2013

Water Quality Monitoring Data Summary Statistics

14-110

MMSD
PARTNERS FOR A CLEANER ENVIRONMENT

MILWAUKEE METROPOLITAN SEWERAGE DISTRICT (MMSD)
SURFACE WATER QUALITY MONITORING PROGRAM DATA
SUMMARY STATISTICS REPORT - SURVEY DESCRIPTIONS

Overview

The goal of the Milwaukee Metropolitan Sewerage District (MMSD) water quality monitoring program is to document long term beneficial water quality improvements as a direct result of the facilities and watercourse improvement projects, nonpoint pollution prevention programs, and stormwater management plans. The monitoring strategies developed by the District support and substantiate the District's goals and policies of improved water quality and environmental protection.

In 1979, the District began its surface water quality-monitoring program to comply with the spirit of the Federal Water Pollution Control Act objectives and State water quality standards. Since the completion of the Inline Storage System (ISS) in 1993, the District has substantially reduced overflows helping to significantly improve Milwaukee-area water quality. Another component to the District's mission is to protect and manage the area's water resources through flood management planning/implementation. Both the reductions of CSO's and improvements made in managing floods are further justification to document long term, surface water quality trends within the District's service area.

The 2013 Water Quality Monitoring program includes thirteen different surveys. Three surveys monitor Lake Michigan conditions near our wastewater treatment plants (Outer Harbor and South Shore surveys) and background lake conditions (Nearshore survey). The District also conducts ten other surveys to monitor the effects of our operations and improvements made to our facilities and from our flood management efforts. These surveys include Rivers (Milwaukee, Menomonee, and Kinnickinnic), Little Menomonee River, Root River, Lincoln, Oak, Southbranch, Indian, Fish, Underwood, and Honey Creeks.

The information that follows lists additional details about this program, the rationale for monitoring area surface waters and the related laboratory variable names and detection limits used to assist with data interpretation. Data analysis for this report includes two parts, statistical summaries of the physical, chemical and biological analytical data from each monitoring site and box plots showing trends in the summarized data dating back to 1980 where available. Due to the extent of box plot trend analysis for 98 sites and 43 variables, it was decided to select some key indicator variables and show trends of select sites that would spatially represent the surveys. The box plots show a comparison of the median and percentile values for up to 14 years prior to the ISS completion, after ISS completion (1994), the past three years (2011-2013), and the current year of analysis (2013). Results that are below the laboratory method detection limit are included as a zero value.

Monitoring Variables

In all, there are 43 types of water quality analyses (some are calculated results) listed in this data summary report. Each sample's tests may vary by survey type and depth due to method specifications,

scientific judgment and costs. Where feasible, the variables analyzed for each survey are kept consistent for data assessment purposes.

Monitoring Depth

The District's routine water quality monitoring program provides for sampling the water column at various depths, depending on the specific depth of a particular monitoring location. Exact sampling depths at any location may vary from year to year or week to week depending on lake levels, seiches, dam operation and precipitation. Generally, three samples are collected at sites greater than four meters in depth (one meter below the surface, one meter above the bottom, and mid-depth point). Locations less than four meters in depth are generally sampled at either two depths (one meter below the surface and one meter above the bottom) or one depth (mid-depth) depending on site conditions. Samples are collected from mid-channel or where the predominance of flow is occurring at each location. Samples for metals tests are collected at mid-depth at sites greater than four meters depth and at the surface for shallower monitoring sites.

Types of Surveys

The District's surface water quality monitoring program is presently engaged in both Lake Michigan and River/Creek surveys including the following:

*Outer Harbor (*East of Jones Island Water Reclamation Facility)
Major Rivers (Milwaukee, Menomonee, Kinnickinnic Rivers)
Fish Creek
Southbranch Creek
Indian Creek
Lincoln Creek
Underwood Creek
Little Menomonee River
Honey Creek
South Shore (East of the South Shore Water Reclamation Facility)
Oak Creek
Root River
Nearshore (Nearshore zone of Lake Michigan)

The sampling rationale for the various monitoring surveys is briefly explained below.

Outer Harbor

Samples are collected from this area 14 times annually once per month March, April, October, and November and twice per month May through September. The sample results are utilized to evaluate the impact that the Jones Island and river discharges are having on the quality of this part of the Lake that is

intensively used for recreational boating and fishing. Sampling sites for this effort were selected based upon their position relative to the effluent outfall at Jones Island and the movement of water (or currents) found in the area. Samples are collected at 15 different locations. The point identified as OH-02 is the existing outfall for the Jones Island Water Reclamation Facility. As a point of reference, the distance from Outer Harbor sampling point OH-7 to Outer Harbor sampling point OH-14 is one mile.

Rivers

Extensive monitoring of the three major river systems within the District's sewer service boundaries provides baseline data for measuring and documenting potential sources of pollution both inside and outside the District boundaries. Surveys are scheduled to be sampled once per month January, February, November, and December and twice a month (March - October). Water quality improvements as a direct result of facility and watercourse planning and systems operations can also be measured through the use of this survey's sampling results. There are 27 sites that are routinely monitored for this survey (designated "RI" and a site number).

- *Milwaukee River* - The Milwaukee River is the largest river within the District's Service area and is currently recognized by community leaders as an important recreational water resource within the metropolitan area. This River enters the District at Pioneer Road (County Trunk C) from the north after passing through 86% of its drainage area. This monitoring effort was started in 1980 to provide baseline data for the Water Pollution Abatement Plan (WPAP) and will enable the District to assess its positive effects on water quality over time. In addition, recent plans for flood management improvements by MMSD on tributaries to this river will also be evaluated by utilizing current and historical water quality monitoring databases.

- *Menomonee and Kinnickinnic River Surveys* – Basically, these two rivers have all of their respective watersheds within the boundaries of the District's service area. Water Quality improvement may result through the control of Combined Sewer Overflows (CSO) discharges and by the elimination of various discharge points which represent relief bypasses. Significant improvements in water quality due to the WPAP may be noted in these two rivers. However, uncontrolled, nonpoint sources of pollution may continue to have impacts. Also, evaluation of current and future flood management improvements, as part of MMSD's Watercourse Management Plan, will rely heavily on water quality data for these waters. Data collected will be useful to evaluate all of these factors.

The Menomonee River Valley has also been recently cited as having a promising potential for economic development. Continued water quality monitoring could help in planning that development.

Fish Creek

Fish Creek is mainly located along the border between Milwaukee and Ozaukee counties in the Village of Bayside and the City of Mequon. The stream emerges from a storm sewer outfall at the south side of Donges Bay Road just west of Port Washington Road in the City of Mequon. Fish Creek drains directly into Lake Michigan 3.43 miles downstream from the source. Major precipitation events result in rapid surface runoff to Fish Creek, thereby causing a flashy response in this stream. This further results in

significant flooding in the Village of Bayside. The District is in the process of evaluating options to reduce flooding as well as decreasing erosion along Fish Creek.

This survey is conducted 8 times per year (once a month, April - November) and has one sampling site (FC-02). The Fish Creek survey was added to the District's monitoring program in 2002 in order to collect baseline data. If construction type improvements are chosen as a means to manage flooding problems in this watershed, then the water quality monitoring data will help in documenting and planning this process.

Southbranch Creek

This creek, approximately 1.5 miles long, drains a 2.95 square mile area within the Villages of Brown Deer, River Hills and the City of Milwaukee before it enters into the Milwaukee River. The entire watershed lies in an urban setting and drains by means of a storm sewer system. Southbranch Creek has a long history of flooding. Residential neighborhoods along the creek periodically flood during significant storms. In response to this recurring problem, the MMSD, along with other concerned parties, have implemented a flood management plan intended to minimize flooding. Highlights include the installation of four stormwater detention basins, the replacement of some culverts and deepening a section of the creek. Water quality monitoring in this watershed was added to the District's sampling program in 1999 to obtain data before, during and after the implementation of the flood management and environmental restoration project. This survey is conducted 9 times per year (once a month, March - November). There is one sampling site, SB-04.

Indian Creek

Indian Creek is a major tributary of the Milwaukee River located in northern Milwaukee County. The creek, 2.6 miles in length, originates in the Village of Bayside near the intersection of East Brown Deer Road and North Rexleigh Drive. The Creek flows in a generally southwest direction through the Village of Fox Point, crosses Interstate 43 at the boundary of Fox Point and the Village of River Hills, and has its confluence with the Milwaukee River just south of Bradley Road in River Hills. Large storms typically cause flooding in this watershed.

This survey is conducted 8 times per year (once a month, April - November) and has one sampling site (IC-04). The Indian Creek survey was added to the District's monitoring program in 2002 prior to implementation of the MMSD watercourse management plan for this stream. Continued monitoring will assist in documenting changes in water quality due to the completion of this plan.

Lincoln Creek

This creek enters the Milwaukee River downstream of Silver Spring Drive (RI-03) and is north of our Port Washington Road sampling site (R1-04). Lincoln Creek is approximately nine miles in length and drains a 21-square mile watershed. There is a history of this creek having poor water quality and flooding problems due to urbanization within its watershed. In response to these problems, the District, along with other concerned parties, has developed and implemented a flood management plan which involves environmental restoration, creation of wetland stormwater detention areas, changes in creek channel

morphology, stream bank erosion controls and improvement in creek bed substrate. Water quality monitoring in this watershed was added to the District's sampling program in 1997 to obtain data before, during and after the implementation of this plan. This survey is sampled once per month; March through November (9 times per year). The three sampling sites (designated "LC" and a site number) cover nearly 90% of the creek, from the headwaters to within a half mile of its confluence with the Milwaukee River.

Underwood Creek

Underwood Creek originates in the City of Brookfield and flows approximately 8 miles, in a southeasterly direction, to its confluence with the Menomonee River. The Underwood Creek subwatershed encompasses approximately 19.8 square miles and includes portions of the communities of Brookfield, Elm Grove and Wauwatosa. The Underwood Creek subwatershed is comprised of the Underwood Creek mainstem, Dousman Ditch, and the South Branch of Underwood Creek. The majority of Underwood Creek (UC) and the South Branch of UC are in a concrete lined channel. The South Branch of UC flows 1.6 miles in a northerly direction from its origin at West Greenfield Avenue to its confluence with Underwood Creek near West Bluemound Road. The South Branch of UC flows through the cities of Milwaukee, West Allis, Brookfield, and New Berlin. Flooding problems have occurred in the UC subwatershed and sections of this creek have undergone flood management improvements

Underwood Creek was added to the MMSD sampling program in 2003 and includes two sites on the South Branch of UC and four sites on the Underwood Creek mainstem. Surveys are scheduled once a month from March – November (9 times per year). The monitoring plan is to collect data for several years prior to stream improvement projects, during construction and for several years after construction is completed to compare and document water quality changes in this watershed.

Little Menomonee River

The Little Menomonee River originates in southern Ozaukee County near Freistadt Rd. and flows in a mostly southerly direction for a distance of approximately 10 miles to its confluence with the Menomonee River near Highway 100 and Hampton Avenue (Timmerman Field airport area). The Little Menomonee River subwatershed encompasses approximately 21.8 square miles, or nearly 16 percent of the Menomonee River watershed and includes portions of the communities of Mequon, Germantown and Milwaukee. It is entirely confined within the borders of Ozaukee and Milwaukee counties.

The Little Menomonee River was added to the MMSD monitoring program in 2007 and includes two sites (ML-01 and ML-02). Surveys are scheduled to be sampled once per month January, February, November, and December and twice a month (March - October) and is sampled concurrently with the Rivers survey. The monitoring plan is to collect data from this subwatershed in order to assess water quality impacts stemming from the Little Menomonee River.

Honey Creek

Honey Creek originates at the S. 43rd Street storm sewer outfall in the City of Greenfield and flows in a northerly direction for approximately 8.8 miles until its confluence with the Menomonee River in the City of Wauwatosa. The Honey Creek subwatershed encompasses 11 square miles and includes portions of the communities of Greenfield, Milwaukee, Wauwatosa, and West Allis. Channel modifications such as deepening, straightening, and lining with concrete have been made to 7.1 miles of Honey Creek. The Creek flows under State Fair Park in an enclosed channel that consists of 3 – 10 foot by 15 foot pipes. The Honey Creek subwatershed has experienced minor flooding problems, but the biggest problem with this Creek has been the ecological degradation and habitat loss due to channel modifications.

Honey Creek was added to the MMSD sampling program in 2003 and includes three sampling sites (HC-01 - HC-03). This survey is conducted nine times per year (once a month, March - November). Baseline monitoring data are being collected to assist with future flood management planning efforts.

South Shore

Samples are collected from this area 14 times annually once per month March, April and October, November and twice per month May through September. The sample results are utilized to assess the impact of the discharge of the South Shore Water Reclamation Facility on the local environs of Lake Michigan. The point identified as SS-01 is the point of discharge from this facility. A major drinking water plant intake (Oak Creek) is located approximately one-mile southeast of SS-01.

As with the Outer Harbor Survey, sample locations were based upon the Lake currents found in the area and relative position of a selected sampling site to the outfall. Samples are collected at three depths at each site in a scheme similar to the Outer Harbor effort. The distance from SS-1 to SS-3 is 1,000 feet; the distance from SS-1 to SS-11 is 3,000 feet.

Oak Creek

This stream lies completely within District boundaries (except for a portion of this creek that flows through South Milwaukee). Oak Creek flows into Lake Michigan about two miles north of the MMSD's South Shore Water Reclamation Facility. Knowledge of its water quality is helpful in determining impacts to the Lake's nearshore area. When monitoring began for the Oak Creek survey in 1985, the area was primarily rural drainage basin. Since then, it has undergone significant development. Urbanization will increase the flows that the stream will be required to handle. The objective of the survey District is to monitor the resulting water quality changes over time. Oak Creek is a part of the District's facility and watercourse management planning initiatives. This survey is sampled once per month; March through November (9 times per year). There are seven sampling sites monitored for this survey and are designated with "OC" and a site number.

Root River

This river drains approximately 197 square miles within Milwaukee, Waukesha, Racine and Kenosha counties. There is a history of low storm sewers within this river's watershed (potential for water back up) and flooding problems due to increasing urbanization within its watershed. In response to these problems, the District, along with other concerned parties, are working on a watershed restoration plan

that may involve environmental restoration, creation of wetland stormwater detention areas, changes in creek channel morphology, stream bank erosion controls and improvement in riverbed substrate. Water quality monitoring in this watershed was added to the District's sampling program to obtain data before, during and after the implementation of this plan.

This survey is sampled once per month (9 times per year); March through November. The six sampling sites (designated "RR" and a site number) cover the upper 72 square miles of the watershed located within the District's service area.

Nearshore Lake Michigan

The purpose of this effort is to provide a data base for the District to assess the impact of MMSD discharges as well as all other sources of pollution, including stormwater runoff, on overall nearshore water quality. The scope of this effort overlaps those efforts being undertaken in the Outer Harbor and at South Shore. Samples are collected from this area 9 times annually, approximately once per month (weather dependent, March - November). Some of this survey's sites are located at a distance from shore to provide data for determining lake background levels. Lake background information has been useful in developing some of the District's effluent limitations and permit discharge fees. Sites located a distance from shore and are not one of the sites that overlap our Outer Harbor or South Shore efforts, have a reduced list of variables tested. This is due to historical results that show values less than the method detection limit or very low concentrations for that test and were consequently removed from the list of tests requested for Lab analysis. The 14 points (Figure 11) sampled during this survey cover the area of the nearshore environs of Lake Michigan from Fox Point on the north to Wind Point on the south and from the western shore of Lake Michigan to a point ten miles east of the western shore. Sample sites are designated as "NS" and a site number. The total area of lake covered by this survey is over 300 square miles.

Data Usage

The data generated by the District's surface water quality and other related environmental monitoring programs have been utilized extensively in-house as well as by other agencies and/or organizations and individual citizens.

Also, the data have allowed other public agencies to make informed, defensible decisions regarding Milwaukee's valuable surface water resources. Examples of uses for this data include the MMSD 2020 Facilities Plan (developed by multi-agency and citizen stakeholder committees) and the Regional Water Quality Management Plan (required under the Clean Water Act). This type of long-term, comprehensive information has provided a service to the community by eliminating the need for smaller, more expensive piecemeal projects that would be required each time a specific need for information arises.
The District's comprehensive and aggressive surface water quality monitoring program reflects the District's commitment to the improvement and preservation of the community's surface water resources and it should be continued for use in future water resource decisions for the Milwaukee metropolitan area.

Water Quality Variables

Variable	Abbreviation	Unit of Measure
pH	pH	Std. Units
Temperature	TEMP	Degrees Celsius
Dissolved Oxygen	DO	mg/L
Chlorophyll *a*	CHLA	mg/m^3
Nitrate Nitrogen	NITRATE	mg/L
Nitrite Nitrogen	NITRITE	mg/L
Nitrite + Nitrate Nitrogen	NO5	mg/L
Ammonia Nitrogen	AMMONIA	mg/L
Total Kjeldahl Nitrogen	TKN	mg/L
Phosphorus	PHOS	mg/L
Soluble Phosphorus	SOLPHOS	mg/L
Soluble Silica	SOLSIL	mg/L
Water Transparency (Secchi Disk)	SCHII	meters
1% Light Level (photometer)	IXLITE	meters
Total Solids	TS	mg/L
Dissolved Solids	DS	mg/L
Volatile Suspended Solids	VSS	mg/L
Suspended Solids	SS	mg/L
Turbidity	TURB	FNU
Specific Conductivity	SPEC	µmhos/cm
Chloride	CHLOR	mg/L
Fecal Coliform Bacteria	FECAL	CFU/100 mL
Log_{10} Fecal Coliform Bacteria	LFC	CFU/100 mL
***Escherichia coli* Bacteria**	ECOLIQT	MPN/100 mL
Total Calcium	CA	mg/L
Total Magnesium	MG	mg/L
Total Cadmium	CD	µg/L
Total Chromium	CR	µg/L
Total Copper	CU	µg/L
Total Nickel	NI	µg/L
Total Lead	PB	µg/L
Total Zinc	ZN	µg/L
Total Silver	AG	µg/L
Total Arsenic	AS	µg/L
Total Selenium	SE	µg/L
Mercury	HG	µg/L
Hardness	HARD	mg/L
Total Alkalinity	TALK	mg/L
Biochemical Oxygen Demand (5 and 20 day)	BOD 5/20	mg/L
Total Carbon	TC	mg/L
Total Nonpurgeable Inorganic Carbon	TNIC	mg/L
Total Nonpurgeable Organic Carbon	TNOC	mg/L
Total Nonpurgeable Dissolved Organic Carbon	TNDOC	mg/L

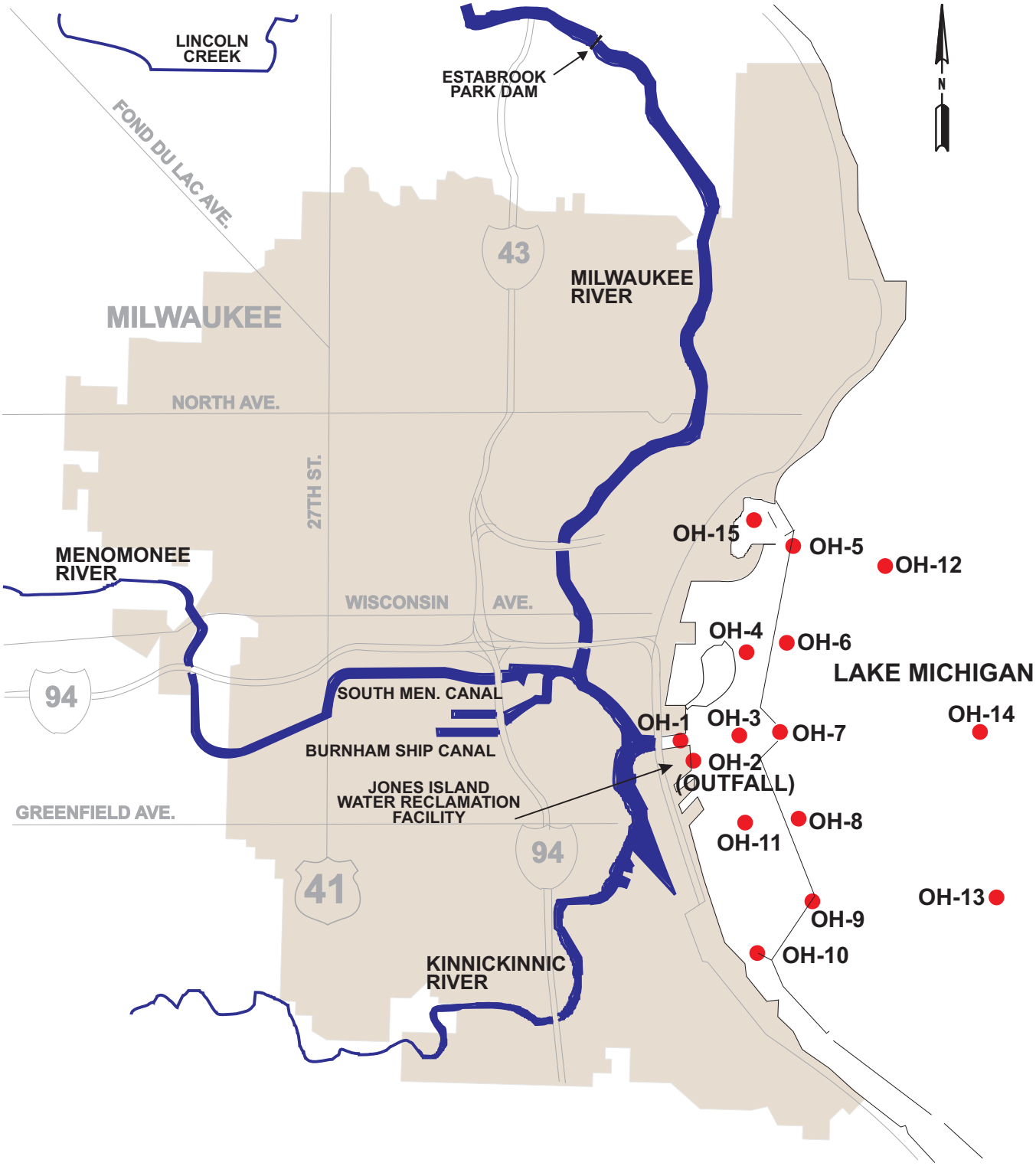
Water Quality Standards/Criteria for Parameters listed in Boxplots

Variable	Applicable Water Body	Standard/Criterion	References
Dissolved Oxygen	Creeks/Rivers/Harbor:	5 mg/L[1]	1
	Open Lake:	6 mg/L	1
Fecal Coliform	All surface water:	200 CFU/100mL[2]	1
	Special variance[3]:	1,000 CFU/100mL[2]	2
Chlorophyll *a*	Rivers/Creeks:	1.54 mg/m^3[4]	4
Chloride	All surface water:	395 mg/L	3
Total Phosphorus	Open Lake:	0.007 mg/L	1
	Creeks/Upstream Menomonee and Kinnickinnic Rivers:	0.075 mg/L	1
	Downstream Menomonee and Kinnickinnic Rivers/All Milwaukee River and Harbor:	0.10 mg/L	1

[1] A subset of the sampling sites fall under the dissolved oxygen special variance criteria of 2 mg/L as designated in NR 104. The most protective criteria listed in NR 102 are used for these purposes.
[2] The Fecal coliform standard is based on a geometric mean using a minimum of 5 samples/month.
[3] The special variance standard is applied to the following creeks; Underwood, Indian, Honey, Lincoln and rivers; Menomonee below the confluence with Honey Creek, Milwaukee River downstream of North Avenue dam, and Kinnickinnic.
[4] This value is a recommended guideline (not a regulatory standard) representing areas minimally impacted by human activities in Ecoregion VII. This should be replaced with site-specific guidelines for urban areas when possible.

References

1. Wisconsin Department of Natural Resources (WDNR), Wisconsin Administrative Code, NR 102, Water Quality Standards for Wisconsin Surface Waters. Register November, 2010, No. 659.
2. WDNR, Wisconsin Administrative Code, NR 104 Use and Designated Standards, Register February, 2004, No. 578.
3. WDNR, Wisconsin Administrative Code, NR 105, Surface Water Quality Criteria and Secondary Values for Toxic Substances. Chronic Toxicity Criteria, Register July, 2010, No. 655.
4. United States Environmental Protection Agency (USEPA), December, 2000. Ambient Water Quality Criteria Recommendations, Rivers and Streams in Nutrient Ecoregion VII: USEPA, Office of Water, EPA 822-B-00-018.



LEGEND

● ACTIVE WATER QUALITY SAMPLING LOCATIONS

COMBINED SEWER SERVICE AREA

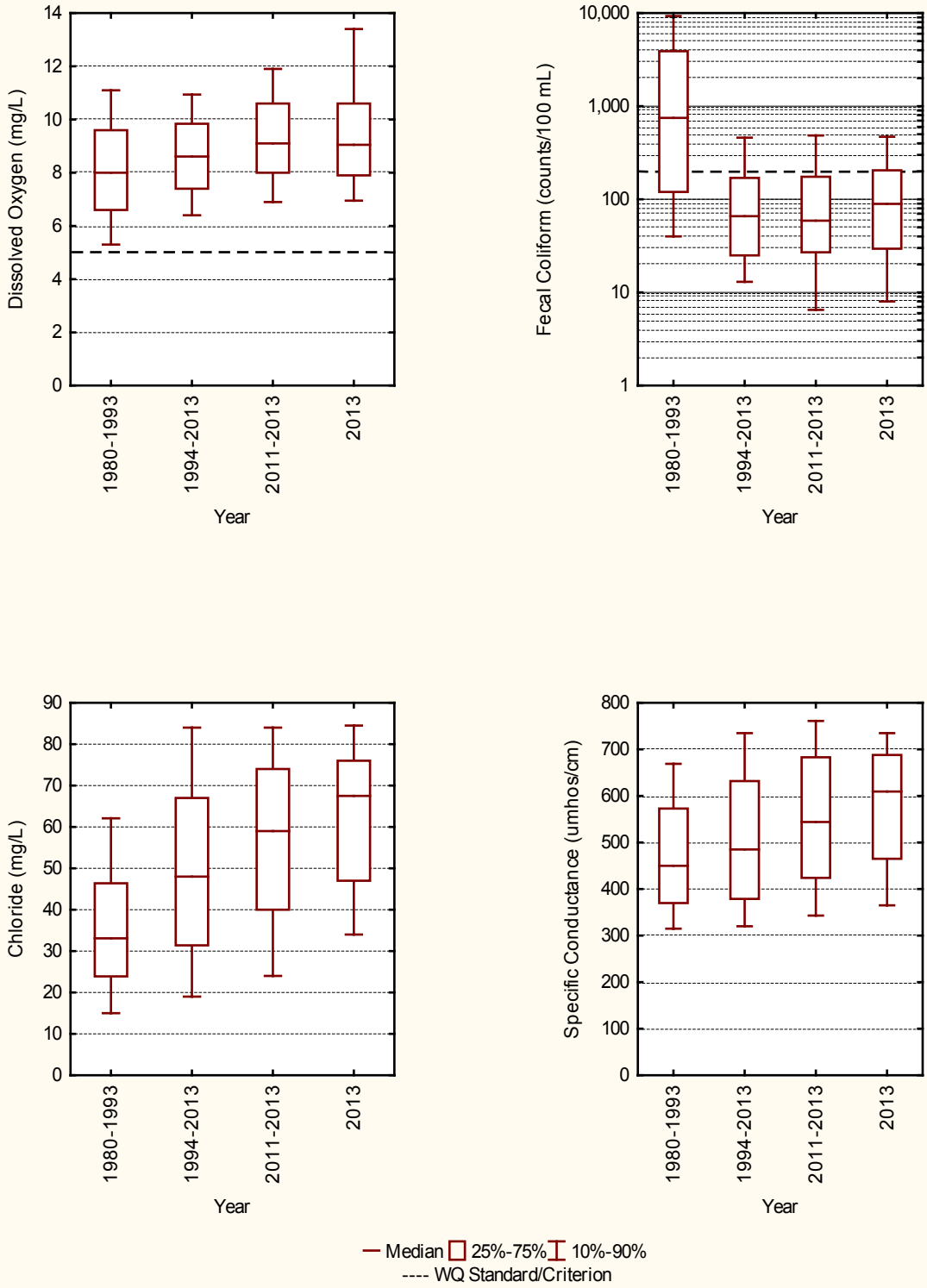
MMSD
PARTNERS FOR A CLEANER ENVIRONMENT

OUTER HARBOR (OH) SURVEY
WATER QUALITY SAMPLING LOCATIONS

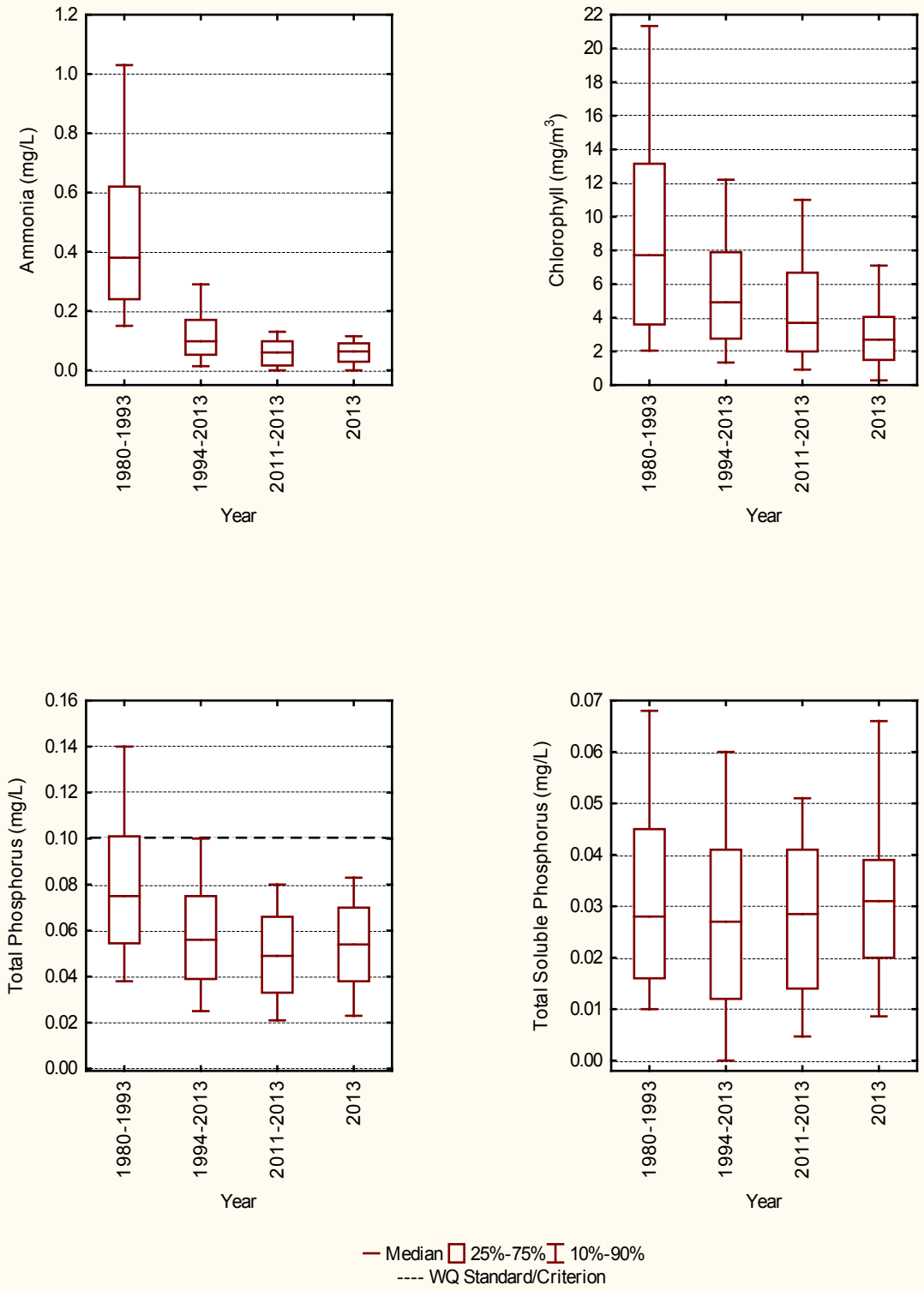
4/14/14

14-061 OH

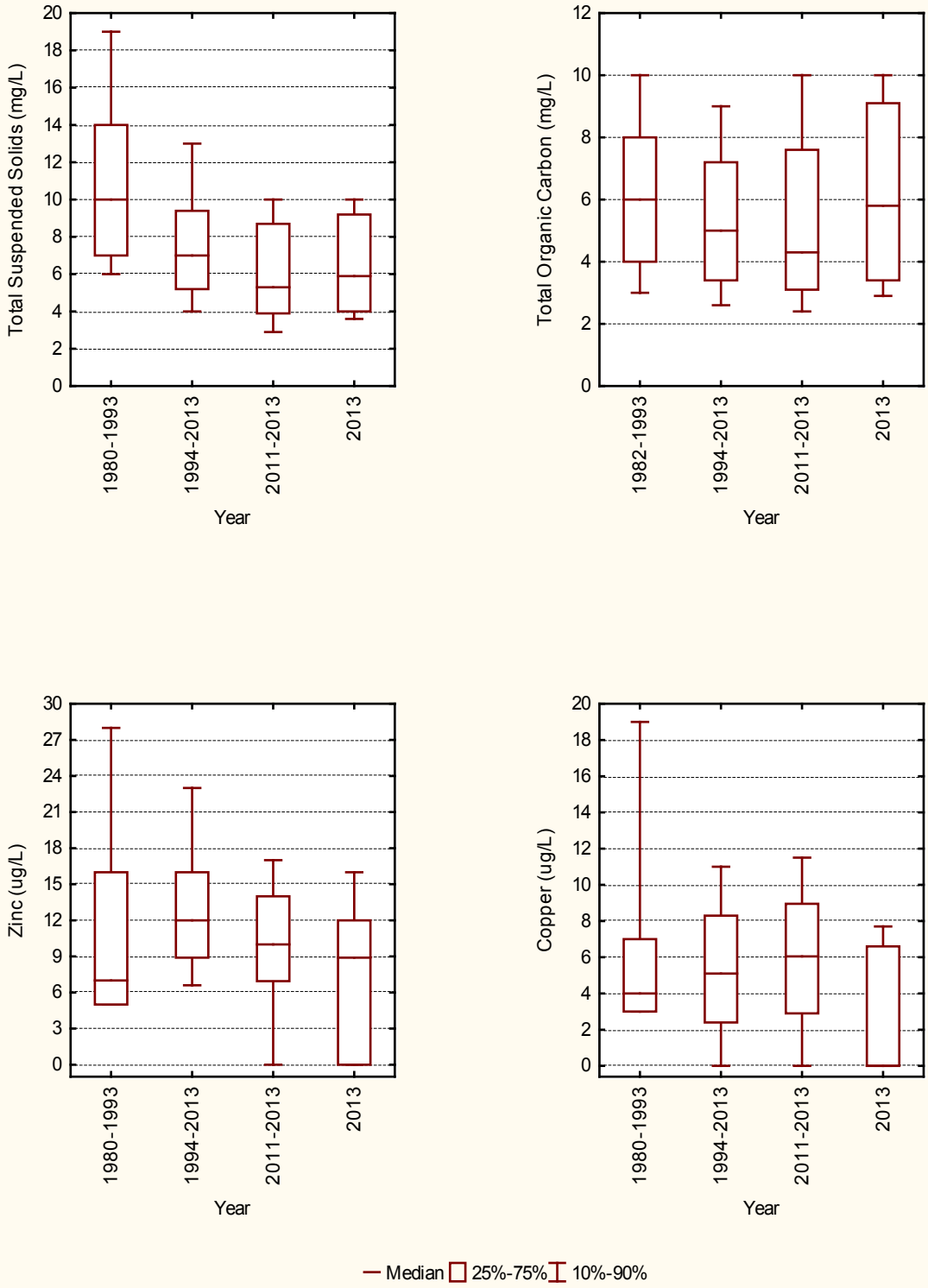
MMSD Water Quality Monitoring Program Data
Outer Harbor, Site OH-01



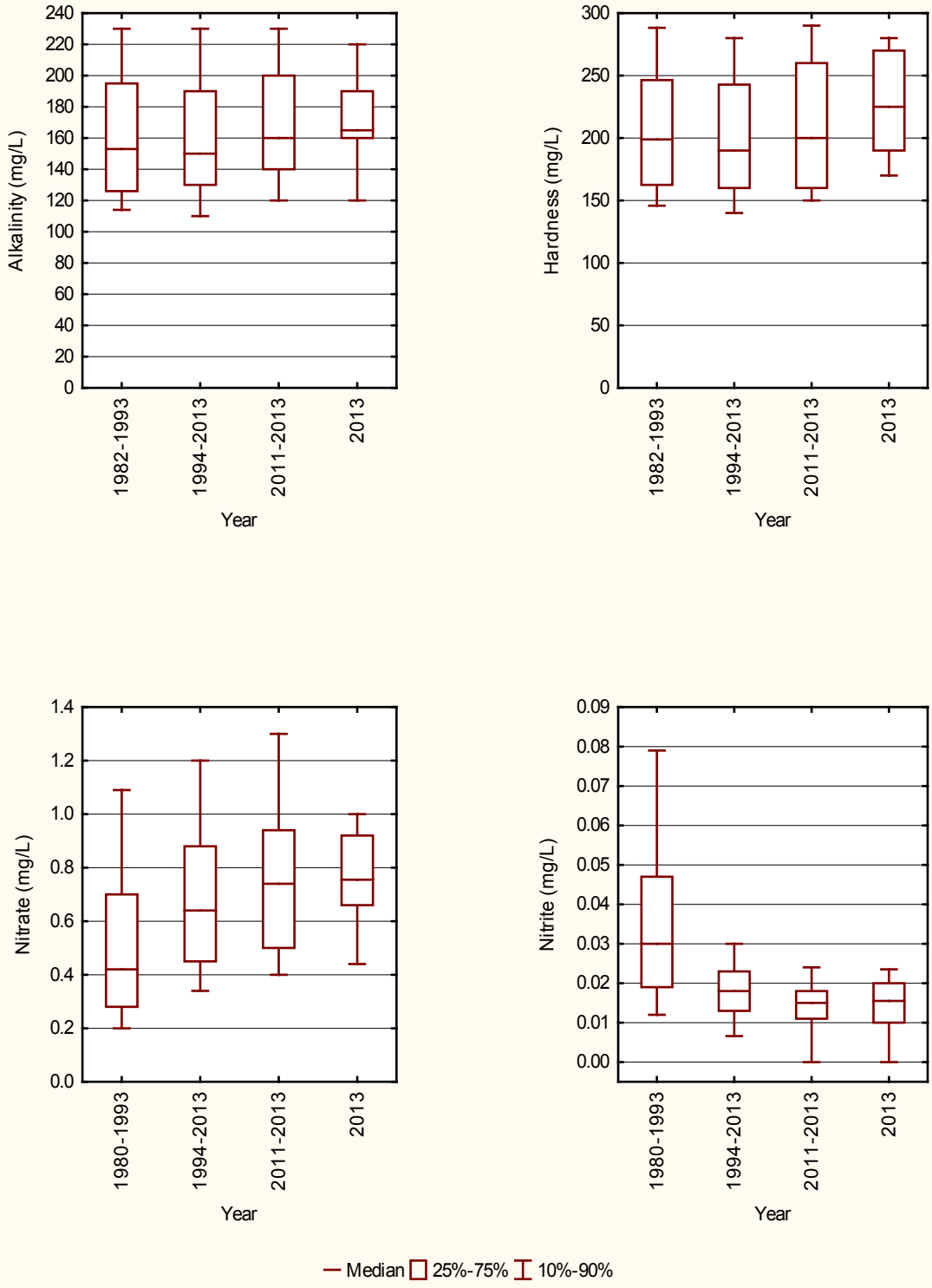
MMSD Water Quality Monitoring Program Data
Outer Harbor, Site OH-01



MMSD Water Quality Monitoring Program Data
Outer Harbor, Site OH-01



MMSD Water Quality Monitoring Program Data
Outer Harbor, Site OH-01



OUTER HARBOR - SITE 1
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.0	13.3	9.5	3.35	0.77	0.014	0.79	0.060	0.70	0.054	0.032	3.84
Standard Error	0.0	0.8	0.3	0.39	0.03	0.001	0.03	0.005	0.04	0.003	0.002	0.21
Median	8.0	13.7	9.1	2.70	0.76	0.016	0.77	0.064	0.69	0.054	0.031	3.65
Mode	8.1	10.6	Multi	Multi	Multi	0.000	Multi	0.000	1.10	Multi	Multi	Multi
Standard Deviation	0.1	6.4	2.2	3.03	0.22	0.008	0.23	0.041	0.29	0.024	0.019	1.66
Sample Variance	0.0	41.6	5.0	9.16	0.05	0.000	0.05	0.002	0.08	0.001	0.000	2.77
Range	0.5	23.0	8.0	14.00	0.98	0.033	1.08	0.140	1.20	0.106	0.076	6.70
Minimum	7.8	1.5	6.0	0.00	0.32	0.000	0.32	0.000	0.00	0.004	0.000	1.30
Maximum	8.3	24.5	14.0	14.00	1.30	0.033	1.40	0.140	1.20	0.110	0.076	8.00
Count	57	60	60	60	60	60	60	60	60	59	59	60
Confidence Level (95%)	0.0	1.7	0.6	0.78	0.06	0.002	0.06	0.011	0.07	0.006	0.005	0.43

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	1.6	4.1	334.3	327.9	2.2	6.4	5.0	583	62.9	184	1.9	247
Standard Error	0.1	0.3	17.8	17.4	0.3	0.8	0.4	19	2.9	62	0.1	96
Median	1.6	4.0	350.0	340.8	2.1	5.9	4.6	610	67.5	90	2.1	150
Mode	1.5	2.6	390.0	Multi	Multi	Multi	4.0	Multi	74.0	30	1.5	Multi
Standard Deviation	0.5	1.5	66.6	65.0	1.2	3.2	3.0	149	22.3	280	0.6	361
Sample Variance	0.3	2.1	4441.8	4222.5	1.5	10.1	9.1	22336	495.1	78124	0.4	130229
Range	2.0	5.8	200.0	197.4	5.6	11.4	16.5	707	127.0	1200	2.4	1387
Minimum	0.6	1.2	220.0	216.0	0.0	2.6	0.8	293	13.0	0	0.7	13
Maximum	2.6	7.0	420.0	413.4	5.6	14.0	17.3	1000	140.0	1200	3.1	1400
Count	20	18	14	14	14	14	60	60	60	20	19	14
Confidence Level (95%)	0.2	0.7	38.5	37.5	0.7	1.8	0.8	39	5.7	131	0.3	208

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

OUTER HARBOR - SITE 1
LAKE MICHIGAN
WATER QUALITY DATA - 2013

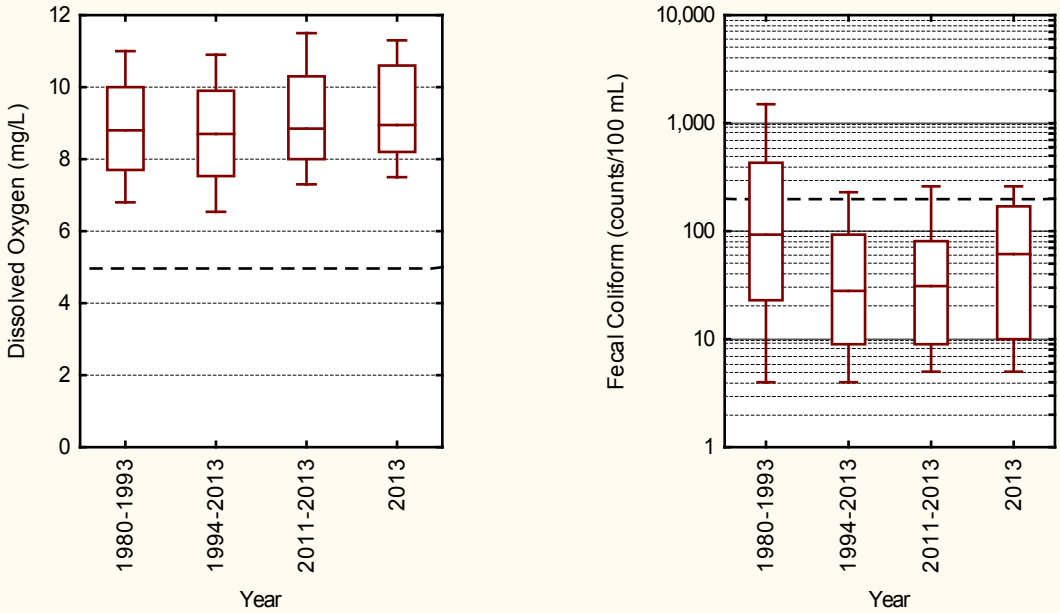
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	50.25	25.25	0.2	2.2	3.1	1.6	0.4	7.2	0.0	2.7	0.2	ND
Standard Error	1.29	0.87	0.0	0.1	0.5	0.2	0.3	1.0	0.0	0.5	0.2	ND
Median	50.50	25.00	0.0	2.1	0.0	2.0	0.0	8.9	0.0	0.0	0.0	ND
Mode	Multi	Multi	0.0	Multi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	8.94	6.04	0.3	0.8	3.7	1.2	1.9	7.1	0.0	3.2	1.4	ND
Sample Variance	79.94	36.45	0.1	0.6	13.7	1.5	3.5	50.4	0.0	10.0	1.9	ND
Range	36.00	22.00	1.6	5.4	12.0	3.9	10.0	27.0	0.0	10.0	9.4	ND
Minimum	35.00	14.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	71.00	36.00	1.6	5.4	12.0	3.9	10.0	27.0	0.0	10.0	9.4	ND
Count	48	48	48	48	48	48	47	48	32	38	47	0
Confidence Level (95%)	2.60	1.75	0.1	0.2	1.1	0.4	0.6	2.1	0.0	1.0	0.4	ND

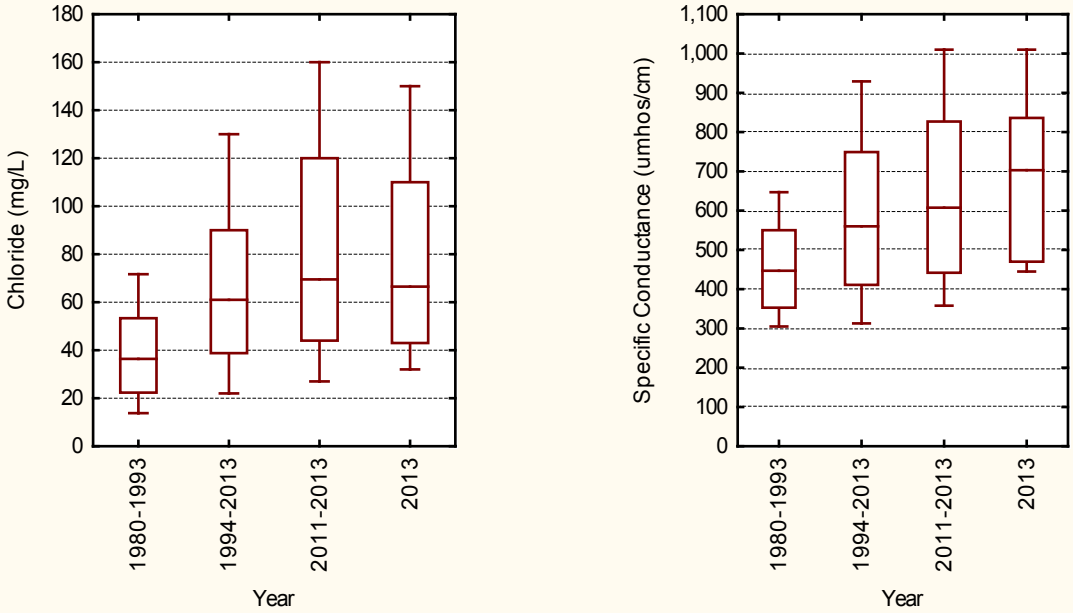
VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	228	171	ND	ND	42.0	35.7	6.4	ND
Standard Error	7	9	ND	ND	1.6	1.1	0.5	ND
Median	225	165	ND	ND	44.0	37.0	5.8	ND
Mode	270	160	ND	ND	46.0	Multi	10.0	ND
Standard Deviation	47	36	ND	ND	10.3	7.4	3.1	ND
Sample Variance	2182	1323	ND	ND	105.8	54.1	9.8	ND
Range	180	150	ND	ND	35.0	27.0	11.5	ND
Minimum	140	110	ND	ND	27.0	24.0	1.5	ND
Maximum	320	260	ND	ND	62.0	51.0	13.0	ND
Count	48	18	0	0	42	42	42	0
Confidence Level (95%)	14	18	ND	ND	3.2	2.3	1.0	ND

ND = No Data **Multi = Multimodal**

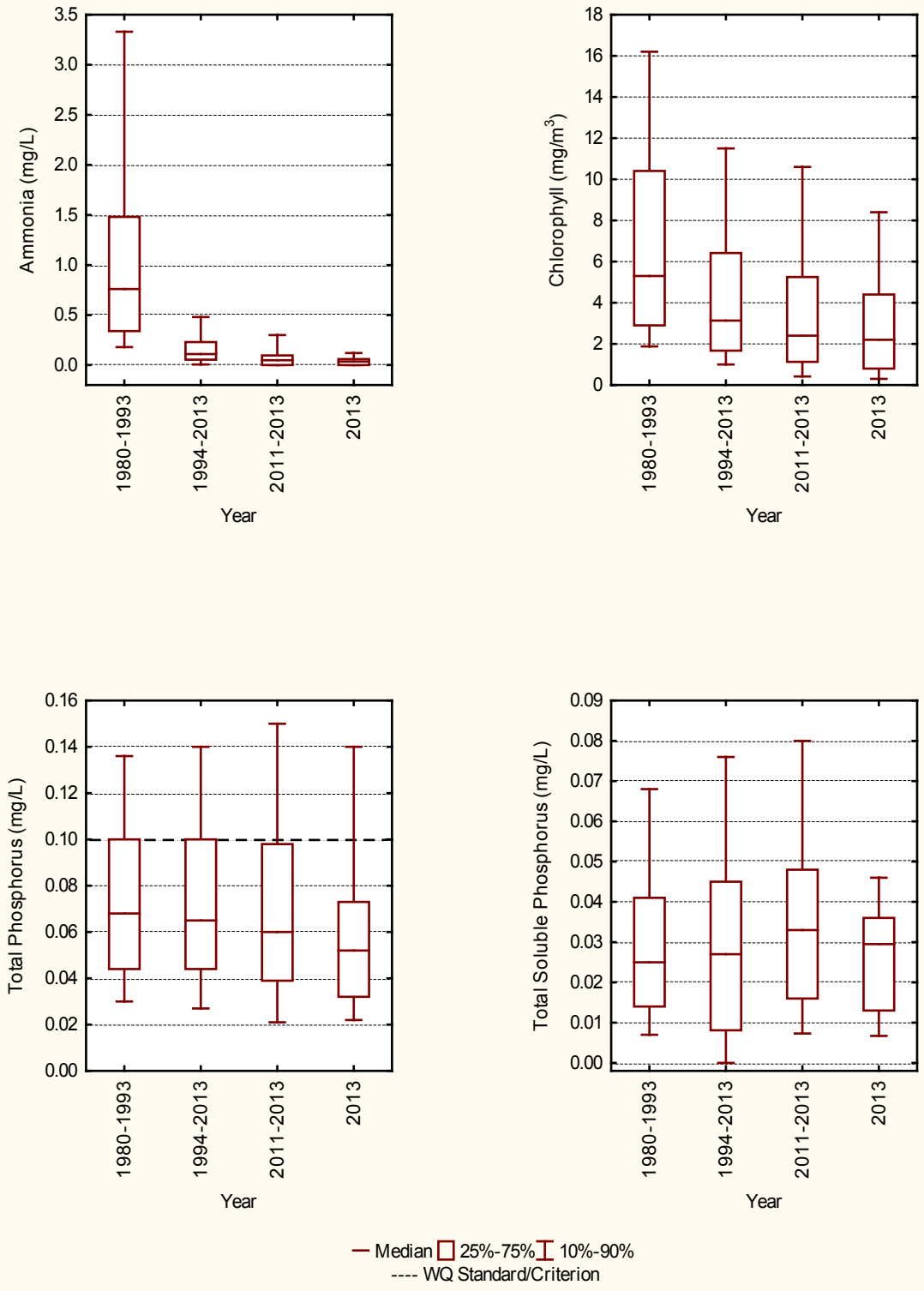
Provisional MMSD Water Quality Data

MMSD Water Quality Monitoring Program Data
Outer Harbor, Site OH-02

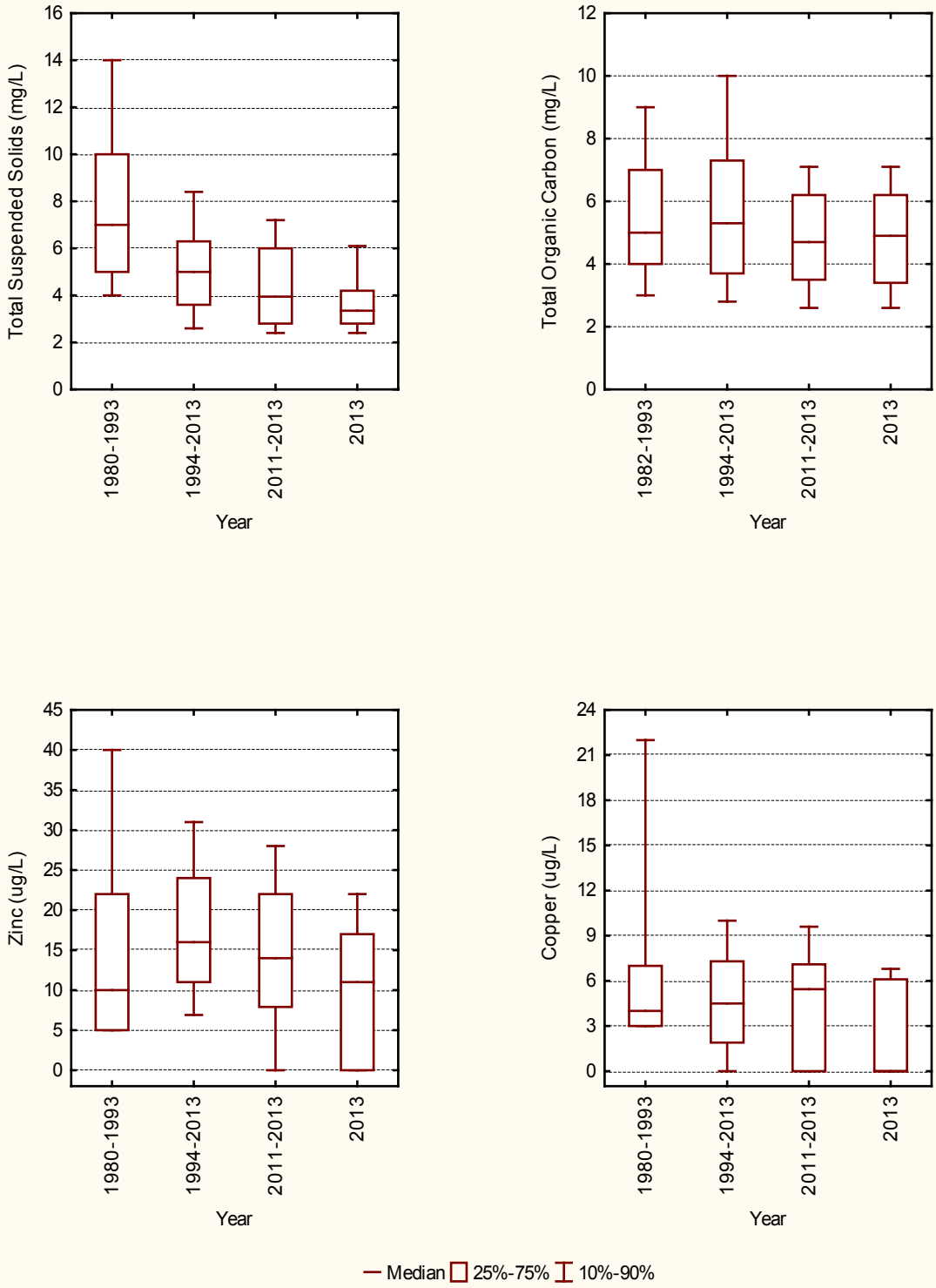




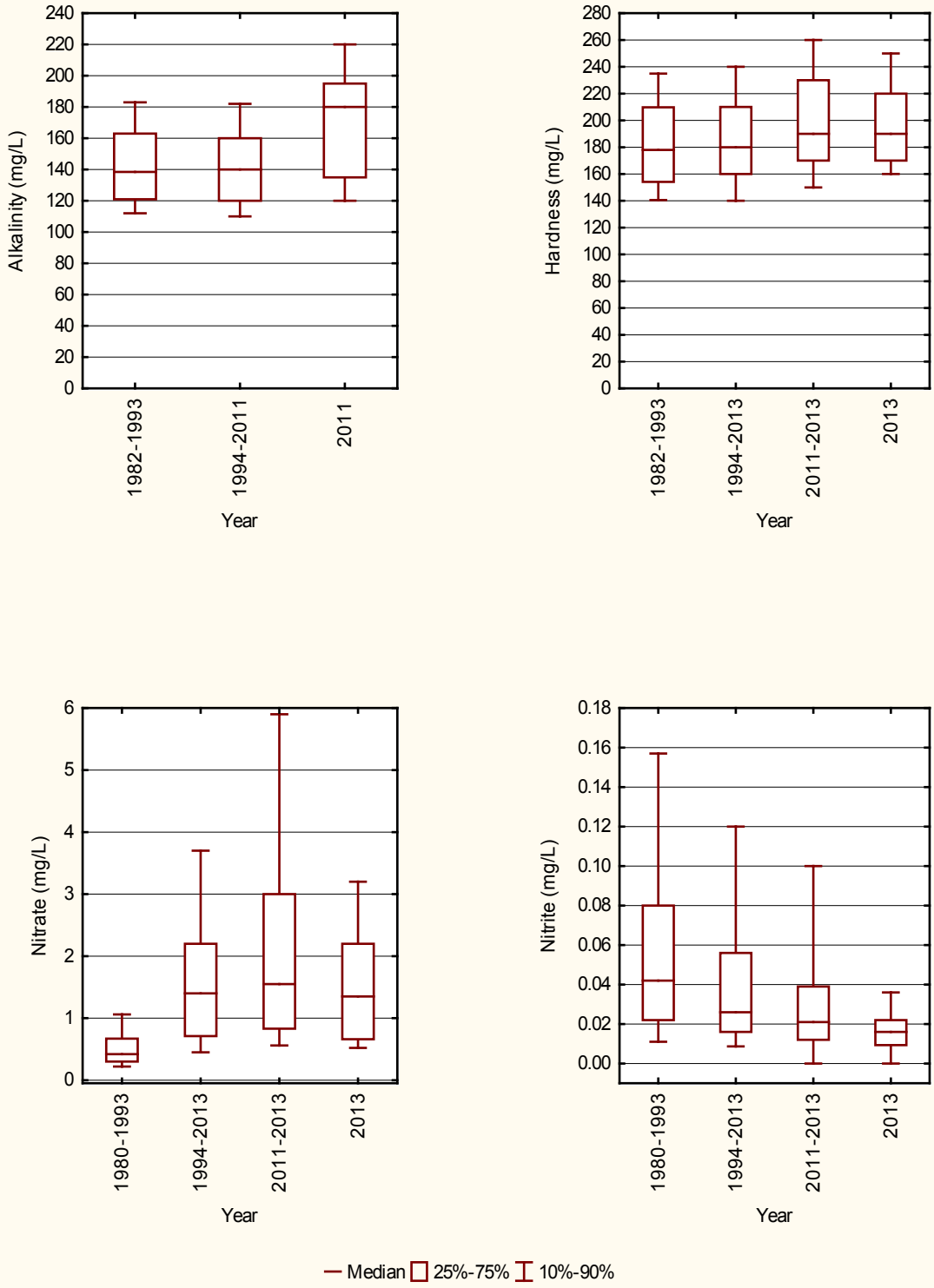
MMSD Water Quality Monitoring Program Data
Outer Harbor, Site OH-02



MMSD Water Quality Monitoring Program Data
Outer Harbor, Site OH-02



MMSD Water Quality Monitoring Program Data
Outer Harbor, Site OH-02



OUTER HARBOR - SITE 2
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.7	14.2	9.4	4.00	1.73	0.022	1.75	0.063	0.68	0.064	0.030	3.04
Standard Error	0.1	0.8	0.3	0.90	0.21	0.005	0.21	0.020	0.05	0.008	0.005	0.15
Median	7.6	14.6	9.0	2.20	1.35	0.016	1.35	0.036	0.69	0.052	0.030	2.95
Mode	7.4	Multi	Multi	Multi	Multi	0.000	Multi	0.000	Multi	0.052	0.035	2.50
Standard Deviation	0.3	5.4	1.7	5.86	1.36	0.030	1.36	0.133	0.33	0.050	0.029	1.00
Sample Variance	0.1	29.0	3.1	34.33	1.84	0.001	1.85	0.018	0.11	0.003	0.001	0.99
Range	1.3	20.2	8.2	32.00	5.55	0.180	5.55	0.800	1.70	0.235	0.180	3.70
Minimum	7.3	1.6	5.9	0.00	0.35	0.000	0.35	0.000	0.00	0.005	0.000	1.40
Maximum	8.6	21.7	14.1	32.00	5.90	0.180	5.90	0.800	1.70	0.240	0.180	5.10
Count	39	42	42	42	42	42	42	42	42	42	42	42
Confidence Level (95%)	0.1	1.7	0.5	1.83	0.42	0.009	0.42	0.041	0.10	0.016	0.009	0.31

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	1.9	5.9	321.4	317.7	2.1	3.8	2.8	694	76.5	89	1.7	89
Standard Error	0.1	0.8	31.0	30.9	0.3	0.4	0.2	40	6.6	26	0.2	33
Median	2.0	5.2	270.0	267.5	1.7	3.4	2.3	703	66.5	62	1.8	61
Mode	2.0	5.9	Multi	217.2	Multi	2.8	1.8	Multi	Multi	10	1.0	Multi
Standard Deviation	0.4	2.7	115.9	115.5	1.1	1.5	1.3	259	43.0	96	0.6	125
Sample Variance	0.2	7.5	13444.0	13333.4	1.3	2.2	1.7	67185	1848.2	9244	0.4	15681
Range	1.5	10.4	380.0	380.3	4.4	5.2	5.6	1210	156.0	280	1.7	487
Minimum	1.1	3.8	210.0	205.9	1.0	2.3	0.8	300	14.0	0	0.7	3
Maximum	2.6	14.2	590.0	586.2	5.4	7.5	6.4	1510	170.0	280	2.4	490
Count	14	12	14	14	14	14	42	42	42	14	13	14
Confidence Level (95%)	0.2	1.7	66.9	66.7	0.7	0.9	0.4	81	13.4	56	0.4	72

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

OUTER HARBOR - SITE 2
LAKE MICHIGAN
WATER QUALITY DATA - 2013

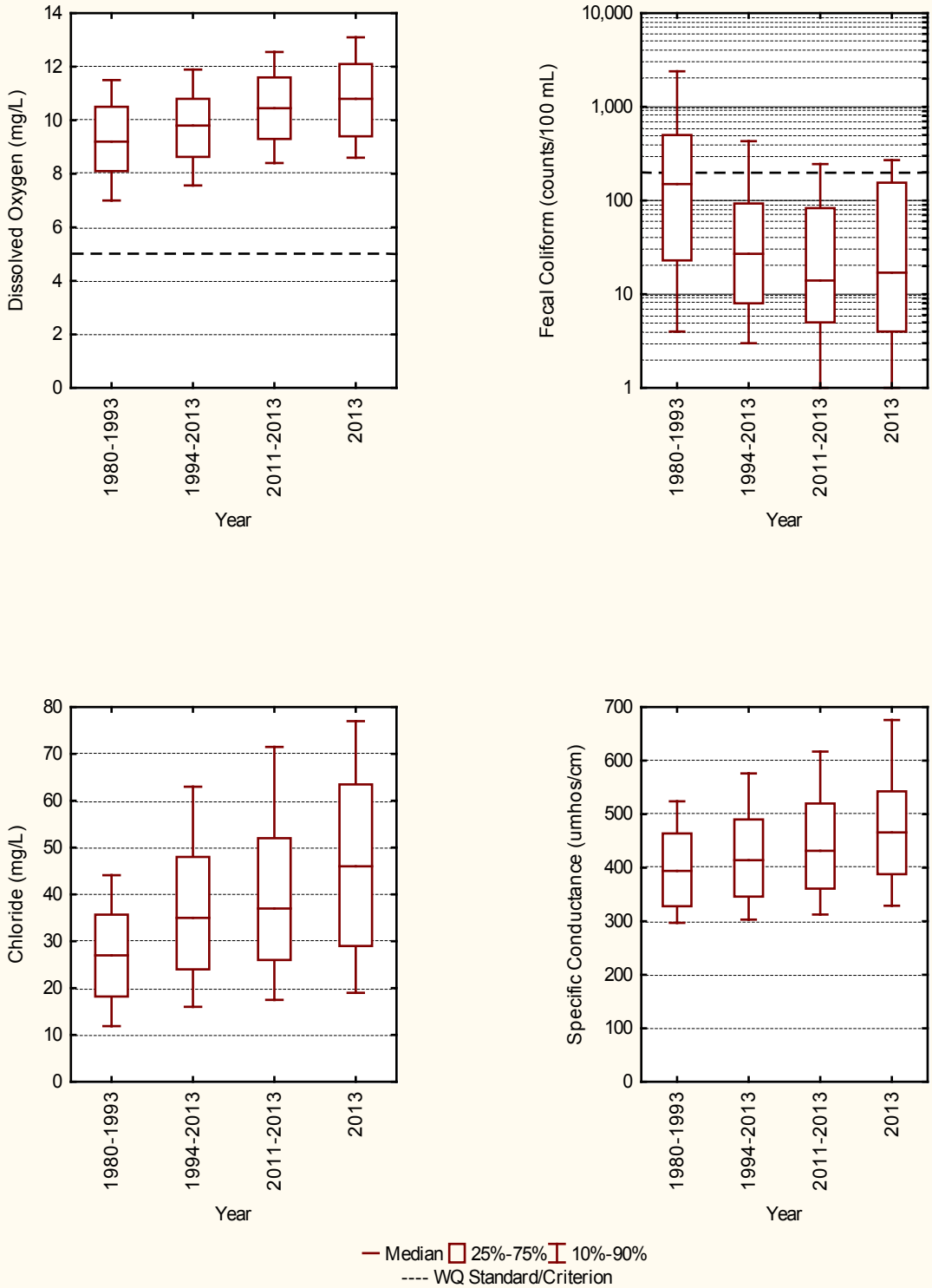
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	46.24	20.24	0.1	2.2	2.0	2.0	0.0	9.7	0.0	2.9	0.0	ND
Standard Error	1.13	0.58	0.0	0.1	0.5	0.2	0.0	1.4	0.0	0.5	0.0	ND
Median	43.50	19.50	0.0	2.2	0.0	2.3	0.0	11.0	0.0	0.0	0.0	ND
Mode	Multi	18.00	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	7.31	3.79	0.2	0.8	3.1	1.4	0.0	9.4	0.0	3.3	0.0	ND
Sample Variance	53.45	14.33	0.0	0.7	9.4	2.0	0.0	87.9	0.0	11.0	0.0	ND
Range	30.00	14.00	0.8	4.5	7.5	4.7	0.0	29.0	0.0	8.9	0.0	ND
Minimum	35.00	14.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	65.00	28.00	0.8	4.5	7.5	4.7	0.0	29.0	0.0	8.9	0.0	ND
Count	42	42	42	42	42	42	38	42	30	37	41	0
Confidence Level (95%)	2.28	1.18	0.1	0.3	1.0	0.4	0.0	2.9	0.0	1.1	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	198	ND	ND	ND	35.4	30.5	4.8	ND
Standard Error	5	ND	ND	ND	1.0	0.7	0.3	ND
Median	190	ND	ND	ND	33.5	29.5	4.9	ND
Mode	Multi	ND	ND	ND	32.0	Multi	3.2	ND
Standard Deviation	33	ND	ND	ND	6.3	4.8	1.8	ND
Sample Variance	1092	ND	ND	ND	39.9	23.0	3.1	ND
Range	130	ND	ND	ND	24.0	19.0	6.2	ND
Minimum	140	ND	ND	ND	26.0	24.0	2.0	ND
Maximum	270	ND	ND	ND	50.0	43.0	8.2	ND
Count	42	0	0	0	42	42	42	0
Confidence Level (95%)	10	ND	ND	ND	2.0	1.5	0.5	ND

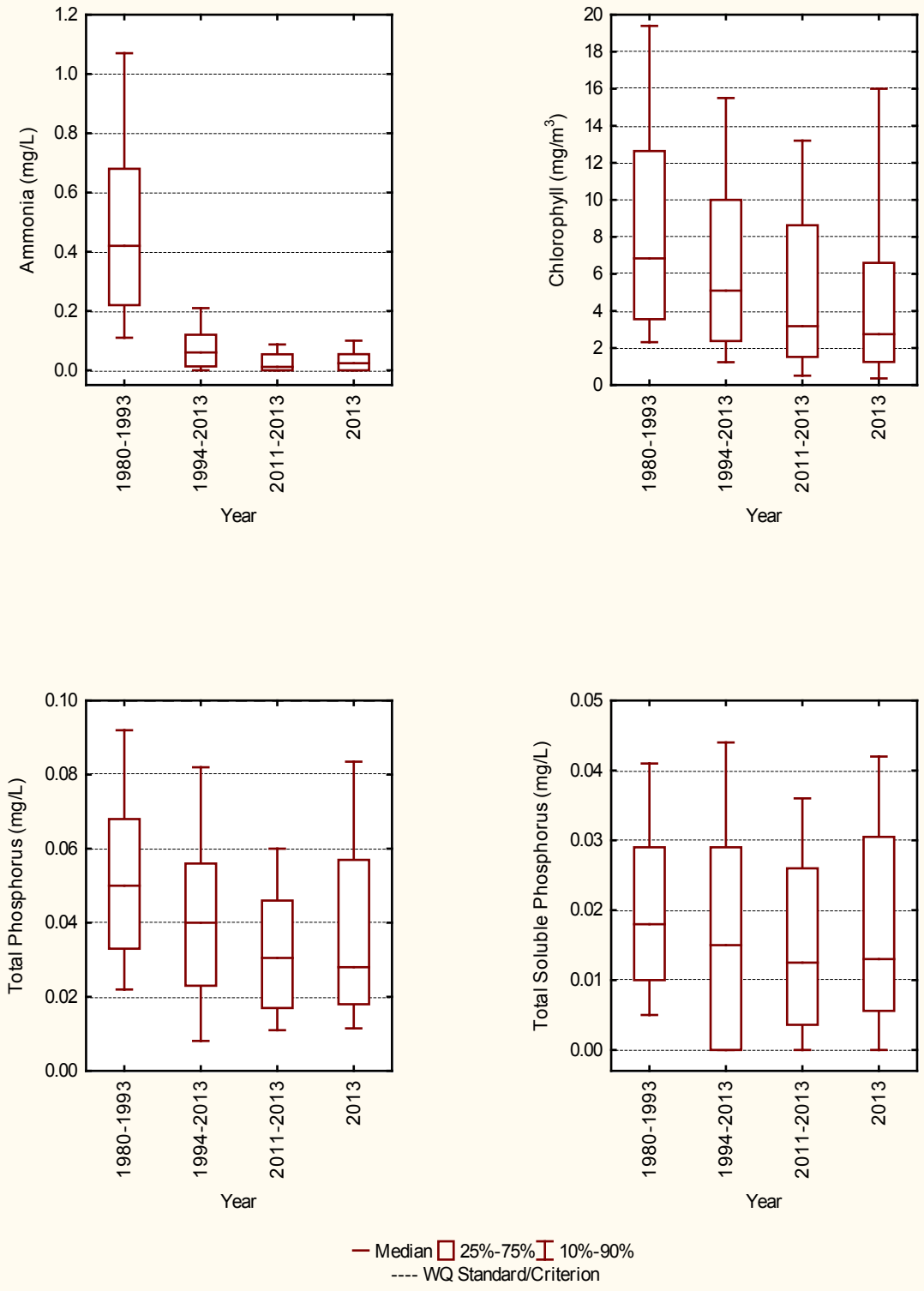
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

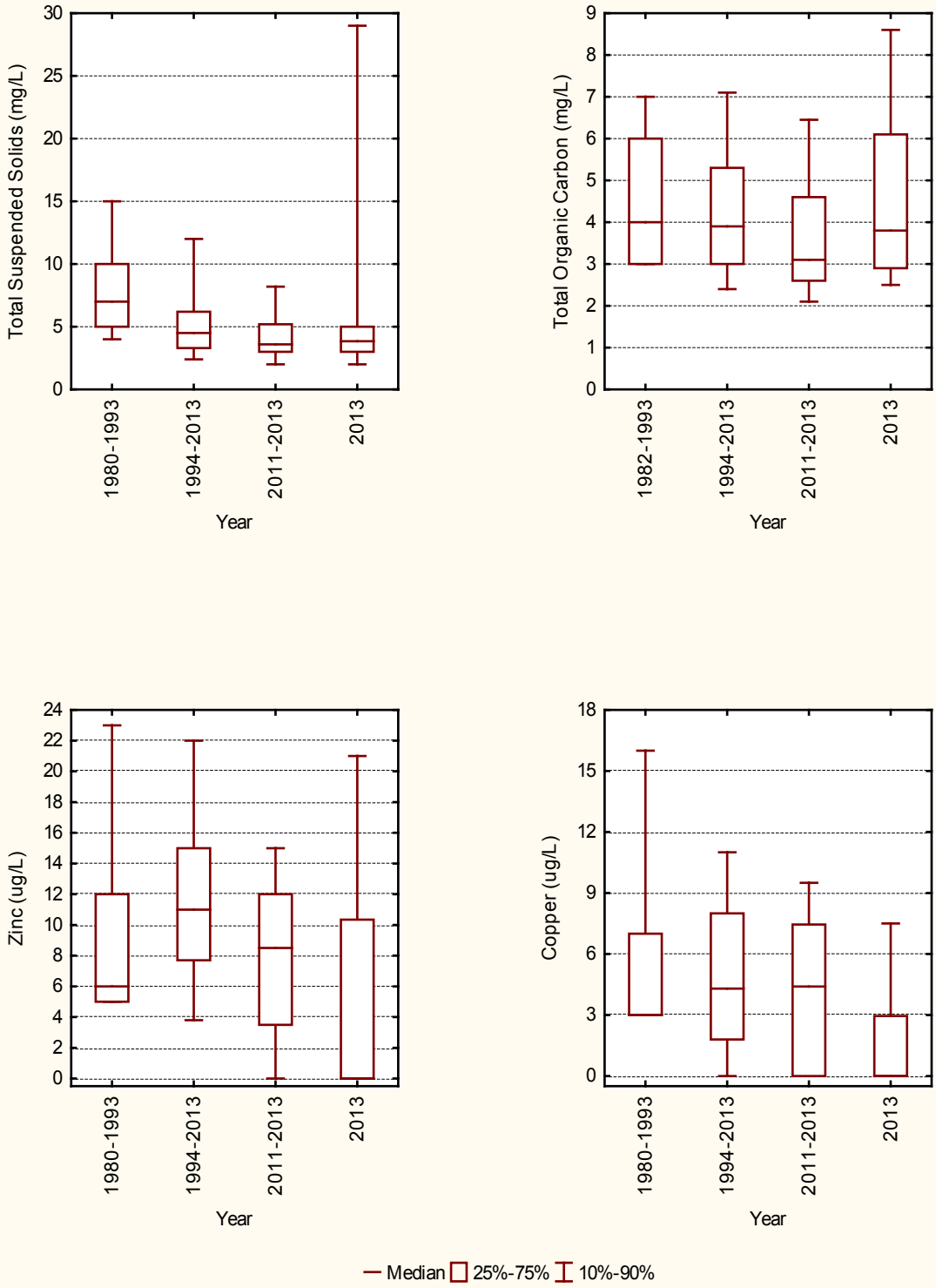
MMSD Water Quality Monitoring Program Data
Outer Harbor, Site OH-03



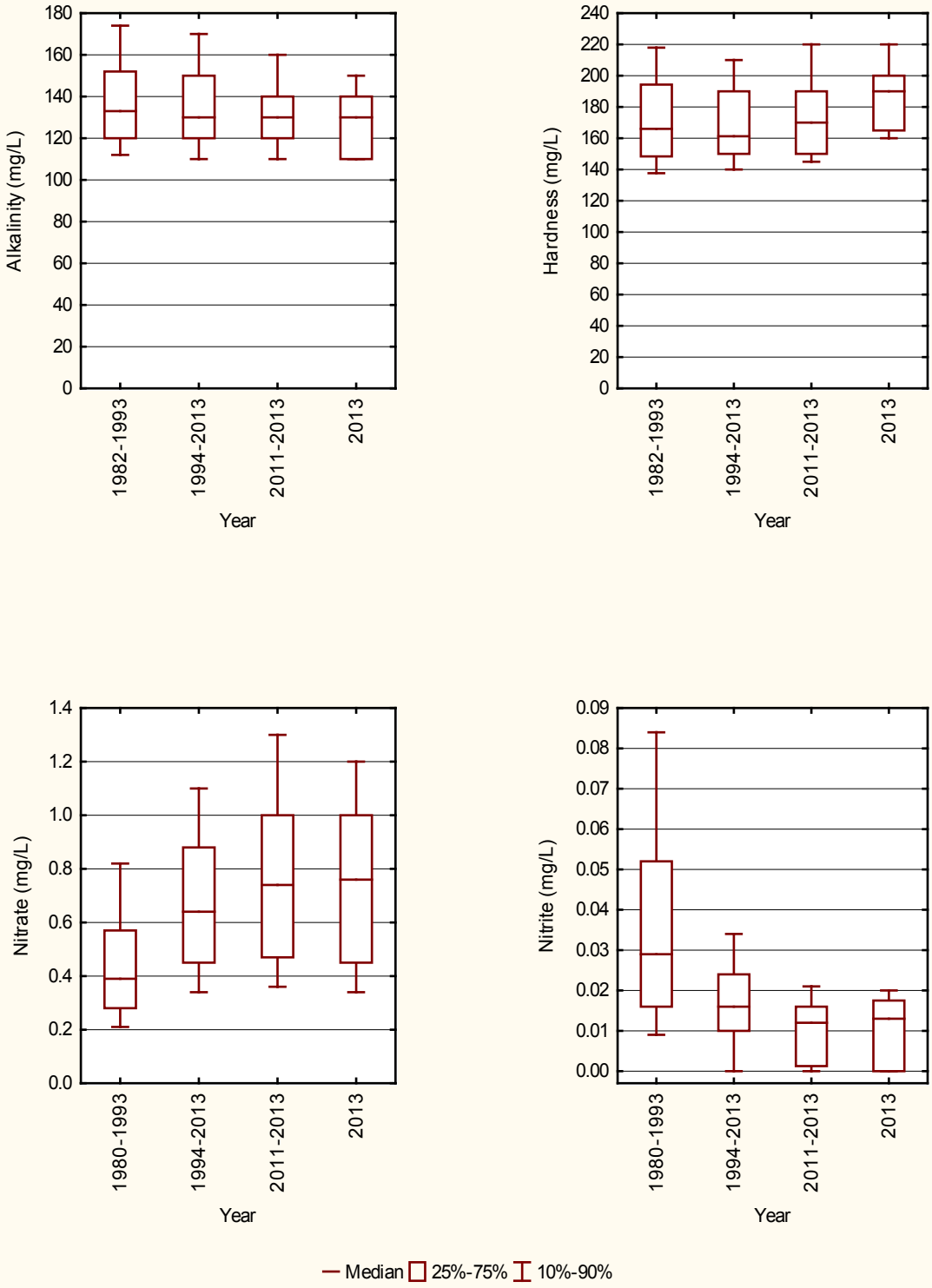
MMSD Water Quality Monitoring Program Data
Outer Harbor, Site OH-03



MMSD Water Quality Monitoring Program Data
Outer Harbor, Site OH-03



MMSD Water Quality Monitoring Program Data
Outer Harbor, Site OH-03



OUTER HARBOR - SITE 3
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.1	12.3	10.8	5.66	0.77	0.012	0.78	0.041	0.50	0.040	0.019	2.62
Standard Error	0.0	0.7	0.2	0.90	0.04	0.001	0.04	0.010	0.03	0.004	0.002	0.14
Median	8.0	11.8	10.8	2.75	0.76	0.013	0.78	0.024	0.48	0.028	0.013	2.35
Mode	8.0	Multi	9.5	Multi	1.00	0.000	1.00	0.000	0.00	0.021	0.000	Multi
Standard Deviation	0.3	6.3	1.7	7.64	0.34	0.009	0.34	0.085	0.25	0.034	0.018	1.23
Sample Variance	0.1	40.2	2.8	58.37	0.12	0.000	0.12	0.007	0.06	0.001	0.000	1.50
Range	1.3	22.4	6.6	40.00	1.42	0.051	1.42	0.670	1.10	0.230	0.068	4.73
Minimum	7.6	1.5	7.6	0.00	0.28	0.000	0.28	0.000	0.00	0.000	0.000	0.57
Maximum	8.9	23.9	14.2	40.00	1.70	0.051	1.70	0.670	1.10	0.230	0.068	5.30
Count	69	72	72	72	72	72	72	72	72	70	72	72
Confidence Level (95%)	0.1	1.5	0.4	1.80	0.08	0.002	0.08	0.020	0.06	0.008	0.004	0.29

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	1.8	5.2	266.1	258.3	2.5	7.8	6.1	481	46.1	166	1.6	653
Standard Error	0.1	0.6	14.3	13.4	0.6	2.8	1.4	15	2.6	95	0.2	554
Median	1.9	4.3	245.0	242.8	1.9	3.9	2.7	466	46.0	17	1.3	153
Mode	1.9	Multi	230.0	Multi	Multi	Multi	2.3	Multi	46.0	Multi	Multi	Multi
Standard Deviation	0.7	2.7	60.5	56.9	2.6	11.7	11.8	128	21.8	464	0.8	1107
Sample Variance	0.5	7.2	3660.5	3239.8	6.6	137.9	138.6	16486	477.3	215631	0.7	1225676
Range	3.4	12.2	200.0	195.6	9.2	46.1	81.4	648	80.0	2300	2.9	2296
Minimum	0.4	1.2	180.0	175.8	0.0	1.9	0.2	294	14.0	0	0.5	4
Maximum	3.8	13.4	380.0	371.4	9.2	48.0	81.6	942	94.0	2300	3.4	2300
Count	24	21	18	18	18	18	72	72	72	24	21	4
Confidence Level (95%)	0.3	1.2	30.1	28.3	1.3	5.8	2.8	30	5.1	196	0.4	1762

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

OUTER HARBOR - SITE 3
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	43.17	19.33	0.2	2.1	1.8	1.9	0.0	5.5	0.0	1.8	0.0	ND
Standard Error	1.07	0.77	0.1	0.2	0.7	0.3	0.0	1.8	0.0	0.5	0.0	ND
Median	43.00	19.00	0.0	2.1	0.0	1.8	0.0	0.0	0.0	0.0	0.0	ND
Mode	Multi	20.00	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	5.26	3.78	0.3	0.7	3.3	1.3	0.0	9.0	0.0	2.6	0.0	ND
Sample Variance	27.62	14.32	0.1	0.6	10.8	1.6	0.0	81.5	0.0	6.6	0.0	ND
Range	21.00	14.00	0.8	3.9	8.7	4.4	0.0	30.0	0.0	7.5	0.0	ND
Minimum	35.00	14.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	56.00	28.00	0.8	3.9	8.7	4.4	0.0	30.0	0.0	7.5	0.0	ND
Count	24	24	24	24	24	24	21	24	21	23	22	0
Confidence Level (95%)	2.22	1.60	0.1	0.3	1.4	0.5	0.0	3.8	0.0	1.1	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	188	129	0.4	4.9	34.5	30.0	4.6	ND
Standard Error	6	4	0.2	0.3	1.1	0.8	0.3	ND
Median	190	130	0.0	5.0	33.0	29.0	3.8	ND
Mode	190	Multi	0.0	3.8	27.0	26.0	3.1	ND
Standard Deviation	28	21	0.9	1.1	7.9	5.7	2.4	ND
Sample Variance	791	448	0.9	1.1	62.1	32.3	5.9	ND
Range	110	109	2.4	4.2	32.0	22.0	10.8	ND
Minimum	150	91	0.0	2.8	26.0	24.0	1.2	ND
Maximum	260	200	2.4	7.0	58.0	46.0	12.0	ND
Count	24	30	17	16	53	51	51	0
Confidence Level (95%)	12	8	0.5	0.6	2.2	1.6	0.7	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

OUTER HARBOR - SITE 4
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.2	12.9	11.2	6.50	0.57	0.008	0.58	0.011	0.41	0.026	0.011	2.06
Standard Error	0.0	1.1	0.3	1.29	0.04	0.001	0.04	0.003	0.04	0.003	0.002	0.14
Median	8.2	13.5	11.4	3.95	0.54	0.010	0.55	0.000	0.42	0.024	0.008	2.20
Mode	Multi	Multi	11.9	Multi	Multi	0.000	0.62	0.000	0.00	Multi	0.000	2.20
Standard Deviation	0.3	6.5	1.6	7.75	0.25	0.007	0.24	0.021	0.24	0.015	0.012	0.86
Sample Variance	0.1	42.1	2.6	60.12	0.06	0.000	0.06	0.000	0.06	0.000	0.000	0.73
Range	1.1	22.6	5.6	36.00	0.99	0.020	0.98	0.078	0.95	0.054	0.052	3.62
Minimum	7.8	1.5	8.6	0.00	0.21	0.000	0.22	0.000	0.00	0.007	0.000	0.38
Maximum	8.9	24.1	14.2	36.00	1.20	0.020	1.20	0.078	0.95	0.061	0.052	4.00
Count	34	36	36	36	36	36	36	36	36	36	36	36
Confidence Level (95%)	0.1	2.2	0.5	2.62	0.08	0.002	0.08	0.007	0.08	0.005	0.004	0.29

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	2.0	6.8	237.8	232.6	2.0	5.2	4.8	412	33.8	70	1.5	178
Standard Error	0.2	0.9	10.1	10.6	0.4	1.4	1.0	13	2.3	28	0.2	129
Median	1.9	5.4	235.0	229.1	1.9	3.4	3.1	394	32.5	19	1.4	81
Mode	1.6	Multi	200.0	Multi	Multi	Multi	2.1	Multi	Multi	Multi	1.0	Multi
Standard Deviation	0.8	3.4	42.9	44.9	1.7	6.0	6.2	80	14.1	118	0.7	257
Sample Variance	0.7	11.4	1841.8	2016.6	2.8	35.4	38.3	6426	197.9	13908	0.5	66247
Range	3.0	8.1	140.0	153.0	6.4	26.8	29.6	308	52.0	400	2.1	550
Minimum	0.5	2.5	180.0	162.0	0.0	1.2	0.4	307	16.0	0	0.5	0
Maximum	3.5	10.6	320.0	315.0	6.4	28.0	30.0	615	68.0	400	2.6	550
Count	18	15	18	18	18	18	36	36	36	18	15	4
Confidence Level (95%)	0.4	1.9	21.3	22.3	0.8	3.0	2.1	27	4.8	59	0.4	410

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

OUTER HARBOR - SITE 4
LAKE MICHIGAN
WATER QUALITY DATA - 2013

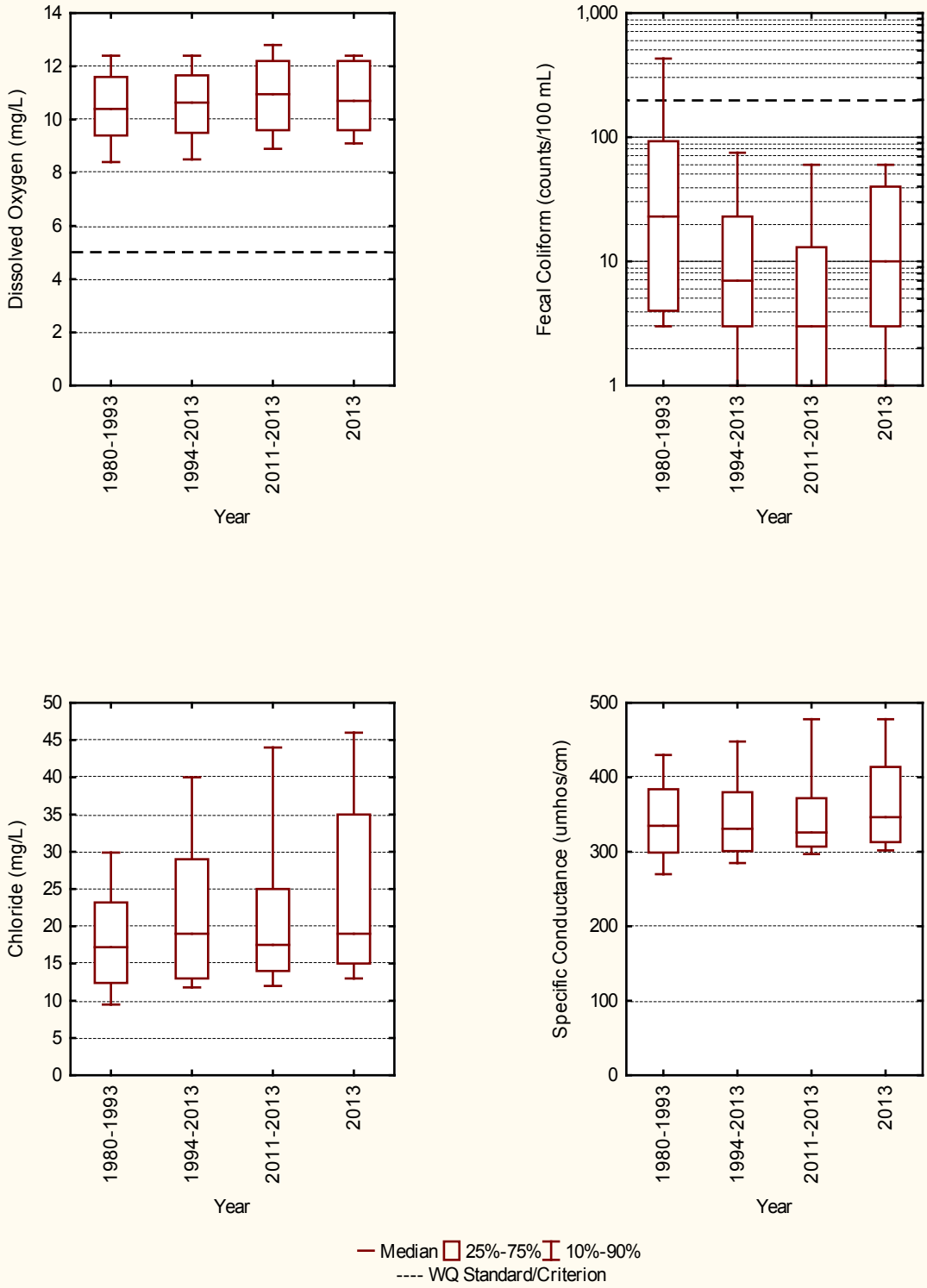
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	40.83	17.83	0.2	1.8	1.6	1.8	0.0	6.0	0.0	1.2	0.0	ND
Standard Error	1.07	0.80	0.1	0.2	0.7	0.3	0.0	1.7	0.0	0.7	0.0	ND
Median	39.50	16.50	0.0	1.7	0.0	1.8	0.0	0.0	0.0	0.0	0.0	ND
Mode	37.00	Multi	0.0	Multi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	4.53	3.38	0.5	0.8	3.1	1.2	0.0	7.4	0.0	2.5	0.0	ND
Sample Variance	20.50	11.44	0.2	0.6	9.6	1.5	0.0	54.3	0.0	6.2	0.0	ND
Range	15.00	11.00	1.7	3.7	8.6	4.1	0.0	18.0	0.0	7.0	0.0	ND
Minimum	36.00	14.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	51.00	25.00	1.7	3.7	8.6	4.1	0.0	18.0	0.0	7.0	0.0	ND
Count	18	18	18	18	18	18	15	18	16	14	18	0
Confidence Level (95%)	2.25	1.68	0.2	0.4	1.5	0.6	0.0	3.7	0.0	1.4	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	176	118	0.9	ND	32.3	28.4	3.9	ND
Standard Error	6	4	0.9	ND	1.0	0.7	0.3	ND
Median	160	115	0.0	ND	30.0	27.5	3.2	ND
Mode	160	110	0.0	ND	28.0	25.0	2.6	ND
Standard Deviation	26	10	1.7	ND	6.1	4.4	1.8	ND
Sample Variance	672	107	2.9	ND	37.2	19.2	3.2	ND
Range	80	30	3.4	ND	24.0	17.0	6.9	ND
Minimum	150	110	0.0	ND	25.0	23.0	1.8	ND
Maximum	230	140	3.4	ND	49.0	40.0	8.7	ND
Count	18	8	4	0	36	36	36	0
Confidence Level (95%)	13	9	2.7	ND	2.1	1.5	0.6	ND

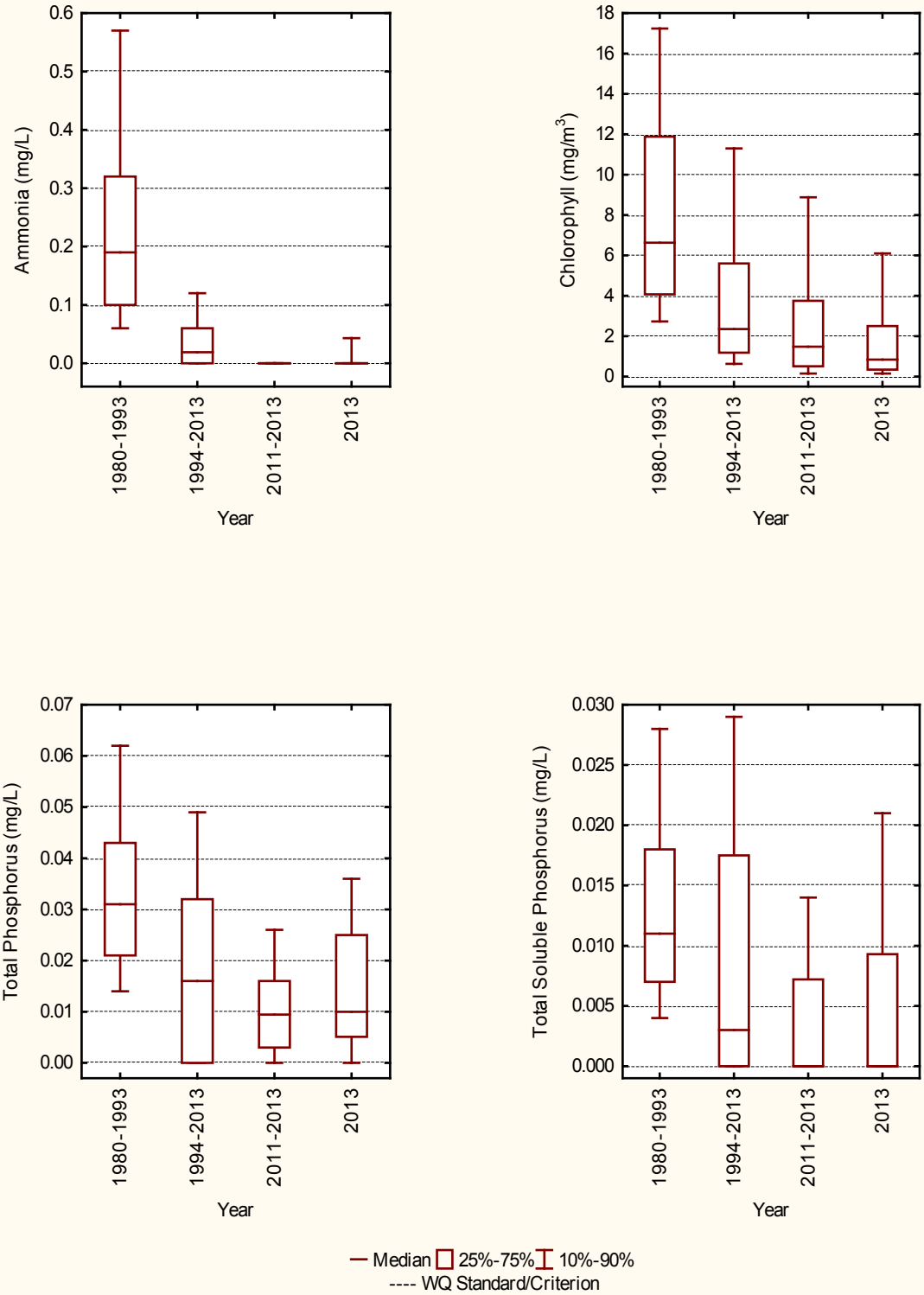
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

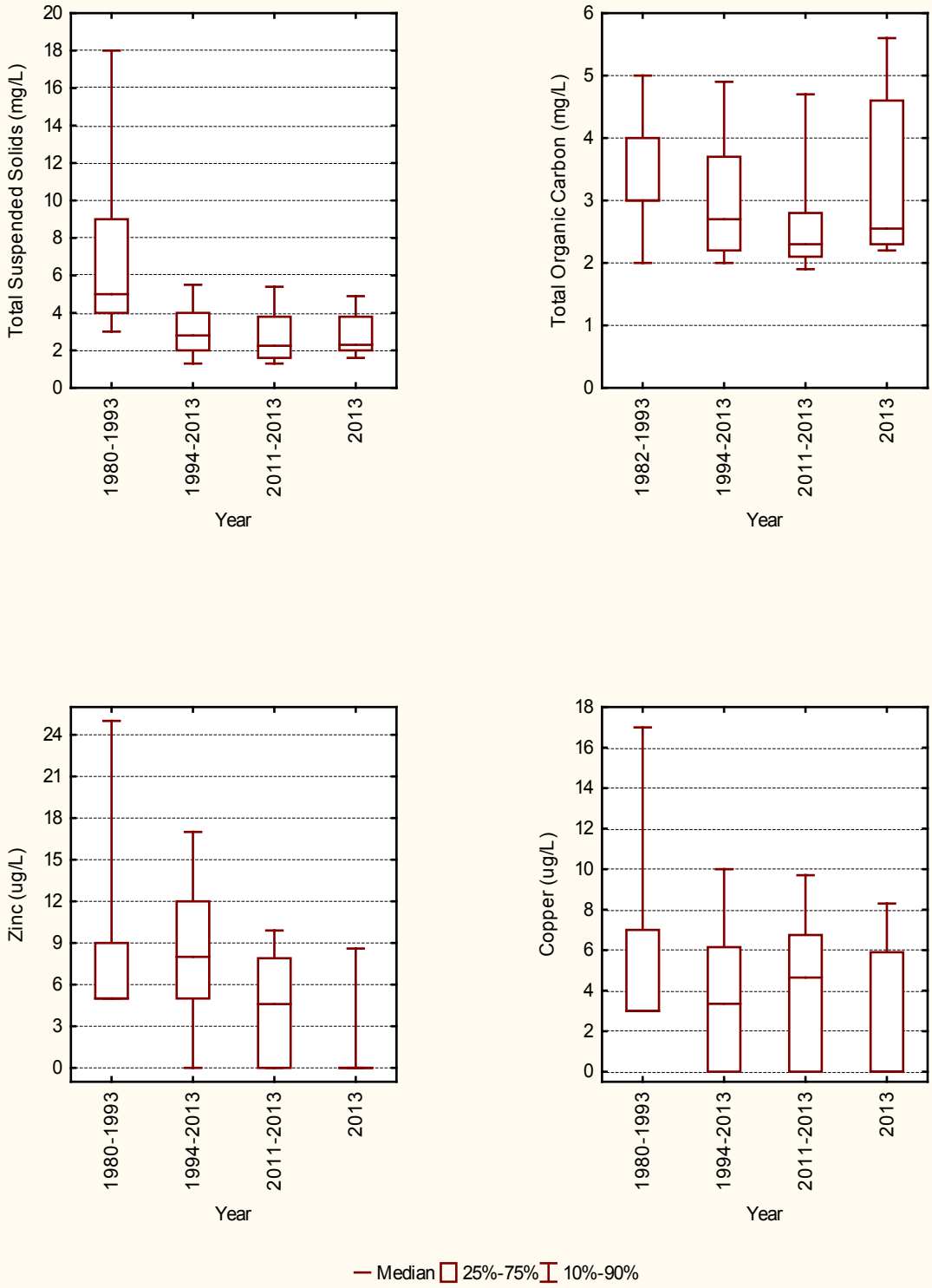
MMSD Water Quality Monitoring Program Data
Outer Harbor, Site OH-05



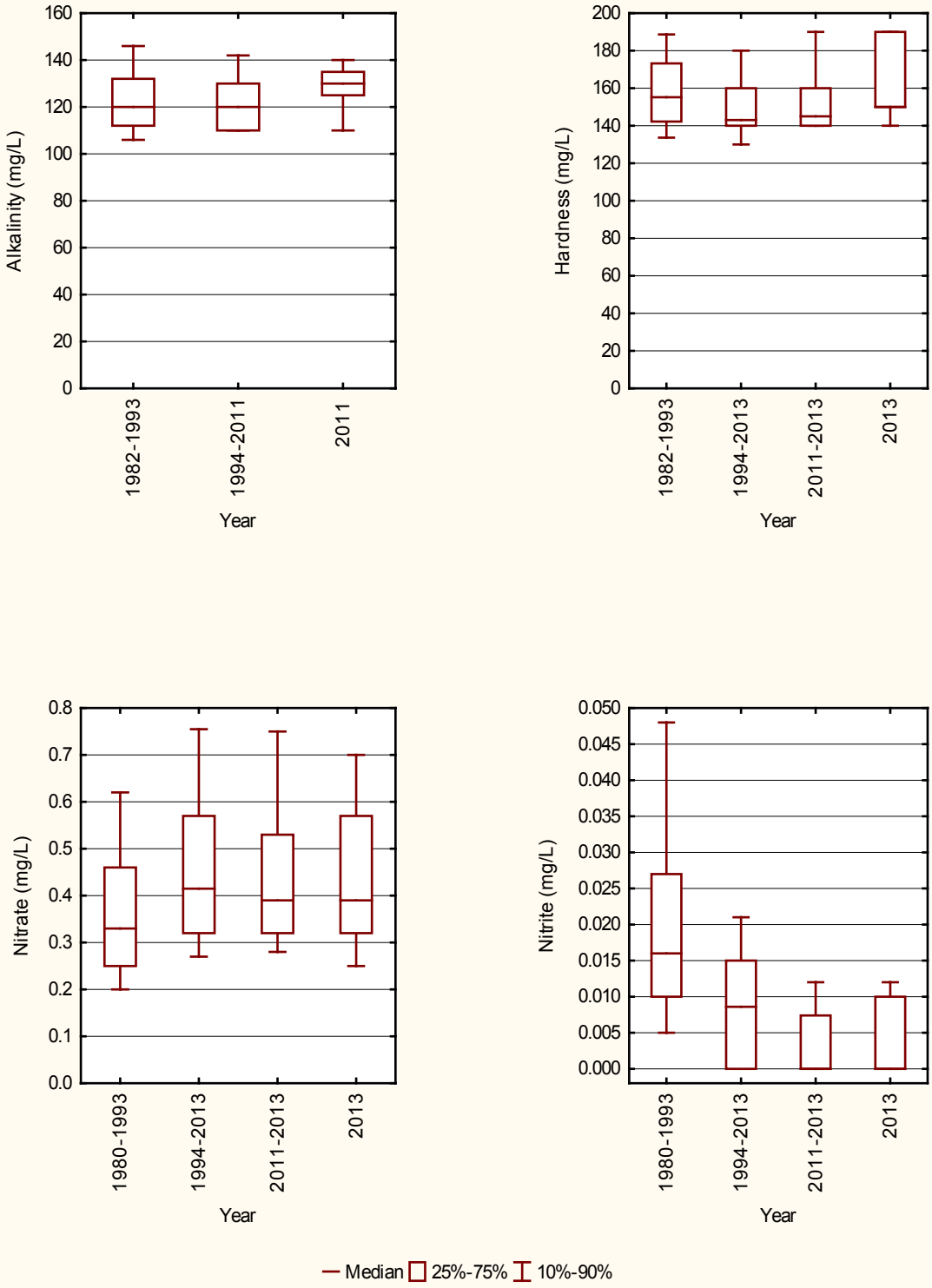
MMSD Water Quality Monitoring Program Data
Outer Harbor, Site OH-05



MMSD Water Quality Monitoring Program Data
Outer Harbor, Site OH-05



MMSD Water Quality Monitoring Program Data
Outer Harbor, Site OH-05



OUTER HARBOR - SITE 5
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.2	12.2	10.9	2.78	0.46	0.004	0.46	0.007	0.31	0.016	0.006	1.78
Standard Error	0.0	0.9	0.2	0.76	0.03	0.001	0.03	0.003	0.03	0.003	0.001	0.11
Median	8.2	12.3	10.7	0.84	0.39	0.000	0.40	0.000	0.30	0.010	0.000	1.70
Mode	8.3	10.3	Multi	Multi	Multi	0.000	Multi	0.000	0.00	0.000	0.000	1.70
Standard Deviation	0.2	5.8	1.5	4.91	0.21	0.008	0.21	0.018	0.22	0.017	0.008	0.74
Sample Variance	0.1	33.5	2.3	24.07	0.04	0.000	0.04	0.000	0.05	0.000	0.000	0.55
Range	1.1	21.0	5.5	23.00	0.78	0.043	0.78	0.059	0.77	0.085	0.024	3.23
Minimum	7.8	0.9	8.9	0.00	0.22	0.000	0.22	0.000	0.00	0.000	0.000	0.37
Maximum	8.9	21.9	14.4	23.00	1.00	0.043	1.00	0.059	0.77	0.085	0.024	3.60
Count	39	42	42	42	42	42	42	42	42	42	42	42
Confidence Level (95%)	0.1	1.8	0.5	1.53	0.06	0.003	0.07	0.005	0.07	0.005	0.003	0.23

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	3.0	8.3	210.0	207.1	0.8	2.9	2.6	370	24.8	25	1.2	ND
Standard Error	0.5	1.2	10.1	9.9	0.2	0.4	0.4	11	2.0	11	0.1	ND
Median	2.2	8.6	205.0	200.6	0.5	2.3	2.0	347	19.0	10	1.1	ND
Mode	Multi	14.5	Multi	Multi	0.0	Multi	1.3	Multi	14.0	0	Multi	ND
Standard Deviation	1.8	4.3	37.8	36.9	0.9	1.7	2.3	69	12.7	40	0.5	ND
Sample Variance	3.2	18.3	1430.8	1363.2	0.8	2.7	5.4	4722	160.3	1620	0.2	ND
Range	5.3	11.7	130.0	128.1	2.5	6.7	7.9	250	39.0	150	1.7	ND
Minimum	1.2	2.8	170.0	167.7	0.0	0.0	0.2	295	12.0	0	0.5	ND
Maximum	6.5	14.5	300.0	295.8	2.5	6.7	8.1	545	51.0	150	2.2	ND
Count	14	12	14	14	14	14	42	42	42	14	11	0
Confidence Level (95%)	1.0	2.7	21.8	21.3	0.5	1.0	0.7	21	3.9	23	0.3	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

OUTER HARBOR - SITE 5
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	38.79	16.21	0.1	1.8	2.1	1.6	0.0	1.9	0.0	2.9	0.0	ND
Standard Error	1.20	0.78	0.0	0.6	0.9	0.5	0.0	1.0	0.0	0.8	0.0	ND
Median	37.50	14.50	0.0	1.3	0.0	1.3	0.0	0.0	0.0	3.5	0.0	ND
Mode	35.00	14.00	0.0	Multi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	4.49	2.91	0.2	2.2	3.5	1.7	0.0	3.9	0.0	3.0	0.0	ND
Sample Variance	20.18	8.49	0.0	4.9	12.6	3.0	0.0	14.9	0.0	9.1	0.0	ND
Range	15.00	7.00	0.5	9.0	9.1	5.8	0.0	9.9	0.0	8.2	0.0	ND
Minimum	34.00	14.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	49.00	21.00	0.5	9.0	9.1	5.8	0.0	9.9	0.0	8.2	0.0	ND
Count	14	14	14	14	14	14	13	14	12	13	14	0
Confidence Level (95%)	2.59	1.68	0.1	1.3	2.0	1.0	0.0	2.2	0.0	1.8	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	163	ND	ND	ND	29.8	26.4	3.3	ND
Standard Error	6	ND	ND	ND	0.7	0.6	0.2	ND
Median	150	ND	ND	ND	28.0	25.0	2.6	ND
Mode	150	ND	ND	ND	26.0	24.0	Multi	ND
Standard Deviation	22	ND	ND	ND	4.8	3.6	1.4	ND
Sample Variance	499	ND	ND	ND	23.1	13.1	2.0	ND
Range	70	ND	ND	ND	16.0	13.0	4.4	ND
Minimum	140	ND	ND	ND	24.0	22.0	2.0	ND
Maximum	210	ND	ND	ND	40.0	35.0	6.4	ND
Count	14	0	0	0	42	42	42	0
Confidence Level (95%)	13	ND	ND	ND	1.5	1.1	0.4	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

OUTER HARBOR - SITE 6
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.2	11.7	11.2	ND	0.35	0.001	0.35	0.000	0.13	0.005	ND	1.37
Standard Error	0.0	0.9	0.2	ND	0.02	0.000	0.02	0.000	0.02	0.002	ND	0.06
Median	8.3	10.1	11.6	ND	0.36	0.000	0.36	0.000	0.00	0.000	ND	1.40
Mode	8.4	18.4	Multi	ND	0.26	0.000	0.26	0.000	0.00	0.000	ND	1.60
Standard Deviation	0.2	5.9	1.5	ND	0.09	0.003	0.09	0.000	0.15	0.009	ND	0.35
Sample Variance	0.0	34.2	2.4	ND	0.01	0.000	0.01	0.000	0.02	0.000	ND	0.12
Range	0.6	19.3	5.5	ND	0.37	0.010	0.37	0.000	0.45	0.054	ND	1.39
Minimum	8.0	1.0	9.0	ND	0.23	0.000	0.23	0.000	0.00	0.000	ND	0.71
Maximum	8.6	20.3	14.5	ND	0.60	0.010	0.60	0.000	0.45	0.054	ND	2.10
Count	36	39	39	0	39	39	39	39	39	39	0	39
Confidence Level (95%)	0.1	1.9	0.5	ND	0.03	0.001	0.03	0.000	0.05	0.003	ND	0.11

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	5.4	13.0	174.6	173.3	0.4	1.3	1.5	314	14.2	21	1.1	ND
Standard Error	0.6	1.3	2.9	3.0	0.2	0.6	0.3	3	0.5	9	0.2	ND
Median	5.3	15.2	170.0	170.0	0.0	0.0	0.7	307	13.0	8	1.2	ND
Mode	Multi	Multi	Multi	Multi	0.0	0.0	Multi	315	12.0	Multi	0.5	ND
Standard Deviation	2.2	4.1	10.5	10.8	0.7	2.0	2.1	18	2.8	31	0.6	ND
Sample Variance	5.0	17.2	110.3	117.2	0.5	4.1	4.4	335	7.9	950	0.3	ND
Range	7.8	10.0	40.0	41.3	2.1	6.9	8.2	62	11.0	110	1.6	ND
Minimum	1.2	5.6	160.0	157.7	0.0	0.0	0.1	292	11.0	0	0.5	ND
Maximum	9.0	15.6	200.0	199.0	2.1	6.9	8.3	354	22.0	110	2.0	ND
Count	13	11	13	13	13	13	39	39	39	13	10	0
Confidence Level (95%)	1.4	2.8	6.3	6.5	0.4	1.2	0.7	6	0.9	19	0.4	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

OUTER HARBOR - SITE 6
LAKE MICHIGAN
WATER QUALITY DATA - 2013

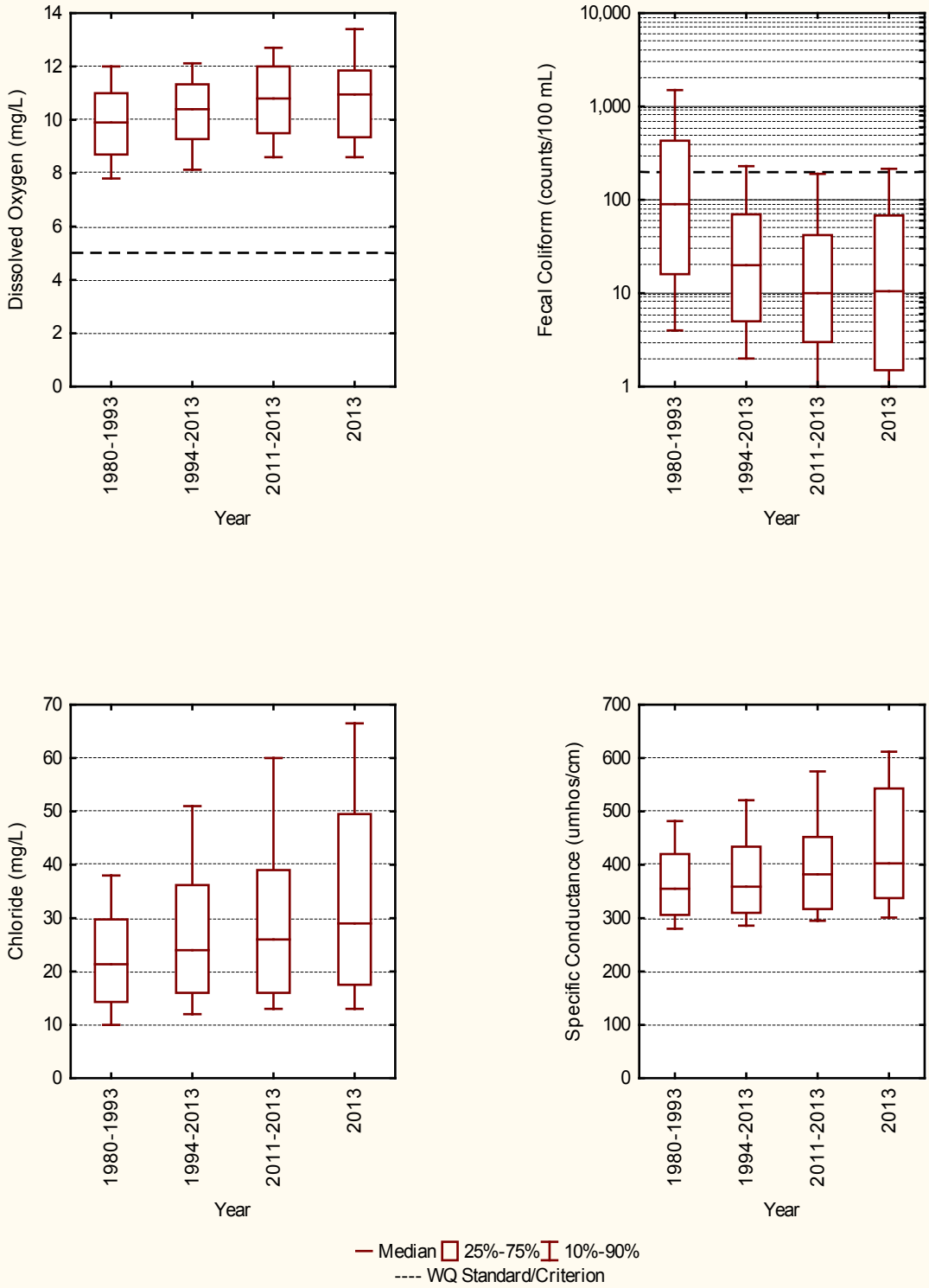
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	35.08	13.67	0.2	1.1	0.5	1.1	0.6	1.0	0.0	3.5	0.0	ND
Standard Error	0.26	0.19	0.1	0.3	0.5	0.3	0.6	1.0	0.0	1.1	0.0	ND
Median	35.00	14.00	0.0	1.2	0.0	1.6	0.0	0.0	0.0	3.4	0.0	ND
Mode	36.00	14.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	0.95	0.65	0.4	0.9	1.7	0.9	2.2	3.6	0.0	3.5	0.0	ND
Sample Variance	0.91	0.42	0.1	0.8	2.8	0.9	4.8	13.0	0.0	11.9	0.0	ND
Range	2.00	2.00	1.0	3.1	6.0	2.1	7.6	13.0	0.0	8.4	0.0	ND
Minimum	34.00	13.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	36.00	15.00	1.0	3.1	6.0	2.1	7.6	13.0	0.0	8.4	0.0	ND
Count	13	12	13	13	13	13	12	13	12	10	13	0
Confidence Level (95%)	0.58	0.41	0.2	0.6	1.0	0.6	1.4	2.2	0.0	2.5	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	144	ND	ND	ND	26.4	24.0	2.4	ND
Standard Error	1	ND	ND	ND	0.3	0.3	0.1	ND
Median	140	ND	ND	ND	26.0	24.0	2.2	ND
Mode	140	ND	ND	ND	26.0	24.0	2.0	ND
Standard Deviation	5	ND	ND	ND	1.8	1.7	0.5	ND
Sample Variance	26	ND	ND	ND	3.1	2.8	0.3	ND
Range	10	ND	ND	ND	9.0	8.0	2.7	ND
Minimum	140	ND	ND	ND	22.0	20.0	1.9	ND
Maximum	150	ND	ND	ND	31.0	28.0	4.6	ND
Count	13	0	0	0	39	39	39	0
Confidence Level (95%)	3	ND	ND	ND	0.6	0.5	0.2	ND

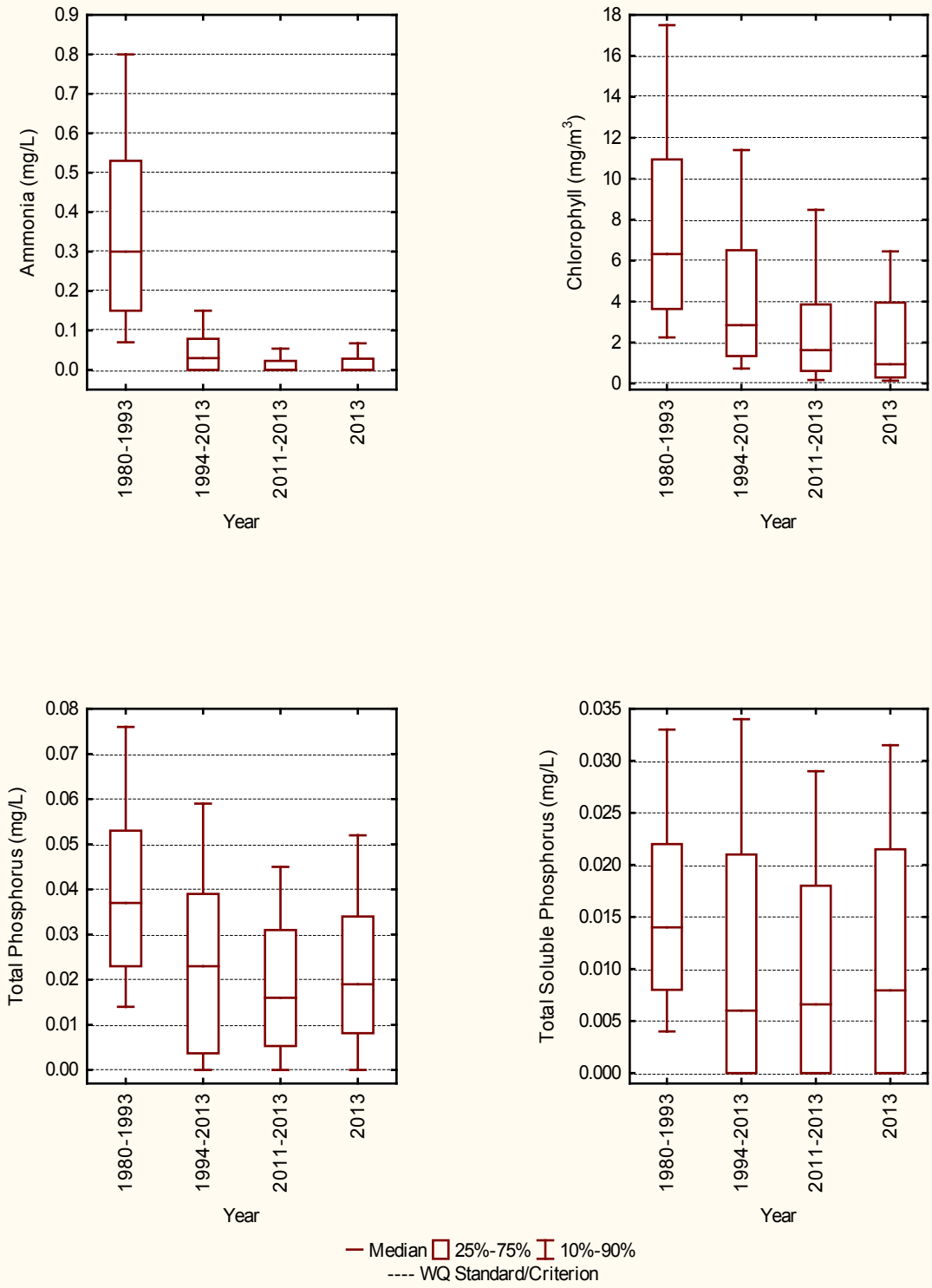
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

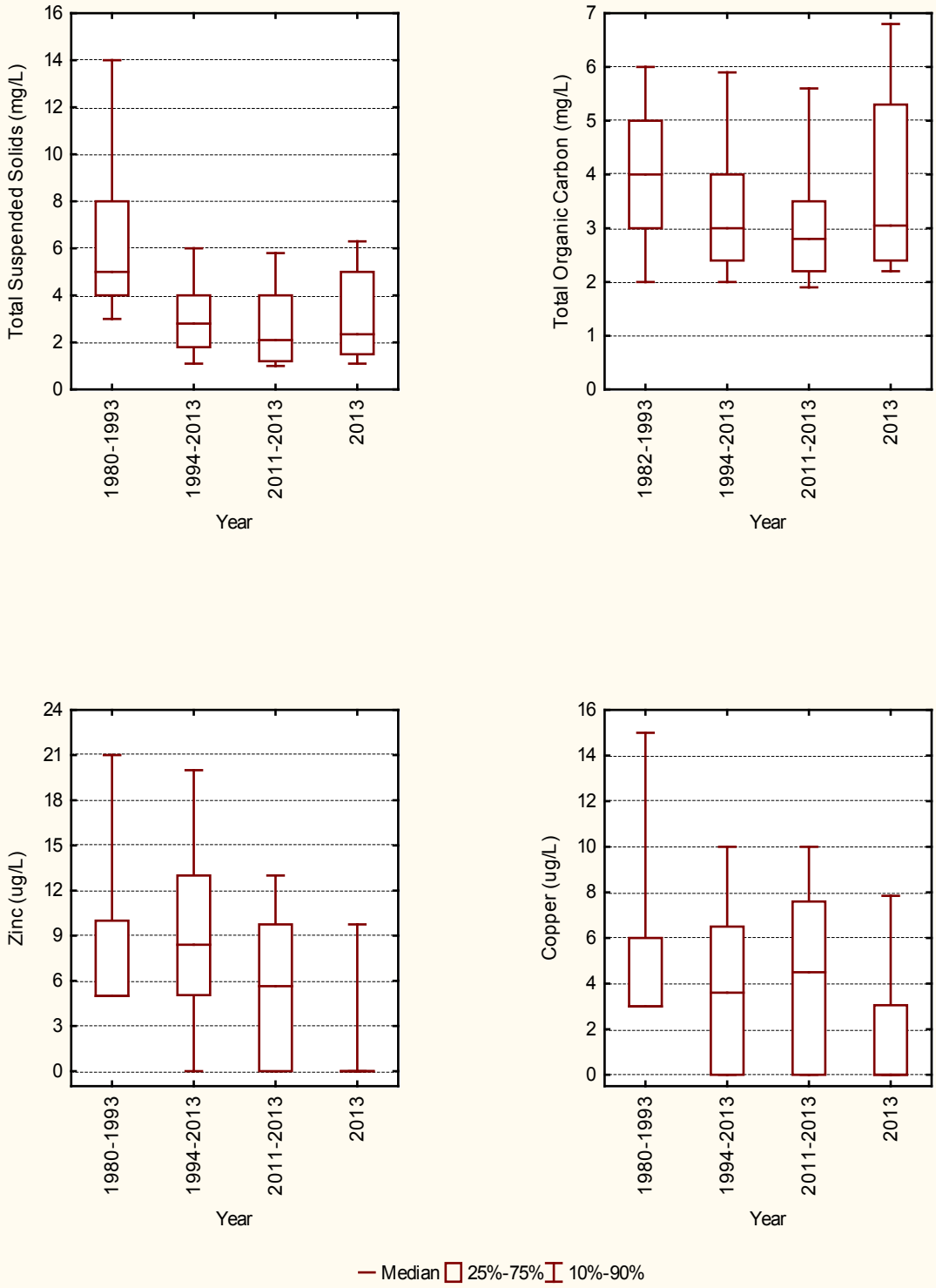
MMSD Water Quality Monitoring Program Data
Outer Harbor, Site OH-07



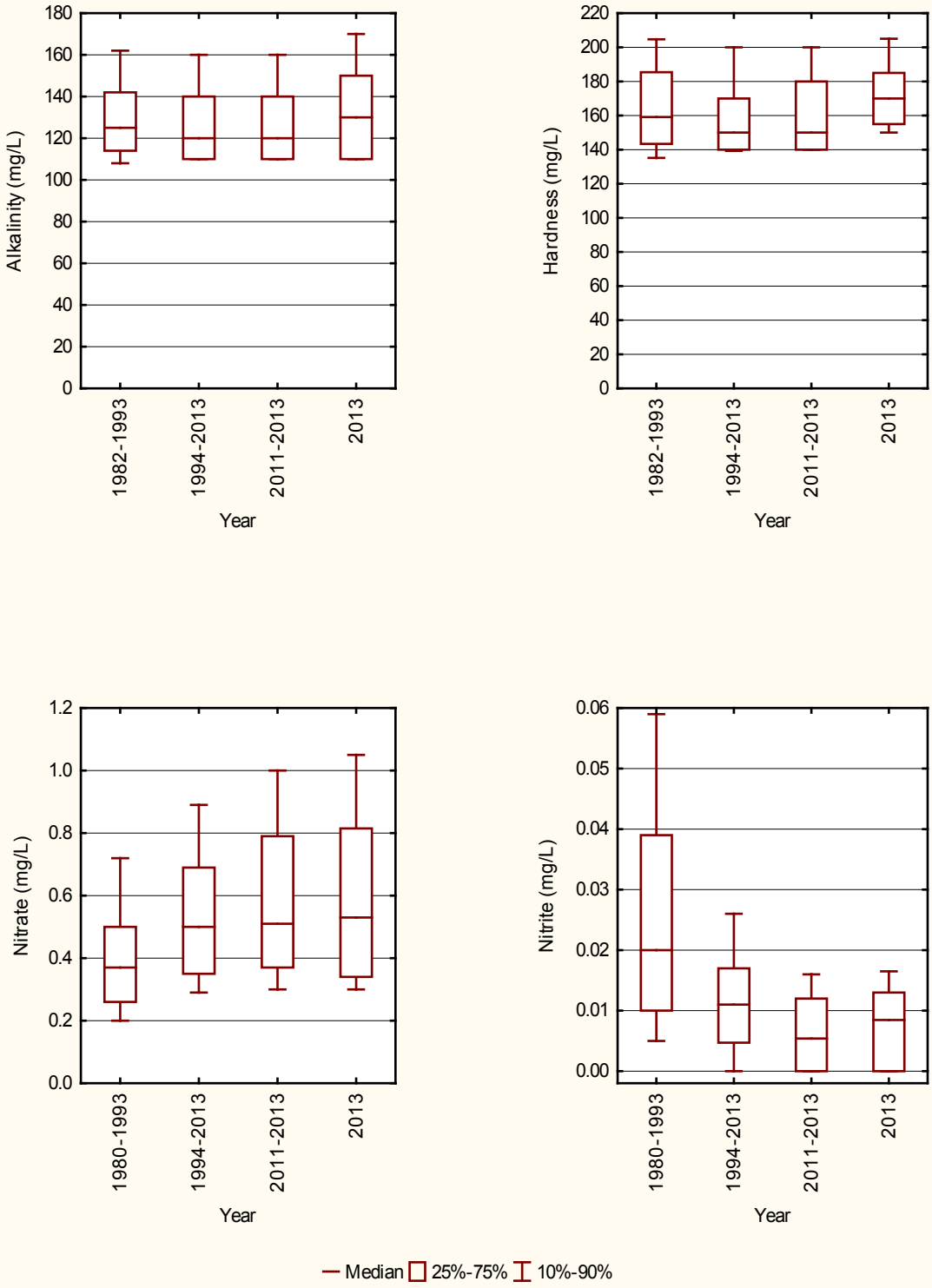
MMSD Water Quality Monitoring Program Data
Outer Harbor, Site OH-07



MMSD Water Quality Monitoring Program Data
Outer Harbor, Site OH-07



MMSD Water Quality Monitoring Program Data
Outer Harbor, Site OH-07



OUTER HARBOR - SITE 7
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.1	11.8	10.8	3.05	0.61	0.007	0.61	0.020	0.39	0.024	0.013	2.16
Standard Error	0.0	0.8	0.2	0.65	0.04	0.001	0.04	0.004	0.04	0.003	0.002	0.15
Median	8.1	11.1	11.0	0.94	0.53	0.008	0.54	0.000	0.39	0.019	0.008	1.80
Mode	Multi	Multi	11.4	Multi	0.30	0.000	0.30	0.000	0.00	0.000	0.000	1.80
Standard Deviation	0.2	6.1	1.8	5.07	0.29	0.007	0.29	0.034	0.27	0.024	0.014	1.17
Sample Variance	0.1	37.3	3.1	25.72	0.09	0.000	0.09	0.001	0.08	0.001	0.000	1.38
Range	1.3	21.5	7.3	24.00	1.15	0.023	1.15	0.150	0.94	0.130	0.059	5.51
Minimum	7.6	1.0	7.2	0.00	0.25	0.000	0.25	0.000	0.00	0.000	0.000	0.09
Maximum	8.9	22.5	14.5	24.00	1.40	0.023	1.40	0.150	0.94	0.130	0.059	5.60
Count	57	60	60	60	60	60	60	60	60	60	60	60
Confidence Level (95%)	0.1	1.6	0.5	1.31	0.08	0.002	0.08	0.009	0.07	0.006	0.004	0.30

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	2.6	7.7	230.0	227.0	0.9	3.0	2.2	443	35.5	57	1.4	70
Standard Error	0.3	0.9	13.1	12.6	0.2	0.6	0.2	18	2.9	22	0.2	23
Median	2.4	7.0	215.0	213.2	1.1	2.4	1.9	403	29.0	11	1.2	17
Mode	2.4	7.7	Multi	207.9	0.0	2.1	0.5	Multi	13.0	0	2.0	190
Standard Deviation	1.2	3.9	48.8	47.2	0.8	2.1	1.6	138	22.5	100	0.7	85
Sample Variance	1.6	15.1	2384.6	2228.8	0.7	4.3	2.4	18939	508.5	10091	0.5	7241
Range	4.4	12.2	160.0	154.6	2.4	6.7	5.8	610	109.0	370	2.1	210
Minimum	1.2	3.3	170.0	170.0	0.0	0.0	0.2	287	11.0	0	0.5	0
Maximum	5.6	15.5	330.0	324.6	2.4	6.7	6.0	897	120.0	370	2.6	210
Count	20	18	14	14	14	14	60	60	60	20	15	14
Confidence Level (95%)	0.6	1.9	28.2	27.3	0.5	1.2	0.4	36	5.8	47	0.4	49

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

OUTER HARBOR - SITE 7
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	40.35	17.75	0.1	1.4	1.9	1.4	0.4	2.0	0.0	2.1	0.0	ND
Standard Error	1.03	0.72	0.1	0.2	0.7	0.3	0.4	0.9	0.0	0.8	0.0	ND
Median	40.00	17.50	0.0	1.7	0.0	1.7	0.0	0.0	0.0	0.0	0.0	ND
Mode	41.00	Multi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	4.61	3.21	0.3	0.9	3.4	1.4	1.6	4.2	0.0	3.3	0.0	ND
Sample Variance	21.29	10.30	0.1	0.8	11.2	2.1	2.7	17.4	0.0	11.2	0.0	ND
Range	18.00	12.00	1.1	2.5	9.2	5.2	7.3	12.0	0.0	8.7	0.0	ND
Minimum	34.00	14.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	52.00	26.00	1.1	2.5	9.2	5.2	7.3	12.0	0.0	8.7	0.0	ND
Count	20	20	20	20	20	20	20	20	19	19	20	0
Confidence Level (95%)	2.16	1.50	0.1	0.4	1.6	0.7	0.8	2.0	0.0	1.6	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	175	134	0.2	3.6	31.4	27.5	3.8	ND
Standard Error	6	6	0.2	0.2	1.0	0.8	0.3	ND
Median	170	130	0.0	3.7	30.0	27.5	3.1	ND
Mode	Multi	110	0.0	Multi	27.0	28.0	2.4	ND
Standard Deviation	25	24	0.6	0.7	6.5	5.3	1.8	ND
Sample Variance	605	566	0.3	0.5	41.9	28.5	3.4	ND
Range	100	80	2.1	2.2	26.0	24.0	6.8	ND
Minimum	140	110	0.0	2.6	24.0	17.0	2.0	ND
Maximum	240	190	2.1	4.8	50.0	41.0	8.8	ND
Count	20	18	13	12	42	42	42	0
Confidence Level (95%)	12	12	0.4	0.5	2.0	1.7	0.6	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

OUTER HARBOR - SITE 8
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.3	12.0	11.2	ND	0.34	0.000	0.34	0.000	0.12	0.004	ND	1.43
Standard Error	0.0	0.9	0.3	ND	0.01	0.000	0.01	0.000	0.03	0.001	ND	0.07
Median	8.3	11.6	11.5	ND	0.33	0.000	0.34	0.000	0.00	0.005	ND	1.40
Mode	Multi	Multi	11.8	ND	Multi	0.000	Multi	0.000	0.00	0.000	ND	1.20
Standard Deviation	0.1	5.9	1.6	ND	0.08	0.001	0.08	0.000	0.16	0.005	ND	0.42
Sample Variance	0.0	34.5	2.5	ND	0.01	0.000	0.01	0.000	0.02	0.000	ND	0.18
Range	0.5	19.4	5.6	ND	0.28	0.009	0.28	0.000	0.52	0.014	ND	2.27
Minimum	8.0	0.9	9.0	ND	0.24	0.000	0.24	0.000	0.00	0.000	ND	0.73
Maximum	8.5	20.3	14.6	ND	0.52	0.009	0.52	0.000	0.52	0.014	ND	3.00
Count	36	39	39	0	39	39	39	39	39	39	0	39
Confidence Level (95%)	0.0	1.9	0.5	ND	0.03	0.000	0.03	0.000	0.05	0.001	ND	0.14

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	5.2	13.6	178.5	177.5	0.3	1.0	1.1	315	14.3	25	0.9	ND
Standard Error	0.6	1.1	3.4	3.3	0.1	0.3	0.2	3	0.5	20	0.2	ND
Median	4.6	15.7	180.0	179.0	0.0	1.0	0.5	310	13.0	3	0.8	ND
Mode	4.6	15.7	190.0	Multi	0.0	0.0	Multi	320	12.0	3	0.5	ND
Standard Deviation	2.2	3.5	12.1	12.0	0.5	1.2	1.3	17	3.0	74	0.6	ND
Sample Variance	4.7	12.4	147.4	142.9	0.2	1.4	1.6	296	8.8	5428	0.4	ND
Range	7.4	8.6	40.0	40.0	1.1	3.4	4.6	73	11.0	270	2.0	ND
Minimum	1.7	7.2	150.0	150.0	0.0	0.0	0.0	290	11.0	0	0.5	ND
Maximum	9.1	15.8	190.0	190.0	1.1	3.4	4.6	363	22.0	270	2.4	ND
Count	13	11	13	13	13	13	39	39	39	13	10	0
Confidence Level (95%)	1.3	2.4	7.3	7.2	0.3	0.7	0.4	6	1.0	45	0.4	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

OUTER HARBOR - SITE 8
LAKE MICHIGAN
WATER QUALITY DATA - 2013

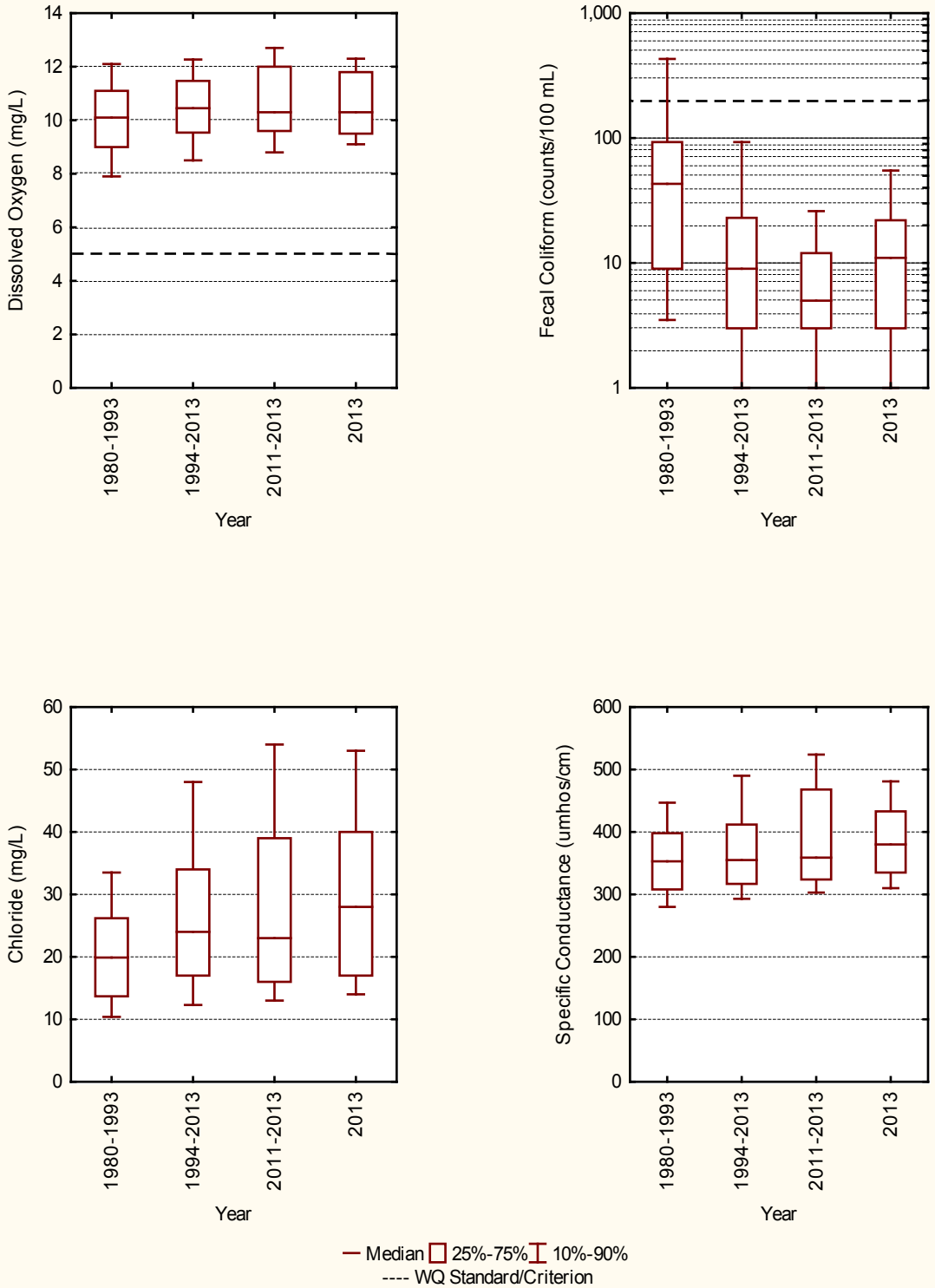
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	35.23	13.85	0.0	1.2	0.0	1.6	0.6	0.0	0.0	4.1	0.0	ND
Standard Error	0.23	0.15	0.0	0.3	0.0	0.5	0.6	0.0	0.0	0.8	0.0	ND
Median	35.00	14.00	0.0	1.4	0.0	1.6	0.0	0.0	0.0	4.4	0.0	ND
Mode	36.00	14.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	0.83	0.55	0.1	0.9	0.0	1.8	2.1	0.0	0.0	2.8	0.0	ND
Sample Variance	0.69	0.31	0.0	0.9	0.0	3.3	4.2	0.0	0.0	8.1	0.0	ND
Range	2.00	2.00	0.4	2.7	0.0	6.0	7.4	0.0	0.0	8.1	0.0	ND
Minimum	34.00	13.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	36.00	15.00	0.4	2.7	0.0	6.0	7.4	0.0	0.0	8.1	0.0	ND
Count	13	13	13	13	13	13	13	12	12	12	13	0
Confidence Level (95%)	0.50	0.34	0.1	0.6	0.0	1.1	1.2	0.0	0.0	1.8	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	144	ND	ND	ND	26.7	24.4	2.3	ND
Standard Error	1	ND	ND	ND	0.5	0.4	0.1	ND
Median	140	ND	ND	ND	26.0	24.0	2.2	ND
Mode	140	ND	ND	ND	26.0	24.0	2.2	ND
Standard Deviation	5	ND	ND	ND	2.9	2.7	0.4	ND
Sample Variance	26	ND	ND	ND	8.6	7.4	0.1	ND
Range	10	ND	ND	ND	17.0	16.0	1.5	ND
Minimum	140	ND	ND	ND	24.0	22.0	1.9	ND
Maximum	150	ND	ND	ND	41.0	38.0	3.4	ND
Count	13	0	0	0	39	39	39	0
Confidence Level (95%)	3	ND	ND	ND	1.0	0.9	0.1	ND

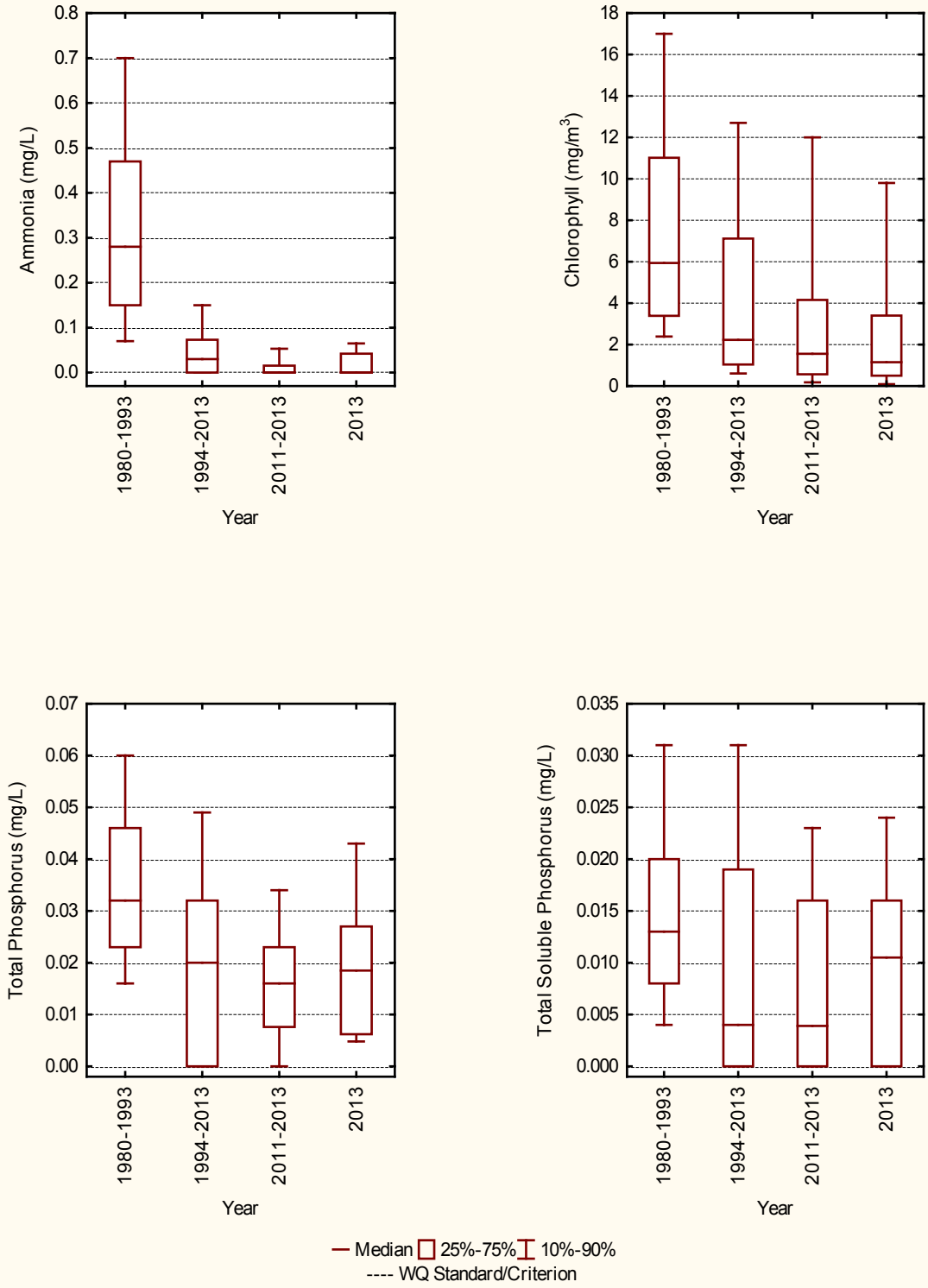
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

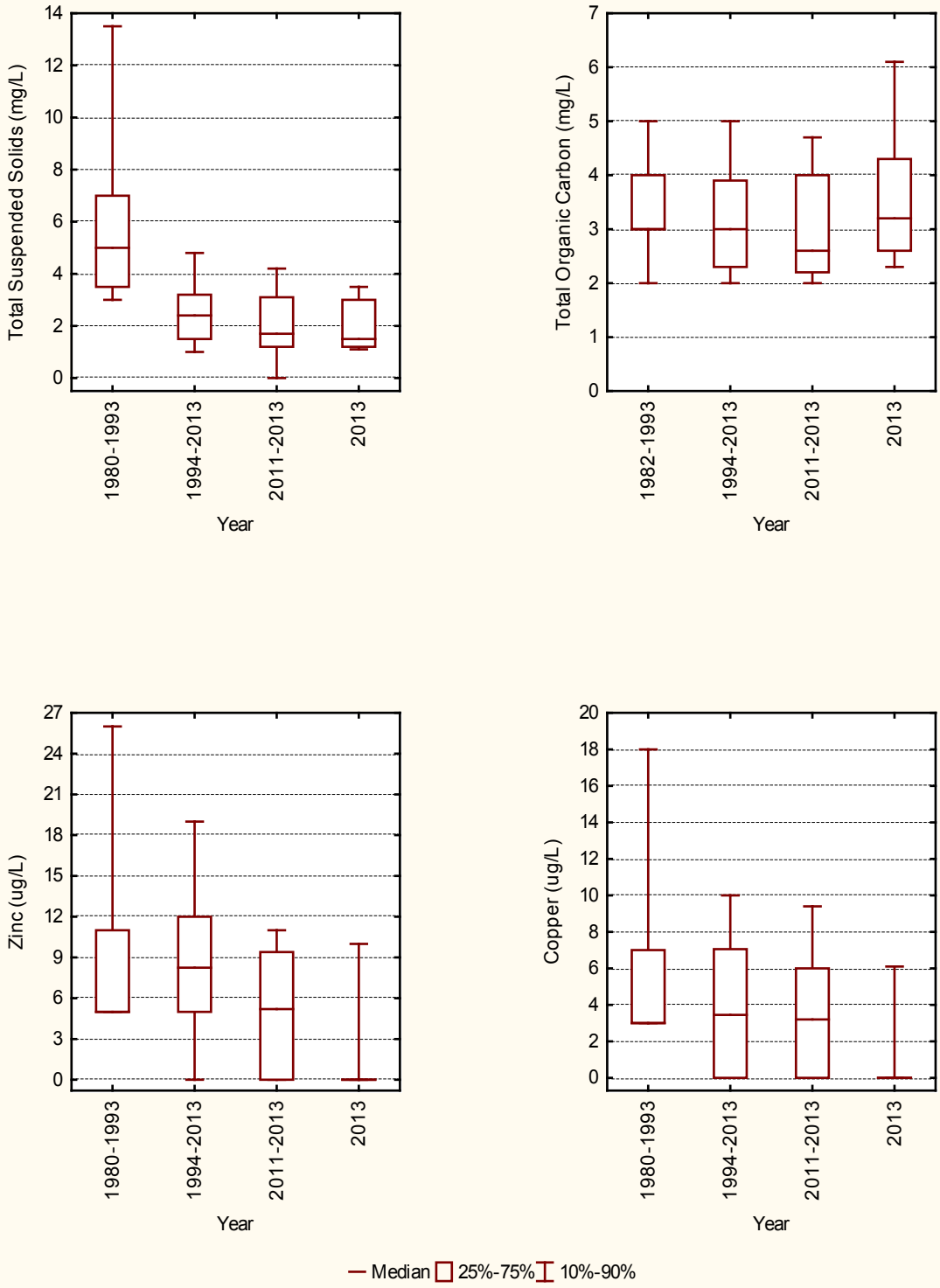
MMSD Water Quality Monitoring Program Data
Outer Harbor, Site OH-09



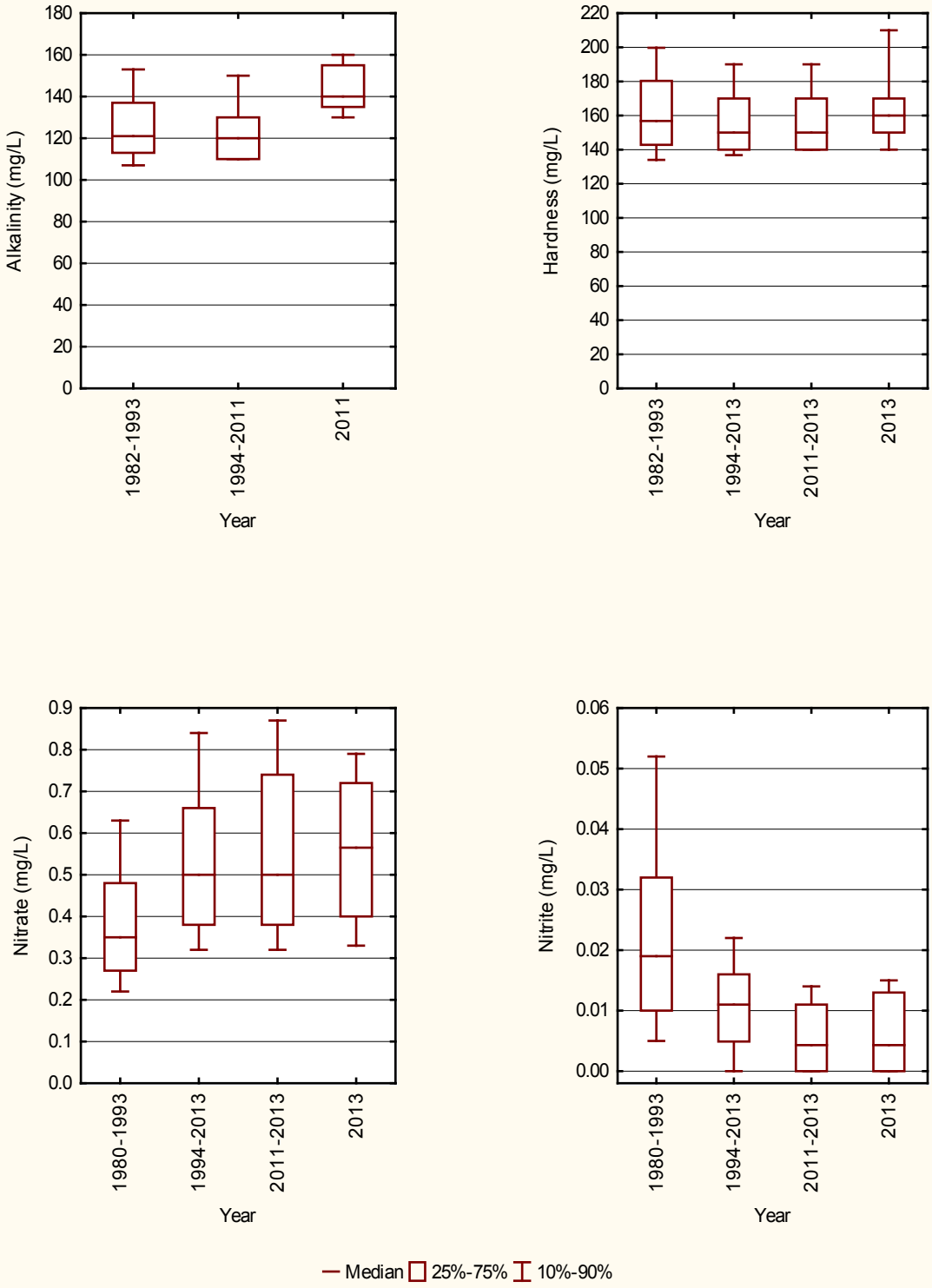
MMSD Water Quality Monitoring Program Data
Outer Harbor, Site OH-09



MMSD Water Quality Monitoring Program Data
Outer Harbor, Site OH-09



MMSD Water Quality Monitoring Program Data
Outer Harbor, Site OH-09



OUTER HARBOR - SITE 9
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.1	12.0	10.7	3.18	0.57	0.007	0.58	0.019	0.37	0.021	0.011	1.92
Standard Error	0.0	0.9	0.2	0.87	0.03	0.001	0.03	0.005	0.04	0.002	0.001	0.12
Median	8.1	12.0	10.3	1.15	0.57	0.004	0.58	0.000	0.35	0.018	0.010	1.80
Mode	Multi	Multi	11.8	0.00	Multi	0.000	0.80	0.000	0.00	Multi	0.000	1.80
Standard Deviation	0.2	5.7	1.6	5.64	0.18	0.007	0.18	0.030	0.24	0.015	0.010	0.79
Sample Variance	0.0	32.6	2.5	31.75	0.03	0.000	0.03	0.001	0.06	0.000	0.000	0.62
Range	1.1	19.9	7.0	30.00	0.69	0.020	0.71	0.110	0.88	0.060	0.034	3.73
Minimum	7.7	1.2	7.2	0.00	0.27	0.000	0.27	0.000	0.00	0.000	0.000	0.47
Maximum	8.8	21.1	14.2	30.00	0.96	0.020	0.98	0.110	0.88	0.060	0.034	4.20
Count	38	41	41	42	42	42	42	42	42	42	42	42
Confidence Level (95%)	0.1	1.8	0.5	1.76	0.06	0.002	0.06	0.009	0.07	0.005	0.003	0.25

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	3.3	9.2	232.1	230.3	0.6	1.9	1.5	391	31.0	56	1.2	31
Standard Error	0.5	1.1	11.5	11.3	0.2	0.3	0.2	11	2.3	42	0.2	17
Median	2.4	8.1	220.0	217.6	0.0	1.5	1.2	380	28.0	11	1.2	12
Mode	Multi	8.2	Multi	Multi	0.0	1.2	Multi	Multi	17.0	Multi	0.5	Multi
Standard Deviation	2.1	3.9	43.0	42.3	0.7	1.1	1.1	68	14.8	157	0.7	65
Sample Variance	4.2	15.1	1848.9	1786.9	0.5	1.2	1.2	4682	220.0	24786	0.5	4215
Range	7.3	12.5	140.0	137.0	1.7	3.7	4.3	272	57.4	600	2.3	250
Minimum	1.5	4.0	180.0	180.0	0.0	0.0	0.2	295	5.6	0	0.5	0
Maximum	8.8	16.5	320.0	317.0	1.7	3.7	4.5	567	63.0	600	2.8	250
Count	14	12	14	14	14	14	41	41	42	14	11	14
Confidence Level (95%)	1.2	2.5	24.8	24.4	0.4	0.6	0.3	22	4.6	91	0.5	37

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

OUTER HARBOR - SITE 9
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	39.07	16.71	0.1	1.1	1.2	1.2	0.0	2.1	0.0	3.4	1.6	ND
Standard Error	1.32	0.89	0.0	0.2	0.8	0.3	0.0	1.1	0.0	1.0	1.1	ND
Median	38.00	16.00	0.0	1.3	0.0	1.6	0.0	0.0	0.0	4.3	0.0	ND
Mode	Multi	14.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	4.95	3.31	0.2	0.7	3.0	1.0	0.0	4.2	0.0	3.6	4.1	ND
Sample Variance	24.53	10.99	0.0	0.6	9.1	1.1	0.0	18.0	0.0	12.6	16.7	ND
Range	18.00	12.00	0.6	2.0	10.0	3.0	0.0	11.0	0.0	8.7	13.0	ND
Minimum	34.00	13.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	52.00	25.00	0.6	2.0	10.0	3.0	0.0	11.0	0.0	8.7	13.0	ND
Count	14	14	14	14	14	14	13	14	13	13	14	0
Confidence Level (95%)	2.86	1.91	0.1	0.4	1.7	0.6	0.0	2.4	0.0	2.1	2.4	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	165	ND	ND	ND	30.9	27.2	3.6	ND
Standard Error	7	ND	ND	ND	0.9	0.7	0.2	ND
Median	160	ND	ND	ND	29.0	26.0	3.2	ND
Mode	Multi	ND	ND	ND	27.0	25.0	3.4	ND
Standard Deviation	27	ND	ND	ND	5.7	4.4	1.5	ND
Sample Variance	704	ND	ND	ND	32.6	19.0	2.4	ND
Range	90	ND	ND	ND	24.0	18.0	6.4	ND
Minimum	140	ND	ND	ND	24.0	21.0	2.0	ND
Maximum	230	ND	ND	ND	48.0	39.0	8.4	ND
Count	14	0	0	0	42	42	42	0
Confidence Level (95%)	15	ND	ND	ND	1.8	1.4	0.5	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

OUTER HARBOR - SITE 10
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.1	13.0	10.5	4.46	0.60	0.010	0.61	0.022	0.39	0.026	0.014	2.13
Standard Error	0.0	0.9	0.2	1.36	0.04	0.001	0.04	0.005	0.03	0.002	0.002	0.14
Median	8.1	13.2	10.4	1.35	0.56	0.012	0.58	0.000	0.39	0.027	0.014	2.10
Mode	8.1	Multi	8.7	Multi	Multi	0.000	Multi	0.000	0.00	Multi	0.000	1.40
Standard Deviation	0.2	6.0	1.6	8.78	0.24	0.006	0.24	0.031	0.21	0.011	0.010	0.88
Sample Variance	0.1	36.1	2.6	77.11	0.06	0.000	0.06	0.001	0.05	0.000	0.000	0.78
Range	1.0	19.9	6.3	45.00	0.85	0.019	0.85	0.110	0.86	0.041	0.036	3.20
Minimum	7.8	1.4	7.7	0.00	0.25	0.000	0.25	0.000	0.00	0.007	0.000	0.50
Maximum	8.8	21.3	14.0	45.00	1.10	0.019	1.10	0.110	0.86	0.048	0.036	3.70
Count	39	42	42	42	42	42	42	42	42	42	42	42
Confidence Level (95%)	0.1	1.9	0.5	2.74	0.08	0.002	0.08	0.010	0.07	0.004	0.003	0.28

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	2.1	7.0	241.4	238.1	1.3	3.3	3.2	435	38.1	33	1.2	21
Standard Error	0.2	0.8	15.0	15.0	0.3	0.4	0.2	12	2.5	17	0.2	6
Median	2.2	5.6	240.0	237.0	1.2	3.0	3.3	446	39.5	20	1.4	13
Mode	Multi	Multi	290.0	Multi	Multi	1.9	Multi	Multi	23.0	3	0.5	2
Standard Deviation	0.6	2.7	56.0	56.2	1.0	1.5	1.6	77	16.4	64	0.6	21
Sample Variance	0.4	7.2	3136.3	3162.1	1.0	2.1	2.5	5881	268.4	4063	0.3	436
Range	2.0	6.3	170.0	169.4	3.8	5.0	6.5	253	54.0	250	1.9	63
Minimum	1.3	4.6	160.0	156.1	0.0	1.8	1.1	303	13.0	0	0.5	2
Maximum	3.3	10.9	330.0	325.5	3.8	6.8	7.6	556	67.0	250	2.4	65
Count	14	12	14	14	14	14	42	42	42	14	13	14
Confidence Level (95%)	0.3	1.7	32.3	32.5	0.6	0.8	0.5	24	5.1	37	0.3	12

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

OUTER HARBOR - SITE 10
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	40.29	17.21	0.1	1.2	1.6	1.8	0.7	6.8	0.0	3.1	0.0	ND
Standard Error	1.26	0.84	0.0	0.3	0.9	0.3	0.7	2.7	0.0	0.6	0.0	ND
Median	40.00	16.50	0.0	1.5	0.0	2.0	0.0	0.0	0.0	4.0	0.0	ND
Mode	36.00	14.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	4.71	3.14	0.2	1.0	3.3	1.1	2.7	10.1	0.0	2.2	0.0	ND
Sample Variance	22.22	9.87	0.0	1.1	10.7	1.3	7.1	102.7	0.0	4.9	0.0	ND
Range	16.00	10.00	0.5	3.1	10.0	3.5	10.0	33.0	0.0	5.5	0.0	ND
Minimum	35.00	14.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	51.00	24.00	0.5	3.1	10.0	3.5	10.0	33.0	0.0	5.5	0.0	ND
Count	14	14	14	14	14	14	14	14	14	13	14	0
Confidence Level (95%)	2.72	1.81	0.1	0.6	1.9	0.7	1.5	5.9	0.0	1.3	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	173	ND	ND	ND	31.8	27.9	3.9	ND
Standard Error	7	ND	ND	ND	0.8	0.6	0.2	ND
Median	165	ND	ND	ND	30.5	27.0	3.8	ND
Mode	150	ND	ND	ND	28.0	25.0	Multi	ND
Standard Deviation	25	ND	ND	ND	5.3	4.1	1.4	ND
Sample Variance	607	ND	ND	ND	28.4	16.7	2.0	ND
Range	80	ND	ND	ND	18.0	14.0	5.1	ND
Minimum	150	ND	ND	ND	24.0	22.0	2.1	ND
Maximum	230	ND	ND	ND	42.0	36.0	7.2	ND
Count	14	0	0	0	42	42	42	0
Confidence Level (95%)	14	ND	ND	ND	1.7	1.3	0.4	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

OUTER HARBOR - SITE 11
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.1	12.4	10.9	6.46	0.70	0.012	0.71	0.024	0.43	0.032	0.015	2.26
Standard Error	0.0	0.8	0.2	1.17	0.04	0.001	0.04	0.005	0.03	0.003	0.002	0.14
Median	8.1	12.6	11.2	2.85	0.68	0.014	0.69	0.000	0.42	0.024	0.012	1.95
Mode	7.9	19.2	Multi	Multi	1.00	0.000	Multi	0.000	0.00	0.044	0.000	1.90
Standard Deviation	0.3	6.0	1.5	8.63	0.27	0.007	0.27	0.035	0.21	0.022	0.012	1.06
Sample Variance	0.1	36.1	2.3	74.49	0.07	0.000	0.07	0.001	0.04	0.000	0.000	1.12
Range	1.6	22.3	6.8	40.00	1.03	0.024	1.02	0.120	0.85	0.110	0.038	4.48
Minimum	7.3	1.5	7.4	0.00	0.27	0.000	0.28	0.000	0.00	0.000	0.000	0.12
Maximum	8.9	23.8	14.2	40.00	1.30	0.024	1.30	0.120	0.85	0.110	0.038	4.60
Count	51	54	54	54	54	54	54	54	54	54	54	54
Confidence Level (95%)	0.1	1.6	0.4	2.36	0.07	0.002	0.07	0.010	0.06	0.006	0.003	0.29

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	2.1	5.8	256.1	252.1	1.5	4.0	3.7	457	41.6	113	1.4	264
Standard Error	0.2	0.8	12.6	12.1	0.3	1.1	0.7	13	2.6	77	0.2	246
Median	2.0	5.2	255.0	250.7	1.2	3.1	2.1	439	36.0	16	1.4	28
Mode	Multi	Multi	Multi	Multi	Multi	Multi	1.1	Multi	Multi	5	0.7	Multi
Standard Deviation	0.9	2.9	53.6	51.5	1.3	4.6	5.0	92	19.4	325	0.7	491
Sample Variance	0.8	8.5	2872.2	2655.0	1.7	20.8	24.6	8472	375.1	105702	0.6	241519
Range	4.0	11.7	160.0	155.7	5.8	21.0	26.5	369	74.0	1400	2.7	1000
Minimum	0.5	2.0	180.0	180.0	0.0	0.0	0.7	294	11.0	0	0.5	0
Maximum	4.5	13.7	340.0	335.7	5.8	21.0	27.2	663	85.0	1400	3.1	1000
Count	18	15	18	18	18	18	54	54	54	18	16	4
Confidence Level (95%)	0.4	1.6	26.7	25.6	0.6	2.3	1.4	25	5.3	162	0.4	782

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

OUTER HARBOR - SITE 11
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	41.28	17.89	0.1	1.6	1.9	1.3	0.0	3.4	0.0	2.3	0.0	ND
Standard Error	1.13	0.79	0.0	0.2	0.7	0.3	0.0	1.7	0.0	0.8	0.0	ND
Median	41.00	17.00	0.0	1.8	0.0	1.3	0.0	0.0	0.0	0.0	0.0	ND
Mode	Multi	Multi	0.0	Multi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	4.80	3.34	0.2	1.0	3.1	1.4	0.0	7.1	0.0	3.3	0.0	ND
Sample Variance	23.04	11.16	0.0	0.9	9.8	1.8	0.0	50.4	0.0	11.1	0.0	ND
Range	17.00	12.00	0.4	4.1	7.2	3.9	0.0	24.0	0.0	8.3	0.0	ND
Minimum	35.00	14.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	52.00	26.00	0.4	4.1	7.2	3.9	0.0	24.0	0.0	8.3	0.0	ND
Count	18	18	18	18	18	18	18	18	18	17	18	0
Confidence Level (95%)	2.39	1.66	0.1	0.5	1.6	0.7	0.0	3.5	0.0	1.7	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	177	120	0.0	ND	33.3	28.9	4.3	ND
Standard Error	6	5	0.0	ND	0.8	0.6	0.2	ND
Median	170	120	0.0	ND	32.0	27.5	3.8	ND
Mode	Multi	130	0.0	ND	28.0	25.0	Multi	ND
Standard Deviation	26	17	0.0	ND	6.1	4.5	1.8	ND
Sample Variance	682	298	0.0	ND	37.2	20.4	3.2	ND
Range	100	56	0.0	ND	22.0	16.0	6.3	ND
Minimum	140	94	0.0	ND	26.0	24.0	2.0	ND
Maximum	240	150	0.0	ND	48.0	40.0	8.3	ND
Count	18	12	4	0	54	54	54	0
Confidence Level (95%)	13	11	0.0	ND	1.7	1.2	0.5	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

OUTER HARBOR - SITE 12
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.2	11.1	11.5	0.31	0.34	0.001	0.34	0.000	0.12	0.004	ND	1.37
Standard Error	0.0	0.9	0.2	0.06	0.01	0.000	0.01	0.000	0.02	0.001	ND	0.05
Median	8.2	9.3	11.7	0.22	0.33	0.000	0.33	0.000	0.00	0.000	ND	1.25
Mode	8.0	Multi	9.3	0.00	Multi	0.000	0.25	0.000	0.00	0.000	ND	1.20
Standard Deviation	0.2	6.1	1.6	0.41	0.09	0.002	0.09	0.000	0.14	0.007	ND	0.36
Sample Variance	0.0	37.0	2.5	0.17	0.01	0.000	0.01	0.000	0.02	0.000	ND	0.13
Range	0.6	19.8	5.4	2.30	0.36	0.009	0.36	0.000	0.41	0.039	ND	1.58
Minimum	8.0	1.0	9.1	0.00	0.24	0.000	0.24	0.000	0.00	0.000	ND	0.72
Maximum	8.6	20.7	14.5	2.30	0.60	0.009	0.60	0.000	0.41	0.039	ND	2.30
Count	39	42	42	42	42	42	42	42	42	42	0	42
Confidence Level (95%)	0.1	1.9	0.5	0.13	0.03	0.001	0.03	0.000	0.04	0.002	ND	0.11

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	6.5	14.6	171.4	170.8	0.2	0.7	1.1	310	13.5	10	0.9	ND
Standard Error	0.8	1.2	4.3	4.5	0.1	0.3	0.3	3	0.5	7	0.2	ND
Median	6.6	16.8	170.0	170.0	0.0	0.0	0.5	302	12.0	0	0.7	ND
Mode	5.0	Multi	170.0	Multi	0.0	0.0	0.5	297	12.0	0	0.5	ND
Standard Deviation	2.9	4.3	16.1	16.9	0.6	1.3	1.7	19	3.3	26	0.6	ND
Sample Variance	8.6	18.3	259.3	286.0	0.3	1.7	3.0	374	11.1	663	0.4	ND
Range	10.4	11.9	60.0	63.0	1.9	4.0	5.7	102	16.0	97	1.5	ND
Minimum	1.6	5.1	130.0	127.0	0.0	0.0	0.0	290	11.0	0	0.5	ND
Maximum	12.0	17.0	190.0	190.0	1.9	4.0	5.7	392	27.0	97	2.0	ND
Count	14	12	14	14	14	14	42	42	42	14	6	0
Confidence Level (95%)	1.7	2.7	9.3	9.8	0.3	0.7	0.5	6	1.0	15	0.6	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

OUTER HARBOR - SITE 12
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	34.71	13.50	0.1	0.8	1.0	0.8	0.0	3.5	0.0	3.7	0.0	ND
Standard Error	0.22	0.20	0.1	0.2	0.7	0.2	0.0	1.9	0.0	0.9	0.0	ND
Median	35.00	13.50	0.0	1.2	0.0	1.1	0.0	0.0	0.0	3.8	0.0	ND
Mode	35.00	Multi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	0.83	0.76	0.2	0.7	2.6	0.8	0.0	7.3	0.0	3.2	0.0	ND
Sample Variance	0.68	0.58	0.0	0.5	6.7	0.7	0.0	53.0	0.0	10.1	0.0	ND
Range	3.00	3.00	0.6	1.8	7.8	2.2	0.0	22.0	0.0	7.9	0.0	ND
Minimum	33.00	12.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	36.00	15.00	0.6	1.8	7.8	2.2	0.0	22.0	0.0	7.9	0.0	ND
Count	14	14	14	14	14	14	13	14	14	14	13	0
Confidence Level (95%)	0.48	0.44	0.1	0.4	1.5	0.5	0.0	4.2	0.0	1.8	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	141	ND	ND	ND	26.1	23.8	2.3	ND
Standard Error	1	ND	ND	ND	0.3	0.2	0.1	ND
Median	140	ND	ND	ND	26.0	24.0	2.2	ND
Mode	140	ND	ND	ND	26.0	23.0	2.0	ND
Standard Deviation	5	ND	ND	ND	1.7	1.5	0.4	ND
Sample Variance	23	ND	ND	ND	2.9	2.3	0.2	ND
Range	20	ND	ND	ND	8.0	7.0	1.8	ND
Minimum	130	ND	ND	ND	24.0	22.0	1.8	ND
Maximum	150	ND	ND	ND	32.0	29.0	3.6	ND
Count	14	0	0	0	42	42	42	0
Confidence Level (95%)	3	ND	ND	ND	0.5	0.5	0.1	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

OUTER HARBOR - SITE 13
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.3	11.0	11.5	0.33	0.34	0.000	0.34	0.000	0.13	0.003	ND	1.39
Standard Error	0.0	0.9	0.2	0.08	0.01	0.000	0.01	0.000	0.03	0.001	ND	0.05
Median	8.2	9.1	12.0	0.17	0.32	0.000	0.32	0.000	0.00	0.000	ND	1.40
Mode	8.2	Multi	12.0	0.00	0.28	0.000	0.28	0.000	0.00	0.000	ND	1.20
Standard Deviation	0.1	5.9	1.6	0.50	0.08	0.000	0.08	0.000	0.17	0.004	ND	0.35
Sample Variance	0.0	35.0	2.4	0.25	0.01	0.000	0.01	0.000	0.03	0.000	ND	0.13
Range	0.6	19.9	5.6	2.70	0.38	0.000	0.38	0.000	0.58	0.016	ND	1.80
Minimum	8.0	0.8	9.0	0.00	0.23	0.000	0.23	0.000	0.00	0.000	ND	0.60
Maximum	8.6	20.7	14.6	2.70	0.61	0.000	0.61	0.000	0.58	0.016	ND	2.40
Count	39	42	42	42	42	42	42	42	42	42	0	42
Confidence Level (95%)	0.0	1.8	0.5	0.16	0.03	0.000	0.03	0.000	0.05	0.001	ND	0.11

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	7.2	17.0	167.9	167.1	0.1	0.7	1.0	311	13.8	4	1.1	3
Standard Error	1.0	1.4	3.0	3.0	0.1	0.3	0.2	4	0.6	3	0.3	2
Median	6.9	19.4	170.0	169.5	0.0	0.0	0.4	303	12.5	0	1.1	1
Mode	12.0	19.5	170.0	170.0	0.0	0.0	Multi	297	12.0	0	Multi	0
Standard Deviation	3.5	4.7	11.2	11.3	0.4	1.1	1.5	28	3.8	12	0.6	7
Sample Variance	12.1	22.3	125.8	127.7	0.1	1.3	2.2	762	14.5	148	0.3	44
Range	10.6	12.4	30.0	32.3	1.0	3.8	5.3	148	19.0	45	1.2	21
Minimum	1.4	7.2	150.0	147.7	0.0	0.0	0.0	290	11.0	0	0.5	0
Maximum	12.0	19.6	180.0	180.0	1.0	3.8	5.3	438	30.0	45	1.7	21
Count	13	12	14	14	14	14	42	42	42	14	3	14
Confidence Level (95%)	2.1	3.0	6.5	6.5	0.2	0.7	0.5	9	1.2	7	1.5	4

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

OUTER HARBOR - SITE 13
LAKE MICHIGAN
WATER QUALITY DATA - 2013

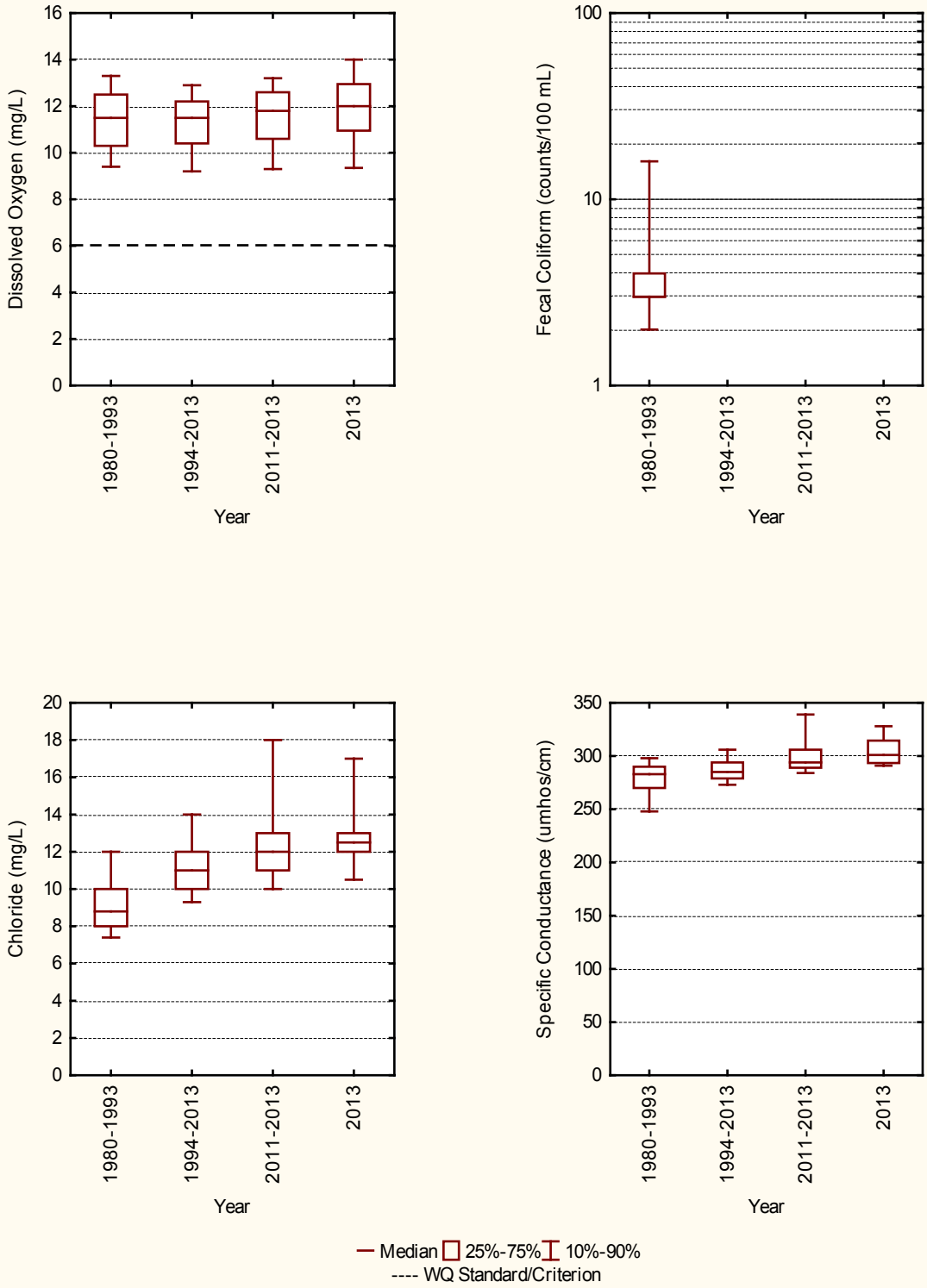
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	34.29	13.29	0.0	1.1	0.0	0.9	0.0	0.0	0.0	3.2	0.0	ND
Standard Error	0.30	0.22	0.0	0.3	0.0	0.3	0.0	0.0	0.0	0.9	0.0	ND
Median	34.00	13.00	0.0	1.5	0.0	0.5	0.0	0.0	0.0	3.3	0.0	ND
Mode	34.00	13.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	1.14	0.83	0.0	1.0	0.0	1.0	0.0	0.0	0.0	3.3	0.0	ND
Sample Variance	1.30	0.68	0.0	1.0	0.0	1.0	0.0	0.0	0.0	11.2	0.0	ND
Range	4.00	3.00	0.0	2.5	0.0	2.9	0.0	0.0	0.0	8.4	0.0	ND
Minimum	32.00	12.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	36.00	15.00	0.0	2.5	0.0	2.9	0.0	0.0	0.0	8.4	0.0	ND
Count	14	14	14	14	14	14	14	14	13	13	14	0
Confidence Level (95%)	0.66	0.48	0.0	0.6	0.0	0.6	0.0	0.0	0.0	2.0	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	140	ND	ND	ND	26.0	23.5	2.3	ND
Standard Error	1	ND	ND	ND	0.2	0.2	0.1	ND
Median	140	ND	ND	ND	26.0	24.0	2.2	ND
Mode	140	ND	ND	ND	26.0	22.0	2.1	ND
Standard Deviation	6	ND	ND	ND	1.6	1.3	0.4	ND
Sample Variance	31	ND	ND	ND	2.5	1.6	0.2	ND
Range	20	ND	ND	ND	6.0	4.0	1.6	ND
Minimum	130	ND	ND	ND	24.0	22.0	1.8	ND
Maximum	150	ND	ND	ND	30.0	26.0	3.4	ND
Count	14	0	0	0	42	42	42	0
Confidence Level (95%)	3	ND	ND	ND	0.5	0.4	0.1	ND

