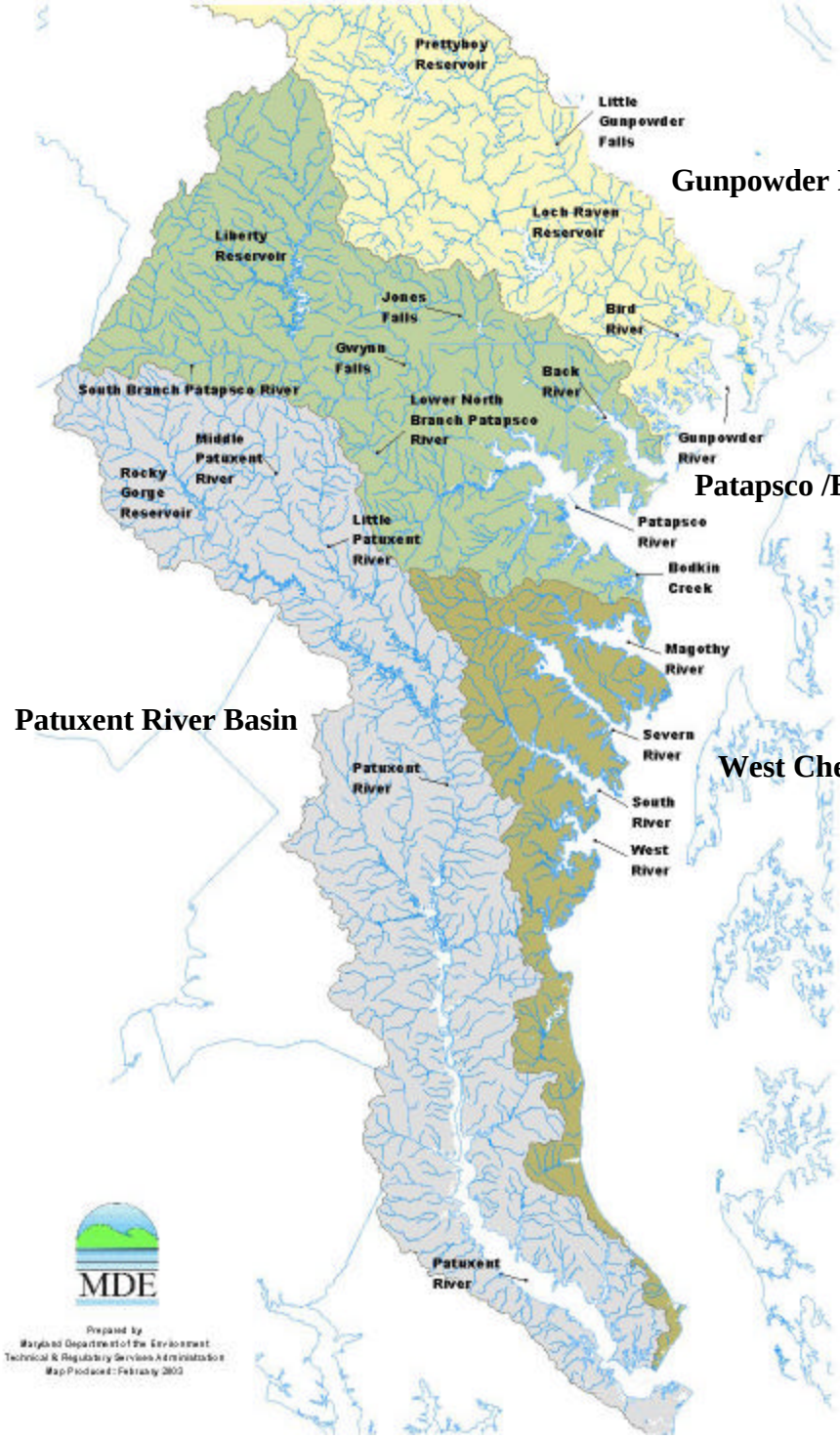
2000 Data Report
Gunpowder River, Patapsco/Back River
West Chesapeake Bay and Patuxent River Watersheds



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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 2000 from Maryland's Upper And Lower Western Shores, Patapsco/Back and Patuxent River Basins.

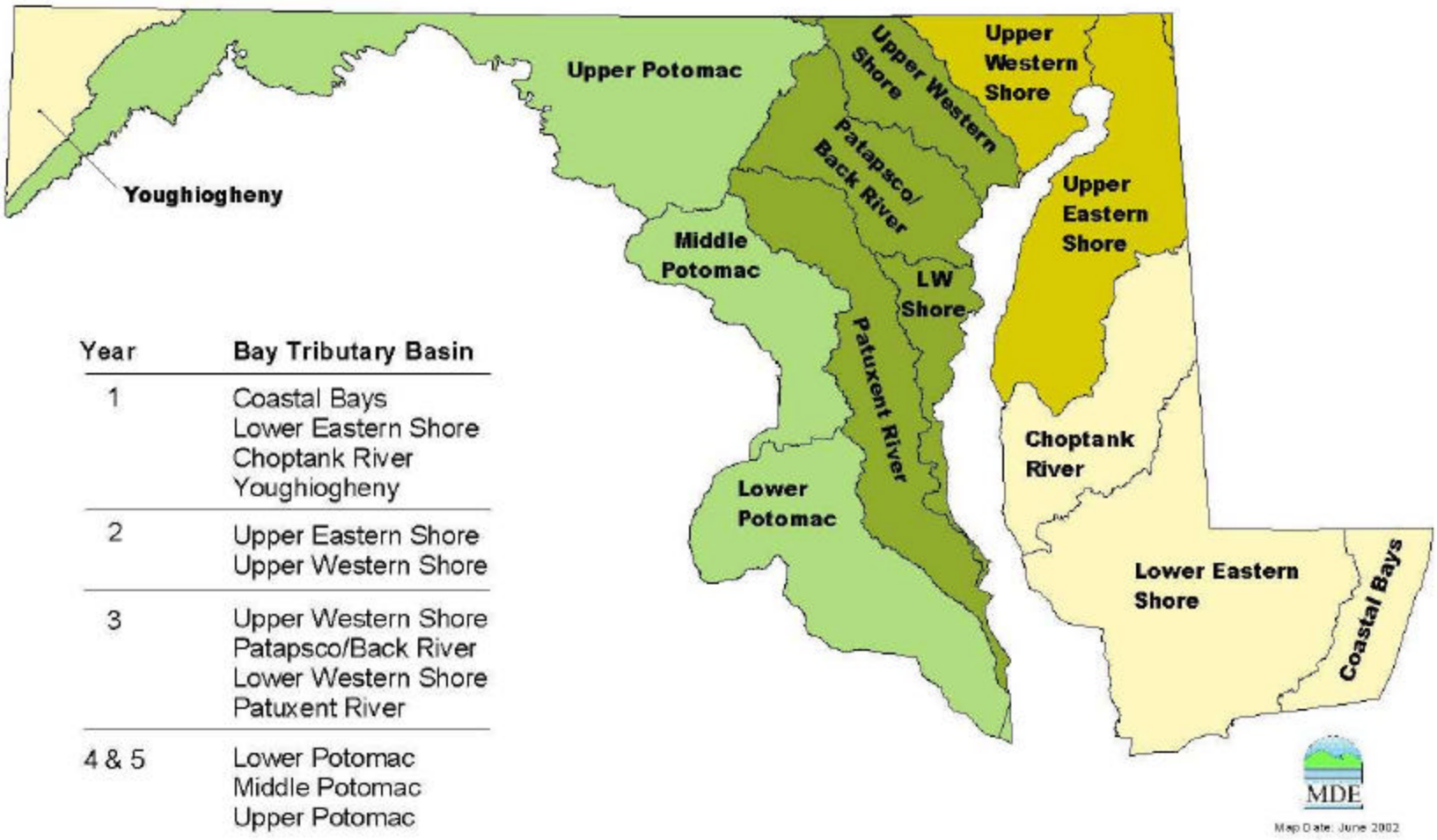
Maryland's Watershed Cycling Strategy

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 20% of the State at any given time increasing resource efficiency and water quality evaluation intensity.

In each region, MDE collects water quality data for three wet periods (March, April, May) and three dry periods (July, August, September) for use 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).

The State's 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

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

Report Organization

The report is organized by geographic region delineated by four major drainage basins. The Upper Western Shore drainage basin consists of the Gunpowder River, Lower Gunpowder Falls, Bird River, Little Gunpowder Falls and Middle River-Browns. The Patapsco River/Back drainage basin consists of Back River, Bodkin Creek, Baltimore Harbor, Jones and Gwynn Falls, Patapsco River Lower and North Branch, Liberty Reservoir and South Branch Patapsco. The Lower Western Shore drainage basin consists of the Magothy, Severn, South and West Rivers. And the Patuxent drainage basin consists of the Patuxenet River Middle, Western Branch and the Patuxent River Upper, the Little and Middle Patuxent Rivers, and the Rocky Gorge and Brighton Dams. (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 mainstem 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. The data available in STORET at http://www.epa.gov/storet.

Gunpowder River Watershed

Gunpowder River

Lower Gunpowder Falls

Bird River

Little Gunpowder Falls

Middle River - Browns

Gunpowder River Sub-Basin
(Sub-basin 02-13-08)

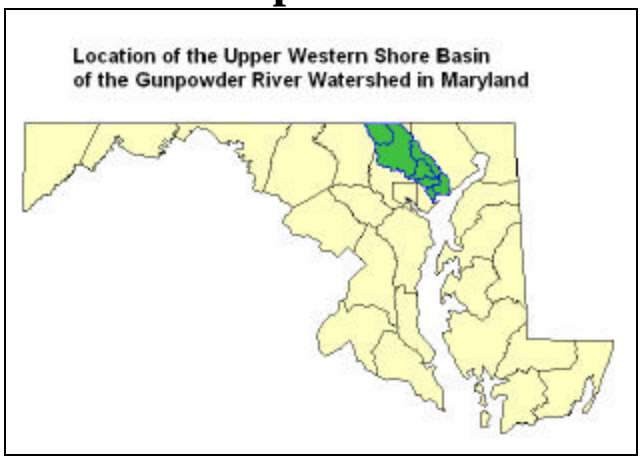
General Description (from 1998, 305 (b) Report)
Water quality at the ambient water quality monitoring stations on the non-tidal Gunpowder River above and below Prettyboy and Loch Raven Reservoirs and water quality data from the MBSS program showed that water quality criteria were not exceeded and no use impairments were noted.

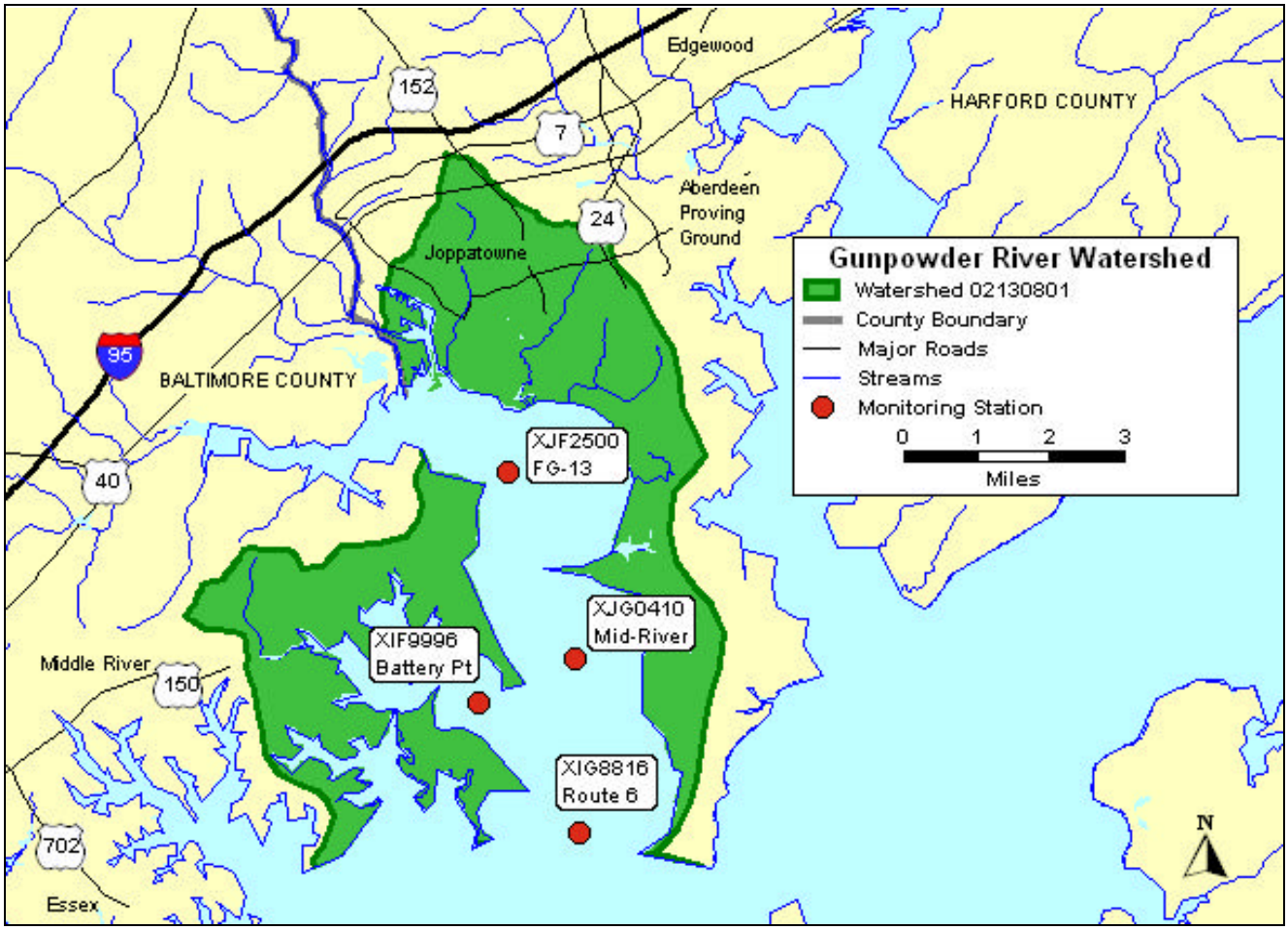
Two areas of use impairment were reported in the estuarine portion of the Bush River watershed. The Baltimore County Health Department reported on a three-month long closure in the Miami Beach/Bowley's Quarters area of Middle River because of excessive bacterial levels due to high waterfowl densities in the area. A study of ambient toxicity in Middle River identified nickel and copper as the source of impacts observed near Wilson Point.

There are two significant, publicly-owned impoundments in this basin, both of which are part of a drinking water supply reservoir for the Baltimore metropolitan area. Loch Raven Reservoir (2,400.0 acres) and Prettyboy Reservoir (1,500.0 acres) are located on the mainstem Gunpowder River. Both reservoirs are listed as having some partial use impairment as a result of low oxygen levels in the deeper portions of these lakes. The source of the hypoxic conditions there is considered to be a result of accelerated eutrophication due to nutrients entering the lake from the watershed (source unknown) and excessive sediment-oxygen demand by bacteria in the organic-rich sediments.

Water Quality Summary
Nutrient impairments to water quality in the Lower Gunpowder Falls (02130802), the Little Gunpowder Falls (02130804) and the Gunpowder River will be addressed at a future date. Middle River-Browns (02130807) will be addressed by a cooperative effort by the Bay States, with the EPA Chesapeake Bay Program taking the lead. A Water Quality Analysis indicating no nutrient impairments in the Bird River (02130803) received a concurrence from EPA on May 5, 2005.

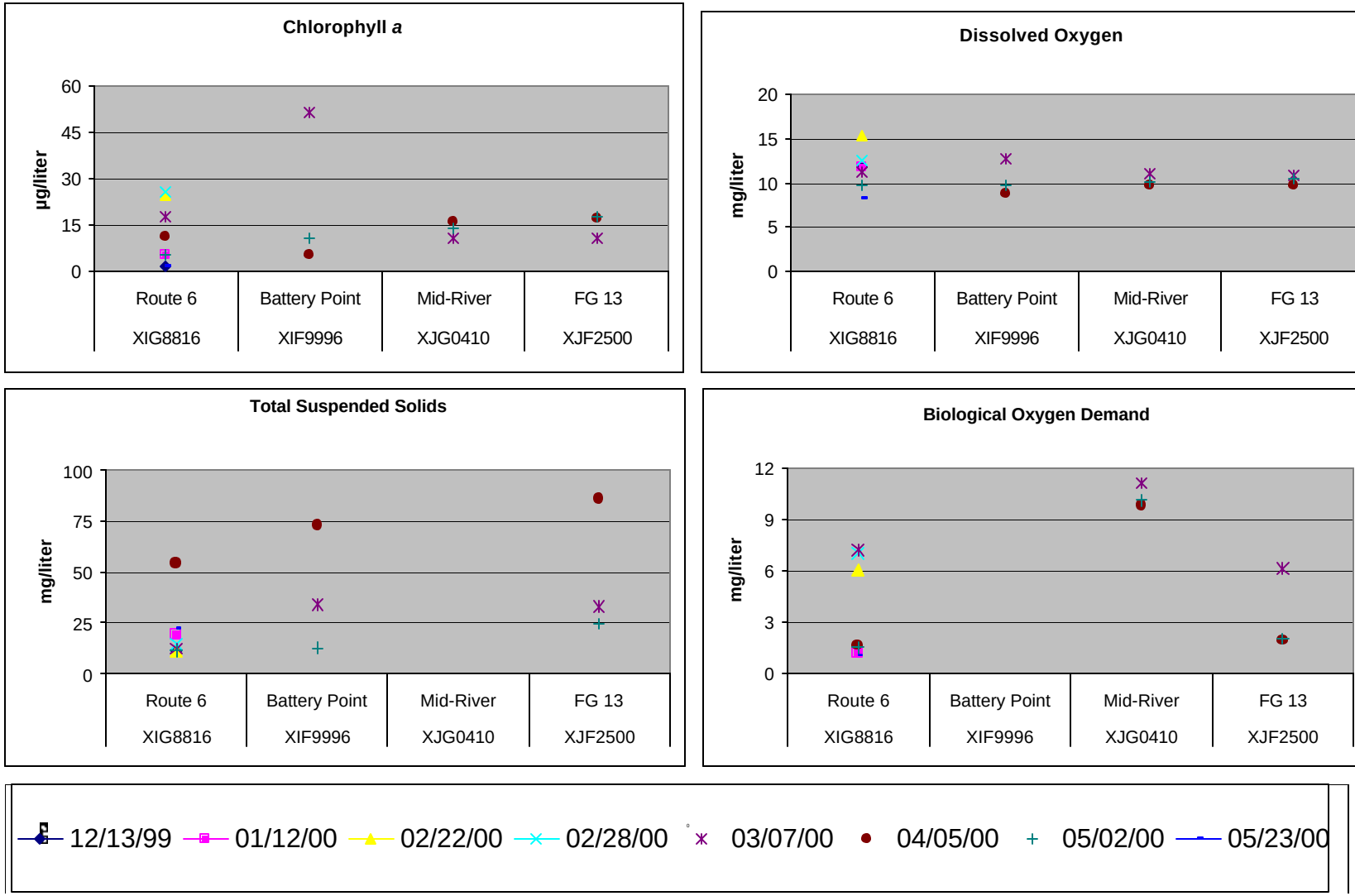
Gunpowder River Monitoring Stations





Map Prepared by the Maryland Department of the Environment
Science Services Administration
Montgomery Park Business Center
1800 Washington Boulevard, Suite 540
Baltimore, Maryland 21230-1718

Gunpowder River
High Flow Conditions (December-May)
Stations are presented from left to right from downstream to upstream



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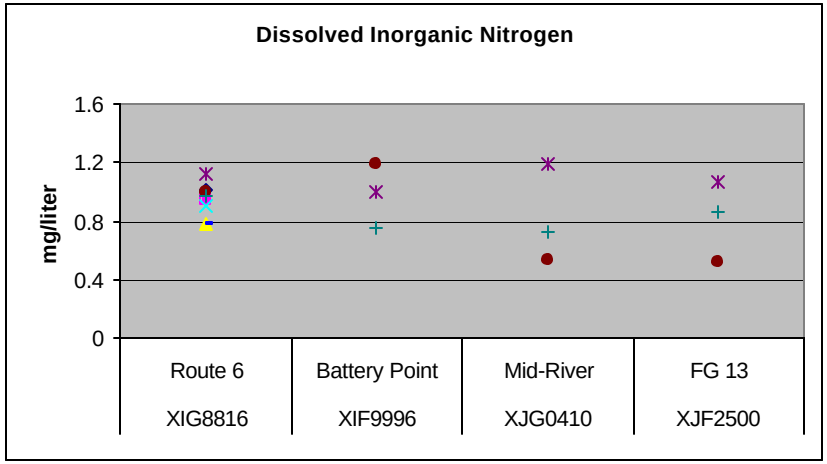

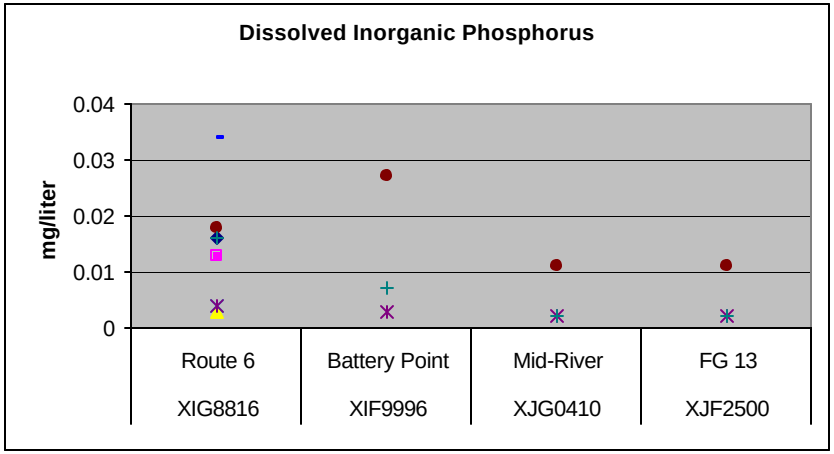

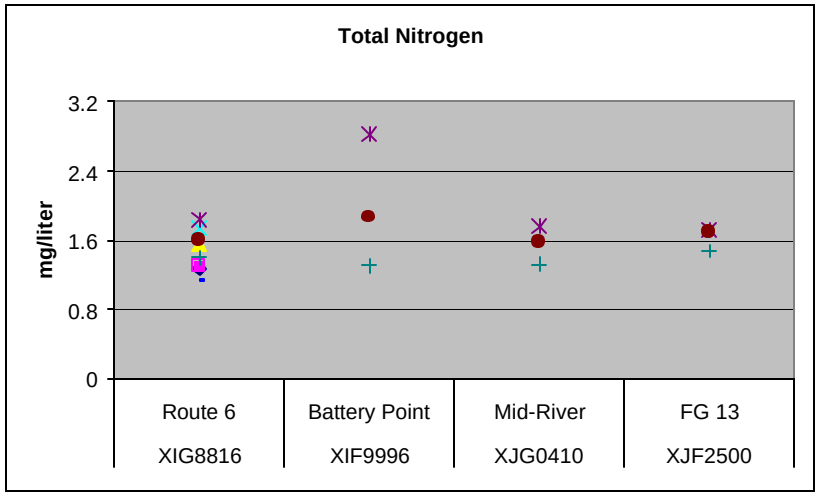

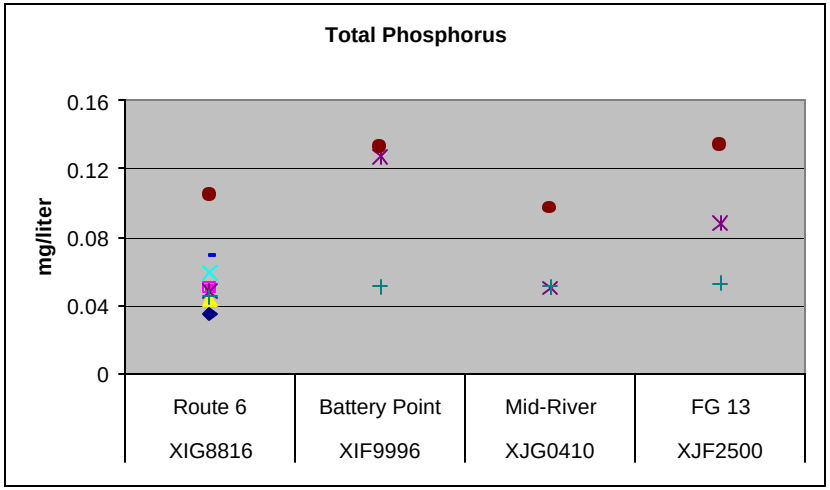

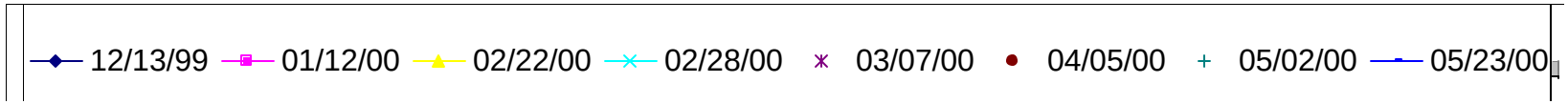

Gunpowder River
Low Flow Conditions (June to November)
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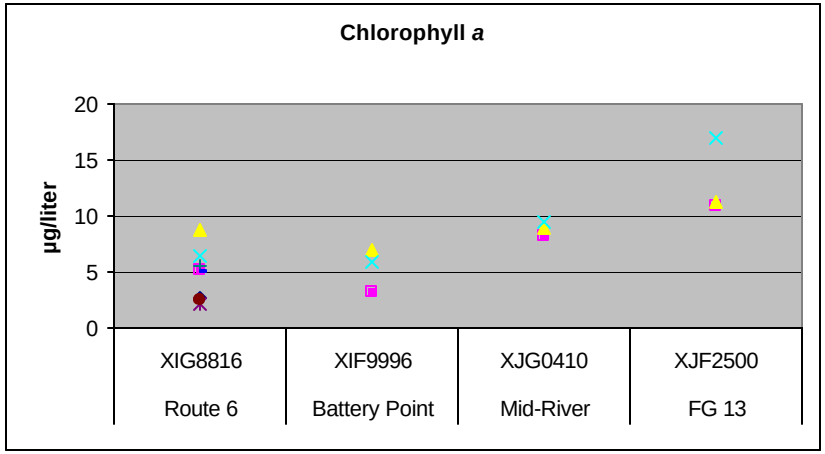

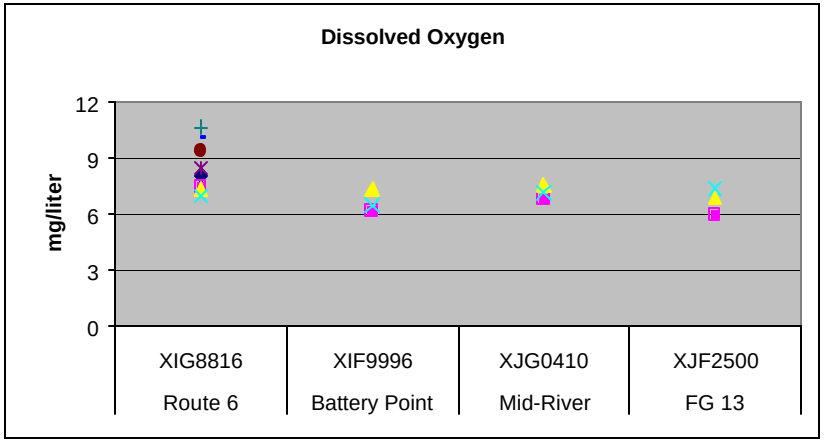

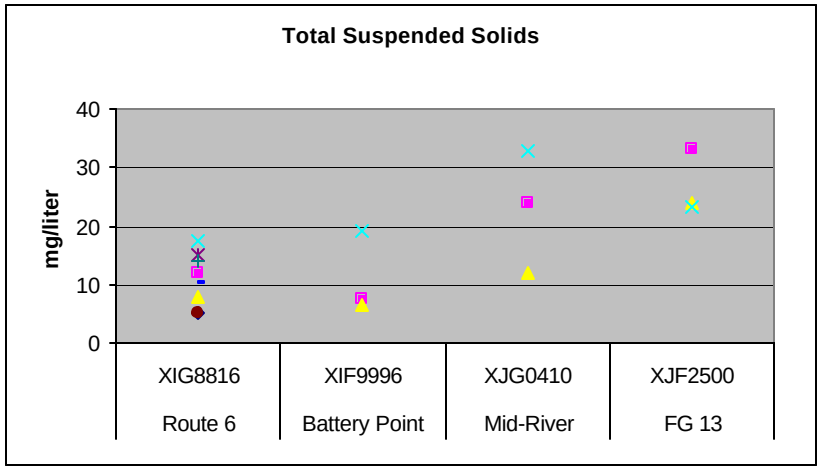

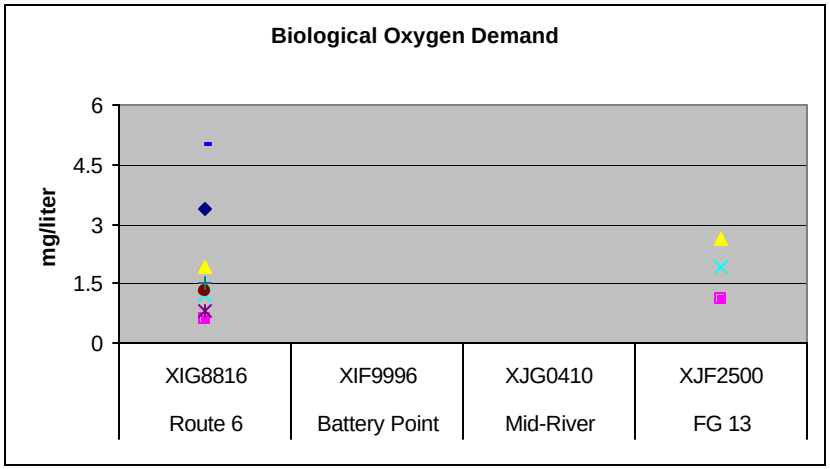

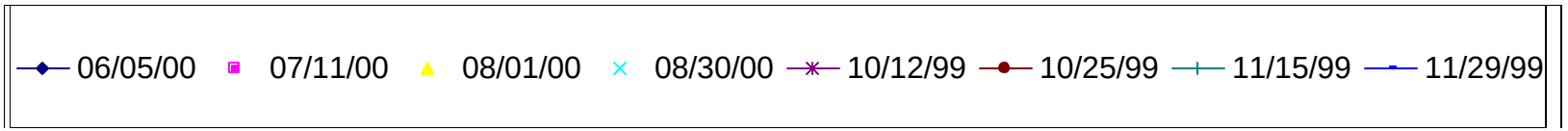

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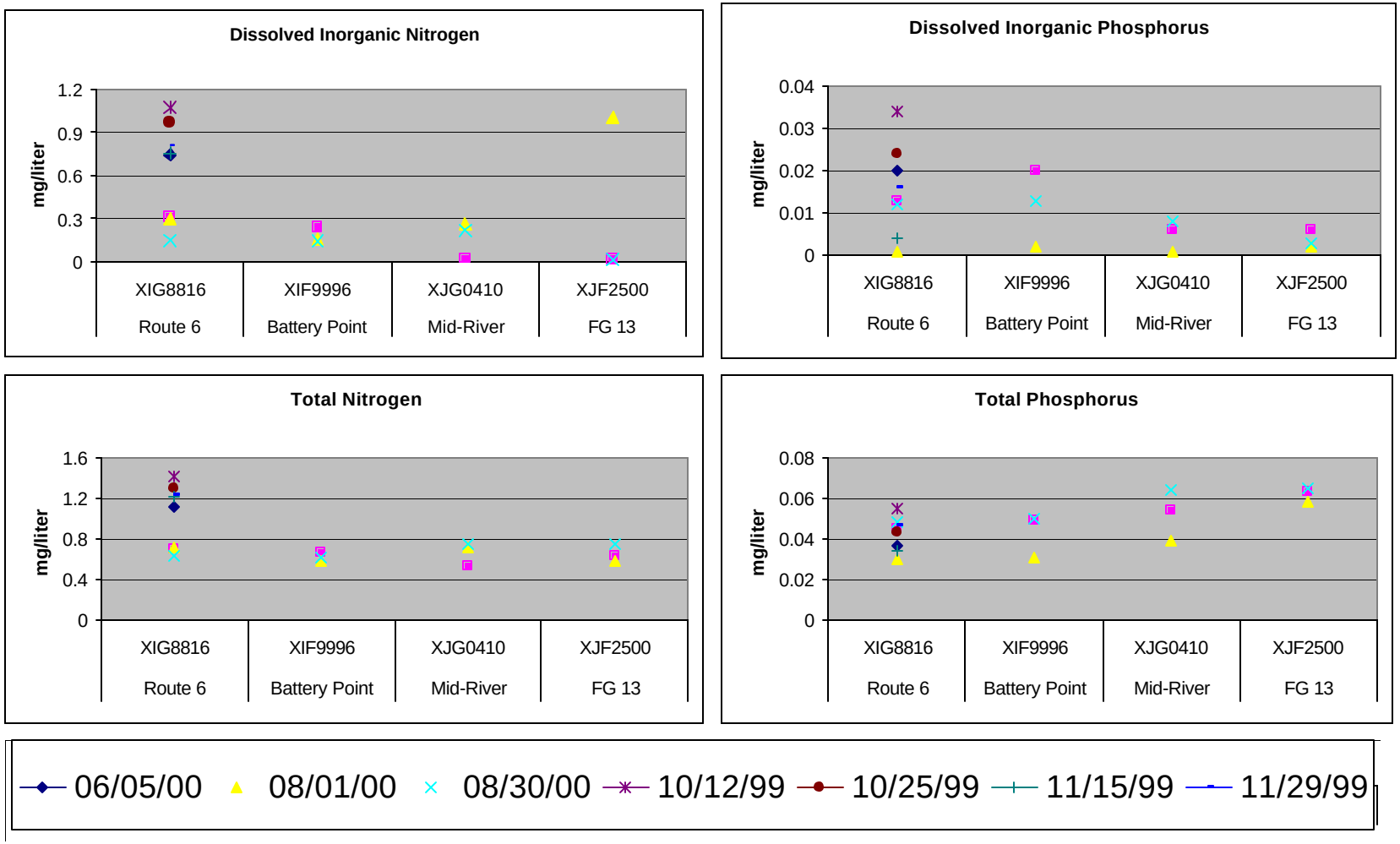
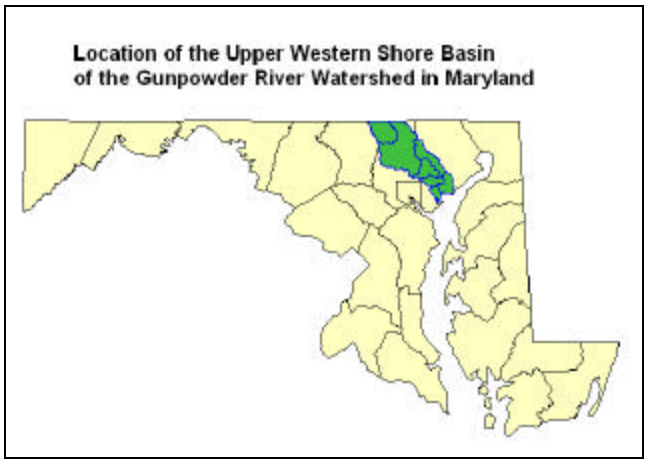
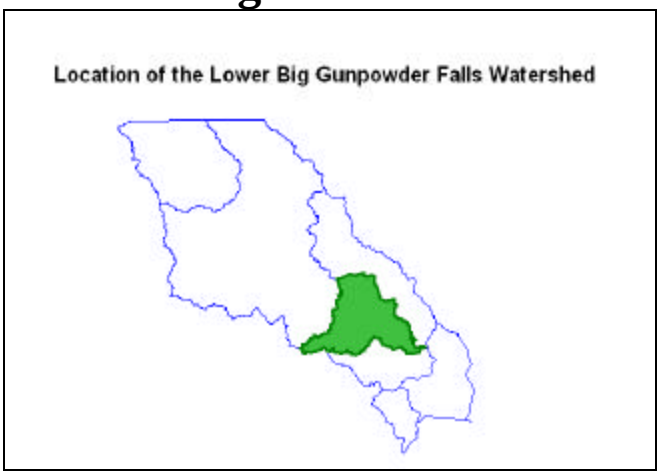


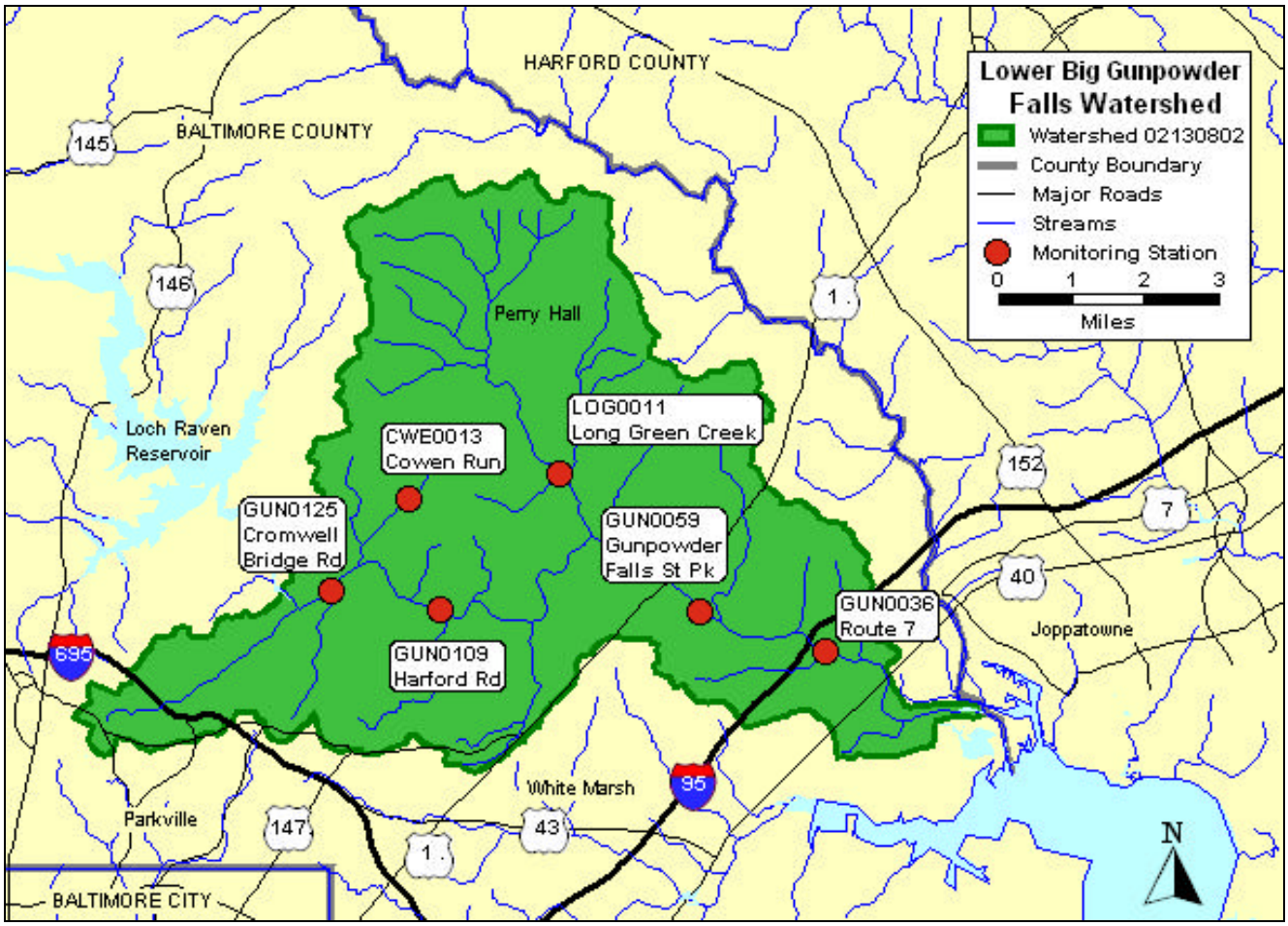
GUNPOWDER RIVER STATION LIST

Station Code	Station Names	Lat/Long	Description
GUNPOWDER RIVER			
XIG8816	Route 6	39 18.360 76 18.914	In channel, near R 6. Depth ~35 ft.
XIF9996	Battery Point	39 19.871 76 20.404	SW of Battery Point. Depth ~ 6 ft.
XJG0410	Mid-River	39 20.370 76 18.969	Mid-river. Depth ~ 7 ft.
XJF2500	FG 13	39 22.557 76 19.990	East of FG 13. Depth ~ 7 ft.

Lower Big Gunpowder Falls Monitoring Stations







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High Flow Conditions (December-May)
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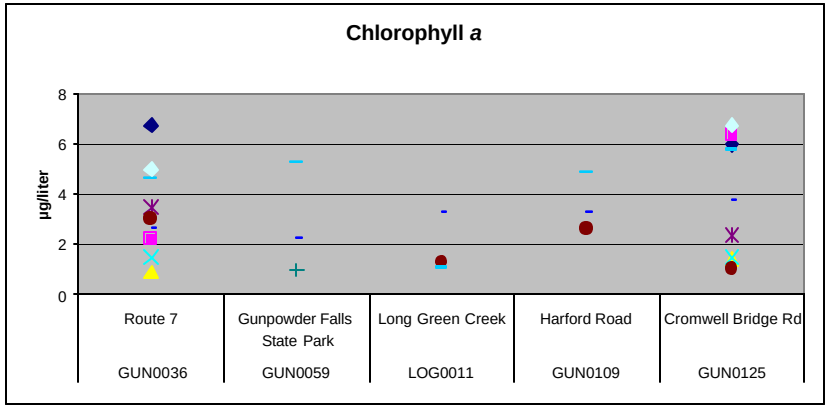

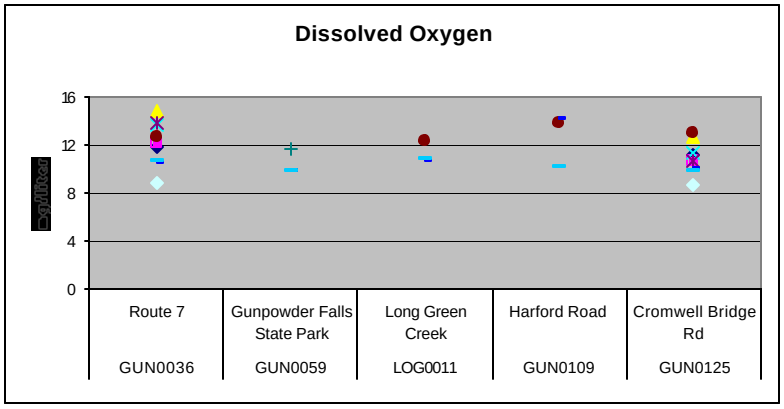

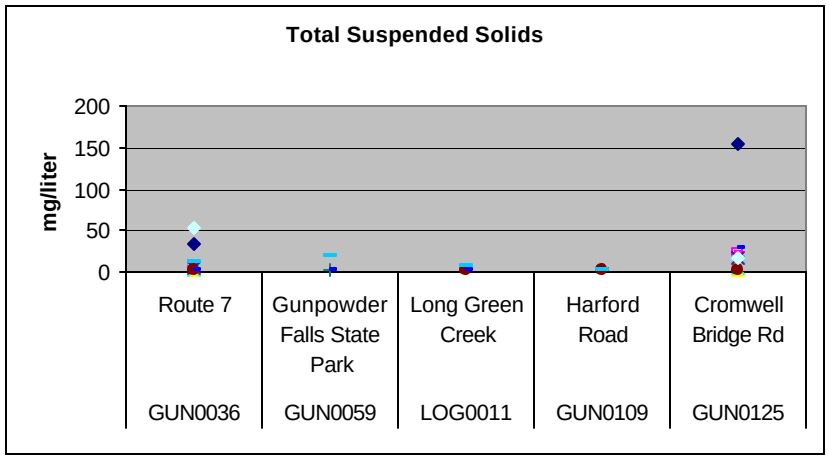

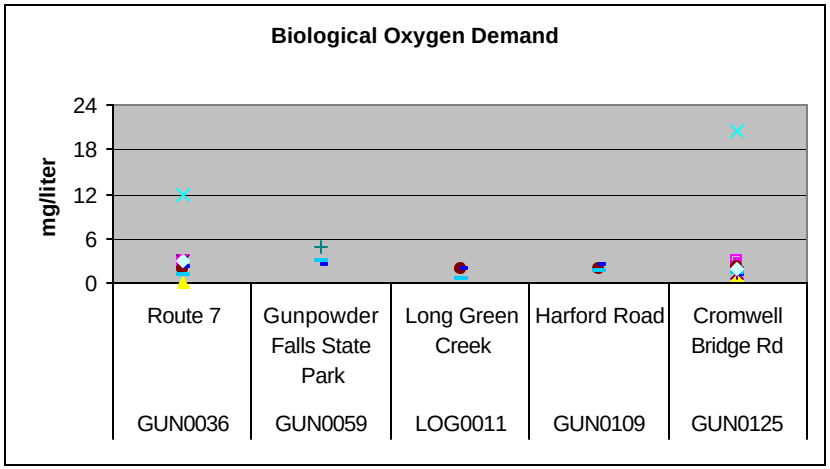

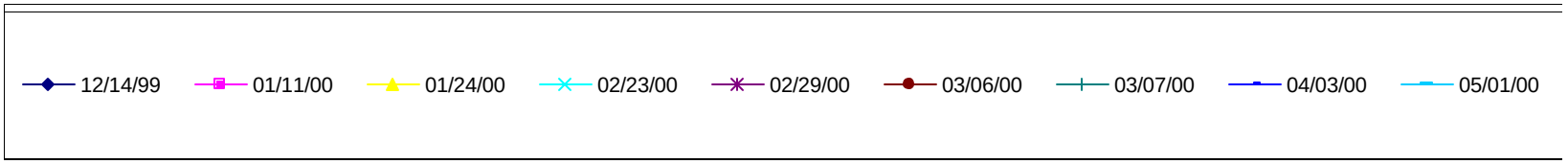

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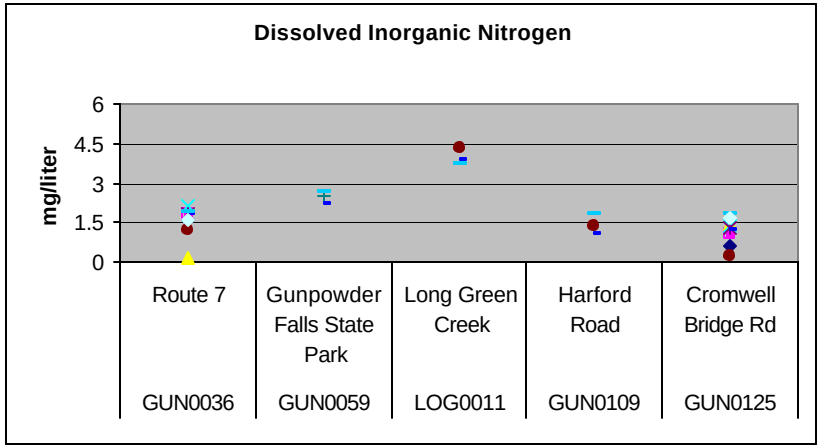

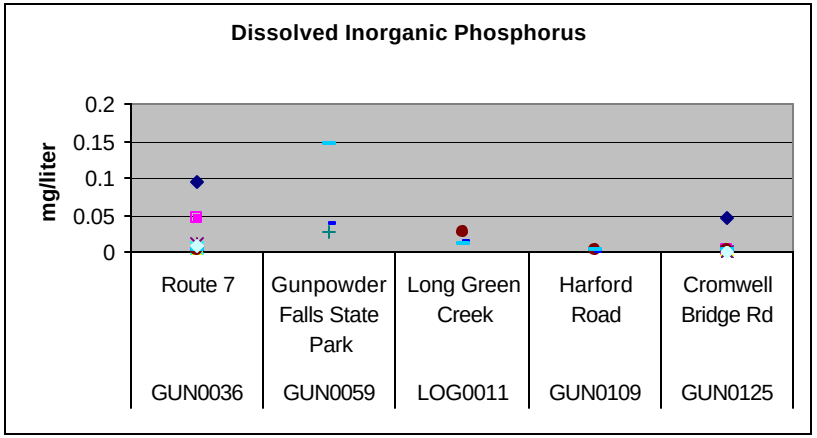

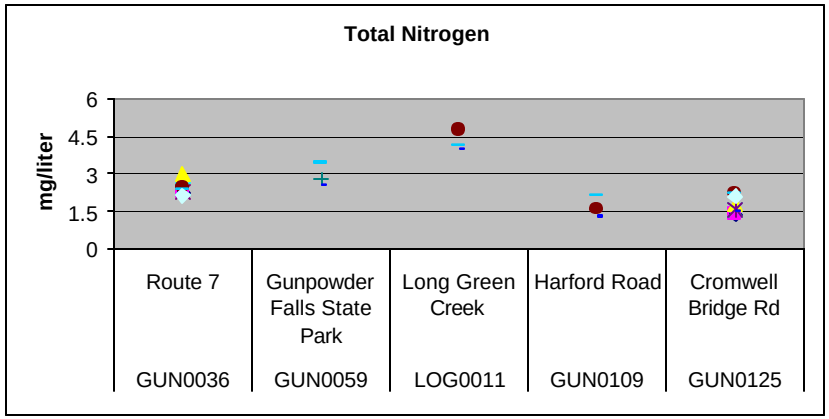

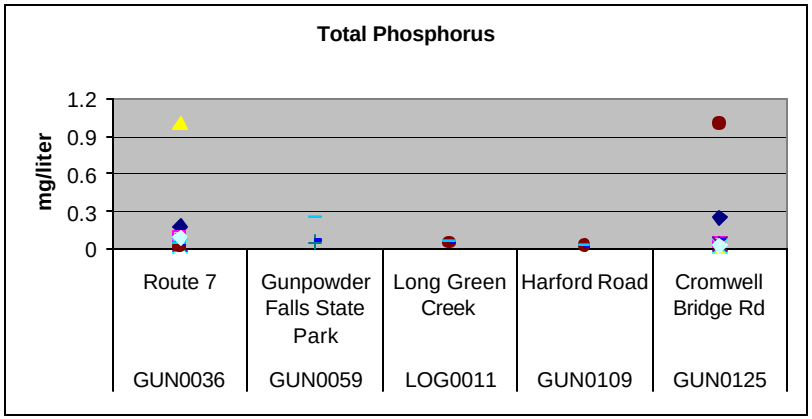

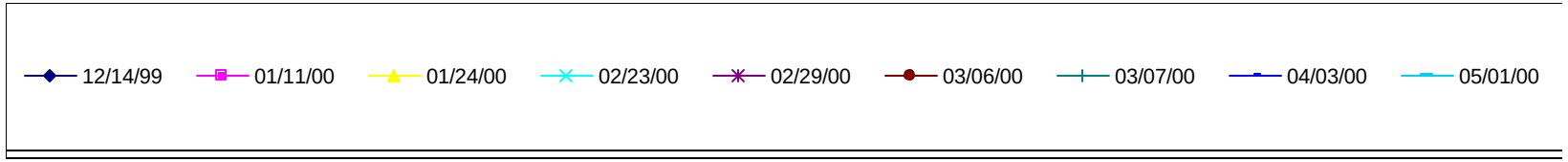

Lower Big Gunpowder Falls
Low Flow Conditions (June to November)
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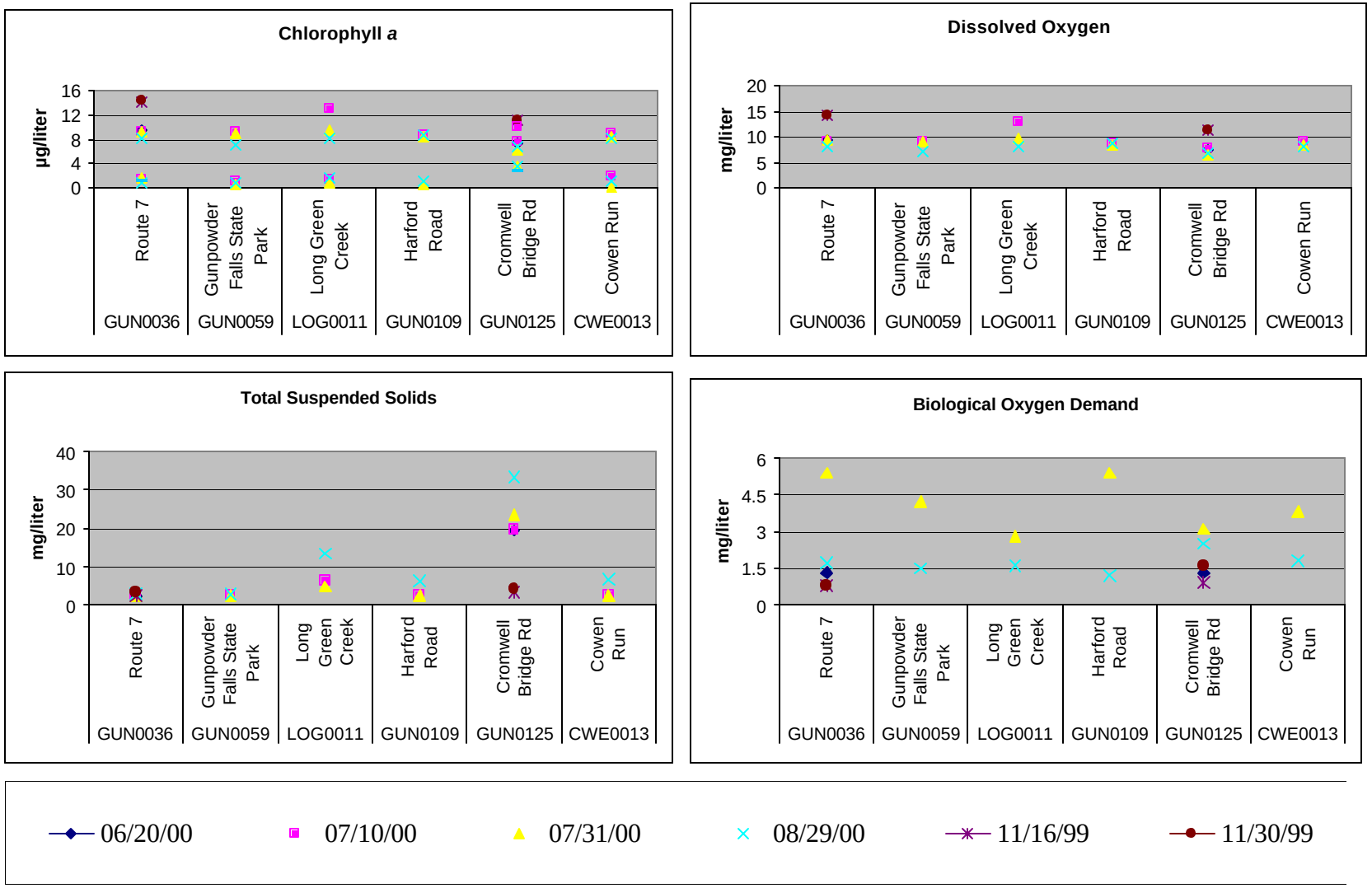

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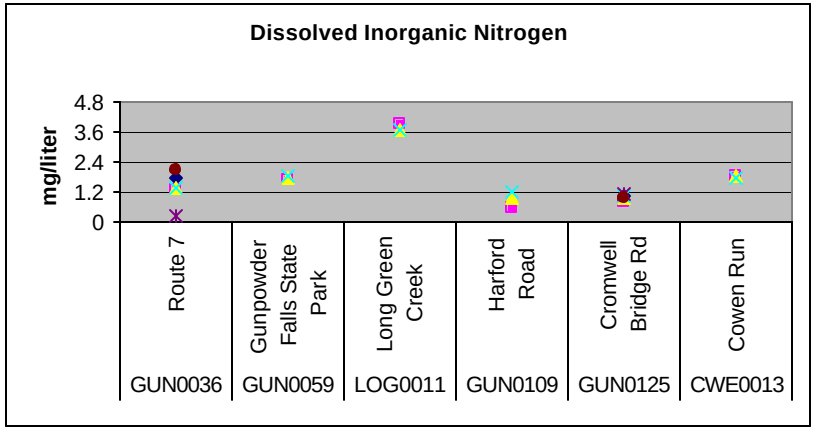
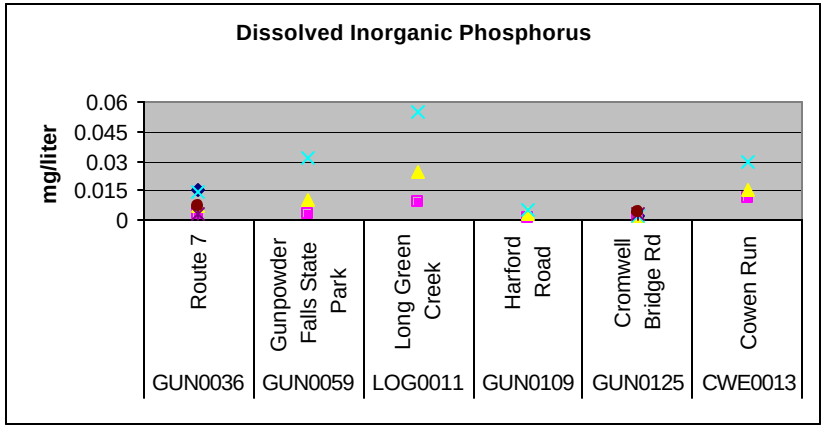
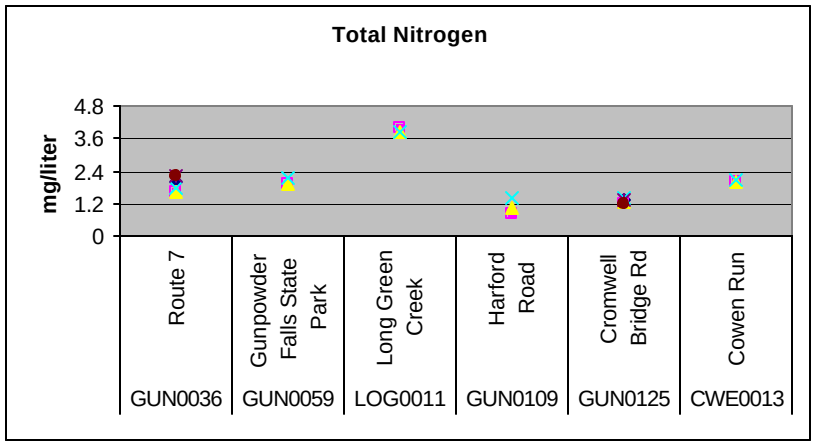
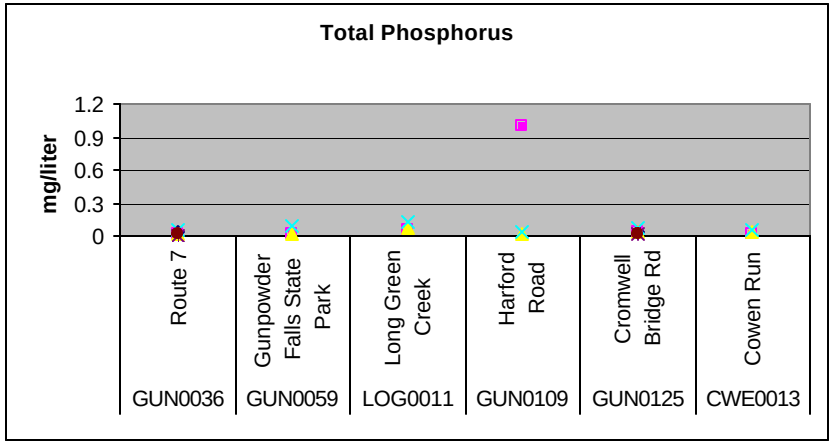
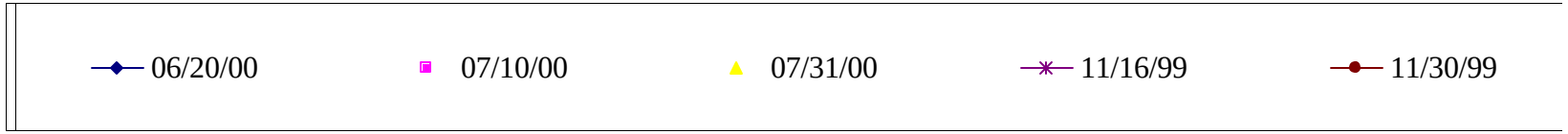






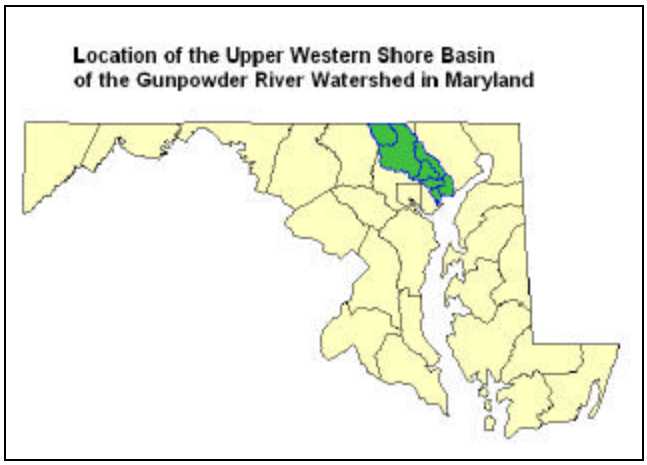


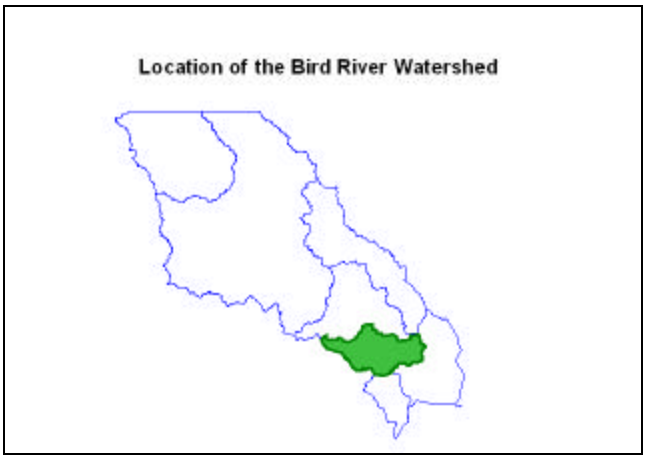


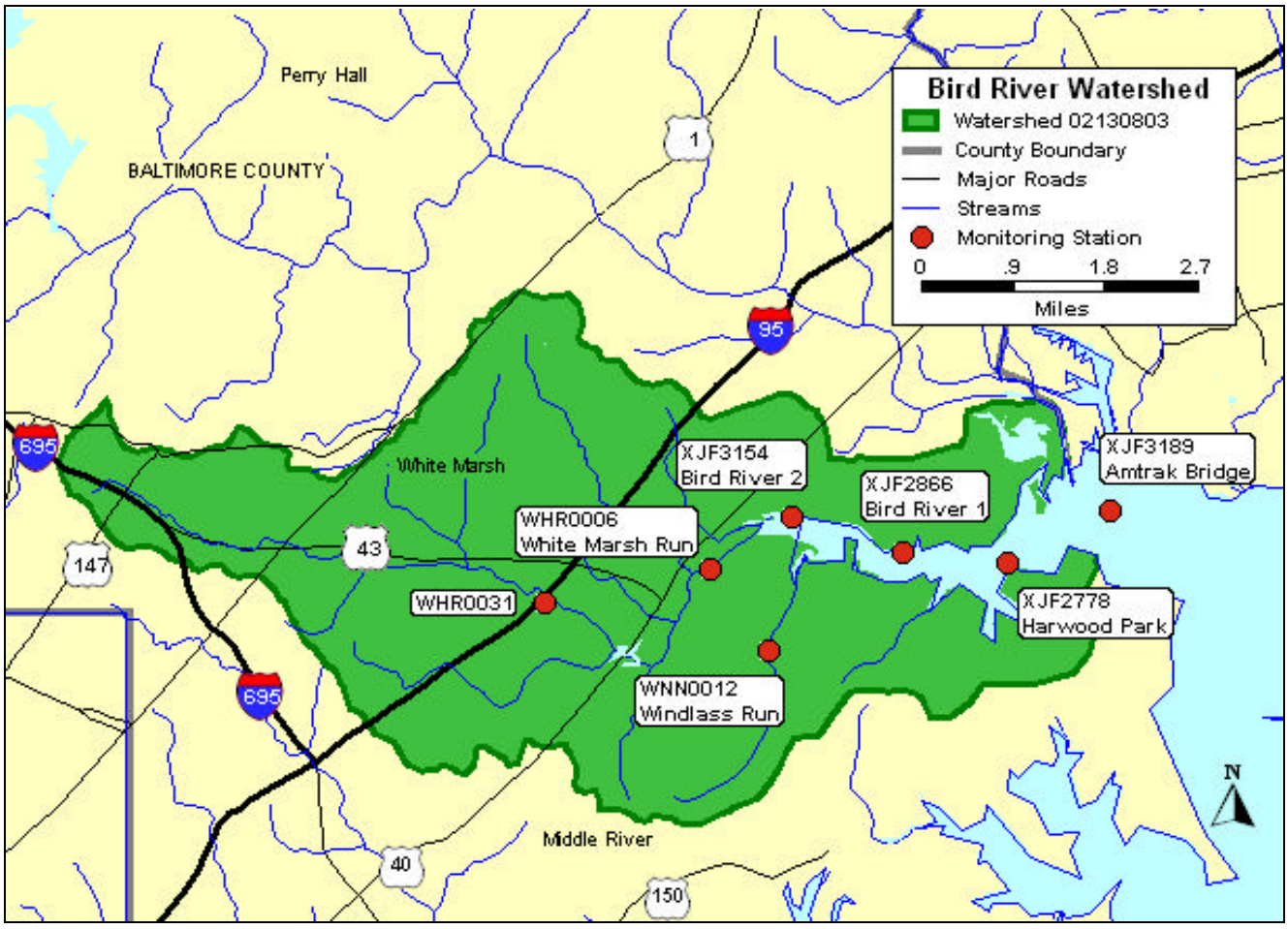
LOWER BIG GUNPOWDER FALLS STATION LIST

Station Code	Station Names	Lat/Long	Description
LOWER BIG GUNPOWDER FALLS (below reservoir)			
GUN0036	Route 7	39 24.836 76 24.338	Rte 7 crossing.
GUN0059	Gunpowder Falls State Park	39 25.293 76 26.227	Richlyn Drive – downstream of Richlyn Manor WWTP. From Rte 1 North (Belair Rd) make right at Forge Road; follow to left on Richlyn Drive. Follow to gate to Gunpowder Falls State Park and proceed down to WWTP.
GUN0109	Harford Road	39 25.326 76 30.130	Harford Road crossing. Follow trail downstream of bridge to collect bank sample.
GUN0125	Cromwell Bridge Rd	39 25.539 76 31.765	Cromwell Bridge Road/Glenarm Road bridge crossing.
LONG GREEN CREEK (tributary of Lower Big Gunpowder)			
LOG0011	Long Green Creek	39 26.925 76 28.325	Harford Road crossing. No good pull-off area; use Hartley Mill Road to park and walk to Harford Rd bridge crossing. There is a staff gage ~0.3 miles upstream on Hartley Mill Rd. Staff is located above Hillrise Rd and below Glen Arm Rd.
COWEN RUN			
CWE0013	Cowen Run	39 26.612 76 30.593	

Bird River Monitoring Stations







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Bird River
High Flow Conditions (December-May)
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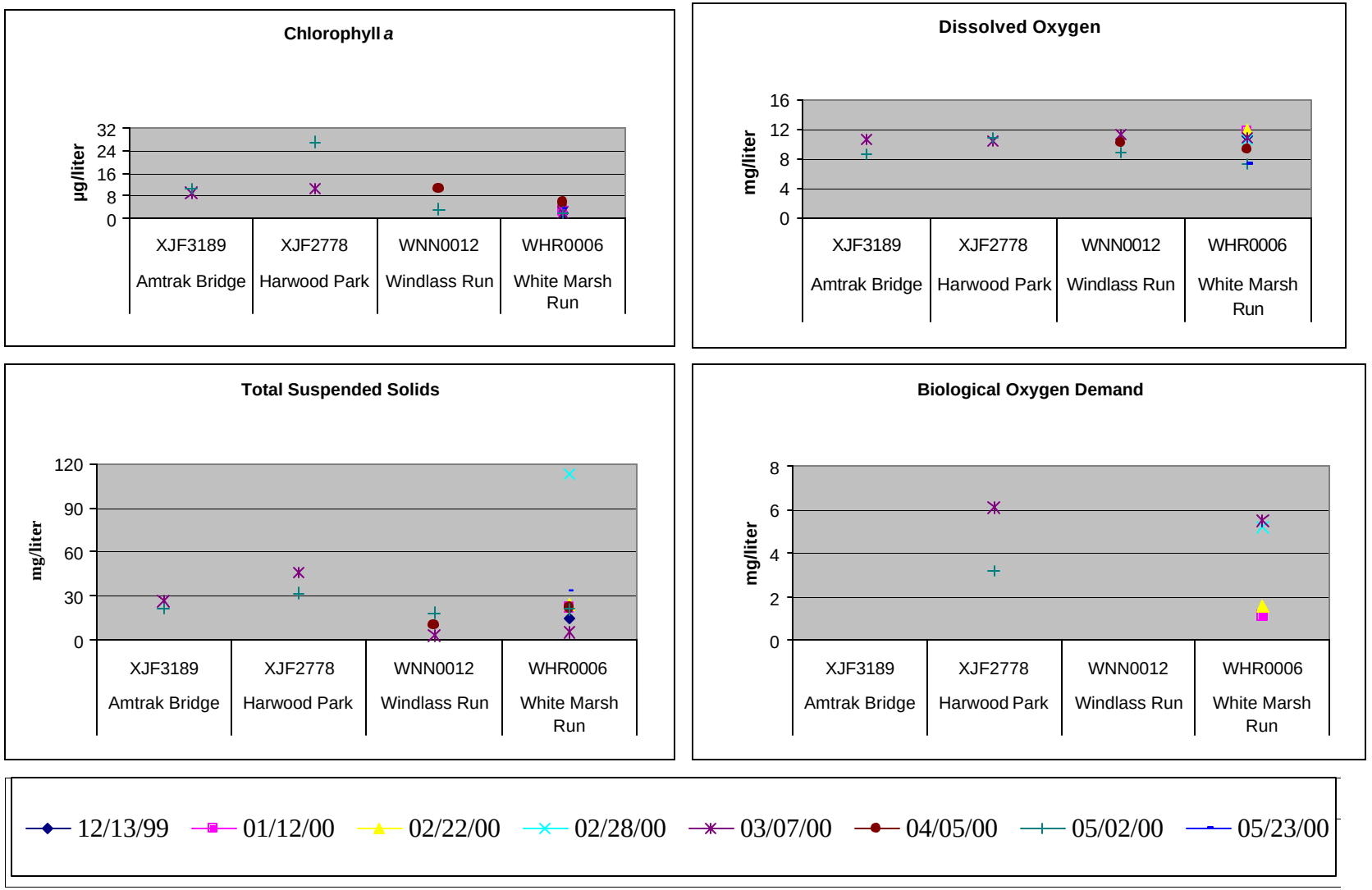

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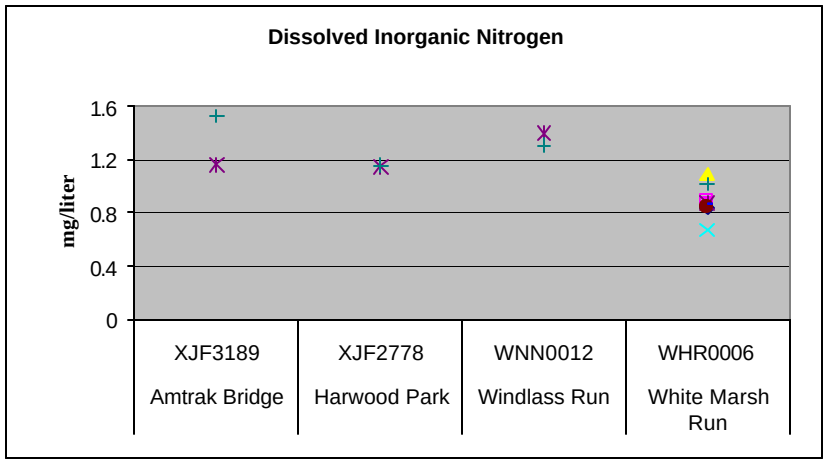
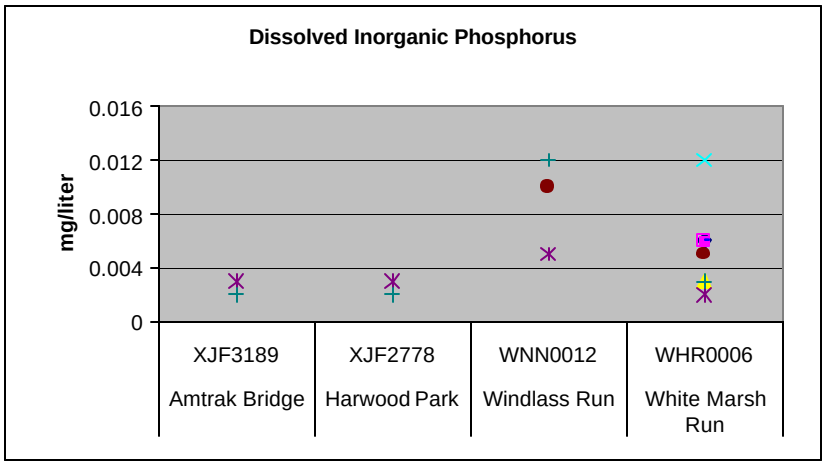
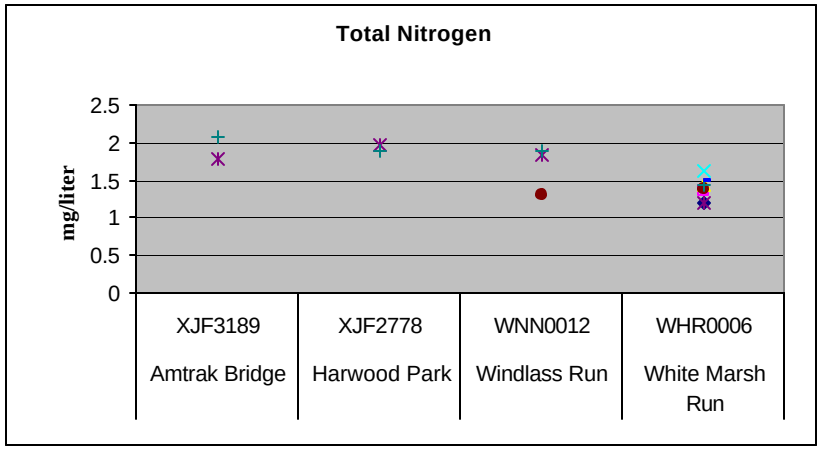
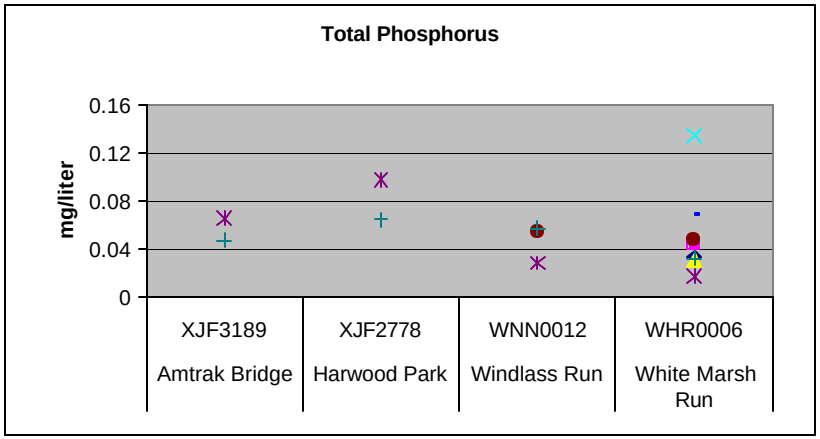
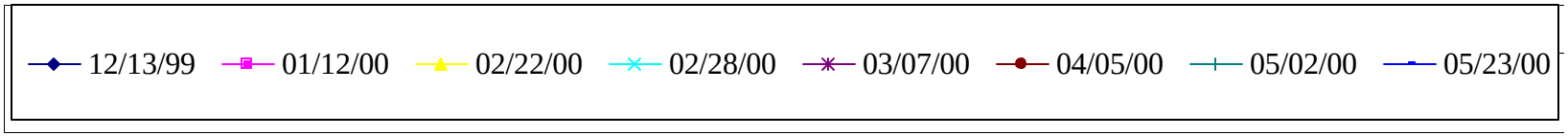


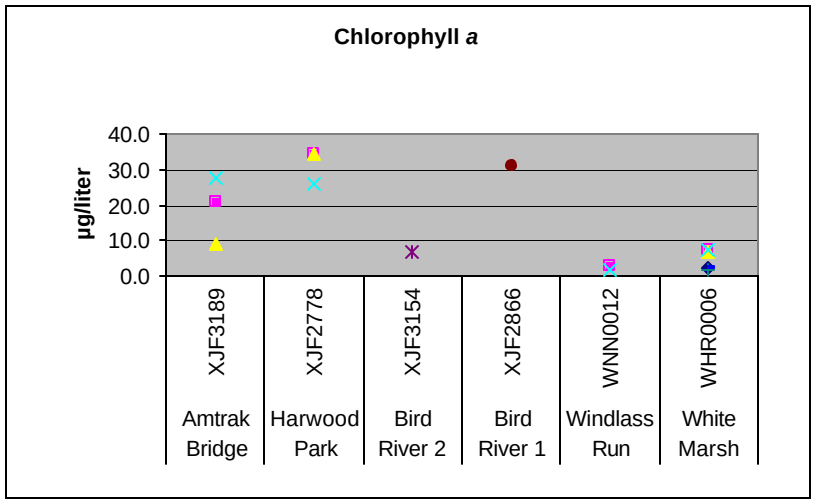


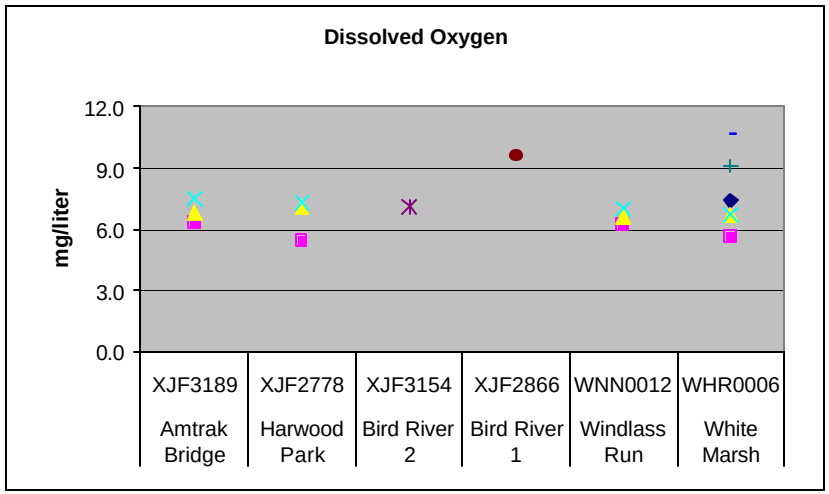


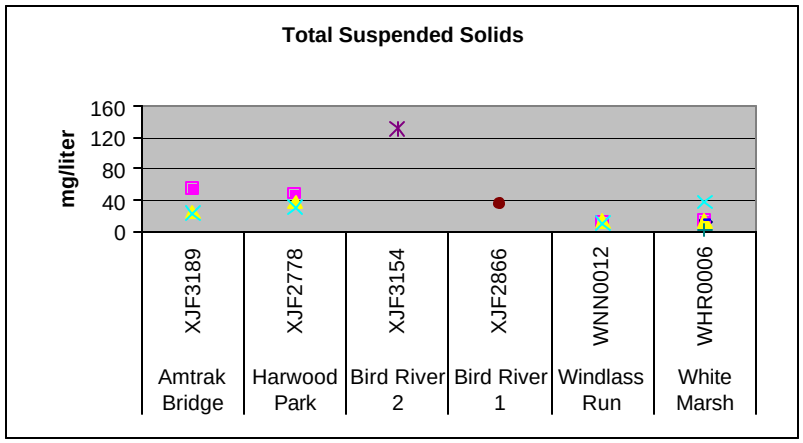


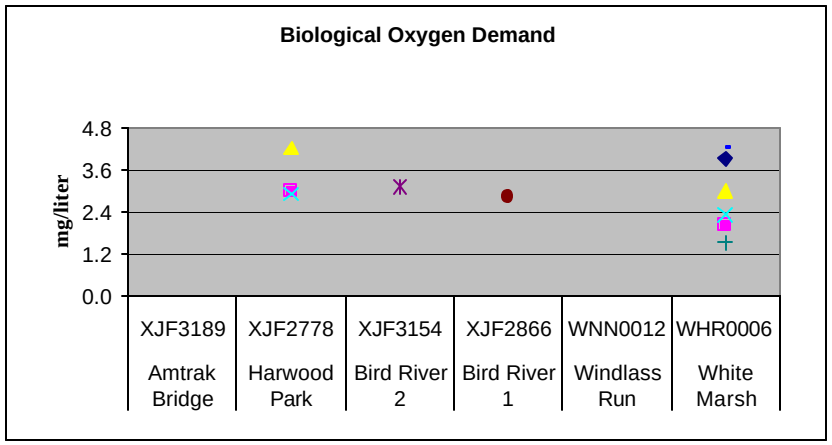


Bird River
Low Flow Conditions (June to November)
Stations are presented from left to right from downstream to upstream









Bird River
Low Flow Conditions (June to November)
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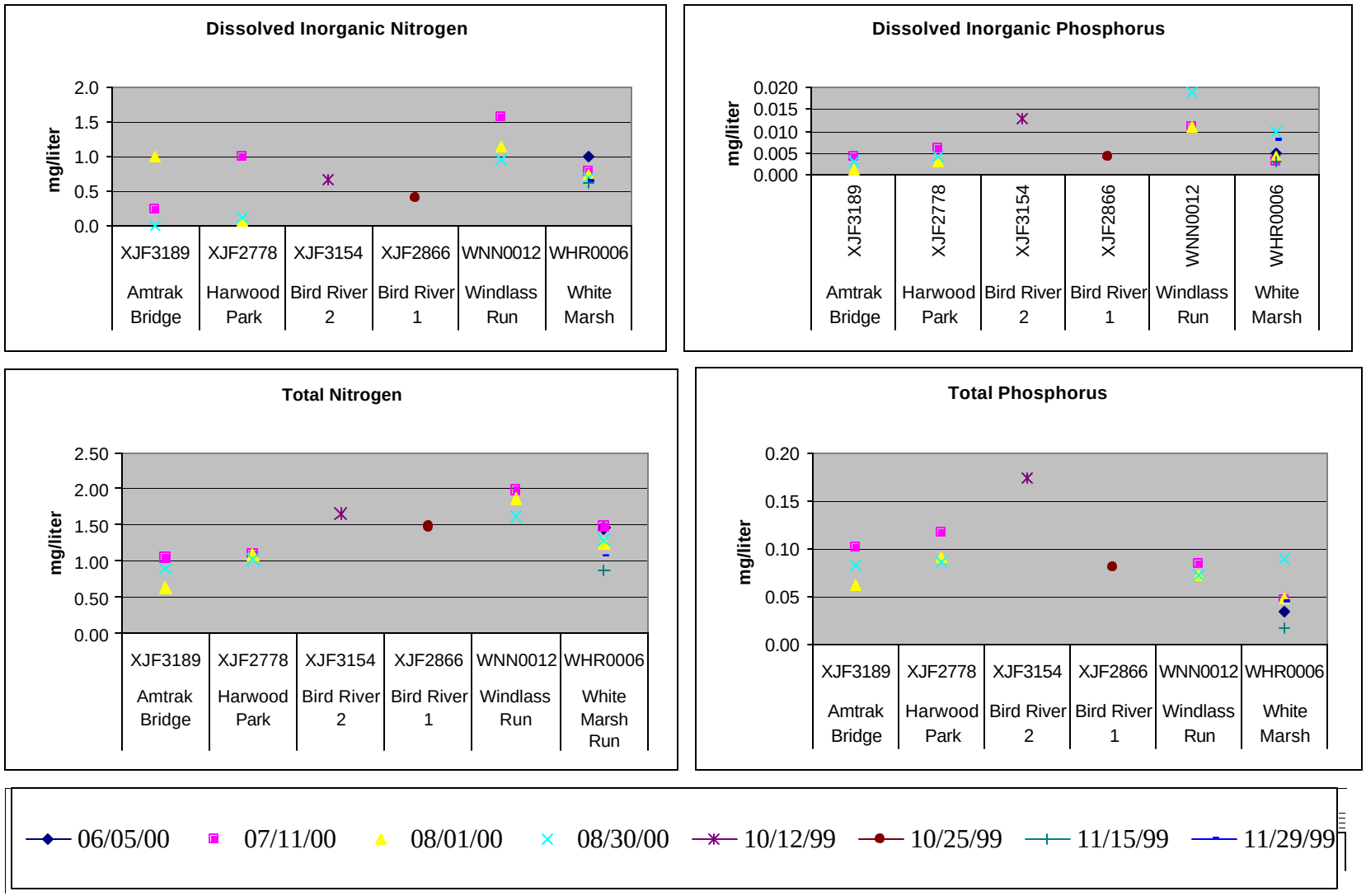
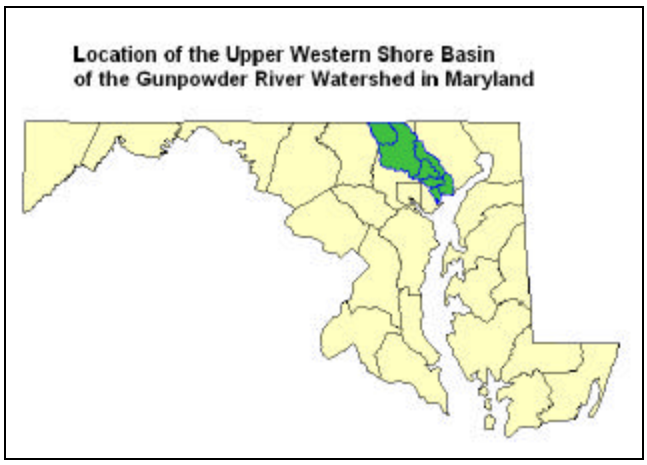
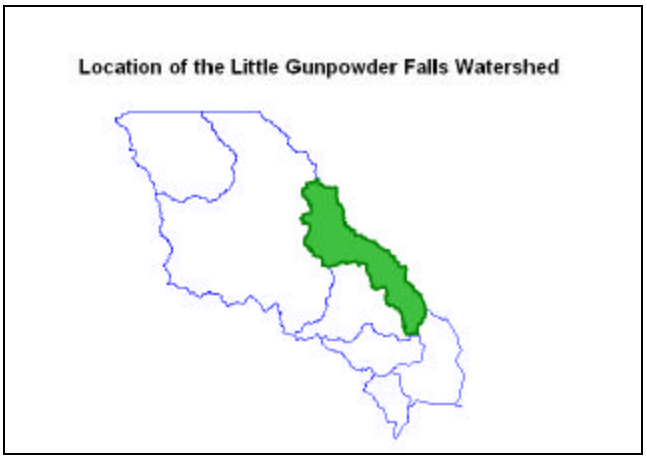


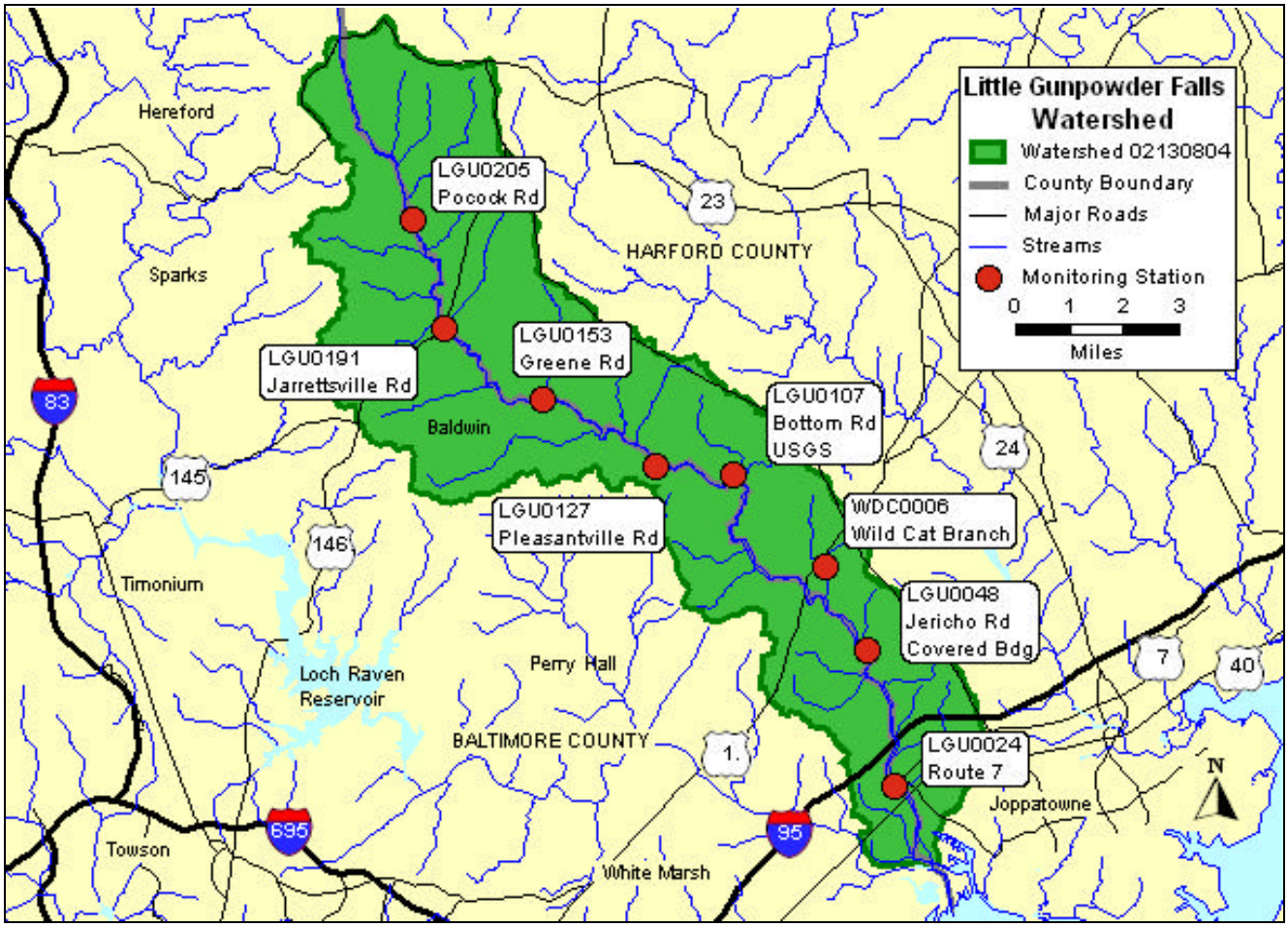
BIRD RIVER STATION LIST

Station Code	Station Names	Lat/Long	Description
BIRD RIVER			
XJF3189	Amtrak bridge	39 23.185 -- 76 21.112	Immediately NW of Amtrak bridge in very shallow (2 FT) water. Not in dredged channel.
XJF2778	Harwood Park	39 22.729 -76 22.221	Close to un-named point on south shore of river. Off Harwood Park. 4 FT.
XJF2866	Bird River 1	39 22.830 -76 23.354	
XJF3154	Bird River 2	39 23.121 -76 24.568	
WINDLASS RUN (tributary of Bird River)			
WNN0012 MB-22	Windlass Run	39 21.990 -76 24.812	Bird River Road crossing. Road construction currently underway, but station can be accessed. Baltimore County ADC map 30 – B12.
WHITE MARSH RUN (tributary of Bird River)			
WHR0006 MB-23	White Marsh Run	39 22.678 -76 25.466	Ebenezer Road crossing.

