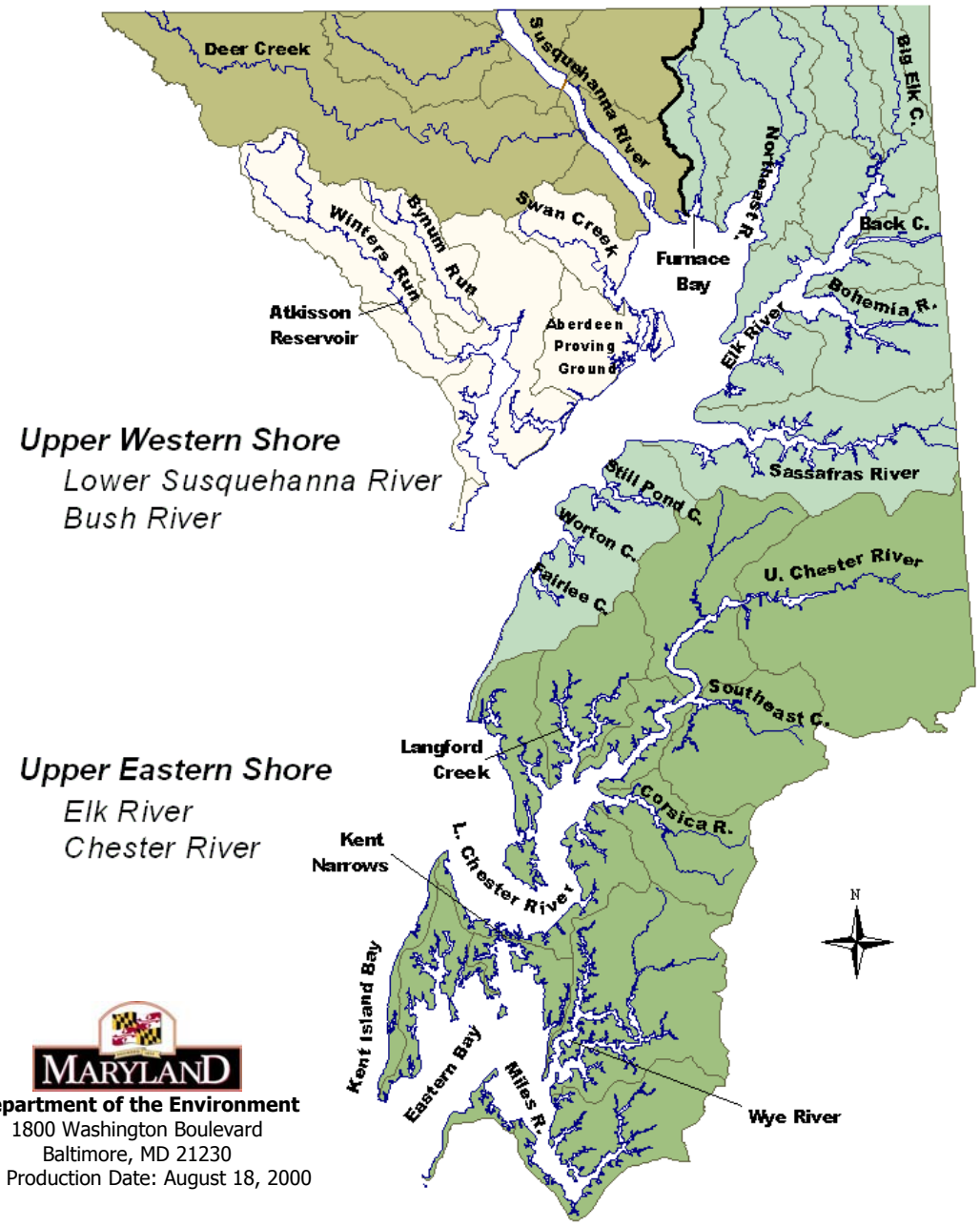
1999 Data Report
Maryland's Upper Eastern and Western Shores



Department of the Environment
1800 Washington Boulevard
Baltimore, MD 21230

Map Production Date: August 18, 2000

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Introduction

Section 303(d) of the federal Clean Water Act directs states to identify and list waters, known as water quality limited segments (WQLSs), for which technology-based effluent controls of a specified substance are inadequate to achieve water quality standards (40 Code of Federal Regulations 130.7(b)(i - iii)). For each WQLS each state must establish a Total Maximum Daily Load (TMDL). A TMDL is an estimate of the maximum amount of the pollutant that a waterbody can assimilate and still meet water quality standards.

As a coordinating framework for Maryland's TMDL program, the Maryland Department of the Environment has developed a watershed cycling approach. This approach focuses on protecting Maryland's water quality by developing and implementing TMDLs in a comprehensive fashion by drainage basin (watershed). By adopting watersheds as the primary management units, MDE addresses the appropriate natural spatial domain and is able to consolidate the necessary resources with sufficient spatial focus.

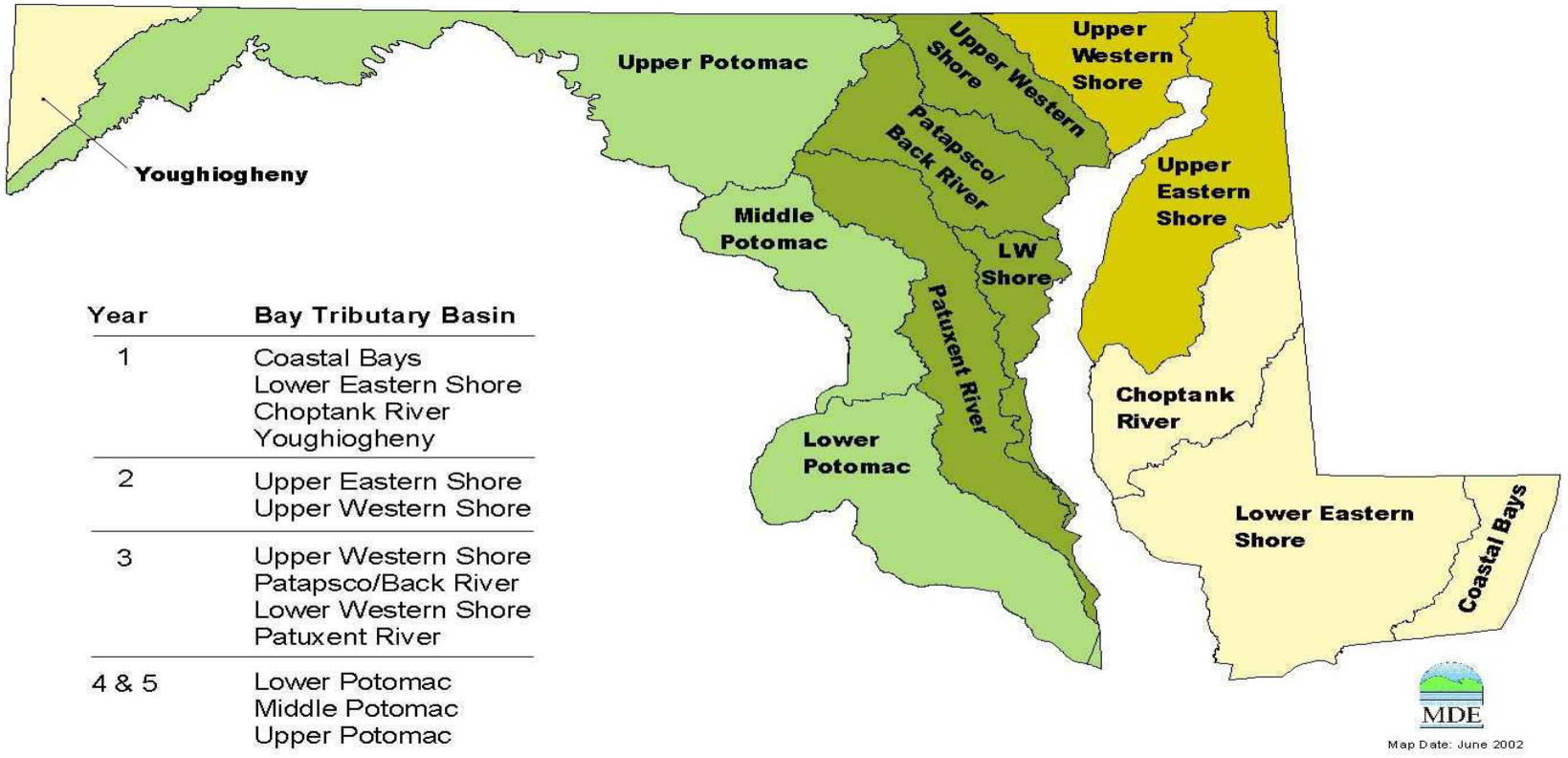
This report compiles data collected in 1999 from Maryland's Upper Western and Upper Eastern Shores. In the Upper Western Shore the major watersheds are the Lower Susquehanna and Bush Rivers. In the Upper Eastern Shore the major watersheds are the Elk and Chester Rivers.

Maryland's Watershed Cycling Strategy
Under the watershed cycling strategy, the State is divided into five regions. Monitoring activities are cycled through these regions over a five-year period (Figure 1). (The cycling process was initiated in the Lower Delmarva Peninsula region in 1998.) This approach allows a significant amount of resources to be concentrated in approximately 20% of the State at any given time. This approach increases resource efficiency and water quality evaluation intensity.

In each region, MDE conducts monitoring for three wet periods (March, April, May) and three dry periods (July, August, September) and monthly samples at the mouth and head of tide of major water bodies. This information is used in estimating watershed model loading rates and for water quality model calibration and validation. Note that these data collection efforts currently focus on characterizing the waterbody systems (flow, geometry, etc.) and water quality attributes associated with eutrophication problems (i.e., over-enrichment with nutrients, causing excessive algal growth leading to loss of water clarity and the potential for low dissolved oxygen levels).

Because the five-year cycle repeats itself, the watershed cycling strategy establishes a natural evaluation framework. As the cycle is completed for a given watershed, field monitoring will be repeated where it was conducted five-years before. This will provide an opportunity to assess the initial results of the TMDL and implementation activities. This watershed cycling framework is endorsed by the federal Environmental Protection Agency (EPA). A similar framework is used by many other states (e.g., Delaware has been using a similar approach for about 4 years).

The Five Regions of Maryland's TMDL Watershed Monitoring Strategy (1998 - 2002)



Year	Bay Tributary Basin
1	Coastal Bays Lower Eastern Shore Choptank River Youghiogheny
2	Upper Eastern Shore Upper Western Shore
3	Upper Western Shore Patapsco/Back River Lower Western Shore Patuxent River
4 & 5	Lower Potomac Middle Potomac Upper Potomac

Data Collection Methodology

Field: A network of monitoring sites located on all major tributaries in each watershed was sampled during both high and low flow periods by MDE's Field Monitoring Program to obtain a broad characterization of water quality conditions. Measurements of stream flow were made at the time of each sampling event, using either U.S. Geological Survey gages or in-situ measurements of flow velocity and cross-sectional area.

Laboratory: Standard laboratory methods were used to analyze samples for the constituents included above. All collections are discrete grab samples interval collections using multiple laboratories. Nutrient chemistry is analyzed by the University of Maryland, Chesapeake Biological Laboratory, using their protocols. BOD5, active chlorophyll *a,* pheophytin are analyzed by the Department of Health and Mental Hygiene. Physical in-situ measurements are done for water and air temperature, dissolved oxygen, conductivity, salinity and pH. Flows are measured at all free flowing "watershed" sites using standard hydrological techniques, primarily the stream segmentation method.

Data Management: The monitoring effort was coordinated with parallel data management activities. The data collected in the field was assembled and verified using standard software maintained for this purpose by the MDE-TARSA Computer Modeling Program. After the data has gone through data QA/QC process it is archived in SAS data sets for future use.

Table 1: Key Parameters Ascertained by Monitoring within the Watershed Cycling Strategy

Parameter	Units
Total Organic Carbon	mg/l as C
Dissolved Organic Carbon	filtered mg/as C
Particulate Carbon	mg/l as C
Total Suspended Solids	mg/l N
Total Dissolved Nitrogen	filtered mg/l as N
Particulate Nitrogen	filtered mg/l as N
Ammonia	mg/l as N
Nitrate and Nitrite	filtered mg/l as N
Nitrite	filtered mg/l N
Total Phosphorus	mg/l as P
Dissolved Phosphorus	mg/l as P
Orthophosphate	mg/l as P
Particulate Phosphorus	mg/l as P
Particulate Inorganic Phosphorus	mg/l as P
Silicate	mg/l
BOD 5 day[1]	mg/l
Chlorophyll *a*	µg/l
Secchi Depth	m
pH	std unit
Dissolved Oxygen	mg/l
Conductivity	µs/cm

Report Organization

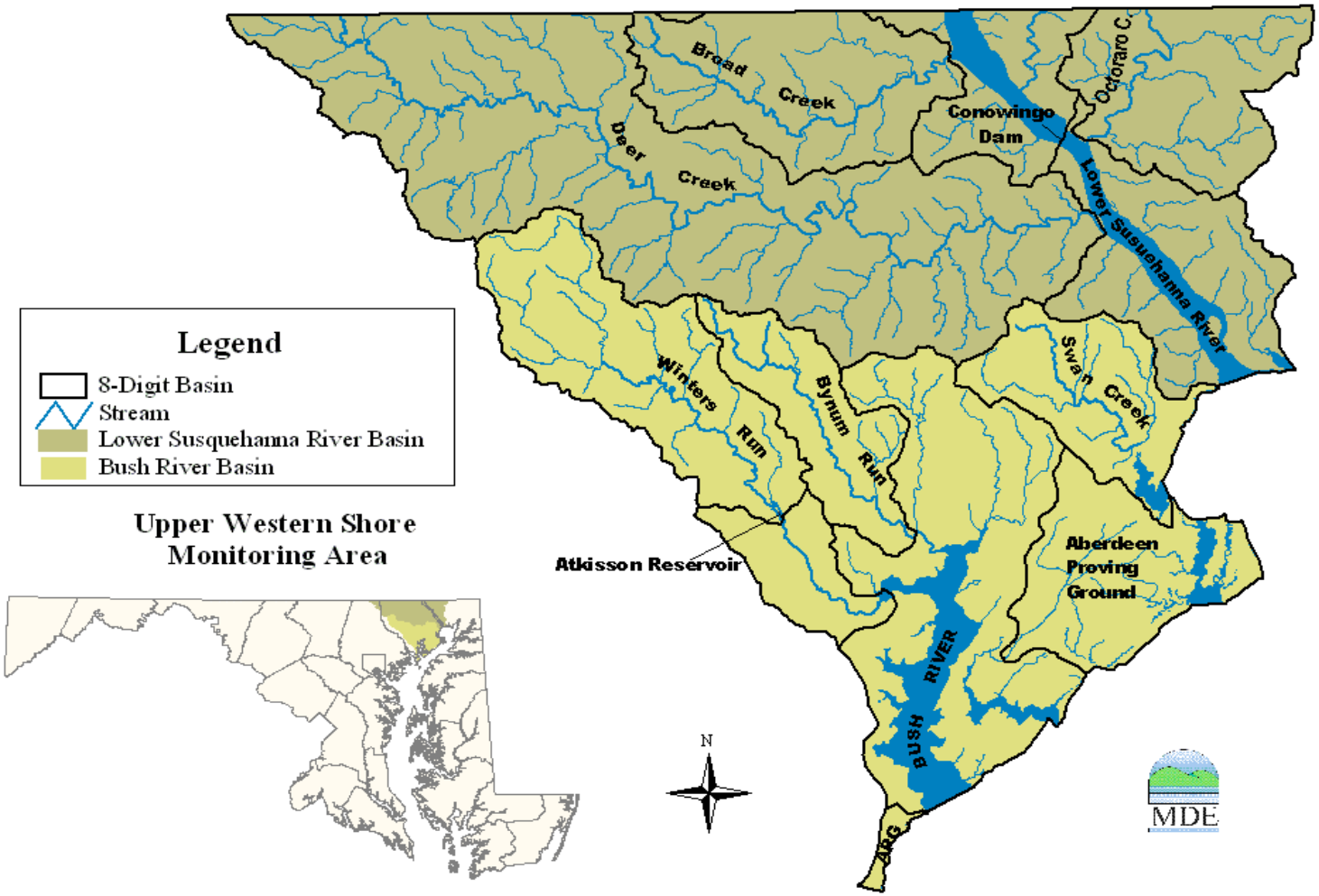
The report is organized by geographic region delineated by four major drainage basins. The Upper Western Shore drainage basin consists of the DNR 6-digit watersheds for the Lower Susquehanna River and the Bush River. The other major drainage basin is the Upper Eastern Shore consisting of the DNR 6-digit watersheds for the Elk River and the Chester River (see cover page). The cover page shows the smaller 8-digit basins contained within the larger 6-digit basins for which data was collected. This organization is reflected in the Table of Contents.

For each 8-digit basin there is a map with stations, graphical presentations of data, and a station description list. The graphs include the parameters of most interest: chlorophyll *a,* dissolved oxygen, total suspended solids, BOD, dissolved inorganic nitrogen, dissolved inorganic phosphorus, total nitrogen and total phosphorus. Data is presented for the mainstream of the river, high flow (January-May) first and then low flow (July-October) followed by the same presentation for the tributaries. The graphs present data from the mouth of the water body progressively upstream.

[1] BOD was not collected at all stations because of lab constraints.

Upper Western Shore

Maryland's Upper Western Shore



Lower Susquehanna River Basin

Bush River Basin

Lower Susquehanna River Basin

Lower Susquehanna River

Deer Creek

Octoraro Creek

Conowingo Dam/Reservoir Susquehanna River (high flow only)

Lower Susquehanna River Sub-Basin
(Sub-basin 02-12-02)

General Description (from 1998 305 (b) Report)
The Lower Susquehanna River sub-basin drains 270 square miles of Harford and Cecil Counties and a small portion of Baltimore County in Maryland to the Pennsylvania line. Most of the sub-basin lies in the Piedmont Province while a small portion of the sub-basin near the mouth of the river is in the Coastal Plain Province. Large water bodies include Deer, Broad and Octoraro Creeks. Conowingo Pool is a 5,000 acre interstate reservoir that is formed on the mainstem Susquehanna River behind Conowingo Dam. The Lower Susquehanna River in Maryland receives water from a 27,500 square mile drainage of the Susquehanna River in the states of Maryland, Pennsylvania and New York.

Land use in the Lower Susquehanna River sub-basin is primarily agricultural use (52 percent) although forested areas comprise almost 35 percent of the land area and 13 percent is developed. Havre de Grace and Perryville at the mouth of the river and Port Deposit, located on the mainstem river below Conowingo Dam, are the largest communities in the sub-basin. Smaller communities are scattered throughout the sub-basin, primarily along US Route 1.

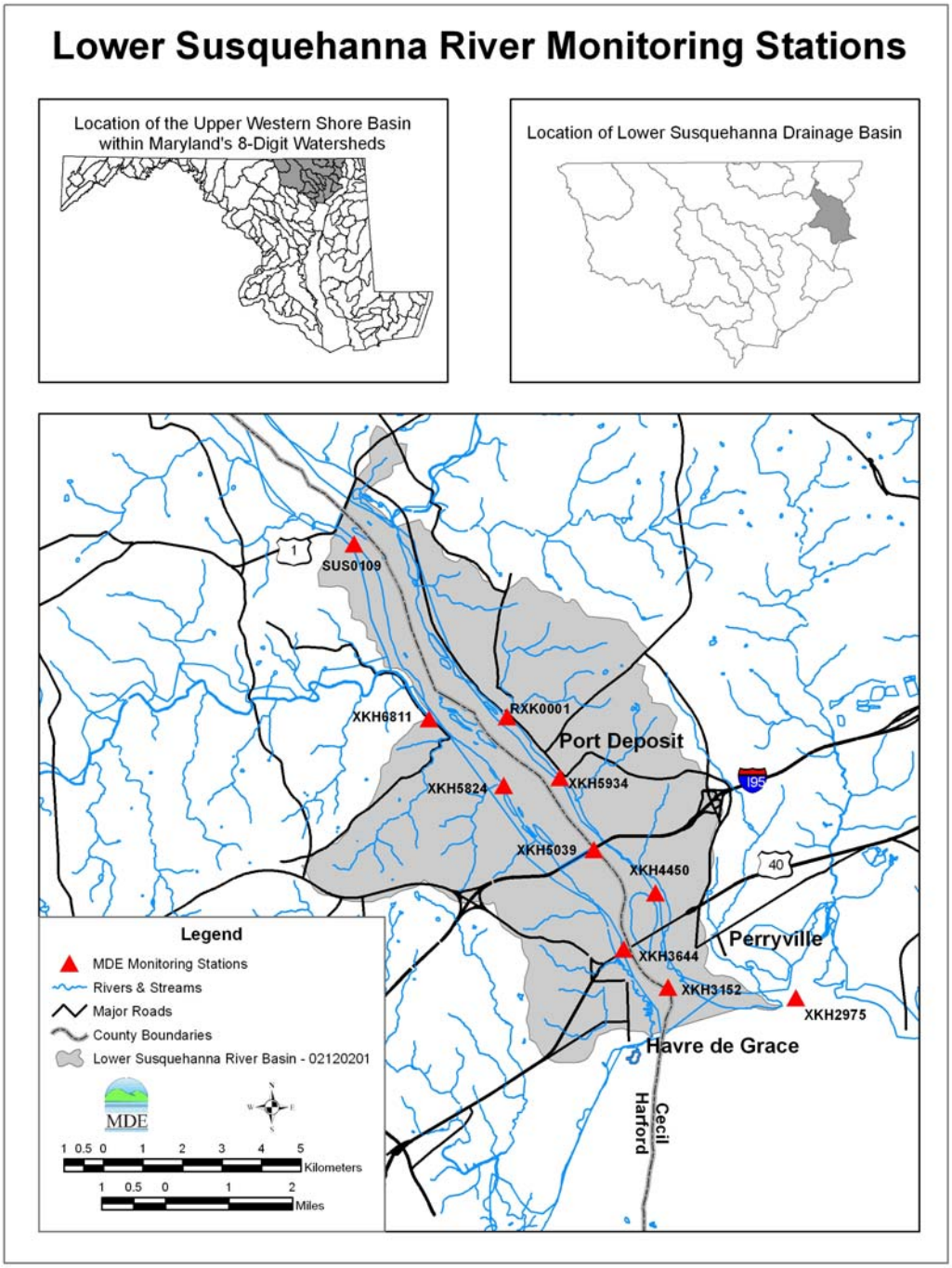
Surface waters are classified as Use I-P (water contact recreation, aquatic life and public water supply), Use III-P (natural trout and public water supply) or Use IV-P (put-and-take trout and public water supply) (COMAR '26.08.02.08A). For the most recent information regarding specific use classes in this watershed, the reader is referred to the Code of Maryland Regulations.

Deer Creek is identified as one of the State's Scenic Rivers (MD Dept. Natural Resources, 1988). This designation is designed to preserve and protect the natural values of the river. The lower two miles of Deer Creek has also been classified as a "critical habitat" by the US Fish and Wildlife Service for the Maryland darter, an endangered fish species. This ensures governmental review of any projects or activity in the watershed which might impact the species and its habitat.

The State routinely monitors water quality at two CORE/Trend stations; one is located on the mainstem river at Conowingo Dam (also a Fall Line Monitoring Station) and the other on lower Deer Creek. The Maryland Biological Stream Survey (MBSS) collected water quality samples in the watershed at 33 stations in 1994 and 35 stations in 1997.

Water Quality Summary
MDE conducted a Water Quality Analysis of the Lower Susquehanna River (02120201) in 2005. Assessment of the data determined that the water quality in the Lower Susquehanna is not impaired by nutrients. The Water Quality Analysis was submitted to the EPA and approved on January 11, 2006.

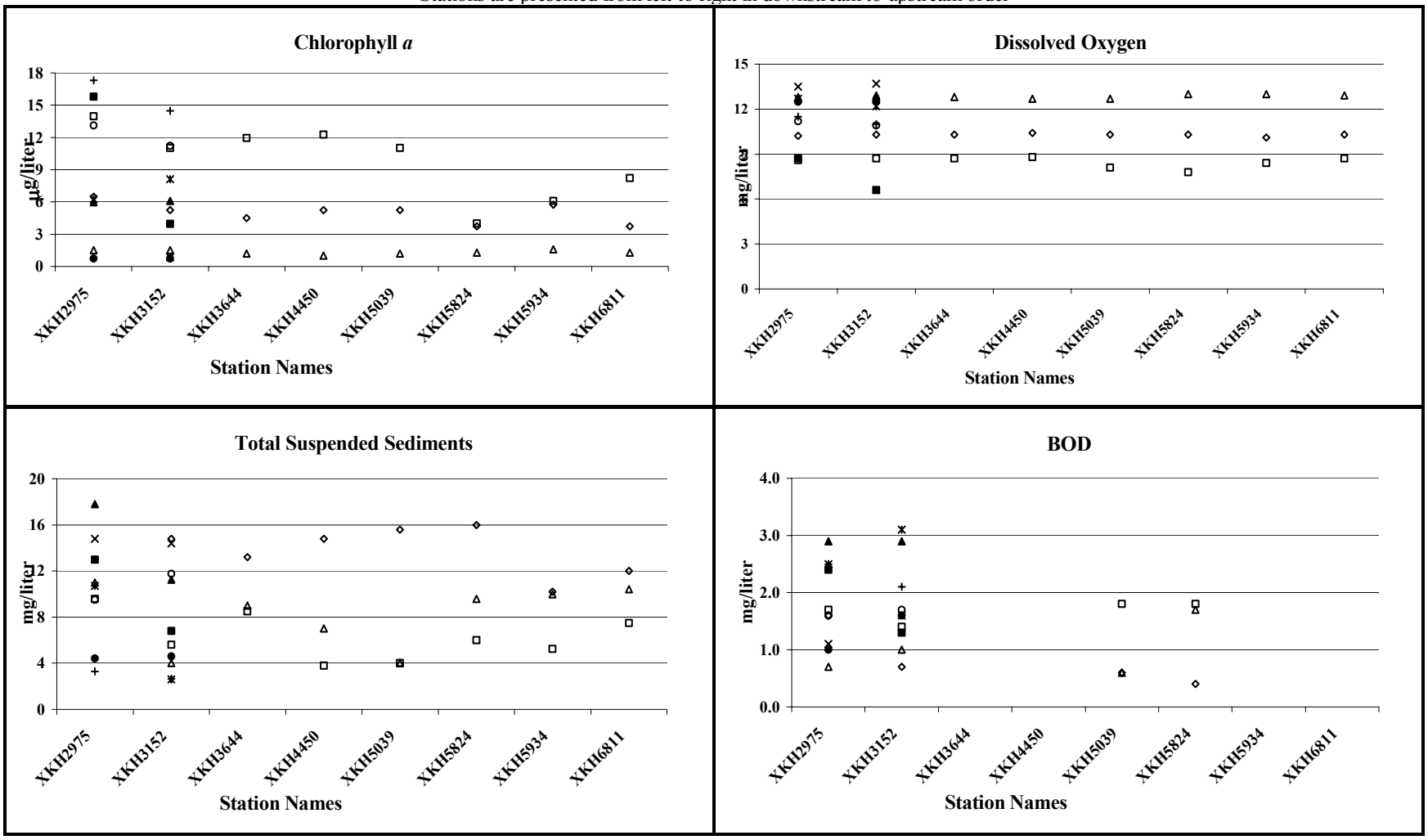
Lower Susquehanna River



Lower Susquehanna River

High Flow Conditions (December - May)

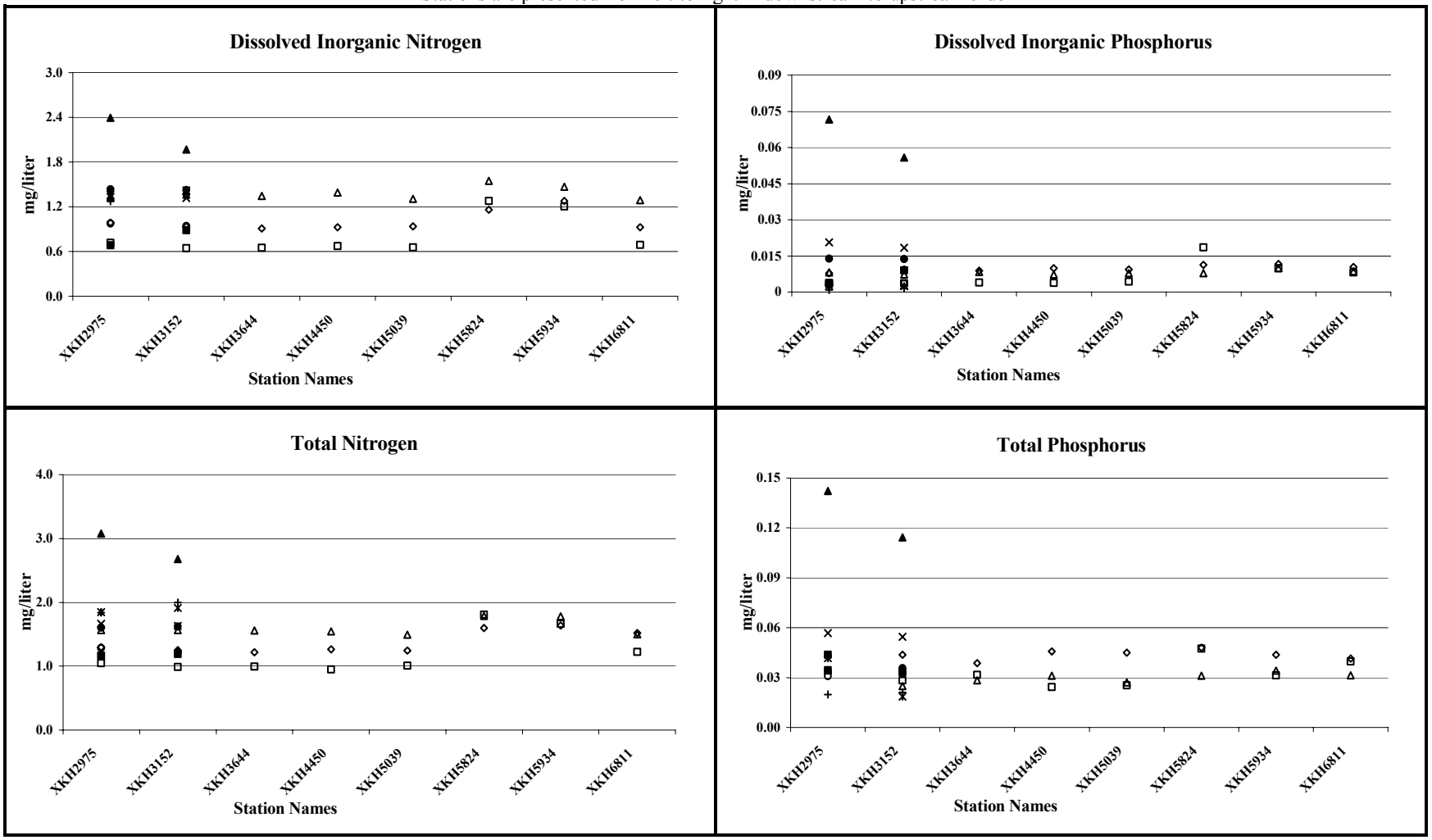
Stations are presented from left to right in downstream to upstream order



Lower Susquehanna River (main)

High Flow Conditions (December - May)

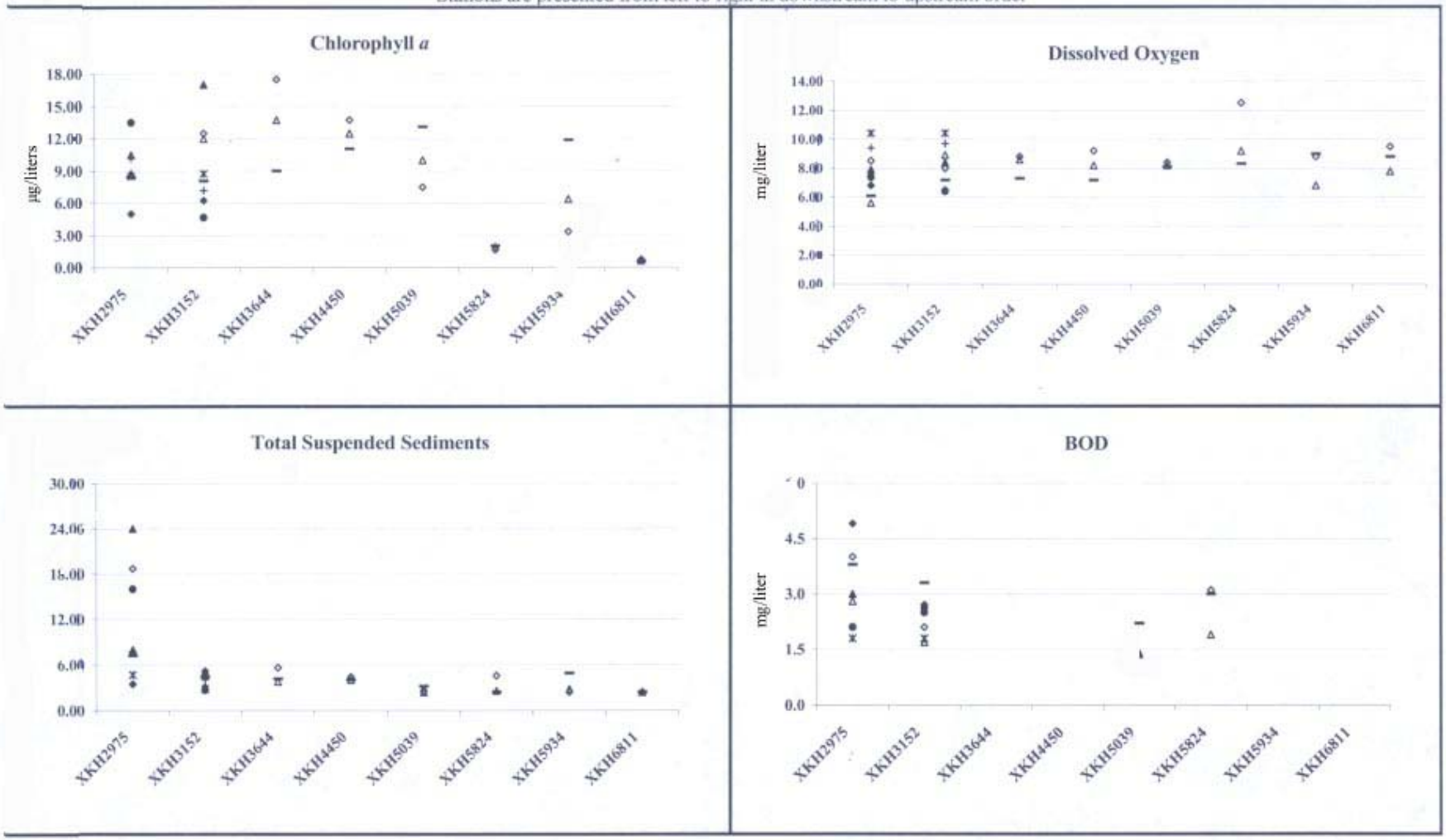
Stations are presented from left to right in downstream to upstream order



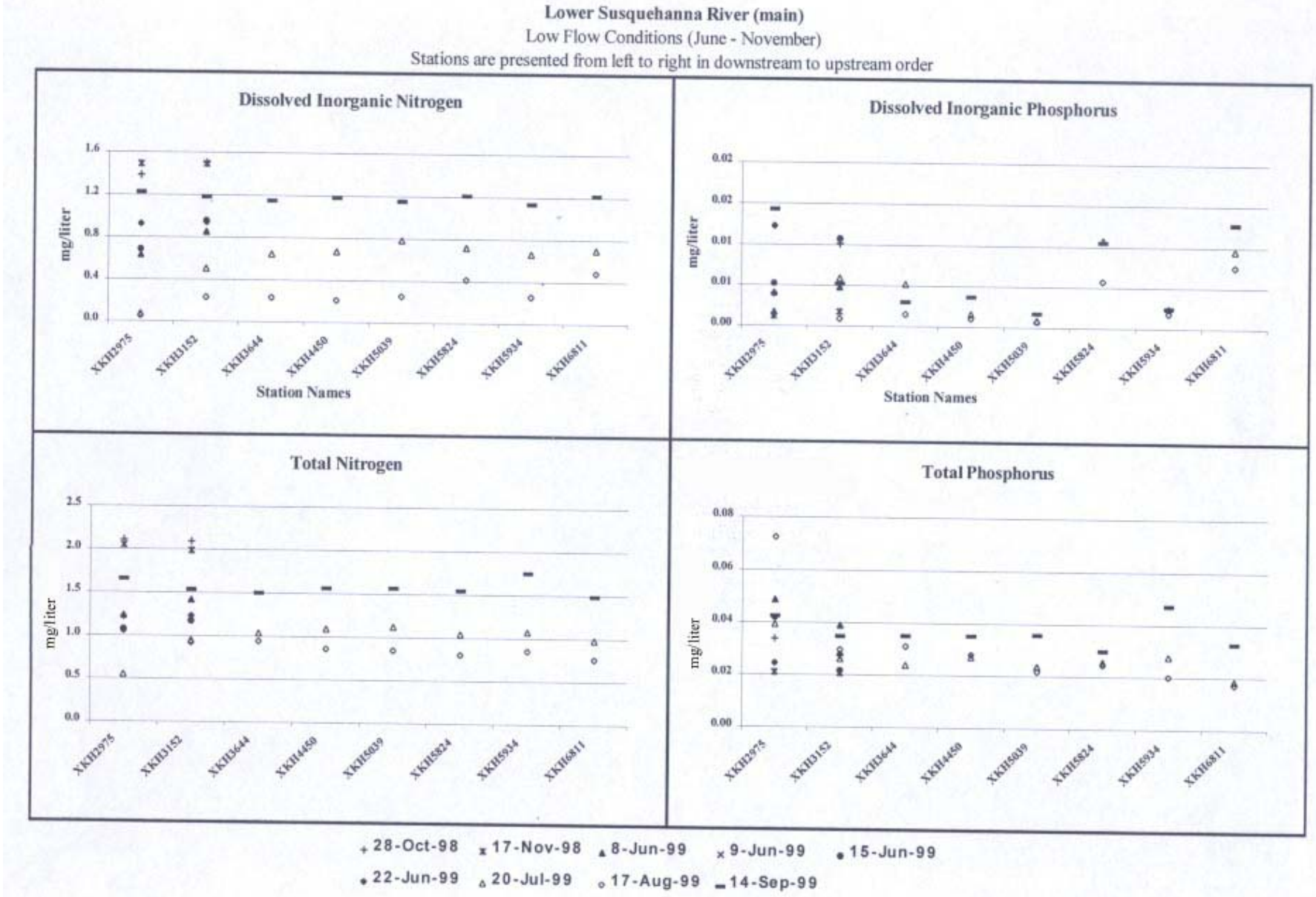
Lower Susquehanna River (main)

Low Flow Conditions (June - November)

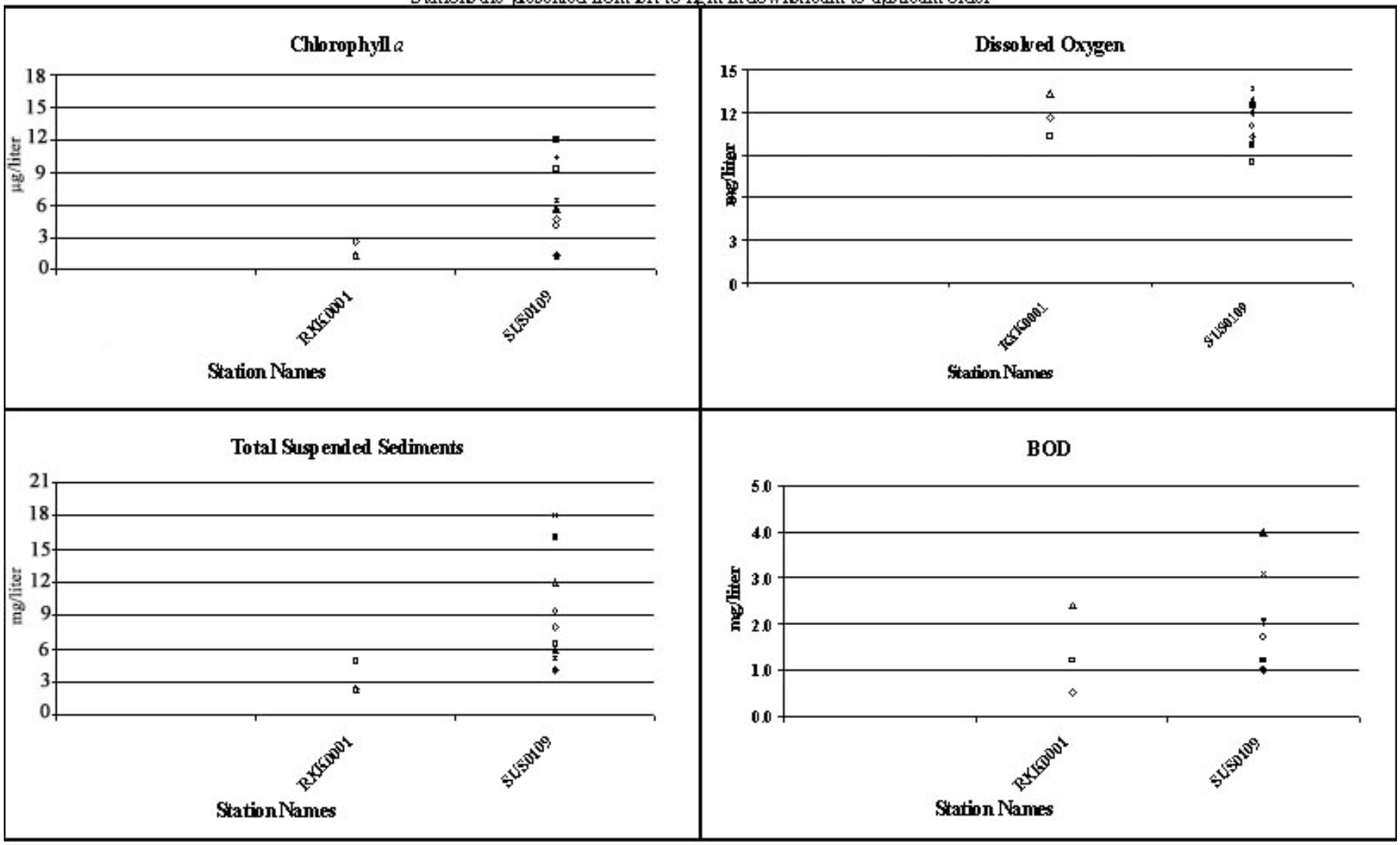
Stations are presented from left to right in downstream to upstream order



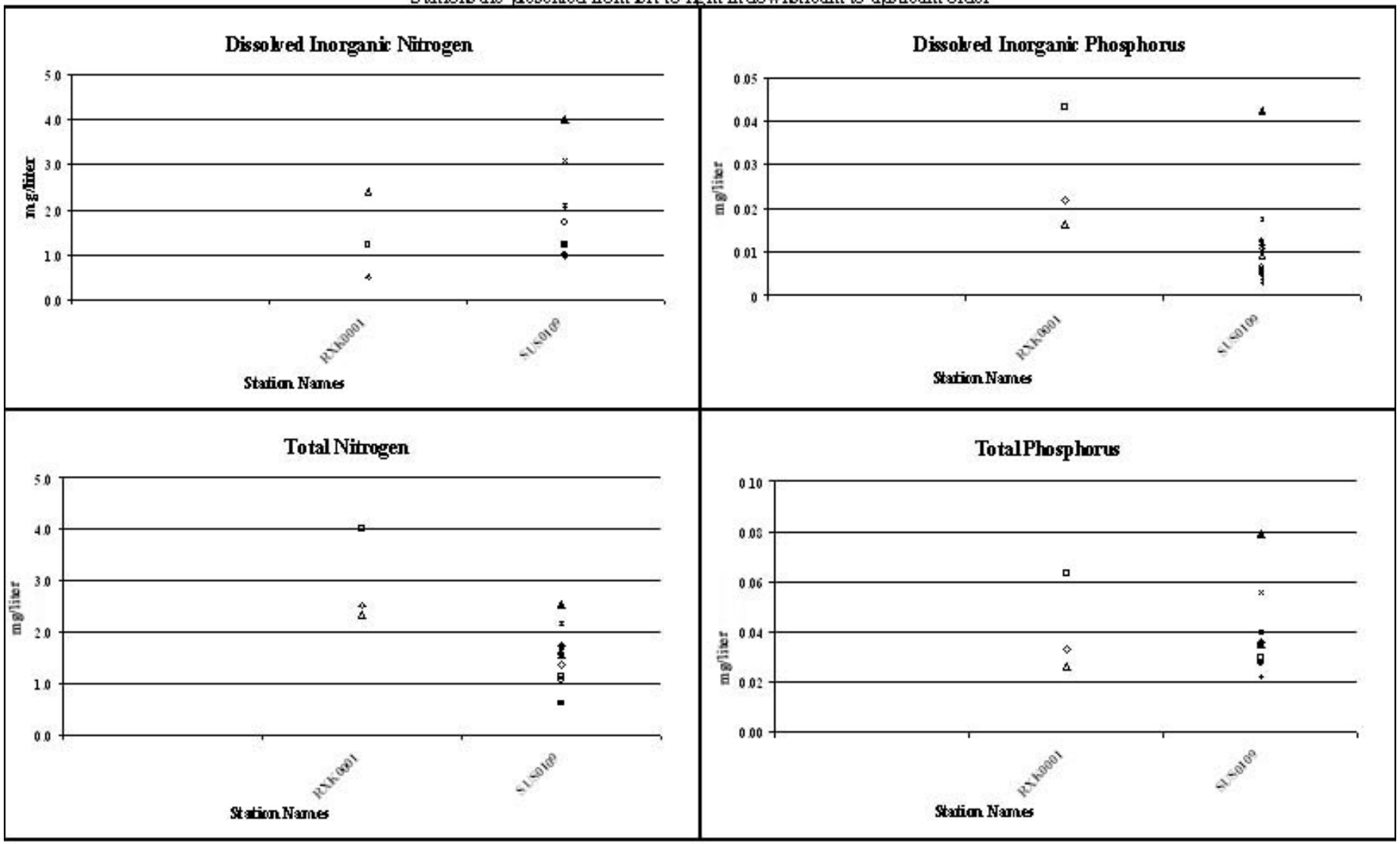
1999


Lower Susquehanna River (main)
Low Flow Conditions (June - November)
Stations are presented from left to right in downstream to upstream order
Dissolved Inorganic Nitrogen
mg/liter
1.6
1.2
0.8
0.4
0.0
XKH2975
XKH3152
XKH3644
XKH4450
XKH5039
XKH5824
XKH5934
XKH6811
Station Names
Dissolved Inorganic Phosphorus
mg/liter
0.02
0.02
0.01
0.01
0.00
XKH2975
XKH3152
XKH3644
XKH4450
XKH5039
XKH5824
XKH5934
XKH6811
Station Names
Total Nitrogen
mg/liter
2.5
2.0
1.5
1.0
0.5
0.0
XKH2975
XKH3152
XKH3644
XKH4450
XKH5039
XKH5824
XKH5934
XKH6811
Total Phosphorus
mg/liter
0.08
0.06
0.04
0.02
0.00
XKH2975
XKH3152
XKH3644
XKH4450
XKH5039
XKH5824
XKH5934
XKH6811
28-Oct-98
17-Nov-98
8-Jun-99
9-Jun-99
15-Jun-99
22-Jun-99
20-Jul-99
17-Aug-99
14-Sep-99

Lower Susquehanna River (tributary)
High Flow Conditions (December - May)
Stations are presented from left to right in downstream to upstream order



Lower Susquehanna River (tributary)
High Flow Conditions (December - May)
Stations are presented from left to right in downstream to upstream order



Lower Susquehanna River (tributary)

Low Flow Conditions (June - November)

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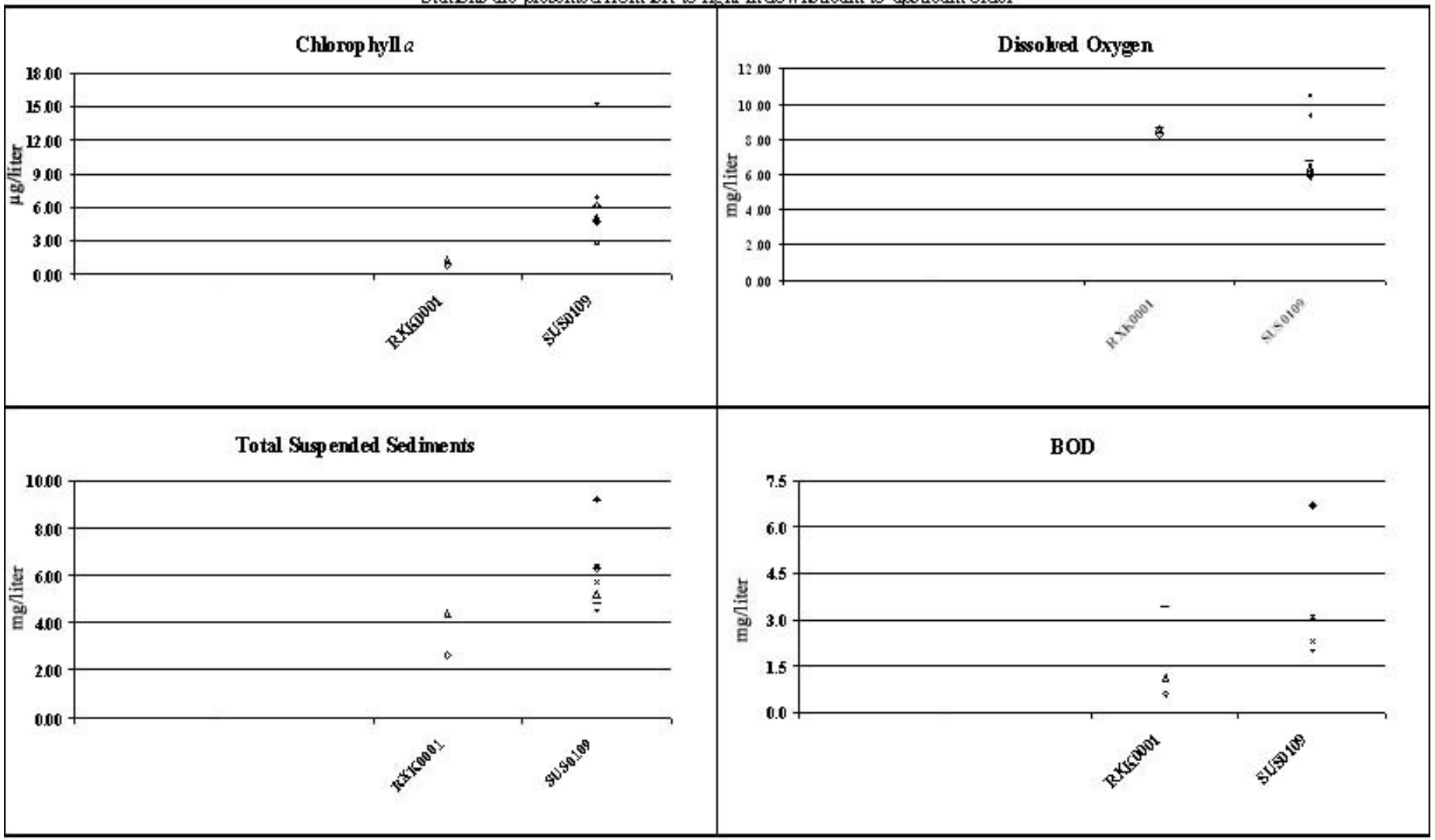


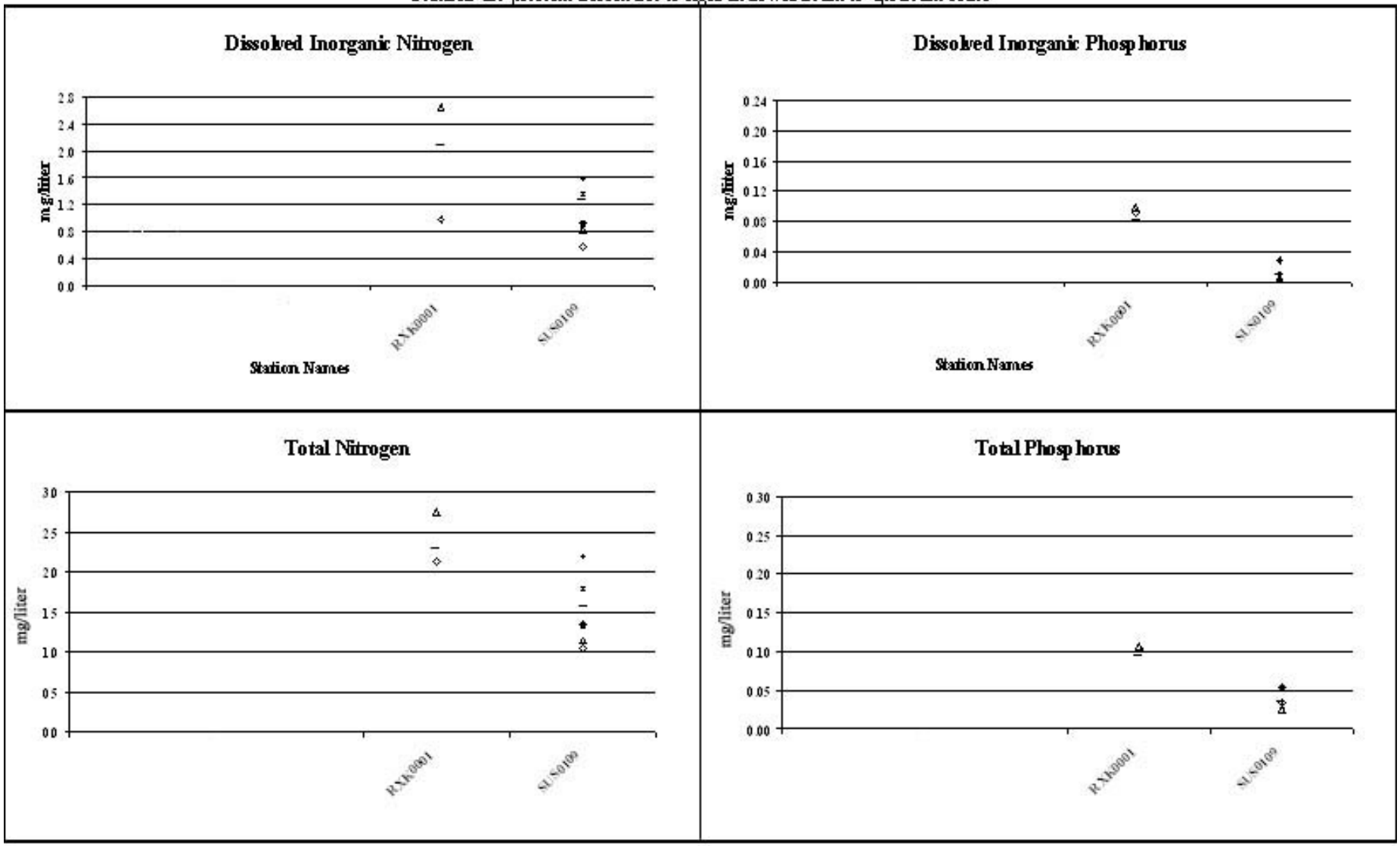
+ 28-Oct-98 × 17-Nov-98 ▲ 8-Jun-99 × 9-Jun-99 ● 15-Jun-99

◆ 22-Jun-99 △ 20-Jul-99 ◇ 17-Aug-99 – 14-Sep-99

Lower Susquehanna River (tributary)

Low Flow Conditions (June - November)

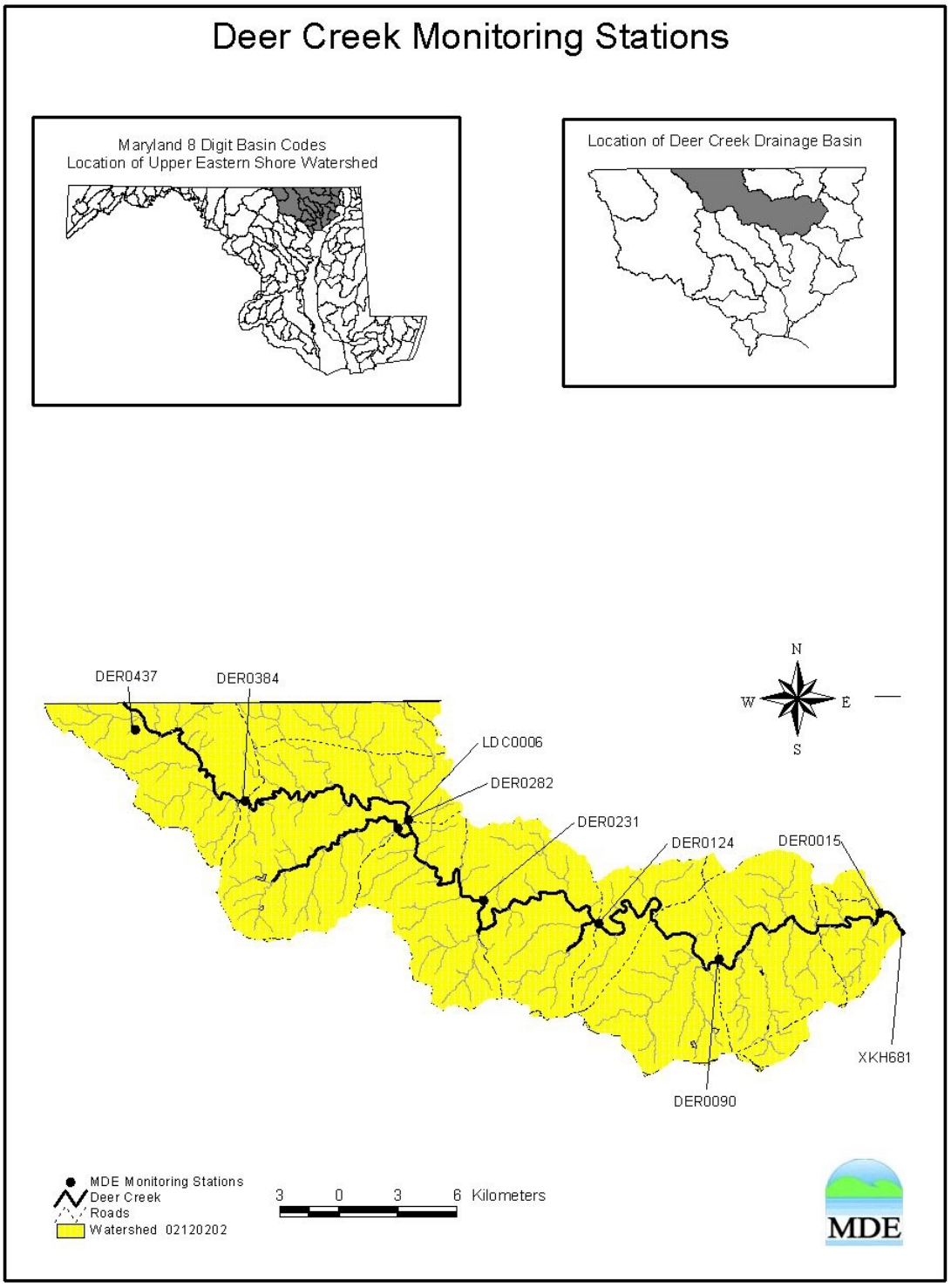
Stations are presented from left to right in downstream to upstream order



LOWER SUSQUEHANNA RIVER STATION LIST

Station Code	Lat/Long	Description
Furnace Bay:		
XKH2975	39 32.913 76 02.532	Mid-bay at mouth of Furnace Bay.
Susquehanna River (below dam)		
XKH3152	39 33.074 76 04.784	Mid-channel, 150 ft east of buoy C 19
XKH3644	39 33.598 76 05.560	Mid-channel, at Thomas Hatum Memorial Bridge (Rte 40).
XKH4450	39 34.360 76 04.984	Northwest of Thomas Hatum Memorial Bridge -
XKH5039	39 34.959 76 06.067	Mid-channel, below I-95 bridge.
XKH5934	39 35.945 76 06.652	Town of Port Deposit Marina Park boat ramp (off Rte 222). Turn at Logans Wharf sign.
XKH5824	39 35.845 76 07.644	Boat ramp on Lapidum Road. Take sample from rocks on shore.
XKH6811	39 36.767 76 08.945	Off Stafford Road. Walk over bridge that crosses Deer Cr. And follow pathway down hill and sample Susquehanna.
SUS0109	39 39.160 76 10.243	Boat ramp near Conowingo Dam - off of Shuresville Road. (USGS Gage at dam).
Rock Run		
RXK0001	39 36.786 76 07.575	Rte 222 bridge crossing near Rock Run.

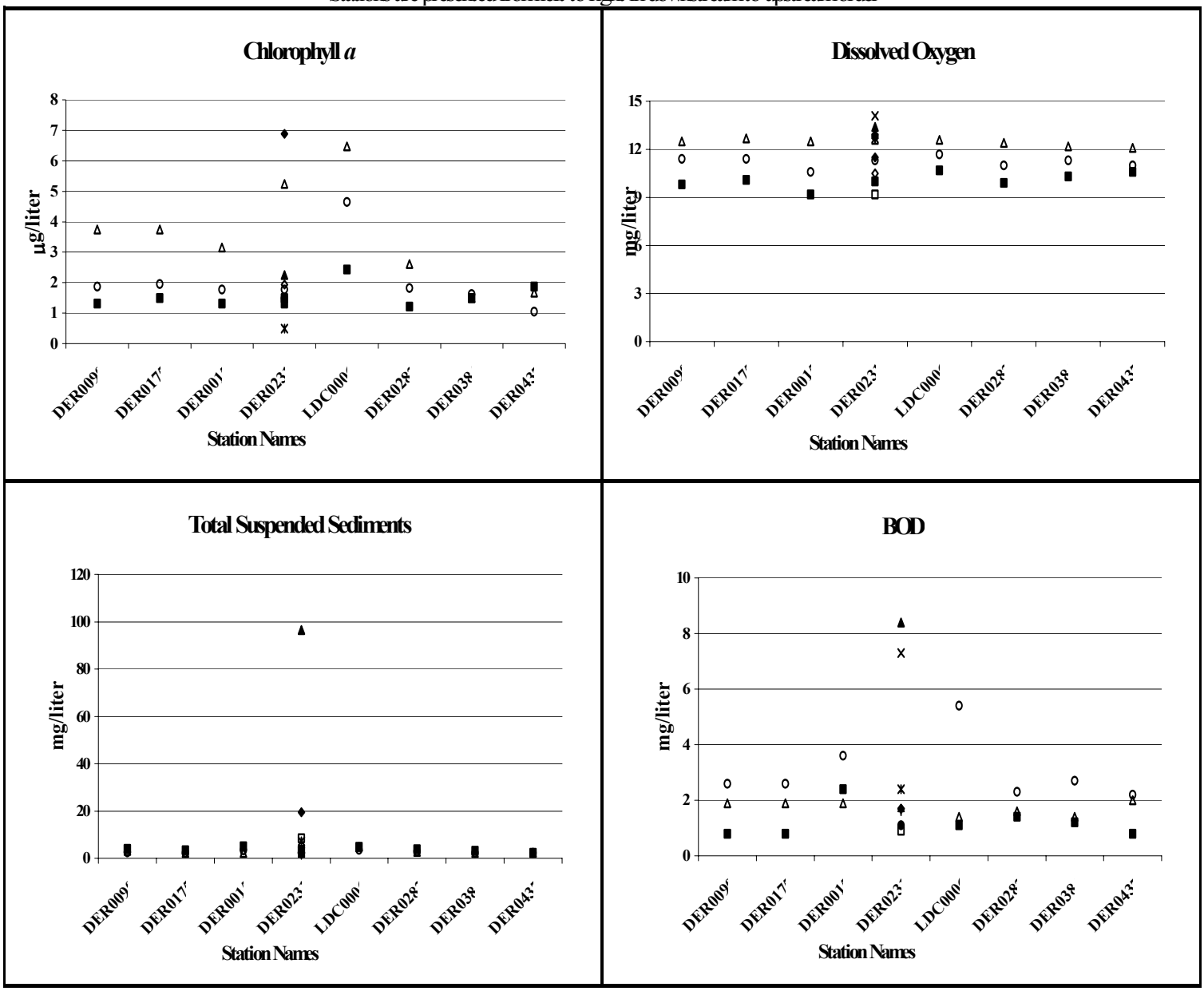
Deer Creek


Deer Creek Monitoring Stations
Maryland 8 Digit Basin Codes
Location of Upper Eastern Shore Watershed
Location of Deer Creek Drainage Basin
DER0437
DER0384
LDC0006
DER0282
DER0231
DER0124
DER0015
XKH681
DER0090
N
W
E
S
MDE Monitoring Stations
Deer Creek
Roads
Watershed 02120202
3 0 3 6 Kilometers
MDE

Deer Creek

High Flow Conditions (December - May)

Stations are presented from left to right in downstream to upstream order



Deer Creek

High Flow Conditions (December - May)

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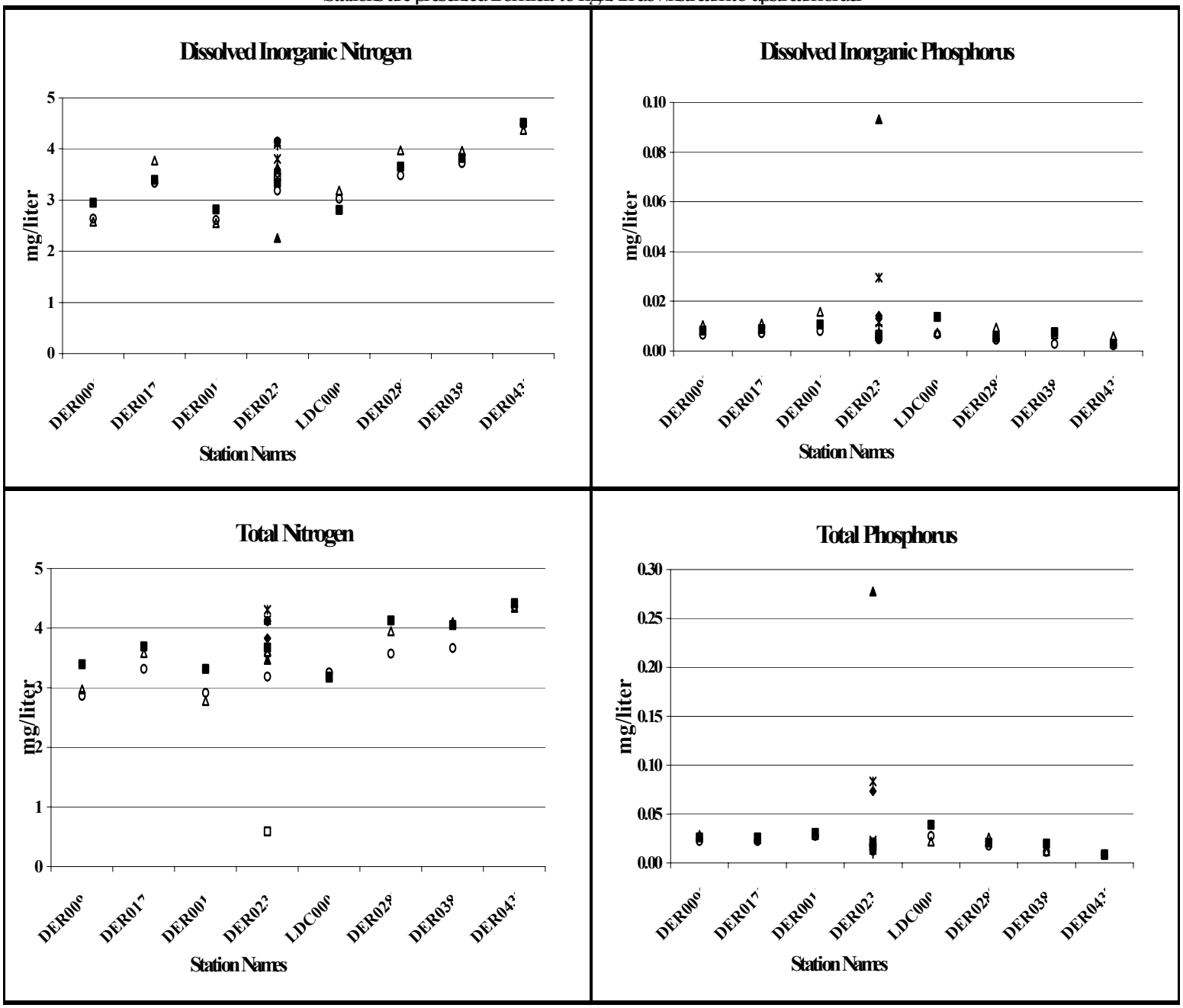

Deer Creek

Low Flow Conditions (June - November)

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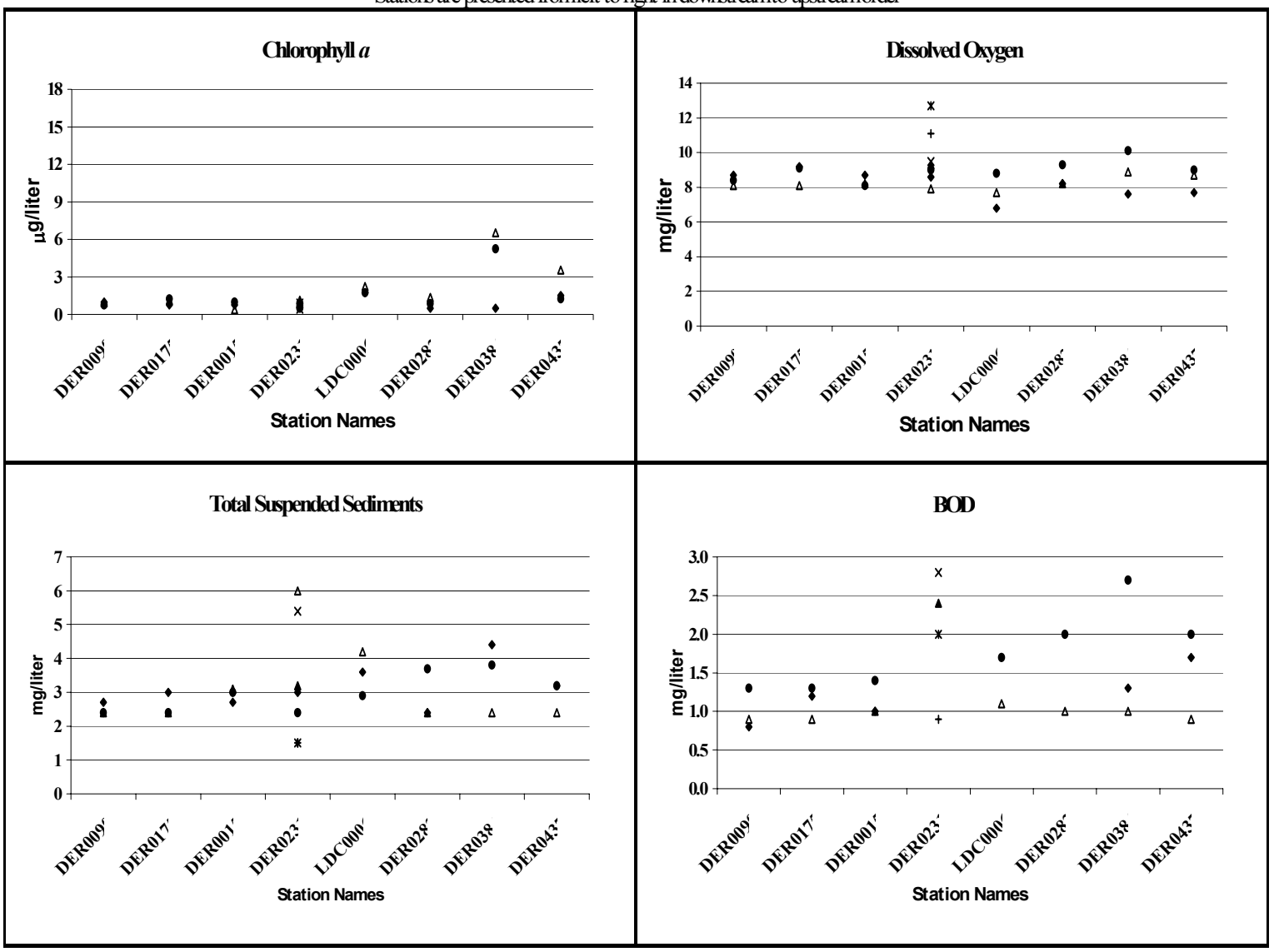

Deer Creek

Low Flow Conditions (June - November)

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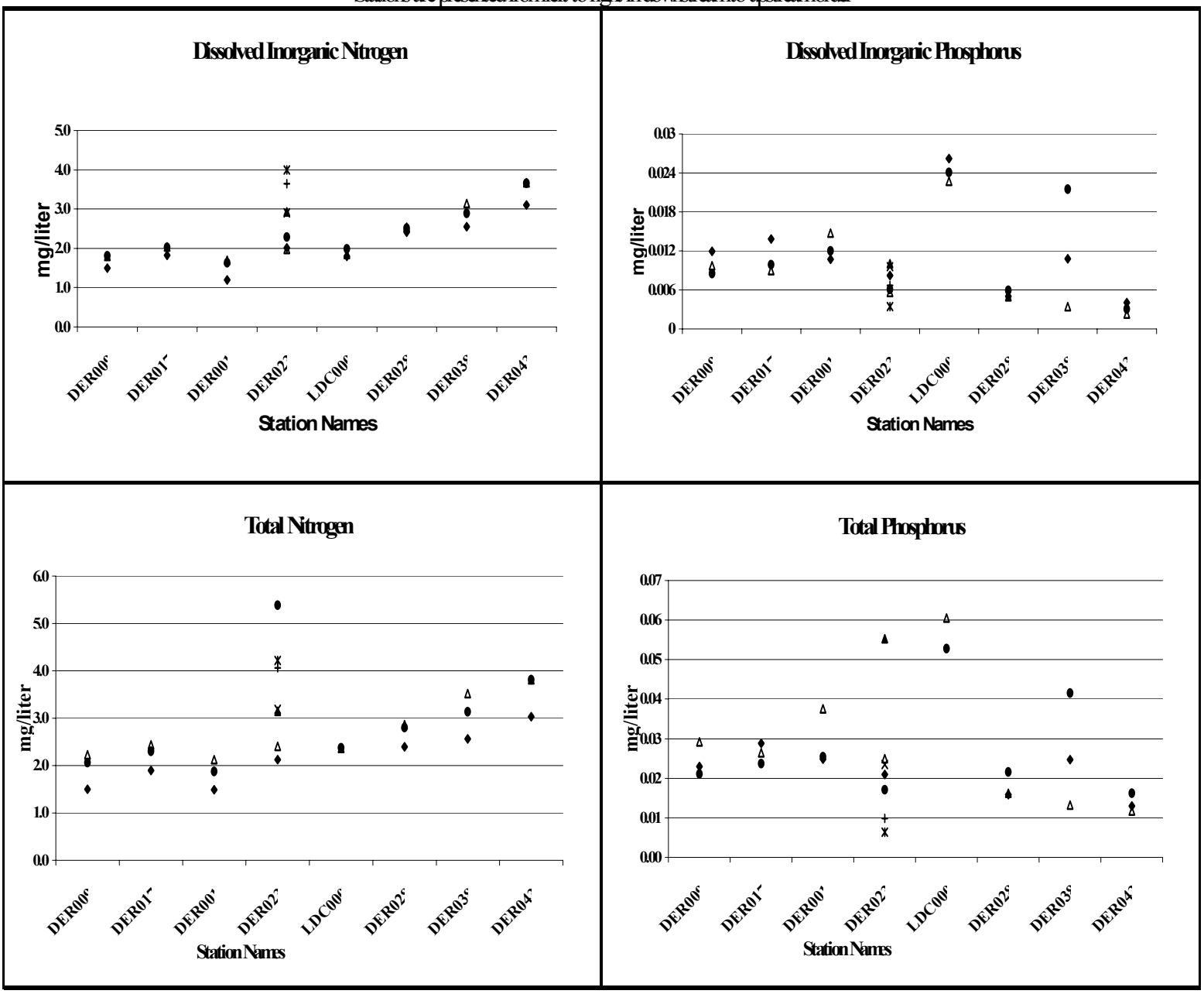
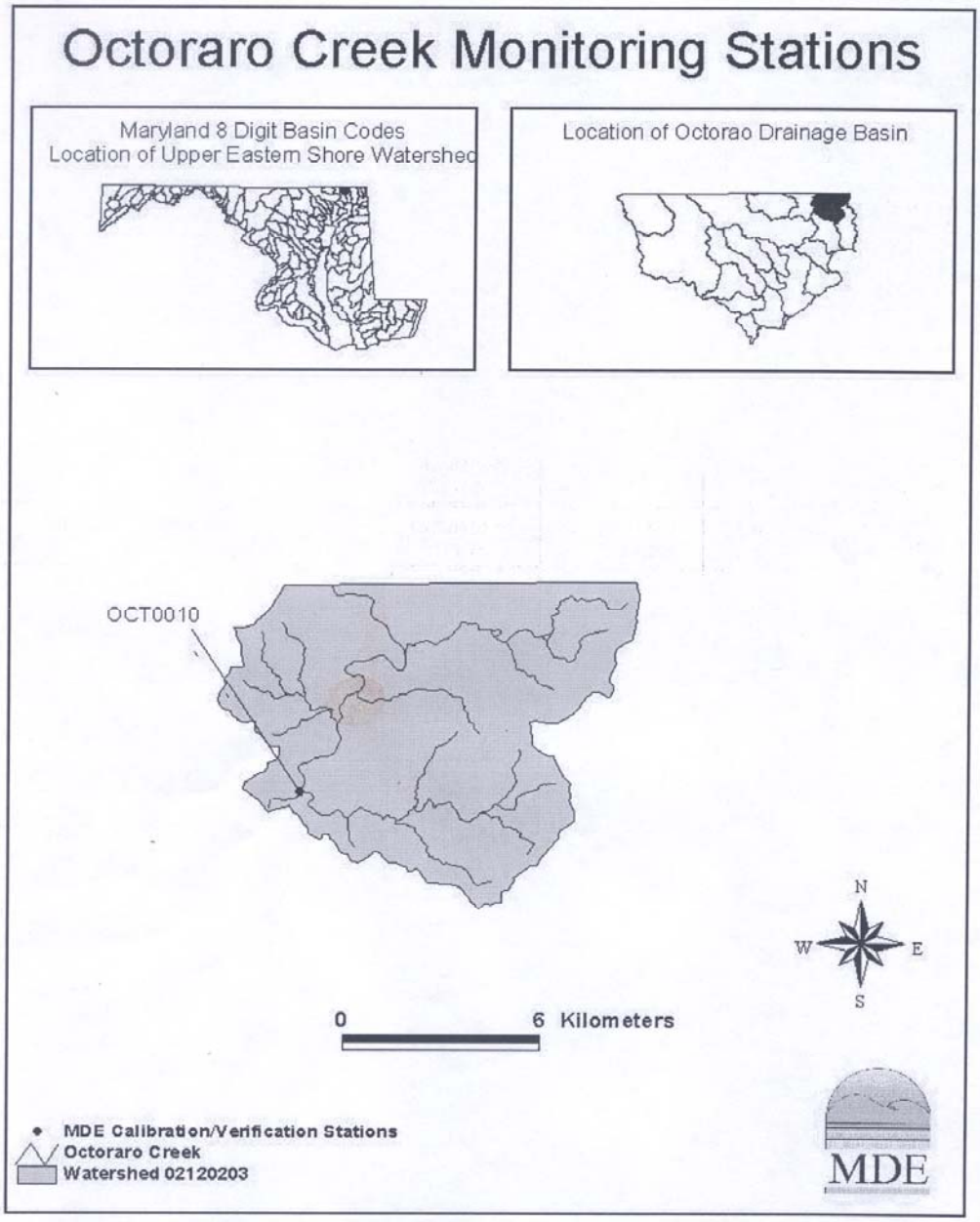


DEER CREEK
STATION LIST

Station Code	Lat/Long	Description
Deer Creek		
DER0015	39 37.364 76 09.861	Bridge crossing on Stafford Road near Susq. State Park.
DER0090	39 36.123 76 15.545	Bridge crossing on Rte 136. Pull down side road and walk down pathway for access.
DER0124	39 37.140 76 19.801	Bridge crossing on Ady Road (Rte 543).
DER0231	39 37.797 76 23.863	Bridge crossing on Cherry Hill Road. USGS is .3 miles upstream on Rocks Rd.
DER0282	39 40.002 76 26.506	Bridge crossing on Rte 165.
DER0384	39 40.537 76 32.270	Bridge crossing on Rte 23.
DER0437	39 42.507 76 36.167	Bridge crossing on Harris Mill Road.
Little Deer Creek		
LDC0006	39 39.767 76 26.897	Bridge crossing on Rte 165.

Octoraro Creek



Octoraro Creek

High Flow Conditions (December - May)

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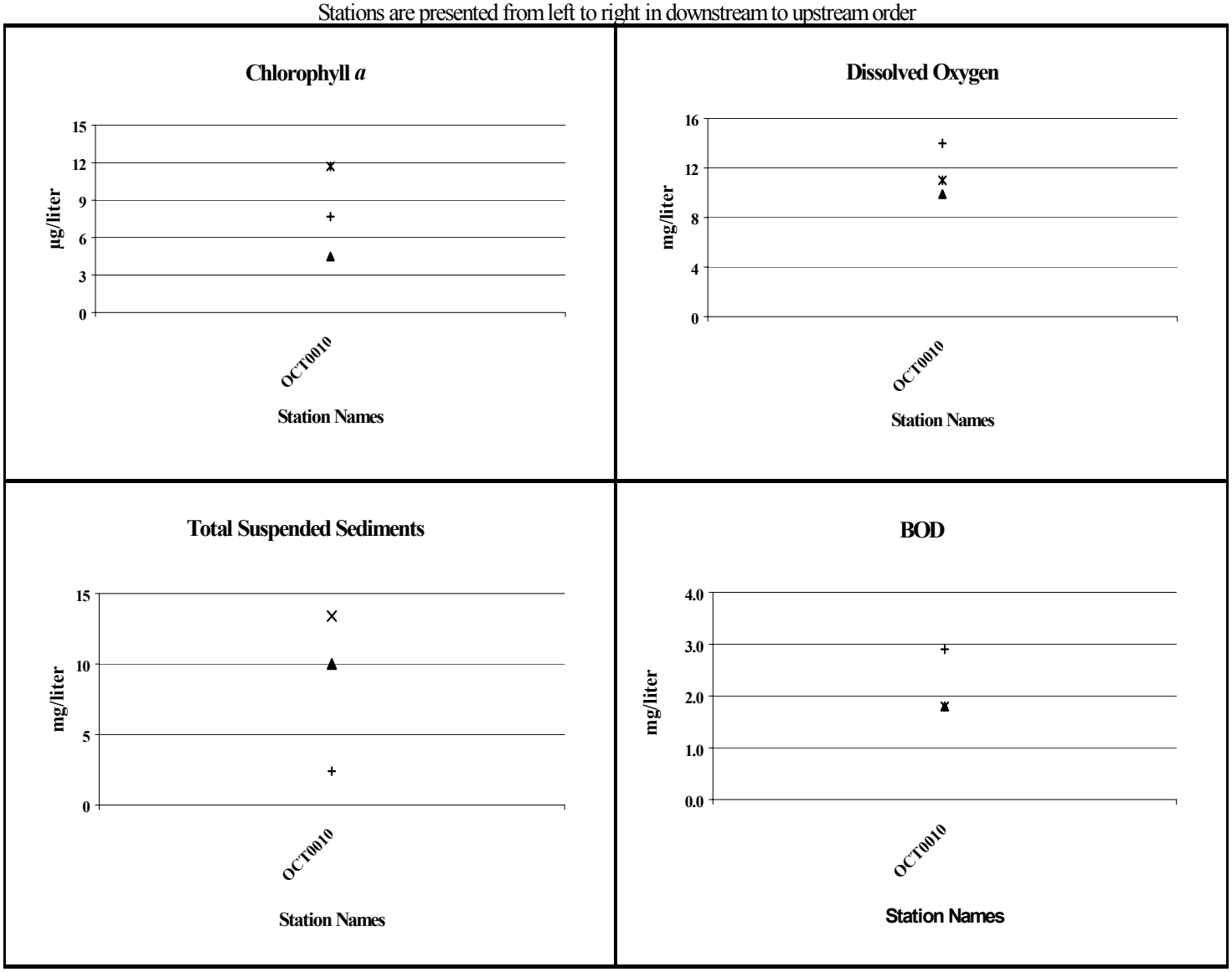

Octoraro Creek

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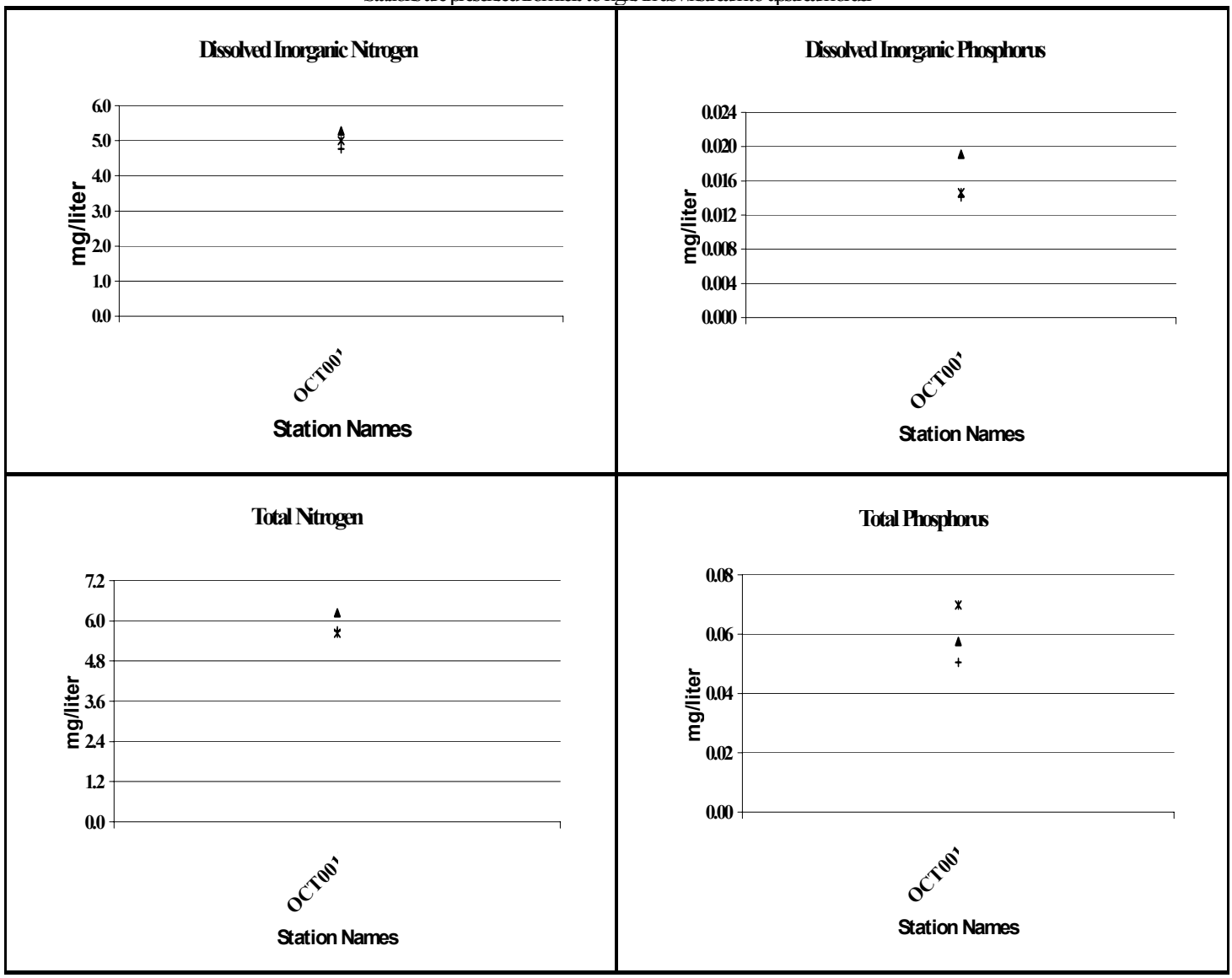

Octoraro Creek

Low Flow Conditions (June - November)

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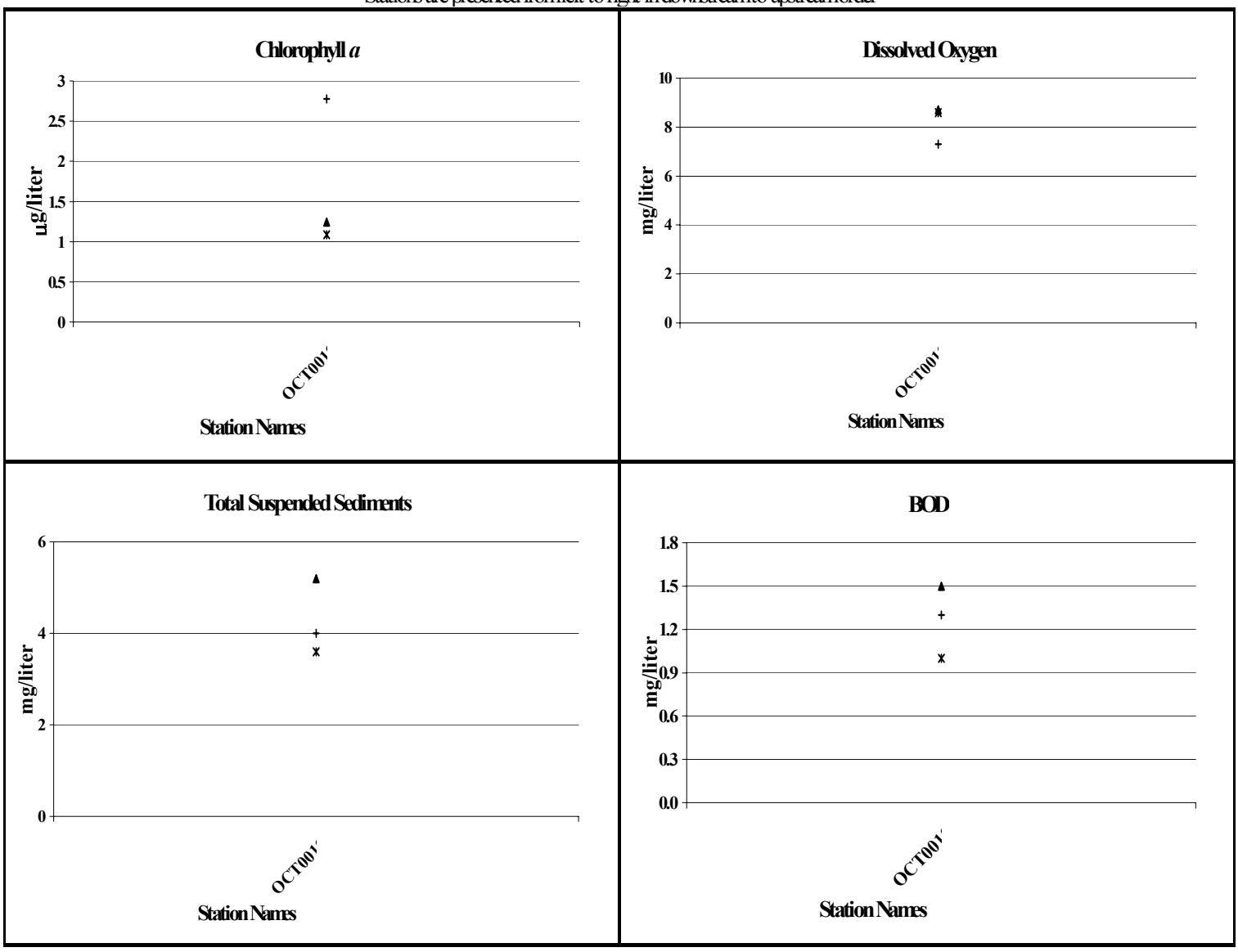

+ 20-Jul-99 x 17-Aug-99 ▲ 14-Sep-99

Octoraro Creek

Low Flow Conditions (June - November)

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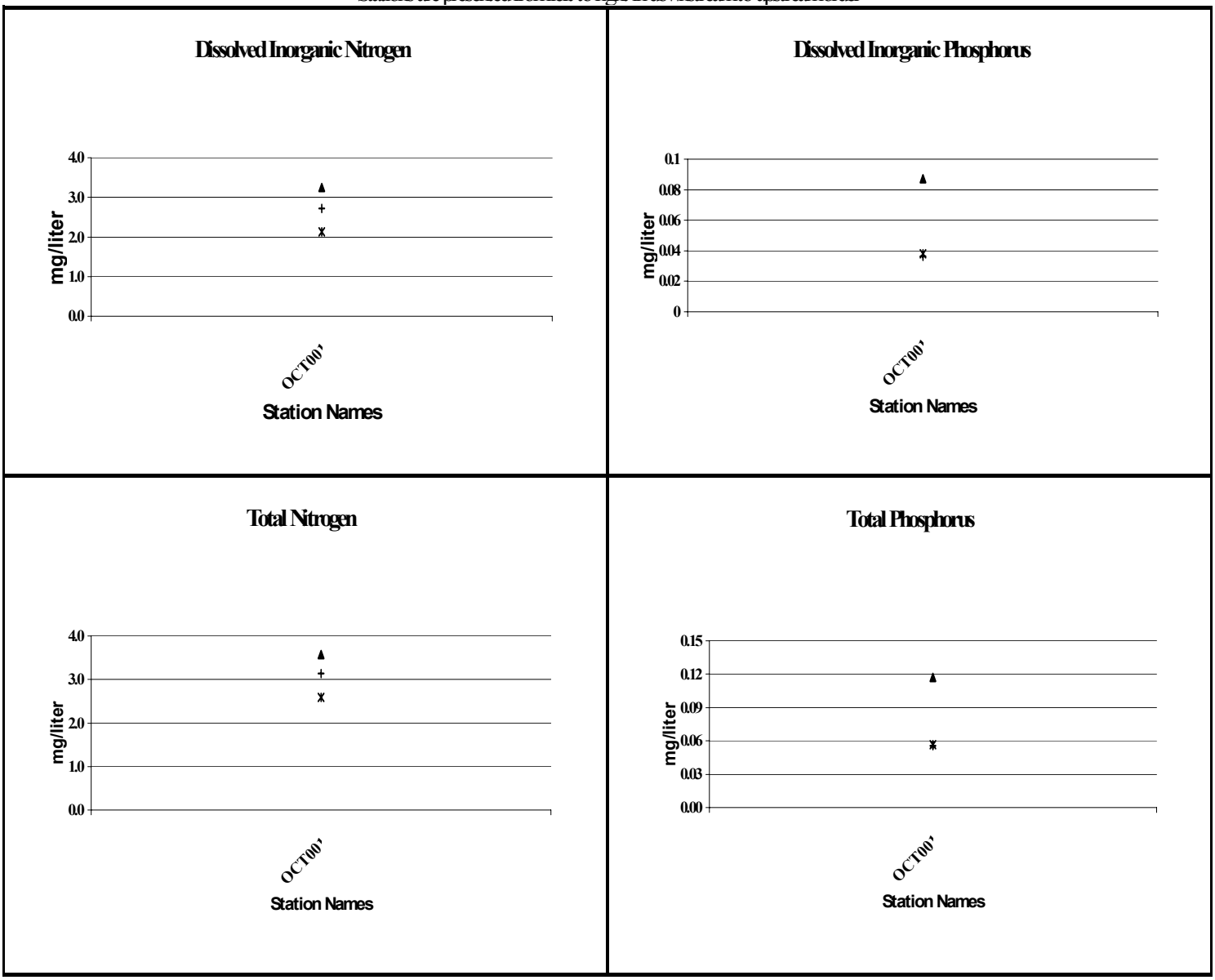
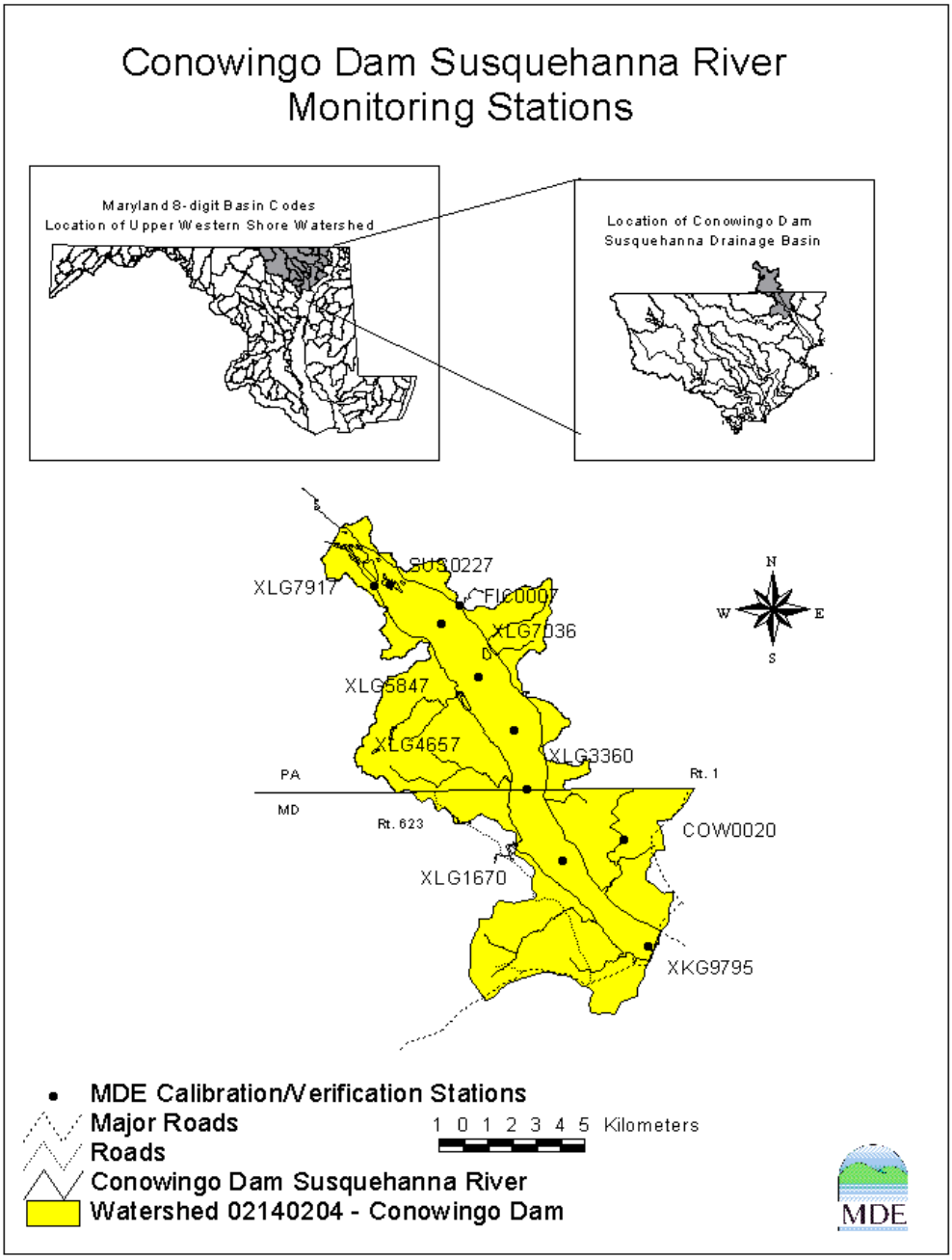


+ 20-Jul-99 x 17-Aug-99 ▲ 14-Sep-99

OCTORARO CREEK
1999 TMDL
STATION LIST

Station Code	Lat/Long	Description
Octoraro Creek		
OCT0010 * (LS-8)	39 39.706 76 08.853	Bridge crossing on Dr. Jack Road.