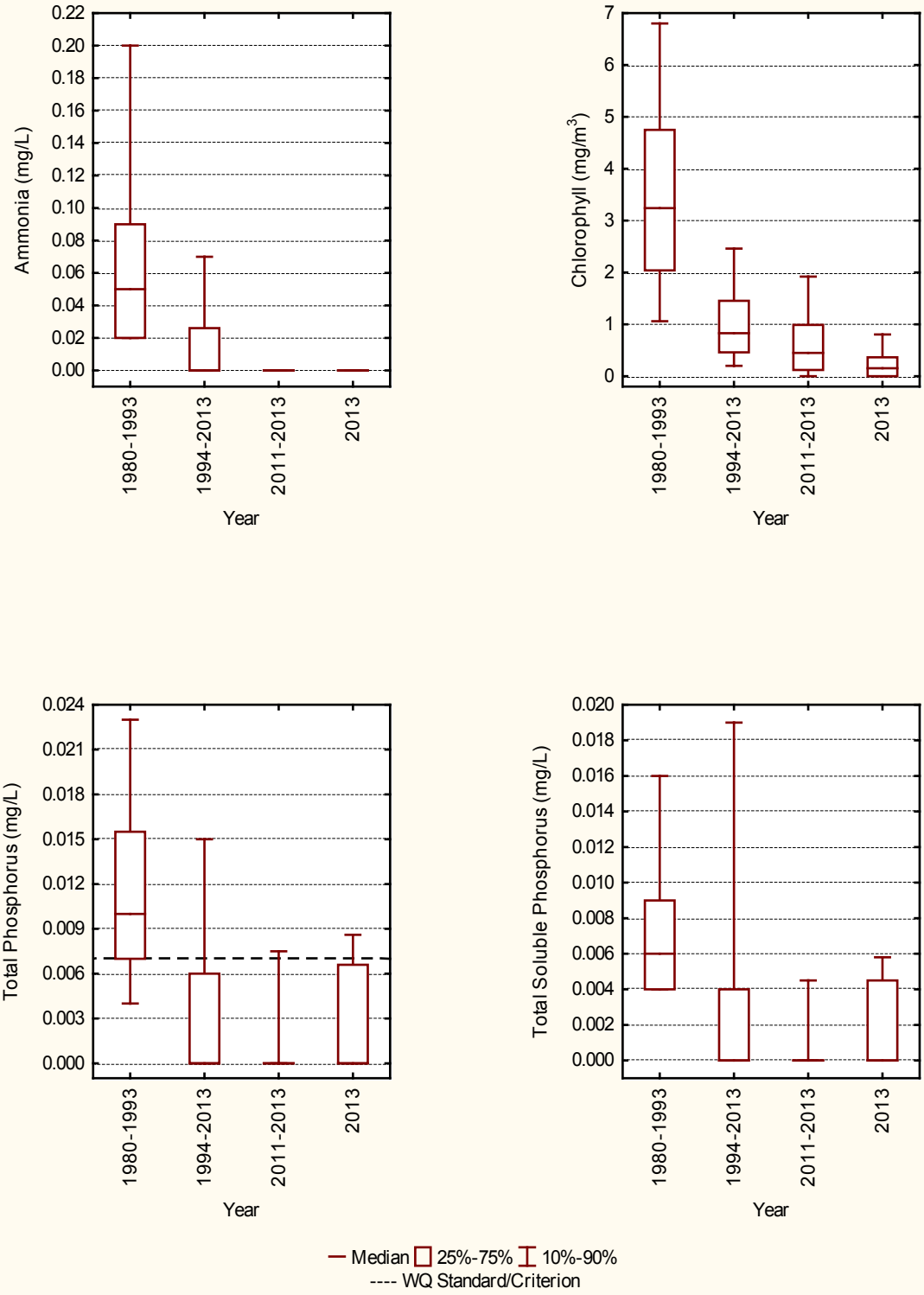
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

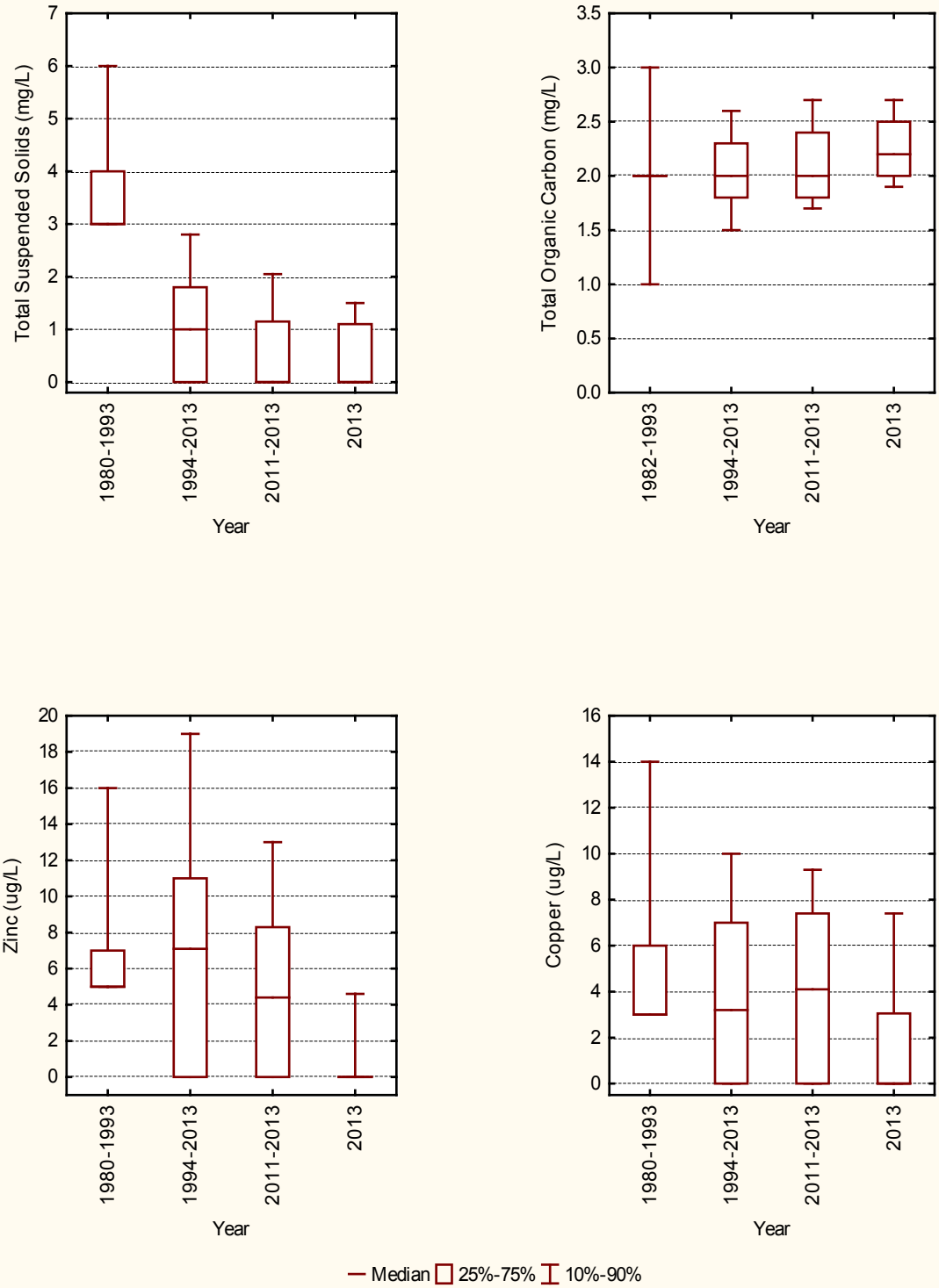
MMSD Water Quality Monitoring Program Data
Outer Harbor, Site OH-14



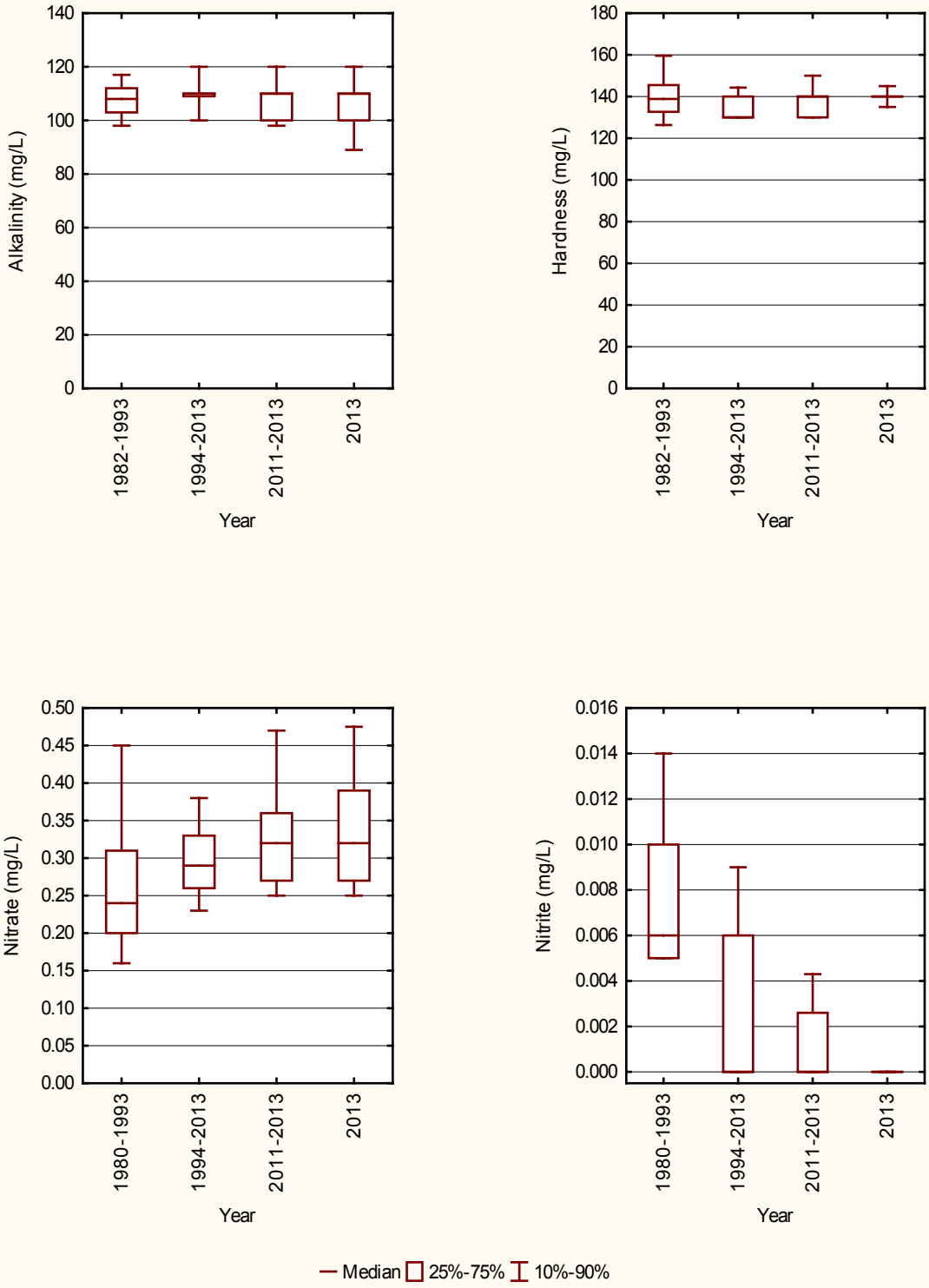
MMSD Water Quality Monitoring Program Data
Outer Harbor, Site OH-14



MMSD Water Quality Monitoring Program Data
Outer Harbor, Site OH-14



MMSD Water Quality Monitoring Program Data
Outer Harbor, Site OH-14



OUTER HARBOR - SITE 14
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.2	10.0	11.9	0.44	0.34	0.000	0.34	0.000	0.08	0.005	0.003	1.44
Standard Error	0.0	0.8	0.2	0.12	0.01	0.000	0.01	0.000	0.02	0.002	0.001	0.06
Median	8.2	7.8	12.0	0.16	0.32	0.000	0.32	0.000	0.00	0.000	0.000	1.50
Mode	8.2	Multi	11.8	0.00	0.26	0.000	0.26	0.000	0.00	0.000	0.000	1.20
Standard Deviation	0.3	6.0	1.5	0.89	0.08	0.002	0.08	0.000	0.13	0.018	0.009	0.43
Sample Variance	0.1	35.7	2.3	0.80	0.01	0.000	0.01	0.000	0.02	0.000	0.000	0.18
Range	1.4	21.2	5.5	4.50	0.35	0.009	0.35	0.000	0.42	0.140	0.057	2.11
Minimum	7.2	0.9	9.0	0.00	0.23	0.000	0.23	0.000	0.00	0.000	0.000	0.29
Maximum	8.6	22.1	14.5	4.50	0.58	0.009	0.58	0.000	0.42	0.140	0.057	2.40
Count	57	60	60	60	60	60	60	60	60	59	42	60
Confidence Level (95%)	0.1	1.5	0.4	0.23	0.02	0.000	0.02	0.000	0.03	0.005	0.003	0.11

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	7.7	17.6	165.7	165.1	0.1	0.6	0.8	308	13.3	16	0.9	ND
Standard Error	0.9	1.0	4.3	4.3	0.1	0.3	0.1	3	0.4	16	0.5	ND
Median	7.4	19.7	170.0	170.0	0.0	0.0	0.5	301	12.5	0	0.5	ND
Mode	Multi	19.8	170.0	170.0	0.0	0.0	Multi	291	12.0	0	0.5	ND
Standard Deviation	3.9	4.1	16.0	16.3	0.3	1.0	1.1	24	3.3	71	1.0	ND
Sample Variance	14.9	16.6	257.1	264.3	0.1	1.0	1.3	556	10.9	5108	1.1	ND
Range	18.3	12.3	50.0	51.5	1.2	3.4	6.9	130	17.0	320	2.2	ND
Minimum	1.7	7.7	140.0	138.5	0.0	0.0	0.0	288	10.0	0	0.3	ND
Maximum	20.0	20.0	190.0	190.0	1.2	3.4	6.9	418	27.0	320	2.5	ND
Count	20	18	14	14	14	14	60	60	60	20	4	0
Confidence Level (95%)	1.8	2.0	9.3	9.4	0.2	0.6	0.3	6	0.9	33	1.7	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

OUTER HARBOR - SITE 14
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	34.50	13.35	0.1	0.9	1.8	1.0	0.8	1.6	0.0	1.9	0.0	ND
Standard Error	0.18	0.17	0.1	0.2	0.7	0.2	0.6	1.2	0.0	0.7	0.0	ND
Median	34.50	13.00	0.0	1.3	0.0	0.6	0.0	0.0	0.0	0.0	0.0	ND
Mode	Multi	13.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	0.83	0.75	0.4	0.8	3.3	1.1	2.5	5.4	0.0	2.8	0.0	ND
Sample Variance	0.68	0.56	0.1	0.6	10.7	1.2	6.1	29.6	0.0	7.7	0.0	ND
Range	3.00	3.00	1.2	1.9	9.1	2.9	8.4	23.0	0.0	7.1	0.0	ND
Minimum	33.00	12.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	36.00	15.00	1.2	1.9	9.1	2.9	8.4	23.0	0.0	7.1	0.0	ND
Count	20	20	20	20	20	20	19	20	20	17	19	0
Confidence Level (95%)	0.39	0.35	0.2	0.4	1.5	0.5	1.2	2.5	0.0	1.4	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	140	106	0.0	2.0	26.0	23.7	2.3	ND
Standard Error	1	2	0.0	0.4	0.2	0.2	0.1	ND
Median	140	110	0.0	2.6	26.0	24.0	2.2	ND
Mode	140	110	0.0	0.0	27.0	22.0	Multi	ND
Standard Deviation	5	10	0.0	1.2	1.5	1.3	0.4	ND
Sample Variance	21	98	0.0	1.5	2.2	1.8	0.2	ND
Range	20	34	0.0	3.2	5.0	4.0	2.0	ND
Minimum	130	86	0.0	0.0	24.0	22.0	1.8	ND
Maximum	150	120	0.0	3.2	29.0	26.0	3.8	ND
Count	20	18	13	12	42	42	42	0
Confidence Level (95%)	2	5	0.0	0.8	0.5	0.4	0.1	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

OUTER HARBOR - SITE 15
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.1	15.5	9.8	2.02	0.49	0.007	0.50	0.032	0.39	0.035	ND	2.79
Standard Error	0.1	1.6	0.4	0.55	0.06	0.002	0.06	0.007	0.06	0.005	ND	0.32
Median	8.1	17.6	9.9	0.93	0.54	0.010	0.54	0.032	0.43	0.028	ND	2.60
Mode	Multi	17.6	Multi	Multi	Multi	0.000	0.65	0.000	Multi	0.028	ND	Multi
Standard Deviation	0.2	5.7	1.3	1.98	0.20	0.006	0.20	0.027	0.23	0.018	ND	1.17
Sample Variance	0.0	32.4	1.7	3.93	0.04	0.000	0.04	0.001	0.05	0.000	ND	1.36
Range	0.7	17.1	4.2	5.50	0.67	0.014	0.66	0.079	0.74	0.062	ND	3.90
Minimum	7.9	4.9	7.8	0.00	0.17	0.000	0.18	0.000	0.00	0.006	ND	1.30
Maximum	8.6	22.0	12.0	5.50	0.84	0.014	0.84	0.079	0.74	0.068	ND	5.20
Count	13	13	13	13	13	13	13	13	13	13	0	13
Confidence Level (95%)	0.1	3.4	0.8	1.20	0.12	0.004	0.12	0.016	0.14	0.011	ND	0.71

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	244.6	242.2	0.5	2.4	2.1	416	30.8	27	1.1	ND
Standard Error	ND	ND	13.6	13.5	0.2	0.3	0.4	17	2.8	10	0.2	ND
Median	ND	ND	220.0	220.0	0.0	2.4	1.8	399	27.0	5	1.0	ND
Mode	ND	ND	220.0	Multi	0.0	Multi	2.0	369	Multi	5	0.7	ND
Standard Deviation	ND	ND	48.9	48.7	0.7	1.1	1.3	60	10.2	34	0.6	ND
Sample Variance	ND	ND	2393.6	2373.7	0.5	1.2	1.7	3587	103.9	1181	0.3	ND
Range	ND	ND	130.0	132.1	1.7	4.4	4.8	194	31.0	110	1.6	ND
Minimum	ND	ND	190.0	185.6	0.0	0.0	0.6	326	15.0	0	0.5	ND
Maximum	ND	ND	320.0	317.7	1.7	4.4	5.4	520	46.0	110	2.0	ND
Count	0	0	13	13	13	13	13	13	13	13	12	0
Confidence Level (95%)	ND	ND	29.6	29.4	0.4	0.7	0.8	36	6.2	21	0.4	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

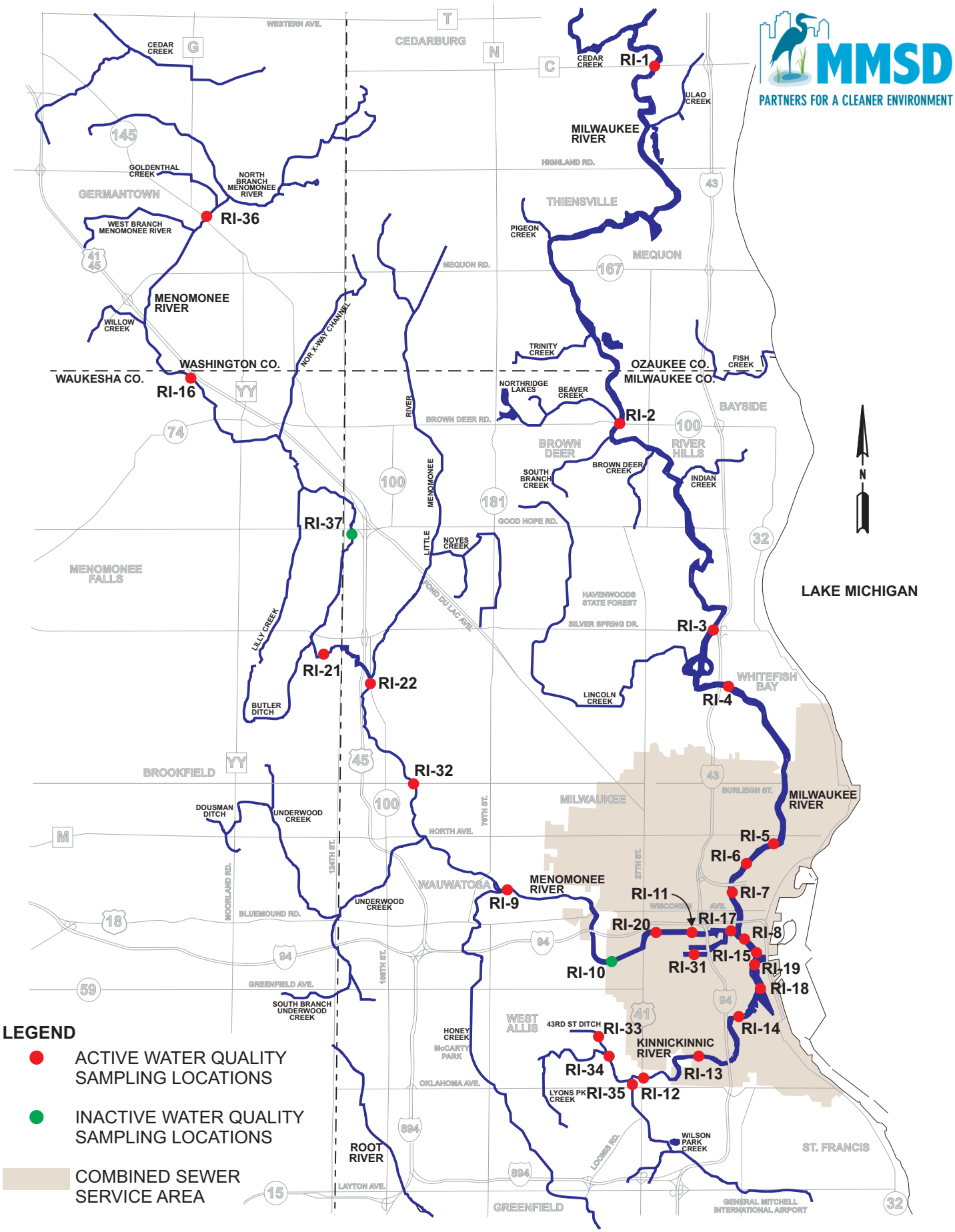
OUTER HARBOR - SITE 15
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	41.54	19.23	0.0	1.3	4.6	1.3	0.0	2.8	0.0	2.1	0.0	ND
Standard Error	1.61	1.05	0.0	0.3	0.9	0.3	0.0	1.5	0.0	0.7	0.0	ND
Median	40.00	18.00	0.0	1.4	6.0	1.5	0.0	0.0	0.0	0.0	0.0	ND
Mode	36.00	16.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	5.81	3.79	0.0	0.9	3.3	1.2	0.0	5.6	0.0	2.5	0.0	ND
Sample Variance	33.77	14.36	0.0	0.8	10.8	1.4	0.0	31.1	0.0	6.2	0.0	ND
Range	16.00	13.00	0.0	3.1	8.2	3.6	0.0	16.0	0.0	5.9	0.0	ND
Minimum	36.00	14.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	52.00	27.00	0.0	3.1	8.2	3.6	0.0	16.0	0.0	5.9	0.0	ND
Count	13	13	13	13	13	13	13	13	12	11	12	0
Confidence Level (95%)	3.51	2.29	0.0	0.6	2.0	0.7	0.0	3.4	0.0	1.7	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	182	ND	0.0	4.1	35.2	30.5	4.6	ND
Standard Error	8	ND	0.0	0.2	1.9	1.4	0.6	ND
Median	170	ND	0.0	4.2	32.0	29.0	3.2	ND
Mode	160	ND	0.0	Multi	Multi	Multi	Multi	ND
Standard Deviation	29	ND	0.0	0.7	7.0	4.9	2.1	ND
Sample Variance	869	ND	0.0	0.4	48.7	24.4	4.5	ND
Range	90	ND	0.0	2.2	22.0	16.0	6.1	ND
Minimum	150	ND	0.0	3.1	26.0	23.0	2.3	ND
Maximum	240	ND	0.0	5.3	48.0	39.0	8.4	ND
Count	13	0	12	11	13	13	13	0
Confidence Level (95%)	18	ND	0.0	0.4	4.2	3.0	1.3	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

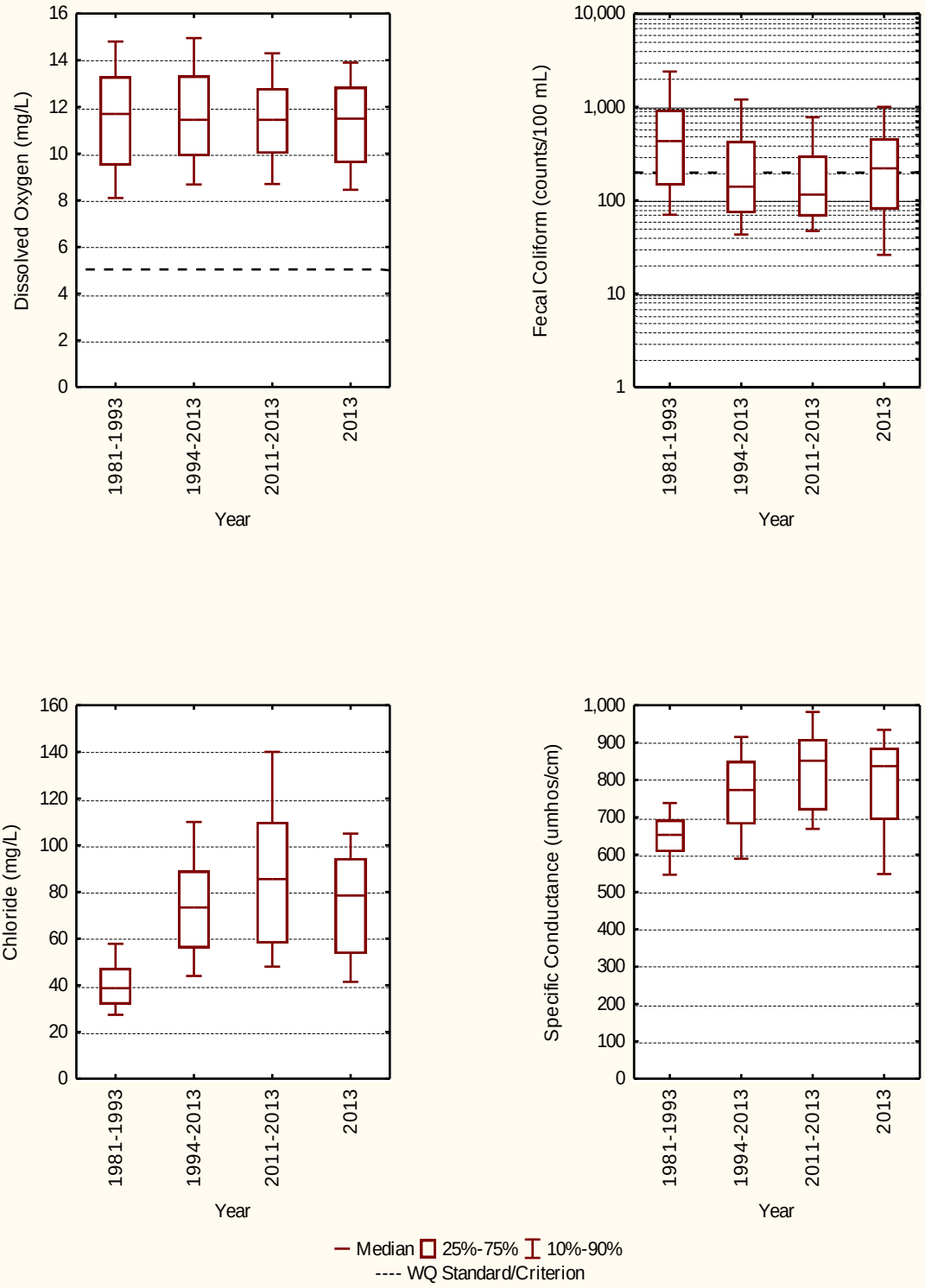


RIVERS (RI) SURVEY WATER QUALITY SAMPLING LOCATIONS

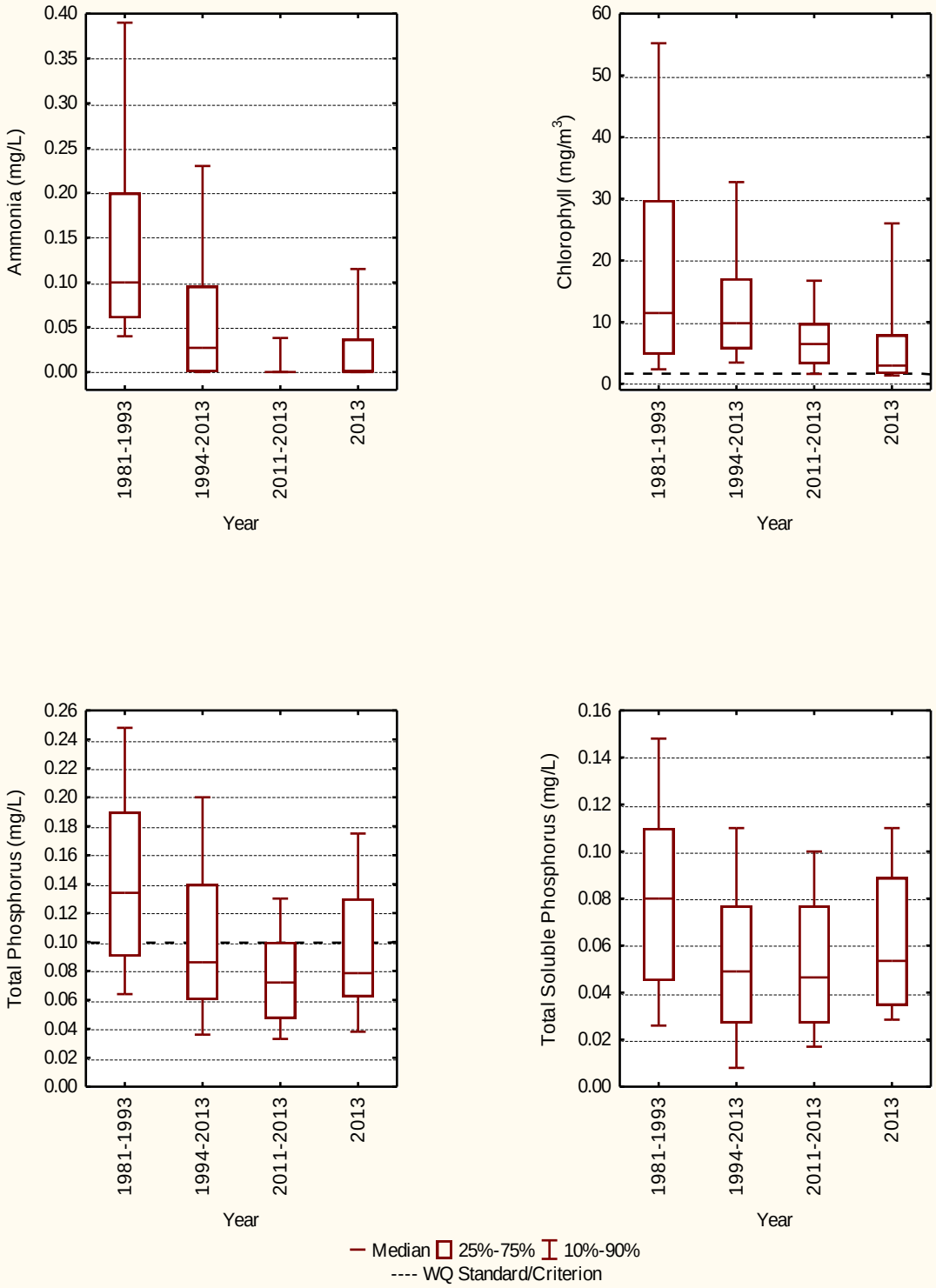
6/6/14

14-061 RI

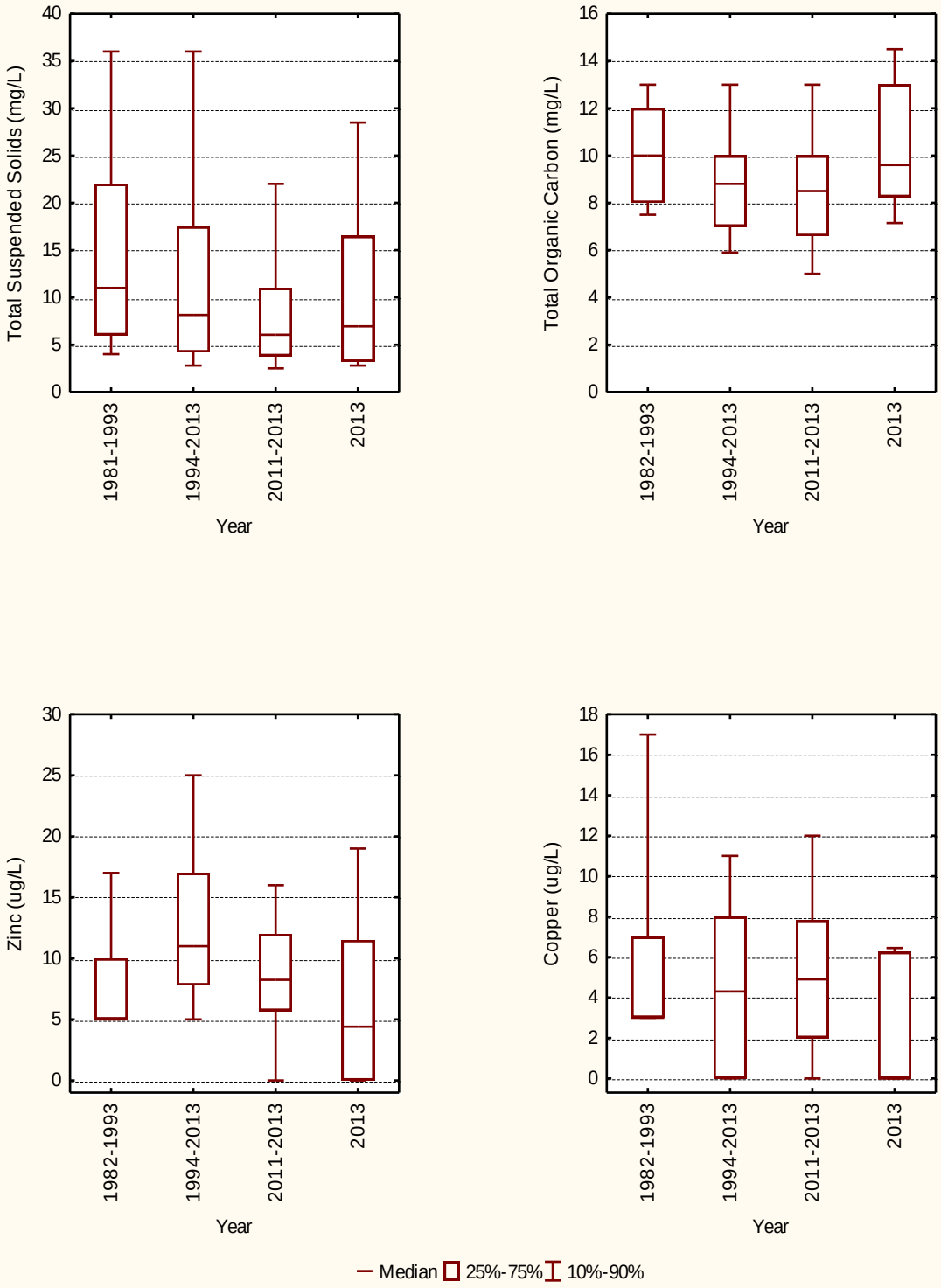
MMSD Water Quality Monitoring Program Data
Milwaukee River at Pioneer Road, Site RI-01



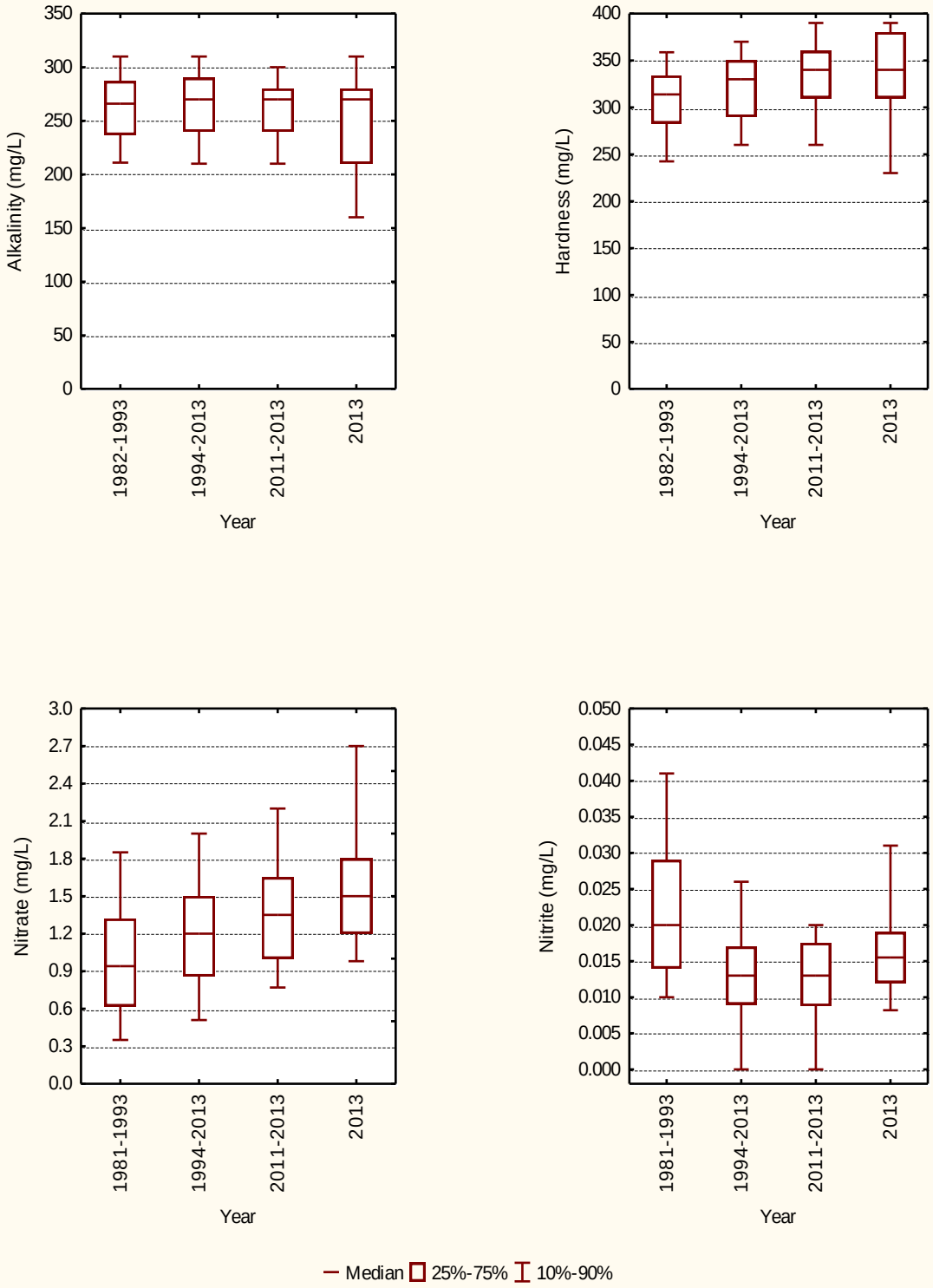
MMSD Water Quality Monitoring Program Data
Milwaukee River at Pioneer Road, Site RI-01



MMSD Water Quality Monitoring Program Data
Milwaukee River at Pioneer Road, Site RI-01



MMSD Water Quality Monitoring Program Data
Milwaukee River at Pioneer Road, Site RI-01



PIONEER RD. - SITE 1
MILWAUKEE RIVER
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.2	13.3	11.2	6.92	1.58	0.016	1.59	0.059	1.10	0.102	0.064	ND
Standard Error	0.0	2.1	0.5	2.06	0.16	0.002	0.16	0.039	0.17	0.018	0.008	ND
Median	8.3	15.5	11.5	2.95	1.50	0.016	1.55	0.000	0.96	0.078	0.054	ND
Mode	8.4	Multi	Multi	1.60	Multi	Multi	Multi	0.000	1.20	Multi	Multi	ND
Standard Deviation	0.2	9.4	2.1	9.20	0.61	0.009	0.61	0.174	0.64	0.082	0.036	ND
Sample Variance	0.0	87.9	4.3	84.55	0.38	0.000	0.37	0.030	0.40	0.007	0.001	ND
Range	0.6	28.3	6.9	28.80	2.22	0.034	2.21	0.780	2.60	0.375	0.139	ND
Minimum	7.9	0.0	7.9	1.20	0.48	0.000	0.49	0.000	0.60	0.025	0.021	ND
Maximum	8.5	28.3	14.8	30.00	2.70	0.034	2.70	0.780	3.20	0.400	0.160	ND
Count	19	20	20	20	14	14	14	20	14	20	20	0
Confidence Level (95%)	0.1	4.4	1.0	4.30	0.35	0.005	0.35	0.081	0.37	0.038	0.017	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	480.7	464.8	5.6	13.8	11.0	789	79.6	336	2.3	484
Standard Error	ND	ND	25.8	28.3	1.8	4.4	3.3	36	7.5	81	0.1	234
Median	ND	ND	490.0	485.7	2.9	7.0	4.8	837	78.5	220	2.3	215
Mode	ND	ND	490.0	Multi	1.4	Multi	4.8	870	Multi	100	2.0	Multi
Standard Deviation	ND	ND	96.4	105.7	6.7	19.9	14.9	163	33.6	353	0.6	874
Sample Variance	ND	ND	9299.5	11174.5	45.5	395.6	221.4	26523	1130.3	124643	0.3	764740
Range	ND	ND	390.0	406.8	24.0	88.3	57.9	690	154.0	1193	2.2	3375
Minimum	ND	ND	270.0	248.0	0.0	1.7	1.6	440	36.0	7	0.8	25
Maximum	ND	ND	660.0	654.8	24.0	90.0	59.5	1130	190.0	1200	3.1	3400
Count	0	0	14	14	14	20	20	20	20	19	19	14
Confidence Level (95%)	ND	ND	55.7	61.0	3.9	9.3	7.0	76	15.7	170	0.3	505

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

PIONEER RD. - SITE 1
MILWAUKEE RIVER
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	66.43	39.14	0.2	2.0	2.7	2.1	0.1	7.0	1.7	4.2	0.0	ND
Standard Error	2.89	2.35	0.1	0.3	0.8	0.4	0.1	2.0	0.6	0.8	0.0	ND
Median	69.50	42.50	0.0	1.9	0.0	1.9	0.0	4.4	0.0	4.6	0.0	ND
Mode	Multi	47.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	10.80	8.80	0.4	1.2	3.5	1.6	0.4	8.7	2.3	3.0	0.0	ND
Sample Variance	116.73	77.52	0.2	1.5	12.6	2.7	0.2	76.2	5.3	8.7	0.0	ND
Range	37.00	25.00	1.5	4.3	11.0	6.1	1.5	30.0	5.2	7.8	0.0	ND
Minimum	43.00	22.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	80.00	47.00	1.5	4.3	11.0	6.1	1.5	30.0	5.2	7.8	0.0	ND
Count	14	14	14	14	20	14	14	20	14	14	14	0
Confidence Level (95%)	6.24	5.08	0.2	0.7	1.7	0.9	0.2	4.1	1.3	1.7	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	326	247	0.9	ND	62.4	51.9	10.4	9.8
Standard Error	16	15	0.6	ND	2.7	2.6	0.7	0.7
Median	340	270	0.0	ND	65.0	55.5	9.6	9.5
Mode	340	280	0.0	ND	Multi	58.0	Multi	11.0
Standard Deviation	60	57	2.7	ND	10.1	9.8	3.0	2.8
Sample Variance	3609	3284	7.4	ND	102.4	95.5	8.8	7.7
Range	190	180	12.0	ND	35.0	31.0	11.1	9.6
Minimum	200	140	0.0	ND	42.0	32.0	4.9	5.4
Maximum	390	320	12.0	ND	77.0	63.0	16.0	15.0
Count	14	14	20	0	14	14	20	14
Confidence Level (95%)	35	33	1.3	ND	5.8	5.6	1.4	1.6

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

BROWN DEER RD. - SITE 2
MILWAUKEE RIVER
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.2	12.8	9.9	6.17	1.47	0.015	1.49	0.034	0.93	0.090	0.060	ND
Standard Error	0.1	2.1	0.6	1.65	0.18	0.003	0.18	0.016	0.05	0.012	0.008	ND
Median	8.2	15.5	9.4	3.20	1.30	0.015	1.40	0.000	0.89	0.070	0.052	ND
Mode	8.0	Multi	5.9	1.40	Multi	0.000	Multi	0.000	Multi	Multi	Multi	ND
Standard Deviation	0.3	9.7	2.9	7.58	0.70	0.010	0.69	0.073	0.20	0.056	0.036	ND
Sample Variance	0.1	93.9	8.6	57.47	0.49	0.000	0.47	0.005	0.04	0.003	0.001	ND
Range	1.5	28.8	9.1	27.10	2.32	0.038	2.31	0.320	0.81	0.181	0.110	ND
Minimum	7.8	-0.1	5.4	0.90	0.58	0.000	0.59	0.000	0.59	0.019	0.010	ND
Maximum	9.3	28.7	14.5	28.00	2.90	0.038	2.90	0.320	1.40	0.200	0.120	ND
Count	20	21	21	21	15	15	15	21	15	21	21	0
Confidence Level (95%)	0.2	4.4	1.3	3.45	0.39	0.006	0.38	0.033	0.11	0.025	0.016	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	492.7	479.0	4.9	12.6	10.3	815	87.8	332	2.2	279
Standard Error	ND	ND	23.8	26.2	1.4	3.0	2.8	35	6.6	116	0.1	68
Median	ND	ND	500.0	490.5	2.6	7.4	5.7	839	91.0	155	2.2	220
Mode	ND	ND	Multi	Multi	Multi	Multi	5.0	Multi	Multi	490	2.7	Multi
Standard Deviation	ND	ND	92.3	101.5	5.4	13.9	12.9	161	30.2	521	0.5	264
Sample Variance	ND	ND	8521.0	10308.2	28.9	194.1	165.8	25889	909.4	271325	0.3	69473
Range	ND	ND	350.0	369.4	16.0	51.8	47.5	671	115.0	2391	2.4	972
Minimum	ND	ND	300.0	274.0	0.0	1.2	0.6	459	45.0	9	1.0	28
Maximum	ND	ND	650.0	643.4	16.0	53.0	48.1	1130	160.0	2400	3.4	1000
Count	0	0	15	15	15	21	21	21	21	20	20	15
Confidence Level (95%)	ND	ND	51.1	56.2	3.0	6.3	5.9	73	13.7	244	0.2	146

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

BROWN DEER RD. - SITE 2
MILWAUKEE RIVER
WATER QUALITY DATA - 2013

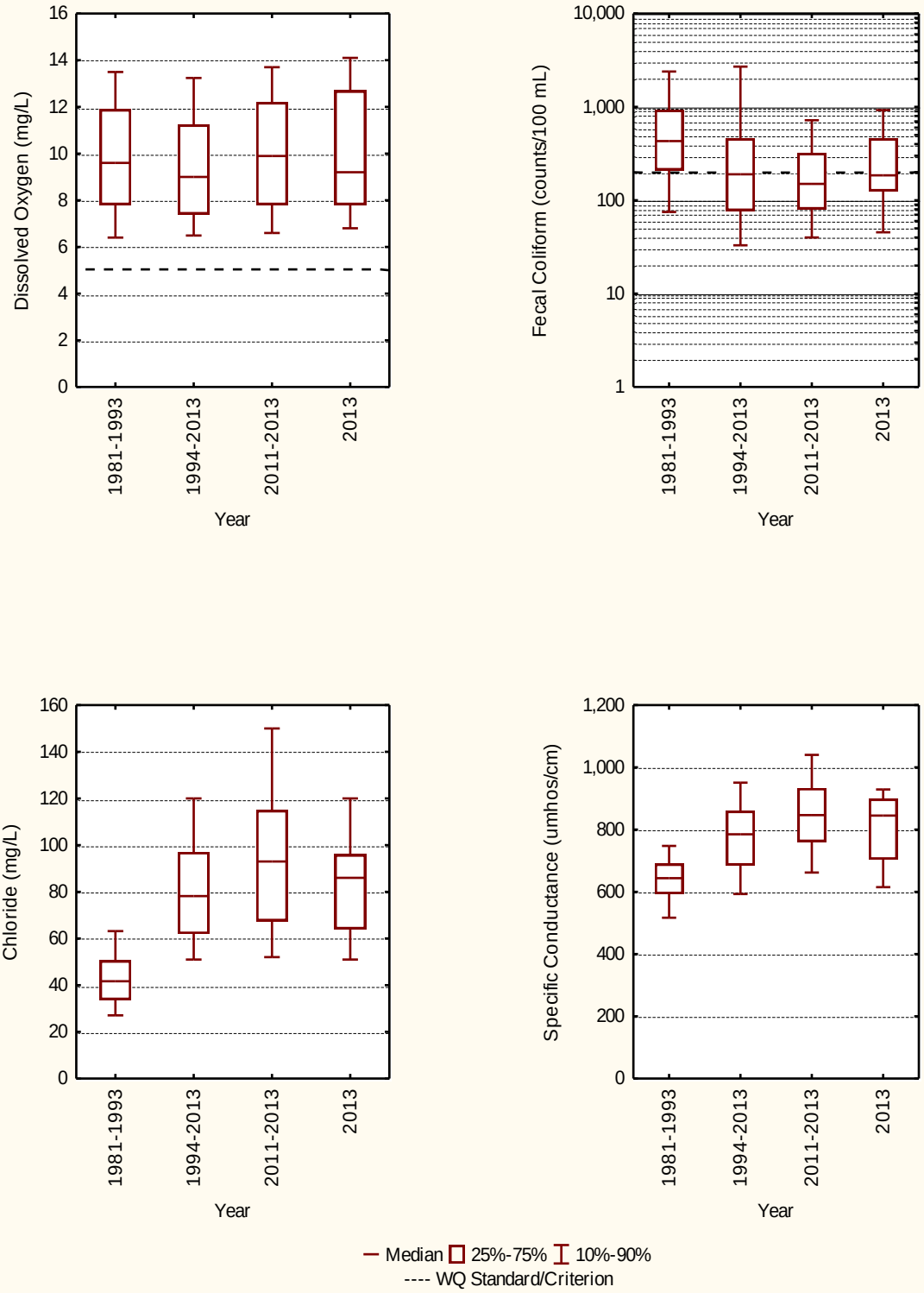
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	66.87	39.20	0.2	1.9	3.9	2.0	0.6	7.0	1.0	2.8	0.2	ND
Standard Error	3.16	2.22	0.1	0.3	1.2	0.5	0.5	1.8	0.5	0.7	0.2	ND
Median	70.00	43.00	0.0	1.8	0.0	1.7	0.0	7.3	0.0	3.7	0.0	ND
Mode	56.00	46.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	12.25	8.58	0.4	1.3	5.6	1.7	1.9	8.2	1.9	2.4	0.6	ND
Sample Variance	150.12	73.60	0.1	1.8	31.0	3.1	3.6	67.5	3.7	6.0	0.4	ND
Range	44.00	25.00	1.1	4.9	23.0	6.9	7.3	30.0	4.9	7.3	2.4	ND
Minimum	44.00	22.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	88.00	47.00	1.1	4.9	23.0	6.9	7.3	30.0	4.9	7.3	2.4	ND
Count	15	15	15	15	21	15	15	21	14	11	15	0
Confidence Level (95%)	6.79	4.75	0.2	0.7	2.5	1.0	1.1	3.7	1.1	1.6	0.3	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	329	244	0.6	ND	61.5	52.1	9.9	9.4
Standard Error	16	15	0.3	ND	2.6	2.5	0.7	0.7
Median	340	260	0.0	ND	65.0	54.0	9.2	8.7
Mode	340	230	0.0	ND	Multi	Multi	14.0	Multi
Standard Deviation	63	57	1.4	ND	10.0	9.5	3.1	2.8
Sample Variance	3970	3211	2.1	ND	100.6	90.2	9.4	7.6
Range	210	170	5.7	ND	35.0	31.0	11.3	9.8
Minimum	200	140	0.0	ND	41.0	32.0	4.7	5.2
Maximum	410	310	5.7	ND	76.0	63.0	16.0	15.0
Count	15	15	21	0	15	15	21	15
Confidence Level (95%)	35	31	0.7	ND	5.6	5.3	1.4	1.5

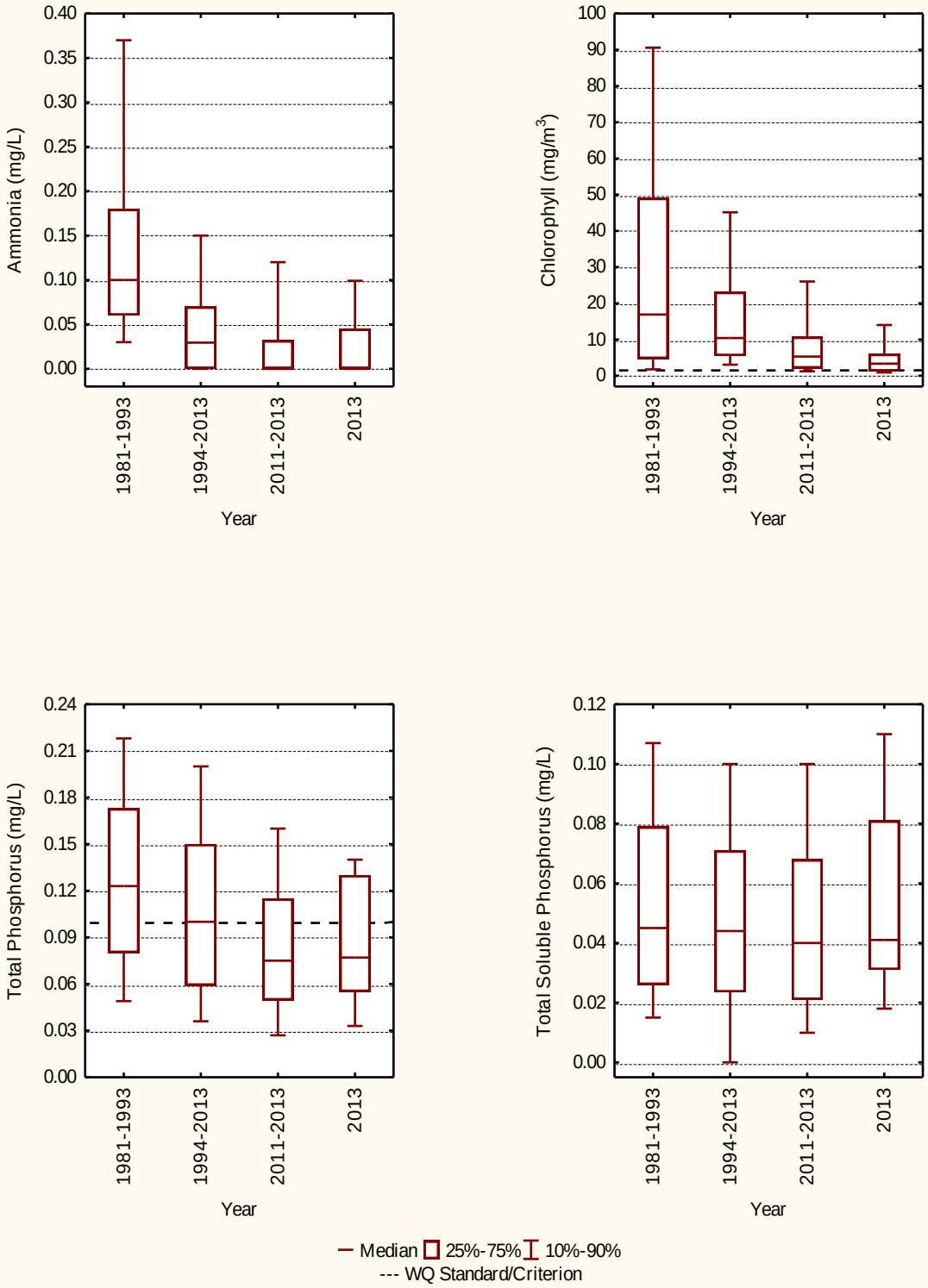
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

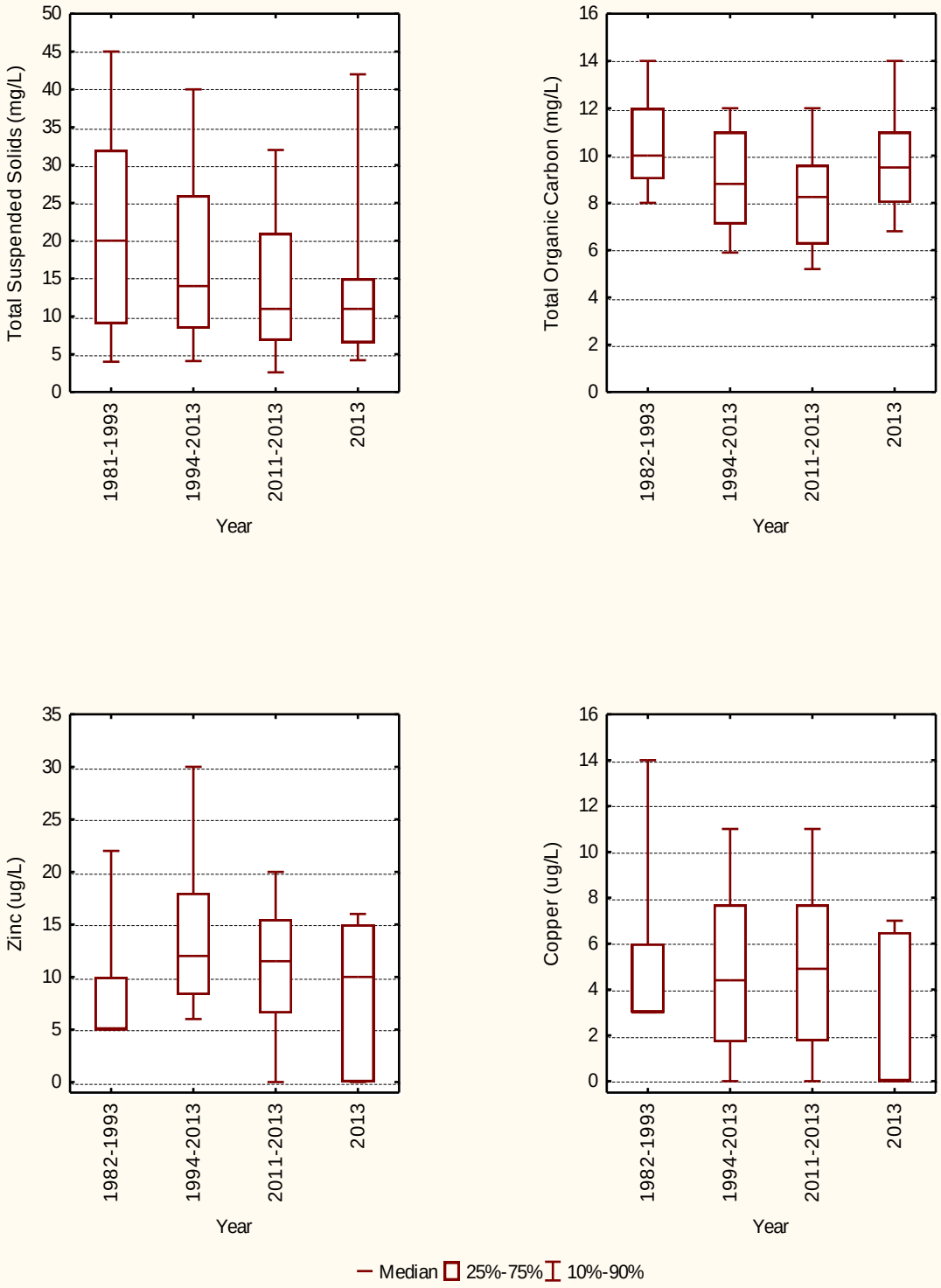
MMSD Water Quality Monitoring Program Data
Milwaukee River at Silver Spring Drive, Site RI-03



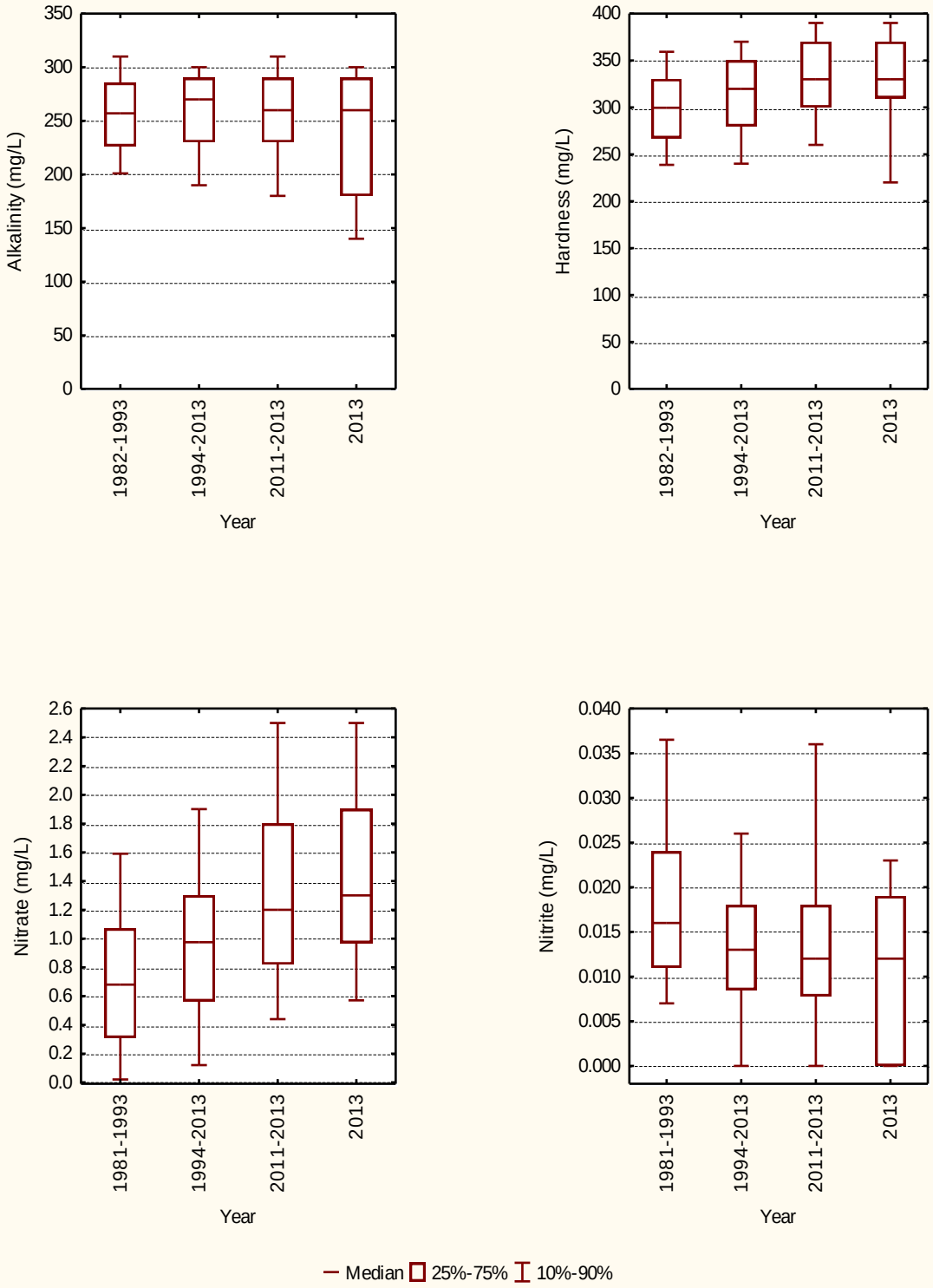
MMSD Water Quality Monitoring Program Data
Milwaukee River at Silver Spring Drive, Site RI-03



MMSD Water Quality Monitoring Program Data
Milwaukee River at Silver Spring Drive, Site RI-03



MMSD Water Quality Monitoring Program Data
Milwaukee River at Silver Spring Drive, Site RI-03



SILVER SPRING DR. - SITE 3
MILWAUKEE RIVER
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.2	12.7	10.2	5.30	1.40	0.012	1.41	0.039	0.90	0.092	0.058	ND
Standard Error	0.0	2.1	0.6	1.30	0.17	0.003	0.17	0.015	0.06	0.013	0.009	ND
Median	8.2	15.4	9.2	3.30	1.30	0.012	1.30	0.000	0.94	0.077	0.041	ND
Mode	8.2	Multi	7.8	1.20	Multi	0.000	Multi	0.000	Multi	0.140	Multi	ND
Standard Deviation	0.2	9.7	2.8	5.94	0.67	0.010	0.67	0.069	0.25	0.058	0.041	ND
Sample Variance	0.0	94.6	7.8	35.24	0.46	0.000	0.45	0.005	0.06	0.003	0.002	ND
Range	0.6	28.3	8.7	20.48	2.09	0.036	2.08	0.290	0.76	0.219	0.160	ND
Minimum	7.9	-0.2	6.4	0.52	0.41	0.000	0.42	0.000	0.54	0.011	0.000	ND
Maximum	8.5	28.1	15.1	21.00	2.50	0.036	2.50	0.290	1.30	0.230	0.160	ND
Count	20	21	21	21	15	15	15	21	15	21	21	0
Confidence Level (95%)	0.1	4.4	1.3	2.70	0.37	0.006	0.37	0.031	0.14	0.026	0.019	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	502.0	486.1	5.2	15.4	14.5	829	92.7	403	2.3	321
Standard Error	ND	ND	29.8	32.0	1.3	3.2	3.4	44	10.1	136	0.1	77
Median	ND	ND	500.0	481.0	3.7	11.0	8.5	845	86.0	185	2.3	210
Mode	ND	ND	460.0	Multi	Multi	11.0	Multi	Multi	86.0	Multi	Multi	Multi
Standard Deviation	ND	ND	115.6	123.8	5.0	14.8	15.5	201	46.1	607	0.5	297
Sample Variance	ND	ND	13360.0	15318.9	24.6	220.2	241.7	40514	2127.9	368274	0.3	87921
Range	ND	ND	500.0	521.0	18.0	52.3	64.4	968	214.0	2686	2.3	1077
Minimum	ND	ND	300.0	272.0	0.0	1.7	0.7	432	46.0	14	1.1	23
Maximum	ND	ND	800.0	793.0	18.0	54.0	65.1	1400	260.0	2700	3.4	1100
Count	0	0	15	15	15	21	21	21	21	20	20	15
Confidence Level (95%)	ND	ND	64.0	68.5	2.7	6.8	7.1	92	21.0	284	0.2	164

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

SILVER SPRING DR. - SITE 3
MILWAUKEE RIVER
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	65.87	38.67	0.3	2.2	2.6	3.0	0.1	9.3	1.4	4.5	0.7	ND
Standard Error	3.11	2.21	0.1	0.5	0.7	0.8	0.1	1.7	0.6	1.0	0.7	ND
Median	68.00	41.00	0.0	1.9	0.0	2.4	0.0	10.0	0.0	4.7	0.0	ND
Mode	Multi	46.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	12.03	8.57	0.4	2.1	3.3	3.1	0.5	8.0	2.4	3.4	2.6	ND
Sample Variance	144.70	73.52	0.2	4.5	10.6	9.8	0.3	63.4	5.8	11.6	6.7	ND
Range	43.00	28.00	1.1	8.9	7.6	12.0	1.9	29.0	5.9	9.2	10.0	ND
Minimum	45.00	22.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	88.00	50.00	1.1	8.9	7.6	12.0	1.9	29.0	5.9	9.2	10.0	ND
Count	15	15	15	15	21	15	14	21	14	12	15	0
Confidence Level (95%)	6.66	4.75	0.2	1.2	1.5	1.7	0.3	3.6	1.4	2.2	1.4	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	323	238	0.6	ND	60.7	51.1	9.7	9.2
Standard Error	16	15	0.3	ND	2.6	2.4	0.6	0.7
Median	330	260	0.0	ND	63.0	51.0	9.5	8.7
Mode	Multi	Multi	0.0	ND	Multi	56.0	14.0	Multi
Standard Deviation	61	58	1.4	ND	9.9	9.1	2.9	2.7
Sample Variance	3667	3331	1.9	ND	97.7	83.3	8.3	7.3
Range	220	160	5.0	ND	34.0	32.0	10.3	8.7
Minimum	200	140	0.0	ND	41.0	32.0	4.7	5.3
Maximum	420	300	5.0	ND	75.0	64.0	15.0	14.0
Count	15	15	21	0	15	15	21	15
Confidence Level (95%)	34	32	0.6	ND	5.5	5.1	1.3	1.5

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

PORT WASHINGTON RD. - SITE 4
MILWAUKEE RIVER
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.2	12.9	10.0	4.53	1.30	0.017	1.30	0.039	0.97	0.100	0.061	ND
Standard Error	0.0	2.1	0.6	0.87	0.17	0.003	0.17	0.014	0.07	0.012	0.008	ND
Median	8.2	15.5	9.0	3.20	1.10	0.016	1.10	0.022	0.95	0.086	0.050	ND
Mode	8.4	Multi	Multi	Multi	1.00	0.011	1.00	0.000	Multi	Multi	0.120	ND
Standard Deviation	0.2	9.8	2.9	4.00	0.65	0.013	0.64	0.066	0.26	0.055	0.035	ND
Sample Variance	0.0	95.7	8.6	16.04	0.42	0.000	0.41	0.004	0.07	0.003	0.001	ND
Range	0.7	28.9	9.4	16.15	2.15	0.048	2.13	0.280	0.80	0.196	0.126	ND
Minimum	7.9	-0.1	5.7	0.85	0.35	0.000	0.37	0.000	0.60	0.024	0.014	ND
Maximum	8.6	28.8	15.1	17.00	2.50	0.048	2.50	0.280	1.40	0.220	0.140	ND
Count	19	21	21	21	15	15	15	21	15	21	21	0
Confidence Level (95%)	0.1	4.5	1.3	1.82	0.36	0.007	0.36	0.030	0.15	0.025	0.016	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	502.7	482.2	7.1	20.0	16.2	846	102.0	1078	2.5	583
Standard Error	ND	ND	36.9	39.7	2.3	3.3	3.0	51	13.0	434	0.2	211
Median	ND	ND	490.0	469.0	4.5	16.0	12.3	851	88.0	220	2.3	410
Mode	ND	ND	Multi	Multi	Multi	Multi	Multi	Multi	Multi	Multi	Multi	Multi
Standard Deviation	ND	ND	143.1	153.8	8.7	14.9	13.9	232	59.5	1942	0.7	817
Sample Variance	ND	ND	20463.8	23669.5	76.5	222.7	192.4	53680	3534.7	3773270	0.5	666680
Range	ND	ND	630.0	672.4	35.0	52.5	59.1	1070	271.0	7984	2.7	3274
Minimum	ND	ND	250.0	198.0	0.0	1.5	0.9	470	49.0	16	1.2	26
Maximum	ND	ND	880.0	870.4	35.0	54.0	60.0	1540	320.0	8000	3.9	3300
Count	0	0	15	15	15	21	21	21	21	20	20	15
Confidence Level (95%)	ND	ND	79.2	85.2	4.8	6.8	6.3	105	27.1	909	0.3	452

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

PORT WASHINGTON RD. - SITE 4
MILWAUKEE RIVER
WATER QUALITY DATA - 2013

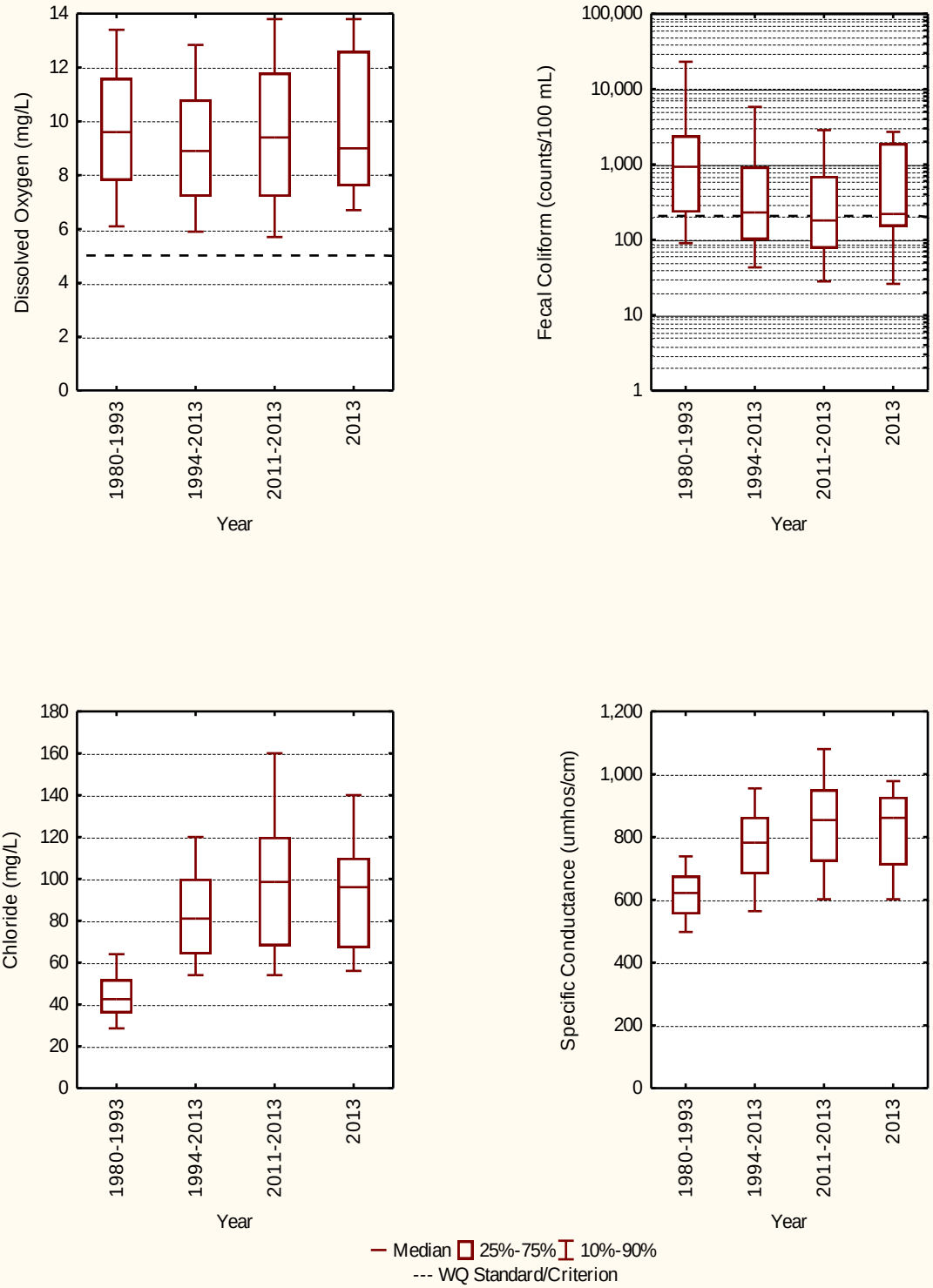
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	64.27	37.33	0.3	2.4	3.8	2.5	0.6	11.8	0.8	1.4	0.6	ND
Standard Error	3.26	2.26	0.1	0.4	0.8	0.4	0.6	2.1	0.6	0.7	0.6	ND
Median	64.00	39.00	0.0	2.2	4.6	2.1	0.0	12.0	0.0	0.0	0.0	ND
Mode	Multi	Multi	0.0	Multi	0.0	Multi	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	12.61	8.75	0.5	1.6	3.7	1.5	2.2	9.5	2.0	2.4	2.5	ND
Sample Variance	159.07	76.52	0.2	2.4	13.4	2.3	4.8	89.8	3.9	5.7	6.0	ND
Range	43.00	26.00	1.6	5.7	9.5	4.9	8.2	40.0	5.5	7.4	9.5	ND
Minimum	44.00	22.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	87.00	48.00	1.6	5.7	9.5	4.9	8.2	40.0	5.5	7.4	9.5	ND
Count	15	15	15	15	21	15	14	21	12	12	15	0
Confidence Level (95%)	6.98	4.84	0.3	0.9	1.7	0.8	1.3	4.3	1.3	1.5	1.4	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	313	227	0.8	ND	58.7	49.3	9.6	9.1
Standard Error	16	15	0.3	ND	2.7	2.5	0.6	0.7
Median	320	240	0.0	ND	58.0	51.0	9.0	8.2
Mode	Multi	140	0.0	ND	58.0	Multi	Multi	Multi
Standard Deviation	63	56	1.4	ND	10.6	9.6	2.8	2.9
Sample Variance	3992	3178	1.9	ND	113.2	92.8	7.6	8.4
Range	210	160	4.8	ND	35.0	31.0	9.0	9.6
Minimum	200	140	0.0	ND	40.0	31.0	6.0	5.4
Maximum	410	300	4.8	ND	75.0	62.0	15.0	15.0
Count	15	15	21	0	15	15	21	15
Confidence Level (95%)	35	31	0.6	ND	5.9	5.3	1.3	1.6

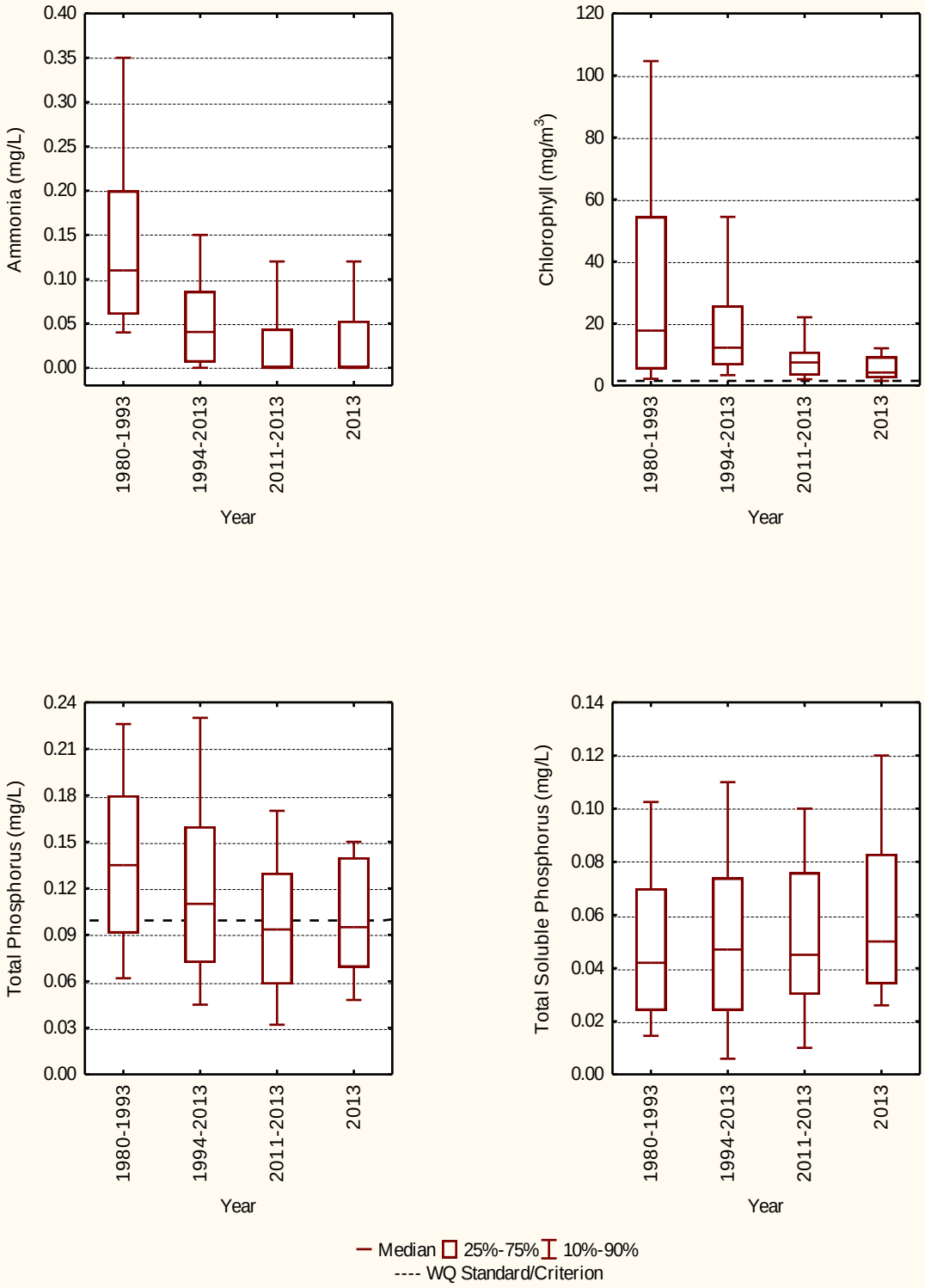
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

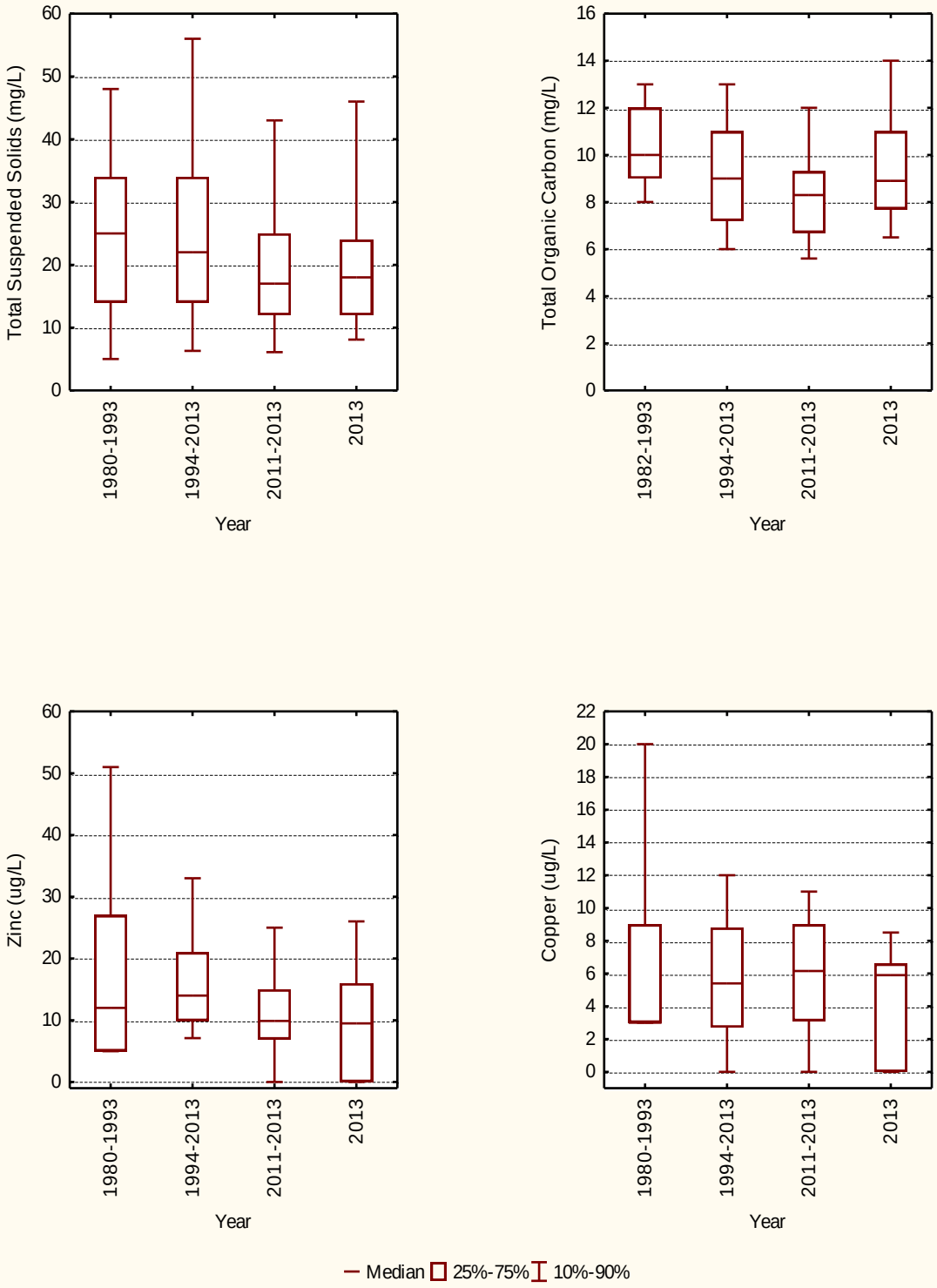
MMSD Water Quality Monitoring Program Data
Milwaukee River at North Avenue Dam, Site RI-05



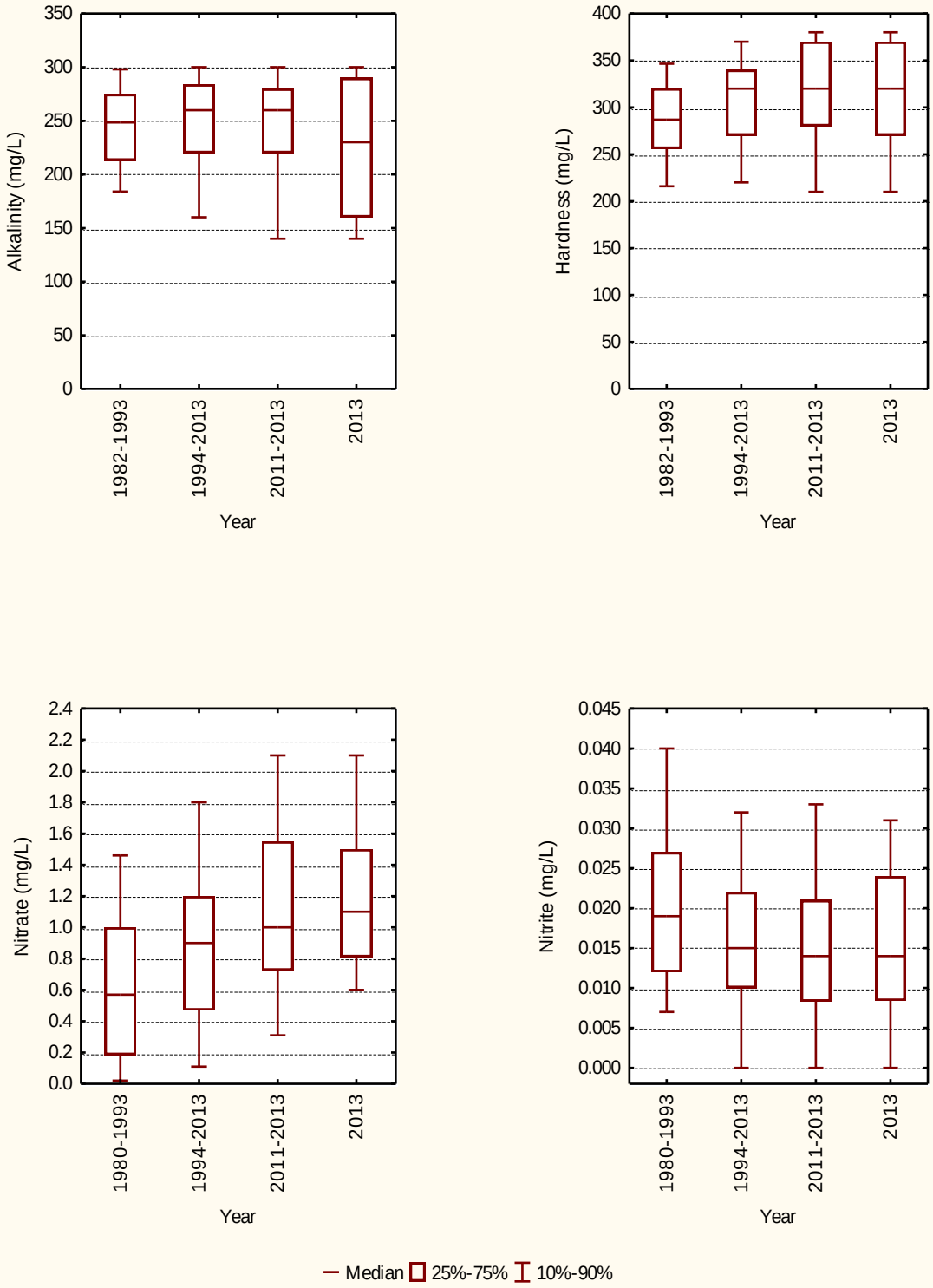
MMSD Water Quality Monitoring Program Data
Milwaukee River at North Avenue Dam, Site RI-05



MMSD Water Quality Monitoring Program Data
Milwaukee River at North Avenue Dam, Site RI-05



MMSD Water Quality Monitoring Program Data
Milwaukee River at North Avenue Dam, Site RI-05



NORTH AVE. DAM - SITE 5
MILWAUKEE RIVER
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.1	12.8	10.0	6.08	1.23	0.016	1.25	0.042	0.99	0.105	0.060	ND
Standard Error	0.0	2.1	0.6	1.17	0.15	0.003	0.16	0.016	0.08	0.013	0.008	ND
Median	8.2	15.3	9.0	4.20	1.10	0.014	1.10	0.000	1.00	0.095	0.050	ND
Mode	Multi	Multi	5.7	Multi	1.10	Multi	1.10	0.000	Multi	0.140	0.120	ND
Standard Deviation	0.2	9.7	2.9	5.34	0.59	0.011	0.60	0.072	0.32	0.058	0.035	ND
Sample Variance	0.0	94.8	8.4	28.51	0.35	0.000	0.36	0.005	0.10	0.003	0.001	ND
Range	0.7	28.7	9.1	21.56	2.11	0.038	2.10	0.280	1.03	0.225	0.113	ND
Minimum	7.8	-0.2	5.7	0.44	0.29	0.000	0.30	0.000	0.57	0.015	0.007	ND
Maximum	8.5	28.5	14.8	22.00	2.40	0.038	2.40	0.280	1.60	0.240	0.120	ND
Count	20	21	21	21	15	15	15	21	15	21	21	0
Confidence Level (95%)	0.1	4.4	1.3	2.43	0.33	0.006	0.33	0.033	0.18	0.026	0.016	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	534.0	508.8	7.4	23.6	19.4	861	109.7	1060	2.5	ND
Standard Error	ND	ND	38.2	40.5	1.6	4.0	4.3	62	18.1	323	0.2	ND
Median	ND	ND	510.0	493.0	5.2	18.0	12.1	861	96.0	220	2.3	ND
Mode	ND	ND	550.0	Multi	Multi	Multi	8.8	847	110.0	180	2.3	ND
Standard Deviation	ND	ND	147.8	157.0	6.1	18.4	19.6	285	82.7	1481	0.8	ND
Sample Variance	ND	ND	21854.3	24650.3	37.0	338.7	383.1	81143	6844.4	2192528	0.6	ND
Range	ND	ND	620.0	685.0	24.0	79.5	75.0	1398	390.0	5791	2.8	ND
Minimum	ND	ND	380.0	299.0	0.0	1.5	0.8	462	50.0	9	1.0	ND
Maximum	ND	ND	1000.0	984.0	24.0	81.0	75.8	1860	440.0	5800	3.8	ND
Count	0	0	15	15	15	21	21	21	21	21	21	0
Confidence Level (95%)	ND	ND	81.9	86.9	3.4	8.4	8.9	130	37.7	674	0.4	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

NORTH AVE. DAM - SITE 5
MILWAUKEE RIVER
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	63.20	36.60	0.2	2.5	4.1	2.4	0.7	11.5	0.3	5.1	0.0	ND
Standard Error	2.95	2.39	0.1	0.4	0.8	0.6	0.5	2.7	0.3	0.8	0.0	ND
Median	62.00	38.00	0.0	2.5	5.9	2.1	0.0	9.5	0.0	5.5	0.0	ND
Mode	Multi	Multi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	11.44	9.24	0.4	1.4	3.8	2.2	1.9	12.2	1.1	3.2	0.0	ND
Sample Variance	130.89	85.40	0.1	2.0	14.1	4.7	3.6	148.9	1.1	10.0	0.0	ND
Range	40.00	29.00	1.0	5.0	9.7	8.2	6.5	40.0	3.8	8.8	0.0	ND
Minimum	42.00	20.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	82.00	49.00	1.0	5.0	9.7	8.2	6.5	40.0	3.8	8.8	0.0	ND
Count	15	15	15	15	21	15	14	21	13	15	15	0
Confidence Level (95%)	6.34	5.12	0.2	0.8	1.7	1.2	1.1	5.6	0.6	1.8	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	309	225	1.1	ND	57.4	48.1	9.5	9.0
Standard Error	16	15	0.3	ND	3.0	2.7	0.6	0.8
Median	320	230	0.0	ND	59.0	52.0	8.9	8.0
Mode	320	230	0.0	ND	Multi	Multi	7.7	8.0
Standard Deviation	63	60	1.5	ND	11.8	10.5	2.8	2.9
Sample Variance	3992	3570	2.4	ND	139.4	110.7	8.0	8.6
Range	220	170	4.6	ND	36.0	30.0	10.2	9.4
Minimum	190	130	0.0	ND	39.0	31.0	4.8	5.6
Maximum	410	300	4.6	ND	75.0	61.0	15.0	15.0
Count	15	15	21	0	15	15	21	15
Confidence Level (95%)	35	33	0.7	ND	6.5	5.8	1.3	1.6

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

PLEASANT ST. - SITE 6
MILWAUKEE RIVER
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.3	15.8	9.4	4.33	1.07	0.010	1.07	0.011	0.73	0.070	0.046	ND
Standard Error	0.1	2.0	0.4	1.65	0.18	0.001	0.18	0.004	0.03	0.007	0.006	ND
Median	8.4	16.6	9.0	1.80	1.01	0.010	1.01	0.000	0.73	0.073	0.038	ND
Mode	Multi	Multi	10.6	Multi	1.30	Multi	1.30	0.000	0.76	Multi	0.038	ND
Standard Deviation	0.2	8.6	1.8	4.95	0.62	0.003	0.62	0.017	0.11	0.028	0.024	ND
Sample Variance	0.1	73.8	3.3	24.47	0.39	0.000	0.38	0.000	0.01	0.001	0.001	ND
Range	0.8	27.5	6.0	15.24	1.92	0.013	1.91	0.036	0.42	0.095	0.082	ND
Minimum	7.9	-0.1	7.4	0.76	0.28	0.000	0.29	0.000	0.58	0.025	0.015	ND
Maximum	8.7	27.4	13.4	16.00	2.20	0.013	2.20	0.036	1.00	0.120	0.097	ND
Count	18	18	18	9	12	12	12	18	12	18	18	0
Confidence Level (95%)	0.1	4.3	0.9	3.80	0.40	0.002	0.39	0.008	0.07	0.014	0.012	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	474.2	464.2	3.0	8.9	7.9	848	93.6	1184	2.7	755
Standard Error	ND	ND	18.9	19.4	0.3	0.9	0.8	21	3.4	549	0.2	333
Median	ND	ND	465.0	459.3	2.9	7.6	6.7	879	96.0	400	2.6	405
Mode	ND	ND	430.0	548.0	Multi	Multi	6.3	Multi	100.0	180	2.3	Multi
Standard Deviation	ND	ND	65.4	67.1	1.1	3.8	3.4	91	14.4	1647	0.6	816
Sample Variance	ND	ND	4281.1	4505.9	1.1	14.4	11.5	8267	207.2	2712753	0.4	665598
Range	ND	ND	170.0	176.0	3.7	14.6	13.7	294	56.0	4920	1.8	2053
Minimum	ND	ND	390.0	372.0	1.2	3.4	2.4	640	64.0	80	1.9	47
Maximum	ND	ND	560.0	548.0	4.9	18.0	16.1	934	120.0	5000	3.7	2100
Count	0	0	12	12	12	18	18	18	18	9	9	6
Confidence Level (95%)	ND	ND	41.6	42.6	0.7	1.9	1.7	45	7.2	1266	0.5	856

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

PLEASANT ST. - SITE 6
MILWAUKEE RIVER
WATER QUALITY DATA - 2013

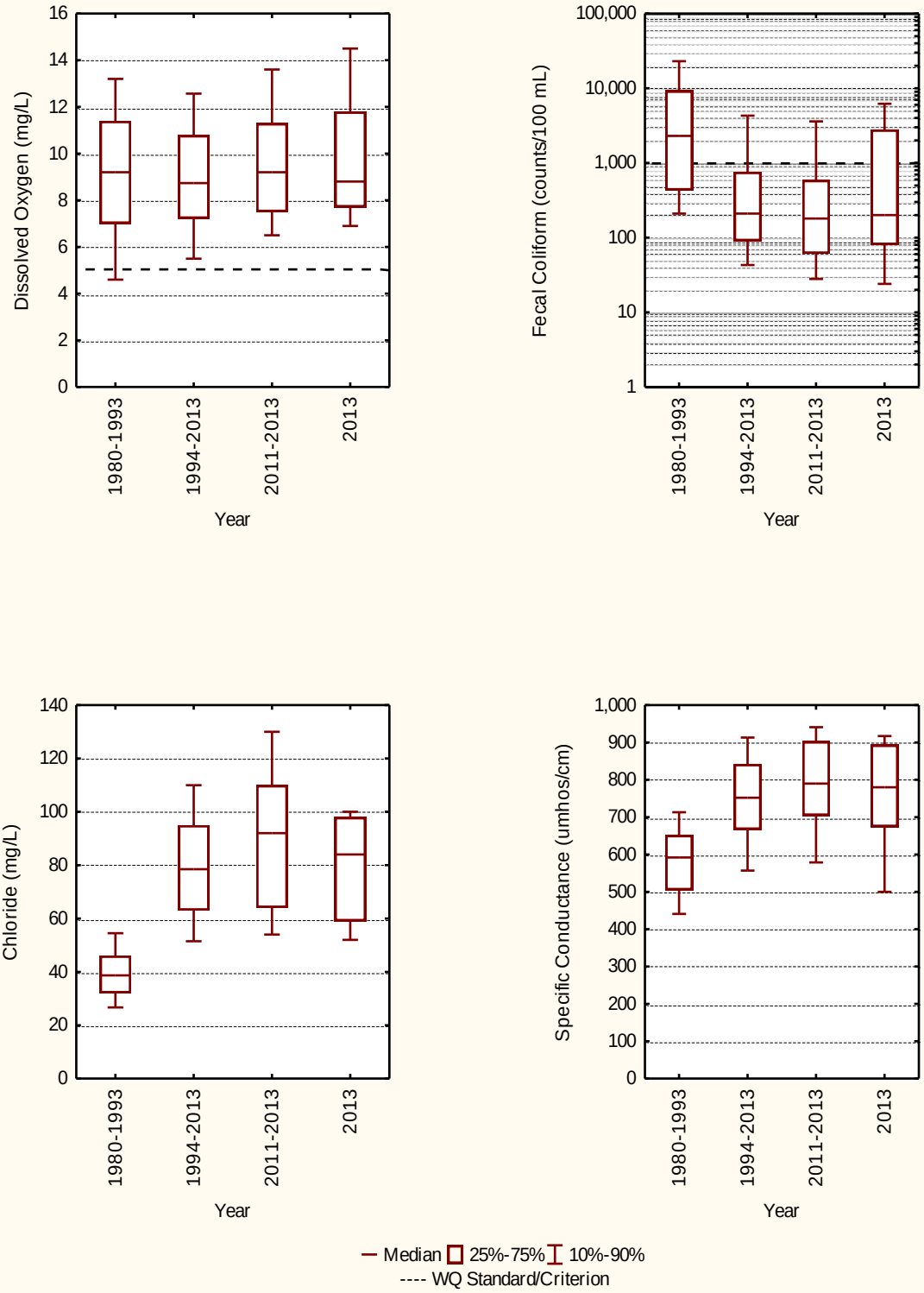
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	60.83	40.00	0.4	3.0	6.6	1.4	1.8	6.2	0.0	1.0	1.7	ND
Standard Error	4.34	2.61	0.1	1.1	1.7	0.7	1.8	2.0	0.0	1.0	1.7	ND
Median	57.00	41.00	0.4	2.0	8.7	1.0	0.0	8.9	0.0	0.0	0.0	ND
Mode	Multi	Multi	0.4	Multi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	10.63	6.39	0.3	2.6	5.2	1.7	4.0	6.1	0.0	1.9	4.1	ND
Sample Variance	112.97	40.80	0.1	7.0	27.3	2.9	16.2	36.7	0.0	3.6	16.7	ND
Range	26.00	16.00	0.8	6.9	13.0	4.2	9.0	14.0	0.0	3.8	10.0	ND
Minimum	50.00	30.00	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	76.00	46.00	0.8	8.3	13.0	4.2	9.0	14.0	0.0	3.8	10.0	ND
Count	6	6	6	6	9	6	5	9	4	4	6	0
Confidence Level (95%)	11.15	6.70	0.3	2.8	4.0	1.8	5.0	4.7	0.0	3.0	4.3	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	318	238	0.6	ND	58.2	50.2	7.9	7.7
Standard Error	20	12	0.3	ND	2.3	2.2	0.4	0.4
Median	310	240	0.0	ND	58.0	51.0	7.9	7.9
Mode	Multi	Multi	0.0	ND	Multi	Multi	9.4	Multi
Standard Deviation	48	41	1.3	ND	7.8	7.7	1.5	1.4
Sample Variance	2337	1706	1.6	ND	61.4	59.1	2.2	1.8
Range	120	120	3.7	ND	20.0	22.0	4.7	3.9
Minimum	260	180	0.0	ND	48.0	38.0	5.2	5.6
Maximum	380	300	3.7	ND	68.0	60.0	9.9	9.5
Count	6	12	18	0	12	12	18	12
Confidence Level (95%)	51	26	0.6	ND	5.0	4.9	0.7	0.9

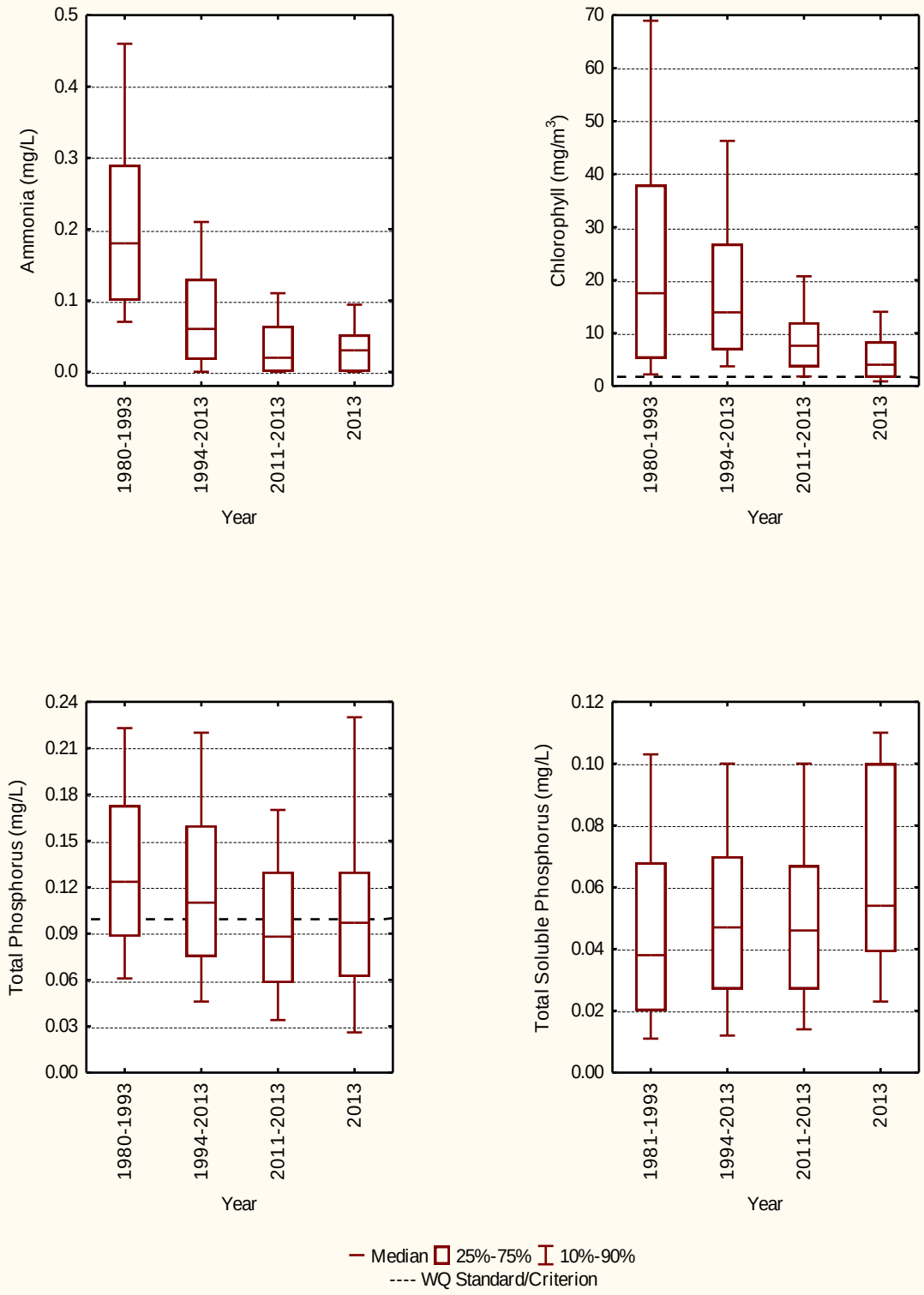
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

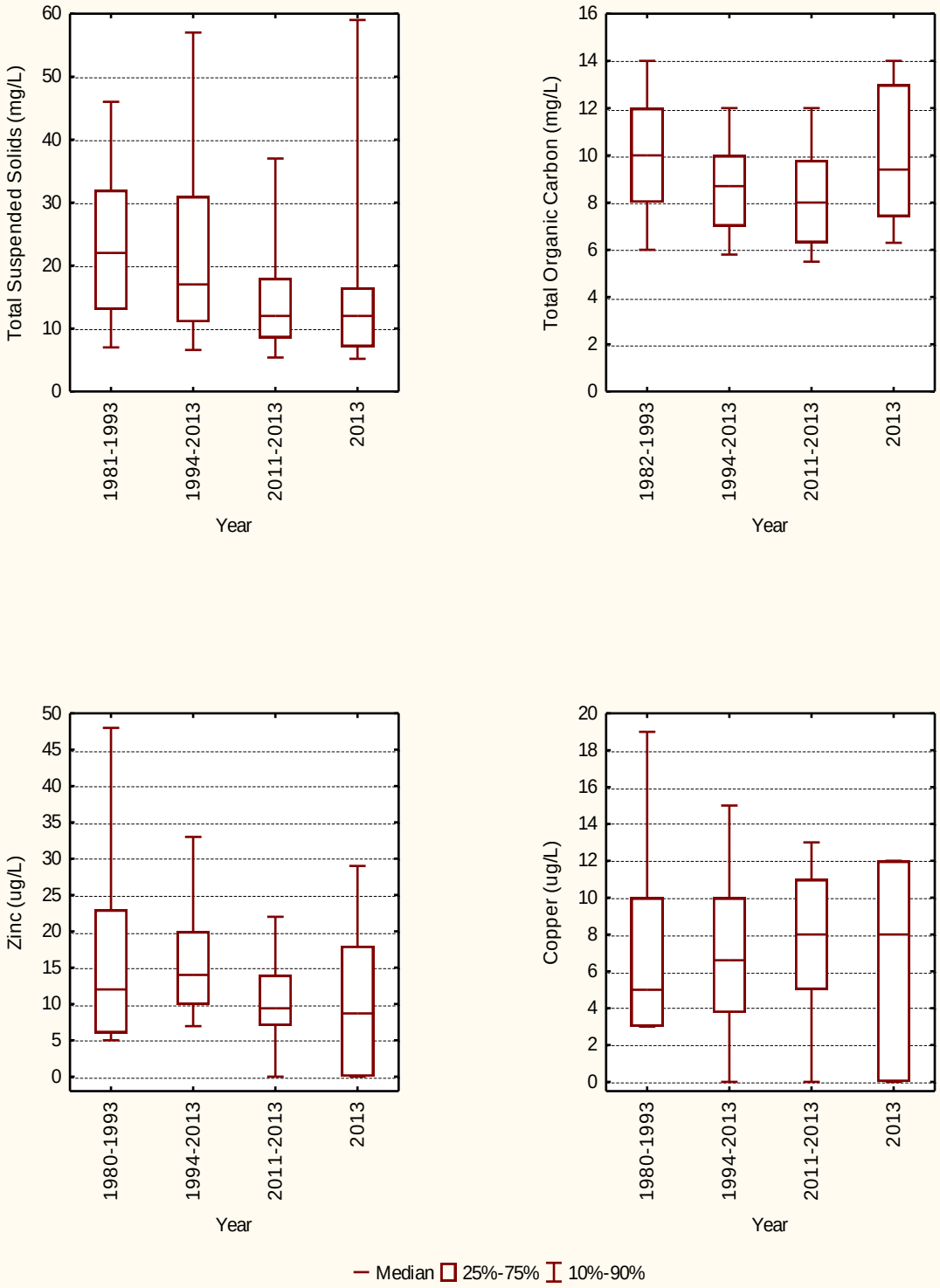
MMSD Water Quality Monitoring Program Data
Milwaukee River at Wells St., Site RI-07



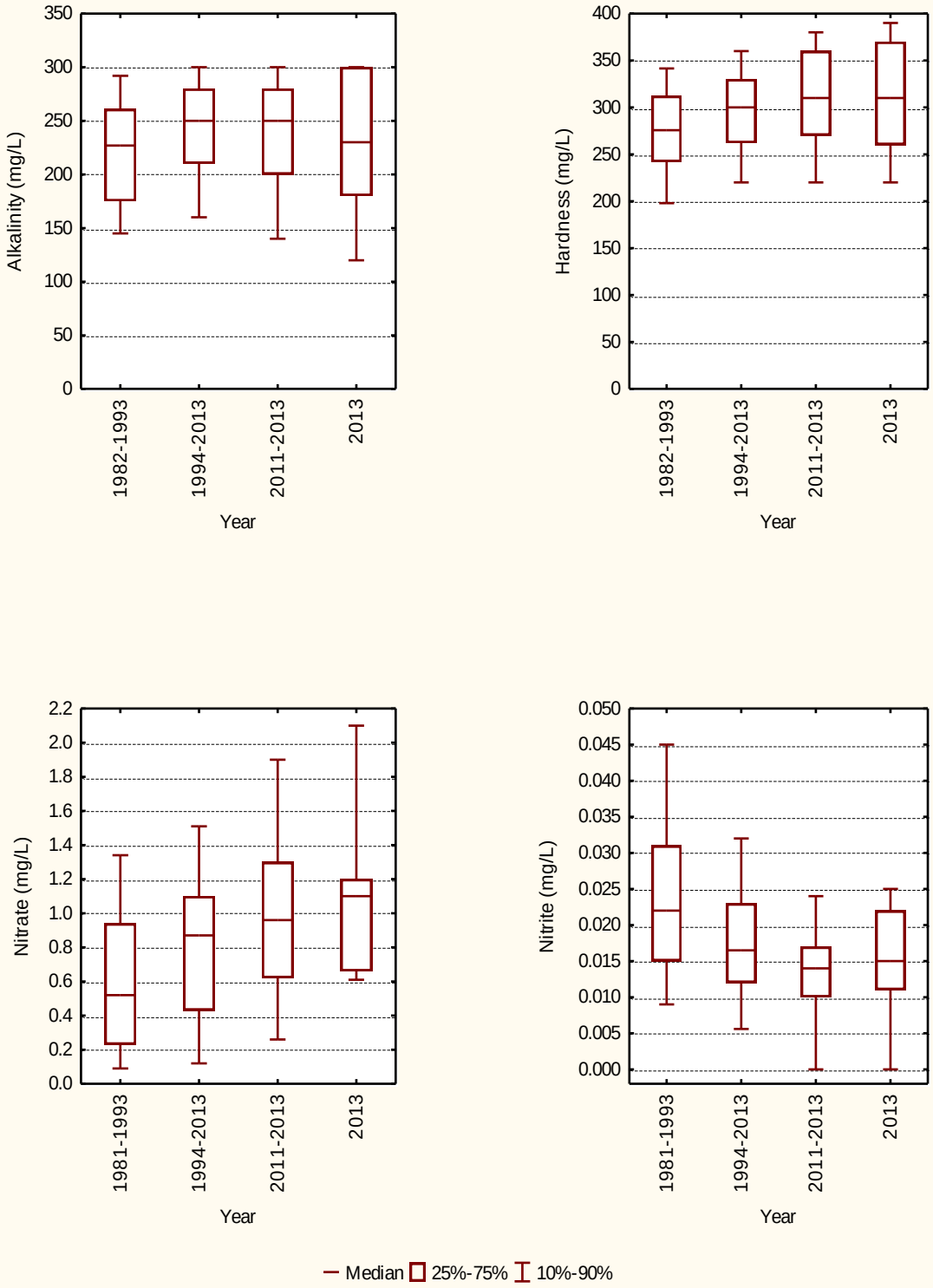
MMSD Water Quality Monitoring Program Data
Milwaukee River at Wells St., Site RI-07



MMSD Water Quality Monitoring Program Data
Milwaukee River at Wells St., Site RI-07



MMSD Water Quality Monitoring Program Data
Milwaukee River at Wells St., Site RI-07



WELLS ST. - SITE 7
MILWAUKEE RIVER
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.1	14.5	9.7	5.18	1.15	0.016	1.17	0.038	0.93	0.108	0.062	ND
Standard Error	0.0	1.2	0.4	1.06	0.10	0.002	0.10	0.005	0.04	0.010	0.004	ND
Median	8.2	17.2	8.8	4.00	1.10	0.015	1.10	0.030	0.88	0.097	0.054	ND
Mode	8.4	Multi	8.3	Multi	1.10	0.000	1.10	0.000	1.00	0.130	0.100	ND
Standard Deviation	0.2	9.0	2.9	4.64	0.60	0.010	0.60	0.039	0.27	0.072	0.033	ND
Sample Variance	0.1	81.2	8.4	21.49	0.36	0.000	0.36	0.001	0.07	0.005	0.001	ND
Range	0.9	29.5	11.5	15.60	2.24	0.042	2.23	0.150	1.29	0.314	0.113	ND
Minimum	7.7	-0.2	3.9	0.40	0.36	0.000	0.37	0.000	0.41	0.016	0.007	ND
Maximum	8.6	29.3	15.4	16.00	2.60	0.042	2.60	0.150	1.70	0.330	0.120	ND
Count	57	57	57	19	39	39	39	57	39	57	57	0
Confidence Level (95%)	0.1	2.4	0.8	2.23	0.19	0.003	0.19	0.010	0.09	0.019	0.009	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	479.7	455.0	7.2	22.4	17.2	774	82.6	2772	2.5	1648
Standard Error	ND	ND	13.8	16.5	1.5	4.3	3.1	23	3.2	1831	0.2	994
Median	ND	ND	470.0	461.0	3.4	12.0	8.1	780	84.0	200	2.3	1070
Mode	ND	ND	500.0	488.0	Multi	12.0	5.0	917	100.0	Multi	Multi	Multi
Standard Deviation	ND	ND	86.4	101.5	9.4	32.3	23.3	174	24.0	7982	0.9	1988
Sample Variance	ND	ND	7465.7	10310.6	87.6	1044.0	543.2	30128	574.1	63704975	0.8	3952627
Range	ND	ND	360.0	379.8	31.0	148.8	99.7	737	99.0	34991	3.6	4349
Minimum	ND	ND	330.0	309.0	0.0	1.2	2.3	473	51.0	9	1.0	51
Maximum	ND	ND	690.0	688.8	31.0	150.0	102.0	1210	150.0	35000	4.5	4400
Count	0	0	39	38	38	56	57	57	57	19	19	4
Confidence Level (95%)	ND	ND	28.0	33.4	3.1	8.7	6.2	46	6.4	3847	0.4	3164

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

WELLS ST. - SITE 7
MILWAUKEE RIVER
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	63.31	37.15	0.3	3.2	6.9	2.5	1.4	10.5	1.0	3.5	0.0	ND
Standard Error	4.10	2.56	0.1	0.6	1.1	0.5	0.9	3.0	0.7	0.8	0.0	ND
Median	65.00	37.00	0.0	2.8	8.0	3.3	0.0	8.7	0.0	4.5	0.0	ND
Mode	Multi	44.00	0.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	14.78	9.22	0.4	2.0	4.9	1.8	3.0	12.9	2.4	2.8	0.0	ND
Sample Variance	218.56	84.97	0.2	4.1	24.0	3.2	9.2	165.7	5.8	7.9	0.0	ND
Range	45.00	29.00	1.3	7.9	13.0	5.5	7.7	48.0	7.5	7.9	0.0	ND
Minimum	44.00	21.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	89.00	50.00	1.3	7.9	13.0	5.5	7.7	48.0	7.5	7.9	0.0	ND
Count	13	13	13	13	19	13	11	19	12	12	13	0
Confidence Level (95%)	8.93	5.57	0.2	1.2	2.4	1.1	2.0	6.2	1.5	1.8	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	311	229	1.0	ND	58.2	48.7	9.7	9.4
Standard Error	20	11	0.2	ND	2.0	1.8	0.4	0.5
Median	310	230	0.0	ND	64.0	53.0	9.4	8.3
Mode	370	300	0.0	ND	70.0	32.0	14.0	Multi
Standard Deviation	73	66	1.7	ND	12.6	11.4	2.8	2.9
Sample Variance	5274	4315	2.7	ND	159.0	130.8	8.1	8.4
Range	230	190	5.6	ND	35.0	33.0	9.3	9.9
Minimum	200	120	0.0	ND	39.0	31.0	5.7	6.1
Maximum	430	310	5.6	ND	74.0	64.0	15.0	16.0
Count	13	39	57	0	39	39	57	39
Confidence Level (95%)	44	21	0.4	ND	4.1	3.7	0.8	0.9

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

WATER ST. - SITE 8
MILWAUKEE RIVER
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.0	13.2	9.1	4.39	1.08	0.022	1.09	0.102	0.92	0.104	0.057	ND
Standard Error	0.0	1.1	0.4	0.98	0.09	0.002	0.09	0.011	0.04	0.008	0.003	ND
Median	8.0	15.5	8.4	2.40	0.89	0.020	0.92	0.079	0.99	0.092	0.055	ND
Mode	8.0	Multi	7.2	1.20	1.10	0.014	1.10	0.000	1.00	0.120	Multi	ND
Standard Deviation	0.2	8.6	3.3	4.47	0.58	0.012	0.57	0.086	0.28	0.060	0.026	ND
Sample Variance	0.0	73.2	10.8	19.97	0.33	0.000	0.33	0.007	0.08	0.004	0.001	ND
Range	0.9	26.2	13.0	15.47	2.05	0.060	2.04	0.410	1.25	0.292	0.106	ND
Minimum	7.6	0.2	1.0	0.53	0.35	0.000	0.36	0.000	0.35	0.028	0.014	ND
Maximum	8.5	26.3	14.0	16.00	2.40	0.060	2.40	0.410	1.60	0.320	0.120	ND
Count	60	63	63	21	45	45	45	63	45	63	63	0
Confidence Level (95%)	0.0	2.2	0.8	2.03	0.17	0.004	0.17	0.022	0.09	0.015	0.007	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	528.7	503.3	7.9	23.0	19.4	878	128.5	3573	2.7	1475
Standard Error	ND	ND	40.3	41.1	1.6	3.4	2.5	59	18.0	1979	0.2	602
Median	ND	ND	460.0	442.2	3.9	13.0	10.1	770	91.0	380	2.6	440
Mode	ND	ND	520.0	Multi	0.0	14.0	9.1	Multi	100.0	Multi	Multi	Multi
Standard Deviation	ND	ND	270.4	276.0	10.6	27.2	19.9	467	143.3	9070	0.8	2330
Sample Variance	ND	ND	73111.8	76182.2	112.2	740.3	394.1	217637	20523.3	82266866	0.7	5430665
Range	ND	ND	1320.0	1308.8	42.0	127.1	91.3	2649	770.0	40920	2.7	8516
Minimum	ND	ND	280.0	271.2	0.0	2.9	3.9	401	40.0	80	1.9	84
Maximum	ND	ND	1600.0	1580.0	42.0	130.0	95.2	3050	810.0	41000	4.6	8600
Count	0	0	45	45	45	63	62	63	63	21	21	15
Confidence Level (95%)	ND	ND	81.2	82.9	3.2	6.9	5.0	117	36.1	4129	0.4	1291

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

WATER ST. - SITE 8
MILWAUKEE RIVER
WATER QUALITY DATA - 2013

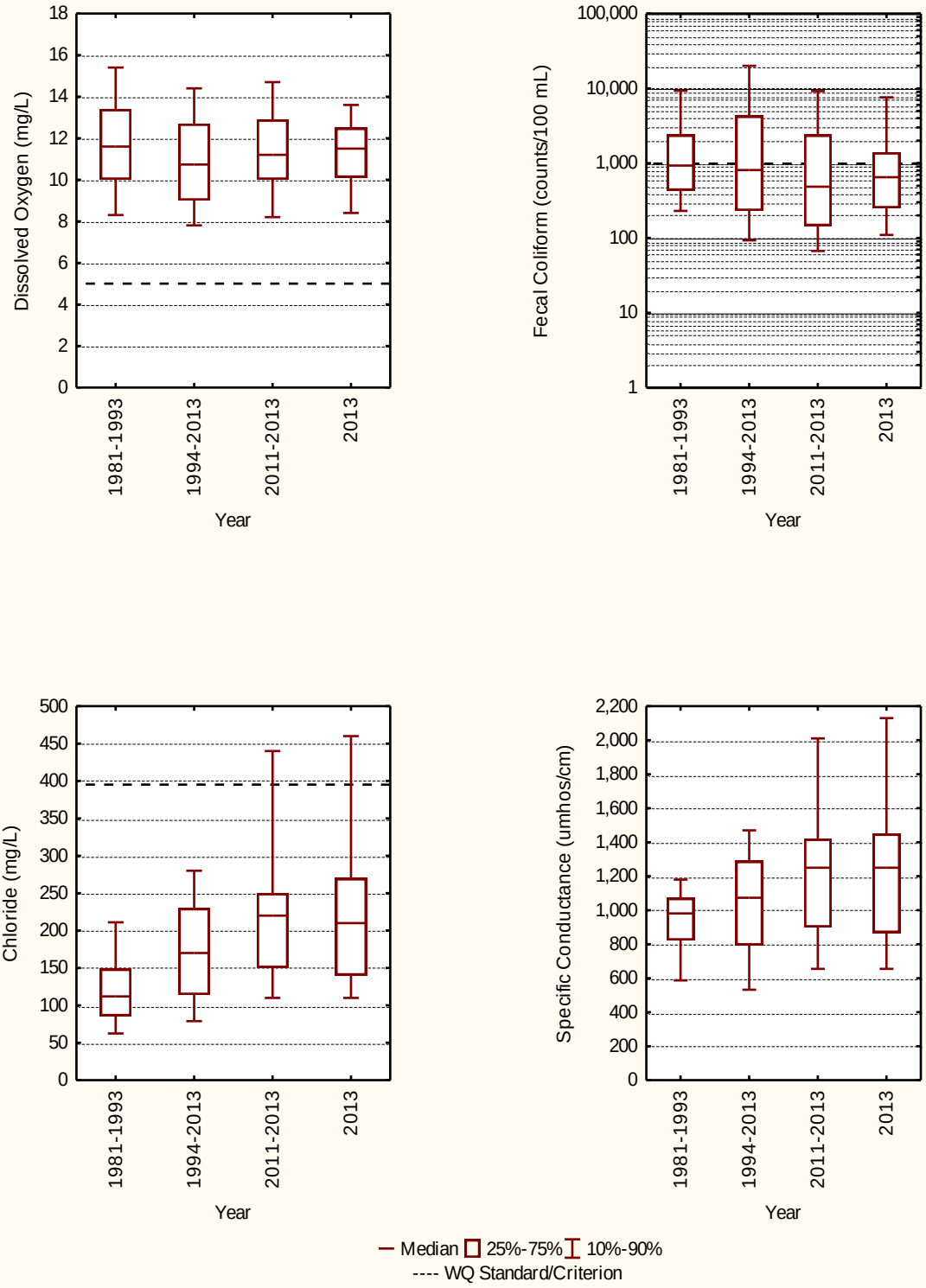
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	58.87	30.93	0.2	3.6	7.1	2.4	1.4	18.4	0.0	3.8	0.6	ND
Standard Error	3.83	2.39	0.1	0.6	0.9	0.5	1.1	3.5	0.0	1.0	0.6	ND
Median	56.00	26.00	0.0	2.7	8.1	2.1	0.0	12.0	0.0	4.1	0.0	ND
Mode	Multi	26.00	0.0	2.4	0.0	Multi	0.0	Multi	0.0	0.0	0.0	ND
Standard Deviation	14.84	9.24	0.3	2.4	4.1	2.0	3.7	16.1	0.0	3.7	2.5	ND
Sample Variance	220.12	85.35	0.1	6.0	16.4	4.1	13.4	259.0	0.0	13.6	6.1	ND
Range	50.00	28.00	1.0	9.6	15.0	7.0	12.0	52.0	0.0	10.0	9.6	ND
Minimum	42.00	20.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	92.00	48.00	1.0	9.6	15.0	7.0	12.0	52.0	0.0	10.0	9.6	ND
Count	15	15	15	15	21	15	12	21	13	13	15	0
Confidence Level (95%)	8.22	5.12	0.2	1.4	1.8	1.1	2.3	7.3	0.0	2.2	1.4	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	275	187	1.3	ND	49.9	41.6	8.7	8.2
Standard Error	19	10	0.3	ND	2.1	1.9	0.4	0.4
Median	250	170	0.0	ND	44.0	37.0	7.9	7.6
Mode	200	Multi	0.0	ND	38.0	31.0	13.0	Multi
Standard Deviation	75	66	2.1	ND	14.3	12.9	2.8	2.7
Sample Variance	5555	4412	4.4	ND	205.5	165.6	8.1	7.3
Range	230	233	6.4	ND	48.0	42.0	9.8	10.1
Minimum	200	77	0.0	ND	25.0	21.0	4.2	3.9
Maximum	430	310	6.4	ND	73.0	63.0	14.0	14.0
Count	15	45	63	0	45	45	63	45
Confidence Level (95%)	41	20	0.5	ND	4.3	3.9	0.7	0.8

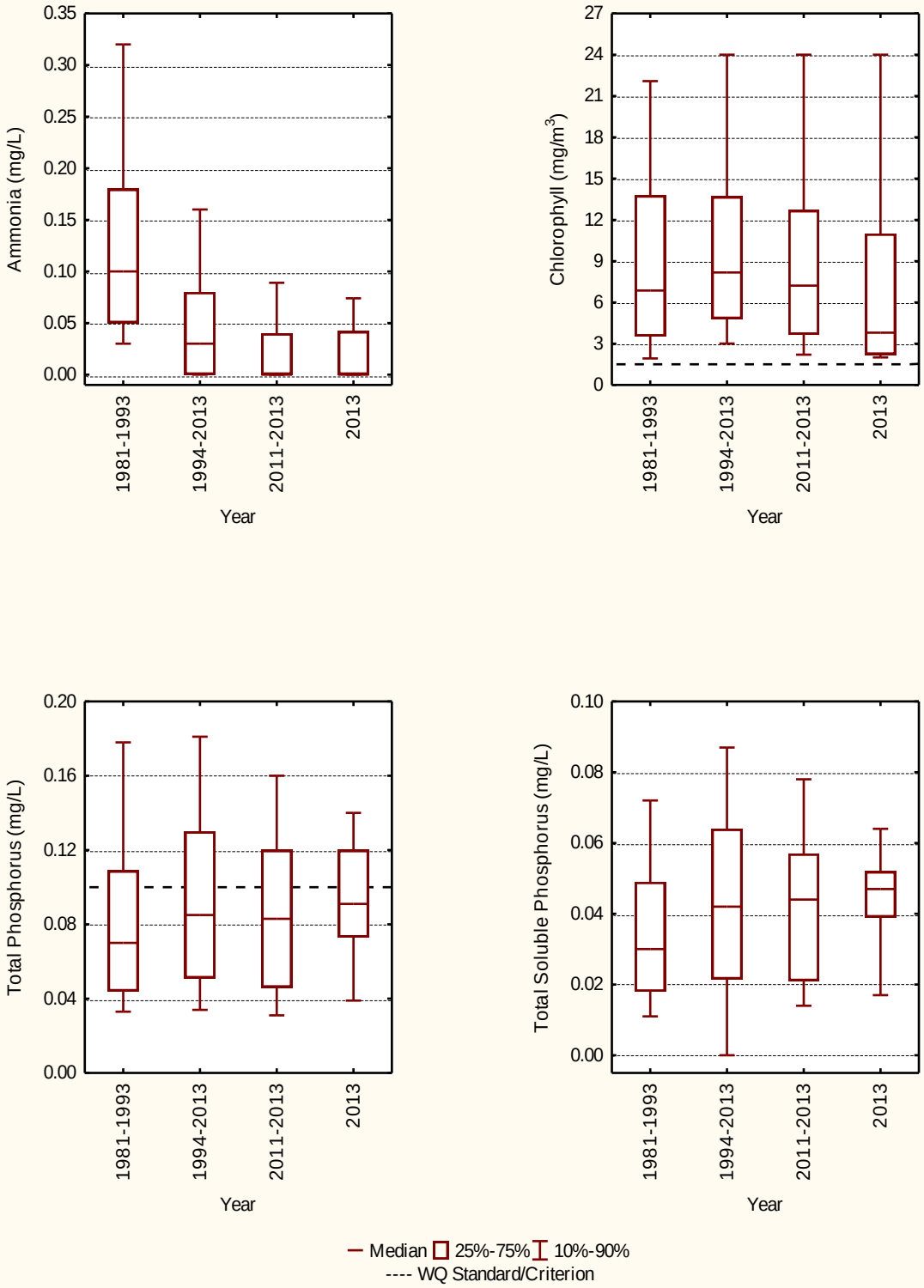
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

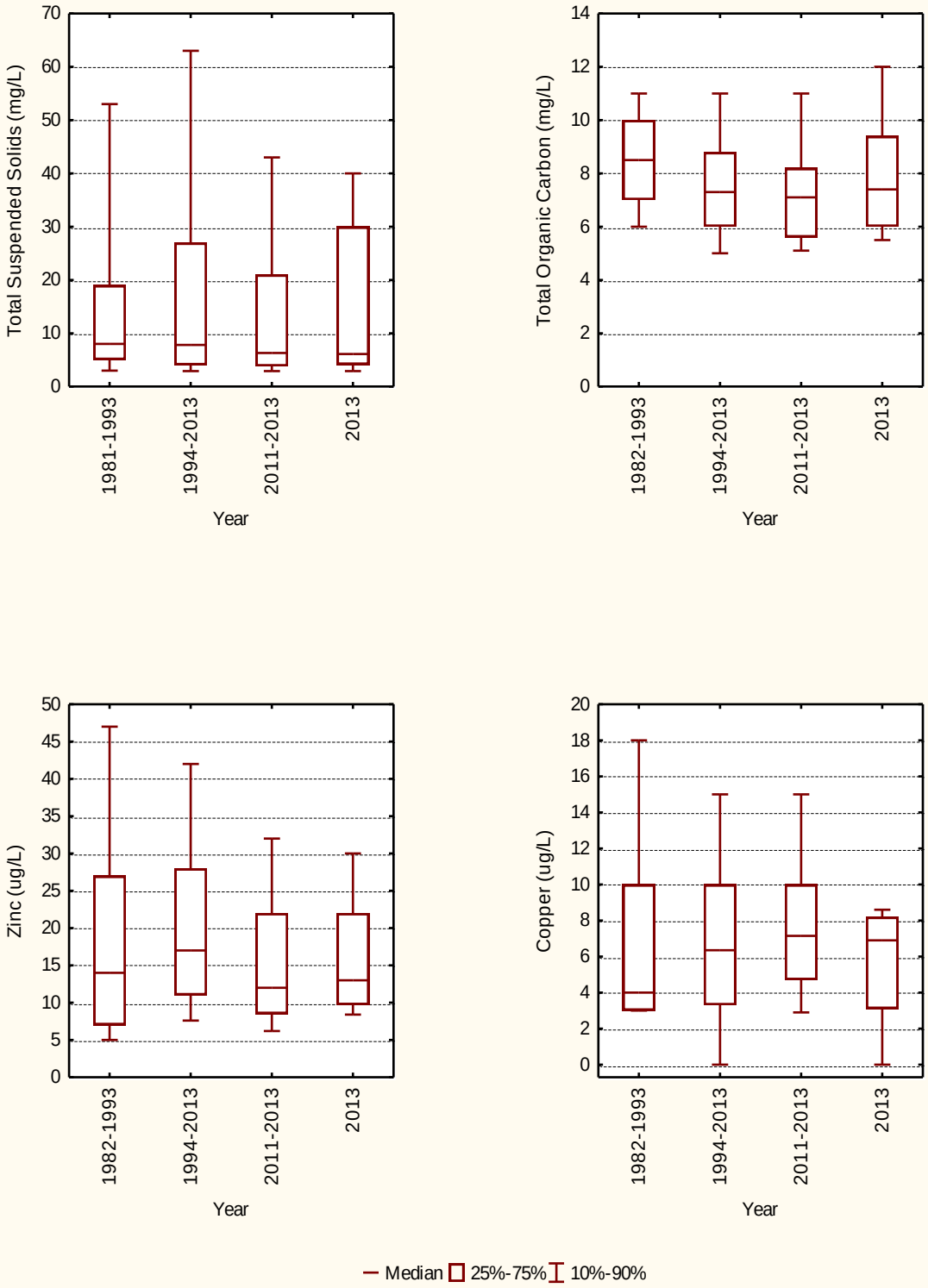
MMSD Water Quality Monitoring Program Data
Menomonee River at North 70th St., Site RI-09



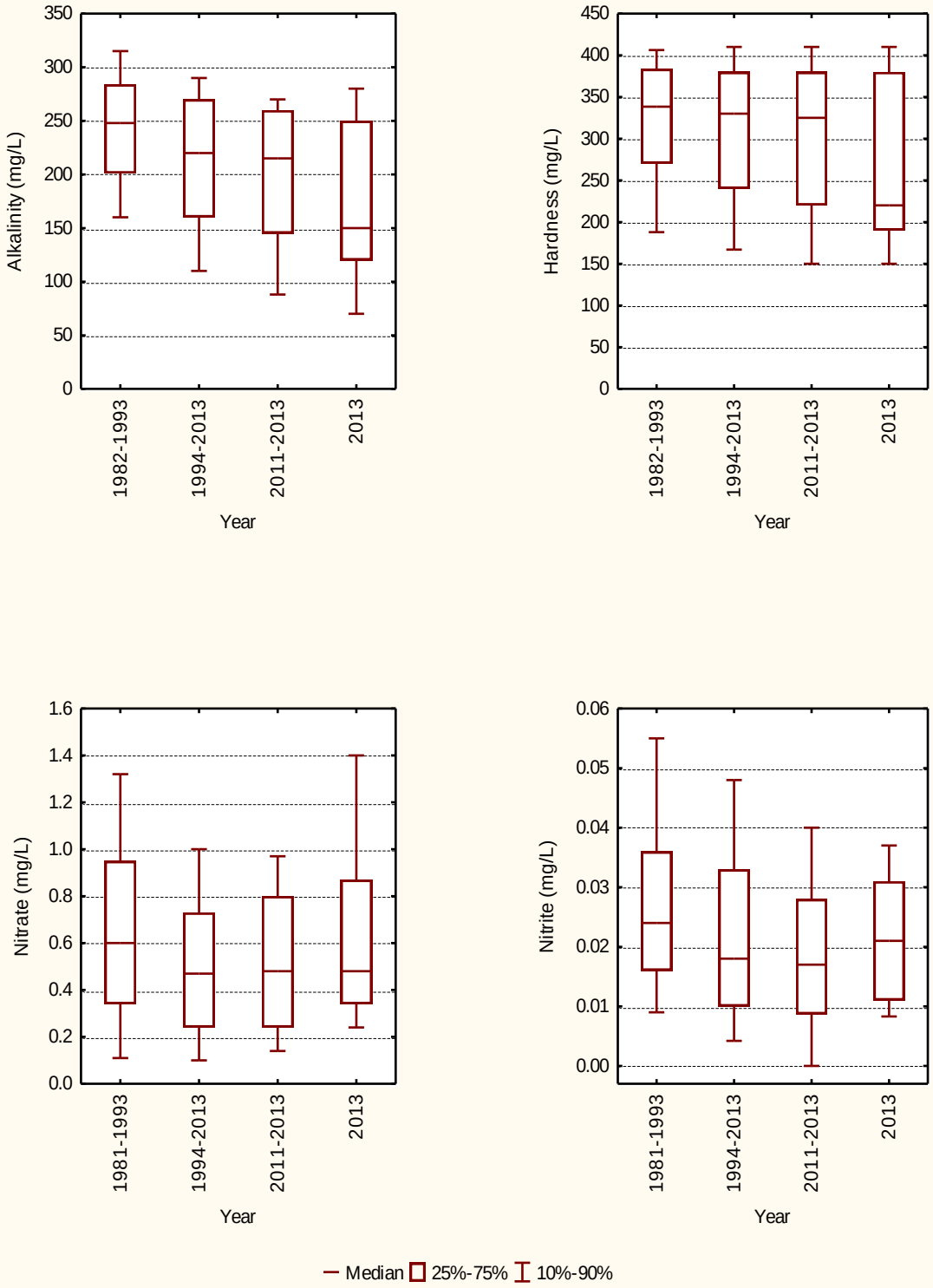
MMSD Water Quality Monitoring Program Data
Menomonee River at North 70th St., Site RI-09



MMSD Water Quality Monitoring Program Data
Menomonee River at North 70th St., Site RI-09



MMSD Water Quality Monitoring Program Data
Menomonee River at North 70th St., Site RI-09



N. 70TH ST. - SITE 9
MENOMONEE RIVER
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.2	13.0	11.4	8.59	0.64	0.021	0.67	0.043	0.76	0.092	0.044	ND
Standard Error	0.1	2.0	0.4	2.28	0.10	0.003	0.11	0.022	0.05	0.009	0.004	ND
Median	8.2	15.7	11.5	3.80	0.48	0.021	0.52	0.000	0.74	0.091	0.047	ND
Mode	Multi	Multi	13.6	2.20	0.44	0.031	Multi	0.000	0.90	Multi	Multi	ND
Standard Deviation	0.2	9.1	2.0	10.43	0.40	0.013	0.41	0.102	0.18	0.041	0.017	ND
Sample Variance	0.1	82.6	4.0	108.87	0.16	0.000	0.17	0.010	0.03	0.002	0.000	ND
Range	0.8	27.3	7.2	39.17	1.33	0.048	1.32	0.430	0.64	0.153	0.064	ND
Minimum	7.8	0.3	8.0	0.83	0.17	0.000	0.18	0.000	0.46	0.027	0.014	ND
Maximum	8.6	27.6	15.2	40.00	1.50	0.048	1.50	0.430	1.10	0.180	0.078	ND
Count	19	21	21	21	15	15	15	21	15	21	21	0
Confidence Level (95%)	0.1	4.1	0.9	4.75	0.22	0.007	0.23	0.046	0.10	0.018	0.008	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	733.3	712.2	7.0	16.9	15.5	1313	264.0	3707	2.9	2769
Standard Error	ND	ND	98.9	100.7	1.8	3.7	3.8	141	43.1	2150	0.2	1688
Median	ND	ND	630.0	591.0	4.7	6.1	5.7	1250	210.0	650	2.8	690
Mode	ND	ND	Multi	Multi	2.0	21.0	Multi	1290	Multi	Multi	Multi	Multi
Standard Deviation	ND	ND	383.1	390.1	6.8	16.9	17.3	646	197.7	9851	0.7	6538
Sample Variance	ND	ND	146738.1	152159.6	46.6	285.1	299.4	417270	39071.8	97033083	0.5	42739029
Range	ND	ND	1270.0	1307.0	26.0	55.6	59.2	2420	804.0	44933	2.8	25932
Minimum	ND	ND	330.0	273.0	0.0	1.4	2.0	590	96.0	67	1.8	68
Maximum	ND	ND	1600.0	1580.0	26.0	57.0	61.2	3010	900.0	45000	4.7	26000
Count	0	0	15	15	15	21	21	21	21	21	21	15
Confidence Level (95%)	ND	ND	212.1	216.0	3.8	7.7	7.9	294	90.0	4484	0.3	3620

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

N. 70TH ST. - SITE 9
MENOMONEE RIVER
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	62.00	29.27	0.1	2.8	5.7	3.4	1.2	16.2	0.3	1.0	0.6	ND
Standard Error	5.63	3.09	0.1	0.5	0.8	0.6	0.7	2.1	0.3	0.7	0.6	ND
Median	50.00	24.00	0.0	2.8	6.9	3.8	0.0	13.0	0.0	0.0	0.0	ND
Mode	Multi	Multi	0.0	0.0	0.0	0.0	0.0	12.0	0.0	0.0	0.0	ND
Standard Deviation	21.80	11.96	0.3	1.9	3.5	2.4	2.4	9.6	1.2	2.2	2.4	ND
Sample Variance	475.14	143.07	0.1	3.6	12.5	5.6	5.7	91.5	1.5	4.9	5.9	ND
Range	66.00	34.00	1.0	5.7	9.9	9.0	7.2	32.0	4.4	6.3	9.4	ND
Minimum	34.00	13.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	100.00	47.00	1.0	5.7	9.9	9.0	7.2	32.0	4.4	6.3	9.4	ND
Count	15	15	15	15	21	15	13	21	13	11	15	0
Confidence Level (95%)	12.07	6.62	0.2	1.1	1.6	1.3	1.4	4.4	0.7	1.5	1.3	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	275	172	2.1	ND	46.5	38.5	8.2	7.7
Standard Error	27	20	0.7	ND	4.1	3.8	0.7	0.8
Median	220	150	0.0	ND	40.0	34.0	7.4	6.6
Mode	Multi	Multi	0.0	ND	Multi	31.0	Multi	Multi
Standard Deviation	103	78	3.0	ND	16.0	14.7	3.1	3.1
Sample Variance	10627	6055	8.9	ND	256.4	217.6	9.6	9.4
Range	300	235	12.0	ND	46.0	42.0	10.9	11.0
Minimum	140	55	0.0	ND	26.0	18.0	5.1	4.0
Maximum	440	290	12.0	ND	72.0	60.0	16.0	15.0
Count	15	15	21	0	15	15	21	15
Confidence Level (95%)	57	43	1.4	ND	8.9	8.2	1.4	1.7

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

N. EMMBER LN. - SITE 11
MENOMONEE RIVER
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.7	14.0	7.9	7.30	0.73	0.026	0.76	0.165	0.91	0.100	0.049	ND
Standard Error	0.0	1.1	0.4	3.12	0.07	0.001	0.07	0.013	0.04	0.006	0.003	ND
Median	7.7	17.5	6.5	2.80	0.52	0.026	0.56	0.150	0.86	0.091	0.050	ND
Mode	7.8	Multi	Multi	Multi	Multi	Multi	Multi	Multi	1.40	Multi	0.056	ND
Standard Deviation	0.3	8.5	3.6	14.28	0.49	0.008	0.49	0.107	0.29	0.047	0.020	ND
Sample Variance	0.1	71.8	12.7	204.01	0.24	0.000	0.24	0.011	0.08	0.002	0.000	ND
Range	1.8	28.5	11.5	64.59	1.58	0.026	1.56	0.480	1.05	0.232	0.104	ND
Minimum	6.7	-0.2	2.4	0.41	0.22	0.013	0.24	0.000	0.45	0.038	0.016	ND
Maximum	8.5	28.3	13.9	65.00	1.80	0.039	1.80	0.480	1.50	0.270	0.120	ND
Count	63	63	63	21	45	45	45	63	45	63	63	0
Confidence Level (95%)	0.1	2.1	0.9	6.50	0.15	0.002	0.15	0.027	0.09	0.012	0.005	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	641.8	619.3	6.7	19.7	18.7	1115	207.8	3899	2.9	ND
Standard Error	ND	ND	50.0	50.5	1.1	2.6	2.0	75	25.3	1720	0.2	ND
Median	ND	ND	580.0	570.0	4.7	11.0	11.3	978	140.0	460	2.7	ND
Mode	ND	ND	670.0	1576.0	12.0	Multi	Multi	Multi	130.0	Multi	Multi	ND
Standard Deviation	ND	ND	335.3	338.8	7.7	20.9	16.2	592	200.6	7883	0.8	ND
Sample Variance	ND	ND	112424.0	114798.4	58.9	435.3	261.8	350279	40228.5	62137859	0.7	ND
Range	ND	ND	1440.0	1429.0	35.0	95.8	63.9	2717	1100.0	30972	3.0	ND
Minimum	ND	ND	260.0	245.0	0.0	3.2	3.9	443	0.0	28	1.4	ND
Maximum	ND	ND	1700.0	1674.0	35.0	99.0	67.8	3160	1100.0	31000	4.5	ND
Count	0	0	45	45	45	63	63	63	63	21	21	0
Confidence Level (95%)	ND	ND	100.7	101.8	2.3	5.3	4.1	149	50.5	3588	0.4	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

N. EMMBER LN. - SITE 11
MENOMONEE RIVER
WATER QUALITY DATA - 2013

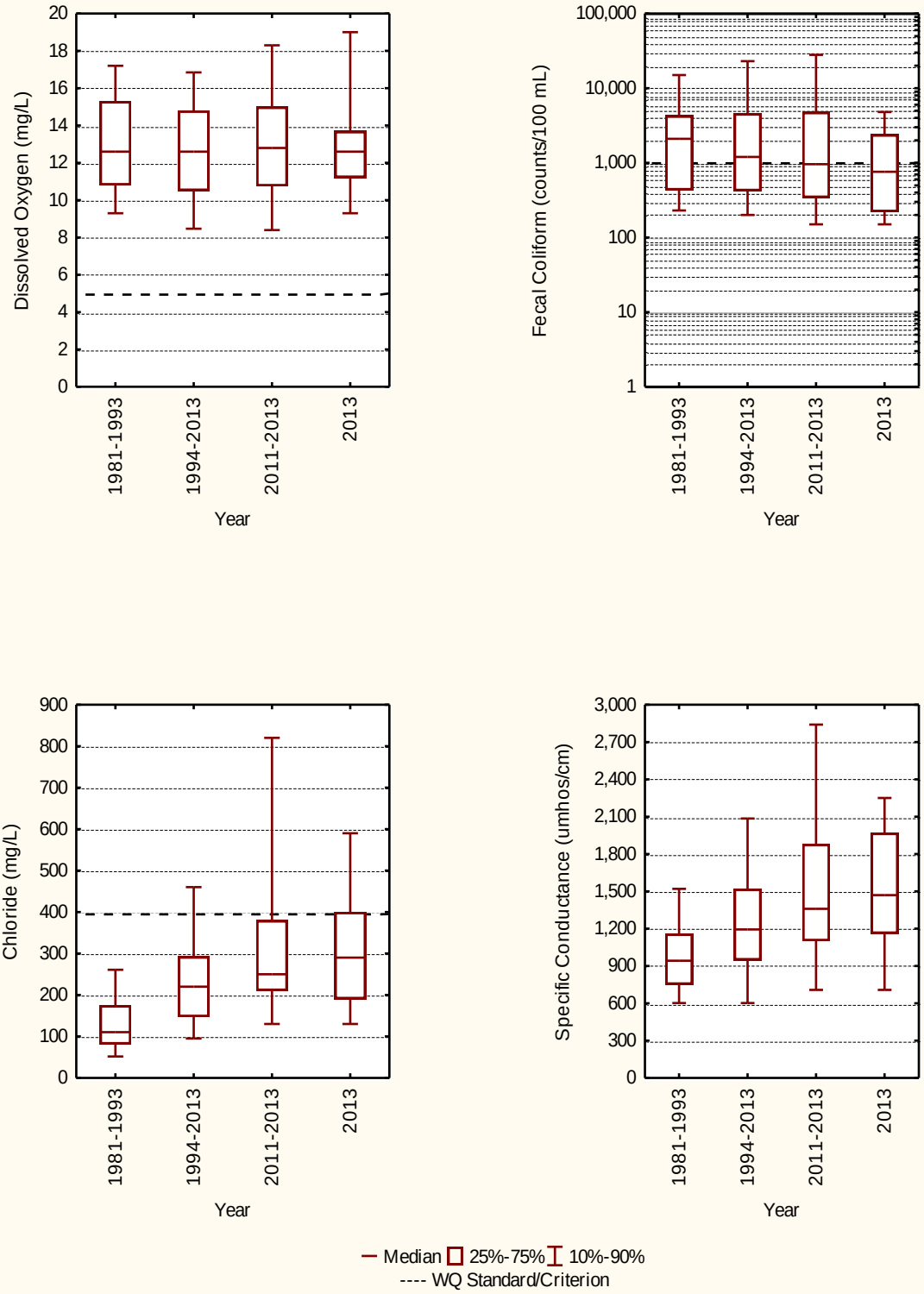
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	58.53	28.13	0.2	2.6	8.3	2.5	0.3	20.9	0.0	2.9	0.0	ND
Standard Error	5.35	3.11	0.1	0.5	0.7	0.4	0.3	2.9	0.0	0.8	0.0	ND
Median	49.00	29.00	0.0	2.3	8.5	2.7	0.0	14.0	0.0	2.5	0.0	ND
Mode	49.00	12.00	0.0	Multi	12.0	Multi	0.0	14.0	0.0	0.0	0.0	ND
Standard Deviation	20.73	12.03	0.3	2.0	3.3	1.6	1.2	13.5	0.0	3.1	0.0	ND
Sample Variance	429.70	144.70	0.1	3.8	10.6	2.5	1.4	182.2	0.0	9.7	0.0	ND
Range	72.00	37.00	0.9	7.9	12.0	5.2	4.3	42.5	0.0	8.8	0.0	ND
Minimum	28.00	12.00	0.0	0.0	0.0	0.0	0.0	9.5	0.0	0.0	0.0	ND
Maximum	100.00	49.00	0.9	7.9	12.0	5.2	4.3	52.0	0.0	8.8	0.0	ND
Count	15	15	15	15	21	15	13	21	11	14	15	0
Confidence Level (95%)	11.48	6.66	0.2	1.1	1.5	0.9	0.7	6.1	0.0	1.8	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	261	171	2.4	ND	45.9	38.1	8.0	7.7
Standard Error	26	11	0.3	ND	2.5	2.3	0.3	0.3
Median	240	160	2.3	ND	43.0	38.0	7.8	7.1
Mode	140	Multi	0.0	ND	Multi	16.0	11.0	Multi
Standard Deviation	100	76	2.7	ND	16.5	15.4	2.1	2.1
Sample Variance	10050	5784	7.0	ND	271.7	237.6	4.2	4.5
Range	340	238	12.0	ND	50.0	46.0	7.1	7.5
Minimum	120	52	0.0	ND	23.0	16.0	4.9	4.5
Maximum	460	290	12.0	ND	73.0	62.0	12.0	12.0
Count	15	45	63	0	45	45	63	45
Confidence Level (95%)	56	23	0.7	ND	5.0	4.6	0.5	0.6

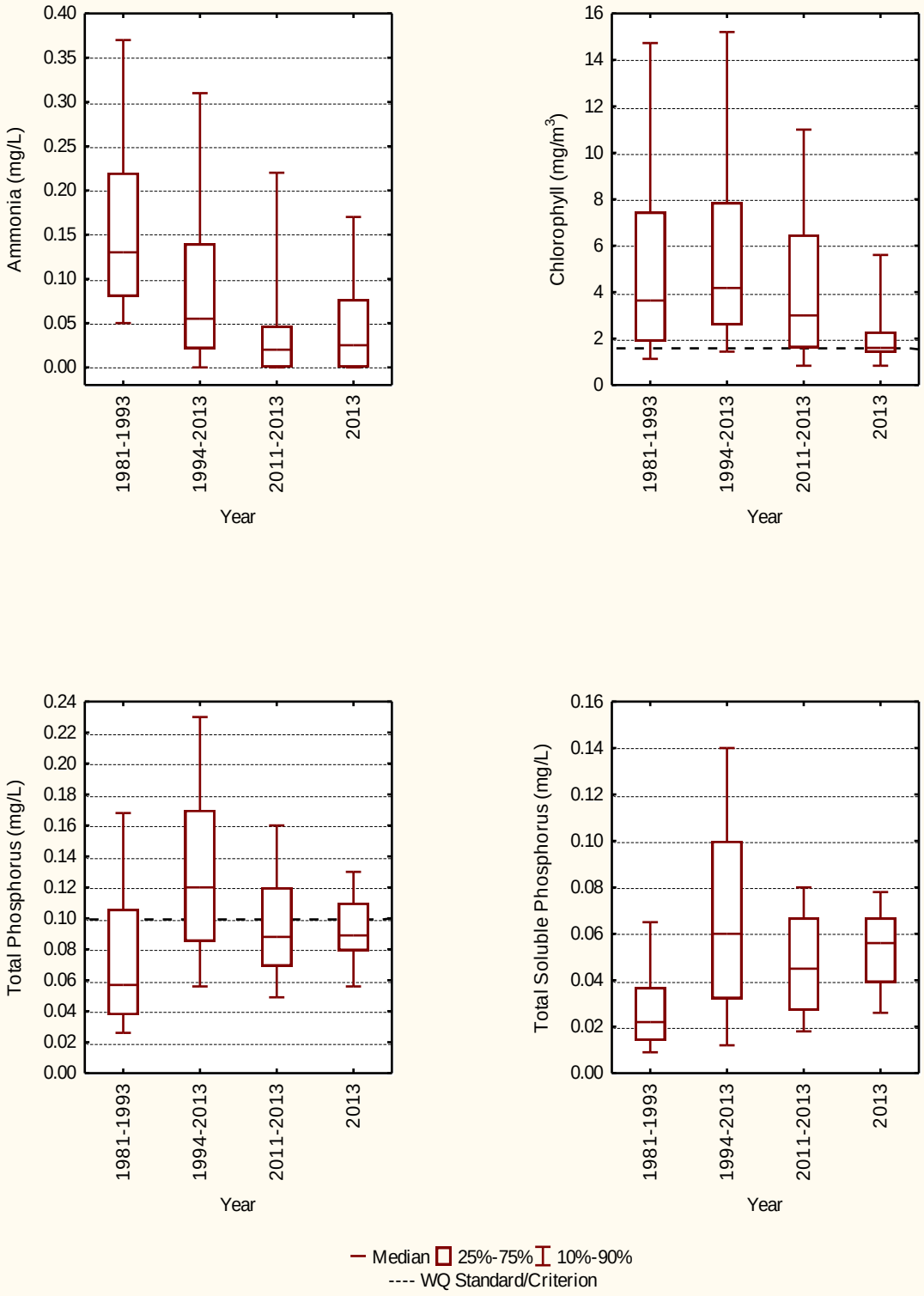
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

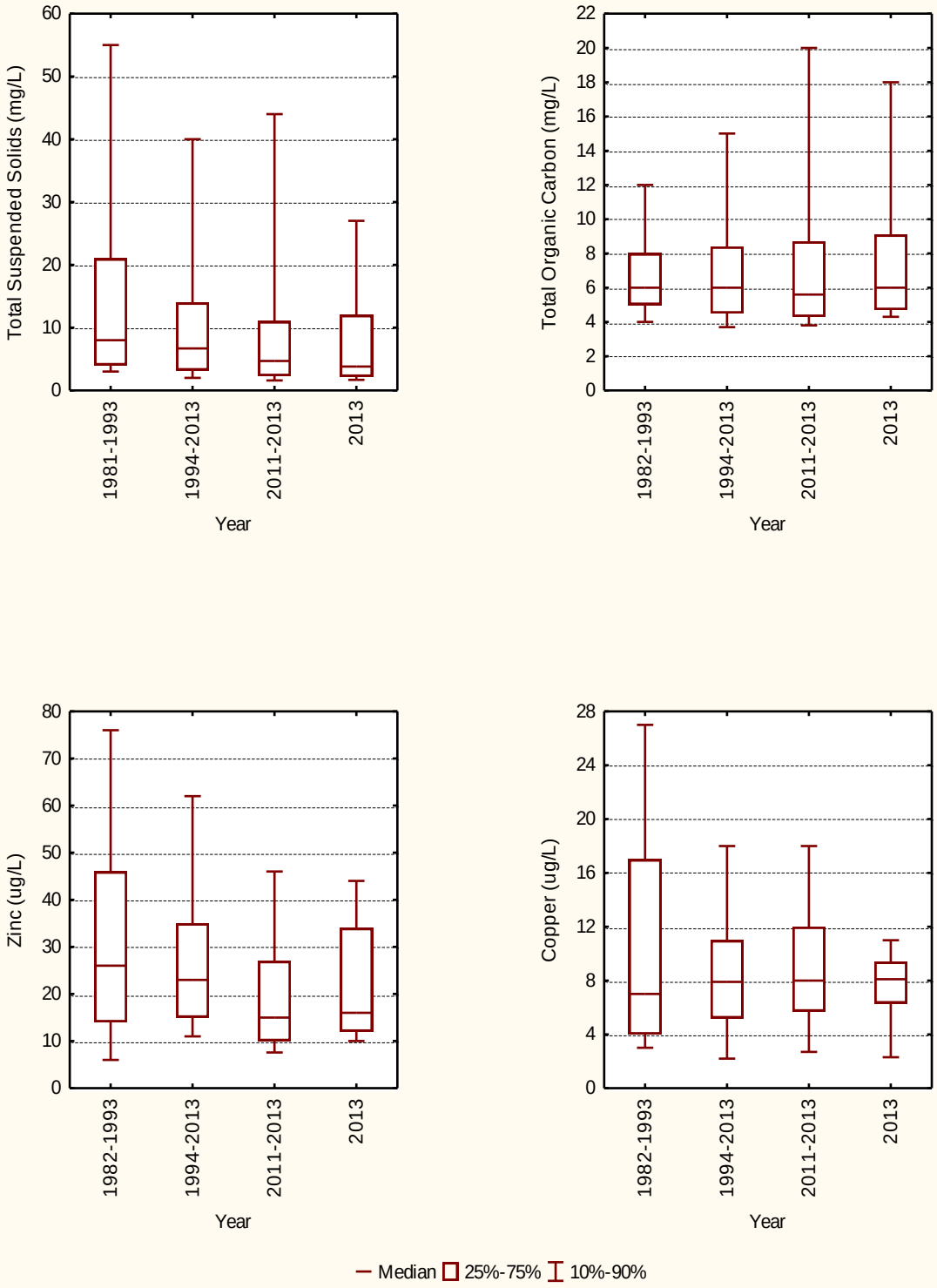
MMSD Water Quality Monitoring Program Data
Kinnickinnic River at S. 27th St., Site RI-12



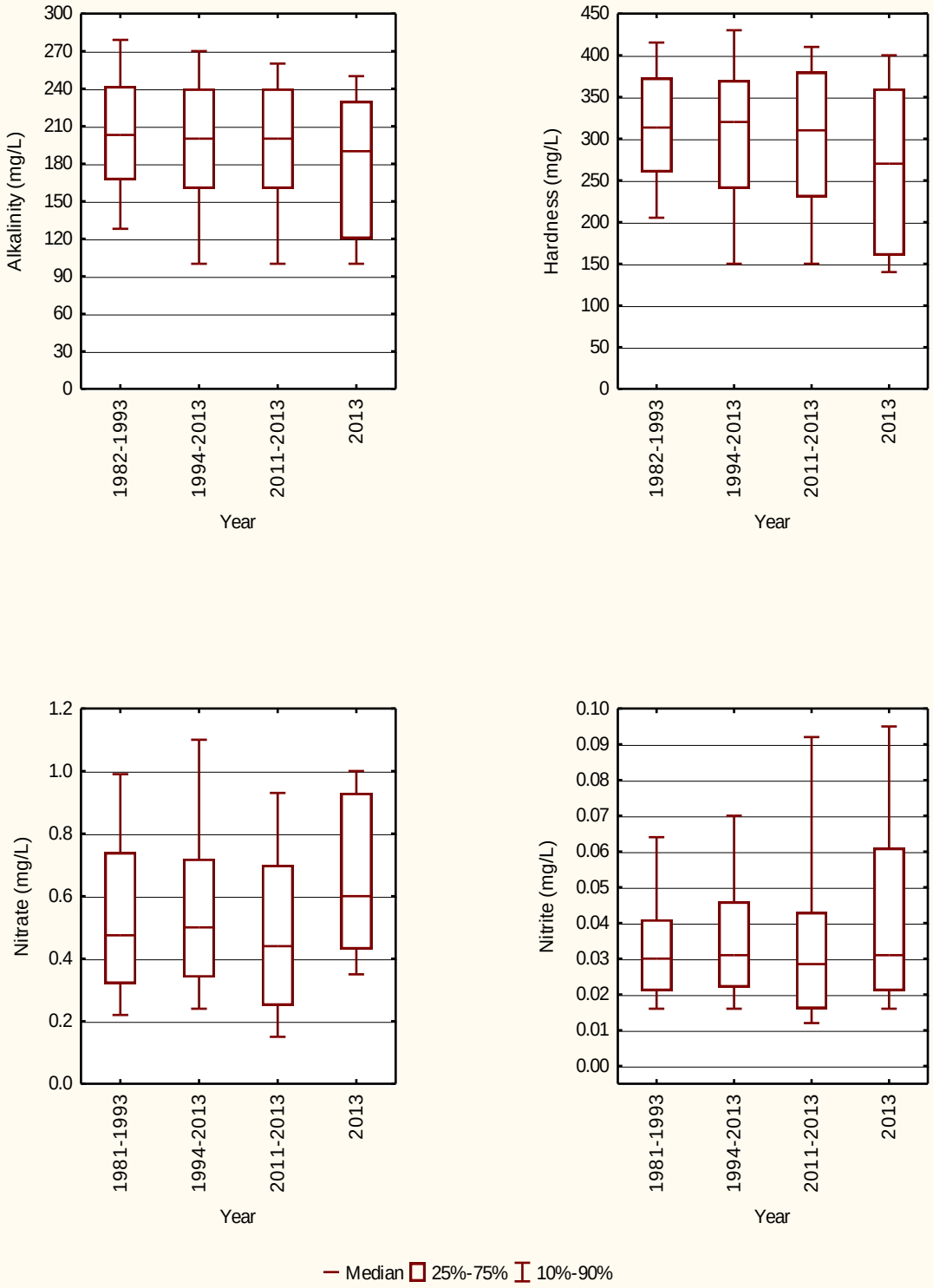
MMSD Water Quality Monitoring Program Data
Kinnickinnic River at S. 27th St., Site RI-12



MMSD Water Quality Monitoring Program Data
Kinnickinnic River at S. 27th St., Site RI-12



MMSD Water Quality Monitoring Program Data
Kinnickinnic River at South 27th St., Site RI-12



S. 27TH ST. - SITE 12
KINNICKINNIC RIVER
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.0	13.3	12.9	2.50	0.64	0.042	0.68	0.064	0.70	0.096	0.057	ND
Standard Error	0.1	1.9	0.7	0.47	0.08	0.008	0.08	0.021	0.06	0.007	0.006	ND
Median	8.1	15.7	12.6	1.60	0.60	0.031	0.63	0.025	0.68	0.089	0.056	ND
Mode	8.5	Multi	12.8	1.40	0.60	0.021	Multi	0.000	1.00	0.110	Multi	ND
Standard Deviation	0.5	8.5	3.4	2.14	0.30	0.031	0.30	0.095	0.25	0.030	0.029	ND
Sample Variance	0.2	72.9	11.7	4.57	0.09	0.001	0.09	0.009	0.06	0.001	0.001	ND
Range	1.7	25.3	13.4	8.14	1.10	0.120	1.12	0.390	0.80	0.117	0.112	ND
Minimum	6.8	1.1	6.6	0.76	0.00	0.000	0.08	0.000	0.40	0.043	0.018	ND
Maximum	8.5	26.4	20.0	8.90	1.10	0.120	1.20	0.390	1.20	0.160	0.130	ND
Count	21	21	21	21	15	15	15	21	15	21	21	0
Confidence Level (95%)	0.2	3.9	1.6	0.97	0.16	0.017	0.17	0.043	0.14	0.014	0.013	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	842.7	827.7	5.1	11.6	14.2	1547	333.6	6871	3.0	4865
Standard Error	ND	ND	110.9	113.2	1.4	3.5	3.4	153	47.3	3866	0.2	2649
Median	ND	ND	780.0	760.0	2.8	3.8	7.2	1470	290.0	760	2.9	920
Mode	ND	ND	1100.0	Multi	1.2	Multi	Multi	1610	Multi	60000	4.8	Multi
Standard Deviation	ND	ND	429.6	438.5	5.5	15.9	15.5	703	216.5	17716	0.8	10258
Sample Variance	ND	ND	184521.0	192288.7	30.1	251.5	239.9	494562	46891.0	313862861	0.6	105233555
Range	ND	ND	1420.0	1462.2	19.0	59.0	52.8	2722	804.0	59910	2.8	38900
Minimum	ND	ND	280.0	231.0	1.0	0.0	0.7	458	66.0	90	2.0	100
Maximum	ND	ND	1700.0	1693.2	20.0	59.0	53.5	3180	870.0	60000	4.8	39000
Count	0	0	15	15	15	21	21	21	21	21	21	15
Confidence Level (95%)	ND	ND	237.9	242.8	3.0	7.2	7.1	320	98.6	8064	0.4	5681

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

S. 27TH ST. - SITE 12
KINNICKINNIC RIVER
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	60.00	28.53	0.3	2.9	7.6	3.4	0.5	23.0	0.5	2.5	1.2	ND
Standard Error	5.63	3.63	0.1	0.4	0.8	0.4	0.3	3.5	0.5	0.7	0.8	ND
Median	64.00	28.00	0.0	2.8	8.1	3.5	0.0	16.0	0.0	1.6	0.0	ND
Mode	Multi	Multi	0.0	Multi	Multi	Multi	0.0	12.0	0.0	0.0	0.0	ND
Standard Deviation	21.82	14.04	0.5	1.7	3.6	1.7	1.2	15.9	1.4	2.8	3.2	ND
Sample Variance	476.29	197.12	0.3	3.0	12.9	2.9	1.5	253.8	2.0	7.7	10.3	ND
Range	65.00	44.00	1.5	5.5	15.0	5.8	3.8	65.0	4.5	7.5	9.1	ND
Minimum	34.00	11.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	99.00	55.00	1.5	5.5	15.0	5.8	3.8	65.0	4.5	7.5	9.1	ND
Count	15	15	15	15	21	15	13	21	10	15	15	0
Confidence Level (95%)	12.09	7.78	0.3	1.0	1.6	0.9	0.7	7.3	1.0	1.5	1.8	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	267	175	8.8	ND	46.1	35.2	9.4	10.5
Standard Error	29	16	4.0	ND	3.1	3.5	2.1	2.9
Median	270	190	2.5	ND	48.0	37.0	6.0	6.1
Mode	160	Multi	0.0	ND	Multi	Multi	Multi	5.4
Standard Deviation	111	62	18.1	ND	12.0	13.7	9.8	11.1
Sample Variance	12381	3902	327.8	ND	142.8	187.9	96.8	124.0
Range	350	204	82.0	ND	32.0	41.0	44.6	43.2
Minimum	130	66	0.0	ND	30.0	14.0	3.4	3.8
Maximum	480	270	82.0	ND	62.0	55.0	48.0	47.0
Count	15	15	21	0	15	15	21	15
Confidence Level (95%)	62	35	8.2	ND	6.6	7.6	4.5	6.2

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

S. 8TH ST. - SITE 13
KINNICKINNIC RIVER
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.4	15.7	14.9	5.54	0.53	0.034	0.56	0.035	0.55	0.070	0.032	ND
Standard Error	0.1	2.1	1.0	2.04	0.12	0.008	0.13	0.015	0.06	0.007	0.004	ND
Median	8.4	18.8	14.1	3.30	0.50	0.028	0.56	0.000	0.48	0.066	0.037	ND
Mode	8.8	25.4	Multi	3.70	Multi	0.000	Multi	0.000	0.37	0.084	Multi	ND
Standard Deviation	0.5	9.3	4.2	8.89	0.45	0.030	0.45	0.066	0.22	0.029	0.017	ND
Sample Variance	0.2	85.7	17.2	79.06	0.20	0.001	0.20	0.004	0.05	0.001	0.000	ND
Range	1.7	29.6	15.5	40.71	1.40	0.090	1.40	0.220	0.65	0.116	0.059	ND
Minimum	7.4	-0.1	7.7	0.29	0.00	0.000	0.00	0.000	0.33	0.014	0.005	ND
Maximum	9.1	29.5	23.2	41.00	1.40	0.090	1.40	0.220	0.98	0.130	0.064	ND
Count	19	19	19	19	13	13	13	19	13	19	19	0
Confidence Level (95%)	0.2	4.5	2.0	4.29	0.27	0.018	0.27	0.032	0.14	0.014	0.008	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	805.4	786.0	6.2	14.3	13.8	1473	302.5	7163	2.8	4399
Standard Error	ND	ND	144.1	146.3	1.8	4.7	3.6	186	60.5	3758	0.2	2058
Median	ND	ND	720.0	717.3	4.7	4.6	6.0	1420	250.0	830	2.9	1200
Mode	ND	ND	390.0	Multi	Multi	Multi	Multi	1540	110.0	130	2.1	Multi
Standard Deviation	ND	ND	519.6	527.6	6.6	20.4	15.8	813	263.8	16382	1.0	7419
Sample Variance	ND	ND	270010.3	278377.9	43.4	415.2	249.6	660575	69605.7	268368387	1.1	55043252
Range	ND	ND	1890.0	1942.4	20.0	71.9	61.0	3595	1200.0	57979	3.4	25986
Minimum	ND	ND	310.0	250.0	0.0	1.1	1.4	455	0.0	21	1.3	14
Maximum	ND	ND	2200.0	2192.4	20.0	73.0	62.4	4050	1200.0	58000	4.8	26000
Count	0	0	13	13	13	19	19	19	19	19	19	13
Confidence Level (95%)	ND	ND	314.0	318.8	4.0	9.8	7.6	392	127.2	7896	0.5	4483

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

S. 8TH ST. - SITE 13
KINNICKINNIC RIVER
WATER QUALITY DATA - 2013

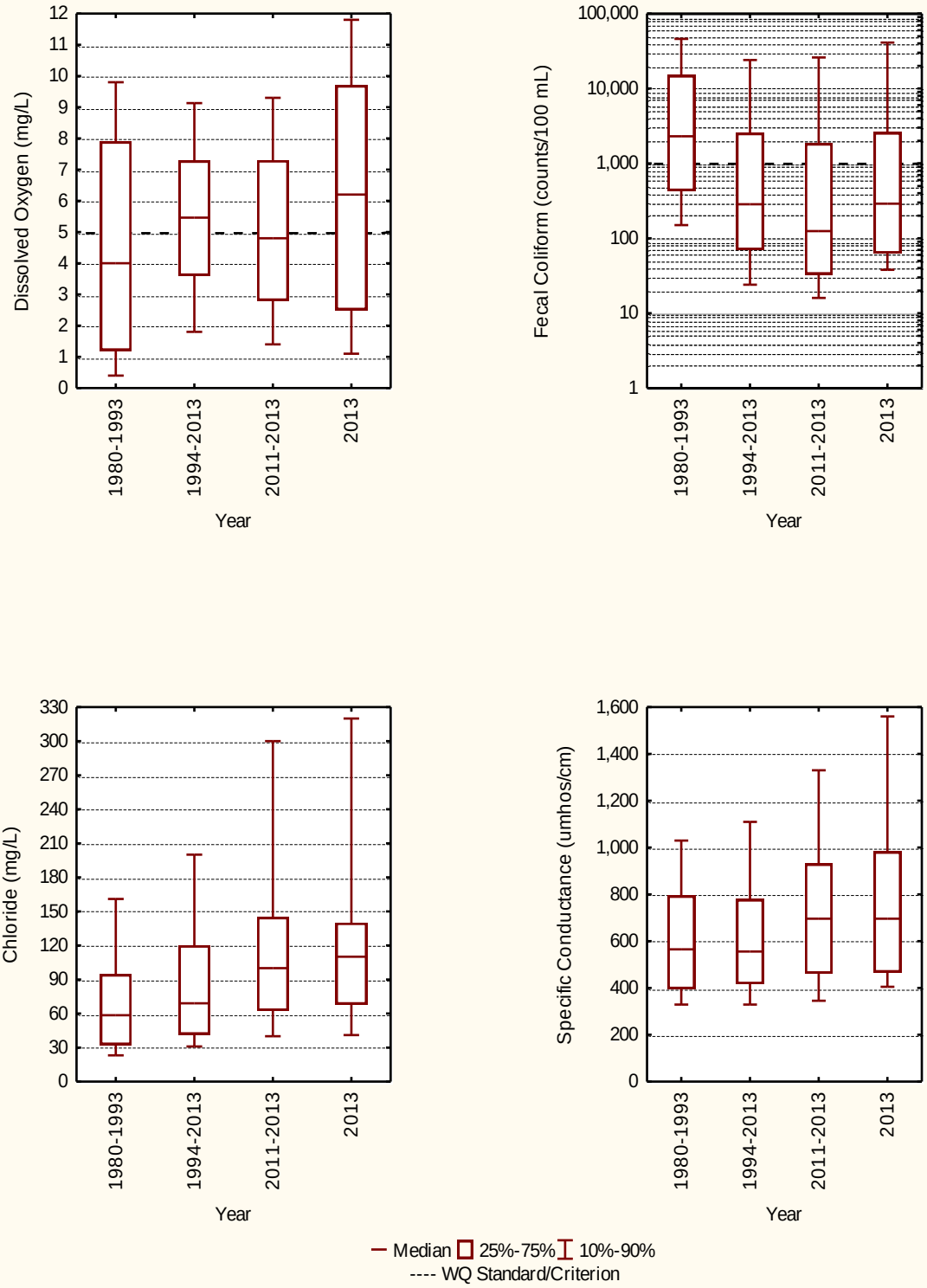
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	58.00	31.00	0.3	3.2	7.9	3.5	1.1	22.0	0.0	3.0	0.0	ND
Standard Error	4.98	4.06	0.1	0.4	0.9	0.9	0.8	3.8	0.0	1.2	0.0	ND
Median	63.00	33.00	0.0	2.7	8.4	3.6	0.0	19.0	0.0	1.9	0.0	ND
Mode	Multi	16.00	0.0	2.0	Multi	0.0	0.0	Multi	0.0	0.0	0.0	ND
Standard Deviation	17.94	14.63	0.5	1.5	3.9	3.1	2.7	16.4	0.0	3.4	0.0	ND
Sample Variance	321.83	214.00	0.2	2.4	15.3	9.7	7.3	268.2	0.0	11.5	0.0	ND
Range	51.00	43.00	1.4	4.8	16.0	12.0	9.0	64.0	0.0	7.3	0.0	ND
Minimum	34.00	14.00	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	85.00	57.00	1.4	6.1	16.0	12.0	9.0	64.0	0.0	7.3	0.0	ND
Count	13	13	13	13	19	13	12	19	8	8	12	0
Confidence Level (95%)	10.84	8.84	0.3	0.9	1.9	1.9	1.7	7.9	0.0	2.8	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	273	163	3.5	ND	41.0	34.5	6.3	6.0
Standard Error	28	10	0.9	ND	2.2	2.5	0.4	0.6
Median	310	180	2.5	ND	44.0	38.0	6.0	5.5
Mode	160	Multi	0.0	ND	46.0	26.0	Multi	4.0
Standard Deviation	101	38	3.8	ND	8.0	9.0	1.9	2.3
Sample Variance	10223	1409	14.1	ND	64.5	81.6	3.7	5.5
Range	300	126	12.0	ND	23.0	26.0	6.0	7.7
Minimum	140	94	0.0	ND	29.0	22.0	4.0	3.3
Maximum	440	220	12.0	ND	52.0	48.0	10.0	11.0
Count	13	13	19	0	13	13	19	13
Confidence Level (95%)	61	23	1.8	ND	4.9	5.5	0.9	1.4

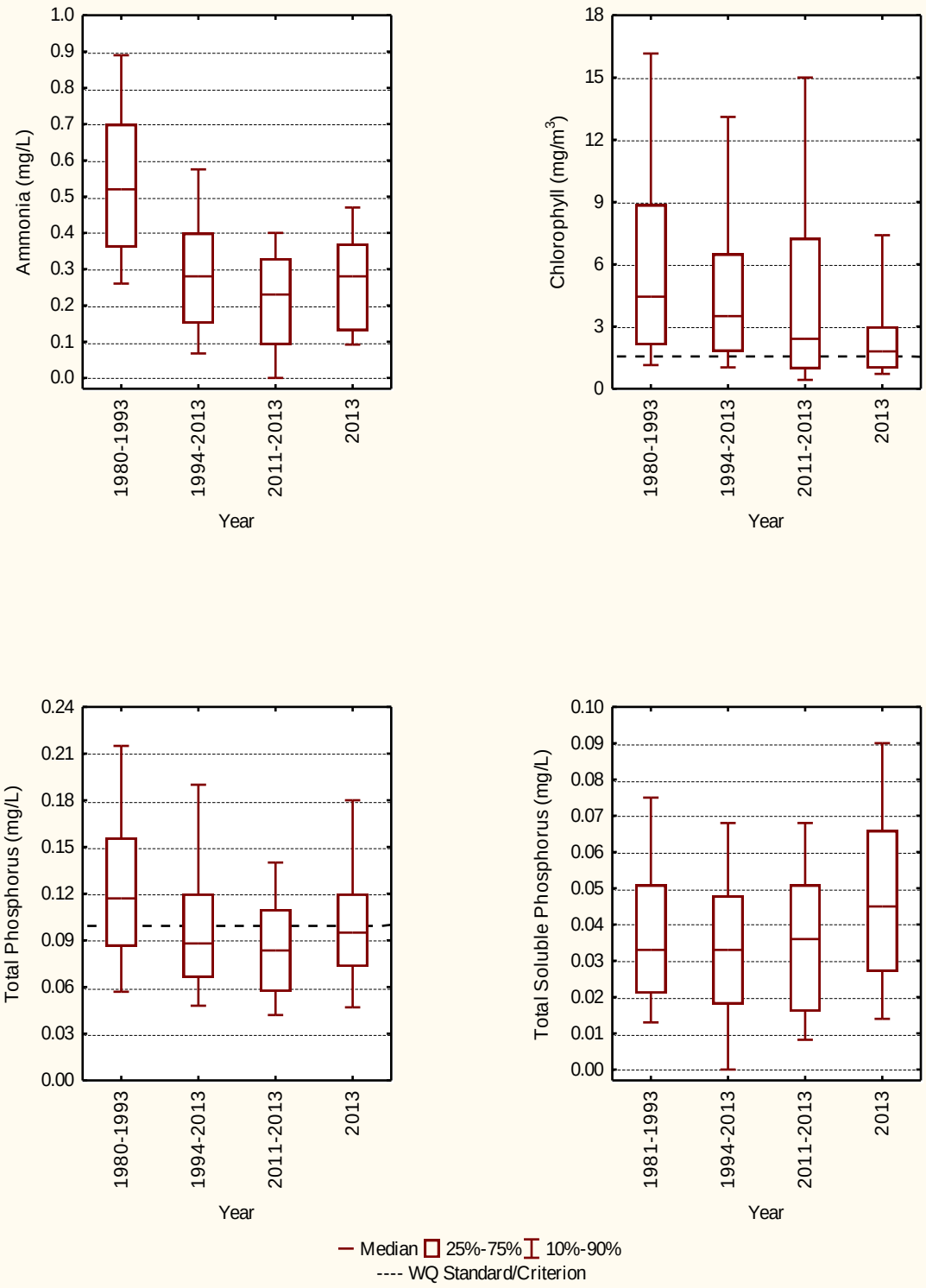
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

