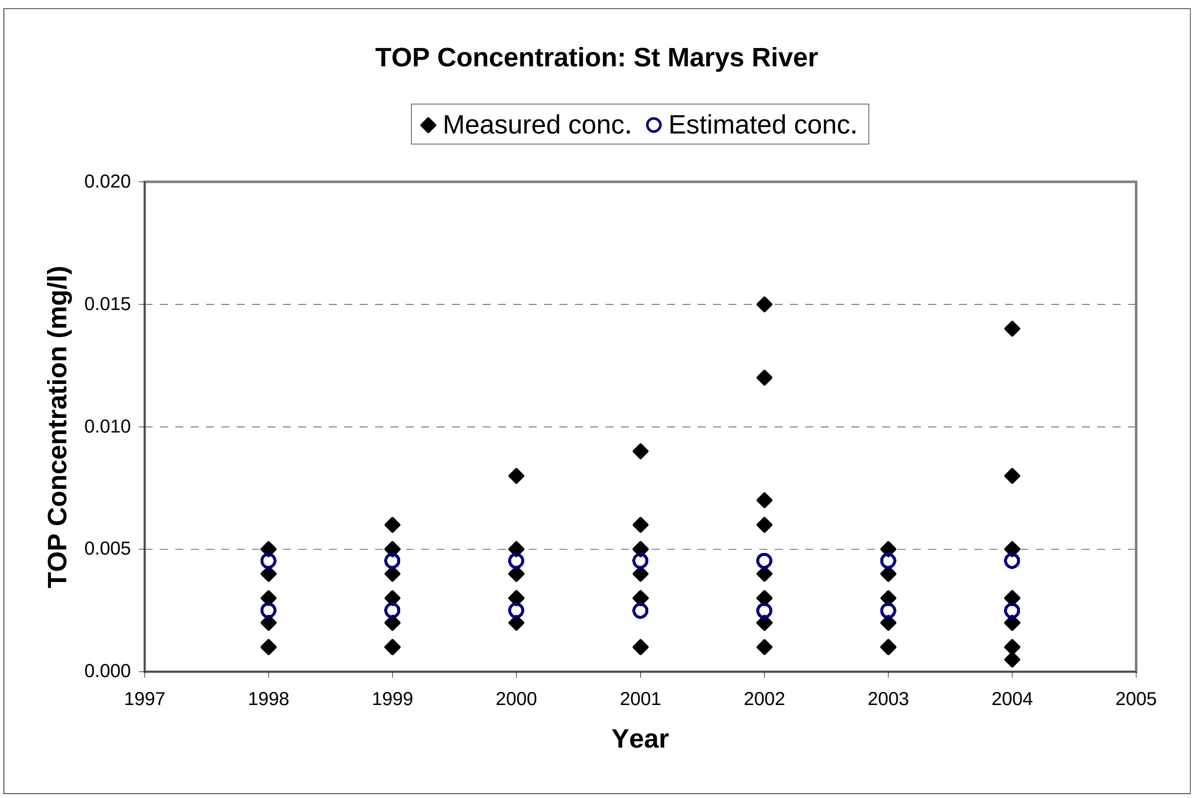


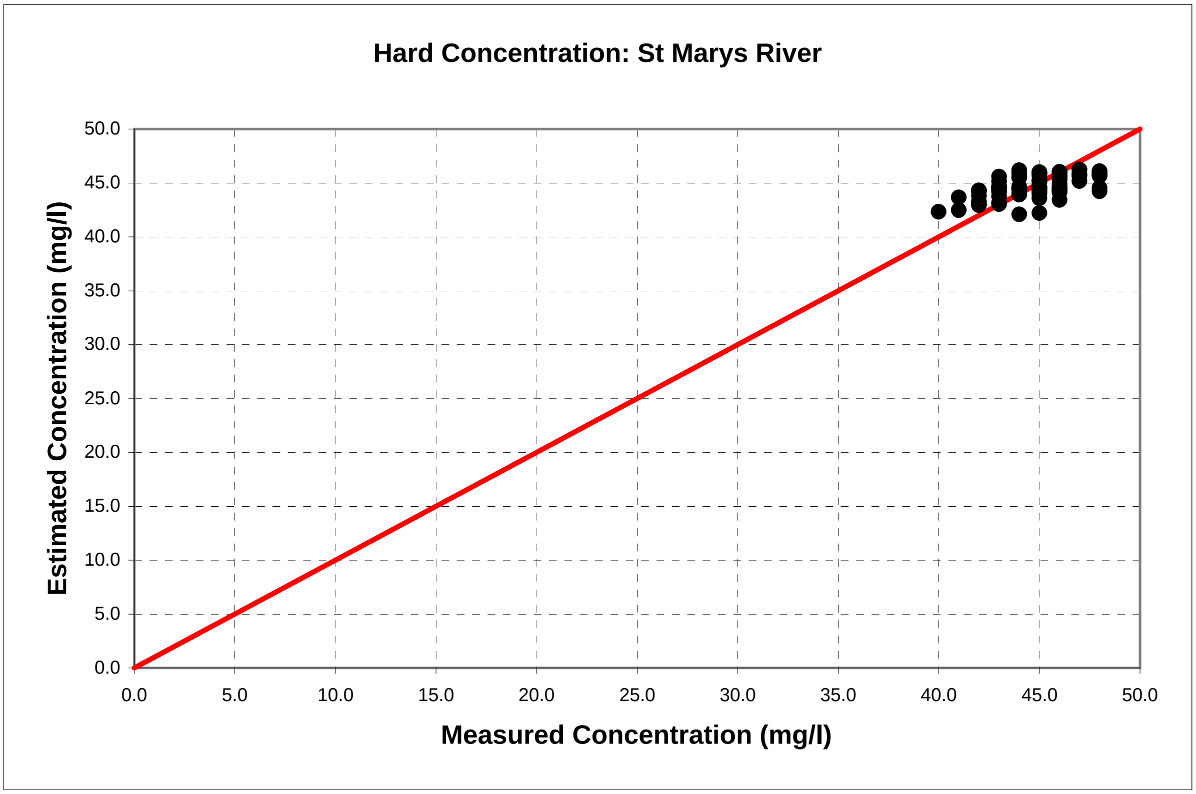
TotP Concentration: St Marys River
Estimated Concentration (mg/l)
0.020
0.015
0.010
0.005
0.000
0.000
0.005
0.010
0.015
0.020
Measured Concentration (mg/l)

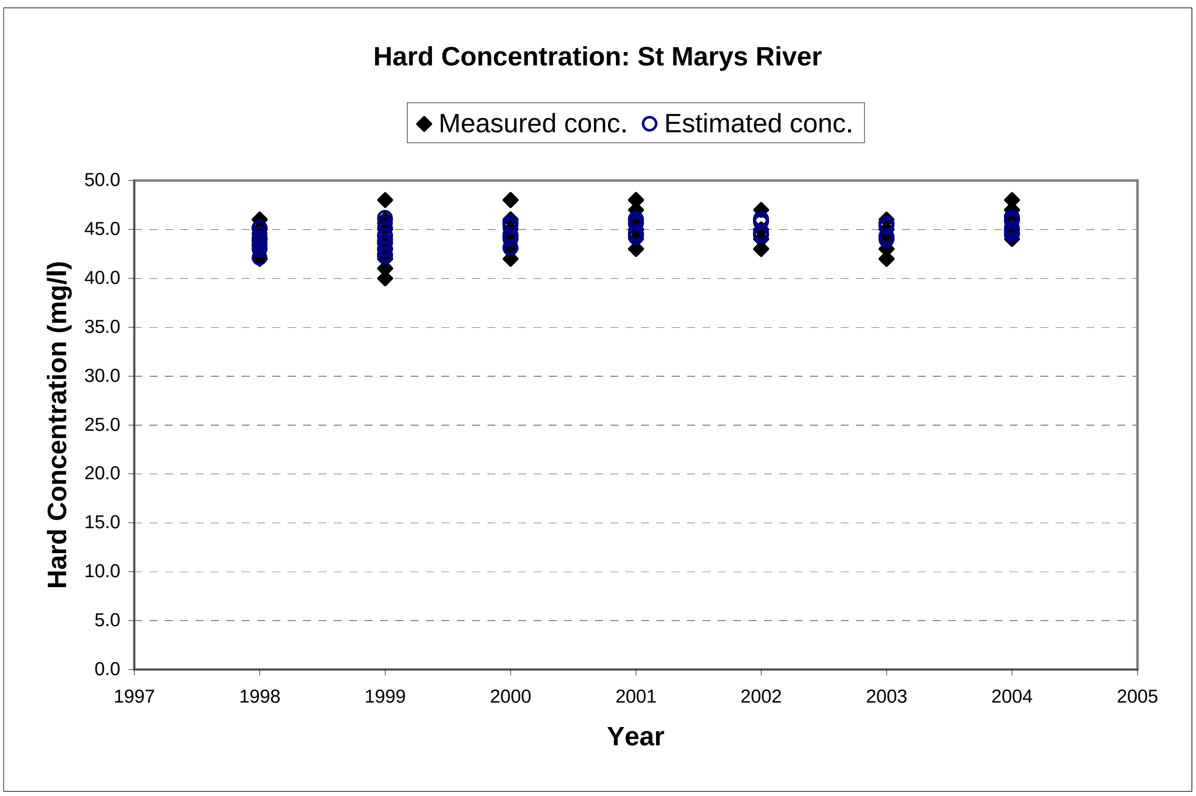


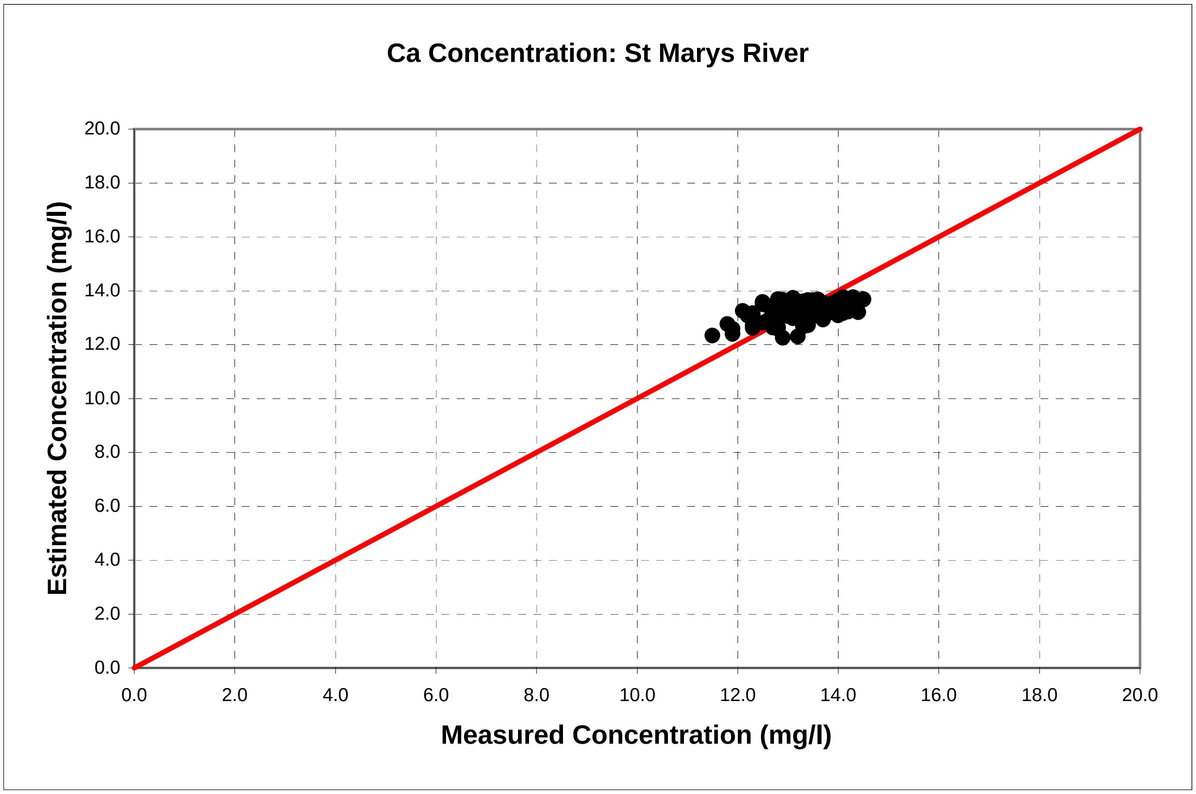
TotP Concentration: St Marys River
Measured conc.
Estimated conc.
TotP Concentration (mg/l)
0.020
0.015
0.010
0.005
0.000
1997
1998
1999
2000
2001
2002
2003
2004
2005
Year


TOP Concentration: St Marys River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.000
0.005
0.010
0.015
0.020

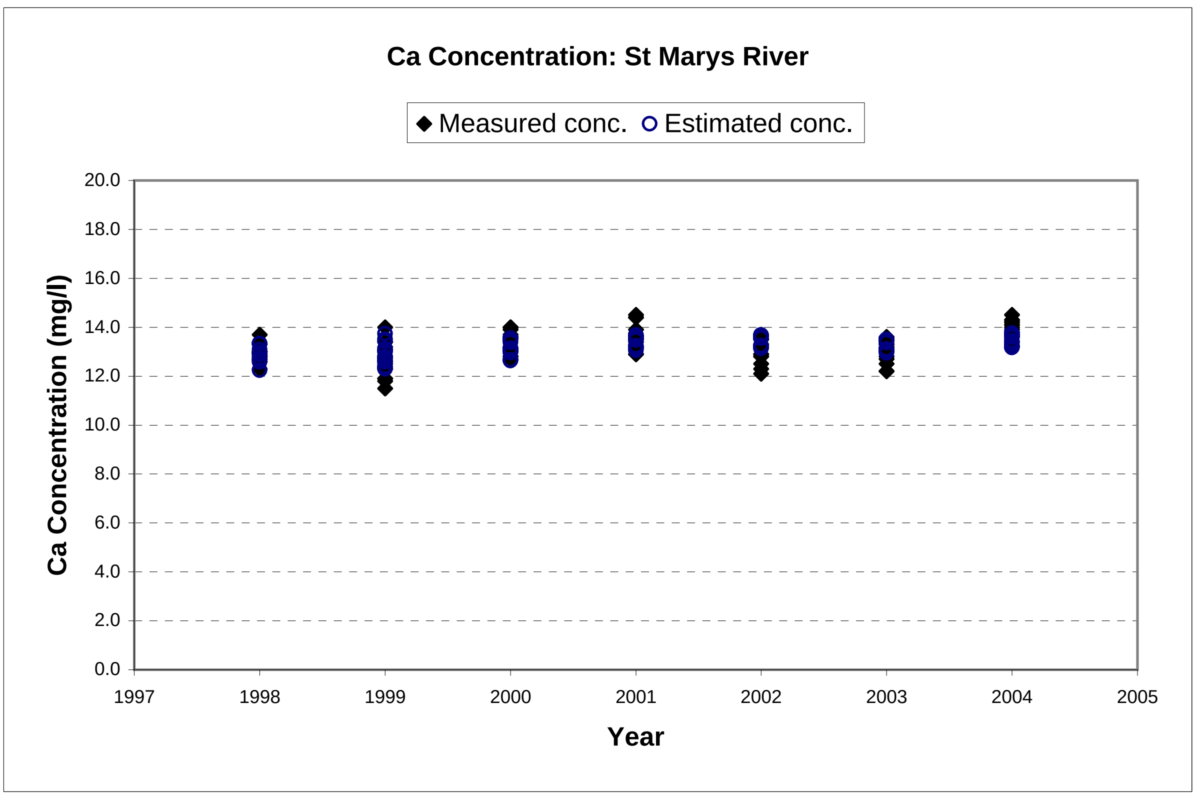

TOP Concentration: St Marys River
Measured conc.
Estimated conc.
TOP Concentration (mg/l)
Year
0.000
0.005
0.010
0.015
0.020
1997
1998
1999
2000
2001
2002
2003
2004
2005


Hard Concentration: St Marys River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
40.0
45.0
50.0

