MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION 2025 TRIENNIAL REVIEW OF WATER QUALITY STANDARDS

SUMMARY OF PUBLIC COMMENTS TO THE BOARD OF ENVIRONMENTAL PROTECTION AND MDEP RESPONSES

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2025 TRIENNIAL REVIEW OF WATER QUALITY STANDARDS

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Introduction

The Maine Board Department of Environmental Protection (Board) published recommendations for water quality standards (WQS) changes, including water quality classification upgrades, considered under the Triennial Review (TR) for public comment on August 28, 2025. The recommendations were posted on the Maine Department of Environmental Protection's (Department or MDEP) website www.maine.gov/dep/water/wqs/triennial-review.html and public notice was provided as described below. One public hearing was held on October 16, 2025, in-person at the Augusta Civic Center. The Board accepted written public comments via MDEP until October 22, 2025. If the Legislature accepts a TR bill for consideration, an additional opportunity for comment will be available in that venue.

Notice of the public hearing and public comment period was sent on August 28, 2025 by e-mail to approximately 3,110 stakeholders, including all entities that had provided TR proposals in the spring of 2024 or supported them or provided public comment to the Department in May/June 2025; officials from all cities and towns in Maine; the Land Use Planning Commission (for unorganized towns); State natural resource agencies; a number of non-profit organizations; the four federally recognized Tribes in Maine; businesses that were potentially affected by proposals (e.g. dischargers, hydropower owners); Soil and Water Conservation Districts; County commissioners; consultants; and a number of private persons. Follow-up e-mails noting the relevance of the e-mail to recipients were sent to any cities and towns located in the watershed of any upgrade candidate as well as any organization included in the prior mailing. Electronic GovDelivery notices were sent to interested persons on two Department subscription lists, one for Opportunities for Comment and one specifically for public meetings. The GovDelivery notice regarding the Opportunities for Comment was sent to all Maine legislators.

A number of comments were received during the official public comment period, and the Department wishes to thank all persons who provided input. The Department considered all comments, which are briefly listed in Table 1 and presented fully in the remainder of the document in the order and with the status that proposals were included in the August 11, 2025 recommendations document. Where applicable, comments are grouped by proposal, and within each group they are arranged in the order received. In some cases, typographical or other minor errors in comments have been corrected. For comments submitted in writing, all footnotes included with those comments are shown in italics. The Department considered all comments in their entirety but have included the most relevant portions in this document in the interest of brevity and clarity. Full written comments are provided in a separate public comments document.

Table 1. List of public comments received between August 28 and October 22, 2025. For the 'Position on Original Proposal' column, an asterisk (*) indicates where the commenter's position differs from the Department's recommendation. For instances where comments were provided or questions asked, but no position was provided, this column was left blank.

#	Affiliation	Original Proposal	Position on Original Proposal
Written comments received (listed in in order received)			
1	City of Westbrook	Upgrade Lower Presumpscot River	Oppose
2	City of Lewiston	Upgrade Lower Androscoggin River	Support*
3	Citizen	Upgrade Chandler Bay	Support*
4	Citizen	Upgrade Chandler Bay	Support*
5	Citizen	Upgrade Lower Androscoggin River	Support*
6	City of Lewiston	Upgrade Lower Androscoggin River	Support*
7	Natural Resources Consultant	Upgrade Chandler Bay	Support*
8	American Rivers	All recommendations for changes to water quality standards All recommendations for changes to water quality classifications, particularly Class AA Upgrade Lower Presumpscot River	Support Support Support*
9	Androscoggin River Watershed Council	Amend Class B Dissolved Oxygen Criteria Develop New Water Quality Class Upgrade Lower Androscoggin River Exemption for Topographic Areas in Riverine Impoundments	Support Support* Support* Support*
10	Remote Ecologist, Inc.	Upgrade Chandler Bay	Support*
11	Appalachian Mountain Club	Comment on All Recommendations Upgrade of Pleasant River Middle Branch and Tributaries Upgrade of Mt. Blue Stream and Tributaries Upgrade of Sandy River and Tributaries Upgrade of Temple Stream and Tributaries	Support Support Support Support Support
12	Friends of Merrymeeting Bay (FOMB)	Upgrade Lower Androscoggin River	Support*
13	Grow L+A	Upgrade Lower Androscoggin River	Support*
14	City of Auburn	Upgrade Lower Androscoggin River Develop New Water Quality Class	Support* Support*
15	Preti Flaherty for Maine Forest Products Council	Amend Freshwater Dissolved Oxygen Criteria Add Odor to Discharge Provisions Develop New Water Quality Class Seasonal Applicability of Recreational Bacteria Criteria Develop Turbidity Criteria Rulemaking – Chapter 584 (Toxics); Mixing Zones Upgrade Androscoggin River Upgrade Lower Androscoggin River Upgrade Lower Presumpscot River Add Freshwater pH Criteria	Support Oppose Oppose Oppose Oppose Oppose Oppose Oppose Oppose Oppose*
16	Eastern Maine Conservation Initiative	Upgrade Chandler Bay	Support*

