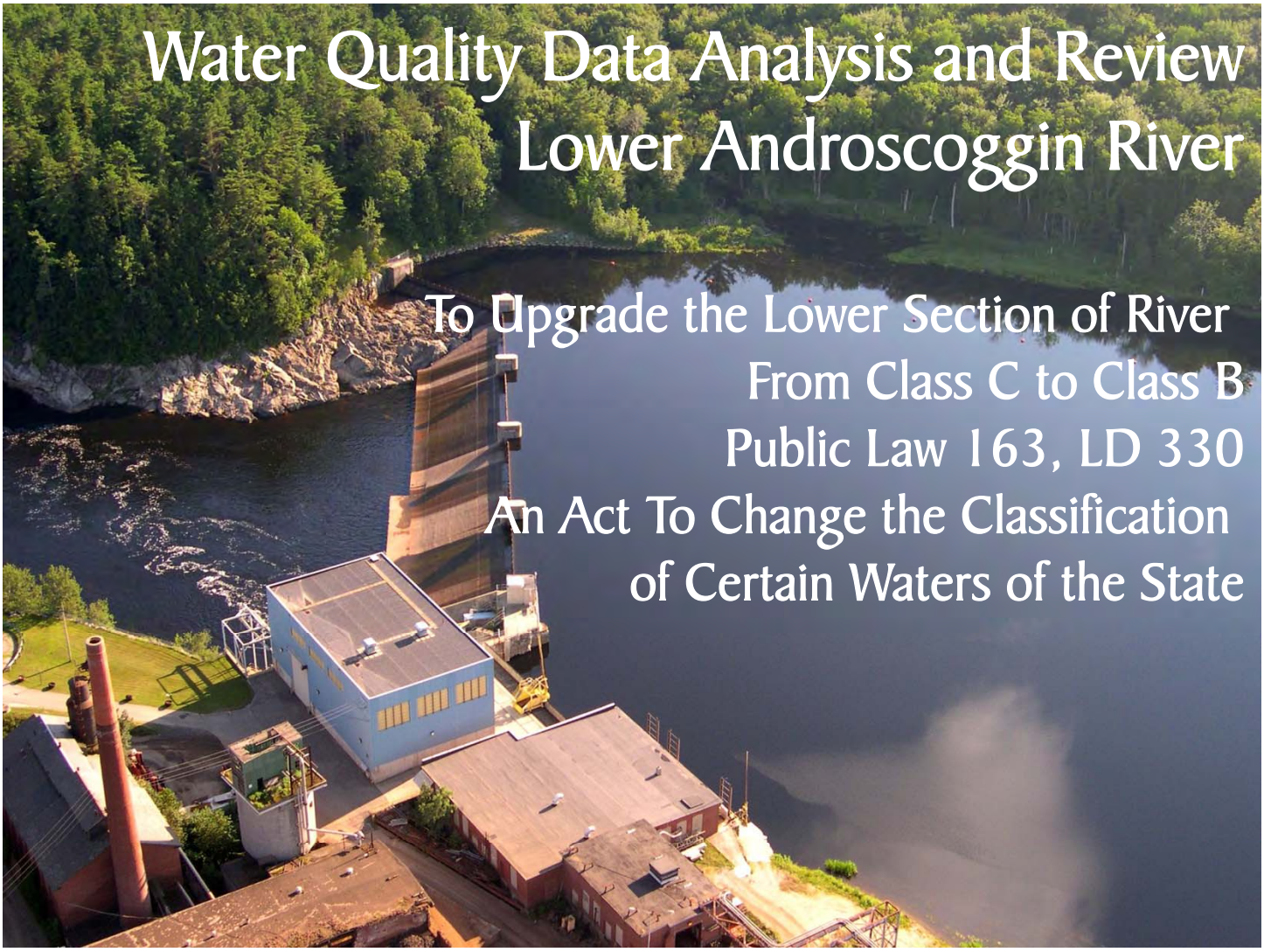
Water Quality Data Analysis and Review
Lower Androscoggin River



To Upgrade the Lower Section of River From Class C to Class B
Public Law 163, LD 330
An Act To Change the Classification of Certain Waters of the State

Prepared by
Friends of Merrymeeting Bay
Applied Biomonitoring
January 28, 2011

Table of Contents

Androscoggin River
Water Quality Data Analysis and Review
To Upgrade the Lower Section of River from Class C to Class B
January 28, 2011

Executive Summary

Clean rivers enhance the local economy and vitality of the communities surrounding them. A clean, healthy river attracts people, new businesses, and increases property value. A clean river is good for business, the environment and quality of life. An upgrade of the Androscoggin will enhance the surrounding communities, not have an adverse impact on current industrial uses along the river since Class B conditions have been met for years in the course of "business as usual."

DEP classification proposal submission guidelines state:

> **"Maine's Water Quality Classification System is goal-based.** ***When proposing an upgrade in classification, recommend waters that either presently attain or with reasonable application of improved treatment or Best Management Practices (BMPs), could reasonably be expected to attain, the standards and criteria of a higher proposed class***."

In accordance with LD 330 Section 24 passed in 2009, intensive water quality data were collected on the lower Androscoggin from April-October of 2009 and 2010 in an effort to better substantiate a classification upgrade proposal for boosting the lower river to Class B from Class C. These data are in addition to those supplied by FOMB in previous years. Friends of Merrymeeting Bay (FOMB) conducted this effort in cooperation with DEP partly under the auspices of their Volunteer River Monitoring Program (VRMP).

2010 data for *E. coli* and dissolved oxygen (DO) were acquired monthly versus 2009 data which were collected bi-weekly. 2010 had low water flows and high temperatures versus 2009 conditions of higher than median flows and mixed temperatures. 2010 results confirmed those of 2009 and prior years; ambient river conditions consistently exceed Class B standards for *E. coli* and DO.

Data continue to support FOMB's proposed upgrade from Class C to Class B of the lower Androscoggin between Worumbo Dam and an extension of the Bath-Brunswick line across Merrymeeting Bay. Intensive sampling by DEP in 2010, support current and past FOMB results. FOMB requests the BEP in accordance with both statute and goal-based or aspirational DEP guidelines and the Clean Water Act, recommend a classification upgrade of this river segment to the legislature and the legislature reclassify it as Class B.

> *38 M.R.S.A. § 464 (4) (F) (4)*
>
> *"When the actual quality of any classified water exceeds the minimum standards of the next highest classification, that higher water quality must be maintained and protected. The board* ***shall recommend*** *to the Legislature that water be reclassified in the next higher classification."*

****

Androscoggin River
Water Quality Data Analysis and Review
To Upgrade the Lower Section of River from Class C to Class B
January 28, 2011

Introduction

Clean rivers enhance the local economy and vitality of the communities surrounding them. A clean, healthy river attracts people, new businesses, and increases property value. A clean river is good for business, the environment and quality of life. An upgrade of the Androscoggin will not have an adverse impact on current industrial uses along the river since Class B conditions have been met for years in the course of "business as usual."

DEP classification proposal submission guidelines state:

> **"Maine's Water Quality Classification System is goal-based.** ***When proposing an upgrade in classification, recommend waters that either presently attain or with reasonable application of improved treatment or Best Management Practices (BMPs), could reasonably be expected to attain, the standards and criteria of a higher proposed class***."

In accordance with LD 330 Section 24 passed in 2009, intensive and additional water quality data were collected on the lower Androscoggin from April-October of 2009 in an effort to better substantiate a classification upgrade proposal for boosting the lower river to Class B from Class C. This effort was conducted by Friends of Merrymeeting Bay (FOMB) in cooperation with DEP partly under the auspices of their Volunteer River Monitoring Program (VRMP). Sampling occurred every two weeks in 2009 and data during a damp summer with above median flows supported an upgrade to Class B.

Class B standards are defined primarily by three sets of numeric criteria, dissolved oxygen (DO) in mg/l (ppm), saturated dissolved oxygen in percent and *E. coli* bacteria in colony counts/100ml. There are also more qualitative habitat and aquatic life criteria typically evaluated by the presence, variety and type of macro-invertebrates to colonize a rock-filled basket over time. Of primary concern are the numeric criteria because the legislature has recognized the special nature of hydropower impoundments when it comes to habitat and aquatic life criteria and understands typical Class A or B community structures may not be achieved due to the impoundment while the segment still may receive the A or B classifications. With this in mind it is clear an absence of Class B type macro-invertebrates in some samples cannot prevent an upgrade.

In our multi-year sampling efforts, *E. coli* parameters for Class B have always been met, in the several hundred DO measurements taken over the years, only in a very few isolated instances has the measured DO dropped slightly (.1-.5) below the Class B standard and in 2011, the first year we measured oxygen saturation, all saturation levels met the Class B standard. With reasonable application of improved treatment or BMPs we can reasonably expect 100% compliance with Class B standards and criteria.

In 2010, FOMB continued sampling of lower Androscoggin sites but cut back to a monthly schedule more sustainable for volunteers. This was an especially hot and dry summer with low flows. The DEP conducted two intensive three-day periods of data collection on which to base a

discharge model. FOMB provided daily volunteers for the department's first round of sampling. Department personnel completed the second session on their own.

According to Maine statutes, modeling has no bearing on the classification process §464 (4) (F) (4) which is based solely on actual ambient river conditions. In contrast to classification, modeling does play a role in relicensing (§464 (4) (D) when dischargers are to meet the river classification under minimum seven-day low flow conditions expected to take place once every ten years (known as 7Q10). The purposeful policy reason for the difference in requirements for classification and relicensing is so that water quality conditions may slowly be improved or ratcheted up. This is the goal-oriented purpose both of the Clean Water Act and Maine statute.

Data gathering and results from 2010 support earlier water quality data gathered in previous years by FOMB on the lower Androscoggin. Trends in both dissolved oxygen and *E .coli* follow similar month patterns exhibited in previous years. The data collected in 2010 show excellent compliance with Class B standards. Intensive sampling by DEP also supported current and past FOMB results.

> *38 M.R.S.A. § 464 (4) (F) (4)*
>
> *"When the actual quality of any classified water exceeds the minimum standards of the next highest classification, that higher water quality must be maintained and protected. The board **shall recommend** to the Legislature that water be reclassified in the next higher classification."*

While 2009 was one of the wettest summers on record with June and July the wettest months, the National Weather Service also recorded some of the highest temperatures ever for Portland in April and August (and November).

According to the National Weather Service, the spring of 2010 in Portland, ME, will go into the record books as the warmest in the past 70 years. This included the warmest March and April on record, plus the second warmest May on record. USGS daily flow records for the Androscoggin River measured from their Auburn, ME station show below normal flows from mid-April through the end of September, with occasional higher flows occurring for short periods during June, July, and August. Flow patterns for the Kennebec River measured at North Sidney, ME were very similar to the Androscoggin River, with flow rates dropping dramatically in mid-April and remaining below the median flow rate until October. There were fewer excursions above the median flow rate in the summer months; one occurrence in early June and one in the first part of July. Flow rates at both USGS stations were extremely different than measured in 2009, as the 2009 mid-June through September flow rates were way above the 23-year median and the 2010 flow rates were below average.

Neither lengthy nor expensive flow models nor, awaiting the confluence of low flows and high temperatures, can by law obstruct the timely passage of "goal oriented" upgrades. This year's data collected under nearly opposite weather and flow conditions from 2009 demonstrate extreme highs and lows have little effect on long-term ambient river conditions, what our classifications are meant to be based on.

Monthly and intensive sampling of the lower Androscoggin in 2010 shows water conditions meet Class B standards virtually all of the time. In only two instances during May through September did measurements within the proposed upgrade area drop below Class B dissolved oxygen standard of ≥7 ppm DO (6.9 and 6.5 ppm DO). **The *E. coli* and dissolved oxygen data continue to support, and we recommend, a goal-based or aspirational upgrade of water**

quality classification from Class C to Class B for the lower Androscoggin between Worumbo Dam and Merrymeeting Bay.

Approach

In 2010, dissolved oxygen (mg/L), DO saturation (%) and *E. coli* (# colonies/100 ml) water quality data were collected between April and October from the same locations in the Androscoggin River sampled in 2009. Distribution of sampling sites provide excellent coverage of the study area. Excluding the two mooring sites there are two sites in tidewater above Merrymeeting Bay at Pleasant Point. There are three sites in the impoundment between the Brunswick-Topsham and Pejepscot dams and two sites in the short impoundment between Pejepscot and Worumbo dams. Durham Boat Launch remains the lower most site between Worumbo and Auburn Boat Launch where we have another monitor. Several of these sites have been sampled for *E.coli* since 2006 and for DO since 1999. These data, along with collection dates/times, weather conditions, and other notations, were tabularized then analyzed to determine if the waterways meet the criterion to be reclassified as Class B. The criteria for reclassification are:

Dissolved Oxygen: =7 ppm instantaneous reading, 75% percent dissolved oxygen saturation ≥ 75%.
E. coli: 64 colonies /100 ml geometric mean; 236 colonies/100ml instantaneous reading

FOMB and Friends of Casco Bay with whom we coordinate, conduct water sampling from April-October. However, data presented here are for the most part limited to those collected from May-September, the period of interest to the DEP. This is the period covered by municipal waste water treatment disinfection, chlorination and de-chlorination, the period of highest human contact and the period of lowest dissolved oxygen conditions. Storm flow or CSO events are more likely outside of this period and are not included when evaluating classification standards.

The following data comparisons were made:

1. *E. coli* v. Class B standard
   - 2010 data
   - historical trends (2006 through 2010)
   - Comparison of all sites
   - Yearly geometric means
2. DO v. standards (instantaneous reading and percent dissolved oxygen) for Class B
   - 2010 data
   - historical trends (2003 through 2010)
   - Comparison of all sites
   - Yearly geometric means
3. Shore v. mid-stream sample grabs at depth

Results - E. coli

Ten (10) sites were sampled during the 2010 season:

Durham Boat Launch (DBL)
Pejepscot Boat Launch (PBL)
Fish Park Up [above dam] (FPU)
Fish Park Down [below dam] (FPD)
Brunswick Interstate Ledges (BIL)
Brunswick Canoe Portage (BCP)

Brunswick Canoe Mooring (BCM) [off BCP]
Brunswick Water St. Boat Launch (BWS)
Water St. Mooring (WSM) [off BWS]
Brunswick Bay Bridge (BBB)

The graphs for these sites show instantaneous values and geometric means for the sampling season. The geometric means were calculated using all data; there were no heavy rain events within 48 hours of data collection so no data were excluded from the analyses. The instantaneous data show excellent compliance with the criterion. No sites were out of compliance during the months of May through September with respect to instantaneous measurements. Similarly, none of the geometric means were out of compliance. A complete listing of *E. coli* data collected for these sites during 2010 is provided.

Historical *E. coli* data were available for three sites to evaluate trends over time: Pejepscot Boat Launch, Brunswick Water Street Boat Launch, and Brunswick Bay Bridge. Four types of graphs were prepared for these data:

(1) the instantaneous data for each site (one site per page),
(2) instantaneous data for all sites graphed together,
(3) the geometric means for each site over times (all sites on one page),
(4) a summary graph showing the geometric mean by year.

The means were calculated using all available data for the year. These graphs show the majority of the instantaneous data are in compliance, with minor exceptions occurring in 2006 and 2009. None of the geometric means by station and year are out of compliance. Similarly, all of the geometric means (for both all data, and no rain event data) determined for the years 2006 through 2010 are in compliance with both the Class C and Class B criteria.

Results - Dissolved Oxygen

Eleven (11) sites were sampled during the 2010 season; additional measurements were collected at Topsham Pleasant Point for informational purposes only about Merrymeeting Bay DO levels in this area. These data were collected at varying times and tides on target days using the Winkler Titration method. This Topsham site falls within a river segment already classified as B. (Actually DO data [all exceeding 7ppm] were also collected in 2009 and 2010 at the Auburn Boat Launch [ABL] in the same manner as at TPP but are not included here since the site is well out of the proposed upgrade area).

Durham Boat Launch (DBL)
Pejepscot Boat Launch (PBL)
Fish Park Up [above dam] (FPU)
Fish Park Down [below dam] (FPD)
Brunswick Interstate Ledges (BIL)
Brunswick Canoe Portage (BCP)
Brunswick Canoe Mooring (BCM) [off BCP]
Brunswick Water St. Boat Launch (BWS)
Water St. Mooring (WSM) [off BWS]
Brunswick Bay Bridge (BBB)
Topsham Pleasant Point (TPP)

The graphs for these data show instantaneous values for the sampling season. The instantaneous data show excellent compliance with the criterion. Only three measurements were out of compliance: Durham Boat Launch (out of the proposal area) and Brunswick Bay Bridge (tidewater adjacent to a 60K/day overboard discharge), both in July, and Water Street Mooring

(impoundment) in August. Interestingly, each of the non-compliance readings was only just below the criterion (see table below). None of the sites were ever out of compliance for the 75% dissolved oxygen saturation criterion. The following table summarizes the number of non-compliance events and the sampling dates for the different sites over the 2010 sampling period:

	2010 DO non-compliance events Criterion = ≥ 7 ppm
Durham Boat Launch (DBL) [out of area]	7/11/10 (6.5 ppm)
Pejepscot Boat Launch (PBL)	none
Fish Park Up [above dam] (FPU)	none
Fish Park Down [below dam] (FPD)	none
Brunswick Interstate Ledges (BIL)	none
Brunswick Canoe Portage (BCP)	none
Brunswick Canoe Mooring (BCM) [off BCP]	none
Brunswick Water St. Boat Launch (BWS)	none
Water St. Mooring (WSM) [off BWS]	8/15/10 (6.9 ppm)
Brunswick Bay Bridge (BBB)	7/11/10 (6.5 ppm)

A complete listing of the DO data collected for these sites during 2010 is provided. Historical DO data were available for three sites to evaluate trends over time: Durham Boat Launch, Pejepscot Boat Launch, and Topsham Pleasant Point. Note that the 2010 Topsham Pleasant Point data were collected after the recommended time of 0800 hours and are, therefore, not included in most of our 2010 analyses. [Note: Topsham Pleasant Pt., Brunswick Bay Bridge and Brunswick Water St. and Mooring sites are all in tidewater. These sites may not be nearly so affected by diurnal DO fluctuations as sites above Brunswick/Topsham dam may be. At these shallow tidal sites, DO could be reduced more by higher temperatures warming the water during the day, particularly at low tide, than by the more typical night-time sag.] Topsham Pleasant Pt. data are provided because this site has already been upgraded to a Class B waterway and they make a good comparison to the sites under evaluation. These graphs show nearly all instantaneous data for each site are in compliance. The exceptions occur at Durham Boat Launch, with three non-compliance events occurring in 2003, one in fall of 2009, and one in 2010. A comparison of the DBL and PBL to a current Class B waterway (TPP) shows since 2003, dissolved oxygen concentrations in these three waterways have been consistently similar.

The graph comparing averages for all data by year shows that since 2003, the lower Androscoggin River has been in compliance with both Class C and Class B criteria.

Shore v. Mid-stream Sampling

Mid-stream sampling on a large river adds more time, logistical problems and hazards to a river monitoring program whether sampling from a bridge or a boat. Prior to 2009, FOMB sampling efforts have all been from shore. In 2009, responding to the DEP new VRMP protocols, two mooring sites were added off of shore sites. Paired shore and mid-stream sampling were conducted at these two sites in 2009 (no significant differences) and again during the 2010 sampling season:

Brunswick Canoe Portage (shore) and Brunswick Canoe Mooring (mid-stream)
Brunswick Water St. Boat Launch (shore) and Water St. Mooring (mid-stream)

Concomitant *E. coli* measurements were made seven times at the two monitoring location; concomitant dissolved oxygen measurements were made 5 times. Regression analysis of the paired 2010 data show excellent correlations between the shore and mid-stream sampling locations. On this stretch of river there is no need to conduct mid-stream sampling.

	E. coli	**DO**
BWS vs WSM	7 pairs of data $R^2 = 0.84$	5 pairs of data $R^2 = 0.98$
BCP vs BCM	7 pairs of data $R^2 = 0.98$	5 pairs of data $R^2 = 1.0$

Previous work by FOMB using Acoustic Doppler Current Profilers and salinity meters in a multi-year circulation study of Merrymeeting Bay (Circulation Patterns of Merrymeeting Bay and its Tidal Tributaries, 2009. www.friendsofmerrymeetingbay.org) has indicated thorough mixing of the tidal water column with no evidence of stratification. Since BWS and WSM are tidewater sites, that there is no significant difference in monitoring results comes as no surprise. These results suggest it is not necessary to collect data at both the shore and mid-stream locations for water quality measurements when shore collection is sufficient.

Similarly, a review of the instantaneous data for both *E. coli* and DO suggest that bi-weekly or even monthly monitoring may not be necessary, particularly if samples are collected more than 48 hours after a heavy rain event. Monthly 2010 results were quite similar to bi-weekly 2009 results. A monthly or every-other month approach may be more appropriate, allowing consistent coverage of multiple sites by volunteers without causing the burnout felt by all participants in maintaining the intense 2009 schedule.

Habitat and Aquatic Life Criteria

These criteria were evaluated for the first time in 2010 by DEP using rock baskets deployed for a month in three locations-at our Brunswick Canoe Mooring and just above and just below the Pejepscot dam. The BCM site and the site above the dam are impoundment sites while the site downstream of Pejepscot is a shallow riffle environment. As these are all run-of-the-river dams, their "impoundments" do not extend very far upstream. After identifying the macro-invertebrates who have colonized the baskets, the DEP then uses a model to predict the water Classification. Some colonizers are more tolerant of low oxygen than others and species diversity and numbers can vary with the local habitat and chemical conditions.

While macro-invertebrates can provide quite valuable information on water quality, impoundments create very unique situations often characterized by higher levels of silt, and lower flows. The legislature recognizing this, has created in statute (§464-10) exceptional requirements for hydropower impoundments. In Class C impoundments, if Class A and B habitat and aquatic life criteria are not met but reasonable changes resulting in improvements to these criteria can be made without significantly affecting existing energy generation capacity, these changes **must** be achieved and maintained.

In existing Class A or B impoundments, as long as habitat and aquatic life criteria meet Class C standards (sufficient quality to support all species of fish indigenous to the receiving waters and maintain the structure and function of the resident biological community), habitat characteristics and aquatic life criteria of Classes A and B **are deemed to be met.**

The DEP found organisms more typical of Class C in their two impoundment sites as might be expected while the riffle site (station 954) had organisms meeting a modeled Class B environment. Clearly with only three data points on a long section of river there is limited knowledge gained. We do know the impoundment type of environments as represented by the DEP station numbers 956 and 955 are but a small percentage of the segment proposed for the upgrade. Because of the language in §464-10, these results have no direct bearing on whether or not to upgrade the proposed section of river, leaving us only with the three numeric criteria: DO, % saturation and *E. coli* to consider.

Sampling Protocols

In 2010 and all past sampling years FOMB volunteers have trained annually in cooperation with Friends of Casco Bay (FOCB) utilizing DO training and sampling protocols from the FOCB EPA Quality Assurance Program Plan (QAPP). In 2009 and again in 2010, FOMB Androscoggin volunteers also participated in and qualified under the DEP Volunteer River Monitoring Program (VRMP) trainings. Under the VRMP Sampling Assurance Plan (SAP), FOMB also followed VRMP Quality Assurance/Quality Control (QA/QC) protocols for sampling and lab procedures in analysis of bacteria samples.

As in 2009, three sample sites (BCM, WSM, and BBB) were considered approved by DEP who wanted sampling done in mid-stream, typically either from a bridge or boat. Two of the four bridges in this sector occurred immediately below dams and were liable to yield unusually high oxygenated water. Of the other two bridges, one was over very fast moving turbulent water (also likely to be higher in DO) and the fourth was quite high and prone to high-speed traffic possibly endangering volunteers. FOMB chose instead to set two buoyed moorings (BCM and WSM) in more typical mid-stream locations, to which a sampler could tie their boat. A third approved site was at the end of a jetty (BBB) extending towards mid-stream. Other sites were from shore and samplers used poles to extend DO meters further from shore, also a standard operating procedure in areas where wading is not an option.

Standard QA/QC procedures included duplicate sampling by all monitors, lab splits and lab blanks. Multiple split bacteria sample analyses were conducted with Brunswick Wastewater Treatment Plant. Splits showed no significant differences.

Discussion

Intense data gathering and results from 2009 and 2010 support water quality data gathered in previous years by FOMB on the lower Androscoggin. Excluding heavy precipitation events, *E. coli* data show excellent compliance with Class B standards. Isolated exceptions over the years could indicate unusual anthropogenic sources (i.e. mechanical failure or spill) or as was the case in 2009, record high temperatures. DO samples meet or exceed the Class B standard in all but two or three isolated samples (during record-breaking heat or unusually low flows) where they fall just .1-.5 below the standard. DO saturation meets the Class B standard all of the time. Ambient river conditions are very clearly exceeding Class B minimums. As we noted to the Board on 10/2/08:

“The water quality of the Androscoggin sections proposed for an upgrade, exceeds the current classification standards and meet those of Class B. This request to upgrade from C to B is supported by the State antidegradation statute:

38 M.R.S.A. § 464 (4) (F) (4)

"When the actual quality of any classified water exceeds the minimum standards of the next highest classification, that higher water quality must be maintained and protected. The board **shall recommend** to the Legislature that water be reclassified in the next higher classification."

Clean rivers enhance the local economy and vitality of the communities surrounding them. A clean, healthy river attracts people, new businesses, and increases property value. An upgrade of the Androscoggin will economically benefit the communities of the area and will not adversely impact current industrial uses considering Class B conditions have been met for years in the course of "business as usual." While higher discharge limits exist for a number of licensees, these artificially high numbers can not be used to create a ceiling on water quality improvements that prevents reclassification to higher levels already obtained by actual conditions.

In 2010 we had the low river flows and high air and water temperatures the DEP has been saying were necessary to get a true picture of river quality under adverse conditions. As stated previously, neither 7Q10 conditions nor discharge modeling are part of classification or reclassification considerations-only actual water conditions. As a wastewater plant operator remarked to us last year, usually the river conditions yielding poor DO levels yield the lowest bacteria levels and when conditions support highest levels of bacteria, they also create the highest levels of oxygen. FOMB data have shown Class B compliance for E. coli and DO under high and low flows, cool and hot temperatures and various tidal stages.

That licensees are not discharging at licensed limits is irrelevant according to current water quality law. As mentioned above, these limits are artificially high (and should be lowered) but regardless, two conditions could cause maximum discharges: 1) Drastic increases in municipal growth which are not going to happen anytime soon under current economic conditions and 2) Extreme storm flows, in which case high *E. coli* levels under CSO conditions are not counted against classification while DO levels will be quite high from the increased aeration and typically cooler water and air temperatures.

In 1999 the DEP used FOMB DO data to support an upgrade of the Kennebec. At that time *E. coli* criteria were not met by the Augusta Wastewater Treatment Plant. Still, Class B conditions were considered close enough to be "reasonably attainable". The DEP and BEP chose to recommend an upgrade and essentially gave the plant until 2009 to meet the standards for Class B. FOMB data show this section of the Androscoggin nearly always well within Class B. If the Board's concern is eliminating the occasional outlier data, this certainly seems to be reasonably attainable with minimal cost and effort--perhaps more so than the Kennebec at the time of that upgrade.

Recommendations

1. Modeling, maximum loading and 7Q10 conditions cannot by statute be used to determine classification. **Classifications must by statute be based on actual water quality.** There is no substitute for years of field data in determining ambient river conditions. Outlier data should not determine water classification. **We recommend the BEP properly use classification statutes not re-licensing statutes to determine the Androscoggin upgrade reclassification.**

2. A cleaner Androscoggin is supported by riverside communities because it is good for business, the environment and improves quality of life for all. **We recommend the BEP and legislature consider along with statutory requirements, the goal-based or aspirational nature of Maine's Water Quality Classification System and US Clean Water Act.**

3. The Department's Classification Upgrade Proposal submission guidelines state:

   "Maine's Water Quality Classification System is goal-based. ***When proposing an upgrade in classification, recommend waters that either presently attain or with reasonable application of improved treatment or Best Management Practices (BMPs), could reasonably be expected to attain, the standards and criteria of a higher proposed class***."

   Intense sampling of the lower Androscoggin in 2009 and 2010 shows water conditions meet Class B standards nearly all of the time supporting many years of FOMB data in all conditions and limited DEP data collected under conditions of low flows and high temperatures. Analyzed data support an upgrade that will be good for the economy, environment and quality of life. **We recommend a statute and goal-based upgrade of water quality classification from Class C to Class B for the lower Androscoggin between Worumbo Dam and Merrymeeting Bay.**

Acknowledgements
This work could not have been done without the assistance of many. Thanks to 2010 volunteer monitors, trainers, data entry and laboratory analysts: Sarah Cowperthwaite, Melinda and Ken Emerson, Ed Friedman, Misty Gorski, Ruth Innes, Kathleen McGee, Bill Milam, Nancy Murphy, Richard Nickerson, Diane Richmond, Jeff Sebell and Kermit Smyth.

Thanks also to John Lichter and the Bowdoin College Environmental Studies department for lab space, Jennifer Nicholson, and Greg Thulen of the Brunswick Sewer District (wastewater treatment plant) for cooperating on QA/QC, property owner Josh Francis for access at BIL, Sandra Salazar of Applied Biomonitoring for analyses and reporting, Jeff Varricchione, Mary Ellen Dennis, and Lisa Vickers of the DEP for VRMP training and QAPP (or SAP-Sampling & Analysis Plan) preparation, Peter Milholland, Mike Doan and Friends of Casco Bay for training, Dave Jefferson at IDEXX and finally, Bath Savings Institution for funding our IDEXX Colilert system.

Friends of Merrymeeting Bay
42 Stevens Rd.
Bowdoinham, ME 04008
207-666-3372
www.friendsofmerrymeetingbay.org
Contact: Ed Friedman or Jim Mason

Applied Biomonitoring
11648 - 72nd PL NE
Kirkland, WA 98034
425-823-3905
www.appliedbiomonitoring.com
Contact: Sandra or Mike Salazar

Appendices:
Appendix 1– Public Law, Chapter 163 LD 330
Appendix 2 – Map-Lower Androscoggin River Sample Sites
Appendix 3 – Lower Androscoggin River, Aerial View Map

Appendix 4 – USGS Monthly Flows, Lower Androscoggin River - Auburn
Appendix 5 – USGS Monthly Flows, Lower Kennebec River - North Sidney
Appendix 6 – National Weather Service, Portland Summary 2010
Appendix 7 – FOMB DEP SAP, 2010 Final
Appendix 8 – Recent Letters of Support:
Times Record Editorial July 17, 2010
Brunswick-2010
Topsham Resolution-2010
Topsham Support letter-2010
Lewiston-2010
Durham-2008
Auburn Sewage District-2008
Brunswick Topsham Land Trust-2008
Appendix 9 –Applied Biomonitoring Qualifications

A Legal Opinion: Excerpt from Conservation Law Foundation BEP Comments 10/2/2008

The Lower Androscoggin River:

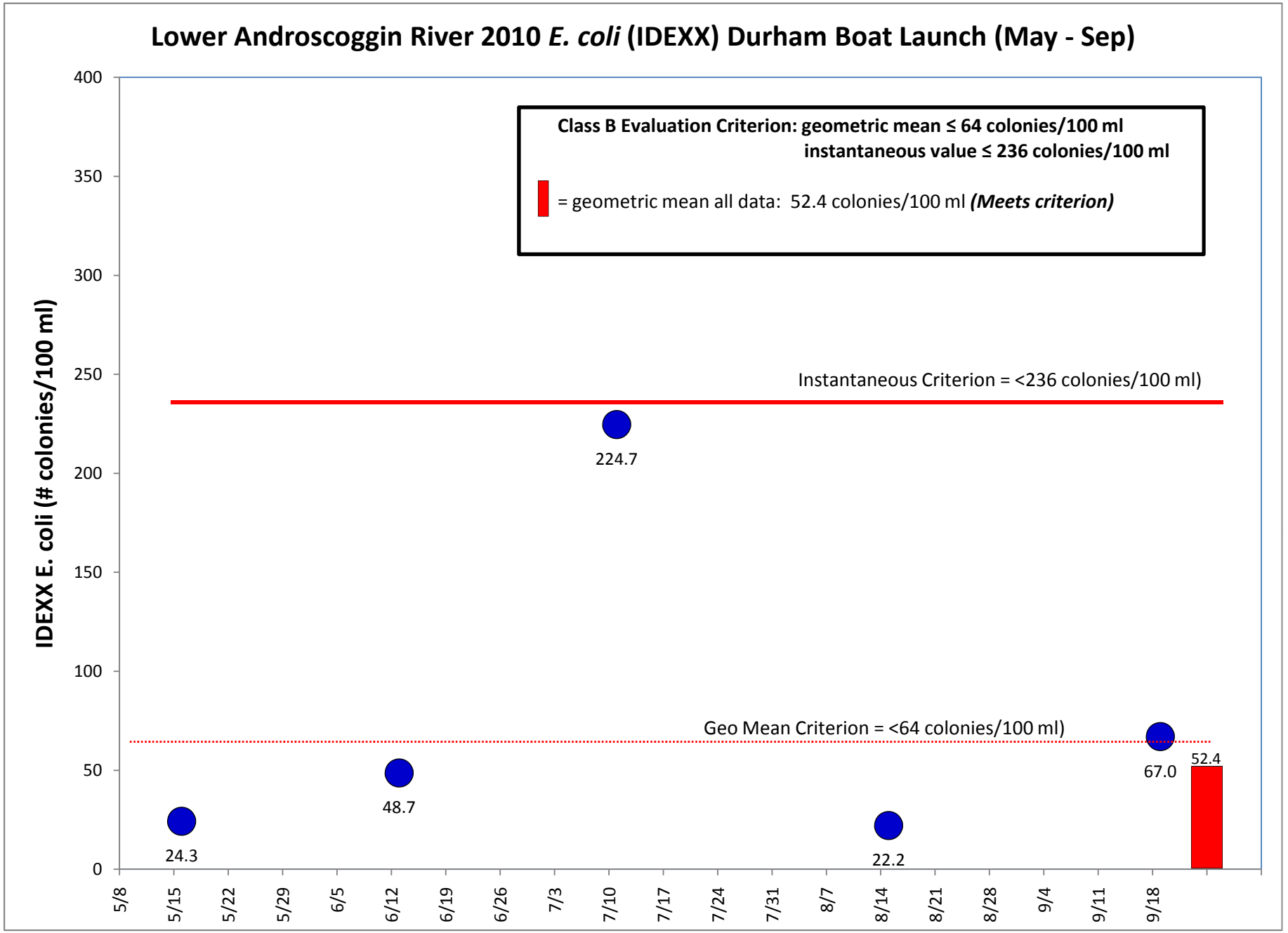
CLF strongly disagrees with the Department's recommendation and rationale for not upgrading this river segment. The Department has stated that proponents must provide water quality data and modeling showing "the likelihood of attainment of Class B water quality criteria at maximum licensed loads." See Reclassification Memorandum at 29. This makes no logical, legal or economic sense. First, no one operates at maximum licensed loads; rather a large buffer is generally built into all permits to avoid violations. Thus, DEP is requesting an impossible and unnecessary showing.

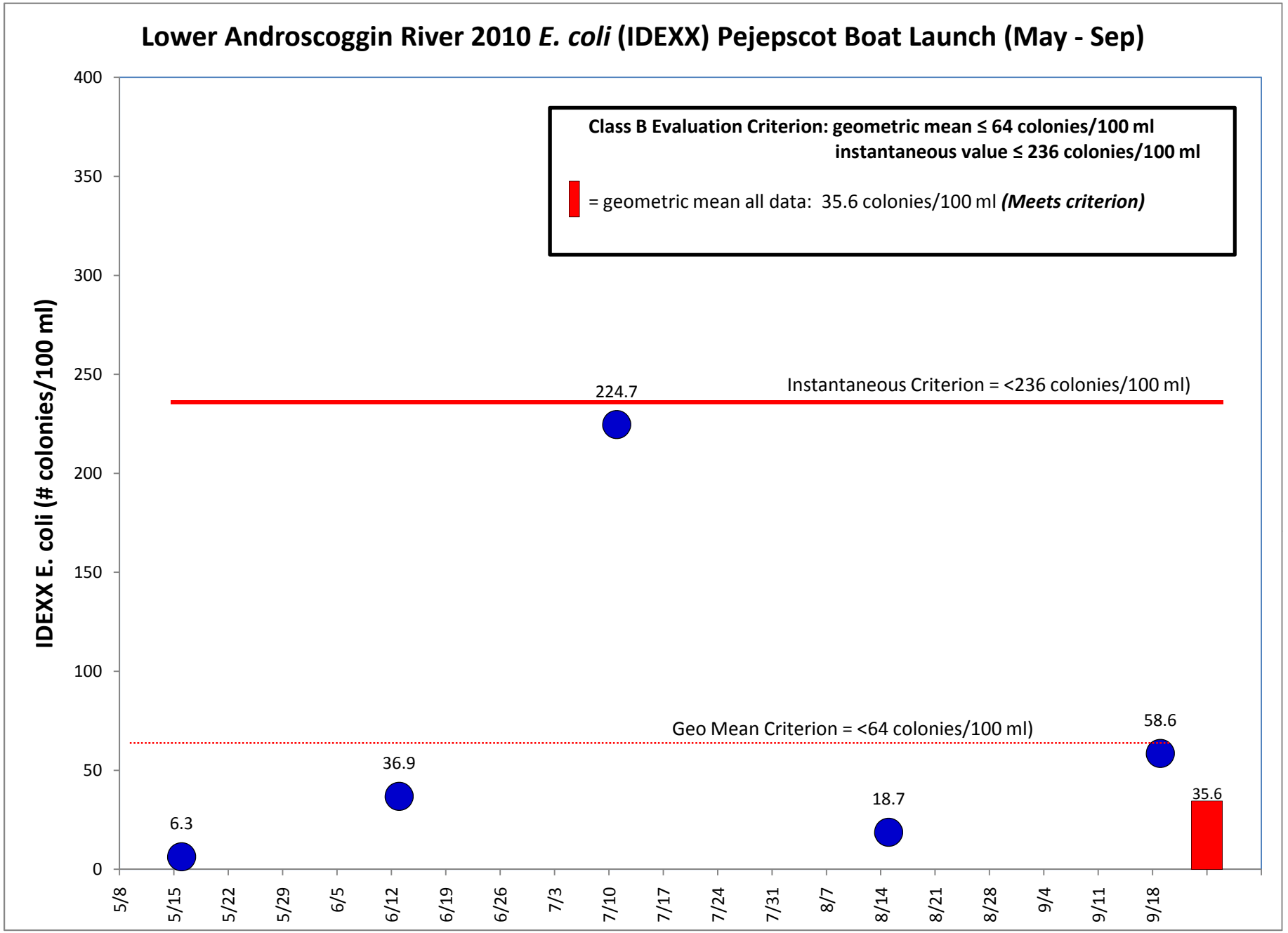
Second, the Department's recommendation violates the legal standard in the Clean Water Act that a state shall revise its standards to reflect uses and water quality actually being attained. 40 C.F.R. § 131.10(i). See also id. § 131.6(d); 38 M.R.S.A. § 464(4)(F). Thus, the Board's analysis must be based on *existing* water quality – not hypothetical modeling with point sources operating at maximum licensed discharge. Indeed, the Board is specifically prohibited from considering maximum licensed loads because both state and federal regulations prohibit consideration of waste discharge or transport as a designated use. 40 C.F.R. § 131.10(a); 38 M.R.S.A. § 464(4)(F)(1)(d).