Conowingo Dam/Reservoir Susquehanna River



Conowingo Dam Susquehanna River (main)

High Flow Conditions (December - May)

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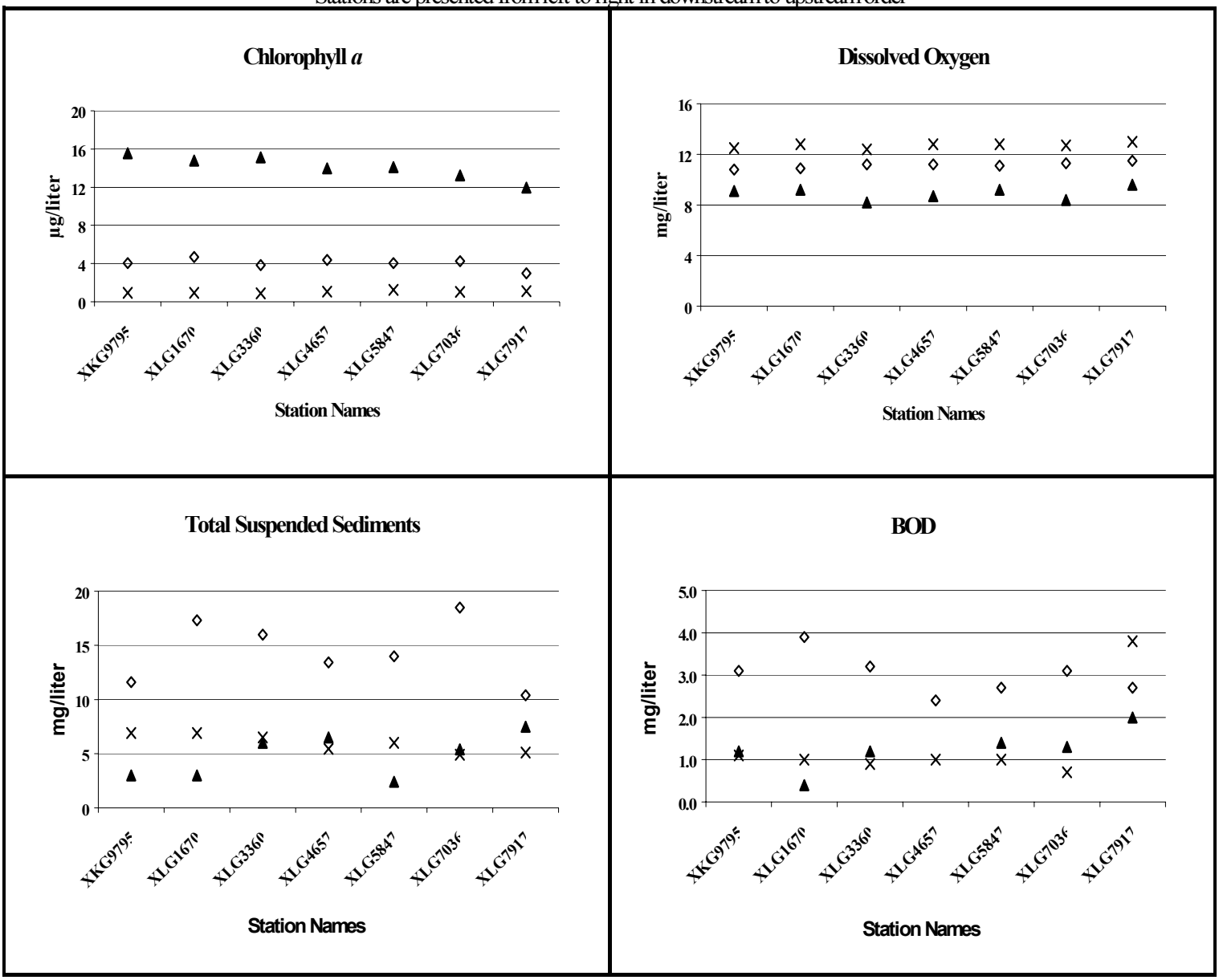

Conowingo Dam Susquehanna River (main)

High Flow Conditions (December - May)

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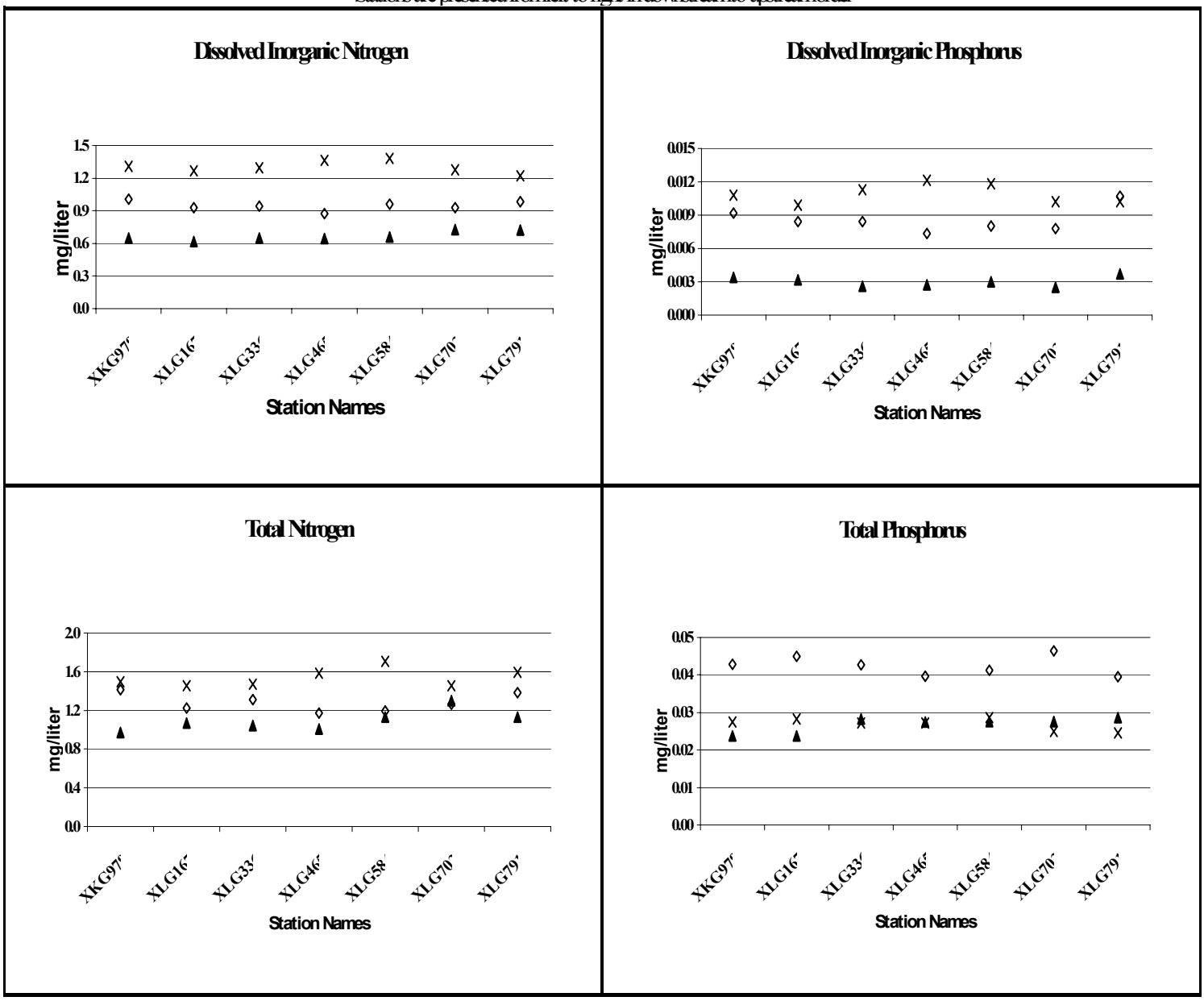
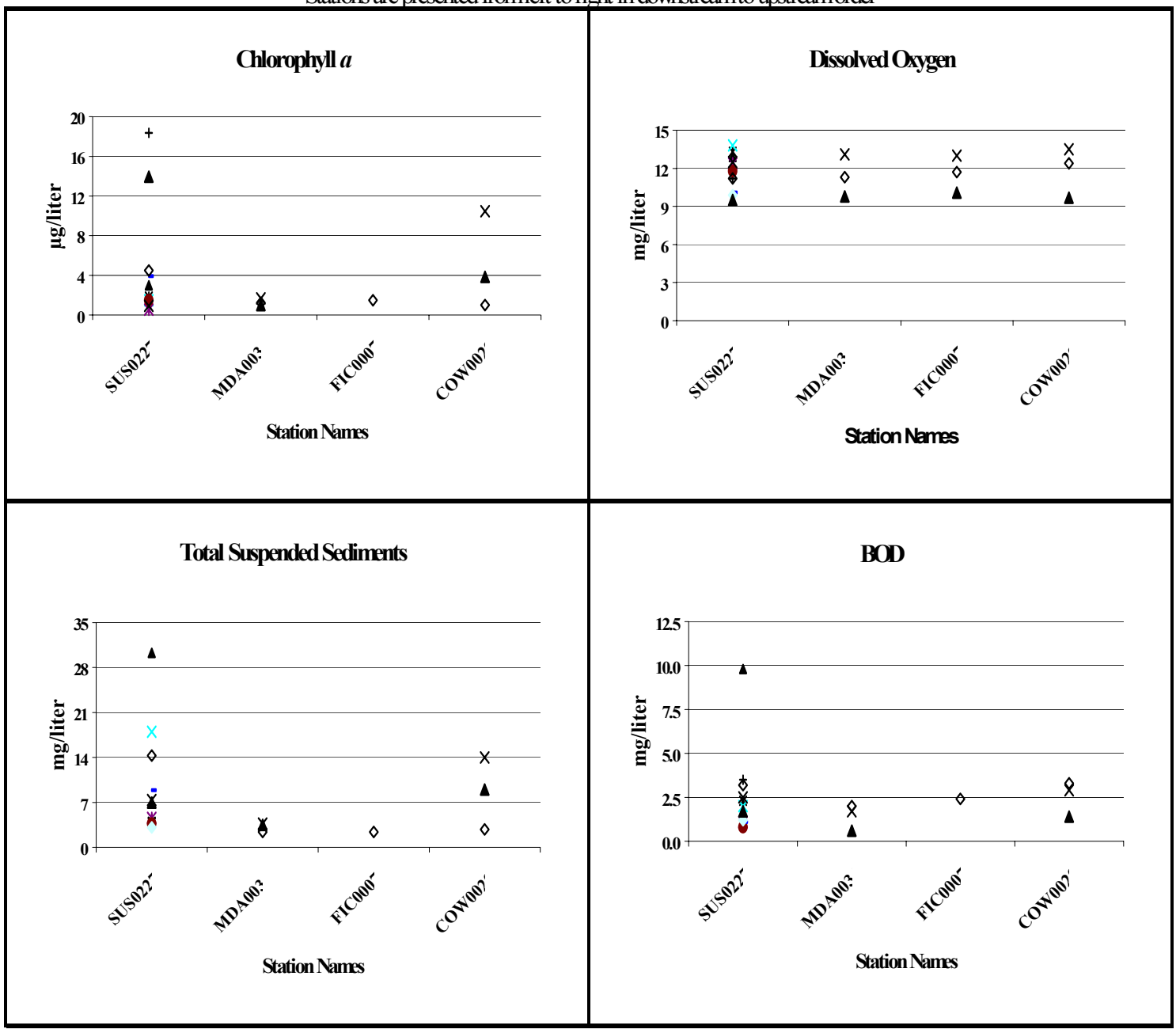


Conowingo Dam Susquehanna River (tributaries)

High Flow Conditions (December - May)

Stations are presented from left to right in downstream to upstream order



Conowingo Dam Susquehanna River (tributaries)

High Flow Conditions (December - May)

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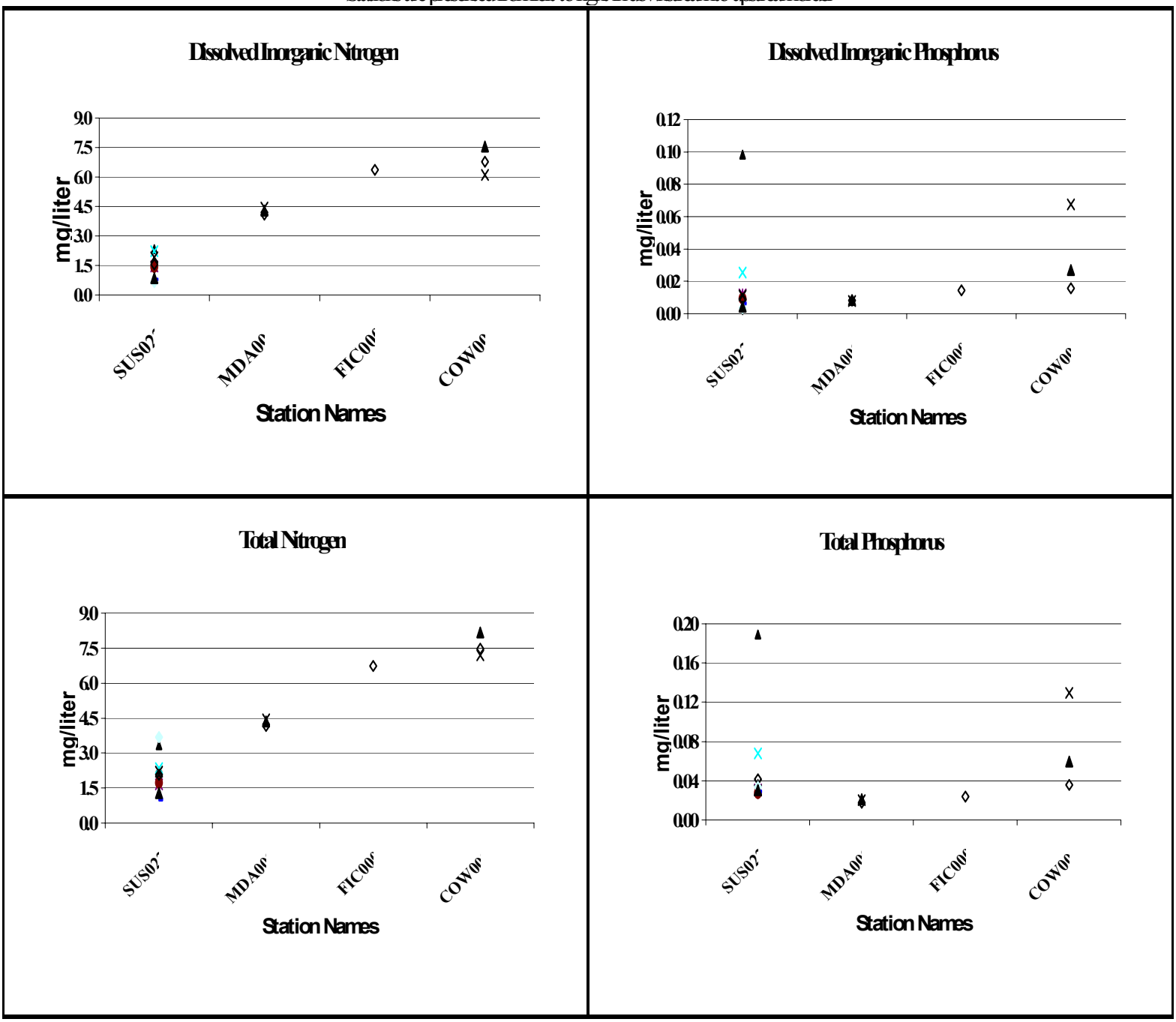


CONOWINGO DAM SUSQUEHANA RIVER
STATION LIST

Station Code	Lat/Long	Description
Susquehanna River (above Conowingo Dam)		
SUS0227	39 48.302 76 17.629	Go to left after tunnel. At "no boat launch" sign, take dirt road. Sample from bank.
XLG7036	39 47.038 76 16.364	Above Peach Bottom –
XLG5847	39 45.818 76 15.350	Off Peach Bottom –
XLG4657	39 44.622 76 14.350	Below Peach Bottom -.
XLG3360	39 43.277 76 13.991	Off Michael Run –
XLG1670	39 41.649 76 12.971	Below State line –
XKG9795	39 39.881 76 10.867	Near Conowingo Dam –
XLG7917	39 47.900 76 18.299	Muddy Creek boat launch. Sampled during high flow surveys only.
Muddy Creek		
MDA0034	39 46 389 76 18.964	Paper Mill Road crossing.
Fishing Creek		
FIC0007	39 47.655 76 15.579	Harmony Ridge Road crossing.
Conowingo Creek		
COW0020	39 42.103 76 11.367	Old Conowingo Road crossing.

Bush River Basin

Bush River

Lower Winters Run

Atkisson Reservoir

Bynum Run

Aberdeen Proving Ground

Swan Creek (Low flow only)

Bush River Sub-Basin
(Sub-basin 02-13-07)

General Description (from 1998 305 (b) Report)
The Bush River sub-basin drains about 195 square miles of Harford County. The northern two-thirds of this sub-basin lies within the Piedmont Province while the southern portion lies in the Atlantic Coastal Plain. Major water bodies include Bush River, Swan Creek, Romney Creek, Bynum Run, Winters Run and Atkisson Reservoir. Atkisson Reservoir is federally-owned; the only significant, public lake in the watershed is Edgewater Village Lake. Streams above the Fall Line generally flow rapidly. Within the lower sub-basin, surface waters meander sluggishly through a system of tidal and generally fresh water wetlands toward the Chesapeake Bay.

Land in the Bush River watershed is approximately one-third forest (36 percent), slightly less than one-third developed land (30 percent), and about one-quarter agricultural areas (27 percent). Major developed areas include the US Army's Aberdeen Proving Ground, the suburban area between Edgewood and Aberdeen along the US 40/Route 7 corridor, and the Town of Bel Air along US Route 1 in the upper sub-basin.

Surface waters are classified as Use I (water contact recreation and aquatic life), Use II (shellfish harvesting), Use III (natural trout) and, in Winters Run area, Use I-P (water contact recreation, aquatic life and public water supply) or Use IV-P (put-and-take trout and public water supply) (COMAR '26.08.02.08H). For the most recent information regarding specific use classes in this watershed, the reader is referred to the Code of Maryland Regulations.

Gashey's Run, a Swan Creek tributary between Havre de Grace and Aberdeen, was declared a critical habitat for the endangered Maryland darter in 1984 by the US Fish and Wildlife Service. This designation requires that projects in this watershed that need federal permits or funding must show that the habitat for the darter will not be degraded.

Use II (shellfish harvesting) waters in this basin are technically restricted because only minimal monitoring is being done due to the lack of a commercially harvestable resource.

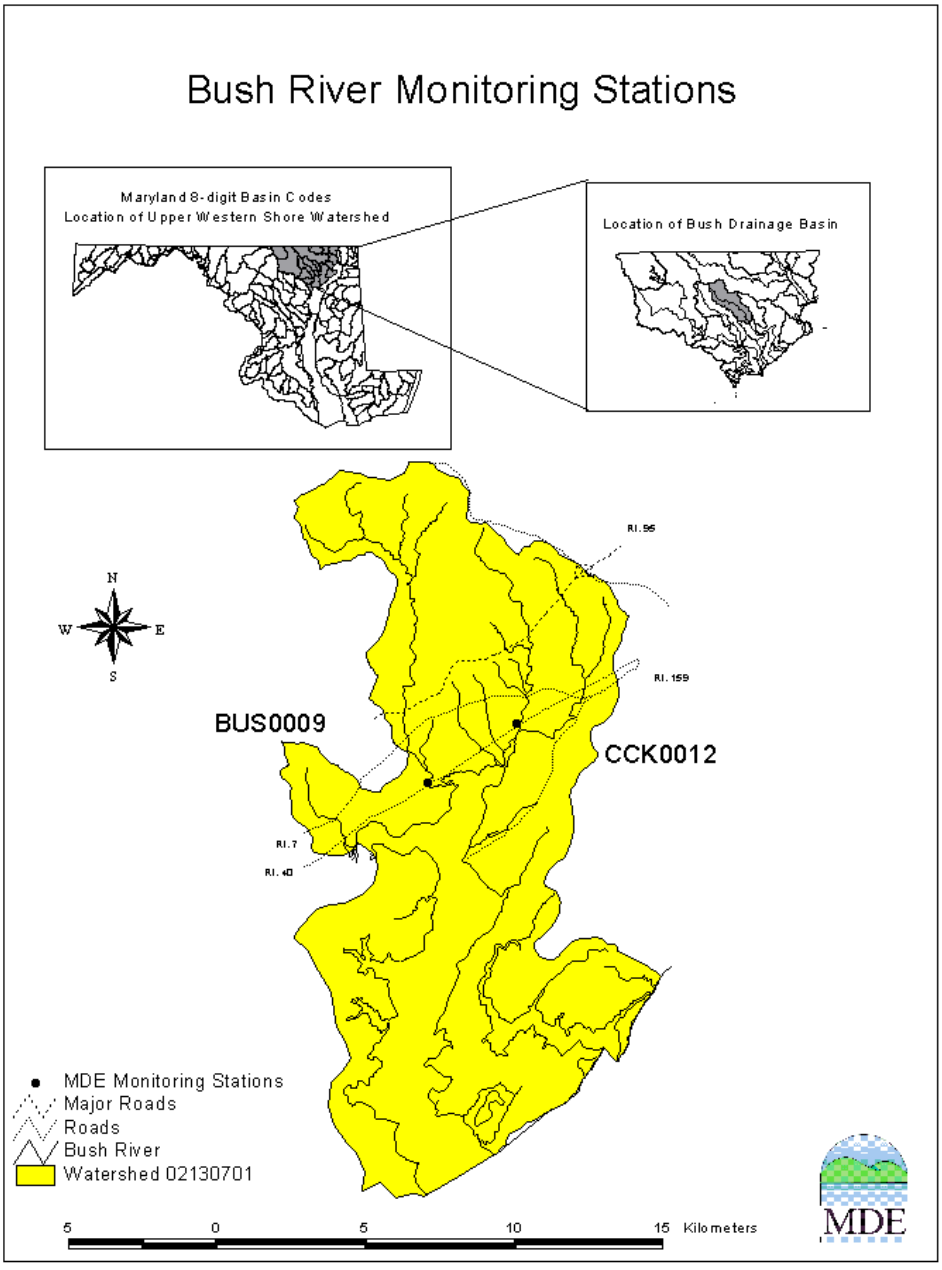
Otter Point Creek has been designated as a component of the Chesapeake Bay National Estuarine Research Reserve in Maryland. A total of 261 acres of open water and 672 acres of adjoining wetlands and uplands are protected for long-term estuarine research and monitoring and for estuarine education.

The State routinely monitors surface water quality in the Bush River sub-basin at one Bay Tributary station in the tidal Bush River. The Maryland Biological Stream Survey (MBSS) collected water quality samples from 20 stations in the watershed in 1996.

Water Quality Summary

TMDLs to address nutrient impairments in the Bush River (02120701), Atkisson Reservoir (02130702), and the Aberdeen Proving Ground watersheds (02130704) will be developed following completion of the Chesapeake Bay Program (CBP) Phase V Watershed and Water Quality Model. It is expected that the model will be completed in approximately three years. The nutrient impairment to water quality in Lower Winters Run (02130702) will be addressed at a future date. A TMDL to address the nutrient impairment in Swan Creek (02130705) was developed by MDE and approved by the EPA on March 27, 2002. A Water Quality Analyses indicating no nutrient impairments in Bynum Run (02130703) was submitted to the EPA on August 29, 2006.

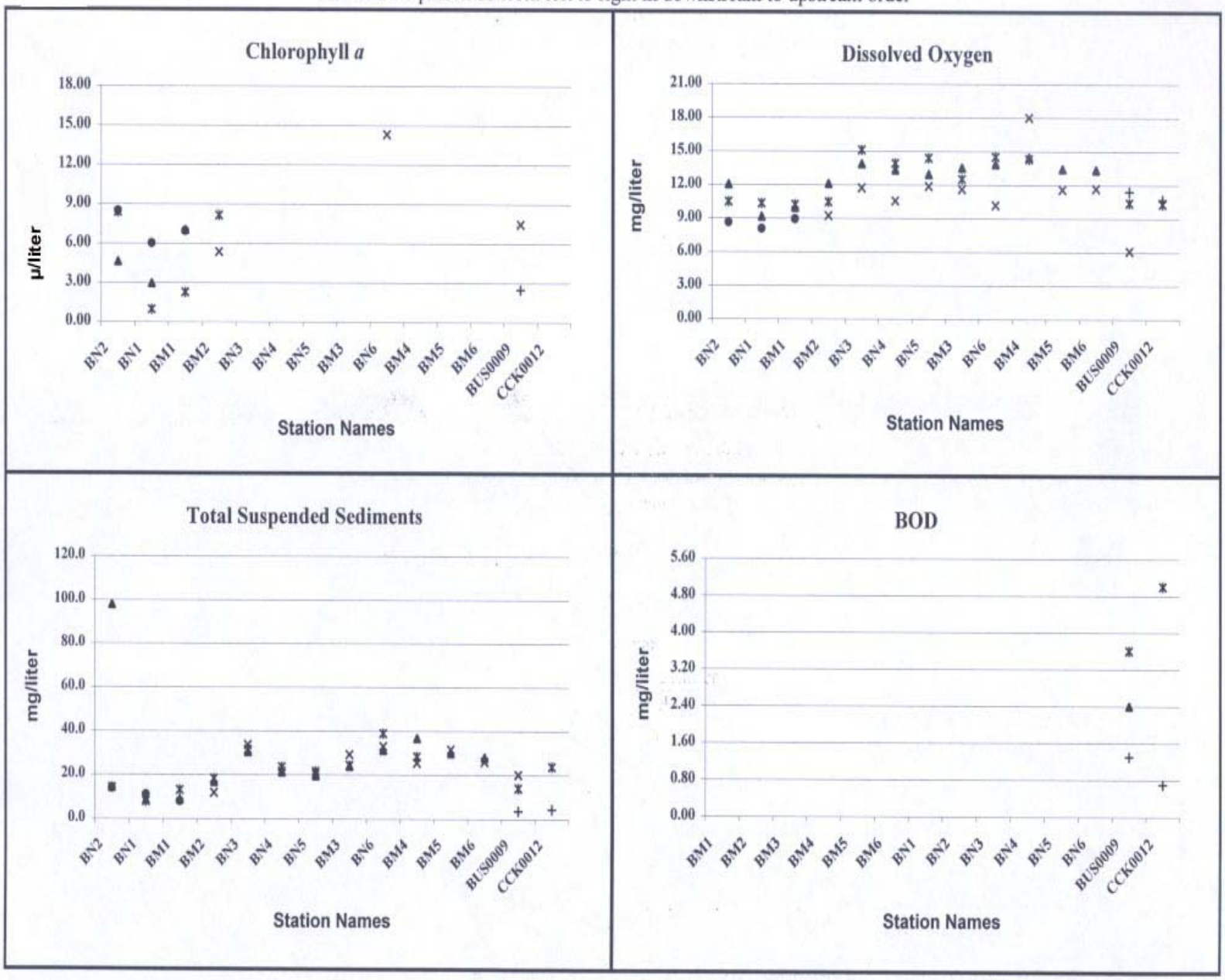
Bush River


Bush River Monitoring Stations
Maryland 8-digit Basin Codes
Location of Upper Western Shore Watershed
Location of Bush Drainage Basin
N
W
E
S
BUS0009
CCK0012
MDE Monitoring Stations
Major Roads
Roads
Bush River
Watershed 02130701
5
0
5
10
15 Kilometers
MDE

Bush River

High Flow Conditions (December - May)

Stations are presented from left to right in downstream to upstream order



Bush River

High Flow Conditions (December - May)

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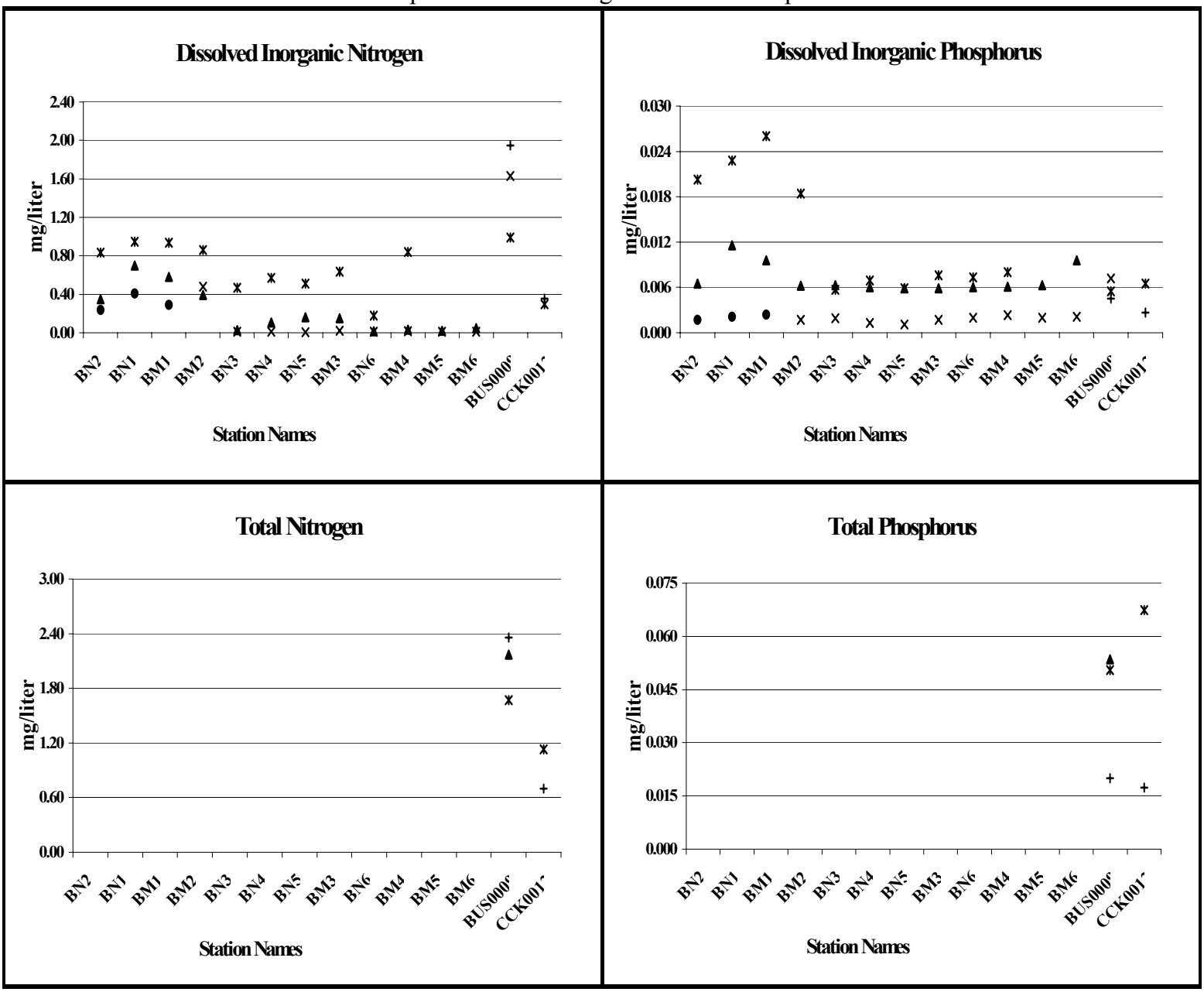
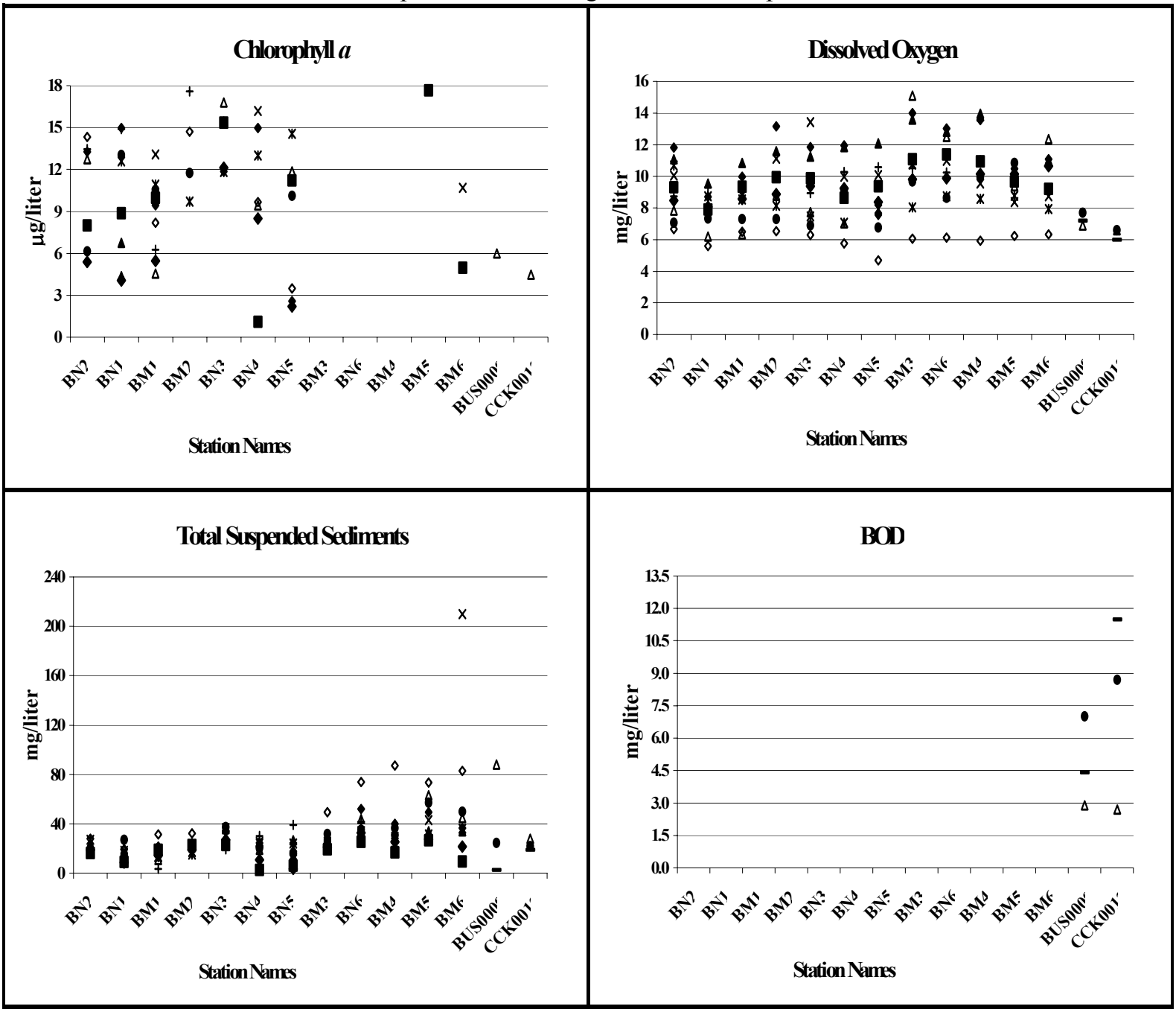


Bush River

Low Flow Conditions (June - November)

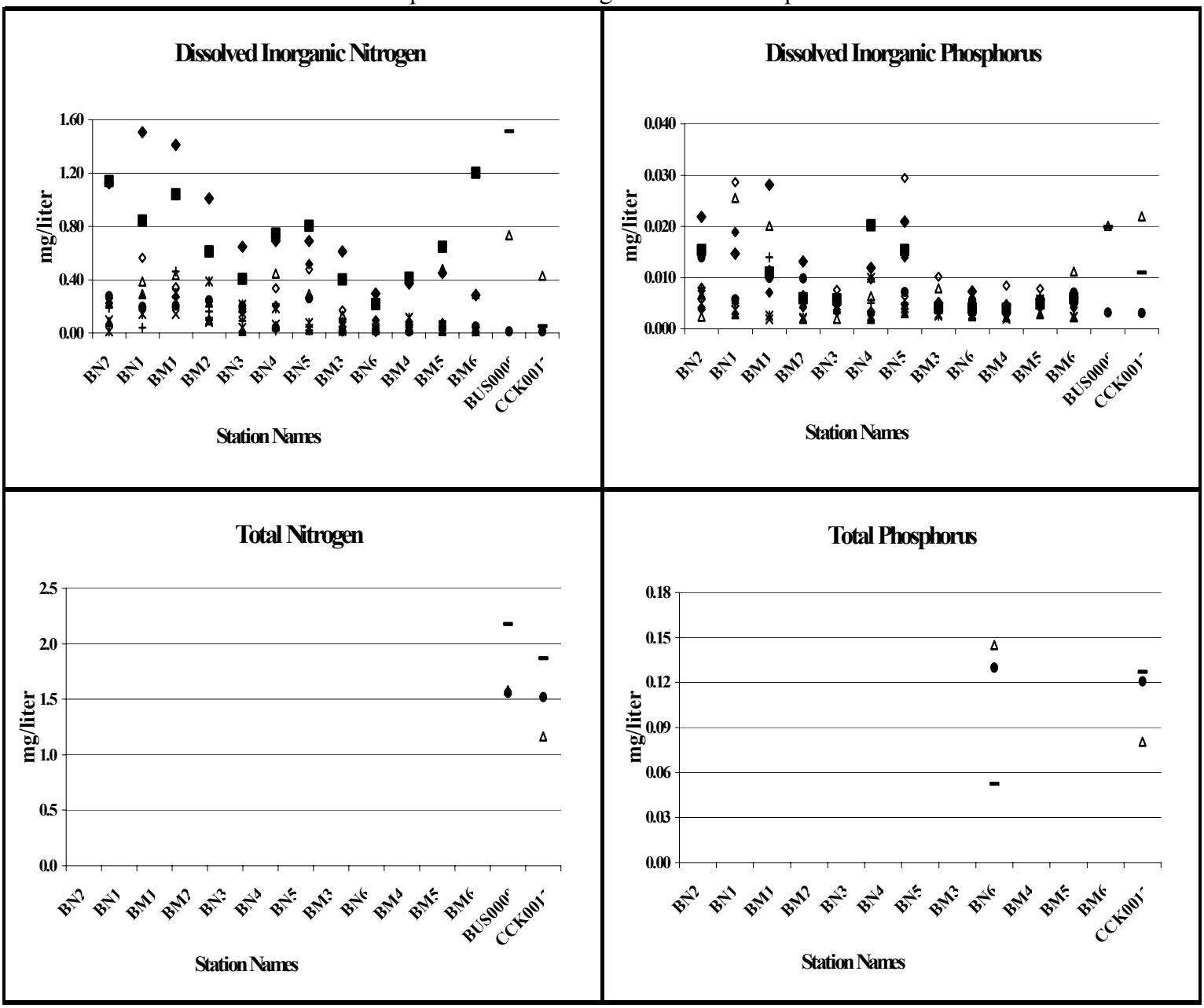
Stations are presented from left to right in downstream to upstream order



Bush River

Low Flow Conditions (June - November)

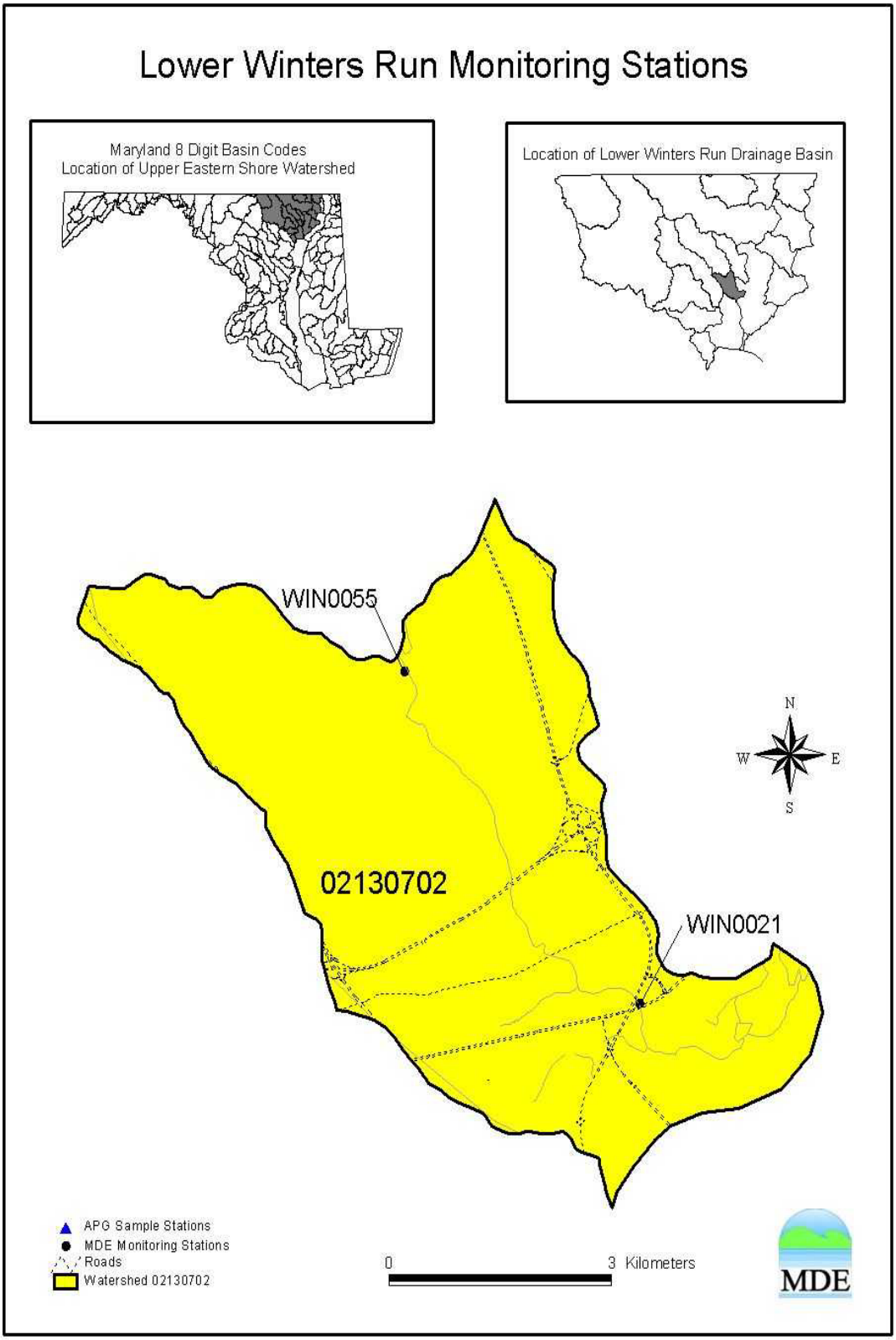
Stations are presented from left to right in downstream to upstream order



BUSH RIVER
STATION LIST

Station Code	Lat/Long	Description
Church Creek		
CCK0012	39 28.795 76 13.079	Rte 40 (Pulaski Highway) and Church Creek crossing.
Bush Creek		
BUS0009	39 27.733 76 15.142	Rte 40 and Bush Creek crossing.

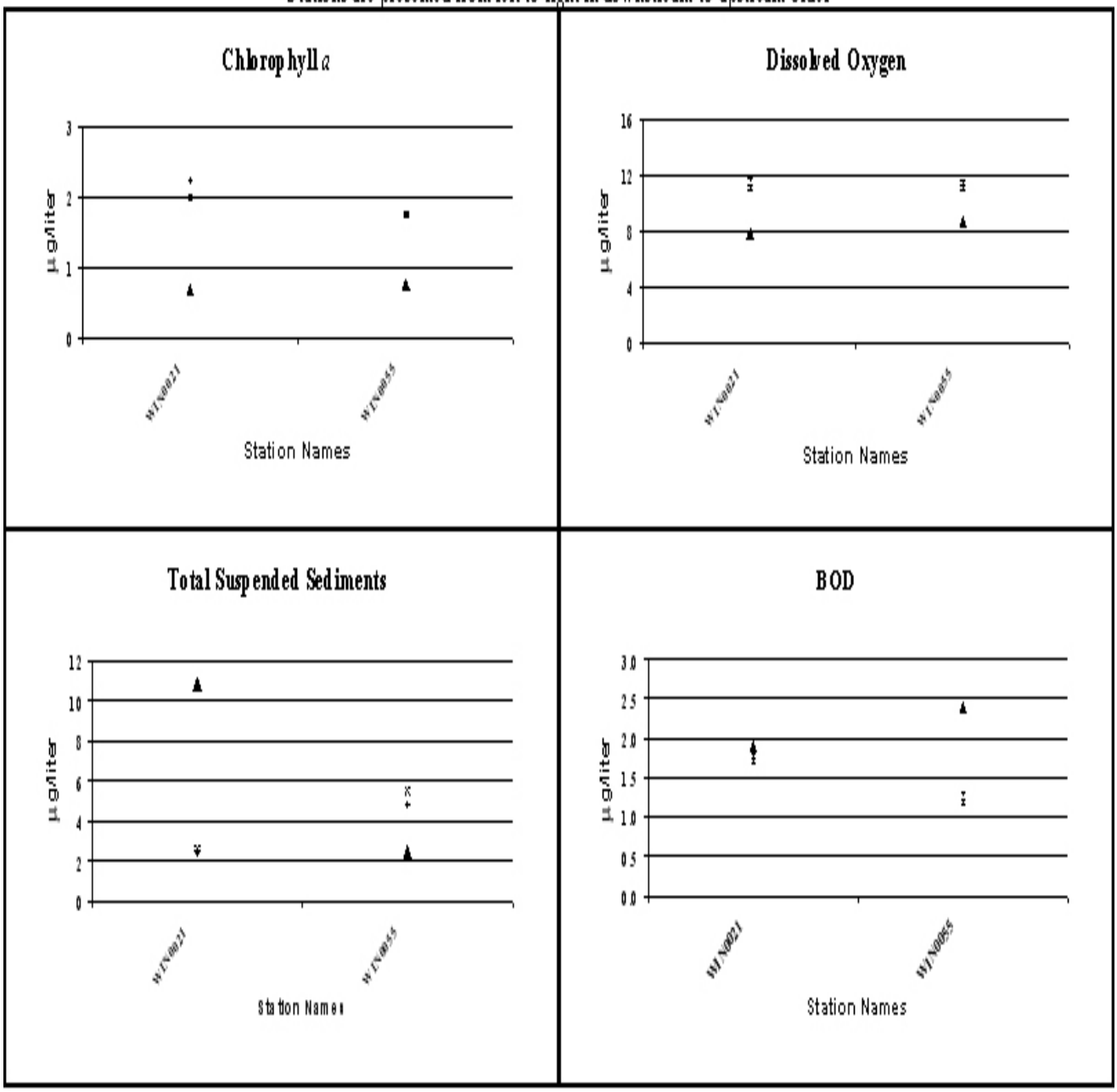
Lower Winters Run



Lower Winters Run

High Flow Conditions (December - May)

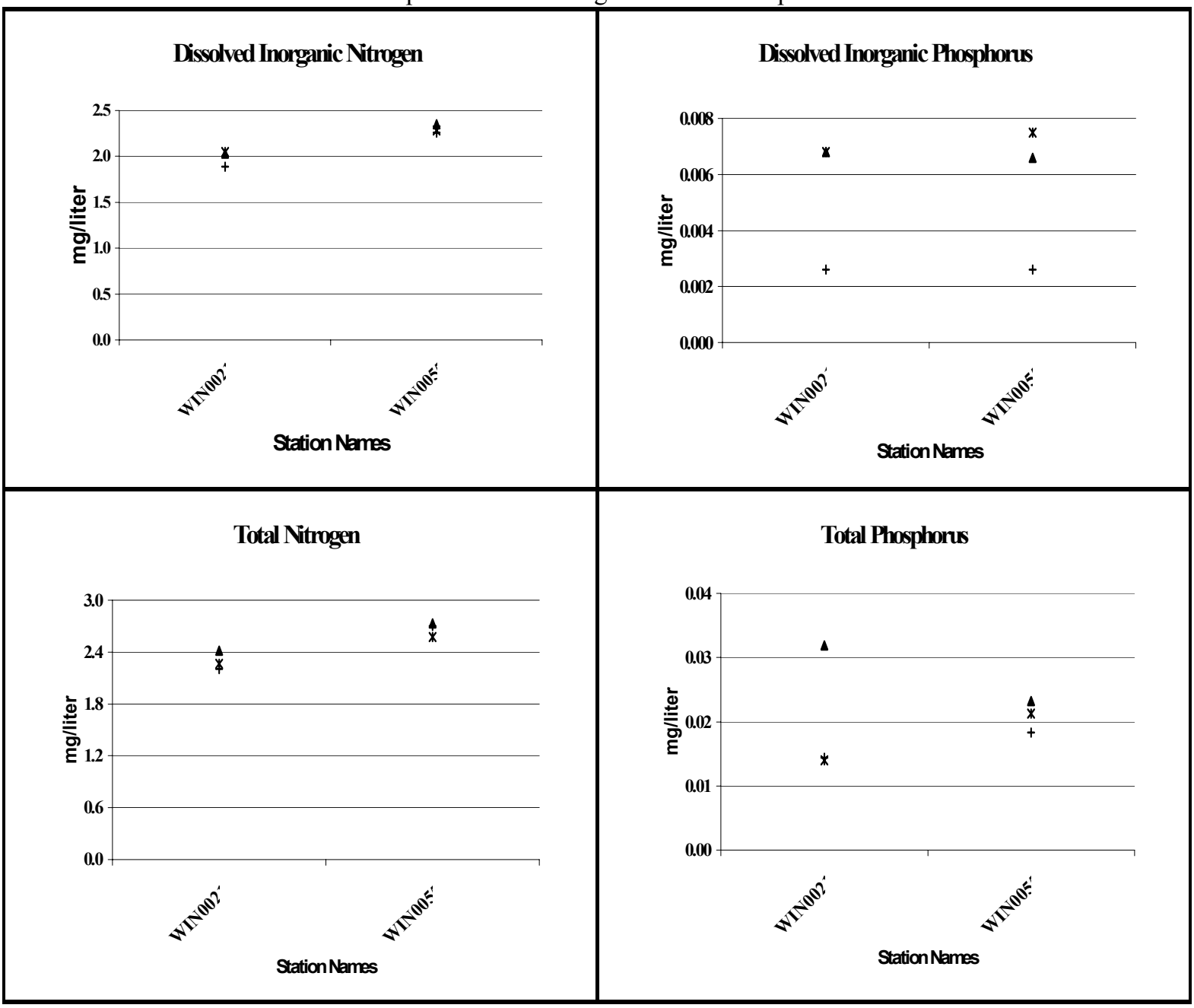
Stations are presented from left to right in downstream to upstream order



Lower Winters Run

High Flow Conditions (December - May)

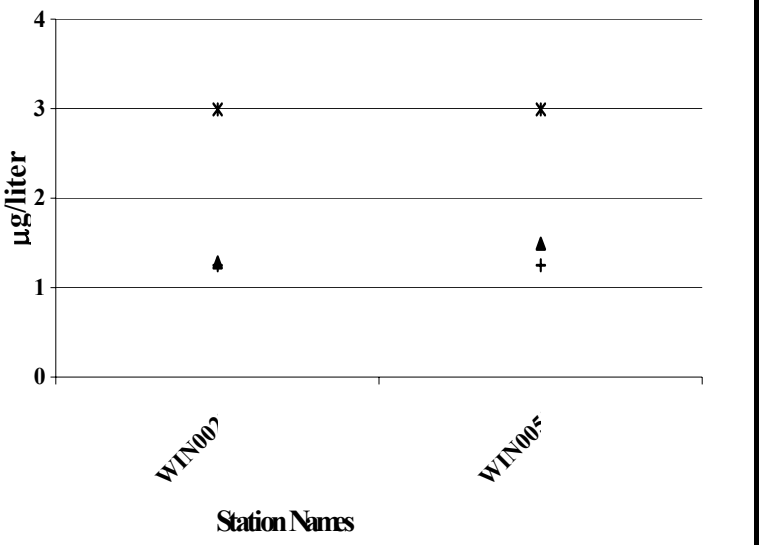
Stations are presented from left to right in downstream to upstream order

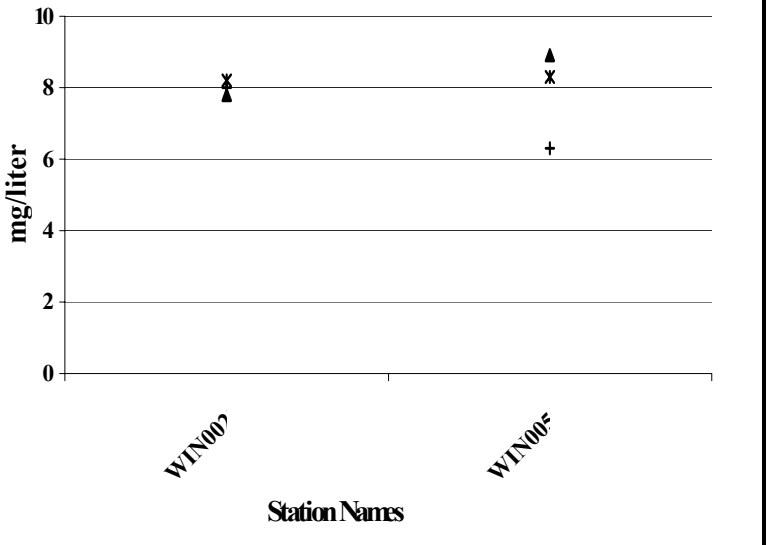


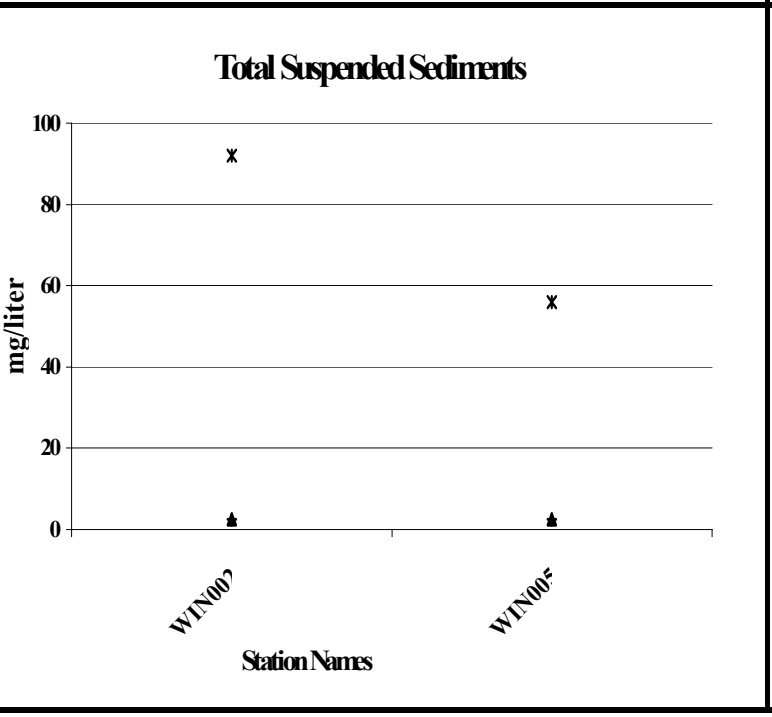
Lower Winters Run

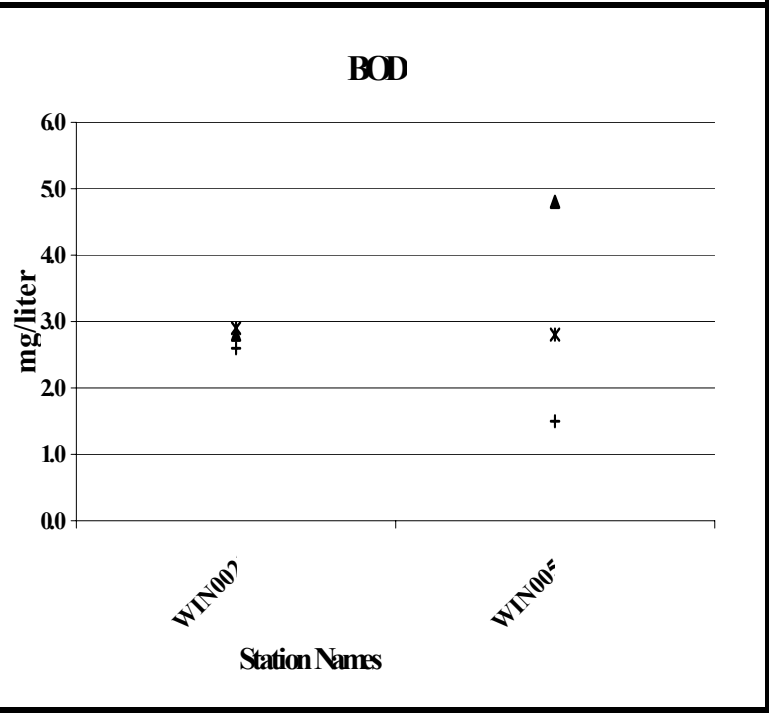
Low Flow Conditions (June - November)

Stations are presented from left to right in downstream to upstream order







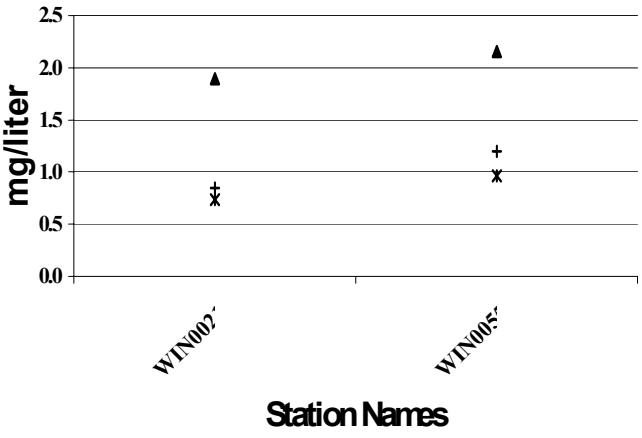


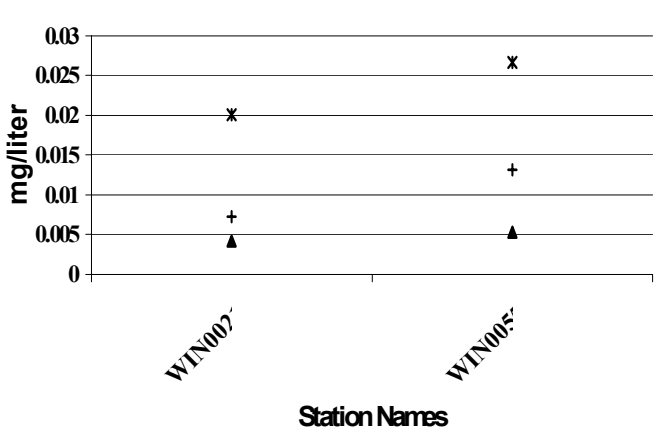
+ 28-Jul-99 x 26-Aug-99 ▲ 29-Sep-99

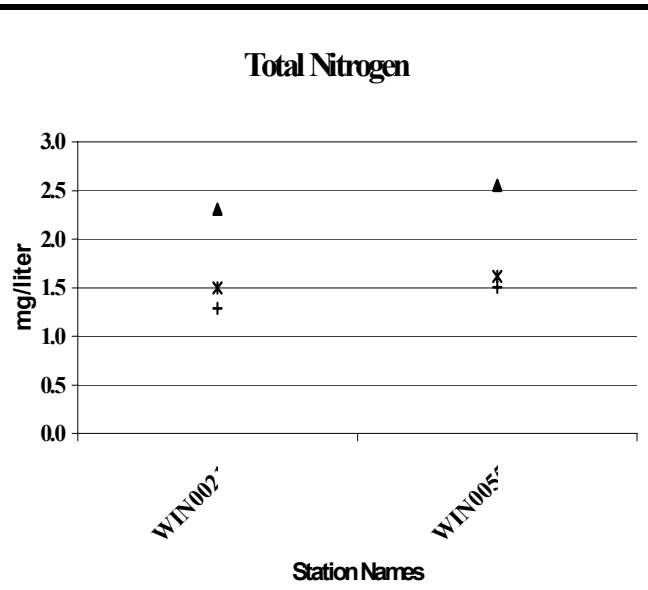
Lower Winters Run

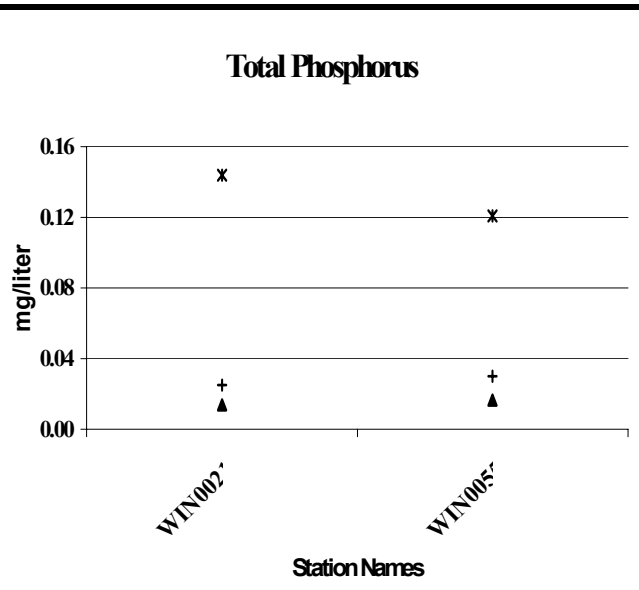
Low Flow Conditions (June - November)

Stations are presented from left to right in downstream to upstream order







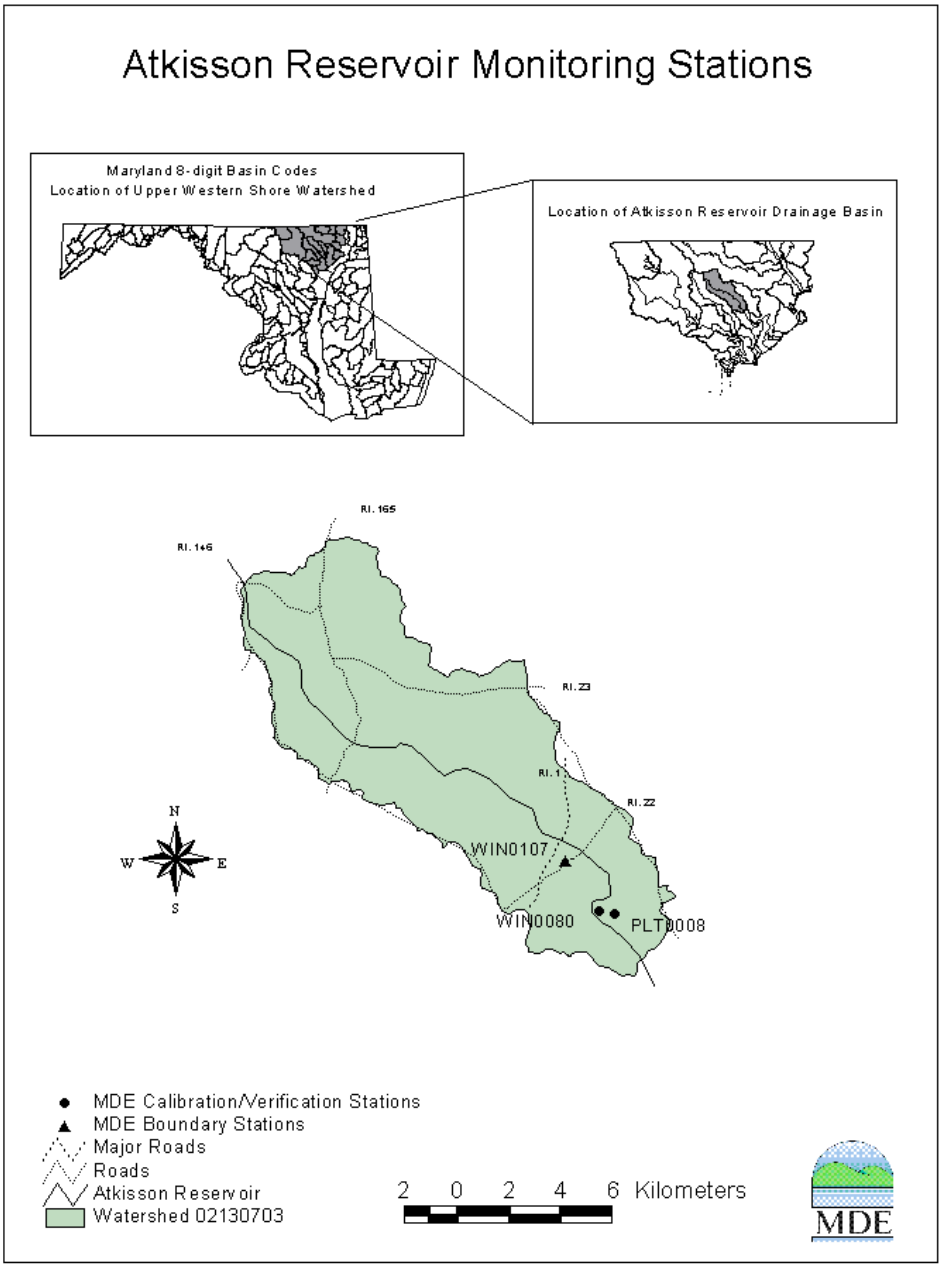


+ 28-Jul-99 x 26-Aug-99 ▲ 29-Sep-99

WINTERS RUN
STATION LIST

Station Code	Lat/Long	Description
Winters Run		
WIN0021	39 26.270 76 18.069	Route 40 and Otter Point Creek crossing. Note: all bridges on Rt. 40 have very high rails.
WIN0055	39 28.460 76 20.244	Singer Road crossing. Park on Winters Run Rd. and walk up.

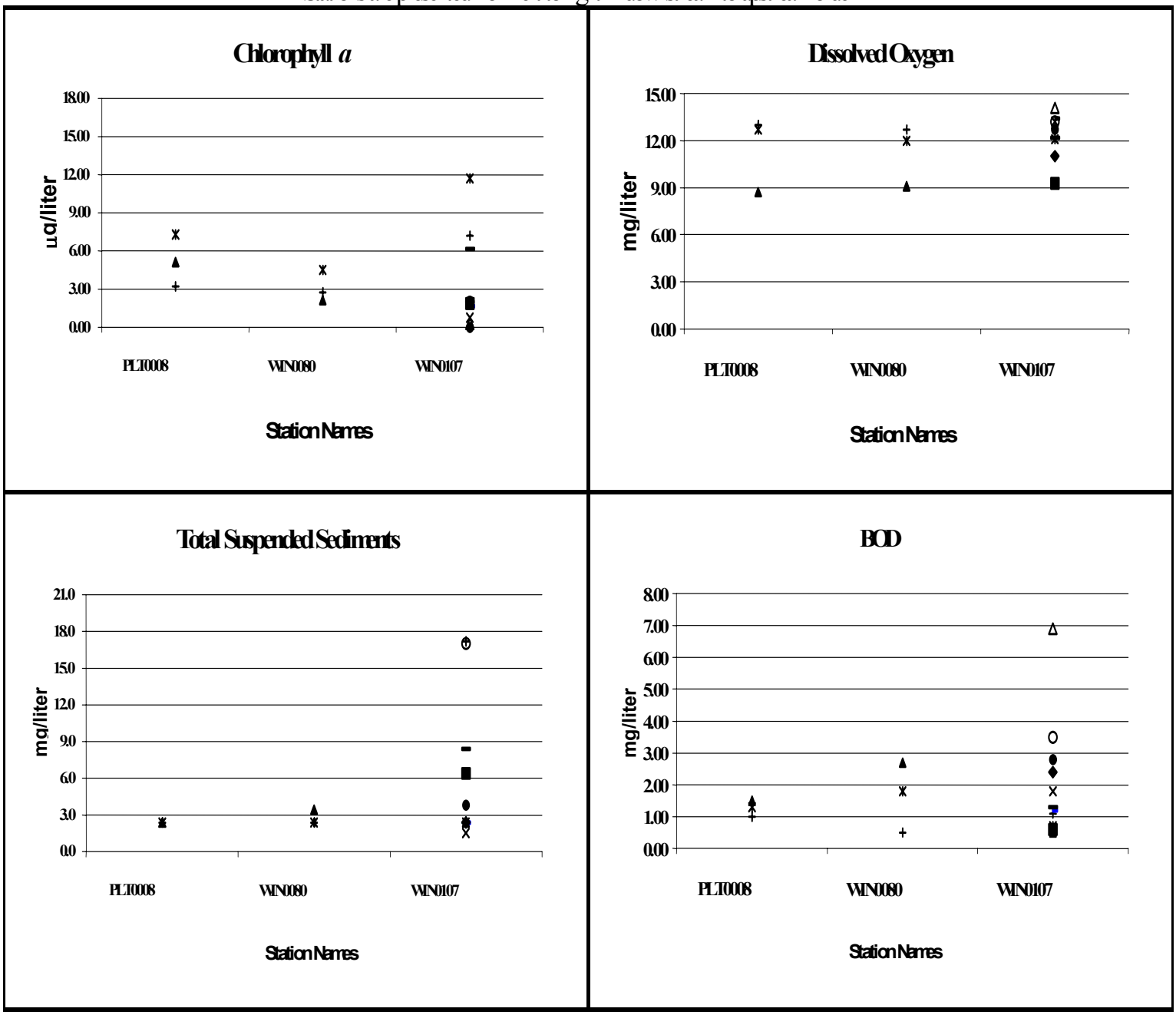
Atkisson Reservoir



Atkisson Reservoir

High Flow Conditions (December - May)

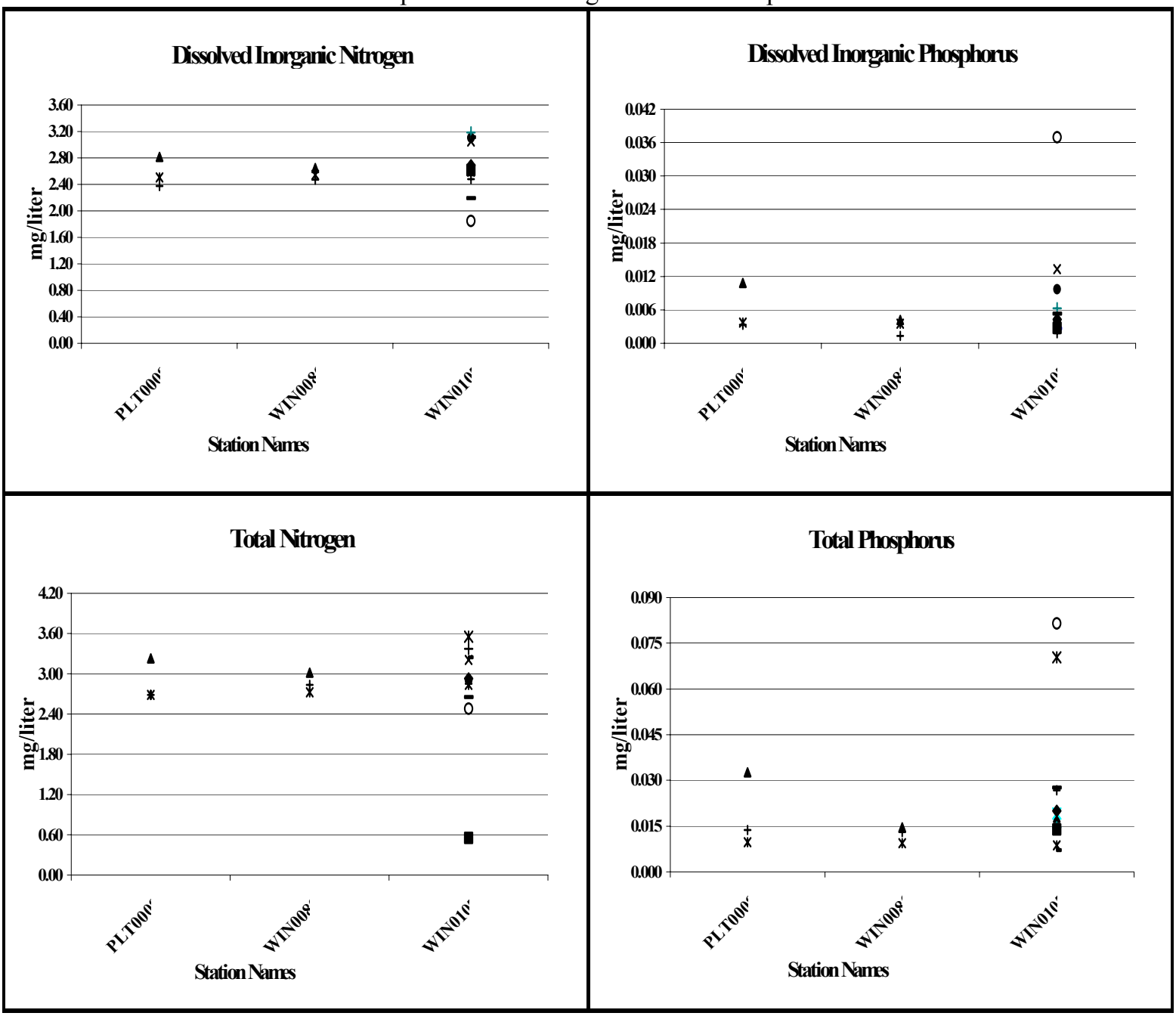
Stations are presented from left to right in downstream to upstream order



Atkisson Reservoir

High Flow Conditions (December - May)

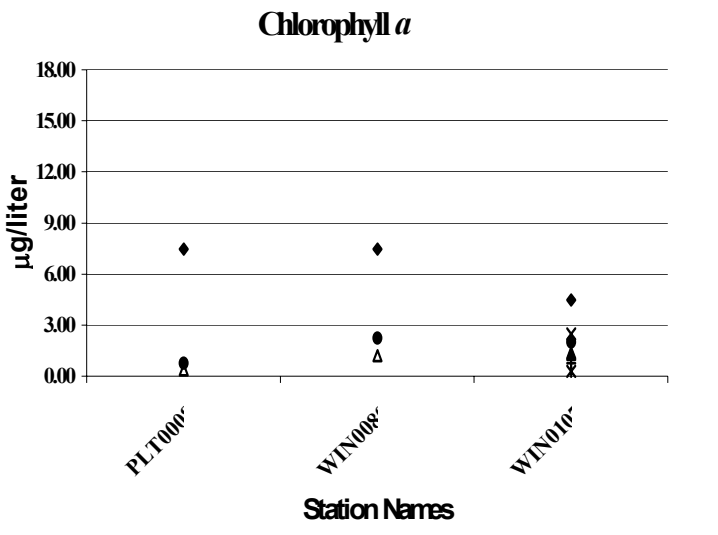
Stations are presented from left to right in downstream to upstream order

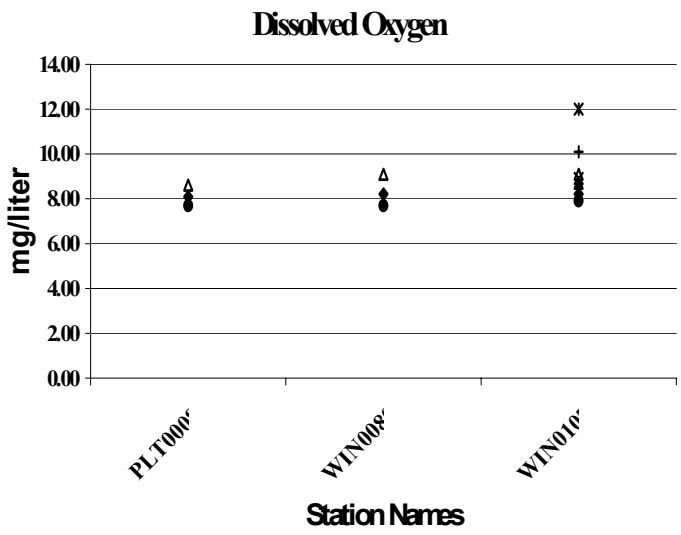


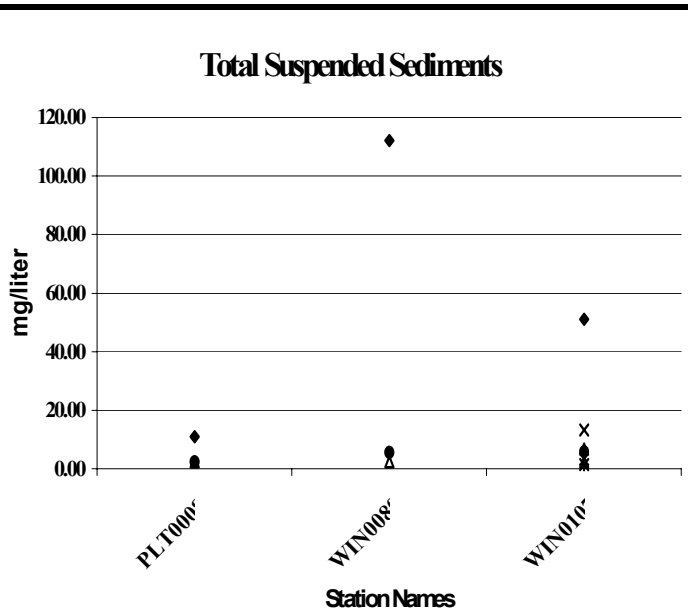
Atkkisson Reservoir

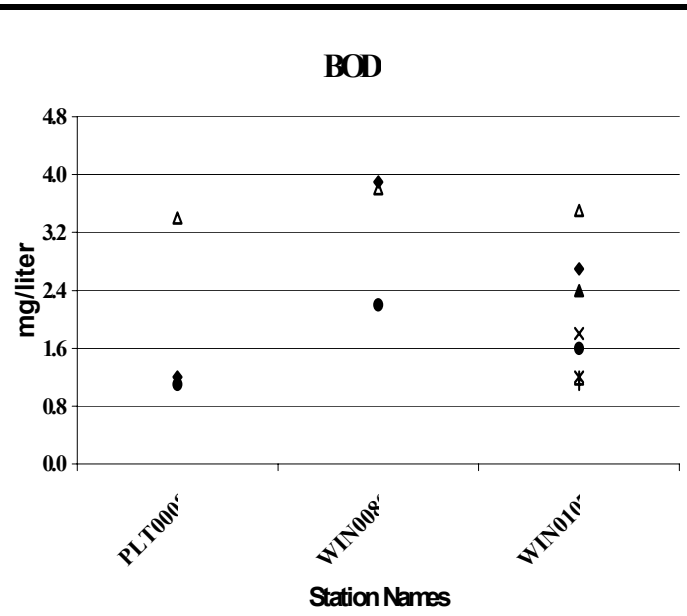
Low Flow Conditions (June - November)

Stations are presented from left to right in downstream to upstream order







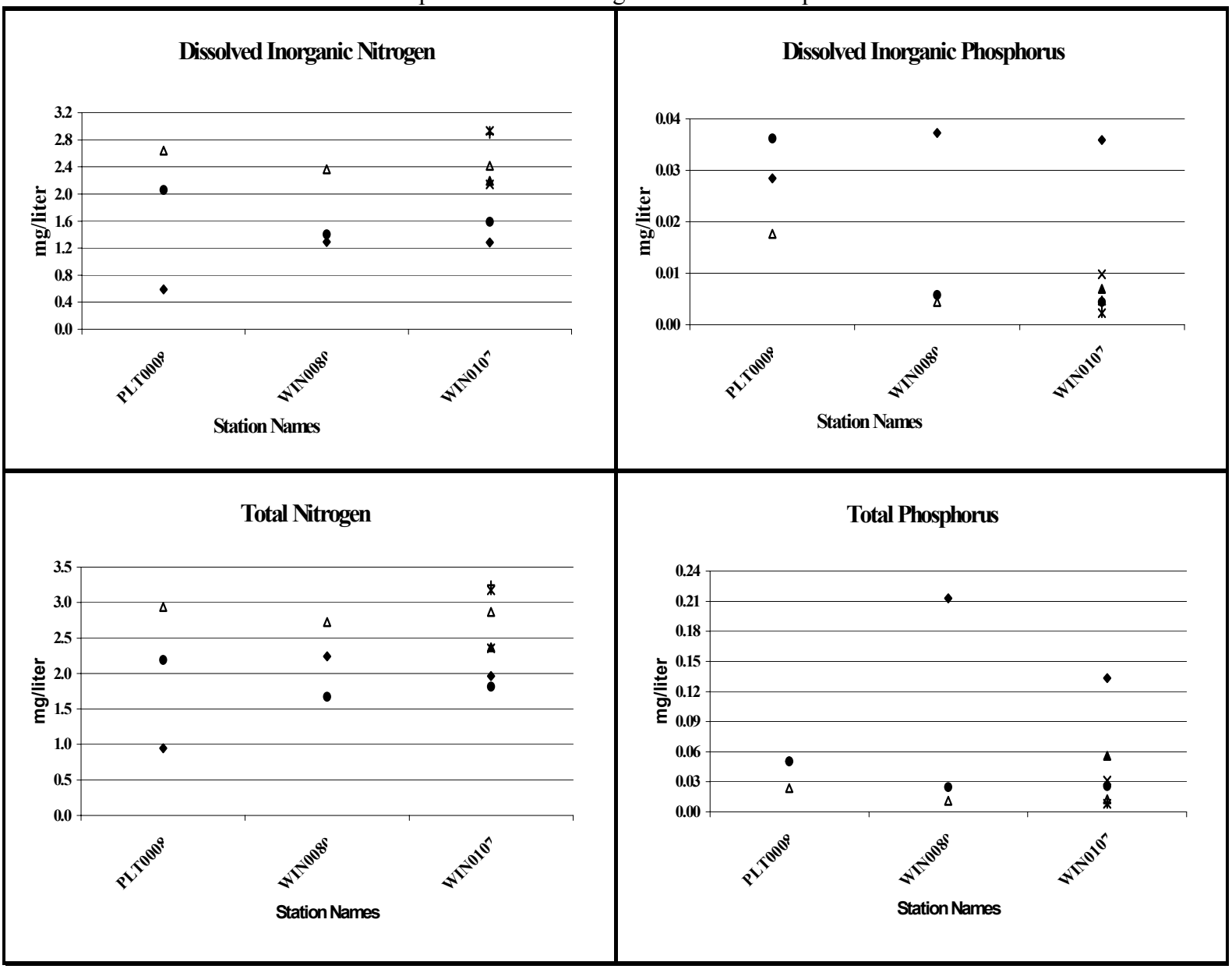


+ 29-Oct-98 x 18-Nov-98 ▲ 9-Jun-99 x 21-Jun-99 ● 28-Jul-99 ♦ 26-Aug-99 △ 29-Sep-99

Atkisson Reservoir

Low Flow Conditions (June - November)

Stations are presented from left to right in downstream to upstream order

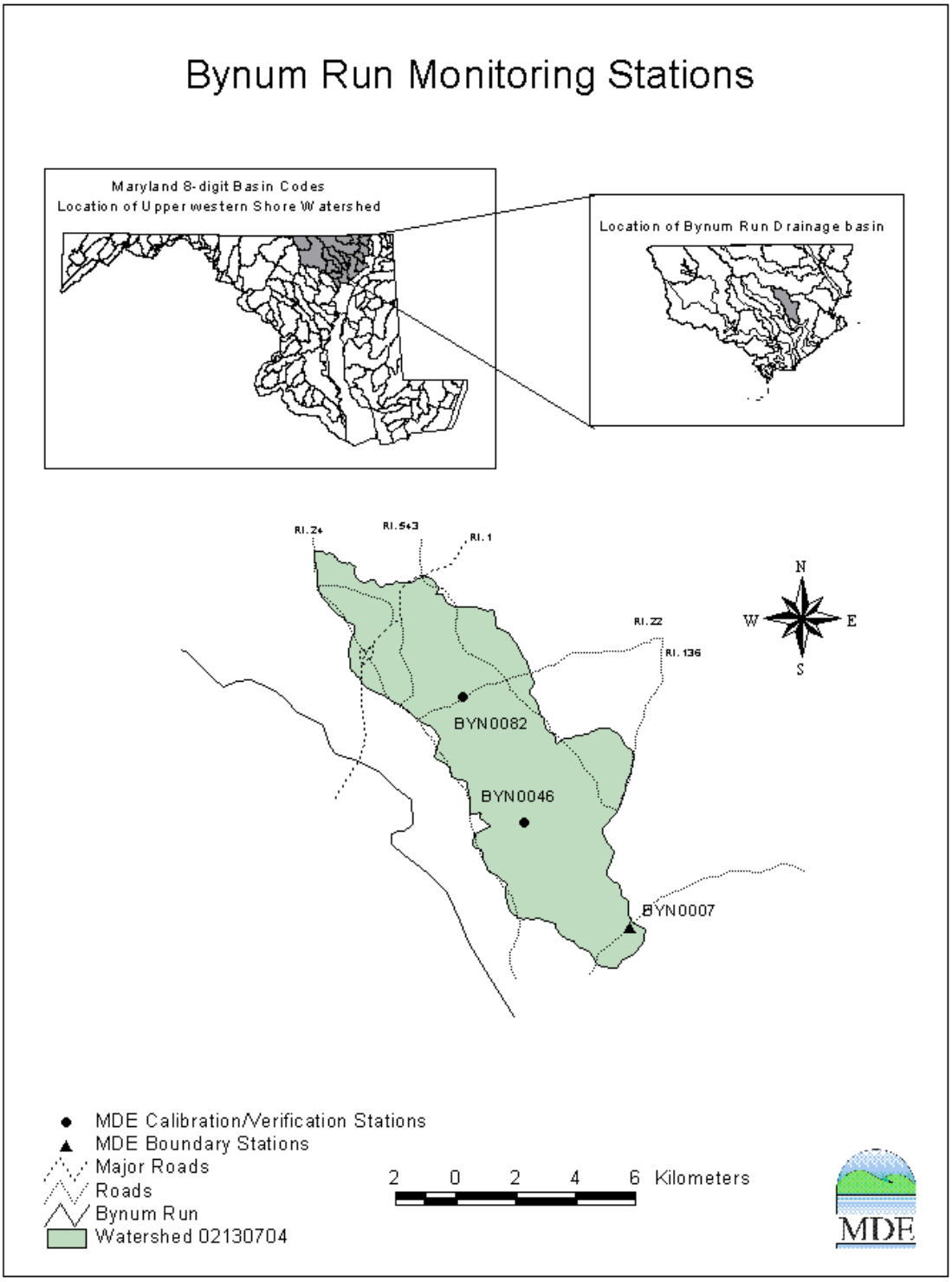


+ 29-Oct-98 ⁎ 18-Nov-98 ▲ 9-Jun-99 × 21-Jun-99 ● 28-Jul-99 ♦ 26-Aug-99 ▵ 29-Sep-99

ATKISSON RESERVOIR
1999 TMDL STATION LIST

Station Code	Lat/Long	Description
Winters Run		
WIN0080*	39 29.855 76 21.240	
WIN0107*	39 30.931 76 22.133	Business Rt.1 at Maryland American Water Works.
Plumtree Run		
PLT0008*	39 29.800 76 20.845	Plumtree Road crossing.

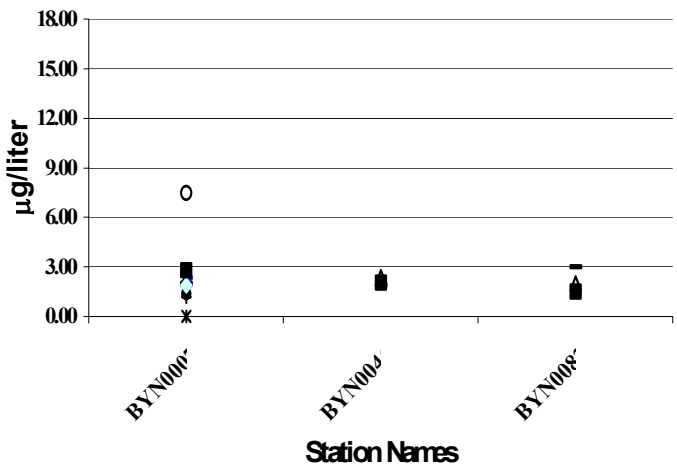
Bynum Run

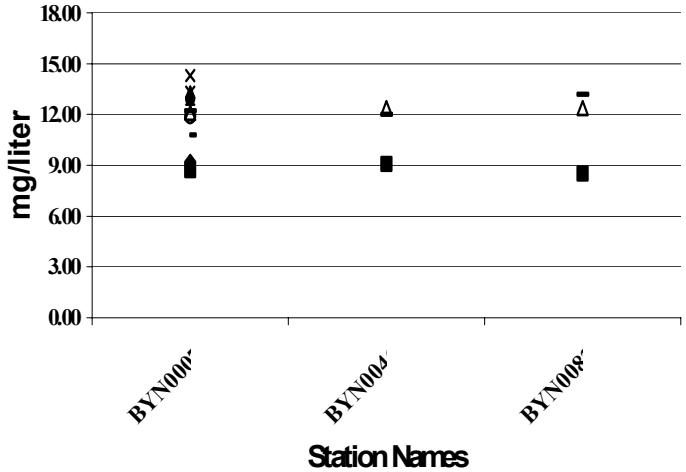

Bynum Run Monitoring Stations
Maryland 8-digit Basin Codes
Location of Upper western Shore Watershed
Location of Bynum Run Drainage basin
RI.24
RI.543
RI.1
RI.22
RI.136
N
W
E
S
BYN0082
BYN0046
BYN0007
MDE Calibration/Verification Stations
MDE Boundary Stations
Major Roads
Roads
Bynum Run
Watershed 02130704
2 0 2 4 6 Kilometers
MDE

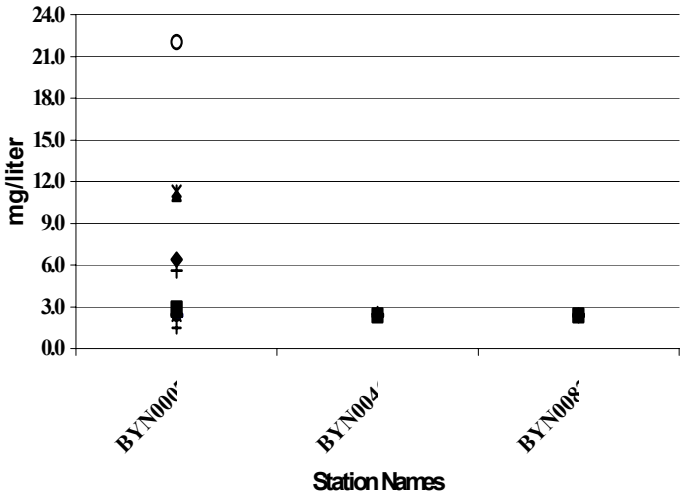
Bynum Run

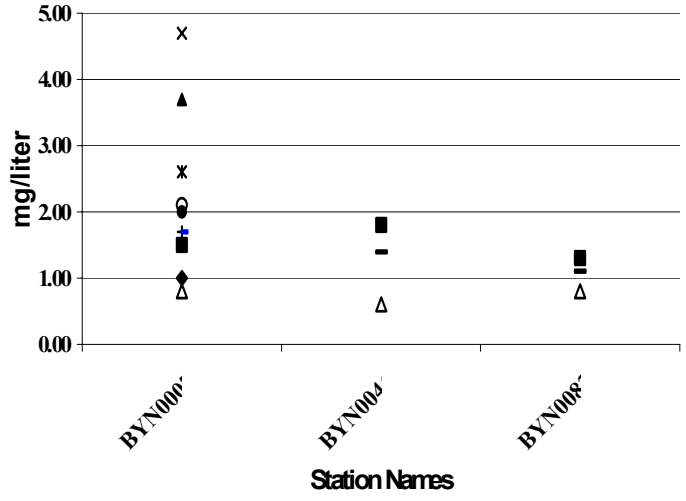
High Flow Conditions (December - May)

Stations are presented from left to right in downstream to upstream order









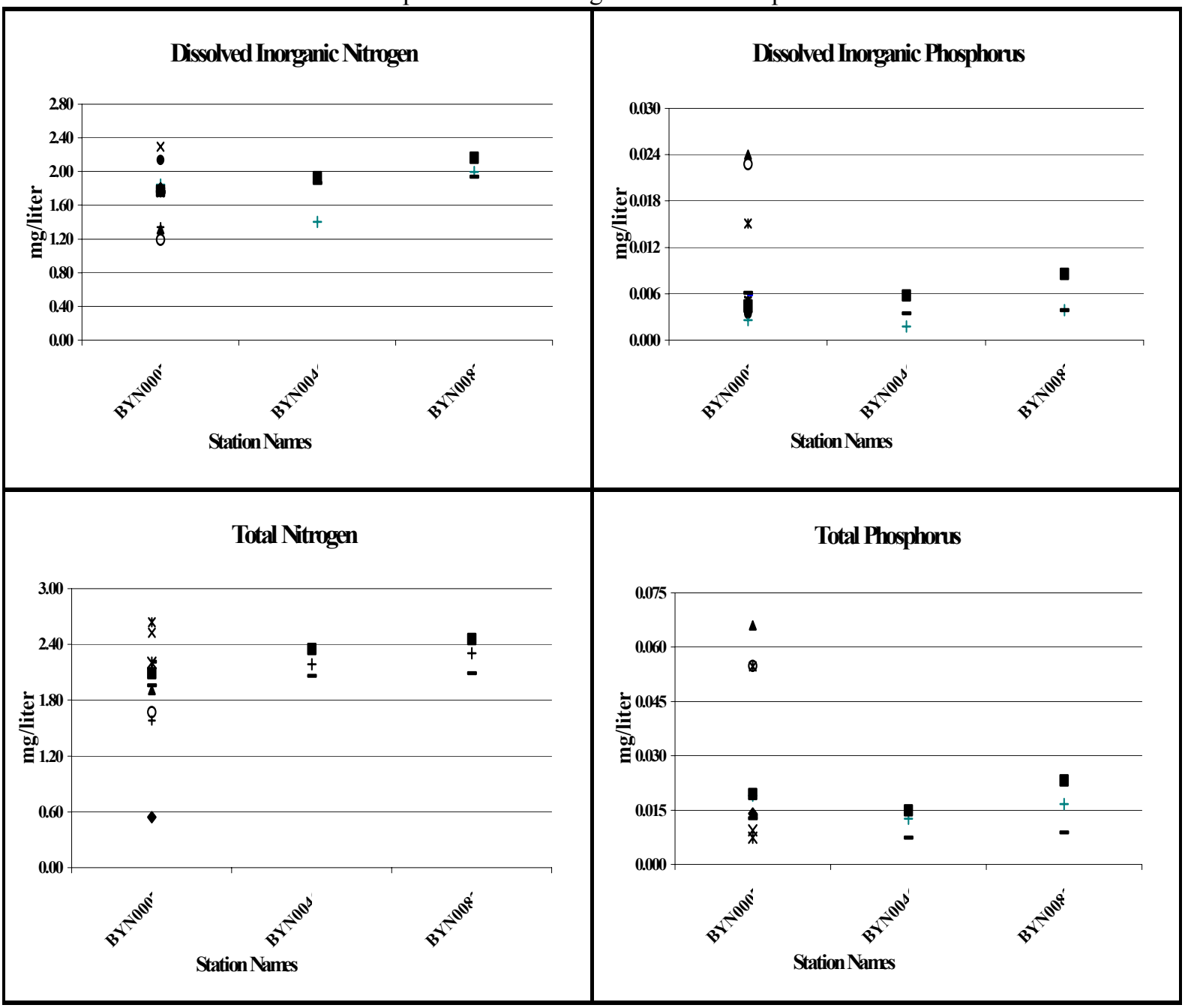
+ 2-Dec-98 ✱ 5-Jan-99 ▲ 19-Jan-99 × 1-Feb-99 ● 17-Feb-99 ○ 4-Mar-99

△ 25-Mar-99 - 8-Apr-99 – 21-Apr-99 ♦ 6-May-99 ■ 19-May-99

Bynum Run

High Flow Conditions (December - May)

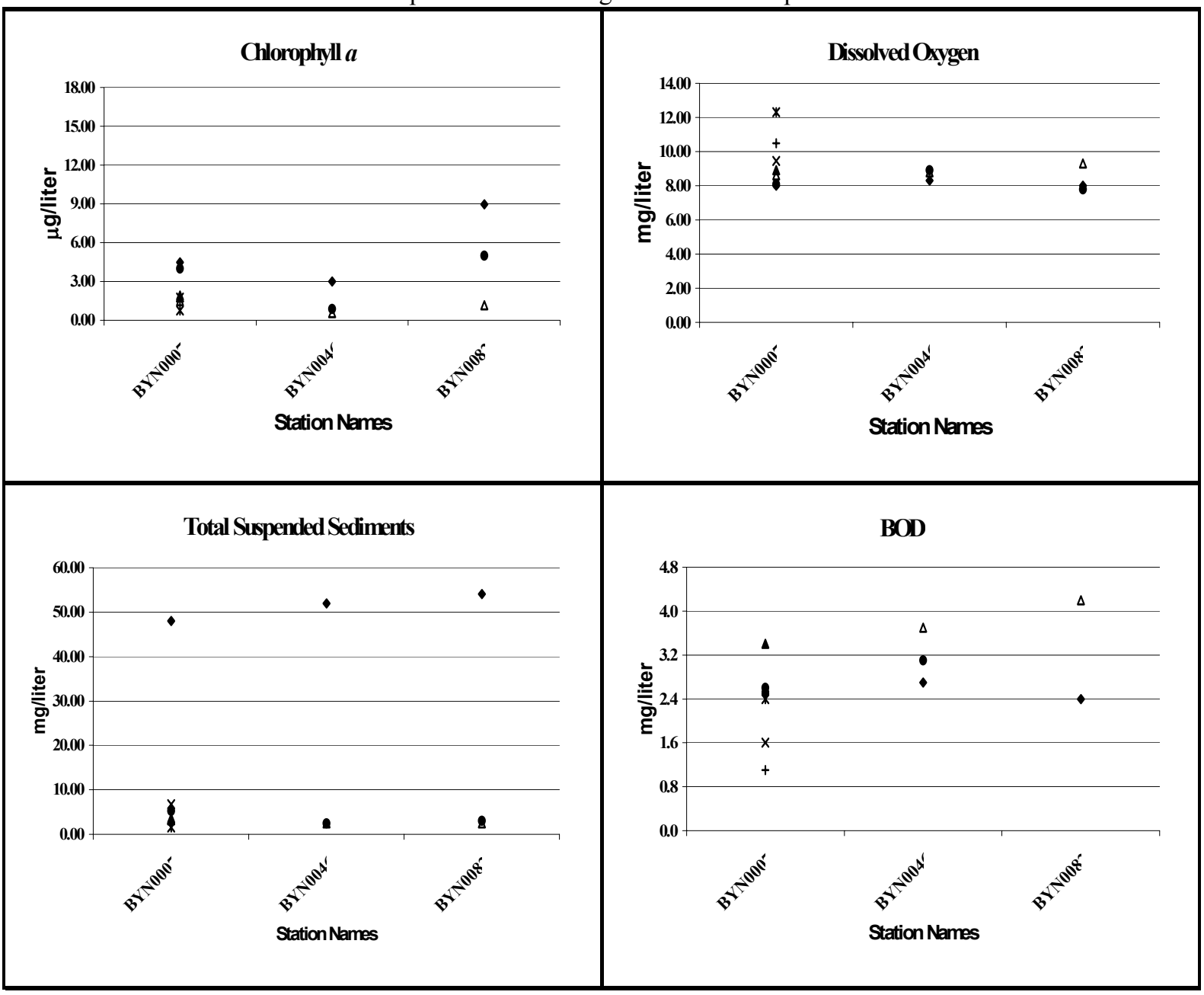
Stations are presented from left to right in downstream to upstream order



Bynum Run

Low Flow Conditions (June - November)

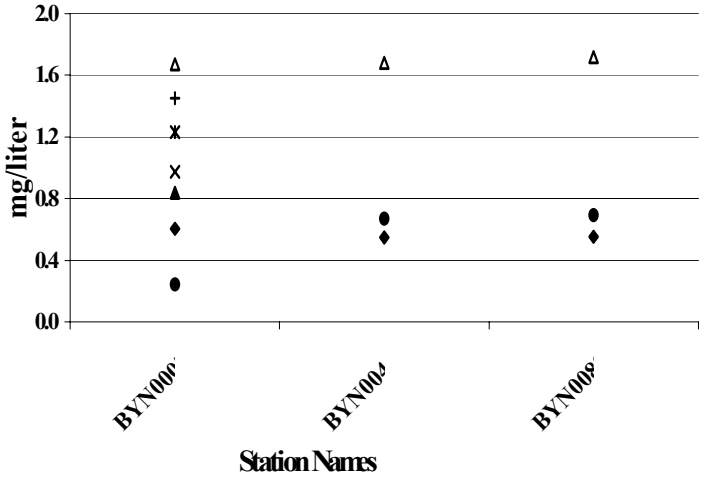
Stations are presented from left to right in downstream to upstream order

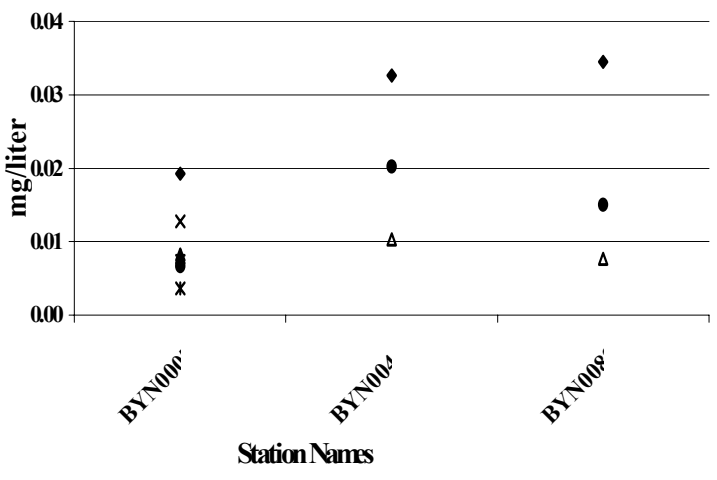


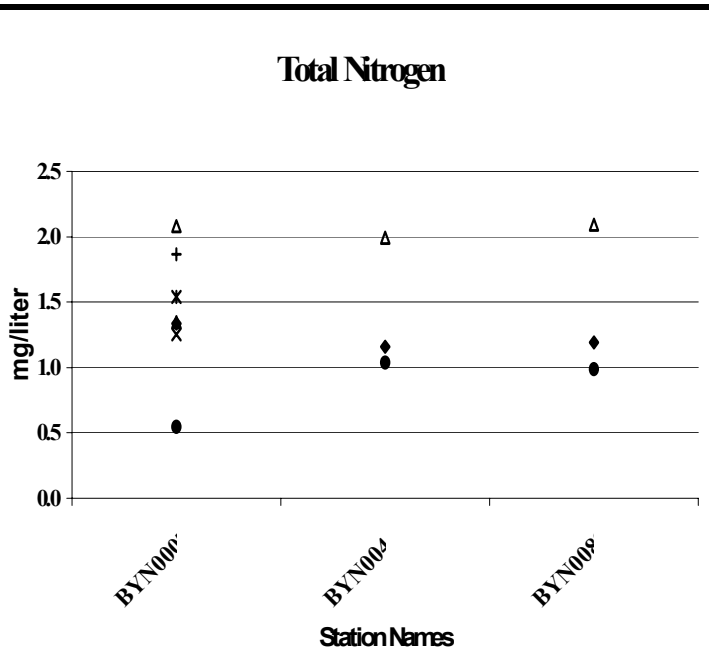
Bynum Run

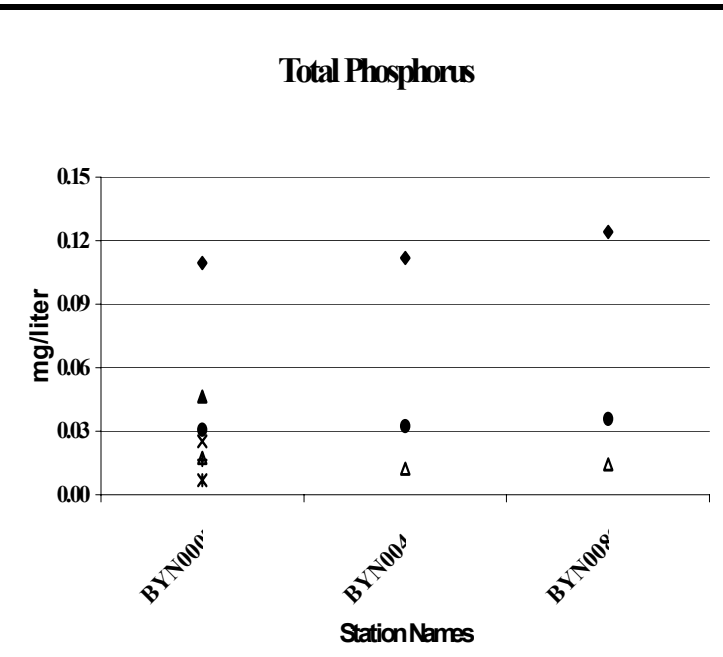
Low Flow Conditions (June - November)

Stations are presented from left to right in downstream to upstream order









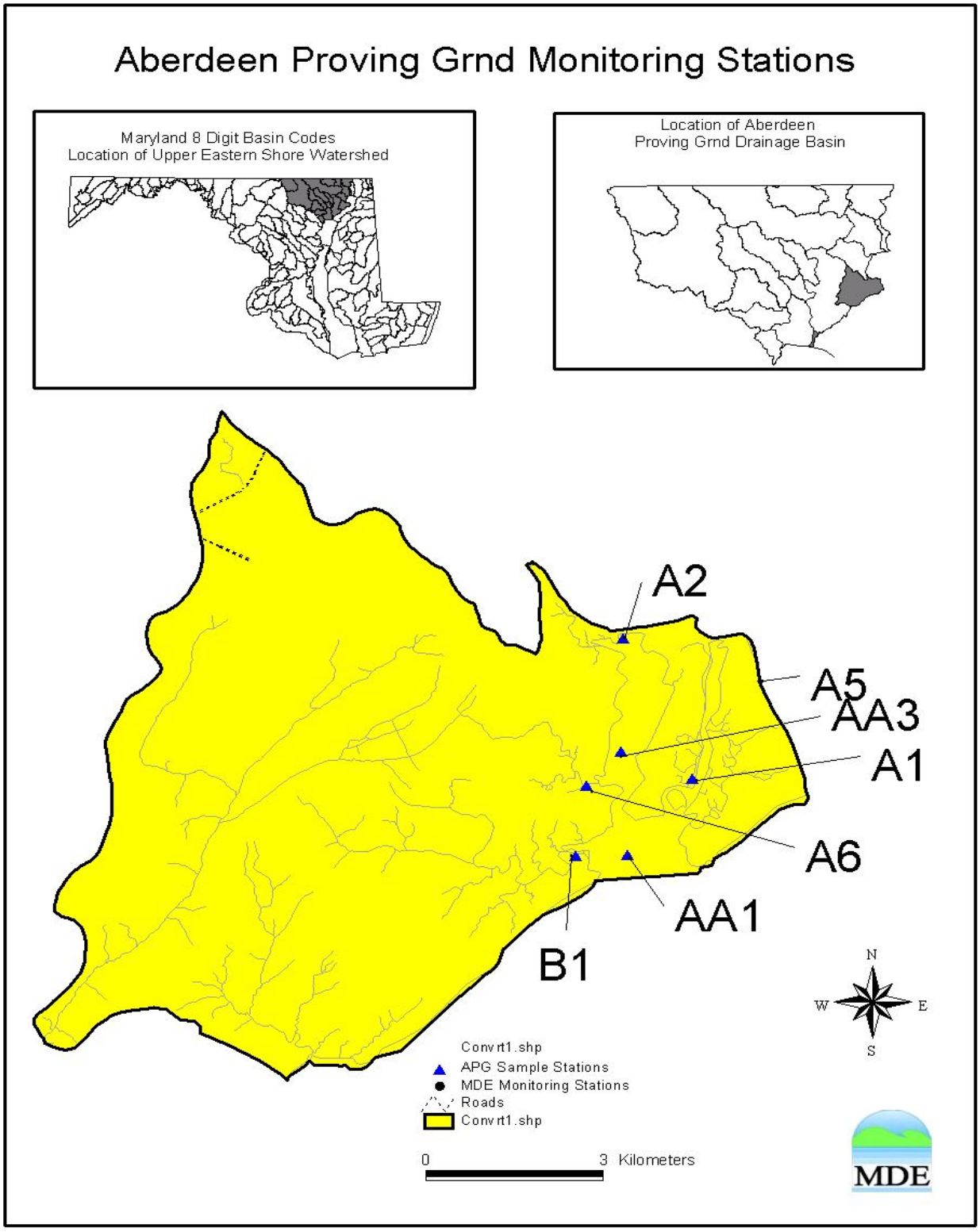
+ 29-Oct-98 ⁕ 18-Nov-98 ▲ 9-Jun-99 × 21-Jun-99 ● 28-Jul-99 ♦ 26-Aug-99 △ 29-Sep-99

BYNUM RUN
1999 TMDL STATION LIST

Station Code	Lat/Long	Description
Bynum Run		
BYN0007*	39 28.320 76 15.955	Heading north on Rte 7 (Philadelphia Rd.), pull off just past Bynum Run bridge.
BYN0046*	39 30.216 76 18.402	Wheel Road crossing..
BYN0082*	39 32.490 76 19.800	Churchville Road (Rte 22) crossing, near Bynum Park. Park in lot.