#	Affiliation	Original Proposal	Position on Original Proposal
17	Maine Department of Inland Fisheries and Wildlife	Upgrade Sheepscot River	Oppose
18	Friends of Casco Bay	Amend Freshwater Dissolved Oxygen Criteria Add Freshwater pH Criteria Add Marine pH Criteria Develop Nitrogen Criteria Rulemaking – Mixing Zones	Support Support Support Support* Support
19	FOMB	Upgrade Lower Androscoggin River	Support*
20	Conservation Law Foundation	Upgrade Chandler Bay	Support*
21	Natural Resources Council of Maine	All recommendations for changes to Class AA water quality classifications Upgrade Sandy River and Tributaries Upgrade Temple Stream and Tributaries Upgrade Lower Androscoggin River	Support Support* Support* Support*
22	Town of Jonesport Selectboard	Upgrade Chandler Bay	Oppose
23	Sierra Club	General Comments – DEP Capacity Amend and Expand Finfish Aquaculture Permitting Provisions Upgrade of Chandler Bay	 Support*
24	The Sells Law Firm for FOMB	Upgrade Lower Androscoggin River	Support*
Oral comments received at October 16, 2025 public hearing (listed in in order received).			
1	Remote Ecologist, Inc.	Upgrade Chandler Bay	Support*
2	Grow L+A	Upgrade Lower Androscoggin River	Support*
3	Friends of Merrymeeting Bay (FOMB)	Upgrade Lower Androscoggin River	Support*
4	The Sells Law Firm for FOMB	Upgrade Lower Androscoggin River	Support*
5	Eastern Maine Conservation Initiative	Upgrade Chandler Bay	Support*
6	Citizen	Upgrade Androscoggin River Upgrade Lower Androscoggin River	Oppose Oppose
7	American Rivers	All recommendations for changes to water quality standards, particularly Class B Do criteria All recommendations for changes to water quality classifications, particularly Class AA Upgrade Lower Presumpscot River	Support Support Support*
8	Friends of the Presumpscot River	Upgrade Lower Presumpscot River	Support*
9	Friends of the Presumpscot River	Upgrade Lower Presumpscot River	Support*
10	Natural Resources Council of Maine	All recommendations for changes to Class AA water quality classifications Upgrade Sandy River and Tributaries Upgrade Temple Stream and Tributaries	Support Support* Support*

#	Affiliation	Original Proposal	Position on Original Proposal
		Upgrade Lower Androscoggin River	Support*
11	Preti Flaherty for Maine Forest Products Council	Amend Freshwater Dissolved Oxygen Criteria Add Odor to Discharge Provisions Develop New Water Quality Class Seasonal Applicability of Recreational Bacteria Criteria Develop Turbidity Criteria Rulemaking – Chapter 584 (Toxics); Mixing Zones Upgrade Androscoggin River Upgrade Lower Androscoggin River Upgrade Lower Presumpscot River Add Freshwater pH Criteria	Support Oppose Oppose Oppose Oppose Oppose Oppose Oppose Oppose Oppose*
12	Trout Unlimited	Upgrade Lower Androscoggin River	Support*
13	Norman, Hanson and DeTroy for Kingfish Maine	Upgrade Chandler Bay	Oppose

COMMENTS RECEIVED

GENERAL COMMENTS

Comments from:

- Andrew Fisk, American Rivers (written and public hearing comment)

I am strongly in support of the additional 47 miles of the proposed AA classification. While 47 miles is not a big portion of the remaining 150,000 miles needed to reach our goal, it is an important action nonetheless.

I am in support of the additional reclassifications and standards changes recommended by the Department in its final proposal.

- Eliza Townsend, Appalachian Mountain Club (written comment)

The Appalachian Mountain Club supports the changes proposed by the Department.

MDEP Response:

The Department appreciates the support expressed for these recommendations. No changes were made to the proposed recommendations posted for public comment between August 28 and October 22, 2025.

- Matthew Cannon, Sierra Club (written comment)

DEP Capacity
Our primary concern is the ongoing need for increasing DEP funding and capacity. DEP states it needs more time and resources “to fully evaluate the potential impacts of, and consider how to most appropriately implement, any revisions to Maine’s DO concentration criteria for Class A waters.” (p. 20) What specific capacity does DEP need to fully evaluate DO concentrations, and in general all of this data? DEP states it needs more time and resources “to fully evaluate the potential impacts of, and consider how to most appropriately implement, any revisions to Maine’s DO concentration criteria for Class A waters.” (p. 20) What type of resources? Would having more staff and more water quality monitoring equipment require substantially more time?

There will always be capacity limits, but it is our position that this report should identify the resources that are needed so that DEP can fulfill its role rather than using the technological and financial capacity of DEP as reasons to not attain higher standards. We question the validity of including these constraints as significant considerations for reclassification. (p 4-5)

MDEP Response:

The Department thanks the commenter for their input. The Department evaluated several new or modified water quality standards (WQS) and water classification upgrade proposals as part of this Triennial Review (TR) process. Developing or modifying WQS is typically a significant undertaking that includes careful consideration of existing and proposed statutory provisions, evaluating the potential implications of implementing the requested change, and consultation with EPA, other agencies, and stakeholders throughout the development process. The level of resources required to fully evaluate proposed changes depends on the complexity of the topic.

Regarding freshwater dissolved oxygen criteria, as noted in the recommendations posted for public comment between August 28 and October 22, 2025, the Department prioritized efforts during this TR to revise dissolved oxygen criteria for Class B waters. The Department commits to evaluating available data and, when feasible, collecting or supporting the collection of additional data to inform additional criteria development and water classification upgrades during a future Triennial Review process. In the meantime, Department staff will continue to work with partners to identify and fill data gaps where Department resources are limited.

COMMENTS ON PROPOSALS FOR CHANGES TO WATER QUALITY STANDARDS - RECOMMENDED

Names provided in parentheses after each item identify the organization(s) that submitted the original proposal.

Update Dissolved Oxygen Criteria for Class A (Friends of Casco Bay, Conservation Law Foundation, MDEP) Class B (Friends of Casco Bay, Conservation Law Foundation, MDEP), and Class C Waters (MDEP)

MDEP Response on page 9

Comments from:

- Andrew Fisk, American Rivers (written and public hearing comment)

I am also testifying in particular support of the Department's revisions to the dissolved oxygen standards, particularly the revision to Class B which establishes the daily average and 6.0 ppm floor. The changes are reasonable, technically and biologically sound and will provide for clearer decision making.