Little Gunpowder Falls Monitoring Stations

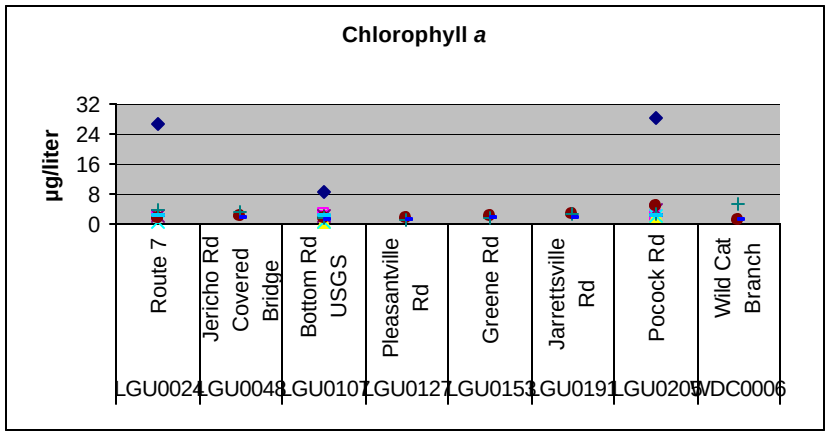


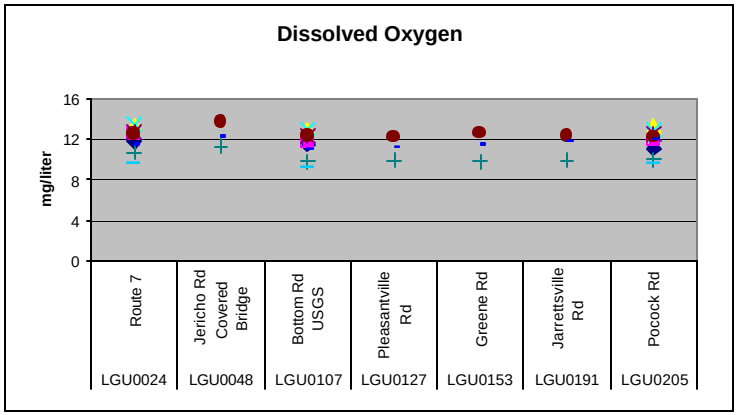


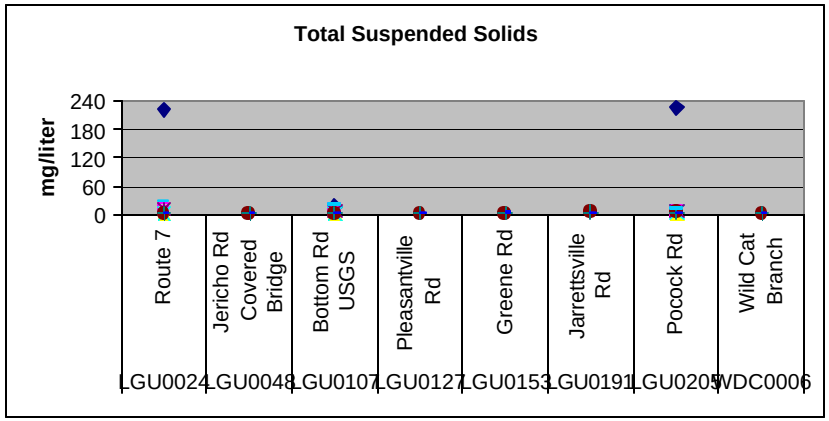


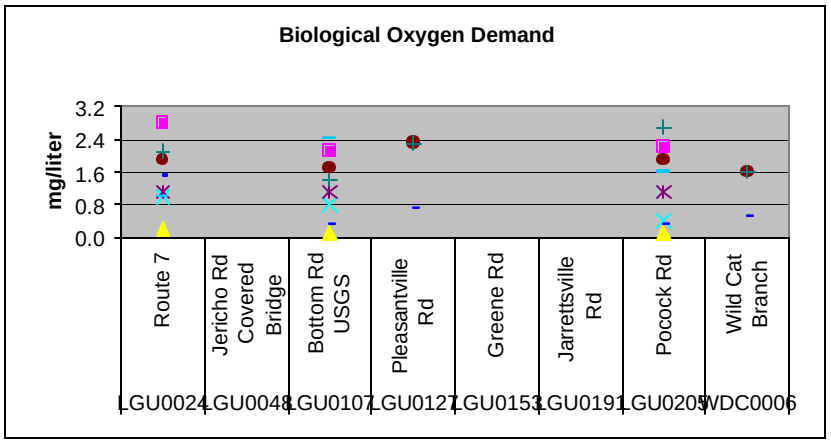
Map Prepared by the Maryland Department of the Environment
Science Services Administration
Montgomery Park Business Center
1800 Washington Boulevard, Suite 540
Baltimore, Maryland 21230-1718

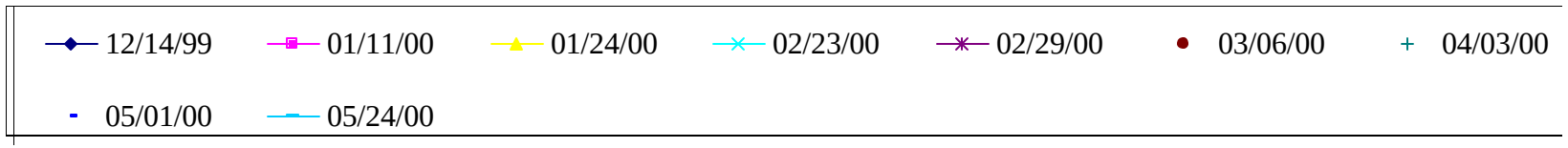
Little Gunpowder Falls
High Flow Conditions (December-May)
Stations are presented from left to right from downstream to upstream



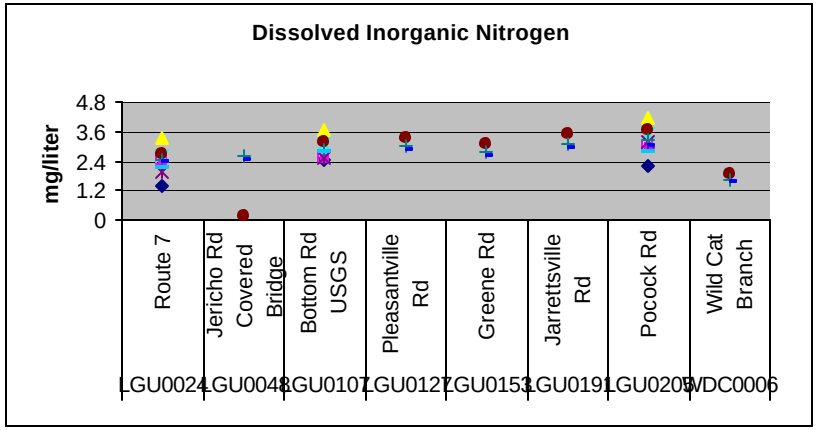


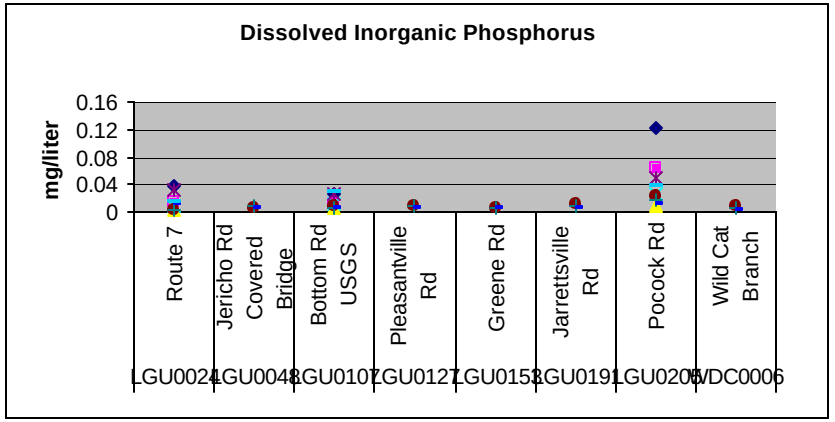


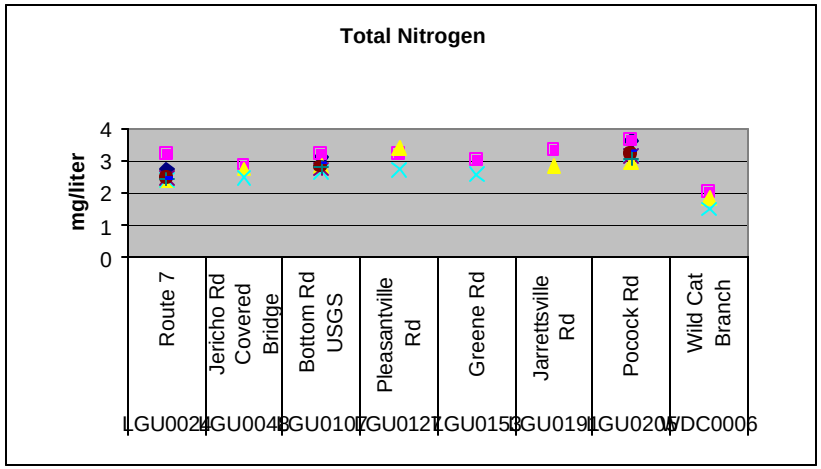


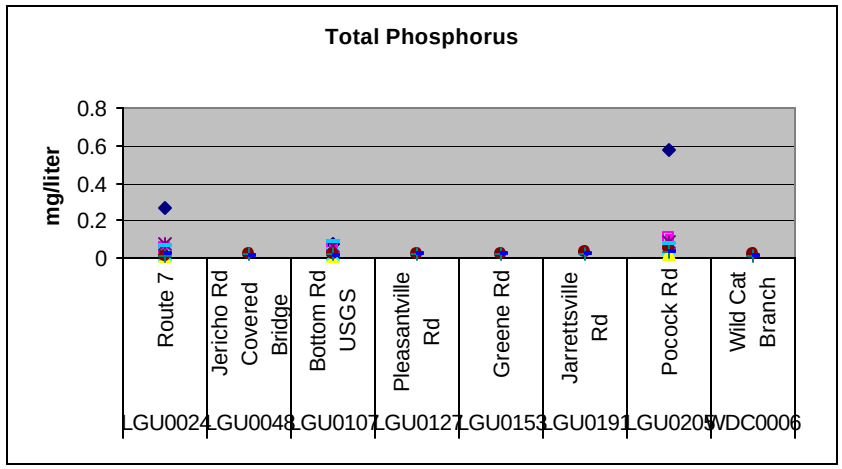


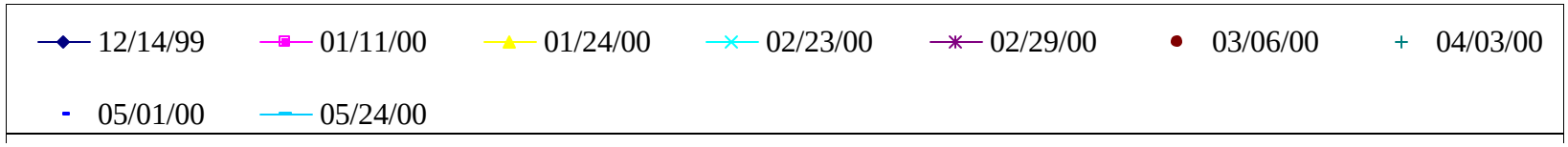
Little Gunpowder Falls
High Flow Conditions (December-May)
Stations are presented from left to right from downstream to upstream



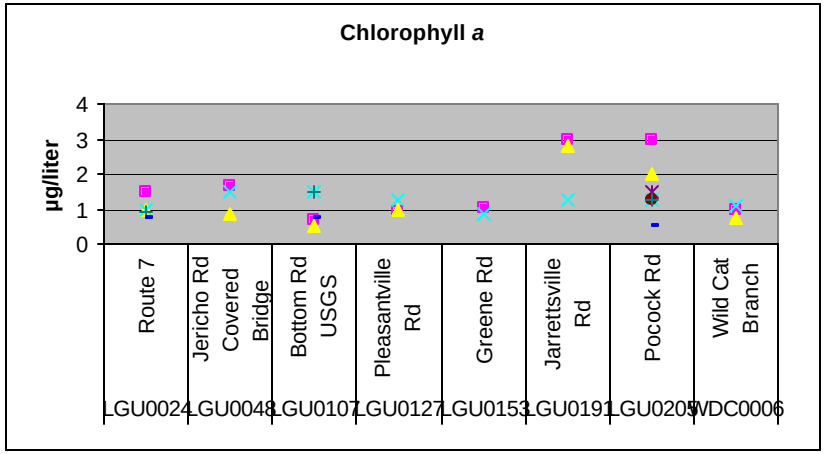


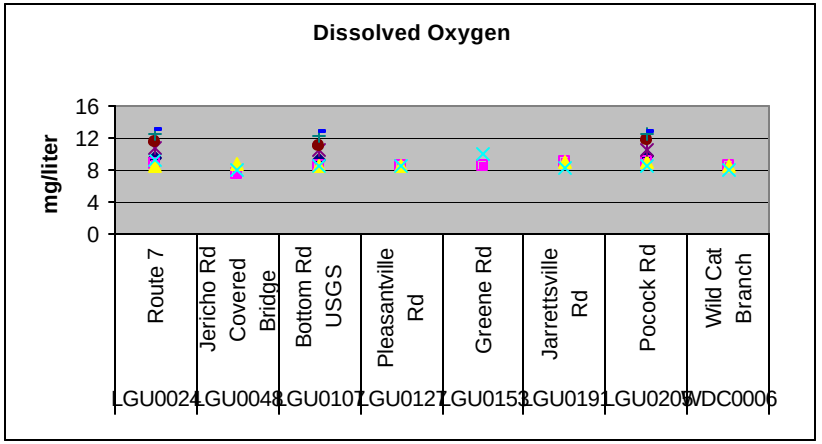


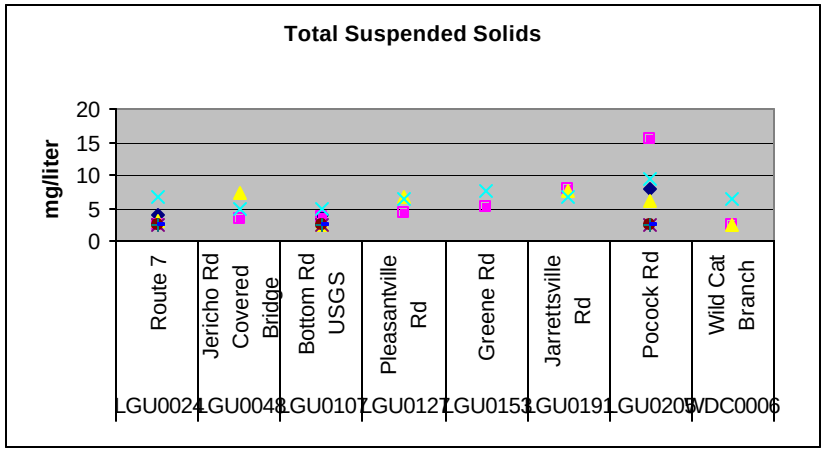


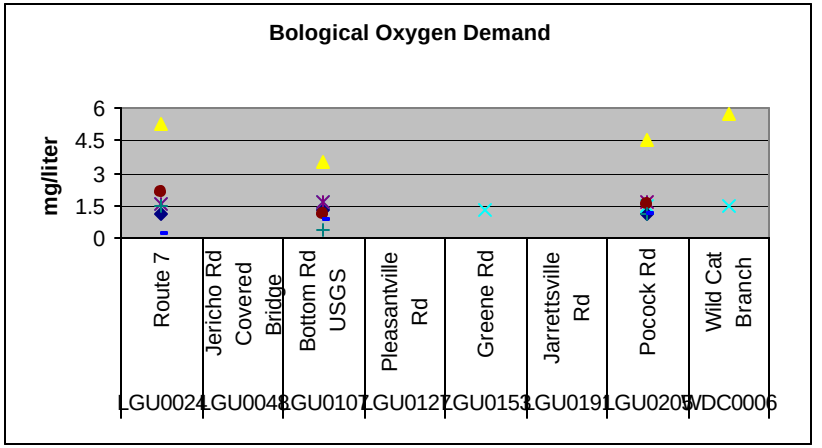


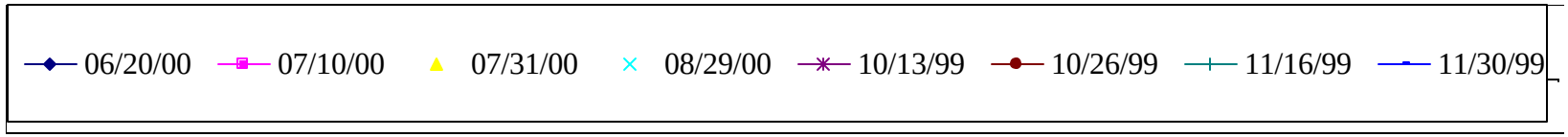
Little Gunpowder Falls
Low Flow Conditions (June to November)
Stations are presented from left to right from downstream to upstream











Little Gunpowder Falls
Low Flow Conditions (June to November)
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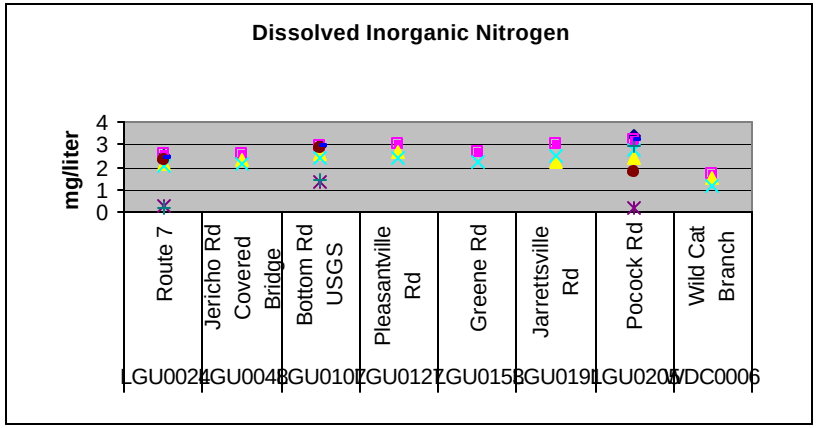
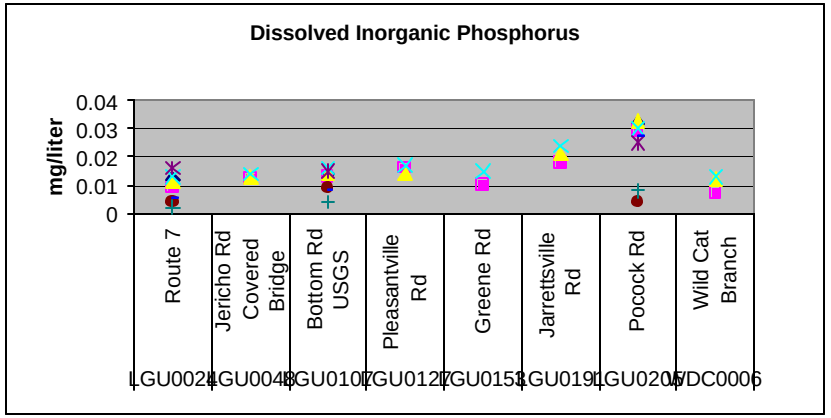
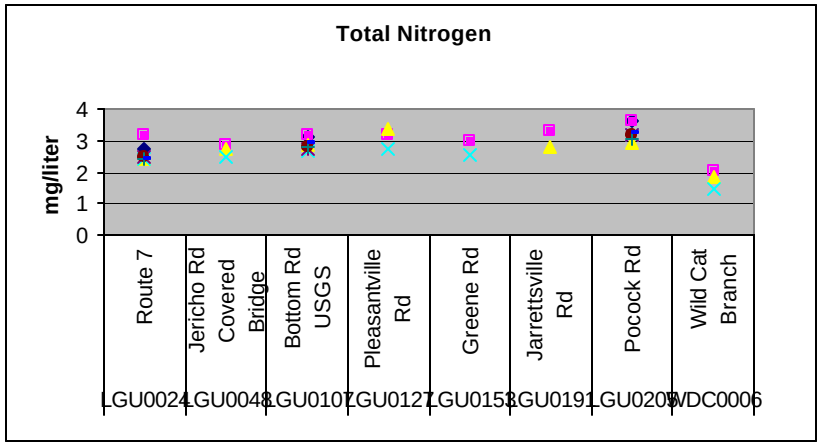
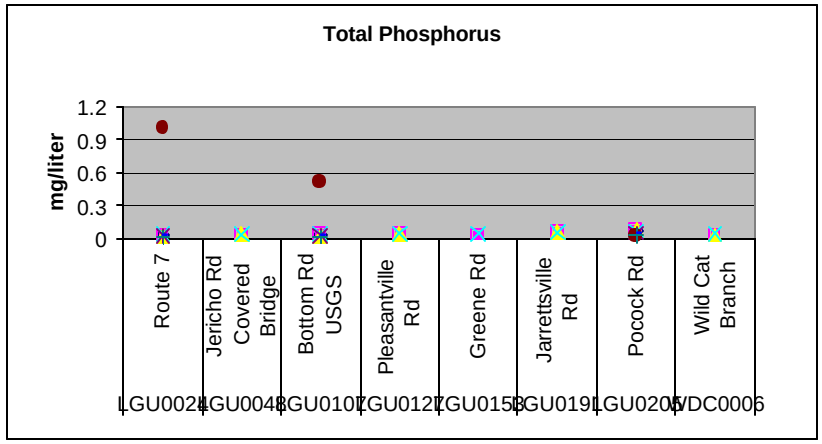




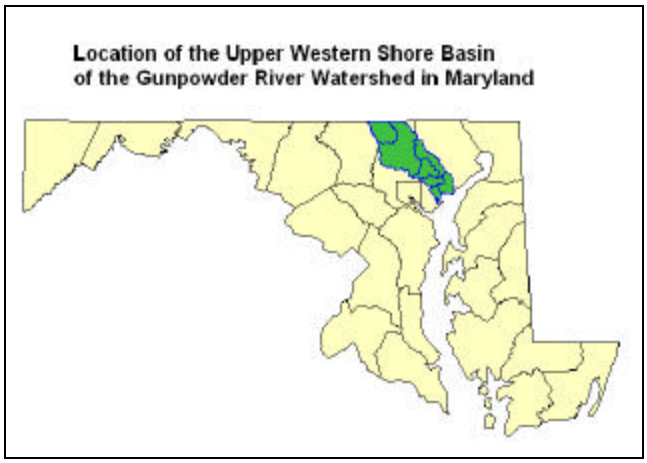


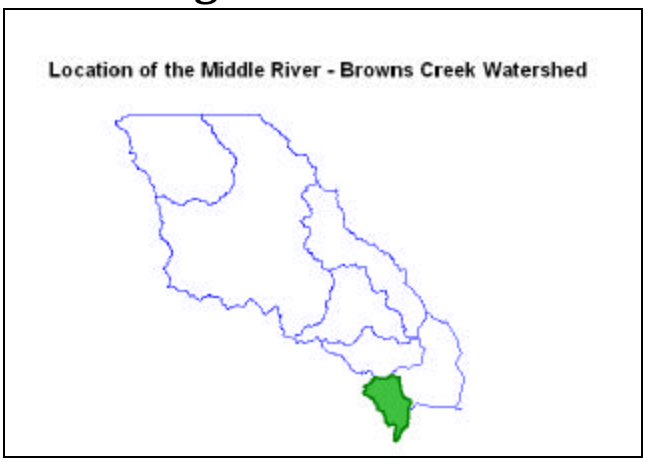


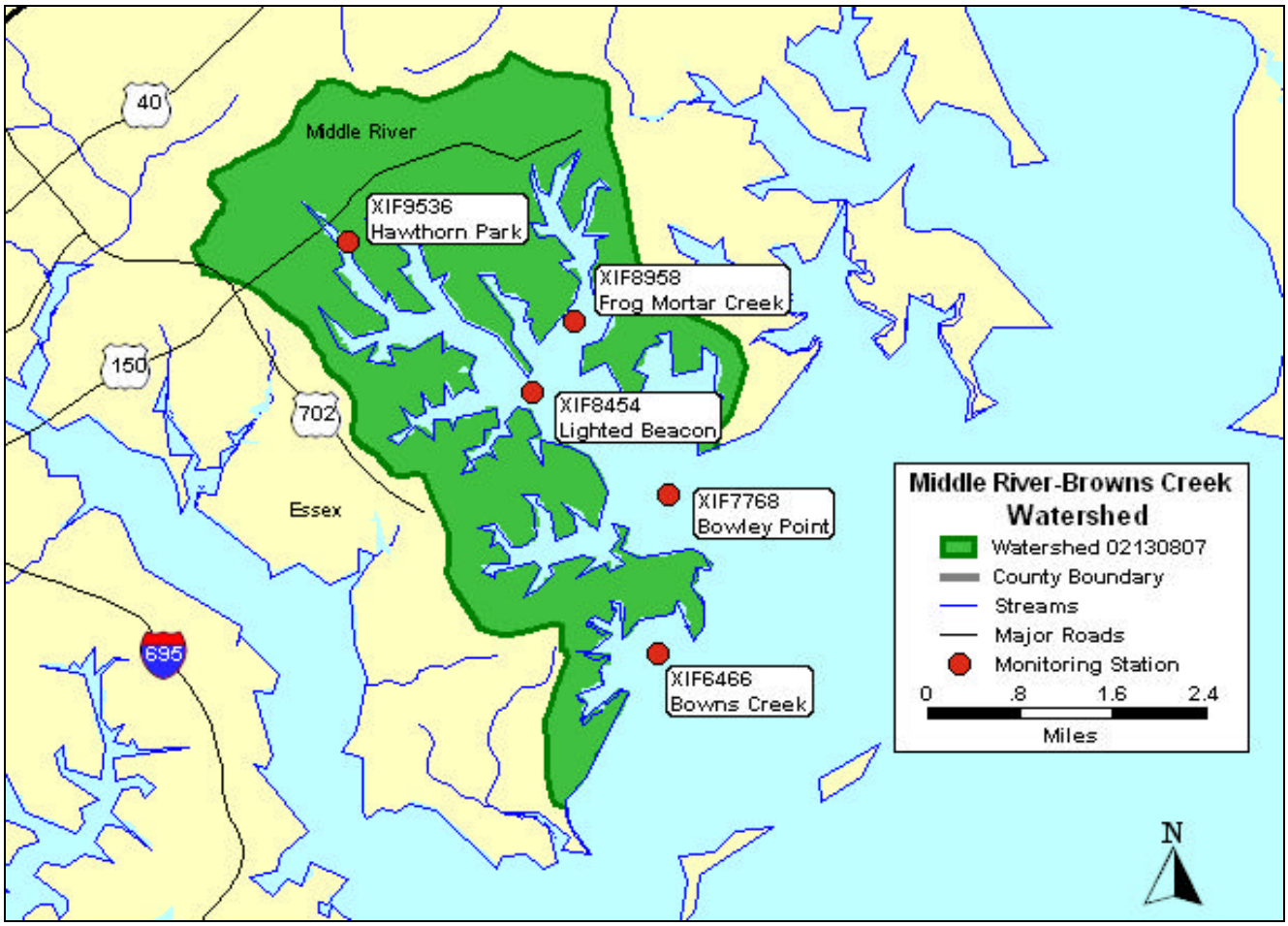
LITTLE GUNPOWDER FALLS STATION LIST

Station Code	Station Names	Lat/Long	Description
LITTLE GUNPOWDER FALLS			
LGU0024	Route 7	39 25.422 76 22.709	Rte 7 crossing. Sample bank from fisherman's path.
LGU0048	Jericho Rd. Covered Bridge	39 27.578 76 23.256	Jericho Road crossing at covered bridge. . Take Jericho south off of Jerusalem Road. Bank sample. Baltimore County ADC map 22 – F8/9
LGU0107	Bottom Rd. USGS	39 30.303 76 25.962	Bottom Road crossing. USGS Gage upstream of road crossing.
LGU0127	Pleasantville Rd.	39 30.450 76 27.562	Pleasantville Road crossing.
LGU0153	Greene Rd.	39 31.488 76 29.848	Greene Road crossing. Make sure you are getting the Little Gunpowder and not the small tributary entering the LGF. There are two crossings on Greene Road. Harford County ADC map 15 – D10.
LGU0191	Jarrettsville Rd.	39 32.615 76 31.849	Jarrettsville Road (Rte 146) crossing.
LGU0205	Pocock Rd.	39 34.312 76 32.450	Pocock Road crossing.
WILD CAT BRANCH (tributary of Little Gunpowder)			
WDC0006	Wild Cat Branch	39 28.860 76 24.105	Reckord Road crossing. Harford County ADC map 22 – H5. Rocky streambed, but flow is possible.

Middle River – Browns Monitoring Stations

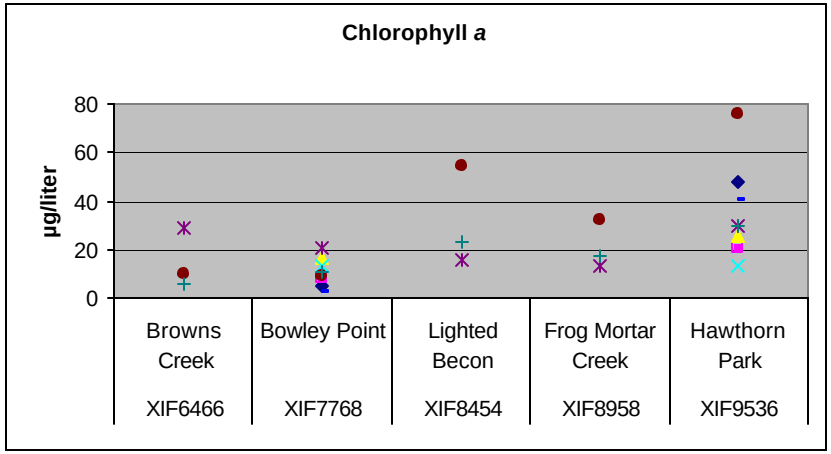


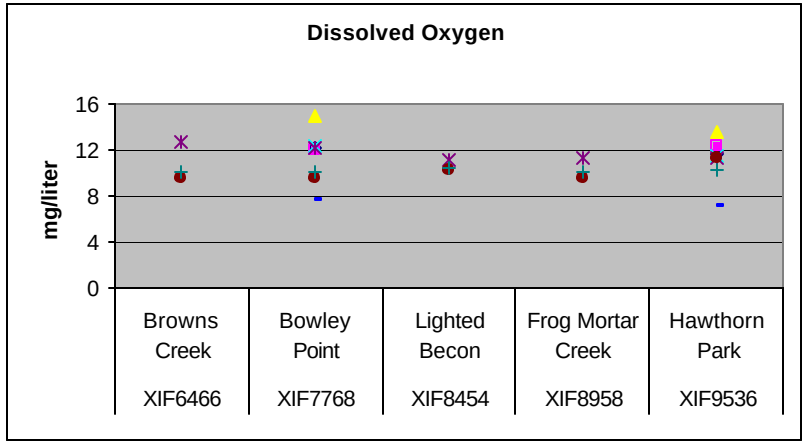


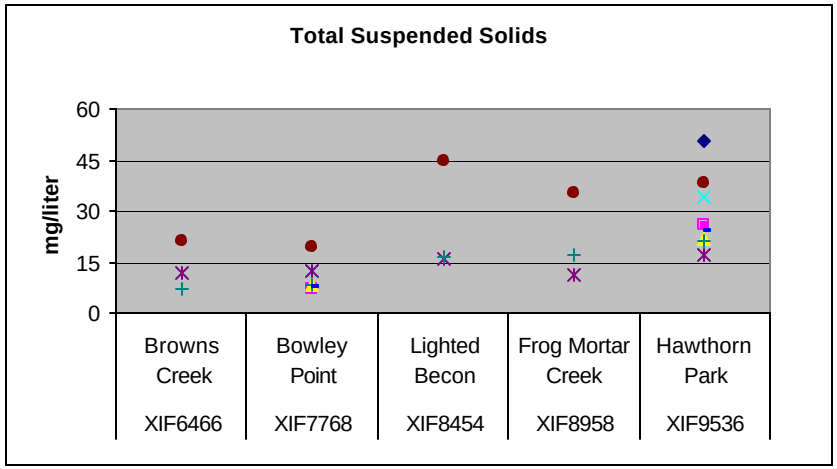


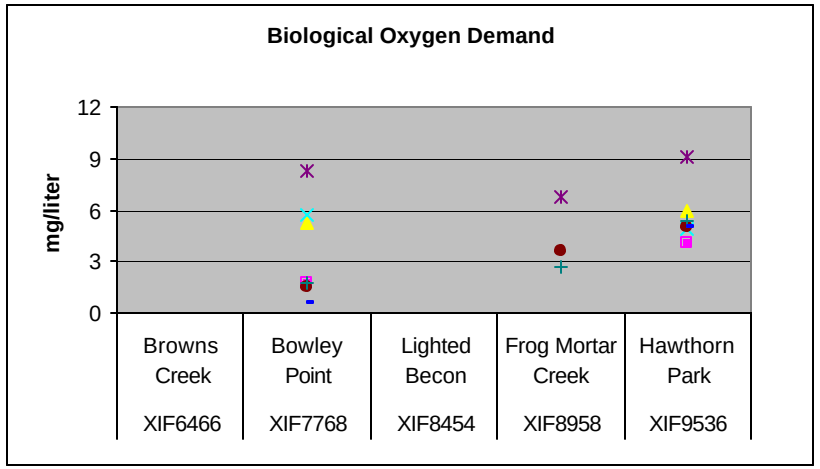
Map Prepared by the MD Department of the Environment
Science Services Administration
Montgomery Park Business Center
1800 Washington Boulevard, Suite 540
Baltimore, Maryland 21230-1718

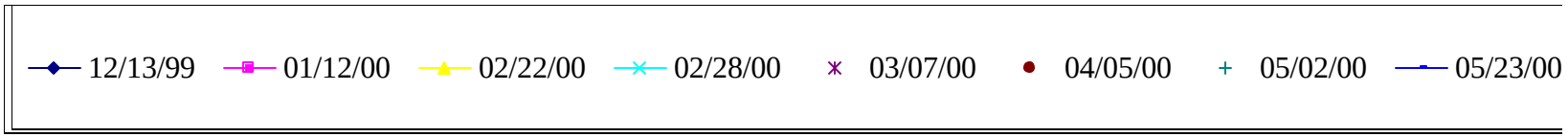
Middle River-Browns
High Flow Conditions (December-May)
Stations are presented from left to right from downstream to upstream











Middle River-Browns
High Flow Conditions (December-May)
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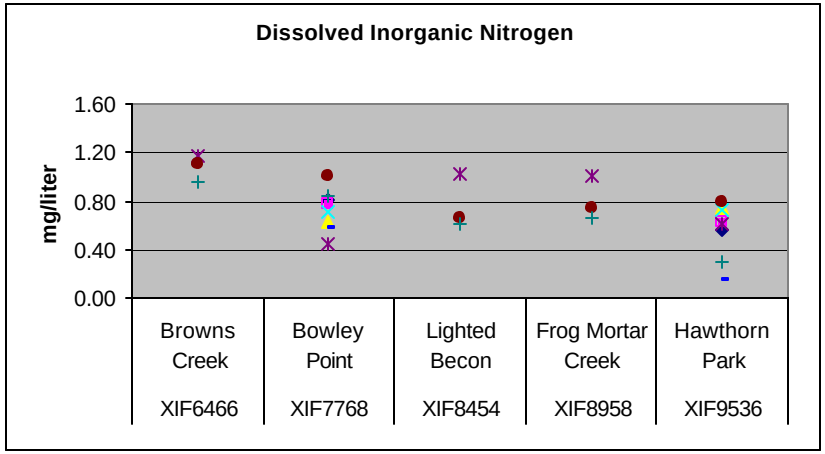

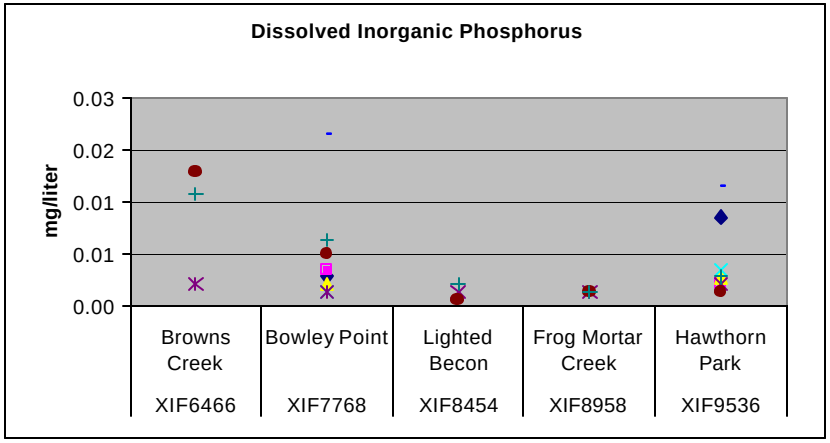

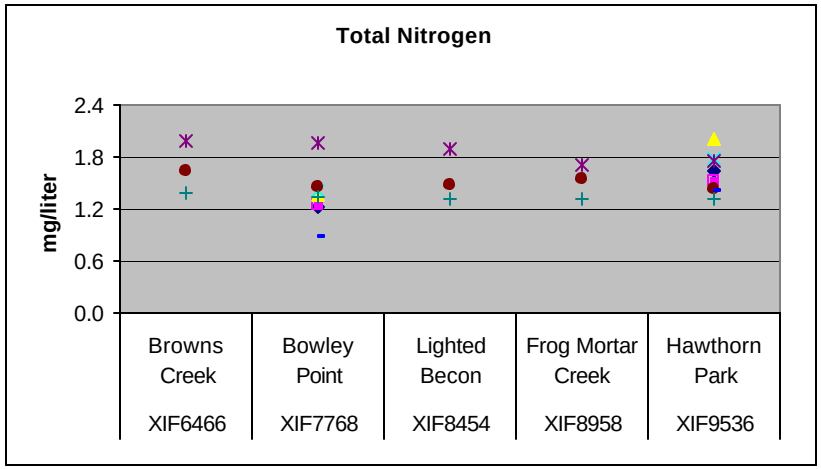

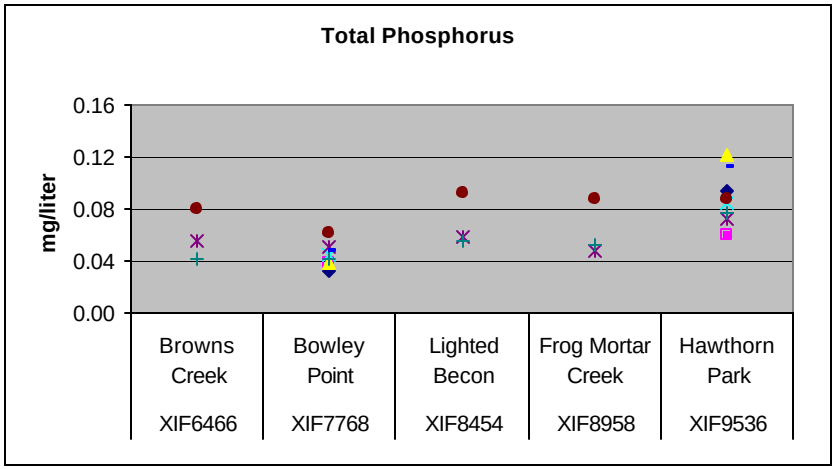

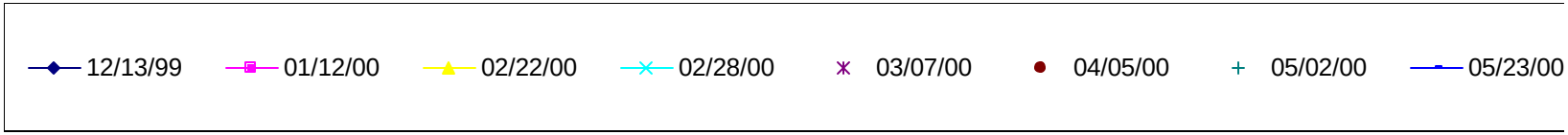

Middle River-Browns
Low Flow Conditions (June to November)
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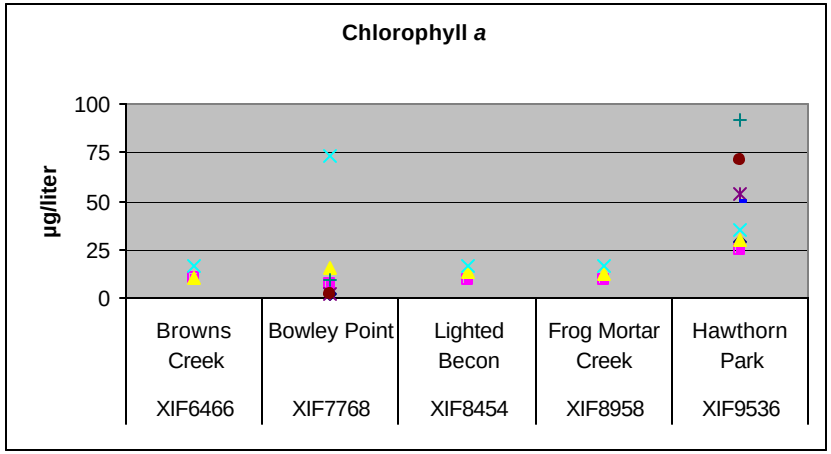

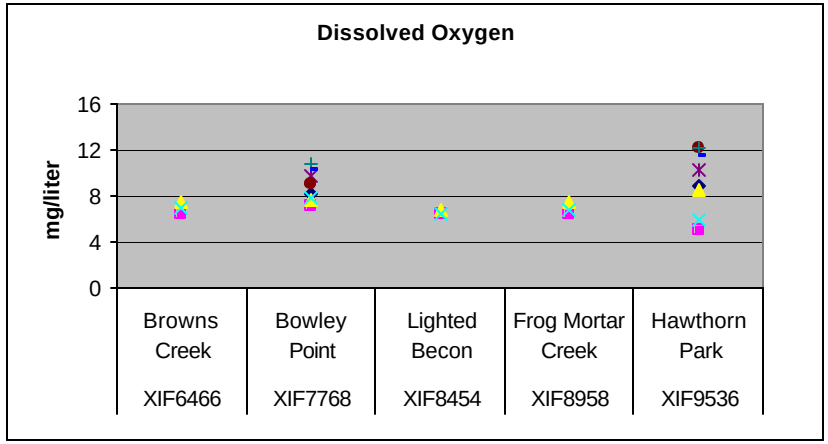

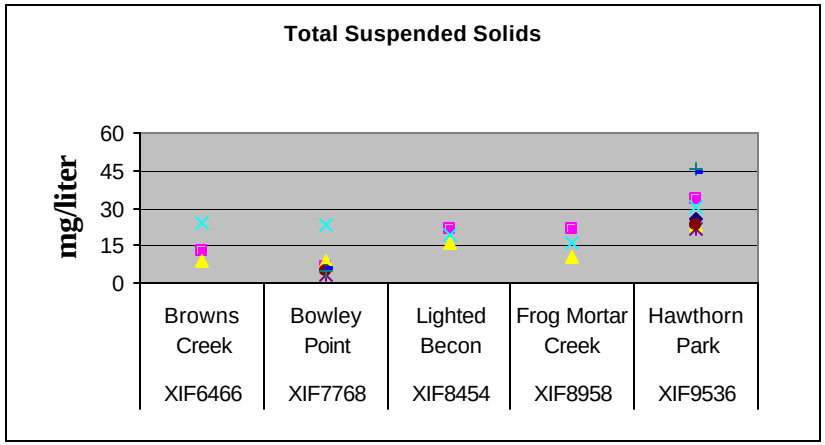

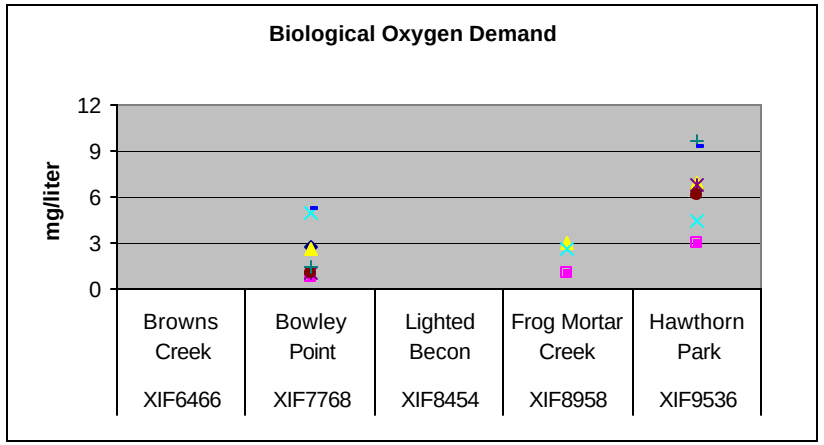

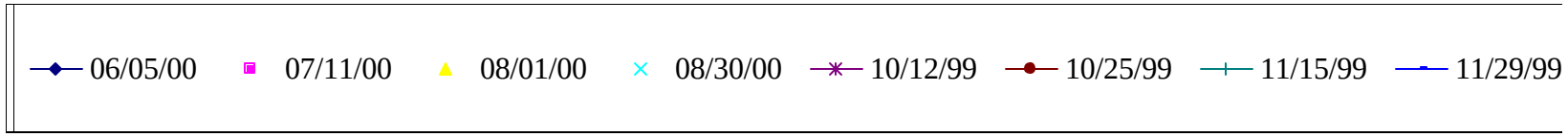

Middle River-Browns
Low Flow Conditions (June to November)
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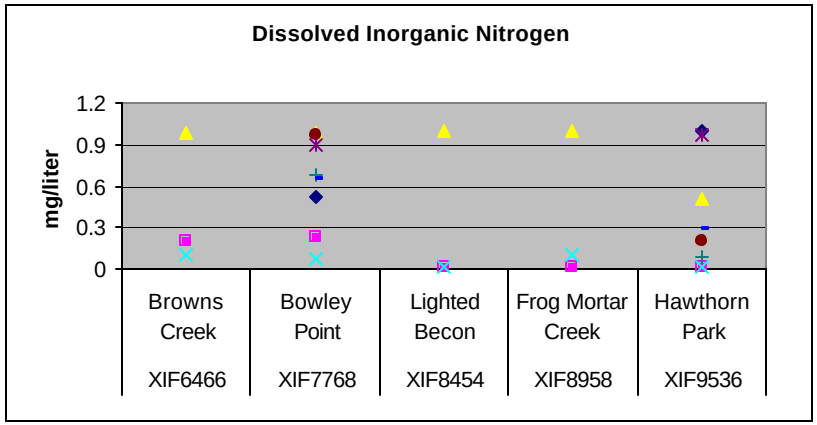
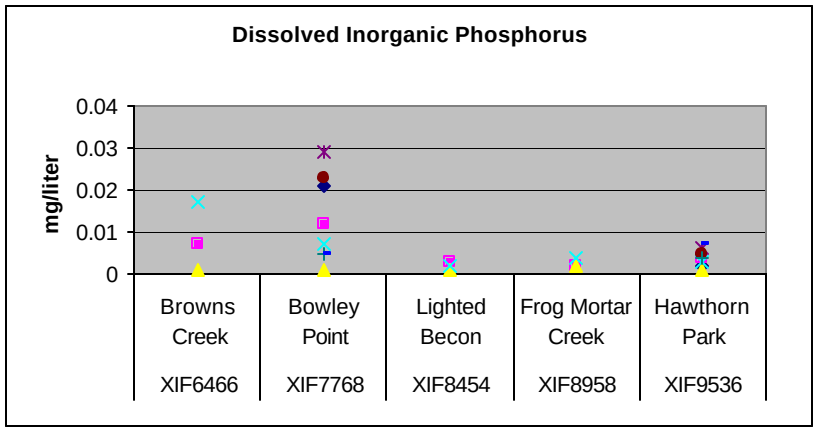
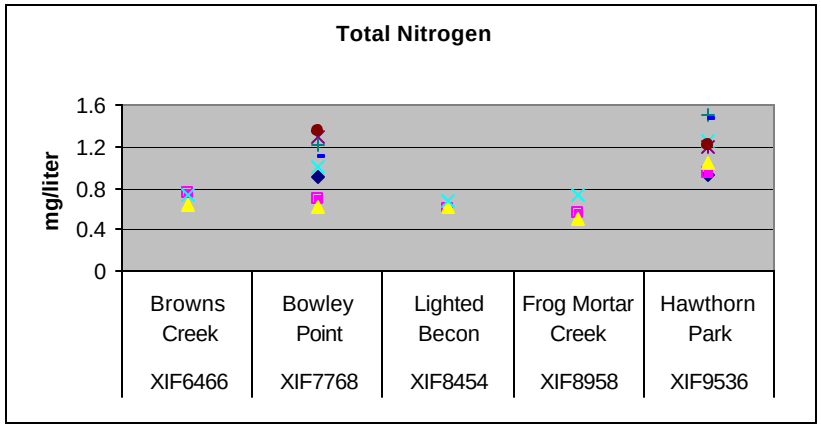
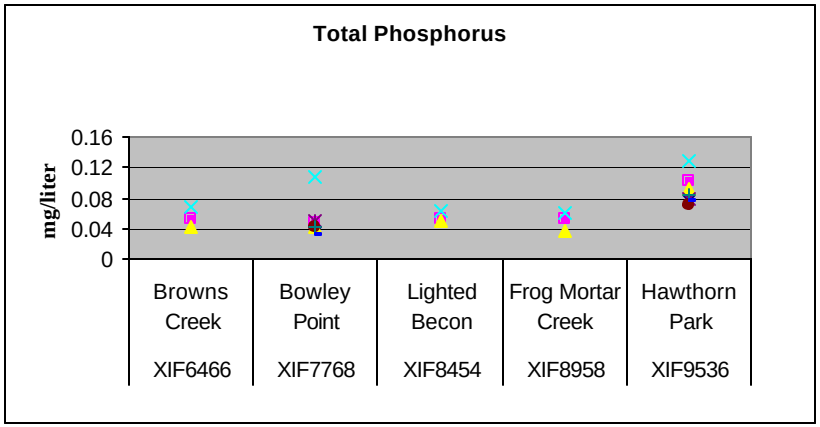
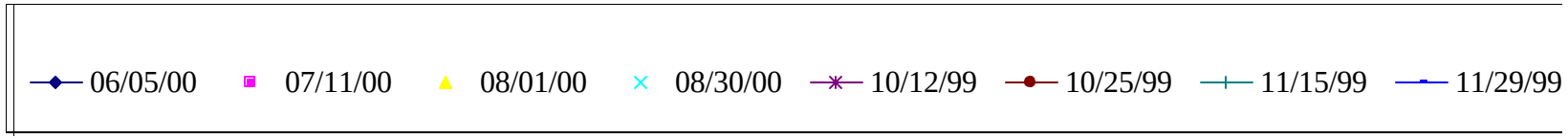










MIDDLE RIVER – BROWNS STATION LIST

Station Code	Station Names	Lat/Long	Description
MIDDLE RIVER			
XIF7768	Bowley Point	39 17.610 76 23.326	West of DM R6, south of Bowley Point. Depth ~ 10 ft.
XIF8454	Lighted Beacon	39 18.375 76 24.636	Middle of marked channel, SW of lighted beacon. Depth ~ 7-10 ft.
XIF9536	Hawthorn Park	39 19.475 76 26.381	At end of Midthorn Road. Sample from pier at Hawthorn Park.
FROG MORTAR CR. (TRIBUTARY OF MIDDLE RIVER)			
XIF8958	Frog Mortar Creek	39 18.892 76 24.230	SE of Martin State Airport. Depth ~ 12 ft.
BROWNS CR. (TRIBUTARY OF MIDDLE RIVER)			
XIF6466	Browns Creek	39 16.440 76 23.432	Between Balliston Point and Wells Point. Depth ~ 6 ft.

Patapsco/Back River Watersheds

Back River

Bodkin Creek

Jones Falls

Gwynn Falls

Patapsco River Lower North Branch

Liberty Reservior

Patapsco River South Branch

Patapsco River Sub-Basin
(Sub-basin 02-13-09)

General Description (from 1998, 305 (b) Report)
The Patapsco/Back Rivers sub-basin drains 635 square miles of Baltimore City and portions of Anne Arundel, Baltimore, Carroll, and Howard Counties.

Except for the immediate area surrounding the Baltimore Harbor area, most of the sub-basin lies in the Piedmont Province; the remaining area lies in the Coastal Plain Province. Large water bodies include Back River, Gwynns and Jones Falls, the South and North Branches of the Patapsco River, Lake Roland, Piney Run Reservoir, Liberty Reservoir, and Baltimore Harbor, a tidal embayment formed at the confluence of the Patapsco River and the Jones and Gwynns Falls.

Land in the Patapsco River sub-basin is primarily developed (47 percent of the drainage land area) although there are significant forest and agricultural areas (29 and 23 percent), particularly in the western portion of the watershed. The City of Baltimore is the sub-basin's largest city with suburban communities extending outward in all directions. Other major communities in this sub-basin include Ellicott City, Towson and Glen Burnie.

Most surface waters in the sub-basin are classified as Use I (water contact recreation and aquatic life), Use III (natural trout) or Use IV (put-and-take trout). Above Liberty Reservoir dam or above the Springfield intake, surface waters are classified as Use I-P (water contact recreation, aquatic life and public water supply) or Use III-P (natural trout and public water supply) or IV-P (put-and-take trout and public water supply) (COMAR '26.08.02.08J). For the most recent information regarding specific use classes in this watershed, the reader is referred to the Code of Maryland Regulations. One small creek, located in North Point State Park (Shallow Creek) is classified as a Use II water and is technically located in this sub-basin, even though it empties directly into the Bay. This creek is closed to shellfish harvesting because of the lack of a monitoring program rather than having poor water quality (Kathy Brohawn, 1998, pers. comm.).

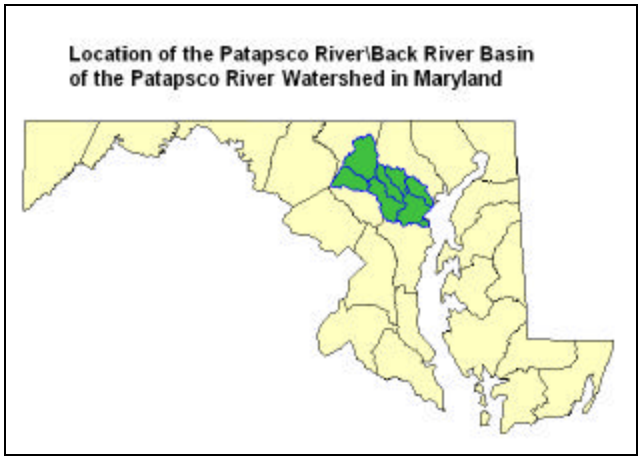
The State routinely monitors water quality at two Bay Tributary stations and at five additional CORE/Trend stations located in the free-flowing and tidal Patapsco River and in Jones and Gwynns Falls. In addition to chemical sampling, phytoplankton and microzooplankton (one station) and mesozooplankton (one station) communities are monitored. Five fixed Long Term Benthic Macroinvertebrate program stations are 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 at 61 stations in 1995 and at 69 stations in 1996.

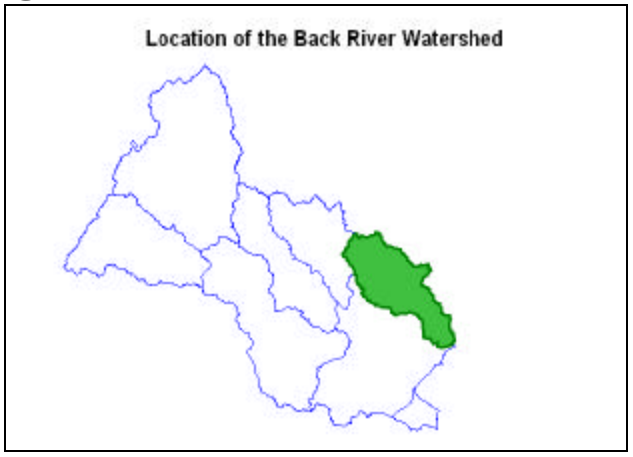
Because of sediment, nutrient and bacterial problems in urban and developing areas in this basin, four areas have been designated for special water quality restoration projects under the State's Targeted Watershed or MDE's Program. These include Sawmill Creek.

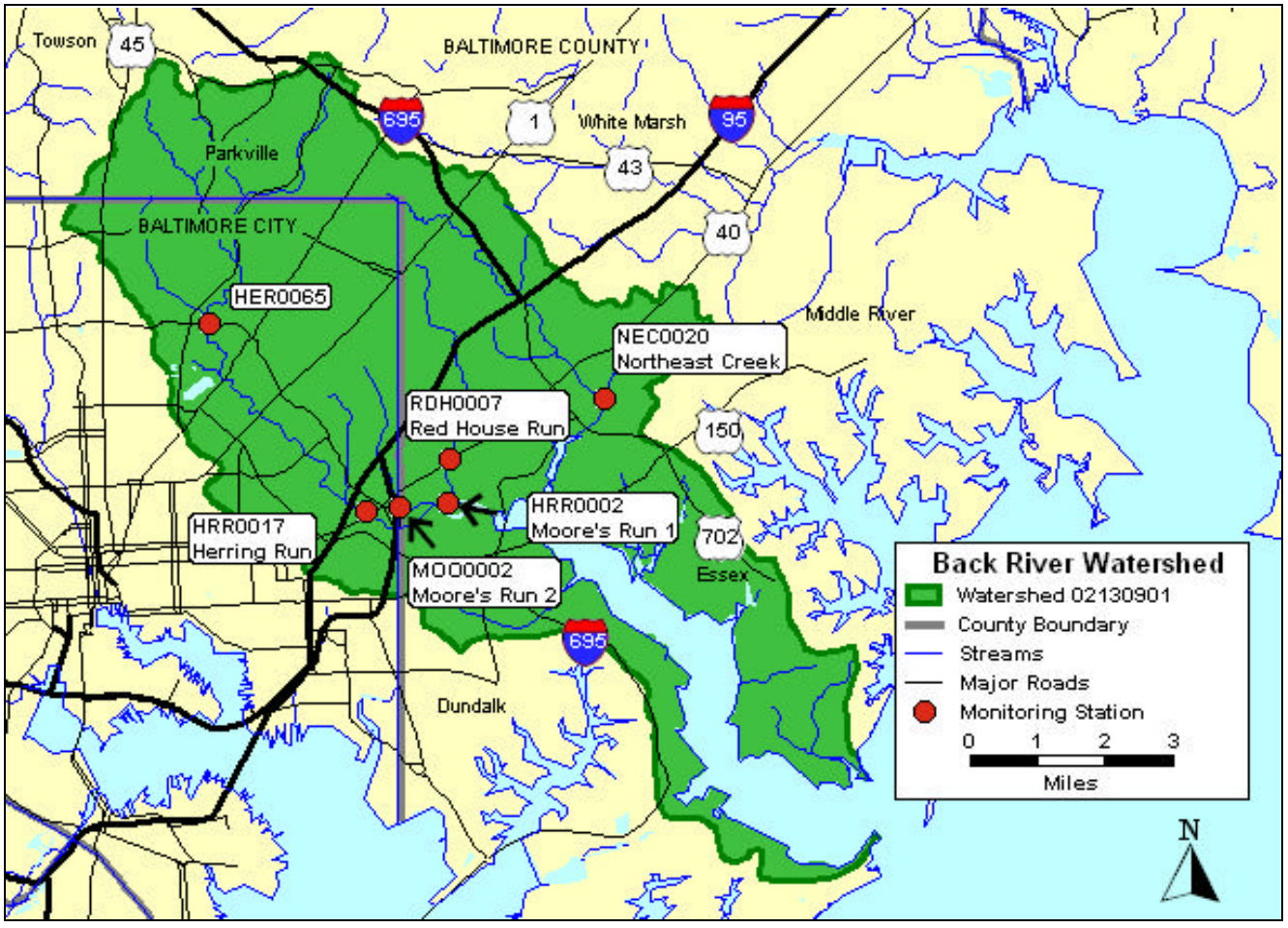
Water Quality Summary
Bodkin Creek (02130902) will be addressed by a cooperative effort by the Bay States with the EPA Chesapeake Bay Program taking the lead. Jones Falls (02130904), Gwynn Falls (02130905), Patapsco River Lower N. Branch (02130906), and Liberty Reservoir (02130907) will be addressed at a future date. South Branch Patapsco (02130908) received a Water Quality Analysis concurrence from EPA on January 20, 2005, and Carroll County has agreed to do a watershed protection plan. TMDLs to address the nutrient impairments in Back River (02130901), and the

Baltimore Harbor (02130903), were developed by MDE. The Back River Nutrient TMDL was approved by EPA June 29, 2005 and the Baltimore Harbor Nutrient TMDL was submitted to EPA December 14, 2006.

Back River Monitoring Stations

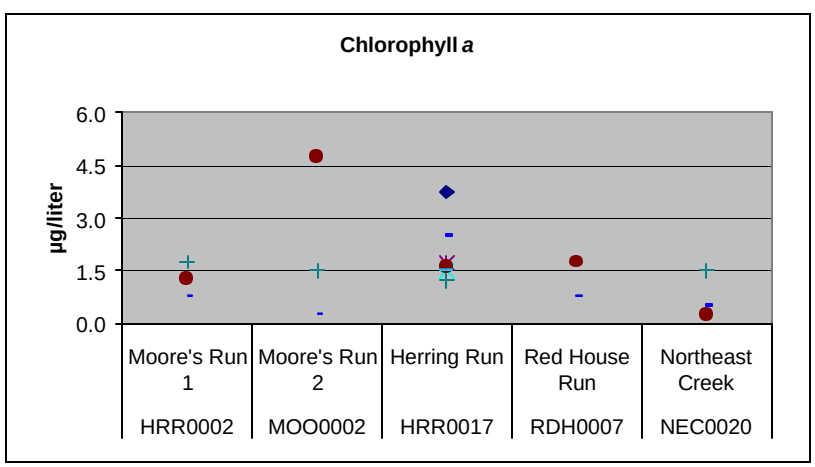


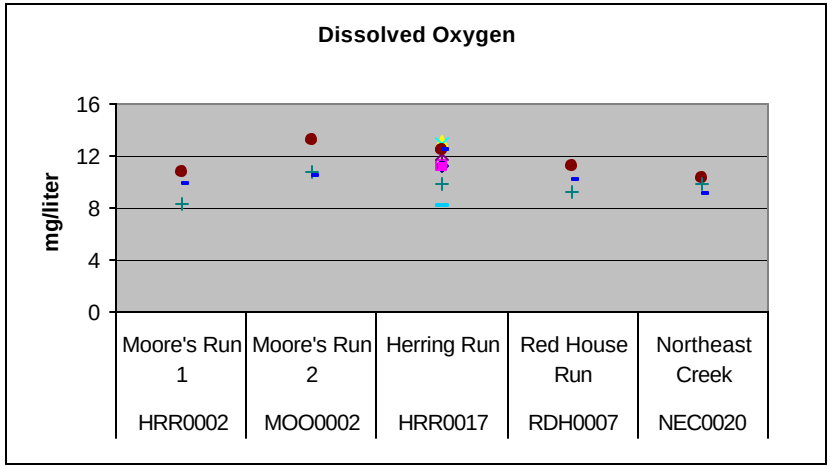


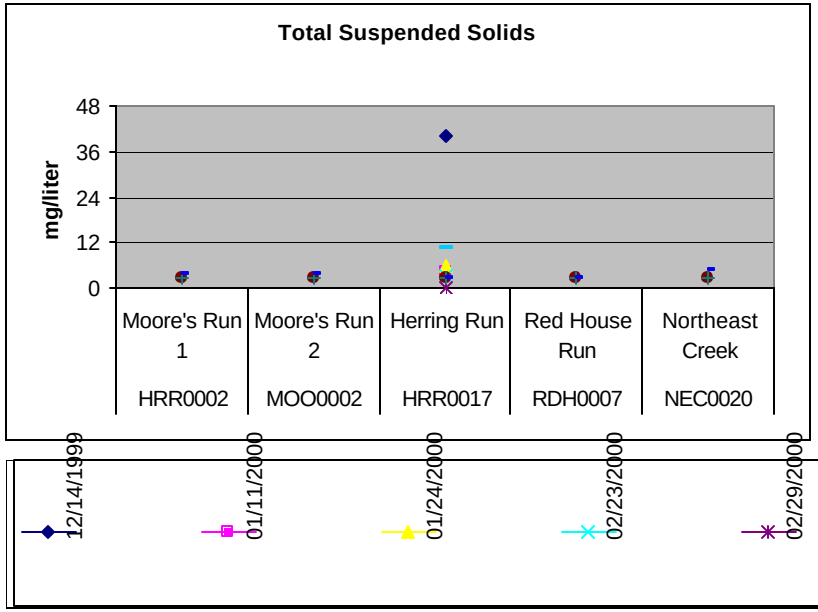


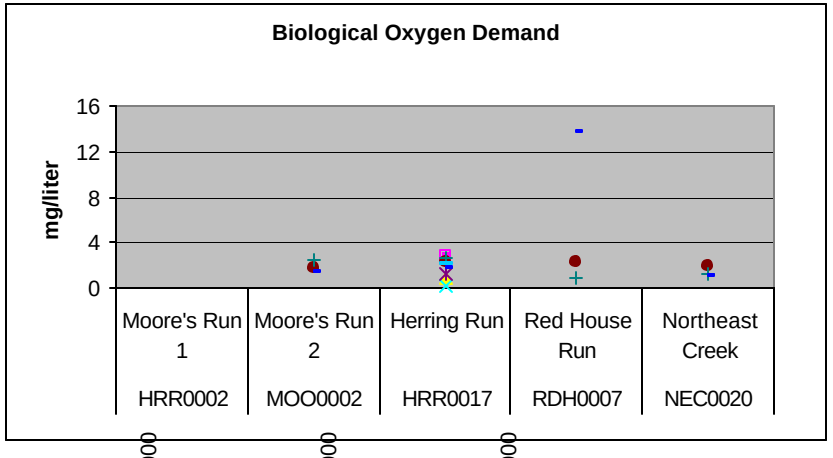
Map Prepared by the Maryland Department of the Environment
Science Services Administration
Montgomery Park Business Center
1800 Washington Boulevard, Suite 540
Baltimore, Maryland 21230-1718

Back River
High Flow Conditions (December-May)
Stations are presented from left to right from downstream to upstream









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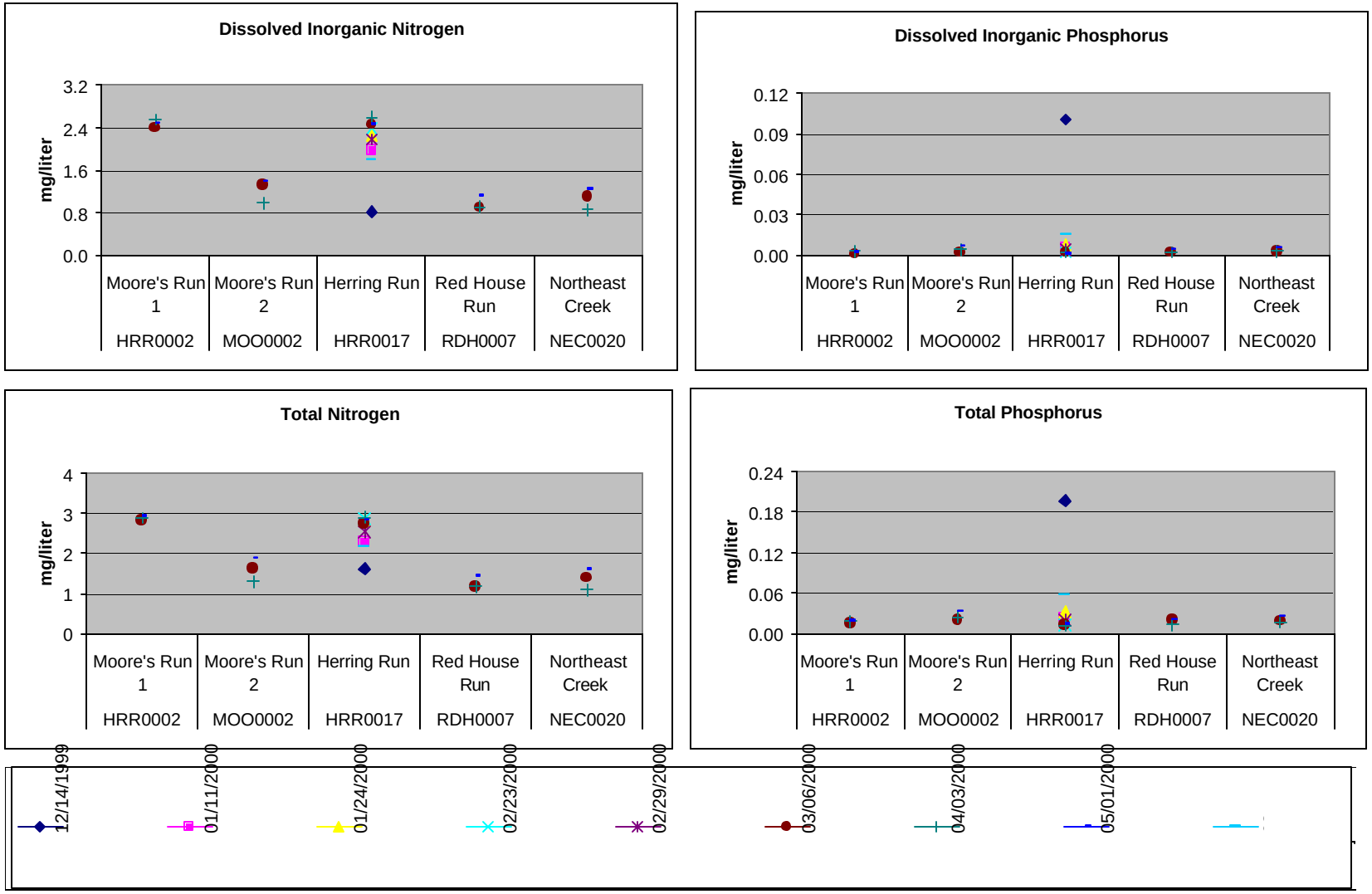

Back River
Low Flow Conditions (June to November)
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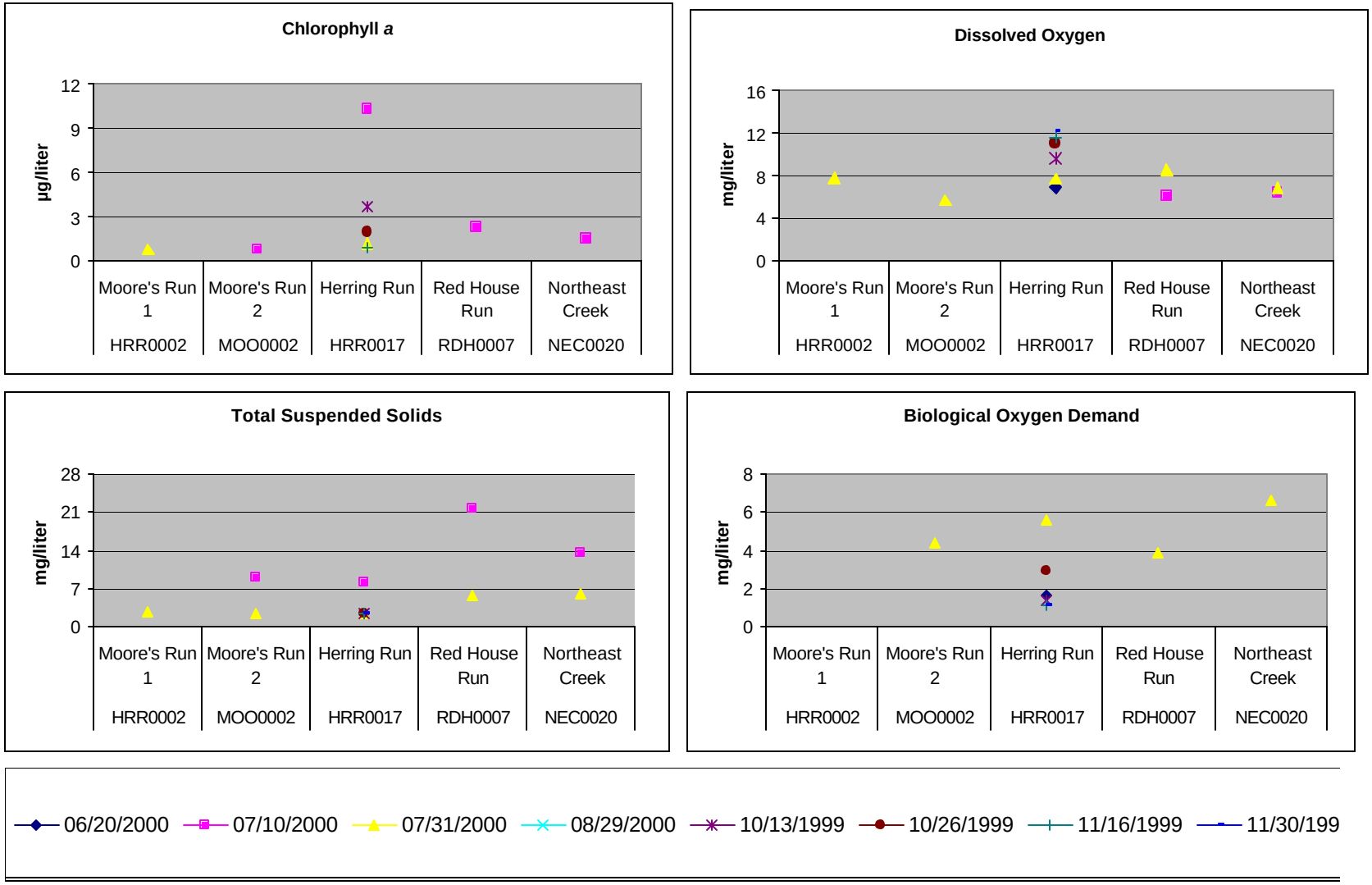

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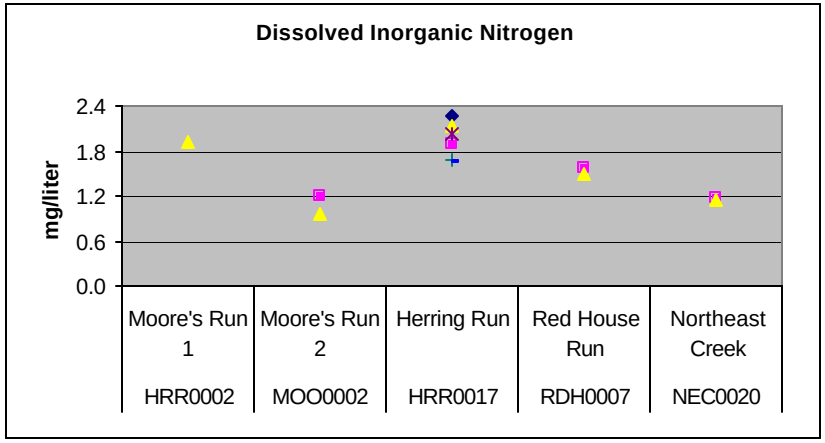
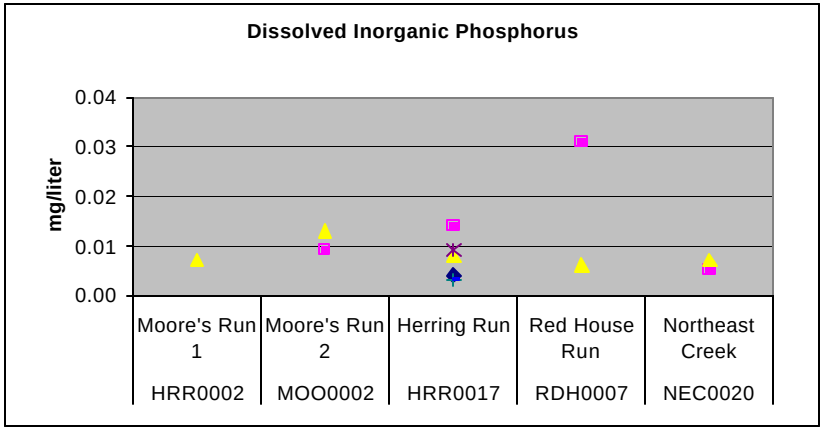
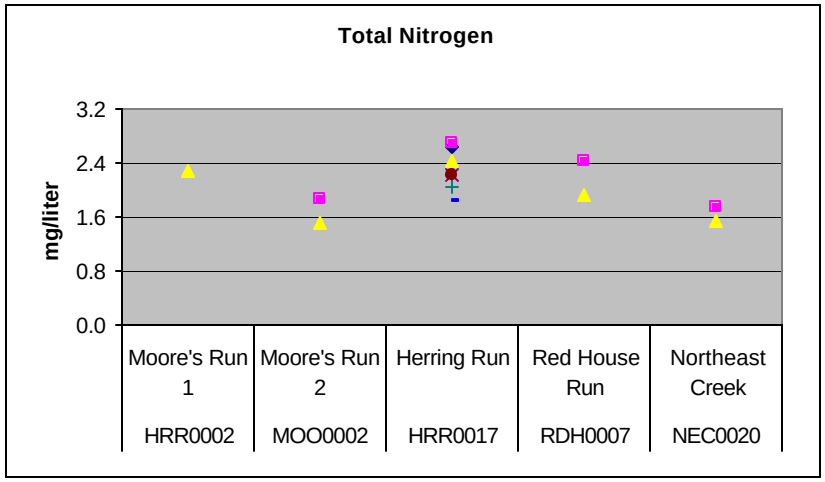
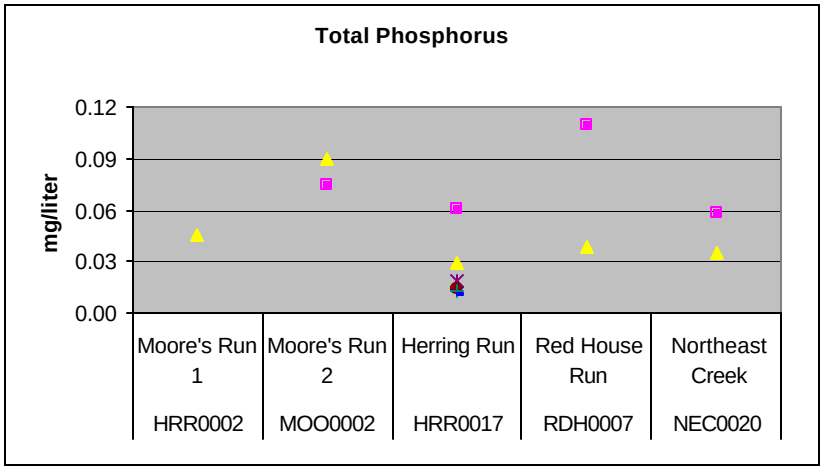
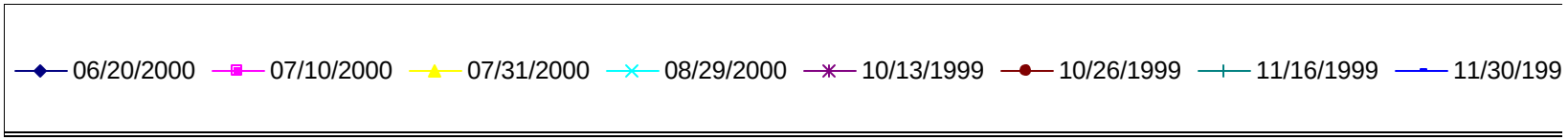






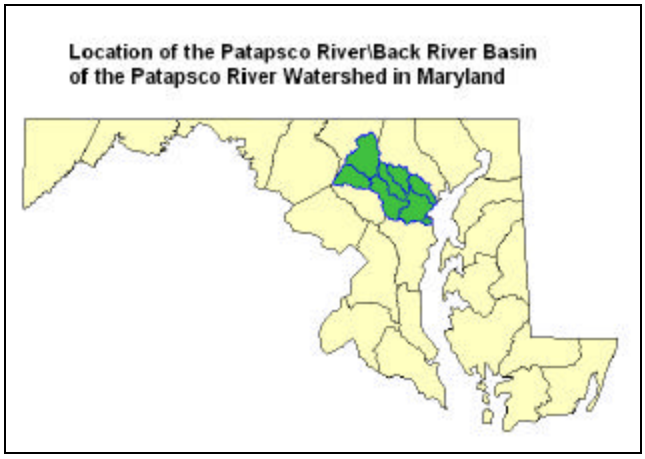


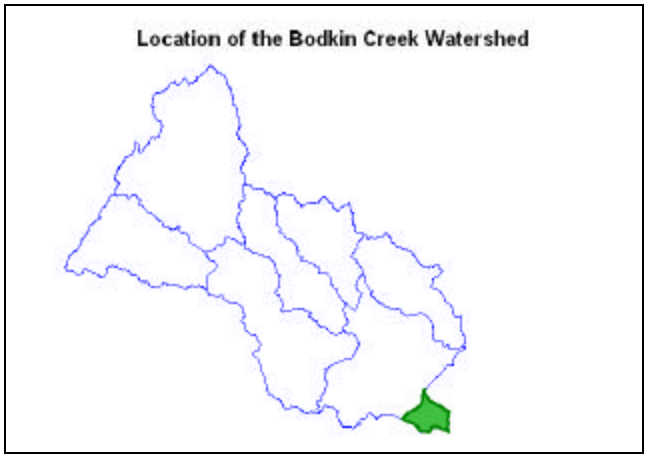


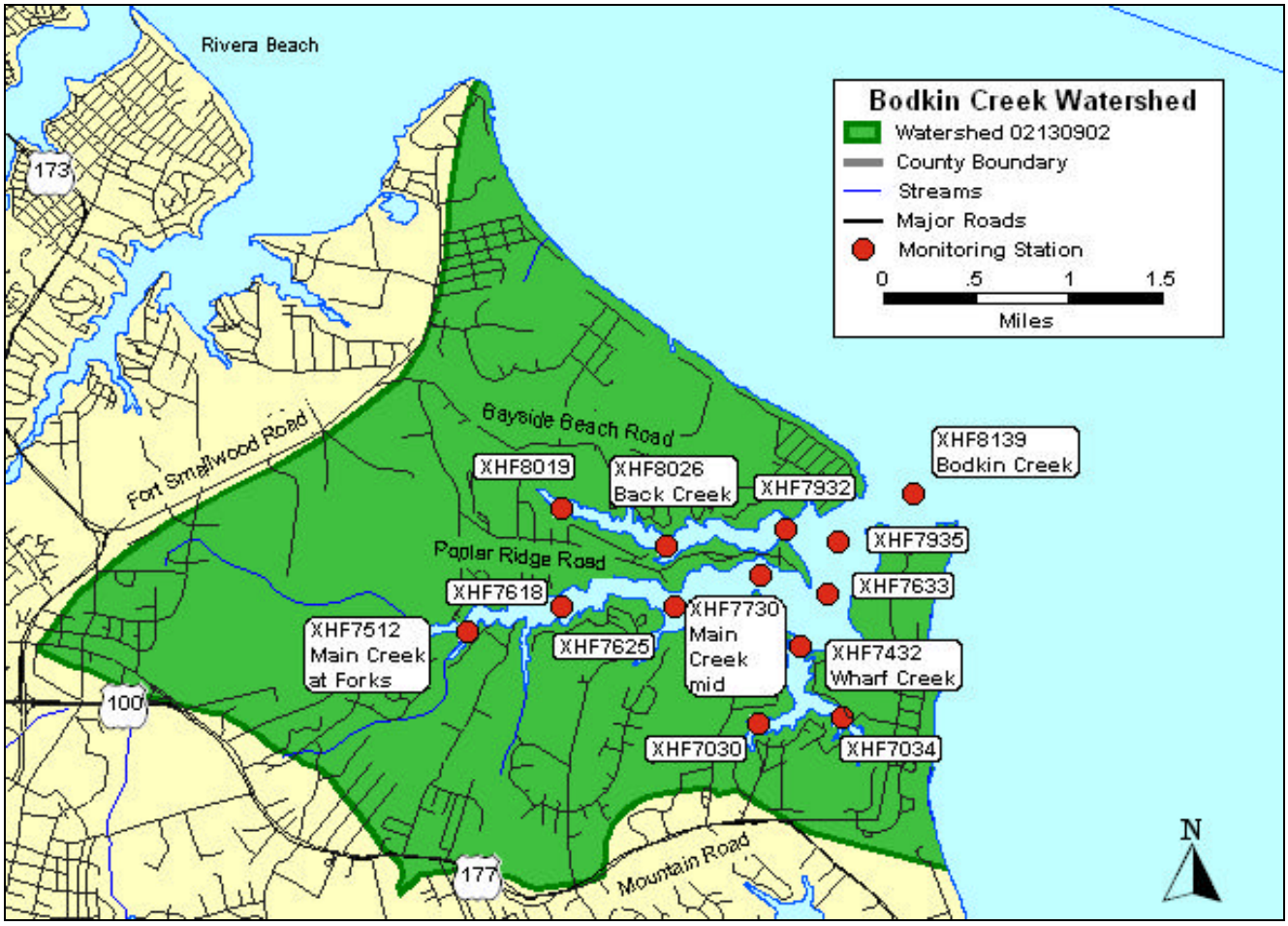
BACK RIVER STATION LIST

Station Code	Station Names	Lat/Long	Description
HERRING RUN			
HRR0017	Herring Run	39 18.375 76 32.306	Rte 40 crossing. Pull into Baltimore City Towing Division and collect bank sample.
HRR0002	Moore's Run 1	39 18.477 76 30.991	Actually named Moores Run according to ADC map. From Baltimore City Towing Division, take Rte 40 West, make left onto North Pt Boulevard. Go through light at Quad Ave. Make left at industrial building on left near 500 block of North Pt Blvd; you are now on an unnamed gravel access road. Follow gravel road under the Rte 95 over-pass and over the first set of train tracks. Follow dirt road along second, larger set of train tracks until you reach a large concrete/steel pipe crossing over Moores Run. The site looks like a dumping grounds for concrete rubble and trash. The station will be obvious once found; no flow due to tidal influence. Baltimore County ADC map 36 – G10.
MOORE'S RUN			
MOO0002	Moore's Run 2	39 18.416 76 31.762	From Rte 40 take 64th or 65th Street and follow to Biddle Street. Make right on Biddle and follow to corner of 62nd Street and Biddle Street. There is a "Road End" sign here and a guard rail blocking where Biddle St used to continue. Walk along old existing Biddle St down to stream. Baltimore County ADC map 36 – E10.
RED HOUSE RUN			
RDH0007	Red House Run	39 19.020 76 30.951	Red House Run at Rte 40 crossing. West bound Rte 40 has a good pull off location on bridge. Baltimore County ADC map 36 – G8.
NORTHEAST CREEK			
NEC0020	Northeast Creek	39 19.799 76 28.446	Northeast Creek / Stemmers Run at Golden Ring Road bridge crossing. Good pull off in Kelly's Bar parking lot directly across from station. . Baltimore County ADC map 37 – C6.