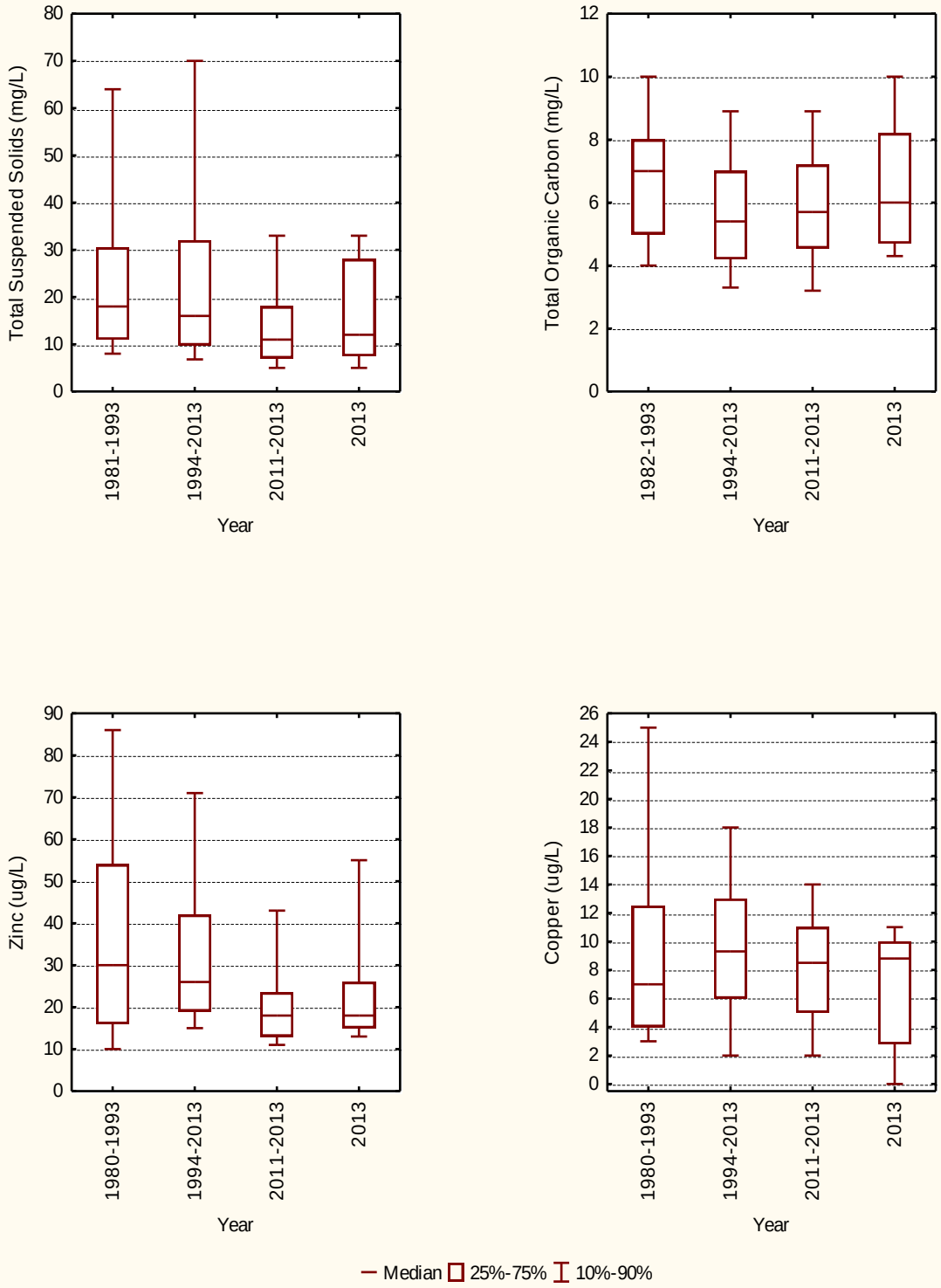
MMSD Water Quality Monitoring Program Data
Kinnickinnic River at 1st St., Site RI-14



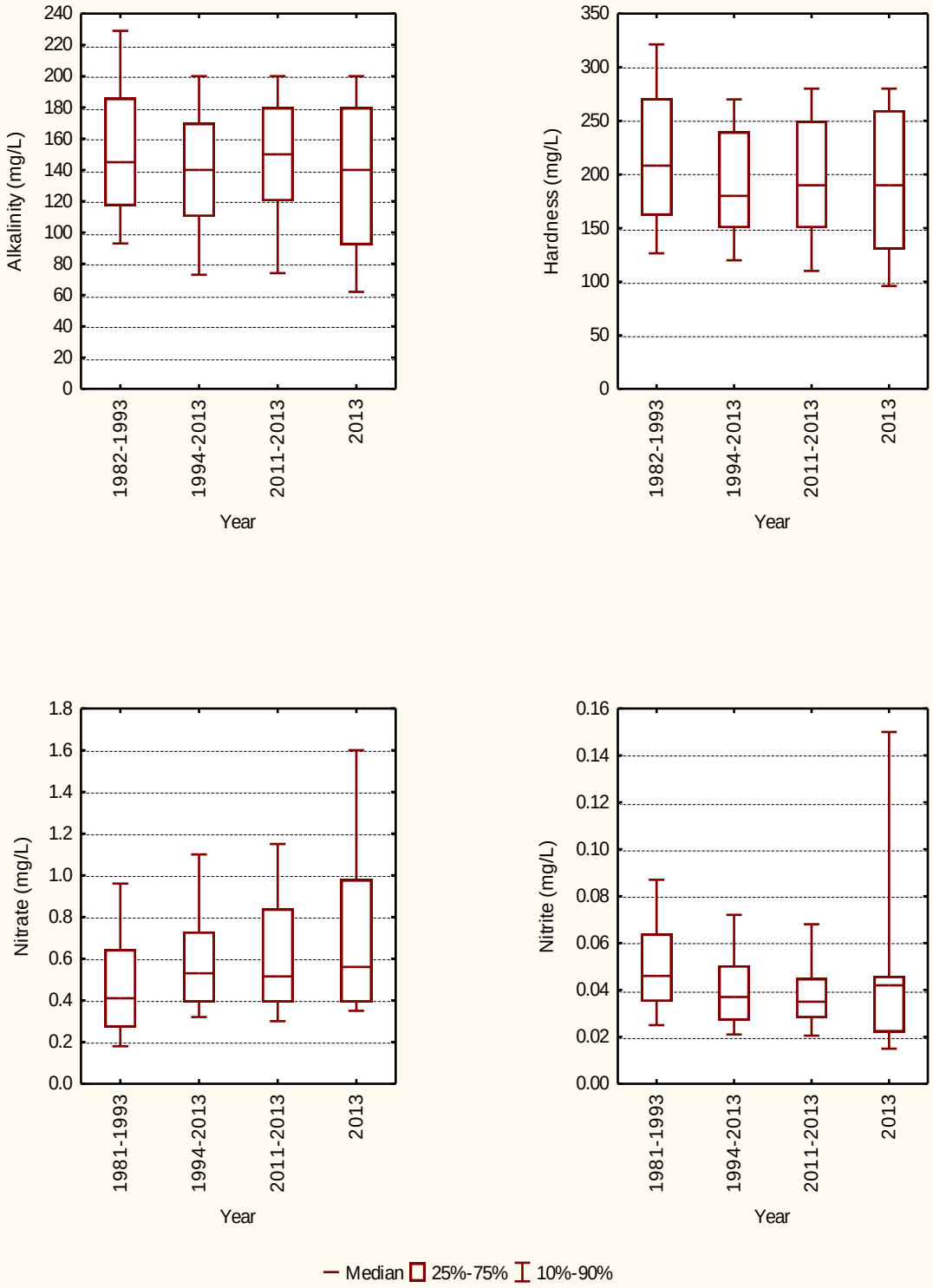
MMSD Water Quality Monitoring Program Data
Kinnickinnic River at 1st St., Site RI-14



MMSD Water Quality Monitoring Program Data
Kinnickinnic River at 1st St., Site RI-14



MMSD Water Quality Monitoring Program Data
Kinnickinnic River at 1st St., Site RI-14



S. 1ST ST. - SITE 14
KINNICKINNIC RIVER
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.5	12.1	6.4	3.13	0.74	0.049	0.78	0.270	0.89	0.109	0.049	ND
Standard Error	0.0	1.0	0.5	0.84	0.07	0.006	0.07	0.019	0.05	0.008	0.004	ND
Median	7.6	15.0	6.2	1.80	0.56	0.042	0.59	0.280	0.90	0.095	0.045	ND
Mode	7.4	20.0	Multi	Multi	Multi	0.150	Multi	Multi	1.00	0.120	Multi	ND
Standard Deviation	0.3	7.6	4.1	3.83	0.49	0.039	0.47	0.151	0.30	0.065	0.029	ND
Sample Variance	0.1	57.6	16.7	14.70	0.24	0.002	0.22	0.023	0.09	0.004	0.001	ND
Range	1.4	22.0	12.8	14.85	1.86	0.150	1.70	0.523	1.13	0.286	0.111	ND
Minimum	6.5	0.2	0.4	0.15	0.14	0.000	0.30	0.067	0.37	0.034	0.009	ND
Maximum	7.9	22.2	13.2	15.00	2.00	0.150	2.00	0.590	1.50	0.320	0.120	ND
Count	63	63	63	21	45	45	45	63	45	63	63	0
Confidence Level (95%)	0.1	1.9	1.0	1.75	0.15	0.012	0.14	0.038	0.09	0.016	0.007	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	504.2	478.5	6.8	22.2	22.5	834	151.7	9294	2.8	14380
Standard Error	ND	ND	42.2	42.7	1.2	3.8	2.9	69	21.3	4202	0.3	8157
Median	ND	ND	430.0	424.3	4.0	12.0	12.6	696	110.0	290	2.6	390
Mode	ND	ND	410.0	Multi	Multi	Multi	Multi	611	110.0	Multi	Multi	Multi
Standard Deviation	ND	ND	283.0	286.5	7.8	30.1	22.8	549	169.0	19256	1.1	31590
Sample Variance	ND	ND	80079.5	82063.7	60.9	906.9	517.9	301467	28574.5	370776420	1.3	997936603
Range	ND	ND	1200.0	1205.0	36.9	146.9	96.3	2559	870.0	60000	3.3	110000
Minimum	ND	ND	200.0	167.0	1.1	3.1	4.7	301	0.0	0	1.5	0
Maximum	ND	ND	1400.0	1372.0	38.0	150.0	101.0	2860	870.0	60000	4.8	110000
Count	0	0	45	45	45	63	63	63	63	21	20	15
Confidence Level (95%)	ND	ND	85.0	86.1	2.3	7.6	5.7	138	42.6	8765	0.5	17494

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

S. 1ST ST. - SITE 14
KINNICKINNIC RIVER
WATER QUALITY DATA - 2013

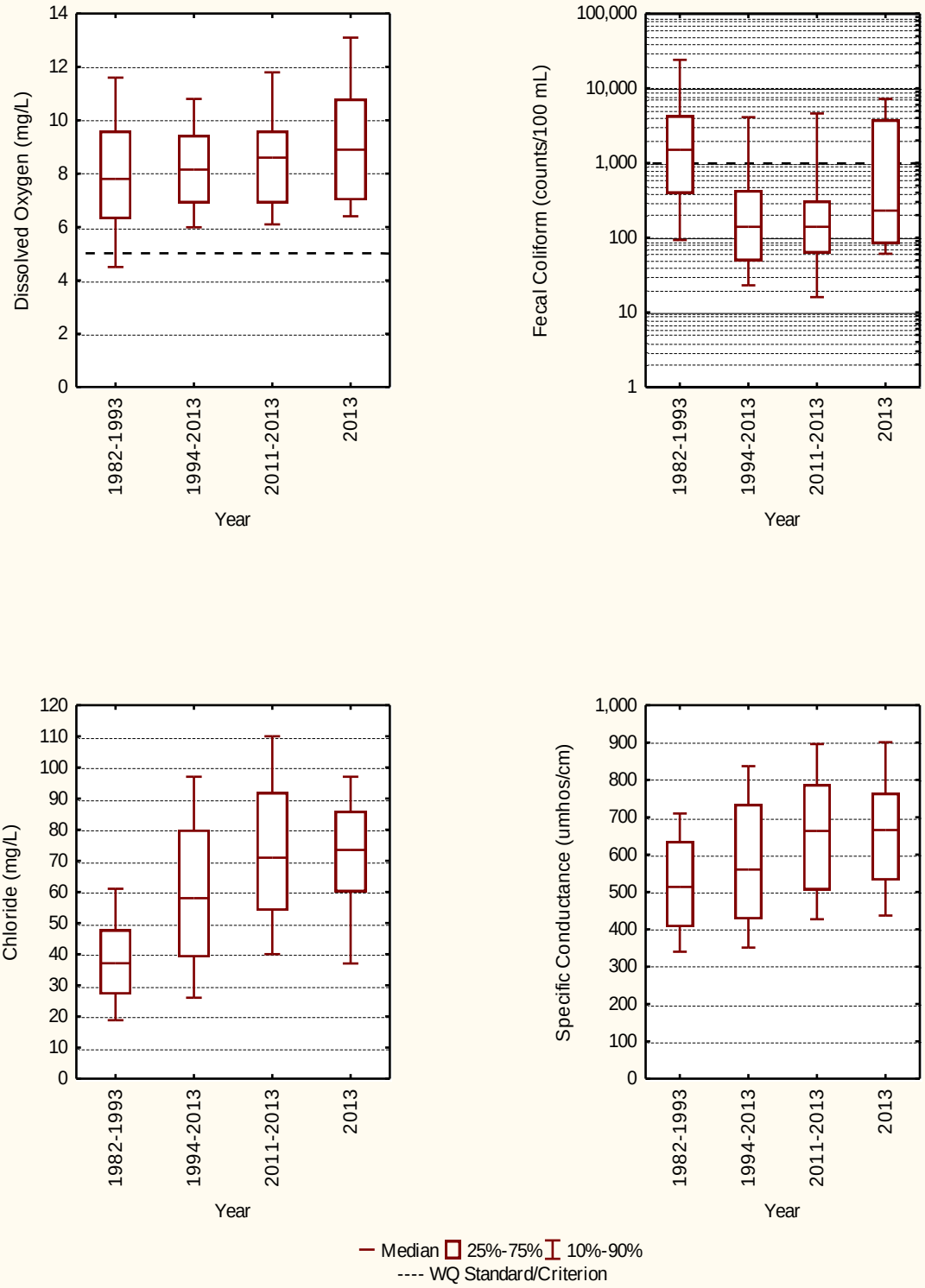
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	44.67	20.71	0.1	3.4	7.2	3.1	1.6	24.6	0.3	3.3	0.9	ND
Standard Error	3.50	2.31	0.1	0.6	1.0	0.6	0.9	3.9	0.3	0.9	0.7	ND
Median	45.00	20.00	0.0	2.7	8.8	2.4	0.0	18.0	0.0	3.7	0.0	ND
Mode	Multi	20.00	0.0	Multi	0.0	0.0	0.0	18.0	0.0	0.0	0.0	ND
Standard Deviation	13.54	8.95	0.3	2.3	4.8	2.2	3.5	18.0	1.1	3.4	2.7	ND
Sample Variance	183.38	80.07	0.1	5.4	22.7	5.0	12.2	322.3	1.3	11.2	7.2	ND
Range	46.00	28.50	0.7	10.0	16.0	7.7	10.0	71.0	3.9	9.0	10.0	ND
Minimum	21.00	7.50	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	67.00	36.00	0.7	10.0	16.0	7.7	10.0	71.0	3.9	9.0	10.0	ND
Count	15	15	15	15	21	15	15	21	12	15	15	0
Confidence Level (95%)	7.50	4.96	0.1	1.3	2.2	1.2	1.9	8.2	0.7	1.9	1.5	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	196	134	7.1	ND	38.2	29.6	8.0	8.5
Standard Error	18	8	2.2	ND	1.6	1.8	0.9	1.2
Median	190	140	2.2	ND	37.0	30.0	6.0	6.3
Mode	190	150	0.0	ND	Multi	Multi	4.8	4.4
Standard Deviation	71	52	17.5	ND	10.5	12.2	7.0	7.9
Sample Variance	4974	2718	307.9	ND	110.8	147.8	49.1	62.9
Range	226	176	83.0	ND	37.0	40.2	36.2	35.2
Minimum	84	44	0.0	ND	19.0	7.8	2.8	2.8
Maximum	310	220	83.0	ND	56.0	48.0	39.0	38.0
Count	15	45	63	0	45	45	63	45
Confidence Level (95%)	39	16	4.4	ND	3.2	3.7	1.8	2.4

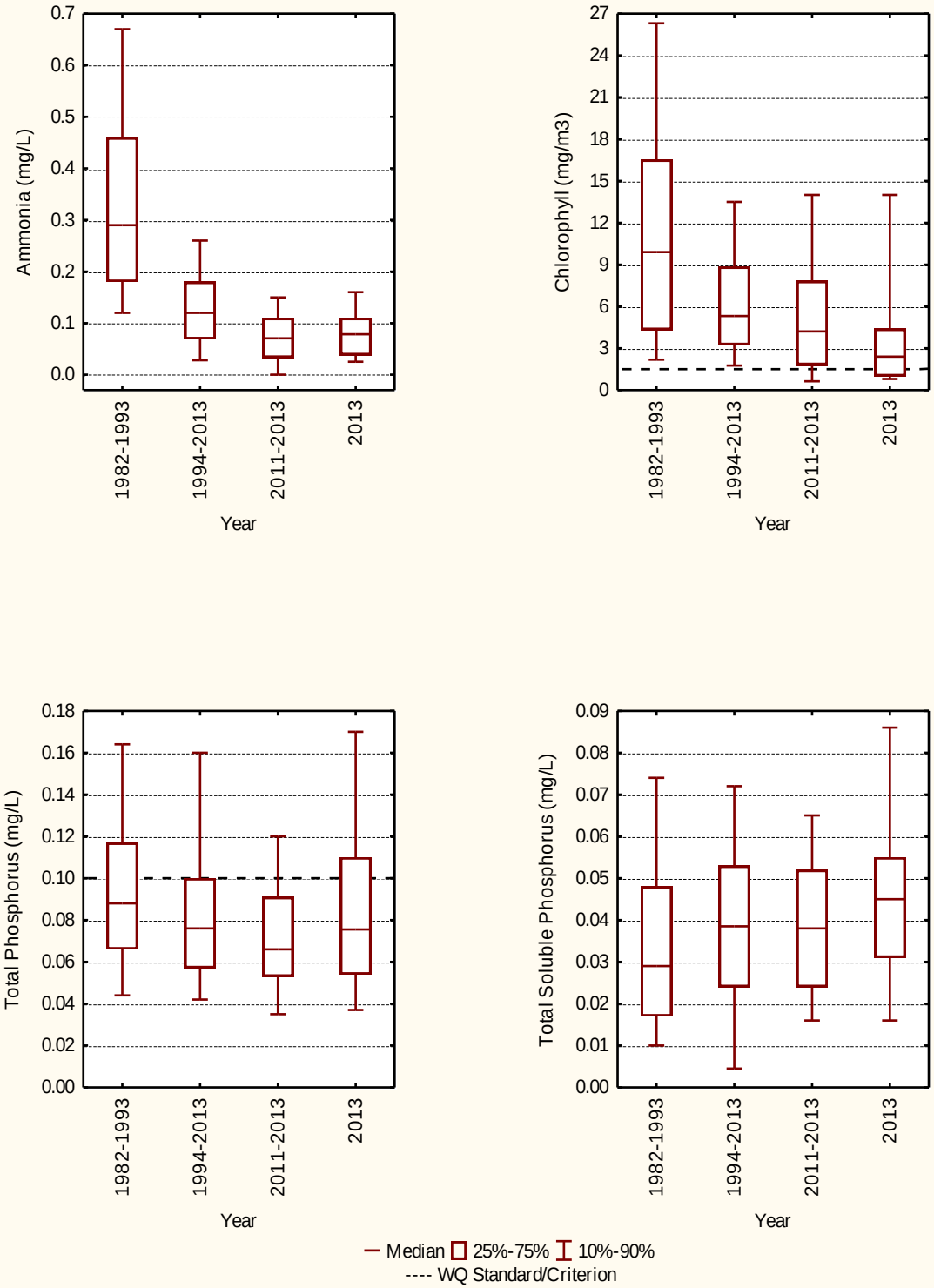
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

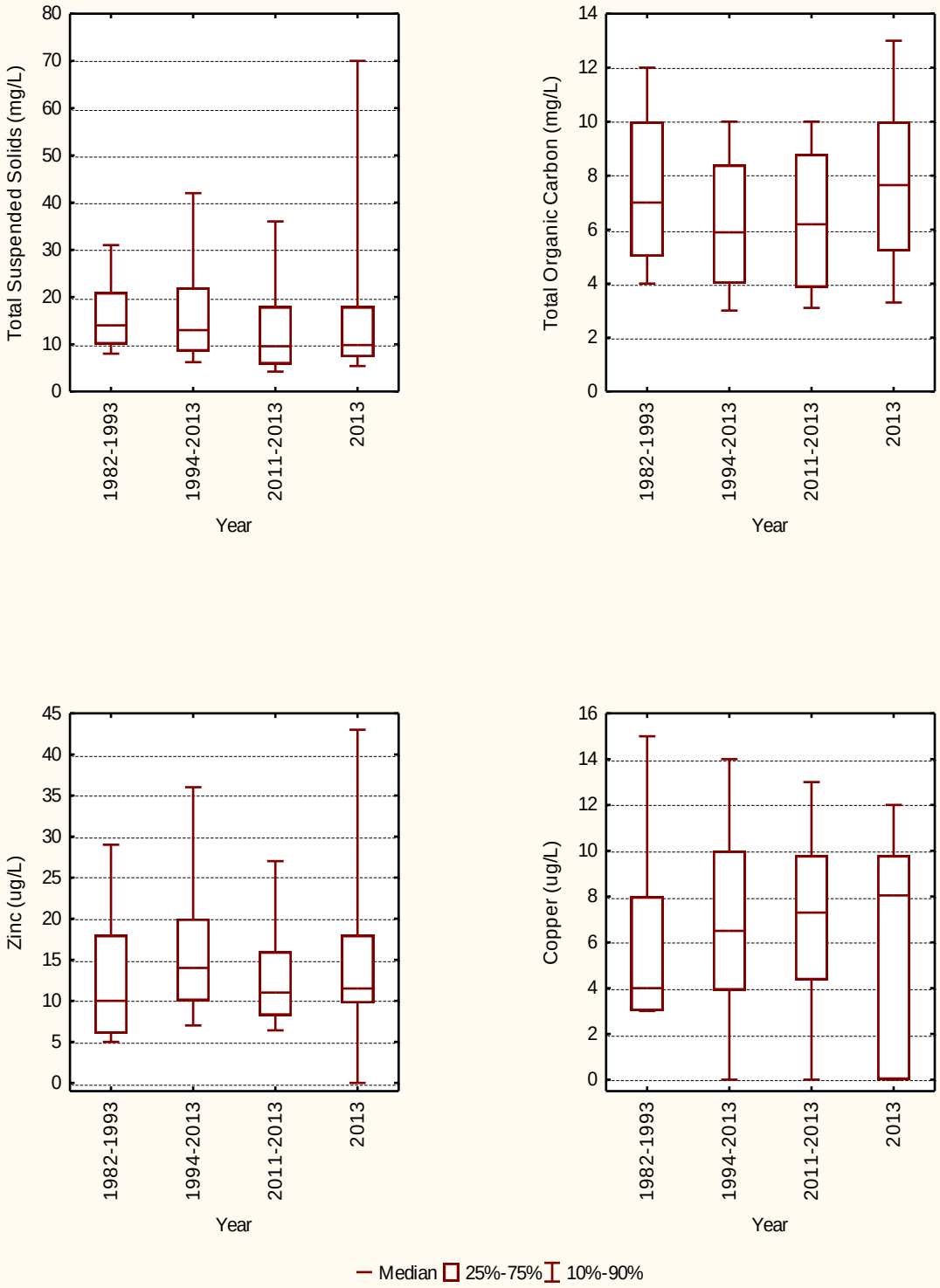
MMSD Water Quality Monitoring Program Data
Milwaukee River at C-NW Railway, Site RI-15



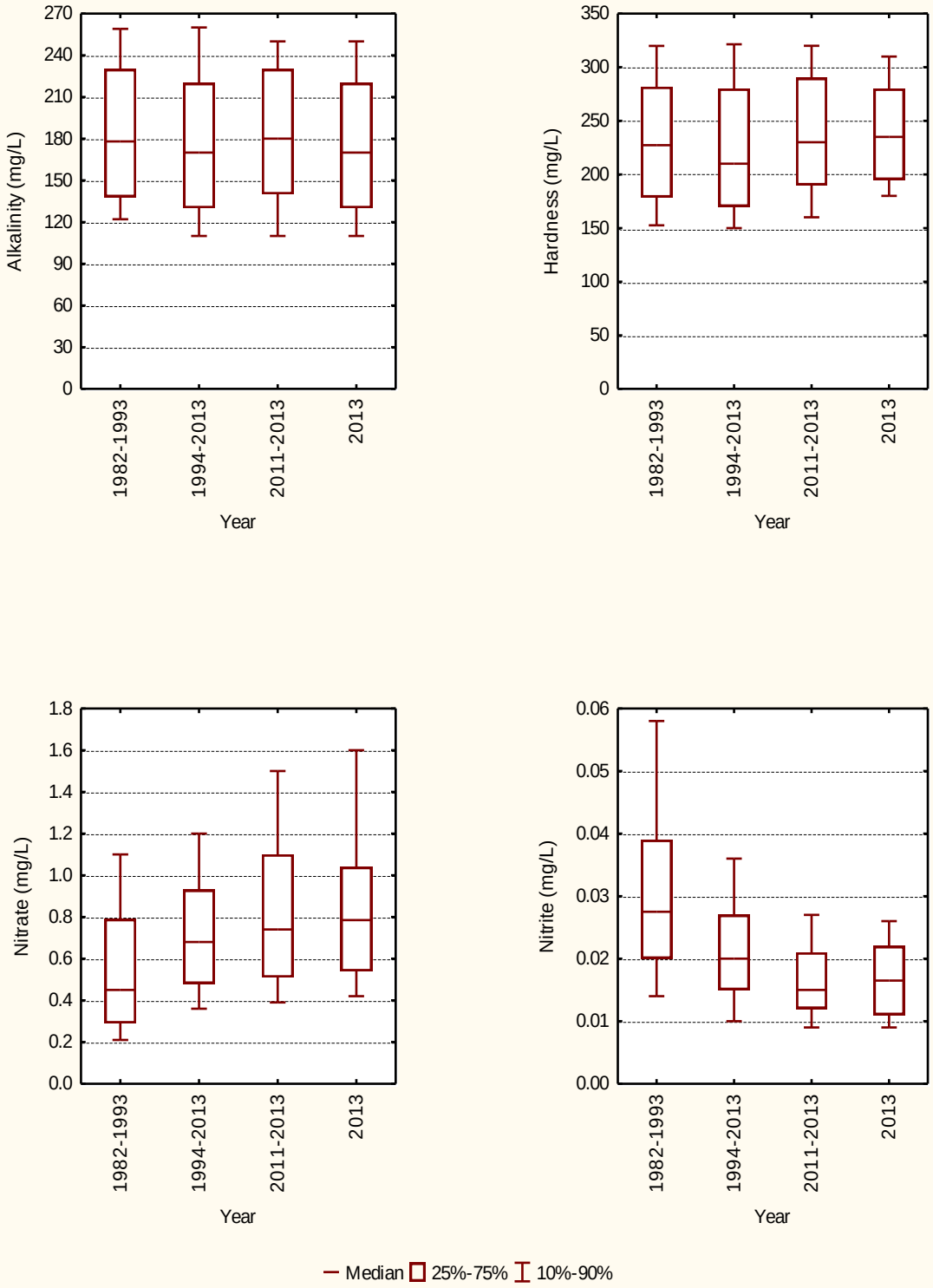
MMSD Water Quality Monitoring Program Data
Milwaukee River at C-NW Railway, Site RI-15



MMSD Water Quality Monitoring Program Data
Milwaukee River at C-NW Railway, Site RI-15



MMSD Water Quality Monitoring Program Data
Milwaukee River at C-NW Railway, Site RI-15



C & NW RAILWAY - SITE 15
MILWAUKEE RIVER
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.0	13.5	9.0	4.22	0.86	0.017	0.88	0.083	0.77	0.092	0.046	ND
Standard Error	0.0	0.9	0.3	1.26	0.07	0.001	0.07	0.007	0.05	0.009	0.003	ND
Median	8.0	15.5	8.9	2.40	0.79	0.016	0.81	0.078	0.77	0.076	0.045	ND
Mode	8.0	Multi	8.9	Multi	Multi	0.011	Multi	0.000	Multi	Multi	Multi	ND
Standard Deviation	0.2	6.7	2.5	5.34	0.42	0.008	0.43	0.054	0.31	0.063	0.024	ND
Sample Variance	0.0	44.7	6.1	28.54	0.18	0.000	0.18	0.003	0.10	0.004	0.001	ND
Range	0.7	21.7	9.2	20.83	1.37	0.036	1.46	0.200	1.34	0.282	0.106	ND
Minimum	7.6	1.5	4.7	0.17	0.33	0.000	0.34	0.000	0.26	0.018	0.004	ND
Maximum	8.3	23.1	13.9	21.00	1.70	0.036	1.80	0.200	1.60	0.300	0.110	ND
Count	54	54	54	18	36	36	36	54	36	54	54	0
Confidence Level (95%)	0.0	1.8	0.7	2.66	0.14	0.003	0.15	0.015	0.11	0.017	0.007	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	1.1	2.7	378.9	351.4	7.2	22.6	17.6	657	73.8	2071	2.6	ND
Standard Error	0.1	0.3	15.5	15.1	1.5	4.4	2.9	23	3.8	794	0.2	ND
Median	1.2	2.8	395.0	336.5	3.3	9.9	8.9	666	73.5	230	2.4	ND
Mode	Multi	Multi	460.0	330.0	Multi	13.0	Multi	Multi	68.0	240	2.4	ND
Standard Deviation	0.5	1.1	93.2	90.7	8.7	32.2	21.4	169	27.8	3370	0.8	ND
Sample Variance	0.3	1.3	8684.4	8219.8	76.2	1036.9	456.7	28514	775.1	11355547	0.7	ND
Range	1.7	3.5	320.0	317.0	28.4	137.4	88.4	719	140.0	11960	2.5	ND
Minimum	0.3	0.7	180.0	173.8	1.6	2.6	2.6	341	20.0	40	1.6	ND
Maximum	2.0	4.2	500.0	490.8	30.0	140.0	91.0	1060	160.0	12000	4.1	ND
Count	18	14	36	36	36	54	54	54	54	18	18	0
Confidence Level (95%)	0.3	0.7	31.5	30.7	3.0	8.8	5.8	46	7.6	1676	0.4	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

C & NW RAILWAY - SITE 15
MILWAUKEE RIVER
WATER QUALITY DATA - 2013

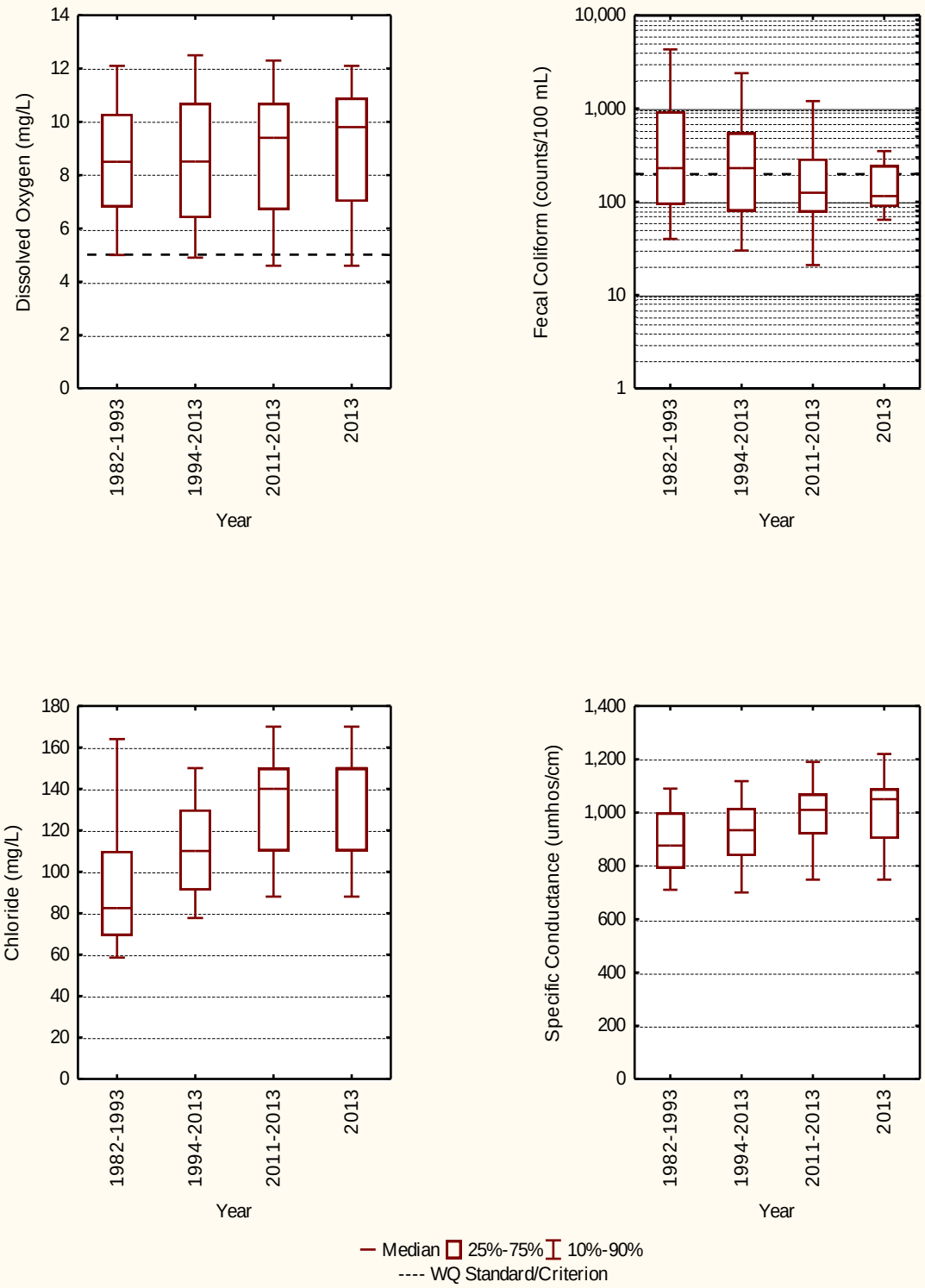
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	51.42	27.08	0.2	3.2	6.6	2.7	1.3	17.3	0.0	5.2	0.0	ND
Standard Error	2.68	2.13	0.1	0.6	1.0	0.6	0.8	4.4	0.0	1.0	0.0	ND
Median	51.50	25.50	0.0	2.3	8.1	2.2	0.0	11.5	0.0	5.9	0.0	ND
Mode	52.00	Multi	0.0	2.1	0.0	0.0	0.0	Multi	0.0	0.0	0.0	ND
Standard Deviation	9.28	7.39	0.4	2.0	4.4	2.2	2.8	18.6	0.0	3.6	0.0	ND
Sample Variance	86.08	54.63	0.2	3.8	19.6	5.0	7.8	345.7	0.0	12.6	0.0	ND
Range	30.00	22.00	1.1	6.2	12.0	8.2	7.0	75.0	0.0	9.7	0.0	ND
Minimum	38.00	17.00	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	68.00	39.00	1.1	7.8	12.0	8.2	7.0	75.0	0.0	9.7	0.0	ND
Count	12	12	12	12	18	12	11	18	10	12	12	0
Confidence Level (95%)	5.90	4.70	0.2	1.2	2.2	1.4	1.9	9.2	0.0	2.3	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	238	172	0.9	ND	45.4	38.1	7.8	7.0
Standard Error	15	8	0.2	ND	2.0	1.6	0.4	0.5
Median	235	170	0.0	ND	43.5	35.5	7.7	6.6
Mode	Multi	110	0.0	ND	37.0	Multi	10.0	13.0
Standard Deviation	53	51	1.6	ND	12.2	9.6	3.2	3.3
Sample Variance	2815	2593	2.5	ND	148.4	91.5	10.4	10.6
Range	160	162	5.6	ND	38.0	28.0	11.4	11.7
Minimum	160	98	0.0	ND	29.0	26.0	2.6	2.3
Maximum	320	260	5.6	ND	67.0	54.0	14.0	14.0
Count	12	36	54	0	36	36	54	36
Confidence Level (95%)	34	17	0.4	ND	4.1	3.2	0.9	1.1

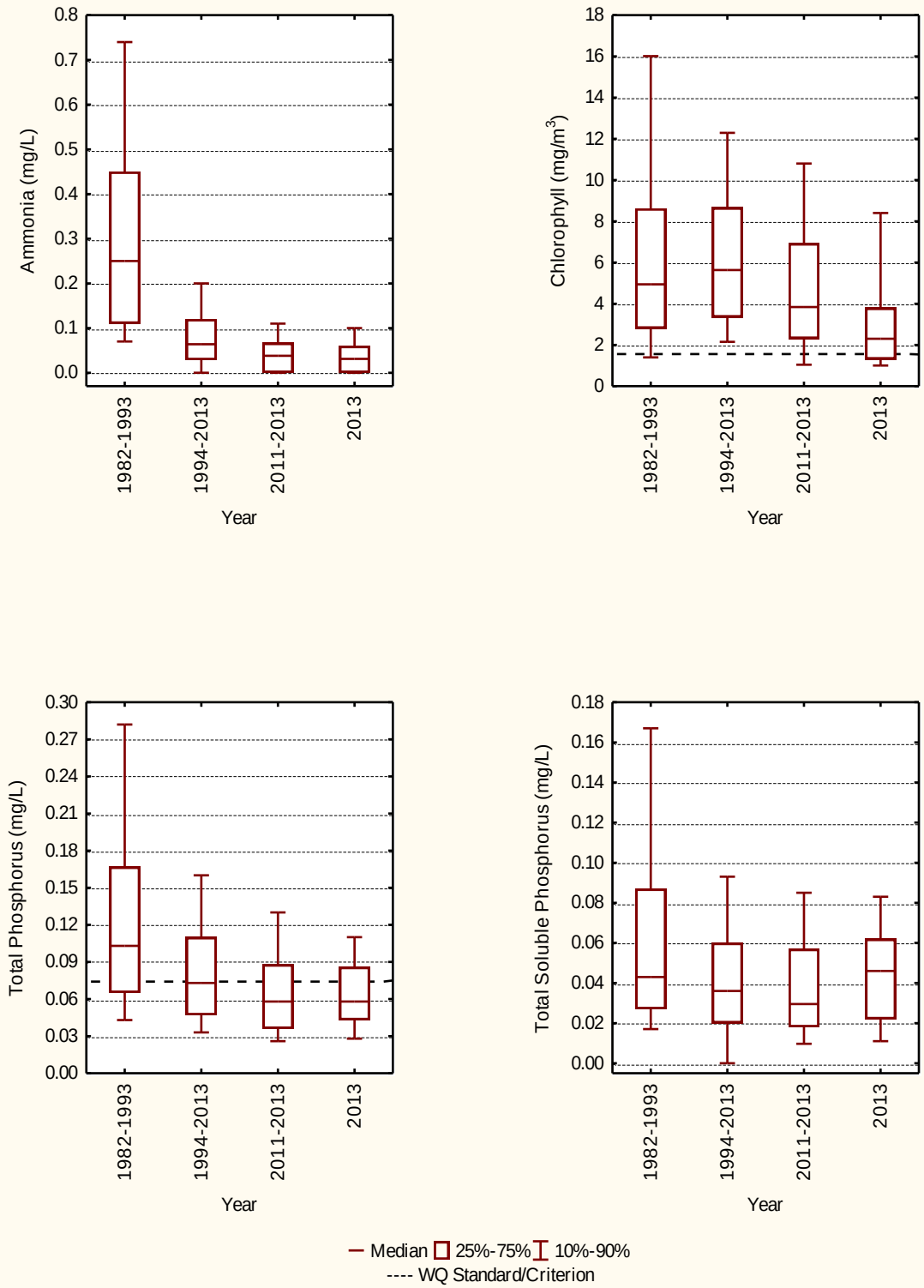
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

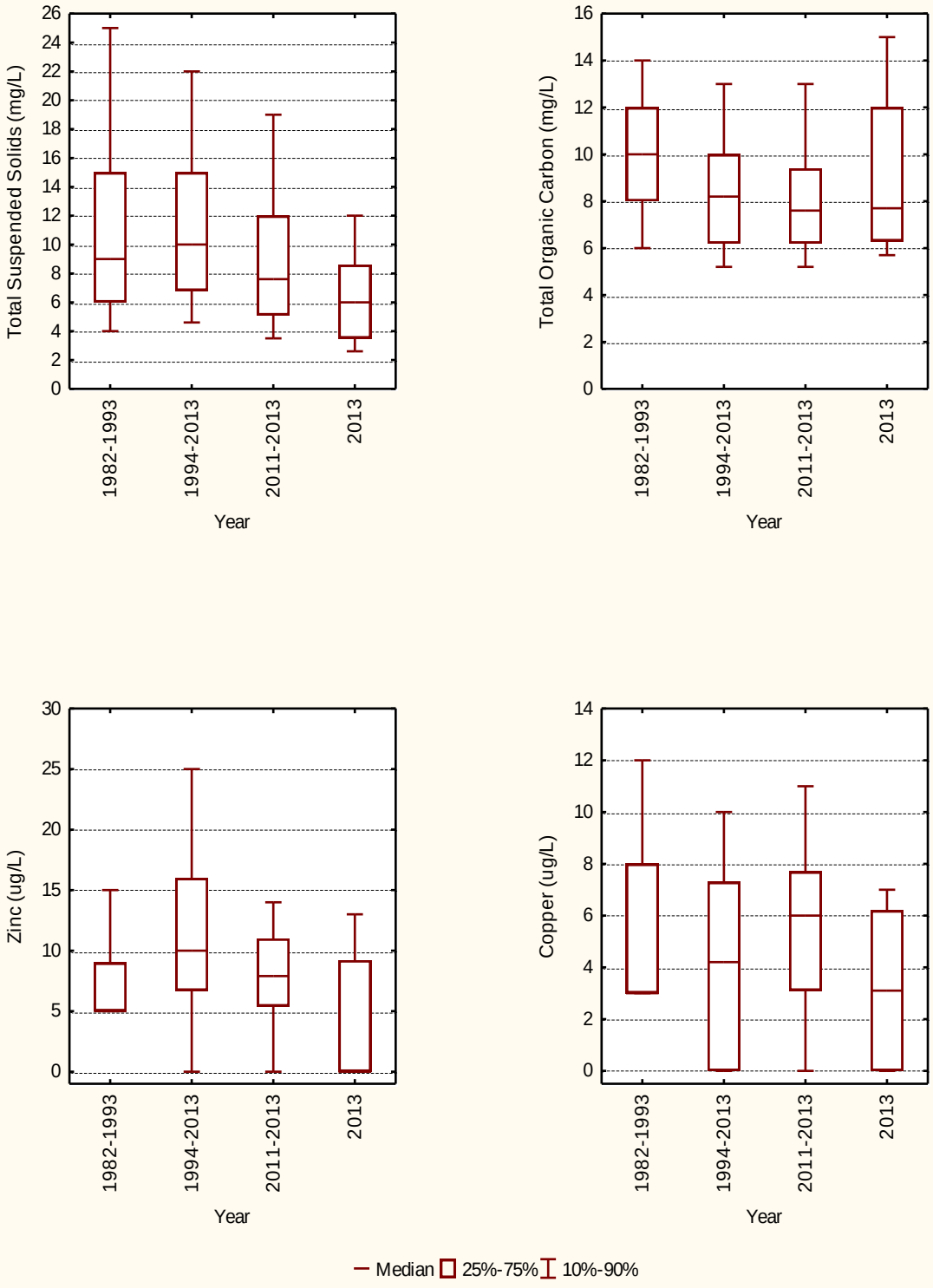
MMSD Water Quality Monitoring Program Data
Menomonee River at County Line Rd., Site RI-16



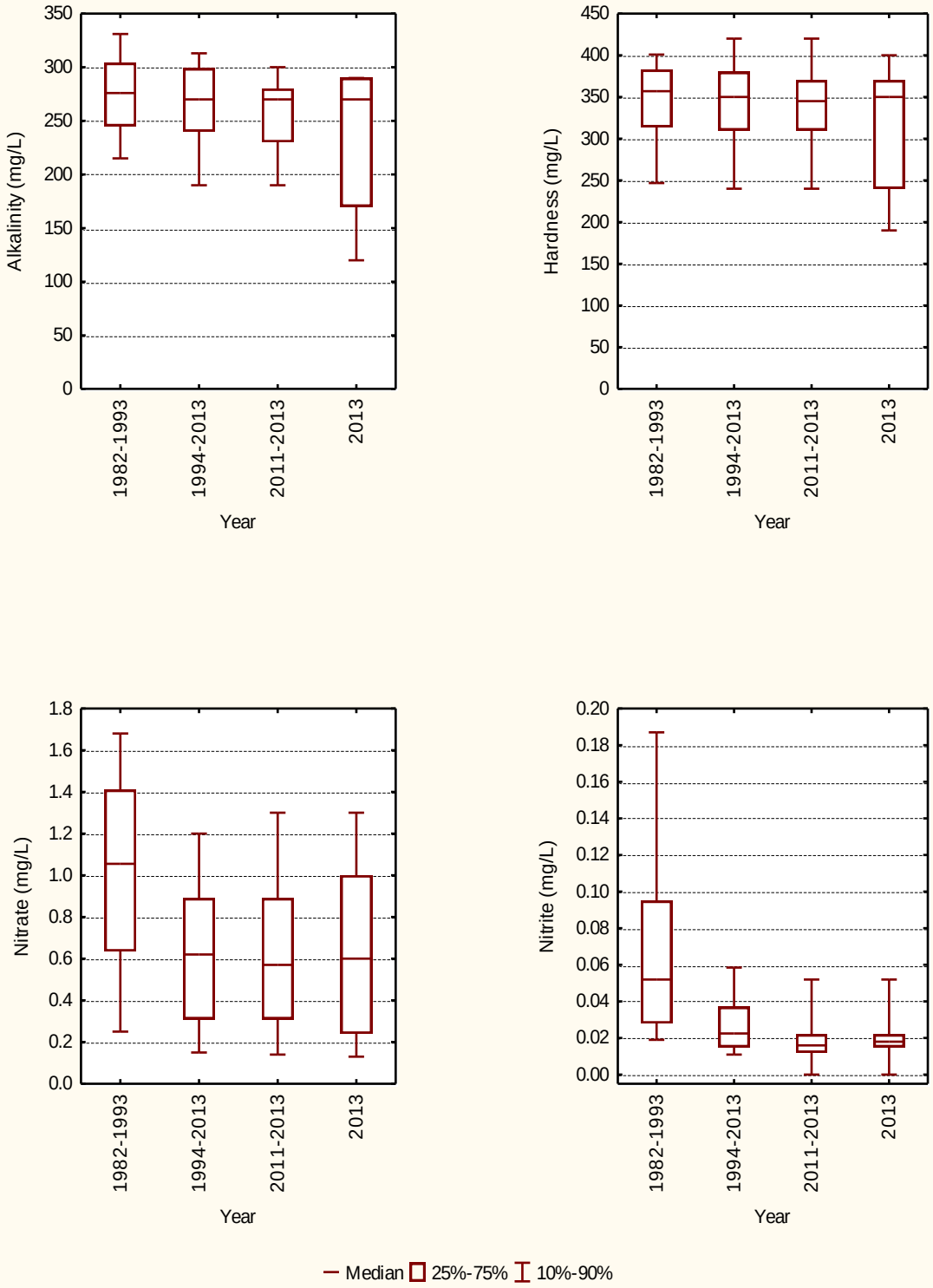
MMSD Water Quality Monitoring Program Data
Menomonee River at County Line Rd., Site RI-16



MMSD Water Quality Monitoring Program Data
Menomonee River at County Line Rd., Site RI-16



MMSD Water Quality Monitoring Program Data
Menomonee River at County Line Rd., Site RI-16



COUNTY LINE RD. - SITE 16
MENOMONEE RIVER
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.8	12.0	9.0	3.83	0.63	0.023	0.65	0.047	0.76	0.068	0.047	ND
Standard Error	0.1	2.0	0.6	0.94	0.11	0.005	0.11	0.013	0.06	0.008	0.007	ND
Median	7.8	14.2	9.8	2.30	0.60	0.018	0.62	0.031	0.68	0.058	0.046	ND
Mode	7.7	18.7	Multi	1.40	0.60	Multi	Multi	0.000	Multi	0.028	Multi	ND
Standard Deviation	0.3	9.0	2.9	4.30	0.44	0.020	0.44	0.062	0.22	0.037	0.032	ND
Sample Variance	0.1	80.5	8.7	18.53	0.19	0.000	0.19	0.004	0.05	0.001	0.001	ND
Range	1.3	26.5	9.8	15.09	1.31	0.077	1.27	0.260	0.78	0.137	0.113	ND
Minimum	7.4	0.0	3.4	0.91	0.09	0.000	0.13	0.000	0.42	0.023	0.007	ND
Maximum	8.7	26.5	13.2	16.00	1.40	0.077	1.40	0.260	1.20	0.160	0.120	ND
Count	18	21	21	21	15	15	15	21	15	21	21	0
Confidence Level (95%)	0.1	4.1	1.3	1.96	0.24	0.011	0.24	0.028	0.12	0.017	0.015	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	568.7	561.3	2.9	7.1	7.6	984	141.7	207	2.2	ND
Standard Error	ND	ND	29.8	30.5	0.8	1.1	1.3	51	10.0	57	0.1	ND
Median	ND	ND	590.0	583.4	2.1	6.0	4.8	1050	150.0	115	2.1	ND
Mode	ND	ND	Multi	Multi	1.0	Multi	Multi	Multi	150.0	110	2.0	ND
Standard Deviation	ND	ND	115.6	118.0	3.2	5.1	5.9	235	46.0	253	0.4	ND
Sample Variance	ND	ND	13355.2	13917.2	10.3	25.6	35.3	55109	2116.2	63971	0.1	ND
Range	ND	ND	390.0	387.0	13.0	18.7	18.1	1015	210.0	1174	1.7	ND
Minimum	ND	ND	360.0	351.0	1.0	2.3	2.0	315	80.0	26	1.4	ND
Maximum	ND	ND	750.0	738.0	14.0	21.0	20.1	1330	290.0	1200	3.1	ND
Count	0	0	15	15	15	21	21	21	21	20	20	0
Confidence Level (95%)	ND	ND	64.0	65.3	1.8	2.3	2.7	107	20.9	118	0.2	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

COUNTY LINE RD. - SITE 16
MENOMONEE RIVER
WATER QUALITY DATA - 2013

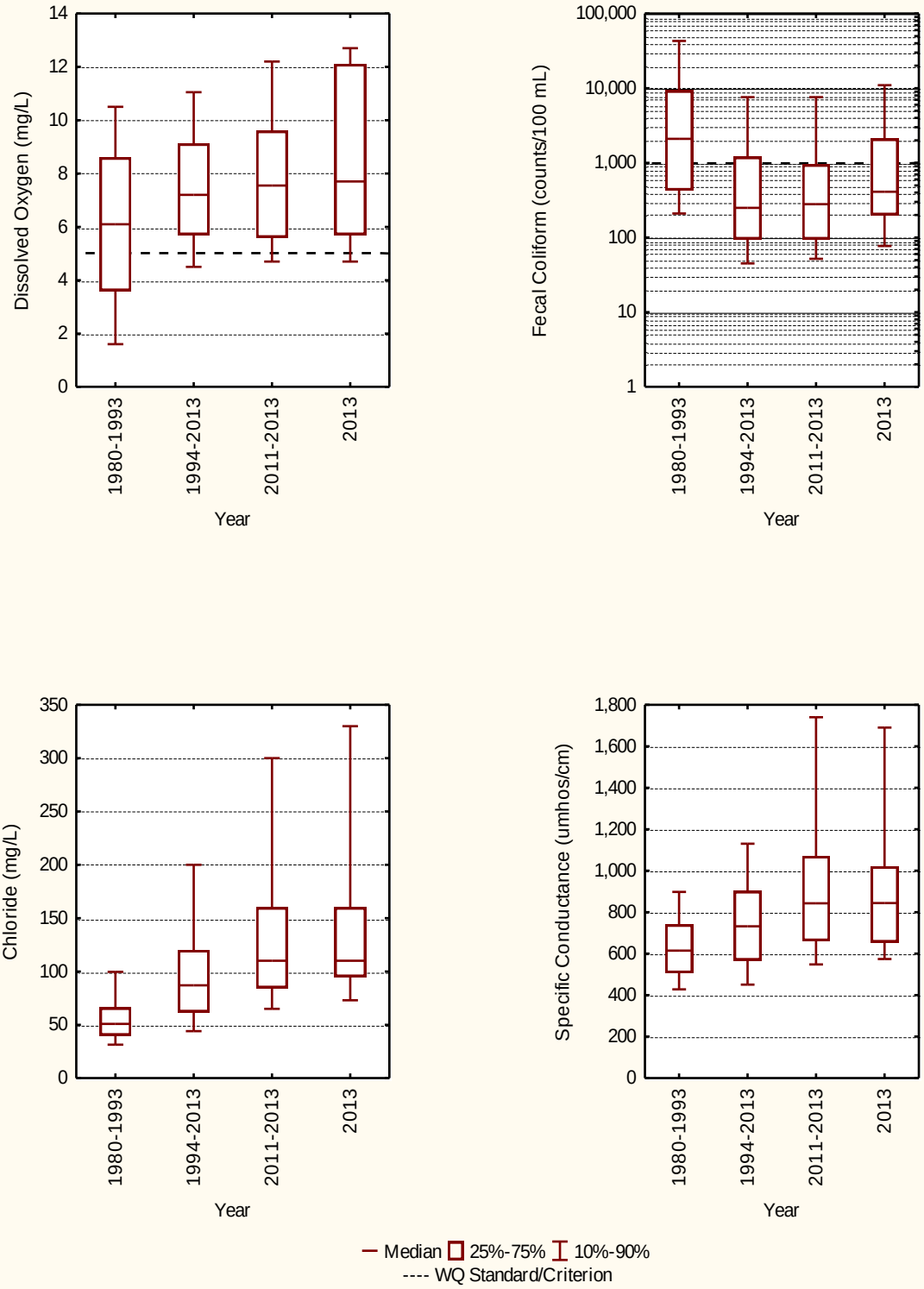
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	66.87	37.47	0.3	1.6	3.2	2.2	0.6	5.1	0.6	5.0	0.0	ND
Standard Error	4.09	2.88	0.1	0.3	0.7	0.5	0.6	1.5	0.4	0.9	0.0	ND
Median	69.00	42.00	0.0	1.8	3.1	1.9	0.0	0.0	0.0	6.4	0.0	ND
Mode	63.00	42.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	15.86	11.17	0.4	1.3	3.3	1.8	2.1	6.8	1.6	3.2	0.0	ND
Sample Variance	251.41	124.70	0.2	1.8	11.0	3.2	4.3	46.7	2.5	10.5	0.0	ND
Range	60.00	35.00	1.3	4.1	8.1	5.4	7.8	24.0	4.4	8.6	0.0	ND
Minimum	40.00	17.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	100.00	52.00	1.3	4.1	8.1	5.4	7.8	24.0	4.4	8.6	0.0	ND
Count	15	15	15	15	21	15	14	21	13	12	14	0
Confidence Level (95%)	8.78	6.18	0.2	0.7	1.5	1.0	1.2	3.1	1.0	2.1	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	321	231	0.3	ND	59.7	50.9	9.0	8.6
Standard Error	21	18	0.2	ND	3.5	3.3	0.8	0.9
Median	350	270	0.0	ND	65.0	57.0	7.7	7.4
Mode	360	Multi	0.0	ND	Multi	60.0	Multi	Multi
Standard Deviation	82	70	1.0	ND	13.6	12.9	3.7	3.6
Sample Variance	6727	4955	0.9	ND	185.4	165.6	13.8	12.7
Range	290	211	3.9	ND	42.0	39.0	12.1	11.2
Minimum	170	89	0.0	ND	34.0	25.0	3.9	4.8
Maximum	460	300	3.9	ND	76.0	64.0	16.0	16.0
Count	15	15	21	0	15	15	21	15
Confidence Level (95%)	45	39	0.4	ND	7.5	7.1	1.7	2.0

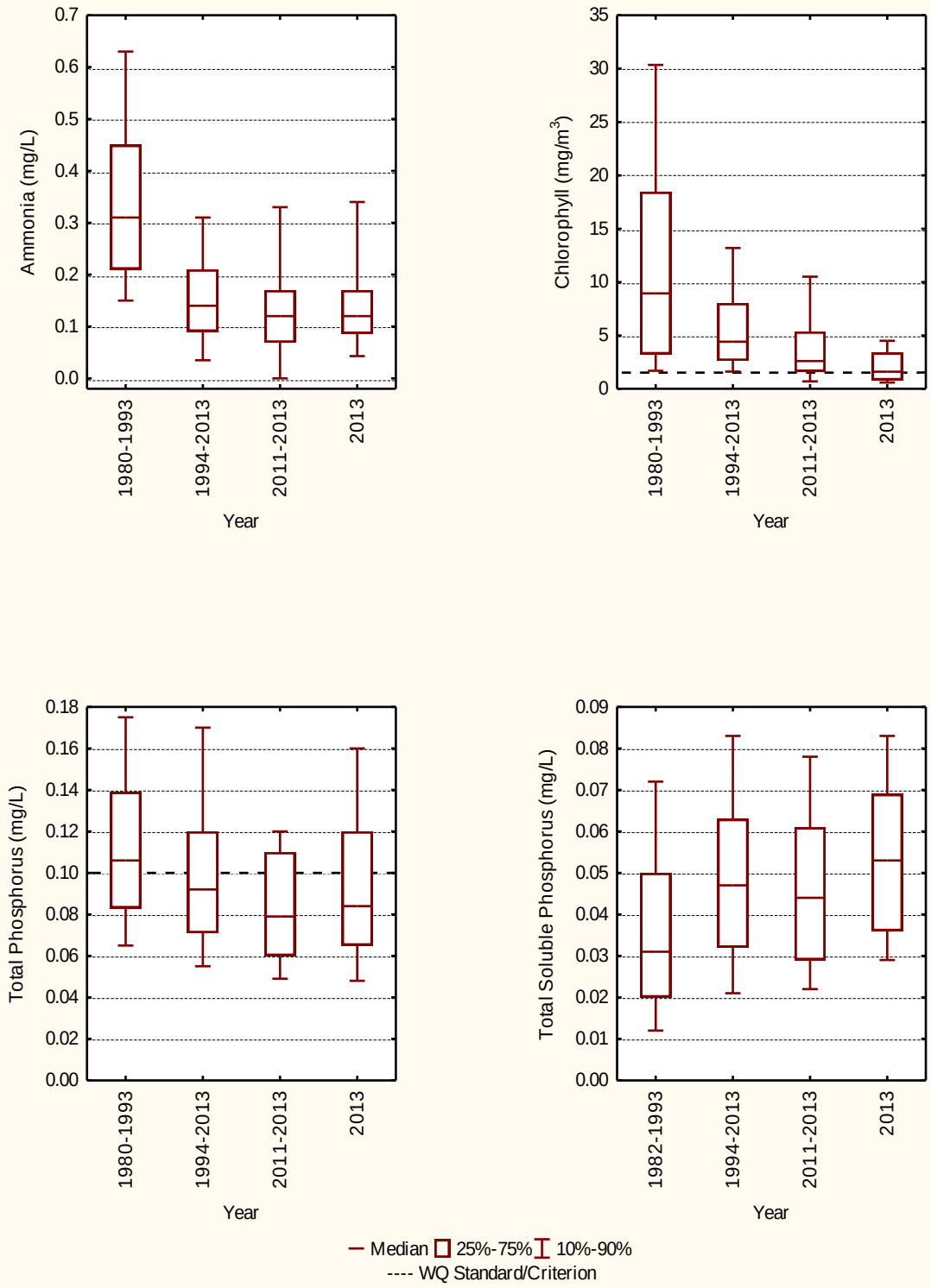
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

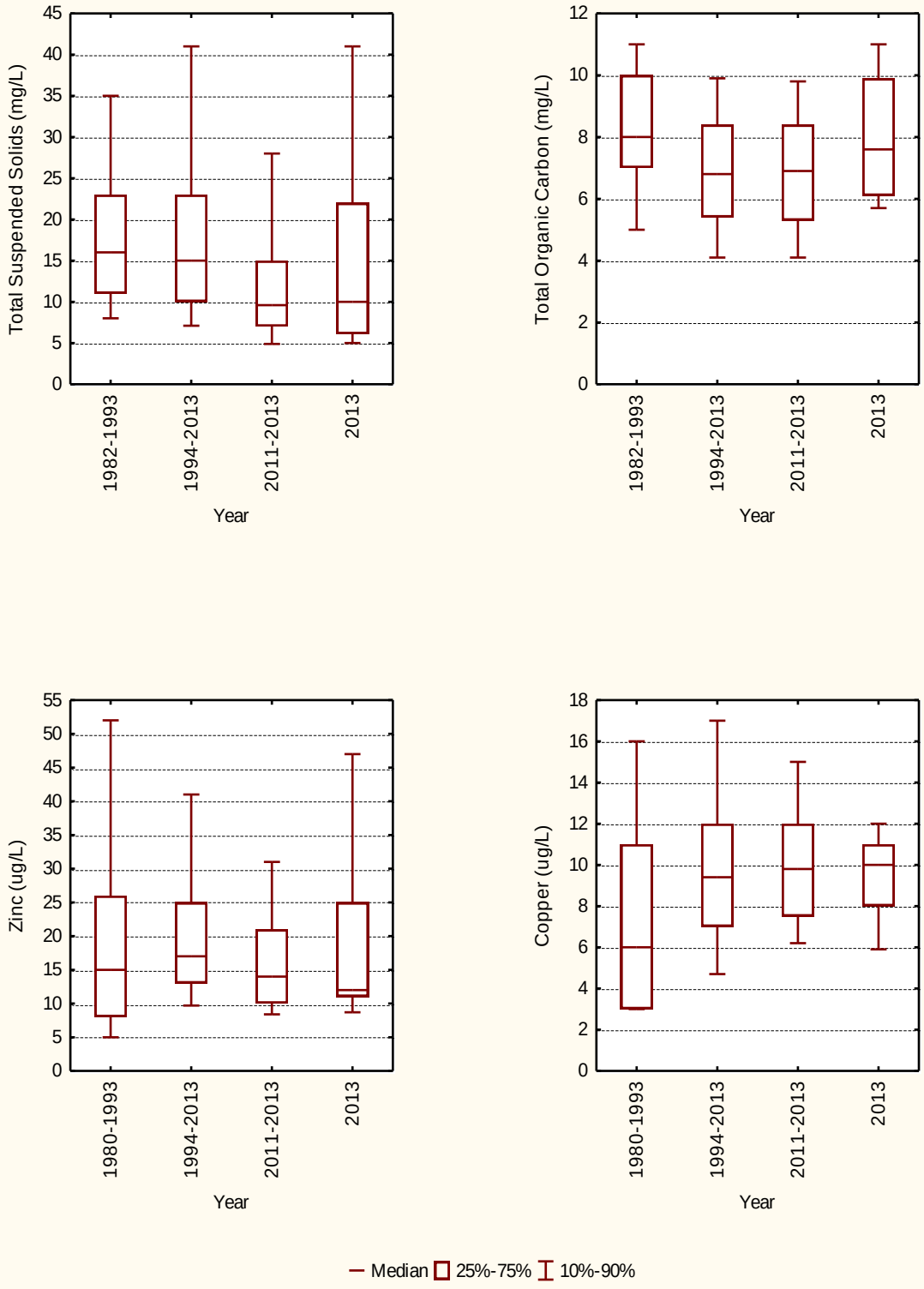
MMSD Water Quality Monitoring Program Data
Menomonee River at South Second St., Site RI-17



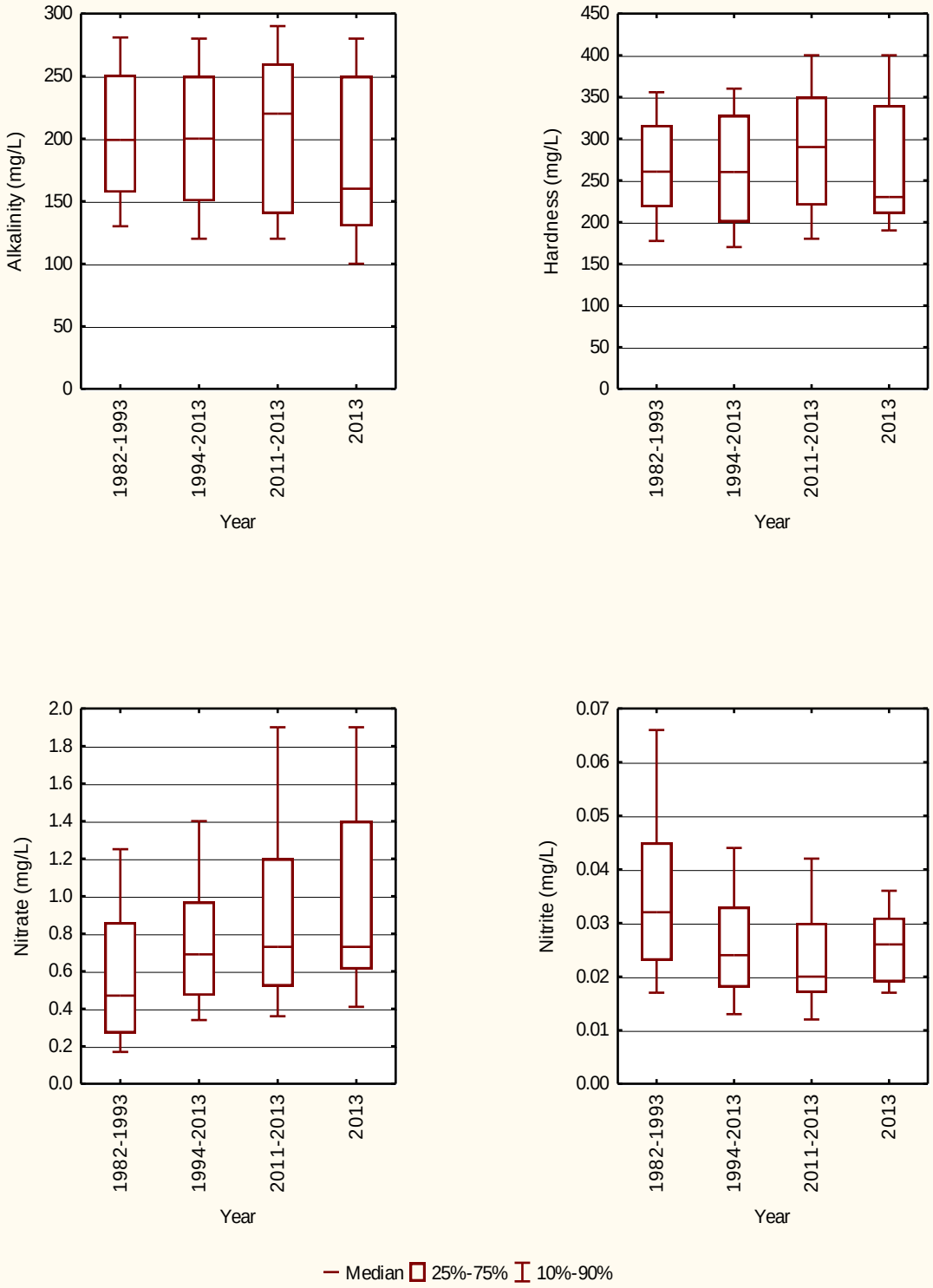
MMSD Water Quality Monitoring Program Data
Menomonee River at South Second St., Site RI-17



MMSD Water Quality Monitoring Program Data
Menomonee River at South Second St., Site RI-17



MMSD Water Quality Monitoring Program Data
Menomonee River at South Second St., Site RI-17



S. 2ND ST. - SITE 17
MENOMONEE RIVER
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.9	14.2	8.4	2.51	0.98	0.026	1.00	0.150	0.88	0.096	0.054	ND
Standard Error	0.0	1.0	0.4	0.54	0.08	0.001	0.08	0.013	0.03	0.006	0.003	ND
Median	7.9	16.3	7.7	1.60	0.73	0.026	0.76	0.120	0.89	0.084	0.053	ND
Mode	7.8	Multi	Multi	1.60	2.00	Multi	2.00	0.120	1.10	0.120	Multi	ND
Standard Deviation	0.2	8.3	3.3	2.48	0.53	0.010	0.53	0.105	0.21	0.044	0.021	ND
Sample Variance	0.0	68.1	10.6	6.13	0.28	0.000	0.28	0.011	0.05	0.002	0.000	ND
Range	0.9	26.2	11.6	9.56	1.65	0.053	1.73	0.460	0.77	0.202	0.087	ND
Minimum	7.6	0.3	1.9	0.44	0.35	0.011	0.37	0.000	0.43	0.028	0.013	ND
Maximum	8.5	26.5	13.5	10.00	2.00	0.064	2.10	0.460	1.20	0.230	0.100	ND
Count	60	63	63	21	45	45	45	63	45	62	62	0
Confidence Level (95%)	0.0	2.1	0.8	1.13	0.16	0.003	0.16	0.026	0.06	0.011	0.005	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	607.1	584.4	6.7	18.7	17.5	1000	183.4	3550	2.8	2622
Standard Error	ND	ND	56.9	57.2	1.2	2.7	2.0	73	29.7	1420	0.2	1296
Median	ND	ND	510.0	497.0	3.8	10.0	10.6	844	110.0	410	2.6	610
Mode	ND	ND	Multi	1878.0	Multi	13.0	Multi	1010	100.0	Multi	Multi	Multi
Standard Deviation	ND	ND	381.4	383.6	8.3	21.6	15.9	577	236.0	6505	0.8	5019
Sample Variance	ND	ND	145493.7	147114.3	68.1	467.9	251.4	333094	55713.3	42318726	0.7	25195254
Range	ND	ND	1650.0	1639.0	39.0	106.7	70.9	3054	1164.0	24953	2.7	16923
Minimum	ND	ND	250.0	239.0	0.0	3.3	4.9	396	36.0	47	1.7	77
Maximum	ND	ND	1900.0	1878.0	39.0	110.0	75.8	3450	1200.0	25000	4.4	17000
Count	0	0	45	45	45	63	63	63	63	21	21	15
Confidence Level (95%)	ND	ND	114.6	115.2	2.5	5.4	4.0	145	59.4	2961	0.4	2780

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

S. 2ND ST. - SITE 17
MENOMONEE RIVER
WATER QUALITY DATA - 2013

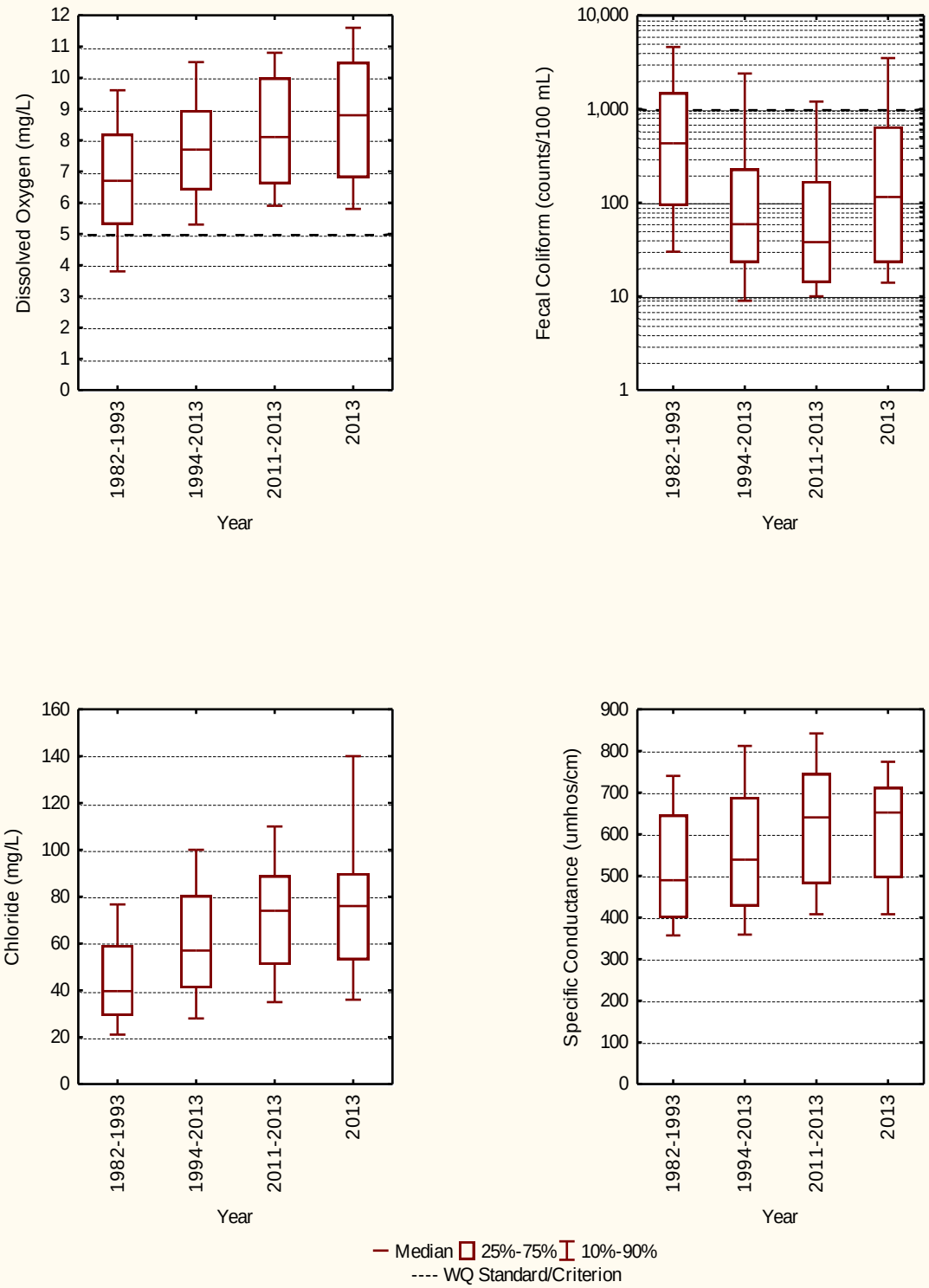
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	58.33	30.20	0.2	3.2	9.4	2.5	0.9	19.5	0.8	3.6	0.0	ND
Standard Error	4.29	2.90	0.1	0.5	0.9	0.8	0.6	3.4	0.5	1.1	0.0	ND
Median	53.00	25.00	0.0	2.7	10.0	2.1	0.0	12.0	0.0	2.6	0.0	ND
Mode	46.00	25.00	0.0	Multi	11.0	0.0	0.0	12.0	0.0	0.0	0.0	ND
Standard Deviation	16.61	11.24	0.3	1.9	4.0	3.0	2.4	15.7	1.8	3.9	0.0	ND
Sample Variance	275.95	126.31	0.1	3.6	16.3	9.1	5.8	246.2	3.3	15.5	0.0	ND
Range	59.00	39.00	0.7	7.9	18.0	11.0	7.1	51.0	4.7	9.5	0.0	ND
Minimum	36.00	12.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	95.00	51.00	0.7	7.9	18.0	11.0	7.1	51.0	4.7	9.5	0.0	ND
Count	15	15	15	15	21	15	14	21	12	14	13	0
Confidence Level (95%)	9.20	6.22	0.2	1.1	1.8	1.7	1.4	7.1	1.2	2.3	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	270	181	1.5	ND	47.9	40.0	8.0	7.6
Standard Error	22	11	0.3	ND	2.2	2.0	0.3	0.4
Median	230	160	0.0	ND	44.0	36.0	7.6	7.0
Mode	Multi	140	0.0	ND	38.0	28.0	11.0	11.0
Standard Deviation	86	71	2.2	ND	14.7	13.5	2.3	2.4
Sample Variance	7400	4997	4.7	ND	216.4	183.4	5.2	5.7
Range	310	239	6.5	ND	47.0	45.0	9.6	10.0
Minimum	140	61	0.0	ND	25.0	17.0	3.4	3.0
Maximum	450	300	6.5	ND	72.0	62.0	13.0	13.0
Count	15	45	63	0	45	45	63	45
Confidence Level (95%)	48	21	0.5	ND	4.4	4.1	0.6	0.7

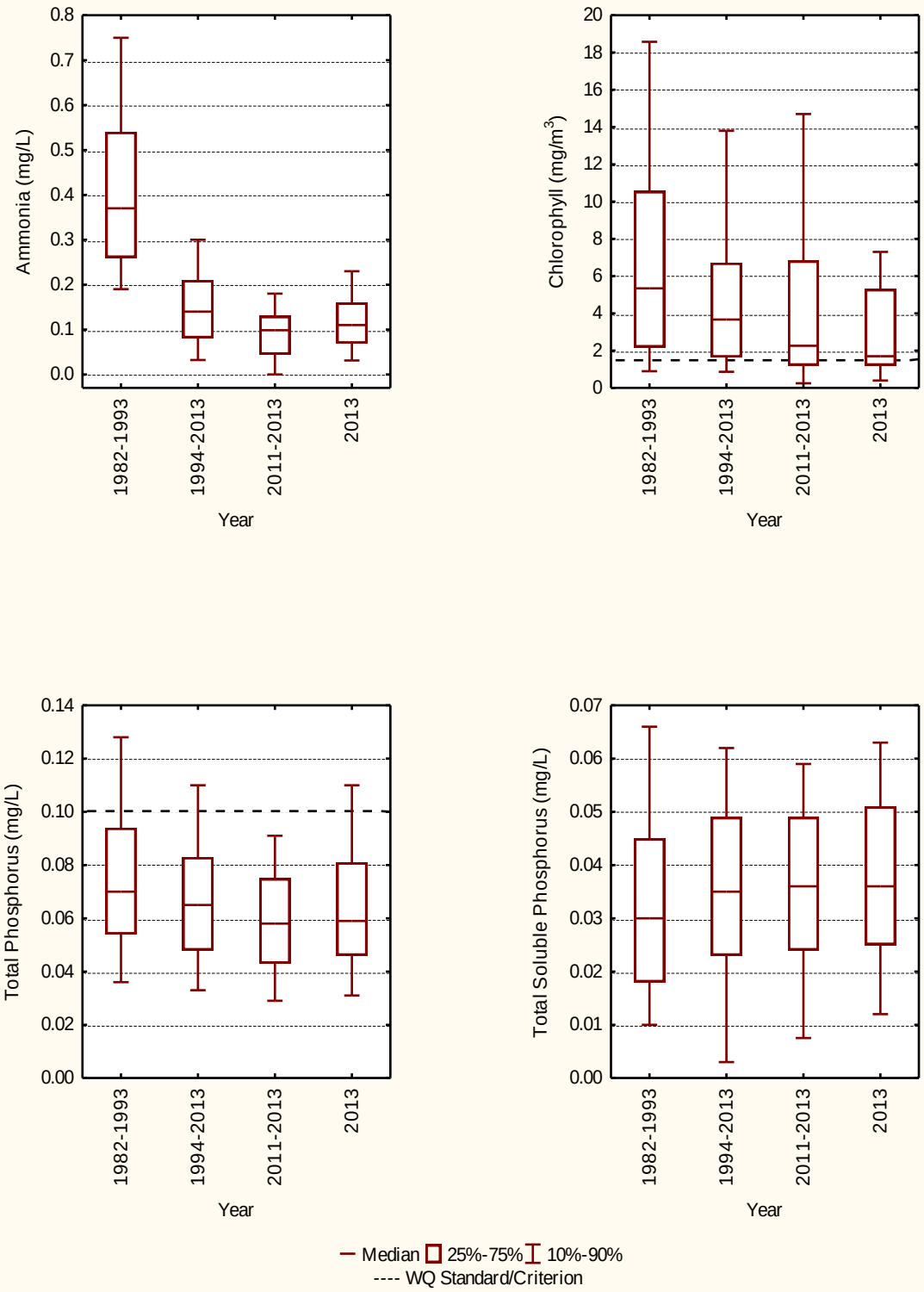
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

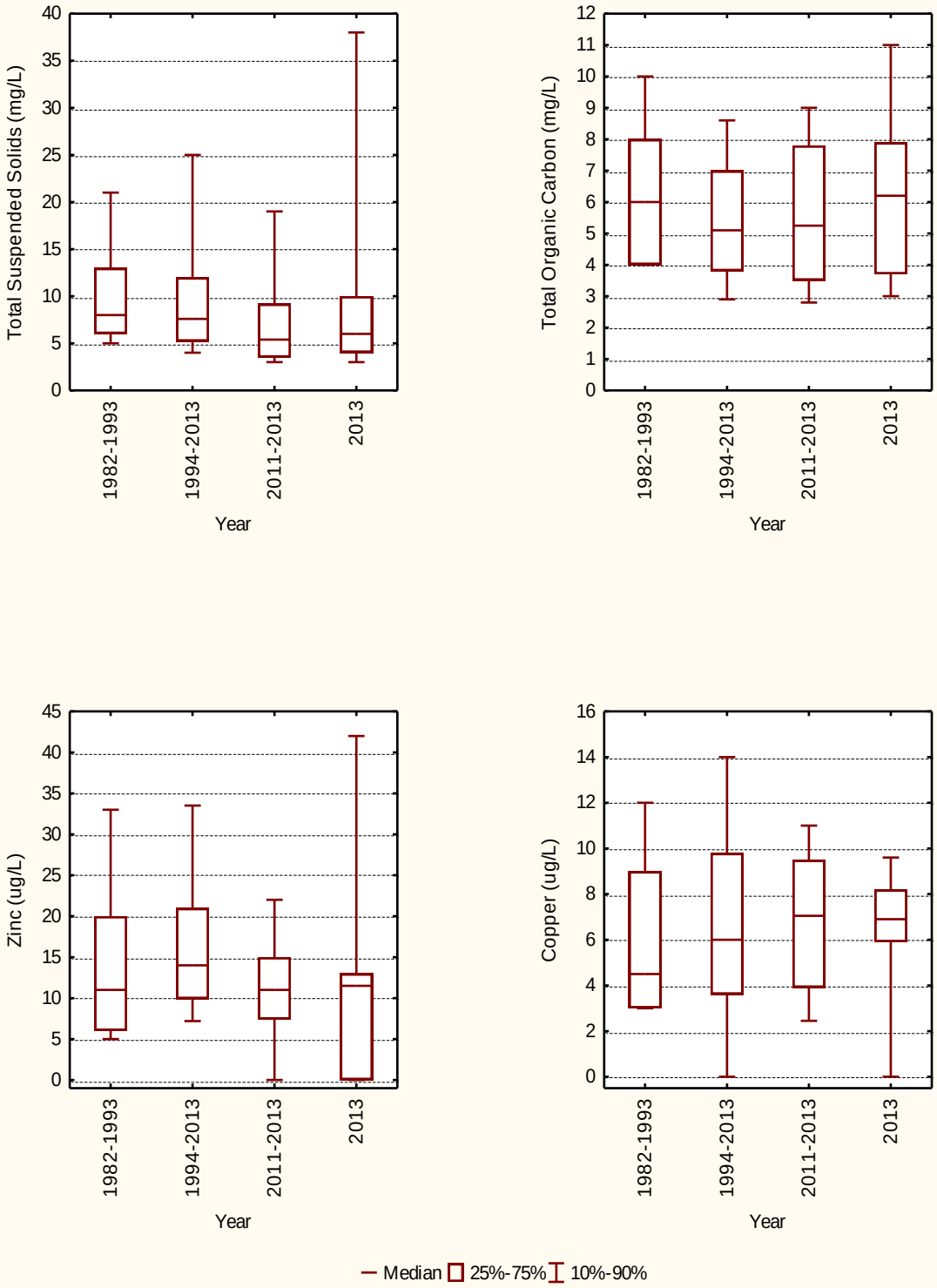
MMSD Water Quality Monitoring Program Data
Kinnickinnic River at Greenfield Ave. Extended, Site RI-18



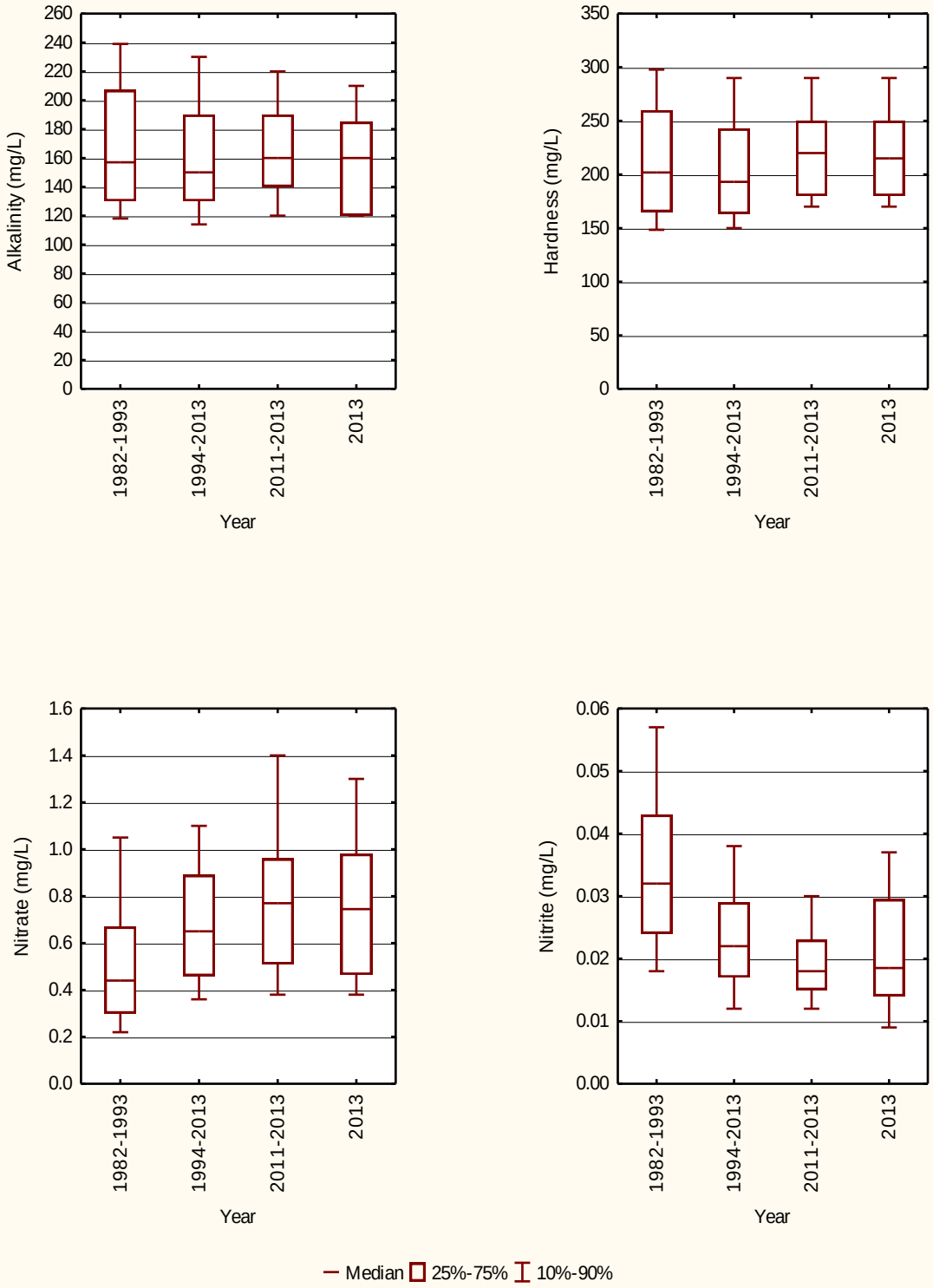
MMSD Water Quality Monitoring Program Data
Kinnickinnic River at Greenfield Ave. Extended, Site RI-18



MMSD Water Quality Monitoring Program Data
Kinnickinnic River at Greenfield Ave. Extended, Site RI-18



MMSD Water Quality Monitoring Program Data
Kinnickinnic River at Greenfield Ave. Extended, Site RI-18



GREENFIELD AVE. EXTENDED - SITE 18
KINNICKINNIC RIVER
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.9	12.9	8.5	3.39	0.78	0.021	0.80	0.128	0.68	0.069	0.039	ND
Standard Error	0.0	0.9	0.3	1.00	0.06	0.002	0.06	0.014	0.04	0.005	0.003	ND
Median	7.8	14.4	8.8	1.70	0.75	0.018	0.77	0.110	0.66	0.059	0.036	ND
Mode	7.8	Multi	10.5	Multi	Multi	Multi	1.20	Multi	1.10	Multi	0.036	ND
Standard Deviation	0.1	6.3	2.2	4.23	0.34	0.012	0.35	0.100	0.26	0.038	0.020	ND
Sample Variance	0.0	39.5	4.6	17.88	0.11	0.000	0.12	0.010	0.07	0.001	0.000	ND
Range	0.6	21.1	7.8	17.79	1.16	0.050	1.26	0.480	1.20	0.179	0.090	ND
Minimum	7.7	1.4	4.4	0.21	0.34	0.000	0.34	0.000	0.00	0.011	0.000	ND
Maximum	8.3	22.4	12.2	18.00	1.50	0.050	1.60	0.480	1.20	0.190	0.090	ND
Count	54	54	54	18	36	36	36	54	36	54	54	0
Confidence Level (95%)	0.0	1.7	0.6	2.10	0.11	0.004	0.12	0.027	0.09	0.010	0.005	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	1.4	3.2	365.6	350.7	4.4	11.8	12.3	624	78.6	1873	2.1	ND
Standard Error	0.1	0.3	15.5	14.6	1.0	2.0	2.1	22	5.1	1433	0.2	ND
Median	1.6	3.3	390.0	374.4	2.3	6.0	6.2	652	76.0	115	2.1	ND
Mode	1.6	Multi	Multi	Multi	0.0	3.0	5.5	713	Multi	14	1.1	ND
Standard Deviation	0.5	1.2	92.8	87.5	6.2	15.0	15.2	164	37.2	6081	1.0	ND
Sample Variance	0.3	1.3	8608.3	7651.7	38.6	224.5	231.9	26750	1385.4	36977802	0.9	ND
Range	1.9	3.6	330.0	316.7	26.0	60.5	53.9	826	186.0	25993	3.6	ND
Minimum	0.3	1.0	180.0	177.3	0.0	2.5	1.9	314	14.0	7	0.8	ND
Maximum	2.2	4.6	510.0	494.0	26.0	63.0	55.8	1140	200.0	26000	4.4	ND
Count	18	14	36	36	36	54	54	54	54	18	18	0
Confidence Level (95%)	0.3	0.7	31.4	29.6	2.1	4.1	4.2	45	10.2	3024	0.5	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

GREENFIELD AVE. EXTENDED - SITE 18
KINNICKINNIC RIVER
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	47.58	24.08	0.2	3.5	5.9	1.8	0.0	11.6	0.0	3.4	0.0	ND
Standard Error	2.37	1.64	0.1	0.5	0.8	0.6	0.0	3.3	0.0	0.9	0.0	ND
Median	46.00	23.50	0.0	3.8	6.9	0.7	0.0	11.5	0.0	3.7	0.0	ND
Mode	Multi	18.00	0.0	Multi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	8.22	5.70	0.4	1.7	3.4	2.1	0.0	13.8	0.0	3.0	0.0	ND
Sample Variance	67.54	32.45	0.1	2.8	11.8	4.5	0.0	190.3	0.0	9.3	0.0	ND
Range	27.00	15.00	1.0	5.3	9.9	5.1	0.0	47.0	0.0	8.3	0.0	ND
Minimum	36.00	18.00	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	63.00	33.00	1.0	6.6	9.9	5.1	0.0	47.0	0.0	8.3	0.0	ND
Count	12	12	12	12	18	12	10	18	9	11	11	0
Confidence Level (95%)	5.22	3.62	0.2	1.1	1.7	1.3	0.0	6.9	0.0	2.0	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	218	157	0.8	ND	41.3	35.1	6.2	6.1
Standard Error	13	6	0.2	ND	1.6	1.2	0.4	0.4
Median	215	160	0.0	ND	40.0	34.0	6.2	6.6
Mode	Multi	120	0.0	ND	40.0	Multi	11.0	Multi
Standard Deviation	45	35	1.7	ND	9.4	7.4	2.7	2.6
Sample Variance	1984	1234	2.8	ND	89.3	54.4	7.1	6.8
Range	130	121	6.8	ND	33.0	24.0	9.6	9.7
Minimum	160	99	0.0	ND	27.0	24.0	2.4	2.3
Maximum	290	220	6.8	ND	60.0	48.0	12.0	12.0
Count	12	36	54	0	35	35	53	35
Confidence Level (95%)	28	12	0.5	ND	3.2	2.5	0.7	0.9

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

JONES ISLAND FERRY - SITE 19
KINNICKINNIC RIVER
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.0	12.8	8.9	3.95	0.78	0.018	0.79	0.094	0.65	0.068	0.038	ND
Standard Error	0.0	0.9	0.3	0.97	0.05	0.002	0.06	0.008	0.04	0.005	0.003	ND
Median	8.0	14.0	8.7	3.10	0.78	0.018	0.80	0.092	0.68	0.066	0.036	ND
Mode	8.0	18.4	7.0	1.20	1.20	0.018	1.20	Multi	1.00	Multi	0.042	ND
Standard Deviation	0.1	6.4	2.1	4.10	0.32	0.009	0.33	0.061	0.27	0.034	0.020	ND
Sample Variance	0.0	41.4	4.4	16.79	0.10	0.000	0.11	0.004	0.07	0.001	0.000	ND
Range	0.5	21.4	7.1	15.88	1.08	0.037	1.17	0.300	1.00	0.157	0.089	ND
Minimum	7.7	1.3	5.7	0.12	0.32	0.000	0.33	0.000	0.00	0.013	0.000	ND
Maximum	8.2	22.7	12.8	16.00	1.40	0.037	1.50	0.300	1.00	0.170	0.089	ND
Count	54	54	54	18	36	36	36	54	36	53	53	0
Confidence Level (95%)	0.0	1.8	0.6	2.04	0.11	0.003	0.11	0.017	0.09	0.009	0.006	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	1.3	3.3	350.0	336.9	4.3	11.2	11.3	625	74.0	875	2.2	ND
Standard Error	0.1	0.4	15.4	14.4	0.8	1.6	1.8	22	4.5	398	0.2	ND
Median	1.5	3.5	385.0	360.7	2.3	6.7	6.3	668	76.0	117	2.0	ND
Mode	Multi	Multi	390.0	Multi	0.0	4.4	2.9	Multi	76.0	Multi	Multi	ND
Standard Deviation	0.5	1.5	92.1	86.6	4.9	11.8	13.5	158	33.2	1689	0.9	ND
Sample Variance	0.3	2.1	8491.4	7493.2	24.0	139.5	183.2	25031	1104.2	2852283	0.8	ND
Range	1.8	4.7	300.0	280.3	20.0	52.2	63.1	685	152.0	5591	2.8	ND
Minimum	0.4	0.7	180.0	175.7	0.0	2.8	1.6	303	18.0	9	1.0	ND
Maximum	2.2	5.4	480.0	456.0	20.0	55.0	64.7	988	170.0	5600	3.7	ND
Count	18	14	36	36	36	54	54	54	54	18	18	0
Confidence Level (95%)	0.3	0.8	31.2	29.3	1.7	3.2	3.7	43	9.1	840	0.4	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

JONES ISLAND FERRY - SITE 19
KINNICKINNIC RIVER
WATER QUALITY DATA - 2013

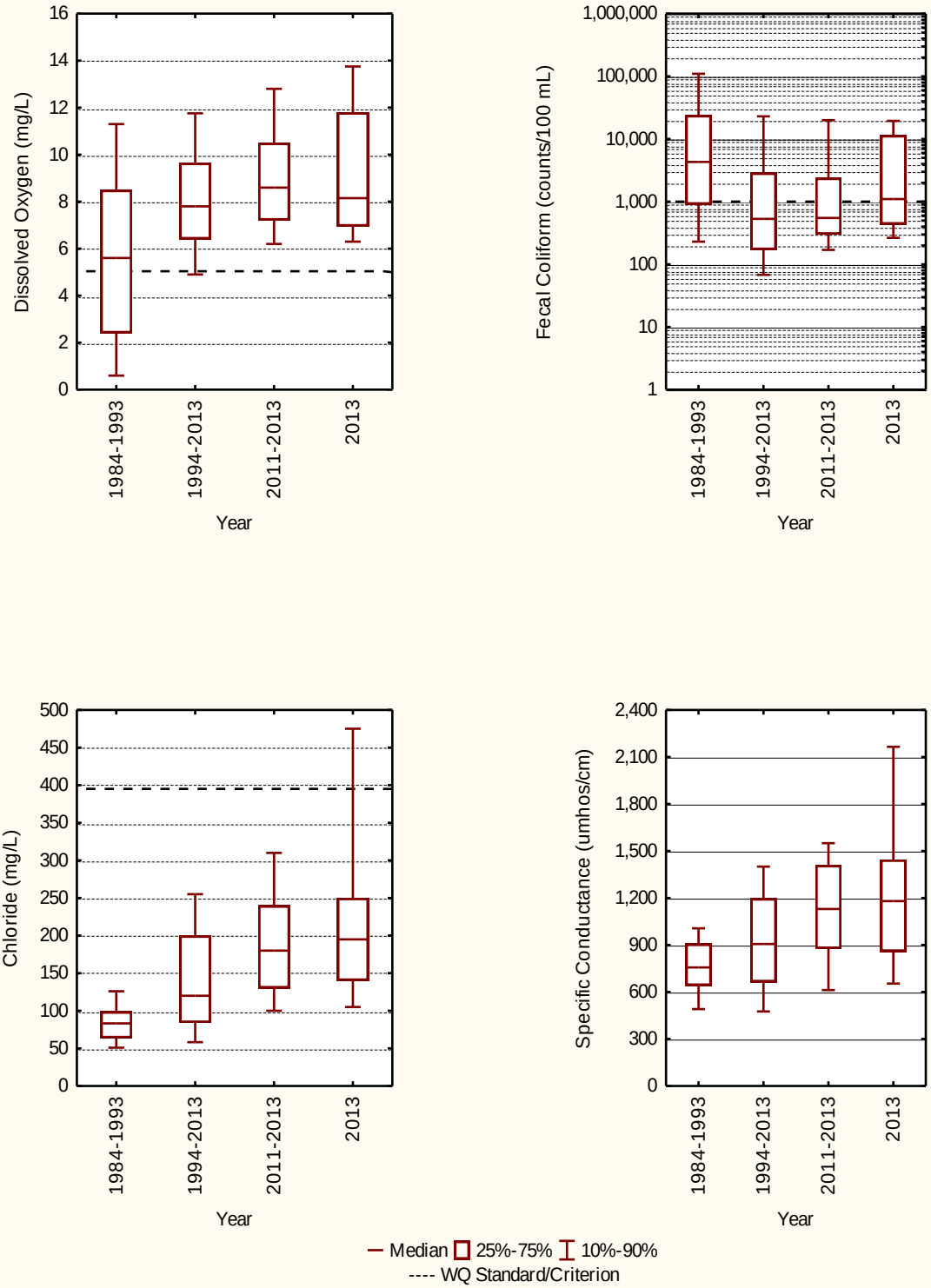
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	48.17	24.33	0.2	2.8	4.6	2.6	1.1	12.3	0.5	3.1	0.0	ND
Standard Error	2.65	1.98	0.1	0.4	0.9	0.7	0.8	2.9	0.5	1.0	0.0	ND
Median	45.50	23.50	0.0	2.3	6.2	2.5	0.0	9.8	0.0	1.8	0.0	ND
Mode	Multi	17.00	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	9.16	6.85	0.3	1.5	3.9	2.6	2.6	12.4	1.6	3.6	0.0	ND
Sample Variance	83.97	46.97	0.1	2.1	15.1	6.5	7.0	154.0	2.7	12.7	0.0	ND
Range	28.00	18.00	0.7	4.6	9.4	8.2	6.8	39.0	4.9	9.5	0.0	ND
Minimum	37.00	16.00	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	65.00	34.00	0.7	5.9	9.4	8.2	6.8	39.0	4.9	9.5	0.0	ND
Count	12	12	12	12	18	12	12	18	9	12	10	0
Confidence Level (95%)	5.82	4.35	0.2	0.9	1.9	1.6	1.7	6.2	1.3	2.3	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	221	164	0.6	ND	42.2	36.1	6.7	6.3
Standard Error	14	7	0.2	ND	1.8	1.4	0.4	0.5
Median	215	155	0.0	ND	40.5	35.0	6.2	6.3
Mode	160	120	0.0	ND	Multi	Multi	6.2	Multi
Standard Deviation	50	44	1.3	ND	10.8	8.4	3.0	2.9
Sample Variance	2517	1899	1.6	ND	116.4	70.2	8.9	8.6
Range	140	150	4.8	ND	37.0	26.0	10.8	10.7
Minimum	160	100	0.0	ND	27.0	25.0	2.2	2.3
Maximum	300	250	4.8	ND	64.0	51.0	13.0	13.0
Count	12	36	54	0	36	35	53	35
Confidence Level (95%)	32	15	0.3	ND	3.7	2.9	0.8	1.0

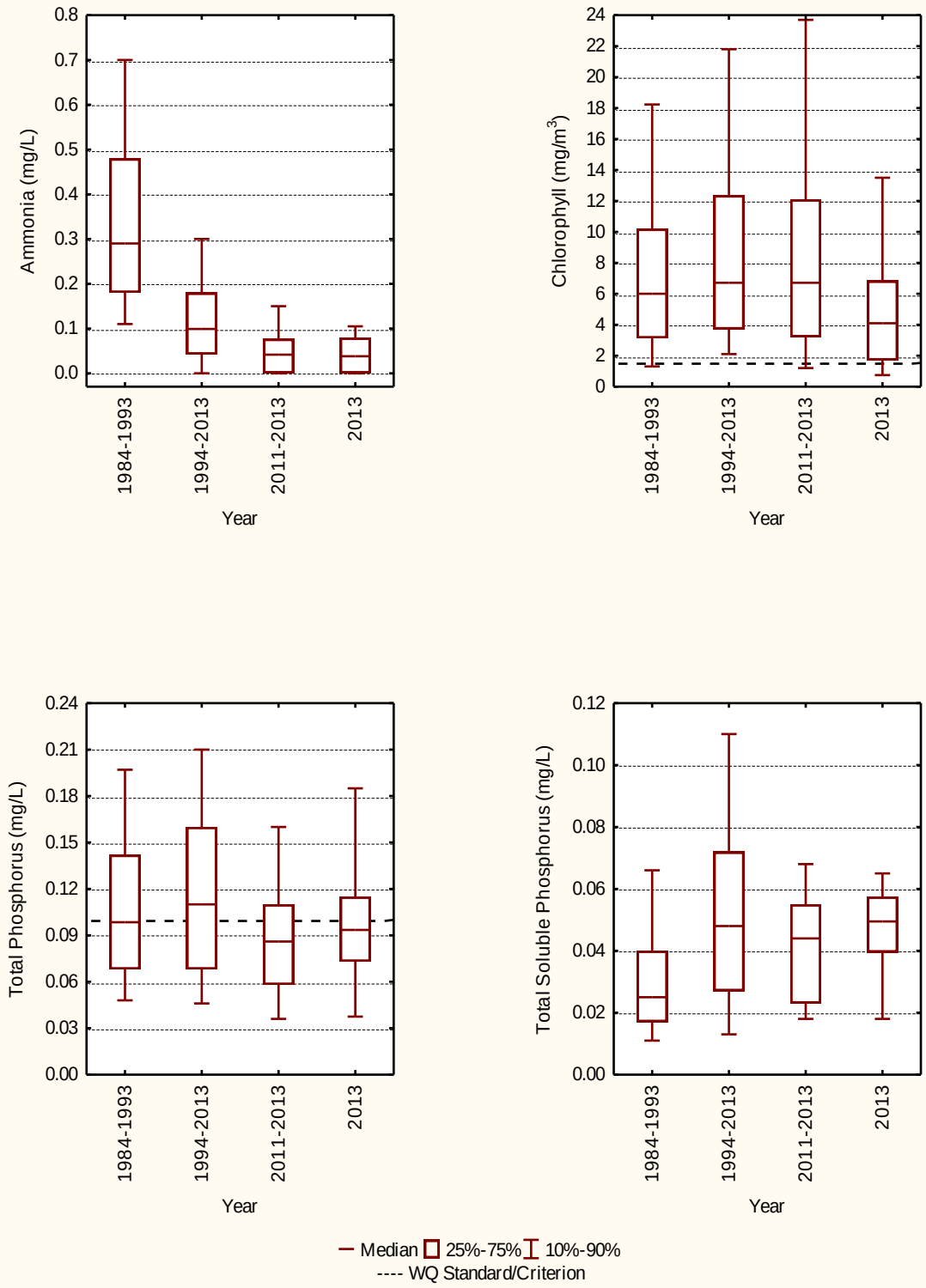
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

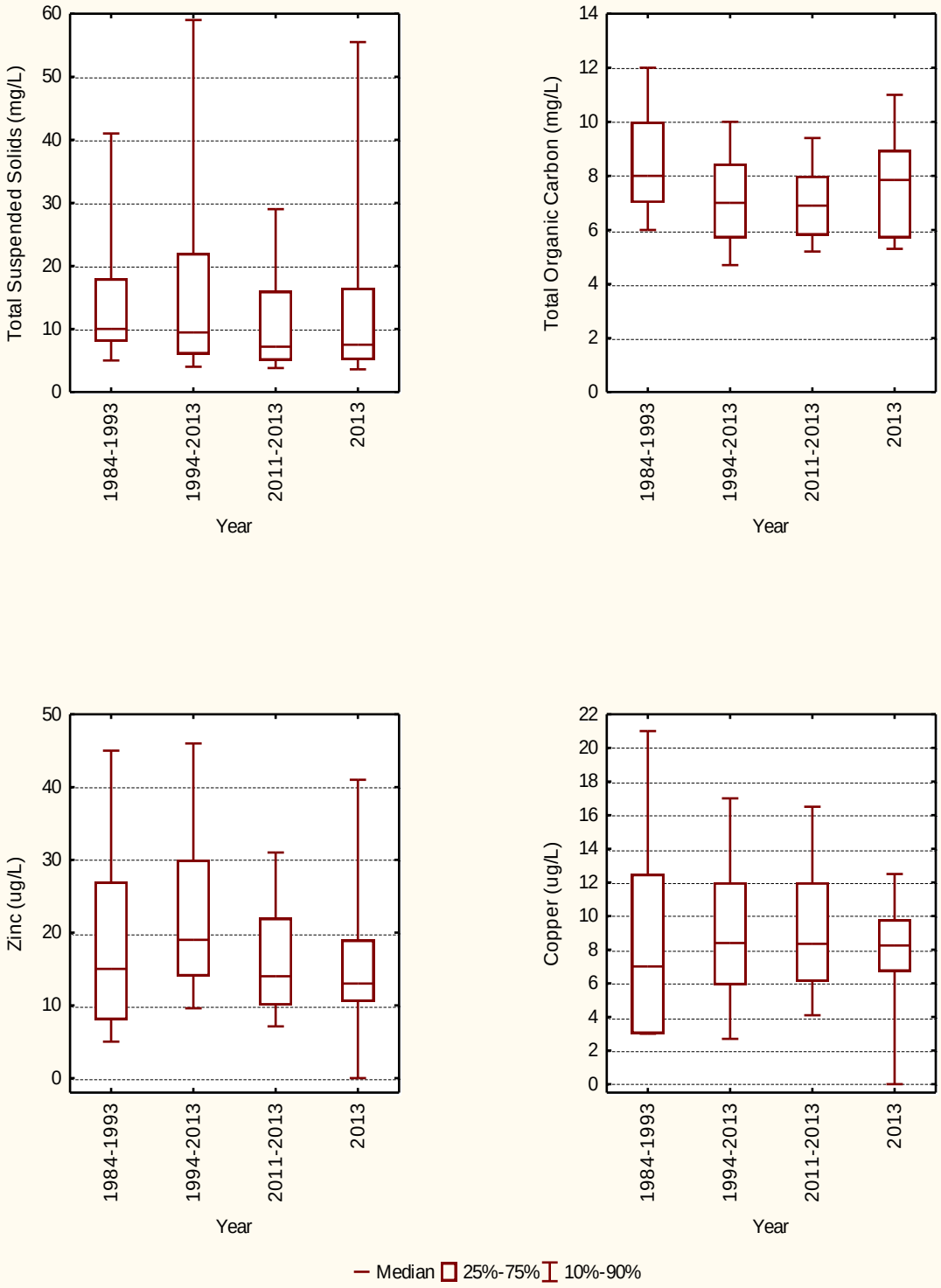
MMSD Water Quality Monitoring Program Data
Menomonee River at 25th St., Site RI-20



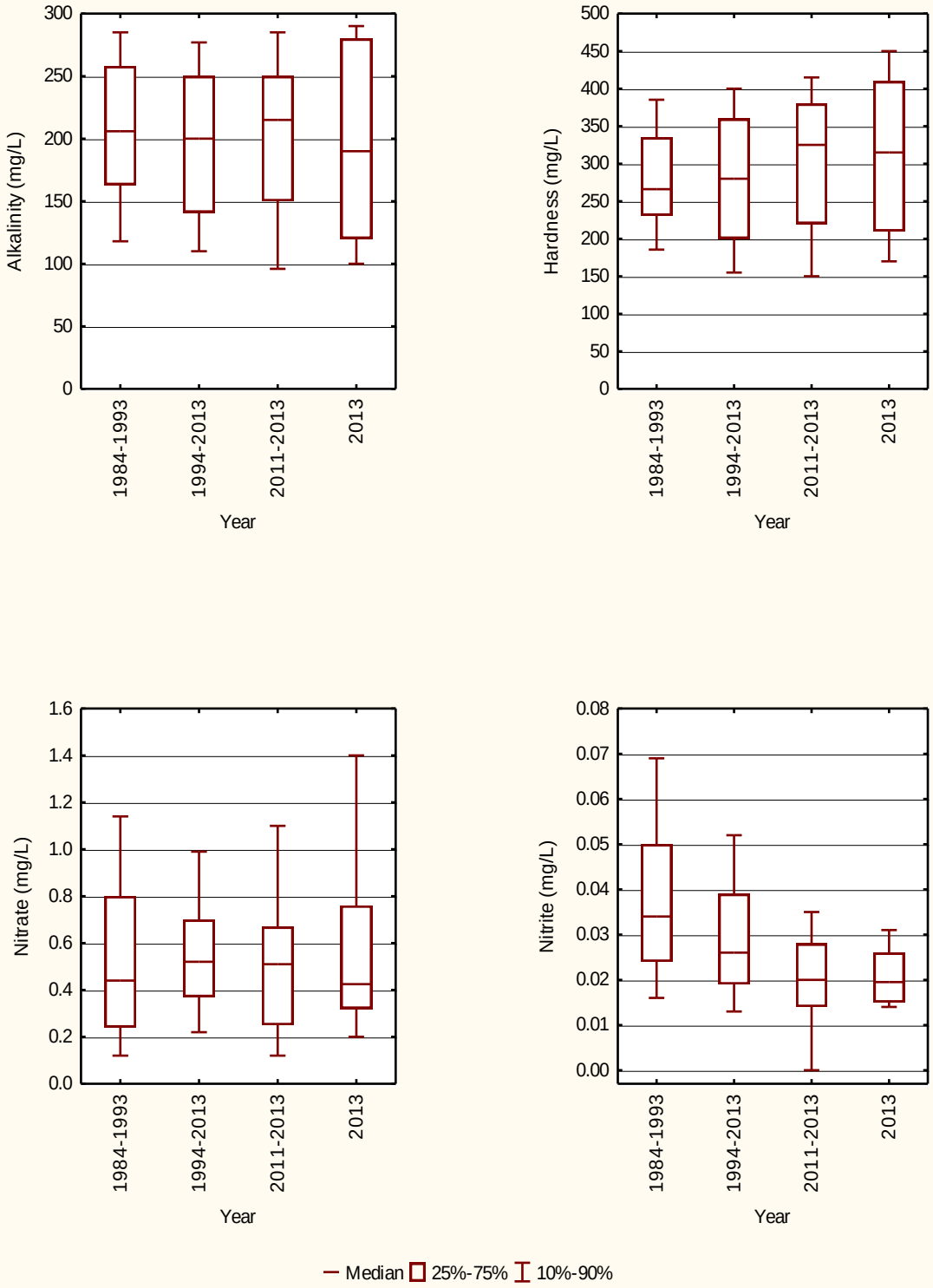
MMSD Water Quality Monitoring Program Data
Menomonee River at 25th St., Site RI-20



MMSD Water Quality Monitoring Program Data
Menomonee River at 25th St., Site RI-20



MMSD Water Quality Monitoring Program Data
Menomonee River at 25th St., Site RI-20



25TH ST. - SITE 20
MENOMONEE RIVER
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.8	13.2	9.2	6.02	0.60	0.021	0.61	0.059	0.79	0.099	0.048	ND
Standard Error	0.0	1.9	0.6	1.53	0.13	0.002	0.13	0.023	0.07	0.011	0.005	ND
Median	7.9	15.1	8.2	4.10	0.43	0.020	0.45	0.038	0.71	0.094	0.050	ND
Mode	7.9	Multi	Multi	1.20	Multi	Multi	0.45	0.000	0.96	Multi	Multi	ND
Standard Deviation	0.2	8.6	2.9	6.83	0.47	0.008	0.47	0.102	0.25	0.050	0.020	ND
Sample Variance	0.0	73.3	8.1	46.71	0.22	0.000	0.22	0.010	0.06	0.002	0.000	ND
Range	0.7	26.5	8.6	29.54	1.66	0.027	1.64	0.460	0.87	0.187	0.086	ND
Minimum	7.5	0.3	5.4	0.46	0.14	0.010	0.16	0.000	0.43	0.033	0.014	ND
Maximum	8.2	26.8	14.0	30.00	1.80	0.037	1.80	0.460	1.30	0.220	0.100	ND
Count	20	20	20	20	14	14	14	20	14	20	20	0
Confidence Level (95%)	0.1	4.0	1.3	3.20	0.27	0.004	0.27	0.048	0.15	0.023	0.009	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	723.6	700.4	6.6	18.8	17.6	1245	228.5	7205	3.2	4609
Standard Error	ND	ND	72.5	76.6	2.6	6.5	6.1	116	28.8	3011	0.2	1794
Median	ND	ND	710.0	672.6	3.0	7.5	6.6	1180	195.0	1100	3.0	1450
Mode	ND	ND	840.0	Multi	1.5	5.2	Multi	1460	140.0	1700	3.2	Multi
Standard Deviation	ND	ND	271.3	286.5	9.9	29.1	27.5	518	128.7	13467	0.8	6713
Sample Variance	ND	ND	73578.6	82104.0	97.1	848.0	754.8	267818	16560.8	181373384	0.6	45064552
Range	ND	ND	940.0	963.8	37.0	118.0	113.2	1879	440.0	56810	2.5	23870
Minimum	ND	ND	360.0	331.0	0.0	2.0	2.8	541	90.0	190	2.3	130
Maximum	ND	ND	1300.0	1294.8	37.0	120.0	116.0	2420	530.0	57000	4.8	24000
Count	0	0	14	14	14	20	20	20	20	20	20	14
Confidence Level (95%)	ND	ND	156.6	165.4	5.7	13.6	12.9	242	60.2	6303	0.4	3876

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

25TH ST. - SITE 20
MENOMONEE RIVER
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	67.71	33.57	0.4	3.2	7.9	3.9	0.6	17.2	0.4	3.1	0.0	ND
Standard Error	6.16	3.59	0.1	0.5	1.0	0.9	0.6	3.3	0.4	1.0	0.0	ND
Median	68.50	34.50	0.4	2.5	8.3	3.3	0.0	13.0	0.0	0.0	0.0	ND
Mode	38.00	Multi	0.0	Multi	0.0	Multi	0.0	13.0	0.0	0.0	0.0	ND
Standard Deviation	23.07	13.41	0.4	2.0	4.4	3.5	2.1	14.7	1.4	3.9	0.0	ND
Sample Variance	532.07	179.96	0.1	4.0	19.6	12.4	4.4	217.0	2.1	15.3	0.0	ND
Range	62.00	37.00	1.0	8.1	18.0	14.0	7.3	58.0	4.8	9.6	0.0	ND
Minimum	38.00	13.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	100.00	50.00	1.0	8.1	18.0	14.0	7.3	58.0	4.8	9.6	0.0	ND
Count	14	14	14	14	20	14	12	20	11	14	12	0
Confidence Level (95%)	13.32	7.75	0.2	1.2	2.1	2.0	1.3	6.9	1.0	2.3	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	308	192	2.2	ND	50.4	42.8	7.7	7.5
Standard Error	30	22	0.5	ND	4.5	4.3	0.5	0.6
Median	315	190	2.3	ND	50.5	44.0	7.9	7.5
Mode	170	Multi	0.0	ND	Multi	58.0	Multi	5.6
Standard Deviation	114	84	2.2	ND	16.8	16.0	2.3	2.1
Sample Variance	13003	6979	5.0	ND	282.9	255.3	5.1	4.4
Range	310	257	6.5	ND	48.0	46.0	8.0	7.0
Minimum	150	43	0.0	ND	25.0	17.0	5.0	5.0
Maximum	460	300	6.5	ND	73.0	63.0	13.0	12.0
Count	14	14	20	0	14	14	20	14
Confidence Level (95%)	66	48	1.0	ND	9.7	9.2	1.1	1.2

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

127TH ST. EXT. - SITE 21
MENOMONEE RIVER
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.0	13.0	10.8	3.56	0.52	0.013	0.54	0.027	0.64	0.081	0.051	ND
Standard Error	0.0	2.0	0.5	0.92	0.10	0.003	0.10	0.020	0.07	0.009	0.007	ND
Median	8.0	14.6	10.5	1.95	0.43	0.014	0.44	0.000	0.61	0.090	0.048	ND
Mode	7.9	Multi	8.0	Multi	0.48	0.000	Multi	0.000	Multi	0.093	0.053	ND
Standard Deviation	0.2	8.9	2.2	4.13	0.37	0.010	0.39	0.089	0.25	0.039	0.033	ND
Sample Variance	0.0	78.6	4.7	17.02	0.14	0.000	0.15	0.008	0.06	0.002	0.001	ND
Range	0.8	26.8	7.1	17.44	1.29	0.028	1.39	0.400	0.72	0.148	0.141	ND
Minimum	7.6	0.2	8.0	0.56	0.11	0.000	0.11	0.000	0.38	0.022	0.009	ND
Maximum	8.4	26.9	15.1	18.00	1.40	0.028	1.50	0.400	1.10	0.170	0.150	ND
Count	19	20	20	20	14	14	14	20	14	20	20	0
Confidence Level (95%)	0.1	4.1	1.0	1.93	0.21	0.006	0.22	0.042	0.15	0.018	0.015	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	590.7	576.2	3.7	12.1	11.5	1101	184.9	708	2.5	759
Standard Error	ND	ND	42.6	44.4	1.1	2.7	2.6	68	15.3	254	0.1	257
Median	ND	ND	600.0	580.6	2.9	8.1	7.4	1085	175.0	305	2.5	440
Mode	ND	ND	Multi	Multi	0.0	Multi	Multi	Multi	Multi	Multi	Multi	Multi
Standard Deviation	ND	ND	159.3	166.2	4.1	12.1	11.6	303	68.5	1135	0.6	963
Sample Variance	ND	ND	25361.0	27634.8	16.8	147.0	133.8	91709	4686.4	1289205	0.4	928283
Range	ND	ND	500.0	524.3	16.0	45.0	47.4	1156	281.0	4186	2.5	3263
Minimum	ND	ND	340.0	314.0	0.0	1.0	1.7	594	99.0	14	1.1	37
Maximum	ND	ND	840.0	838.3	16.0	46.0	49.1	1750	380.0	4200	3.6	3300
Count	0	0	14	14	14	20	20	20	20	20	20	14
Confidence Level (95%)	ND	ND	91.9	96.0	2.4	5.7	5.4	142	32.0	531	0.3	556

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

127TH ST. EXT. - SITE 21
MENOMONEE RIVER
WATER QUALITY DATA - 2013

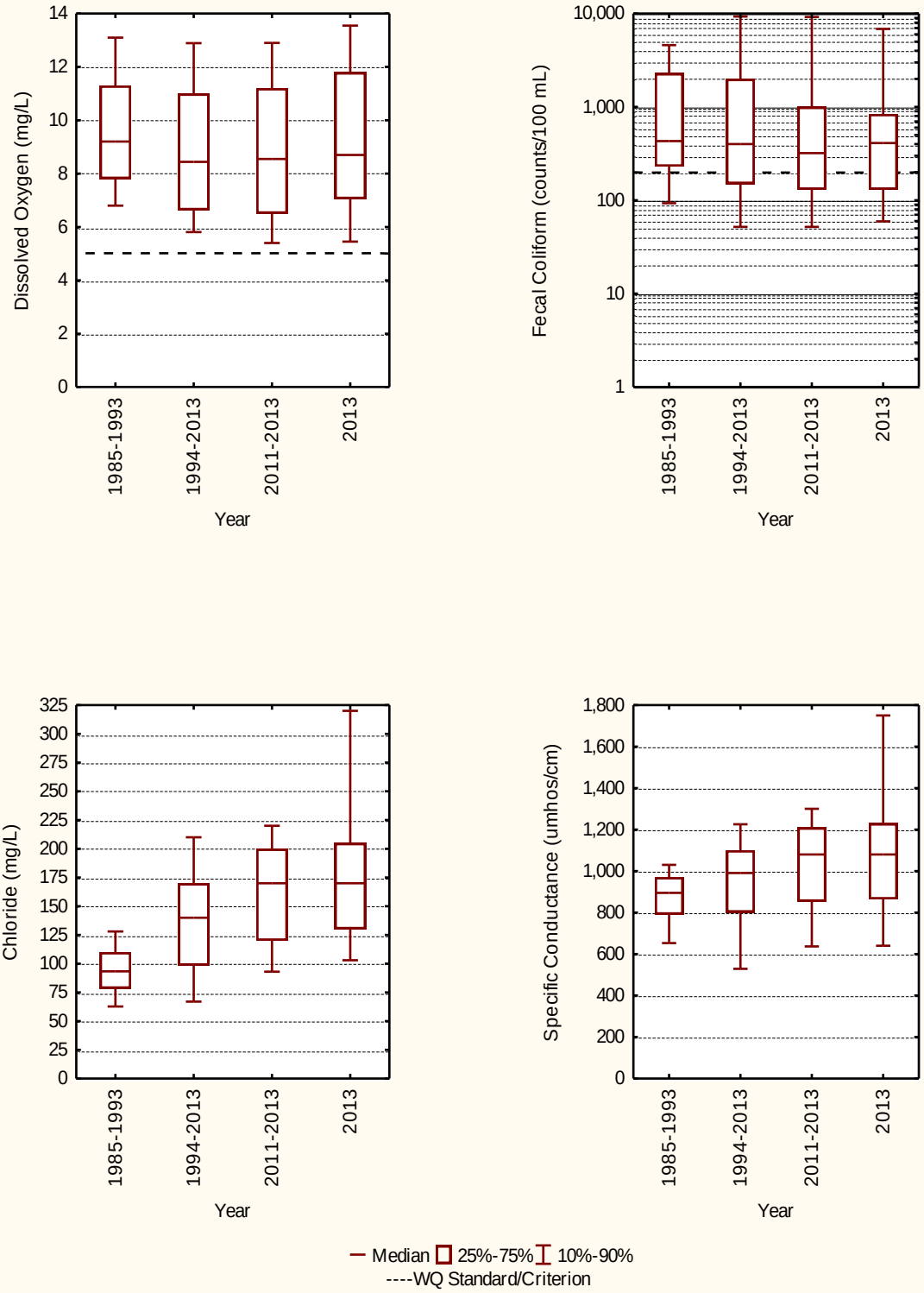
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	63.29	32.79	0.2	2.1	4.5	2.5	0.4	7.7	0.2	2.8	0.4	ND
Standard Error	5.07	3.09	0.1	0.3	0.9	0.5	0.4	1.8	0.2	0.8	0.4	ND
Median	64.50	33.00	0.0	2.0	5.9	2.7	0.0	8.6	0.0	3.6	0.0	ND
Mode	52.00	46.00	0.0	1.7	0.0	Multi	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	18.97	11.54	0.3	1.0	4.1	1.7	1.2	8.1	0.5	2.9	1.3	ND
Sample Variance	359.76	133.26	0.1	0.9	16.5	2.8	1.5	66.4	0.3	8.2	1.6	ND
Range	61.00	33.00	1.2	4.3	11.0	5.5	4.2	23.0	1.7	7.4	4.6	ND
Minimum	35.00	14.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	96.00	47.00	1.2	4.3	11.0	5.5	4.2	23.0	1.7	7.4	4.6	ND
Count	14	14	14	14	20	14	12	20	11	13	13	0
Confidence Level (95%)	10.95	6.67	0.2	0.6	1.9	1.0	0.8	3.8	0.3	1.7	0.8	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	294	202	0.8	ND	53.4	45.1	8.3	8.0
Standard Error	25	19	0.3	ND	4.0	3.7	0.6	0.8
Median	300	210	0.0	ND	57.5	47.0	7.7	7.2
Mode	160	260	0.0	ND	64.0	34.0	Multi	13.0
Standard Deviation	92	70	1.5	ND	14.9	13.8	2.8	2.9
Sample Variance	8471	4910	2.3	ND	221.9	189.5	7.8	8.2
Range	270	220	4.9	ND	42.0	40.0	9.2	8.0
Minimum	160	70	0.0	ND	30.0	21.0	4.8	5.0
Maximum	430	290	4.9	ND	72.0	61.0	14.0	13.0
Count	14	14	20	0	14	14	20	14
Confidence Level (95%)	53	40	0.7	ND	8.6	7.9	1.3	1.7

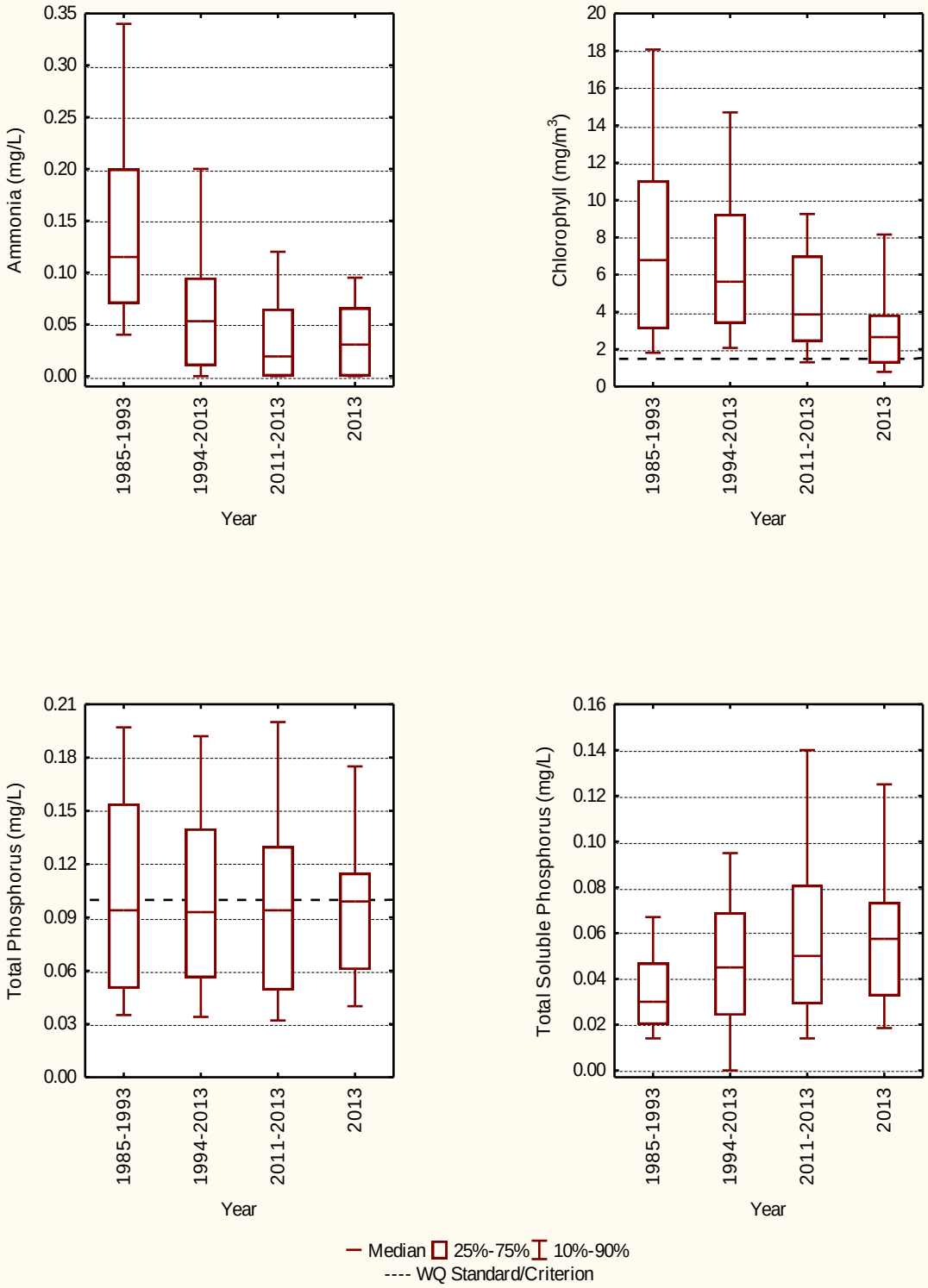
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

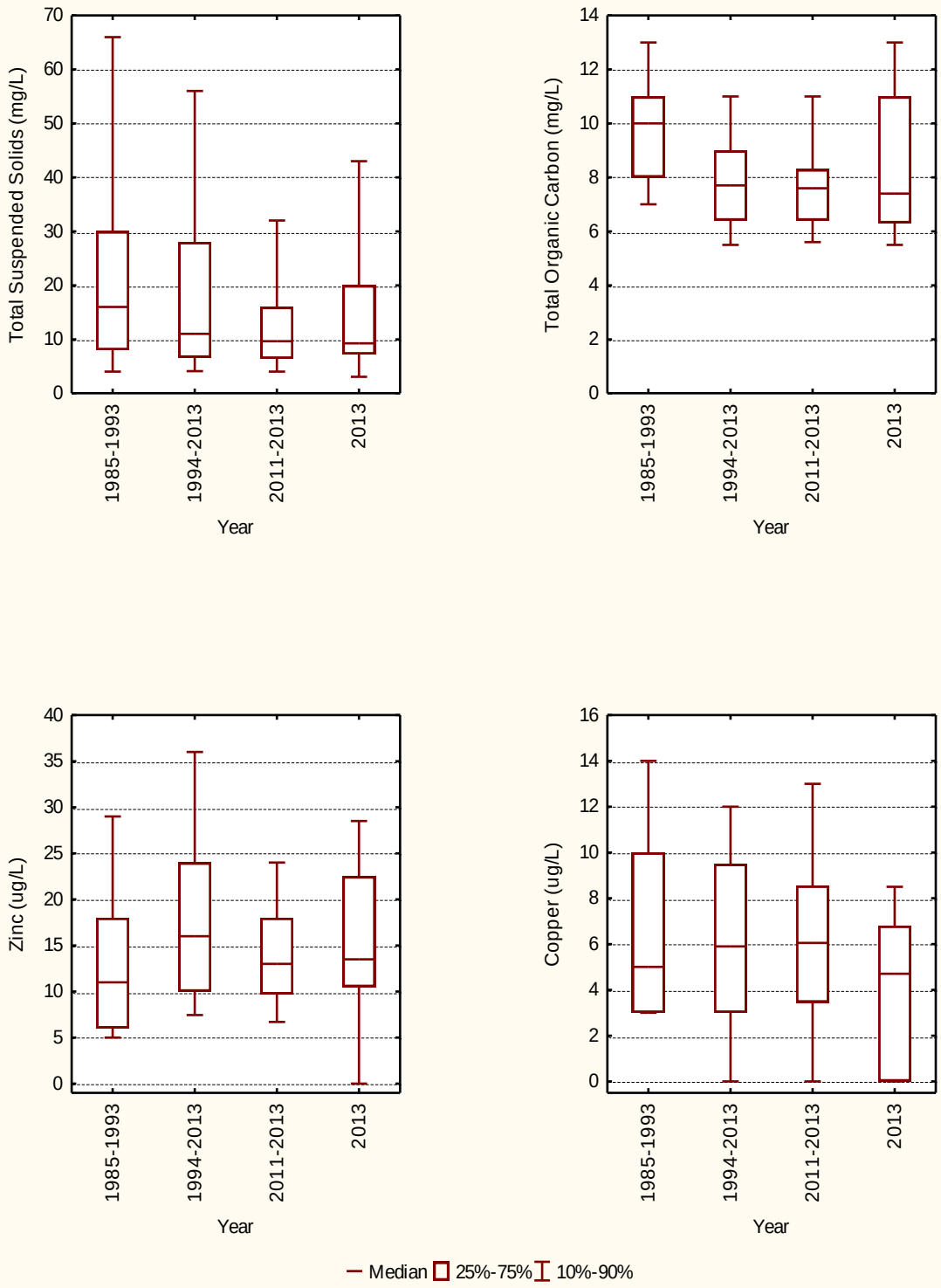
MMSD Water Quality Monitoring Program Data
Menomonee River at Hampton Ave., Site RI-22



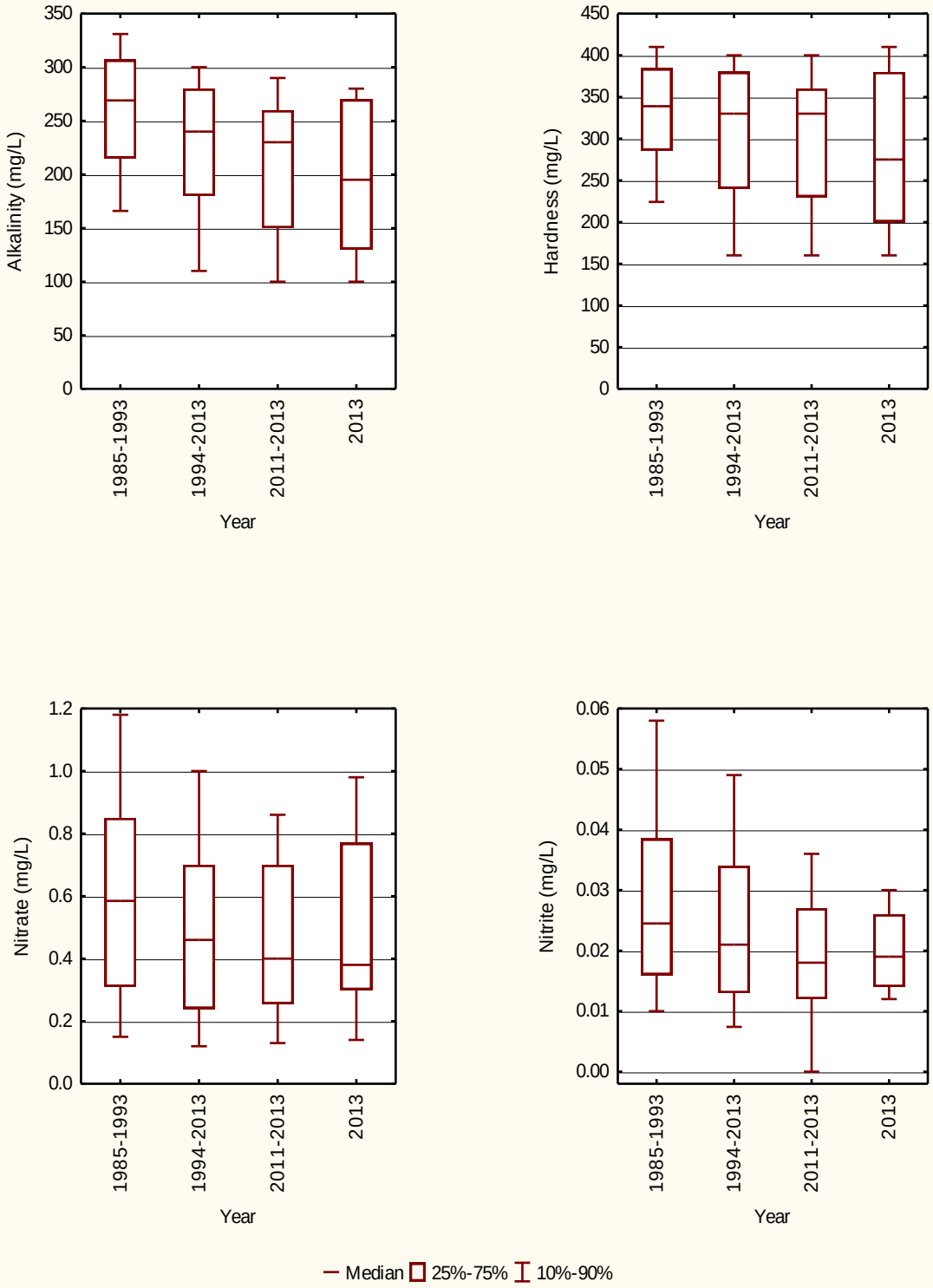
MMSD Water Quality Monitoring Program Data
Menomonee River at Hampton Ave., Site RI-22



MMSD Water Quality Monitoring Program Data
Menomonee River at Hampton Ave., Site RI-22



MMSD Water Quality Monitoring Program Data
Menomonee River at Hampton Ave., Site RI-22



HAMPTON AVE. - SITE 22
MENOMONEE RIVER
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.9	13.1	9.3	3.84	0.51	0.020	0.53	0.051	0.68	0.098	0.061	ND
Standard Error	0.0	2.0	0.7	1.07	0.09	0.002	0.09	0.020	0.07	0.011	0.009	ND
Median	7.9	14.8	8.7	2.65	0.38	0.019	0.41	0.030	0.59	0.099	0.058	ND
Mode	Multi	Multi	Multi	Multi	Multi	0.014	Multi	0.000	Multi	0.100	0.058	ND
Standard Deviation	0.2	8.8	2.9	4.81	0.32	0.008	0.34	0.091	0.26	0.048	0.040	ND
Sample Variance	0.0	78.0	8.6	23.09	0.11	0.000	0.11	0.008	0.07	0.002	0.002	ND
Range	0.8	26.8	9.7	21.67	1.08	0.026	1.17	0.410	0.80	0.180	0.146	ND
Minimum	7.5	0.0	4.9	0.33	0.12	0.010	0.13	0.000	0.40	0.030	0.014	ND
Maximum	8.3	26.8	14.6	22.00	1.20	0.036	1.30	0.410	1.20	0.210	0.160	ND
Count	19	20	20	20	14	14	14	20	14	20	20	0
Confidence Level (95%)	0.1	4.1	1.4	2.25	0.19	0.004	0.19	0.043	0.15	0.022	0.019	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	589.3	570.4	5.2	15.7	15.0	1095	186.9	1642	2.6	ND
Standard Error	ND	ND	51.9	54.0	1.4	3.3	3.1	83	18.6	768	0.2	ND
Median	ND	ND	580.0	545.8	3.4	9.3	9.7	1080	170.0	410	2.6	ND
Mode	ND	ND	400.0	Multi	Multi	11.0	Multi	Multi	140.0	840	2.9	ND
Standard Deviation	ND	ND	194.3	202.2	5.1	14.7	14.0	372	83.3	3437	0.7	ND
Sample Variance	ND	ND	37745.6	40890.8	26.5	215.3	196.3	138391	6933.6	11811568	0.5	ND
Range	ND	ND	610.0	653.7	20.0	51.9	58.7	1348	309.0	11953	2.4	ND
Minimum	ND	ND	350.0	297.0	0.0	1.1	2.2	502	91.0	47	1.7	ND
Maximum	ND	ND	960.0	950.7	20.0	53.0	60.9	1850	400.0	12000	4.1	ND
Count	0	0	14	14	14	20	20	20	20	20	20	0
Confidence Level (95%)	ND	ND	112.2	116.8	3.0	6.9	6.6	174	39.0	1608	0.3	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

HAMPTON AVE. - SITE 22
MENOMONEE RIVER
WATER QUALITY DATA - 2013

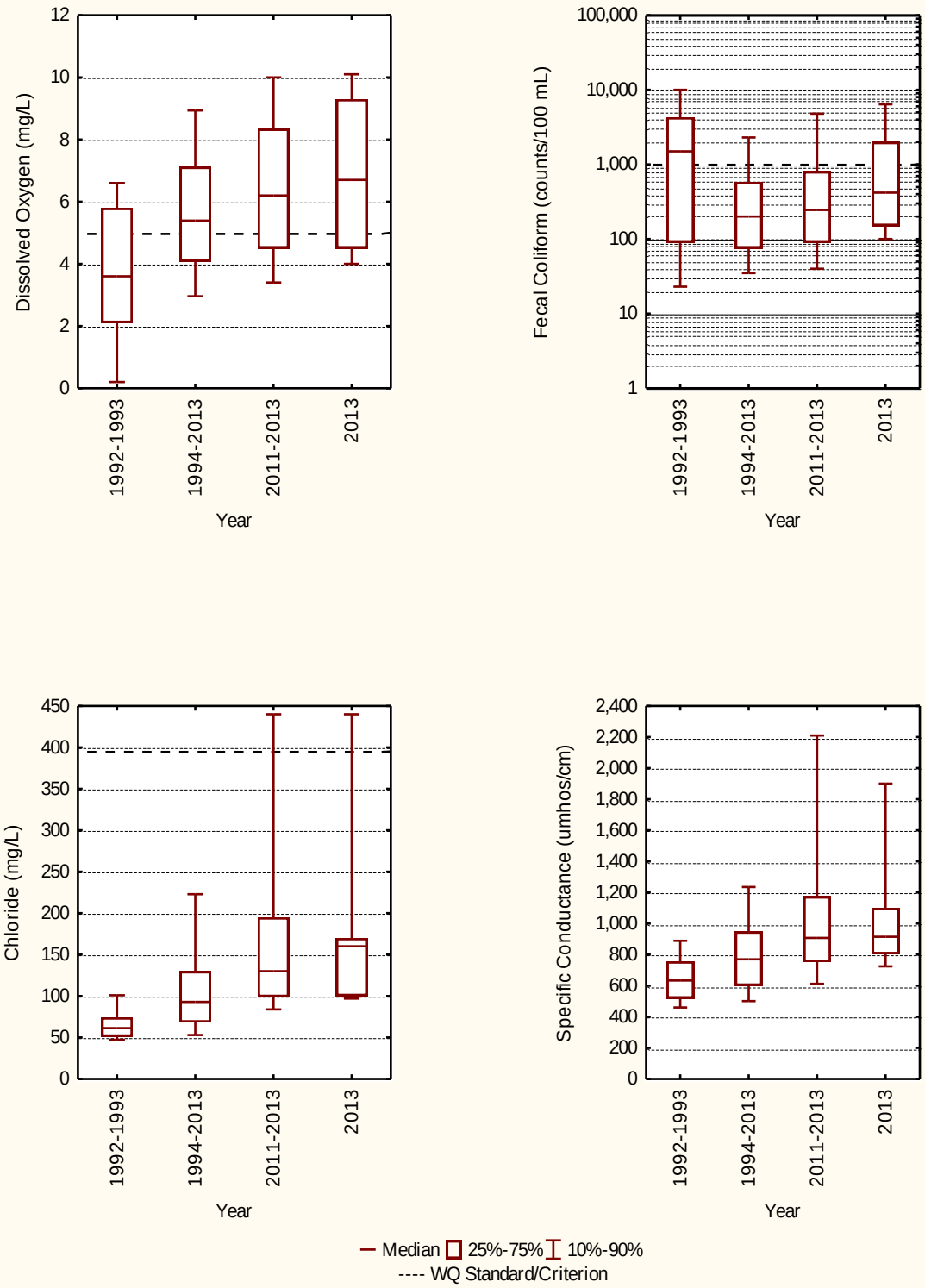
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	61.07	31.14	0.2	2.5	4.0	2.9	0.0	15.9	0.2	2.5	0.0	ND
Standard Error	5.35	3.09	0.1	0.3	0.9	0.7	0.0	2.4	0.2	1.0	0.0	ND
Median	59.50	30.50	0.0	2.1	4.7	2.8	0.0	13.5	0.0	0.0	0.0	ND
Mode	Multi	Multi	0.0	2.1	0.0	0.0	0.0	13.0	0.0	0.0	0.0	ND
Standard Deviation	20.04	11.55	0.3	1.2	4.2	2.8	0.0	10.6	0.8	3.4	0.0	ND
Sample Variance	401.46	133.36	0.1	1.4	17.5	7.6	0.0	113.1	0.6	11.4	0.0	ND
Range	63.00	33.00	0.9	4.9	14.0	10.0	0.0	43.0	2.6	9.7	0.0	ND
Minimum	34.00	14.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	97.00	47.00	0.9	4.9	14.0	10.0	0.0	43.0	2.6	9.7	0.0	ND
Count	14	14	14	14	20	14	14	20	12	12	12	0
Confidence Level (95%)	11.57	6.67	0.2	0.7	2.0	1.6	0.0	5.0	0.5	2.1	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	282	191	1.4	ND	51.4	43.6	8.5	8.5
Standard Error	26	20	0.4	ND	4.1	4.1	0.6	0.8
Median	275	195	0.0	ND	54.5	47.0	7.4	7.6
Mode	Multi	130	0.0	ND	Multi	Multi	Multi	13.0
Standard Deviation	97	74	2.0	ND	15.3	14.6	2.7	2.8
Sample Variance	9387	5489	3.9	ND	235.5	213.8	7.2	7.9
Range	280	224	6.2	ND	43.0	41.0	8.8	7.7
Minimum	160	66	0.0	ND	29.0	21.0	5.2	5.3
Maximum	440	290	6.2	ND	72.0	62.0	14.0	13.0
Count	14	14	20	0	14	13	19	13
Confidence Level (95%)	56	43	0.9	ND	8.9	8.8	1.3	1.7

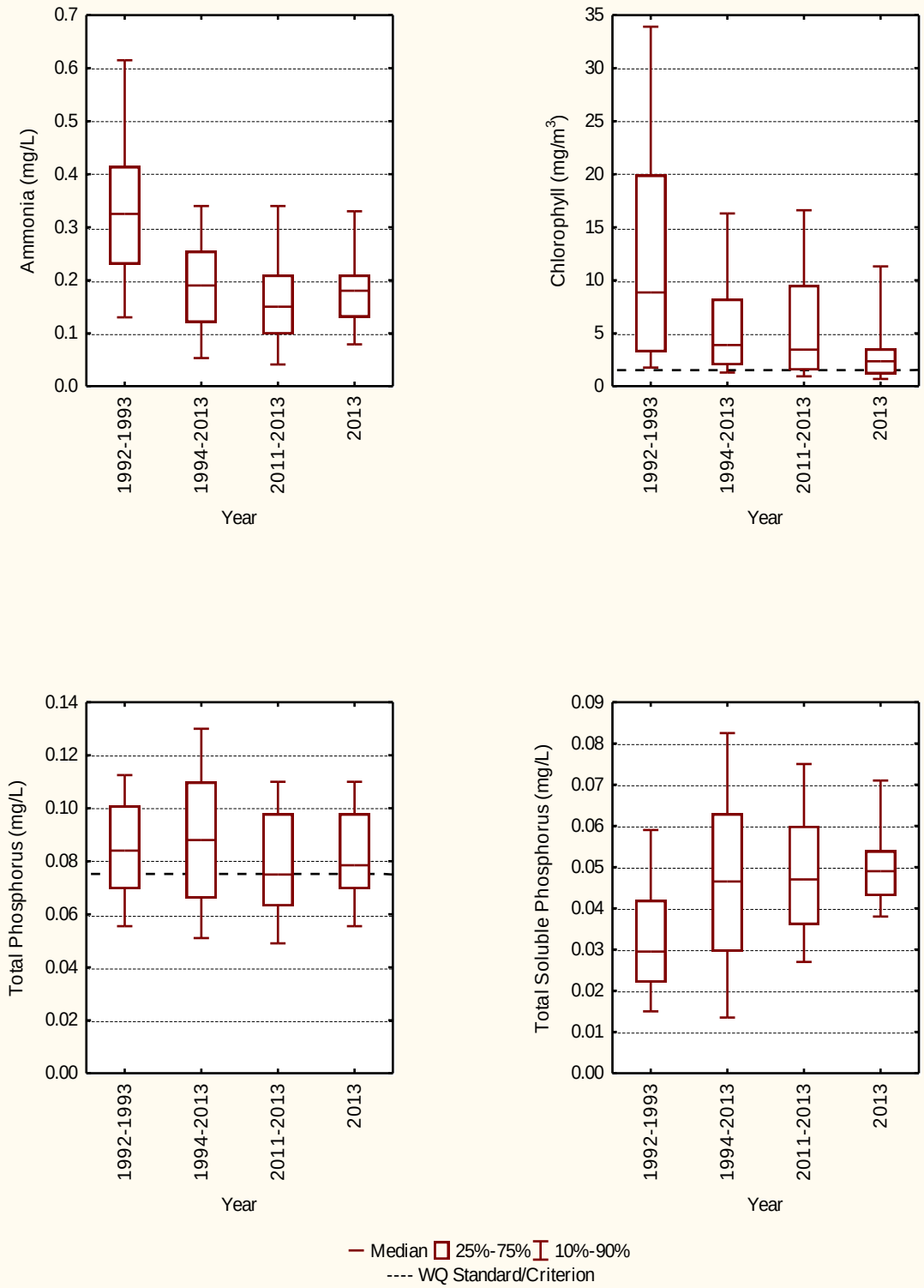
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

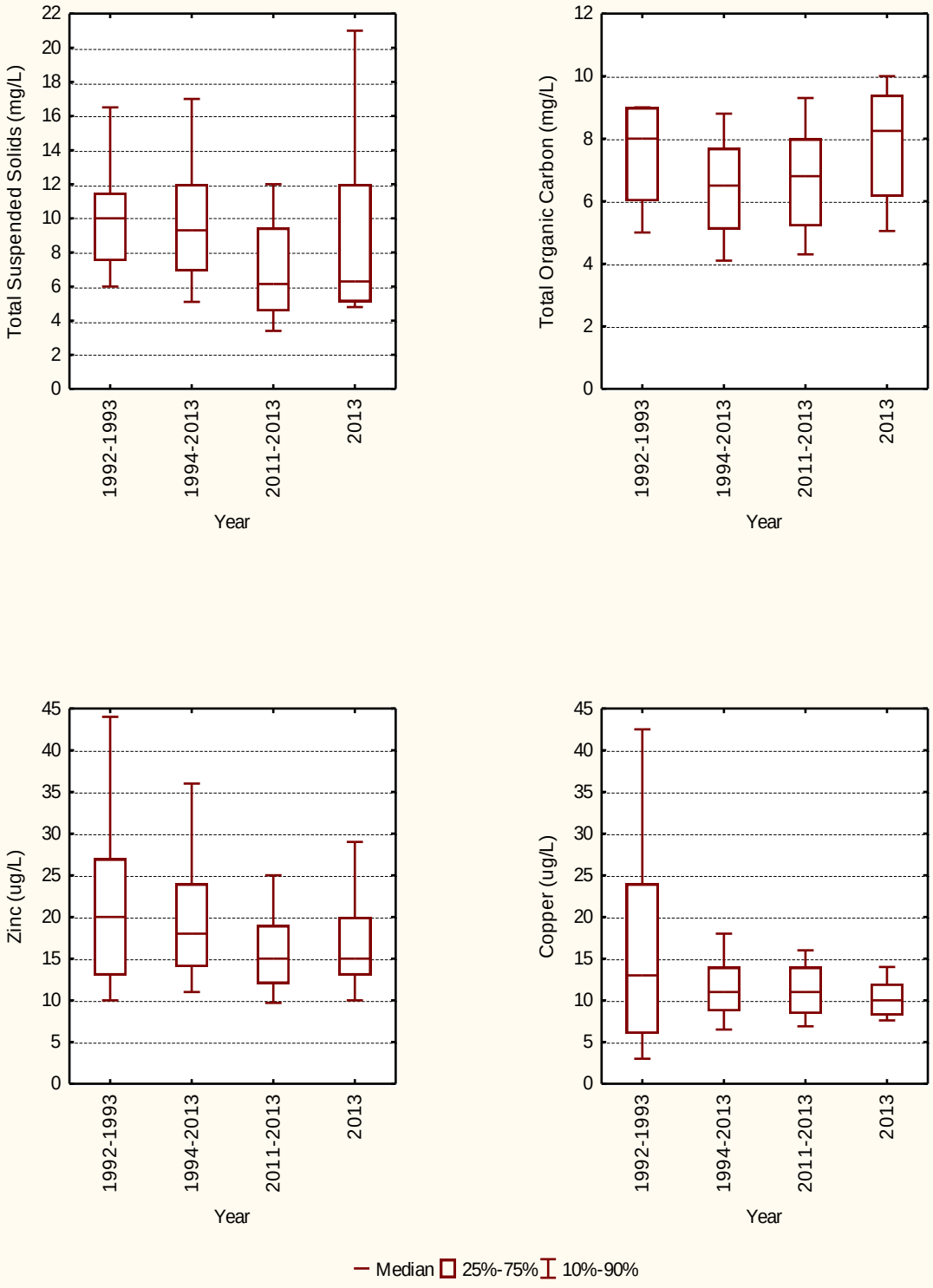
MMSD Water Quality Monitoring Program Data
Burnham Ship Canal at 11th St., Site RI-31



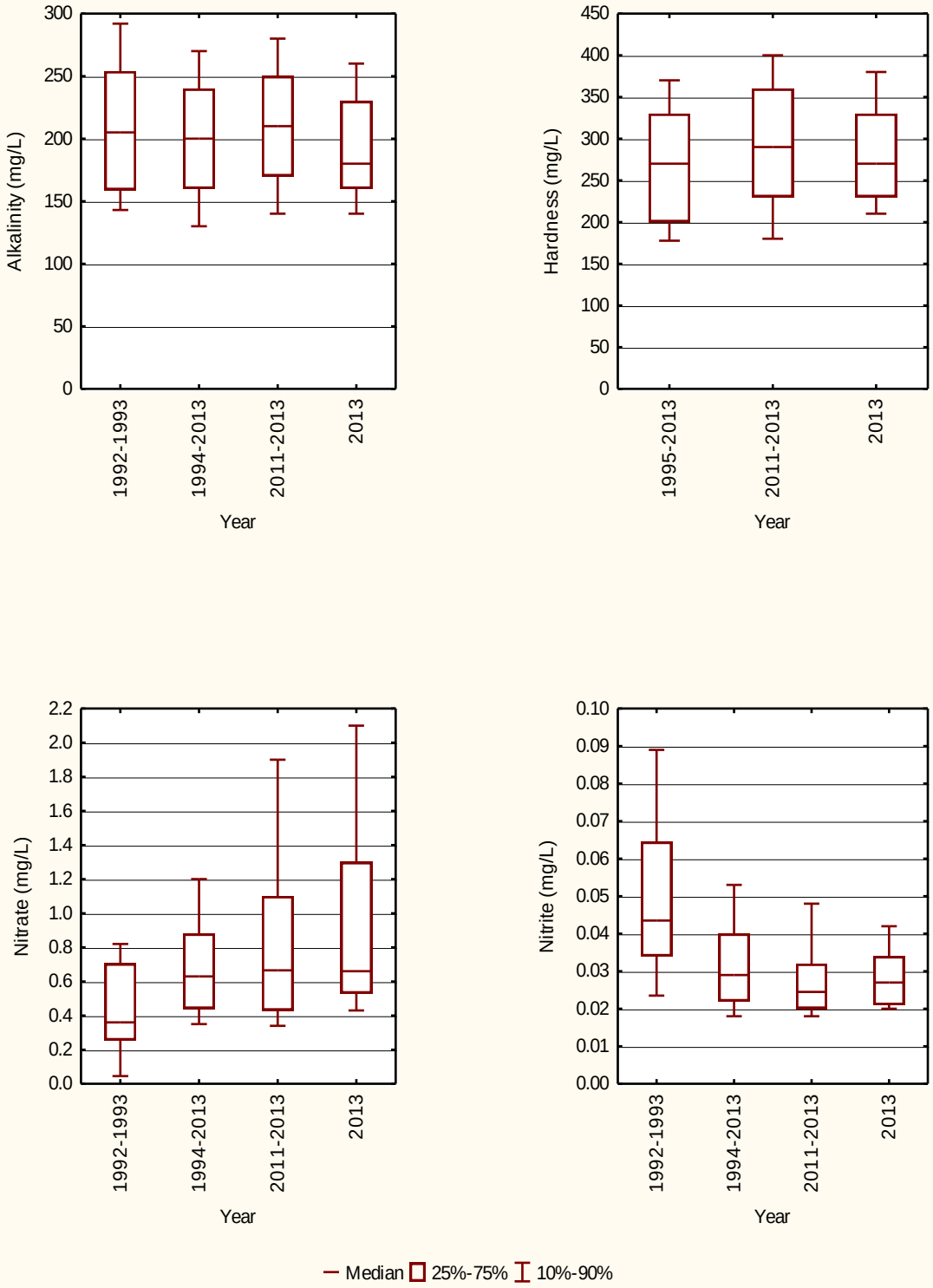
MMSD Water Quality Monitoring Program Data
Burnham Ship Canal at 11th St., Site RI-31



MMSD Water Quality Monitoring Program Data
Burnham Ship Canal at 11th St., Site RI-31



MMSD Water Quality Monitoring Program Data
Burnham Ship Canal at 11th St., Site RI-31



BURNHAM SHIP CANAL - SITE 31
MENOMONEE RIVER
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.6	17.6	6.8	3.92	0.96	0.029	0.98	0.183	0.81	0.082	0.049	ND
Standard Error	0.0	1.5	0.6	1.23	0.16	0.002	0.16	0.019	0.07	0.004	0.003	ND
Median	7.7	19.8	6.7	2.35	0.66	0.027	0.69	0.180	0.82	0.078	0.049	ND
Mode	7.7	Multi	Multi	Multi	Multi	0.020	0.69	0.210	1.20	0.110	Multi	ND
Standard Deviation	0.2	6.7	2.6	5.50	0.63	0.008	0.64	0.087	0.25	0.018	0.013	ND
Sample Variance	0.1	45.0	7.0	30.27	0.40	0.000	0.41	0.008	0.06	0.000	0.000	ND
Range	0.9	22.4	9.1	20.66	1.94	0.023	2.02	0.343	0.83	0.059	0.049	ND
Minimum	7.0	6.1	3.1	0.34	0.36	0.020	0.38	0.047	0.37	0.051	0.026	ND
Maximum	7.9	28.5	12.2	21.00	2.30	0.043	2.40	0.390	1.20	0.110	0.075	ND
Count	21	21	21	20	15	15	15	21	15	20	21	0
Confidence Level (95%)	0.1	3.1	1.2	2.58	0.35	0.004	0.35	0.040	0.14	0.009	0.006	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	697.3	686.4	3.5	10.1	10.2	1137	209.6	2859	2.8	ND
Standard Error	ND	ND	94.5	93.9	0.8	1.6	2.0	130	41.7	1487	0.2	ND
Median	ND	ND	610.0	604.4	2.9	6.3	6.3	915	160.0	420	2.6	ND
Mode	ND	ND	Multi	Multi	Multi	Multi	4.4	Multi	Multi	Multi	Multi	ND
Standard Deviation	ND	ND	366.0	363.7	3.1	7.3	9.0	595	190.9	6814	0.8	ND
Sample Variance	ND	ND	133978.1	132314.0	9.9	53.0	81.7	354147	36456.1	46436398	0.6	ND
Range	ND	ND	1390.0	1384.1	13.0	25.9	31.8	2458	769.0	30953	2.8	ND
Minimum	ND	ND	310.0	304.9	0.0	4.1	3.0	542	61.0	47	1.7	ND
Maximum	ND	ND	1700.0	1689.0	13.0	30.0	34.8	3000	830.0	31000	4.5	ND
Count	0	0	15	15	15	21	21	21	21	21	21	0
Confidence Level (95%)	ND	ND	202.7	201.4	1.7	3.3	4.1	271	86.9	3102	0.3	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

BURNHAM SHIP CANAL - SITE 31
MENOMONEE RIVER
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	63.73	31.40	0.2	2.3	10.6	2.0	1.6	17.5	0.5	3.3	0.0	ND
Standard Error	4.03	2.03	0.1	0.4	0.7	0.4	0.8	2.1	0.4	0.8	0.0	ND
Median	60.00	32.00	0.0	2.0	10.0	2.3	0.0	15.0	0.0	4.0	0.0	ND
Mode	55.00	32.00	0.0	Multi	12.0	0.0	0.0	15.0	0.0	0.0	0.0	ND
Standard Deviation	15.60	7.85	0.4	1.5	3.0	1.6	2.9	9.4	1.4	3.0	0.0	ND
Sample Variance	243.35	61.69	0.2	2.3	9.0	2.6	8.6	88.4	1.8	9.1	0.0	ND
Range	58.00	29.00	1.2	6.0	10.8	4.6	8.5	44.0	4.1	9.0	0.0	ND
Minimum	41.00	20.00	0.0	0.0	6.2	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	99.00	49.00	1.2	6.0	17.0	4.6	8.5	44.0	4.1	9.0	0.0	ND
Count	15	15	15	15	21	15	14	21	13	14	15	0
Confidence Level (95%)	8.64	4.35	0.2	0.8	1.4	0.9	1.7	4.3	0.8	1.7	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	287	193	1.0	ND	50.5	43.4	7.8	7.6
Standard Error	18	13	0.3	ND	2.6	2.4	0.5	0.5
Median	270	180	0.0	ND	49.0	42.0	8.3	7.5
Mode	Multi	170	0.0	ND	49.0	41.0	8.5	6.9
Standard Deviation	70	49	1.6	ND	10.1	9.0	2.1	1.9
Sample Variance	4838	2407	2.4	ND	101.8	81.8	4.3	3.7
Range	260	180	4.6	ND	32.0	30.0	7.7	6.5
Minimum	190	100	0.0	ND	36.0	29.0	4.3	4.5
Maximum	450	280	4.6	ND	68.0	59.0	12.0	11.0
Count	15	15	21	0	15	14	20	14
Confidence Level (95%)	39	27	0.7	ND	5.6	5.2	1.0	1.1

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

BURLEIGH ST. - SITE 32
MENOMONEE RIVER
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.1	11.5	10.9	4.58	0.50	0.020	0.52	0.086	0.72	0.101	0.061	ND
Standard Error	0.1	3.0	0.8	1.78	0.08	0.004	0.08	0.042	0.10	0.014	0.011	ND
Median	8.1	15.3	9.6	2.50	0.47	0.014	0.49	0.024	0.58	0.095	0.061	ND
Mode	Multi	Multi	9.6	Multi	Multi	0.014	Multi	0.000	Multi	0.110	0.061	ND
Standard Deviation	0.3	10.1	2.8	5.63	0.27	0.012	0.27	0.140	0.32	0.047	0.038	ND
Sample Variance	0.1	102.2	7.6	31.69	0.07	0.000	0.07	0.019	0.10	0.002	0.001	ND
Range	0.8	25.1	9.2	19.68	0.82	0.043	0.81	0.440	0.98	0.148	0.138	ND
Minimum	7.6	0.0	6.6	0.32	0.16	0.000	0.17	0.000	0.42	0.042	0.012	ND
Maximum	8.4	25.1	15.8	20.00	0.98	0.043	0.98	0.440	1.40	0.190	0.150	ND
Count	10	11	11	10	11	11	11	11	11	11	11	0
Confidence Level (95%)	0.2	6.8	1.9	4.03	0.18	0.008	0.18	0.094	0.21	0.032	0.025	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	705.5	691.8	3.9	13.6	13.8	1253	251.4	4799	2.9	1967
Standard Error	ND	ND	103.7	103.8	0.9	3.3	3.5	190	60.8	3927	0.2	1124
Median	ND	ND	610.0	572.0	3.5	8.9	8.7	1060	170.0	1100	3.0	920
Mode	ND	ND	470.0	Multi	Multi	6.6	Multi	Multi	Multi	1200	3.1	Multi
Standard Deviation	ND	ND	344.0	344.3	2.8	10.9	11.6	630	201.7	13025	0.8	3728
Sample Variance	ND	ND	118307.3	118562.1	8.0	119.4	134.9	397100	40700.5	169646907	0.6	13897840
Range	ND	ND	1180.0	1177.0	9.8	34.5	34.4	2165	705.0	43936	2.8	12923
Minimum	ND	ND	320.0	305.0	1.2	3.5	2.1	555	85.0	64	1.8	77
Maximum	ND	ND	1500.0	1482.0	11.0	38.0	36.5	2720	790.0	44000	4.6	13000
Count	0	0	11	11	11	11	11	11	11	11	11	11
Confidence Level (95%)	ND	ND	231.1	231.3	1.9	7.3	7.8	423	135.5	8750	0.5	2504

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

BURLEIGH ST. - SITE 32
MENOMONEE RIVER
WATER QUALITY DATA - 2013

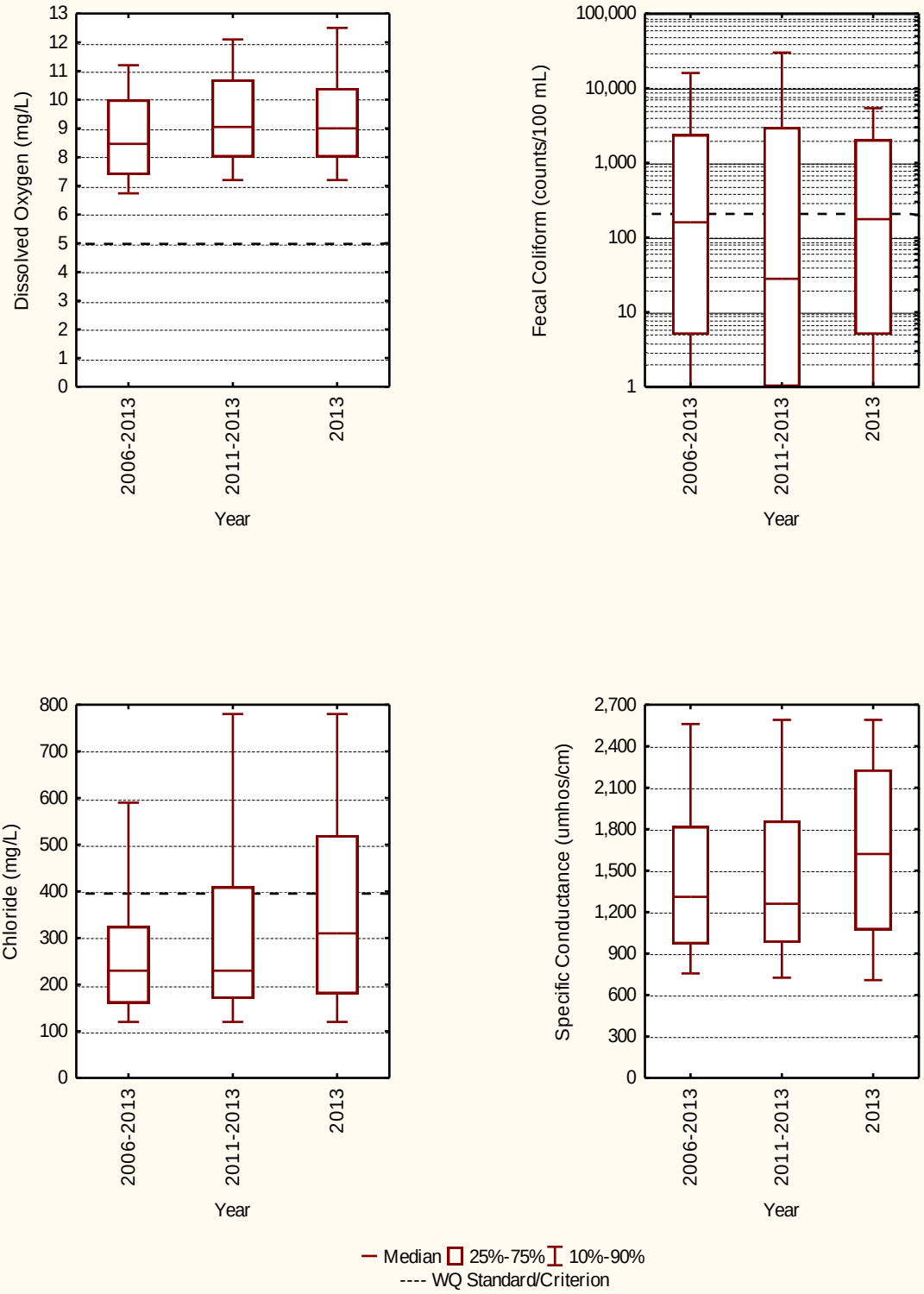
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	60.82	29.91	0.3	2.2	4.9	2.0	0.0	15.6	0.3	2.8	0.0	ND
Standard Error	6.34	3.83	0.1	0.5	1.6	0.7	0.0	4.4	0.3	1.2	0.0	ND
Median	62.00	33.00	0.0	1.9	4.7	1.4	0.0	12.0	0.0	0.0	0.0	ND
Mode	Multi	16.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	21.03	12.71	0.4	1.5	5.3	2.2	0.0	14.6	0.8	3.8	0.0	ND
Sample Variance	442.16	161.49	0.2	2.3	28.4	4.9	0.0	214.1	0.7	14.6	0.0	ND
Range	61.00	35.00	1.2	4.4	14.0	7.0	0.0	41.0	2.6	11.0	0.0	ND
Minimum	34.00	12.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	95.00	47.00	1.2	4.4	14.0	7.0	0.0	41.0	2.6	11.0	0.0	ND
Count	11	11	11	11	11	11	10	11	10	11	7	0
Confidence Level (95%)	14.13	8.54	0.3	1.0	3.6	1.5	0.0	9.8	0.6	2.6	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	275	178	2.3	ND	48.7	39.8	8.8	8.2
Standard Error	31	26	0.8	ND	5.2	4.8	1.0	1.0
Median	290	220	2.1	ND	56.0	46.0	8.0	6.8
Mode	Multi	220	0.0	ND	Multi	20.0	6.0	Multi
Standard Deviation	103	85	2.6	ND	17.4	16.1	3.5	3.2
Sample Variance	10707	7176	7.0	ND	302.6	258.0	12.0	10.5
Range	290	241	7.4	ND	46.0	41.0	10.8	9.6
Minimum	140	49	0.0	ND	26.0	18.0	5.2	5.4
Maximum	430	290	7.4	ND	72.0	59.0	16.0	15.0
Count	11	11	11	0	11	11	11	11
Confidence Level (95%)	70	57	1.8	ND	11.7	10.8	2.3	2.2

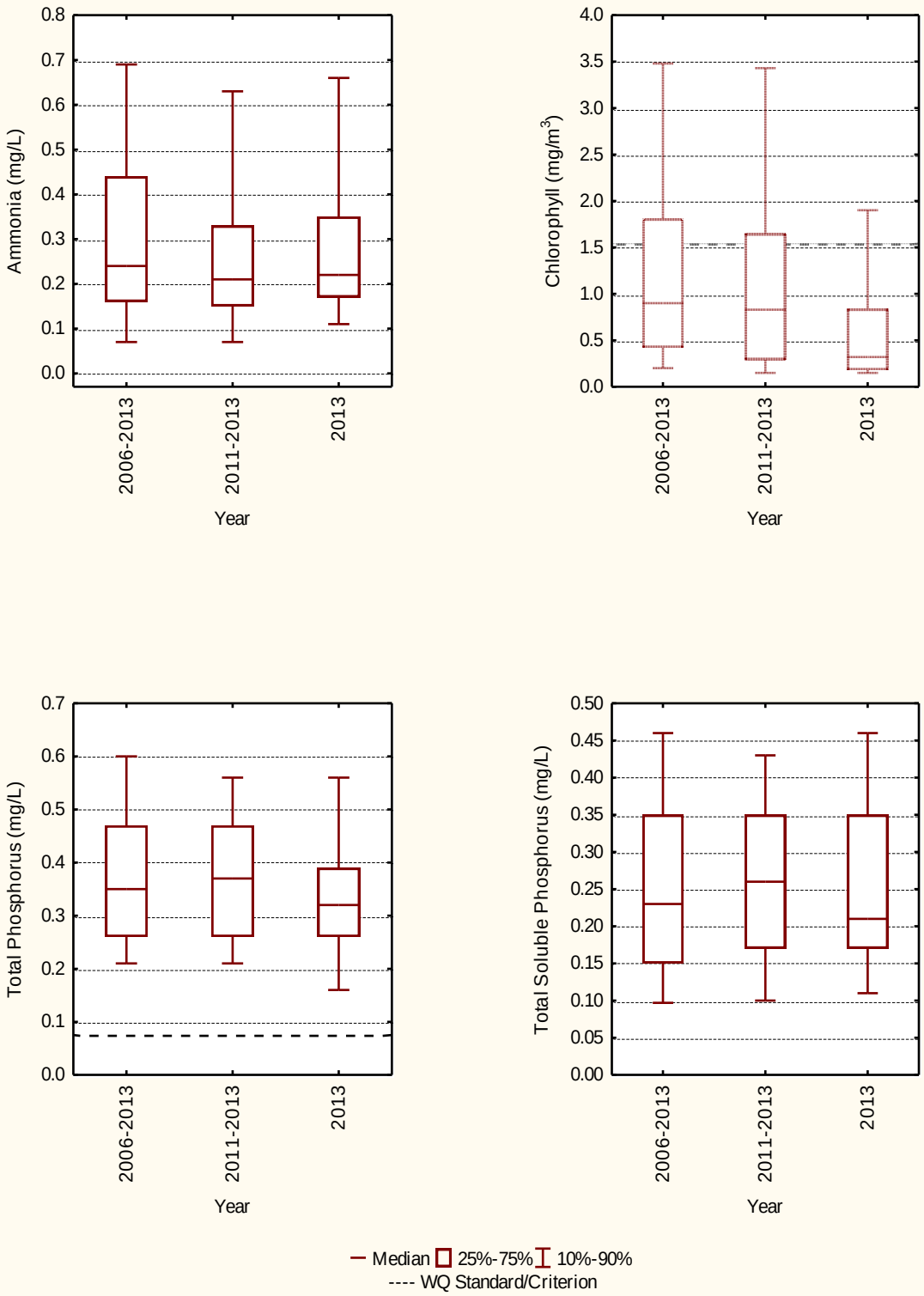
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

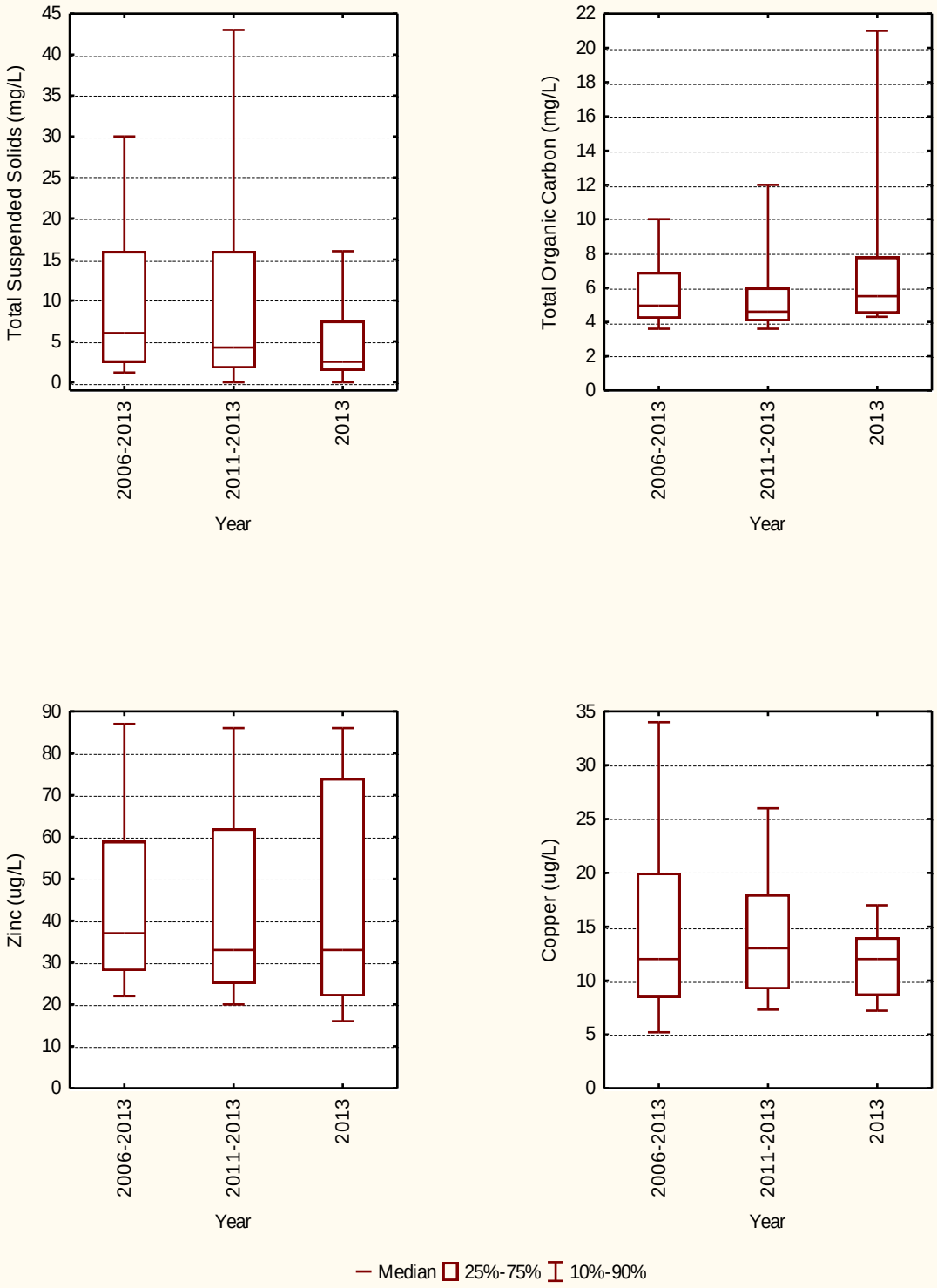
MMSD Water Quality Monitoring Program Data
43rd St. Ditch at Lincoln Ave.,Site RI-33



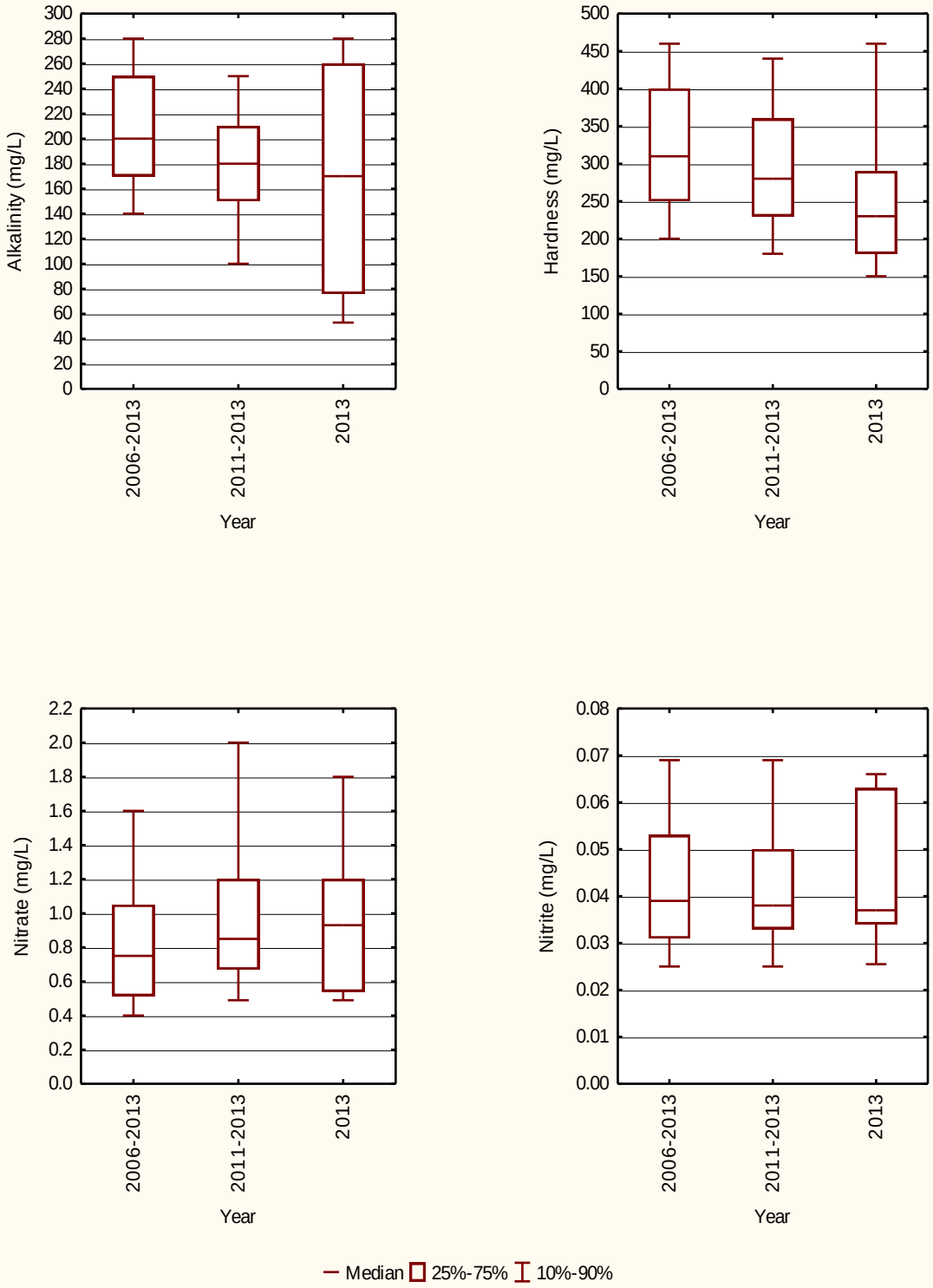
MMSD Water Quality Monitoring Program Data
43rd St. Ditch at Lincoln Ave., Site RI-33