* Free flowing stations.

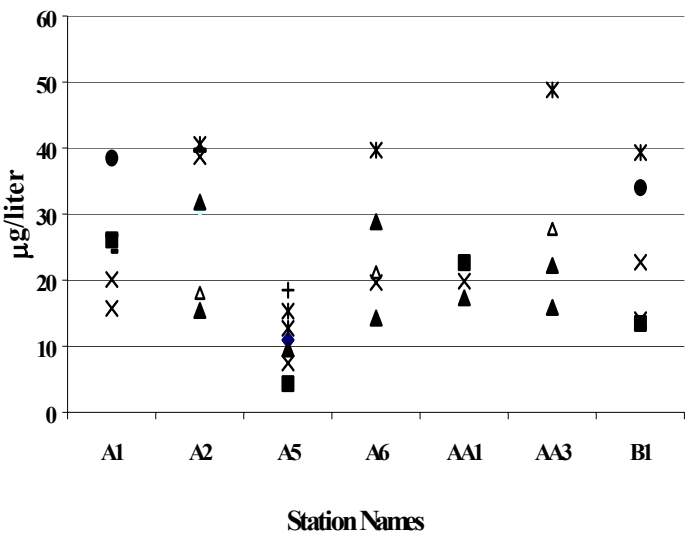
Aberdeen Proving Ground

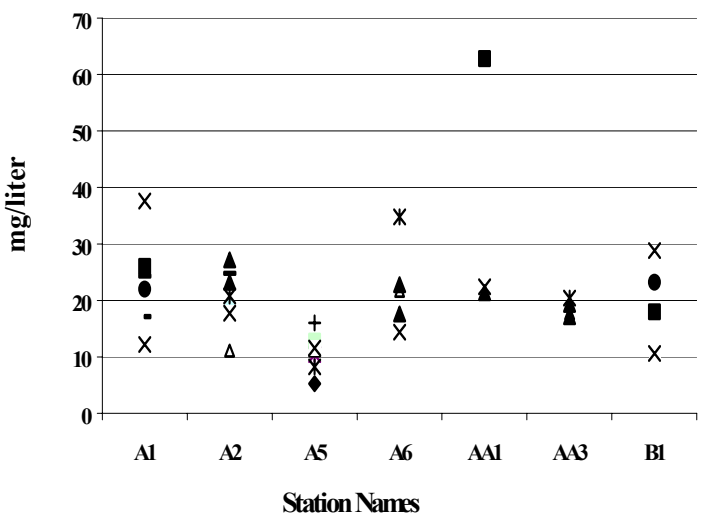


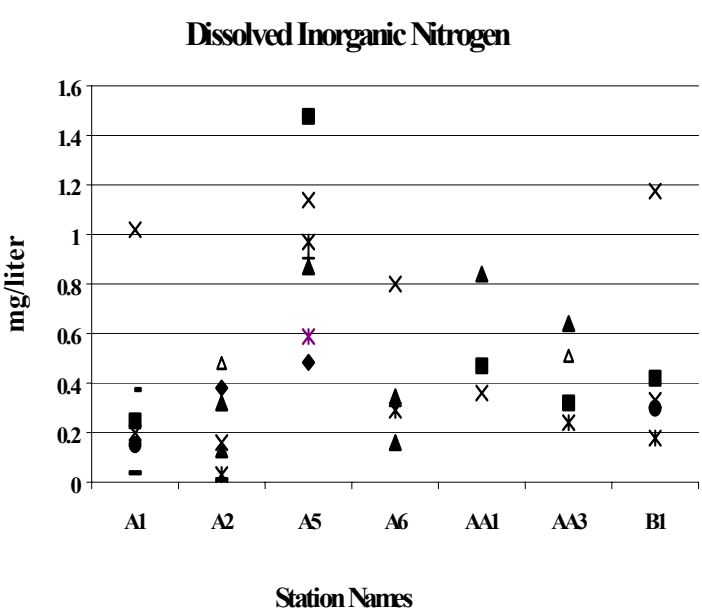
Aberdeen Proving Ground

High Flow Conditions (December - May)

Stations are presented from left to right in downstream to upstream order







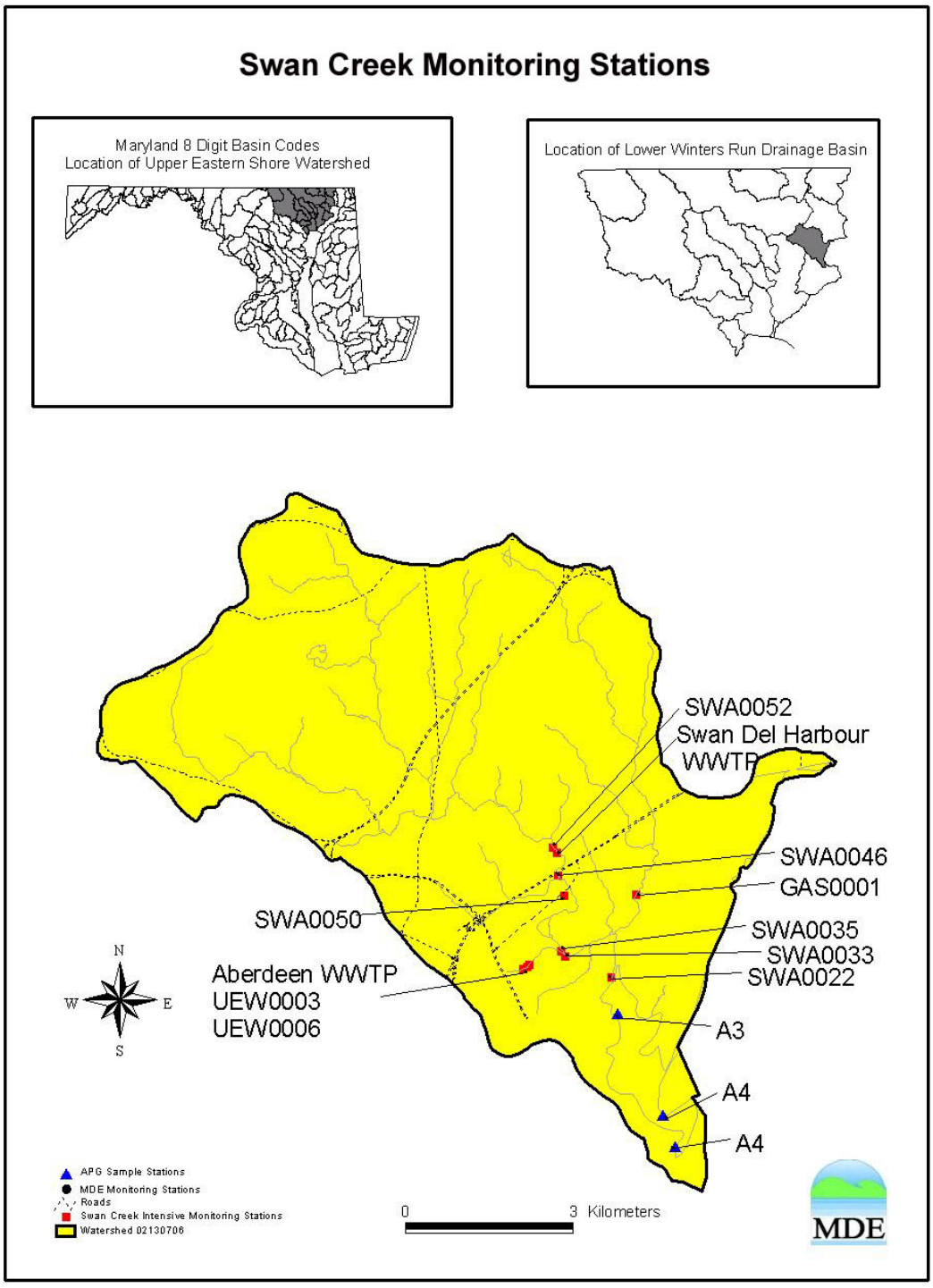
+ 04/22/1997 * 04/29/1997 ▲ 05/08/1997 × 05/16/1997 ● 05/21/1997 ♦ 05/28/1997 △ 06/23/1997 ◇ 10/03/1997 ○ 10/14/1997

□ 10/29/1997 ■ 03/31/1998

ABERDEEN PROVING GROUND
1999 TMDL STATION LIST

Station Code	Lat/Long
Swan Creek / Spesutie Island	
A1	39 27.117 76 04.950
A2	39 28.500 76 05.750
A5	39 28.117 76 04.100
A6	39 27.050 76 06.200
AA1	39 26.367 76 05.717
AA3	39 27.383 76 05.783
Chesapeake Bay Mainstream	
B1	39 26.367 76 06.333

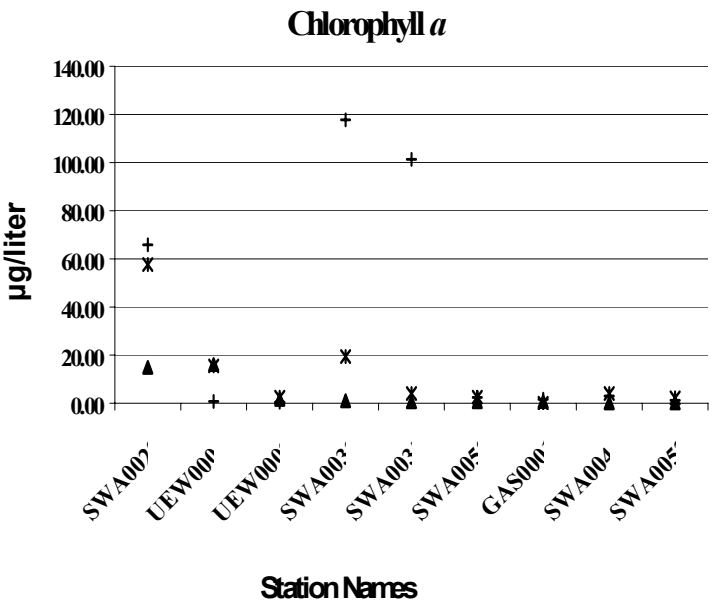
Swan Creek

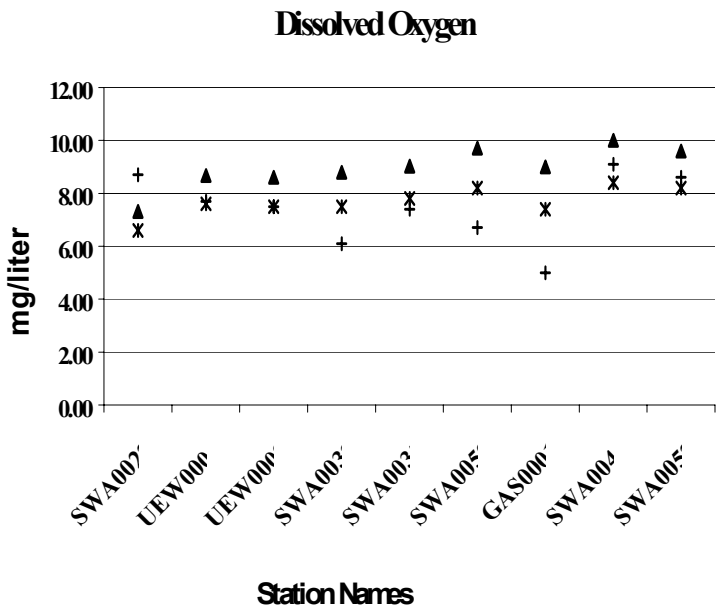

Swan Creek Monitoring Stations
Maryland 8 Digit Basin Codes
Location of Upper Eastern Shore Watershed
Location of Lower Winters Run Drainage Basin
SWA0052
Swan Del Harbour
WWTP
SWA0046
GAS0001
SWA0050
SWA0035
SWA0033
SWA0022
Aberdeen WWTP
UEW0003
UEW0006
A3
A4
A4
N
W
E
S
APG Sample Stations
MDE Monitoring Stations
Roads
Swan Creek Intensive Monitoring Stations
Watershed 02130706
0
3 Kilometers
MDE

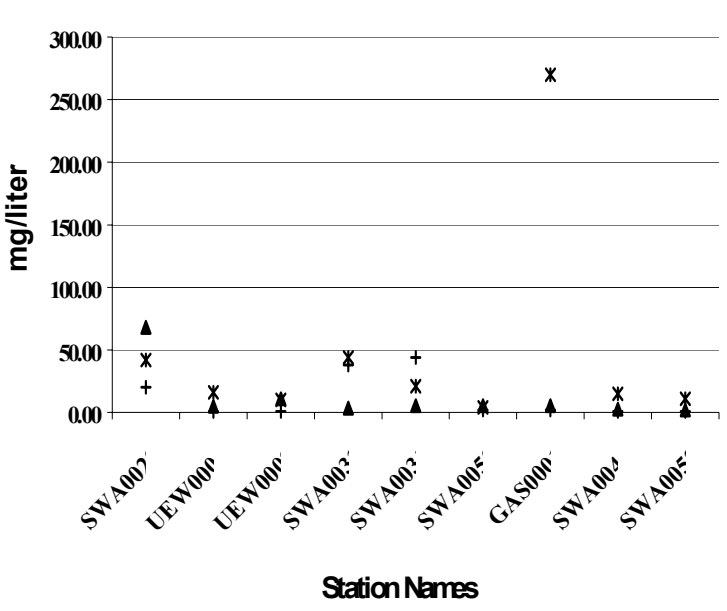
Swan Creek (main)

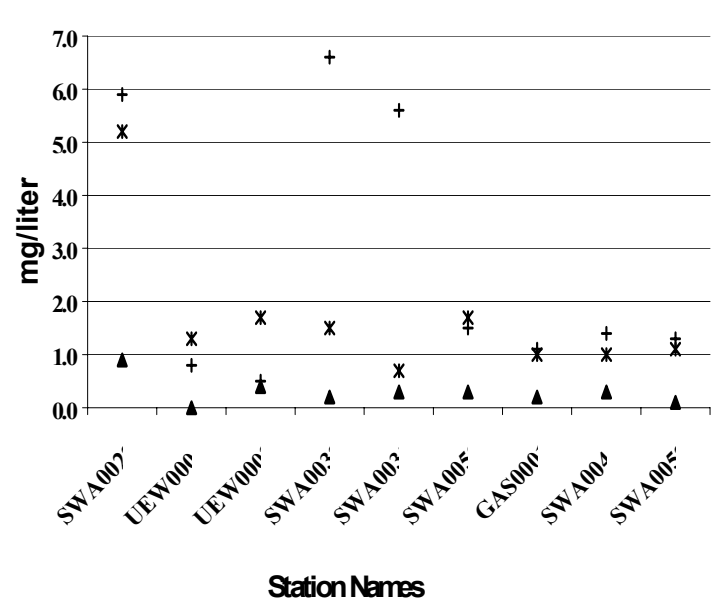
Low Flow Conditions (August - September)

Stations are presented from left to right in downstream to upstream order







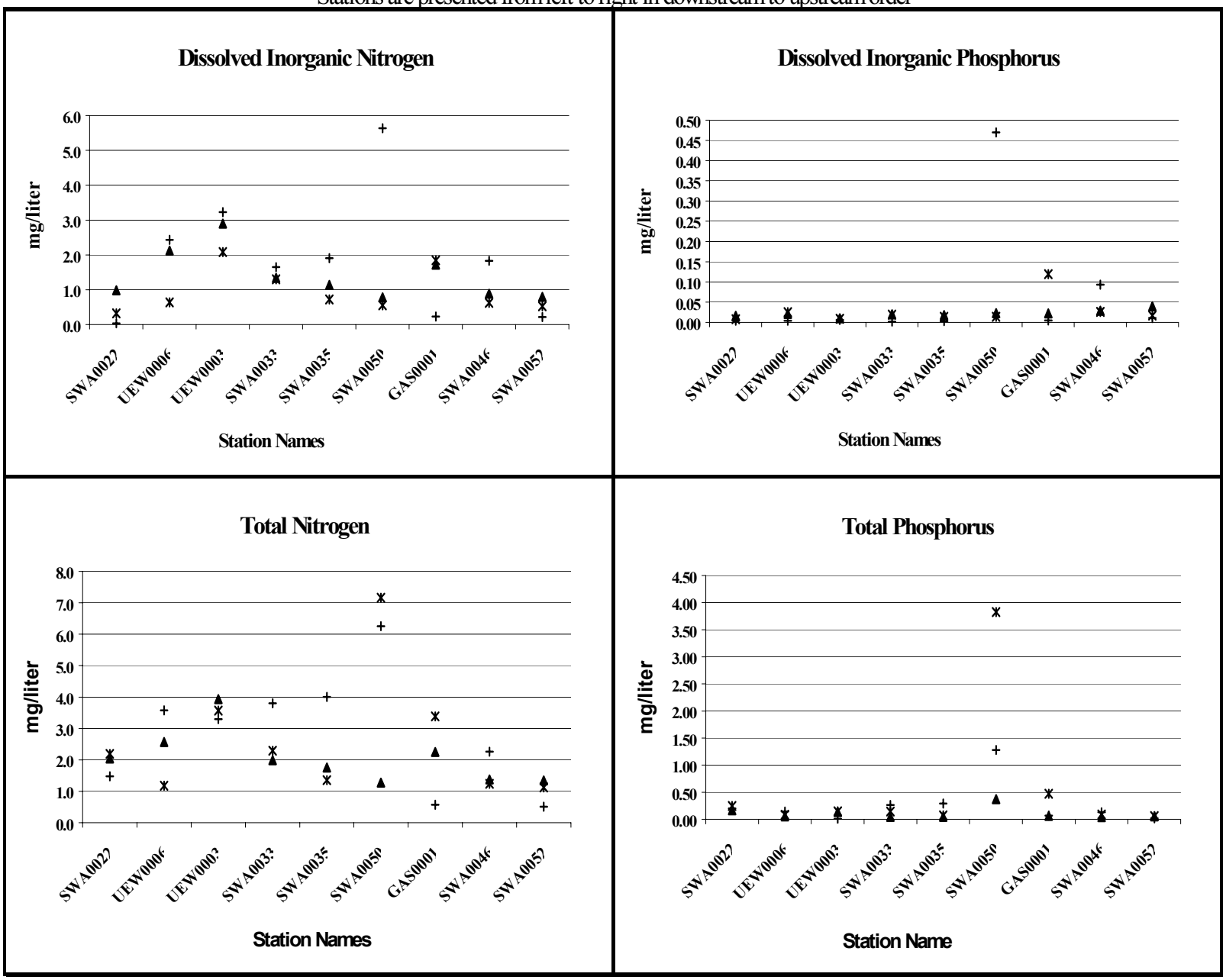


+ 08/12/1999 x 08/26/1999 ▲ 09/23/1999

Swan Creek (main)

Low Flow Conditions (August - September)

Stations are presented from left to right in downstream to upstream order



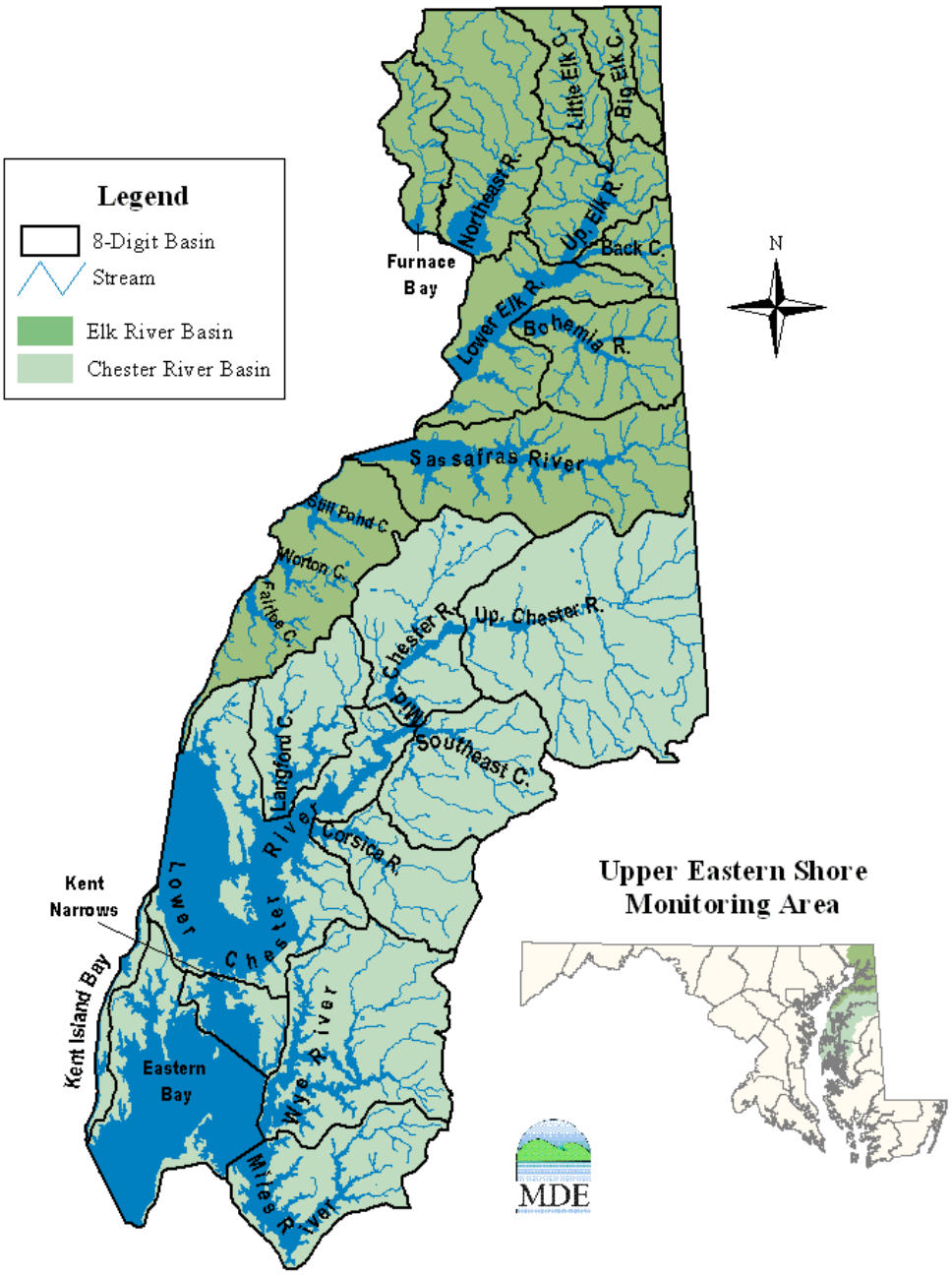
+ 08/12/1999 * 08/26/1999 ▲ 09/23/1999

SWAN CREEK
1999 TMDL STUDY
STATION LIST

Station Code	Lat/Long	Description
SWA0052	39 31.599 76 08.578	Oak Street bridge crossing
Swan Del Harbour WWTP	39 31.551 76 08.532	Out-fall
SWA0050	39 31.143 76 08.451	Robinhood Rd. under railroad crossing
GAS0001	39 31.143 76 07.561	Gasheys Creek. Oakington Rd. bridge crossing
SWA0022	39 30.363 76 07.865	Off of boat landing at the end of Old Landing Road
SWA0046	39 31.332 76 08.516	Old Post Rd. bridge crossing
Aberdeen WWTP	39 30.476 76 08.914	Out-fall
UEW0003	39 30.495 76 08.890	30 feet downstream from Aberdeen STP out-fall
UEW0006	39 30.451 76 08.971	30 feet upstream from Aberdeen STP out-fall
SWA0035	39 30.622 76 08.497	0.1 miles above unnamed tributary carrying discharge from Aberdeen STP
SWA0033	39 30.570 76 08.443	0.1 miles below unnamed tributary carrying discharge from Aberdeen STP

Upper Eastern Shore

Maryland's Upper Eastern Shore



Elk River Basin

Chester River Basin

Elk River Basin

Lower Elk River

Bohemia River

Upper Elk River

Back Creek-C & D Canal

Northeast River

Furnace Bay

Sassafras River

Stillpond-Worton-Fairlee

Elk River Sub-Basin
(Sub-basin 02-13-06)

General Description (from 1998 305 (b) Report)
The Elk River sub-basin drains about 400 square miles of Cecil County and portions of Kent County (Maryland) to the Pennsylvania and Delaware lines. The upper portion of the sub-basin lies in the Piedmont Province while the lower portion lies in the Coastal Plain Province. An intermediate region of rolling hills is found between the Fall Line and Elk River. Large water bodies include the Sassafras, Bohemia, Elk, and Northeast Rivers and Principio Creek. Back Creek forms the western end of the Chesapeake and Delaware Canal, a sea-level shipping canal that connects the Chesapeake and Delaware Bays. There are no "significant, publicly-owned" lakes in this sub-basin.

Land use in the Elk River sub-basin is primarily agricultural (52 percent of the land) while about 36 percent of the land is forested, and ten percent is developed. Rapidly developing areas include the Town of Elkton, the sub-basin's largest community, and the I-95/US Route 40 corridor between Elkton and the Susquehanna River to the east. Other major communities include Chesapeake City, Cecilton and Georgetown along the north-south MD Route 218 corridor to the south.

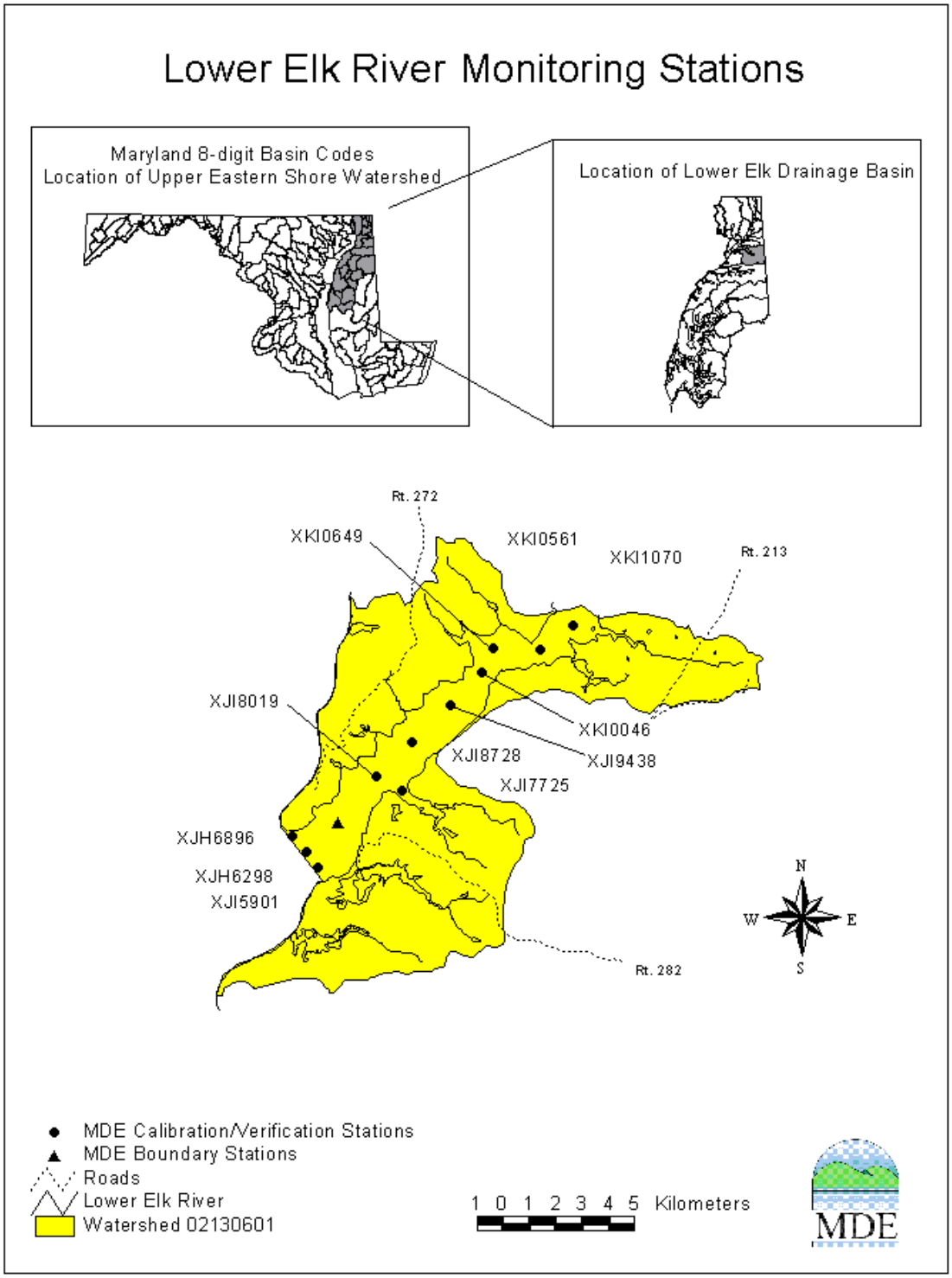
Surface waters in this basin are classified as Use I (water contact recreation and aquatic life), as Use I-P (water contact recreation, aquatic life and public water supply), Use II (shellfish harvesting), or Use III (natural trout) (COMAR '26.08.02.08G). For the most recent information regarding specific use classes in this watershed, the reader is referred to the Code of Maryland Regulations.

The State routinely monitors water quality in the Elk River sub-basin at five Bay Tributary stations and at five benthic macroinvertebrate sampling stations located in free-flowing streams near the Fall Line. One fixed Long Term Benthic Macroinvertebrate program stations is monitored for estuarine benthos in addition to randomly selected Long Term Benthic Macroinvertebrate program sites. The Maryland Biological Stream Survey (MBSS) collected water quality samples in the watershed at 18 randomly selected stations in 1996 and at four stations in 1997.

Water Quality Summary
MDE assessed the nutrient impairments and developed TMDLs for the Bohemia (02130602), Northeast (02130608), and Sassafras (02130610) Rivers; and for Stillpond (02130611), Worton (02130611) and Fairlee (02130611) Creeks. The EPA approved the TMDLs on January 29, 2001 (Bohemia); January 12, 2005 (Northeast); January 1, 2002 (Sassafras); March 25, 2002 (Stillpond); February 6, 2002 (Worton); and February 18, 1999 (Fairlee). Nutrient impairments to water quality in the Lower Elk (02130702) and Upper Elk (02130603) Rivers will be addressed at a future date.

A TMDL to address the nutrient impairment in Back Creek-C & D Canal will be developed following completion of the CBP Phase V Watershed and Water Quality Model. It is expected that the model will be completed in approximately three years. An assessment of the nutrient impairments in Furnace Bay is ongoing.

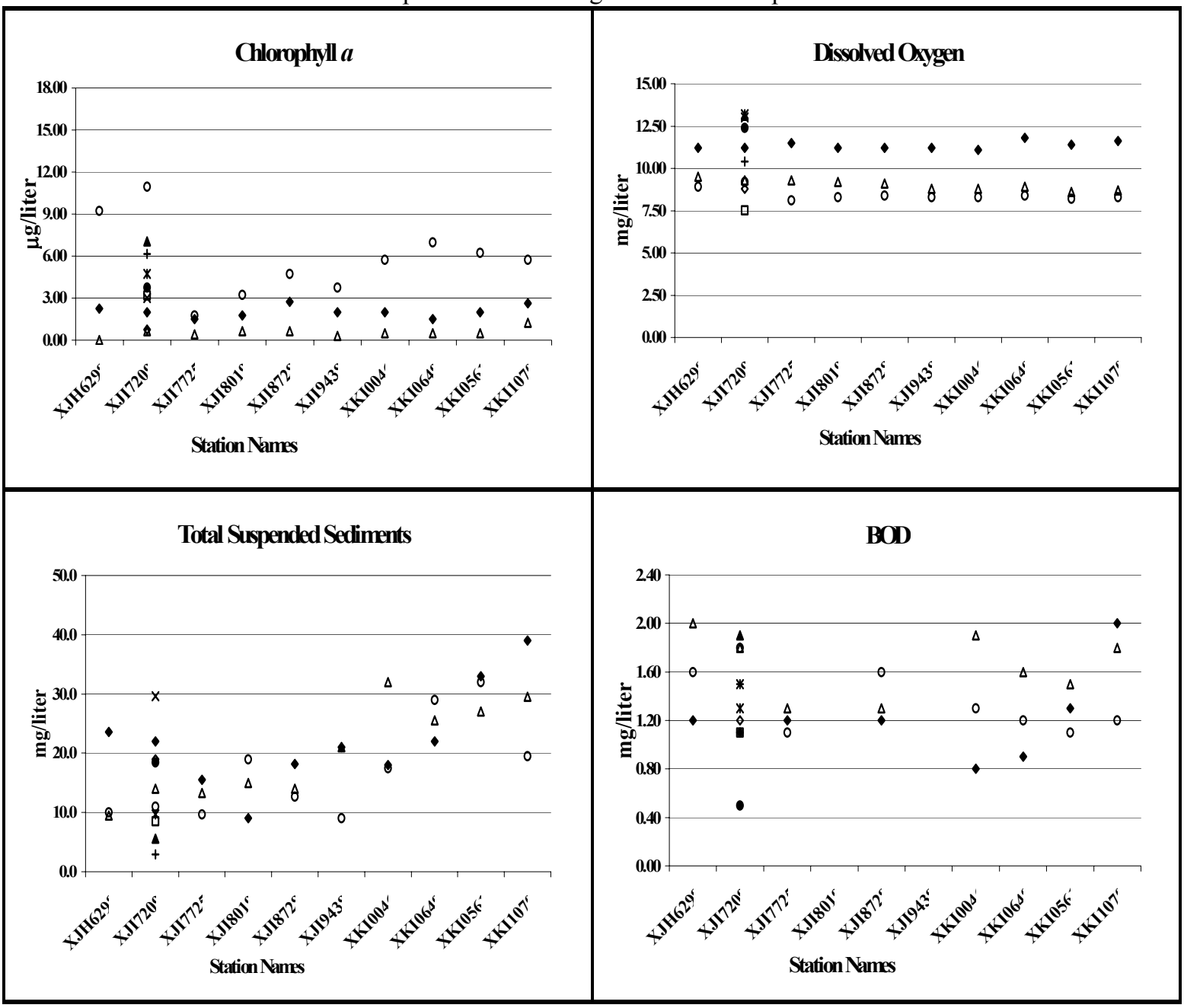
Lower Elk River



Lower ELK River

High Flow Conditions (December - May)

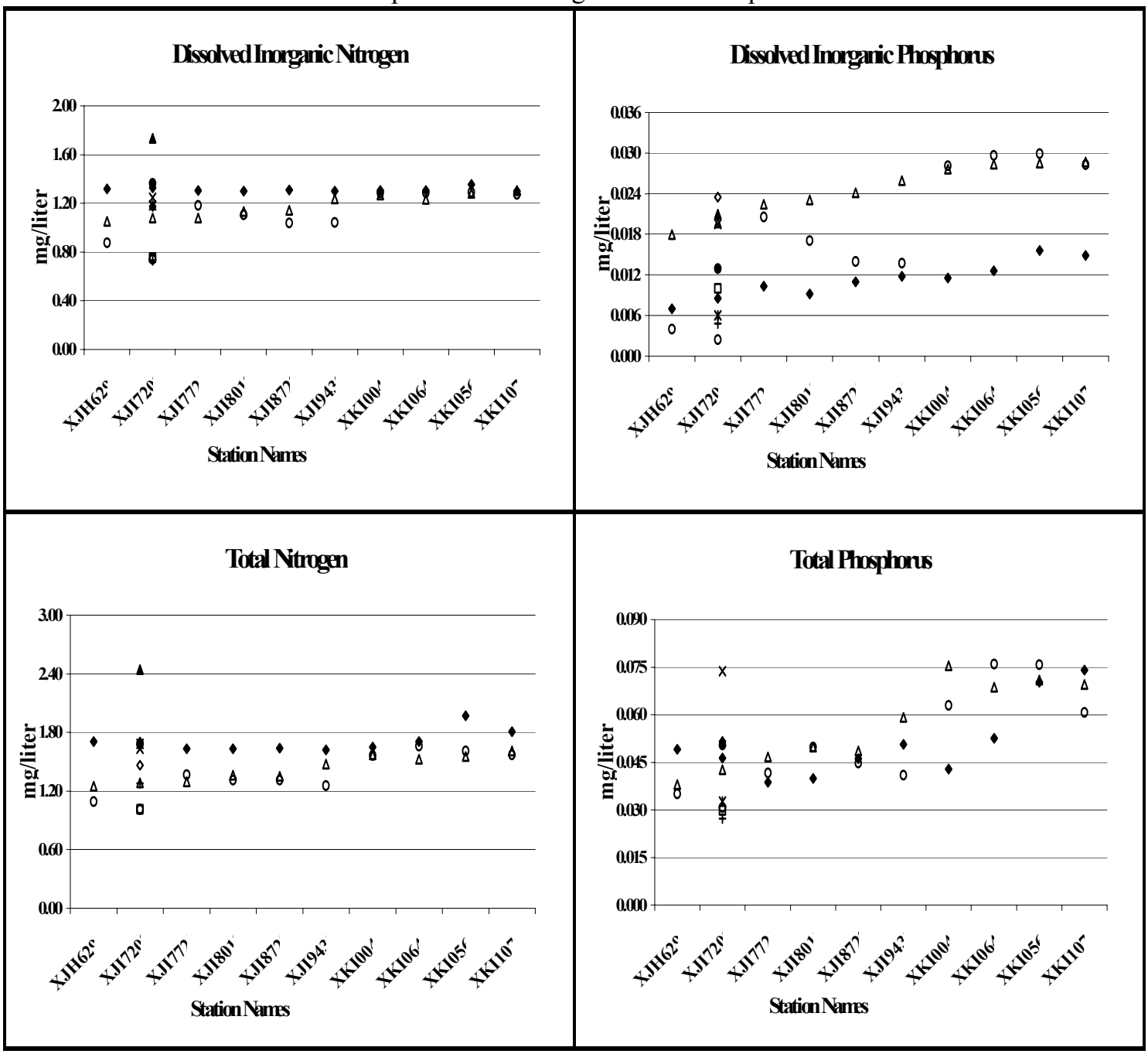
Stations are presented from left to right in downstream to upstream order



Lower ELK River

High Flow Conditions (December - May)

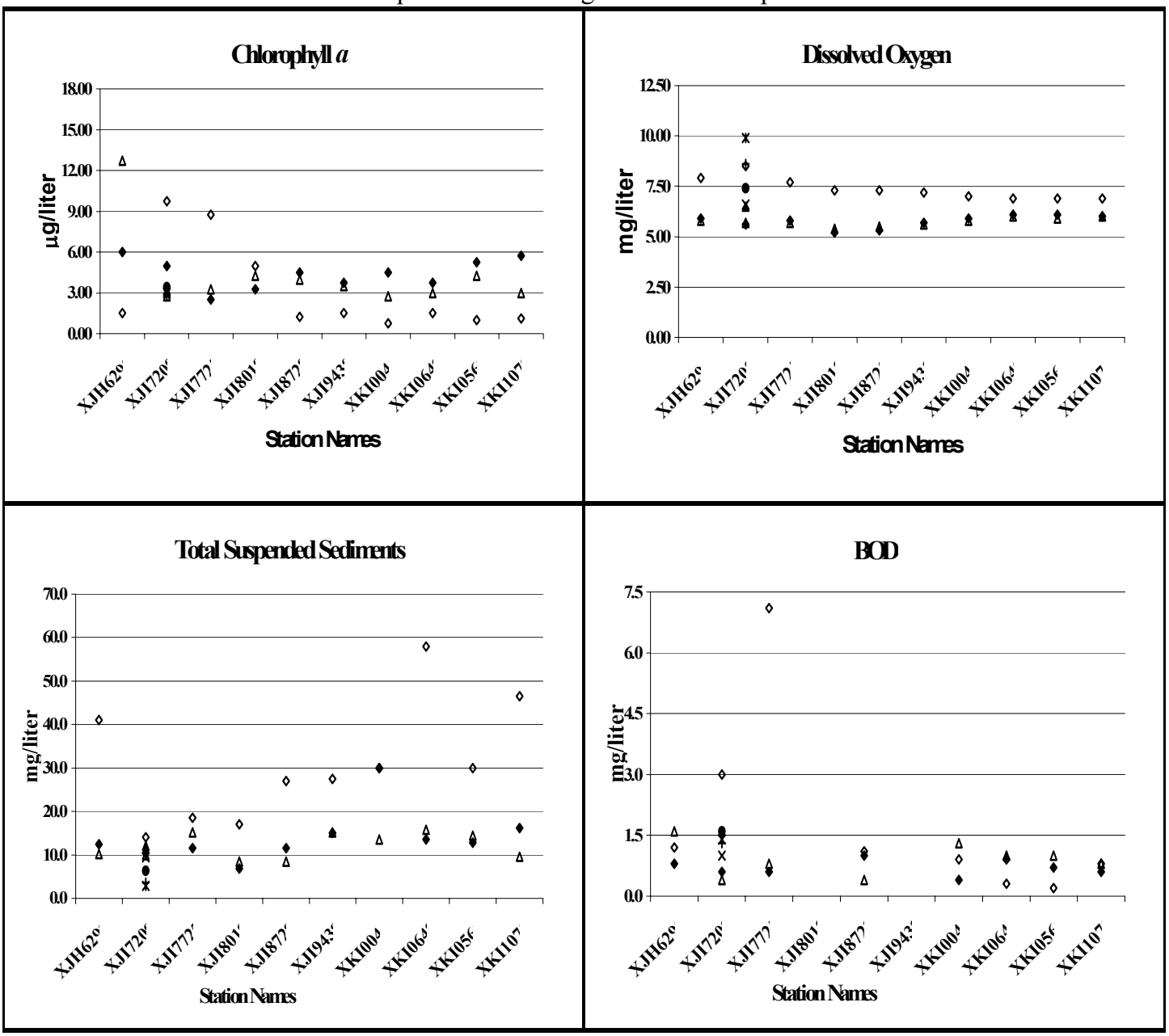
Stations are presented from left to right in downstream to upstream order



Lower ELK River

Low Flow Conditions (June - November)

Stations are presented from left to right in downstream to upstream order



Lower Elk River

Low Flow Conditions (June - November)

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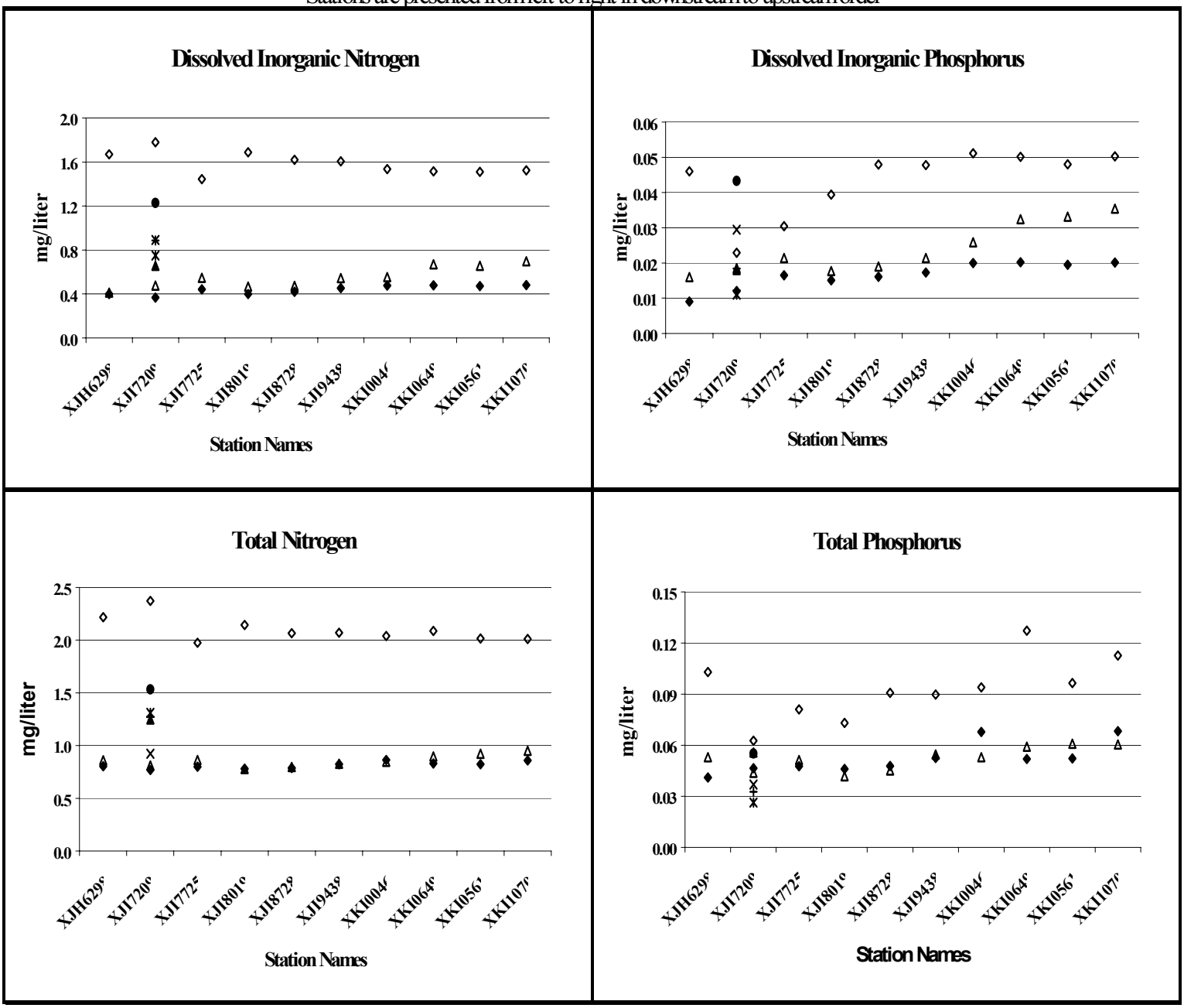
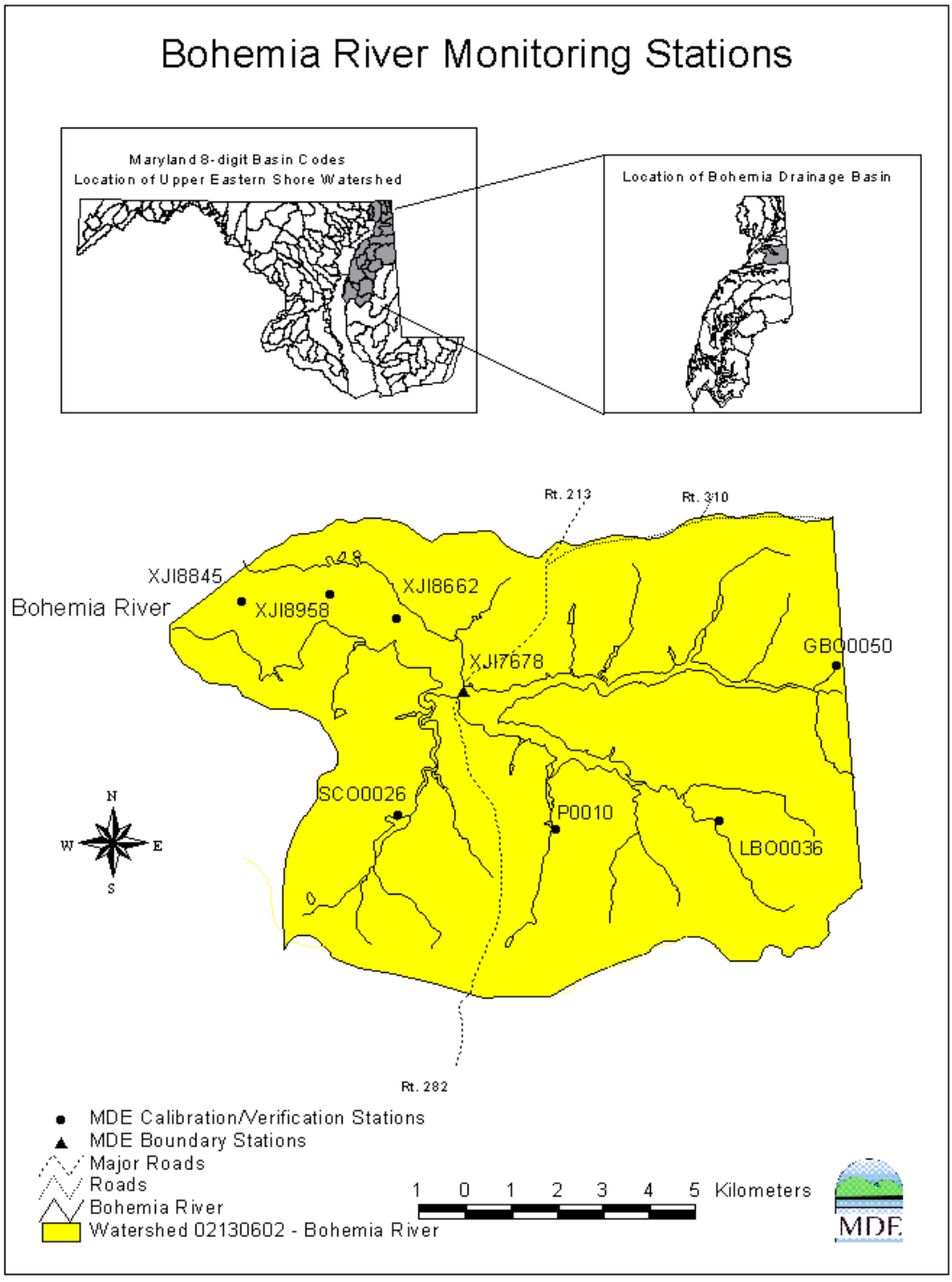


Station Code	Lat/Long	Description
Elk River		
XJI5901	39 25.923 75 59.932	Approx. 500 yards off shore **Physical readings only.**
XJH6298	39 26.192 76 00.255	Mid-channel, approx. 1000 yds upstream from markers
XJH6896	39 26.820 76 00.384	Approx. 500 yds off shore from Turkey Point lighthouse . **Physical readings only.**
XJI7209	39 27.226 75 59.098	Mid-channel, off Jacobs Nose.
XJI8019	39 27.998 75 58.172	Between markers G 11 and R 12 .
XJI8728	39 28.712 75 57.209	Between markers G 13 and R 14 -
XJI9438	39 29.451 75 56.236	Between markers G 15 and R 16
XKI0046	39 30.094 75 55.398	Mid-channel, approx. 400 yds downstream of R 18, off of dock on right.
XKI0649	39 30.586 75 55.099	1500 yds from marker G 19, towards large white house with white dock -
XKI0561	39 30.555 75 53.881	Mid-channel, off Oldfield Point between markers G 21 and R 22 -
XKI1070	39 31.047 75 52.980	Mid-channel, between markers R 24 and R 26.
Cabin John Creek		
XJI7725	39 27.505 75 57.166	Depth ~ 6 ft.

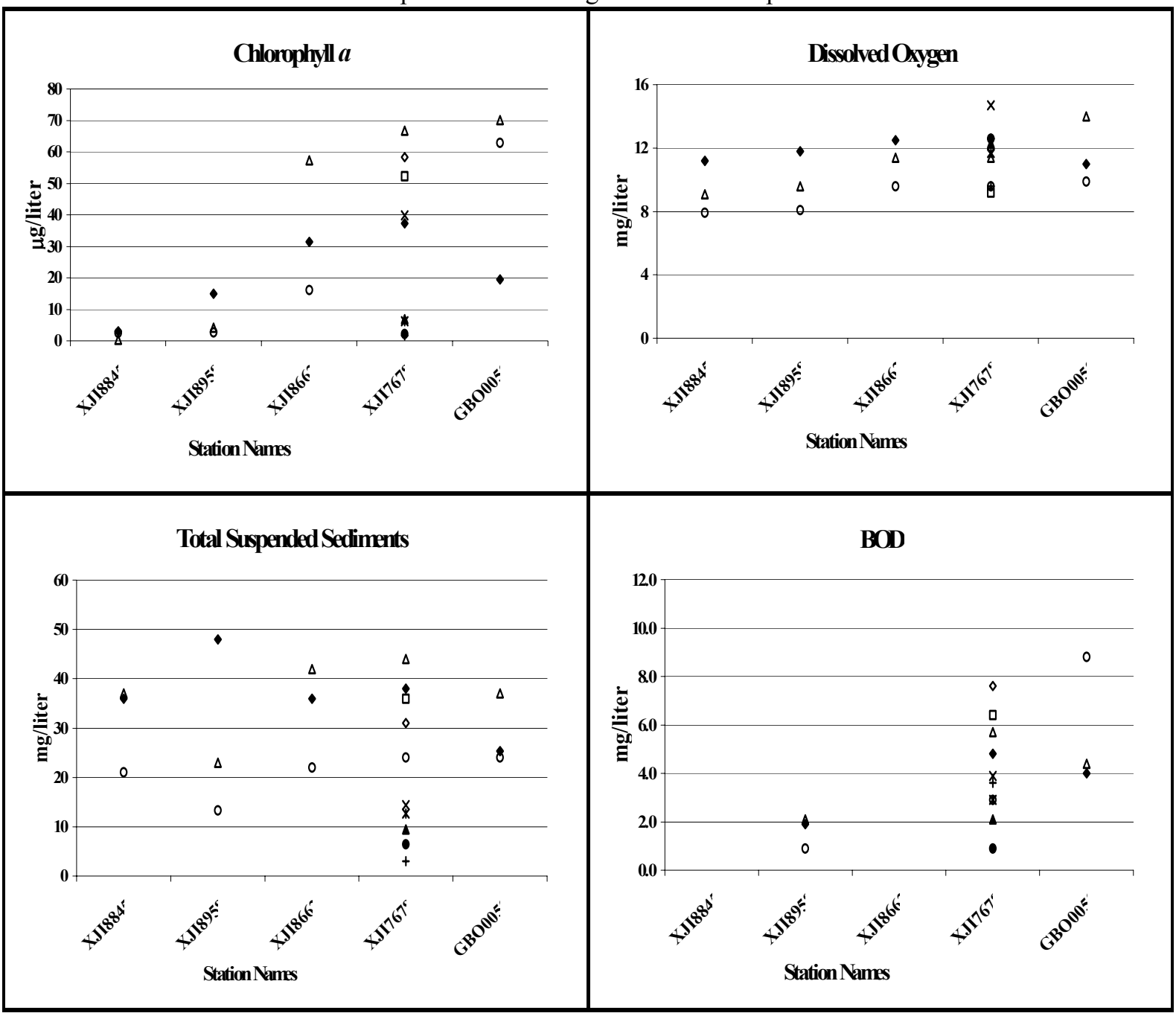
Bohemia River



Bohemia River (main)

High Flow Conditions (December - May)

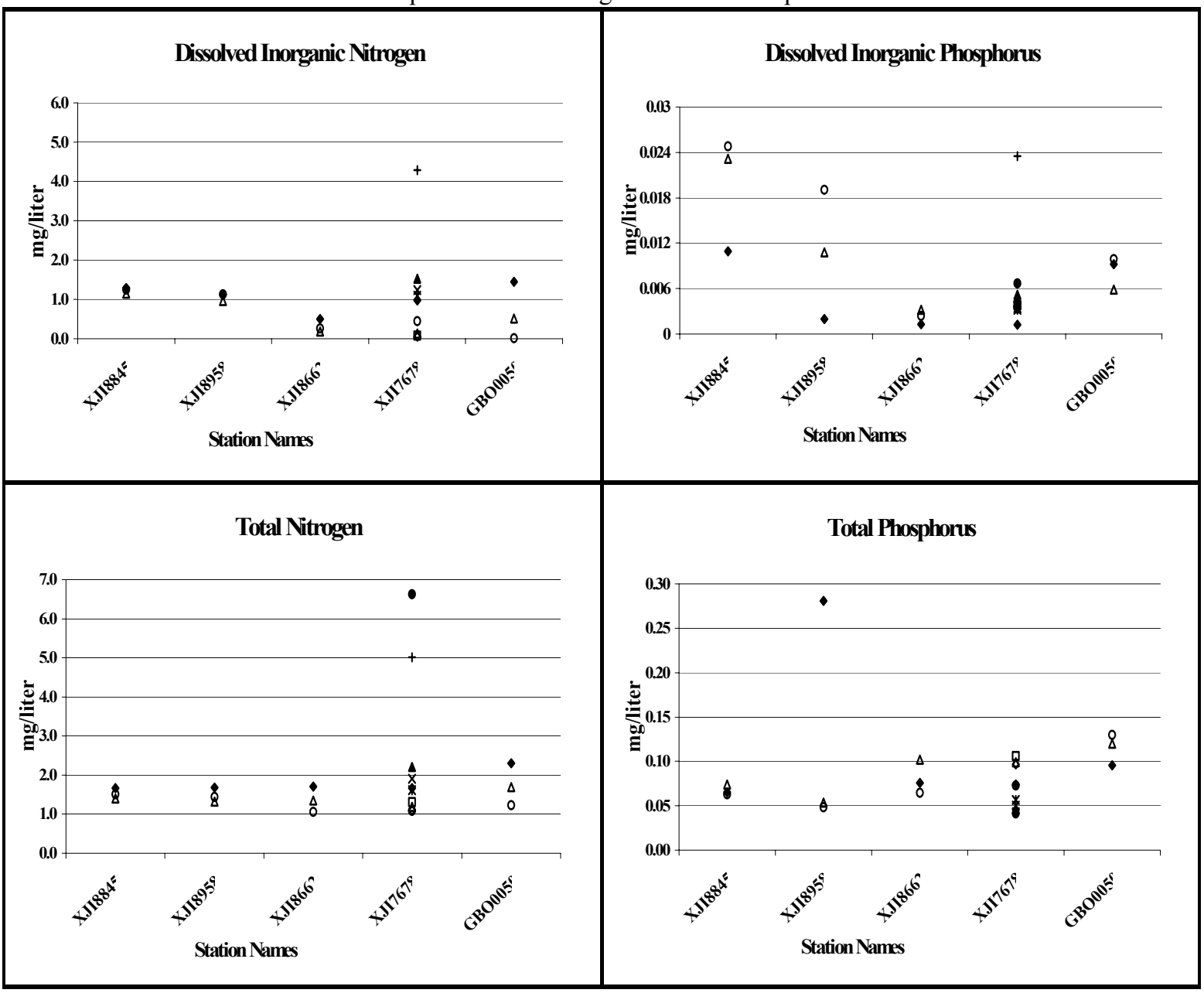
Stations are presented from left to right in downstream to upstream order



Bohemia River (main)

High Flow Conditions (December - May)

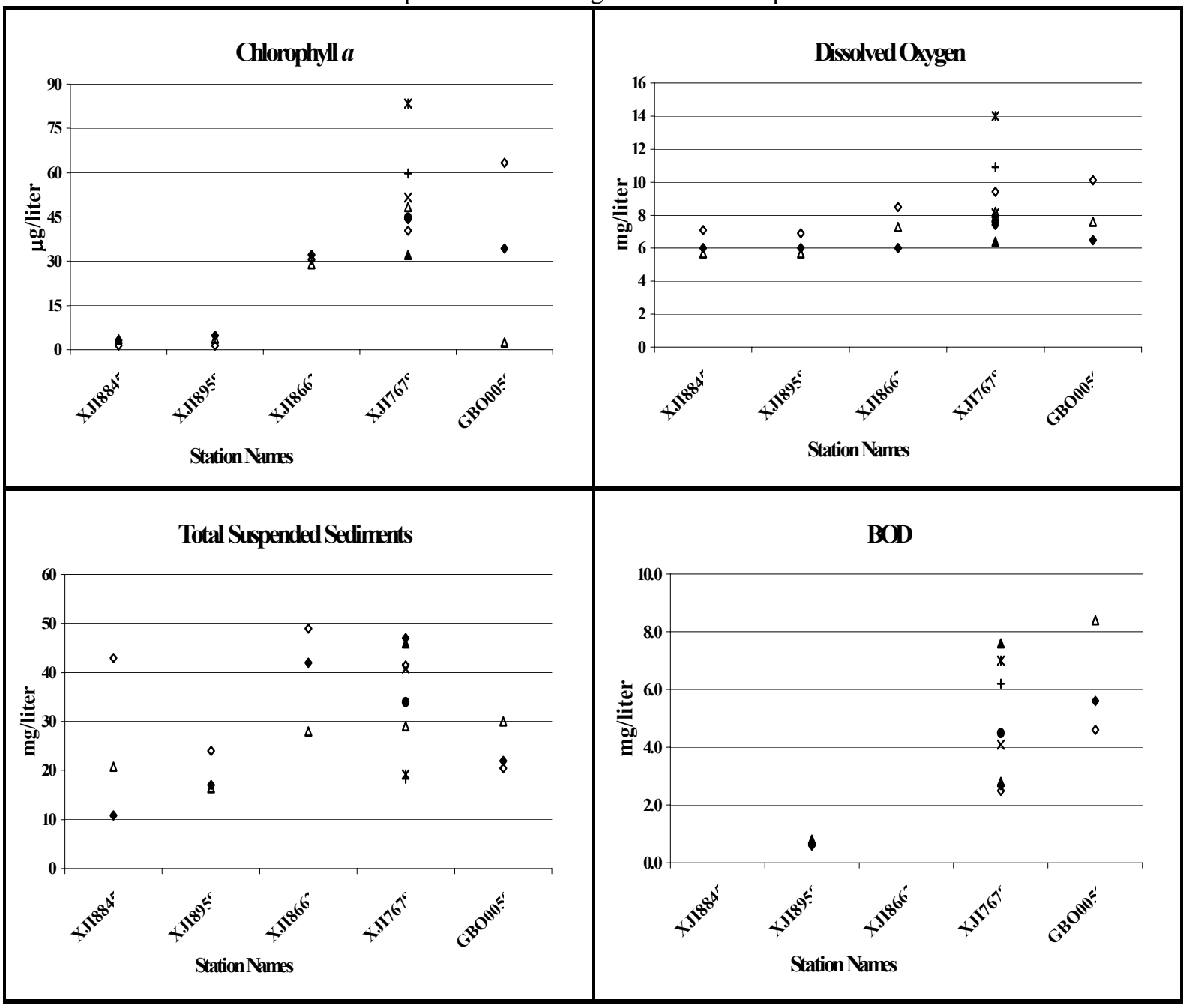
Stations are presented from left to right in downstream to upstream order



Bohemia River (main)

Low Flow Conditions (June - November)

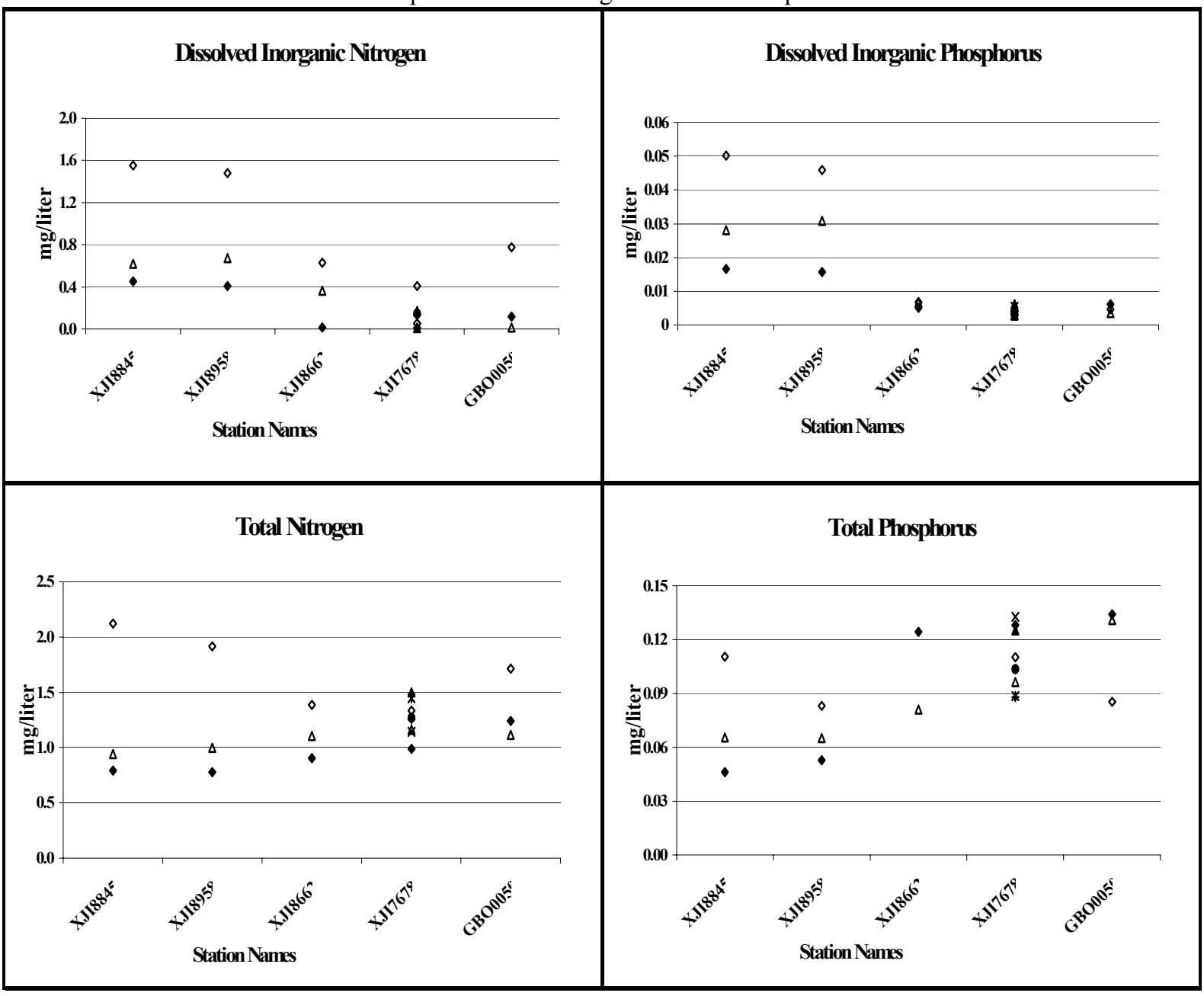
Stations are presented from left to right in downstream to upstream order



Bohemia River (main)

Low Flow Conditions (June - November)

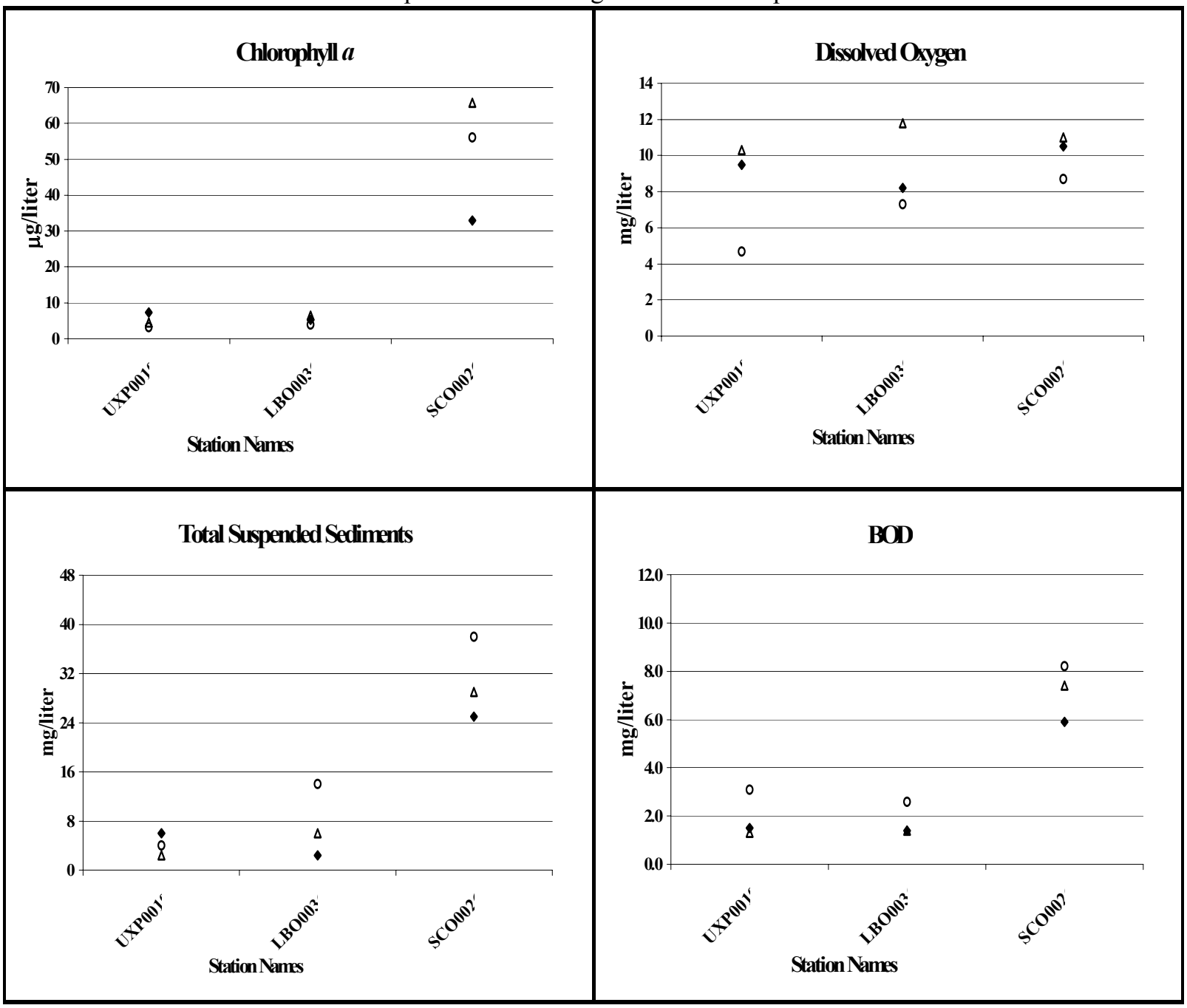
Stations are presented from left to right in downstream to upstream order



Bohemia River (tributaries)

High Flow Conditions (December - May)

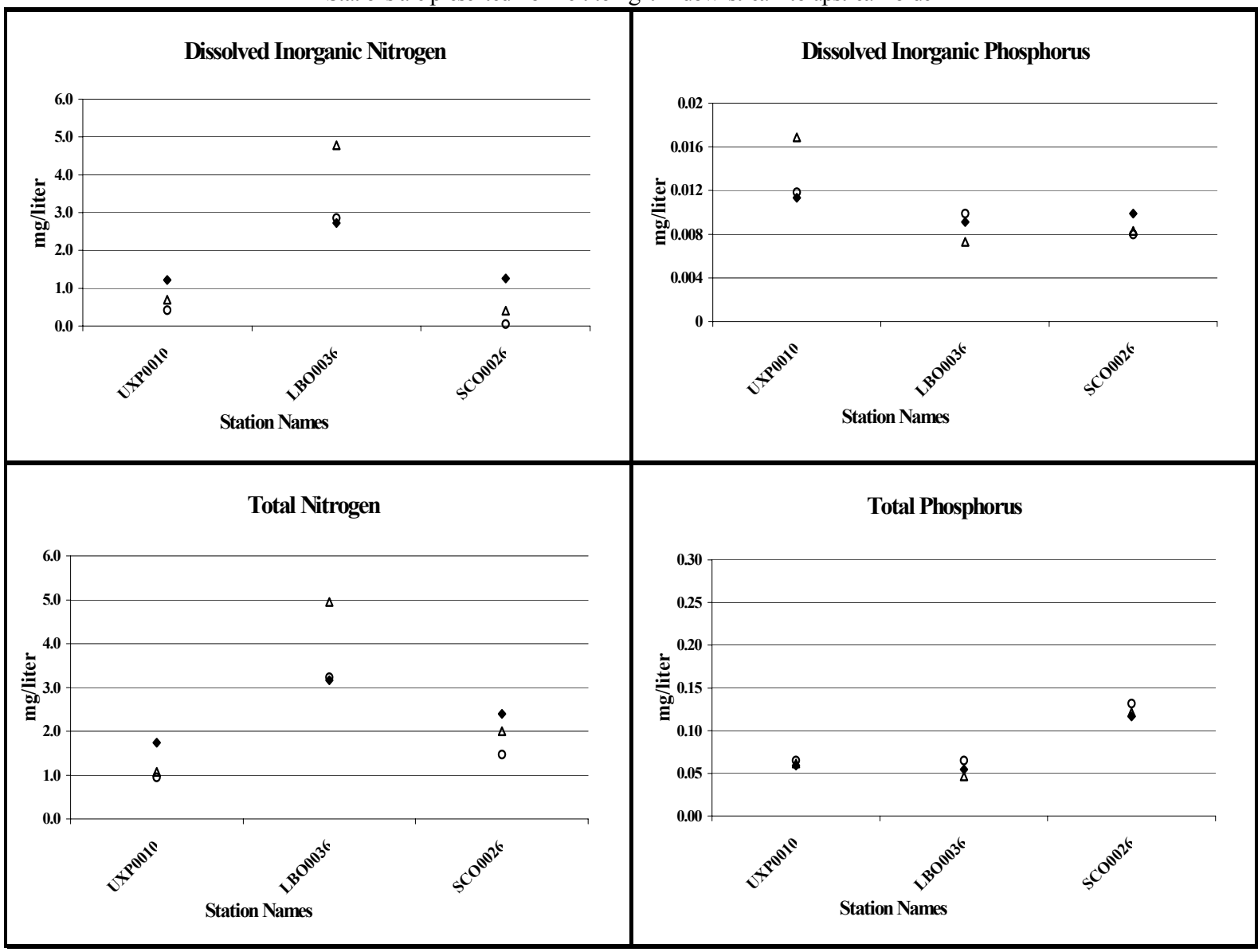
Stations are presented from left to right in downstream to upstream order



Bohemia River (tributaries)

High Flow Conditions (December - May)

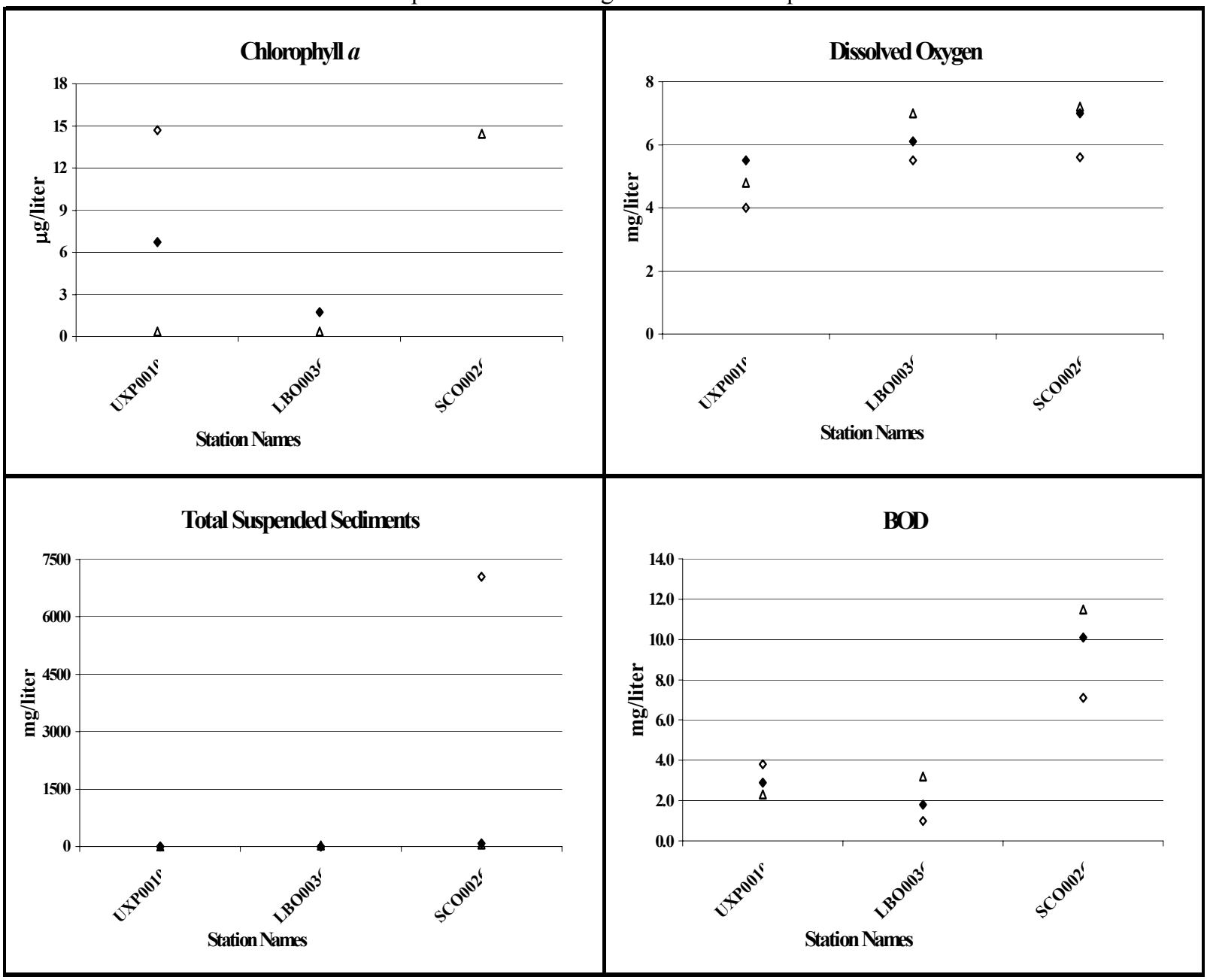
Stations are presented from left to right in downstream to upstream order



Bohemia River (tributaries)

Low Flow Conditions (June - November)

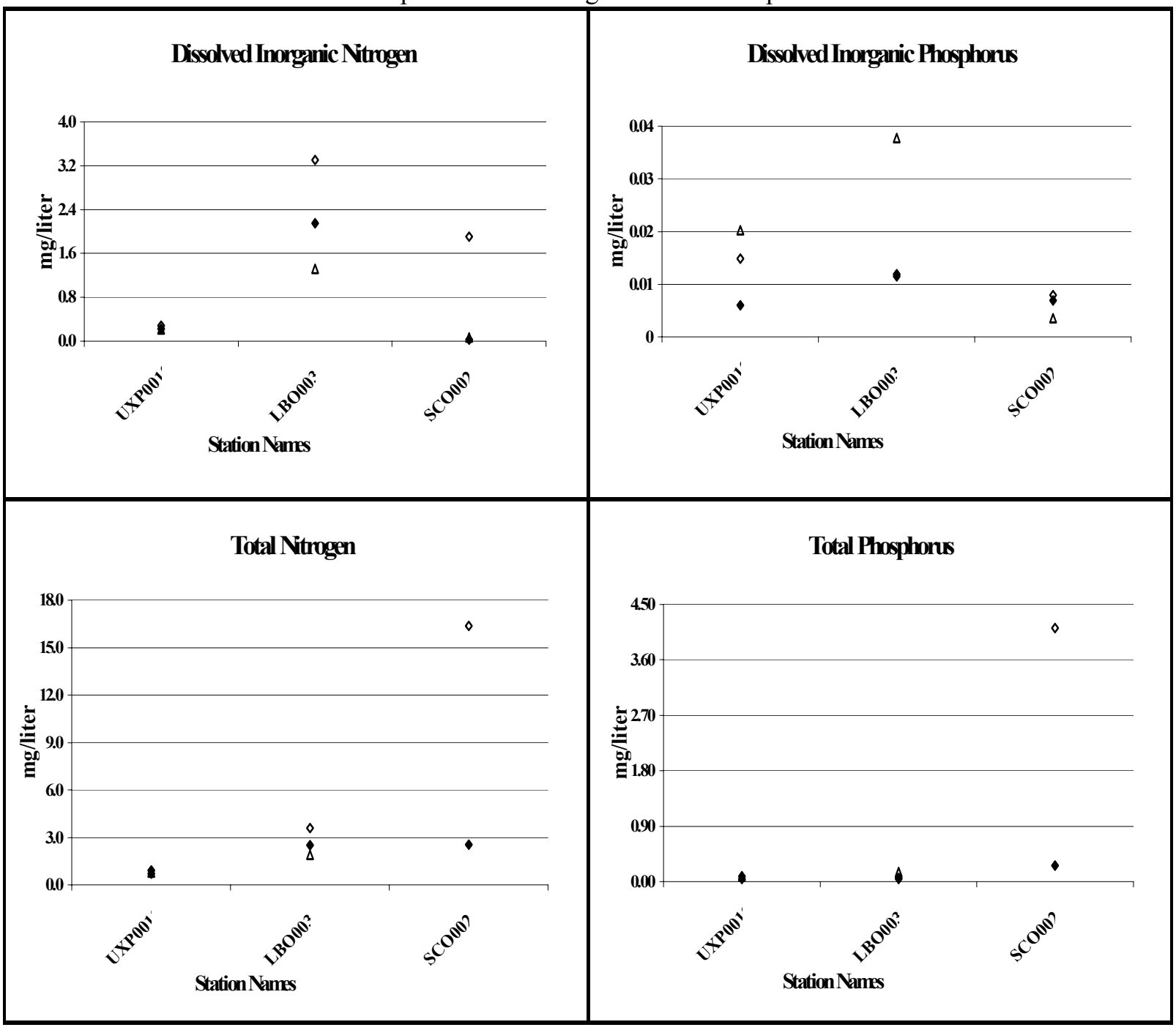
Stations are presented from left to right in downstream to upstream order



Bohemia River (tributaries)

Low Flow Conditions (June - November)

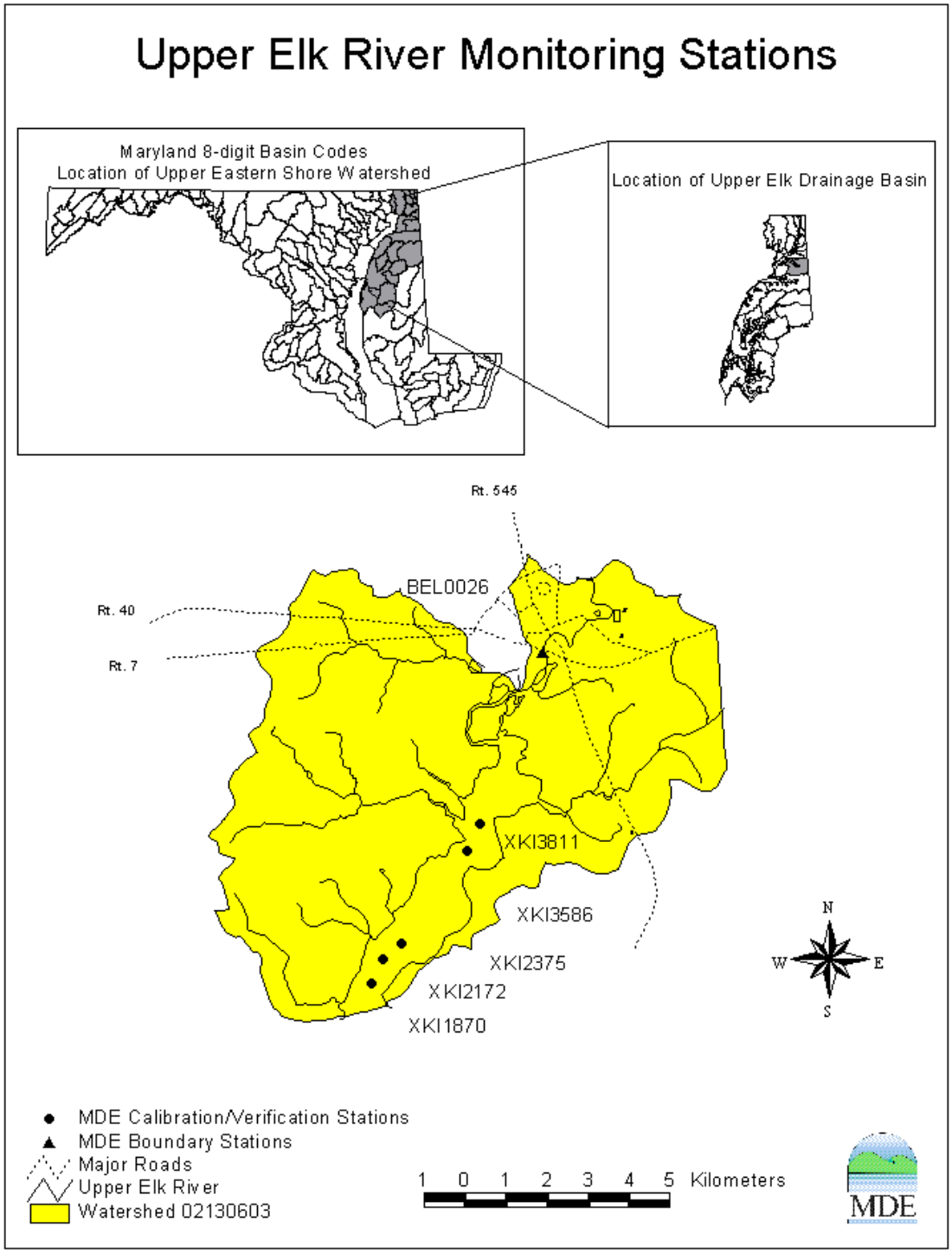
Stations are presented from left to right in downstream to upstream order



BOHEMIA RIVER
1999 TMDL STUDY STATION LIST

Station Code	Lat/Long	Description
Scotchman Creek		
SCO0026	39 26.212 75 53.170	Road crossing on Frazers Lake Rd., below Mill Pond. Enter Frazers Lake Rd. from Glebe Rd.
Black Duck Creek		
UXP0010	39 26.028 75 50.826	Bridge crossing on Bohemia Church Road. First Stream east of Rt. 213.
Little Bohemia Creek		
LBO0036	39 26.105 75 48.334	Road crossing at Bohemia Church Road. First stream west of Church Rd.
Great Bohemia Creek		
GBO0050	39 27.927 75 46.539	Old Telegraph Road crossing, below pond on Great Bohemia Creek.
Bohemia River		
XJI8845	39 28.779 75 55.515	Mid-channel, between Town Pt. and Veazey Cove.
XJI8958	39 28.858 75 54.175	Mid-channel, between Battery Pt. and Bohemia Vista Marina.
XJI8662	39 28.558 75 53.174	At marker R 2 .
XJI7678	39 27.633 75 52.207	Rte 213 bridge. In channel near marina.