- Ferg Lea, Androscoggin River Watershed Council (ARWC) (written comment)

ARWC supports the change in the Class B criteria proposed by the Department of Environmental Protection staff. However, we believe that further changes are needed to the Classification System to reflect the scientific reality of rivers and streams in watersheds with significant development.

- Krysta West, Maine Forest Products Council (MFPC) (written comment)[1]

MFPC supports the Department's recommendation to adopt a daily average dissolved oxygen (DO) criterion for Class B and C waters.[2] The shift to a daily average recognizes natural diurnal fluctuations in DO and provides a more realistic and scientifically defensible framework for assessing water quality.

Equally important, incorporating a daily average provides critical flexibility in regulatory implementation. Without this flexibility, isolated short-term DO fluctuations — even those caused by natural conditions — could result in findings that a waterbody is impaired. Such impairment determinations can in turn trigger costly and time-consuming processes such as the development of total maximum daily loads ("TMDLs") or necessitate drastic permit modifications for dischargers. For MFPC members, this would create significant compliance risks and unnecessary economic burdens without corresponding environmental improvements. Adopting a daily average approach will help ensure that water quality standards remain protective of aquatic life while buffering against unwarranted impairment findings and the disruptive regulatory measures that can follow.

At the same time, MFPC cautions against using this new daily average as the sole basis for reclassifying Class C waters to Class B, and Class B waters to Class A, in the absence of long-term, comprehensive data demonstrating attainment under critical conditions. Premature reclassification could subject facilities not only to more stringent permit limits that are neither technologically nor economically feasible, but also to costly facility upgrades in an effort to comply with standards that the receiving water may not be able to support naturally. Such outcomes would threaten the competitiveness of Maine's forest products industry and, by extension, the livelihoods of thousands of Maine workers and the economic health of entire communities that depend on these employers.

- Heather Kenyon, Friends of Casco Bay (FOCB) (written comment)

We support the Department's recommendations to revise 38 MRS Sections 465.2.B, 465.3.B, and 465.4.B to update the dissolved oxygen criteria.

<u>MDEP Response:</u>

The Department appreciates the support expressed for these recommendations. No changes were made to the proposed recommendations posted for public comment between August 28 and October 22, 2025.

[1] This comment was also shared at the public hearing by Kijana Plenderleith (Preti Flaherty on behalf of Maine Forest Products Council).

[2] The Department wishes to clarify that the recommendation to update dissolved oxygen criteria for Class C waters does not include the adoption of a daily average for the concentration and percent saturation components. The implementation of a daily average is applicable only for the proposed revisions to Class B dissolved oxygen criteria.

Add Numeric Criteria for pH of Fresh (EPA and Hancock County Soil and Water Conservation District) and Marine Surface Waters (EPA)

Comments from:

- Krysta West, Maine Forest Products Council (MFPC) (written comment)[3]

VI. Proposed Numeric Criteria for Freshwater pH

MFPC respectfully disagrees with and opposes DEP's recommendation to adopt a numeric pH criterion of 6.5 to 9.0 for freshwater waterbodies.

First, this proposal appears inconsistent with existing federal discharge limitations set forth under 40 CFR Part 430.22, Subpart B, which establish effluent limitation guidelines for the pulp, paper, and paperboard industry. Under EPA's own regulations, a pH range of 5.0 to 9.0 is deemed the degree of effluent reduction attainable through the application of best practicable control technology currently available ("BPT"). DEP has not provided sufficient technical justification as to why Maine's water quality requires a narrower range than EPA has already determined to be protective under federal standards.

Moreover, the broader implications of adopting a 6.5 to 9.0 criterion are not fully understood and thus warrant further evaluation. Facilities and dischargers subject to these criteria could face significant new compliance challenges without clear evidence that such a change is necessary for water quality protection. Before proceeding, DEP should more fully assess whether the proposed criterion is even needed, whether it is achievable under actual operating conditions in Maine, and what impacts it might have on regulated entities and their host communities.

For these reasons, MFPC does not support the adoption of this new numeric pH criterion at this time and urges DEP to conduct additional technical evaluation before moving forward.

- Heather Kenyon, Friends of Casco Bay (FOCB) (written comment)

We also support the Department's recommendations to add criteria for pH to fresh surface waters (38 MRS Sections 465(2)-(4) and marine surface waters (38 MRS Sections 465-B(2) and (3).

<u>MDEP Response:</u>

The Department appreciates the comments submitted expressing support for and opposition to these recommendations. The key points raised by MFPC were addressed by the Department in the Responses to Comments available for the May 28 through June 30, 2025, public comment period. In the interest of brevity, readers are referred to that document for a complete response. No changes were made to the proposed recommendations posted for public comment between August 28 and October 22, 2025.

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[3] This comment was also shared at the public hearing by Kijana Plenderleith (Preti Flaherty on behalf of Maine Forest Products Council).

COMMENTS ON PROPOSALS FOR CHANGES TO WATER QUALITY STANDARDS – NOT RECOMMENDED

Names provided in parentheses after each item identify the organization(s) that submitted the original proposal.

Amend and Expand Finfish Aquaculture Permitting Provisions (Frenchman Bay United)

Comment from:

- Matthew Cannon, Sierra Club (written comment)

Finfish Aquaculture Permitting
Within the analysis on the net pen aquaculture general permit, there is a discrepancy on what is appropriate to consider in this review. DEP states that "The recommendations provided by FBU largely pertain to the Department's Net Pen Aquaculture General Permit and revisions to Maine's waste discharge permitting and licensing processes." DEP thinks "such recommendations are more appropriately addressed through regular permit renewal or development processes, which follow a separate public process" because the "requests do not pertain to the development or revision of water quality standards and are thus outside the scope of this triennial review (TR) process." (page 34)

The recommendations from FBU on aquaculture permits are directly related to water quality standards, and fully within the scope of this triennial review. It is promising to see the Dept. changing its general permits to reflect this need, but it would be more accurate to say that it does relate to water quality, and the best way to change the permit is through the regular permit renewal process.