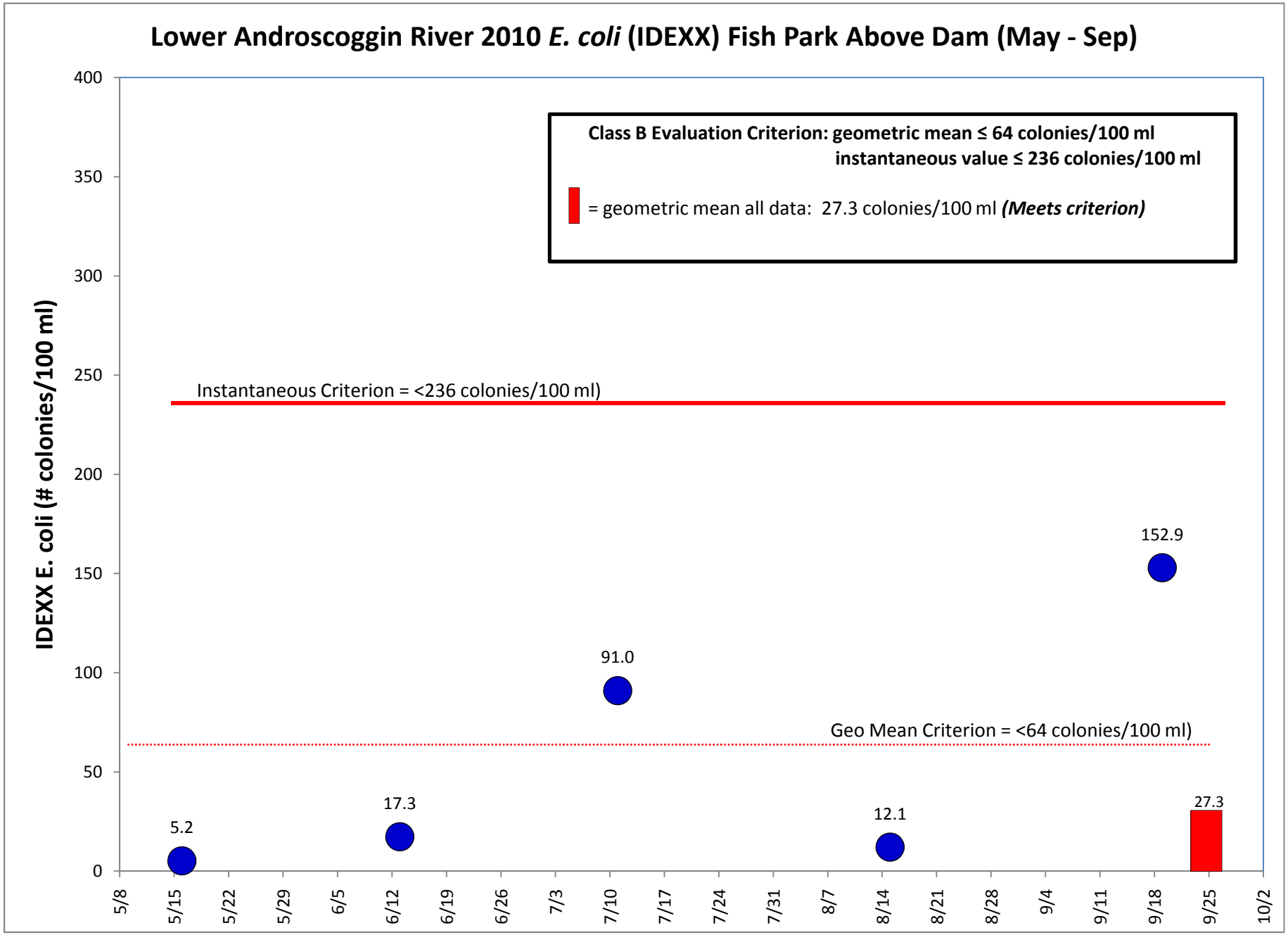
Third, as many of the dischargers in this watershed have already recognized, water quality upgrades are generally good for surrounding communities. As has been shown over and over again, clean water is an economic boon. Examples abound throughout New England, including the recent revival of Boston Harbor, the Portland Waterfront, the Auburn Riverfront, and the resurgence of Merrymeeting Bay and the Kennebec River. The Androscoggin River deserves the same.

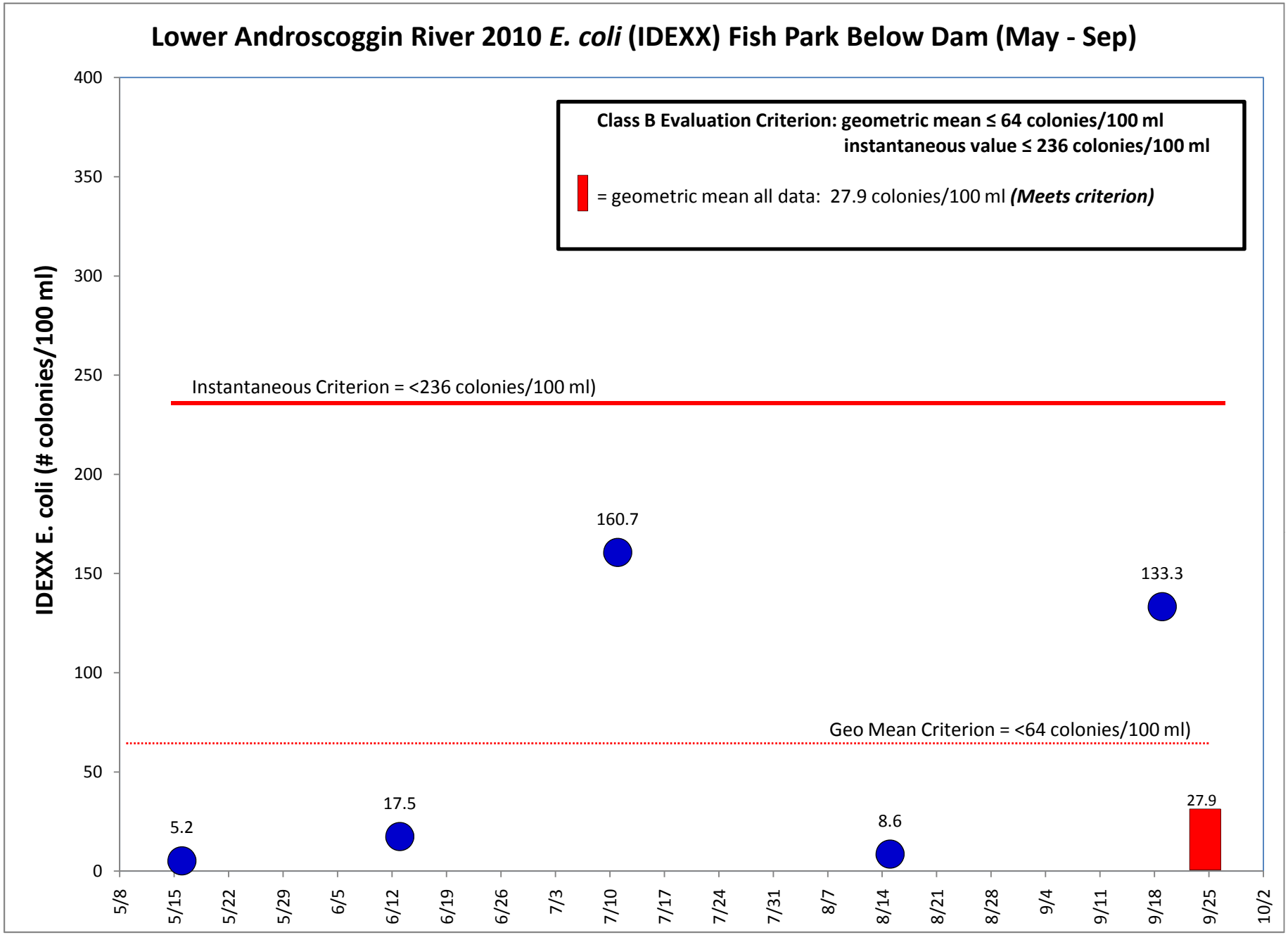
CLF believes that the data, including both dissolved oxygen levels and recreational uses, shows that existing uses in the lower Androscoggin have improved over time and that the river currently attains the higher bacteria and dissolved oxygen standards set forth in the Class B designation. As noted by the Department, it has no reason to question the data; indeed, it has relied upon data supplied by the proponent in prior reclassifications. Therefore, barring a showing that the data is invalid, the Board must recommend upgrading this section.

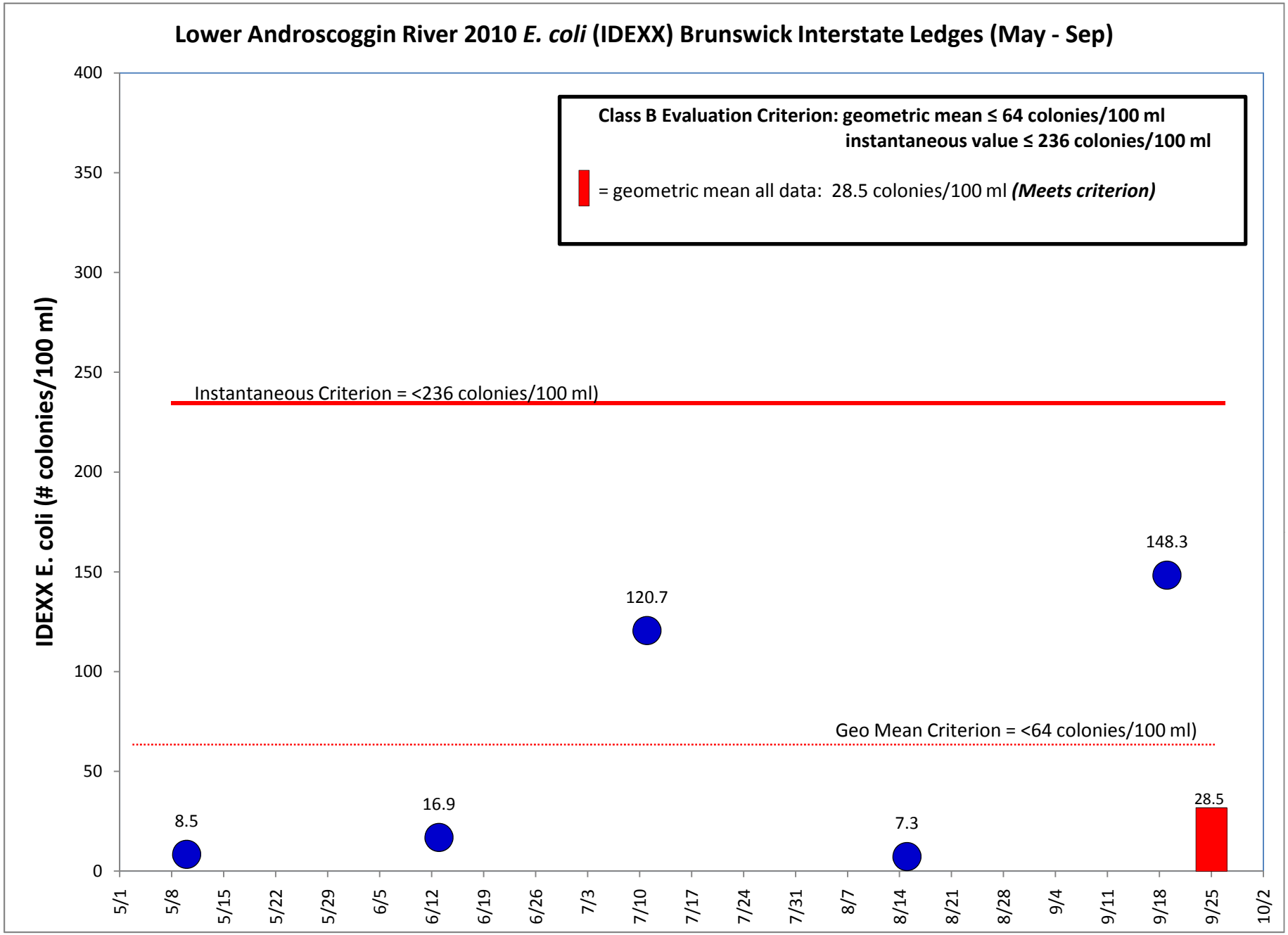
E. coli 2010 by Station
May to September

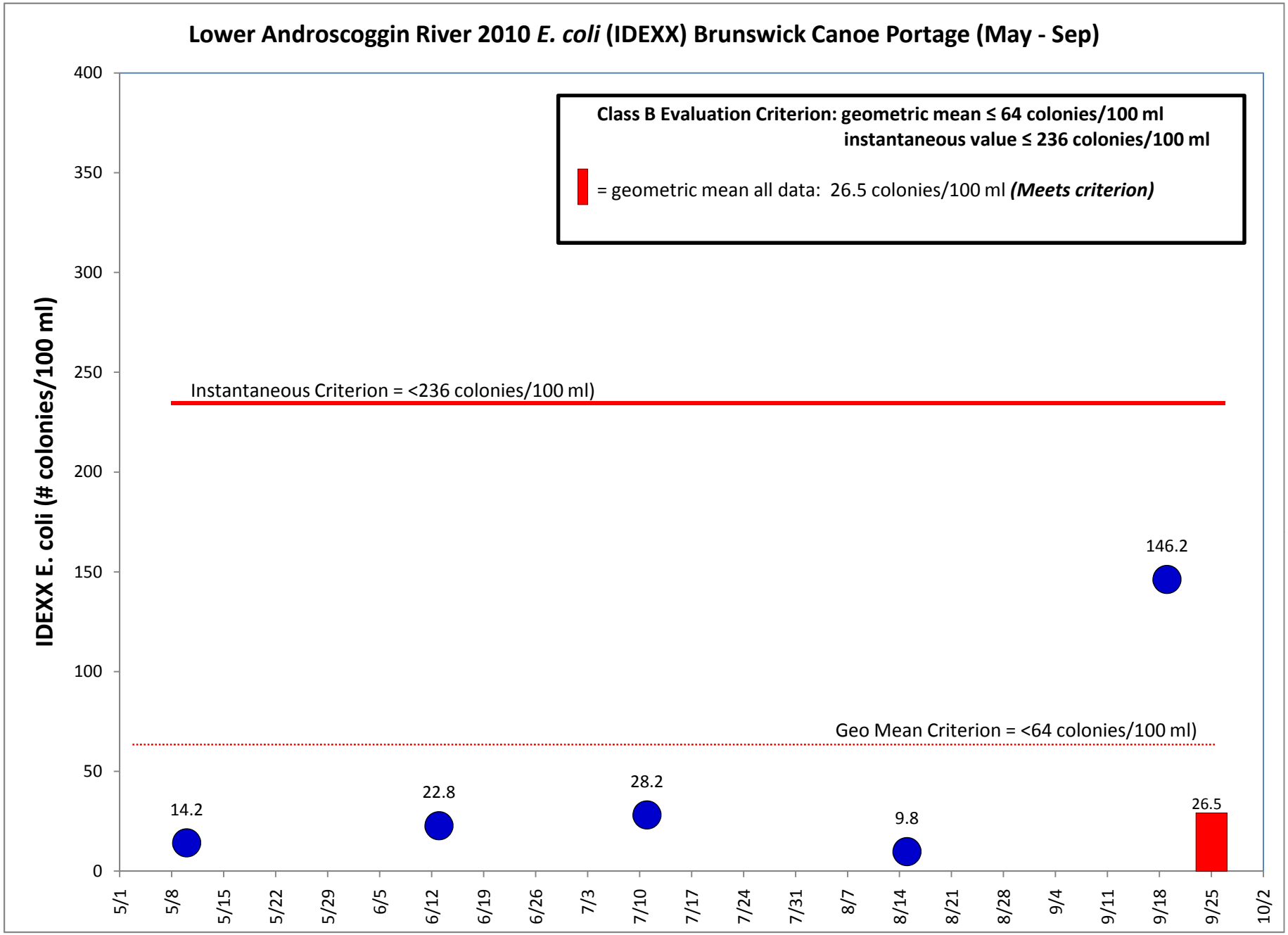

Lower Androscoggin River 2010 E. coli (IDEXX) Durham Boat Launch (May - Sep)
IDEXX E. coli (# colonies/100 ml)
400
350
300
250
200
150
100
50
0
Class B Evaluation Criterion: geometric mean ≤ 64 colonies/100 ml
instantaneous value ≤ 236 colonies/100 ml
= geometric mean all data: 52.4 colonies/100 ml (Meets criterion)
Instantaneous Criterion = <236 colonies/100 ml)
Geo Mean Criterion = <64 colonies/100 ml)
224.7
48.7
24.3
22.2
67.0
52.4
5/8
5/15
5/22
5/29
6/5
6/12
6/19
6/26
7/3
7/10
7/17
7/24
7/31
8/7
8/14
8/21
8/28
9/4
9/11
9/18

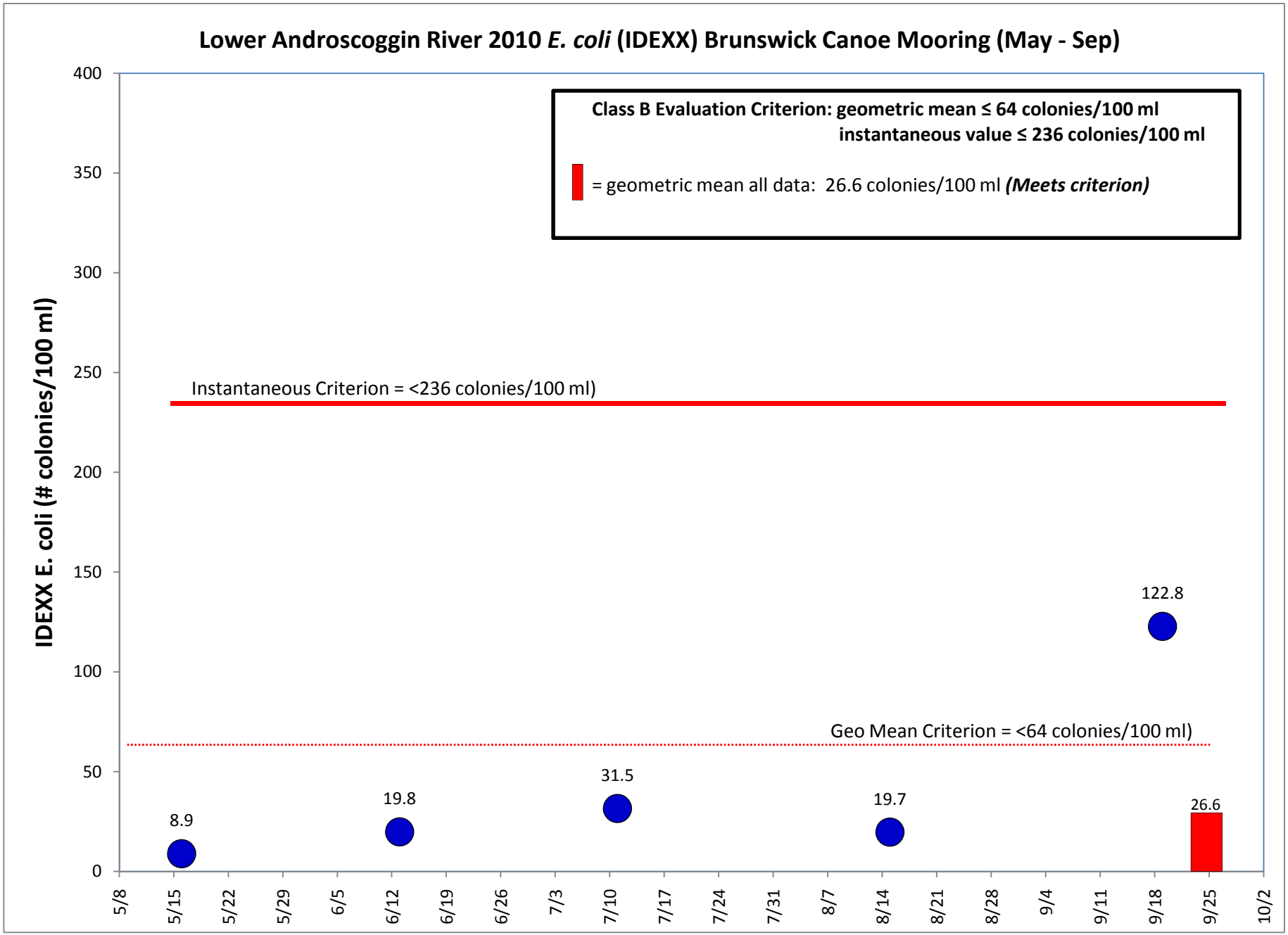

Lower Androscoggin River 2010 E. coli (IDEXX) Pejepscot Boat Launch (May - Sep)
IDEXX E. coli (# colonies/100 ml)
400
350
300
250
200
150
100
50
0
Class B Evaluation Criterion: geometric mean ≤ 64 colonies/100 ml
instantaneous value ≤ 236 colonies/100 ml
= geometric mean all data: 35.6 colonies/100 ml (Meets criterion)
Instantaneous Criterion = <236 colonies/100 ml)
Geo Mean Criterion = <64 colonies/100 ml)
224.7
58.6
36.9
35.6
18.7
6.3
5/8
5/15
5/22
5/29
6/5
6/12
6/19
6/26
7/3
7/10
7/17
7/24
7/31
8/7
8/14
8/21
8/28
9/4
9/11
9/18

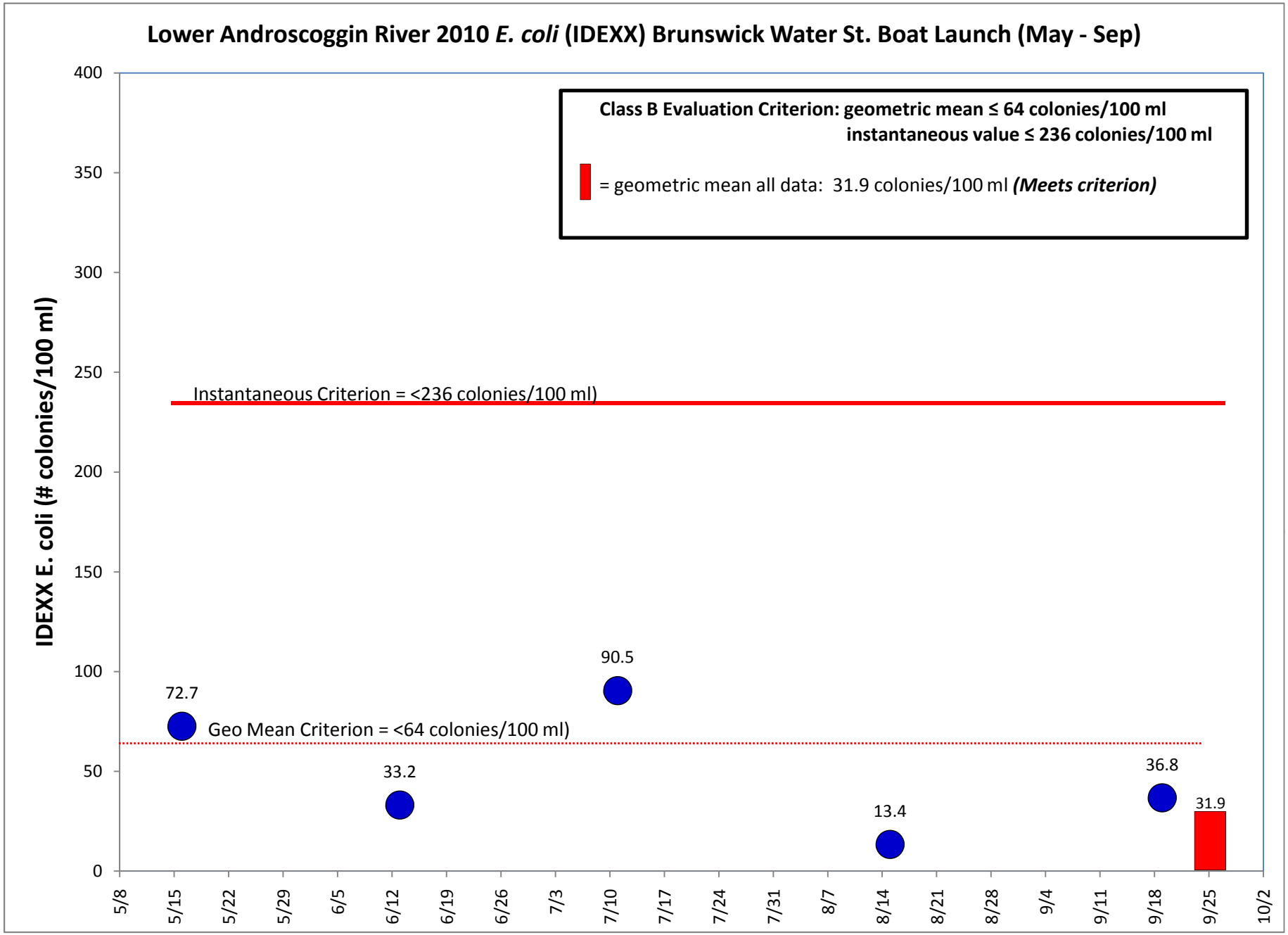

Lower Androscoggin River 2010 E. coli (IDEXX) Fish Park Above Dam (May - Sep)
IDEXX E. coli (# colonies/100 ml)
400
350
300
250
200
150
100
50
0
Class B Evaluation Criterion: geometric mean ≤ 64 colonies/100 ml
instantaneous value ≤ 236 colonies/100 ml
= geometric mean all data: 27.3 colonies/100 ml (Meets criterion)
Instantaneous Criterion = <236 colonies/100 ml)
Geo Mean Criterion = <64 colonies/100 ml)
5.2
17.3
91.0
12.1
152.9
27.3
5/8
5/15
5/22
5/29
6/5
6/12
6/19
6/26
7/3
7/10
7/17
7/24
7/31
8/7
8/14
8/21
8/28
9/4
9/11
9/18
9/25
10/2

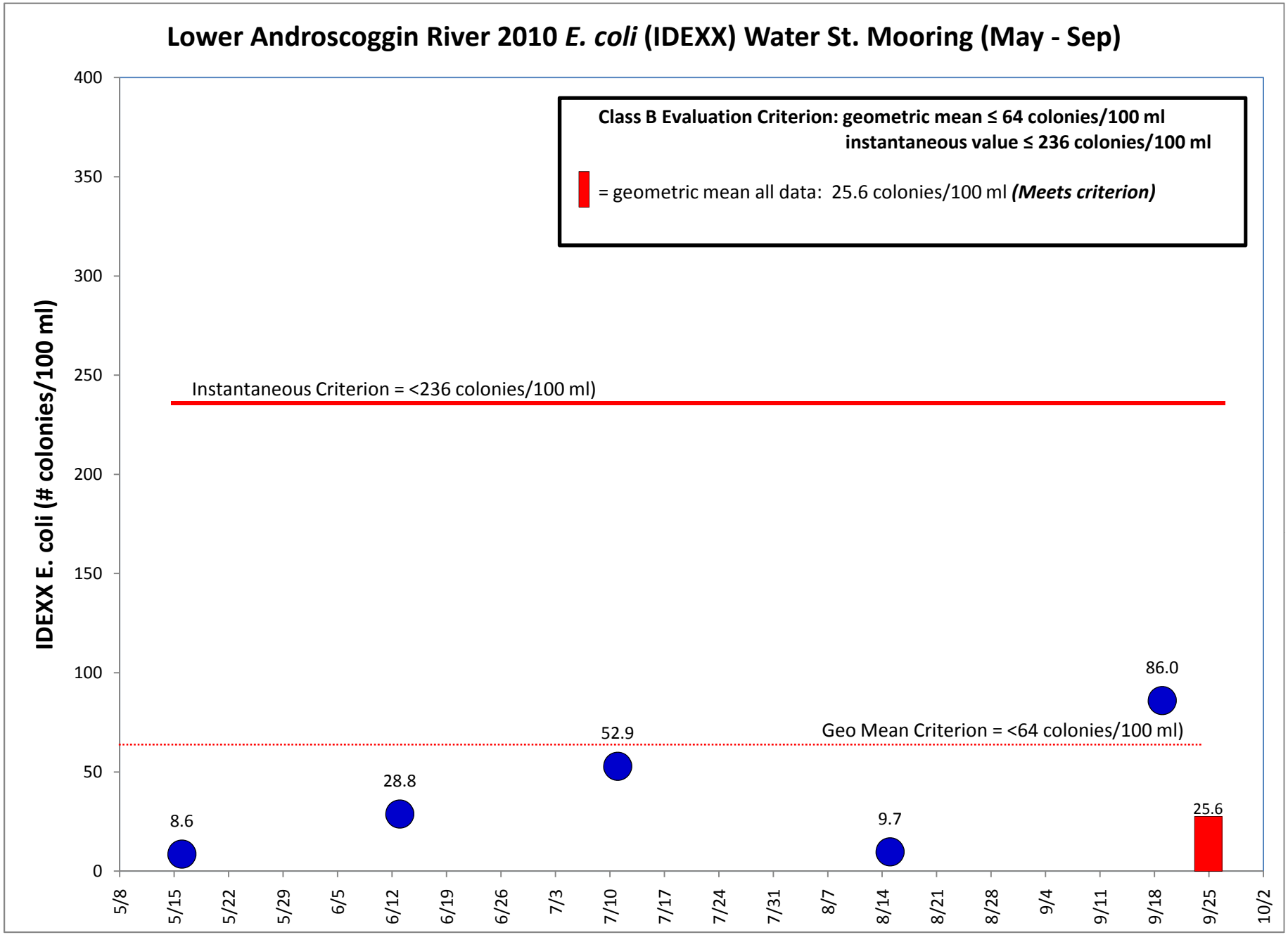

Lower Androscoggin River 2010 E. coli (IDEXX) Fish Park Below Dam (May - Sep)
IDEXX E. coli (# colonies/100 ml)
400
350
300
250
200
150
100
50
0
Class B Evaluation Criterion: geometric mean ≤ 64 colonies/100 ml
instantaneous value ≤ 236 colonies/100 ml
= geometric mean all data: 27.9 colonies/100 ml (Meets criterion)
Instantaneous Criterion = <236 colonies/100 ml)
Geo Mean Criterion = <64 colonies/100 ml)
5.2
17.5
160.7
8.6
133.3
27.9
5/8
5/15
5/22
5/29
6/5
6/12
6/19
6/26
7/3
7/10
7/17
7/24
7/31
8/7
8/14
8/21
8/28
9/4
9/11
9/18
9/25
10/2

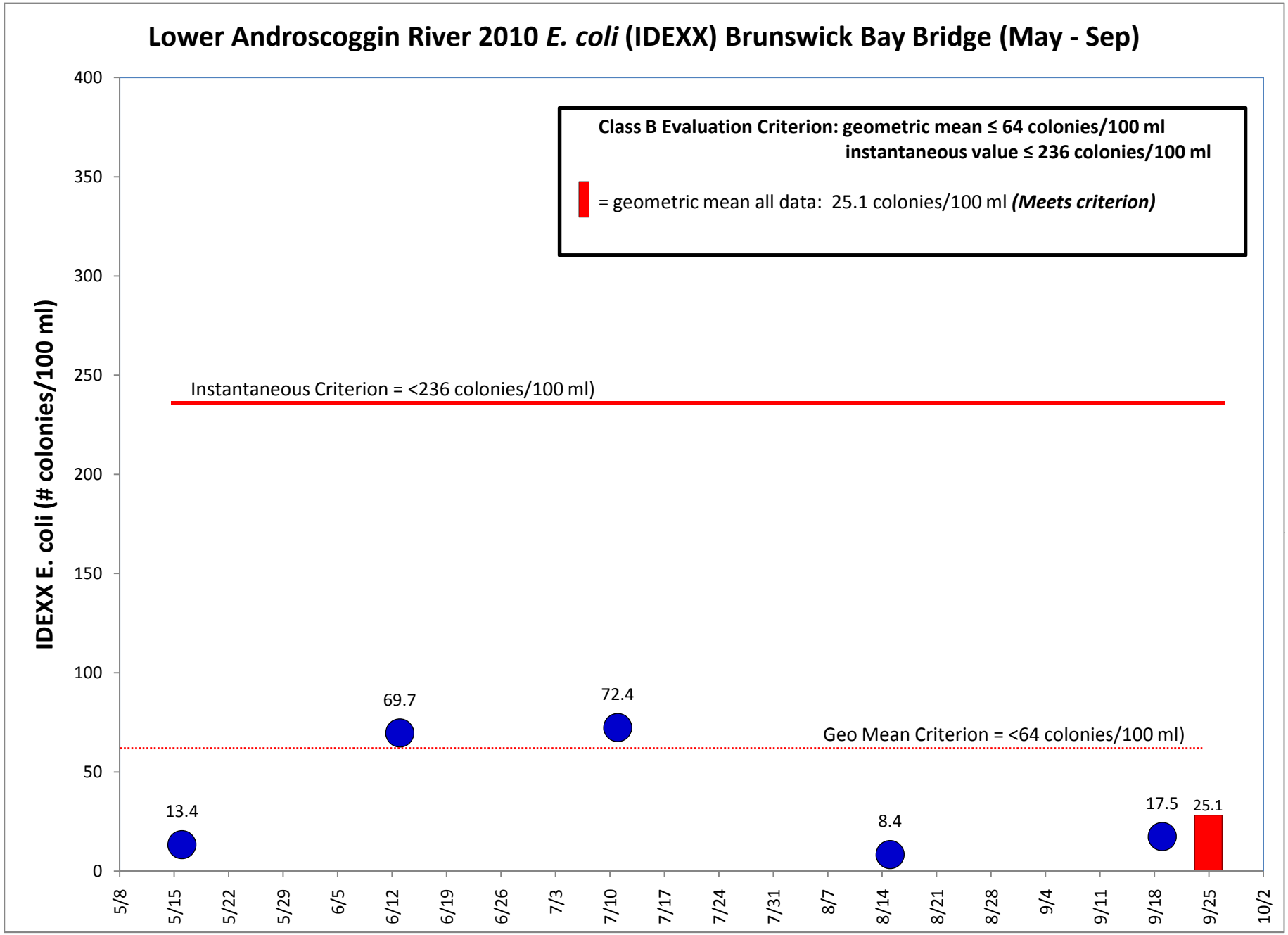

Lower Androscoggin River 2010 E. coli (IDEXX) Brunswick Interstate Ledges (May - Sep)
IDEXX E. coli (# colonies/100 ml)
400
350
300
250
200
150
100
50
0
Class B Evaluation Criterion: geometric mean ≤ 64 colonies/100 ml
instantaneous value ≤ 236 colonies/100 ml
= geometric mean all data: 28.5 colonies/100 ml (Meets criterion)
Instantaneous Criterion = <236 colonies/100 ml)
Geo Mean Criterion = <64 colonies/100 ml)
8.5
16.9
120.7
7.3
148.3
28.5
5/1
5/8
5/15
5/22
5/29
6/5
6/12
6/19
6/26
7/3
7/10
7/17
7/24
7/31
8/7
8/14
8/21
8/28
9/4
9/11
9/18
9/25
10/2


Lower Androscoggin River 2010 E. coli (IDEXX) Brunswick Canoe Portage (May - Sep)
IDEXX E. coli (# colonies/100 ml)
400
350
300
250
200
150
100
50
0
Class B Evaluation Criterion: geometric mean ≤ 64 colonies/100 ml
instantaneous value ≤ 236 colonies/100 ml
= geometric mean all data: 26.5 colonies/100 ml (Meets criterion)
Instantaneous Criterion = <236 colonies/100 ml)
Geo Mean Criterion = <64 colonies/100 ml)
14.2
22.8
28.2
9.8
146.2
26.5
5/1
5/8
5/15
5/22
5/29
6/5
6/12
6/19
6/26
7/3
7/10
7/17
7/24
7/31
8/7
8/14
8/21
8/28
9/4
9/11
9/18
9/25
10/2

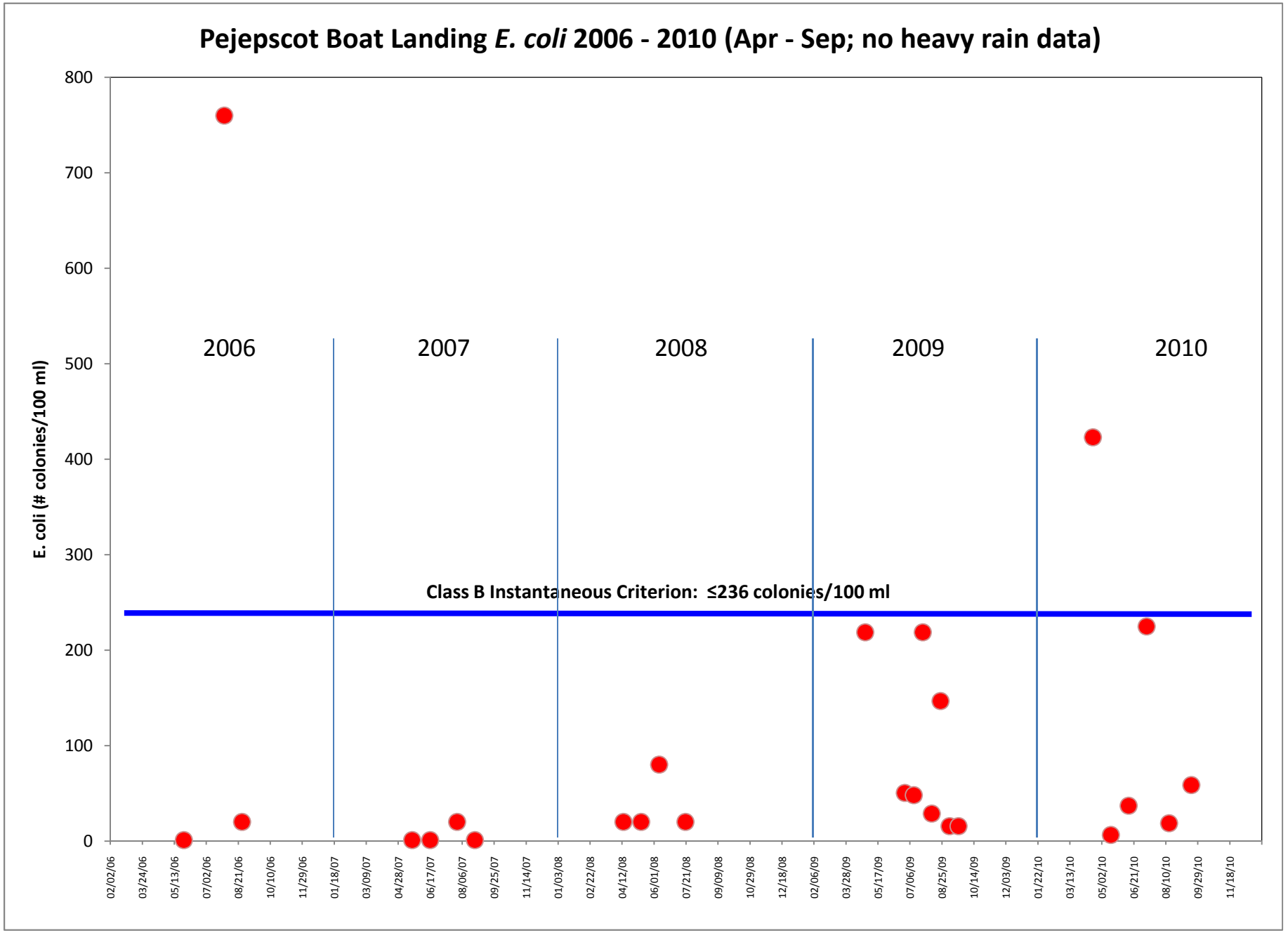

Lower Androscoggin River 2010 E. coli (IDEXX) Brunswick Canoe Mooring (May - Sep)
Class B Evaluation Criterion: geometric mean ≤ 64 colonies/100 ml
instantaneous value ≤ 236 colonies/100 ml
= geometric mean all data: 26.6 colonies/100 ml (Meets criterion)
IDEXX E. coli (# colonies/100 ml)
400
350
300
250
200
150
100
50
0
Instantaneous Criterion = <236 colonies/100 ml)
Geo Mean Criterion = <64 colonies/100 ml)
8.9
19.8
31.5
19.7
122.8
26.6
5/8
5/15
5/22
5/29
6/5
6/12
6/19
6/26
7/3
7/10
7/17
7/24
7/31
8/7
8/14
8/21
8/28
9/4
9/11
9/18
9/25
10/2

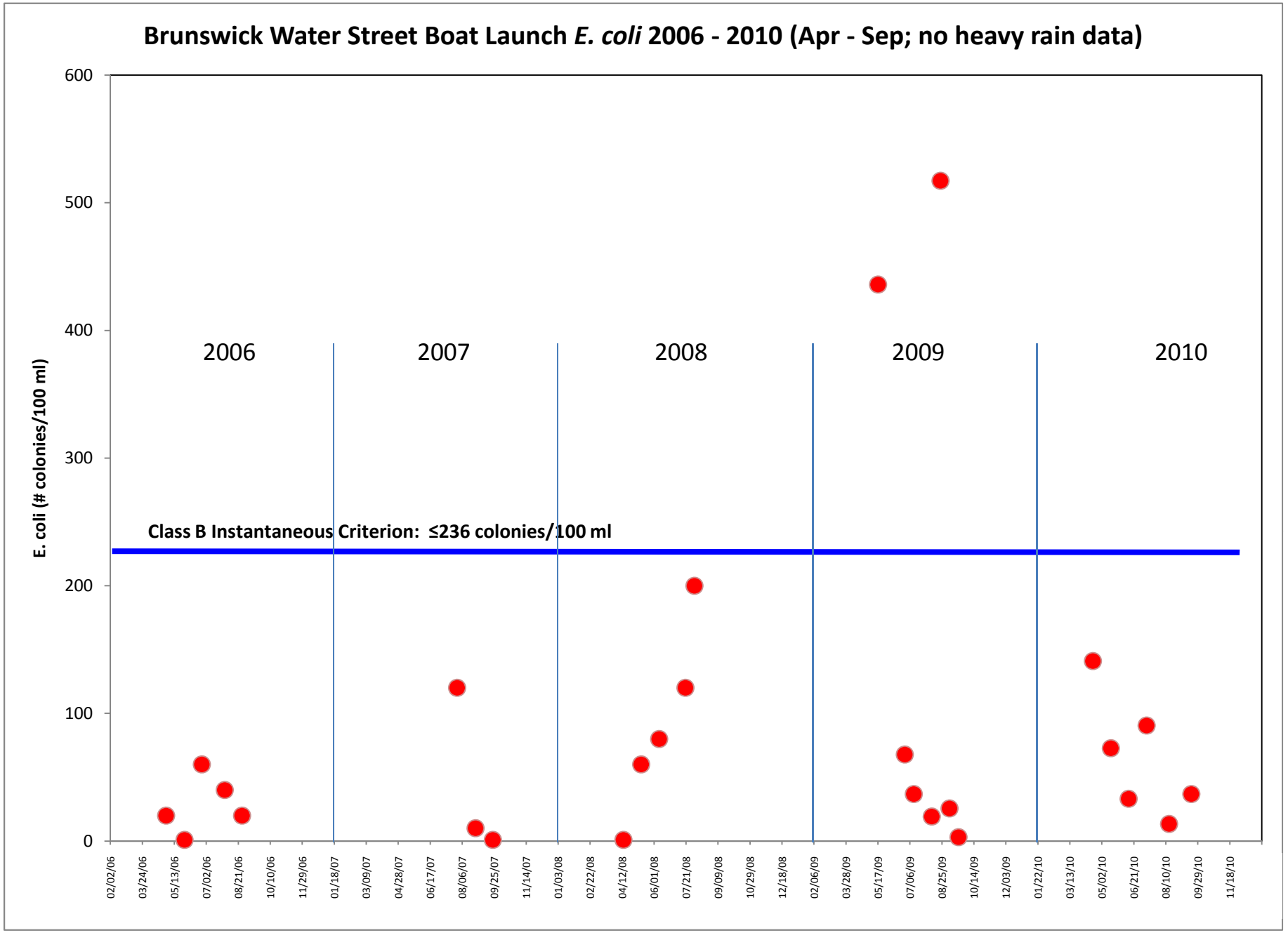

Lower Androscoggin River 2010 E. coli (IDEXX) Brunswick Water St. Boat Launch (May - Sep)
IDEXX E. coli (# colonies/100 ml)
400
350
300
250
200
150
100
50
0
Class B Evaluation Criterion: geometric mean ≤ 64 colonies/100 ml
instantaneous value ≤ 236 colonies/100 ml
= geometric mean all data: 31.9 colonies/100 ml (Meets criterion)
Instantaneous Criterion = <236 colonies/100 ml)
Geo Mean Criterion = <64 colonies/100 ml)
72.7
33.2
90.5
13.4
36.8
31.9
5/8
5/15
5/22
5/29
6/5
6/12
6/19
6/26
7/3
7/10
7/17
7/24
7/31
8/7
8/14
8/21
8/28
9/4
9/11
9/18
9/25
10/2