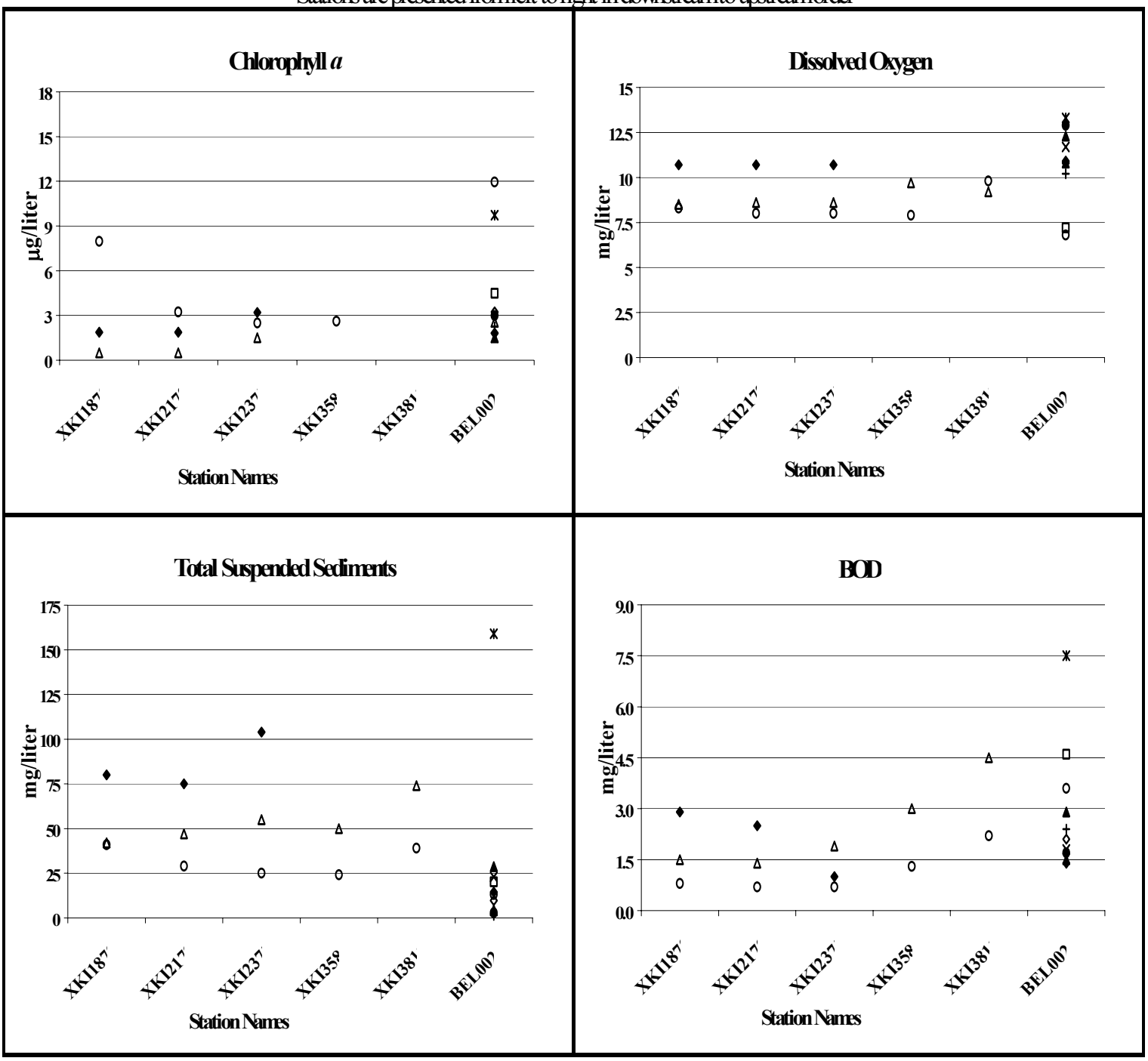
Upper Elk River



Upper Elk River

High Flow Conditions (December - May)

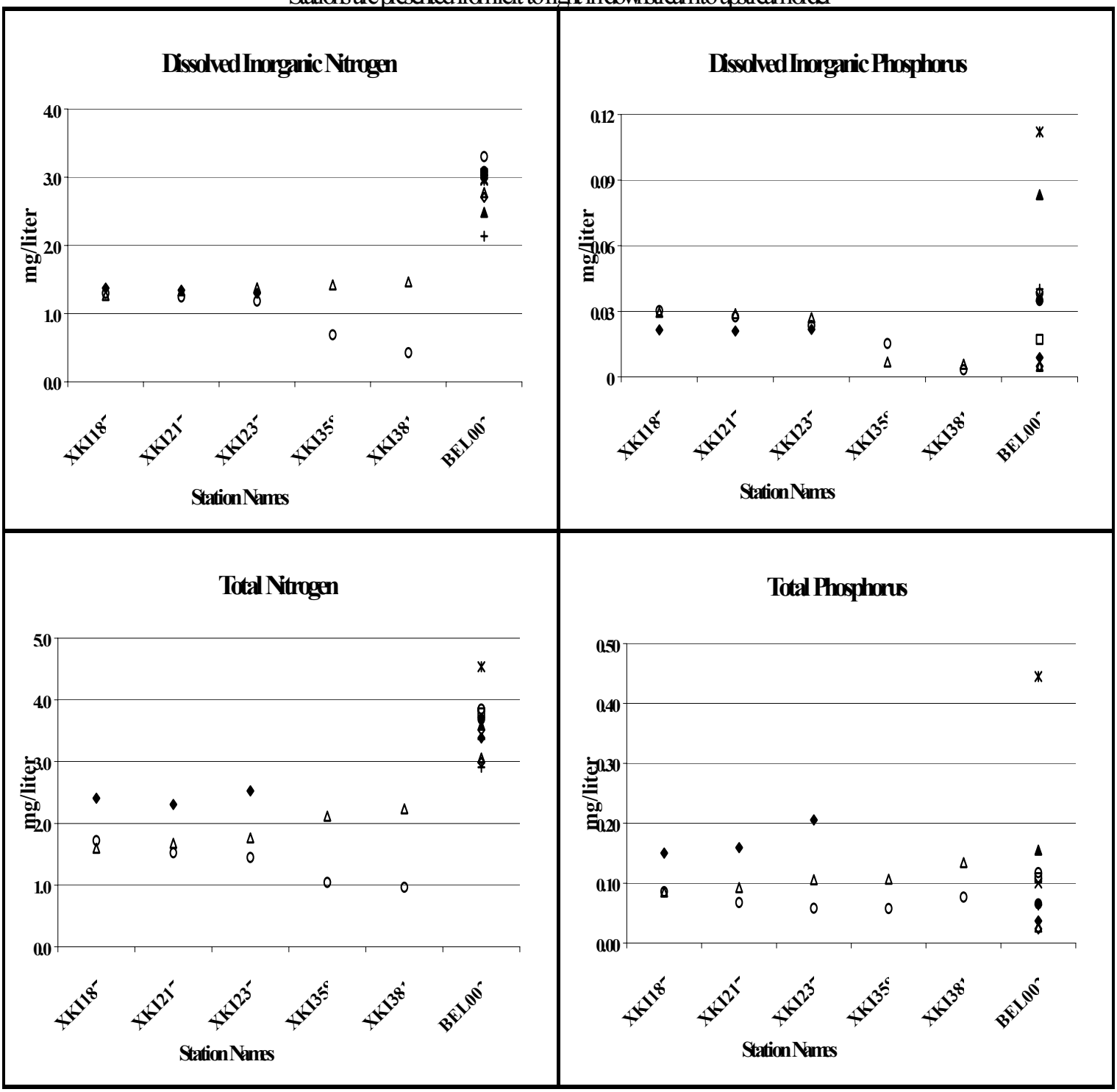
Stations are presented from left to right in downstream to upstream order



Upper ELK River

High Flow Conditions (December - May)

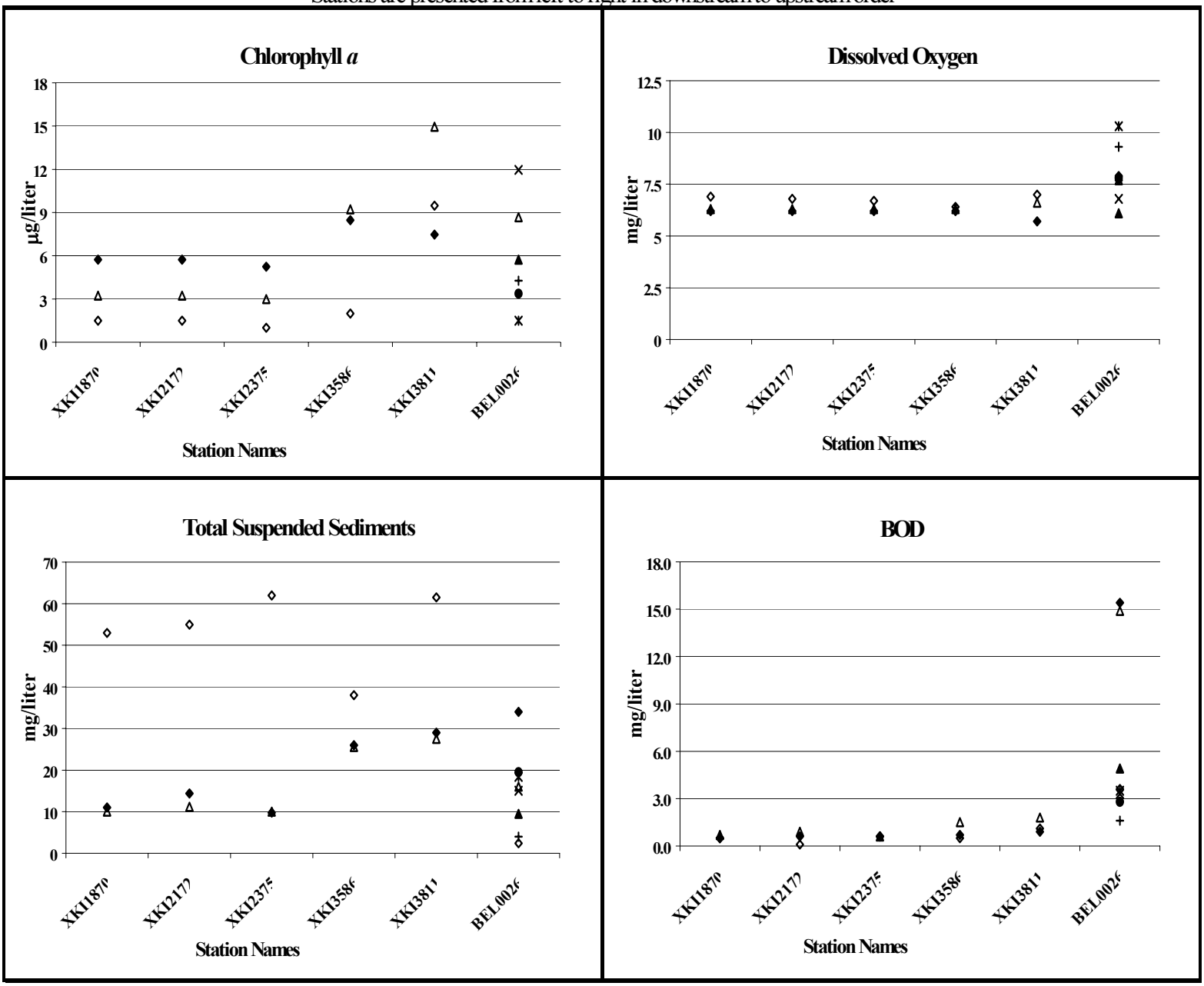
Stations are presented from left to right in downstream to upstream order



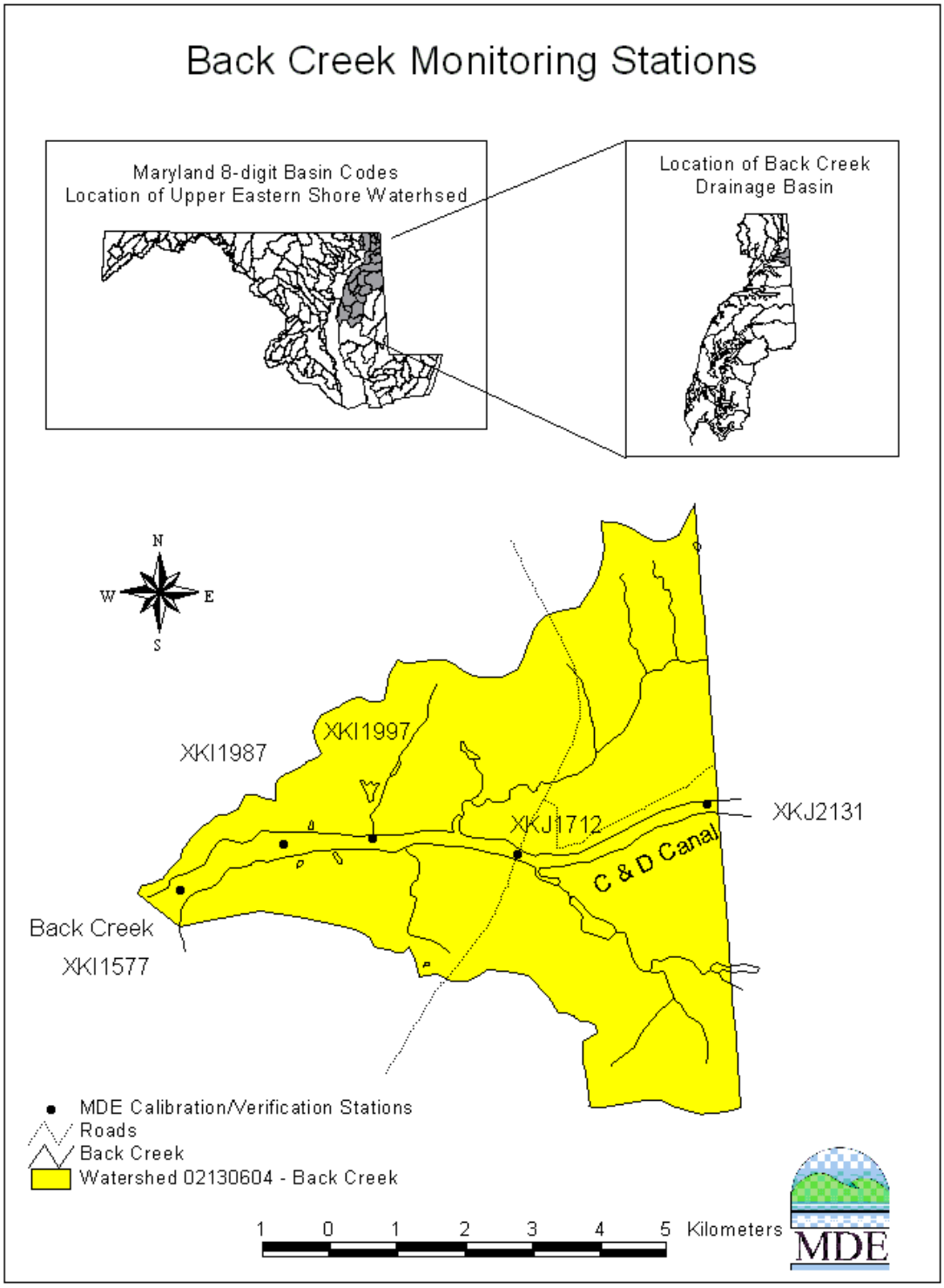
Upper Elk River

Low Flow Conditions (June - November)

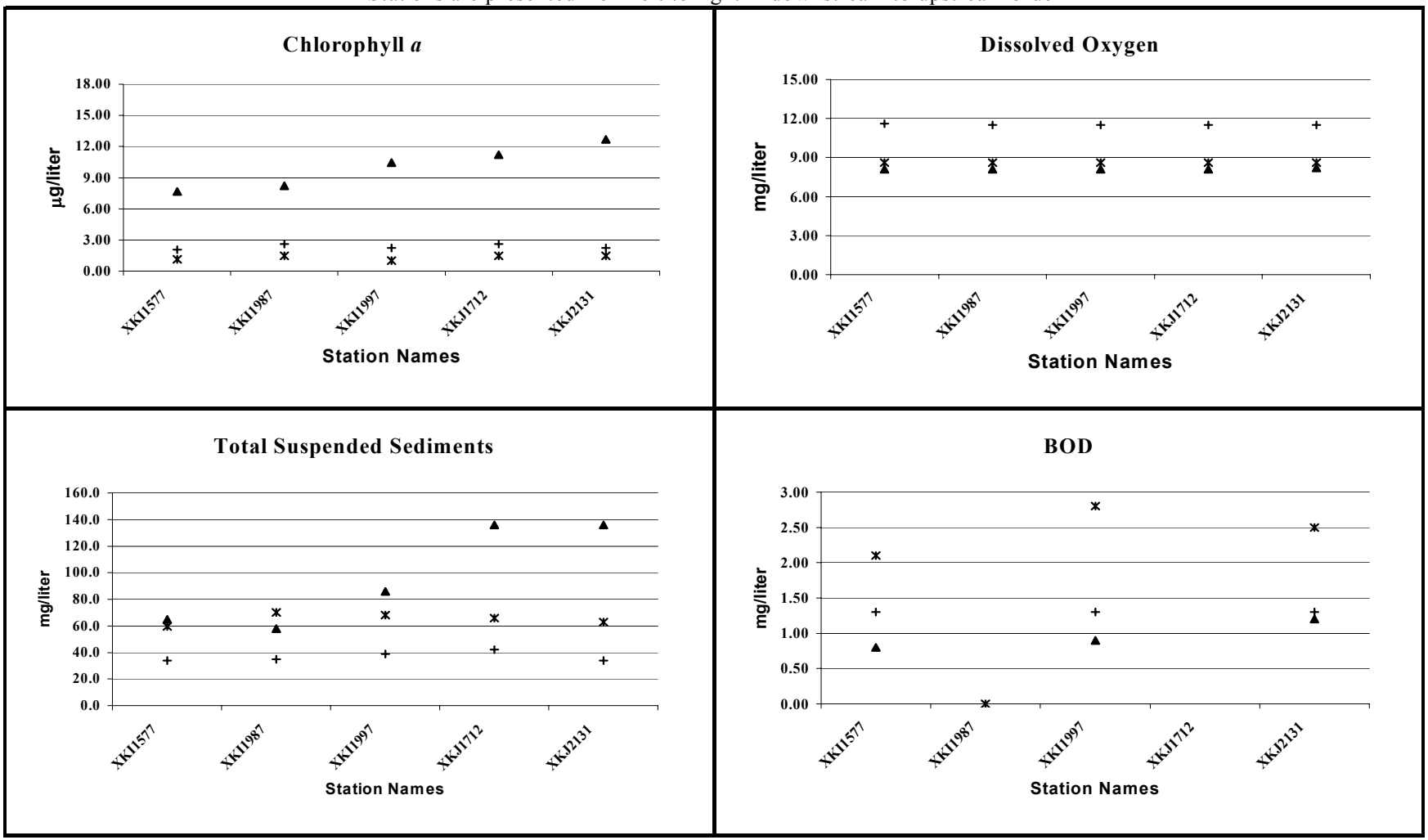
Stations are presented from left to right in downstream to upstream order



Back Creek – C & D Canal


Back Creek Monitoring Stations
Maryland 8-digit Basin Codes
Location of Upper Eastern Shore Waterhsed
Location of Back Creek
Drainage Basin
N
W
E
S
XKI1997
XKI1987
XKJ1712
XKJ2131
C & D Canal
Back Creek
XKI1577
MDE Calibration/Verification Stations
Roads
Back Creek
Watershed 02130604 - Back Creek
1 0 1 2 3 4 5 Kilometers
MDE

Back Creek-C &D Canal
High Flow Conditions (December - May)
Stations are presented from left to right in downstream to upstream order

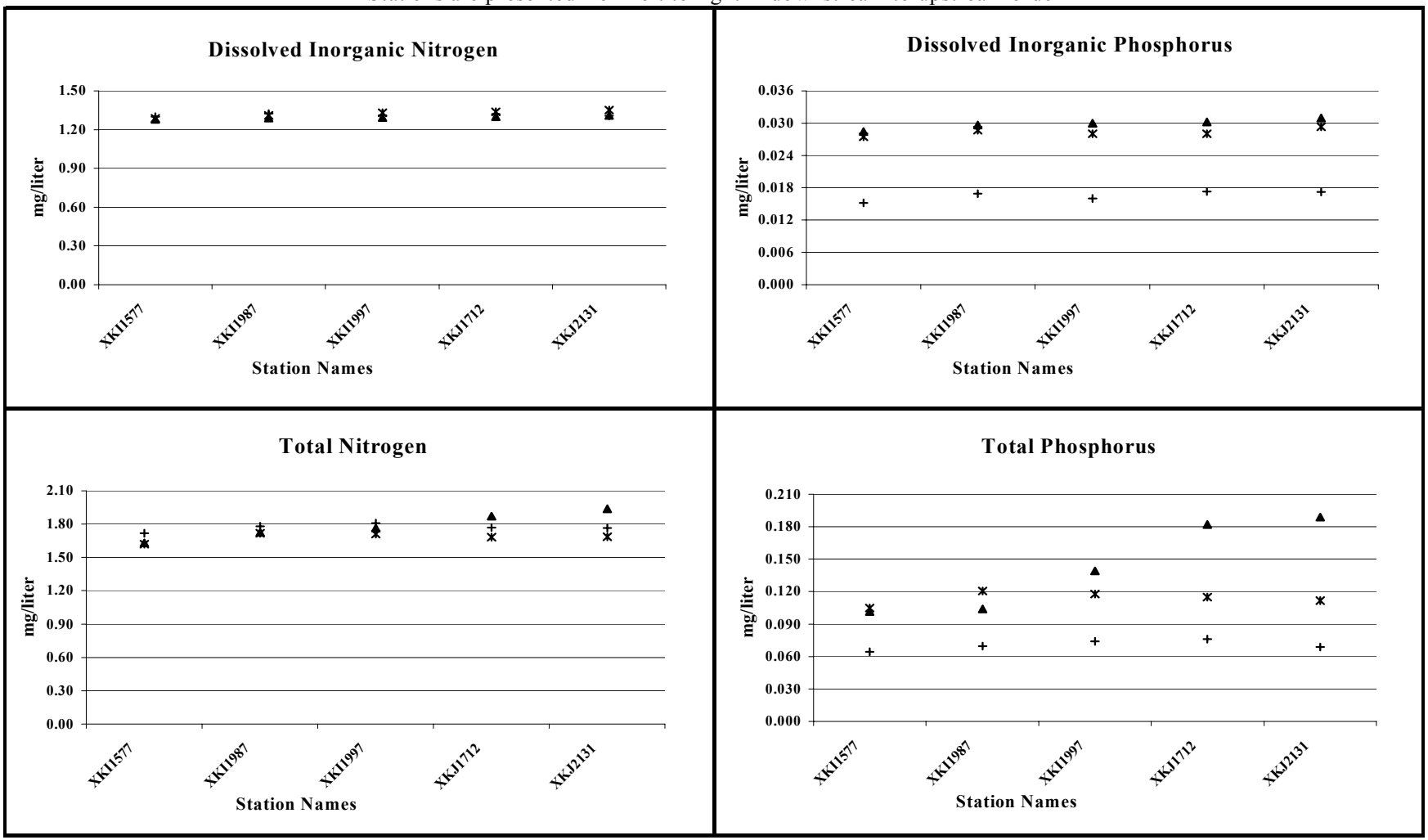


+ 24-Mar-99 ⁎ 20-Apr-99 ▲ 18-May-99

Back Creek-C &D Canal

High Flow Conditions (December - May)

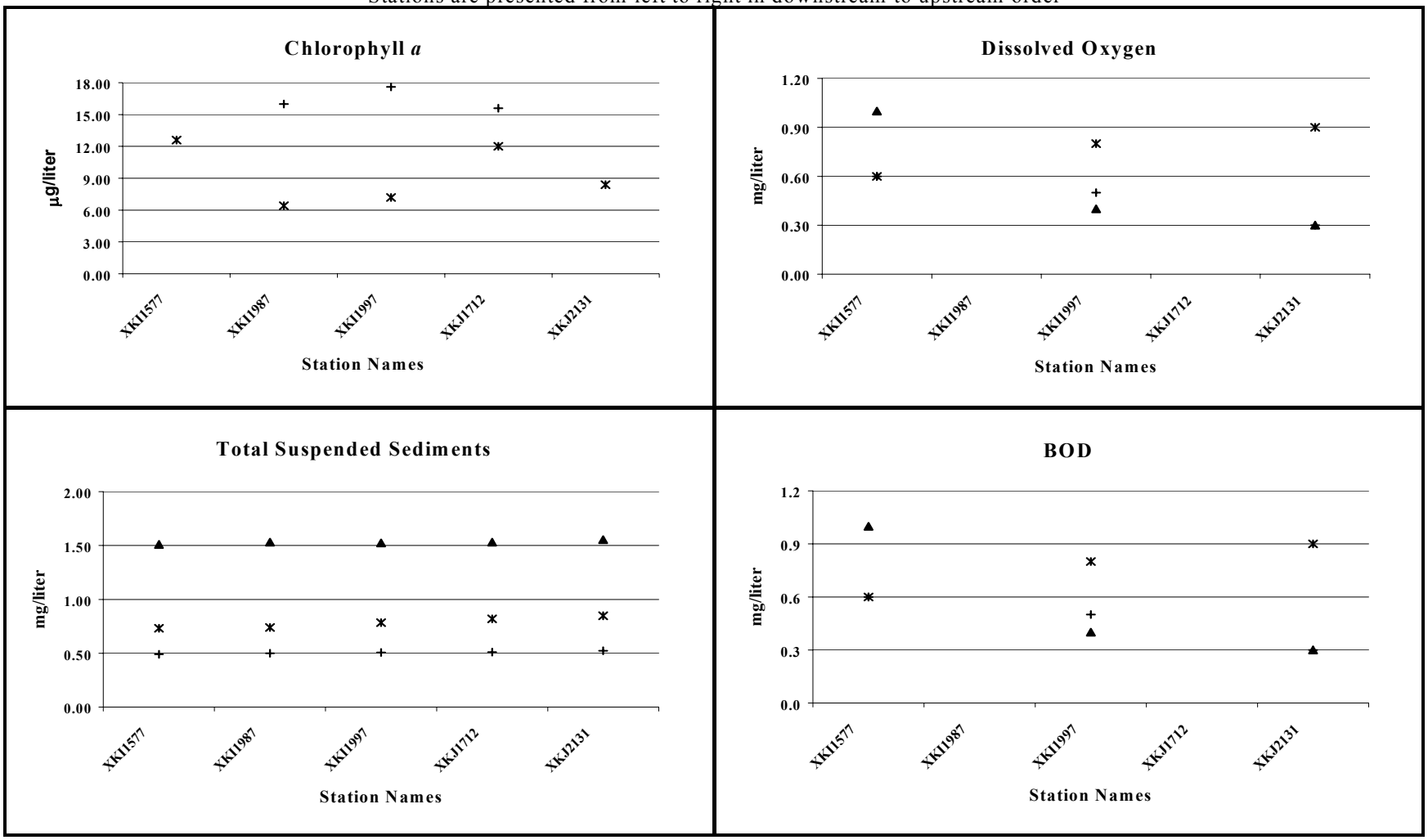
Stations are presented from left to right in downstream to upstream order



Back Creek-C &D Canal

Low Flow Conditions (June - November)

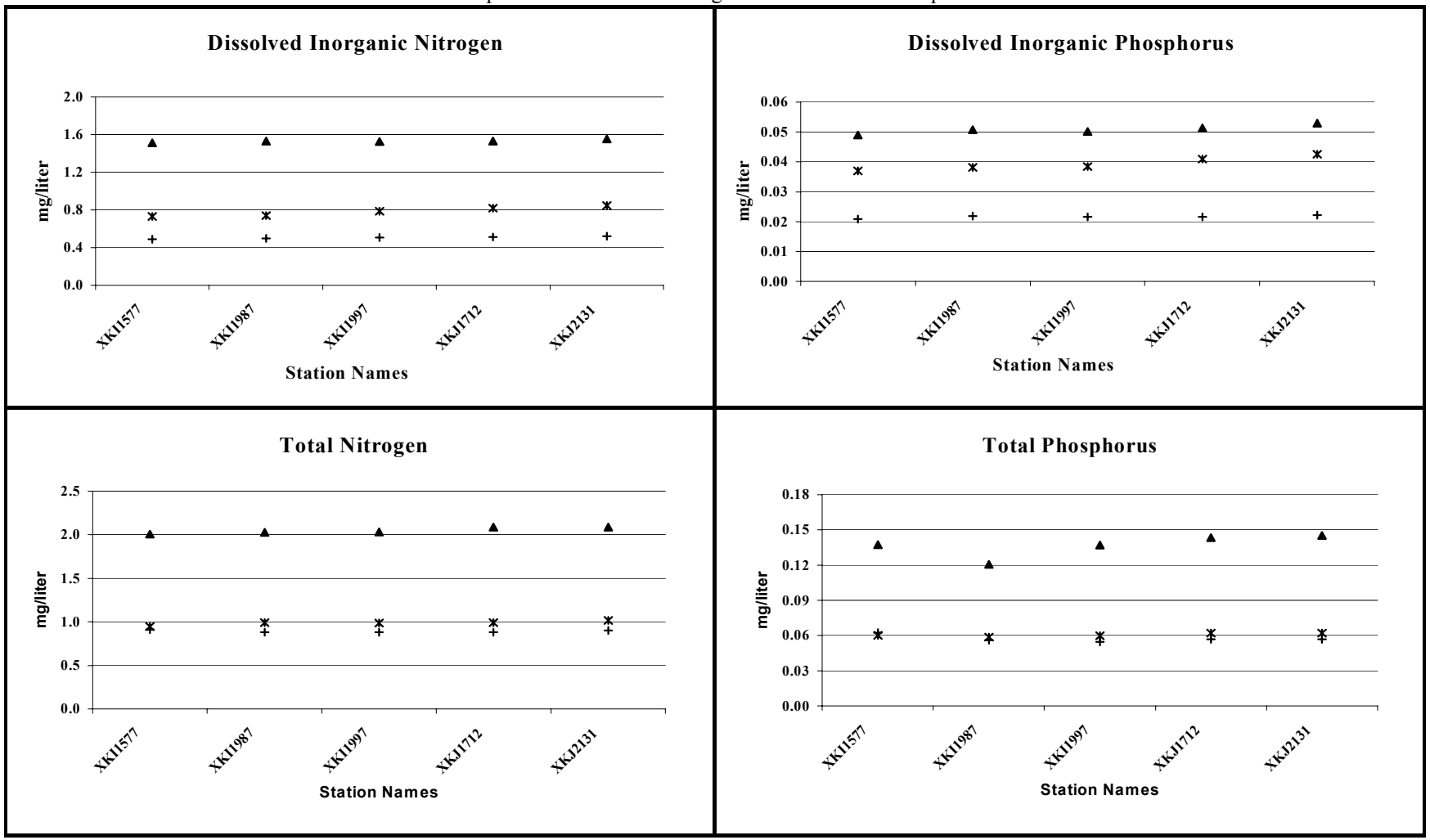
Stations are presented from left to right in downstream to upstream order



Back Creek-C &D Canal

Low Flow Conditions (June - November)

Stations are presented from left to right in downstream to upstream order

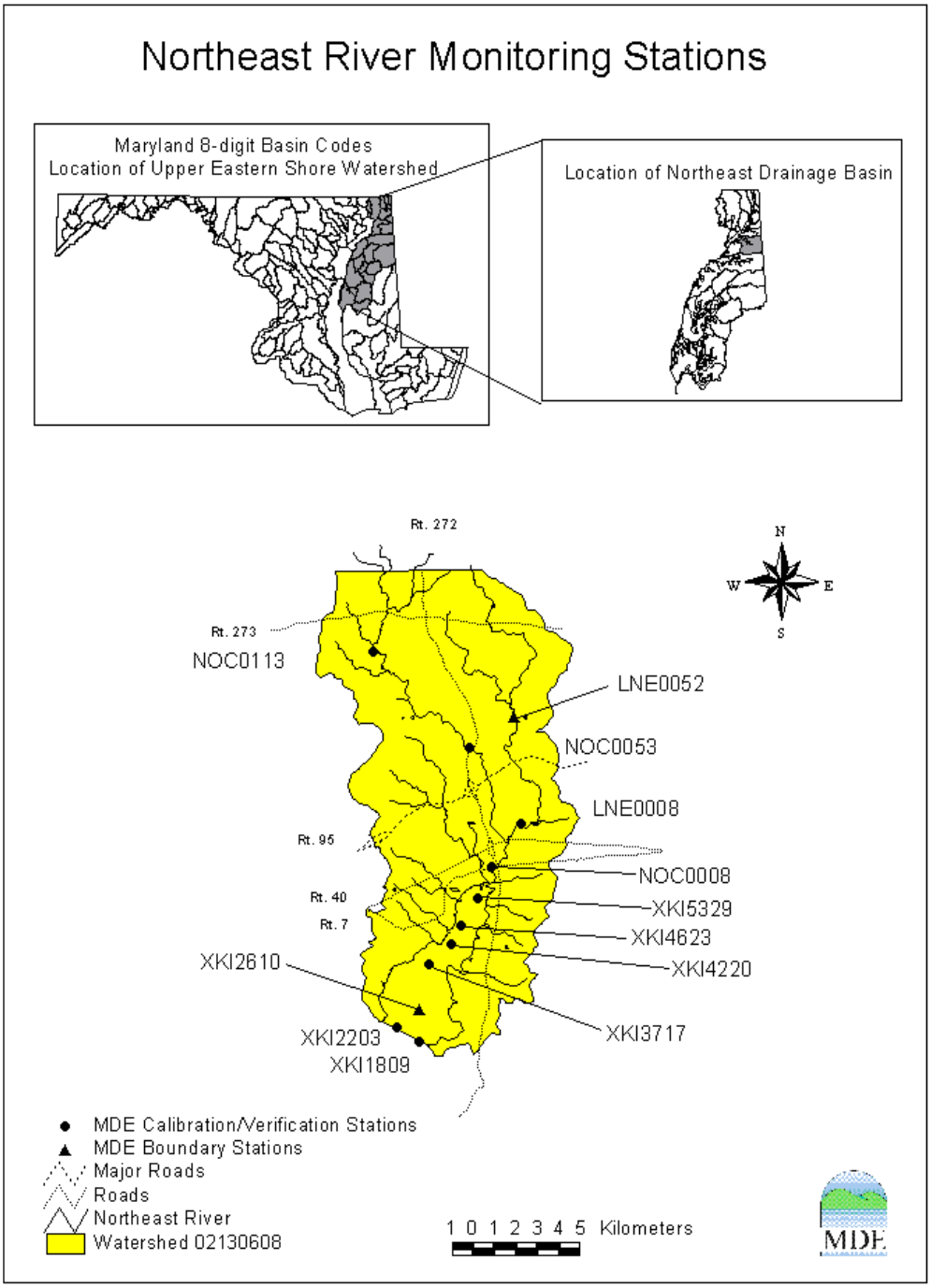


+ 27-Jul-99 * 25-Aug-99 ▲ 28-Sep-99

Back Creek-C&D Canal
1999 TMDL STUDY STATION LIST

Station Code	Lat/Long	Description
Back Creek		
XKI1577	39 31.489 75 52.326	Approx. 300 yds downstream from R 28.
XKI1987	39 31.859 75 51.260	Mid-channel, approx. 100 yds upstream of R 32.
XKI1997	39 31.885 75 50.329	Mid-channel, off three pipes on left.
C&D Canal		
XKJ1712	39 31.748 75 48.837	Beneath Chesapeake City bridge.
XKJ2131	39 32.136 75 46.862	Approx. 125 yds west of MD/DE line.

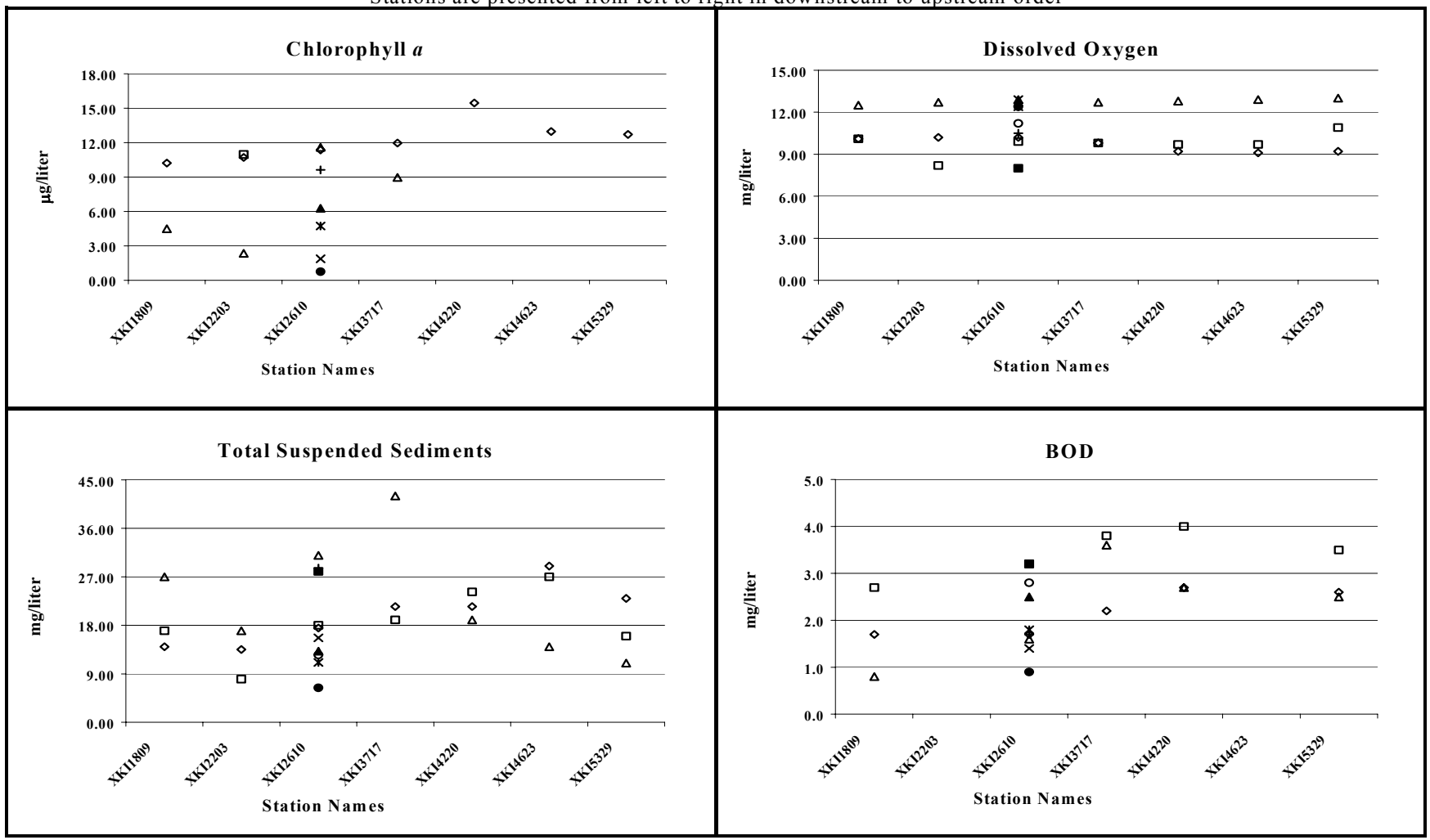
Northeast River



Northeast River (main)

High Flow Conditions (December - May)

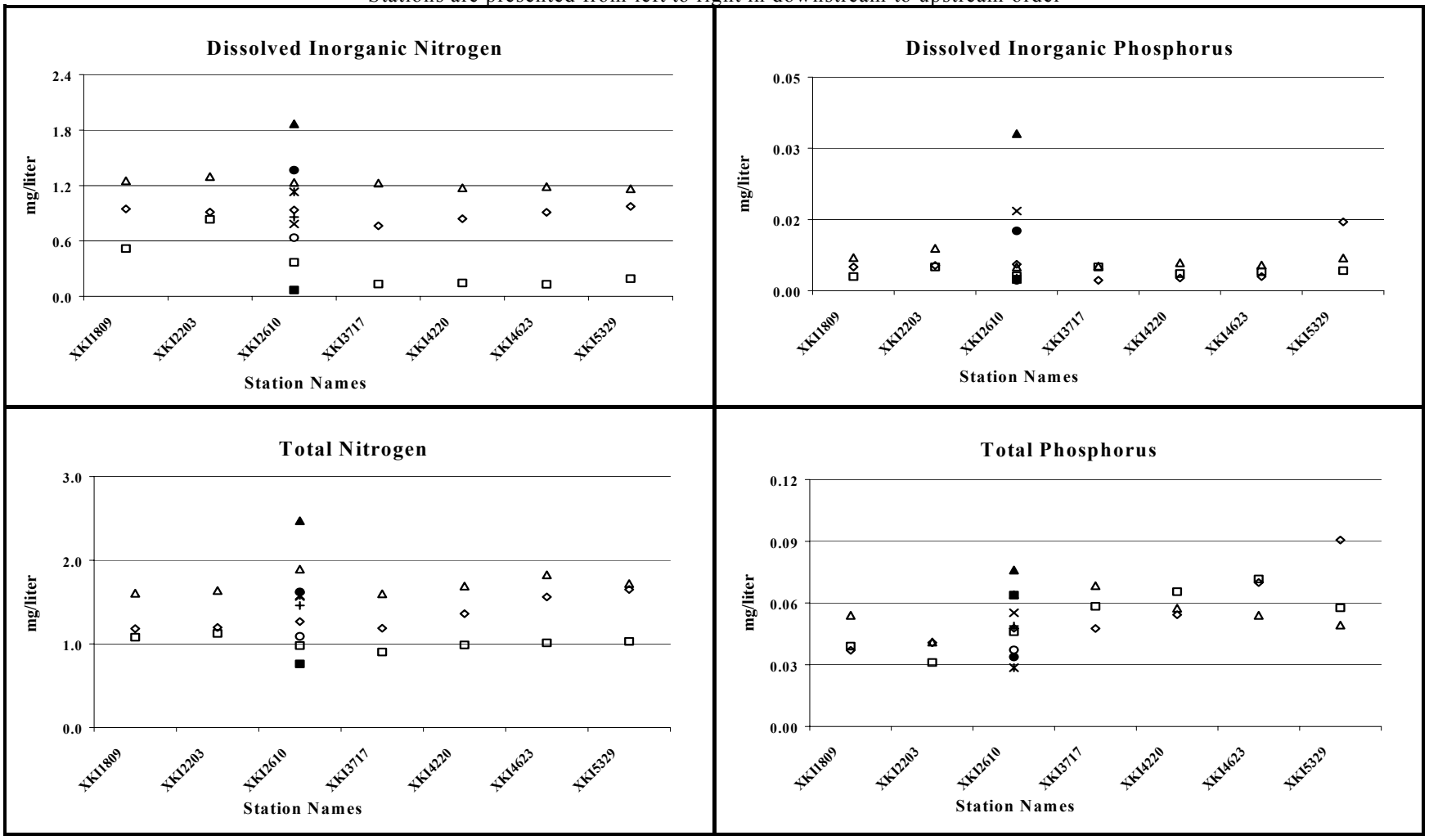
Stations are presented from left to right in downstream to upstream order



Northeast River (main)

High Flow Conditions (December - May)

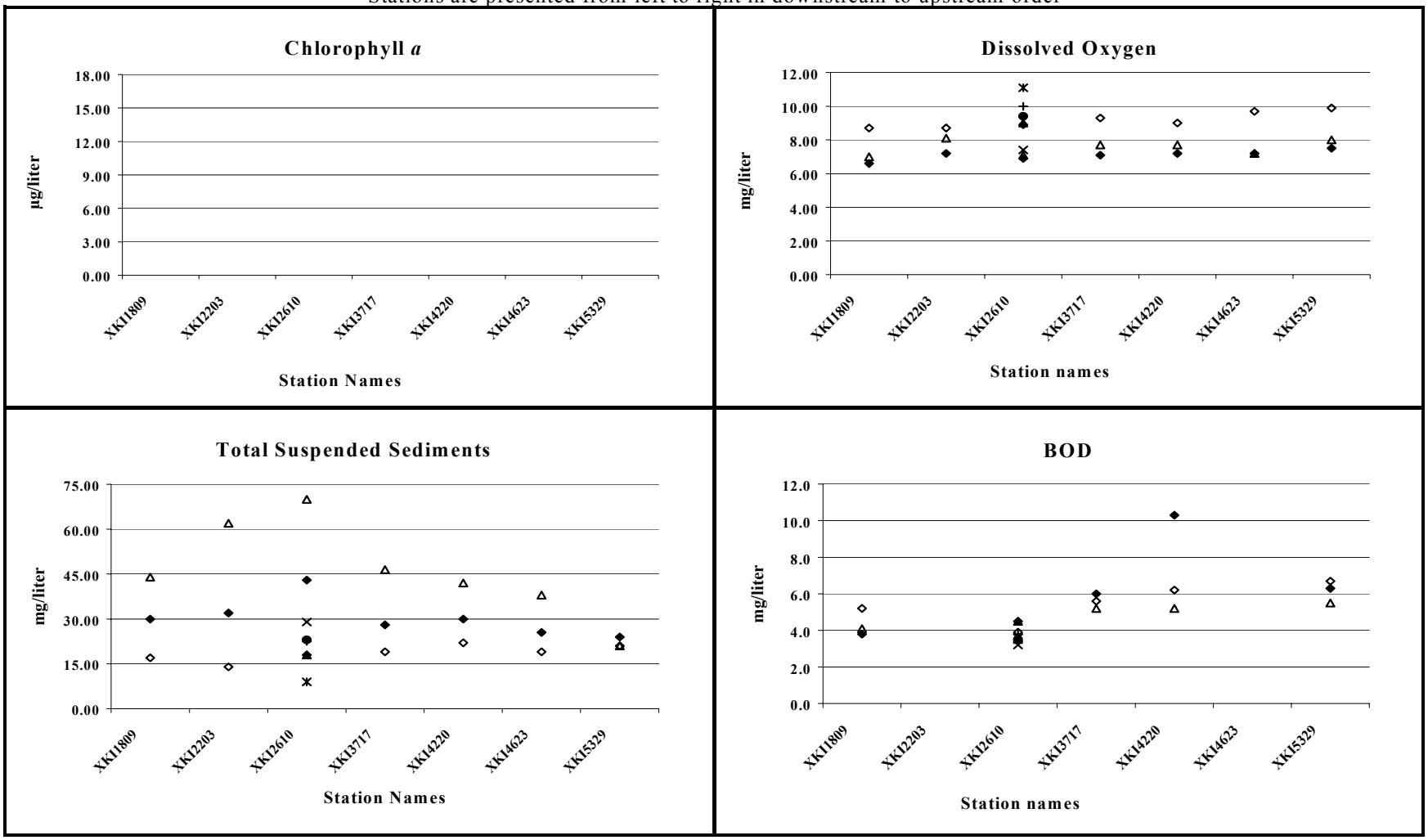
Stations are presented from left to right in downstream to upstream order



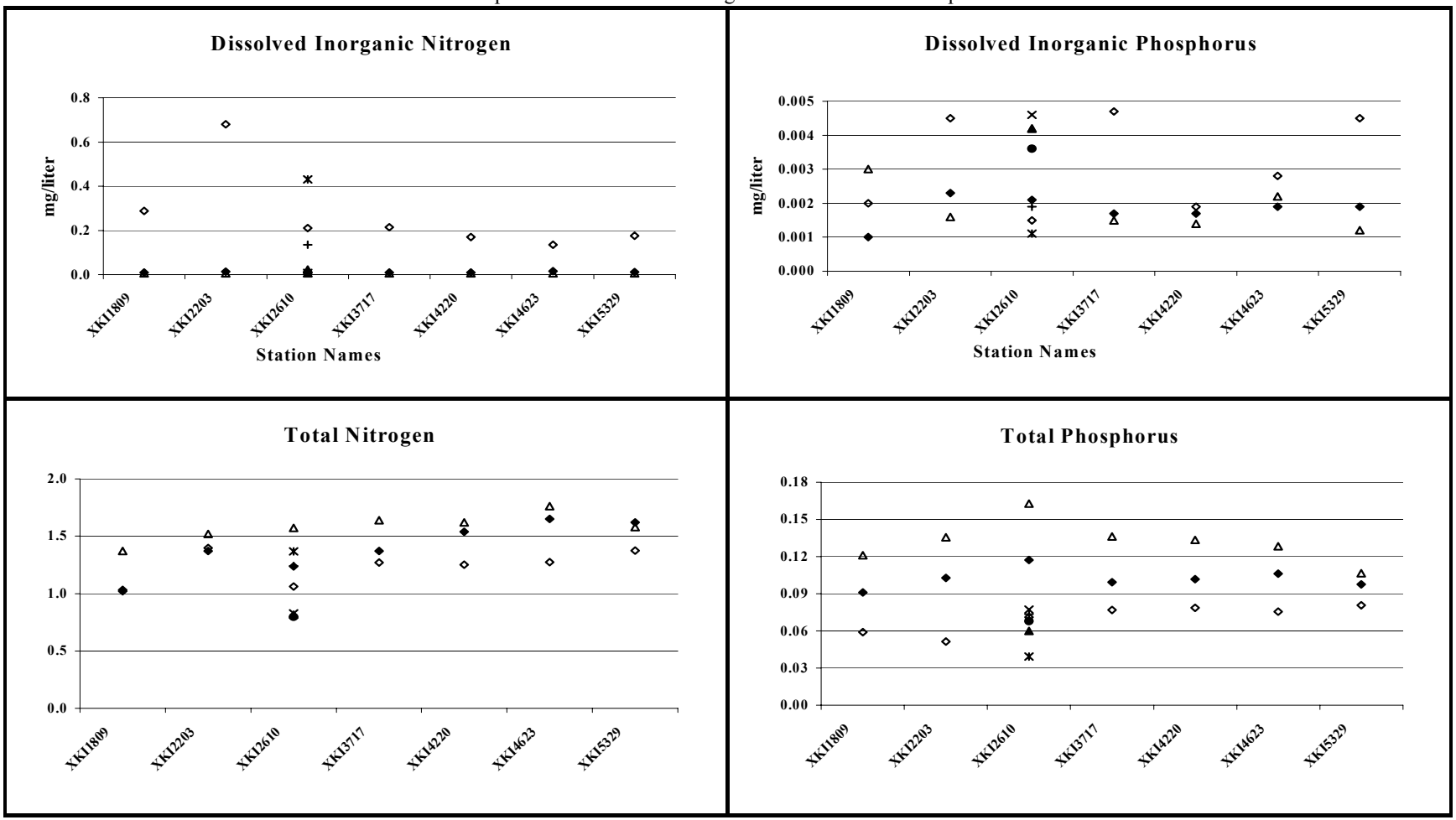
Northeast River (main)

Low Flow Conditions (June - November)

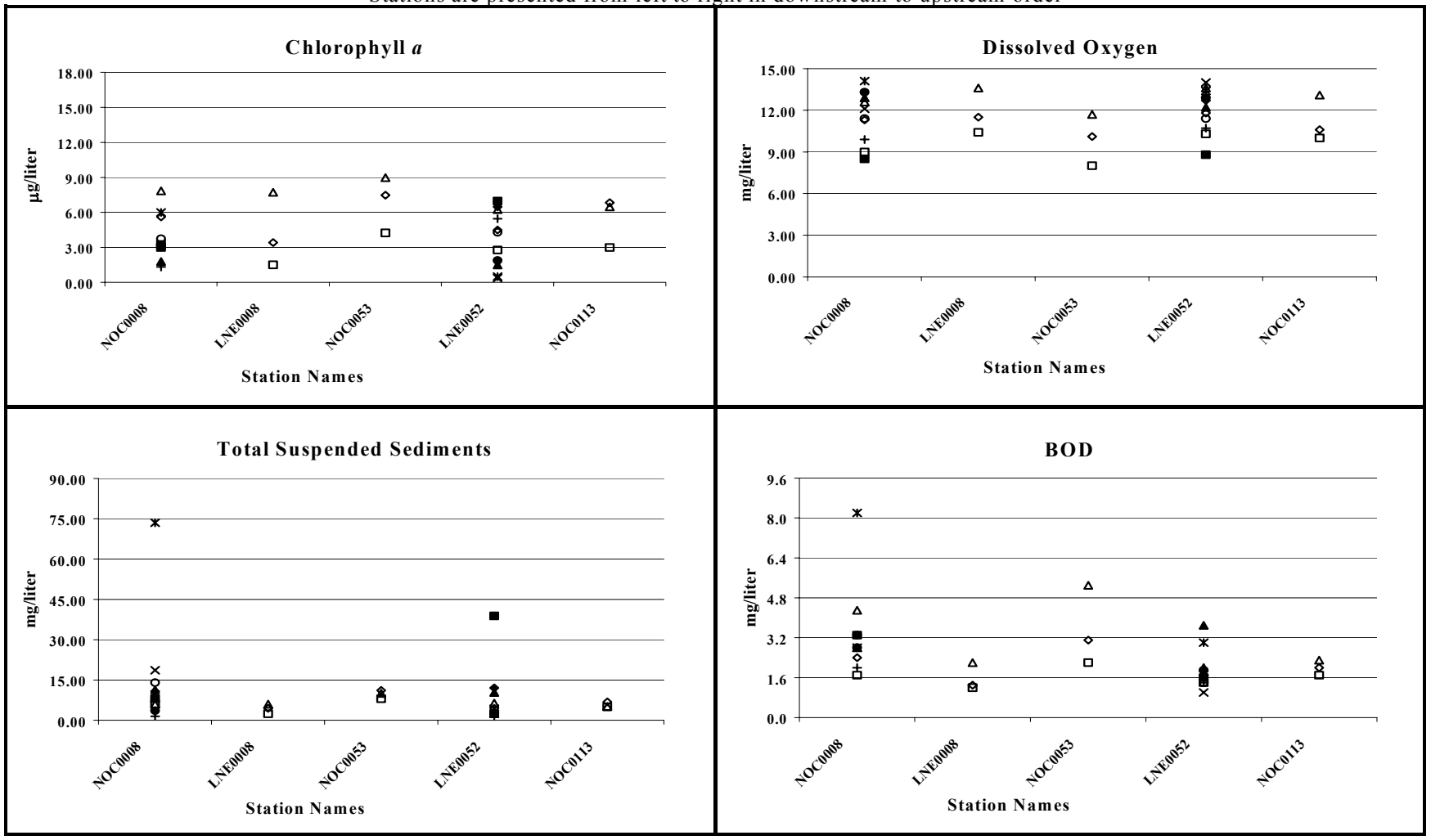
Stations are presented from left to right in downstream to upstream order



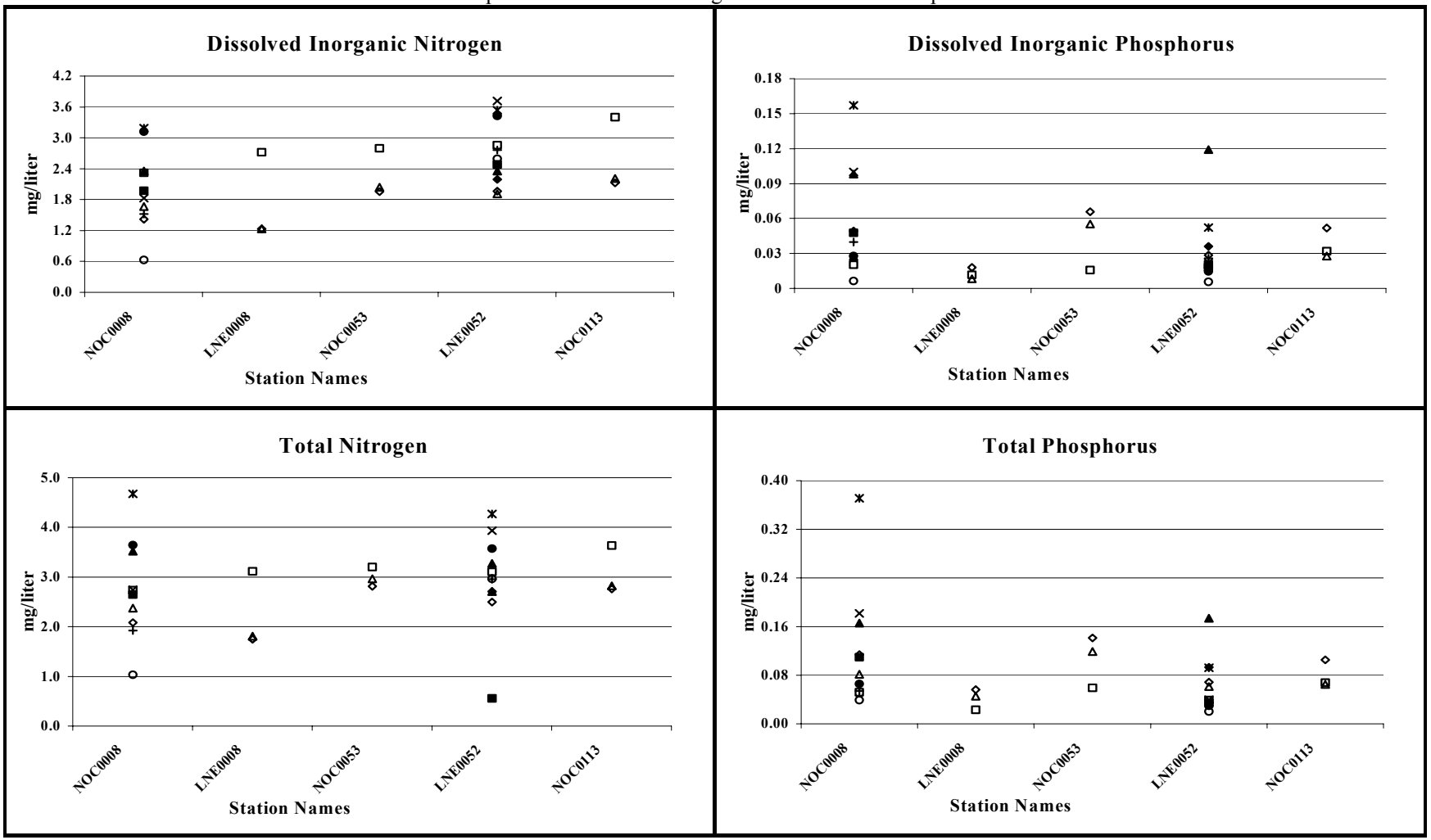
North East River (main)
Low Flow Conditions (June - November)
Stations are presented from left to right in downstream to upstream order



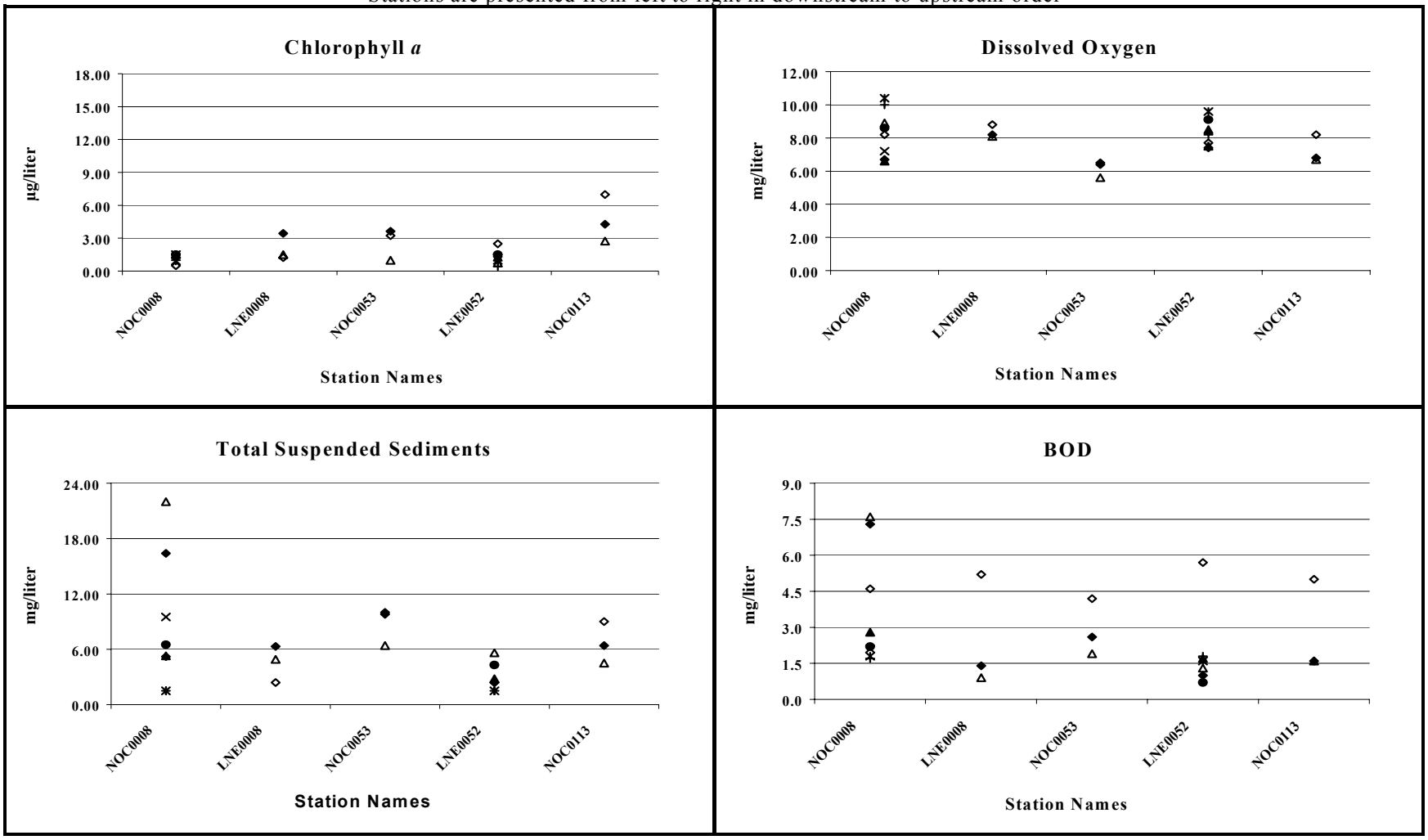
Northeast River (tributary)
High Flow Conditions (December - May)
Stations are presented from left to right in downstream to upstream order



North East River (tributary)
High Flow Conditions (December - May)
Stations are presented from left to right in downstream to upstream order



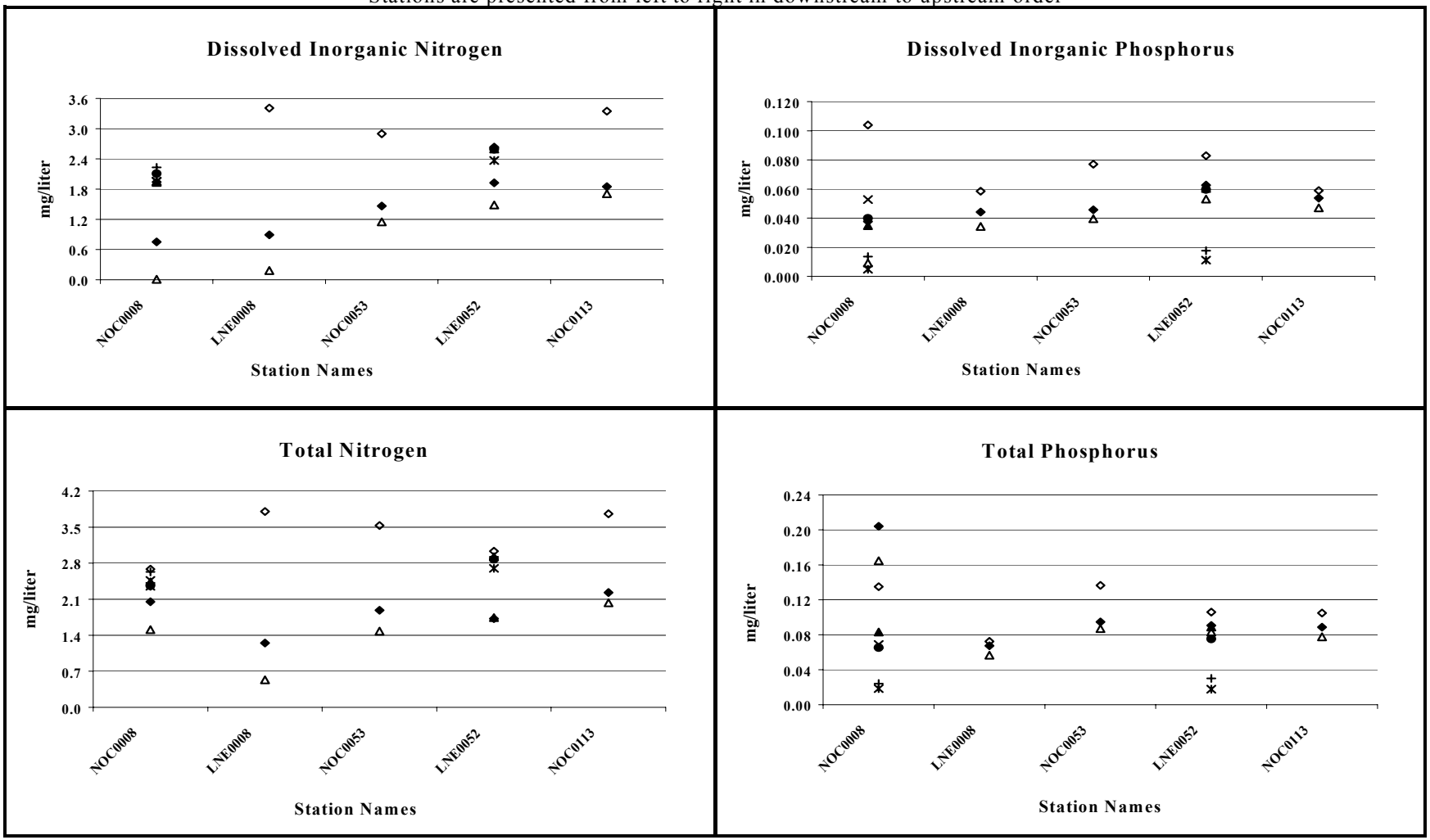
Northeast River (tributary)
Low Flow Conditions (June - November)
Stations are presented from left to right in downstream to upstream order



Northeast River (tributary)

Low Flow Conditions (June - November)

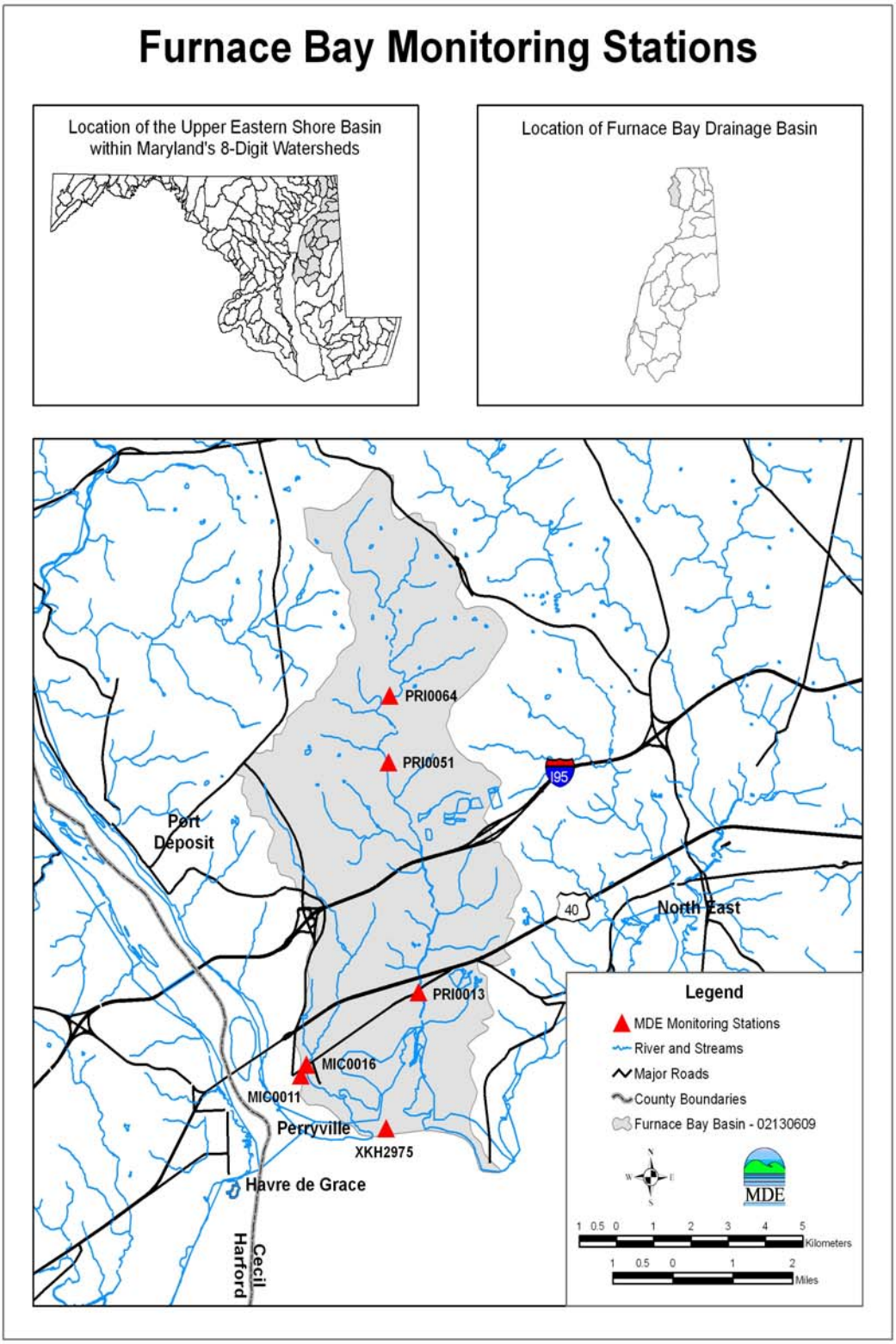
Stations are presented from left to right in downstream to upstream order



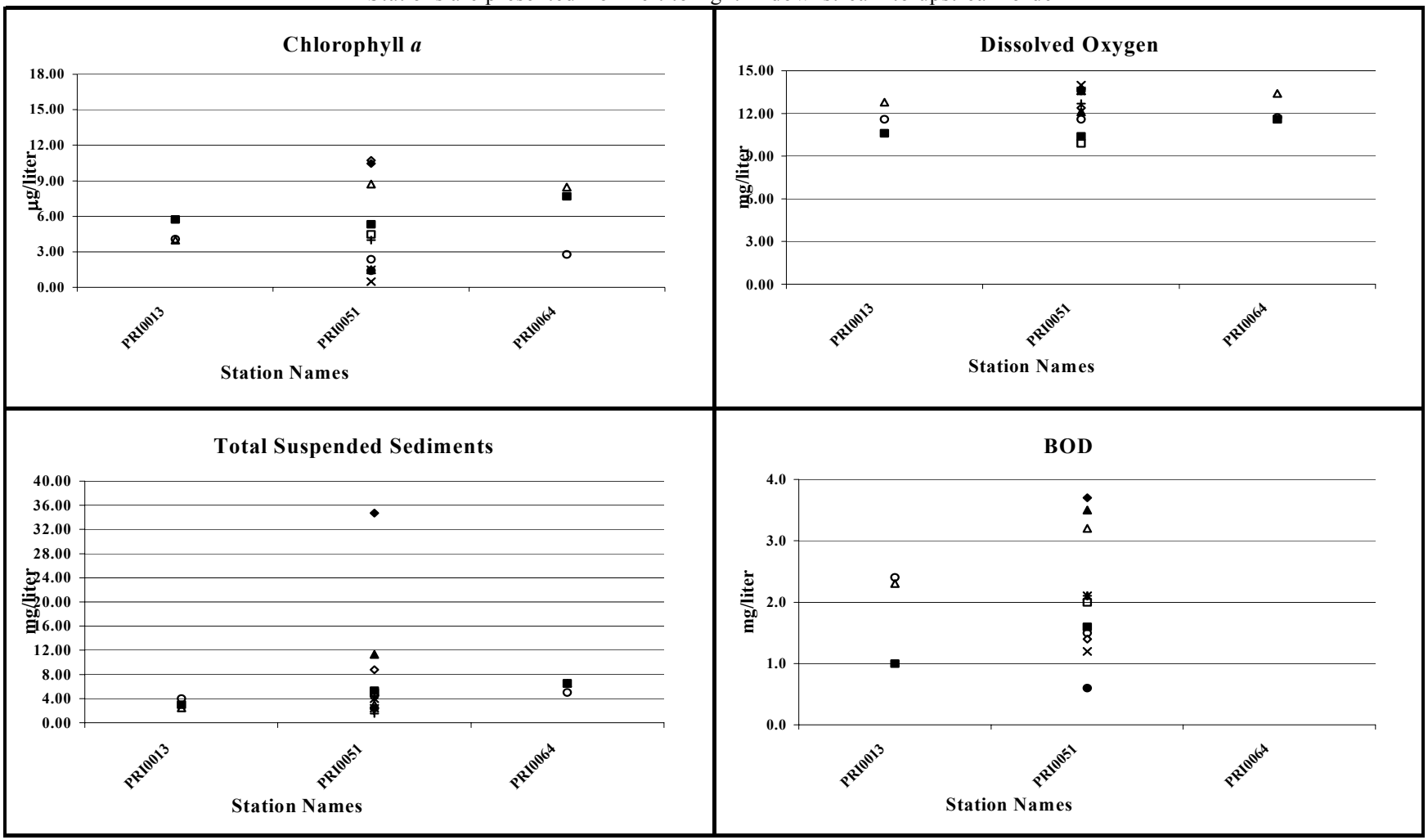
NORTHEAST RIVER
1999 TMDL STUDY STATION LIST

Station Code	Lat/Long	
Northeast River		
XKI1809	39 31.811 75 59.059	West of FL R 6 buoy.
XKI2203	39 32.158 75 59.790	(depth ~ 3 feet)
XKI2610	39 32.615 75 59.054	Mid-channel, between Carpenter and Roach Point.
XKI3717	39 33.663 75 58.735	Mid-channel, west of FL R 10 - off shore from Hance Point
XKI4220	39 34.165 75 58.065	20 yds north of R 12 – 300 yds south of main piers at Charlestown
XKI4623	39 34.602 75 57.713	North of FL R 14
XKI5329	39 35.281 75 57.161	Midway between R 16 buoy and FL G 17.
Northeast Creek		
NOC0008	39 36.010 75 56 907	Bridge crossing on Route 7.
NOC0053	39 38.955 75 57.373	Bridge crossing on Route 272 (near Gilpins Covered Bridge).
NOC0113	39 41.295 76 00.433	Bridge crossing on Calvert Road.
Little Northeast Creek		
LNE0008	39 37.069 75 55.749	Bridge crossing on Mechanic Valley Road at Indian Falls.
LNE0052	39 39.688 75 55.923	Warburton road crossing.

Furnace Bay


Furnace Bay Monitoring Stations
Location of the Upper Eastern Shore Basin within Maryland's 8-Digit Watersheds
Location of Furnace Bay Drainage Basin
PRI0064
PRI0051
I95
Port Deposit
40
North East
PRI0013
MIC0016
MIC0011
Perryville
XKH2975
Havre de Grace
Cecil
Harford
Legend
MDE Monitoring Stations
River and Streams
Major Roads
County Boundaries
Furnace Bay Basin - 02130609
MDE
1 0.5 0 1 2 3 4 5
Kilometers
1 0.5 0 1 2
Miles

Furnace Bay
High Flow Conditions (December - May)
Stations are presented from left to right in downstream to upstream order



Furnace Bay

High Flow Conditions (December - May)

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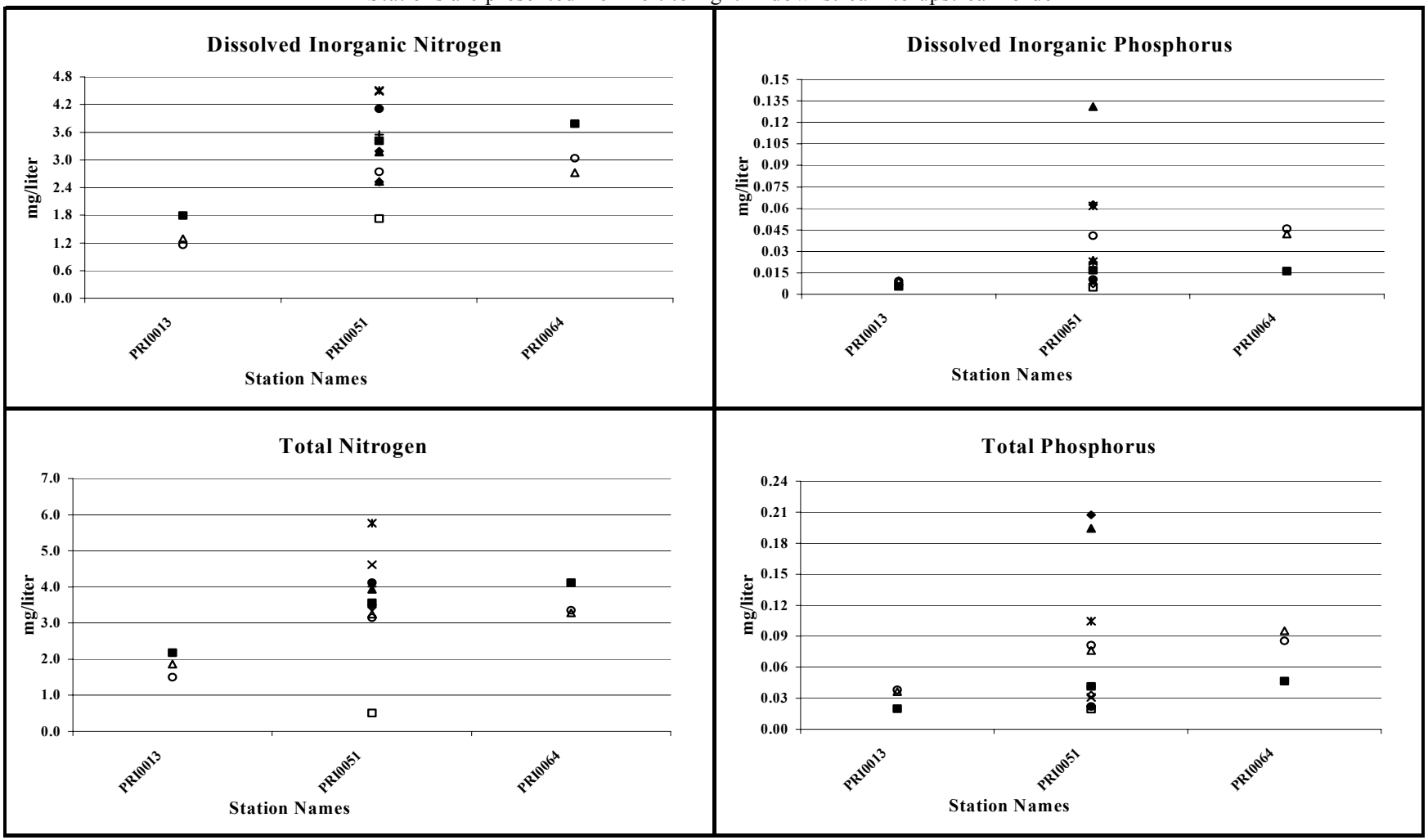

Furnace Bay

Low Flow Conditions (June - November)

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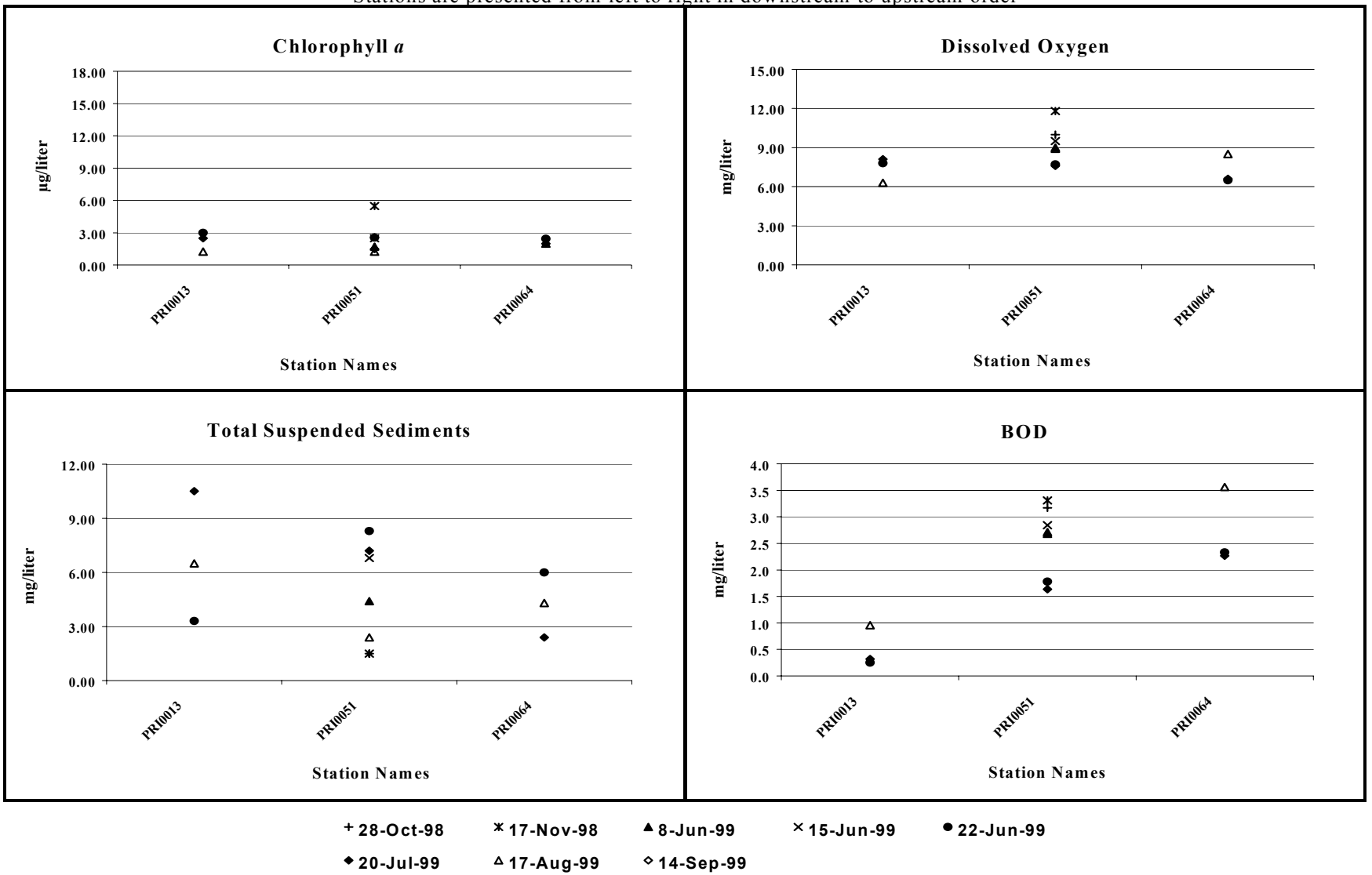
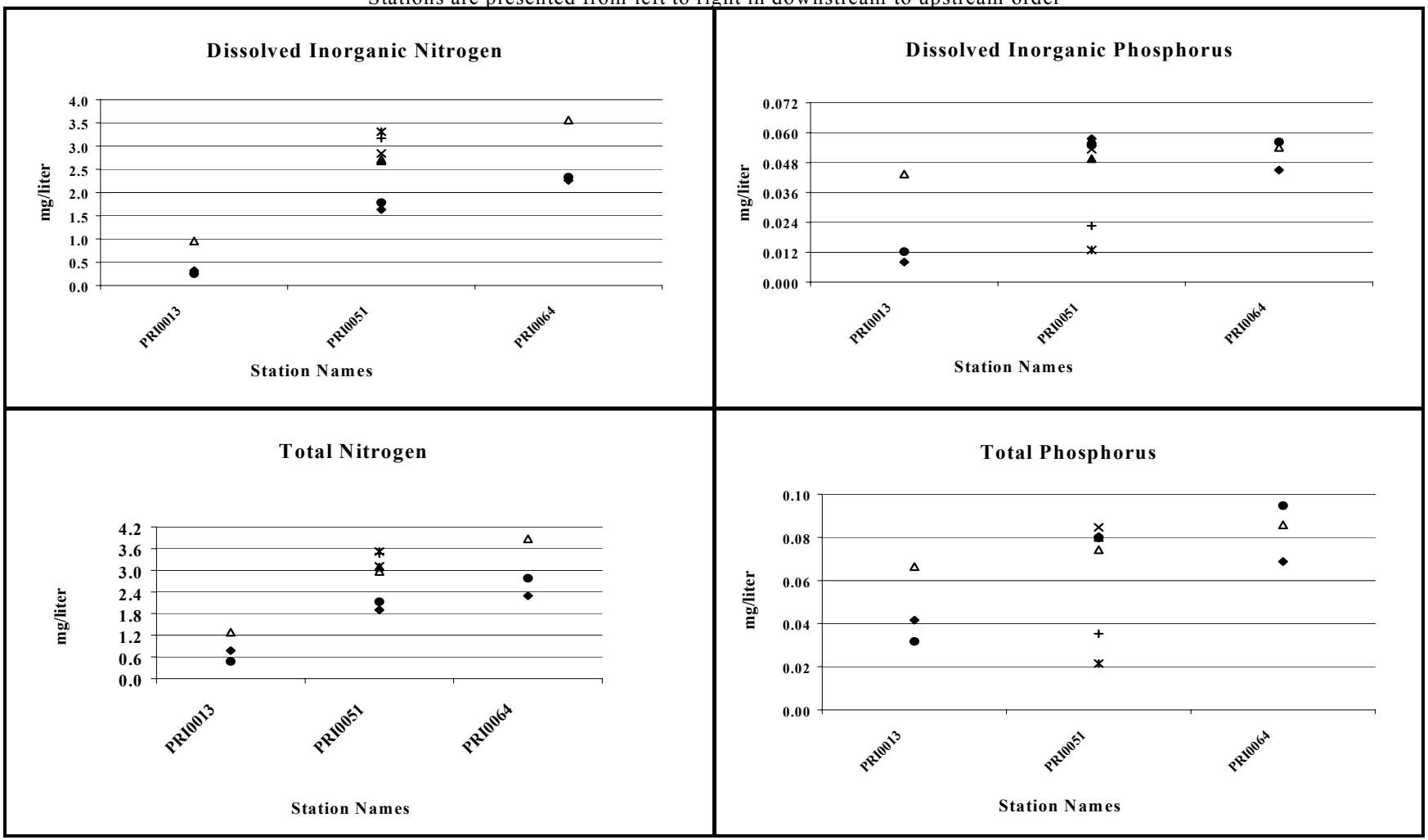
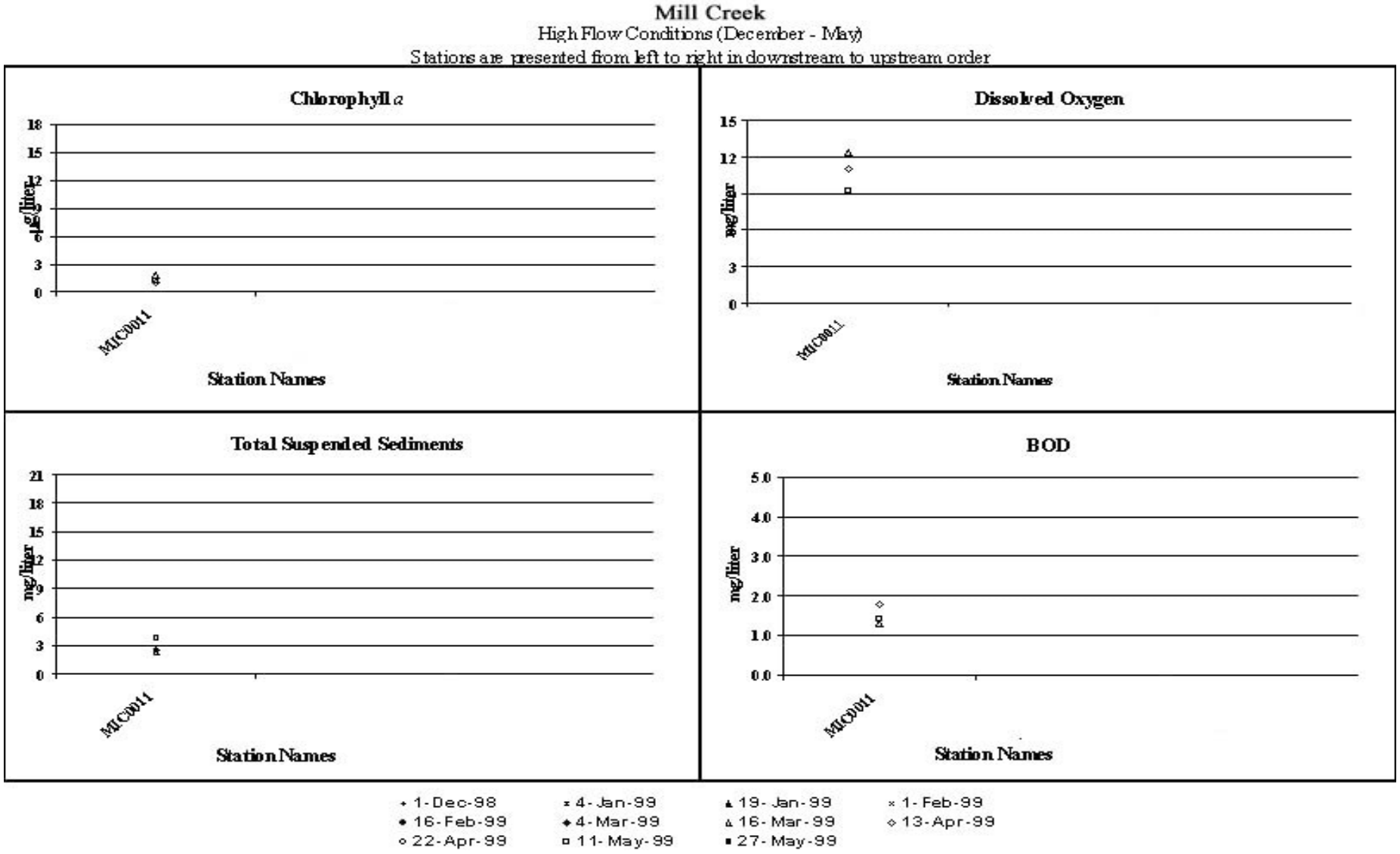


Furnace Bay

Low Flow Conditions (June - November)

Stations are presented from left to right in downstream to upstream order




Mill Creek
High Flow Conditions (December - May)
Stations are presented from left to right in downstream to upstream order
Chlorophyll a
ug/liter
MIC0011
Station Names
Dissolved Oxygen
mg/liter
MIC0011
Station Names
Total Suspended Sediments
mg/liter
MIC0011
Station Names
BOD
mg/liter
MIC0011
Station Names
1-Dec-98
4-Jan-99
19-Jan-99
1-Feb-99
16-Feb-99
4-Mar-99
16-Mar-99
13-Apr-99
22-Apr-99
11-May-99
27-May-99

Mill Creek

High Flow Conditions (December - May)

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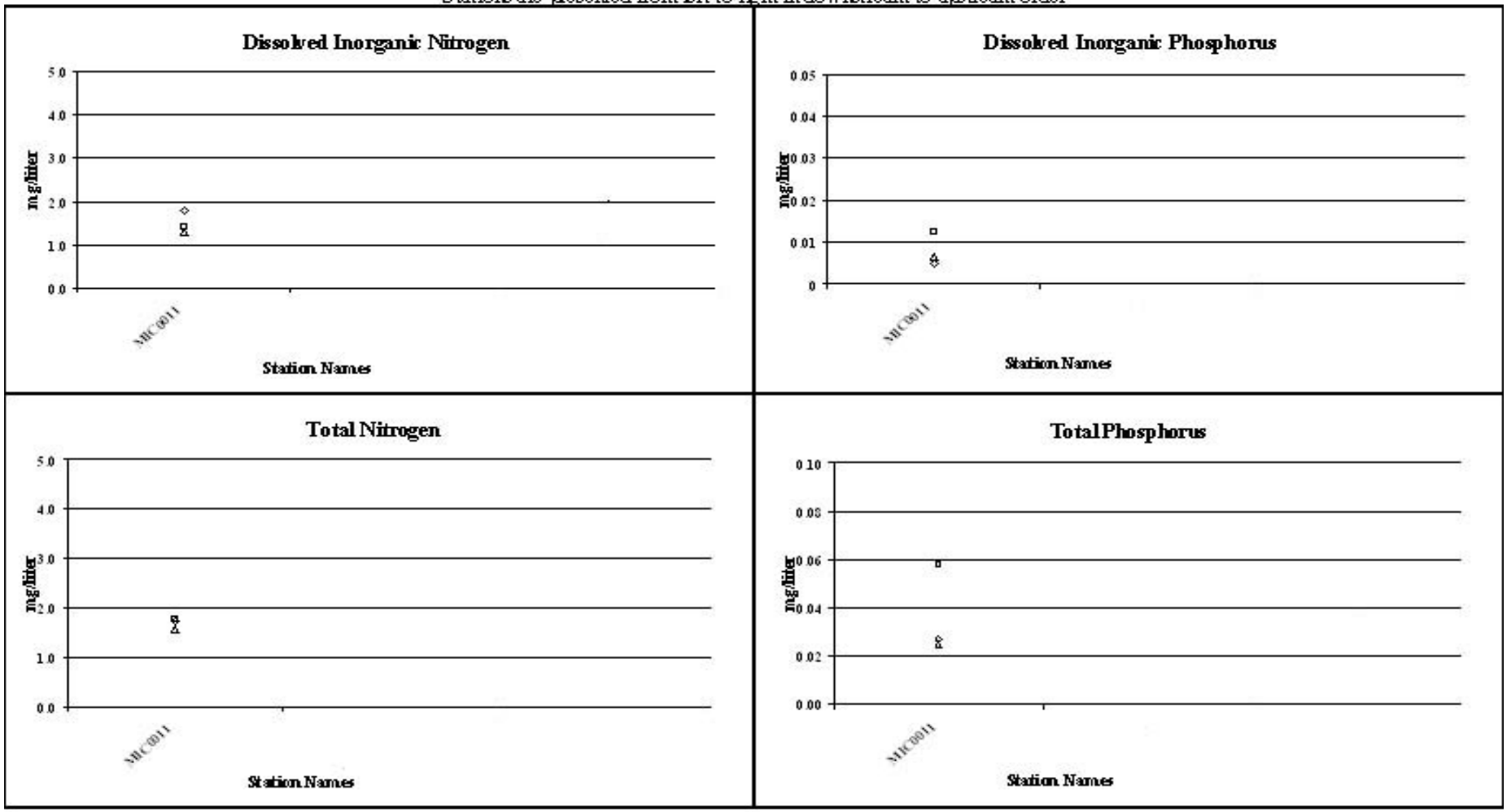
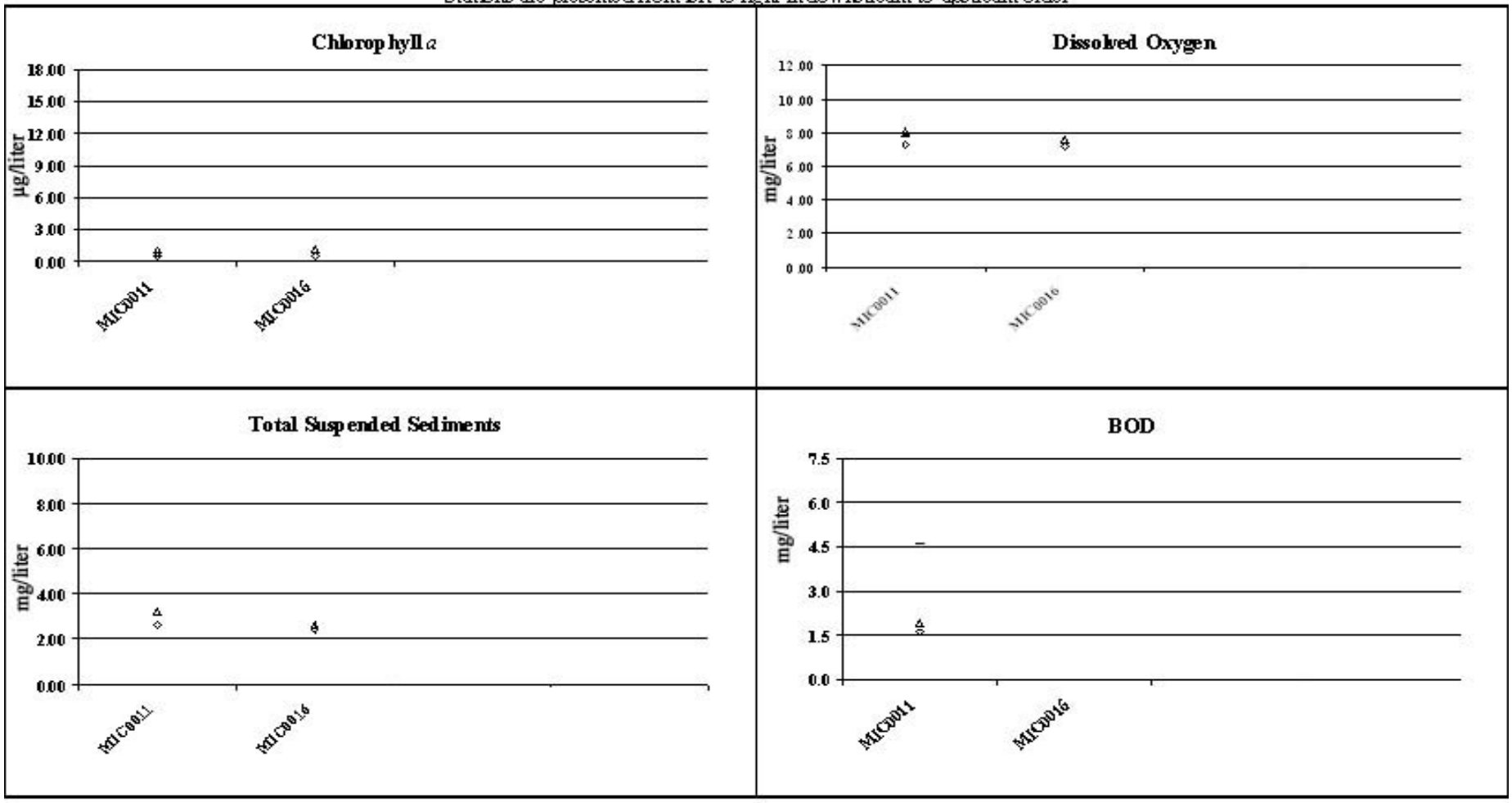


Mill Creek

Low Flow Conditions (June - November)

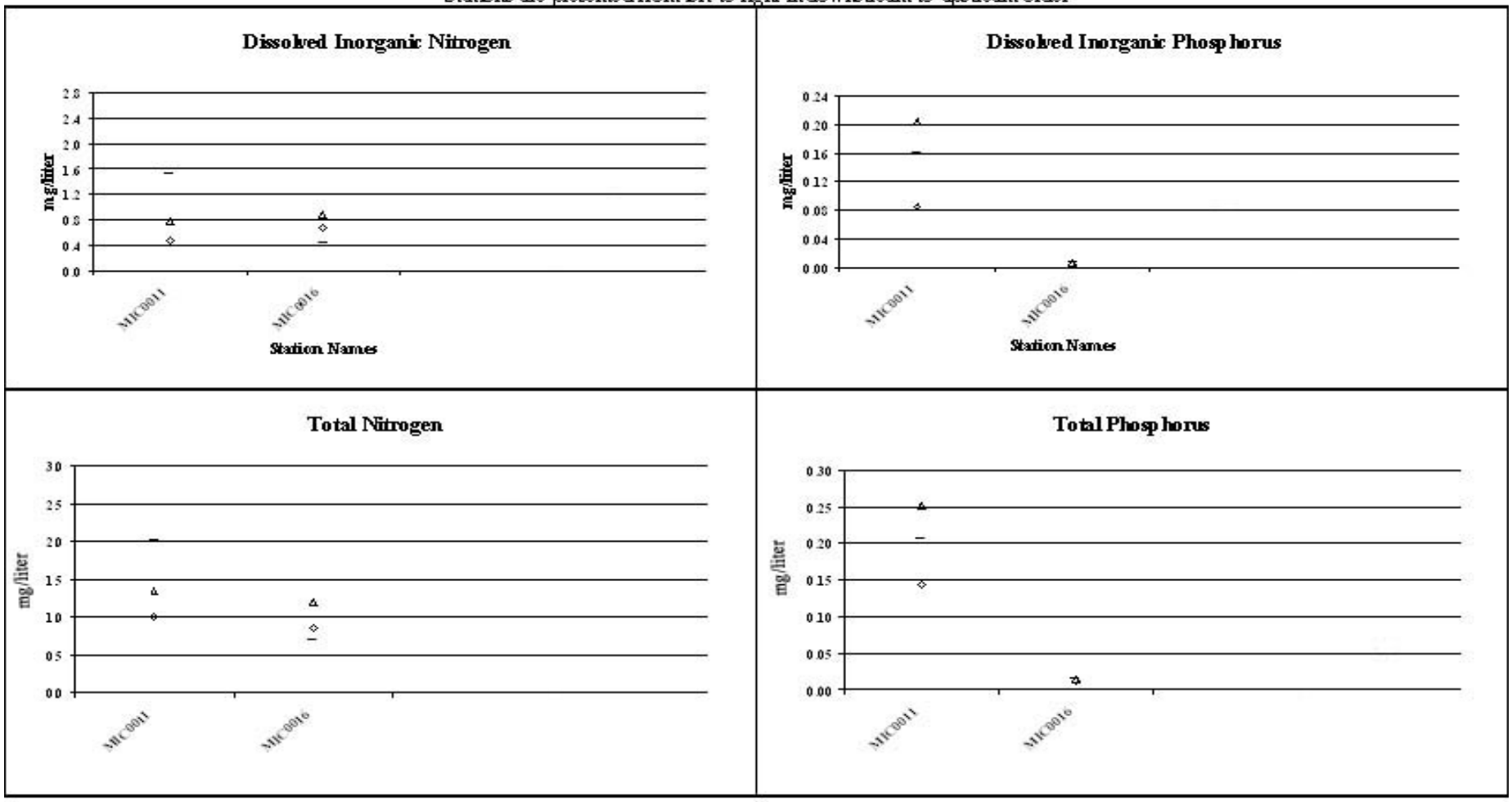
Stations are presented from left to right in downstream to upstream order



Mill Creek

Low Flow Conditions (June - November)

Stations are presented from left to right in downstream to upstream order

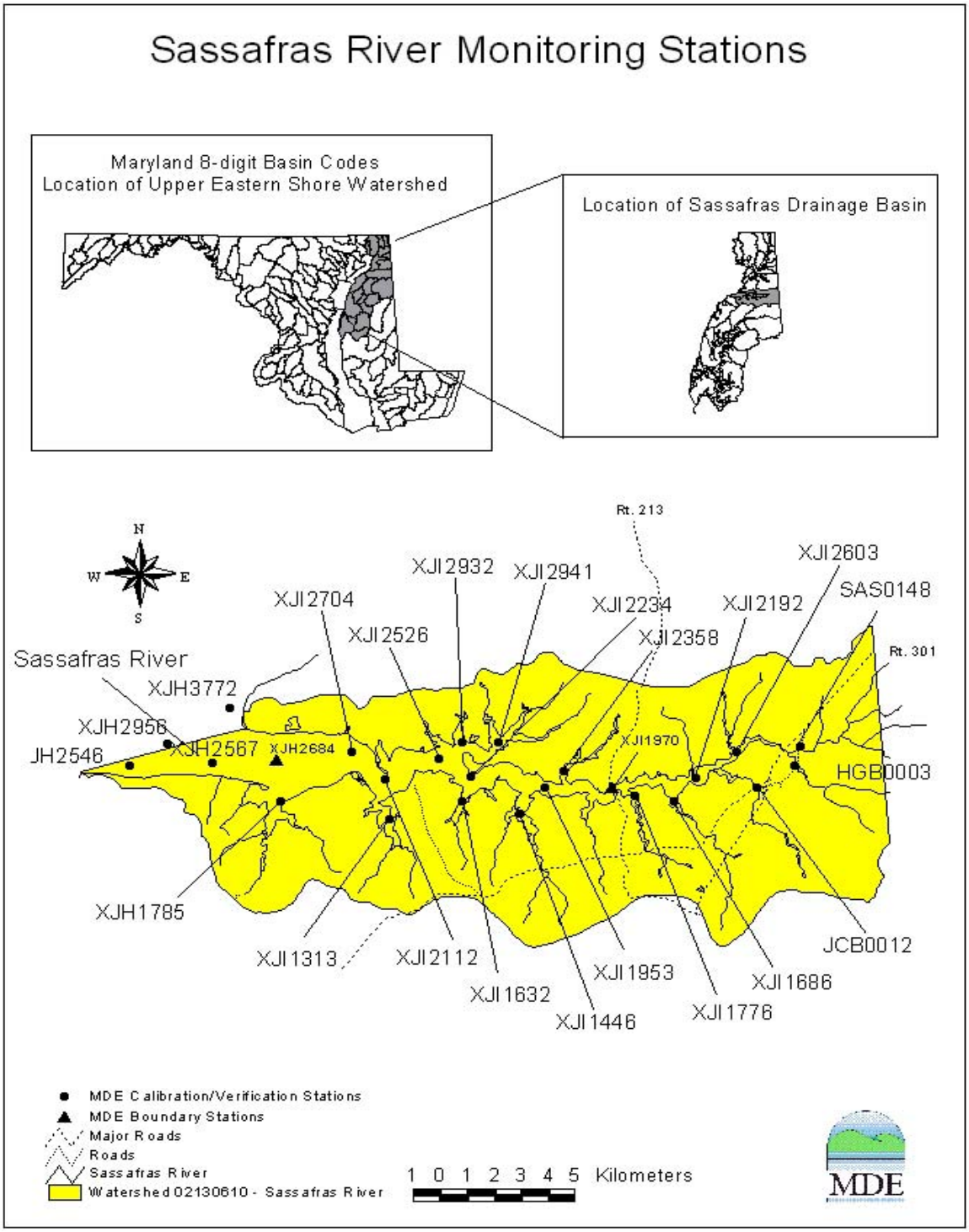


FURNACE BAY
1999 TMDL STUDY STATION LIST

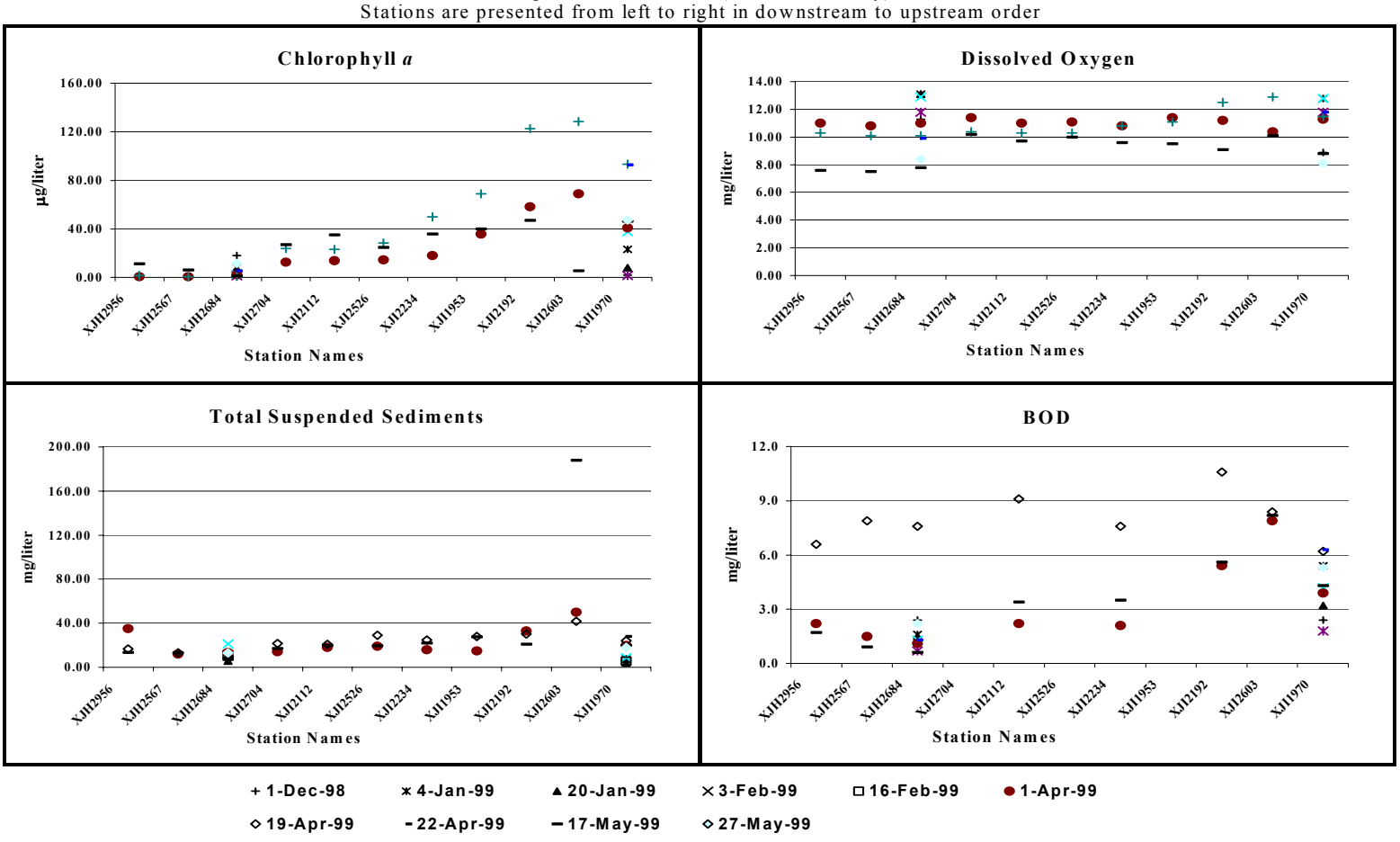
Station Code	Lat/Long	Description
Principio Creek		
PRI0013 *	39 34.657 76 01.902	Route 7 crossing. Sample left side of bridge, facing upstream.
PRI0051 *	39 37.619 76 02.427	Bridge crossing on Belvidere Road.
PRI0064 *	39 38.478 76 02.389	Pull off on Principio Road.
Mill Creek		
MIC0011	39 33.604 76 04.117	Bridge crossing at end of Firestone Road (at entrance to Perryville Park).
MIC0016	39 33.744 76 04.017	Route 7 crossing - above STP. Sampled during low flow survey only.