Bodkin Creek Monitoring Stations







Map Prepared by the Maryland Department of the Environment
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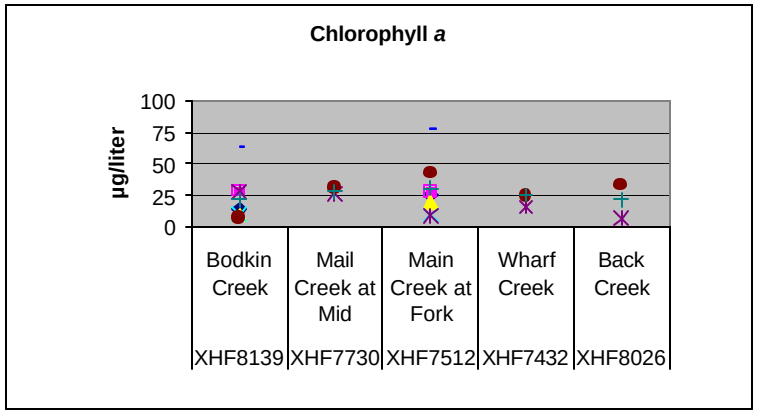
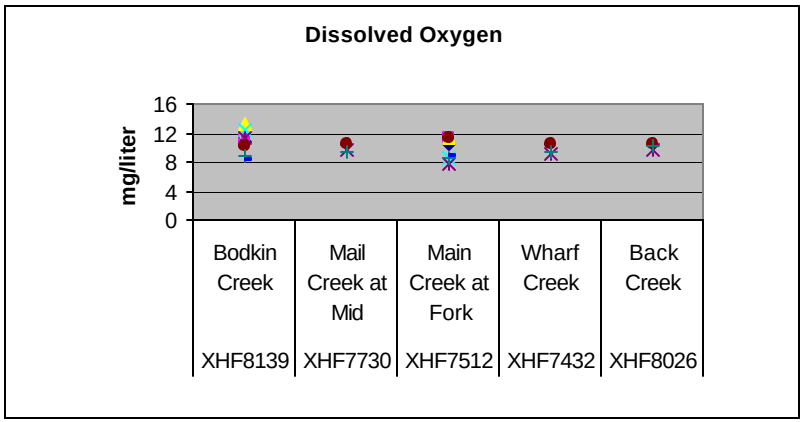
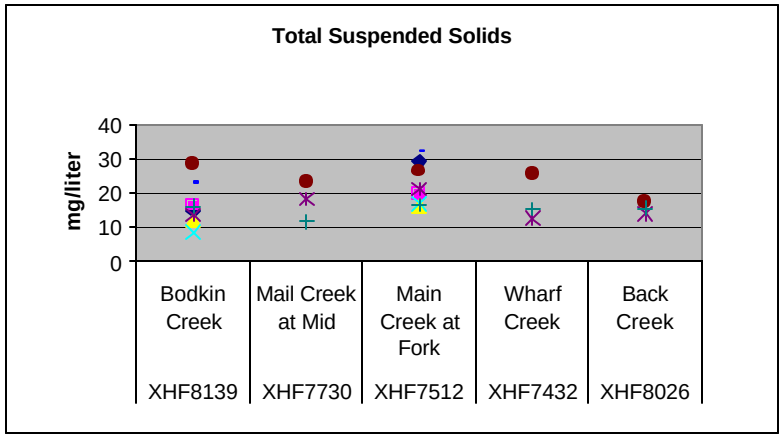
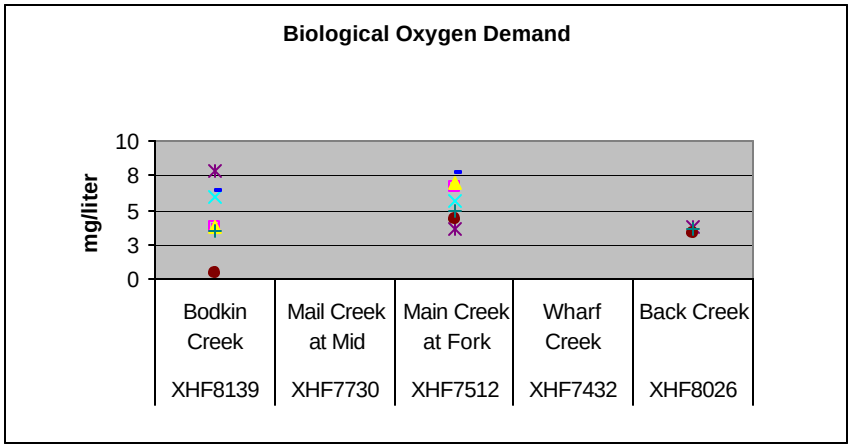
Baltimore, Maryland 21230-1718

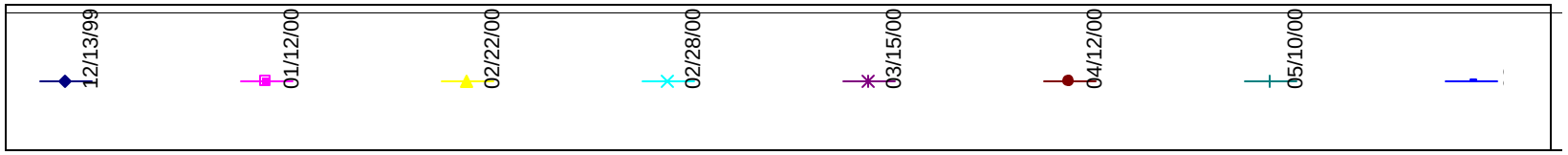
Bodkin Creek
High Flow Conditions (December-May)
Stations are presented from left to right from downstream to upstream











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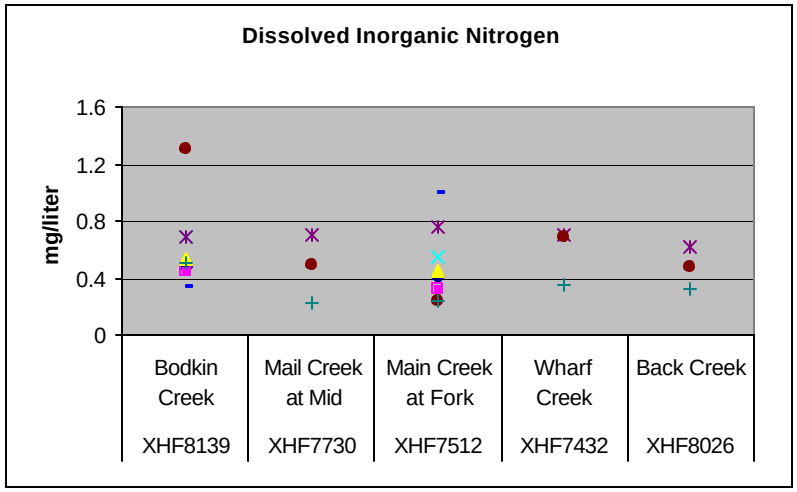

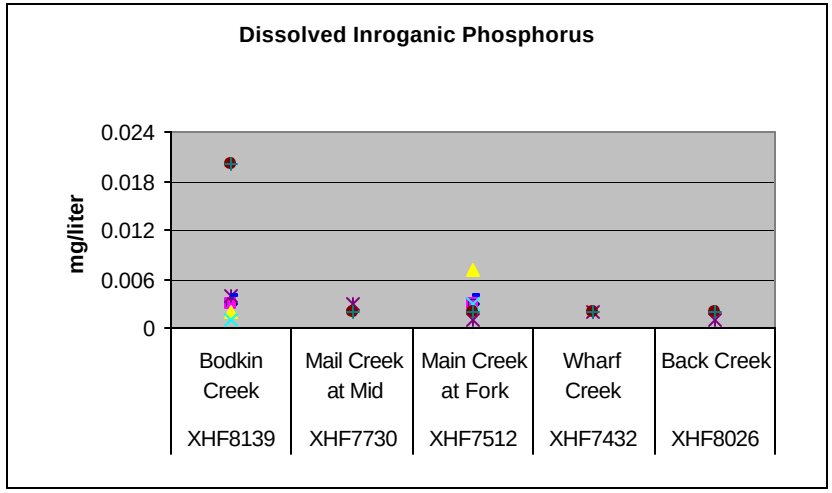

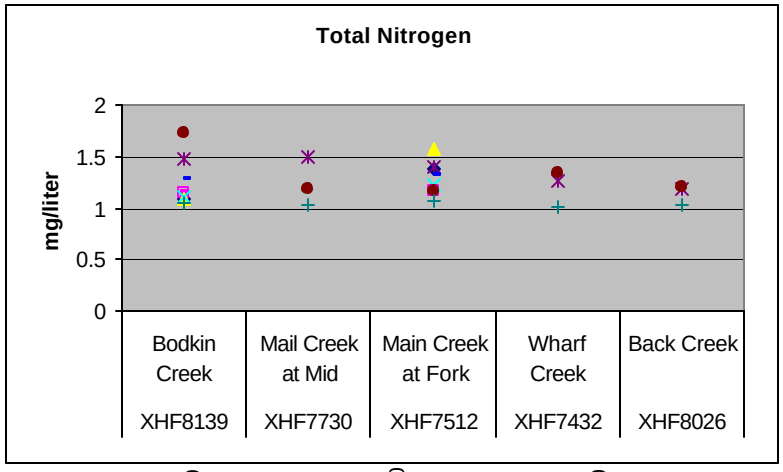

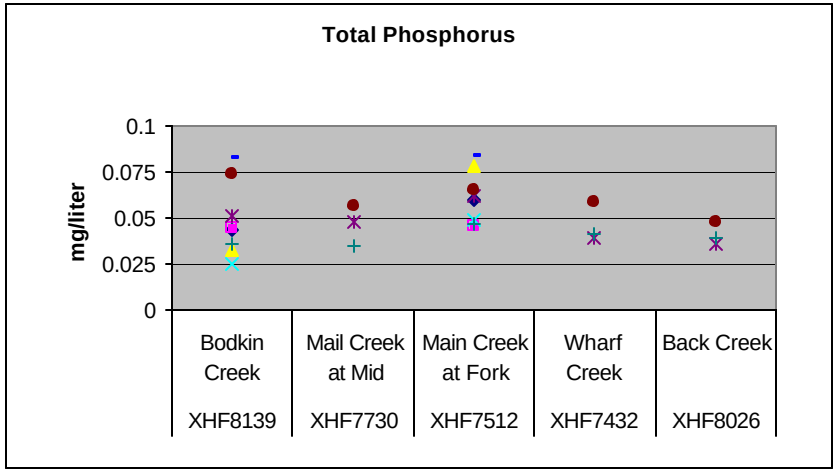

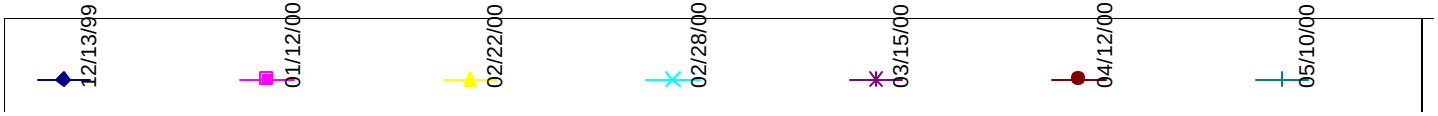

Bodkin Creek
Low Flow Conditions (June to November)
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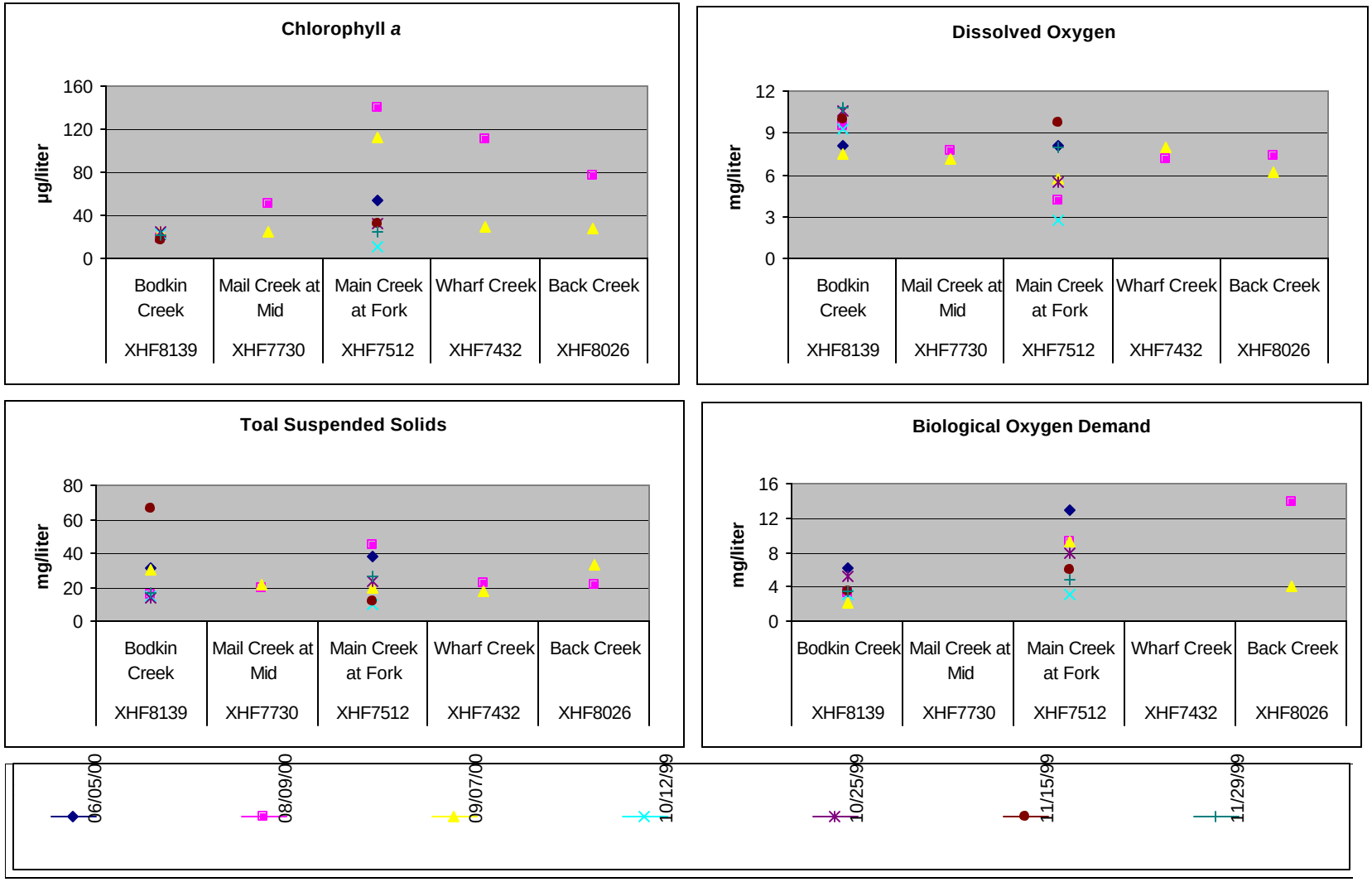

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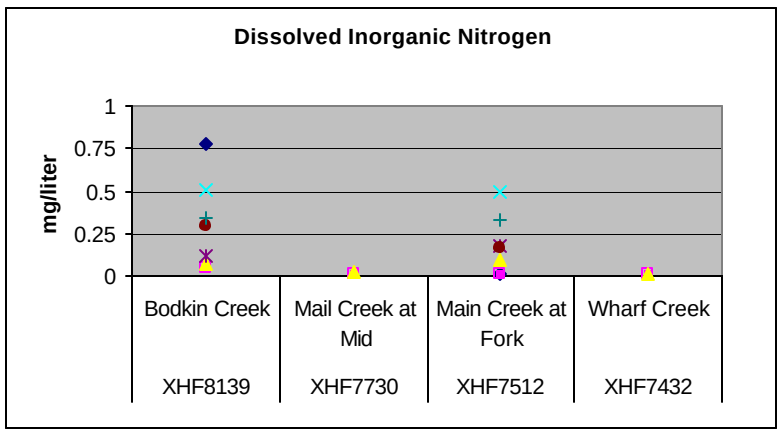
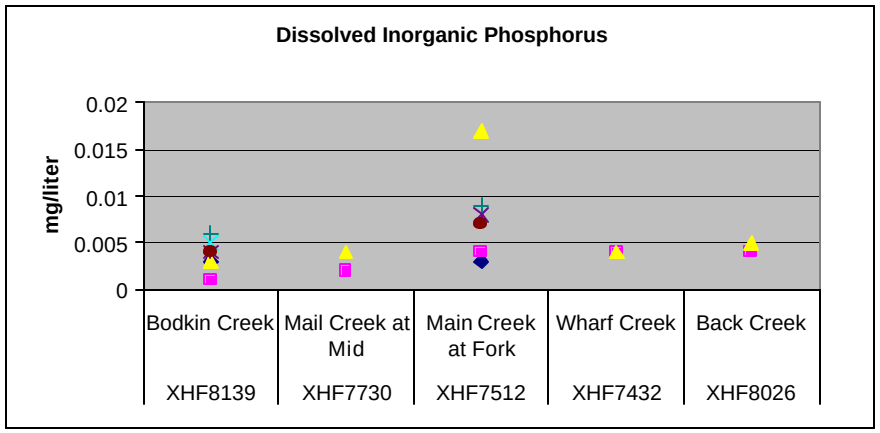
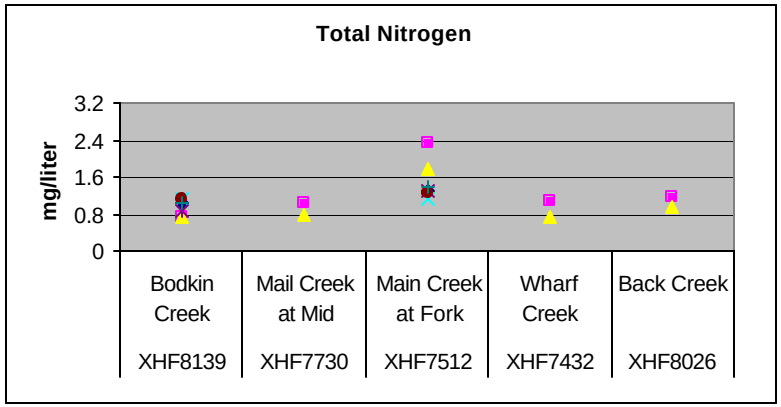
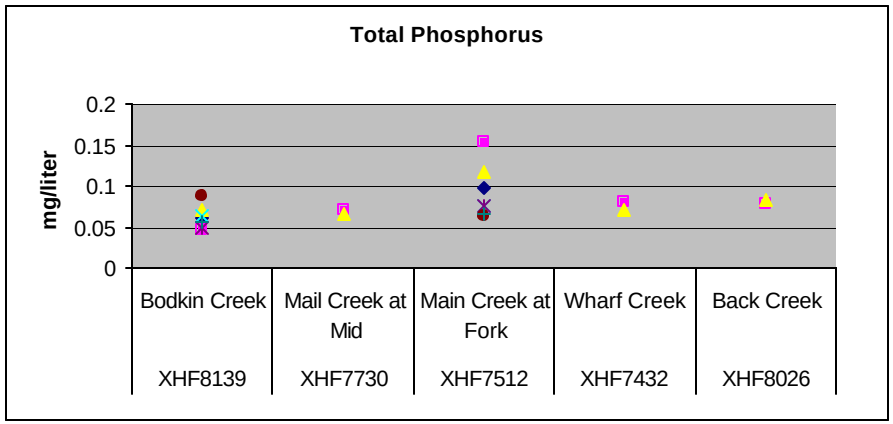
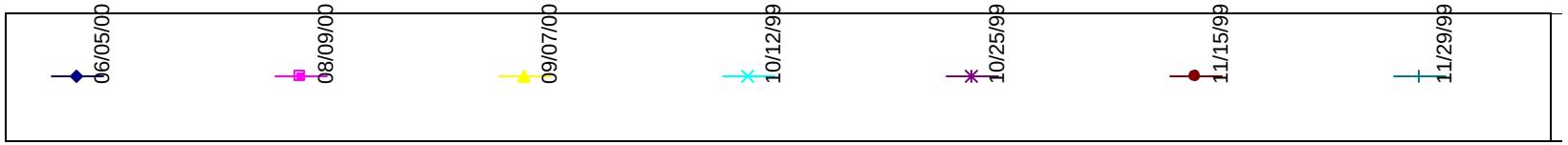






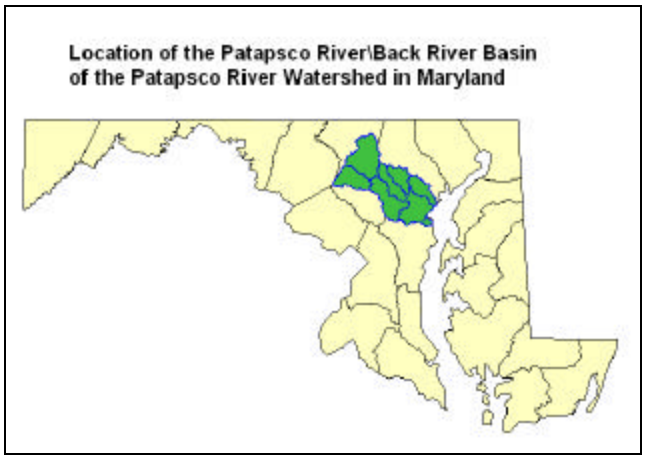


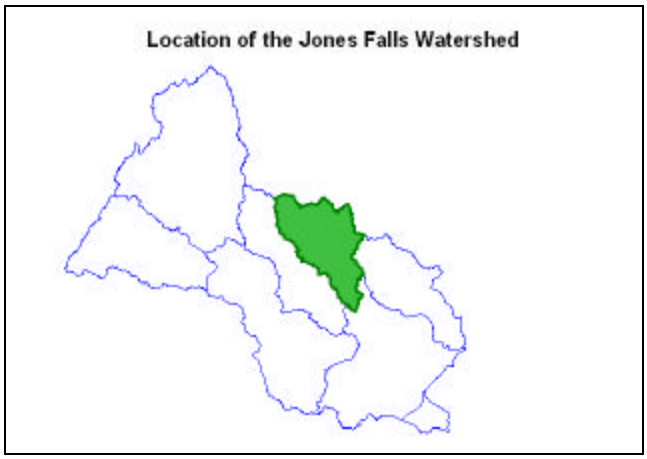


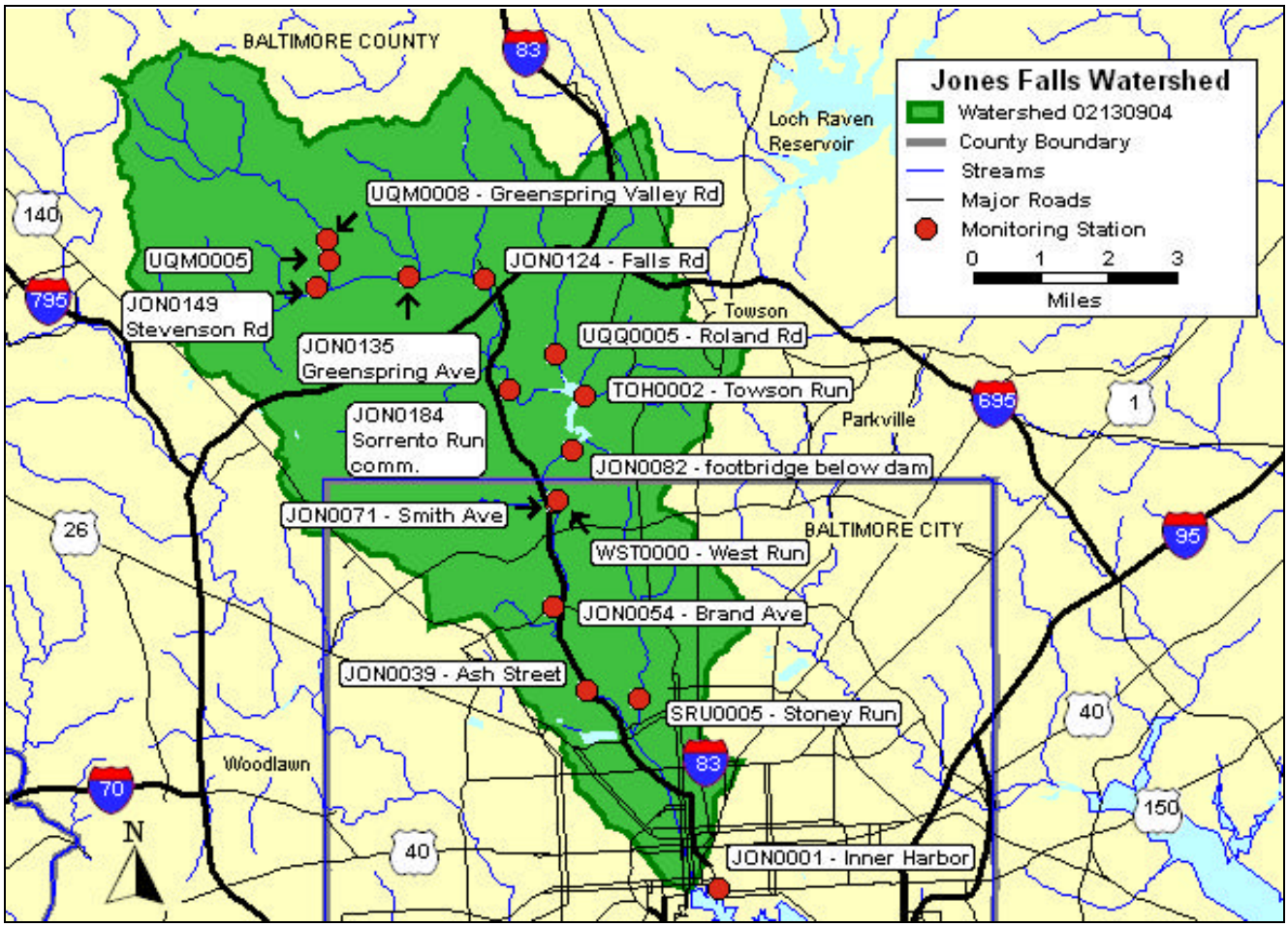
BODKIN CREEK STATION LIST

Station Code	Station Names	Lat/Long	Description
BODKIN CREEK			
XHF8139	Bodkin Creek	39 08.099 76 26.078	Approx. 350 ft east of markers G 9 and R 10. Depth ~ 9 ft.
MAIN CREEK			
XHF7730	Main Creek mid	39 07.720 76 26.986	Mid-channel, off Graveyard Point (Ventnor Marina). Depth ~ 9 ft.
XHF7512	Main Creek at Forks	39 07.455 76 28.742	Head of creek, at confluence of forks. Depth ~ 4-5 ft.
WHARF CREEK			
XHF7432	Wharf Creek	39 07.385 76 26.758	Mouth of creek between Old Bee Point and Orchard Point. Depth ~ 8 ft.
BACK CREEK			
XHF8026	Back Creek	39 07.854 76 27.556	Depth ~ 8 ft.

Jones Falls Monitoring Stations







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Jones Falls (main)
High Flow Conditions (December-May)
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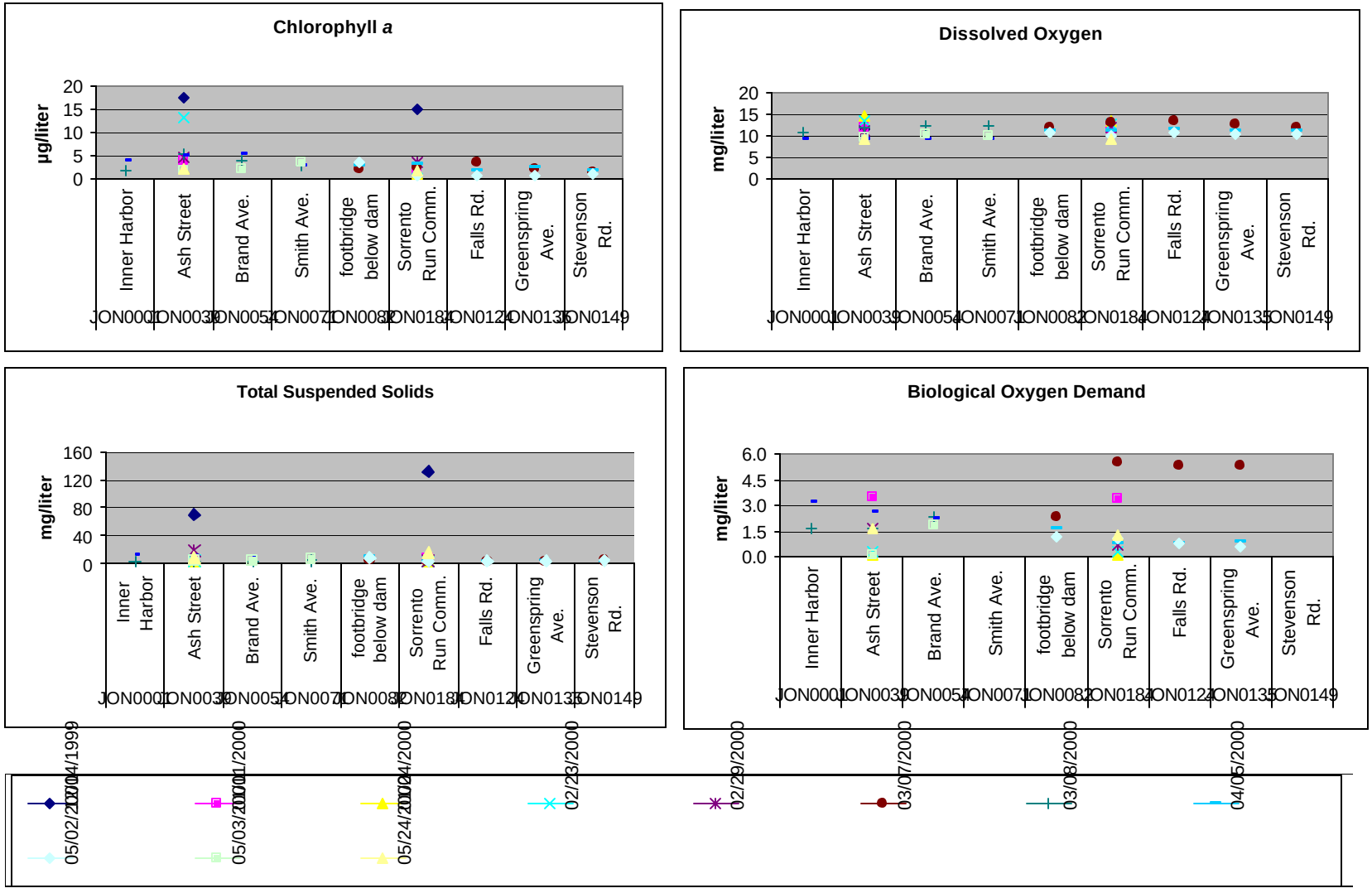

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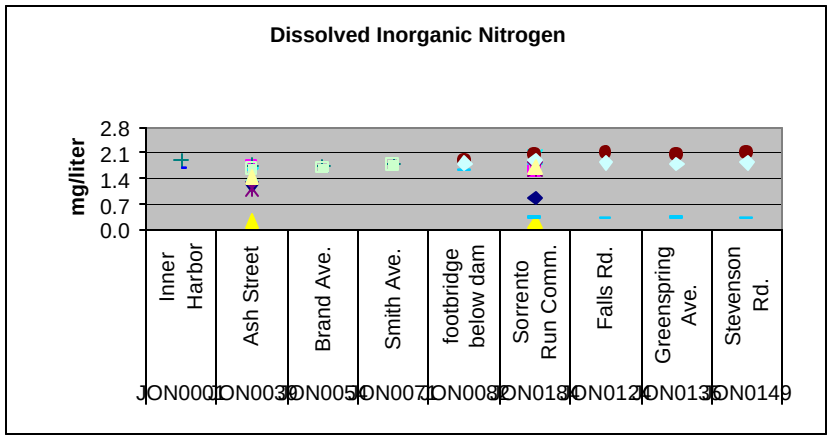

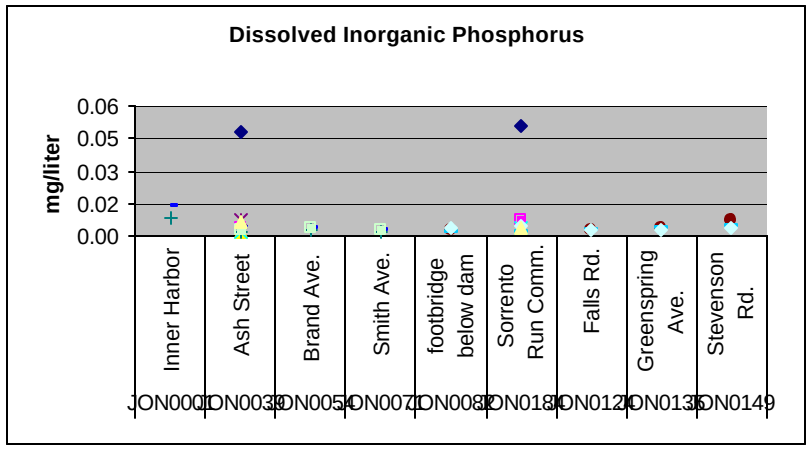

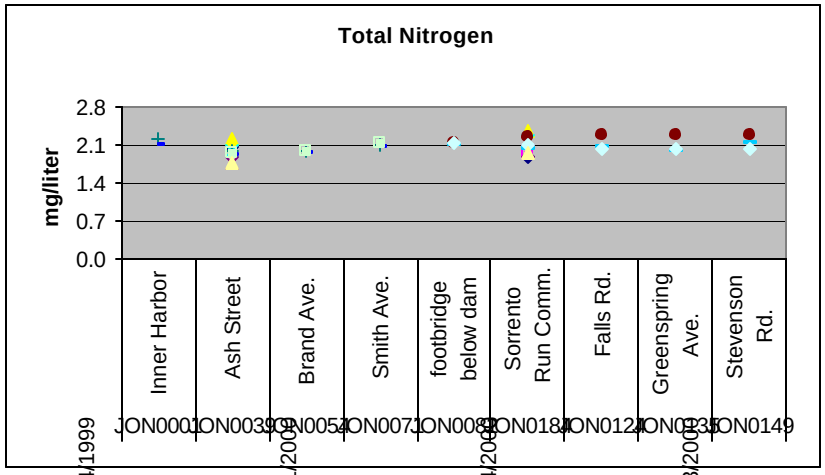

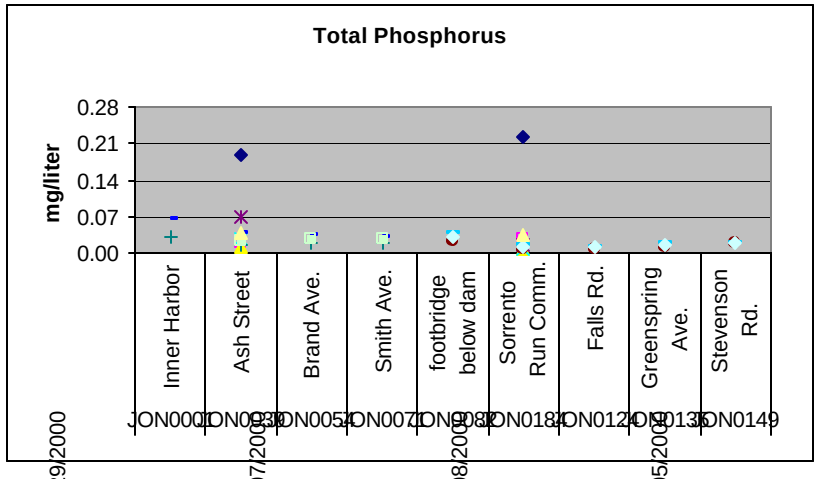

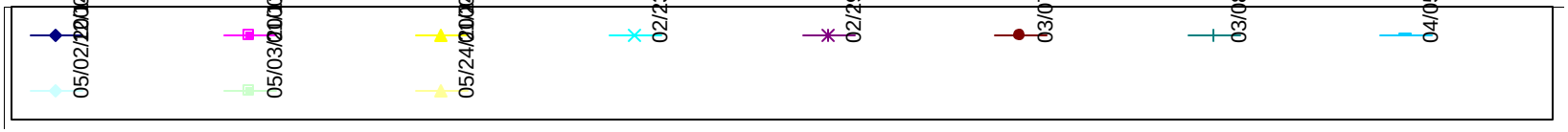

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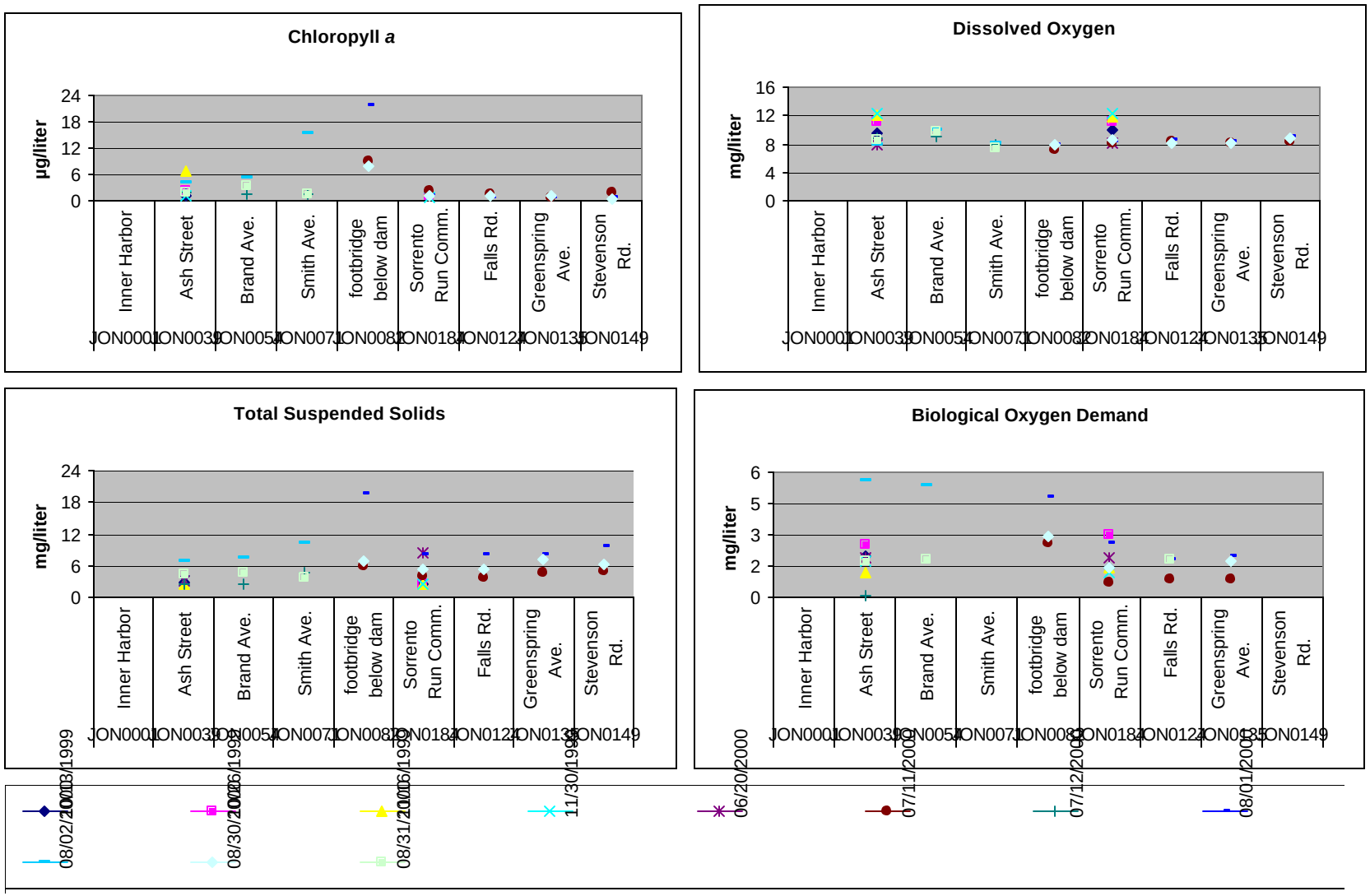

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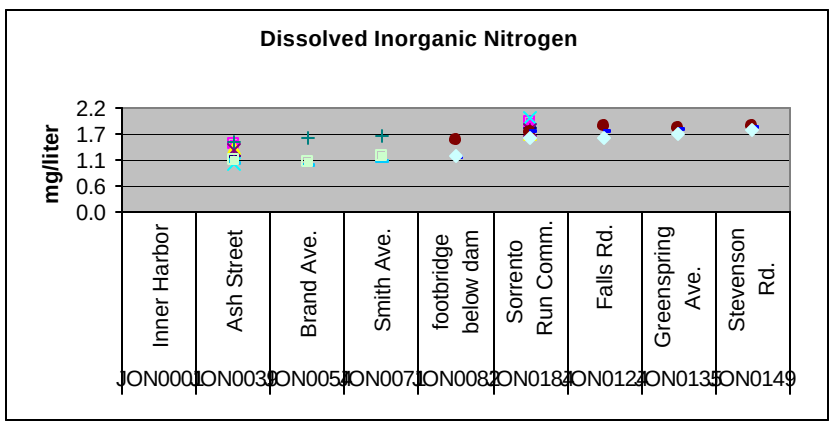

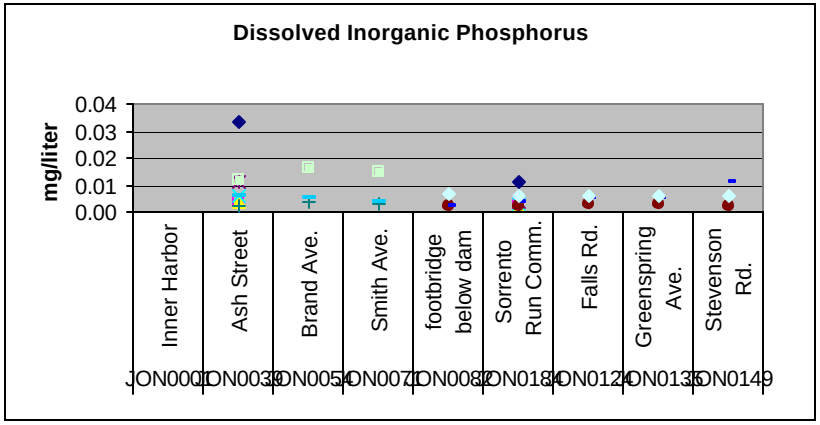

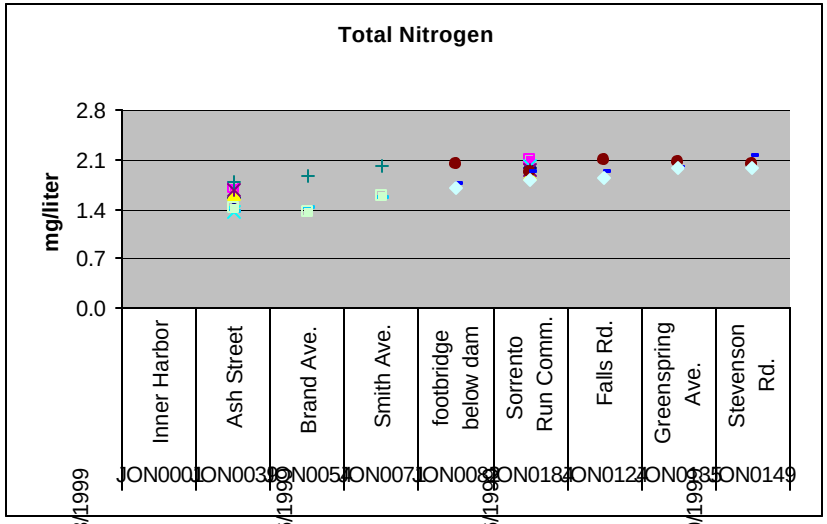

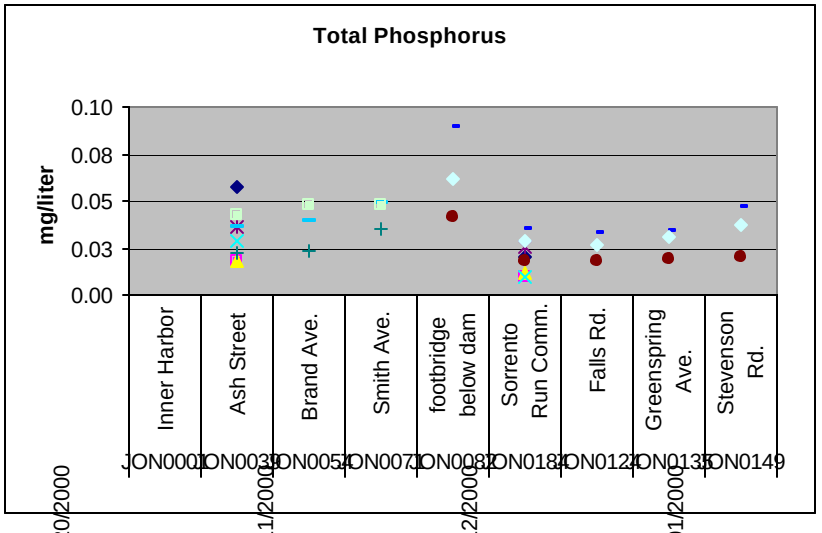

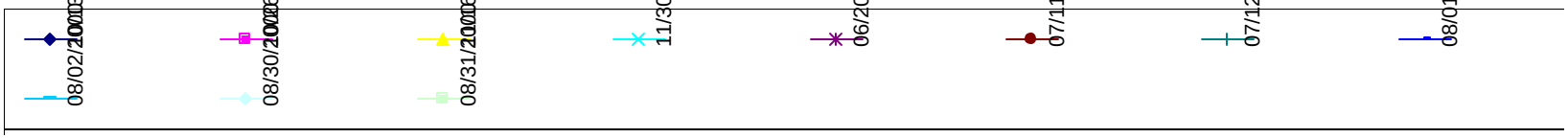

Jones Falls (tributaries)
High Flow Conditions (December-May)
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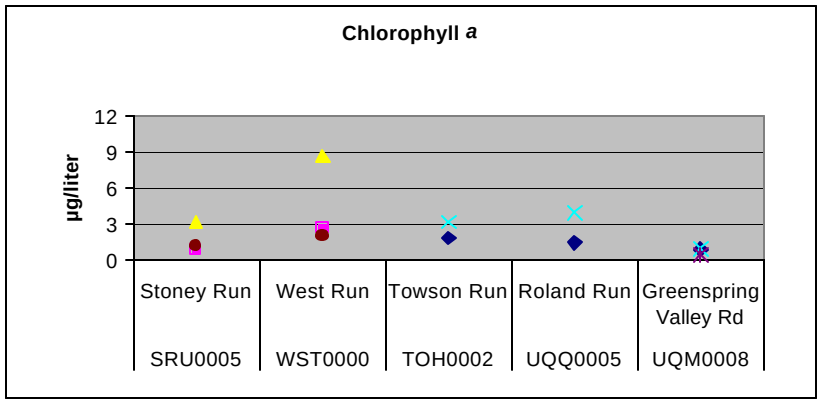

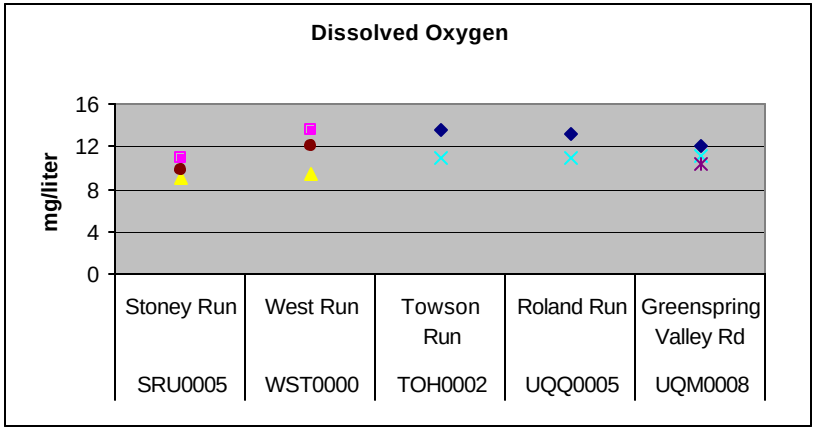

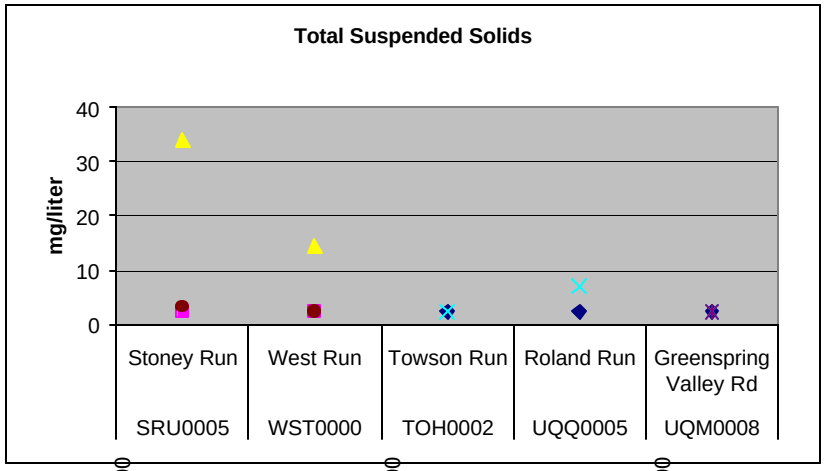

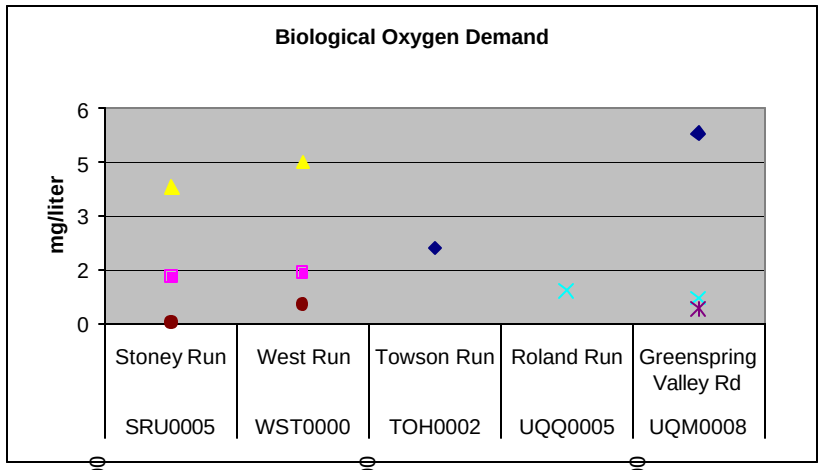

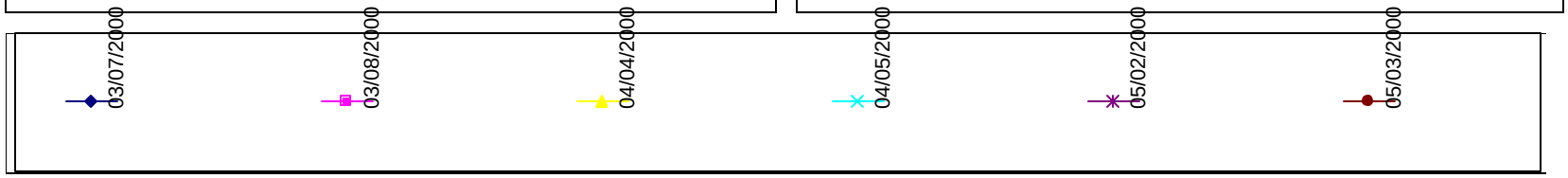

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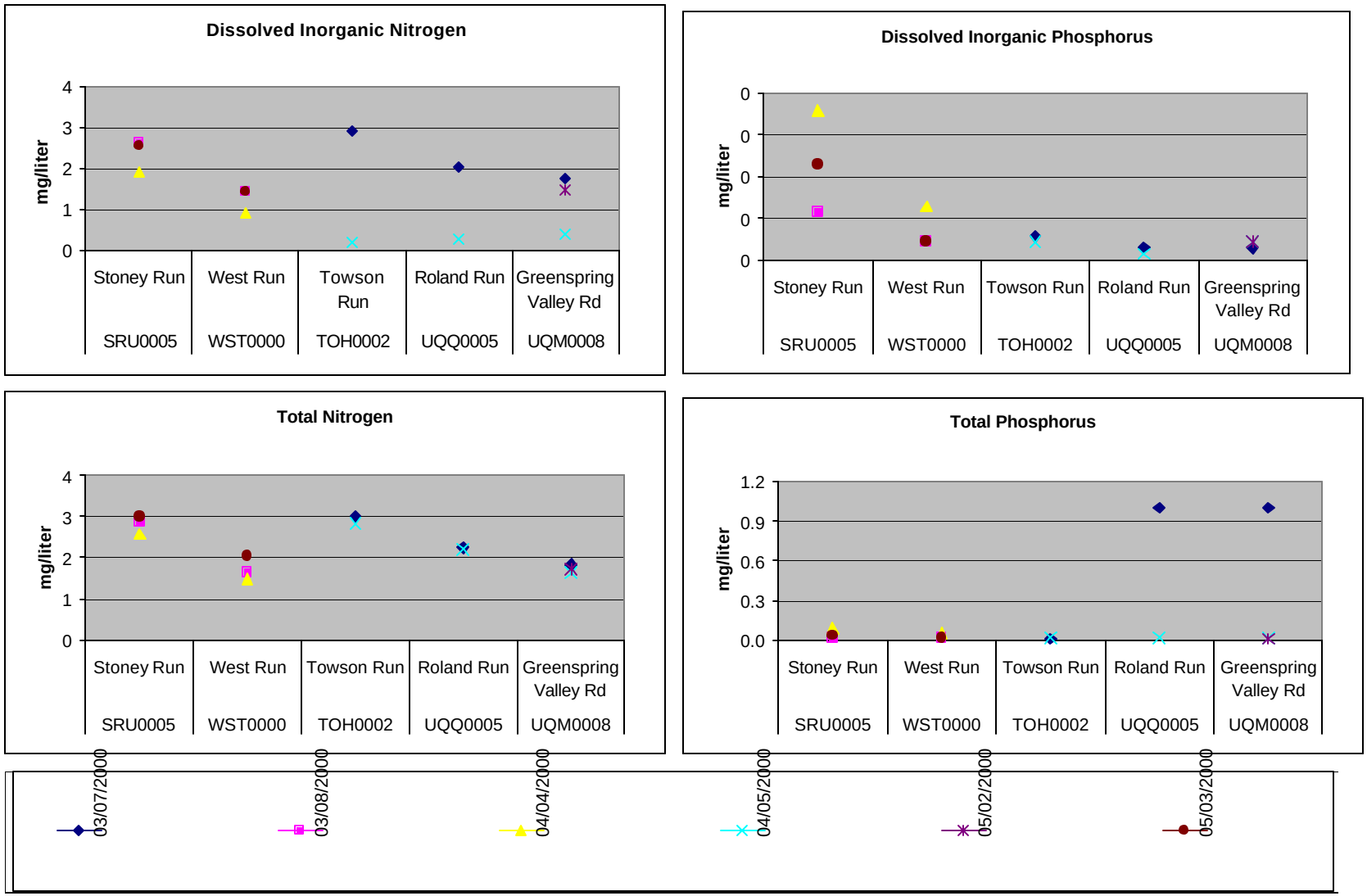

Jones Falls (tributaries)
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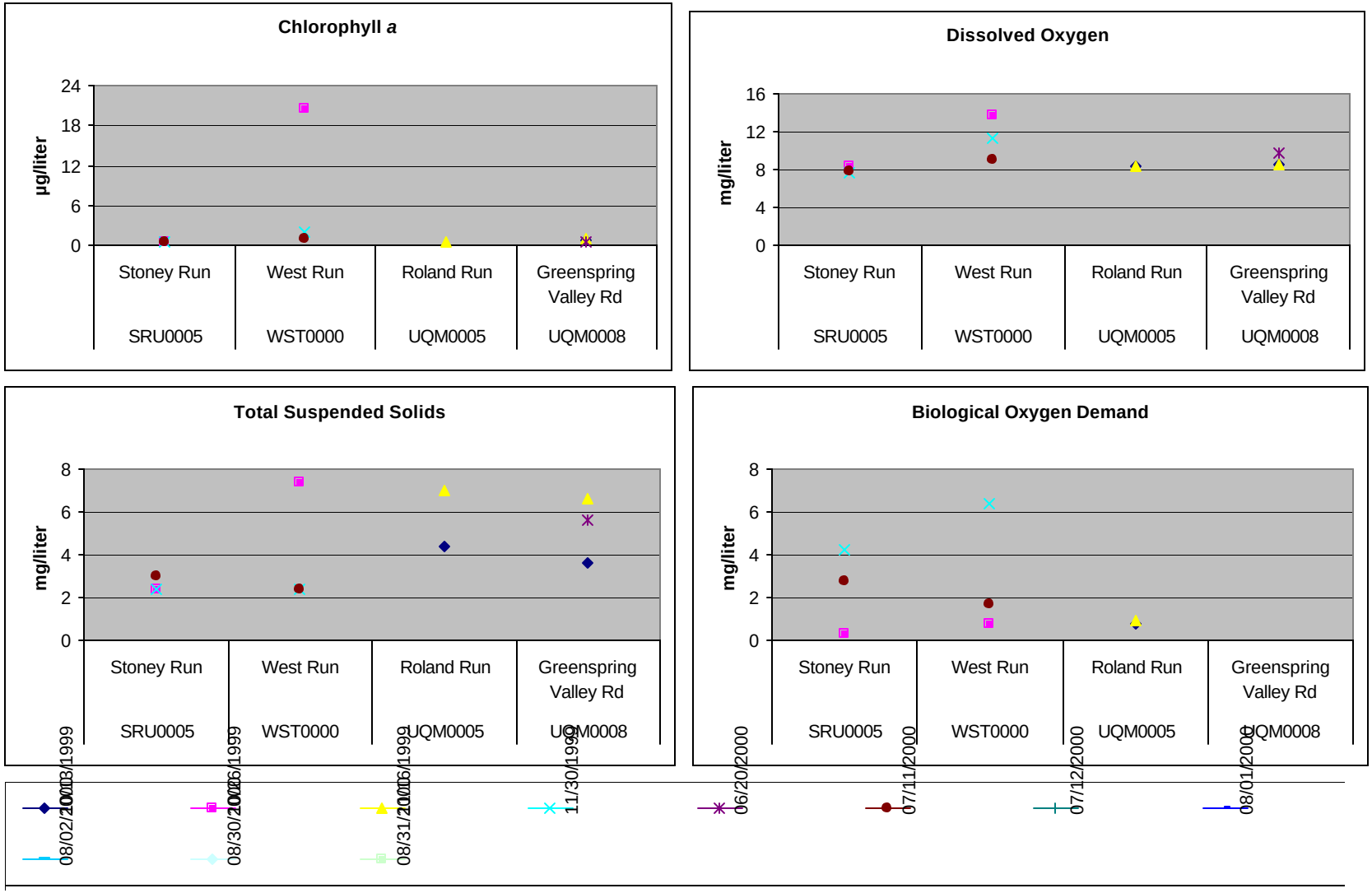

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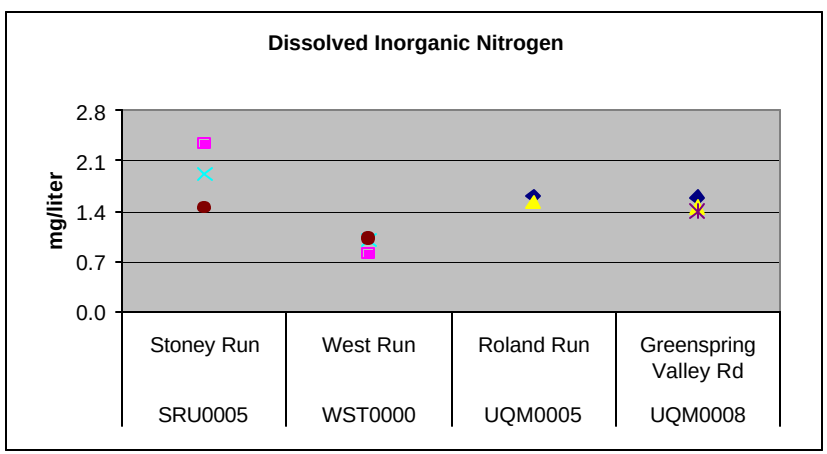
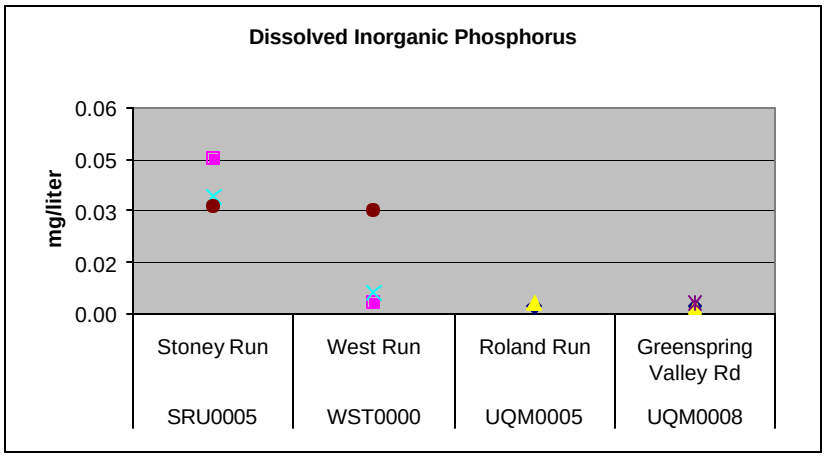
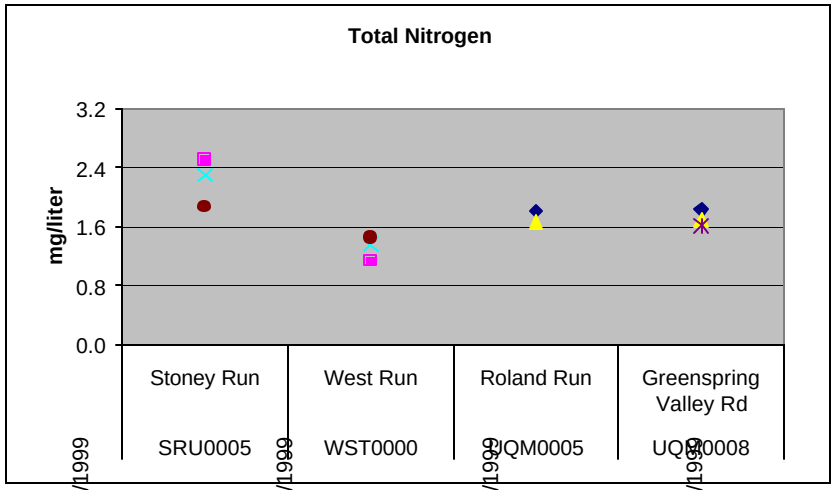
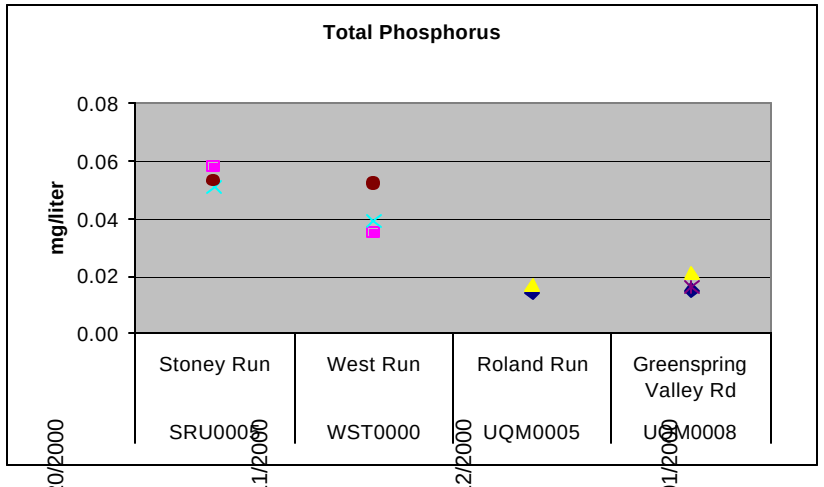
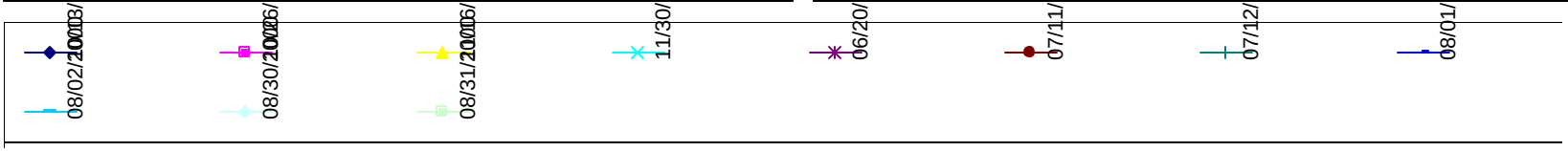






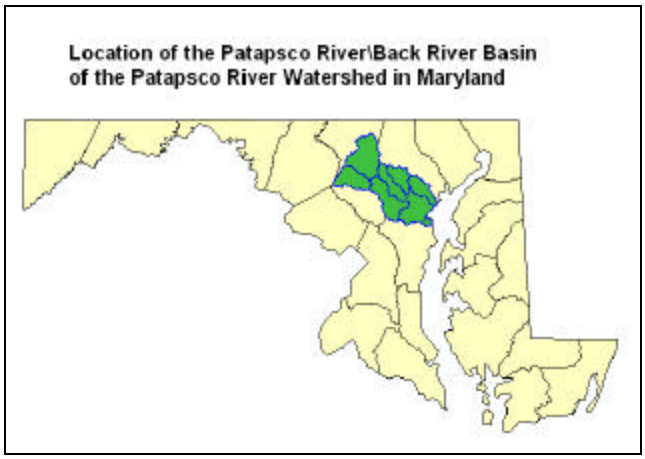


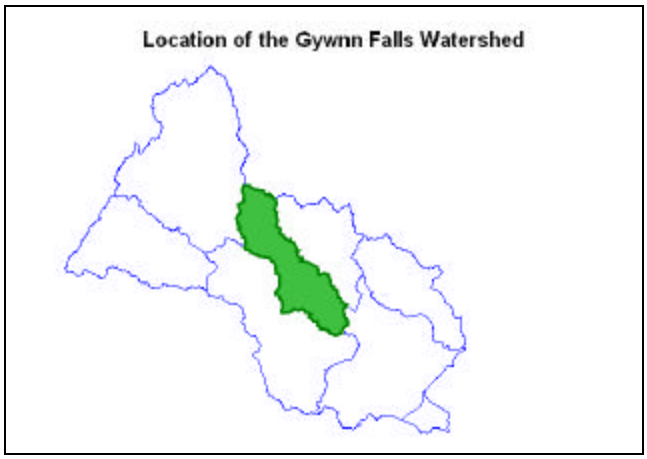


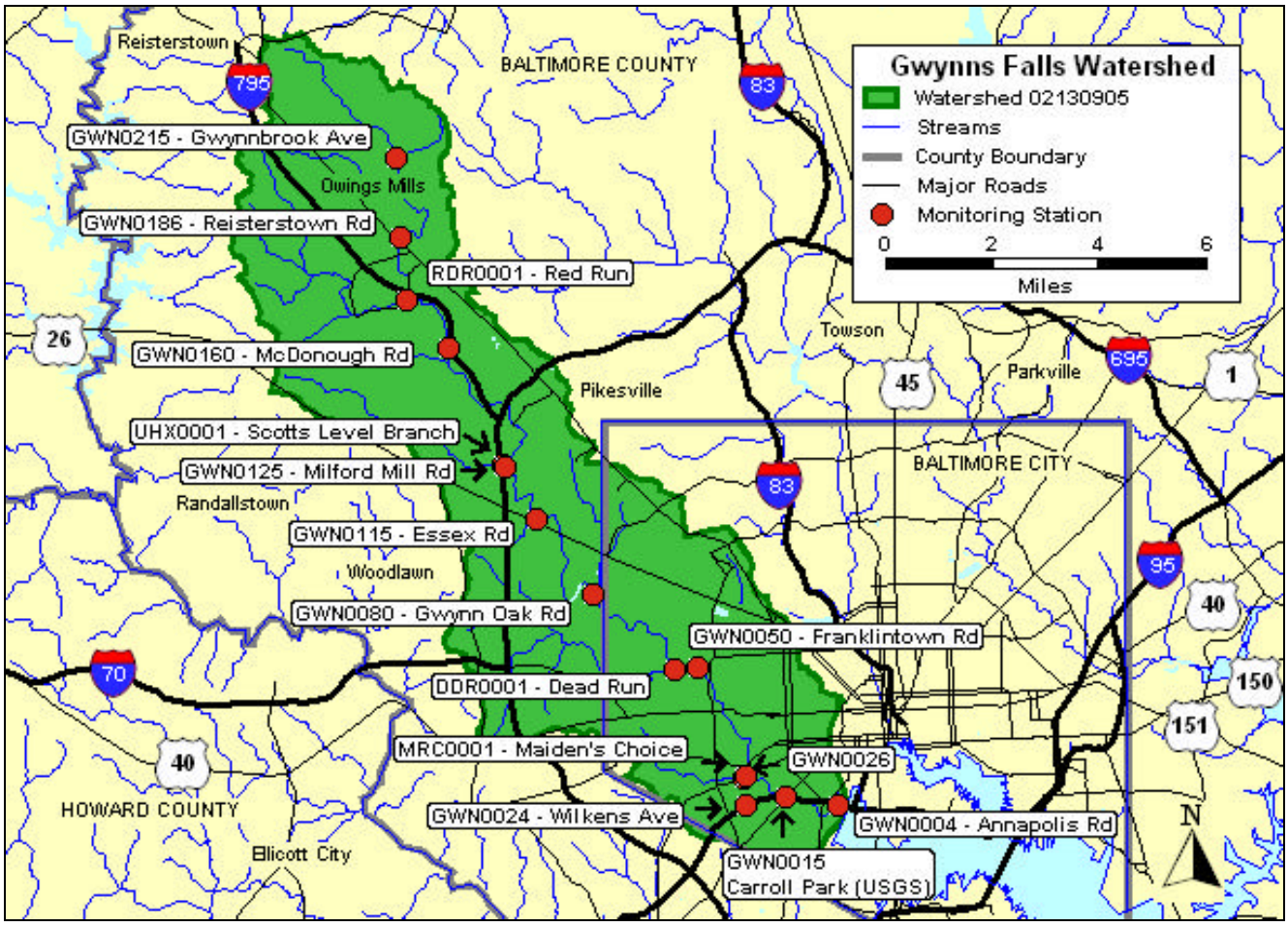
JONES FALLS STATION LIST

Station Code	Station Names	Lat/Long	Description
UPPER JONES FALLS			
JON0001	Inner Harbor	39 17.163 76 36.260	Bridge sample from Eastern Ave. extension near Baltimore City historic pump house and Pier 6 Pavillion. Tidal. Station dropped after 4/14/00.
JON0039	Ash Street	39 19.649 76 38.415	Sample at end of Ash Street (off Clipper Mill Road).
JON0054	Brand Ave	39 20.727 76 38.966	Bridge sample from driveway to Brand Ave (driveway to Fleishmanns vinegar plant). Driveway is off west-bound Coldspring Lane.
JON0071	Smith Ave.	39 22.065 76 38.880	Bridge sample off Smith Ave. in Mt. Washington. Site is above confluence with Western Run.
JON0082	footbridge below dam	39 22.692 76 38.661	Take sample from footbridge below dam (off Lakeside Dr). Measure flow in one of three flumes below dam.
JON0184	Sorrento Run comm.	39 23.466 76 39.662	Take bank sample along Falls Road opposite Sorrento Run community.
JON0124	Falls Rd	39 24.863 76 40.071	Bridge sample from Falls Rd., just outside beltway.
JON0135	Greenspring Ave.	39 24.885 76 41.315	Bridge sample from Greenspring Ave.
JON0149	Stevenson Rd.	39 24.738 76 42.823	Bridge sample from Stevenson Rd.
STONEY RUN			
SRU0005	Stoney Run	39 19.550 76 37.562	Bank sample at bottom of paved jogging trail starting at west side of Remington Ave. bridge. Park on trail. Measure flow and record staff height under bridge.
WEST RUN			
WST0000	West Run	39 22.042 76 38.941	Bridge sample at Cottonworth Ave. Measure flow and record staff height under JFX bridge. Need to drive up and park in framing shop parking lot (just before Smith St. curves around). Walk down steps and under bridge to find staff.
TOWSON RUN			
TOH0002	Towson Run	39 23.373 76 38.459	Bank sample near Bellona Ave. bridge. Station dropped after 4/14/00.
ROLAND RUN			
UQQ0005	Roland Run	30 23.918 76 38.927	Bridge sample at Circle Rd. Station dropped after 4/14/00.
NORTH BRANCH (tributary of Jones Falls)			
UQM0008	Greenspring Valley Rd.	39 25.345 76 42.633	Bridge sample at Greenspring Valley Rd.