MDEP Response:

The Department thanks the commenter for their input. No changes were made to the proposed recommendations posted for public comment between August 28 and October 22, 2025. The Department evaluated the language change requested by the Sierra Club and determined the language as written accurately reflects the Department's position on this topic.

Amend Statute to Include a Prohibition on Discharges that Impart Odor (Conservation Law Foundation);

Review Seasonal Applicability of Recreational Bacteria Criteria in Water Quality Classes B, C, SB and SC (EPA); and

Development of Water Quality Standards to Address Turbidity Problems (Hancock County Soil and Water Conservation District)

Comment from:

- Krysta West, Maine Forest Products Council (MFPC) (written comment)[4]

II. Proposals Not Recommended by DEP

MFPC strongly supports DEP's decision not to recommend certain proposals that would have introduced significant regulatory burdens with little or no demonstrated environmental benefit, including:

1. *Prohibiting discharges that impart odor;*
3. *Revisiting the seasonal applicability of recreational bacteria criteria for Class B and C waters; and*
4. *Developing numeric water quality standards for turbidity.*

If advanced, these proposals could have resulted in sweeping changes to permitting requirements and substantial compliance costs for facilities along Maine's major rivers. For example, numeric turbidity standards would be extremely difficult to implement given natural variability, while a prohibition on discharges that impart odor could expose facilities to enforcement actions based on inherently subjective criteria.

Our members are committed to continued investment in environmental stewardship. However, unnecessary regulatory uncertainty threatens both operational planning and the long-term competitiveness of Maine's mills. More importantly, these mills are anchor employers in many rural communities, supporting high-paying jobs, local tax bases, and critical infrastructure. Regulatory changes that lack a sound scientific foundation risk undermining those broader community benefits.

MDEP Response:

The Department appreciates the comments submitted expressing opposition to these recommendations. No changes were made to the proposed recommendations posted for public comment between August 28 and October 22, 2025.

[4] This comment was also shared at the public hearing by Kijana Plenderleith (Preti Flaherty on behalf of Maine Forest Products Council).

Development of a New Water Quality Class (Androscoggin River Watershed Council)

MDEP Response on page 15

Comments from:

- Ferg Lea, Androscoggin River Watershed Council (ARWC) (written comment)

Classification System
ARWC supports the change in the Class B criteria proposed by the Department of Environmental Protection staff. However, we believe that further changes are needed to the Classification System to reflect the scientific reality of rivers and streams in watersheds with significant development.

ARWC requests that the Board of Environmental Protection use these comments in a request to the Department staff to consider changes in the Classification system utilizing current scientific data to better reflect the good quality of many rivers and streams that have significant developed areas in their watersheds.

Class A and Class B have similar dissolved oxygen limits including those required for spawning and egg incubation for cold water species. Class A and B waters require a dissolved oxygen (DO) concentration of 7.0mg/l (ppm), and C Classification requires only 5.0 mg/l of dissolved oxygen (DO), a much lower standard.

The discussion that follows does not pertain to the area commonly referred to as the "Deep Hole" in Gulf Island Pond. That will be addressed in later paragraphs. Since passage of the Clean Water Act in 1972, the Androscoggin River has continually improved. By the mid 1980's the river had reasonably consistent dissolved oxygen levels of 5 mg/l, the current Class C standard. At that time, the Androscoggin Valley Council of Governments recognized the improvement and developed a recreation plan for the lower river. With improvements to treatment facilities and the closure of a New Hampshire mill, the quality today is B upriver from its confluence with the Ellis River and close to the B standard below that confluence. The entire river is now above 7.0 mg/l the vast majority of the time, very rarely dropping below 6.0 and seldom dropping below 6.3 mg/l.

ARWC Volunteer River Monitoring (VRMP) that takes instantaneous measurements of DO indicates that there may be a number of smaller rivers and streams that are classified as B but do not consistently meet the 7.0mg/l standard through the warm summer months.

Given that we have rivers of very good quality and meeting the B standard the vast majority of the time and other rivers and streams meeting the B standard consistently, in our comments to the DEP we recommended that the B standard be divided into two classifications: "BB" (possibly called B Prime) and "B". BB would be the current Class B. The new Class B would maintain a DO of 7 mg/l the vast majority of the time but allow short duration excursions below 7mg/l, but have a floor minimum DO of 6.0 mg/l. Excursions below 7mg/l could be for a period of a week or two; the period would be subject to further comment and consideration by DEP staff. This provides for those rivers that cannot maintain a DO of 7.0 mg/l or 75% saturation, whichever is higher, consistently to be recognized as being much better quality than Class C.

After reviewing some literature on cold water species and especially brook trout, it appears that the Class B standard was based on the oxygen levels necessary for cold water species to breed and mature through the fry stage. In addition, literature also indicates that breeding and rearing can tolerate short periods, the length varies amongst the literature, of dissolved oxygen levels as low as 6 mg/l. The Androscoggin and other rivers that do not meet the current or DEP proposed B classification do maintain a DO level that the literature suggests would be adequate for cold water breeding and rearing.

The Androscoggin River has one of the greater elevation changes in New England, and therefore, it was very attractive to harness for power. Development has created non-point sources of pollution, and both residential and industrial development necessitated direct discharges of wastewaters to our rivers and streams. More recent changes in logging operations have "cleaned" the forest floor and reduced both the buffering capacity of the land, but it also may have starved our surface waters of a consistent and measured flow of nutrients.