* Free flowing stations (Not tidal)

Sassafras River



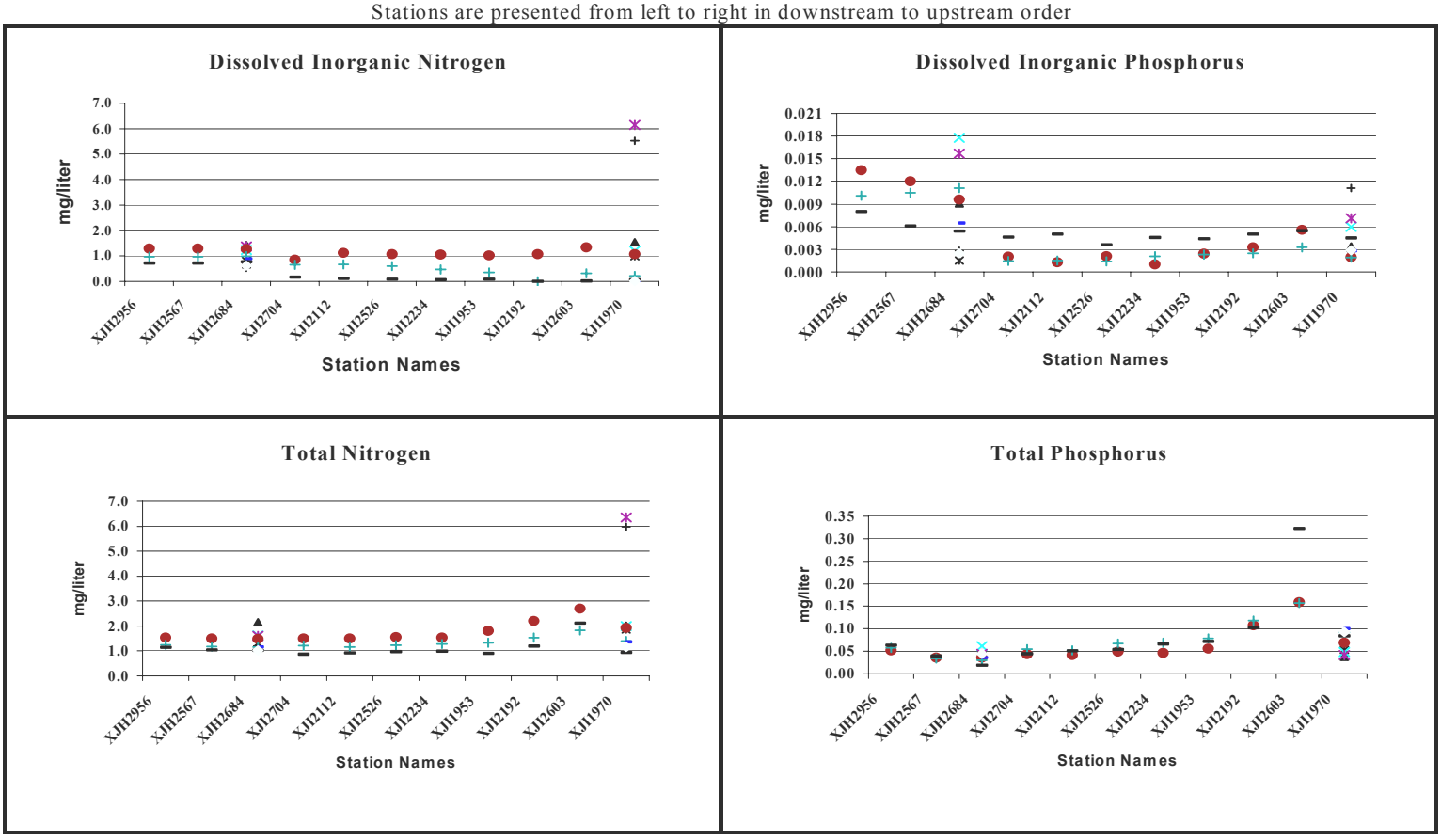
Sassafras River (main)
High Flow Conditions (December - May)
Stations are presented from left to right in downstream to upstream order



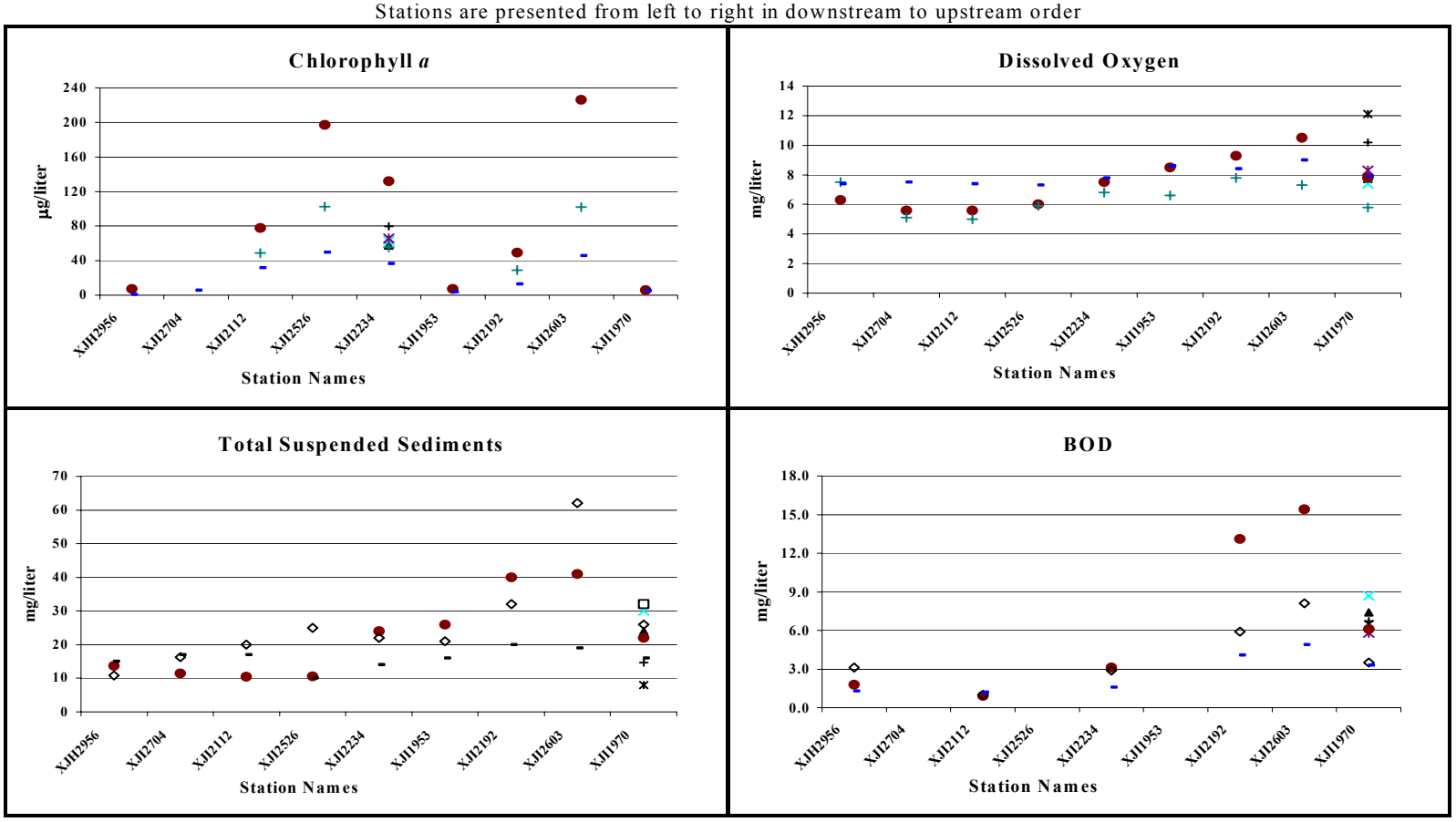
Sassafras River (Main)

High Flow Conditions (December - May)

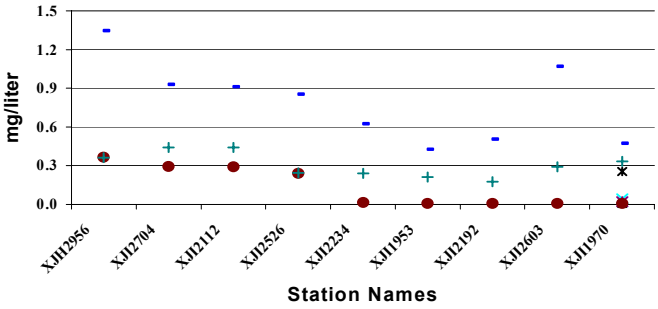
Stations are presented from left to right in downstream to upstream order

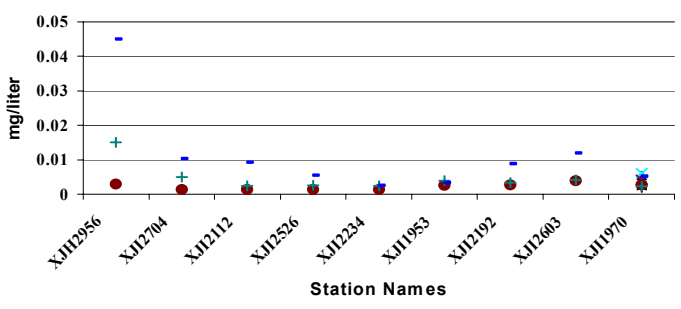


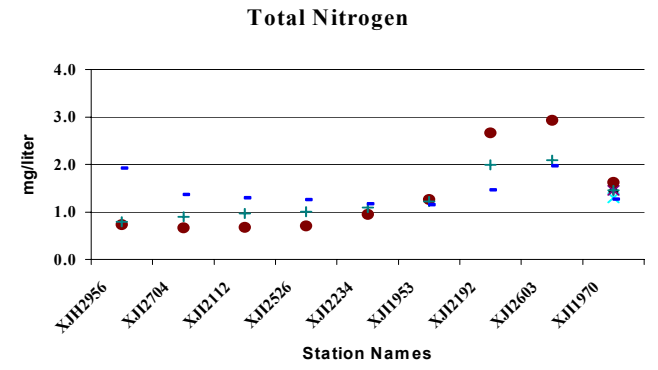
Sassafras River (main)
Low Flow Conditions (June - November)
Stations are presented from left to right in downstream to upstream order

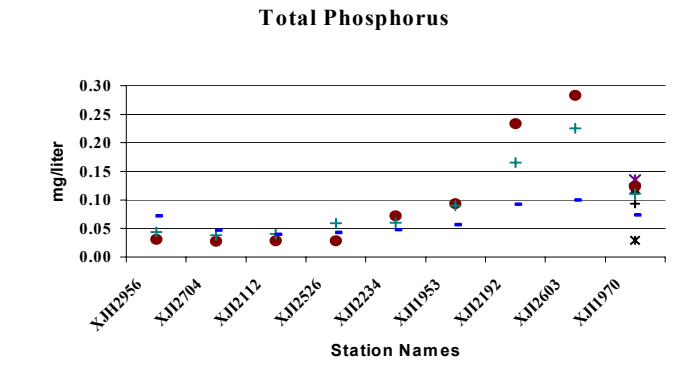


Sassafras River (Main)
Low Flow Conditions (June - November)
Stations are presented from left to right in downstream to upstream order



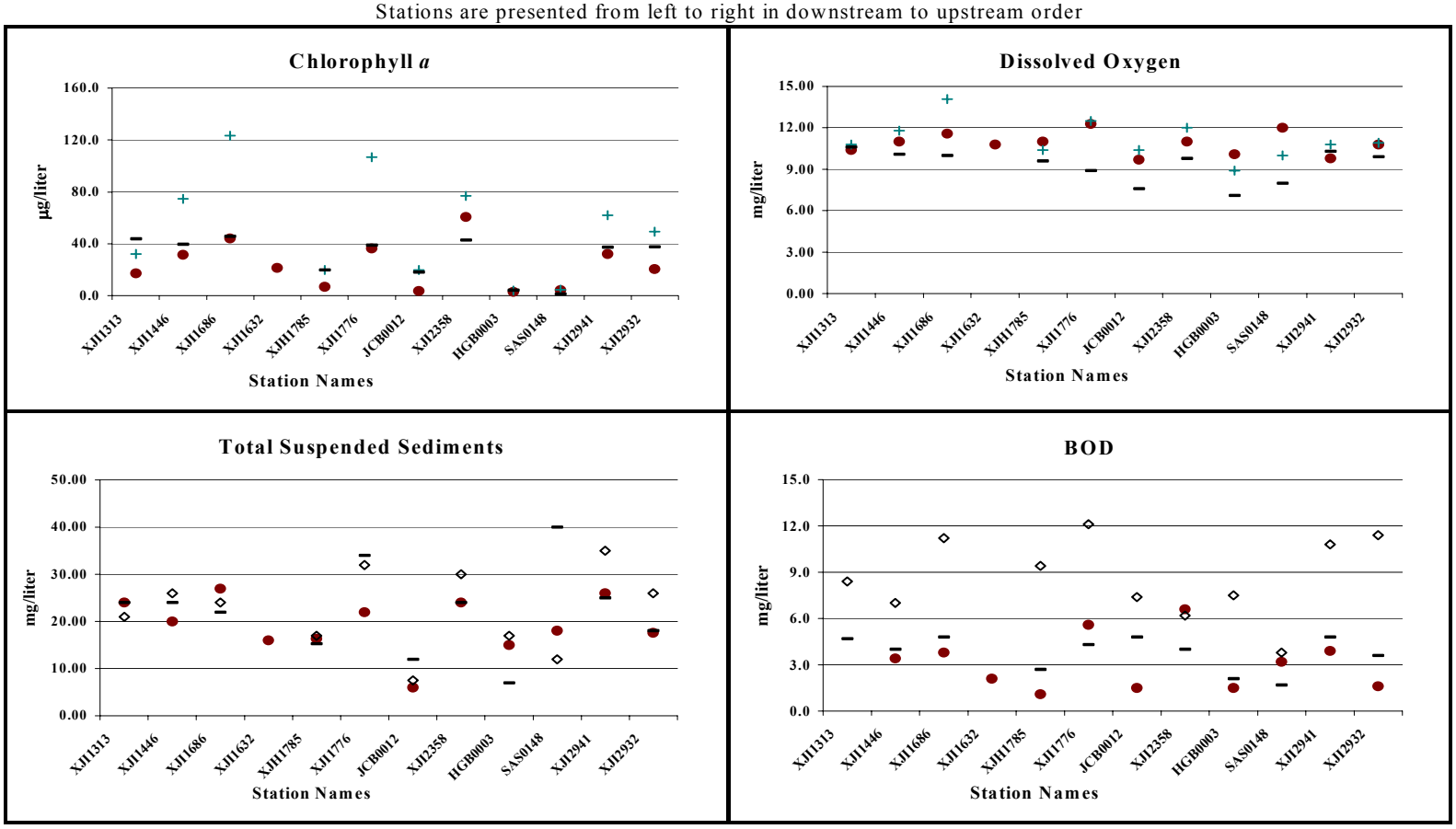




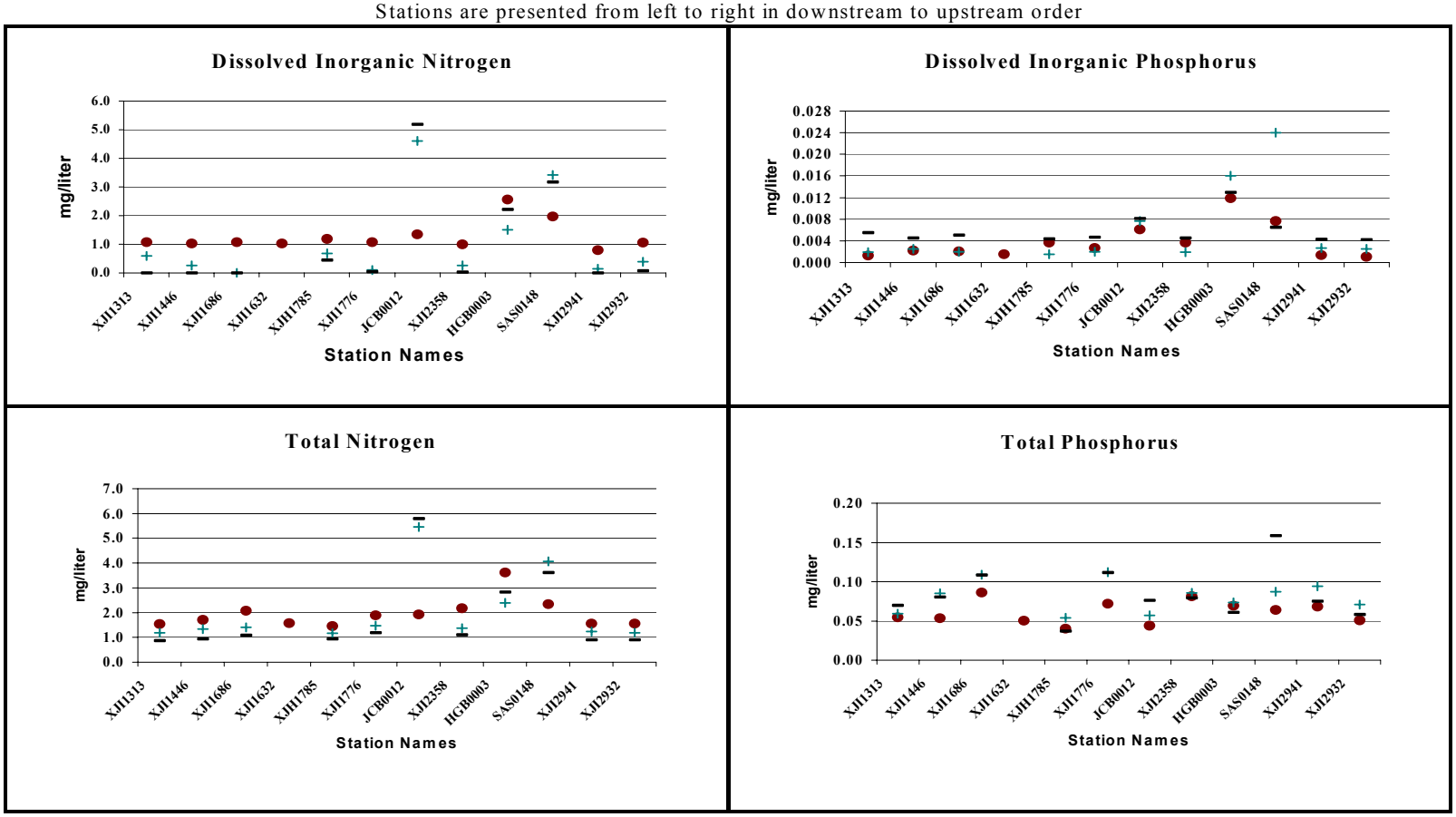


+ 28-Oct-98 * 17-Nov-98 ▲ 8-Jun-99 × 15-Jun-99 * 22-Jun-99 ● 26-Jul-99
◇ 23-Aug-99 - 27-Sep-99

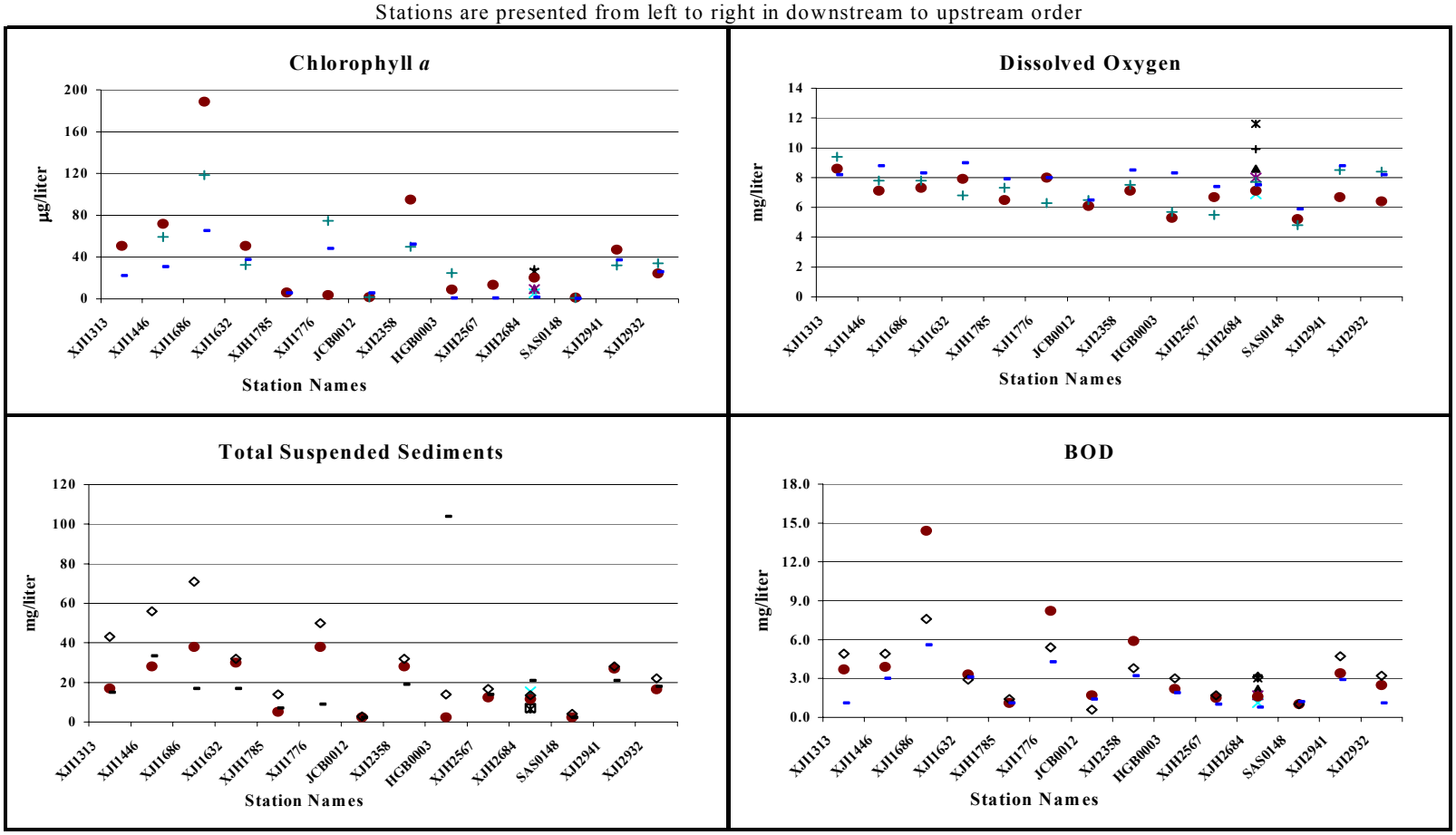
Sassafras River (tributaries)
High Flow Conditions (December - May)
Stations are presented from left to right in downstream to upstream order



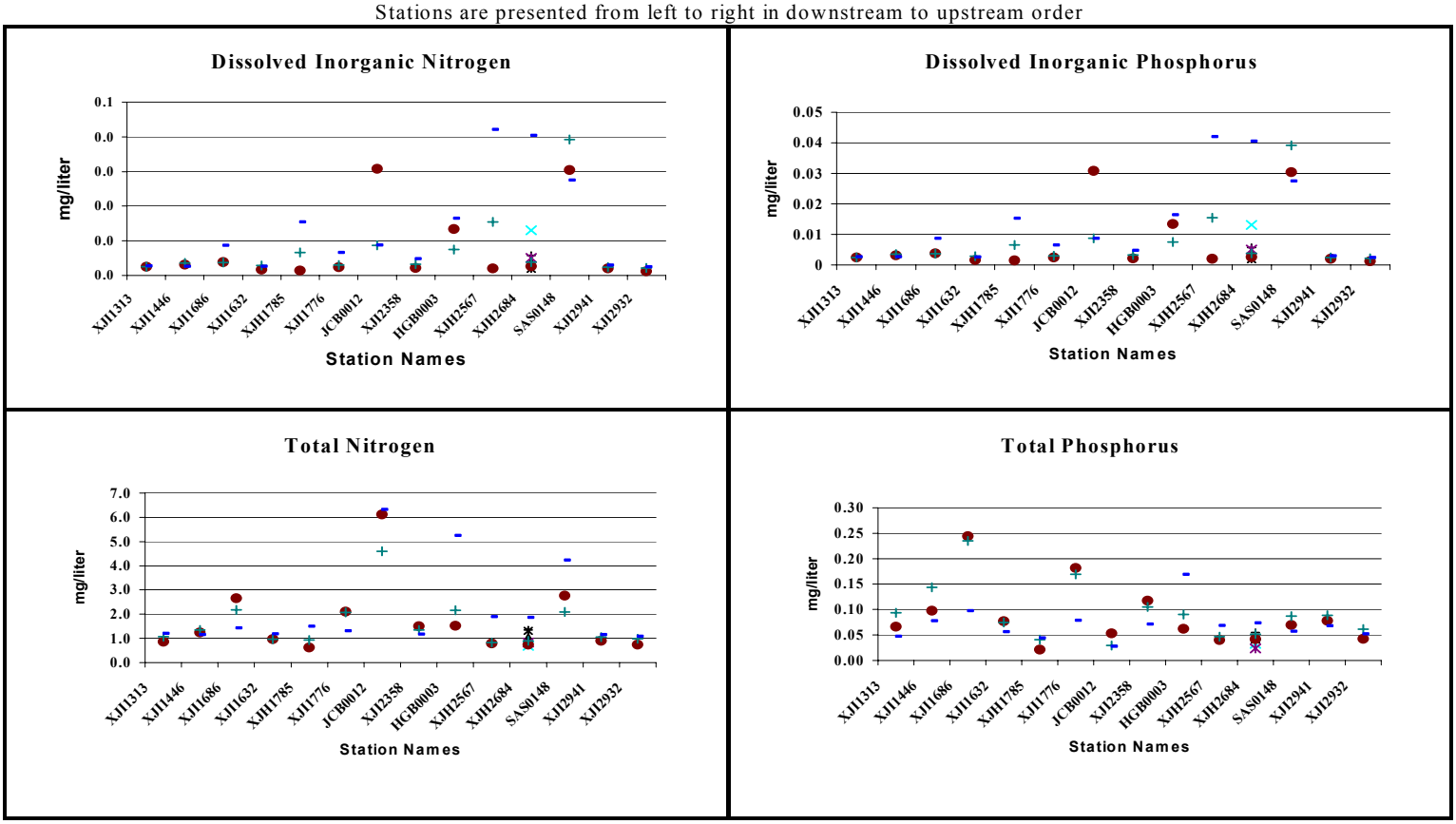
Sassafras River (tributaries)
High Flow Conditions (December - May)
Stations are presented from left to right in downstream to upstream order



Sassafras River (tributaries)
Low Flow Conditions (June - November)
Stations are presented from left to right in downstream to upstream order



Sassafras River (tributaries)
Low Flow Conditions (June - November)
Stations are presented from left to right in downstream to upstream order



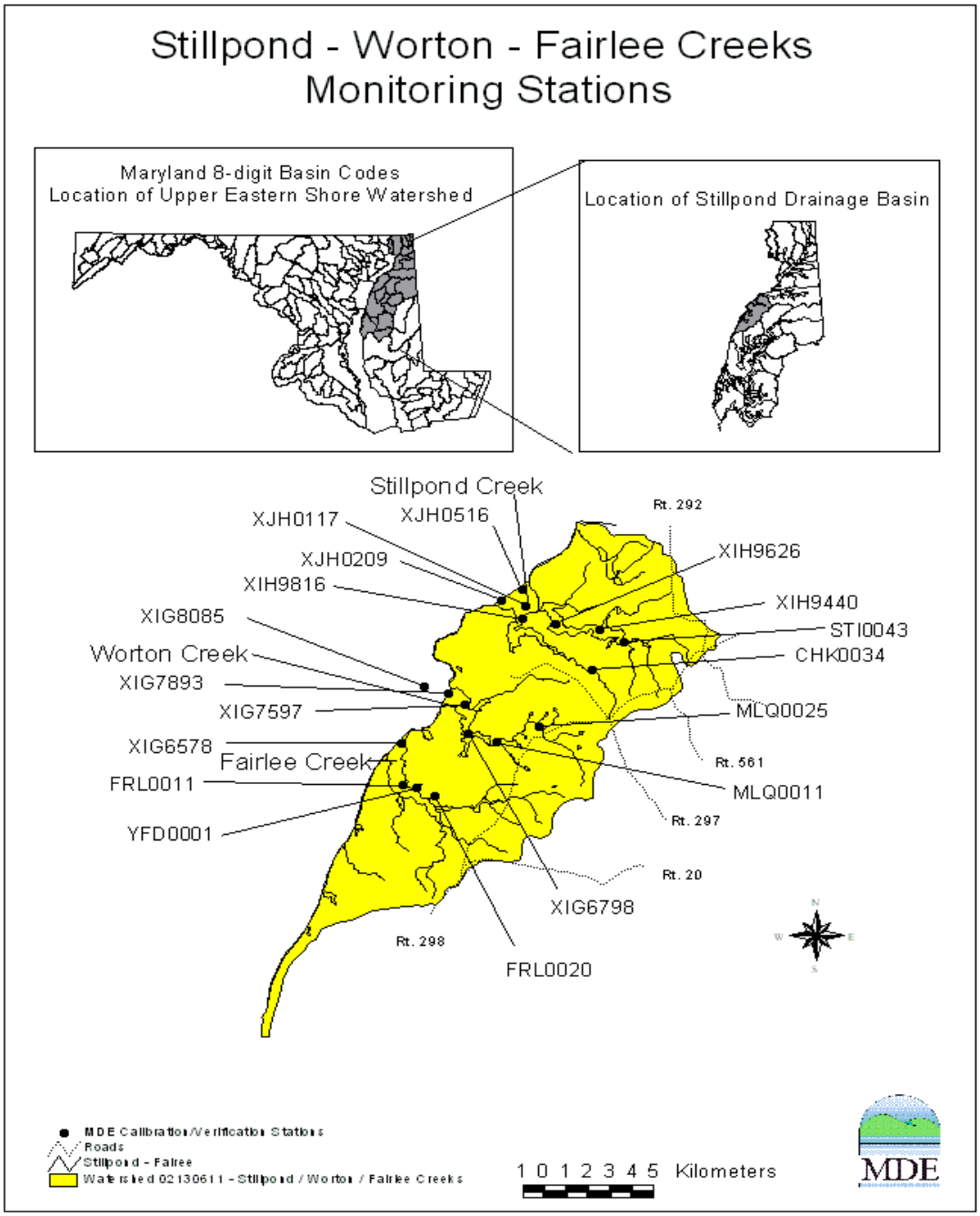
SASSAFRAS RIVER
1999 TMDL STUDY STATION LIST

Station Code	Lat/Long	Description
Sassafras River		
XJH2546	39 22.472 76 05.418	Off two story brick house. **Physical readings only.**
XJH2956	39 22.928 76 04.437	Depth ~20ft
XJH3772	39 23.673 76 02.794	. **Physical readings only.**
XJH2567	39 22.495 76 03.277	Barns on cliff.
XJH2684	39 22.558 76 01.610	Mid-river – 14 ft.
XJI2704	39 22.718 75 59.643	Mainstem, off red marker 2.
XJI2112	39 22.118 75 58.792	Mainstem, off green marker 5.
XJI2526	39 22.531 75 57.385	Mainstem, off red marker 8.
XJI2234	39 22.158 75 56.610	Mainstem, off green marker 9.
XJI1953	39 21.901 75 54.690	Mainstem
XJI1970	39 21.883 75 52.961	Georgetown, near Rte 213 bridge
XJI2192	39 22.060 75 50.795	Mainstem

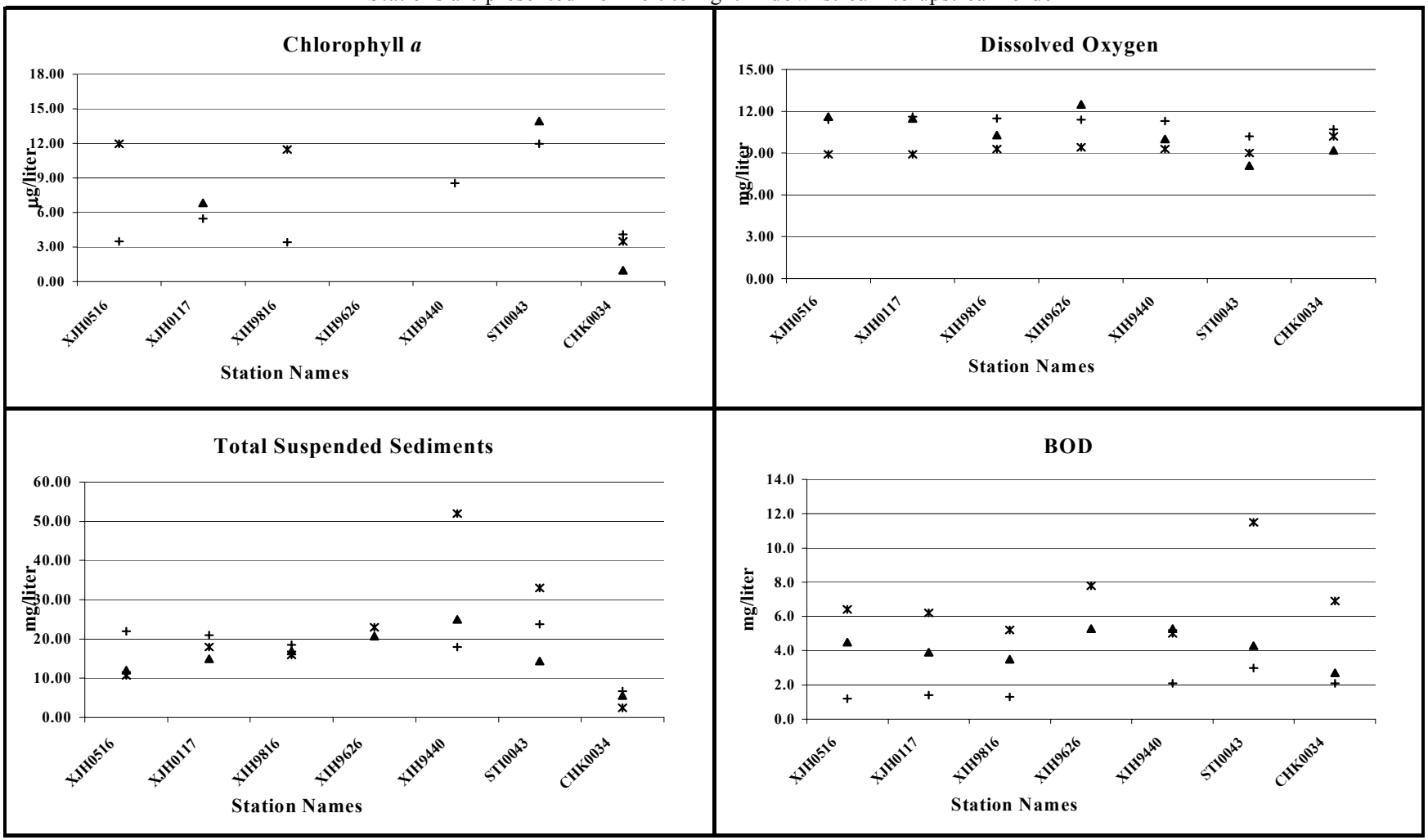
XJI2603	39 22.626 75 49.734	Mainstem - dock located to the right.
SAS0148	39 22.716 75 48.081	Route 299 crossing. Go downstream for flow.

Lloyd Creek		
XJH1785	39 21.665 76 01.487	Enter creek near large steep clay cliff. Station off yellow house with yellow wall.
Turner Creek		
XJI1313	39 21.271 75 58.701	Mid-channel, off last dock.
Foreman Creek		
XJI2932	39 22.878 75 56.817	Mouth of Foreman Creek.
Back Creek		
XJI2941	39 22.872 75 55.881	~ 300 yds downstream from dock of mansion
Freeman Creek		
XJI1632	39 21.620 75 56.831	Off gray house with dock -
Woodland Creek		
XJI1446	39 21.351 75 55.356	Depth ~ 13 ft.
Hall Creek		
XJI2358	39 22.257 75 54.225	Across from last dock on left, heading upstream.
Mill Creek		
XJI1776	39 21.718 75 52.381	Midstream, across from blue house.
Swantown Creek		
XJI1686	39 21.567 75 51.371	Mid-channel, off dock with roof
Jacobs Creek		
JCB0012	39 21.848 75 49.204	Route 290 crossing. Take flow upstream of bridge.
Herring Branch		
HGB0003	39 22.301 75 48.248	Route 299 crossing. Take flow downstream of bridge.

Stillpond-Worton-Fairlee



Still Pond Creek
High Flow Conditions (December - May)
Stations are presented from left to right in downstream to upstream order



Still Pond Creek

High Flow Conditions (December - May)

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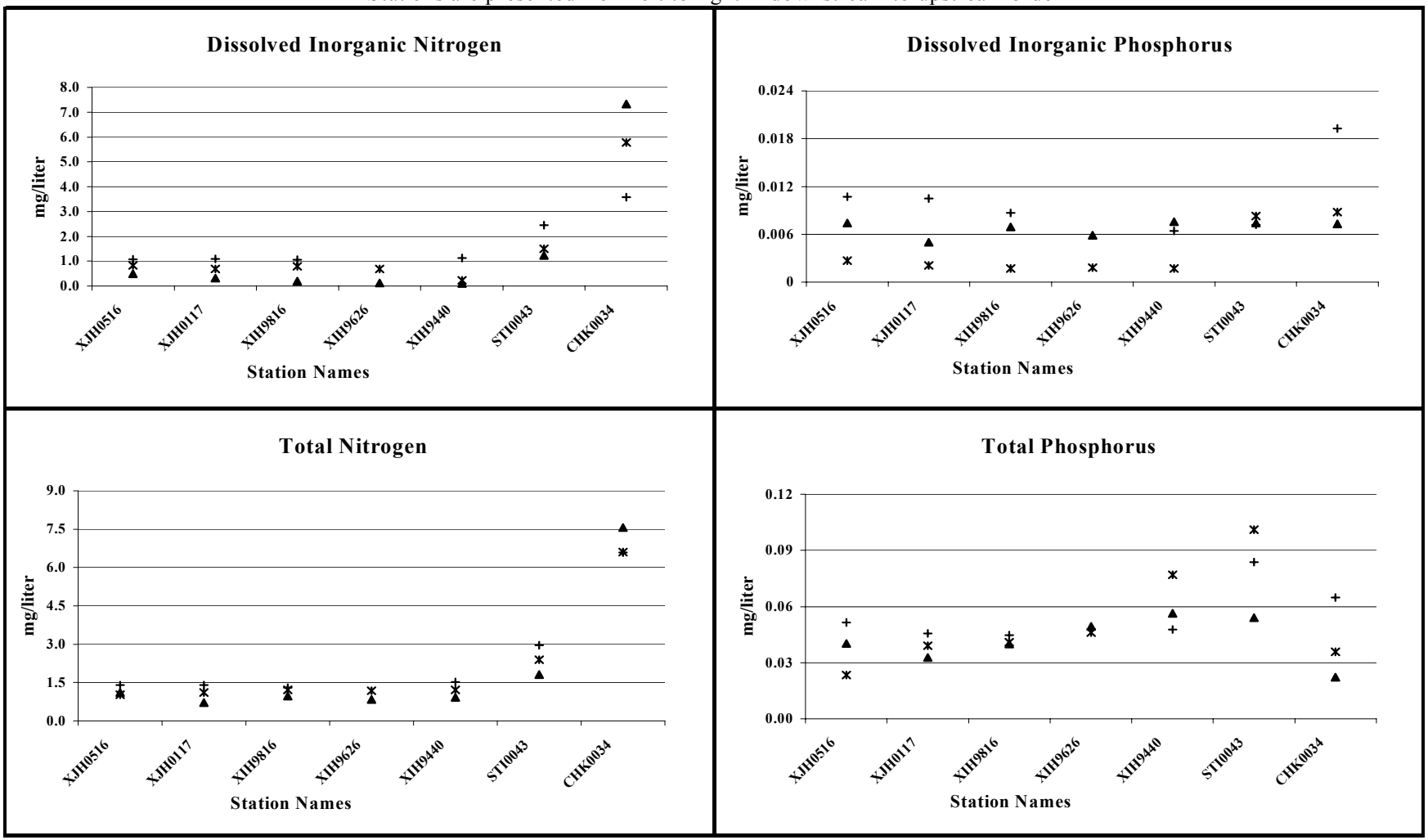
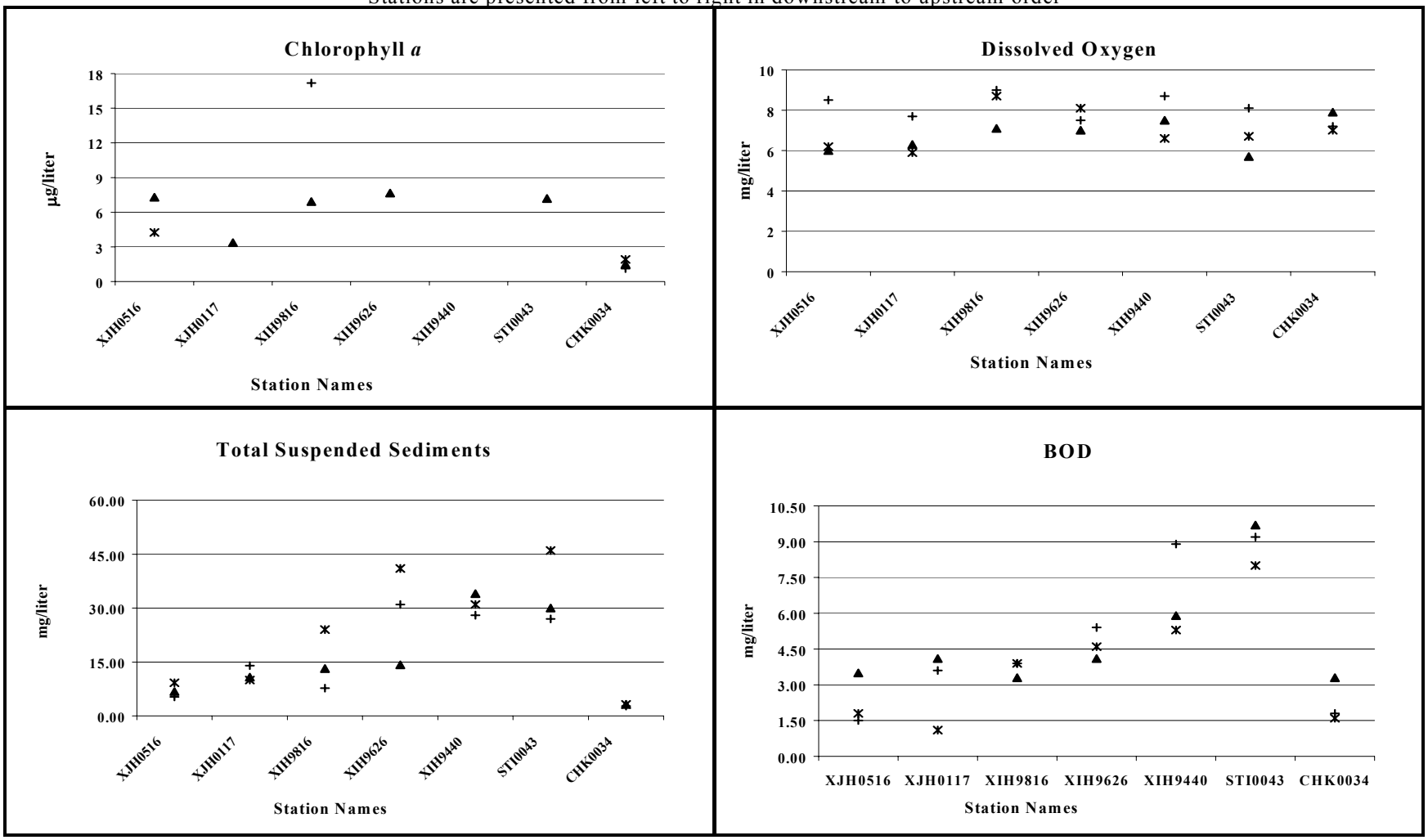


+ 18-Mar-99 × 12-Apr-99 ▲ 10-May-99

Still Pond Creek

Low Flow Conditions (June - November)

Stations are presented from left to right in downstream to upstream order



+ 19-Jul-99 * 16-Aug-99 ▲ 13-Sep-99

Still Pond Creek

Low Flow Conditions (June - November)

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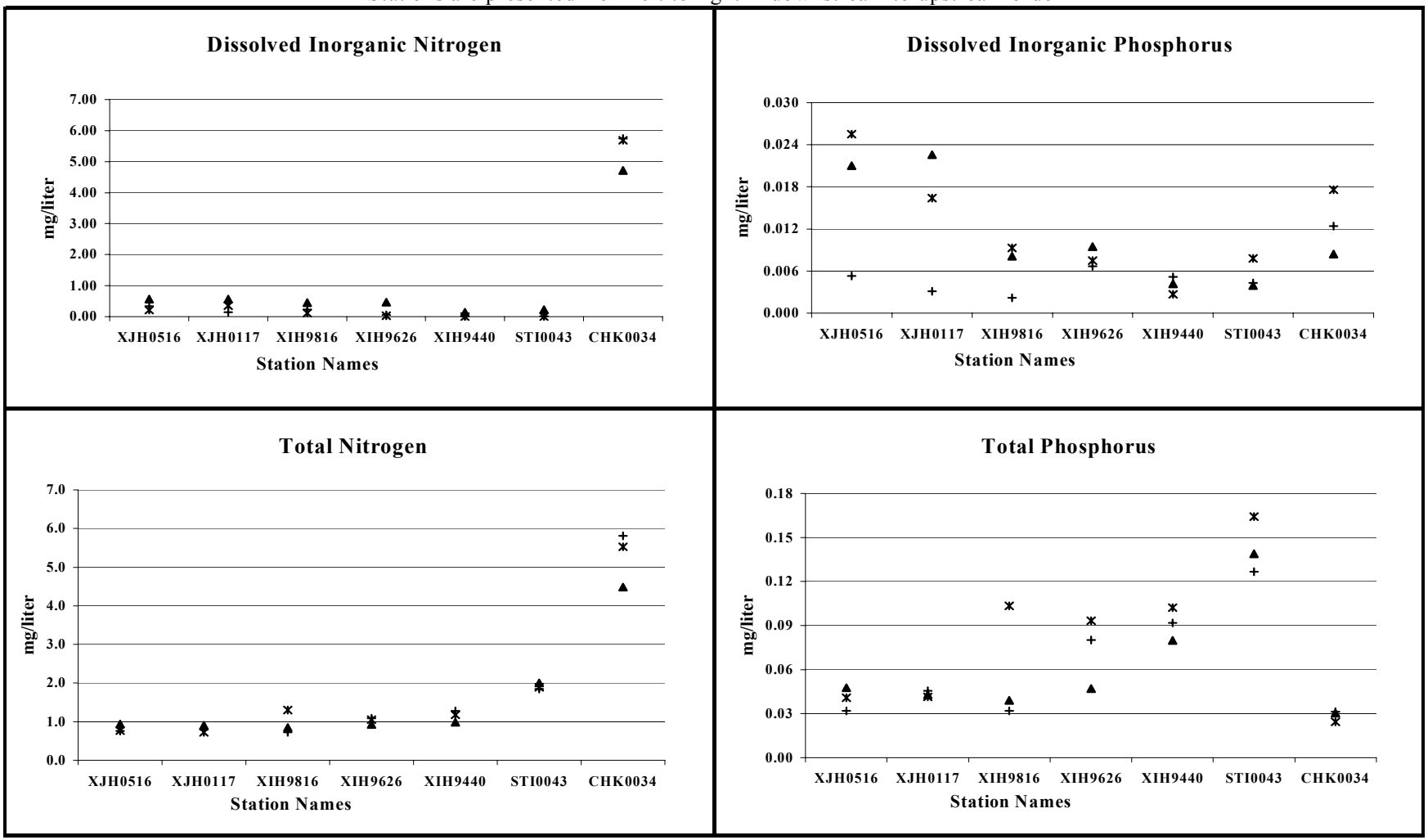
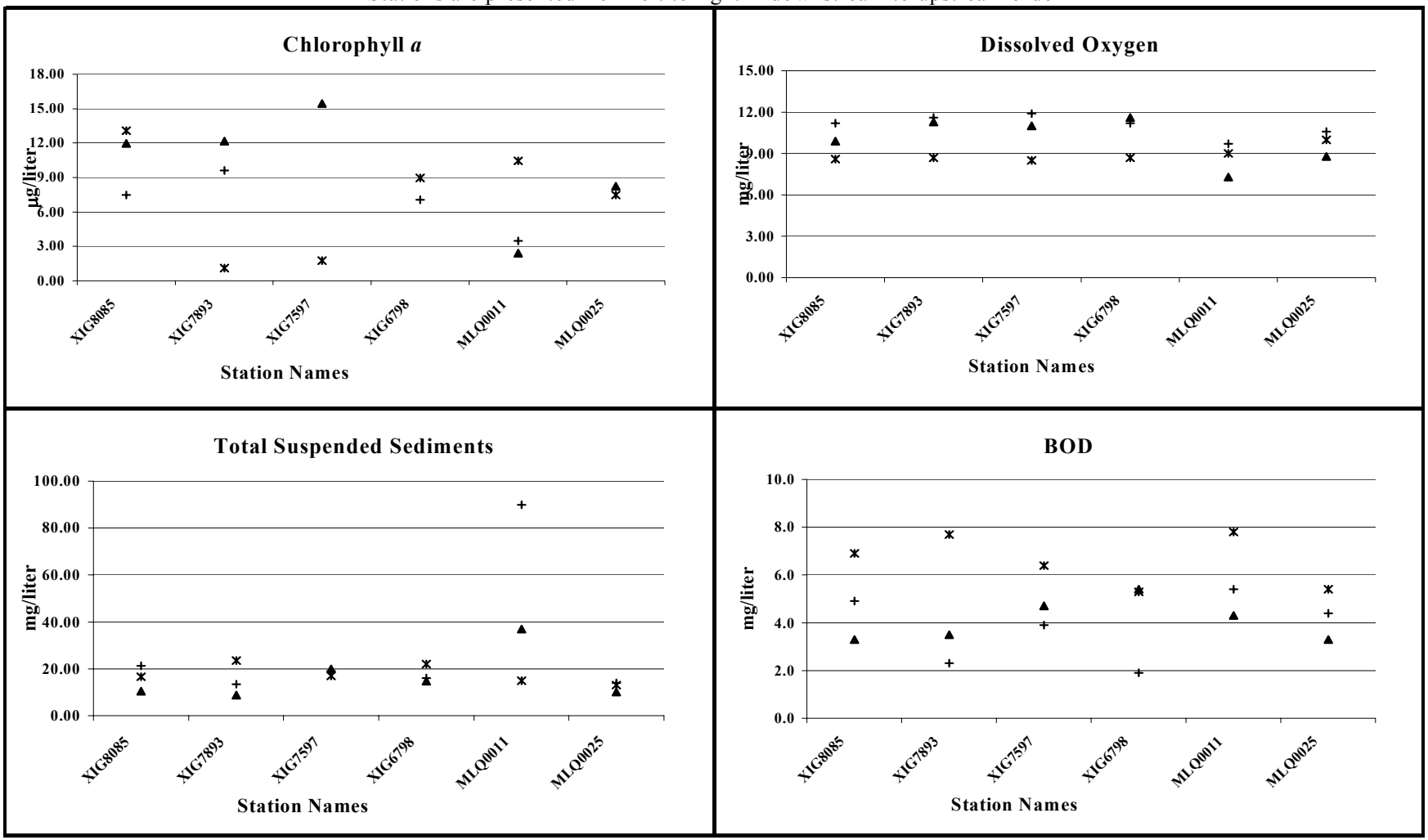


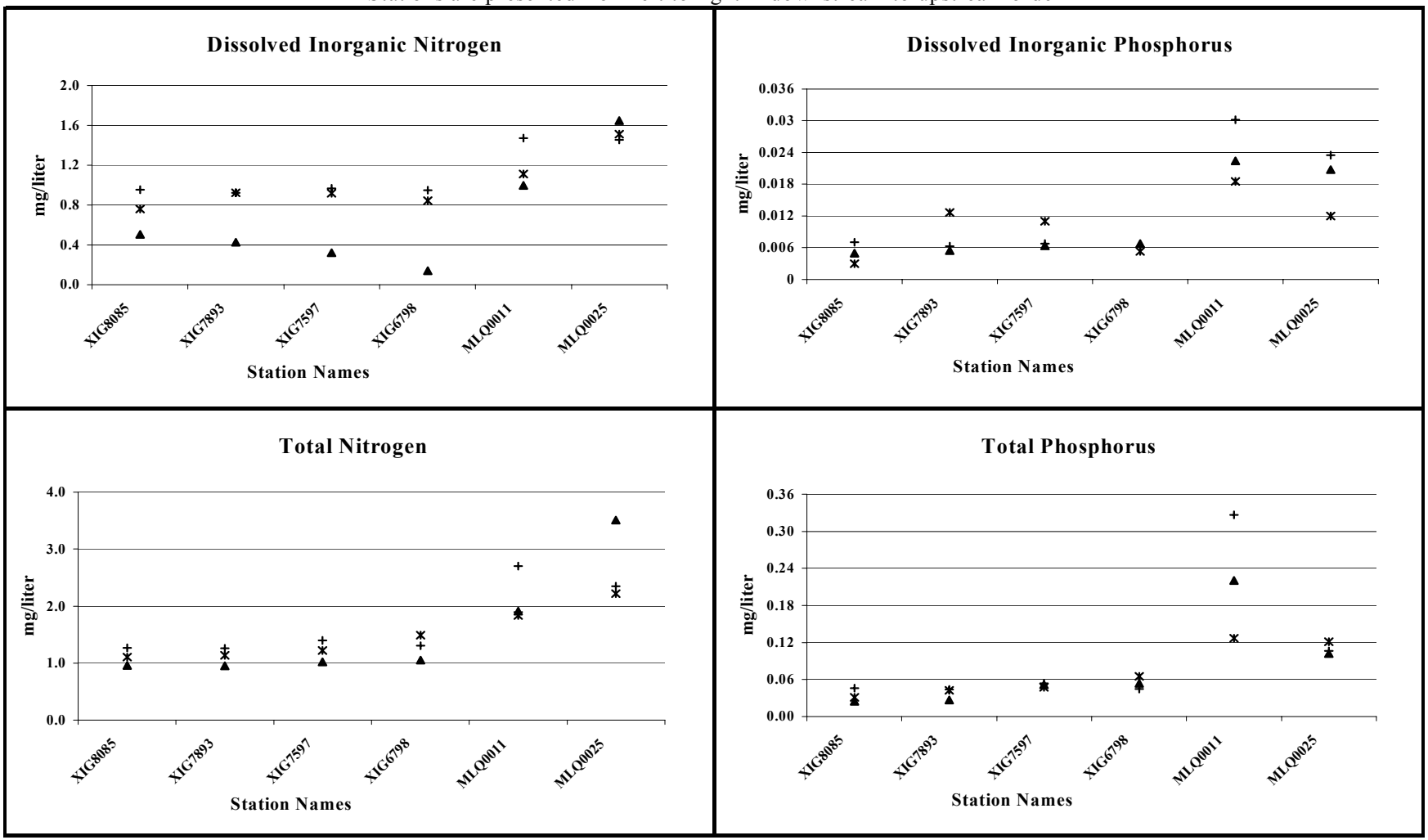
Worton Creek
High Flow Conditions (December - May)
Stations are presented from left to right in downstream to upstream order



Worton Creek

High Flow Conditions (December - May)

Stations are presented from left to right in downstream to upstream order

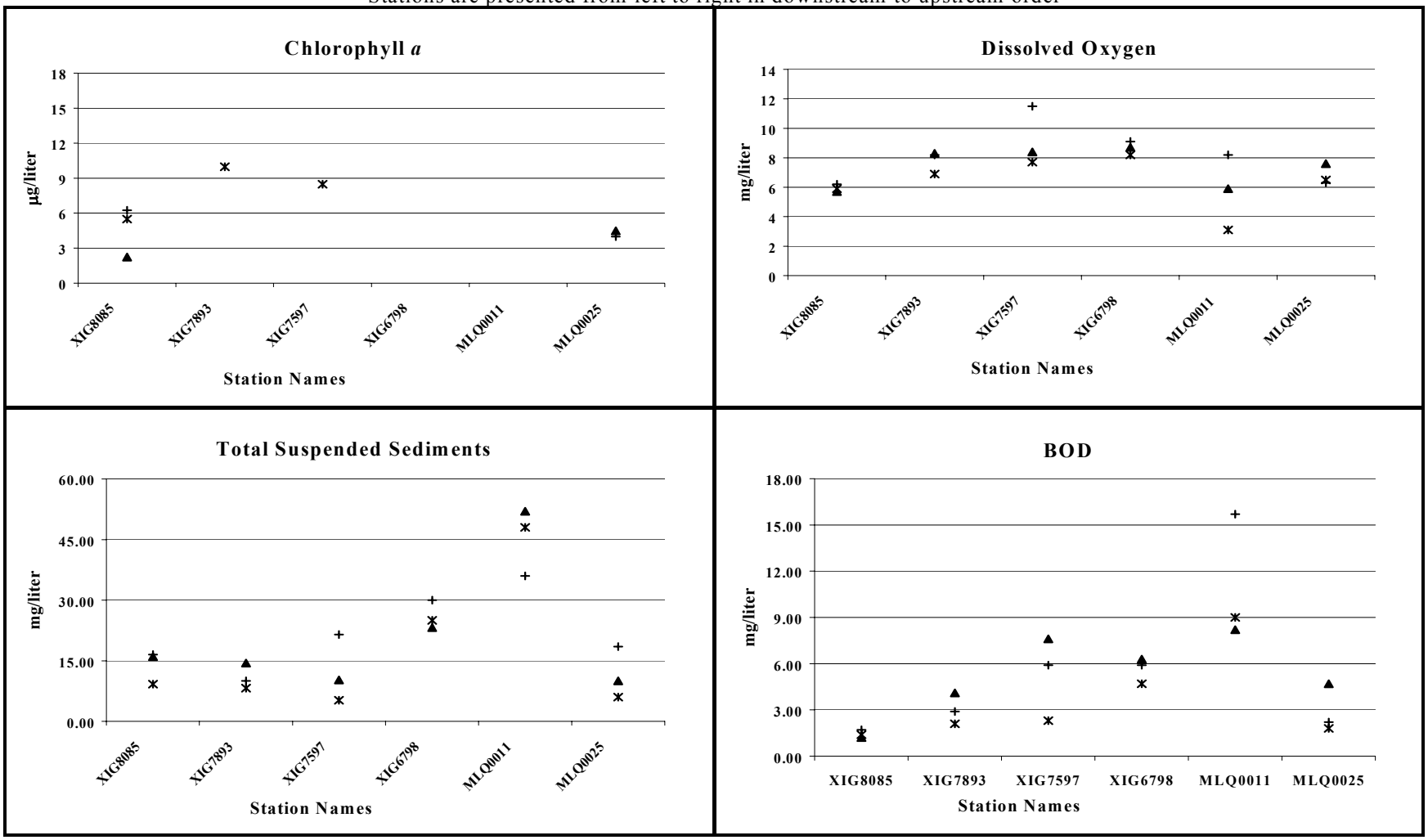


+ 18-Mar-99 ⁎ 12-Apr-99 ▲ 10-May-99

Worton Creek

Low Flow Conditions (June - November)

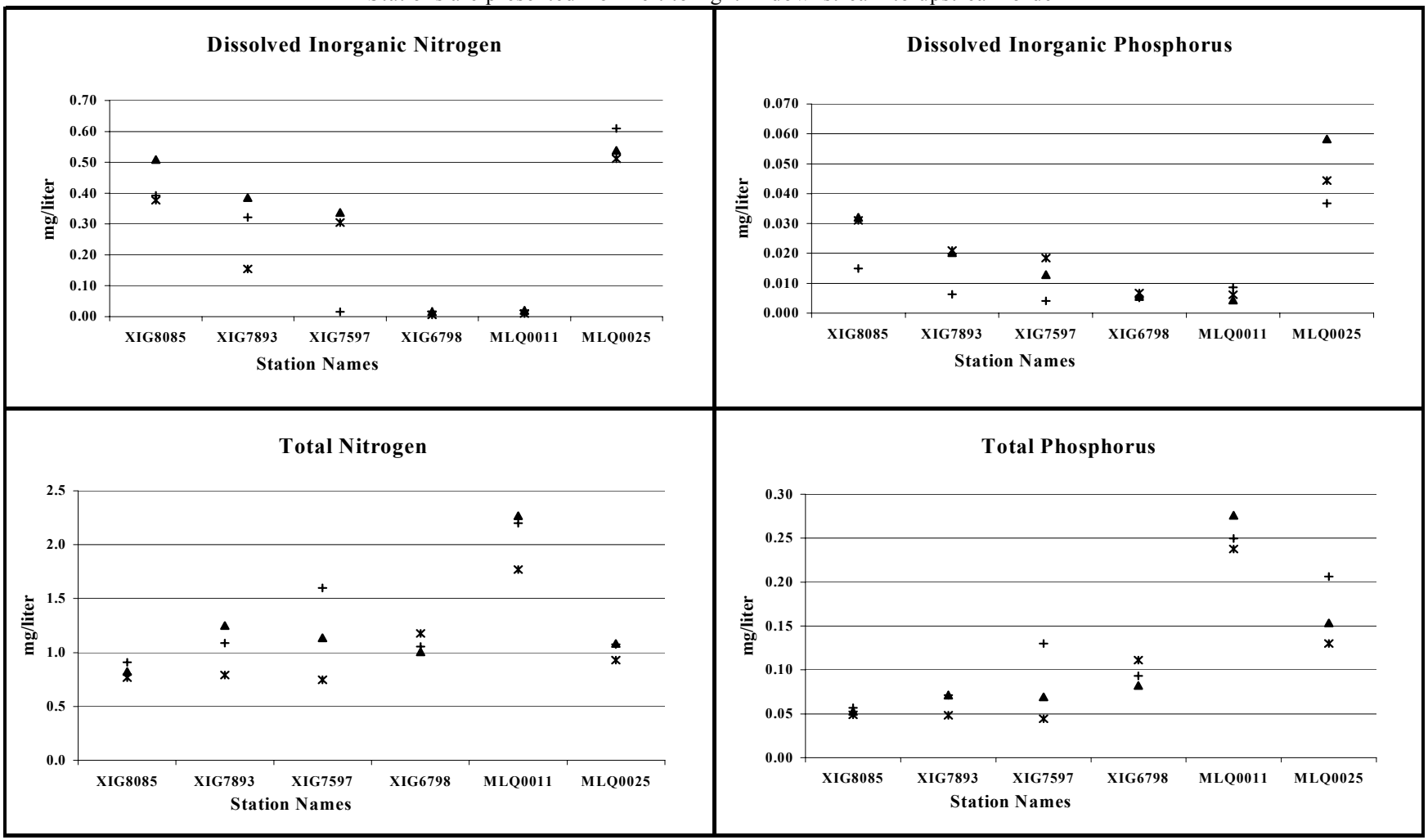
Stations are presented from left to right in downstream to upstream order



Worton Creek

Low Flow Conditions (June - November)

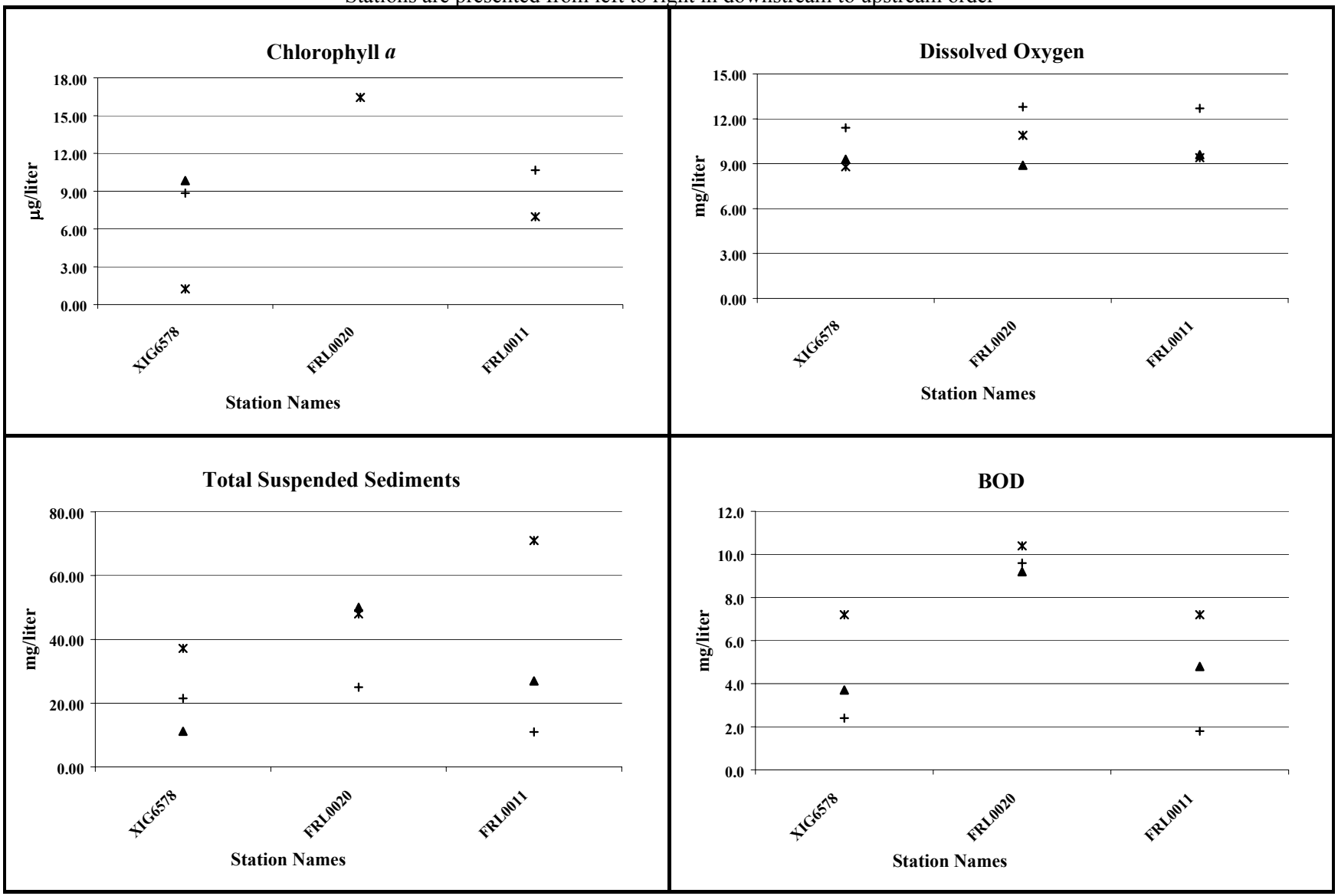
Stations are presented from left to right in downstream to upstream order



Fairlee Creek

High Flow Conditions (December - May)

Stations are presented from left to right in downstream to upstream order



Fairlee Creek

High Flow Conditions (December - May)

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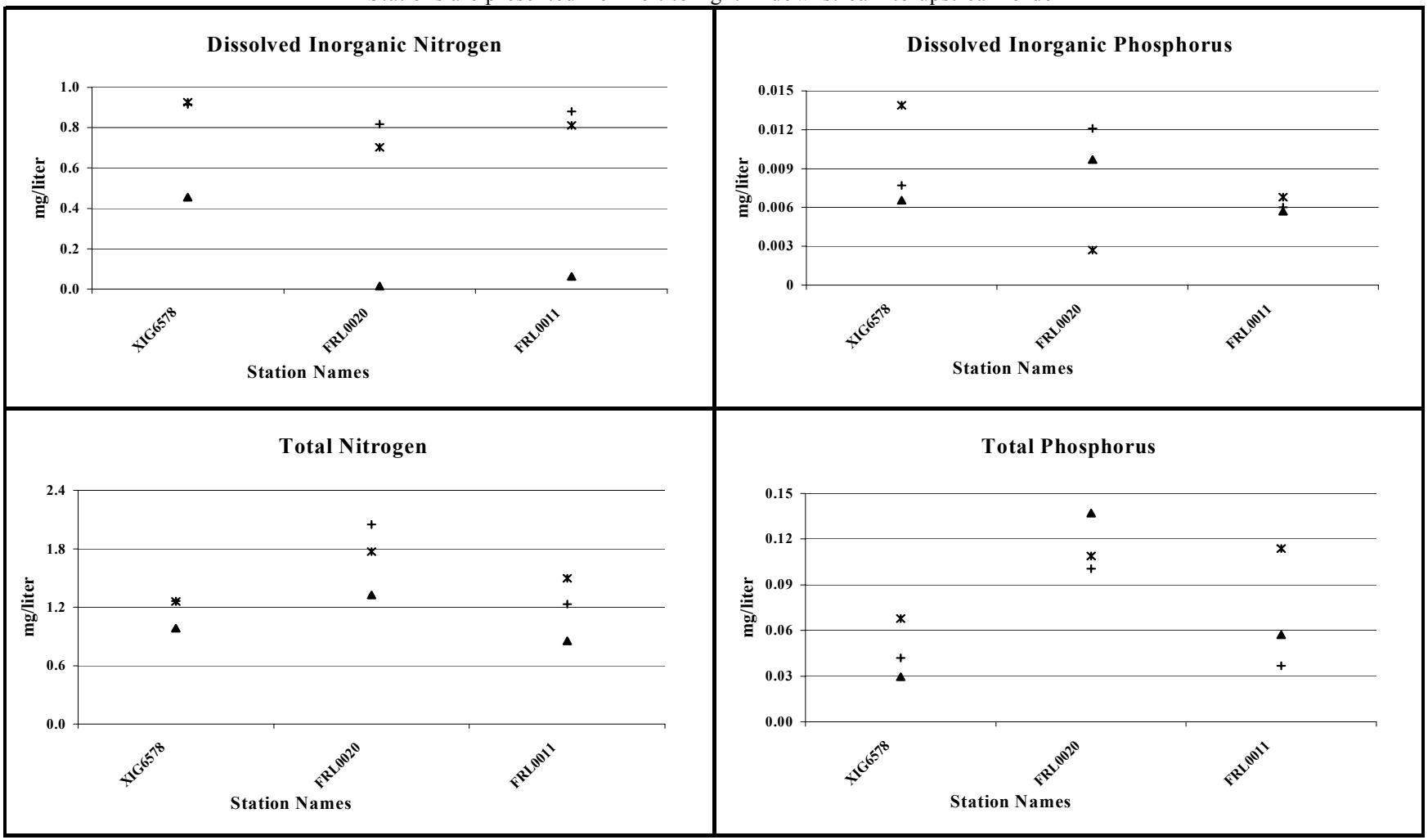

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Fairlee Creek

Low Flow Conditions (June - November)

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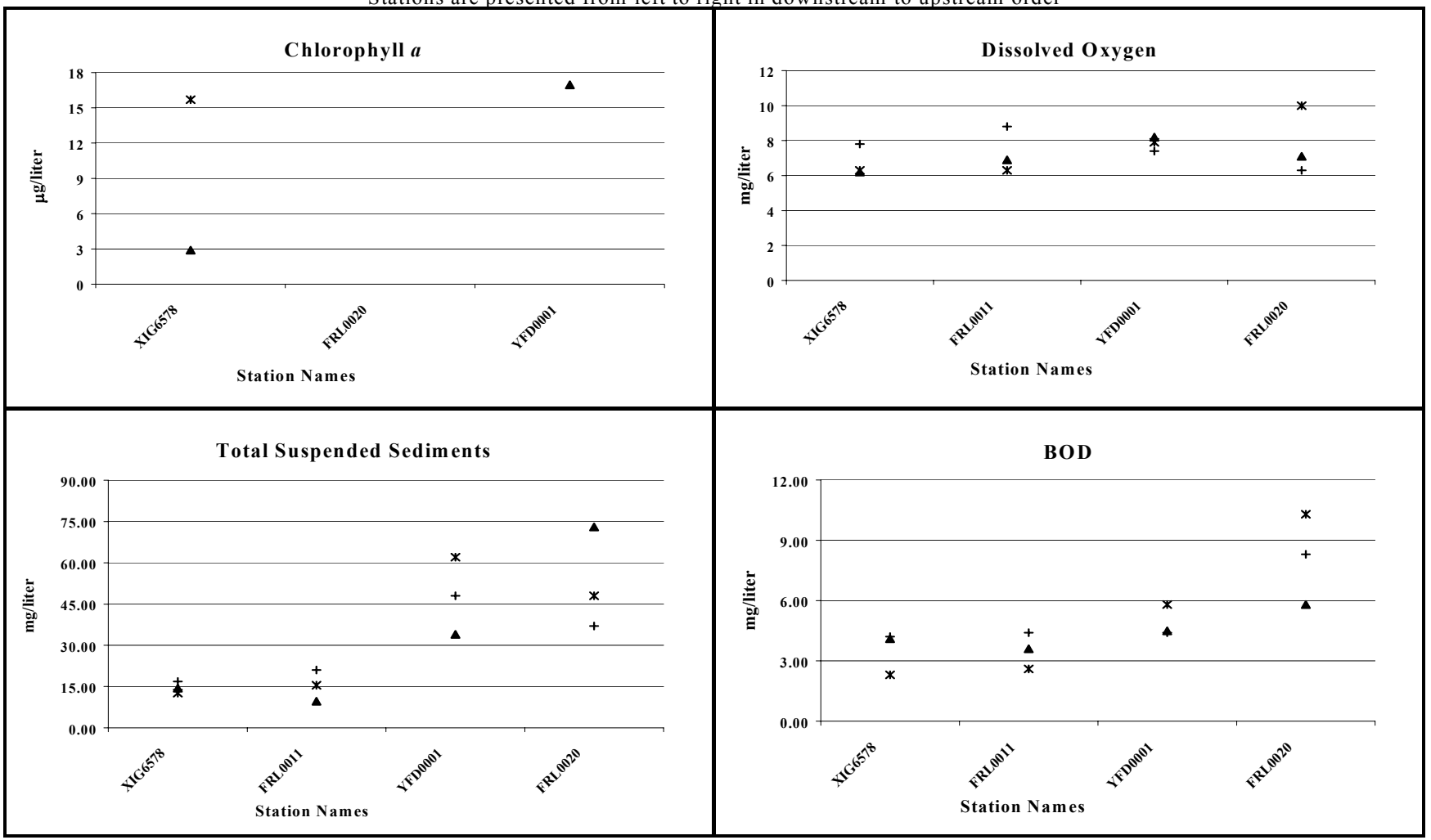

Fairlee Creek

Low Flow Conditions (June - November)

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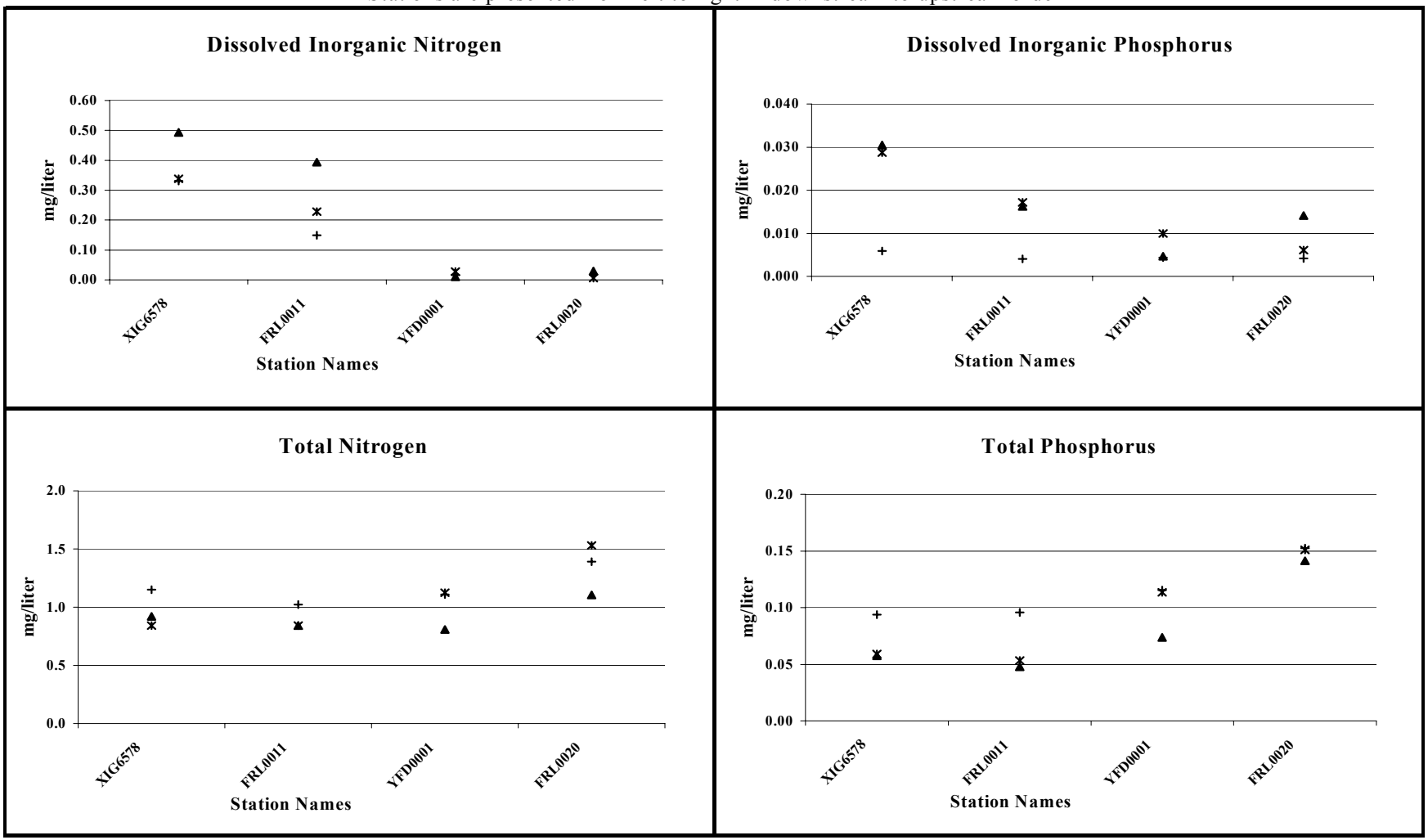


STILLPOND CREEK
1999 TMDL STUDY STATION LIST

StationCode	Lat/Long	Description
Still Pond		
XJH0209	39 20.213 76 09.019	At mouth of Still Pond, approx. 700 yds off shore.
XJH0516	39 20.547 76 08.409	At mouth of Still Pond, approx. 1000 yds off shore from yellow house -
XJH0117	39 20.114 76 08.331	Approx. 200 yds SW of R "2-S".
Still Pond Creek		
XIH9626	39 19.625 76 07.391	Depth ~ 3.5 ft.
XIH9440	39 19.442 76 06.016	Mid-channel near mouth of Jacks Cove -
STI0043	39 19.125 76 05 102	Bridge crossing on Still Pond Creek Rd. Take sample from bank below bridge.
Churn Creek		
XIH9816	39 19.785 76 08.429	Off shore from brown gazebo/dock -
CHK0034	39 18.383 76 06.269	Montabello Road crossing.

WORTON CREEK
1999 TMDL STUDY STATION LIST

StationCode	Lat/Long	Description
Worton Creek		
XIG8085	39 17.957 76 11.526	Depth ~ 10 ft.
XIG7893	39 17.779 76 10.729	Approx. 500 yds from point on south shoreDepth ~ 11.5 ft.
XIG7597	39 17.486 76 10.277	Approx. 50 ft from marker R 2. Depth ~ 10ft.
XIG6798	39 16.705 76 10.184	Just below confluence of Worton Creek and Mill Creek. Depth – 5 ft.
Mill Creek		
MLQ0011	39 16.518 76 09.093	Go left on Canvas Back Rd., first house on the right (the Whomsley's). Go down steps located to the right of house and sample off pier.
MLQ0025	39 16.968 76 08.069	At St. James/Smithville Rd. crossing.

FAIRLEE CREEK
1999 TMDL STUDY STATION LIST

StationCode	Lat/Long	Description
Fairlee Creek		
XIG6578	39 16.467 76 12.240	Approx. 250 yds off shore from light brown house - depth ~12 ft.
FRL0011	39 15.618 76 12.294	Downstream of big house on cliff. Depth ~ 4.5 ft.
FRL0020	39 14.710 76 11.310	At confluence of Fairlee Creek and unnamed trib. Approx. 3 ft. deep.
YFD0001	39 15.276 76 11.779	In cove near Great Oaks. (Sample during **low** flow surveys only, July – Sept.)

Chester River Basin

Eastern Bay

Miles River

Wye River

Lower Chester River

Langford Creek

Corsica River

Southeast Creek

Middle Chester River

Upper Chester River

Chester River Sub-Basin
(Sub-basin 02-13-05)

General Description (from 1998 305 (b) Report)
The Chester River sub-basin drains 547 square miles of Kent, Queen Anne's and Talbot Counties in Maryland to the Delaware line. The entire sub-basin lies in the Coastal Plain Province. Other than the mainstem Chester River, large water bodies include Corsica, Miles and Wye Rivers and Southeast Creek and several large embayments (e.g., Eastern Bay Prospect Bay, Crab Alley Bay). There are two significant publicly-owned lakes in the watershed - Urieville Lake and Unicorn Mill Pond.

More than 64 percent of the land in the Chester River sub-basin is used for agriculture; less than 27 percent of the land is forested. Urban areas comprise only seven percent and wetlands only two percent of the drainage area. Chestertown, located in the middle Chester River, is the sub-basin's largest community although the Kent Island and US Route 50 corridor extending eastward from Kent Island to Queenstown and then south to Easton are rapidly developing areas. Other major communities include Stevensville, Grasonville, Queenstown and Rock Hall.

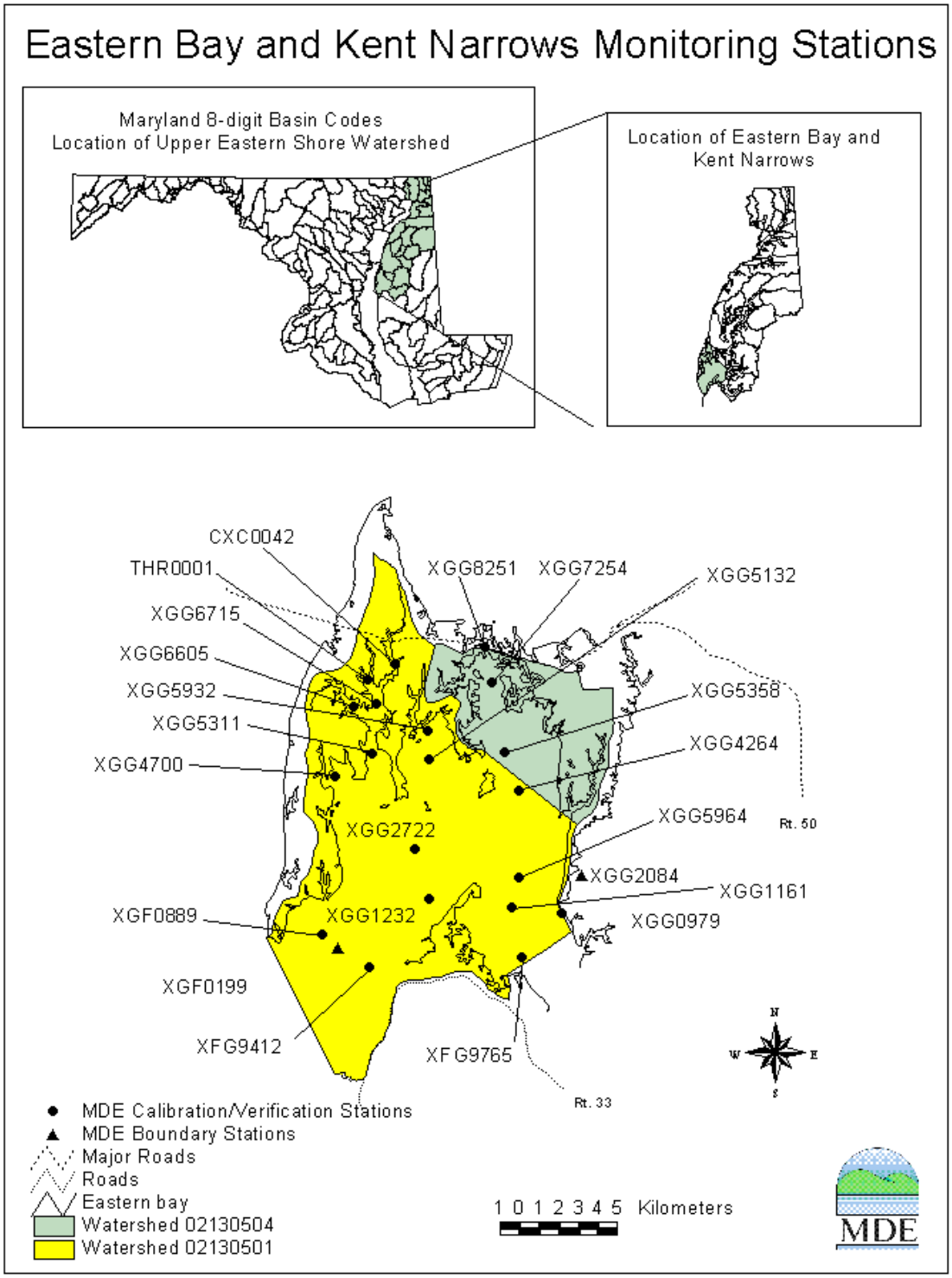
Surface waters are classified as Use I (water contact recreation and aquatic life) or Use II (shellfish harvesting) (COMAR '26.08.02.08F). For the most recent information regarding specific use classes in this watershed, the reader is referred to the Code of Maryland Regulations.

The State routinely monitors water quality at three Bay Tributary stations and at one CORE/Trend station located in the lower Chester River. One fixed Long Term Benthic Macroinvertebrate program station is monitored for estuarine benthos in addition to randomly selected Long Term Benthic Macroinvertebrate program sites. The Maryland Biological Stream Survey (MBSS) collected water quality samples in the watershed at 39 stations in 1996 and at three stations in 1997.

Water Quality Summary
TMDLs will be developed to address the nutrient impairments to water quality in the Eastern Bay (02130501), and the Miles (02130502), Wye (02130503) and Lower Chester (02130505) Rivers, following completion of the CBP Phase V Watershed and Water Quality Model. It is expected that the model will be completed in approximately two years.

MDE developed a TMDL to address the nutrient impairment in the Corsica River (02130507). The TMDL was submitted to EPA and approved on May 9, 2000. A TMDL for phosphorus impairment in Southeast Creek (02130508) was submitted and approved by EPA on September 22, 2003. TMDLs for nutrient impairments in the Middle (021130509) and Upper (02130510) Chester Rivers were submitted to EPA April 11, 2006. A Water Quality Analysis indicating no nutrient impairments in Langford Creek (02130506) was submitted to the EPA and approved on January 22, 2003.

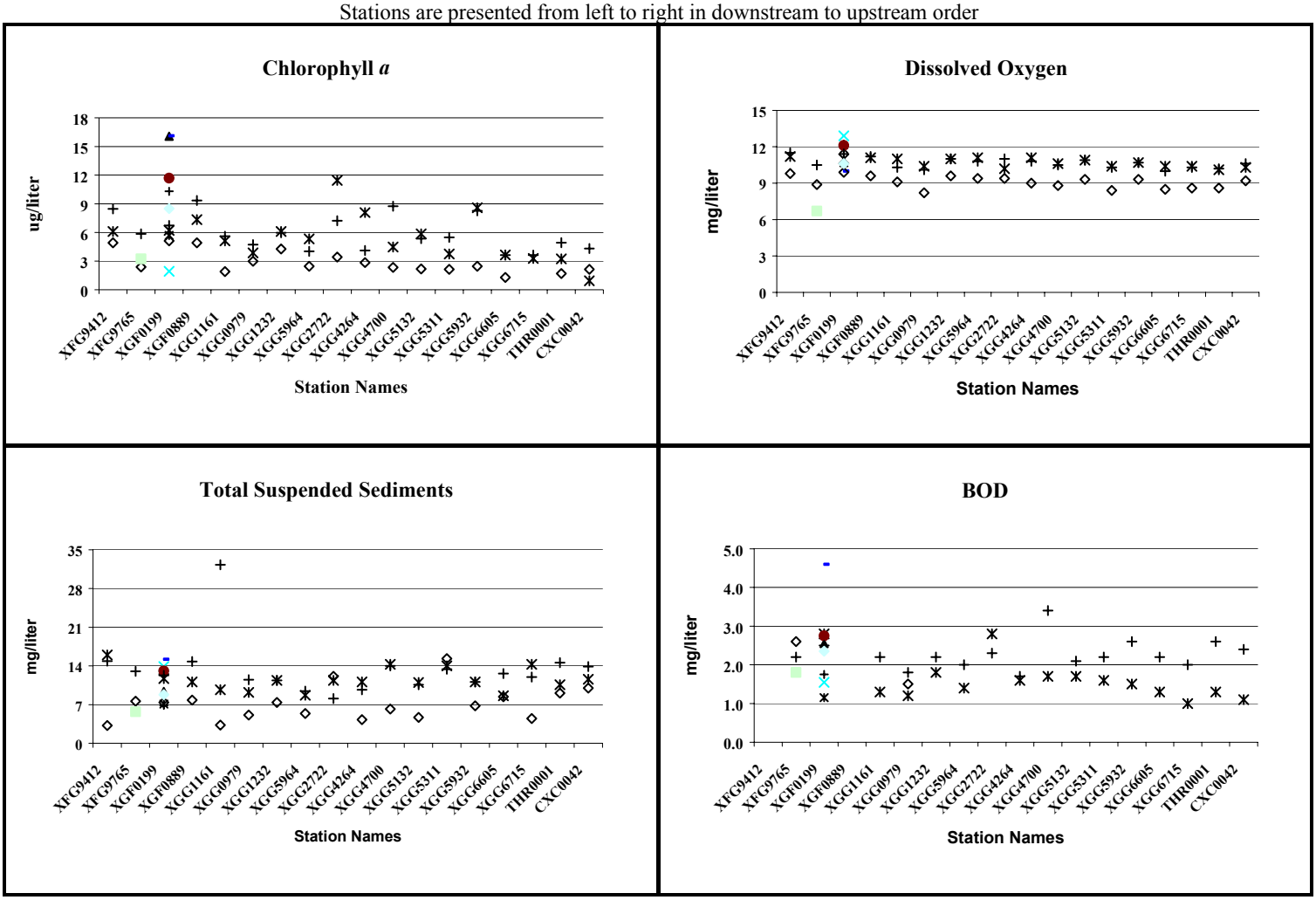
Eastern Bay


Eastern Bay and Kent Narrows Monitoring Stations
Maryland 8-digit Basin Codes
Location of Upper Eastern Shore Watershed
Location of Eastern Bay and
Kent Narrows
CXC0042
THR0001
XGG6715
XGG6605
XGG5932
XGG5311
XGG4700
XGG8251
XGG7254
XGG5132
XGG5358
XGG4264
XGG5964
Rt. 50
XGG2722
XGG2084
XGG1161
XGG0979
XGF0889
XGG1232
XGF0199
XFG9412
XFG9765
Rt. 33
N
W
E
S
MDE Calibration/Verification Stations
MDE Boundary Stations
Major Roads
Roads
Eastern bay
Watershed 02130504
Watershed 02130501
1 0 1 2 3 4 5 Kilometers
MDE

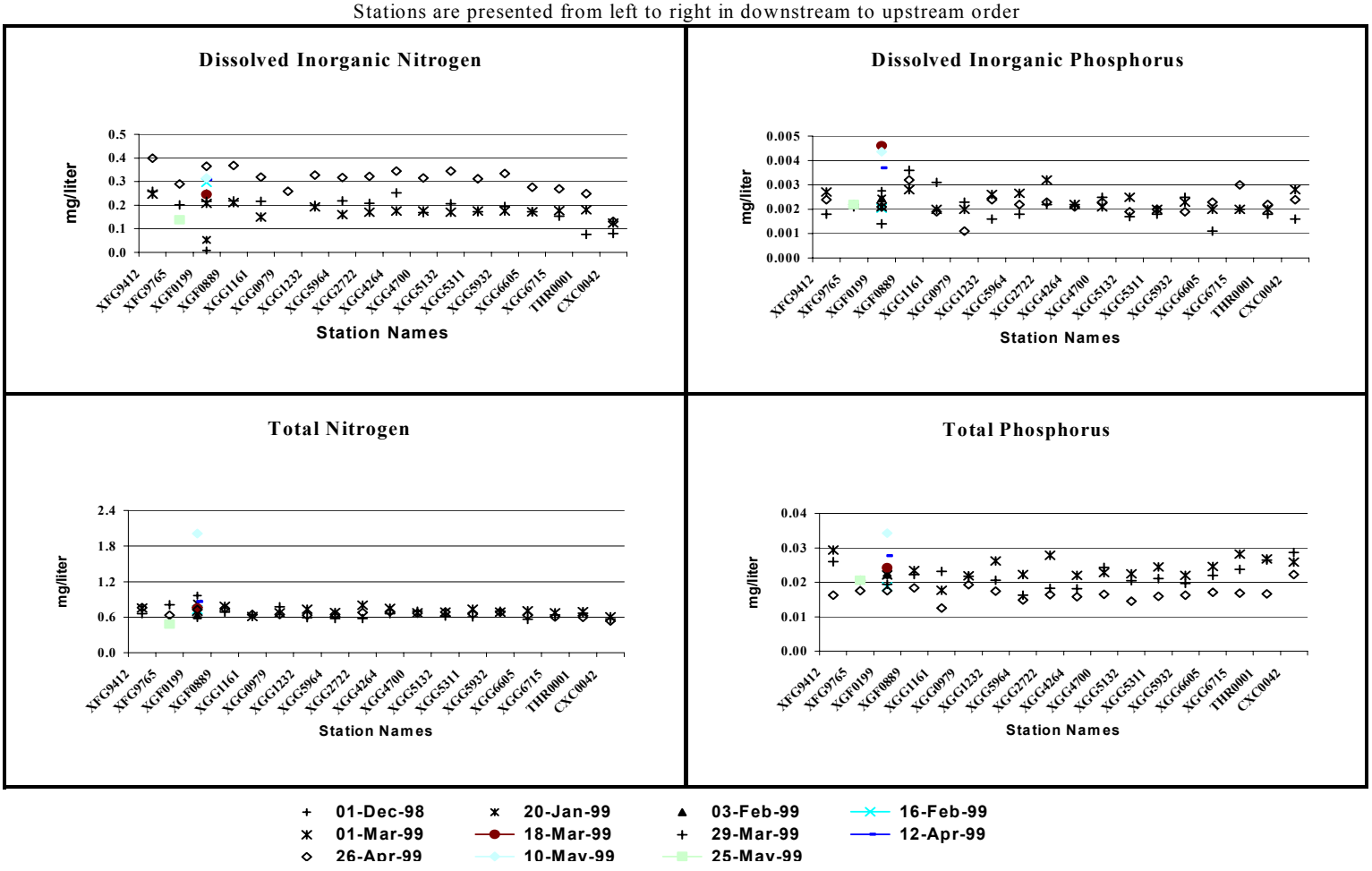
Eastern Bay and Kent Narrows

High Flow Conditions (December - May)

Stations are presented from left to right in downstream to upstream order



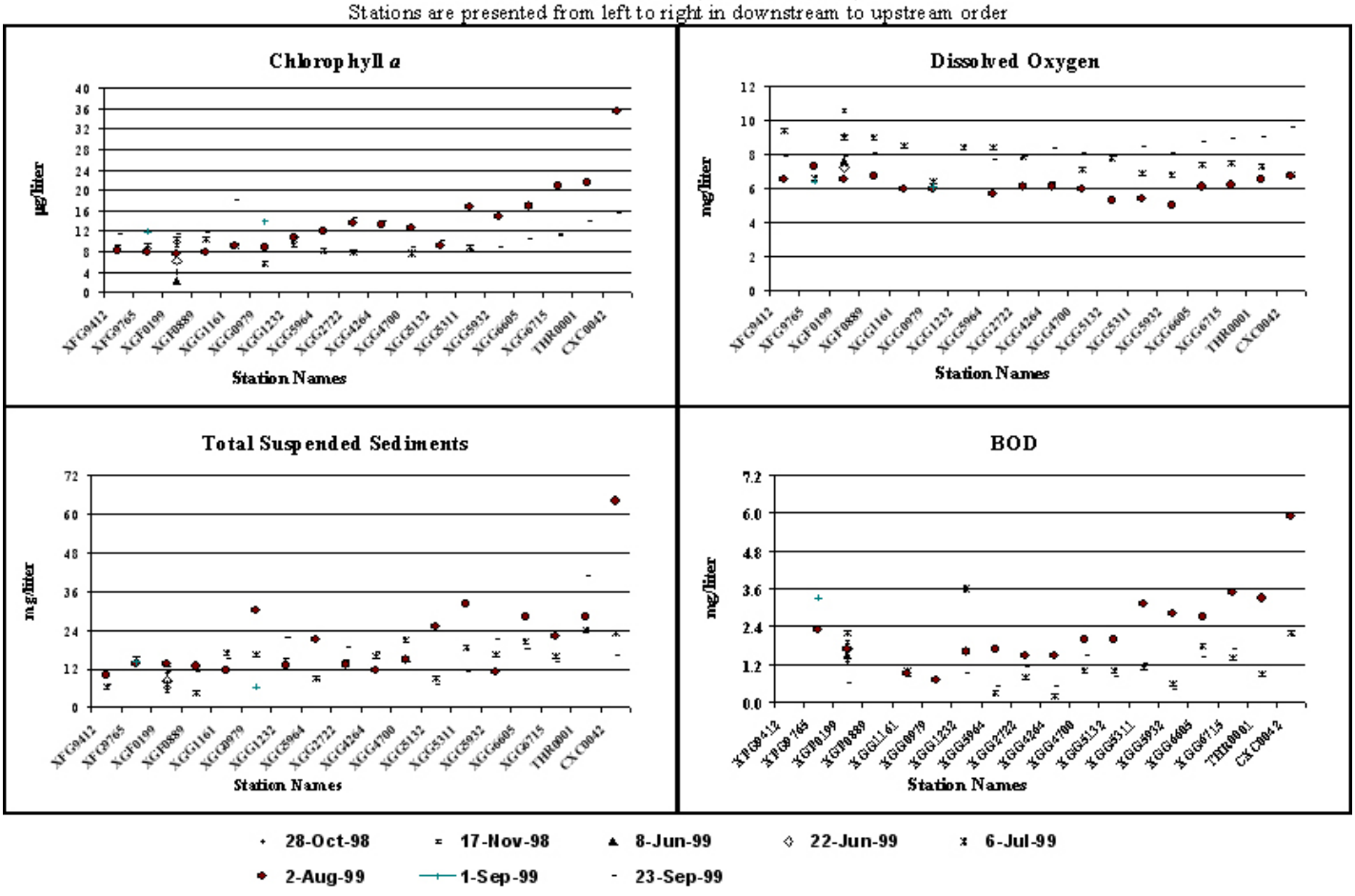
Eastern Bay and Kent Narrows
High Flow Conditions (December - May)
Stations are presented from left to right in downstream to upstream order



Eastern Bay and Kent Narrows

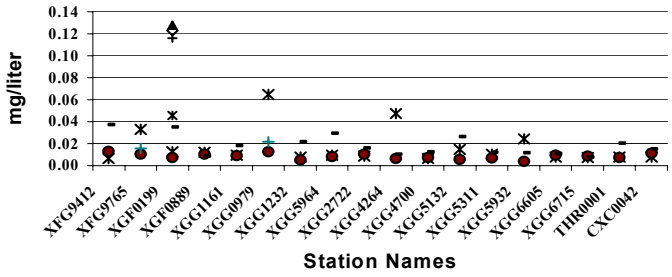
Low Flow Conditions (June - November)

Stations are presented from left to right in downstream to upstream order

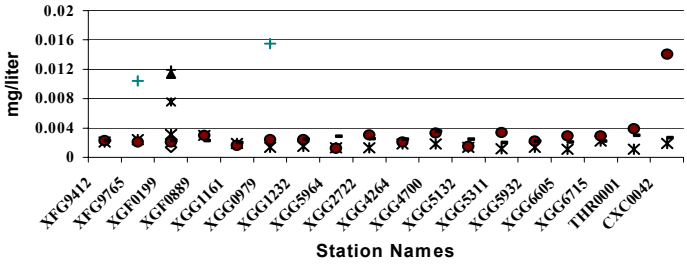


Eastern Bay and Kent Narrows
Low Flow Conditions (June - November)
Stations are presented from left to right in downstream to upstream order

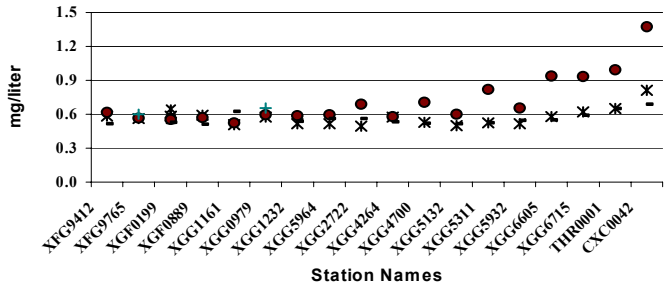
Dissolved Inorganic Nitrogen



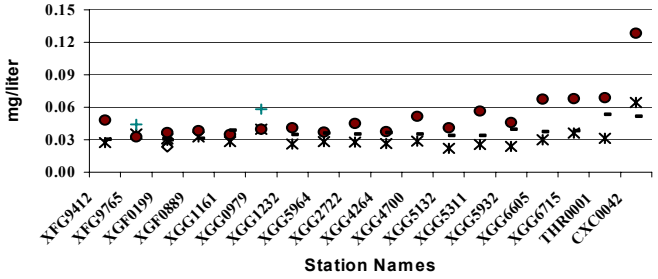
Dissolved Inorganic Phosphorus



Total Nitrogen



Total Phosphorus

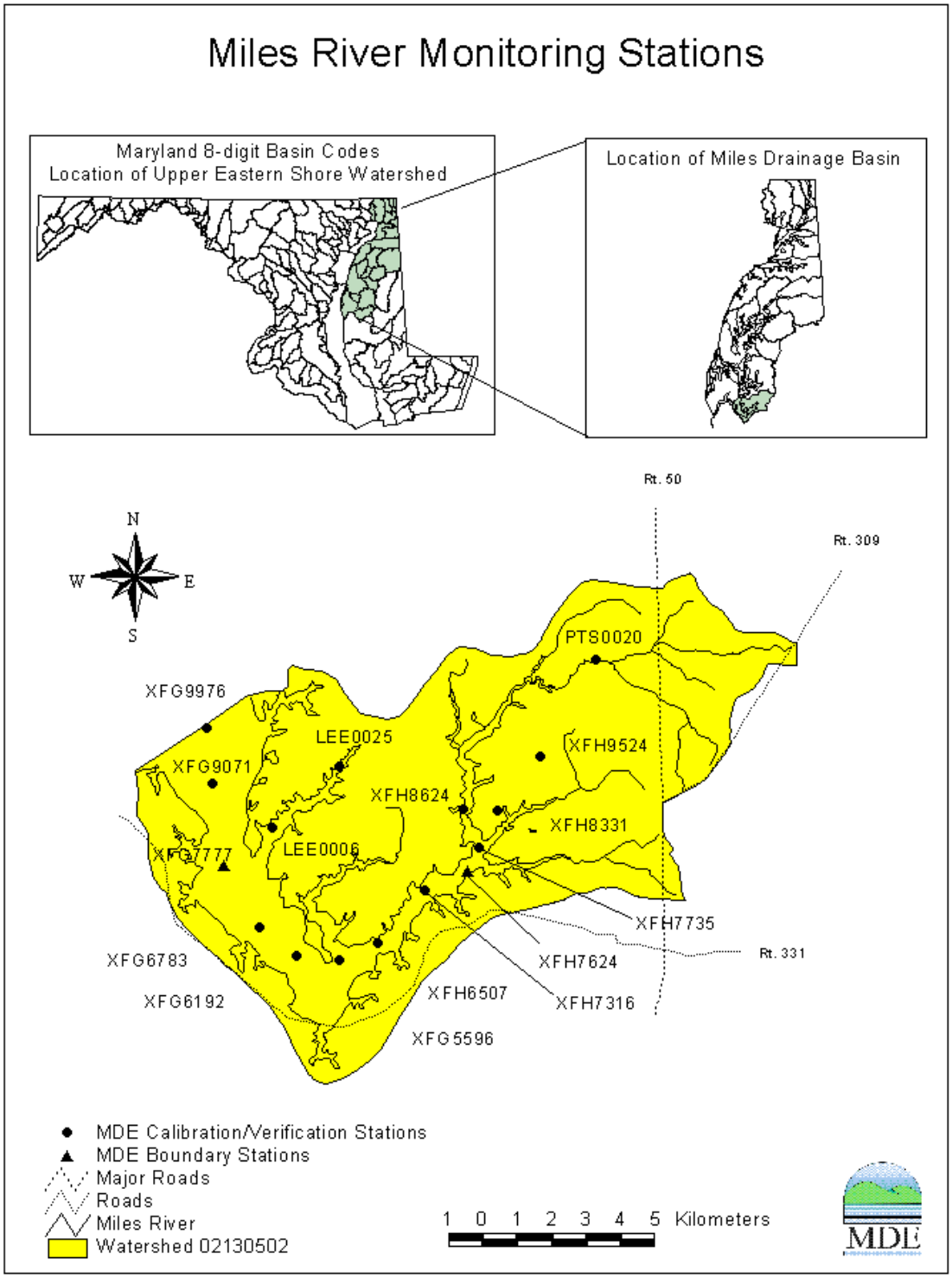


EASTERN BAY AND KENT NARROWS
1999 TMDL STATION LIST

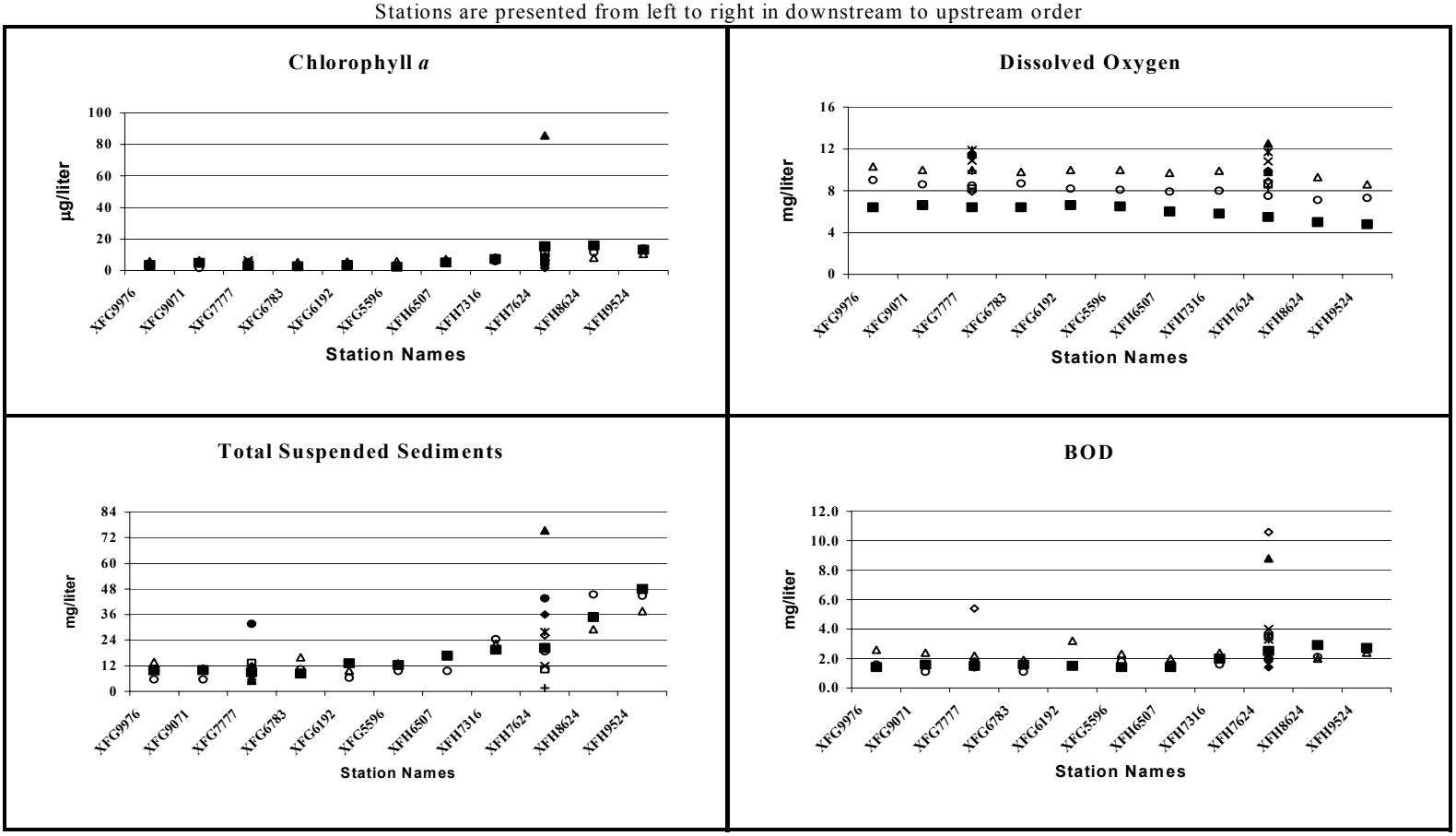
Station Code	Lat/Long	Description
Eastern Bay		
XGF0889	38 50.352 76 20.573	Depth 32 ft.
XGF0199	38 50.057 76 20.354	Approx 2050 yds off Kent Point, mid-channel. Between buoy "A" and red Nun "2". Depth ~ 54.
XFG9412	38 49.521 76 19.211	Depth ~ 27 ft.
XGG1232	38 51.518 76 16.821	Approx. 200 yds south of green buoy can 3. Depth ~ 55 ft
XGG2722	38 52.679 76 17.266	South of Turkey Point.
XGG4700	38 54.709 76 20.072	Approx. 300 yds NW of mouth of Shipping Creek, mid-creek. Depth 10 ft.
Cox Creek		
XGG5311	38 55.559 76 18.760	Mid-channel off huge beige brick house. Depth ~ 14 ft.
XGG6715	38 56.759 76 18.579	Mid-creek, above confluence with Warehouse Creek. Depth 9 ft.
CXC0042	38 57.794 76 17.916	Mid-channel above duck blind. Depth 8 ft.
Warehouse Creek		
XGG6605	38 56.621 76 19.383	NW of mouth of Warehouse Creek. Depth 9 ft.