Gwynns Falls Monitoring Stations







Map Prepared by the Maryland Department of the Environment
Science Services Administration
Montgomery Park Business Center
1800 Washington Boulevard, Suite 540
Baltimore, Maryland 21230-1718

Gwynns Falls (main)
High Flow Conditions (December-May)
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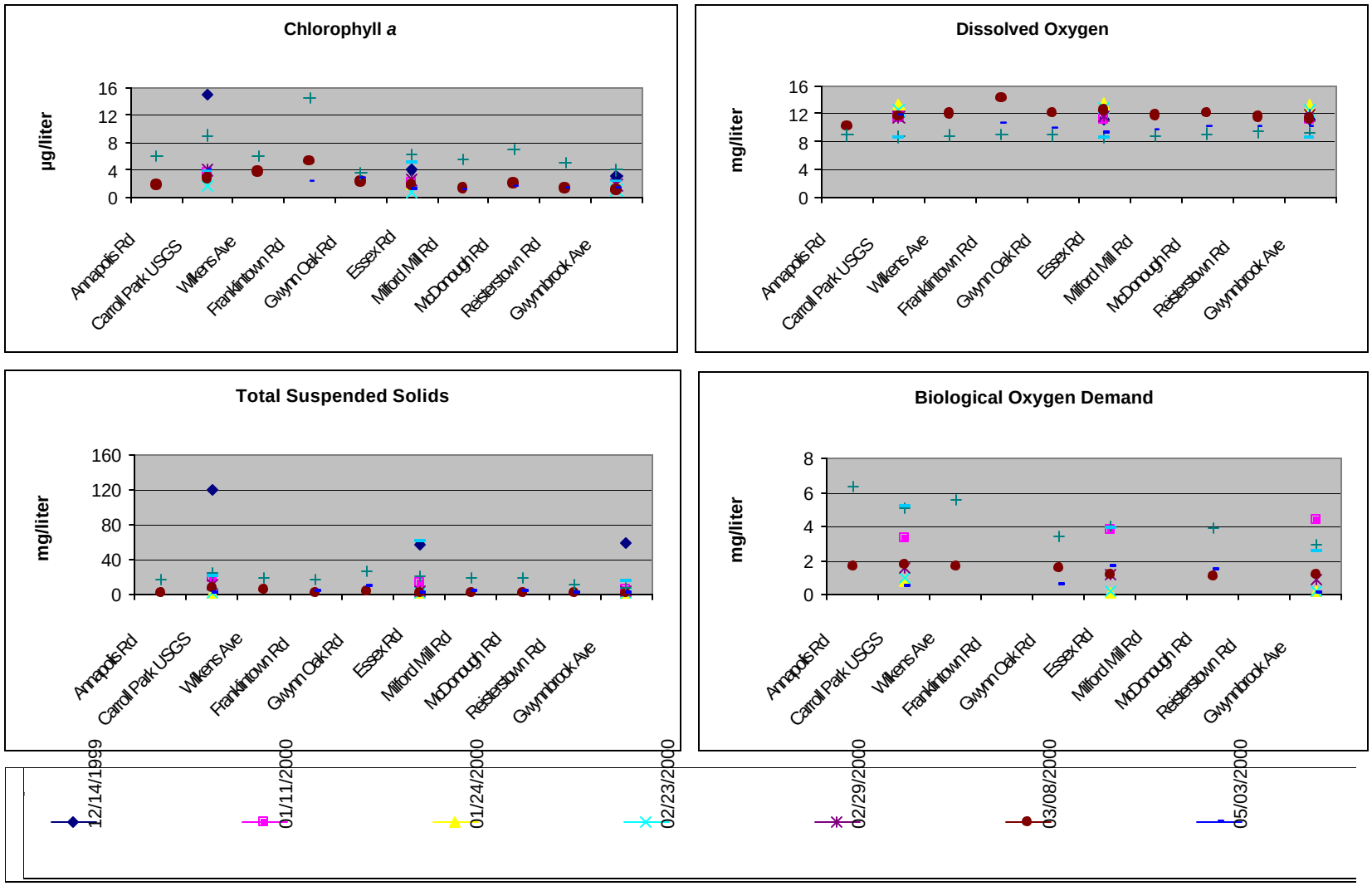

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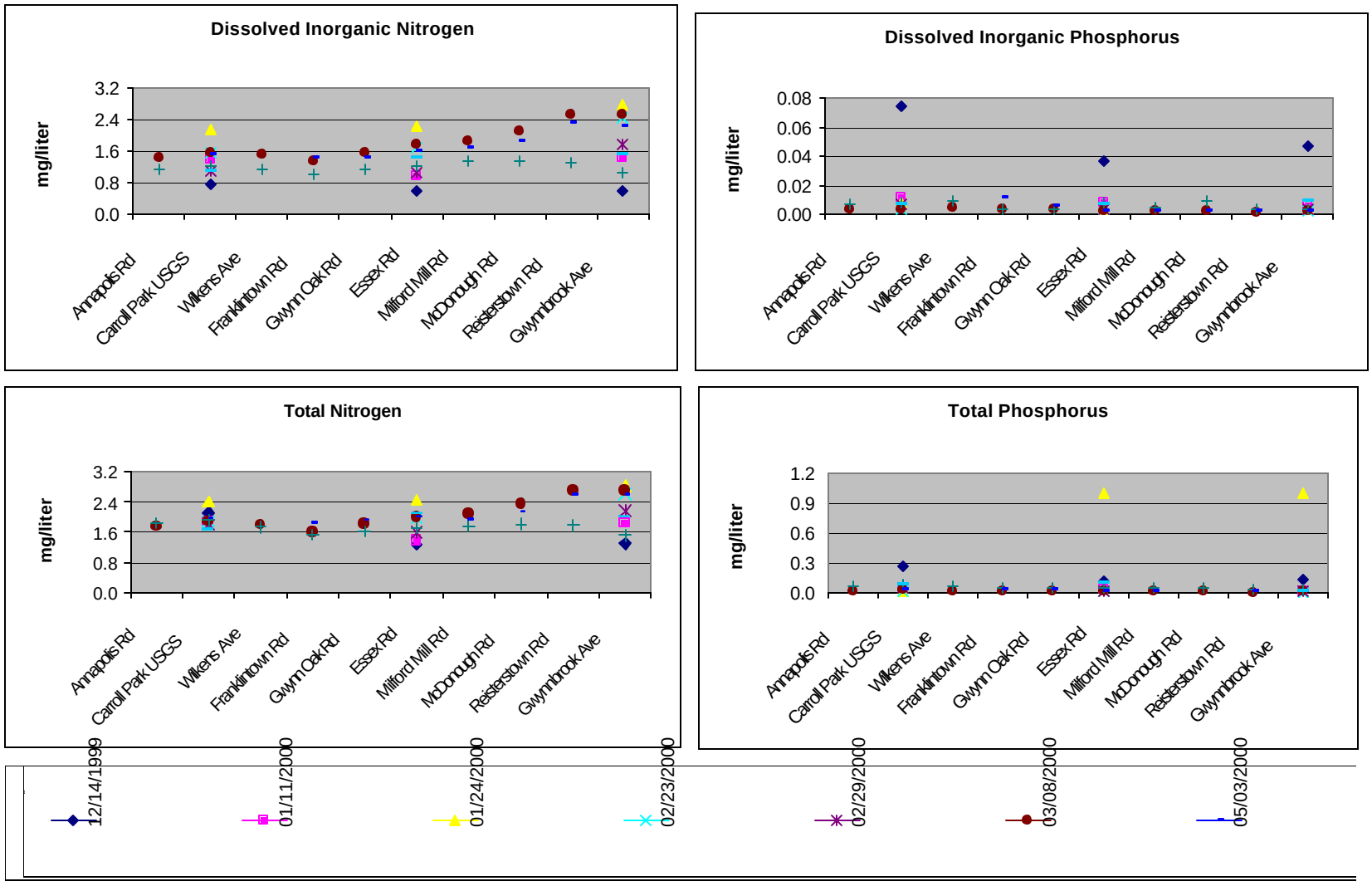

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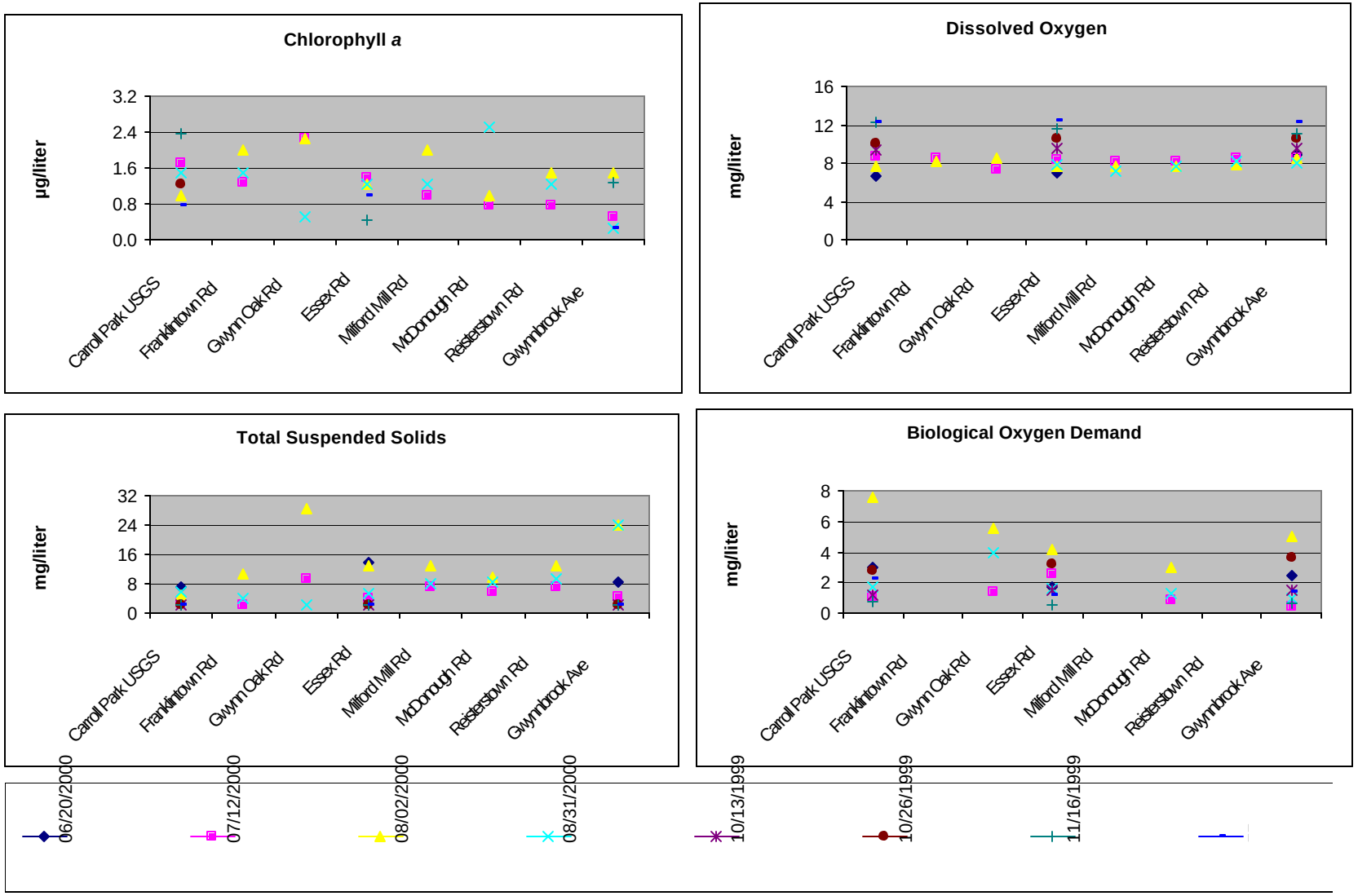

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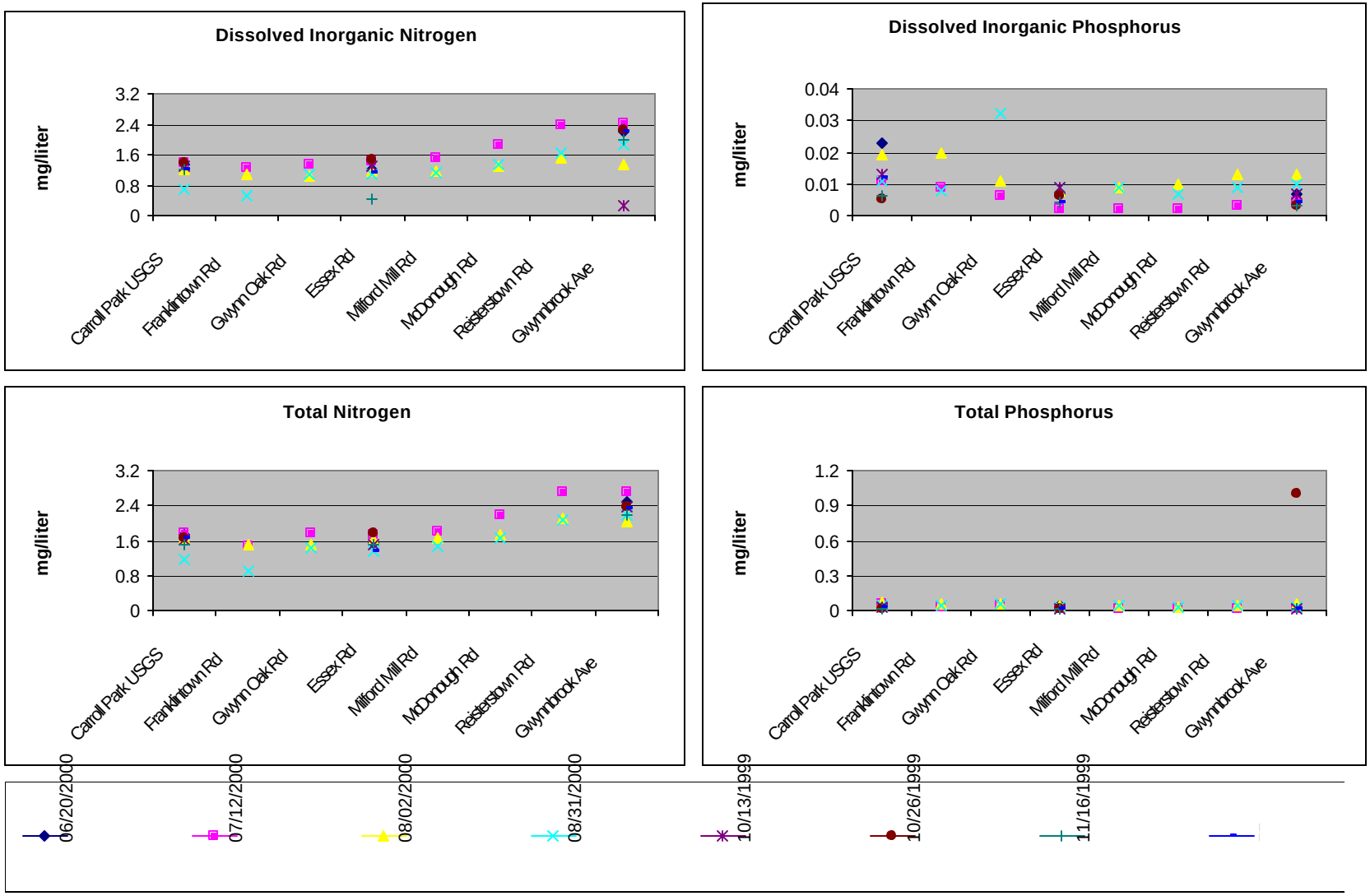

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High Flow Conditions (December-May)
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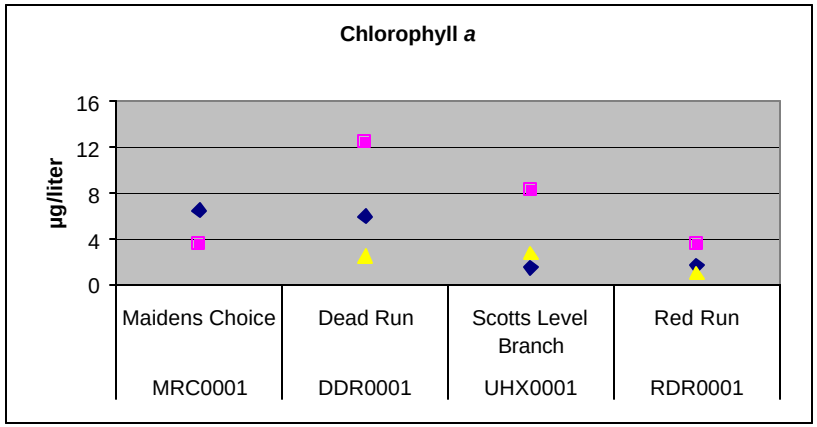

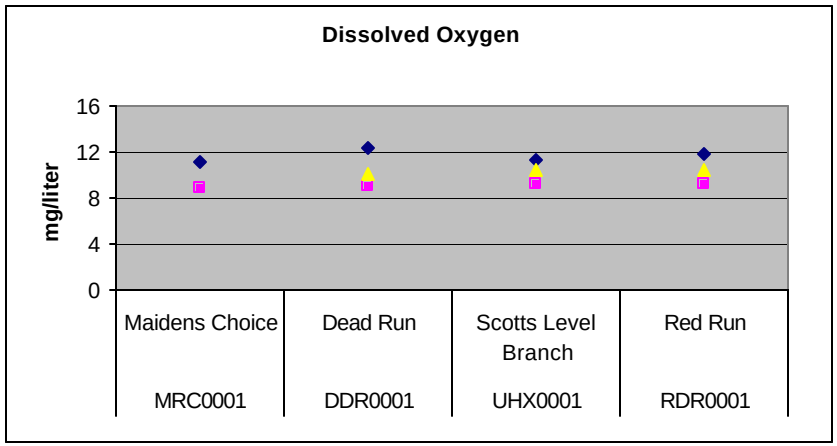

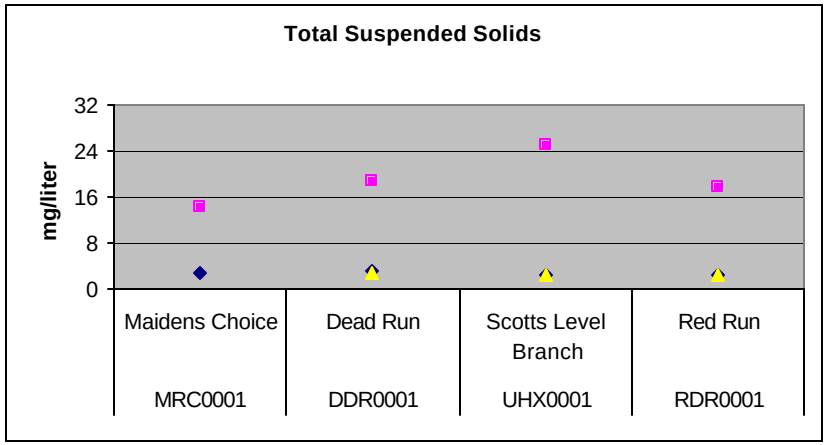

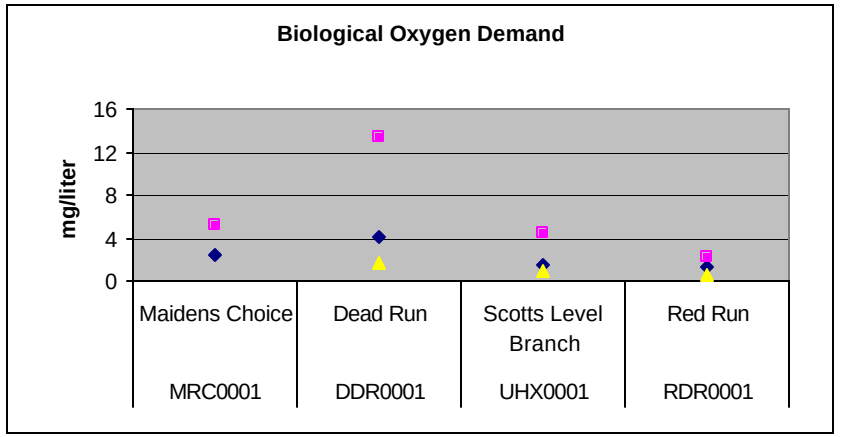

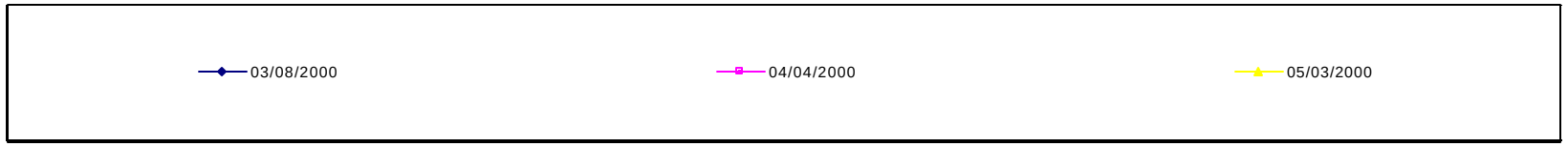

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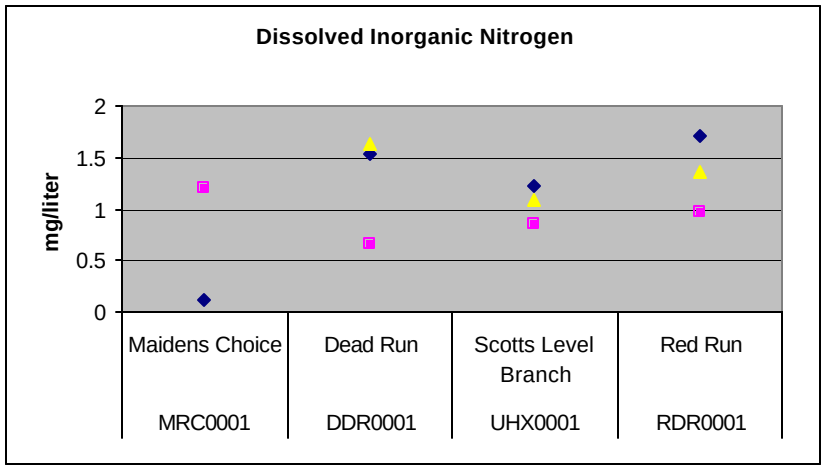

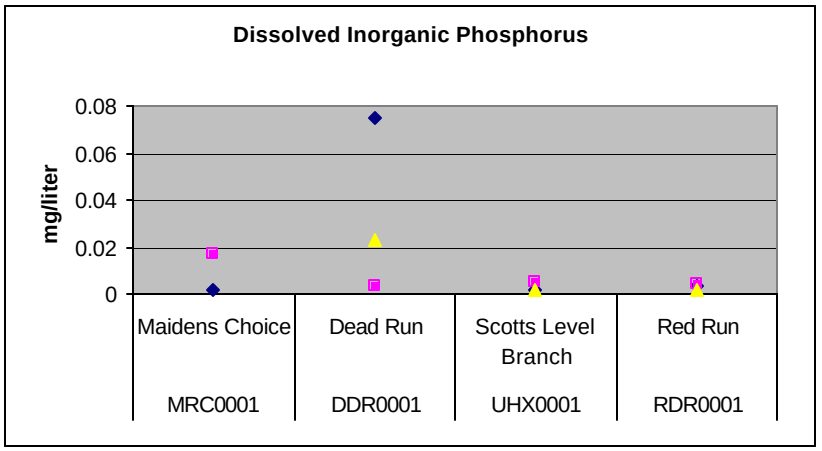

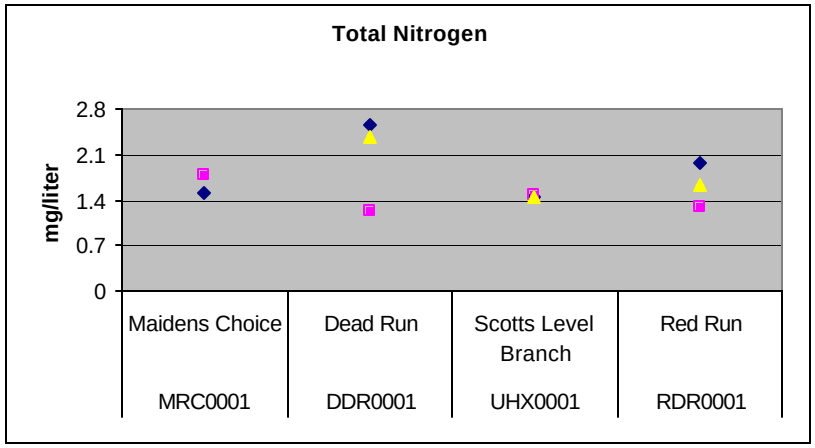

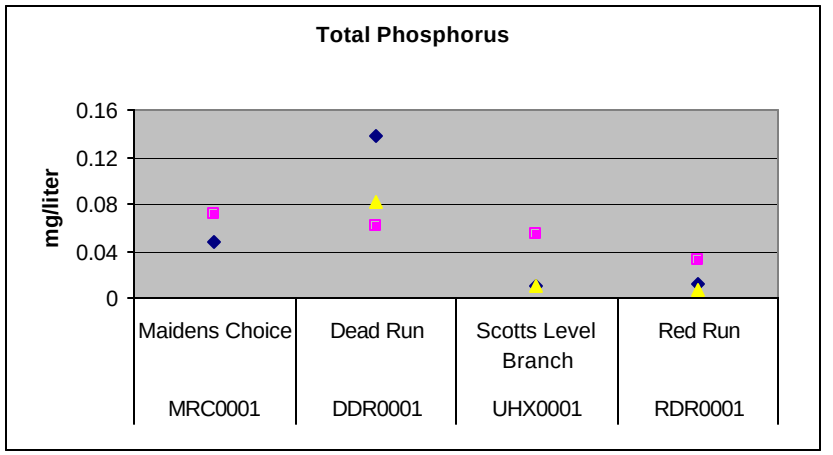

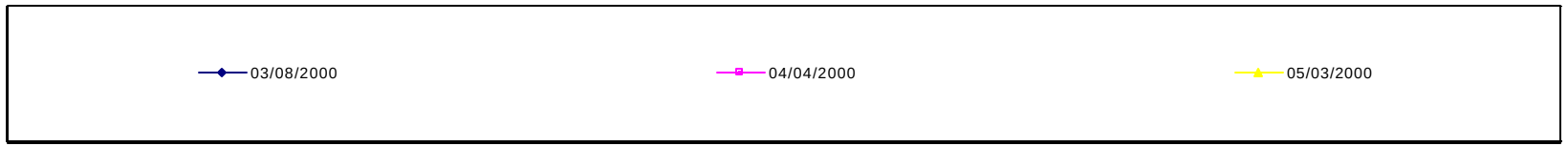

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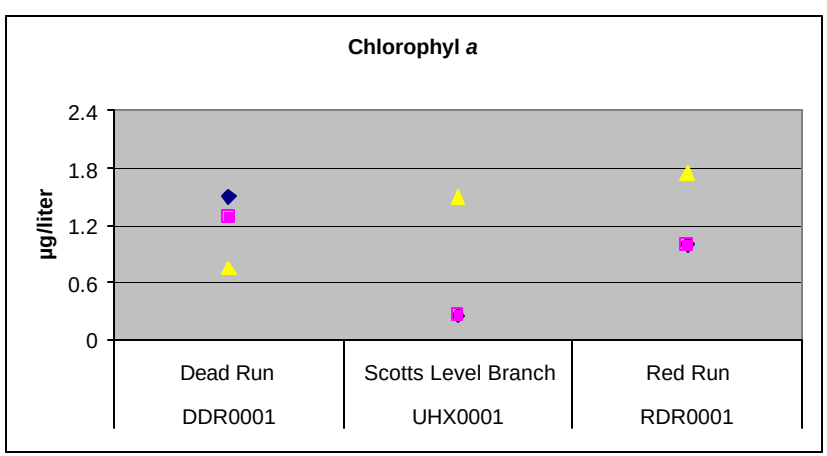

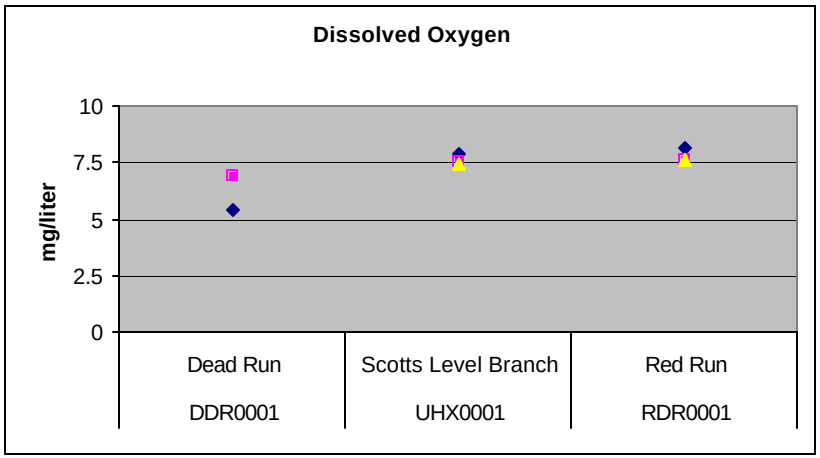

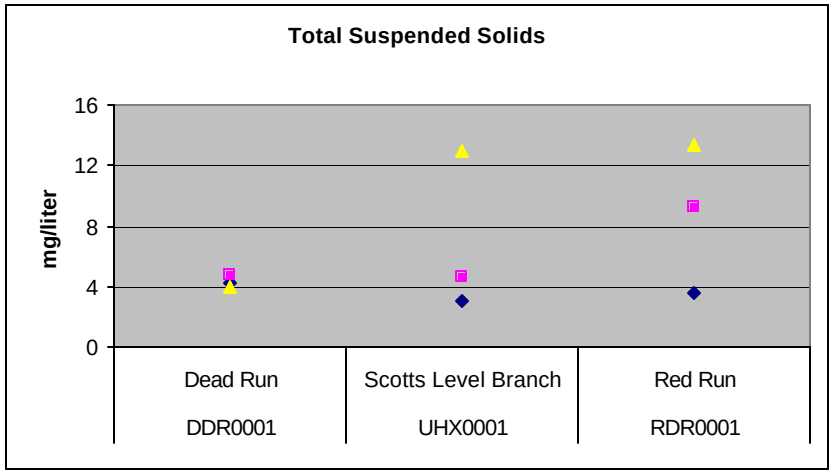

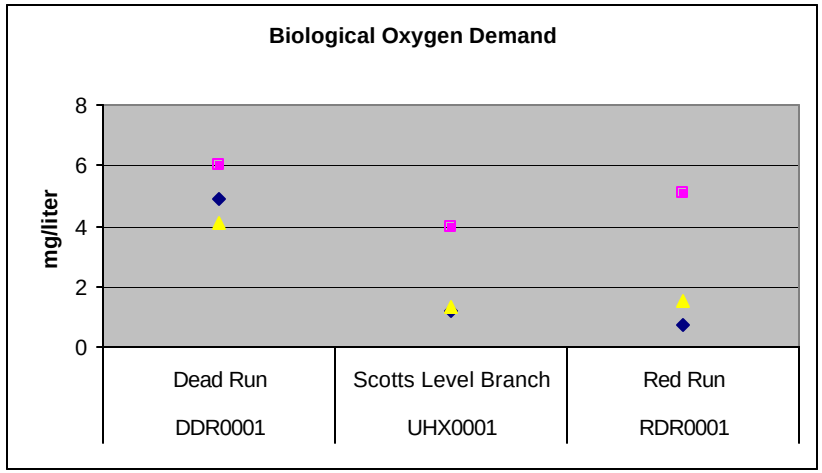

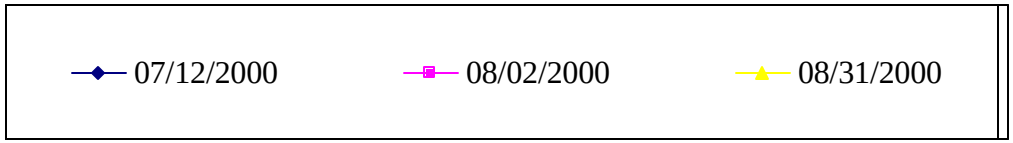

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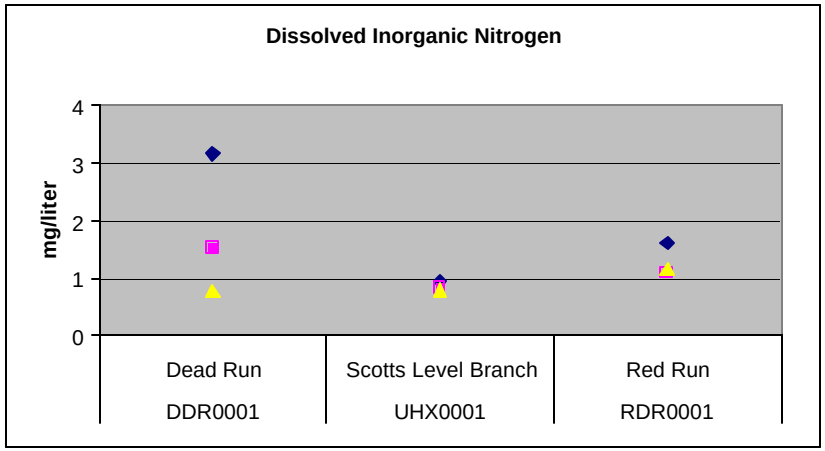
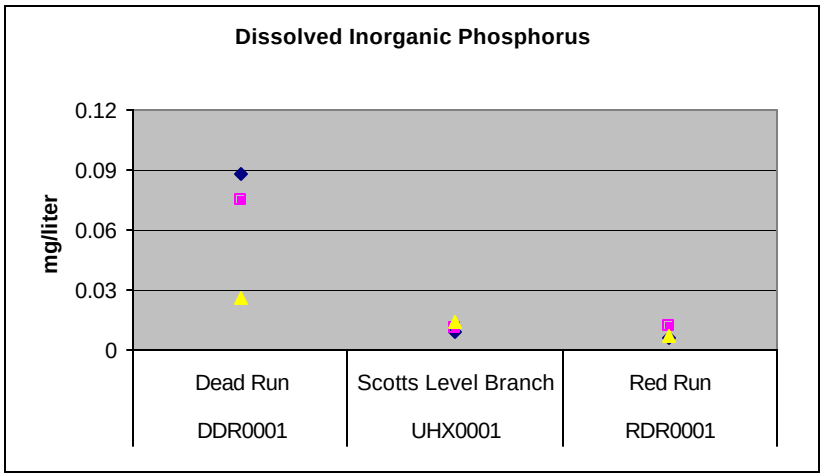
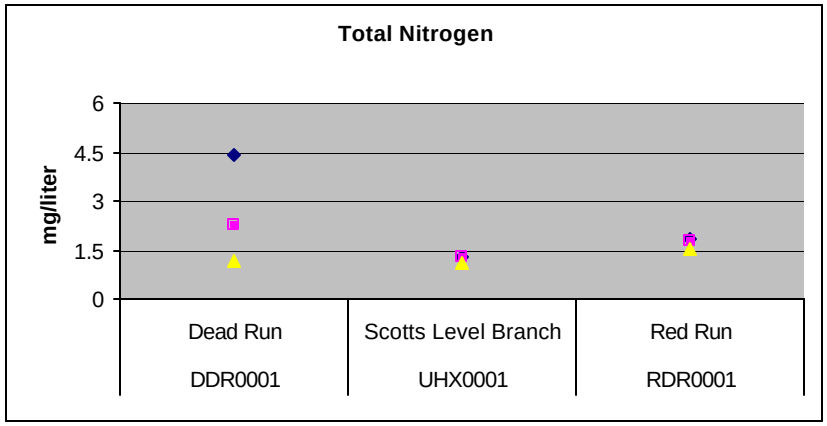
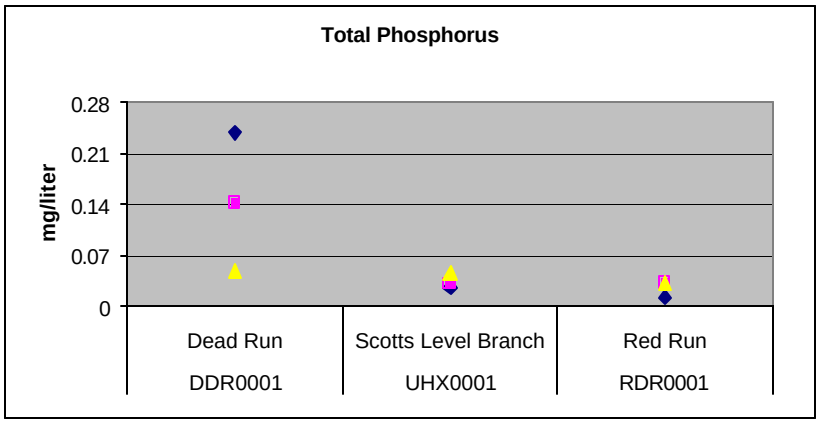
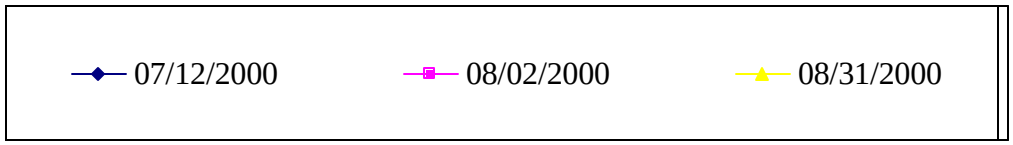






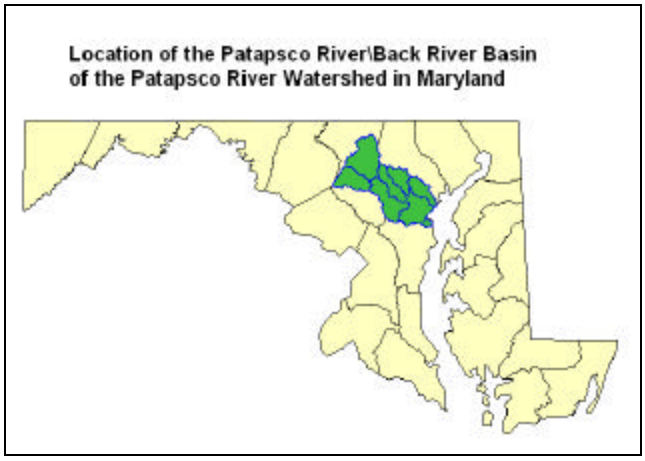


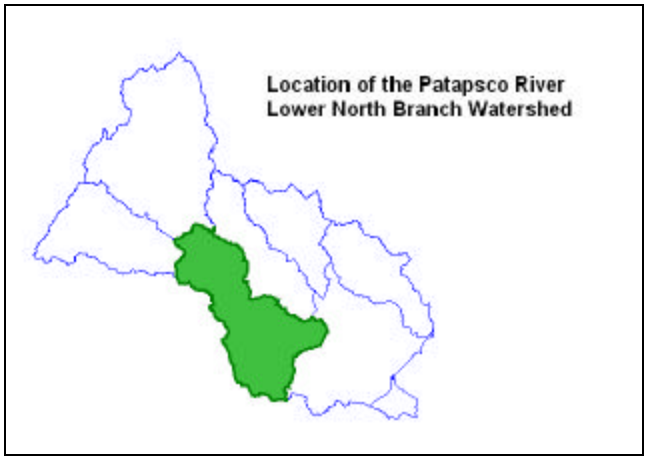


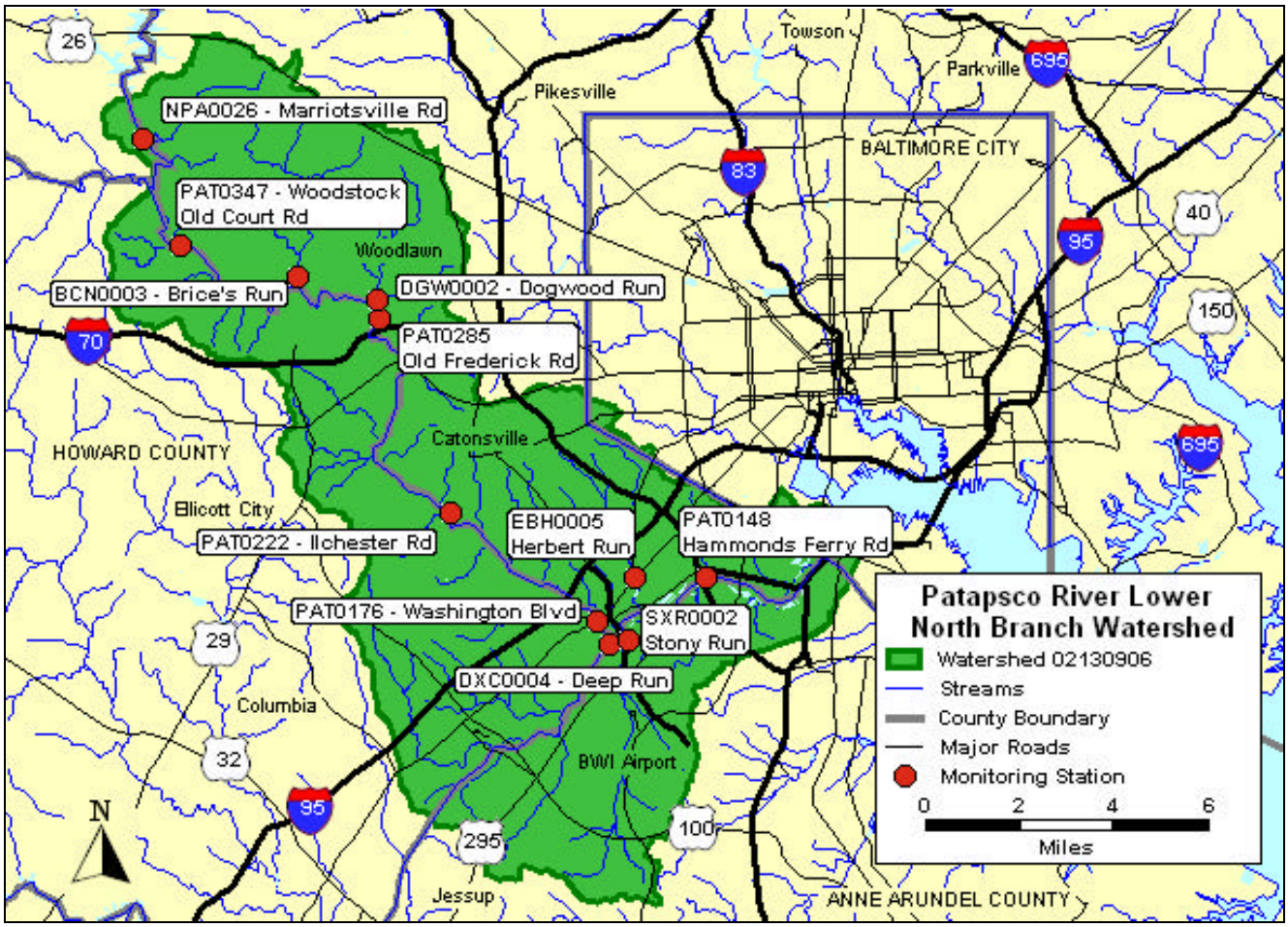
GWYNNS FALLS STATION LIST

Station Code	Station Names	Lat/Long	Description
GWYNNS FALLS			
GWN0004	Annapolis Rd	39 16.140 76 37.800	Bridge sample from Annapolis Rd. Take 295N (Russell St) and turn near RESCO plant onto Annapolis Rd. Tidal. Station dropped after 4/14/00.
GWN0015	Carroll Park USGS	39 16.252 76 38.897	In Carroll Park Golf Course, off Washington Blvd. Sample off golf cart path which parallels river. USGS gage.
GWN0024	Wilkens Ave.	39 16.140 76 39.705	Bridge sample (bring milk crate and 2 ropes) or bank sample at Wilkens Ave. Station dropped after 4/14/00.
GWN0050	Franklintown Rd.	39 18.365 76 40.726	Bridge sample at Franklintown Rd.
GWN0080	Gwynn Oak Rd.	39 19.515 76 42.870	Bridge sample at Gwynn Oak Rd. Try to read staff gage on Purnell Dr.
GWN0115	Essex Road	39 20.759 76 44.048	Bridge sample at Essex Road. Located inside beltway (695) off Liberty Road (Rte 26).
GWN0125	Milford Mill Rd.	39 21.595 76 44.705	Bridge sample at Milford Mill Rd. Wier upstream is 50 ft wide.
GWN0160	McDonough Rd	39 23.493 76 45.915	Bridge sample at McDonough Rd. Park on west-bound side pull-off.
GWN0186	Reisterstown Rd.	39 25.279 76 46.910	Bridge sample at Reisterstown Rd.
GWN0215	Gwynnbrook Ave	39 26.587 76 46.990	Bridge sample at Gwynnbrook Ave.
MAIDEN'S CHOICE			
MCR0001	Maiden's Choice	39 16.579 76 39.737	Sample from top of concrete tunnel passing under Dukeland St. Try to read staff gage 75' upstream of Wilkens Ave crossing. Station dropped after 4/14/00.
DEAD RUN			
DDR0001	Dead Run	39 18.318 76 41.185	Bridge sample at Wethersfield Rd (closed to traffic). Good flow site 50 yds. upstream of bridge. Read staff under footbridge and take flow (no staff conversion).
SCOTTS LEVEL BRANCH			
UHX0001	Scotts Level Branch	39 21.610 76 44.773	Bridge sample at Scotts Hill Rd (not Scotts Level Rd.). May be too rocky for flow.
RED RUN			
RDR0001	Red Run	39 24.270 76 46.755	Bank sample at Painters Mill Rd. Park in "South Station General Parking" for the Metro. Good flow site under bridge.

Patapsco River Lower North Branch Monitoring Stations







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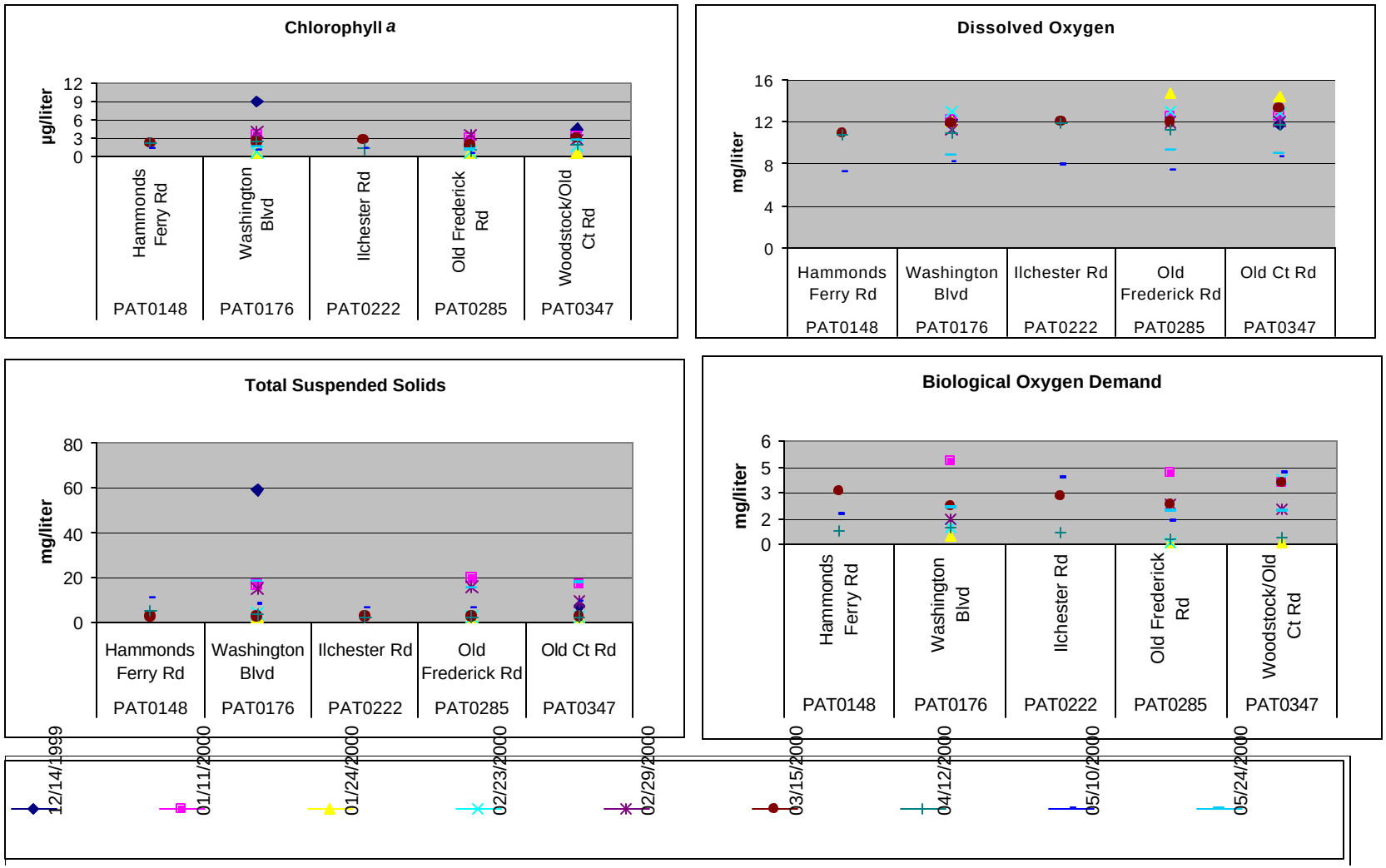

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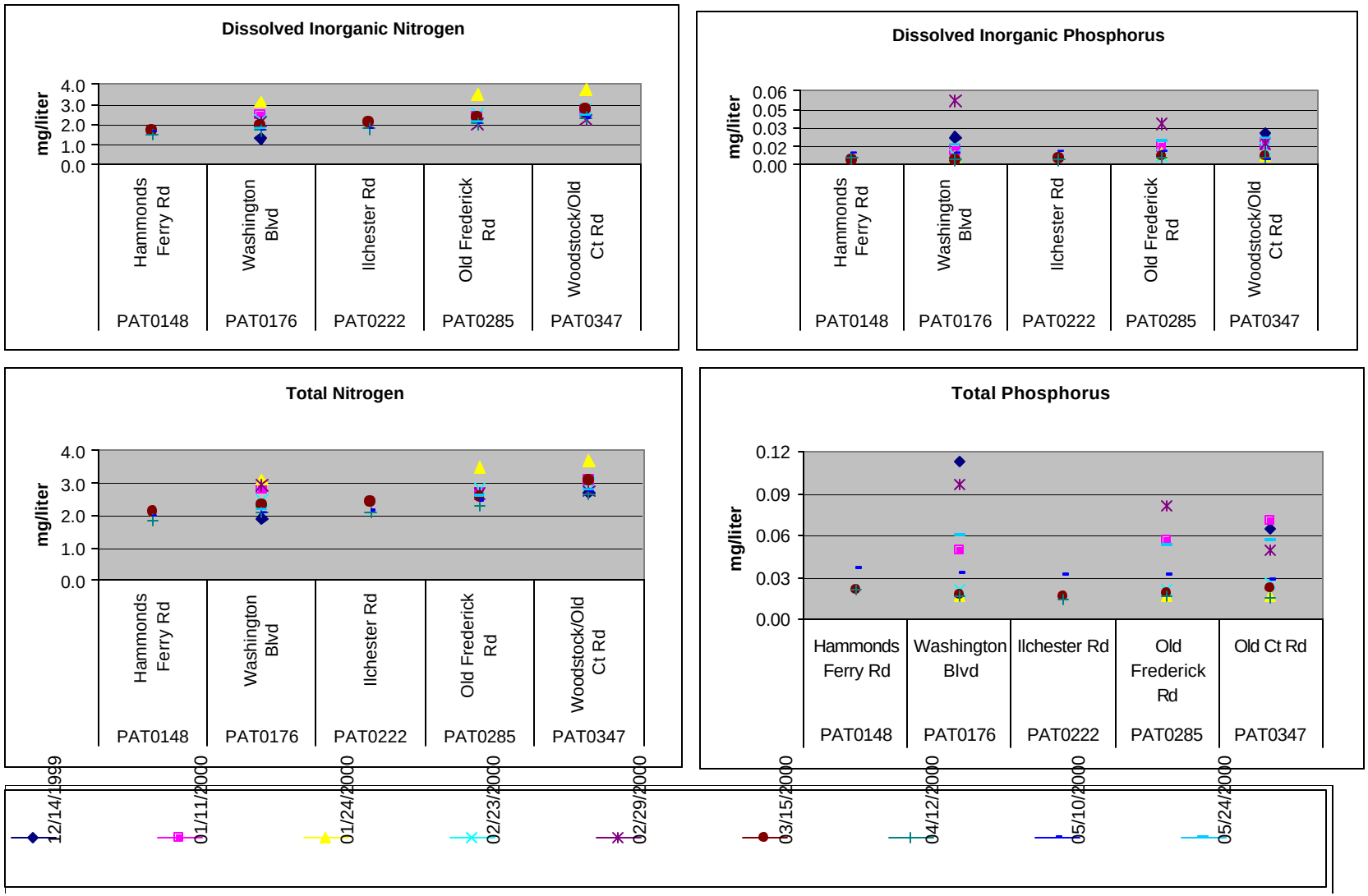

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Low Flow Conditions (June to November)
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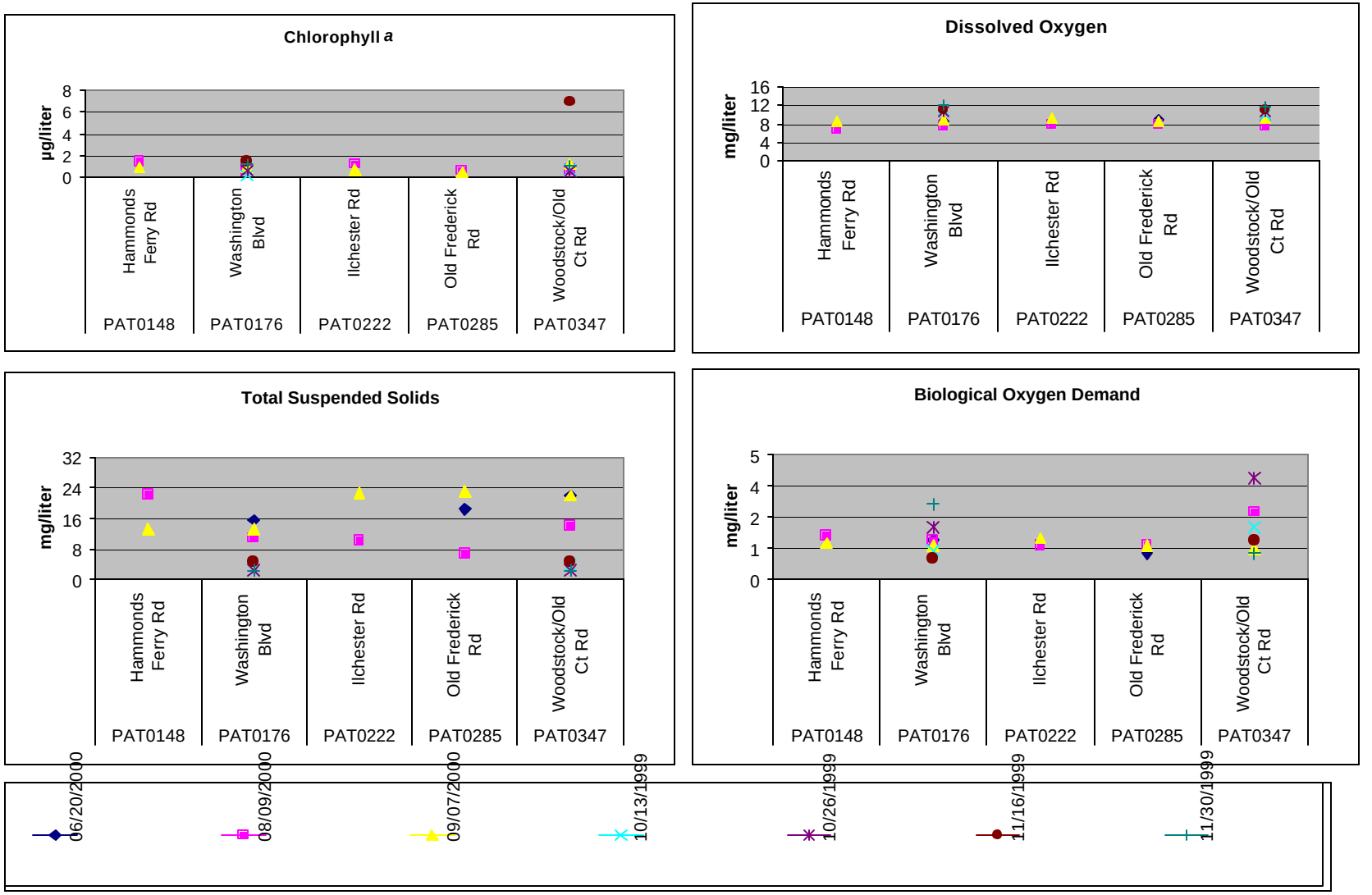
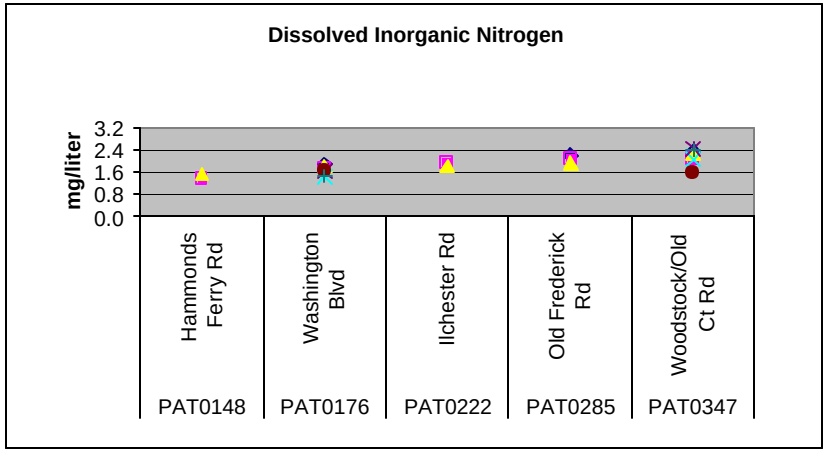
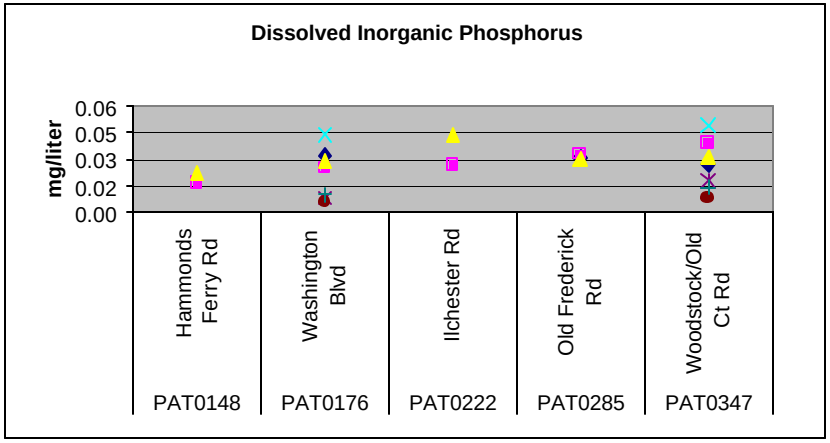
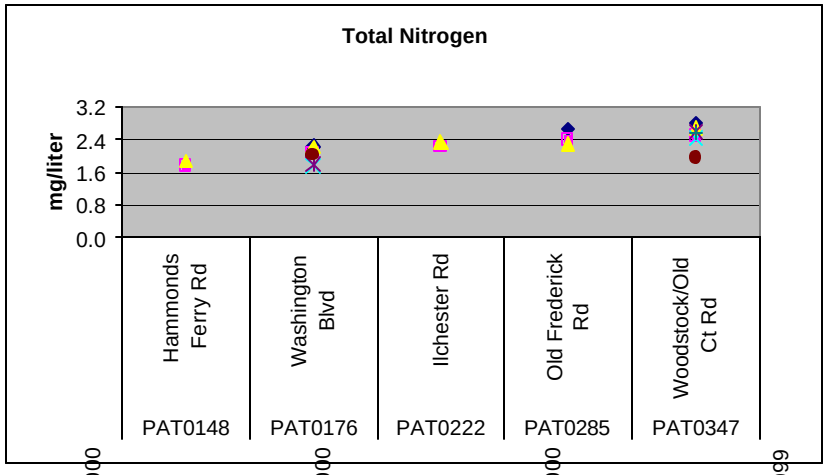
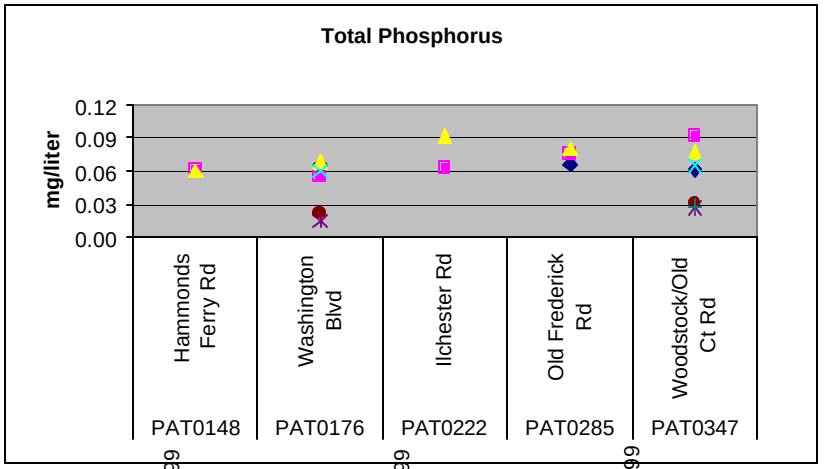


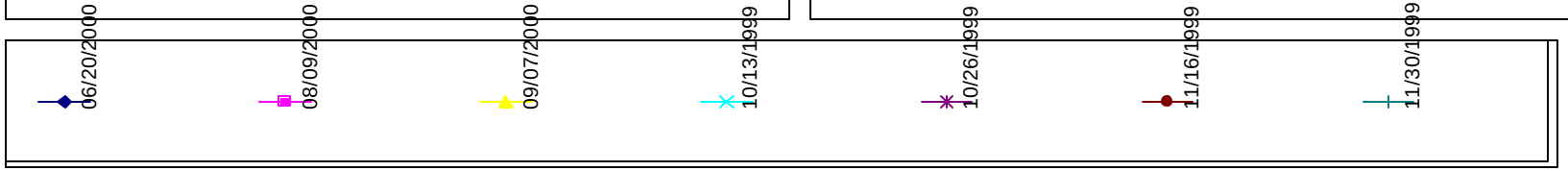
Patapsco River Lower North Branch (main)
Low Flow Conditions (June to November)
Stations are presented from left to right from downstream to upstream











Patapsco River Lower North Branch (tributaries)
High Flow Conditions (December-May)
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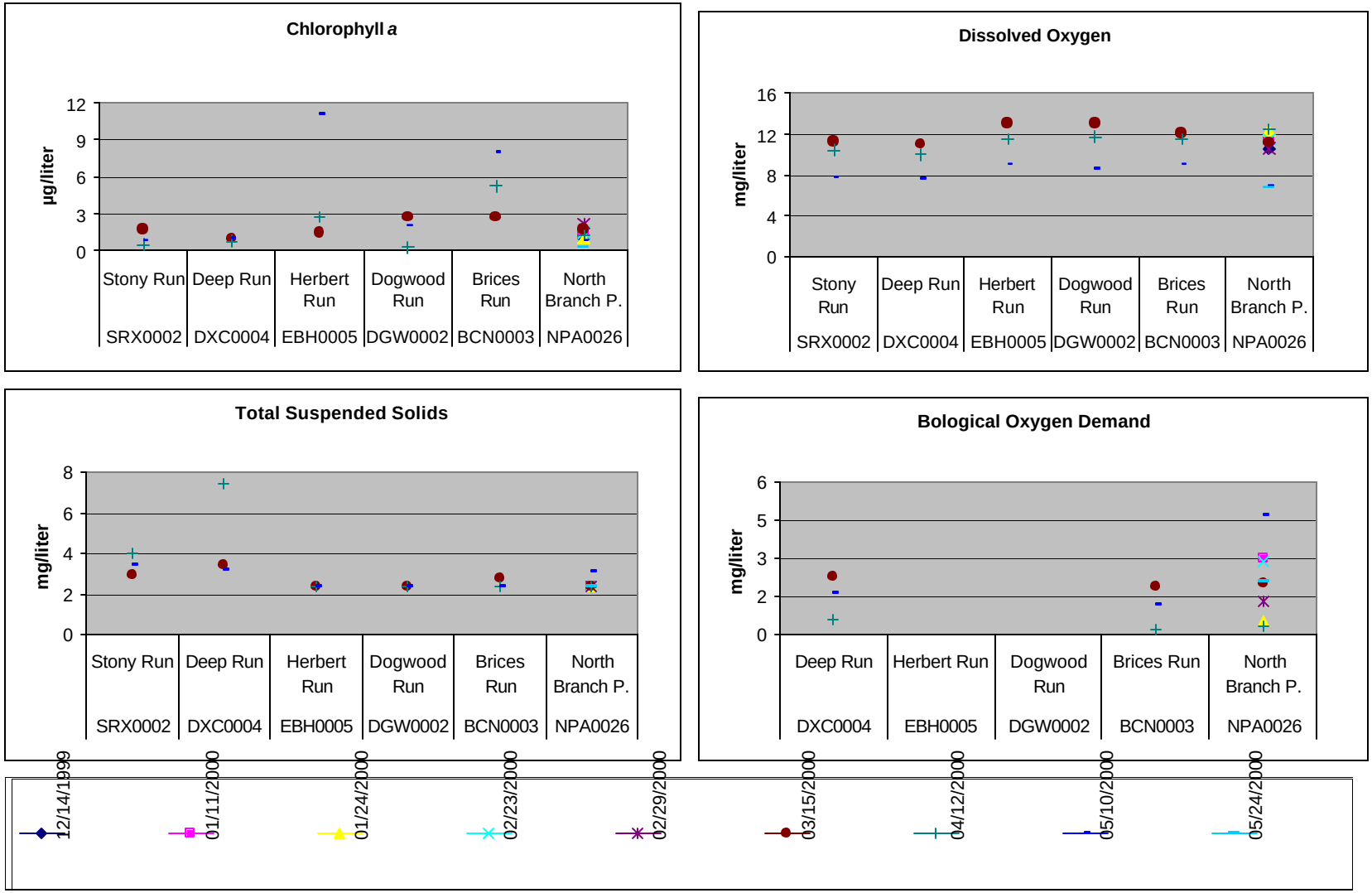

Patapsco River Lower North Branch (tributaries)
High Flow Conditions (December-May)
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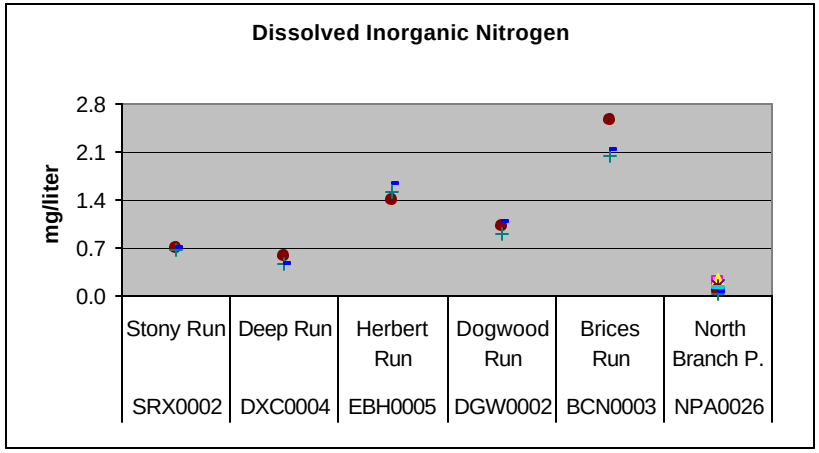

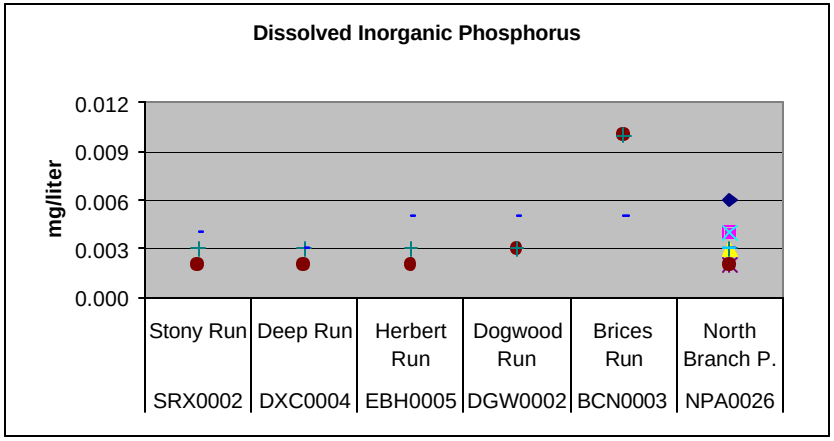

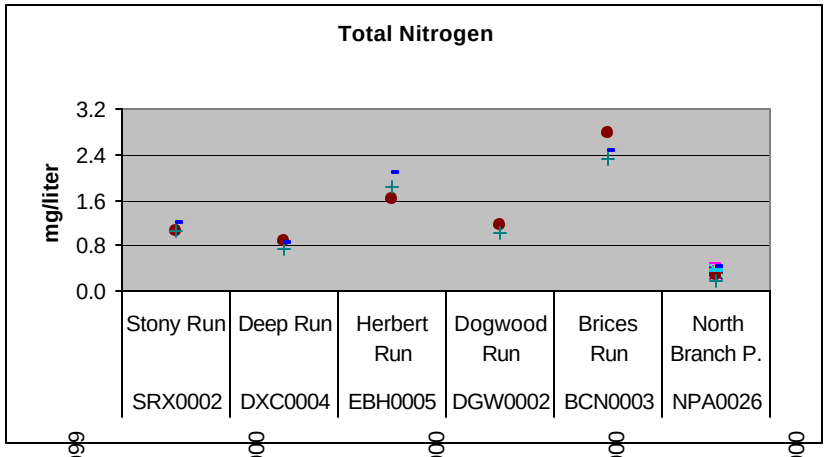

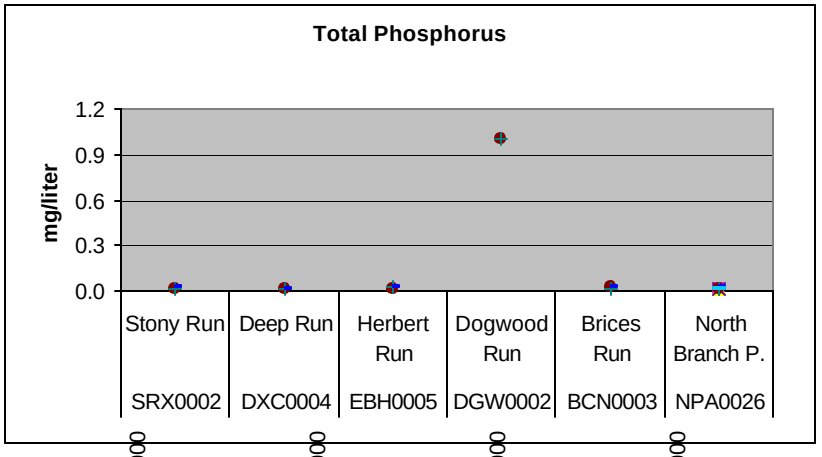

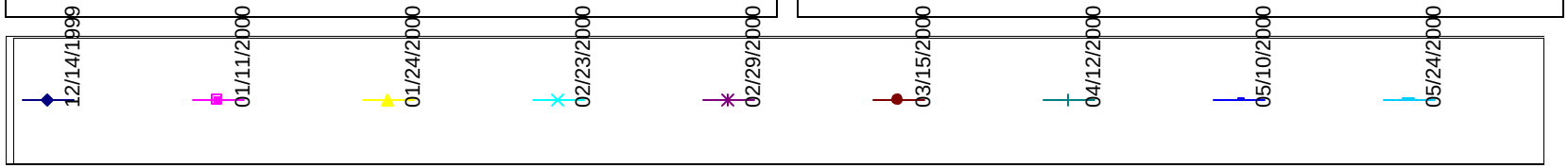

Patapsco River Lower North Branch (tributaries)
Low Flow Conditions (June to November)
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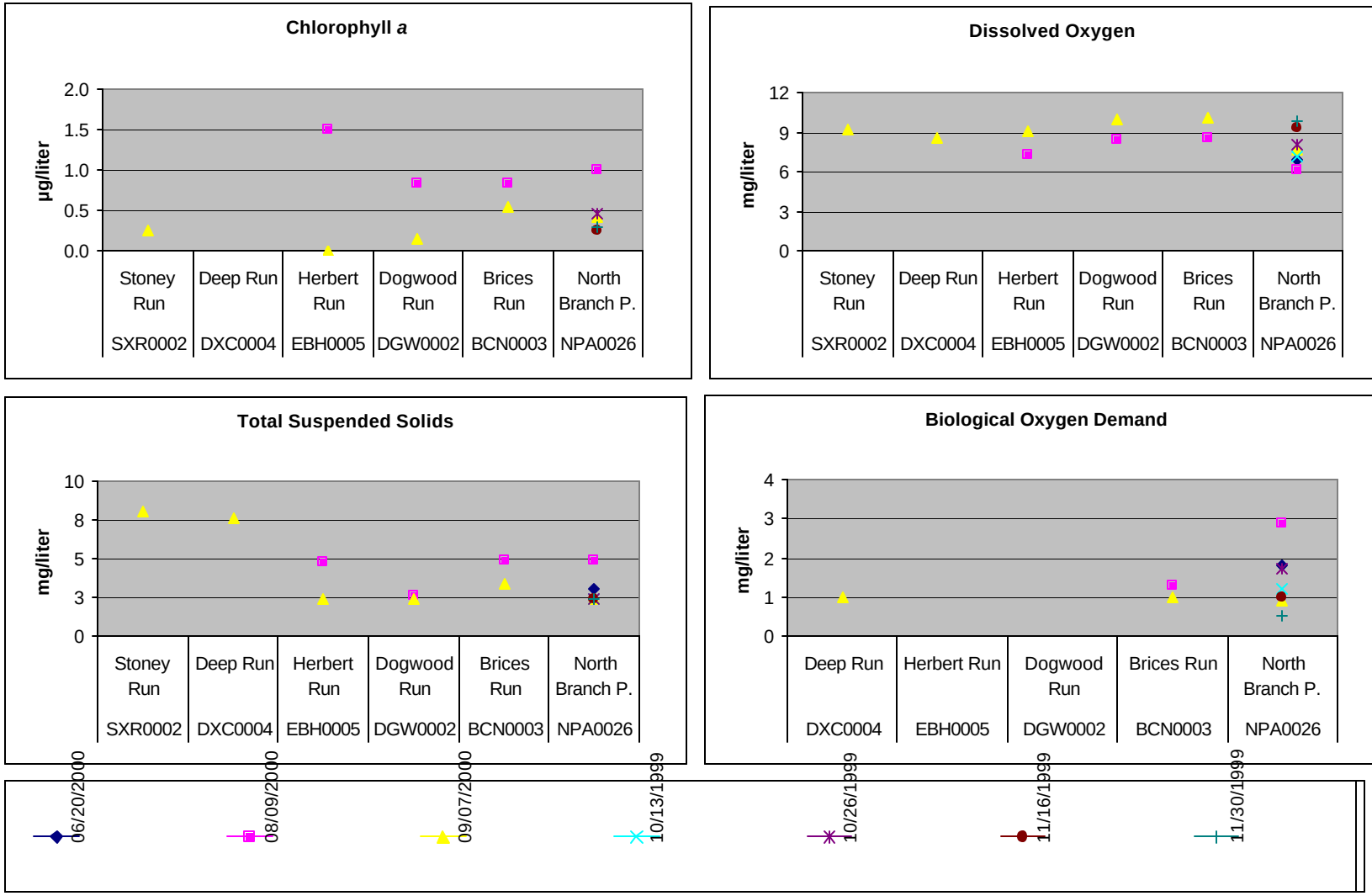

Patapsco River Lower North Branch (tributaries)
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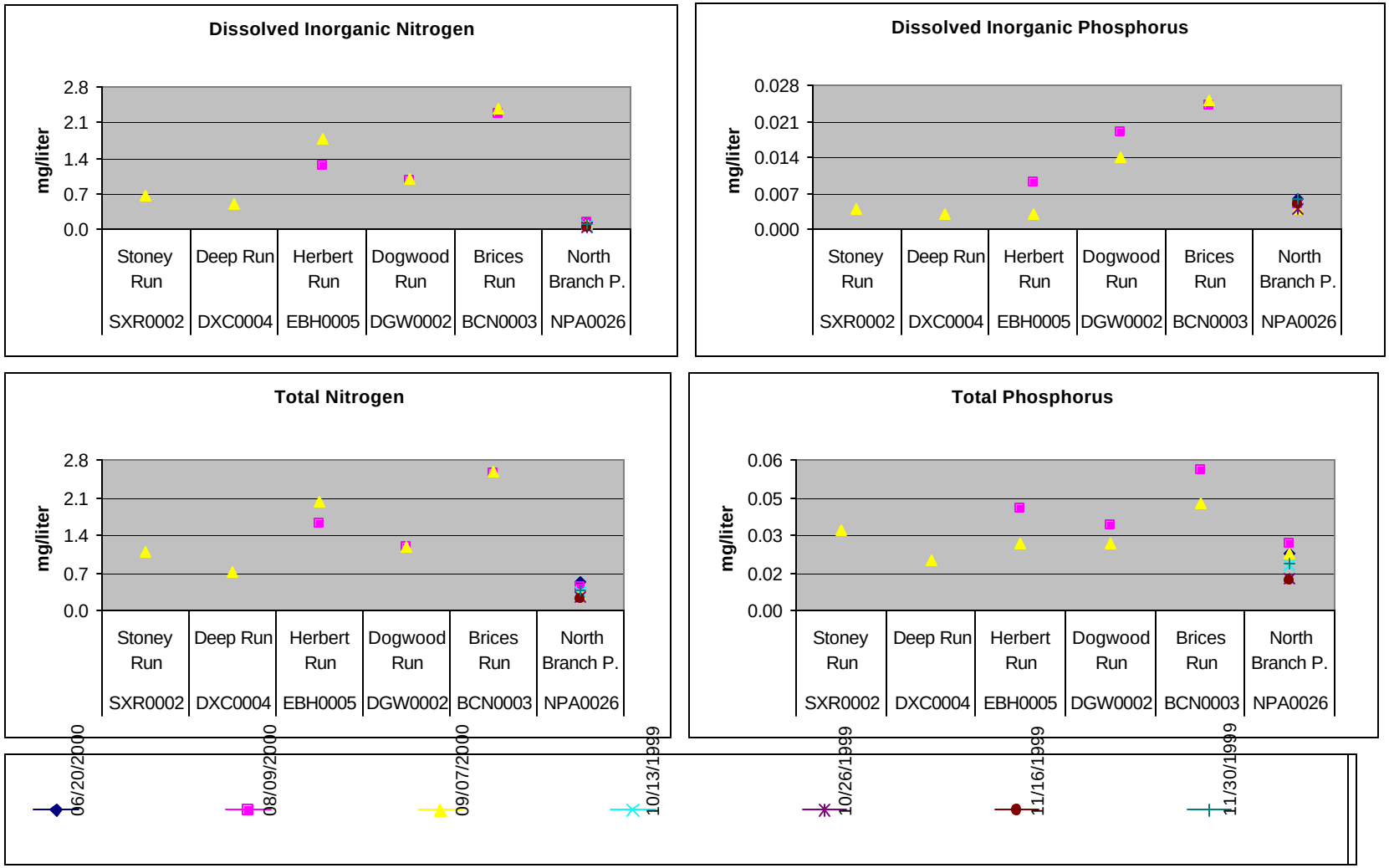
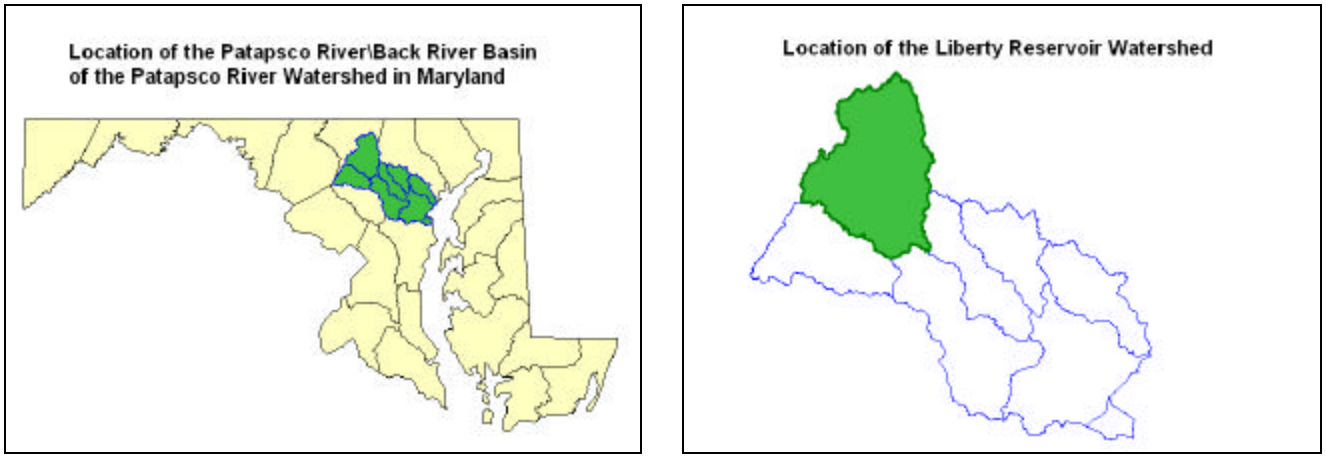
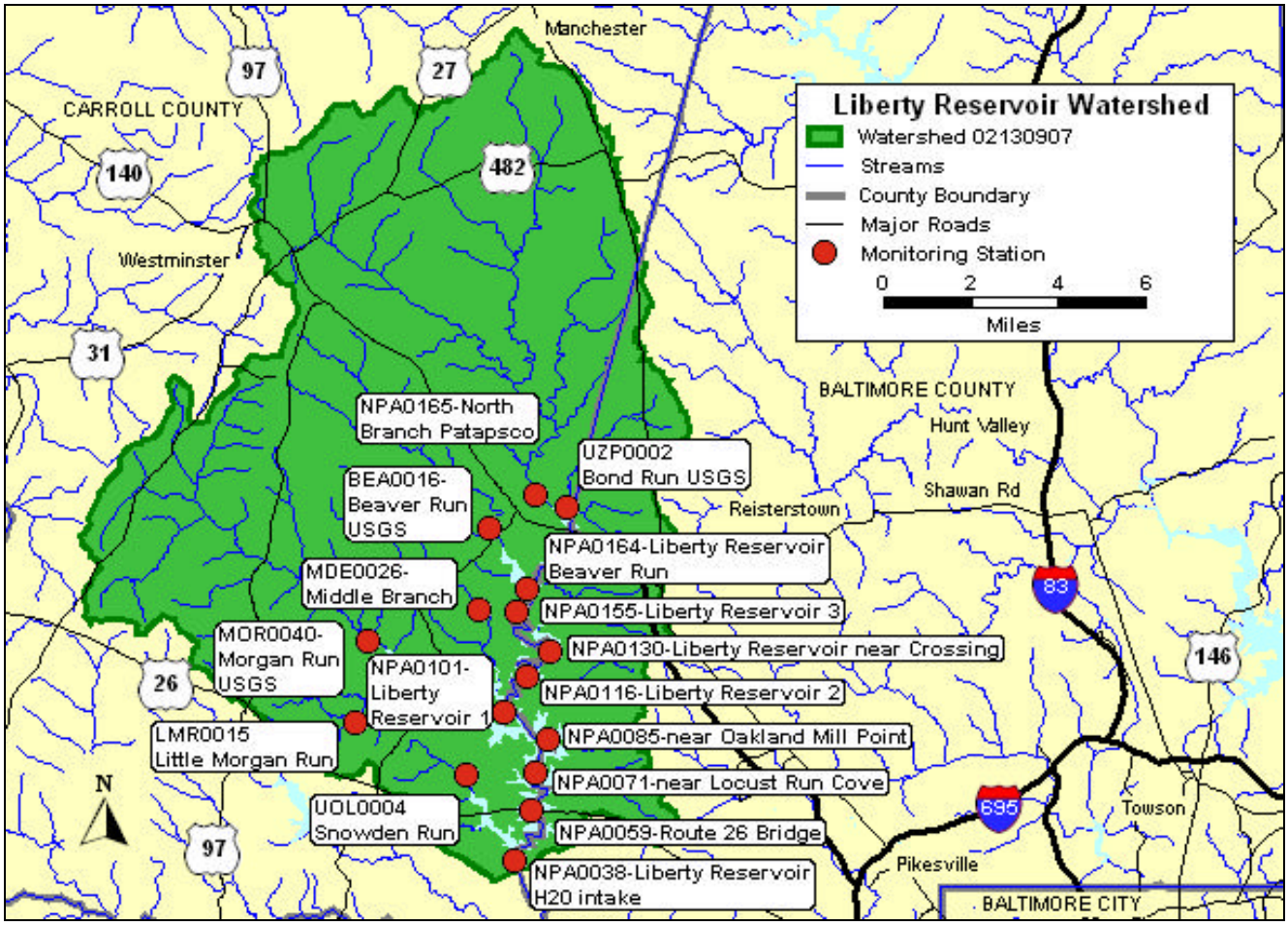