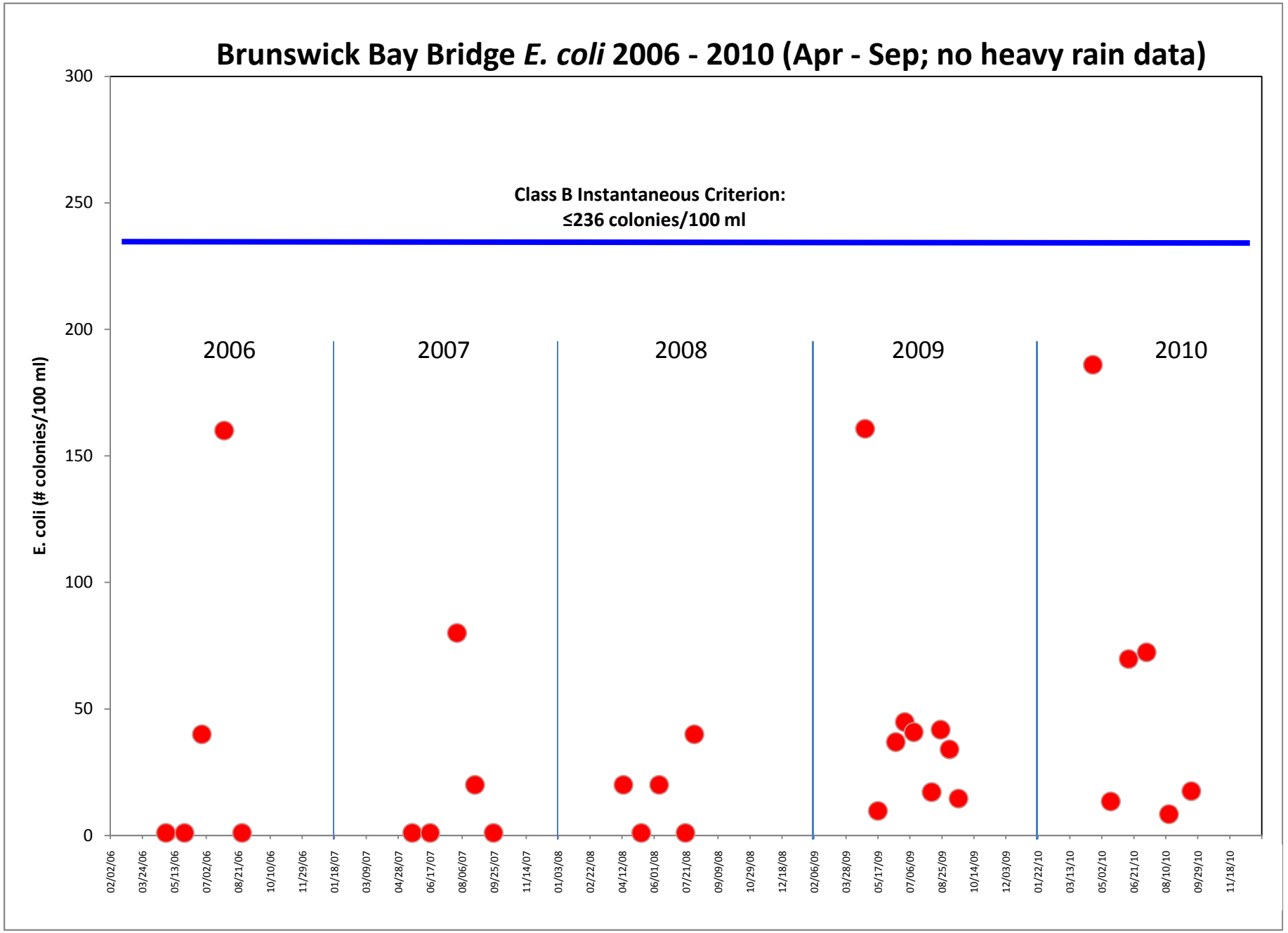

Lower Androscoggin River 2010 E. coli (IDEXX) Water St. Mooring (May - Sep)
IDEXX E. coli (# colonies/100 ml)
400
350
300
250
200
150
100
50
0
Class B Evaluation Criterion: geometric mean ≤ 64 colonies/100 ml
instantaneous value ≤ 236 colonies/100 ml
= geometric mean all data: 25.6 colonies/100 ml (Meets criterion)
Instantaneous Criterion = <236 colonies/100 ml)
Geo Mean Criterion = <64 colonies/100 ml)
8.6
28.8
52.9
9.7
86.0
25.6
5/8
5/15
5/22
5/29
6/5
6/12
6/19
6/26
7/3
7/10
7/17
7/24
7/31
8/7
8/14
8/21
8/28
9/4
9/11
9/18
9/25
10/2


Lower Androscoggin River 2010 E. coli (IDEXX) Brunswick Bay Bridge (May - Sep)
IDEXX E. coli (# colonies/100 ml)
400
350
300
250
200
150
100
50
0
Class B Evaluation Criterion: geometric mean ≤ 64 colonies/100 ml
instantaneous value ≤ 236 colonies/100 ml
= geometric mean all data: 25.1 colonies/100 ml (Meets criterion)
Instantaneous Criterion = <236 colonies/100 ml)
Geo Mean Criterion = <64 colonies/100 ml)
13.4
69.7
72.4
8.4
17.5
25.1
5/8
5/15
5/22
5/29
6/5
6/12
6/19
6/26
7/3
7/10
7/17
7/24
7/31
8/7
8/14
8/21
8/28
9/4
9/11
9/18
9/25
10/2

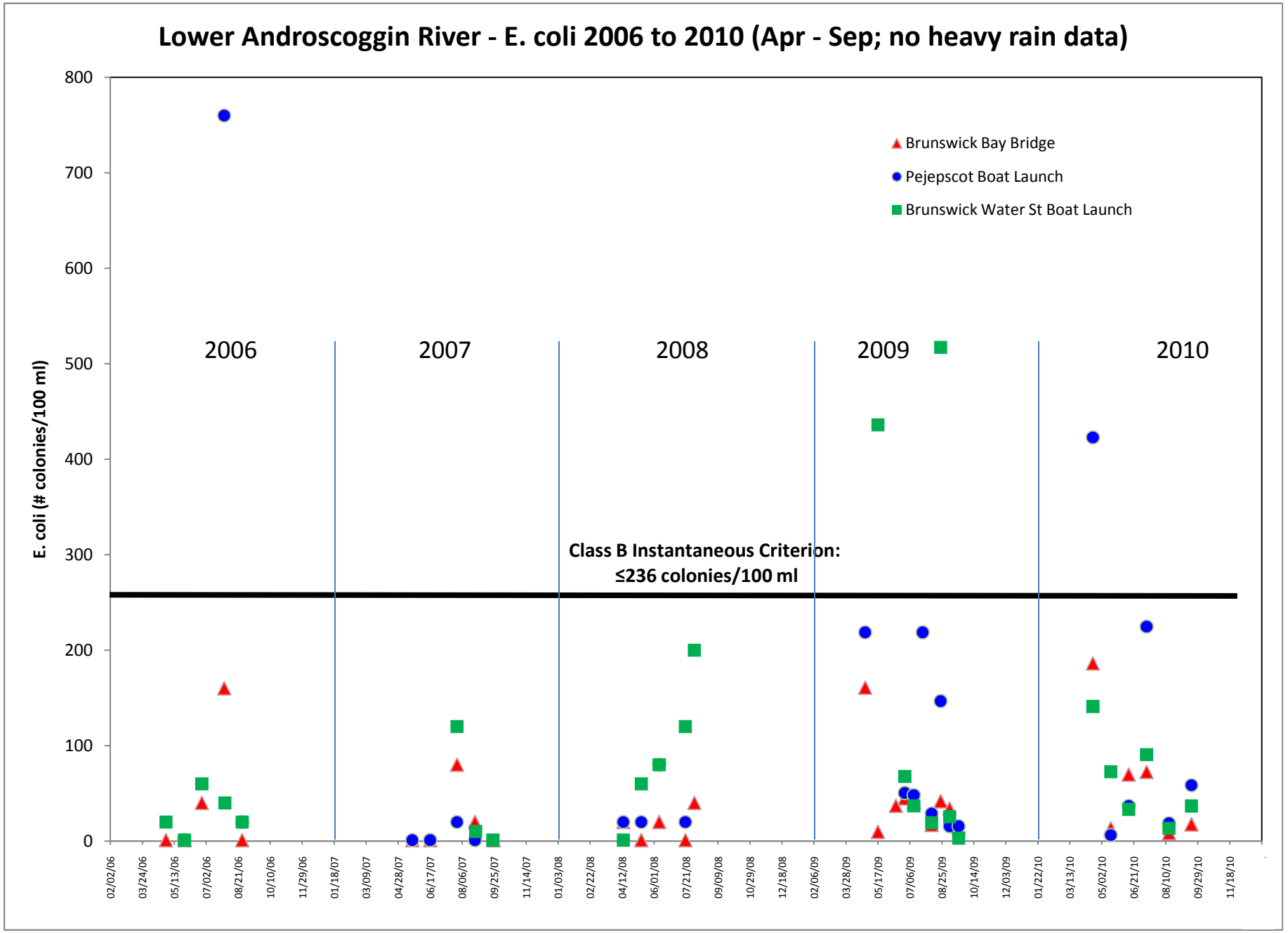
E. coli 2006 - 2010 Long-term Stations
Historical Trends
April to September


Pejepscot Boat Landing E. coli 2006 - 2010 (Apr - Sep; no heavy rain data)
E. coli (# colonies/100 ml)
800
700
600
500
400
300
200
100
0
2006
2007
2008
2009
2010
Class B Instantaneous Criterion: ≤236 colonies/100 ml
02/02/06
03/24/06
05/13/06
07/02/06
08/21/06
10/10/06
11/29/06
01/18/07
03/09/07
04/28/07
06/17/07
08/06/07
09/25/07
11/14/07
01/03/08
02/22/08
04/12/08
06/01/08
07/21/08
09/09/08
10/29/08
12/18/08
02/06/09
03/28/09
05/17/09
07/06/09
08/25/09
10/14/09
12/03/09
01/22/10
03/13/10
05/02/10
06/21/10
08/10/10
09/29/10
11/18/10

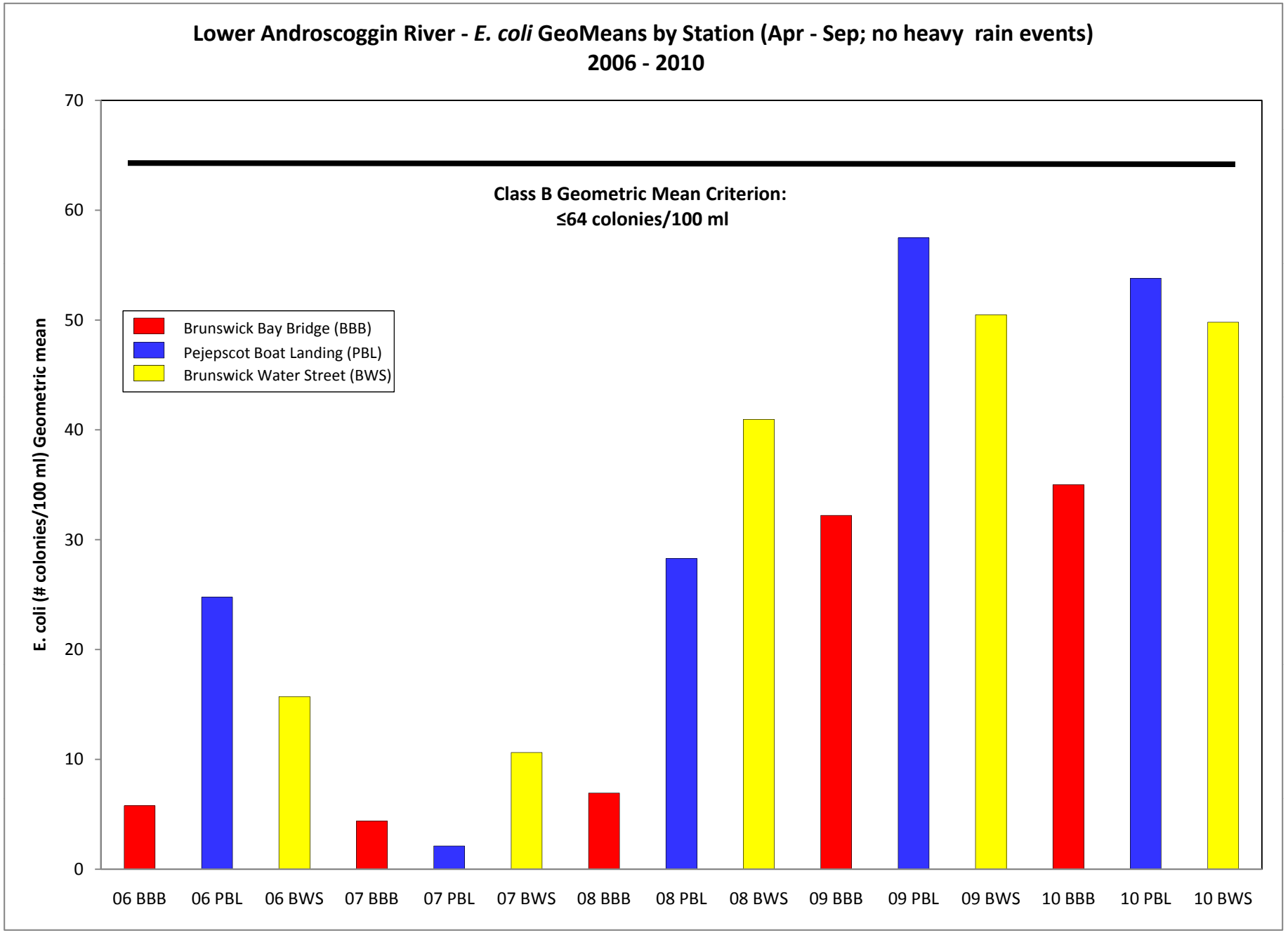

Brunswick Water Street Boat Launch E. coli 2006 - 2010 (Apr - Sep; no heavy rain data)
E. coli (# colonies/100 ml)
600
500
400
300
200
100
0
2006
2007
2008
2009
2010
Class B Instantaneous Criterion: ≤236 colonies/100 ml
02/02/06
03/24/06
05/13/06
07/02/06
08/21/06
10/10/06
11/29/06
01/18/07
03/09/07
04/28/07
06/17/07
08/06/07
09/25/07
11/14/07
01/03/08
02/22/08
04/12/08
06/01/08
07/21/08
09/09/08
10/29/08
12/18/08
02/06/09
03/28/09
05/17/09
07/06/09
08/25/09
10/14/09
12/03/09
01/22/10
03/13/10
05/02/10
06/21/10
08/10/10
09/29/10
11/18/10

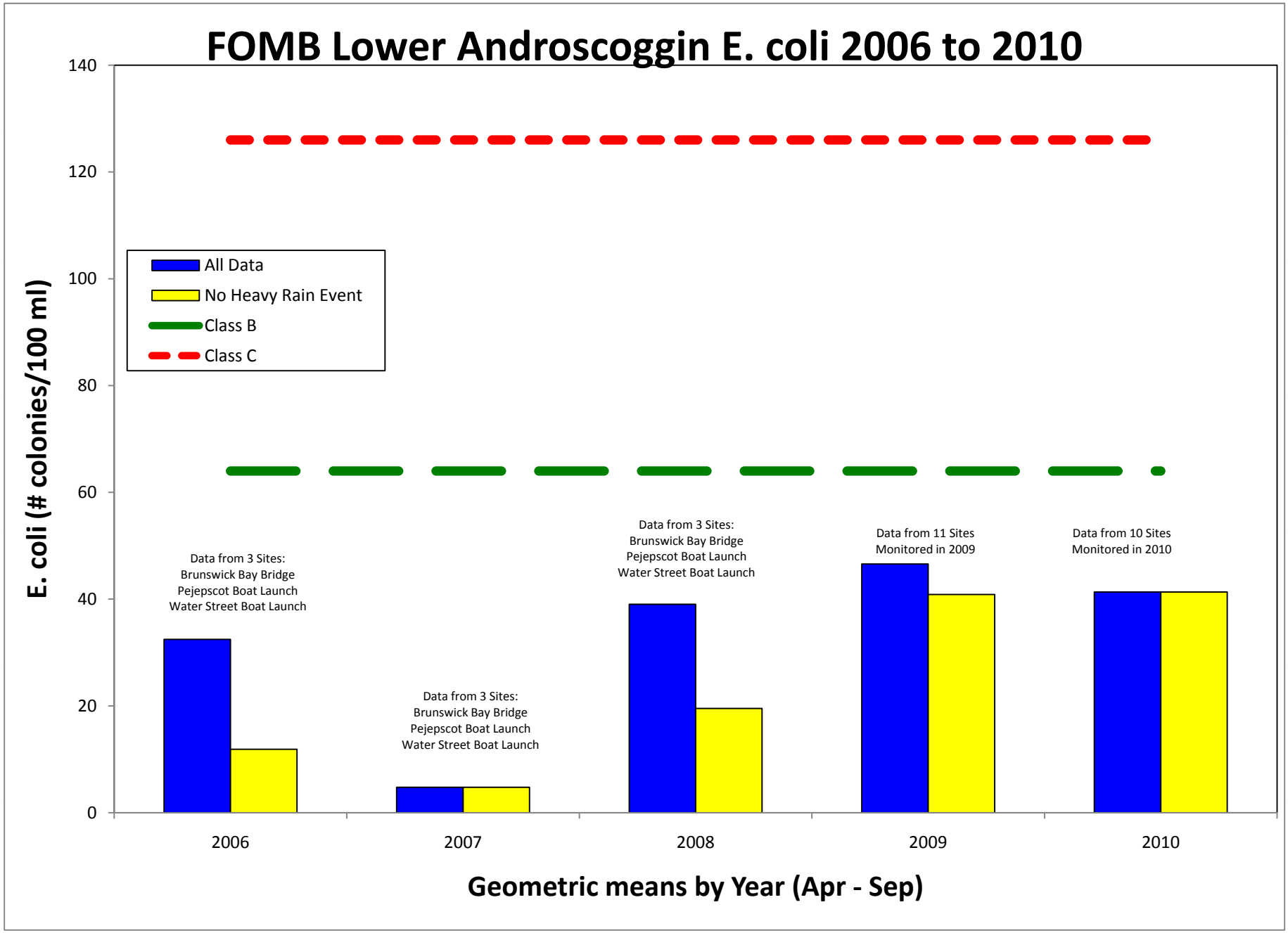

Brunswick Bay Bridge E. coli 2006 - 2010 (Apr - Sep; no heavy rain data)
E. coli (# colonies/100 ml)
300
250
200
150
100
50
0
Class B Instantaneous Criterion:
≤236 colonies/100 ml
2006
2007
2008
2009
2010
02/02/06
03/24/06
05/13/06
07/02/06
08/21/06
10/10/06
11/29/06
01/18/07
03/09/07
04/28/07
06/17/07
08/06/07
09/25/07
11/14/07
01/03/08
02/22/08
04/12/08
06/01/08
07/21/08
09/09/08
10/29/08
12/18/08
02/06/09
03/28/09
05/17/09
07/06/09
08/25/09
10/14/09
12/03/09
01/22/10
03/13/10
05/02/10
06/21/10
08/10/10
09/29/10
11/18/10

E. coli 2006 - 2010 Long-term Stations Combined
Historical Trends
April to September


Lower Androscoggin River - E. coli 2006 to 2010 (Apr - Sep; no heavy rain data)
E. coli (# colonies/100 ml)
800
700
600
500
400
300
200
100
0
Brunswick Bay Bridge
Pejepscot Boat Launch
Brunswick Water St Boat Launch
2006
2007
2008
2009
2010
Class B Instantaneous Criterion:
≤236 colonies/100 ml
02/02/06
03/24/06
05/13/06
07/02/06
08/21/06
10/10/06
11/29/06
01/18/07
03/09/07
04/28/07
06/17/07
08/06/07
09/25/07
11/14/07
01/03/08
02/22/08
04/12/08
06/01/08
07/21/08
09/09/08
10/29/08
12/18/08
02/06/09
03/28/09
05/17/09
07/06/09
08/25/09
10/14/09
12/03/09
01/22/10
03/13/10
05/02/10
06/21/10
08/10/10
09/29/10
11/18/10

E. coli 2006 - 2010
Historical Trends
Yearly Geometric Means


Lower Androscoggin River - E. coli GeoMeans by Station (Apr - Sep; no heavy rain events)
2006 - 2010
E. coli (# colonies/100 ml) Geometric mean
70
60
50
40
30
20
10
0
Class B Geometric Mean Criterion:
≤64 colonies/100 ml
Brunswick Bay Bridge (BBB)
Pejepscot Boat Landing (PBL)
Brunswick Water Street (BWS)
06 BBB
06 PBL
06 BWS
07 BBB
07 PBL
07 BWS
08 BBB
08 PBL
08 BWS
09 BBB
09 PBL
09 BWS
10 BBB
10 PBL
10 BWS


FOMB Lower Androscoggin E. coli 2006 to 2010
E. coli (# colonies/100 ml)
140
120
100
80
60
40
20
0
All Data
No Heavy Rain Event
Class B
Class C
Data from 3 Sites:
Brunswick Bay Bridge
Pejepscot Boat Launch
Water Street Boat Launch
Data from 3 Sites:
Brunswick Bay Bridge
Pejepscot Boat Launch
Water Street Boat Launch
Data from 3 Sites:
Brunswick Bay Bridge
Pejepscot Boat Launch
Water Street Boat Launch
Data from 11 Sites
Monitored in 2009
Data from 10 Sites
Monitored in 2010
2006
2007
2008
2009
2010
Geometric means by Year (Apr - Sep)

Lower Androscoggin River 2010 E. coli Data Tables

Lower Androscoggin River 2010 E. coli

= MEAN VALUE
Bolded Red Text =
VALUE EXCEEDS CRITERIA

Site	Date	Sample Time	Weather	Adversities	Sample Type	**Criteria: GeoMean ≤ 64/100 ml or ≤ 236/100 ml inst** ALL DATA IDEXX	**Criteria: GeoMean ≤ 64/100 ml or ≤ 236/100 ml inst** ALL DATA WITH MEANS FOR REPLICATE SAMPLES	**Criteria: GeoMean ≤ 64/100 ml or ≤ 236/100 ml inst** NO APR OR OCT IDEXX DATA (Means for reps used)	**Criteria: GeoMean ≤ 64/100 ml or ≤ 236/100 ml inst** NO OCT IDEXX DATA (Means for reps used)
						MPN colonies/ 100mgl	MPN colonies/ 100mgl	MPN colonies/ 100mgl	MPN colonies/ 100mgl
Durham Boat Launch (DBL)									
DBL	4/18/2010	8:00 AM	fog/haze	L	Monthly	218.4	218.4	APR DATA ELIM	218.4
DBL	5/16/2010	7:50 AM	clear	L	Monthly	24.3	24.3	24.3	24.3
DBL	6/13/2010	8:00 AM	overcast	L, B	Monthly	48.7	48.7	48.7	48.7
DBL	7/11/2010	8:00 AM	overcast	Rain	Monthly	224.7	224.7	224.7	224.7
DBL	8/15/2010	6:50 AM	clear		Monthly	19.7	22.15	22.15	22.15
DBL	8/15/2010	6:50 AM	clear		Replicate	24.6			
DBL	9/19/2010	8:00 AM	clear		Monthly	67	67	67	67
DBL	10/17/2010	8:00 AM	clear	**Heavy Rain**	Monthly	**260.3**	**260.3**	OCT DATA ELIM	OCT DATA ELIM
					Geomean DBL	**68.6**	**80.8**	**52.4**	**66.5**
Pejepscot Boat Launch (PBL)									
PBL	4/18/2010	7:40 AM	overcast	L	Monthly	**435.2**	**422.9**	APR DATA ELIM	422.9
PBL	4/18/2010	7:40 AM	overcast	L	Replicate	**410.6**			
PBL	5/16/2010	7:20 AM	clear		Monthly	6.3	6.3	6.3	6.3
PBL	6/13/2010	6:55 AM	overcast	L	Monthly	36.9	36.9	36.9	36.9
PBL	7/11/2010	7:00 AM	overcast	L	Monthly	224.7	224.7	224.7	224.7
PBL	8/15/2010	6:50 AM	clear		Monthly	18.7	18.7	18.7	18.7
PBL	9/19/2010	6:15 AM	clear		Monthly	42.8	58.55	58.55	58.55
PBL	9/19/2010	6:15 AM	clear		Replicate	74.3			
PBL	10/17/2010	7:35 AM	clear	H	Monthly	**686.7**	**686.7**	OCT DATA ELIM	OCT DATA ELIM
					Geomean PBL	**89.8**	**77.4**	**35.6**	**53.8**

Lower Androscoggin River 2010 E. coli

= MEAN VALUE Bolded Red Text = VALUE EXCEEDS CRITERIA						Criteria: GeoMean ≤ 64/100 ml or ≤ 236/100 ml inst	Criteria: GeoMean ≤ 64/100 ml or ≤ 236/100 ml inst	Criteria: GeoMean ≤ 64/100 ml or ≤ 236/100 ml inst	Criteria: GeoMean ≤ 64/100 ml or ≤ 236/100 ml inst
Site	**Date**	**Sample Time**	**Weather**	**Adversities**	**Sample Type**	**ALL DATA IDEXX**	**ALL DATA WITH MEANS FOR REPLICATE SAMPLES**	**NO APR OR OCT IDEXX DATA (Means for reps used)**	**NO OCT IDEXX DATA (Means for reps used)**
						MPN colonies/ 100mgl	MPN colonies/ 100mgl	MPN colonies/ 100mgl	MPN colonies/ 100mgl
Fish Park Up (FPU)									
FPU	4/18/2010	8:25 AM	overcast	L	Monthly	156.5	156.5	APR DATA ELIM	156.5
FPU	5/16/2010	7:45 AM	clear		Monthy	5.2	5.2	5.2	5.2
FPU	6/13/2010	7:35 AM	overcast	L	Monthy	18.5	17.3	17.3	17.3
FPU	6/13/2010	7:35 AM	overcast	L	Replicate	16.1			
FPU	7/11/2010	7:20 AM	overcast	L	Monthy	91	91	91	91
FPU	8/15/2010	7:45 AM	clear		Monthy	12.1	12.1	12.1	12.1
FPU	9/19/2010	7:05 AM	clear		Monthy	152.9	152.9	152.9	152.9
FPU	10/17/2010	8:35 AM	clear	**Heavy Rain**	Monthy	**435.2**	435.2	OCT DATA ELIM	OCT DATA ELIM
					Geomean FPU	**45.3**	**52.0**	**27.3**	**36.5**
Fish Park Down (FPD)									
FPD	4/18/2010	8:40 AM	overcast	L	Monthly	**307.6**	**307.6**	APR DATA ELIM	307.6
FPD	5/16/2010	7:55 AM	clear		Replicate	5.2	5.2	5.2	5.2
FPD	5/16/2010	7:55 AM	clear		Monthly	5.2			
FPD	6/13/2010	7:50 AM	overcast	L	Monthly	17.5	17.5	17.5	17.5
FPD	7/11/2010	7:40 AM	overcast	L	Monthly	160.7	160.7	160.7	160.7
FPD	8/15/2010	7:55 AM	clear		Monthly	8.6	8.6	8.6	8.6
FPD	9/19/2010	7:17 AM	clear		Monthly	133.3	133.3	133.3	133.3
FPD	10/17/2010	8:50 AM	clear	**Heavy Rain**	Monthly	**272.3**	**272.3**	OCT DATA ELIM	OCT DATA ELIM
					Geomean FPD	**40.5**	**54.4**	**27.9**	**41.6**

Lower Androscoggin River 2010 E. coli

= MEAN VALUE
Bolded Red Text =
VALUE EXCEEDS CRITERIA

Site	Date	Sample Time	Weather	Adversities	Sample Type	**Criteria: GeoMean ≤ 64/100 ml or ≤ 236/100 ml inst** ALL DATA IDEXX	**Criteria: GeoMean ≤ 64/100 ml or ≤ 236/100 ml inst** ALL DATA WITH MEANS FOR REPLICATE SAMPLES	**Criteria: GeoMean ≤ 64/100 ml or ≤ 236/100 ml inst** NO APR OR OCT IDEXX DATA (Means for reps used)	**Criteria: GeoMean ≤ 64/100 ml or ≤ 236/100 ml inst** NO OCT IDEXX DATA (Means for reps used)
						MPN colonies/ 100mgl	MPN colonies/ 100mgl	MPN colonies/ 100mgl	MPN colonies/ 100mgl
Brunswick Interstate Ledges (BIL)									
BIL	4/18/2010	9:00 AM	**overcast**	L	Monthly	178.2	178.2	APR DATA ELIM	178.2
BIL	5/10/2010	8:15 AM	clear		Monthly	8.5	8.5	8.5	8.5
BIL	6/13/2010	8:10 AM	overcast	L	Monthly	16.9	16.9	16.9	16.9
BIL	7/11/2010	8:00 AM		L	Replicate	81.6	120.65	120.65	120.65
BIL	7/11/2010	8:00 AM		L	Monthly	159.7			
BIL	8/15/2010	8:15 AM			Monthly	7.3	7.3	7.3	7.3
BIL	9/19/2010	7:45 AM	**clear**		Monthly	148.3	148.3	148.3	148.3
BIL	10/17/2010	9:10 AM	**clear**	**Heavy Rain**	Monthly	**328.2**	**300.25**	OCT DATA ELIM	OCT DATA ELIM
BIL	10/17/2010	9:10 AM	**clear**	**Heavy Rain**	Replicate	**272.3**			
					Geomean BIL	**68.3**	**51.8**	**28.5**	**38.7**
Brunswick Canoe Portage (BCP)									
BCP	4/18/2010	8:00 AM	overcast	N,W	Monthly	172.3	172.3	APR DATA ELIM	172.3
BCP	5/10/2010	8:00 AM			Monthly	14.2	14.2	14.2	14.2
BCP	6/13/2010	8:00 AM	overcast	L	Monthly	22.8	22.8	22.8	22.8
BCP	7/11/2010	8:00 AM	clear		Monthly	28.2	28.2	28.2	28.2
BCP	8/15/2010	8:15 AM	clear		Monthly	9.8	9.8	9.8	9.8
BCP	9/19/2010	8:00 AM	clear		Monthly	172.5	146.15	146.15	146.15
BCP	9/19/2010	8:00 AM	clear		Surface	119.8	119.8		
BCP	10/17/2010	8:00 AM	clear	**Heavy Rain**	Monthly	**365.4**	**441.3**	OCT DATA ELIM	OCT DATA ELIM
BCP	10/17/2010	8:00 AM	clear	**Heavy Rain**	Replicate	**517.2**			
					Geomean BCP	**73.2**	**57.5**	**26.5**	**36.2**

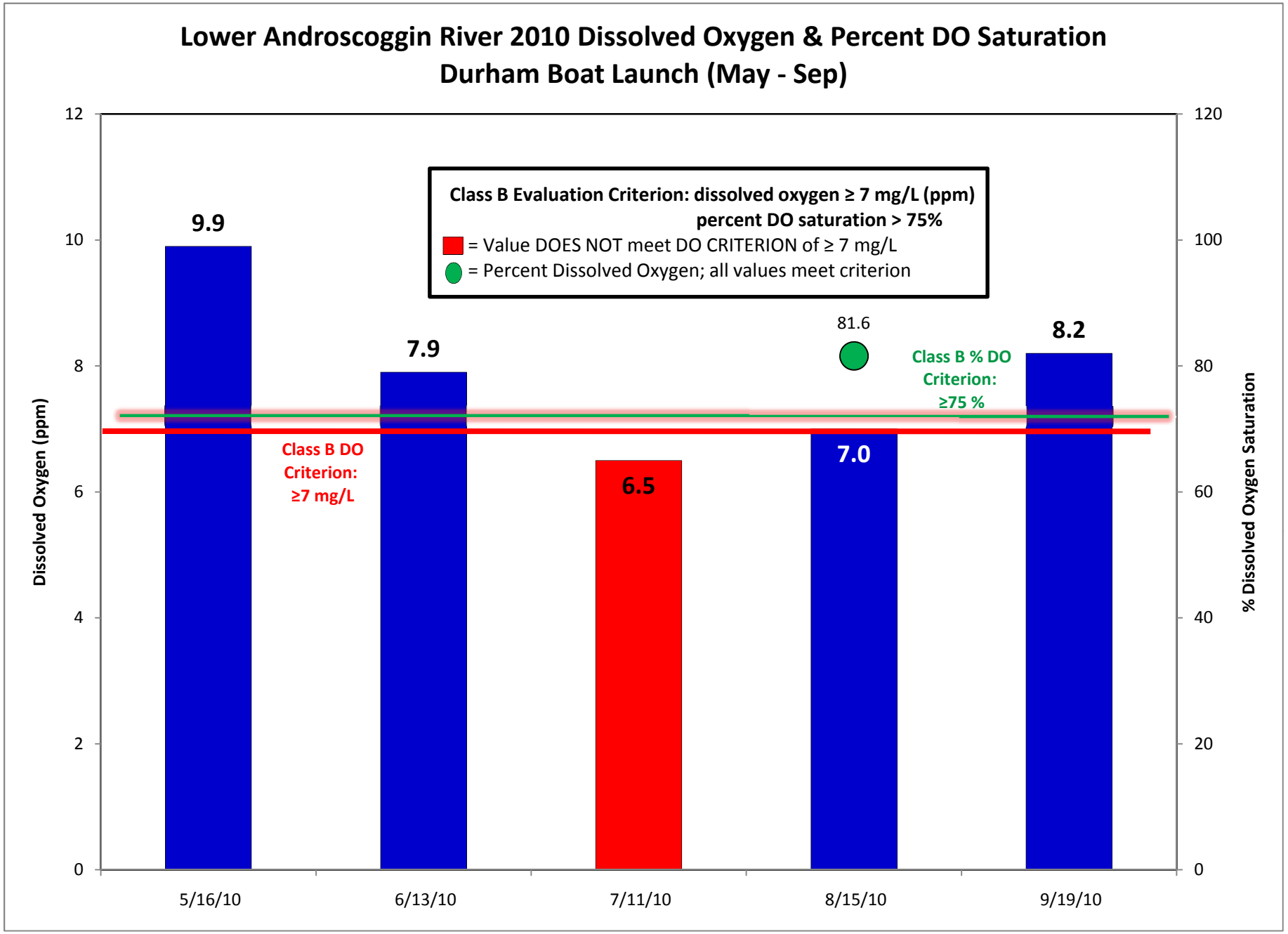
Lower Androscoggin River 2010 E. coli

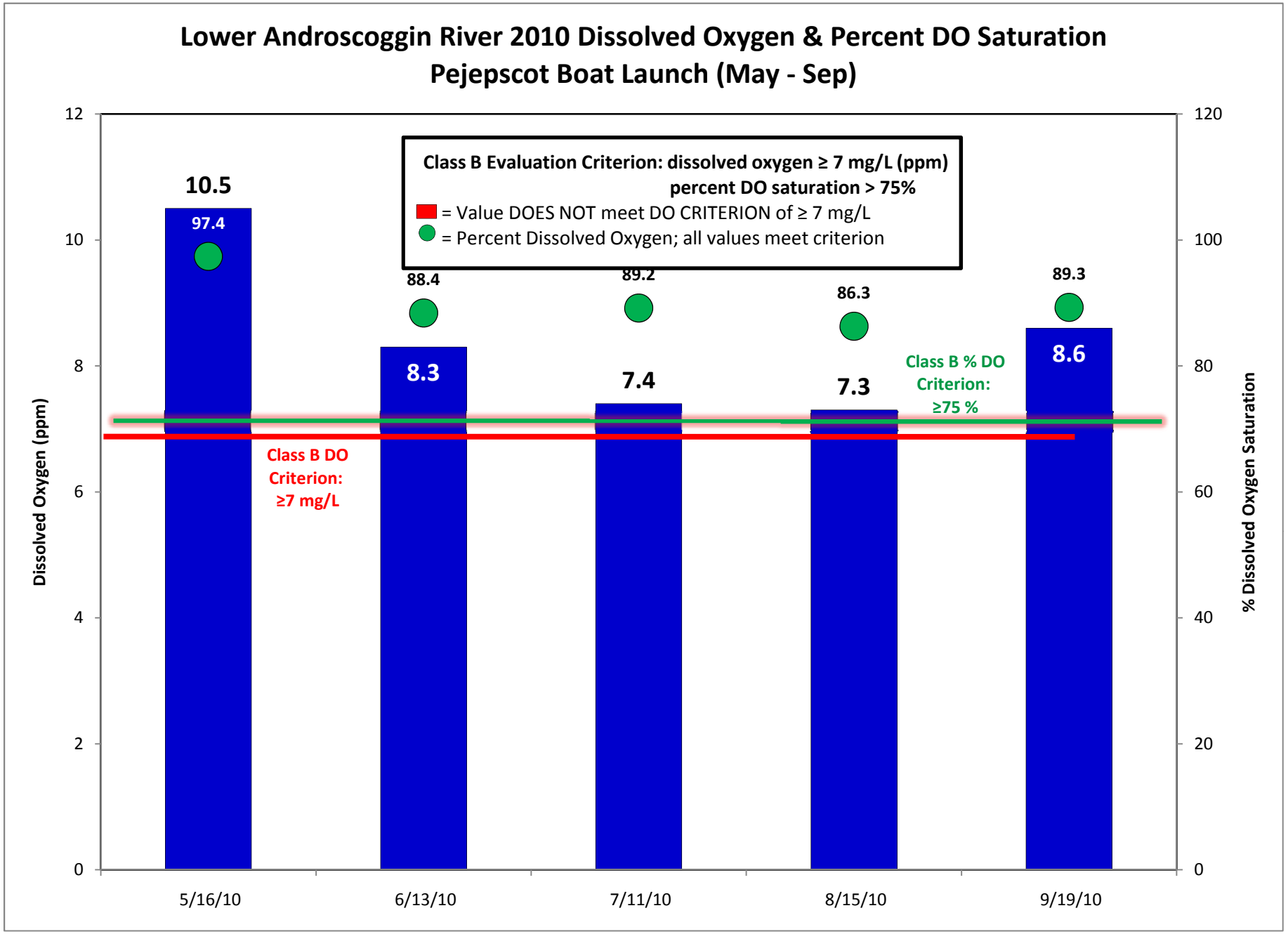
= MEAN VALUE Bolded Red Text = VALUE EXCEEDS CRITERIA						Criteria: GeoMean ≤ 64/100 ml or ≤ 236/100 ml inst	Criteria: GeoMean ≤ 64/100 ml or ≤ 236/100 ml inst	Criteria: GeoMean ≤ 64/100 ml or ≤ 236/100 ml inst	Criteria: GeoMean ≤ 64/100 ml or ≤ 236/100 ml inst
Site	**Date**	**Sample Time**	**Weather**	**Adversities**	**Sample Type**	**ALL DATA IDEXX**	**ALL DATA WITH MEANS FOR REPLICATE SAMPLES**	**NO APR OR OCT IDEXX DATA (Means for reps used)**	**NO OCT IDEXX DATA (Means for reps used)**
						MPN colonies/ 100mgl	MPN colonies/ 100mgl	MPN colonies/ 100mgl	MPN colonies/ 100mgl
Brunswick Canoe Mooring (BCM)									
BCM	4/18/2010	8:00 AM	overcast	W	Monthly	95.9	95.9	APR DATA ELIM	95.9
BCM	5/16/2010				Lab Split	9.7	8.9	8.9	8.9
BCM	5/16/2010	8:00 AM	clear		Monthly	8.5			
BCM	5/16/2010	8:00 AM	clear		Monthly	8.5			
BCM	6/13/2010	8:00 AM	overcast	N	Surface grab	19.5	19.8	19.8	19.8
BCM	6/13/2010	8:00 AM	overcast		Monthly	20.1			
BCM	7/11/2010	8:00 AM	clear		Monthly	41.7	31.5	31.5	31.5
BCM	7/11/2010	8:00 AM	clear		Monthly	21.3			
BCM	8/15/2010	8:15 AM	clear		Monthly	19.7	19.7	19.7	19.7
BCM	9/19/2010	8:00 AM	clear		Monthly	143.9	122.8	122.8	122.8
BCM	9/19/2010	8:00 AM	clear		Replicate	101.7			
BCM	10/17/2010	8:00 AM	clear	**Heavy Rain**	Monthly	**275.5**	**280.3**	OCT DATA ELIM	OCT DATA ELIM
BCM	10/17/2019	8:00 AM	clear	**Heavy Rain**	Surface grab	**285.1**			
					Geomean BCM	**39.3**	**44.8**	**26.6**	**33.0**
Brunswick Water St. (BWS)									
BWS	4/18/2010	9:15 AM	overcast	M, N	Monthly	135.4	141.05	APR DATA ELIM	141.05
BWS	4/18/2010	9:15 AM	overcast	M,N	Replicate	146.7			
BWS	5/16/2010	9:45 AM	clear	N	Monthly	72.7	72.7	72.7	72.7
BWS	6/13/2010	9:20 AM	overcast	B, M, N	Monthly	33.2	33.2	33.2	33.2
BWS	7/11/2010	7:50 AM	overcast	Rain	Monthly	90.5	90.5	90.5	90.5
BWS	8/15/2010	6:45 AM	clear		Monthly	13.4	13.4	13.4	13.4
BWS	9/19/2010	8:40 AM		Rain	Monthly	36.8	36.8	36.8	36.8
BWS	10/17/2010	8:45 AM	clear	**Heavy Rain**	Monthly	**248.9**	**248.9**	OCT DATA ELIM	OCT DATA ELIM
					Geomean BWS	**69.3**	**62.6**	**40.4**	**49.8**