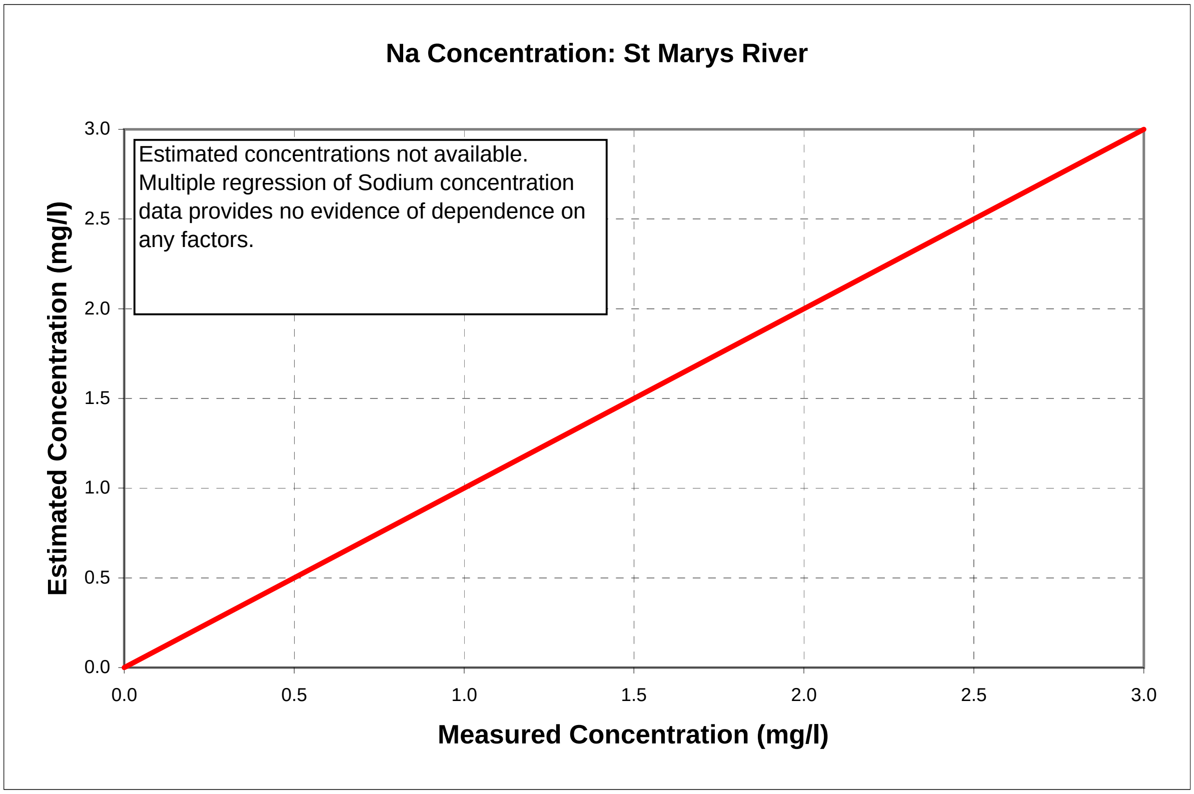

Hard Concentration: St Marys River
Measured conc.
Estimated conc.
Hard Concentration (mg/l)
Year
0.0
5.0
10.0
15.0
20.0
25.0
30.0
35.0
40.0
45.0
50.0
1997
1998
1999
2000
2001
2002
2003
2004
2005

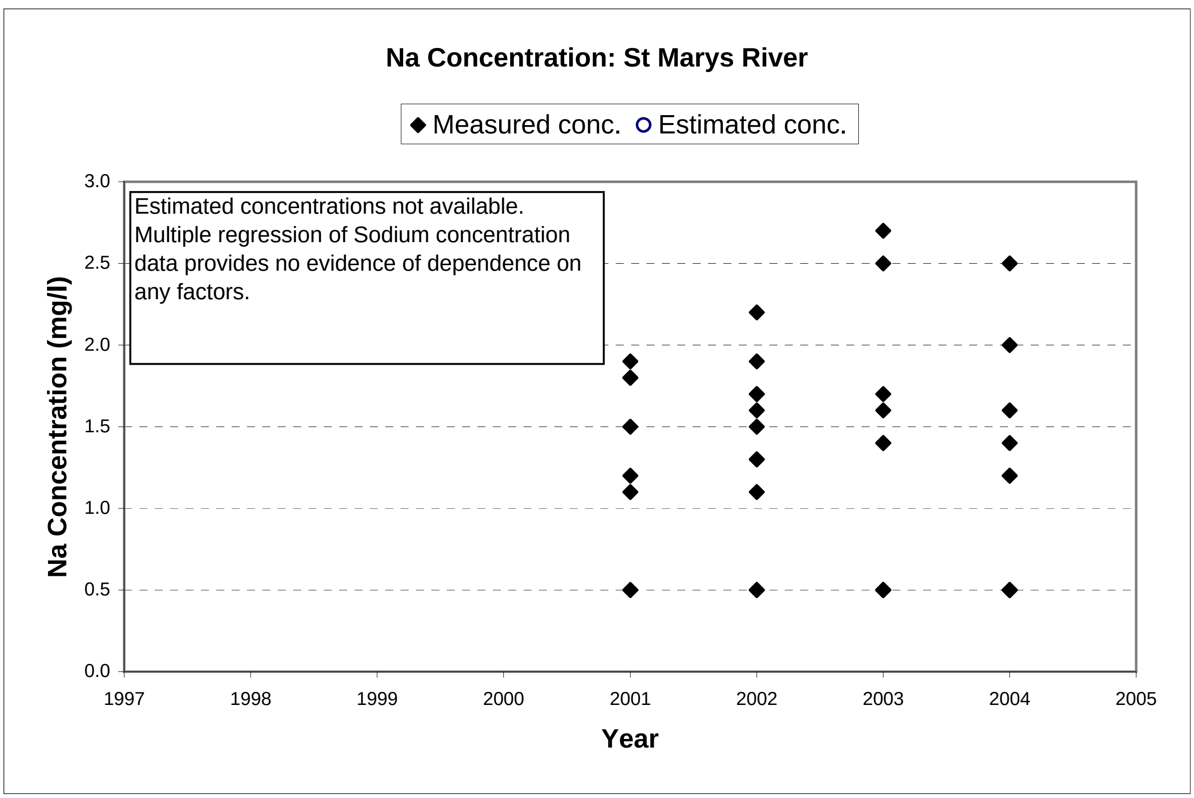


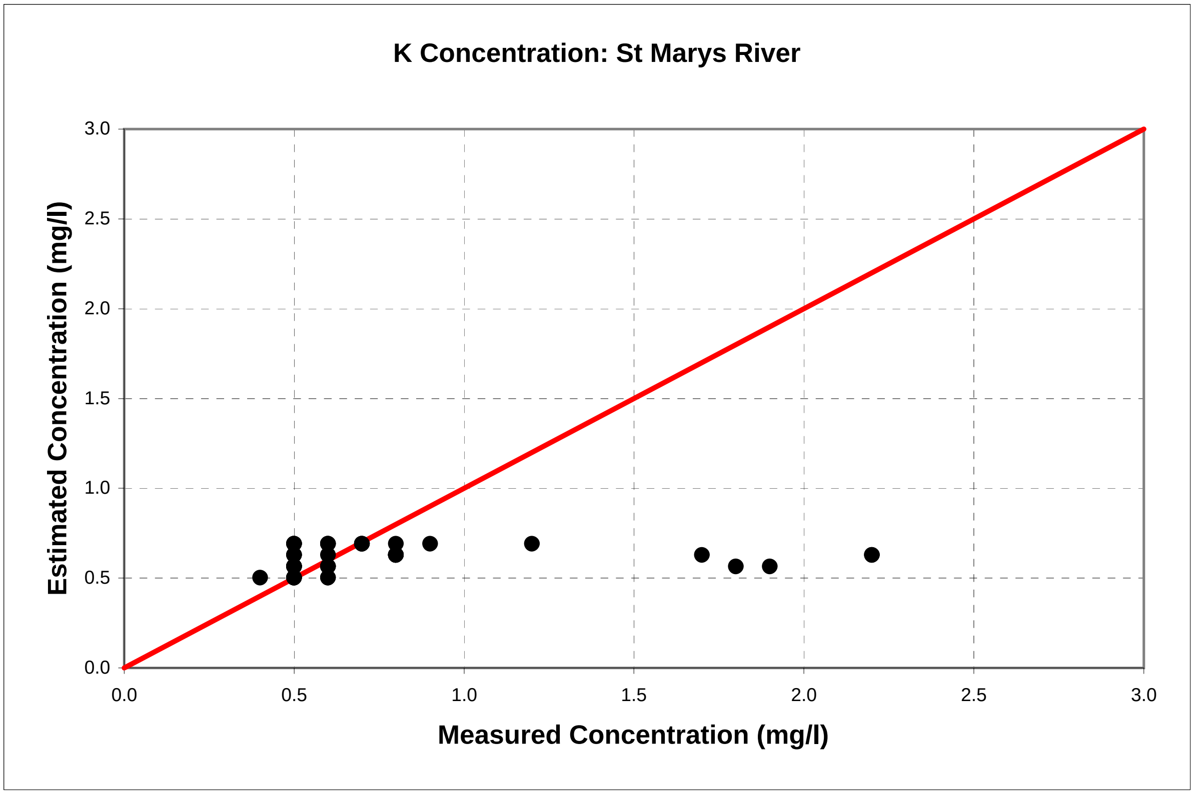
Ca Concentration: St Marys River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0



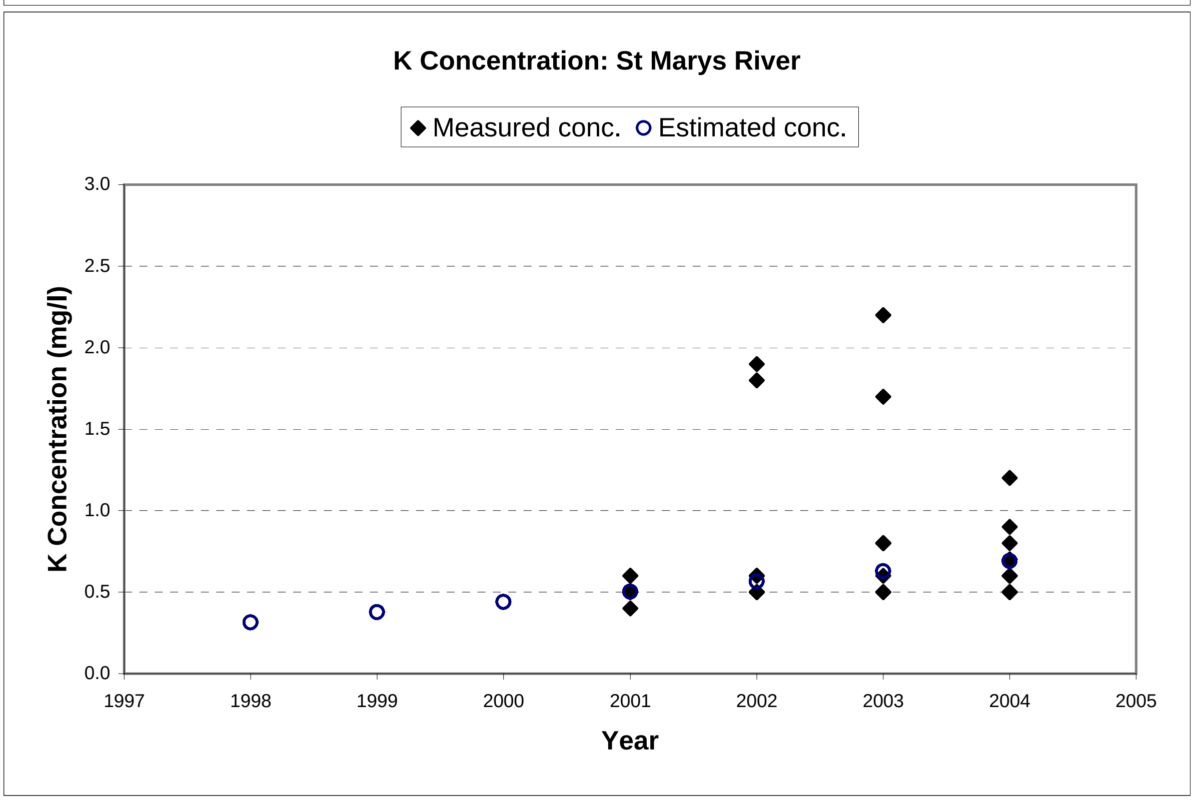
Ca Concentration: St Marys River
Measured conc.
Estimated conc.
Ca Concentration (mg/l)
Year
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
1997
1998
1999
2000
2001
2002
2003
2004
2005


Na Concentration: St Marys River
Estimated concentrations not available.
Multiple regression of Sodium concentration
data provides no evidence of dependence on
any factors.
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
3.0
2.5
2.0
1.5
1.0
0.5
0.0

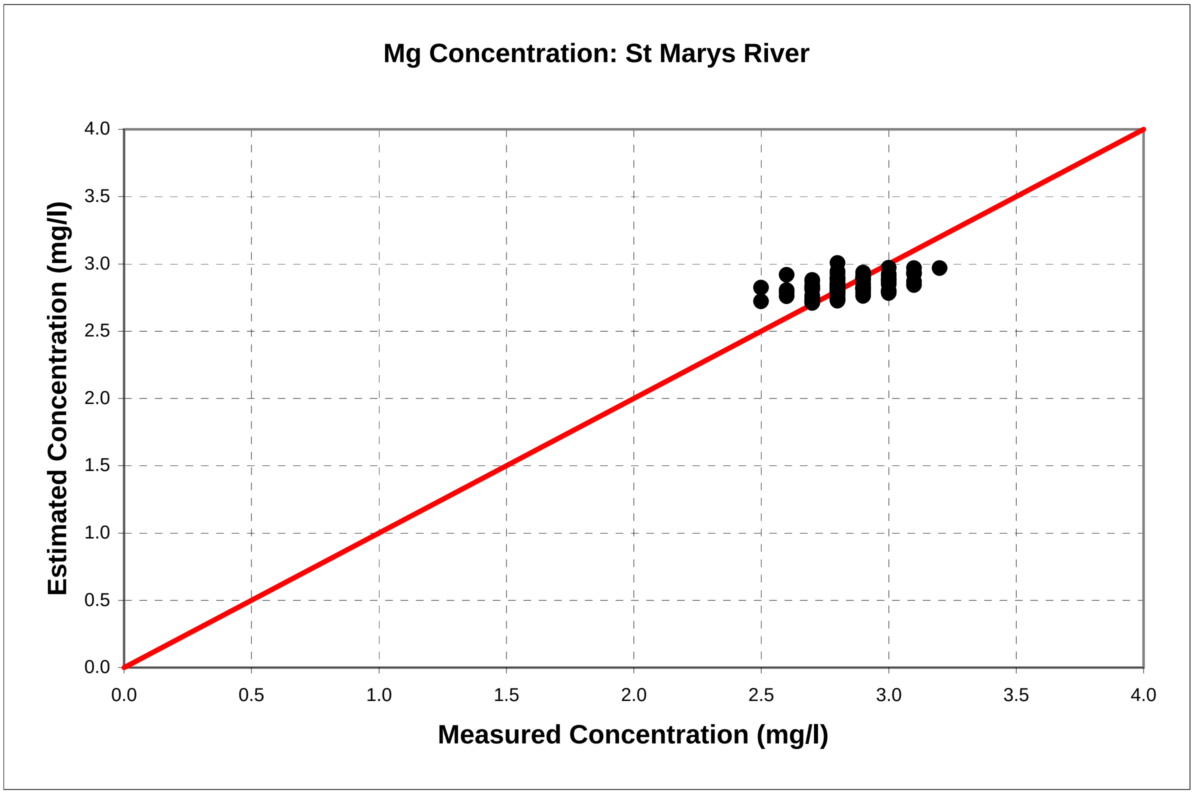

Na Concentration: St Marys River
Measured conc.
Estimated conc.
Estimated concentrations not available.
Multiple regression of Sodium concentration
data provides no evidence of dependence on
any factors.
Na Concentration (mg/l)
Year
1997
1998
1999
2000
2001
2002
2003
2004
2005



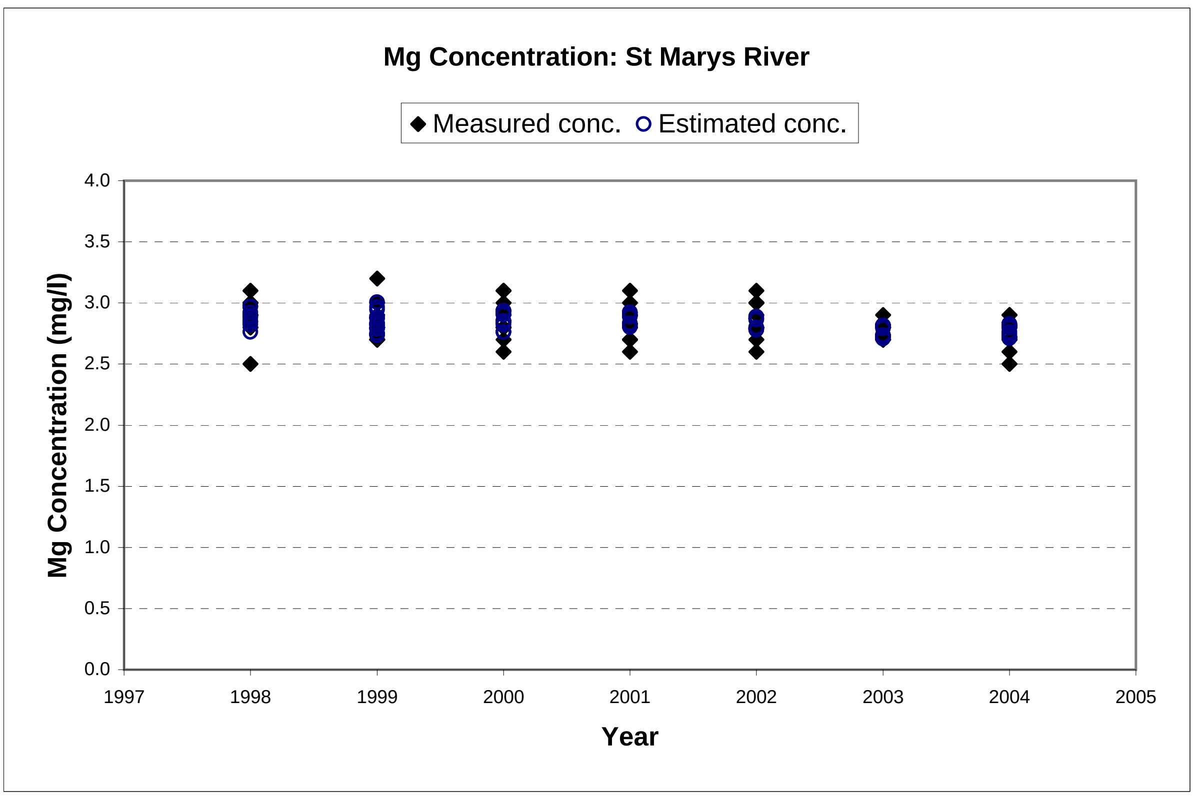
K Concentration: St Marys River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
3.0
2.5
2.0
1.5
1.0
0.5
0.0