LOWER NORTH BRANCH PATAPSCO STATION LIST

Station Code	Station Names	Lat/Long	Description
PATAPSCO RIVER			
PAT0148	Hammonds Ferry Rd.	39 13.864 76 39.872	Hammonds Ferry Road Crossing Baltimore ADC Map 42 E-11
PAT0176	Wash. Blvd	39 13.059 76 42.394	Route 1 (Washington Boulevard) Crossing Baltimore ADC Map 41 J-13
PAT0222	Ilchester Rd	39 15.052 76 45.852	Ilchester Road Crossing. Park on south side near RR tracks. Bank sample.
PAT0285	Old Frederick Rd.	39 18.609 76 47.549	Old Frederick Road Crossing. Bank sample. Baltimore ADC Map 32 F-9
PAT0347	Old Court Road	39 19.908 76 52.197	Woodstock/Old Court Road Crossing. Bank sample under bridge from RR track side.
HERBERT RUN			
EBH0005	Herbert Run	39 13.877 76 41.527	Route 1 – heading north on Route 1 (Southwestern Boulevard) Crossing. Try flow upstream - you may have electrical interference.
STONY RUN			
SXR0002	Stony Run	39 12.730 76 41.698	Furnace Avenue Crossing. Try to take flow – may have electrical interference. Anne Arundel ADC Map 1 J-6
DEEP RUN			
DXC0004	Deep Run	39 12.651 76 42.124	Furnace Avenue Crossing Anne Arundel ADC Map 1 J-6
DOGWOOD RUN			
DGW0002	Dogwood Run	39 18.931 76 47.599	Dogwood Road Crossing Baltimore ADC Map 32 F-8
BRICE'S RUN			
BCN0003	Brice's Run	39 19.350 76 49.461	Wrights Mill Road Crossing Baltimore ADC Map 32 A-7
NORTH BRANCH PATAPSCO			
NPA0026	Marriotsville Rd	39 21.879 76 53.104	Marriotsville Road Crossing Baltimore ADC Map 23 B-12

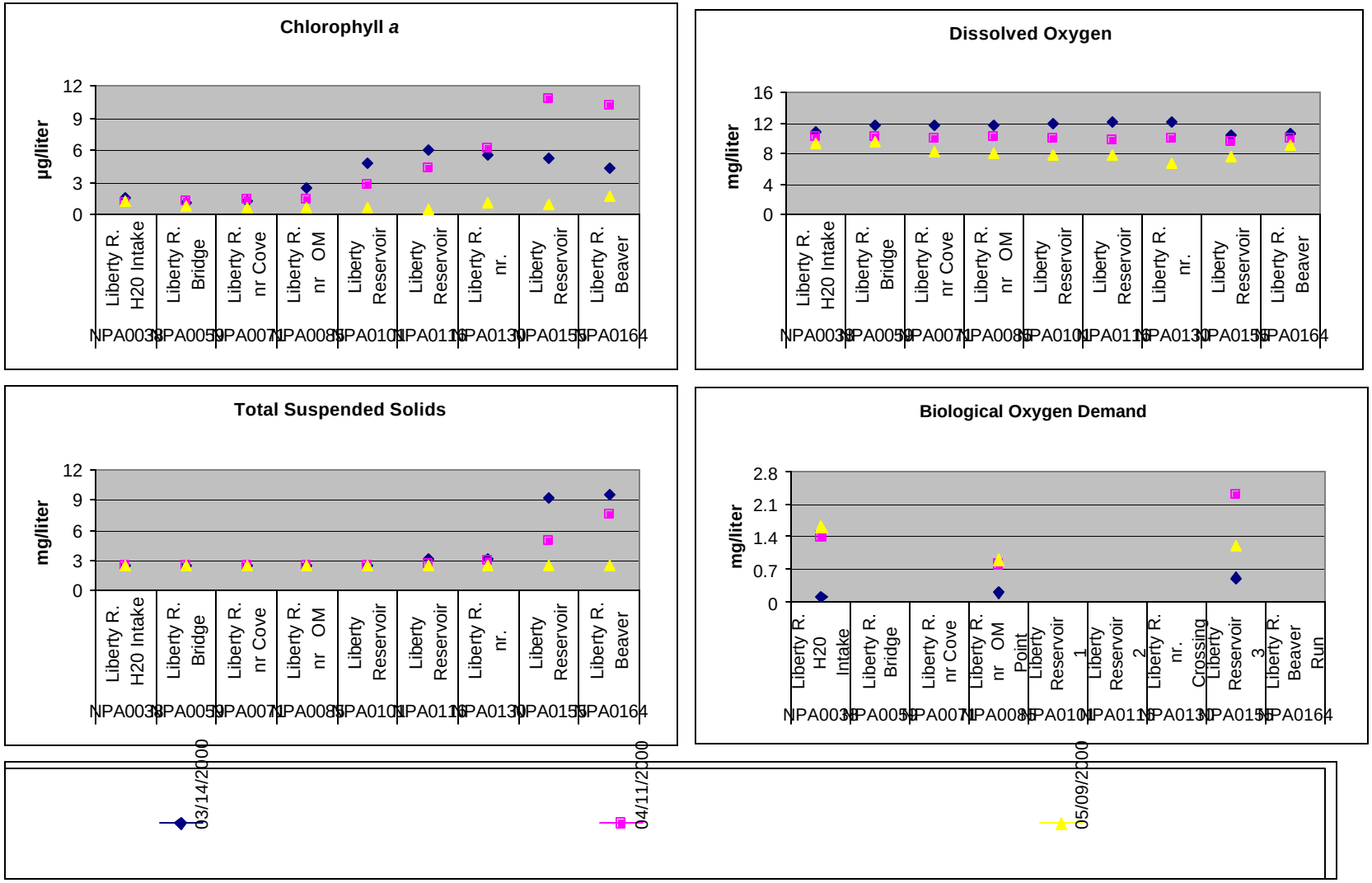
Liberty Reservoir Monitoring Stations





Map Prepared by the Maryland Department of the Environment
Science Services Administration
Montgomery Park Business Center
1800 Washington Boulevard, Suite 540
Baltimore, Maryland 21230-1718

Liberty Reservoir (main)
High Flow Conditions (December-May)
Stations are presented from left to right from downstream to upstream



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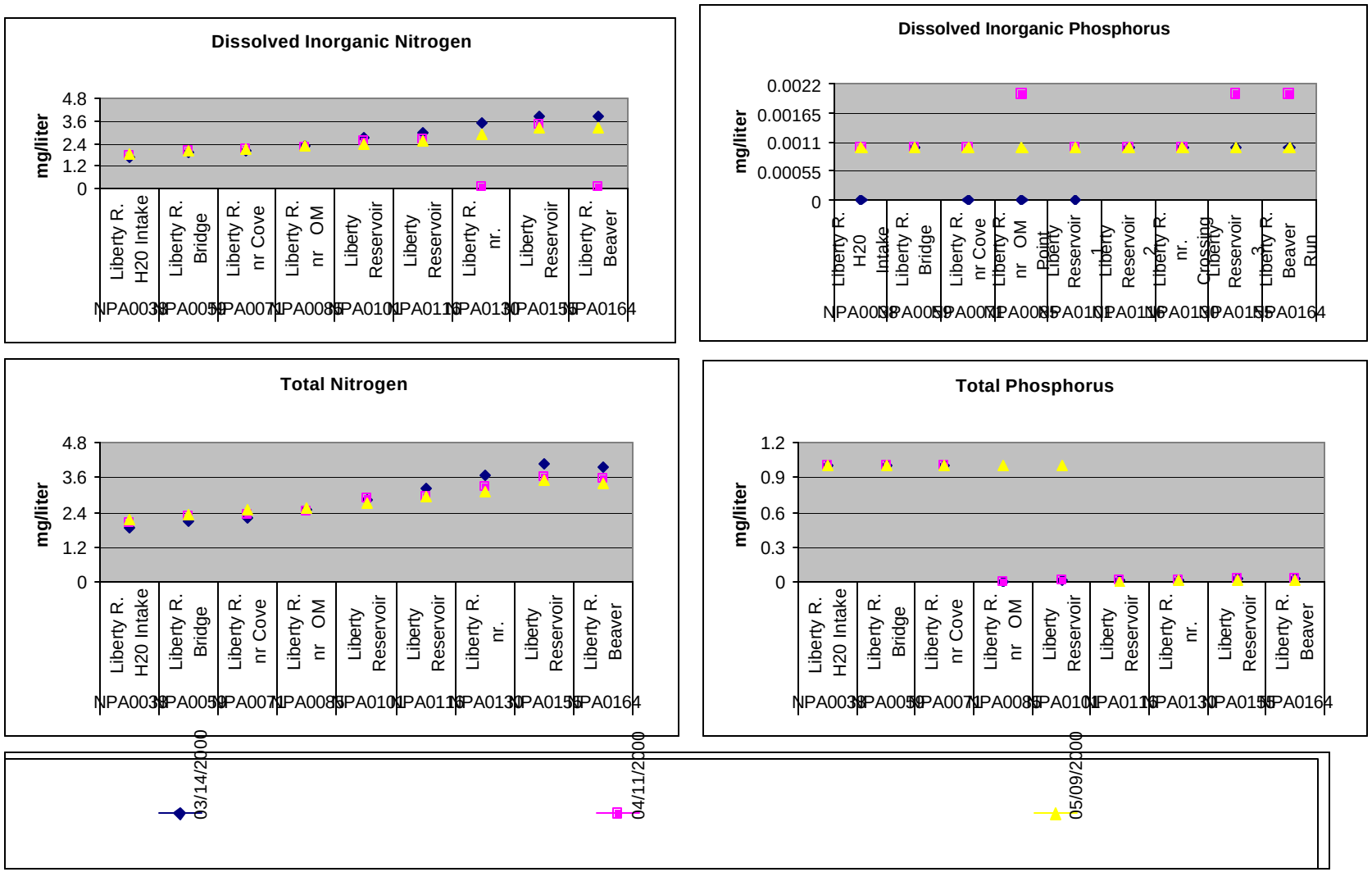

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Low Flow Conditions (June to November)
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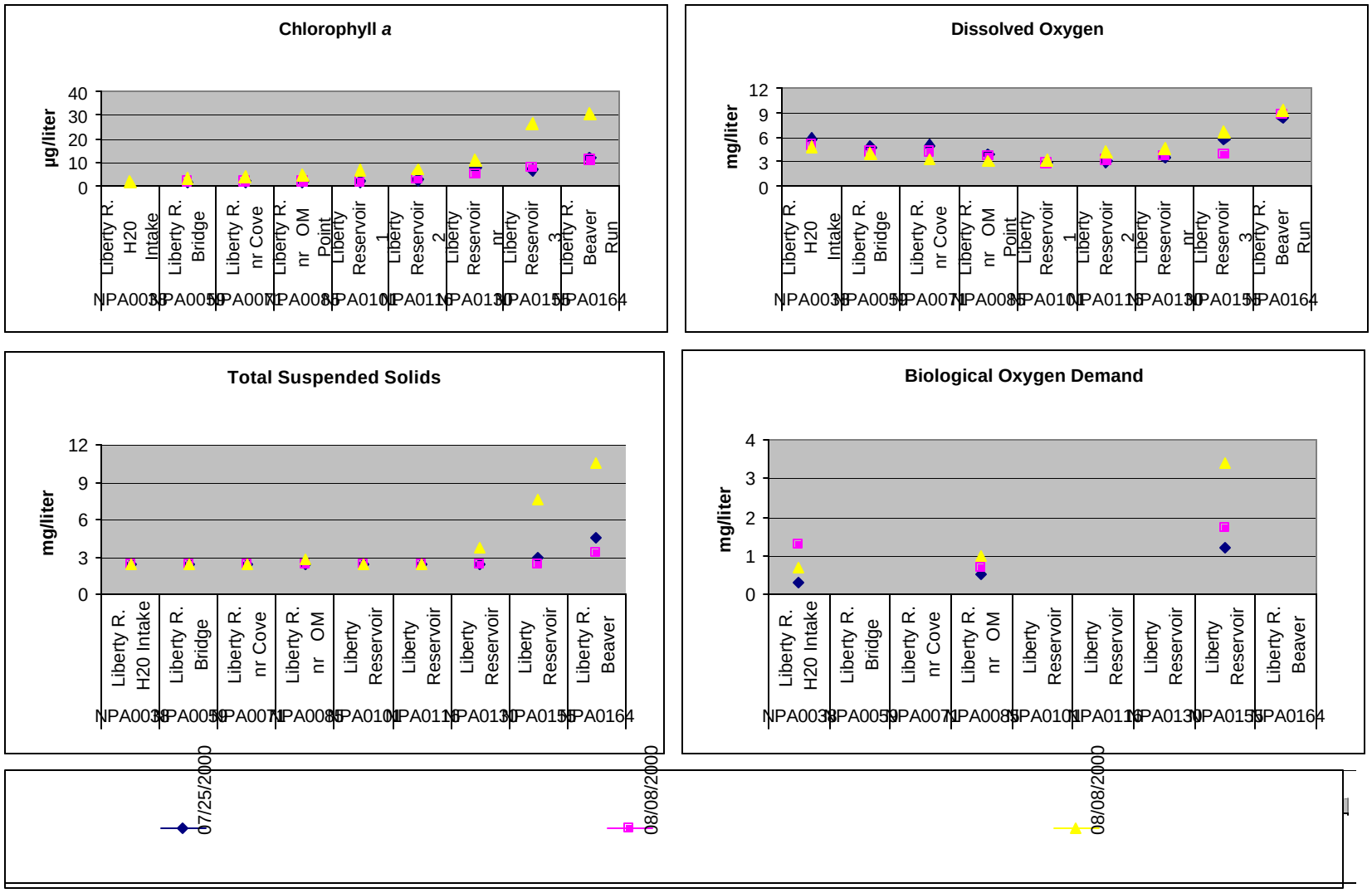

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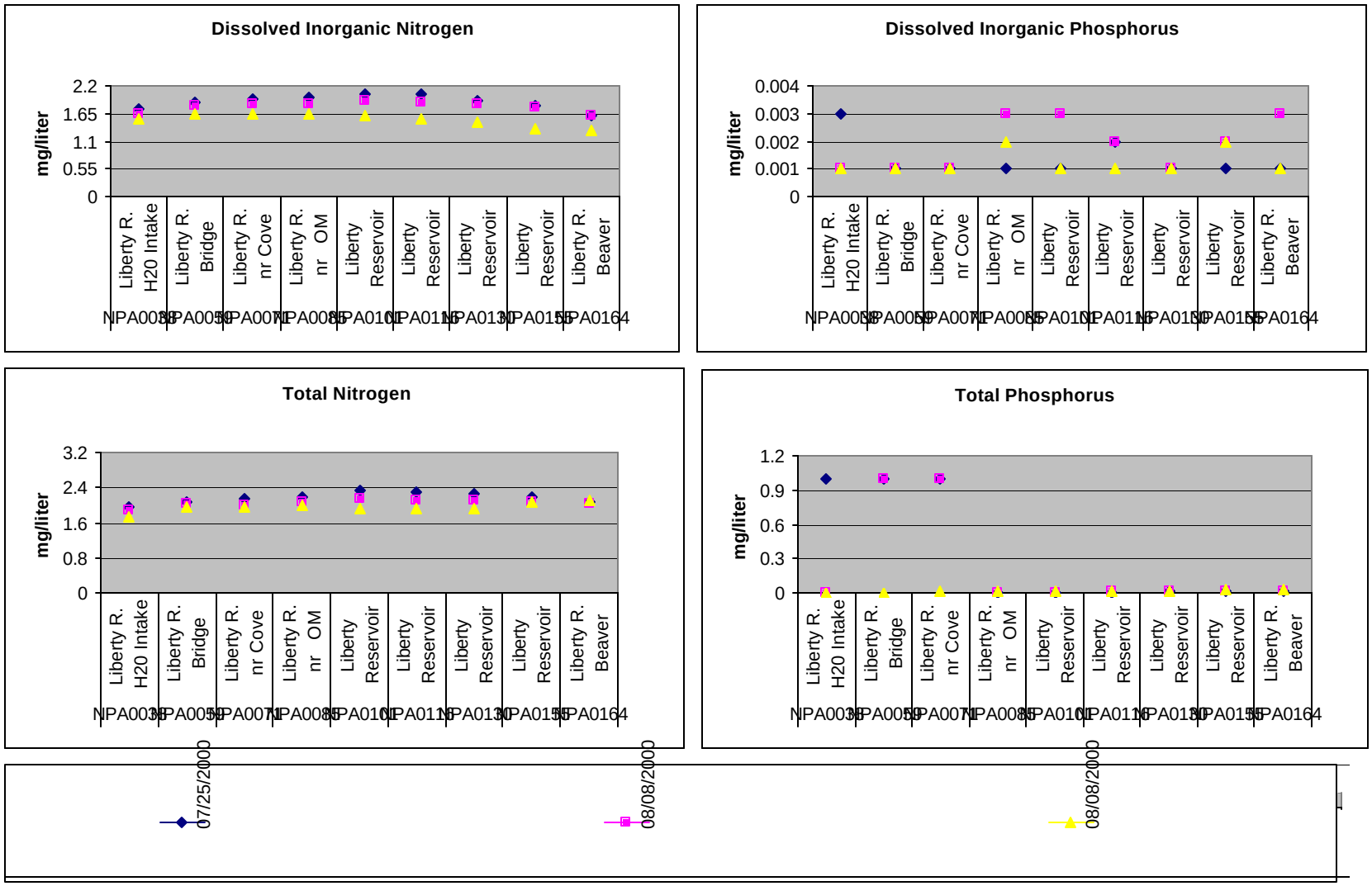

Liberty Reservoir (tributaries)
High Flow Conditions (December-May)
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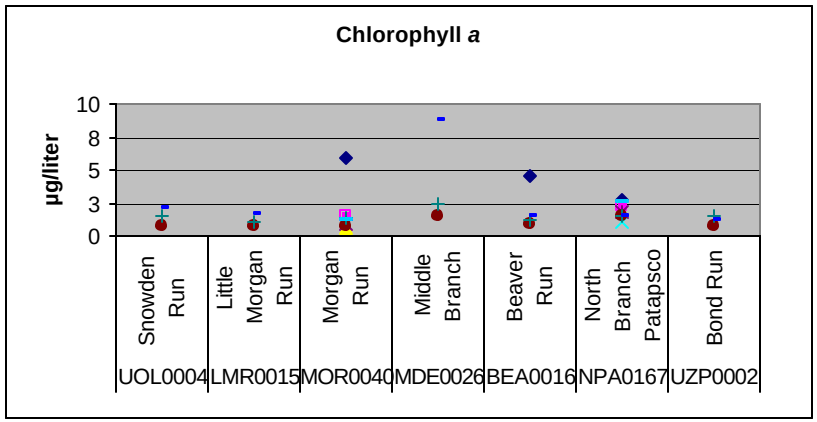

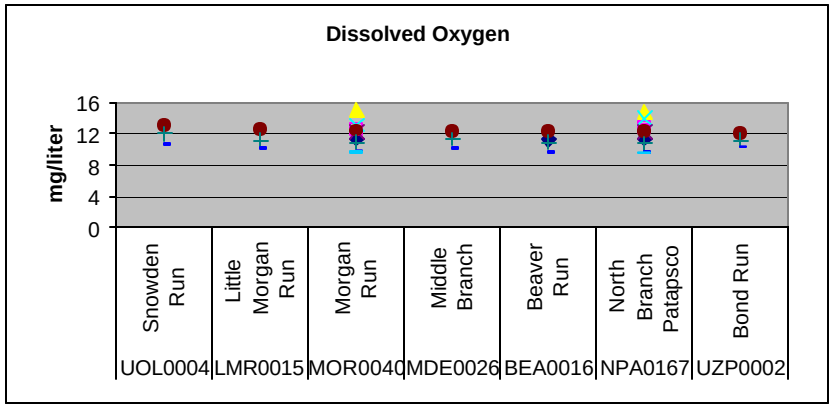

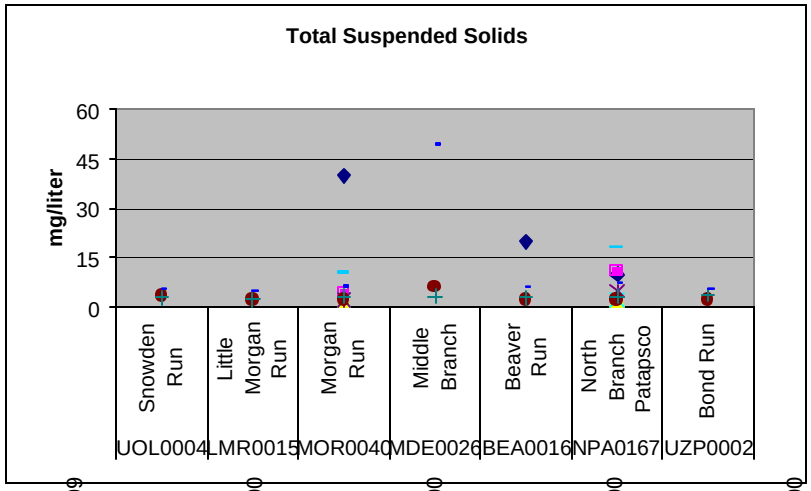

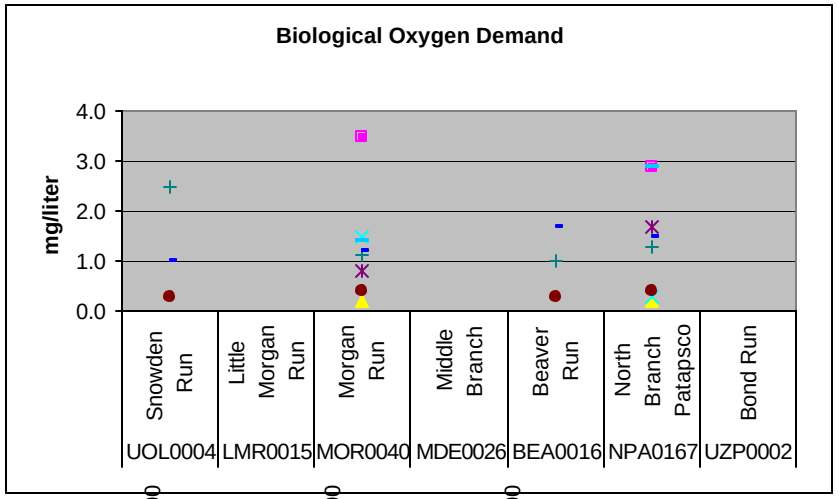

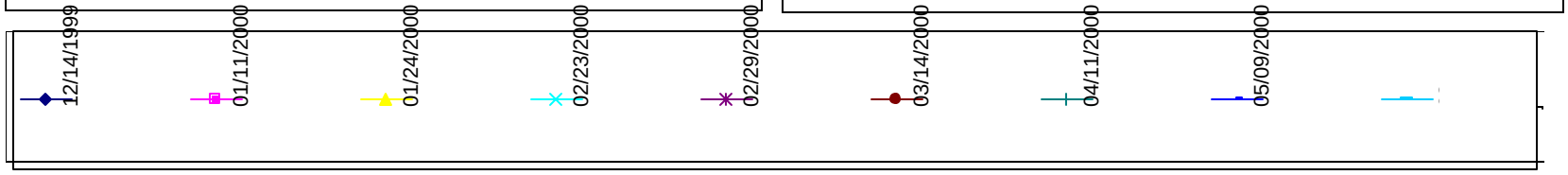

Liberty Reservoir (tributaries)
High Flow Conditions (December-May)
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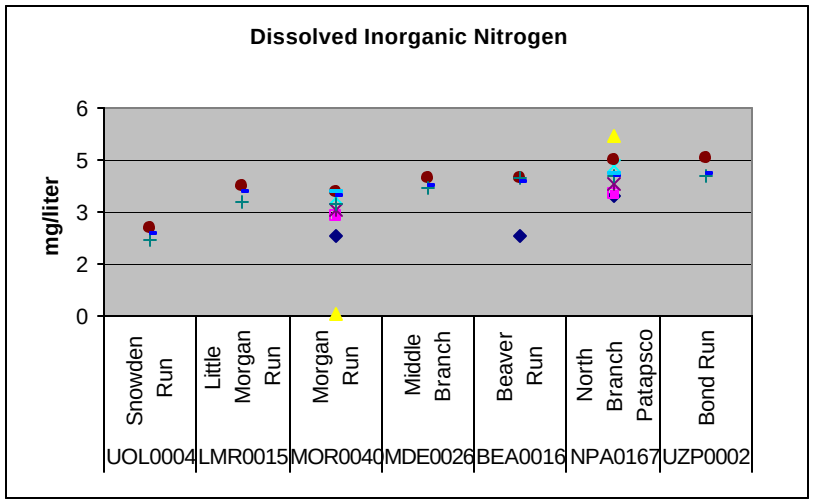

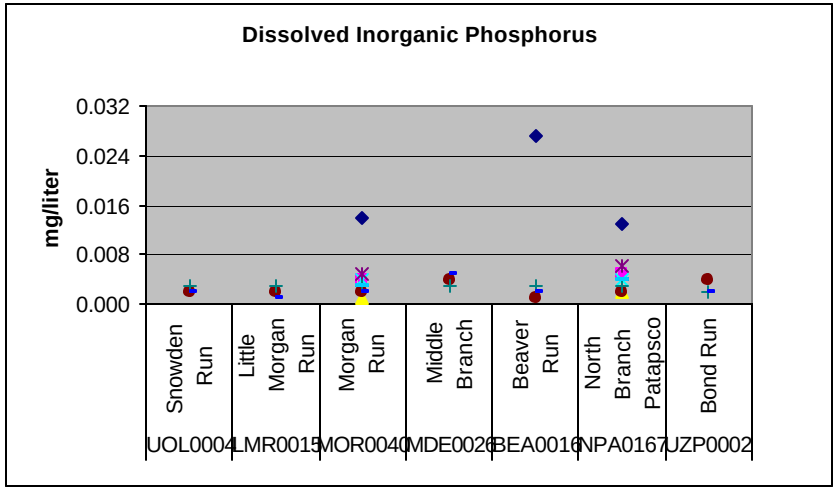

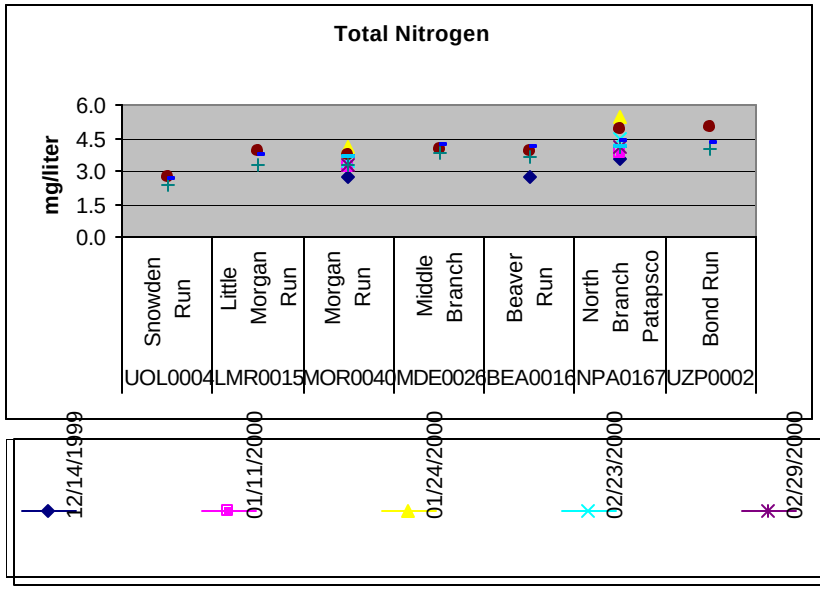

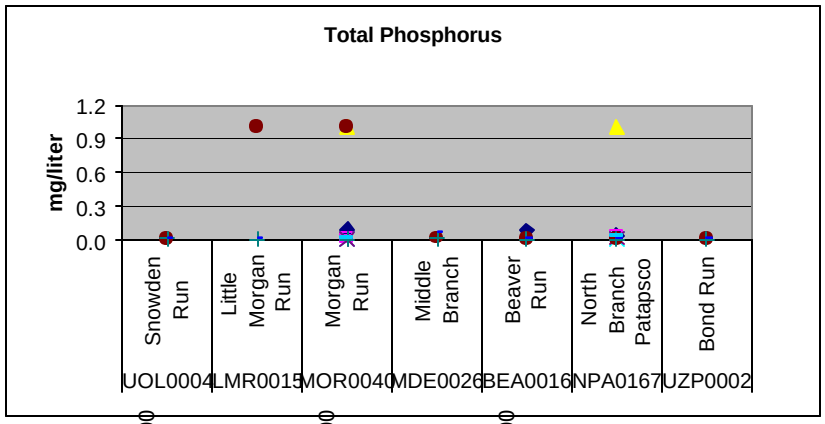

Liberty Reservoir (tributaries)
Low Flow Conditions (June to November)
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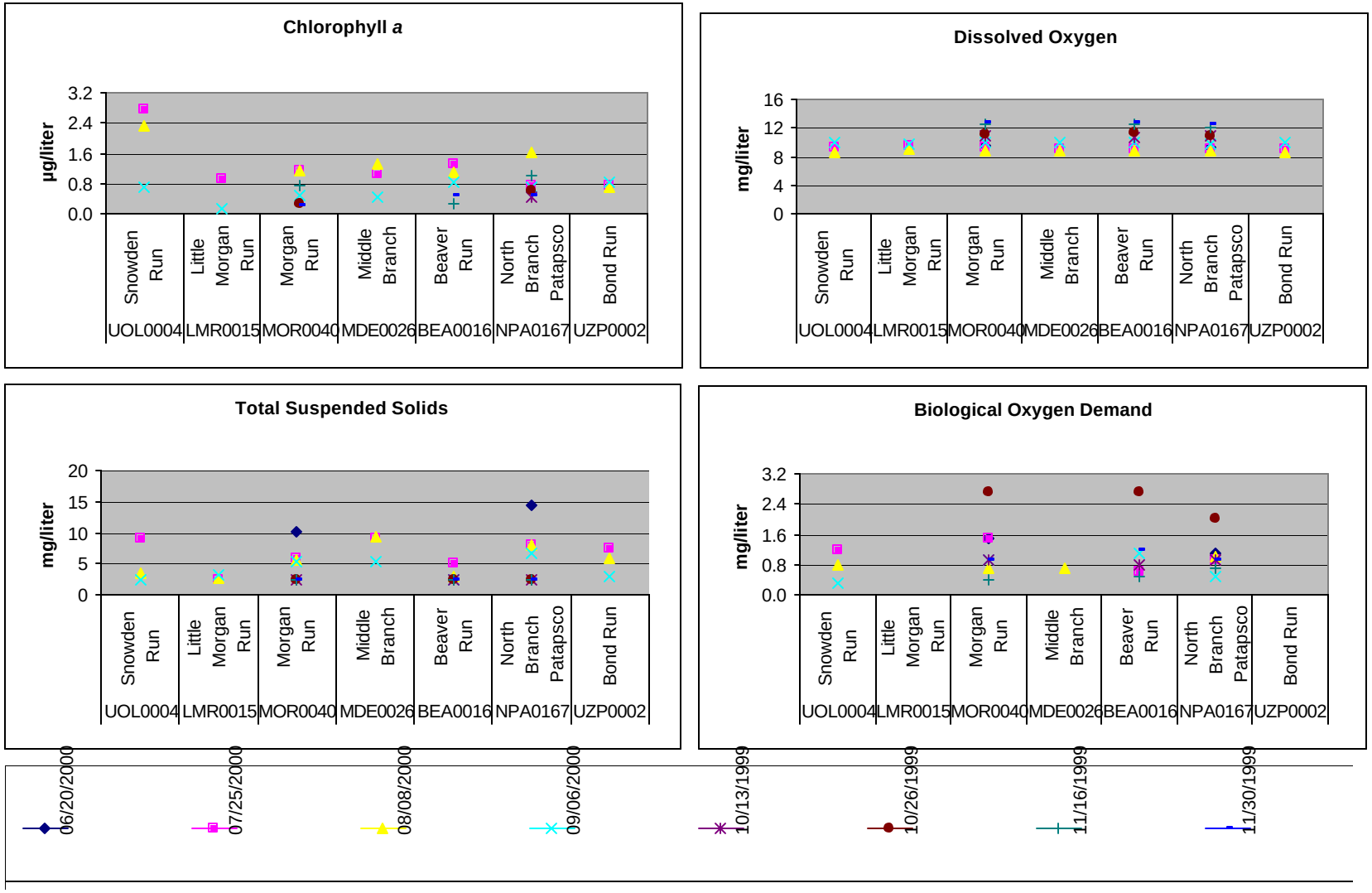

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Low Flow Conditions (June to November)
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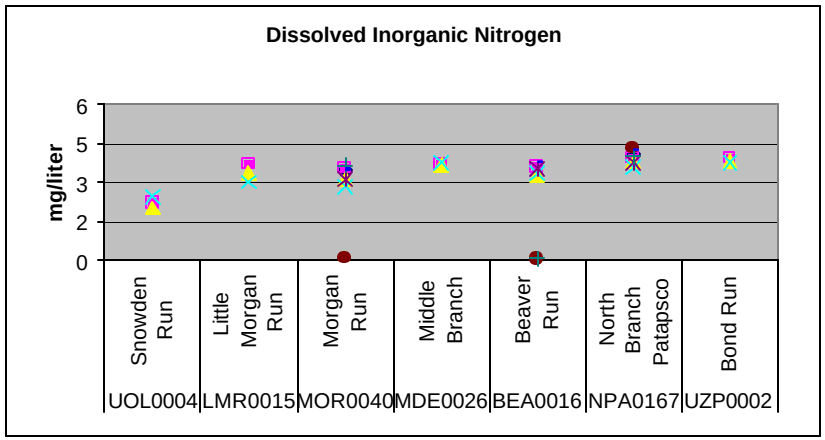
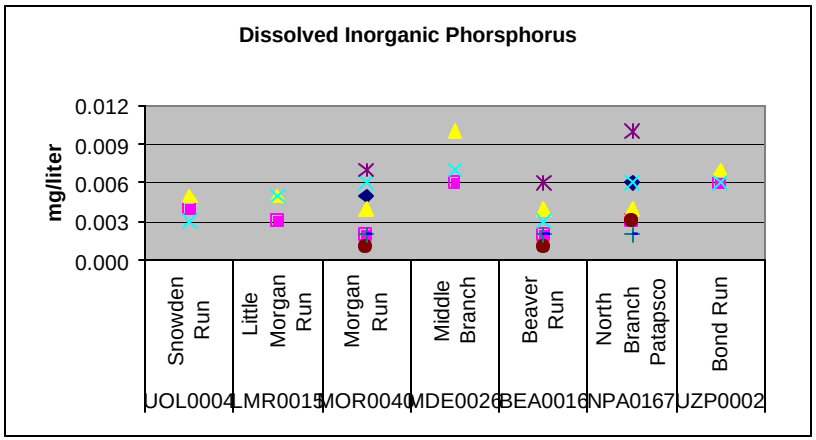
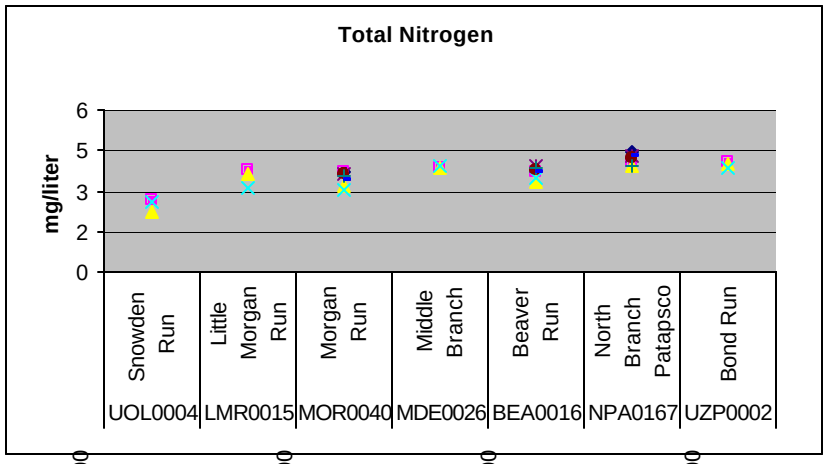
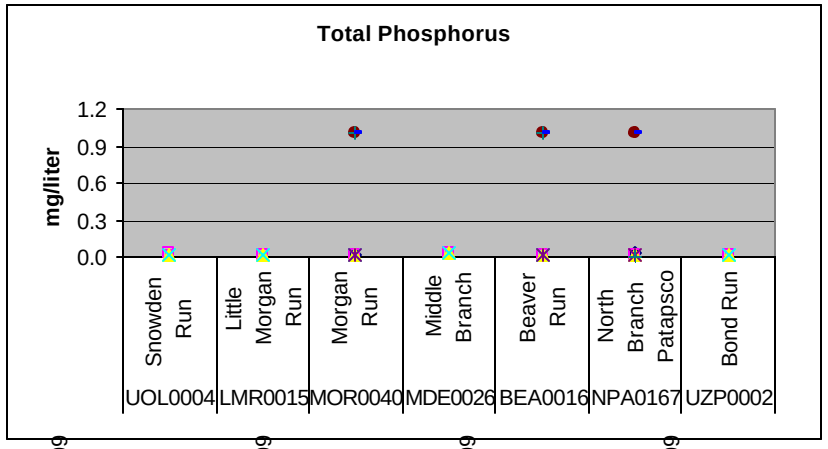
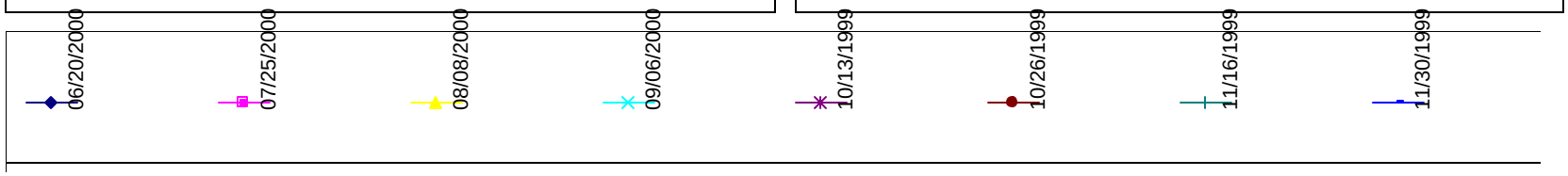








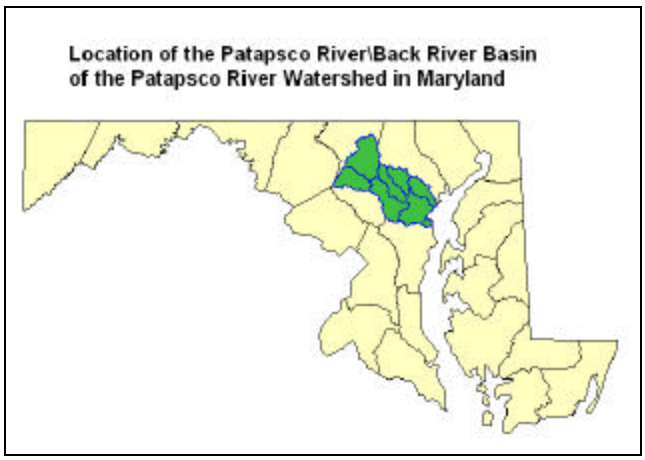


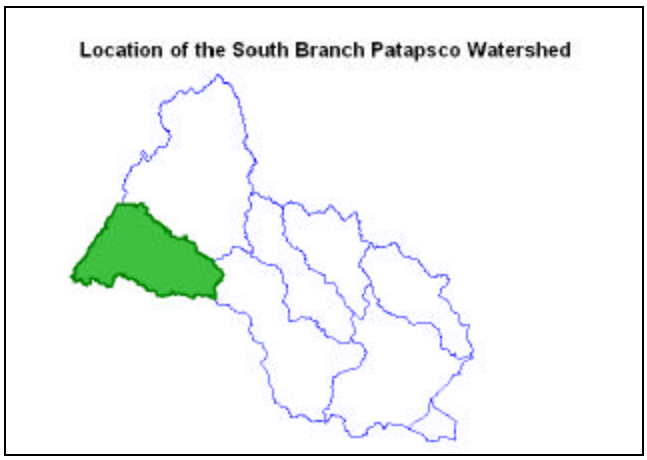
LIBERTY RESERVOIR STATION LIST

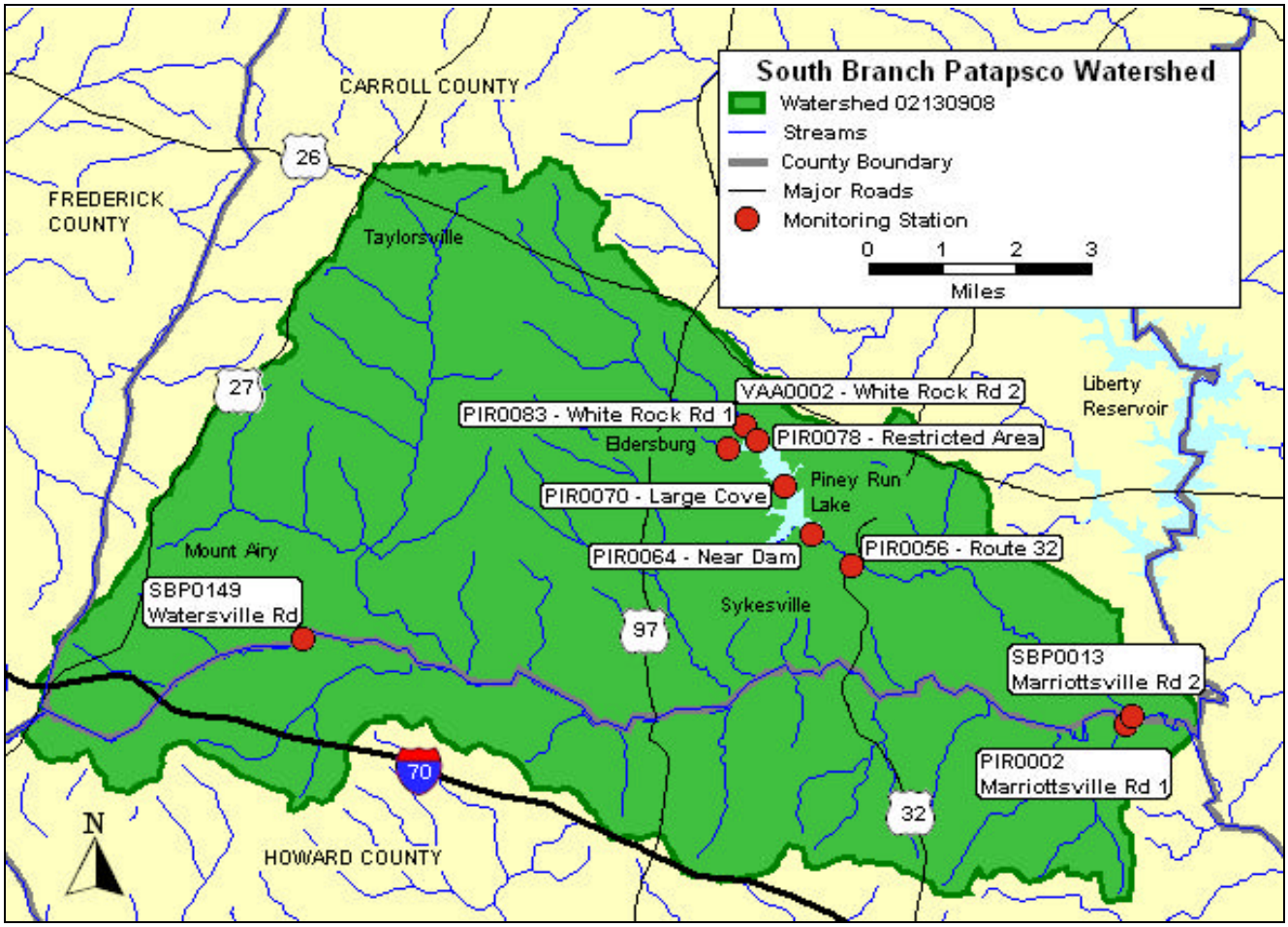
Station Code	Station Name	Lat/Long	Description
LIBERTY RESERVIOR			
NPA0038	Liberty R. H20 Intake	39 22.821 76 53.535	Center reservoir near drinking water intake 114 ft.
NPA0059	Liberty R. Bridge	39 23.808 76 53.129	Center reservoir route 26 bridge crossing 85 ft.
NPA0071	Liberty R. nr Cove	39 24.522 76 53.005	Center reservoir just northwest of Locust Run Cove 90 ft.
NPA0085	Liberty R. nr OM Point	39 25.208 76 52.679	Center reservoir Northeast of Oakland Mill Point 85 ft.
NPA0101	Liberty Reservoir 1	39 25.714 76 53.814	Center reservoir after bend 70 ft.
NPA0116	Liberty Reservoir 2	39 26.448 76 53.256	Center reservoir after second sharp bend just starting to turn back north. 56 ft.
NPA0130	Liberty Reservoir nr Crossing	39 26.930 76 52.666	Center reservoir Deer Park Road crossing 48 ft.
NPA0155	Liberty Reservoir 3	39 27.687 76 53.498	Center reservoir on sharp bend 24 ft.
NPA0164	Liberty R. Beaver Run	39 28.170 76 53.227	Center reservoir confluence of Beaver Run and North Branch Patapsco.
SNOWDEN RUN			
UOL0004	Snowden Run	39 24.506 76 54.814	Snowdens Run Road crossing. Good parking near some type of pumping station looking building.
LITTLE MORGAN RUN			
LMR0015	Little Morgan Run	39 25.524 76 57.638	Bartholow Road Crossing. Staff gage. Take flow and read staff. ADC Carroll County MAP 30 B-5
MORGAN RUN			
MOR0040	Morgan Run USGS	39 27.142 76 57.310	London Bridge Road crossing. USGS Gage. ADC Carroll County MAP 30 C-1
MIDDLE BRANCH			
MDE0026	Middle Branch	39 27.754 76 54.454	Louisville Road crossing. Good parking and access. Flow site. ADC Carroll County MAP 30 J-1
BEAVER RUN			
BEA0016	Beaver Run USGS	39 29.359 76 54.212	Hughes Road crossing. USGS Gage. ADC Carroll County MAP 26 A-7

NORTH BRANCH PATAPSCO			
NPA0165	No. Br. Patapsco	39 30.032 76 53.000	Take Industrial Park Drive (off Rte 91) – sample off foot bridge in Congoleum plant. Check in at office.
BOND RUN			
UZP0002	Bond Run USGS	39 29.783 76 52.203	Hollingsworth Road Crossing. Old USGS gage house. Good access and flow site.

South Branch Patapsco Monitoring Stations







Map Prepared by the Maryland Department of the Environment
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South Branch Patapsco River
High Flow Conditions (December-May)
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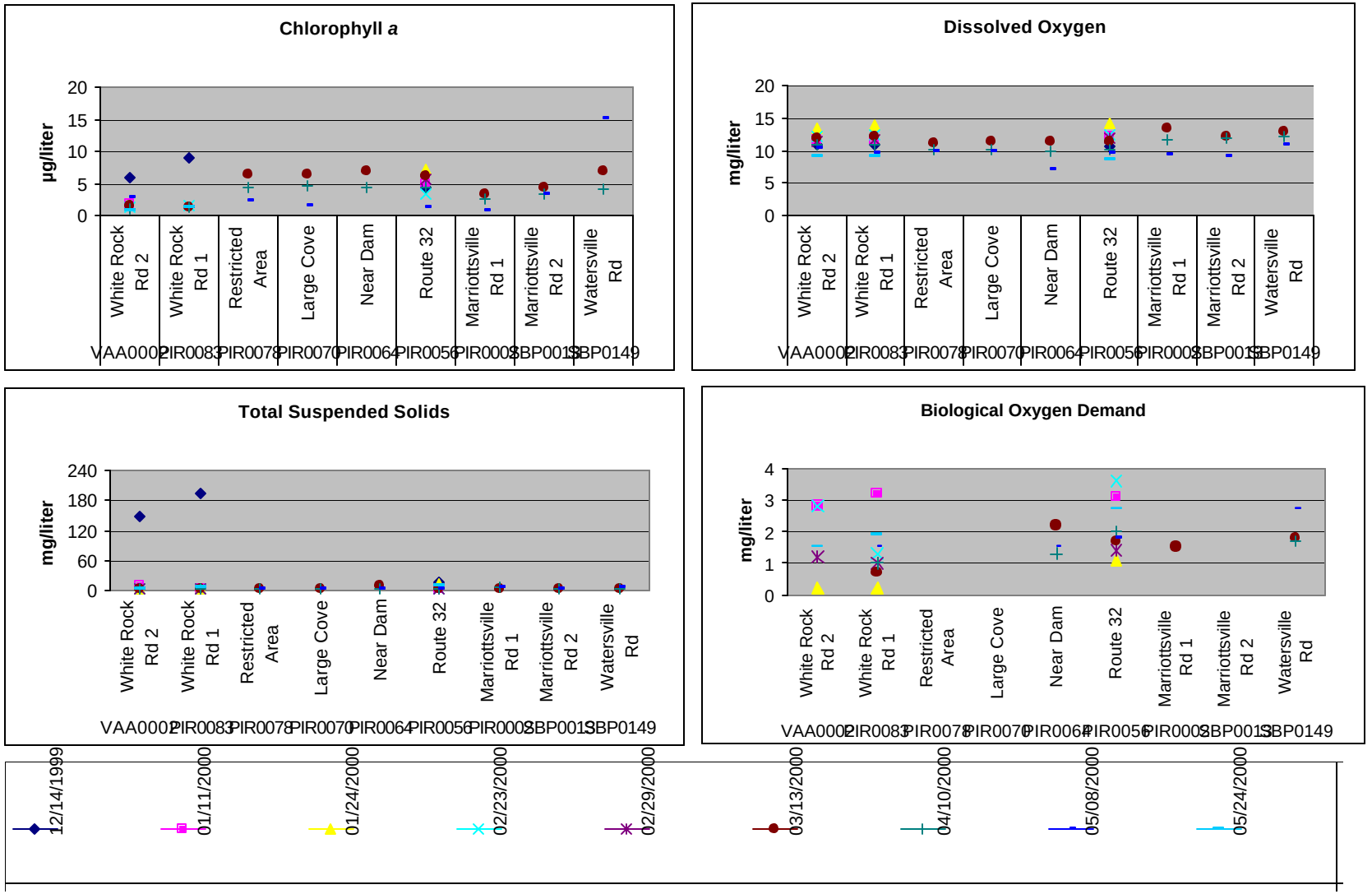

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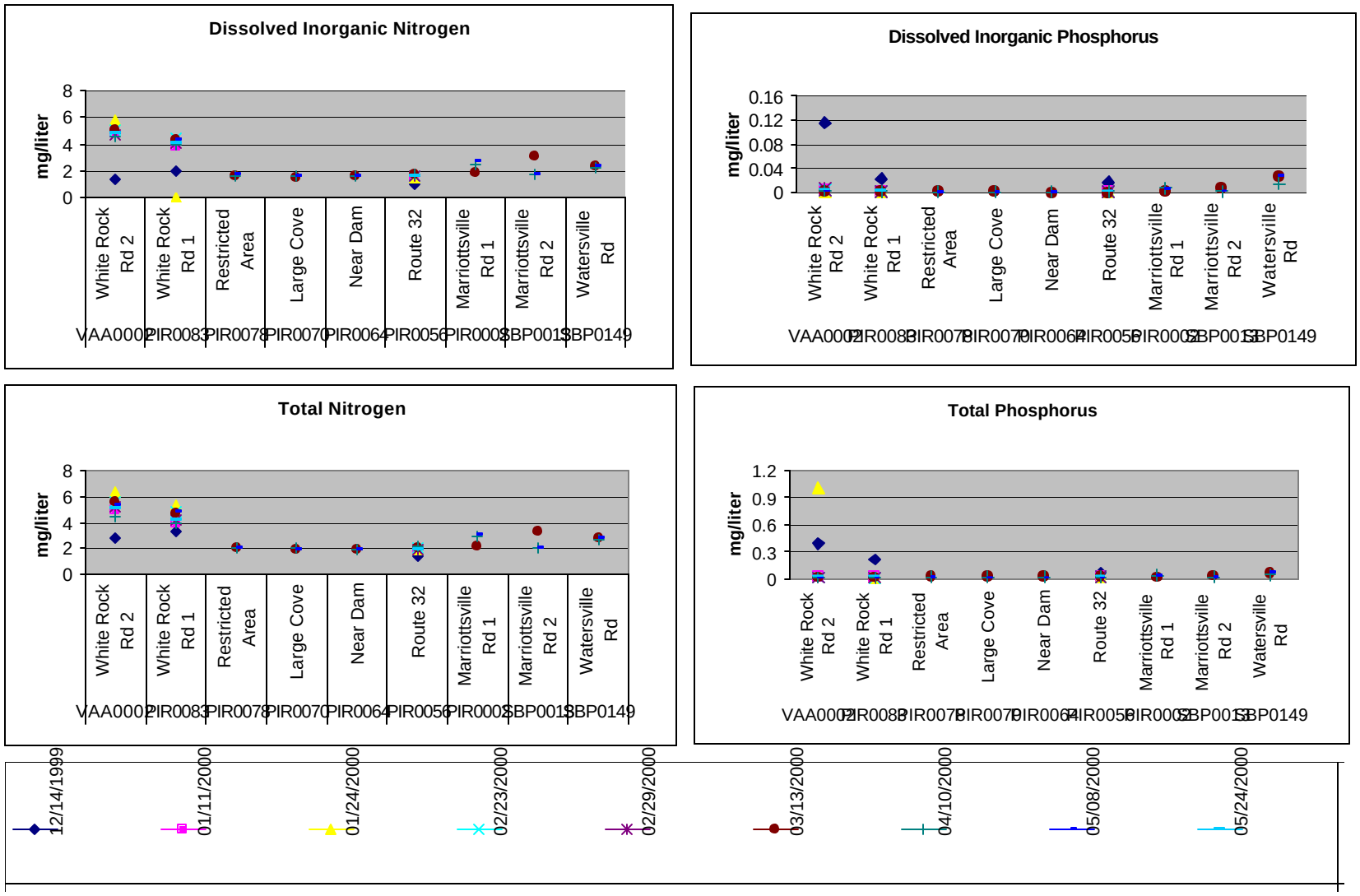

Patapsco River Lower North Branch
Low Flow Conditions (June to November)
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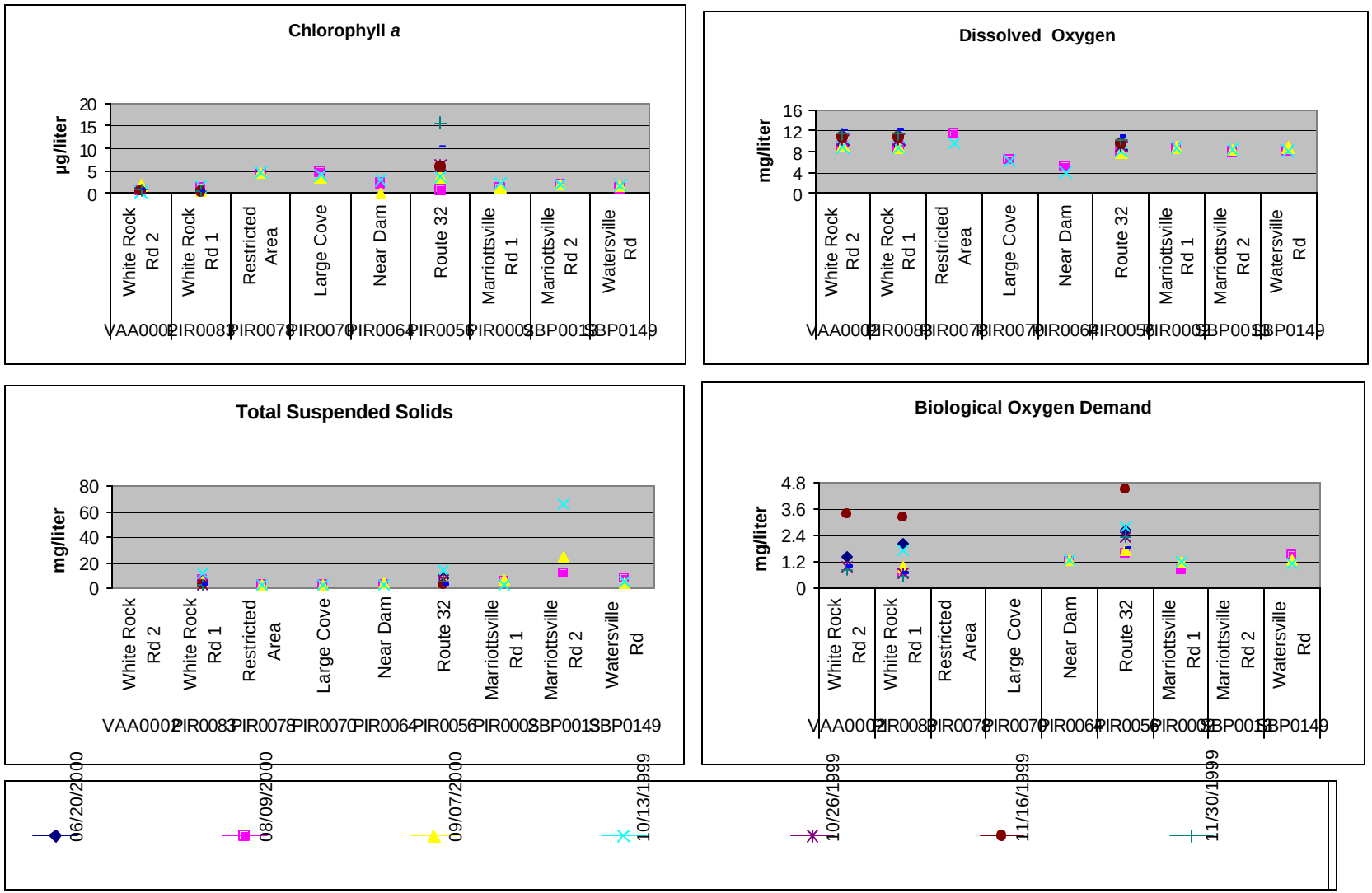

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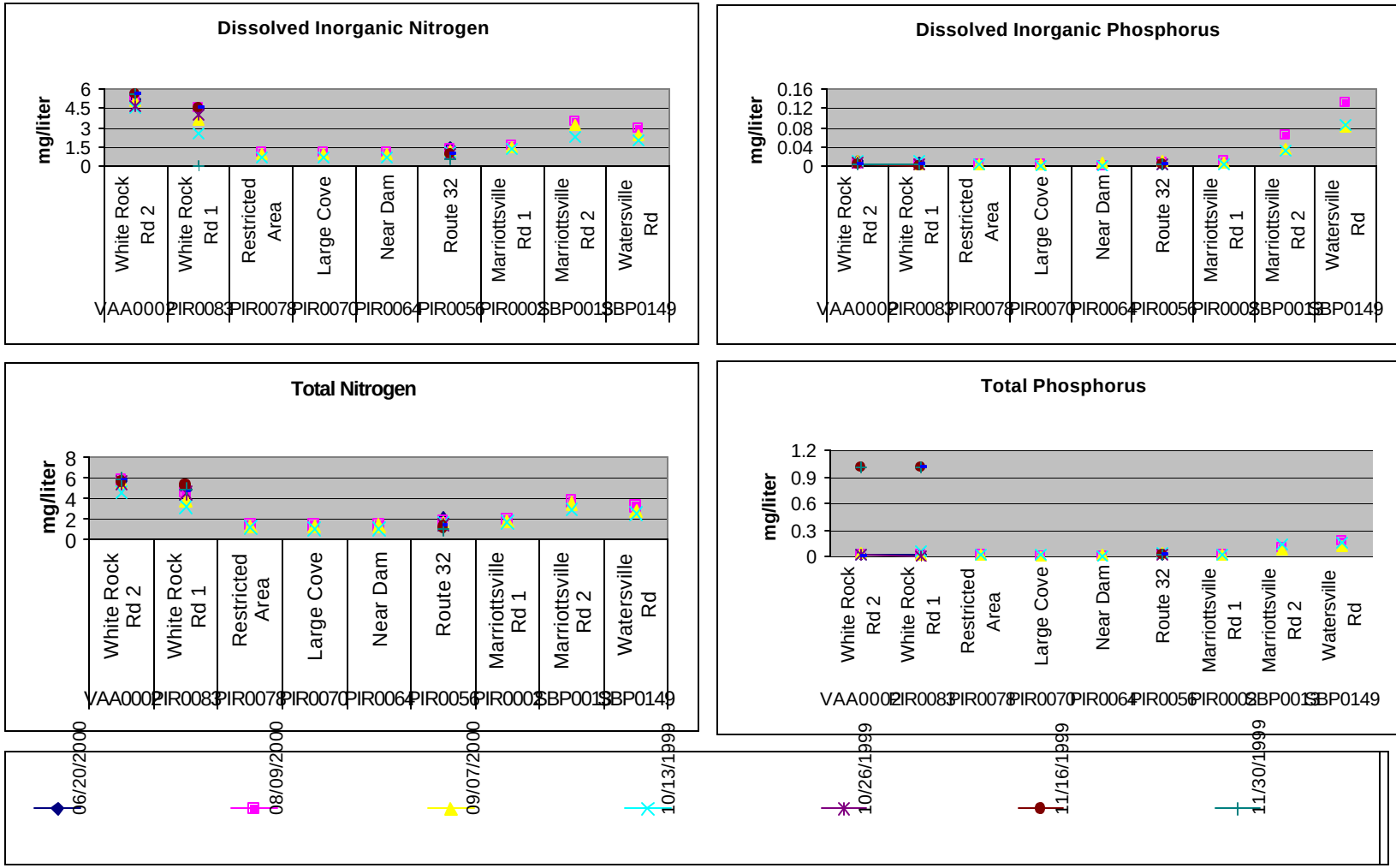


SOUTH BRANCH PATAPSCO STATION LIST

Station Code	Station Names	Lat/Long	Description
PINEY RUN RESERVIOR			
PIR0078	Restricted Area	39 24.383 76 59.416	At line of restricted area. Area maybe floats across this area. Use GPS and take descriptions.
PIR0070	Large Cove	39 23.850 76 59.000	Mid-reservoir. Down reservoir from boat ramps on right and large cove on left when facing down reservoir.
PIR0064	Near Dam	39 23.300 76 58.600	Mid-reservoir near dam across from cove on left when facing the dam.
PINEY RUN RESERVIOR INPUTS			
PIR0002	Marriottsville Rd. 1	39 21.186 76 53.818	Marriottsville Road Crossing, flow site upstream. ADC Carroll County MAP 36 A-6
PIR0056	Route 32	39 22.925 76 58.015	Route 32 Road crossing, flow site. ADC Carroll County MAP 30 A-13
PIR0083	White Rock Rd. 1	39 24.287 76 59.849	White Rock Road crossing, flow site upstream. ADC Carroll County MAP 29 G-9
VAA0002	White Rock Rd. 2	39 24.568 76 59.610	White Rock Road crossing, flow site. ADC Carroll County MAP 29 G-8
SOUTH BRANCH PATAPSCO			
SBP0013	Marriottsville Rd. 2	39 21.084 76 53.902	Marriottsville Road Crossing, flow site if possible. ADC Carroll County MAP A-6
SBP0149	Watersville Rd.	39 22.078 77 06.242	Watersville Road crossing, flow site upstream. ADC Carroll County MAP 33 A-3

West Chesapeake Bay Watershed

Magothy River

Severn River

South River

West River

WEST CHESAPEAKE AREA
(Sub-basin 02-13-10)

General Description (from 1998, 305 (b) Report)
The West Chesapeake sub-basin drains 267 square miles of Anne Arundel County and portions of Calvert County on the Western Shore of the Chesapeake Bay. The entire sub-basin lies in the Coastal Plain Province. In many areas near tidal waters, the hill-terrain forms cliffs along the shoreline. Large water bodies include Lake Waterford and the Magothy, Severn, South, West, and Rhode Rivers.

Most land in the West Chesapeake sub-basin is forested (49 percent), however, 34 percent of the drainage land area is developed. Less than 16 percent of the drainage is agricultural land. The only city in the sub-basin is Annapolis but other communities include Pasadena, Severna Park, Edgewater, Highland Beach, and Chesapeake Beach.

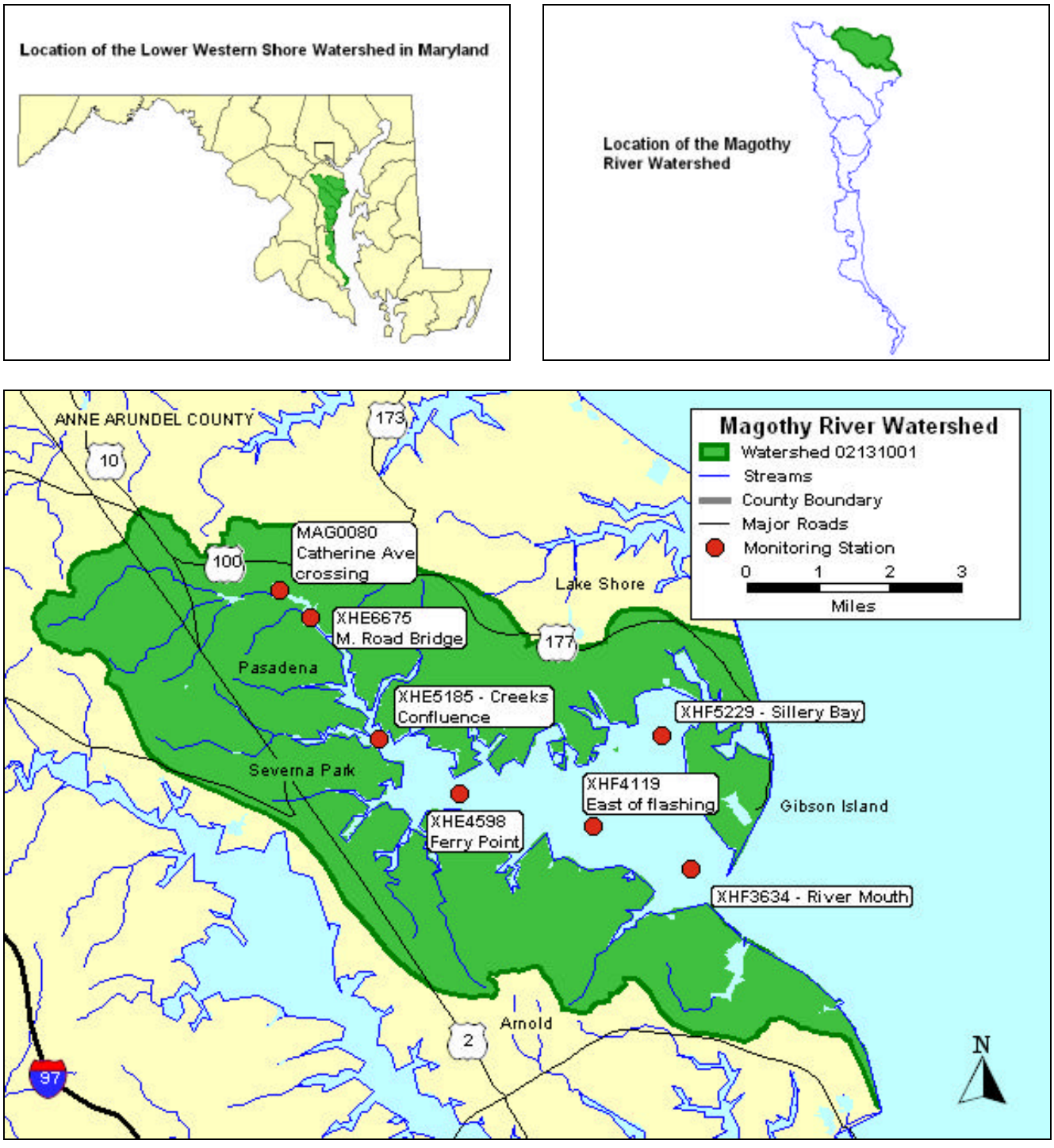
Surface waters are classified as Use I (water contact recreation and aquatic life), Use II (shellfish harvesting) or, in some free-flowing areas of Severn River, Use III (natural trout) or Use IV (put-and-take trout) (COMAR '26.08.02.08K). For the most recent information regarding specific use classes in this watershed, the reader is referred to the Code of Maryland Regulations.

The Severn River was identified as one of the State's Scenic Rivers; this designation is designed to preserve and protect the rivers natural values. One stream (Jabez Branch) supports a natural brook trout population for a total of 0.5 miles of stream length.

The State routinely monitors water quality at five Bay Tributary stations. 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 at 45 stations in 1994 and at 32 stations in 1997. In addition, water quality data are available from MDE's shellfish sanitation program for most tidal areas.

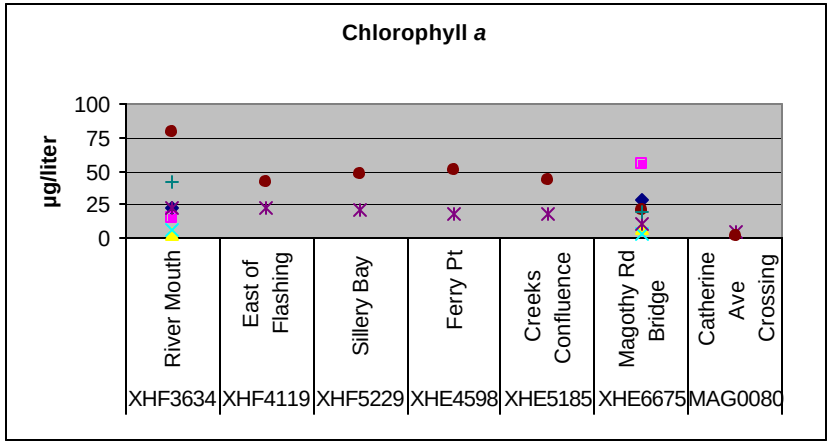
Water Quality Summary
The Magothy (02131001), Severn (02131002), South (02131003), and West Rivers (02131004), will be addressed by a cooperative effort by the Bay States with the EPA Chesapeake Bay Program taking the lead.