MMSD Water Quality Monitoring Program Data
43rd St. Ditch at Lincoln Ave., Site RI-33



MMSD Water Quality Monitoring Program Data
43rd St. Ditch at Lincoln Ave., Site RI-33



43RD ST. DITCH - SITE 33
KINNICKINNIC RIVER
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.6	13.0	9.4	0.64	0.98	0.044	1.12	0.317	1.18	0.368	0.280	ND
Standard Error	0.1	1.6	0.5	0.15	0.18	0.005	0.17	0.063	0.31	0.047	0.043	ND
Median	7.6	14.4	9.0	0.32	0.93	0.037	1.00	0.220	0.81	0.320	0.210	ND
Mode	Multi	18.6	Multi	Multi	Multi	Multi	Multi	0.210	Multi	Multi	0.170	ND
Standard Deviation	0.3	6.8	2.0	0.62	0.59	0.016	0.53	0.260	1.02	0.193	0.176	ND
Sample Variance	0.1	46.0	3.9	0.39	0.35	0.000	0.28	0.068	1.04	0.037	0.031	ND
Range	1.1	19.4	6.3	2.00	2.10	0.045	1.65	1.024	3.45	0.820	0.703	ND
Minimum	7.2	2.3	6.3	0.00	0.00	0.024	0.55	0.076	0.45	0.130	0.097	ND
Maximum	8.3	21.7	12.6	2.00	2.10	0.069	2.20	1.100	3.90	0.950	0.800	ND
Count	17	17	17	17	11	10	10	17	11	17	17	0
Confidence Level (95%)	0.1	3.5	1.0	0.32	0.40	0.012	0.38	0.134	0.69	0.099	0.091	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	879.1	870.0	3.9	6.7	9.2	1646	363.3	4627	2.3	6668
Standard Error	ND	ND	119.4	119.5	1.8	2.5	2.6	174	55.6	3711	0.4	3235
Median	ND	ND	860.0	819.0	1.9	2.5	5.5	1620	310.0	177	2.6	1400
Mode	ND	ND	1400.0	Multi	0.0	0.0	3.4	Multi	Multi	Multi	0.7	Multi
Standard Deviation	ND	ND	396.1	396.3	6.1	10.1	10.9	716	229.1	14844	1.4	10729
Sample Variance	ND	ND	156869.1	157066.7	37.5	102.9	118.0	512919	52472.0	220336340	1.9	115101021
Range	ND	ND	1160.0	1174.6	21.0	41.0	43.4	2572	734.0	60000	4.3	35961
Minimum	ND	ND	240.0	224.0	0.0	0.0	1.9	438	66.0	0	0.5	39
Maximum	ND	ND	1400.0	1398.6	21.0	41.0	45.3	3010	800.0	60000	4.8	36000
Count	0	0	11	11	11	17	17	17	17	16	14	11
Confidence Level (95%)	ND	ND	266.1	266.2	4.1	5.2	5.6	368	117.8	7910	0.8	7208

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

43RD ST. DITCH - SITE 33
KINNICKINNIC RIVER
WATER QUALITY DATA - 2013

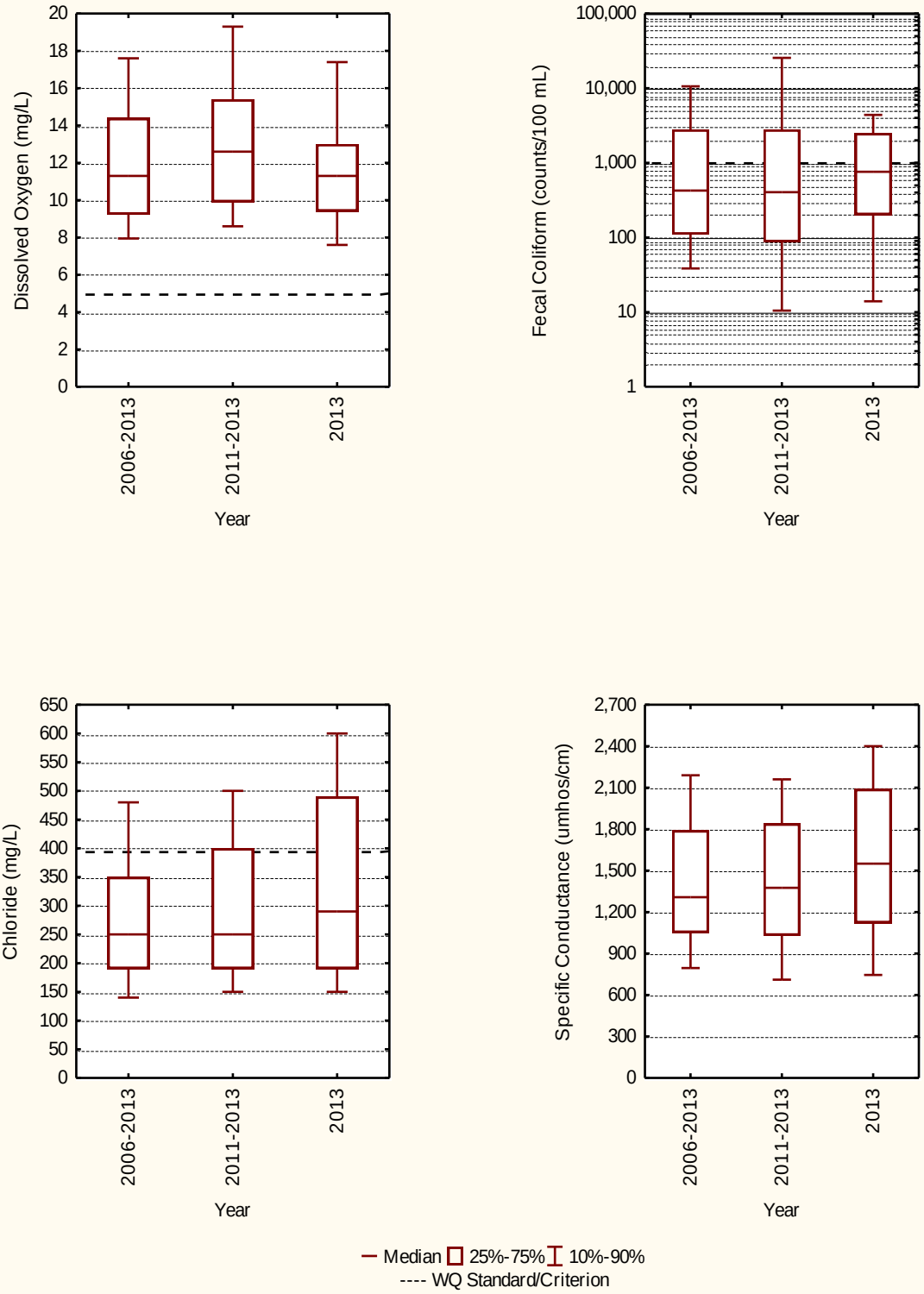
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	64.55	23.92	0.3	2.7	11.1	2.9	2.3	48.9	0.3	2.3	0.3	ND
Standard Error	8.35	3.66	0.1	0.7	1.0	0.6	1.3	8.7	0.3	0.7	0.3	ND
Median	57.00	22.00	0.0	2.3	12.0	2.9	0.0	33.0	0.0	2.3	0.0	ND
Mode	Multi	Multi	0.0	0.0	12.0	0.0	0.0	22.0	0.0	0.0	0.0	ND
Standard Deviation	27.69	12.14	0.4	2.2	4.2	2.0	4.2	35.7	1.0	2.3	0.9	ND
Sample Variance	766.47	147.37	0.2	4.8	17.6	4.1	17.4	1276.4	0.9	5.3	0.9	ND
Range	95.00	37.90	1.1	7.6	17.0	6.6	12.0	135.0	2.9	6.1	3.1	ND
Minimum	25.00	8.10	0.0	0.0	0.0	0.0	0.0	15.0	0.0	0.0	0.0	ND
Maximum	120.00	46.00	1.1	7.6	17.0	6.6	12.0	150.0	2.9	6.1	3.1	ND
Count	11	11	11	11	17	11	11	17	9	10	11	0
Confidence Level (95%)	18.60	8.16	0.3	1.5	2.2	1.4	2.8	18.4	0.7	1.7	0.6	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	261	169	4.3	ND	41.9	32.7	8.0	9.5
Standard Error	36	27	1.5	ND	3.5	4.5	1.8	2.5
Median	230	170	2.2	ND	43.0	36.0	5.5	5.8
Mode	230	170	0.0	ND	Multi	36.0	Multi	Multi
Standard Deviation	120	91	6.3	ND	11.5	15.0	6.9	7.5
Sample Variance	14300	8271	39.5	ND	132.7	224.3	48.0	56.3
Range	395	280	21.0	ND	39.0	52.5	23.8	22.1
Minimum	95	40	0.0	ND	24.0	5.5	4.2	3.9
Maximum	490	320	21.0	ND	63.0	58.0	28.0	26.0
Count	11	11	17	0	11	11	15	9
Confidence Level (95%)	80	61	3.2	ND	7.7	10.1	3.8	5.8

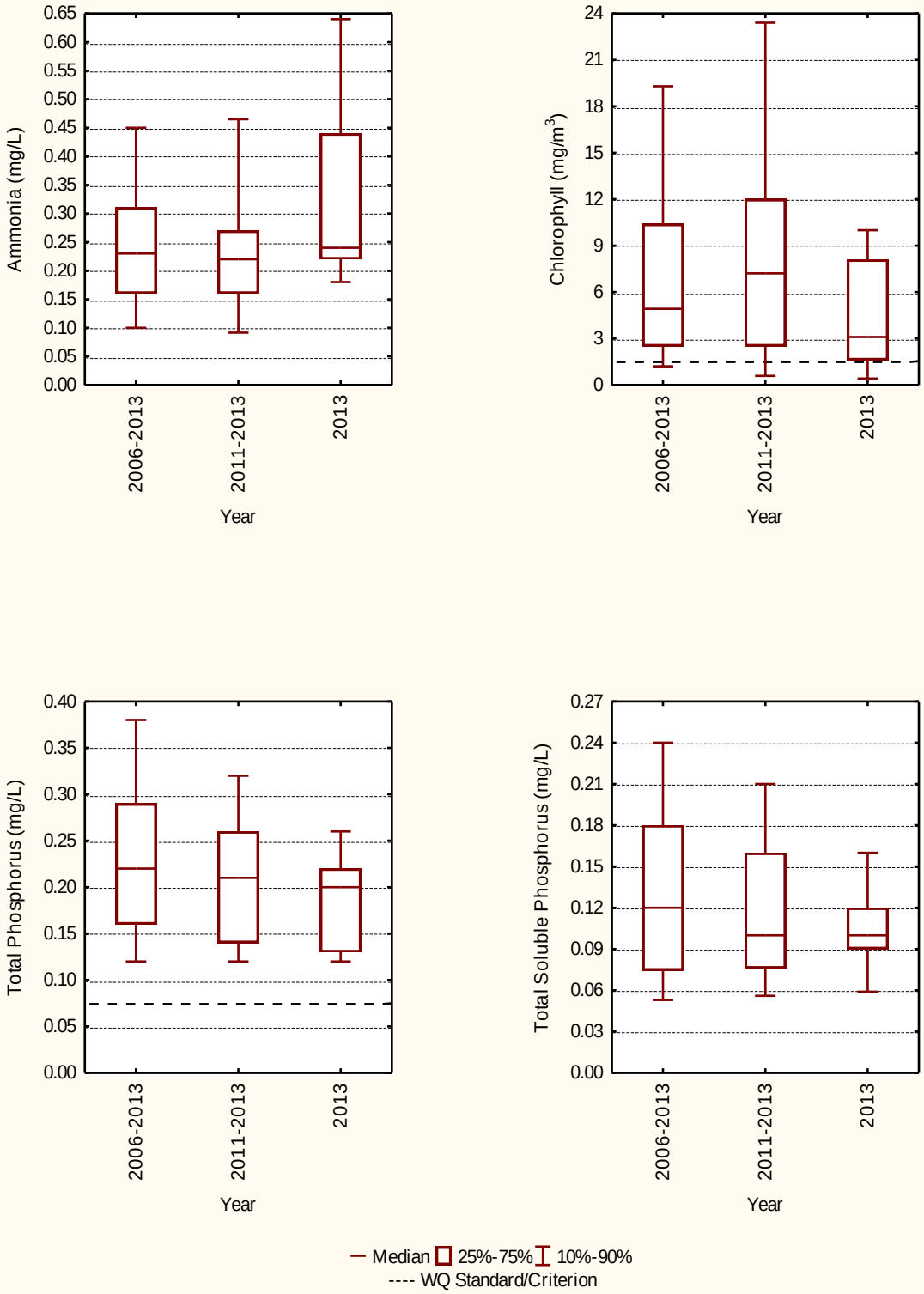
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

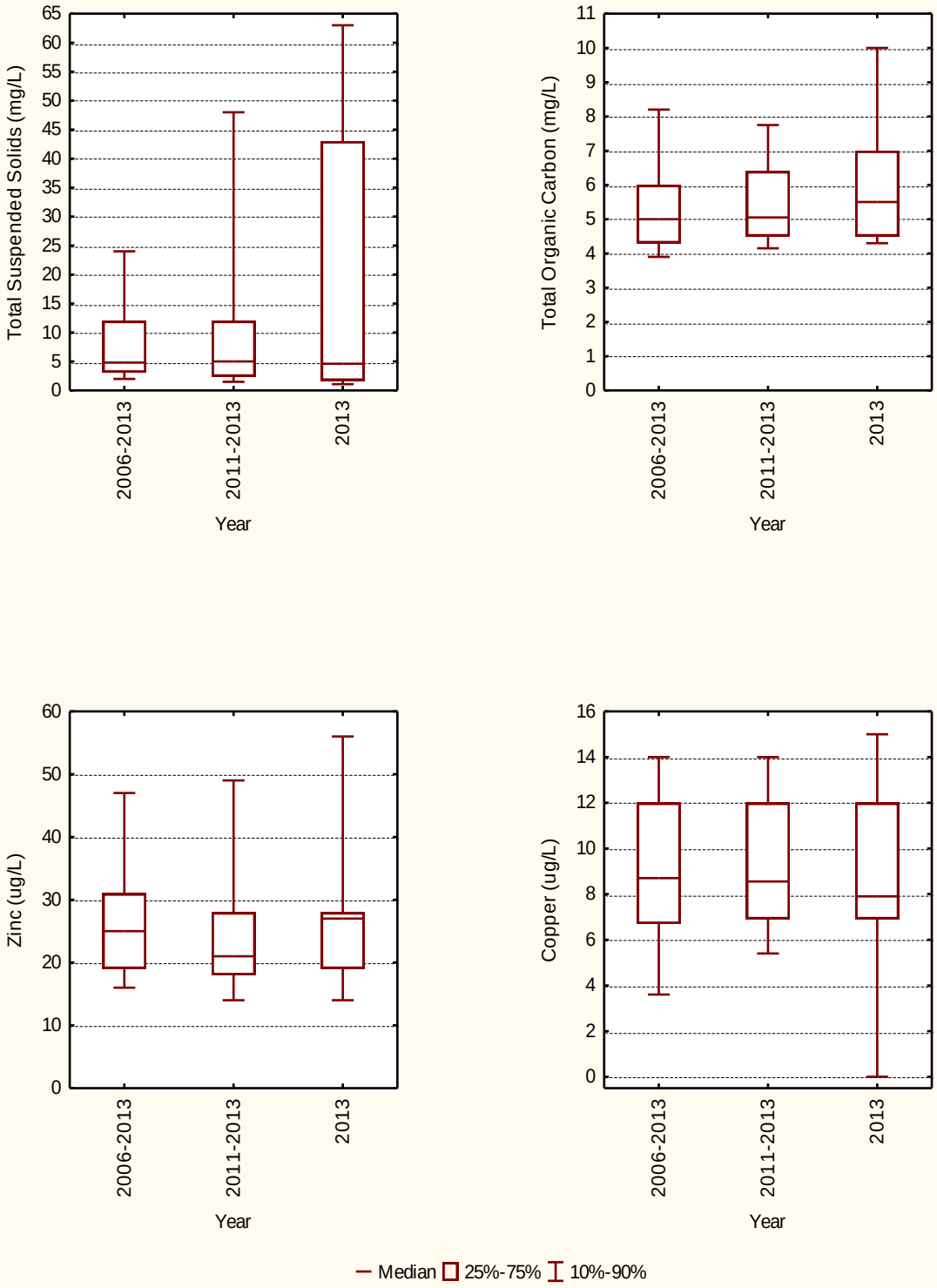
MMSD Water Quality Monitoring Program Data
Kinnickinnic River at W. Forest Home Ave., Site RI-34



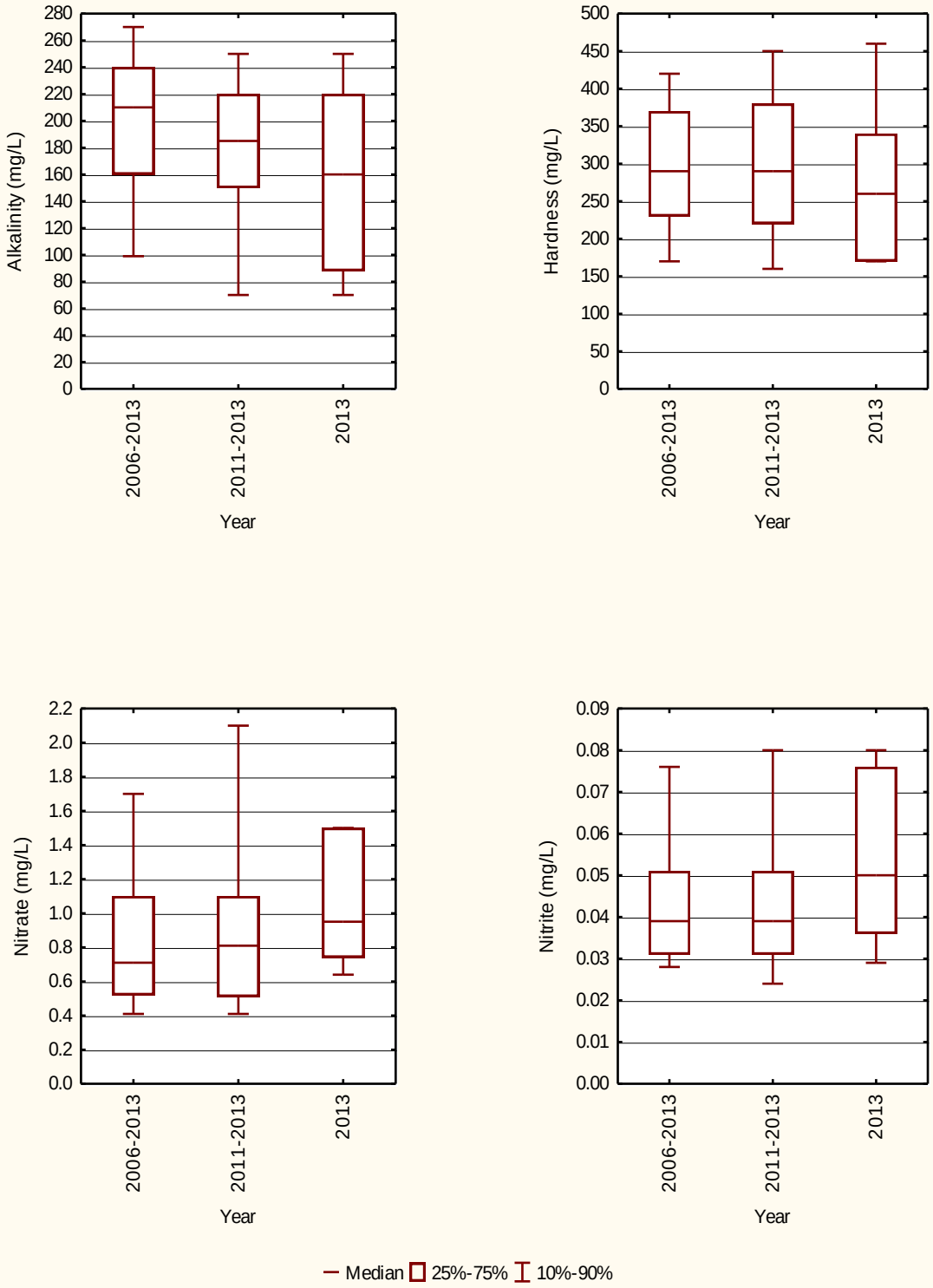
MMSD Water Quality Monitoring Program Data
Kinnickinnic River at W. Forest Home Ave., Site RI-34



MMSD Water Quality Monitoring Program Data
Kinnickinnic River at W. Forest Home Ave., Site RI-34



MMSD Water Quality Monitoring Program Data
Kinnickinnic River at W. Forest Home Ave., Site RI-34



DOWNSTREAM OF JACKSON PARK LAGOON - SITE 34
KINNICKINNIC RIVER
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.7	13.5	11.7	4.63	1.02	0.056	1.08	0.325	0.97	0.191	0.106	ND
Standard Error	0.1	2.0	0.7	0.94	0.11	0.008	0.11	0.048	0.13	0.013	0.011	ND
Median	7.7	16.2	11.3	3.10	0.95	0.050	1.00	0.240	0.81	0.200	0.100	ND
Mode	Multi	Multi	13.0	8.60	Multi	0.036	Multi	Multi	1.30	0.120	0.120	ND
Standard Deviation	0.3	8.3	3.0	3.87	0.38	0.026	0.38	0.199	0.43	0.055	0.045	ND
Sample Variance	0.1	68.4	9.3	14.94	0.15	0.001	0.14	0.040	0.18	0.003	0.002	ND
Range	1.0	23.6	10.3	11.62	1.17	0.086	1.23	0.750	1.14	0.190	0.195	ND
Minimum	7.2	1.5	7.3	0.38	0.43	0.024	0.47	0.150	0.56	0.120	0.045	ND
Maximum	8.2	25.1	17.6	12.00	1.60	0.110	1.70	0.900	1.70	0.310	0.240	ND
Count	17	17	17	17	11	11	11	17	11	17	17	0
Confidence Level (95%)	0.1	4.3	1.6	1.99	0.26	0.018	0.25	0.102	0.29	0.028	0.023	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	938.2	915.0	5.0	18.6	19.5	1613	360.7	4567	2.7	4102
Standard Error	ND	ND	122.7	121.7	1.6	6.2	6.0	158	48.7	3355	0.2	2715
Median	ND	ND	890.0	888.7	2.0	4.6	6.7	1550	290.0	760	2.9	1400
Mode	ND	ND	1400.0	Multi	0.0	Multi	Multi	Multi	190.0	Multi	Multi	1400
Standard Deviation	ND	ND	406.9	403.8	5.4	25.4	24.8	653	200.6	13831	1.0	9003
Sample Variance	ND	ND	165556.4	163039.8	28.7	644.4	613.4	426565	40251.0	191304704	1.0	81057349
Range	ND	ND	1150.0	1161.0	14.0	72.0	78.0	2451	758.0	57993	3.9	30951
Minimum	ND	ND	350.0	287.0	0.0	0.0	2.7	489	92.0	7	0.8	49
Maximum	ND	ND	1500.0	1448.0	14.0	72.0	80.7	2940	850.0	58000	4.8	31000
Count	0	0	11	11	11	17	17	17	17	17	17	11
Confidence Level (95%)	ND	ND	273.3	271.3	3.6	13.1	12.7	336	103.2	7111	0.5	6048

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

DOWNSTREAM OF JACKSON PARK LAGOON - SITE 34
KINNICKINNIC RIVER
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	65.27	27.27	0.2	3.0	8.7	2.9	1.6	29.9	1.5	4.1	0.0	ND
Standard Error	6.88	4.15	0.1	0.6	1.1	0.5	1.1	3.6	0.8	1.1	0.0	ND
Median	63.00	24.00	0.0	2.7	7.9	3.1	0.0	27.0	0.0	6.2	0.0	ND
Mode	Multi	13.00	0.0	0.0	Multi	Multi	0.0	28.0	0.0	0.0	0.0	ND
Standard Deviation	22.83	13.76	0.4	2.1	4.4	1.8	3.4	15.0	2.4	3.5	0.0	ND
Sample Variance	521.42	189.42	0.1	4.4	19.6	3.2	11.6	225.5	5.6	12.5	0.0	ND
Range	72.00	37.00	1.1	6.1	16.0	5.7	8.7	47.0	5.9	8.5	0.0	ND
Minimum	28.00	13.00	0.0	0.0	0.0	0.0	0.0	12.0	0.0	0.0	0.0	ND
Maximum	100.00	50.00	1.1	6.1	16.0	5.7	8.7	59.0	5.9	8.5	0.0	ND
Count	11	11	11	11	17	11	10	17	10	11	10	0
Confidence Level (95%)	15.34	9.25	0.2	1.4	2.3	1.2	2.4	7.7	1.7	2.4	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	278	166	4.3	ND	44.2	37.6	6.1	6.3
Standard Error	34	22	1.3	ND	4.2	4.6	0.5	0.7
Median	260	160	2.5	ND	43.0	39.0	5.5	5.2
Mode	Multi	Multi	0.0	ND	40.0	Multi	4.5	5.1
Standard Deviation	114	73	5.2	ND	13.9	15.3	2.0	2.2
Sample Variance	12896	5336	27.5	ND	193.8	232.7	4.0	4.9
Range	340	231	19.0	ND	42.0	46.0	6.8	6.6
Minimum	120	69	0.0	ND	24.0	15.0	4.2	4.4
Maximum	460	300	19.0	ND	66.0	61.0	11.0	11.0
Count	11	11	17	0	11	11	17	11
Confidence Level (95%)	76	49	2.7	ND	9.4	10.2	1.0	1.5

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

WILSON PARK CREEK - SITE 35
KINNICKINNIC RIVER
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.2	12.9	12.6	2.30	0.37	0.027	0.39	0.036	0.54	0.066	0.036	ND
Standard Error	0.1	2.0	0.6	0.41	0.10	0.010	0.10	0.021	0.07	0.006	0.004	ND
Median	8.3	15.5	12.1	2.20	0.19	0.028	0.19	0.000	0.47	0.066	0.034	ND
Mode	8.3	22.2	12.1	Multi	0.75	0.000	Multi	0.000	Multi	0.057	0.035	ND
Standard Deviation	0.4	8.2	2.6	1.69	0.32	0.033	0.34	0.088	0.22	0.025	0.018	ND
Sample Variance	0.1	66.9	6.7	2.86	0.10	0.001	0.12	0.008	0.05	0.001	0.000	ND
Range	1.3	23.0	11.1	4.94	0.90	0.110	0.90	0.330	0.64	0.099	0.070	ND
Minimum	7.4	1.2	8.8	0.36	0.04	0.000	0.07	0.000	0.21	0.021	0.013	ND
Maximum	8.7	24.2	19.9	5.30	0.94	0.110	0.97	0.330	0.85	0.120	0.083	ND
Count	17	17	17	17	11	11	11	17	11	17	17	0
Confidence Level (95%)	0.2	4.2	1.3	0.87	0.22	0.022	0.23	0.045	0.14	0.013	0.009	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	933.6	925.1	2.7	6.3	10.1	1611	334.1	3023	2.8	2837
Standard Error	ND	ND	118.8	119.2	0.8	1.8	2.8	156	53.3	1841	0.2	1559
Median	ND	ND	750.0	734.0	2.0	3.0	5.4	1500	270.0	420	2.6	1600
Mode	ND	ND	Multi	Multi	Multi	0.0	4.0	Multi	190.0	Multi	Multi	Multi
Standard Deviation	ND	ND	394.1	395.3	2.6	7.5	11.6	643	219.6	7590	0.7	5169
Sample Variance	ND	ND	155305.5	156297.8	6.5	56.5	135.3	413076	48205.1	57606784	0.5	26719028
Range	ND	ND	1300.0	1304.1	8.4	29.0	46.0	2508	791.0	31955	2.9	17929
Minimum	ND	ND	400.0	390.1	0.0	0.0	1.0	692	99.0	45	1.7	71
Maximum	ND	ND	1700.0	1694.2	8.4	29.0	47.0	3200	890.0	32000	4.5	18000
Count	0	0	11	11	11	17	17	17	17	17	17	11
Confidence Level (95%)	ND	ND	264.8	265.6	1.7	3.9	6.0	330	112.9	3902	0.4	3473

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

WILSON PARK CREEK - SITE 35
KINNICKINNIC RIVER
WATER QUALITY DATA - 2013

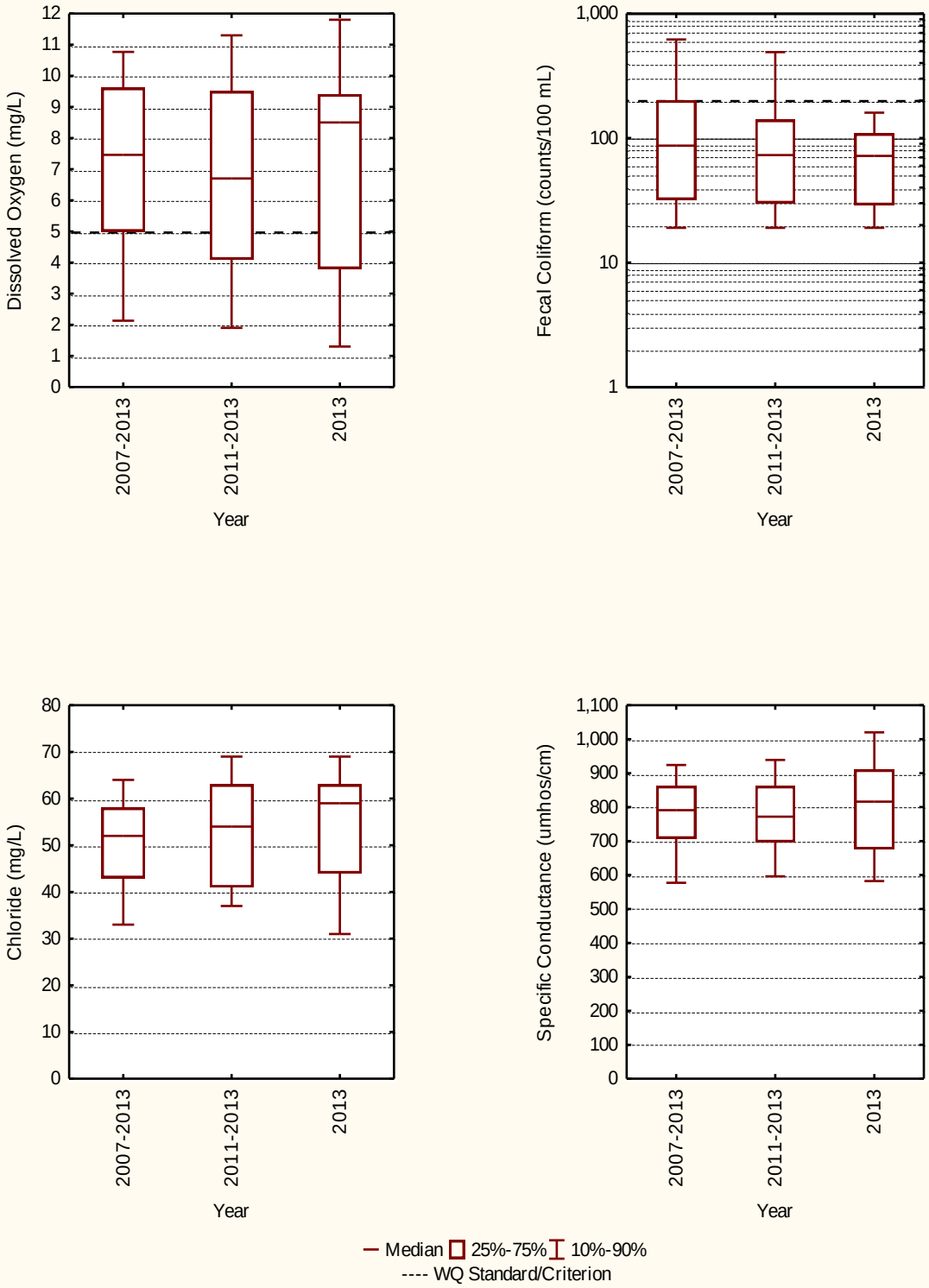
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	62.64	32.00	0.2	2.6	5.4	2.3	0.6	17.8	2.2	1.1	0.0	ND
Standard Error	5.50	4.46	0.1	0.5	1.1	0.5	0.6	3.2	0.8	0.8	0.0	ND
Median	66.00	29.00	0.0	3.2	6.6	2.6	0.0	18.0	1.6	0.0	0.0	ND
Mode	Multi	Multi	0.0	Multi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	18.24	14.80	0.4	1.5	4.7	1.7	2.0	13.1	2.4	2.4	0.0	ND
Sample Variance	332.85	219.00	0.1	2.2	21.9	2.8	4.0	171.3	5.8	5.6	0.0	ND
Range	65.00	45.00	0.9	4.0	14.0	4.4	6.6	45.0	5.8	6.6	0.0	ND
Minimum	33.00	10.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	98.00	55.00	0.9	4.0	14.0	4.4	6.6	45.0	5.8	6.6	0.0	ND
Count	11	11	11	11	17	11	11	17	10	8	9	0
Confidence Level (95%)	12.26	9.94	0.2	1.0	2.4	1.1	1.3	6.7	1.7	2.0	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	287	180	11.6	ND	52.5	37.1	12.2	15.0
Standard Error	31	16	5.0	ND	3.9	4.4	3.7	5.3
Median	280	180	2.5	ND	49.0	43.0	5.5	7.2
Mode	280	Multi	0.0	ND	Multi	13.0	Multi	Multi
Standard Deviation	104	54	20.7	ND	12.8	14.5	15.3	17.6
Sample Variance	10902	2962	429.4	ND	163.7	211.3	233.8	309.8
Range	350	185	83.0	ND	43.0	45.0	60.9	58.7
Minimum	120	75	0.0	ND	34.0	13.0	3.1	3.3
Maximum	470	260	83.0	ND	77.0	58.0	64.0	62.0
Count	11	11	17	0	11	11	17	11
Confidence Level (95%)	70	37	10.7	ND	8.6	9.8	7.9	11.8

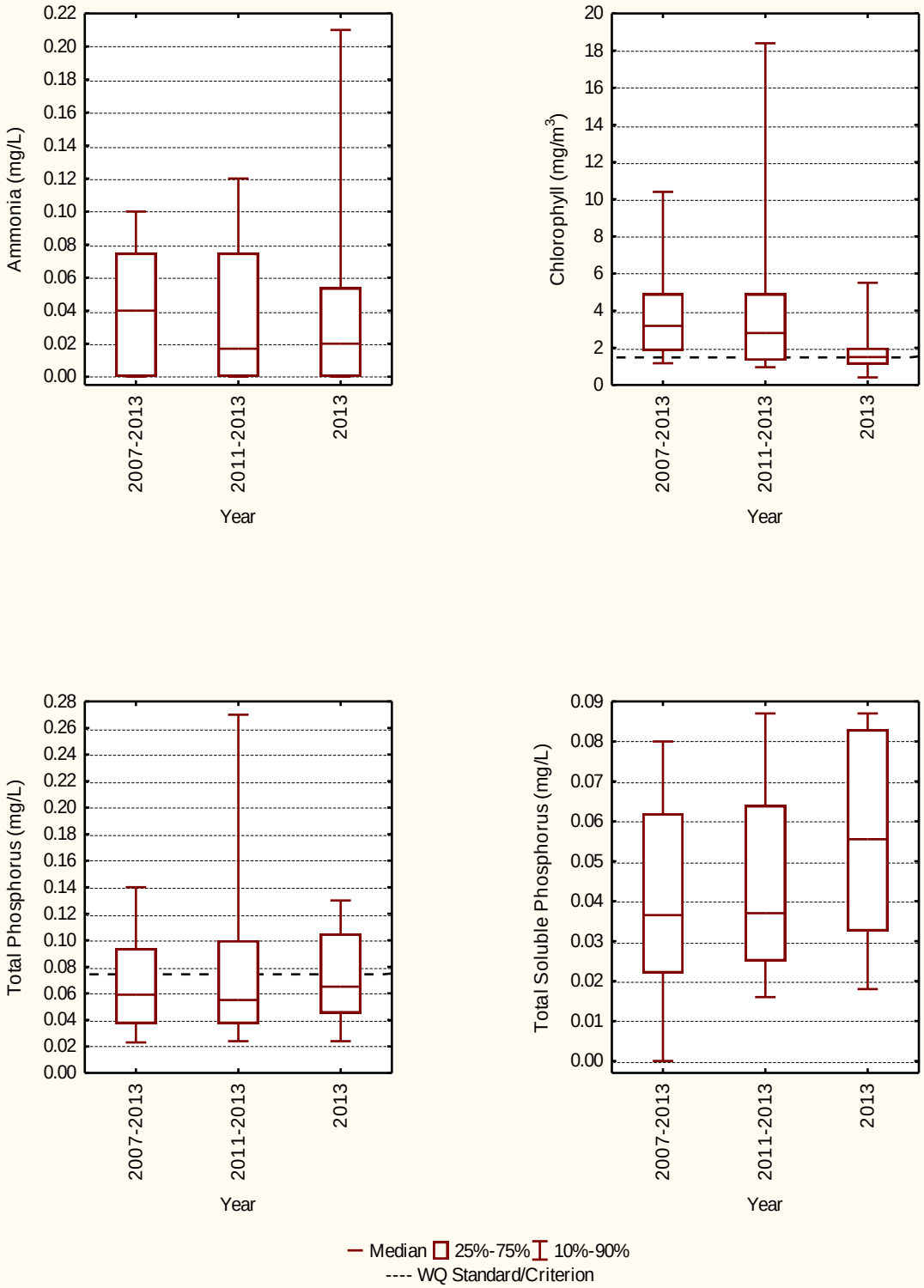
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

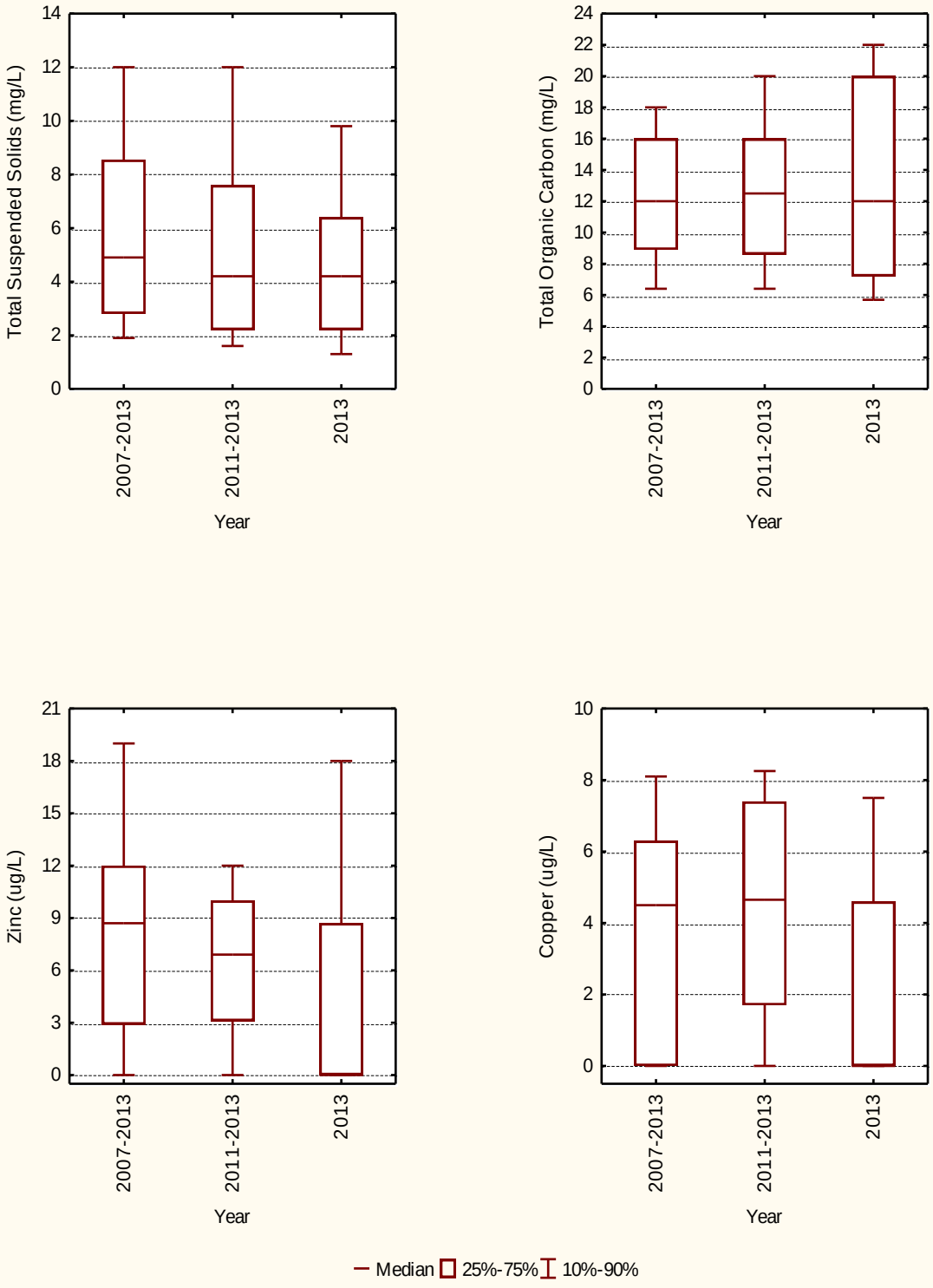
MMSD Water Quality Monitoring Program Data
Menomonee River at Hwy 145 N. of Freistadt Rd., Site RI-36



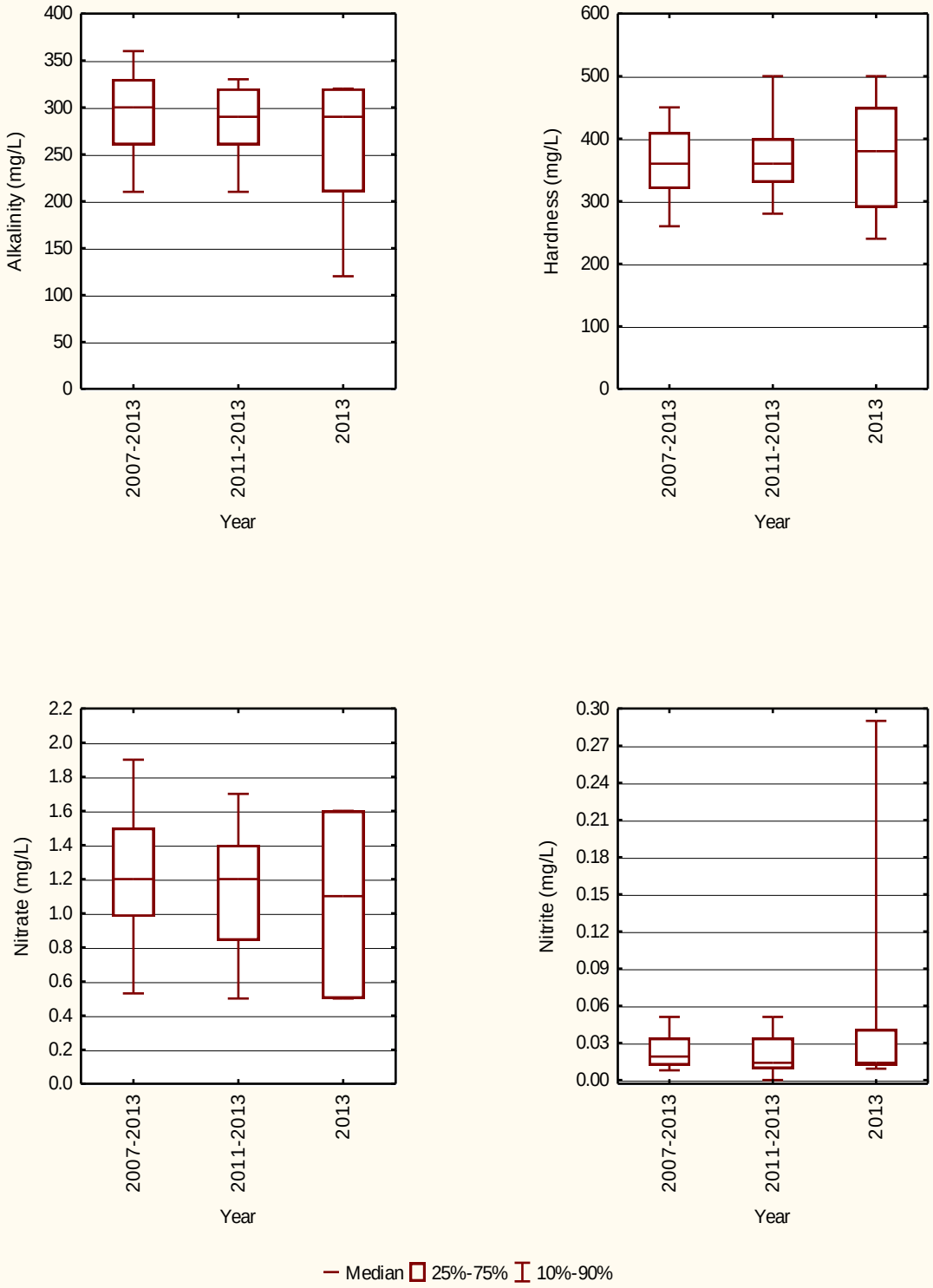
MMSD Water Quality Monitoring Program Data
Menomonee River at Hwy 145 N. of Freistadt Rd., Site RI-36



MMSD Water Quality Monitoring Program Data
Menomonee River at Hwy 145 N. of Freistadt Rd., Site RI-36



MMSD Water Quality Monitoring Program Data
Menomonee River at Hwy 145 N. of Freistadt Rd., Site RI-36



FOND DU LAC AVE & FREISTADT RD. - SITE 36
MENOMONEE RIVER
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.5	10.5	7.0	2.07	1.09	0.074	1.19	0.050	0.96	0.074	0.056	ND
Standard Error	0.0	1.9	0.9	0.43	0.18	0.038	0.16	0.019	0.09	0.009	0.007	ND
Median	7.5	12.1	8.5	1.50	1.10	0.014	1.20	0.020	0.84	0.065	0.055	ND
Mode	Multi	Multi	Multi	1.30	Multi	0.012	0.52	0.000	Multi	Multi	Multi	ND
Standard Deviation	0.2	7.6	3.7	1.79	0.61	0.126	0.54	0.077	0.30	0.038	0.028	ND
Sample Variance	0.0	58.4	13.9	3.21	0.37	0.016	0.29	0.006	0.09	0.001	0.001	ND
Range	0.6	23.4	11.0	6.85	2.04	0.360	1.68	0.220	0.94	0.120	0.086	ND
Minimum	7.3	0.0	1.3	0.15	0.16	0.000	0.52	0.000	0.46	0.020	0.014	ND
Maximum	7.9	23.4	12.3	7.00	2.20	0.360	2.20	0.220	1.40	0.140	0.100	ND
Count	15	17	17	17	11	11	11	17	11	16	16	0
Confidence Level (95%)	0.1	3.9	1.9	0.92	0.41	0.084	0.36	0.040	0.20	0.020	0.015	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	491.8	487.1	1.3	4.9	5.1	775	53.7	77	1.8	108
Standard Error	ND	ND	43.8	44.6	0.3	1.0	1.5	48	3.3	13	0.1	20
Median	ND	ND	500.0	497.8	1.3	4.2	2.6	816	59.0	72	1.9	82
Mode	ND	ND	Multi	Multi	0.0	2.8	Multi	Multi	Multi	19	1.3	Multi
Standard Deviation	ND	ND	145.3	148.1	1.1	4.0	6.1	196	13.4	54	0.3	66
Sample Variance	ND	ND	21116.4	21925.0	1.3	16.2	37.1	38586	180.6	2880	0.1	4313
Range	ND	ND	540.0	551.1	3.7	16.0	24.8	795	46.0	181	1.0	209
Minimum	ND	ND	180.0	164.0	0.0	0.0	1.0	275	25.0	19	1.3	31
Maximum	ND	ND	720.0	715.1	3.7	16.0	25.8	1070	71.0	200	2.3	240
Count	0	0	11	11	11	17	17	17	17	16	16	11
Confidence Level (95%)	ND	ND	97.6	99.5	0.8	2.1	3.1	101	6.9	29	0.2	44

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

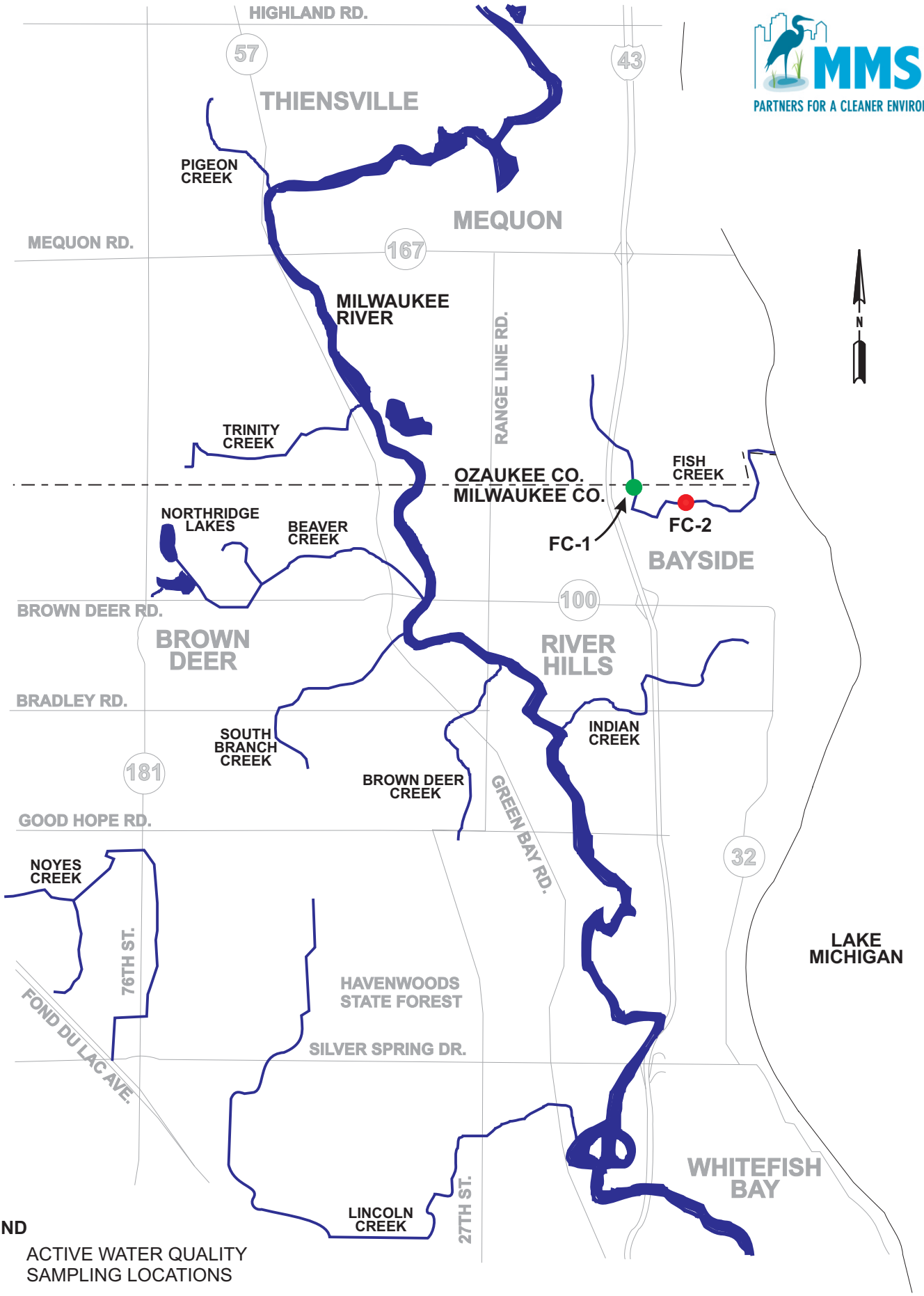
FOND DU LAC AVE & FREISTADT RD. - SITE 36
MENOMONEE RIVER
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	78.27	41.09	0.3	1.4	2.3	1.6	0.3	5.0	0.0	2.6	0.0	ND
Standard Error	7.29	4.24	0.1	0.3	0.8	0.6	0.3	1.7	0.0	1.1	0.0	ND
Median	77.00	45.00	0.0	1.7	0.0	1.5	0.0	0.0	0.0	1.0	0.0	ND
Mode	110.00	Multi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	24.17	14.05	0.4	1.0	3.3	1.9	1.1	7.2	0.0	3.3	0.0	ND
Sample Variance	584.22	197.29	0.2	1.0	10.9	3.4	1.2	51.2	0.0	11.1	0.0	ND
Range	84.00	47.00	1.2	2.8	8.8	4.9	3.7	23.0	0.0	8.0	0.0	ND
Minimum	26.00	10.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	110.00	57.00	1.2	2.8	8.8	4.9	3.7	23.0	0.0	8.0	0.0	ND
Count	11	11	11	11	17	11	11	17	10	9	10	0
Confidence Level (95%)	16.24	9.44	0.3	0.7	1.7	1.2	0.7	3.7	0.0	2.6	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	363	250	0.2	ND	67.6	54.5	13.3	12.8
Standard Error	35	27	0.2	ND	5.4	5.1	1.7	1.9
Median	380	290	0.0	ND	71.0	59.0	12.0	11.0
Mode	500	Multi	0.0	ND	75.0	68.0	22.0	21.0
Standard Deviation	116	89	1.0	ND	18.0	17.0	6.9	6.2
Sample Variance	13362	7882	1.0	ND	323.5	289.1	47.2	38.4
Range	390	269	4.1	ND	64.0	54.0	20.5	16.1
Minimum	110	61	0.0	ND	26.0	17.0	5.5	5.9
Maximum	500	330	4.1	ND	90.0	71.0	26.0	22.0
Count	11	11	17	0	11	11	17	11
Confidence Level (95%)	78	60	0.5	ND	12.1	11.4	3.5	4.2

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data



MMSD
PARTNERS FOR A CLEANER ENVIRONMENT

LEGEND

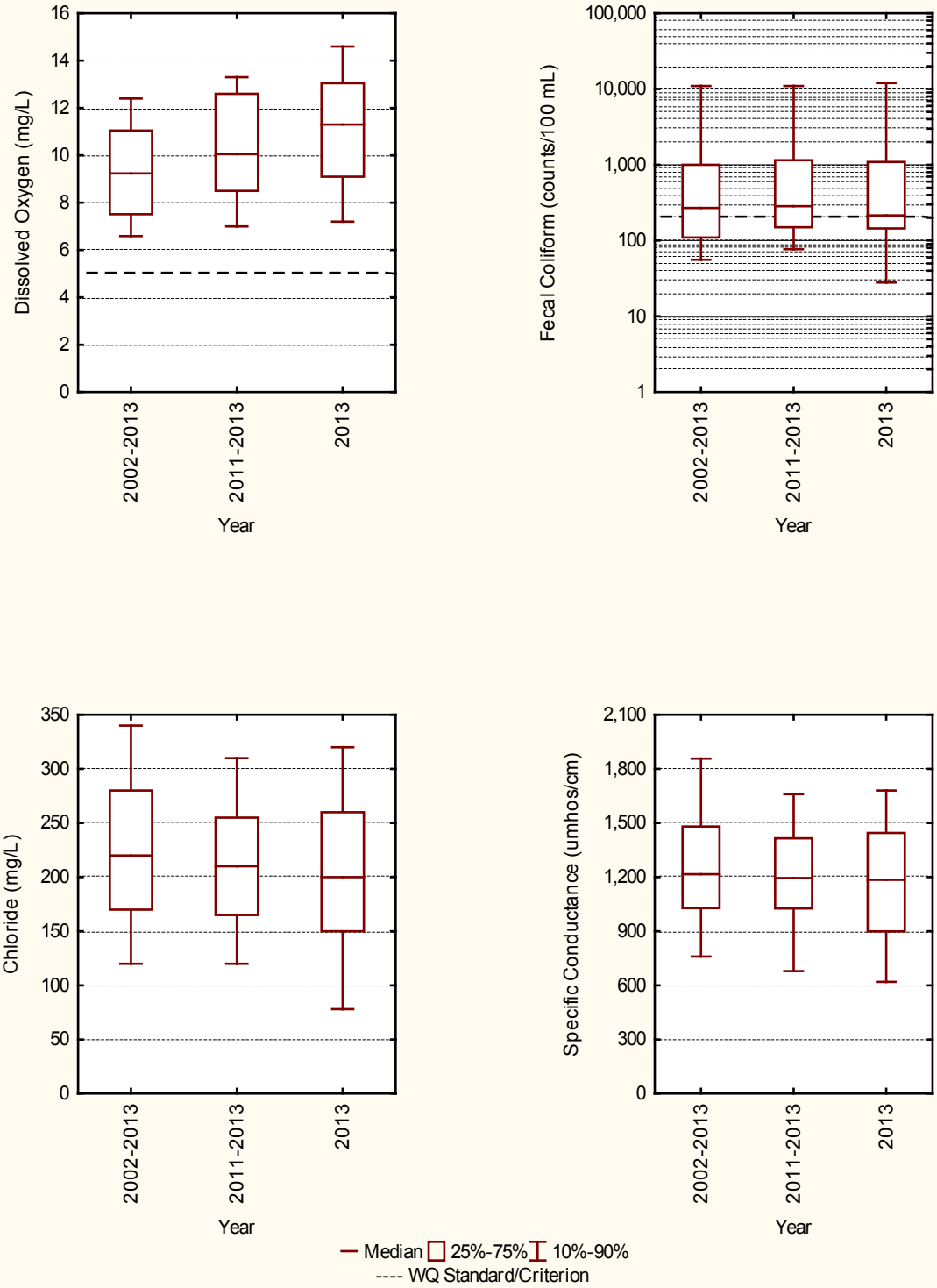
- ● ACTIVE WATER QUALITY SAMPLING LOCATIONS
- ● INACTIVE WATER QUALITY SAMPLING LOCATIONS

FISH CREEK (FC) SURVEY
WATER QUALITY SAMPLING LOCATIONS

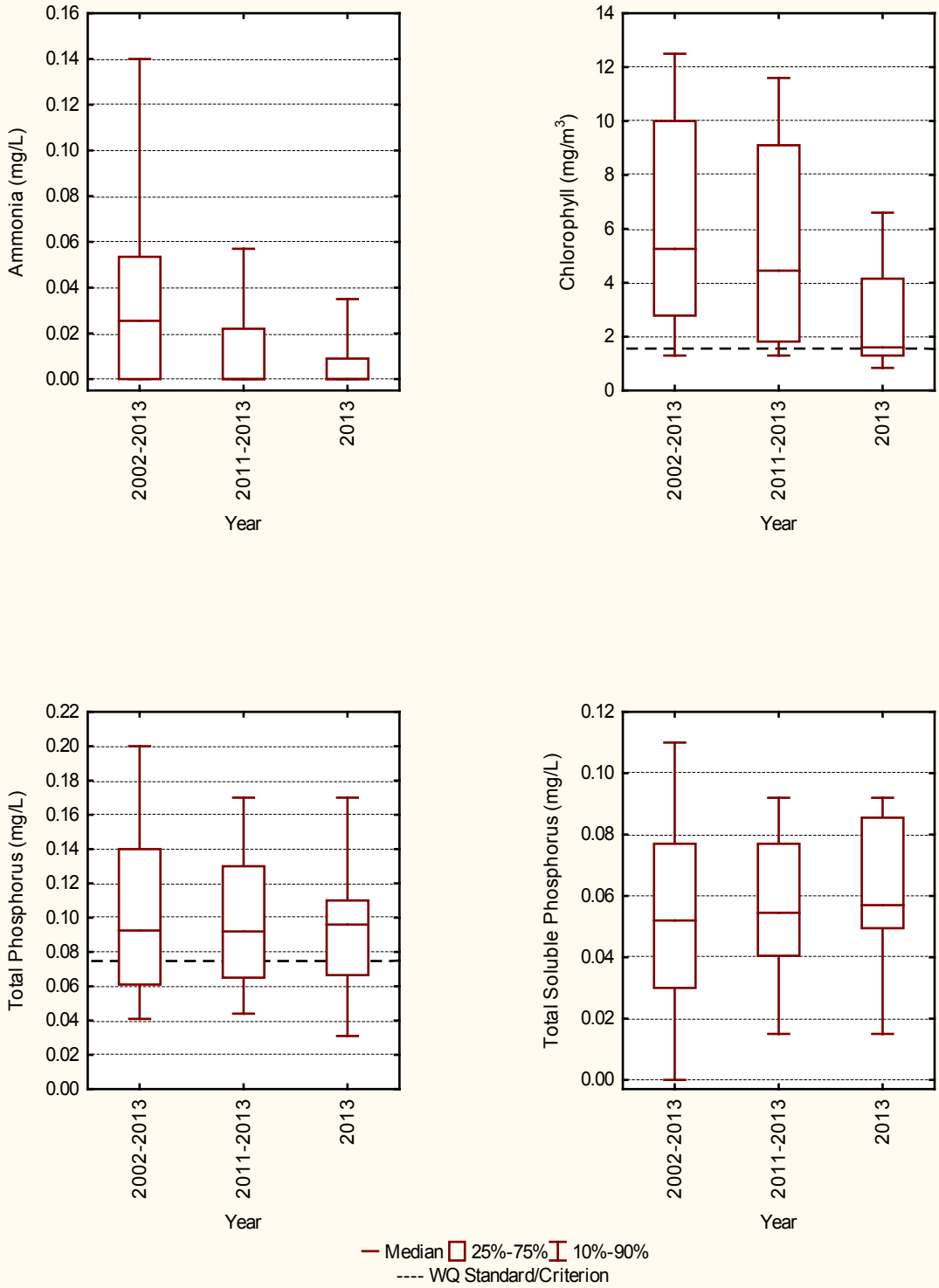
6/6/14

14-061 FC

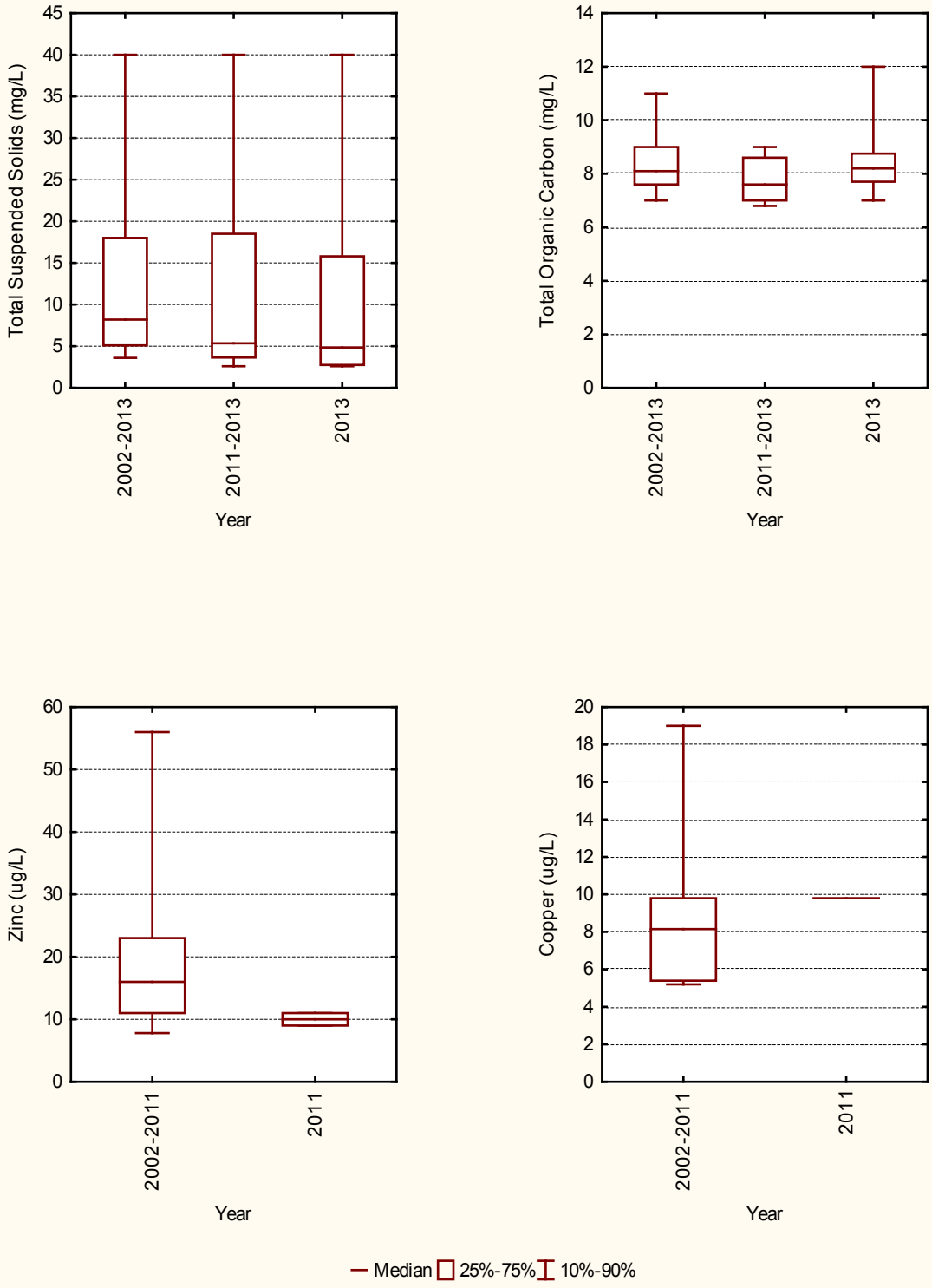
MMSD Water Quality Monitoring Program Data
Fish Creek at Broadmoor Dr. & Union Pacific Railroad, Site FC-02



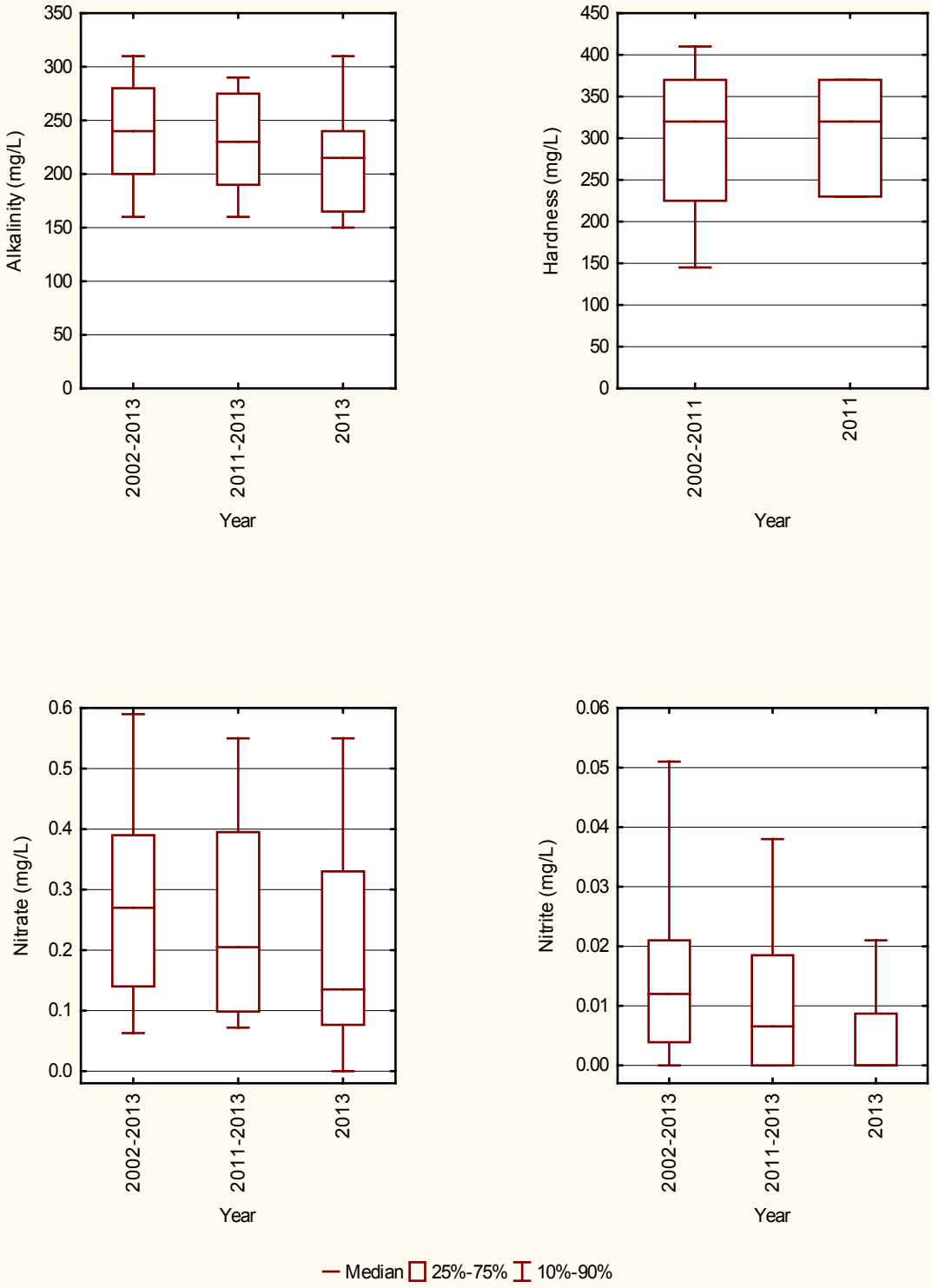
MMSD Water Quality Monitoring Program Data
Fish Creek at Broadmoor Dr. & Union Pacific Railroad, Site FC-02



MMSD Water Quality Monitoring Program Data
Fish Creek at Broadmoor Dr. & Union Pacific Railroad, Site FC-02



MMSD Water Quality Monitoring Program Data
Fish Creek at Broadmoor Dr. & Union Pacific Railroad, Site FC-02



BROADMOOR DR. AND UNION PACIFIC RAILROAD - SITE 2
FISH CREEK
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.0	12.8	11.1	2.69	0.20	0.005	0.21	0.007	0.56	0.093	0.061	ND
Standard Error	0.1	2.6	0.9	0.73	0.07	0.003	0.07	0.005	0.08	0.015	0.009	ND
Median	8.0	16.5	11.3	1.60	0.14	0.000	0.14	0.000	0.49	0.096	0.057	ND
Mode	Multi	Multi	Multi	1.30	Multi	0.000	Multi	0.000	Multi	Multi	Multi	ND
Standard Deviation	0.3	7.4	2.6	2.06	0.20	0.008	0.20	0.013	0.23	0.042	0.026	ND
Sample Variance	0.1	55.0	6.5	4.26	0.04	0.000	0.04	0.000	0.05	0.002	0.001	ND
Range	1.1	18.7	7.4	5.76	0.55	0.021	0.56	0.035	0.70	0.139	0.077	ND
Minimum	7.5	1.2	7.2	0.84	0.00	0.000	0.00	0.000	0.40	0.031	0.015	ND
Maximum	8.6	19.9	14.6	6.60	0.55	0.021	0.56	0.035	1.10	0.170	0.092	ND
Count	8	8	8	8	8	8	8	8	8	8	8	0
Confidence Level (95%)	0.3	6.2	2.1	1.73	0.16	0.006	0.17	0.011	0.19	0.035	0.022	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	651.3	640.1	2.2	11.2	11.6	1170	202.3	1866	2.5	1673
Standard Error	ND	ND	68.0	70.8	0.9	4.9	4.2	131	28.9	1462	0.3	1330
Median	ND	ND	645.0	631.3	2.1	4.9	6.3	1185	200.0	215	2.3	280
Mode	ND	ND	Multi	Multi	0.0	2.6	Multi	Multi	Multi	Multi	Multi	Multi
Standard Deviation	ND	ND	192.2	200.2	2.4	13.8	12.0	371	81.6	4135	0.8	3518
Sample Variance	ND	ND	36955.4	40074.2	6.0	191.2	143.0	137869	6663.4	17095219	0.6	12374086
Range	ND	ND	590.0	627.4	7.1	37.4	35.8	1061	242.0	11972	2.6	9572
Minimum	ND	ND	380.0	340.0	0.0	2.6	3.9	619	78.0	28	1.4	28
Maximum	ND	ND	970.0	967.4	7.1	40.0	39.7	1680	320.0	12000	4.1	9600
Count	0	0	8	8	8	8	8	8	8	8	8	7
Confidence Level (95%)	ND	ND	160.7	167.4	2.0	11.6	10.0	310	68.2	3457	0.7	3253

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

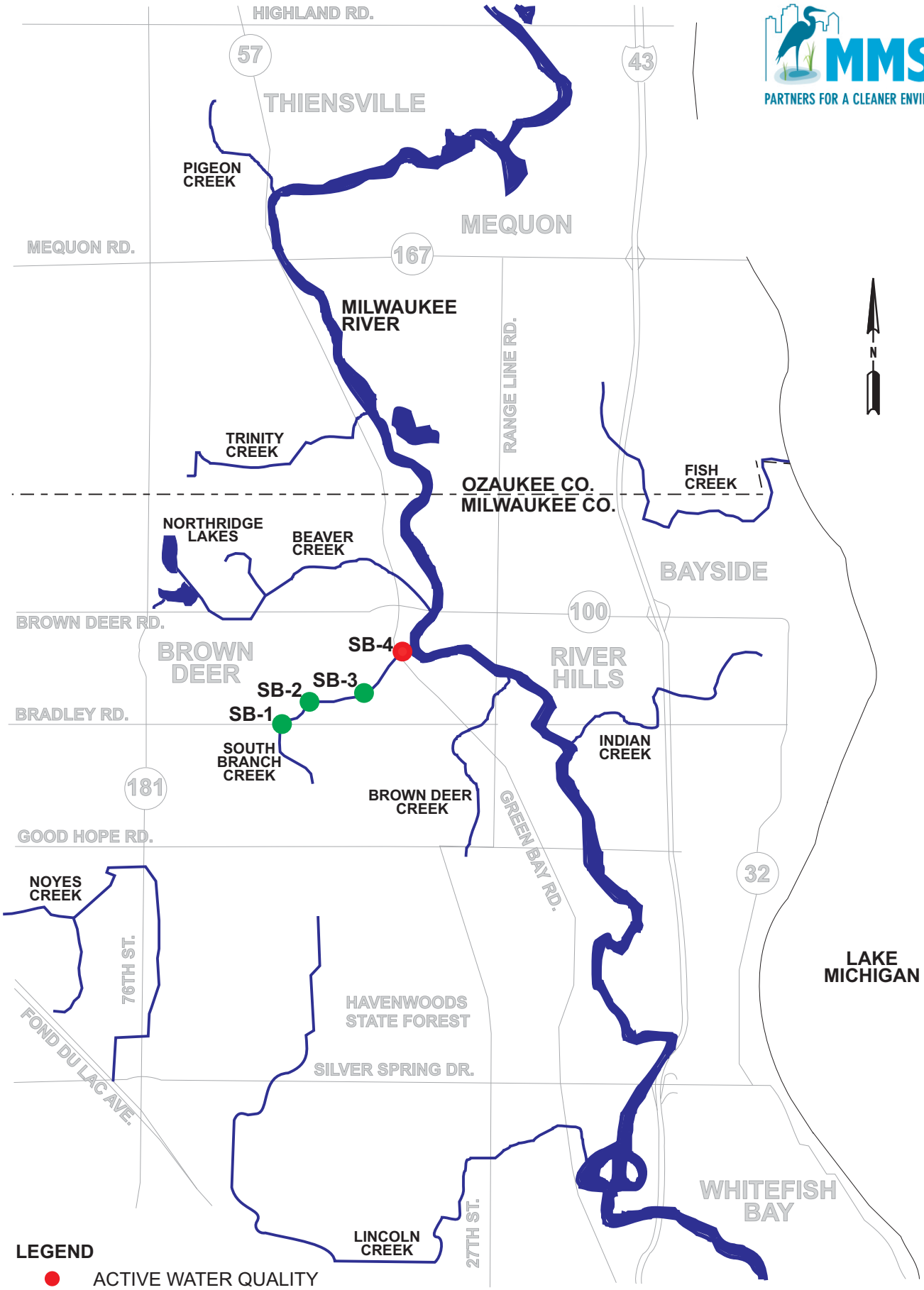
BROADMOOR DR. AND UNION PACIFIC RAILROAD - SITE 2
FISH CREEK
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Standard Error	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Median	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mode	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Standard Deviation	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sample Variance	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Minimum	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Count	0	0	0	0	0	0	0	0	0	0	0	0
Confidence Level (95%)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	ND	213	1.1	ND	53.5	44.9	8.5	8.2
Standard Error	ND	19	0.6	ND	3.3	3.3	0.5	0.5
Median	ND	215	0.0	ND	54.5	46.5	8.2	7.9
Mode	ND	240	0.0	ND	Multi	49.0	Multi	Multi
Standard Deviation	ND	53	1.6	ND	9.3	9.5	1.5	1.3
Sample Variance	ND	2793	2.6	ND	86.0	89.6	2.3	1.7
Range	ND	160	3.8	ND	29.0	29.0	5.0	4.4
Minimum	ND	150	0.0	ND	41.0	33.0	7.0	6.6
Maximum	ND	310	3.8	ND	70.0	62.0	12.0	11.0
Count	0	8	8	0	8	8	8	8
Confidence Level (95%)	ND	44	1.3	ND	7.8	7.9	1.3	1.1

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data



LEGEND

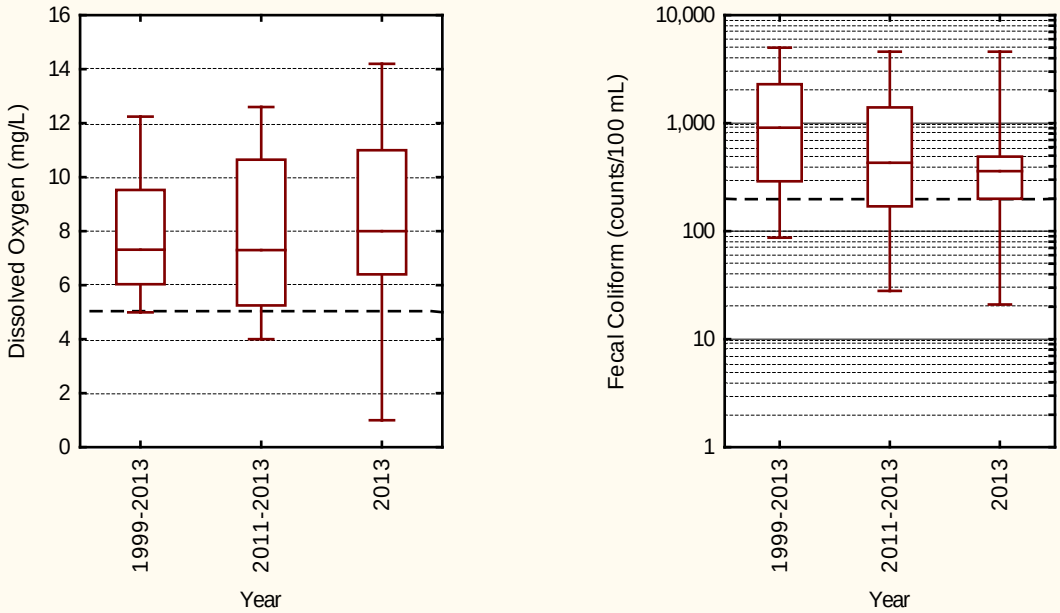
- ACTIVE WATER QUALITY SAMPLING LOCATIONS
- INACTIVE WATER QUALITY SAMPLING LOCATIONS

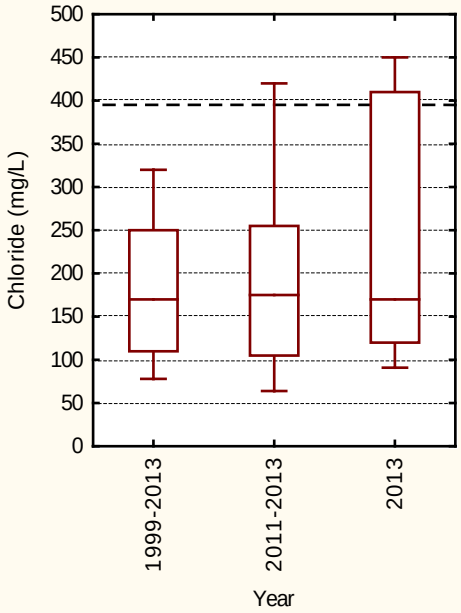
SOUTH BRANCH CREEK (SB) SURVEY
WATER QUALITY SAMPLING LOCATIONS

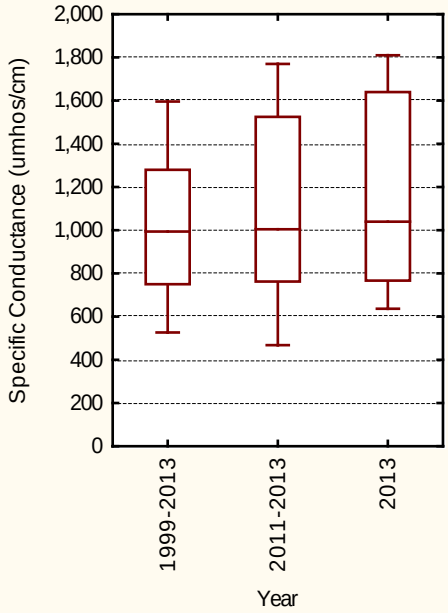
6/6/14

14-061 SB

MMSD Water Quality Monitoring Program Data
Southbranch Creek at Green Bay Ct., Site SB-04

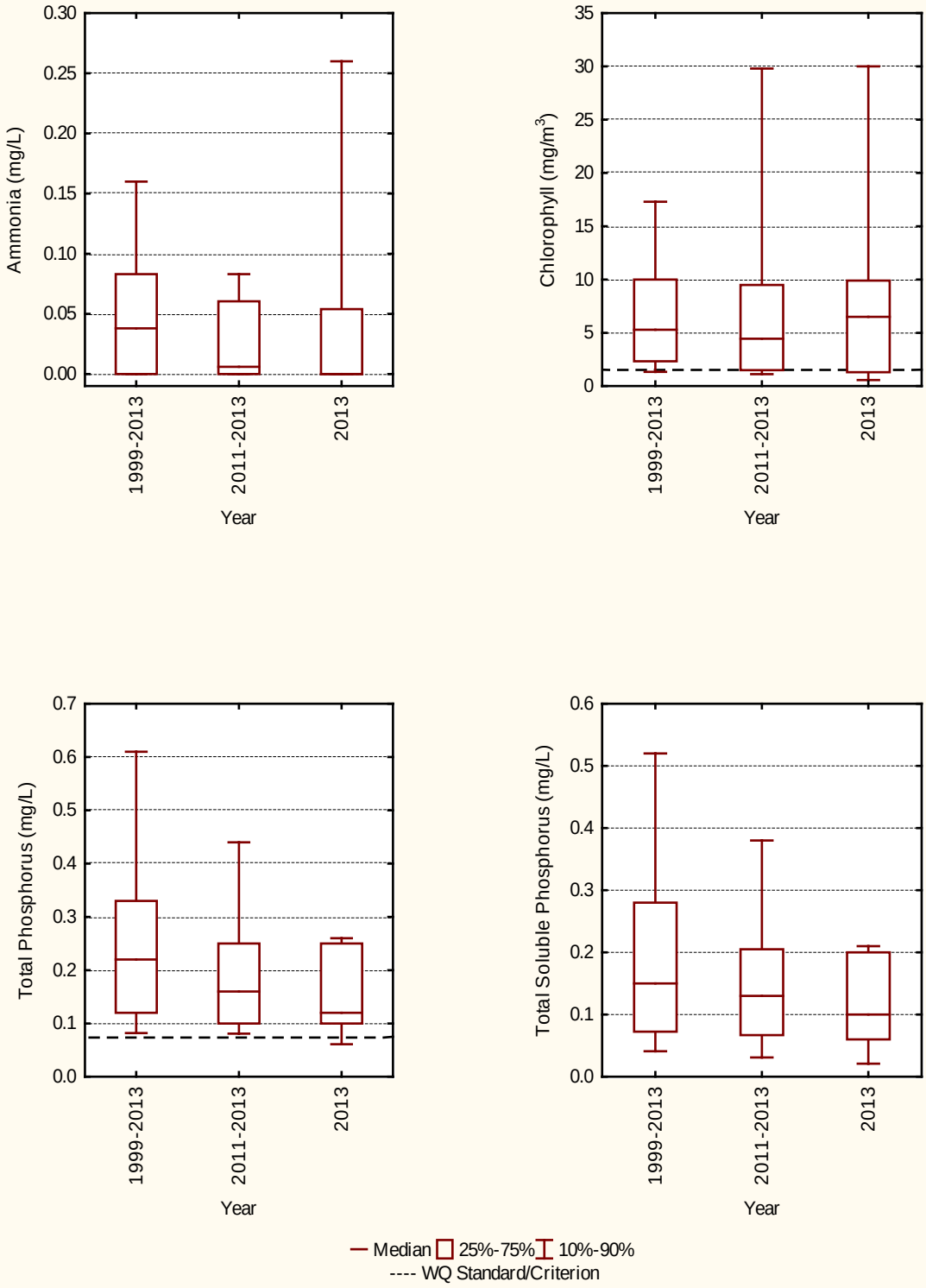




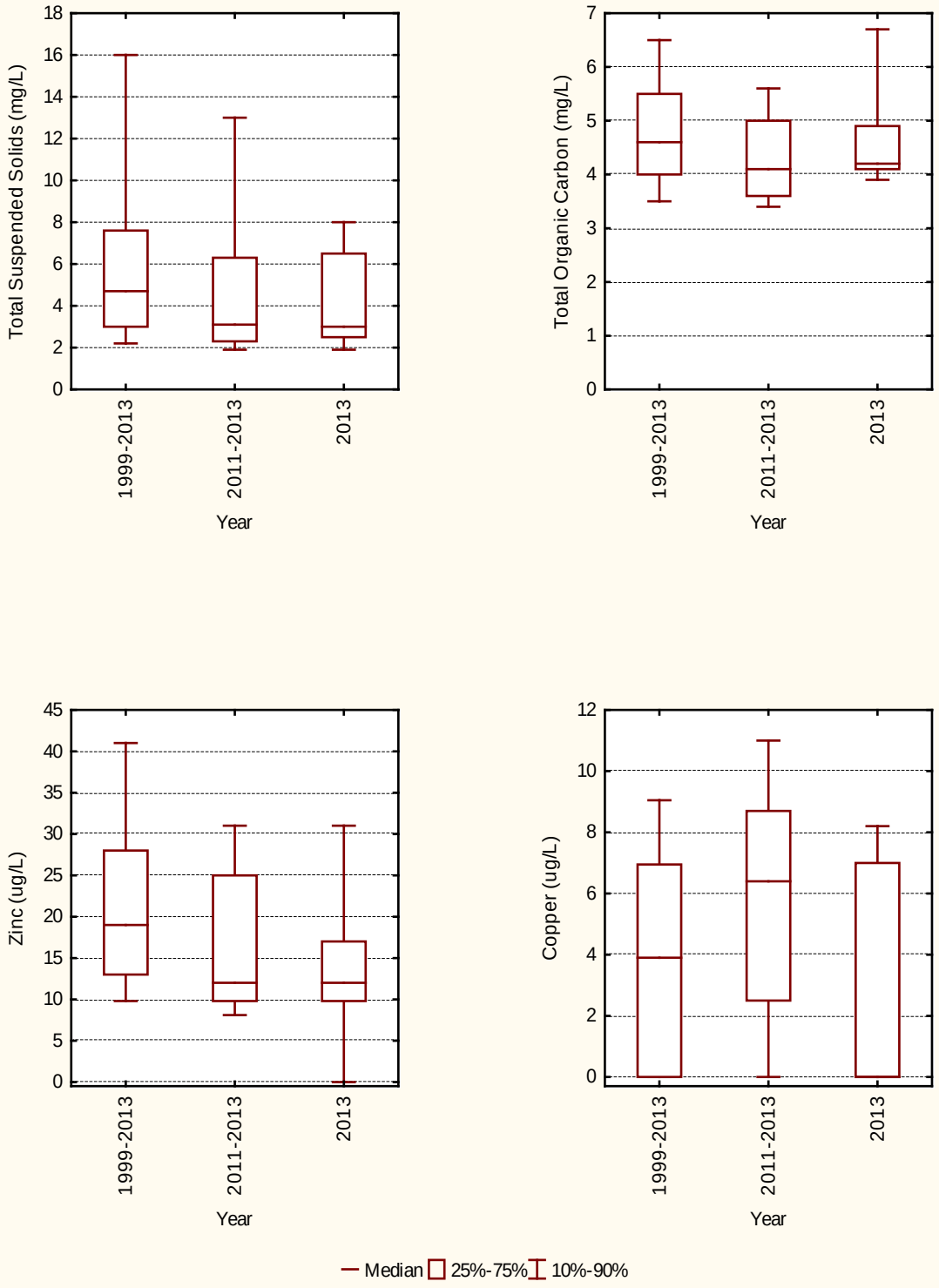


— Median ☐ 25%-75% I 10%-90%
---- WQ Standard/Criterion

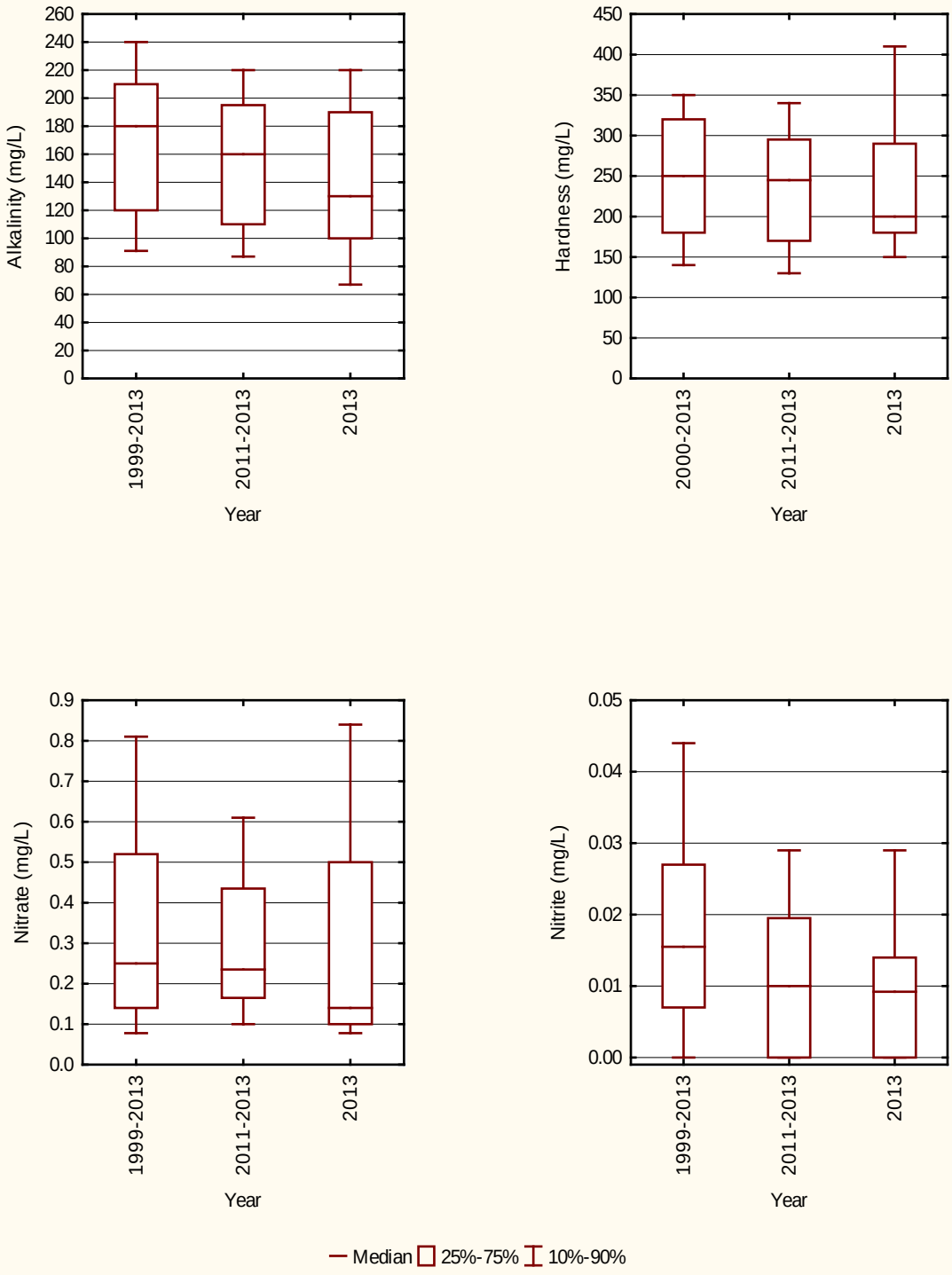
MMSD Water Quality Monitoring Program Data
Southbranch Creek at Green Bay Ct., Site SB-04



MMSD Water Quality Monitoring Program Data
Southbranch Creek at Green Bay Ct., Site SB-04



MMSD Water Quality Monitoring Program Data
Southbranch Creek at Green Bay Ct., Site SB-04



GREEN BAY COURT - SITE 4
SOUTHBRANCH CREEK
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.5	11.2	8.6	8.16	0.29	0.010	0.30	0.042	0.43	0.150	0.111	ND
Standard Error	0.1	2.4	1.4	3.18	0.09	0.004	0.10	0.029	0.05	0.027	0.025	ND
Median	7.4	14.6	8.0	6.50	0.14	0.009	0.14	0.000	0.39	0.120	0.100	ND
Mode	Multi	Multi	Multi	1.30	Multi	0.000	Multi	0.000	Multi	Multi	Multi	ND
Standard Deviation	0.3	7.1	4.2	9.55	0.28	0.011	0.29	0.086	0.16	0.081	0.076	ND
Sample Variance	0.1	50.9	17.6	91.24	0.08	0.000	0.09	0.007	0.03	0.007	0.006	ND
Range	0.8	17.1	13.2	29.43	0.76	0.029	0.79	0.260	0.47	0.199	0.189	ND
Minimum	7.2	1.4	1.0	0.57	0.08	0.000	0.08	0.000	0.20	0.061	0.021	ND
Maximum	8.0	18.5	14.2	30.00	0.84	0.029	0.87	0.260	0.67	0.260	0.210	ND
Count	9	9	9	9	9	9	9	9	9	9	9	0
Confidence Level (95%)	0.2	5.5	3.2	7.34	0.22	0.008	0.22	0.066	0.12	0.062	0.059	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	642.2	637.9	2.0	4.4	5.2	1186	233.4	891	2.5	ND
Standard Error	ND	ND	91.8	91.6	0.4	0.8	1.0	161	49.5	489	0.2	ND
Median	ND	ND	590.0	587.5	1.5	3.0	4.8	1040	170.0	360	2.6	ND
Mode	ND	ND	Multi	Multi	Multi	Multi	Multi	Multi	Multi	Multi	Multi	ND
Standard Deviation	ND	ND	275.5	274.7	1.3	2.4	3.0	484	148.6	1468	0.7	ND
Sample Variance	ND	ND	75919.4	75441.8	1.8	5.8	9.0	234377	22089.3	2155175	0.5	ND
Range	ND	ND	720.0	714.0	4.6	6.1	8.3	1173	359.0	4579	2.3	ND
Minimum	ND	ND	380.0	378.0	0.0	1.9	1.6	637	91.0	21	1.3	ND
Maximum	ND	ND	1100.0	1092.0	4.6	8.0	9.9	1810	450.0	4600	3.7	ND
Count	0	0	9	9	9	9	9	9	9	9	9	0
Confidence Level (95%)	ND	ND	211.8	211.1	1.0	1.8	2.3	372	114.2	1128	0.5	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

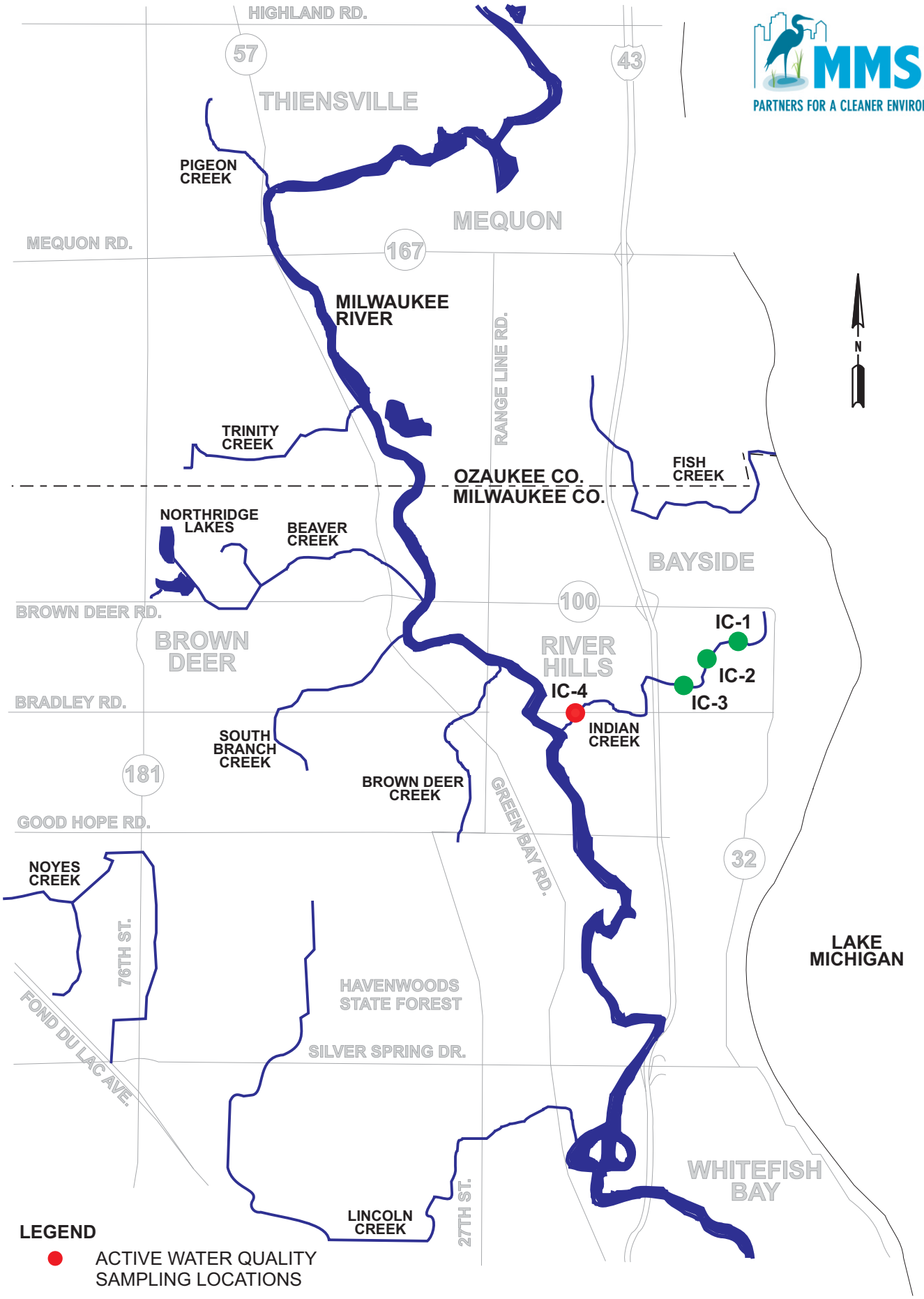
GREEN BAY COURT - SITE 4
SOUTHBRANCH CREEK
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	56.67	24.44	0.1	1.8	2.5	1.7	0.0	14.5	2.0	2.2	0.0	ND
Standard Error	6.11	3.60	0.1	0.1	1.3	0.4	0.0	3.1	0.8	1.1	0.0	ND
Median	47.00	20.00	0.0	1.8	0.0	1.9	0.0	12.0	0.0	0.0	0.0	ND
Mode	Multi	18.00	0.0	Multi	0.0	Multi	0.0	Multi	0.0	0.0	0.0	ND
Standard Deviation	18.32	10.79	0.2	0.4	3.8	1.2	0.0	9.3	2.4	3.4	0.0	ND
Sample Variance	335.50	116.53	0.0	0.2	14.3	1.5	0.0	85.7	5.7	11.6	0.0	ND
Range	50.00	35.00	0.4	1.3	8.2	3.6	0.0	31.0	4.8	8.1	0.0	ND
Minimum	38.00	12.00	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	88.00	47.00	0.4	2.6	8.2	3.6	0.0	31.0	4.8	8.1	0.0	ND
Count	9	9	9	9	9	9	9	9	9	9	9	0
Confidence Level (95%)	14.08	8.30	0.1	0.3	2.9	1.0	0.0	7.1	1.8	2.6	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	242	142	2.2	ND	37.9	33.2	4.6	4.5
Standard Error	30	17	0.6	ND	3.0	3.2	0.3	0.3
Median	200	130	2.5	ND	34.0	30.0	4.2	4.2
Mode	Multi	100	0.0	ND	Multi	Multi	Multi	Multi
Standard Deviation	89	52	1.8	ND	9.1	9.7	0.9	0.9
Sample Variance	7994	2700	3.1	ND	83.4	94.9	0.9	0.8
Range	260	153	4.5	ND	26.0	29.0	2.8	2.8
Minimum	150	67	0.0	ND	26.0	19.0	3.9	3.7
Maximum	410	220	4.5	ND	52.0	48.0	6.7	6.5
Count	9	9	9	0	9	9	9	9
Confidence Level (95%)	69	40	1.4	ND	7.0	7.5	0.7	0.7

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data



LEGEND

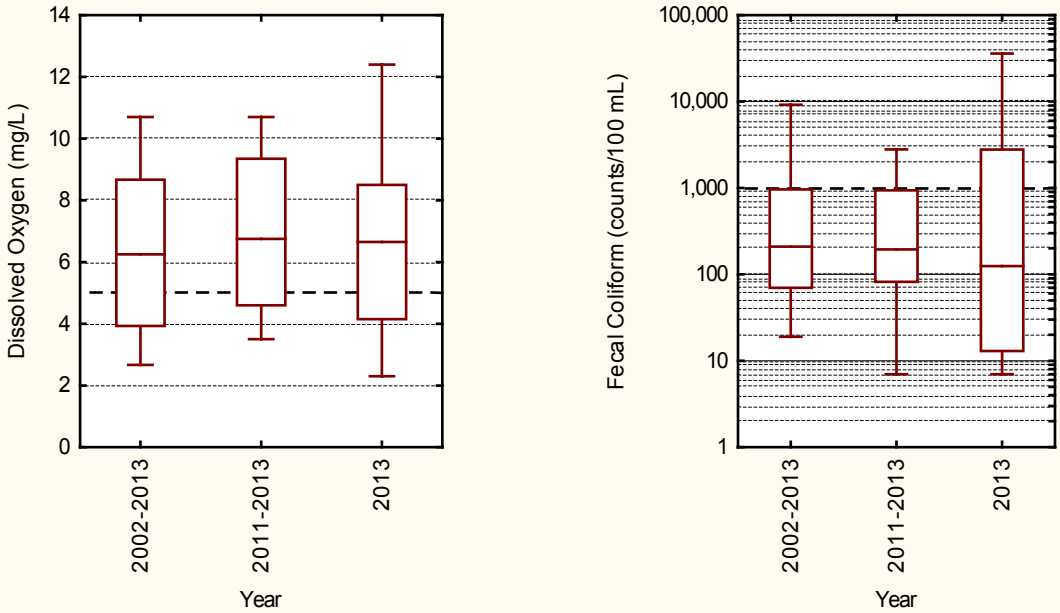
- ● ACTIVE WATER QUALITY SAMPLING LOCATIONS
- ● INACTIVE WATER QUALITY SAMPLING LOCATIONS

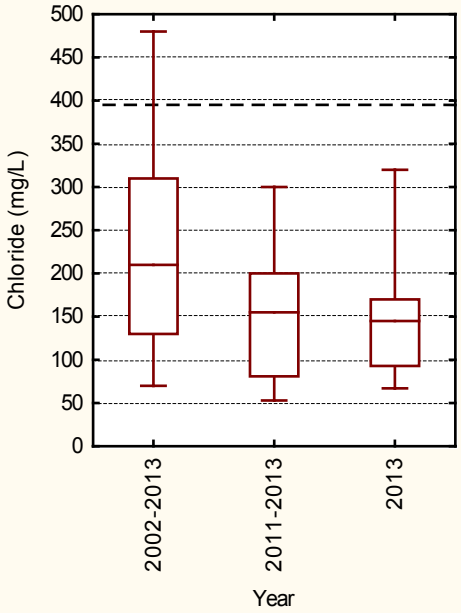
INDIAN CREEK (IC) SURVEY
WATER QUALITY SAMPLING LOCATIONS

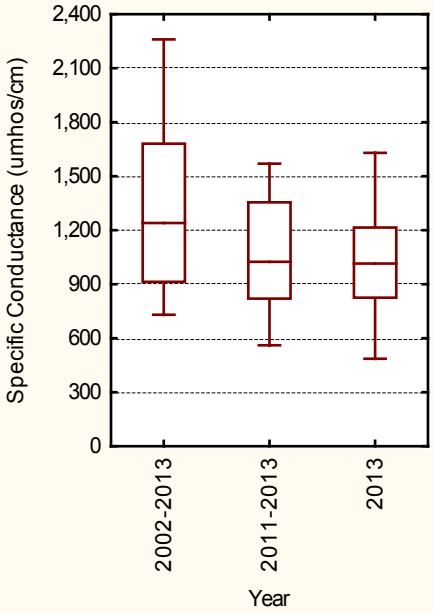
6/6h/14

14-061 IC

MMSD Water Quality Monitoring Program Data
Indian Creek at Bradley Rd., Site IC-04

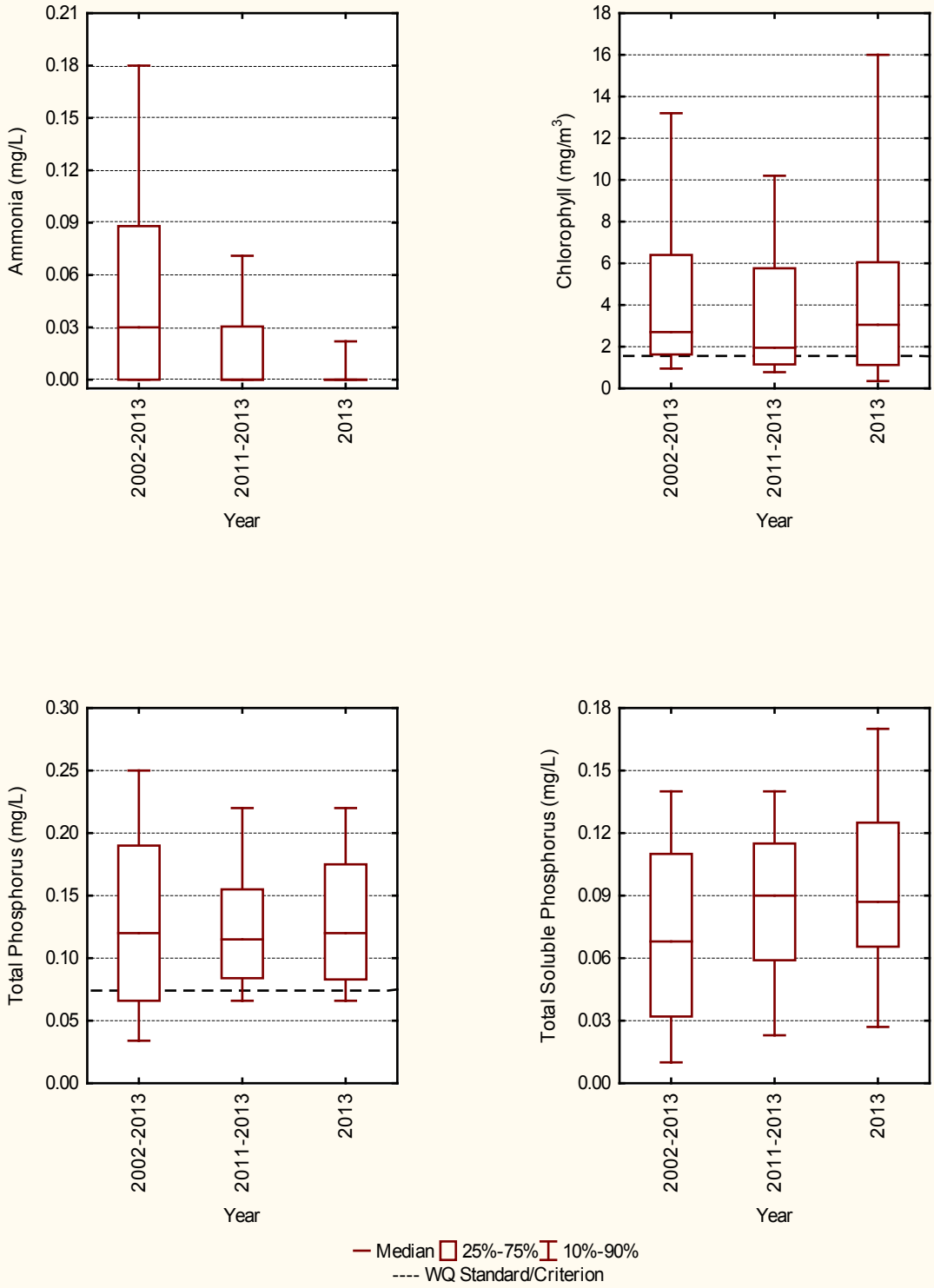




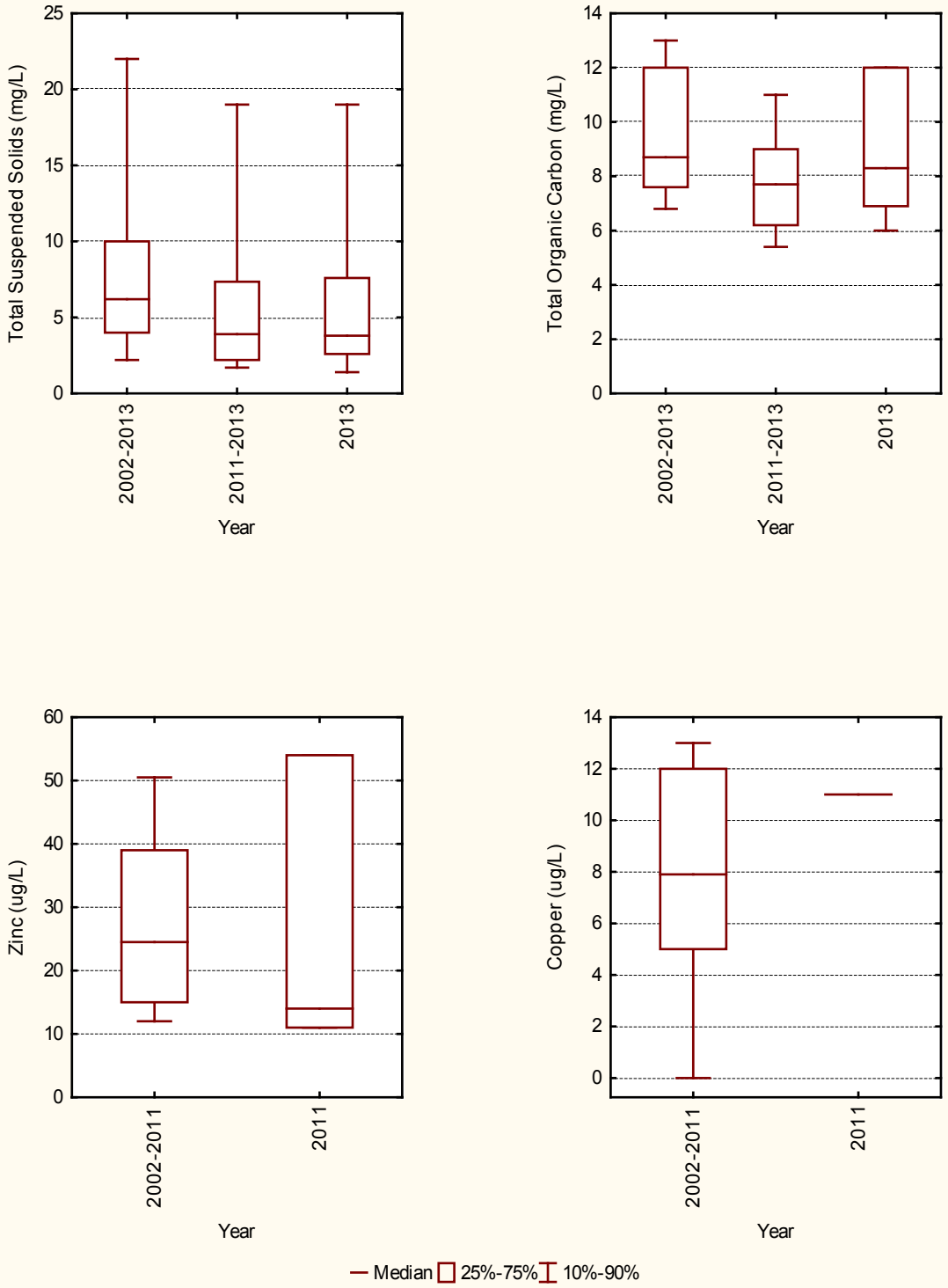


— Median ☐ 25%-75% ⊥ 10%-90%
---- WQ Standard/Criterion

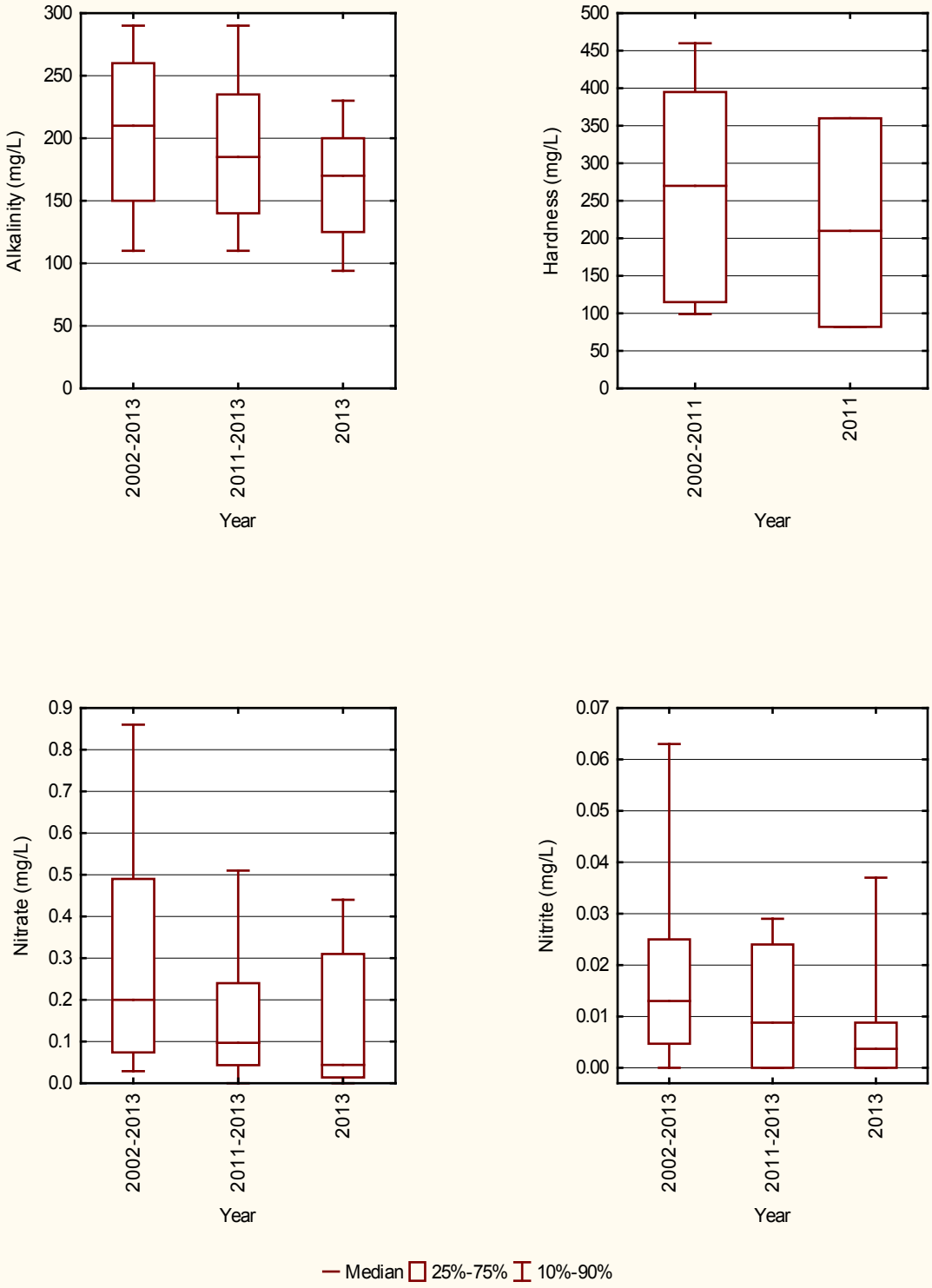
MMSD Water Quality Monitoring Program Data
Indian Creek at Bradley Rd., Site IC-04



MMSD Water Quality Monitoring Program Data
Indian Creek at Bradley Rd., Site IC-04



MMSD Water Quality Monitoring Program Data
Indian Creek at Bradley Rd., Site IC-04



BRADLEY RD. - SITE 4
INDIAN CREEK
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.7	11.5	6.7	4.60	0.15	0.008	0.16	0.003	0.59	0.130	0.094	ND
Standard Error	0.1	2.1	1.2	1.83	0.06	0.004	0.07	0.003	0.10	0.021	0.016	ND
Median	7.7	14.1	6.7	3.05	0.04	0.004	0.05	0.000	0.56	0.120	0.087	ND
Mode	7.8	15.7	Multi	1.30	0.00	0.000	0.00	0.000	Multi	0.140	Multi	ND
Standard Deviation	0.2	5.9	3.3	5.18	0.18	0.013	0.20	0.008	0.29	0.059	0.045	ND
Sample Variance	0.1	34.5	10.8	26.80	0.03	0.000	0.04	0.000	0.08	0.003	0.002	ND
Range	0.7	15.4	10.1	15.65	0.44	0.037	0.48	0.022	0.96	0.154	0.143	ND
Minimum	7.4	1.9	2.3	0.35	0.00	0.000	0.00	0.000	0.24	0.066	0.027	ND
Maximum	8.1	17.3	12.4	16.00	0.44	0.037	0.48	0.022	1.20	0.220	0.170	ND
Count	8	8	8	8	8	8	8	8	8	8	8	0
Confidence Level (95%)	0.2	4.9	2.8	4.33	0.15	0.010	0.16	0.007	0.24	0.049	0.038	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	550.0	544.0	2.1	6.1	9.5	1029	150.4	5232	2.2	4124
Standard Error	ND	ND	51.7	52.9	0.5	2.1	2.9	124	27.8	4445	0.5	3664
Median	ND	ND	525.0	521.5	1.7	3.8	6.2	1016	145.0	125	2.1	120
Mode	ND	ND	490.0	Multi	1.7	Multi	Multi	1070	Multi	7	0.8	120
Standard Deviation	ND	ND	146.3	149.6	1.3	6.0	8.2	351	78.5	12571	1.3	9693
Sample Variance	ND	ND	21400.0	22387.4	1.7	35.9	67.1	122990	6169.4	158037351	1.8	93952130
Range	ND	ND	500.0	516.8	4.0	17.6	24.6	1144	253.0	35993	3.7	25993
Minimum	ND	ND	310.0	291.0	0.0	1.4	4.7	486	67.0	7	0.8	7
Maximum	ND	ND	810.0	807.8	4.0	19.0	29.3	1630	320.0	36000	4.6	26000
Count	0	0	8	8	8	8	8	8	8	8	8	7
Confidence Level (95%)	ND	ND	122.3	125.1	1.1	5.0	6.9	293	65.7	10510	1.1	8964

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

BRADLEY RD. - SITE 4
INDIAN CREEK
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Standard Error	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Median	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mode	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Standard Deviation	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Sample Variance	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Range	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Minimum	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Count	0	0	0	0	0	0	0	0	0	0	0	0
Confidence Level (95%)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	ND	164	2.4	ND	46.4	37.6	9.0	8.7
Standard Error	ND	17	1.0	ND	3.7	3.5	0.9	0.8
Median	ND	170	1.3	ND	43.5	36.0	8.3	8.2
Mode	ND	180	0.0	ND	Multi	Multi	12.0	Multi
Standard Deviation	ND	48	2.8	ND	10.6	9.9	2.4	2.2
Sample Variance	ND	2345	7.7	ND	111.7	98.0	5.5	4.9
Range	ND	136	6.3	ND	30.0	25.0	6.0	6.0
Minimum	ND	94	0.0	ND	32.0	25.0	6.0	6.0
Maximum	ND	230	6.3	ND	62.0	50.0	12.0	12.0
Count	0	8	8	0	8	8	7	7
Confidence Level (95%)	ND	40	2.3	ND	8.8	8.3	2.2	2.0

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

MMSD
PARTNERS FOR A CLEANER ENVIRONMENT

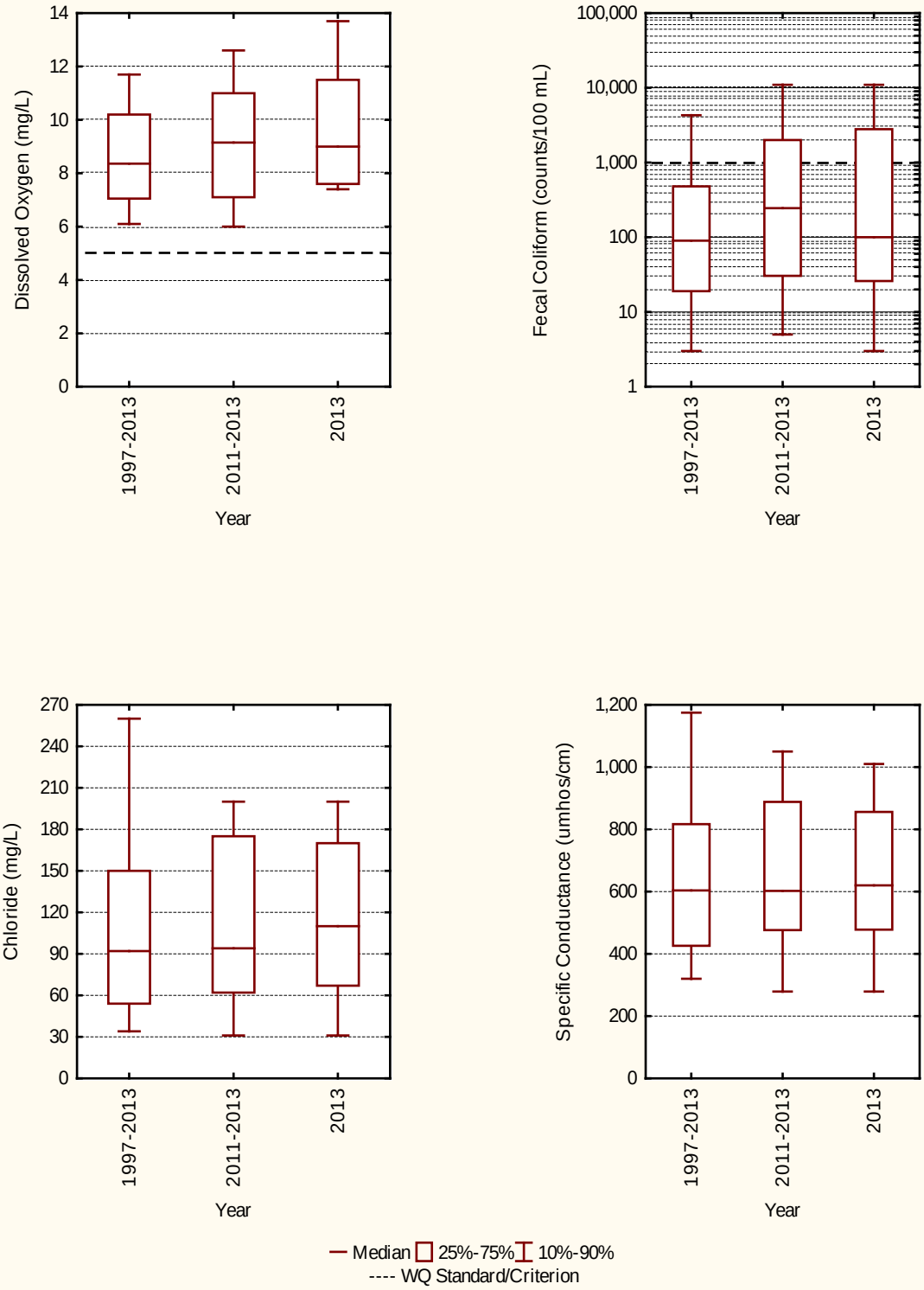
LEGEND

- ACTIVE WATER QUALITY SAMPLING LOCATIONS
- INACTIVE WATER QUALITY SAMPLING LOCATIONS

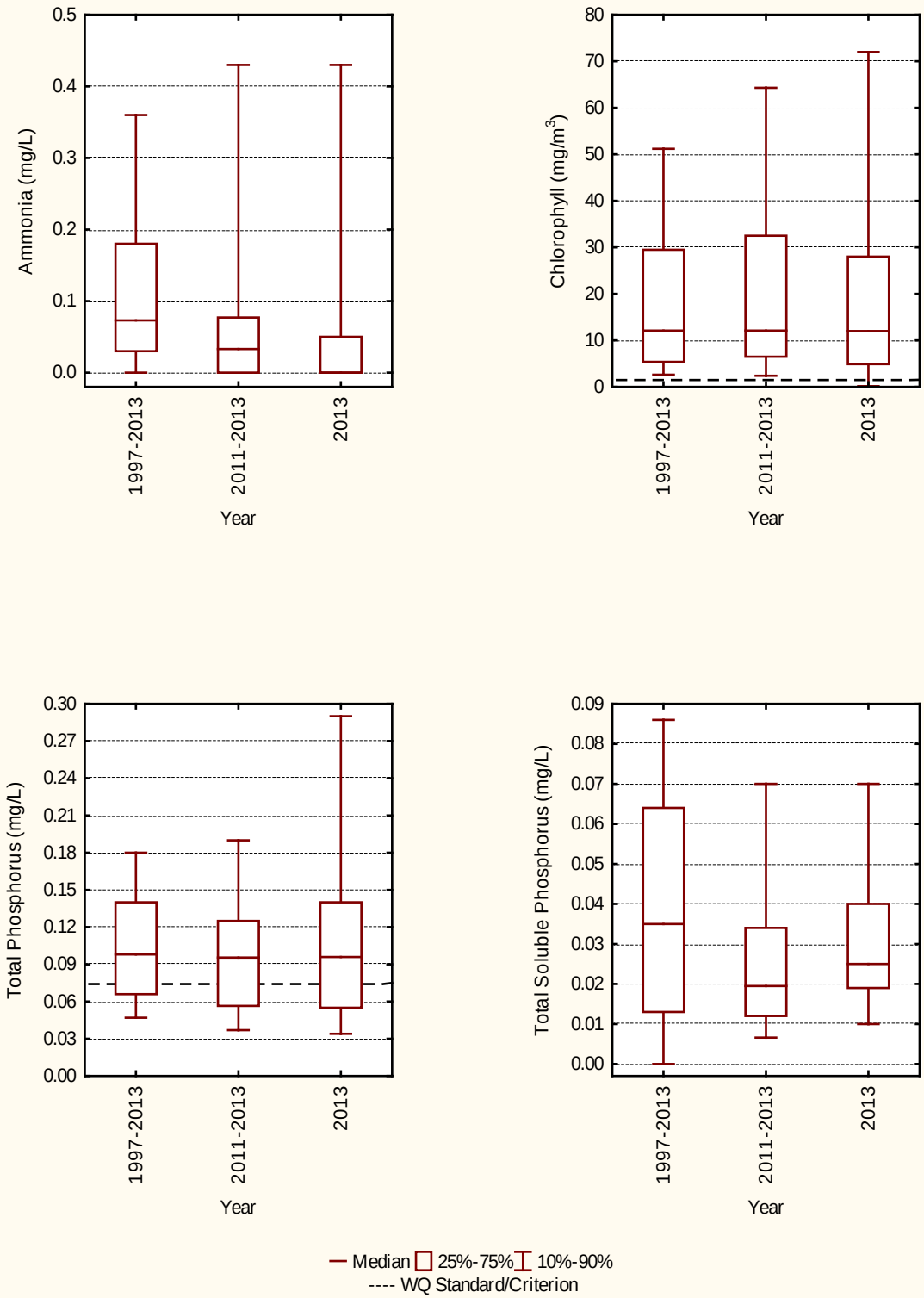
LINCOLN CREEK (LC) SURVEY
WATER QUALITY SAMPLING LOCATIONS

6/6/14 14-061 LC

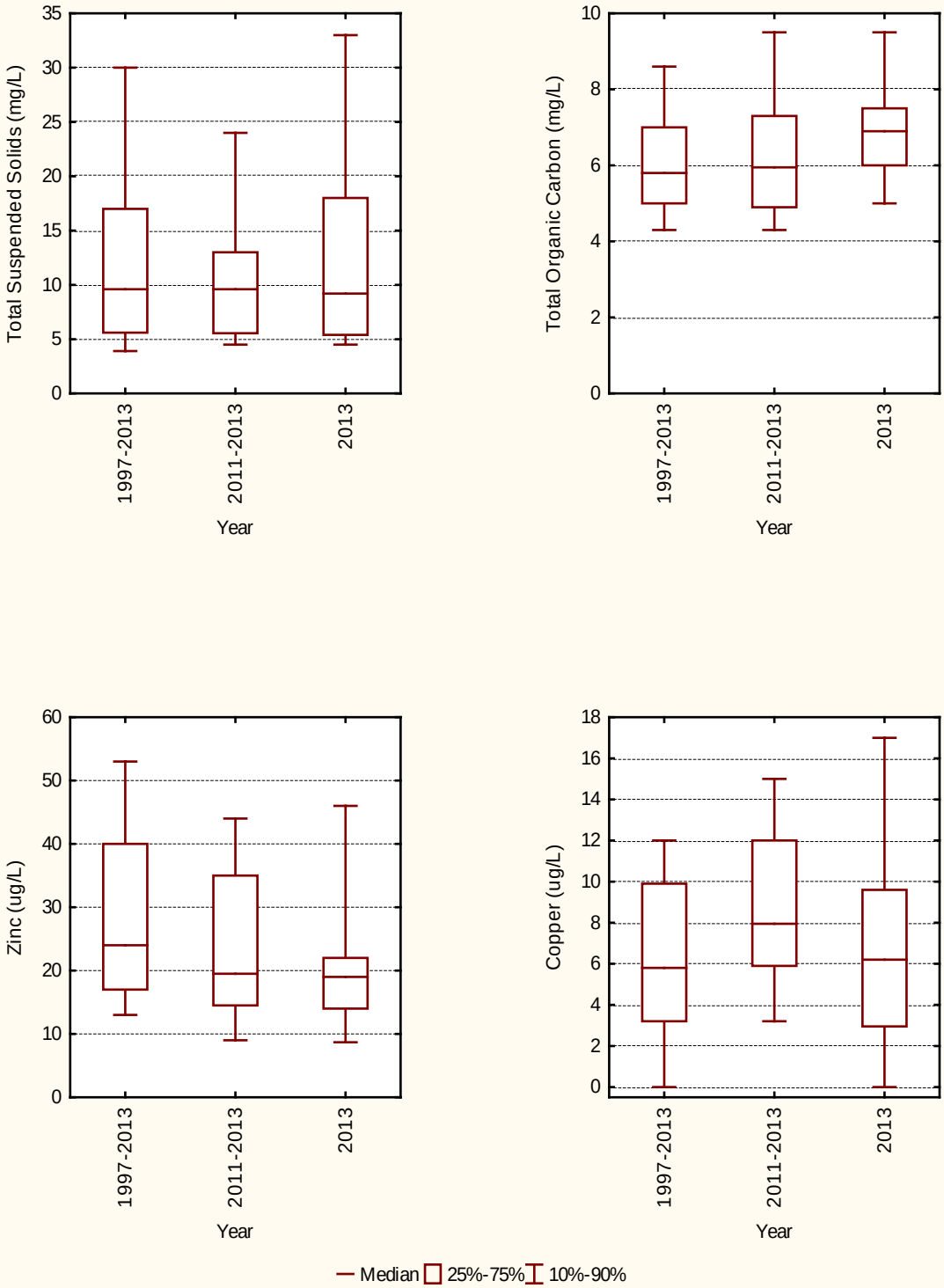
MMSD Water Quality Monitoring Program Data
Lincoln Creek at 60th St., Site LC-01



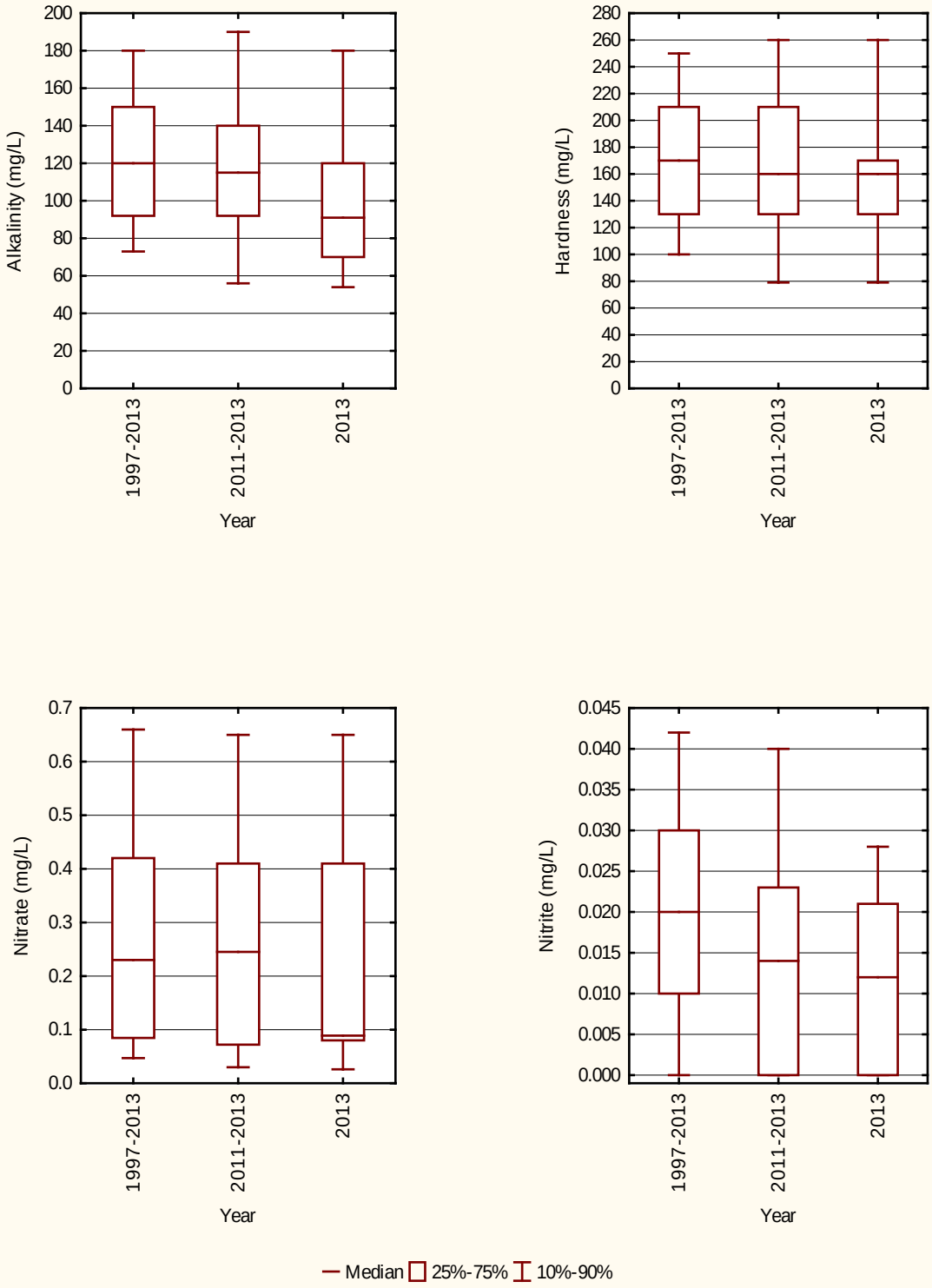
MMSD Water Quality Monitoring Program Data
Lincoln Creek at 60th St., Site LC-01



MMSD Water Quality Monitoring Program Data
Lincoln Creek at 60th St., Site LC-01



MMSD Water Quality Monitoring Program Data
Lincoln Creek at 60th St., Site LC-01



60TH ST., NORTH OF W. GOOD HOPE RD. - SITE 1
LINCOLN CREEK
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.9	13.8	9.8	19.41	0.23	0.012	0.25	0.087	0.83	0.117	0.034	ND
Standard Error	0.1	2.9	0.8	7.50	0.07	0.004	0.08	0.052	0.14	0.027	0.007	ND
Median	7.9	18.5	9.0	12.00	0.09	0.012	0.11	0.000	0.77	0.096	0.025	ND
Mode	7.9	Multi	Multi	Multi	Multi	0.000	Multi	0.000	Multi	0.140	0.070	ND
Standard Deviation	0.4	8.8	2.3	22.50	0.22	0.011	0.23	0.155	0.42	0.080	0.022	ND
Sample Variance	0.2	77.1	5.2	506.41	0.05	0.000	0.05	0.024	0.17	0.006	0.001	ND
Range	1.2	24.1	6.3	71.83	0.62	0.028	0.65	0.430	1.30	0.256	0.060	ND
Minimum	7.3	0.3	7.4	0.17	0.03	0.000	0.03	0.000	0.40	0.034	0.010	ND
Maximum	8.5	24.4	13.7	72.00	0.65	0.028	0.68	0.430	1.70	0.290	0.070	ND
Count	9	9	9	9	9	9	9	9	9	9	9	0
Confidence Level (95%)	0.3	6.8	1.8	17.30	0.17	0.008	0.18	0.119	0.32	0.062	0.017	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	373.3	360.6	6.5	12.7	14.1	660	118.2	2597	2.3	ND
Standard Error	ND	ND	46.5	46.7	1.4	3.3	4.3	80	20.3	1379	0.5	ND
Median	ND	ND	380.0	369.0	4.3	9.2	9.2	620	110.0	100	2.0	ND
Mode	ND	ND	450.0	Multi	10.0	Multi	Multi	Multi	Multi	Multi	Multi	ND
Standard Deviation	ND	ND	139.6	140.0	4.3	9.8	12.9	241	60.8	4136	1.4	ND
Sample Variance	ND	ND	19500.0	19599.9	18.9	95.6	167.1	58155	3695.2	17106629	1.9	ND
Range	ND	ND	430.0	425.4	12.8	28.5	36.2	731	169.0	10997	3.6	ND
Minimum	ND	ND	150.0	145.4	2.2	4.5	2.6	279	31.0	3	0.5	ND
Maximum	ND	ND	580.0	570.8	15.0	33.0	38.8	1010	200.0	11000	4.0	ND
Count	0	0	9	9	9	9	9	9	9	9	9	0
Confidence Level (95%)	ND	ND	107.3	107.6	3.3	7.5	9.9	185	46.7	3179	1.0	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

60TH ST., NORTH OF W. GOOD HOPE RD. - SITE 1
LINCOLN CREEK
WATER QUALITY DATA - 2013

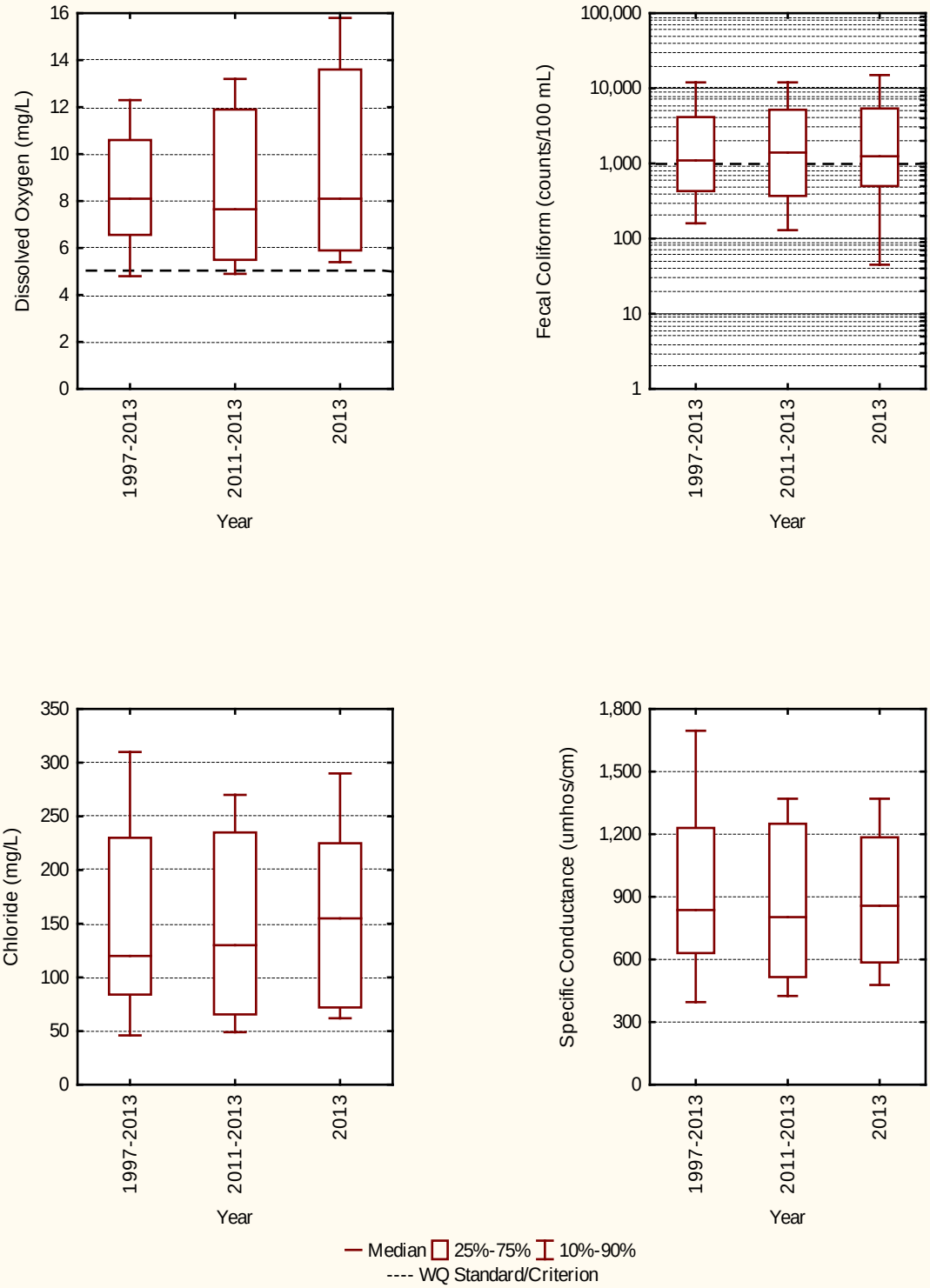
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	36.89	15.88	0.2	2.1	6.8	2.4	0.0	22.0	0.0	3.1	0.0	ND
Standard Error	4.08	2.61	0.1	0.4	2.0	0.4	0.0	4.3	0.0	1.0	0.0	ND
Median	35.00	16.00	0.0	1.7	6.2	2.5	0.0	19.0	0.0	3.5	0.0	ND
Mode	35.00	17.00	0.0	Multi	Multi	Multi	0.0	19.0	0.0	0.0	0.0	ND
Standard Deviation	12.25	7.83	0.3	1.3	5.6	1.2	0.0	12.9	0.0	2.9	0.0	ND
Sample Variance	150.11	61.30	0.1	1.8	31.1	1.5	0.0	166.5	0.0	8.1	0.0	ND
Range	36.00	23.80	0.7	4.3	17.0	3.7	0.0	37.3	0.0	7.4	0.0	ND
Minimum	20.00	6.20	0.0	0.0	0.0	0.0	0.0	8.7	0.0	0.0	0.0	ND
Maximum	56.00	30.00	0.7	4.3	17.0	3.7	0.0	46.0	0.0	7.4	0.0	ND
Count	9	9	9	9	8	9	7	9	9	8	9	0
Confidence Level (95%)	9.42	6.02	0.2	1.0	4.7	0.9	0.0	9.9	0.0	2.4	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	157	105	4.7	ND	30.0	23.0	7.1	6.1
Standard Error	20	15	0.6	ND	3.0	2.9	0.5	0.5
Median	160	91	4.8	ND	30.0	20.0	6.9	6.2
Mode	160	120	Multi	ND	26.0	20.0	9.5	Multi
Standard Deviation	60	44	1.7	ND	8.9	8.7	1.6	1.4
Sample Variance	3625	1968	2.8	ND	79.3	76.3	2.6	2.1
Range	181	126	5.4	ND	26.0	26.0	4.5	4.4
Minimum	79	54	2.6	ND	18.0	10.0	5.0	4.0
Maximum	260	180	8.0	ND	44.0	36.0	9.5	8.4
Count	9	9	9	0	9	9	9	9
Confidence Level (95%)	46	34	1.3	ND	6.8	6.7	1.2	1.1

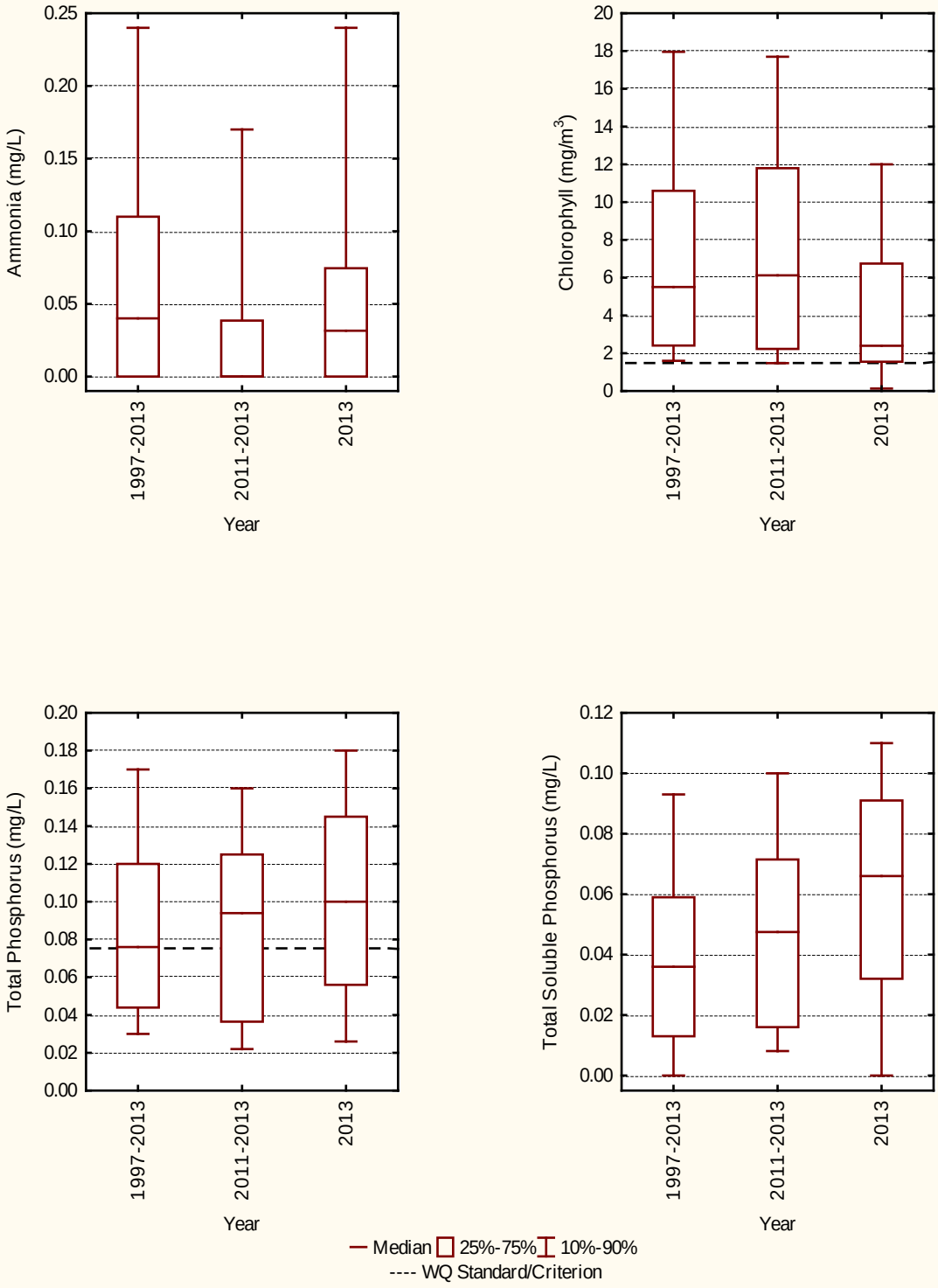
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

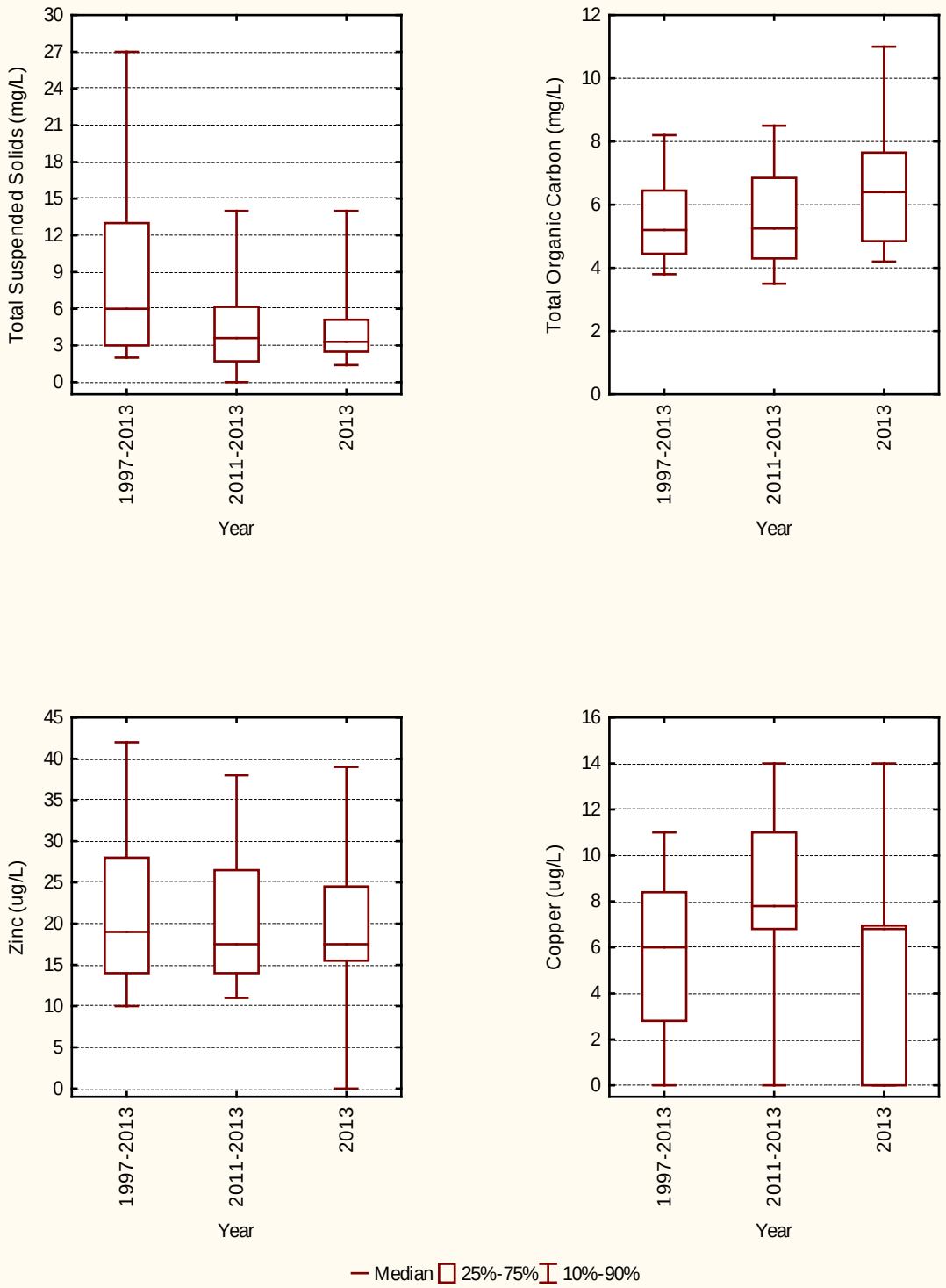
MMSD Water Quality Monitoring Program Data
Lincoln Creek at 51st St., N. of Woolworth Ave., Site LC-02



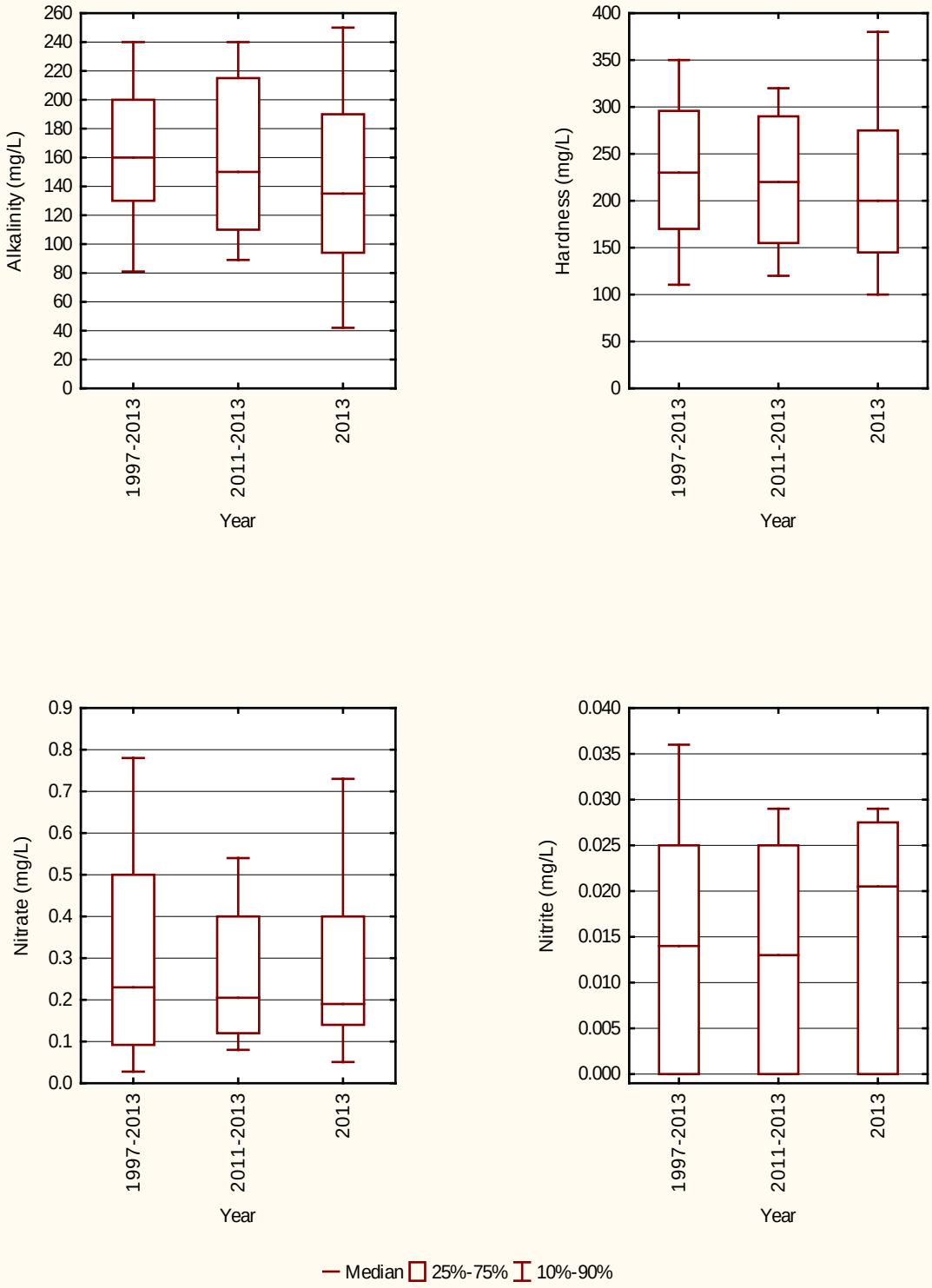
MMSD Water Quality Monitoring Program Data
Lincoln Creek at 51st St., N. of Woolworth Ave., Site LC-02



MMSD Water Quality Monitoring Program Data
Lincoln Creek at 51st St., N. of Woolworth Ave., Site LC-02



MMSD Water Quality Monitoring Program Data
Lincoln Creek at 51st St., N. of Woolworth Ave., Site LC-02



51ST ST., NORTH OF WOOLWORTH AVE. - SITE 2
LINCOLN CREEK
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.6	10.4	9.6	4.19	0.28	0.016	0.30	0.057	0.49	0.101	0.061	ND
Standard Error	0.1	2.7	1.5	1.42	0.08	0.005	0.08	0.029	0.06	0.019	0.014	ND
Median	7.5	13.3	8.1	2.40	0.19	0.020	0.21	0.032	0.46	0.100	0.066	ND
Mode	7.5	Multi	Multi	Multi	0.14	0.000	0.16	0.000	Multi	0.100	Multi	ND
Standard Deviation	0.3	7.7	4.2	4.03	0.22	0.013	0.23	0.081	0.17	0.054	0.039	ND
Sample Variance	0.1	59.2	17.3	16.23	0.05	0.000	0.05	0.007	0.03	0.003	0.002	ND
Range	0.9	18.0	10.4	11.87	0.68	0.029	0.71	0.240	0.45	0.154	0.110	ND
Minimum	7.3	0.5	5.4	0.13	0.05	0.000	0.05	0.000	0.31	0.026	0.000	ND
Maximum	8.2	18.5	15.8	12.00	0.73	0.029	0.76	0.240	0.76	0.180	0.110	ND
Count	8	8	8	8	8	8	8	8	8	8	8	0
Confidence Level (95%)	0.2	6.4	3.5	3.37	0.18	0.011	0.19	0.068	0.14	0.045	0.033	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	496.3	491.6	2.5	4.7	6.1	888	157.0	3669	3.0	ND
Standard Error	ND	ND	70.4	71.1	0.7	1.4	1.6	123	31.3	1792	0.3	ND
Median	ND	ND	465.0	462.3	1.9	3.3	5.5	858	155.0	1250	3.1	ND
Mode	ND	ND	360.0	Multi	1.7	Multi	Multi	Multi	Multi	Multi	Multi	ND
Standard Deviation	ND	ND	199.0	201.2	1.9	4.0	4.6	347	88.6	5069	0.9	ND
Sample Variance	ND	ND	39598.2	40479.8	3.5	16.3	21.4	120653	7848.3	25691739	0.8	ND
Range	ND	ND	540.0	541.2	5.7	12.6	12.4	892	228.0	14955	2.5	ND
Minimum	ND	ND	270.0	266.9	1.3	1.4	1.1	478	62.0	45	1.7	ND
Maximum	ND	ND	810.0	808.1	7.0	14.0	13.5	1370	290.0	15000	4.2	ND
Count	0	0	8	8	8	8	8	8	8	8	8	0
Confidence Level (95%)	ND	ND	166.4	168.2	1.6	3.4	3.9	290	74.1	4238	0.7	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

51ST ST., NORTH OF WOOLWORTH AVE. - SITE 2
LINCOLN CREEK
WATER QUALITY DATA - 2013

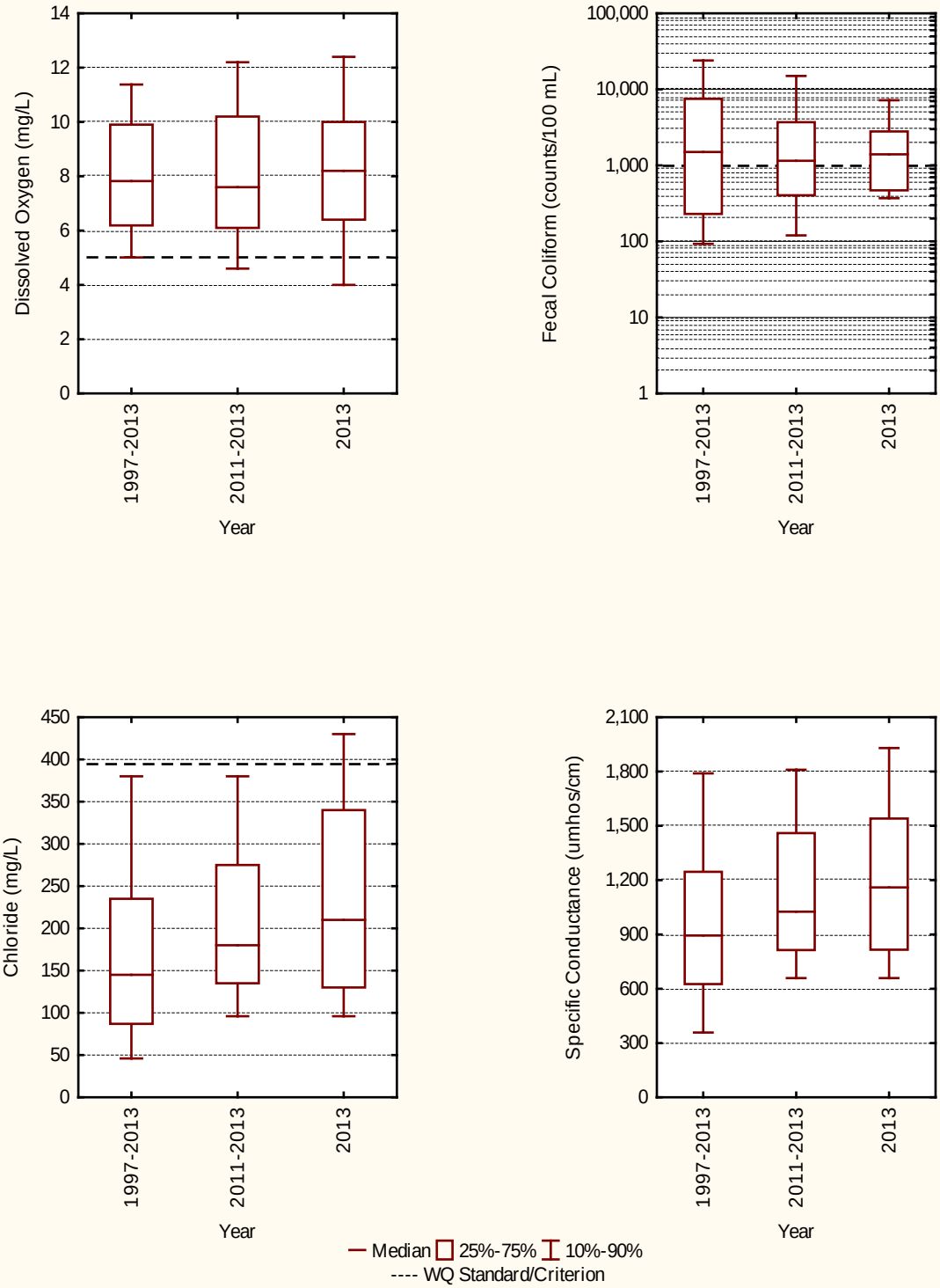
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	50.38	21.16	0.1	3.8	5.2	2.7	0.0	19.3	0.0	2.2	0.0	ND
Standard Error	7.21	3.78	0.1	1.4	1.7	0.9	0.0	4.0	0.0	1.1	0.0	ND
Median	47.00	19.50	0.0	2.2	6.8	2.4	0.0	17.5	0.0	0.0	0.0	ND
Mode	Multi	Multi	0.0	Multi	0.0	0.0	0.0	Multi	0.0	0.0	0.0	ND
Standard Deviation	20.40	10.70	0.3	3.9	4.9	2.4	0.0	11.3	0.0	3.2	0.0	ND
Sample Variance	415.98	114.44	0.1	14.9	24.3	5.9	0.0	127.4	0.0	10.1	0.0	ND
Range	58.00	31.70	0.6	11.7	14.0	7.4	0.0	39.0	0.0	7.5	0.0	ND
Minimum	28.00	8.30	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	86.00	40.00	0.6	13.0	14.0	7.4	0.0	39.0	0.0	7.5	0.0	ND
Count	8	8	8	8	8	8	7	8	7	8	8	0
Confidence Level (95%)	17.05	8.94	0.2	3.2	4.1	2.0	0.0	9.4	0.0	2.7	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	215	141	2.3	ND	38.1	31.3	6.6	5.9
Standard Error	34	24	0.9	ND	4.2	4.8	0.8	1.0
Median	200	135	1.6	ND	37.0	30.0	6.4	6.4
Mode	Multi	Multi	0.0	ND	Multi	20.0	Multi	Multi
Standard Deviation	95	69	2.6	ND	11.9	13.4	2.2	2.7
Sample Variance	9029	4696	6.6	ND	142.7	180.5	4.9	7.4
Range	280	208	6.4	ND	35.0	38.0	6.8	9.3
Minimum	100	42	0.0	ND	22.0	15.0	4.2	0.7
Maximum	380	250	6.4	ND	57.0	53.0	11.0	10.0
Count	8	8	8	0	8	8	8	8
Confidence Level (95%)	79	57	2.2	ND	10.0	11.2	1.9	2.3

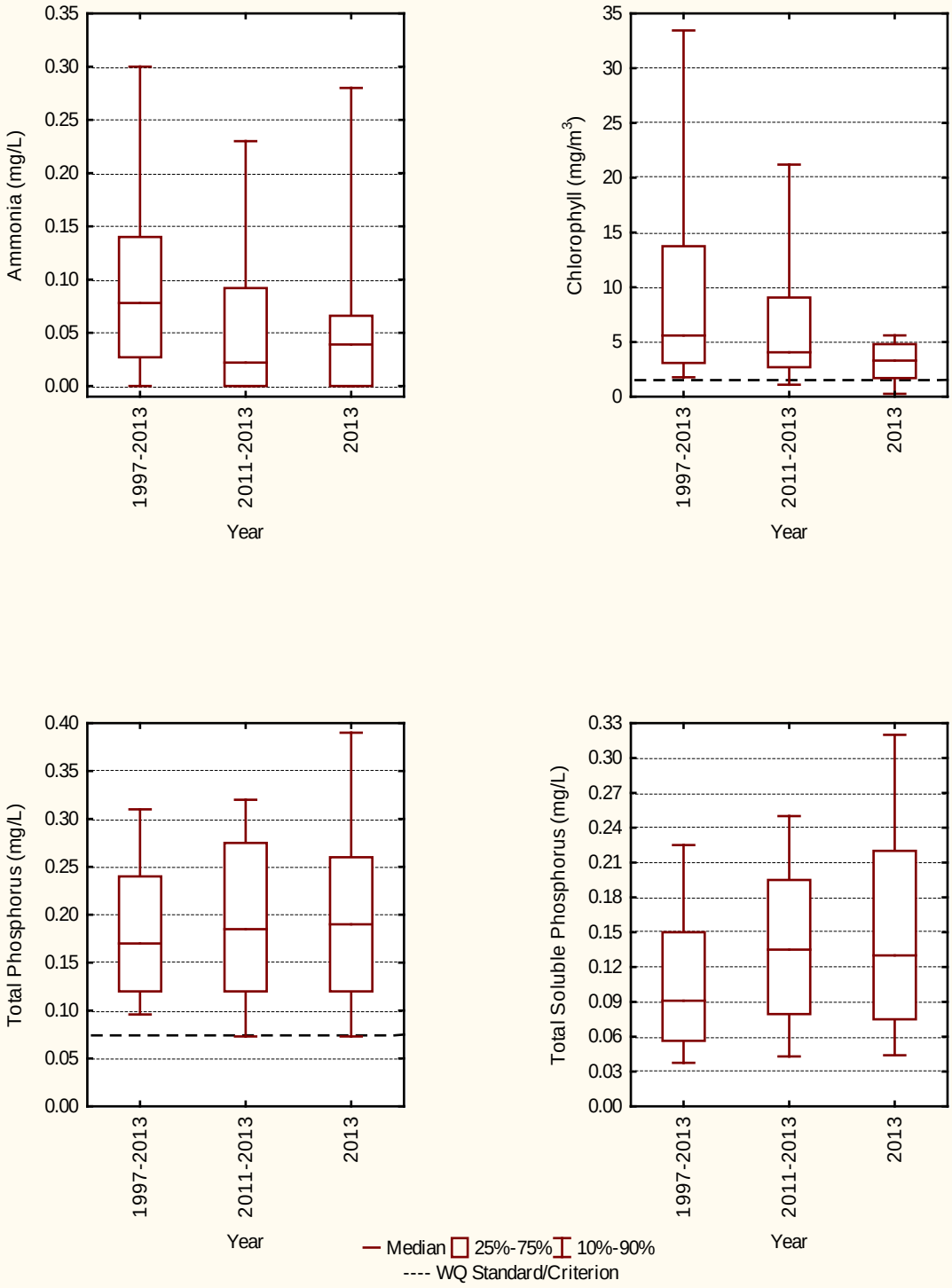
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

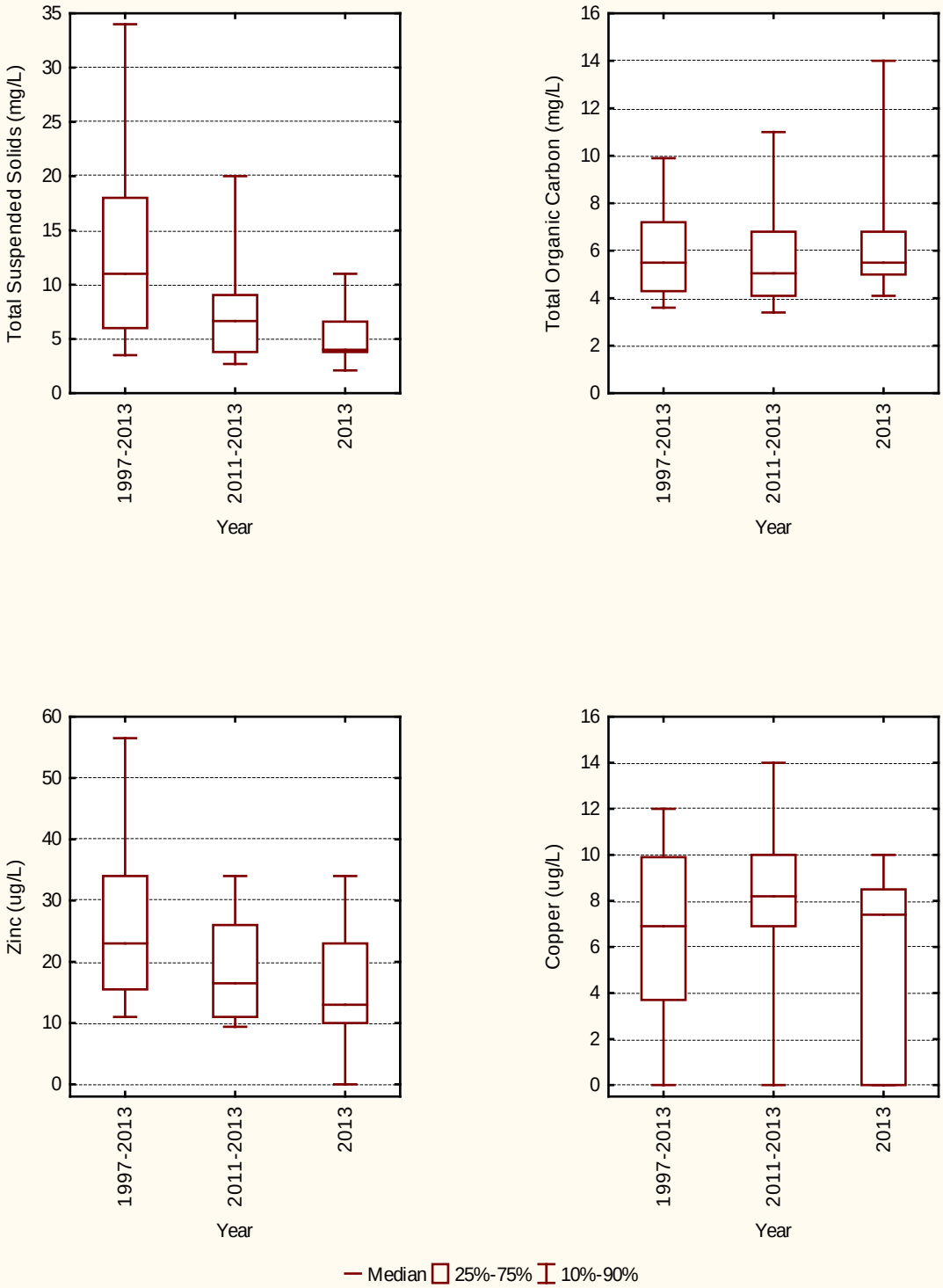
MMSD Water Quality Monitoring Program Data
Lincoln Creek at Green Bay Ave., Site LC-05



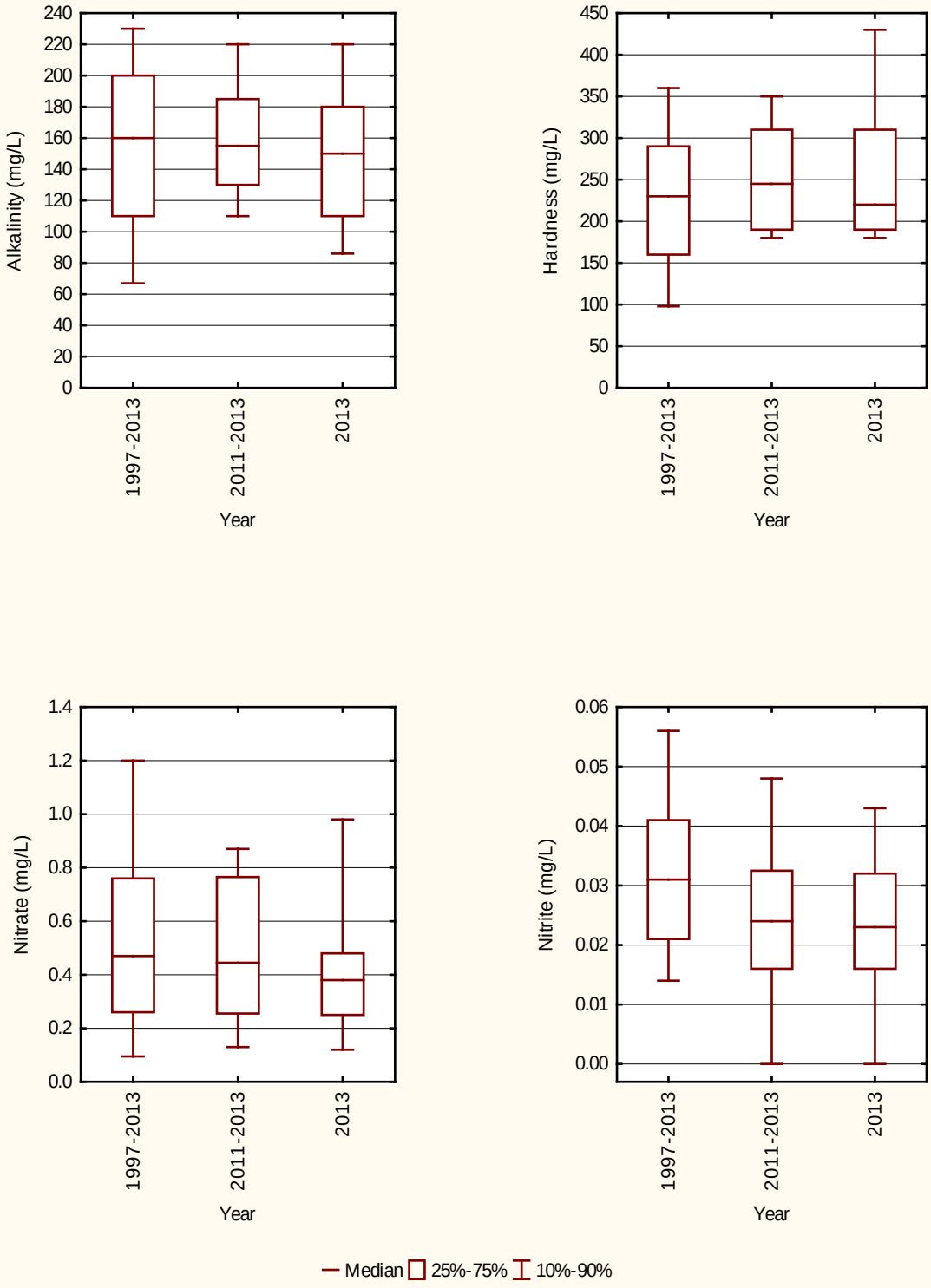
MMSD Water Quality Monitoring Program Data
Lincoln Creek at Green Bay Ave., Site LC-05



MMSD Water Quality Monitoring Program Data
Lincoln Creek at Green Bay Ave., Site LC-05



MMSD Water Quality Monitoring Program Data
Lincoln Creek at Green Bay Ave., Site LC-05



GREEN BAY AVE. - SITE 5
LINCOLN CREEK
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.0	13.5	8.5	3.28	0.44	0.023	0.46	0.061	0.49	0.197	0.150	ND
Standard Error	0.2	2.7	0.9	0.63	0.10	0.004	0.10	0.030	0.08	0.035	0.032	ND
Median	8.0	17.2	8.2	3.30	0.38	0.023	0.40	0.039	0.53	0.190	0.130	ND
Mode	Multi	Multi	Multi	Multi	0.25	Multi	0.26	0.000	Multi	0.120	Multi	ND
Standard Deviation	0.5	8.0	2.8	1.90	0.29	0.012	0.30	0.089	0.24	0.106	0.095	ND
Sample Variance	0.3	63.9	7.7	3.61	0.08	0.000	0.09	0.008	0.06	0.011	0.009	ND
Range	1.8	21.8	8.4	5.34	0.86	0.043	0.88	0.280	0.77	0.317	0.276	ND
Minimum	7.2	1.5	4.0	0.26	0.12	0.000	0.12	0.000	0.00	0.073	0.044	ND
Maximum	9.0	23.3	12.4	5.60	0.98	0.043	1.00	0.280	0.77	0.390	0.320	ND
Count	9	9	9	9	9	9	9	9	9	9	9	0
Confidence Level (95%)	0.4	6.1	2.1	1.46	0.22	0.010	0.23	0.068	0.19	0.081	0.073	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	658.9	653.7	2.2	5.1	6.8	1190	234.0	2229	3.1	1741
Standard Error	ND	ND	86.5	86.8	0.3	0.9	1.8	153	41.0	792	0.2	544
Median	ND	ND	680.0	677.9	2.0	4.0	5.6	1160	210.0	1400	3.1	1500
Mode	ND	ND	Multi	Multi	1.9	3.8	Multi	Multi	130.0	Multi	Multi	1600
Standard Deviation	ND	ND	259.4	260.4	0.9	2.7	5.2	460	123.1	2376	0.5	1540
Sample Variance	ND	ND	67286.1	67825.1	0.9	7.3	27.3	211939	15164.0	5645036	0.2	2370927
Range	ND	ND	730.0	731.7	2.9	8.9	15.5	1271	334.0	6830	1.3	4260
Minimum	ND	ND	370.0	364.5	1.0	2.1	2.1	659	96.0	370	2.6	240
Maximum	ND	ND	1100.0	1096.2	3.9	11.0	17.6	1930	430.0	7200	3.9	4500
Count	0	0	9	9	9	9	8	9	9	9	9	8
Confidence Level (95%)	ND	ND	199.4	200.2	0.7	2.1	4.4	354	94.7	1826	0.4	1287