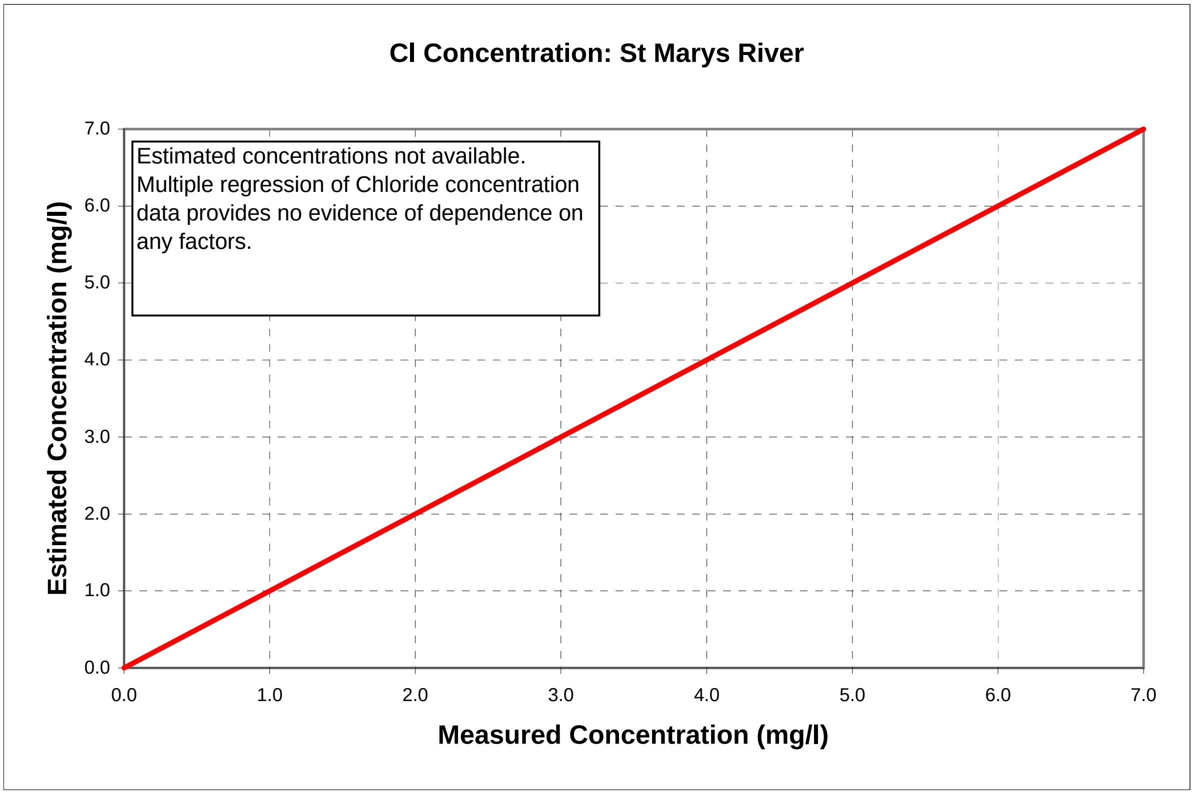
K Concentration: St Marys River
Measured conc.
Estimated conc.
K Concentration (mg/l)
Year
1997
1998
1999
2000
2001
2002
2003
2004
2005

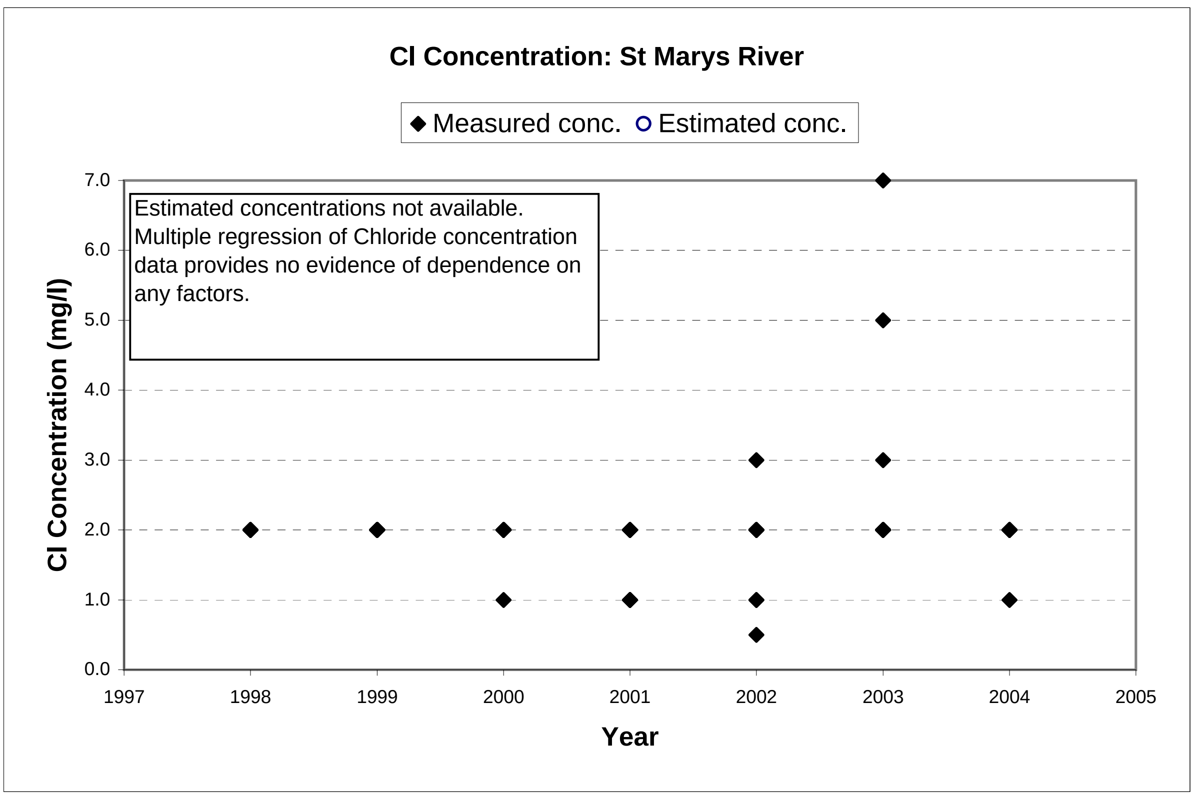


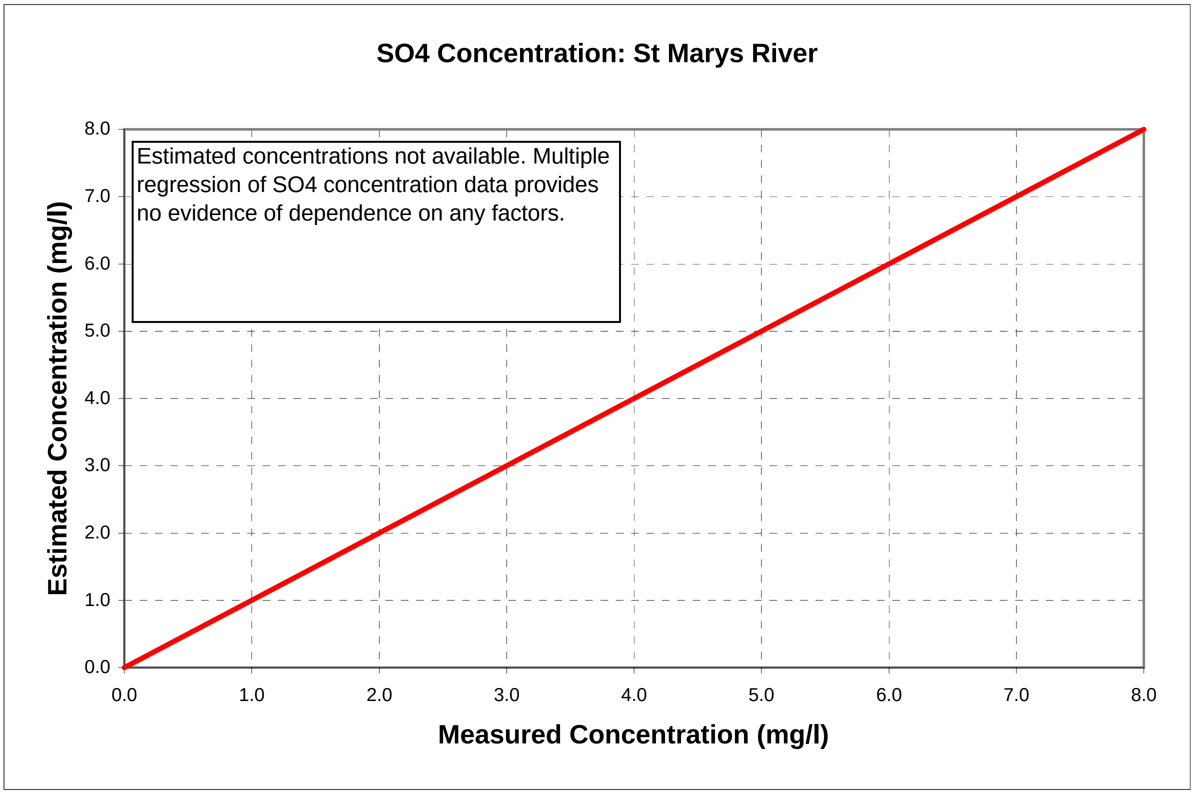
Mg Concentration: St Marys River
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0

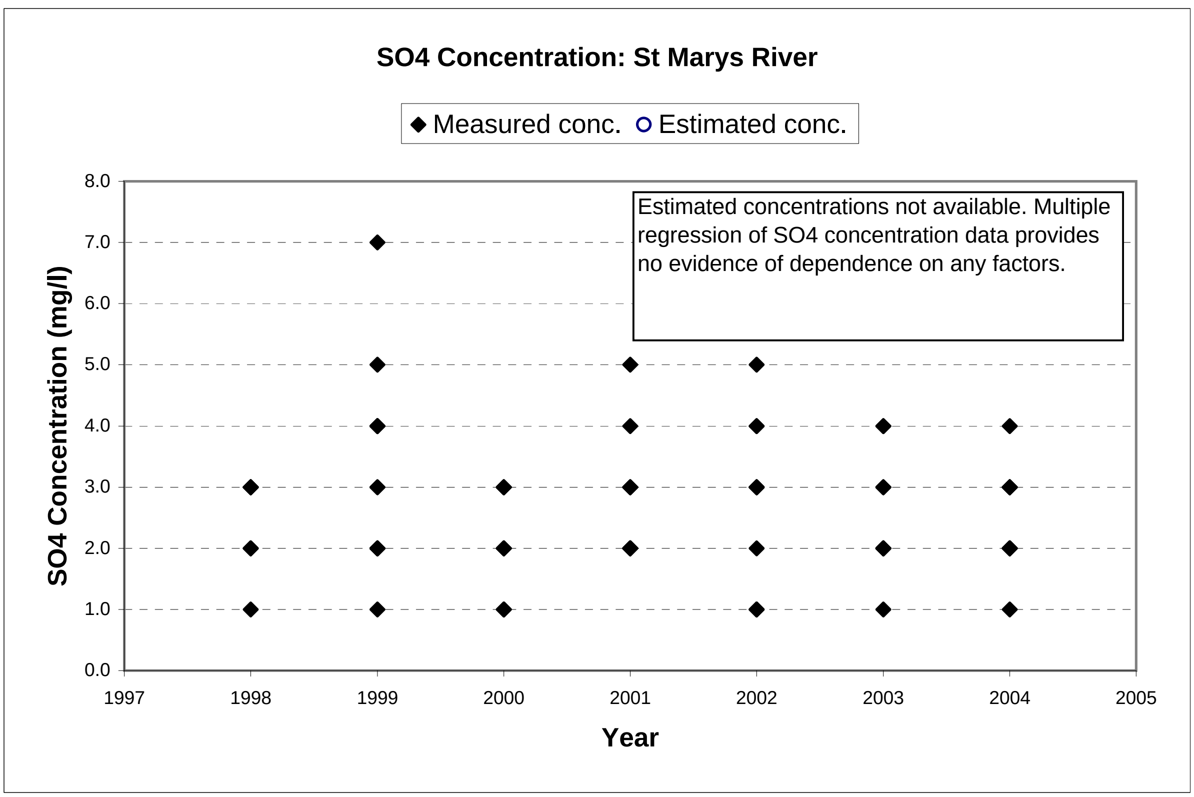


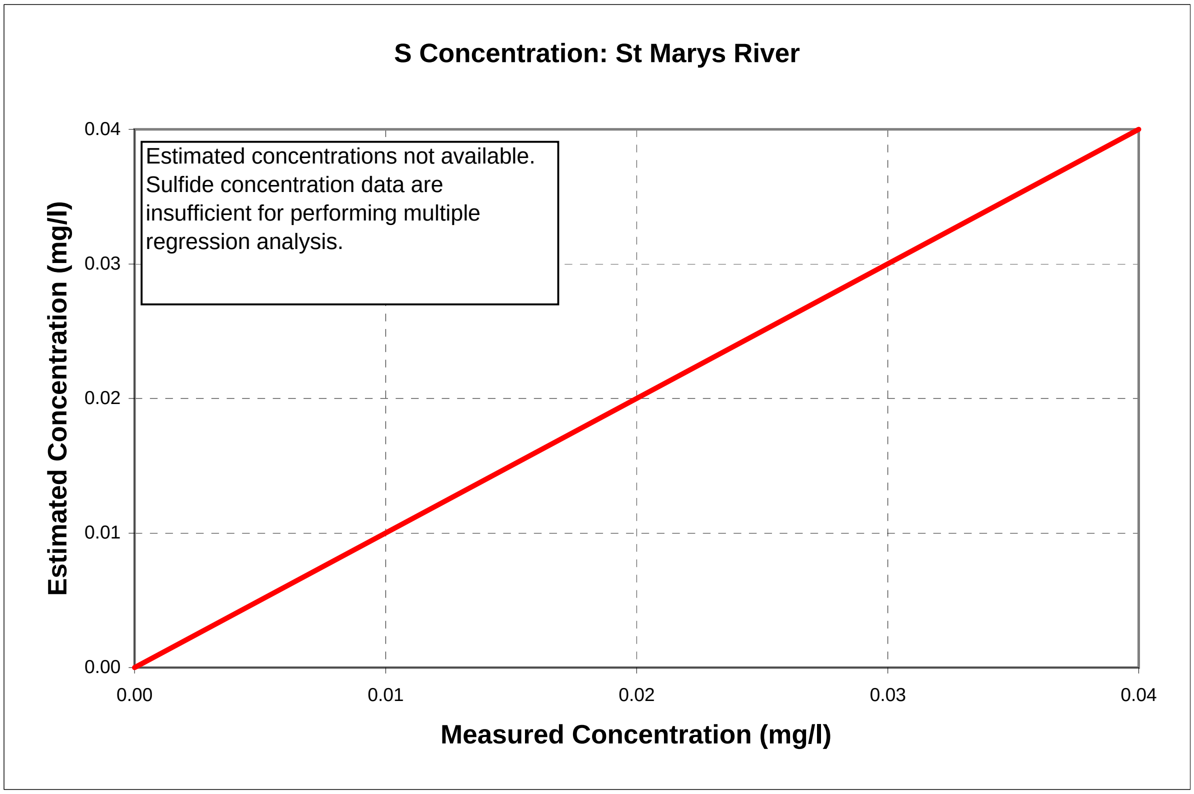
Mg Concentration: St Marys River
Measured conc.
Estimated conc.
Mg Concentration (mg/l)
Year
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
1997
1998
1999
2000
2001
2002
2003
2004
2005