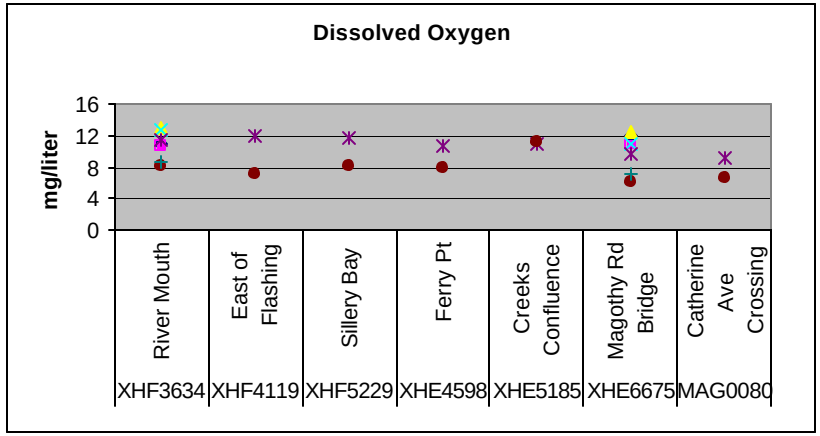
Magothy River Monitoring Stations

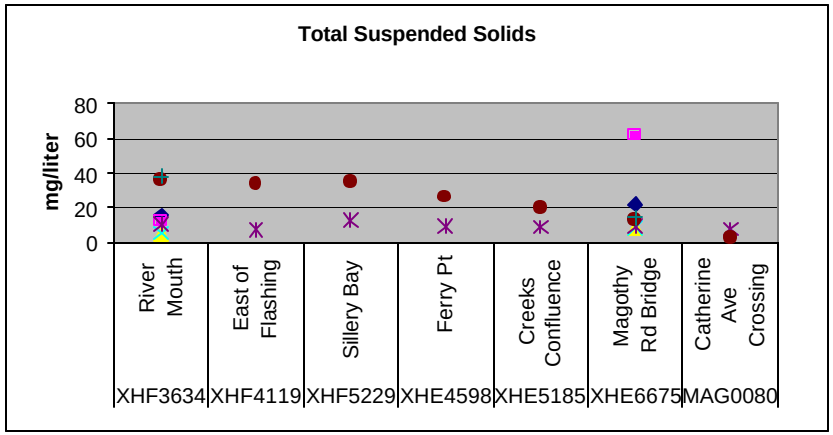


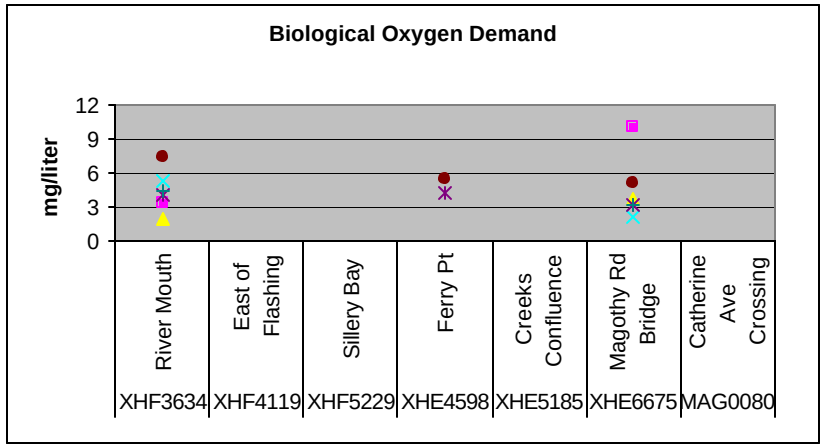
Map Prepared by the Maryland Department of the Environment
Science Services Administration
Montgomery Park Business Center
1800 Washington Boulevard, Suite 540
Baltimore, Maryland 21230-1718

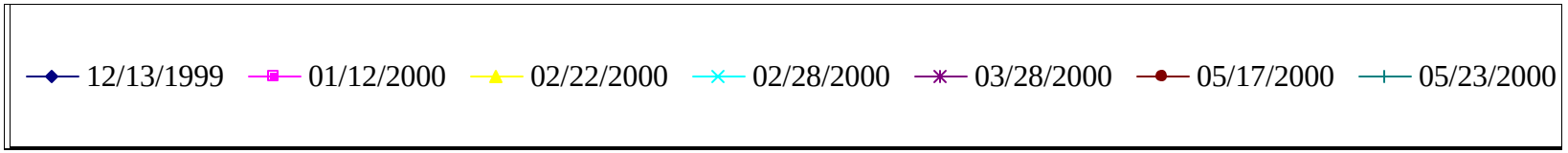
Magothy River
High Flow Conditions (December-May)
Stations are presented from left to right from downstream to upstream











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High Flow Conditions (December-May)
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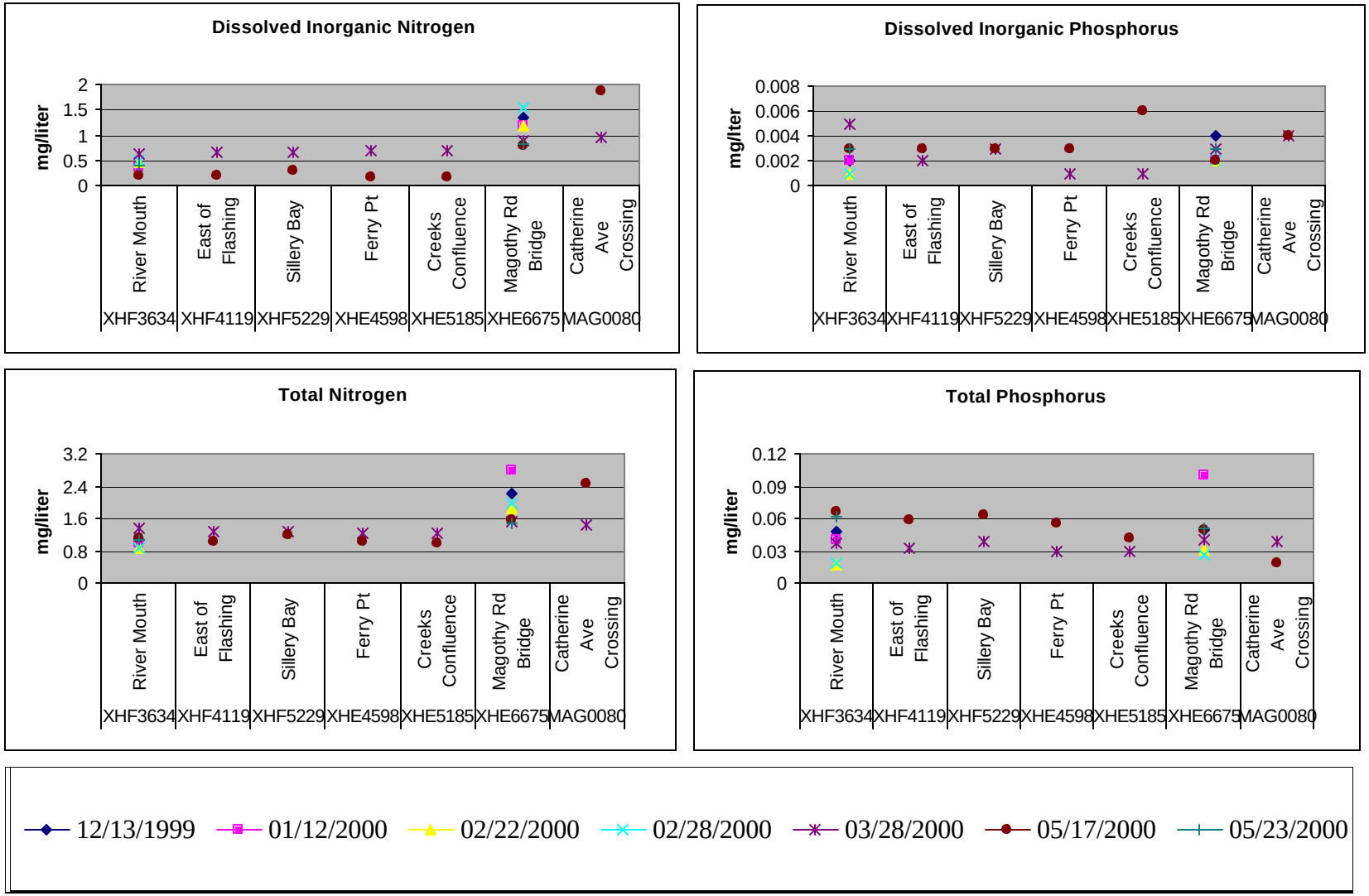

Magothy River
Low Flow Conditions (June to November)
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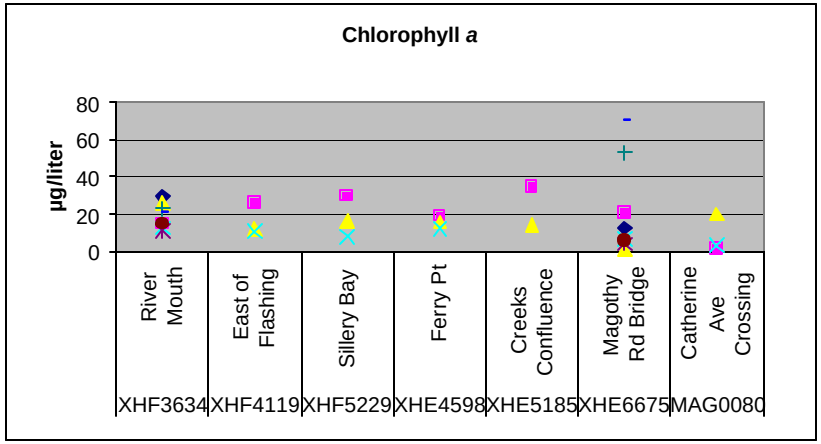

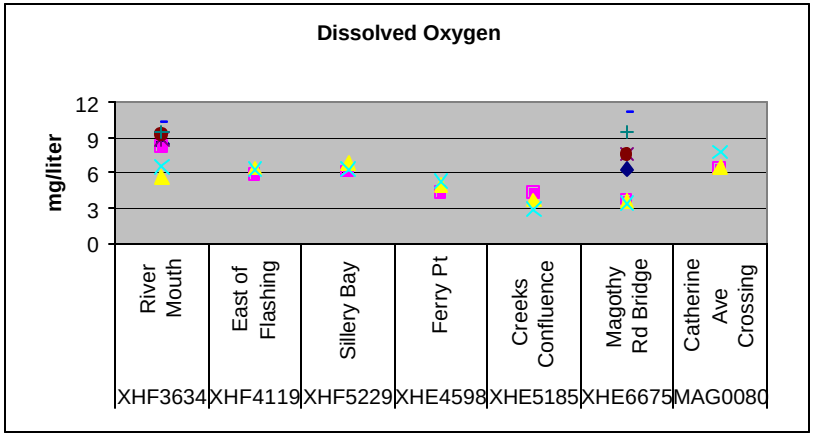

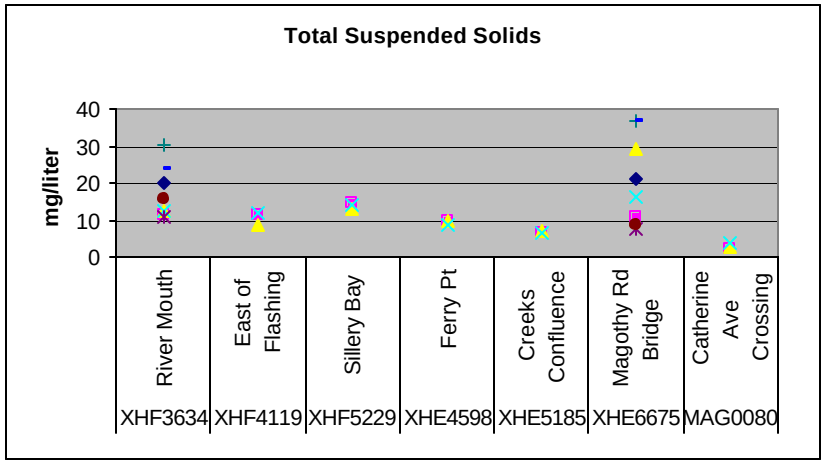

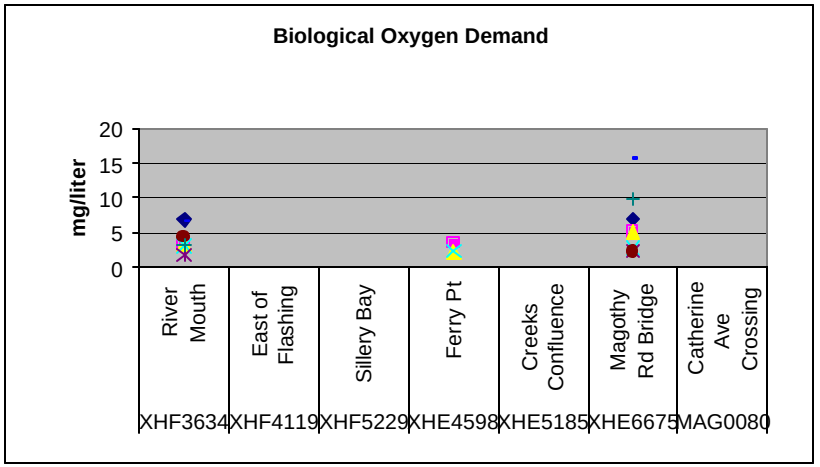

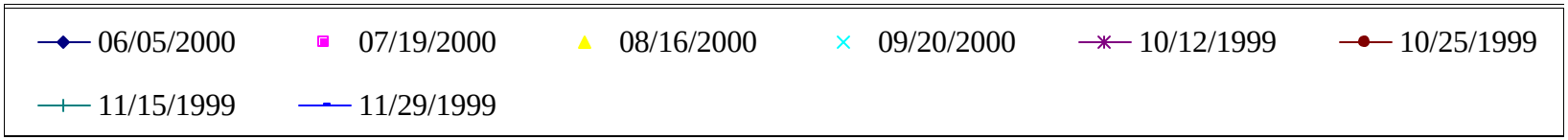

Magothy River
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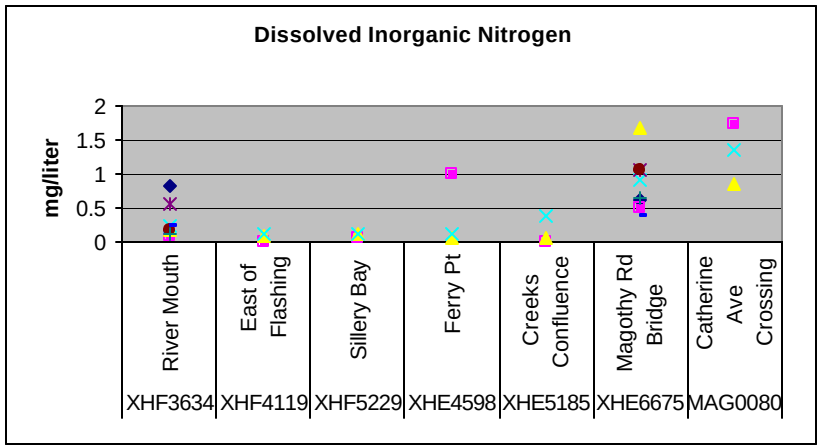
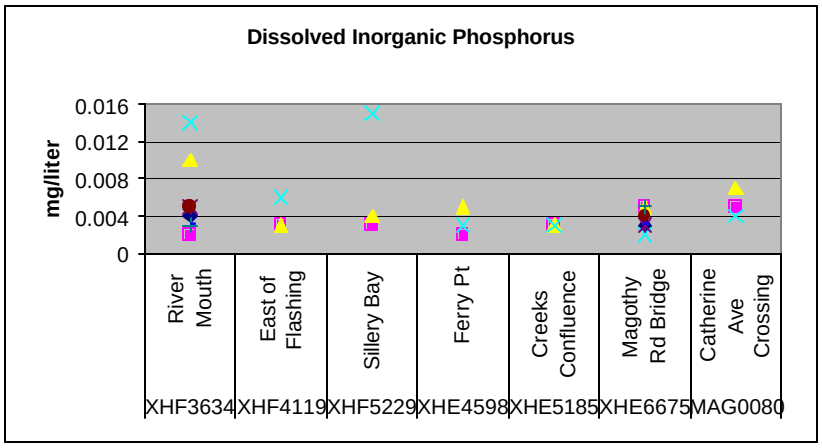
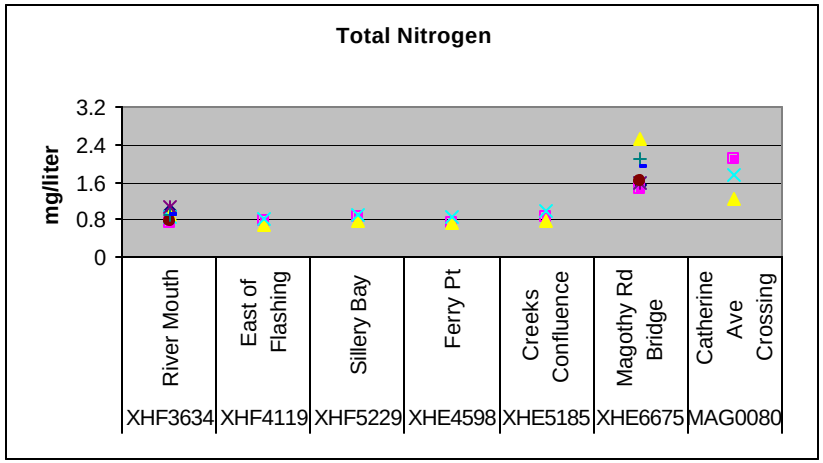
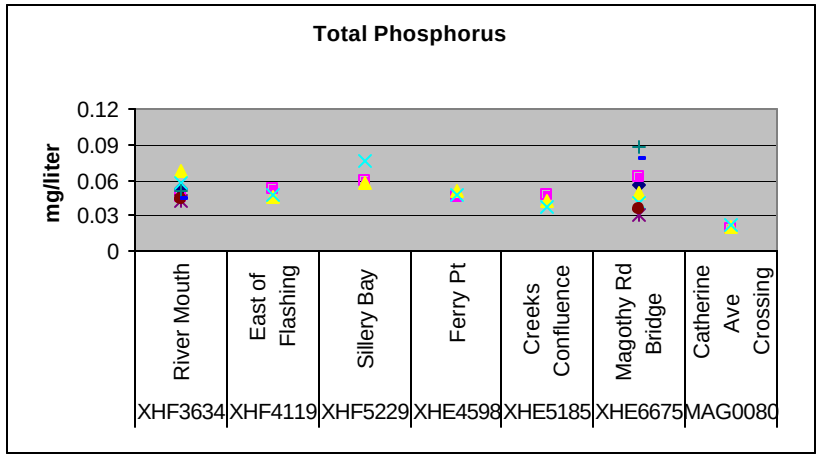
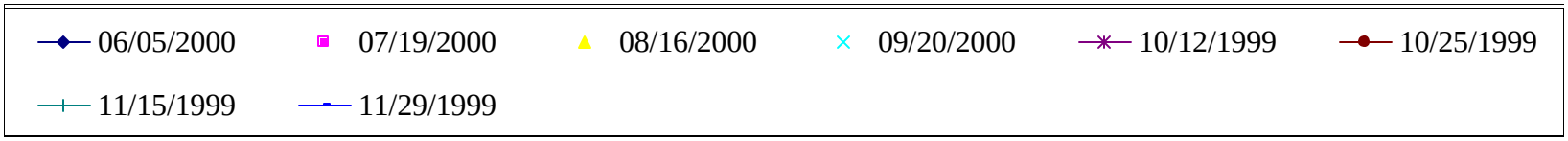






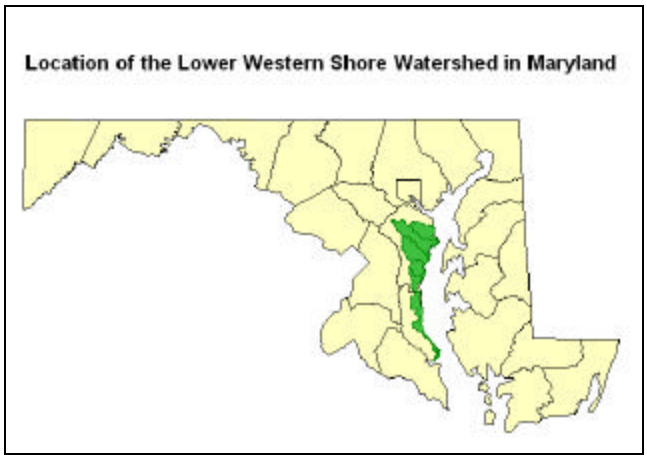


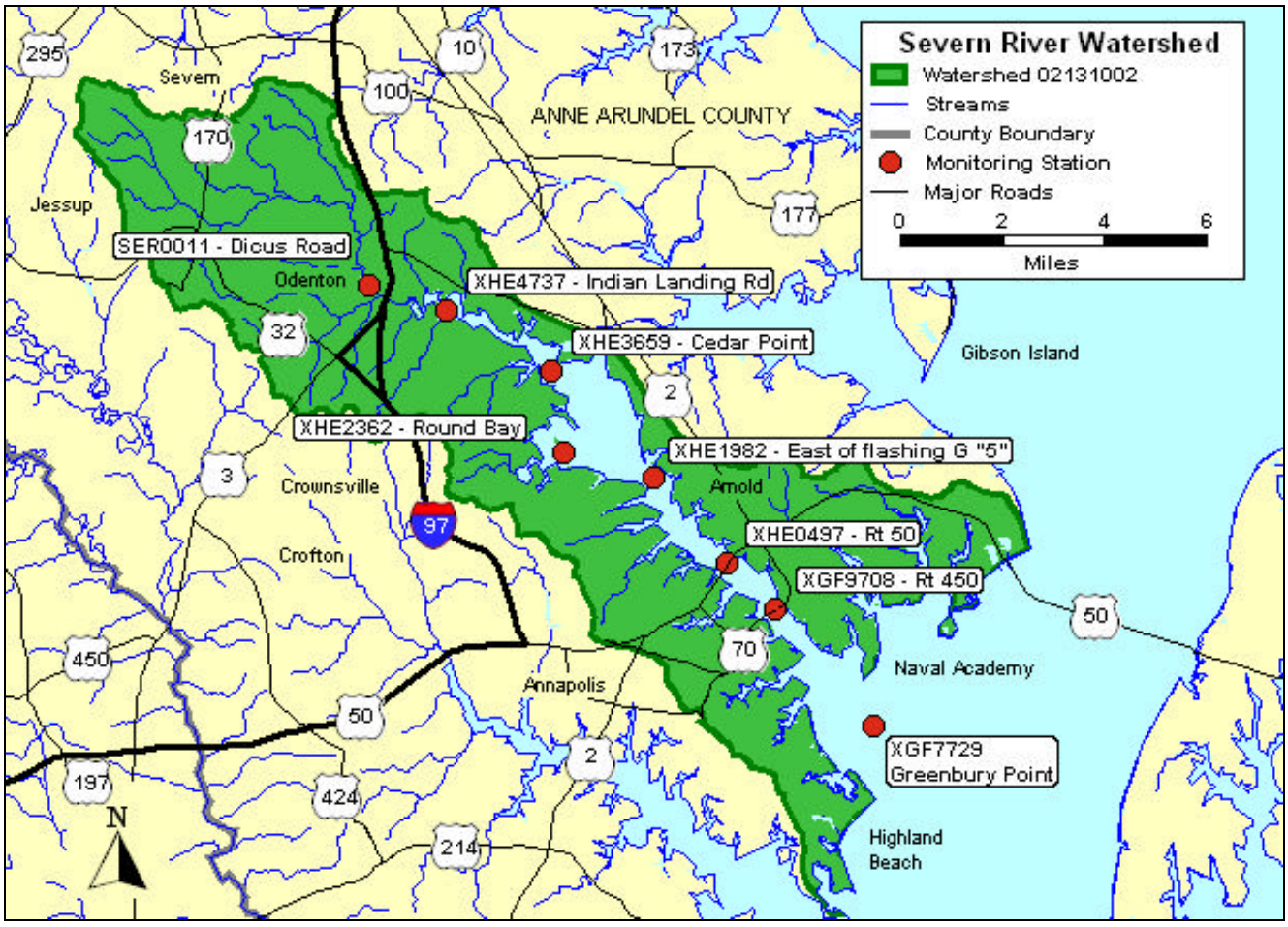


MAGOTHY RIVER STATION LIST

Station Code	Station Name	Lat/Long	Description
MAGOTHY RIVER			
XHF3634	River Mouth	39 03.586 76 26.611	Mid-channel, inside mouth. 15 ft.
XHF4119	East of Flashing	39 04.094 76 28.129	East of flashing G"9". 13 ft.
XHE4598	Ferry Pt.	39 04.501 76 30.189	Mid-channel between R"12" and G"11" between North Ferry Pt and South Ferry Pt.
XHE5185	Creeks Confluence	39 05.147 76 31.450	Confluence of Cattail Creek and Corkey Creek near DM "MR". 15 ft.
XHE6675	Magothy Road Bridge	39 06.606 76 32.506	Bridge crossing on Magothy Road.
MAG0080	Catherine Ave. Crossing	39 06.942 76 32.990	Catherine Avenue crossing.
SILLERY BAY			
XHF5229		39 05.202 76 27.061	Southeast of Hickory Pt. 12 Ft.

Severn River Monitoring Stations





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Severn River
High Flow Conditions (December-May)
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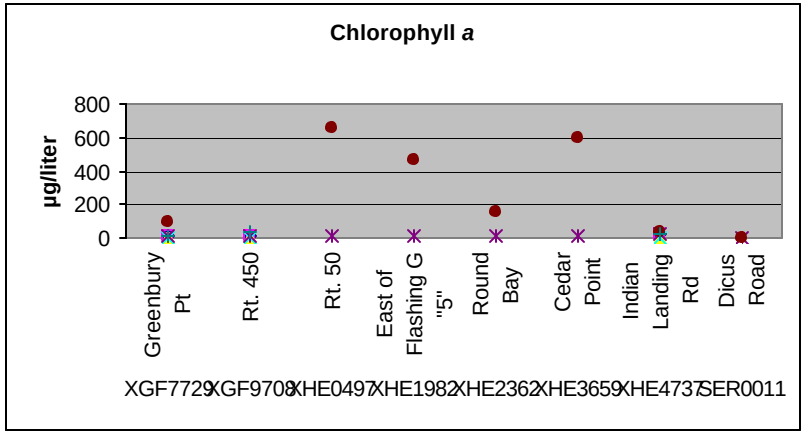

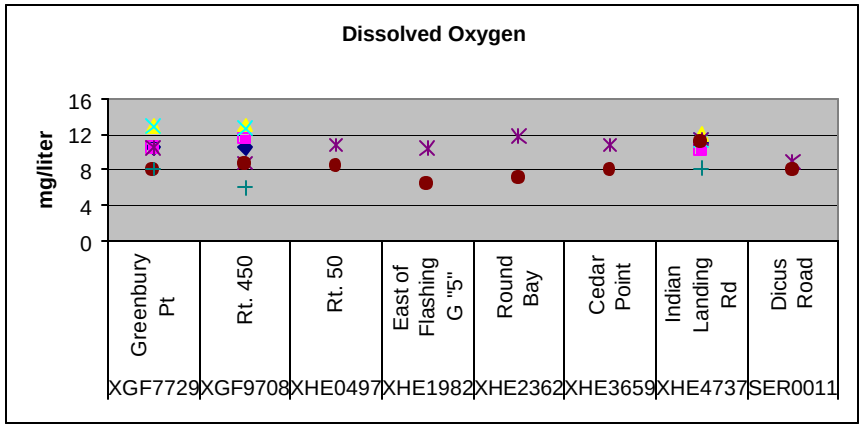

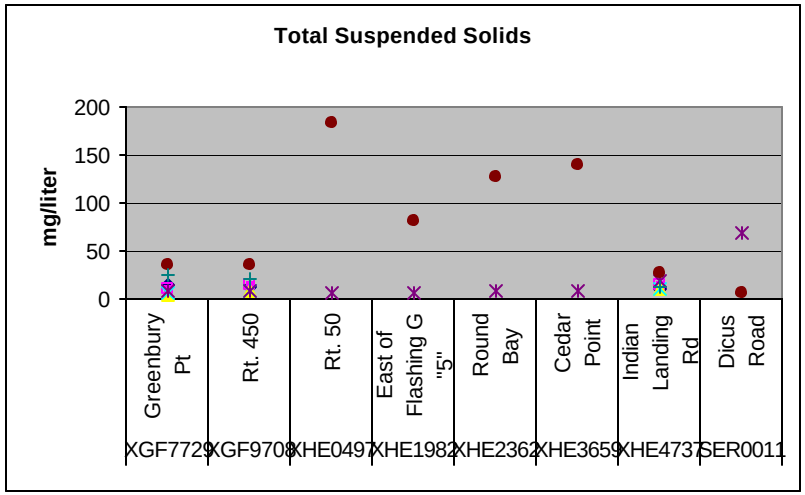

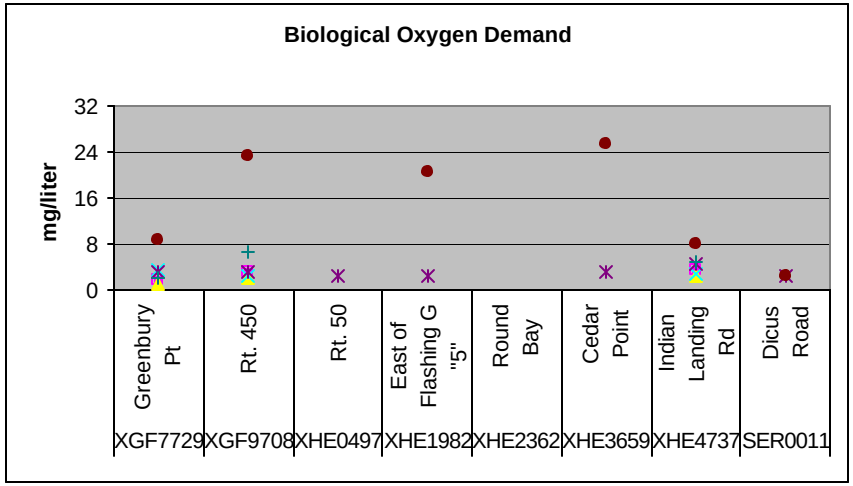

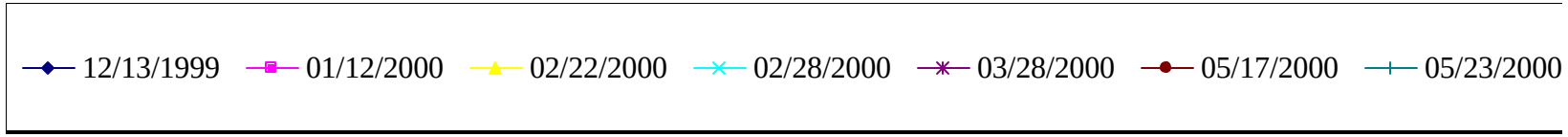

Severn River
High Flow Conditions (December-May)
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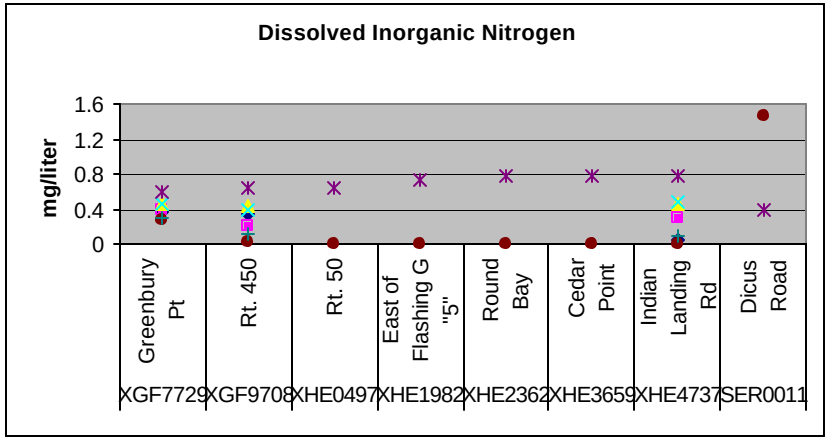

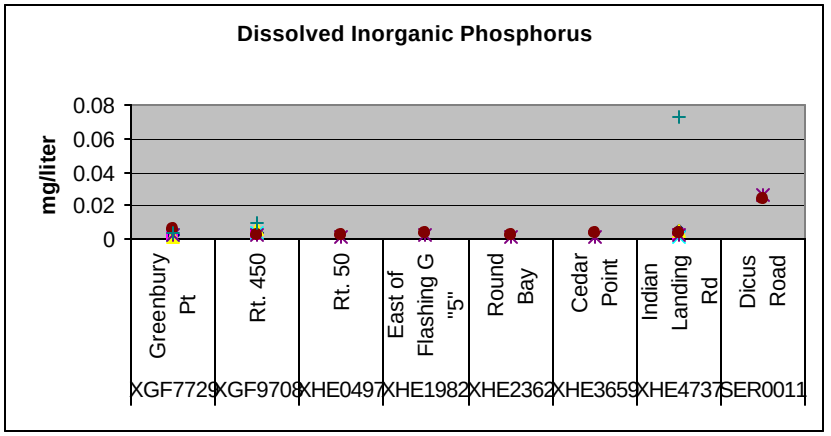

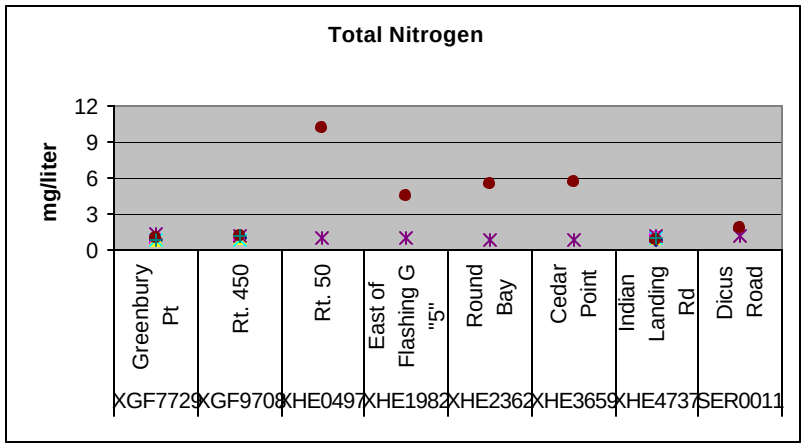

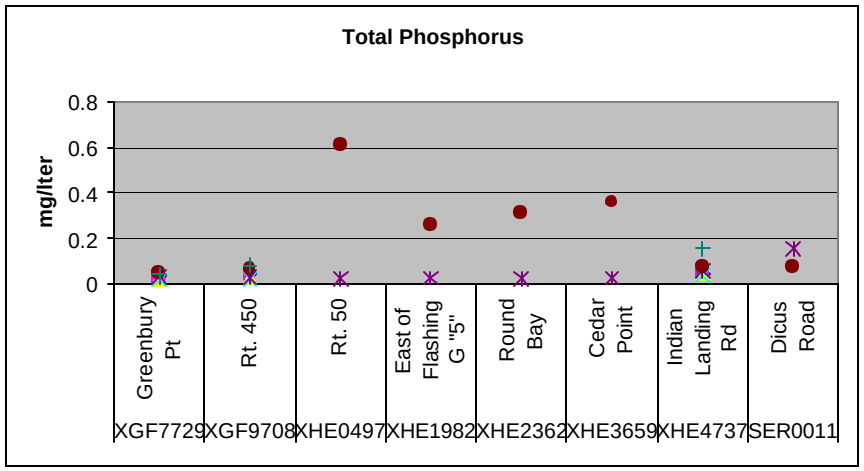

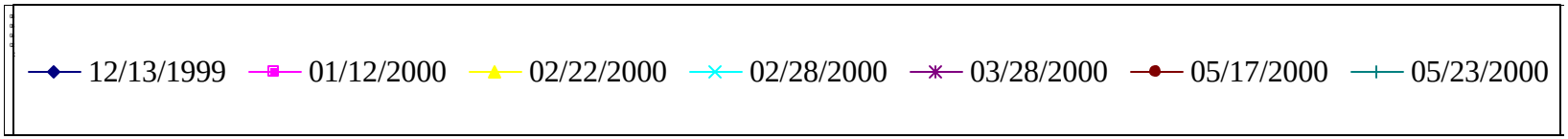

Severn River
Low Flow Conditions (June to November)
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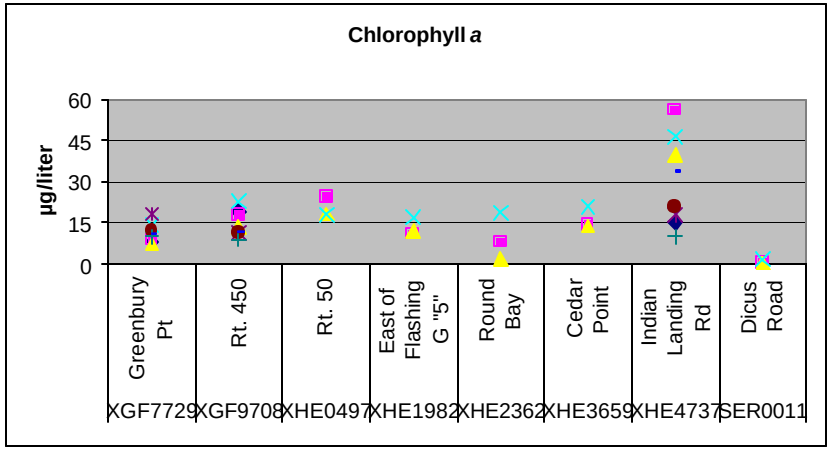

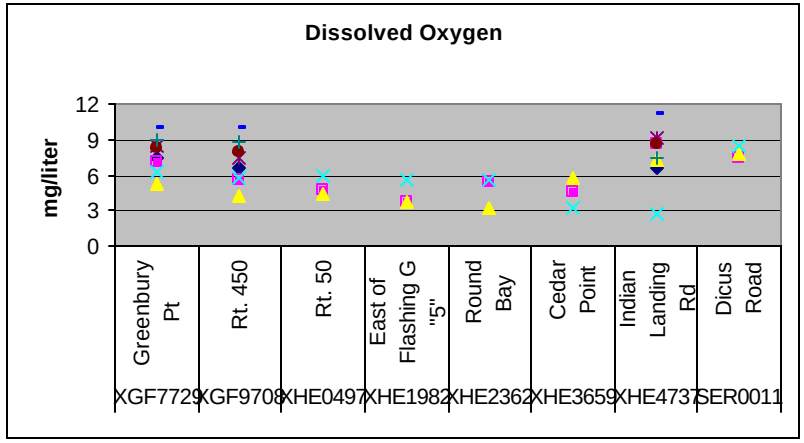

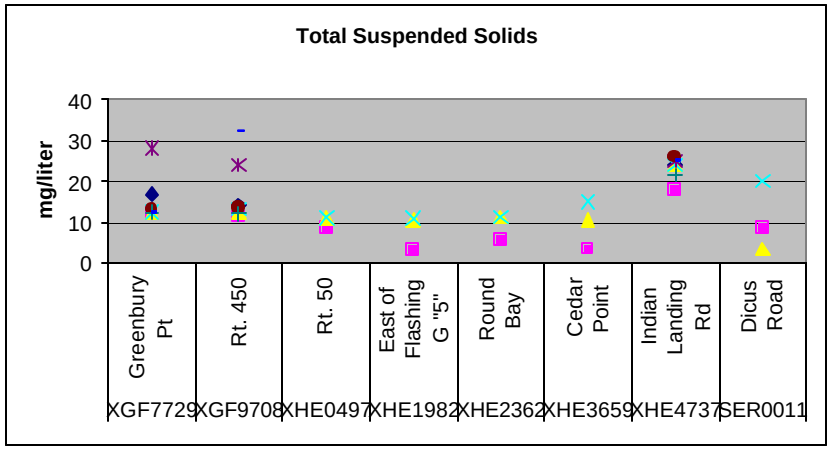

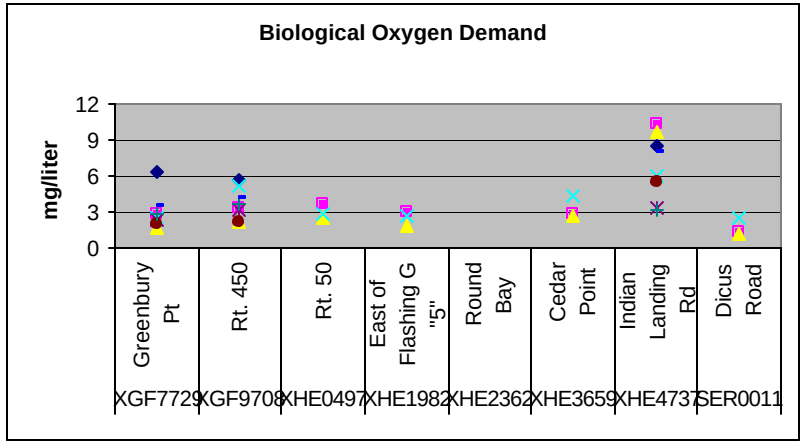

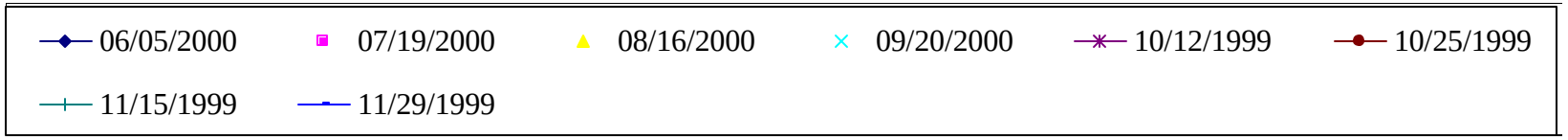

Severn River
Low Flow Conditions (June to November)
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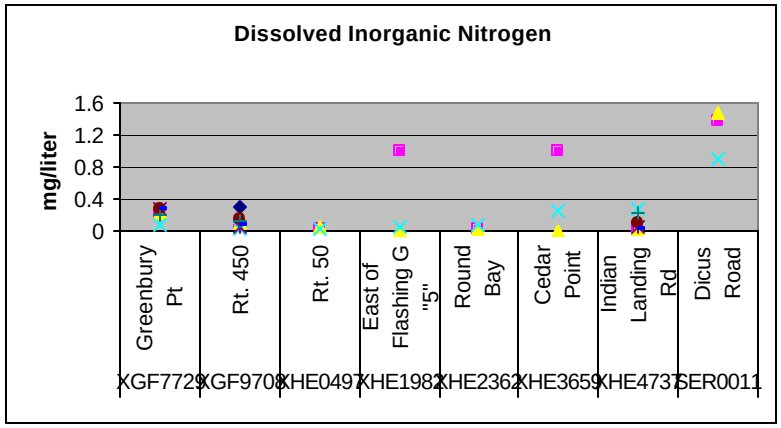
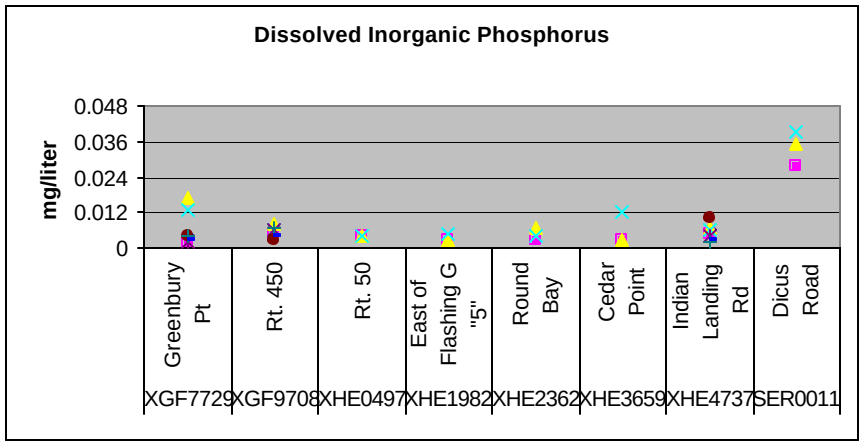
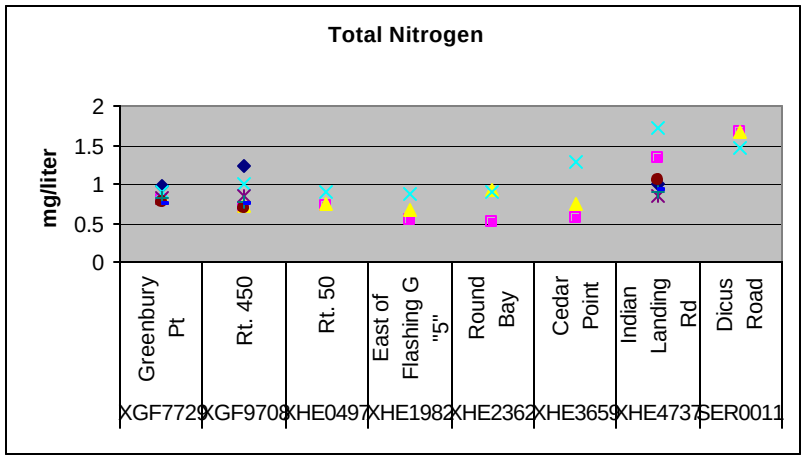
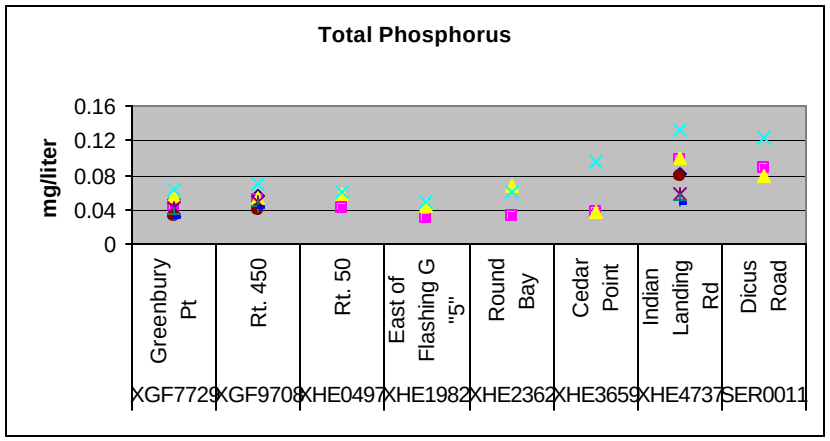
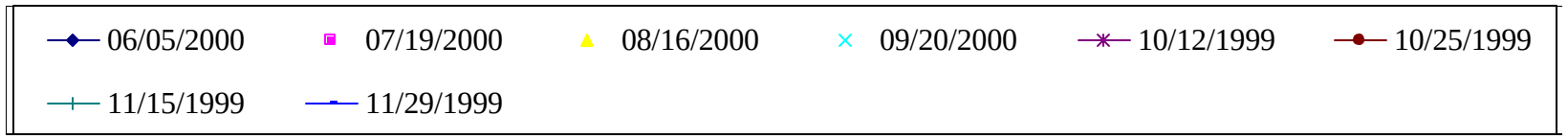






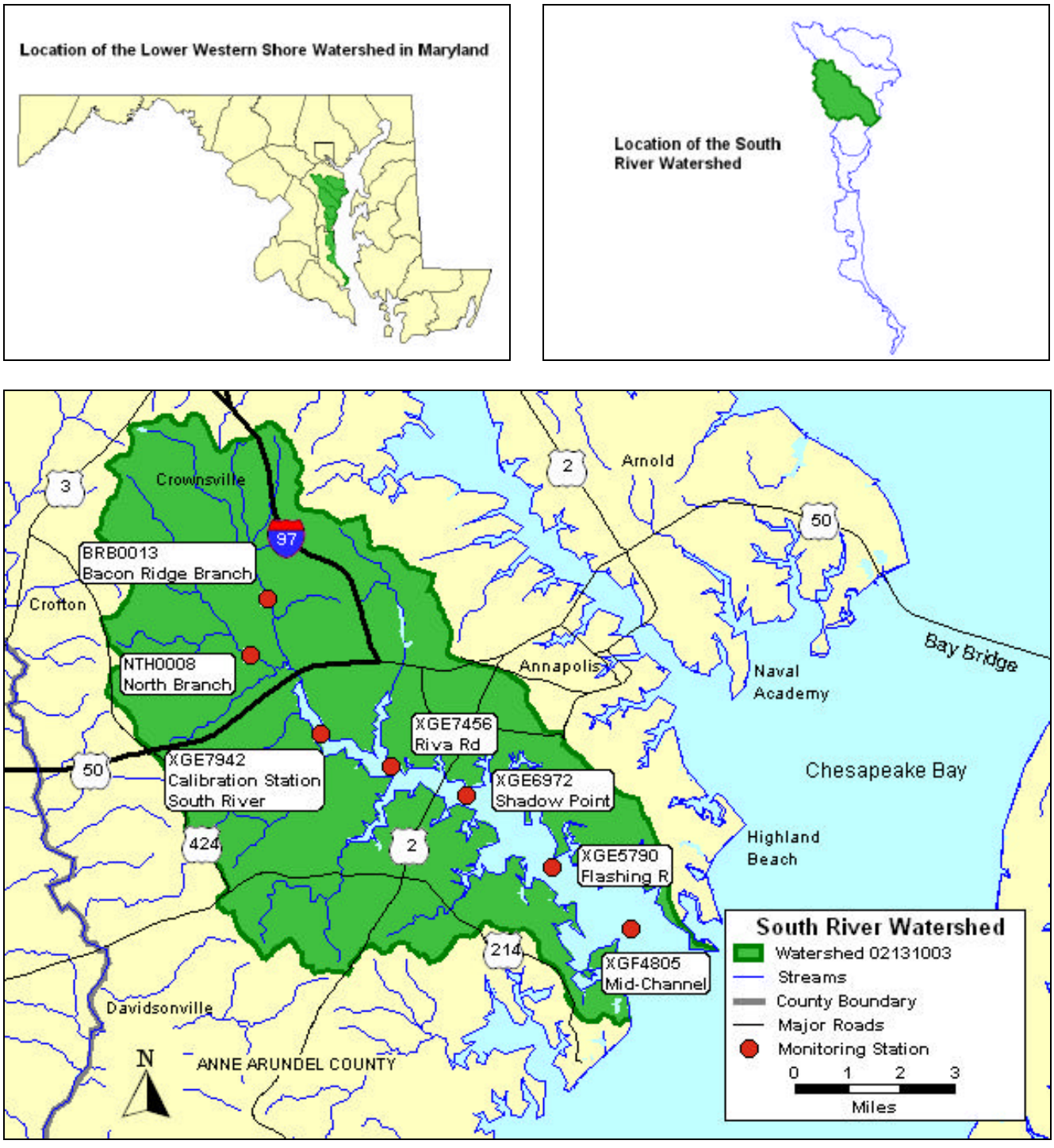




SEVERN RIVER STATION LIST

Station Code	Station Names	Lat/Long	Description
SEVERN RIVER			
XGF7729	Greenbury Pt.	38 57.684 76 27.077	1500 yds south of Greenbury Pt. Depth ~ 20 ft.
XGF9708	Rte 450	38 59.653 76 29.185	Near old Rte 450 bridge.
XHE0497	Rt. 50	39 00.417 76 30.265	Just northwest of Rt. 50 bridge off A-frame house. 35 Ft.
XHE1982	East of flashing G "5".	39 01.854 76 31.835	East of flashing G "5". 35 FT.
XHE3659	Cedar point	39 03.649 76 34.050	Southwest of Cedar point and southwest of flashing R "12". 20 FT.
XHE4737	Indian Landing Rd	39 04.667 76 36.309	Arlington Echo Education Center. At end of Indian Landing Rd, veer right. Park in lot and walk down road and hill to get dock sample. Long walk.
SER0011	Dicus Road	39 05.109 76 37.993	Dicus Road crossing. Take flow upstream.
ROUND BAY			
XHE2362		39 02.292 76 33.778	Southeast end of St. Helena island and east of R "2". 20 FT.

South River Monitoring Stations



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South River
High Flow Conditions (December-May)
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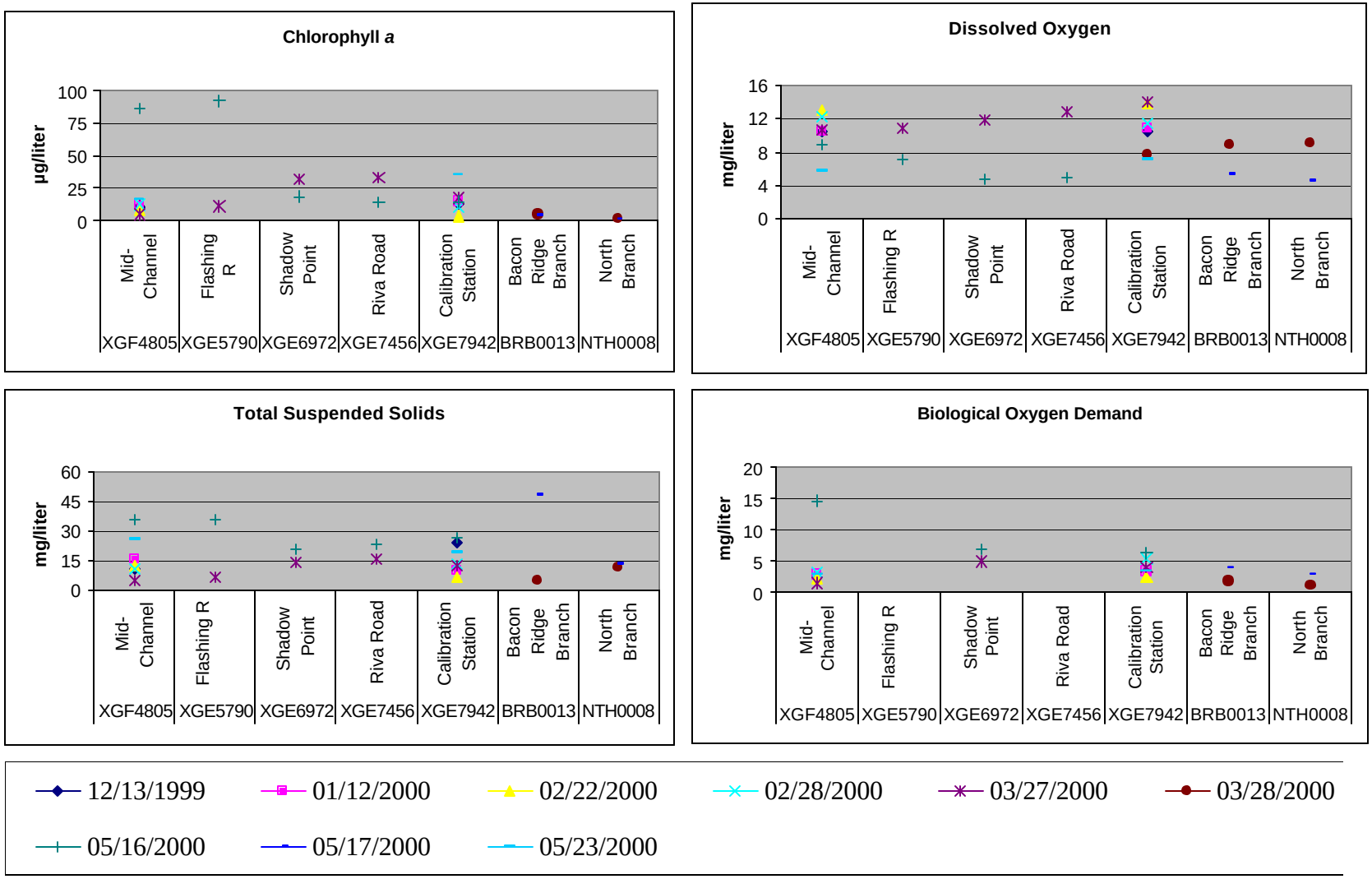

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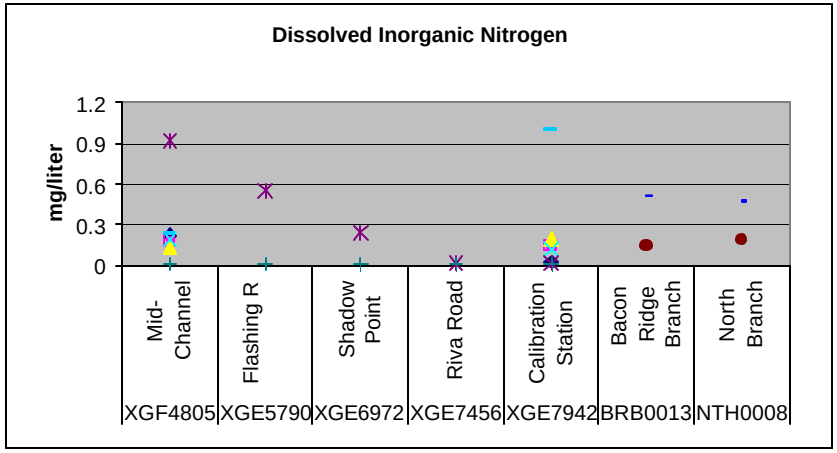

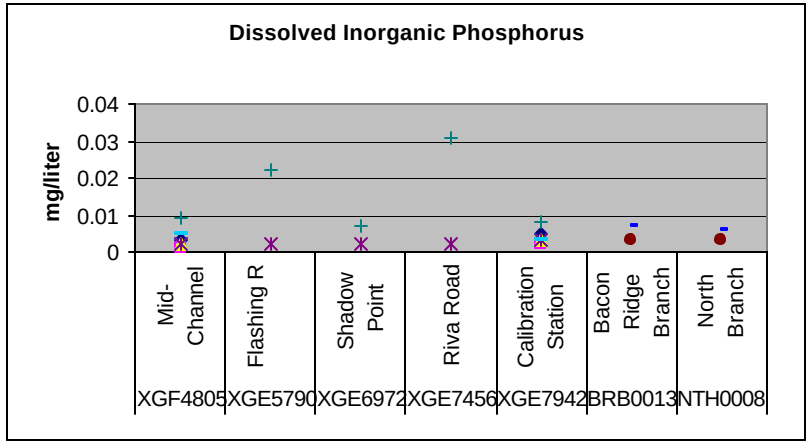

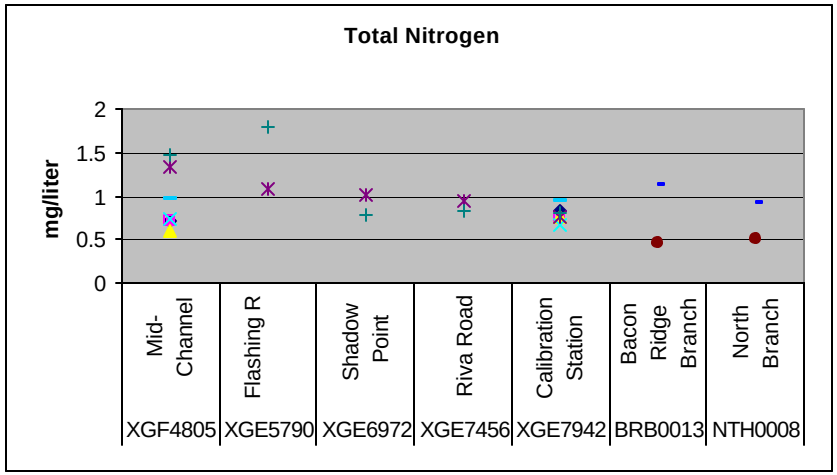

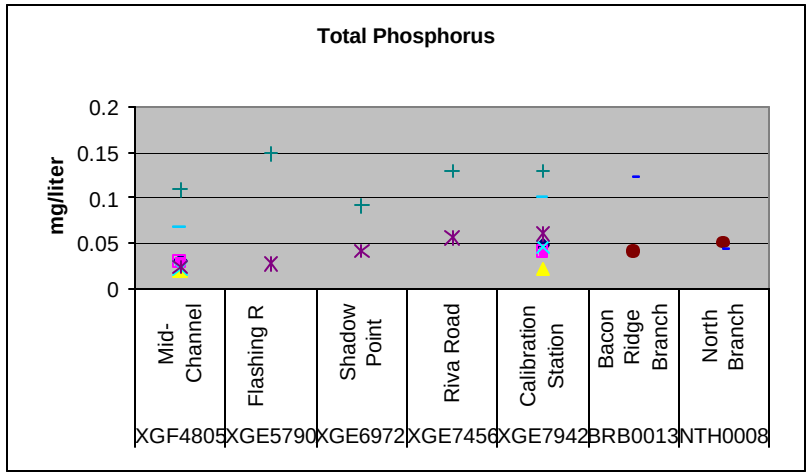

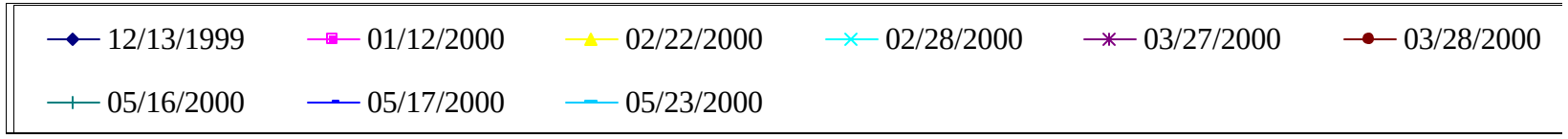

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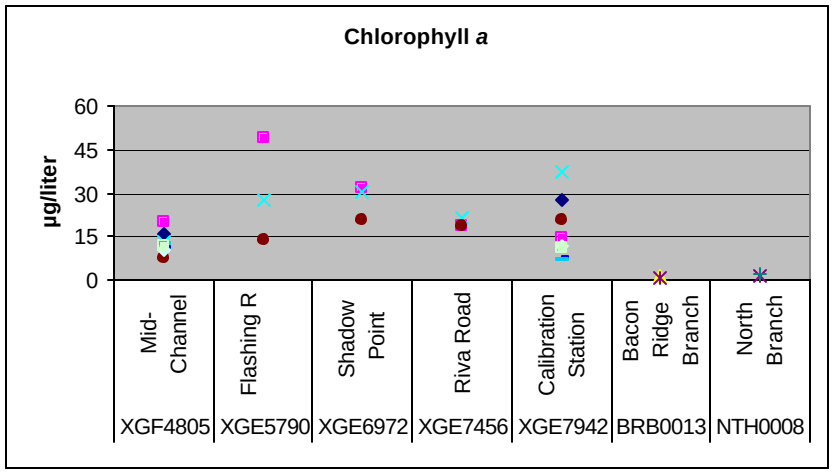

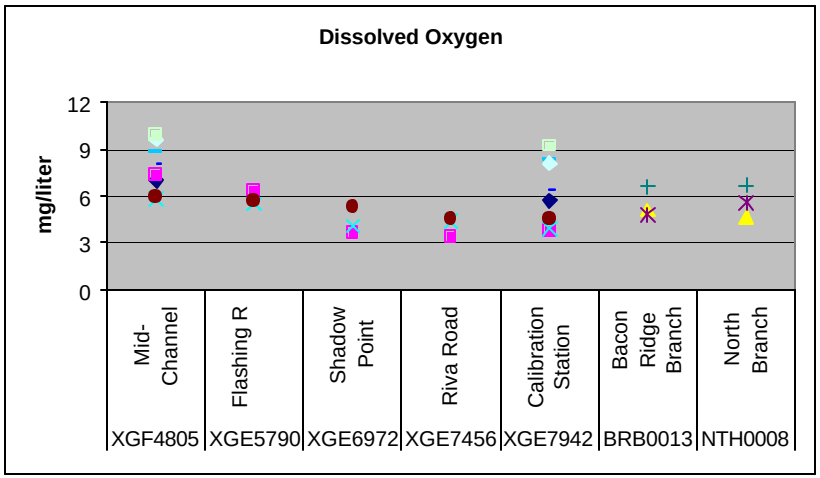

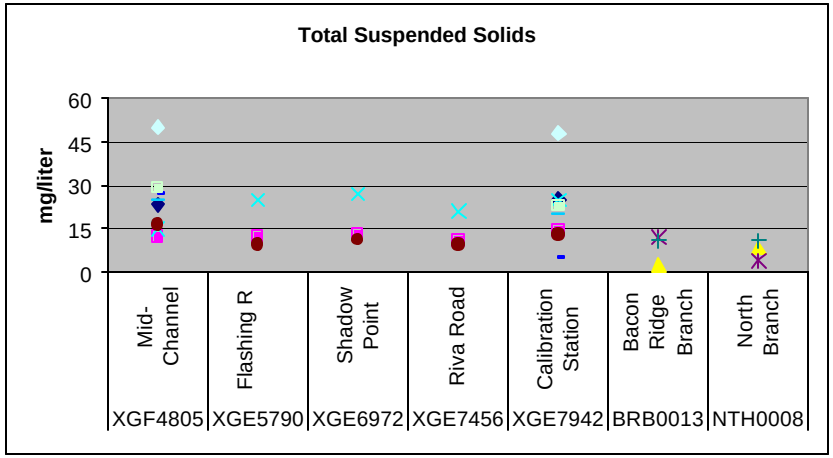

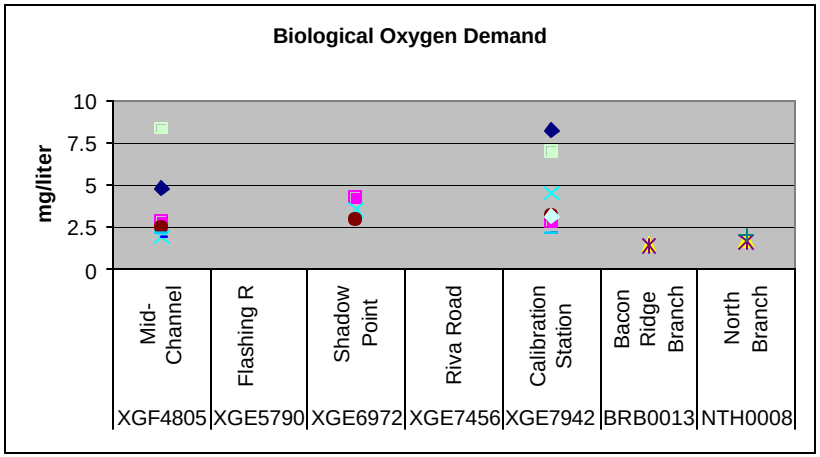

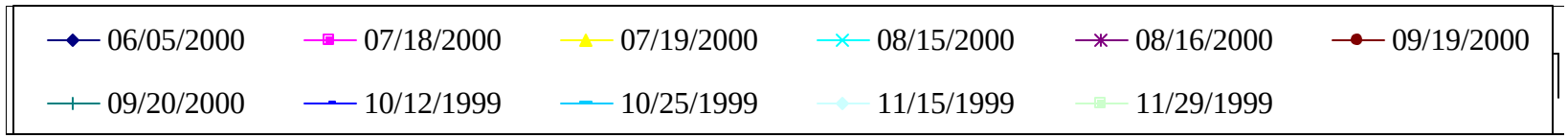

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Low Flow Conditions (June to November)
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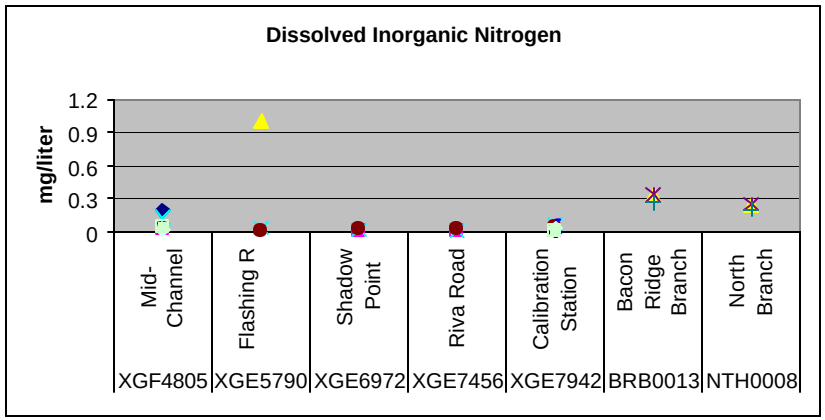
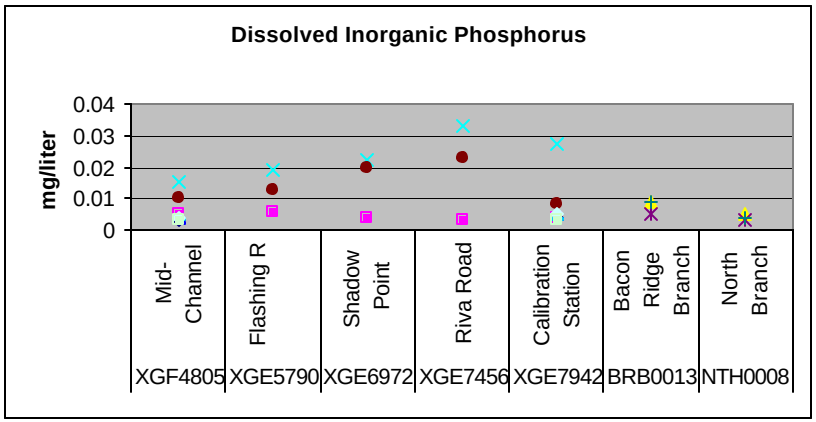
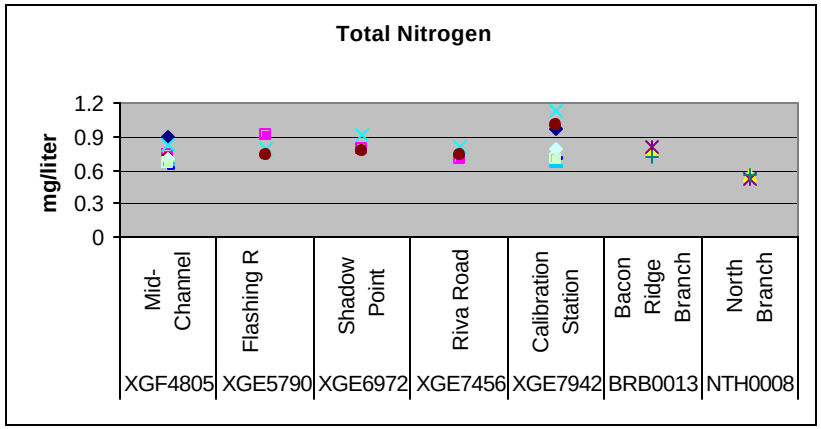
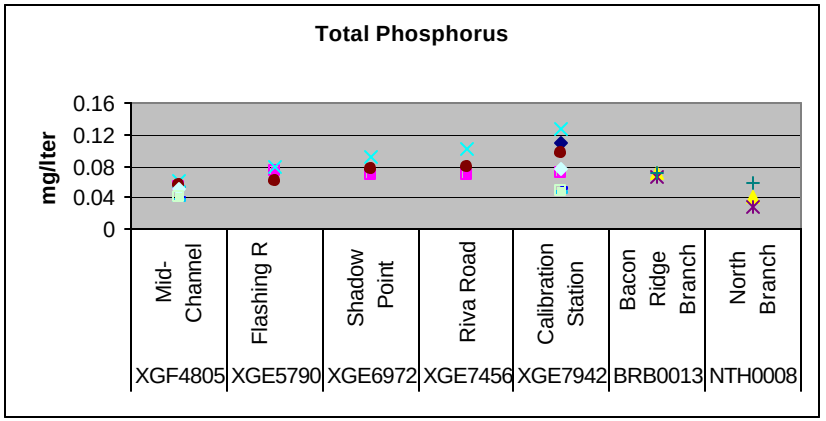
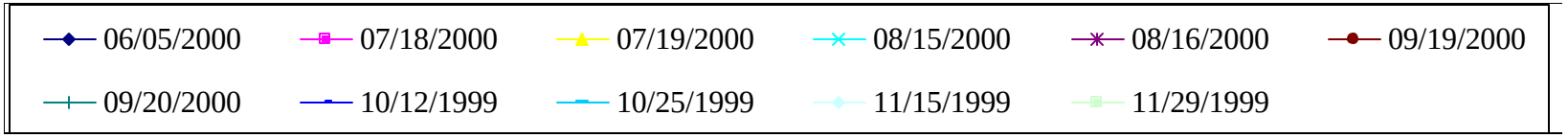






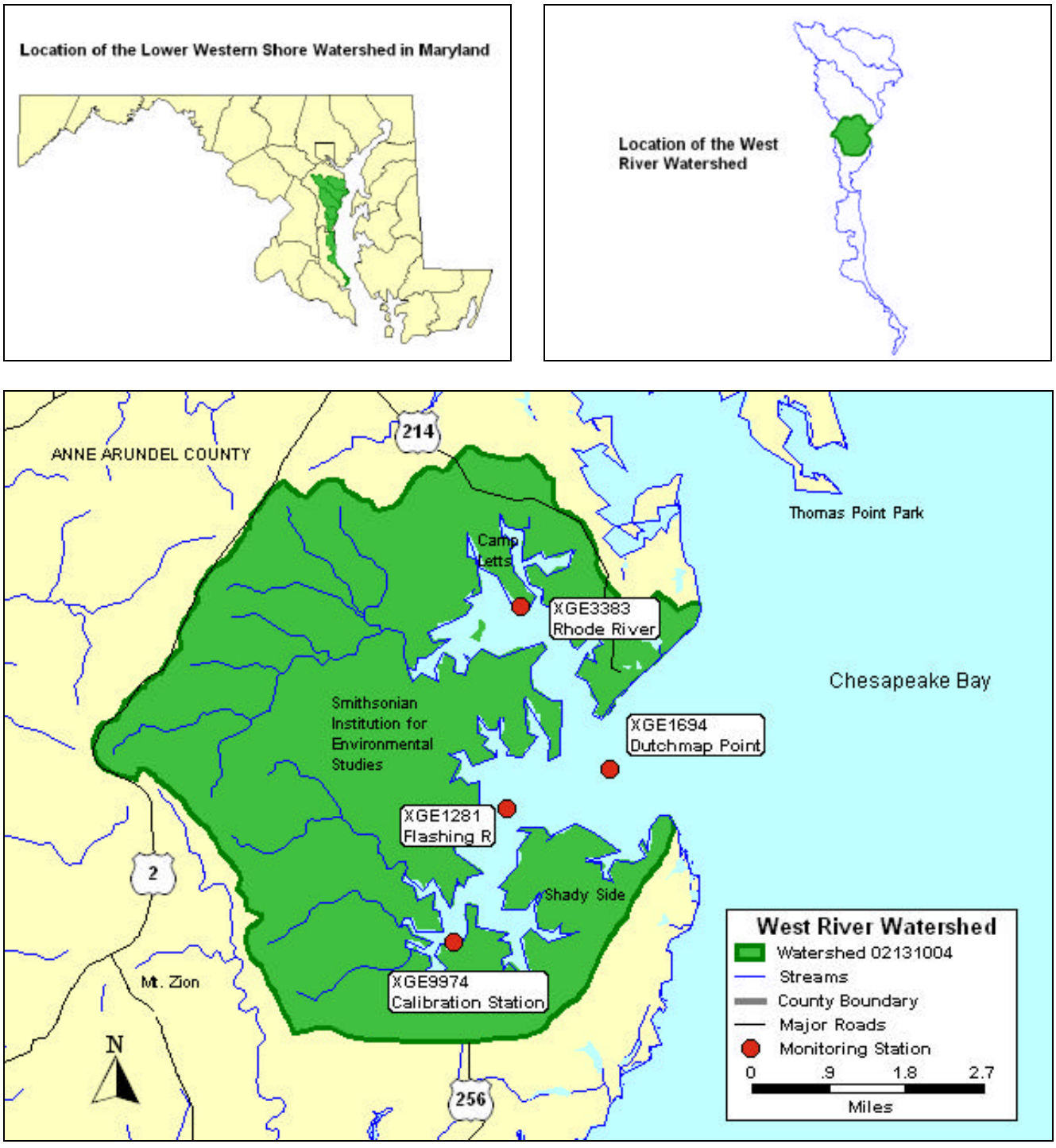




SOUTH RIVER STATION LIST

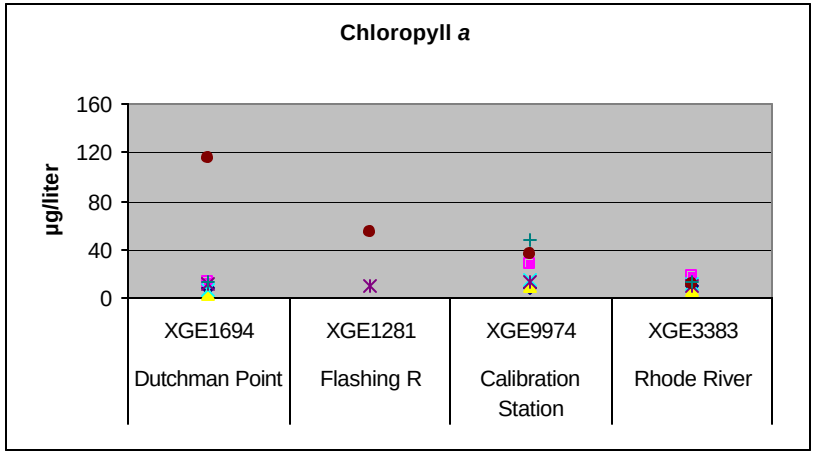
Station Code	Station Names	Lat/Long	Description
SOUTH RIVER			
XGF4805 PS-16, 17	Mid-channel	38 54.783 76 29.412	Mid-channel between DM 5 & 6. Depth ~ 25 ft.
XGE5790 PS-18	Flashing R	38 55.756 76 31.027	South of Flashing R "10". 10 FT.
XGE6972 PS-19	Shadow Point	38 56.931 76 32.781	South of Shadow Point near R "16". 20 FT.
XGE7456 PS-20	Riva Rd	38 57.399 76 34.367	East of Riva Rd. bridge. 14 FT.
XGE7942 PS-21	Calibration Station	38 57.904 76 35.794	This calibration land station is collected by boat for high/low surveys. Use coords 38 57.896, 76 35.788 for GPS. 7 ft.
BACON RIDGE BRANCH			
BRB0013 SM-16	Bacon Ridge Branch	39 00.081 76 36.898	Chesterfield Road crossing. Parking near old sludge mixing pumping station. Can take flow downstream
NORTH BRANCH			
NTH0008 SM-15	North Branch	38 59.167 76 37.269	100 yds down from Rutland Road, going eastbound on Rt 450. Pull off on right.

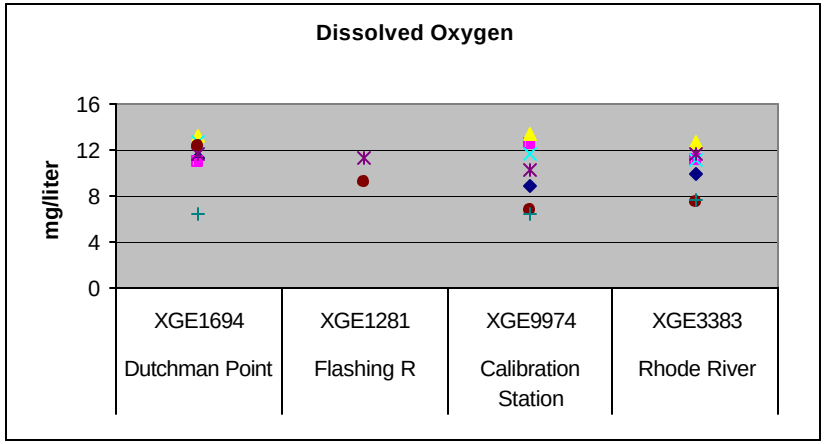
West River Monitoring Stations

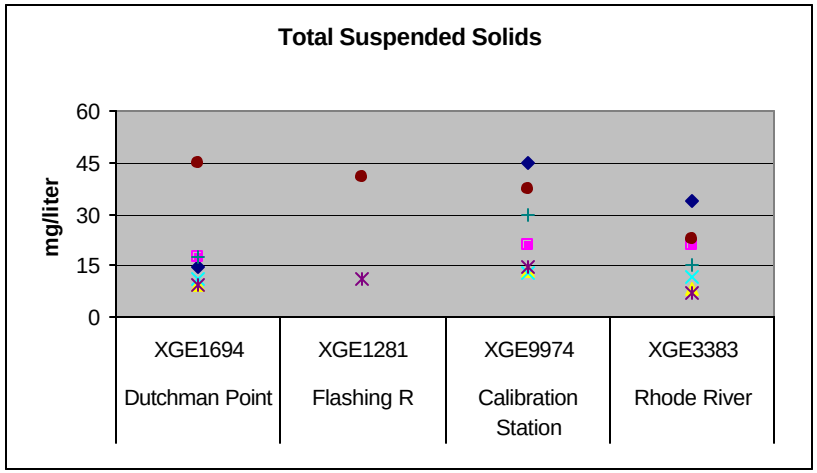


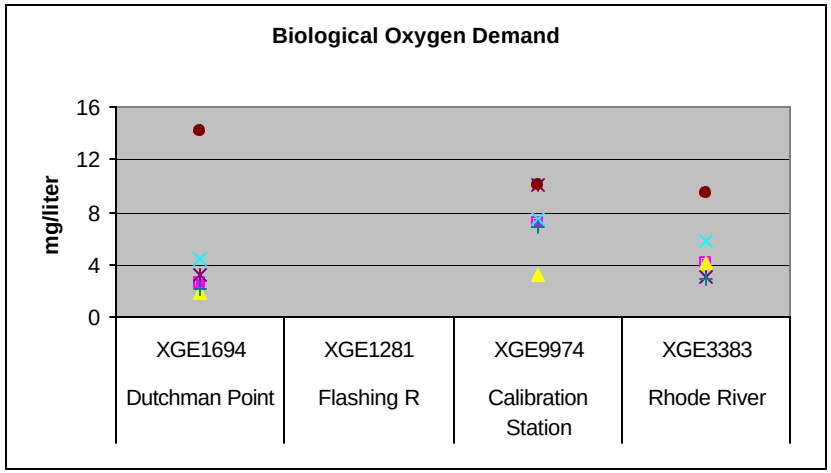
Map Prepared by the Maryland Department of the Environment
Science Services Administration
Montgomery Park Business Center
1800 Washington Boulevard, Suite 540
Baltimore, Maryland 21230-1718

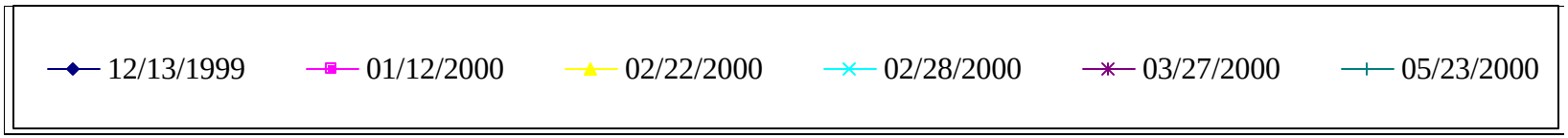
West River
High Flow Conditions (December-May)
Stations are presented from left to right from downstream to upstream



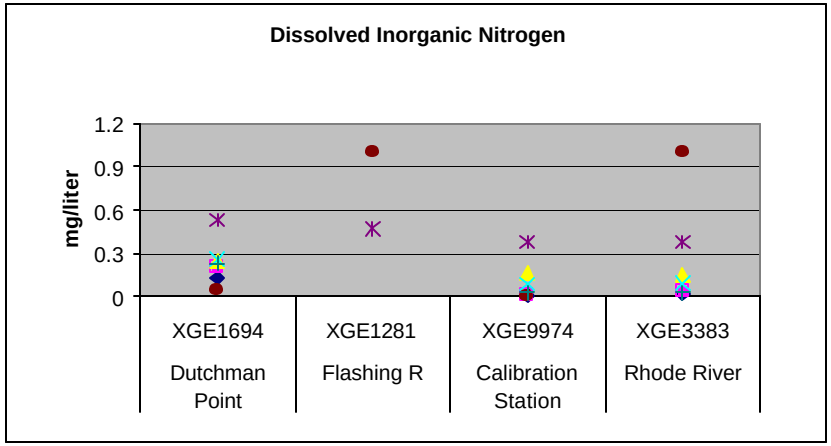


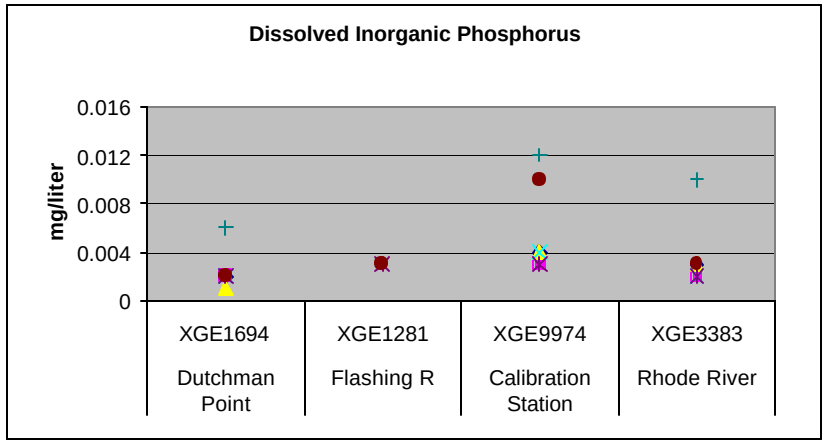


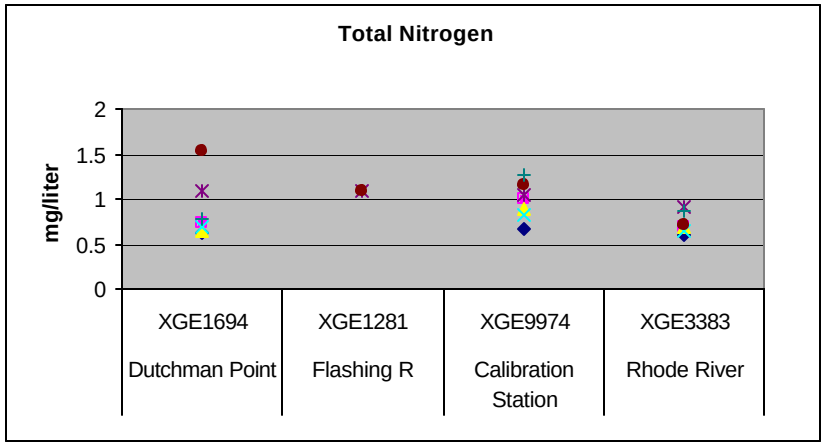


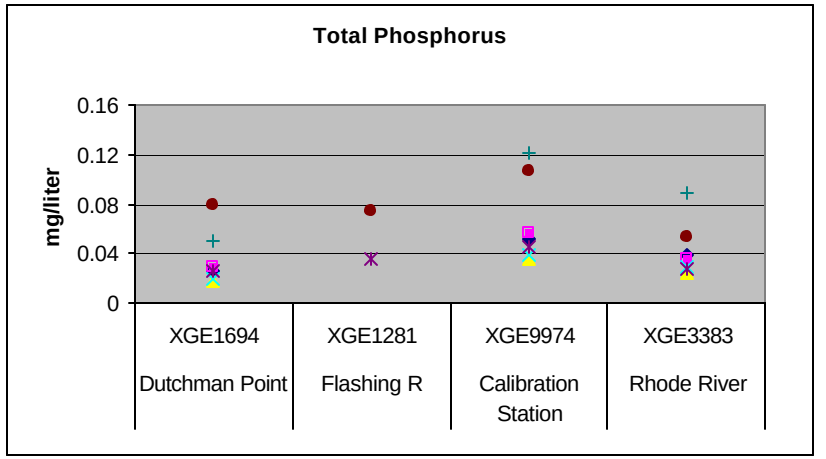


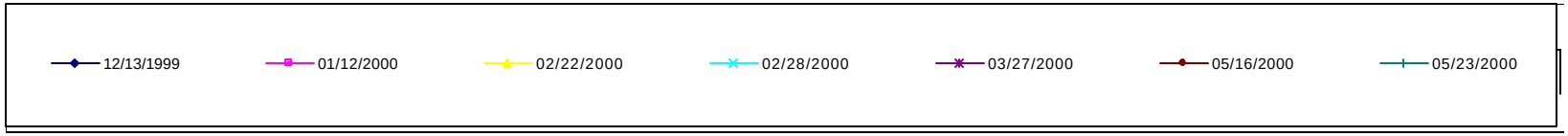
West River
High Flow Conditions (December-May)
Stations are presented from left to right from downstream to upstream



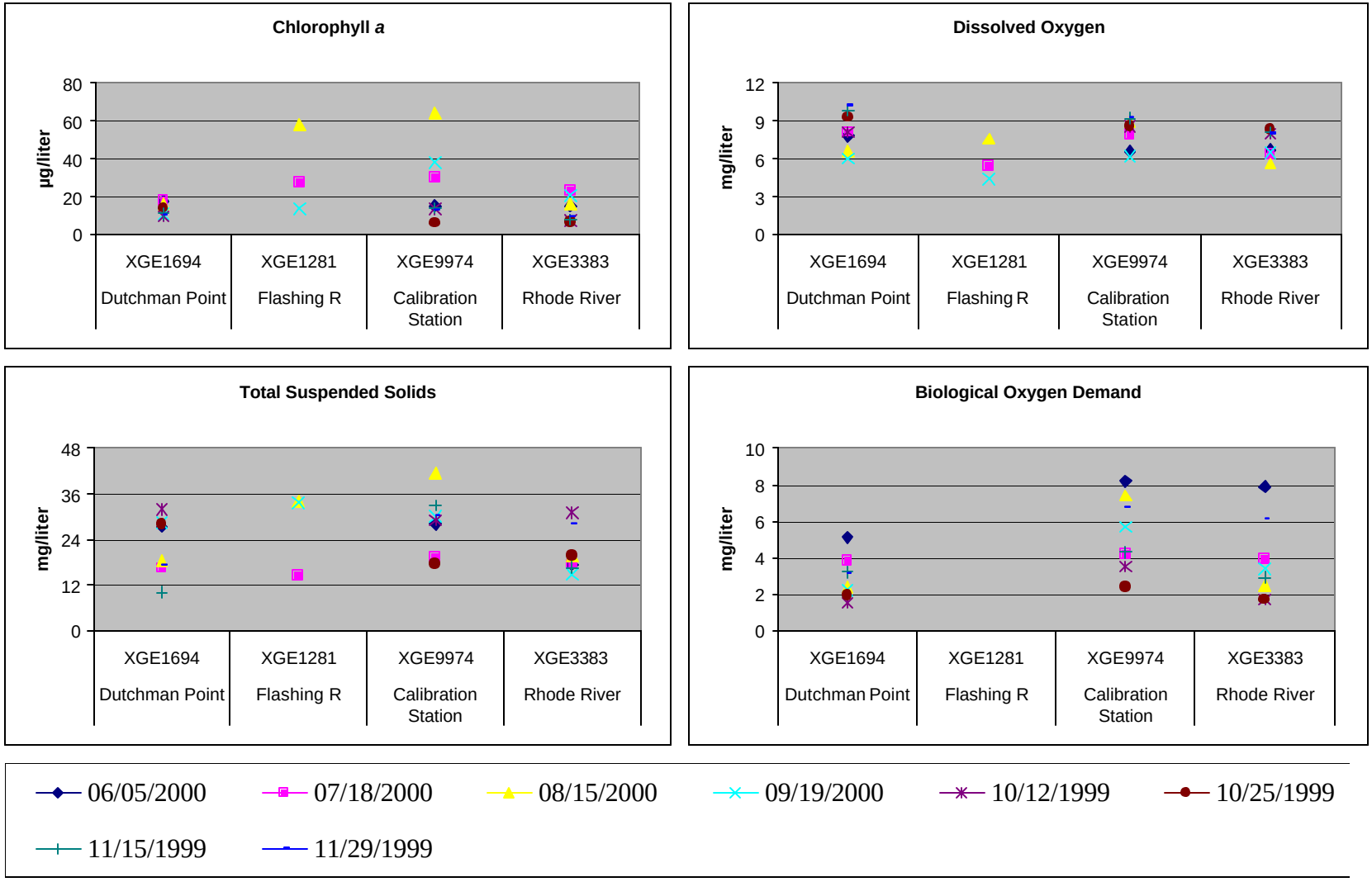




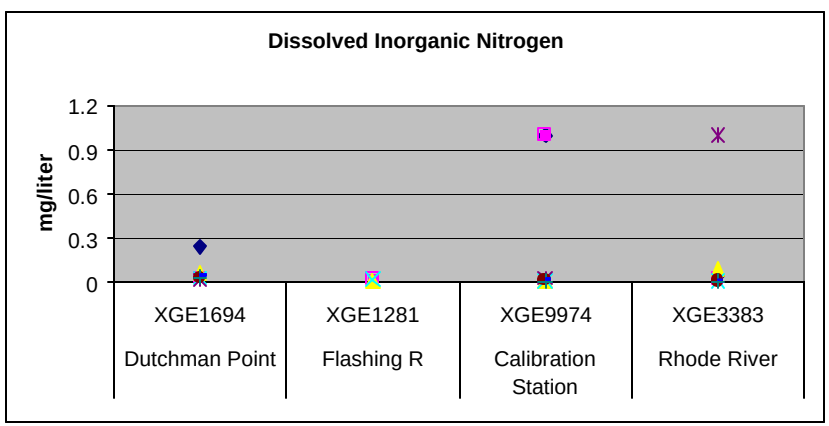


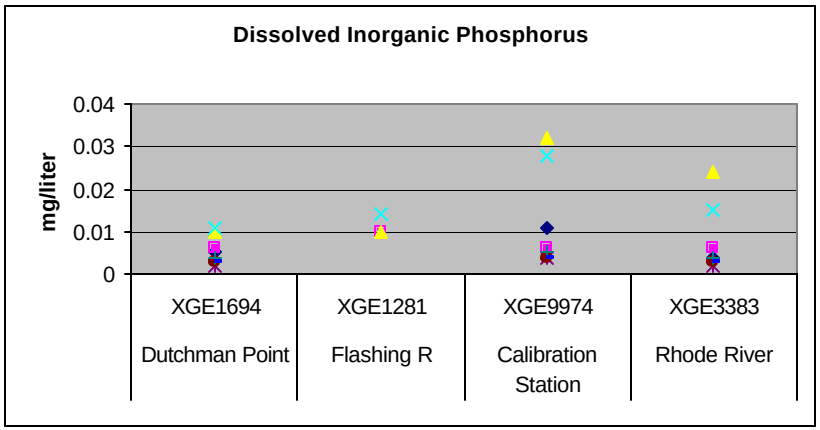


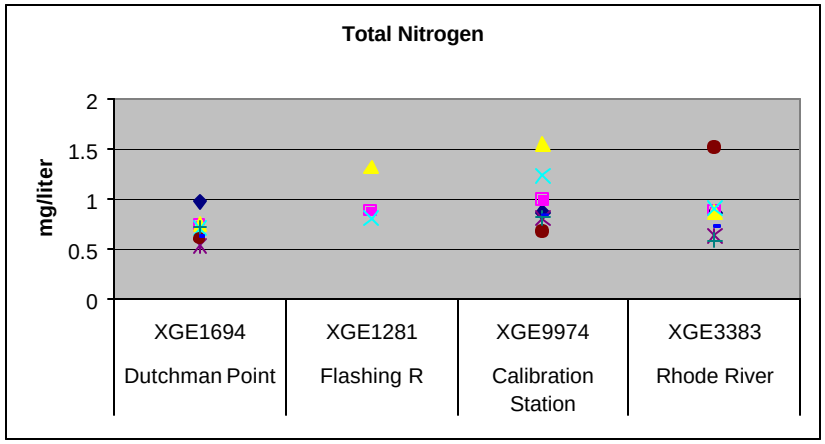
West River
Low Flow Conditions (June to November)
Stations are presented from left to right from downstream to upstream

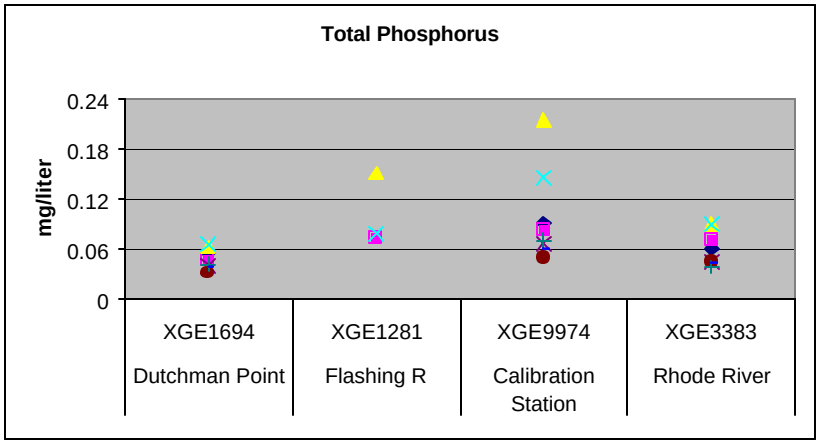


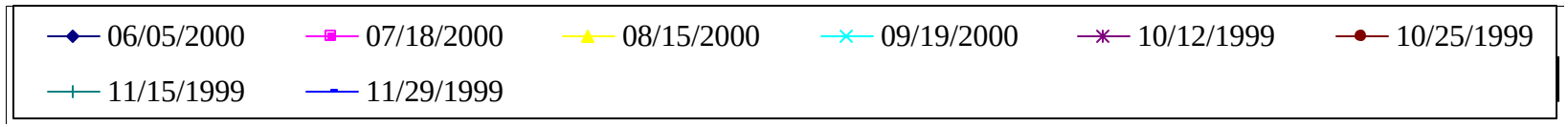
West River
Low Flow Conditions (June to November)
Stations are presented from left to right from downstream to upstream











WEST RIVER STATION LIST

Station Code	Station names	Lat/Long	Description
WEST RIVER			
XGE1694	Dutchman Point	38 51.640 76 30.552	Mid-river, south of Dutchman Point. Depth ~13 ft.
XGE1281	flashing R	38 51.248 76 31.889	Southeast of flashing R "4". 11 FT.
XGE9974	Calibration Station	38 49.905 76 32.564	This calibration land station is collected by boat for high/low surveys. Use coords 38 50.063, 76 32.583 for GPS. 6 ft.
RHODE RIVER			
XGE3383 PS-23	Rhode River	38 53.273 76 31.721	This calibration land station is collected by boat for high/low surveys. Use coords 38 53.193, 76 31.784 for GPS. 10 ft. Near Camp Lett's Dock.