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

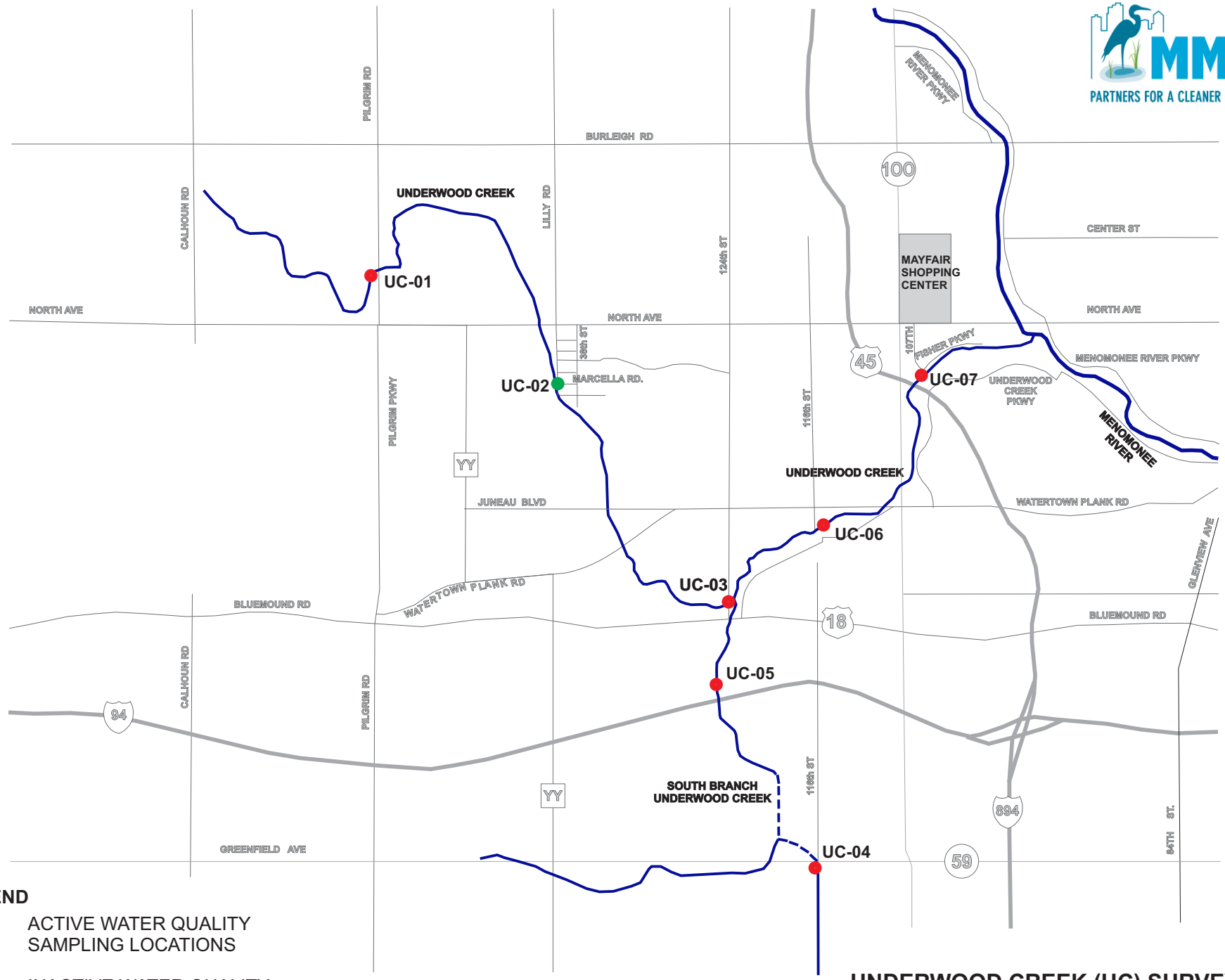
GREEN BAY AVE. - SITE 5
LINCOLN CREEK
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	59.78	25.78	0.2	1.9	5.4	1.8	0.0	16.4	1.5	3.2	0.0	ND
Standard Error	5.68	3.77	0.1	0.3	1.4	0.5	0.0	3.6	1.0	0.9	0.0	ND
Median	54.00	22.00	0.0	2.0	7.4	2.3	0.0	13.0	0.0	3.4	0.0	ND
Mode	44.00	18.00	0.0	2.0	0.0	0.0	0.0	Multi	0.0	0.0	0.0	ND
Standard Deviation	17.05	11.30	0.4	0.9	4.2	1.5	0.0	10.8	2.6	2.7	0.0	ND
Sample Variance	290.69	127.69	0.2	0.8	17.3	2.3	0.0	116.6	6.7	7.6	0.0	ND
Range	48.00	36.00	1.3	3.1	10.0	3.6	0.0	34.0	5.8	7.5	0.0	ND
Minimum	44.00	14.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	92.00	50.00	1.3	3.1	10.0	3.6	0.0	34.0	5.8	7.5	0.0	ND
Count	9	9	9	9	9	9	9	9	7	9	9	0
Confidence Level (95%)	13.11	8.69	0.3	0.7	3.2	1.2	0.0	8.3	2.4	2.1	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	256	152	3.1	ND	40.0	33.2	6.6	6.3
Standard Error	29	15	1.5	ND	2.4	3.0	1.0	1.0
Median	220	150	2.2	ND	38.0	32.0	5.5	5.1
Mode	Multi	110	0.0	ND	37.0	40.0	5.0	Multi
Standard Deviation	86	45	4.5	ND	7.2	8.9	3.0	3.1
Sample Variance	7428	2008	20.3	ND	52.5	78.4	9.2	9.5
Range	250	134	14.0	ND	23.0	26.0	9.9	10.1
Minimum	180	86	0.0	ND	30.0	22.0	4.1	3.9
Maximum	430	220	14.0	ND	53.0	48.0	14.0	14.0
Count	9	9	9	0	9	9	9	9
Confidence Level (95%)	66	34	3.5	ND	5.6	6.8	2.3	2.4

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data



LEGEND

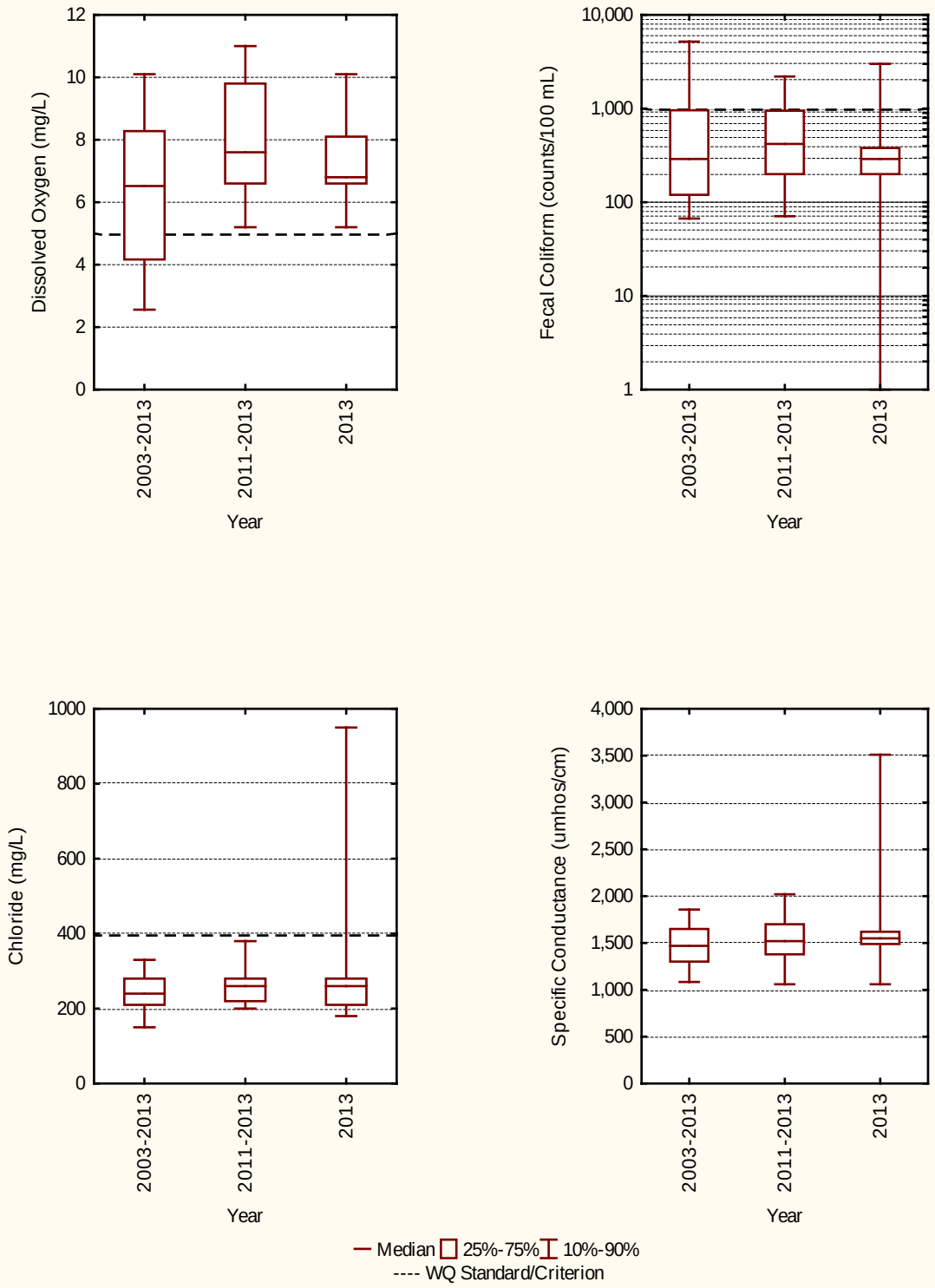
- ● ACTIVE WATER QUALITY SAMPLING LOCATIONS
- ● INACTIVE WATER QUALITY SAMPLING LOCATIONS

UNDERWOOD CREEK (UC) SURVEY
WATER QUALITY SAMPLING LOCATIONS

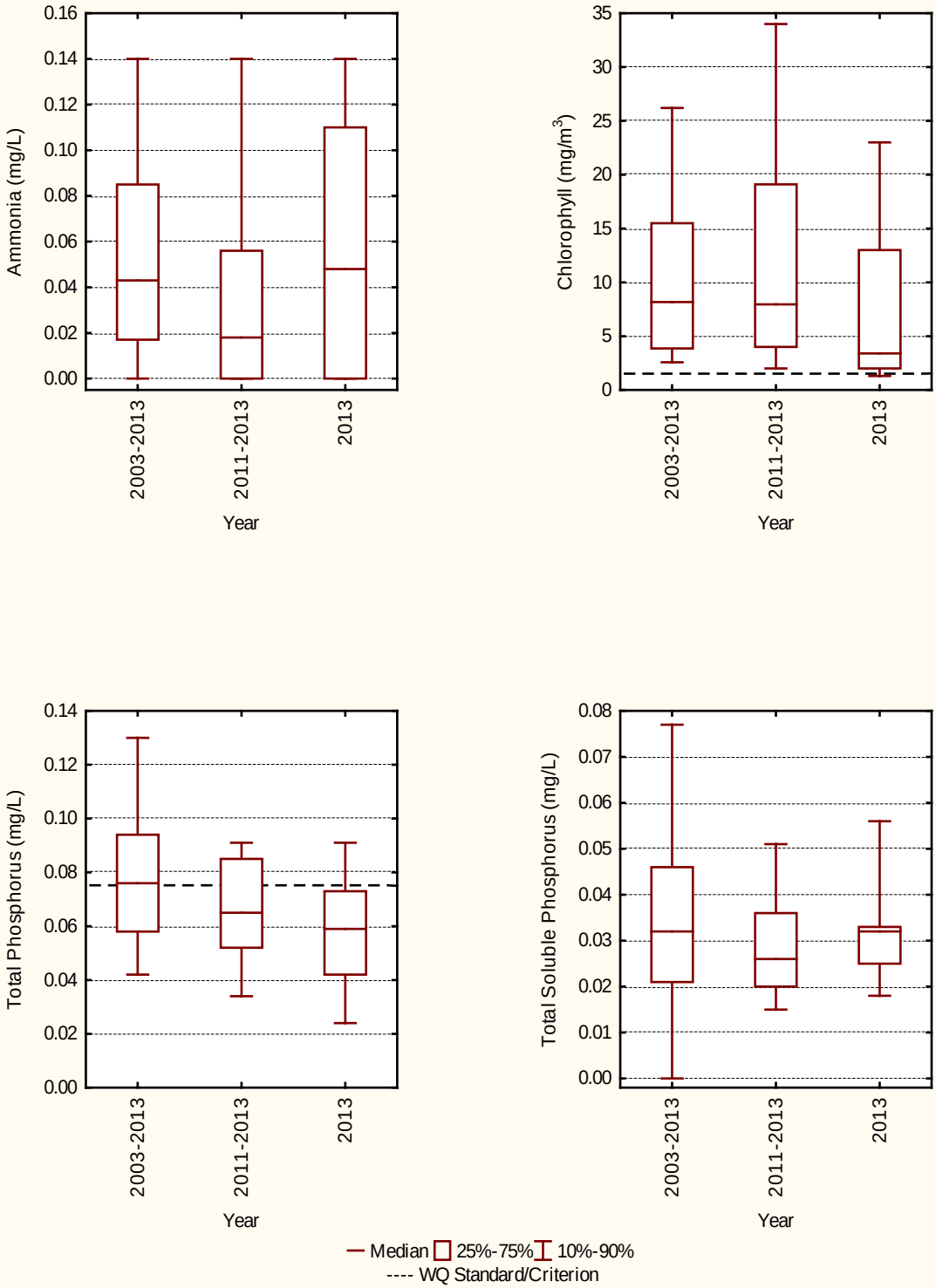
6/6/14

14-061 UC

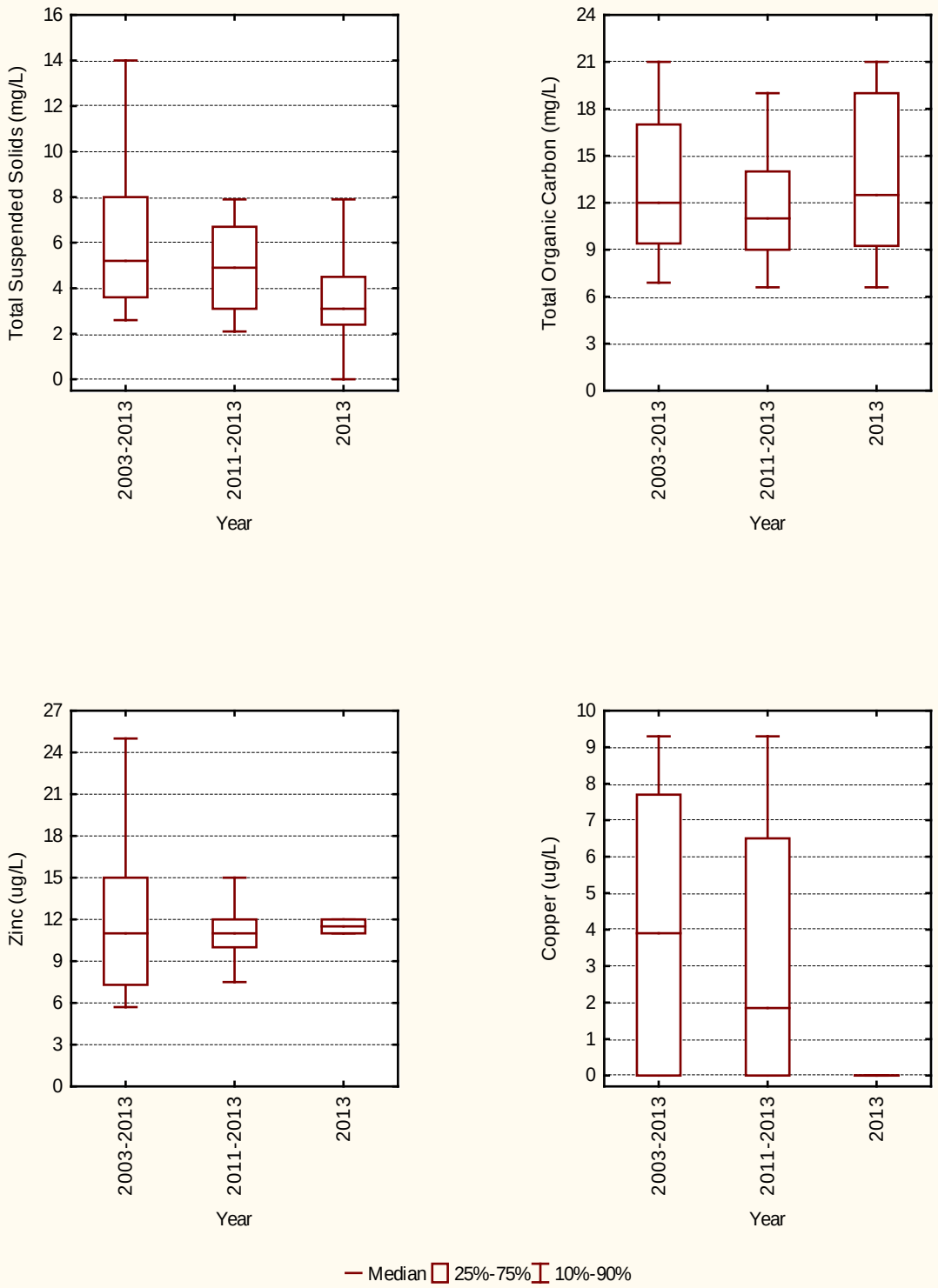
MMSD Water Quality Program Data
Underwood Creek at Wirth Park, Site UC-01



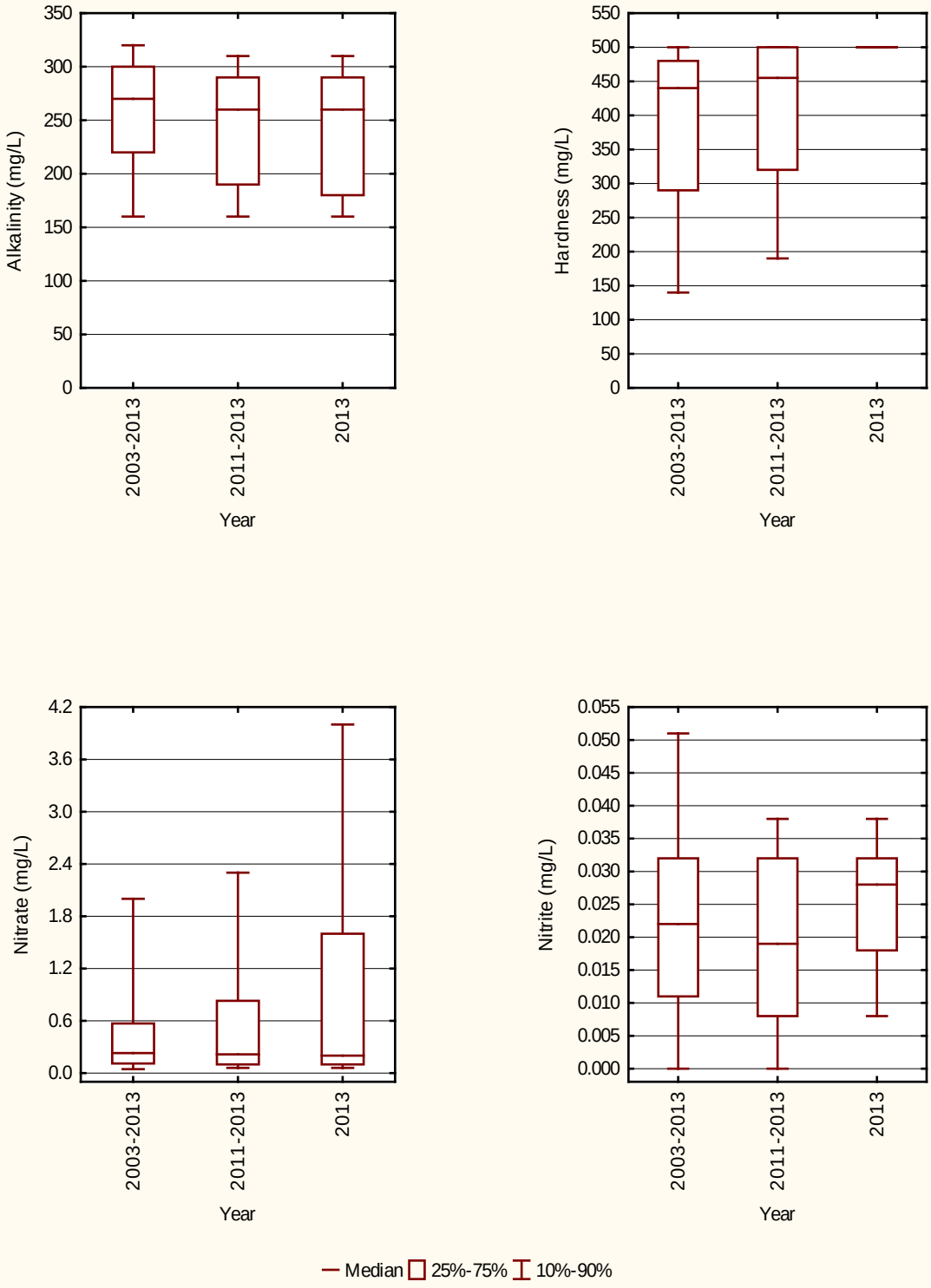
MMSD Water Quality Program Data
Underwood Creek at Wirth Park, Site UC-01



MMSD Water Quality Program Data
Underwood Creek at Wirth Park, Site UC-01



MMSD Water Quality Program Data
Underwood Creek at Wirth Park, Site UC-01



WIRTH PARK @ PILGRIM RD. AND FIELDSTONE DR. - SITE 1
UNDERWOOD CREEK
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.3	12.3	7.4	7.57	1.16	0.025	1.19	0.054	1.11	0.059	0.031	ND
Standard Error	0.1	2.1	0.5	2.68	0.52	0.004	0.52	0.019	0.17	0.008	0.004	ND
Median	7.3	14.6	6.8	3.40	0.20	0.028	0.23	0.048	1.10	0.059	0.032	ND
Mode	7.4	Multi	6.6	Multi	Multi	Multi	Multi	0.000	Multi	Multi	Multi	ND
Standard Deviation	0.2	6.4	1.5	8.05	1.56	0.011	1.55	0.058	0.50	0.024	0.011	ND
Sample Variance	0.0	40.9	2.4	64.73	2.42	0.000	2.41	0.003	0.25	0.001	0.000	ND
Range	0.5	18.1	4.9	21.70	3.94	0.030	3.93	0.140	1.39	0.067	0.038	ND
Minimum	7.0	2.2	5.2	1.30	0.06	0.008	0.07	0.000	0.41	0.024	0.018	ND
Maximum	7.5	20.3	10.1	23.00	4.00	0.038	4.00	0.140	1.80	0.091	0.056	ND
Count	9	9	9	9	9	9	9	9	9	9	9	0
Confidence Level (95%)	0.1	4.9	1.2	6.18	1.20	0.009	1.19	0.044	0.38	0.018	0.009	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	1037.8	1034.1	1.5	3.7	3.8	1690	324.4	550	2.5	479
Standard Error	ND	ND	125.9	126.4	0.6	0.8	0.7	238	79.3	310	0.2	157
Median	ND	ND	960.0	956.9	1.3	3.1	2.7	1550	260.0	290	2.5	290
Mode	ND	ND	960.0	Multi	0.0	Multi	Multi	1490	260.0	Multi	Multi	Multi
Standard Deviation	ND	ND	377.8	379.2	1.7	2.5	2.2	714	238.0	930	0.5	470
Sample Variance	ND	ND	142719.4	143797.5	2.9	6.1	5.0	510300	56627.8	864805	0.2	220553
Range	ND	ND	1250.0	1257.9	4.4	7.9	6.4	2450	770.0	3000	1.6	1482
Minimum	ND	ND	750.0	742.1	0.0	0.0	1.9	1060	180.0	0	1.9	18
Maximum	ND	ND	2000.0	2000.0	4.4	7.9	8.3	3510	950.0	3000	3.5	1500
Count	0	0	9	9	9	9	9	9	9	9	8	9
Confidence Level (95%)	ND	ND	290.4	291.5	1.3	1.9	1.7	549	182.9	715	0.4	361

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

WIRTH PARK @ PILGRIM RD. AND FIELDSTONE DR. - SITE 1
UNDERWOOD CREEK
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	115.00	53.50	0.4	1.6	0.0	3.4	0.0	11.5	0.0	10.0	0.0	ND
Standard Error	5.00	0.50	0.0	0.4	0.0	0.6	0.0	0.5	0.0	2.0	0.0	ND
Median	115.00	53.50	0.4	1.6	0.0	3.4	0.0	11.5	0.0	10.0	0.0	ND
Mode	Multi	Multi	0.4	Multi	0.0	Multi	0.0	Multi	0.0	Multi	0.0	ND
Standard Deviation	7.07	0.71	0.0	0.5	0.0	0.8	0.0	0.7	0.0	2.8	0.0	ND
Sample Variance	50.00	0.50	0.0	0.2	0.0	0.6	0.0	0.5	0.0	8.0	0.0	ND
Range	10.00	1.00	0.0	0.7	0.0	1.1	0.0	1.0	0.0	4.0	0.0	ND
Minimum	110.00	53.00	0.4	1.2	0.0	2.8	0.0	11.0	0.0	8.0	0.0	ND
Maximum	120.00	54.00	0.4	1.9	0.0	3.9	0.0	12.0	0.0	12.0	0.0	ND
Count	2	2	2	2	2	2	2	2	2	2	2	0
Confidence Level (95%)	63.53	6.35	0.0	4.4	0.0	7.0	0.0	6.4	0.0	25.4	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	500	238	0.6	ND	65.9	50.2	13.6	13.4
Standard Error	0	20	0.4	ND	3.4	3.6	2.0	2.0
Median	500	260	0.0	ND	67.0	55.0	12.5	12.5
Mode	500	Multi	0.0	ND	61.0	Multi	11.0	Multi
Standard Deviation	0	59	1.2	ND	10.1	10.7	5.5	5.7
Sample Variance	0	3494	1.5	ND	102.4	114.2	30.7	33.1
Range	0	150	2.8	ND	33.0	29.0	14.4	14.6
Minimum	500	160	0.0	ND	45.0	34.0	6.6	6.4
Maximum	500	310	2.8	ND	78.0	63.0	21.0	21.0
Count	2	9	9	0	9	9	8	8
Confidence Level (95%)	0	45	0.9	ND	7.8	8.2	4.6	4.8

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

124TH ST. AND BLUEMOUND RD. - SITE 3
UNDERWOOD CREEK
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.8	12.3	11.1	2.80	0.95	0.017	0.96	0.023	0.80	0.036	0.018	ND
Standard Error	0.1	2.3	0.7	1.04	0.39	0.004	0.39	0.009	0.11	0.006	0.003	ND
Median	7.8	14.2	11.2	1.80	0.42	0.022	0.45	0.024	0.86	0.034	0.014	ND
Mode	Multi	Multi	9.0	Multi	Multi	0.000	Multi	0.000	Multi	Multi	Multi	ND
Standard Deviation	0.2	7.0	2.0	3.12	1.18	0.011	1.18	0.026	0.33	0.018	0.008	ND
Sample Variance	0.0	49.6	4.1	9.75	1.40	0.000	1.39	0.001	0.11	0.000	0.000	ND
Range	0.6	22.1	5.8	10.04	3.40	0.029	3.40	0.063	0.88	0.052	0.024	ND
Minimum	7.4	0.3	9.0	0.96	0.10	0.000	0.10	0.000	0.42	0.012	0.008	ND
Maximum	8.0	22.4	14.8	11.00	3.50	0.029	3.50	0.063	1.30	0.064	0.032	ND
Count	9	9	9	9	9	9	9	9	9	9	9	0
Confidence Level (95%)	0.1	5.4	1.6	2.40	0.91	0.009	0.91	0.020	0.25	0.014	0.006	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	1002.2	995.4	2.4	6.8	8.4	1651	298.9	913	2.8	9581
Standard Error	ND	ND	114.9	115.7	1.0	2.4	3.3	200	63.9	235	0.2	8556
Median	ND	ND	920.0	918.4	1.5	5.1	4.7	1540	250.0	1050	3.0	980
Mode	ND	ND	Multi	Multi	0.0	2.5	4.5	Multi	250.0	Multi	Multi	Multi
Standard Deviation	ND	ND	344.8	347.2	3.0	7.2	10.0	600	191.7	663	0.5	25668
Sample Variance	ND	ND	118869.4	120529.2	9.0	52.1	99.7	359961	36761.1	440136	0.2	658868371
Range	ND	ND	1090.0	1108.9	9.7	22.4	31.6	1970	620.0	1890	1.3	77937
Minimum	ND	ND	710.0	686.0	0.0	1.6	3.2	1130	180.0	110	2.0	63
Maximum	ND	ND	1800.0	1794.9	9.7	24.0	34.8	3100	800.0	2000	3.3	78000
Count	0	0	9	9	9	9	9	9	9	8	8	9
Confidence Level (95%)	ND	ND	265.0	266.9	2.3	5.5	7.7	461	147.4	555	0.4	19731

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

124TH ST. AND BLUEMOUND RD. - SITE 3
UNDERWOOD CREEK
WATER QUALITY DATA - 2013

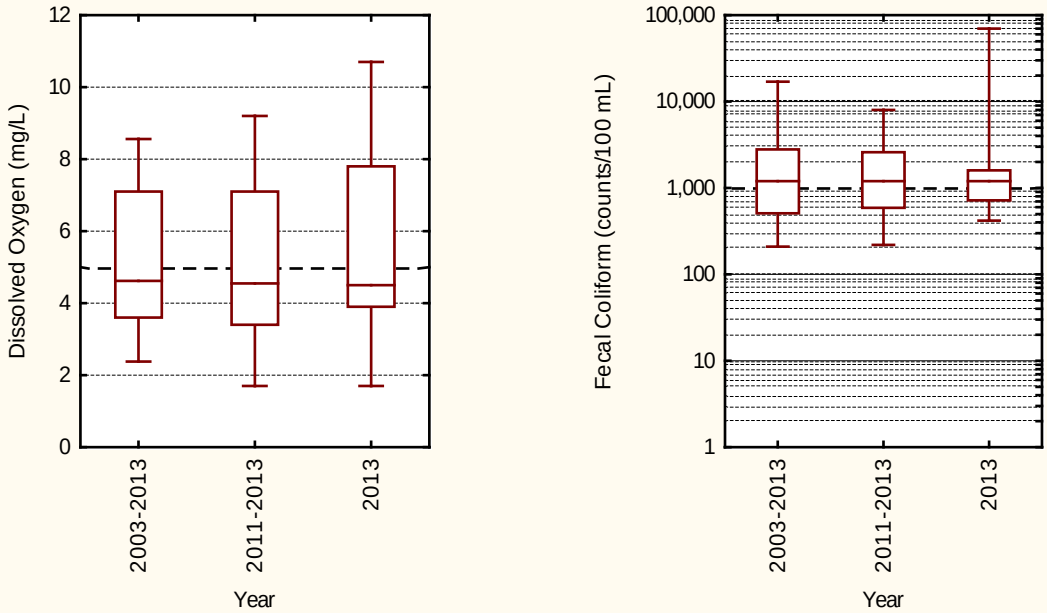
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	101.00	47.50	0.0	2.1	4.2	5.0	0.0	33.5	0.0	2.0	0.0	ND
Standard Error	19.00	8.50	0.0	0.4	4.2	0.9	0.0	21.5	0.0	2.0	0.0	ND
Median	101.00	47.50	0.0	2.1	4.2	5.0	0.0	33.5	0.0	2.0	0.0	ND
Mode	Multi	Multi	0.0	Multi	Multi	Multi	0.0	Multi	0.0	Multi	0.0	ND
Standard Deviation	26.87	12.02	0.0	0.6	5.9	1.2	0.0	30.4	0.0	2.8	0.0	ND
Sample Variance	722.00	144.50	0.0	0.3	35.3	1.4	0.0	924.5	0.0	8.0	0.0	ND
Range	38.00	17.00	0.0	0.8	8.4	1.7	0.0	43.0	0.0	4.0	0.0	ND
Minimum	82.00	39.00	0.0	1.7	0.0	4.1	0.0	12.0	0.0	0.0	0.0	ND
Maximum	120.00	56.00	0.0	2.5	8.4	5.8	0.0	55.0	0.0	4.0	0.0	ND
Count	2	2	2	2	2	2	2	2	2	2	2	0
Confidence Level (95%)	241.42	108.00	0.0	5.1	53.4	10.8	0.0	273.2	0.0	25.4	0.0	ND

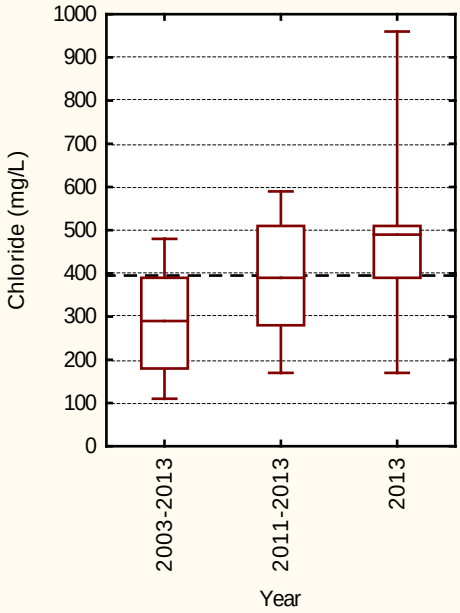
VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	445	254	0.7	ND	64.3	54.4	10.2	9.8
Standard Error	85	20	0.5	ND	3.3	3.6	1.5	1.5
Median	445	240	0.0	ND	63.0	57.5	10.1	9.4
Mode	Multi	200	0.0	ND	63.0	41.0	Multi	Multi
Standard Deviation	120	61	1.5	ND	10.0	10.3	4.4	4.2
Sample Variance	14450	3753	2.4	ND	100.5	105.7	19.2	17.6
Range	170	150	4.4	ND	28.0	25.0	13.0	11.6
Minimum	360	190	0.0	ND	48.0	41.0	4.0	4.4
Maximum	530	340	4.4	ND	76.0	66.0	17.0	16.0
Count	2	9	9	0	9	8	8	8
Confidence Level (95%)	1080	47	1.2	ND	7.7	8.6	3.7	3.5

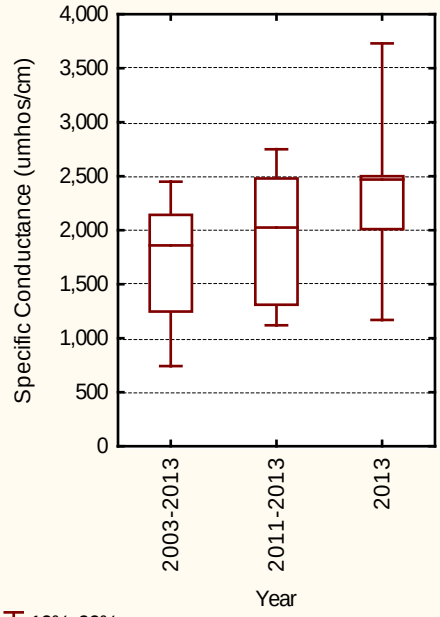
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

MMSD Water Quality Monitoring Program Data
Underwood Creek at 116th St. and Greenfield, Site UC-04

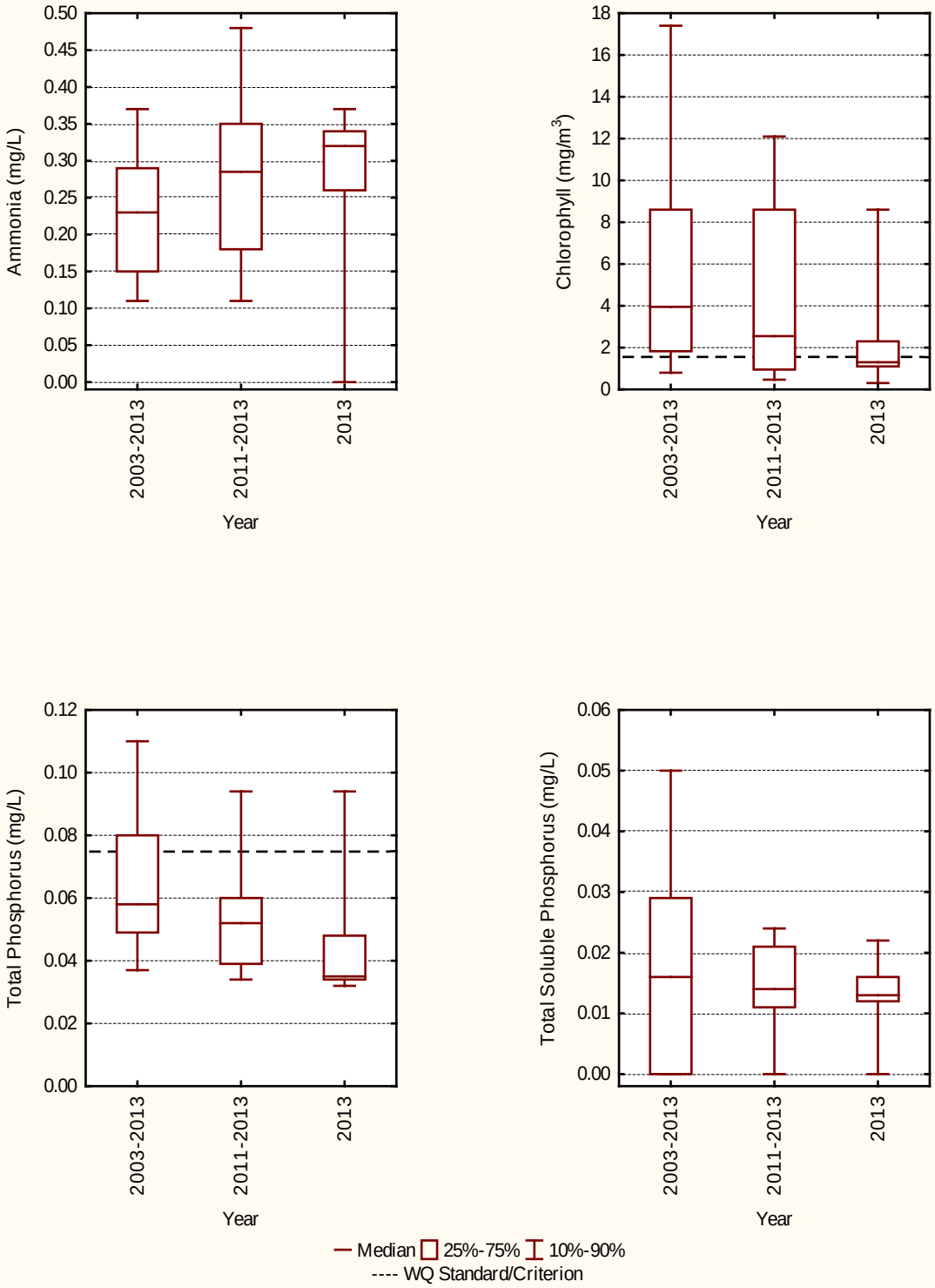




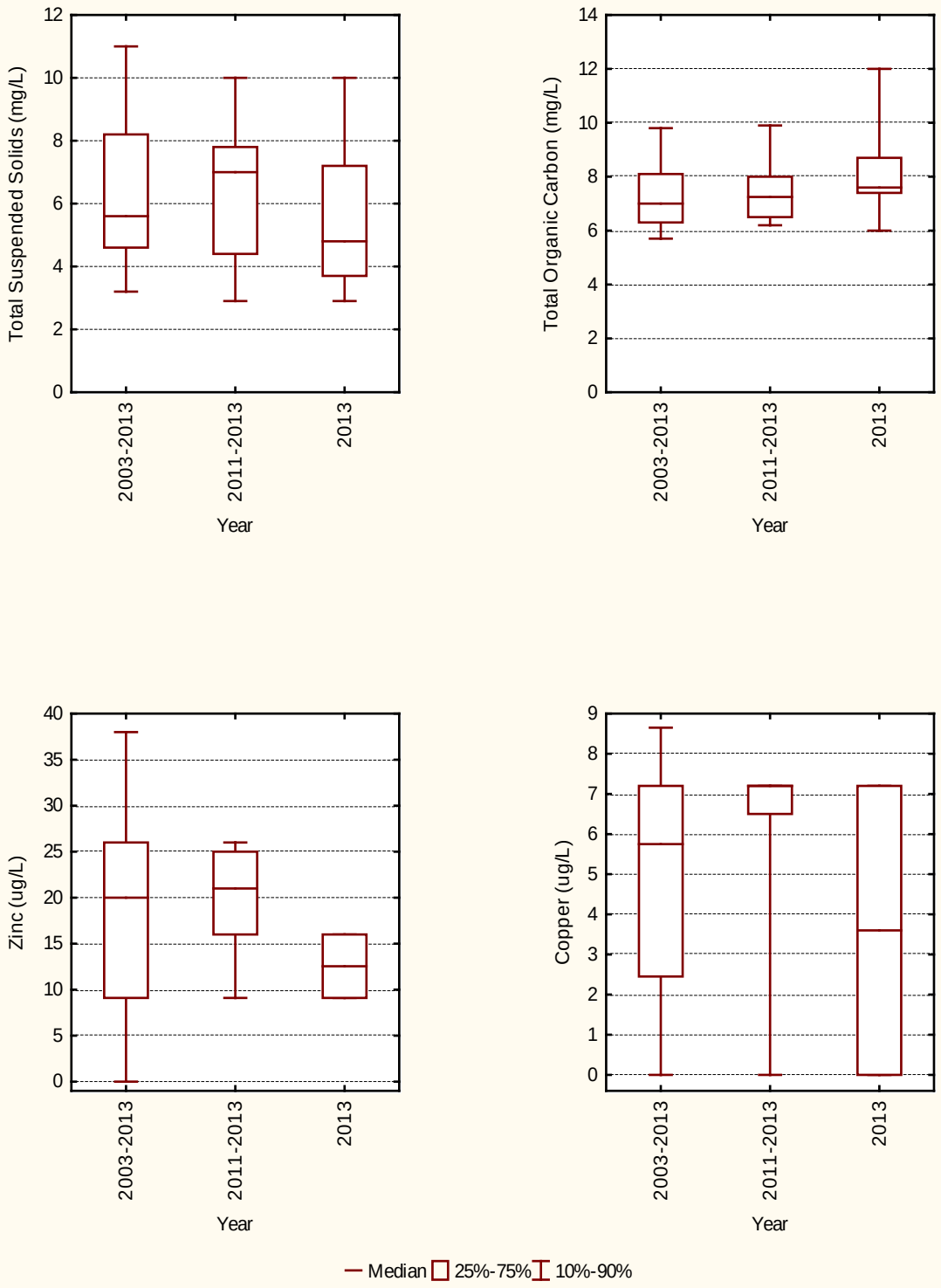


Median 25%-75% 10%-90%
WQ Standard/Criterion

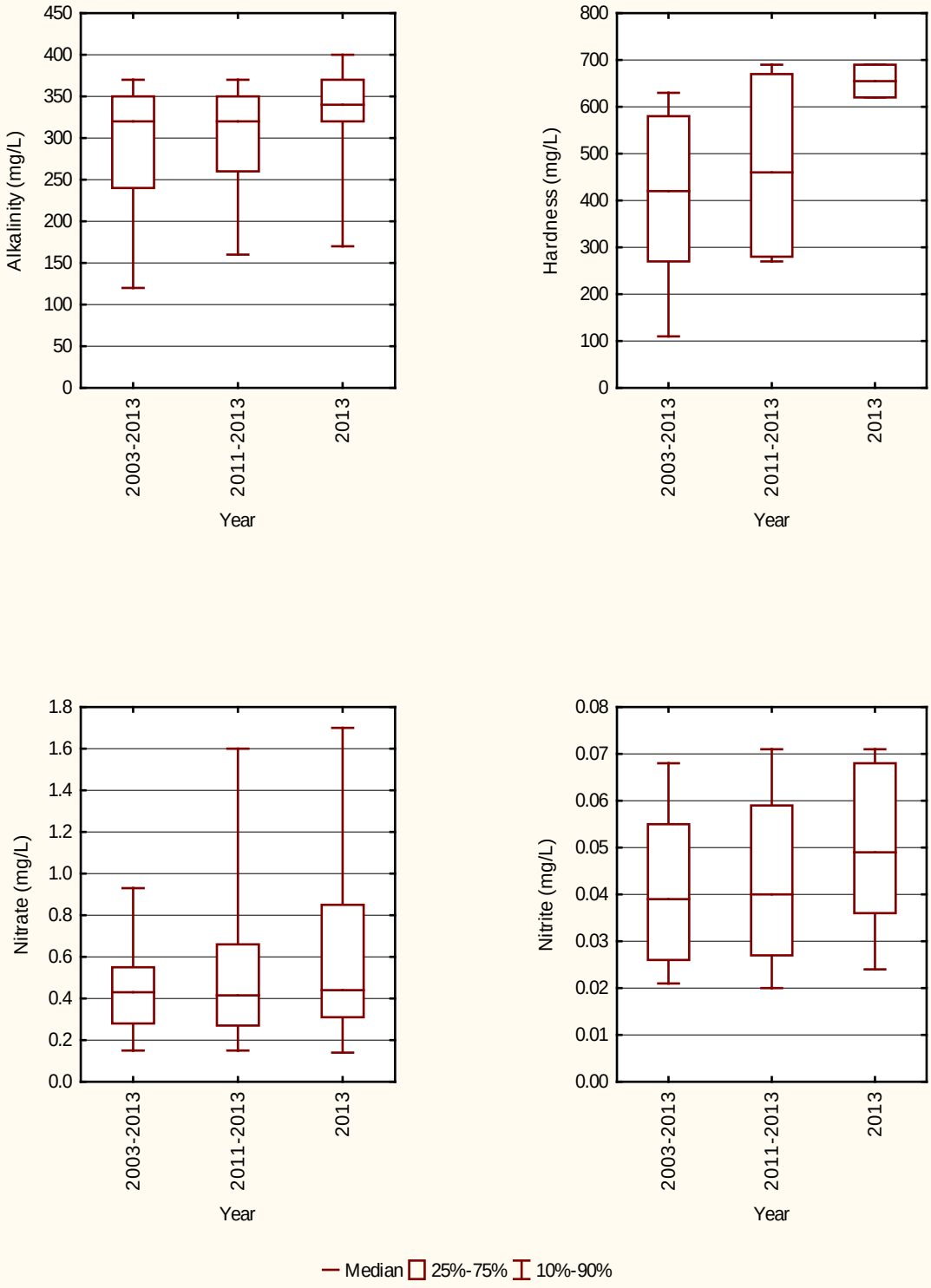
MMSD Water Quality Monitoring Program Data
Underwood Creek at 116th St. and Greenfield, Site UC-04



MMSD Water Quality Monitoring Program Data
Underwood Creek at 116th St. and Greenfield, Site UC-04



MMSD Water Quality Monitoring Program Data
Underwood Creek at 116th St. and Greenfield, Site UC-04



116TH ST. AND GREENFIELD AVE. - SITE 4
UNDERWOOD CREEK
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.4	12.0	5.9	2.24	0.69	0.049	0.73	0.267	0.87	0.046	0.013	ND
Standard Error	0.1	2.4	1.1	0.84	0.20	0.006	0.19	0.040	0.04	0.007	0.002	ND
Median	7.4	13.7	4.5	1.30	0.44	0.049	0.49	0.320	0.85	0.035	0.013	ND
Mode	7.4	Multi	Multi	Multi	Multi	Multi	Multi	Multi	Multi	0.034	Multi	ND
Standard Deviation	0.2	7.1	3.2	2.51	0.59	0.018	0.56	0.120	0.13	0.020	0.006	ND
Sample Variance	0.0	50.0	10.1	6.32	0.35	0.000	0.32	0.014	0.02	0.000	0.000	ND
Range	0.6	21.2	9.0	8.29	1.56	0.047	1.51	0.370	0.37	0.062	0.022	ND
Minimum	7.2	0.3	1.7	0.31	0.14	0.024	0.19	0.000	0.73	0.032	0.000	ND
Maximum	7.8	21.5	10.7	8.60	1.70	0.071	1.70	0.370	1.10	0.094	0.022	ND
Count	9	9	9	9	9	9	9	9	9	9	9	0
Confidence Level (95%)	0.1	5.4	2.4	1.93	0.45	0.014	0.43	0.092	0.10	0.015	0.005	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	1376.7	1371.1	1.9	5.6	10.6	2297	474.4	9012	3.2	5757
Standard Error	ND	ND	143.5	144.0	0.4	0.9	2.0	255	73.5	7632	0.2	4534
Median	ND	ND	1500.0	1495.1	2.3	4.8	8.5	2470	490.0	1200	3.1	1200
Mode	ND	ND	Multi	Multi	Multi	Multi	Multi	Multi	Multi	Multi	Multi	1600
Standard Deviation	ND	ND	430.6	432.0	1.2	2.6	5.9	766	220.4	22897	0.7	13602
Sample Variance	ND	ND	185450.0	186664.3	1.5	6.6	34.6	586525	48577.8	524262294	0.4	185013300
Range	ND	ND	1370.0	1373.5	4.1	7.1	18.8	2560	790.0	69580	2.2	41420
Minimum	ND	ND	730.0	722.8	0.0	2.9	7.0	1170	170.0	420	2.6	580
Maximum	ND	ND	2100.0	2096.3	4.1	10.0	25.8	3730	960.0	70000	4.8	42000
Count	0	0	9	9	9	9	9	9	9	9	9	9
Confidence Level (95%)	ND	ND	331.0	332.1	0.9	2.0	4.5	589	169.4	17600	0.5	10455

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

116TH ST. AND GREENFIELD AVE. - SITE 4
UNDERWOOD CREEK
WATER QUALITY DATA - 2013

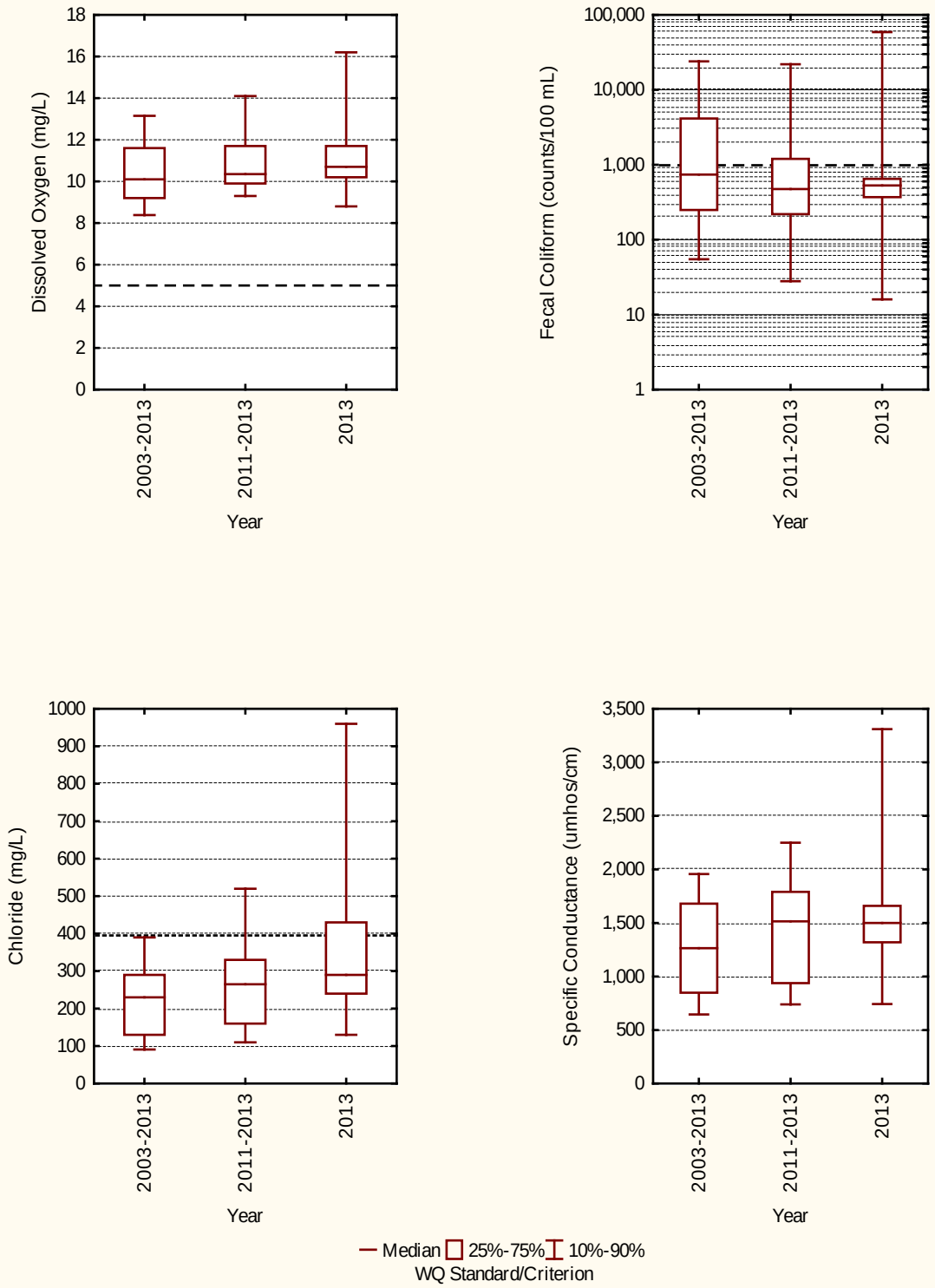
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	155.00	64.00	0.0	2.2	3.6	4.6	0.0	12.6	0.0	2.0	0.0	ND
Standard Error	5.00	4.00	0.0	0.3	3.6	2.0	0.0	3.5	0.0	2.0	0.0	ND
Median	155.00	64.00	0.0	2.2	3.6	4.6	0.0	12.6	0.0	2.0	0.0	ND
Mode	Multi	Multi	0.0	Multi	Multi	Multi	0.0	Multi	0.0	Multi	0.0	ND
Standard Deviation	7.07	5.66	0.0	0.4	5.1	2.8	0.0	4.9	0.0	2.8	0.0	ND
Sample Variance	50.00	32.00	0.0	0.2	25.9	7.6	0.0	23.8	0.0	8.0	0.0	ND
Range	10.00	8.00	0.0	0.6	7.2	3.9	0.0	6.9	0.0	4.0	0.0	ND
Minimum	150.00	60.00	0.0	1.9	0.0	2.6	0.0	9.1	0.0	0.0	0.0	ND
Maximum	160.00	68.00	0.0	2.5	7.2	6.5	0.0	16.0	0.0	4.0	0.0	ND
Count	2	2	2	2	2	2	2	2	2	2	2	0
Confidence Level (95%)	63.53	50.82	0.0	3.8	45.7	24.8	0.0	43.8	0.0	25.4	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	655	328	2.8	ND	74.9	66.1	8.4	8.1
Standard Error	35	24	1.3	ND	4.1	4.5	0.6	0.7
Median	655	340	0.0	ND	74.0	66.0	7.6	7.4
Mode	Multi	Multi	0.0	ND	Multi	Multi	7.4	Multi
Standard Deviation	49	71	3.9	ND	12.2	13.4	1.9	2.1
Sample Variance	2450	5044	14.9	ND	148.6	178.4	3.7	4.3
Range	70	230	9.7	ND	37.0	40.0	6.0	6.6
Minimum	620	170	0.0	ND	51.0	42.0	6.0	5.4
Maximum	690	400	9.7	ND	88.0	82.0	12.0	12.0
Count	2	9	9	0	9	9	9	9
Confidence Level (95%)	445	55	3.0	ND	9.4	10.3	1.5	1.6

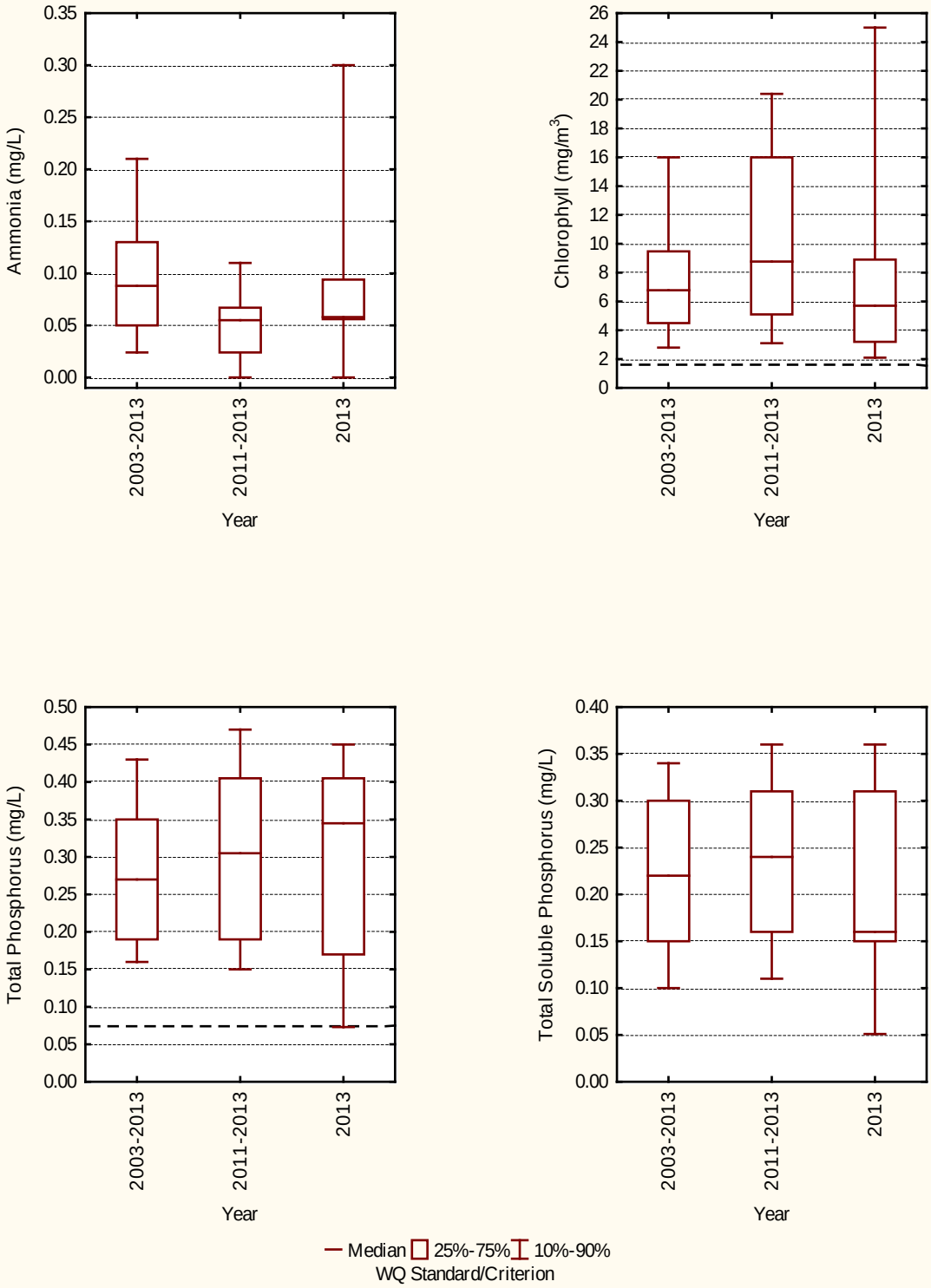
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

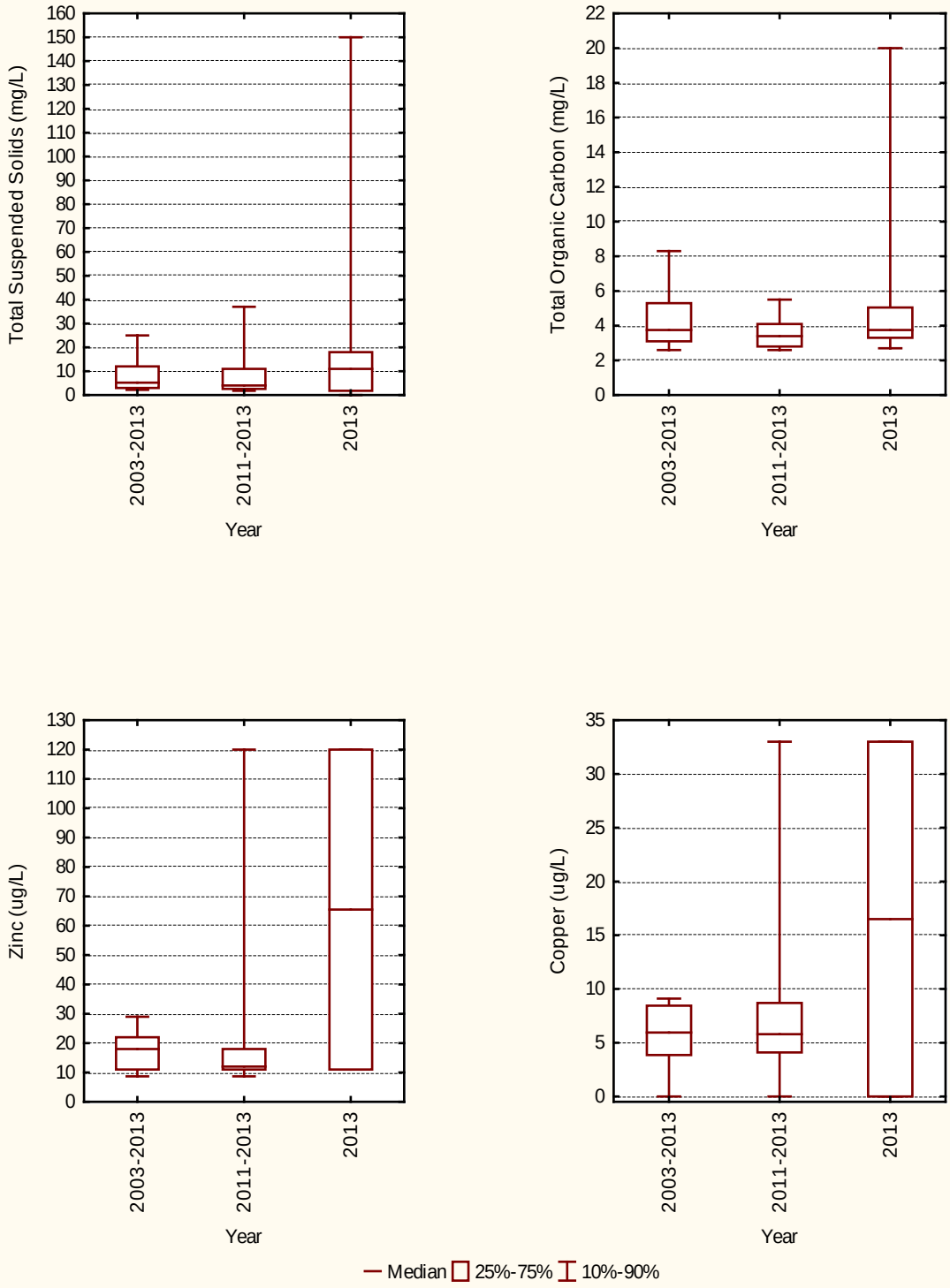
MMSD Water Quality Program Data
Underwood Creek Parkway Downstream of Zoo Discharge., Site UC-05



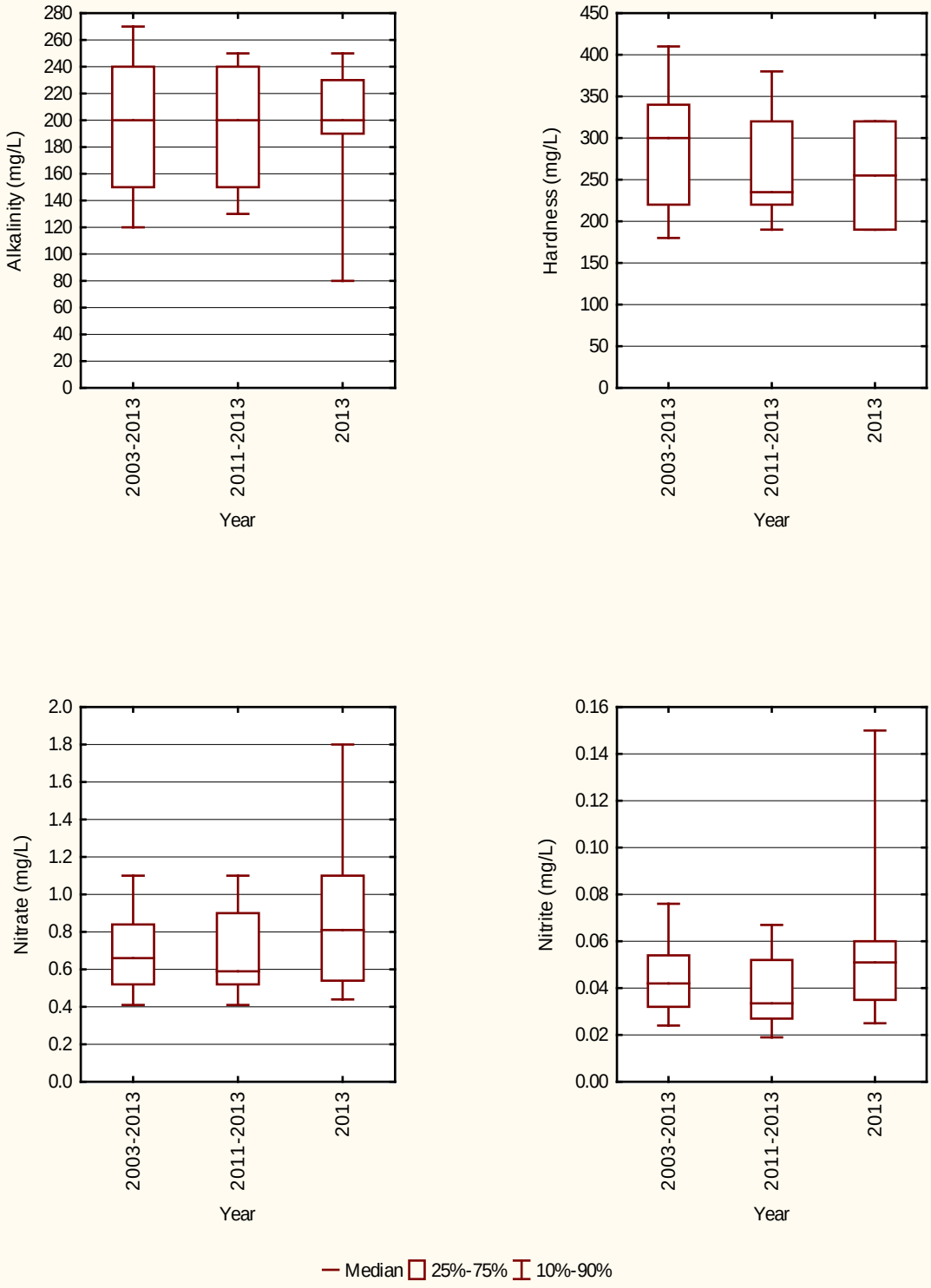
MMSD Water Quality Program Data
Underwood Creek Parkway Downstream of Zoo Discharge, Site UC-05



MMSD Water Quality Program Data
Underwood Creek Parkway Downstream of Zoo Discharge, Site UC-05



MMSD Water Quality Program Data
Underwood Creek Parkway Downstream of Zoo Discharge, Site UC-05



UNDERWOOD CREEK PARKWAY JUST DOWNSTREAM OF ZOO DISCHARGE - SITE 5
UNDERWOOD CREEK
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.8	12.0	11.3	7.94	0.88	0.058	0.92	0.088	0.76	0.295	0.216	ND
Standard Error	0.1	1.6	0.7	2.32	0.14	0.013	0.13	0.028	0.19	0.049	0.037	ND
Median	7.9	12.7	10.7	5.70	0.81	0.051	0.88	0.058	0.56	0.345	0.160	ND
Mode	Multi	Multi	Multi	Multi	1.10	Multi	1.10	0.058	Multi	Multi	0.150	ND
Standard Deviation	0.2	4.8	2.1	6.97	0.42	0.038	0.40	0.085	0.56	0.139	0.110	ND
Sample Variance	0.0	22.9	4.5	48.57	0.18	0.001	0.16	0.007	0.31	0.019	0.012	ND
Range	0.5	14.4	7.4	22.90	1.36	0.125	1.33	0.300	1.81	0.377	0.309	ND
Minimum	7.5	3.7	8.8	2.10	0.44	0.025	0.47	0.000	0.39	0.073	0.051	ND
Maximum	8.0	18.0	16.2	25.00	1.80	0.150	1.80	0.300	2.20	0.450	0.360	ND
Count	9	9	9	9	9	9	9	9	9	8	9	0
Confidence Level (95%)	0.2	3.7	1.6	5.36	0.32	0.029	0.30	0.065	0.43	0.116	0.084	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	1007.8	981.4	9.1	26.4	66.0	1648	372.2	7388	2.7	969
Standard Error	ND	ND	140.7	149.8	5.9	15.9	57.9	235	82.8	6470	0.4	417
Median	ND	ND	920.0	883.0	2.9	11.0	9.6	1500	290.0	530	2.7	550
Mode	ND	ND	Multi	Multi	0.0	1.8	Multi	1500	290.0	650	2.8	Multi
Standard Deviation	ND	ND	422.0	449.3	17.6	47.8	173.7	705	248.3	19411	1.1	1252
Sample Variance	ND	ND	178044.4	201888.9	308.8	2282.5	30172.1	497240	61644.4	376779236	1.1	1566780
Range	ND	ND	1490.0	1640.0	55.0	150.0	527.7	2567	830.0	58984	3.6	4066
Minimum	ND	ND	510.0	360.0	0.0	0.0	1.3	743	130.0	16	1.2	34
Maximum	ND	ND	2000.0	2000.0	55.0	150.0	529.0	3310	960.0	59000	4.8	4100
Count	0	0	9	9	9	9	9	9	9	9	9	9
Confidence Level (95%)	ND	ND	324.3	345.4	13.5	36.7	133.5	542	190.8	14920	0.8	962

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

UNDERWOOD CREEK PARKWAY JUST DOWNSTREAM OF ZOO DISCHARGE - SITE 5
UNDERWOOD CREEK
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	60.50	24.50	0.0	6.0	16.5	6.0	0.0	65.5	0.0	3.1	0.0	ND
Standard Error	14.50	6.50	0.0	3.9	16.5	3.2	ND	54.5	0.0	3.1	0.0	ND
Median	60.50	24.50	0.0	6.0	16.5	6.0	0.0	65.5	0.0	3.1	0.0	ND
Mode	Multi	Multi	0.0	Multi	Multi	Multi	0.0	Multi	0.0	Multi	0.0	ND
Standard Deviation	20.51	9.19	0.0	5.4	23.3	4.5	ND	77.1	0.0	4.4	0.0	ND
Sample Variance	420.50	84.50	0.0	29.6	544.5	20.5	ND	5940.5	0.0	19.2	0.0	ND
Range	29.00	13.00	0.0	7.7	33.0	6.4	0.0	109.0	0.0	6.2	0.0	ND
Minimum	46.00	18.00	0.0	2.1	0.0	2.8	0.0	11.0	0.0	0.0	0.0	ND
Maximum	75.00	31.00	0.0	9.8	33.0	9.2	0.0	120.0	0.0	6.2	0.0	ND
Count	2	2	2	2	2	2	1	2	2	2	2	0
Confidence Level (95%)	184.24	82.59	0.0	48.9	209.7	40.7	ND	692.5	0.0	39.4	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	255	197	4.0	ND	47.4	41.4	5.9	5.4
Standard Error	65	17	2.5	ND	2.8	4.0	2.0	2.0
Median	255	200	2.3	ND	46.0	42.0	3.8	3.2
Mode	Multi	200	0.0	ND	46.0	47.0	Multi	3.0
Standard Deviation	92	50	7.6	ND	8.0	11.4	5.8	5.6
Sample Variance	8450	2550	57.6	ND	63.7	130.0	33.6	30.9
Range	130	170	24.0	ND	24.0	40.0	17.3	16.2
Minimum	190	80	0.0	ND	38.0	18.0	2.7	2.8
Maximum	320	250	24.0	ND	62.0	58.0	20.0	19.0
Count	2	9	9	0	8	8	8	8
Confidence Level (95%)	826	39	5.8	ND	6.7	9.5	4.8	4.6

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

115TH ST. (JUST SOUTH OF WATERTOWN PLANK RD.) - SITE 6
UNDERWOOD CREEK
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.1	13.8	16.2	87.55	0.89	0.030	0.93	0.024	1.12	0.136	0.037	ND
Standard Error	0.1	2.6	1.8	60.09	0.34	0.009	0.35	0.017	0.36	0.080	0.015	ND
Median	8.3	15.1	15.6	12.00	0.51	0.022	0.58	0.000	0.83	0.056	0.017	ND
Mode	Multi	Multi	Multi	Multi	Multi	0.014	Multi	0.000	Multi	0.056	0.014	ND
Standard Deviation	0.4	7.7	5.3	180.26	1.01	0.026	1.04	0.052	1.07	0.239	0.045	ND
Sample Variance	0.1	59.8	27.9	32493.65	1.03	0.001	1.09	0.003	1.14	0.057	0.002	ND
Range	1.0	23.3	16.3	559.08	2.97	0.083	3.06	0.160	3.49	0.740	0.143	ND
Minimum	7.6	1.2	7.8	0.92	0.03	0.014	0.04	0.000	0.41	0.030	0.007	ND
Maximum	8.6	24.5	24.1	560.00	3.00	0.097	3.10	0.160	3.90	0.770	0.150	ND
Count	9	9	9	9	9	9	9	9	9	9	9	0
Confidence Level (95%)	0.3	5.9	4.1	138.56	0.78	0.020	0.80	0.040	0.82	0.184	0.035	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	1090.0	1053.3	12.8	36.7	35.4	1774	332.2	15501	3.2	10108
Standard Error	ND	ND	92.4	96.0	8.5	22.6	30.3	184	55.8	10655	0.3	8514
Median	ND	ND	1000.0	977.2	3.2	8.7	5.5	1590	260.0	1000	3.0	1200
Mode	ND	ND	1200.0	Multi	0.0	Multi	Multi	1820	260.0	Multi	Multi	Multi
Standard Deviation	ND	ND	277.1	287.9	25.6	67.9	91.0	551	167.3	31964	0.9	25542
Sample Variance	ND	ND	76800.0	82903.7	656.2	4613.9	8280.8	303928	27994.4	1021685661	0.9	652411819
Range	ND	ND	880.0	901.3	80.0	208.5	275.0	1920	560.0	92830	2.7	77810
Minimum	ND	ND	820.0	790.0	0.0	1.5	3.0	1150	200.0	170	2.2	190
Maximum	ND	ND	1700.0	1691.3	80.0	210.0	278.0	3070	760.0	93000	5.0	78000
Count	0	0	9	9	9	9	9	9	9	9	9	9
Confidence Level (95%)	ND	ND	213.0	221.3	19.7	52.2	69.9	424	128.6	24570	0.7	19634

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

115TH ST. (JUST SOUTH OF WATERTOWN PLANK RD.) - SITE 6
UNDERWOOD CREEK
WATER QUALITY DATA - 2013

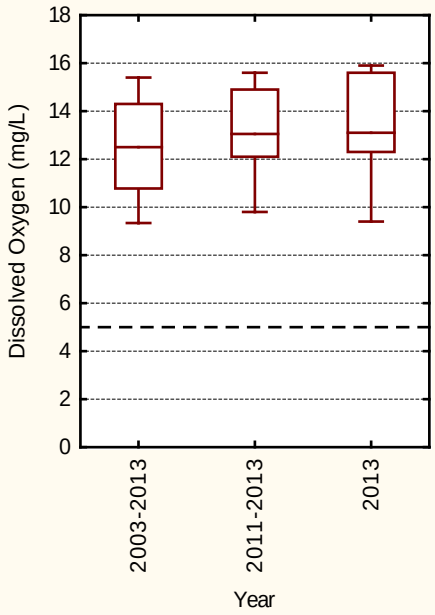
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	110.00	50.00	0.0	3.5	9.5	4.3	0.0	34.5	0.0	1.8	0.0	ND
Standard Error	10.00	9.00	0.0	2.3	9.5	2.8	ND	34.5	0.0	1.8	0.0	ND
Median	110.00	50.00	0.0	3.5	9.5	4.3	0.0	34.5	0.0	1.8	0.0	ND
Mode	Multi	Multi	0.0	Multi	Multi	Multi	0.0	Multi	0.0	Multi	0.0	ND
Standard Deviation	14.14	12.73	0.0	3.2	13.4	3.9	ND	48.8	0.0	2.5	0.0	ND
Sample Variance	200.00	162.00	0.0	10.1	180.5	15.1	ND	2380.5	0.0	6.5	0.0	ND
Range	20.00	18.00	0.0	4.5	19.0	5.5	0.0	69.0	0.0	3.6	0.0	ND
Minimum	100.00	41.00	0.0	1.2	0.0	1.5	0.0	0.0	0.0	0.0	0.0	ND
Maximum	120.00	59.00	0.0	5.7	19.0	7.0	0.0	69.0	0.0	3.6	0.0	ND
Count	2	2	2	2	2	2	1	2	2	2	2	0
Confidence Level (95%)	127.06	114.36	0.0	28.6	120.7	34.9	ND	438.4	0.0	22.9	0.0	ND

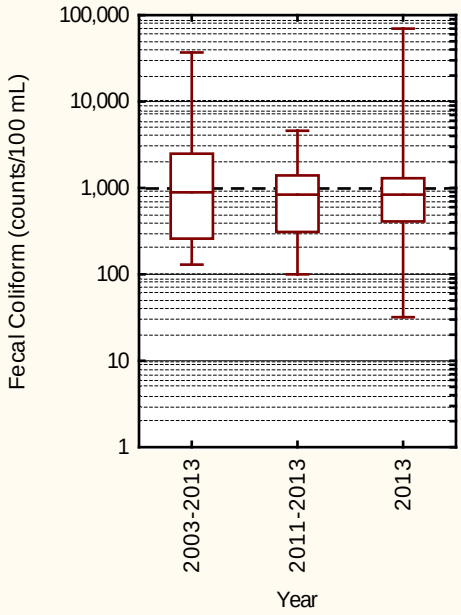
VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	485	250	6.1	ND	61.3	50.2	11.2	10.2
Standard Error	55	15	4.4	ND	2.6	3.3	2.3	2.0
Median	485	250	3.0	ND	61.0	50.0	11.0	10.0
Mode	Multi	250	0.0	ND	Multi	50.0	11.0	10.0
Standard Deviation	78	44	13.2	ND	7.8	9.8	6.8	6.0
Sample Variance	6050	1900	174.4	ND	60.5	96.2	46.8	36.5
Range	110	140	41.0	ND	23.0	34.0	22.6	20.2
Minimum	430	190	0.0	ND	52.0	30.0	4.4	3.8
Maximum	540	330	41.0	ND	75.0	64.0	27.0	24.0
Count	2	9	9	0	9	9	9	9
Confidence Level (95%)	699	34	10.2	ND	6.0	7.5	5.3	4.6

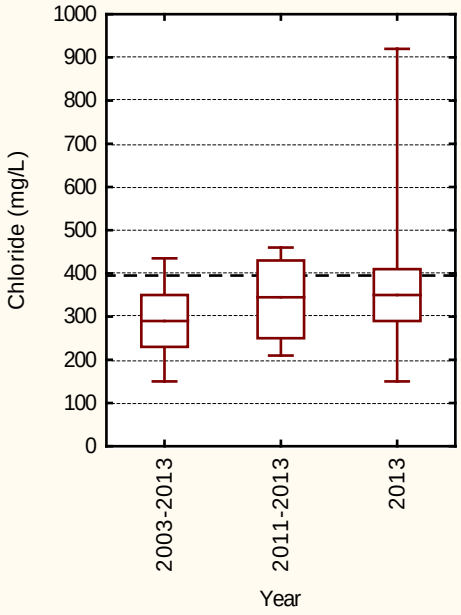
ND = No Data **Multi = Multimodal**

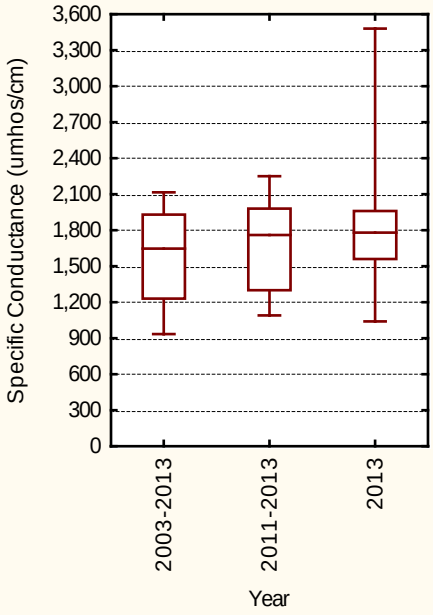
Provisional MMSD Water Quality Data

MMSD Water Quality Program Data
Underwood Creek at 107th St. and Fisher Pkwy., Site UC-07



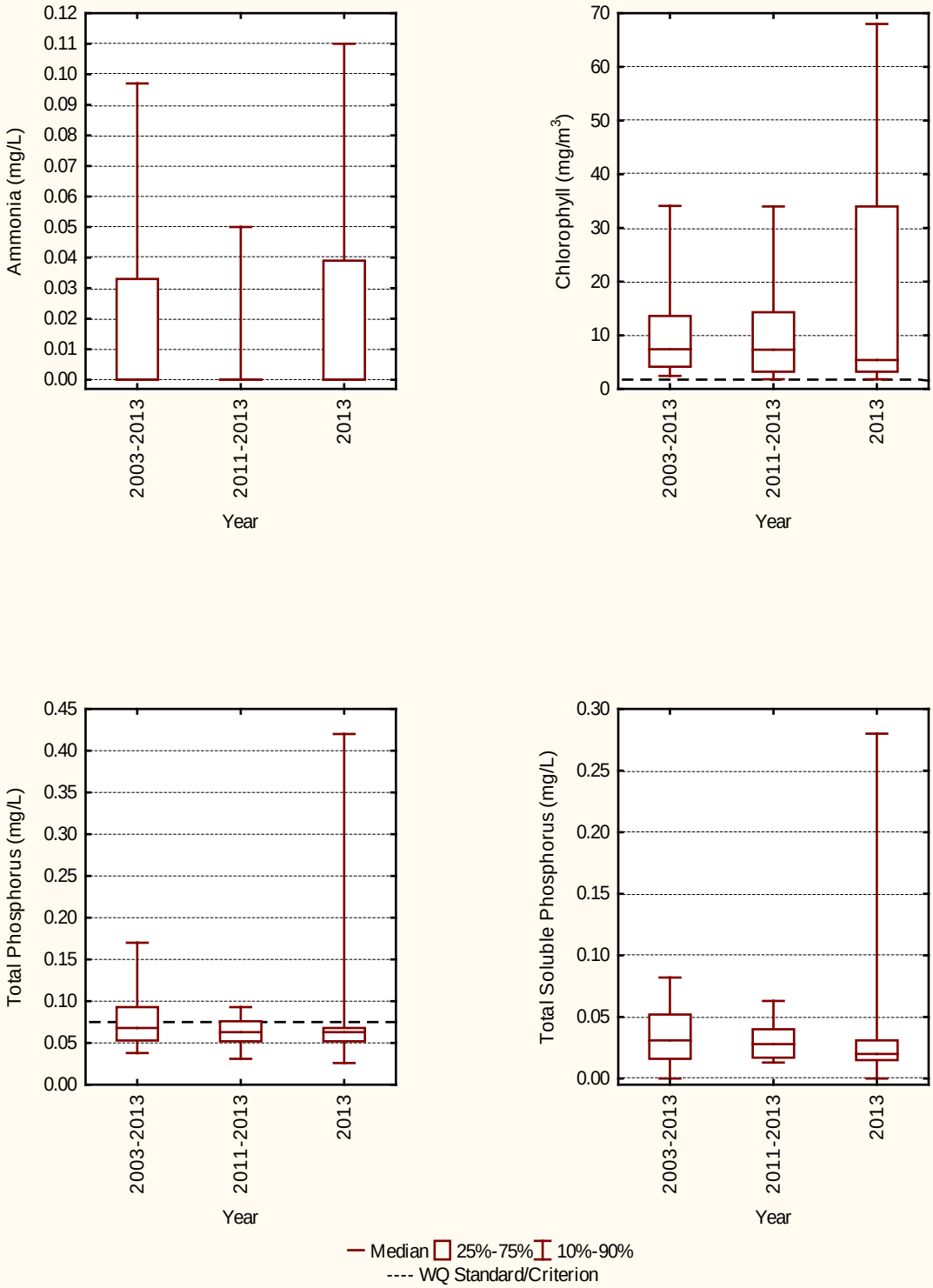




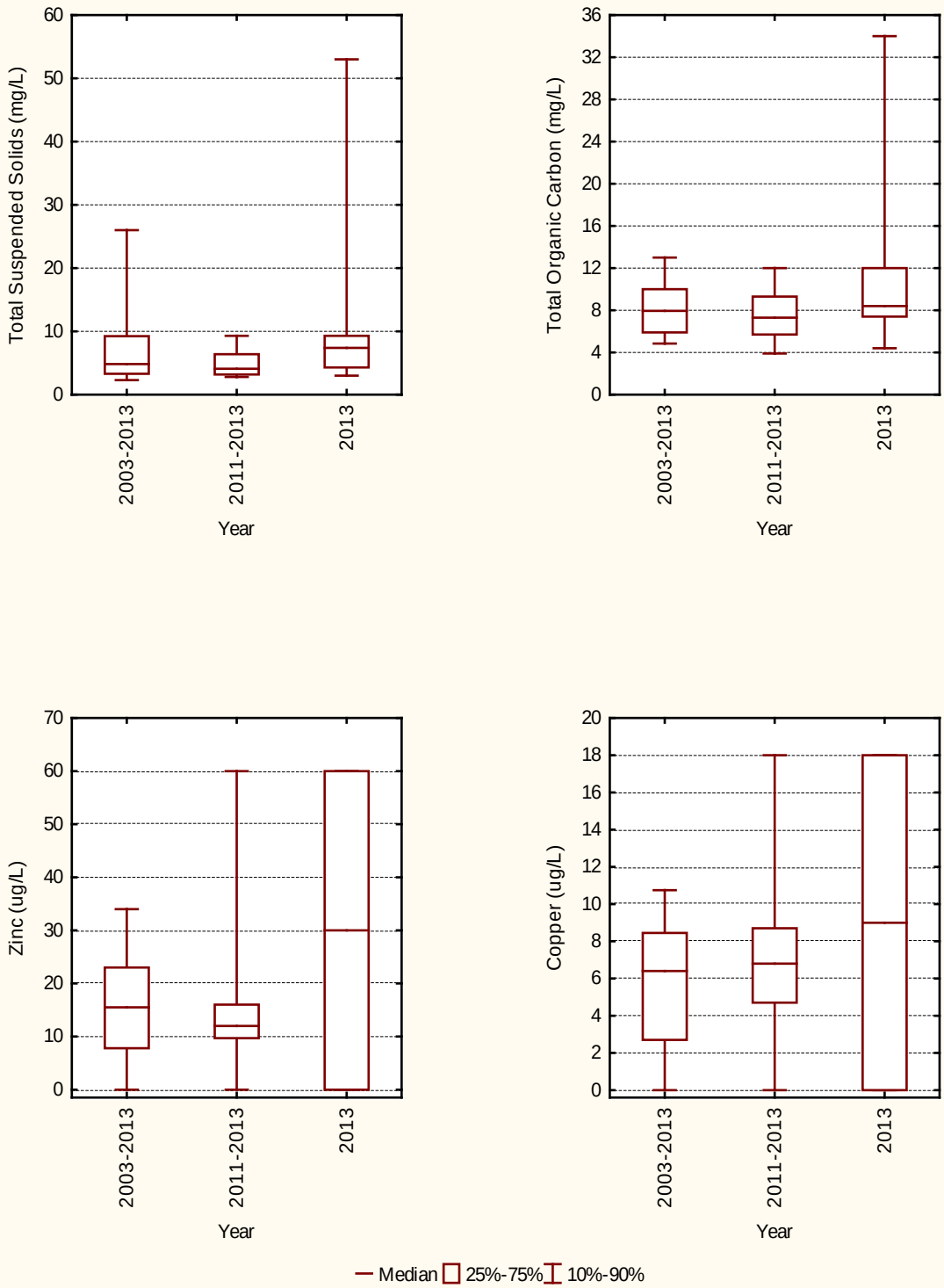


— Median ☐ 25%-75% I 10%-90%
---- WQ Standard/Criterion

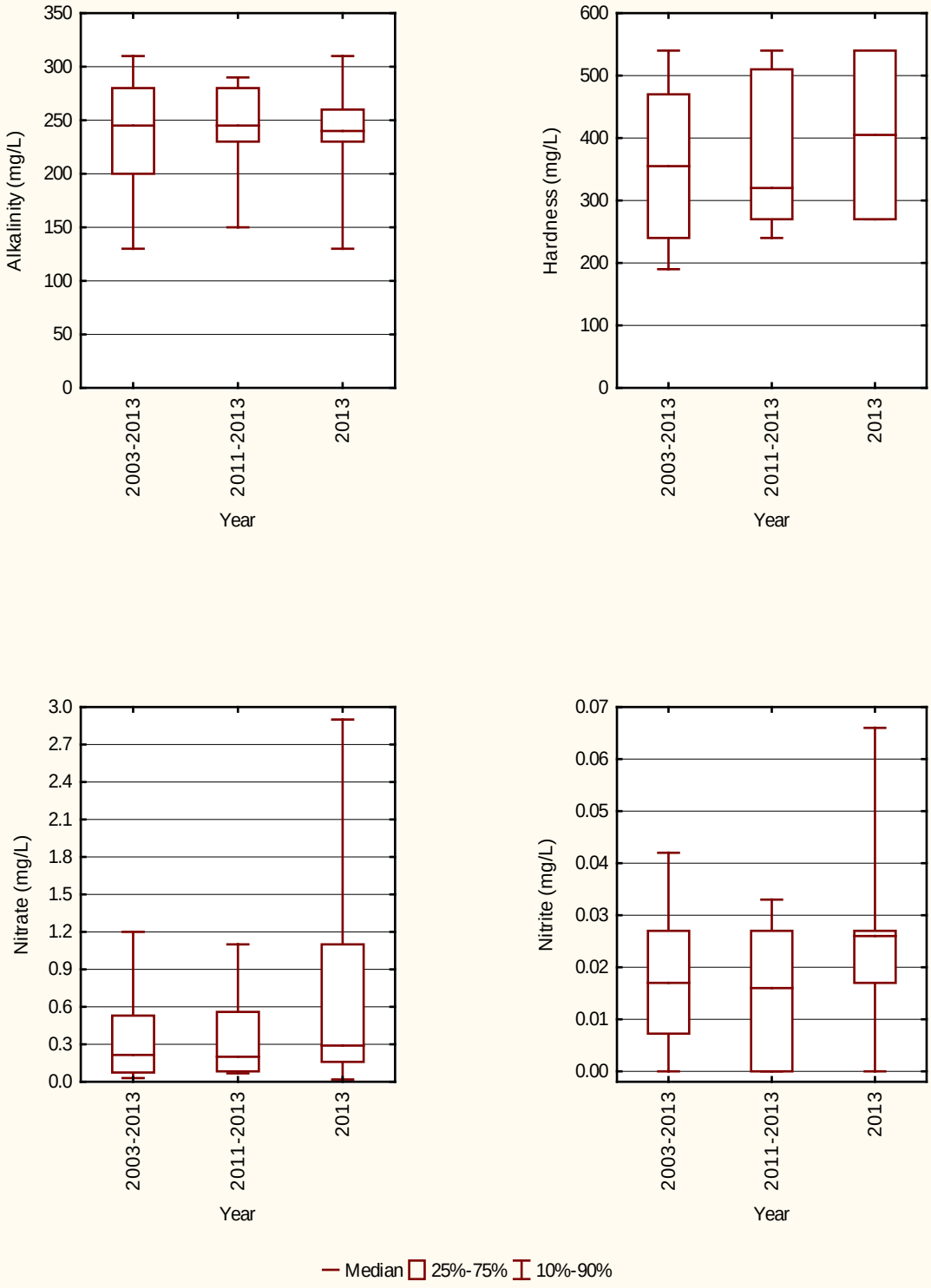
MMSD Water Quality Program Data
Underwood Creek at 107th St. and Fisher Pkwy., Site UC-07



MMSD Water Quality Program Data
Underwood Creek at 107th St. and Fisher Pkwy., Site UC-07



MMSD Water Quality Program Data
Underwood Creek at 107th St. and Fisher Pkwy., Site UC-07



107TH ST. AND FISHER PARKWAY - SITE 7
UNDERWOOD CREEK
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.1	14.1	13.2	19.58	0.78	0.024	0.82	0.022	0.86	0.096	0.050	ND
Standard Error	0.1	2.6	0.7	8.14	0.32	0.006	0.33	0.013	0.10	0.041	0.029	ND
Median	8.1	15.7	13.1	5.40	0.29	0.026	0.32	0.000	0.88	0.063	0.020	ND
Mode	Multi	Multi	15.6	Multi	Multi	Multi	Multi	0.000	0.88	Multi	0.031	ND
Standard Deviation	0.2	7.9	2.2	24.43	0.95	0.019	0.98	0.038	0.31	0.123	0.087	ND
Sample Variance	0.1	62.7	5.0	596.93	0.91	0.000	0.95	0.001	0.09	0.015	0.008	ND
Range	0.6	24.1	6.5	66.20	2.88	0.066	2.98	0.110	0.93	0.394	0.280	ND
Minimum	7.8	1.7	9.4	1.80	0.02	0.000	0.02	0.000	0.47	0.026	0.000	ND
Maximum	8.4	25.8	15.9	68.00	2.90	0.066	3.00	0.110	1.40	0.420	0.280	ND
Count	9	9	9	9	9	9	9	9	9	9	9	0
Confidence Level (95%)	0.2	6.1	1.7	18.78	0.73	0.015	0.75	0.029	0.24	0.094	0.067	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	1144.4	1131.5	3.7	12.9	22.3	1862	386.7	8470	2.9	10992
Standard Error	ND	ND	134.2	137.3	1.8	5.4	14.3	237	73.6	7694	0.3	10003
Median	ND	ND	1100.0	1096.7	3.2	7.4	5.0	1780	350.0	840	2.9	1300
Mode	ND	ND	Multi	Multi	0.0	Multi	Multi	Multi	Multi	Multi	Multi	1300
Standard Deviation	ND	ND	402.6	411.8	5.3	16.2	43.0	712	220.9	23081	0.9	30009
Sample Variance	ND	ND	162102.8	169616.1	28.2	263.1	1846.6	507569	48800.0	532718930	0.8	900565388
Range	ND	ND	1380.0	1427.8	17.0	50.0	132.4	2440	770.0	69968	3.3	90954
Minimum	ND	ND	620.0	567.0	0.0	3.0	1.6	1040	150.0	32	1.5	46
Maximum	ND	ND	2000.0	1994.8	17.0	53.0	134.0	3480	920.0	70000	4.8	91000
Count	0	0	9	9	9	9	9	9	9	9	9	9
Confidence Level (95%)	ND	ND	309.5	316.6	4.1	12.5	33.0	548	169.8	17741	0.7	23067

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

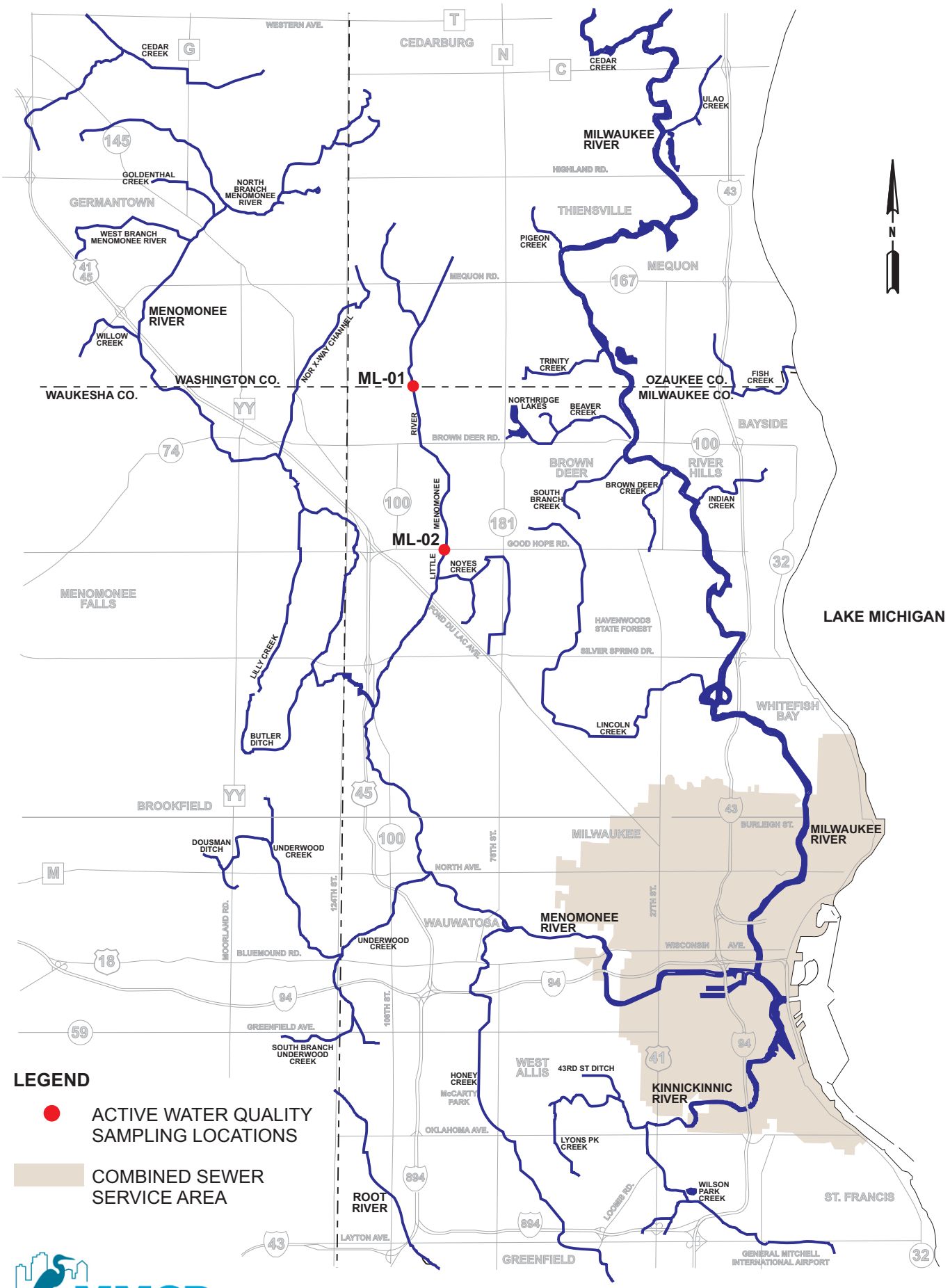
107TH ST. AND FISHER PARKWAY - SITE 7
UNDERWOOD CREEK
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	87.00	44.50	0.2	3.9	9.0	5.5	0.0	30.0	0.0	0.0	ND	ND
Standard Error	23.00	16.50	0.2	2.4	9.0	3.0	0.0	30.0	0.0	0.0	ND	ND
Median	87.00	44.50	0.2	3.9	9.0	5.5	0.0	30.0	0.0	0.0	ND	ND
Mode	Multi	Multi	Multi	Multi	Multi	Multi	0.0	Multi	0.0	0.0	ND	ND
Standard Deviation	32.53	23.33	0.3	3.3	12.7	4.2	0.0	42.4	0.0	0.0	ND	ND
Sample Variance	1058.00	544.50	0.1	11.0	162.0	18.0	0.0	1800.0	0.0	0.0	ND	ND
Range	46.00	33.00	0.4	4.7	18.0	6.0	0.0	60.0	0.0	0.0	ND	ND
Minimum	64.00	28.00	0.0	1.5	0.0	2.5	0.0	0.0	0.0	0.0	ND	ND
Maximum	110.00	61.00	0.4	6.2	18.0	8.5	0.0	60.0	0.0	0.0	ND	ND
Count	2	2	2	2	2	2	2	2	2	2	0	0
Confidence Level (95%)	292.24	209.65	2.5	29.9	114.4	38.1	0.0	381.2	0.0	0.0	ND	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	405	237	5.5	ND	59.6	48.0	11.7	11.2
Standard Error	135	17	4.5	ND	2.2	4.0	3.0	2.9
Median	405	240	0.0	ND	59.0	48.0	8.4	8.0
Mode	Multi	240	0.0	ND	Multi	Multi	Multi	7.1
Standard Deviation	191	50	13.4	ND	6.5	11.9	9.0	8.7
Sample Variance	36450	2500	179.3	ND	42.3	142.8	80.2	76.2
Range	270	180	41.0	ND	19.0	41.0	29.6	28.9
Minimum	270	130	0.0	ND	52.0	20.0	4.4	4.1
Maximum	540	310	41.0	ND	71.0	61.0	34.0	33.0
Count	2	9	9	0	9	9	9	9
Confidence Level (95%)	1715	38	10.3	ND	5.0	9.2	6.9	6.7

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data



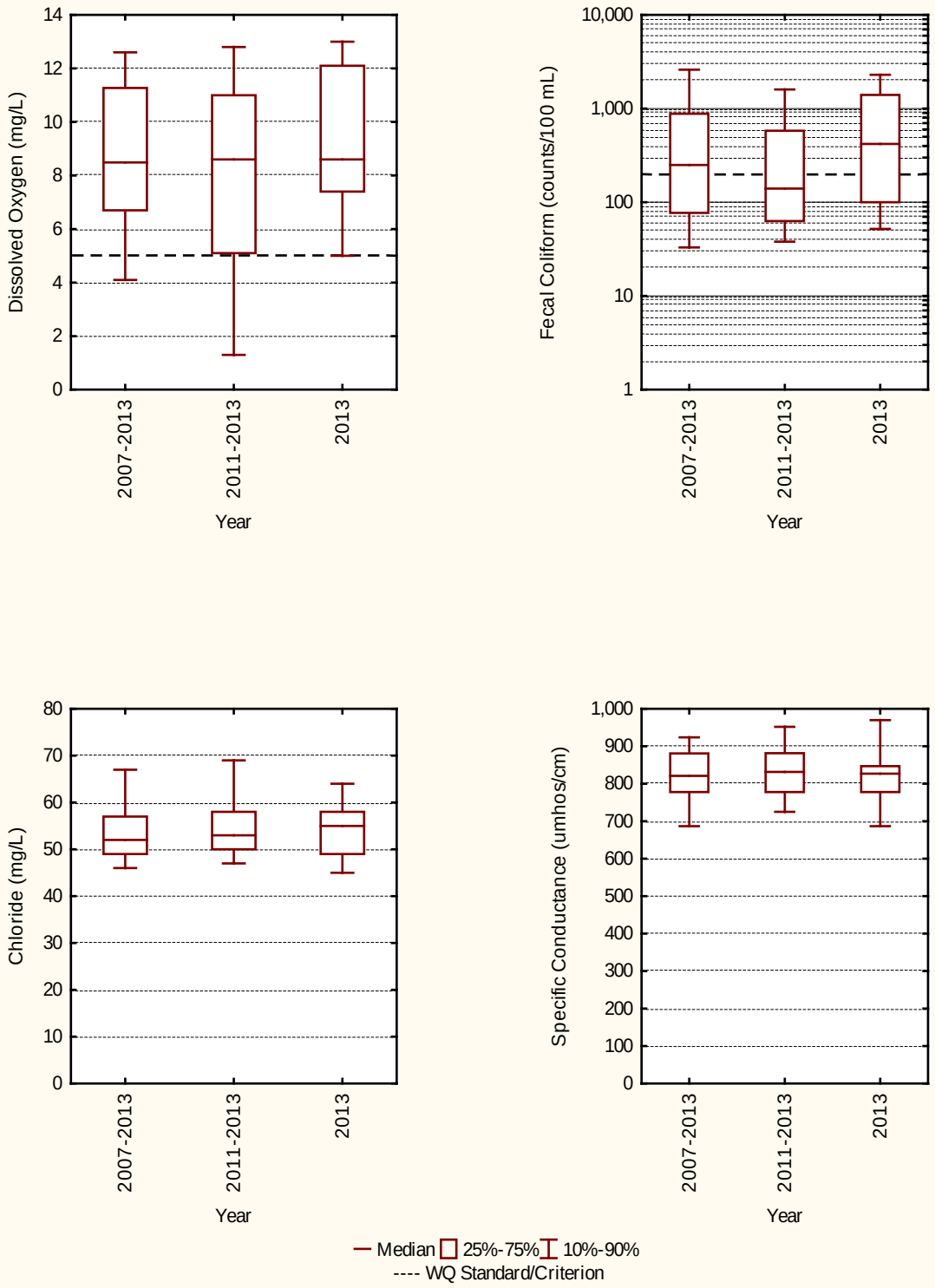
MMSD
PARTNERS FOR A CLEANER ENVIRONMENT

LITTLE MENOMONEE RIVER (ML) SURVEY WATER QUALITY SAMPLING LOCATIONS

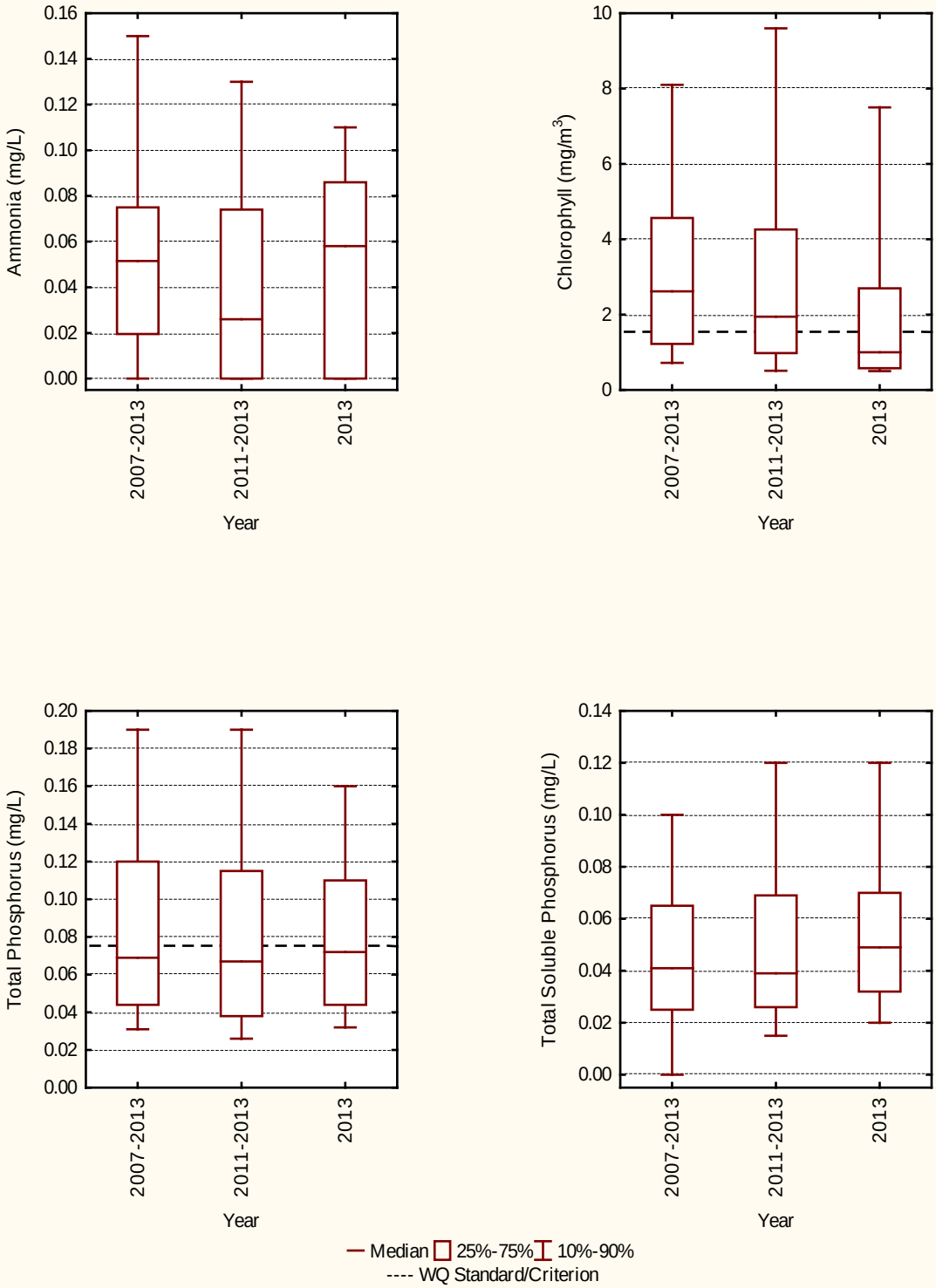
6/6/14

14-061 ML

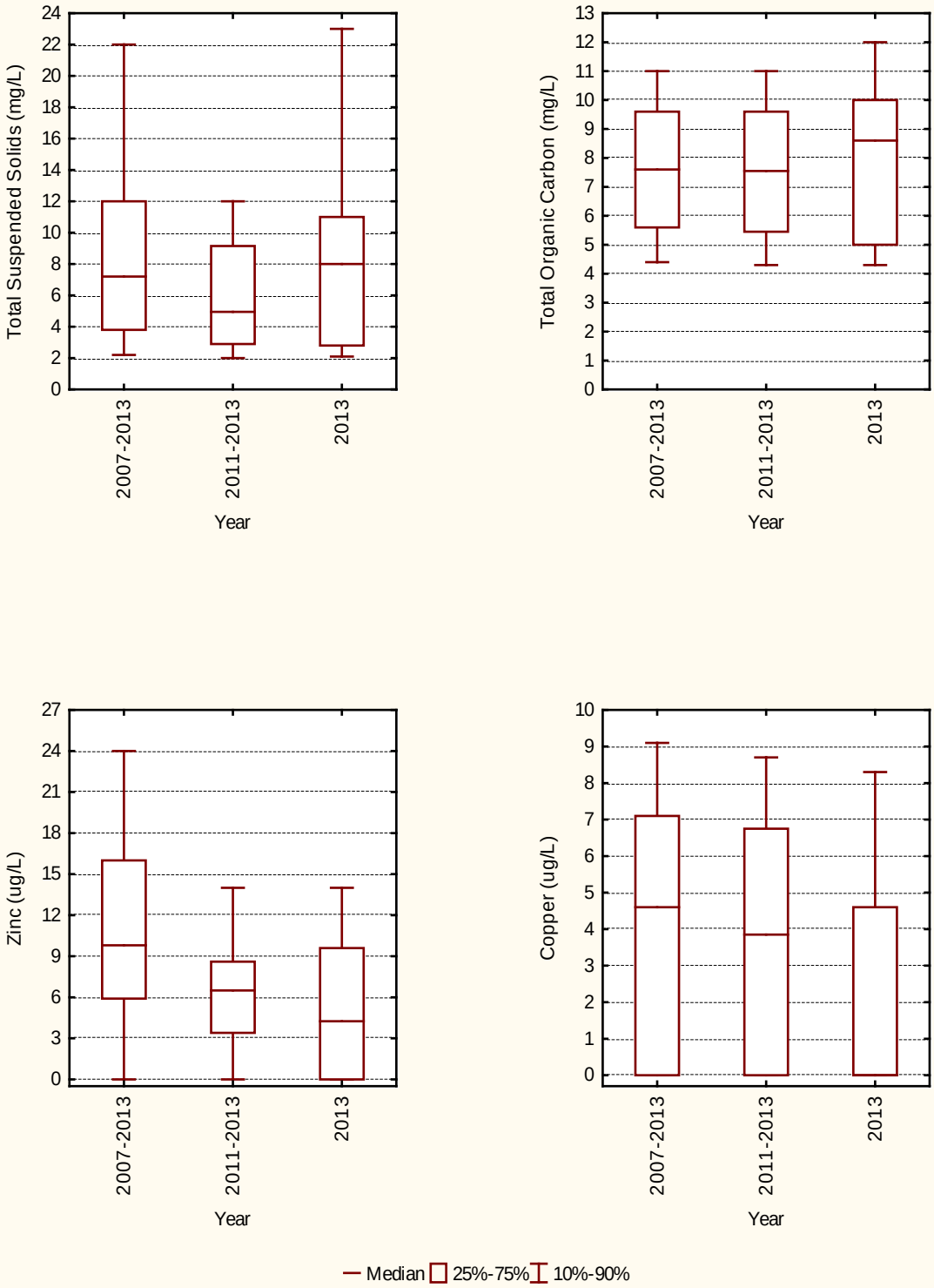
MMSD Water Quality Monitoring Program Data
Little Menomonee River at County Line Rd., Site ML-01



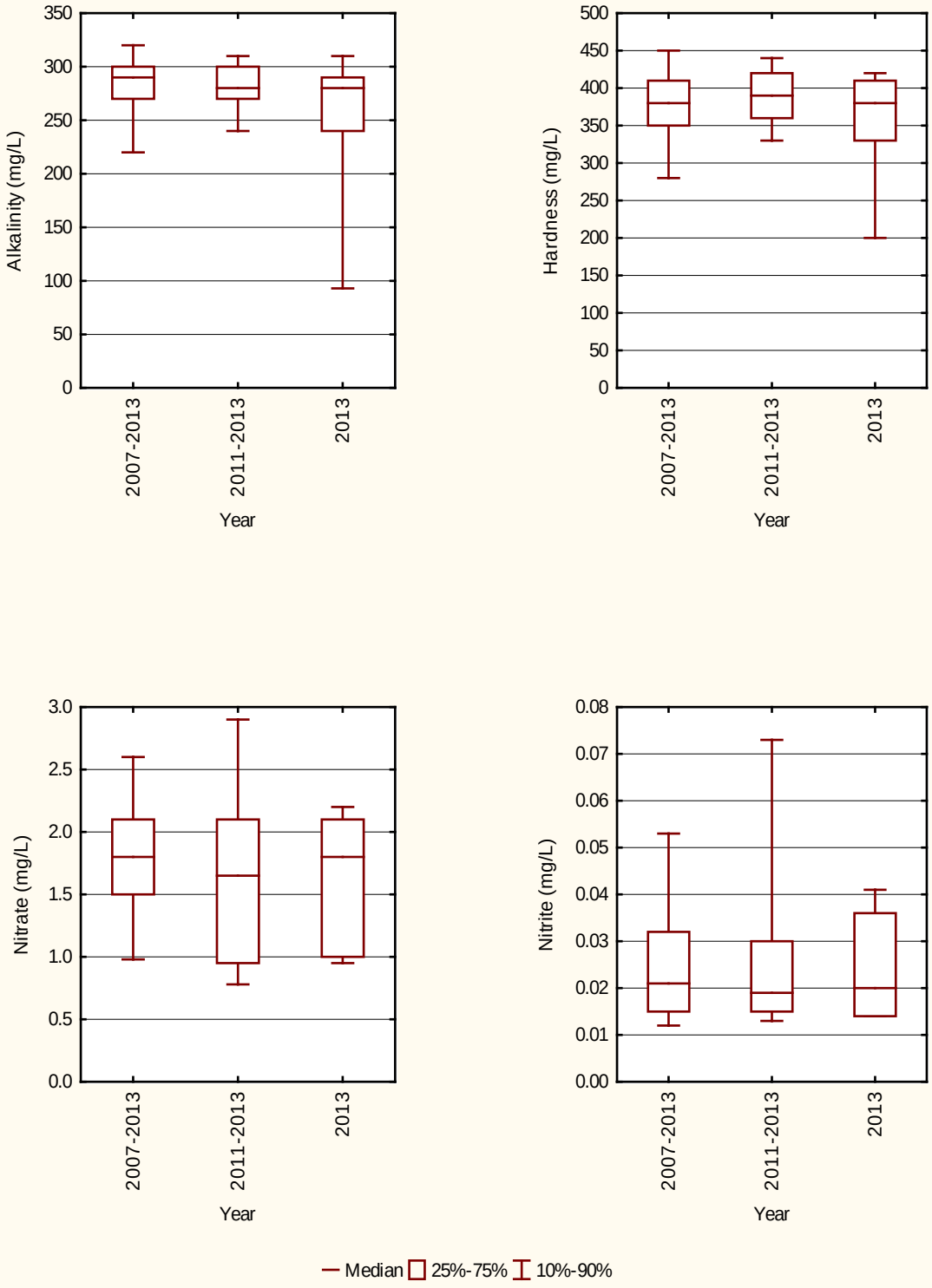
MMSD Water Quality Monitoring Program Data
Little Menomonee River at County Line Rd., Site ML-01



MMSD Water Quality Monitoring Program Data
Little Menomonee River at County Line Rd., Site ML-01



MMSD Water Quality Monitoring Program Data
Little Menomonee River at County Line Rd., Site ML-01



COUNTY LINE RD. - SITE 1
LITTLE MENOMONEE RIVER
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.8	10.3	9.2	2.12	1.70	0.028	1.72	0.080	0.79	0.083	0.055	ND
Standard Error	0.1	1.8	0.8	0.64	0.22	0.007	0.22	0.033	0.10	0.014	0.009	ND
Median	7.8	12.5	8.6	1.00	1.80	0.020	1.80	0.058	0.67	0.072	0.049	ND
Mode	7.8	Multi	Multi	1.40	Multi	Multi	1.80	0.000	Multi	0.044	Multi	ND
Standard Deviation	0.2	7.3	3.1	2.62	0.74	0.022	0.73	0.135	0.34	0.056	0.036	ND
Sample Variance	0.0	53.0	9.9	6.89	0.54	0.000	0.53	0.018	0.11	0.003	0.001	ND
Range	0.9	22.8	11.5	9.41	2.61	0.079	2.59	0.580	1.10	0.211	0.131	ND
Minimum	7.4	0.1	2.1	0.19	0.79	0.008	0.81	0.000	0.40	0.029	0.019	ND
Maximum	8.3	22.9	13.6	9.60	3.40	0.087	3.40	0.580	1.50	0.240	0.150	ND
Count	16	17	17	17	11	11	11	17	11	17	17	0
Confidence Level (95%)	0.1	3.7	1.6	1.35	0.49	0.015	0.49	0.070	0.23	0.029	0.019	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	490.0	479.2	2.6	9.3	11.5	809	56.2	870	2.6	1036
Standard Error	ND	ND	33.3	36.2	0.7	2.2	2.7	39	3.7	274	0.2	346
Median	ND	ND	520.0	509.0	2.3	8.0	7.9	827	55.0	420	2.6	550
Mode	ND	ND	Multi	Multi	0.0	11.0	1.5	818	Multi	Multi	Multi	Multi
Standard Deviation	ND	ND	110.5	119.9	2.5	9.3	11.1	160	15.1	1130	0.6	1148
Sample Variance	ND	ND	12220.0	14384.9	6.0	85.9	123.2	25639	228.7	1277919	0.4	1318385
Range	ND	ND	430.0	465.0	8.5	36.5	36.8	802	72.0	4367	2.1	3860
Minimum	ND	ND	210.0	172.0	0.0	1.5	1.1	308	38.0	33	1.5	40
Maximum	ND	ND	640.0	637.0	8.5	38.0	37.9	1110	110.0	4400	3.6	3900
Count	0	0	11	11	11	17	17	17	17	17	17	11
Confidence Level (95%)	ND	ND	74.3	80.6	1.7	4.8	5.7	82	7.8	581	0.3	771

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

COUNTY LINE RD. - SITE 1
LITTLE MENOMONEE RIVER
WATER QUALITY DATA - 2013

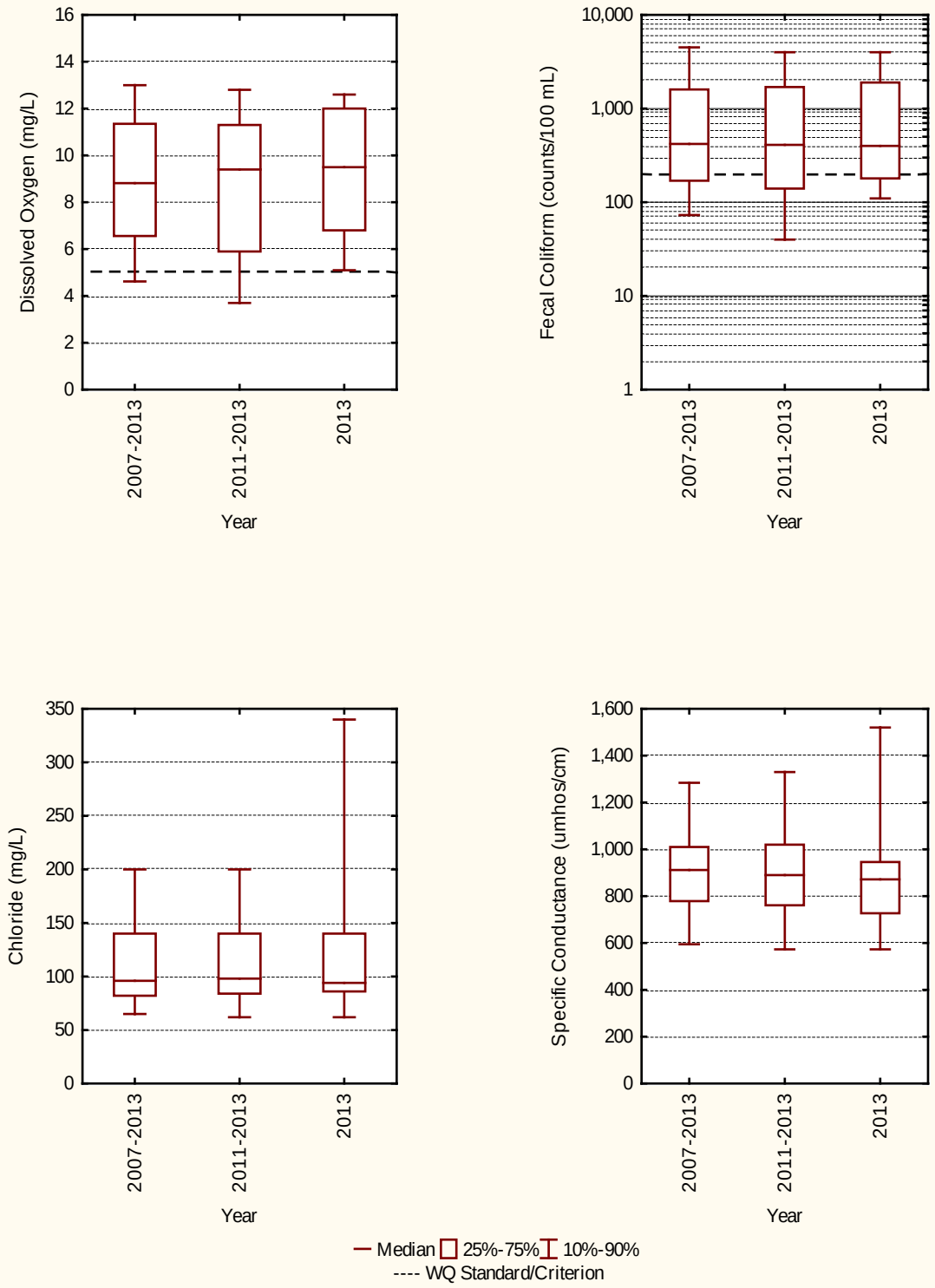
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	76.27	38.91	0.1	1.7	2.3	1.9	0.3	5.4	0.1	2.0	0.1	ND
Standard Error	6.61	3.83	0.1	0.3	0.8	0.5	0.3	1.5	0.1	1.0	0.1	ND
Median	83.00	44.00	0.0	1.9	0.0	2.0	0.0	4.3	0.0	1.2	0.0	ND
Mode	80.00	Multi	0.0	Multi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	21.93	12.69	0.2	1.0	3.4	1.8	0.9	5.9	0.3	2.3	0.3	ND
Sample Variance	480.82	161.09	0.0	1.0	11.5	3.3	0.9	34.9	0.1	5.5	0.1	ND
Range	73.00	41.00	0.5	3.1	8.6	5.5	3.0	16.0	0.8	4.8	1.1	ND
Minimum	25.00	10.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	98.00	51.00	0.5	3.1	8.6	5.5	3.0	16.0	0.8	4.8	1.1	ND
Count	11	11	11	11	17	11	10	16	10	6	11	0
Confidence Level (95%)	14.73	8.53	0.1	0.7	1.7	1.2	0.7	3.1	0.2	2.5	0.2	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	350	243	0.8	ND	60.4	52.4	8.1	7.7
Standard Error	32	26	0.6	ND	4.8	5.1	0.8	0.8
Median	380	280	0.0	ND	65.0	56.0	8.6	8.2
Mode	380	280	0.0	ND	Multi	Multi	Multi	Multi
Standard Deviation	106	86	2.3	ND	15.9	16.8	3.1	2.7
Sample Variance	11280	7345	5.2	ND	251.9	280.9	9.7	7.4
Range	360	252	8.6	ND	48.0	52.0	9.7	8.6
Minimum	100	58	0.0	ND	26.0	16.0	4.3	3.4
Maximum	460	310	8.6	ND	74.0	68.0	14.0	12.0
Count	11	11	17	0	11	11	17	11
Confidence Level (95%)	71	58	1.2	ND	10.7	11.3	1.6	1.8

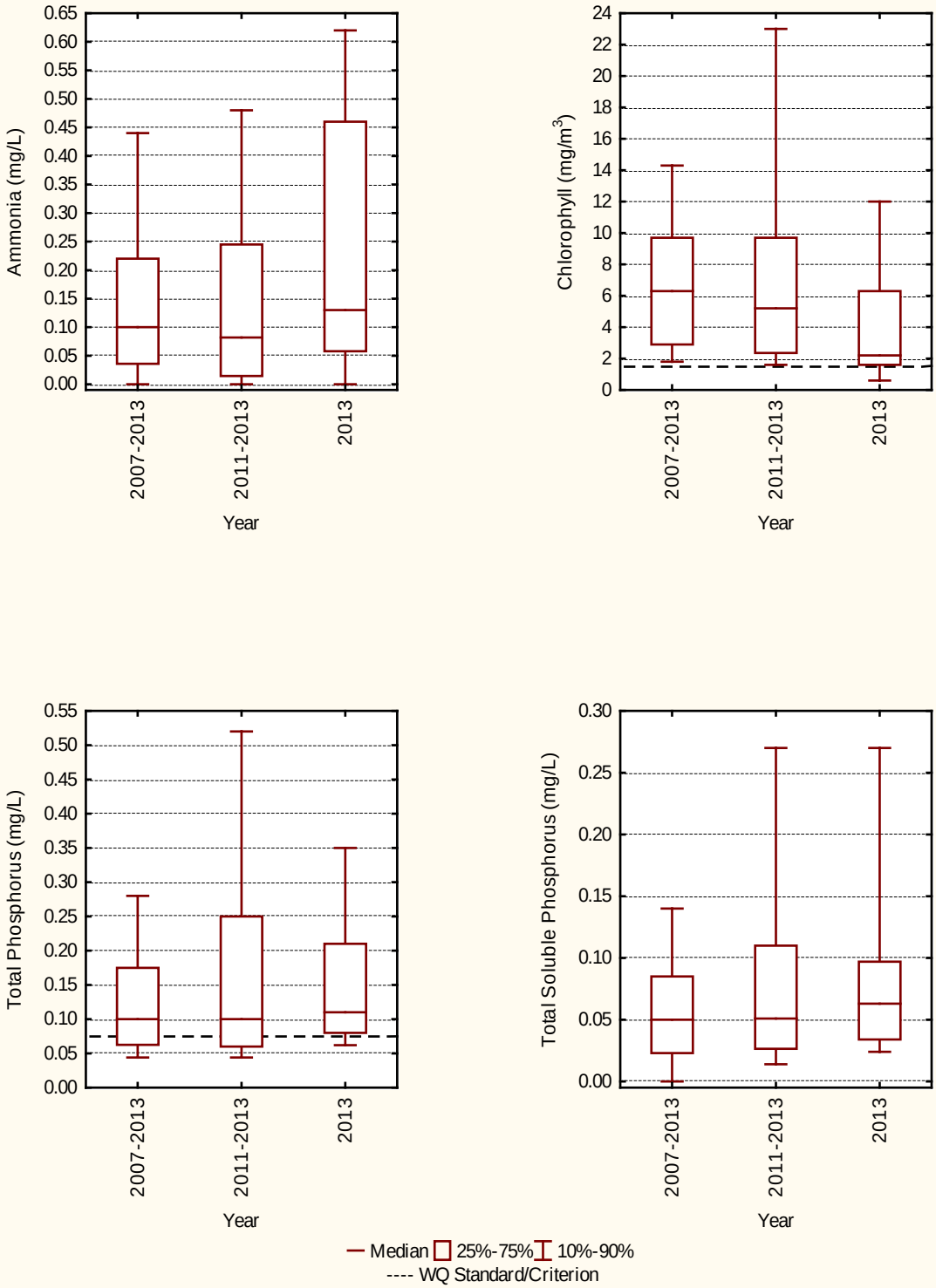
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

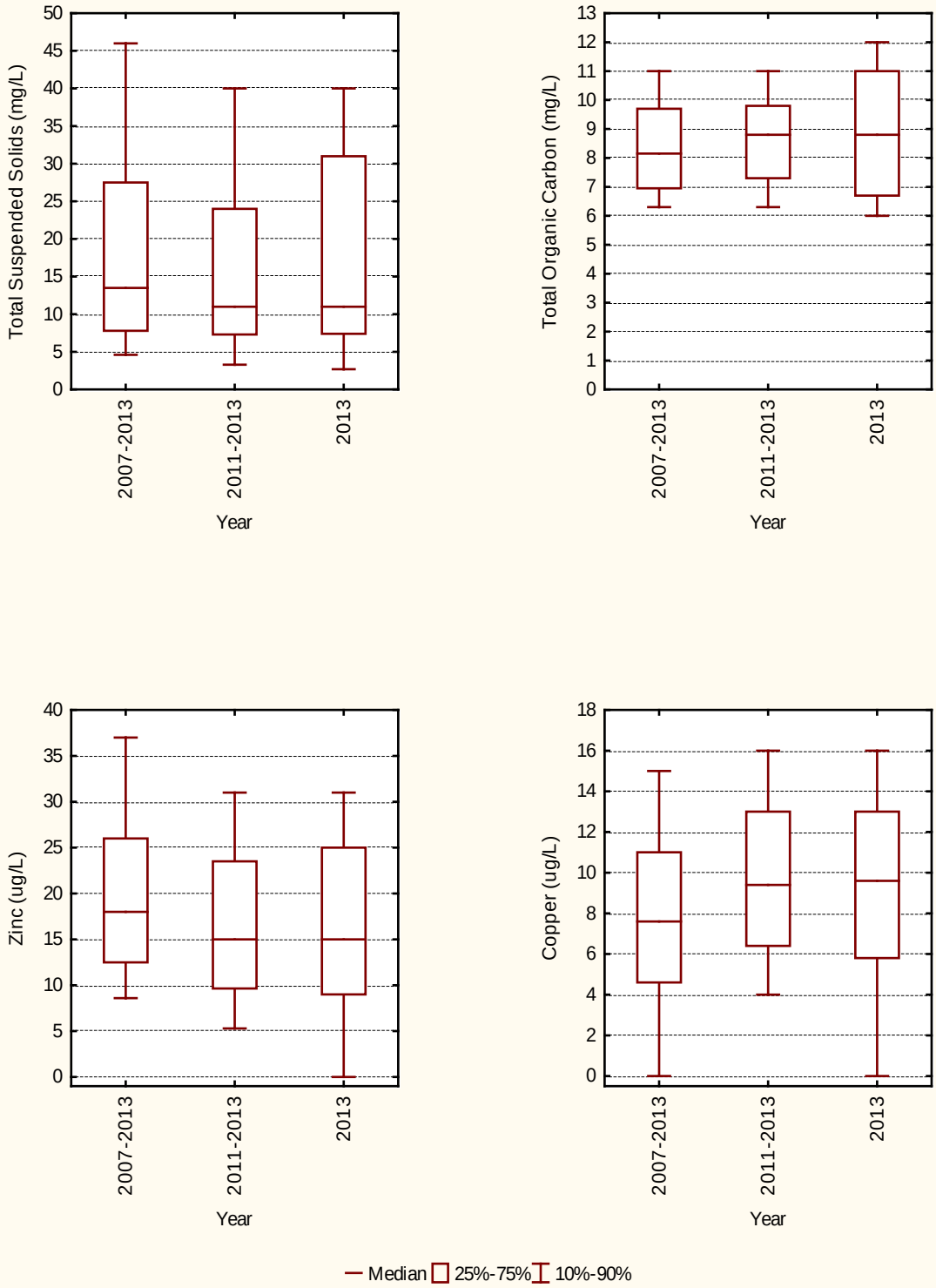
MMSD Water Quality Monitoring Program Data
Little Menomonee River at Granville Rd. and Good Hope Rd., Site ML-02



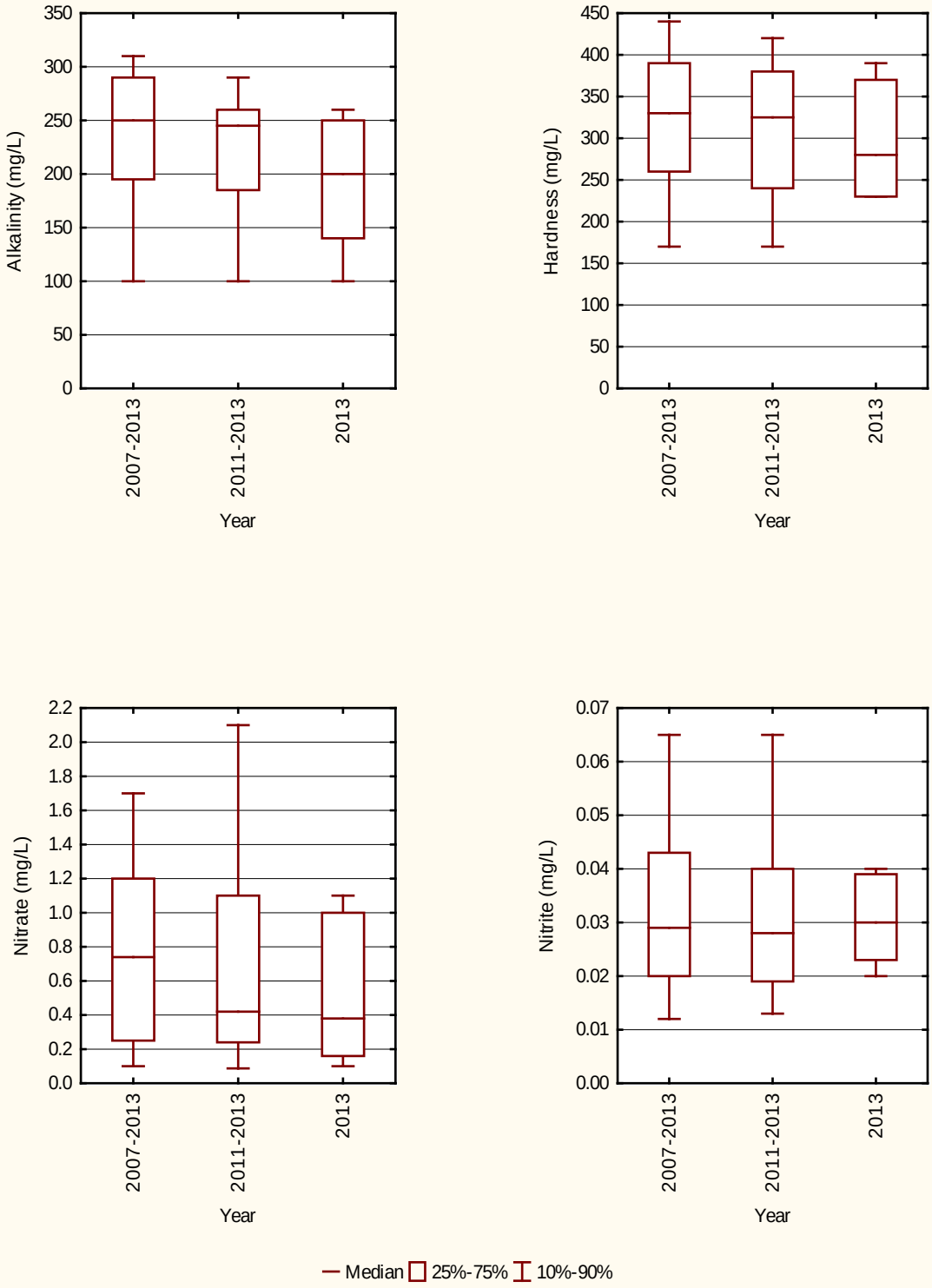
MMSD Water Quality Monitoring Program Data
Little Menomonee River at Granville Rd. and Good Hope Rd., Site ML-02



MMSD Water Quality Monitoring Program Data
Little Menomonee River at Granville Rd. and Good Hope Rd., Site ML-02



MMSD Water Quality Monitoring Program Data
Little Menomonee River at Granville Rd. and Good Hope Rd., Site ML-02



N. GRANVILLE RD. (NORTH OF GOOD HOPE RD.) - SITE 2
LITTLE MENOMONEE RIVER
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.8	12.1	9.2	5.21	0.61	0.033	0.64	0.236	0.96	0.171	0.107	ND
Standard Error	0.1	2.2	0.8	1.38	0.17	0.005	0.16	0.054	0.09	0.036	0.031	ND
Median	7.8	14.3	9.5	2.20	0.38	0.030	0.42	0.130	0.89	0.110	0.063	ND
Mode	Multi	Multi	9.5	Multi	Multi	Multi	Multi	Multi	1.10	0.100	0.051	ND
Standard Deviation	0.3	8.9	3.4	5.70	0.55	0.017	0.54	0.224	0.31	0.150	0.127	ND
Sample Variance	0.1	79.4	11.5	32.49	0.30	0.000	0.29	0.050	0.09	0.022	0.016	ND
Range	0.9	24.2	12.5	23.00	1.80	0.062	1.76	0.640	1.13	0.606	0.501	ND
Minimum	7.4	0.2	2.2	0.00	0.00	0.016	0.04	0.000	0.57	0.044	0.019	ND
Maximum	8.3	24.4	14.7	23.00	1.80	0.078	1.80	0.640	1.70	0.650	0.520	ND
Count	16	17	17	17	11	11	11	17	11	17	17	0
Confidence Level (95%)	0.1	4.6	1.7	2.93	0.37	0.011	0.36	0.115	0.21	0.077	0.065	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	551.8	533.5	4.0	17.3	14.7	926	129.5	1341	2.7	1937
Standard Error	ND	ND	60.0	61.2	0.9	3.5	2.5	76	20.8	495	0.1	756
Median	ND	ND	510.0	501.9	3.0	11.0	10.0	872	94.0	400	2.6	920
Mode	ND	ND	Multi	Multi	3.0	Multi	7.1	Multi	340.0	1900	3.3	Multi
Standard Deviation	ND	ND	199.0	203.1	2.9	14.4	10.3	313	85.9	2041	0.6	2509
Sample Variance	ND	ND	39596.4	41248.3	8.4	208.4	105.9	97846	7379.0	4166843	0.4	6294061
Range	ND	ND	580.0	618.6	9.6	44.0	30.9	1175	279.0	7910	1.9	7712
Minimum	ND	ND	310.0	264.0	0.0	2.0	2.2	485	61.0	90	2.0	88
Maximum	ND	ND	890.0	882.6	9.6	46.0	33.1	1660	340.0	8000	3.9	7800
Count	0	0	11	11	11	17	17	17	17	17	17	11
Confidence Level (95%)	ND	ND	133.7	136.4	2.0	7.4	5.3	161	44.2	1050	0.3	1685

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

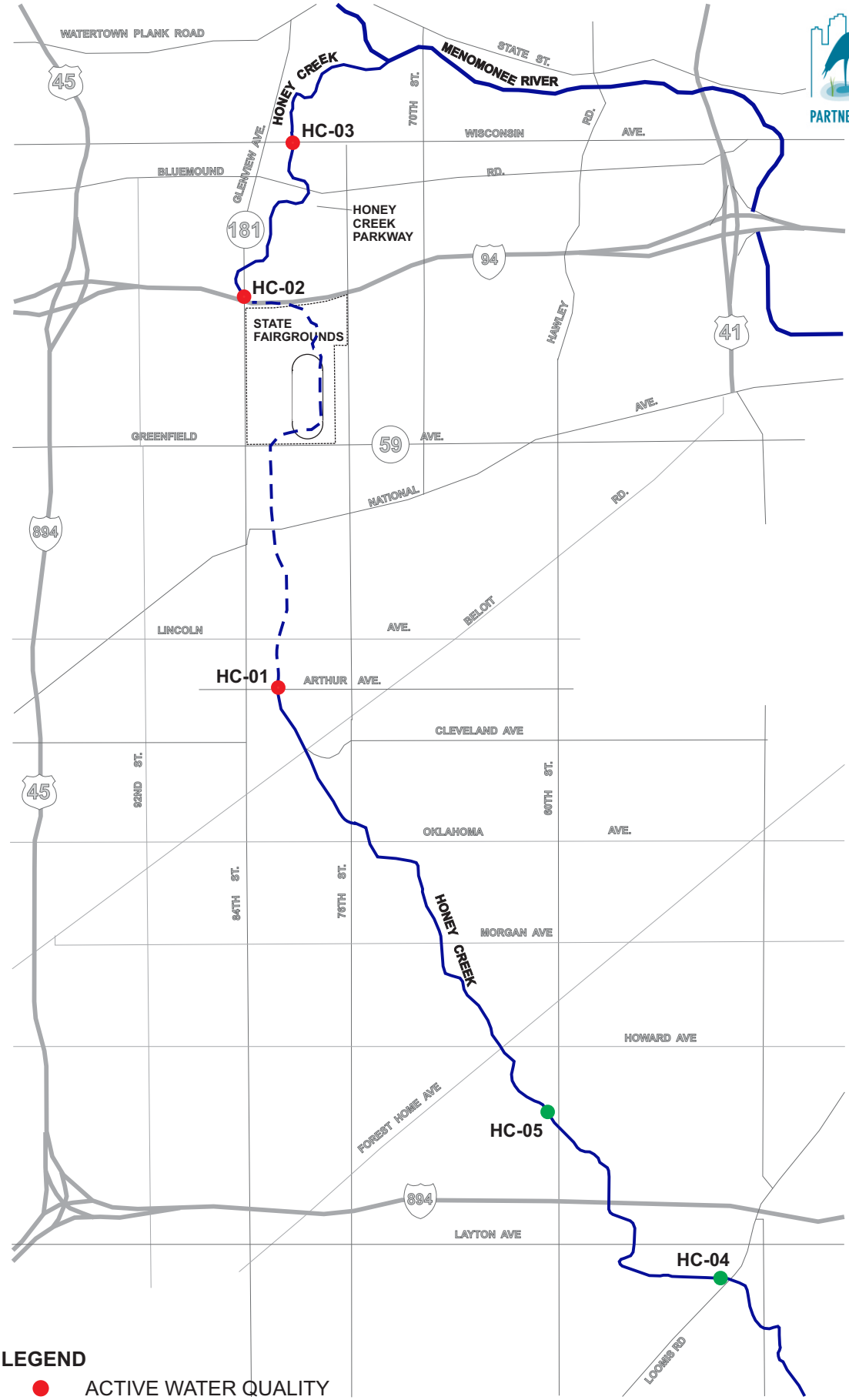
N. GRANVILLE RD. (NORTH OF GOOD HOPE RD.) - SITE 2
LITTLE MENOMONEE RIVER
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	62.18	32.64	0.2	1.9	8.9	1.7	0.0	15.5	0.4	2.5	0.0	ND
Standard Error	5.84	3.06	0.1	0.4	1.5	0.5	0.0	2.6	0.4	1.0	0.0	ND
Median	59.00	31.00	0.0	1.8	9.6	1.8	0.0	15.0	0.0	0.0	0.0	ND
Mode	83.00	Multi	0.0	Multi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	19.35	10.16	0.3	1.2	6.3	1.6	0.0	10.7	1.2	3.2	0.0	ND
Sample Variance	374.56	103.25	0.1	1.5	40.0	2.4	0.0	115.3	1.5	10.0	0.0	ND
Range	65.00	36.00	1.1	3.5	20.0	4.2	0.0	33.0	3.5	7.8	0.0	ND
Minimum	29.00	11.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	94.00	47.00	1.1	3.5	20.0	4.2	0.0	33.0	3.5	7.8	0.0	ND
Count	11	11	11	11	17	11	10	17	8	11	10	0
Confidence Level (95%)	13.00	6.83	0.2	0.8	3.3	1.0	0.0	5.5	1.0	2.1	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	291	193	2.6	ND	51.8	42.9	9.0	8.8
Standard Error	26	21	0.6	ND	4.1	4.2	0.6	0.9
Median	280	200	2.8	ND	51.0	43.0	8.8	7.7
Mode	230	200	0.0	ND	45.0	60.0	11.0	11.0
Standard Deviation	88	70	2.5	ND	13.7	14.0	2.3	3.1
Sample Variance	7709	4861	6.1	ND	188.8	195.9	5.4	9.9
Range	310	225	10.0	ND	44.0	45.0	6.4	10.4
Minimum	120	75	0.0	ND	27.0	15.0	5.6	5.6
Maximum	430	300	10.0	ND	71.0	60.0	12.0	16.0
Count	11	11	17	0	11	11	17	11
Confidence Level (95%)	59	47	1.3	ND	9.2	9.4	1.2	2.1

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data



LEGEND

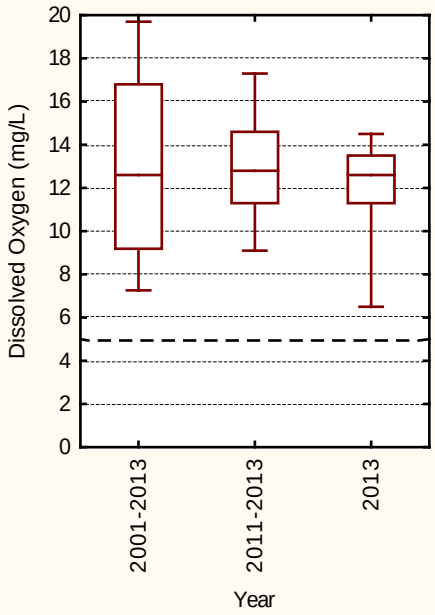
- ● ACTIVE WATER QUALITY SAMPLING LOCATIONS
- ● INACTIVE WATER QUALITY SAMPLING LOCATIONS

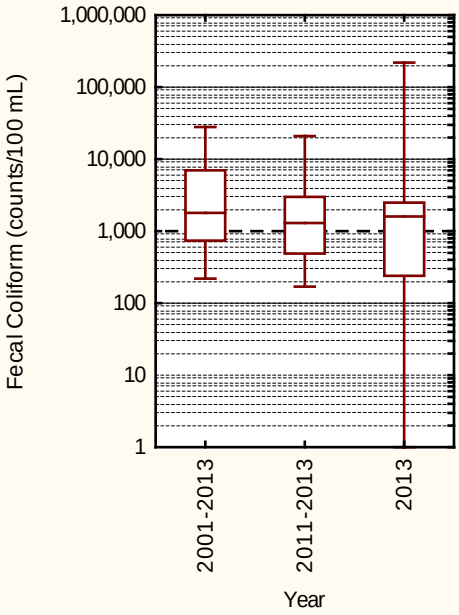
HONEY CREEK (HC) SURVEY
WATER QUALITY SAMPLING LOCATIONS

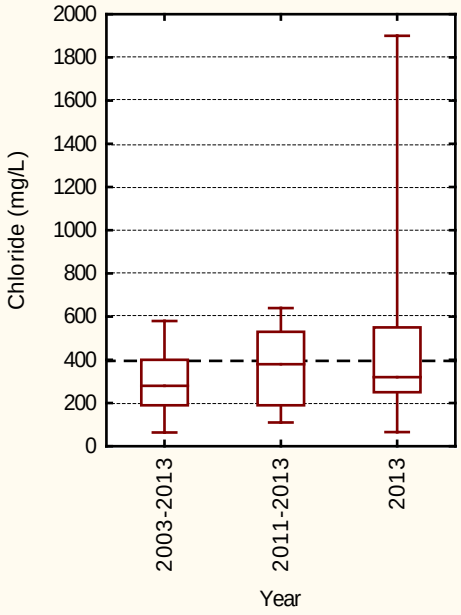
6/6/14

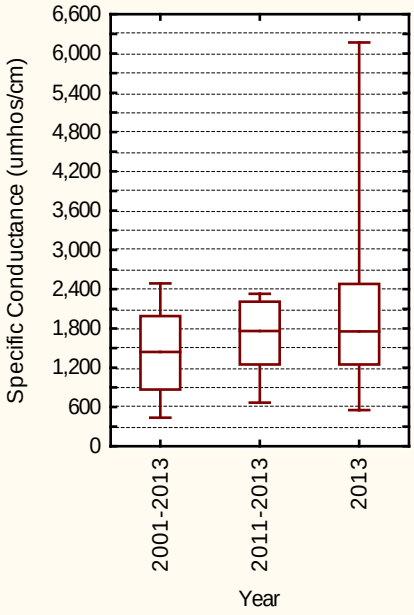
14-061 HC

MMSD Water Quality Monitoring Program Data
Honey Creek at Arthur Ave., Site HC-01



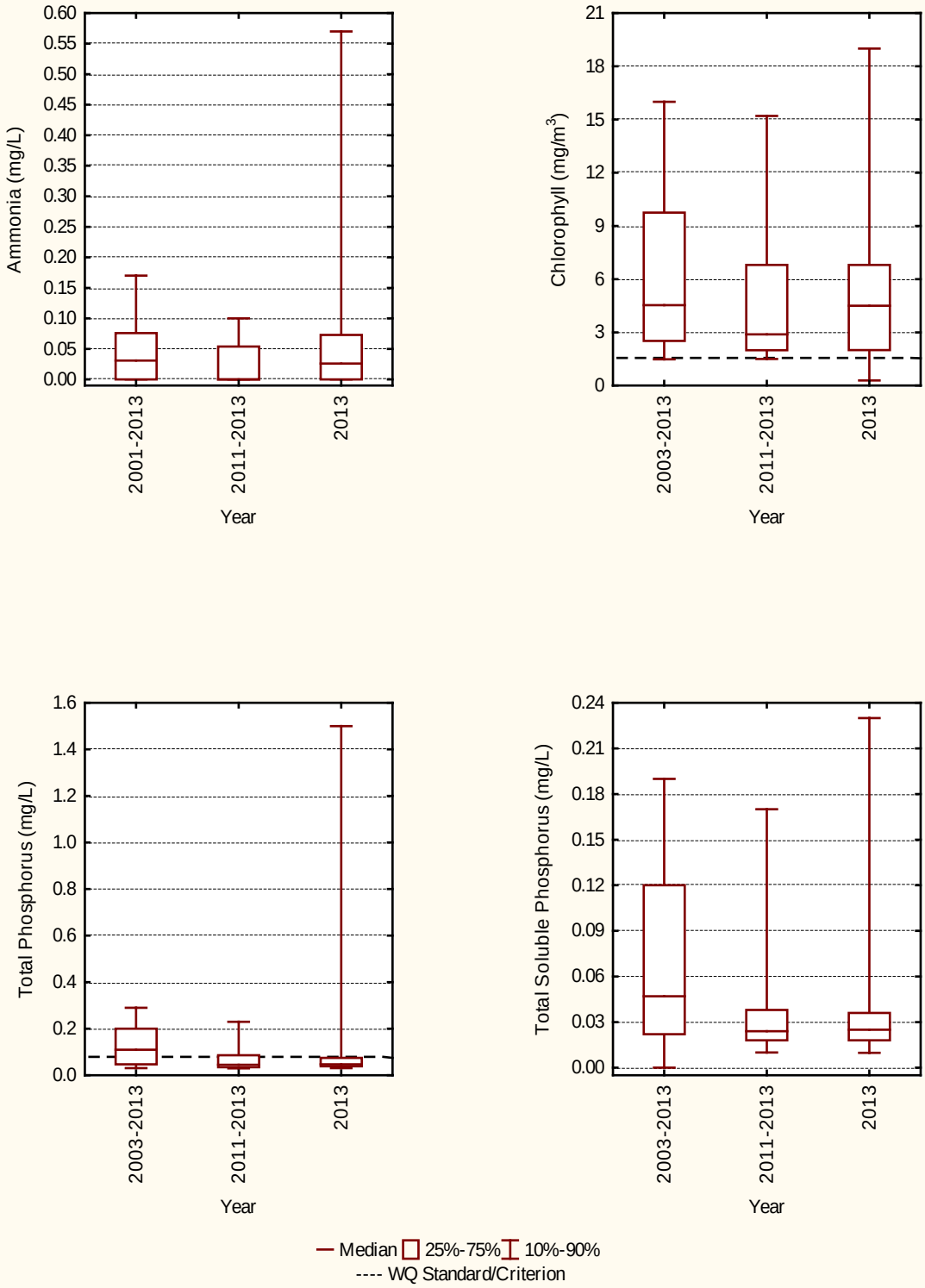




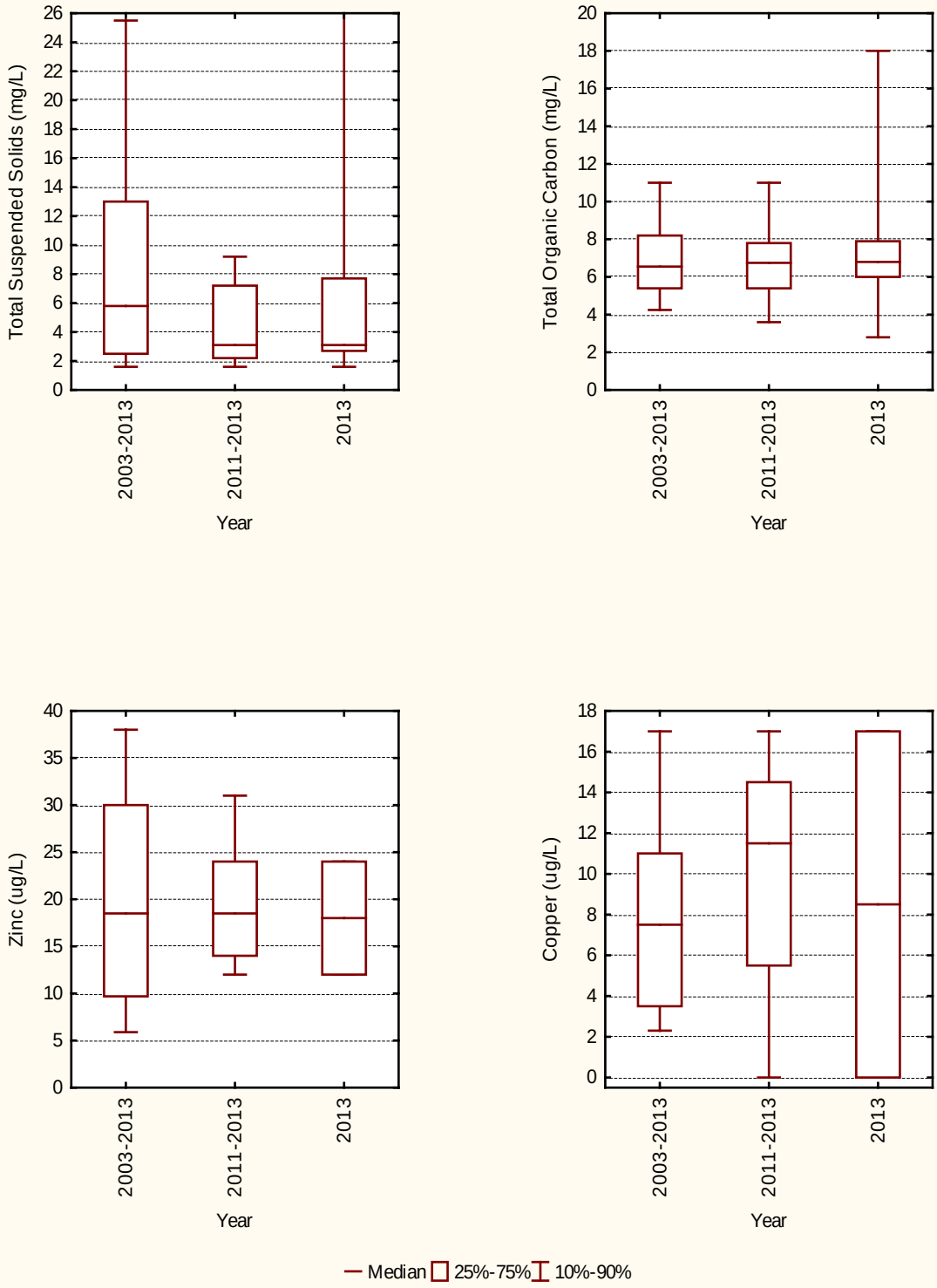


— Median ☐ 25%-75% I 10%-90%
---- WQ Standard/Criterion

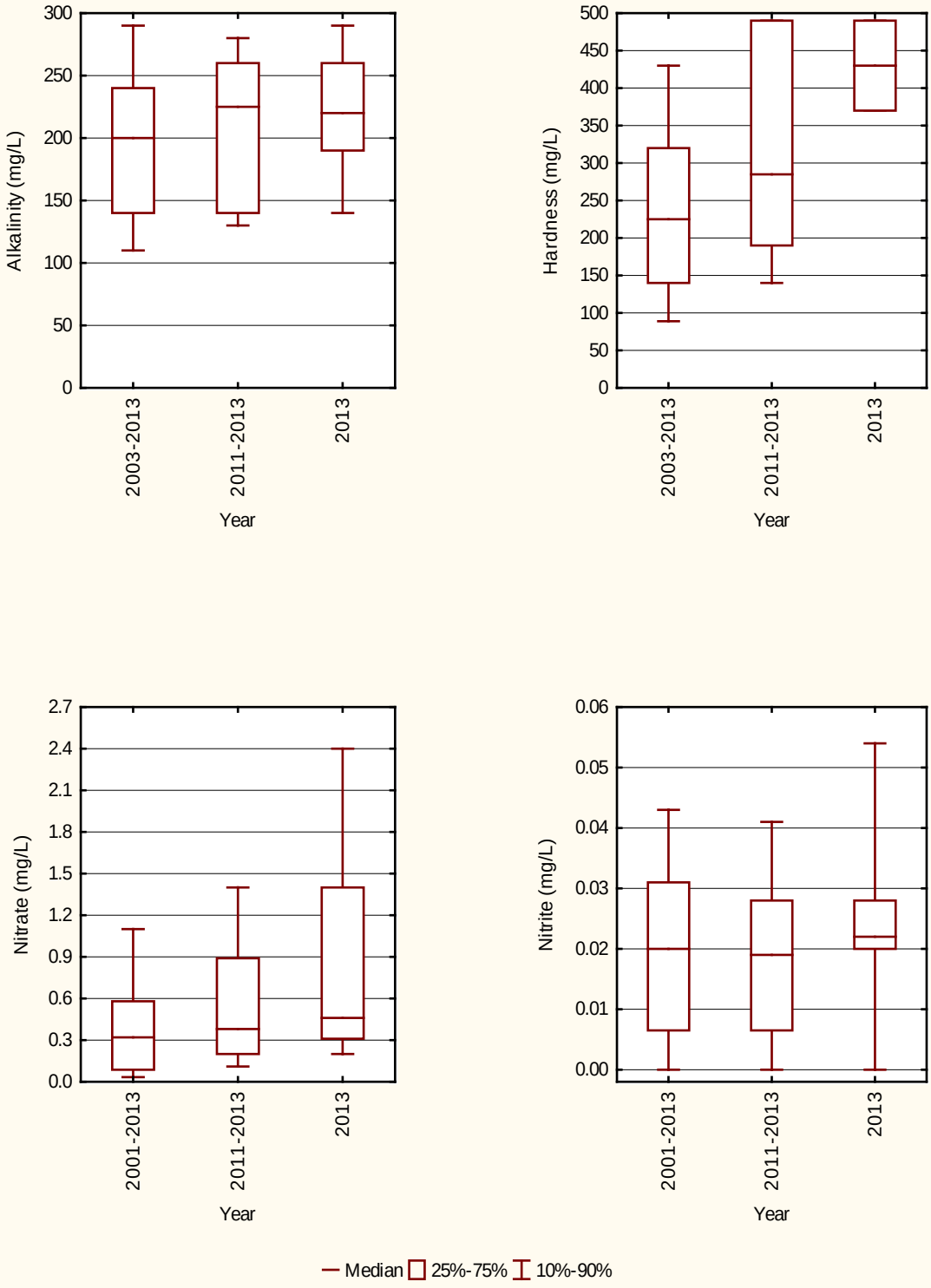
MMSD Water Quality Monitoring Program Data
Honey Creek at Arthur Ave., Site HC-01



MMSD Water Quality Monitoring Program Data
Honey Creek at Arthur Ave., Site HC-01



MMSD Water Quality Monitoring Program Data
Honey Creek at Arthur Ave., Site HC-01



81ST ST. AND ARTHUR AVE. (MCCARTY PARK) - SITE 1
HONEY CREEK
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.9	13.1	11.8	5.77	0.86	0.024	0.87	0.090	0.92	0.230	0.060	ND
Standard Error	0.1	2.7	0.9	1.89	0.28	0.005	0.27	0.061	0.18	0.160	0.026	ND
Median	8.1	14.9	12.6	4.50	0.46	0.022	0.48	0.026	0.81	0.047	0.025	ND
Mode	8.2	Multi	14.5	Multi	0.46	0.020	0.48	0.000	Multi	Multi	Multi	ND
Standard Deviation	0.3	8.2	2.7	5.66	0.83	0.015	0.82	0.184	0.54	0.480	0.077	ND
Sample Variance	0.1	66.8	7.3	31.99	0.68	0.000	0.67	0.034	0.30	0.231	0.006	ND
Range	0.9	25.4	8.0	18.71	2.20	0.054	2.20	0.570	1.60	1.469	0.220	ND
Minimum	7.4	0.3	6.5	0.29	0.20	0.000	0.20	0.000	0.40	0.031	0.010	ND
Maximum	8.3	25.7	14.5	19.00	2.40	0.054	2.40	0.570	2.00	1.500	0.230	ND
Count	9	9	9	9	9	9	9	9	9	9	9	0
Confidence Level (95%)	0.3	6.3	2.1	4.35	0.63	0.012	0.63	0.141	0.42	0.369	0.059	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	1483.3	1224.1	30.7	259.3	138.7	2212	509.6	25773	3.3	22816
Standard Error	ND	ND	339.5	310.8	28.7	255.1	133.9	614	184.9	24284	0.3	20920
Median	ND	ND	1100.0	856.9	2.2	3.1	5.6	1755	320.0	1600	3.3	1200
Mode	ND	ND	Multi	Multi	0.0	Multi	1.6	Multi	Multi	Multi	Multi	Multi
Standard Deviation	ND	ND	1018.5	932.4	86.0	765.3	401.8	1736	554.7	72852	1.0	62759
Sample Variance	ND	ND	1037300.0	869410.3	7397.5	585651.5	161414.8	3014618	307666.8	5307464575	1.0	3938666574
Range	ND	ND	3040.0	3046.9	260.0	2298.4	1209.5	5617	1834.0	220000	3.1	189999
Minimum	ND	ND	460.0	451.5	0.0	1.6	0.5	553	66.0	0	2.2	1
Maximum	ND	ND	3500.0	3498.4	260.0	2300.0	1210.0	6170	1900.0	220000	5.3	190000
Count	0	0	9	9	9	9	9	8	9	9	8	9
Confidence Level (95%)	ND	ND	782.9	716.7	66.1	588.2	308.8	1452	426.4	55999	0.8	48241

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

81ST ST. AND ARTHUR AVE. (MCCARTY PARK) - SITE 1
HONEY CREEK
WATER QUALITY DATA - 2013

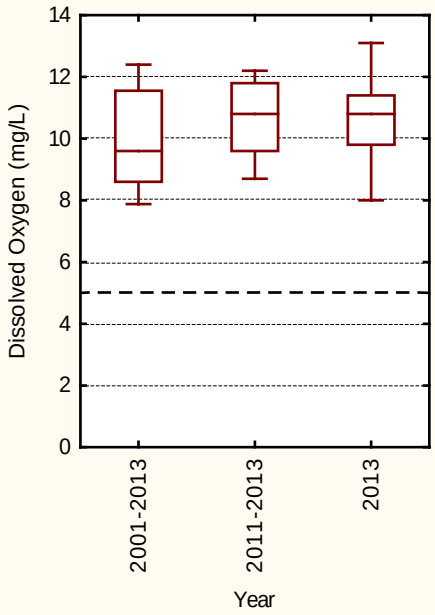
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	81.00	55.50	0.0	2.7	8.5	5.1	0.0	18.0	3.0	4.4	0.0	ND
Standard Error	6.00	11.50	0.0	0.1	8.5	1.0	0.0	6.0	3.0	4.4	0.0	ND
Median	81.00	55.50	0.0	2.7	8.5	5.1	0.0	18.0	3.0	4.4	0.0	ND
Mode	Multi	Multi	0.0	Multi	Multi	Multi	0.0	Multi	Multi	Multi	0.0	ND
Standard Deviation	8.49	16.26	0.0	0.1	12.0	1.3	0.0	8.5	4.2	6.2	0.0	ND
Sample Variance	72.00	264.50	0.0	0.0	144.5	1.8	0.0	72.0	17.4	38.7	0.0	ND
Range	12.00	23.00	0.0	0.2	17.0	1.9	0.0	12.0	5.9	8.8	0.0	ND
Minimum	75.00	44.00	0.0	2.6	0.0	4.1	0.0	12.0	0.0	0.0	0.0	ND
Maximum	87.00	67.00	0.0	2.8	17.0	6.0	0.0	24.0	5.9	8.8	0.0	ND
Count	2	2	2	2	2	2	2	2	2	2	2	0
Confidence Level (95%)	76.24	146.12	0.0	1.3	108.0	12.1	0.0	76.2	37.5	55.9	0.0	ND

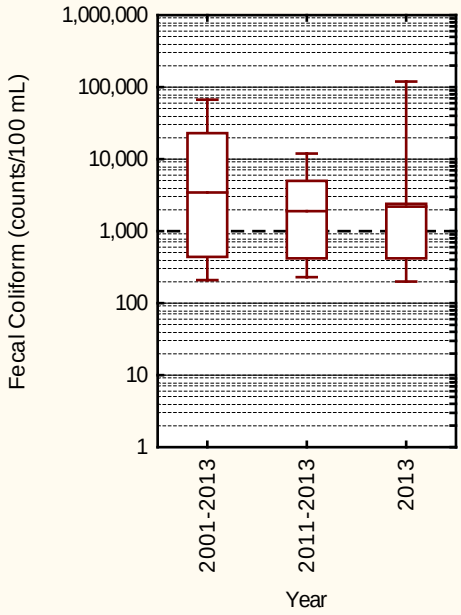
VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	430	220	2.6	ND	55.1	47.1	7.8	6.6
Standard Error	60	18	1.3	ND	4.6	4.6	1.5	1.3
Median	430	220	0.0	ND	57.0	47.0	6.8	6.3
Mode	Multi	Multi	0.0	ND	57.0	Multi	6.8	Multi
Standard Deviation	85	54	4.0	ND	13.9	13.8	4.5	3.9
Sample Variance	7200	2950	16.1	ND	194.4	189.6	20.1	15.2
Range	120	150	12.0	ND	50.0	49.0	15.2	13.9
Minimum	370	140	0.0	ND	29.0	26.0	2.8	2.1
Maximum	490	290	12.0	ND	79.0	75.0	18.0	16.0
Count	2	9	9	0	9	9	9	9
Confidence Level (95%)	762	42	3.1	ND	10.7	10.6	3.4	3.0

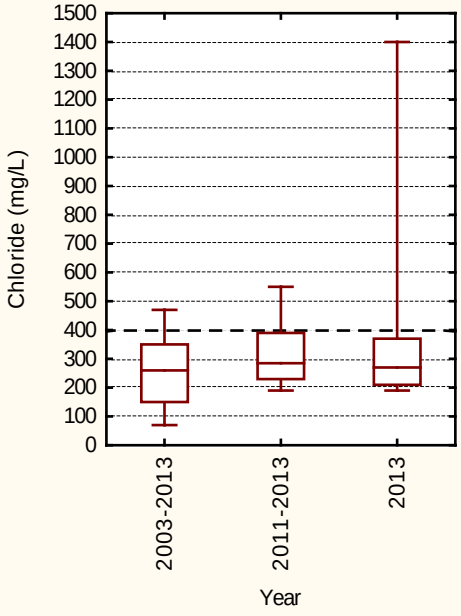
ND = No Data **Multi = Multimodal**

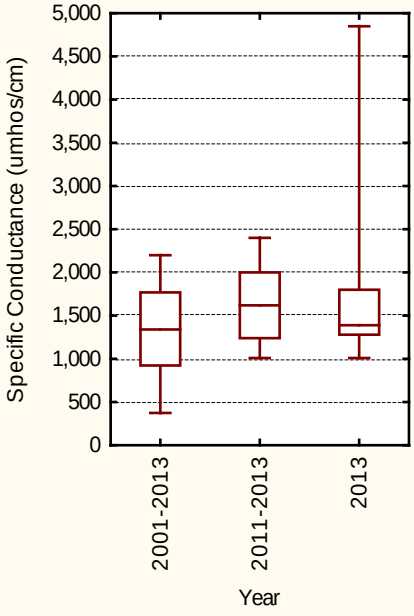
Provisional MMSD Water Quality Data

MMSD Water Quality Monitoring Program Data
Honey Creek at 84th St., Site HC-02



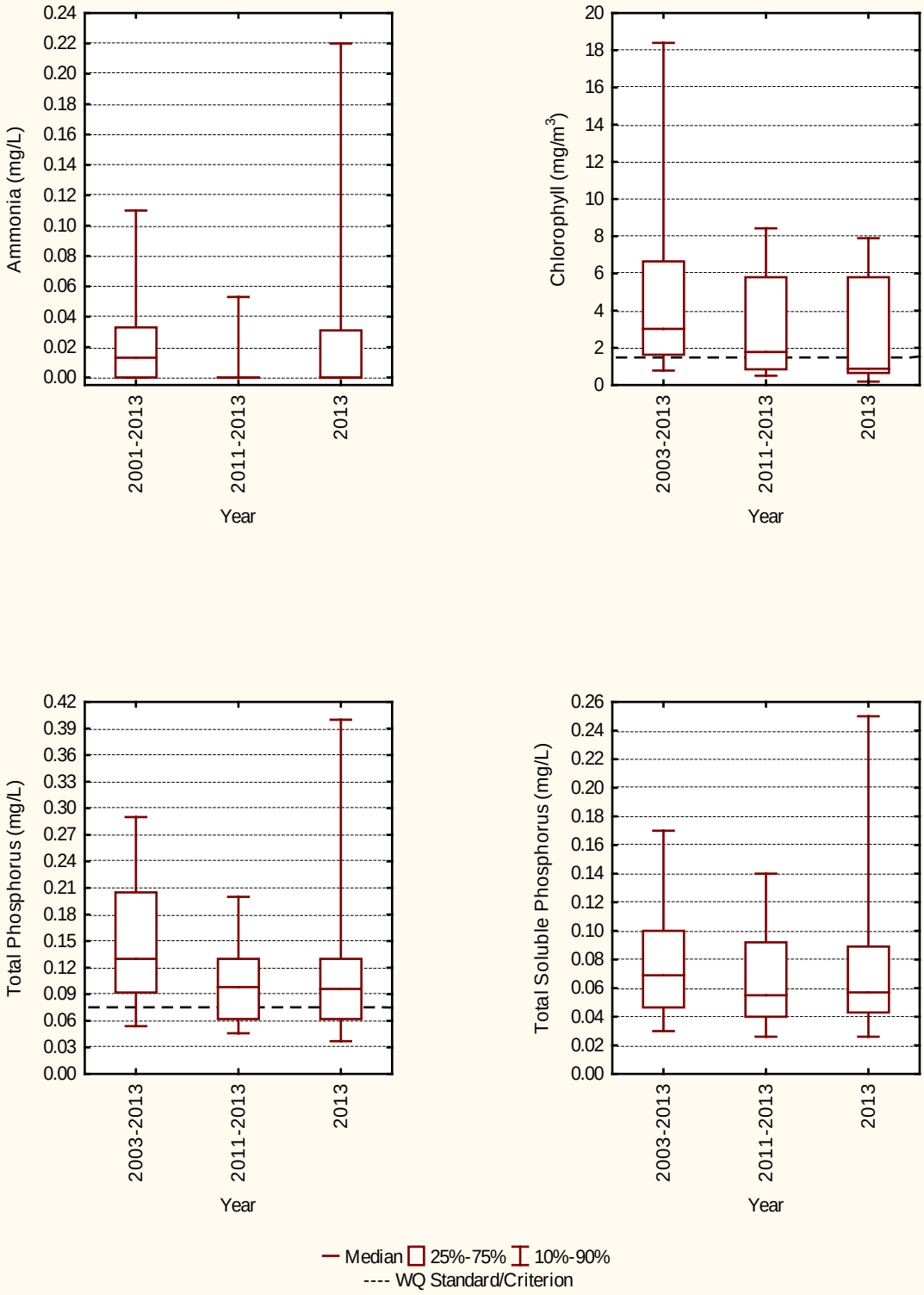




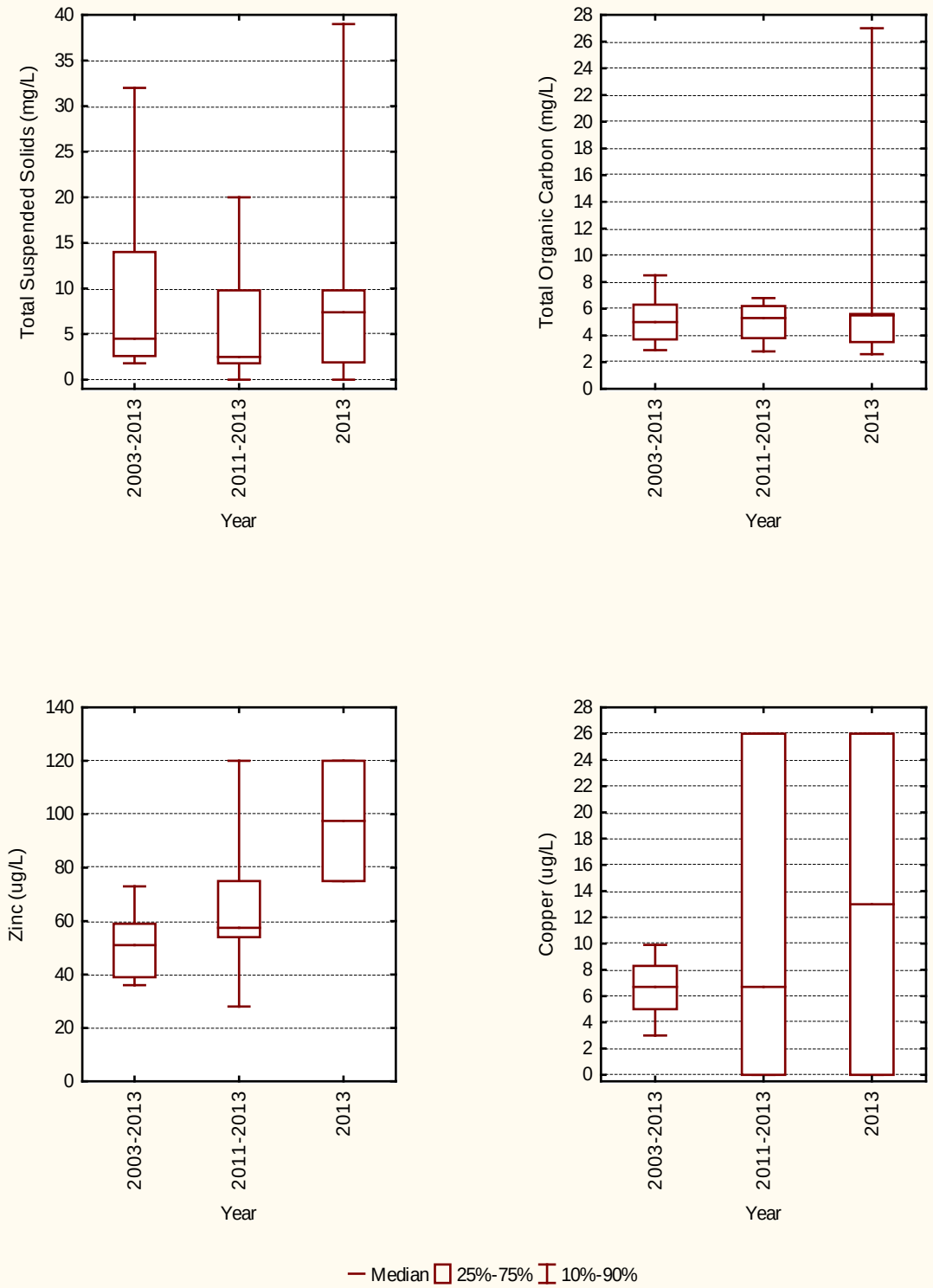


— Median ☐ 25%-75% I 10%-90%
---- WQ Standard/Criterion

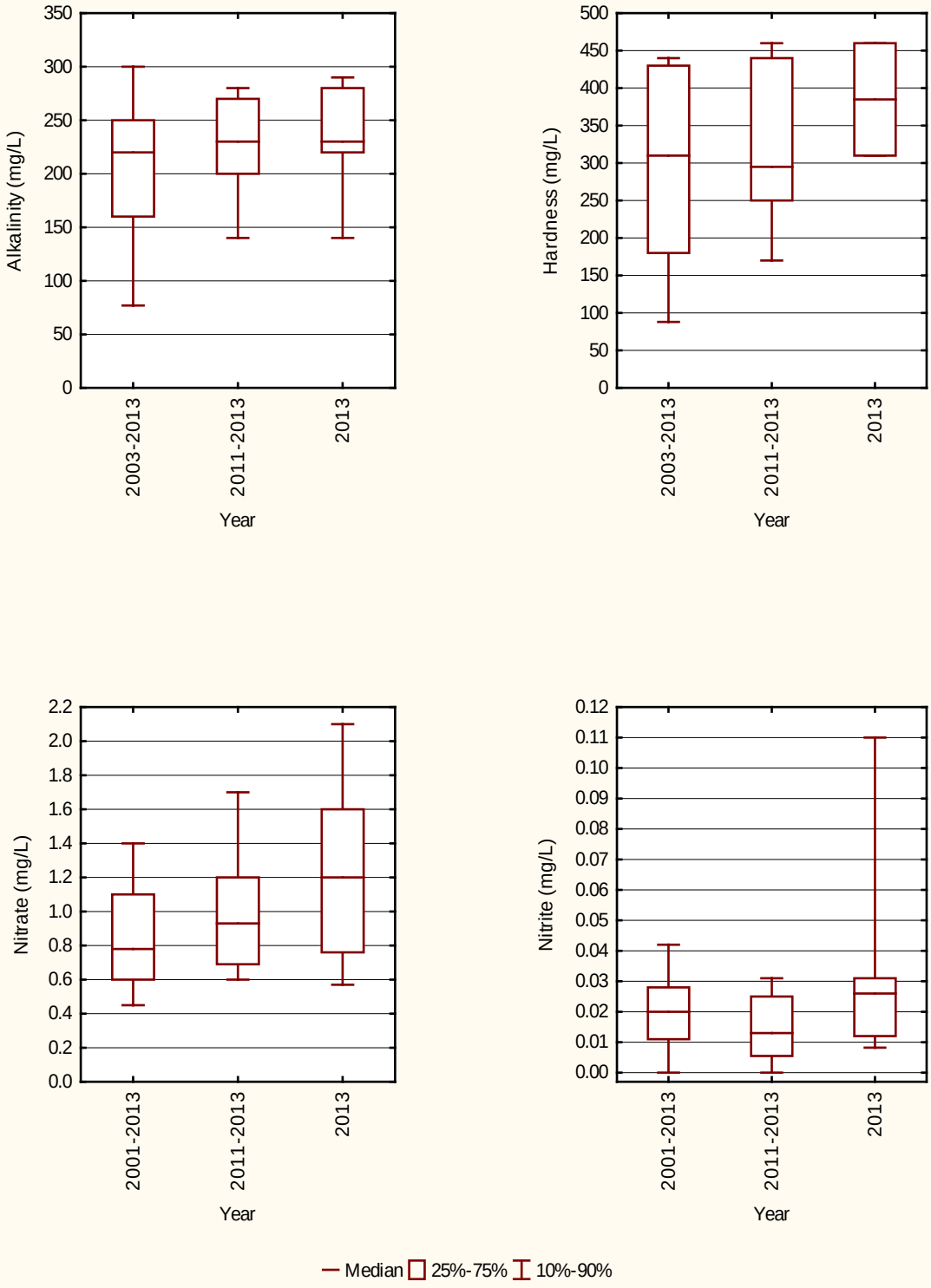
MMSD Water Quality Monitoring Program Data
Honey Creek at 84th St., Site HC-02