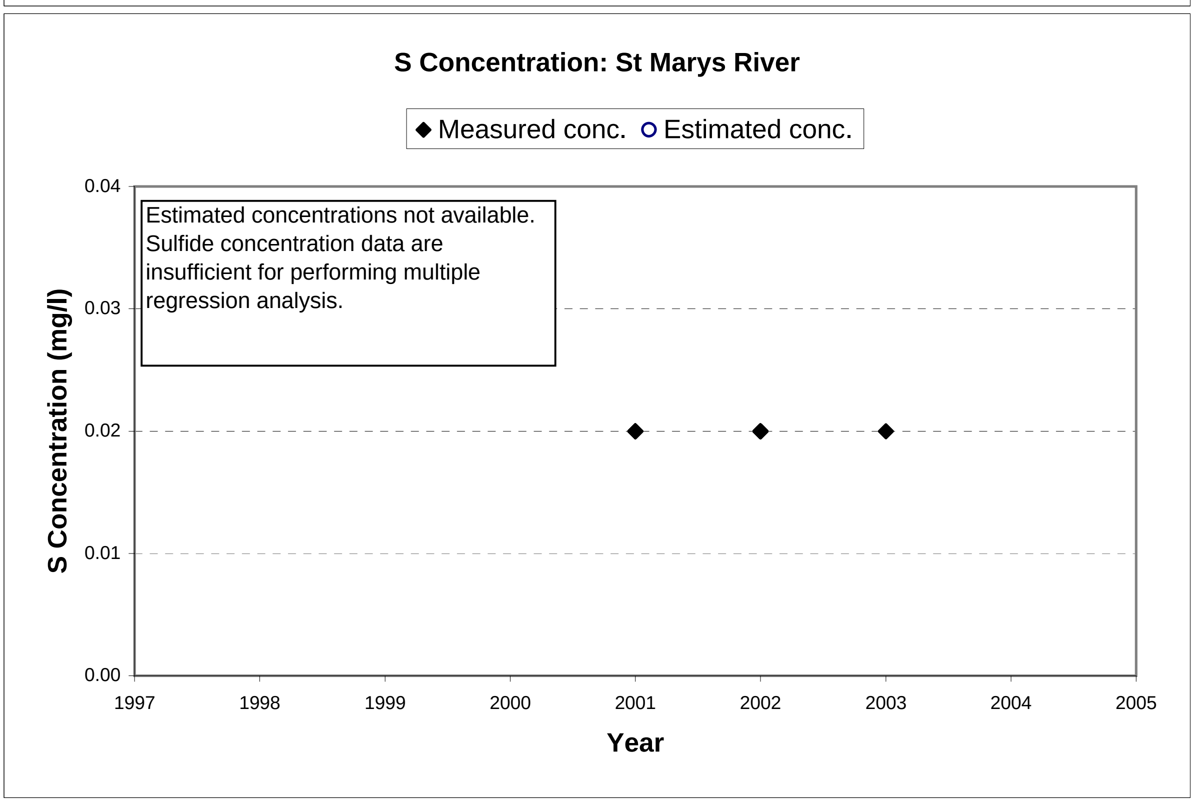

Cl Concentration: St Marys River
Estimated concentrations not available.
Multiple regression of Chloride concentration
data provides no evidence of dependence on
any factors.
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0

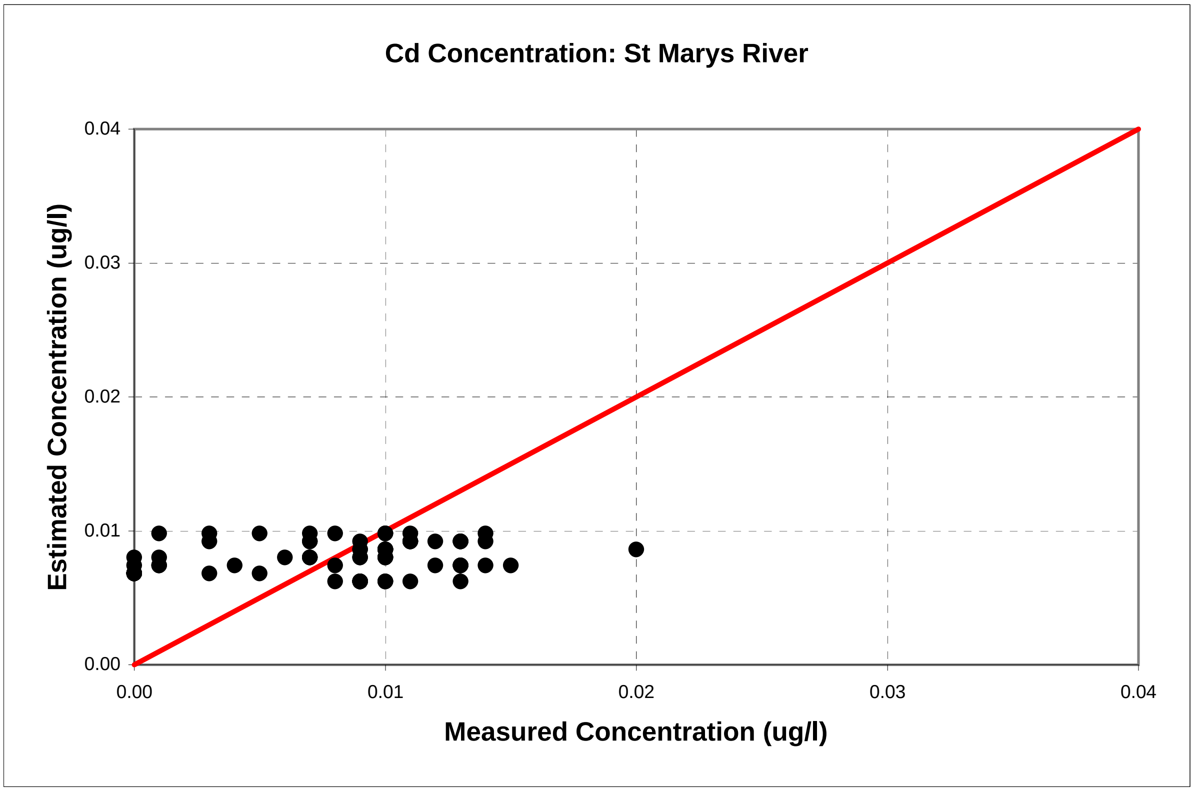

Cl Concentration: St Marys River
Measured conc.
Estimated conc.
Estimated concentrations not available.
Multiple regression of Chloride concentration
data provides no evidence of dependence on
any factors.
Cl Concentration (mg/l)
Year
1997
1998
1999
2000
2001
2002
2003
2004
2005

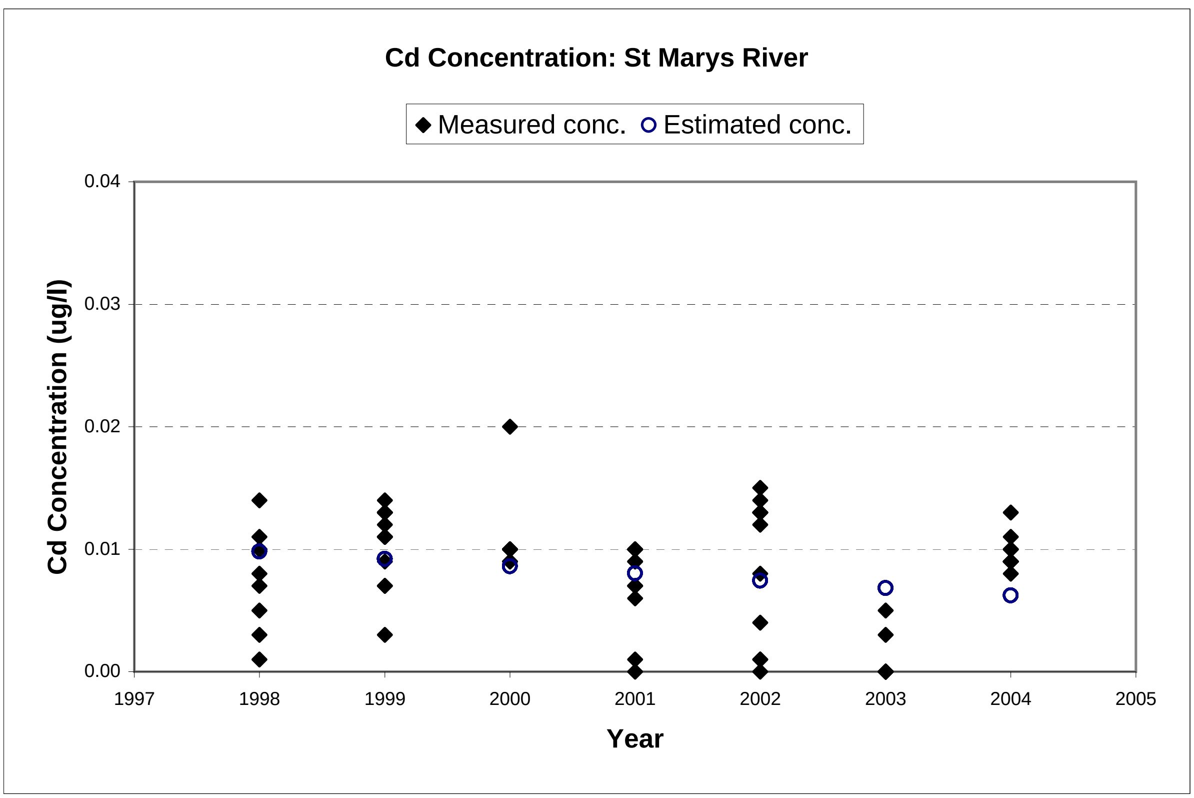

SO4 Concentration: St Marys River
Estimated concentrations not available. Multiple regression of SO4 concentration data provides no evidence of dependence on any factors.
Estimated Concentration (mg/l)
Measured Concentration (mg/l)
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0

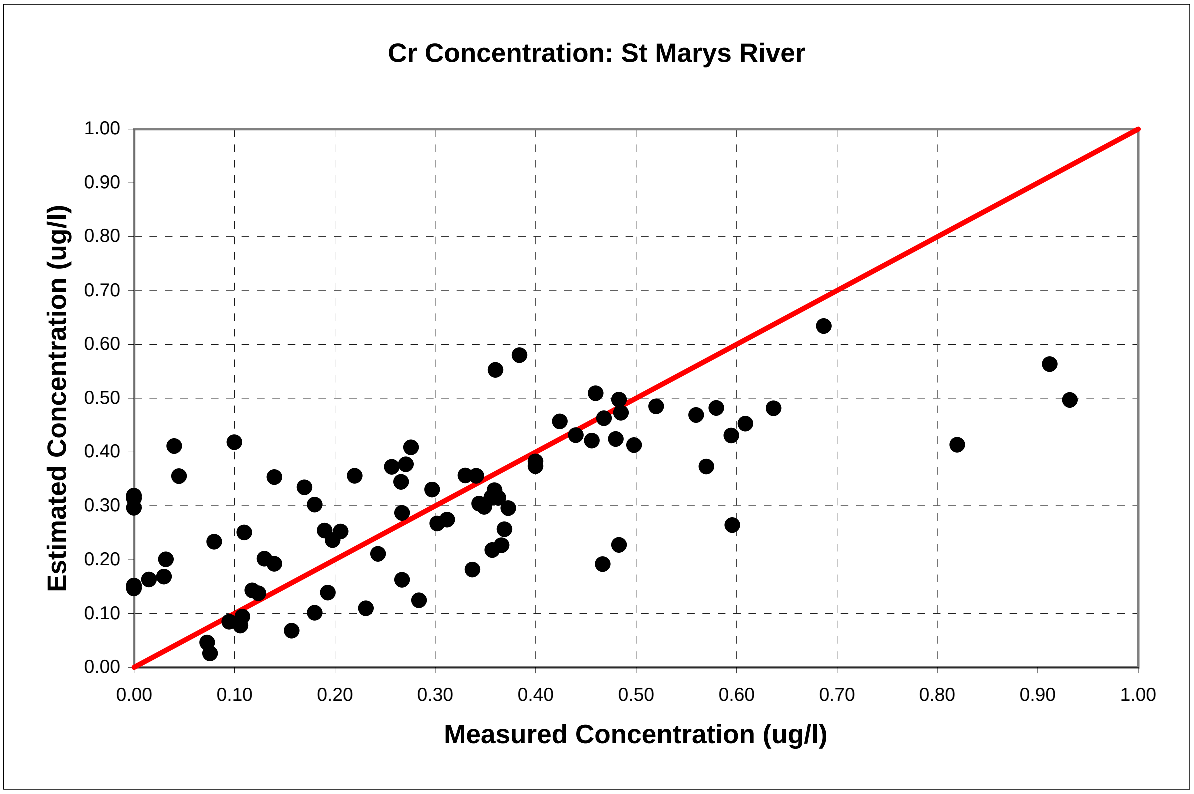

SO4 Concentration: St Marys River
Measured conc.
Estimated conc.
Estimated concentrations not available. Multiple regression of SO4 concentration data provides no evidence of dependence on any factors.
SO4 Concentration (mg/l)
Year
1997
1998
1999
2000
2001
2002
2003
2004
2005


S Concentration: St Marys River
Estimated concentrations not available. Sulfide concentration data are insufficient for performing multiple regression analysis.
Estimated Concentration (mg/l)
0.04
0.03
0.02
0.01
0.00
0.00
0.01
0.02
0.03
0.04
Measured Concentration (mg/l)

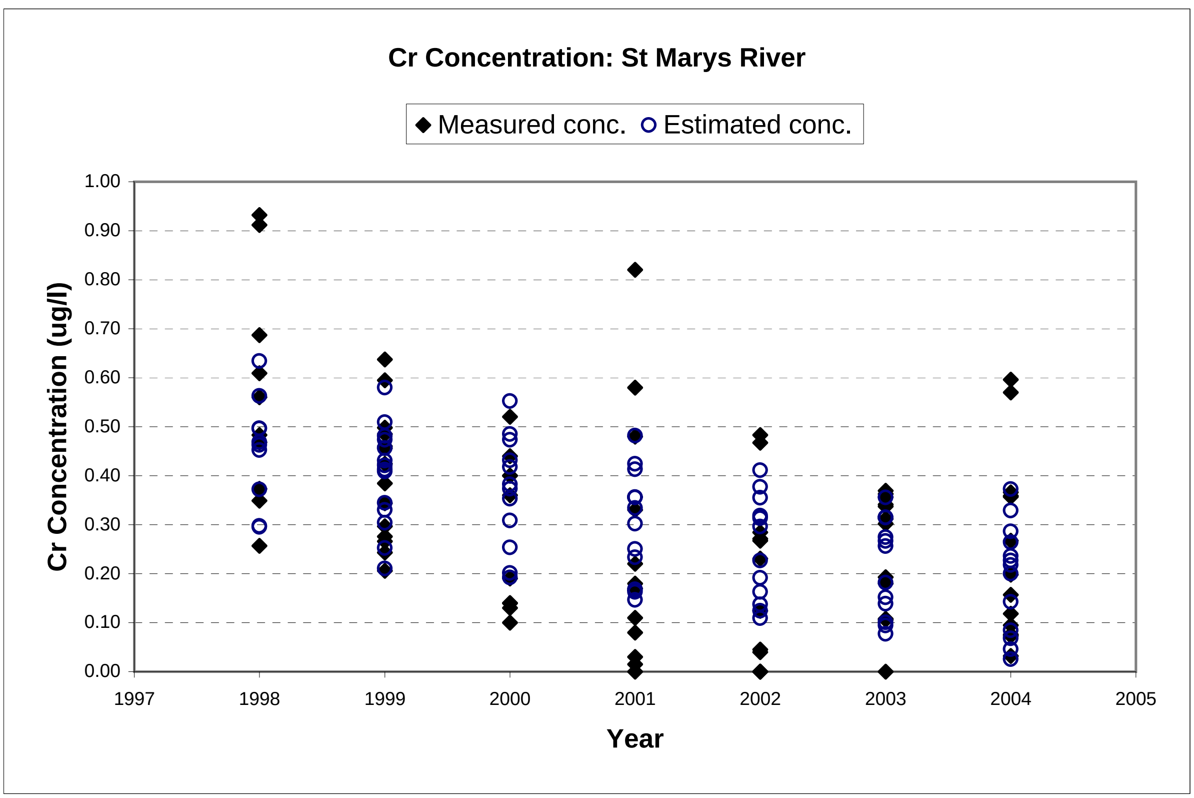

S Concentration: St Marys River
Measured conc.
Estimated conc.
Estimated concentrations not available. Sulfide concentration data are insufficient for performing multiple regression analysis.
S Concentration (mg/l)
0.04
0.03
0.02
0.01
0.00
1997
1998
1999
2000
2001
2002
2003
2004
2005
Year


Cd Concentration: St Marys River
Estimated Concentration (ug/l)
0.04
0.03
0.02
0.01
0.00
0.00
0.01
0.02
0.03
0.04
Measured Concentration (ug/l)