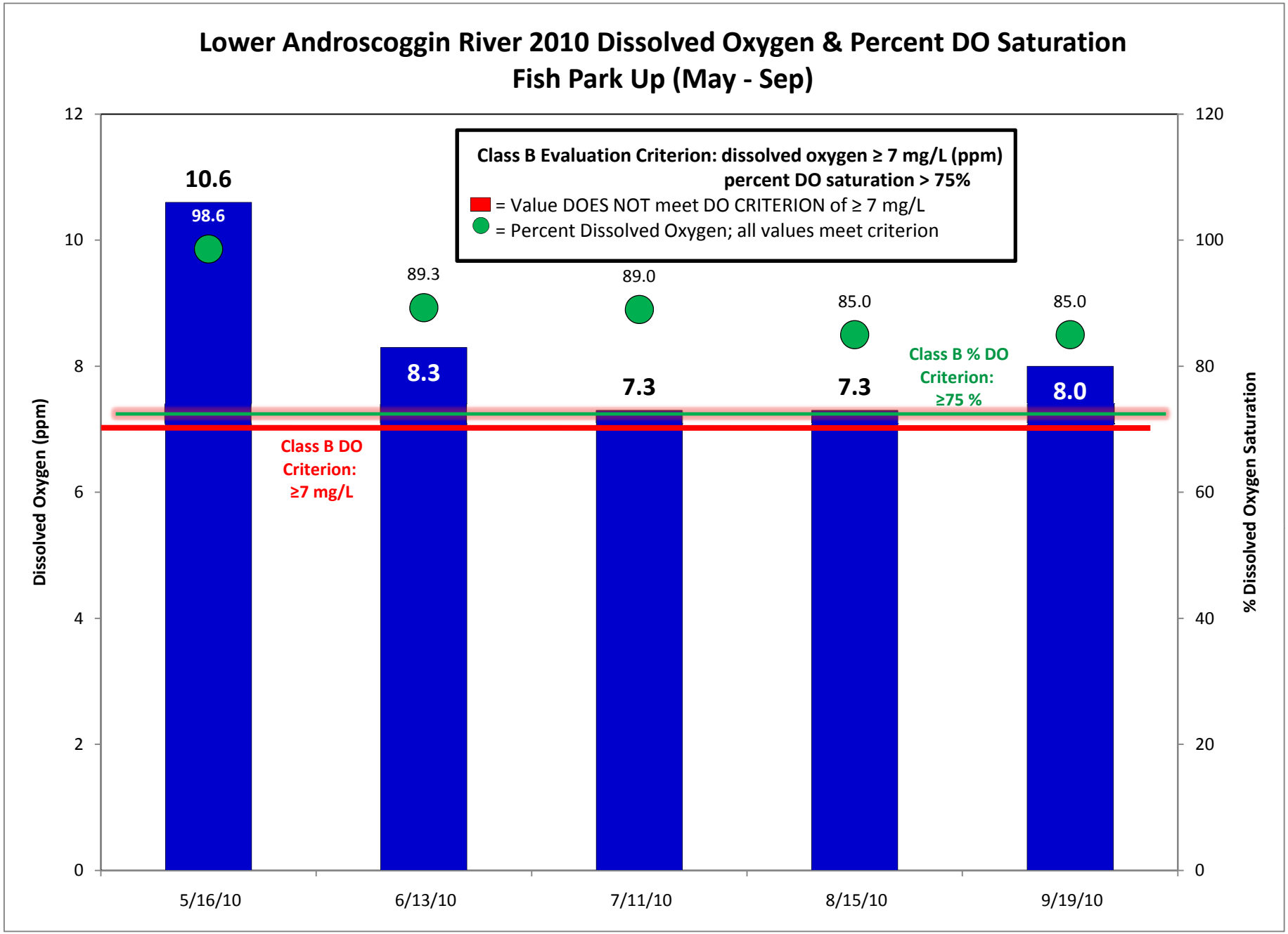
Lower Androscoggin River 2010 E. coli

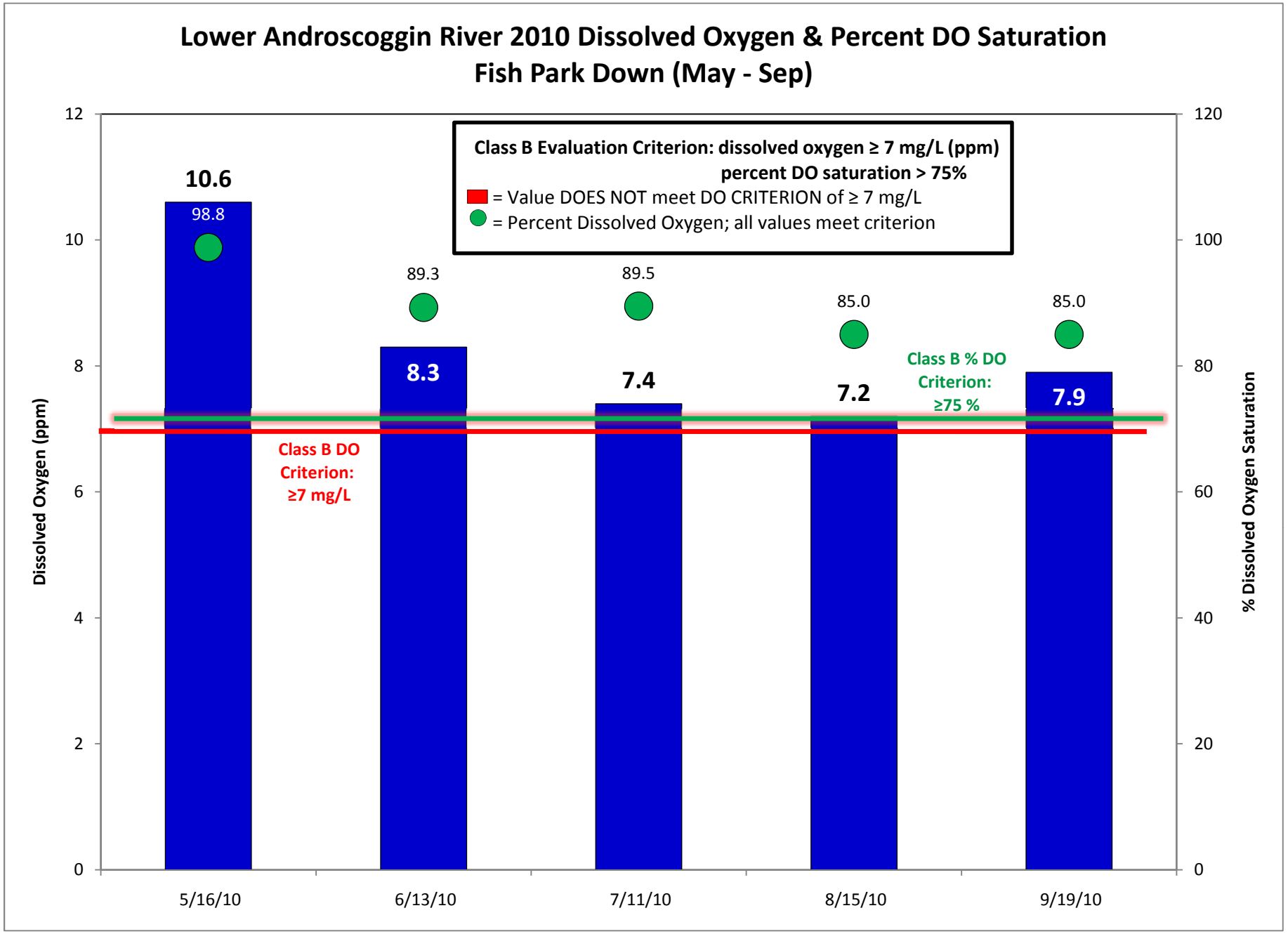
= MEAN VALUE Bolded Red Text = VALUE EXCEEDS CRITERIA						Criteria: GeoMean ≤ 64/100 ml or ≤ 236/100 ml inst	Criteria: GeoMean ≤ 64/100 ml or ≤ 236/100 ml inst	Criteria: GeoMean ≤ 64/100 ml or ≤ 236/100 ml inst	Criteria: GeoMean ≤ 64/100 ml or ≤ 236/100 ml inst
Site	**Date**	**Sample Time**	**Weather**	**Adversities**	**Sample Type**	**ALL DATA IDEXX**	**ALL DATA WITH MEANS FOR REPLICATE SAMPLES**	**NO APR OR OCT IDEXX DATA (Means for reps used)**	**NO OCT IDEXX DATA (Means for reps used)**
						MPN colonies/ 100mgl	MPN colonies/ 100mgl	MPN colonies/ 100mgl	MPN colonies/ 100mgl
Water St. Mooring (WSM)									
WSM	4/18/2010	8:10 AM	overcast		Monthly	124.6	124.6	APR DATA ELIM	124.6
WSM	5/16/2010	7:35 AM	clear		Monthly	8.6	8.6	8.6	8.6
WSM	6/13/2010	8:15 AM	overcast		Monthly	28.8	28.8	28.8	28.8
WSM	7/11/2010	8:00 AM	overcast		Monthly	52.9	52.9	52.9	52.9
WSM	8/15/2010	8:10 AM	clear		Monthly	9.7	9.7	9.7	9.7
WSM	9/19/2010	8:05 AM	overcast		Monthly	86	86	86	86
WSM	10/17/2010	9:10 AM	clear	**Heavy Rain**	Monthly	**410.6**	**410.6**	OCT DATA ELIM	OCT DATA ELIM
					Geomean WSM	**47.7**	**47.7**	**25.6**	**33.3**
Brunswick Bay Bridge (BBB)									
BBB	4/18/2010	7:45 AM	overcast		Monthly	186	186	APR DATA ELIM	186
BBB	5/16/2010	8:05 AM	clear		Monthly	13.4	13.4	13.4	13.4
BBB	6/13/2010	7:15 AM	overcast		Monthly	110.6	69.7	69.7	69.7
BBB	6/13/2010	7:15 AM	overcast		Replicate	69.7			
BBB	7/11/2010	7:15 AM	overcast		Monthly	72.4	72.4	72.4	72.4
BBB	8/15/2010	7:40 AM	clear		Monthly	8.4	8.4	8.4	8.4
BBB	9/19/2010	7:10 AM	overcast	fog	Monthly	17.5	17.5	17.5	17.5
	10/17/2010	8:32 AM	clear	**Heavy Rain**	Monthly	**648.8**	**648.8**	OCT DATA ELIM	OCT DATA ELIM
					Geomean BBB	**58.3**	**53.2**	**25.1**	**35.0**

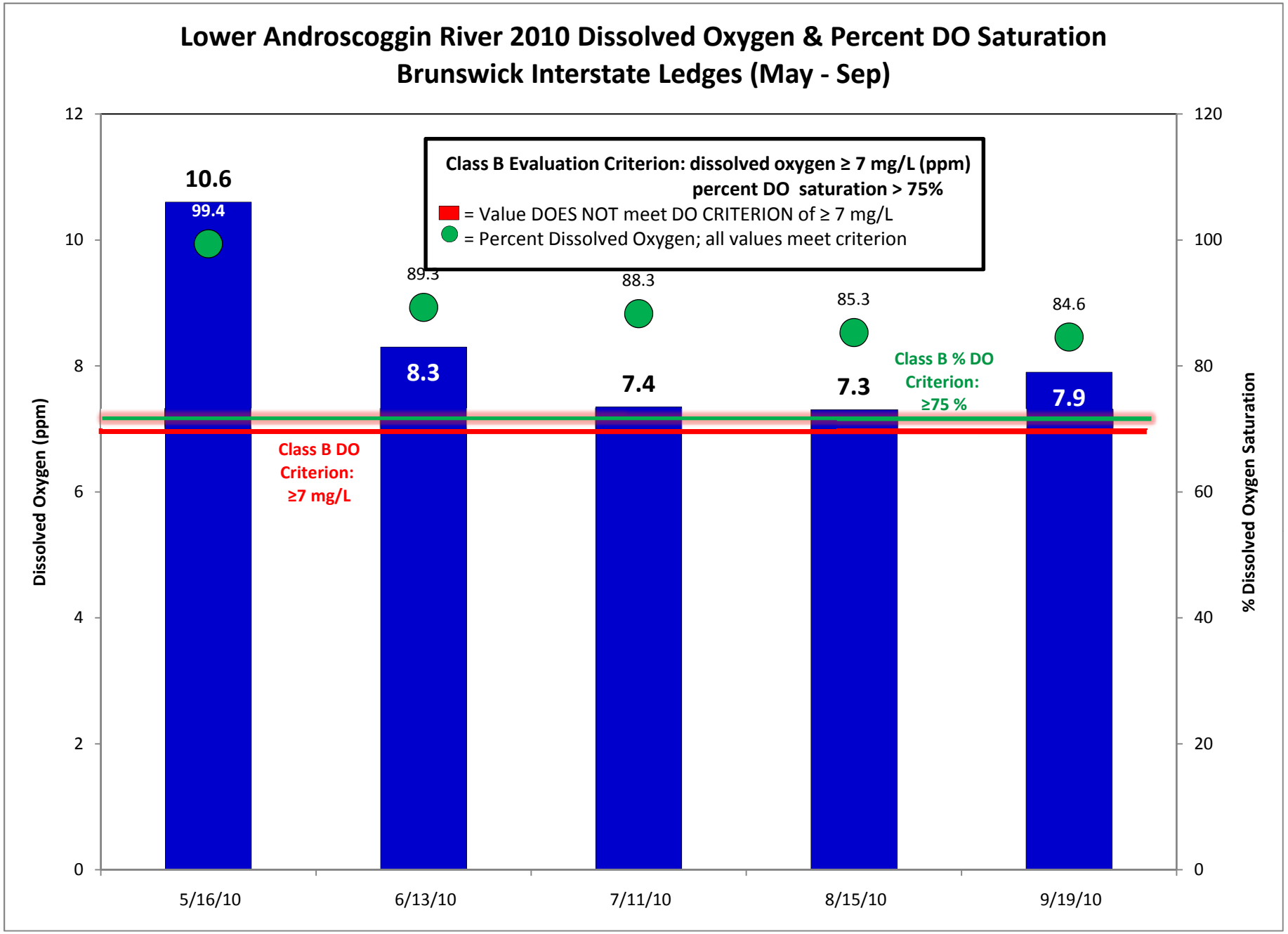
DO & Percent DO Saturation - 2010 by Station
May to September

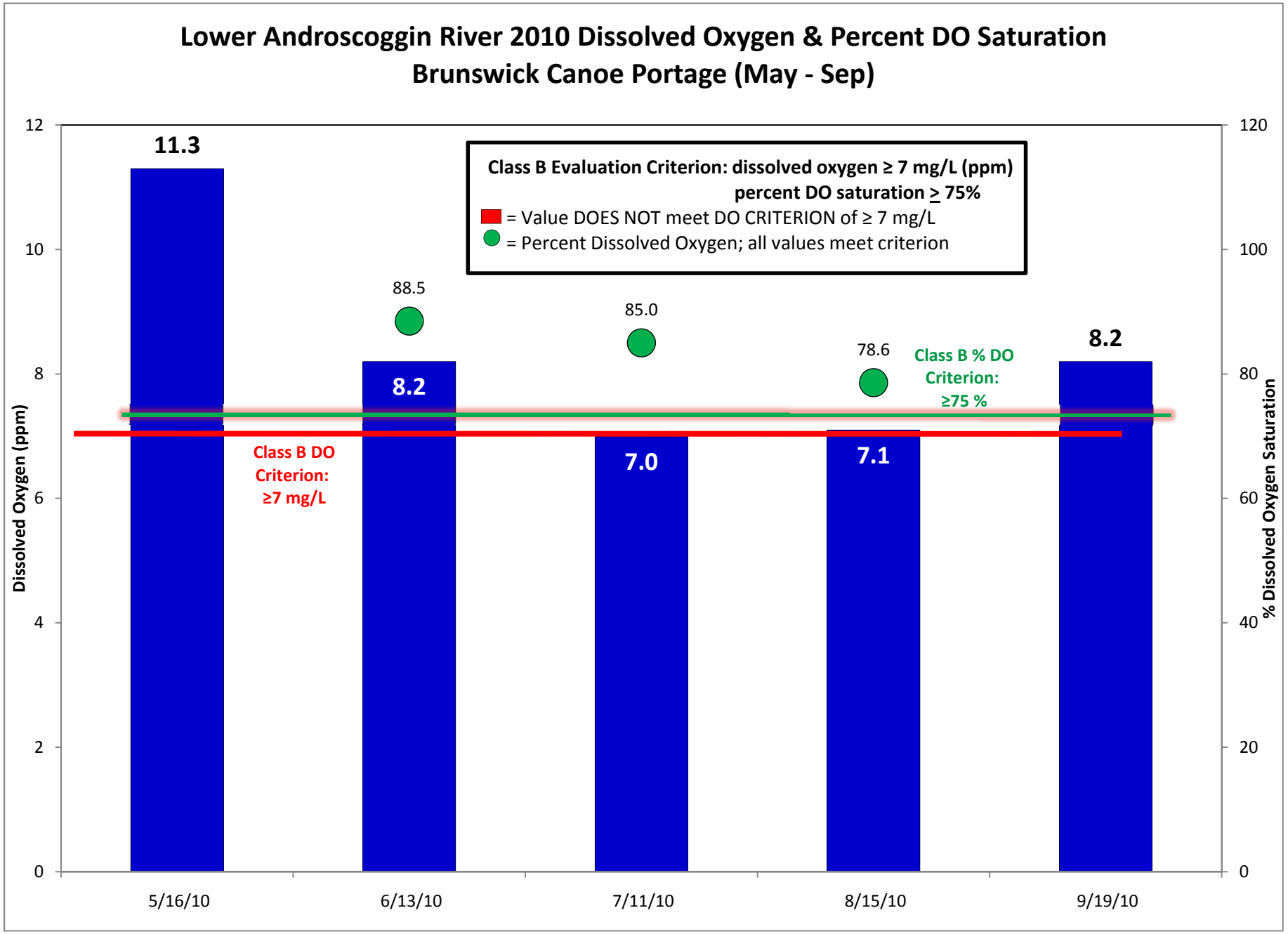

Lower Androscoggin River 2010 Dissolved Oxygen & Percent DO Saturation
Durham Boat Launch (May - Sep)
Class B Evaluation Criterion: dissolved oxygen ≥ 7 mg/L (ppm)
percent DO saturation > 75%
= Value DOES NOT meet DO CRITERION of ≥ 7 mg/L
= Percent Dissolved Oxygen; all values meet criterion
Dissolved Oxygen (ppm)
% Dissolved Oxygen Saturation
0
2
4
6
8
10
12
0
20
40
60
80
100
120
9.9
7.9
6.5
81.6
7.0
8.2
Class B DO Criterion: ≥7 mg/L
Class B % DO Criterion: ≥75 %
5/16/10
6/13/10
7/11/10
8/15/10
9/19/10

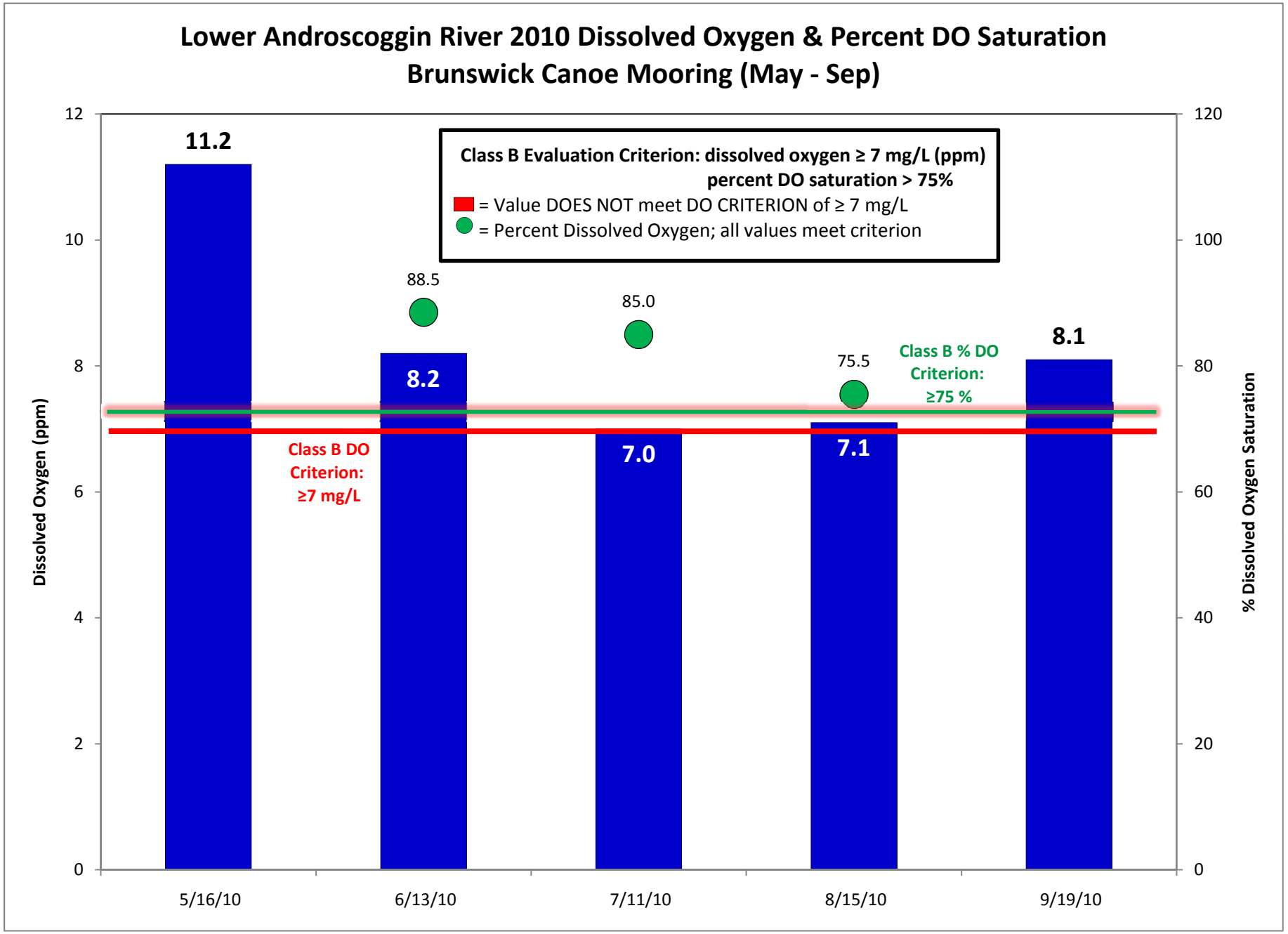

Lower Androscoggin River 2010 Dissolved Oxygen & Percent DO Saturation
Pejepscot Boat Launch (May - Sep)
Class B Evaluation Criterion: dissolved oxygen ≥ 7 mg/L (ppm)
percent DO saturation > 75%
= Value DOES NOT meet DO CRITERION of ≥ 7 mg/L
= Percent Dissolved Oxygen; all values meet criterion
Dissolved Oxygen (ppm)
% Dissolved Oxygen Saturation
0
2
4
6
8
10
12
0
20
40
60
80
100
120
10.5
97.4
88.4
8.3
89.2
7.4
86.3
7.3
89.3
8.6
Class B DO Criterion: ≥7 mg/L
Class B % DO Criterion: ≥75 %
5/16/10
6/13/10
7/11/10
8/15/10
9/19/10

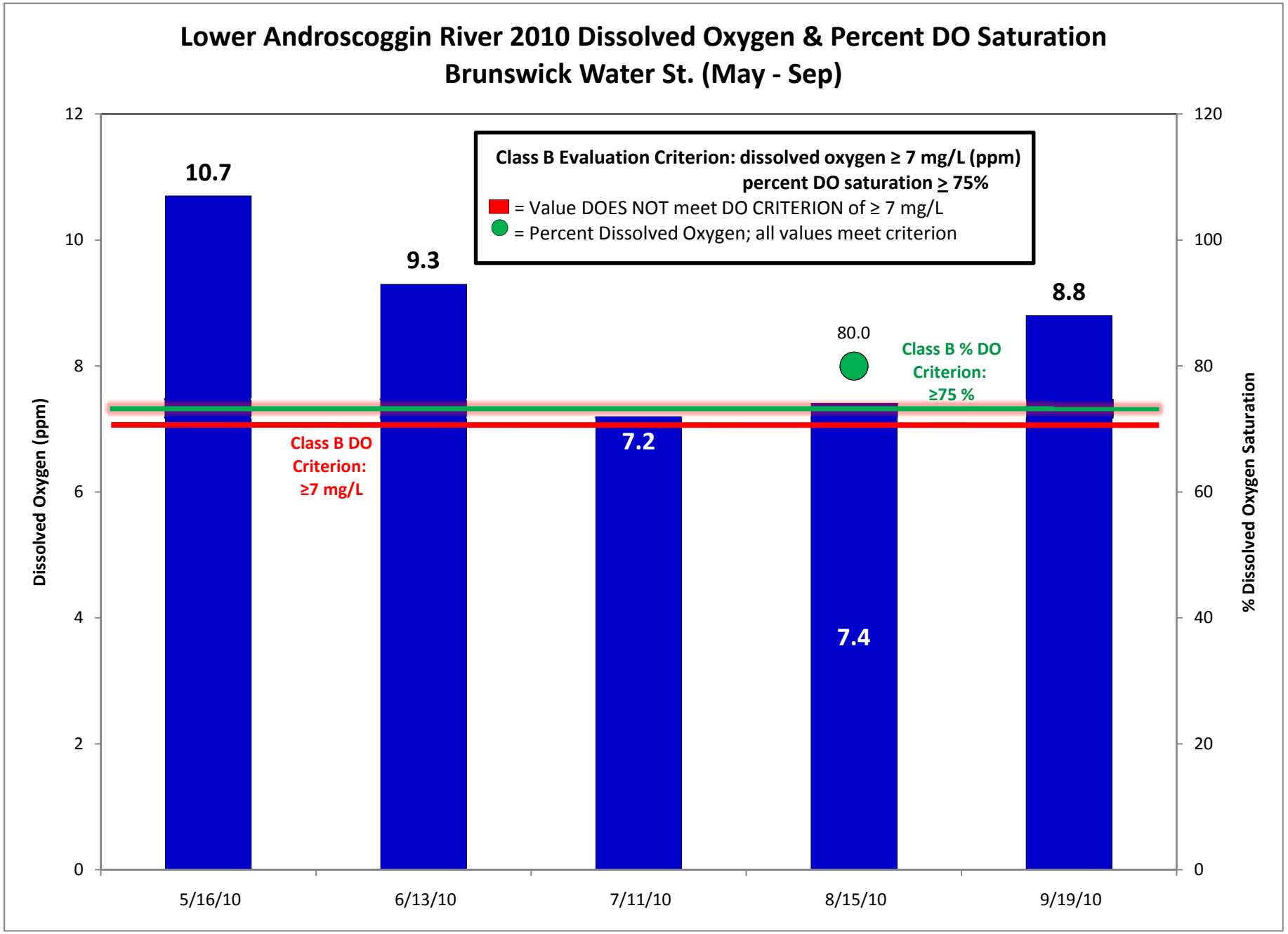

Lower Androscoggin River 2010 Dissolved Oxygen & Percent DO Saturation
Fish Park Up (May - Sep)
Class B Evaluation Criterion: dissolved oxygen ≥ 7 mg/L (ppm)
percent DO saturation > 75%
= Value DOES NOT meet DO CRITERION of ≥ 7 mg/L
= Percent Dissolved Oxygen; all values meet criterion
Dissolved Oxygen (ppm)
% Dissolved Oxygen Saturation
0
2
4
6
8
10
12
0
20
40
60
80
100
120
10.6
98.6
89.3
8.3
89.0
7.3
85.0
7.3
85.0
8.0
Class B DO Criterion: ≥7 mg/L
Class B % DO Criterion: ≥75 %
5/16/10
6/13/10
7/11/10
8/15/10
9/19/10

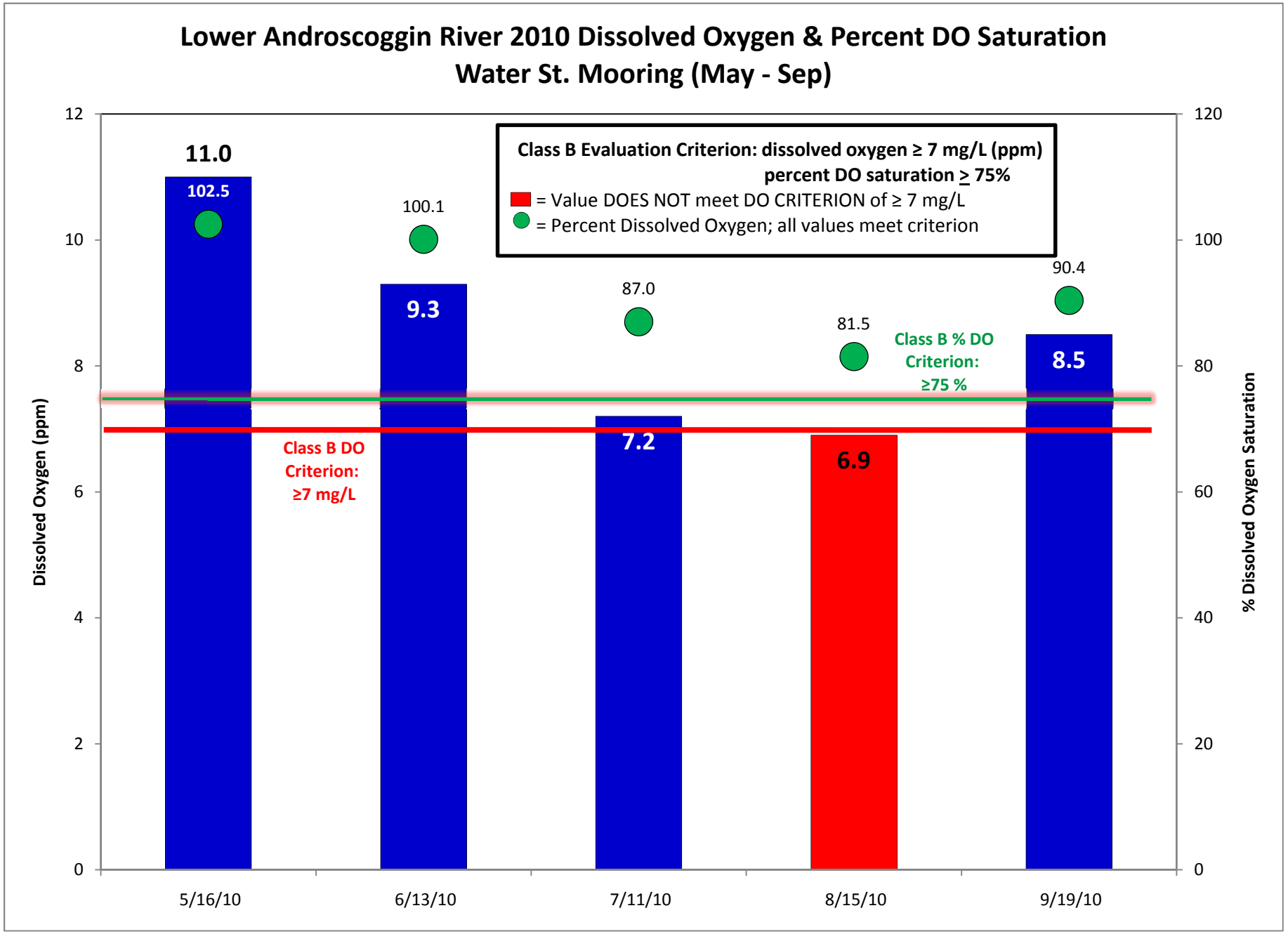

Lower Androscoggin River 2010 Dissolved Oxygen & Percent DO Saturation
Fish Park Down (May - Sep)
Class B Evaluation Criterion: dissolved oxygen ≥ 7 mg/L (ppm)
percent DO saturation > 75%
= Value DOES NOT meet DO CRITERION of ≥ 7 mg/L
= Percent Dissolved Oxygen; all values meet criterion
Dissolved Oxygen (ppm)
% Dissolved Oxygen Saturation
0
2
4
6
8
10
12
0
20
40
60
80
100
120
10.6
98.8
8.3
89.3
7.4
89.5
7.2
85.0
7.9
85.0
Class B DO Criterion: ≥7 mg/L
Class B % DO Criterion: ≥75 %
5/16/10
6/13/10
7/11/10
8/15/10
9/19/10

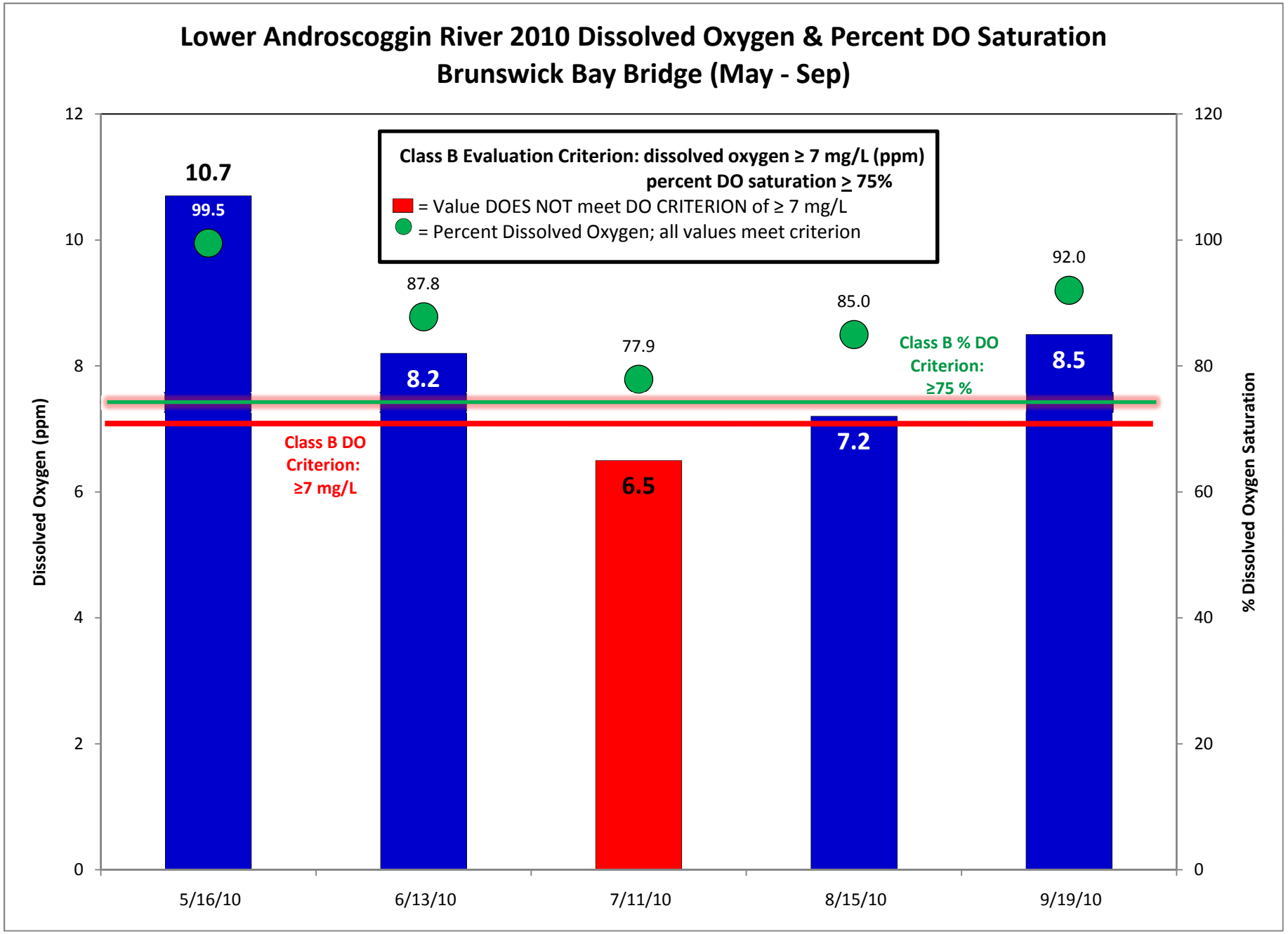

Lower Androscoggin River 2010 Dissolved Oxygen & Percent DO Saturation
Brunswick Interstate Ledges (May - Sep)
Class B Evaluation Criterion: dissolved oxygen ≥ 7 mg/L (ppm)
percent DO saturation > 75%
= Value DOES NOT meet DO CRITERION of ≥ 7 mg/L
= Percent Dissolved Oxygen; all values meet criterion
Dissolved Oxygen (ppm)
% Dissolved Oxygen Saturation
Class B DO Criterion: ≥7 mg/L
Class B % DO Criterion: ≥75 %
10.6
99.4
89.3
8.3
88.3
7.4
85.3
7.3
84.6
7.9
0
2
4
6
8
10
12
0
20
40
60
80
100
120
5/16/10
6/13/10
7/11/10
8/15/10
9/19/10

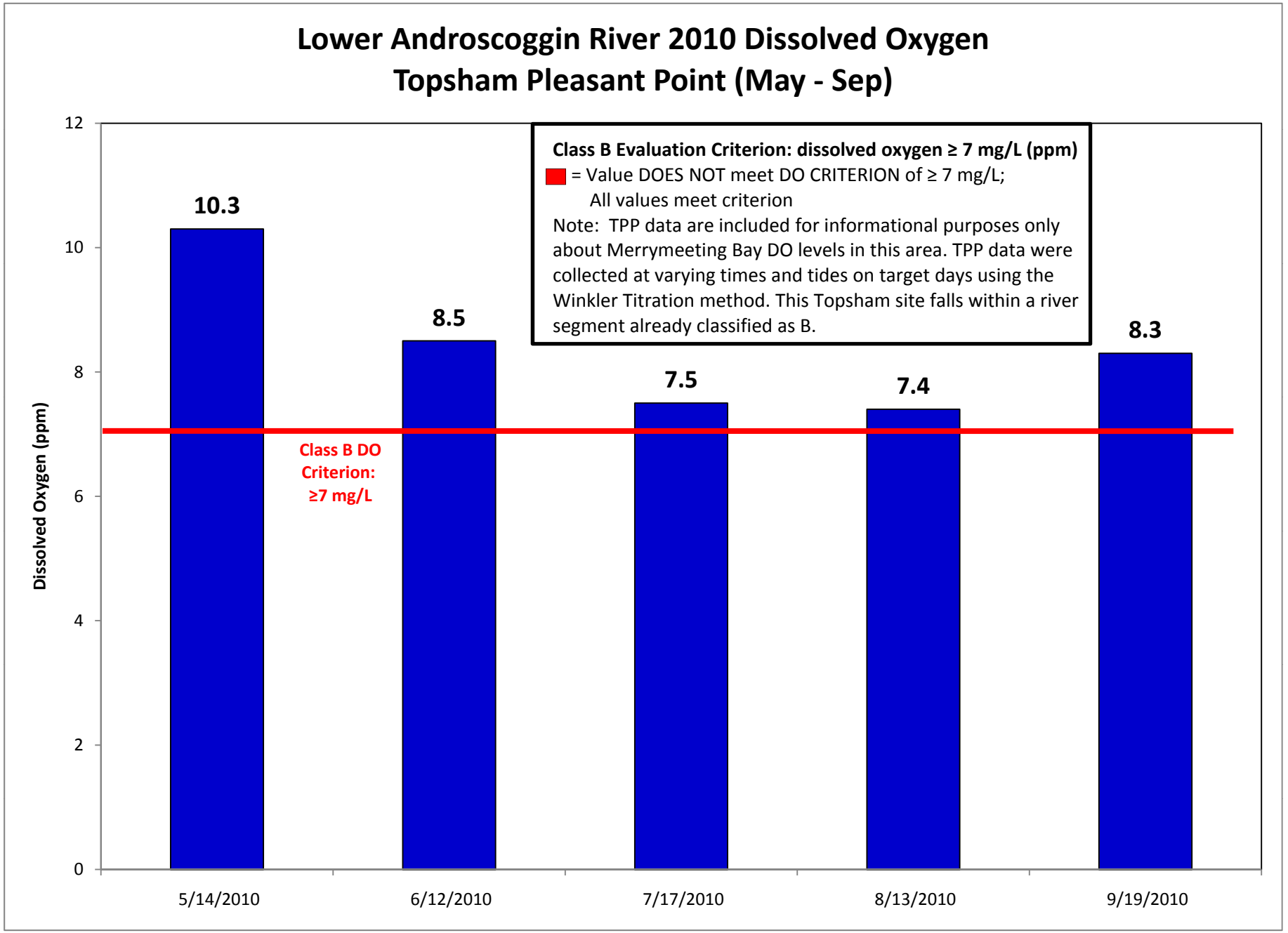

Lower Androscoggin River 2010 Dissolved Oxygen & Percent DO Saturation
Brunswick Canoe Portage (May - Sep)
Class B Evaluation Criterion: dissolved oxygen ≥ 7 mg/L (ppm)
percent DO saturation ≥ 75%
= Value DOES NOT meet DO CRITERION of ≥ 7 mg/L
= Percent Dissolved Oxygen; all values meet criterion
Class B DO Criterion: ≥7 mg/L
Class B % DO Criterion: ≥75 %
11.3
8.2
7.0
7.1
8.2
88.5
85.0
78.6
Dissolved Oxygen (ppm)
% Dissolved Oxygen Saturation
0
2
4
6
8
10
12
0
20
40
60
80
100
120
5/16/10
6/13/10
7/11/10
8/15/10
9/19/10