Station Code	Lat/Long	Description
Thompson Creek		
THR0001	38 57.349 76 18.850	Confluence of three creeks.
Crab Alley		
XGG5132	38 55.176 76 16.771	SE of red day marker; directly south of marina.
XGG5932	38 55.937 76 16.771	East of Johnson Island.
Kent Narrows		
XGG8251	38 58.252 76 14.822	Kent Narrows Bridge
Prospect Bay		
XGG7254	38 57.274 76 14.584	50 yds east of daymarker “1K”.
XGG5358	38 55.323 76 14.144	Near red buoy “2”.
XGG4264	38 54.078 76 14.000	Buoy “1”.
XGG5964	38 51.896 76 13.649	Directly east of Tighlman Point.
XGG1161	38 50.513 76 13.775	In channel, east of red nun buoy “8”.
Miles River		
XFG9765	38 49.743 76 13.541	300 yds S of green can #9.
Wye River		
XGG0979	38 50.875 76 12.182	At the mouth of Wye River -
XGG2084	38 51.933 76 11.371	Approx. 150 ft E of day marker #1 -

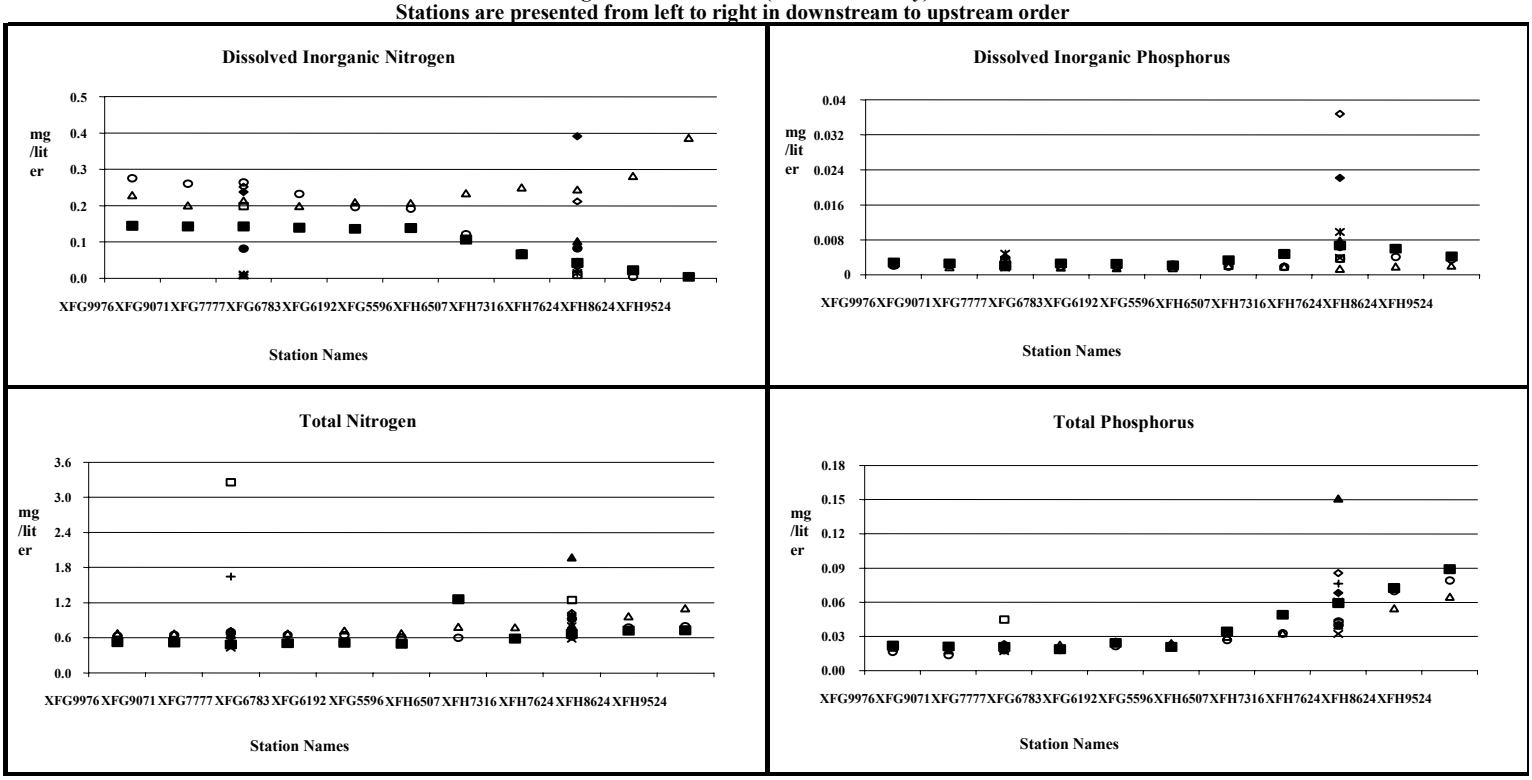
Miles River


Miles River Monitoring Stations
Maryland 8-digit Basin Codes
Location of Upper Eastern Shore Watershed
Location of Miles Drainage Basin
Rt. 50
Rt. 309
N
W
E
S
PTS0020
XFG9976
LEE0025
XFH9524
XFG9071
XFH8624
XFH8331
LEE0006
XFH7735
XFG6783
Rt. 331
XFH7624
XFG6192
XFH6507
XFH7316
XFG5596
MDE Calibration/Verification Stations
MDE Boundary Stations
Major Roads
Roads
Miles River
Watershed 02130502
1 0 1 2 3 4 5 Kilometers
MDE

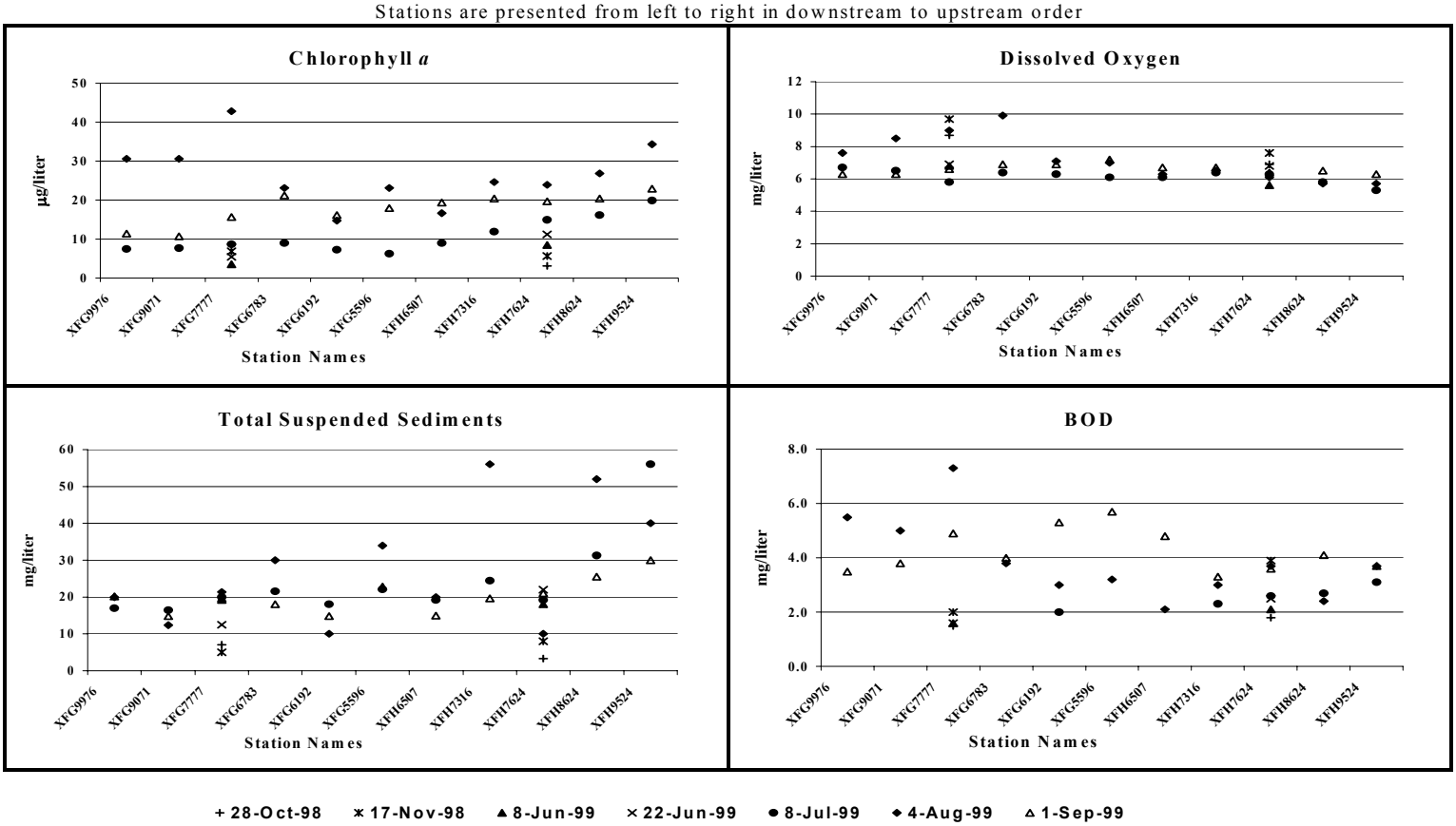
Miles River (main)
High Flow Conditions (December - May)
Stations are presented from left to right in downstream to upstream order



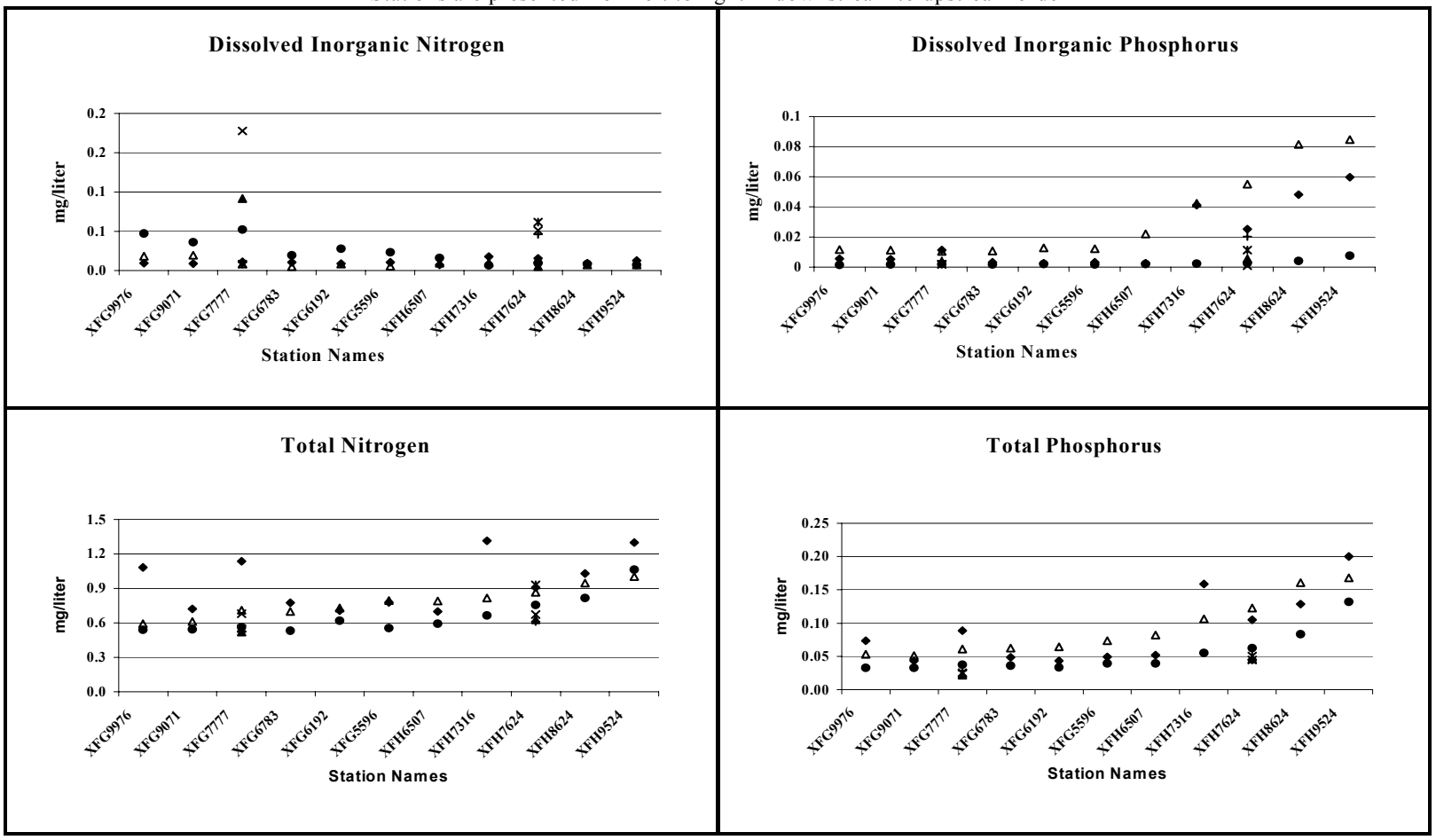
Miles River (main)
High Flow Conditions (December - May)
Stations are presented from left to right in downstream to upstream order



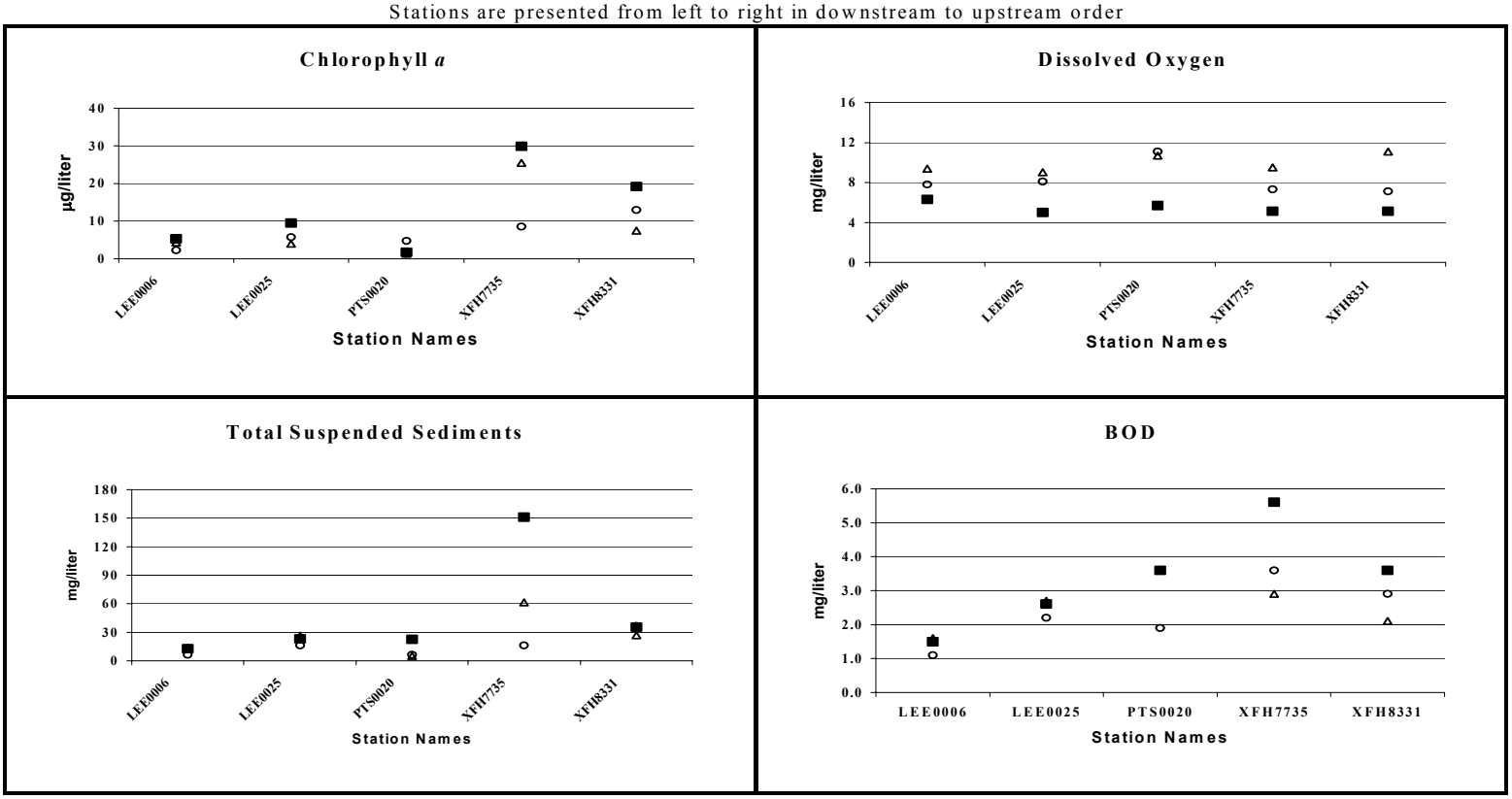
Miles River (main)
Low Flow Conditions (June - November)
Stations are presented from left to right in downstream to upstream order



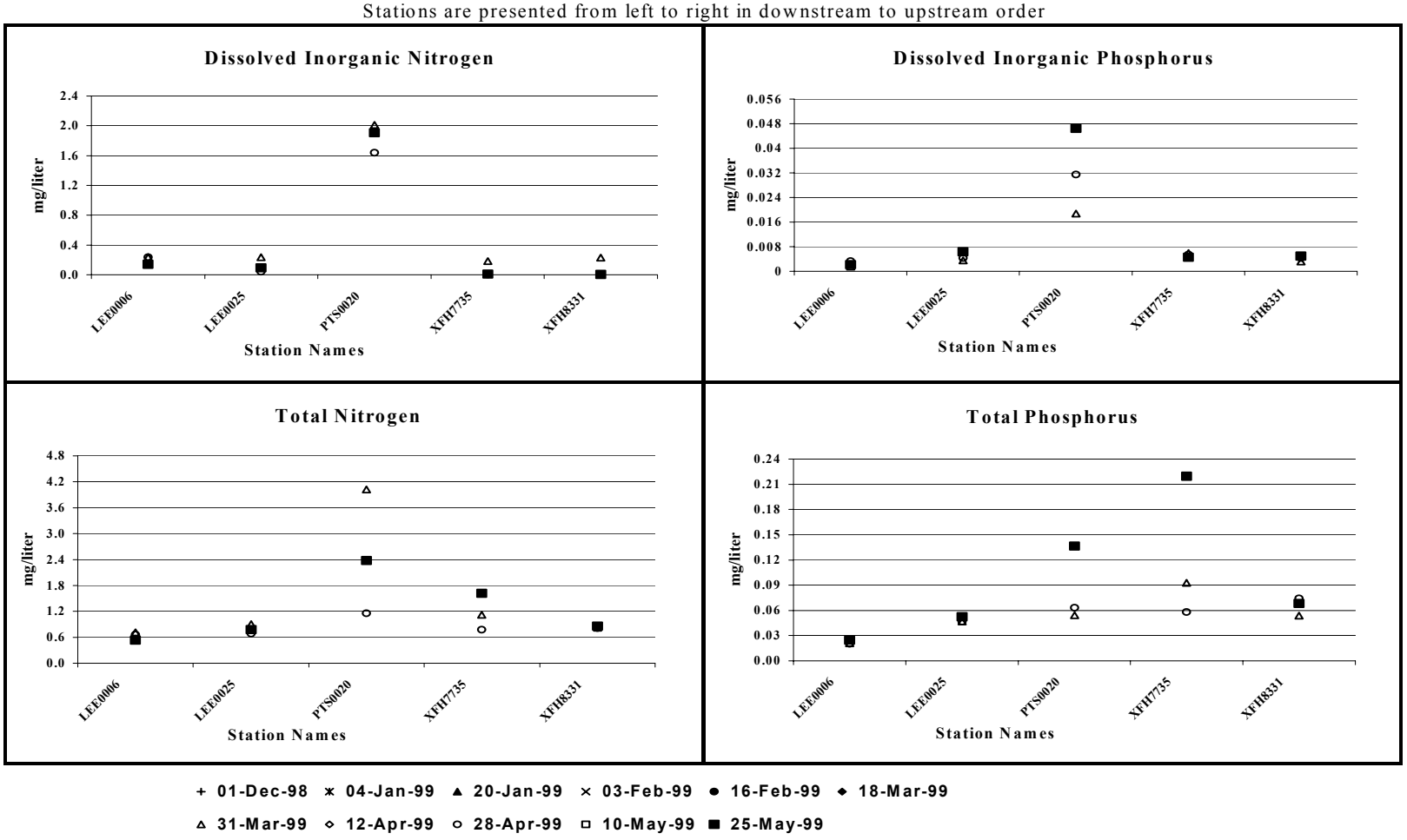
Miles River (Main)
Low Flow Conditions (June - November)
Stations are presented from left to right in downstream to upstream order



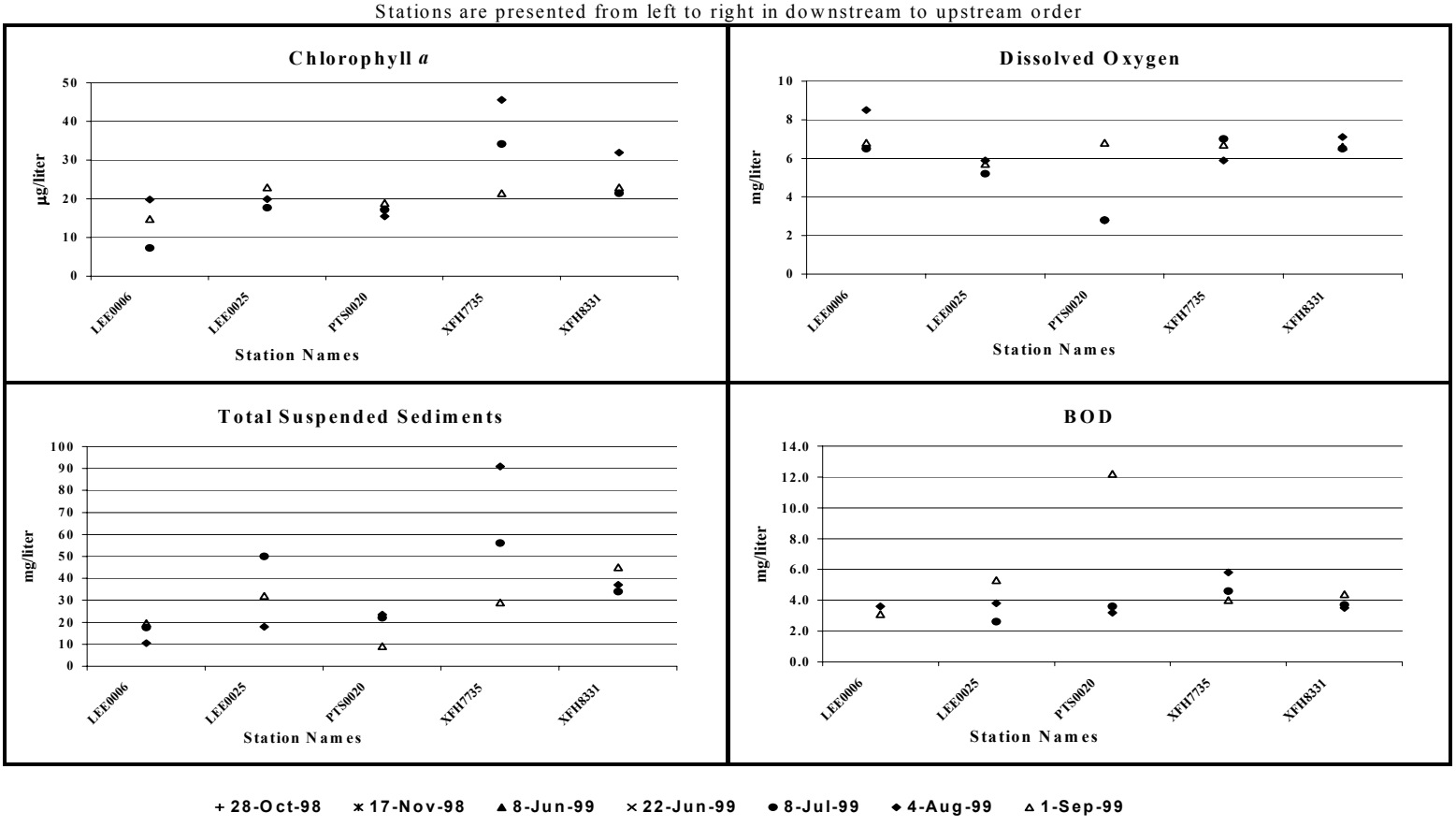
Miles River (tributaries)
High Flow Conditions (December - May)
Stations are presented from left to right in downstream to upstream order



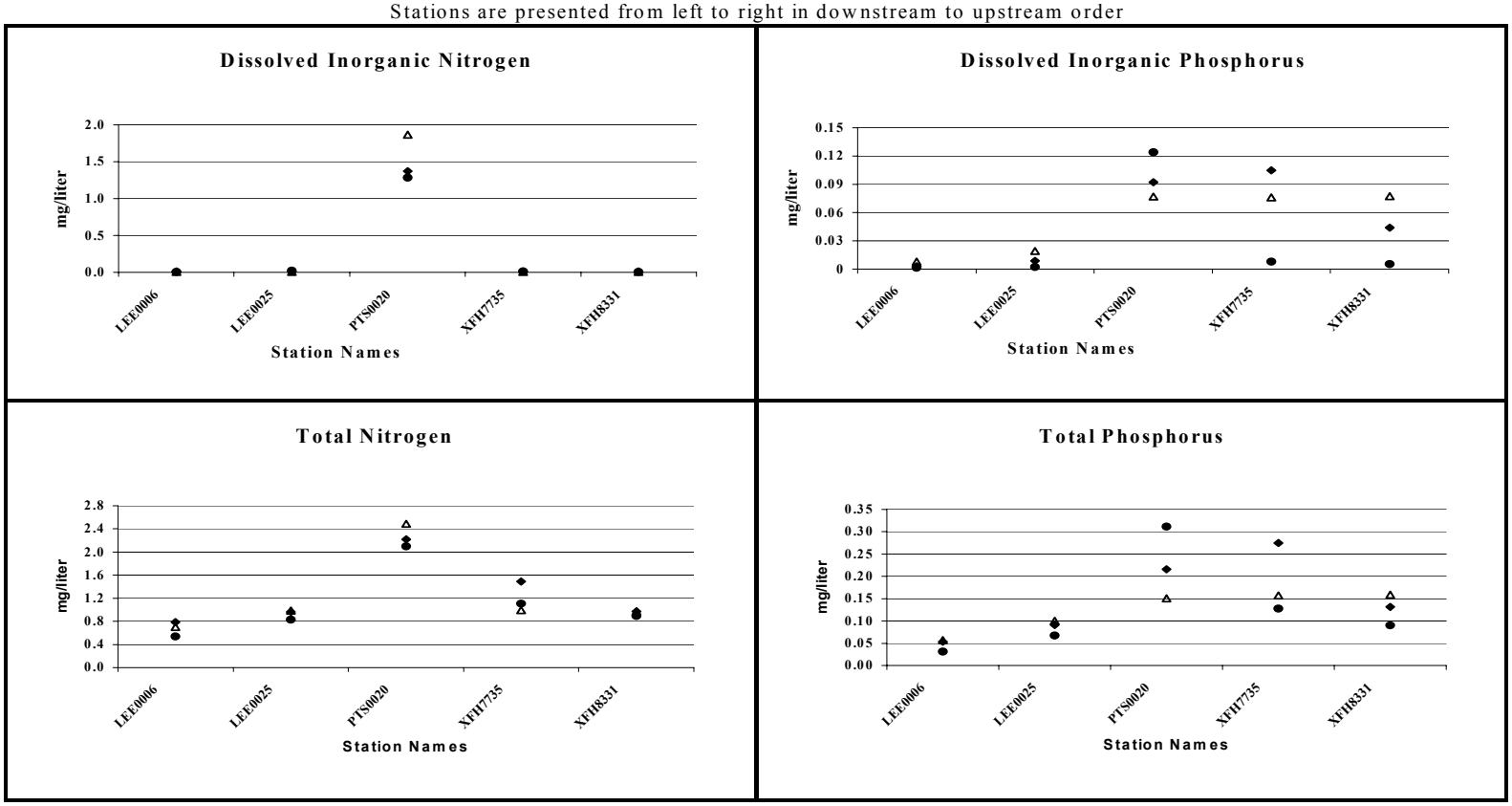
Miles River (tributaries)
High Flow Conditions (December - May)
Stations are presented from left to right in downstream to upstream order



Miles River (tributaries)
Low Flow Conditions (June - November)
Stations are presented from left to right in downstream to upstream order



Miles River (tributaries)
Low Flow Conditions (June - November)
Stations are presented from left to right in downstream to upstream order

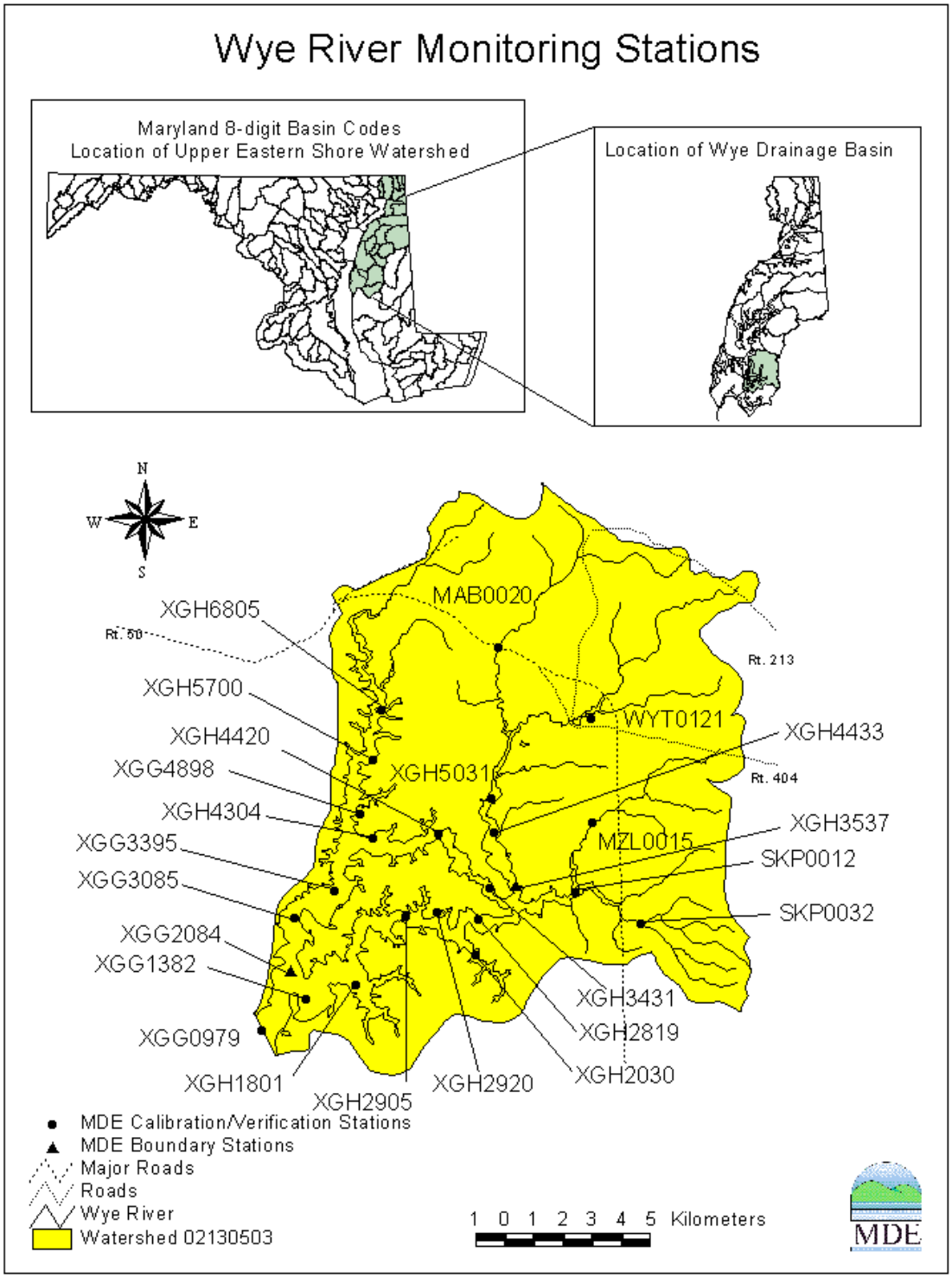


MILES RIVER
1999 TMDL STUDY STATION LIST

Station Code	Lat/Long	Description
Miles River		
XFG9976	38 49.973 76 12.425	300 yds E of green can #1.
XFG9071	38 48.915 76 12.751	Mid-channel.
XFG7777	38 47.733 76 12.343	Approx. 100 yds N of buoy R 4, off St. Michaels Harbor.
XFG6783	38 46.765 76 11.665	Approx. 800 yds SSE of green buoy #5.
XFG6192	38 46.066 76 10.816	Approx. 600 yds NW of lighted beacon 7.
XFG5596	38 45.532 76 10.492	1000 yds. Downstream from bridge, mid-channel.
XFH6507	38 46.486 76 09.297	Facing upstream: between channel to the south and plantation style house to the north.
XFH7316	38 47.316 76 08.347	30 yds. Downstream of R “10”.
XFH7624	38 47.607 76 07.521	At Route 370 crossing.

Station Code	Lat/Long	Description
Miles River		
XFH8624	38 48.584 76 07.582	Approx. 1300 yds above mouth of Goldborough Creek.
XFH9524	38 49.530 76 07.599	Off pier of large white house on east shore, below confluence of trib.
Potts Mill Creek		
PTS0020	38 50.899 76 04.890	Bridge crossing on Longwoods Road.
Goldsborough Creek		
XFH8331	38 48.313 76 06.855	Approx. 50 yds from white house with pier
Glebe Creek		
XFH7735	38 47.683 76 06.478	Off pier of large brick house with 3 car garage
Leeds Creek		
LEE0006	38 48.318 76 11.360	Approx. 1350 yds above mouth. Near flagpole.
LEE0025	38 49.260 76 10.023	Sample from pier off of bridge on Tunis Mill Rd.

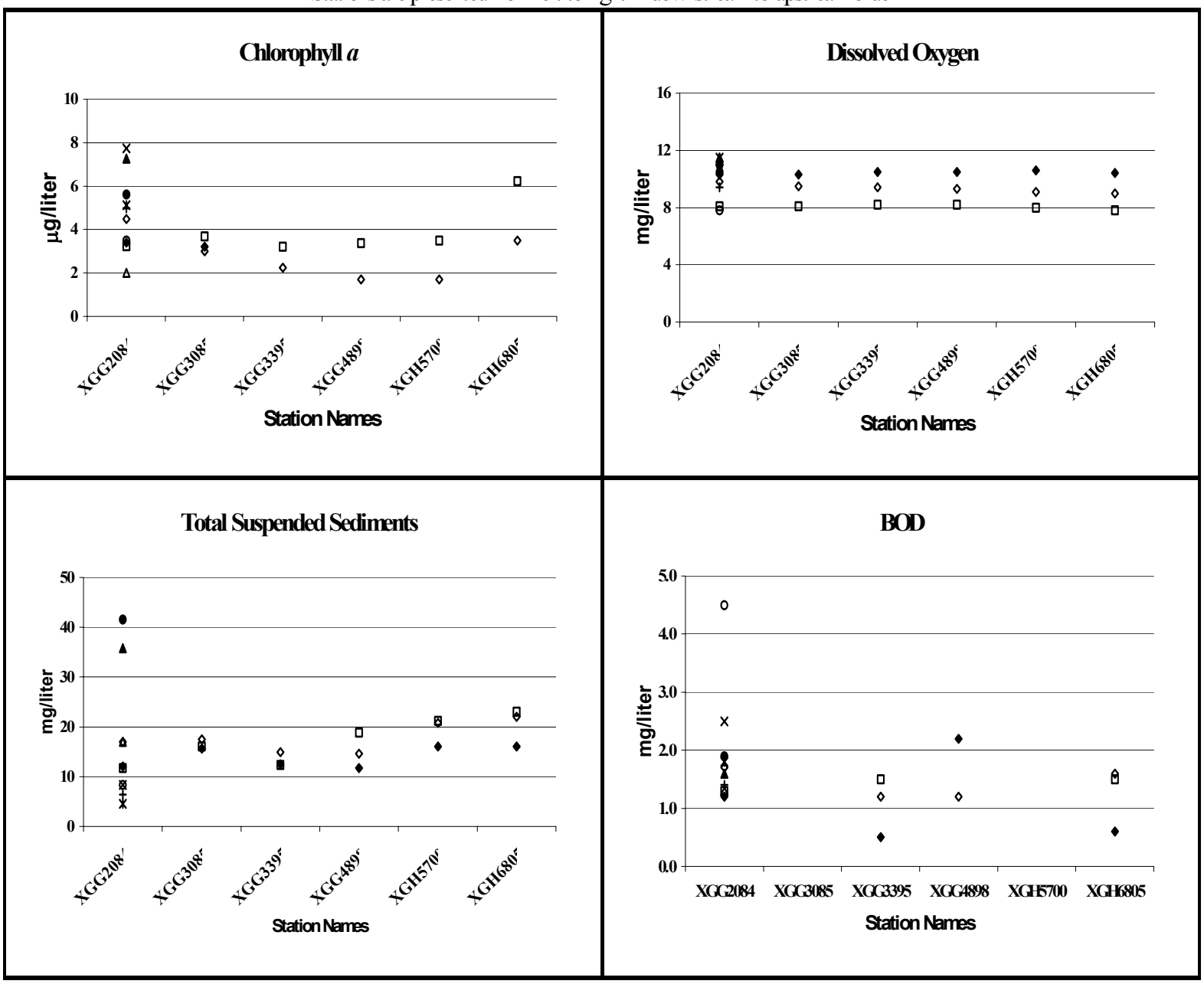
Wye River


Wye River Monitoring Stations
Maryland 8-digit Basin Codes
Location of Upper Eastern Shore Watershed
Location of Wye Drainage Basin
N
W
E
S
XGH6805
Rt. 50
MAB0020
Rt. 213
XGH5700
WYT0121
XGH4433
XGH4420
XGG4898
XGH5031
Rt. 404
XGH4304
XGG3395
XGG3085
MZL0015
XGH3537
SKP0012
SKP0032
XGG2084
XGG1382
XGH3431
XGH2819
XGG0979
XGH1801
XGH2905
XGH2920
XGH2030
MDE Calibration/Verification Stations
MDE Boundary Stations
Major Roads
Roads
Wye River
Watershed 02130503
1 0 1 2 3 4 5 Kilometers
MDE

Wye River (main)

High Flow Conditions (December - May)

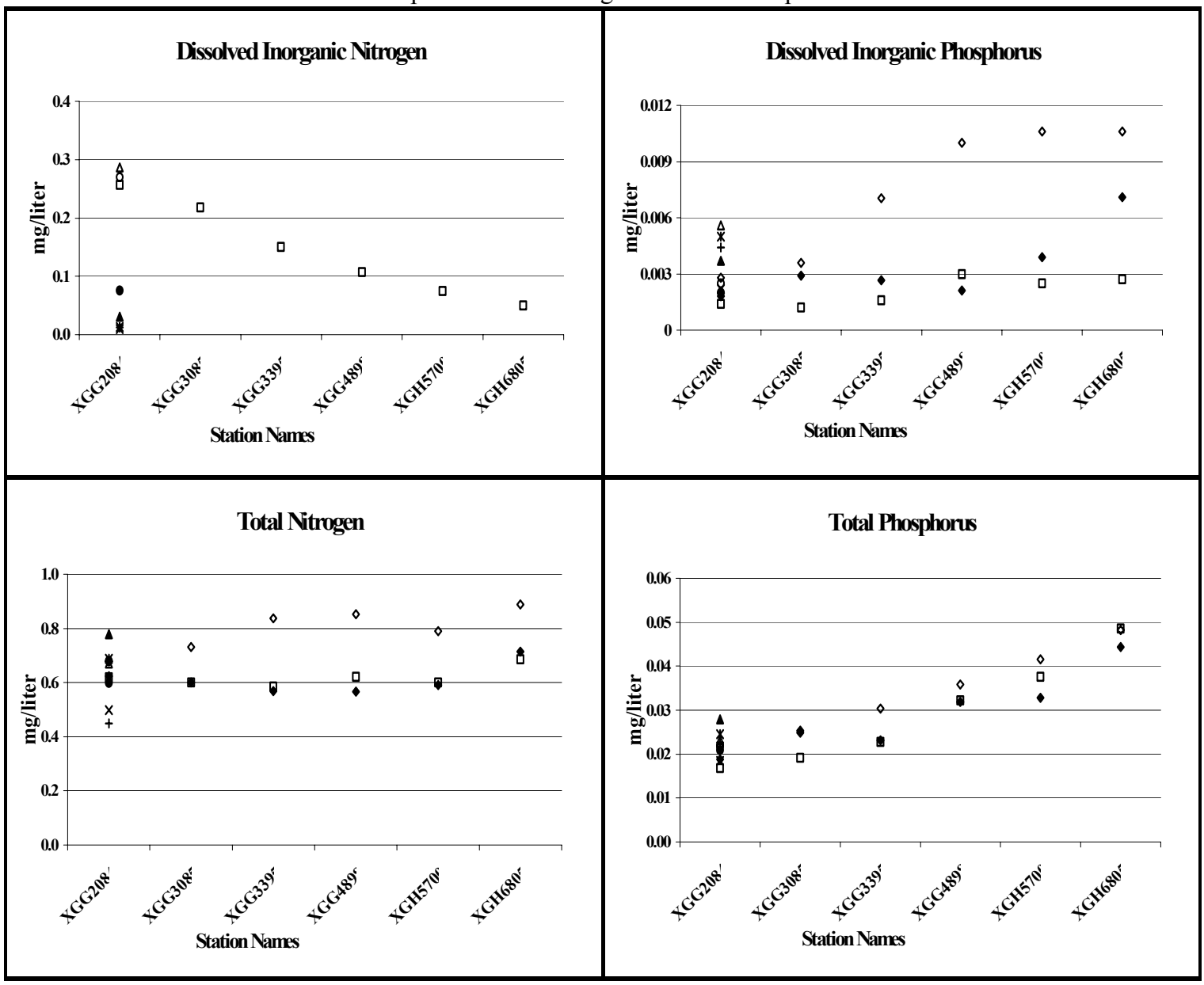
Stations are presented from left to right in downstream to upstream order



Wye River (main)

High Flow Conditions (December - May)

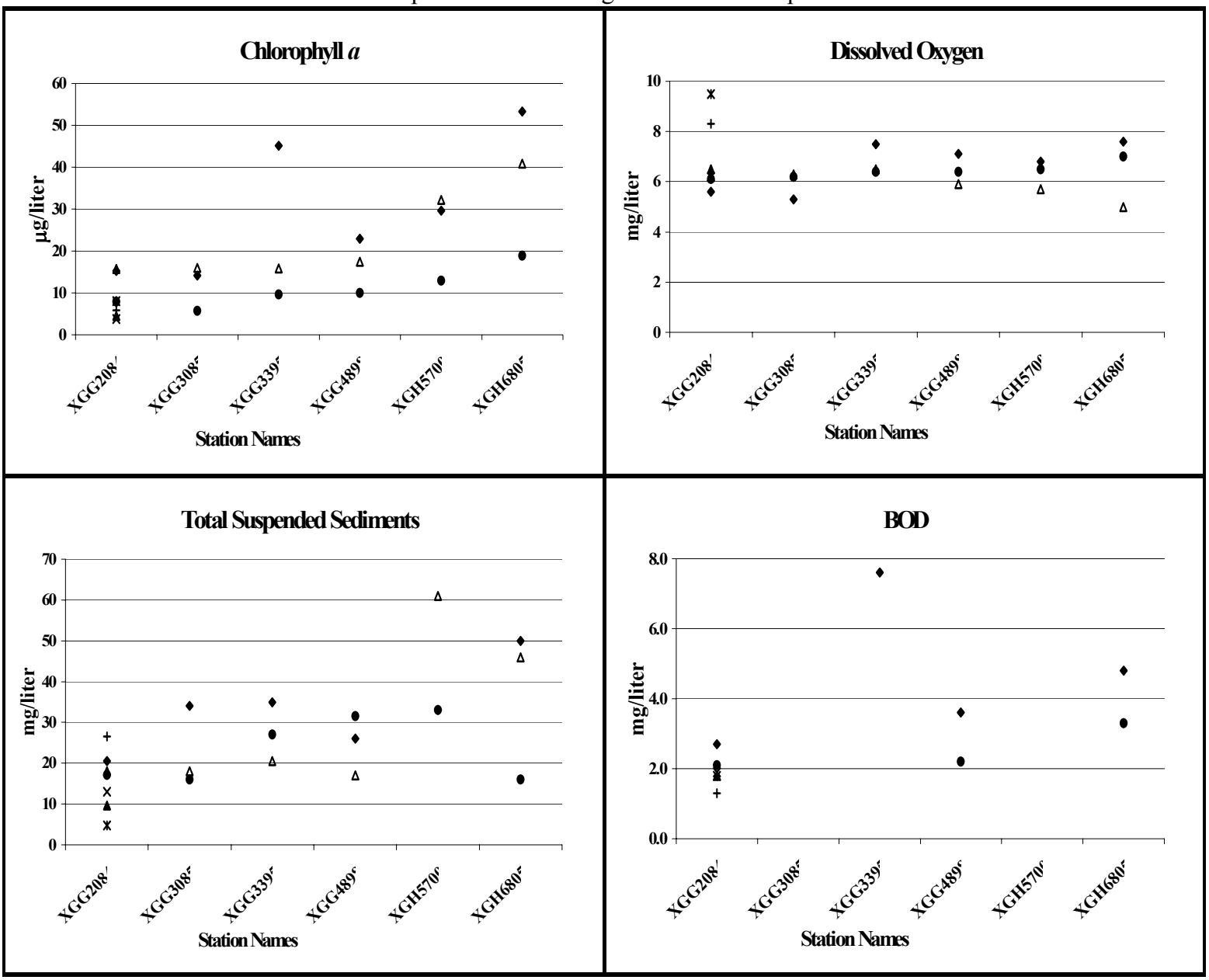
Stations are presented from left to right in downstream to upstream order



Wye River (main)

Low Flow Conditions (June - November)

Stations are presented from left to right in downstream to upstream order

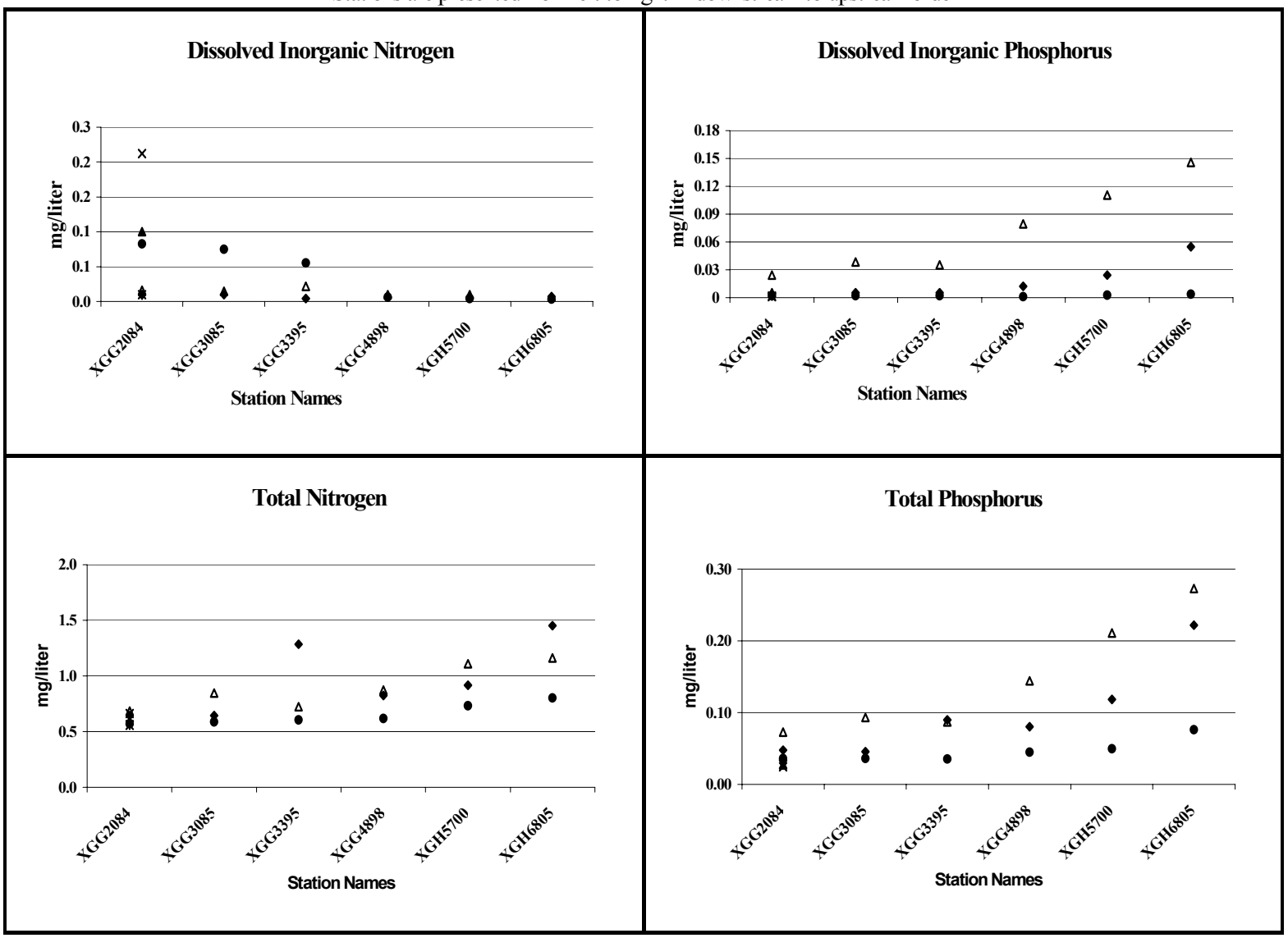


+ 28-Oct-98 ⁎ 17-Nov-98 ▲ 8-Jun-99 × 22-Jun-99 ● 7-Jul-99 ♦ 3-Aug-99 ▵ 30-Aug-99

Wye River (Main)

Low Flow Conditions (June - November)

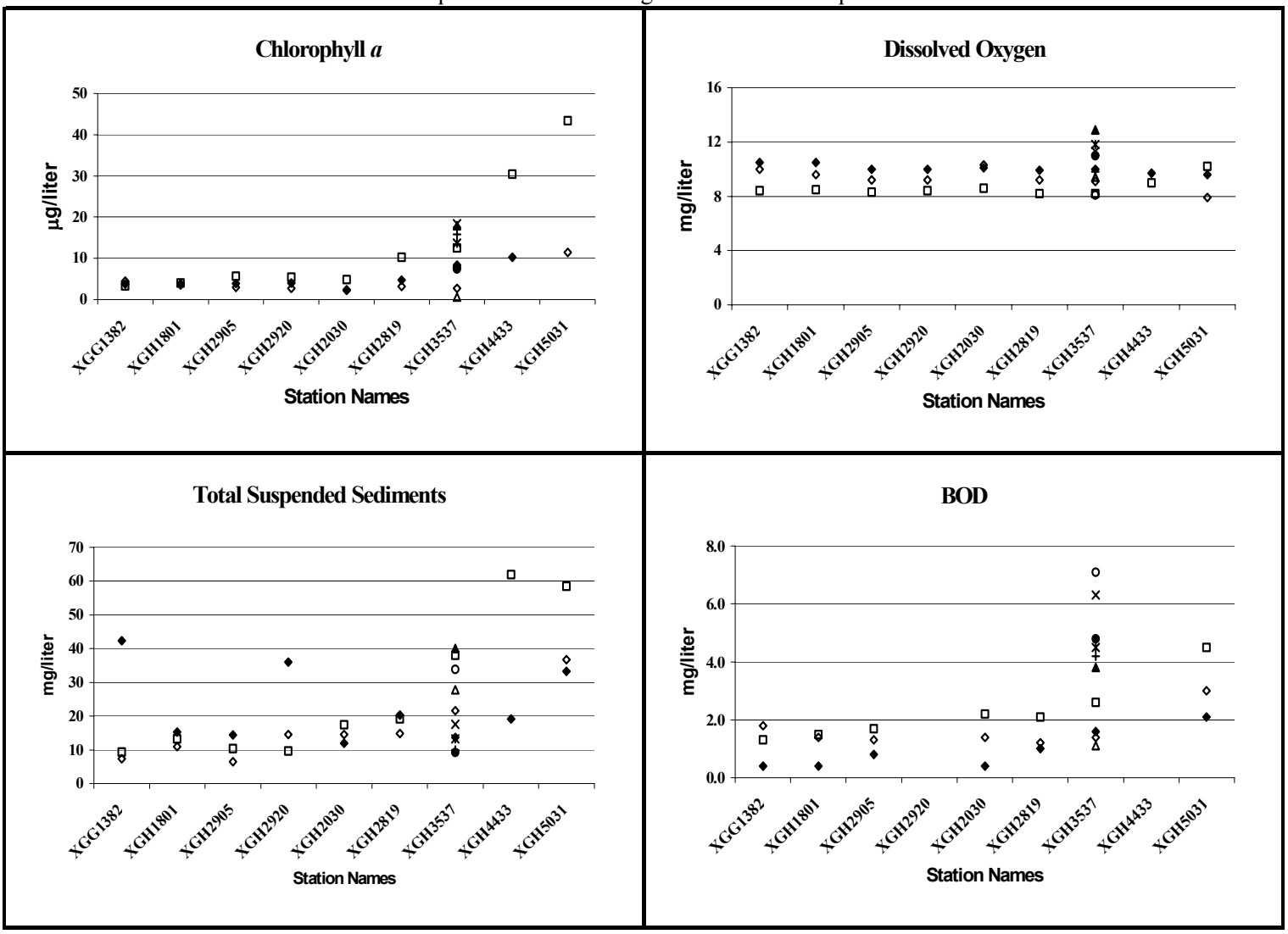
Stations are presented from left to right in downstream to upstream order



Wye East River (main)

High Flow Conditions (December - May)

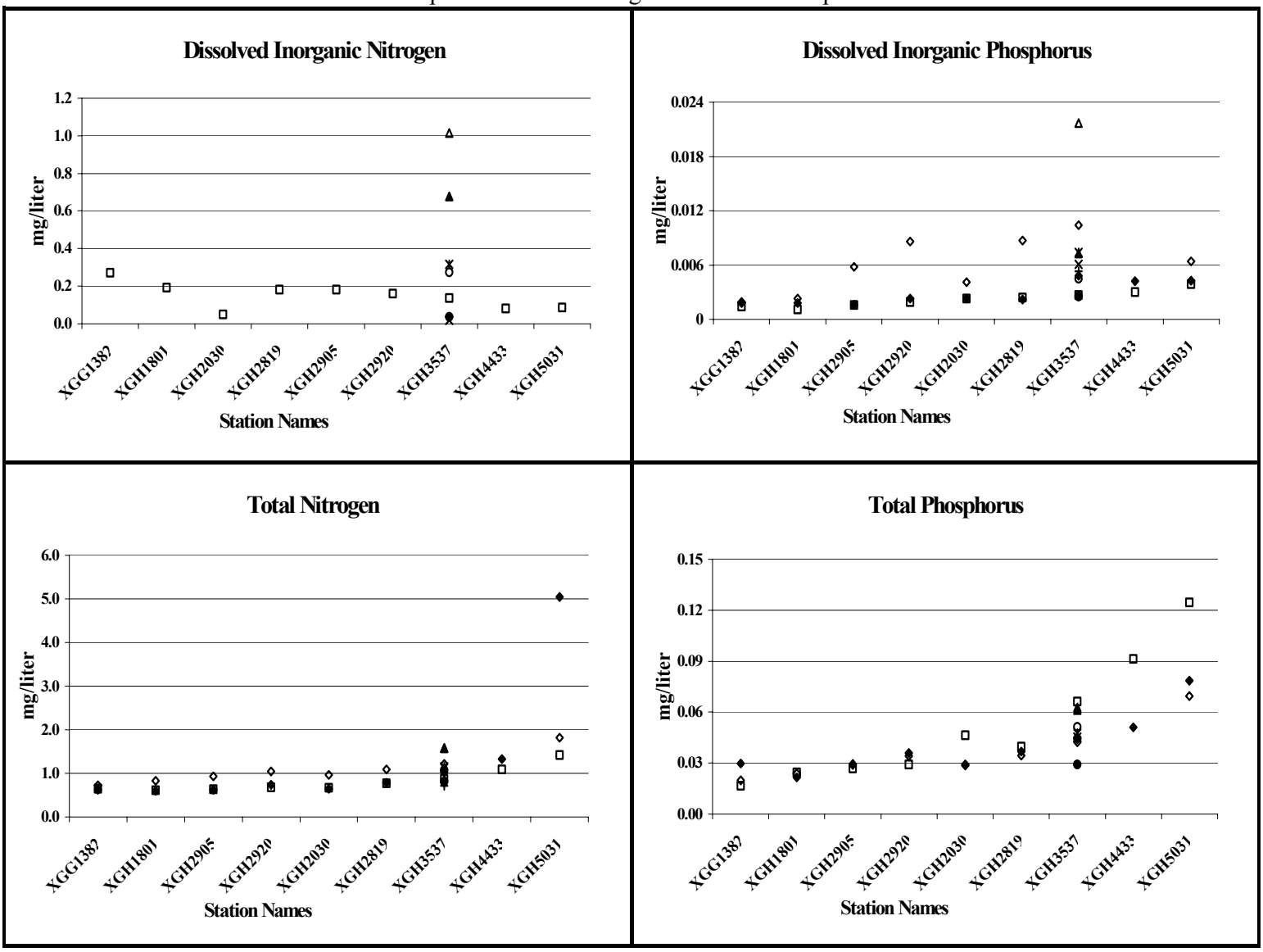
Stations are presented from left to right in downstream to upstream order



Wye East River (main)

High Flow Conditions (December - May)

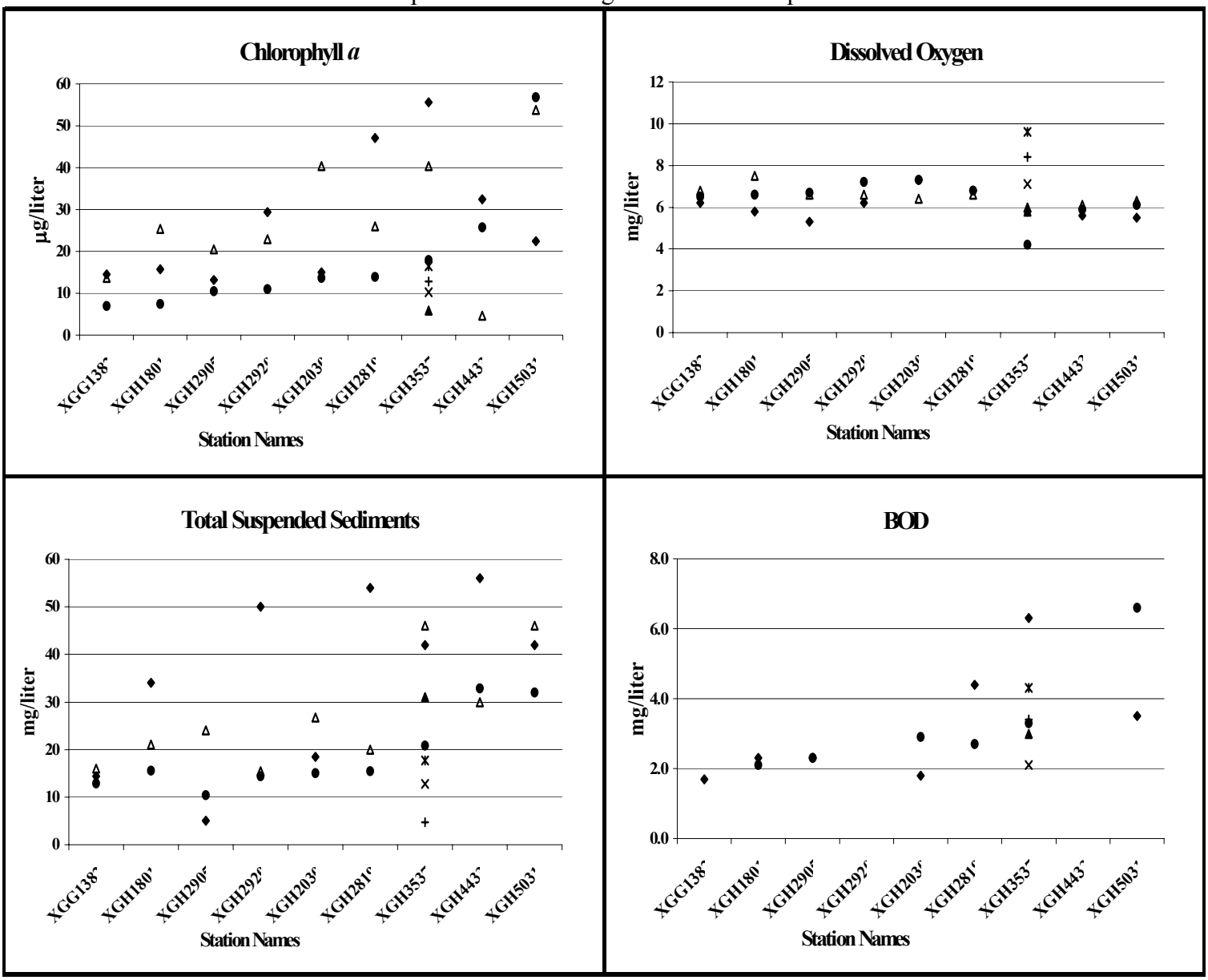
Stations are presented from left to right in downstream to upstream order



Wye East River (main)

Low Flow Conditions (June - November)

Stations are presented from left to right in downstream to upstream order

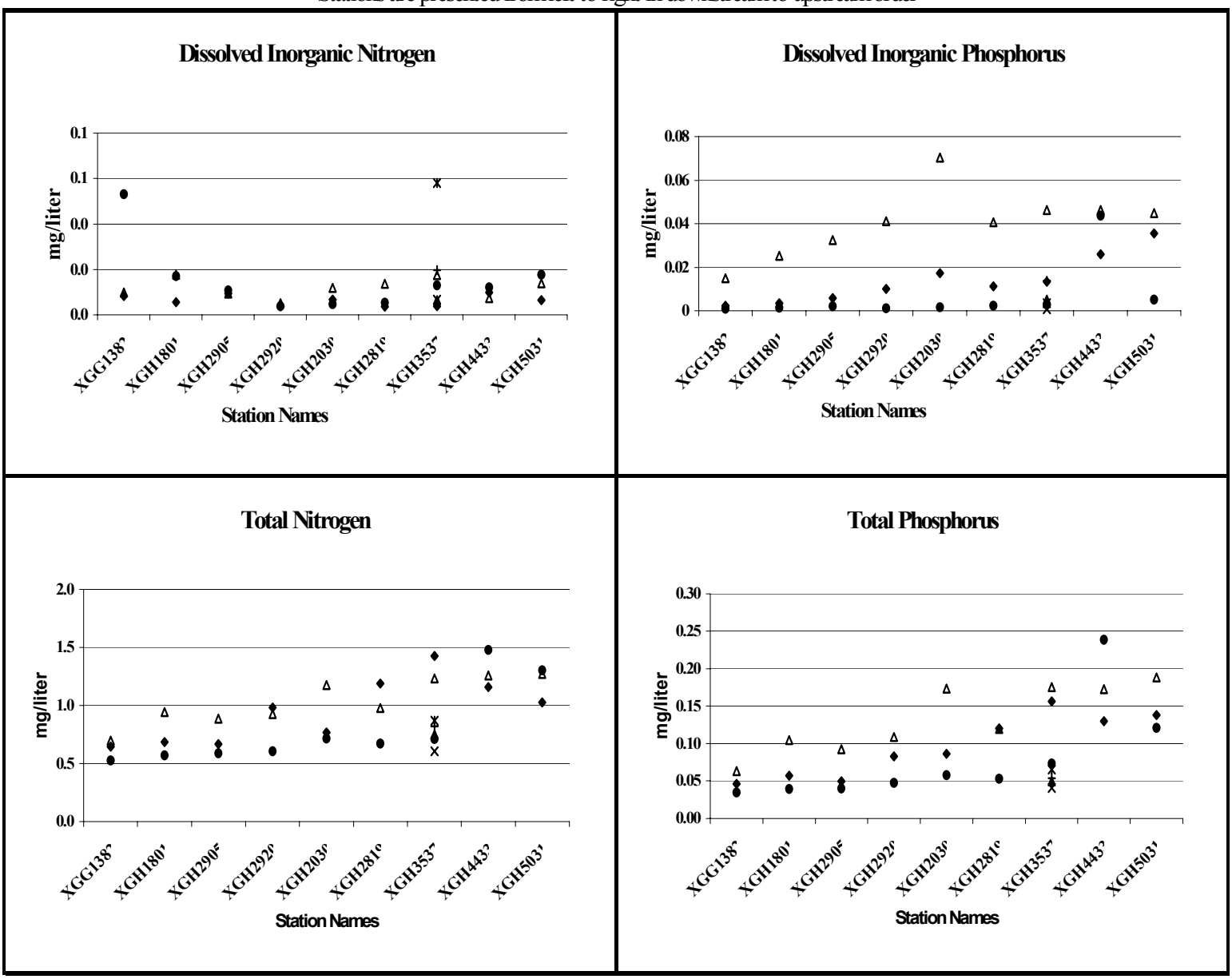


+ 28-Oct-98 ✱ 17-Nov-98 ▲ 8-Jun-99 × 22-Jun-99 ● 7-Jul-99 ♦ 3-Aug-99 △ 30-Aug-99

Wye East River (Main)

Low Flow Conditions (June - November)

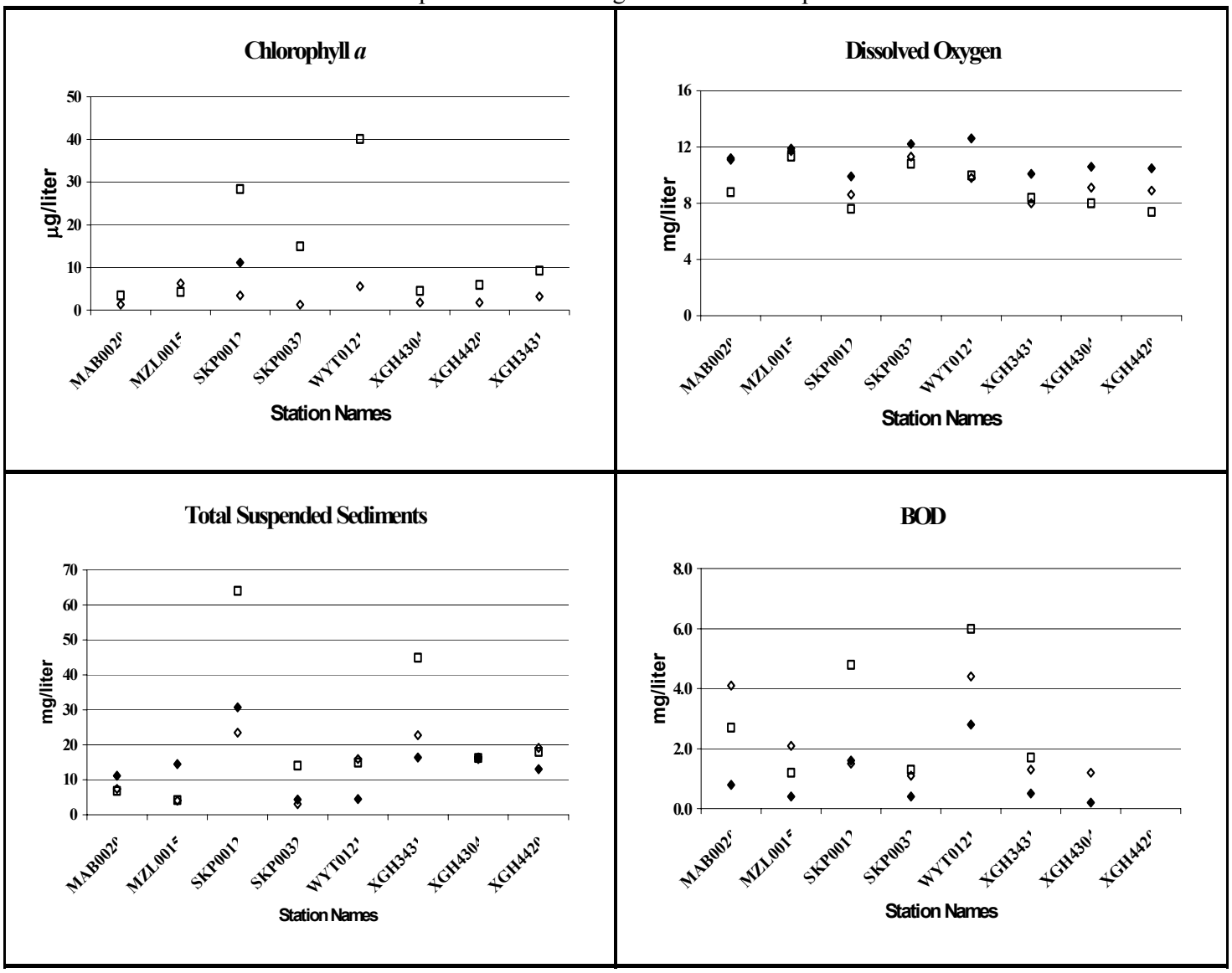
Stations are presented from left to right in downstream to upstream order



Wye River (tributaries)

High Flow Conditions (December - May)

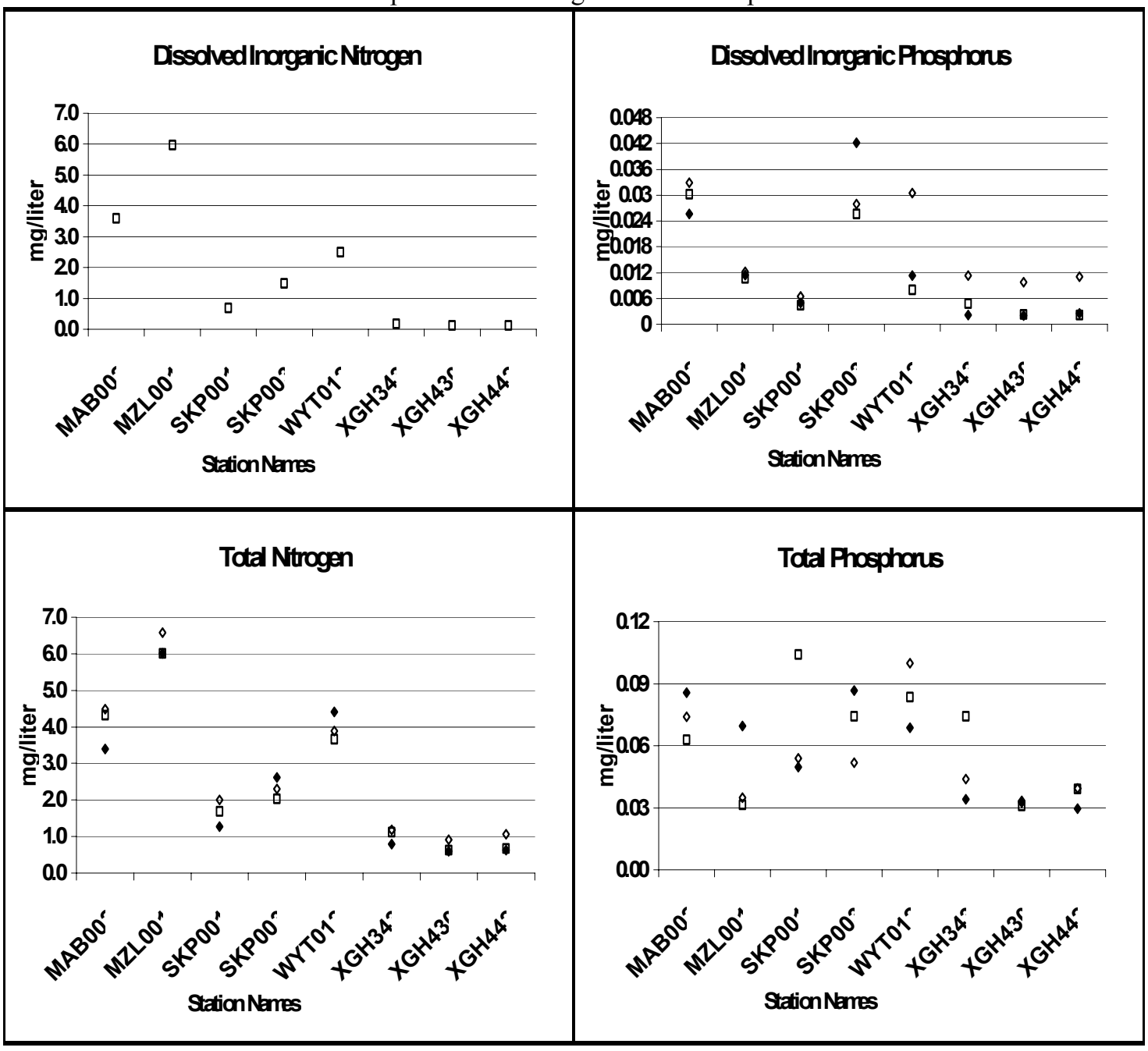
Stations are presented from left to right in downstream to upstream order



Wye River (tributaries)

High Flow Conditions (December - May)

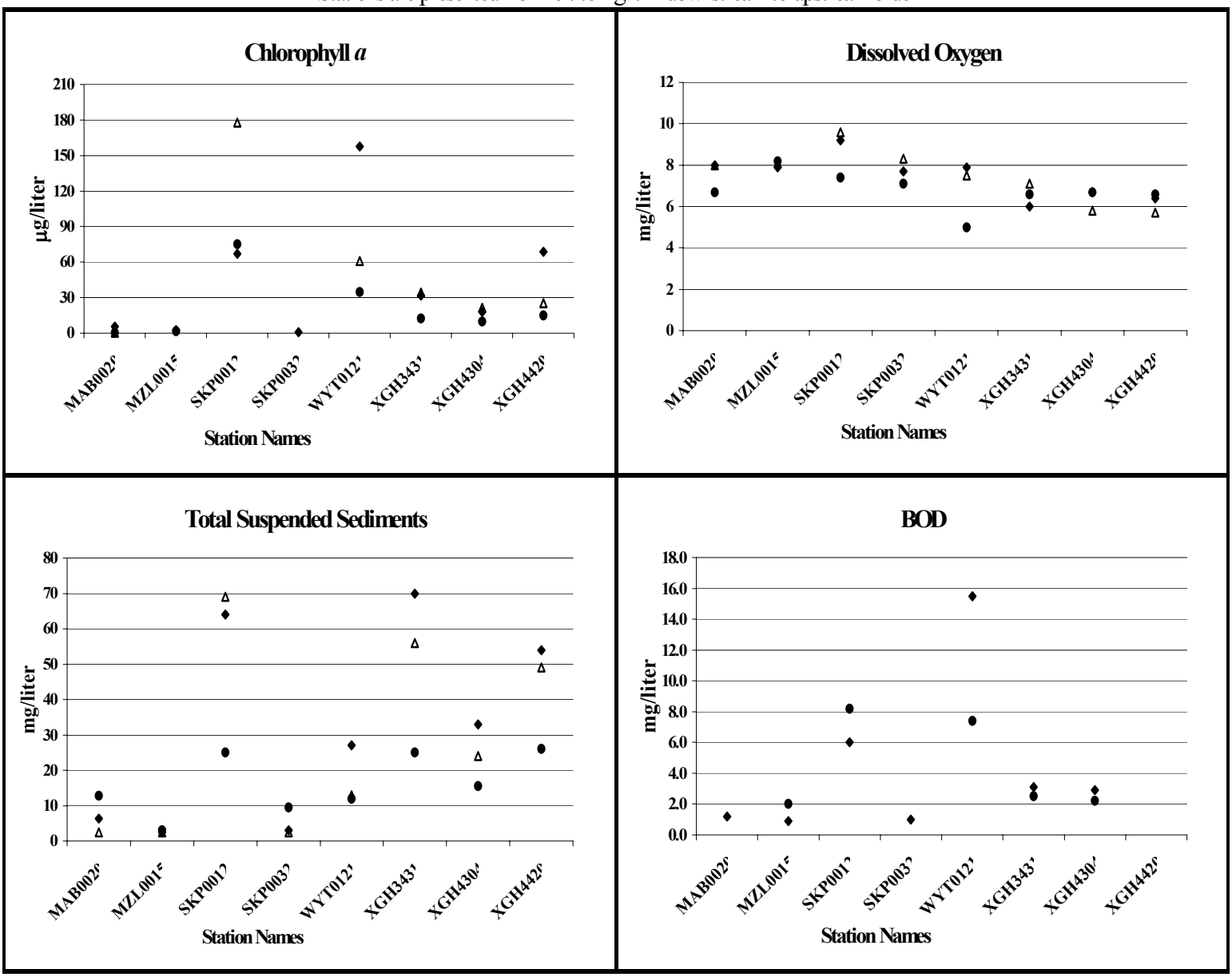
Stations are presented from left to right in downstream to upstream order



Wye River (tributaries)

Low Flow Conditions (June - November)

Stations are presented from left to right in downstream to upstream order



Wye River (tributaries)

Low Flow Conditions (June - November)

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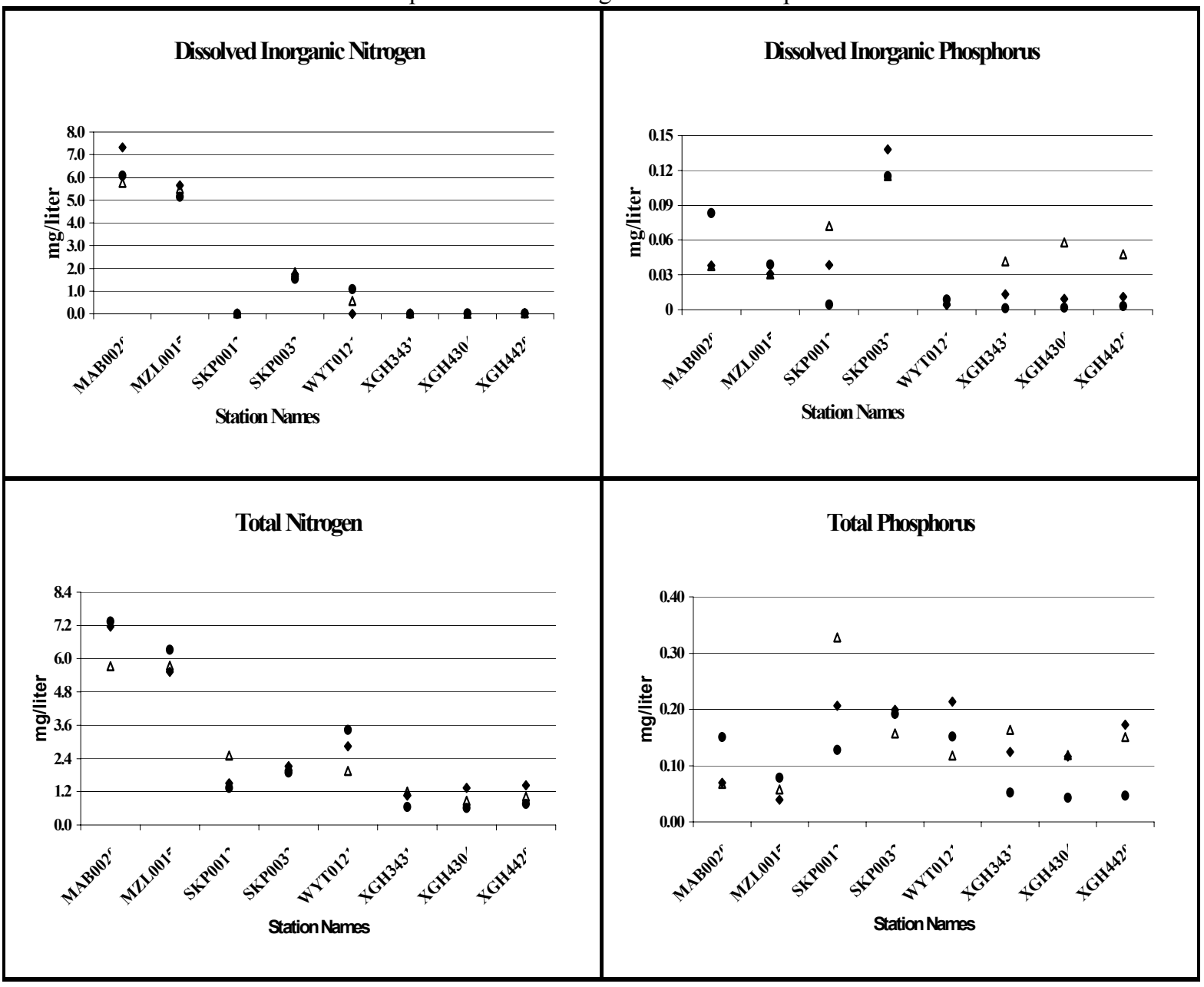


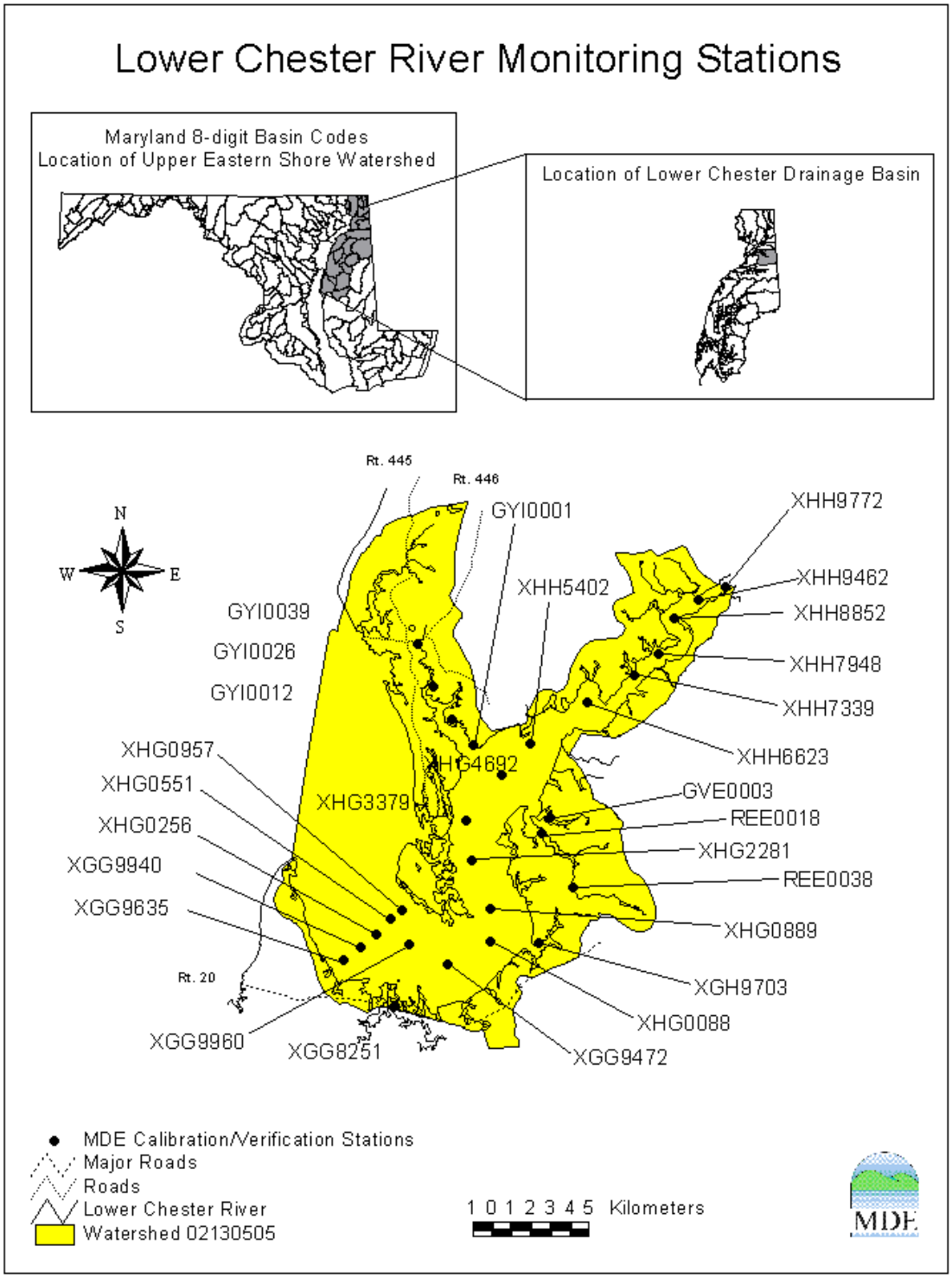
WYE RIVER
1999 TMDL STUDY STATION LIST

Station Code	Lat/Long	Description
Wye River		
XGG0979	38 50.875 76 12.182	At the mouth of Wye River
XGG2084	38 51.933 76 11.371	Approx. 150 ft E of day marker #1
XGG3085	38 52.992 76 11.458	West of Drum Point.
XGG3395	38 53.442 76 10.430	Approx. 1000 yds SW of mouth of Bigwood Cove. Off large white house on pt.
XGG4898	38 54.791 76 10.188	Approx. 800 yds SW of mouth of Quarter Creek.50 yds off daymarker "6". Mid-channel
XGH5700	38 55.807 76 09.968	Before sharp turn in river.
XGH6805	38 56.802 76 09.467	Off white boathouse on point
Wye East River		
XGG1382	38 51.255 76 11.189	In Shaw Bay, due W of Lloyd Creek. Silo near Bruffs Island.
XGH1801	38 51.677 76 09.883	Mouth of Lloyd Creek..
XGH2905	38 52.815 76 09.232	Approx. 300 yds W of mouth of Dividing Creek.
XGH2920	38 52.808 76 08.018	Near mouth of Granary Creek. Off pier.

Station Code	Lat/Long	Description
Wye East River		
XGH2819	38 52.877 76 07.071	Approx. 800 yds upstream from mouth of Pickering Creek, off point located NE of creek.
XGH3537	38 53.510 76 06.165	Mid-channel off Wye Landing. Take sample off pier at boat ramp.
XGH4433	38 54.392 76 06.802	First tributary on right, approx. 1.2 miles above Wye Landing. Off gaxebo
XGH5031	38 54.989 76 06.895	2nd brick mansion on wooded hill next to small stream.
WYT0121	38 56.578 76 04.352	Bridge crossing at Rte 662 - spillage of Wye Mills Community Lake.
Madam Alices Branch		
MAB0020	38 57.898 76 06.534	Route 50 crossing of Madam Alices Branch.
Wye Narrows		
XGH3431	38 53.466 76 06.805	Mid-channel, approx.0.77 miles from mouth of Skipton Creek.
XGH4420	38 54.474 76 07.967	At Wye Island bridge.
XGH4304	38 54.296 76 09.550	Mid-channel. Off white house.
Skipton Creek		
SKP0012	38 53.371 76 04.785	Skipton Creek confluence with Mill Creek, near the mouth of Mill Creek
SKP0032	38 52.779 76 03.215	Intersection of Route 662 and Three Bridges Branch Road.

Station Code	Lat/Long	Description
Mill Creek		
MZL0015	38 54.655 76 04.352	Bridge crossing on Old Wye Mills Road.
Pickering Creek		
XGH2030	38 52.155 76 07.154	Approx. 300 yds downstream from small white boat house.