Patuxent River Watershed

Patuxent River Middle

Western Branch

Patuxent River Upper

Little Patuxent River

Middle Patuxent

Rocky Gorge Dam

Brighton Dam

PATUXENT RIVER SUB-BASIN
(Sub-basin 02-13-11)

General Description (from 1998, 305 (b) Report)
The Patuxent River sub-basin drains about 900 square miles of St. Mary's, Calvert, Charles, Anne Arundel, Prince George's, Howard, and Montgomery Counties and a very small portion of Frederick County.

The upper 25 percent of the sub-basin lies within the Piedmont Province, while the lower 75 percent lies within the Coastal Plain Province. Large water bodies include Western Branch, Little Patuxent River, Laurel Lake, Centennial Lake, Lake Elkhorn, Lake Kittamaqundi, Wilde Lake, and two large water supply reservoirs on the mainstem river above Laurel (T. Howard Duckett and Triadelphia Reservoirs) that supply water for Prince George's and Montgomery Counties in the Washington metropolitan area.

Although the sub-basin is situated between the Washington and Baltimore metropolitan areas, much of the sub-basin remains forested (46 percent). Almost 30 percent of the land is agricultural and 24 percent is developed. The middle portion of the segment bordered by I-95 and Route 214 is the most heavily developed area in the sub-basin and includes the cities of Laurel and Bowie, the communities of Jessup and Savage and much of Fort Meade, a US Army installation. Other communities include the Town of Columbia in the upper Little Patuxent River and Upper Marlboro on the Western Branch. A number of communities dot the lower, tidal portion of the Patuxent River including Broomes and Solomons Islands.

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

The Patuxent River is designated as one of the State's Scenic Rivers. This designation is designed to preserve and protect the natural values of the river. The Patuxent River restoration effort has become a symbol of pride and success to much more than the State. US Senator Barbara Mikulski (MD) won designation of the Patuxent River as a National Estuarine Demonstration Project, ensuring additional support for new research opportunities in watershed restoration.

Jug Bay is designated as a component of the Chesapeake Bay National Estuarine Research Reserve in Maryland. A total of 241 acres of open water and 481 acres of adjoining wetlands and uplands (including Jug Bay Wetlands Sanctuary in Anne Arundel County and a portion of Patuxent River Park in Prince George's County) are protected for long-term estuarine research and monitoring and for estuarine education.

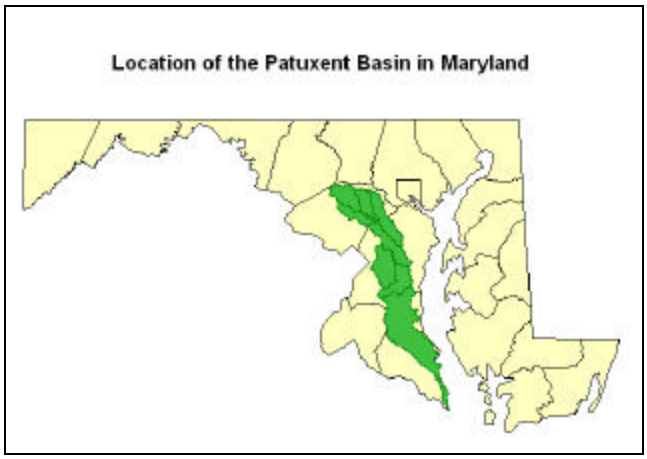
The State routinely monitors water quality at three CORE/Trend stations in the upper watershed, at 11 stations throughout the mainstem estuary, and at two stations on Western Branch as part of the State's Patuxent Estuary Monitoring Program and the Bay Tributary Monitoring Program. In addition to chemical sampling, phytoplankton and microzooplankton (three stations) and mesozooplankton (three stations) communities are monitored. Samples for nutrient bioassays are taken at two stations. Four fixed Long Term Benthic Macroinvertebrate program stations are monitored for estuarine benthos in addition to 25 Long Term Benthic Macroinvertebrate program sites selected randomly each year. The Maryland Biological Stream Survey (MBSS) collected water quality samples at 41 stations in 1994 and

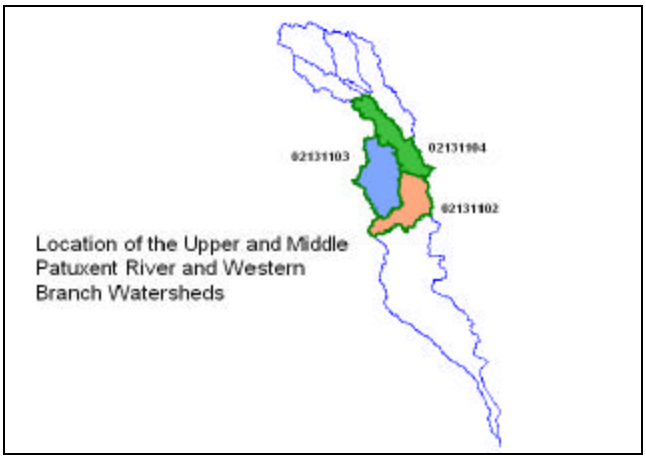
at 80 stations in 1997. Additional water quality data in the lower estuary is available through MDE's shellfish monitoring program.

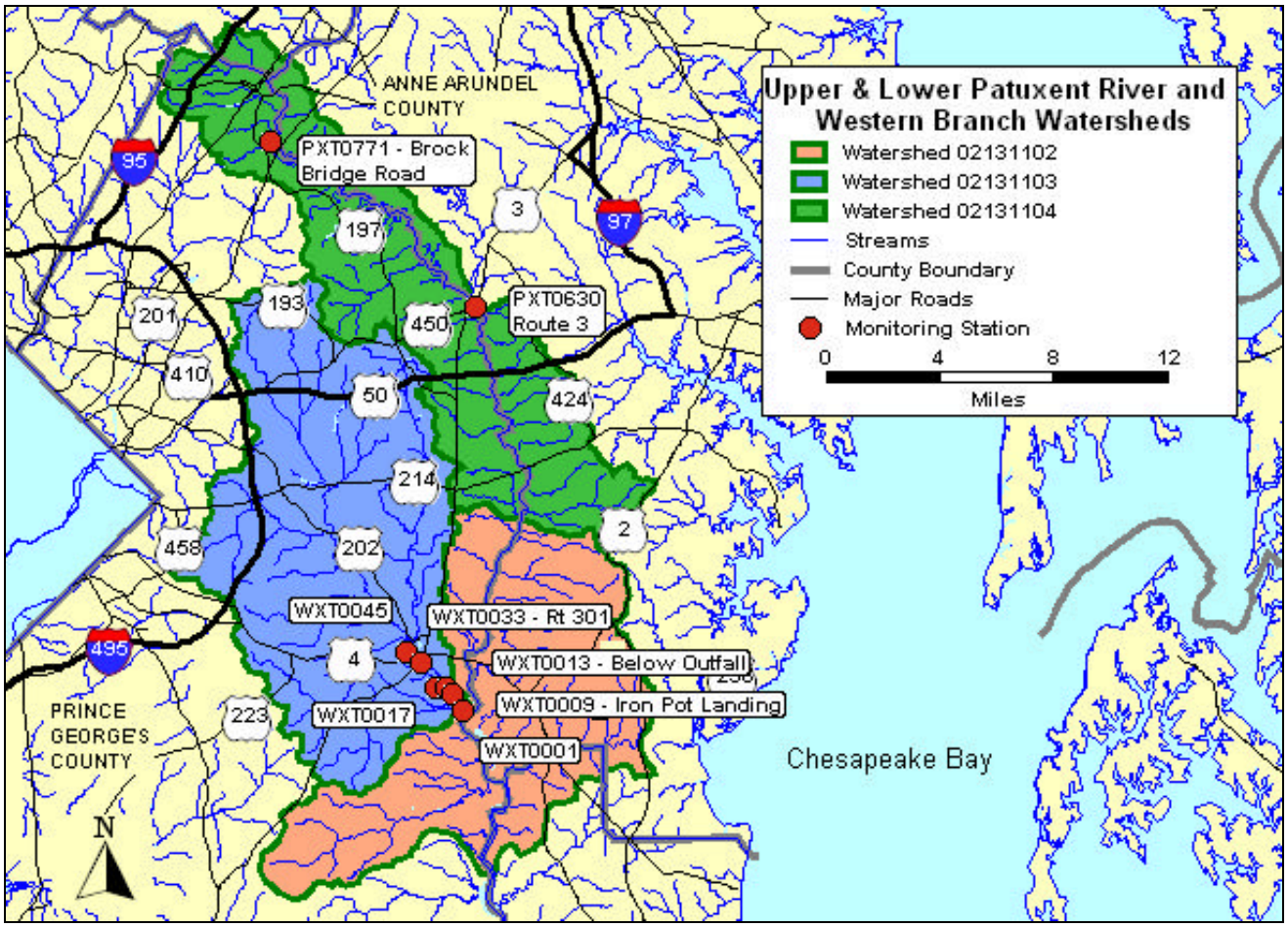
Water Quality Summary

A TMDL to address the nutrient impairments to water quality in the Little Patuxent River (02131105) (Centennial Lake) received approval from EPA, April 24, 2002. The nutrient impairment in the Western Branch (02131103) was addressed by a BOD TMDL approved by EPA June 6, 2000. The Patuxent River Middle (02131102) will be addressed by a cooperative effort by the Bay States with the EPA Chesapeake Bay Program taking the lead. Water Quality Analyses were done indicating no nutrient impairments for the Patuxent River Upper (02131104) and the Middle Patuxent River (02131106), and received concurrence from EPA on February 2, 2007 and February 21, 2007 respectively. TMDLs to address the nutrient impairments in Rocky Gorge Dam (02131107); and Brighton Dam (02131108) are under development for 2007.

Upper, Lower Patuxent River and Western Branch Monitoring Stations

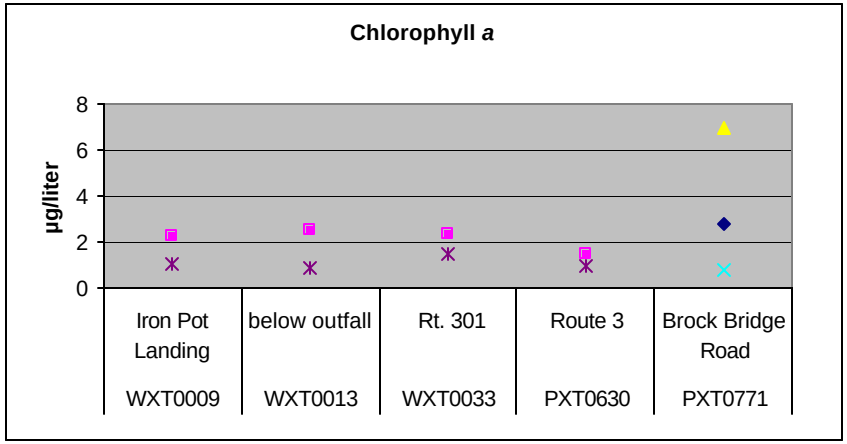


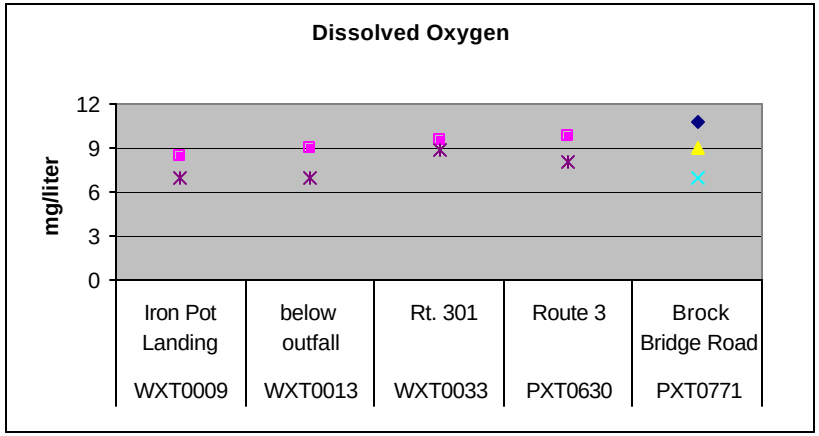


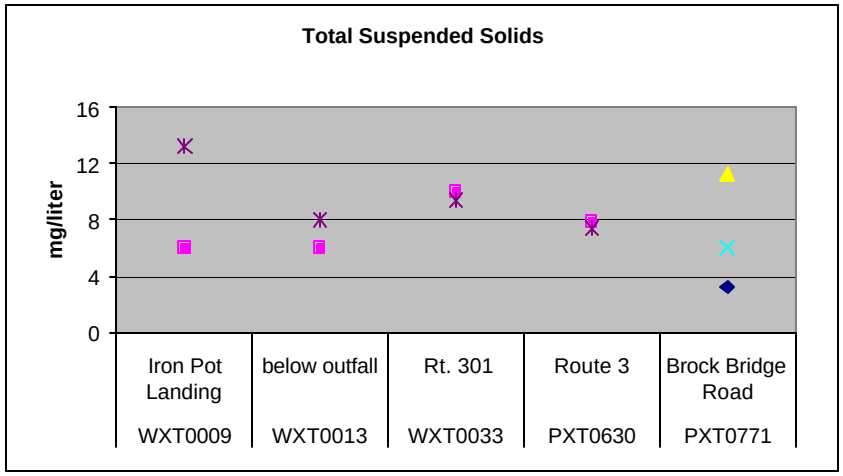


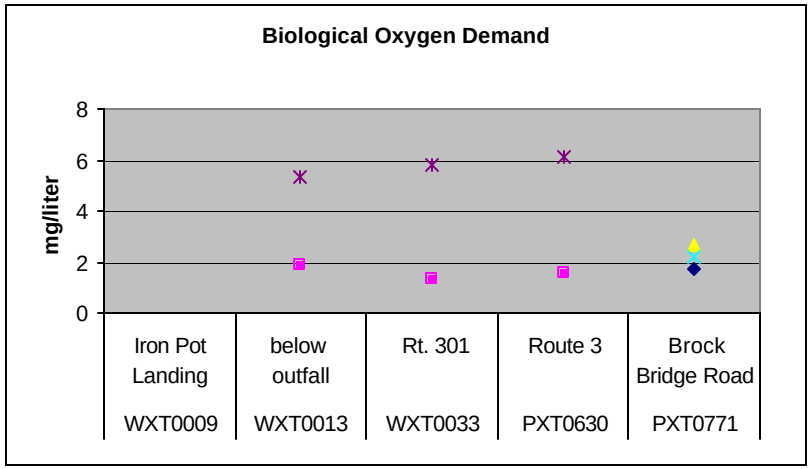
Map Prepared by the Maryland Department of the Environment
Science Services Administration
Montgomery Park Business Center
1800 Washington Boulevard, Suite 540
Baltimore, Maryland 21230-1718

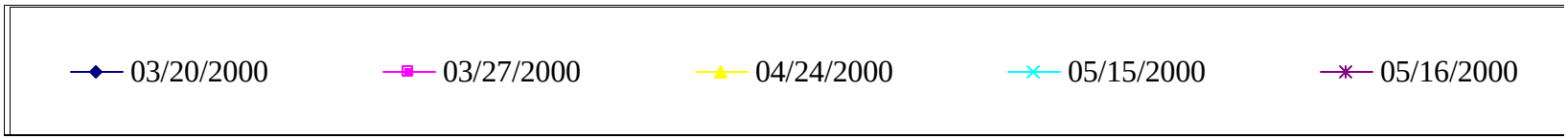
Patuxent River Middle, Upper and Western Branch
High Flow Conditions (December-May)
Stations are presented from left to right from downstream to upstream



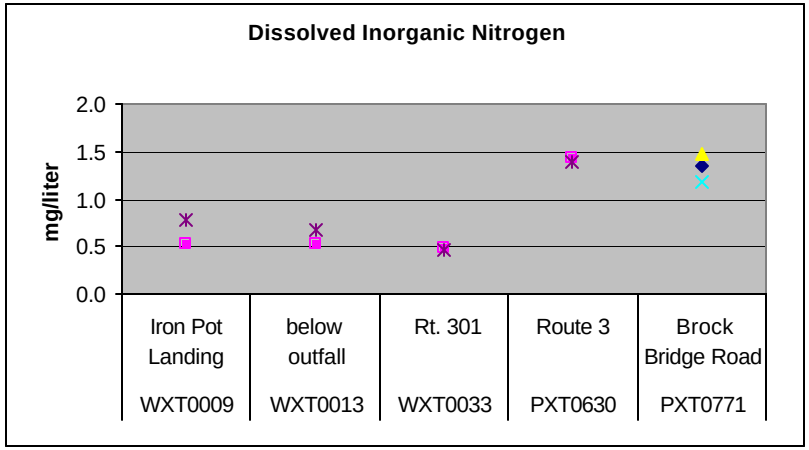


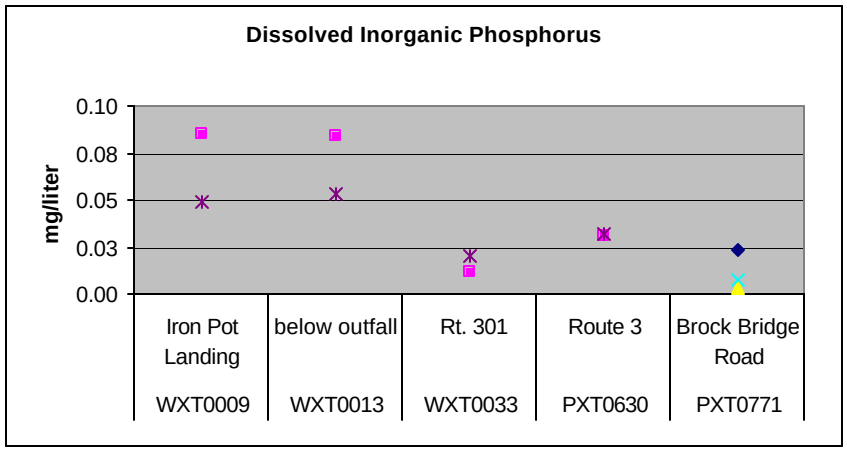


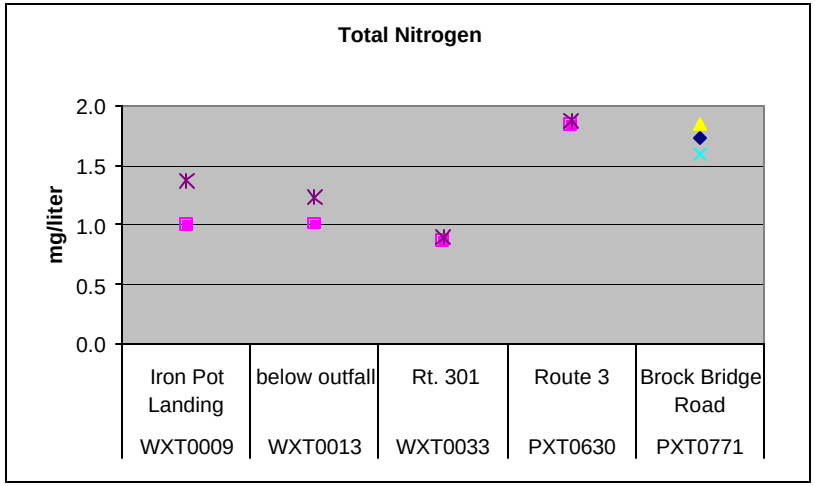


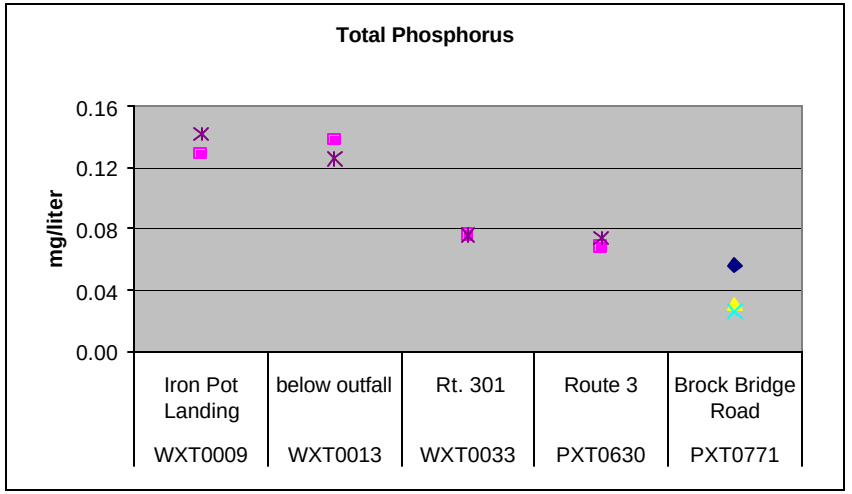


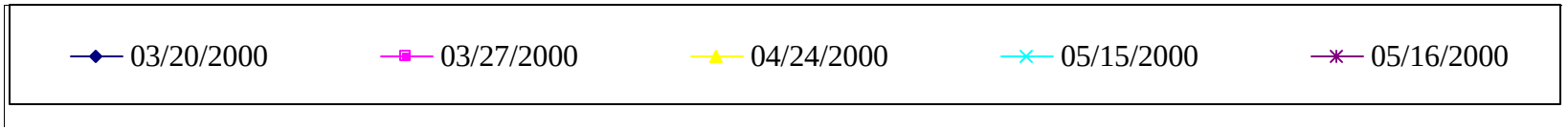
Patuxent River Middle, Upper and Western Branch
High Flow Conditions (December-May)
Stations are presented from left to right from downstream to upstream



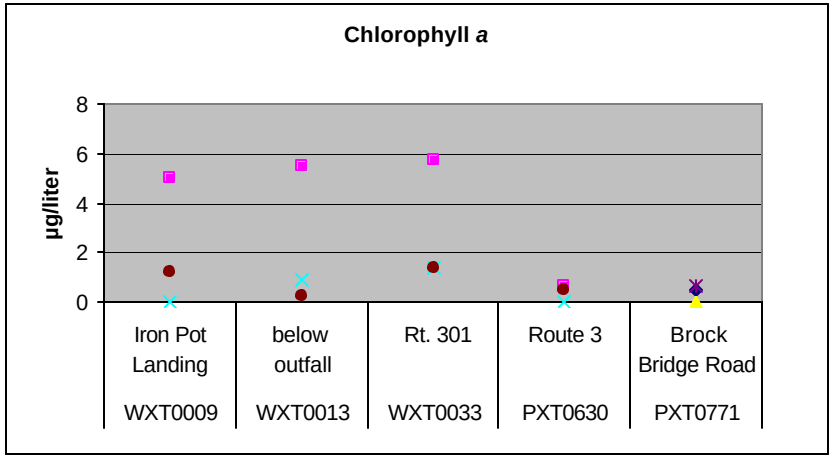


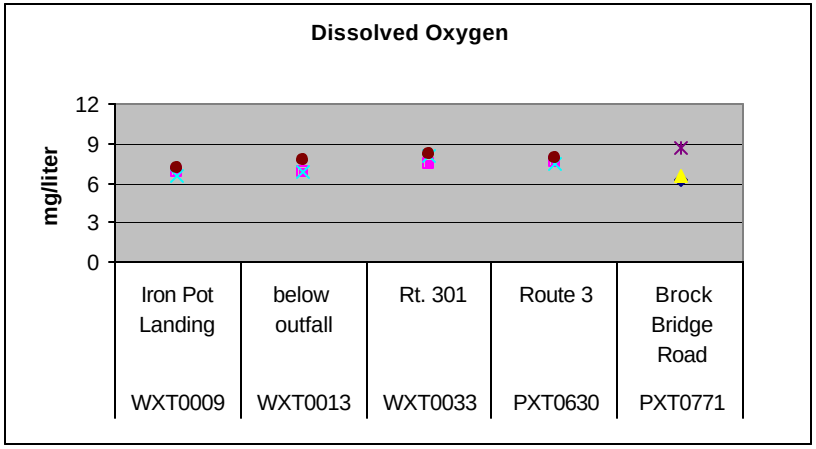


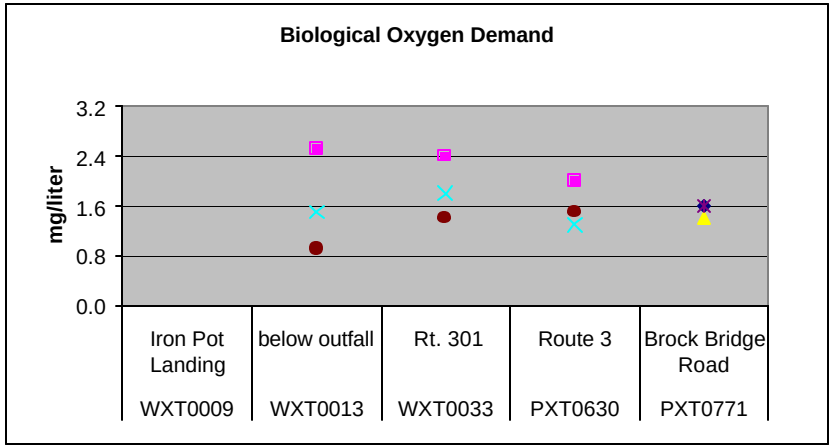


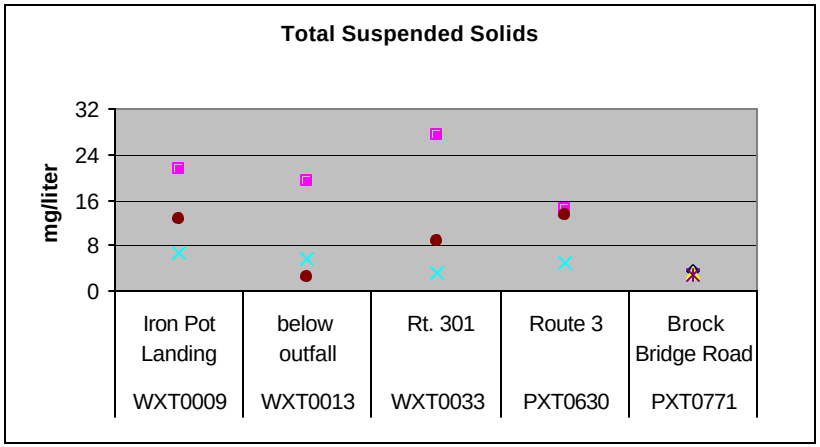


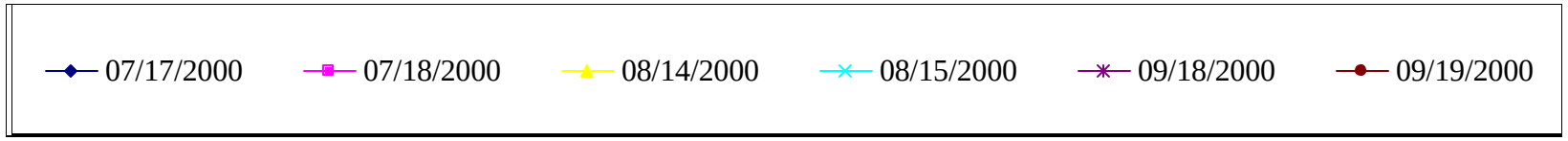
Patuxent River Middle, Upper and Western Branch
Low Flow Conditions (June to November)
Stations are presented from left to right from downstream to upstream



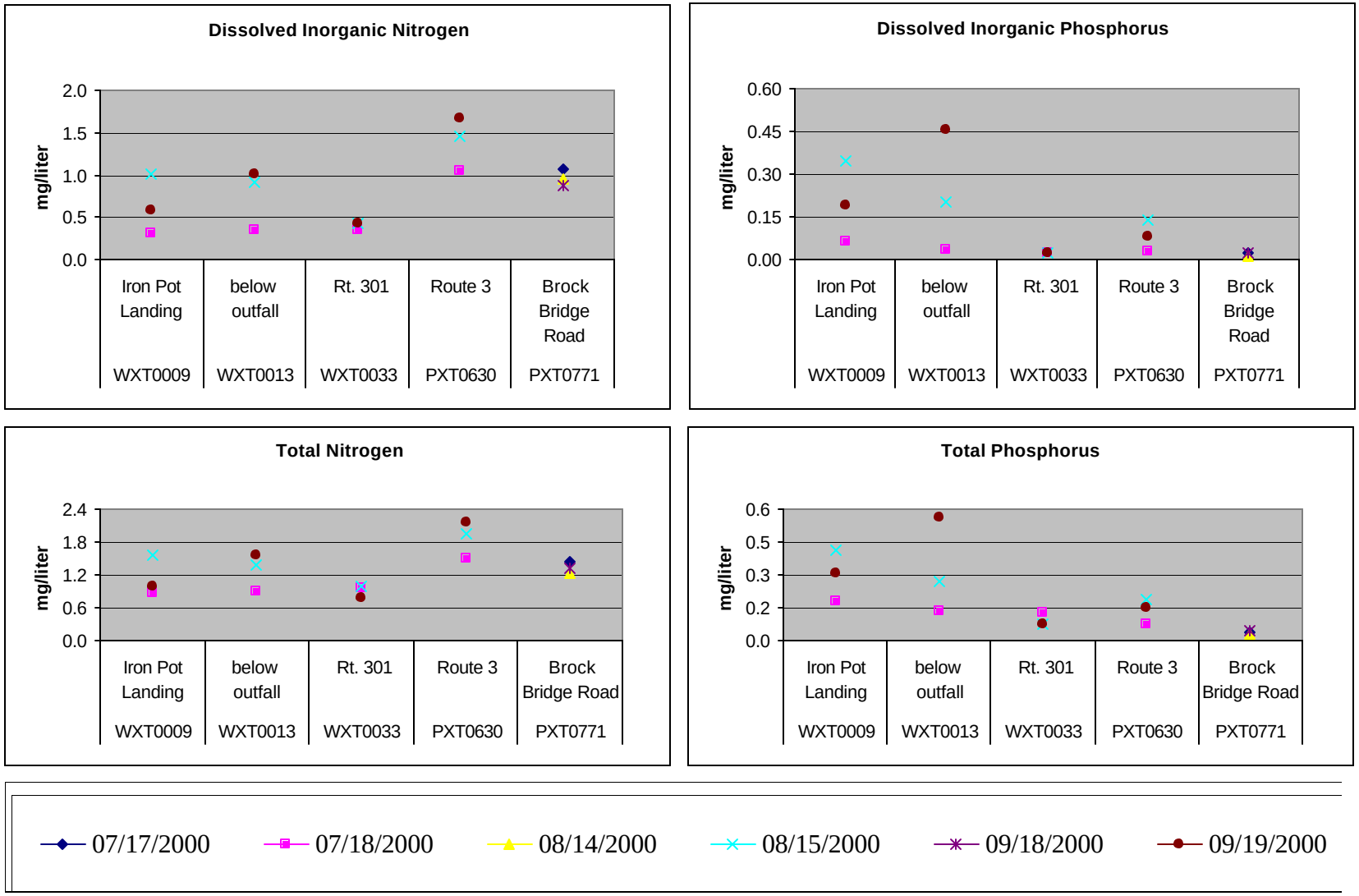








Patuxent River Middle, Upper and Western Branch
Low Flow Conditions (June to November)
Stations are presented from left to right from downstream to upstream



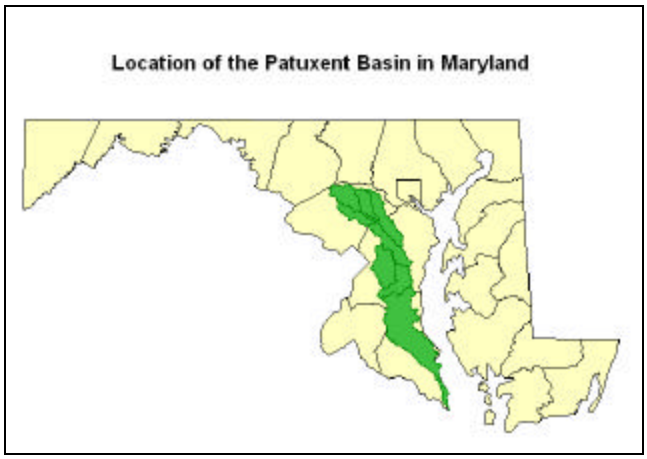
WESTERN BRANCH AND PATUXENT RIVER MIDDLE STATION LIST

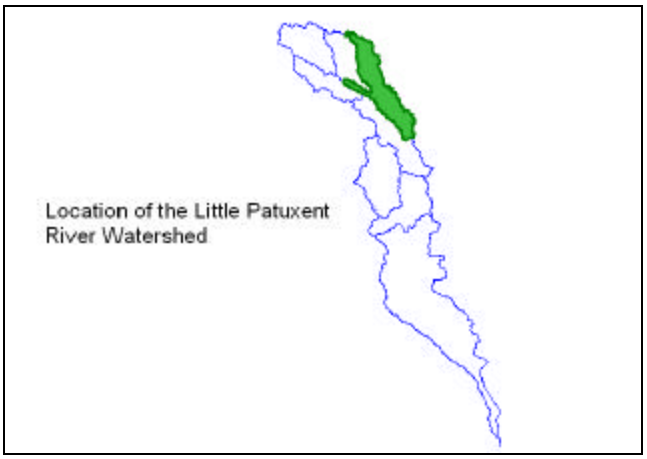
Station Code	Station Names	Lat/Long	Description
WESTERN BRANCH			
WXT0009	Iron Pot Landing	38 47.554 76 43.769	Iron Pot Landing. Near stream confluence and old duck blind. Approx. 3-4 ft.
WXT0013	Below outfall	38 47.806 76 43.436	¼ Mile below outfall. Approx. 3-4 ft.
WXT0033	Rt. 301	38 48.560 76 44.489	Bridge sample at Rt. 301.

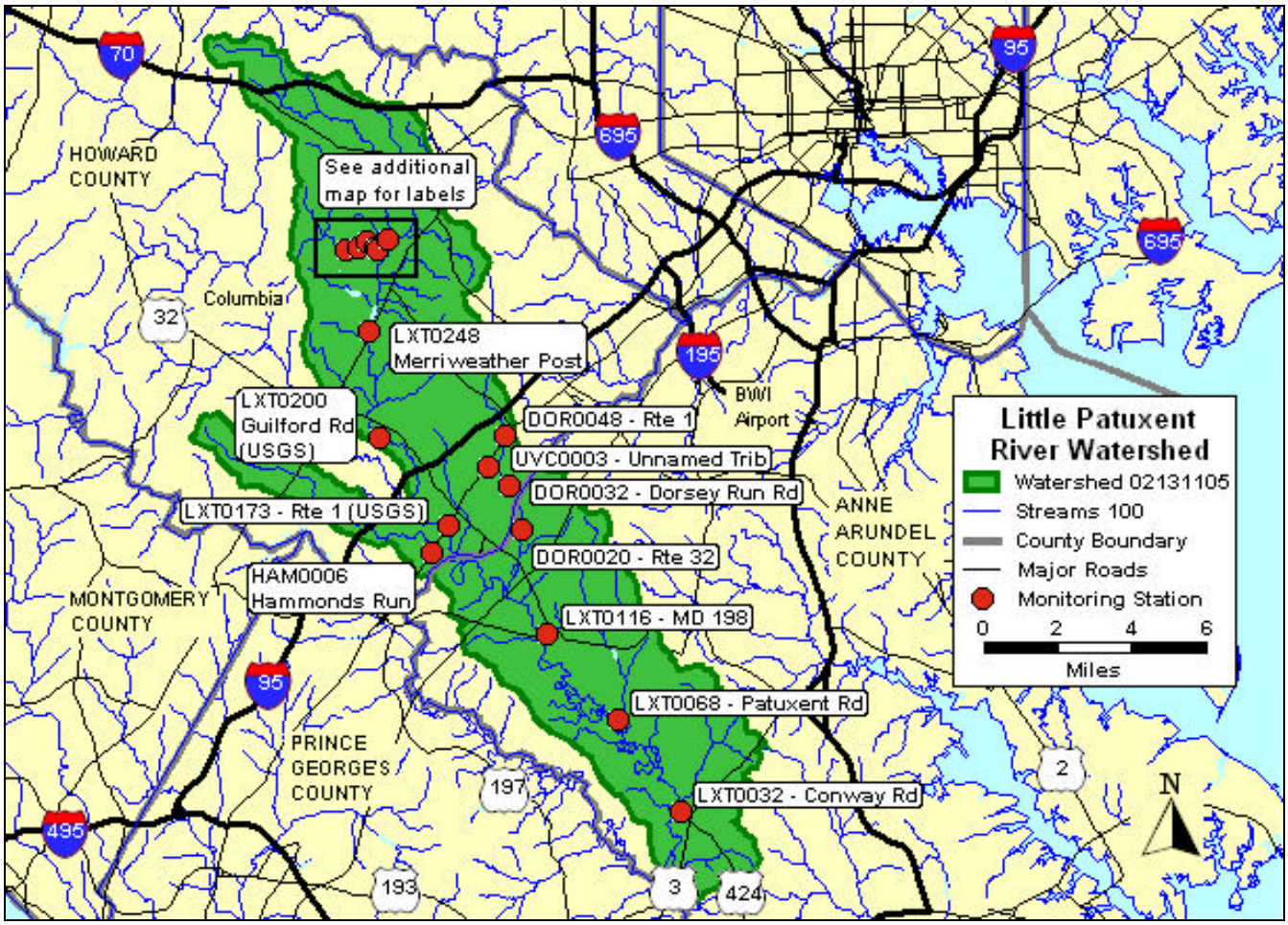
UPPER PATUXENT RIVER STATION LIST

Station Code	Station Names	Lat/Long	Description
UPPER PATUXENT RIVER			
PXT0630	Route 3	38 59.311 76 42.316	Route 3 bridge crossing.
PXT0771	Brock Bridge Road	39 04.321 76 50.302	Brock Bridge Road crossing.

Little Patuxent River Monitoring Stations







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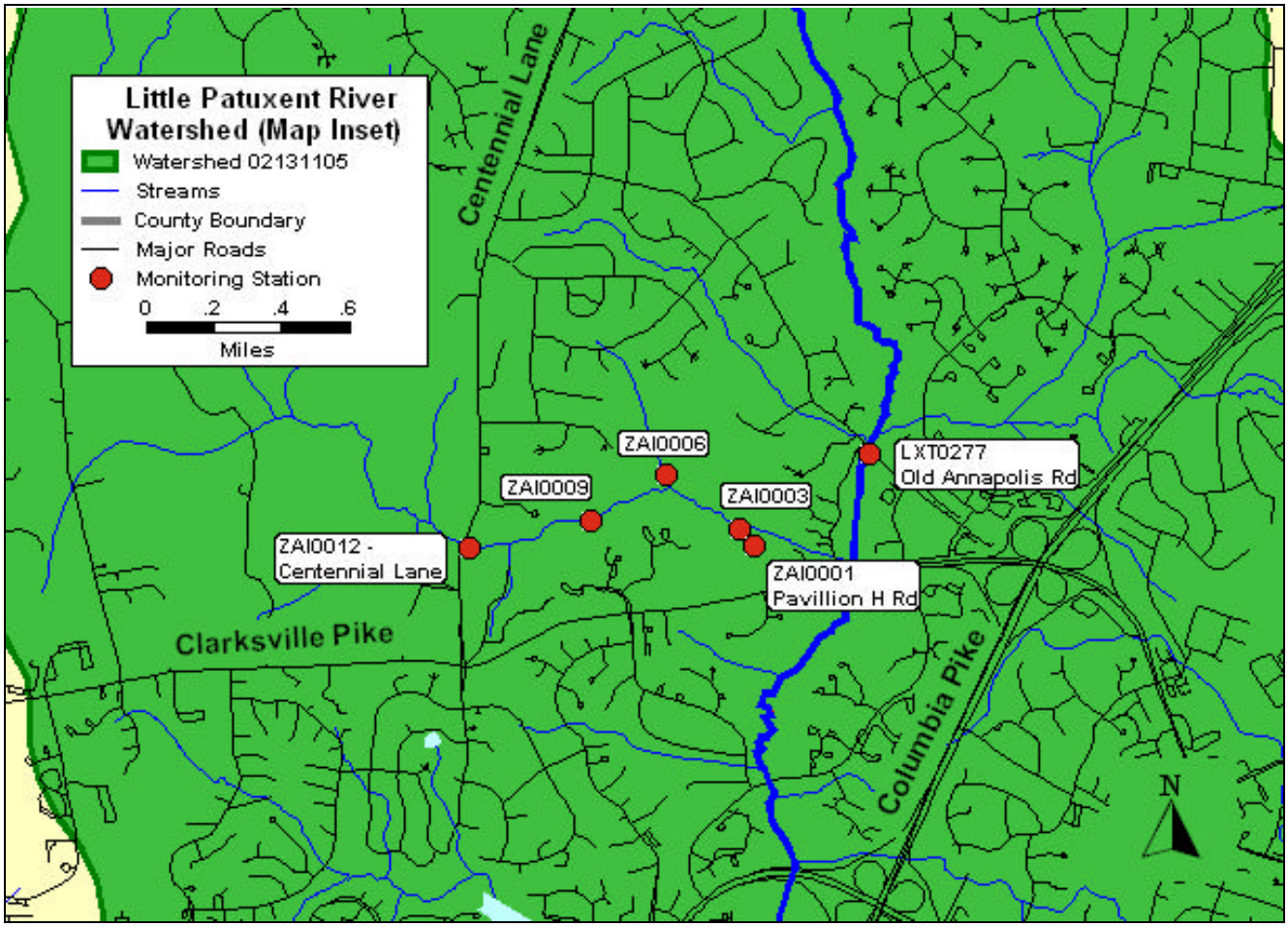
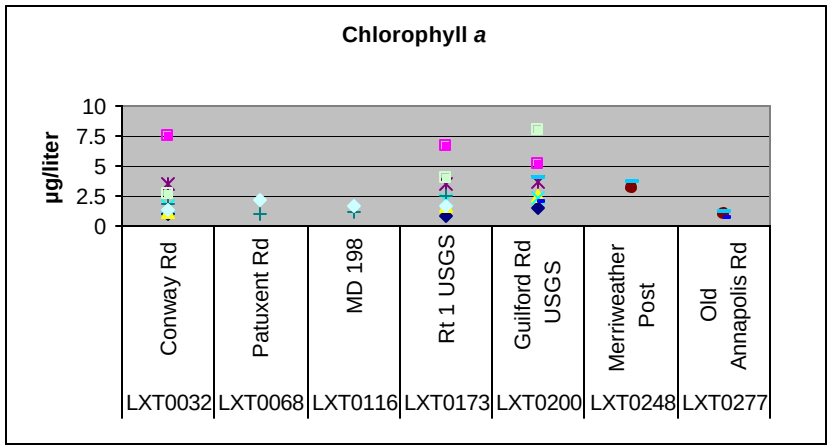
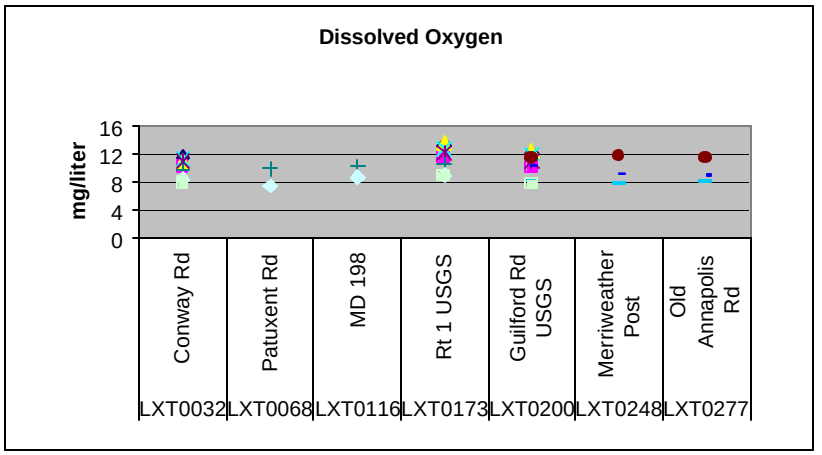
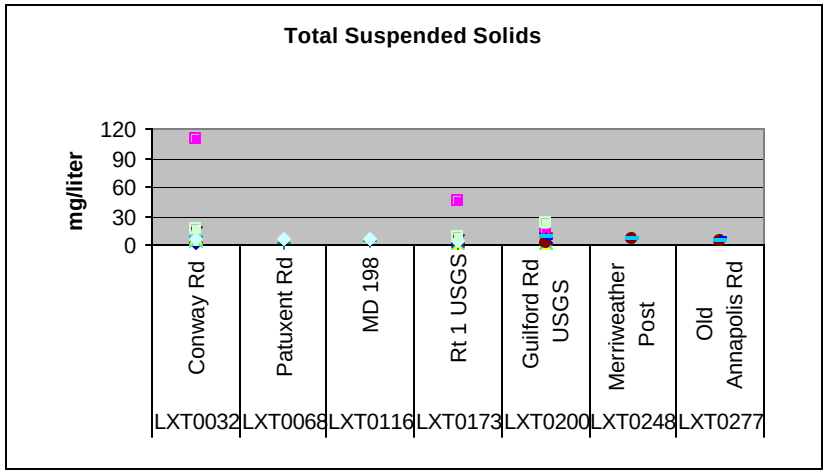
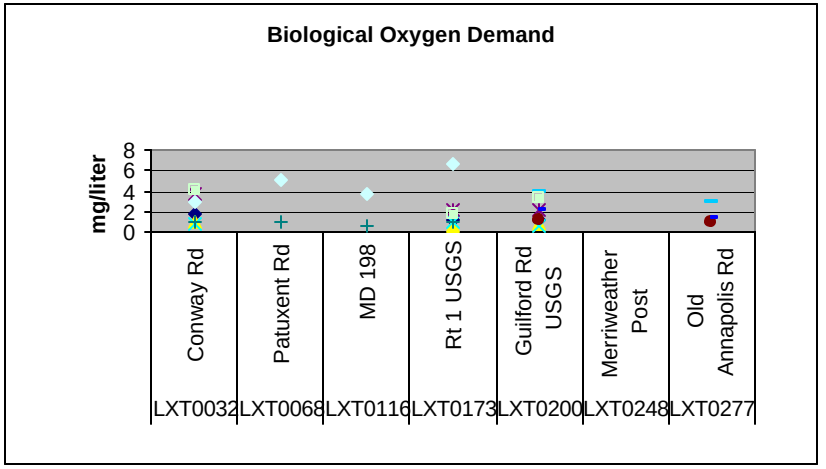

Little Patuxent River
Watershed (Map Inset)
Watershed 02131105
Streams
County Boundary
Major Roads
Monitoring Station
0 .2 .4 .6
Miles
Centennial Lane
ZAI0006
ZAI0009
ZAI0003
LXT0277
Old Annapolis Rd
ZAI0012 -
Centennial Lane
ZAI0001
Pavillion H Rd
Clarksville Pike
Columbia Pike
N

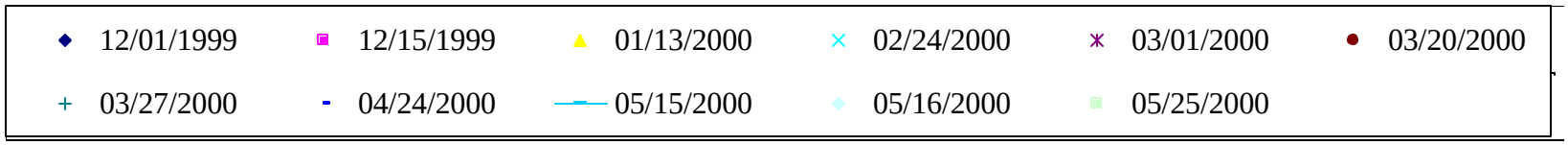
Little Patuxent River (main)
High Flow Conditions (December-May)
Stations are presented from left to right from downstream to upstream



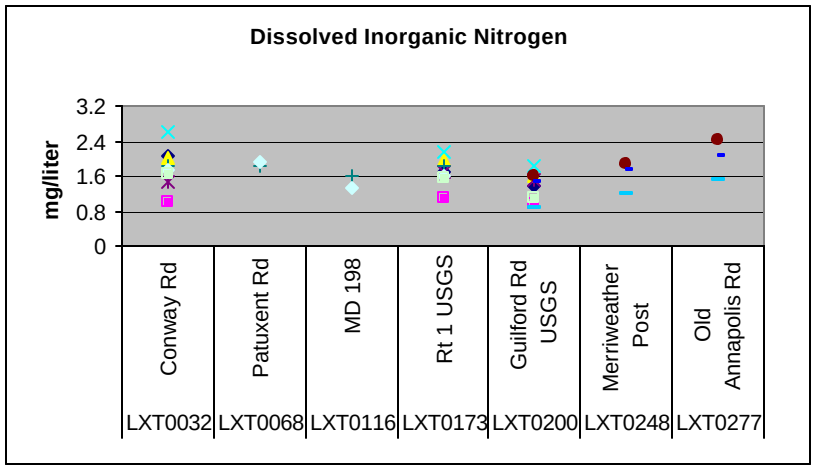


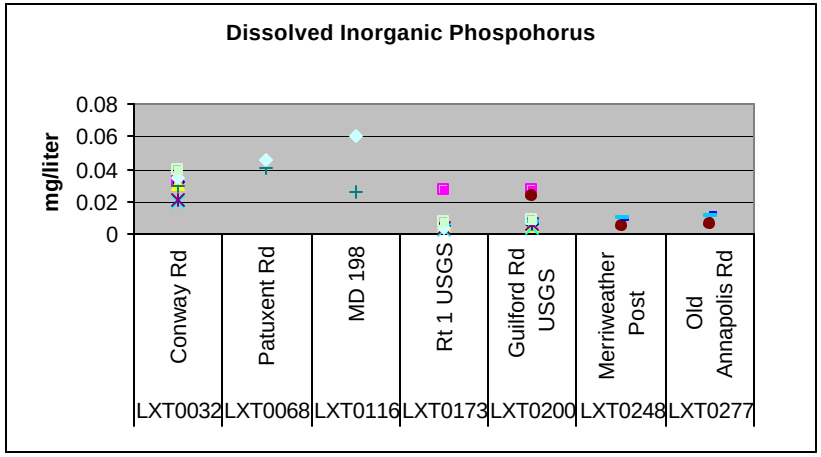


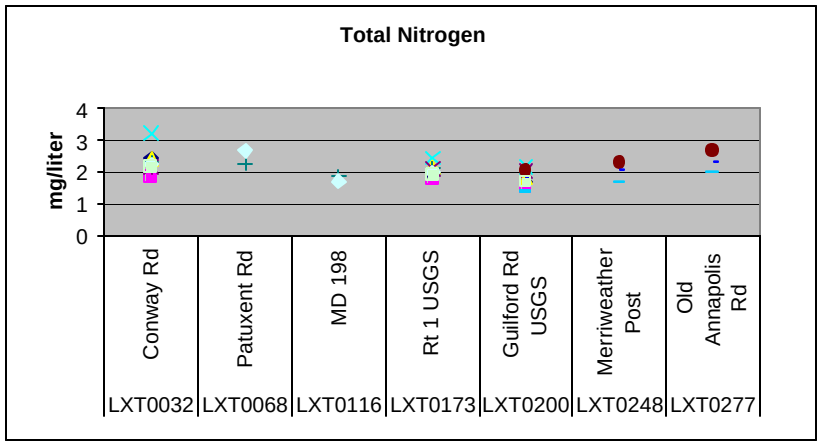


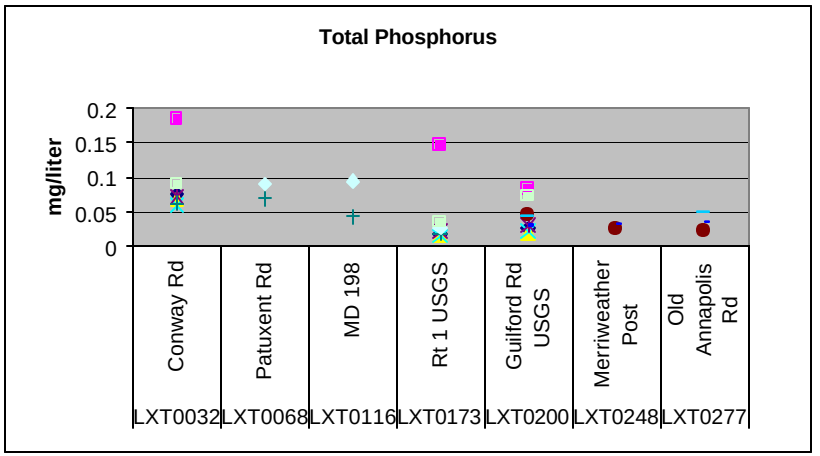


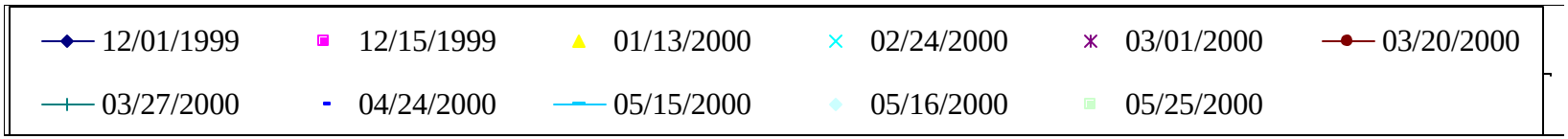
Little Patuxent River (main)
High Flow Conditions (December-May)
Stations are presented from left to right from downstream to upstream



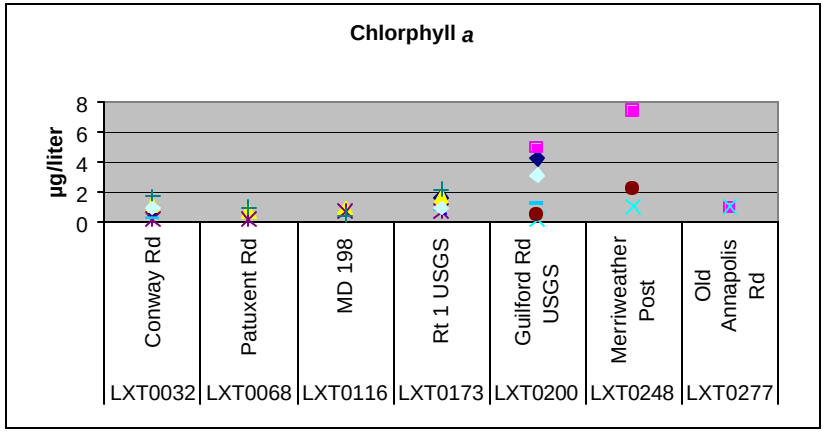


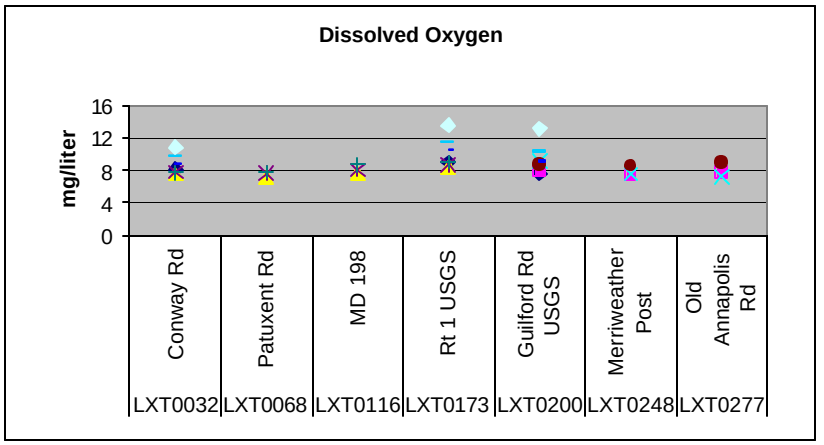


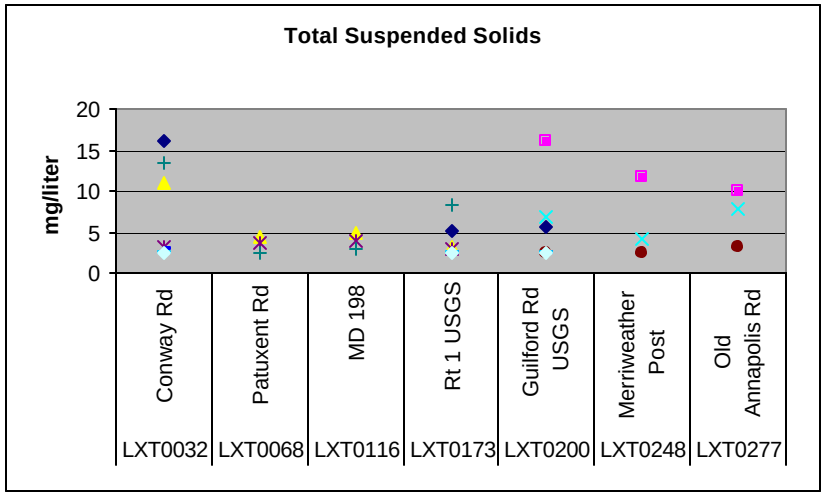


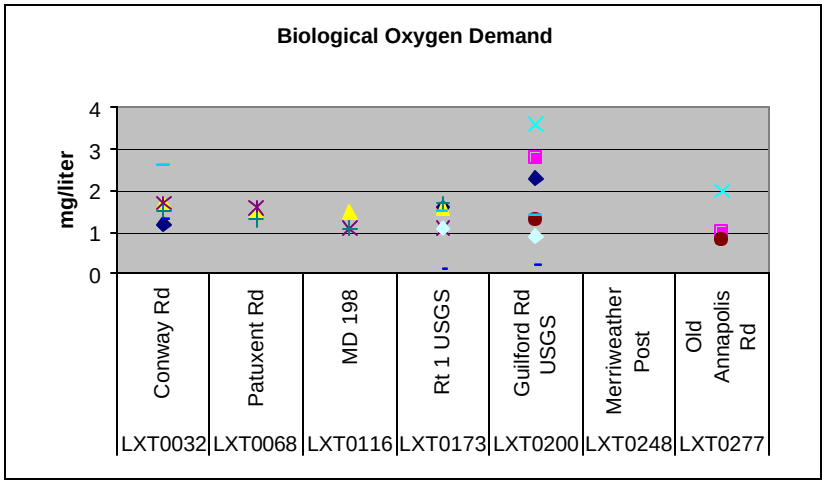


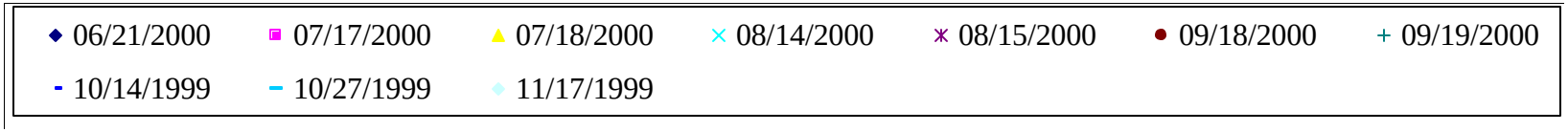
Little Patuxent River (main)
Low Flow Conditions (June to November)
Stations are presented from left to right from downstream to upstream



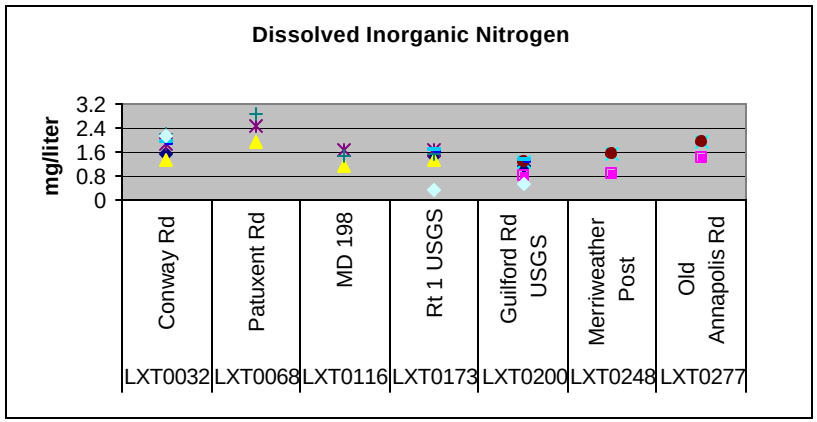


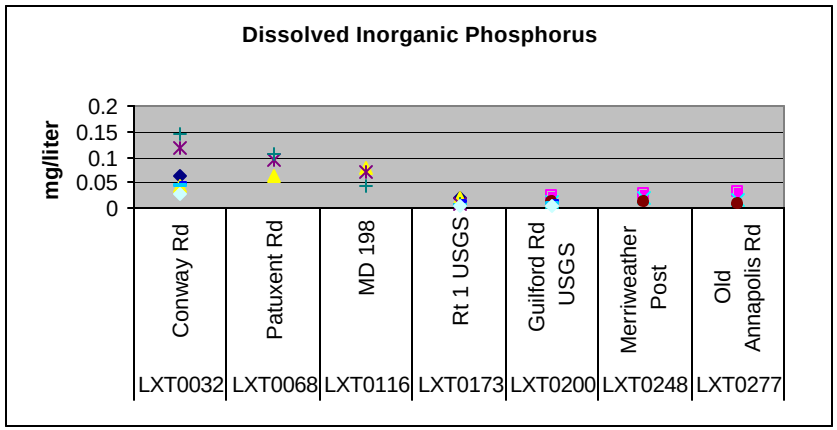


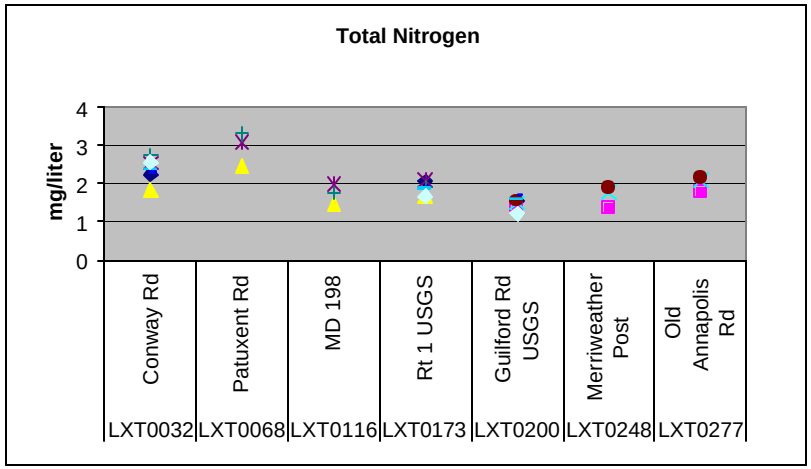


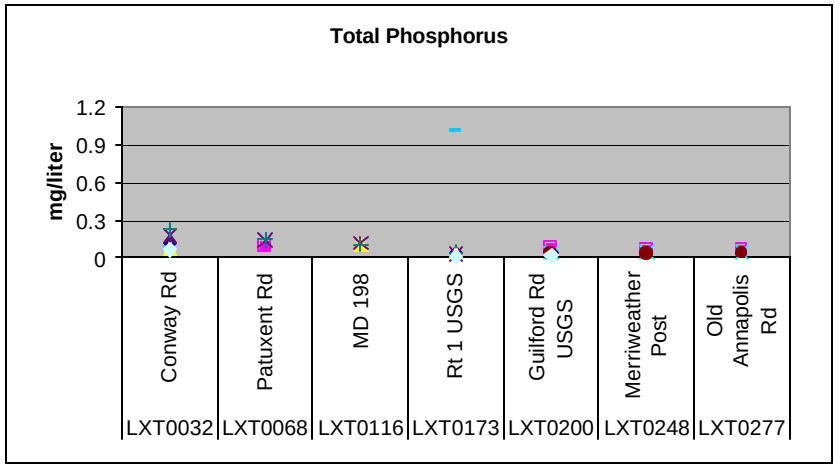


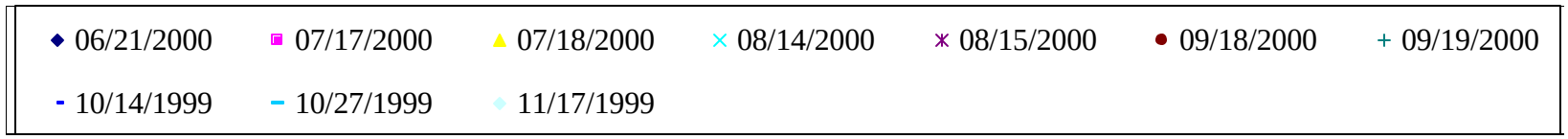
Little Patuxent River (main)
Low Flow Conditions (June to November)
Stations are presented from left to right from downstream to upstream



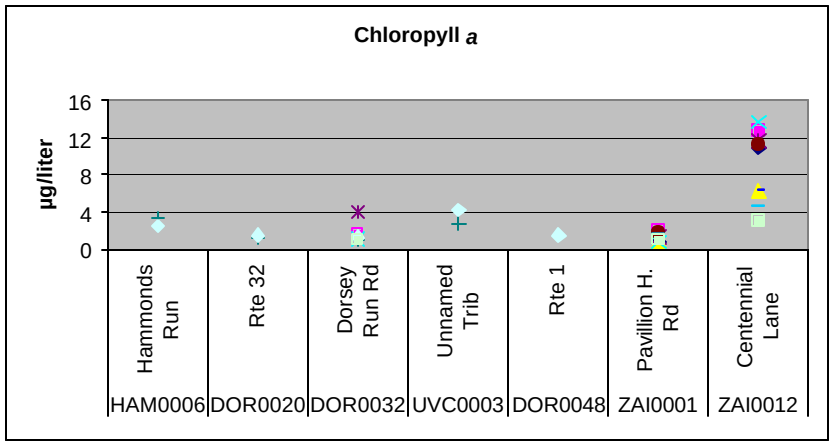


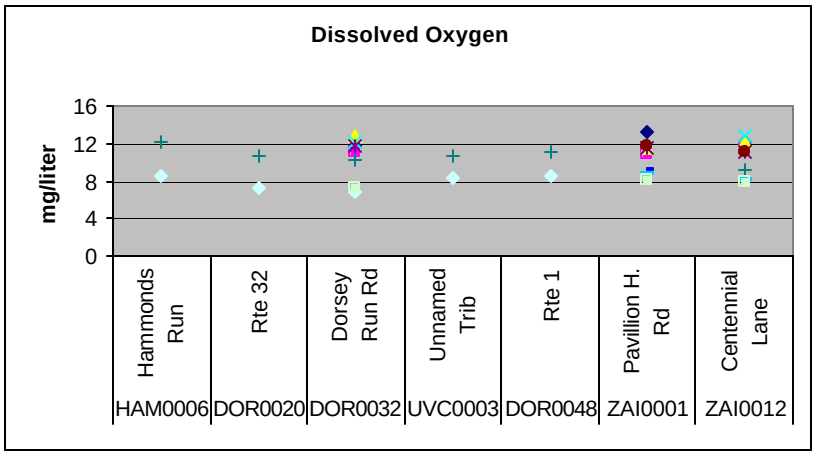


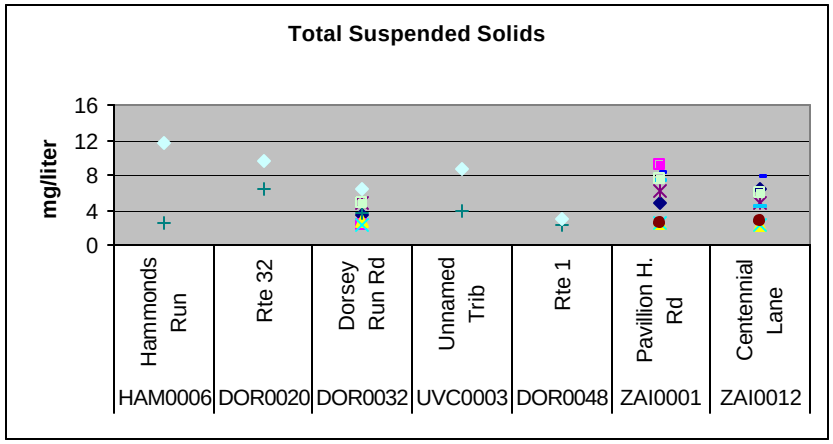


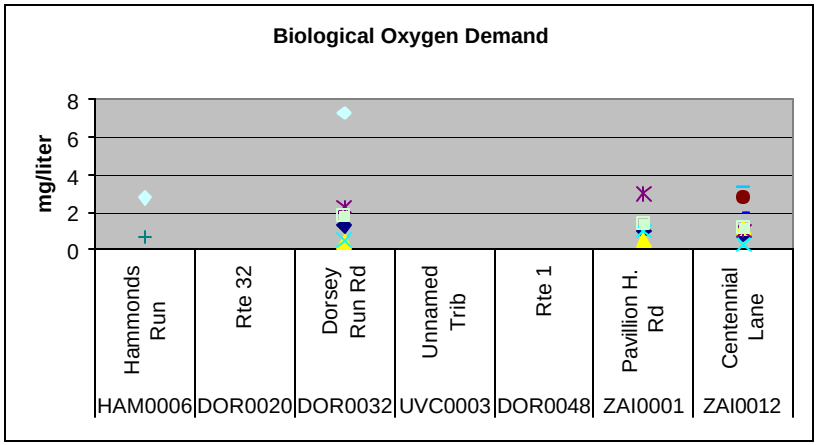


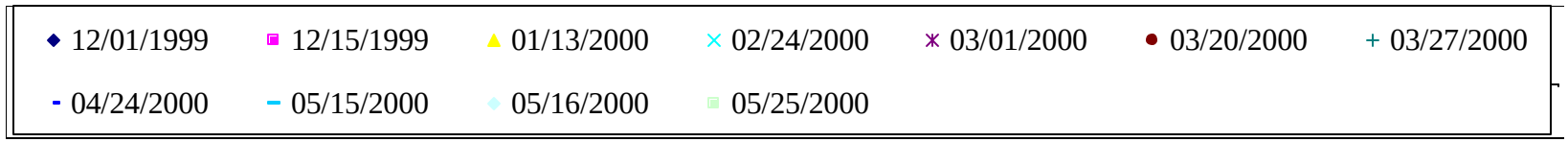
Little Patuxent River (tributaries)
High Flow Conditions (December-May)
Stations are presented from left to right from downstream to upstream



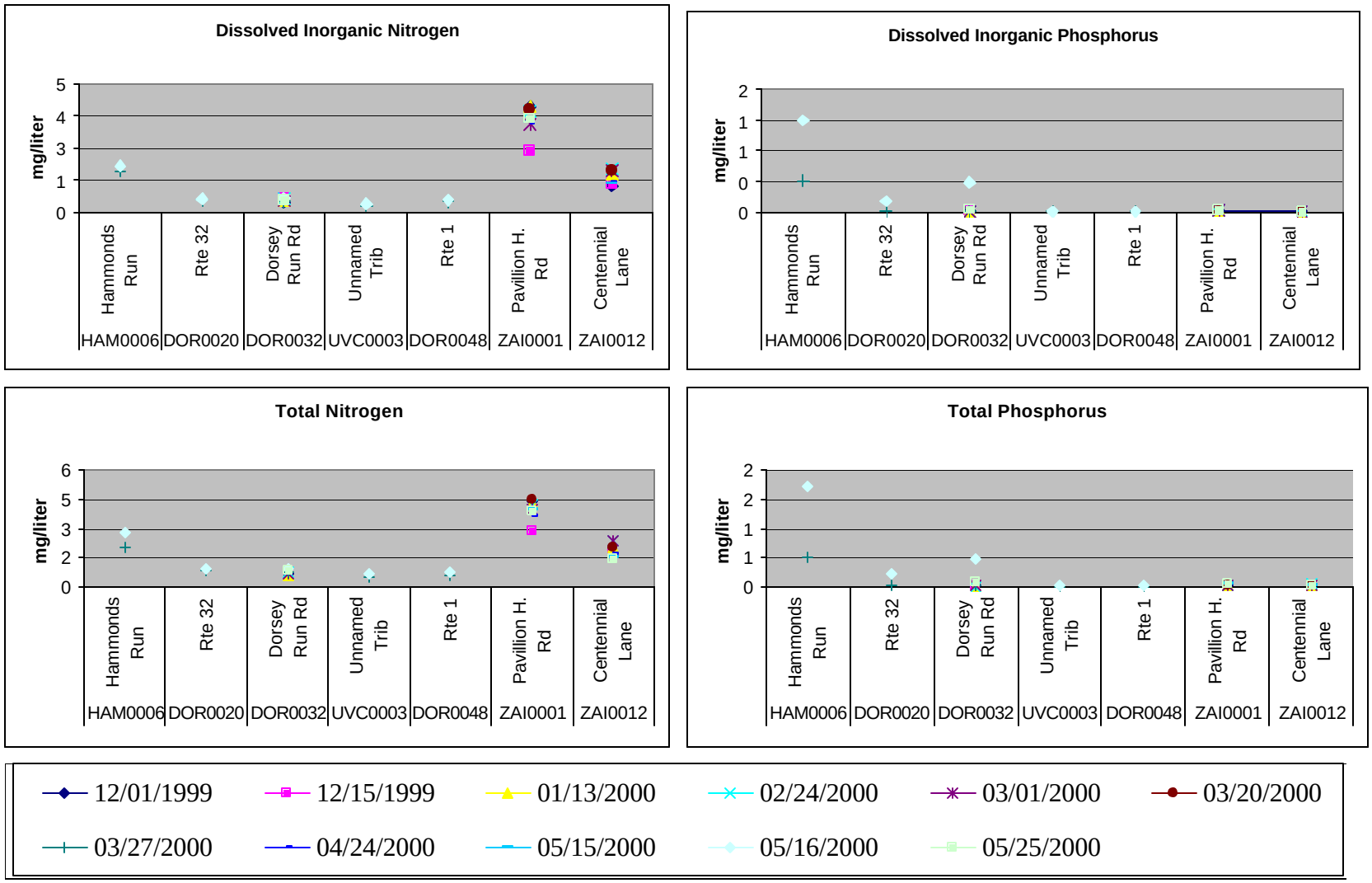




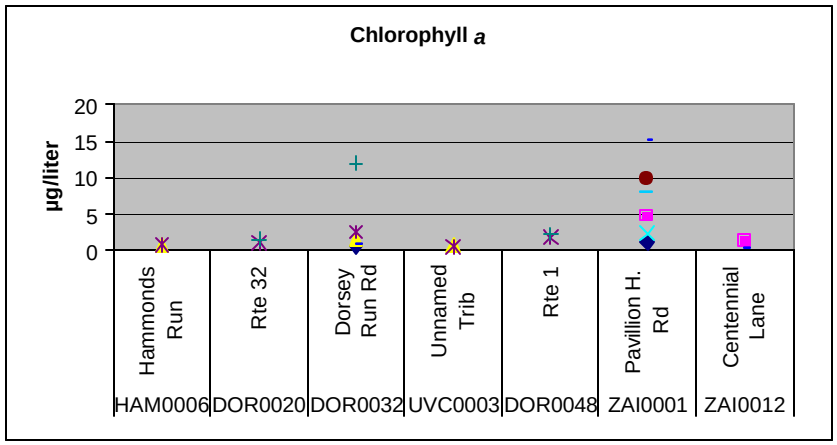


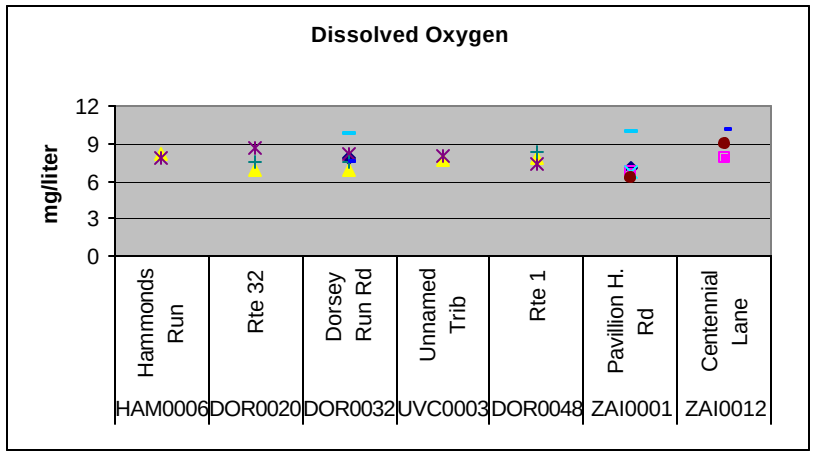


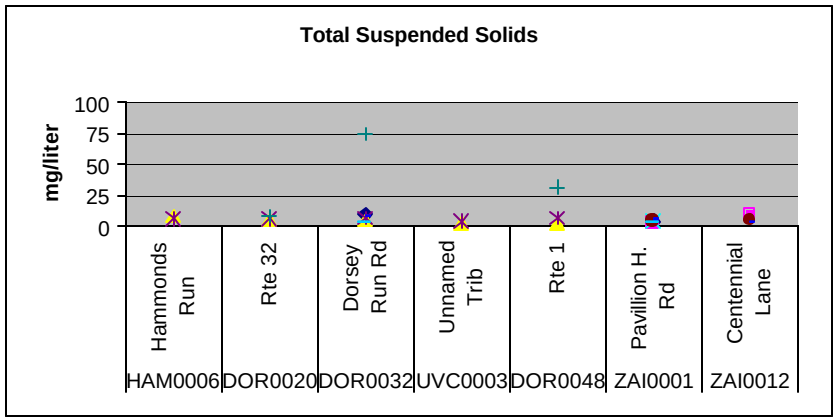
Little Patuxent River (tributaries)
High Flow Conditions (December-May)
Stations are presented from left to right from downstream to upstream

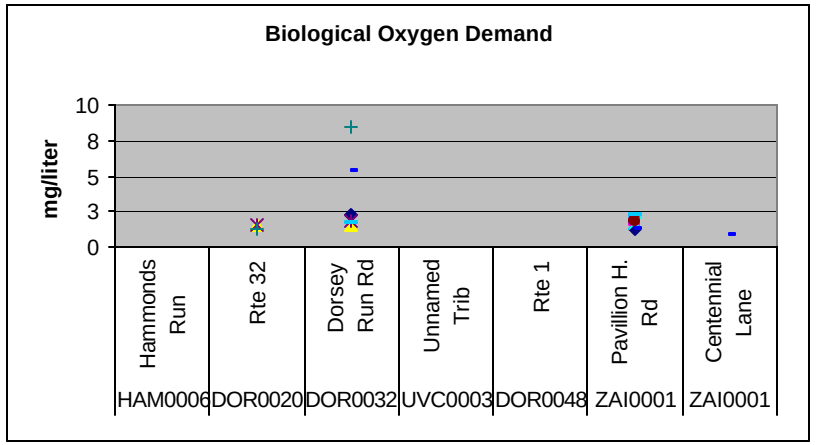


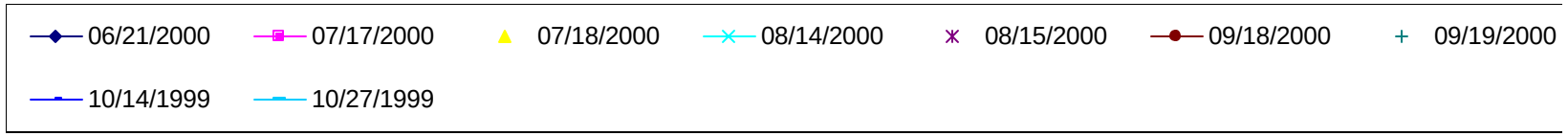
Little Patuxent River (tributaries)
Low Flow Conditions (June to November)
Stations are presented from left to right from downstream to upstream