Climate change and the warming of our waters is certainly the most recent anthropogenic impact on our waters. Rainfall acidification is another impact that has occurred over the past four to five decades. A combination of these changes and more distant past changes, even not including the construction of the hydroelectric dams, has created impacts that, while difficult to measure, are, most probably, impacting dissolved oxygen levels and aquatic communities in all sections of the river. ARWC believes the combination of these factors are responsible for the biology of some river segments not meeting the biological standards. Therefore, the biologic standard for rivers that do not meet the higher, proposed Class BB standard, but do meet the proposed Class B standard for DO should be reexamined.

- Eric Cousens, City of Auburn (written comment)

However, we also acknowledge the challenges associated with meeting the current Class B standard 100% of the time, particularly during periods of warm weather and low flow. In light of recent discussions with Maine DEP staff, including those held during the Government Paddle Day on September 30, we understand that the Department is considering a refined classification framework that would introduce a Class BB designation. This new standard would allow for minor deviations from the 7-ppm dissolved oxygen threshold while still maintaining high water quality and supporting public use and ecological health.

If a full reclassification to Class B is not feasible under the current criteria, the City of Auburn supports the adoption of the proposed Class BB standard as a practical and science-based alternative. This approach would recognize the river's substantial progress, provide a realistic permitting framework, and offer the public and our regional partners the recognition that the Androscoggin River deserves.

- Krysta West, Maine Forest Products Council (MFPC) (written comment)[5]

II. Proposals Not Recommended by DEP

MFPC strongly supports DEP's decision not to recommend certain proposals that would have introduced significant regulatory burdens with little or no demonstrated environmental benefit, including:

2. Creating a new water quality class for Class B waters

If advanced, these proposals could have resulted in sweeping changes to permitting requirements and substantial compliance costs for facilities along Maine's major rivers. For example, numeric turbidity standards would be extremely difficult to implement given natural variability, while a prohibition on discharges that impart odor could expose facilities to enforcement actions based on inherently subjective criteria.

Our members are committed to continued investment in environmental stewardship. However, unnecessary regulatory uncertainty threatens both operational planning and the long-term competitiveness of Maine's mills. More importantly, these mills are anchor employers in many rural communities, supporting high-paying jobs, local tax bases, and critical infrastructure. Regulatory changes that lack a sound scientific foundation risk undermining those broader community benefits.

<u>MDEP Response:</u>

The Department appreciates the comments submitted expressing support for and opposition to this recommendation. The key points raised were addressed by the Department in prior public documents, including the Responses to Comments available for the May 28 through June 30, 2025, public comment period and the draft revised Triennial Review recommendations that were available for public comment between August 28 and October 22, 2025. In the interest of brevity, readers are referred to those documents for a complete response.

As detailed in the recommendations, the Department determined that there are a number of issues with revising Maine's classification system as proposed by ARWC. The Department determined that revising Maine's existing Class B DO criteria, which was proposed by the Department and two other external entities as part of the Triennial Review process, would better address the concerns raised, as these concerns primarily pertain to the stringency of Maine's existing Class B dissolved oxygen criteria. No changes were made to the proposed recommendations posted for public comment between August 28 and October 22, 2025.

Develop Narrative Nitrogen Criteria for Class SB and SC Waters (Friends of Casco Bay)

<u>**Comment from:**</u>

[5] This comment was also shared at the public hearing by Kijana Plenderleith (Preti Flaherty on behalf of Maine Forest Products Council).

- Heather Kenyon, Friends of Casco Bay (FOCB) (written comment)

We encourage the Department to reconsider our proposal to develop and add narrative nitrogen criteria for Class SB and SC waters. We understand the Department is developing numeric nitrogen criteria, however we are concerned with the amount of time that might take. We reiterate that Maine should take a two-step approach to adopting nitrogen criteria, similar to Massachusetts and other states. Those states added narrative nitrogen criteria to their marine water quality standards, then later developed numeric limits for specific waters. The numeric limits derive from TMDLs, watershed management plans, or rule. Taking this approach makes sense for Maine. The State has 3,500 miles of coastline, with unique configurations of bays, coves, and islands; rural and urban areas; and differing circulation patterns. Maine should adopt flexible nitrogen criteria that set the basis for attainment and later adopt numeric thresholds by water.

MDEP Response:

The Department appreciates the support expressed for this recommendation. As addressed by the Department in the Responses to Comments available for the May 28 through June 30, 2025, public comment period and the draft revised Triennial Review recommendations that were available for public comment between August 28 and October 22, 2025, the Department is currently working on a draft rule and anticipates sharing a concept draft and convening a stakeholder meeting in the coming year. The draft rule will be further refined during the stakeholder and rulemaking processes in consultation with stakeholders, including EPA. No changes were made to the proposed recommendations posted for public comment between August 28 and October 22, 2025.

COMMENTS ON PROPOSALS FOR DEFFERRED OR NEW RULEMAKING

Names provided in parentheses after each item identify the organization(s) that submitted the original proposal.

Amend Surface Water Quality Criteria for Toxic Pollutants Relating to the Protection of Aquatic Life (EPA); Update Mixing Zone Law (EPA)

MDEP Response on page 17

Comments from:

- Krysta West, Maine Forest Products Council (MFPC) (written comment)[6]

III. Deferred Rulemaking on Toxic Pollutant Criteria

MFPC supports DEP's decision to defer rulemaking on revised aquatic life criteria for toxic pollutants, including criteria for aluminum, copper, and selenium. These criteria are highly complex, site-specific, and cannot responsibly be applied statewide without a much more robust dataset.

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[6] This comment was also shared at the public hearing by Kijana Plenderleith (Preti Flaherty on behalf of Maine Forest Products Council).