MMSD Water Quality Monitoring Program Data
Honey Creek at 84th St., Site HC-02



MMSD Water Quality Monitoring Program Data
Honey Creek at 84th St., Site HC-02



84TH ST. AND O'CONNER ST. - SITE 2
HONEY CREEK
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.9	12.6	10.6	2.80	1.26	0.030	1.31	0.036	0.59	0.128	0.087	ND
Standard Error	0.1	1.9	0.5	1.02	0.18	0.010	0.19	0.024	0.14	0.037	0.025	ND
Median	7.8	13.3	10.8	0.88	1.20	0.026	1.30	0.000	0.42	0.096	0.057	ND
Mode	8.1	Multi	Multi	Multi	Multi	0.012	Multi	0.000	Multi	Multi	0.026	ND
Standard Deviation	0.2	5.6	1.5	3.07	0.55	0.031	0.56	0.073	0.41	0.112	0.074	ND
Sample Variance	0.0	31.2	2.2	9.45	0.30	0.001	0.32	0.005	0.17	0.012	0.005	ND
Range	0.5	17.0	5.1	7.71	1.53	0.102	1.62	0.220	1.38	0.363	0.224	ND
Minimum	7.6	2.9	8.0	0.19	0.57	0.008	0.58	0.000	0.22	0.037	0.026	ND
Maximum	8.1	19.9	13.1	7.90	2.10	0.110	2.20	0.220	1.60	0.400	0.250	ND
Count	9	9	9	9	9	9	9	9	9	9	9	0
Confidence Level (95%)	0.2	4.3	1.2	2.36	0.42	0.024	0.43	0.056	0.32	0.086	0.057	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	1117.8	1107.9	3.0	9.9	13.1	1890	417.8	15573	3.2	11303
Standard Error	ND	ND	231.5	232.3	1.5	4.2	7.7	398	129.9	13111	0.3	9597
Median	ND	ND	780.0	780.0	1.3	7.4	3.6	1390	270.0	2200	3.3	1200
Mode	ND	ND	730.0	Multi	0.0	7.4	Multi	1280	Multi	2200	3.3	1200
Standard Deviation	ND	ND	694.4	696.8	4.5	12.5	23.1	1195	389.7	39334	0.9	28792
Sample Variance	ND	ND	482219.4	485497.3	20.6	157.2	534.3	1427750	151894.4	1547151375	0.8	828996475
Range	ND	ND	2100.0	2107.1	13.0	39.0	73.2	3840	1210.0	119800	2.8	87810
Minimum	ND	ND	700.0	691.0	0.0	0.0	0.3	1010	190.0	200	2.3	190
Maximum	ND	ND	2800.0	2798.1	13.0	39.0	73.5	4850	1400.0	120000	5.1	88000
Count	0	0	9	9	9	9	9	9	9	9	9	9
Confidence Level (95%)	ND	ND	533.8	535.6	3.5	9.6	17.8	918	299.6	30235	0.7	22132

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

84TH ST. AND O'CONNER ST. - SITE 2
HONEY CREEK
WATER QUALITY DATA - 2013

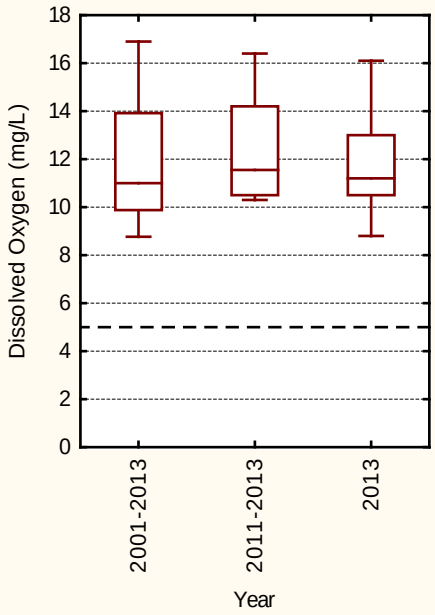
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	81.00	44.50	0.0	3.7	13.0	7.6	0.0	97.5	2.7	6.5	0.0	ND
Standard Error	14.00	10.50	0.0	1.5	13.0	0.1	0.0	22.5	2.7	6.5	0.0	ND
Median	81.00	44.50	0.0	3.7	13.0	7.6	0.0	97.5	2.7	6.5	0.0	ND
Mode	Multi	Multi	0.0	Multi	Multi	Multi	0.0	Multi	Multi	Multi	0.0	ND
Standard Deviation	19.80	14.85	0.0	2.1	18.4	0.1	0.0	31.8	3.7	9.2	0.0	ND
Sample Variance	392.00	220.50	0.0	4.2	338.0	0.0	0.0	1012.5	14.0	84.5	0.0	ND
Range	28.00	21.00	0.0	2.9	26.0	0.2	0.0	45.0	5.3	13.0	0.0	ND
Minimum	67.00	34.00	0.0	2.2	0.0	7.5	0.0	75.0	0.0	0.0	0.0	ND
Maximum	95.00	55.00	0.0	5.1	26.0	7.7	0.0	120.0	5.3	13.0	0.0	ND
Count	2	2	2	2	2	2	2	2	2	2	2	0
Confidence Level (95%)	177.89	133.42	0.0	18.4	165.2	1.3	0.0	285.9	33.7	82.6	0.0	ND

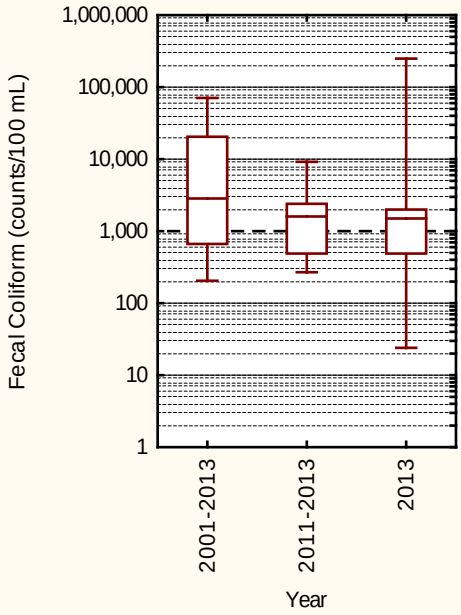
VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	385	230	4.7	ND	54.4	47.3	7.1	6.8
Standard Error	75	17	3.7	ND	2.9	3.9	2.5	2.3
Median	385	230	0.0	ND	53.0	47.0	5.5	5.2
Mode	Multi	Multi	0.0	ND	53.0	50.0	5.5	5.3
Standard Deviation	106	52	11.2	ND	8.6	11.6	7.6	7.0
Sample Variance	11250	2725	124.6	ND	73.3	134.8	57.4	48.4
Range	150	150	34.0	ND	28.0	40.0	24.4	22.4
Minimum	310	140	0.0	ND	42.0	27.0	2.6	2.6
Maximum	460	290	34.0	ND	70.0	67.0	27.0	25.0
Count	2	9	9	0	9	9	9	9
Confidence Level (95%)	953	40	8.6	ND	6.6	8.9	5.8	5.3

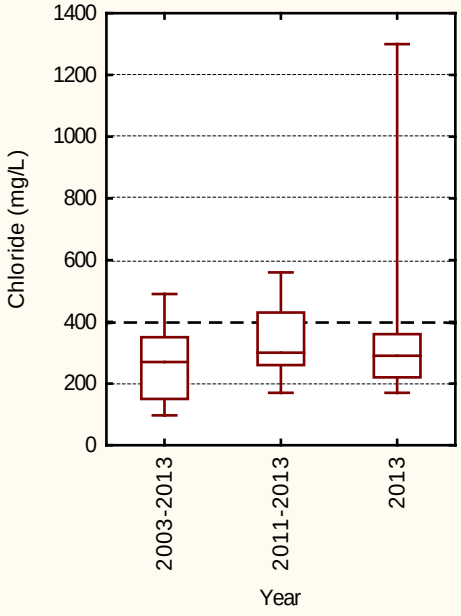
ND = No Data **Multi = Multimodal**

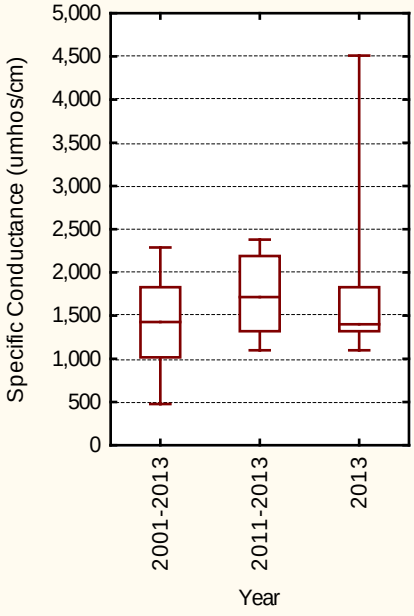
Provisional MMSD Water Quality Data

MMSD Water Quality Monitoring Program Data
Honey Creek at Wisconsin Ave., Site HC-03



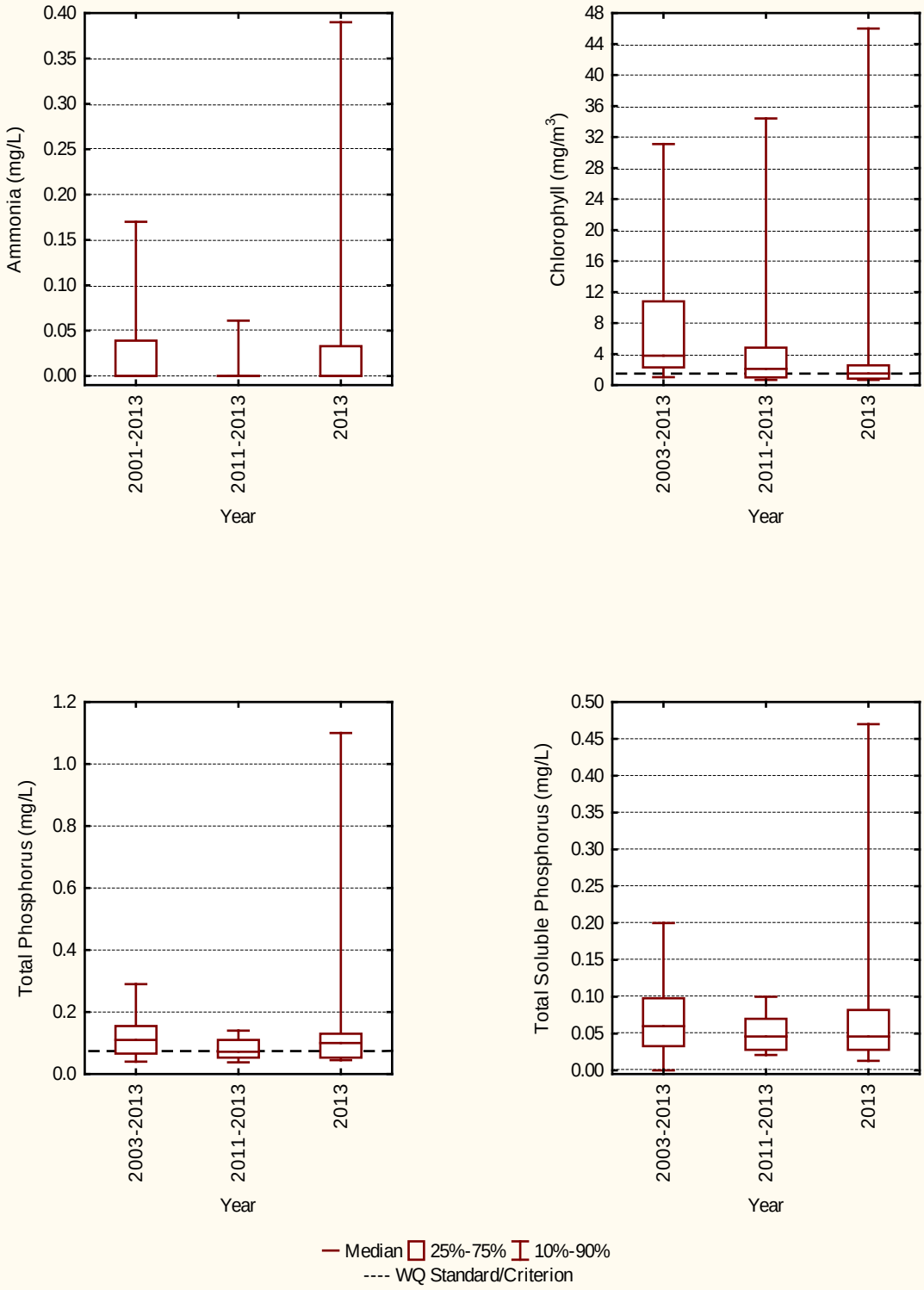




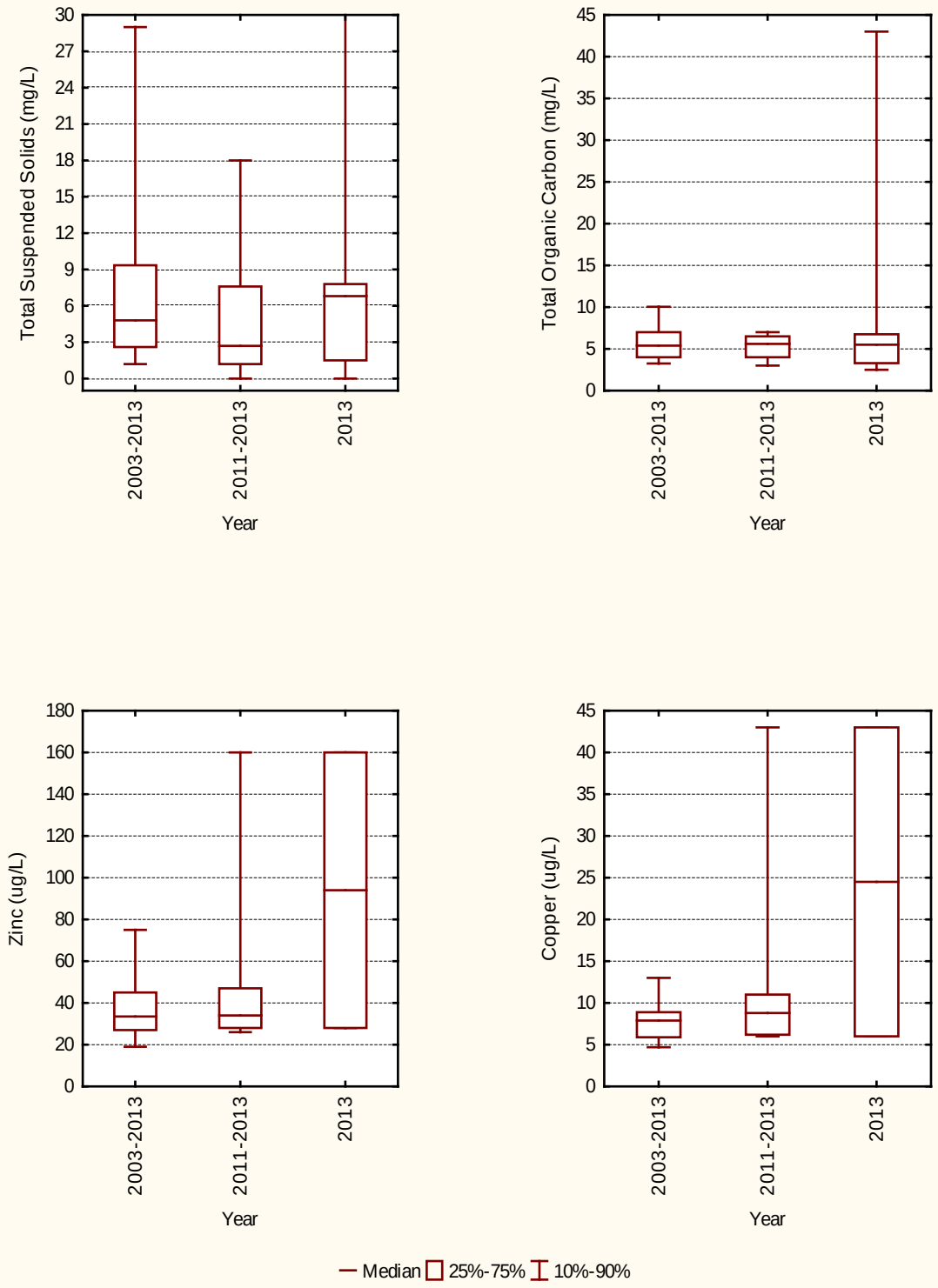


— Median ☐ 25%-75% ⊥ 10%-90%
---- WQ Standard/Criterion

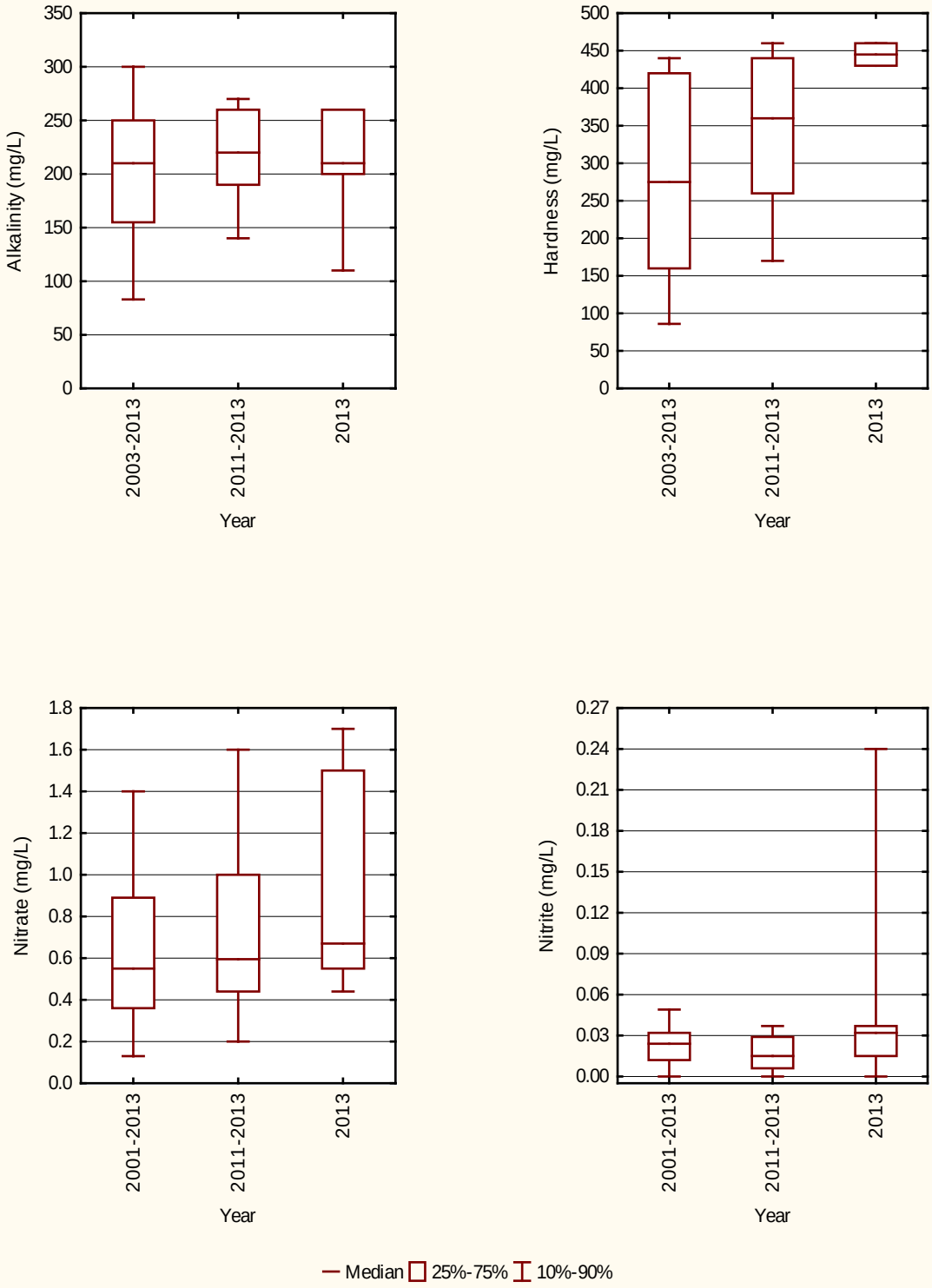
MMSD Water Quality Monitoring Program Data
Honey Creek at Wisconsin Ave., Site HC-03



MMSD Water Quality Monitoring Program Data
Honey Creek at Wisconsin Ave., Site HC-03



MMSD Water Quality Monitoring Program Data
Honey Creek at Wisconsin Ave., Site HC-03



80TH ST. AND WISCONSIN AVE.- SITE 3
HONEY CREEK
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.1	12.3	12.0	7.06	0.99	0.052	1.04	0.054	0.71	0.203	0.101	ND
Standard Error	0.1	2.2	0.8	5.57	0.18	0.024	0.17	0.043	0.24	0.113	0.048	ND
Median	8.2	14.1	11.2	1.50	0.67	0.032	0.84	0.000	0.47	0.100	0.046	ND
Mode	Multi	Multi	10.5	0.68	Multi	Multi	1.50	0.000	0.52	Multi	Multi	ND
Standard Deviation	0.2	6.5	2.3	15.76	0.54	0.073	0.52	0.128	0.73	0.339	0.143	ND
Sample Variance	0.0	42.3	5.1	248.30	0.29	0.005	0.28	0.016	0.53	0.115	0.020	ND
Range	0.5	20.2	7.3	45.32	1.26	0.240	1.26	0.390	2.32	1.055	0.457	ND
Minimum	7.9	-0.2	8.8	0.68	0.44	0.000	0.44	0.000	0.28	0.045	0.013	ND
Maximum	8.4	20.0	16.1	46.00	1.70	0.240	1.70	0.390	2.60	1.100	0.470	ND
Count	9	9	9	8	9	9	9	9	9	9	9	0
Confidence Level (95%)	0.1	5.0	1.7	13.17	0.41	0.056	0.40	0.098	0.56	0.261	0.110	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	1148.9	1076.9	9.8	72.0	101.2	1850	403.3	28780	3.1	39656
Standard Error	ND	ND	192.6	197.6	8.4	66.0	93.9	357	118.8	27654	0.4	26235
Median	ND	ND	960.0	790.0	1.8	6.8	7.9	1400	290.0	1500	3.2	1300
Mode	ND	ND	790.0	Multi	0.0	Multi	Multi	Multi	Multi	Multi	Multi	Multi
Standard Deviation	ND	ND	577.9	592.8	25.2	198.1	281.6	1071	356.5	82961	1.1	78706
Sample Variance	ND	ND	334011.1	351421.5	637.2	39229.5	79302.0	1147775	127075.0	6882579417	1.1	6194691249
Range	ND	ND	1830.0	1832.3	77.0	600.0	851.5	3410	1130.0	249976	4.0	209942
Minimum	ND	ND	670.0	662.4	0.0	0.0	0.5	1100	170.0	24	1.4	58
Maximum	ND	ND	2500.0	2494.7	77.0	600.0	852.0	4510	1300.0	250000	5.4	210000
Count	0	0	9	9	9	9	9	9	9	9	9	9
Confidence Level (95%)	ND	ND	444.2	455.7	19.4	152.2	216.5	824	274.0	63770	0.8	60499

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

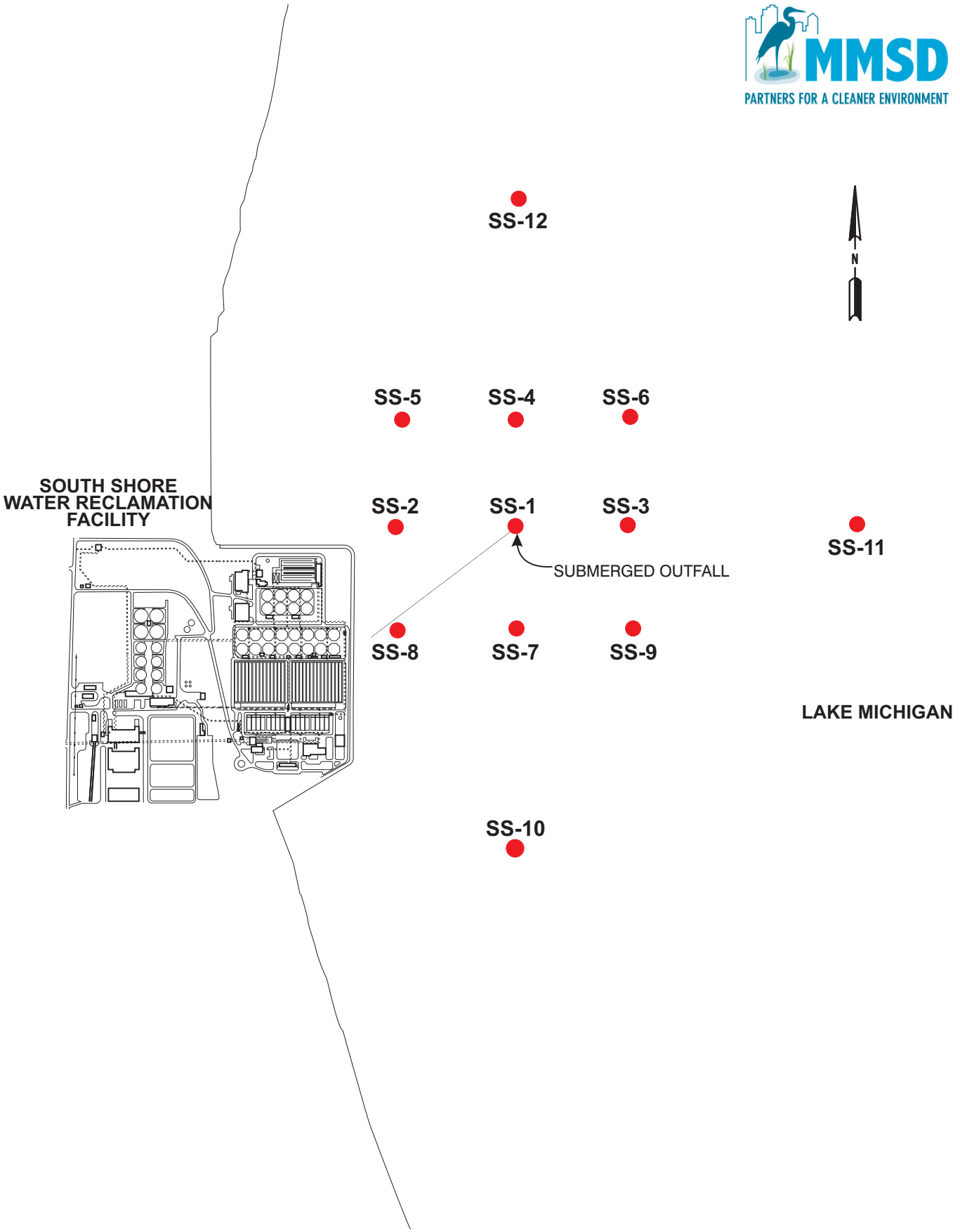
80TH ST. AND WISCONSIN AVE.- SITE 3
HONEY CREEK
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	96.50	50.00	0.0	16.5	24.5	17.5	0.0	94.0	0.0	6.1	0.0	ND
Standard Error	0.50	4.00	0.0	14.5	18.5	14.6	0.0	66.0	0.0	0.8	0.0	ND
Median	96.50	50.00	0.0	16.5	24.5	17.5	0.0	94.0	0.0	6.1	0.0	ND
Mode	Multi	Multi	0.0	Multi	Multi	Multi	0.0	Multi	0.0	Multi	0.0	ND
Standard Deviation	0.71	5.66	0.0	20.5	26.2	20.6	0.0	93.3	0.0	1.1	0.0	ND
Sample Variance	0.50	32.00	0.0	420.5	684.5	423.4	0.0	8712.0	0.0	1.1	0.0	ND
Range	1.00	8.00	0.0	29.0	37.0	29.1	0.0	132.0	0.0	1.5	0.0	ND
Minimum	96.00	46.00	0.0	2.0	6.0	2.9	0.0	28.0	0.0	5.3	0.0	ND
Maximum	97.00	54.00	0.0	31.0	43.0	32.0	0.0	160.0	0.0	6.8	0.0	ND
Count	2	2	2	2	2	2	2	2	2	2	2	0
Confidence Level (95%)	6.35	50.82	0.0	184.2	235.1	184.9	0.0	838.6	0.0	9.5	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	445	211	5.2	ND	54.7	43.6	9.6	9.0
Standard Error	15	18	4.5	ND	2.6	4.3	4.8	4.6
Median	445	210	0.0	ND	55.0	45.0	5.5	5.4
Mode	Multi	260	0.0	ND	55.0	45.0	Multi	5.4
Standard Deviation	21	55	13.5	ND	7.9	12.3	13.6	13.0
Sample Variance	450	3011	181.8	ND	63.0	150.6	185.1	169.3
Range	30	150	41.0	ND	23.0	42.0	40.5	38.6
Minimum	430	110	0.0	ND	42.0	19.0	2.5	2.4
Maximum	460	260	41.0	ND	65.0	61.0	43.0	41.0
Count	2	9	9	0	9	8	8	8
Confidence Level (95%)	191	42	10.4	ND	6.1	10.3	11.4	10.9

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data



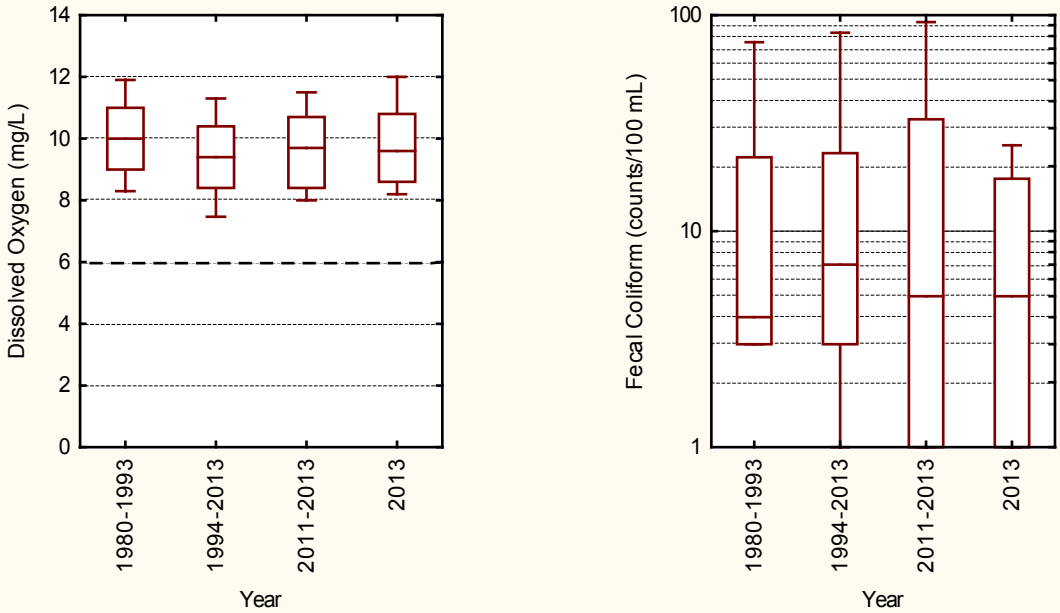
LEGEND

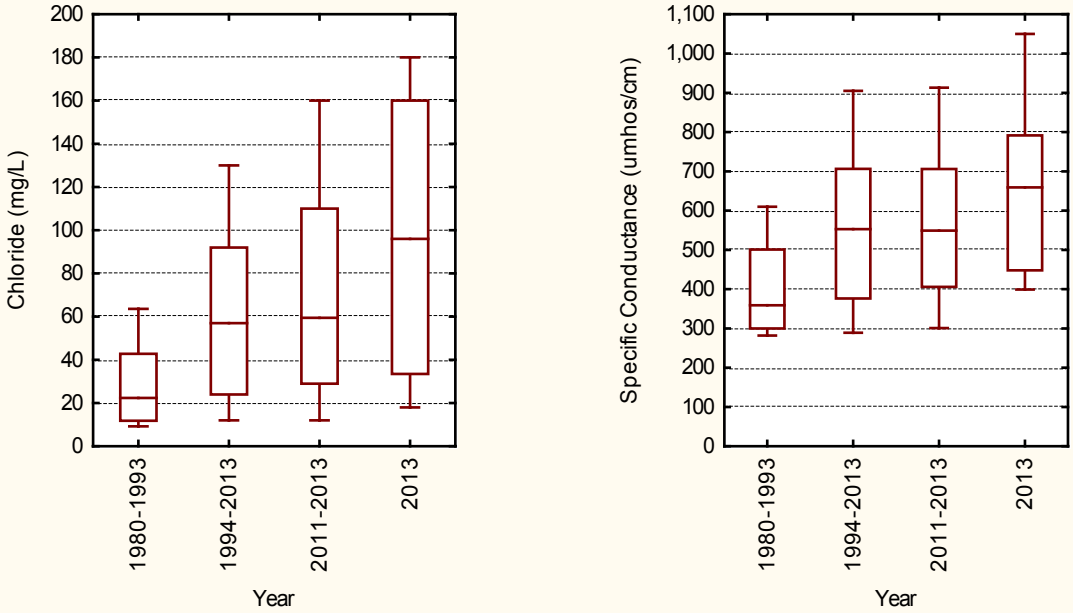
● ACTIVE WATER QUALITY SAMPLING LOCATIONS

SOUTH SHORE (SS) SURVEY
WATER QUALITY SAMPLING LOCATIONS

6/6/14 14-061 SS

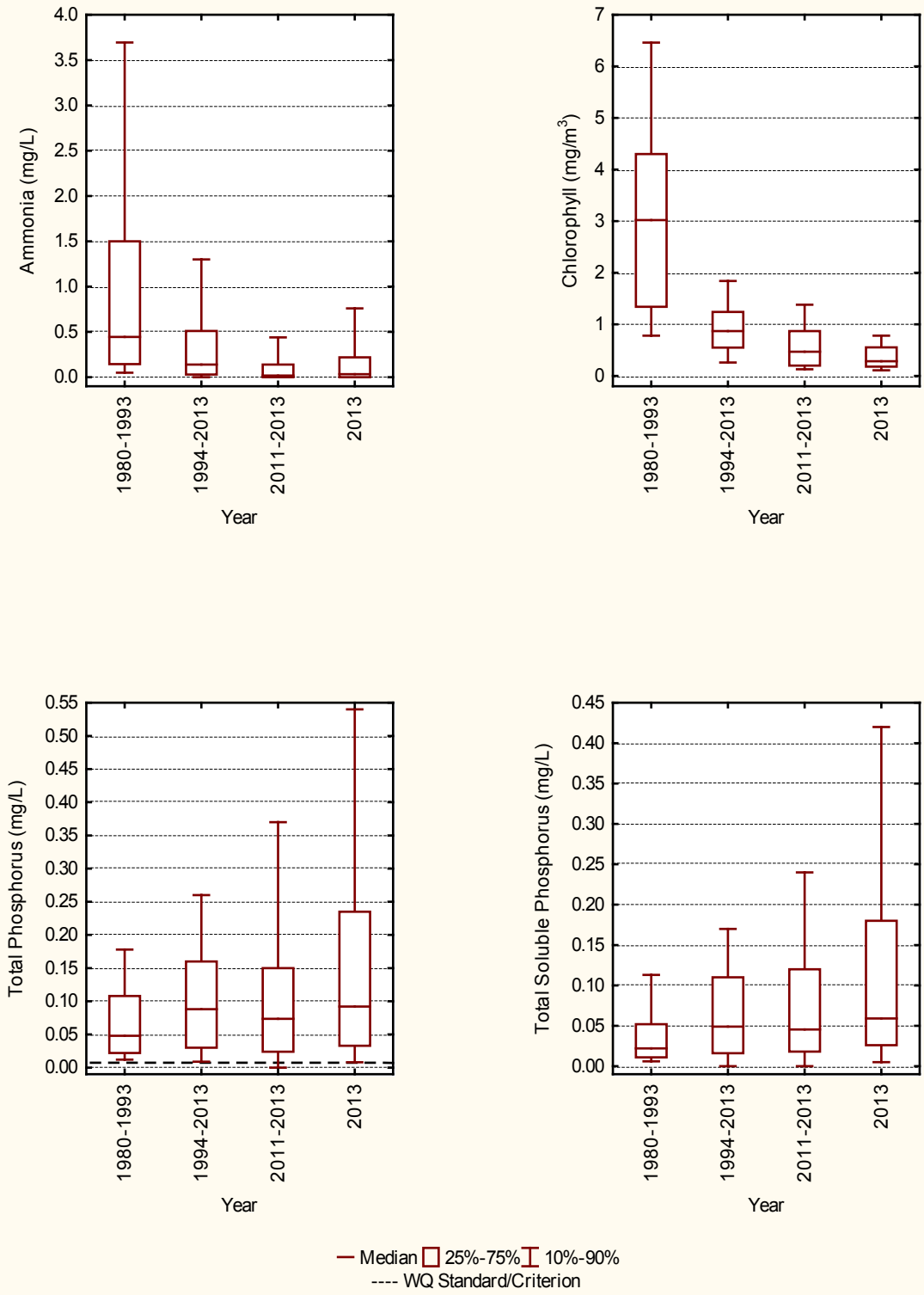
MMSD Water Quality Monitoring Program Data
South Shore, Site SS-01



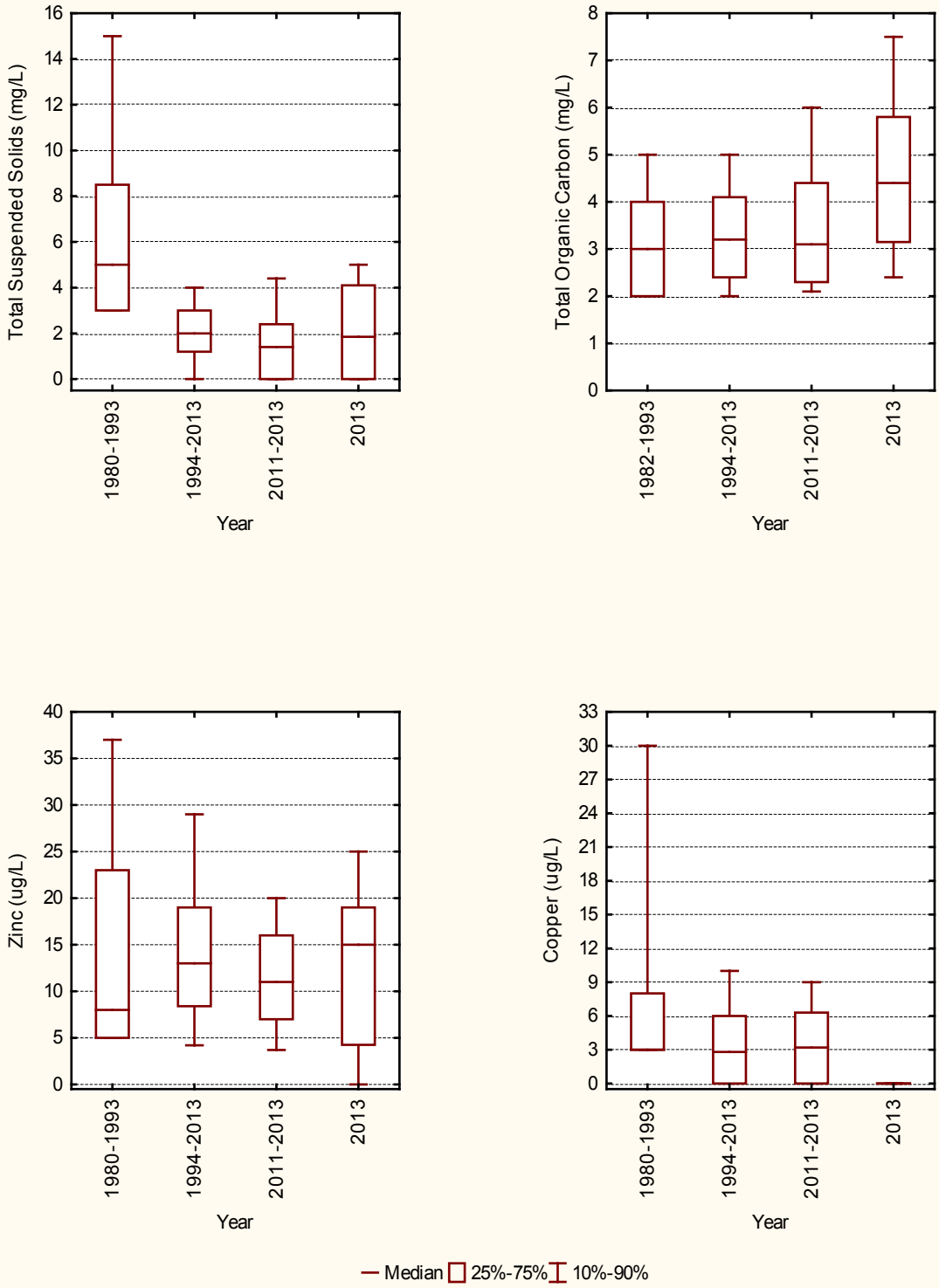


— Median ☐ 25%-75% I 10%-90%
---- WQ Standard/Criterion

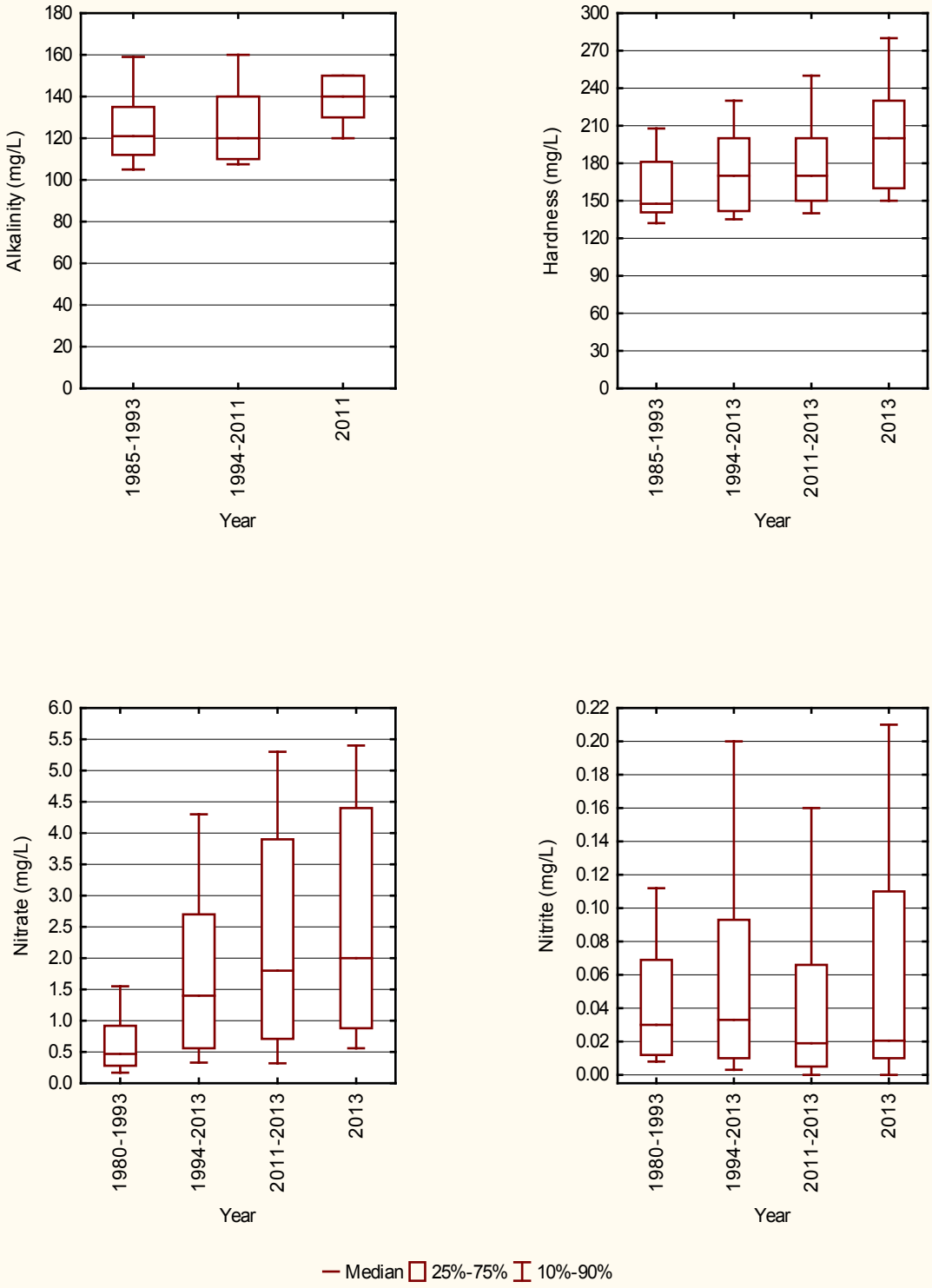
MMSD Water Quality Monitoring Program Data
South Shore, Site SS-01



MMSD Water Quality Monitoring Program Data
South Shore, Site SS-01



MMSD Water Quality Monitoring Program Data
South Shore, Site SS-01



SOUTH SHORE - SITE 1
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.7	13.8	9.8	0.45	2.63	0.068	2.70	0.163	0.78	0.195	0.152	3.25
Standard Error	0.0	0.9	0.2	0.09	0.33	0.014	0.33	0.044	0.08	0.041	0.036	0.30
Median	7.7	16.0	9.6	0.29	2.00	0.020	2.05	0.034	0.75	0.092	0.059	3.30
Mode	7.7	Multi	Multi	0.60	Multi	0.000	Multi	0.000	1.00	0.000	Multi	3.30
Standard Deviation	0.3	5.1	1.4	0.54	1.96	0.083	1.99	0.263	0.47	0.249	0.217	1.82
Sample Variance	0.1	26.3	1.9	0.29	3.85	0.007	3.97	0.069	0.22	0.062	0.047	3.32
Range	1.2	15.6	4.8	2.40	6.34	0.270	6.44	0.870	1.70	0.900	0.840	6.47
Minimum	7.1	4.0	7.8	0.00	0.26	0.000	0.26	0.000	0.00	0.000	0.000	0.73
Maximum	8.3	19.6	12.6	2.40	6.60	0.270	6.70	0.870	1.70	0.900	0.840	7.20
Count	36	36	36	36	36	36	36	36	36	36	36	36
Confidence Level (95%)	0.1	1.7	0.5	0.18	0.66	0.028	0.67	0.089	0.16	0.084	0.073	0.62

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	4.5	10.7	360.8	358.4	1.4	2.4	1.6	666	98.2	14	1.1	68
Standard Error	0.9	1.0	52.3	51.7	0.6	0.7	0.2	42	10.7	8	0.2	27
Median	3.7	12.0	305.0	303.0	0.6	1.9	1.3	659	96.0	5	0.9	23
Mode	5.5	12.0	Multi	Multi	0.0	0.0	0.3	940	160.0	0	0.7	Multi
Standard Deviation	3.1	3.0	181.2	178.9	1.9	2.6	1.5	252	64.5	26	0.5	88
Sample Variance	9.5	9.1	32844.7	32022.9	3.7	6.7	2.2	63254	4154.4	687	0.2	7829
Range	11.5	8.9	500.0	493.5	5.6	8.4	5.7	1105	208.0	93	1.5	240
Minimum	1.5	3.9	180.0	178.1	0.0	0.0	0.0	315	12.0	0	0.5	0
Maximum	13.0	12.8	680.0	671.6	5.6	8.4	5.7	1420	220.0	93	2.0	240
Count	12	10	12	12	12	12	36	36	36	12	8	11
Confidence Level (95%)	2.0	2.2	115.1	113.7	1.2	1.6	0.5	85	21.8	17	0.4	59

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

SOUTH SHORE - SITE 1
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	47.36	20.72	0.1	2.1	0.5	4.6	0.0	12.9	0.0	2.9	0.0	ND
Standard Error	1.64	0.94	0.0	0.2	0.3	0.6	0.0	1.5	0.0	0.6	0.0	ND
Median	46.50	20.00	0.0	2.0	0.0	4.1	0.0	15.0	0.0	0.0	0.0	ND
Mode	38.00	20.00	0.0	Multi	0.0	2.4	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	9.87	5.65	0.2	1.2	1.8	3.3	0.0	9.2	0.0	3.4	0.0	ND
Sample Variance	97.38	31.98	0.1	1.5	3.2	11.1	0.0	84.6	0.0	11.4	0.0	ND
Range	37.00	23.00	0.9	6.1	6.4	14.0	0.0	30.0	0.0	8.3	0.0	ND
Minimum	34.00	13.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	71.00	36.00	0.9	6.1	6.4	14.0	0.0	30.0	0.0	8.3	0.0	ND
Count	36	36	36	36	35	36	35	36	24	30	35	0
Confidence Level (95%)	3.34	1.91	0.1	0.4	0.6	1.1	0.0	3.1	0.0	1.3	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	203	ND	2.0	6.3	35.2	30.7	4.6	ND
Standard Error	8	ND	0.8	1.2	1.3	1.1	0.3	ND
Median	200	ND	0.0	4.6	35.0	30.0	4.4	ND
Mode	160	ND	0.0	Multi	35.0	33.0	2.6	ND
Standard Deviation	47	ND	2.5	4.0	7.8	6.5	1.8	ND
Sample Variance	2215	ND	6.4	15.7	61.6	42.2	3.2	ND
Range	180	ND	6.4	10.2	31.0	25.0	6.5	ND
Minimum	140	ND	0.0	2.8	24.0	22.0	2.1	ND
Maximum	320	ND	6.4	13.0	55.0	47.0	8.6	ND
Count	36	0	11	11	36	36	36	0
Confidence Level (95%)	16	ND	1.7	2.7	2.7	2.2	0.6	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

SOUTH SHORE - SITE 2
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.2	13.2	10.8	0.27	0.54	0.006	0.55	0.010	0.22	0.010	0.007	1.32
Standard Error	0.0	1.1	0.3	0.07	0.04	0.002	0.04	0.006	0.03	0.002	0.002	0.09
Median	8.2	15.8	11.3	0.18	0.45	0.000	0.46	0.000	0.26	0.008	0.000	1.15
Mode	8.3	19.1	8.7	0.18	0.70	0.000	Multi	0.000	0.00	0.000	0.000	1.70
Standard Deviation	0.2	6.3	1.6	0.24	0.24	0.013	0.24	0.039	0.17	0.012	0.010	0.57
Sample Variance	0.0	40.3	2.6	0.06	0.06	0.000	0.06	0.002	0.03	0.000	0.000	0.32
Range	0.9	19.1	5.8	0.84	0.79	0.073	0.79	0.230	0.52	0.053	0.041	2.83
Minimum	7.5	1.5	8.4	0.00	0.21	0.000	0.21	0.000	0.00	0.000	0.000	0.57
Maximum	8.4	20.6	14.2	0.84	1.00	0.073	1.00	0.230	0.52	0.053	0.041	3.40
Count	36	36	36	12	36	36	36	36	36	36	36	36
Confidence Level (95%)	0.1	2.1	0.5	0.15	0.08	0.004	0.08	0.013	0.06	0.004	0.003	0.19

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	5.7	9.6	206.7	205.3	0.0	1.3	1.7	381	25.1	5	0.8	ND
Standard Error	1.2	0.7	11.7	11.7	0.0	0.4	0.3	15	2.6	3	0.2	ND
Median	4.0	10.7	195.0	195.0	0.0	1.6	0.8	356	21.5	2	0.7	ND
Mode	11.0	Multi	Multi	Multi	0.0	0.0	Multi	315	Multi	0	Multi	ND
Standard Deviation	4.1	2.3	40.5	40.6	0.0	1.4	2.1	91	15.5	10	0.4	ND
Sample Variance	16.9	5.1	1642.4	1650.8	0.0	2.1	4.3	8270	240.4	97	0.2	ND
Range	9.6	6.0	110.0	110.2	0.0	4.7	6.5	445	80.0	35	1.1	ND
Minimum	1.4	5.2	160.0	158.3	0.0	0.0	0.0	298	11.0	0	0.5	ND
Maximum	11.0	11.2	270.0	268.5	0.0	4.7	6.5	743	91.0	35	1.5	ND
Count	12	10	12	12	12	12	36	36	36	12	6	0
Confidence Level (95%)	2.6	1.6	25.7	25.8	0.0	0.9	0.7	31	5.2	6	0.4	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

SOUTH SHORE - SITE 2
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	37.25	14.92	0.2	1.4	0.0	1.9	0.0	3.7	0.0	1.1	0.0	ND
Standard Error	0.94	0.58	0.1	0.3	0.0	0.4	0.0	2.0	0.0	0.7	0.0	ND
Median	36.00	14.00	0.0	1.6	0.0	2.0	0.0	0.0	0.0	0.0	0.0	ND
Mode	35.00	14.00	0.0	0.0	0.0	Multi	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	3.25	2.02	0.3	1.2	0.0	1.3	0.0	6.9	0.0	2.0	0.0	ND
Sample Variance	10.57	4.08	0.1	1.4	0.0	1.6	0.0	47.0	0.0	3.8	0.0	ND
Range	9.00	7.00	0.9	3.3	0.0	4.6	0.0	19.0	0.0	4.2	0.0	ND
Minimum	34.00	12.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	43.00	19.00	0.9	3.3	0.0	4.6	0.0	19.0	0.0	4.2	0.0	ND
Count	12	12	12	12	12	12	12	12	8	7	12	0
Confidence Level (95%)	2.07	1.28	0.2	0.8	0.0	0.8	0.0	4.4	0.0	1.8	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	155	ND	ND	ND	27.1	24.3	2.7	ND
Standard Error	4	ND	ND	ND	0.5	0.4	0.1	ND
Median	150	ND	ND	ND	26.0	24.0	2.5	ND
Mode	150	ND	ND	ND	26.0	23.0	Multi	ND
Standard Deviation	14	ND	ND	ND	2.8	2.4	0.7	ND
Sample Variance	191	ND	ND	ND	8.0	5.6	0.5	ND
Range	40	ND	ND	ND	13.0	11.0	2.7	ND
Minimum	140	ND	ND	ND	24.0	22.0	1.9	ND
Maximum	180	ND	ND	ND	37.0	33.0	4.6	ND
Count	12	0	0	0	36	36	36	0
Confidence Level (95%)	9	ND	ND	ND	1.0	0.8	0.2	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

SOUTH SHORE - SITE 3
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.2	12.9	11.0	0.23	0.35	0.002	0.36	0.001	0.07	0.003	0.002	1.25
Standard Error	0.0	1.1	0.3	0.08	0.03	0.001	0.03	0.001	0.02	0.001	0.001	0.07
Median	8.3	15.2	11.3	0.18	0.30	0.000	0.30	0.000	0.00	0.000	0.000	1.10
Mode	8.4	19.2	Multi	Multi	0.24	0.000	0.24	0.000	0.00	0.000	0.000	Multi
Standard Deviation	0.3	6.4	1.6	0.27	0.19	0.004	0.20	0.004	0.14	0.009	0.006	0.39
Sample Variance	0.1	41.2	2.7	0.07	0.04	0.000	0.04	0.000	0.02	0.000	0.000	0.16
Range	1.1	19.1	7.0	1.00	1.07	0.014	1.17	0.026	0.53	0.050	0.036	1.40
Minimum	7.4	1.2	7.5	0.00	0.13	0.000	0.13	0.000	0.00	0.000	0.000	0.60
Maximum	8.5	20.3	14.5	1.00	1.20	0.014	1.30	0.026	0.53	0.050	0.036	2.00
Count	36	36	36	12	36	36	36	36	36	36	36	36
Confidence Level (95%)	0.1	2.2	0.6	0.17	0.06	0.001	0.07	0.001	0.05	0.003	0.002	0.13

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	7.1	11.4	185.0	184.2	0.0	0.8	1.1	344	16.0	1	0.5	ND
Standard Error	1.2	1.0	7.8	7.7	0.0	0.3	0.2	17	1.3	0	0.0	ND
Median	6.2	12.9	180.0	178.4	0.0	0.0	0.4	313	12.5	0	0.5	ND
Mode	13.0	Multi	180.0	180.0	0.0	0.0	0.1	297	12.0	0	0.5	ND
Standard Deviation	4.0	3.0	27.1	26.7	0.0	1.2	1.4	99	7.6	1	0.0	ND
Sample Variance	16.0	9.2	736.4	711.8	0.0	1.3	2.1	9873	57.6	1	0.0	ND
Range	11.2	8.2	80.0	78.9	0.0	3.2	4.9	420	34.0	3	0.0	ND
Minimum	1.8	5.0	160.0	160.0	0.0	0.0	0.0	290	11.0	0	0.5	ND
Maximum	13.0	13.2	240.0	238.9	0.0	3.2	4.9	710	45.0	3	0.5	ND
Count	12	10	12	12	12	12	36	36	36	12	2	0
Confidence Level (95%)	2.5	2.2	17.2	17.0	0.0	0.7	0.5	34	2.6	1	0.0	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

SOUTH SHORE - SITE 3
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	35.25	13.75	0.0	1.0	0.0	1.1	0.0	1.6	0.0	3.2	0.0	ND
Standard Error	0.57	0.35	0.0	0.4	0.0	0.4	0.0	1.6	0.0	1.1	0.0	ND
Median	34.50	14.00	0.0	0.6	0.0	0.6	0.0	0.0	0.0	4.5	0.0	ND
Mode	34.00	14.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	1.96	1.22	0.1	1.3	0.0	1.5	0.0	5.5	0.0	3.3	0.0	ND
Sample Variance	3.84	1.48	0.0	1.7	0.0	2.1	0.0	30.1	0.0	10.9	0.0	ND
Range	6.00	4.00	0.4	4.3	0.0	4.3	0.0	19.0	0.0	8.1	0.0	ND
Minimum	33.00	12.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	39.00	16.00	0.4	4.3	0.0	4.3	0.0	19.0	0.0	8.1	0.0	ND
Count	12	12	12	12	12	12	12	12	9	9	12	0
Confidence Level (95%)	1.25	0.77	0.1	0.8	0.0	0.9	0.0	3.5	0.0	2.5	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	143	ND	ND	ND	25.9	23.5	2.4	ND
Standard Error	3	ND	ND	ND	0.3	0.2	0.1	ND
Median	140	ND	ND	ND	25.0	23.0	2.2	ND
Mode	140	ND	ND	ND	25.0	23.0	2.1	ND
Standard Deviation	9	ND	ND	ND	1.5	1.3	0.4	ND
Sample Variance	79	ND	ND	ND	2.4	1.8	0.1	ND
Range	30	ND	ND	ND	5.0	4.0	1.2	ND
Minimum	130	ND	ND	ND	24.0	22.0	2.0	ND
Maximum	160	ND	ND	ND	29.0	26.0	3.2	ND
Count	12	0	0	0	36	36	36	0
Confidence Level (95%)	6	ND	ND	ND	0.5	0.5	0.1	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

SOUTH SHORE - SITE 4
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.2	13.0	11.0	0.14	0.41	0.002	0.41	0.000	0.11	0.005	0.004	1.27
Standard Error	0.0	1.1	0.3	0.05	0.03	0.001	0.03	0.000	0.03	0.001	0.001	0.07
Median	8.3	15.4	11.2	0.09	0.34	0.000	0.35	0.000	0.00	0.005	0.000	1.20
Mode	8.3	Multi	8.9	0.00	Multi	0.000	Multi	0.000	0.00	0.000	0.000	1.60
Standard Deviation	0.3	6.4	1.6	0.16	0.20	0.005	0.20	0.000	0.21	0.005	0.005	0.42
Sample Variance	0.1	40.9	2.5	0.02	0.04	0.000	0.04	0.000	0.04	0.000	0.000	0.18
Range	1.1	18.9	5.5	0.39	1.09	0.024	1.09	0.000	0.98	0.018	0.018	1.56
Minimum	7.4	1.4	8.9	0.00	0.21	0.000	0.21	0.000	0.00	0.000	0.000	0.54
Maximum	8.5	20.3	14.4	0.39	1.30	0.024	1.30	0.000	0.98	0.018	0.018	2.10
Count	36	36	36	12	36	36	36	36	36	35	35	36
Confidence Level (95%)	0.1	2.2	0.5	0.10	0.07	0.002	0.07	0.000	0.07	0.002	0.002	0.14

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	7.1	11.3	180.8	180.0	0.2	0.9	1.3	354	18.1	2	0.8	ND
Standard Error	1.2	0.7	4.8	4.9	0.1	0.4	0.3	14	1.5	1	0.1	ND
Median	6.5	12.1	180.0	180.0	0.0	0.0	0.5	326	16.0	0	0.7	ND
Mode	12.0	Multi	180.0	180.0	0.0	0.0	Multi	Multi	12.0	0	0.7	ND
Standard Deviation	4.0	2.2	16.8	17.0	0.4	1.3	1.8	85	8.8	4	0.3	ND
Sample Variance	16.3	4.7	281.1	290.7	0.2	1.7	3.4	7279	78.3	20	0.1	ND
Range	10.5	7.1	60.0	61.7	1.1	3.8	7.1	404	44.0	15	0.7	ND
Minimum	1.5	5.3	160.0	157.1	0.0	0.0	0.0	291	12.0	0	0.5	ND
Maximum	12.0	12.4	220.0	218.8	1.1	3.8	7.1	695	56.0	15	1.2	ND
Count	12	10	12	12	12	12	36	36	36	12	4	0
Confidence Level (95%)	2.6	1.5	10.7	10.8	0.3	0.8	0.6	29	3.0	3	0.5	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

SOUTH SHORE - SITE 4
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	35.58	14.00	0.0	1.3	1.8	0.8	0.6	4.9	0.0	3.4	0.0	ND
Standard Error	0.60	0.39	0.0	0.4	1.2	0.4	0.6	2.8	0.0	1.1	0.0	ND
Median	35.00	14.00	0.0	1.4	0.0	0.0	0.0	0.0	0.0	4.2	0.0	ND
Mode	34.00	14.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	2.07	1.35	0.1	1.2	4.1	1.3	1.9	9.8	0.0	3.0	0.0	ND
Sample Variance	4.27	1.82	0.0	1.5	16.8	1.6	3.7	95.5	0.0	9.1	0.0	ND
Range	6.00	4.00	0.5	4.4	11.0	3.9	6.7	29.0	0.0	7.4	0.0	ND
Minimum	33.00	12.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	39.00	16.00	0.5	4.4	11.0	3.9	6.7	29.0	0.0	7.4	0.0	ND
Count	12	12	12	12	12	12	12	12	10	8	12	0
Confidence Level (95%)	1.31	0.86	0.1	0.8	2.6	0.8	1.2	6.2	0.0	2.5	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	146	ND	ND	ND	26.1	23.6	2.4	ND
Standard Error	3	ND	ND	ND	0.3	0.3	0.1	ND
Median	140	ND	ND	ND	26.0	23.0	2.3	ND
Mode	140	ND	ND	ND	24.0	23.0	Multi	ND
Standard Deviation	10	ND	ND	ND	1.9	1.6	0.4	ND
Sample Variance	99	ND	ND	ND	3.8	2.5	0.2	ND
Range	30	ND	ND	ND	8.0	6.0	1.5	ND
Minimum	130	ND	ND	ND	24.0	22.0	2.0	ND
Maximum	160	ND	ND	ND	32.0	28.0	3.5	ND
Count	12	0	0	0	36	35	35	0
Confidence Level (95%)	6	ND	ND	ND	0.7	0.5	0.1	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

SOUTH SHORE - SITE 5
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.2	13.2	10.9	ND	0.55	0.008	0.56	0.004	0.16	0.011	ND	1.32
Standard Error	0.0	1.1	0.3	ND	0.04	0.001	0.04	0.002	0.03	0.002	ND	0.07
Median	8.2	16.0	11.3	ND	0.52	0.009	0.54	0.000	0.22	0.008	ND	1.20
Mode	8.2	Multi	Multi	ND	Multi	0.000	Multi	0.000	0.00	0.000	ND	Multi
Standard Deviation	0.2	6.5	1.7	ND	0.25	0.009	0.25	0.010	0.16	0.010	ND	0.44
Sample Variance	0.0	41.7	2.8	ND	0.06	0.000	0.06	0.000	0.03	0.000	ND	0.19
Range	0.8	19.1	5.7	ND	1.17	0.042	1.17	0.034	0.51	0.043	ND	2.04
Minimum	7.7	1.5	8.5	ND	0.23	0.000	0.23	0.000	0.00	0.000	ND	0.46
Maximum	8.5	20.6	14.2	ND	1.40	0.042	1.40	0.034	0.51	0.043	ND	2.50
Count	36	36	36	0	36	36	36	36	36	36	0	36
Confidence Level (95%)	0.1	2.2	0.6	ND	0.09	0.003	0.09	0.003	0.06	0.003	ND	0.15

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	5.4	9.5	212.5	211.2	0.2	1.3	1.4	367	25.4	2	0.6	ND
Standard Error	1.0	0.6	11.5	11.6	0.1	0.3	0.2	10	2.0	1	0.1	ND
Median	4.5	10.5	195.0	193.5	0.0	1.4	0.8	347	22.5	0	0.5	ND
Mode	11.0	Multi	180.0	Multi	0.0	0.0	0.2	331	Multi	0	0.5	ND
Standard Deviation	3.6	2.0	39.8	40.0	0.4	1.2	1.4	57	12.2	2	0.1	ND
Sample Variance	12.6	4.1	1584.1	1603.8	0.2	1.4	2.0	3266	148.7	4	0.0	ND
Range	9.6	5.4	120.0	119.7	1.2	4.3	4.7	227	40.0	5	0.2	ND
Minimum	1.4	5.6	160.0	158.6	0.0	0.0	0.0	298	12.0	0	0.5	ND
Maximum	11.0	11.0	280.0	278.3	1.2	4.3	4.7	525	52.0	5	0.7	ND
Count	12	10	12	12	12	12	36	36	36	12	5	0
Confidence Level (95%)	2.3	1.5	25.3	25.4	0.3	0.7	0.5	19	4.1	1	0.2	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

SOUTH SHORE - SITE 5
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	37.00	14.75	0.1	1.4	0.6	1.2	0.0	3.2	0.0	3.3	0.0	ND
Standard Error	0.79	0.51	0.1	0.3	0.6	0.3	0.0	2.3	0.0	1.1	0.0	ND
Median	36.50	14.00	0.0	1.6	0.0	1.1	0.0	0.0	0.0	3.8	0.0	ND
Mode	Multi	14.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	2.73	1.76	0.2	0.9	2.2	1.1	0.0	8.0	0.0	3.3	0.0	ND
Sample Variance	7.45	3.11	0.0	0.8	4.9	1.2	0.0	63.6	0.0	11.0	0.0	ND
Range	8.00	6.00	0.6	2.7	7.7	3.1	0.0	26.0	0.0	7.7	0.0	ND
Minimum	34.00	12.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	42.00	18.00	0.6	2.7	7.7	3.1	0.0	26.0	0.0	7.7	0.0	ND
Count	12	12	12	12	12	11	12	12	10	9	12	0
Confidence Level (95%)	1.73	1.12	0.1	0.6	1.4	0.7	0.0	5.1	0.0	2.5	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	154	ND	ND	ND	27.0	24.5	2.6	ND
Standard Error	4	ND	ND	ND	0.4	0.3	0.1	ND
Median	150	ND	ND	ND	26.0	24.0	2.4	ND
Mode	150	ND	ND	ND	26.0	23.0	Multi	ND
Standard Deviation	14	ND	ND	ND	2.2	1.8	0.5	ND
Sample Variance	190	ND	ND	ND	5.1	3.3	0.3	ND
Range	40	ND	ND	ND	8.0	6.0	2.1	ND
Minimum	140	ND	ND	ND	24.0	22.0	1.9	ND
Maximum	180	ND	ND	ND	32.0	28.0	4.0	ND
Count	12	0	0	0	36	36	36	0
Confidence Level (95%)	9	ND	ND	ND	0.8	0.6	0.2	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

SOUTH SHORE - SITE 6
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.3	12.8	11.1	ND	0.33	0.002	0.34	0.002	0.07	0.003	ND	1.24
Standard Error	0.0	1.1	0.3	ND	0.02	0.001	0.02	0.001	0.02	0.001	ND	0.06
Median	8.3	15.2	11.2	ND	0.30	0.000	0.30	0.000	0.00	0.000	ND	1.10
Mode	8.4	18.0	Multi	ND	0.29	0.000	Multi	0.000	0.00	0.000	ND	Multi
Standard Deviation	0.2	6.4	1.6	ND	0.11	0.004	0.11	0.008	0.12	0.005	ND	0.39
Sample Variance	0.0	41.3	2.6	ND	0.01	0.000	0.01	0.000	0.01	0.000	ND	0.15
Range	0.9	19.0	5.7	ND	0.40	0.011	0.41	0.045	0.37	0.018	ND	1.46
Minimum	7.6	1.3	8.7	ND	0.21	0.000	0.21	0.000	0.00	0.000	ND	0.64
Maximum	8.5	20.3	14.4	ND	0.61	0.011	0.62	0.045	0.37	0.018	ND	2.10
Count	36	36	36	0	36	36	36	36	36	36	0	36
Confidence Level (95%)	0.1	2.2	0.5	ND	0.04	0.001	0.04	0.003	0.04	0.002	ND	0.13

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	7.8	11.6	185.8	185.2	0.0	0.6	1.0	319	15.4	1	0.8	ND
Standard Error	1.3	0.9	8.8	8.7	0.0	0.3	0.2	7	1.0	1	0.1	ND
Median	6.8	12.8	180.0	180.0	0.0	0.0	0.4	312	13.0	0	0.8	ND
Mode	Multi	Multi	180.0	180.0	0.0	0.0	0.3	297	12.0	0	Multi	ND
Standard Deviation	4.6	2.9	30.6	30.1	0.0	1.2	1.5	40	5.8	2	0.1	ND
Sample Variance	21.6	8.5	935.6	906.7	0.0	1.4	2.2	1626	33.9	6	0.0	ND
Range	13.5	9.5	120.0	117.0	0.0	3.0	5.4	240	24.0	7	0.1	ND
Minimum	1.5	5.6	140.0	140.0	0.0	0.0	0.0	291	10.0	0	0.7	ND
Maximum	15.0	15.1	260.0	257.0	0.0	3.0	5.4	531	34.0	7	0.8	ND
Count	12	10	12	12	12	12	36	36	36	12	2	0
Confidence Level (95%)	3.0	2.1	19.4	19.1	0.0	0.8	0.5	14	2.0	2	0.9	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

SOUTH SHORE - SITE 6
LAKE MICHIGAN
WATER QUALITY DATA - 2013

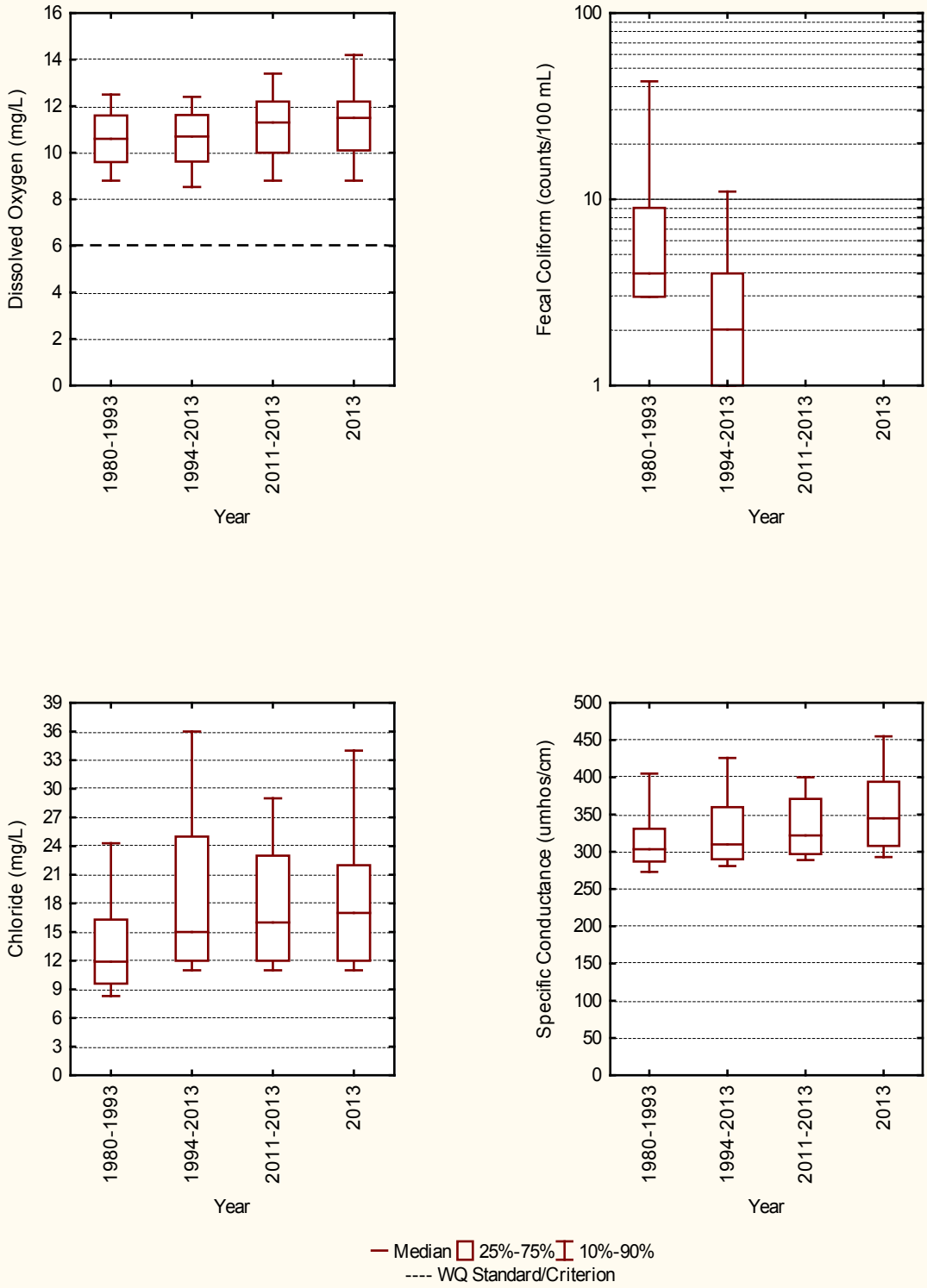
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	35.25	13.67	0.1	1.5	1.0	2.3	0.0	2.1	0.0	3.8	0.0	ND
Standard Error	0.51	0.36	0.1	0.3	0.7	0.9	0.0	1.4	0.0	1.0	0.0	ND
Median	35.00	13.50	0.0	1.4	0.0	1.6	0.0	0.0	0.0	4.8	0.0	ND
Mode	34.00	13.00	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	1.76	1.23	0.2	0.9	2.4	3.0	0.0	4.9	0.0	3.5	0.0	ND
Sample Variance	3.11	1.52	0.1	0.8	5.9	8.8	0.0	24.1	0.0	12.6	0.0	ND
Range	6.00	4.00	0.8	3.2	6.3	10.0	0.0	14.0	0.0	8.5	0.0	ND
Minimum	33.00	12.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	39.00	16.00	0.8	3.2	6.3	10.0	0.0	14.0	0.0	8.5	0.0	ND
Count	12	12	12	12	12	12	11	12	11	12	12	0
Confidence Level (95%)	1.12	0.78	0.1	0.6	1.5	1.9	0.0	3.1	0.0	2.3	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	143	ND	ND	ND	25.5	23.2	2.3	ND
Standard Error	2	ND	ND	ND	0.3	0.2	0.0	ND
Median	140	ND	ND	ND	25.0	23.0	2.2	ND
Mode	140	ND	ND	ND	25.0	22.0	2.1	ND
Standard Deviation	8	ND	ND	ND	1.5	1.4	0.3	ND
Sample Variance	57	ND	ND	ND	2.3	2.1	0.1	ND
Range	30	ND	ND	ND	6.0	7.0	1.0	ND
Minimum	130	ND	ND	ND	22.0	19.0	1.9	ND
Maximum	160	ND	ND	ND	28.0	26.0	2.9	ND
Count	12	0	0	0	36	36	36	0
Confidence Level (95%)	5	ND	ND	ND	0.5	0.5	0.1	ND

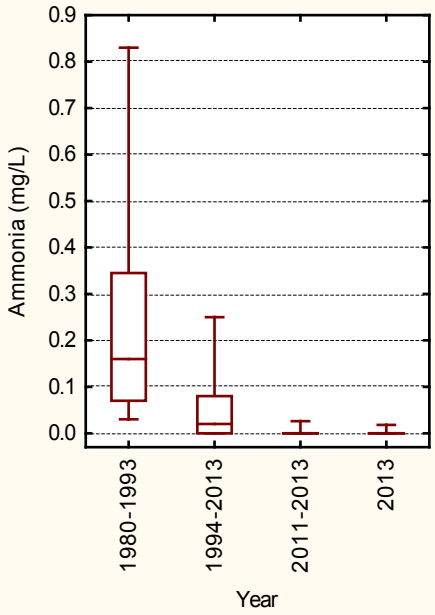
ND = No Data **Multi = Multimodal**

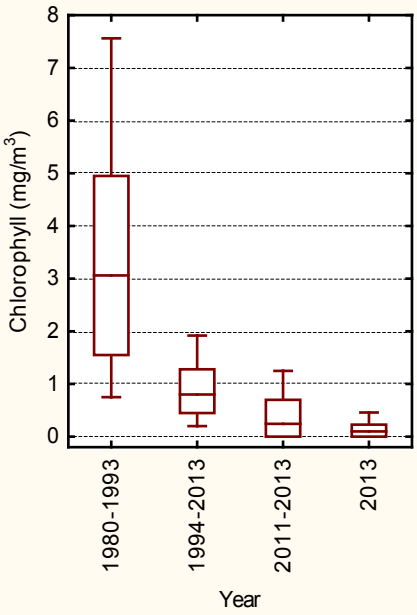
Provisional MMSD Water Quality Data

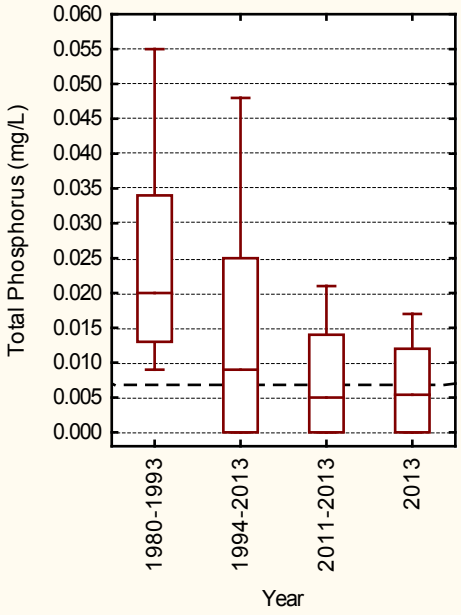
MMSD Water Quality Monitoring Program Data
South Shore, Site SS-07

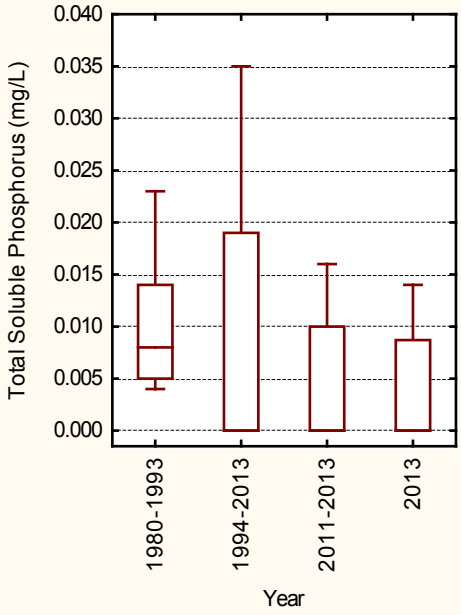


MMSD Water Quality Monitoring Program Data
South Shore, Site SS-07



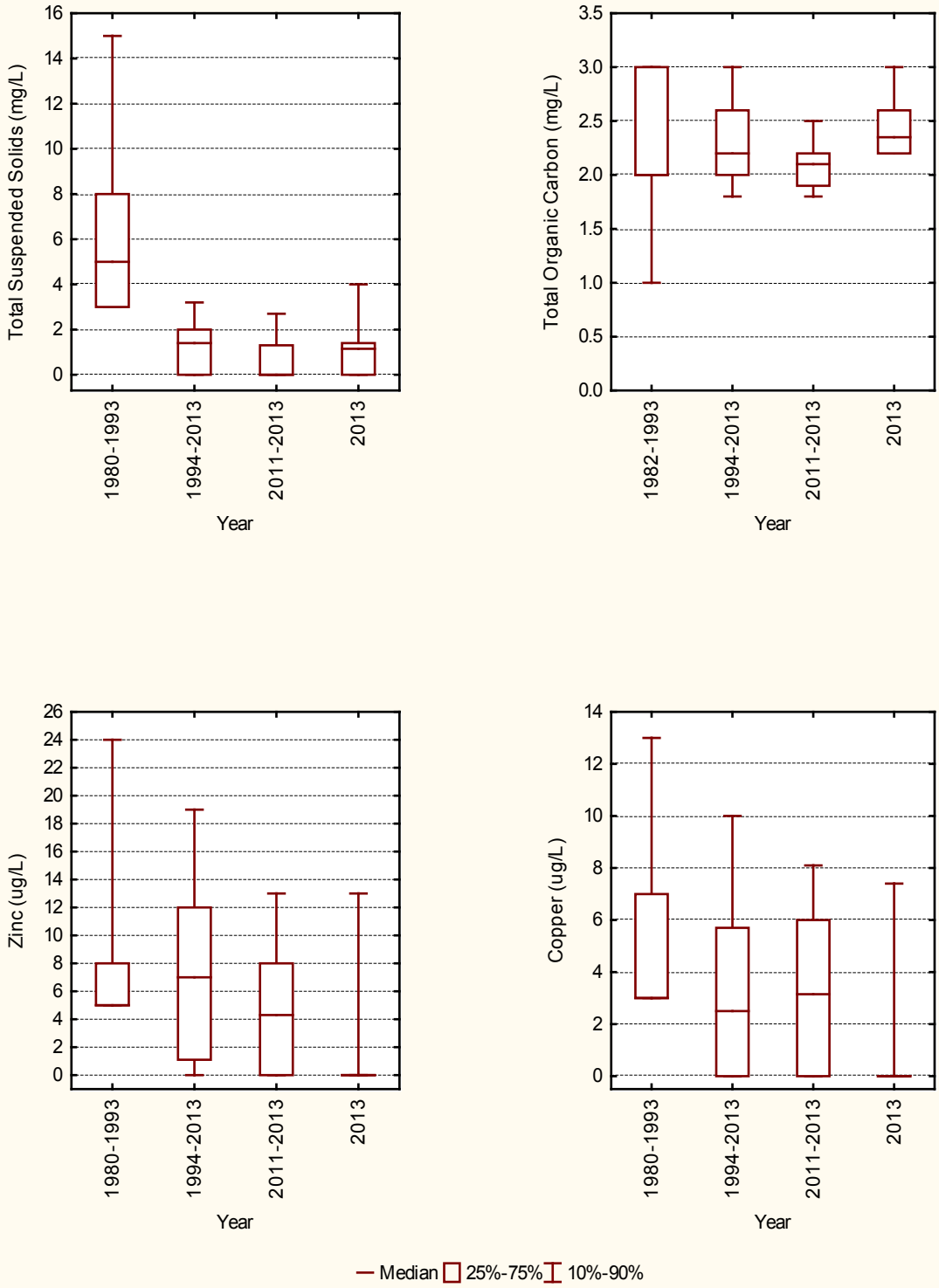




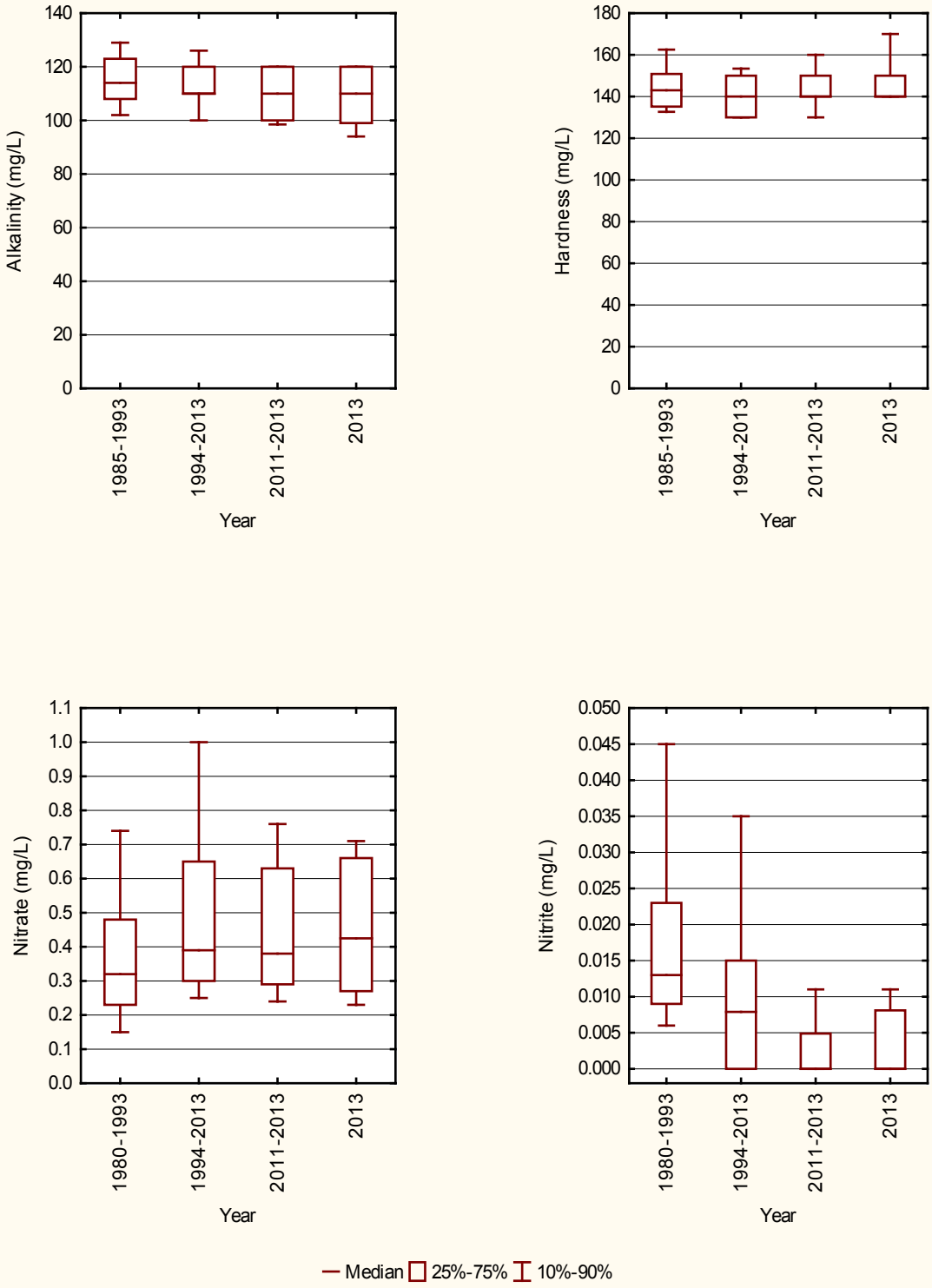


— Median ☐ 25%-75% ⌶ 10%-90%
---- WQ Standard/Criterion

MMSD Water Quality Monitoring Program Data
South Shore, Site SS-07



MMSD Water Quality Monitoring Program Data
South Shore, Site SS-07



SOUTH SHORE - SITE 7
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.2	12.2	11.5	0.15	0.47	0.003	0.48	0.004	0.12	0.007	0.005	1.35
Standard Error	0.0	0.9	0.2	0.04	0.03	0.001	0.03	0.001	0.02	0.001	0.001	0.07
Median	8.2	12.9	11.5	0.10	0.43	0.000	0.43	0.000	0.00	0.005	0.000	1.40
Mode	8.2	19.1	11.5	0.00	0.27	0.000	Multi	0.000	0.00	0.000	0.000	Multi
Standard Deviation	0.3	6.6	1.8	0.20	0.22	0.005	0.22	0.009	0.14	0.008	0.007	0.51
Sample Variance	0.1	43.0	3.3	0.04	0.05	0.000	0.05	0.000	0.02	0.000	0.000	0.26
Range	1.2	20.0	8.1	0.78	1.07	0.019	1.07	0.033	0.45	0.032	0.028	1.90
Minimum	7.6	1.4	7.9	0.00	0.13	0.000	0.13	0.000	0.00	0.000	0.000	0.50
Maximum	8.8	21.4	16.0	0.78	1.20	0.019	1.20	0.033	0.45	0.032	0.028	2.40
Count	54	54	54	29	54	54	54	54	54	53	35	54
Confidence Level (95%)	0.1	1.8	0.5	0.08	0.06	0.001	0.06	0.002	0.04	0.002	0.002	0.14

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	7.4	10.5	205.0	203.7	0.1	1.3	1.5	360	19.9	2	0.7	ND
Standard Error	0.9	0.7	9.0	8.7	0.1	0.5	0.3	9	1.3	1	0.1	ND
Median	6.1	11.4	200.0	198.9	0.0	1.2	0.6	345	17.0	0	0.7	ND
Mode	12.0	11.3	Multi	Multi	0.0	0.0	Multi	297	11.0	0	Multi	ND
Standard Deviation	3.9	2.8	31.2	30.2	0.4	1.8	2.0	67	9.7	3	0.2	ND
Sample Variance	15.1	7.7	972.7	914.4	0.1	3.1	4.2	4541	93.6	10	0.1	ND
Range	11.0	9.5	100.0	94.4	1.3	5.6	8.1	284	40.0	10	0.7	ND
Minimum	1.0	2.8	160.0	160.0	0.0	0.0	0.0	280	11.0	0	0.3	ND
Maximum	12.0	12.3	260.0	254.4	1.3	5.6	8.1	564	51.0	10	1.0	ND
Count	18	16	12	12	12	12	54	54	54	18	7	0
Confidence Level (95%)	1.9	1.5	19.8	19.2	0.2	1.1	0.6	18	2.6	2	0.2	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

SOUTH SHORE - SITE 7
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	35.89	14.28	0.1	1.3	1.3	1.0	0.0	2.2	0.0	2.5	0.0	ND
Standard Error	0.54	0.32	0.1	0.1	0.7	0.2	0.0	1.3	0.0	0.8	0.0	ND
Median	35.00	14.00	0.0	1.5	0.0	1.2	0.0	0.0	0.0	0.0	0.0	ND
Mode	35.00	13.00	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	2.27	1.36	0.3	0.6	3.1	1.0	0.0	5.3	0.0	3.4	0.0	ND
Sample Variance	5.16	1.86	0.1	0.4	9.8	1.0	0.0	28.2	0.0	11.5	0.0	ND
Range	9.00	4.00	0.8	2.1	9.8	2.8	0.0	18.0	0.0	7.7	0.0	ND
Minimum	33.00	13.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	42.00	17.00	0.8	2.1	9.8	2.8	0.0	18.0	0.0	7.7	0.0	ND
Count	18	18	18	18	18	18	16	18	18	16	18	0
Confidence Level (95%)	1.13	0.68	0.1	0.3	1.6	0.5	0.0	2.6	0.0	1.8	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	147	108	ND	ND	26.6	24.1	2.5	ND
Standard Error	3	3	ND	ND	0.4	0.3	0.1	ND
Median	140	110	ND	ND	26.0	24.0	2.4	ND
Mode	140	120	ND	ND	26.0	Multi	2.2	ND
Standard Deviation	12	11	ND	ND	2.2	2.0	0.4	ND
Sample Variance	139	130	ND	ND	4.9	3.8	0.2	ND
Range	40	38	ND	ND	8.0	6.0	1.4	ND
Minimum	140	92	ND	ND	24.0	22.0	2.1	ND
Maximum	180	130	ND	ND	32.0	28.0	3.5	ND
Count	18	18	0	0	36	36	36	0
Confidence Level (95%)	6	6	ND	ND	0.7	0.7	0.1	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

SOUTH SHORE - SITE 8
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.1	13.2	10.8	ND	0.60	0.006	0.61	0.008	0.19	0.012	ND	1.36
Standard Error	0.0	1.0	0.3	ND	0.04	0.001	0.04	0.003	0.02	0.002	ND	0.09
Median	8.2	15.8	11.2	ND	0.65	0.004	0.65	0.000	0.24	0.013	ND	1.30
Mode	8.2	Multi	11.3	ND	0.74	0.000	Multi	0.000	0.00	0.000	ND	1.40
Standard Deviation	0.2	6.3	1.6	ND	0.25	0.006	0.26	0.016	0.14	0.012	ND	0.55
Sample Variance	0.1	39.2	2.5	ND	0.06	0.000	0.07	0.000	0.02	0.000	ND	0.30
Range	0.8	19.0	6.1	ND	1.16	0.018	1.26	0.062	0.48	0.069	ND	2.16
Minimum	7.6	1.5	8.2	ND	0.24	0.000	0.24	0.000	0.00	0.000	ND	0.54
Maximum	8.4	20.5	14.3	ND	1.40	0.018	1.50	0.062	0.48	0.069	ND	2.70
Count	36	36	36	0	36	36	36	36	36	36	0	36
Confidence Level (95%)	0.1	2.1	0.5	ND	0.09	0.002	0.09	0.006	0.05	0.004	ND	0.19

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	5.9	9.3	215.0	213.6	0.3	1.4	2.2	382	25.8	4	0.6	ND
Standard Error	1.1	0.8	10.2	10.1	0.2	0.6	0.4	12	2.1	1	0.1	ND
Median	4.6	10.5	215.0	211.5	0.0	0.5	1.0	361	25.0	3	0.7	ND
Mode	10.0	Multi	220.0	220.0	0.0	0.0	Multi	Multi	26.0	3	0.5	ND
Standard Deviation	4.0	2.5	35.3	35.0	0.6	2.0	2.5	71	12.4	3	0.2	ND
Sample Variance	15.7	6.4	1245.5	1224.2	0.4	3.9	6.4	5027	153.3	8	0.0	ND
Range	10.1	6.5	120.0	116.8	1.5	6.0	7.8	261	43.0	8	0.4	ND
Minimum	0.9	4.3	160.0	158.8	0.0	0.0	0.0	297	11.0	0	0.5	ND
Maximum	11.0	10.8	280.0	275.6	1.5	6.0	7.8	558	54.0	8	0.9	ND
Count	12	10	12	12	12	12	36	36	36	12	9	0
Confidence Level (95%)	2.5	1.8	22.4	22.2	0.4	1.3	0.9	24	4.2	2	0.1	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

SOUTH SHORE - SITE 8
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	37.08	15.00	0.1	1.0	0.5	1.4	0.0	1.0	0.0	0.6	0.0	ND
Standard Error	0.97	0.56	0.1	0.2	0.5	0.5	0.0	1.0	0.0	0.6	0.0	ND
Median	36.00	14.50	0.0	1.3	0.0	1.1	0.0	0.0	0.0	0.0	0.0	ND
Mode	Multi	Multi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	3.37	1.95	0.3	0.7	1.7	1.6	0.0	3.5	0.0	1.7	0.0	ND
Sample Variance	11.36	3.82	0.1	0.5	3.0	2.5	0.0	12.0	0.0	2.8	0.0	ND
Range	10.00	6.00	0.9	1.7	6.0	4.3	0.0	12.0	0.0	5.0	0.0	ND
Minimum	34.00	13.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	44.00	19.00	0.9	1.7	6.0	4.3	0.0	12.0	0.0	5.0	0.0	ND
Count	12	12	12	12	12	12	12	12	12	9	12	0
Confidence Level (95%)	2.14	1.24	0.2	0.5	1.1	1.0	0.0	2.2	0.0	1.3	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	154	ND	ND	ND	27.4	24.7	2.7	ND
Standard Error	4	ND	ND	ND	0.4	0.4	0.1	ND
Median	150	ND	ND	ND	27.0	24.0	2.5	ND
Mode	140	ND	ND	ND	26.0	24.0	Multi	ND
Standard Deviation	14	ND	ND	ND	2.6	2.3	0.6	ND
Sample Variance	208	ND	ND	ND	6.8	5.1	0.3	ND
Range	40	ND	ND	ND	9.0	7.0	2.1	ND
Minimum	140	ND	ND	ND	24.0	22.0	2.1	ND
Maximum	180	ND	ND	ND	33.0	29.0	4.2	ND
Count	12	0	0	0	36	36	36	0
Confidence Level (95%)	9	ND	ND	ND	0.9	0.8	0.2	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

SOUTH SHORE - SITE 9
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.3	12.7	11.1	ND	0.39	0.002	0.39	0.002	0.08	0.005	ND	1.28
Standard Error	0.0	1.0	0.2	ND	0.04	0.001	0.04	0.002	0.02	0.002	ND	0.07
Median	8.3	14.7	11.4	ND	0.30	0.000	0.30	0.000	0.00	0.000	ND	1.20
Mode	8.4	Multi	9.0	ND	0.24	0.000	0.25	0.000	0.00	0.000	ND	1.60
Standard Deviation	0.2	6.3	1.5	ND	0.22	0.005	0.22	0.013	0.13	0.010	ND	0.41
Sample Variance	0.1	39.3	2.2	ND	0.05	0.000	0.05	0.000	0.02	0.000	ND	0.17
Range	0.9	19.0	5.4	ND	1.18	0.021	1.18	0.077	0.48	0.053	ND	1.49
Minimum	7.6	1.3	9.0	ND	0.22	0.000	0.22	0.000	0.00	0.000	ND	0.51
Maximum	8.5	20.3	14.4	ND	1.40	0.021	1.40	0.077	0.48	0.053	ND	2.00
Count	36	36	36	0	36	36	36	36	36	36	0	36
Confidence Level (95%)	0.1	2.1	0.5	ND	0.08	0.002	0.08	0.004	0.04	0.003	ND	0.14

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	7.8	11.3	183.3	182.4	0.1	1.0	1.0	333	16.4	0	0.5	ND
Standard Error	1.3	0.9	5.8	5.8	0.1	0.3	0.2	11	1.3	0	ND	ND
Median	6.9	12.9	185.0	184.0	0.0	1.0	0.3	314	13.0	0	0.5	ND
Mode	13.0	13.2	Multi	200.0	0.0	0.0	Multi	297	11.0	0	0.5	ND
Standard Deviation	4.5	3.0	20.2	19.9	0.3	1.1	1.5	68	7.8	1	ND	ND
Sample Variance	19.9	8.7	406.1	397.3	0.1	1.3	2.1	4645	61.0	1	ND	ND
Range	12.6	7.5	60.0	58.7	1.2	3.4	5.5	315	37.0	3	0.0	ND
Minimum	1.4	5.8	150.0	150.0	0.0	0.0	0.0	290	11.0	0	0.5	ND
Maximum	14.0	13.3	210.0	208.7	1.2	3.4	5.5	605	48.0	3	0.5	ND
Count	12	10	12	12	12	12	36	36	36	12	1	0
Confidence Level (95%)	2.8	2.1	12.8	12.7	0.2	0.7	0.5	23	2.6	1	ND	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

SOUTH SHORE - SITE 9
LAKE MICHIGAN
WATER QUALITY DATA - 2013

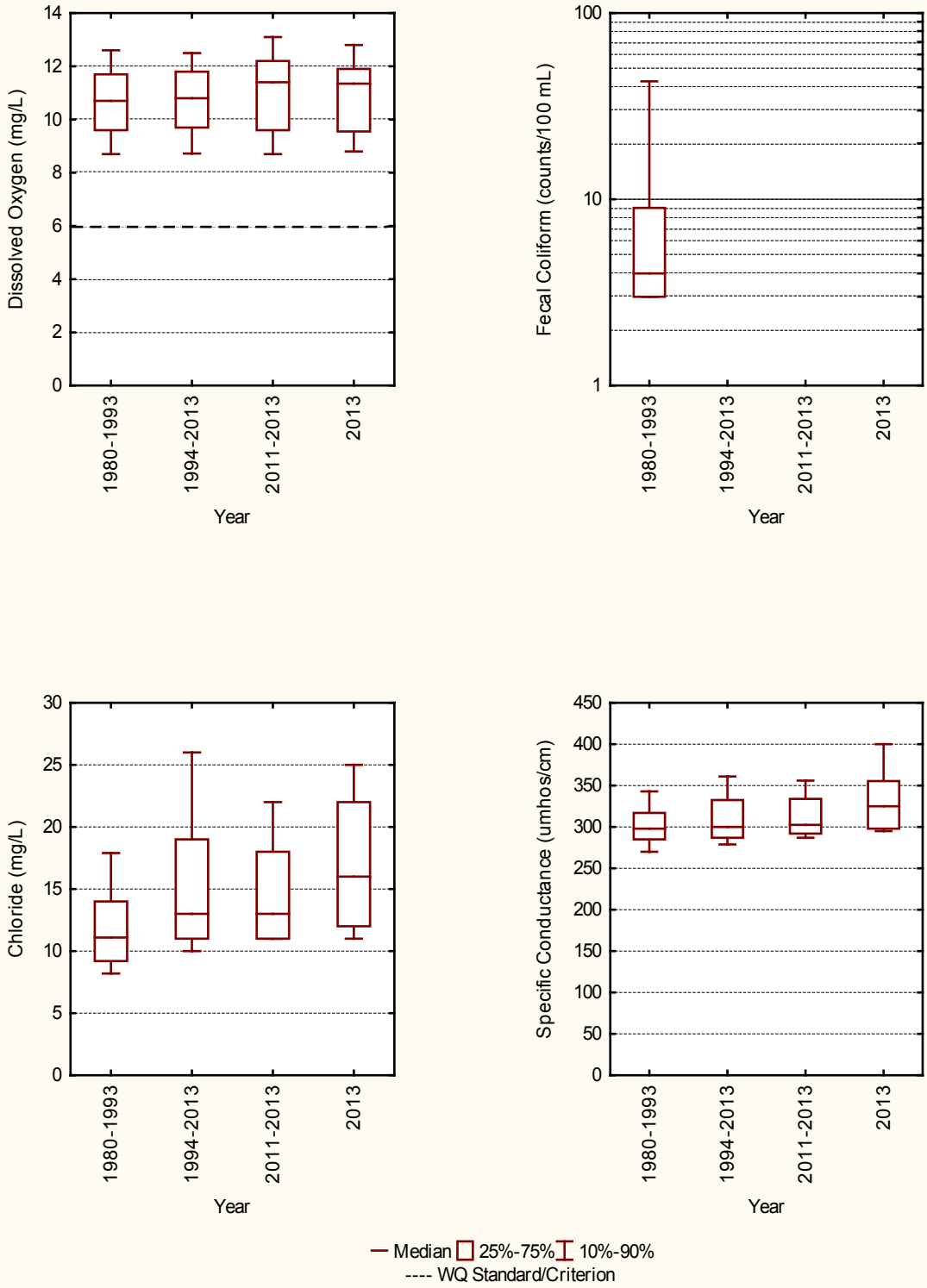
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	35.25	13.67	0.1	1.0	1.0	1.5	0.0	1.7	0.0	3.0	0.0	ND
Standard Error	0.49	0.36	0.1	0.2	1.0	0.5	0.0	1.2	0.0	1.0	0.0	ND
Median	35.00	13.50	0.0	1.3	0.0	0.7	0.0	0.0	0.0	3.7	0.0	ND
Mode	34.00	13.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	1.71	1.23	0.3	0.7	3.5	1.9	0.0	4.1	0.0	2.9	0.0	ND
Sample Variance	2.93	1.52	0.1	0.5	12.0	3.5	0.0	17.0	0.0	8.6	0.0	ND
Range	6.00	4.00	1.0	1.8	12.0	5.5	0.0	12.0	0.0	6.7	0.0	ND
Minimum	33.00	12.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	39.00	16.00	1.0	1.8	12.0	5.5	0.0	12.0	0.0	6.7	0.0	ND
Count	12	12	12	12	12	12	12	12	12	9	12	0
Confidence Level (95%)	1.09	0.78	0.2	0.5	2.2	1.2	0.0	2.6	0.0	2.2	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	145	ND	ND	ND	26.0	23.6	2.4	ND
Standard Error	2	ND	ND	ND	0.3	0.3	0.1	ND
Median	140	ND	ND	ND	25.0	23.0	2.2	ND
Mode	140	ND	ND	ND	25.0	Multi	2.1	ND
Standard Deviation	8	ND	ND	ND	1.7	1.6	0.3	ND
Sample Variance	64	ND	ND	ND	2.9	2.5	0.1	ND
Range	20	ND	ND	ND	6.0	6.0	1.2	ND
Minimum	140	ND	ND	ND	24.0	22.0	2.0	ND
Maximum	160	ND	ND	ND	30.0	28.0	3.2	ND
Count	12	0	0	0	36	36	36	0
Confidence Level (95%)	5	ND	ND	ND	0.6	0.5	0.1	ND

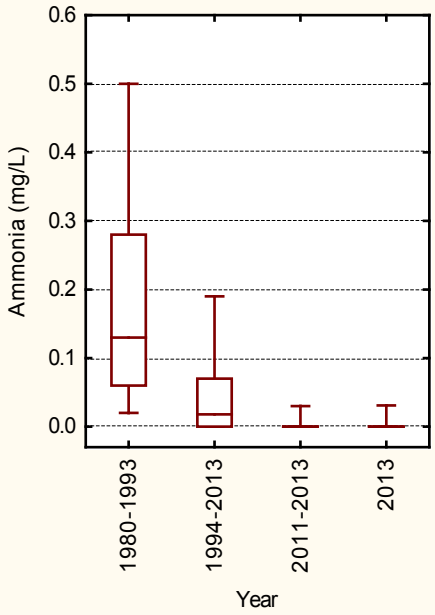
ND = No Data **Multi = Multimodal**

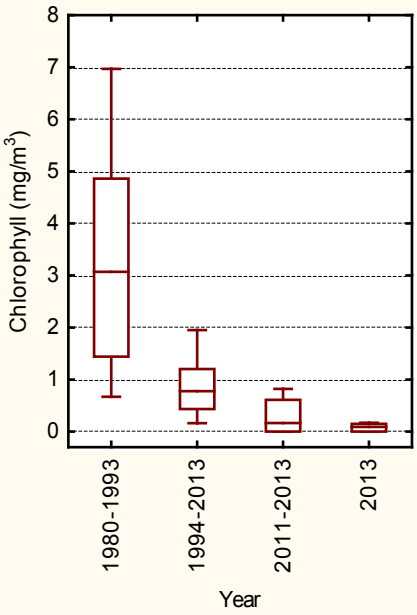
Provisional MMSD Water Quality Data

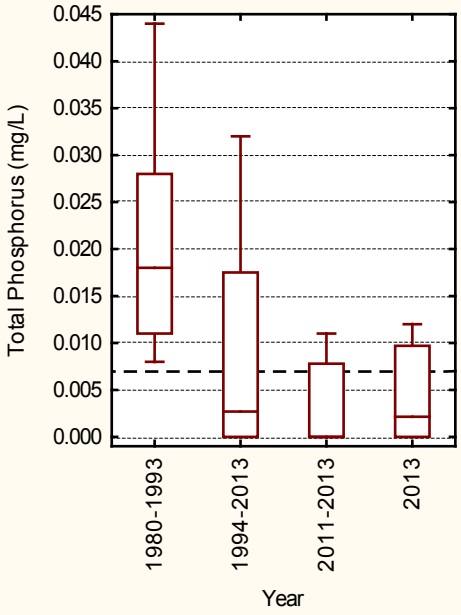
MMSD Water Quality Monitoring Program Data
South Shore, Site SS-10

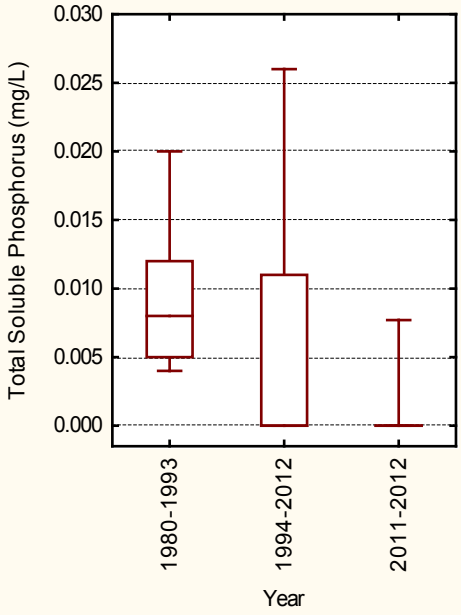


MMSD Water Quality Monitoring Program Data
South Shore, Site SS-10



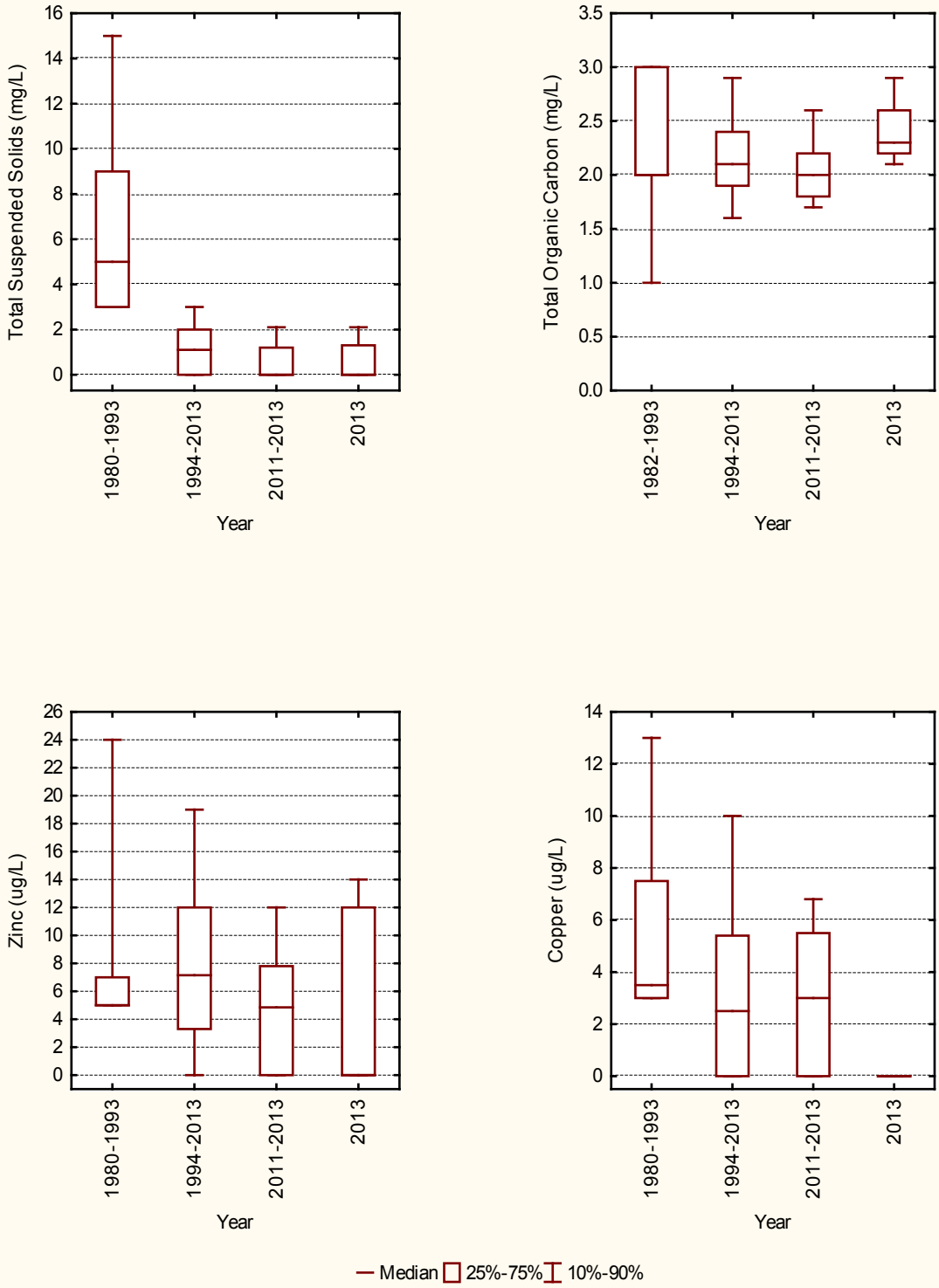




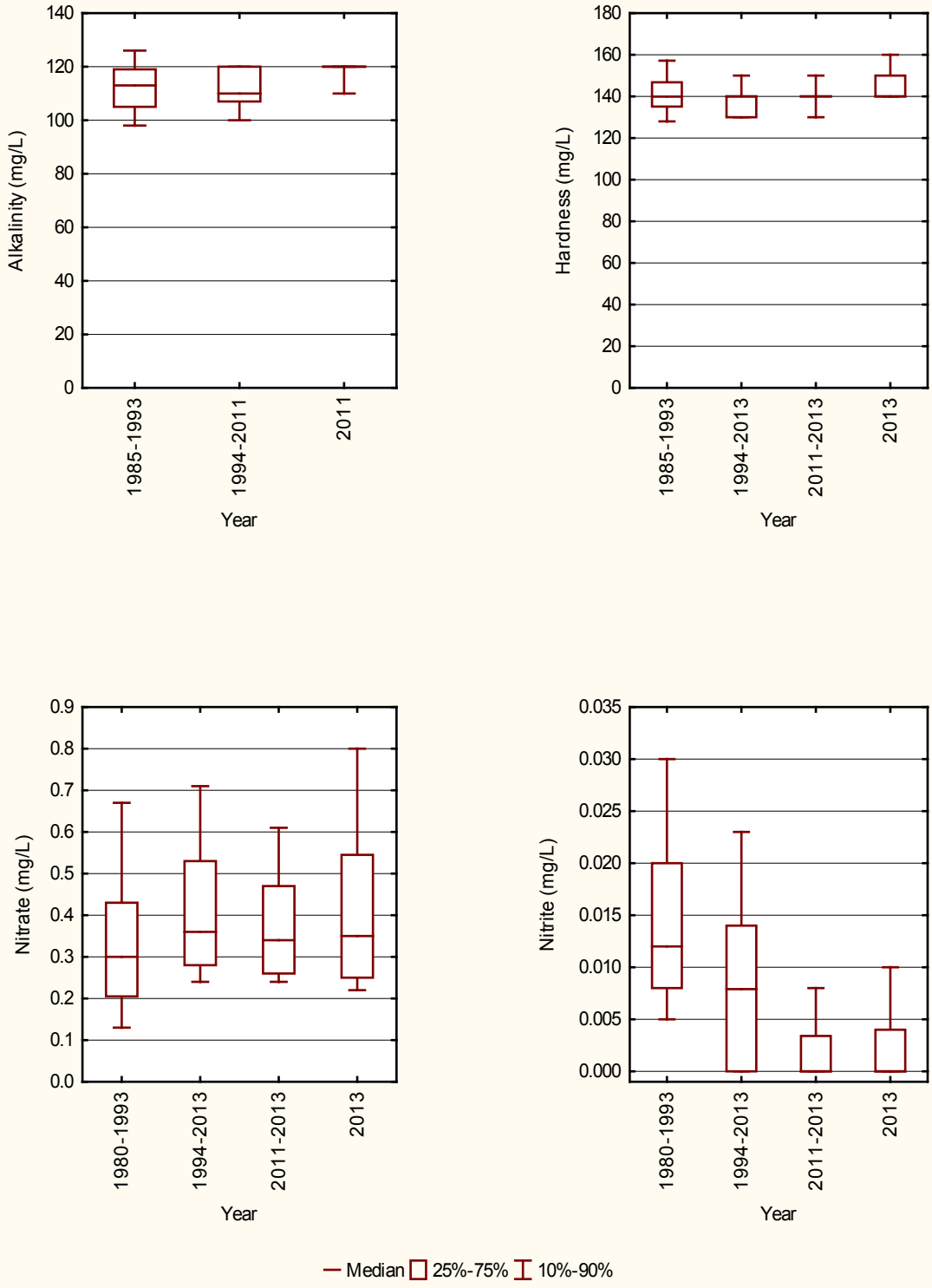


— Median ☐ 25%-75% ⌶ 10%-90%
---- WQ Standard/Criterion

MMSD Water Quality Monitoring Program Data
South Shore, Site SS-10



MMSD Water Quality Monitoring Program Data
South Shore, Site SS-10



SOUTH SHORE - SITE 10
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.3	13.0	11.0	0.14	0.43	0.002	0.43	0.008	0.10	0.005	ND	1.25
Standard Error	0.0	1.1	0.3	0.07	0.04	0.001	0.04	0.005	0.02	0.001	ND	0.08
Median	8.2	15.3	11.4	0.09	0.35	0.000	0.36	0.000	0.00	0.002	ND	1.20
Mode	8.1	19.2	11.5	0.00	Multi	0.000	Multi	0.000	0.00	0.000	ND	1.70
Standard Deviation	0.2	6.4	1.6	0.23	0.23	0.004	0.23	0.028	0.13	0.007	ND	0.47
Sample Variance	0.0	40.6	2.6	0.06	0.05	0.000	0.05	0.001	0.02	0.000	ND	0.22
Range	0.6	19.1	6.1	0.86	0.80	0.011	0.80	0.160	0.34	0.024	ND	1.44
Minimum	7.9	1.4	8.2	0.00	0.19	0.000	0.19	0.000	0.00	0.000	ND	0.56
Maximum	8.5	20.5	14.3	0.86	0.99	0.011	0.99	0.160	0.34	0.024	ND	2.00
Count	36	36	36	12	36	36	36	36	36	36	0	36
Confidence Level (95%)	0.1	2.2	0.5	0.15	0.08	0.001	0.08	0.009	0.05	0.002	ND	0.16

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	7.4	11.2	195.8	195.0	0.1	0.9	1.3	336	18.7	0	0.5	ND
Standard Error	1.3	0.2	10.8	10.8	0.1	0.4	0.3	8	1.6	0	ND	ND
Median	6.0	11.5	190.0	189.4	0.0	0.0	0.4	325	16.0	0	0.5	ND
Mode	12.0	Multi	Multi	Multi	0.0	0.0	Multi	306	Multi	0	0.5	ND
Standard Deviation	4.3	0.5	37.3	37.3	0.3	1.4	1.8	46	9.7	1	ND	ND
Sample Variance	18.2	0.3	1390.2	1389.6	0.1	2.0	3.1	2115	94.2	1	ND	ND
Range	10.4	1.8	130.0	131.2	1.1	4.7	5.4	160	36.0	3	0.0	ND
Minimum	1.6	10.0	140.0	138.8	0.0	0.0	0.0	290	11.0	0	0.5	ND
Maximum	12.0	11.8	270.0	270.0	1.1	4.7	5.4	450	47.0	3	0.5	ND
Count	11	10	12	12	12	12	36	36	36	12	1	0
Confidence Level (95%)	2.9	0.4	23.7	23.7	0.2	0.9	0.6	16	3.3	1	ND	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

SOUTH SHORE - SITE 10
LAKE MICHIGAN
WATER QUALITY DATA - 2013

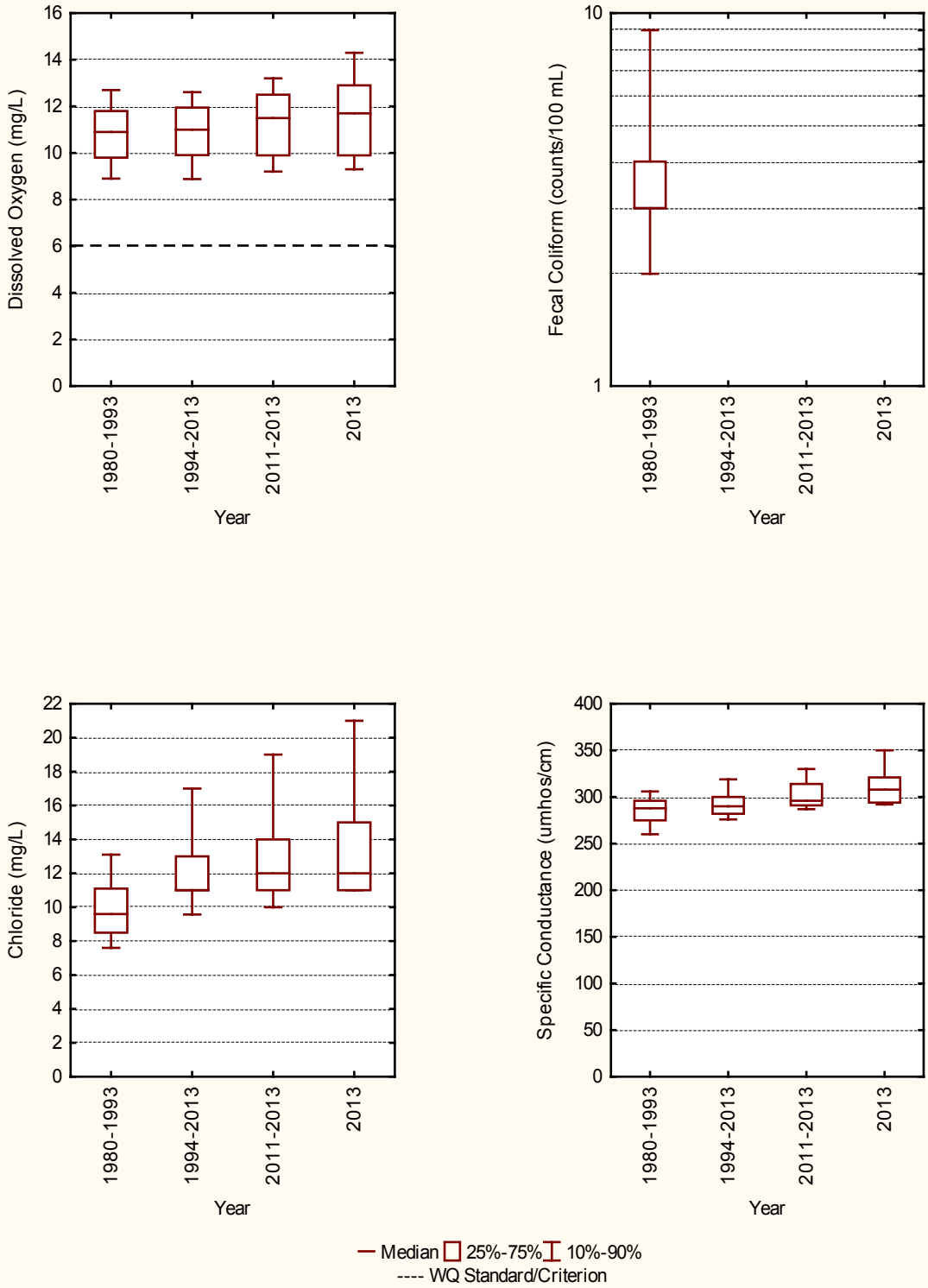
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	35.83	14.17	0.0	1.0	0.0	0.8	0.0	6.4	0.0	5.0	0.0	ND
Standard Error	0.69	0.44	0.0	0.3	0.0	0.3	0.0	2.7	0.0	0.9	0.0	ND
Median	35.00	14.00	0.0	1.3	0.0	0.5	0.0	0.0	0.0	5.5	0.0	ND
Mode	34.00	13.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	2.41	1.53	0.0	0.9	0.0	0.9	0.0	9.2	0.0	2.9	0.0	ND
Sample Variance	5.79	2.33	0.0	0.9	0.0	0.9	0.0	84.3	0.0	8.5	0.0	ND
Range	8.00	5.00	0.0	2.5	0.0	2.7	0.0	29.0	0.0	8.4	0.0	ND
Minimum	34.00	13.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	42.00	18.00	0.0	2.5	0.0	2.7	0.0	29.0	0.0	8.4	0.0	ND
Count	12	12	12	12	12	12	12	12	12	11	12	0
Confidence Level (95%)	1.53	0.97	0.0	0.6	0.0	0.6	0.0	5.8	0.0	2.0	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	148	ND	0.0	2.9	26.4	23.9	2.5	ND
Standard Error	4	ND	0.0	0.1	0.5	0.4	0.1	ND
Median	140	ND	0.0	2.9	26.0	23.0	2.3	ND
Mode	140	ND	0.0	Multi	25.0	23.0	2.2	ND
Standard Deviation	12	ND	0.0	0.4	2.9	2.5	0.5	ND
Sample Variance	148	ND	0.0	0.1	8.6	6.2	0.2	ND
Range	40	ND	0.0	1.1	16.0	14.0	1.7	ND
Minimum	140	ND	0.0	2.4	20.0	18.0	2.1	ND
Maximum	180	ND	0.0	3.5	36.0	32.0	3.8	ND
Count	12	0	11	11	36	36	36	0
Confidence Level (95%)	8	ND	0.0	0.3	1.0	0.8	0.2	ND

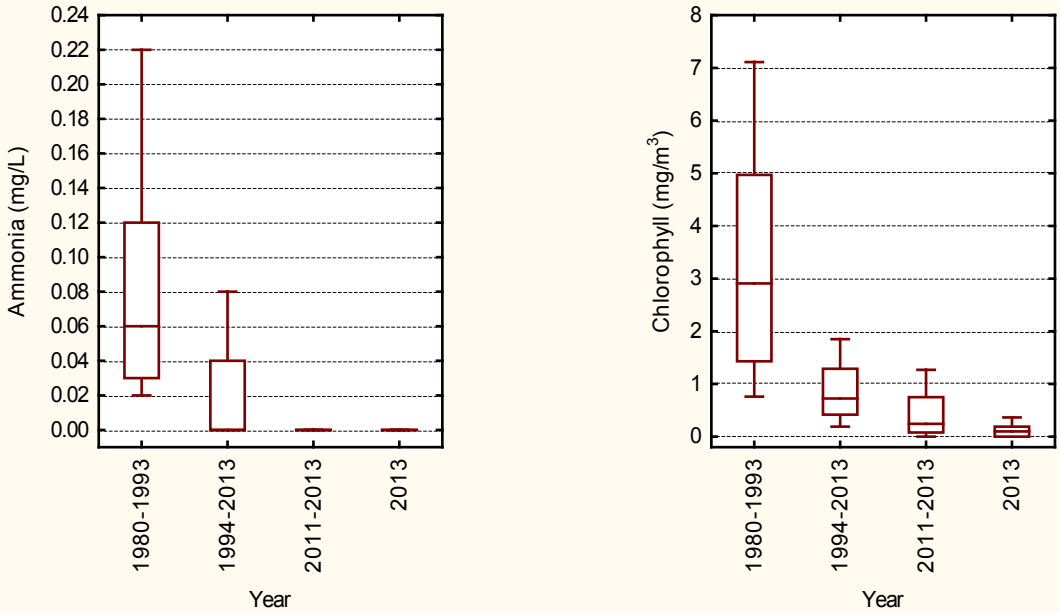
ND = No Data **Multi = Multimodal**

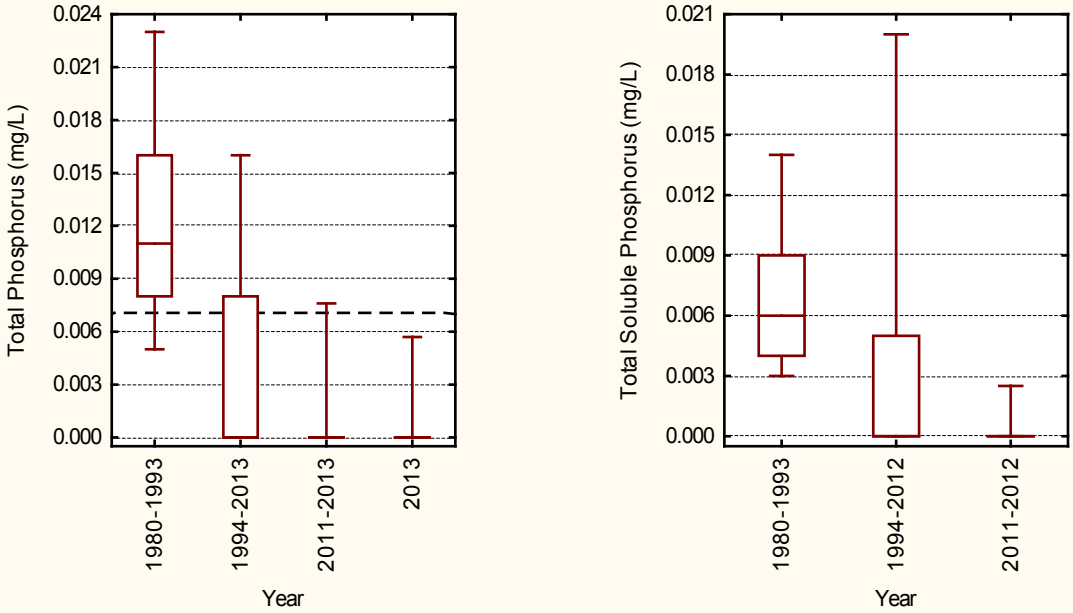
Provisional MMSD Water Quality Data

MMSD Water Quality Monitoring Program Data
South Shore, Site SS-11

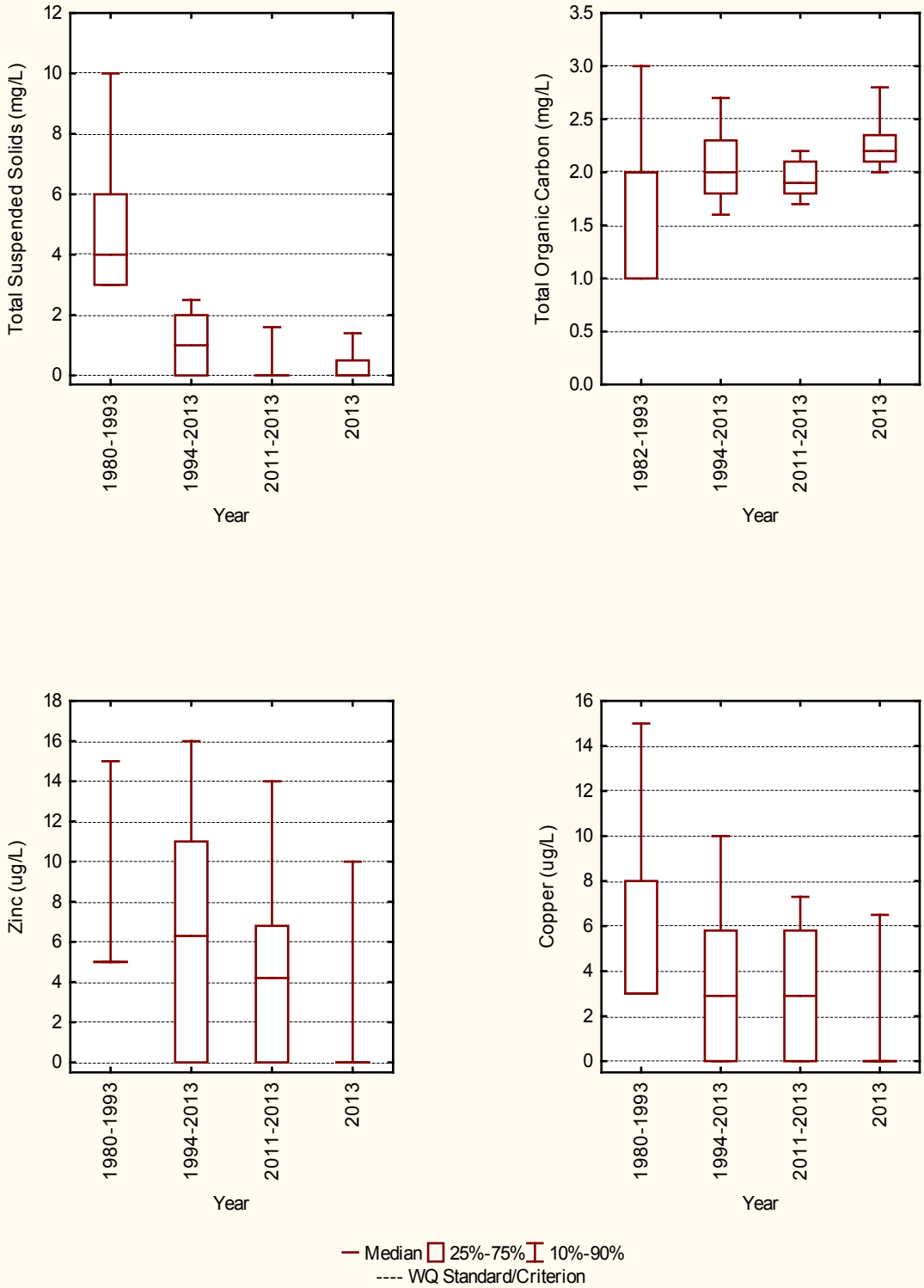


MMSD Water Quality Monitoring Program Data
South Shore, Site SS-11

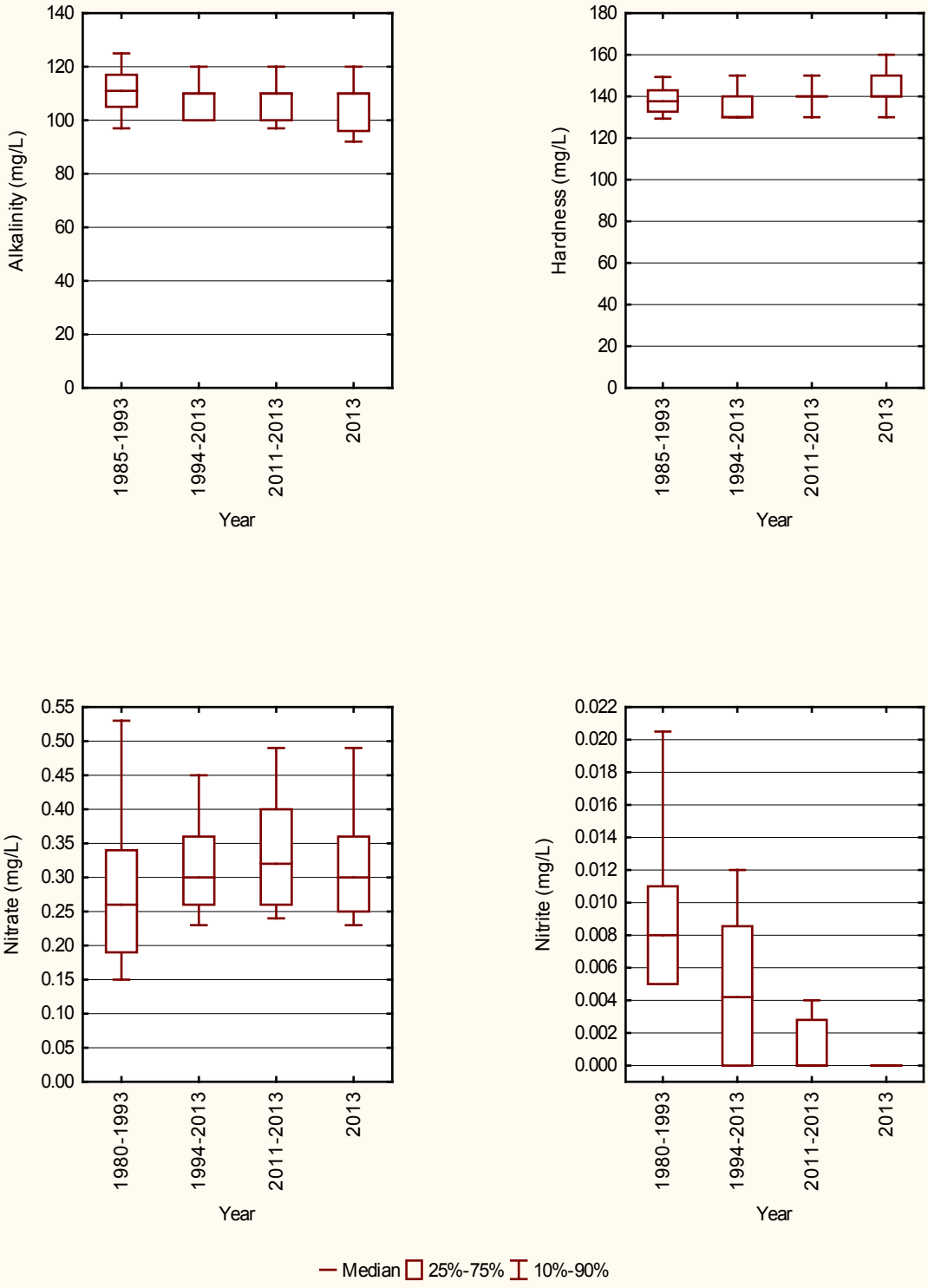




MMSD Water Quality Monitoring Program Data
South Shore, Site SS-11



MMSD Water Quality Monitoring Program Data
South Shore, Site SS-11



SOUTH SHORE - SITE 11
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.3	11.6	11.6	0.14	0.32	0.001	0.45	0.001	0.06	0.002	ND	1.33
Standard Error	0.0	0.9	0.2	0.03	0.01	0.000	0.13	0.001	0.02	0.001	ND	0.05
Median	8.3	11.7	11.7	0.10	0.30	0.000	0.30	0.000	0.00	0.000	ND	1.25
Mode	8.4	19.2	9.2	0.00	0.24	0.000	0.25	0.000	0.00	0.000	ND	Multi
Standard Deviation	0.2	6.7	1.7	0.14	0.10	0.002	0.94	0.005	0.12	0.004	ND	0.39
Sample Variance	0.0	44.4	2.8	0.02	0.01	0.000	0.88	0.000	0.01	0.000	ND	0.15
Range	0.6	19.2	5.3	0.47	0.33	0.011	7.00	0.027	0.42	0.022	ND	1.47
Minimum	7.9	1.1	9.2	0.00	0.20	0.000	0.20	0.000	0.00	0.000	ND	0.63
Maximum	8.5	20.3	14.5	0.47	0.53	0.011	7.20	0.027	0.42	0.022	ND	2.10
Count	54	54	54	30	53	54	54	54	54	54	0	54
Confidence Level (95%)	0.0	1.8	0.5	0.05	0.03	0.001	0.26	0.001	0.03	0.001	ND	0.11

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	8.7	13.1	180.0	179.6	0.0	0.4	0.7	313	14.0	1	0.5	ND
Standard Error	0.9	0.4	6.5	6.5	0.0	0.2	0.1	3	0.6	0	0.0	ND
Median	8.3	13.4	180.0	180.0	0.0	0.0	0.4	308	12.0	0	0.5	ND
Mode	13.0	Multi	180.0	180.0	0.0	0.0	Multi	Multi	12.0	0	0.5	ND
Standard Deviation	3.8	1.4	22.6	22.5	0.0	0.8	0.7	22	4.5	2	0.1	ND
Sample Variance	14.3	2.1	509.1	508.3	0.0	0.7	0.5	502	19.9	3	0.0	ND
Range	10.7	6.0	90.0	90.0	0.0	2.5	2.4	106	17.0	5	0.4	ND
Minimum	3.3	8.1	140.0	140.0	0.0	0.0	0.0	287	10.0	0	0.3	ND
Maximum	14.0	14.1	230.0	230.0	0.0	2.5	2.4	393	27.0	5	0.7	ND
Count	18	16	12	12	12	12	54	54	54	18	7	0
Confidence Level (95%)	1.9	0.8	14.3	14.3	0.0	0.5	0.2	6	1.2	1	0.1	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

SOUTH SHORE - SITE 11
LAKE MICHIGAN
WATER QUALITY DATA - 2013

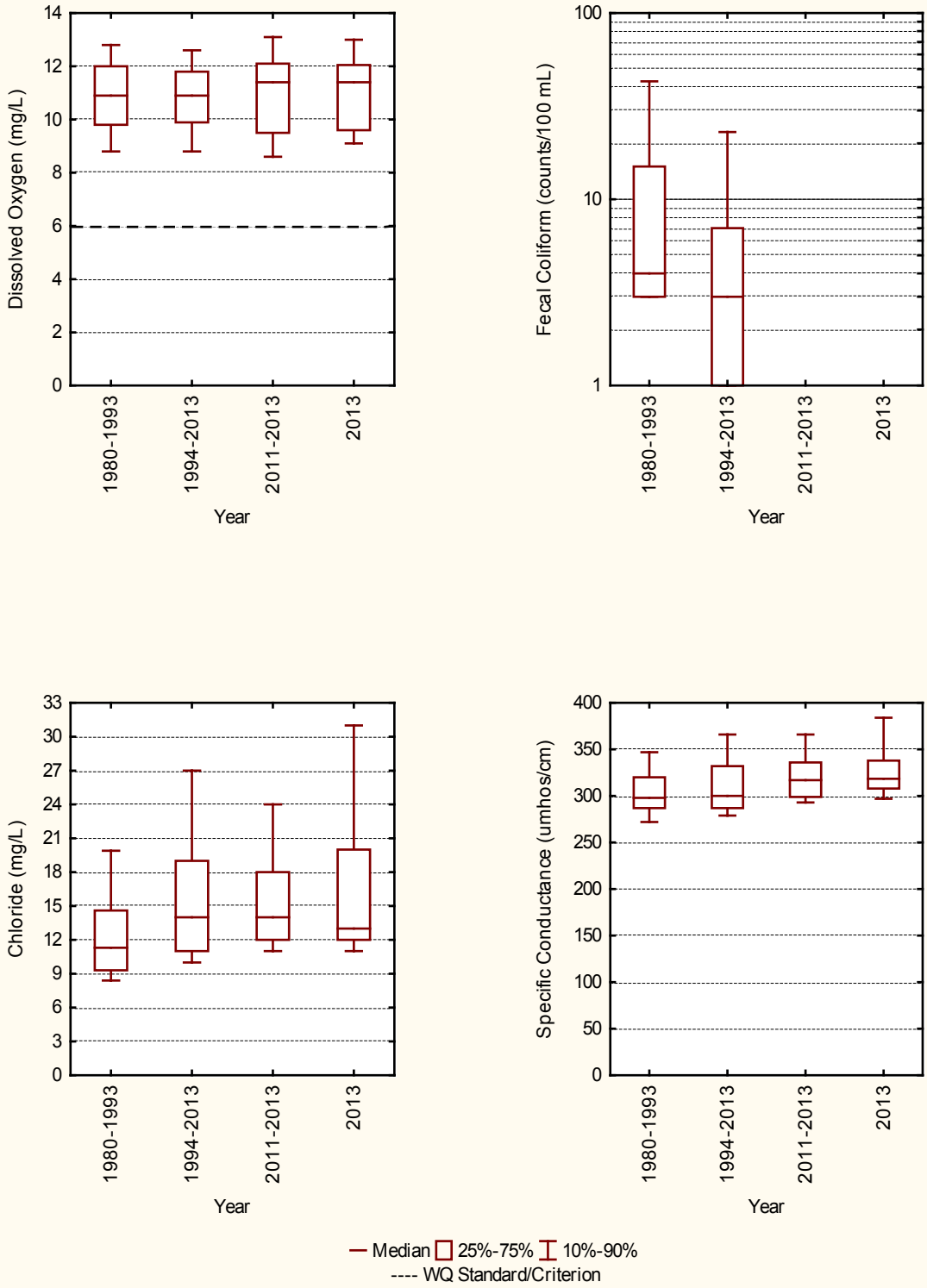
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	35.06	13.83	0.1	0.8	1.2	1.4	0.0	1.2	0.0	2.7	0.5	ND
Standard Error	0.35	0.26	0.1	0.2	0.7	0.3	0.0	0.8	0.0	0.9	0.5	ND
Median	35.00	14.00	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	ND
Mode	Multi	13.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	1.47	1.10	0.3	0.9	2.9	1.3	0.0	3.4	0.0	3.7	2.1	ND
Sample Variance	2.17	1.21	0.1	0.8	8.2	1.7	0.0	11.6	0.0	13.4	4.4	ND
Range	6.00	4.00	1.1	2.3	9.2	4.1	0.0	11.0	0.0	9.7	8.9	ND
Minimum	33.00	12.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	39.00	16.00	1.1	2.3	9.2	4.1	0.0	11.0	0.0	9.7	8.9	ND
Count	18	18	18	18	18	18	17	18	17	15	18	0
Confidence Level (95%)	0.73	0.55	0.1	0.4	1.4	0.6	0.0	1.7	0.0	2.0	1.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	143	106	0.0	2.3	25.8	23.6	2.3	ND
Standard Error	2	3	0.0	0.3	0.4	0.3	0.1	ND
Median	140	110	0.0	2.4	25.0	23.0	2.2	ND
Mode	140	110	0.0	2.3	25.0	23.0	2.2	ND
Standard Deviation	8	11	0.0	0.8	2.2	2.0	0.3	ND
Sample Variance	71	119	0.0	0.7	5.1	4.0	0.1	ND
Range	30	39	0.0	3.1	8.0	7.0	1.0	ND
Minimum	130	91	0.0	0.0	24.0	22.0	1.9	ND
Maximum	160	130	0.0	3.1	32.0	29.0	2.9	ND
Count	18	18	11	11	36	36	36	0
Confidence Level (95%)	4	5	0.0	0.6	0.8	0.7	0.1	ND

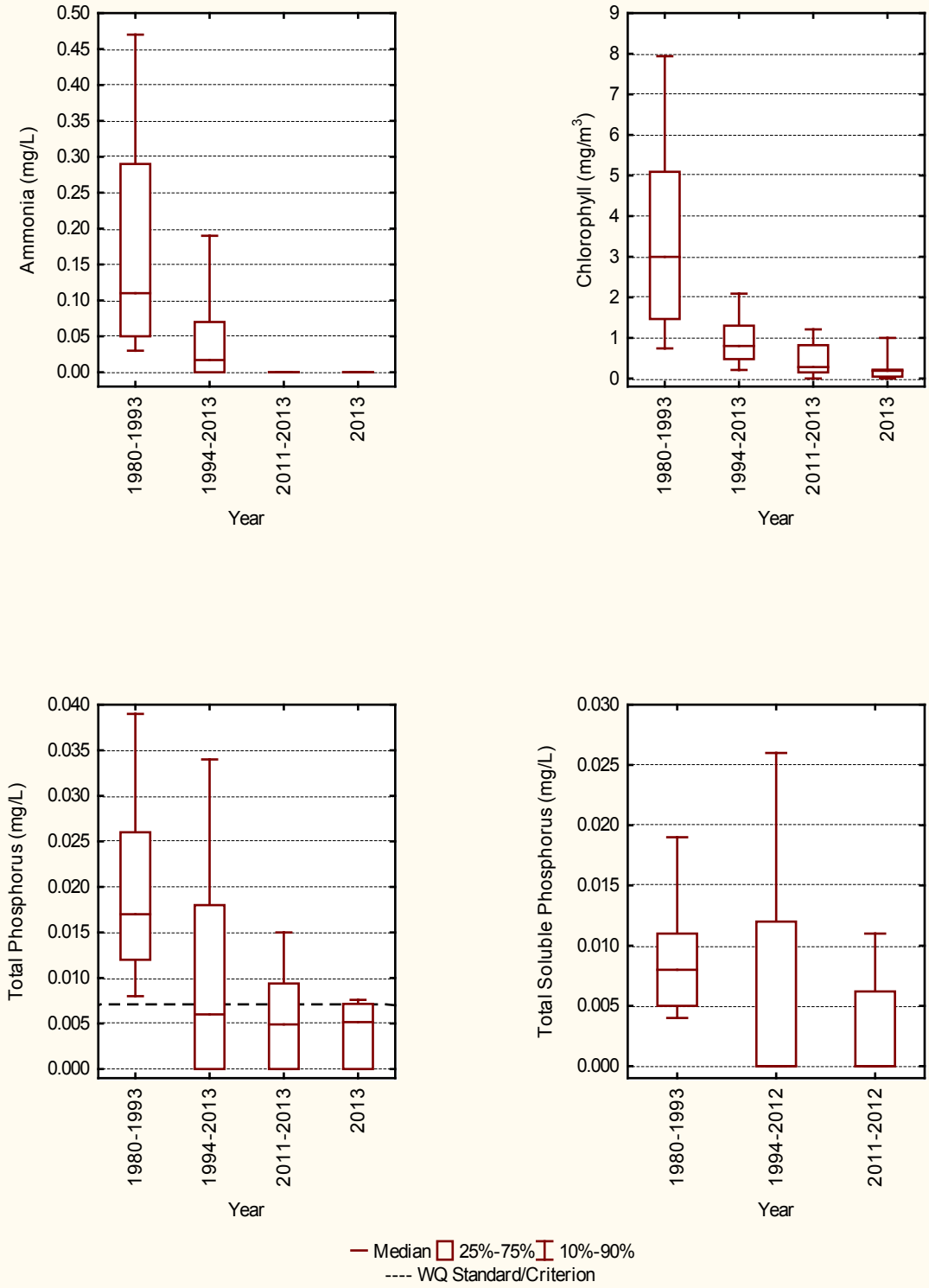
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

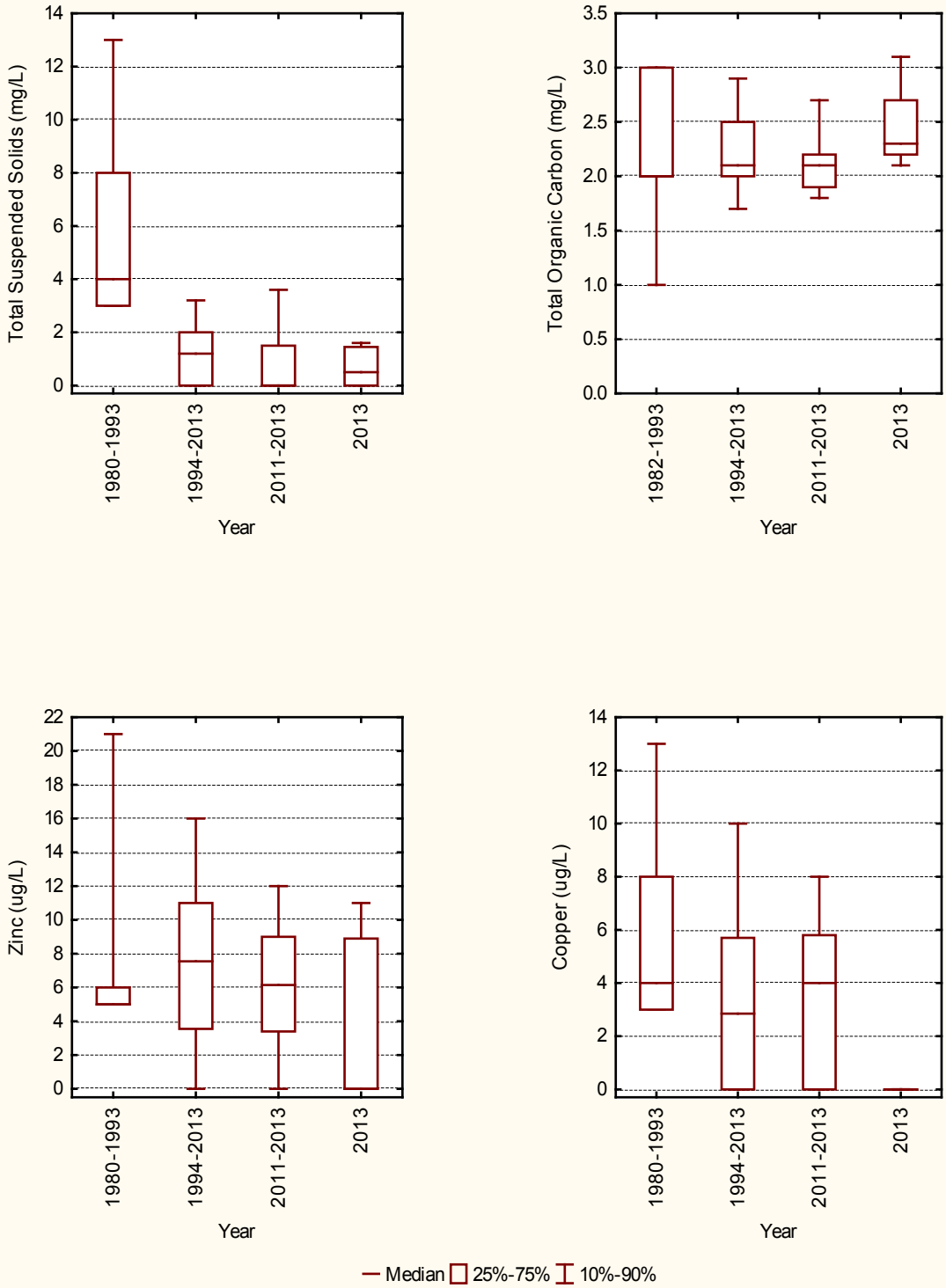
MMSD Water Quality Monitoring Program Data
South Shore, Site SS-12



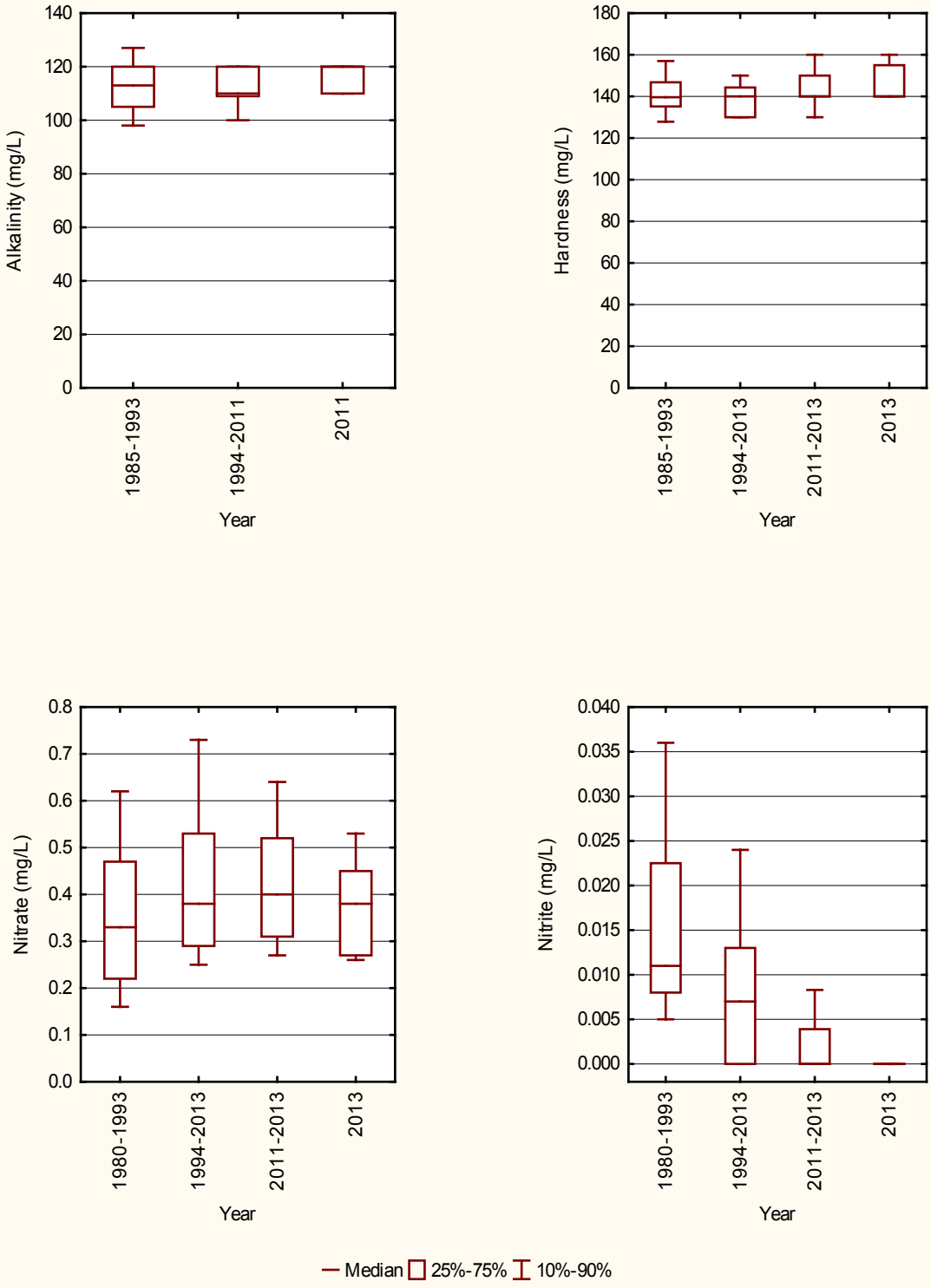
MMSD Water Quality Monitoring Program Data
South Shore, Site SS-12



MMSD Water Quality Monitoring Program Data
South Shore, Site SS-12



MMSD Water Quality Monitoring Program Data
South Shore, Site SS-12



SOUTH SHORE - SITE 12
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.2	12.9	11.1	0.35	0.37	0.001	0.37	0.001	0.09	0.004	ND	1.23
Standard Error	0.0	1.1	0.3	0.16	0.02	0.001	0.02	0.001	0.02	0.001	ND	0.06
Median	8.3	15.4	11.4	0.19	0.38	0.000	0.38	0.000	0.00	0.005	ND	1.10
Mode	8.3	Multi	11.6	Multi	0.38	0.000	Multi	0.000	0.00	0.000	ND	1.60
Standard Deviation	0.2	6.5	1.6	0.56	0.11	0.005	0.11	0.005	0.13	0.003	ND	0.36
Sample Variance	0.0	42.3	2.5	0.31	0.01	0.000	0.01	0.000	0.02	0.000	ND	0.13
Range	0.7	19.0	5.4	1.90	0.41	0.024	0.41	0.023	0.32	0.010	ND	1.35
Minimum	7.8	1.3	8.8	0.00	0.21	0.000	0.21	0.000	0.00	0.000	ND	0.65
Maximum	8.5	20.3	14.2	1.90	0.62	0.024	0.62	0.023	0.32	0.010	ND	2.00
Count	36	36	36	12	36	36	36	36	36	36	0	36
Confidence Level (95%)	0.1	2.2	0.5	0.35	0.04	0.002	0.04	0.002	0.04	0.001	ND	0.12

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	6.8	10.8	194.2	193.2	0.1	1.0	1.1	328	16.5	2	0.6	ND
Standard Error	1.2	0.9	9.8	9.8	0.1	0.4	0.2	5	1.1	1	0.1	ND
Median	5.2	12.2	180.0	180.0	0.0	0.5	0.5	319	13.0	0	0.6	ND
Mode	12.0	Multi	180.0	180.0	0.0	0.0	Multi	Multi	13.0	0	0.5	ND
Standard Deviation	4.0	2.8	34.0	34.1	0.4	1.5	1.5	30	6.5	3	0.2	ND
Sample Variance	15.9	8.0	1153.8	1162.7	0.2	2.2	2.1	914	42.1	7	0.0	ND
Range	10.5	8.3	120.0	119.0	1.4	5.2	5.3	122	21.0	8	0.4	ND
Minimum	1.5	4.1	160.0	160.0	0.0	0.0	0.0	290	11.0	0	0.5	ND
Maximum	12.0	12.4	280.0	279.0	1.4	5.2	5.3	412	32.0	8	0.9	ND
Count	12	10	12	12	12	12	36	36	36	12	4	0
Confidence Level (95%)	2.5	2.0	21.6	21.7	0.3	0.9	0.5	10	2.2	2	0.3	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

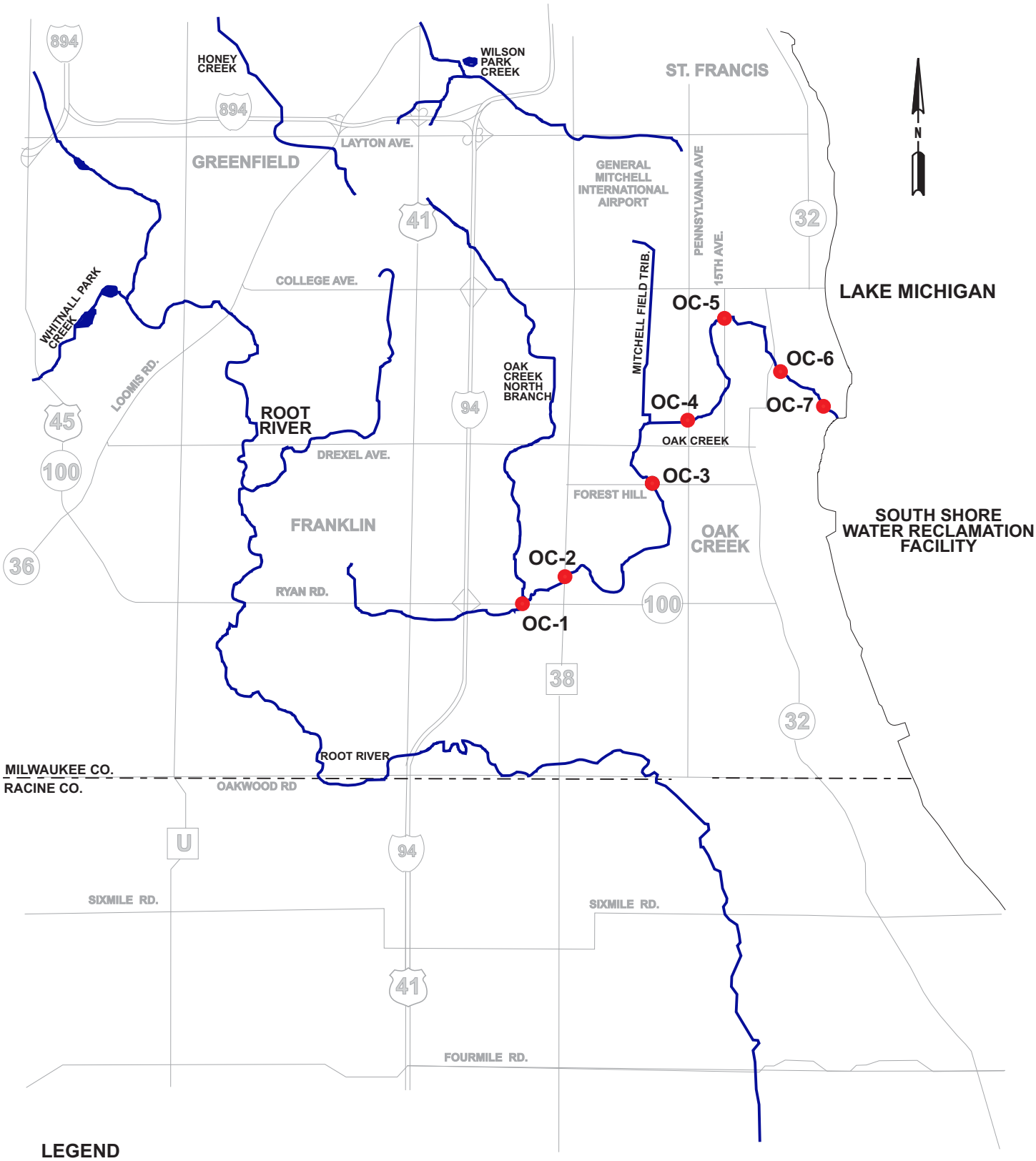
SOUTH SHORE - SITE 12
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	35.83	14.17	0.1	0.9	0.7	1.5	0.0	4.2	0.0	4.2	0.7	ND
Standard Error	0.52	0.44	0.1	0.2	0.7	0.3	0.0	1.5	0.0	1.0	0.7	ND
Median	35.50	14.00	0.0	1.3	0.0	1.8	0.0	0.0	0.0	4.6	0.0	ND
Mode	34.00	14.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	1.80	1.53	0.3	0.8	2.5	1.1	0.0	5.3	0.0	3.5	2.6	ND
Sample Variance	3.24	2.33	0.1	0.6	6.0	1.2	0.0	28.3	0.0	12.0	6.6	ND
Range	5.00	5.00	1.1	2.2	8.5	3.5	0.0	13.0	0.0	9.3	8.9	ND
Minimum	34.00	12.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	39.00	17.00	1.1	2.2	8.5	3.5	0.0	13.0	0.0	9.3	8.9	ND
Count	12	12	12	12	12	12	12	12	12	12	12	0
Confidence Level (95%)	1.14	0.97	0.2	0.5	1.6	0.7	0.0	3.4	0.0	2.2	1.6	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	147	ND	0.0	2.5	25.9	23.4	2.5	ND
Standard Error	3	ND	0.0	0.3	0.2	0.2	0.1	ND
Median	140	ND	0.0	2.6	25.0	23.0	2.3	ND
Mode	140	ND	0.0	2.3	25.0	23.0	2.2	ND
Standard Deviation	9	ND	0.0	0.9	1.3	1.2	0.4	ND
Sample Variance	79	ND	0.0	0.9	1.8	1.4	0.2	ND
Range	20	ND	0.0	3.7	5.0	4.0	1.6	ND
Minimum	140	ND	0.0	0.0	24.0	22.0	2.0	ND
Maximum	160	ND	0.0	3.7	29.0	26.0	3.6	ND
Count	12	0	11	11	36	36	36	0
Confidence Level (95%)	6	ND	0.0	0.6	0.4	0.4	0.1	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data



LEGEND

● ACTIVE WATER QUALITY SAMPLING LOCATIONS

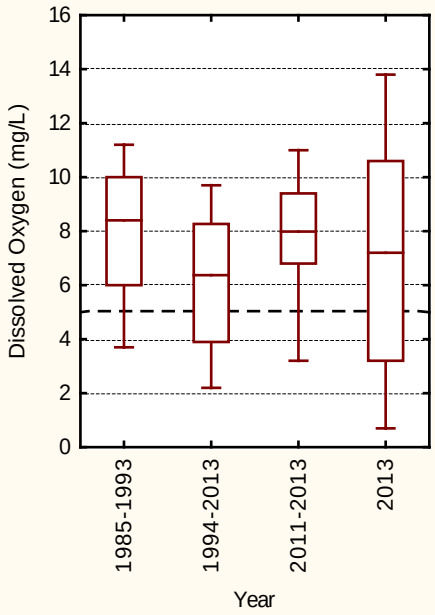
MMSD
PARTNERS FOR A CLEANER ENVIRONMENT

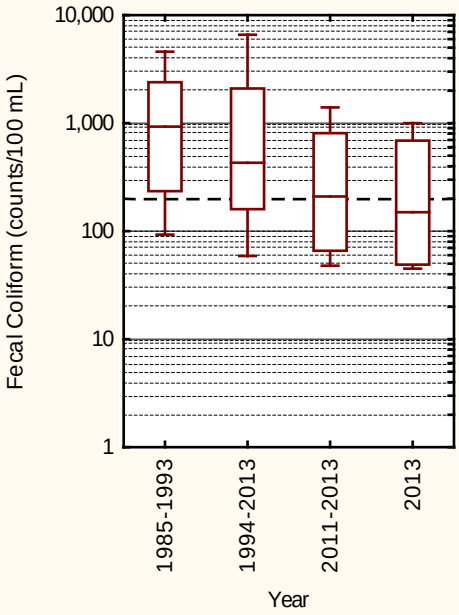
OAK CREEK (OC) SURVEY
WATER QUALITY SAMPLING LOCATIONS

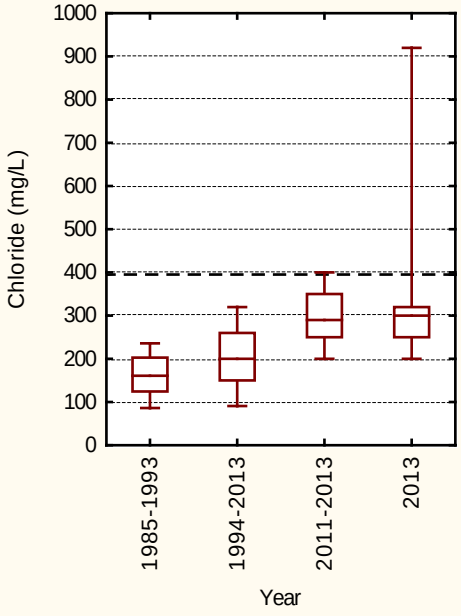
4/14/14

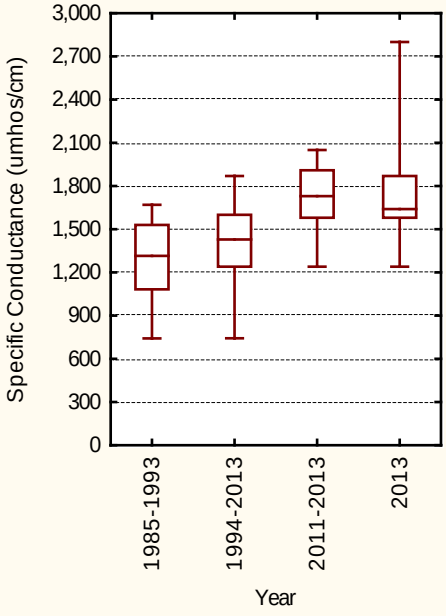
14-061 OC

MMSD Water Quality Monitoring Program Data
Oak Creek at Ryan Rd., Site OC-01



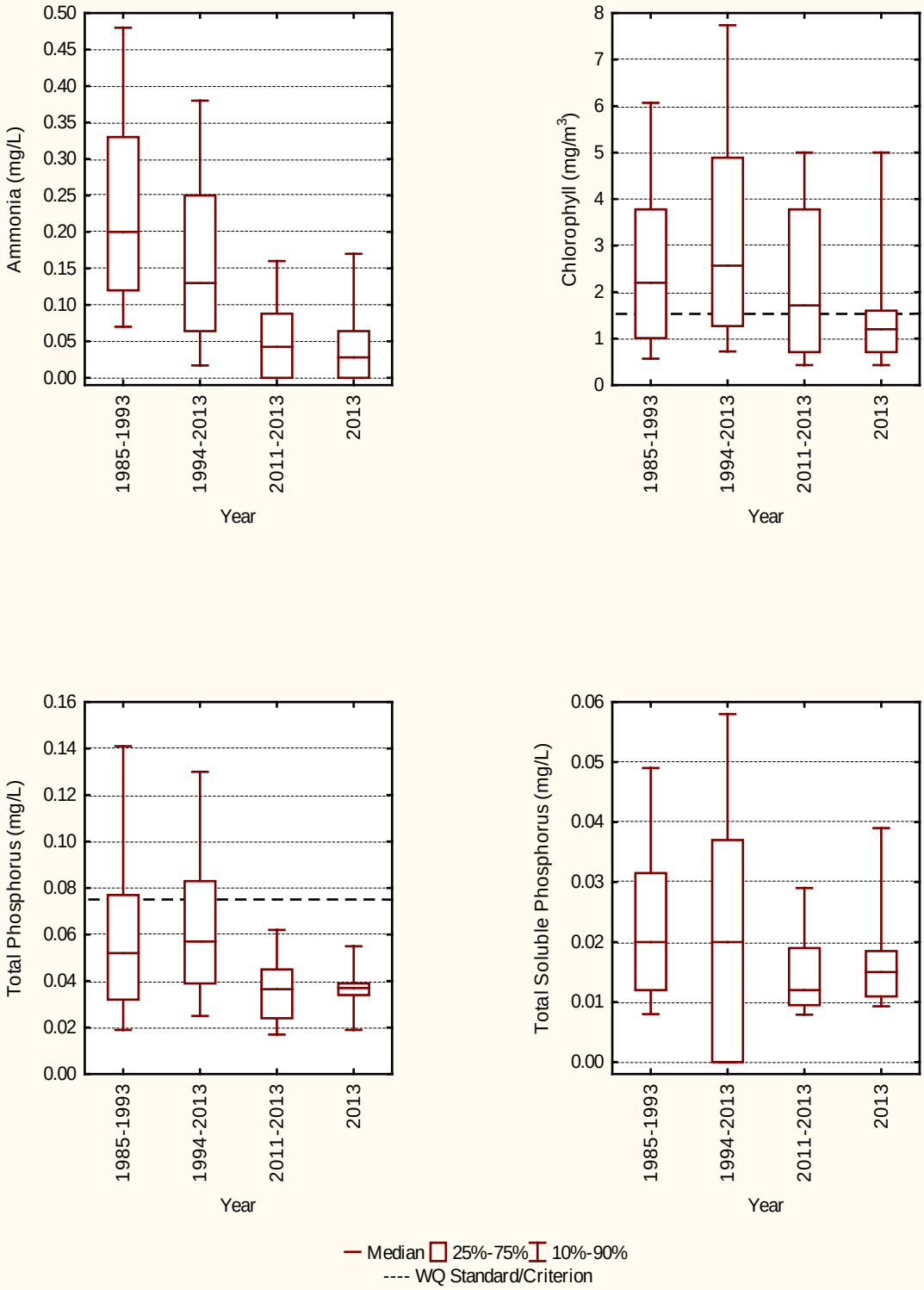




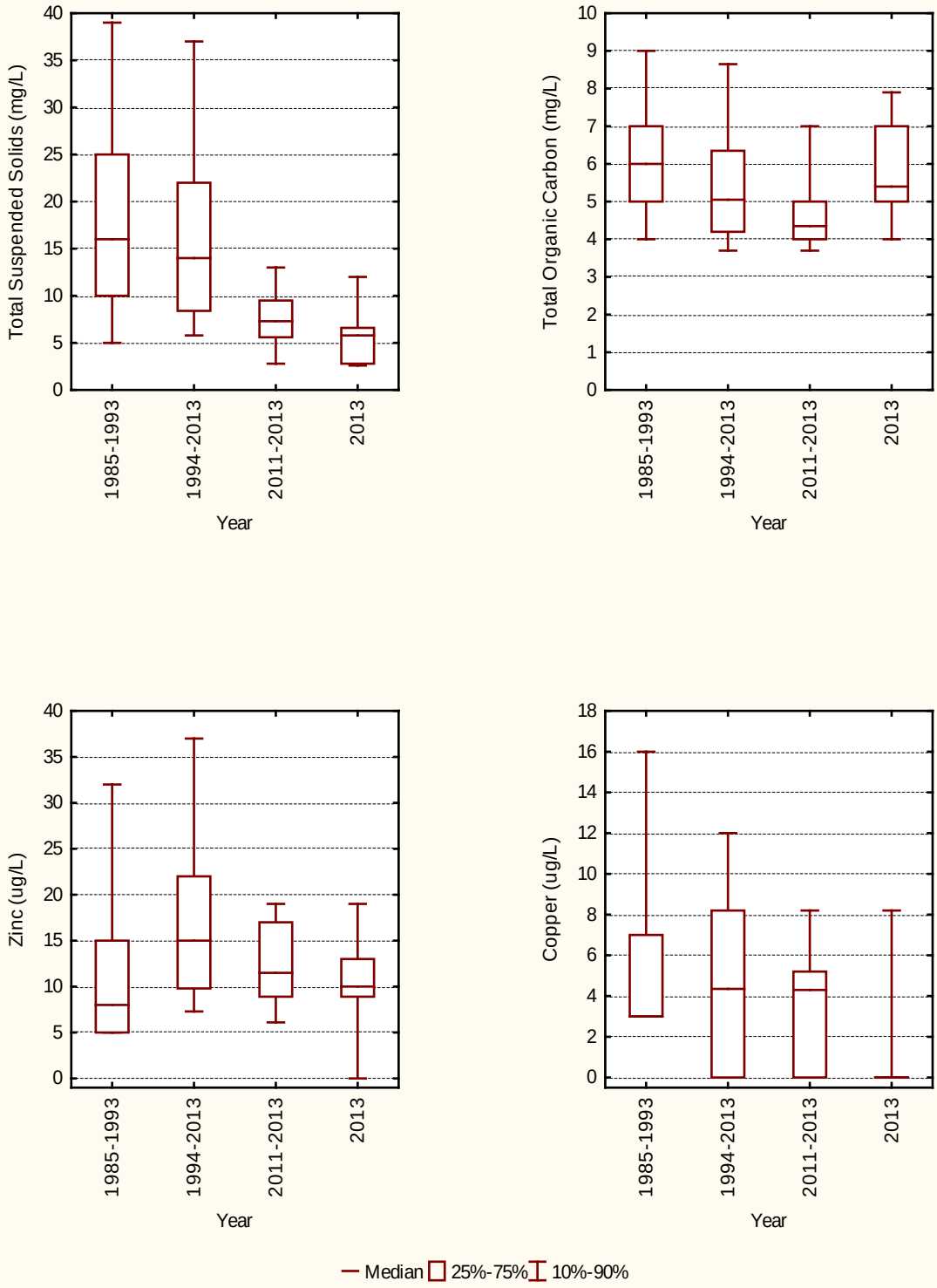


— Median ☐ 25%-75% I 10%-90%
---- WQ Standard/Criterion

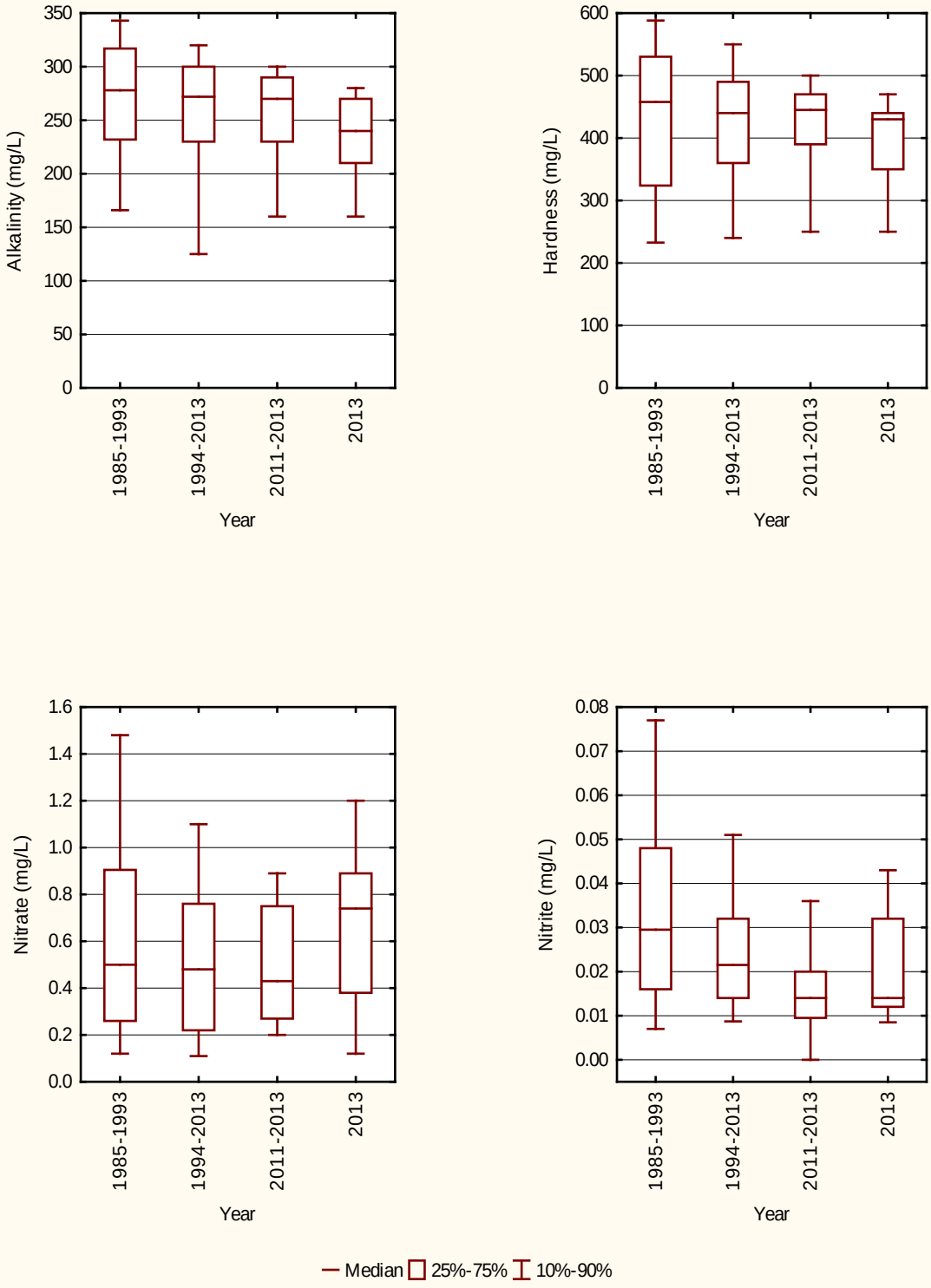
MMSD Water Quality Monitoring Program Data
Oak Creek at Ryan Rd., Site OC-01