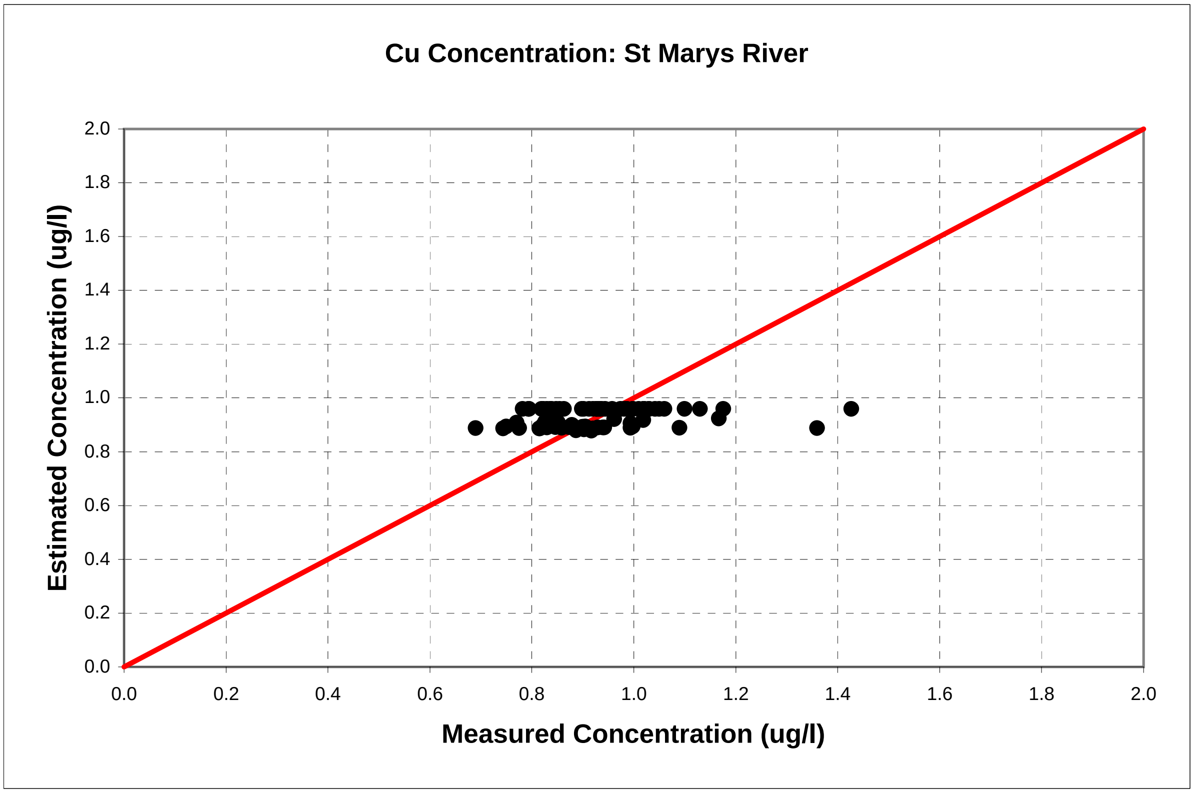

Cd Concentration: St Marys River
Measured conc.
Estimated conc.
Cd Concentration (ug/l)
0.04
0.03
0.02
0.01
0.00
1997
1998
1999
2000
2001
2002
2003
2004
2005
Year

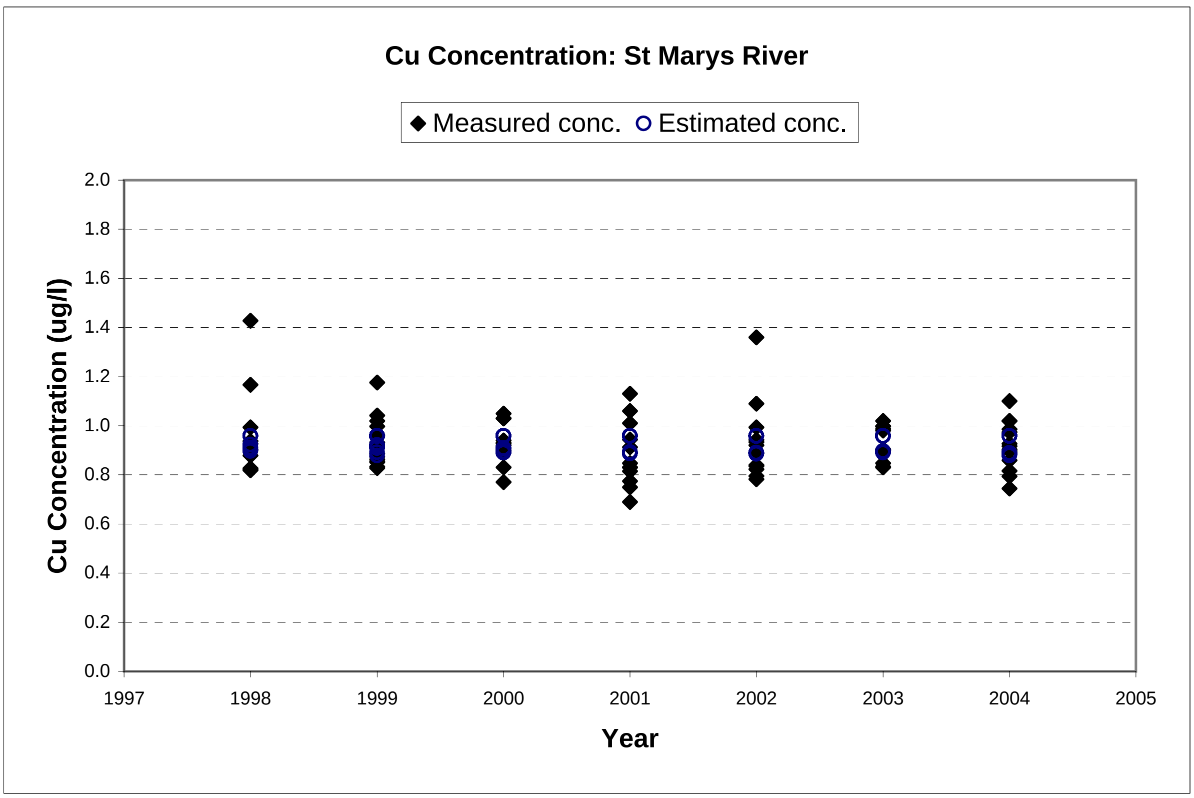


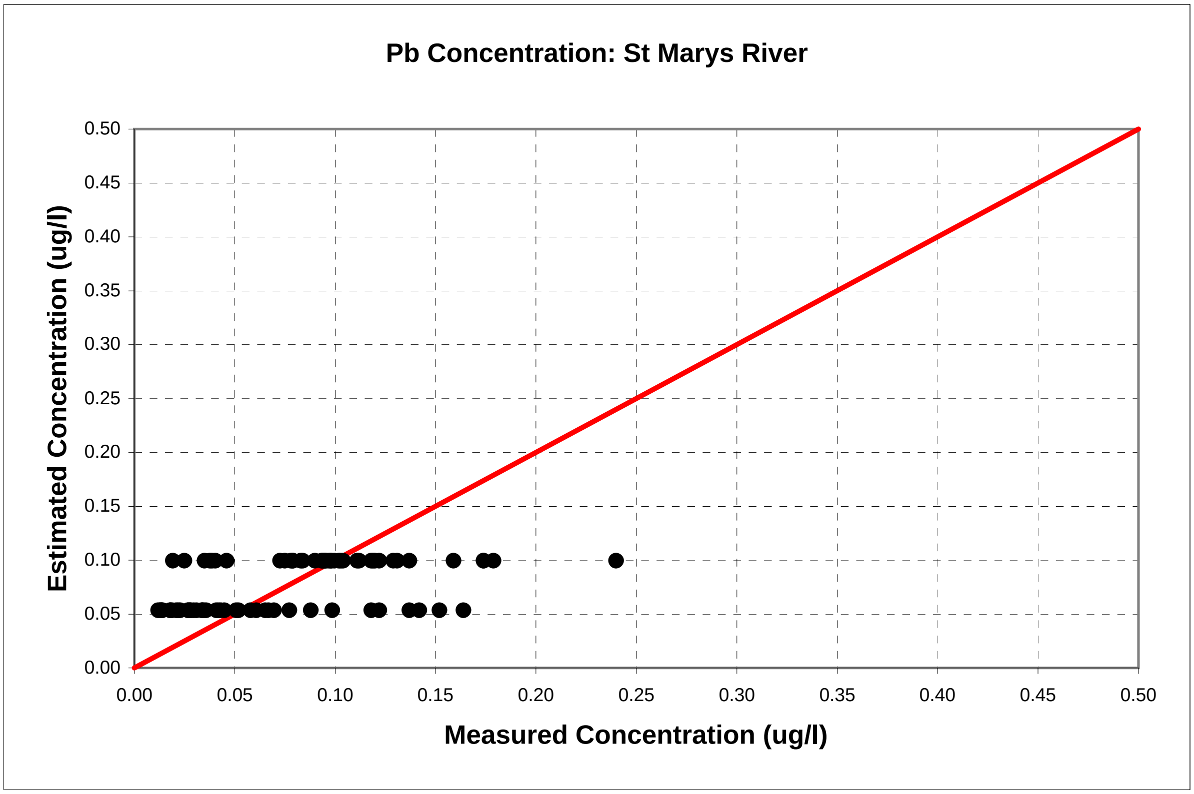
Cr Concentration: St Marys River
Estimated Concentration (ug/l)
Measured Concentration (ug/l)
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
1.00

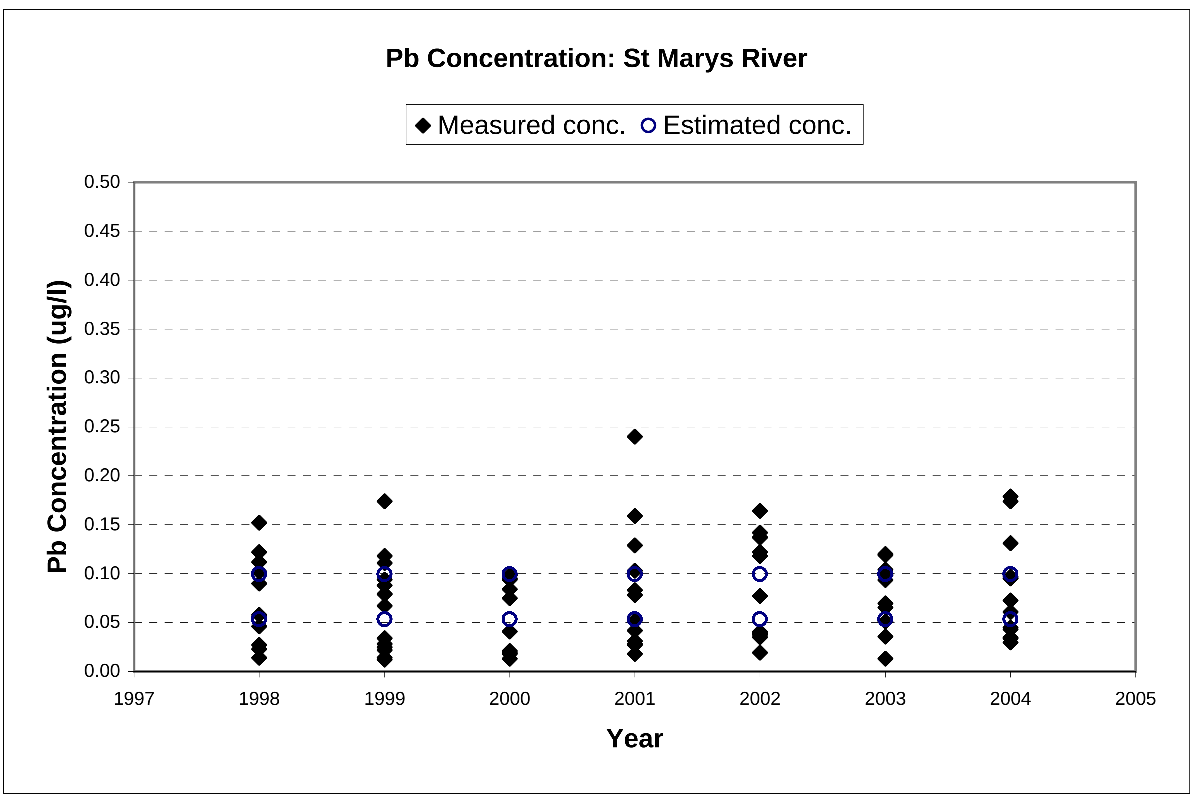


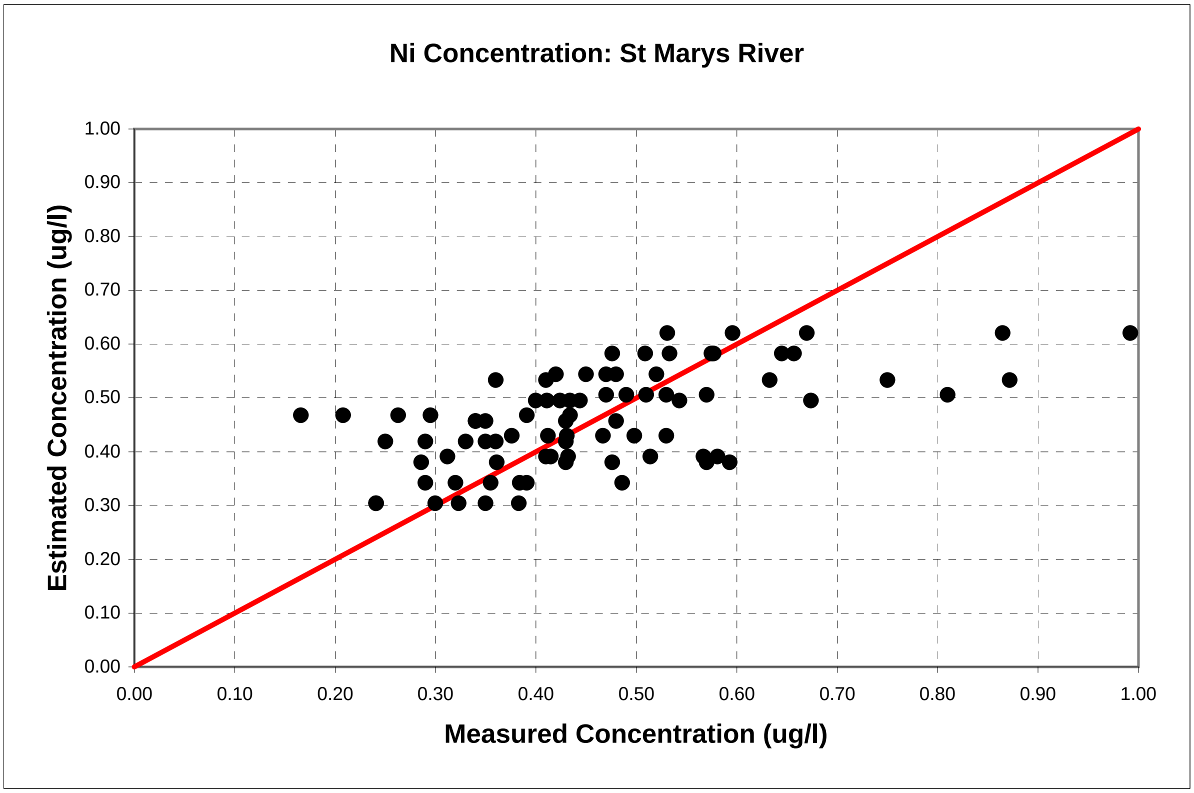
Cr Concentration: St Marys River
Measured conc.
Estimated conc.
Cr Concentration (ug/l)
Year
1997
1998
1999
2000
2001
2002
2003
2004
2005


Cu Concentration: St Marys River
Estimated Concentration (ug/l)
Measured Concentration (ug/l)
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0

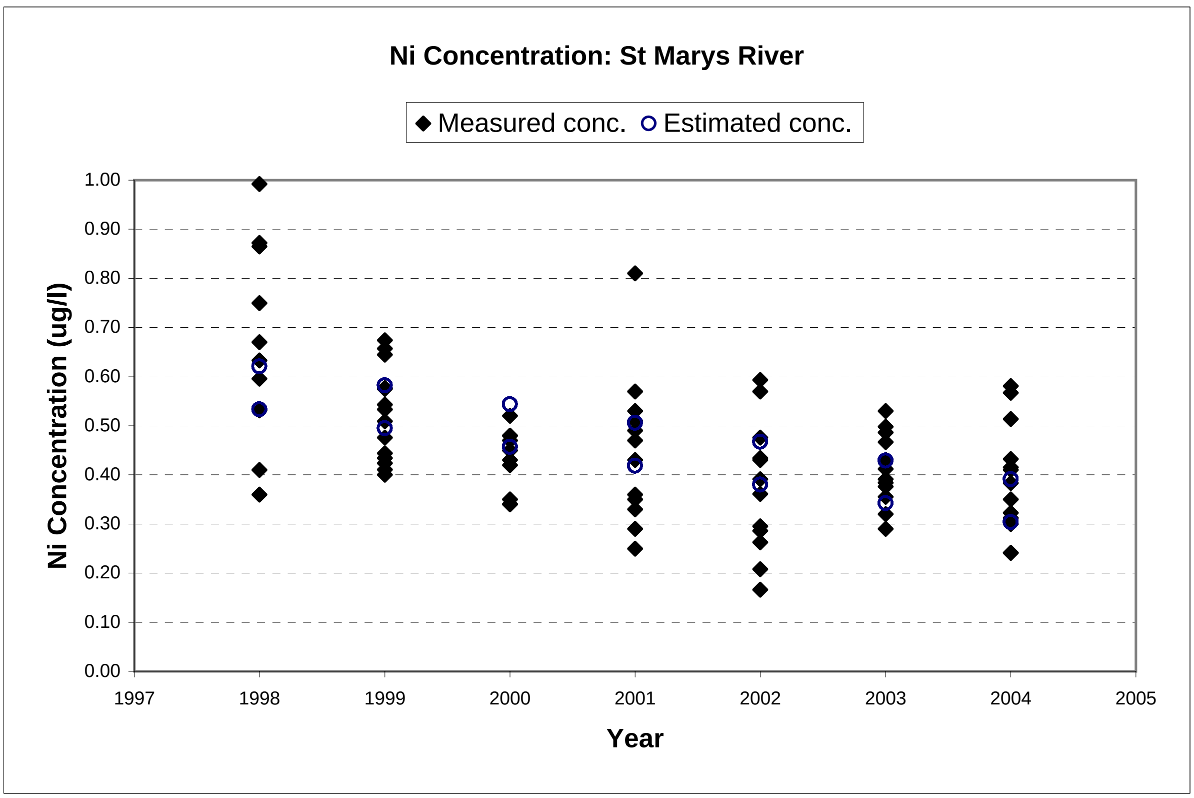

Cu Concentration: St Marys River
Measured conc.
Estimated conc.
Cu Concentration (ug/l)
Year
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
1.8
2.0
1997
1998
1999
2000
2001
2002
2003
2004
2005