In particular, we share DEP's reluctance to advance EPA's suggested approach of adopting the Biotic Ligand Model for copper and the multilinear model for aluminum. While these models may have value in some contexts, they cannot substitute for the substantial site-specific data that has already been developed for many of the state's waterbodies. Permittees and municipalities along the Androscoggin, Little Androscoggin, and St. Croix Rivers have invested significant resources — funding hundreds of aquatic toxicity tests across multiple seasons and flow conditions — to develop water effect ratios that describe the actual bioavailability of metals in these waters. DEP has relied on those water effect ratios to establish site-specific criteria that more accurately reflect present conditions in these rivers and, importantly, provide a more protective basis for safeguarding the waterway than generalized model outputs.

EPA's suggestion that DEP abandon this investment in favor of default computer-based models is not only inconsistent with sound science but also unfair to the regulated community. The hierarchy of water quality standards development — which prioritizes site-specific data over default modeling approaches — is well established and fully supported by federal law and EPA's own regulations. To disregard site-specific studies in favor of generalized models would devalue years of collaborative work, squander capital investments already made, and risk imposing overly conservative criteria that are not reflective of actual environmental conditions in Maine's rivers.

For MFPC members, this issue is not academic. Discarding site-specific criteria in favor of generic models could result in the imposition of unattainable permit limits, forcing costly facility upgrades that yield no measurable environmental benefit. It also stands to undermine confidence in the regulatory process by signaling that collaborative, science-based studies may simply be disregarded at EPA's, and by virtue DEP's, discretion.

DEP's decision to defer rulemaking on these toxic pollutant criteria is therefore prudent and appropriate. We strongly encourage the Department to continue resisting efforts to replace scientifically robust, site-specific data with model-based default criteria until such time as a statewide dataset exists that can justify and support such an approach.

IV. Mixing Zone Policy

MFPC commends DEP for not moving forward with revisions to its existing mixing zone policy as part of this Triennial Review. We also urge the Board to exercise caution before initiating such rulemaking in the future.

There are only a limited number of facilities statewide that operate under mixing zones. DEP's case-by-case permitting approach has proven effective in balancing protection of water quality with the practical needs of regulated entities. Developing a new rule would not only create unnecessary compliance challenges for these few facilities, but also divert DEP's limited resources away from higher-priority initiatives.

For mills and other industrial facilities that anchor Maine's rural economies, maintaining flexibility in how mixing zones are evaluated is essential. An inflexible statewide rule could force costly and unnecessary investments that provide no additional environmental protection, again placing good-paying jobs at risk in communities where alternatives are limited to non-existent.

- Heather Kenyon, Friends of Casco Bay (FOCB) (written comment)

We also urge the Department to reconsider EPA's recommendation that DEP update its current mixing zone policy to include specific restrictions on the scope and extent of mixing zones adequate to protect designated uses. We understand that the Department intends to develop a new mixing zone rule as part of a future rulemaking process, yet the Department recognizes it is bound by the availability of Department resources. While we understand the staffing and funding shortage, an updated mixing zone policy is crucial in these times of climate change, warming waters, and intense storms that deliver loads of nutrients to the coastal environment.

MDEP Response:

The Department appreciates the comments submitted expressing support for and opposition to these recommendations. The key points raised were addressed by the Department in prior public documents, including the Responses to Comments available for the May 28 through June 30, 2025, public comment period and the draft revised Triennial Review recommendations that were available for public comment between August 28 and October 22, 2025. In the interest of brevity, readers are referred to those documents for a complete response. In summary, the Department is currently undertaking a number of rulemaking updates related to its water quality standards and will pursue updates to Chapter 584 and explore the development of a new mixing zone rule as resources allow. Details of rule updates will be determined during the rulemaking process in consultation with stakeholders, and the Department will include MFPC and FOCB in that rulemaking process. No changes were made to the proposed recommendations posted for public comment between August 28 and October 22, 2025.

COMMENTS ON PROPOSALS FOR CHANGES TO WATER QUALITY STANDARDS REQUIRING FURTHER INVESTIGATION

Names provided in parentheses after each item identify the organization(s) that submitted the original proposal.

Provide a Limited Exemption for Topographic Areas Regarding Measurement of Dissolved Oxygen in Riverine Impoundments (Androscoggin River Watershed Council)

Comment from:

- Ferg Lea, Androscoggin River Watershed Council (ARWC) (written comment)

Recognizing the Gulf Island Pond for what it is and the Canyon or Trench that is the so-called Deep Hole
Gulf Island Pond has unique morphology and biology. While it does not function exactly like a lake, it displays a number of characteristics of a lake and certainly does not function like a river or the impoundments behind the other dams in the river. Prior to the dam construction, the river bed in that area was surrounded by steep embankments. The significant depth helped make Gulf Island Dam feasible.

The topography makes the Deep Hole topographically isolated from the area of the pond. Since the water flows through the topographically isolated area at a much, much slower velocity, as the water heats up in the summer, the Deep Hole is further isolated by thermal stratification, very *similar to a lake. The depth at which the isolation occurs varies with temperature and flow. Data indicates the isolation ranges from 12 to 16 meters. With the river being quite wide in Gulf Island Pond, the water from the surface to 12 meters functions much like a lake with decreasing dissolved oxygen from the surface to the 12 meter depth. This is considered the epilimnion.*

There is an abundance of data from the continuous monitors, and DEP staff have done considerable analysis of this area, but questions remain. However, we believe and the data suggests that the vast majority of water flowing through Gulf Island Dam is a mix of the epilimnion. The epilimnion exhibits some values below 7 mg/l as it approaches the 12 meter depth, but an average of the epilimnion dissolved oxygen levels is still close to 7 mg/l and meets the proposed Class B criteria.

There is currently an oxygenation system in Gulf Island Pond, with a number of diffusers in the area of the Deep Hole. The system appears to have little impact on the hypolimnion of the Deep Hole, and it is unclear of its impacts on the epilimnion. However, comparing the Center Bridge data to that in the epilimnion, indicates that the oxygenation system has little if any impact on that layer also. This past summer, DEP experimented with turning off the oxygenation system during some periods of low flow, but we have not analyzed those results.