MMSD Water Quality Monitoring Program Data
Oak Creek at Ryan Rd., Site OC-01



MMSD Water Quality Monitoring Program Data
Oak Creek at Ryan Rd., Site OC-01



RYAN RD. - SITE 1
OAK CREEK
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.4	10.3	7.0	1.80	0.68	0.021	0.70	0.045	0.47	0.037	0.017	ND
Standard Error	0.1	2.1	1.5	0.55	0.12	0.004	0.12	0.019	0.05	0.003	0.003	ND
Median	7.4	13.0	7.2	1.20	0.74	0.014	0.76	0.028	0.50	0.037	0.015	ND
Mode	7.2	13.0	Multi	Multi	Multi	Multi	Multi	0.000	Multi	0.037	Multi	ND
Standard Deviation	0.3	6.4	4.5	1.64	0.36	0.013	0.37	0.057	0.14	0.010	0.010	ND
Sample Variance	0.1	41.2	20.7	2.69	0.13	0.000	0.14	0.003	0.02	0.000	0.000	ND
Range	0.9	15.1	13.1	4.57	1.08	0.035	1.16	0.170	0.39	0.036	0.030	ND
Minimum	7.0	1.6	0.7	0.43	0.12	0.009	0.14	0.000	0.29	0.019	0.009	ND
Maximum	7.9	16.7	13.8	5.00	1.20	0.043	1.30	0.170	0.68	0.055	0.039	ND
Count	9	9	9	9	9	9	9	9	9	9	8	0
Confidence Level (95%)	0.2	4.9	3.5	1.26	0.28	0.010	0.29	0.044	0.11	0.008	0.008	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	992.2	986.8	0.9	5.5	8.9	1776	358.9	364	2.3	ND
Standard Error	ND	ND	136.3	136.1	0.5	1.0	1.6	146	73.4	125	0.2	ND
Median	ND	ND	870.0	867.2	0.0	5.8	9.4	1640	300.0	150	2.2	ND
Mode	ND	ND	1000.0	Multi	0.0	2.8	Multi	Multi	300.0	Multi	Multi	ND
Standard Deviation	ND	ND	408.9	408.2	1.5	3.1	4.9	439	220.3	375	0.6	ND
Sample Variance	ND	ND	167169.4	166604.3	2.3	9.3	23.8	192403	48536.1	140785	0.3	ND
Range	ND	ND	1400.0	1396.7	4.2	9.4	14.7	1560	720.0	955	1.3	ND
Minimum	ND	ND	600.0	597.4	0.0	2.6	3.4	1240	200.0	45	1.7	ND
Maximum	ND	ND	2000.0	1994.1	4.2	12.0	18.1	2800	920.0	1000	3.0	ND
Count	0	0	9	9	9	9	9	9	9	9	9	0
Confidence Level (95%)	ND	ND	314.3	313.7	1.2	2.3	3.7	337	169.3	288	0.4	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

RYAN RD. - SITE 1
OAK CREEK
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	87.33	43.22	0.1	1.8	1.7	3.1	1.1	9.9	0.0	4.3	0.0	ND
Standard Error	5.28	2.70	0.1	0.3	1.1	0.6	1.1	2.2	0.0	1.2	0.0	ND
Median	92.00	47.00	0.0	1.8	0.0	3.3	0.0	10.0	0.0	5.1	0.0	ND
Mode	Multi	47.00	0.0	1.8	0.0	Multi	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	15.83	8.09	0.3	0.9	3.4	1.7	3.3	6.6	0.0	3.6	0.0	ND
Sample Variance	250.50	65.44	0.1	0.8	11.7	2.7	11.1	43.1	0.0	12.8	0.0	ND
Range	55.00	24.00	0.8	3.3	8.2	5.8	10.0	19.0	0.0	8.8	0.0	ND
Minimum	55.00	28.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	110.00	52.00	0.8	3.3	8.2	5.8	10.0	19.0	0.0	8.8	0.0	ND
Count	9	9	9	9	9	9	9	9	5	9	9	0
Confidence Level (95%)	12.17	6.22	0.2	0.7	2.6	1.3	2.6	5.0	0.0	2.8	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	396	238	0.3	ND	56.8	51.1	5.7	5.5
Standard Error	24	13	0.3	ND	2.7	2.9	0.5	0.4
Median	430	240	0.0	ND	59.0	55.0	5.4	5.1
Mode	440	270	0.0	ND	61.0	Multi	Multi	Multi
Standard Deviation	71	40	1.0	ND	8.0	8.7	1.4	1.3
Sample Variance	5003	1569	1.0	ND	64.2	75.9	2.0	1.8
Range	220	120	3.0	ND	26.0	27.0	3.9	3.7
Minimum	250	160	0.0	ND	40.0	33.0	4.0	3.8
Maximum	470	280	3.0	ND	66.0	60.0	7.9	7.5
Count	9	9	9	0	9	9	9	9
Confidence Level (95%)	54	30	0.8	ND	6.2	6.7	1.1	1.0

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

HIGHWAY 38 - SITE 2
OAK CREEK
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.8	11.4	9.5	4.34	0.41	0.014	0.43	0.031	0.44	0.053	0.029	ND
Standard Error	0.1	2.7	1.1	2.50	0.07	0.003	0.07	0.014	0.07	0.007	0.004	ND
Median	7.7	13.6	7.9	1.40	0.45	0.014	0.47	0.000	0.40	0.052	0.026	ND
Mode	7.7	Multi	Multi	0.68	Multi	Multi	Multi	0.000	Multi	Multi	Multi	ND
Standard Deviation	0.3	8.2	3.2	7.51	0.21	0.009	0.21	0.041	0.22	0.021	0.013	ND
Sample Variance	0.1	67.3	10.4	56.43	0.04	0.000	0.05	0.002	0.05	0.000	0.000	ND
Range	1.1	19.9	8.3	23.43	0.55	0.028	0.57	0.098	0.74	0.051	0.033	ND
Minimum	7.4	0.6	6.0	0.57	0.17	0.000	0.17	0.000	0.00	0.027	0.014	ND
Maximum	8.5	20.5	14.3	24.00	0.72	0.028	0.74	0.098	0.74	0.078	0.047	ND
Count	9	9	9	9	9	9	9	9	9	9	9	0
Confidence Level (95%)	0.2	6.3	2.5	5.77	0.16	0.007	0.16	0.031	0.17	0.016	0.010	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	868.9	857.8	2.3	11.1	8.4	1551	316.7	810	2.5	ND
Standard Error	ND	ND	94.9	96.8	0.8	3.4	1.5	209	57.8	464	0.2	ND
Median	ND	ND	810.0	807.8	1.6	7.0	7.6	1450	260.0	390	2.6	ND
Mode	ND	ND	Multi	Multi	0.0	Multi	Multi	1450	Multi	Multi	Multi	ND
Standard Deviation	ND	ND	284.8	290.5	2.5	10.3	4.6	627	173.3	1391	0.6	ND
Sample Variance	ND	ND	81111.1	84364.8	6.2	106.9	21.5	393526	30050.0	1933852	0.3	ND
Range	ND	ND	1010.0	1028.0	6.8	30.8	12.2	2127	590.0	4333	1.8	ND
Minimum	ND	ND	490.0	466.0	0.0	2.2	3.9	973	160.0	67	1.8	ND
Maximum	ND	ND	1500.0	1494.0	6.8	33.0	16.1	3100	750.0	4400	3.6	ND
Count	0	0	9	9	9	9	9	9	9	9	9	0
Confidence Level (95%)	ND	ND	218.9	223.3	1.9	7.9	3.6	482	133.2	1069	0.5	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

HIGHWAY 38 - SITE 2
OAK CREEK
WATER QUALITY DATA - 2013

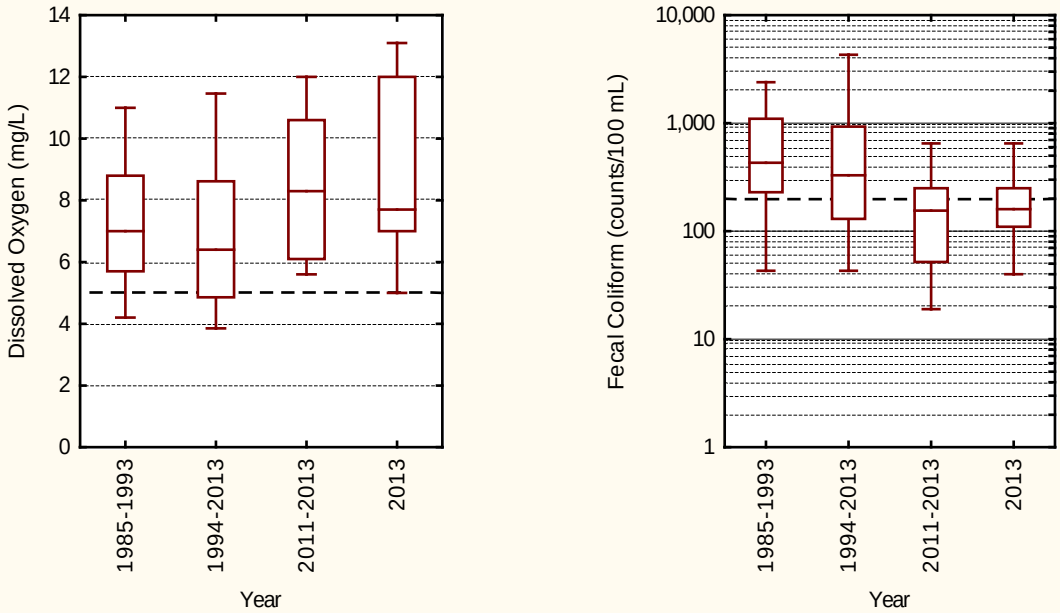
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	74.44	36.22	0.1	2.7	4.3	3.2	0.0	14.6	0.0	3.7	0.0	ND
Standard Error	5.58	2.77	0.1	0.5	1.4	0.4	0.0	3.0	0.0	1.5	0.0	ND
Median	78.00	40.00	0.0	2.3	6.1	2.7	0.0	13.0	0.0	2.4	0.0	ND
Mode	Multi	43.00	0.0	Multi	0.0	2.0	0.0	Multi	0.0	0.0	0.0	ND
Standard Deviation	16.74	8.32	0.3	1.6	4.3	1.2	0.0	8.9	0.0	4.1	0.0	ND
Sample Variance	280.28	69.19	0.1	2.5	18.4	1.4	0.0	79.9	0.0	17.0	0.0	ND
Range	53.00	22.00	0.8	5.3	10.0	3.4	0.0	30.0	0.0	8.5	0.0	ND
Minimum	45.00	21.00	0.0	1.3	0.0	2.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	98.00	43.00	0.8	6.6	10.0	5.4	0.0	30.0	0.0	8.5	0.0	ND
Count	9	9	9	9	9	9	9	9	6	8	9	0
Confidence Level (95%)	12.87	6.39	0.2	1.2	3.3	0.9	0.0	6.9	0.0	3.4	0.0	ND

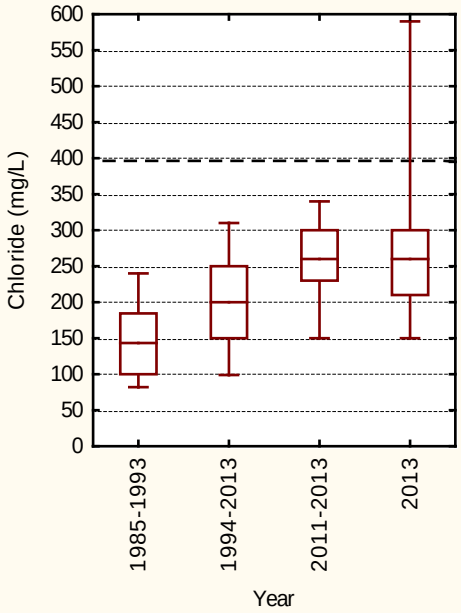
VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	334	216	0.9	ND	52.8	45.8	7.0	6.7
Standard Error	25	18	0.7	ND	3.2	3.5	0.6	0.5
Median	360	230	0.0	ND	55.0	49.0	7.1	6.8
Mode	Multi	260	0.0	ND	58.0	Multi	8.4	Multi
Standard Deviation	74	55	2.1	ND	9.6	10.4	1.7	1.4
Sample Variance	5478	3078	4.3	ND	91.7	108.4	3.0	2.0
Range	210	170	6.0	ND	29.0	31.0	5.1	4.4
Minimum	200	120	0.0	ND	37.0	27.0	4.9	4.7
Maximum	410	290	6.0	ND	66.0	58.0	10.0	9.1
Count	9	9	9	0	9	9	9	9
Confidence Level (95%)	57	43	1.6	ND	7.4	8.0	1.3	1.1

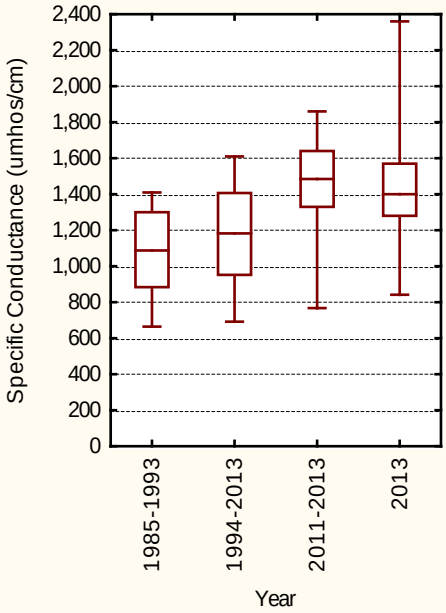
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

MMSD Water Quality Monitoring Program Data
Oak Creek at Forest Hill Rd., Site OC-03

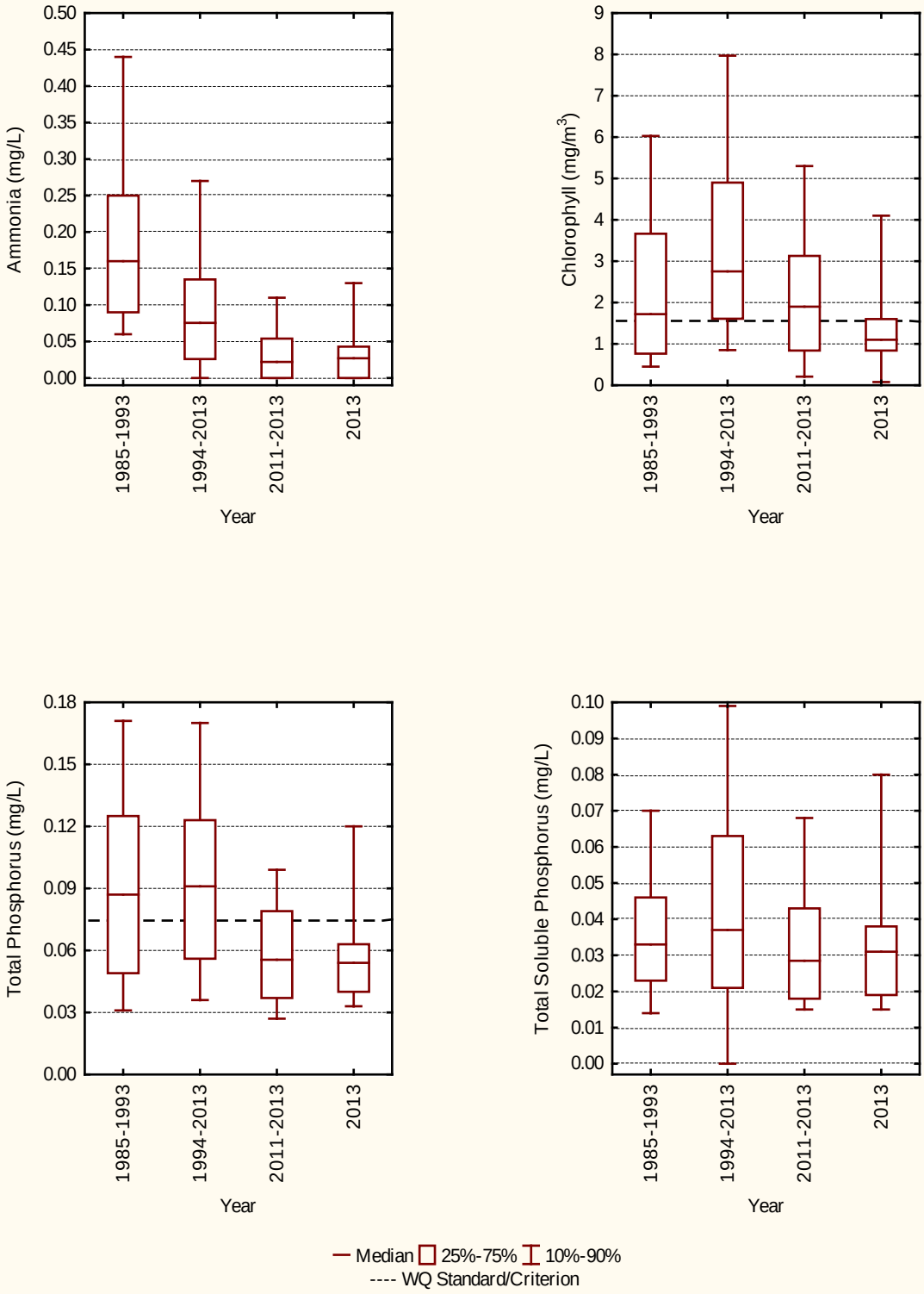




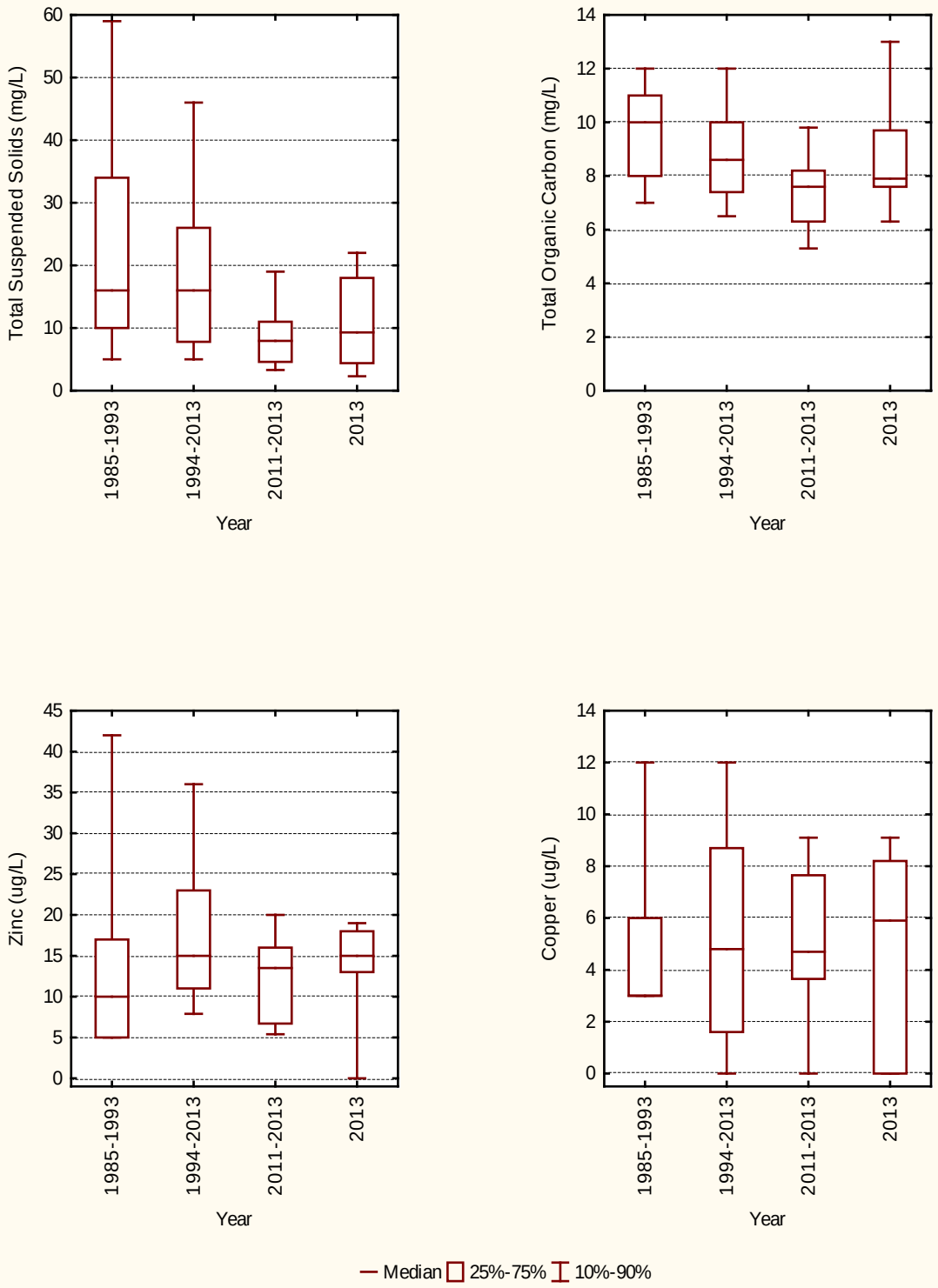


— Median ☐ 25%-75% I 10%-90%
---- WQ Standard/Criterion

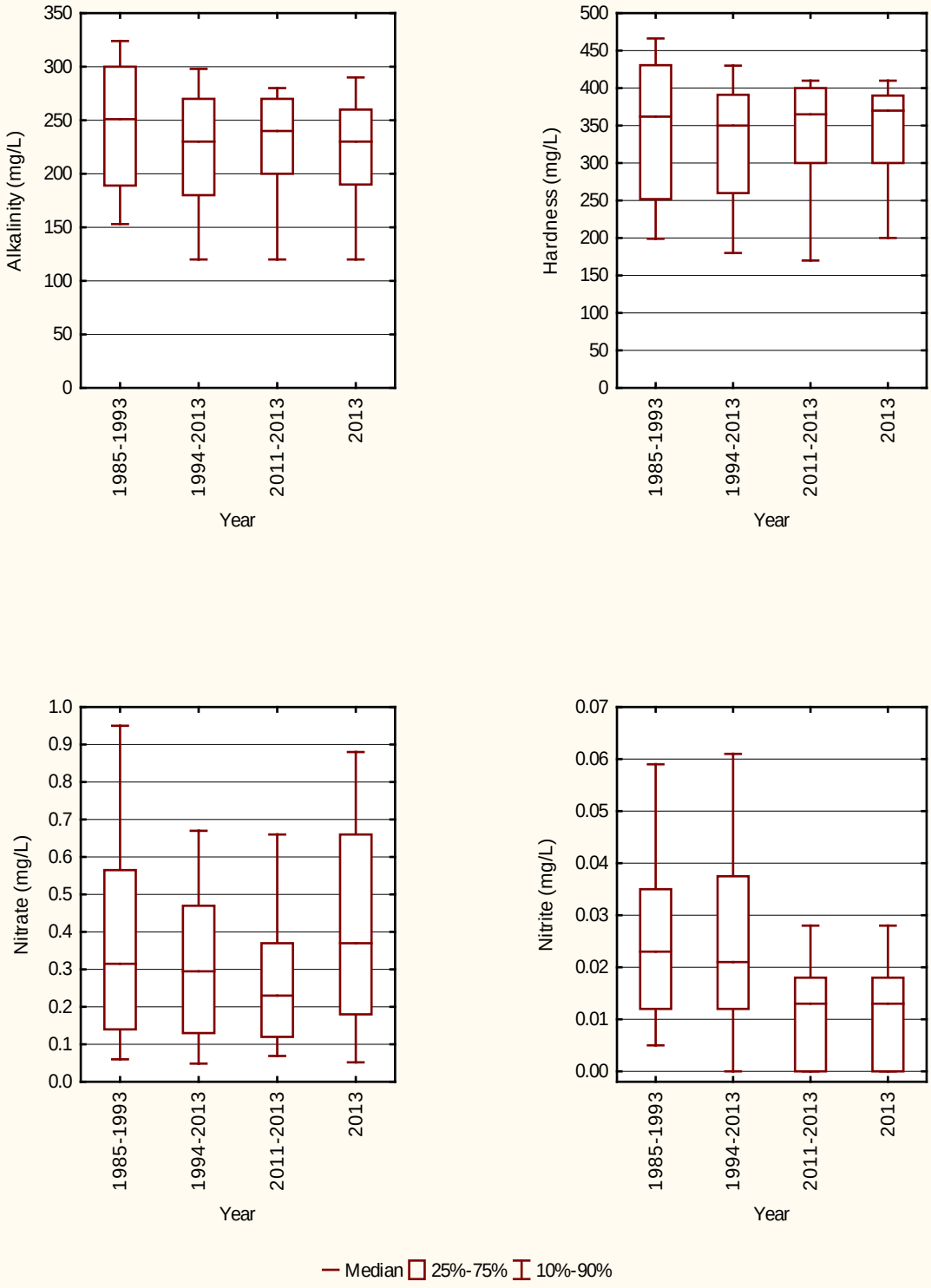
MMSD Water Quality Monitoring Program Data
Oak Creek at Forest Hill Rd., Site OC-03



MMSD Water Quality Monitoring Program Data
Oak Creek at Forest Hill Rd., Site OC-03



MMSD Water Quality Monitoring Program Data
Oak Creek at Forest Hill Rd., Site OC-03



FOREST HILL RD. - SITE 3
OAK CREEK
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.6	11.9	8.8	1.42	0.39	0.012	0.41	0.040	0.54	0.061	0.035	ND
Standard Error	0.1	2.8	1.0	0.41	0.10	0.004	0.10	0.015	0.08	0.010	0.007	ND
Median	7.6	15.1	7.7	1.10	0.37	0.013	0.40	0.027	0.44	0.054	0.031	ND
Mode	7.6	Multi	Multi	Multi	Multi	0.000	0.40	0.000	Multi	Multi	Multi	ND
Standard Deviation	0.2	8.5	3.1	1.23	0.29	0.011	0.29	0.046	0.25	0.029	0.021	ND
Sample Variance	0.0	72.5	9.5	1.53	0.09	0.000	0.09	0.002	0.06	0.001	0.000	ND
Range	0.5	21.5	8.1	4.02	0.83	0.028	0.84	0.130	0.78	0.087	0.065	ND
Minimum	7.4	0.4	5.0	0.08	0.05	0.000	0.05	0.000	0.32	0.033	0.015	ND
Maximum	7.9	21.9	13.1	4.10	0.88	0.028	0.89	0.130	1.10	0.120	0.080	ND
Count	9	9	9	9	9	9	9	9	9	9	9	0
Confidence Level (95%)	0.1	6.5	2.4	0.95	0.23	0.008	0.23	0.035	0.19	0.023	0.016	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	834.4	823.6	2.6	10.9	10.9	1456	285.6	219	2.2	ND
Standard Error	ND	ND	77.4	76.9	0.6	2.4	1.8	140	43.4	64	0.1	ND
Median	ND	ND	810.0	800.1	2.3	9.3	9.9	1400	260.0	160	2.2	ND
Mode	ND	ND	Multi	Multi	Multi	Multi	Multi	Multi	260.0	Multi	Multi	ND
Standard Deviation	ND	ND	232.3	230.6	1.9	7.2	5.3	419	130.3	191	0.4	ND
Sample Variance	ND	ND	53977.8	53174.2	3.7	51.6	27.8	175895	16977.8	36439	0.2	ND
Range	ND	ND	830.0	825.1	5.8	19.7	16.7	1518	440.0	610	1.2	ND
Minimum	ND	ND	470.0	465.6	0.0	2.3	5.0	842	150.0	40	1.6	ND
Maximum	ND	ND	1300.0	1290.7	5.8	22.0	21.7	2360	590.0	650	2.8	ND
Count	0	0	9	9	9	9	9	9	9	9	9	0
Confidence Level (95%)	ND	ND	178.6	177.3	1.5	5.5	4.1	322	100.2	147	0.3	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

FOREST HILL RD. - SITE 3
OAK CREEK
WATER QUALITY DATA - 2013

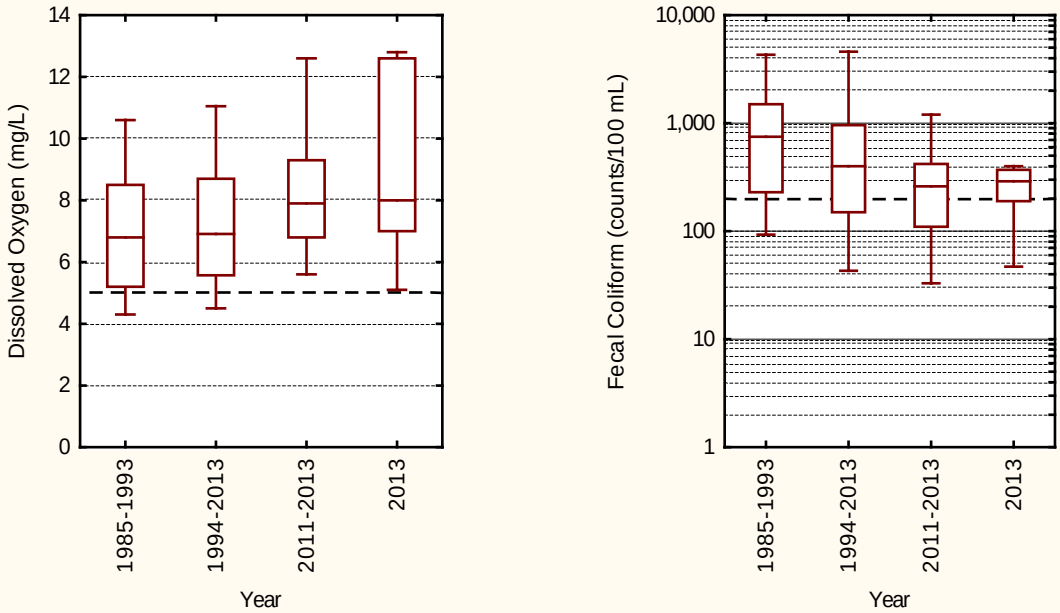
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	76.56	36.89	0.2	2.0	4.5	3.3	0.0	12.6	0.0	0.8	0.0	ND
Standard Error	5.28	2.59	0.1	0.3	1.4	0.7	0.0	2.5	0.0	0.8	0.0	ND
Median	79.00	39.00	0.0	2.3	5.9	3.1	0.0	15.0	0.0	0.0	0.0	ND
Mode	Multi	Multi	0.0	2.3	0.0	Multi	0.0	Multi	0.0	0.0	0.0	ND
Standard Deviation	15.84	7.77	0.4	0.8	4.3	2.0	0.0	7.4	0.0	2.2	0.0	ND
Sample Variance	250.78	60.36	0.1	0.6	18.8	4.2	0.0	54.5	0.0	4.8	0.0	ND
Range	54.00	23.00	0.9	2.6	9.1	7.9	0.0	19.0	0.0	5.8	0.0	ND
Minimum	43.00	21.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	97.00	44.00	0.9	2.6	9.1	7.9	0.0	19.0	0.0	5.8	0.0	ND
Count	9	9	9	9	9	9	9	9	7	7	9	0
Confidence Level (95%)	12.17	5.97	0.3	0.6	3.3	1.6	0.0	5.7	0.0	2.0	0.0	ND

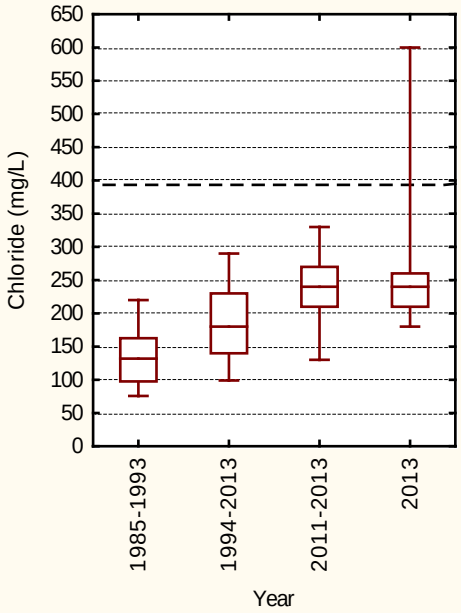
VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	344	219	0.3	ND	54.1	45.3	8.7	8.6
Standard Error	22	19	0.3	ND	4.3	3.8	0.7	0.7
Median	370	230	0.0	ND	57.0	48.0	7.9	7.8
Mode	300	Multi	0.0	ND	Multi	28.0	7.6	Multi
Standard Deviation	67	56	0.9	ND	12.9	11.4	2.2	2.2
Sample Variance	4528	3186	0.8	ND	167.6	129.5	4.7	4.6
Range	210	170	2.7	ND	39.0	32.0	6.7	6.9
Minimum	200	120	0.0	ND	34.0	28.0	6.3	6.1
Maximum	410	290	2.7	ND	73.0	60.0	13.0	13.0
Count	9	9	9	0	9	9	9	9
Confidence Level (95%)	52	43	0.7	ND	10.0	8.7	1.7	1.7

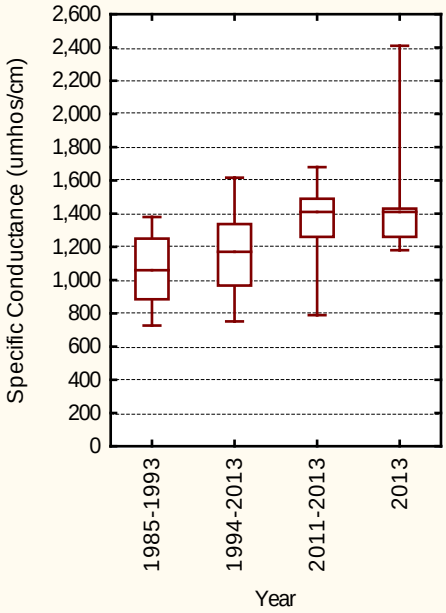
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

MMSD Water Quality Monitoring Program Data
Oak Creek at Pennsylvania Ave., Site OC-04

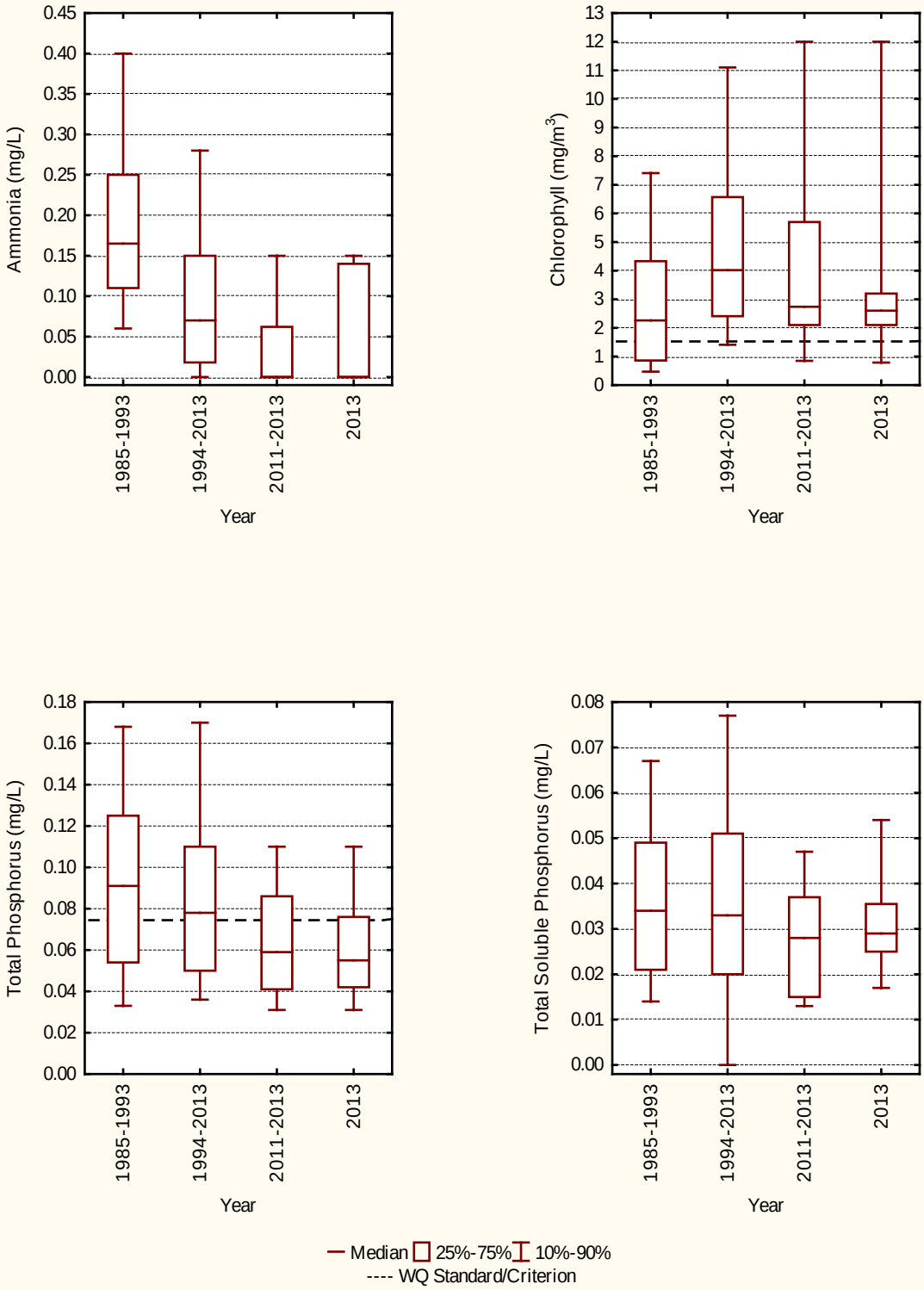




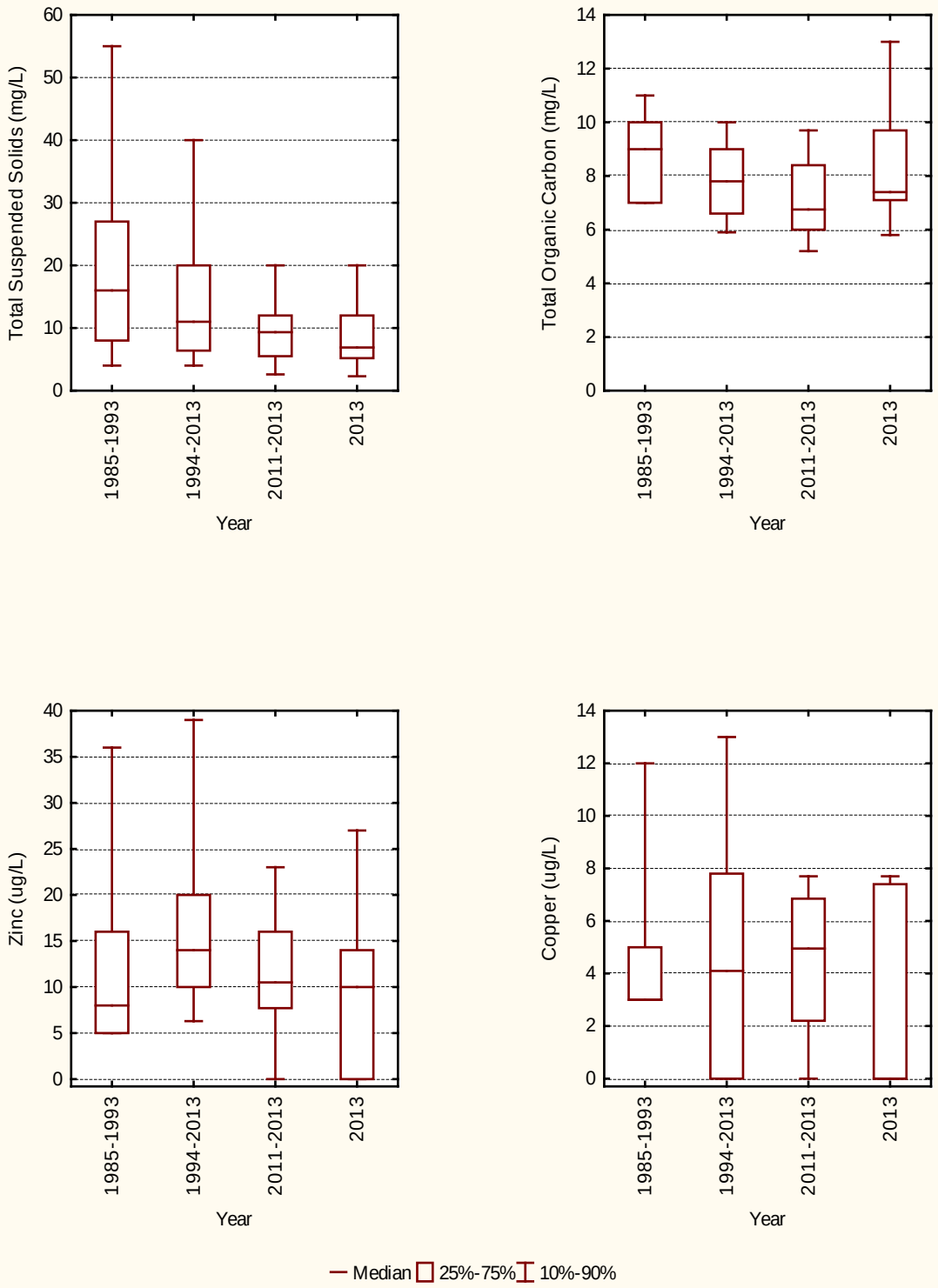


— Median ☐ 25%-75% I 10%-90%
---- WQ Standard/Criterion

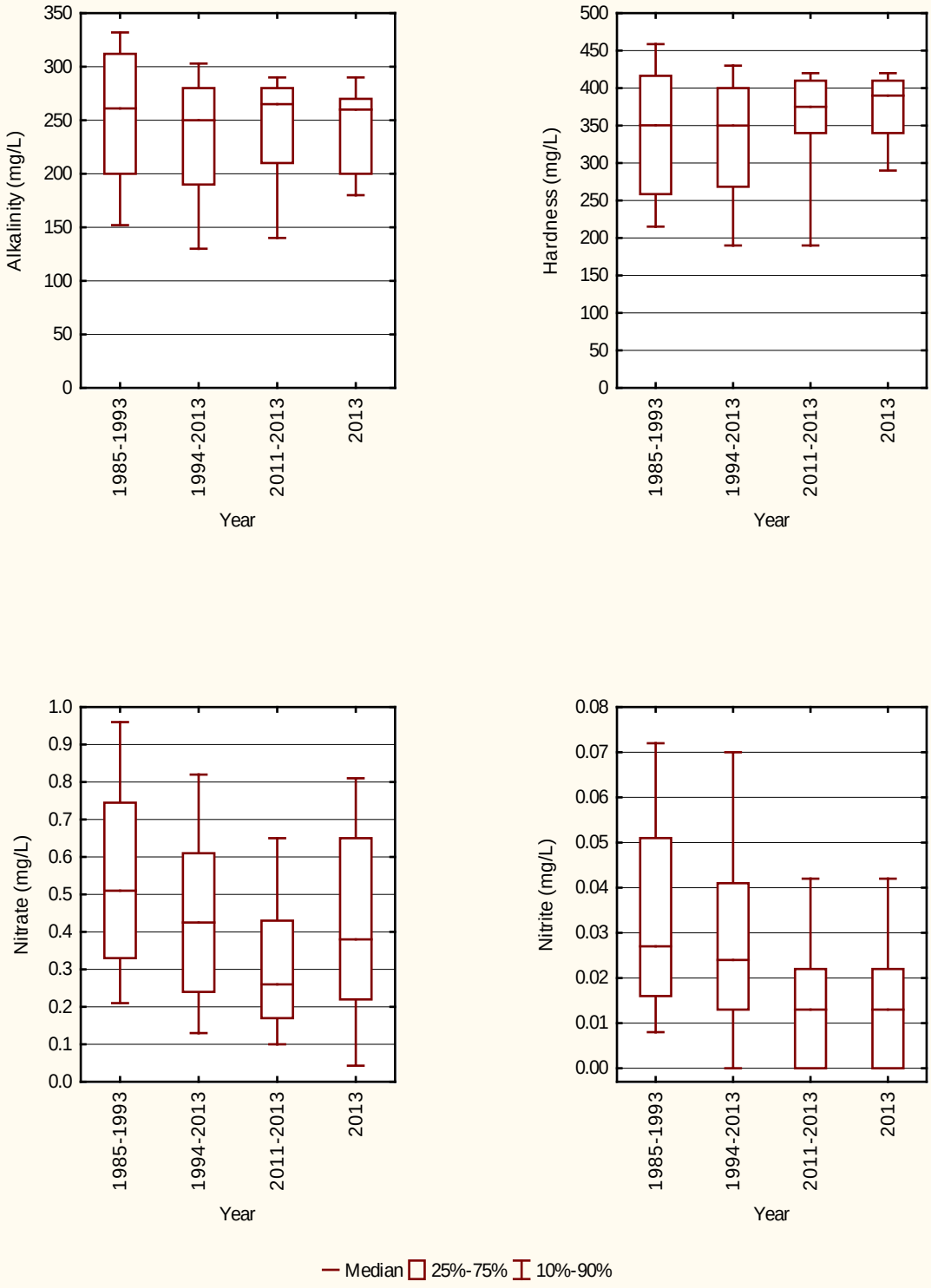
MMSD Water Quality Monitoring Program Data
Oak Creek at Pennsylvania Ave., Site OC-04



MMSD Water Quality Monitoring Program Data
Oak Creek at Pennsylvania Ave., Site OC-04



MMSD Water Quality Monitoring Program Data
Oak Creek at Pennsylvania Ave., Site OC-04



PENNSYLVANIA AVE. - SITE 4
OAK CREEK
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.7	11.6	8.9	3.68	0.40	0.015	0.41	0.055	0.64	0.061	0.031	ND
Standard Error	0.1	2.7	1.0	1.13	0.09	0.005	0.09	0.023	0.08	0.009	0.004	ND
Median	7.7	14.0	8.0	2.60	0.38	0.013	0.41	0.000	0.56	0.055	0.029	ND
Mode	7.7	Multi	12.6	Multi	0.22	0.000	Multi	0.000	0.84	Multi	0.030	ND
Standard Deviation	0.2	8.0	3.0	3.40	0.27	0.015	0.27	0.070	0.24	0.026	0.011	ND
Sample Variance	0.0	64.0	8.8	11.57	0.07	0.000	0.07	0.005	0.06	0.001	0.000	ND
Range	0.5	19.7	7.7	11.21	0.77	0.042	0.78	0.150	0.74	0.079	0.037	ND
Minimum	7.4	0.8	5.1	0.79	0.04	0.000	0.04	0.000	0.26	0.031	0.017	ND
Maximum	7.9	20.5	12.8	12.00	0.81	0.042	0.82	0.150	1.00	0.110	0.054	ND
Count	9	9	9	9	9	9	9	9	9	9	8	0
Confidence Level (95%)	0.1	6.1	2.3	2.61	0.21	0.011	0.21	0.053	0.18	0.020	0.010	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	843.3	834.2	2.3	9.1	9.1	1480	275.6	259	2.3	ND
Standard Error	ND	ND	65.7	65.9	0.6	2.2	1.7	126	43.5	46	0.1	ND
Median	ND	ND	770.0	767.5	2.3	6.9	7.3	1410	240.0	290	2.5	ND
Mode	ND	ND	Multi	Multi	0.0	Multi	4.4	1410	240.0	Multi	Multi	ND
Standard Deviation	ND	ND	197.0	197.7	1.7	6.6	5.0	378	130.4	138	0.4	ND
Sample Variance	ND	ND	38800.0	39080.6	3.0	43.5	24.5	143025	17002.8	19035	0.1	ND
Range	ND	ND	620.0	623.7	5.0	17.7	13.5	1230	420.0	353	0.9	ND
Minimum	ND	ND	680.0	671.1	0.0	2.3	4.4	1180	180.0	47	1.7	ND
Maximum	ND	ND	1300.0	1294.8	5.0	20.0	17.9	2410	600.0	400	2.6	ND
Count	0	0	9	9	9	9	9	9	9	9	9	0
Confidence Level (95%)	ND	ND	151.4	152.0	1.3	5.1	3.8	291	100.2	106	0.3	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

PENNSYLVANIA AVE. - SITE 4
OAK CREEK
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	81.78	39.78	0.1	2.6	3.3	2.6	0.0	9.7	0.0	5.3	0.0	ND
Standard Error	3.73	1.92	0.1	0.3	1.3	0.6	0.0	3.0	0.0	1.0	0.0	ND
Median	84.00	39.00	0.0	2.3	0.0	3.6	0.0	10.0	0.0	5.6	0.0	ND
Mode	Multi	Multi	0.0	Multi	0.0	0.0	0.0	0.0	0.0	Multi	0.0	ND
Standard Deviation	11.18	5.76	0.2	0.9	3.9	1.8	0.0	9.0	0.0	2.6	0.0	ND
Sample Variance	124.94	33.19	0.0	0.8	15.1	3.2	0.0	80.2	0.0	6.7	0.0	ND
Range	36.00	17.00	0.6	2.7	7.7	4.6	0.0	27.0	0.0	8.4	0.0	ND
Minimum	62.00	30.00	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	98.00	47.00	0.6	4.5	7.7	4.6	0.0	27.0	0.0	8.4	0.0	ND
Count	9	9	9	9	9	9	9	9	7	7	9	0
Confidence Level (95%)	8.59	4.43	0.2	0.7	3.0	1.4	0.0	6.9	0.0	2.4	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	368	241	1.8	ND	60.4	52.0	8.6	8.3
Standard Error	16	14	1.5	ND	2.7	2.4	0.8	0.8
Median	390	260	0.0	ND	62.0	54.0	7.4	7.3
Mode	Multi	270	0.0	ND	64.0	Multi	Multi	Multi
Standard Deviation	48	42	4.6	ND	8.1	7.1	2.4	2.4
Sample Variance	2344	1761	21.5	ND	65.3	51.0	5.7	6.0
Range	130	110	14.0	ND	28.0	23.0	7.2	7.4
Minimum	290	180	0.0	ND	45.0	39.0	5.8	5.6
Maximum	420	290	14.0	ND	73.0	62.0	13.0	13.0
Count	9	9	9	0	9	9	9	9
Confidence Level (95%)	37	32	3.6	ND	6.2	5.5	1.8	1.9

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

15TH AVE. - SITE 5
OAK CREEK
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.7	11.8	9.1	3.45	0.53	0.017	0.55	0.052	0.58	0.058	0.026	ND
Standard Error	0.1	2.6	0.9	1.17	0.06	0.005	0.06	0.019	0.05	0.008	0.006	ND
Median	7.8	14.4	8.2	2.30	0.52	0.015	0.56	0.050	0.51	0.054	0.015	ND
Mode	7.8	Multi	Multi	2.30	Multi	Multi	Multi	0.000	Multi	Multi	0.014	ND
Standard Deviation	0.2	7.7	2.7	3.52	0.19	0.014	0.19	0.058	0.16	0.024	0.019	ND
Sample Variance	0.0	59.3	7.4	12.39	0.04	0.000	0.04	0.003	0.03	0.001	0.000	ND
Range	0.5	19.1	7.2	11.38	0.50	0.040	0.50	0.140	0.53	0.068	0.057	ND
Minimum	7.4	1.1	5.9	0.62	0.28	0.000	0.29	0.000	0.41	0.032	0.010	ND
Maximum	7.9	20.1	13.1	12.00	0.78	0.040	0.79	0.140	0.94	0.100	0.067	ND
Count	9	9	9	9	9	9	9	9	9	9	9	0
Confidence Level (95%)	0.1	5.9	2.1	2.71	0.15	0.010	0.15	0.044	0.12	0.019	0.015	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	816.7	807.0	2.8	9.7	7.9	1459	257.8	3934	2.9	ND
Standard Error	ND	ND	75.4	76.0	0.6	2.1	1.2	126	45.3	3263	0.2	ND
Median	ND	ND	770.0	767.6	3.0	6.0	6.9	1340	210.0	500	2.7	ND
Mode	ND	ND	Multi	Multi	Multi	Multi	6.9	1260	210.0	Multi	Multi	ND
Standard Deviation	ND	ND	226.2	227.9	1.8	6.2	3.5	379	135.9	9789	0.7	ND
Sample Variance	ND	ND	51175.0	51937.8	3.2	38.1	12.2	143636	18469.4	95819103	0.6	ND
Range	ND	ND	810.0	819.5	5.2	17.6	10.1	1230	470.0	29930	2.6	ND
Minimum	ND	ND	490.0	475.0	0.0	2.4	4.8	1190	130.0	70	1.8	ND
Maximum	ND	ND	1300.0	1294.5	5.2	20.0	14.9	2420	600.0	30000	4.5	ND
Count	0	0	9	9	9	9	9	9	9	9	9	0
Confidence Level (95%)	ND	ND	173.9	175.2	1.4	4.7	2.7	291	104.5	7524	0.6	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

15TH AVE. - SITE 5
OAK CREEK
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	81.89	38.56	0.2	2.0	4.3	2.5	0.0	10.7	0.0	1.7	0.0	ND
Standard Error	5.24	2.66	0.1	0.2	1.4	0.4	0.0	1.8	0.0	1.2	0.0	ND
Median	84.00	39.00	0.0	1.8	6.1	2.9	0.0	11.0	0.0	0.0	0.0	ND
Mode	Multi	39.00	0.0	1.6	0.0	Multi	0.0	11.0	0.0	0.0	0.0	ND
Standard Deviation	15.73	7.97	0.3	0.6	4.3	1.2	0.0	5.4	0.0	3.4	0.0	ND
Sample Variance	247.36	63.53	0.1	0.4	18.3	1.5	0.0	29.3	0.0	11.2	0.0	ND
Range	47.00	24.00	0.8	1.8	11.0	3.5	0.0	21.0	0.0	8.8	0.0	ND
Minimum	52.00	23.00	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	99.00	47.00	0.8	3.2	11.0	3.5	0.0	21.0	0.0	8.8	0.0	ND
Count	9	9	9	9	9	9	7	9	7	8	9	0
Confidence Level (95%)	12.09	6.13	0.3	0.5	3.3	0.9	0.0	4.2	0.0	2.8	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	363	238	2.6	ND	59.1	50.9	8.1	7.7
Standard Error	24	18	1.6	ND	3.3	3.3	0.8	0.7
Median	380	260	0.0	ND	62.0	53.0	8.3	7.9
Mode	Multi	Multi	0.0	ND	Multi	53.0	Multi	7.9
Standard Deviation	71	54	4.9	ND	9.9	10.0	2.5	2.2
Sample Variance	4975	2919	23.7	ND	98.1	99.4	6.1	4.9
Range	210	150	14.0	ND	29.0	31.0	8.2	7.6
Minimum	220	150	0.0	ND	42.0	32.0	4.8	4.4
Maximum	430	300	14.0	ND	71.0	63.0	13.0	12.0
Count	9	9	9	0	9	9	9	9
Confidence Level (95%)	54	42	3.7	ND	7.6	7.7	1.9	1.7

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

OAK CREEK PKWY (EAST OF HWY. 32) - SITE 6
OAK CREEK
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.8	11.9	10.2	2.54	0.48	0.016	0.50	0.031	0.51	0.042	0.019	ND
Standard Error	0.1	2.5	0.7	1.07	0.07	0.005	0.07	0.018	0.11	0.007	0.004	ND
Median	7.9	14.9	9.2	1.20	0.46	0.013	0.50	0.000	0.44	0.035	0.014	ND
Mode	7.9	Multi	8.4	Multi	0.46	0.000	Multi	0.000	0.36	Multi	Multi	ND
Standard Deviation	0.2	7.4	2.2	3.21	0.20	0.016	0.21	0.053	0.33	0.020	0.011	ND
Sample Variance	0.0	55.1	5.0	10.32	0.04	0.000	0.04	0.003	0.11	0.000	0.000	ND
Range	0.5	18.1	5.5	10.06	0.54	0.037	0.56	0.140	0.97	0.053	0.028	ND
Minimum	7.6	1.3	8.4	0.94	0.19	0.000	0.19	0.000	0.00	0.020	0.009	ND
Maximum	8.1	19.4	13.9	11.00	0.73	0.037	0.75	0.140	0.97	0.073	0.037	ND
Count	9	9	9	9	9	9	9	9	9	9	9	0
Confidence Level (95%)	0.1	5.7	1.7	2.47	0.15	0.012	0.16	0.040	0.25	0.015	0.009	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	880.0	874.5	1.6	5.5	6.7	1510	274.4	1687	2.7	ND
Standard Error	ND	ND	70.8	71.1	0.5	1.5	1.2	135	48.7	1173	0.2	ND
Median	ND	ND	850.0	843.4	1.3	3.4	5.7	1410	240.0	330	2.5	ND
Mode	ND	ND	Multi	Multi	0.0	Multi	Multi	Multi	Multi	210	2.3	ND
Standard Deviation	ND	ND	212.5	213.3	1.5	4.5	3.6	404	146.0	3518	0.6	ND
Sample Variance	ND	ND	45150.0	45492.1	2.2	20.3	12.9	163225	21327.8	12373950	0.4	ND
Range	ND	ND	710.0	710.2	3.7	12.6	11.0	1340	470.0	10860	1.9	ND
Minimum	ND	ND	690.0	686.6	0.0	1.4	2.8	1200	190.0	140	2.1	ND
Maximum	ND	ND	1400.0	1396.8	3.7	14.0	13.8	2540	660.0	11000	4.0	ND
Count	0	0	9	9	9	9	9	9	9	9	9	0
Confidence Level (95%)	ND	ND	163.3	163.9	1.1	3.5	2.8	311	112.3	2704	0.5	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

OAK CREEK PKWY (EAST OF HWY. 32) - SITE 6
OAK CREEK
WATER QUALITY DATA - 2013

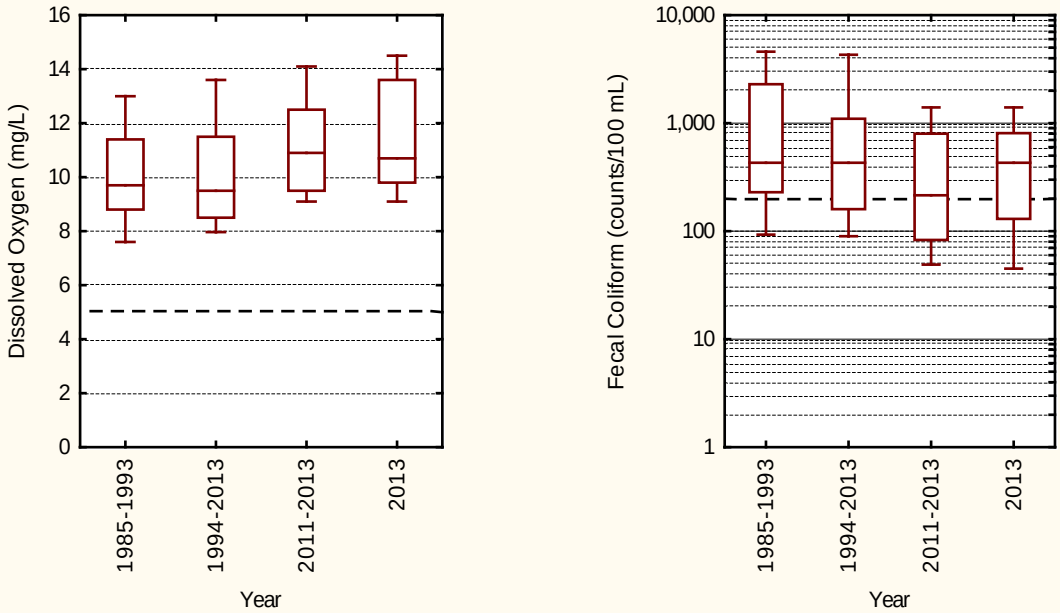
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	89.89	41.11	0.0	2.0	4.3	2.3	0.0	7.2	0.0	3.4	0.0	ND
Standard Error	4.45	1.95	0.0	0.1	1.1	0.6	0.0	1.8	0.0	1.1	0.0	ND
Median	88.00	40.00	0.0	2.1	6.3	3.0	0.0	9.8	0.0	4.1	0.0	ND
Mode	100.00	40.00	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	13.36	5.84	0.1	0.4	3.3	1.9	0.0	5.5	0.0	3.2	0.0	ND
Sample Variance	178.61	34.11	0.0	0.2	10.7	3.6	0.0	30.7	0.0	10.0	0.0	ND
Range	42.00	19.00	0.4	1.3	7.0	4.2	0.0	13.0	0.0	8.6	0.0	ND
Minimum	68.00	31.00	0.0	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	110.00	50.00	0.4	2.6	7.0	4.2	0.0	13.0	0.0	8.6	0.0	ND
Count	9	9	9	9	9	9	9	9	8	8	8	0
Confidence Level (95%)	10.27	4.49	0.1	0.3	2.5	1.5	0.0	4.3	0.0	2.6	0.0	ND

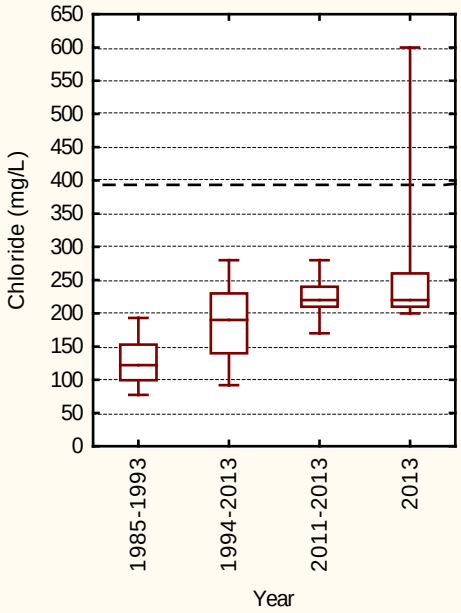
VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	392	258	1.6	ND	61.0	53.8	7.2	7.1
Standard Error	18	17	1.1	ND	2.3	2.4	0.7	0.7
Median	400	280	0.0	ND	62.0	56.0	6.8	6.6
Mode	430	300	0.0	ND	62.0	60.0	10.0	Multi
Standard Deviation	53	51	3.4	ND	7.0	7.1	2.2	2.2
Sample Variance	2794	2619	11.9	ND	49.3	50.4	5.0	4.6
Range	160	140	9.7	ND	23.0	20.0	6.0	6.1
Minimum	310	180	0.0	ND	48.0	42.0	4.0	3.9
Maximum	470	320	9.7	ND	71.0	62.0	10.0	10.0
Count	9	9	9	0	9	9	9	9
Confidence Level (95%)	41	39	2.6	ND	5.4	5.5	1.7	1.7

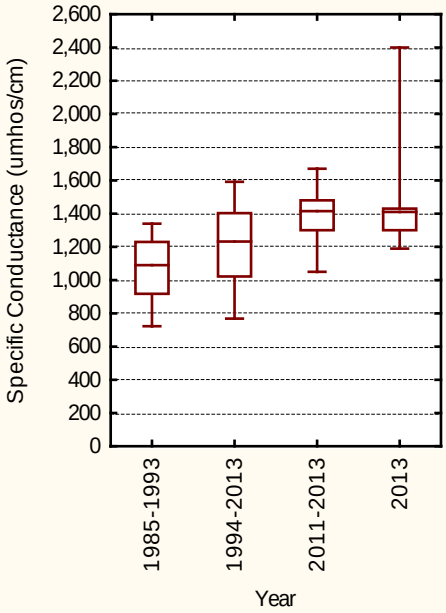
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

MMSD Water Quality Monitoring Program Data
Oak Creek at Oak Creek Pkwy., Site OC-07

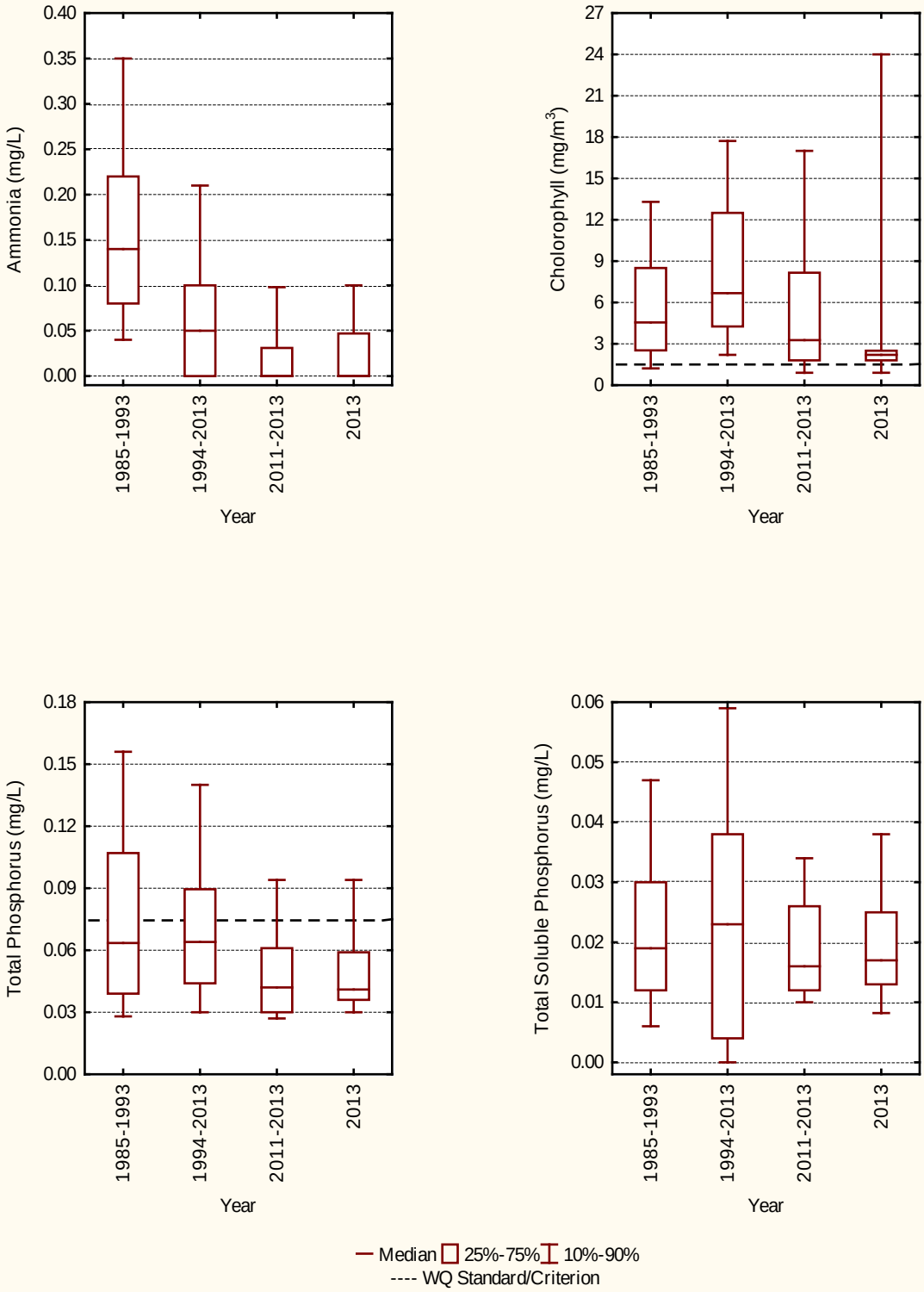




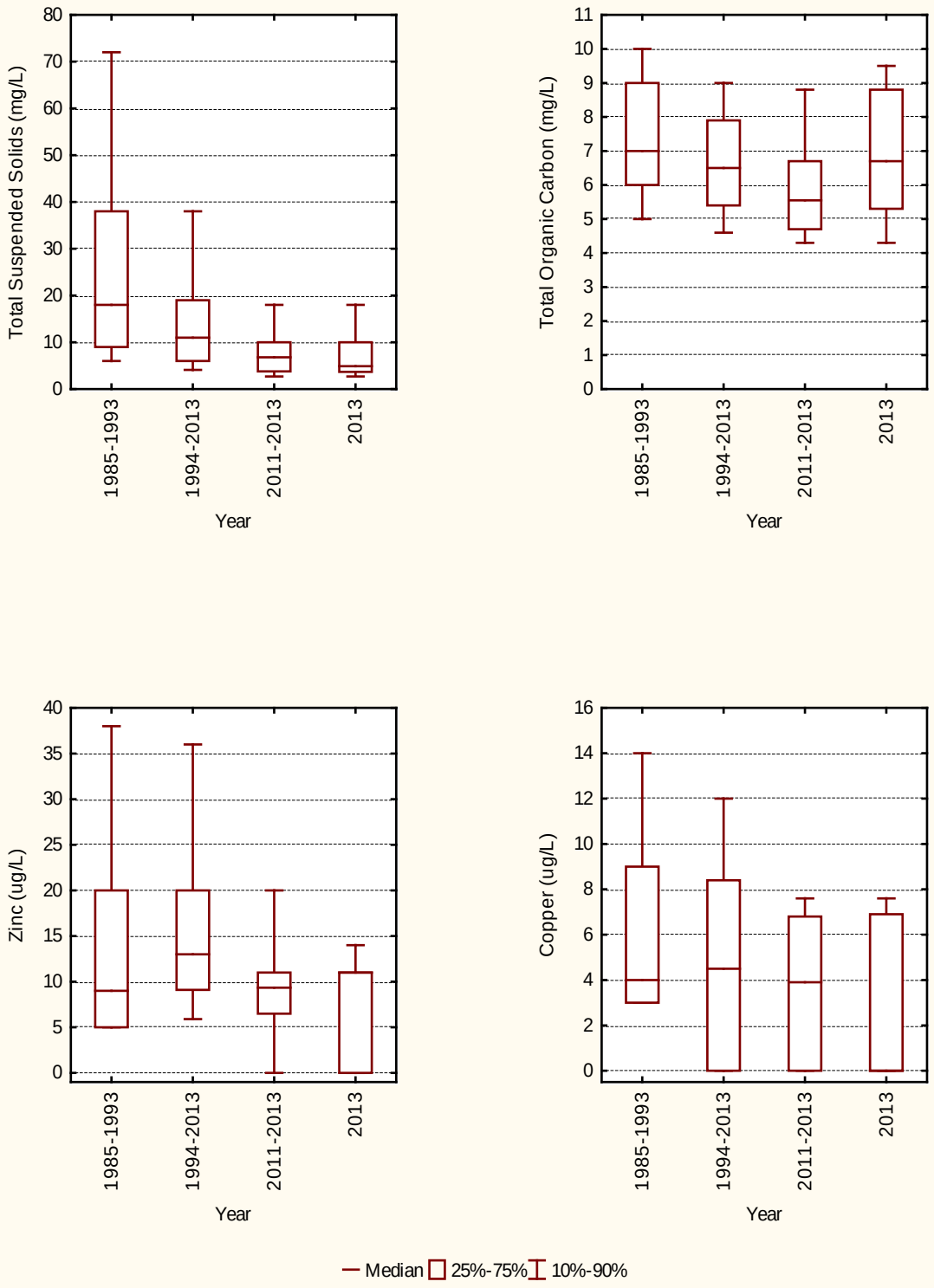


— Median ☐ 25%-75% I 10%-90%
---- WQ Standard/Criterion

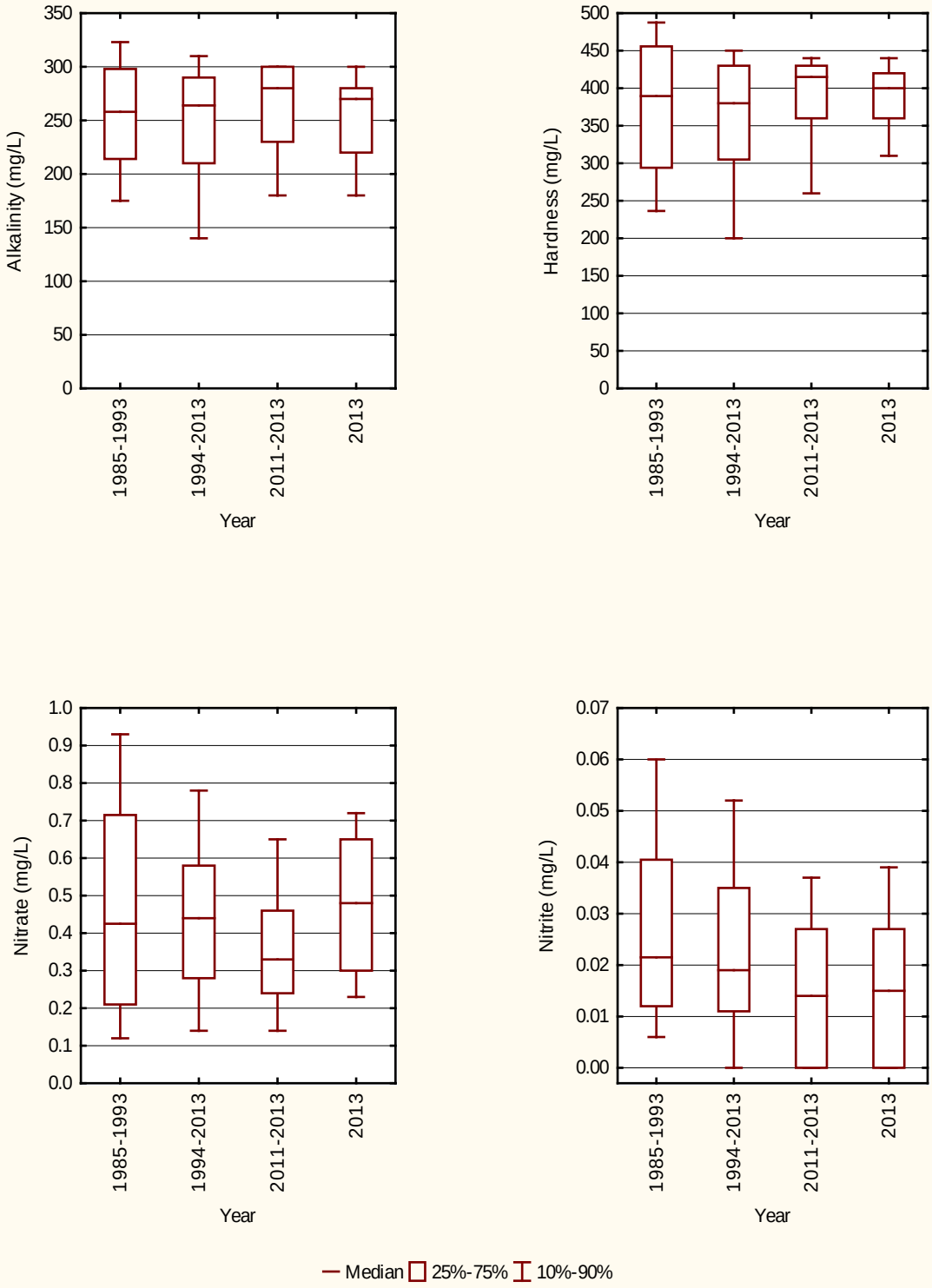
MMSD Water Quality Monitoring Program Data
Oak Creek at Oak Creek Pkwy., Site OC-07



MMSD Water Quality Monitoring Program Data
Oak Creek at Oak Creek Pkwy., Site OC-07



MMSD Water Quality Monitoring Program Data
Oak Creek at Oak Creek Pkwy., Site OC-07



OAK CREEK PKWY (EAST OF LAKE DR. EX.) - SITE 7
OAK CREEK
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.1	12.6	11.4	6.06	0.46	0.016	0.48	0.029	0.50	0.051	0.019	ND
Standard Error	0.1	2.6	0.7	2.80	0.07	0.005	0.07	0.014	0.09	0.007	0.003	ND
Median	8.1	15.8	10.7	2.20	0.48	0.015	0.51	0.000	0.45	0.041	0.017	ND
Mode	8.2	Multi	Multi	1.80	Multi	0.000	0.24	0.000	0.64	Multi	0.013	ND
Standard Deviation	0.2	7.9	2.1	8.39	0.20	0.016	0.20	0.042	0.27	0.020	0.010	ND
Sample Variance	0.0	63.1	4.3	70.36	0.04	0.000	0.04	0.002	0.07	0.000	0.000	ND
Range	0.5	19.4	5.4	23.10	0.49	0.039	0.50	0.100	1.00	0.064	0.030	ND
Minimum	7.8	1.5	9.1	0.90	0.23	0.000	0.24	0.000	0.00	0.030	0.008	ND
Maximum	8.3	20.9	14.5	24.00	0.72	0.039	0.74	0.100	1.00	0.094	0.038	ND
Count	9	9	9	9	9	9	9	9	9	9	9	0
Confidence Level (95%)	0.1	6.1	1.6	6.45	0.15	0.012	0.15	0.033	0.21	0.016	0.007	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	865.6	857.4	2.5	8.1	9.0	1479	266.7	503	2.5	ND
Standard Error	ND	ND	59.1	59.5	0.5	2.0	1.4	119	42.3	151	0.2	ND
Median	ND	ND	830.0	812.0	3.4	4.9	7.9	1410	220.0	430	2.6	ND
Mode	ND	ND	Multi	Multi	Multi	18.0	9.5	1410	220.0	130	2.1	ND
Standard Deviation	ND	ND	177.3	178.6	1.5	6.1	4.2	357	126.8	452	0.5	ND
Sample Variance	ND	ND	31452.8	31899.7	2.2	37.2	17.8	127361	16075.0	204344	0.2	ND
Range	ND	ND	600.0	600.1	3.8	15.3	12.6	1210	400.0	1355	1.5	ND
Minimum	ND	ND	700.0	696.3	0.0	2.7	5.0	1190	200.0	45	1.7	ND
Maximum	ND	ND	1300.0	1296.4	3.8	18.0	17.6	2400	600.0	1400	3.1	ND
Count	0	0	9	9	9	9	9	9	9	9	9	0
Confidence Level (95%)	ND	ND	136.3	137.3	1.1	4.7	3.2	274	97.5	347	0.4	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

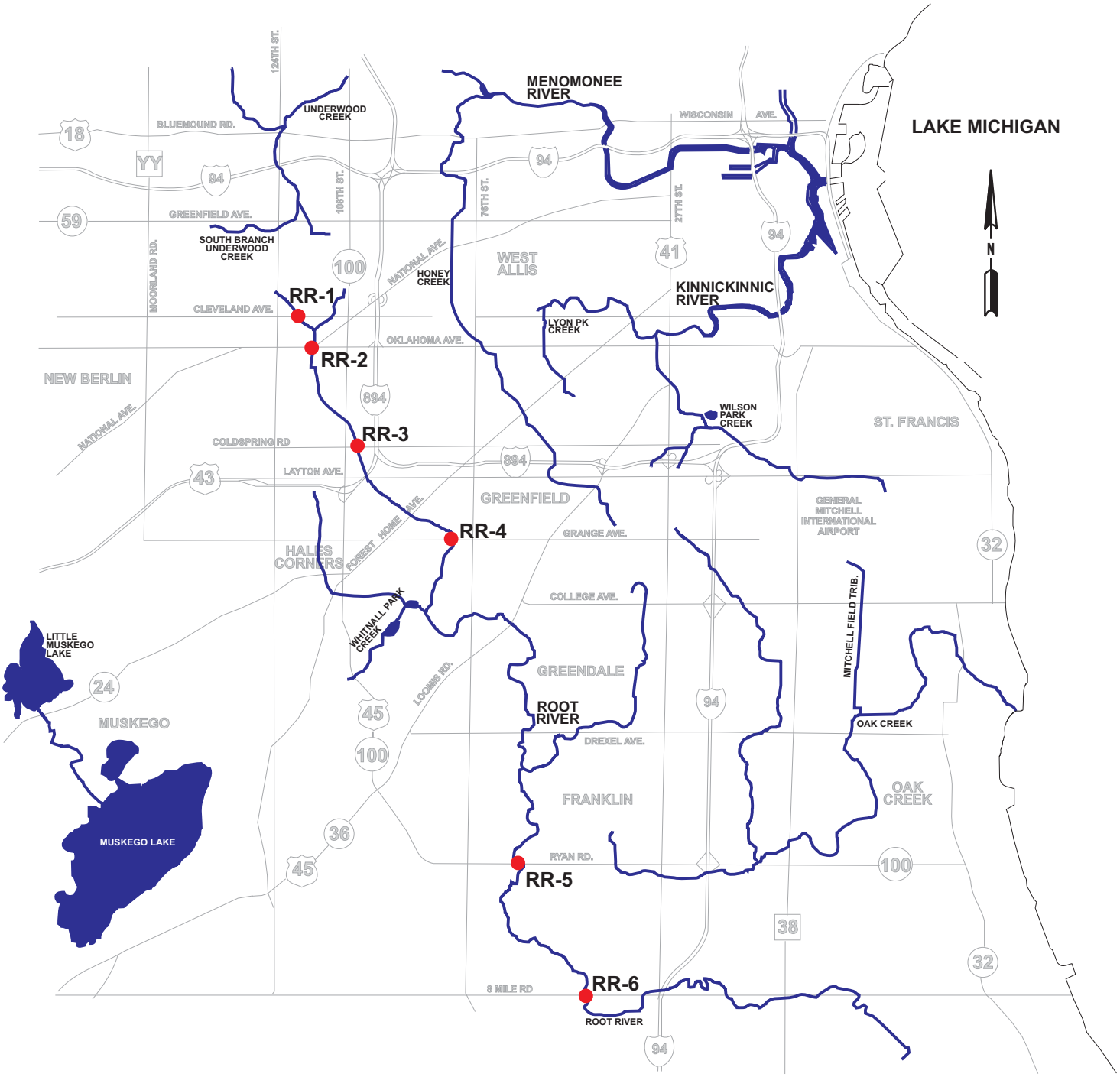
OAK CREEK PKWY (EAST OF LAKE DR. EX.) - SITE 7
OAK CREEK
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	87.44	40.67	0.1	2.5	2.4	2.3	0.0	7.6	0.0	5.2	0.0	ND
Standard Error	3.35	1.62	0.1	0.4	1.2	0.5	0.0	1.9	0.0	1.4	0.0	ND
Median	89.00	40.00	0.0	1.9	0.0	2.4	0.0	11.0	0.0	6.8	0.0	ND
Mode	Multi	Multi	0.0	Multi	0.0	Multi	0.0	Multi	0.0	Multi	0.0	ND
Standard Deviation	10.05	4.85	0.2	1.1	3.6	1.4	0.0	5.8	0.0	3.7	0.0	ND
Sample Variance	101.03	23.50	0.0	1.3	13.1	1.9	0.0	33.9	0.0	13.6	0.0	ND
Range	27.00	16.00	0.5	3.2	7.6	4.8	0.0	14.0	0.0	8.4	0.0	ND
Minimum	73.00	31.00	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	100.00	47.00	0.5	4.8	7.6	4.8	0.0	14.0	0.0	8.4	0.0	ND
Count	9	9	9	9	9	9	9	9	8	7	9	0
Confidence Level (95%)	7.73	3.73	0.1	0.9	2.8	1.1	0.0	4.5	0.0	3.4	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	387	253	1.3	ND	60.6	53.7	7.0	6.7
Standard Error	15	14	0.9	ND	2.1	2.1	0.6	0.6
Median	400	270	0.0	ND	62.0	55.0	6.7	6.6
Mode	Multi	280	0.0	ND	Multi	60.0	Multi	Multi
Standard Deviation	44	41	2.7	ND	6.3	6.3	1.9	1.9
Sample Variance	1950	1700	7.2	ND	39.5	40.0	3.8	3.7
Range	130	120	7.6	ND	19.0	16.0	5.2	5.2
Minimum	310	180	0.0	ND	51.0	45.0	4.3	4.1
Maximum	440	300	7.6	ND	70.0	61.0	9.5	9.3
Count	9	9	9	0	9	9	9	9
Confidence Level (95%)	34	32	2.1	ND	4.8	4.9	1.5	1.5

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data



LEGEND

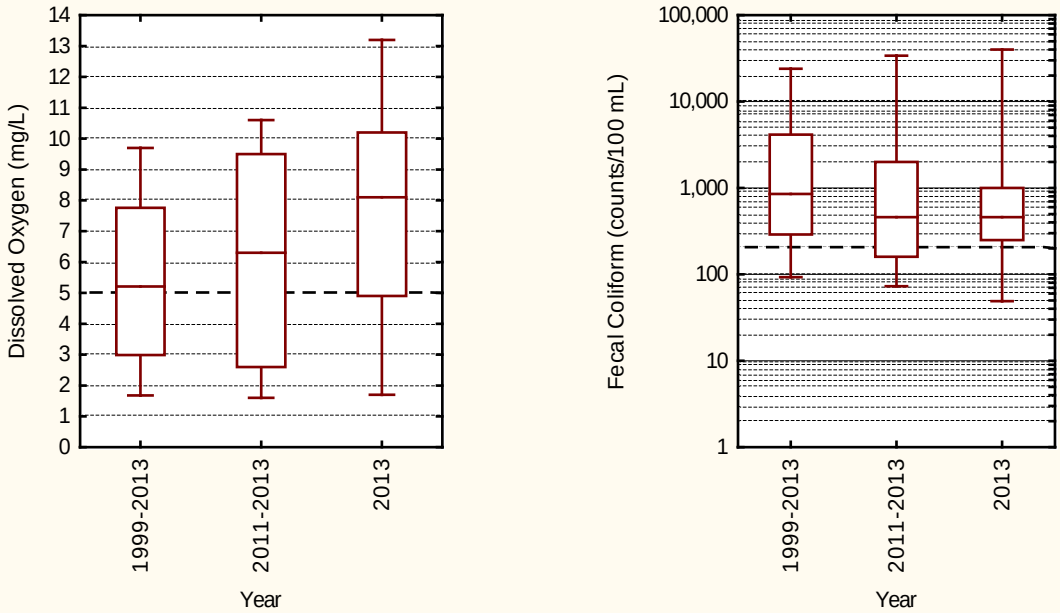
● ACTIVE WATER QUALITY SAMPLING LOCATIONS

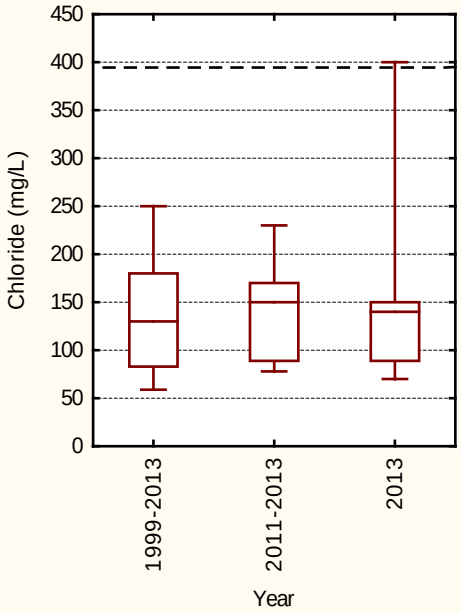
MMSD
PARTNERS FOR A CLEANER ENVIRONMENT

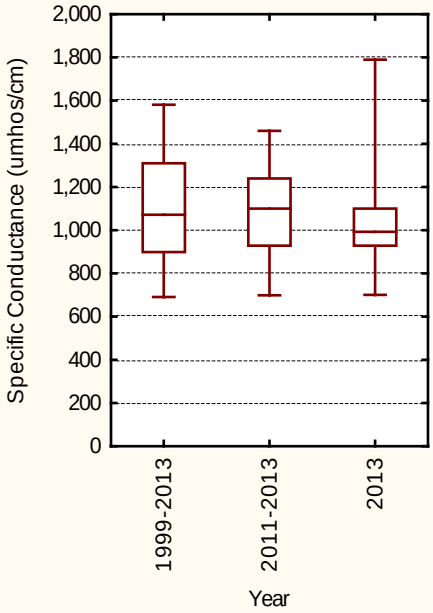
ROOT RIVER (RR) SURVEY
WATER QUALITY SAMPLING LOCATIONS

4/14/14 14-061 RR

MMSD Water Quality Monitoring Program Data
Root River at Cleveland Ave., Site RR-01

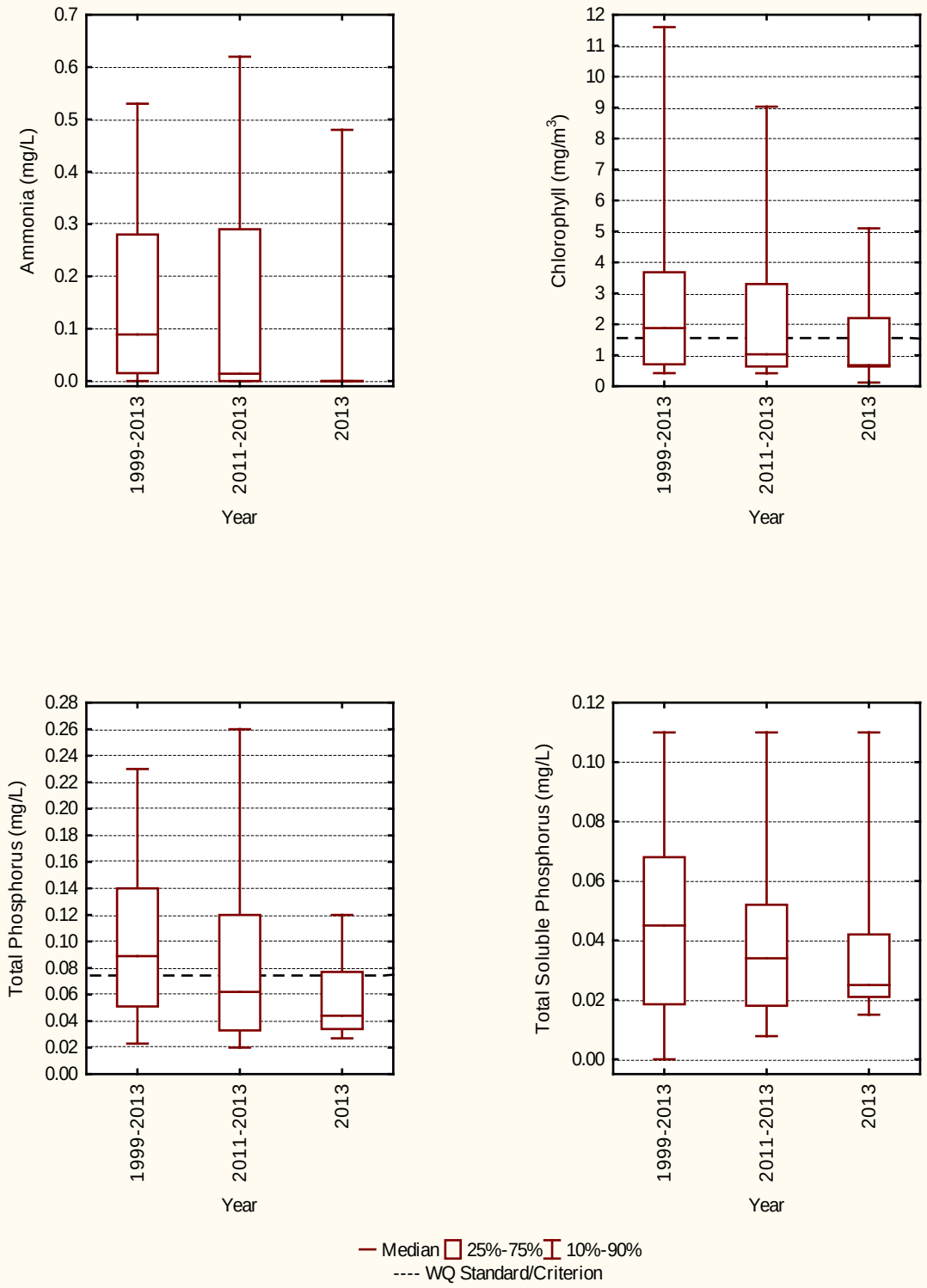




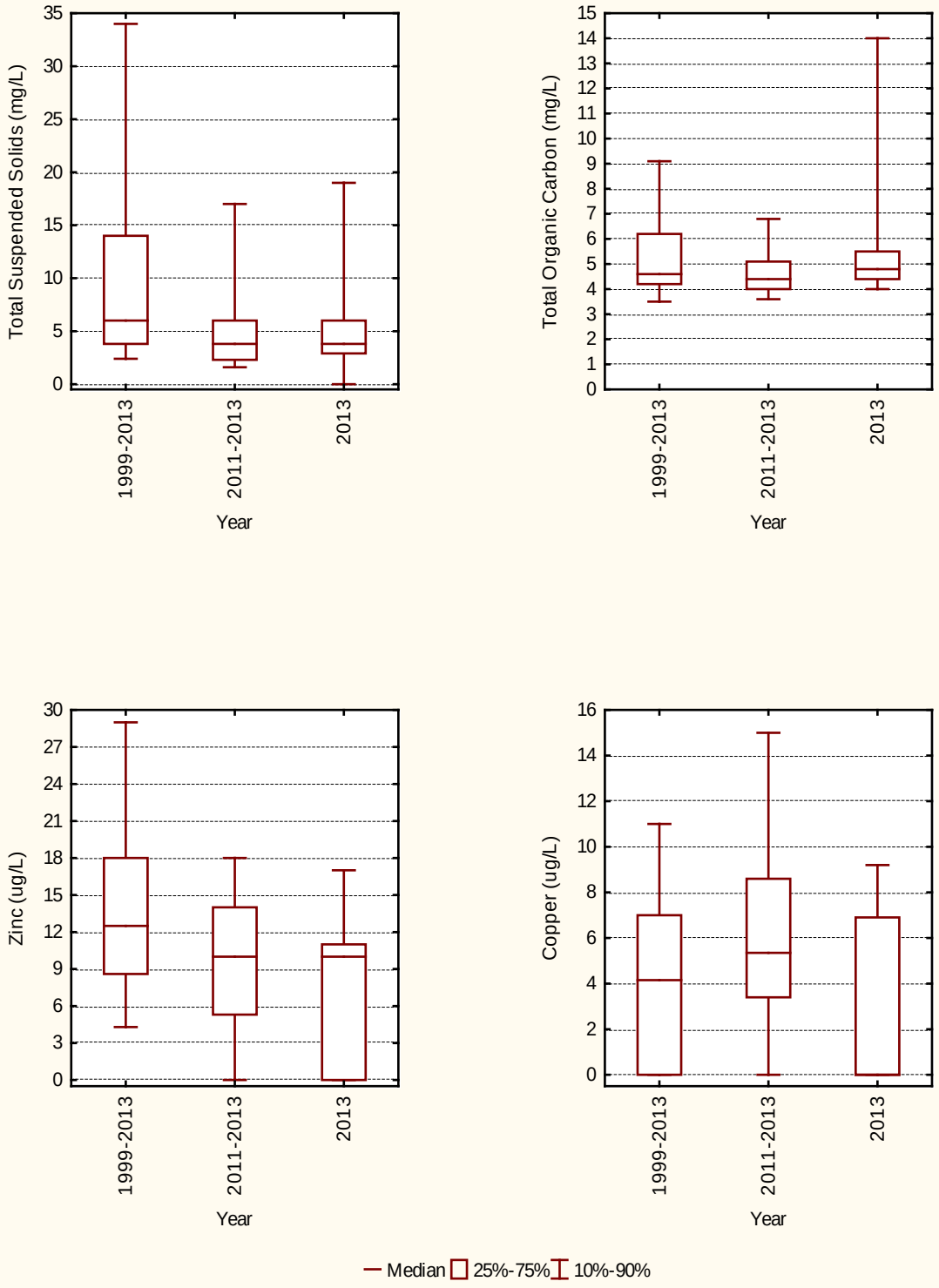


— Median ☐ 25%-75% I 10%-90%
---- WQ Standard/Criterion

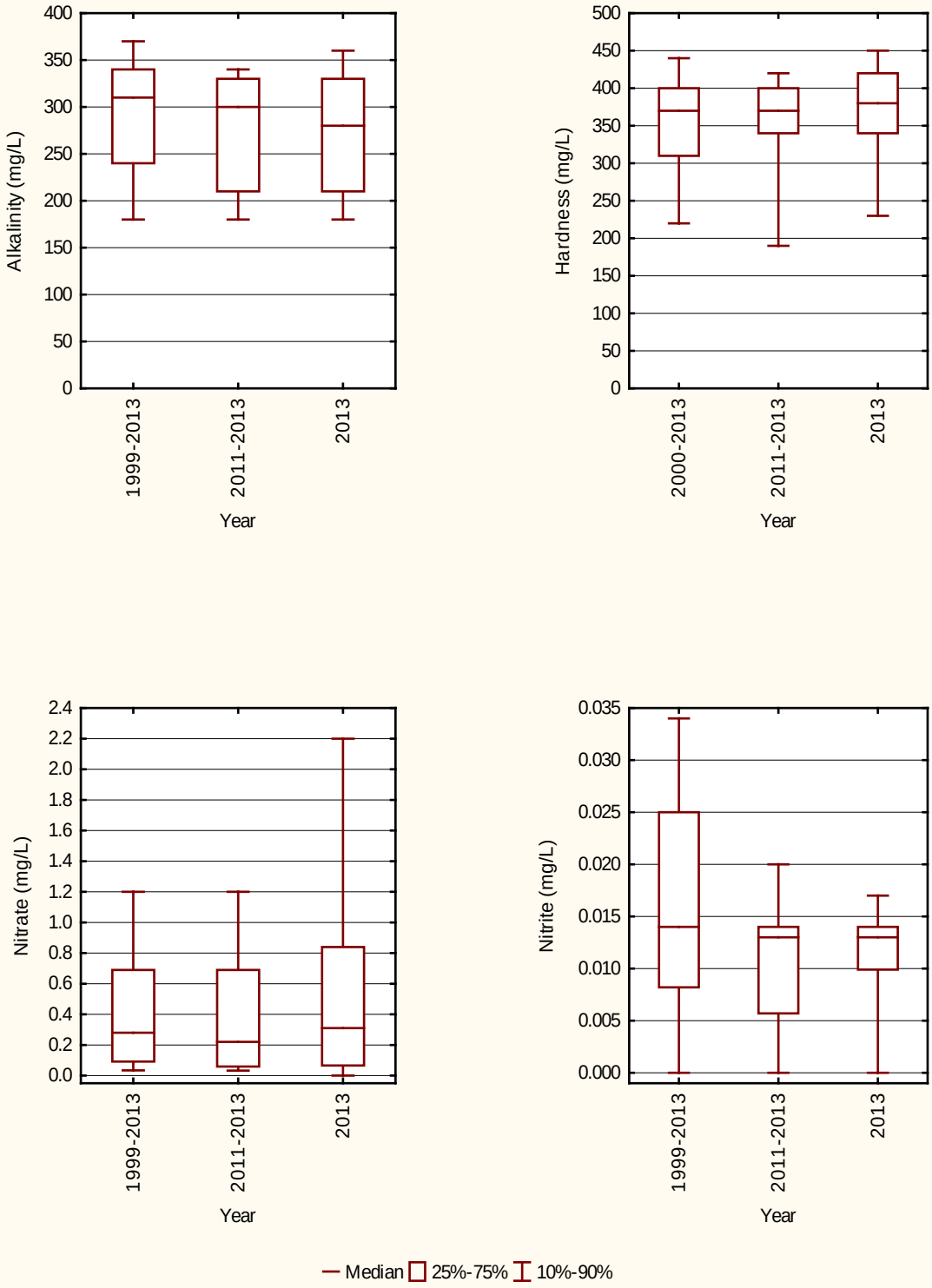
MMSD Water Quality Monitoring Program Data
Root River at Cleveland Ave., Site RR-01



MMSD Water Quality Monitoring Program Data
Root River at Cleveland Ave., Site RR-01



MMSD Water Quality Monitoring Program Data
Root River at Cleveland Ave., Site RR-01



CLEVELAND AVE (JUST EAST OF 124TH ST.) - SITE 1
ROOT RIVER
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.5	10.0	7.7	1.54	0.66	0.012	0.67	0.066	0.52	0.059	0.038	ND
Standard Error	0.1	2.4	1.3	0.56	0.26	0.002	0.26	0.053	0.07	0.012	0.010	ND
Median	7.5	11.9	8.1	0.68	0.31	0.013	0.32	0.000	0.53	0.044	0.025	ND
Mode	Multi	Multi	Multi	0.68	Multi	0.013	Multi	0.000	0.53	0.120	Multi	ND
Standard Deviation	0.2	7.3	4.0	1.67	0.79	0.005	0.79	0.160	0.20	0.037	0.030	ND
Sample Variance	0.1	53.7	15.9	2.80	0.62	0.000	0.62	0.025	0.04	0.001	0.001	ND
Range	0.6	18.2	11.5	4.98	2.20	0.017	2.18	0.480	0.68	0.093	0.095	ND
Minimum	7.3	0.8	1.7	0.12	0.00	0.000	0.02	0.000	0.32	0.027	0.015	ND
Maximum	7.9	19.0	13.2	5.10	2.20	0.017	2.20	0.480	1.00	0.120	0.110	ND
Count	9	9	9	9	9	9	9	9	9	9	9	0
Confidence Level (95%)	0.2	5.6	3.1	1.29	0.61	0.004	0.60	0.123	0.16	0.029	0.023	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	603.3	597.9	1.4	5.4	5.2	1072	154.7	6007	2.9	ND
Standard Error	ND	ND	62.8	63.6	0.5	1.8	1.6	117	34.0	4407	0.3	ND
Median	ND	ND	580.0	580.0	1.5	3.8	3.7	993	140.0	460	2.7	ND
Mode	ND	ND	Multi	Multi	0.0	Multi	2.6	Multi	150.0	Multi	Multi	ND
Standard Deviation	ND	ND	188.5	190.7	1.5	5.5	4.9	350	101.9	13221	0.9	ND
Sample Variance	ND	ND	35550.0	36370.1	2.4	29.8	24.5	122714	10389.3	174790989	0.8	ND
Range	ND	ND	620.0	621.5	4.4	19.0	16.2	1089	330.0	39951	2.9	ND
Minimum	ND	ND	360.0	354.7	0.0	0.0	1.5	701	70.0	49	1.7	ND
Maximum	ND	ND	980.0	976.2	4.4	19.0	17.7	1790	400.0	40000	4.6	ND
Count	0	0	9	9	9	9	9	9	9	9	9	0
Confidence Level (95%)	ND	ND	144.9	146.6	1.2	4.2	3.8	269	78.3	10162	0.7	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

CLEVELAND AVE (JUST EAST OF 124TH ST.) - SITE 1
ROOT RIVER
WATER QUALITY DATA - 2013

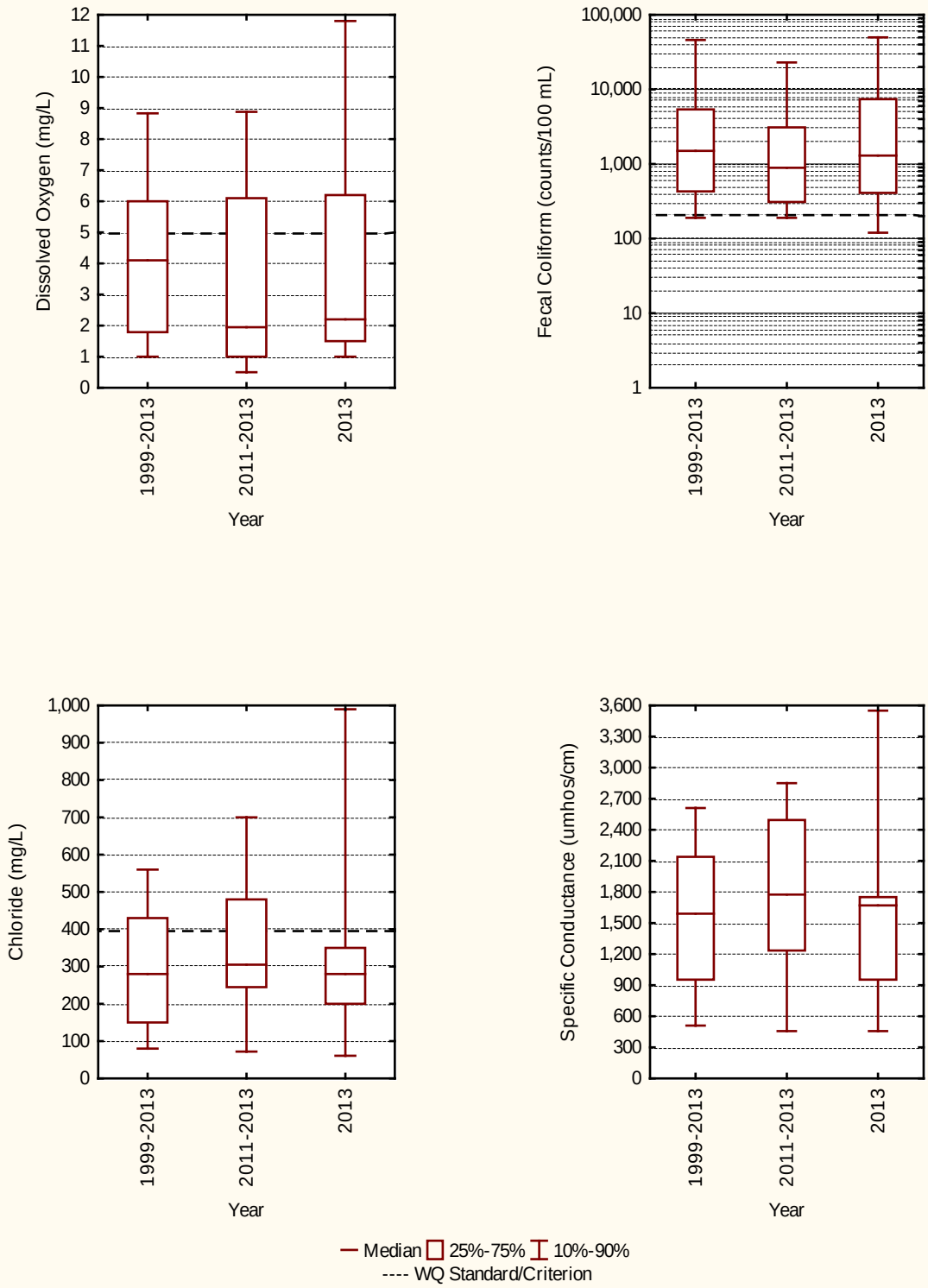
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	77.78	40.11	0.2	1.8	3.4	3.4	0.0	8.0	0.0	4.1	0.0	ND
Standard Error	5.59	2.95	0.1	0.4	1.3	0.8	0.0	2.1	0.0	1.2	0.0	ND
Median	80.00	43.00	0.0	2.0	0.0	2.6	0.0	10.0	0.0	4.6	0.0	ND
Mode	97.00	Multi	0.0	Multi	0.0	Multi	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	16.78	8.85	0.3	1.3	4.0	2.5	0.0	6.4	0.0	3.5	0.0	ND
Sample Variance	281.44	78.36	0.1	1.6	16.4	6.3	0.0	41.5	0.0	12.1	0.0	ND
Range	47.00	25.00	0.9	4.1	9.2	7.4	0.0	17.0	0.0	8.7	0.0	ND
Minimum	50.00	26.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	97.00	51.00	0.9	4.1	9.2	7.4	0.0	17.0	0.0	8.7	0.0	ND
Count	9	9	9	9	9	9	9	9	8	9	9	0
Confidence Level (95%)	12.90	6.80	0.2	1.0	3.1	1.9	0.0	4.9	0.0	2.7	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	360	270	1.5	ND	63.0	57.2	5.8	5.5
Standard Error	25	22	1.2	ND	3.7	4.3	1.0	0.8
Median	380	280	0.0	ND	61.0	56.0	4.8	4.7
Mode	420	330	0.0	ND	Multi	Multi	4.8	4.7
Standard Deviation	76	67	3.7	ND	11.1	12.8	3.1	2.5
Sample Variance	5850	4500	13.4	ND	123.8	163.4	9.8	6.4
Range	220	180	11.0	ND	34.0	37.0	10.0	8.1
Minimum	230	180	0.0	ND	45.0	38.0	4.0	3.9
Maximum	450	360	11.0	ND	79.0	75.0	14.0	12.0
Count	9	9	9	0	9	9	9	9
Confidence Level (95%)	59	52	2.8	ND	8.6	9.8	2.4	1.9

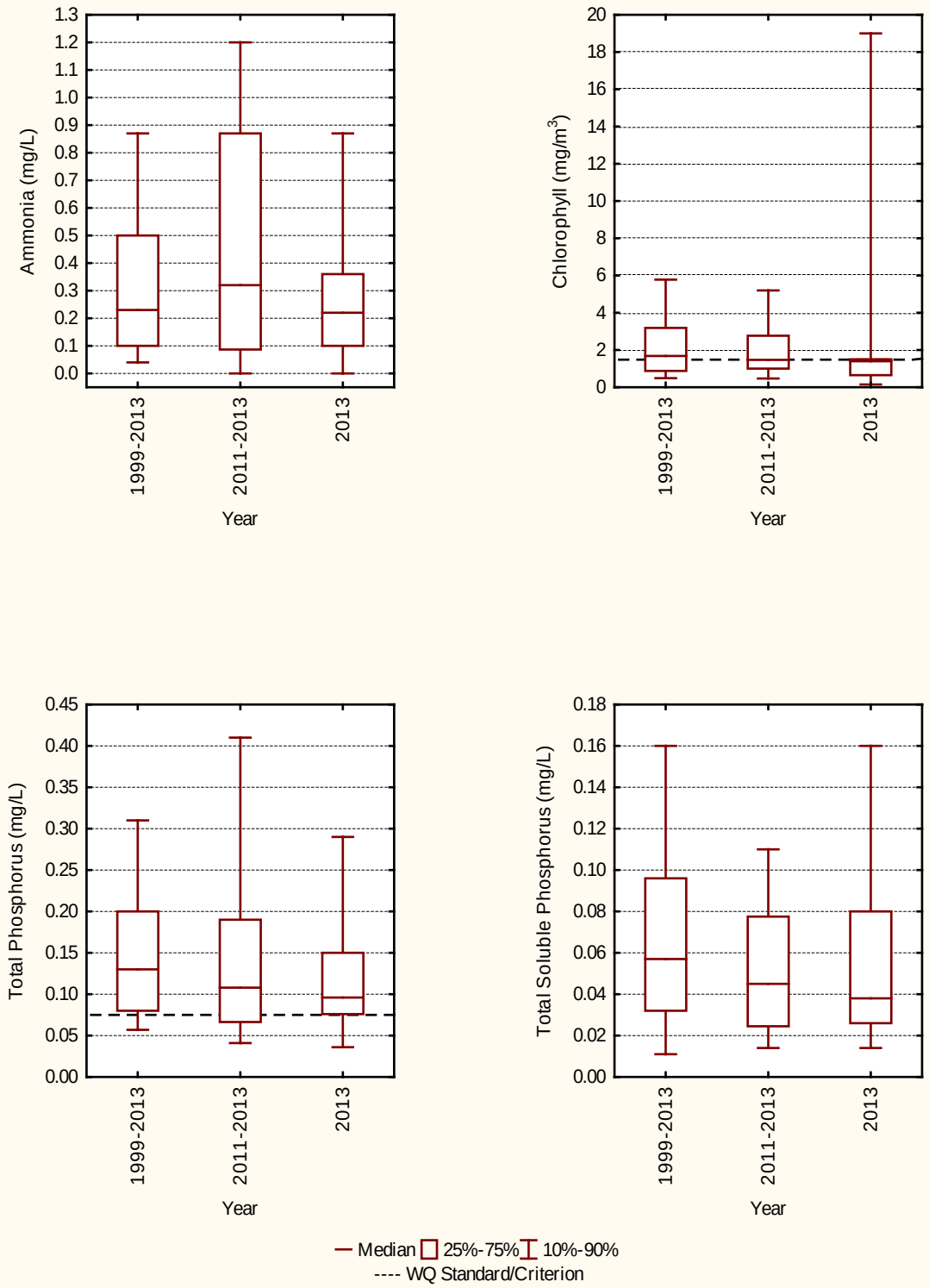
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

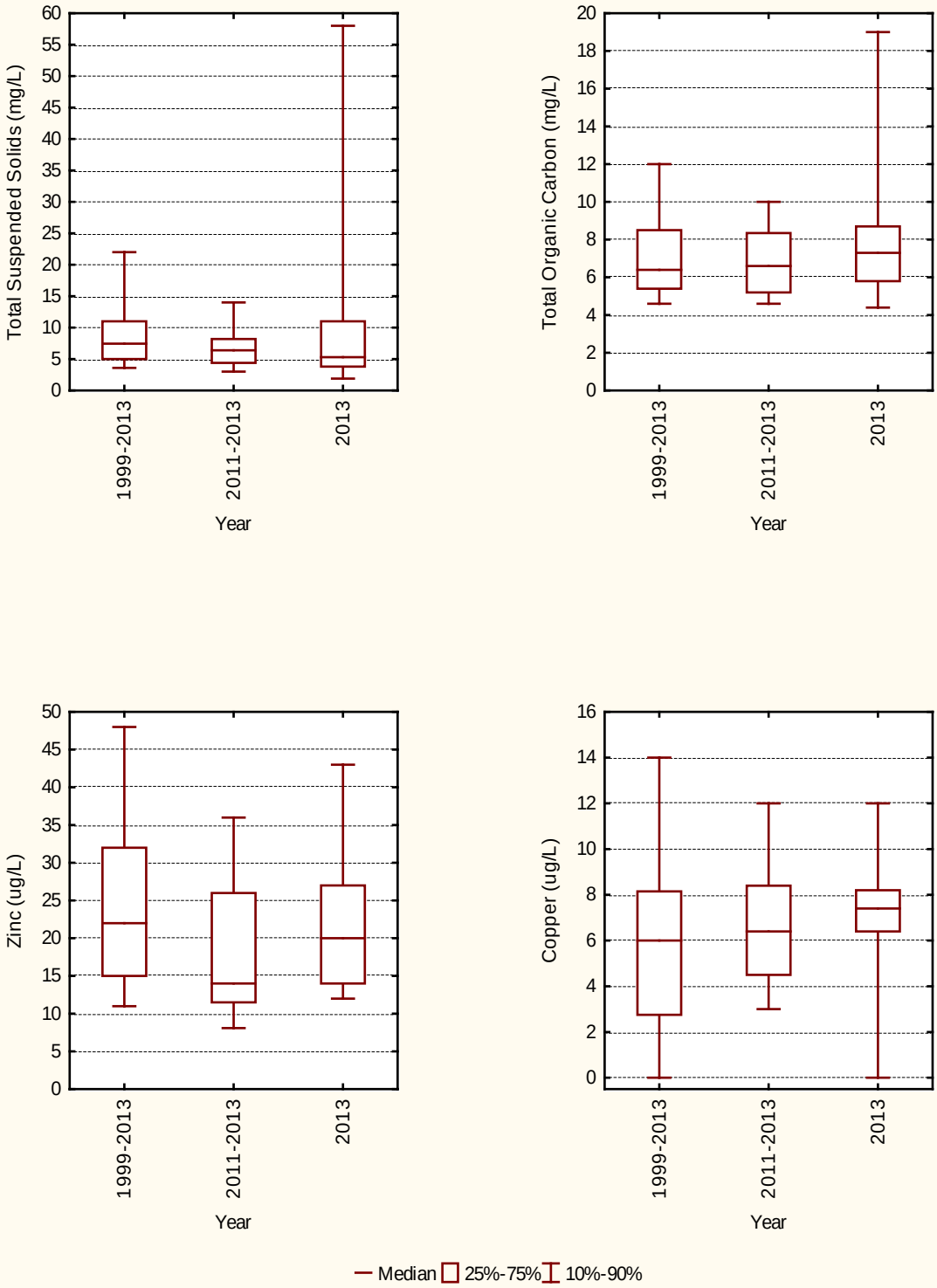
MMSD Water Quality Monitoring Program Data
Root River at National and Oklahoma Ave., Site RR-02



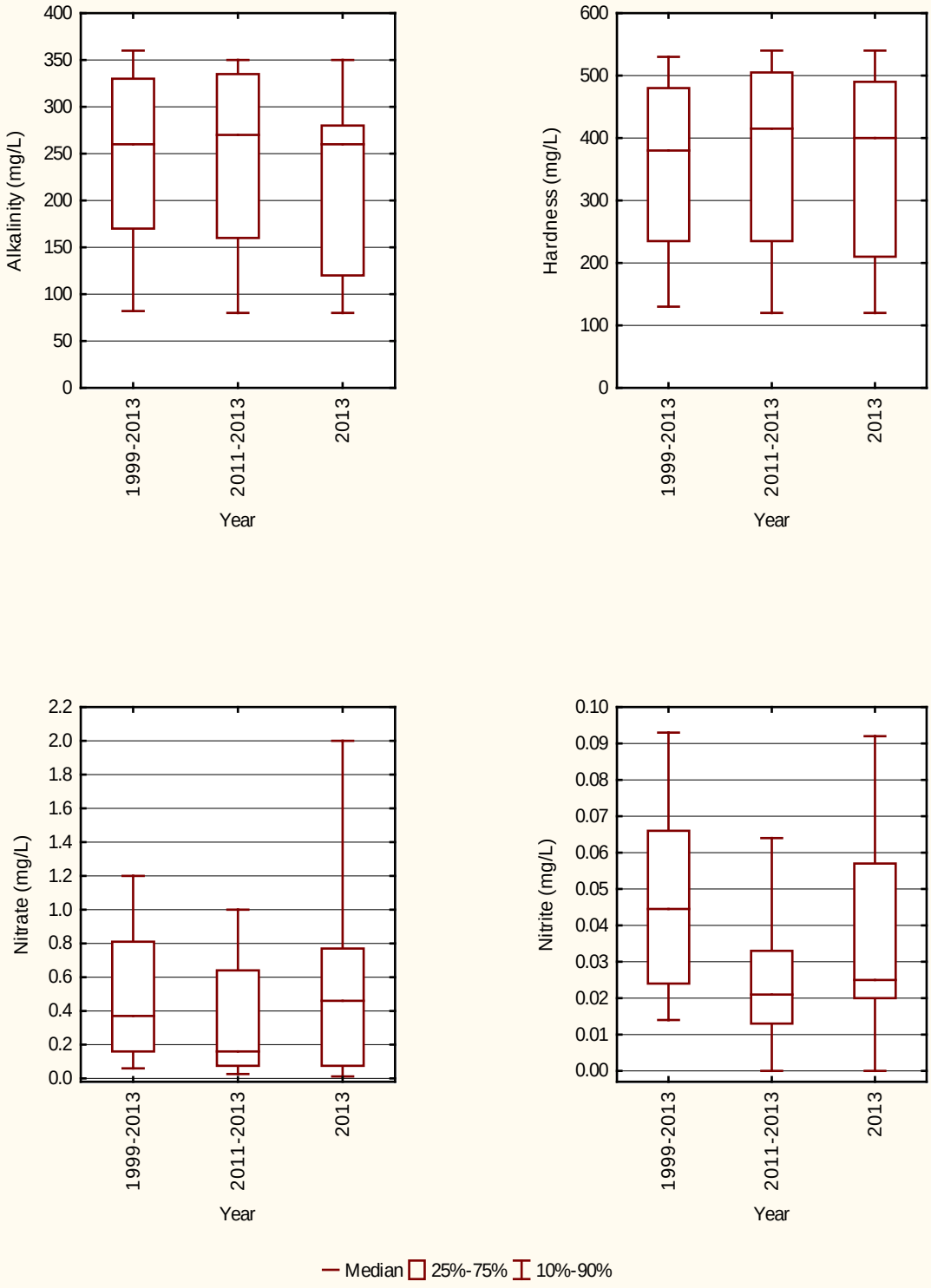
MMSD Water Quality Monitoring Program Data
Root River at National and Oklahoma Ave., Site RR-02



MMSD Water Quality Monitoring Program Data
Root River at National and Oklahoma Ave., Site RR-02



MMSD Water Quality Monitoring Program Data
Root River at National and Oklahoma Ave., Site RR-02



NATIONAL AVE. AND OKLAHOMA AVE. (~116TH ST.) - SITE 2
ROOT RIVER
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.3	10.5	4.5	3.45	0.59	0.036	0.62	0.286	0.95	0.118	0.058	ND
Standard Error	0.1	2.3	1.5	2.00	0.23	0.010	0.23	0.098	0.18	0.026	0.016	ND
Median	7.3	12.0	2.2	1.40	0.46	0.025	0.52	0.220	0.78	0.096	0.038	ND
Mode	7.3	Multi	Multi	1.50	0.46	Multi	Multi	0.000	0.41	0.096	Multi	ND
Standard Deviation	0.2	7.0	4.4	6.01	0.70	0.029	0.69	0.295	0.53	0.079	0.047	ND
Sample Variance	0.0	48.7	19.1	36.16	0.49	0.001	0.48	0.087	0.28	0.006	0.002	ND
Range	0.6	18.4	10.8	18.85	1.99	0.092	1.98	0.870	1.39	0.254	0.146	ND
Minimum	7.1	1.4	1.0	0.15	0.01	0.000	0.02	0.000	0.41	0.036	0.014	ND
Maximum	7.7	19.8	11.8	19.00	2.00	0.092	2.00	0.870	1.80	0.290	0.160	ND
Count	9	9	9	9	9	9	9	9	9	9	9	0
Confidence Level (95%)	0.1	5.4	3.4	4.62	0.54	0.023	0.53	0.227	0.41	0.060	0.036	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	961.1	948.9	4.6	12.2	9.2	1659	364.6	9500	3.2	ND
Standard Error	ND	ND	189.0	186.8	1.6	5.9	1.8	327	99.0	5628	0.3	ND
Median	ND	ND	960.0	957.0	4.1	5.3	9.5	1670	280.0	1300	3.1	ND
Mode	ND	ND	Multi	Multi	Multi	Multi	Multi	Multi	Multi	Multi	Multi	ND
Standard Deviation	ND	ND	567.0	560.3	4.7	17.6	5.4	981	297.1	16883	0.9	ND
Sample Variance	ND	ND	321461.1	313981.6	22.4	311.1	28.9	962634	88251.8	285051125	0.9	ND
Range	ND	ND	1760.0	1762.8	16.0	56.1	18.3	3093	929.0	49880	2.6	ND
Minimum	ND	ND	240.0	231.9	0.0	1.9	3.6	457	61.0	120	2.1	ND
Maximum	ND	ND	2000.0	1994.7	16.0	58.0	21.9	3550	990.0	50000	4.7	ND
Count	0	0	9	9	9	9	9	9	9	9	9	0
Confidence Level (95%)	ND	ND	435.8	430.7	3.6	13.6	4.1	754	228.3	12978	0.7	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

NATIONAL AVE. AND OKLAHOMA AVE. (~116TH ST.) - SITE 2
ROOT RIVER
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	81.33	38.67	0.2	2.5	7.0	3.1	0.0	22.2	1.1	3.3	0.0	ND
Standard Error	11.80	6.13	0.1	0.3	1.1	0.5	0.0	3.7	0.7	1.2	0.0	ND
Median	95.00	44.00	0.0	2.4	7.4	3.0	0.0	20.0	0.0	4.8	0.0	ND
Mode	Multi	Multi	0.0	Multi	7.4	2.5	0.0	Multi	0.0	0.0	0.0	ND
Standard Deviation	35.40	18.40	0.3	1.0	3.2	1.6	0.0	11.2	2.1	3.2	0.0	ND
Sample Variance	1253.25	338.50	0.1	1.1	10.1	2.7	0.0	125.9	4.4	10.5	0.0	ND
Range	92.00	49.00	0.6	3.6	12.0	5.4	0.0	31.0	5.2	7.6	0.0	ND
Minimum	28.00	12.00	0.0	1.4	0.0	0.0	0.0	12.0	0.0	0.0	0.0	ND
Maximum	120.00	61.00	0.6	5.0	12.0	5.4	0.0	43.0	5.2	7.6	0.0	ND
Count	9	9	9	9	9	9	9	9	9	7	8	0
Confidence Level (95%)	27.21	14.14	0.2	0.8	2.4	1.3	0.0	8.6	1.6	3.0	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	362	226	4.5	ND	56.7	47.7	9.0	8.0
Standard Error	54	34	2.2	ND	6.2	7.4	1.8	1.6
Median	400	260	2.4	ND	64.0	57.0	7.3	6.0
Mode	Multi	Multi	0.0	ND	Multi	57.0	Multi	Multi
Standard Deviation	163	103	6.7	ND	18.5	22.2	5.3	4.9
Sample Variance	26594	10569	44.2	ND	341.8	494.3	28.0	24.4
Range	420	270	16.0	ND	54.0	58.0	14.6	14.0
Minimum	120	80	0.0	ND	26.0	16.0	4.4	4.0
Maximum	540	350	16.0	ND	80.0	74.0	19.0	18.0
Count	9	9	9	0	9	9	9	9
Confidence Level (95%)	125	79	5.1	ND	14.2	17.1	4.1	3.8

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

COLDSPRING RD. (JUST EAST OF 108TH ST.) - SITE 3
ROOT RIVER
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.5	10.4	6.9	1.73	0.48	0.036	0.51	0.159	0.62	0.076	0.041	ND
Standard Error	0.1	2.4	1.2	0.54	0.17	0.011	0.17	0.045	0.07	0.009	0.009	ND
Median	7.4	12.2	5.6	1.20	0.25	0.023	0.27	0.150	0.57	0.073	0.040	ND
Mode	Multi	Multi	5.6	0.29	0.12	Multi	0.27	0.000	0.87	Multi	Multi	ND
Standard Deviation	0.3	7.2	3.6	1.61	0.50	0.032	0.50	0.135	0.21	0.027	0.026	ND
Sample Variance	0.1	51.2	12.7	2.61	0.25	0.001	0.25	0.018	0.05	0.001	0.001	ND
Range	0.9	18.0	10.6	4.31	1.48	0.096	1.48	0.430	0.49	0.087	0.070	ND
Minimum	7.2	1.0	2.4	0.29	0.03	0.000	0.03	0.000	0.38	0.043	0.010	ND
Maximum	8.1	19.0	13.0	4.60	1.50	0.096	1.50	0.430	0.87	0.130	0.080	ND
Count	9	9	9	9	9	9	9	9	9	9	9	0
Confidence Level (95%)	0.2	5.5	2.7	1.24	0.39	0.024	0.38	0.104	0.16	0.021	0.020	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	915.6	911.5	1.5	4.1	6.5	1611	334.4	3125	2.2	ND
Standard Error	ND	ND	167.5	167.3	0.5	0.6	0.9	309	99.8	2985	0.3	ND
Median	ND	ND	840.0	837.3	1.3	3.6	5.6	1480	250.0	140	2.1	ND
Mode	ND	ND	Multi	Multi	0.0	Multi	Multi	Multi	Multi	Multi	Multi	ND
Standard Deviation	ND	ND	502.6	502.0	1.6	1.9	2.8	926	299.4	8954	0.9	ND
Sample Variance	ND	ND	252577.8	252004.9	2.6	3.5	7.6	857280	89652.8	80170045	0.9	ND
Range	ND	ND	1730.0	1730.3	4.4	5.5	9.6	3193	990.0	26981	3.2	ND
Minimum	ND	ND	370.0	364.0	0.0	1.7	3.6	687	110.0	19	1.3	ND
Maximum	ND	ND	2100.0	2094.3	4.4	7.2	13.2	3880	1100.0	27000	4.4	ND
Count	0	0	9	9	9	9	9	9	9	9	9	0
Confidence Level (95%)	ND	ND	386.3	385.9	1.2	1.4	2.1	712	230.2	6882	0.7	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

COLDSPRING RD. (JUST EAST OF 108TH ST.) - SITE 3
ROOT RIVER
WATER QUALITY DATA - 2013

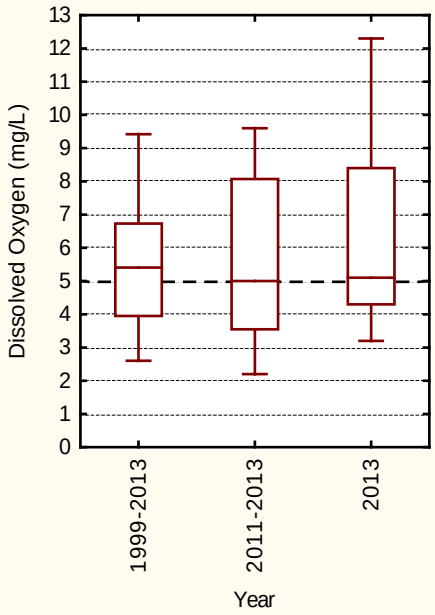
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	83.89	41.33	0.2	2.0	3.9	2.3	0.0	10.4	0.8	1.8	0.0	ND
Standard Error	8.66	4.35	0.1	0.3	1.3	0.4	0.0	2.3	0.8	0.9	0.0	ND
Median	90.00	46.00	0.0	2.2	5.9	2.2	0.0	11.0	0.0	0.0	0.0	ND
Mode	Multi	46.00	0.0	Multi	0.0	Multi	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	25.98	13.06	0.2	0.9	3.8	1.2	0.0	6.8	2.2	2.6	0.0	ND
Sample Variance	674.86	170.50	0.1	0.9	14.3	1.5	0.0	45.6	5.0	6.5	0.0	ND
Range	81.00	35.00	0.5	3.0	8.6	4.0	0.0	19.0	6.3	5.9	0.0	ND
Minimum	39.00	18.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	120.00	53.00	0.5	3.0	8.6	4.0	0.0	19.0	6.3	5.9	0.0	ND
Count	9	9	9	9	9	9	9	9	8	8	9	0
Confidence Level (95%)	19.97	10.04	0.2	0.7	2.9	0.9	0.0	5.2	1.9	2.1	0.0	ND

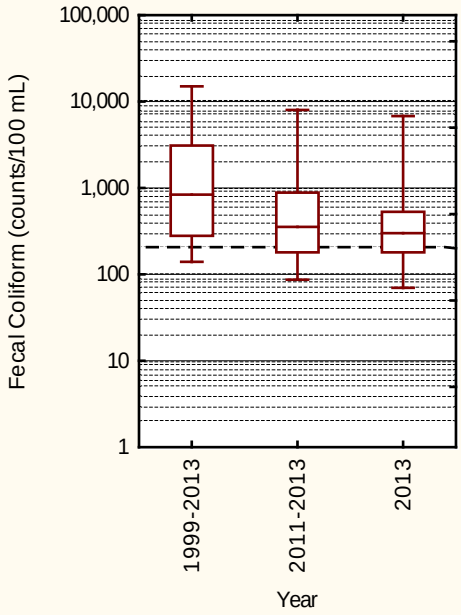
VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	378	257	1.2	ND	60.1	53.1	6.9	6.5
Standard Error	39	28	0.8	ND	5.2	5.5	0.6	0.5
Median	410	260	0.0	ND	65.0	59.0	6.6	6.3
Mode	Multi	Multi	0.0	ND	34.0	59.0	5.8	Multi
Standard Deviation	116	85	2.4	ND	15.6	16.4	1.8	1.6
Sample Variance	13394	7275	5.6	ND	242.4	267.6	3.1	2.6
Range	330	230	7.1	ND	43.0	47.0	6.3	5.8
Minimum	170	110	0.0	ND	34.0	23.0	4.7	4.2
Maximum	500	340	7.1	ND	77.0	70.0	11.0	10.0
Count	9	9	9	0	9	9	9	9
Confidence Level (95%)	89	66	1.8	ND	12.0	12.6	1.4	1.2

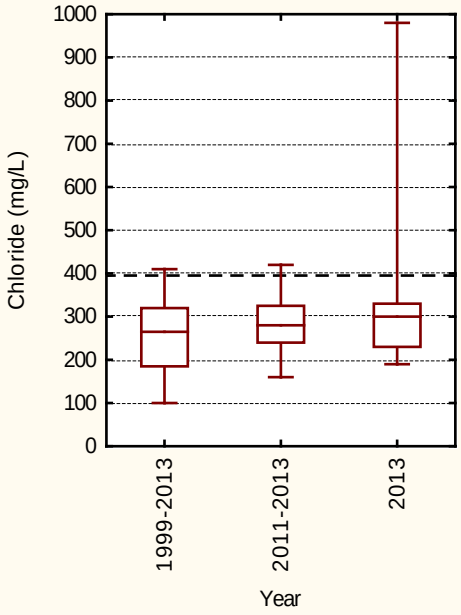
ND = No Data **Multi = Multimodal**

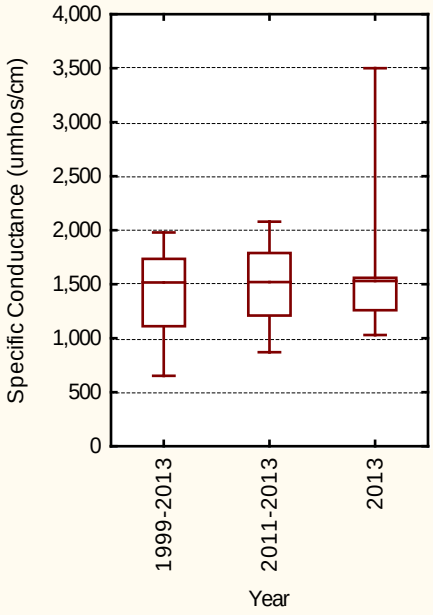
Provisional MMSD Water Quality Data

MMSD Water Quality Monitoring Program Data
Root River at Grange Ave., Site RR-04



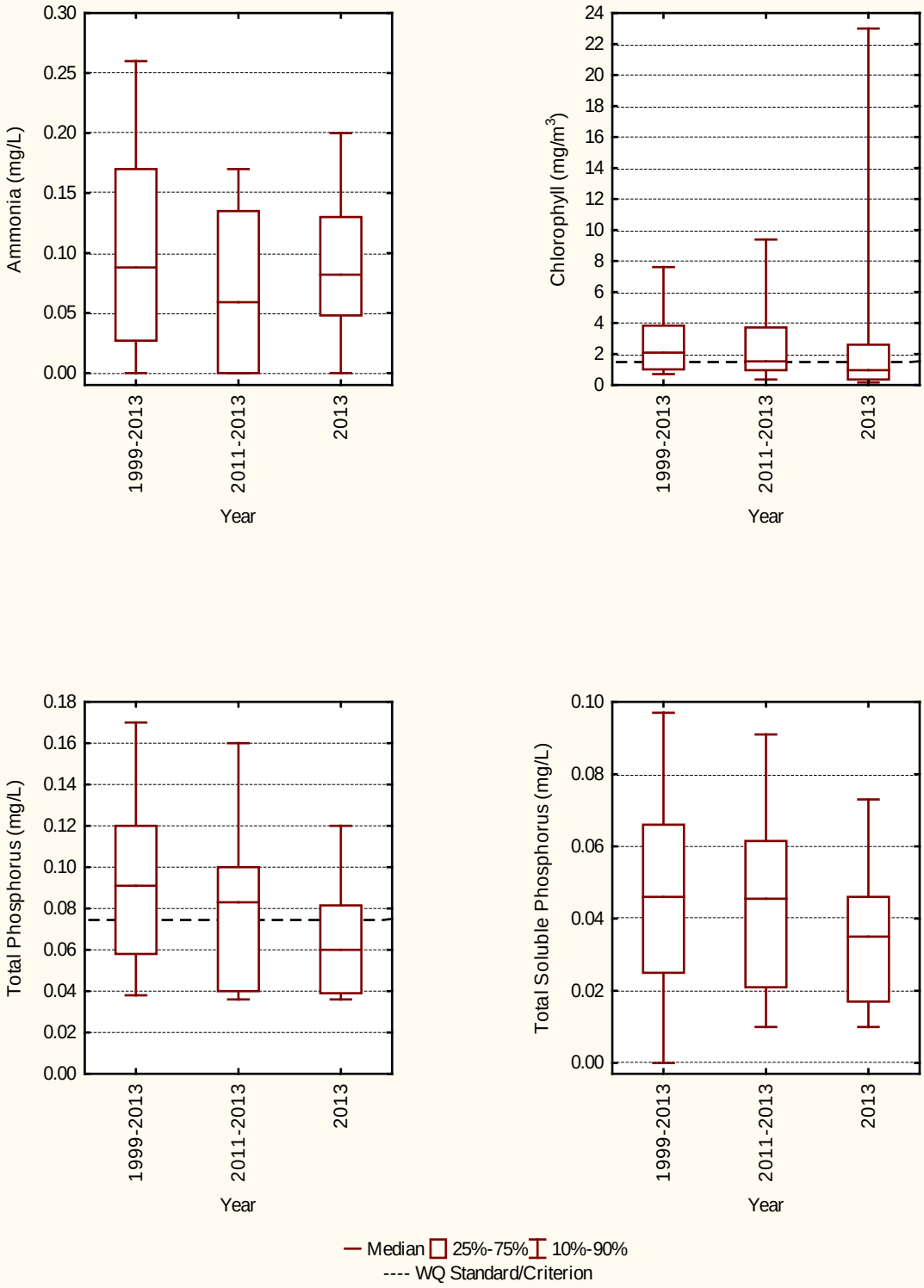




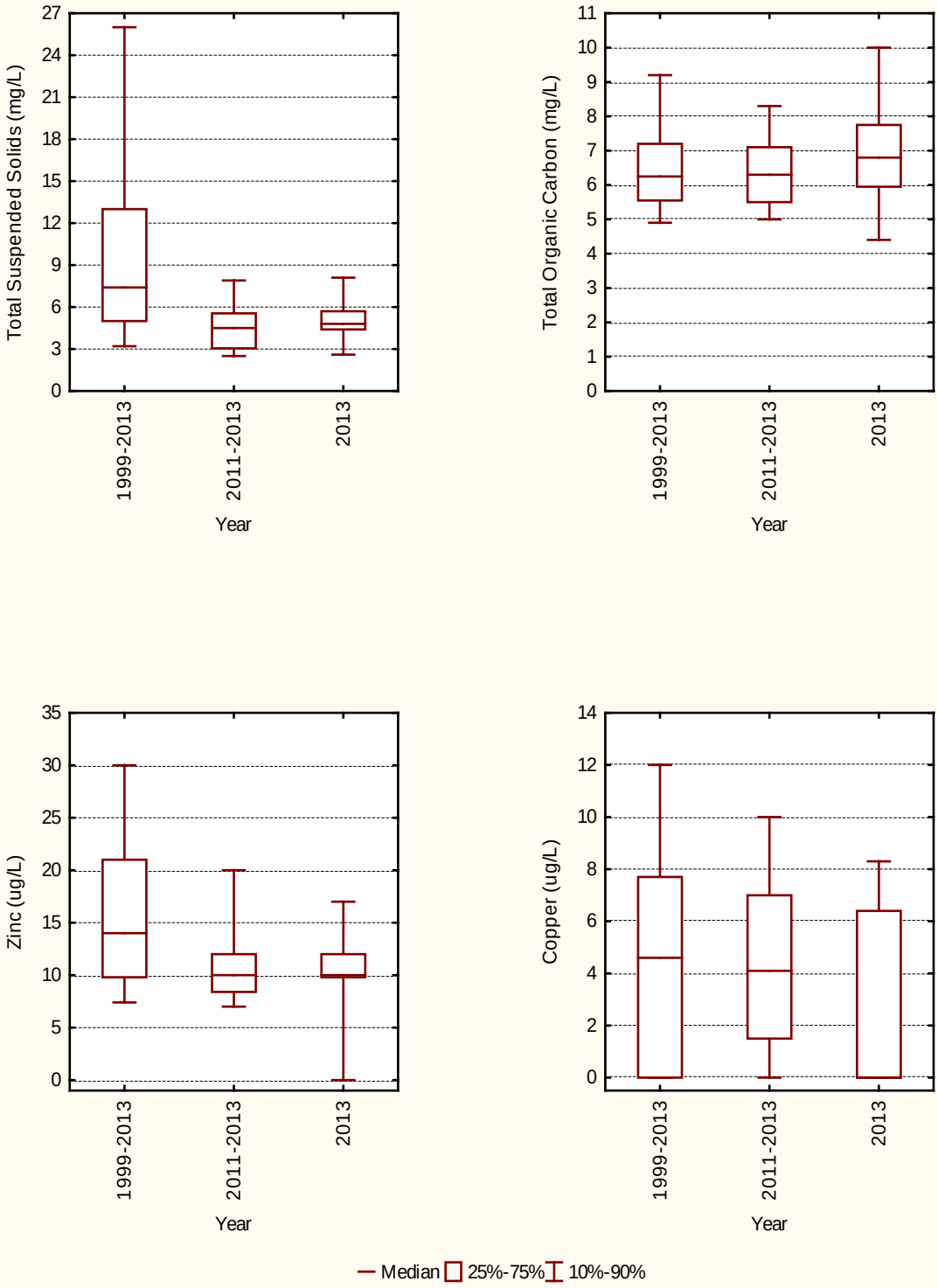


— Median ☐ 25%-75% I 10%-90%
---- WQ Standard/Criterion

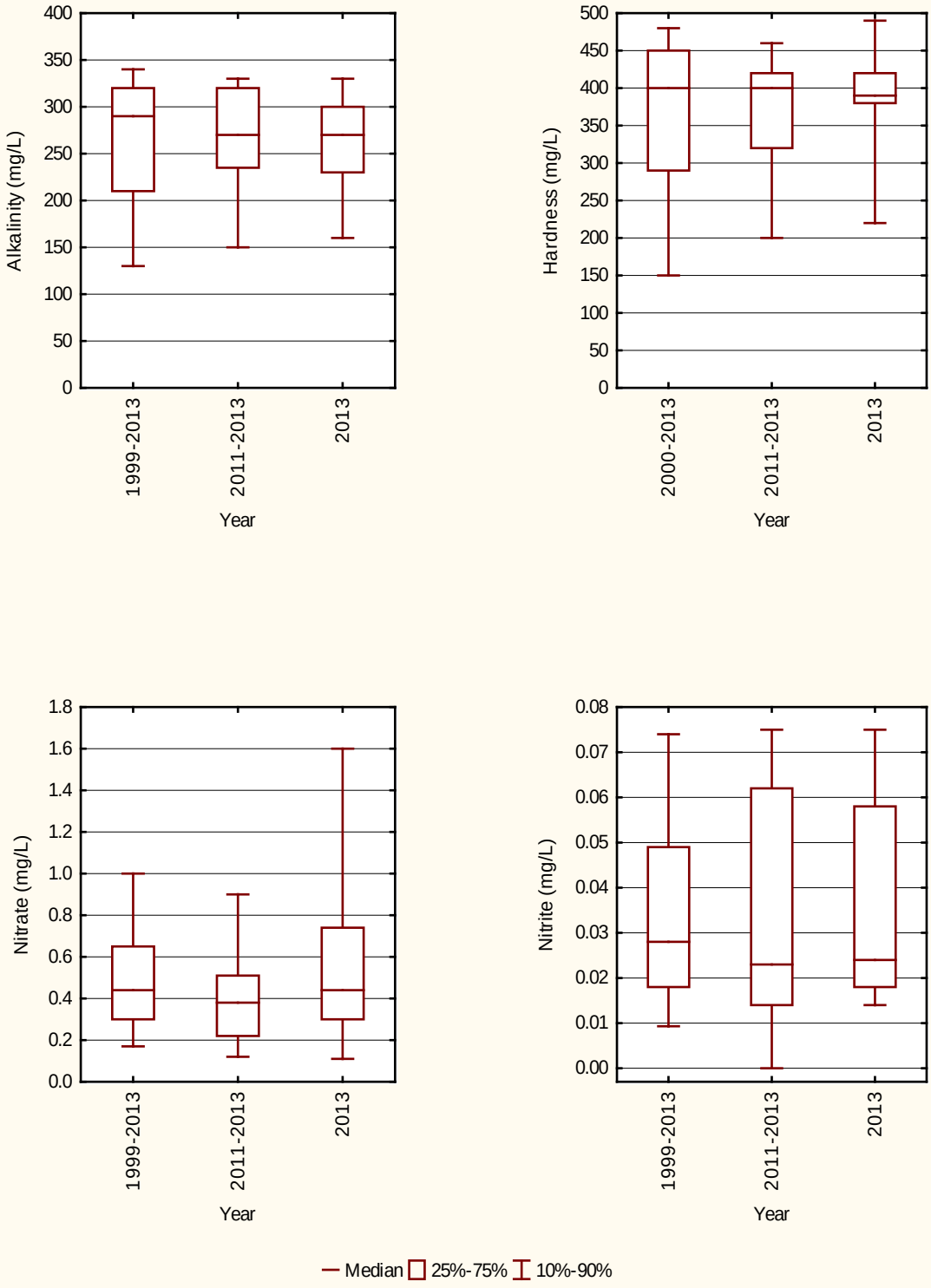
MMSD Water Quality Monitoring Program Data
Root River at Grange Ave., Site RR-04



MMSD Water Quality Monitoring Program Data
Root River at Grange Ave., Site RR-04



MMSD Water Quality Monitoring Program Data
Root River at Grange Ave., Site RR-04



GRANGE AVE. (JUST WEST OF 76TH ST.) - SITE 4
ROOT RIVER
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.6	10.6	6.7	3.79	0.63	0.036	0.67	0.090	0.67	0.065	0.036	ND
Standard Error	0.1	2.4	1.1	2.44	0.17	0.008	0.17	0.023	0.09	0.011	0.007	ND
Median	7.5	12.9	5.1	0.96	0.44	0.024	0.49	0.082	0.51	0.060	0.035	ND
Mode	7.4	Multi	Multi	Multi	Multi	0.014	Multi	Multi	Multi	Multi	Multi	ND
Standard Deviation	0.3	7.1	3.3	7.31	0.50	0.025	0.52	0.070	0.28	0.030	0.021	ND
Sample Variance	0.1	50.8	11.1	53.41	0.25	0.001	0.27	0.005	0.08	0.001	0.000	ND
Range	1.1	18.0	9.1	22.83	1.49	0.061	1.58	0.200	0.85	0.084	0.063	ND
Minimum	7.3	1.3	3.2	0.17	0.11	0.014	0.12	0.000	0.45	0.036	0.010	ND
Maximum	8.4	19.3	12.3	23.00	1.60	0.075	1.70	0.200	1.30	0.120	0.073	ND
Count	9	9	9	9	9	9	9	9	9	8	9	0
Confidence Level (95%)	0.3	5.5	2.6	5.62	0.39	0.019	0.40	0.054	0.21	0.025	0.016	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	963.3	958.4	1.9	4.9	6.3	1644	356.7	1138	2.6	ND
Standard Error	ND	ND	126.3	126.3	0.4	0.5	0.6	245	80.3	722	0.2	ND
Median	ND	ND	920.0	914.0	1.5	4.8	6.1	1530	300.0	300	2.5	ND
Mode	ND	ND	Multi	Multi	Multi	Multi	Multi	Multi	Multi	Multi	Multi	ND
Standard Deviation	ND	ND	378.9	378.8	1.2	1.6	1.9	734	240.8	2167	0.6	ND
Sample Variance	ND	ND	143600.0	143475.7	1.5	2.6	3.5	538928	58000.0	4694394	0.4	ND
Range	ND	ND	1330.0	1327.5	3.7	5.5	6.2	2470	790.0	6730	2.0	ND
Minimum	ND	ND	570.0	566.8	0.0	2.6	3.2	1030	190.0	70	1.8	ND
Maximum	ND	ND	1900.0	1894.3	3.7	8.1	9.4	3500	980.0	6800	3.8	ND
Count	0	0	9	9	9	9	9	9	9	9	9	0
Confidence Level (95%)	ND	ND	291.3	291.2	0.9	1.2	1.4	564	185.1	1665	0.5	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

GRANGE AVE. (JUST WEST OF 76TH ST.) - SITE 4
ROOT RIVER
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	84.56	42.67	0.2	2.0	2.4	2.8	0.0	10.3	1.8	2.7	0.0	ND
Standard Error	6.40	2.83	0.1	0.3	1.2	0.4	0.0	1.6	0.9	1.1	0.0	ND
Median	85.00	44.00	0.0	2.3	0.0	2.9	0.0	10.0	0.0	0.0	0.0	ND
Mode	Multi	44.00	0.0	2.3	0.0	Multi	0.0	10.0	0.0	0.0	0.0	ND
Standard Deviation	19.21	8.50	0.3	0.9	3.6	1.2	0.0	4.7	2.5	3.2	0.0	ND
Sample Variance	369.03	72.25	0.1	0.7	13.3	1.5	0.0	22.4	6.1	10.4	0.0	ND
Range	71.00	28.00	0.8	2.9	8.3	4.3	0.0	17.0	5.0	6.9	0.0	ND
Minimum	49.00	24.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	120.00	52.00	0.8	2.9	8.3	4.3	0.0	17.0	5.0	6.9	0.0	ND
Count	9	9	9	9	9	9	9	9	8	9	7	0
Confidence Level (95%)	14.77	6.53	0.3	0.7	2.8	0.9	0.0	3.6	2.1	2.5	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	386	259	1.0	ND	61.1	54.0	6.9	6.6
Standard Error	27	18	0.7	ND	3.7	4.0	0.6	0.5
Median	390	270	0.0	ND	64.0	57.0	6.8	6.6
Mode	Multi	270	0.0	ND	64.0	Multi	Multi	6.3
Standard Deviation	80	55	2.1	ND	10.5	11.3	1.7	1.5
Sample Variance	6328	3011	4.5	ND	110.4	127.1	2.8	2.4
Range	270	170	6.2	ND	35.0	36.0	5.6	5.3
Minimum	220	160	0.0	ND	40.0	32.0	4.4	4.2
Maximum	490	330	6.2	ND	75.0	68.0	10.0	9.5
Count	9	9	9	0	8	8	8	8
Confidence Level (95%)	61	42	1.6	ND	8.8	9.4	1.4	1.3

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

RYAN RD. (JUST WEST OF 60TH ST.) - SITE 5
ROOT RIVER
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.7	12.4	8.9	3.05	0.51	0.023	0.53	0.058	0.56	0.051	0.028	ND
Standard Error	0.0	2.9	0.9	0.96	0.08	0.007	0.08	0.023	0.07	0.006	0.004	ND
Median	7.8	14.5	8.0	1.75	0.47	0.018	0.48	0.046	0.50	0.043	0.026	ND
Mode	7.8	Multi	Multi	Multi	0.52	0.000	0.44	0.000	0.41	0.038	Multi	ND
Standard Deviation	0.1	8.2	2.4	2.72	0.22	0.021	0.22	0.066	0.21	0.017	0.012	ND
Sample Variance	0.0	66.5	5.9	7.41	0.05	0.000	0.05	0.004	0.04	0.000	0.000	ND
Range	0.4	20.7	6.0	7.40	0.74	0.053	0.73	0.180	0.55	0.044	0.032	ND
Minimum	7.5	0.3	6.8	1.00	0.25	0.000	0.27	0.000	0.31	0.032	0.015	ND
Maximum	7.9	21.0	12.8	8.40	0.99	0.053	1.00	0.180	0.86	0.076	0.047	ND
Count	8	8	8	8	8	8	8	8	8	8	8	0
Confidence Level (95%)	0.1	6.8	2.0	2.28	0.19	0.017	0.19	0.055	0.17	0.015	0.010	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	726.3	718.3	2.2	7.9	8.3	1253	203.8	409	2.1	ND
Standard Error	ND	ND	57.6	57.9	0.4	1.6	1.1	118	42.6	220	0.2	ND
Median	ND	ND	685.0	678.6	2.5	6.9	7.5	1175	160.0	86	1.9	ND
Mode	ND	ND	Multi	Multi	3.4	Multi	7.5	1180	160.0	Multi	Multi	ND
Standard Deviation	ND	ND	163.0	163.8	1.2	4.4	3.2	332	120.6	623	0.7	ND
Sample Variance	ND	ND	26569.6	26819.4	1.6	19.5	10.0	110450	14541.1	388009	0.4	ND
Range	ND	ND	500.0	501.6	3.4	14.0	9.4	1030	360.0	1562	1.6	ND
Minimum	ND	ND	600.0	590.3	0.0	3.0	4.5	1030	140.0	38	1.6	ND
Maximum	ND	ND	1100.0	1091.9	3.4	17.0	13.9	2060	500.0	1600	3.2	ND
Count	0	0	8	8	8	8	8	8	8	8	8	0
Confidence Level (95%)	ND	ND	136.3	136.9	1.0	3.7	2.6	278	100.8	521	0.6	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

RYAN RD. (JUST WEST OF 60TH ST.) - SITE 5
ROOT RIVER
WATER QUALITY DATA - 2013

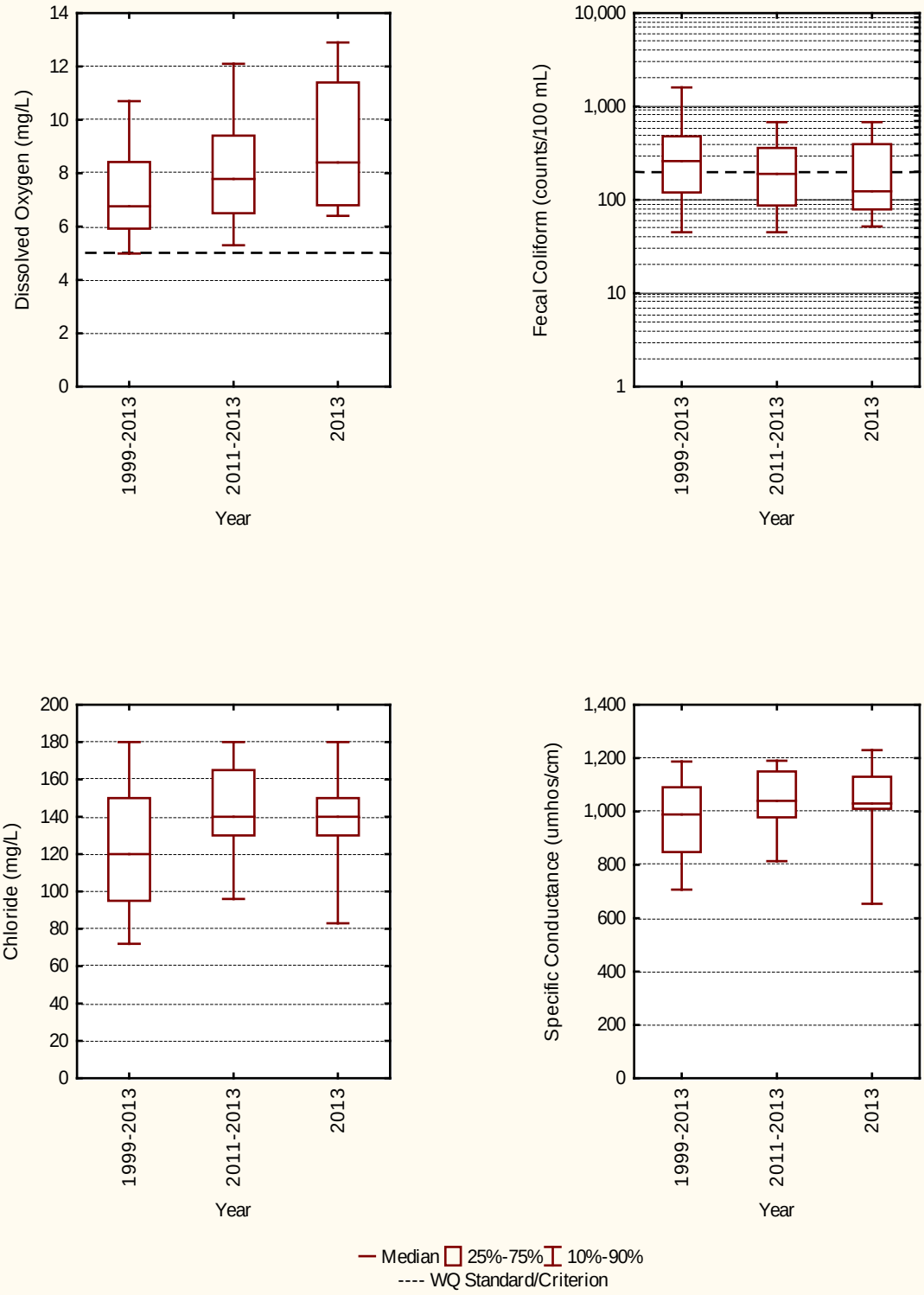
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	75.13	43.88	0.4	2.5	2.4	2.6	1.2	5.0	1.2	3.4	0.0	ND
Standard Error	3.26	2.89	0.1	0.3	1.2	0.7	1.2	2.6	0.8	1.3	0.0	ND
Median	77.50	41.50	0.4	2.3	0.0	2.6	0.0	0.0	0.0	2.8	0.0	ND
Mode	80.00	40.00	0.0	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	9.23	8.17	0.4	0.9	3.4	1.9	3.3	7.4	2.1	3.7	0.0	ND
Sample Variance	85.27	66.70	0.1	0.8	11.2	3.5	10.6	54.6	4.5	13.8	0.0	ND
Range	31.00	27.00	1.0	2.7	6.7	4.8	9.2	19.0	4.5	8.4	0.0	ND
Minimum	55.00	35.00	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	86.00	62.00	1.0	3.9	6.7	4.8	9.2	19.0	4.5	8.4	0.0	ND
Count	8	8	8	8	8	8	8	8	7	8	8	0
Confidence Level (95%)	7.72	6.83	0.3	0.8	2.8	1.6	2.7	6.2	2.0	3.1	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	368	236	0.6	ND	55.3	49.0	6.2	6.0
Standard Error	17	13	0.4	ND	2.9	2.5	0.4	0.4
Median	370	245	0.0	ND	55.5	49.0	6.2	6.0
Mode	370	Multi	0.0	ND	54.0	Multi	Multi	6.0
Standard Deviation	48	37	1.1	ND	8.2	7.2	1.1	1.1
Sample Variance	2279	1398	1.3	ND	66.8	51.4	1.2	1.3
Range	170	110	2.8	ND	25.0	22.0	3.6	3.6
Minimum	280	170	0.0	ND	39.0	34.0	4.2	4.1
Maximum	450	280	2.8	ND	64.0	56.0	7.8	7.7
Count	8	8	8	0	8	8	8	8
Confidence Level (95%)	40	31	1.0	ND	6.8	6.0	0.9	0.9

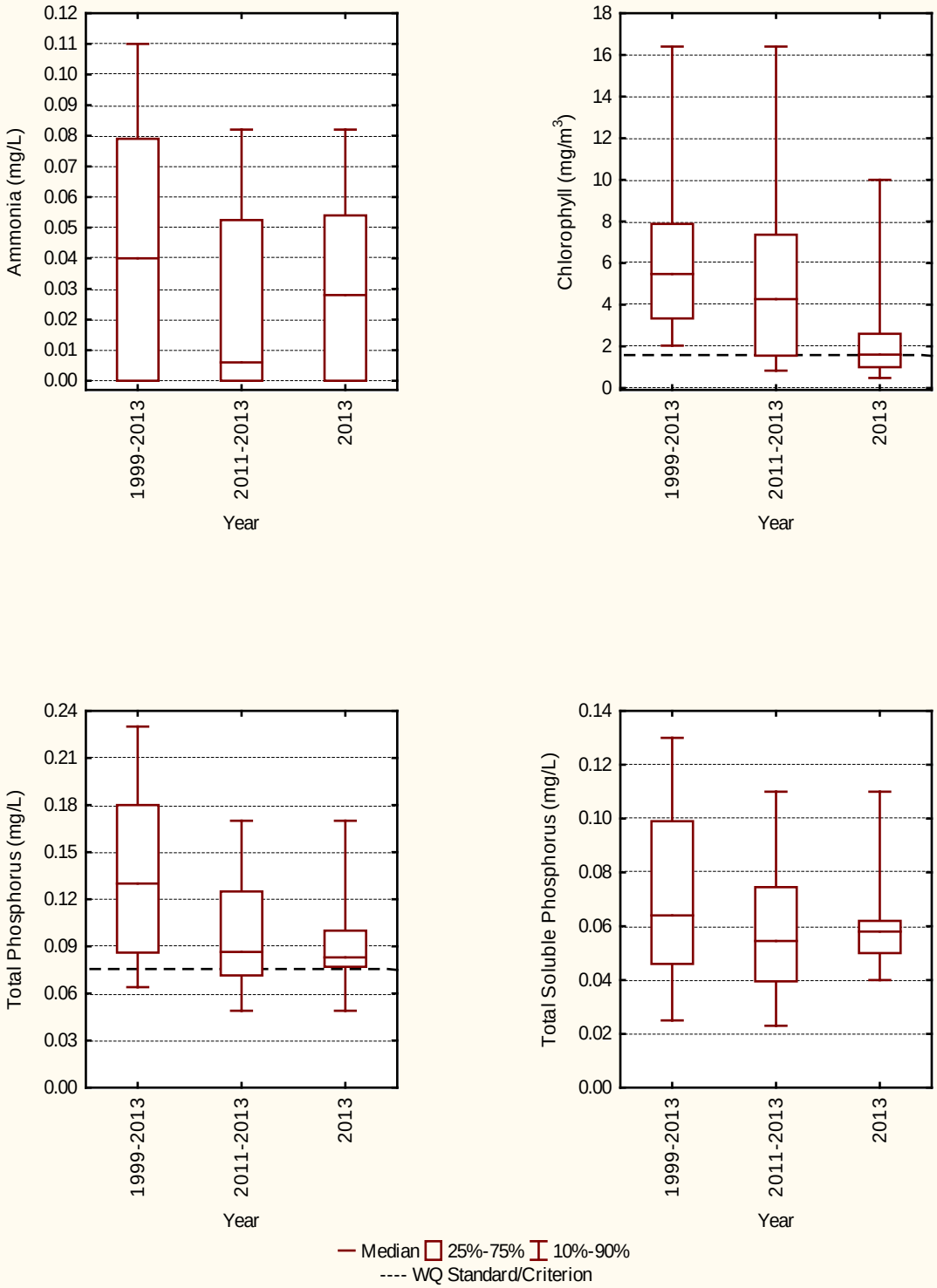
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

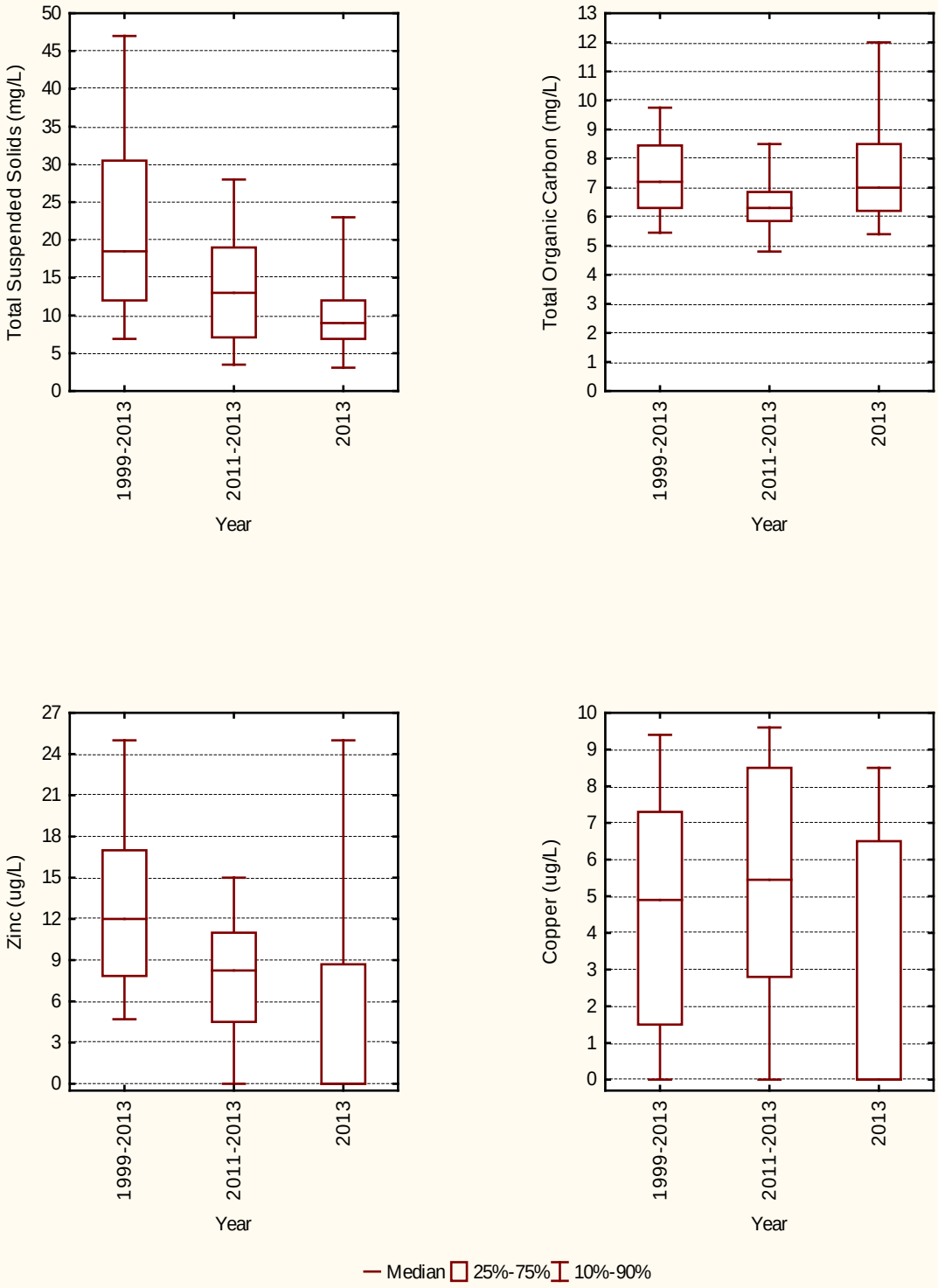
MMSD Water Quality Monitoring Program Data
Root River at County Line Rd., Site RR-06



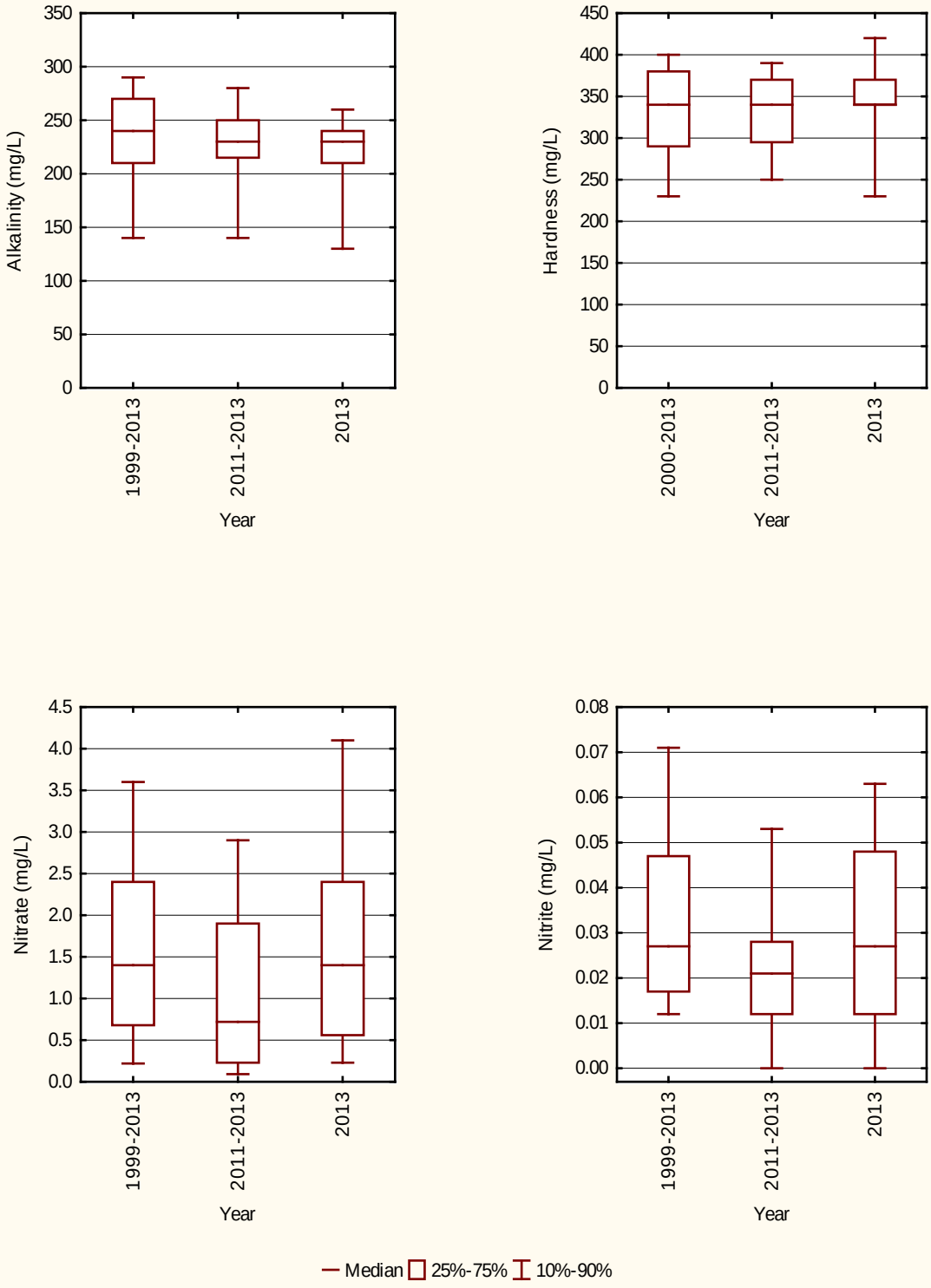
MMSD Water Quality Monitoring Program Data
Root River at County Line Rd., Site RR-06



MMSD Water Quality Monitoring Program Data
Root River at County Line Rd., Site RR-06



MMSD Water Quality Monitoring Program Data
Root River at County Line Rd., Site RR-06



COUNTY LINE RD. (8 MILE RD,~47TH ST.) - SITE 6
ROOT RIVER
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	7.7	11.3	9.0	2.79	1.63	0.030	1.66	0.032	0.71	0.093	0.061	ND
Standard Error	0.1	2.8	0.8	1.02	0.45	0.007	0.45	0.011	0.10	0.012	0.007	ND
Median	7.7	13.6	8.4	1.60	1.40	0.027	1.40	0.028	0.60	0.083	0.058	ND
Mode	Multi	Multi	Multi	Multi	1.40	Multi	1.40	0.000	Multi	Multi	0.062	ND
Standard Deviation	0.2	8.4	2.5	3.07	1.34	0.021	1.34	0.034	0.31	0.035	0.020	ND
Sample Variance	0.0	70.9	6.3	9.44	1.81	0.000	1.80	0.001	0.10	0.001	0.000	ND
Range	0.5	21.1	6.5	9.52	3.87	0.063	3.87	0.082	1.02	0.121	0.070	ND
Minimum	7.4	0.2	6.4	0.48	0.23	0.000	0.23	0.000	0.38	0.049	0.040	ND
Maximum	7.9	21.3	12.9	10.00	4.10	0.063	4.10	0.082	1.40	0.170	0.110	ND
Count	9	9	9	9	9	9	9	9	9	9	9	0
Confidence Level (95%)	0.1	6.5	1.9	2.36	1.03	0.016	1.03	0.026	0.24	0.027	0.015	ND

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	ND	ND	612.2	602.1	2.6	10.2	11.7	1014	136.0	241	2.2	ND
Standard Error	ND	ND	29.8	30.2	0.6	2.0	1.6	58	11.2	86	0.1	ND
Median	ND	ND	650.0	642.7	2.1	9.0	10.0	1030	140.0	124	2.1	ND
Mode	ND	ND	650.0	Multi	2.1	12.0	7.7	1010	Multi	Multi	Multi	ND
Standard Deviation	ND	ND	89.4	90.6	1.7	5.9	4.7	173	33.6	243	0.4	ND
Sample Variance	ND	ND	7994.4	8209.8	3.0	34.3	22.5	30021	1125.8	58851	0.2	ND
Range	ND	ND	280.0	278.3	6.1	19.9	14.7	576	97.0	628	1.1	ND
Minimum	ND	ND	420.0	414.8	0.0	3.1	7.7	654	83.0	52	1.7	ND
Maximum	ND	ND	700.0	693.1	6.1	23.0	22.4	1230	180.0	680	2.8	ND
Count	0	0	9	9	9	9	9	9	9	8	8	0
Confidence Level (95%)	ND	ND	68.7	69.6	1.3	4.5	3.6	133	25.8	203	0.3	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

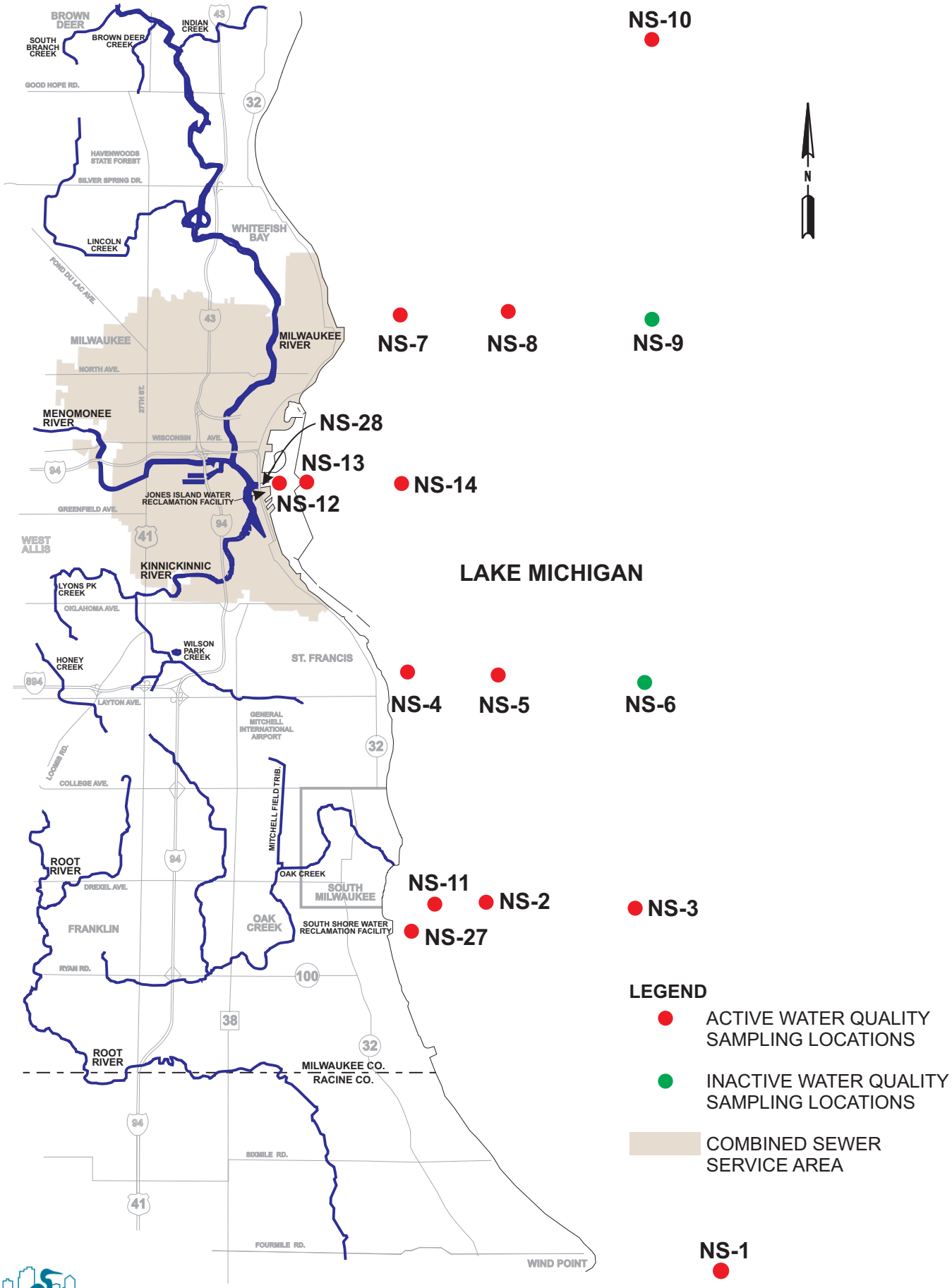
COUNTY LINE RD. (8 MILE RD,~47TH ST.) - SITE 6
ROOT RIVER
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	70.33	39.22	0.2	2.5	3.2	3.9	0.0	5.0	0.0	1.6	0.0	ND
Standard Error	3.03	2.68	0.1	0.2	1.3	0.5	0.0	2.9	0.0	0.8	0.0	ND
Median	73.00	39.00	0.0	2.5	0.0	3.9	0.0	0.0	0.0	0.0	0.0	ND
Mode	73.00	42.00	0.0	2.2	0.0	Multi	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	9.10	8.04	0.3	0.5	3.8	1.6	0.0	8.7	0.0	2.0	0.0	ND
Sample Variance	82.75	64.69	0.1	0.3	14.4	2.6	0.0	75.0	0.0	4.1	0.0	ND
Range	30.00	27.00	0.8	1.5	8.5	5.1	0.0	25.0	0.0	4.1	0.0	ND
Minimum	50.00	26.00	0.0	1.8	0.0	2.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	80.00	53.00	0.8	3.3	8.5	7.1	0.0	25.0	0.0	4.1	0.0	ND
Count	9	9	9	9	9	9	9	9	9	7	8	0
Confidence Level (95%)	6.99	6.18	0.3	0.4	2.9	1.2	0.0	6.7	0.0	1.9	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	338	214	1.0	ND	52.9	45.2	7.5	7.6
Standard Error	18	16	0.4	ND	2.5	2.4	0.7	0.7
Median	340	230	0.0	ND	52.0	46.0	7.0	7.4
Mode	340	Multi	0.0	ND	Multi	Multi	Multi	8.4
Standard Deviation	53	47	1.2	ND	7.6	7.3	2.0	2.0
Sample Variance	2844	2228	1.5	ND	58.4	52.7	4.1	4.1
Range	190	130	2.6	ND	23.0	21.0	6.6	6.7
Minimum	230	130	0.0	ND	40.0	32.0	5.4	5.3
Maximum	420	260	2.6	ND	63.0	53.0	12.0	12.0
Count	9	9	9	0	9	9	9	9
Confidence Level (95%)	41	36	0.9	ND	5.9	5.6	1.6	1.6