Pb Concentration: St Marys River
Estimated Concentration (ug/l)
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.40
0.45
0.50
Measured Concentration (ug/l)

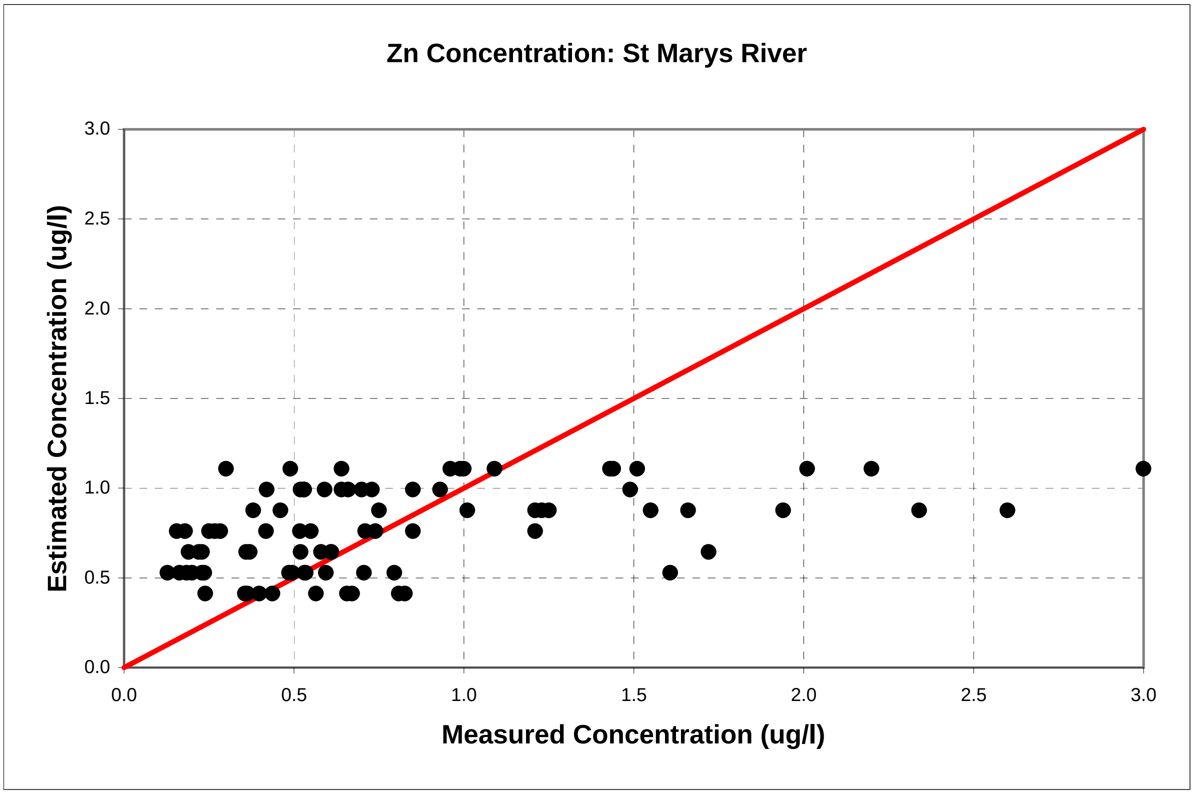

Pb Concentration: St Marys River
Measured conc.
Estimated conc.
Pb Concentration (ug/l)
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
1997
1998
1999
2000
2001
2002
2003
2004
2005
Year



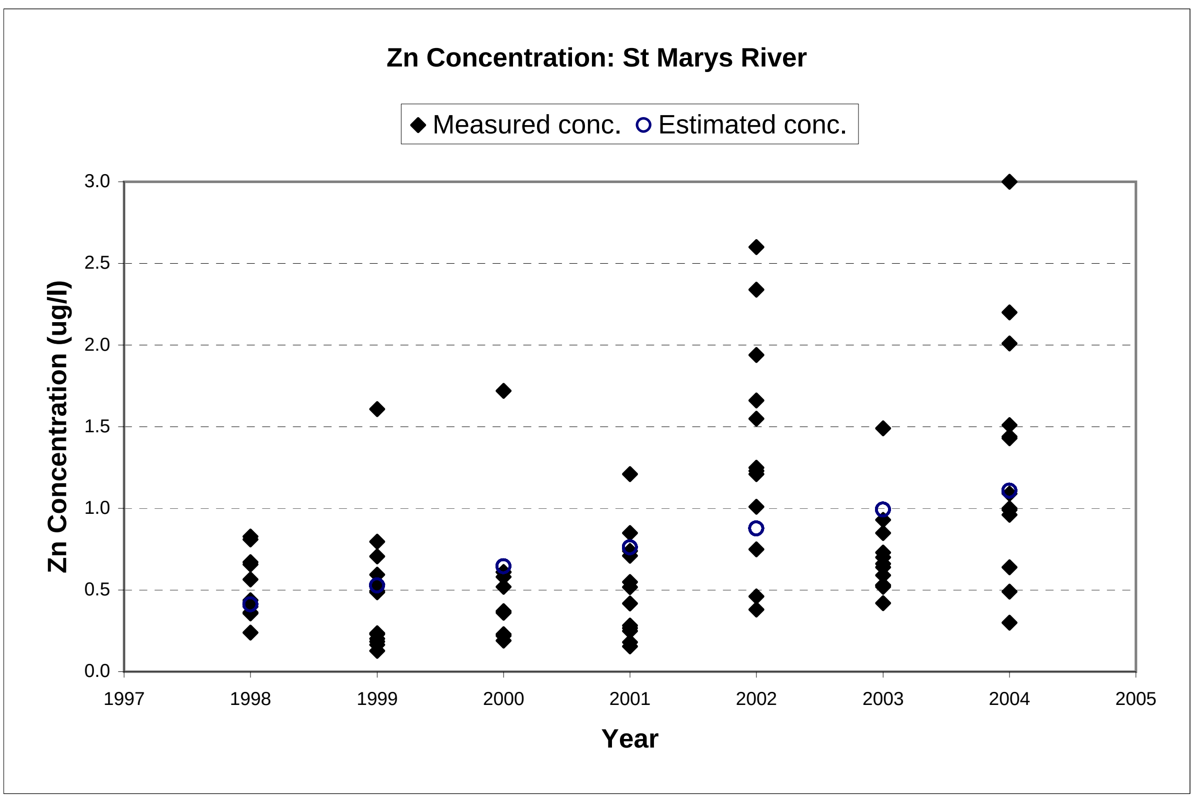
Ni Concentration: St Marys River
Estimated Concentration (ug/l)
Measured Concentration (ug/l)
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.80
0.90
1.00



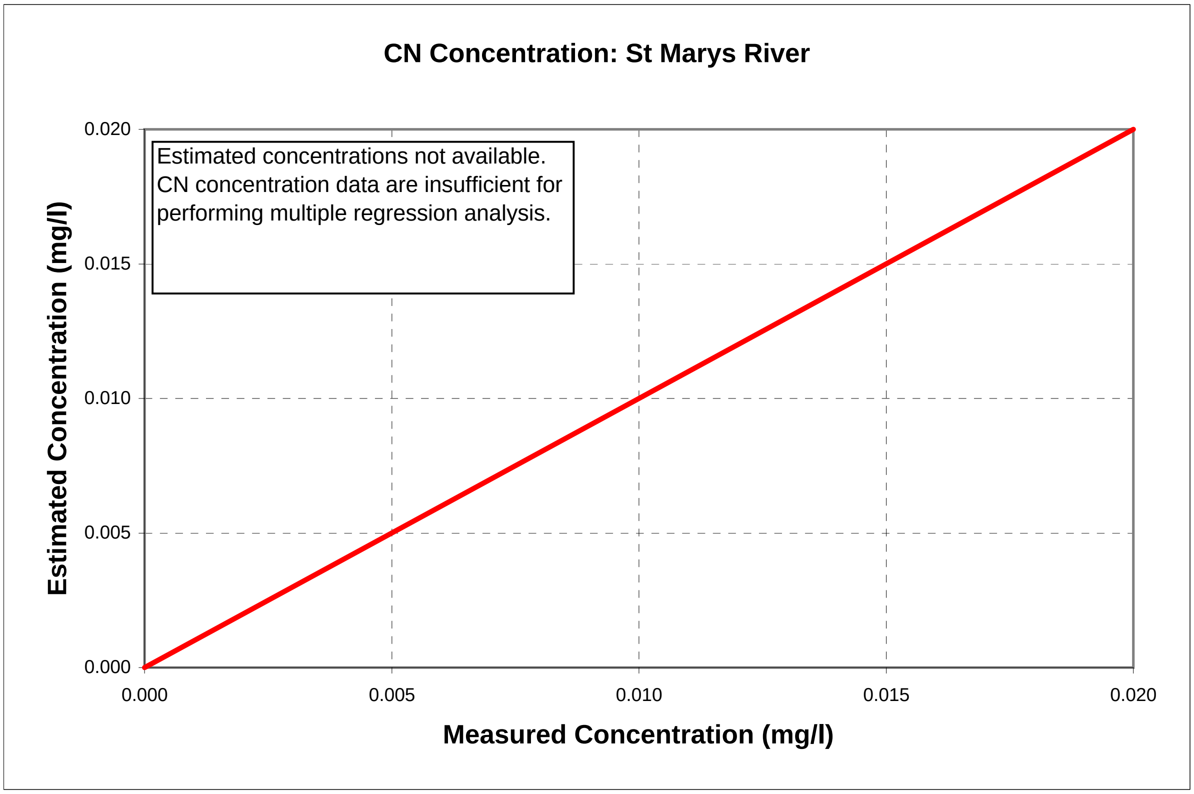
Ni Concentration: St Marys River
Measured conc.
Estimated conc.
Ni Concentration (ug/l)
Year
1997
1998
1999
2000
2001
2002
2003
2004
2005



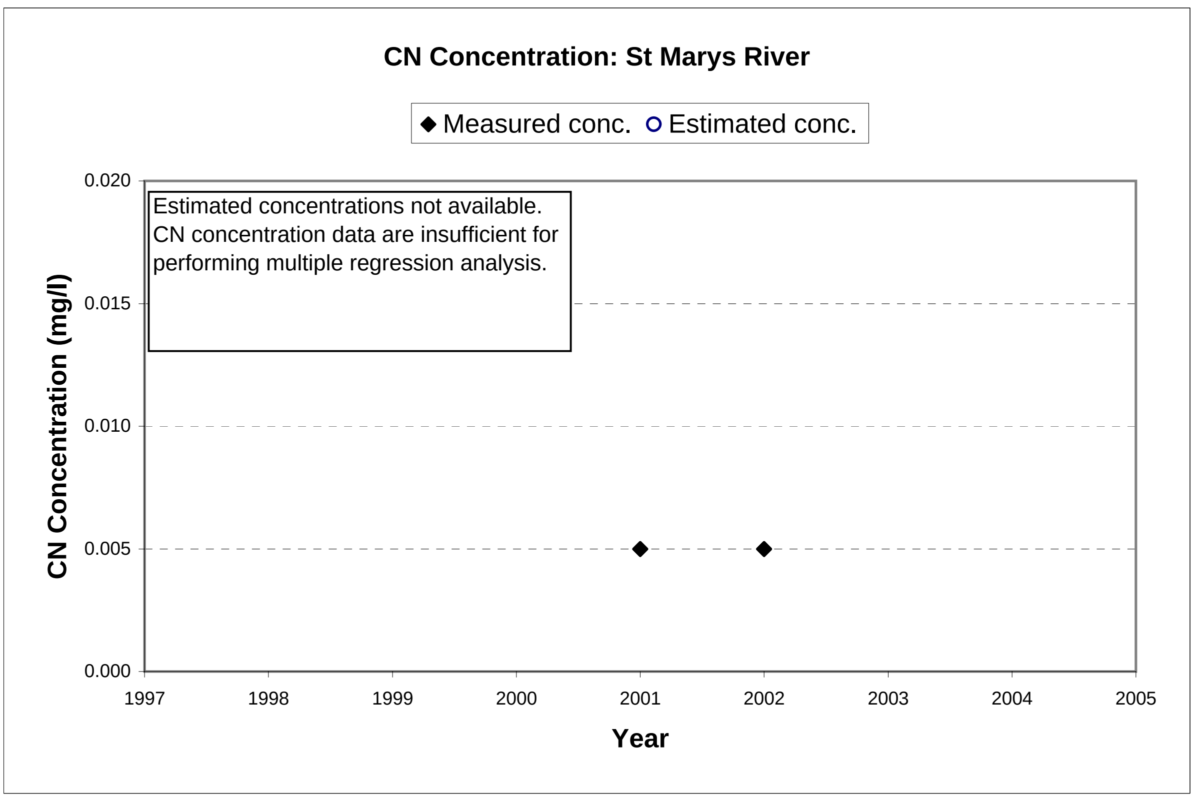
Zn Concentration: St Marys River
Estimated Concentration (ug/l)
Measured Concentration (ug/l)
0.0
0.5
1.0
1.5
2.0
2.5
3.0



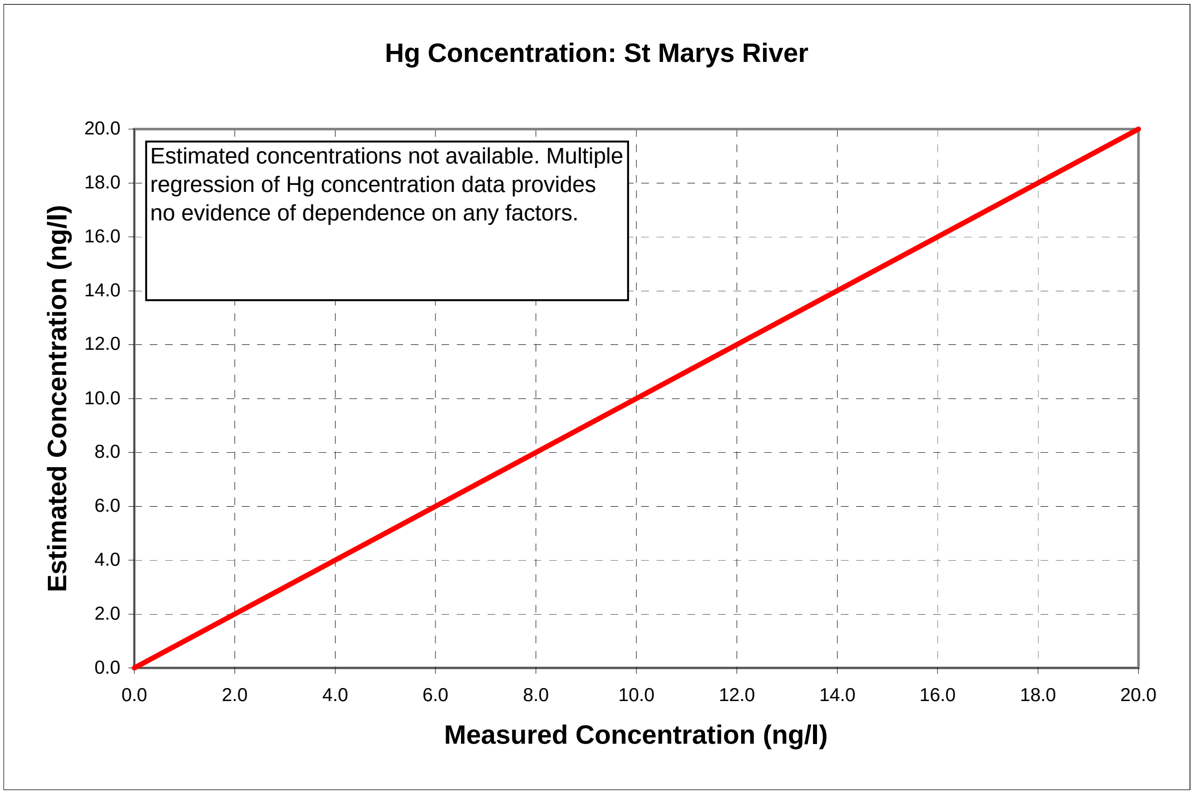
Zn Concentration: St Marys River
Measured conc.
Estimated conc.
Zn Concentration (ug/l)
Year
0.0
0.5
1.0
1.5
2.0
2.5
3.0
1997
1998
1999
2000
2001
2002
2003
2004
2005