Changes in mill discharges do not appear to have a significant impact on the dissolved oxygen in the Deep Hole. A comparison of the data profile before and after the closing of the Pixelle mill in Jay, does not show any significant improvement of the water quality of the Deep Hole hypolimnion. Based on this information, ARWC has the following two comments. First, given that the Deep Hole is isolated and appears to act similar to the hypolimnion of a lake, it needs a special designation within the classification statutes and rules. This was proposed in our comments to the Maine DEP and should be further evaluated by the staff. Second, given this isolation, we do not believe that the Deep Hole oxygen levels should impact license discharges. While not necessarily a good condition, many lakes in Maine have very limited and sometimes no dissolved oxygen in the hypolimnion.

<u>MDEP Response</u>:

The Department appreciates the support expressed for this recommendation. As provided in the Responses to Comments available for the May 28 through June 30, 2025, public comment period, the Department is committed to studying the overall issue and carefully considering possible statutory changes, if needed. As part of these efforts, the Department will include ARWC as a stakeholder in future criteria revision, interpretation, or implementation discussions. If statutory revisions are pursued by the Department, consultation with EPA, other agencies, and stakeholders will occur as appropriate. The Department is committed to working on this task but acknowledges that resource limitations may delay progress with this effort. No changes were made to the proposed recommendations posted for public comment between August 28 and October 22, 2025.

COMMENTS ON PROPOSALS FOR WATER CLASSIFICATION UPGRADE – RECOMMENDED

Names provided in parentheses after each item identify the organization(s) that submitted the original proposal.

Abbott Brook and Tributary, Parkertown Township (MDEP)

<u>Comment from:</u>

- Luke Frankel, Natural Resources Council of Maine (NRCM) (written and public hearing comment)

In the initial proposal released on May 28, 2025, DEP recommended that three waterbodies be upgraded from Class A to Class AA: (1) Abbott Brook and tributary, (2) Mt. Blue Stream and tributaries, and (3) Pleasant River Middle Branch and tributaries. NRCM supports these upgrades, as the three waterbodies are outstanding natural resources that are ecologically important due to the presence of high-quality salmonid habitat, and we are pleased that DEP continues to recommend these upgrades in the revised proposal released on August 11, 2025.

<u>MDEP Response</u>:

The Department appreciates the support expressed for this recommendation. No changes were made to the proposed recommendations posted for public comment between August 28 and October 22, 2025.

Mt. Blue Stream and Tributaries, Avon and Weld (MDEP)

<u>Comments from:</u>

- Eliza Townsend, Appalachian Mountain Club (AMC) (written comment)

Therefore, AMC strongly supports proposed reclassifications in the Kennebec River Basin, including Mt. Blue Stream, the Sandy River, and Temple Stream and their tributaries. We appreciate that the approach has been to include entire watersheds rather than selected stream channels. This mirrors AMC's approach to stream reconnections, allowing us to ensure connectivity across entire stream and river networks.

- Luke Frankel, Natural Resources Council of Maine (NRCM) (written and public hearing comment)

In the initial proposal released on May 28, 2025, DEP recommended that three waterbodies be upgraded from Class A to Class AA: (1) Abbott Brook and tributary, (2) Mt. Blue Stream and tributaries, and (3) Pleasant River Middle Branch and tributaries. NRCM supports these upgrades, as the three waterbodies are outstanding natural resources that are ecologically important due to the presence of high-quality salmonid habitat, and we are pleased that DEP continues to recommend these upgrades in the revised proposal released on August 11, 2025.

<u>MDEP Response</u>:

The Department appreciates the support expressed for this recommendation. No changes were made to the proposed recommendations posted for public comment between August 28 and October 22, 2025.

Sandy River and Tributaries, Avon, Freeman Twp., Phillips, Strong, and Other Towns and Townships (MDEP)

MDEP Response on page 23

Comments from:

- Eliza Townsend, Appalachian Mountain Club (AMC) (written comment)

Therefore, AMC strongly supports proposed reclassifications in the Kennebec River Basin, including Mt. Blue Stream, the Sandy River, and Temple Stream and their tributaries. We appreciate that the approach has been to include entire watersheds rather than selected stream channels. This mirrors AMC's approach to stream reconnections, allowing us to ensure connectivity across entire stream and river networks.

- Luke Frankel, Natural Resources Council of Maine (NRCM) (written and public hearing comment)

Additionally, in the initial proposal, DEP recommended not proceeding with WQC upgrades for the other eight proposals put forward by stakeholders. These include upgrades for two other waterbodies (the Sandy River and tributaries from Phillips to Farmington and Temple Stream and tributaries), which, in addition to Mt. Blue Stream, are also located within the Sandy River watershed. After reviewing data submitted during the public comment period for these two waterbodies, DEP now recommends that the portions of these two sub-watersheds that are predominantly forested be upgraded from Class B to Class A in the updated proposal. DEP's reasoning for not recommending a complete upgrade for the stretch of the Sandy River from Phillips to Farmington and Temple Stream is a lack of data.

Although we agree that data is limited for these two waterbodies (as it is for most waterbodies across Maine), we believe that there is sufficient data to support upgrading the entirety of these two sub-watersheds at this time and recommend that the BEP revise DEP's updated recommendation to do so. Some of this data is presented below, building off our written comments submitted on June 30, 2025.

<u>Sandy River and Tributaries</u>
The stretch of the Sandy River from Phillips to Farmington begins at the Route 142 road crossing in Phillips and flows southeast between Route 4 and Route 149 to the Strong-Farmington town line. All tributaries flowing into the river through this stretch are included within the same DEP assessment unit as the mainstem river and classified as Class B, except for Mt. Blue Stream, which is separated into a different assessment unit and classified as Class A (to be upgraded to Class AA under the current proposal). Above Route 149 in Phillips and further upstream, the Sandy River is classified as Class AA (Appendix A; Figure A-1).