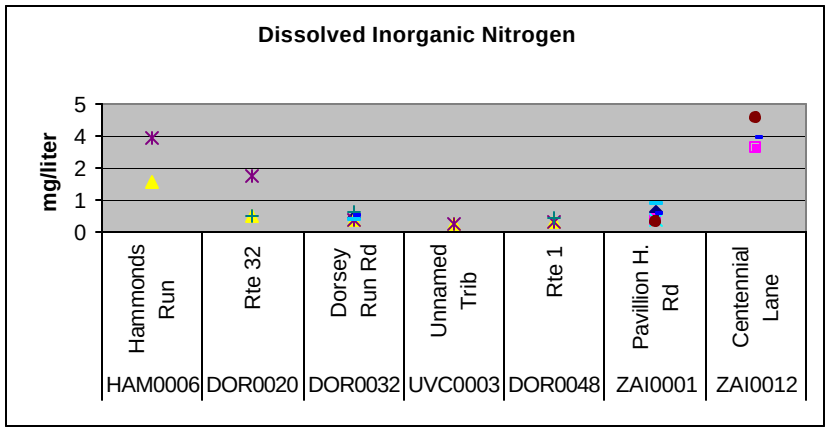


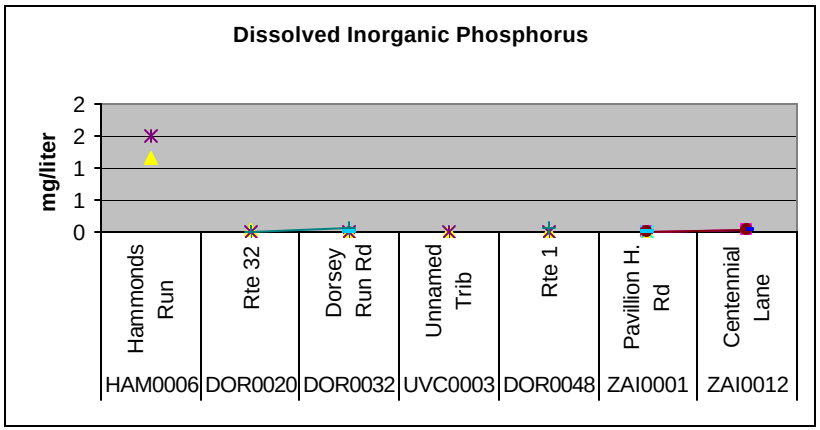


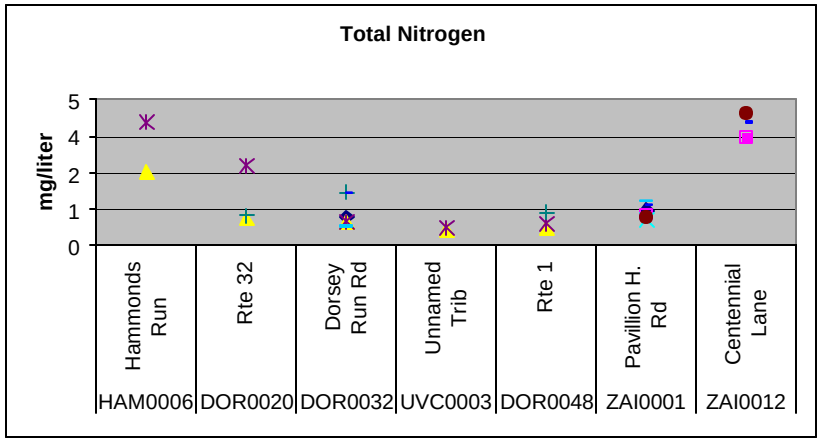


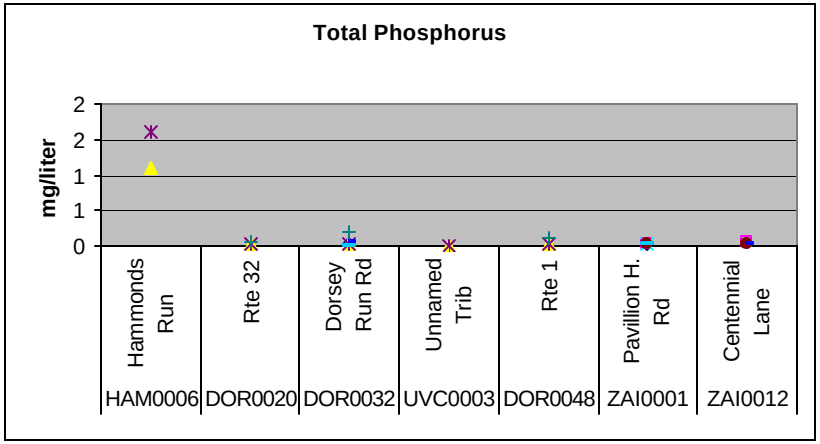


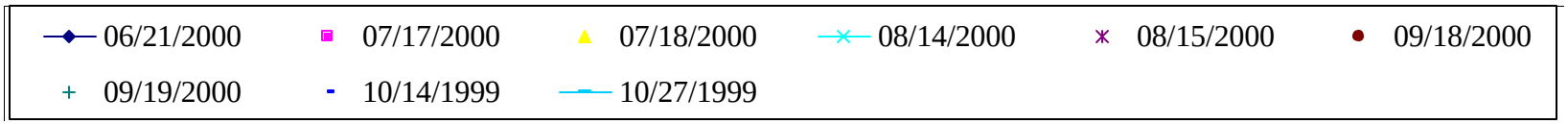
Little Patuxent River (tributaries)
Low Flow Conditions (June to November)
Stations are presented from left to right from downstream to upstream







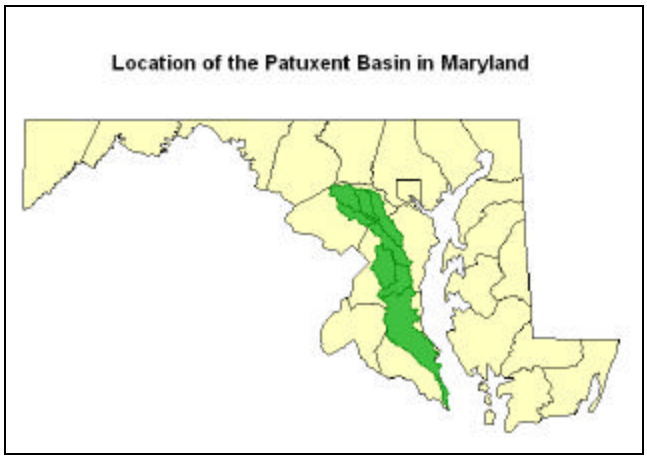


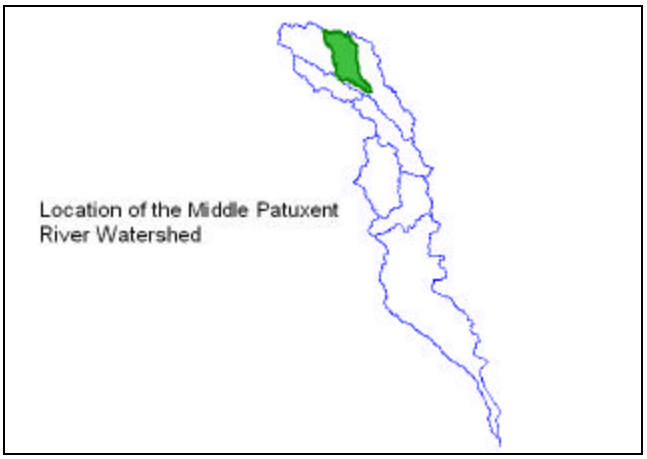


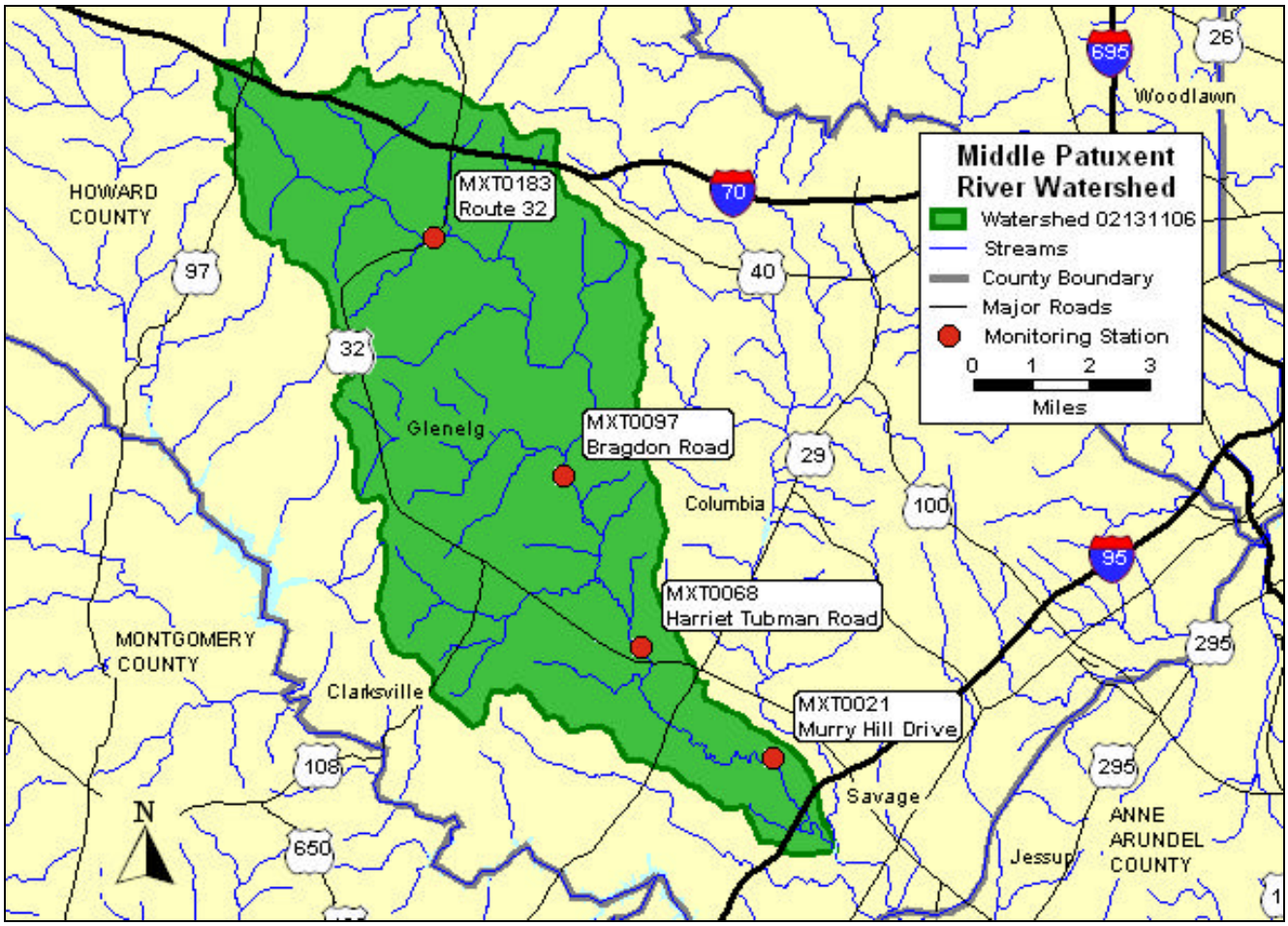
LITTLE PATUXENT RIVER STATION LIST

Station Code	Station Names	Lat/Long	Description
LITTLE PATUXENT RIVER			
LXT0032	Conway Rd.	39 01.412 76 42.087	424 (Conway Road) bridge crossing.
LXT0068	Patuxent Rd.	39 03.554 76 43.912	Patuxent Road crossing.
LXT0116	MD 198	39 05.526 76 46.092	MD 198 crossing. Park in sandy lot. Bank sample above STP outfall.
LXT0173	Rt. 1 USGS	39 08.067 76 48.985	Southbound lane of Rte 1 crossing. USGS Gage across Rt. 1.
LXT0200	Guilford Rd. USGS	39 10.057 76 51.077	Guilford Road crossing. USGS Gage. Read staff.
LXT0248	Merriweather Post	39 12.555 76 51.359	Merriweather Post access road off southbound US 29 crossing, below Lake Kittamaquandi.
LXT0277	Old Annapolis Road	39 14.672 76 50.787	Old Annapolis Road
CENTENNIAL LAKE			
ZAI0012	Centennial Lane	39 14.436 76 52.085	Centennial Lane bridge – sample on lake side.
ZAI0001	Pavillion H Road	39 14.443 76 51.157	Pavillion H Road, off of Woodland Road.
DORSEY RUN			
DOR0020	Rte 32	39 07.960 76 46.801	Rte 32/ Guilford Road crossing. Bank sample between from least dangerous road.
DOR0032	Dorsey Run Rd.	39 08.971 76 47.201	Dorsey Run Road crossing. Take flow upstream, left side.
DOR0048	Rte 1	39 10.135 76 47.302	Rte 1 crossing (north crossing). Park in the Red Roof Inn driveway.
UNNAMED TRIB (of Dorsey Run)			
UVC0003	Unnamed Trib	39 09.422 76 47.832	Rte 1 crossing (south crossing). Park on northbound side, sample from southbound side (deeper).
HAMMONDS RUN (tributary of Little Patuxent)			
HAM0006	Hammonds Run	39 07.433 76 49.496	Rte 1 crossing. Bank sample from BG&E gravel drive.

Middle Patuxent River Monitoring Stations

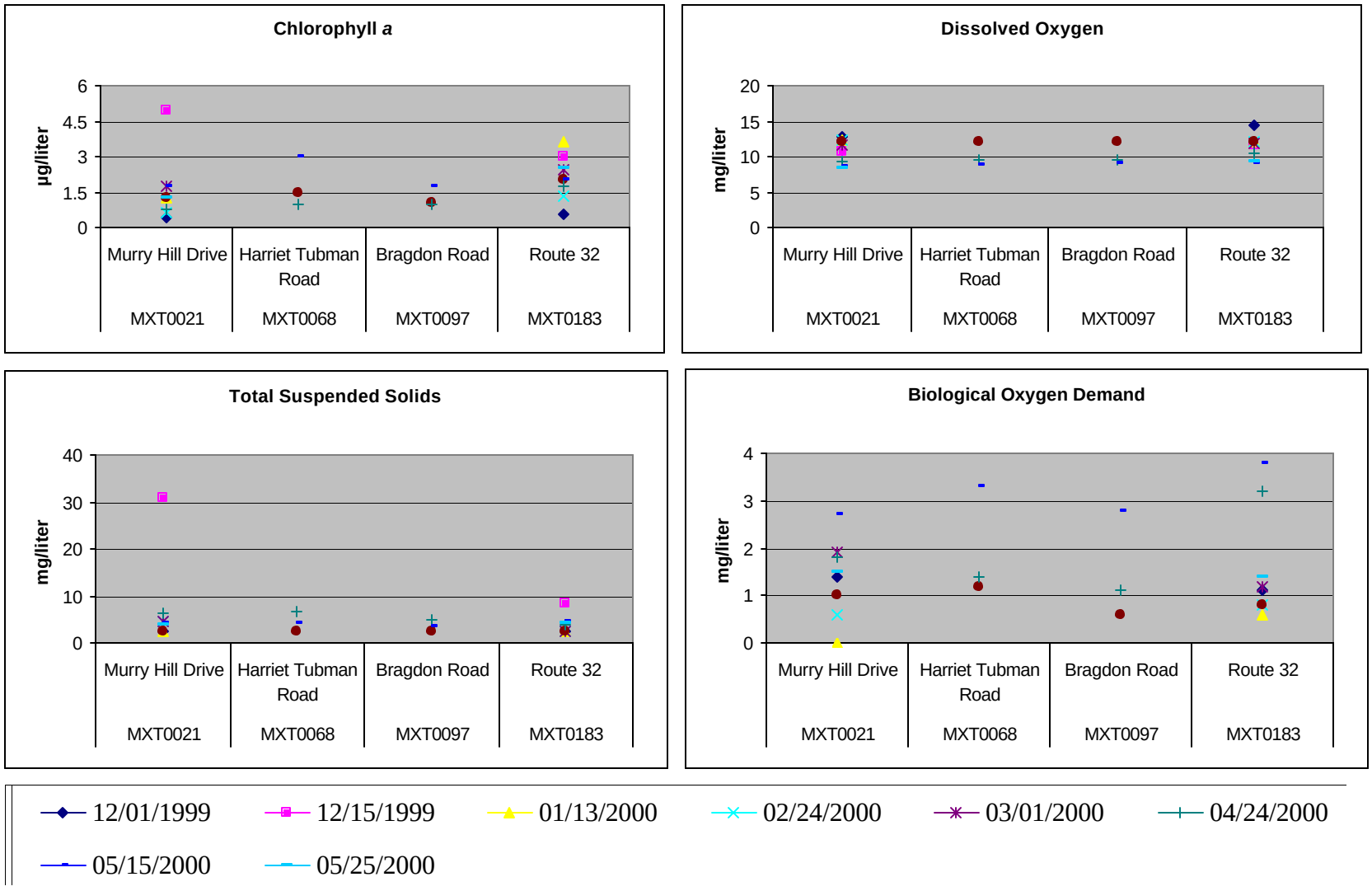






Map Prepared by the Maryland Department of the Environment
Science Services Administration
Montgomery Park Business Center
1800 Washington Boulevard, Suite 540
Baltimore, Maryland 21230-1718

Middle Patuxent River
High Flow Conditions (December-May)
Stations are presented from left to right from downstream to upstream



Middle Patuxent River
High Flow Conditions (December-May)
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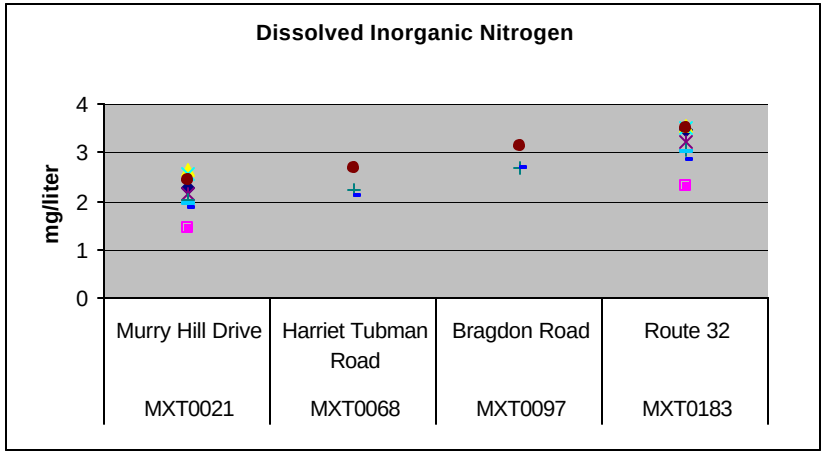
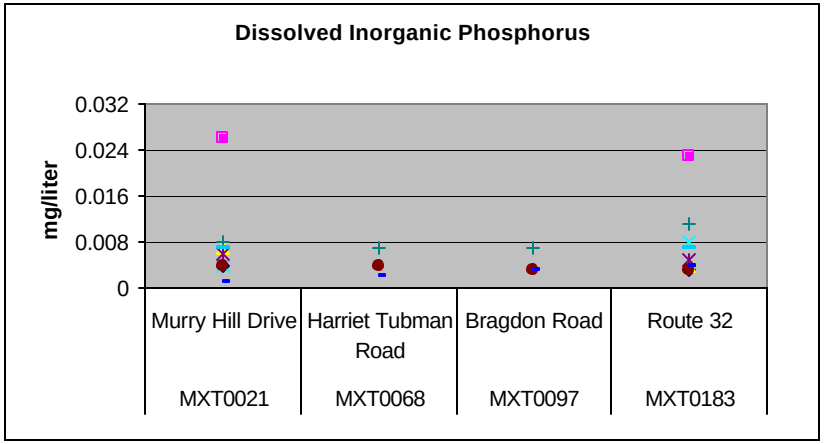
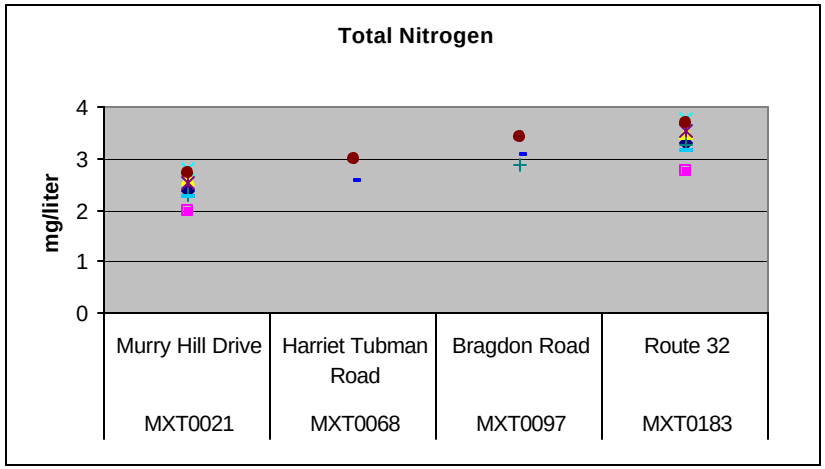
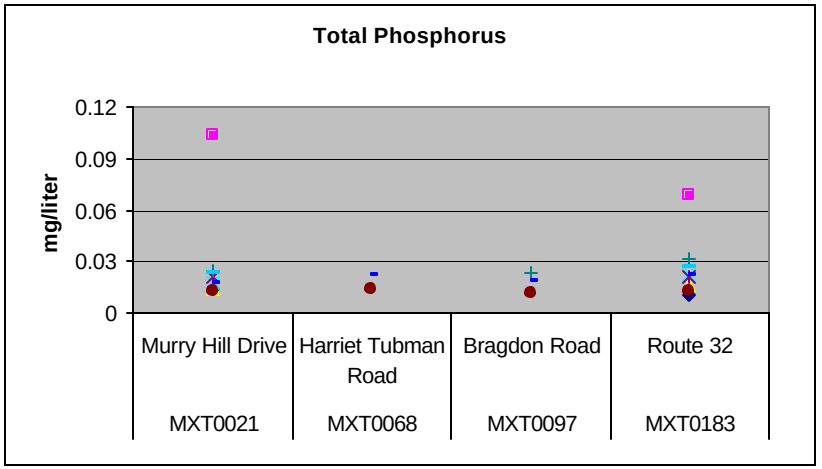
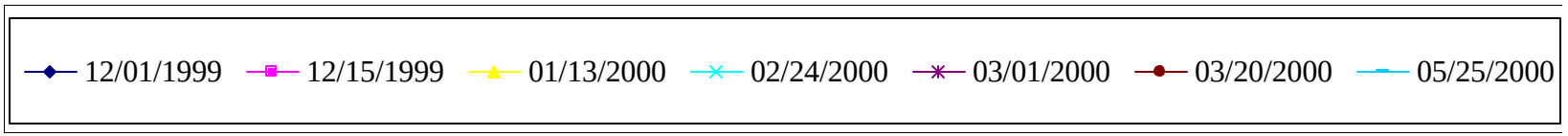


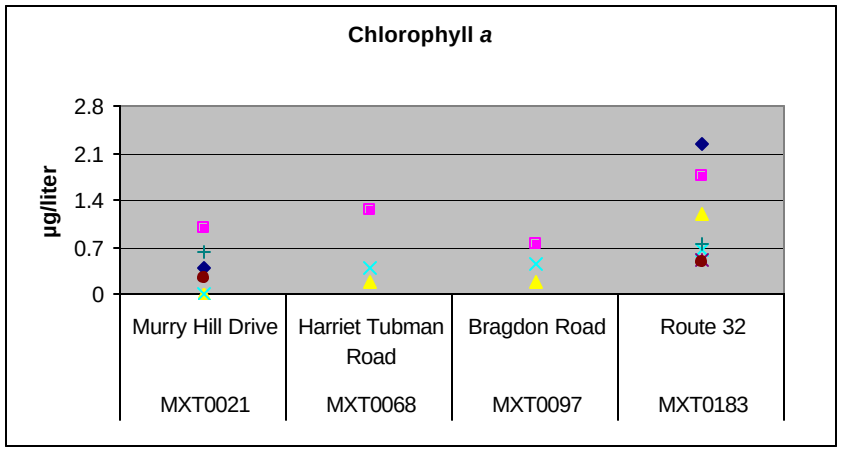


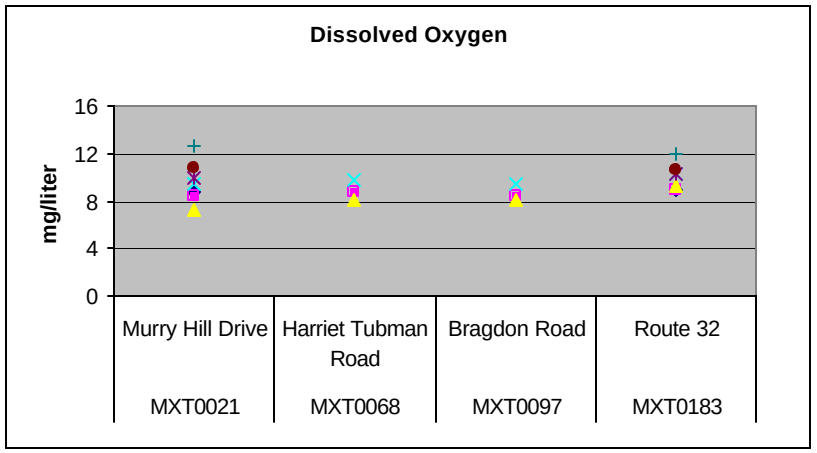


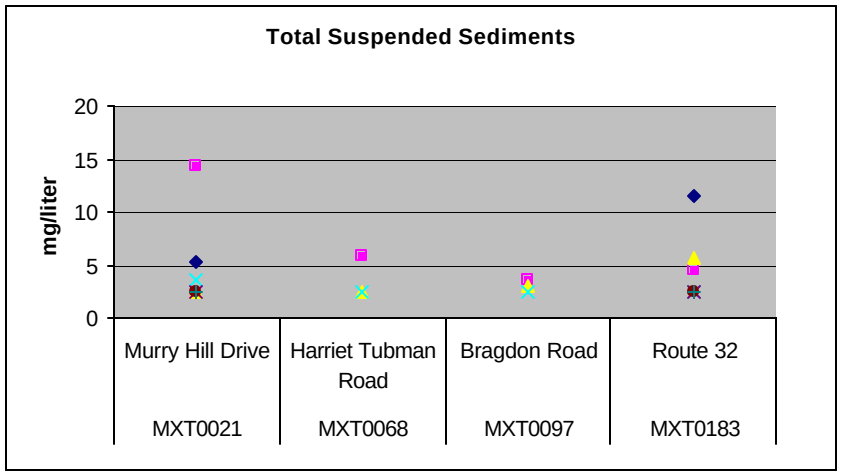


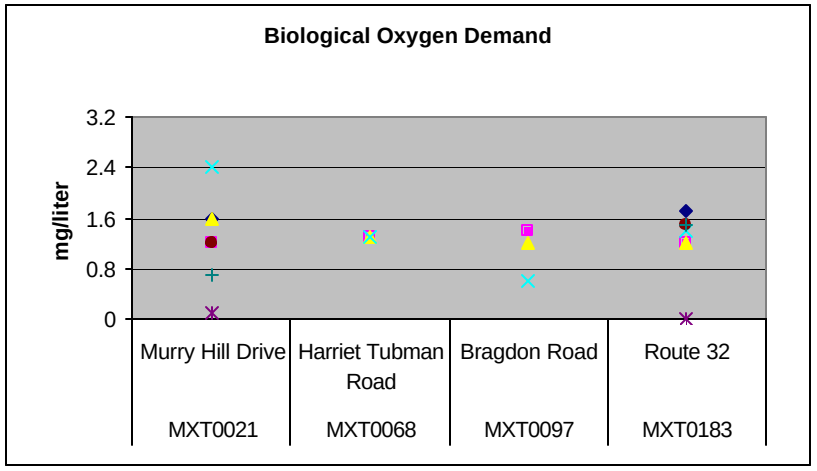


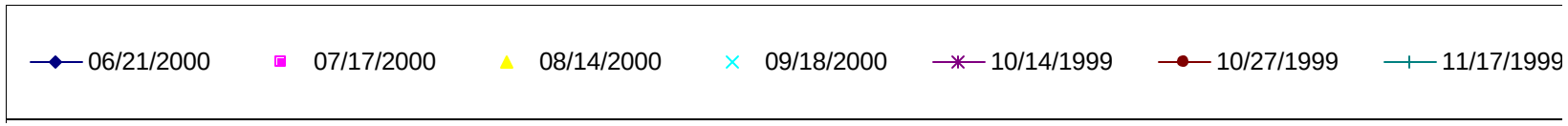
Middle Patuxent River
Low Flow Conditions (June to November)
Stations are presented from left to right from downstream to upstream



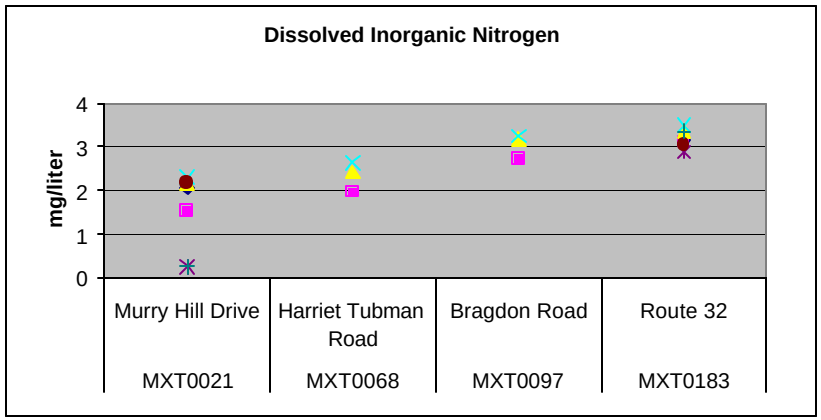


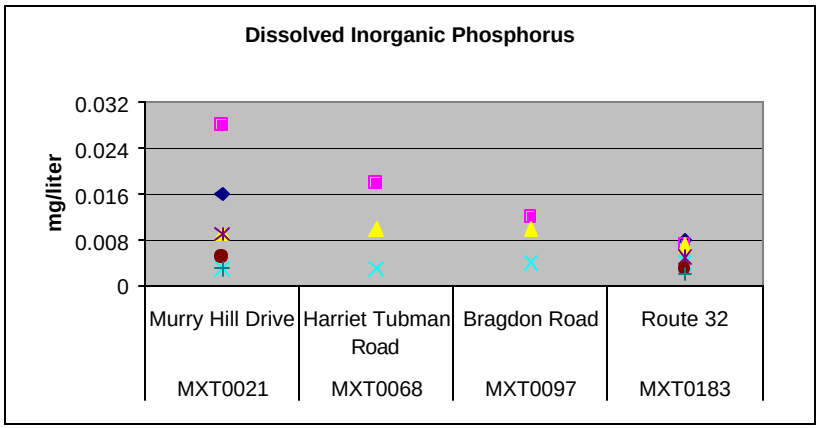


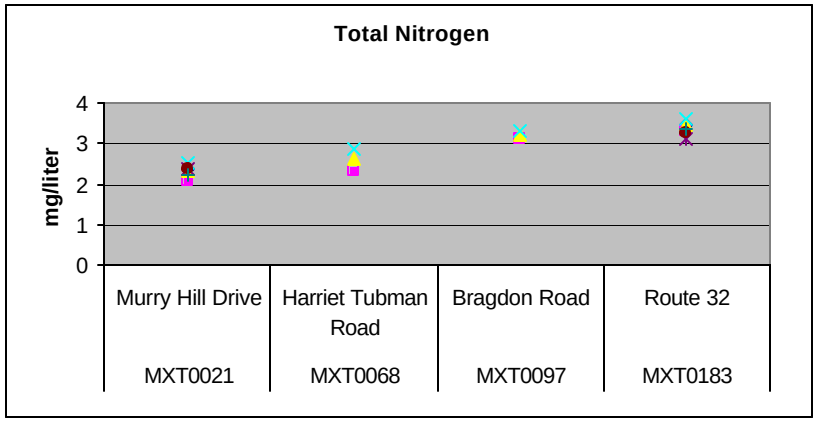


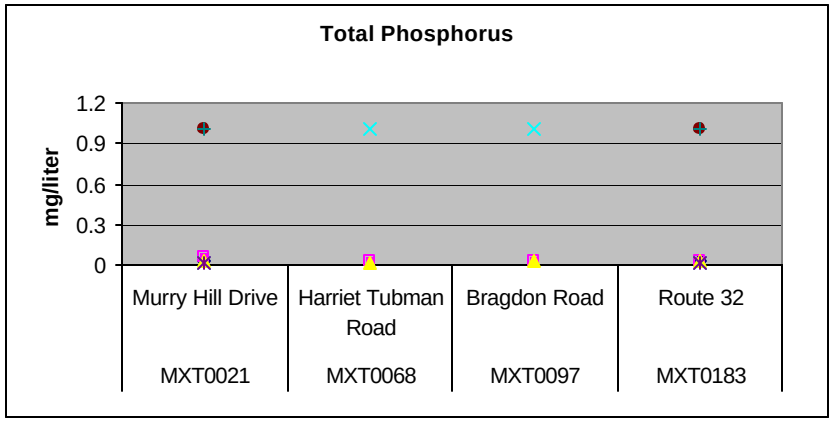


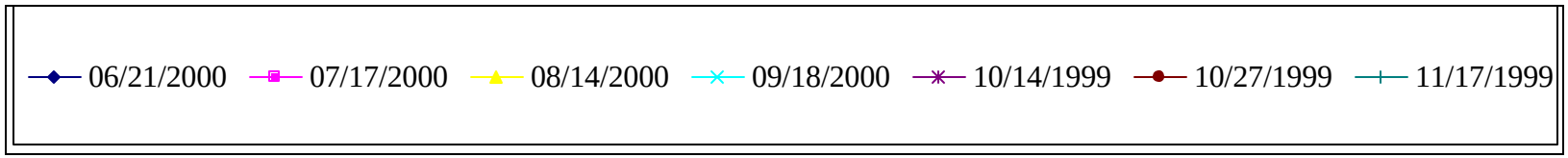
Middle Patuxent River
Low Flow Conditions (June to November)
Stations are presented from left to right from downstream to upstream







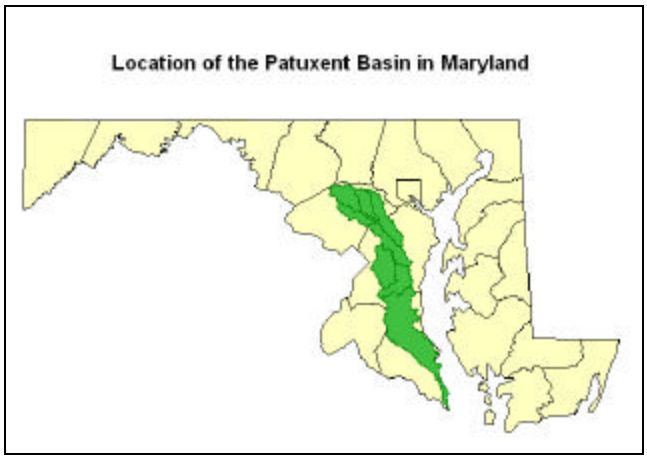


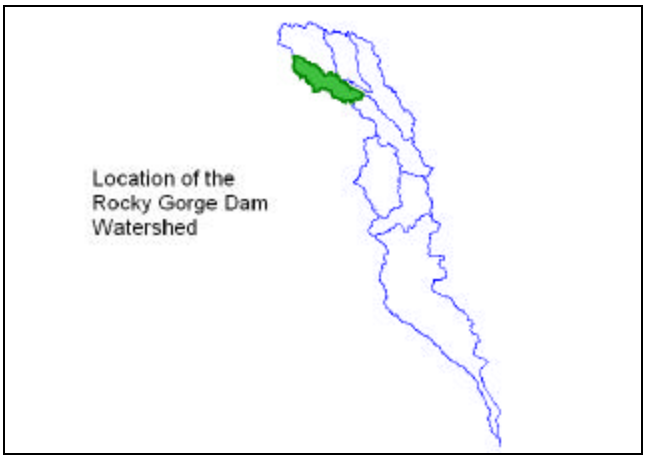


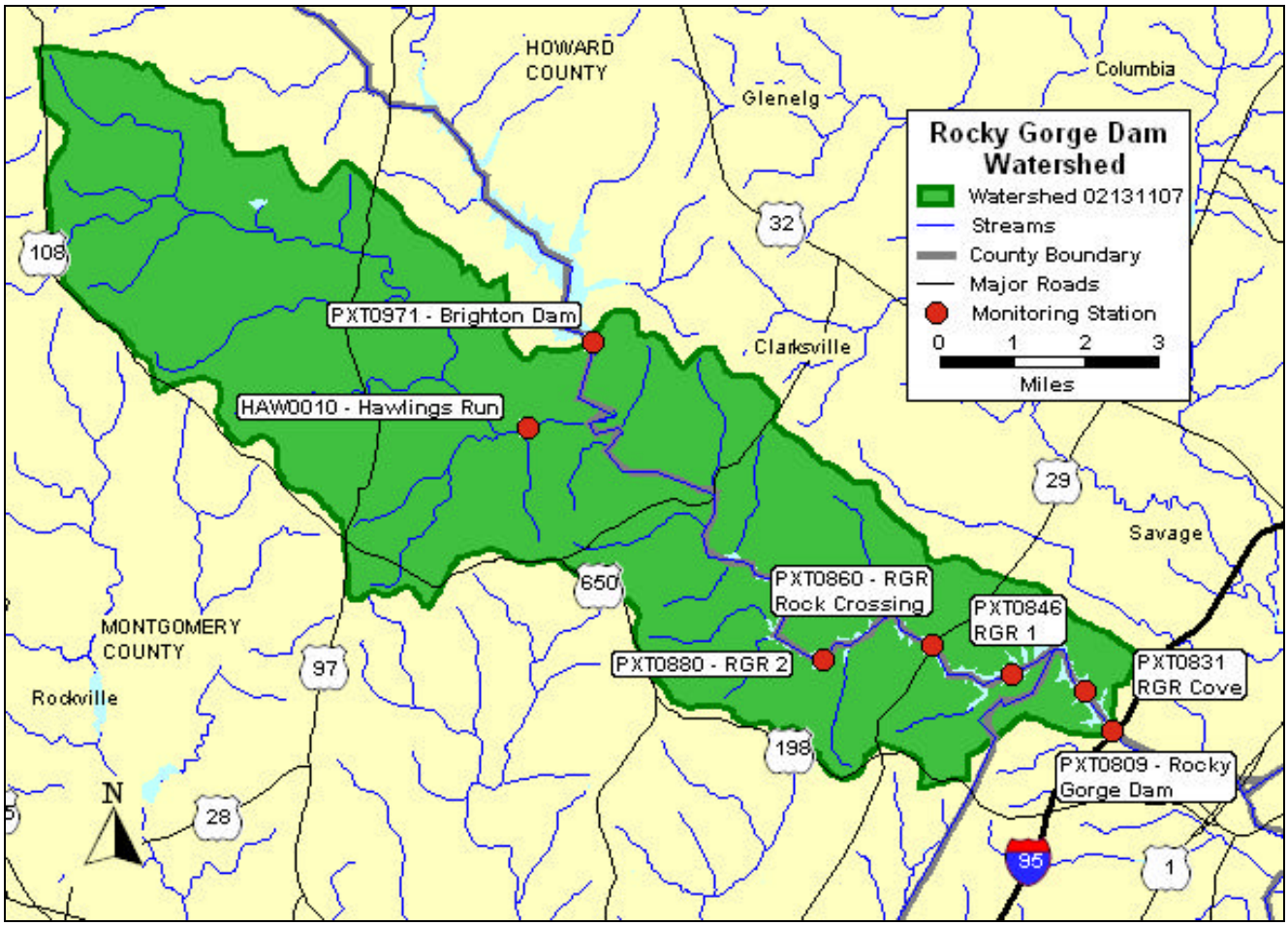
MIDDLE PATUXENT STATION LIST

Station Code	Station Names	Lat/Long	Description
MIDDLE PATUXENT RIVER			
MXT0021	Murry Hill Drive	39 09.609 76 51.128	Murry Hill Drive crossing.
MXT0068	Harriet Tubman Road	39 11.246 76 53.586	Harriet Tubman Road foot bridge crossing off Cedar Lane.
MXT0097	Bragdon Road	39 13.743 76 55.039	Bragdon Road off Route 108 crossing, bank sample.
MXT0183	Route 32	39 17.231 76 57.522	Route 32, Middle Patuxent Bridge crossing.

Rocky Gorge Dam Monitoring Stations

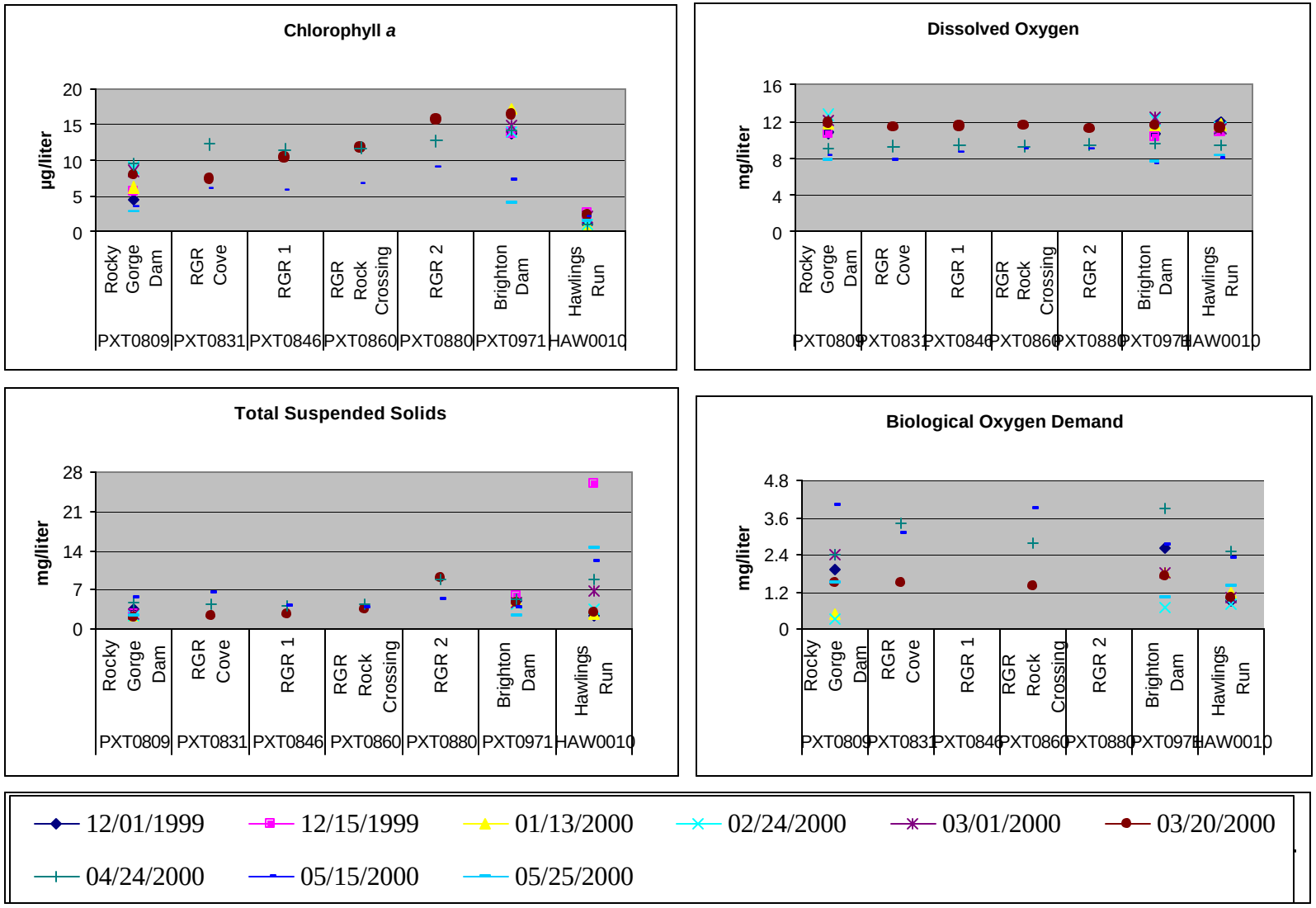






Map Prepared by the Maryland Department of the Environment
Science Services Administration
Montgomery Park Business Center
1800 Washington Boulevard, Suite 540
Baltimore, Maryland 21230-1718

Rocky Gorge Dam
High Flow Conditions (December-May)
Stations are presented from left to right from downstream to upstream



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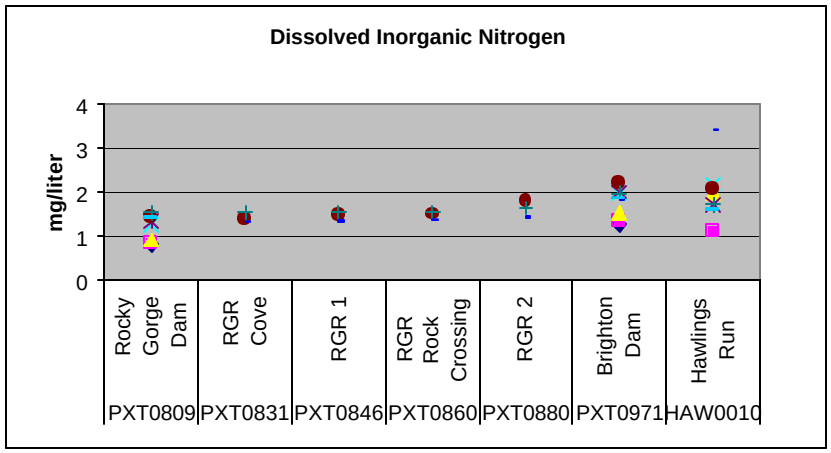

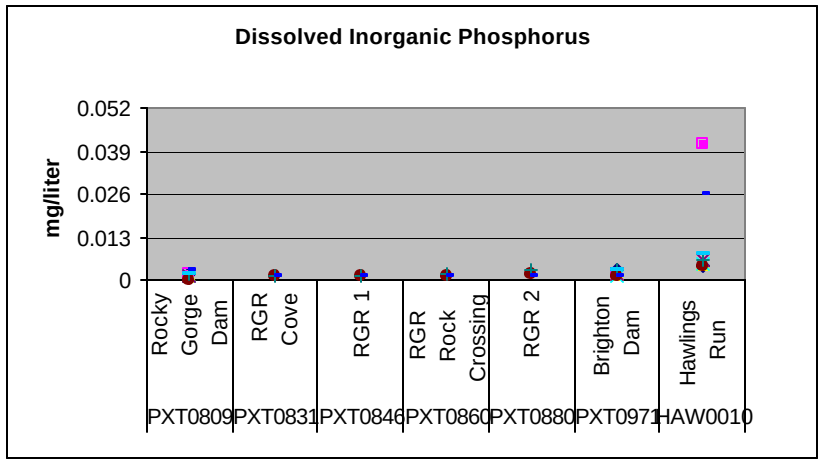

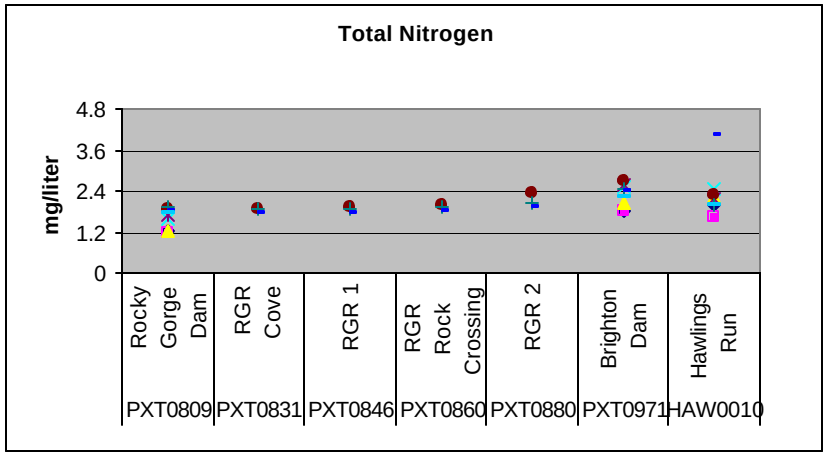

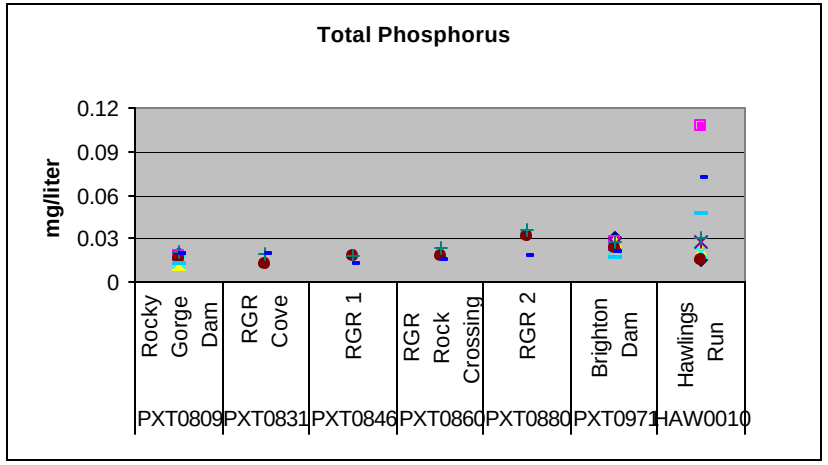

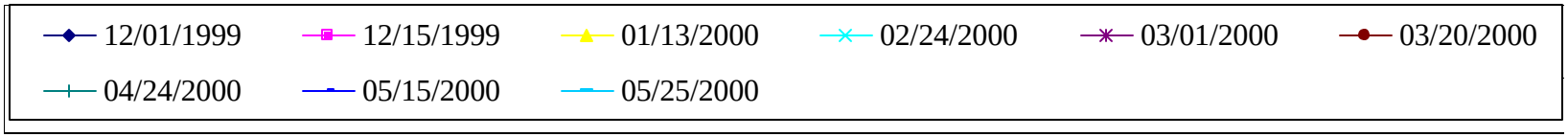

Rocky Gorge Dam
Low Flow Conditions (June to November)
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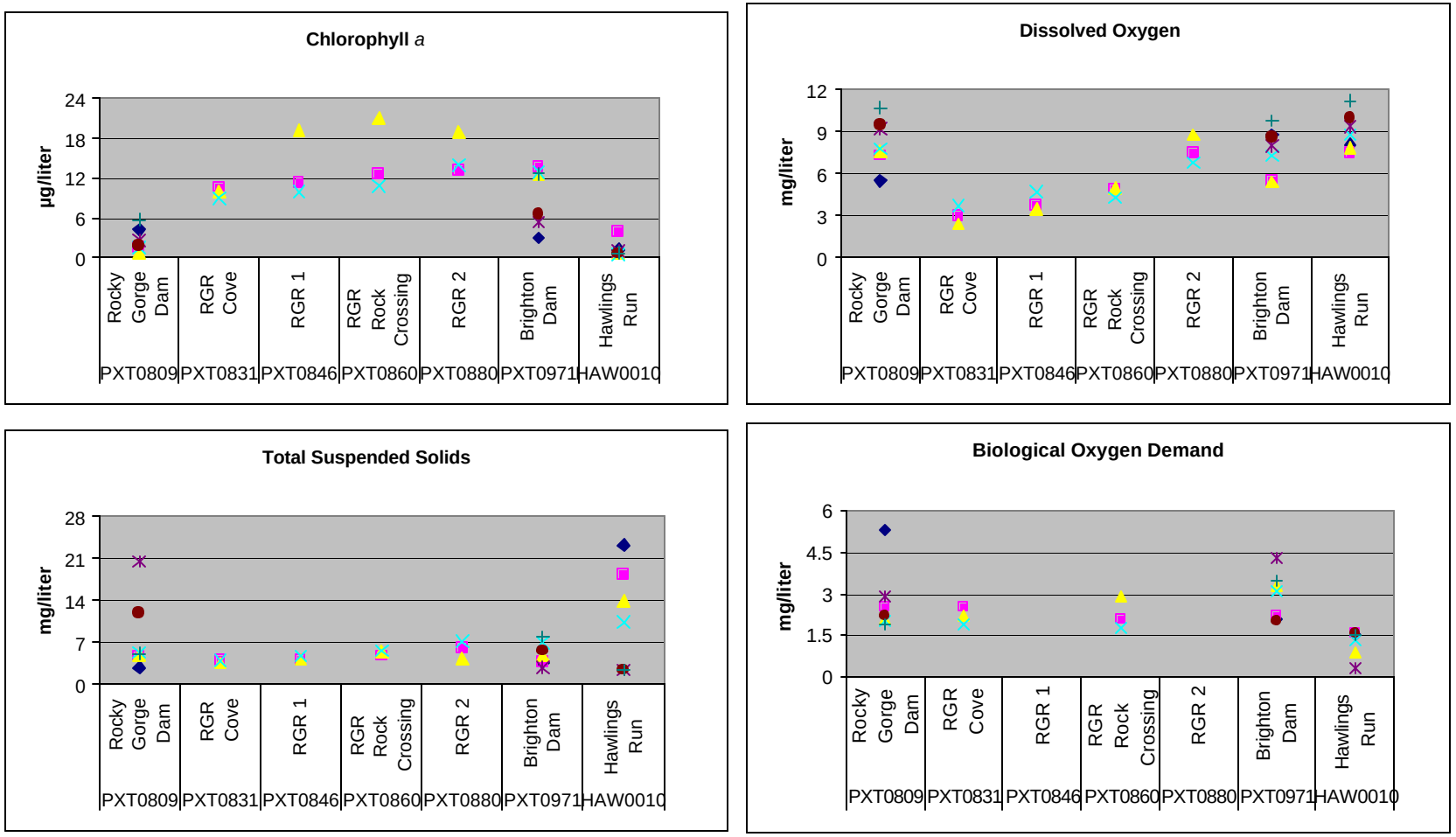

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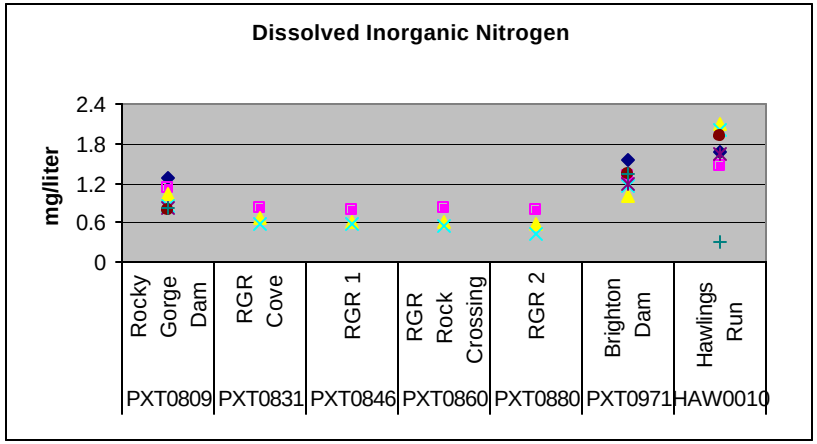
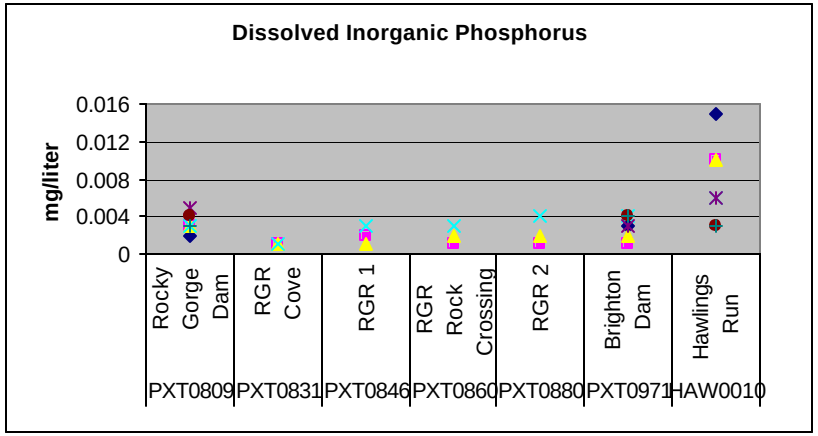
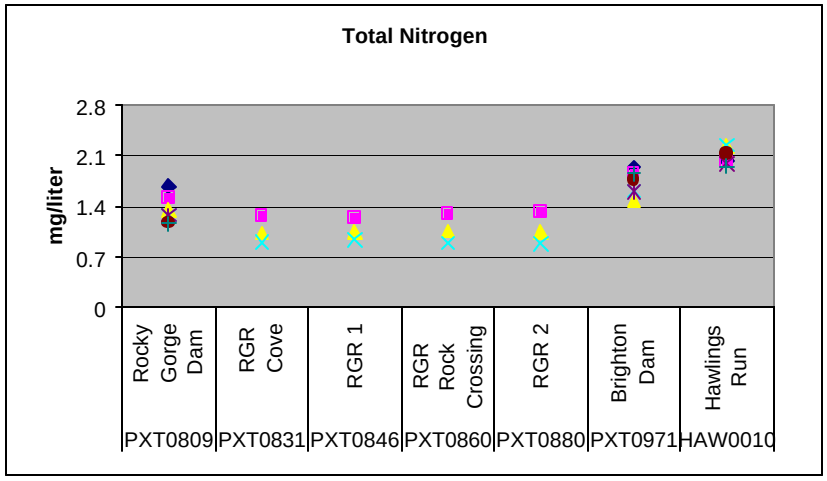
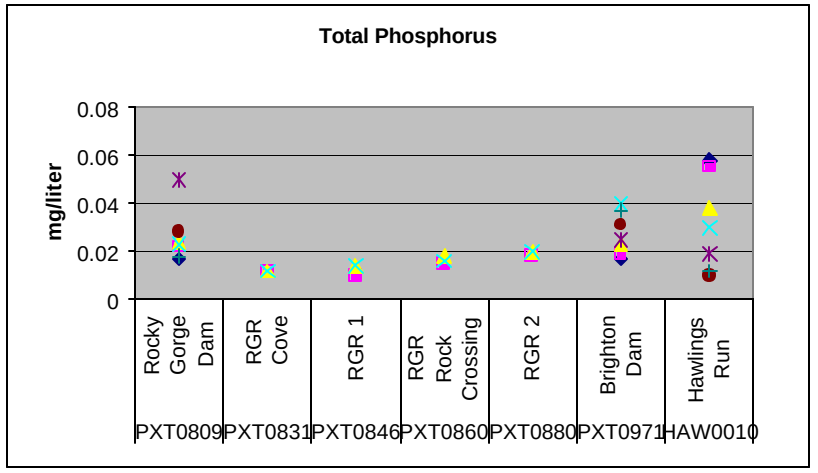
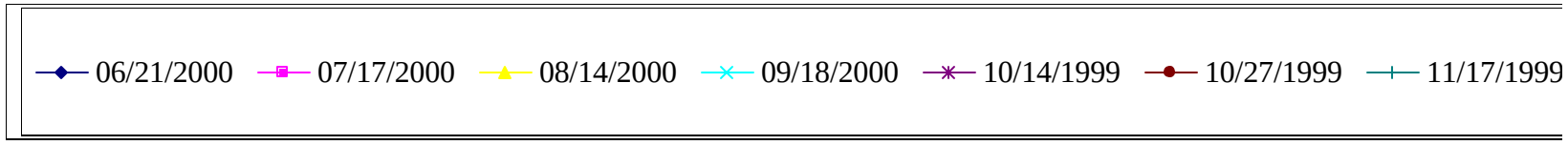






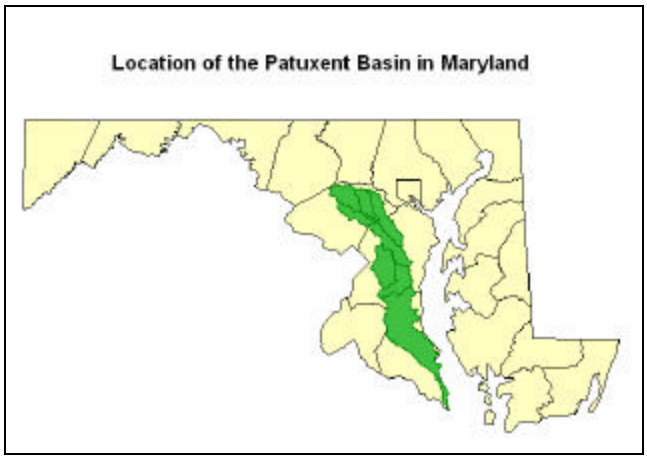


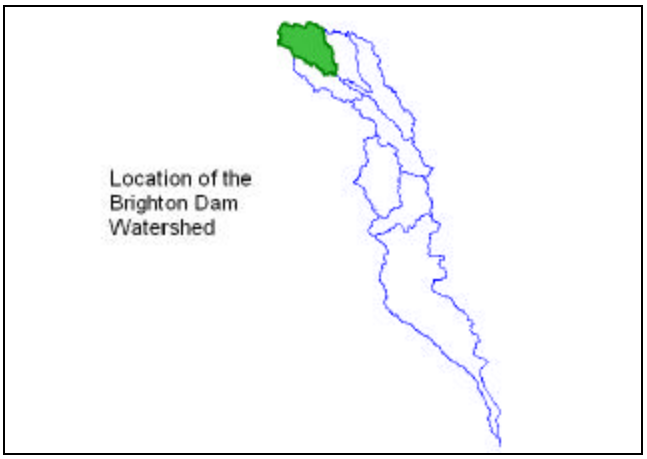


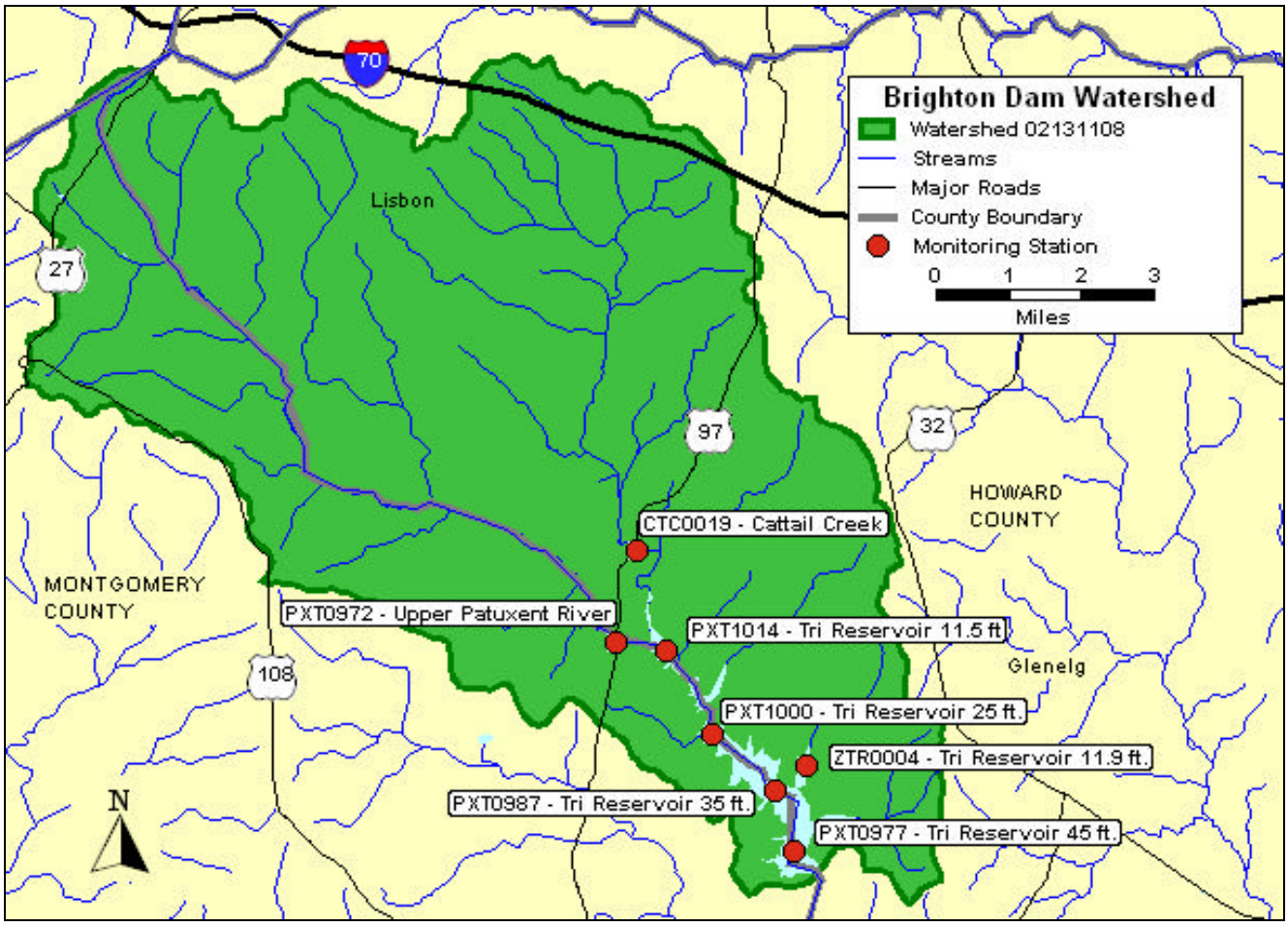
ROCKY GORGE RESERVIOR STATION LIST

Station Code	Station Names	Lat/Long	Description
ROCKY GORGE RESERVOIR			
PXT0831	RGR Cove	39 07.395 76 52.826	Off 2nd cove above dam. 74 ft.
PXT0846	RGR 1	39 07.600 76 53.931	44 ft.
PXT0860	RGR Rock Crossing	39 07.939 76 55.146	Upstream of rock crossing.
PXT0880	RGR 2	39 07.769 76 56.791	16 ft.
UPPER PATUXENT RIVER			
PXT0809	Rocky Gorge Dam	39 06.934 76 52.404	Follow road to base of Rocky Gorge dam. Need card to access gate, read staff.
PXT0971	Brighton Dam	39 11.506 77 00.278	Brighton Dam at Brighton Dam. Take sample from handicap access ramp. See ranger for flow and gate access.
HAWLINGS RUN (tributary of Patuxent River)			
HAW0010	Hawlings Run	39 10.501 77 01.279	Route 650 crossing. USGS Gage downstream side of bridge.

Brighton Dam Monitoring Stations







Map Prepared by the Maryland Department of the Environment
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Brighton Dam
High Flow Conditions (December-May)
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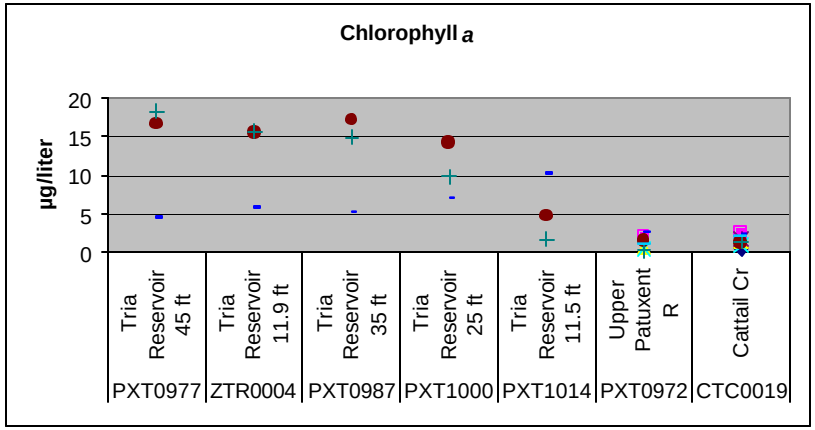

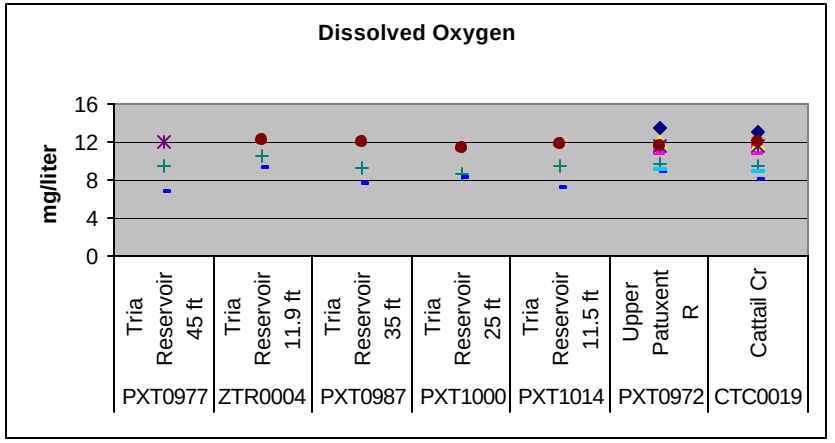

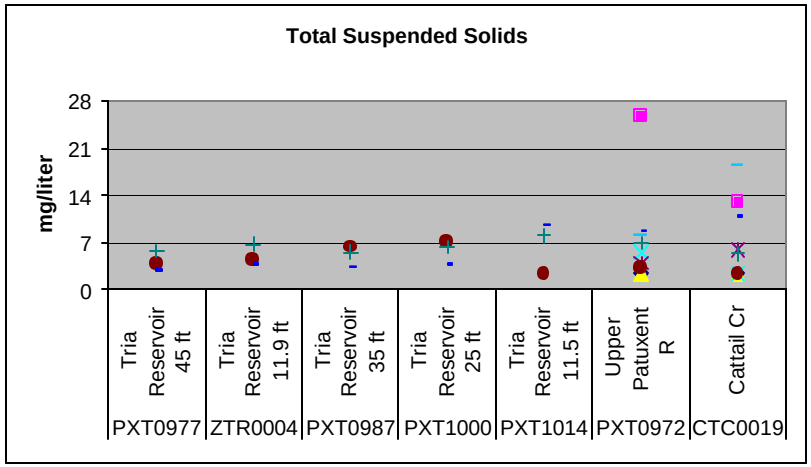

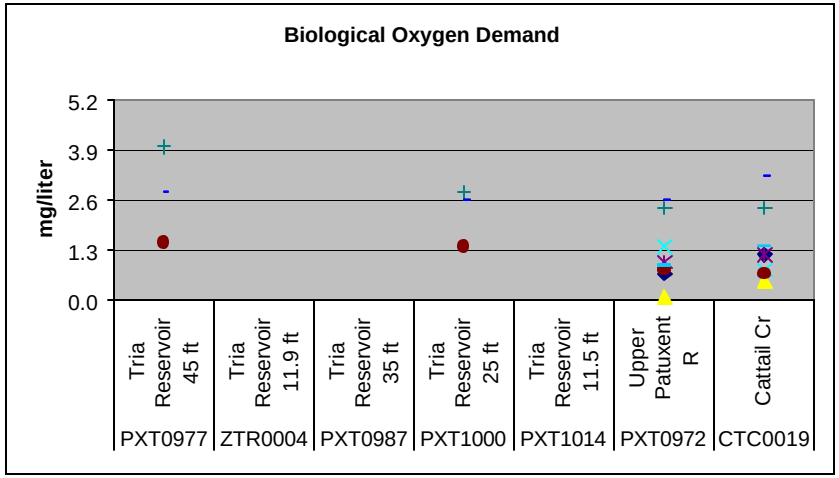

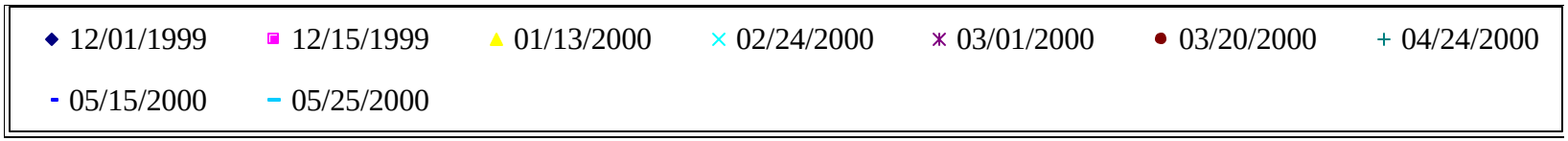

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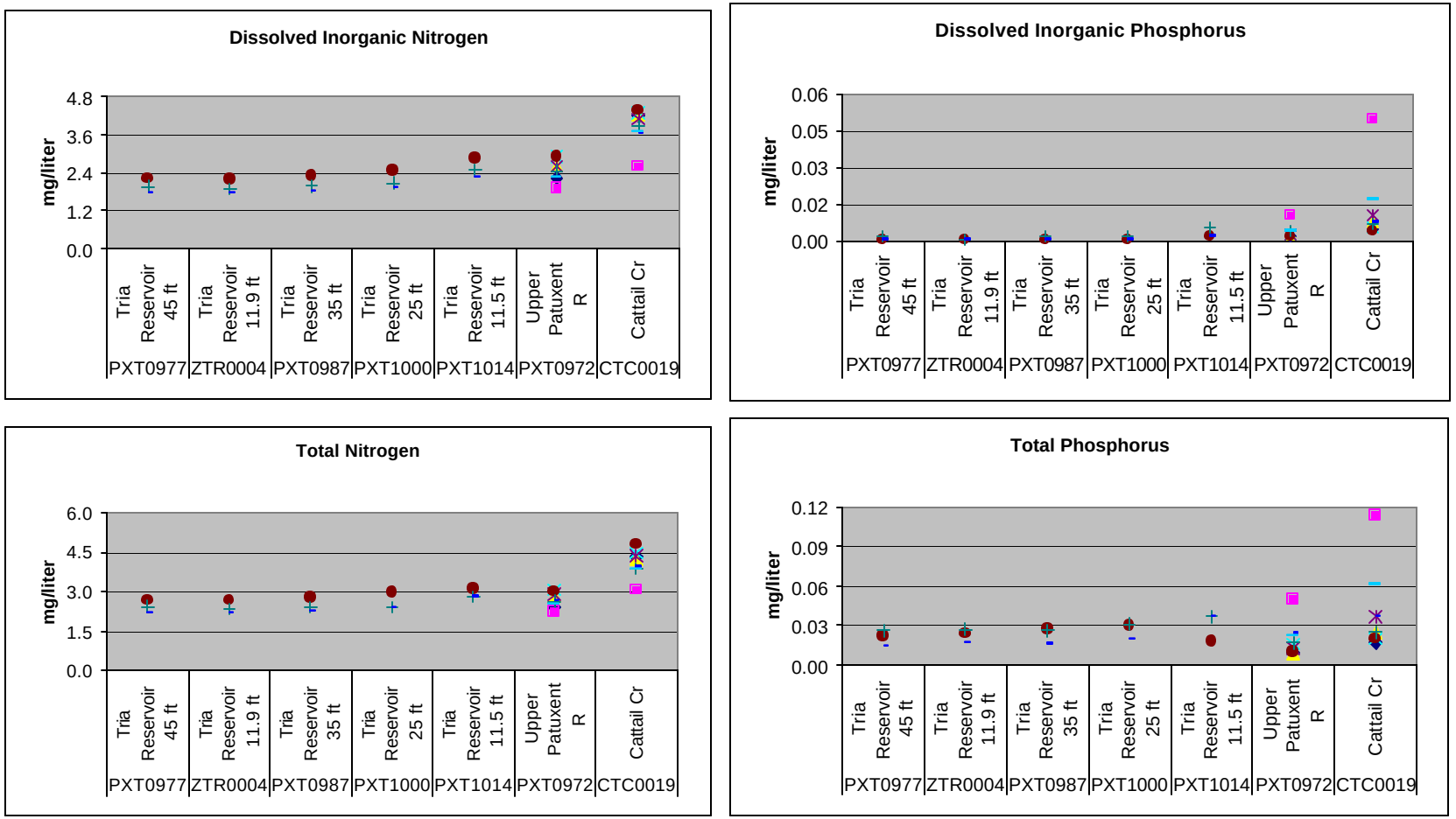

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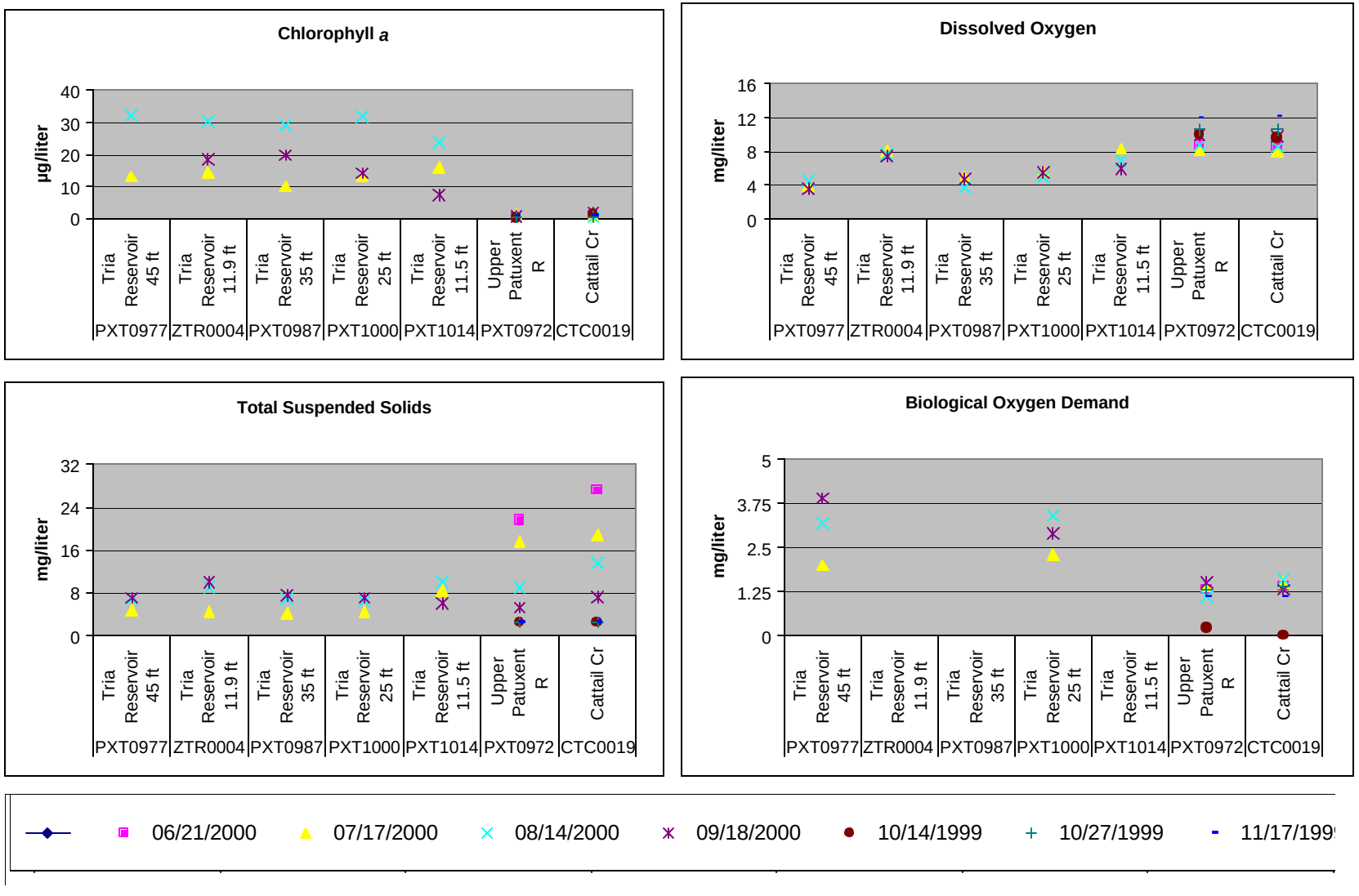

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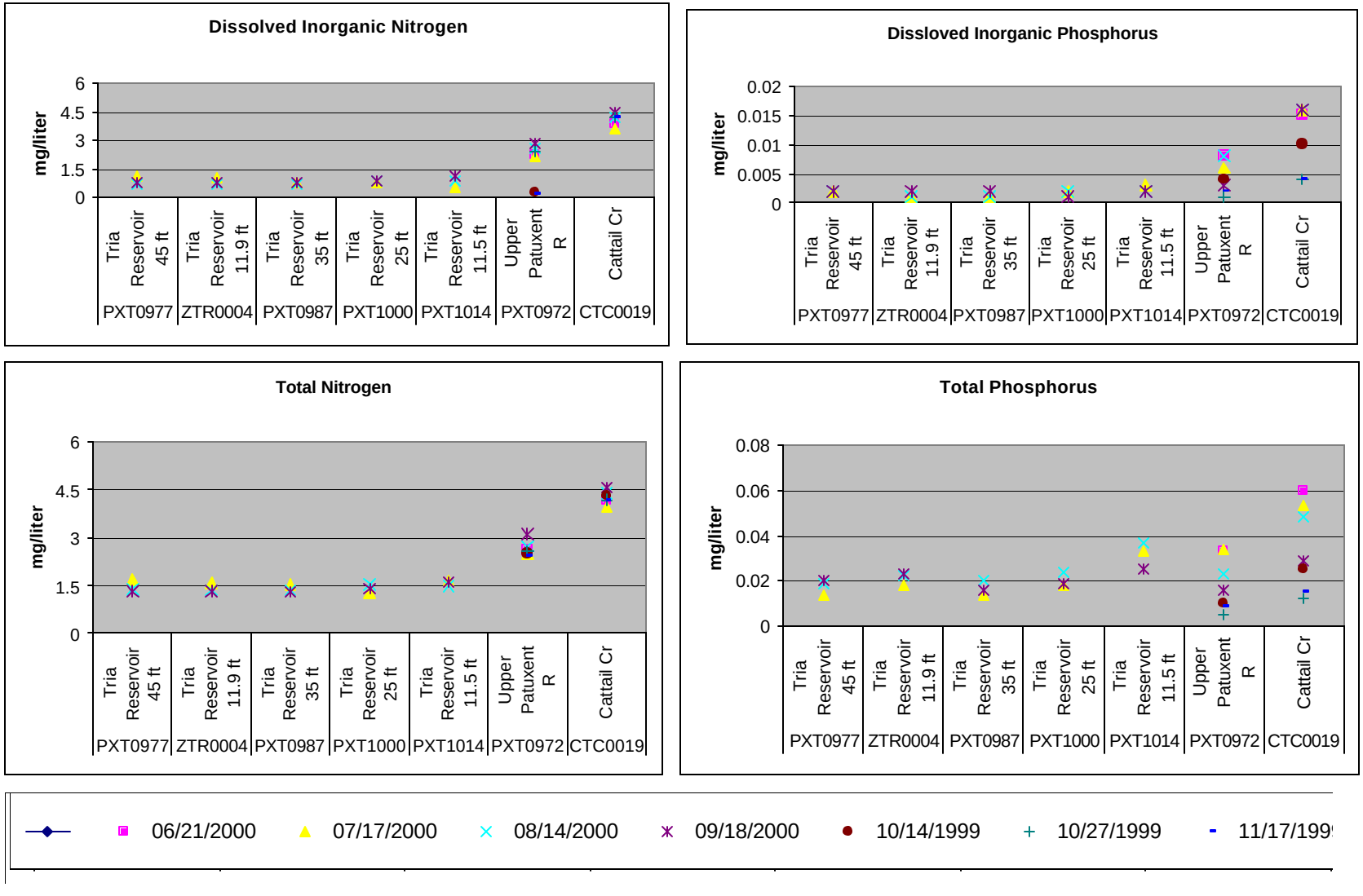

BRIGHTON DAM STATION LIST

Station Code	Station Names	Lat/Long	Description
TRIADELPHIA RESERVOIR			
PXT0977	Tri Reservoir 45 ft.	39 11.826 77 00.663	45 ft.
ZTR0004	Tri Reservoir 11.9 ft.	39 12.839 77 00.485	11.9 ft.
PXT0987	Tri Reservoir 35 ft.	39 12.522 77 00.942	35 ft.
PXT1000	Tri Reservoir 25 ft.	39 13.210 77 01.904	25 ft.
PXT1014	Tri Reservoir 11.5 ft.	39 14.174 77 02.619	11.5 ft.
UPPER PATUXENT RIVER			
PXT0972	Upper Patuxent River	39 14.291 77 03.363	MD 97/Georgia Avenue crossing.
CATTAIL CREEK			
CTC0019	Cattail Creek	39 15.360 77 03.067	MD 97 bridge crossing. USGS Gage downstream side of bridge.