Lower Androscoggin River 2010 Dissolved Oxygen & Percent DO Saturation
Brunswick Canoe Mooring (May - Sep)
Class B Evaluation Criterion: dissolved oxygen ≥ 7 mg/L (ppm)
percent DO saturation > 75%
= Value DOES NOT meet DO CRITERION of ≥ 7 mg/L
= Percent Dissolved Oxygen; all values meet criterion
Class B DO Criterion: ≥7 mg/L
Class B % DO Criterion: ≥75 %
Dissolved Oxygen (ppm)
% Dissolved Oxygen Saturation
11.2
8.2
7.0
7.1
8.1
88.5
85.0
75.5
0
2
4
6
8
10
12
0
20
40
60
80
100
120
5/16/10
6/13/10
7/11/10
8/15/10
9/19/10

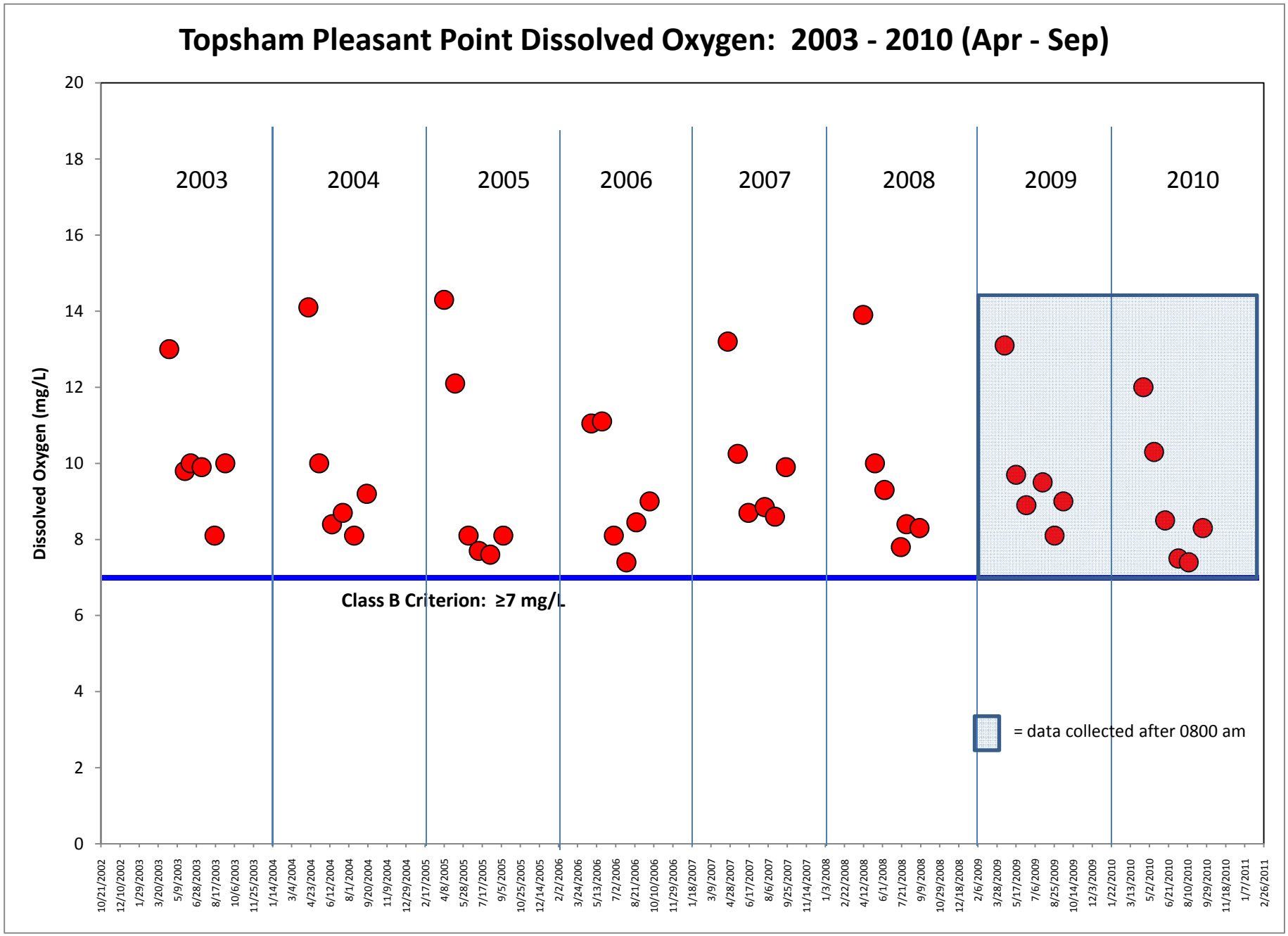

Lower Androscoggin River 2010 Dissolved Oxygen & Percent DO Saturation
Brunswick Water St. (May - Sep)
Class B Evaluation Criterion: dissolved oxygen ≥ 7 mg/L (ppm)
percent DO saturation ≥ 75%
= Value DOES NOT meet DO CRITERION of ≥ 7 mg/L
= Percent Dissolved Oxygen; all values meet criterion
Dissolved Oxygen (ppm)
% Dissolved Oxygen Saturation
0
2
4
6
8
10
12
0
20
40
60
80
100
120
10.7
9.3
7.2
7.4
80.0
8.8
Class B DO Criterion: ≥7 mg/L
Class B % DO Criterion: ≥75 %
5/16/10
6/13/10
7/11/10
8/15/10
9/19/10

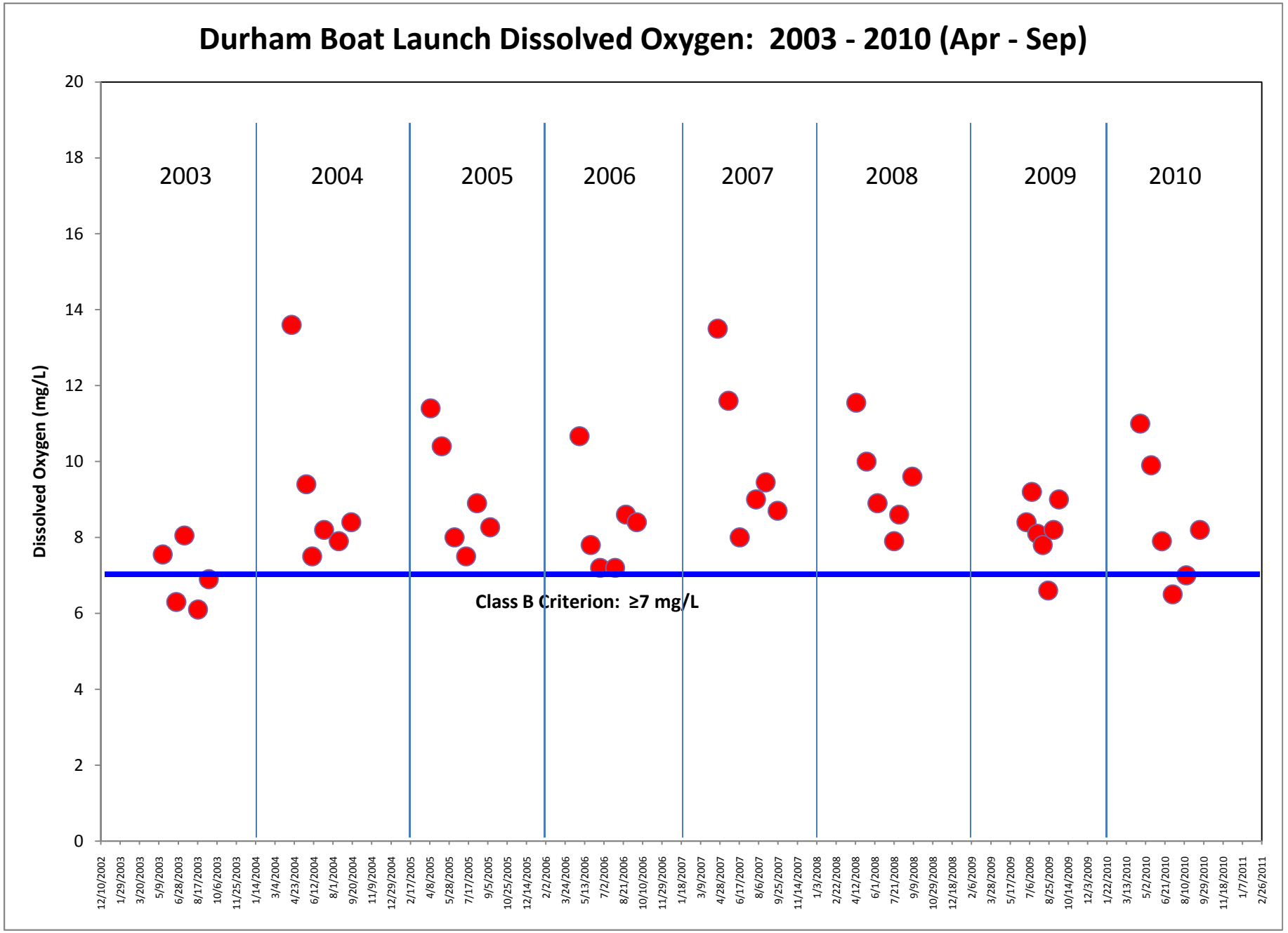

Lower Androscoggin River 2010 Dissolved Oxygen & Percent DO Saturation
Water St. Mooring (May - Sep)
Class B Evaluation Criterion: dissolved oxygen ≥ 7 mg/L (ppm)
percent DO saturation ≥ 75%
= Value DOES NOT meet DO CRITERION of ≥ 7 mg/L
= Percent Dissolved Oxygen; all values meet criterion
Dissolved Oxygen (ppm)
% Dissolved Oxygen Saturation
0
2
4
6
8
10
12
0
20
40
60
80
100
120
11.0
102.5
100.1
9.3
87.0
7.2
81.5
6.9
90.4
8.5
Class B DO Criterion: ≥7 mg/L
Class B % DO Criterion: ≥75 %
5/16/10
6/13/10
7/11/10
8/15/10
9/19/10

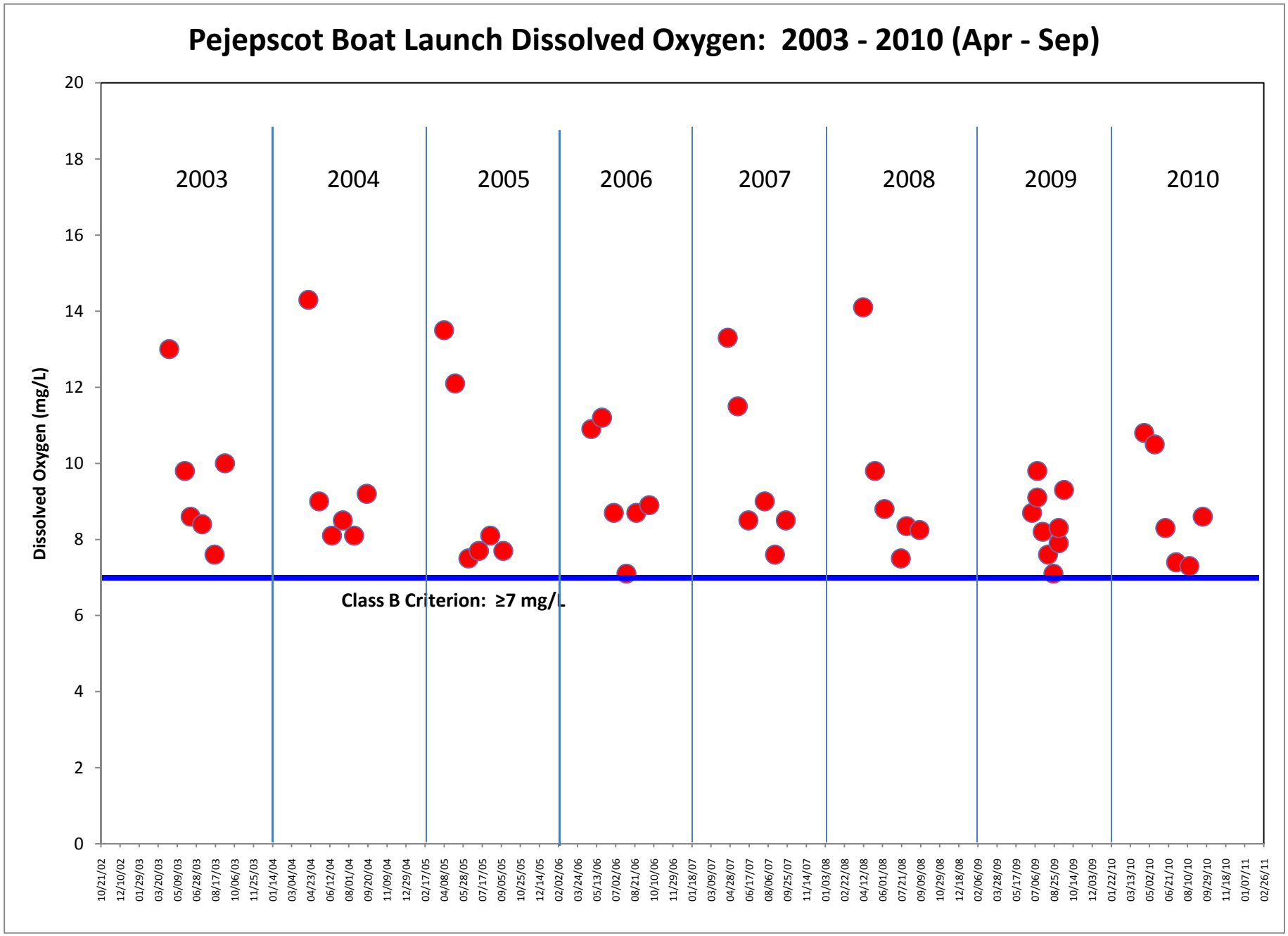

Lower Androscoggin River 2010 Dissolved Oxygen & Percent DO Saturation
Brunswick Bay Bridge (May - Sep)
Class B Evaluation Criterion: dissolved oxygen ≥ 7 mg/L (ppm)
percent DO saturation ≥ 75%
= Value DOES NOT meet DO CRITERION of ≥ 7 mg/L
= Percent Dissolved Oxygen; all values meet criterion
Dissolved Oxygen (ppm)
% Dissolved Oxygen Saturation
Class B DO Criterion: ≥7 mg/L
Class B % DO Criterion: ≥75 %
10.7
99.5
87.8
8.2
77.9
6.5
85.0
7.2
92.0
8.5
5/16/10
6/13/10
7/11/10
8/15/10
9/19/10


Lower Androscoggin River 2010 Dissolved Oxygen
Topsham Pleasant Point (May - Sep)
Class B Evaluation Criterion: dissolved oxygen ≥ 7 mg/L (ppm)
= Value DOES NOT meet DO CRITERION of ≥ 7 mg/L;
All values meet criterion
Note: TPP data are included for informational purposes only about Merrymeeting Bay DO levels in this area. TPP data were collected at varying times and tides on target days using the Winkler Titration method. This Topsham site falls within a river segment already classified as B.
Dissolved Oxygen (ppm)
12
10
8
6
4
2
0
10.3
8.5
7.5
7.4
8.3
Class B DO Criterion: ≥7 mg/L
5/14/2010
6/12/2010
7/17/2010
8/13/2010
9/19/2010

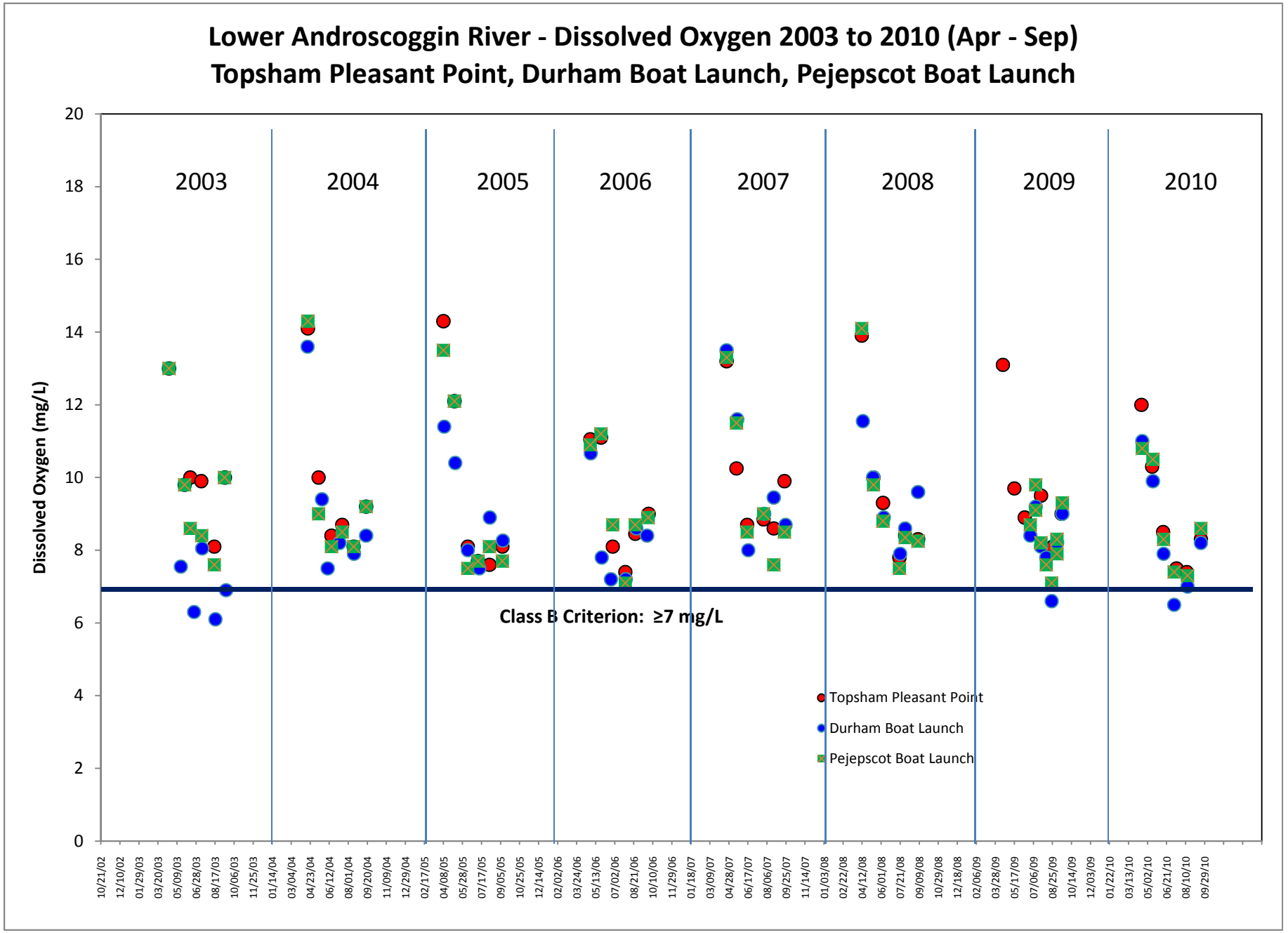
DO 2003 - 2010 Long-term Historical Trends April to September


Topsham Pleasant Point Dissolved Oxygen: 2003 - 2010 (Apr - Sep)
Dissolved Oxygen (mg/L)
20
18
16
14
12
10
8
6
4
2
0
2003
2004
2005
2006
2007
2008
2009
2010
Class B Criterion: ≥7 mg/L
= data collected after 0800 am
10/21/2002
12/10/2002
1/29/2003
3/20/2003
5/9/2003
6/28/2003
8/17/2003
10/6/2003
11/25/2003
1/14/2004
3/4/2004
4/23/2004
6/12/2004
8/1/2004
9/20/2004
11/9/2004
12/29/2004
2/17/2005
4/8/2005
5/28/2005
7/17/2005
9/5/2005
10/25/2005
12/14/2005
2/2/2006
3/24/2006
5/13/2006
7/2/2006
8/21/2006
10/10/2006
11/29/2006
1/18/2007
3/9/2007
4/28/2007
6/17/2007
8/6/2007
9/25/2007
11/14/2007
1/3/2008
2/22/2008
4/12/2008
6/1/2008
7/21/2008
9/9/2008
10/29/2008
12/18/2008
2/6/2009
3/28/2009
5/17/2009
7/6/2009
8/25/2009
10/14/2009
12/3/2009
1/22/2010
3/13/2010
5/2/2010
6/21/2010
8/10/2010
9/29/2010
11/18/2010
1/7/2011
2/26/2011


Durham Boat Launch Dissolved Oxygen: 2003 - 2010 (Apr - Sep)
Dissolved Oxygen (mg/L)
20
18
16
14
12
10
8
6
4
2
0
2003
2004
2005
2006
2007
2008
2009
2010
Class B Criterion: ≥7 mg/L
12/10/2002
1/29/2003
3/20/2003
5/9/2003
6/28/2003
8/17/2003
10/6/2003
11/25/2003
1/14/2004
3/4/2004
4/23/2004
6/12/2004
8/1/2004
9/20/2004
11/9/2004
12/29/2004
2/17/2005
4/8/2005
5/28/2005
7/17/2005
9/5/2005
10/25/2005
12/14/2005
2/2/2006
3/24/2006
5/13/2006
7/2/2006
8/21/2006
10/10/2006
11/29/2006
1/18/2007
3/9/2007
4/28/2007
6/17/2007
8/6/2007
9/25/2007
11/14/2007
1/3/2008
2/22/2008
4/12/2008
6/1/2008
7/21/2008
9/9/2008
10/29/2008
12/18/2008
2/6/2009
3/28/2009
5/17/2009
7/6/2009
8/25/2009
10/14/2009
12/3/2009
1/22/2010
3/13/2010
5/2/2010
6/21/2010
8/10/2010
9/29/2010
11/18/2010
1/7/2011
2/26/2011

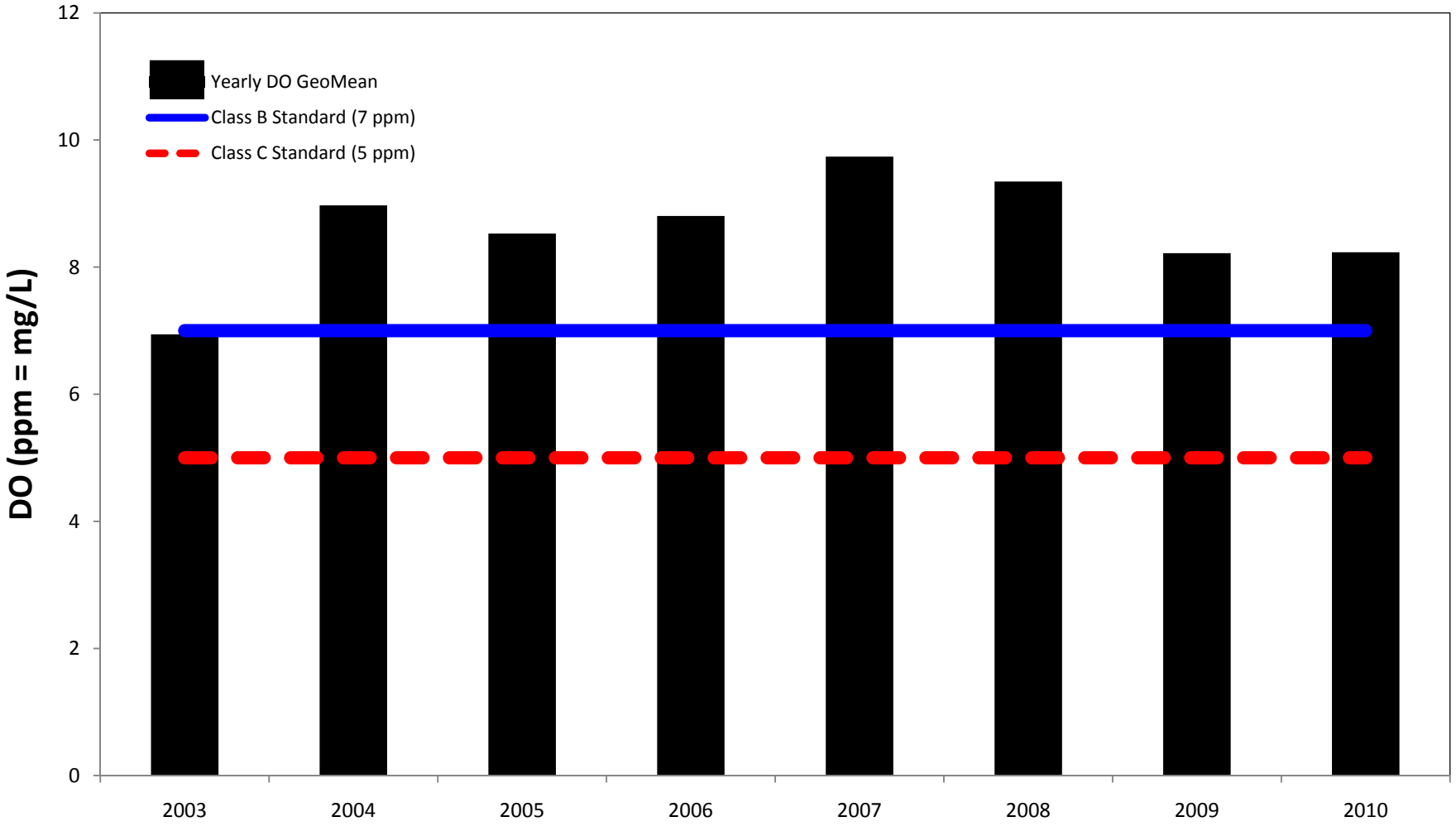

Pejepscot Boat Launch Dissolved Oxygen: 2003 - 2010 (Apr - Sep)
Dissolved Oxygen (mg/L)
20
18
16
14
12
10
8
6
4
2
0
2003
2004
2005
2006
2007
2008
2009
2010
Class B Criterion: ≥7 mg/L
10/21/02
12/10/02
01/29/03
03/20/03
05/09/03
06/28/03
08/17/03
10/06/03
11/25/03
01/14/04
03/04/04
04/23/04
06/12/04
08/01/04
09/20/04
11/09/04
12/29/04
02/17/05
04/08/05
05/28/05
07/17/05
09/05/05
10/25/05
12/14/05
02/02/06
03/24/06
05/13/06
07/02/06
08/21/06
10/10/06
11/29/06
01/18/07
03/09/07
04/28/07
06/17/07
08/06/07
09/25/07
11/14/07
01/03/08
02/22/08
04/12/08
06/01/08
07/21/08
09/09/08
10/29/08
12/18/08
02/06/09
03/28/09
05/17/09
07/06/09
08/25/09
10/14/09
12/03/09
01/22/10
03/13/10
05/02/10
06/21/10
08/10/10
09/29/10
11/18/10
01/07/11
02/26/11

DO 2003 - 2010 Long-term Stations Combined
Historical Trends
April to September


Lower Androscoggin River - Dissolved Oxygen 2003 to 2010 (Apr - Sep)
Topsham Pleasant Point, Durham Boat Launch, Pejepscot Boat Launch
Dissolved Oxygen (mg/L)
20
18
16
14
12
10
8
6
4
2
0
2003
2004
2005
2006
2007
2008
2009
2010
Class B Criterion: ≥7 mg/L
Topsham Pleasant Point
Durham Boat Launch
Pejepscot Boat Launch
10/21/02
12/10/02
01/29/03
03/20/03
05/09/03
06/28/03
08/17/03
10/06/03
11/25/03
01/14/04
03/04/04
04/23/04
06/12/04
08/01/04
09/20/04
11/09/04
12/29/04
02/17/05
04/08/05
05/28/05
07/17/05
09/05/05
10/25/05
12/14/05
02/02/06
03/24/06
05/13/06
07/02/06
08/21/06
10/10/06
11/29/06
01/18/07
03/09/07
04/28/07
06/17/07
08/06/07
09/25/07
11/14/07
01/03/08
02/22/08
04/12/08
06/01/08
07/21/08
09/09/08
10/29/08
12/18/08
02/06/09
03/28/09
05/17/09
07/06/09
08/25/09
10/14/09
12/03/09
01/22/10
03/13/10
05/02/10
06/21/10
08/10/10
09/29/10

DO 2003 - 2010 Long-term
Historical Trends
April to September

2003 -2010
Yearly DO Geometric Means for Lower Androscoggin River vs Class B & C Standards



(for 2003 to 2008 Sites = Topsham Pleasant Pt., Pejepscot Boat Launch & Durham Boat Launch; for 2009 & 2010 = all sites monitored)

Lower Androscoggin River 2010 Dissolved Oxygen Data Tables

Lower Androscoggin River 2010
Dissolved Oxygen

= MEAN VALUE
Bolded Red Text = **VALUE EXCEEDS CRITERIA**

Site	Date	Sample Time	Weather	Adversities	ALL DATA DO	ALL DATA WITH MEANS FOR REPLICATE SAMPLES	NO APR OR OCT DO DATA (Means for reps used)	NO APR OR OCT DO DATA - HEAVY RAIN DATA ELIMINATED (Means for reps used)	Percent DO All Data Collected, Including Replicate Values
					Dissolved Oxygen Class B Criteria: ≥ 7 ppm; 75% saturation	**Dissolved Oxygen Class B Criteria: ≥ 7 ppm; 75% saturation**	**Dissolved Oxygen Class B Criteria: ≥ 7 ppm; 75% saturation**	**Dissolved Oxygen Class B Criteria: ≥ 7 ppm; 75% saturation**	**% Dissolved Oxygen Class B Criteria: 75% saturation**
Durham Boat Launch (DBL)									
	4/18/2010								
DBL	4/18/2010	8:00 AM	fog/haze	L	11	11			
DBL	5/16/2010	7:50 AM	clear	L	9.9	9.9	9.9	9.9	
DBL	6/13/2010	8:00 AM	overcast	L, B	7.9	7.9	7.9	7.9	
DBL	7/11/2010	8:00 AM	overcast	Rain	**6.5**	**6.5**	**6.5**	**HEAVY RAIN ELIM**	
DBL	8/15/2010	6:50 AM	clear		7	7	7	7	81.6
DBL	8/15/2010	6:50 AM	clear		7				
DBL	9/19/2010	8:00 AM	clear		8.2	8.2	8.2	8.2	
DBL	10/17/2010	8:00 AM	clear	**Heavy Rain**	10.3	10.3			101.5
				GeoMean DBL	**8.33**	**8.54**	**7.82**	**8.19**	**91.0**
Pejepscot Boat Launch (PBL)									
PBL	4/18/2010	7:40 AM	overcast	L	10.8	10.8			
PBL	4/18/2010	7:40 AM	overcast	L	10.8				
PBL	5/16/2010	7:20 AM	clear		10.5	10.5	10.5	10.5	97.4
PBL	6/13/2010	6:55 AM	overcast	L	8.3	8.3	8.3	8.3	88.4
PBL	7/11/2010	7:00 AM	overcast	L	7.4	7.4	7.4	7.4	89.2
PBL	8/15/2010	6:50 AM	clear		7.3	7.3	7.3	7.3	86.3
PBL	9/19/2010	6:15 AM	clear		8.6	8.6	8.6	8.6	89.3
PBL	9/19/2010	6:15 AM	clear		8.6				89.3
PBL	10/17/2010	7:35 AM	clear	H	11.6	11.6			104.4
				GeoMean PBL	**9.20**	**9.08**	**8.35**	**8.35**	**91.9**

Lower Androscoggin River 2010
Dissolved Oxygen

= MEAN VALUE
Bolded Red Text = **VALUE EXCEEDS CRITERIA**

Site	Date	Sample Time	Weather	Adversities	Dissolved Oxygen Class B Criteria: ≥ 7 ppm; 75% saturation ALL DATA DO	Dissolved Oxygen Class B Criteria: ≥ 7 ppm; 75% saturation ALL DATA WITH MEANS FOR REPLICATE SAMPLES	Dissolved Oxygen Class B Criteria: ≥ 7 ppm; 75% saturation NO APR OR OCT DO DATA (Means for reps used)	Dissolved Oxygen Class B Criteria: ≥ 7 ppm; 75% saturation NO APR OR OCT DO DATA - HEAVY RAIN DATA ELIMINATED (Means for reps used)	% Dissolved Oxygen Class B Criteria: 75% saturation Percent DO All Data Collected, Including Replicate Values
Fish Park Up (FPU)									
FPU	4/18/2010	8:25 AM	overcast	L					
FPU	5/16/2010	7:45 AM	clear		10.6	10.6	10.6	10.6	98.6
FPU	6/13/2010	7:35 AM	overcast	L	8.3	8.3	8.3	8.3	89.3
FPU	6/13/2010	7:35 AM	overcast	L	8.3				89.3
FPU	7/11/2010	7:20 AM	overcast	L	7.3	7.3	7.3	7.3	89
FPU	8/15/2010	7:45 AM	clear		7.3	7.3	7.3	7.3	85
FPU	9/19/2010	7:05 AM	clear		8	8	8	8	85
FPU	10/17/2010	8:35 AM	clear	**Heavy Rain**	11.5	11.5			103.6
				GeoMean FPU	**8.64**	**8.69**	**8.22**	**8.22**	**91.2**
Fish Park Down (FPD)									
FPD	4/18/2010	8:40 AM	overcast	L					
FPD	5/16/2010	7:55 AM	clear		10.6	10.6	10.6	10.6	98.8
FPD	5/16/2010	7:55 AM	clear		10.6				98.8
FPD	6/13/2010	7:50 AM	overcast	L	8.3	8.3	8.3	8.3	89.3
FPD	7/11/2010	7:40 AM	overcast	L	7.4	7.4	7.4	7.4	89.5
FPD	8/15/2010	7:55 AM	clear		7.2	7.2	7.2	7.2	85
FPD	9/19/2010	7:17 AM	clear		7.9	7.9	7.9	7.9	85
FPD	10/17/2010	8:50 AM	clear	**Heavy Rain**	12.7	12.7			110.3
				GeoMean FPD	**9.05**	**8.82**	**8.20**	**8.20**	**93.4**

Lower Androscoggin River 2010
Dissolved Oxygen

= MEAN VALUE
Bolded Red Text = **VALUE EXCEEDS CRITERIA**

Site	Date	Sample Time	Weather	Adversities	Dissolved Oxygen Class B Criteria: ≥ 7 ppm; 75% saturation ALL DATA DO	Dissolved Oxygen Class B Criteria: ≥ 7 ppm; 75% saturation ALL DATA WITH MEANS FOR REPLICATE SAMPLES	Dissolved Oxygen Class B Criteria: ≥ 7 ppm; 75% saturation NO APR OR OCT DO DATA (Means for reps used)	Dissolved Oxygen Class B Criteria: ≥ 7 ppm; 75% saturation NO APR OR OCT DO DATA - HEAVY RAIN DATA ELIMINATED (Means for reps used)	% Dissolved Oxygen Class B Criteria: 75% saturation Percent DO All Data Collected, Including Replicate Values
Brunswick Interstate Ledges (BIL)									
BIL	4/18/2010	9:00 AM	**overcast**	L					
BIL	5/10/2010	8:15 AM	clear		10.6	10.6	10.6	10.6	99.4
BIL	6/13/2010	8:10 AM	overcast	L	8.3	8.3	8.3	8.3	89.3
BIL	7/11/2010	8:00 AM		L	7.3	7.35	7.35	7.35	88.3
BIL	7/11/2010	8:00 AM		L	7.4				88.3
BIL	8/15/2010	8:15 AM			7.3	7.3	7.3	7.3	85.3
BIL	9/19/2010	7:45 AM	**clear**		7.9	7.9	7.9	7.9	84.6
BIL	10/17/2010	9:10 AM	**clear**	**Heavy Rain**	12.7	12.7			110.3
BIL	10/17/2010	9:10 AM	**clear**	**Heavy Rain**	12.7				110.3
				GeoMean BIL	**9.03**	**8.83**	**8.21**	**8.21**	**94.0**
Brunswick Canoe Portage (BCP)									
BCP	4/18/2010	8:00 AM	overcast	N,W					
BCP	5/10/2010	8:00 AM			11.3	11.3	11.3	11.3	
BCP	6/13/2010	8:00 AM	overcast	L	8.2	8.2	8.2	8.2	88.5
BCP	7/11/2010	8:00 AM	clear		7	7	7	7	85
BCP	8/15/2010	8:15 AM	clear		7.1	7.1	7.1	7.1	78.6
BCP	9/19/2010	8:00 AM	clear		8.2	8.2	8.2	8.2	
BCP	9/19/2010	8:00 AM	clear		8.2				
BCP	10/17/2010	8:00 AM	clear	**Heavy Rain**	12.9	12.9			116
BCP	10/17/2010	8:00 AM	clear	**Heavy Rain**					116
				GeoMean BCP	**8.8**	**8.9**	**8.2**	**8.2**	**95.5**

Lower Androscoggin River 2010
Dissolved Oxygen

= MEAN VALUE
Bolded Red Text = **VALUE EXCEEDS CRITERIA**

Site	Date	Sample Time	Weather	Adversities	Dissolved Oxygen Class B Criteria: ≥ 7 ppm; 75% saturation ALL DATA DO	Dissolved Oxygen Class B Criteria: ≥ 7 ppm; 75% saturation ALL DATA WITH MEANS FOR REPLICATE SAMPLES	Dissolved Oxygen Class B Criteria: ≥ 7 ppm; 75% saturation NO APR OR OCT DO DATA (Means for reps used)	Dissolved Oxygen Class B Criteria: ≥ 7 ppm; 75% saturation NO APR OR OCT DO DATA - HEAVY RAIN DATA ELIMINATED (Means for reps used)	% Dissolved Oxygen Class B Criteria: 75% saturation Percent DO All Data Collected, Including Replicate Values
Brunswick Canoe Mooring (BCM)									
BCM	4/18/2010	8:00 AM	overcast	W	12.07	12.07			
BCM	5/16/2010								
BCM	5/16/2010	8:00 AM	clear		11.2	11.2	11.2	11.2	
BCM	5/16/2010	8:00 AM	clear		11.2				
BCM	6/13/2010	8:00 AM	overcast	N	8.2	8.2	8.2	8.2	88.5
BCM	6/13/2010	8:00 AM	overcast		8.2				88.5
BCM	7/11/2010	8:00 AM	clear		7	7	7	7	85
BCM	7/11/2010	8:00 AM	clear		7				85
BCM	8/15/2010	8:15 AM	clear		7.1	7.1	7.1	7.1	75.5
BCM	9/19/2010	8:00 AM	clear		8.1	8.1	8.1	8.1	
BCM	9/19/2010	8:00 AM	clear		8.1				
BCM	10/17/2010	8:00 AM	clear	**Heavy Rain**	12.9	12.9			116
BCM	10/17/2019	8:00 AM	clear	**Heavy Rain**	12.9				116
				GeoMean BCM	**9.24**	**9.24**	**8.20**	**8.20**	**92.4**
Brunswick Water St. (BWS)									
BWS	4/18/2010	9:15 AM	overcast	M, N	11.8	11.8			
BWS	4/18/2010	9:15 AM	overcast	M,N	11.8				
BWS	5/16/2010	9:45 AM	clear	N	10.7	10.7	10.7	10.7	
BWS	6/13/2010	9:20 AM	overcast	B, M, N	9.3	9.3	9.3	9.3	
BWS	7/11/2010	7:50 AM	overcast	rain	7.2	7.2	7.2	7.2	
BWS	8/15/2010	6:45 AM	clear		7.4	7.4	7.4	7.4	80
BWS	9/19/2010	8:40 AM		rain	8.8	8.8	8.8	8.8	
BWS	10/17/2010	8:45 AM	clear	**Heavy Rain**	12.1	12.1			
				GeoMean BWS	**9.70**	**9.44**	**8.59**	**9.03**	**80.0**