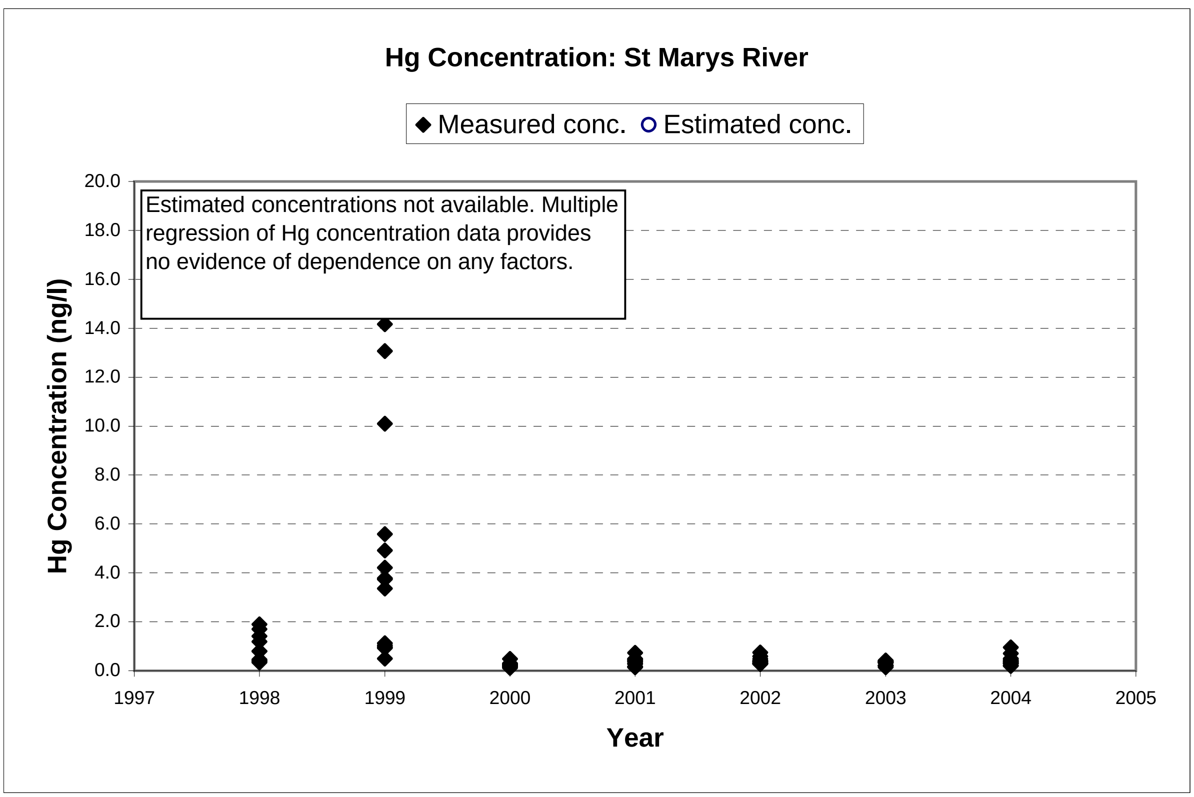


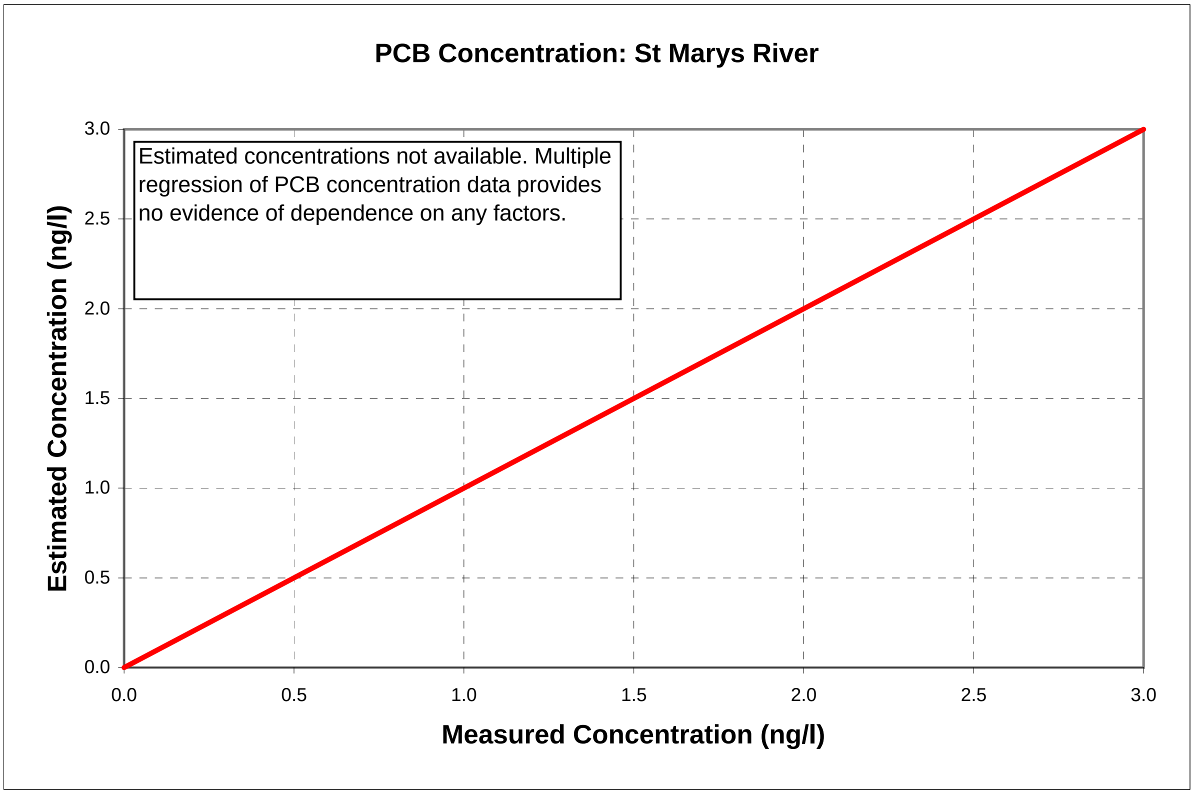
CN Concentration: St Marys River
Estimated concentrations not available.
CN concentration data are insufficient for
performing multiple regression analysis.
Estimated Concentration (mg/l)
0.020
0.015
0.010
0.005
0.000
0.000
0.005
0.010
0.015
0.020
Measured Concentration (mg/l)

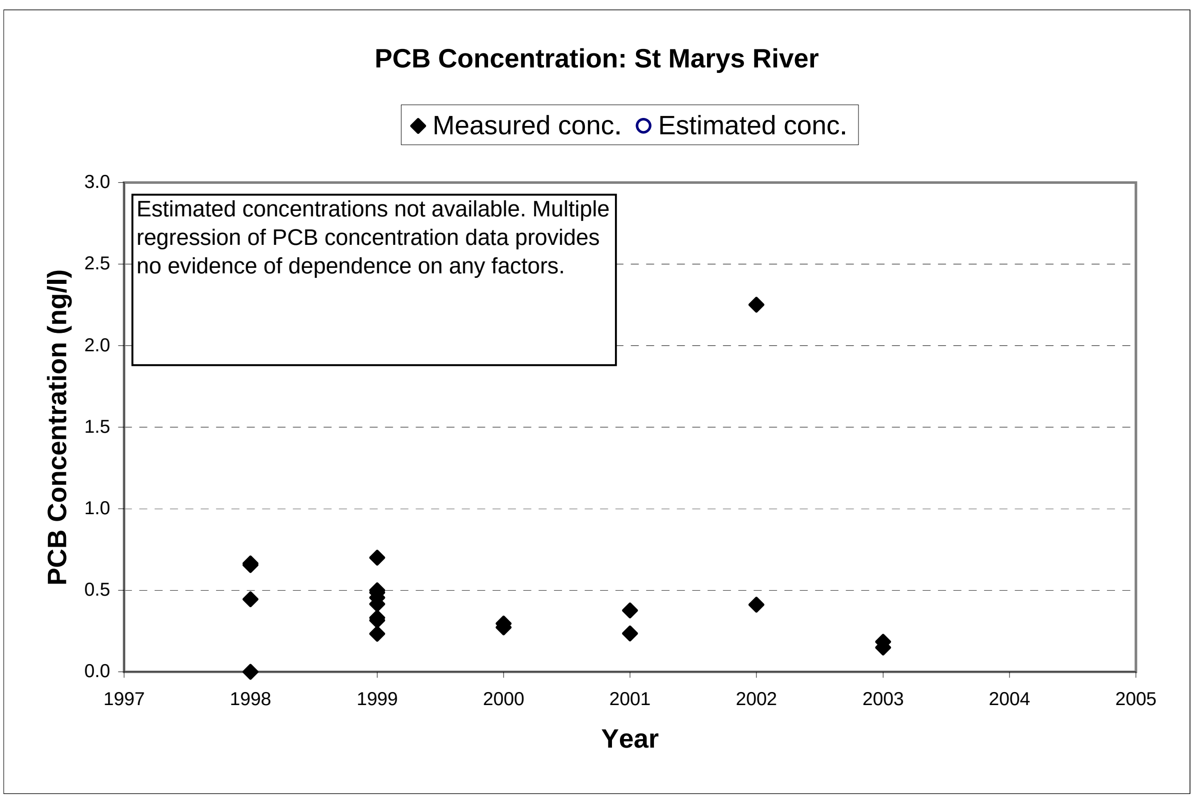


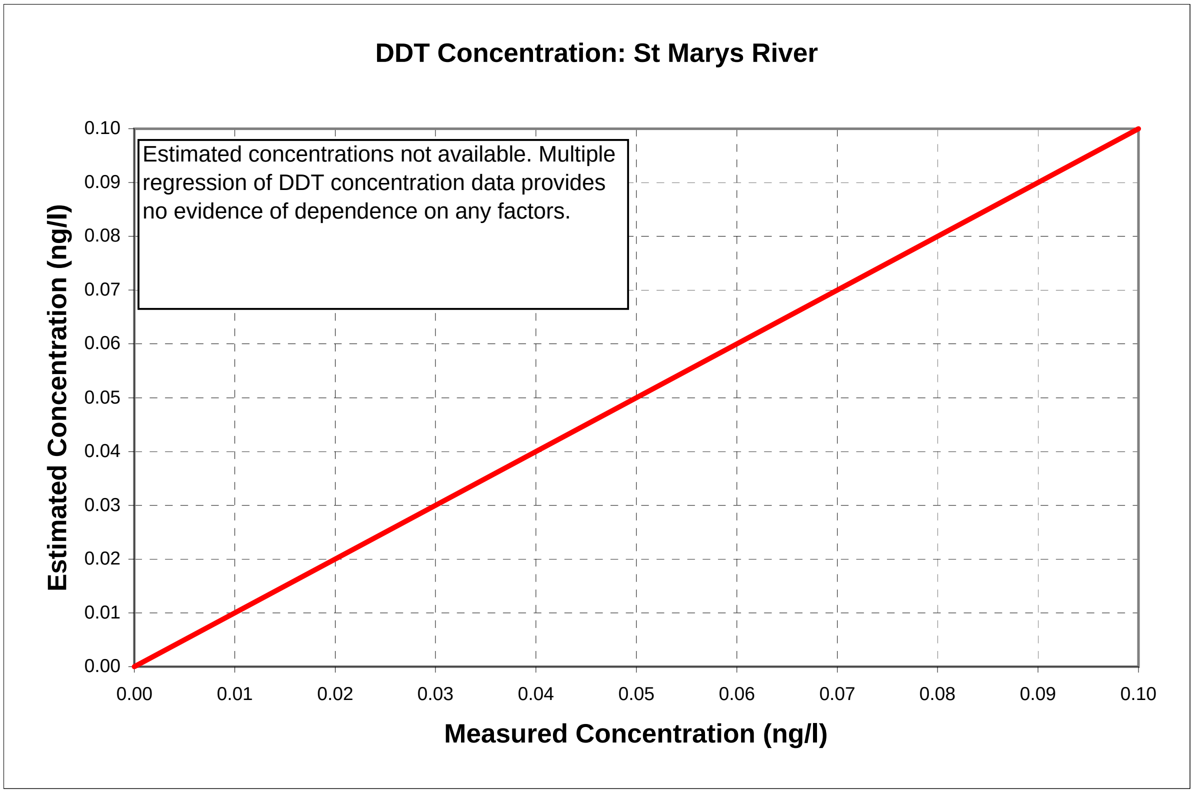
CN Concentration: St Marys River
Measured conc.
Estimated conc.
Estimated concentrations not available.
CN concentration data are insufficient for
performing multiple regression analysis.
CN Concentration (mg/l)
0.020
0.015
0.010
0.005
0.000
1997
1998
1999
2000
2001
2002
2003
2004
2005
Year

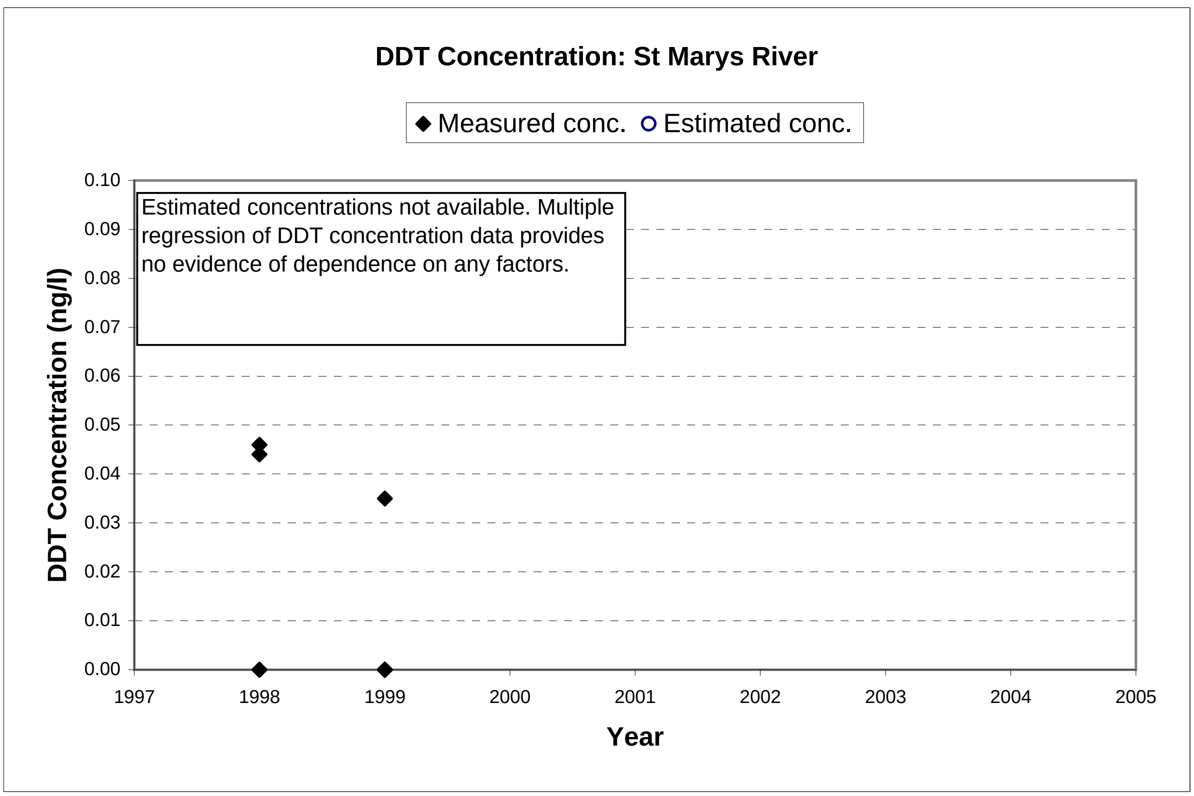

Hg Concentration: St Marys River
Estimated concentrations not available. Multiple regression of Hg concentration data provides no evidence of dependence on any factors.
Estimated Concentration (ng/l)
Measured Concentration (ng/l)
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0


Hg Concentration: St Marys River
Measured conc.
Estimated conc.
Estimated concentrations not available. Multiple regression of Hg concentration data provides no evidence of dependence on any factors.
Hg Concentration (ng/l)
Year
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
1997
1998
1999
2000
2001
2002
2003
2004
2005


PCB Concentration: St Marys River
Estimated concentrations not available. Multiple regression of PCB concentration data provides no evidence of dependence on any factors.
Estimated Concentration (ng/l)
Measured Concentration (ng/l)
0.0
0.5
1.0
1.5
2.0
2.5
3.0


PCB Concentration: St Marys River
Measured conc.
Estimated conc.
Estimated concentrations not available. Multiple regression of PCB concentration data provides no evidence of dependence on any factors.
PCB Concentration (ng/l)
Year
0.0
0.5
1.0
1.5
2.0
2.5
3.0
1997
1998
1999
2000
2001
2002
2003
2004
2005


DDT Concentration: St Marys River
Estimated concentrations not available. Multiple regression of DDT concentration data provides no evidence of dependence on any factors.
Estimated Concentration (ng/l)
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.10
Measured Concentration (ng/l)


DDT Concentration: St Marys River
Measured conc.
Estimated conc.
Estimated concentrations not available. Multiple regression of DDT concentration data provides no evidence of dependence on any factors.
DDT Concentration (ng/l)
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
1997
1998
1999
2000
2001
2002
2003
2004
2005
Year