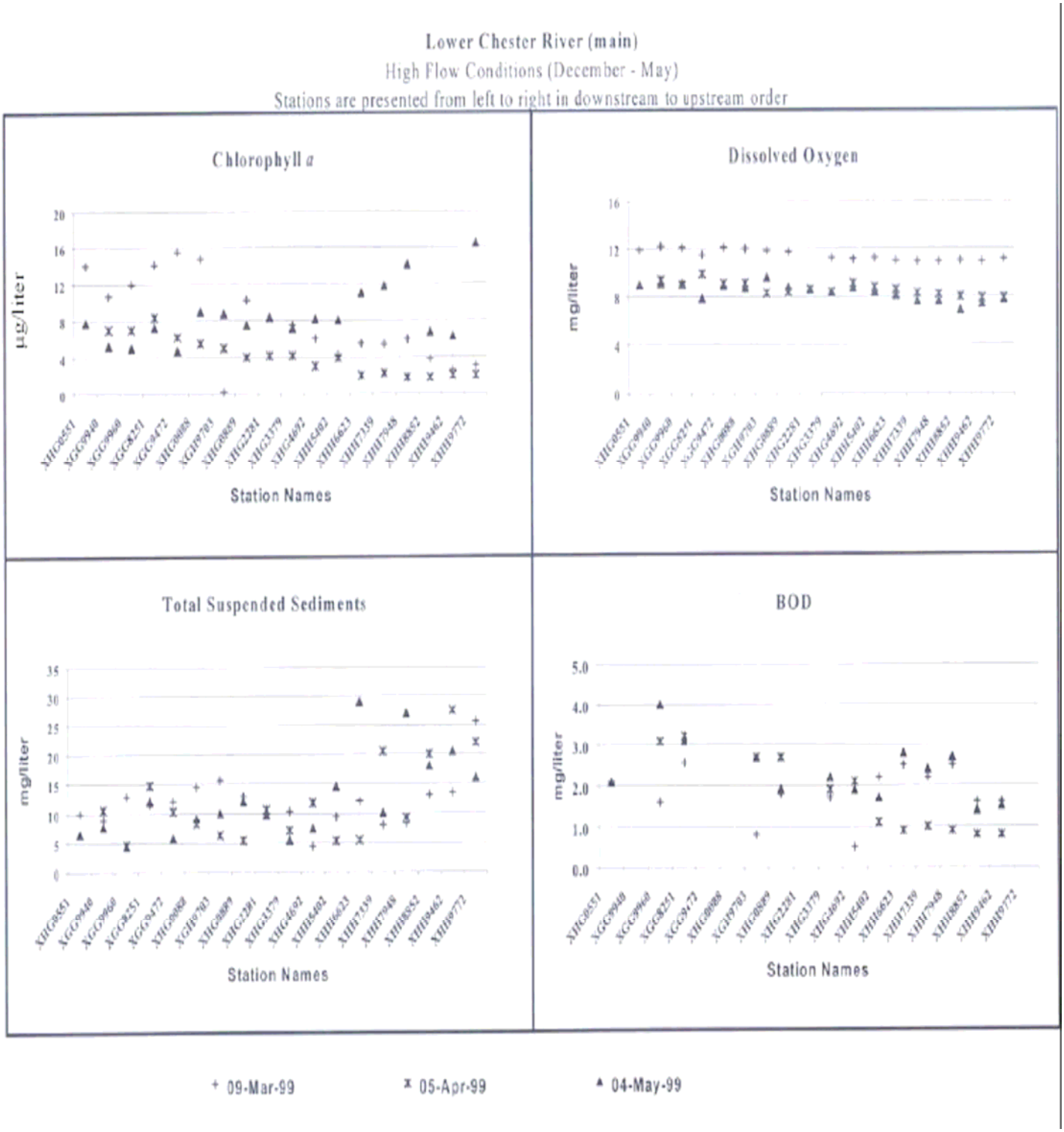
Lower Chester River



Lower Chester River (main)

High Flow Conditions (December - May)

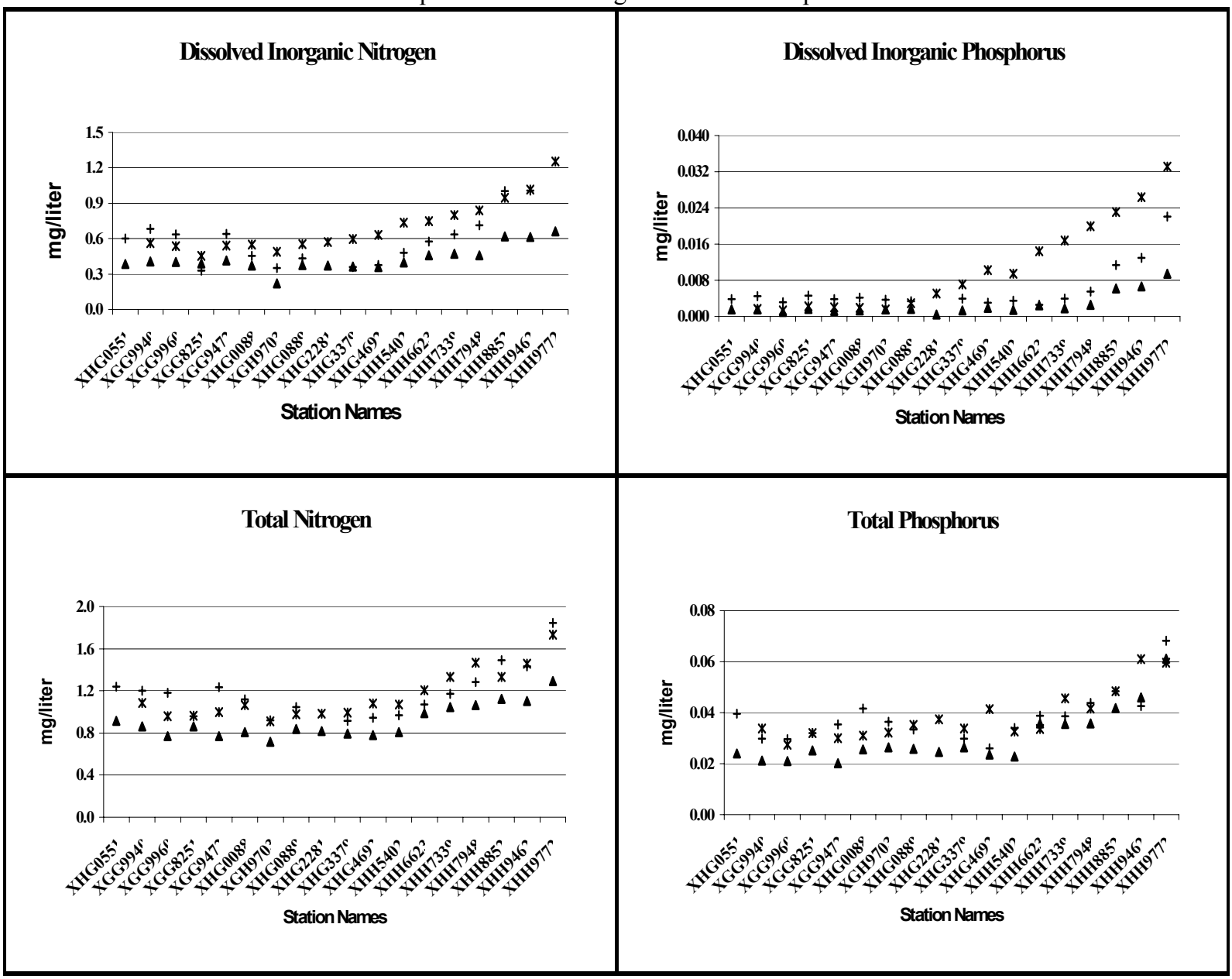
Stations are presented from left to right in downstream to upstream order



Lower Chester River (main)

High Flow Conditions (December - May)

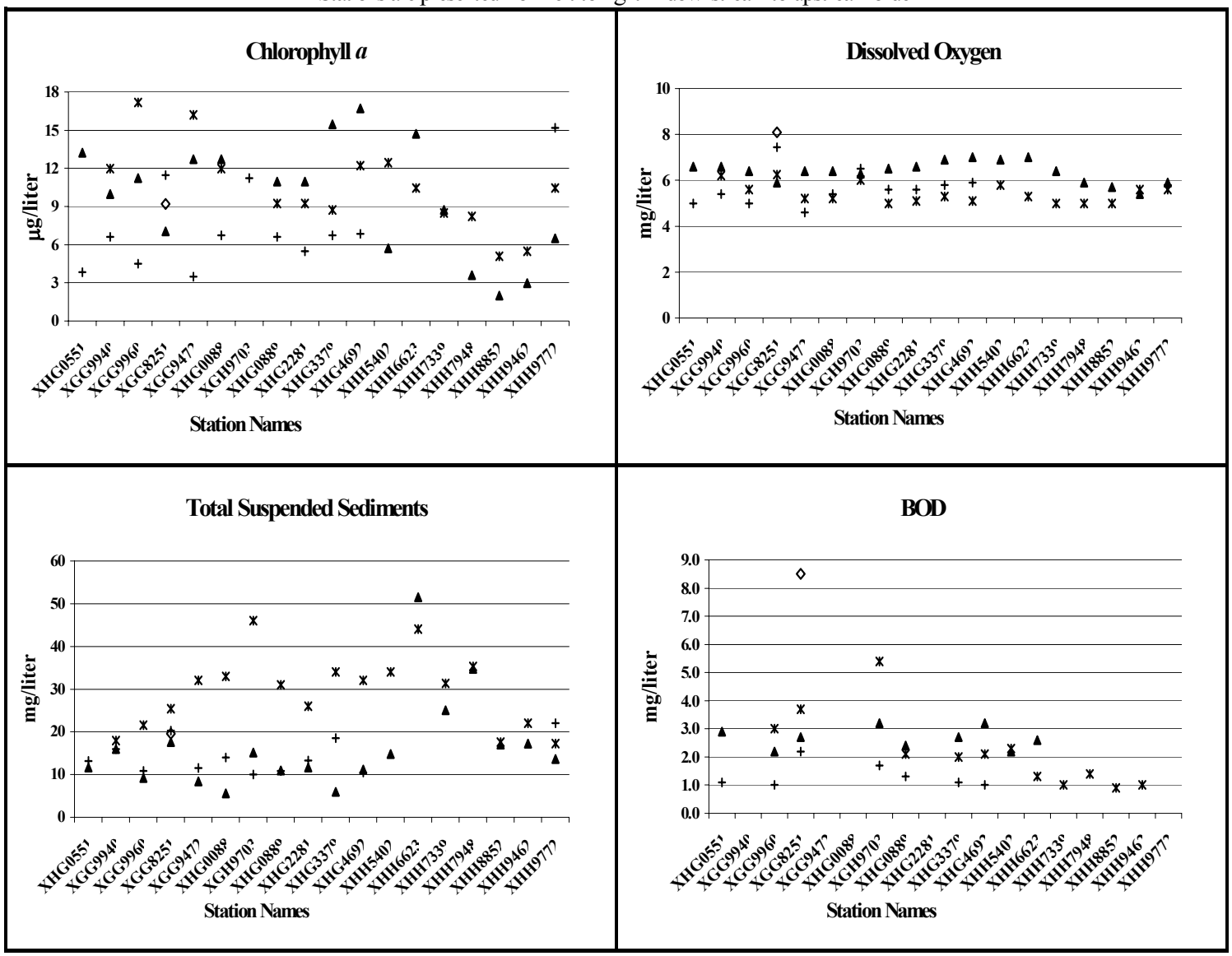
Stations are presented from left to right in downstream to upstream order



Lower Chester River (main)

Low Flow Conditions (June - November)

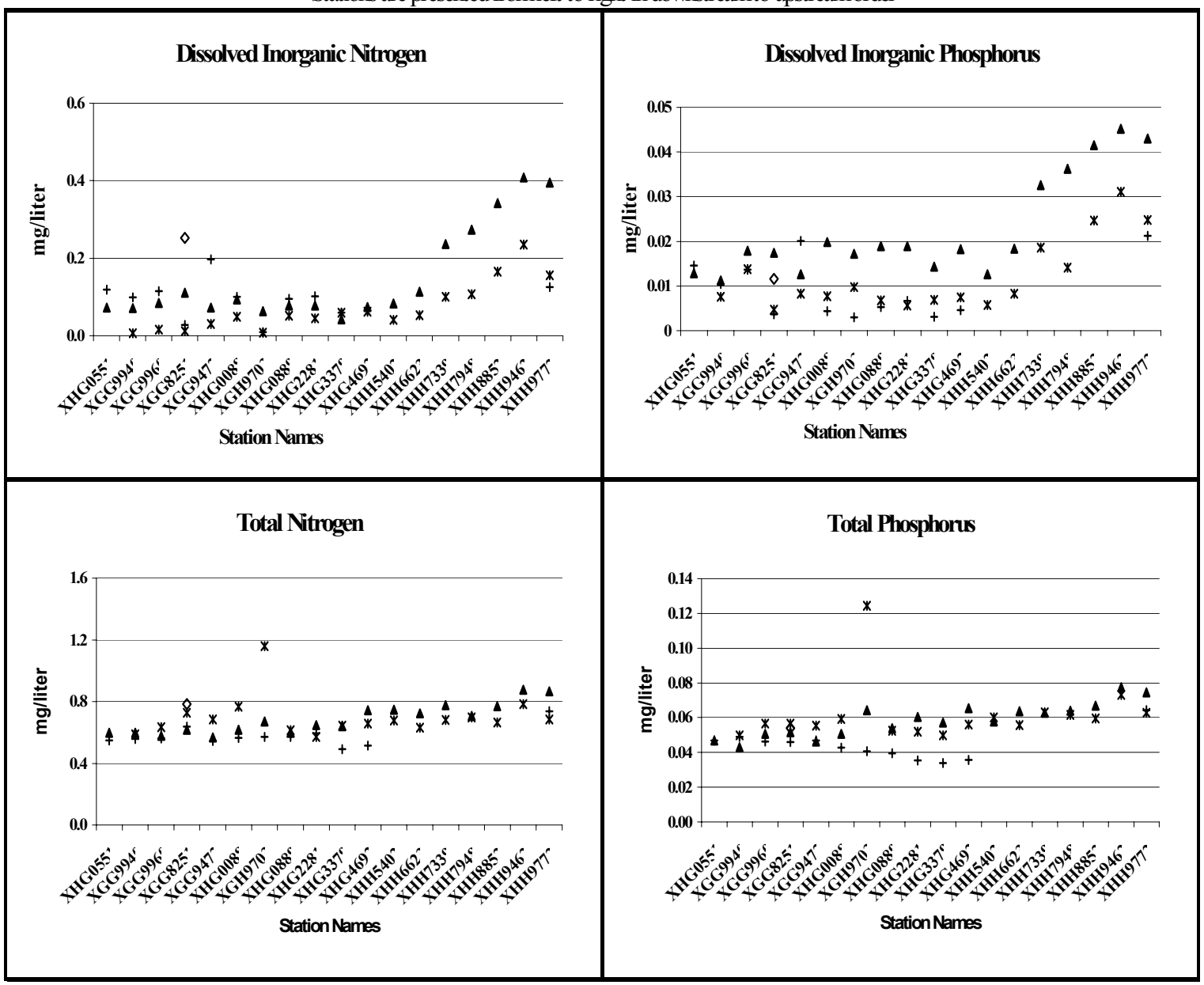
Stations are presented from left to right in downstream to upstream order



Lower Chester River (main)

Low Flow Conditions (June - November)

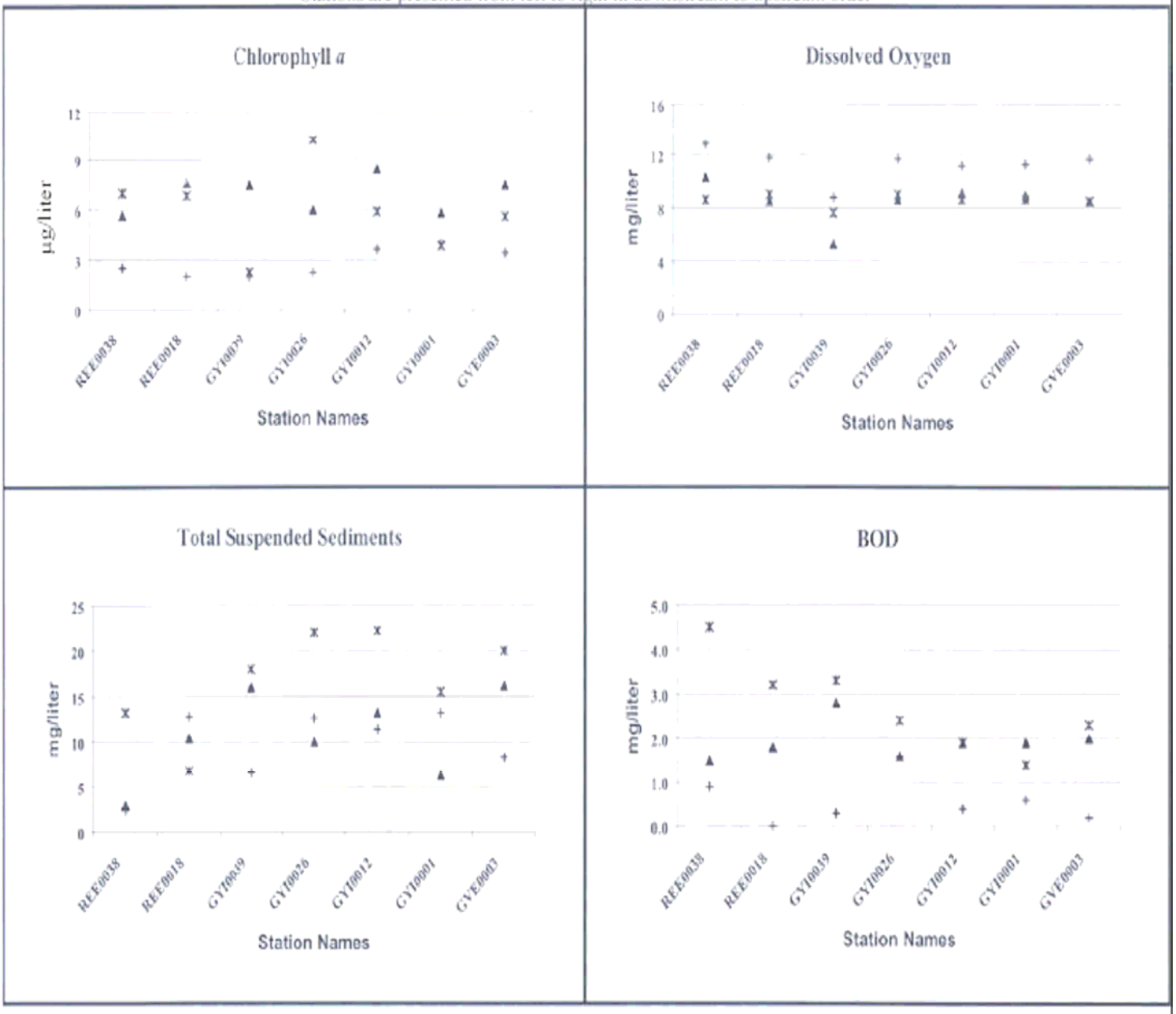
Stations are presented from left to right in downstream to upstream order



Lower Chester River (tributaries)

High Flow Conditions (December - May)

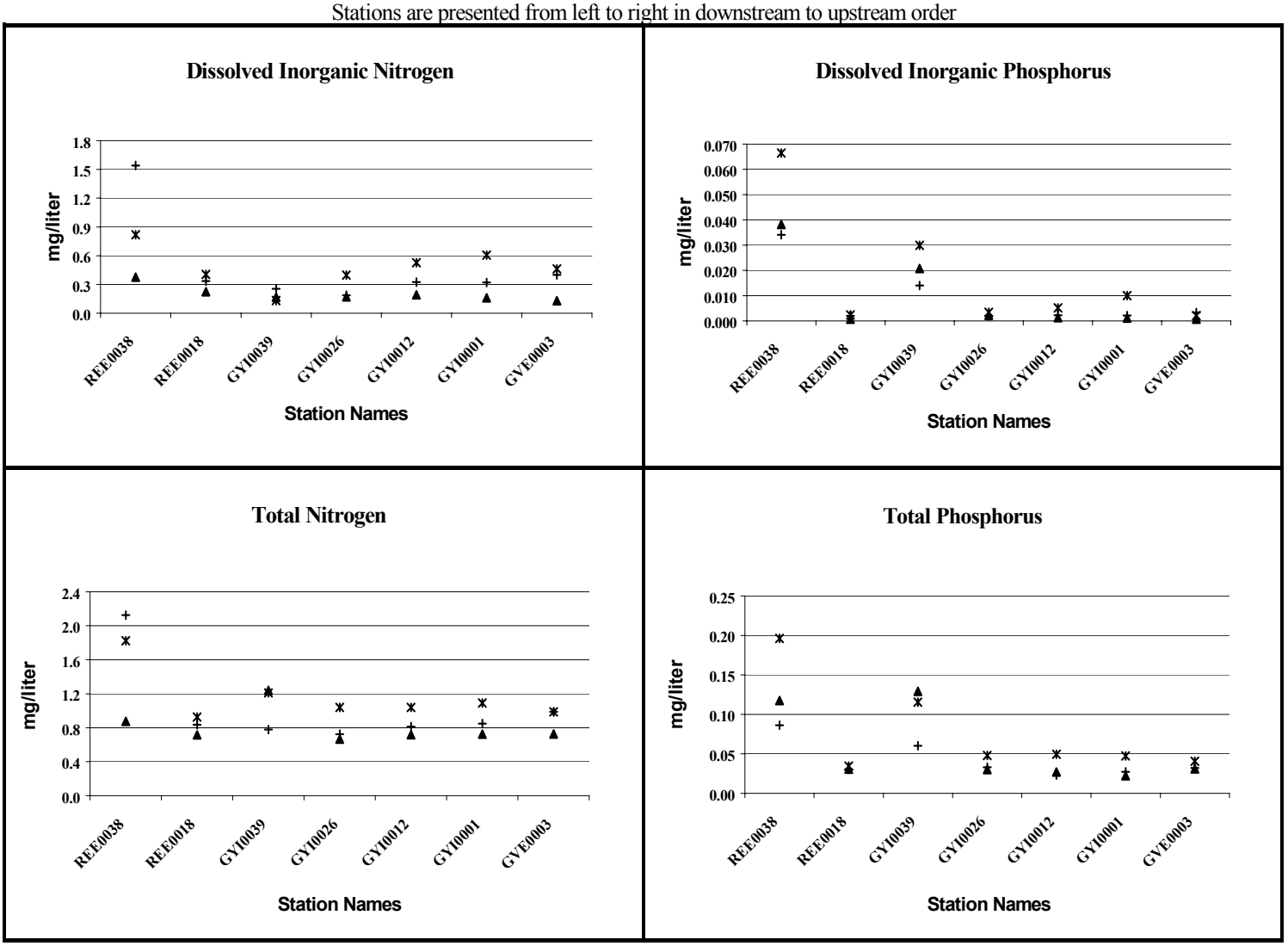
Stations are presented from left to right in downstream to upstream order



Lower Chester River (tributaries)

High Flow Conditions (December - May)

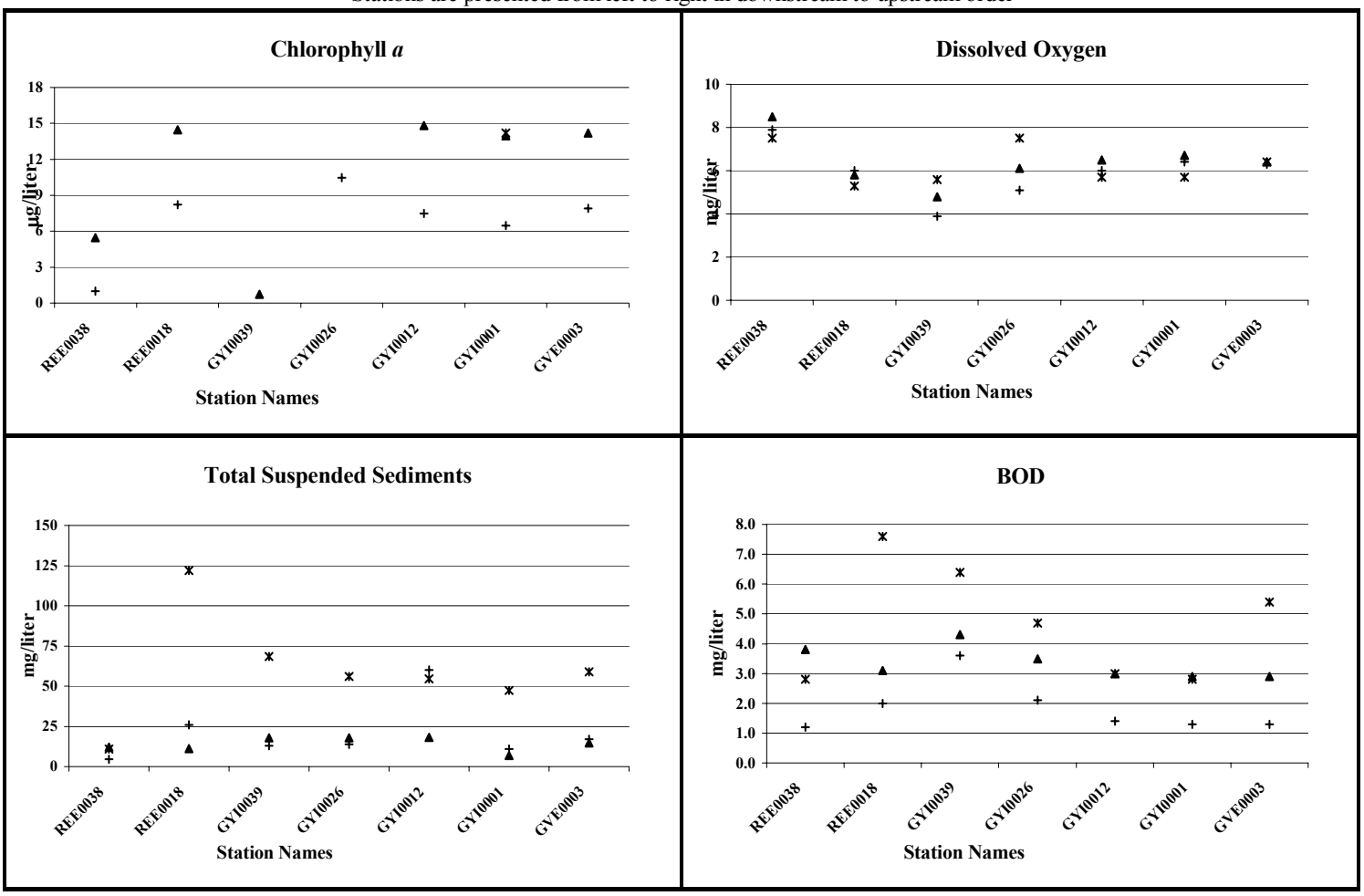
Stations are presented from left to right in downstream to upstream order



Lower Chester River (tributaries)

Low Flow Conditions (June - November)

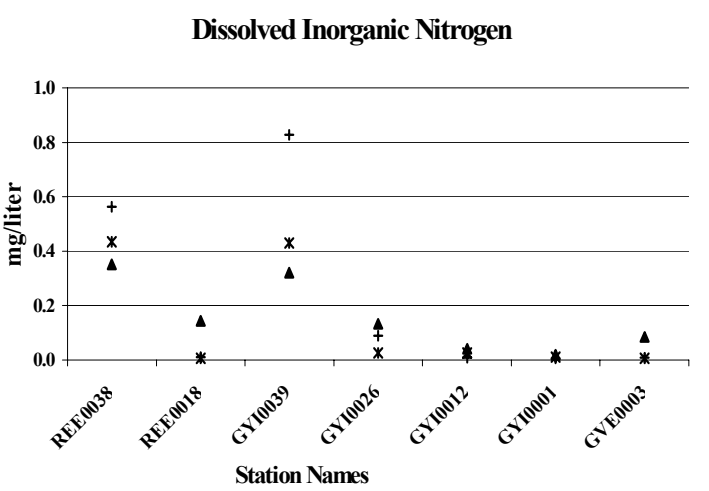
Stations are presented from left to right in downstream to upstream order

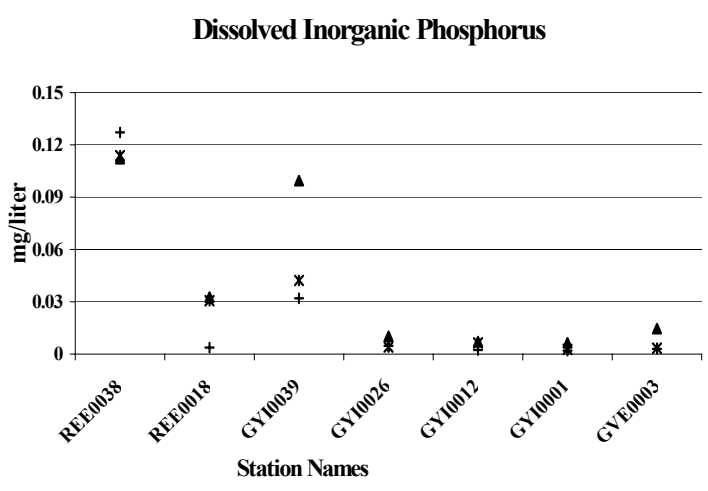


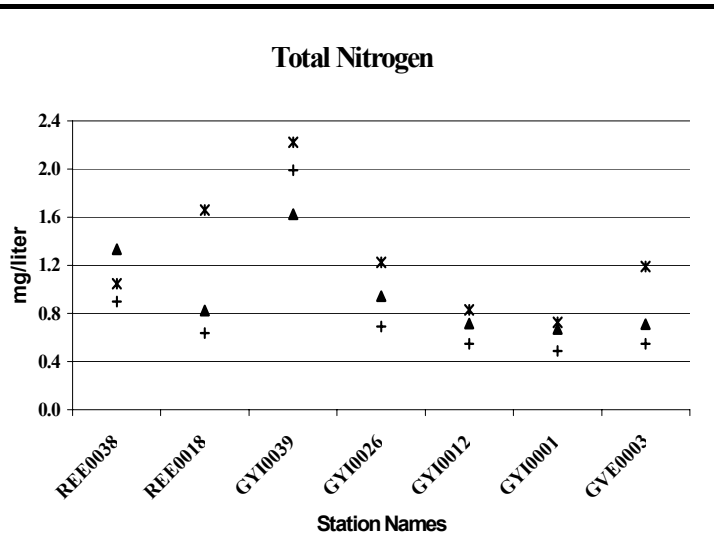
Lower Chester River (tributaries)

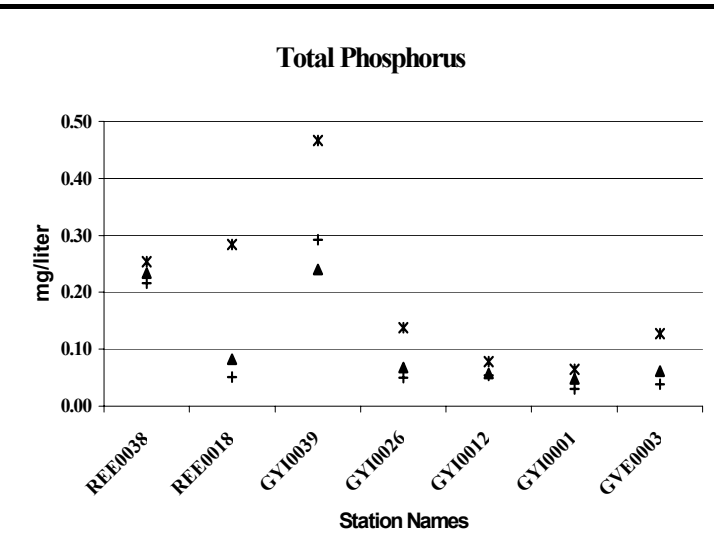
Low Flow Conditions (June - November)

Stations are presented from left to right in downstream to upstream order









+ 12-Jul-99 x 9-Aug-99 ▲ 7-Sep-99 ◇ 23-Sep-99

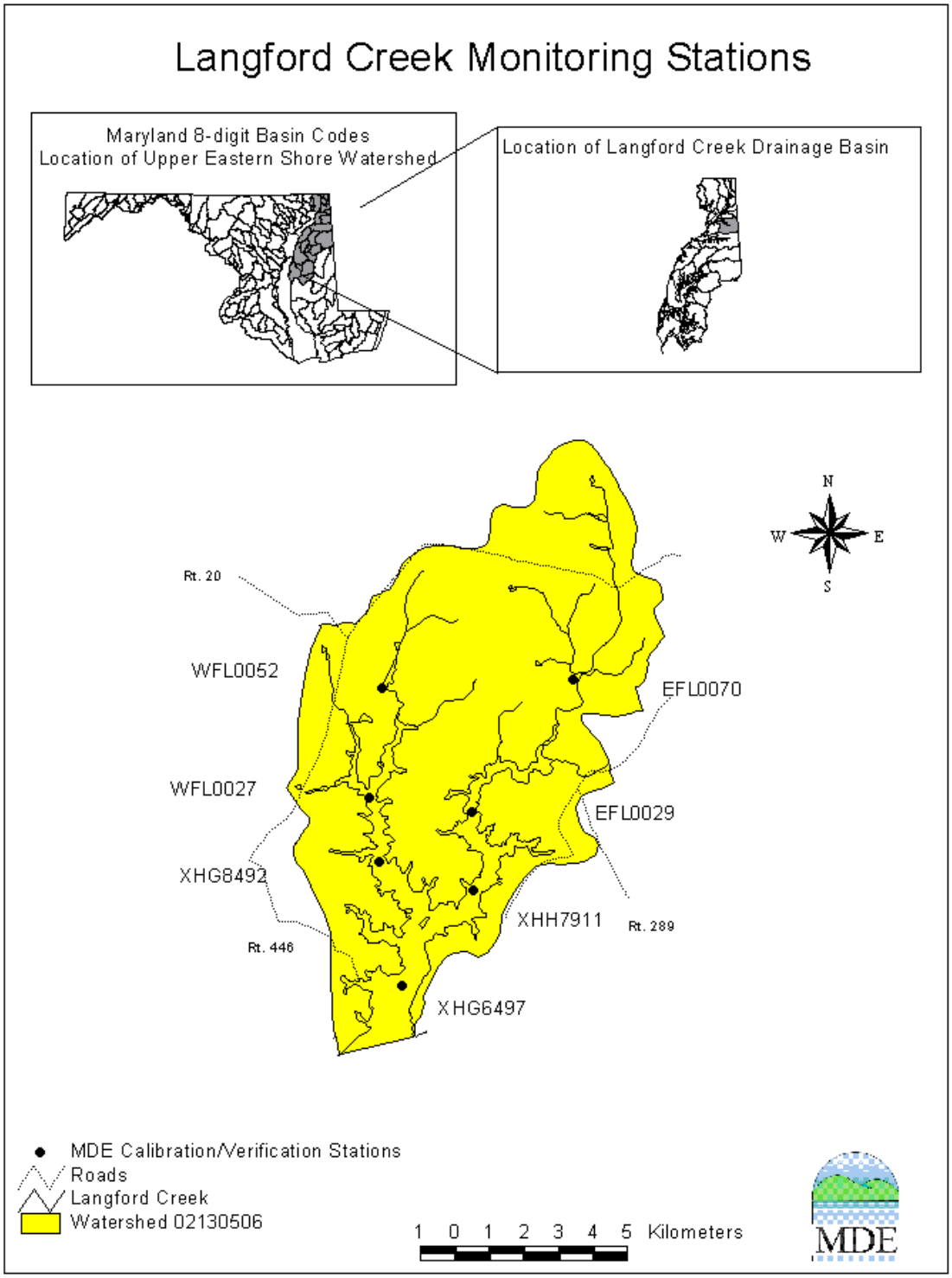
LOWER CHESTER RIVER
1999 TMDL STUDY STATION LIST

Station Code	Lat/Long	Description
Kent Narrows		
XGG8251	38 58.252 76 14.822	Kent Narrows Bridge
Chester River		
XGG9635	38 59.671 76 16.443	Off red/green buoys. Physical readings only.
XGG9940	38 59.905 76 15.963	Depth ~ 20 ft.
XHG0256	39 00.234 76 15.387	Near buoy, physical readings only.
XHG0551	39 00.600 76 14.829	300 yds NE of buoy "R"
XHG0957	39 00.866 76 14.313	Physical readings only.
XGG9960	38 59.922 76 14.092	Mid-channel.
XGG9472	38 59.377 76 12.769	Mid-channel, south of buoy G 9
XHG0088	39 00.257 76 11.486	Depth 27-30 ft.
XHG0889	39 01.179 76 11.285	Mid-channel, WSW of buoy R 12 Off mouth of Tilghman Cr.
XHG2281	39 02.242 76 11.891	Mid-channel.

Station Code	Lat/Long	Description
XHG3379	39 03.324 76 12.057	East of Ringgold Point, off day marker "15
Chester River		
XHG4692	39 04.569 76 10.778	Depth ~ 23 ft.
XHH5402	39 05.453 76 09.786	NW of red "16"
XHH9772	39 09.727 76 02.815	At confluence with Southeast Creek.
XHH6623	39 06.556 76 07.753	Depth ~ 8 ft.
XHH7339	39 07.315 76 06.072	SE of Shippen Creek inlet.
XHH7948	39 07.894 76 05.196	Upstream of N "24", mid-channel.
XHH8852	39 08.847 76 04.843	West of RN 30.
XHH9462	39 09.375 76 03.763	Just upstream of Broad Cr., mid-channel.
Grays Inn Creek		
GYI0001	39 05.256 76 11.988	Mid-channel at confluence with Chester River
GYI0012	39 05.908 76 12.781	Mid-channel, between Lucy Cove and Joiners
GYI0026	39 06.955 76 13.514	0.81 miles above Browns Point, east of Cove.
GYI0039	39 08.202 76 13.665	Grays Inn Creek at Sharp Street. First left (unnamed) after Rt. 288 from Rt. 20.

Station Code	Lat/Long	Description
Queenstown Creek		
XGH9703	38 59.736 76 09.742	At confluence of Queenstown and L. Queenstown Creek, N of DM "2".
Reed Creek		
REE0018	39 02.951 76 09.390	Depth ~ 8 ft.
REE0038	39 01.455 76 08.303	Watershed outlet of Reed Creek at Tilman Neck Road.
Grove Creek		
GVE0003	39 03.407 76 09.235	Mid-channel off white house.

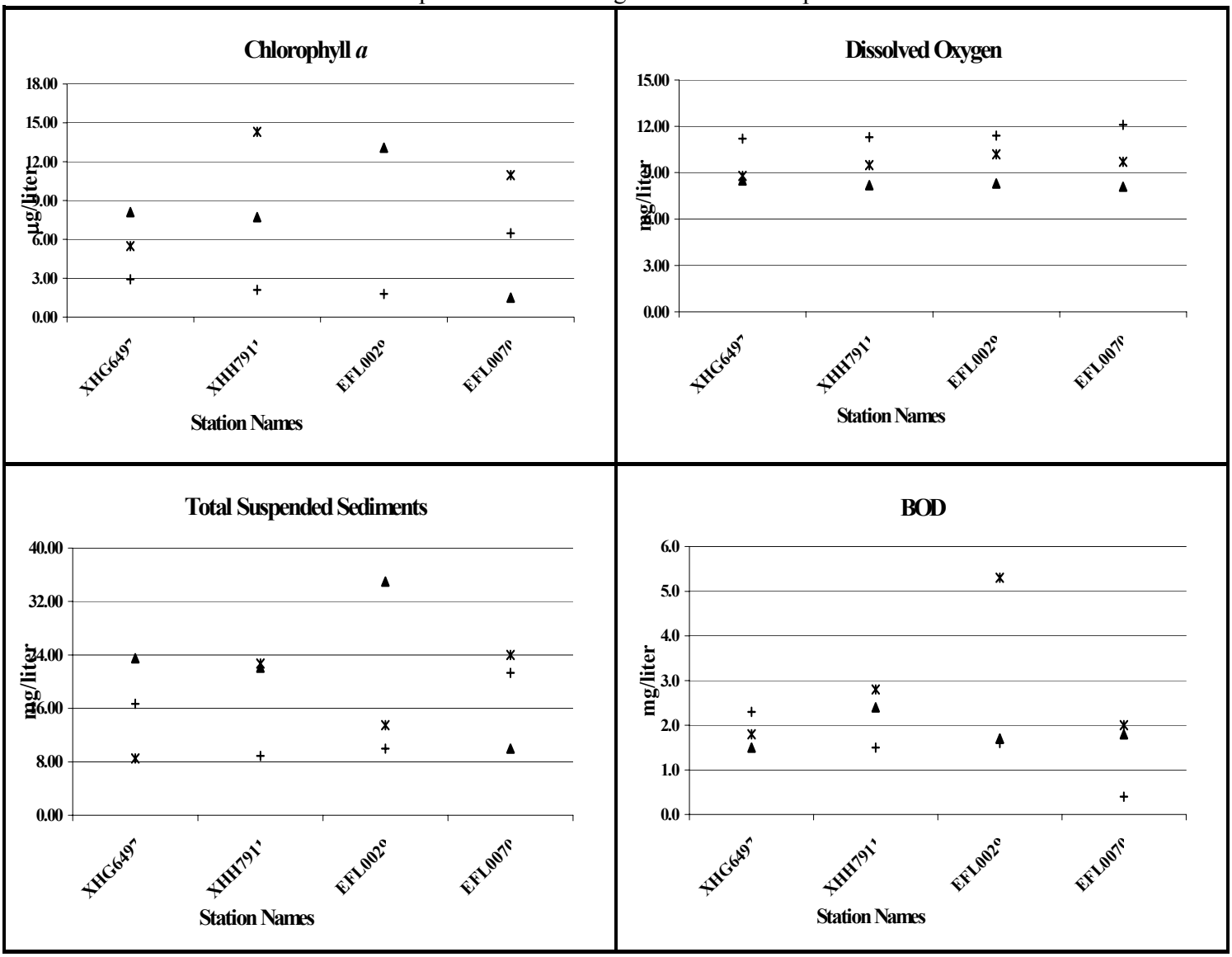
Langford Creek



Langford Creek (East Fork)

High Flow Conditions (December - May)

Stations are presented from left to right in downstream to upstream order



Langford Creek (East Fork)

High Flow Conditions (December - May)

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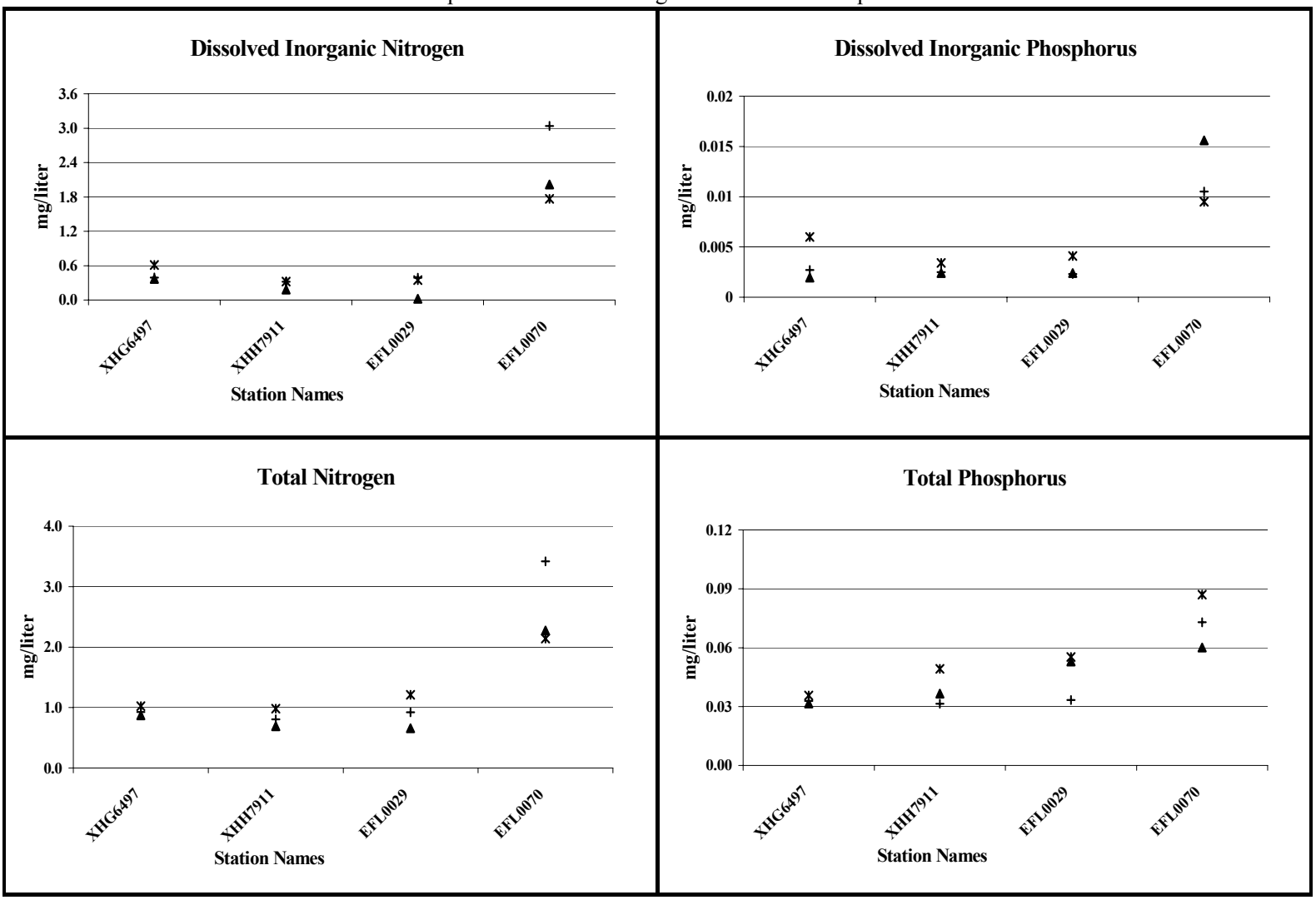
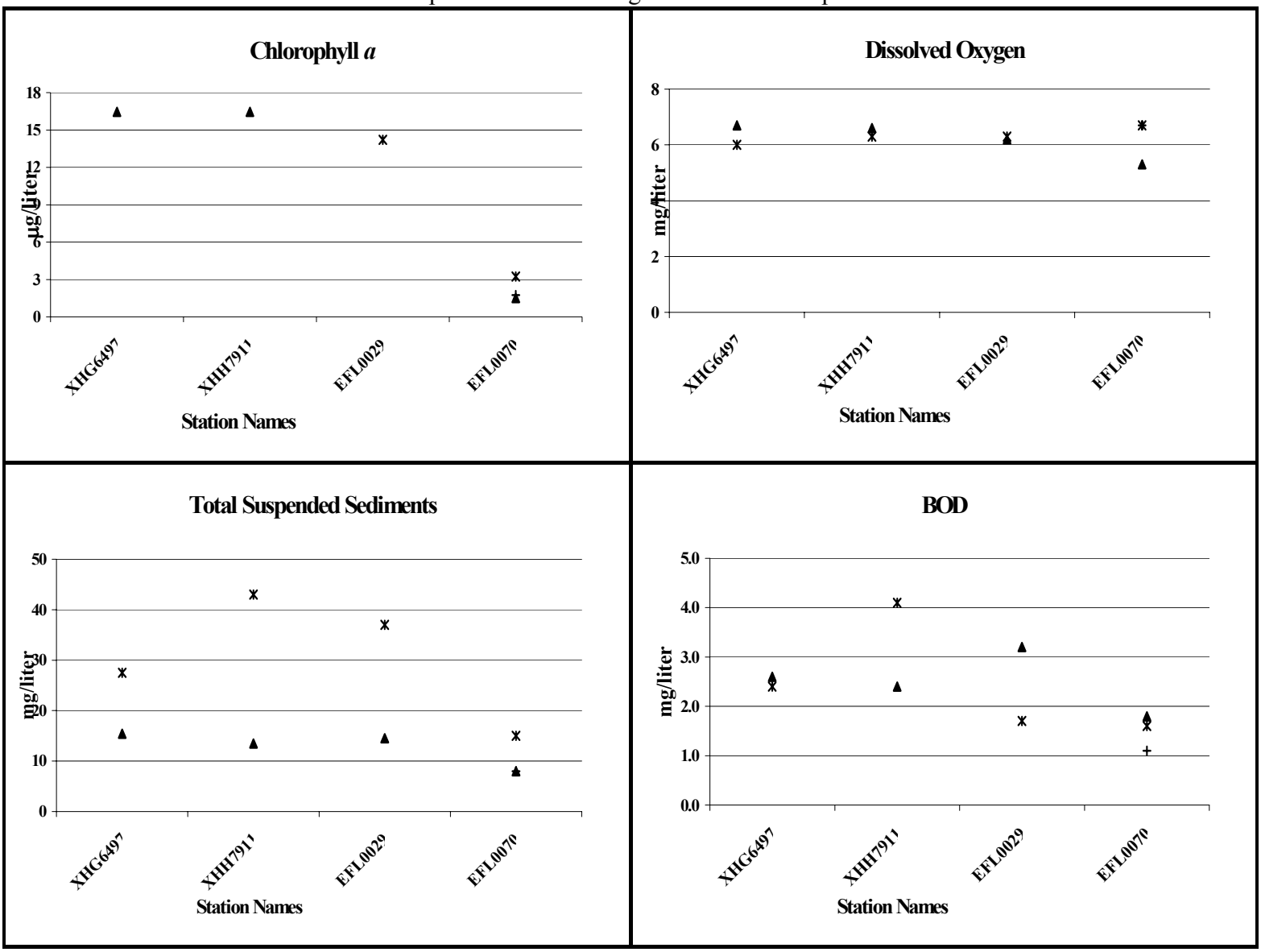


+ 10-Mar-99 ✳ 06-Apr-99 ▲ 03-May-99

Langford Creek (East Fork)

Low Flow Conditions (June - November)

Stations are presented from left to right in downstream to upstream order

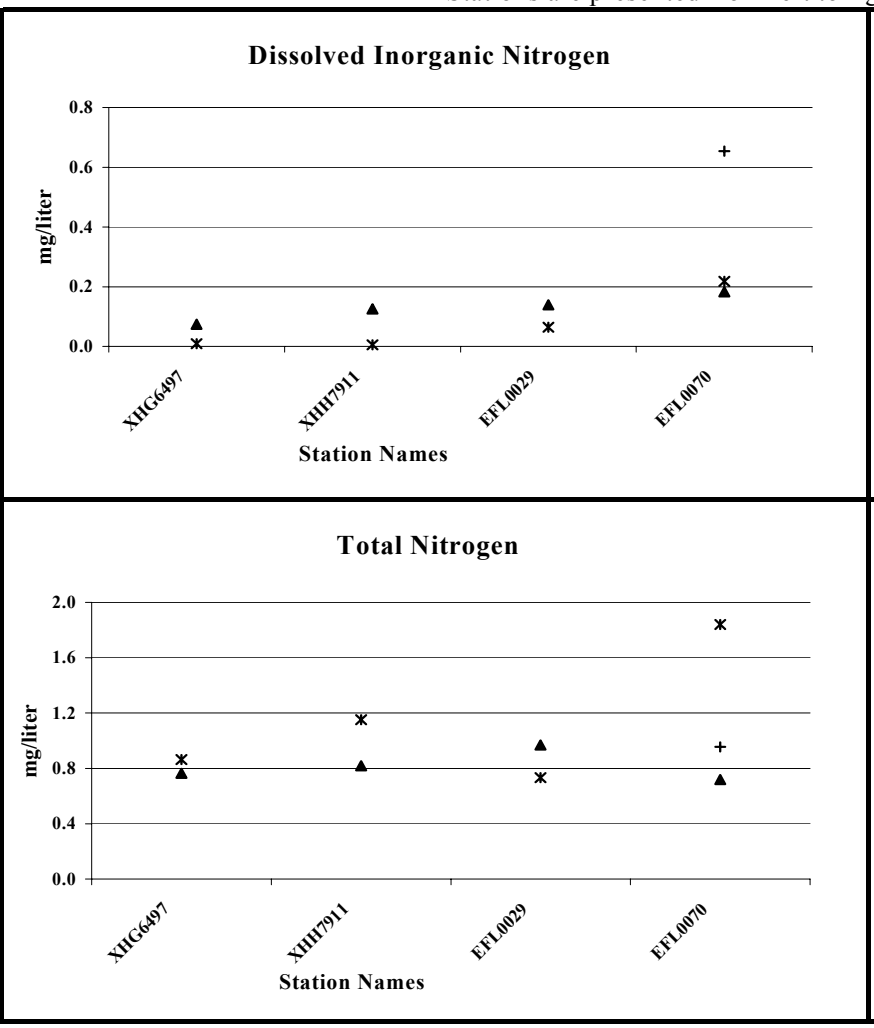


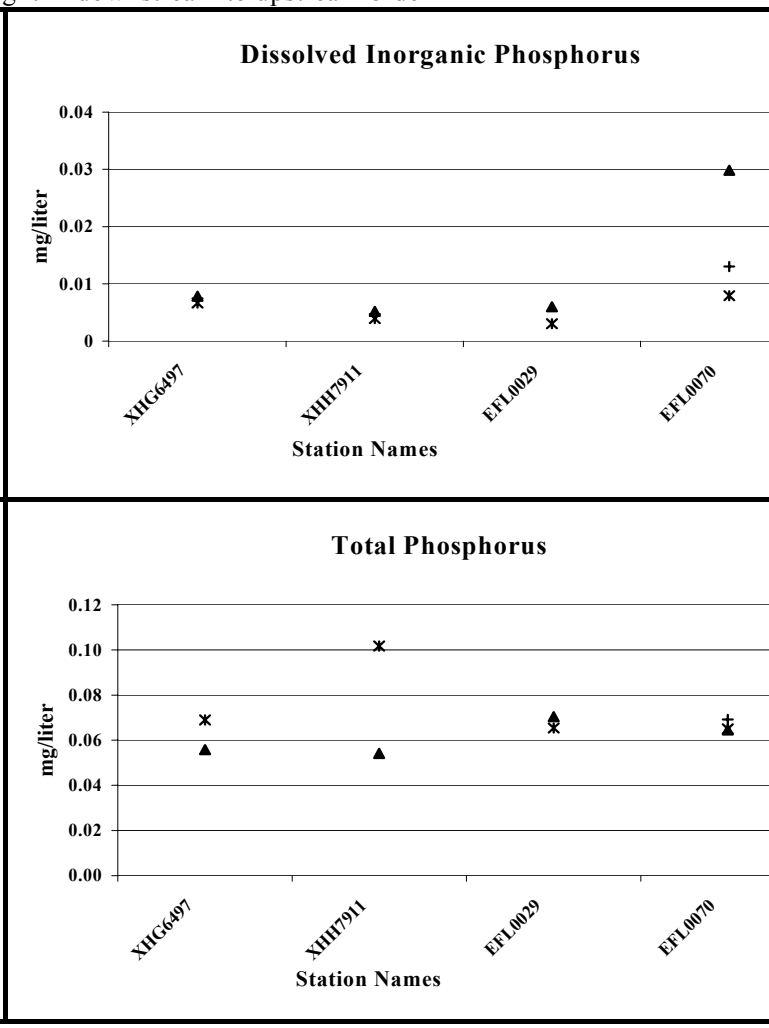
+ 13-Jul-99 ⁎ 10-Aug-99 ▲ 08-Sep-99

Langford Creek (East Fork)

Low Flow Conditions (June - November)

Stations are presented from left to right in downstream to upstream order



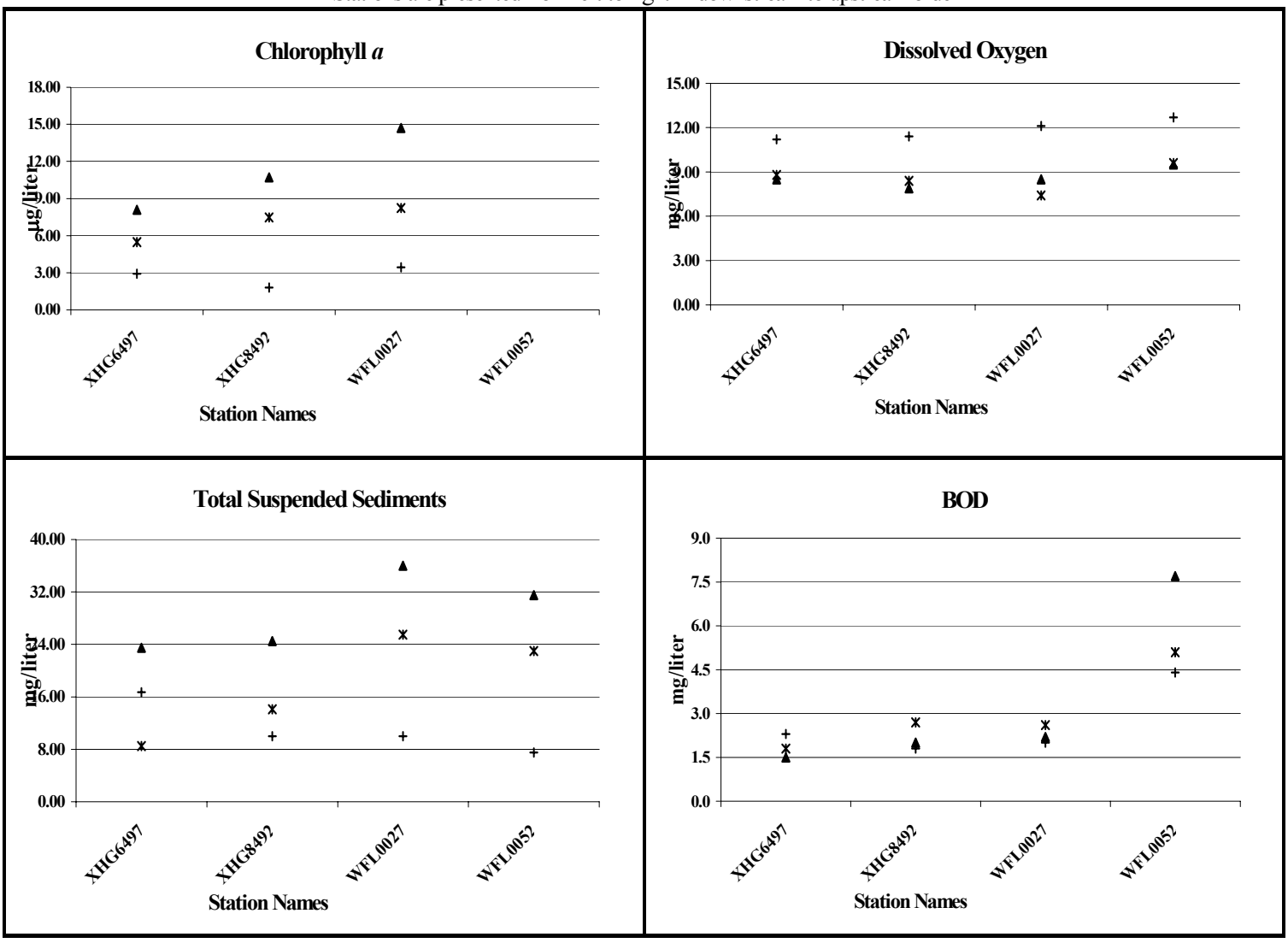


+ 13-Jul-99 ✱ 10-Aug-99 ▲ 08-Sep-99

Langford Creek (West Fork)

High Flow Conditions (December - May)

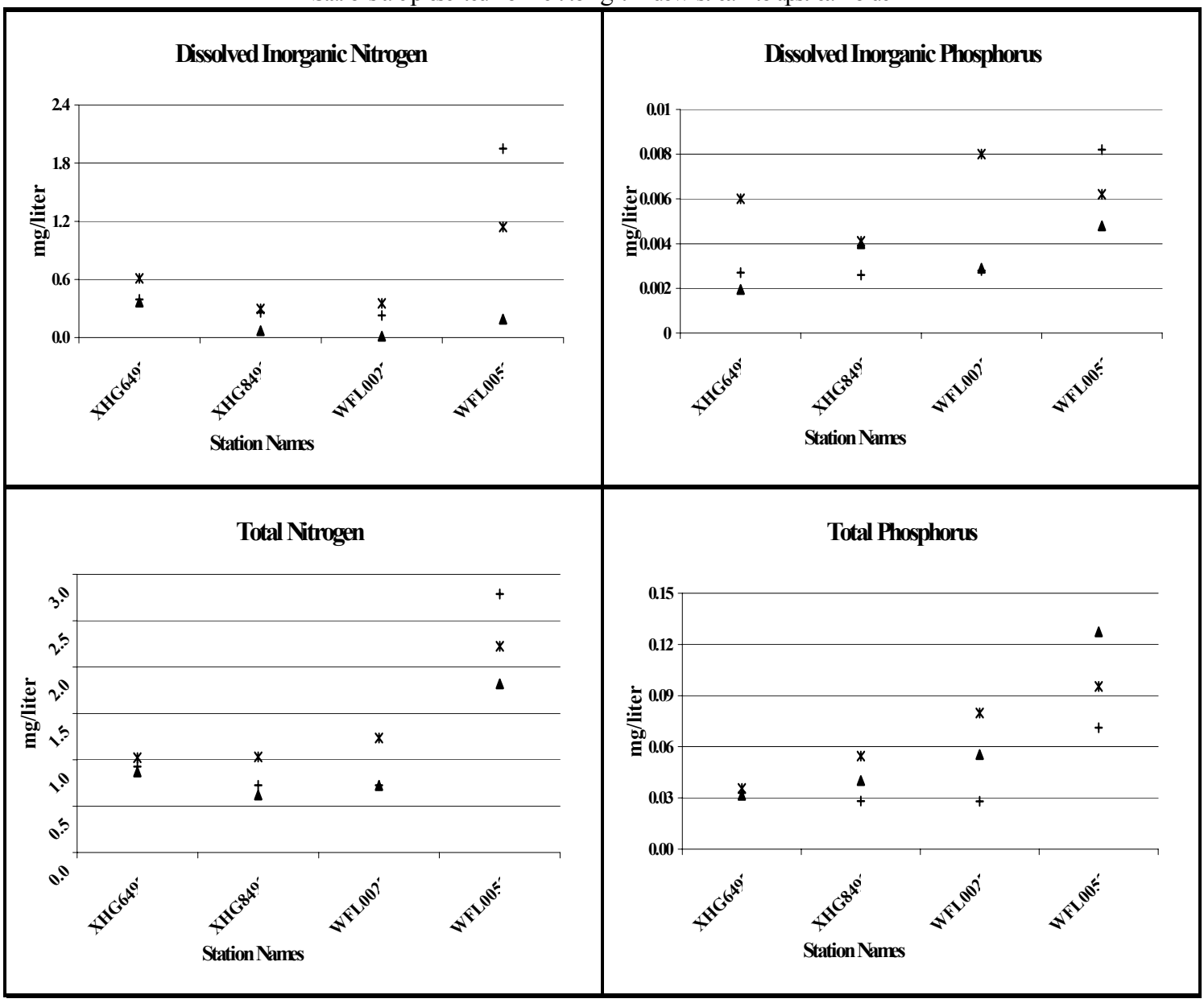
Stations are presented from left to right in downstream to upstream order



Langford Creek (West Fork)

High Flow Conditions (December - May)

Stations are presented from left to right in downstream to upstream order

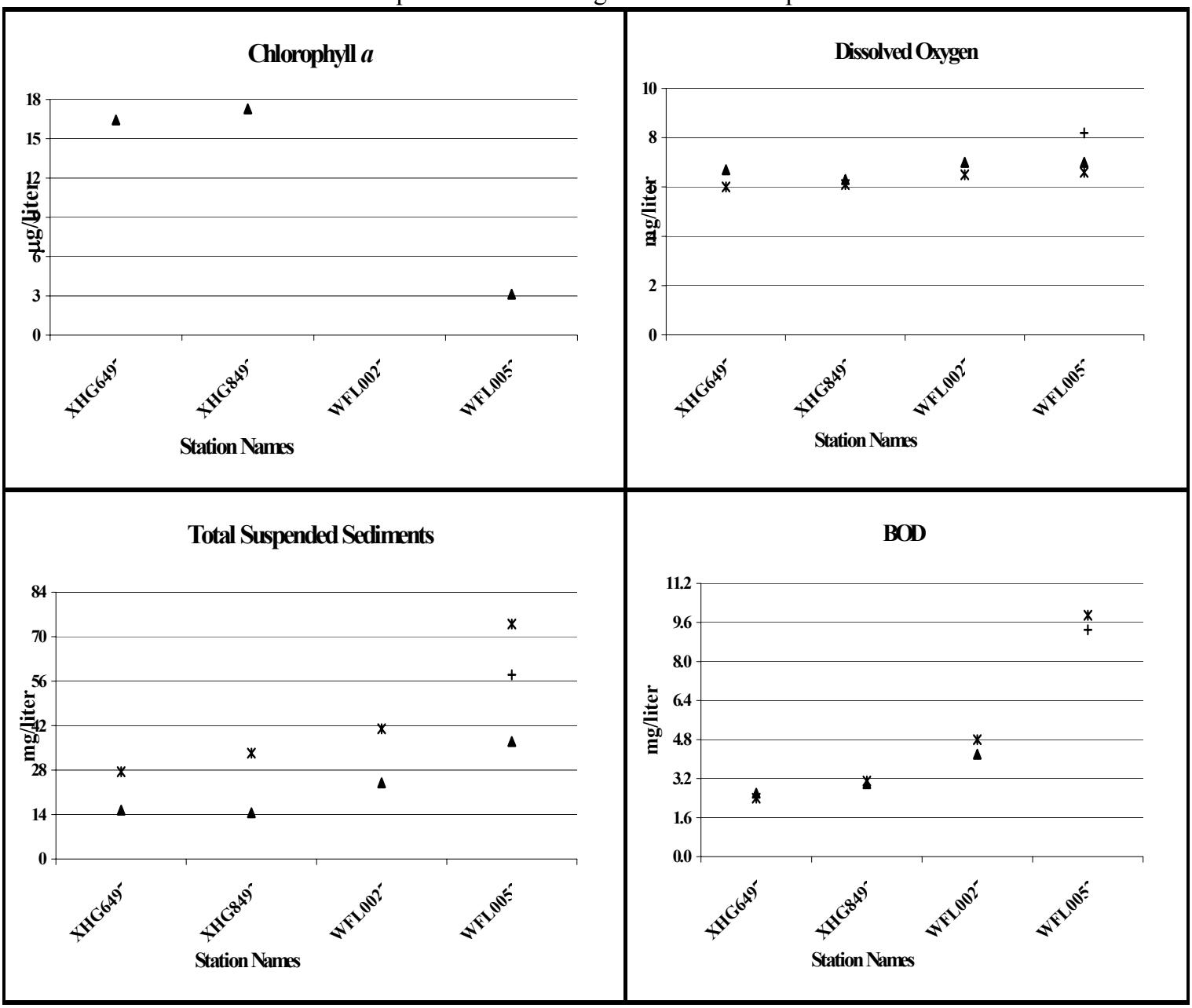


+ 10-Mar-99 x 06-Apr-99 ▲ 03-May-99

Langford Creek (West Fork)

Low Flow Conditions (June - November)

Stations are presented from left to right in downstream to upstream order

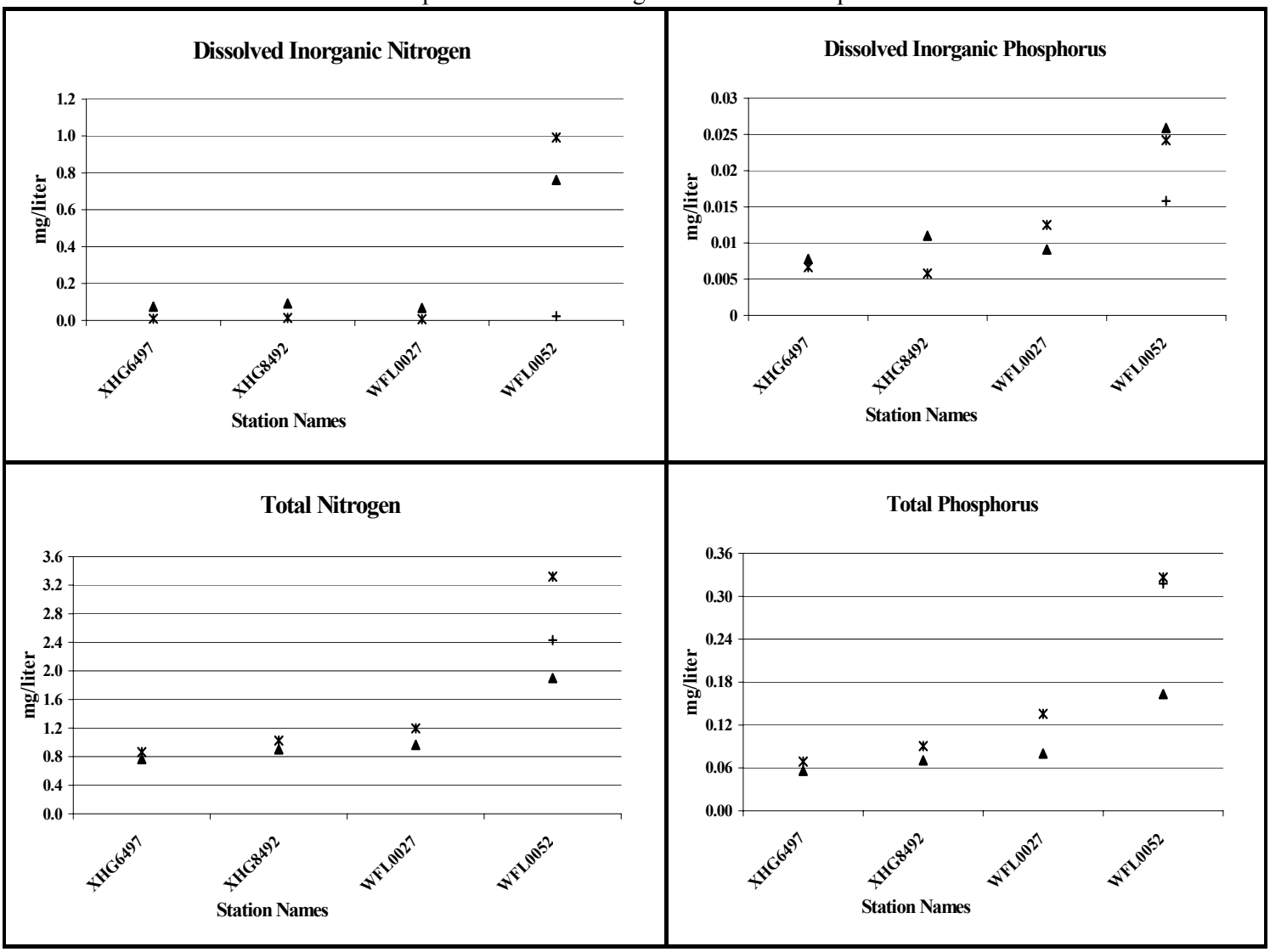


+ 13-Jul-99 ✱ 10-Aug-99 ▲ 08-Sep-99

Langford Creek (West Fork)

Low Flow Conditions (June - November)

Stations are presented from left to right in downstream to upstream order

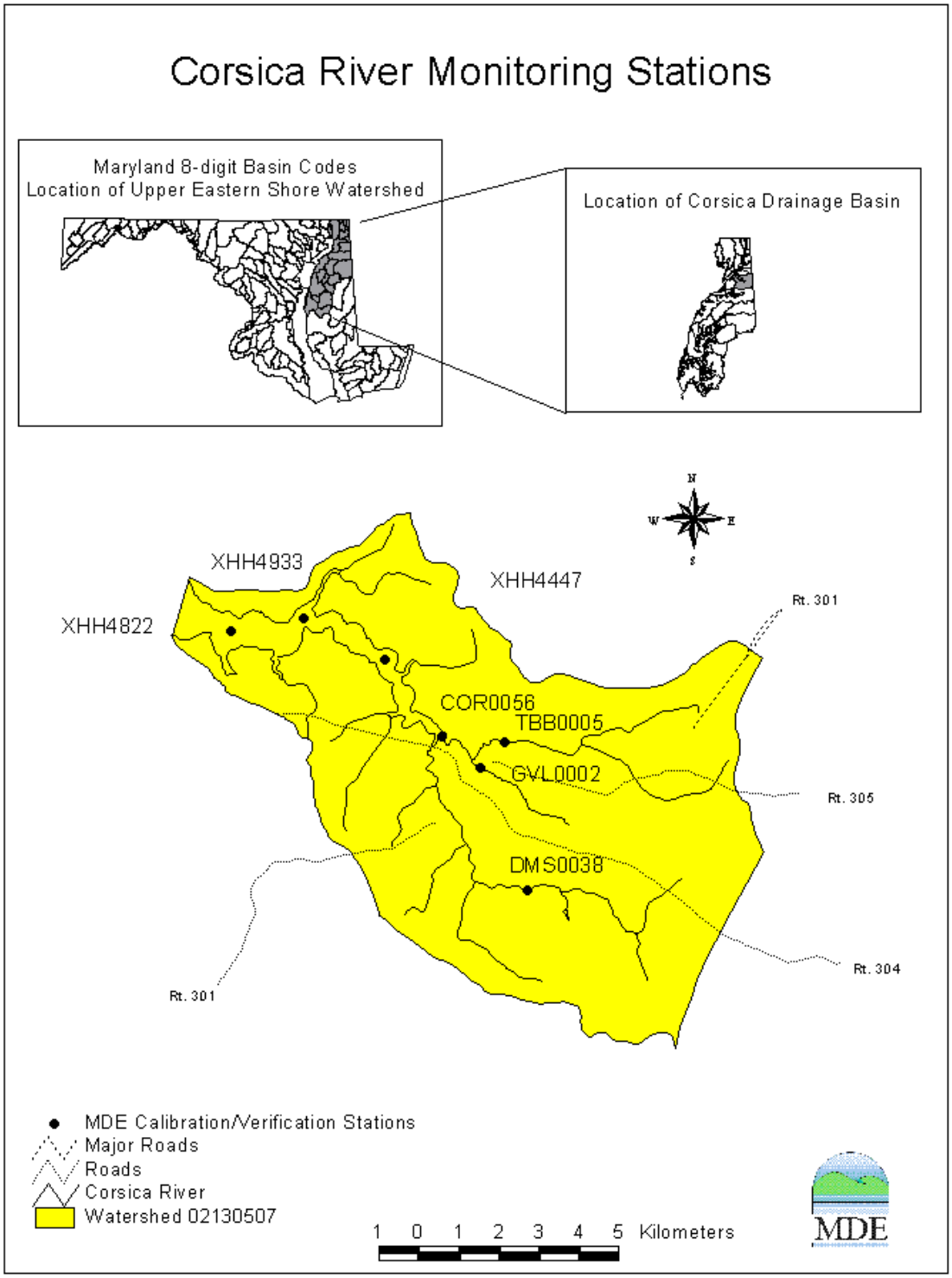


+ 13-Jul-99 ⁎ 10-Aug-99 ▲ 08-Sep-99

LANGFORD CREEK
1999 TMDL STUDY STATION LIST

Station Code	Lat/Long	Description
East Fork (Langford Creek)		
EFL0070	39 11.213 76 06.865	Bridge crossing at Langford-Pomona Rd. Sample free-flowing drainage from Mill Pond. – located west of Brices Mill Road.
West Fork (Langford Creek)		
WFL0052	39 11.106 76 10.708	Spillage of St. Pauls Mill Pond at Langford Road.
Langford Creek		
XHG6497	39 06.400 76 10.300	Mid-channel off Long Cove.
East Fork (Langford Creek)		
XHH7911	39 07.917 76 08.924	Off cove on western shore.
EFL0029	39 09.149 76 08.937	Depth ~ 10 ft.
West Fork (Langford Creek)		
XHG8492	39 08.411 76 10.836	NE of Pastor Point. Off large blue boathouse.
WFL0027	39 09.385 76 10.962	Below confluence of river fork.

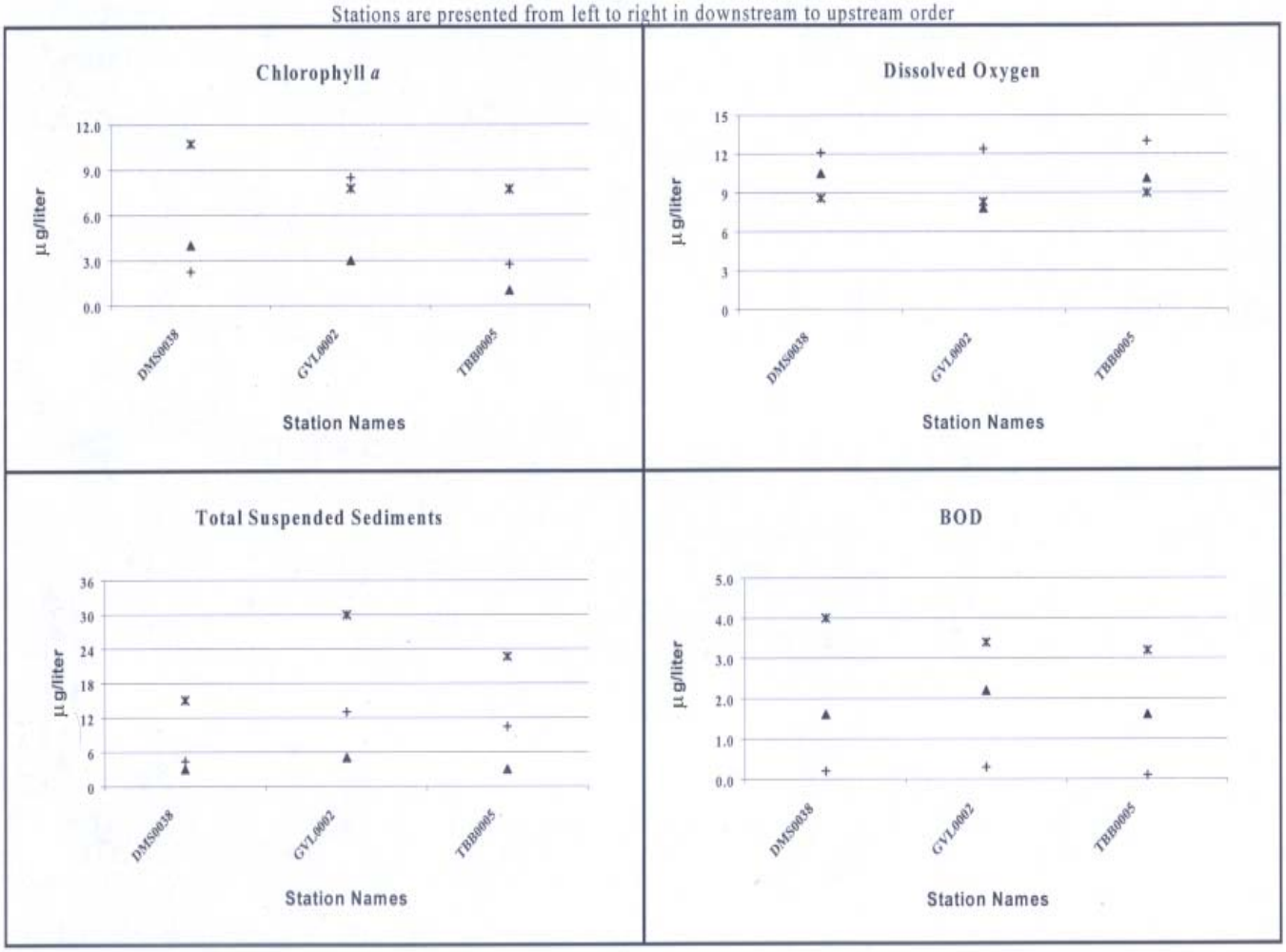
Corsica River



Corsica River (tributaries)

High Flow Conditions (December - May)

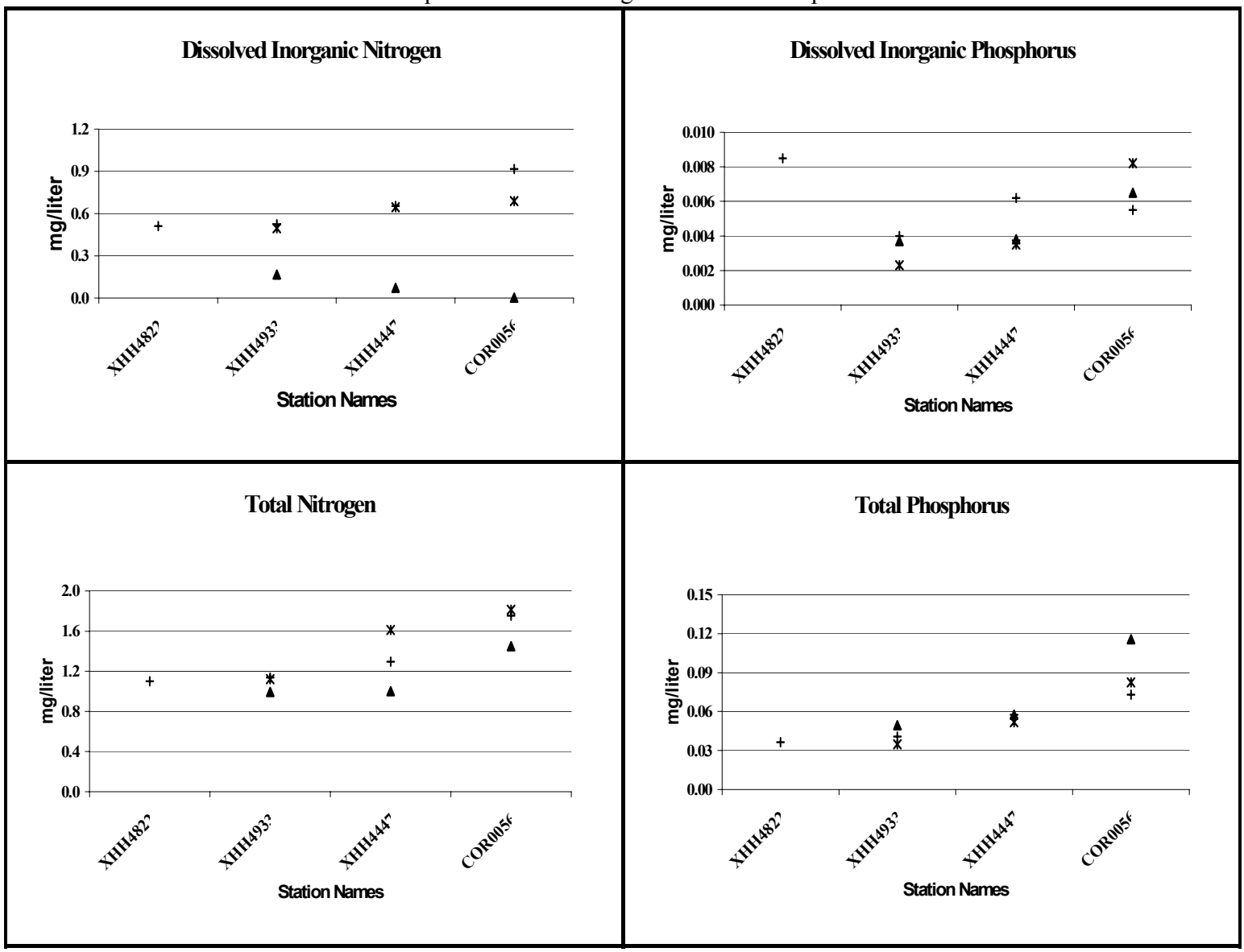
Stations are presented from left to right in downstream to upstream order



Corsica River (main)

High Flow Conditions (December - May)

Stations are presented from left to right in downstream to upstream order

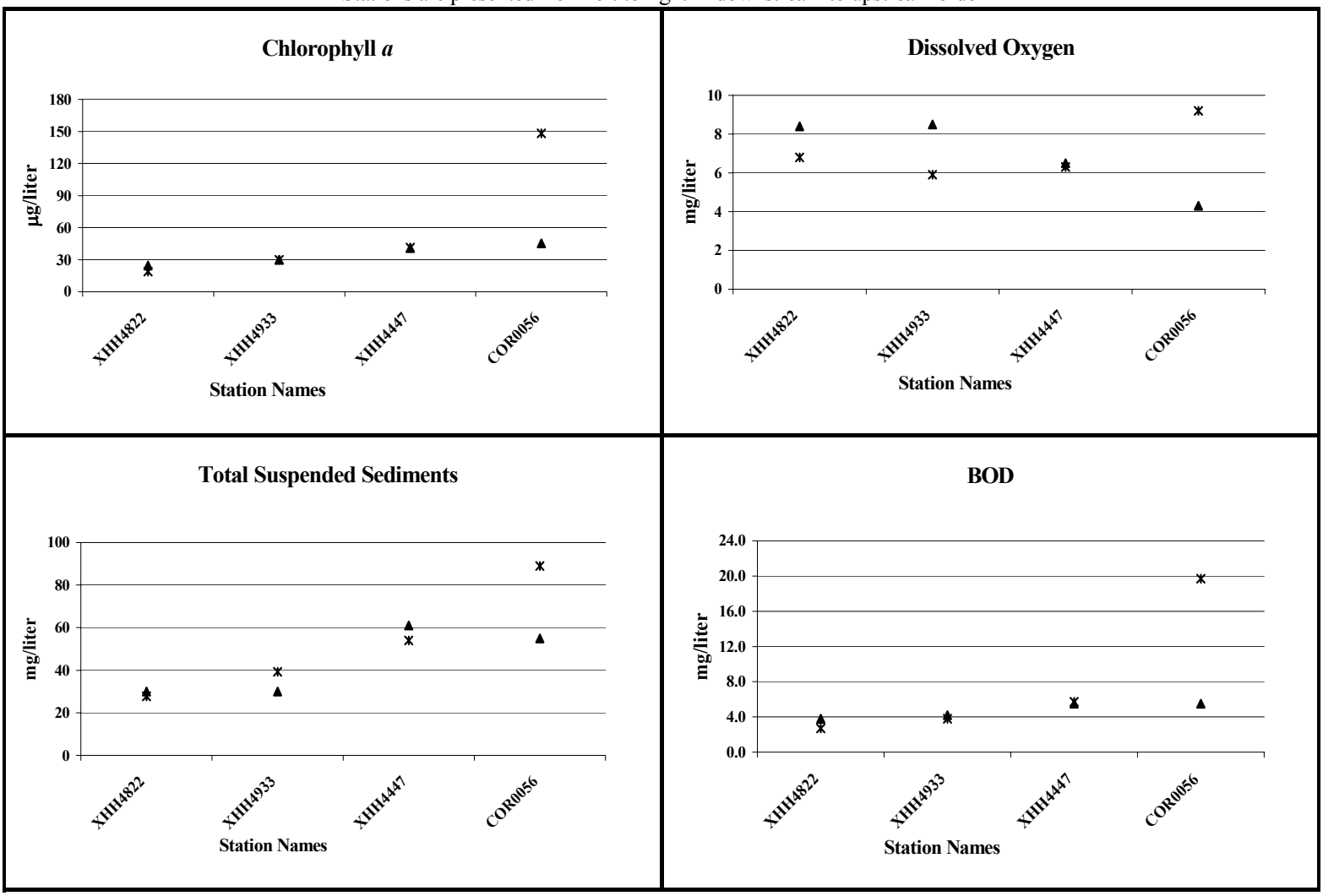


+ 10-Mar-99 x 06-Apr-99 ▲ 04-May-99

Corsica River (main)

Low Flow Conditions (June - November)

Stations are presented from left to right in downstream to upstream order

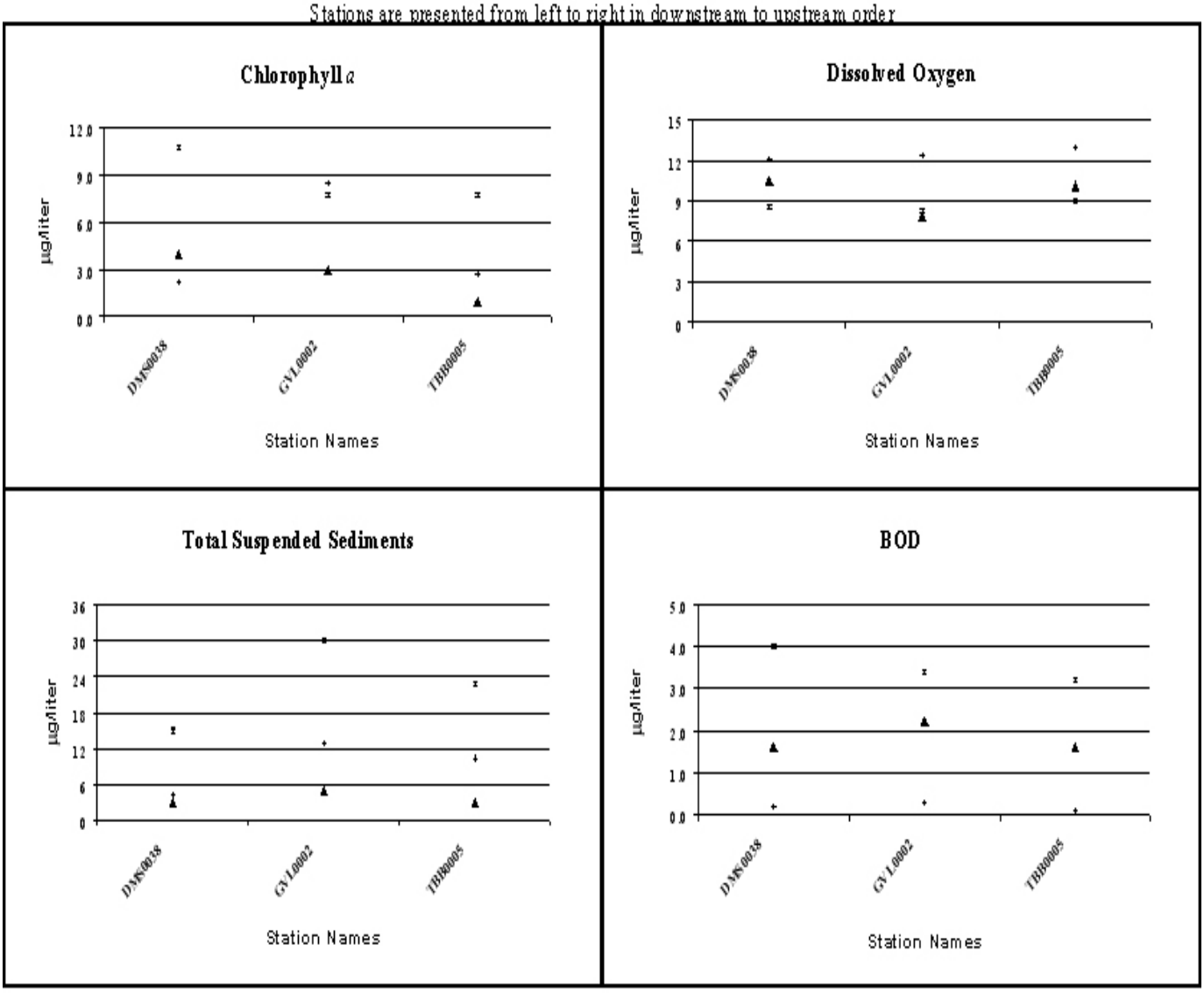


+ 13-Jul-99 ✱ 10-Aug-99 ▲ 08-Sep-99

Corsica River (tributaries)

High Flow Conditions (December - May)

Stations are presented from left to right in downstream to upstream order

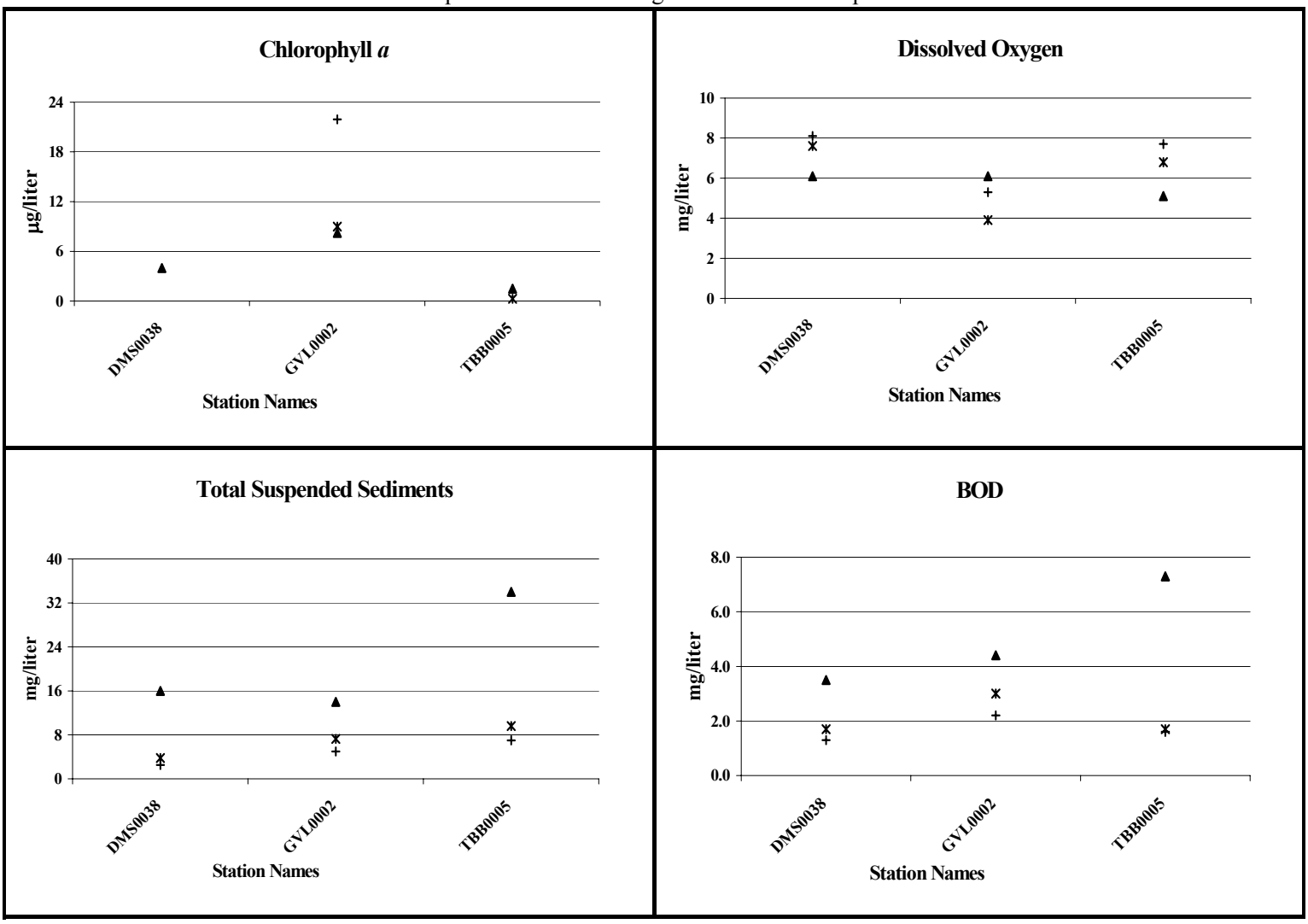


* 10-Mar-99 x 06-Apr-99 ▲ 04-May-99

Corsica River (tributaries)

Low Flow Conditions (June - November)

Stations are presented from left to right in downstream to upstream order

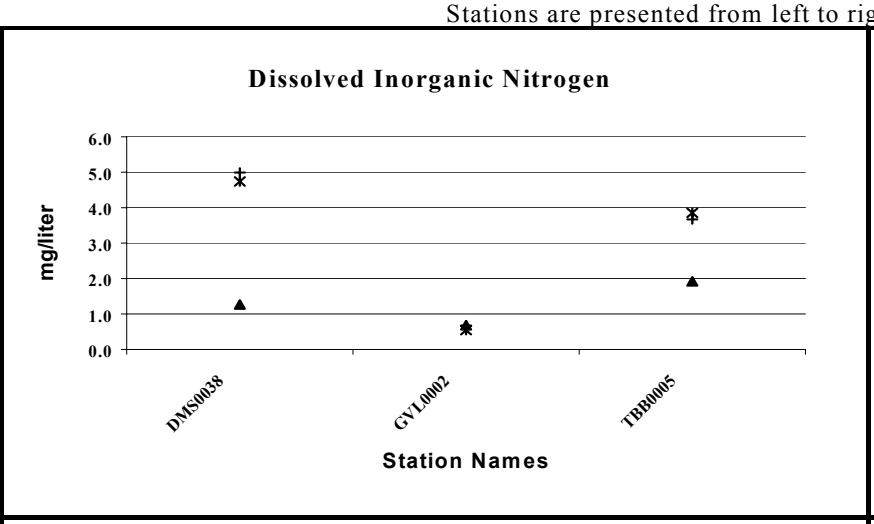


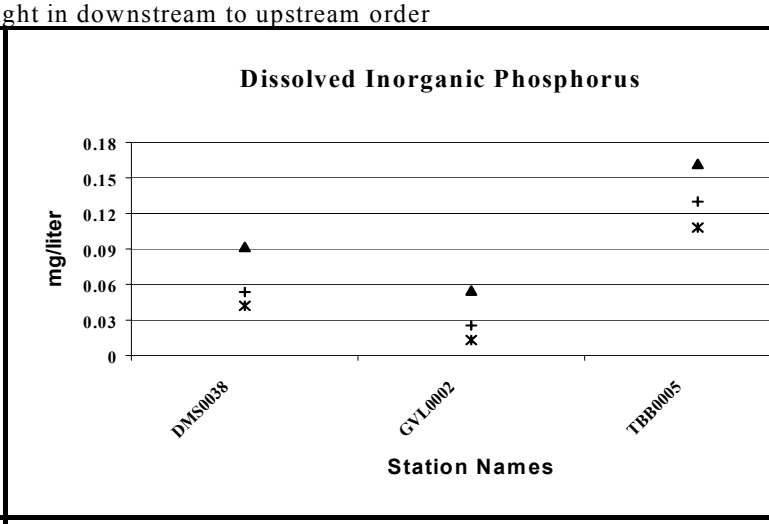
+ 13-Jul-99 × 10-Aug-99 ▲ 08-Sep-99

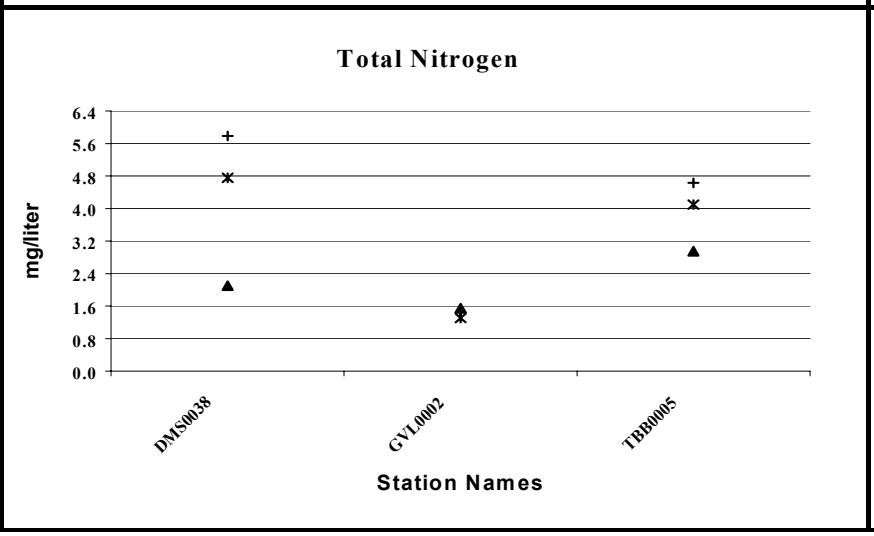
Corsica River (tributaries)

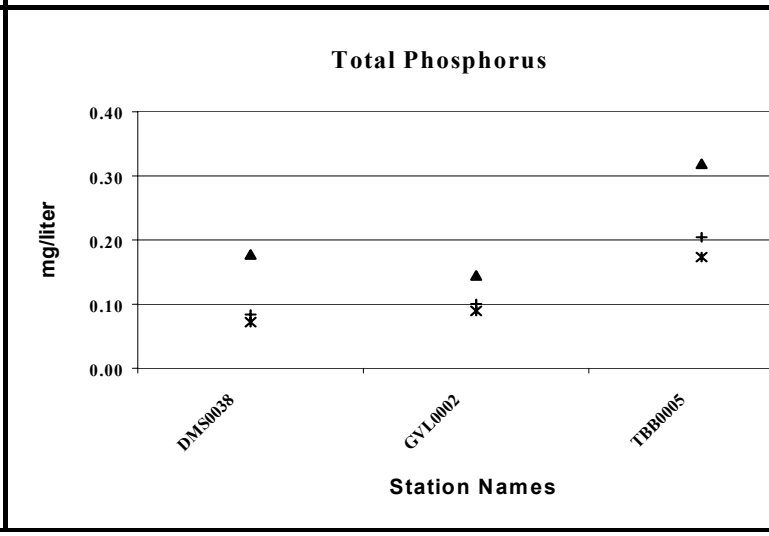
Low Flow Conditions (June - November)

Stations are presented from left to right in downstream to upstream order







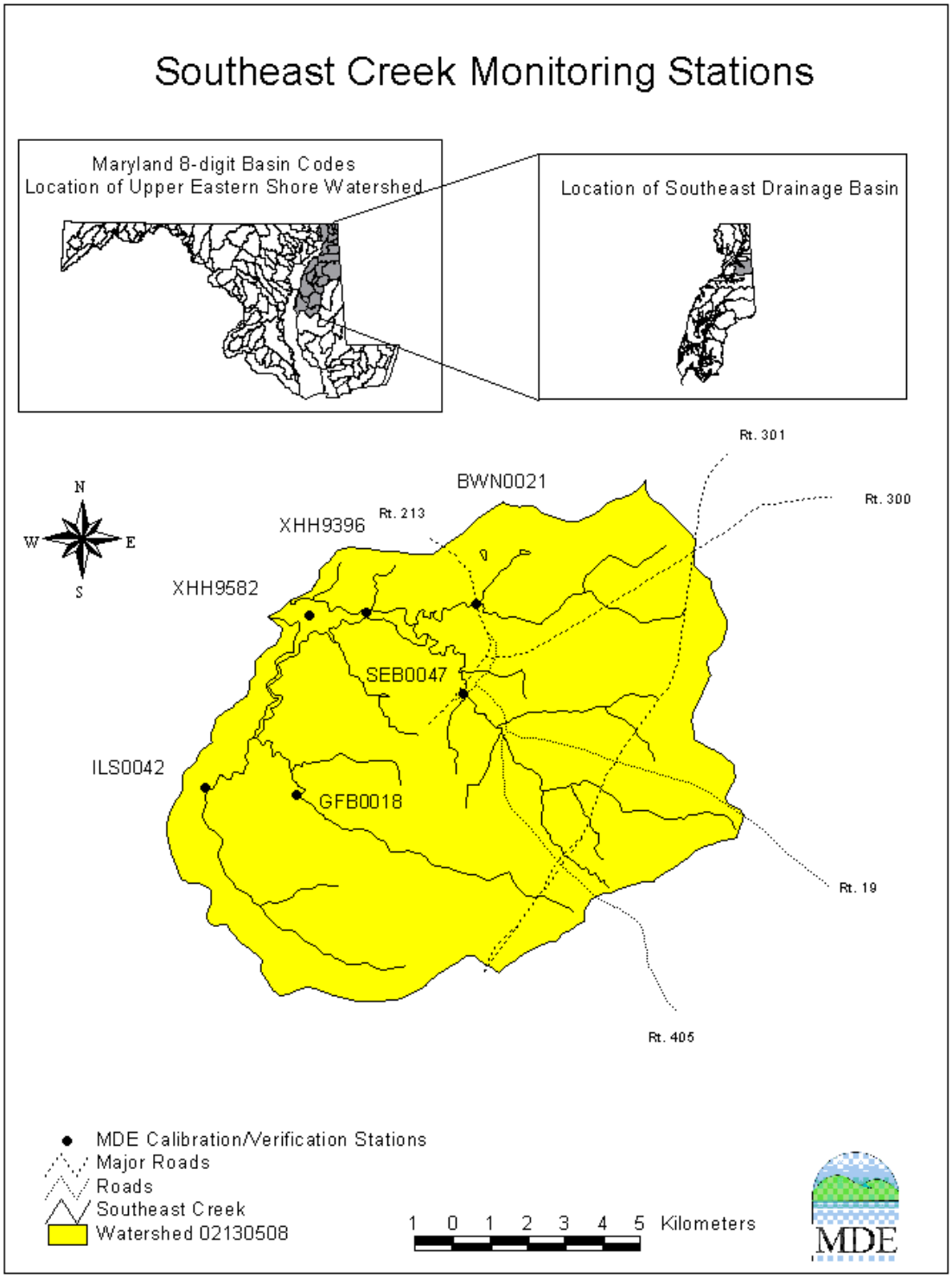


+ 13-Jul-99 * 10-Aug-99 ▲ 08-Sep-99

CORSICA RIVER
1999 TMDL STUDY STATION LIST

Station Code	Lat/Long	Description
Mill Stream Branch		
DMS0038	39 01.214 76 02.894	Road crossing at Rolling Bridge Road.
Gravel Run Branch		
GVL0002	39 02.879 76 03.733	Route 213 crossing.
Three Bridges Branch		
TBB0005	39 03.266 76 03.259	Route 213 crossing.
Corsica River		
XHH4822	39 04.822 76 07.824	Mid-channel off point.
XHH4933	39 04.943 76 06.711	N of day marker R 4.
XHH4447	39 04.389 76 05.301	S of day marker R 6.
COR0056	39 03.386 76 04.369	At confluence of Gravel Run and Old Mill Branch.