Lower Androscoggin River 2010
Dissolved Oxygen

= MEAN VALUE
Bolded Red Text = **VALUE EXCEEDS CRITERIA**

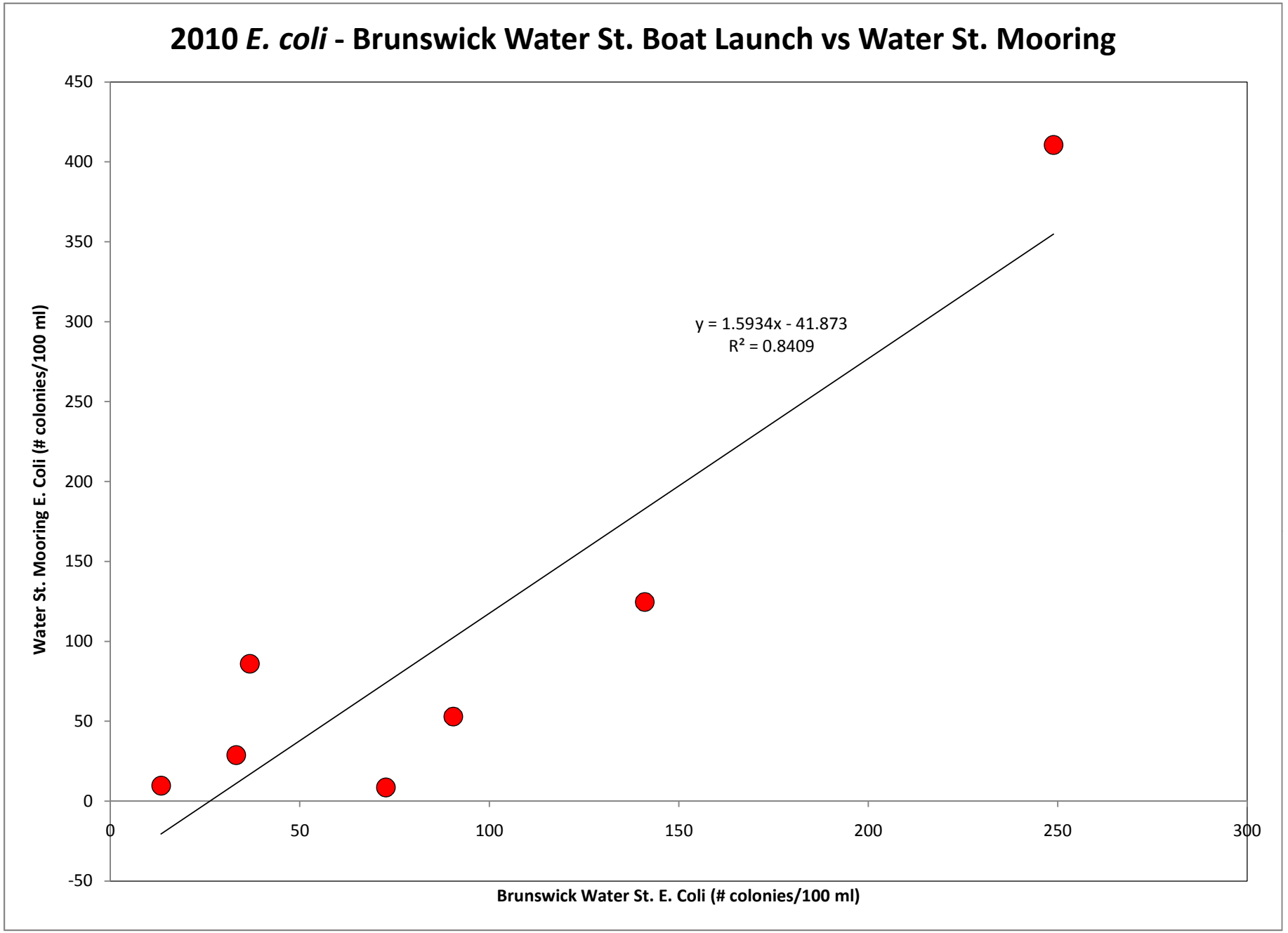
Site	Date	Sample Time	Weather	Adversities	Dissolved Oxygen Class B Criteria: ≥ 7 ppm; 75% saturation ALL DATA DO	Dissolved Oxygen Class B Criteria: ≥ 7 ppm; 75% saturation ALL DATA WITH MEANS FOR REPLICATE SAMPLES	Dissolved Oxygen Class B Criteria: ≥ 7 ppm; 75% saturation NO APR OR OCT DO DATA (Means for reps used)	Dissolved Oxygen Class B Criteria: ≥ 7 ppm; 75% saturation NO APR OR OCT DO DATA - HEAVY RAIN DATA ELIMINATED (Means for reps used)	% Dissolved Oxygen Class B Criteria: 75% saturation Percent DO All Data Collected, Including Replicate Values
Water St. Mooring (WSM)									
WSM	4/18/2010	8:10 AM	overcast		11.9	11.9			
WSM	5/16/2010	7:35 AM	clear		11	11	11	11	102.5
WSM	6/13/2010	8:15 AM	overcast		9.3	9.3	9.3	9.3	100.1
WSM	7/11/2010	8:00 AM	overcast		7.2	7.2	7.2	7.2	87
WSM	8/15/2010	8:10 AM	clear		**6.9**	**6.9**	**6.9**	**6.9**	81.5
WSM	9/19/2010	8:05 AM	overcast		8.5	8.5	8.5	8.5	90.4
WSM	10/17/2010	9:10 AM	clear	**Heavy Rain**	12.1	12.1			109
				GeoMean WSM	**9.34**	**9.34**	**8.45**	**8.45**	**94.6**
Brunswick Bay Bridge (BBB)									
BBB	4/18/2010	7:45 AM	overcast		11.8	11.8			
BBB	5/16/2010	8:05 AM	clear		10.7	10.7	10.7	10.7	99.5
BBB	6/13/2010	7:15 AM	overcast		8.2	8.2	8.2	8.2	87.8
BBB	6/13/2010	7:15 AM	overcast		8.2				87.8
BBB	7/11/2010	7:15 AM	overcast		**6.5**	**6.5**	**6.5**	**6.5**	77.9
BBB	8/15/2010	7:40 AM	clear		7.2	7.2	7.2	7.2	85
BBB	9/19/2010	7:10 AM	overcast	fog	8.5	8.5	8.5	8.5	92
	10/17/2010	8:32 AM	clear	**Heavy Rain**	11.9	11.9			108
				GeoMean BBB	**8.92**	**9.03**	**8.10**	**8.10**	**90.7**

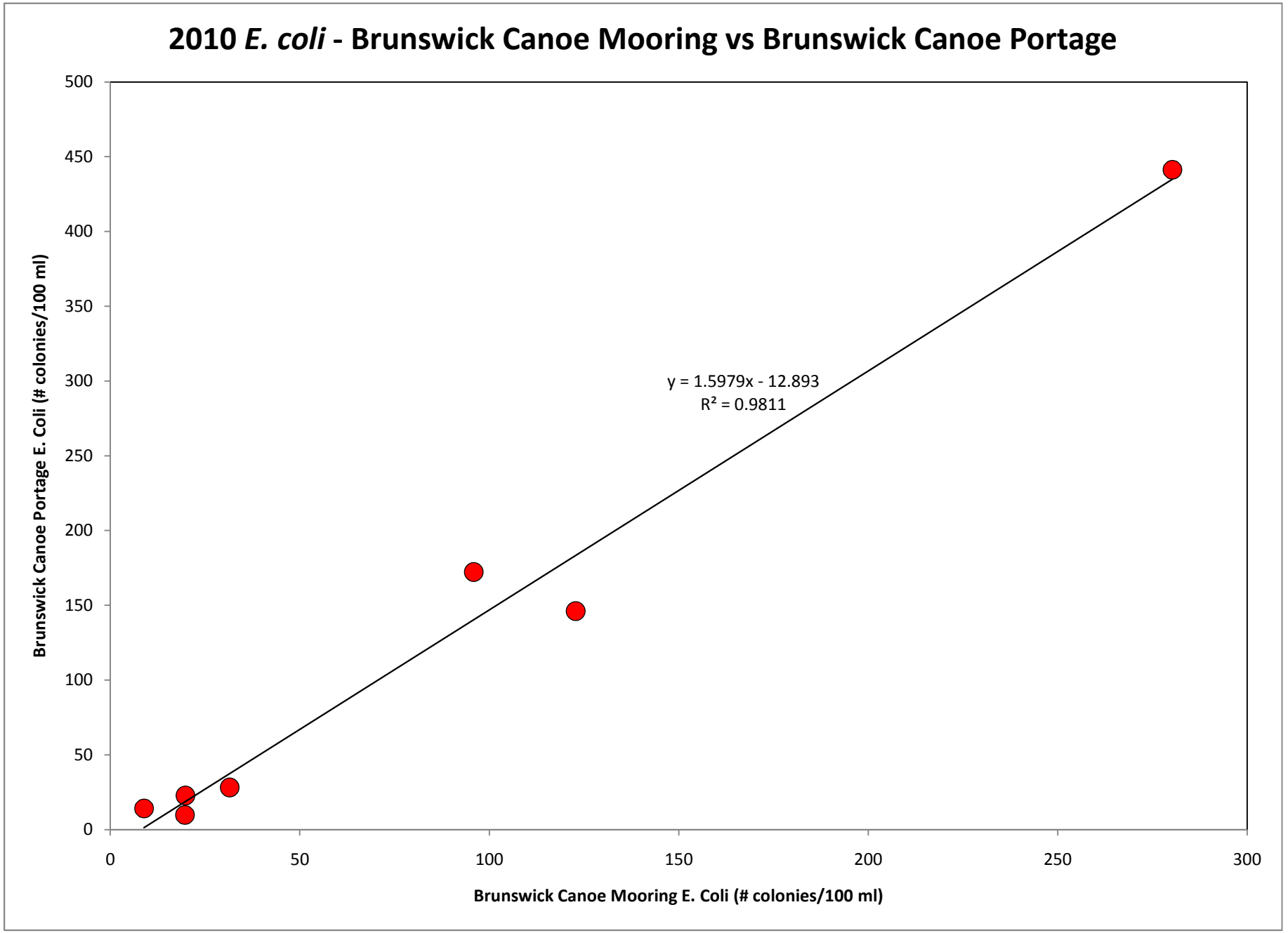
Lower Androscoggin River 2010
Dissolved Oxygen

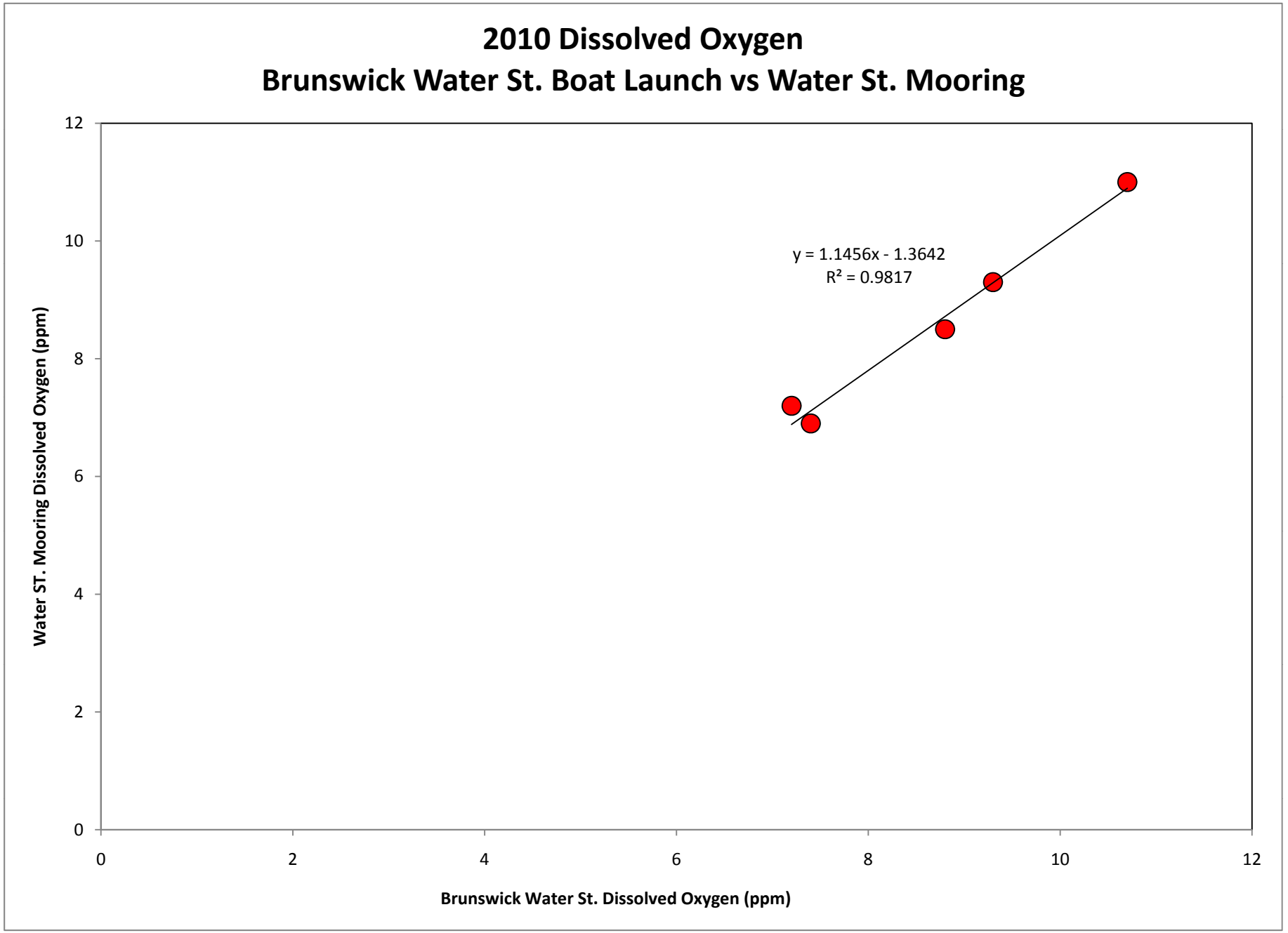
= MEAN VALUE Bolded Red Text = **VALUE EXCEEDS CRITERIA**					**Dissolved Oxygen Class B Criteria: ≥ 7 ppm; 75% saturation**	**Dissolved Oxygen Class B Criteria: ≥ 7 ppm; 75% saturation**	**Dissolved Oxygen Class B Criteria: ≥ 7 ppm; 75% saturation**	**Dissolved Oxygen Class B Criteria: ≥ 7 ppm; 75% saturation**	**% Dissolved Oxygen Class B Criteria: 75% saturation**
Site	**Date**	**Sample Time**	**Weather**	**Adversities**	**ALL DATA DO**	**ALL DATA WITH MEANS FOR REPLICATE SAMPLES**	**NO APR OR OCT DO DATA (Means for reps used)**	**NO APR OR OCT DO DATA - HEAVY RAIN DATA ELIMINATED (Means for reps used)**	**Percent DO All Data Collected, Including Replicate Values**
Topsham Pleasant Point (TPP)*									
TPP	4/16/2010	1000			12				
TPP	5/14/2010	1000			10.3				
TPP	6/12/2010	820			8.5				
TPP	7/17/2010	1400			7.5				
TPP	8/13/2010	830			7.4				
TPP	9/19/2010	910			8.3				
TPP	10/17/2010	1030			11.2				
				GeoMean TPP	**9.16**				

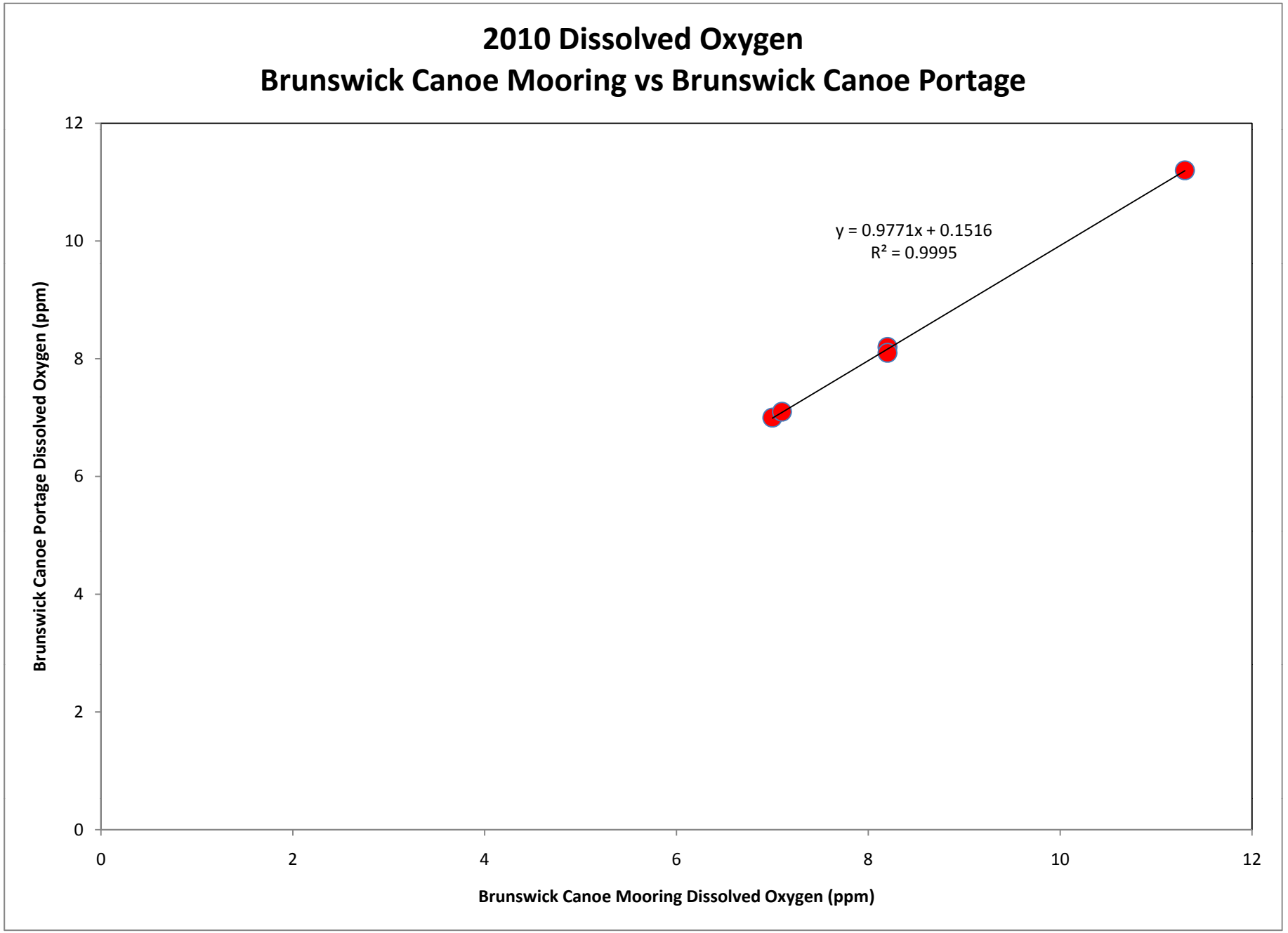
*TPP data are included for informational purposes only about Merrymeeting Bay DO levels in this area. TPP data were collected at varying times and tides on target days using the Winkler Titration method. This Topsham site falls within a river segment already classified as B.

Mid-stream vs. Near-shore Comparisons for E. coli and Dissolved Oxygen Relationships determined by Linear Regression


2010 E. coli - Brunswick Water St. Boat Launch vs Water St. Mooring
Water St. Mooring E. Coli (# colonies/100 ml)
Brunswick Water St. E. Coli (# colonies/100 ml)
y = 1.5934x - 41.873
R² = 0.8409
450
400
350
300
250
200
150
100
50
0
-50
0
50
100
150
200
250
300


2010 E. coli - Brunswick Canoe Mooring vs Brunswick Canoe Portage
Brunswick Canoe Portage E. Coli (# colonies/100 ml)
Brunswick Canoe Mooring E. Coli (# colonies/100 ml)
y = 1.5979x - 12.893
R² = 0.9811
0
50
100
150
200
250
300
350
400
450
500


2010 Dissolved Oxygen
Brunswick Water St. Boat Launch vs Water St. Mooring
y = 1.1456x - 1.3642
R² = 0.9817
Water ST. Mooring Dissolved Oxygen (ppm)
Brunswick Water St. Dissolved Oxygen (ppm)
0
2
4
6
8
10
12


2010 Dissolved Oxygen
Brunswick Canoe Mooring vs Brunswick Canoe Portage
y = 0.9771x + 0.1516
R² = 0.9995
Brunswick Canoe Portage Dissolved Oxygen (ppm)
Brunswick Canoe Mooring Dissolved Oxygen (ppm)
0
2
4
6
8
10
12

List of Appendices

Appendix 1
Public Law, Chapter 163 LD 330
(Lower Androscoggin is Section 24)

An Act To Change the Classification of Certain Waters of the State

Be it enacted by the People of the State of Maine as follows:

Sec. 1. 38 MRSA §467, sub-§1, ¶C, as amended by PL 2003, c. 317, §2, is further amended to read:

C. Androscoggin River, Upper Drainage; that portion within the State lying above the river's most upstream crossing of the Maine-New Hampshire boundary - Class A unless otherwise specified.

(1) Cupsuptic River and its tributaries - Class AA.

(2) Kennebago River and its tributaries except for the impoundment of the dam at Kennebago Falls - Class AA.

(3) Rapid River, from a point located 1,000 feet downstream of Middle Dam to its confluence with Umbagog Lake - Class AA.

(4) Magalloway River and tributaries above Aziscohos Lake in Lynchton Township, Parmachenee Township and Bowmantown Township - Class AA.

(4-A) Abbott Brook and its tributaries in Lincoln Plantation - Class AA.

(5) Little Magalloway River and tributaries in Parmachenee Township and Bowmantown Township - Class AA.

(6) Long Pond Stream in Rangeley - Class AA.

(7) Dodge Pond Stream in Rangeley - Class AA.

Sec. 2. 38 MRSA §467, sub-§1, ¶D, as amended by PL 2003, c. 317, §3, is further amended to read:

D. Androscoggin River, minor tributaries - Class B unless otherwise specified.

(1) All tributaries of the Androscoggin River that enter between the Maine-New Hampshire boundary in Gilead and its confluence with, and including, the Ellis River and that are not otherwise classified - Class A.

(2) Bear River - Class AA.

(3) Sabattus River from Sabattus Lake to limits of the Lisbon urban area - Class C.

(4) Webb River - Class A.

(5) Swift River, and its tributaries, above the Mexico-Rumford boundary - Class A.

(6) Nezinscot River, east and west branches above their confluence in Buckfield - Class A.

(7) Wild River in Gilead, Batchelders Grant - Class AA.

(8) Aunt Hannah Brook and its tributaries in Dixfield - Class A.

Sec. 3. 38 MRSA §467, sub-§4, ¶A, as amended by PL 2003, c. 317, §6 and affected by §25, is further amended to read:

A. Kennebec River, main stem.

(1) From the east outlet of Moosehead Lake to a point 1,000 feet below the lake - Class A.

(2) From the west outlet of Moosehead Lake to a point 1,000 feet below the lake - Class A.

(3) From a point 1,000 feet below Moosehead Lake to its confluence with Indian Pond - Class AA.

(4) From Harris Dam to a point located 1,000 feet downstream from Harris Dam - Class A.

(5) From a point located 1,000 feet downstream from Harris Dam to its confluence with the Dead River - Class AA.

(6) From its confluence with the Dead River to the confluence with Wyman Lake, including all impoundments - Class A.

(7) From the Wyman Dam to its confluence with the impoundment formed by the Williams Dam - Class A.

(8) From the confluence with the Williams impoundment to the Route 201A bridge in Anson-Madison, including all impoundments - Class A.

(9) From the Route 201A bridge in Anson-Madison to the Fairfield-Skowhegan boundary, including all impoundments - Class B.

(10) From the Fairfield-Skowhegan boundary to ~~its confluence with Messalonskee Stream, including all impoundments~~the Shawmut Dam - Class C.

(10-A) From the Shawmut Dam to its confluence with Messalonskee Stream, excluding all impoundments - Class B.

(a) Waters impounded by the Hydro-Kennebec Dam and the Lockwood Dam in Waterville-Winslow - Class C.

(11) From its confluence with Messalonskee Stream to the Sidney-Augusta boundary, including all impoundments - Class B.

(12) From the Sidney-Augusta boundary to the Father John J. Curran Bridge in Augusta, including all impoundments - Class B.

(13) From the Father John J. Curran Bridge in Augusta to a line drawn across the tidal estuary of the Kennebec River due east of Abagadasset Point - Class B. Further, the Legislature finds that the free-flowing habitat of this river segment provides irreplaceable social and economic benefits and that this use must be maintained. Further, the license limits for total residual chlorine and bacteria for existing direct discharges of wastewater to this segment as of January 1, 2003 must remain the same as the limits in effect on that date and must remain in effect until June 30, 2009 or upon renewal of the license, whichever comes later. Thereafter, license limits for total residual chlorine and bacteria must be those established by the department in the license and may include a compliance schedule pursuant to section 414-A, subsection 2.

(14) From a line drawn across the tidal estuary of the Kennebec River due east of Abagadasset Point, to a line across the southwesterly area of Merrymeeting Bay formed by an extension of the Brunswick-Bath boundary across the bay in a northwesterly direction to the westerly shore of Merrymeeting Bay and to a line drawn from Chop Point in Woolwich to West Chop Point in Bath - Class B. Further, the Legislature finds that the free-flowing habitat of this river segment provides irreplaceable social and economic benefits and that this use must be maintained.

Sec. 4. 38 MRSA §467, sub-§4, ¶I, as repealed and replaced by PL 1989, c. 228, §2, is amended to read:

I. Kennebec River, minor tributaries - Class B unless otherwise specified.

(1) All minor tributaries entering above Wyman Dam that are not otherwise classified - Class A.

(2) All tidal portions of tributaries entering between ~~Edwards Dam~~the Sidney-Vassalboro-Augusta town line and a line drawn across the tidal estuary of the Kennebec River due east of Abagadasset Point - Class ~~C~~B, unless otherwise specified.

(a) Eastern River from head of tide to its confluence with the Kennebec River - Class C.

(3) Cold Stream, West Forks Plantation - Class AA.

(4) Moxie Stream, Moxie Gore, below a point located 1,000 feet downstream of the Moxie

Pond dam - Class AA.

(5) Austin Stream and its tributaries above the highway bridge of Route 201 in the Town of Bingham - Class A.

Sec. 5. 38 MRSA §467, sub-§7, ¶E, as amended by PL 1999, c. 277, §11, is further amended to read:

E. Piscataquis River Drainage.

(1) Piscataquis River, main stem.

(a) From the confluence of the East Branch and the West Branch to the Route 15 bridge in Guilford - Class A.

(b) From the Route 15 bridge in Guilford to the Maine Central Railroad bridge in Dover-Foxcroft - Class B.

(c) From the Maine Central Railroad bridge in Dover-Foxcroft to its confluence with the Penobscot River - Class B.

(2) Piscataquis River, tributaries - Class B unless otherwise specified.

(a) Except as otherwise provided, East and West Branches of the Piscataquis River and their tributaries above their confluence near Blanchard - Class A.

(b) East Branch of the Piscataquis River from 1,000 feet below Shirley Pond to its confluence with the West Branch - Class AA.

(c) Pleasant River, East Branch and its tributaries - Class A.

(d) Pleasant River, West Branch, from the outlet of Fourth West Branch Pond to its confluence with the East Branch - Class AA.

(e) Pleasant River, West Branch tributaries - Class A.

(f) Sebec River and its tributaries above Route 6 in Milo - Class A.

(g) West Branch of the Piscataquis River from 1,000 feet below West Shirley Bog to its confluence with the East Branch - Class AA.

(h) Black Stream - Class A.

(i) Cold Stream - Class A.

(j) Kingsbury Stream - Class A.

(k) Schoodic Stream - Class A.

(l) Scutaze Stream - Class A.

(m) ~~Sebois~~Seboeis Stream, including East and West Branches, and tributaries - Class A.

(n) Alder Stream and its tributaries - Class A.

Sec. 6. 38 MRSA §467, sub-§7, ¶F, as amended by PL 2003, c. 317, §13, is further amended to read:

F. Penobscot River, minor tributaries - Class B unless otherwise specified.

(1) Cambolasse Stream (Lincoln) below the Route 2 bridge - Class C.

(2) Great Works Stream (Bradley) and its tributaries above the Route 178 bridge - Class A.

(3) Kenduskeag Stream (Bangor) below the Bullseye Bridge - Class C.

(4) Mattanawcook Stream (Lincoln) below the outlet of Mattanawcook Pond - Class C.

(5) Olamon Stream and its tributaries above the bridge on Horseback Road - Class A.

(6) Passadumkeag River and its tributaries - Class A, unless otherwise specified.

(a) Passadumkeag River from the Pumpkinhill Dam to its confluence with the Penobscot River - Class AA.

(b) Ayers Brook - Class AA.

(7) Souadabscook Stream above head of tide - Class AA.

(7-A) Souadabscook Stream, tributaries of - Class B, unless otherwise specified.

(a) West Branch Souadabscook Stream (Hampden, Newburgh) - Class A.

(b) Brown Brook (Hampden) - Class A.

(8) Sunkhaze Stream and its tributaries - Class AA.

(9) Birch Stream - Class A.

(10) Hemlock Stream - Class A.

(11) Mattamiscontis Stream and its tributaries - Class A.

(12) Medunkeunk Stream - Class A.

(13) Rockabema Stream - Class A.

(14) Salmon Stream - Class A.

(15) Salmon Stream in Winn - Class A.

(16) Little Salmon Stream in Medway - Class A.

(17) Narrimissic River in Bucksport and Orland, including all impoundments - Class B.

Sec. 7. 38 MRSA §467, sub-§9, ¶B, as amended by PL 1991, c. 499, §16, is further amended to read:

B. Presumpscot River, tributaries - Class A unless otherwise specified.

(1) All tributaries entering below the outlet of Sebago Lake - Class B.

(2) Crooked River and its tributaries, except as otherwise provided, excluding existing impoundments ~~and excluding that area of the river previously impounded at Scribners Mill~~ - Class AA.

(3) Stevens Brook (Bridgton) - Class B.

(4) Mile Brook (Casco) - Class B.

Sec. 8. 38 MRSA §467, sub-§12, ¶B, as amended by PL 2003, c. 317, §15, is further amended to read:

B. Saco River, tributaries, those waters lying within the State - Class B unless otherwise specified.

(1) All tributaries entering above the confluence of the Ossipee River lying within the State

and not otherwise classified - Class A.

(2) Wards Brook (Fryeburg) - Class C.

(3) Buff Brook (Waterboro) - Class A.

(4) Ossipee River Drainage, those waters lying within the State - Class B unless otherwise specified.

(a) Emerson Brook in Parsonsfield - Class A.

(b) South River and its tributaries (Parsonsfield), those waters lying within the State - Class A.

Sec. 9. 38 MRSA §467, sub-§13, ¶A, as repealed and replaced by PL 1989, c. 764, §14, is amended to read:

A. St. Croix River, main stem.

(1) Except as otherwise provided, from the outlet of Chiputneticook Lakes to its confluence with the Woodland Lake impoundment, those waters lying within the State - Class A.

(2) Those waters ~~of~~impounded in the Grand Falls Flowage including those waters between Route 1 (Princeton and Indian Township) and ~~Black Cat Island~~Grand Falls Dam - Class ~~B~~GPA.

(3) Woodland Lake impoundment - Class C.

(4) From the Woodland Dam to tidewater, those waters lying within the State, including all impoundments - Class C.

Sec. 10. 38 MRSA §467, sub-§15, ¶C, as amended by PL 2003, c. 317, §17, is further amended to read:

C. Aroostook River Drainage.

(1) Aroostook River, main stem.

(a) From the confluence of Millinocket Stream and Munsungan Stream to the Route 11 bridge - Class AA.

(b) From the Route 11 bridge to the Sheridan Dam - Class B.

(c) From the Sheridan Dam to its confluence with Presque Isle Stream, including all impoundments - Class B.

(d) From its confluence with Presque Isle Stream to a point located 3.0 miles upstream of the intake of the Caribou water supply, including all impoundments - Class C.

(e) From a point located 3.0 miles upstream of the intake of the Caribou water supply to a point located 100 yards downstream of the intake of the Caribou water supply, including all impoundments - Class B.

(f) From a point located 100 yards downstream of the intake of the Caribou water supply to the international boundary, including all impoundments - Class C.

(2) Aroostook River, tributaries, those waters lying within the State - Class A unless otherwise specified.

(a) All tributaries of the Aroostook River entering below the confluence of the Machias River that are not otherwise classified - Class B.

(b) Little Machias River and its tributaries - Class A.

(c) Little Madawaska River and its tributaries, including Madawaska Lake tributaries above the Caribou-Connor Township line - Class A.

(d) Machias River, from the outlet of Big Machias Lake to the Aroostook River - Class AA.

(e) Millinocket Stream, from the outlet of Millinocket Lake to its confluence with Munsungan Stream - Class AA.

(f) Munsungan Stream, from the outlet of Little Munsungan Lake to its confluence with Millinocket Stream - Class AA.

(g) Presque Isle Stream and its tributaries above the Mapleton-Presque Isle town line - Class A.

(h) St. Croix Stream from its confluence with Hall Brook in T.9, R.5, W.E.L.S. to its confluence with the Aroostook River - Class AA.

(j) Squa Pan Stream from the outlet of Squa Pan Lake to its confluence with the Aroostook River - Class C.

(k) Limestone Stream from the Long Road bridge to the Canadian border - Class C.

(l) Beaver Brook and its tributaries (T.14 R.6 W.E.L.S., T.14 R.5 W.E.L.S., T.13 R.5 W.E.L.S., Portage Lake, Ashland, Castle Hill) - Class A.

(m) Gardner Brook and its tributaries (T.14 R.5 W.E.L.S., T.13 R.5 W.E.L.S., Wade) - Class A.

Sec. 11. 38 MRSA §467, sub-§15, ¶F, as amended by PL 2003, c. 317, §18, is further amended to read:

F. St. John River, minor tributaries, those waters lying within the State - Class A unless otherwise specified.

(1) Except as otherwise classified, all minor tributaries of the St. John River entering below the international bridge in Fort Kent, those waters lying within the State - Class B.

(2) Baker Branch, from the headwaters at the St. John Ponds to its confluence with the Southwest Branch - Class AA.

(3) Big Black River, from the international boundary to its confluence with the St. John River - Class AA.

(4) Northwest Branch, from the outlet of Beaver Pond in T.12, R.17, W.E.L.S. to its confluence with the St. John River - Class AA.

(5) Prestile Stream from its source to Route 1A in Mars Hill - Class A.

(6) Southwest Branch, from a point located 5 miles downstream of the international boundary to its confluence with the Baker Branch - Class AA.

(7) Violette Stream and its tributaries, from its source to the confluence with Caniba Brook - Class A.

Sec. 12. 38 MRSA §467, sub-§16, ¶B, as amended by PL 1999, c. 277, §22, is further amended to read:

B. Salmon Falls River, tributaries, those waters lying within the State - Class B unless otherwise specified.

(1) Chicks Brook (South Berwick, York) - Class A.

(2) Little River and its tributaries (Berwick, North Berwick, Lebanon) - Class A.

Sec. 13. 38 MRSA §468, sub-§1, ¶A-1 is enacted to read:

A-1. Cape Elizabeth.

(1) Trout Brook, those waters that form the town boundary with South Portland - Class C.

Sec. 14. 38 MRSA §468, sub-§1, ¶B, as repealed and replaced by PL 1989, c. 764, §21, is amended to read:

B. Portland.

(1) All minor drainages unless otherwise specified - Class C.

(2) Stroudwater River from its origin to tidewater, including all tributaries - Class B.

Sec. 15. 38 MRSA §468, sub-§1, ¶C, as repealed and replaced by PL 1989, c. 764, §21, is amended to read:

C. Scarborough.

(1) All minor drainages - Class C unless otherwise specified.

(2) Finnard Brook - Class B.

(3) Stuart Brook - Class B.

(4) Nonesuch River from the headwaters to a point 1/2 mile downstream of Mitchell Hill Road crossing - Class B.

(5) Stroudwater River from its origin to tidewater, including all tributaries - Class B.

Sec. 16. 38 MRSA §468, sub-§1, ¶D, as repealed and replaced by PL 1989, c. 764, §21, is amended to read:

D. South Portland.

(1) All minor drainages - Class C.

(2) Trout Brook downstream of the first point where the brook becomes the town boundary between South Portland and Cape Elizabeth - Class C.

Sec. 17. 38 MRSA §468, sub-§1, ¶J is enacted to read:

J. Westbrook.

(1) Long Creek, main stem - Class C.

Sec. 18. 38 MRSA §468, sub-§4, ¶D is enacted to read:

D. Bristol.

(1) Pemaquid River and its tributaries, all freshwater sections below Pemaquid Pond - Class A.

Sec. 19. 38 MRSA §468, sub-§7, ¶D is enacted to read:

D. Black Brook in Lincolnville - Class A.

Sec. 20. 38 MRSA §468, sub-§7, ¶E is enacted to read:

E. Kendall Brook in Lincolnville - Class A.

Sec. 21. 38 MRSA §468, sub-§7, ¶F is enacted to read:

F. Tucker Brook in Lincolnville - Class A.

Sec. 22. 38 MRSA §469, sub-§5, ¶B, as enacted by PL 1989, c. 764, §27, is amended to read:

B. Phippsburg.

(1) Tidal waters east of longitude 69`-50'-05" W. and west of longitude 69`-47'-00" W. - Class SA.

(2) Tidal waters of The Basin, including The Narrows east of a line drawn between 69`-51'-57" W. and 43`-48'-14" N. - Class SA.

Sec. 23. Report concerning procedures for reclassification. The Department of Environmental Protection shall review the current procedures for reclassification contained in the Maine Revised Statutes, Title 38, section 464, subsection 2 and suggest any changes or clarifications needed to make the procedures more consistent and efficient while maintaining a full public review process. The recommendations may include draft legislation. The report must be submitted to the Joint Standing Committee on Natural Resources by January 15, 2010 and the committee may submit legislation related to this report to the Second Regular Session of the 124th Legislature.

Sec. 24. Lower Androscoggin River water quality sampling; report; legislation. The Department of Environmental Protection, with the assistance of and in consultation with volunteer river monitors, shall establish and implement a water quality sampling program for the lower Androscoggin River from Gulf Island Dam to the line formed by the extension of the Bath-Brunswick boundary across Merrymeeting Bay in a northwesterly direction.

1. Timing. The water quality sampling program must occur during the 2009 sampling season.

2. Purpose. The purpose of the water quality sampling program implemented under this section is to allow additional water quality data to be collected to determine if the section of the Androscoggin River from Worumbo Dam in Lisbon Falls to the line formed by the extension of the Bath-Brunswick boundary across Merrymeeting Bay in a northwesterly direction meets, or can reasonably be expected

to meet, the criteria for reclassification from Class C to Class B.

3. Reclassification procedures. Unless the Department of Environmental Protection is unable to obtain the required monitoring data due to excessive rainfall or other unforeseen events, or unless the monitoring data indicate an upgrade is unwarranted, the department shall initiate the procedures for reclassification in accordance with the Maine Revised Statutes, Title 38, section 464, subsection 2 to upgrade the lower Androscoggin River from Worumbo Dam in Lisbon Falls to the line formed by the extension of the Bath-Brunswick boundary across Merrymeeting Bay in a northwesterly direction from Class C to Class B.