Appendix C
Base Neutral Organic and Volatile Organic Compound Data

BASE/NEUTRAL ORGANICS

STORET ID	River	Location	Sample Collection Date	Bis(2-chloroethyl)ether	m-Dichlorobenzene	1,4-Dichlorobenzene	1,2 Dichlorobenzene	Bis(2-chloroisopropyl) ether	N-nitroso dipropyl amine	Hexachloroethane	nitro-Benzene	Isophorone	bis(2-chloro ethoxy) methane	1,2,4-Trichlorobenzene
				111-44-4	541-73-1	106-46-7	95-50-1	108-60-1	621-64-7	67-72-1	98-95-3	78-59-1	111-91-1	120-82-1
				(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	5/17/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	6/15/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	7/13/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	8/10/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	9/7/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	10/6/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	11/8/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	Downstream	Raber	5/18/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	Downstream	Raber	6/15/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	Downstream	Raber	7/12/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	Downstream	Raber	8/9/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	Downstream	Raber	9/7/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	Downstream	Raber	10/5/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	Downstream	Raber	11/8/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	4/20/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	5/12/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	6/8/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/7/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	8/3/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	9/14/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	10/13/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	11/17/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	8/2/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	9/13/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	10/13/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	11/17/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	4/19/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	5/12/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	6/7/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/7/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	4/22/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	5/11/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	7/6/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	8/5/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

BASE/NEUTRAL ORGANICS														
STORET ID	River	Location	Sample Collection Date	Bis(2-chloroethyl)ether	m-Dichlorobenzene	1,4-Dichlorobenzene	1,2 Dichlorobenzene	Bis(2-chloroisopropyl) ether	N-nitroso dipropyl amine	Hexachloroethane	nitro-Benzene	Isophorone	bis(2-chloro ethoxy) methane	1,2,4-Trichlorobenzene
				111-44-4	541-73-1	106-46-7	95-50-1	108-60-1	621-64-7	67-72-1	98-95-3	78-59-1	111-91-1	120-82-1
				(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
820017	Detroit River Downstream	East of City of Rockwood	9/16/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	10/12/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	11/16/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	4/21/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	5/11/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/6/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	8/4/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	9/15/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	10/12/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	11/16/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	7/12/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Rabe	7/12/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/10/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/11/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	7/10/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/10/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	7/17/2001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Rabe	7/17/2001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/16/2001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/16/2001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	7/16/2001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/16/2001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/9/2002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/9/2002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/9/2002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Rabe	7/10/2002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	7/10/2002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	7/23/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/23/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/23/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/23/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	Downstream	Between Pt. Aux Frenes/Hay Pt., Rabe	8/19/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	8/19/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	7/14/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/14/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/14/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/14/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	Downstream	Between Pt. Aux Frenes/Hay Pt., Rabe	7/12/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	7/12/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

BASE/NEUTRAL ORGANICS

STORET ID	River	Location	Sample Collection Date	Naphthalene	Hexachlorobutadiene	Hexachlorocyclopentadiene	2-Chloronaphthalene	Dimethyl phthalate	Acenaphthylene	2,6-Dinitrotoluene	Acenaphthene	2,4-Dinitrotoluene
				91-20-3	87-68-3	77-47-4	91-58-7	131-11-3	208-96-8	606-20-2	83-32-9	121-14-2
				(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	5/17/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	6/15/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	7/13/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	8/10/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	9/7/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	10/6/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	11/8/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	Downstream	Raber	5/18/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	Downstream	Raber	6/15/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	Downstream	Raber	7/12/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	Downstream	Raber	8/9/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	Downstream	Raber	9/7/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	Downstream	Raber	10/5/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	Downstream	Raber	11/8/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	4/20/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	5/12/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	6/8/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/7/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	8/3/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	9/14/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	10/13/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	11/17/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	8/2/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	9/13/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	10/13/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	11/17/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	4/19/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	5/12/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	6/7/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/7/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	4/22/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	5/11/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	7/6/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	8/5/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND

BASE/NEUTRAL ORGANICS

STORET ID	River	Location	Sample Collection Date	Naphthalene	Hexachlorobutadiene	Hexachlorocyclopentadiene	2-Chloro naphthalene	Dimethyl phthalate	Acenaphthylene	2,6-Dinitro toluene	Acenaphthene	2,4-Dinitro toluene
				91-20-3	87-68-3	77-47-4	91-58-7	131-11-3	208-96-8	606-20-2	83-32-9	121-14-2
				(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
820017	Detroit River Downstream	East of City of Rockwood	9/16/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	10/12/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	11/16/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	4/21/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	5/11/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/6/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	8/4/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	9/15/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	10/12/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	11/16/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	7/12/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Rabe	7/12/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/10/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/11/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	7/10/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/10/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	7/17/2001	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Rabe	7/17/2001	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/16/2001	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/16/2001	ND	ND	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	7/16/2001	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/16/2001	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/9/2002	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/9/2002	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/9/2002	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Rabe	7/10/2002	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	7/10/2002	ND	ND	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	7/23/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/23/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/23/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/23/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	Downstream	Between Pt. Aux Frenes/Hay Pt., Rabe	8/19/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	8/19/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	7/14/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/14/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/14/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/14/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	Downstream	Between Pt. Aux Frenes/Hay Pt., Rabe	7/12/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	7/12/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND

BASE/NEUTRAL ORGANICS

STORET ID	River	Location	Sample Collection Date	Fluorene	Diethyl phthalate	1-chloro-4-phenoxybenzene	4-Nitroso diphenyl amine	Azobenzene	4-Bromophenyl phenyl ether	Hexachlorobenzene	Phenanthrene	Anthracene
				86-73-7	84-66-2	7005-72-3	156-10-5	103-33-3	101-55-3	118-74-1	85-01-8	120-12-7
				(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	5/17/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	6/15/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	7/13/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	8/10/1999	ND	2.6	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	9/7/1999	ND	1.1	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	10/6/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	11/8/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	Downstream	Raber	5/18/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	Downstream	Raber	6/15/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	Downstream	Raber	7/12/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	Downstream	Raber	8/9/1999	ND	3.5	ND	ND	ND	ND	ND	ND	ND
170140	Downstream	Raber	9/7/1999	ND	1.1	ND	ND	ND	ND	ND	ND	ND
170140	Downstream	Raber	10/5/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	Downstream	Raber	11/8/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	4/20/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	5/12/1999	ND	1.2	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	6/8/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/7/1999	ND	2	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	8/3/1999	ND	3.4	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	9/14/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	10/13/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	11/17/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	8/2/1999	ND	4.5	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	9/13/1999	ND	1.5	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	10/13/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	11/17/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	4/19/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	5/12/1999	ND	1.5	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	6/7/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/7/1999	ND	3.1	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	4/22/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	5/11/1999	ND	2.3	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	7/6/1999	ND	3.7	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	8/5/1999	ND	2.9	ND	ND	ND	ND	ND	ND	ND

BASE/NEUTRAL ORGANICS												
STORET ID	River	Location	Sample Collection Date	Fluorene	Diethyl phthalate	1-chloro-4-phenoxybenzene	4-Nitroso diphenyl amine	Azobenzene	4-Bromophenyl phenyl ether	Hexachlorobenzene	Phenanthrene	Anthracene
				86-73-7	84-66-2	7005-72-3	156-10-5	103-33-3	101-55-3	118-74-1	85-01-8	120-12-7
				(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
820017	Detroit River Downstream	East of City of Rockwood	9/16/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	10/12/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	11/16/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	4/21/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	5/11/1999	ND	1.5	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/6/1999	ND	2.3	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	8/4/1999	ND	3.3	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	9/15/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	10/12/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	11/16/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	7/12/2000	ND	2.1	ND	ND	ND	ND	ND	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Rabe	7/12/2000	ND	1.8	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/10/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/11/2000	ND	1.2	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	7/10/2000	ND	2.6	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/10/2000	ND	1.5	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	7/17/2001	ND	1.2	ND	ND	ND	ND	ND	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Rabe	7/17/2001	ND	1.5	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/16/2001	ND	2.1	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/16/2001	ND	1.1	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	7/16/2001	ND	2	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/16/2001	ND	1.4	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/9/2002	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/9/2002	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/9/2002	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Rabe	7/10/2002	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	7/10/2002	ND	ND	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	7/23/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/23/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/23/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/23/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	Downstream	Between Pt. Aux Frenes/Hay Pt., Rabe	8/19/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	8/19/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	7/14/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/14/2004	ND	0.16	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/14/2004	ND	0.16	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/14/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	Downstream	Between Pt. Aux Frenes/Hay Pt., Rabe	7/12/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	7/12/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND

BASE/NEUTRAL ORGANICS

STORET ID	River	Location	Sample Collection Date	Di-n-butyl phthalate	Fluoranthene	Pyrene	Butyl benzyl phthalate	Benzo(a) anthracene	Chrysene	Bis(2-ethylhexyl)phthalate	Di-n-octyl phthalate	Benzo(b) fluoranthene	Benzo[k] fluoranthene
				84-74-2	206-44-0	129-00-0	85-68-7	56-55-3	218-01-9	117-81-7	117-84-0	205-99-2	207-08-9
				(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	5/17/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	6/15/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	7/13/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	8/10/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	9/7/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	10/6/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	11/8/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	Downstream	Raber	5/18/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	Downstream	Raber	6/15/1999	ND	ND	ND	ND	ND	ND	4.7	ND	ND	ND
170140	Downstream	Raber	7/12/1999	ND	ND	ND	ND	ND	ND	3.2	ND	ND	ND
170140	Downstream	Raber	8/9/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	Downstream	Raber	9/7/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	Downstream	Raber	10/5/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	Downstream	Raber	11/8/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	4/20/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	5/12/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	6/8/1999	3.8	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/7/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	8/3/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	9/14/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	10/13/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	11/17/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	8/2/1999	ND	ND	ND	ND	ND	ND	7.3	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	9/13/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	10/13/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	11/17/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	4/19/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	5/12/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	6/7/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/7/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	4/22/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	5/11/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	7/6/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	8/5/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

BASE/NEUTRAL ORGANICS

STORET ID	River	Location	Sample Collection Date	Di-n-butyl phthalate	Fluoranthene	Pyrene	Butyl benzyl phthalate	Benzo(a) anthracene	Chrysene	Bis(2-ethylhexyl)phthalate	Di-n-octyl phthalate	Benzo(b) fluoranthene	Benzo[k] fluoranthene
				84-74-2	206-44-0	129-00-0	85-68-7	56-55-3	218-01-9	117-81-7	117-84-0	205-99-2	207-08-9
				(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
820017	Detroit River Downstream	East of City of Rockwood	9/16/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	10/12/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	11/16/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	4/21/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	5/11/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/6/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	8/4/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	9/15/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	10/12/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	11/16/1999	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	7/12/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Rabe	7/12/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/10/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/11/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	7/10/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/10/2000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	7/17/2001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Rabe	7/17/2001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/16/2001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/16/2001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	7/16/2001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/16/2001	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/9/2002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/9/2002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/9/2002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Rabe	7/10/2002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	7/10/2002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	7/23/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/23/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/23/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/23/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	Downstream	Between Pt. Aux Frenes/Hay Pt., Rabe	8/19/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	8/19/2003	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	7/14/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/14/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/14/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/14/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170140	Downstream	Between Pt. Aux Frenes/Hay Pt., Rabe	7/12/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	7/12/2004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

BASE/NEUTRAL ORGANICS

STORET ID	River	Location	Sample Collection Date	Benzo(a)pyrene	Indeno (1,2,3-cd) pyrene	Dibenzo(a,h)anthracene	Benzo[g,h,i]perylene
				50-32-8	193-39-5	53-70-3	191-24-2
				(ug/L)	(ug/L)	(ug/L)	(ug/L)
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	5/17/1999	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	6/15/1999	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	7/13/1999	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	8/10/1999	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	9/7/1999	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	10/6/1999	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	11/8/1999	ND	ND	ND	ND
170140	Downstream	Raber	5/18/1999	ND	ND	ND	ND
170140	Downstream	Raber	6/15/1999	ND	ND	ND	ND
170140	Downstream	Raber	7/12/1999	ND	ND	ND	ND
170140	Downstream	Raber	8/9/1999	ND	ND	ND	ND
170140	Downstream	Raber	9/7/1999	ND	ND	ND	ND
170140	Downstream	Raber	10/5/1999	ND	ND	ND	ND
170140	Downstream	Raber	11/8/1999	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	4/20/1999	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	5/12/1999	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	6/8/1999	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/7/1999	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	8/3/1999	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	9/14/1999	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	10/13/1999	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	11/17/1999	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	8/2/1999	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	9/13/1999	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	10/13/1999	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	11/17/1999	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	4/19/1999	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	5/12/1999	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	6/7/1999	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/7/1999	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	4/22/1999	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	5/11/1999	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	7/6/1999	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	8/5/1999	ND	ND	ND	ND

BASE/NEUTRAL ORGANICS							
STORET ID	River	Location	Sample Collection Date	Benzo(a)pyrene	Indeno (1,2,3-cd) pyrene	Dibenzo(a,h)anthracene	Benzo[g,h,i]perylene
				50-32-8	193-39-5	53-70-3	191-24-2
				(ug/L)	(ug/L)	(ug/L)	(ug/L)
820017	Detroit River Downstream	East of City of Rockwood	9/16/1999	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	10/12/1999	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	11/16/1999	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	4/21/1999	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	5/11/1999	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/6/1999	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	8/4/1999	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	9/15/1999	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	10/12/1999	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	11/16/1999	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	7/12/2000	ND	ND	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Rabe	7/12/2000	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/10/2000	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/11/2000	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	7/10/2000	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/10/2000	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	7/17/2001	ND	ND	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Rabe	7/17/2001	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/16/2001	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/16/2001	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	7/16/2001	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/16/2001	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/9/2002	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/9/2002	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/9/2002	ND	ND	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Rabe	7/10/2002	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	7/10/2002	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	7/23/2003	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/23/2003	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/23/2003	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/23/2003	ND	ND	ND	ND
170140	Downstream	Between Pt. Aux Frenes/Hay Pt., Rabe	8/19/2003	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	8/19/2003	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	7/14/2004	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/14/2004	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/14/2004	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/14/2004	ND	ND	ND	ND
170140	Downstream	Between Pt. Aux Frenes/Hay Pt., Rabe	7/12/2004	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	7/12/2004	ND	ND	ND	ND

VOLATILE ORGANIC COMPOUNDS

STORET ID	River	Location	Sample Collection Date	MTBE	Benzene	Toluene	Ethylbenzene
				(ug/L)	(ug/L)	(ug/L)	(ug/L)
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Raber	5/18/1999	ND	ND	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Raber	6/15/1999	ND	ND	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Raber	7/12/1999	ND	ND	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Raber	8/9/1999	ND	ND	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Raber	9/7/1999	ND	ND	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Raber	10/5/1999	ND	ND	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Raber	11/8/1999	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	5/17/1999	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	6/15/1999	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	7/13/1999	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	8/10/1999	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	9/7/1999	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	10/6/1999	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	11/8/1999	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	4/21/1999	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	5/11/1999	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	6/9/1999	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/6/1999	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	8/4/1999	ND	2.6	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	9/15/1999	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	10/12/1999	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	11/16/1999	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	4/22/1999	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	5/11/1999	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	6/10/1999	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	7/6/1999	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	8/5/1999	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	9/16/1999	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	10/12/1999	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	11/16/1999	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	4/20/1999	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	5/12/1999	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	6/8/1999	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/7/1999	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	8/3/1999	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	9/14/1999	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	10/13/1999	ND	ND	ND	ND

VOLATILE ORGANIC COMPOUNDS

STORET ID	River	Location	Sample Collection Date	MTBE	Benzene	Toluene	Ethylbenzene
				(ug/L)	(ug/L)	(ug/L)	(ug/L)
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	11/17/1999	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	4/19/1999	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	5/12/1999	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	6/7/1999	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/7/1999	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	8/2/1999	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	9/13/1999	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	10/13/1999	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	11/17/1999	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	7/10/2000	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/10/2000	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/10/2000	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/11/2000	ND	ND	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Raber	7/12/2000	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	7/12/2000	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	7/16/2001	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/16/2001	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/16/2001	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/16/2001	ND	ND	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Raber	7/17/2001	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	7/17/2001	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	7/9/2002	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/9/2002	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/9/2002	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/9/2002	ND	ND	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Raber	7/10/2002	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	7/10/2002	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	7/23/2003	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/23/2003	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/23/2003	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/23/2003	ND	ND	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Raber	8/19/2003	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	8/19/2003	ND	ND	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	7/14/2004	ND	ND	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	7/14/2004	ND	ND	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	7/14/2004	ND	ND	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	7/14/2004	ND	ND	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Raber	7/12/2004	ND	ND	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	7/12/2004	ND	ND	ND	ND

VOLATILE ORGANIC COMPOUNDS

STORET ID	River	Location	m & p Xylene	o-Xylene
			(ug/L)	(ug/L)
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Raber	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Raber	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Raber	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Raber	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Raber	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Raber	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Raber	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	ND	ND

VOLATILE ORGANIC COMPOUNDS

STORET ID	River	Location	m & p Xylene	o-Xylene
			(ug/L)	(ug/L)
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Raber	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Raber	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Raber	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Raber	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	ND	ND
820017	Detroit River Downstream	East of City of Rockwood	ND	ND
820414	Detroit River Upstream	at Windmill Pt., Peach Island	ND	ND
740016	St. Clair River Downstream	at Algonac State Park, Clay Twp.	ND	ND
740376	St. Clair River Upstream	at Blue Water Bridge, Port Huron Twp.	ND	ND
170140	St. Mary's River Downstream	Between Pt. Aux Frenes/Hay Pt., Raber	ND	ND
170139	St. Mary's River Upstream	at Brush Pt., Buoy #13, Soo Twp.	ND	ND