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data



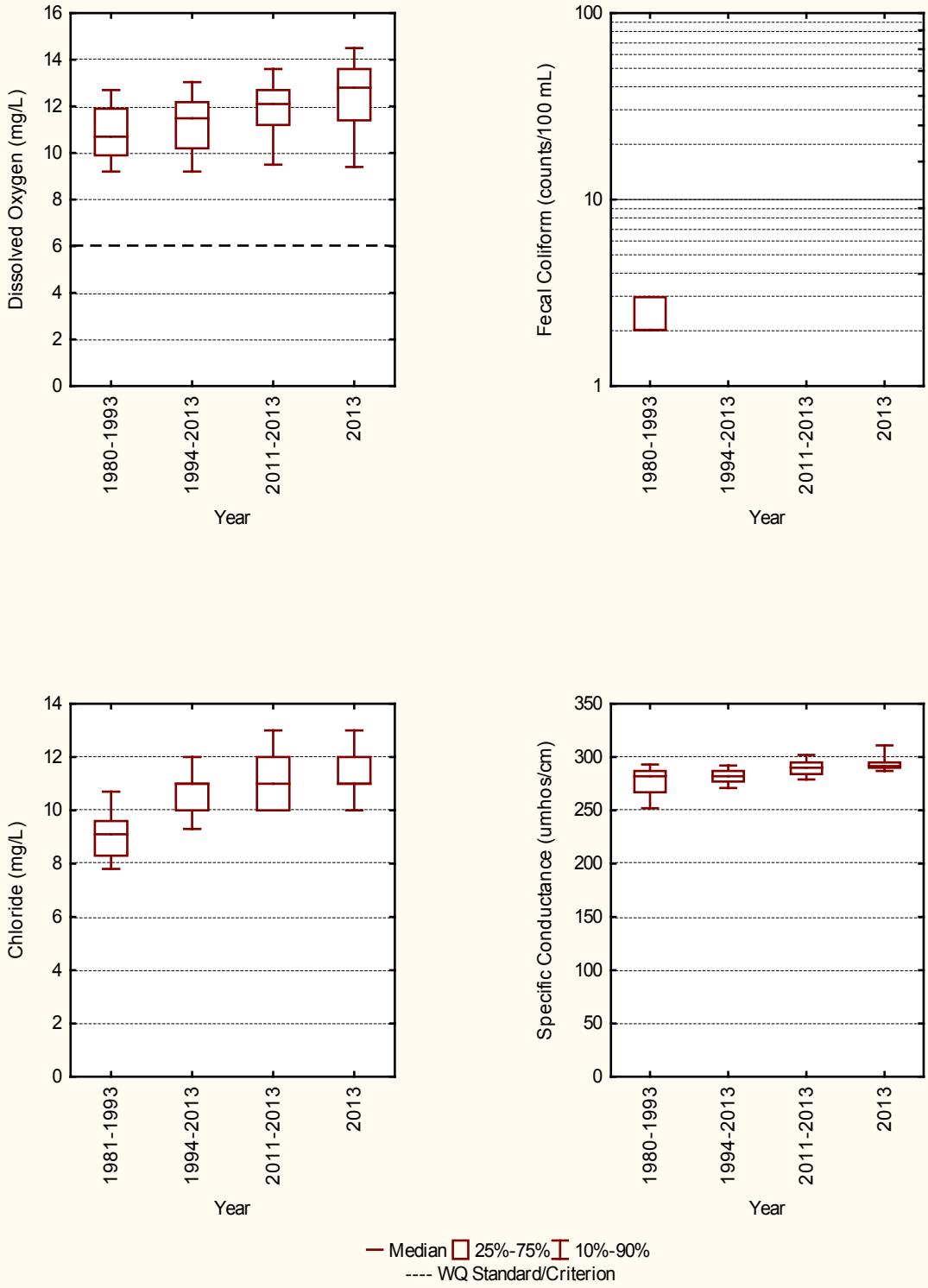
MMSD
PARTNERS FOR A CLEANER ENVIRONMENT

NEARSHORE (NS) SURVEY
WATER QUALITY SAMPLING LOCATIONS

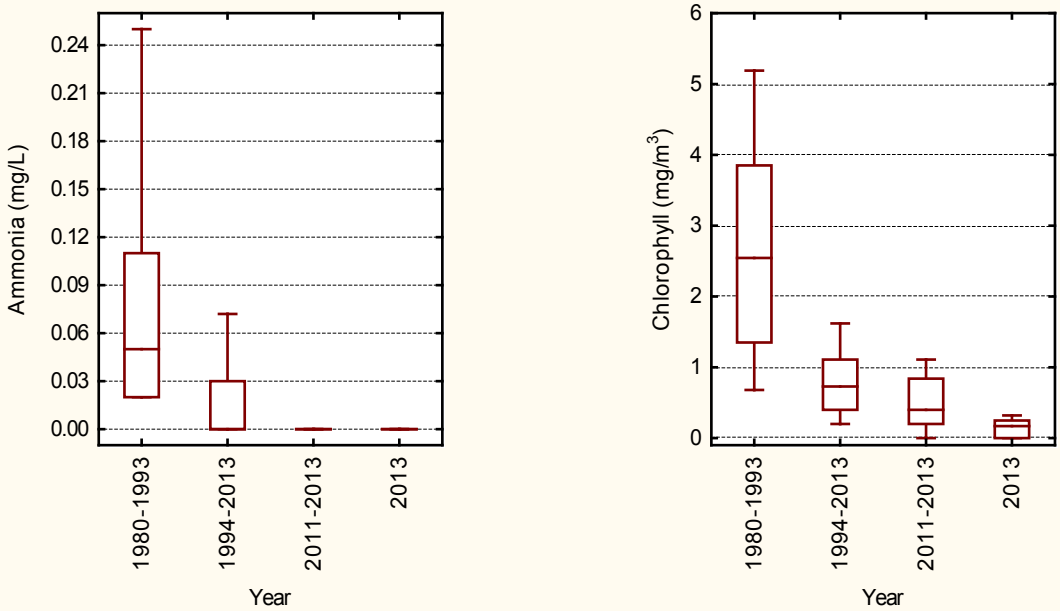
6/6/14

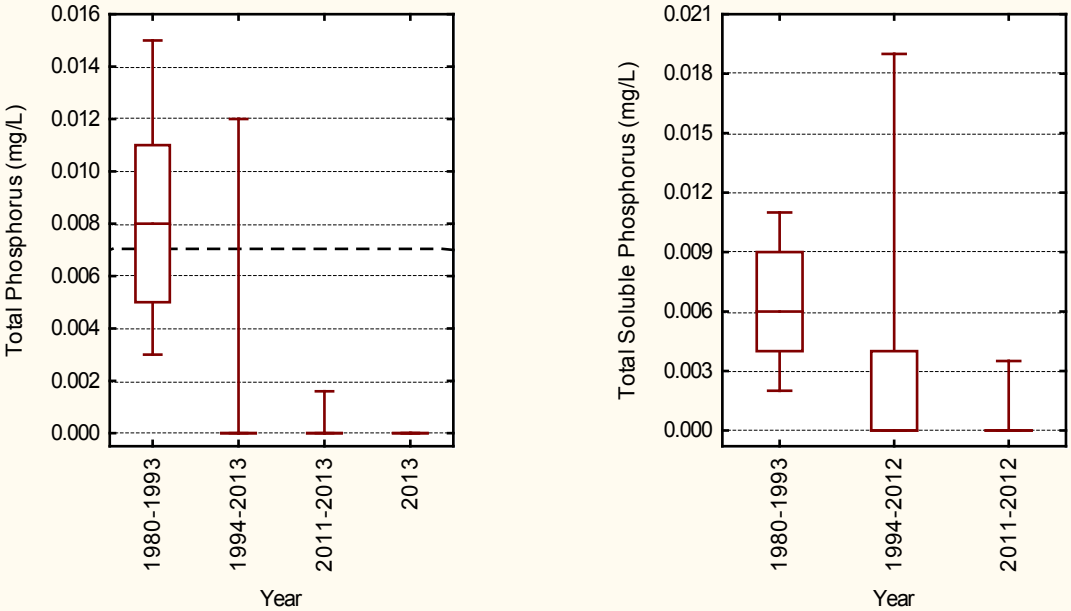
14-061 NS

MMSD Water Quality Program Data
Nearshore survey, Site NS-01

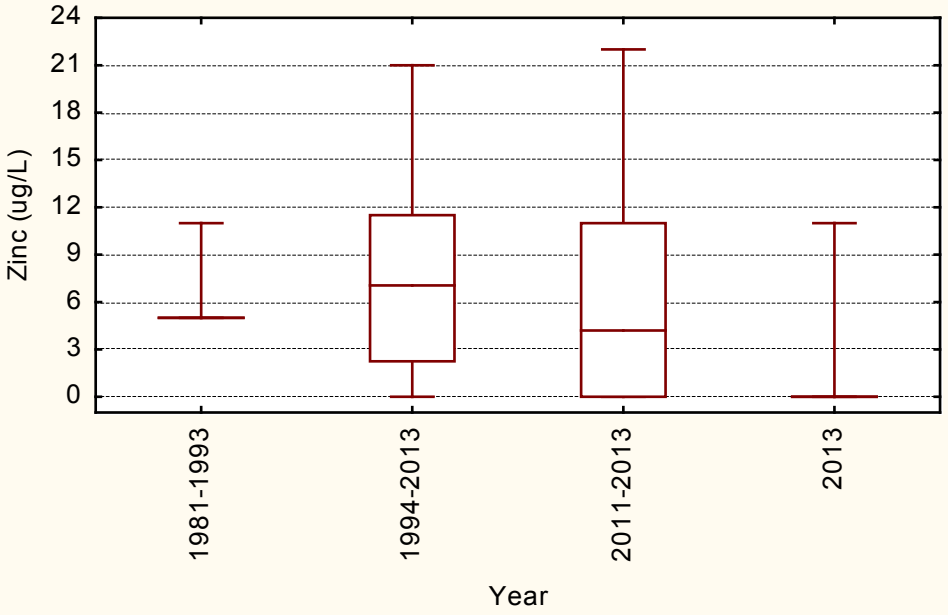


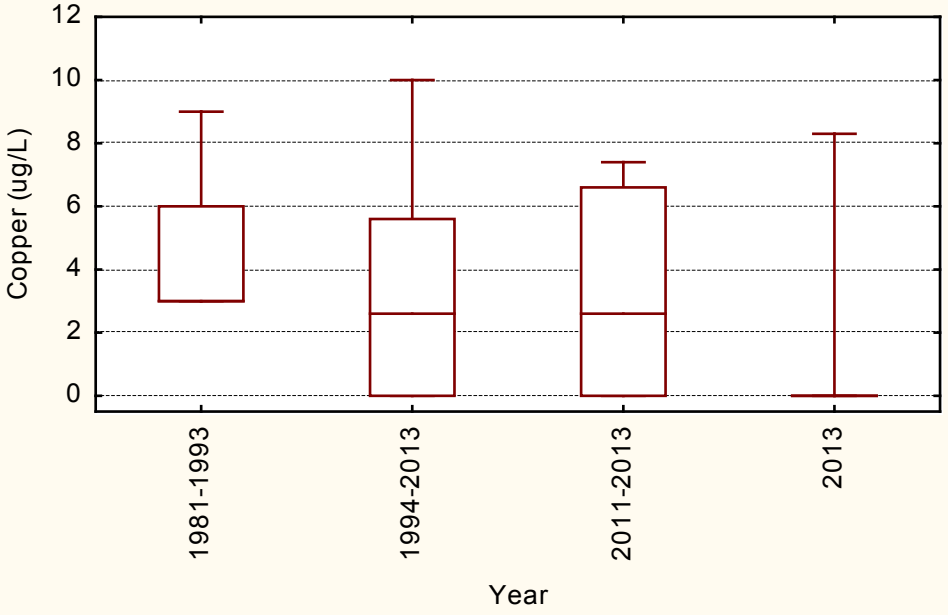
MMSD Water Quality Program Data
Nearshore survey, Site NS-01





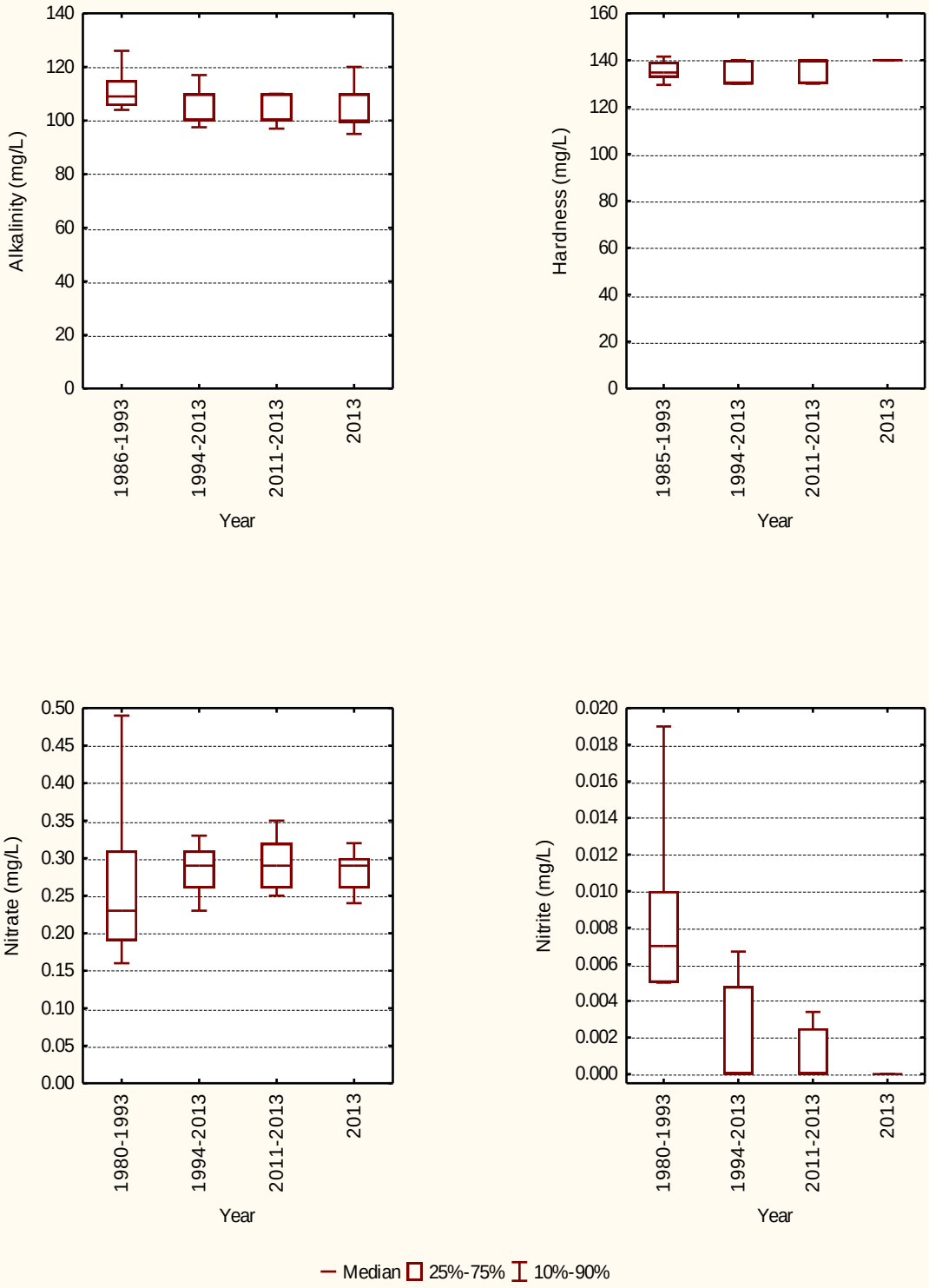
MMSD Water Quality Program Data
Nearshore survey, Site NS-01





Median 25%-75% 10%-90%

MMSD Water Quality Program Data
Nearshore survey, Site NS-01



NEAR SHORE - SITE 1
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.2	8.2	12.4	0.15	0.28	0.000	0.28	0.000	0.13	0.000	ND	1.56
Standard Error	0.0	1.5	0.4	0.03	0.01	0.000	0.01	0.000	0.04	0.000	ND	0.06
Median	8.2	6.4	12.8	0.17	0.29	0.000	0.29	0.000	0.00	0.000	ND	1.65
Mode	8.2	1.9	13.6	0.00	0.30	0.000	0.30	0.000	0.00	0.000	ND	1.70
Standard Deviation	0.1	6.4	1.7	0.13	0.03	0.000	0.03	0.000	0.15	0.001	ND	0.27
Sample Variance	0.0	40.3	2.9	0.02	0.00	0.000	0.00	0.000	0.02	0.000	ND	0.07
Range	0.4	20.3	5.3	0.34	0.09	0.000	0.09	0.000	0.43	0.004	ND	0.96
Minimum	8.0	1.9	9.2	0.00	0.24	0.000	0.24	0.000	0.00	0.000	ND	0.94
Maximum	8.4	22.2	14.5	0.34	0.33	0.000	0.33	0.000	0.43	0.004	ND	1.90
Count	18	18	18	18	18	18	18	18	18	18	0	18
Confidence Level (95%)	0.1	3.2	0.8	0.06	0.01	0.000	0.01	0.000	0.08	0.000	ND	0.13

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	12.3	27.3	ND	ND	ND	ND	0.4	295	11.4	0	ND	ND
Standard Error	1.2	1.1	ND	ND	ND	ND	0.1	2	0.2	0	ND	ND
Median	12.5	28.3	ND	ND	ND	ND	0.3	292	11.0	0	ND	ND
Mode	Multi	28.0	ND	ND	ND	ND	0.3	295	11.0	0	ND	ND
Standard Deviation	3.0	2.7	ND	ND	ND	ND	0.5	9	1.0	0	ND	ND
Sample Variance	9.2	7.2	ND	ND	ND	ND	0.2	76	1.0	0	ND	ND
Range	7.3	7.1	ND	ND	ND	ND	1.4	29	3.0	0	ND	ND
Minimum	8.7	21.9	ND	ND	ND	ND	0.0	287	10.0	0	ND	ND
Maximum	16.0	29.0	ND	ND	ND	ND	1.4	316	13.0	0	ND	ND
Count	6	6	0	0	0	0	18	18	18	6	0	0
Confidence Level (95%)	3.2	2.8	ND	ND	ND	ND	0.2	4	0.5	0	ND	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

NEAR SHORE - SITE 1
LAKE MICHIGAN
WATER QUALITY DATA - 2013

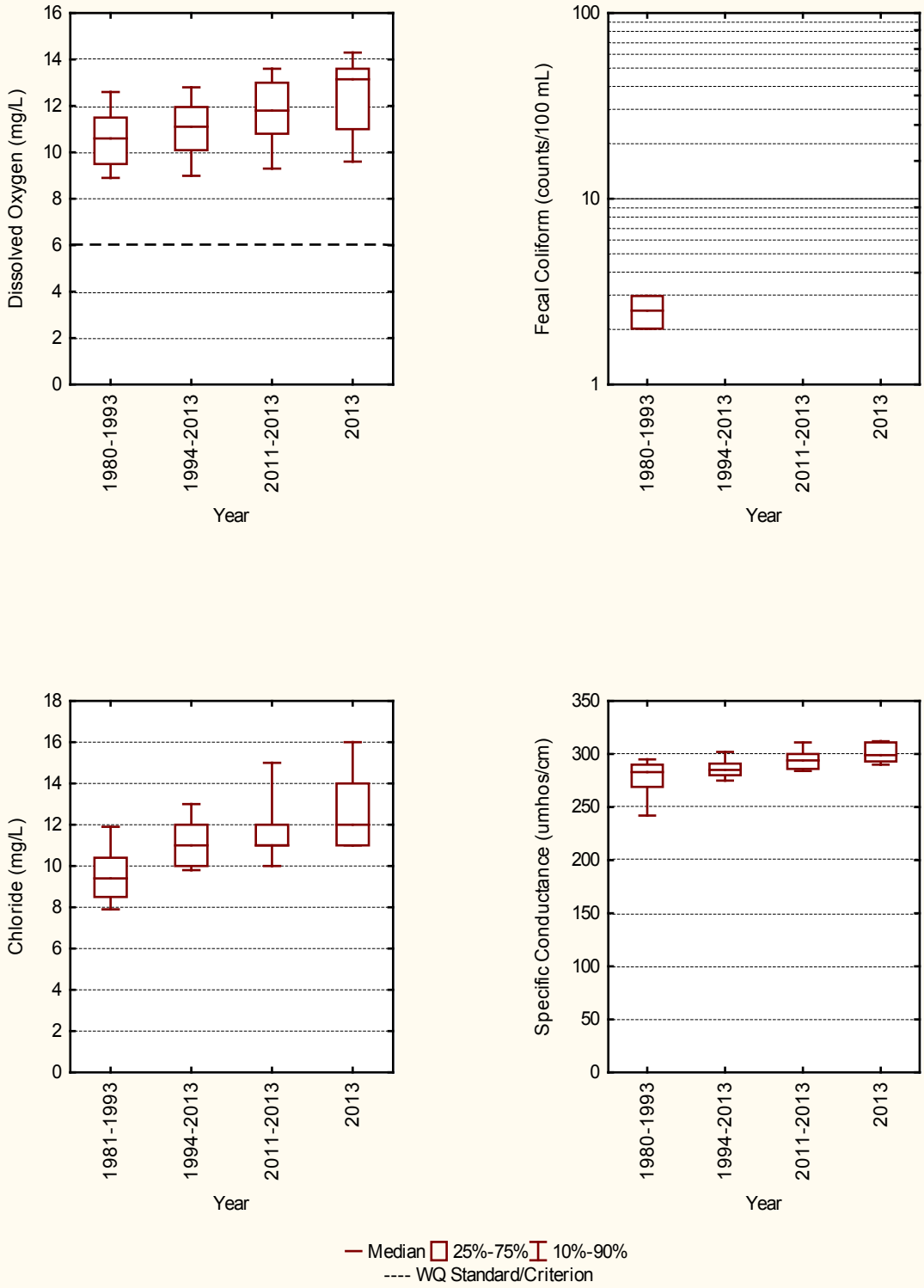
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	34.67	13.17	0.3	1.5	1.4	2.0	0.0	1.8	0.9	0.0	0.0	ND
Standard Error	0.21	0.17	0.2	0.3	1.4	0.7	0.0	1.8	0.9	0.0	0.0	ND
Median	35.00	13.00	0.0	1.8	0.0	1.4	0.0	0.0	0.0	0.0	0.0	ND
Mode	35.00	13.00	0.0	Multi	0.0	1.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	0.52	0.41	0.5	0.8	3.4	1.8	0.0	4.5	2.1	0.0	0.0	ND
Sample Variance	0.27	0.17	0.3	0.6	11.5	3.1	0.0	20.2	4.2	0.0	0.0	ND
Range	1.00	1.00	1.3	2.1	8.3	4.7	0.0	11.0	4.6	0.0	0.0	ND
Minimum	34.00	13.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	35.00	14.00	1.3	2.1	8.3	4.7	0.0	11.0	4.6	0.0	0.0	ND
Count	6	6	6	6	6	6	4	6	5	3	6	0
Confidence Level (95%)	0.54	0.43	0.6	0.8	3.6	1.9	0.0	4.7	2.6	0.0	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	140	103	ND	ND	ND	ND	ND	ND
Standard Error	0	2	ND	ND	ND	ND	ND	ND
Median	140	100	ND	ND	ND	ND	ND	ND
Mode	140	100	ND	ND	ND	ND	ND	ND
Standard Deviation	0	8	ND	ND	ND	ND	ND	ND
Sample Variance	0	68	ND	ND	ND	ND	ND	ND
Range	0	30	ND	ND	ND	ND	ND	ND
Minimum	140	90	ND	ND	ND	ND	ND	ND
Maximum	140	120	ND	ND	ND	ND	ND	ND
Count	6	18	0	0	0	0	0	0
Confidence Level (95%)	0	4	ND	ND	ND	ND	ND	ND

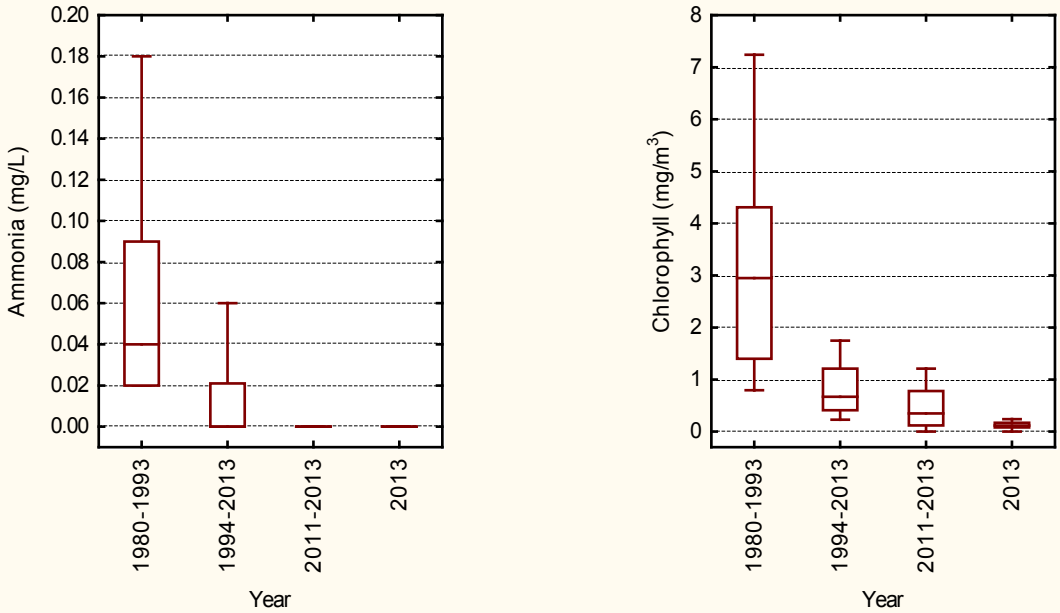
ND = No Data **Multi = Multimodal**

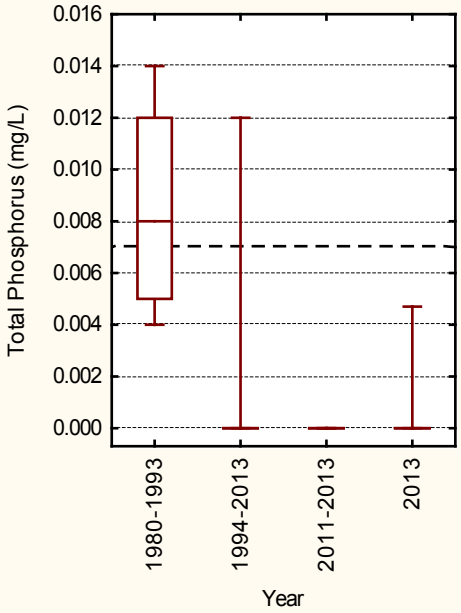
Provisional MMSD Water Quality Data

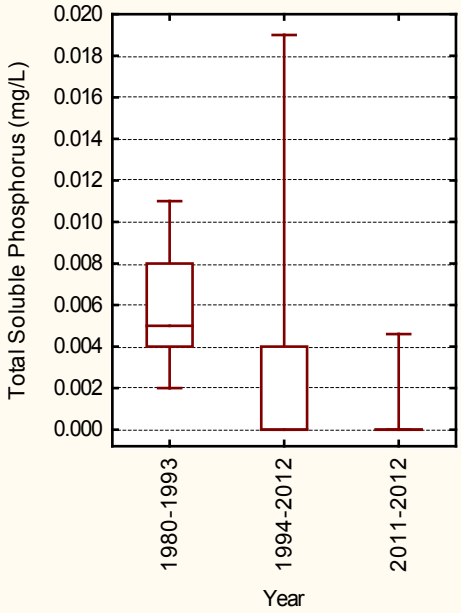
MMSD Water Quality Program Data
Nearshore survey, Site NS-02



MMSD Water Quality Program Data
Nearshore survey, Site NS-02

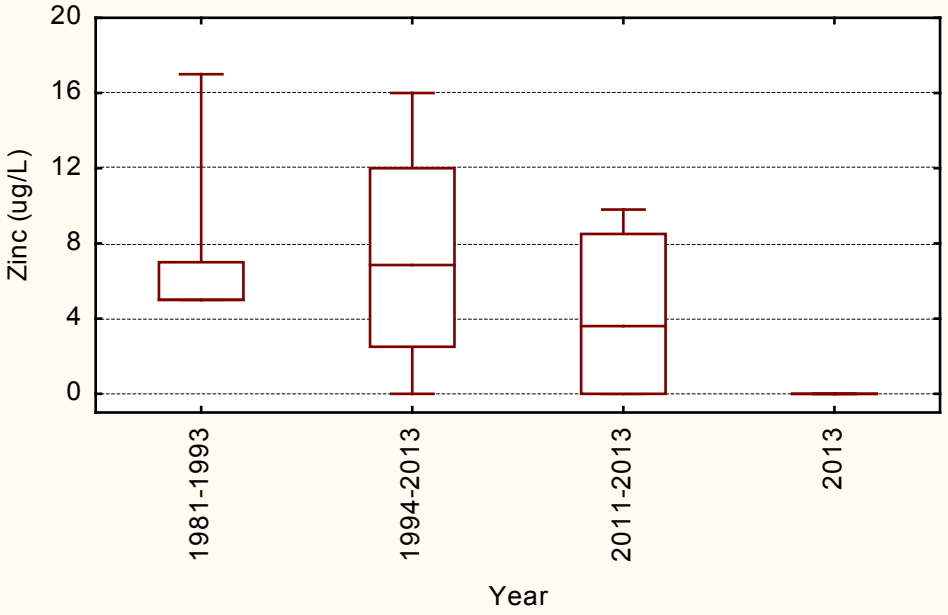


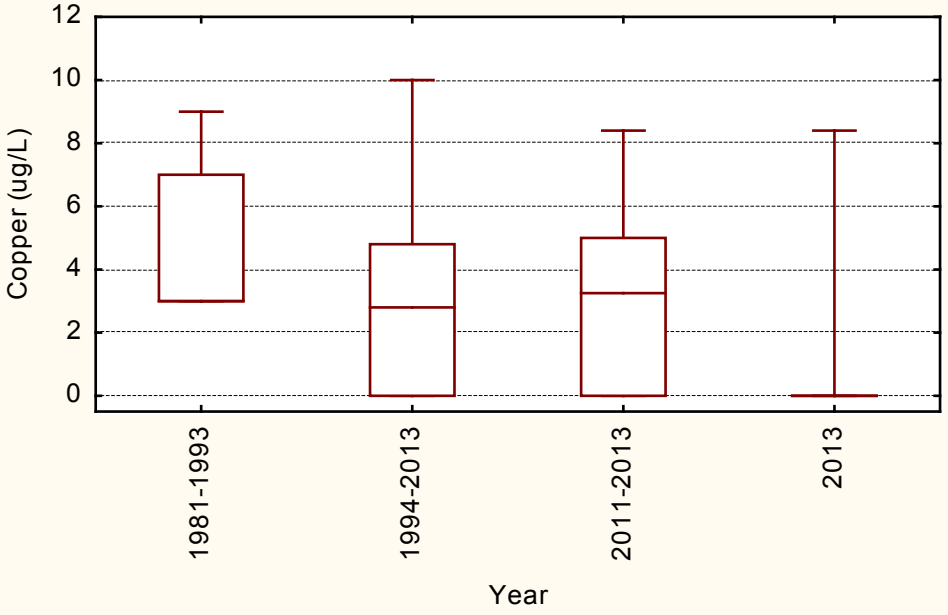




— Median ☐ 25%-75% I 10%-90%
---- WQ Standard/Criterion

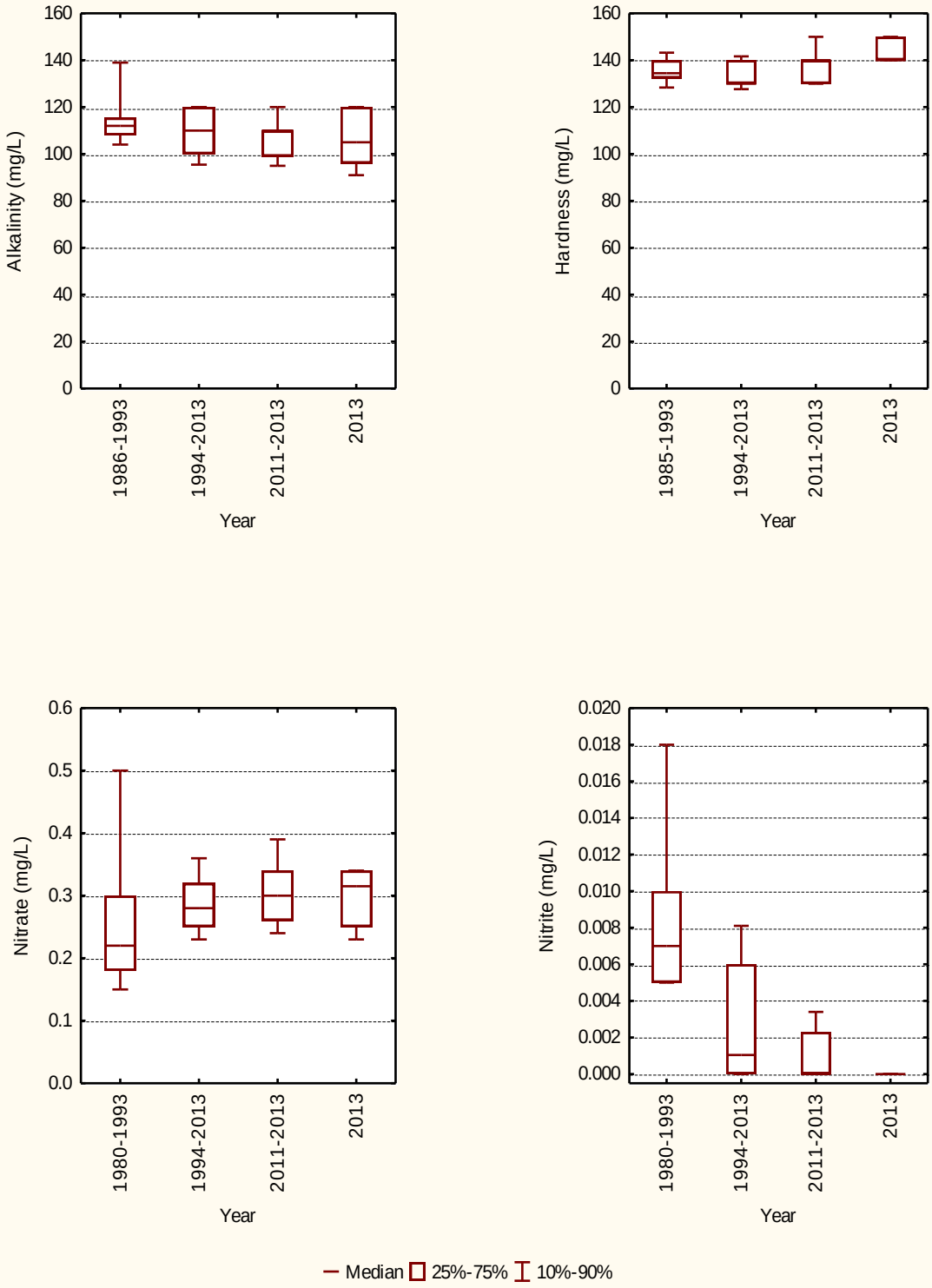
MMSD Water Quality Program Data
Nearshore survey, Site NS-02





Median 25%-75% 10%-90%

MMSD Water Quality Program Data
Nearshore survey, Site NS-02



NEAR SHORE - SITE 2
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.2	9.3	12.4	0.12	0.37	0.000	0.37	0.000	0.18	0.001	ND	1.53
Standard Error	0.0	1.6	0.4	0.02	0.08	0.000	0.08	0.000	0.09	0.000	ND	0.08
Median	8.2	7.4	13.2	0.12	0.32	0.000	0.32	0.000	0.00	0.000	ND	1.70
Mode	8.2	Multi	Multi	0.00	0.34	0.000	0.34	0.000	0.00	0.000	ND	1.80
Standard Deviation	0.2	6.9	1.7	0.08	0.33	0.000	0.33	0.000	0.38	0.002	ND	0.35
Sample Variance	0.0	46.9	3.0	0.01	0.11	0.000	0.11	0.000	0.14	0.000	ND	0.12
Range	0.5	20.3	5.1	0.26	1.49	0.000	1.49	0.000	1.60	0.005	ND	0.94
Minimum	8.0	2.2	9.3	0.00	0.21	0.000	0.21	0.000	0.00	0.000	ND	0.86
Maximum	8.5	22.5	14.4	0.26	1.70	0.000	1.70	0.000	1.60	0.005	ND	1.80
Count	18	18	18	18	18	18	18	18	18	18	0	18
Confidence Level (95%)	0.1	3.4	0.9	0.04	0.17	0.000	0.17	0.000	0.19	0.001	ND	0.18

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	11.4	16.2	ND	ND	ND	ND	0.5	301	12.7	0	ND	ND
Standard Error	1.0	0.2	ND	ND	ND	ND	0.1	2	0.5	0	ND	ND
Median	11.0	16.2	ND	ND	ND	ND	0.3	299	12.0	0	ND	ND
Mode	11.0	16.2	ND	ND	ND	ND	0.2	299	12.0	0	ND	ND
Standard Deviation	2.3	0.4	ND	ND	ND	ND	0.5	9	2.0	0	ND	ND
Sample Variance	5.4	0.2	ND	ND	ND	ND	0.3	78	4.1	0	ND	ND
Range	6.5	1.2	ND	ND	ND	ND	1.7	27	7.0	0	ND	ND
Minimum	9.5	15.5	ND	ND	ND	ND	0.0	287	10.0	0	ND	ND
Maximum	16.0	16.7	ND	ND	ND	ND	1.7	314	17.0	0	ND	ND
Count	6	6	0	0	0	0	18	18	18	6	0	0
Confidence Level (95%)	2.4	0.4	ND	ND	ND	ND	0.3	4	1.0	0	ND	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

NEAR SHORE - SITE 2
LAKE MICHIGAN
WATER QUALITY DATA - 2013

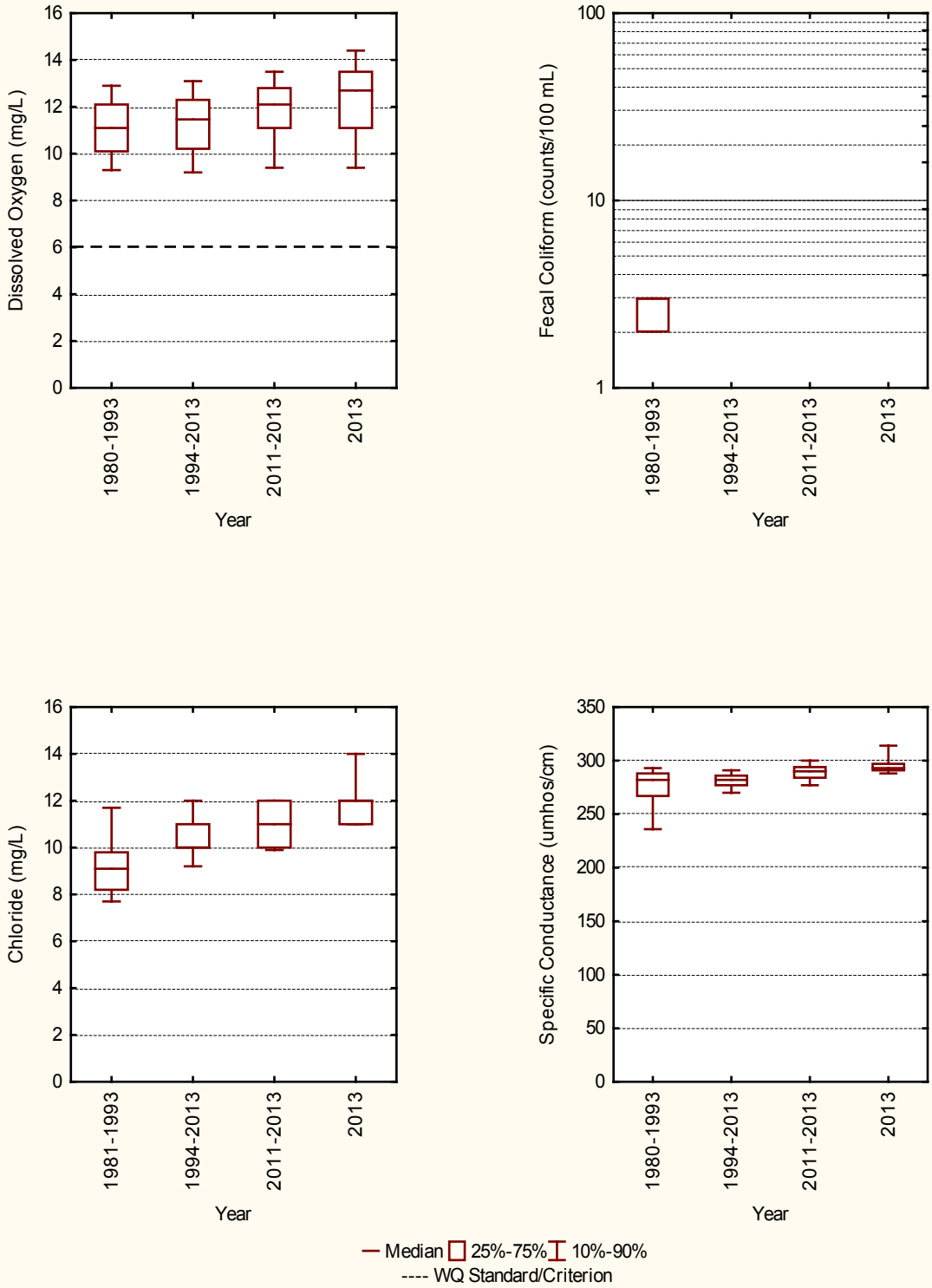
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	35.00	13.33	0.2	1.5	1.4	1.2	0.0	0.0	0.8	0.9	0.0	ND
Standard Error	0.37	0.21	0.2	0.3	1.4	0.6	0.0	0.0	0.8	0.9	0.0	ND
Median	35.00	13.00	0.0	1.6	0.0	0.8	0.0	0.0	0.0	0.0	0.0	ND
Mode	Multi	13.00	0.0	Multi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	0.89	0.52	0.4	0.8	3.4	1.5	0.0	0.0	1.9	2.0	0.0	ND
Sample Variance	0.80	0.27	0.2	0.7	11.8	2.2	0.0	0.0	3.5	3.9	0.0	ND
Range	2.00	1.00	1.1	2.5	8.4	3.6	0.0	0.0	4.6	4.4	0.0	ND
Minimum	34.00	13.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	36.00	14.00	1.1	2.5	8.4	3.6	0.0	0.0	4.6	4.4	0.0	ND
Count	6	6	6	6	6	6	5	6	6	5	6	0
Confidence Level (95%)	0.94	0.54	0.5	0.9	3.6	1.6	0.0	0.0	2.0	2.4	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	143	106	ND	ND	ND	ND	ND	ND
Standard Error	2	3	ND	ND	ND	ND	ND	ND
Median	140	105	ND	ND	ND	ND	ND	ND
Mode	140	120	ND	ND	ND	ND	ND	ND
Standard Deviation	5	11	ND	ND	ND	ND	ND	ND
Sample Variance	27	129	ND	ND	ND	ND	ND	ND
Range	10	34	ND	ND	ND	ND	ND	ND
Minimum	140	86	ND	ND	ND	ND	ND	ND
Maximum	150	120	ND	ND	ND	ND	ND	ND
Count	6	18	0	0	0	0	0	0
Confidence Level (95%)	5	6	ND	ND	ND	ND	ND	ND

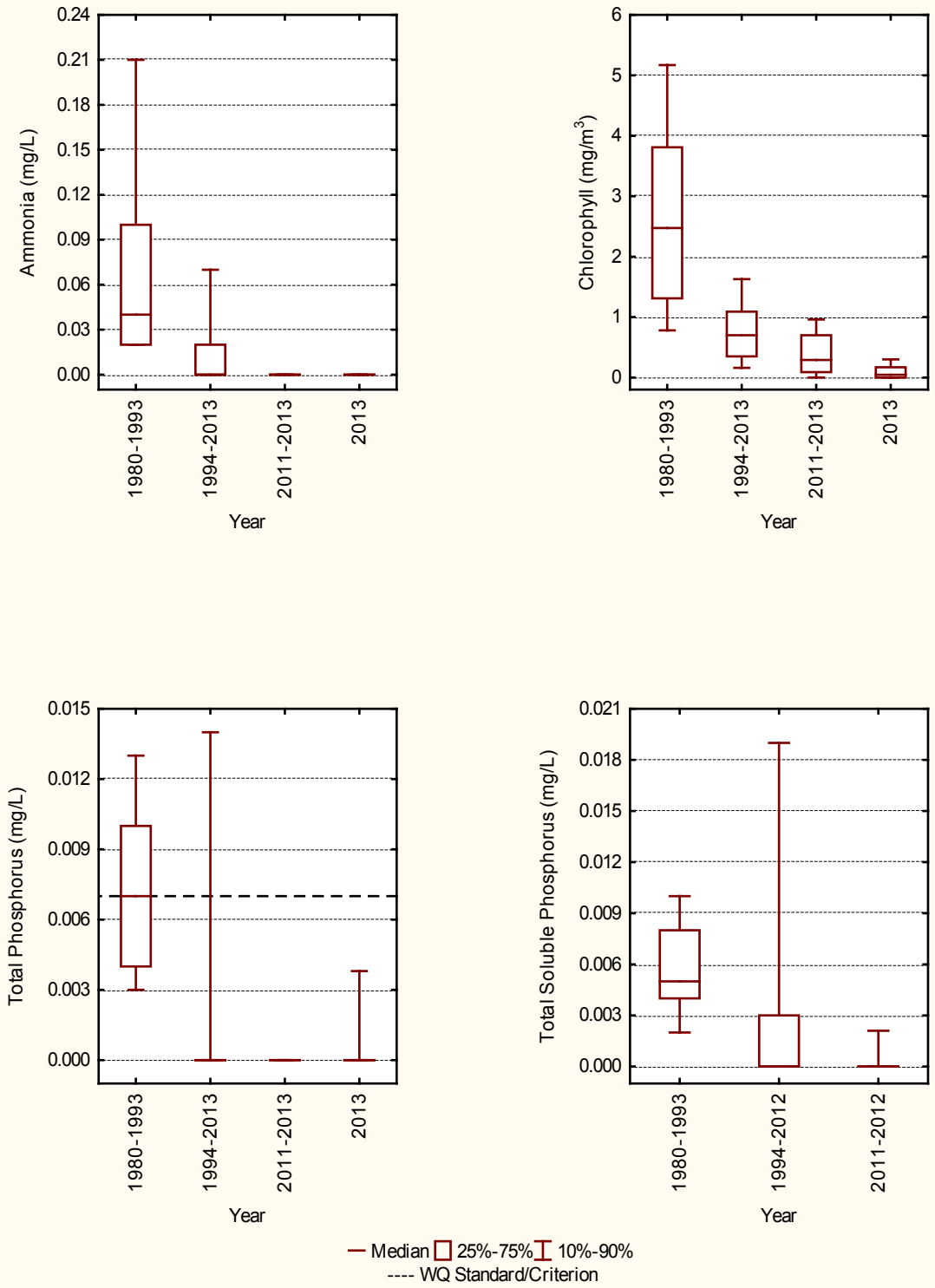
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

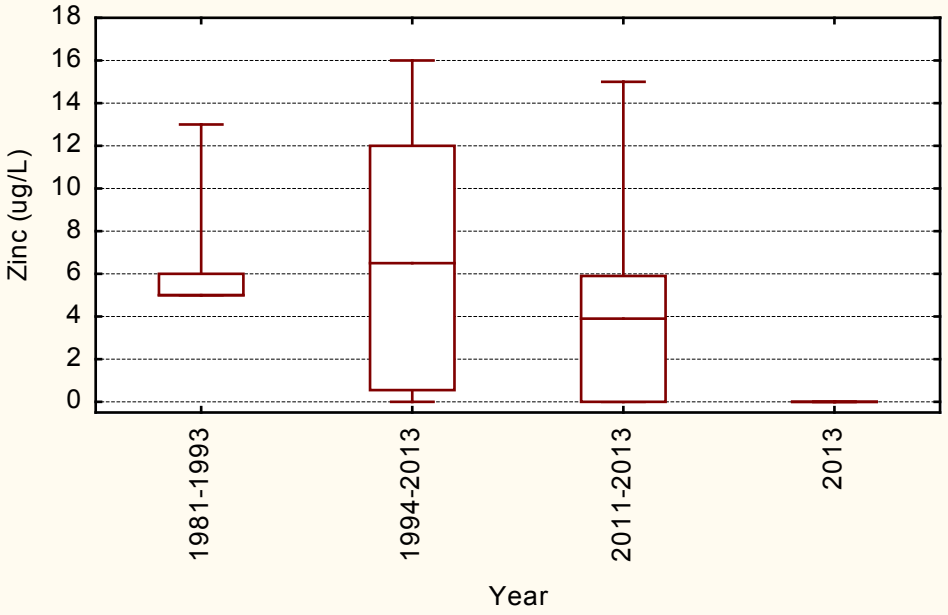
MMSD Water Quality Program Data
Nearshore survey, Site NS-03

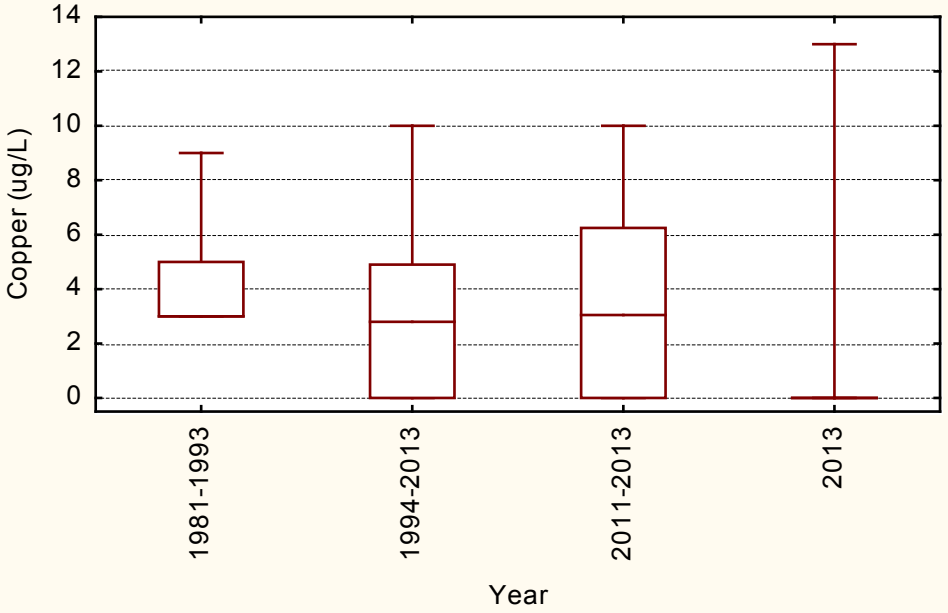


MMSD Water Quality Program Data
Nearshore survey, Site NS-03



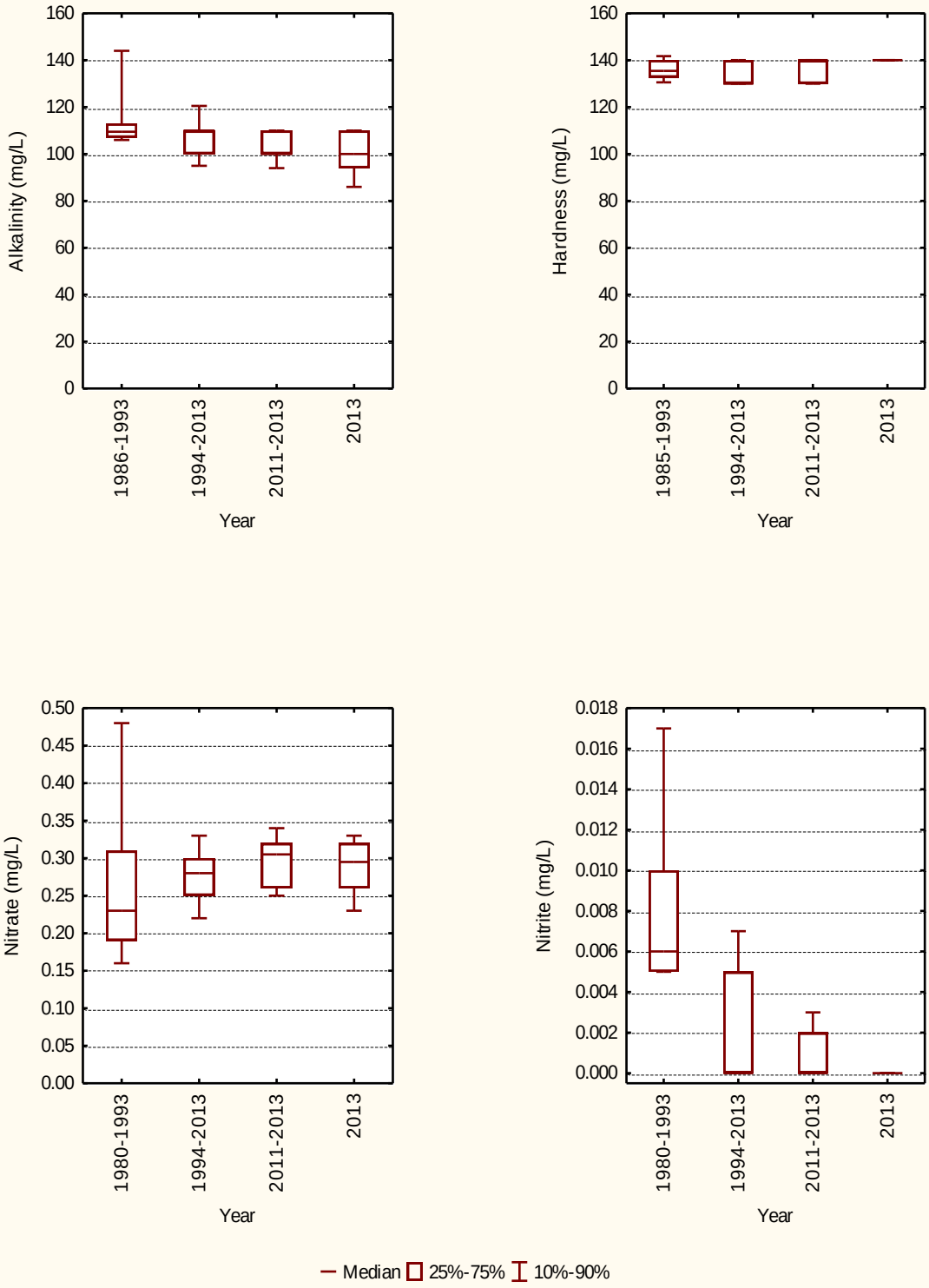
MMSD Water Quality Program Data
Nearshore survey, Site NS-03





Median 25%-75% 10%-90%

MMSD Water Quality Program Data
Nearshore survey, Site NS-03



NEAR SHORE - SITE 3
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.2	8.4	12.3	0.10	0.29	0.000	0.29	0.000	0.05	0.000	ND	1.57
Standard Error	0.0	1.6	0.4	0.03	0.01	0.000	0.01	0.000	0.02	0.000	ND	0.07
Median	8.2	6.2	12.7	0.05	0.30	0.000	0.30	0.000	0.00	0.000	ND	1.70
Mode	8.1	1.7	13.5	0.00	0.31	0.000	0.31	0.000	0.00	0.000	ND	1.80
Standard Deviation	0.1	6.7	1.8	0.13	0.03	0.000	0.03	0.000	0.10	0.001	ND	0.30
Sample Variance	0.0	45.3	3.1	0.02	0.00	0.000	0.00	0.000	0.01	0.000	ND	0.09
Range	0.3	21.1	5.5	0.41	0.11	0.000	0.11	0.000	0.27	0.005	ND	0.96
Minimum	8.1	1.7	9.0	0.00	0.23	0.000	0.23	0.000	0.00	0.000	ND	0.94
Maximum	8.4	22.8	14.5	0.41	0.34	0.000	0.34	0.000	0.27	0.005	ND	1.90
Count	18	18	18	18	18	18	18	18	18	18	0	18
Confidence Level (95%)	0.1	3.3	0.9	0.06	0.02	0.000	0.02	0.000	0.05	0.001	ND	0.15

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	12.9	24.2	ND	ND	ND	ND	0.4	296	12.1	0	ND	ND
Standard Error	0.9	1.5	ND	ND	ND	ND	0.1	2	0.2	0	ND	ND
Median	13.0	26.4	ND	ND	ND	ND	0.3	293	12.0	0	ND	ND
Mode	Multi	Multi	ND	ND	ND	ND	0.3	Multi	12.0	0	ND	ND
Standard Deviation	2.2	3.7	ND	ND	ND	ND	0.5	8	1.1	0	ND	ND
Sample Variance	5.0	13.4	ND	ND	ND	ND	0.2	72	1.1	0	ND	ND
Range	6.5	8.8	ND	ND	ND	ND	1.5	26	3.0	0	ND	ND
Minimum	9.5	17.9	ND	ND	ND	ND	0.0	288	11.0	0	ND	ND
Maximum	16.0	26.7	ND	ND	ND	ND	1.5	314	14.0	0	ND	ND
Count	6	6	0	0	0	0	18	18	18	6	0	0
Confidence Level (95%)	2.4	3.8	ND	ND	ND	ND	0.2	4	0.5	0	ND	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

NEAR SHORE - SITE 3
LAKE MICHIGAN
WATER QUALITY DATA - 2013

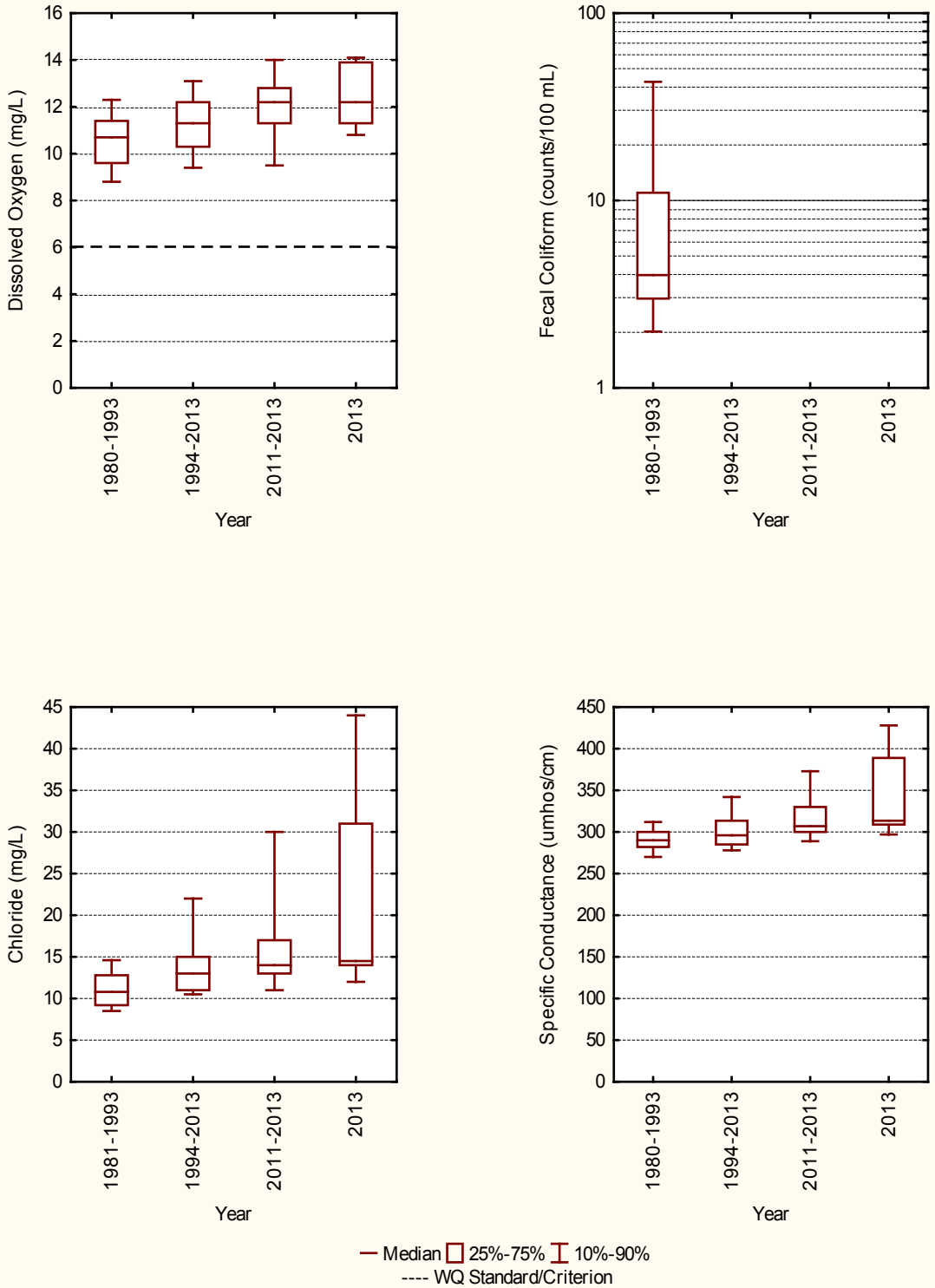
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	34.67	13.00	0.2	0.8	2.2	1.3	0.0	0.0	1.0	1.0	0.0	ND
Standard Error	0.33	0.26	0.2	0.3	2.2	0.3	0.0	0.0	1.0	1.0	0.0	ND
Median	34.50	13.00	0.0	0.6	0.0	1.5	0.0	0.0	0.0	0.0	0.0	ND
Mode	34.00	13.00	0.0	0.0	0.0	Multi	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	0.82	0.63	0.4	0.8	5.3	0.7	0.0	0.0	2.1	2.2	0.0	ND
Sample Variance	0.67	0.40	0.2	0.7	28.2	0.5	0.0	0.0	4.6	4.8	0.0	ND
Range	2.00	2.00	1.1	1.8	13.0	1.9	0.0	0.0	4.8	4.9	0.0	ND
Minimum	34.00	12.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	36.00	14.00	1.1	1.8	13.0	1.9	0.0	0.0	4.8	4.9	0.0	ND
Count	6	6	6	6	6	6	6	6	5	5	6	0
Confidence Level (95%)	0.86	0.66	0.5	0.9	5.6	0.7	0.0	0.0	2.7	2.7	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	140	101	ND	ND	ND	ND	ND	ND
Standard Error	0	3	ND	ND	ND	ND	ND	ND
Median	140	100	ND	ND	ND	ND	ND	ND
Mode	140	110	ND	ND	ND	ND	ND	ND
Standard Deviation	0	11	ND	ND	ND	ND	ND	ND
Sample Variance	0	117	ND	ND	ND	ND	ND	ND
Range	0	40	ND	ND	ND	ND	ND	ND
Minimum	140	80	ND	ND	ND	ND	ND	ND
Maximum	140	120	ND	ND	ND	ND	ND	ND
Count	6	18	0	0	0	0	0	0
Confidence Level (95%)	0	5	ND	ND	ND	ND	ND	ND

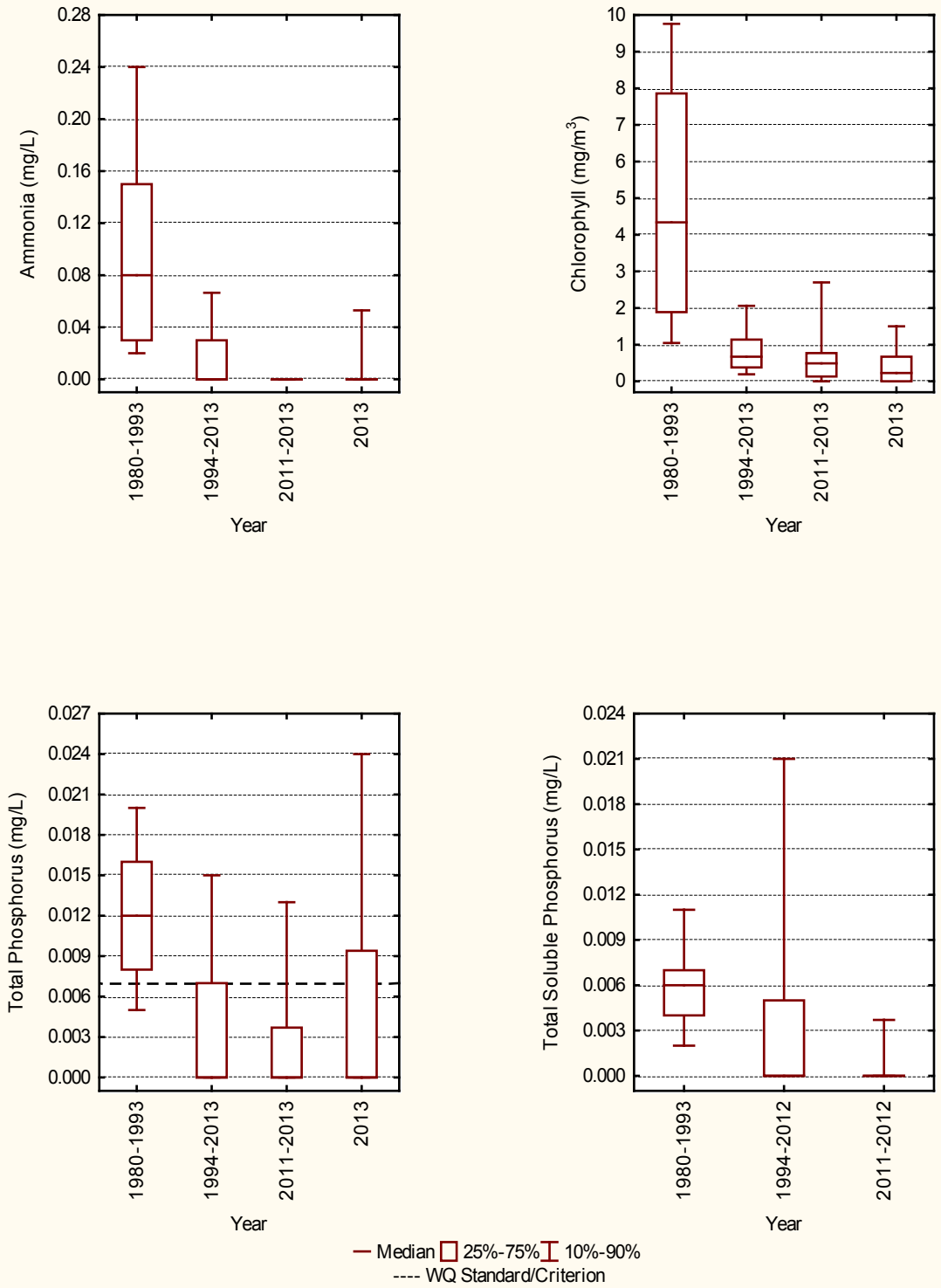
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

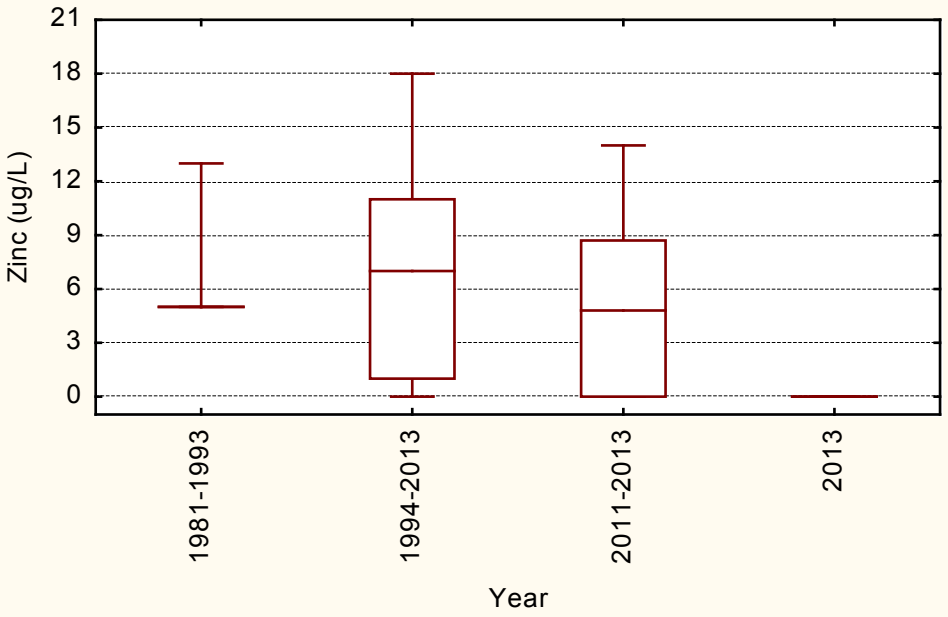
MMSD Water Quality Program Data
Nearshore survey, Site NS-04

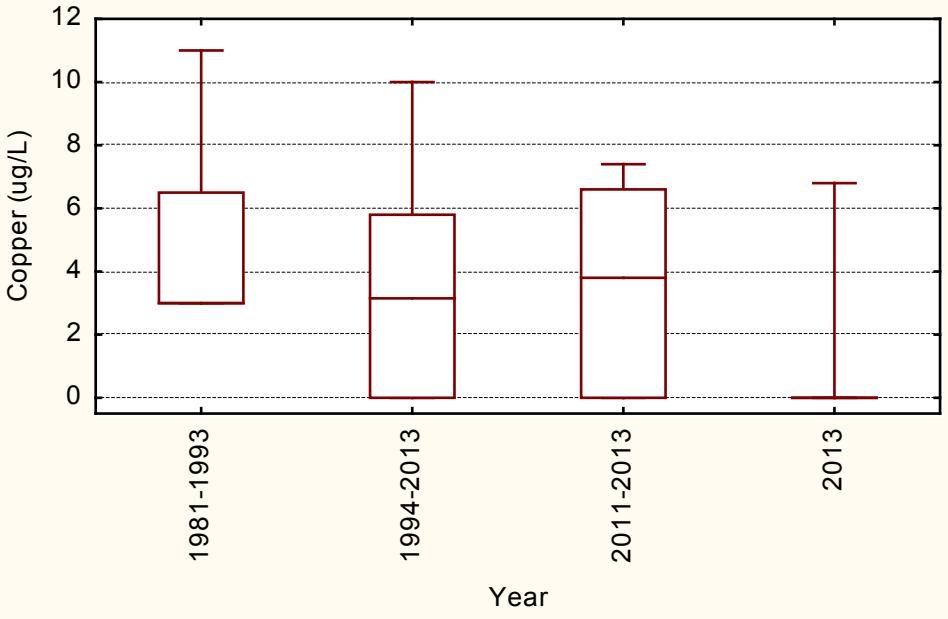


MMSD Water Quality Program Data
Nearshore survey, Site NS-04



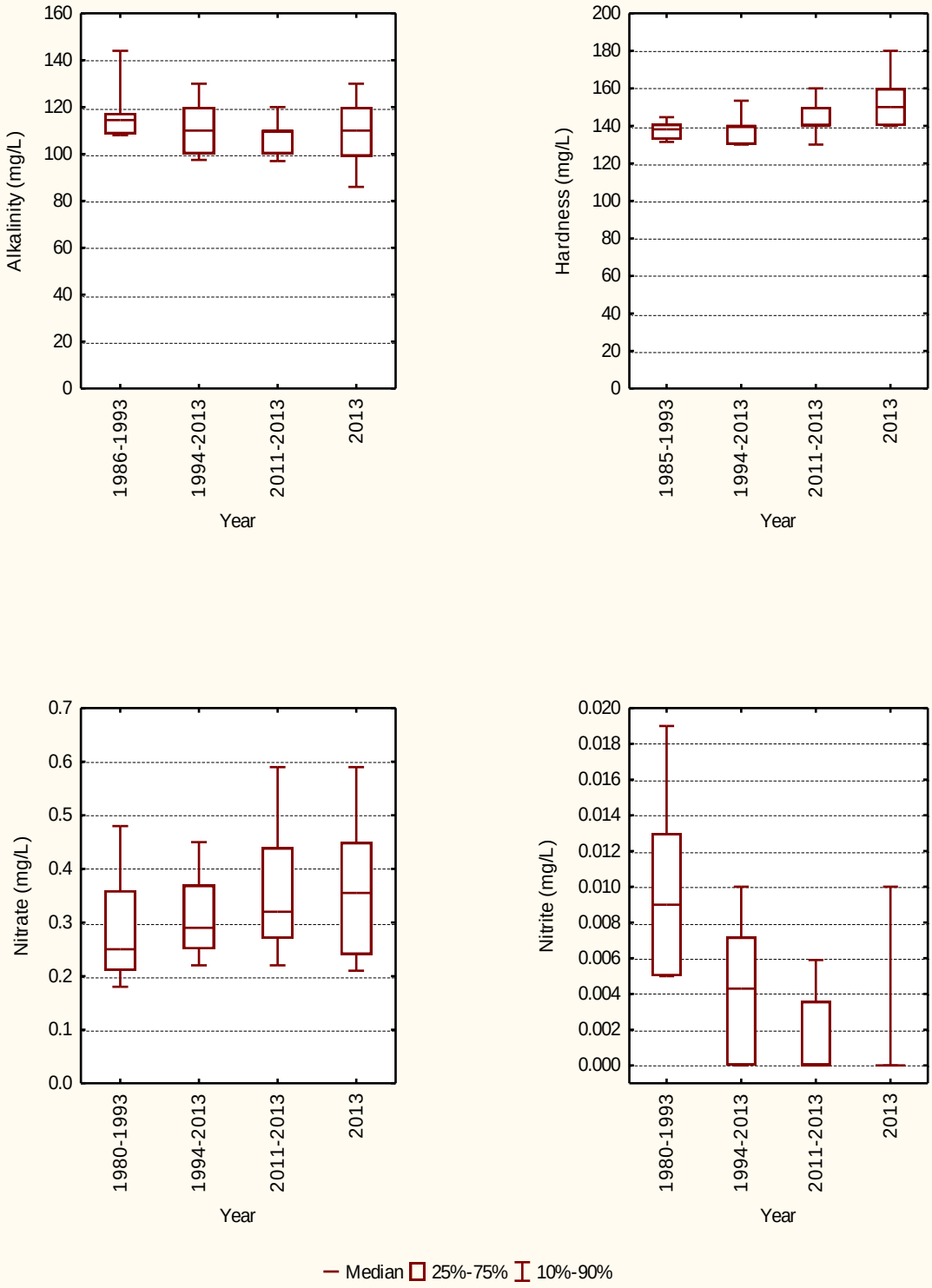
MMSD Water Quality Program Data
Nearshore survey, Site NS-04





Median 25%-75% 10%-90%

MMSD Water Quality Program Data
Nearshore survey, Site NS-04



NEAR SHORE - SITE 4
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.3	11.0	12.5	0.49	0.36	0.002	0.37	0.008	0.09	0.005	ND	1.27
Standard Error	0.1	1.7	0.3	0.16	0.03	0.001	0.03	0.004	0.04	0.002	ND	0.16
Median	8.2	10.9	12.2	0.23	0.36	0.000	0.36	0.000	0.00	0.000	ND	1.35
Mode	Multi	2.6	13.9	0.00	Multi	0.000	Multi	0.000	0.00	0.000	ND	Multi
Standard Deviation	0.2	7.1	1.3	0.68	0.13	0.004	0.13	0.019	0.18	0.009	ND	0.67
Sample Variance	0.1	50.4	1.8	0.47	0.02	0.000	0.02	0.000	0.03	0.000	ND	0.45
Range	0.6	19.1	3.4	2.70	0.41	0.011	0.42	0.053	0.54	0.025	ND	2.02
Minimum	8.1	2.5	10.7	0.00	0.18	0.000	0.18	0.000	0.00	0.000	ND	0.28
Maximum	8.7	21.6	14.1	2.70	0.59	0.011	0.60	0.053	0.54	0.025	ND	2.30
Count	18	18	18	18	18	18	18	18	18	18	0	18
Confidence Level (95%)	0.1	3.5	0.7	0.34	0.07	0.002	0.07	0.009	0.09	0.004	ND	0.33

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	9.2	10.2	ND	ND	ND	ND	0.8	343	21.5	0	ND	ND
Standard Error	1.0	0.1	ND	ND	ND	ND	0.1	12	2.8	0	ND	ND
Median	10.0	10.3	ND	ND	ND	ND	0.6	314	14.5	0	ND	ND
Mode	10.0	10.3	ND	ND	ND	ND	0.6	310	14.0	0	ND	ND
Standard Deviation	2.4	0.3	ND	ND	ND	ND	0.6	52	11.7	0	ND	ND
Sample Variance	5.7	0.1	ND	ND	ND	ND	0.3	2687	137.3	0	ND	ND
Range	6.6	0.9	ND	ND	ND	ND	1.6	169	33.0	0	ND	ND
Minimum	4.4	9.8	ND	ND	ND	ND	0.1	294	12.0	0	ND	ND
Maximum	11.0	10.7	ND	ND	ND	ND	1.7	463	45.0	0	ND	ND
Count	6	6	0	0	0	0	18	18	18	6	0	0
Confidence Level (95%)	2.5	0.3	ND	ND	ND	ND	0.3	26	5.8	0	ND	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

NEAR SHORE - SITE 4
LAKE MICHIGAN
WATER QUALITY DATA - 2013

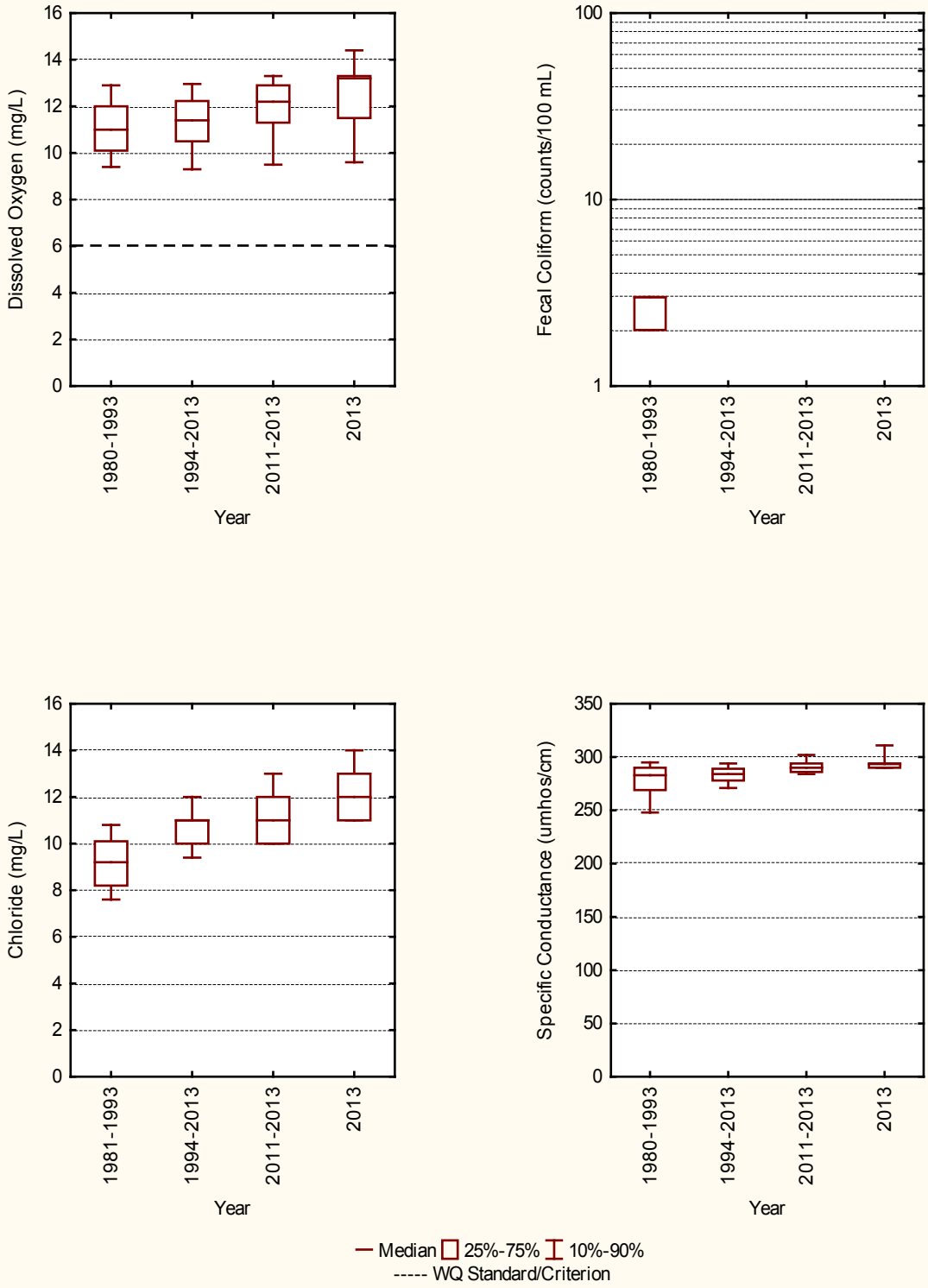
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	37.00	14.67	0.4	1.0	1.1	0.8	0.0	0.0	0.0	3.2	0.0	ND
Standard Error	1.18	0.92	0.3	0.4	1.1	0.4	0.0	0.0	0.0	1.1	0.0	ND
Median	35.50	14.00	0.0	1.2	0.0	0.6	0.0	0.0	0.0	3.5	0.0	ND
Mode	35.00	Multi	0.0	Multi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	2.90	2.25	0.6	0.9	2.8	0.9	0.0	0.0	0.0	2.8	0.0	ND
Sample Variance	8.40	5.07	0.4	0.8	7.7	0.8	0.0	0.0	0.0	7.9	0.0	ND
Range	7.00	6.00	1.5	2.3	6.8	1.9	0.0	0.0	0.0	6.8	0.0	ND
Minimum	35.00	13.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	42.00	19.00	1.5	2.3	6.8	1.9	0.0	0.0	0.0	6.8	0.0	ND
Count	6	6	6	6	6	6	5	6	4	6	6	0
Confidence Level (95%)	3.04	2.36	0.7	0.9	2.9	0.9	0.0	0.0	0.0	2.9	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	153	111	ND	ND	ND	ND	ND	ND
Standard Error	6	4	ND	ND	ND	ND	ND	ND
Median	150	110	ND	ND	ND	ND	ND	ND
Mode	Multi	110	ND	ND	ND	ND	ND	ND
Standard Deviation	15	16	ND	ND	ND	ND	ND	ND
Sample Variance	227	254	ND	ND	ND	ND	ND	ND
Range	40	55	ND	ND	ND	ND	ND	ND
Minimum	140	85	ND	ND	ND	ND	ND	ND
Maximum	180	140	ND	ND	ND	ND	ND	ND
Count	6	18	0	0	0	0	0	0
Confidence Level (95%)	16	8	ND	ND	ND	ND	ND	ND

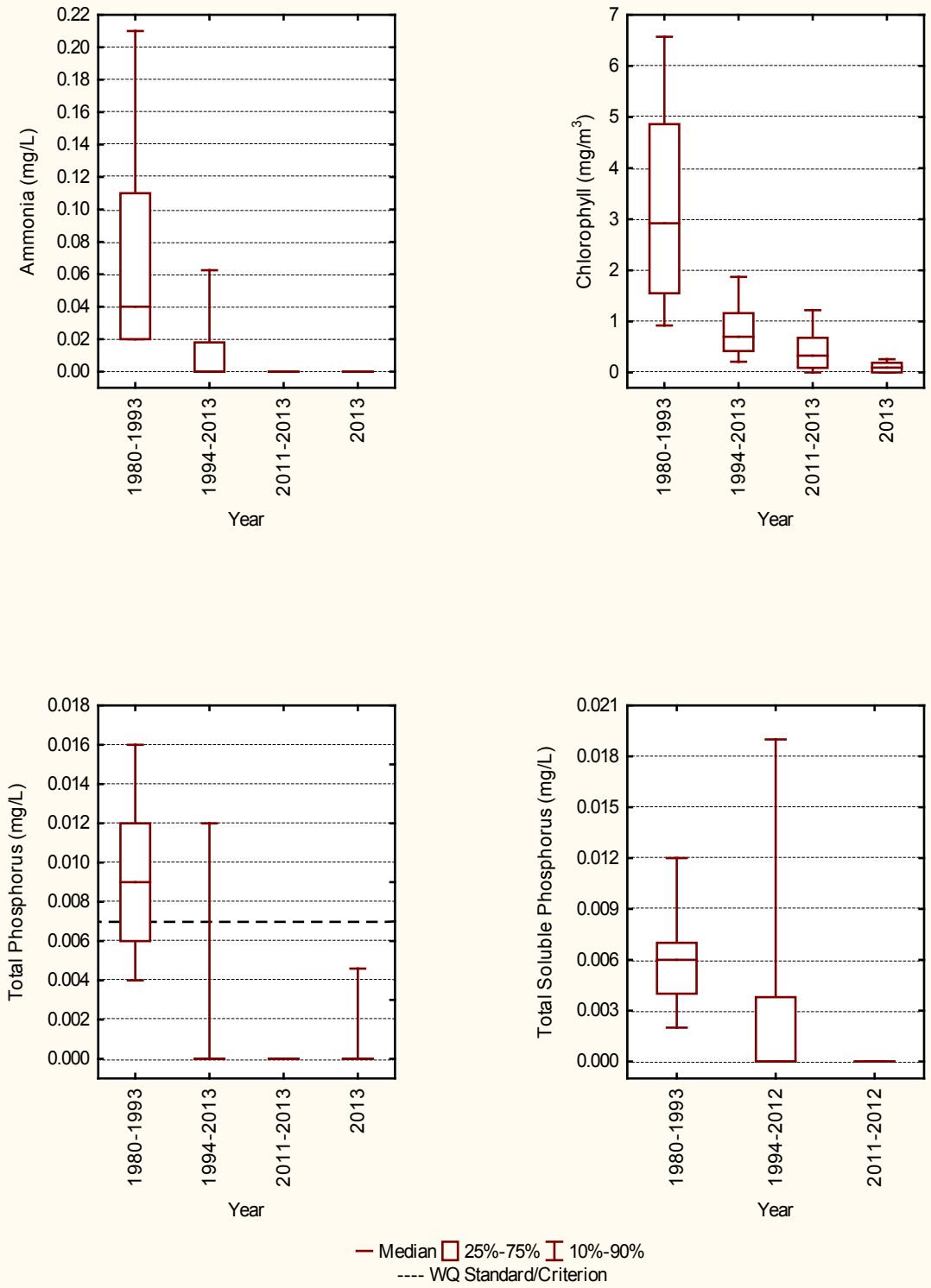
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

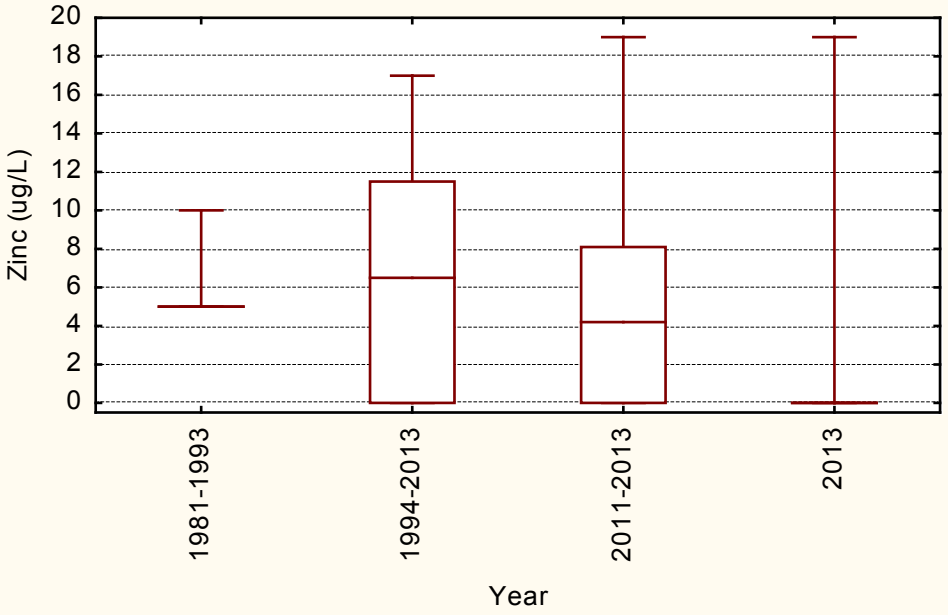
MMSD Water Quality Program Data
Nearshore survey, Site NS-05

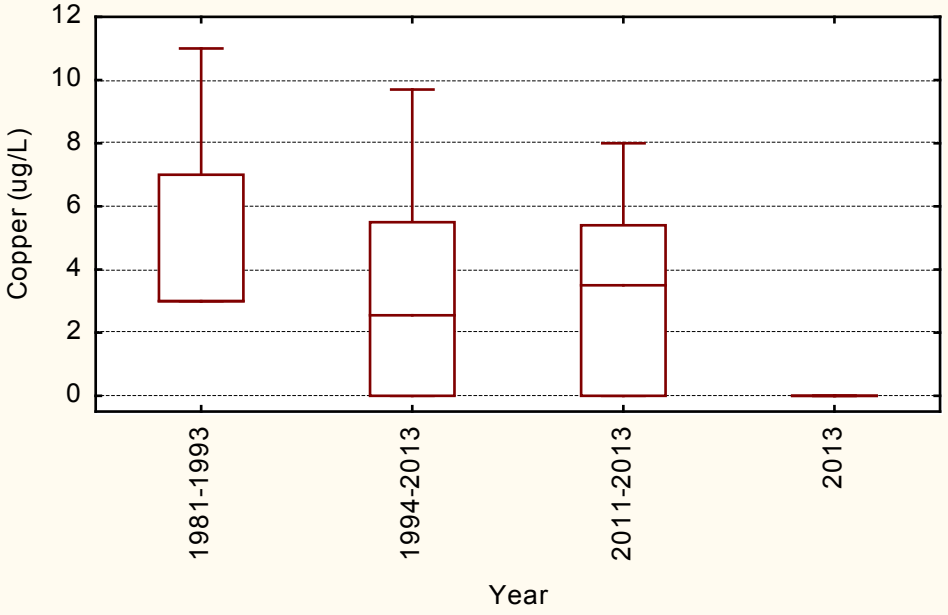


MMSD Water Quality Program Data
Nearshore survey, Site NS-05



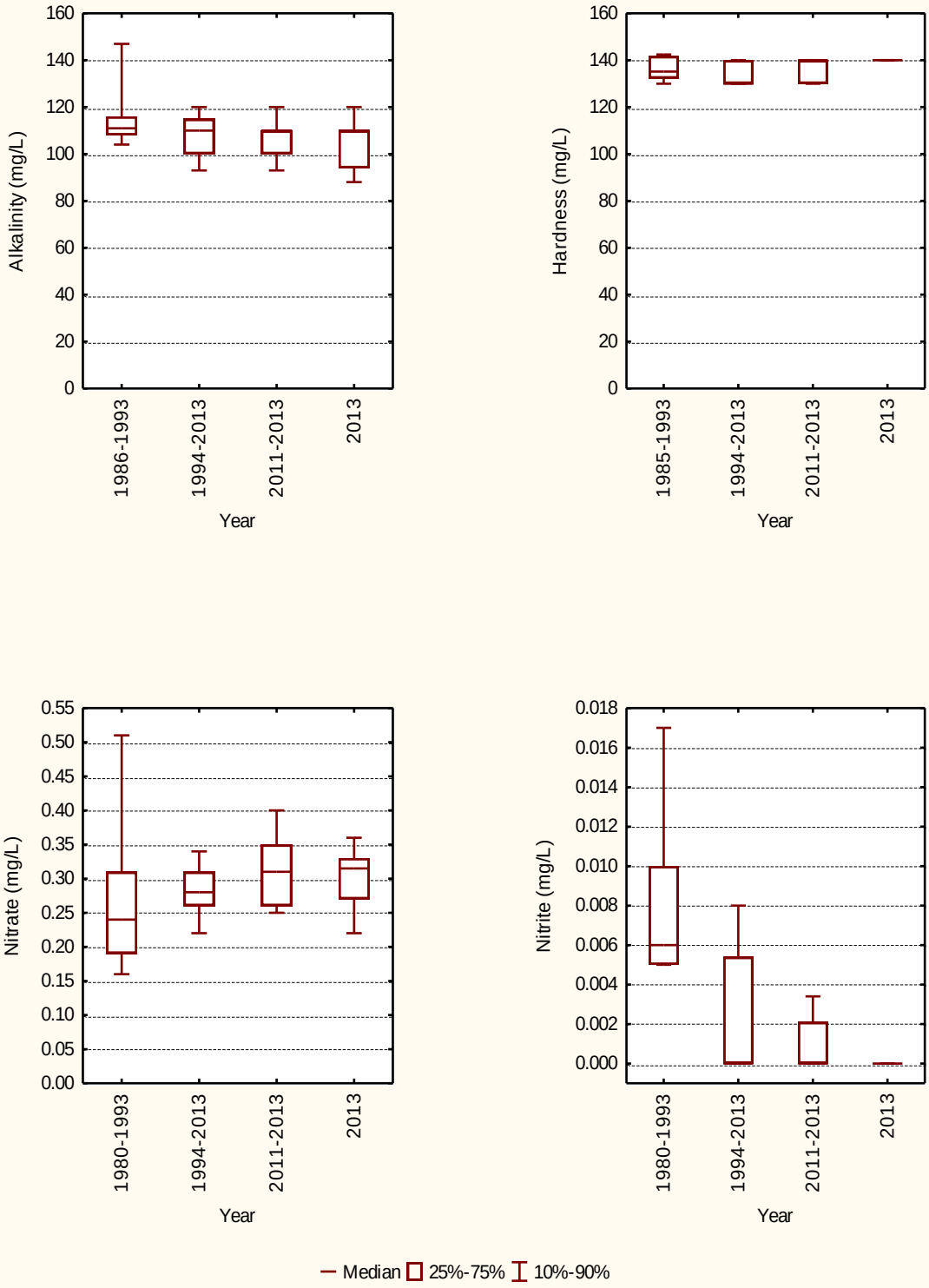
MMSD Water Quality Program Data
Nearshore survey, Site NS-05





Median 25%-75% 10%-90%

MMSD Water Quality Program Data
Nearshore survey, Site NS-05



NEAR SHORE - SITE 5
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.0	7.7	12.6	0.13	0.31	0.000	0.31	0.000	0.04	0.001	ND	1.55
Standard Error	0.0	1.4	0.4	0.04	0.02	0.000	0.02	0.000	0.02	0.000	ND	0.09
Median	8.1	6.4	13.2	0.10	0.32	0.000	0.32	0.000	0.00	0.000	ND	1.75
Mode	8.1	Multi	13.3	0.00	0.32	0.000	0.32	0.000	0.00	0.000	ND	1.80
Standard Deviation	0.2	6.1	1.5	0.15	0.07	0.000	0.07	0.000	0.10	0.002	ND	0.36
Sample Variance	0.0	36.9	2.4	0.02	0.00	0.000	0.00	0.000	0.01	0.000	ND	0.13
Range	0.5	21.0	5.0	0.62	0.33	0.000	0.33	0.000	0.29	0.005	ND	1.09
Minimum	7.8	1.6	9.5	0.00	0.20	0.000	0.20	0.000	0.00	0.000	ND	0.81
Maximum	8.3	22.6	14.5	0.62	0.53	0.000	0.53	0.000	0.29	0.005	ND	1.90
Count	18	18	18	18	18	18	18	18	18	18	0	18
Confidence Level (95%)	0.1	3.0	0.8	0.08	0.03	0.000	0.03	0.000	0.05	0.001	ND	0.18

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	10.3	21.6	ND	ND	ND	ND	0.4	295	12.1	0	ND	ND
Standard Error	0.9	1.7	ND	ND	ND	ND	0.1	2	0.3	0	ND	ND
Median	10.5	23.8	ND	ND	ND	ND	0.3	294	12.0	0	ND	ND
Mode	Multi	24.5	ND	ND	ND	ND	Multi	294	11.0	0	ND	ND
Standard Deviation	2.1	4.3	ND	ND	ND	ND	0.5	8	1.3	0	ND	ND
Sample Variance	4.6	18.1	ND	ND	ND	ND	0.2	58	1.8	0	ND	ND
Range	5.3	10.1	ND	ND	ND	ND	1.4	25	5.0	0	ND	ND
Minimum	7.7	14.8	ND	ND	ND	ND	0.0	287	10.0	0	ND	ND
Maximum	13.0	24.9	ND	ND	ND	ND	1.4	312	15.0	0	ND	ND
Count	6	6	0	0	0	0	18	18	18	6	0	0
Confidence Level (95%)	2.2	4.5	ND	ND	ND	ND	0.2	4	0.7	0	ND	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

NEAR SHORE - SITE 5
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	34.67	13.17	0.2	1.3	0.0	1.2	0.0	3.2	0.0	0.0	0.0	ND
Standard Error	0.42	0.17	0.2	0.7	0.0	0.4	0.0	3.2	0.0	0.0	0.0	ND
Median	35.00	13.00	0.0	0.7	0.0	1.4	0.0	0.0	0.0	0.0	0.0	ND
Mode	35.00	13.00	0.0	0.0	0.0	Multi	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	1.03	0.41	0.4	1.8	0.0	1.0	0.0	7.8	0.0	0.0	0.0	ND
Sample Variance	1.07	0.17	0.1	3.1	0.0	1.0	0.0	60.2	0.0	0.0	0.0	ND
Range	3.00	1.00	0.9	4.5	0.0	2.5	0.0	19.0	0.0	0.0	0.0	ND
Minimum	33.00	13.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	36.00	14.00	0.9	4.5	0.0	2.5	0.0	19.0	0.0	0.0	0.0	ND
Count	6	6	6	6	6	6	6	6	4	5	6	0
Confidence Level (95%)	1.08	0.43	0.4	1.8	0.0	1.1	0.0	8.1	0.0	0.0	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	140	104	ND	ND	ND	ND	ND	ND
Standard Error	0	3	ND	ND	ND	ND	ND	ND
Median	140	110	ND	ND	ND	ND	ND	ND
Mode	140	110	ND	ND	ND	ND	ND	ND
Standard Deviation	0	11	ND	ND	ND	ND	ND	ND
Sample Variance	0	125	ND	ND	ND	ND	ND	ND
Range	0	34	ND	ND	ND	ND	ND	ND
Minimum	140	86	ND	ND	ND	ND	ND	ND
Maximum	140	120	ND	ND	ND	ND	ND	ND
Count	6	18	0	0	0	0	0	0
Confidence Level (95%)	0	6	ND	ND	ND	ND	ND	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

NEAR SHORE - SITE 7
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.2	8.4	12.7	0.29	0.29	0.000	0.29	0.000	0.03	0.001	ND	1.45
Standard Error	0.0	1.5	0.4	0.17	0.01	0.000	0.01	0.000	0.02	0.000	ND	0.10
Median	8.2	6.8	13.2	0.09	0.30	0.000	0.30	0.000	0.00	0.000	ND	1.60
Mode	8.2	Multi	13.3	0.00	Multi	0.000	Multi	0.000	0.00	0.000	ND	1.70
Standard Deviation	0.1	6.6	1.6	0.72	0.03	0.000	0.03	0.000	0.09	0.001	ND	0.41
Sample Variance	0.0	43.1	2.4	0.52	0.00	0.000	0.00	0.000	0.01	0.000	ND	0.16
Range	0.5	21.6	5.1	3.10	0.10	0.000	0.10	0.000	0.28	0.005	ND	1.51
Minimum	8.0	2.1	9.3	0.00	0.24	0.000	0.24	0.000	0.00	0.000	ND	0.39
Maximum	8.5	23.7	14.4	3.10	0.34	0.000	0.34	0.000	0.28	0.005	ND	1.90
Count	18	18	18	18	18	18	18	18	18	18	0	18
Confidence Level (95%)	0.1	3.3	0.8	0.36	0.02	0.000	0.02	0.000	0.04	0.001	ND	0.20

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	10.1	22.4	ND	ND	ND	ND	0.4	296	12.0	0	ND	ND
Standard Error	0.9	0.2	ND	ND	ND	ND	0.1	2	0.2	0	ND	ND
Median	10.5	22.5	ND	ND	ND	ND	0.3	294	12.0	0	ND	ND
Mode	12.0	Multi	ND	ND	ND	ND	Multi	Multi	12.0	0	ND	ND
Standard Deviation	2.2	0.6	ND	ND	ND	ND	0.4	10	1.0	0	ND	ND
Sample Variance	4.7	0.3	ND	ND	ND	ND	0.2	91	0.9	0	ND	ND
Range	5.0	1.4	ND	ND	ND	ND	1.3	35	4.0	0	ND	ND
Minimum	7.0	21.7	ND	ND	ND	ND	0.0	287	10.0	0	ND	ND
Maximum	12.0	23.1	ND	ND	ND	ND	1.3	322	14.0	0	ND	ND
Count	6	6	0	0	0	0	18	18	18	6	0	0
Confidence Level (95%)	2.3	0.6	ND	ND	ND	ND	0.2	5	0.5	0	ND	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

NEAR SHORE - SITE 7
LAKE MICHIGAN
WATER QUALITY DATA - 2013

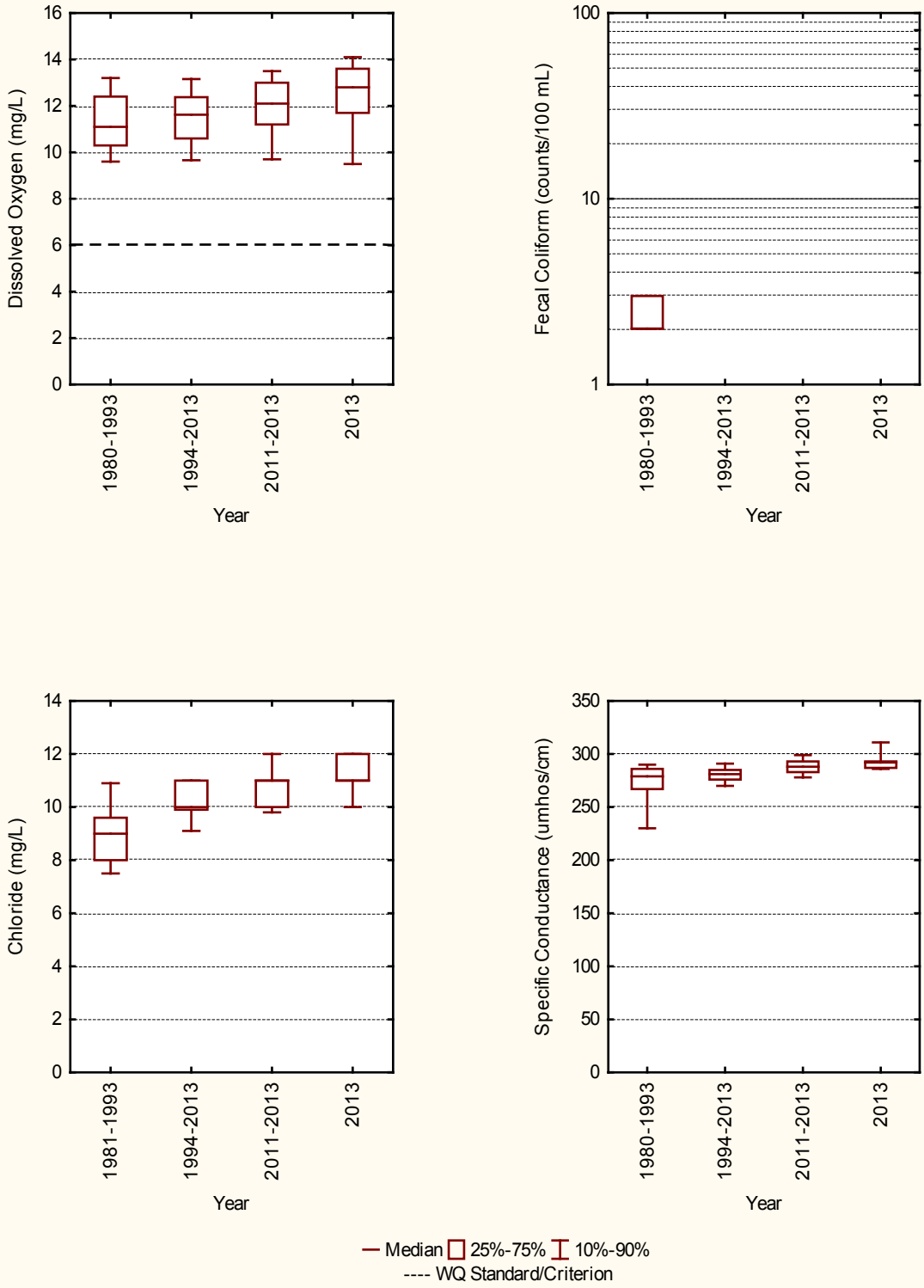
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	34.50	13.17	0.3	1.1	1.2	0.6	0.0	0.0	1.0	1.4	0.0	ND
Standard Error	0.34	0.17	0.2	0.4	1.2	0.4	0.0	0.0	1.0	0.9	0.0	ND
Median	35.00	13.00	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Mode	35.00	13.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	0.84	0.41	0.4	0.9	2.9	1.1	0.0	0.0	2.2	2.1	0.0	ND
Sample Variance	0.70	0.17	0.2	0.8	8.2	1.2	0.0	0.0	5.0	4.4	0.0	ND
Range	2.00	1.00	0.8	2.1	7.0	2.6	0.0	0.0	5.0	4.2	0.0	ND
Minimum	33.00	13.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	35.00	14.00	0.8	2.1	7.0	2.6	0.0	0.0	5.0	4.2	0.0	ND
Count	6	6	6	6	6	6	5	6	5	6	6	0
Confidence Level (95%)	0.88	0.43	0.4	1.0	3.0	1.1	0.0	0.0	2.8	2.2	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	140	101	ND	ND	ND	ND	ND	ND
Standard Error	0	3	ND	ND	ND	ND	ND	ND
Median	140	100	ND	ND	ND	ND	ND	ND
Mode	140	100	ND	ND	ND	ND	ND	ND
Standard Deviation	0	12	ND	ND	ND	ND	ND	ND
Sample Variance	0	140	ND	ND	ND	ND	ND	ND
Range	0	41	ND	ND	ND	ND	ND	ND
Minimum	140	79	ND	ND	ND	ND	ND	ND
Maximum	140	120	ND	ND	ND	ND	ND	ND
Count	6	18	0	0	0	0	0	0
Confidence Level (95%)	0	6	ND	ND	ND	ND	ND	ND

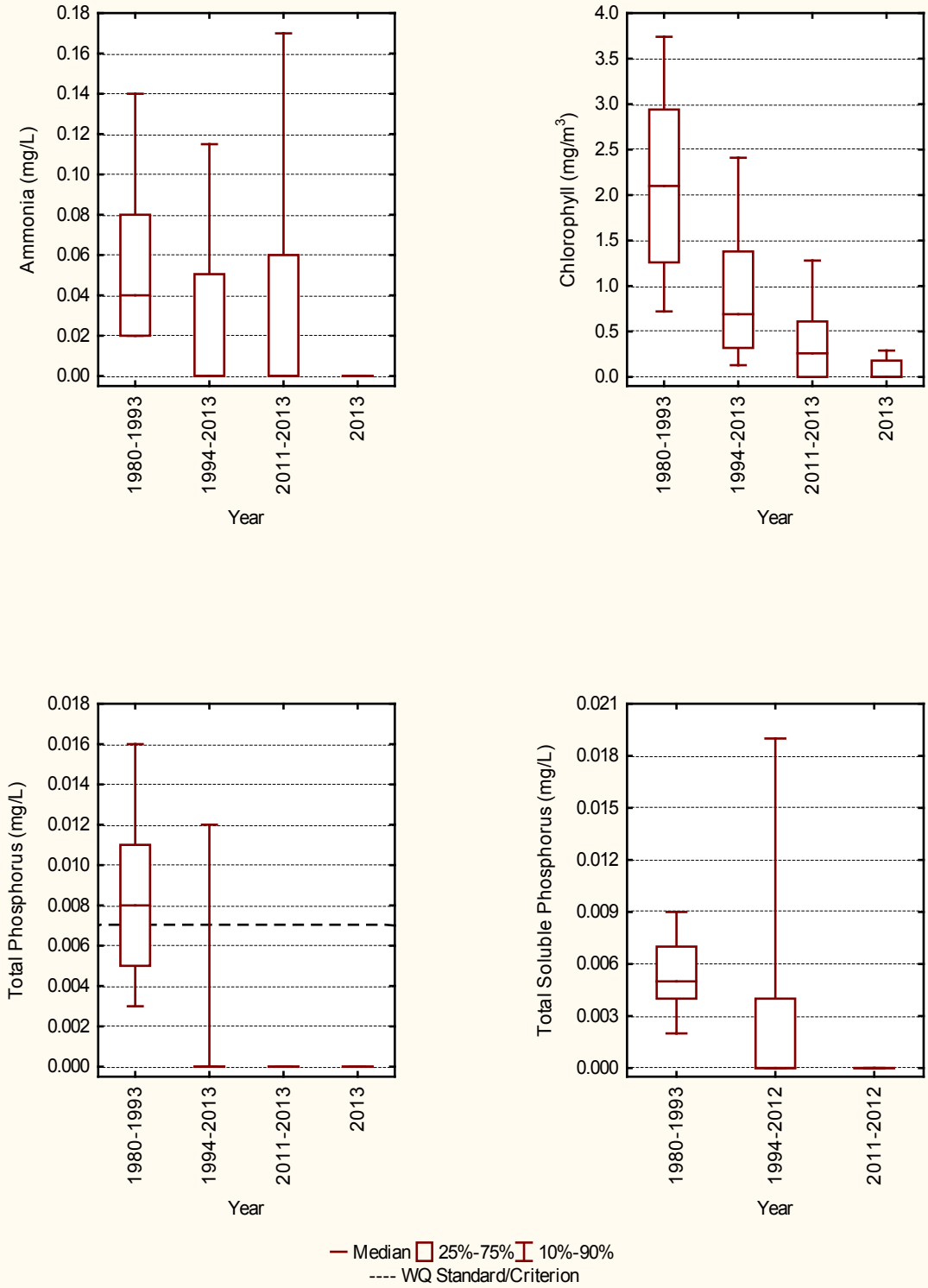
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

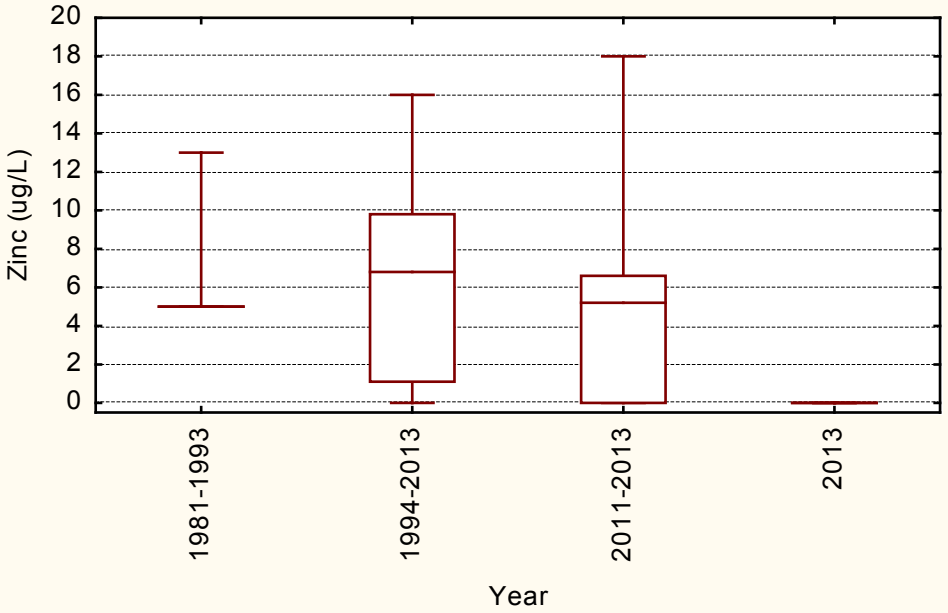
MMSD Water Quality Program Data
Nearshore survey, Site NS-08

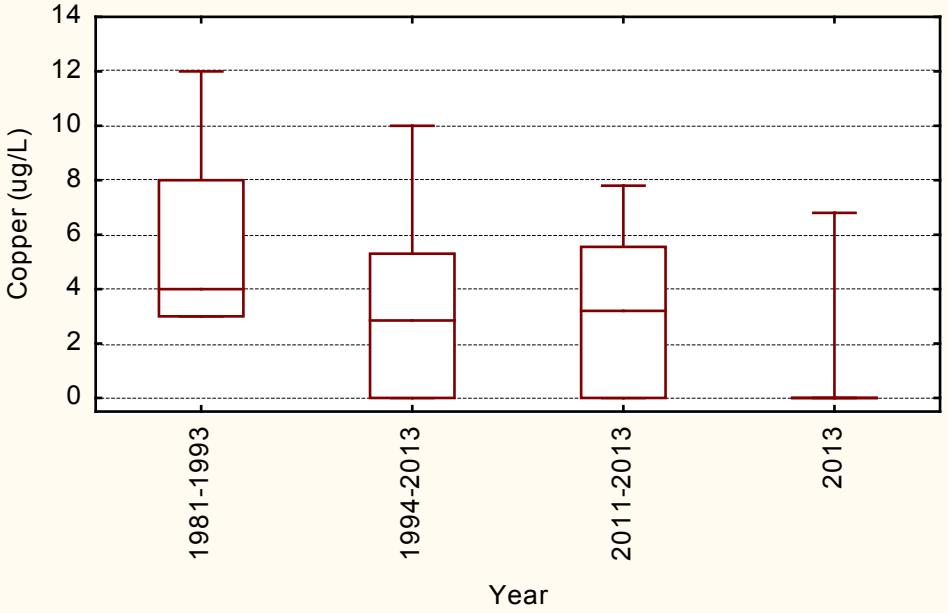


MMSD Water Quality Program Data
Nearshore survey, Site NS-08



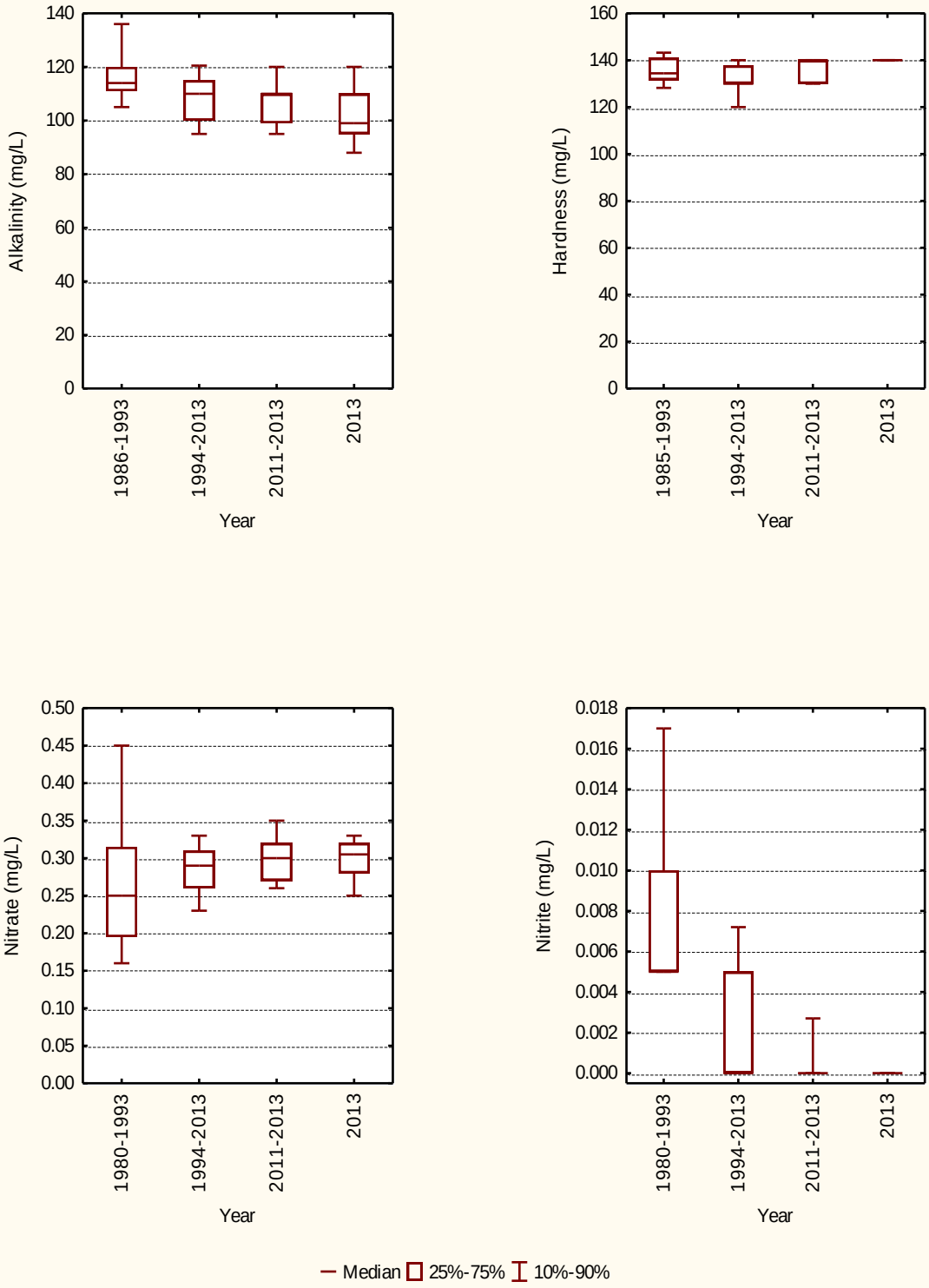
MMSD Water Quality Program Data
Nearshore survey, Site NS-08





Median 25%-75% 10%-90%

MMSD Water Quality Program Data
Nearshore survey, Site NS-08



NEAR SHORE - SITE 8
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.2	6.9	12.4	0.09	0.30	0.000	0.30	0.000	0.03	0.000	ND	1.70
Standard Error	0.0	1.5	0.4	0.03	0.01	0.000	0.01	0.000	0.02	0.000	ND	0.08
Median	8.2	5.0	12.8	0.00	0.31	0.000	0.31	0.000	0.00	0.000	ND	1.80
Mode	8.1	Multi	Multi	0.00	0.32	0.000	0.32	0.000	0.00	0.000	ND	1.80
Standard Deviation	0.1	6.3	1.5	0.13	0.03	0.000	0.03	0.000	0.07	0.001	ND	0.34
Sample Variance	0.0	39.6	2.3	0.02	0.00	0.000	0.00	0.000	0.01	0.000	ND	0.12
Range	0.4	21.0	4.8	0.40	0.10	0.000	0.10	0.000	0.23	0.005	ND	1.10
Minimum	8.0	1.7	9.4	0.00	0.23	0.000	0.23	0.000	0.00	0.000	ND	0.90
Maximum	8.4	22.7	14.2	0.40	0.33	0.000	0.33	0.000	0.23	0.005	ND	2.00
Count	18	18	18	18	18	18	18	18	18	18	0	18
Confidence Level (95%)	0.1	3.1	0.8	0.06	0.01	0.000	0.01	0.000	0.04	0.001	ND	0.17

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	13.2	37.2	ND	ND	ND	ND	0.3	294	11.2	0	ND	ND
Standard Error	1.1	2.1	ND	ND	ND	ND	0.1	2	0.2	0	ND	ND
Median	14.0	39.8	ND	ND	ND	ND	0.2	292	11.0	0	ND	ND
Mode	15.0	40.0	ND	ND	ND	ND	0.2	293	11.0	0	ND	ND
Standard Deviation	2.7	5.1	ND	ND	ND	ND	0.4	9	0.6	0	ND	ND
Sample Variance	7.4	25.9	ND	ND	ND	ND	0.1	80	0.4	0	ND	ND
Range	7.0	13.0	ND	ND	ND	ND	1.1	28	2.0	0	ND	ND
Minimum	9.0	27.6	ND	ND	ND	ND	0.0	286	10.0	0	ND	ND
Maximum	16.0	40.6	ND	ND	ND	ND	1.1	314	12.0	0	ND	ND
Count	6	6	0	0	0	0	18	18	18	6	0	0
Confidence Level (95%)	2.8	5.3	ND	ND	ND	ND	0.2	4	0.3	0	ND	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

NEAR SHORE - SITE 8
LAKE MICHIGAN
WATER QUALITY DATA - 2013

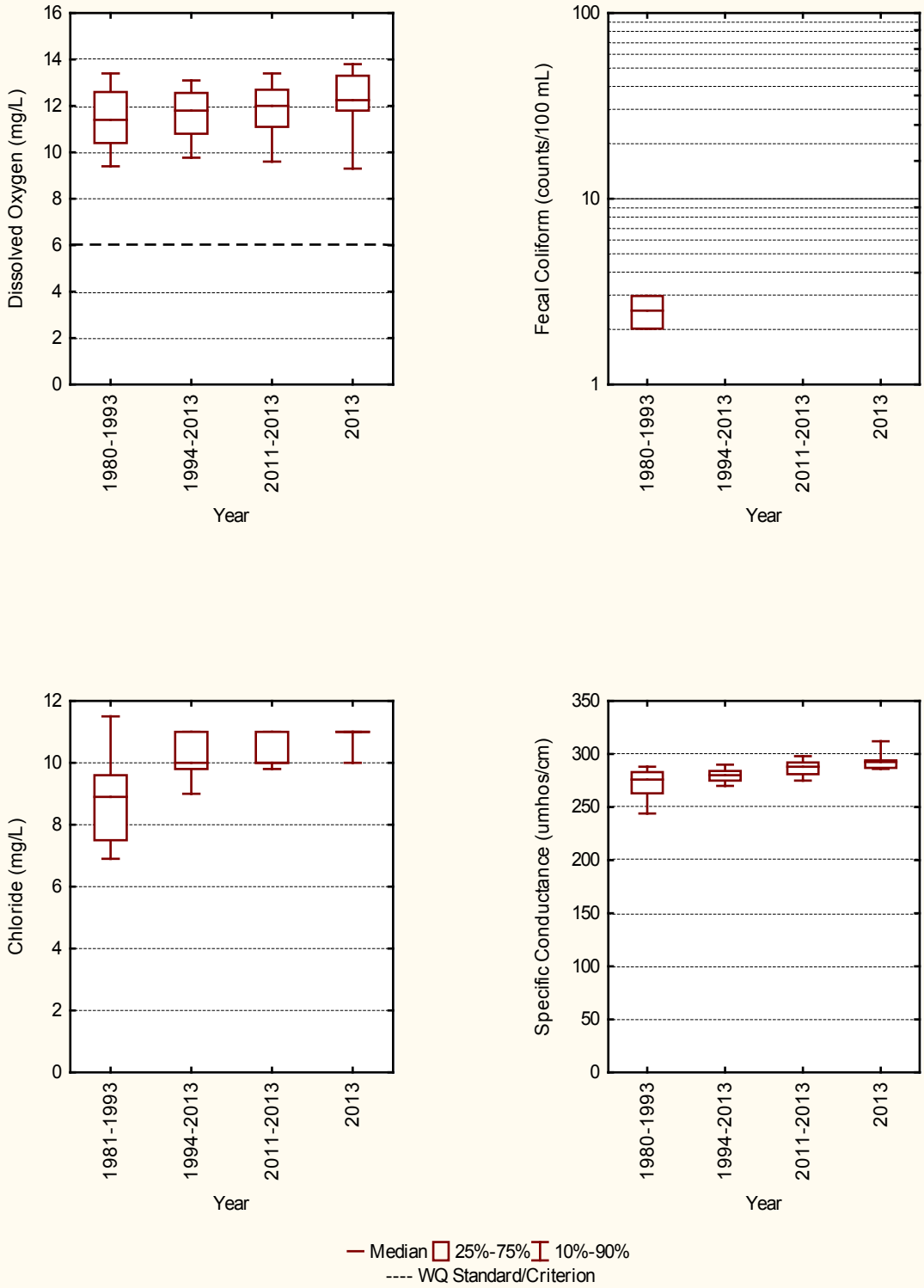
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	34.67	13.00	0.2	0.8	1.1	1.0	0.0	0.0	0.0	0.6	0.0	ND
Standard Error	0.33	0.26	0.1	0.4	1.1	0.5	0.0	0.0	0.0	0.6	0.0	ND
Median	34.50	13.00	0.0	0.6	0.0	0.7	0.0	0.0	0.0	0.0	0.0	ND
Mode	34.00	13.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	0.82	0.63	0.3	0.9	2.8	1.2	0.0	0.0	0.0	1.6	0.0	ND
Sample Variance	0.67	0.40	0.1	0.8	7.7	1.4	0.0	0.0	0.0	2.4	0.0	ND
Range	2.00	2.00	0.6	2.0	6.8	2.8	0.0	0.0	0.0	3.8	0.0	ND
Minimum	34.00	12.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	36.00	14.00	0.6	2.0	6.8	2.8	0.0	0.0	0.0	3.8	0.0	ND
Count	6	6	6	6	6	6	5	6	5	6	5	0
Confidence Level (95%)	0.86	0.66	0.3	0.9	2.9	1.3	0.0	0.0	0.0	1.6	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	140	101	ND	ND	ND	ND	ND	ND
Standard Error	0	2	ND	ND	ND	ND	ND	ND
Median	140	99	ND	ND	ND	ND	ND	ND
Mode	140	Multi	ND	ND	ND	ND	ND	ND
Standard Deviation	0	11	ND	ND	ND	ND	ND	ND
Sample Variance	0	111	ND	ND	ND	ND	ND	ND
Range	0	35	ND	ND	ND	ND	ND	ND
Minimum	140	85	ND	ND	ND	ND	ND	ND
Maximum	140	120	ND	ND	ND	ND	ND	ND
Count	6	18	0	0	0	0	0	0
Confidence Level (95%)	0	5	ND	ND	ND	ND	ND	ND

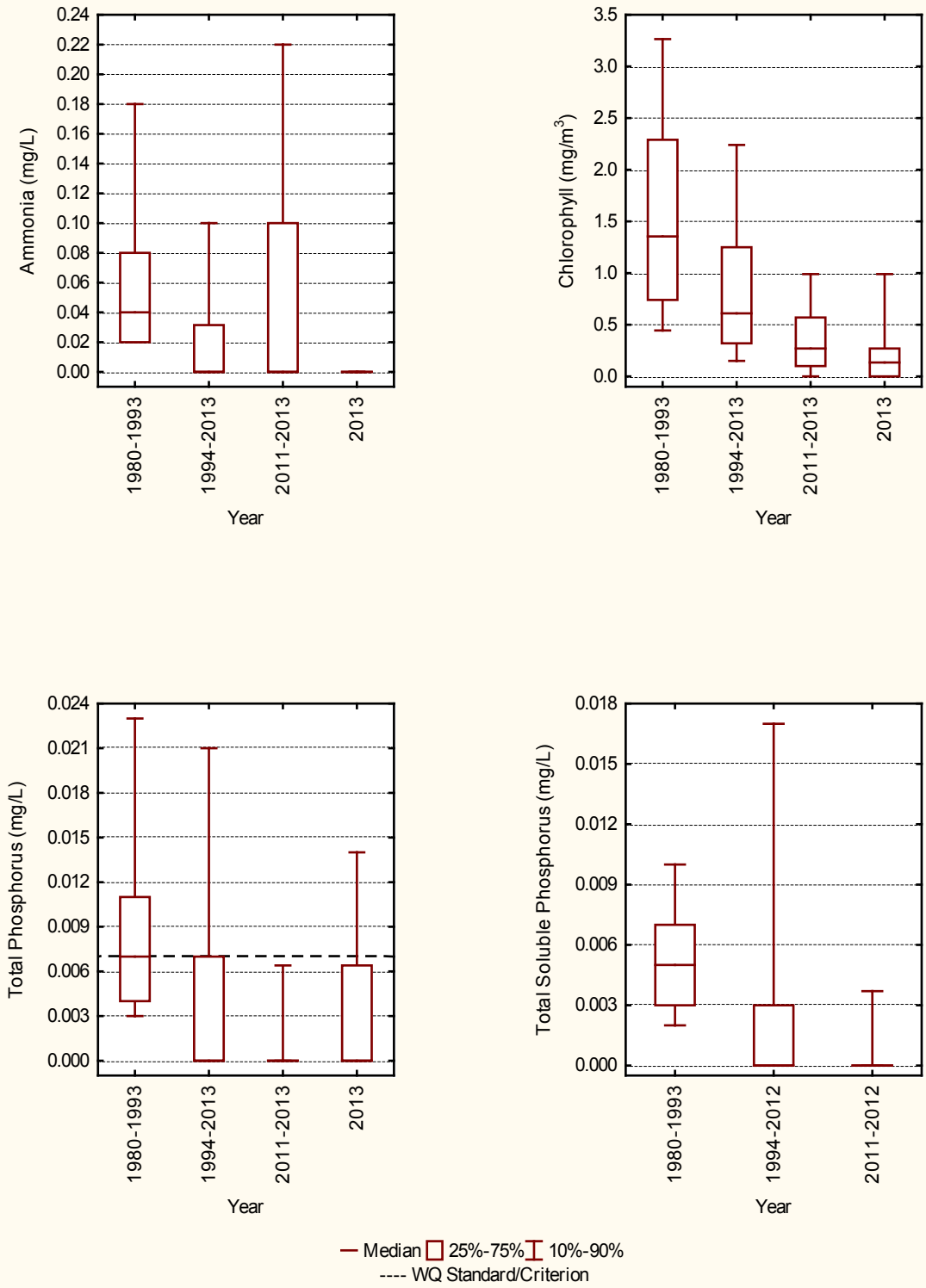
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

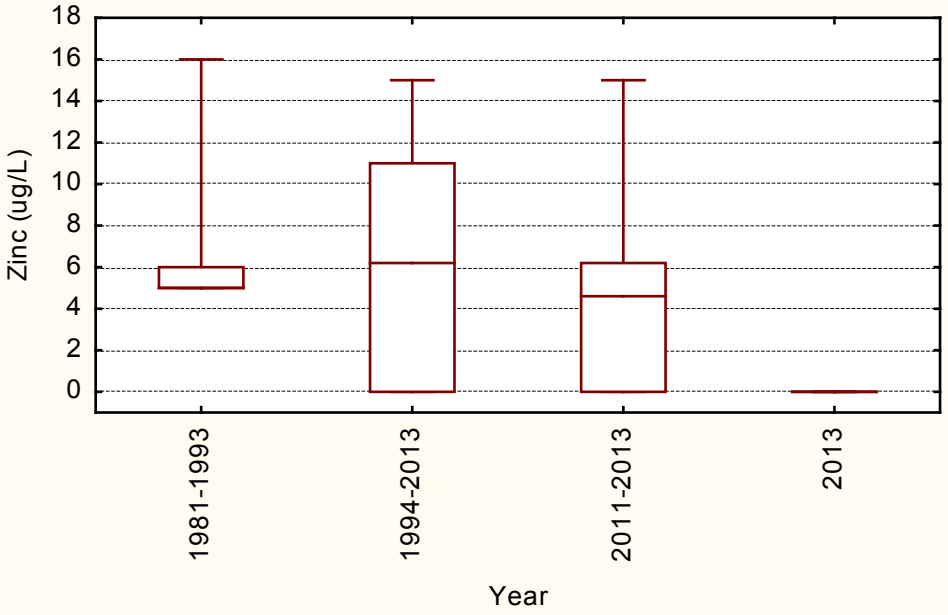
MMSD Water Quality Program Data
Nearshore survey, Site NS-10

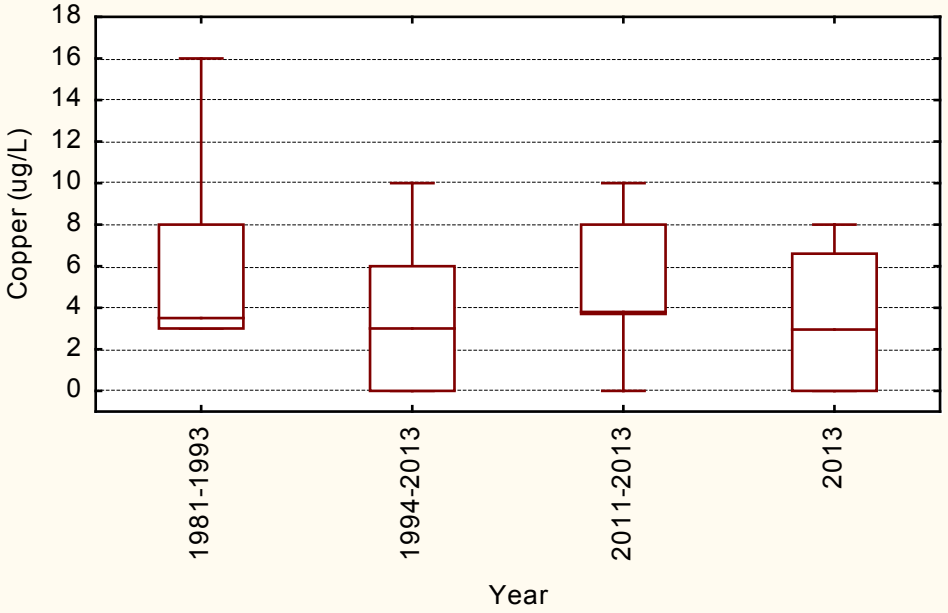


MMSD Water Quality Program Data
Nearshore survey, Site NS-10



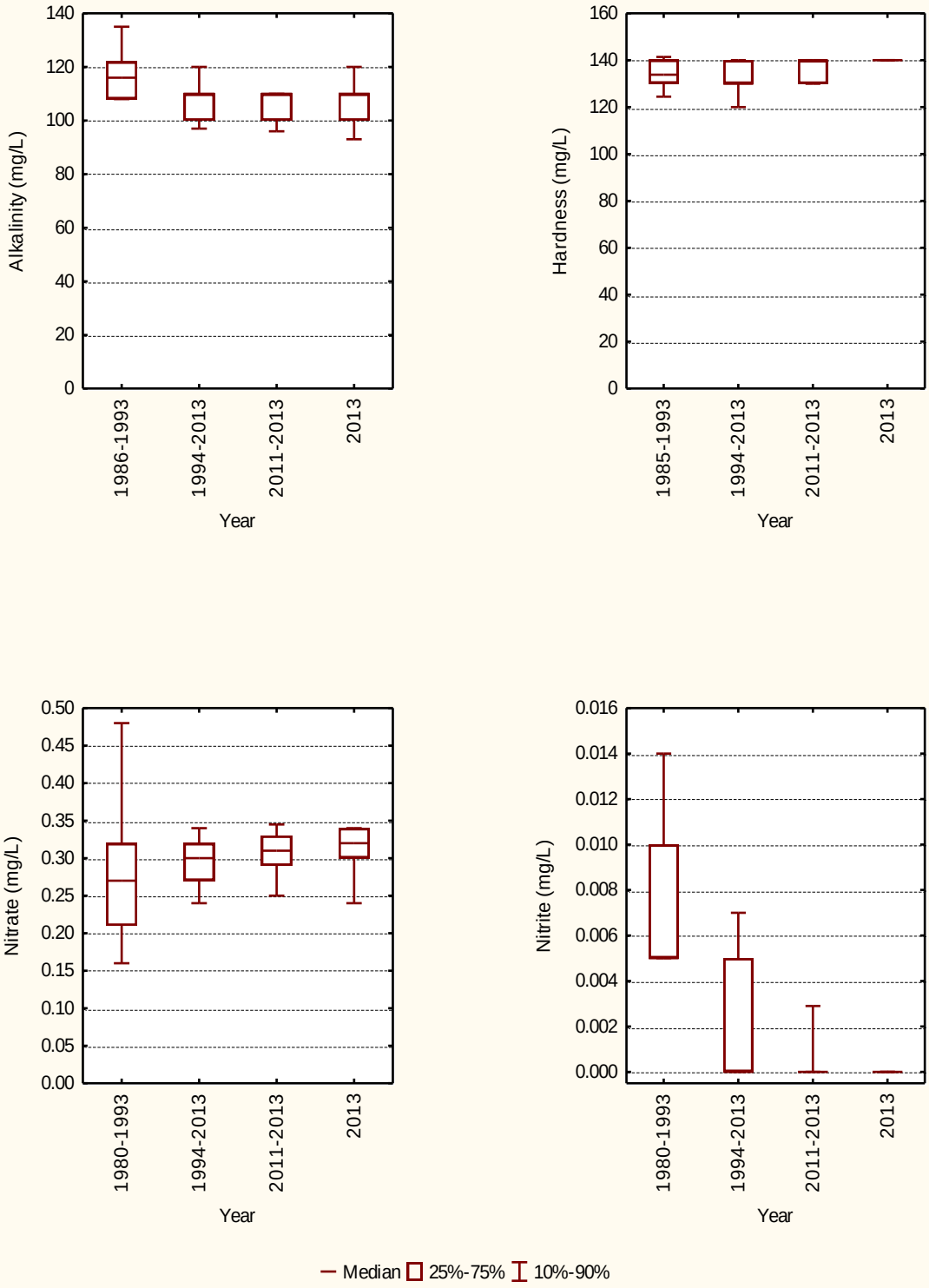
MMSD Water Quality Program Data
Nearshore survey, Site NS-10





Median 25%-75% 10%-90%

MMSD Water Quality Program Data
Nearshore survey, Site NS-10



NEAR SHORE - SITE 10
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.2	6.8	12.1	0.23	0.31	0.000	0.40	0.000	0.07	0.003	ND	1.77
Standard Error	0.0	1.5	0.4	0.07	0.01	0.000	0.09	0.000	0.03	0.001	ND	0.07
Median	8.2	4.6	12.3	0.14	0.32	0.000	0.32	0.000	0.00	0.000	ND	1.90
Mode	8.2	Multi	Multi	0.00	Multi	0.000	Multi	0.000	0.00	0.000	ND	1.90
Standard Deviation	0.1	6.5	1.5	0.32	0.03	0.000	0.38	0.000	0.14	0.006	ND	0.32
Sample Variance	0.0	42.0	2.2	0.10	0.00	0.000	0.14	0.000	0.02	0.000	ND	0.10
Range	0.4	20.1	4.9	1.10	0.11	0.000	1.66	0.000	0.51	0.015	ND	1.14
Minimum	8.0	2.4	9.0	0.00	0.24	0.000	0.24	0.000	0.00	0.000	ND	0.96
Maximum	8.4	22.5	13.9	1.10	0.35	0.000	1.90	0.000	0.51	0.015	ND	2.10
Count	18	18	18	18	17	18	18	18	18	18	0	18
Confidence Level (95%)	0.1	3.2	0.7	0.16	0.02	0.000	0.19	0.000	0.07	0.003	ND	0.16

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	15.9	37.0	ND	ND	ND	ND	0.3	294	10.9	0	ND	ND
Standard Error	3.1	4.0	ND	ND	ND	ND	0.1	2	0.1	0	ND	ND
Median	14.0	35.2	ND	ND	ND	ND	0.2	293	11.0	0	ND	ND
Mode	12.0	Multi	ND	ND	ND	ND	0.2	293	11.0	0	ND	ND
Standard Deviation	7.6	9.8	ND	ND	ND	ND	0.4	9	0.3	0	ND	ND
Sample Variance	57.0	95.2	ND	ND	ND	ND	0.1	84	0.1	0	ND	ND
Range	21.5	28.8	ND	ND	ND	ND	1.1	30	1.0	0	ND	ND
Minimum	8.5	26.2	ND	ND	ND	ND	0.0	285	10.0	0	ND	ND
Maximum	30.0	55.0	ND	ND	ND	ND	1.1	315	11.0	0	ND	ND
Count	6	6	0	0	0	0	18	18	18	6	0	0
Confidence Level (95%)	7.9	10.2	ND	ND	ND	ND	0.2	5	0.2	0	ND	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

NEAR SHORE - SITE 10
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	34.50	13.00	0.3	0.4	3.4	1.1	0.0	0.0	0.0	1.1	0.0	ND
Standard Error	0.34	0.00	0.1	0.3	1.6	0.5	0.0	0.0	0.0	1.1	0.0	ND
Median	35.00	13.00	0.2	0.0	3.0	0.6	0.0	0.0	0.0	0.0	0.0	ND
Mode	35.00	13.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	0.84	0.00	0.3	0.7	3.8	1.3	0.0	0.0	0.0	2.5	0.0	ND
Sample Variance	0.70	0.00	0.1	0.5	14.5	1.7	0.0	0.0	0.0	6.3	0.0	ND
Range	2.00	0.00	0.7	1.3	8.0	3.0	0.0	0.0	0.0	5.6	0.0	ND
Minimum	33.00	13.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	35.00	13.00	0.7	1.3	8.0	3.0	0.0	0.0	0.0	5.6	0.0	ND
Count	6	6	6	6	6	6	6	6	5	5	6	0
Confidence Level (95%)	0.88	0.00	0.3	0.7	4.0	1.4	0.0	0.0	0.0	3.1	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	140	106	ND	ND	ND	ND	ND	ND
Standard Error	0	2	ND	ND	ND	ND	ND	ND
Median	140	110	ND	ND	ND	ND	ND	ND
Mode	140	110	ND	ND	ND	ND	ND	ND
Standard Deviation	0	10	ND	ND	ND	ND	ND	ND
Sample Variance	0	94	ND	ND	ND	ND	ND	ND
Range	0	36	ND	ND	ND	ND	ND	ND
Minimum	140	84	ND	ND	ND	ND	ND	ND
Maximum	140	120	ND	ND	ND	ND	ND	ND
Count	6	18	0	0	0	0	0	0
Confidence Level (95%)	0	5	ND	ND	ND	ND	ND	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

NEAR SHORE - SITE 11
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.3	11.6	11.6	0.14	0.32	0.001	0.45	0.001	0.06	0.002	ND	1.33
Standard Error	0.0	0.9	0.2	0.03	0.01	0.000	0.13	0.001	0.02	0.001	ND	0.05
Median	8.3	11.7	11.7	0.10	0.30	0.000	0.30	0.000	0.00	0.000	ND	1.25
Mode	8.4	19.2	9.2	0.00	0.24	0.000	0.25	0.000	0.00	0.000	ND	Multi
Standard Deviation	0.2	6.7	1.7	0.14	0.10	0.002	0.94	0.005	0.12	0.004	ND	0.39
Sample Variance	0.0	44.4	2.8	0.02	0.01	0.000	0.88	0.000	0.01	0.000	ND	0.15
Range	0.6	19.2	5.3	0.47	0.33	0.011	7.00	0.027	0.42	0.022	ND	1.47
Minimum	7.9	1.1	9.2	0.00	0.20	0.000	0.20	0.000	0.00	0.000	ND	0.63
Maximum	8.5	20.3	14.5	0.47	0.53	0.011	7.20	0.027	0.42	0.022	ND	2.10
Count	54	54	54	30	53	54	54	54	54	54	0	54
Confidence Level (95%)	0.0	1.8	0.5	0.05	0.03	0.001	0.26	0.001	0.03	0.001	ND	0.11

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	8.7	13.1	180.0	179.6	0.0	0.4	0.7	313	14.0	1	0.5	ND
Standard Error	0.9	0.4	6.5	6.5	0.0	0.2	0.1	3	0.6	0	0.0	ND
Median	8.3	13.4	180.0	180.0	0.0	0.0	0.4	308	12.0	0	0.5	ND
Mode	13.0	Multi	180.0	180.0	0.0	0.0	Multi	Multi	12.0	0	0.5	ND
Standard Deviation	3.8	1.4	22.6	22.5	0.0	0.8	0.7	22	4.5	2	0.1	ND
Sample Variance	14.3	2.1	509.1	508.3	0.0	0.7	0.5	502	19.9	3	0.0	ND
Range	10.7	6.0	90.0	90.0	0.0	2.5	2.4	106	17.0	5	0.4	ND
Minimum	3.3	8.1	140.0	140.0	0.0	0.0	0.0	287	10.0	0	0.3	ND
Maximum	14.0	14.1	230.0	230.0	0.0	2.5	2.4	393	27.0	5	0.7	ND
Count	18	16	12	12	12	12	54	54	54	18	7	0
Confidence Level (95%)	1.9	0.8	14.3	14.3	0.0	0.5	0.2	6	1.2	1	0.1	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

NEAR SHORE - SITE 11
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	35.06	13.83	0.1	0.8	1.2	1.4	0.0	1.2	0.0	2.7	0.5	ND
Standard Error	0.35	0.26	0.1	0.2	0.7	0.3	0.0	0.8	0.0	0.9	0.5	ND
Median	35.00	14.00	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0	0.0	ND
Mode	Multi	13.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	1.47	1.10	0.3	0.9	2.9	1.3	0.0	3.4	0.0	3.7	2.1	ND
Sample Variance	2.17	1.21	0.1	0.8	8.2	1.7	0.0	11.6	0.0	13.4	4.4	ND
Range	6.00	4.00	1.1	2.3	9.2	4.1	0.0	11.0	0.0	9.7	8.9	ND
Minimum	33.00	12.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	39.00	16.00	1.1	2.3	9.2	4.1	0.0	11.0	0.0	9.7	8.9	ND
Count	18	18	18	18	18	18	17	18	17	15	18	0
Confidence Level (95%)	0.73	0.55	0.1	0.4	1.4	0.6	0.0	1.7	0.0	2.0	1.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	143	106	0.0	2.3	25.8	23.6	2.3	ND
Standard Error	2	3	0.0	0.3	0.4	0.3	0.1	ND
Median	140	110	0.0	2.4	25.0	23.0	2.2	ND
Mode	140	110	0.0	2.3	25.0	23.0	2.2	ND
Standard Deviation	8	11	0.0	0.8	2.2	2.0	0.3	ND
Sample Variance	71	119	0.0	0.7	5.1	4.0	0.1	ND
Range	30	39	0.0	3.1	8.0	7.0	1.0	ND
Minimum	130	91	0.0	0.0	24.0	22.0	1.9	ND
Maximum	160	130	0.0	3.1	32.0	29.0	2.9	ND
Count	18	18	11	11	36	36	36	0
Confidence Level (95%)	4	5	0.0	0.6	0.8	0.7	0.1	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

NEAR SHORE - SITE 12
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.1	12.3	10.8	5.66	0.77	0.012	0.78	0.041	0.50	0.040	0.019	2.62
Standard Error	0.0	0.7	0.2	0.90	0.04	0.001	0.04	0.010	0.03	0.004	0.002	0.14
Median	8.0	11.8	10.8	2.75	0.76	0.013	0.78	0.024	0.48	0.028	0.013	2.35
Mode	8.0	Multi	9.5	Multi	1.00	0.000	1.00	0.000	0.00	0.021	0.000	Multi
Standard Deviation	0.3	6.3	1.7	7.64	0.34	0.009	0.34	0.085	0.25	0.034	0.018	1.23
Sample Variance	0.1	40.2	2.8	58.37	0.12	0.000	0.12	0.007	0.06	0.001	0.000	1.50
Range	1.3	22.4	6.6	40.00	1.42	0.051	1.42	0.670	1.10	0.230	0.068	4.73
Minimum	7.6	1.5	7.6	0.00	0.28	0.000	0.28	0.000	0.00	0.000	0.000	0.57
Maximum	8.9	23.9	14.2	40.00	1.70	0.051	1.70	0.670	1.10	0.230	0.068	5.30
Count	69	72	72	72	72	72	72	72	72	70	72	72
Confidence Level (95%)	0.1	1.5	0.4	1.80	0.08	0.002	0.08	0.020	0.06	0.008	0.004	0.29

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	1.8	5.2	266.1	258.3	2.5	7.8	6.1	481	46.1	166	1.6	653
Standard Error	0.1	0.6	14.3	13.4	0.6	2.8	1.4	15	2.6	95	0.2	554
Median	1.9	4.3	245.0	242.8	1.9	3.9	2.7	466	46.0	17	1.3	153
Mode	1.9	Multi	230.0	Multi	Multi	Multi	2.3	Multi	46.0	Multi	Multi	Multi
Standard Deviation	0.7	2.7	60.5	56.9	2.6	11.7	11.8	128	21.8	464	0.8	1107
Sample Variance	0.5	7.2	3660.5	3239.8	6.6	137.9	138.6	16486	477.3	215631	0.7	1225676
Range	3.4	12.2	200.0	195.6	9.2	46.1	81.4	648	80.0	2300	2.9	2296
Minimum	0.4	1.2	180.0	175.8	0.0	1.9	0.2	294	14.0	0	0.5	4
Maximum	3.8	13.4	380.0	371.4	9.2	48.0	81.6	942	94.0	2300	3.4	2300
Count	24	21	18	18	18	18	72	72	72	24	21	4
Confidence Level (95%)	0.3	1.2	30.1	28.3	1.3	5.8	2.8	30	5.1	196	0.4	1762

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

NEAR SHORE - SITE 12
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	43.17	19.33	0.2	2.1	1.8	1.9	0.0	5.5	0.0	1.8	0.0	ND
Standard Error	1.07	0.77	0.1	0.2	0.7	0.3	0.0	1.8	0.0	0.5	0.0	ND
Median	43.00	19.00	0.0	2.1	0.0	1.8	0.0	0.0	0.0	0.0	0.0	ND
Mode	Multi	20.00	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	5.26	3.78	0.3	0.7	3.3	1.3	0.0	9.0	0.0	2.6	0.0	ND
Sample Variance	27.62	14.32	0.1	0.6	10.8	1.6	0.0	81.5	0.0	6.6	0.0	ND
Range	21.00	14.00	0.8	3.9	8.7	4.4	0.0	30.0	0.0	7.5	0.0	ND
Minimum	35.00	14.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	56.00	28.00	0.8	3.9	8.7	4.4	0.0	30.0	0.0	7.5	0.0	ND
Count	24	24	24	24	24	24	21	24	21	23	22	0
Confidence Level (95%)	2.22	1.60	0.1	0.3	1.4	0.5	0.0	3.8	0.0	1.1	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	188	129	0.4	4.9	34.5	30.0	4.6	ND
Standard Error	6	4	0.2	0.3	1.1	0.8	0.3	ND
Median	190	130	0.0	5.0	33.0	29.0	3.8	ND
Mode	190	Multi	0.0	3.8	27.0	26.0	3.1	ND
Standard Deviation	28	21	0.9	1.1	7.9	5.7	2.4	ND
Sample Variance	791	448	0.9	1.1	62.1	32.3	5.9	ND
Range	110	109	2.4	4.2	32.0	22.0	10.8	ND
Minimum	150	91	0.0	2.8	26.0	24.0	1.2	ND
Maximum	260	200	2.4	7.0	58.0	46.0	12.0	ND
Count	24	30	17	16	53	51	51	0
Confidence Level (95%)	12	8	0.5	0.6	2.2	1.6	0.7	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

NEAR SHORE - SITE 13
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.1	11.8	10.8	3.05	0.61	0.007	0.61	0.020	0.39	0.024	0.013	2.16
Standard Error	0.0	0.8	0.2	0.65	0.04	0.001	0.04	0.004	0.04	0.003	0.002	0.15
Median	8.1	11.1	11.0	0.94	0.53	0.008	0.54	0.000	0.39	0.019	0.008	1.80
Mode	Multi	Multi	11.4	Multi	0.30	0.000	0.30	0.000	0.00	0.000	0.000	1.80
Standard Deviation	0.2	6.1	1.8	5.07	0.29	0.007	0.29	0.034	0.27	0.024	0.014	1.17
Sample Variance	0.1	37.3	3.1	25.72	0.09	0.000	0.09	0.001	0.08	0.001	0.000	1.38
Range	1.3	21.5	7.3	24.00	1.15	0.023	1.15	0.150	0.94	0.130	0.059	5.51
Minimum	7.6	1.0	7.2	0.00	0.25	0.000	0.25	0.000	0.00	0.000	0.000	0.09
Maximum	8.9	22.5	14.5	24.00	1.40	0.023	1.40	0.150	0.94	0.130	0.059	5.60
Count	57	60	60	60	60	60	60	60	60	60	60	60
Confidence Level (95%)	0.1	1.6	0.5	1.31	0.08	0.002	0.08	0.009	0.07	0.006	0.004	0.30

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	2.6	7.7	230.0	227.0	0.9	3.0	2.2	443	35.5	57	1.4	70
Standard Error	0.3	0.9	13.1	12.6	0.2	0.6	0.2	18	2.9	22	0.2	23
Median	2.4	7.0	215.0	213.2	1.1	2.4	1.9	403	29.0	11	1.2	17
Mode	2.4	7.7	Multi	207.9	0.0	2.1	0.5	Multi	13.0	0	2.0	190
Standard Deviation	1.2	3.9	48.8	47.2	0.8	2.1	1.6	138	22.5	100	0.7	85
Sample Variance	1.6	15.1	2384.6	2228.8	0.7	4.3	2.4	18939	508.5	10091	0.5	7241
Range	4.4	12.2	160.0	154.6	2.4	6.7	5.8	610	109.0	370	2.1	210
Minimum	1.2	3.3	170.0	170.0	0.0	0.0	0.2	287	11.0	0	0.5	0
Maximum	5.6	15.5	330.0	324.6	2.4	6.7	6.0	897	120.0	370	2.6	210
Count	20	18	14	14	14	14	60	60	60	20	15	14
Confidence Level (95%)	0.6	1.9	28.2	27.3	0.5	1.2	0.4	36	5.8	47	0.4	49

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

NEAR SHORE - SITE 13
LAKE MICHIGAN
WATER QUALITY DATA - 2013

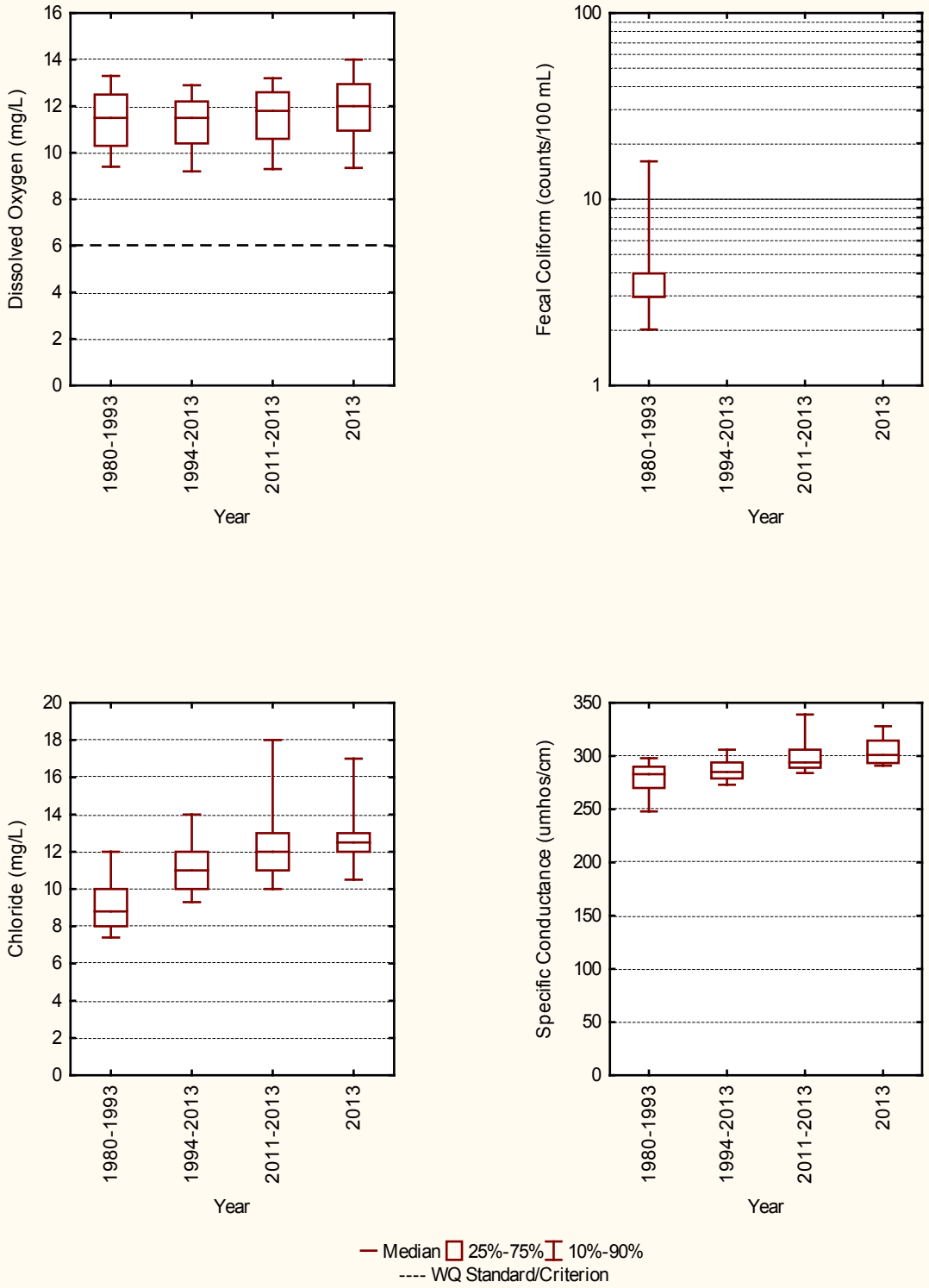
VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	40.35	17.75	0.1	1.4	1.9	1.4	0.4	2.0	0.0	2.1	0.0	ND
Standard Error	1.03	0.72	0.1	0.2	0.7	0.3	0.4	0.9	0.0	0.8	0.0	ND
Median	40.00	17.50	0.0	1.7	0.0	1.7	0.0	0.0	0.0	0.0	0.0	ND
Mode	41.00	Multi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	4.61	3.21	0.3	0.9	3.4	1.4	1.6	4.2	0.0	3.3	0.0	ND
Sample Variance	21.29	10.30	0.1	0.8	11.2	2.1	2.7	17.4	0.0	11.2	0.0	ND
Range	18.00	12.00	1.1	2.5	9.2	5.2	7.3	12.0	0.0	8.7	0.0	ND
Minimum	34.00	14.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	52.00	26.00	1.1	2.5	9.2	5.2	7.3	12.0	0.0	8.7	0.0	ND
Count	20	20	20	20	20	20	20	20	19	19	20	0
Confidence Level (95%)	2.16	1.50	0.1	0.4	1.6	0.7	0.8	2.0	0.0	1.6	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	175	134	0.2	3.6	31.4	27.5	3.8	ND
Standard Error	6	6	0.2	0.2	1.0	0.8	0.3	ND
Median	170	130	0.0	3.7	30.0	27.5	3.1	ND
Mode	Multi	110	0.0	Multi	27.0	28.0	2.4	ND
Standard Deviation	25	24	0.6	0.7	6.5	5.3	1.8	ND
Sample Variance	605	566	0.3	0.5	41.9	28.5	3.4	ND
Range	100	80	2.1	2.2	26.0	24.0	6.8	ND
Minimum	140	110	0.0	2.6	24.0	17.0	2.0	ND
Maximum	240	190	2.1	4.8	50.0	41.0	8.8	ND
Count	20	18	13	12	42	42	42	0
Confidence Level (95%)	12	12	0.4	0.5	2.0	1.7	0.6	ND

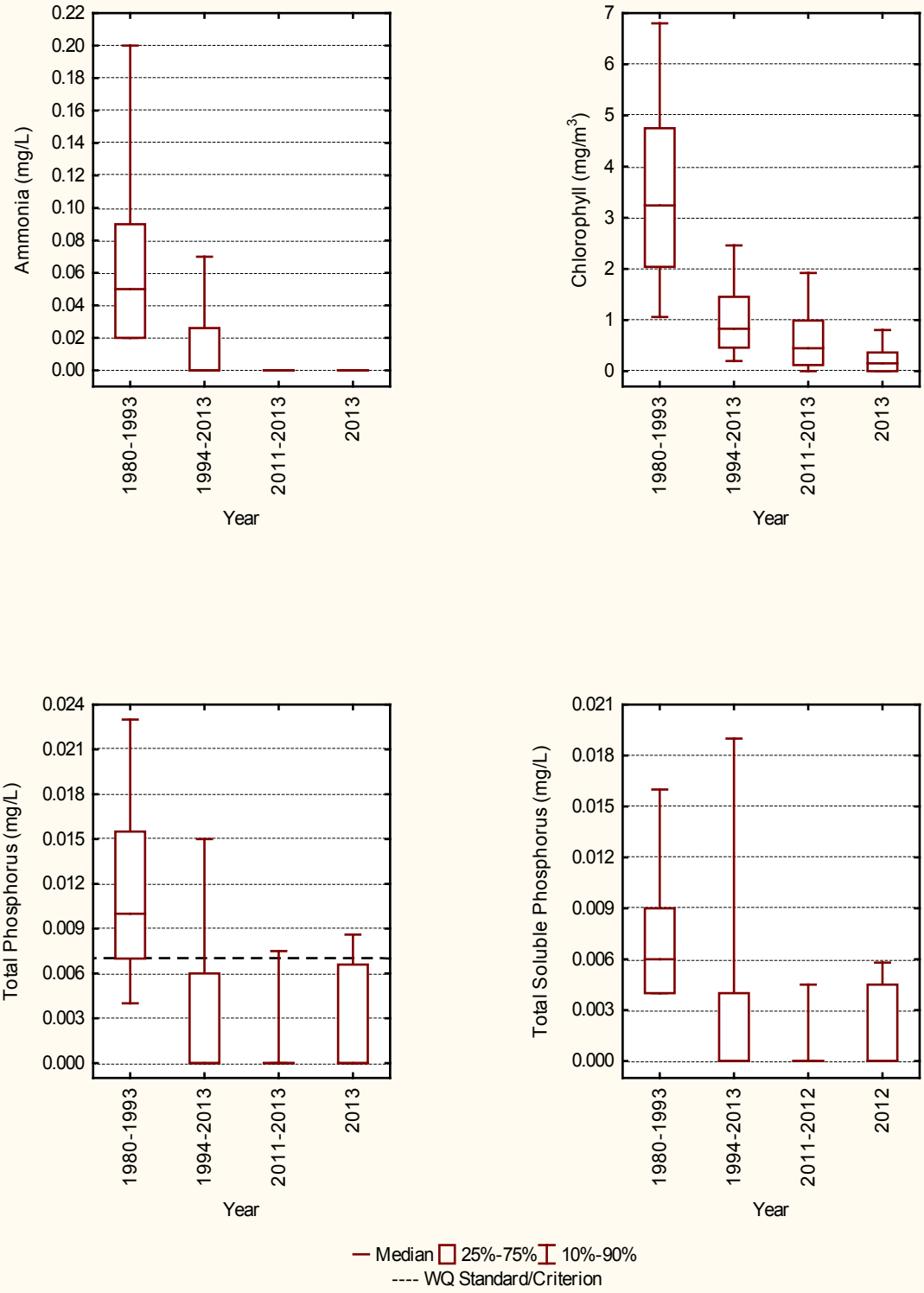
ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

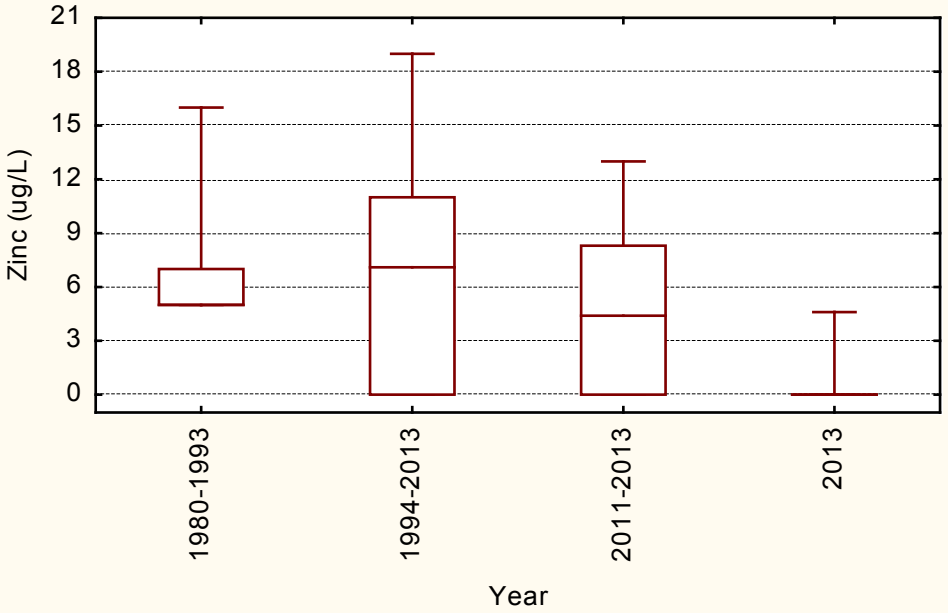
MMSD Water Quality Program Data
Nearshore survey, Site NS-14

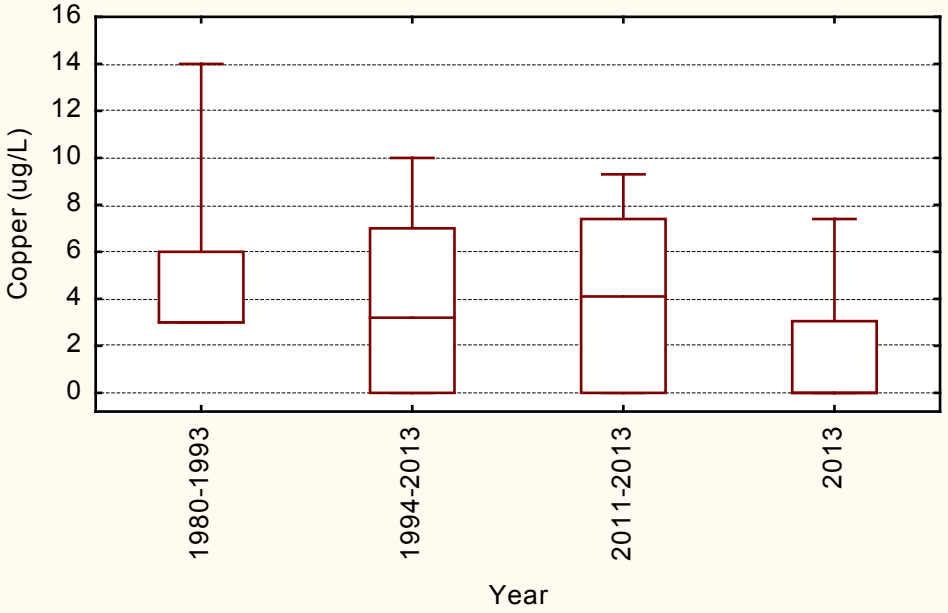


MMSD Water Quality Program Data
Nearshore survey, Site NS-14



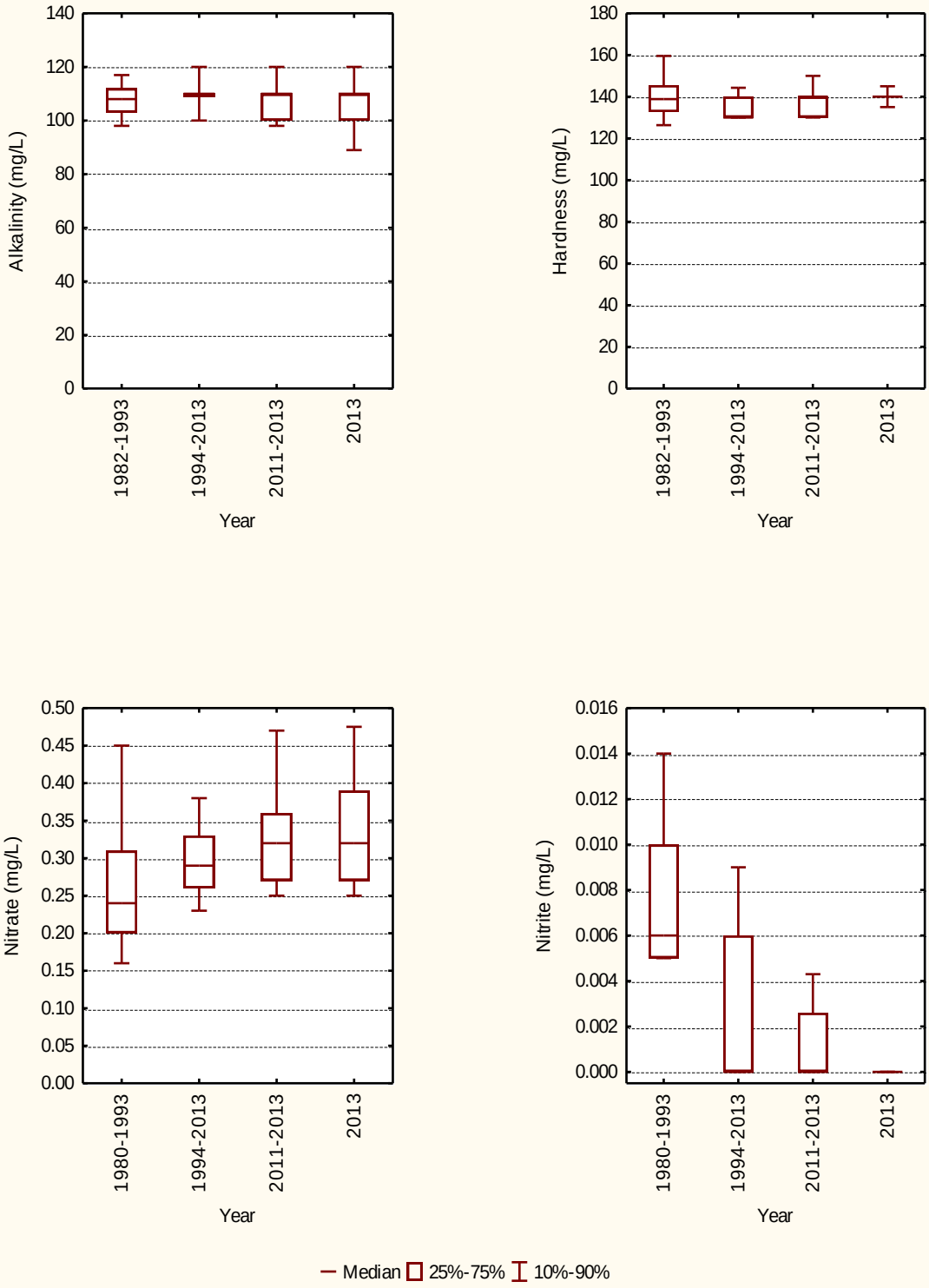
MMSD Water Quality Program Data
Nearshore survey, Site NS-14





— Median ☐ 25%-75% I 10%-90%

MMSD Water Quality Program Data
Nearshore survey, Site NS-14



NEAR SHORE - SITE 14
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.2	10.0	11.9	0.44	0.34	0.000	0.34	0.000	0.08	0.005	0.003	1.44
Standard Error	0.0	0.8	0.2	0.12	0.01	0.000	0.01	0.000	0.02	0.002	0.001	0.06
Median	8.2	7.8	12.0	0.16	0.32	0.000	0.32	0.000	0.00	0.000	0.000	1.50
Mode	8.2	Multi	11.8	0.00	0.26	0.000	0.26	0.000	0.00	0.000	0.000	1.20
Standard Deviation	0.3	6.0	1.5	0.89	0.08	0.002	0.08	0.000	0.13	0.018	0.009	0.43
Sample Variance	0.1	35.7	2.3	0.80	0.01	0.000	0.01	0.000	0.02	0.000	0.000	0.18
Range	1.4	21.2	5.5	4.50	0.35	0.009	0.35	0.000	0.42	0.140	0.057	2.11
Minimum	7.2	0.9	9.0	0.00	0.23	0.000	0.23	0.000	0.00	0.000	0.000	0.29
Maximum	8.6	22.1	14.5	4.50	0.58	0.009	0.58	0.000	0.42	0.140	0.057	2.40
Count	57	60	60	60	60	60	60	60	60	59	42	60
Confidence Level (95%)	0.1	1.5	0.4	0.23	0.02	0.000	0.02	0.000	0.03	0.005	0.003	0.11

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	7.7	17.6	165.7	165.1	0.1	0.6	0.8	308	13.3	16	0.9	ND
Standard Error	0.9	1.0	4.3	4.3	0.1	0.3	0.1	3	0.4	16	0.5	ND
Median	7.4	19.7	170.0	170.0	0.0	0.0	0.5	301	12.5	0	0.5	ND
Mode	Multi	19.8	170.0	170.0	0.0	0.0	Multi	291	12.0	0	0.5	ND
Standard Deviation	3.9	4.1	16.0	16.3	0.3	1.0	1.1	24	3.3	71	1.0	ND
Sample Variance	14.9	16.6	257.1	264.3	0.1	1.0	1.3	556	10.9	5108	1.1	ND
Range	18.3	12.3	50.0	51.5	1.2	3.4	6.9	130	17.0	320	2.2	ND
Minimum	1.7	7.7	140.0	138.5	0.0	0.0	0.0	288	10.0	0	0.3	ND
Maximum	20.0	20.0	190.0	190.0	1.2	3.4	6.9	418	27.0	320	2.5	ND
Count	20	18	14	14	14	14	60	60	60	20	4	0
Confidence Level (95%)	1.8	2.0	9.3	9.4	0.2	0.6	0.3	6	0.9	33	1.7	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

NEAR SHORE - SITE 14
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	34.50	13.35	0.1	0.9	1.8	1.0	0.8	1.6	0.0	1.9	0.0	ND
Standard Error	0.18	0.17	0.1	0.2	0.7	0.2	0.6	1.2	0.0	0.7	0.0	ND
Median	34.50	13.00	0.0	1.3	0.0	0.6	0.0	0.0	0.0	0.0	0.0	ND
Mode	Multi	13.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	0.83	0.75	0.4	0.8	3.3	1.1	2.5	5.4	0.0	2.8	0.0	ND
Sample Variance	0.68	0.56	0.1	0.6	10.7	1.2	6.1	29.6	0.0	7.7	0.0	ND
Range	3.00	3.00	1.2	1.9	9.1	2.9	8.4	23.0	0.0	7.1	0.0	ND
Minimum	33.00	12.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	36.00	15.00	1.2	1.9	9.1	2.9	8.4	23.0	0.0	7.1	0.0	ND
Count	20	20	20	20	20	20	19	20	20	17	19	0
Confidence Level (95%)	0.39	0.35	0.2	0.4	1.5	0.5	1.2	2.5	0.0	1.4	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	140	106	0.0	2.0	26.0	23.7	2.3	ND
Standard Error	1	2	0.0	0.4	0.2	0.2	0.1	ND
Median	140	110	0.0	2.6	26.0	24.0	2.2	ND
Mode	140	110	0.0	0.0	27.0	22.0	Multi	ND
Standard Deviation	5	10	0.0	1.2	1.5	1.3	0.4	ND
Sample Variance	21	98	0.0	1.5	2.2	1.8	0.2	ND
Range	20	34	0.0	3.2	5.0	4.0	2.0	ND
Minimum	130	86	0.0	0.0	24.0	22.0	1.8	ND
Maximum	150	120	0.0	3.2	29.0	26.0	3.8	ND
Count	20	18	13	12	42	42	42	0
Confidence Level (95%)	2	5	0.0	0.8	0.5	0.4	0.1	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

NEAR SHORE - SITE 27
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.2	12.2	11.5	0.15	0.47	0.003	0.48	0.004	0.12	0.007	0.005	1.35
Standard Error	0.0	0.9	0.2	0.04	0.03	0.001	0.03	0.001	0.02	0.001	0.001	0.07
Median	8.2	12.9	11.5	0.10	0.43	0.000	0.43	0.000	0.00	0.005	0.000	1.40
Mode	8.2	19.1	11.5	0.00	0.27	0.000	Multi	0.000	0.00	0.000	0.000	Multi
Standard Deviation	0.3	6.6	1.8	0.20	0.22	0.005	0.22	0.009	0.14	0.008	0.007	0.51
Sample Variance	0.1	43.0	3.3	0.04	0.05	0.000	0.05	0.000	0.02	0.000	0.000	0.26
Range	1.2	20.0	8.1	0.78	1.07	0.019	1.07	0.033	0.45	0.032	0.028	1.90
Minimum	7.6	1.4	7.9	0.00	0.13	0.000	0.13	0.000	0.00	0.000	0.000	0.50
Maximum	8.8	21.4	16.0	0.78	1.20	0.019	1.20	0.033	0.45	0.032	0.028	2.40
Count	54	54	54	29	54	54	54	54	54	53	35	54
Confidence Level (95%)	0.1	1.8	0.5	0.08	0.06	0.001	0.06	0.002	0.04	0.002	0.002	0.14

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	7.4	10.5	205.0	203.7	0.1	1.3	1.5	360	19.9	2	0.7	ND
Standard Error	0.9	0.7	9.0	8.7	0.1	0.5	0.3	9	1.3	1	0.1	ND
Median	6.1	11.4	200.0	198.9	0.0	1.2	0.6	345	17.0	0	0.7	ND
Mode	12.0	11.3	Multi	Multi	0.0	0.0	Multi	297	11.0	0	Multi	ND
Standard Deviation	3.9	2.8	31.2	30.2	0.4	1.8	2.0	67	9.7	3	0.2	ND
Sample Variance	15.1	7.7	972.7	914.4	0.1	3.1	4.2	4541	93.6	10	0.1	ND
Range	11.0	9.5	100.0	94.4	1.3	5.6	8.1	284	40.0	10	0.7	ND
Minimum	1.0	2.8	160.0	160.0	0.0	0.0	0.0	280	11.0	0	0.3	ND
Maximum	12.0	12.3	260.0	254.4	1.3	5.6	8.1	564	51.0	10	1.0	ND
Count	18	16	12	12	12	12	54	54	54	18	7	0
Confidence Level (95%)	1.9	1.5	19.8	19.2	0.2	1.1	0.6	18	2.6	2	0.2	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

NEAR SHORE - SITE 27
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	35.89	14.28	0.1	1.3	1.3	1.0	0.0	2.2	0.0	2.5	0.0	ND
Standard Error	0.54	0.32	0.1	0.1	0.7	0.2	0.0	1.3	0.0	0.8	0.0	ND
Median	35.00	14.00	0.0	1.5	0.0	1.2	0.0	0.0	0.0	0.0	0.0	ND
Mode	35.00	13.00	0.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	2.27	1.36	0.3	0.6	3.1	1.0	0.0	5.3	0.0	3.4	0.0	ND
Sample Variance	5.16	1.86	0.1	0.4	9.8	1.0	0.0	28.2	0.0	11.5	0.0	ND
Range	9.00	4.00	0.8	2.1	9.8	2.8	0.0	18.0	0.0	7.7	0.0	ND
Minimum	33.00	13.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	42.00	17.00	0.8	2.1	9.8	2.8	0.0	18.0	0.0	7.7	0.0	ND
Count	18	18	18	18	18	18	16	18	18	16	18	0
Confidence Level (95%)	1.13	0.68	0.1	0.3	1.6	0.5	0.0	2.6	0.0	1.8	0.0	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	147	108	ND	ND	26.6	24.1	2.5	ND
Standard Error	3	3	ND	ND	0.4	0.3	0.1	ND
Median	140	110	ND	ND	26.0	24.0	2.4	ND
Mode	140	120	ND	ND	26.0	Multi	2.2	ND
Standard Deviation	12	11	ND	ND	2.2	2.0	0.4	ND
Sample Variance	139	130	ND	ND	4.9	3.8	0.2	ND
Range	40	38	ND	ND	8.0	6.0	1.4	ND
Minimum	140	92	ND	ND	24.0	22.0	2.1	ND
Maximum	180	130	ND	ND	32.0	28.0	3.5	ND
Count	18	18	0	0	36	36	36	0
Confidence Level (95%)	6	6	ND	ND	0.7	0.7	0.1	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

NEAR SHORE - SITE 28
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	PH	TEMP	DO	CHLA	NITRATE	NITRITE	NO5	AMMONIA	TKN	PHOS	SOLPHOS	SOLSIL
units	su	°C	mg/L	mg/m3	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS												
Mean	8.0	13.3	9.5	3.35	0.77	0.014	0.79	0.060	0.70	0.054	0.032	3.84
Standard Error	0.0	0.8	0.3	0.39	0.03	0.001	0.03	0.005	0.04	0.003	0.002	0.21
Median	8.0	13.7	9.1	2.70	0.76	0.016	0.77	0.064	0.69	0.054	0.031	3.65
Mode	8.1	10.6	Multi	Multi	Multi	0.000	Multi	0.000	1.10	Multi	Multi	Multi
Standard Deviation	0.1	6.4	2.2	3.03	0.22	0.008	0.23	0.041	0.29	0.024	0.019	1.66
Sample Variance	0.0	41.6	5.0	9.16	0.05	0.000	0.05	0.002	0.08	0.001	0.000	2.77
Range	0.5	23.0	8.0	14.00	0.98	0.033	1.08	0.140	1.20	0.106	0.076	6.70
Minimum	7.8	1.5	6.0	0.00	0.32	0.000	0.32	0.000	0.00	0.004	0.000	1.30
Maximum	8.3	24.5	14.0	14.00	1.30	0.033	1.40	0.140	1.20	0.110	0.076	8.00
Count	57	60	60	60	60	60	60	60	60	59	59	60
Confidence Level (95%)	0.0	1.7	0.6	0.78	0.06	0.002	0.06	0.011	0.07	0.006	0.005	0.43

VARIABLE	SCHII	IXLITE	TS	DS	VSS	SS	TURB	SPEC	CHLOR	FECAL	LFC	ECOLIQT
units	meters	meters	mg/L	mg/L	mg/L	mg/L	FNU	µmhos/cm	mg/L	CFU/100 mL	CFU/100 mL	MPN/100 mL
STATISTICS												
Mean	1.6	4.1	334.3	327.9	2.2	6.4	5.0	583	62.9	184	1.9	247
Standard Error	0.1	0.3	17.8	17.4	0.3	0.8	0.4	19	2.9	62	0.1	96
Median	1.6	4.0	350.0	340.8	2.1	5.9	4.6	610	67.5	90	2.1	150
Mode	1.5	2.6	390.0	Multi	Multi	Multi	4.0	Multi	74.0	30	1.5	Multi
Standard Deviation	0.5	1.5	66.6	65.0	1.2	3.2	3.0	149	22.3	280	0.6	361
Sample Variance	0.3	2.1	4441.8	4222.5	1.5	10.1	9.1	22336	495.1	78124	0.4	130229
Range	2.0	5.8	200.0	197.4	5.6	11.4	16.5	707	127.0	1200	2.4	1387
Minimum	0.6	1.2	220.0	216.0	0.0	2.6	0.8	293	13.0	0	0.7	13
Maximum	2.6	7.0	420.0	413.4	5.6	14.0	17.3	1000	140.0	1200	3.1	1400
Count	20	18	14	14	14	14	60	60	60	20	19	14
Confidence Level (95%)	0.2	0.7	38.5	37.5	0.7	1.8	0.8	39	5.7	131	0.3	208

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data

NEAR SHORE - SITE 28
LAKE MICHIGAN
WATER QUALITY DATA - 2013

VARIABLE	CA	MG	CD	CR	CU	NI	PB	ZN	AG	AS	SE	HG
units	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
STATISTICS												
Mean	50.25	25.25	0.2	2.2	3.1	1.6	0.4	7.2	0.0	2.7	0.2	ND
Standard Error	1.29	0.87	0.0	0.1	0.5	0.2	0.3	1.0	0.0	0.5	0.2	ND
Median	50.50	25.00	0.0	2.1	0.0	2.0	0.0	8.9	0.0	0.0	0.0	ND
Mode	Multi	Multi	0.0	Multi	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Standard Deviation	8.94	6.04	0.3	0.8	3.7	1.2	1.9	7.1	0.0	3.2	1.4	ND
Sample Variance	79.94	36.45	0.1	0.6	13.7	1.5	3.5	50.4	0.0	10.0	1.9	ND
Range	36.00	22.00	1.6	5.4	12.0	3.9	10.0	27.0	0.0	10.0	9.4	ND
Minimum	35.00	14.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	ND
Maximum	71.00	36.00	1.6	5.4	12.0	3.9	10.0	27.0	0.0	10.0	9.4	ND
Count	48	48	48	48	48	48	47	48	32	38	47	0
Confidence Level (95%)	2.60	1.75	0.1	0.2	1.1	0.4	0.6	2.1	0.0	1.0	0.4	ND

VARIABLE	HARD	TALK	BOD5	BOD20	TC	TNIC	TNOC	TNDOC
units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
STATISTICS								
Mean	228	171	ND	ND	42.0	35.7	6.4	ND
Standard Error	7	9	ND	ND	1.6	1.1	0.5	ND
Median	225	165	ND	ND	44.0	37.0	5.8	ND
Mode	270	160	ND	ND	46.0	Multi	10.0	ND
Standard Deviation	47	36	ND	ND	10.3	7.4	3.1	ND
Sample Variance	2182	1323	ND	ND	105.8	54.1	9.8	ND
Range	180	150	ND	ND	35.0	27.0	11.5	ND
Minimum	140	110	ND	ND	27.0	24.0	1.5	ND
Maximum	320	260	ND	ND	62.0	51.0	13.0	ND
Count	48	18	0	0	42	42	42	0
Confidence Level (95%)	14	18	ND	ND	3.2	2.3	1.0	ND

ND = No Data **Multi = Multimodal**

Provisional MMSD Water Quality Data