Southeast Creek

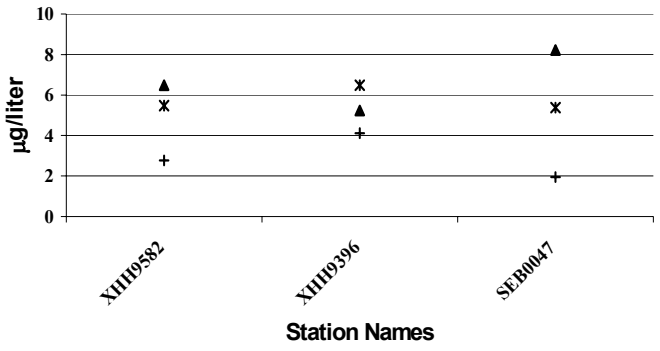


Southeast Creek (main)

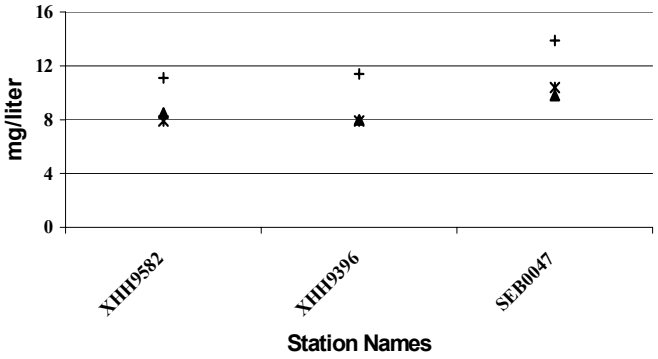
High Flow Conditions (December - May)

Stations are presented from left to right in downstream to upstream order

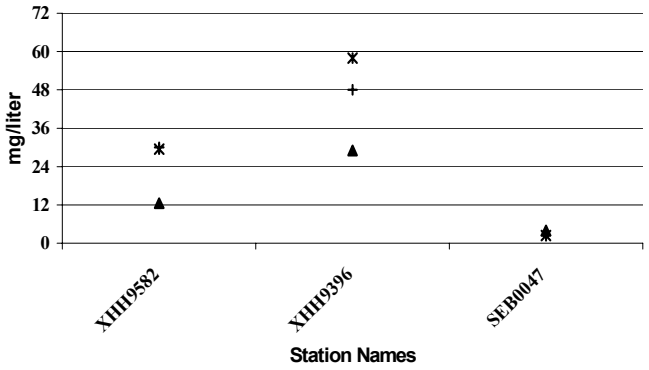
Chlorophyll *a*



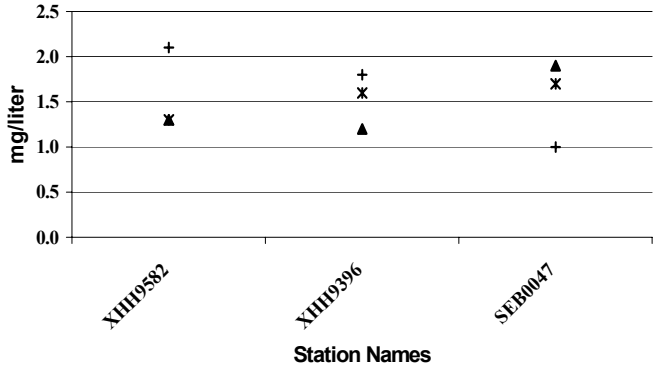
Dissolved Oxygen



Total Suspended Sediments



BOD

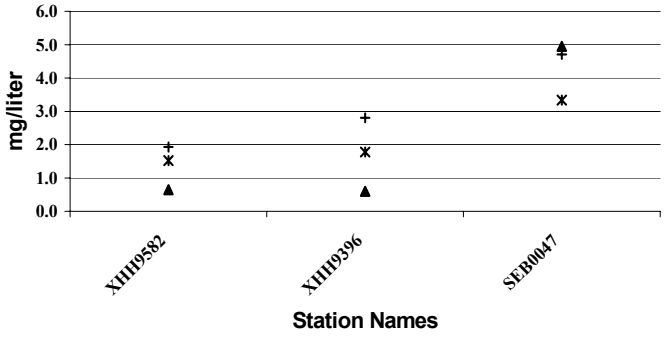


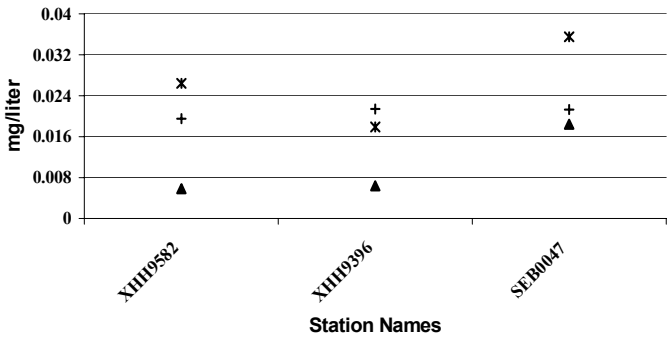
+ 10-Mar-99 ⁎ 06-Apr-99 ▲ 03-May-99

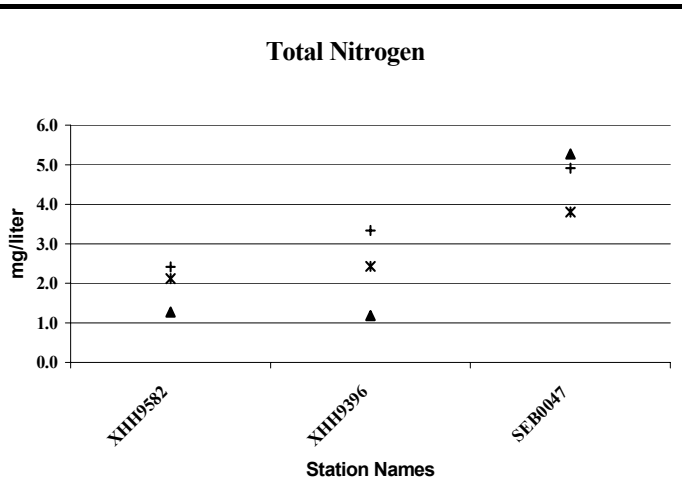
Southeast Creek (main)

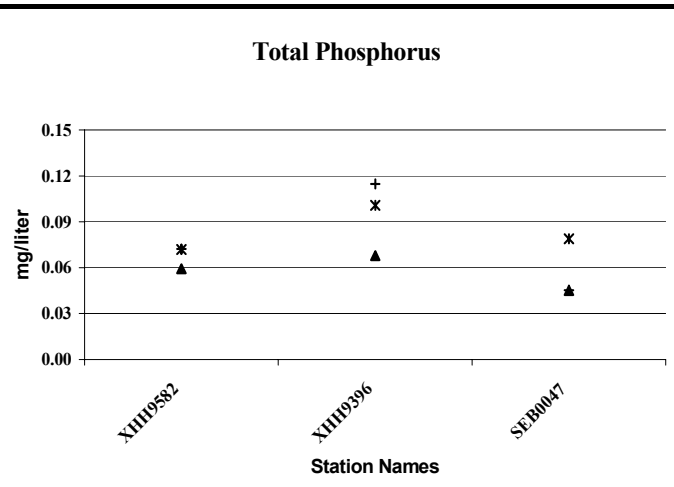
High Flow Conditions (December - May)

Stations are presented from left to right in downstream to upstream order







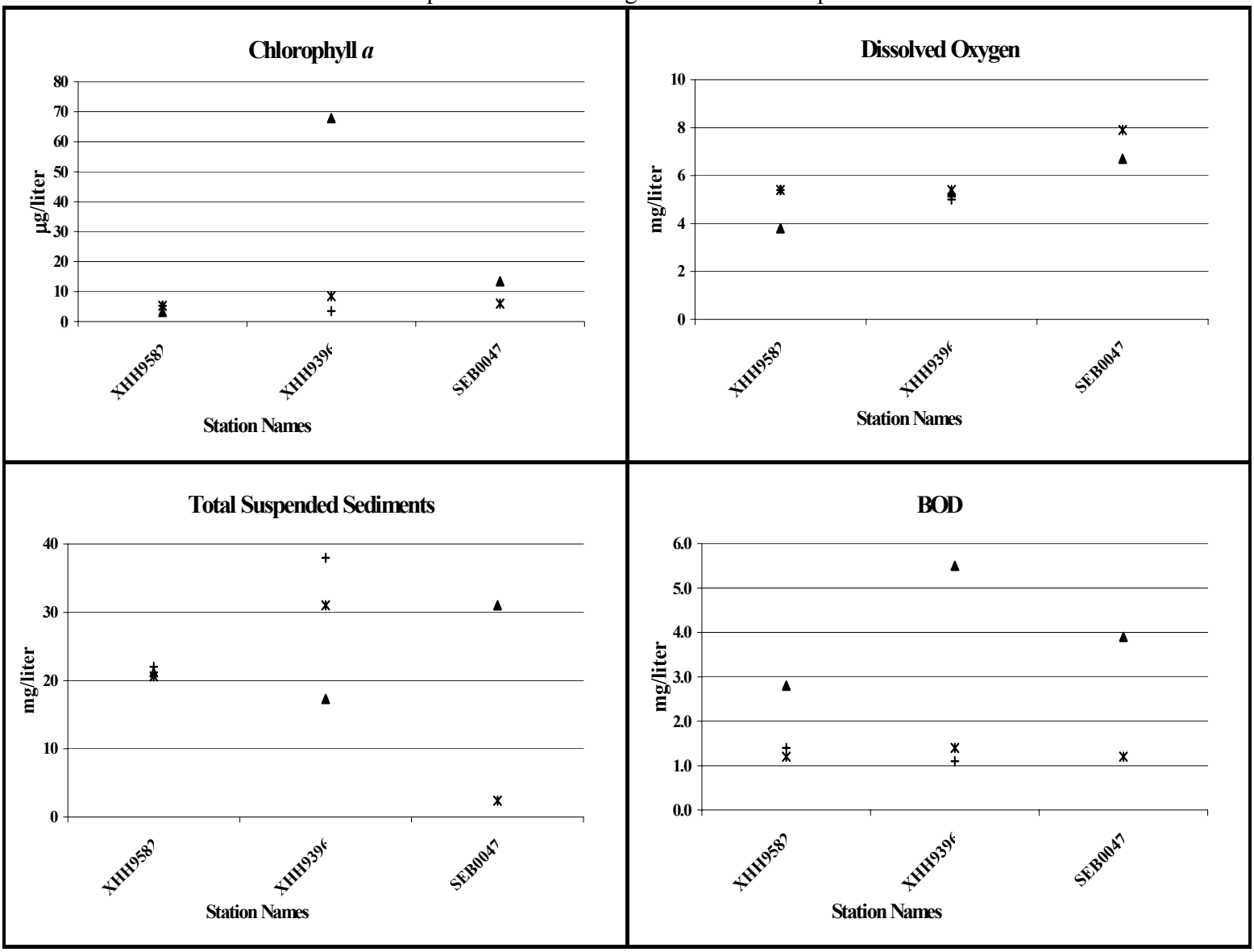


+ 10-Mar-99 ✱ 06-Apr-99 ▲ 03-May-99

Southeast Creek (main)

Low Flow Conditions (June - November)

Stations are presented from left to right in downstream to upstream order



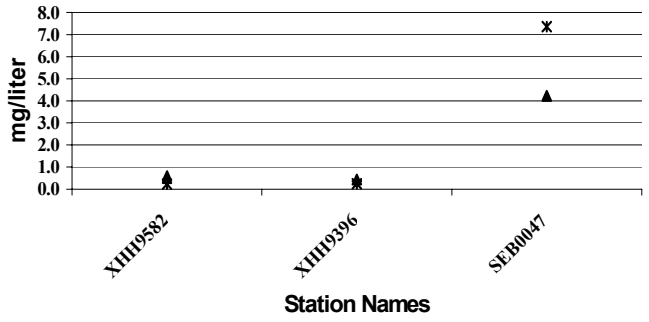
+ 13-Jul-99 ⁎ 10-Aug-99 ▲ 08-Sep-99

Southeast Creek (Main)

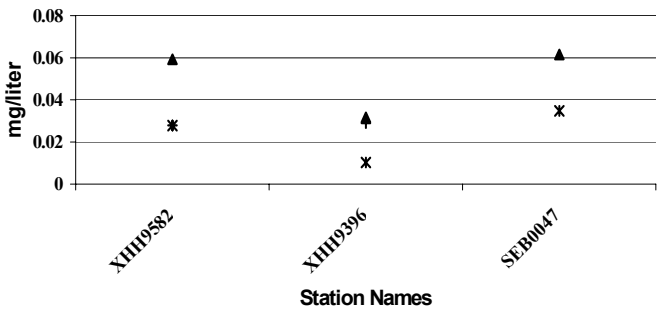
Low Flow Conditions (June - November)

Stations are presented from left to right in downstream to upstream order

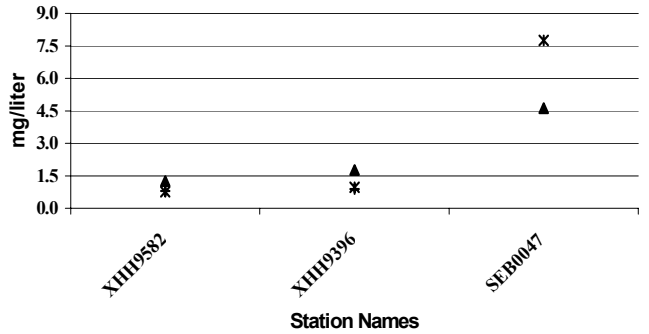
Dissolved Inorganic Nitrogen



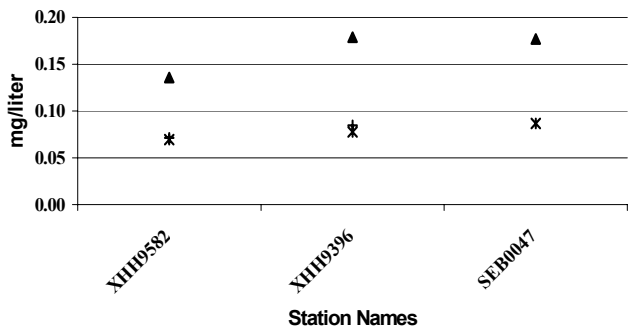
Dissolved Inorganic Phosphorus



Total Nitrogen



Total Phosphorus



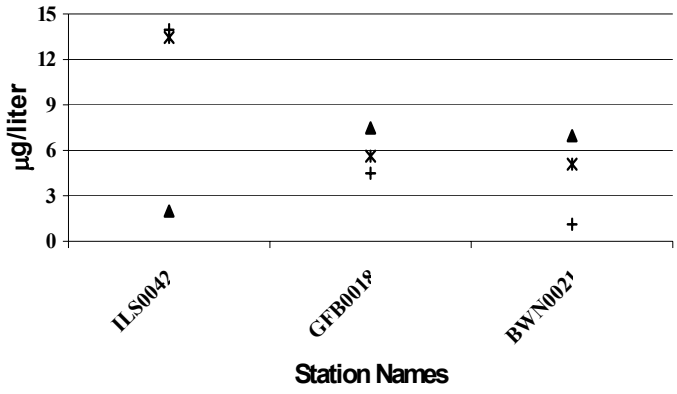
+ 13-Jul-99 **⁎ 10-Aug-99** **▲ 08-Sep-99**

Southeast Creek (tributaries)

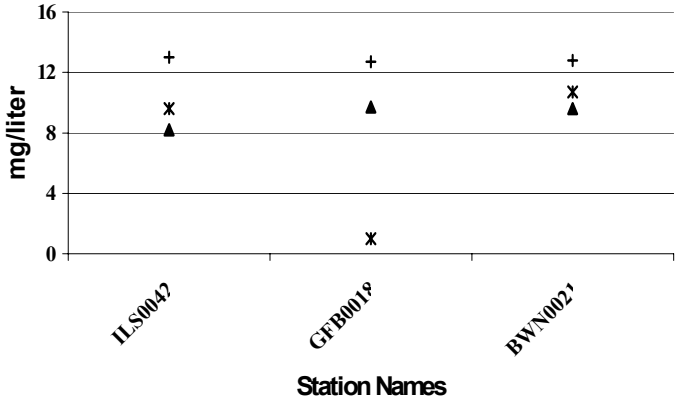
High Flow Conditions (December - May)

Stations are presented from left to right in downstream to upstream order

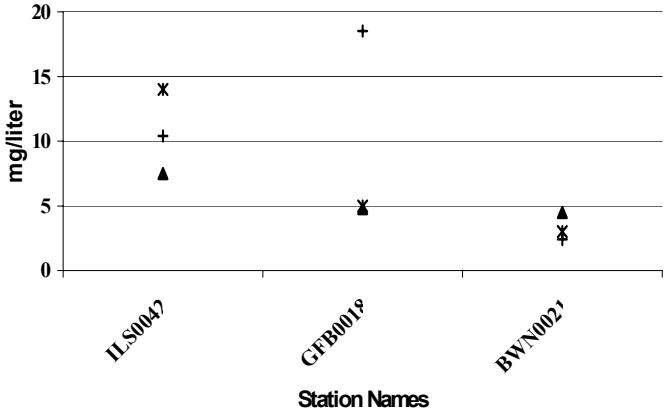
Chlorophyll *a*



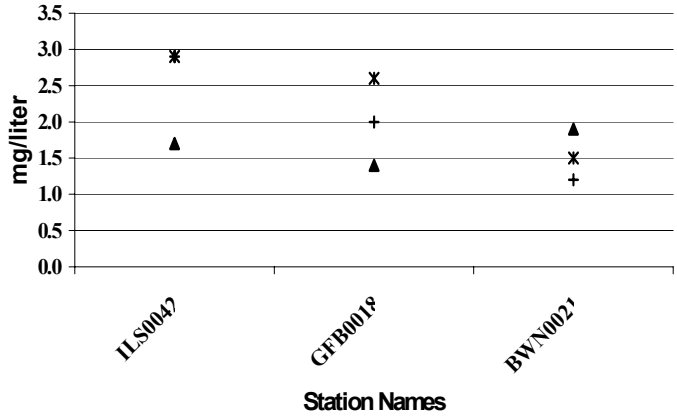
Dissolved Oxygen



Total Suspended Sediments



BOD

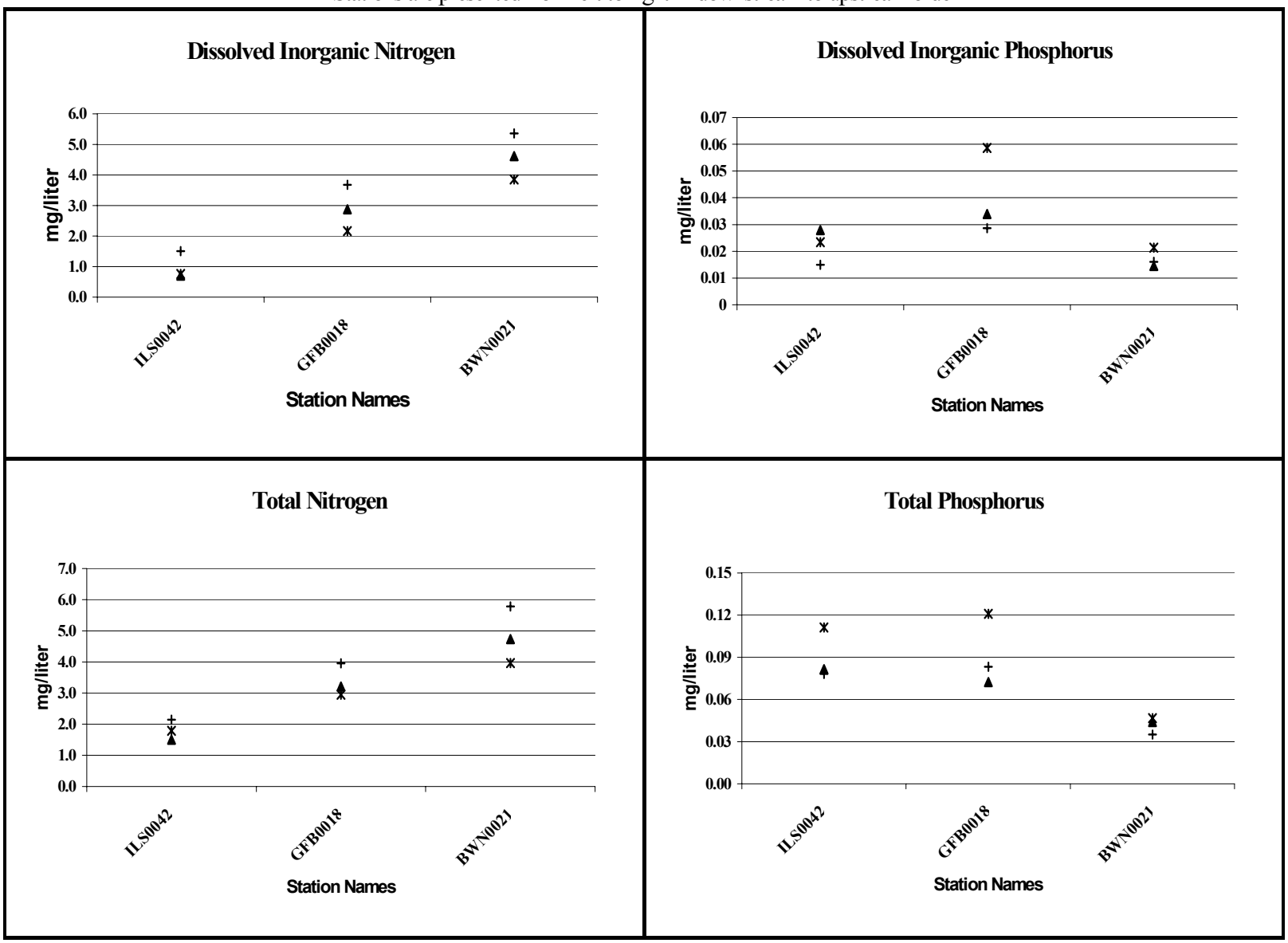


+ 10-Mar-99 ⁎ 06-Apr-99 ▲ 03-May-99

Southeasr Creek (tributaries)

High Flow Conditions (December - May)

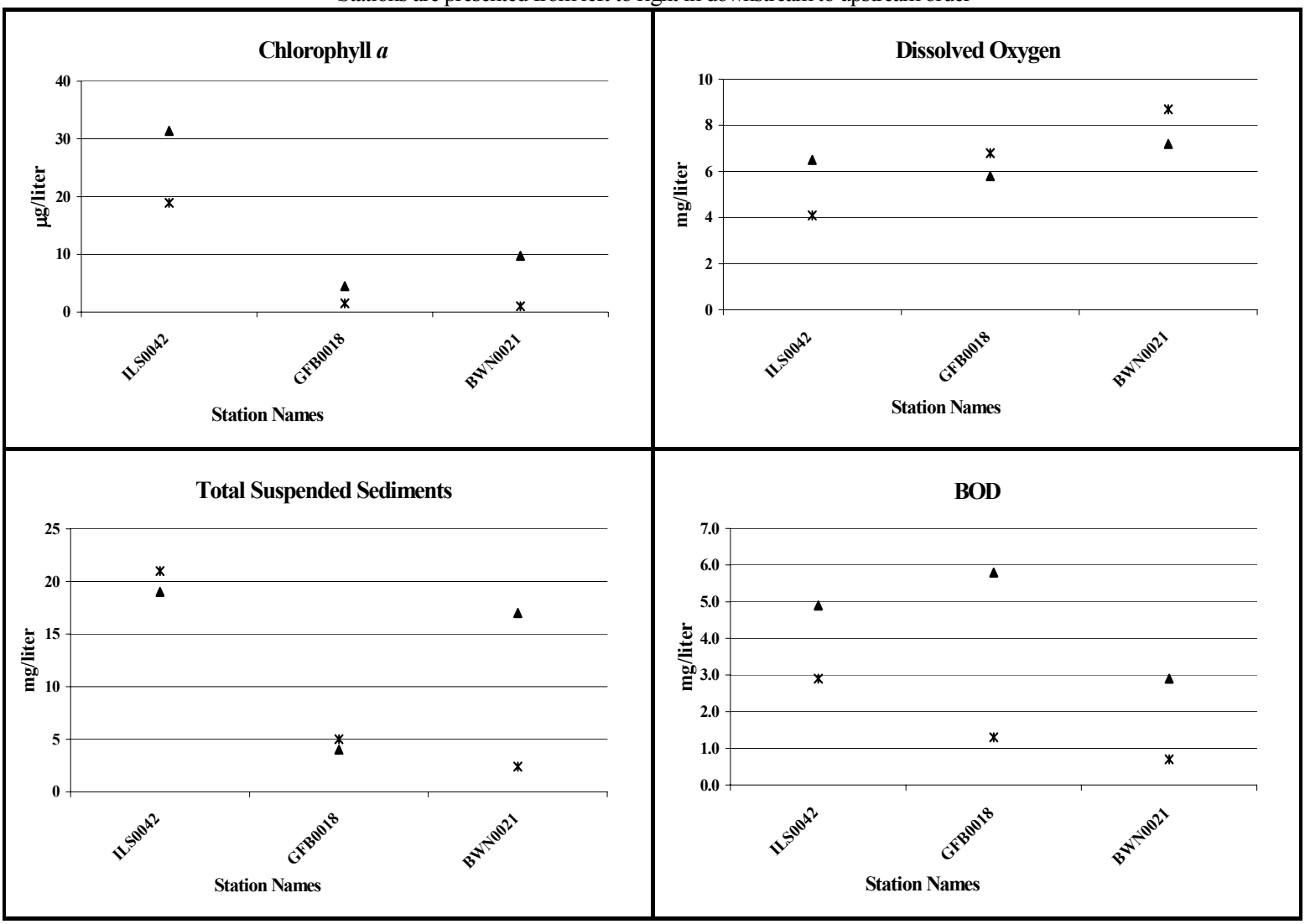
Stations are presented from left to right in downstream to upstream order



Southeast Creek (tributaries)

Low Flow Conditions (June - November)

Stations are presented from left to right in downstream to upstream order



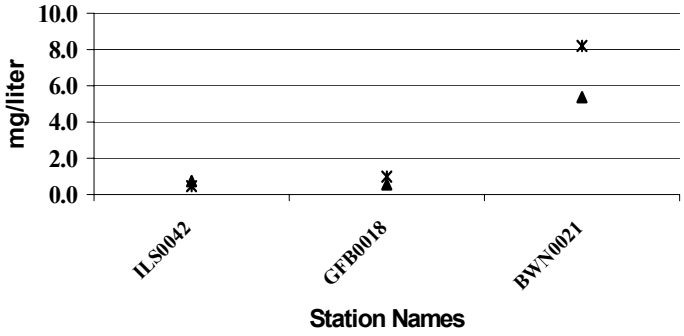
+ 13-Jul-99 ⁎ 10-Aug-99 ▲ 08-Sep-99

Southeast Creek (tributaries)

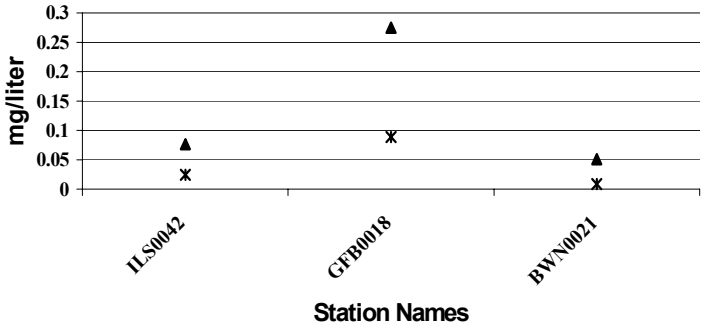
Low Flow Conditions (June - November)

Stations are presented from left to right in downstream to upstream order

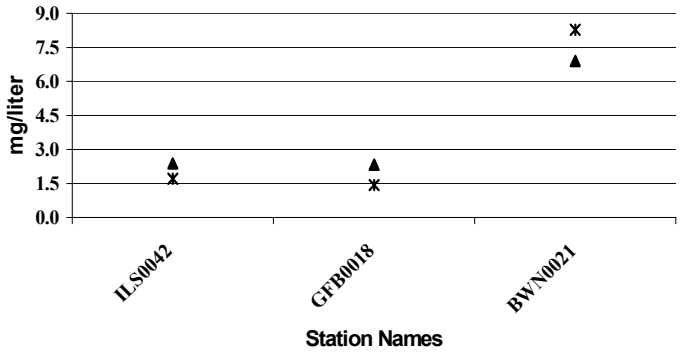
Dissolved Inorganic Nitrogen



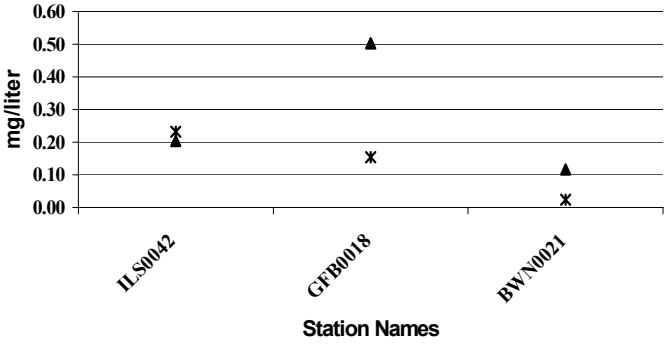
Dissolved Inorganic Phosphorus



Total Nitrogen



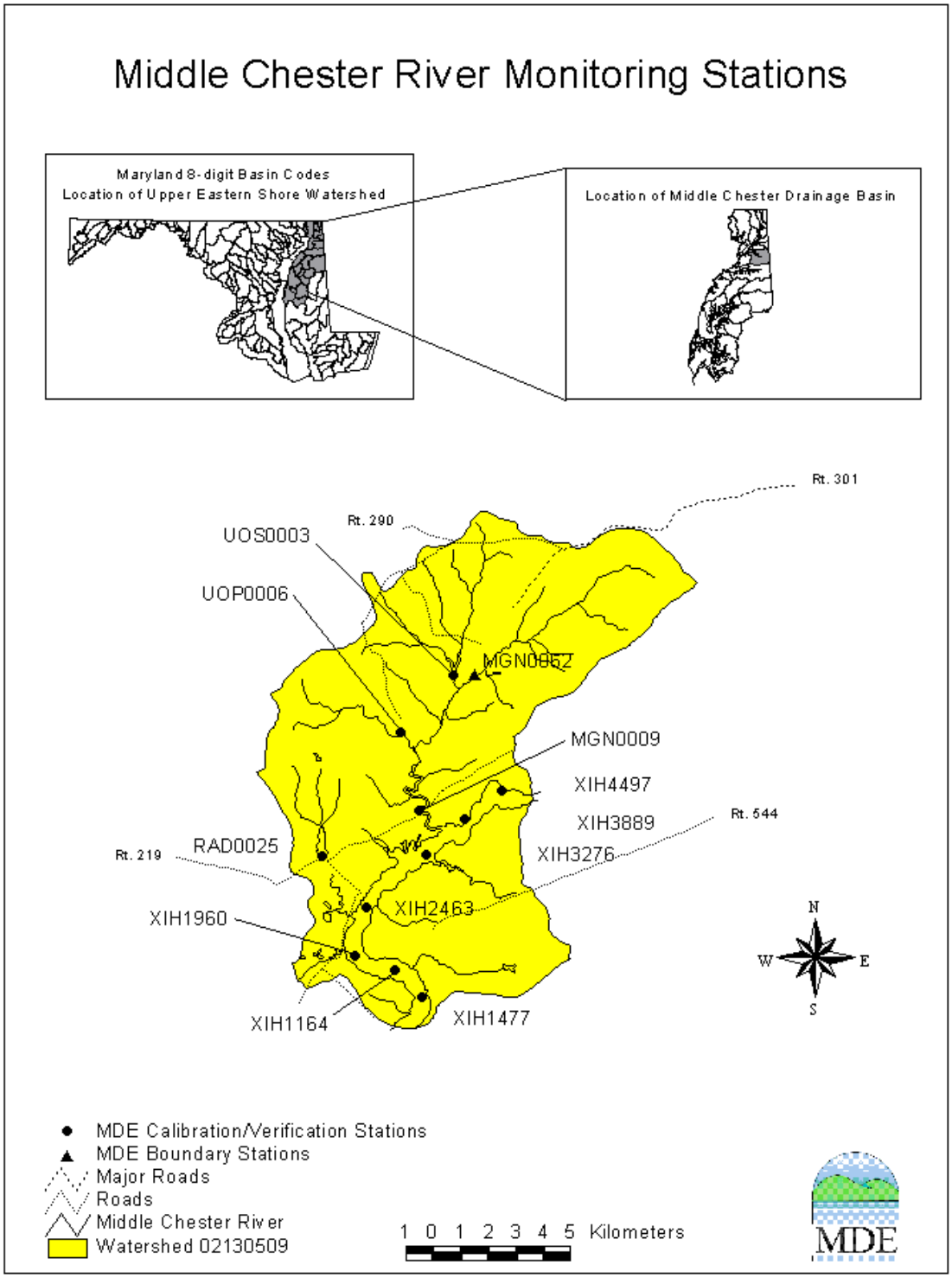
Total Phosphorus



+ 13-Jul-99 **× 10-Aug-99** **▲ 08-Sep-99**

SOUTHEAST CREEK
1999 TMDL STUDY STATION LIST

Station Code	Lat/Long	Description
Island Creek		
ILS0042	39 07.043 76 04.114	Road crossing on Sparks Mill Road. Tidal
Granny Finley Branch		
GFB0018	39 06.921 76 02.437	Road crossing on Sparks Mill Road.
Southeast Branch		
SEB0047	39 08.359 75 59.351	Route 19 (Main Street) road crossing.
Browns Branch		
BWN0021	39 09.652 75 59.089	Rt. 213 road crossing. Take flow upstream.
Southeast Creek		
XHH9582	39 09.463 76 01.776	S of point. Depth ~ 3 ft.
XHH9396	39 09.579 76 00.747	Depth ~ 5 ft.

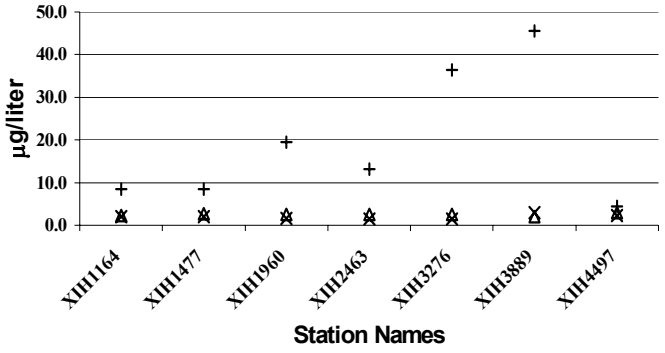

Middle Chester River Monitoring Stations
Maryland 8-digit Basin Codes
Location of Upper Eastern Shore Watershed
Location of Middle Chester Drainage Basin
Rt. 301
Rt. 290
UOS0003
UOP0006
MGN0002
MGN0009
XIH4497
XIH3889
Rt. 544
Rt. 219
RAD0025
XIH3276
XIH2463
XIH1960
XIH1164
XIH1477
N
W
E
S
MDE Calibration/Verification Stations
MDE Boundary Stations
Major Roads
Roads
Middle Chester River
Watershed 02130509
1 0 1 2 3 4 5 Kilometers
MDE

Middle Chester River (main)

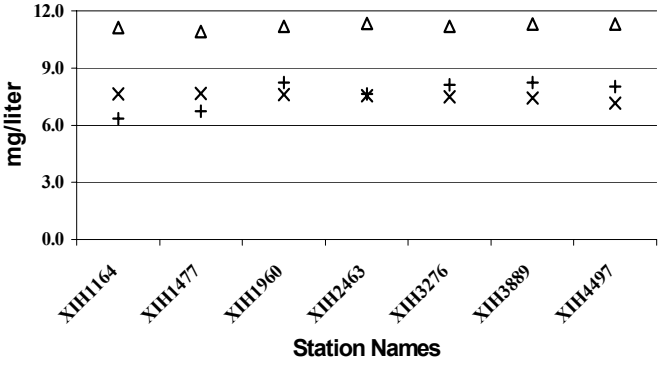
High Flow Conditions (December - May)

Stations are presented from left to right in downstream to upstream order

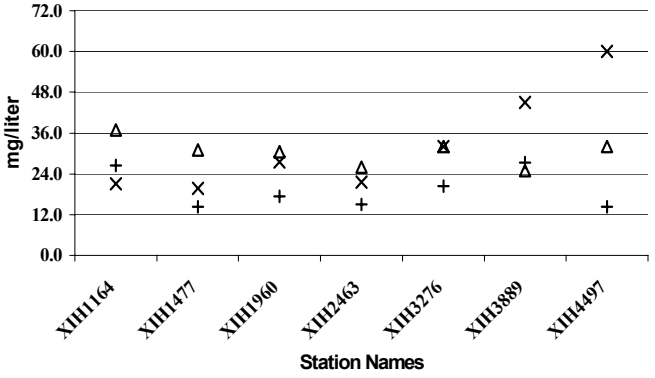
Chlorophyll *a*



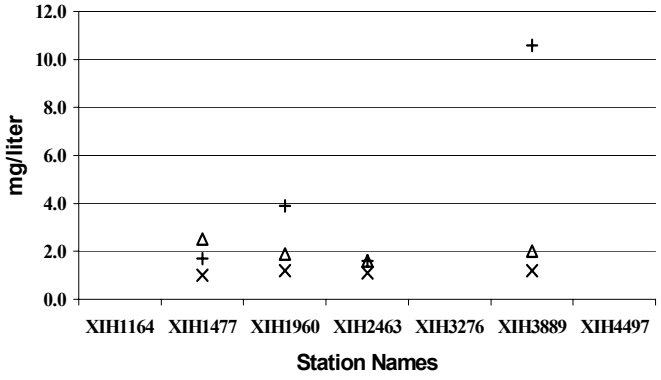
Dissolved Oxygen



Total Suspended Sediments



BOD



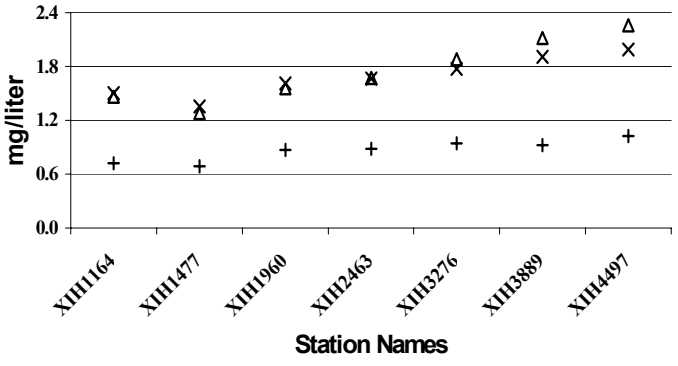
△ 8-Mar-99 × 7-Apr-99 + 5-May-99

Middle Chester River (main)

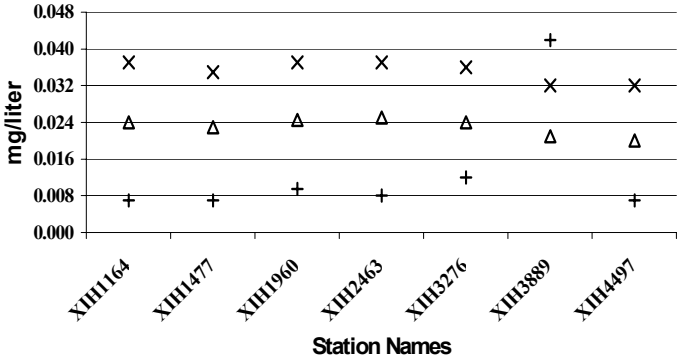
High Flow Conditions (December - May)

Stations are presented from left to right in downstream to upstream order

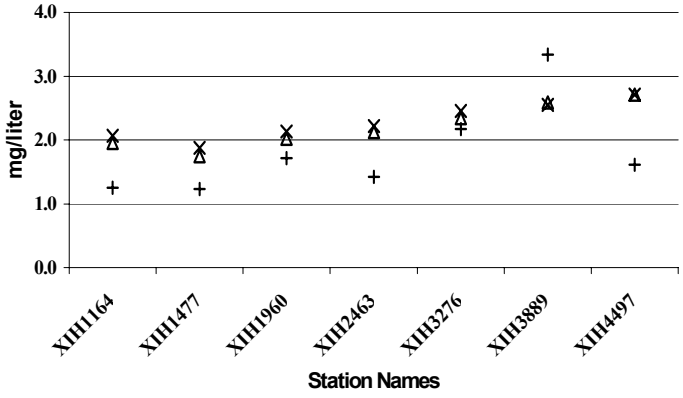
Dissolved Inorganic Nitrogen



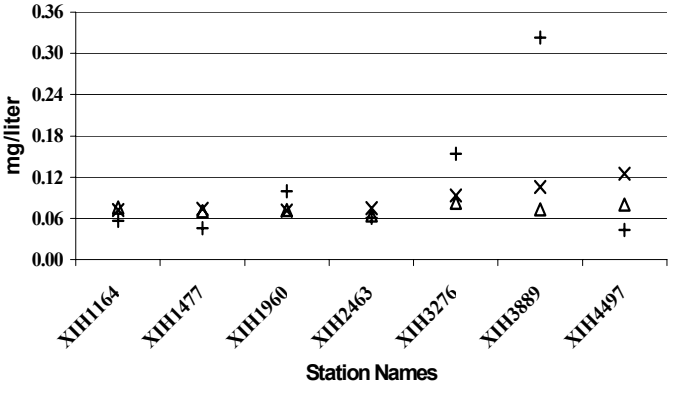
Dissolved Inorganic Phosphorus



Total Nitrogen



Total Phosphorus

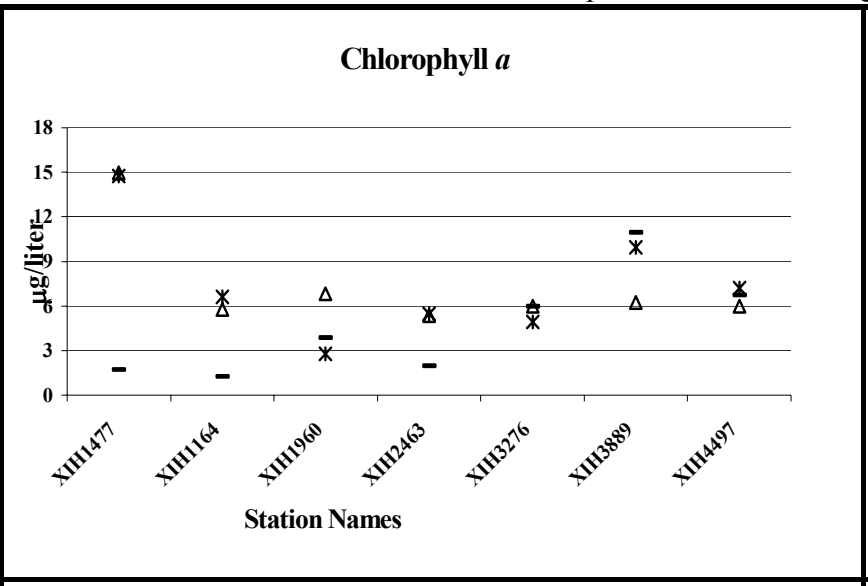


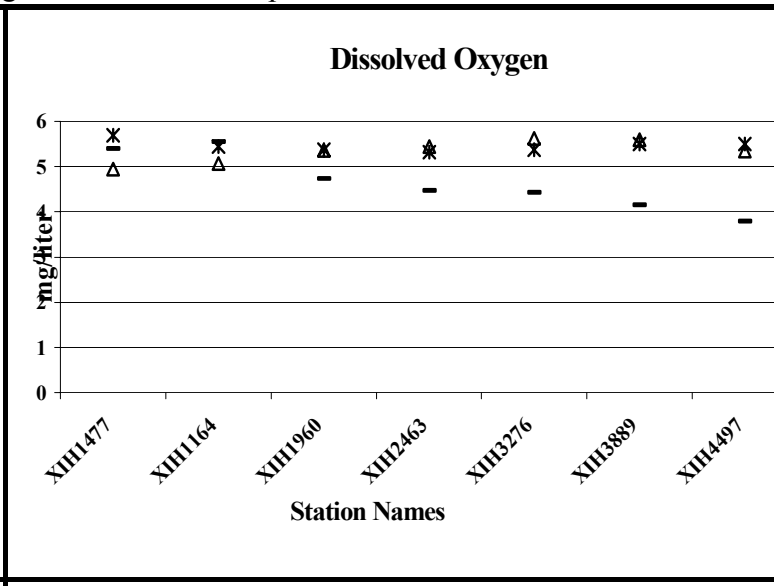
Δ 8-Mar-99 **× 7-Apr-99** **+ 5-May-99**

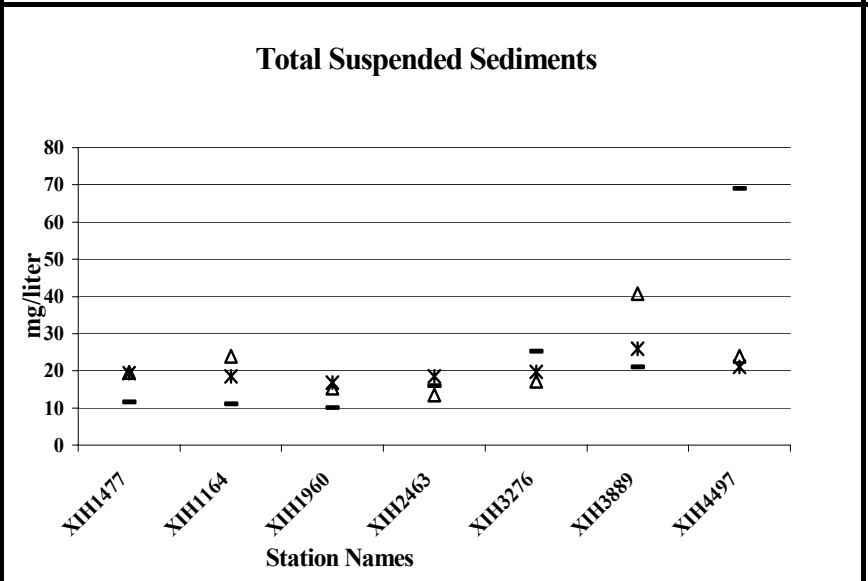
Middle Chester River (main)

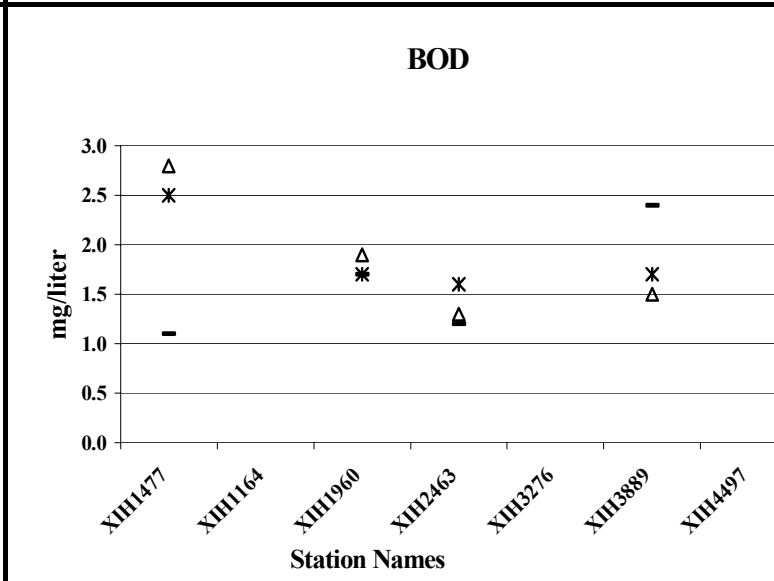
Low Flow Conditions (June - November)

Stations are presented from left to right in downstream to upstream order





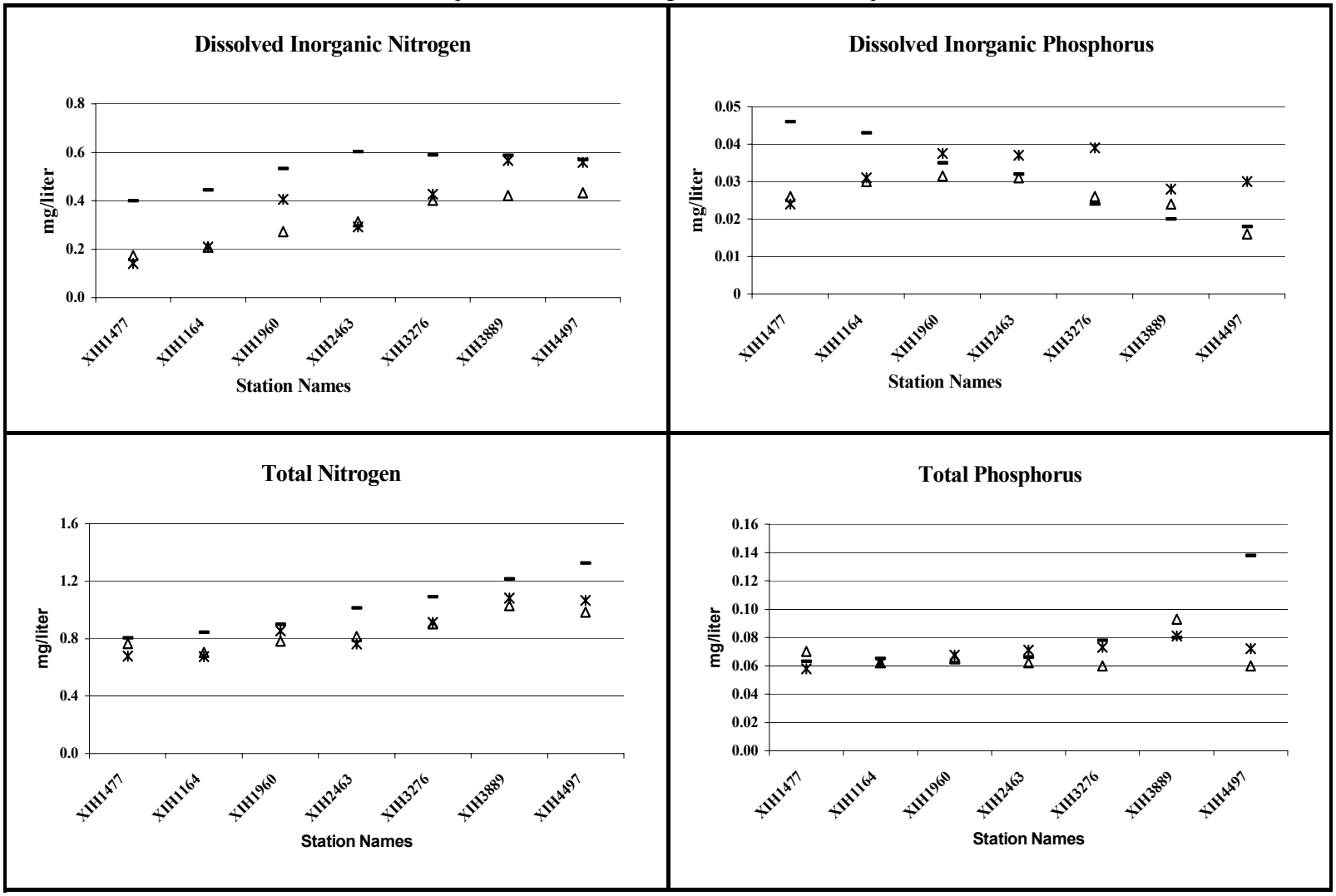




Middle Chester River (main)

Low Flow Conditions (June - November)

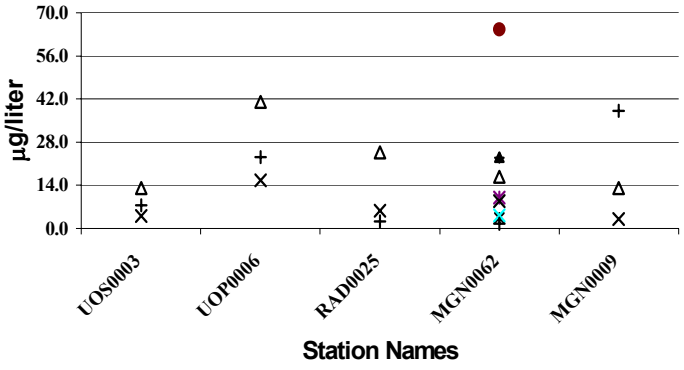
Stations are presented from left to right in downstream to upstream order

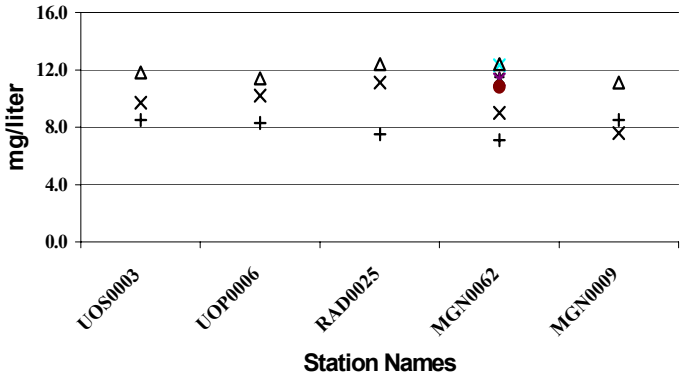


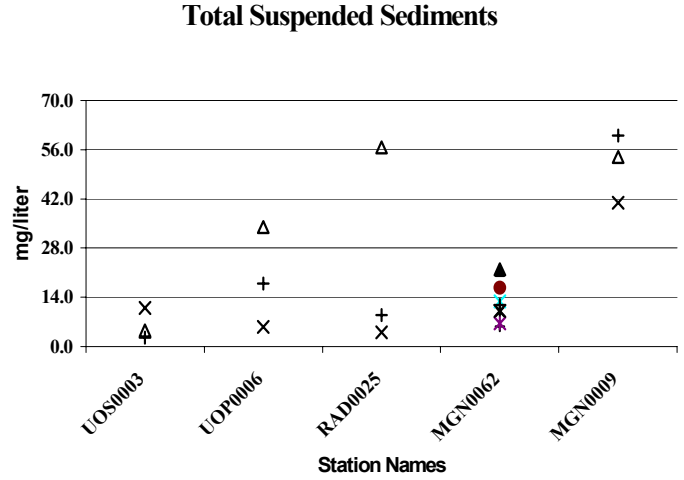
Middle Chester River (tributaries)

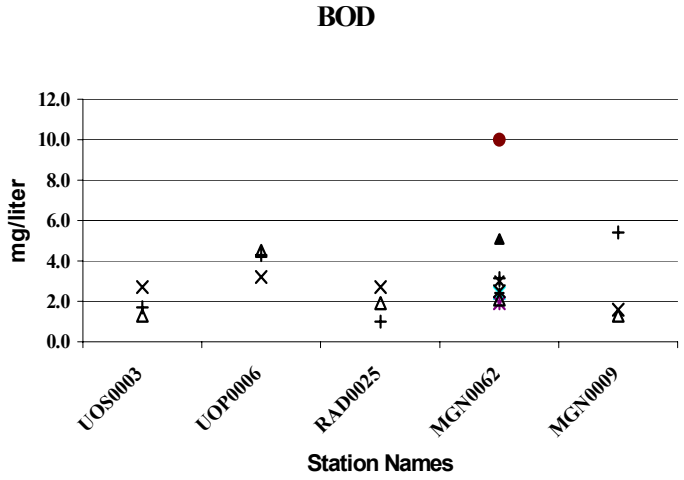
High Flow Conditions (December - May)

Stations are presented from left to right in downstream to upstream order









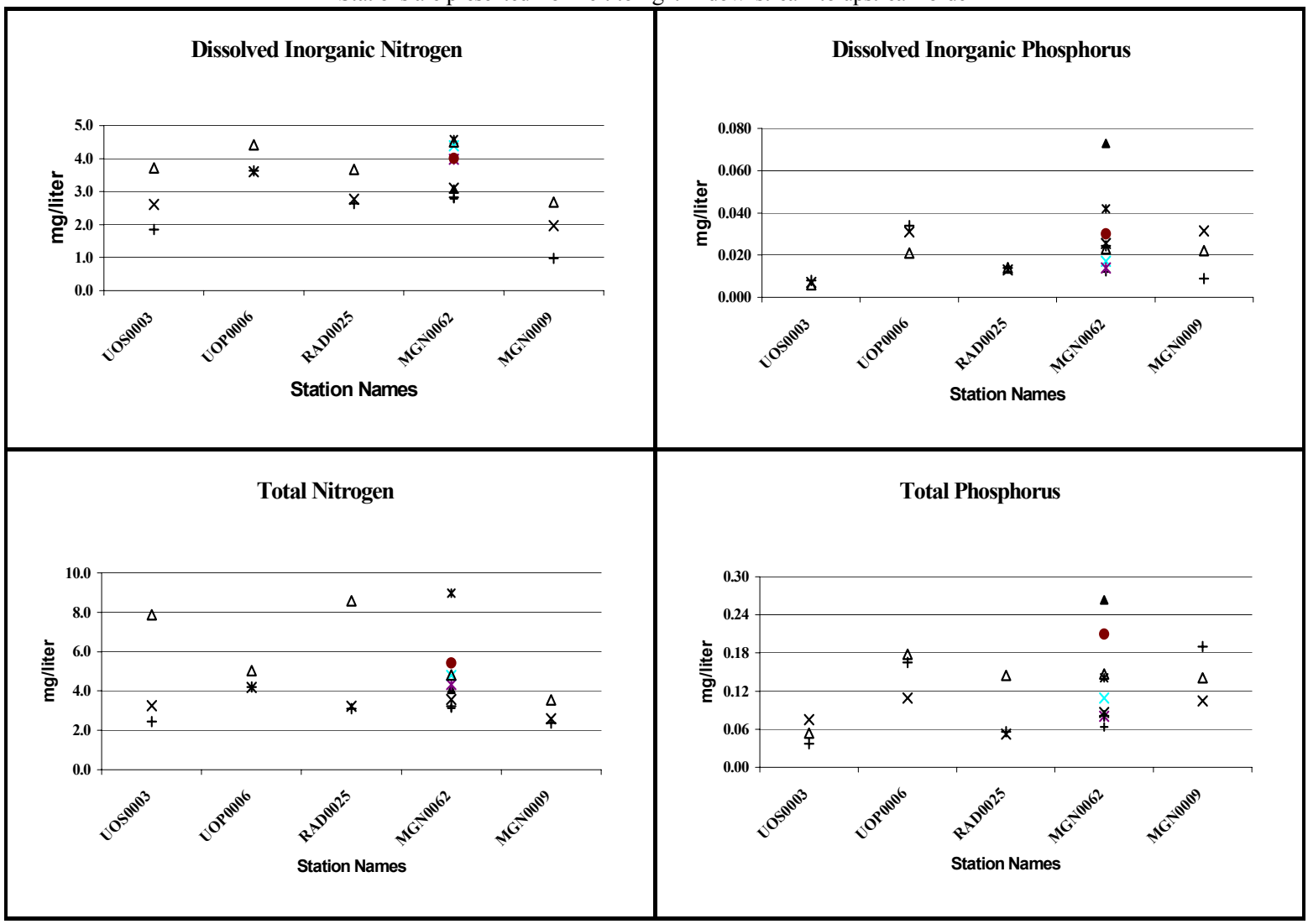
+ 2-Dec-98 * 5-Jan-99 ▲ 19-Jan-99 1-Feb-99 17-Feb-99

△ 4-Mar-99 △ 8-Mar-99 × 7-Apr-99 + 5-May-99

Middle Chester River (tributaries)

High Flow Conditions (December - May)

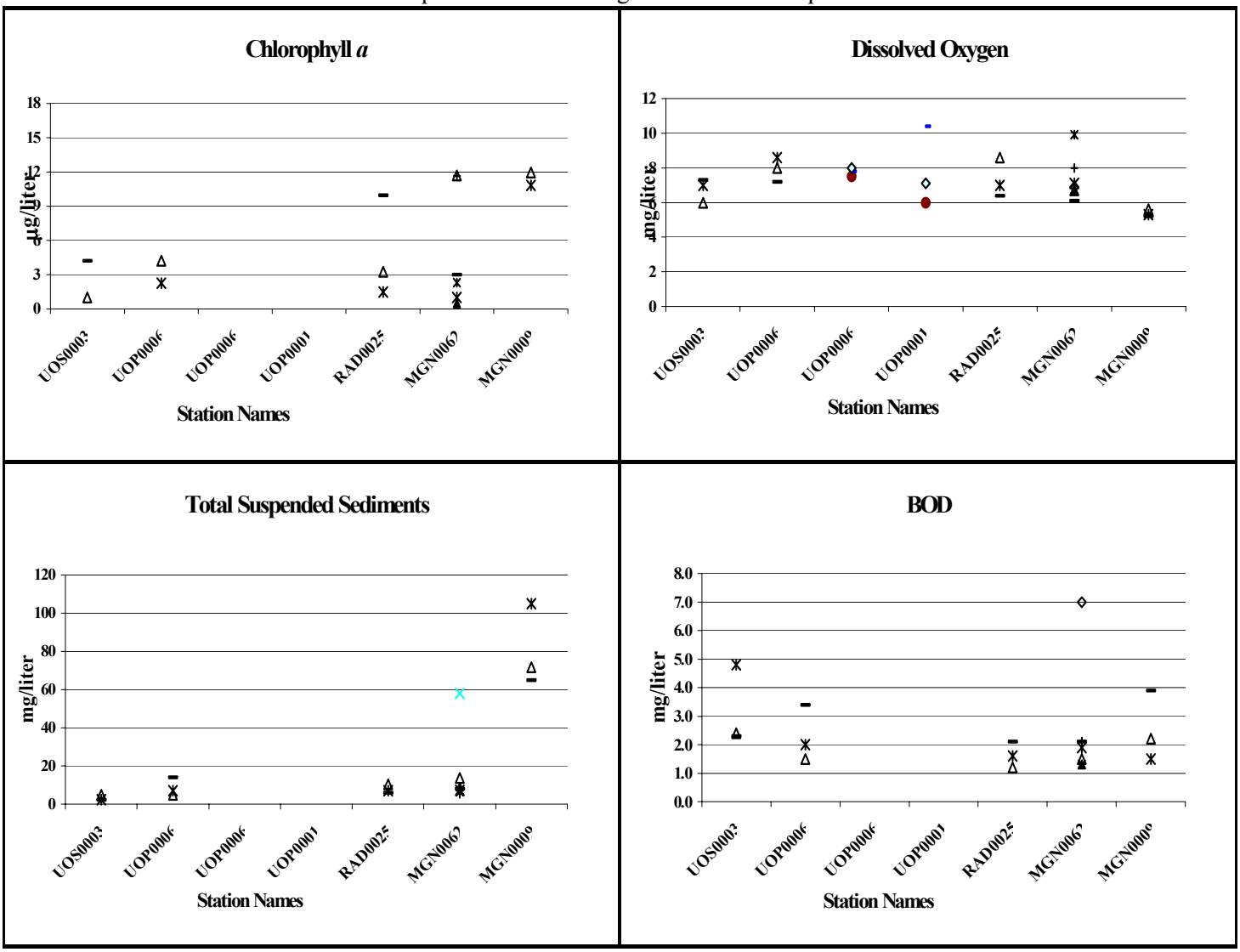
Stations are presented from left to right in downstream to upstream order



Middle Chester River (tributaries)

Low Flow Conditions (June - November)

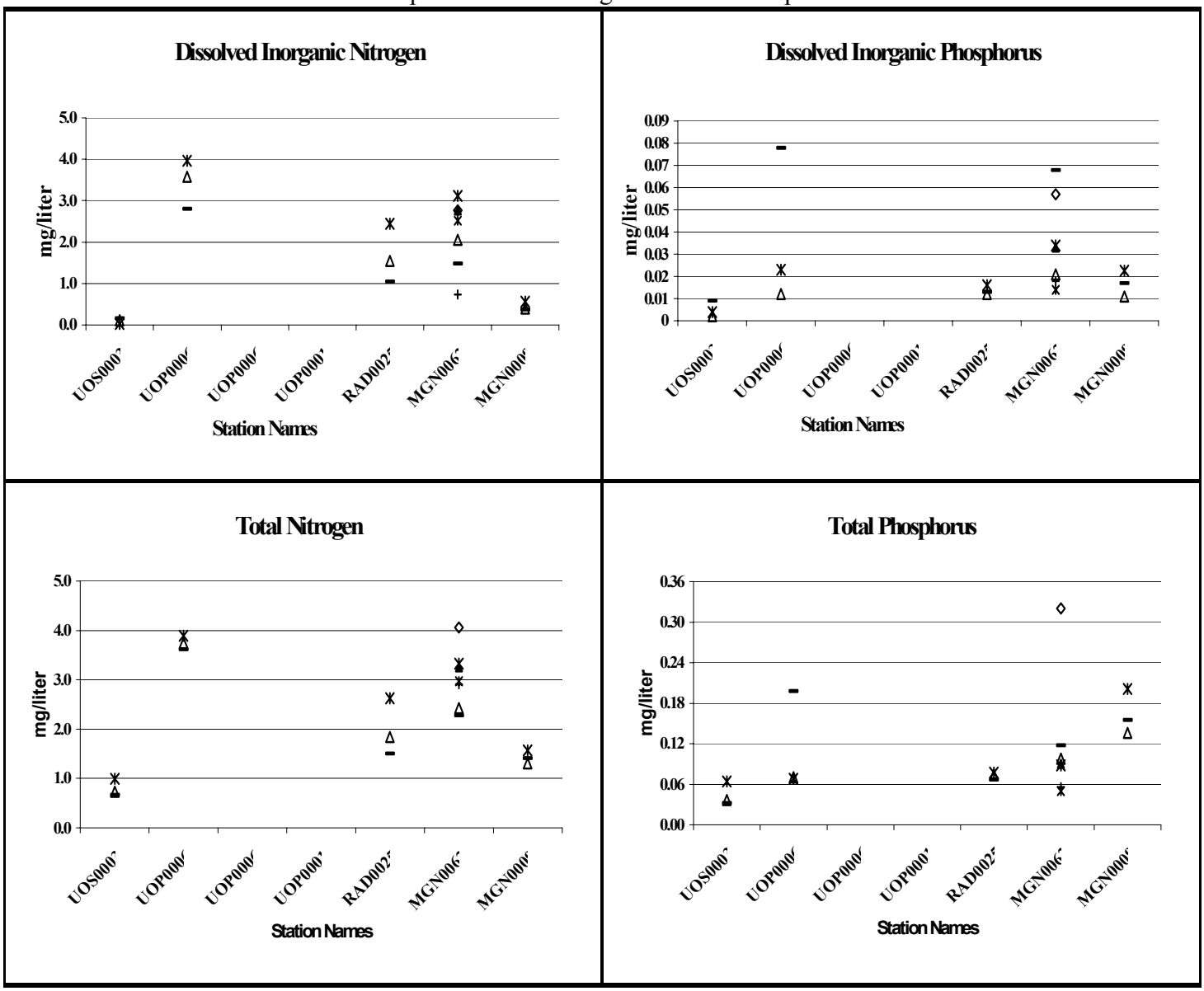
Stations are presented from left to right in downstream to upstream order



Middle Chester River (tributaries)

Low Flow Conditions (June - November)

Stations are presented from left to right in downstream to upstream order

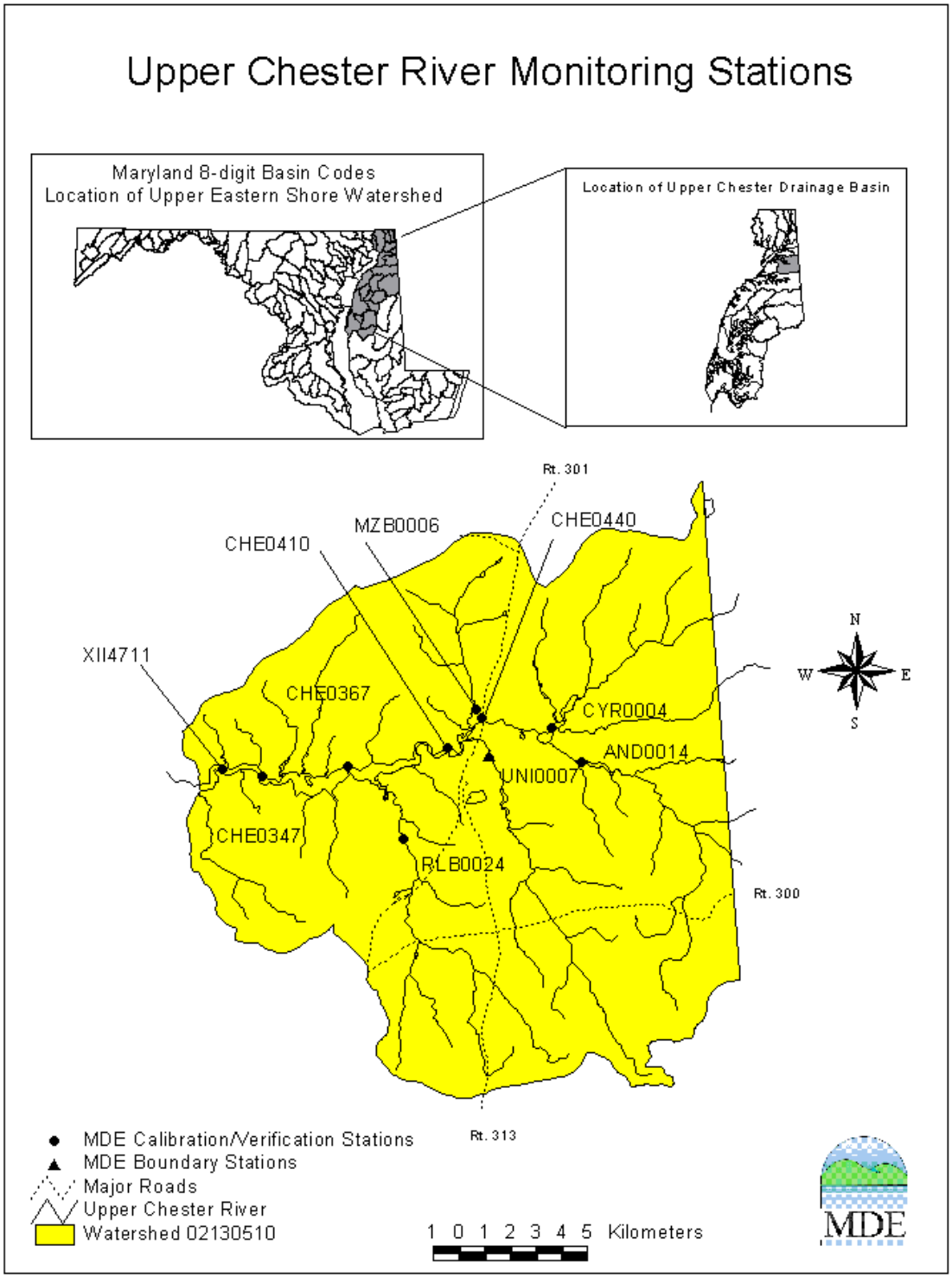


MIDDLE CHESTER RIVER
1999 TMDL STUDY STATION LIST

Station Code	Lat/Long	Description
Chester River		
XIH1477	39 10.367 76 02.330	East of GC 35.
XIH1164	39 10.976 76 03.619	Off Primrose Point. Depth – 20 ft.
XIH1960	39 11.921 76 03.988	South of sewer outfall, off Radcliff Cr. Depth – 23 ft.
XIH2463	39 12.487 76 03.636	At Route 213 bridge crossing. Depth 20 ft.
XIH3276	39 13.286 76 02.407	West of confluence with Rosin Creek. Depth – 17ft.
XIH3889	39 13.797 76 01.145	Just upstream of white boathouse. Depth – 26 ft.
XIH4497	39 14.275 76 00.184	Mid-channel off cedar house. Depth – 10 ft.
Morgan Creek		
MGN0009	39 14.067 76 02.341	Bridge crossing at Morgnec Road.
MGN0062	39 16.781 76 00.913	Bridge crossing on Perkins Hill Road (near Wallis Road intersection). USGS Gage house is back in woods, upstream.

Station Code	Lat/Long	Description
Unnamed Tribs		
UOS0003	39 16.755 76 01.472	Spillage of Urieville Community Lake at bridge crossing on Route 213
UOP0006	39 15.629 76 02.796	Take Rileys Mill Road. Turn on Mill Hollow Ln (private drive) and sample at pipe under driveway, on downstream side. Take flow downstream from bridge.
Radcliffe Creek		
RAD0025	39 13.191 76 04.848	Route 20 road crossing (near intersection of Rte 213/291).

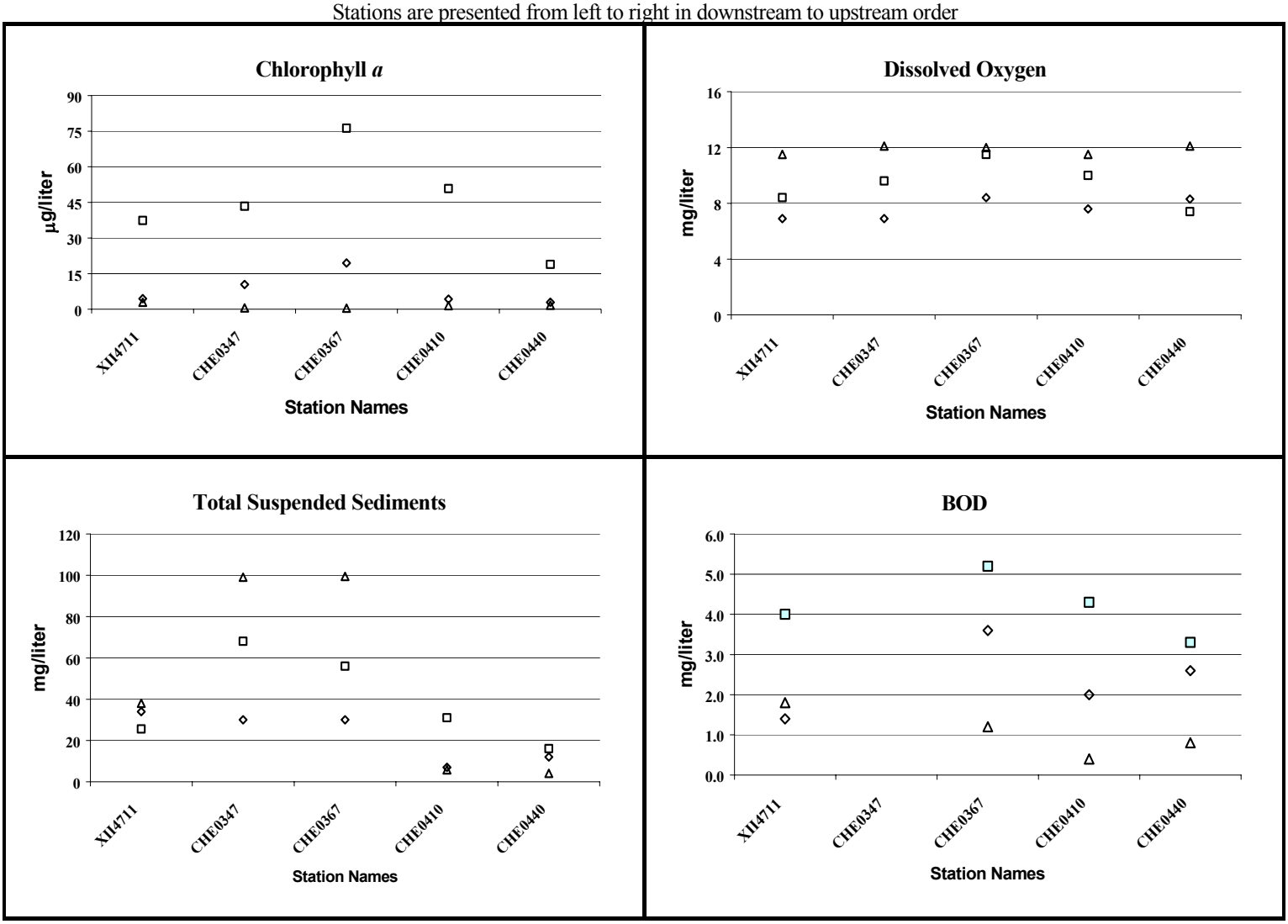
Upper Chester River



Upper Chester River (main)

High Flow Conditions (December - May)

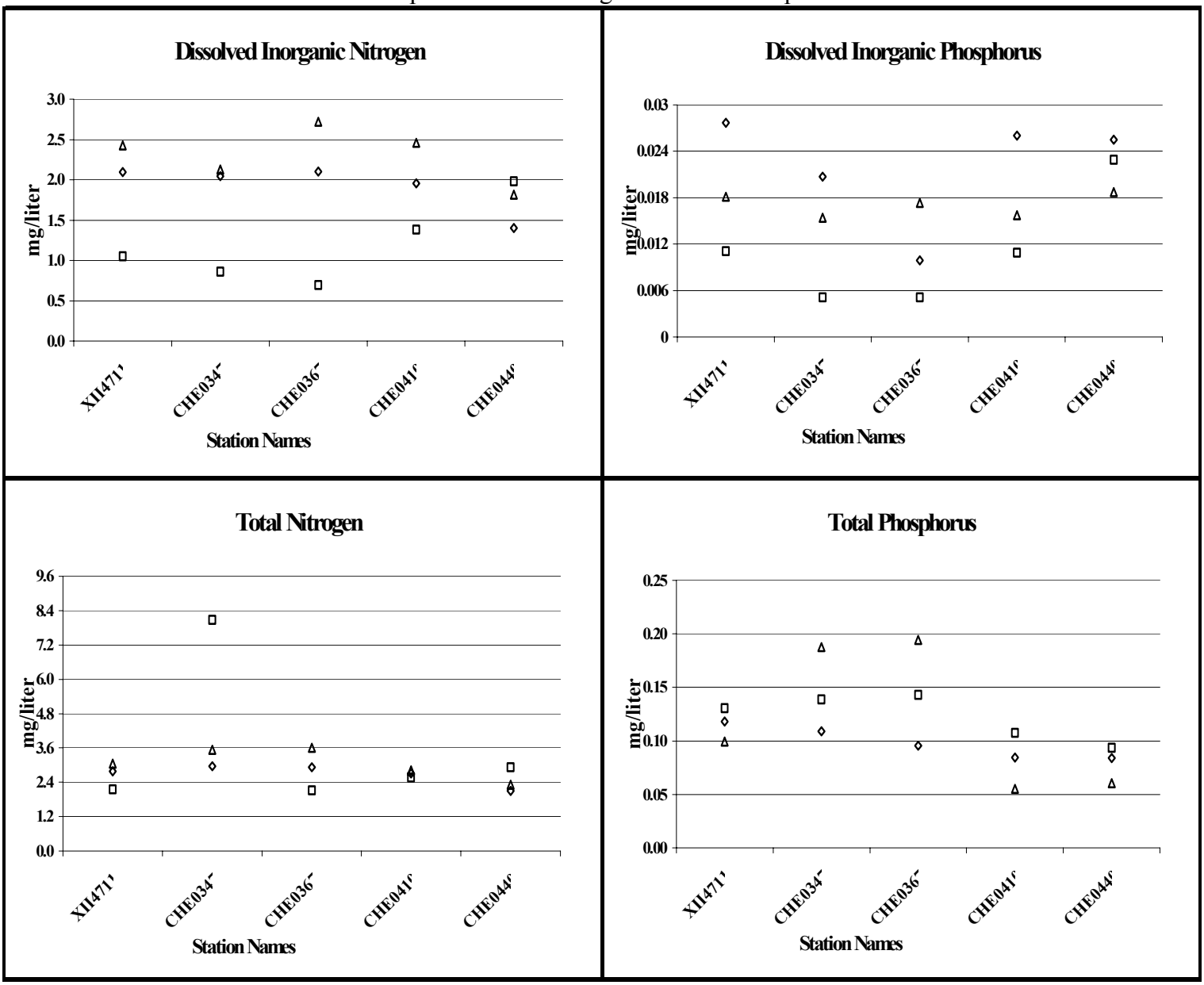
Stations are presented from left to right in downstream to upstream order



Upper Chester River (main)

High Flow Conditions (December - May)

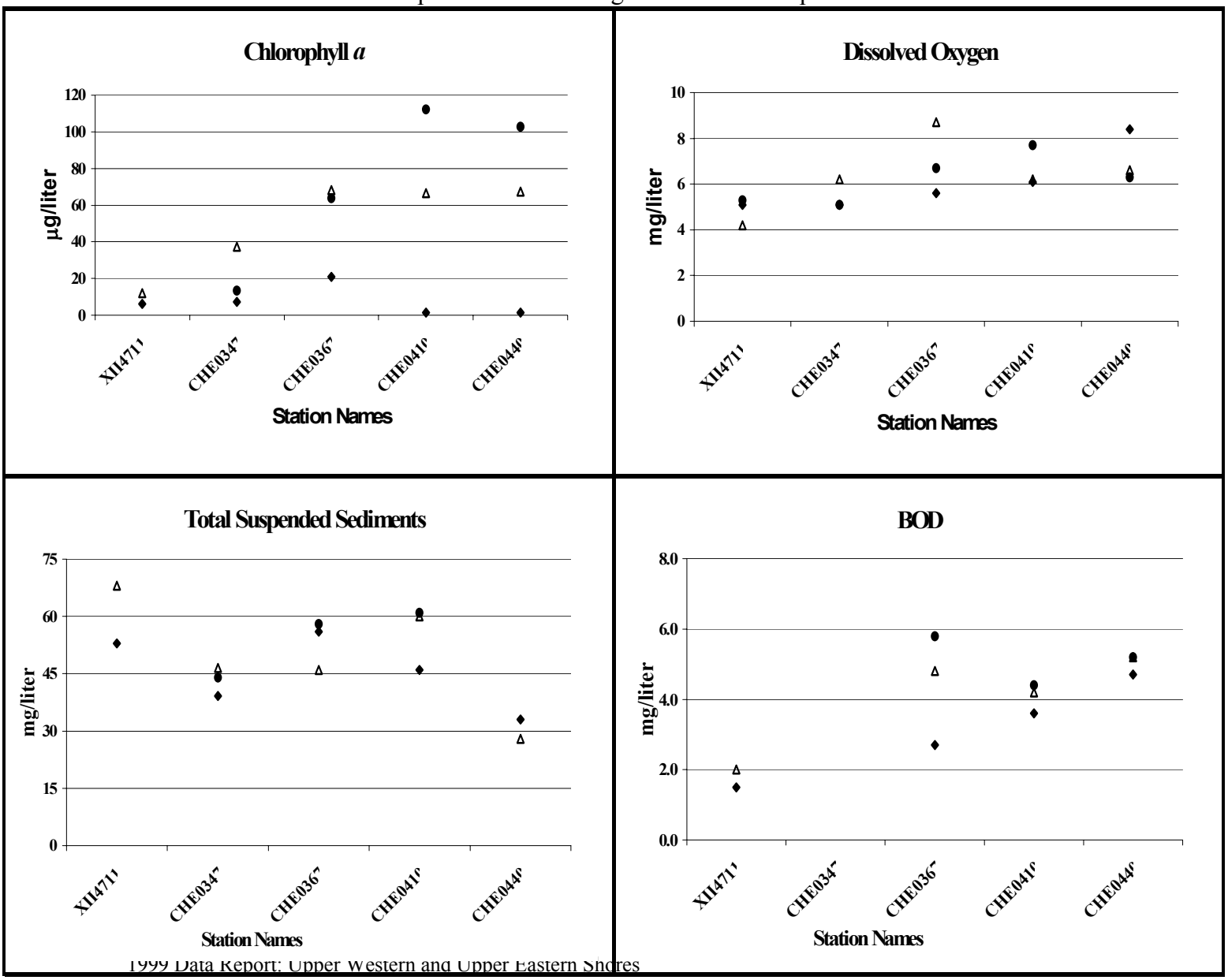
Stations are presented from left to right in downstream to upstream order



Upper Chester River (main)

Low Flow Conditions (June - November)

Stations are presented from left to right in downstream to upstream order

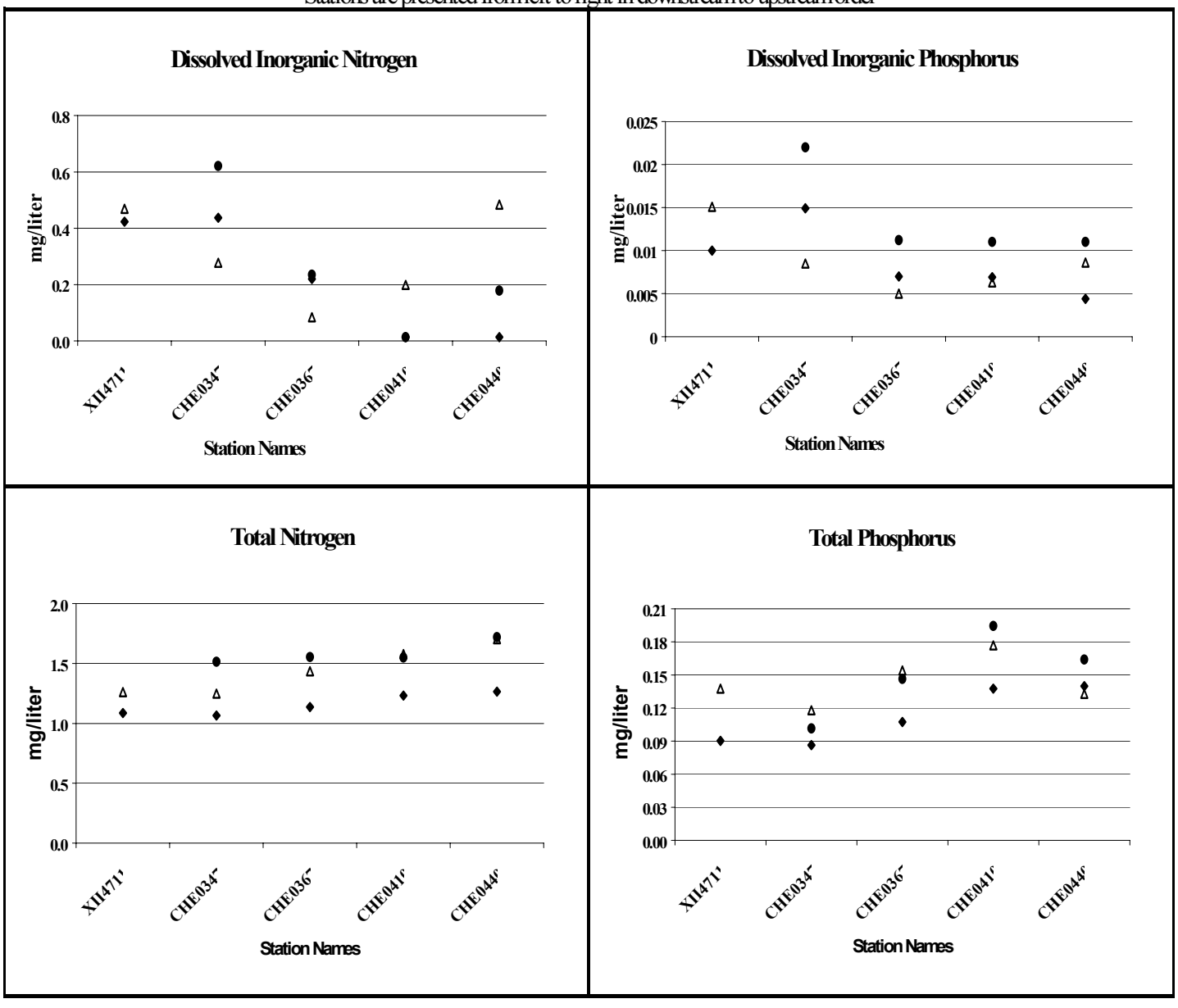


+ 29-Oct-98 ⁎ 18-Nov-98 ▲ 9-Jun-99 × 21-Jun-99 ● 14-Jul-99 ♦ 11-Aug-99 ▵ 9-Sep-99

Upper Chester River (main)

Low Flow Conditions (June - November)

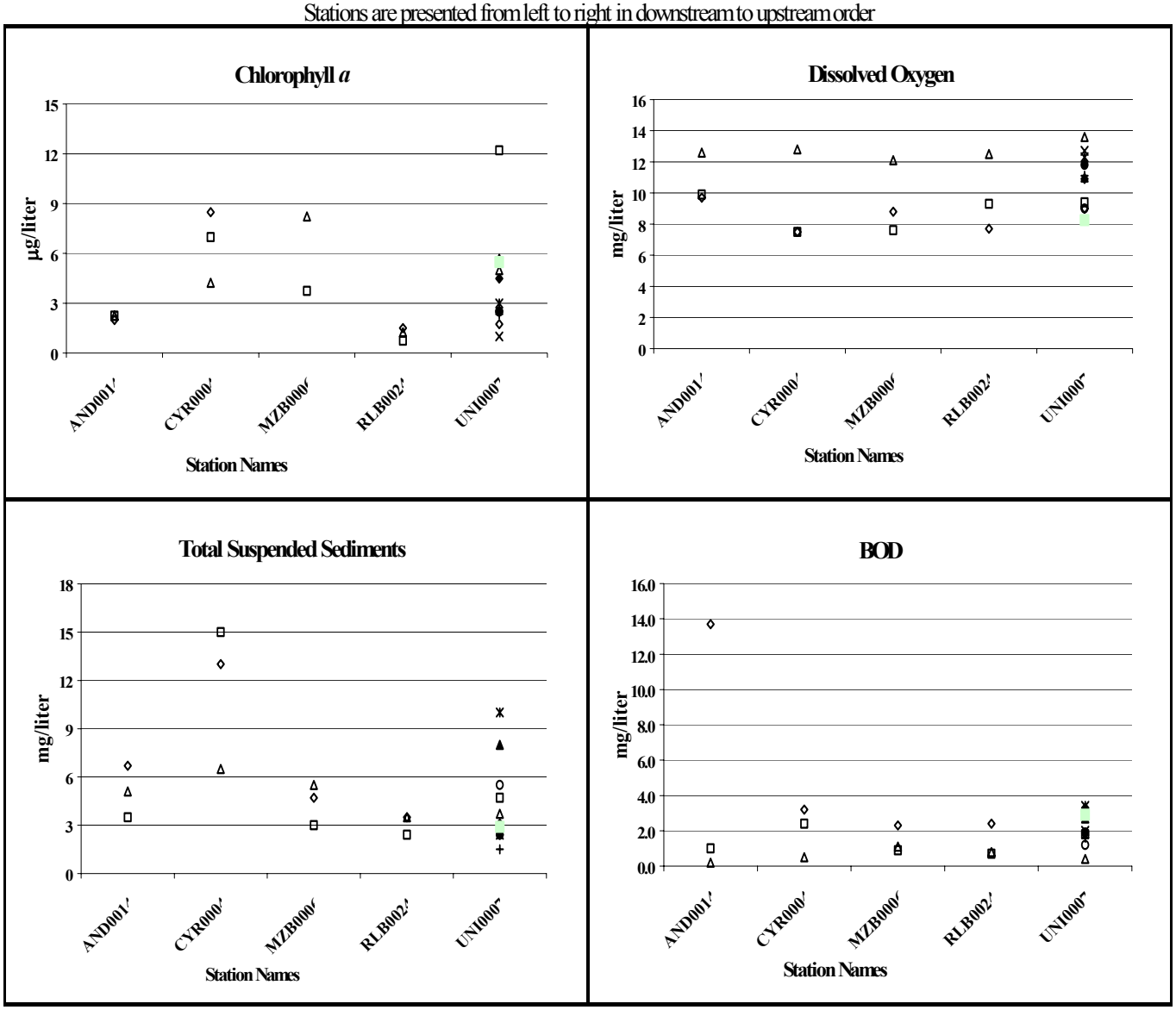
Stations are presented from left to right in downstream to upstream order



Upper Chester River (tributaries)

High Flow Conditions (December - May)

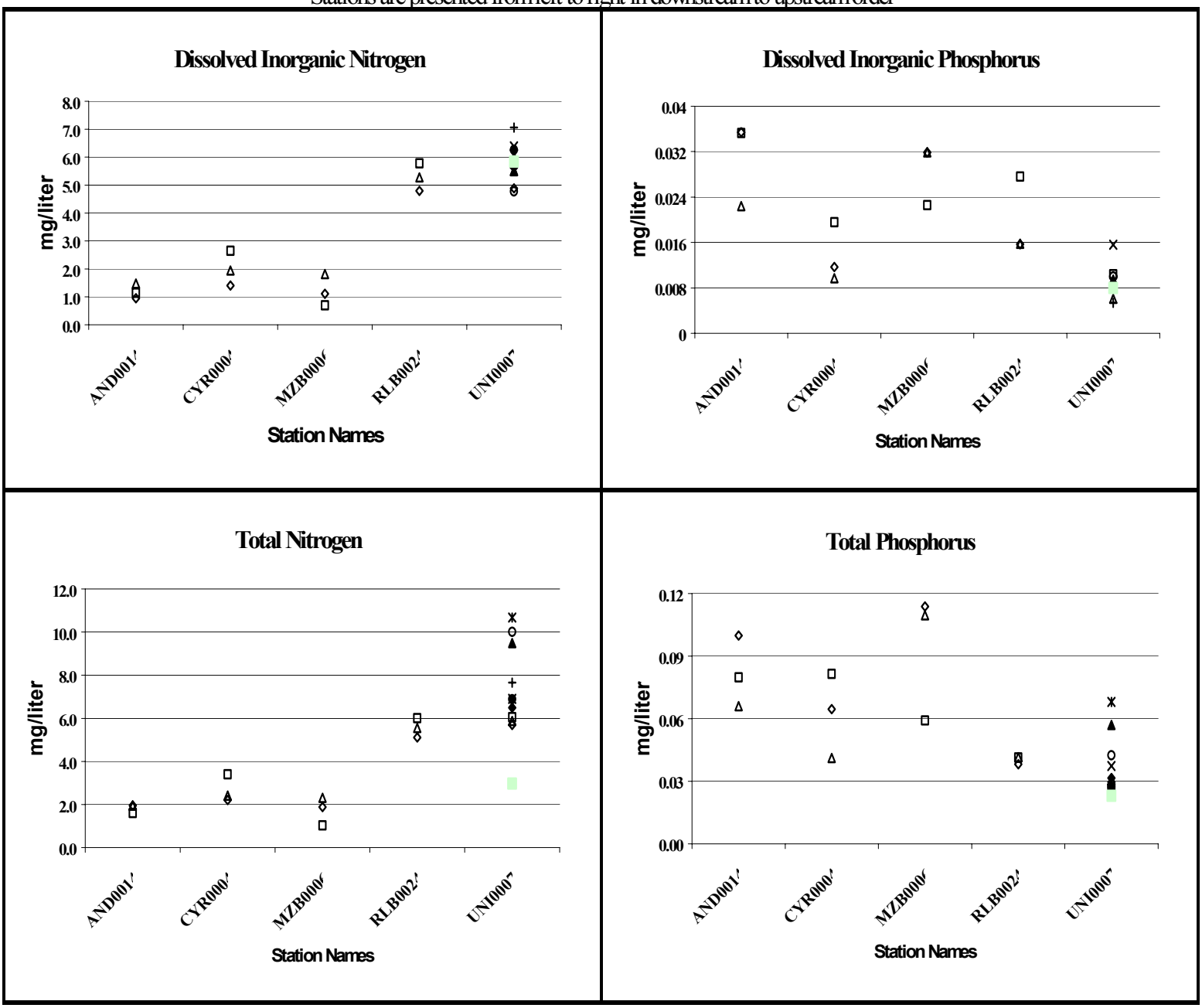
Stations are presented from left to right in downstream to upstream order



Upper Chester River (tributaries)

High Flow Conditions (December - May)

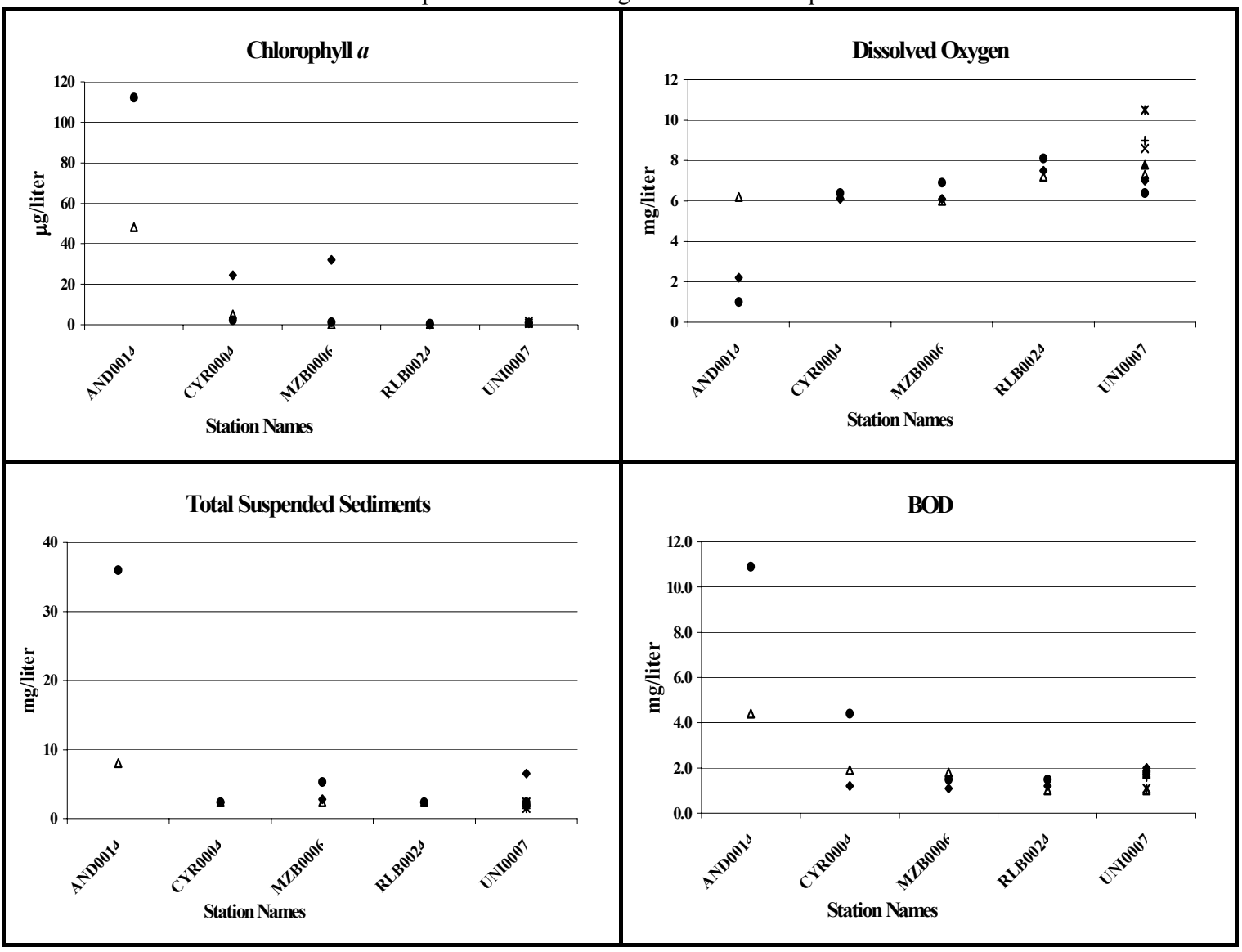
Stations are presented from left to right in downstream to upstream order



Upper Chester River (tributaries)

Low Flow Conditions (June - November)

Stations are presented from left to right in downstream to upstream order

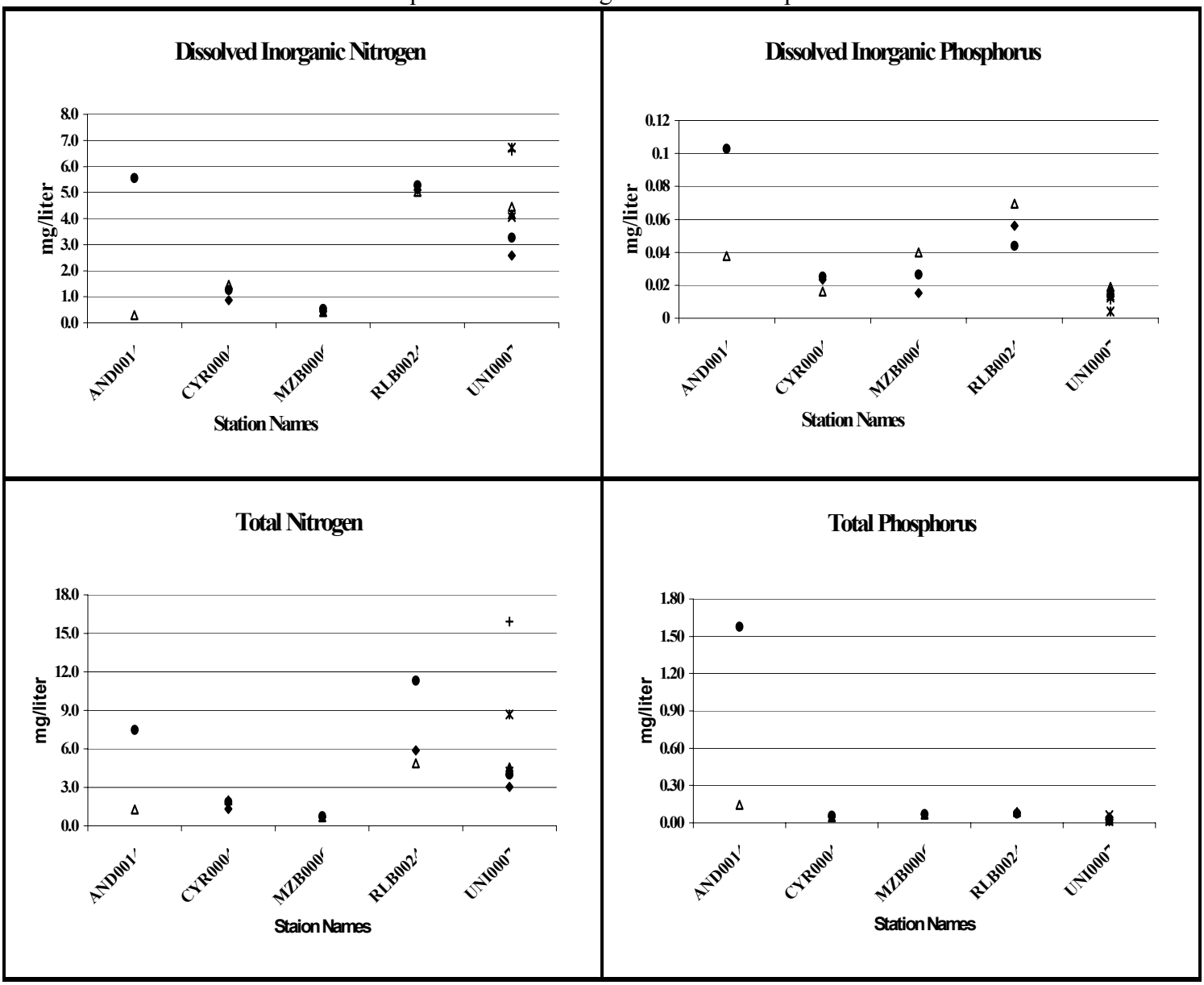


+ 29-Oct-98 x 18-Nov-98 ▲ 9-Jun-99 × 21-Jun-99 ● 14-Jul-99 ♦ 11-Aug-99 △ 9-Sep-99

Upper Chester River (tributaries)

Low Flow Conditions (June - November)

Stations are presented from left to right in downstream to upstream order



+ 29-Oct-98 x 18-Nov-98 ▲ 9-Jun-99 × 21-Jun-99 ● 14-Jul-99 ♦ 11-Aug-99 △ 9-Sep-99

UPPER CHESTER RIVER
1999 TMDL STUDY STATION LIST

Station Code	Lat/Long	Description
Chester River		
XII4711	39 14.754 75 58.941	Mid-stream above major point off small brown house. Depth 15 ft.
CHE0347	39 14.445 75 57.608	Boat ramp at the end of Deep Landing Road. Tidal – collected from land.
CHE0367	39 14.733 75 55.487	Bridge crossing on Route 290. Tidal - collected from land.
CHE0410	39 15.105 75 52.803	At the end of Shadding Reach Road, go through gate into trailer park and follow road to pier. Need to call Corky at 1-410-928-3601 to open gate.
CHE0440	39 15.713 75 51.875	Chester River at Route 301 crossing (near Millington). Go to River Park Road off 291. Go to end of dirt road, take fork to left and take sample at ramp at the end of road.
Red Lion Branch		
RLB0024	39 13.188 75 53.995	Road crossing at Red Lion Branch Road. Try to get flow downstream – may need chest waders.
Unicorn Branch		
UNI0007	39 14.945 75 51.683	At Route 313 crossing, below Unicorn Pond. USGS Gage.
Andover Sewell Branch		
AND0014	39 14.765 75 49.188	Sample at Peacock Corner Road, below Jones Lake.
Cypress Branch		
CYR0004	39 15.471 75 49.962	At Route 291 road crossing, below Little Mill Pond and Big Mill Pond
Mills Branch		
MZB0006	39 15.892 75 52.011	Route 291 road crossing.