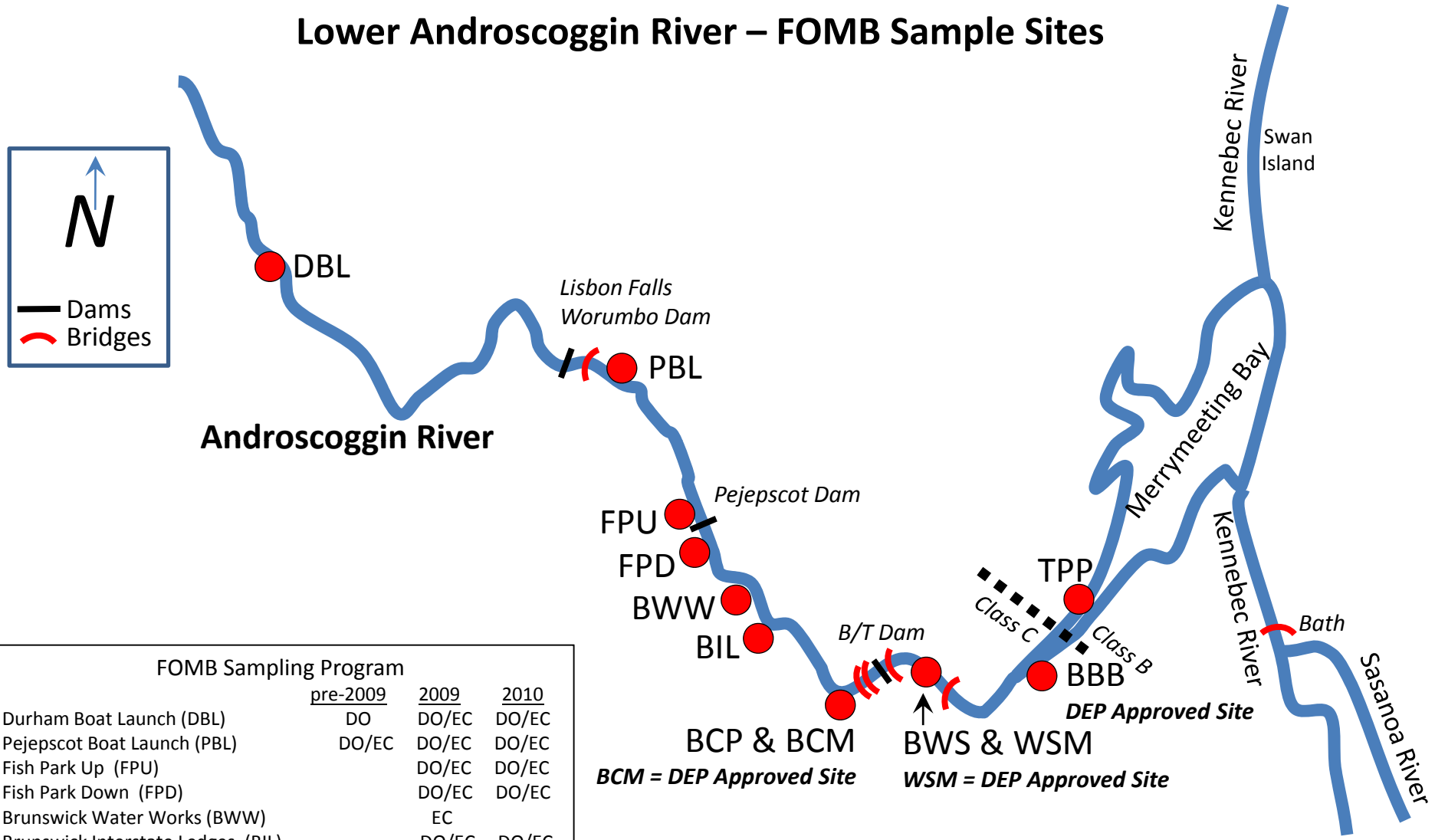
4. Report. By February 15, 2010, the Department of Environmental Protection shall submit a report, including recommendations and any necessary implementing legislation, in connection with the water quality sampling program required under this section to the Joint Standing Committee on Natural Resources.

5. Legislation authorized. The Joint Standing Committee on Natural Resources may report out legislation relating to the subject matter of this section to the Second Regular Session of the 124th Legislature.

Effective September 12, 2009

Appendix 2
Map-Lower Androscoggin River Sample Sites

Lower Androscoggin River – FOMB Sample Sites

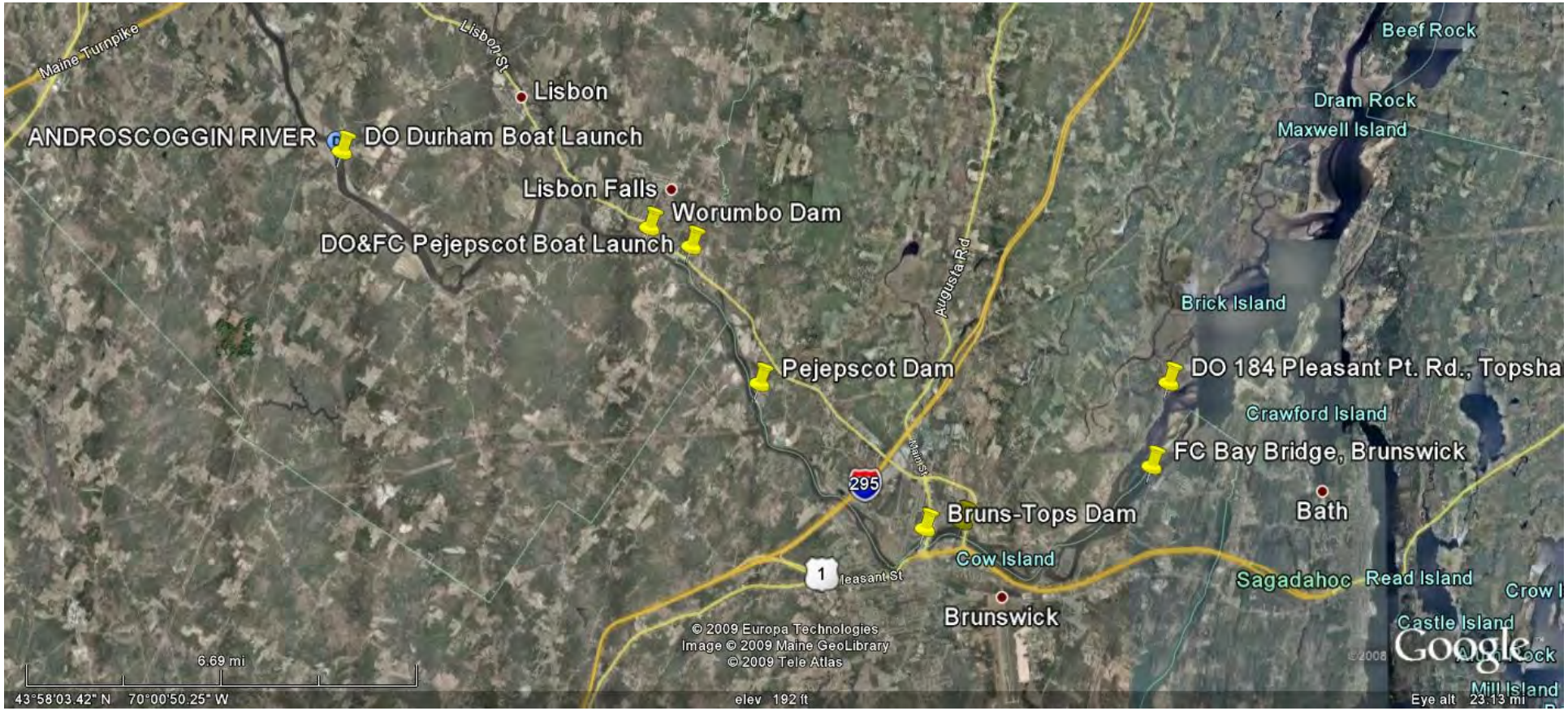


FOMB Sampling Program

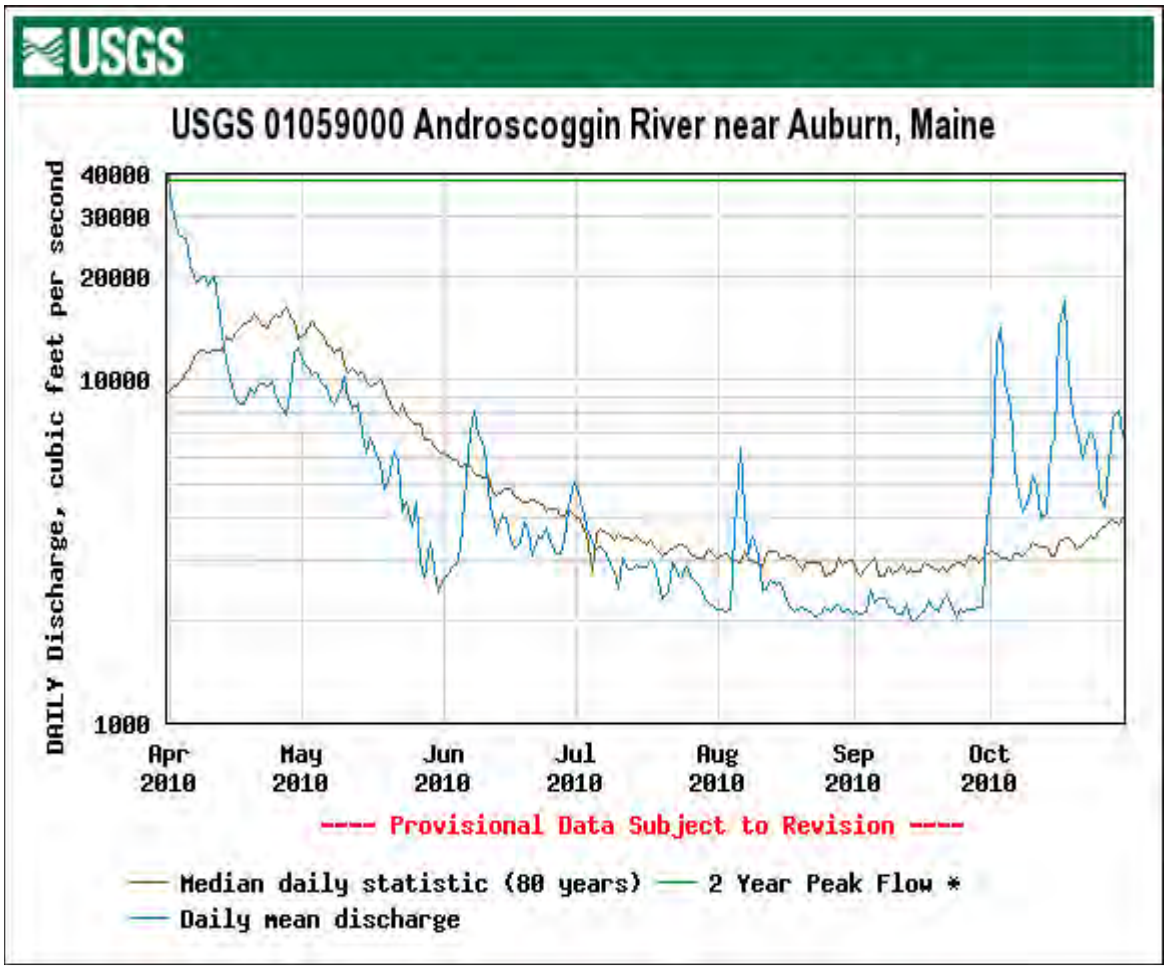
	pre-2009	2009	2010
Durham Boat Launch (DBL)	DO	DO/EC	DO/EC
Pejepscot Boat Launch (PBL)	DO/EC	DO/EC	DO/EC
Fish Park Up (FPU)		DO/EC	DO/EC
Fish Park Down (FPD)		DO/EC	DO/EC
Brunswick Water Works (BWW)		EC	
Brunswick Interstate Ledges (BIL)		DO/EC	DO/EC
Brunswick Canoe Portage (BCP)		DO/EC	DO/EC
Brunswick Canoe Mooring (BCM)		DO/EC	DO/EC
Brunswick Water St. Boat Launch (BWS)	EC	DO/EC	DO/EC
Water Street Mooring (WSM)		DO/EC	DO/EC
Brunswick Bay Bridge (BBB)	EC	DO/EC	DO/EC
Topsham Pleasant Pt. (TPP)	DO	DO	DO

Upstream Monitoring	pre-2009	2009	2010
Gulf Island Pond Above	DO		
Gulf Island Pond Below (Bates Boathouse)	DO		
Auburn Boat Launch		DO	DO

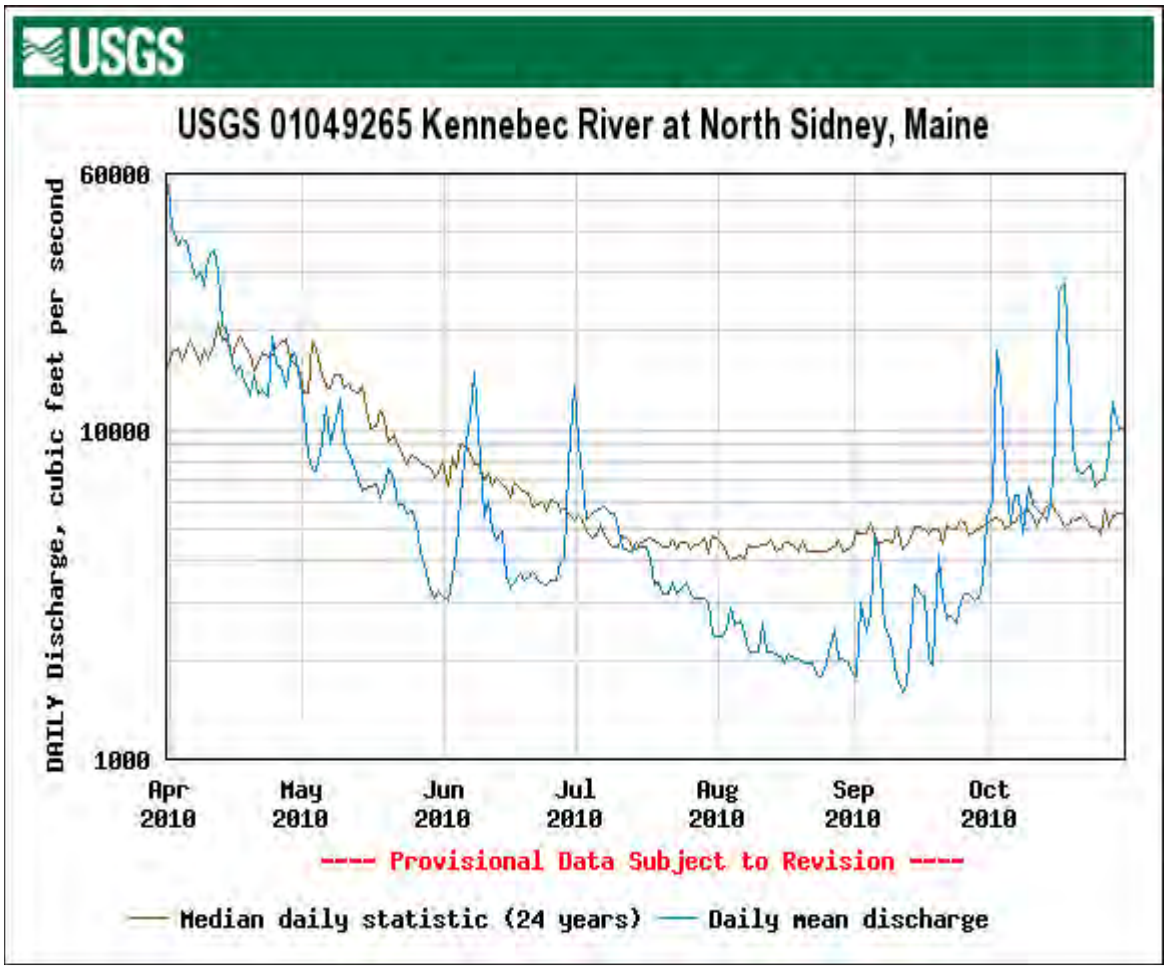
Appendix 3
Lower Androscoggin River
Aerial View Map


Maine Turnpike
Lisbon St
Lisbon
ANDROSCOGGIN RIVER
DO Durham Boat Launch
Lisbon Falls
Worumbo Dam
DO&FC Pejepscot Boat Launch
Augusta Rd
Pejepscot Dam
Beef Rock
Dram Rock
Maxwell Island
Brick Island
DO 184 Pleasant Pt. Rd., Topsha
Crawford Island
FC Bay Bridge, Brunswick
Main St
295
Bruns-Tops Dam
Bath
Cow Island
1
Pleasant St
Sagadahoc
Read Island
Brunswick
Castle Island
© 2009 Europa Technologies
Image © 2009 Maine GeoLibrary
©2009 Tele Atlas
6.69 mi
43°58'03.42" N 70°00'50.25" W
elev 192 ft
Google
Eye alt 23.13 mi

Appendix 4
USGS Monthly Flows
Lower Androscoggin River - Auburn


USGS
USGS 01059000 Androscoggin River near Auburn, Maine
DAILY Discharge, cubic feet per second
40000
30000
20000
10000
1000
Apr 2010
May 2010
Jun 2010
Jul 2010
Aug 2010
Sep 2010
Oct 2010
---- Provisional Data Subject to Revision ----
Median daily statistic (80 years)
2 Year Peak Flow *
Daily mean discharge

Appendix 5
USGS Monthly Flows
Lower Kennebec River - North Sidney


USGS
USGS 01049265 Kennebec River at North Sidney, Maine
DAILY Discharge, cubic feet per second
60000
10000
1000
Apr 2010
May 2010
Jun 2010
Jul 2010
Aug 2010
Sep 2010
Oct 2010
---- Provisional Data Subject to Revision ----
Median daily statistic (24 years)
Daily mean discharge

Appendix 6
National Weather Service
Portland Summary
2010

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - http://www.ncdc.noaa.gov.

Climatological Report (Seasonal)

```
000
CXUS51 KGYX 080415
CLSPWM

CLIMATE DATA FOR THE SPRING OF 2010 IN PORTLAND
NATIONAL WEATHER SERVICE GRAY ME
1215 AM EDT TUE JUN 8 2010
```

HERE IS A SEASONAL SUMMARY FOR THE METEOROLOGICAL SPRING (MARCH...APRIL...MAY) OF 2010 FOR PORTLAND, MAINE.

THE METEOROLOGICAL SPRING OF 2010 IN PORTLAND WILL GO INTO THE RECORD BOOKS AS THE WARMEST IN THE PAST 70 YEARS OF TEMPERATURE RECORDS AT THE PORTLAND JETPORT. THIS INCLUDED THE WARMEST MARCH AND THE WARMEST APRIL ON RECORD PLUS THE SECOND WARMEST MAY ON RECORD. THIS SPRING, WITH AN AVERAGE OF 48.9 DEGREES, SHATTERED THE OLD RECORD BY 1.9 DEGREES AND WAS MORE THAN FIVE DEGREES /5.2 DEGREES/ ABOVE NORMAL. TEMPERATURE RECORDS AT THE PORTLAND JETPORT BEGAN IN NOVEMBER 1940.

HERE IS A LIST OF THE WARMEST SPRINGS AT THE PORTLAND JETPORT...

RANK	TEMPERATURE	YEAR	
1	48.9 DEGREES	2010	<===
2	47.0 DEGREES	1991	
3	46.4 DEGREES	1998	
4	45.4 DEGREES	1981	
5	45.1 DEGREES	1942	
6	45.0 DEGREES	1945	
	45.0 DEGREES	1999	
8	44.9 DEGREES	1986	
	44.9 DEGREES	2006	
	44.9 DEGREES	2009	
11	44.8 DEGREES	1973	

HERE IS A LIST OF THE WARMEST MARCHS AT THE PORTLAND JETPORT...

RANK	TEMPERATURE	YEAR

1	39.9 DEGREES	2010 <===
2	39.5 DEGREES	1946
3	38.6 DEGREES	1945
4	37.7 DEGREES	1973
5	37.6 DEGREES	2000
6	37.0 DEGREES	1991
7	36.7 DEGREES	1998
8	36.2 DEGREES	1958
	36.2 DEGREES	1977
10	36.0 DEGREES	1942
COLDEST	25.6 DEGREES	1956
NORMAL	33.7 DEGREES	

HERE IS A LIST OF THE WARMEST APRILS AT THE PORTLAND JETPORT...

RANK	TEMPERATURE	YEAR
1	48.8 DEGREES	2010 <===
2	47.0 DEGREES	1991
3	46.4 DEGREES	1998
4	45.4 DEGREES	1981
5	45.1 DEGREES	1942
6	45.0 DEGREES	1945
	45.0 DEGREES	1999
8	44.9 DEGREES	1986
	44.9 DEGREES	2006
	44.9 DEGREES	2009
11	44.8 DEGREES	1973
COLDEST	37.9 DEGREES	1956
NORMAL	43.7 DEGREES	

HERE IS A LIST OF THE WARMEST MAYS AT THE PORTLAND JETPORT...

RANK	TEMPERATURE	YEAR
1	58.1 DEGREES	1991
2	DEGREES	2010 <===
3	56.8 DEGREES	1998
4	56.2 DEGREES	1959
5	56.0 DEGREES	1955
	56.0 DEGREES	2007
7	55.7 DEGREES	1944
	55.7 DEGREES	1970
9	55.6 DEGREES	1975
	55.6 DEGREES	1989
COLDEST	47.3 DEGREES	1967

NORMAL 53.8 DEGREES

PORTLAND REACHED 85 DEGREES ON APRIL 7TH THIS YEAR. THIS TIED THE SECOND WARMEST TEMPERATURE EVER RECORDED IN THE MONTH OF APRIL AT THE PORTLAND JETPORT. ONLY THE 92 DEGREE READING FROM APRIL 28TH LAST YEAR WAS WARMER.

HERE IS A LIST OF THE WARMEST TEMPERATURES EVER RECORDED AT THE PORTLAND JETPORT IN THE MONTH OF APRIL...

RANK	TEMPERATURE	DATE	
1	92 DEGREES	APRIL 28, 2009	
2	85 DEGREES	APRIL 21, 1957	
	85 DEGREES	APRIL 20, 2005	
	85 DEGREES	APRIL 7, 2010	<===
5	84 DEGREES	APRIL 27, 1990	
6	83 DEGREES	APRIL 15, 2003	
7	82 DEGREES	APRIL 30, 1942	
	82 DEGREES	APRIL 29, 1974	
	82 DEGREES	APRIL 22, 1977	
	82 DEGREES	APRIL 30, 1985	
11	81 DEGREES	APRIL 22, 1974	
	81 DEGREES	APRIL 20, 1976	
	81 DEGREES	APRIL 28, 1990	
	81 DEGREES	APRIL 22, 2001	
	81 DEGREES	APRIL 23, 2007	
16	80 DEGREES	APRIL 12, 1945	
	80 DEGREES	APRIL 27, 1970	
	80 DEGREES	APRIL 17, 2002	
	80 DEGREES	APRIL 26, 2009	

THIS LIST CONTAINS ALL READINGS OF 80 OR HIGHER IN THE MONTH OF APRIL AT THE PORTLAND JETPORT.

THE 91 DEGREE READING ON MAY 26TH TIED 3 OTHER DAYS IN MAY AS THE 6TH WARMEST TEMPERATURE EVER RECORDED AT THE JETPORT IN THE MONTH OF MAY. HERE IS A LIST OF THE WARMEST MAY TEMPERATURES AT THE PORTLAND JETPORT...

RANK	TEMPERATURE	DATE
1	94 DEGREES	MAY 31, 1987
2	92 DEGREES	MAY 31, 1944
	92 DEGREES	MAY 9, 1979
	92 DEGREES	MAY 3, 2001
	92 DEGREES	MAY 25, 2007
6	91 DEGREES	MAY 24, 1991
	91 DEGREES	MAY 2, 2001

	91 DEGREES	MAY 21, 2009
	91 DEGREES	MAY 26, 2010
10	90 DEGREES	MAY 16, 1951
	90 DEGREES	MAY 24, 1964
	90 DEGREES	MAY 17, 1977
	90 DEGREES	MAY 28, 1988
	90 DEGREES	MAY 22, 1992
	90 DEGREES	MAY 29, 1998

THE PORTLAND JETPORT HAS REACHED 90 OR HIGHER 15 TIMES IN THE MONTH OF MAY...FIVE OF THOSE SINCE 2000 AND EIGHT OF THE 15 SINCE 1990.

MARCH 2010 WAS THE WETTEST MARCH ON RECORD IN PORTLAND AND IT WAS ALSO THE 9TH WETTEST OF ANY MONTH IN PORTLAND.

HERE IS A LIST OF THE WETTEST MONTHS IN PORTLAND...

RANK	PRECIPITATION	MONTH	
1	16.86 INCHES	OCTOBER 1996	
2	15.22 INCHES	AUGUST 1991	
3	14.38 INCHES	OCTOBER 2005	
4	13.50 INCHES	NOVEMBER 1983	
5	12.34 INCHES	MAY 2006	
6	12.29 INCHES	JANUARY 1935	
7	12.27 INCHES	OCTOBER 1962	
8	11.92 INCHES	JANUARY 1979	
9	11.24 INCHES	MARCH 2010	<===
10	10.86 INCHES	JUNE 1917	
11	10.84 INCHES	JULY 1915	
	10.84 INCHES	SEPTEMBER 2008	
13	10.47 INCHES	JUNE 1922	
14	10.45 INCHES	OCTOBER 1998	
15	10.01 INCHES	JANUARY 1936	
16	9.97 INCHES	MARCH 1953	

THE RECORD SETTING PRECIPITATION IN MARCH WAS FOLLOWED BY MUCH BELOW NORMAL PRECIPITATION IN BOTH APRIL AND MAY. THIS GAVE PORTLAND A TOTAL OF 14.51 INCHES OF PRECIPITATION DURING THE SPRING WHICH WAS 2.29 INCHES ABOVE NORMAL. SPRING 2010 RANKS AS THE 25TH WETTEST SPRING IN THE PAST 140 YEARS.

PORTLAND HAD THE THIRD LEAST SNOWIEST SPRING ON RECORD WITH JUST A TENTH OF AN INCH /0.1 INCH/ OF SNOWFALL. THE LEAST SNOWIEST SPRINGS WERE IN 1910 AND 1921 WITH JUST A TRACE OF SNOWFALL.

THE SNOWIEST SPRING WAS IN 1906 WITH 61.5 INCHES. NORMALLY

PORTLAND CAN EXPECT 16.2 INCHES OF SPRING SNOWFALL.

HERE IS A LIST OF THE 10 LEAST SNOWIEST SPRINGS IN PORTLAND

RANK	SNOWFALL	YEAR	
1	TRACE	1910	
	TRACE	1921	
3	0.1 INCHES	2010	<===
4	1.1 INCHES	1995	
5	1.3 INCHES	1930	
6	1.4 INCHES	1927	
7	1.5 INCHES	2006	
8	2.1 INCHES	1983	
9	2.8 INCHES	1973	
10	2.9 INCHES	1979	

MOST SNOWFALL	61.5 INCHES	1906
NORMAL	16.2 INCHES	

SNOWFALL RECORDS IN PORTLAND BEGAN IN 1882.

SPRING 2010 IN PORTLAND BY THE NUMBERS...

	MAR	APR	MAY	SPRING 2010
...TEMPERATURES...				
AVERAGE TEMPERATURE	39.9	48.8	57.9	48.9
30 YEAR NORMAL	33.7	43.7	53.8	43.7
DEPARTURE	PLUS 6.2	PLUS 5.1	PLUS 4.1	PLUS 5.2
RANK (1 THROUGH 70) (1 = WARMEST)	1ST	1ST	2ND	1ST
HIGHEST TEMPERATURE	70	85	91	91 - MAY 26TH
LOWEST TEMPERATURE	19	31	36	19 - MAR 27TH
...PRECIPITATION...				
MEASURED (INCHES)	11.24	1.50	1.77	14.51
30 YEAR NORMAL	4.14	4.26	3.82	12.22
DEPARTURE	PLUS 7.10	MINUS 2.76	MINUS 2.05	PLUS 2.29
RANK (1 THROUGH 140) (1 = WETTEST)	1ST	129TH	113TH (TIED)	25TH

GREATEST RAINFALL IN ANY 24-HOUR PERIOD
2.91 0.47 1.08 2.91 - MAR 30-31ST

...SNOWFALL DATA...

MEASURED (INCHES)	0.1	TRACE	0.0	0.1
30 YEAR NORMAL	13.0	3.2	TRACE	16.2
DEPARTURE	MINUS 12.9	MINUS 3.2	MINUS TRACE	MINUS 5.6
RANK (1 THROUGH 129) (1 = SNOWIEST)	125TH	92ND (TIED)	23RD (TIED)	83RD (TIED)
GREATEST SNOWFALL (INCHES) IN ANY 24-HOUR PERIOD	0.1	TRACE	0.0	0.1 - MAR 26TH

...WIND...

AVERAGE SPEED	9.6 MPH	7.3 MPH	7.2 MPH	8.0 MPH
NORMAL	10.1 MPH	10.0 MPH	9.0 MPH	9.7 MPH
DEPARTURE	- 0.5 MPH	- 2.7 MPH	- 1.8 MPH	- 1.7 MPH
HIGHEST WIND GUST	45 MPH	46 MPH	41 MPH	46 MPH - APR 29TH

...DEGREE DAY DATA...

HEATING DEGREE DAYS	773	478	235	1486
NORMAL	985	649	361	1995
DEPARTURE	MINUS 212	MINUS 171	MINUS 126	MINUS 509
COOLING DEGREE DAYS	0	0	22	22
NORMAL	0	0	7	7
DEPARTURE	NONE	NONE	PLUS 15	PLUS 15

...SEA LEVEL PRESSURE...

HIGHEST (IN INCHES)	30.45	30.51	30.40	30.51 - APR 13TH
LOWEST (IN INCHES)	29.29	29.25	29.39	29.25 - APR 28TH

	SPRING 2010	NORMAL	DEPARTURE
...NUMBER OF DAYS WITH...			
MAX TEMPERATURE 90 OR WARMER	1	0.2	PLUS 0.8
MAX TEMPERATURE 32 OR COLDER	0	4.4	MINUS 4.4
MIN TEMPERATURE 32 OR COLDER	22	37.9	MINUS 15.9

MIN TEMPERATURE 0 OR COLDER	0	0.3	MINUS 0.3
THUNDERSTORMS	3	2.8	PLUS 0.2
DENSE FOG (VSBY < 1/4 MI)	4	11.3	MINUS 7.3
PCPN 0.01 INCH OR MORE	25	36.2	MINUS 11.2
PCPN 1.00 INCH OR MORE	5	2.7	PLUS 2.3
SNOWFALL TRACE OR MORE	7	N/A	
SNOWFALL 1 INCH OR MORE	0	4.0	MINUS 4.0
SNOWFALL 6 INCHES OR MORE	0	N/A	

WARMEST SPRING ..... 48.9 DEGREES IN 2010
SECOND WARMEST SPRING.... 47.0 DEGREES IN 1991
COLDEST SPRING ..... 37.9 DEGREES IN 1956
WETTEST SPRING ..... 22.55 INCHES IN 1983
DRIEST SPRING ..... 4.23 INCHES IN 1965
SNOWIEST SPRING ..... 61.5 INCHES IN 1906
LEAST SNOWIEST SPRING ... TRACE IN 1910 AND 1921

NOTE...THE METEOROLOGICAL SPRING REFERS TO MARCH - APRIL - MAY TOTALS ONLY.

HERE IS A LIST OF DAILY RECORDS SET OR TIED DURING MARCH, APRIL AND MAY
OF 2010...

DATE	RECORD	PREVIOUS RECORD
MAR 8	56 - WARMEST HIGH TEMPERATURE	54 DEGREES IN 1987 & 1995
MAR 14	2.27 - GREATEST PRECIPITATION	2.17 INCHES IN 1951
MAR 17	64 - WARMEST HIGH TEMPERATURE	62 DEGREES IN 1990
MAR 17	33 - GREATEST DAILY TEMP. RANGE	31 DEGREES IN 1991 & 1996
MAR 18	43 - WARMEST LOW TEMPERATURE	40 DEGREES IN 1968
MAR 18	53 - WARMEST AVERAGE TEMPERATURE	48 DEGREES IN 1945 & 1990
MAR 19	56 - WARMEST HIGH TEMPERATURE	56 DEGREES IN 1986 /TIED/
MAR 20	70 - WARMEST HIGH TEMPERATURE	62 DEGREES IN 1959
MAR 20	52 - WARMEST AVERAGE TEMPERATURE	49 DEGREES IN 1959
MAR 23	39 - WARMEST LOW TEMPERATURE	37 DEGREES IN 1972
MAR 23	2.44 - GREATEST PRECIPITATION	1.63 INCHES IN 1950
MAR 30	2.73 - GREATEST PRECIPITATION	1.73 INCHES IN 1911
APR 3	50 - WARMEST AVERAGE TEMPERATURE	50 DEGREES IN 2002 /TIED/
APR 4	76 - WARMEST HIGH TEMPERATURE	63 DEGREES IN 1991

APR 4   46 - WARMEST LOW TEMPERATURE   45 DEGREES IN 1981
APR 4   61 - WARMEST AVERAGE TEMPERATURE 53 DEGREES IN 1981
APR 7   85 - WARMEST HIGH TEMPERATURE   78 DEGREES IN 1991
APR 7   63 - WARMEST AVERAGE TEMPERATURE 62 DEGREES IN 1991
APR 7   45 - GREATEST DAILY TEMP. RANGE   34 DEGREES IN 1969
APR 11   43 - WARMEST LOW TEMPERATURE   43 DEGREES IN 1993
/TIED/
MAY 11   29 - RECORD LOW TEMPERATURE   29 DEGREES IN 1951 &
1962
                                                              /TIED/
MAY 26   91 - RECORD HIGH TEMPERATURE   86 DEGREES IN 1965
MAY 26   73 - WARMEST DAILY AVERAGE TEMP. 73 DEGREES IN 1981
/TIED/

HERE IS A LIST OF MONTHLY RECORDS SET IN PORTLAND THIS YEAR...

MONTH NEW RECORD   OLD RECORD
MARCH WARMEST AVERAGE TEMPERATURE OF 39.9 DEGREES   39.5 DEGREES IN
1946
MARCH WARMEST LOW TEMPERATURE OF 31.4 DEGREES   31.0 DEGREES IN
1973
MARCH GREATEST PRECIPITATION OF 11.24 INCHES   9.97 INCHES IN
1953
APRIL WARMEST AVERAGE TEMPERATURE OF 48.8 DEGREES   47.0 DEGREES IN
1945
APRIL WARMEST AVERAGE HIGH TEMPERATURE OF 59.2 DEG 58.8 DEGREES IN
1941
APRIL WARMEST AVERAGE LOW TEMPERATURE OF 38.3 DEG   37.2 DEGREES IN
1973

HERE IS A LIST OF SPRING RECORDS SET OR TIED IN PORTLAND...

WARMEST SPRING: 48.9 DEGREES IN 2010. OLD RECORD WAS 47.0 DEGREES IN
1991.

SJC

000
CXUS51 KGYX 100430
CLSPWM

CLIMATE DATA FOR THE SUMMER OF 2010 IN PORTLAND
1230 AM EDT FRI SEP 10 2010

THIS IS A SEASONAL SUMMARY FOR THE METEOROLOGICAL SUMMER (JUNE...JULY...AUGUST) OF 2010 FOR PORTLAND, MAINE.

THE SUMMER OF 2010 IN PORTLAND WILL BE REMEMBERED FOR IT`S RECORD TYING HEAT. THE AVERAGE TEMPERATURE FOR THE SUMMER /JUNE, JULY AND AUGUST/ WAS 68.7 DEGREES WHICH TIED 1988 AS THE WARMEST SUMMER ON RECORD AT THE PORTLAND JETPORT.

THIS SUMMER WAS 2.4 DEGREES ABOVE NORMAL AND FOLLOWS ON THE HEELS OF THE WARMEST SPRING ON RECORD IN PORTLAND. SO, FOR THE SIX MONTH PERIOD, FROM MARCH THROUGH AUGUST, PORTLAND HAS THE WARMEST COMBINED SPRING AND SUMMER ON RECORD.

THIS RECORD TYING WARM SUMMER CONTRASTS TO LAST YEAR WHEN PORTLAND HAD A VERY COOL AND WET SUMMER. SUMMER OF 2009 WAS 0.7 DEGREES BELOW NORMAL AND THE 25TH COLDEST IN 70 YEARS. IN COMPARISON...THIS SUMMER AVERAGED 3.1 DEGREES WARMER THAN LAST SUMMER.

HERE IS A LIST OF THE WARMEST SUMMERS ON RECORD IN PORTLAND...

RANK	TEMPERATURE	YEAR	
1	68.7 DEGREES	1988	
	68.7 DEGREES	2010	<===
3	68.6 DEGREES	1999	
4	68.5 DEGREES	1973	
	68.5 DEGREES	1991	
6	68.3 DEGREES	1994	
7	68.2 DEGREES	1949	
8	68.1 DEGREES	2005	
9	68.0 DEGREES	1952	
	68.0 DEGREES	2006	
COLDEST	63.7 DEGREES	1954, 1962 & 1964	
LAST YEAR	65.6 DEGREES	2009	
NORMAL	66.3 DEGREES		

ALL THREE SUMMER MONTHS WERE ABOVE NORMAL. IN FACT, PORTLAND HAS NOW HAD TEN CONSECUTIVE MONTHS WITH ABOVE NORMAL TEMPERATURES. THIS STREAK BEGAN IN NOVEMBER OF 2009.

JUNE OF 2010 WAS THE 11TH WARMEST JUNE ON RECORD AND AUGUST 2010 WAS THE 15TH WARMEST AUGUST. JULY 2010 RECORDED THE SECOND

WARMEST JULY ON RECORD WITH AN AVERAGE TEMPERATURE OF 72.3 DEGREES ...JUST MISSING THE RECORD OF 72.4 DEGREES SET IN 1994 BY A TENTH OF A DEGREE.

TEMPERATURE RECORDS AT THE PORTLAND JETPORT BEGAN IN NOVEMBER OF 1941.

LAST YEAR, SUMMER 2009 WAS THE WETTEST SUMMER ON RECORD WITH 22.31 INCHES OF RAIN. THIS YEAR`S SUMMER IN PORTLAND MEASURED LESS THAN HALF THAT AMOUNT WITH JUST 10.48 INCHES OF RAIN. STILL THE TEN AND A HALF INCHES OF RAIN WAS ABOVE NORMAL BY NEARLY AN INCH /0.83 INCHES/. THIS SUMMER WAS THE 41ST WETTEST IN THE PAST 140 YEARS OF PRECIPITATION RECORDS IN PORTLAND.

NEARLY HALF OF THE TOTAL SUMMER RAINFALL OCCURRED IN JUST TWO DAYS. PORTLAND HAD A RECORD SETTING 2.26 INCHES OF RAIN ON JULY 14 AND ANOTHER RECORD SETTING 2.64 INCHES ON AUGUST 25. THE COMBINED 4.90 INCHES OF RAIN FROM THESE TWO RAIN EVENTS ACCOUNTED FOR 47 PERCENT OF THE TOTAL SUMMER RAINFALL.

BOTH JUNE AND JULY HAD ABOVE NORMAL RAINFALL WHILE AUGUST WAS SLIGHTLY BELOW NORMAL. MOST OF AUGUST WAS DRY...WITH NEARLY ALL OF THE MONTHLY RAINFALL FALLING OVER THE LAST WEEK OF THE MONTH.

HERE IS A TABULAR SUMMARY OF THE SUMMER OF 2010 IN PORTLAND MAINE.

	JUNE	JULY	AUGUST	SUMMER 2010
...TEMPERATURES...				
AVERAGE TEMPERATURE	64.6	72.3	69.3	68.7
30 YEAR NORMAL	62.9	68.7	67.2	66.3
DEPARTURE	PLUS 1.7	PLUS 3.6	PLUS 2.1	PLUS 2.4
RANK (1 THROUGH 70) (1 = WARMEST)	11TH (T)	2ND	15TH	1ST
HIGHEST TEMPERATURE - JULY 6	87	95	94	95
LOWEST TEMPERATURE - JUNE 9	45	49	47	45
...PRECIPITATION...				
MEASURED (INCHES)	3.47	4.06	2.95	10.48
30 YEAR NORMAL	3.28	3.32	3.05	9.65

DEPARTURE	PLUS 0.19	PLUS 0.74	MINUS 0.10	PLUS 0.83
RANK (1 THROUGH 140) (1 = WETTEST)	55TH	28TH (T)	59TH	41ST
GREATEST RAINFALL IN ANY 24-HOUR PERIOD AUGUST 25	1.01	2.28	2.64	2.64

...DEGREE DAY DATA...

HEATING DEGREE DAYS	78	9	9	96
NORMAL	116	19	37	172
DEPARTURE	MINUS 38	MINUS 10	MINUS 28	MINUS 76
COOLING DEGREE DAYS	73	240	152	465
NORMAL	51	144	120	315
DEPARTURE	PLUS 22	PLUS 96	PLUS 32	PLUS 150

...WIND...

AVERAGE SPEED	5.7 MPH	6.8 MPH	6.3 MPH	6.3 MPH
NORMAL	8.4 MPH	7.7 MPH	7.6 MPH	7.9 MPH
DEPARTURE	-2.7 MPH	-0.9 MPH	-1.3 MPH	-1.6 MPH
HIGHEST WIND GUST	MISSING	MISSING	MISSING	MISSING

...SEA LEVEL PRESSURE...

HIGHEST (IN INCHES) - JUNE 16	30.18	30.14	30.15	30.18
LOWEST (IN INCHES) - JUNE 6	29.27	29.65	29.75	29.27

...NUMBER OF DAYS WITH...	SUMMER 2010	NORMAL	DEPARTURE
MAX TEMPERATURE 90 OR WARMER	7	4.2	PLUS 2.8
THUNDERSTORMS	5	11.8	MINUS 6.8
DENSE FOG (VSBY 1/4 MI OR LESS)	13	16.8	MINUS 3.8
0.01 INCH OR MORE PCPN	27	31.4	MINUS 4.4
1.00 INCH OR MORE PCPN	3	2.0	PLUS 1.0

WARMEST SUMMER ... 68.7 DEGREES IN 1988 AND 2010
COLDEST SUMMER ... 63.7 DEGREES IN 1954...1962 AND 1964
WETTEST SUMMER ... 22.31 INCHES IN 2009
DRIEST SUMMER .... 4.10 INCHES IN 1999

HERE IS A LIST OF DAILY RECORDS SET OR TIED DURING THE SUMMER OF 2010...

DATE	RECORD	PREVIOUS RECORD
JUL 4	90 - RECORD HIGH TEMPERATURE	90 DEGREES IN 1949 & 2002 /TIED/
JUL 5	68 - WARMEST LOW TEMPERATURE	67 DEGREES IN 1999
JUL 6	95 - RECORD HIGH TEMPERATURE	91 DEGREES IN 1952
JUL 6	69 - WARMEST LOW TEMPERATURE	67 DEGREES IN 2003
JUL 6	82 - WARMEST AVERAGE TEMP.	78 DEGREES IN 2003
JUL 10	68 - WARMEST LOW TEMPERATURE	68 DEGREES IN 1955 & 1993 /TIED/
JUL 13	67 - WARMEST LOW TEMPERATURE	67 DEGREES IN 1943 /TIED/
JUL 14	2.26 - GREATEST PRECIPITATION	1.01 INCHES IN 1964
AUG 25	2.64 - GREATEST PRECIPITATION	2.02 INCHES IN 1901
AUG 25	4 - SMALLEST TEMPERATURE RANGE	5 DEGREES IN 1945, 1975 & 1985
AUG 31	94 - RECORD HIGH TEMPERATURE	92 DEGREES IN 1969
AUG 31	79 - WARMEST AVERAGE TEMP.	78 DEGREES IN 1973 & 1980

THERE WERE NO DAILY RECORDS SET OR TIED DURING THE MONTH OF JUNE. THERE WERE NO MONTHLY RECORDS SET OR TIED THIS SUMMER. HOWEVER, 2010 TIED 1988 AS THE WARMEST SUMMER ON RECORD AT THE PORTLAND JETPORT WITH AN AVERAGE TEMPERATURE OF 68.7 DEGREES FOR THE THREE MONTH PERIOD.

NOTE...THE METEOROLOGICAL SUMMER REFERS TO THE MONTHS OF JUNE...JULY AND AUGUST.

SJC

000
CXUS51 KGYX 181820
CLSPWM

CLIMATE DATA FOR THE AUTUMN OF 2010 IN PORTLAND
120 PM EST SAT DEC 18 2010

THIS IS A SEASONAL SUMMARY FOR THE METEOROLOGICAL AUTUMN (SEPTEMBER...OCTOBER...NOVEMBER) OF 2010 FOR PORTLAND, MAINE.

..... PORTLAND MAINE .....

	SEP.	OCT.	NOV.	AUTUMN 2010
...TEMPERATURES...				
AVERAGE TEMPERATURE	63.4	49.4	40.0	50.9
30 YEAR NORMAL	58.7	47.7	38.3	48.2
DEPARTURE	PLUS 4.7	PLUS 1.7	PLUS 1.7	PLUS 2.7
RANK (1 THROUGH 70) (T) (1 = WARMEST)	3RD	24TH	26TH	7TH
HIGHEST TEMPERATURE - SEP. 2ND	93	71	65	93
LOWEST TEMPERATURE - NOV. 29TH	42	29	20	20
...PRECIPITATION...				
MEASURED (INCHES)	2.30	7.11	5.00	14.41
30 YEAR NORMAL	3.37	4.40	4.72	12.49
DEPARTURE	MINUS 1.07	PLUS 2.71	PLUS 0.28	PLUS 1.92
RANK (1 THROUGH 140) (1 = WETTEST)	94TH	9TH	42ND	28TH
GREATEST RAINFALL IN ANY 24-HOUR PERIOD - OCT. 15TH	1.13	3.51	1.85	3.51
...SNOWFALL DATA...				
MEASURED (INCHES)	0.0	0.0	0.1	0.1
30 YEAR NORMAL	0.0	0.1	3.2	3.3
DEPARTURE	NONE	MINUS 0.1	MINUS 3.1	MINUS 3.2
RANK (1 THROUGH 130) (1 = SNOWIEST)	----	49TH (T)	97TH	97TH

(NOTE: AUTUMN TIED FOR SECOND LEAST SNOWIEST WITH A TRACE...THERE WERE FOUR AUTUMNS
WITH ZERO SNOWFALL.)

GREATEST SNOWFALL (INCHES) IN ANY 24-HOUR PERIOD - NOV. 26TH	0.0	0.0	0.1	0.1
...DEGREE DAY DATA...				

HEATING DEGREE DAYS	112	481	737	1330
NORMAL	199	523	790	1512
DEPARTURE	MINUS 87	MINUS 42	MINUS 53	MINUS 182
COOLING DEGREE DAYS	72	0	0	72
NORMAL	24	1	0	25
DEPARTURE	PLUS 48	MINUS 1	NONE	PLUS 47

...WIND...

AVERAGE SPEED	6.8 MPH	7.5 MPH	7.6 MPH	7.3 MPH
NORMAL	8.0 MPH	8.5 MPH	8.9 MPH	8.5 MPH
DEPARTURE	-1.2 MPH	-1.0 MPH	-1.3 MPH	-1.2 MPH
HIGHEST WIND GUST	MISSING	48 MPH	63 MPH	63 MPH
- NOV. 7TH				

...SEA LEVEL PRESSURE...

HIGHEST (IN INCHES)	30.28	30.31	30.57	30.57
ON NOV. 30TH				
LOWEST (IN INCHES)	29.30	28.96	29.33	28.96
ON OCT. 15TH				

	AUTUMN 2010	NORMAL	DEPARTURE
...NUMBER OF DAYS WITH...			
MAX TEMPERATURE 90 OR WARMER	2	0.3	PLUS 1.7
MAX TEMPERATURE 32 OR COLDER	0	1.2	MINUS 1.2
MIN TEMPERATURE 32 OR COLDER	24	27.9	MINUS 3.9
MIN TEMPERATURE 0 OR COLDER	0	0.0	NONE
THUNDERSTORMS	1	2.5	MINUS 1.5
DENSE FOG (VSBY < 1/4 MI)	10	13.1	MINUS 3.1
0.01 INCH OR MORE PCPN	36	31.1	PLUS 4.9
1.00 INCH OR MORE PCPN	4	3.5	PLUS 0.5
SNOWFALL TRACE OR MORE	2	N/A	
SNOWFALL 1 INCH OR MORE	0	1.0	MINUS 1.0
SNOWFALL 6 INCHES OR MORE	0	N/A	

WARMEST AUTUMN ... 51.5 DEGREES IN 1961 & 2005
COLDEST AUTUMN ... 45.6 DEGREES IN 1976
WETTEST AUTUMN ... 24.18 INCHES IN 2005
DRIEST AUTUMN .... 4.88 INCHES IN 1915
SNOWIEST AUTUMN ..... 24.3 INCHES IN 1921
LEAST SNOWIEST AUTUMN ... 0.0 INCHES IN 1918...1960...1973 & 2006

NOTE...THE METEOROLOGICAL AUTUMN REFERS TO SEPTEMBER – OCTOBER – NOVEMBER

...DISCUSSION...

PORTLAND HAD A WARMER AND WETTER THAN NORMAL FALL IN 2010.

THE AVERAGE TEMPERATURE THIS FALL WAS 50.9 DEGREES WHICH WAS 2.7 DEGREES
ABOVE NORMAL AND TIES 2001 AS THE 7TH WARMEST IN THE PAST 70 YEARS OF
TEMPERATURE RECORDS AT THE PORTLAND JETPORT. THE WARMEST FALL WAS 51.5
DEGREES IN 1961 AND 2005 AND THE COLDEST WAS 45.6 DEGREES IN 1976.

EVERY MONTH THIS FALL HAD ABOVE NORMAL TEMPERATURES AND CONTINUES A STREAK OF 13 CONSECUTIVE MONTHS WITH ABOVE NORMAL TEMPERATURES. THE LAST MONTH THAT WAS COLDER THAN NORMAL WAS OCTOBER OF LAST YEAR. THIS IS
ALSO THE FOURTH STRAIGHT SEASON WITH ABOVE NORMAL TEMPERATURES.

THE FALL SEASON STARTED OUT ON A HOT NOTE AS A LATE SUMMER HEAT WAVE CONTINUED INTO EARLY SEPTEMBER. THIS WAS THE FIRST TIME THAT PORTLAND
HAS HAD A HEAT WAVE EXTEND INTO SEPTEMBER. PORTLAND REACHED 91 DEGREES
ON SEPTEMBER 1ST THEN REACHED 93 DEGREES ON THE 2ND. INCIDENTALLY NEITHER TEMPERATURE WAS A RECORD.

THE 93 DEGREE READING WAS THE HIGHEST TEMPERATURE THIS FALL. PORTLAND
ALSO HAD FIVE DAYS WITH HIGHS IN THE 80S IN ADDITION TO THE TWO 90 DEGREE DAYS. THESE WARM READINGS CONTRIBUTED TO PORTLAND RECORDING THE 3RD WARMEST SEPTEMBER ON RECORD. THE AVERAGE FOR THE MONTH WAS 63.4 DEGREES. THE WARMEST SEPTEMBER WAS 64.1 DEGREES IN 1961 FOLLOWED BY 63.6 DEGREES IN 2005.

THE AVERAGE LOW TEMPERATURE IN SEPTEMBER WAS A RECORD SETTING 54.4 DEGREES. THIS BROKE THE OLD RECORD OF 53.6 DEGREES SET IN 1999. THE AVERAGE HIGH IN SEPTEMBER OF 72.4 DEGREES WAS THE 10TH WARMEST ON RECORD...FALLING WELL SHORT OF THE RECORD 75.1 DEGREES SET IN 1961 AND AGAIN IN 1983.

THE WARMEST TEMPERATURE IN OCTOBER WAS 71 DEGREES ON THE 1ST DAY OF THE MONTH AND AGAIN ON THE 8TH. THESE WERE THE ONLY TWO DAYS IN

OCTOBER TO TOP THE 70 DEGREE MARK. THE WARMEST READING IN NOVEMBER WAS
65 DEGREES ON THE 13TH AND THIS WAS THE ONLY 60 PLUS DAY FOR THE MONTH.

PORTLAND HAD 14.41 INCHES OF PRECIPITATION THIS FALL. THIS WAS 1.92 INCHES ABOVE NORMAL AND RANKS AS THE 28TH WETTEST FALL ON RECORD. THE WETTEST FALL WAS 24.18 INCHES IN 2005 AND THE DRIEST WAS 4.88 INCHES IN 1915. RAINFALL RECORDS GO BACK 140 YEARS.

SEPTEMBER WAS MUCH DRIER THAN NORMAL WITH ONLY 2.30 INCHES OF RAIN. NEARLY HALF THAT RAIN, 1.13 INCHES, FELL IN ONE 24 HOUR PERIOD ON THE 3RD AND 4TH.

OCTOBER FOLLOWED WITH THE WETTEST MONTH THIS FALL. THE 7.11 INCHES OF RAIN WAS 2.71 INCHES ABOVE NORMAL AND WAS THE 9TH WETTEST OCTOBER ON RECORD. NOVEMBER FOLLOWED WITH EXACTLY FIVE INCHES OF PRECIPITATION WHICH WAS 0.28 INCHES ABOVE NORMAL.

THE MOST RAIN IN A 24 HOUR PERIOD WAS THREE AND A HALF INCHES /3.51 INCHES/ OF RAIN ON OCTOBER 15TH.

PORTLAND HAD JUST A TENTH OF AN INCH OF SNOW THIS FALL. THERE WAS NO SNOW IN SEPTEMBER, WHICH WOULD BE EXPECTED, AND NO SNOW IN OCTOBER. NORMALLY OCTOBER SEES A TRACE OF SNOW.

NOVEMBER HAD 0.1 INCH OF SNOW WHICH FELL ON THE 26TH DAY OF THE MONTH. THERE WAS ONE OTHER DAY IN NOVEMBER WITH SNOW...AND THAT WAS A TRACE ON THE 27TH.

THE 0.1 INCH OF SNOW THIS FALL WAS 3.1 INCHES BELOW NORMAL. THIS RANKS AS THE 97TH SNOWIEST FALL IN THE PAST 140 YEARS. THERE HAVE BEEN 33 YEARS WITH LESS SNOW DURING THE THREE FALL MONTHS. FOUR OF THOSE YEARS HAD ZERO SNOWFALL. THEY ARE 1918, 1960, 1973 AND 2006. TWENTY NINE YEARS HAVE RECORDED JUST A TRACE OF SNOW. THIS INCLUDES THE LAST THREE YEARS...2007, 2008 AND 2009.

HERE IS A LIST OF DAILY RECORDS SET OR TIED IN PORTLAND THIS FALL...

DATE	RECORD	PREVIOUS RECORD
SEP 3	67 - WARMEST LOW TEMPERATURE	65 DEGREES IN 1973
SEP 27 /TIED/	5 - SMALLEST TEMPERATURE RANGE	5 DEGREES IN 1994
SEP 29	70 - WARMEST AVERAGE TEMPERATURE	68 DEGREES IN 1959 & 1987
SEP 30 /TIED/	59 - WARMEST LOW TEMPERATURE	59 DEGREES IN 1987

OCT 15 3.51 - GREATEST PRECIPITATION 2.87 INCHES IN 2005
NOV 13 33 - GREATEST DAILY TEMP. RANGE 31 DEGREES IN 1958 & 2005

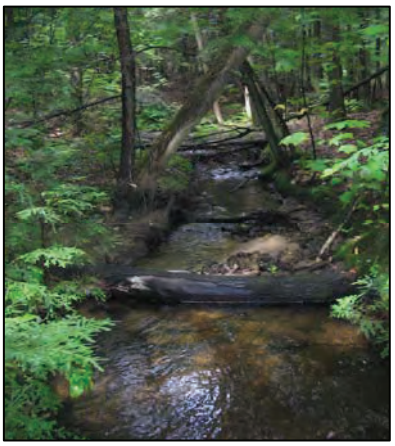
HERE IS A LIST OF MONTHLY RECORDS SET OR TIED IN PORTLAND THIS FALL...

MONTH	RECORD	PREVIOUS RECORD
SEPTEMBER	54.4 - WARMEST AVERAGE LOW TEMP.	53.6 DEGREES IN 1999

SJC

Appendix 7
FOMB DEP SAP
2010 Final

Maine Volunteer River Monitoring Program (VRMP)
Quality Assurance Program Plan



SAMPLING and ANALYSIS PLAN (SAP)

Maine Department of Environmental Protection
Bureau of Land and Water Quality
Division of Watershed Management &
Division of Environmental Assessment

Title of SAP: Androscoggin River

Volunteer Group Name: Friends of Merrymeeting Bay (FOMB)

Date of Latest Modification to SAP: July 29, 2009

Date of VRMP QAPP Being Referenced in this SAP: June 10, 2009

Project Duration (if known):

Review & Approval Signatures:

FOMB Board Chair- Research & Advocacy	Ed Friedman	Date
Maine DEP QA Manager:	Malcolm Burson	Date
Maine DEP-DEA Representative:	Barry Mower	Date
Maine DEP-VRMP Biologist:	Mary Ellen Dennis	Date
Maine DEP-VRMP Coordinator:	Jeff Varricchione	Date

Appendix 8
Recent Letters of Support

Recent Letters of Support
(Please click on title to link to web files)

Times Record Editorial July 17, 2010 (pdf file 58 KB)
2010 Letters of support for Andro Upgrade proposal

Brunswick (pdf file 58 KB)

Topsham Resolution (pdf file 49 KB)
Support letter (pdf file 56 KB)

Lewiston (pdf file 52 KB)

Durham (pdf file 108 KB)

Auburn Sewage District (pdf file 44 KB)

Brunswick Topsham Land Trust (pdf file 128 KB)

SERVING THE COMMUNITES OF MID-COAST MAINE AND BEYOND
The Times Record
www.timesrecord.com

OPINION > LETTERS

Another year of data, now what?

Print Page

Published:
Friday, July 16, 2010 2:11 PM EDT

When the Maine Board of Environmental Protection rejected in February 2009 upgrading the water quality classification for the lower Androscoggin River from Class C to Class B, it gave this as its reason: "More data is needed to support a change in the classification."

Never mind that the section of the Androscoggin River from Worumbo Dam in Lisbon Falls to its mouth in Merrymeeting Bay by then had been actively monitored by well-trained volunteers of the Friends of Merrymeeting Bay for 10 years. Or that the data they collected showed that for six years the lower Androscoggin had been meeting Class B dissolved oxygen standards and "nearly always" had met Class B bacteria level standards.

"More data is needed" — which is a polite bureaucratic way of saying "Come back later ... and maybe we'll consider it then."

The BEP's refusal begs the question: Who benefits from delaying upgrading the lower Androscoggin to the Class B standard that six years of data show is already being met more often than not?

It's not the people who swim, fish, canoe or kayak on that stretch of river. They would vigorously argue in favor of a higher standard because it means the river that inspired the 1972 federal Clean Water Act is that much closer to being healthy again. They place a high value on the return of bald eagles and osprey to that stretch of river; they welcome its resurgence of fish species that once roiled its waters by the hundreds of thousands.

Nor is it the municipalities along that stretch of river, who've spent millions upgrading their sewage treatment plants and sewer lines precisely because their citizens want to do what's right for the river. Auburn, Lewiston, Durham, Topsham, Brunswick, all wrote letters of support in for Friends of Merrymeeting Bay's 2009 petition to upgrade the lower Androscoggin to a Class B river.

They were joined by Androscoggin River Alliance, Brunswick-Topsham Land Trust, Merrymeeting Audubon Society, the Conservation Law Foundation, Natural Resources Council of Maine, Friends of Casco Bay, Maine Audubon, Maine Rivers, Atlantic Salmon Foundation and a number of private citizens — all writing letters of support.

So who benefits from the Androscoggin being kept a Class C river, instead of a Class B?

Anyone with even a casual understanding of Maine history — specifically, the power the paper and pulp industries have had over the decades in guiding our environmental policies — might identify paper companies with mills upriver in Jay and Rumford as prime suspects.

But if Class B standards are currently being met — as six years of data suggested — it would mean that existing industries along the river already are meeting clean water requirements. Presumably, then, they have nothing to fear and would not have to spend additional money to accomplish the upgrade.

No matter, the BEP made its ruling and called upon citizen groups such as Friends of Merrymeeting Bay and the Department of Environmental Protection "to work cooperatively to obtain the data necessary" to justify reclassification of the lower Androscoggin to Class B standards.

Well, that's exactly what took place last year, from April to mid-October. Friends of Merrymeeting Bay volunteers, working closely with the DEP, increased the frequency of sampling from monthly to every other week. They increased the sampling sites from three to 10.

The results verified the previous finding that the lower Androscoggin River consistently meets Class B standards for dissolved oxygen and E. coli bacteria.

What, then, are we waiting for? Isn't the point of federal and state clean water laws to improve water quality? Shouldn't the Department of Environmental Protection and its board be leading that charge?

Instead, they, along with the Legislature's Natural Resources Committee, seem content to regard the lower Androscoggin "the poor stepchild of Maine's rivers" — as Ed Friedman, chairman of Friends of Merrymeeting Bay, so aptly expressed in his testimony seeking the upgrade in 2009.

letters@timesrecord.com

Town of Brunswick, Maine

INCORPORATED 1739
OFFICE OF THE TOWN MANAGER

GARY L. BROWN, MANAGER

28 FEDERAL STREET
BRUNSWICK, MAINE 04011
TELEPHONE 725-6659
FAX # 725-6663

March 2, 2010

Honorable Seth Goodall
Honorable Robert Duchesne
Natural Resources Committee
Cross State Office Building, Room 214
3 State House Station
Augusta, ME 04333

Dear Senator Goodall, Rep. Duchesne & members of the Natural Resources Committee:

At their meeting on March 1, 2010, the Brunswick Town Council decided unanimously to update their letter of support from September 15, 2008, for reclassification of the lower Androscoggin River between Durham Boat Launch or Worumbo Dam to its mouth in Merrymeeting Bay, from Class C to Class B, as proposed by Friends of Merrymeeting Bay (FOMB).

Last summer, at the request of your committee, FOMB, in cooperation with the DEP, conducted intensive water quality monitoring on this river segment, increasing from their earlier protocols both number of sample sites and sampling frequency. FOMB data gathered in 2009 supports their previous upgrade proposal, which we recommended in our 2008 letter. In that the recent more thorough data set also shows the river in attainment of Class B conditions, we have no hesitation in our continued support of the upgrade.

Reclassification will result in the maintenance of Class B standards, which FOMB data clearly show continue to be met on this river section. Reclassification will bring the river into compliance with the law [38 M.R.S.A. § 464 (F) (4) *"When the actual quality of any classified water exceeds the minimum standards of the next highest classification, that higher water quality must be maintained and protected."*], providing the river with increased protection against future degradation and enable its condition to continually improve.

As you know, classification upgrades are appropriate where it is socially or ecologically desirable to attain higher standards and when the technological and financial capacity exists to achieve those higher standards within a reasonable time. Because the river already meets Class B standards (i.e., it is clearly technologically and financially feasible to meet them) and because there are also clear social and economic benefits from a cleaner river, the requested classification is appropriate.

The experience of other communities around the nation has shown time and again the tremendous potential for social, recreational, environmental and economic benefit from river restoration.

Therefore, on behalf of the Brunswick Town Council, we implore the Natural Resources Committee to send to the full legislature as soon as possible, legislation proposing a reclassification of this lower Androscoggin river segment from Class C to Class B.

Your kind and prompt consideration of our request is sincerely appreciated.

Sincerely,

Gary L. Brown
Town Manager

cc: Brunswick Town Council
FOMB

RESOLUTION OF THE BOARD OF SELECTMEN
OF THE TOWN OF TOPSHAM

Whereas, since 1750 Topsham has benefited from the wild power of the Androscoggin; and

Whereas, due to his love for the Androscoggin, Senator Muskie saw the need for, and is generally recognized as the Congressman most responsible for the drafting and passage of the Federal Clean Water Act; and

Whereas, sadly, the Androscoggin has not been accorded the protections of the Clean Water Act and fails to meet minimal environmental standards; and

Whereas, it is in the clear social, recreational, environmental and economic interest of the State of Maine and of the communities which are situated near to it that the Androscoggin be accorded all of the benefits and entitlements of the Clean Water Act and that the provisions of the Act be strictly enforced on behalf of the River.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF SELECTMEN OF THE TOWN OF TOPSHAM AS FOLLOWS:

The State of Maine should take all necessary actions to ensure that the Androscoggin River receives the same protection as that accorded to the other rivers in the State of Maine.

The Board of Selectmen shall support the Androscoggin River Alliance in its efforts to restore the Androscoggin to a condition which will enable the citizens of Topsham to enjoy all of the benefits which the River can provide to them. The Board shall offer this Resolution to demonstrate such support.

Adopted by the Board of Selectmen of the Town of Topsham by the vote of its members on this 4th day of February, 2010.

Ronald Riendeau, Chairman

James Trusiani, Vice Chair

Steve Edmondson

Sandra Consolini

Donald Russell

Office of the Town Manager
100 Main Street
Topsham, ME 04086

James L. Ashe
Town Manager
Phone: 207-725-5821
Fax: 207-725-1731
jashe@topshammaine.com

March 5, 2010

Senator Seth Goodall
Representative Robert Duchesne
Natural Resources Committee
Cross State Office Building, Room 214
3 State House Station
Augusta, ME 04333

Dear Sen. Goodall, Rep. Duchesne & members of the Natural Resources Committee,

At their meeting on March 4, 2010, the Topsham Selectmen decided unanimously to update their letter of support from September 18, 2008 for reclassification of the lower Androscoggin River between Durham Boat Launch or Worumbo Dam to its mouth in Merrymeeting Bay, from Class C to Class B, as proposed by Friends of Merrymeeting Bay (FOMB).

Last summer at the request of your committee, FOMB in cooperation with the DEP conducted intensive water quality monitoring on this river segment increasing from their earlier protocols both number of sample sites and sampling frequency. FOMB data gathered in 2009 supports their previous upgrade proposal which we recommended in our 2008 letter. In that the recent more thorough data set also shows the river in attainment of Class B conditions, we have no hesitation in our continued support of the upgrade.

Reclassification will result in the maintenance of Class B standards, which FOMB data clearly show continue to be met on this river section. Reclassification will bring the river into compliance with the law [38 M.R.S.A. § 464 (F) (4) *"When the actual quality of any classified water exceeds the minimum standards of the next highest classification, that higher water quality must be maintained and protected."*], providing the river with increased protection against future degradation and enable its condition to continually improve.

As you know, classification upgrades are appropriate where it is socially or ecologically desirable to attain higher standards and when the technological and financial capacity exists to achieve those higher standards within a reasonable time. Because the river already meets Class B standards (i.e., it is clearly technologically and financially feasible to meet them) and because there are also clear social and economic benefits from a cleaner river, the requested classification is appropriate.

The experience of other communities around the nation has shown time and again the tremendous potential for social, recreational, environmental and economic benefit from river restoration.

Therefore, on behalf of the Topsham Board of Selectmen, we implore the Natural Resources Committee to send to the full legislature as soon as possible, legislation proposing a reclassification of this lower Androscoggin river segment from Class C to Class B.

Your kind and prompt consideration of our request is sincerely appreciated.

Sincerely,

James Ashe
Town Manager

Cc: Topsham Board of Selectmen
FOMB

Lewiston
All-America City
2007

Executive Department
Laurent F. Gilbert, Sr.
Mayor

It's Happening Here!
LEWISTON • AUBURN

February 26, 2010

Senator Seth A. Goodall, (Chair)
Joint Standing Committee on Natural Resources
100 State House Station
Augusta, ME 04333-0100

RE: Reclassification of the Androscoggin River

Dear Senator Goodall:

I am writing on behalf of the City of Lewiston. In the fall of 2008, the City supported a petition submitted by Friends of Merrymeetng Bay (FOMB) to reclassify the the Androscoggin River from the Durham boat launch or Worumbo Dam to its mouth at Merrymeeting Bay from Class C to Class B.

LD 330 Section 24 passed in 2009, required additional water quality data be collected on the lower Androscoggin to substantiate and support the classification upgrade. We understand from April-October of 2009 this additional data was collected. This Friends of Merrymeeting Bay (FOMB) effort was done in cooperation with DEP partly under the auspices of their Volunteer River Monitoring Program (VRMP). We also understand a report will be presented to the Natural Resources Committee next week outlining the results of the effort. FOMB reports results of the intensive monitoring supports the previous request to upgrade this section of the Androscoggin River from Class C to Class B. More than one hundred samples were taken during the period in 2009 and the water quality results statistically support the recommendation to upgrade this section of the river.

As stated in the October 1, 2008 letter to Ernest Hilton (then Chair of the Board of Environmental Protection), The taxpayers of the City of Lewiston have invested millions of dollars into the effort to clean up the river. These investments have occurred at a time when every dollar paid by the public is increasingly difficult to part with. Those investments have come through the City's aggressive combined sewer overflow (CSO) program and the sewer user fees going directly to our jointly owned wastewater treatment plant. Not only does the City of Lewiston value the river and understand the potential benefit of this request, we have demonstrated our financial commitment to the same. It is gratifying to see the data results demonstrate our efforts are working!

Again, as stated in 2008, we further understand classification upgrades are appropriate where it is socially or ecologically desirable to attain higher standards and when the

Lewiston City Hall, 27 Pine Street, Lewiston, ME 04240-7242; Telephone: (207) 513-3121;
TTY/TDD: (207) 513-3007; Email: gilbertmayor@aol.com; Web: www.ci.lewiston.me.us

technological and financial capacity exists to achieve those higher standards within a reasonable time. Given that the river already meets Class B standards and because there is also clear social and ecological benefit from a cleaner river, the requested classification appears appropriate. The experience other communities around the nation has shown time and again the tremendous potential for social, recreational, environmental and economic benefit from river restorations.

We understand that such an upgrade request, given the current conditions that have been measured, would not require any additional financial impact, now or in the future, on the citizens of our community. If that understanding is correct on behalf of the City, we encourage the Committee to move forward with the reclassification of the Androscoggin River below Lewiston/Auburn to Class B.

Sincerely,

Laurent F. Gilbert Sr.
Mayor

Lewiston City Hall, 27 Pine Street, Lewiston, ME 04240-7242; Telephone: (207) 513-3121;
TTY/TDD: (207) 513-3007; Email: gilbertmayor@aol.com; Web: www.ci.lewiston.me.us

To: Ernest Hilton, Chair
Maine Board of Environmental Protection

From: Board of Selectmen, Durham, Maine

Re: Reclassification of the Androscoggin River pursuant to 38 MRSA, secs. 464 and 465

Date: September 16, 2008

The Board of Selectmen of the Town of Durham is pleased to advise you of its enthusiastic support of the reclassification of the Androscoggin River from the Durham Boat launch or Worumbo Dam to its mouth at Merrymeeting Bay from Class C to Class B as set forth in the petition of the Friends of Merrymeeting Bay.

Reclassification will result in the maintenance of Class B standards that are presently being met in this section of the river as well as in other sections. Reclassification will also provide the river with increased protection against degradation in the future that will enable its condition to continue to improve.

As you know, upgrades to reclassification are appropriate where it is socially or ecologically desirable to attain higher standards and when the technological and financial capacity exists to achieve those higher standards within a reasonable time.

In light of the tremendous potential for social, recreational, environmental and economic benefit to be derived by the entire river valley, and in particular the Town of Durham, from an improved river, and the fact that the data shows the river presently attains Class B status, demonstrating that it is clearly technologically and financially feasible to attain Class B status, the requested reclassification is appropriate.

Therefore, on behalf of the Town of Durham, we, the Board of Selectmen, do hereby implore the Board of Environmental Protection to approve the reclassification of the Androscoggin River to Class B at your meeting now scheduled for September 18, 2008.

Your kind consideration of this request is sincerely appreciated.

Board of Selectmen
for the Town of Durham

By:_____

By:_____

By:_____

(207) 784-6469 (207) 784-6460

AUBURN SEWERAGE DISTRICT

268 COURT ST. - P.O. BOX 414

AUBURN, MAINE 04212-0414

September 17, 2008

Chairman Ernest Hilton
Maine Board of Environmental Protection
17 State House Station
Augusta, ME 04333

RE: **Proposal to reclassify a portion of the Androscoggin River**

Dear Mr. Hilton and Members of the Board,

This letter is written neither in support or opposition to the proposal submitted by the Friends of Merrymeeting Bay (FOMB) to reclassify, from Class C to Class B, the lower Androscoggin River from its mouth in Merrymeeting Bay to the Durham Boat Launch or Worumbo Dam. We strongly believe FOMB should be commended for the interest and efforts to collect water quality data along this section of river with the goal of demonstrating that Class B standards are being met.

We also believe that water quality on sections of the Androscoggin River currently meet or exceed the current classification and meet those of Class B. We also believe the Board of Environmental Protection needs to give strong consideration to reclassifying portions of the Androscoggin River. To this end we believe the Maine Department of Environmental Protection should, at minimum, immediately establish a water quality monitoring program on the Androscoggin River from Merrymeeting Bay to the base of Gulf Island Dam.

The Cities of Lewiston and Auburn have invested millions of dollars in recent years in efforts to improve water quality of the Androscoggin River. In addition millions of public and private dollars have been invested in public access trails, and numerous private investments along the river are also evident. We recognize that clean rivers enhance the local economy and vitality of all communities surrounding them. A clean, healthy river attracts people, new businesses, and increases property value.

The original estimated cost of the separation improvements required in Auburn as detailed in our CSO Master Plan (prepared in 1999) was $19.2 M. Through December 31, 2007, capital improvements have exceeded $13M coming from local property taxes and sewer user fees. This investment has separated nearly 25 miles of sewers, or 81% of the projected full separation effort. Completion of the separation work in Auburn is projected for the year 2013.

On behalf of the Trustees of the Auburn Sewerage District we wish to be on record as neither supporting nor opposing the FOMB proposal to reclassify the lower Androscoggin River from Class C to Class B. We strongly urge the MDEP to immediately establish a water quality monitoring program on the Androscoggin River from Merrymeeting Bay to the base of Gulf Island Dam to be prepared with the data to reclassify the Androscoggin River from Class C to Class B in the very near future.

Sincerely,

Normand R. Lamie, P.E.
General Manager
Auburn Sewerage District

September 16, 2008

Ernest Hilton, Chairman
Maine Board of Environmental Protection
17 State House Station
Augusta, ME 04333

Re: Reclassification of the Androscoggin River pursuant to 38 MRSA, secs. 464 and 465

Dear Chairman Hilton,

The Board of Directors of the Brunswick-Topsham Land Trust is pleased to advise you of its support for the reclassification of the Androscoggin River from the Durham Boat launch or Worumbo Dam to its mouth at Merrymeeting Bay, from Class C to Class B, as set forth in the petition of the Friends of Merrymeeting Bay (FOMB). The BTLT Board voted in favor of this reclassification at its September 15, 2008 board meeting.

Reclassification will result in the maintenance of Class B standards, which FOMB data show are presently being met in this section of the river. Because the river already meets Class B standards, the BTLT Board of Directors believes the requested reclassification is appropriate and desirable to help ensure that the Androscoggin River's water quality will continue to improve into the future.

The Androscoggin River is a significant natural resource in the communities of Brunswick and Topsham and it is important to the BTLT that its water quality and associated wildlife habitat and recreational resources remain healthy and improve into the future. The BTLT holds two easements on the banks of the Androscoggin River in Brunswick totaling 36 acres as well as 40-acre Cow Island located in the middle of the river between Brunswick and Topsham. Because of this land ownership, we are particularly vested in maintaining and improving the health of the Androscoggin River.

On a personal note, having grown up on the Androscoggin River in Turner and Auburn in the 1970s and 1980s, I can attest firsthand to how far the health of the river has come; yet, as I continue to live on the river today (now in Topsham), I am often reminded of how far it still has to go. When I am out on

(over)

108 Maine Street / Brunswick, ME 04011 / 207-729-7694 / btlt@gwi.net / www.btlt.org

the river or walking on its banks with my young children, I will frequently get questions like – "why can't we go swimming in the river" or "why can't we eat that fish". These innocent questions remind me that even though we have come so far in cleaning up this beautiful river, there is still a lot to be done.

Therefore, on behalf of the Brunswick-Topsham Land Trust Board of Directors, I would like to urge the Board of Environmental Protection to approve the reclassification of the Androscoggin River (from the Durham Boat launch or Worumbo Dam to its mouth at Merrymeeting Bay) from Class C to Class B at your meeting scheduled for September 18, 2008.

Please contact me with any questions. Your consideration of this request is sincerely appreciated.

Sincerely,

Angela Twitchell
Executive Director

Appendix 9
Applied Biomonitoring Qualifications

Applied Biomonitoring
11648 - 72nd PL NE
Kirkland, WA 98034
425-823-3905

Applied Biomonitoring is an environmental consulting firm specializing in innovative, state-of-the art environmental monitoring and assessment services coupled with timely client communication and scientific credibility. We have conducted numerous field studies to support projects for federal regulatory agencies, state and local authorities (including Maine DEP) and private industry.

Michael H. Salazar, Principal of Applied Biomonitoring, has been a leader in state-of-the-art environmental monitoring methodology with over 30 years of experience. Michael Salazar, in collaboration with his associate Sandra Salazar, have the ability to provide clients a wide range of environmental services, including monitoring and assessment, work plan development, experimental planning and design, data analysis and interpretation, peer review, and meeting facilitation. Our primary area of expertise is analysis and interpretation of tissue, water and sediment chemistry data with respect to chemical bioavailability and associated effects on aquatic organisms.

Applied Biomonitoring is recognized as a national and international expert in characterizing and understanding the processes of bioaccumulation and associated biological effects. We are also leaders in conducting field bioassays with caged bivalves. This unique experience and expertise to design, plan, and conduct in-situ field assessments has been developed over the past 30 years by conducting more than 40 transplant studies.

In addition to services directly associated with monitoring and assessment, Applied Biomonitoring has conducted numerous peer reviews, prepared countless technical reports and guidance manuals, and provided oversight and management on many high-profile projects. Applied Biomonitoring has the unparalleled capability of conducting on-the-spot literature searches for many environmental issues. An electronic database of over 15,000 citations with an emphasis on exposure and effects measurements and assessment techniques is maintained at the Applied Biomonitoring offices.

Our primary fields of experience and expertise include:

- Work plan & criteria development
- Environmental monitoring & assessment
- Bioaccumulation & bioeffects interpretation
- In-situ field studies with caged bivalves
- Ecological risk and damage assessment
- Sediment evaluation
- Teaching & technology transfer
- Meeting facilitation
- Electronic database & literature summaries
- In-situ temperature monitoring

Environmental Monitoring & Assessment
Applied Biomonitoring has provided an extensive review of the EPA Region 10 Interim Sediment Quality Guidelines for tributyltin (TBT) and participated in a number of discussion groups to evaluate that document and is frequently contacted by the Seattle districts of EPA and the COE for technical guidance. We have been contracted by EPA to evaluate updates of Ambient Water Quality Criteria for TBT, cadmium, and copper, and contracted by Environment Canada to review two TBT assessment documents. As part of a project to evaluate the potential effects of ammonia for the City of Winnipeg using caged bivalves, Applied Biomonitoring conducted an intensive review of the EPA Ambient Water Quality Criteria for ammonia. Most recently, Applied Biomonitoring has focused on bivalve bioaccumulation, bioeffects, and pathways of exposure for metals. We have developed extensive working expertise on the relative differences in metal accumulation among various marine and freshwater mussel species.

Field Bioassays, Field Monitoring and Toxicity Testing
Applied Biomonitoring is a recognized leader in the development of *in-situ* monitoring techniques that permit synoptic collection of chemical exposure and biological effects data. Since the first pilot study conducted in 1973, Mr. Salazar has conducted 60 transplant studies using 18 marine, estuarine, and freshwater bivalve species. Results of these studies have been used by the US Navy in their risk assessment for TBT, NOAA and the US EPA in their evaluations of Superfund sites in Puget Sound, Washington; Tampa, Florida, Sault Ste. Marie, Michigan, and the Sudbury River in Massachusetts, and most recently by the Washington State Department of Natural Resources for a programmatic evaluation of herring stocks in Puget Sound.

The *in-situ* transplant approach has become a well-established monitoring tool accepted by both industry and regulatory agencies. Both Mr. and Mrs. Salazar have developed the standard protocols for conducting field studies with caged bivalves. This extensively peer reviewed document appeared for the first time in American Society for Testing and Materials (ASTM) 2001 Annual Book of Standards. The methods have also been accepted by the American Public Health Association in their Standard Methods for the Examination of Water and Wastewater, and Environment Canada for monitoring pulp and paper and mining effluents. Applied Biomonitoring has worked with scientists at Environment Canada's St. Lawrence Center for the past 6 years to develop environmental monitoring and assessment systems for endocrine disrupting chemicals. Biomarkers have been developed to quantify estrogenic effects and a benthic cage was developed to assess long-term effects under environmentally realistic conditions.

Relevant Project List:
- Lynn Lake Peer Review (2009)
- Duwamish River Mussel Study (2009)
- Motiva Oil Spill Assessment & Review (2006, 2007)
- Blanchard Seafood Study (2006)
- Puget Sound Naval Shipyard Caged Mussel Study (2005)
- Devil's Lake Canal Diversion (2005)
- Lynn Lake, Manitoba, Canada Caged Mussel Study (2004, 2005, 2009)

- Review of TBT Documents for Environment Canada (2004)
- Review of EPA Ambient Water Quality Criteria for Copper (2003)
- Kennebec River, ME Caged Mussel Study (2003)
- Androscoggin River, ME Caged Mussel Study (2003)
- Santa Barbara Shell Mound Study (2003)
- Bear Creek, WA Mussel Study (2003)
- Capitol Regional District Tissue Residue Effects Database (2002)
- San Diego Bay Dietary Copper Study (2002)
- Montreal Dietary Copper Study (2002)
- Developing a Benthic Cage for Long-term, In-situ Tests with Freshwater and Marine Bivalves (2002)
- Bonney Lake Fluoride (2002)
- Assessing Acute WET Test Variability (2001)
- Assist in Sampling Plan Development and Interpret Tissue Residues of PAHs (2001)
- PCB Site Monitoring (2001, 2002, 2003)
- Port Valdez Monitoring (2001)
- Review of Interlaboratory Variability Study, EPA Short-term Chronic & Acute Whole Effluent Toxicity Test Methods (2001)
- Environmental Monitoring for Sewage Treatment Plant (2001)
- Review of EPA Ambient Water Quality Criteria for Cadmium (2000)
- Caged Mussel Study in Augusta, ME (2000)
- Caged Clam Study at Sault Ste. Marie, MI (2000)
- Potential Toxicity and Risk to Aquatic Organisms and Human Health from Exposure to Fiberglass (2000)
- Caged Mussel Study at Cherry Point, WA (1998, 1999, 2000)
- City of Winnipeg Ammonia Study, Winnipeg, MB, Canada (1999)
- Environment Canada Effluent Monitoring Studies, Montreal, Canada (1999, 2000, 2001, 2002, 2003, 2004)
- Technical Review of Biomonitoring Study Work Plan for MCCDC Quantico, VA (1999)
- Critique of San Francisco Estuary Institute Mussel Watch (1999)
- Review of EPA Tissue Residue Effects Database (1998)
- Caged Bivalve Pilot Study at Port Alice, Vancouver Is, BC (1997)
- Caged Bivalve Pilot Study at Port Valdez, AK (1997)
- Critical Evaluation of Bivalve Mollusc Biomonitoring (1997)
- Review of EPA Ambient Water Quality Criteria for TBT (1997)