Although DEP only has three water quality monitoring stations within the stretch of the Sandy River from Phillips to Farmington and its tributaries (stations 18, 631, and 632; Figure A-1), there are other DEP stations both upstream and downstream of the segment that are useful in evaluating the water quality conditions of the segment. These include biomonitoring station 17 upstream in the Class AA waters of the mainstem Sandy River as well as biomonitoring station

572 and continuous monitoring stations SR312, SR301, and SR290 downstream in the Class B waters of the mainstem Sandy River in Farmington (Figure A-1).

The water quality data from these stations overwhelmingly supports the upgrade of this segment from Class B to Class A. All biomonitoring samples collected within the last 10 years show attainment of applicable criteria, both for macroinvertebrates at the three stations within the segment and for macroinvertebrates and algae at the stations along the mainstem Sandy River above and below the segment (Table 1). All dissolved oxygen measurements collected at these stations are well above the Class A thresholds of 7 mg/L and 75% saturation, with values above 100% saturation across the board (Appendix B; Figures B-1 and B-2). Although continuous logger data does not exist within the segment, data from the three continuous monitoring stations within the mainstem Sandy River downstream of the segment collected during the late summer from 2015-2016 overwhelmingly support attainment of Class A standards and are similar in range to the values collected in Class A water in Mt. Blue Stream in 2020 (Figure B-3). For total phosphorus, although only 3 samples have been collected within the segment in question within the past 10 years, with one attaining the Class A criteria in the mainstem river and two exceeding the criteria in a smaller tributary, the total phosphorus concentration downstream of the segment at station 572 is still below the Class A criteria (Figure B-4), suggesting that the water quality within the segment upstream is excellent.

Table 1. Biomonitoring results from the last 10 years for the Sandy River and its tributaries from Phillips to Farmington and the mainstem Sandy River above and below.

Station	Year	Sample Type	Sample Determination
Sandy River (Phillips) – Class AA			
17	2017	Macroinvertebrate	A (attainment)
17	2017	Algae	A (attainment)
Sandy River and Tributaries (Phillips to Farmington) – Class B			
18	2022	Macroinvertebrate	A (attainment)
631	2022	Macroinvertebrate	A (attainment)
632	2022	Macroinvertebrate	A (attainment)
Sandy River (Farmington) – Class B			
572	2017	Macroinvertebrate	A (attainment)
572	2017	Algae	B (attainment)

Seeing that Maine's classification system is goal-oriented, we believe that the data presented above is more than sufficient to support the upgrade of both the Sandy River from Phillips to Farmington and Temple Stream from Class B to Class A. Protecting the water quality of these waterbodies is critical as they serve as high-quality habitat for endangered Atlantic salmon, especially in light of ongoing efforts to improve fish passage within the Sandy River watershed. If these waterbodies are indeed upgraded to Class A, it would allow for roughly 46% of the Sandy River watershed to be protected by Class A water quality standards or greater. This level of water quality protection would be a gamechanger for Atlantic salmon restoration in light of the outsized role that the Sandy River plays in the overall management strategy for the species and the prospect of additional river restoration downstream in the coming years.

MDEP Response:

The Department appreciates the support expressed for this recommendation, including the additional analysis provided by NRCM in support of the reclassification. The key points raised were addressed by the Department in prior public documents, including the Responses to Comments available for the May 28 through June 30, 2025, public comment period and the draft revised Triennial Review recommendations that were available for public comment between August 28 and October 22, 2025. In the interest of brevity, readers are referred to those documents for a complete response.

Prior to the formal public comment period initiated by the Board, the Department invited the public to provide initial input on draft recommendations. In those draft recommendations, the Department did not recommend an upgrade for the Sandy River and tributaries to Class A. After consideration of the comments received and further evaluation, Department staff revised the initial draft recommendations to recommend a partial upgrade for a predominantly forested area of the watershed where little to no existing residential development exists and where future development pressures are likely minimal. This partial upgrade recommendation was included in the draft recommendations the Board invited public comment on.

The Department 's position is that further investigation and supporting data are needed for other parts of the watershed to allow for a comprehensive assessment of attainment for narrative and numeric criteria, including recently adopted freshwater nutrient criteria. Although the data provided as part of NRCM's additional analysis is informative, the four monitoring stations evaluated (572, SR312, SR301, and SR290) are not within the boundaries of the Sandy River watershed proposed for upgrade and do not provide sufficient information regarding the attainment of Class A criteria for the waters in question.

The Department commits to evaluating other areas of the watershed that may be appropriate for a potential future upgrade to Class A and, as resources allow, will collect additional data to evaluate criteria attainment, particularly in the more developed areas of the watershed where there are data gaps.

No changes were made to the proposed recommendations posted for public comment between August 28 and October 22, 2025.

Temple Stream and Tributaries, Avon, Temple, Wilton, and Farmington (MDEP)

MDEP Response on page 25

Comments from:

- Eliza Townsend, Appalachian Mountain Club (AMC) (written comment)

Therefore, AMC strongly supports proposed reclassifications in the Kennebec River Basin, including Mt. Blue Stream, the Sandy River, and Temple Stream and their tributaries. We appreciate that the approach has been to include entire watersheds rather than selected stream channels. This mirrors AMC's approach to stream reconnections, allowing us to ensure connectivity across entire stream and river networks.

- Luke Frankel, Natural Resources Council of Maine (NRCM) (written and public hearing comment)

Additionally, in the initial proposal, DEP recommended not proceeding with WQC upgrades for the other eight proposals put forward by stakeholders. These include upgrades for two other waterbodies (the Sandy River and tributaries from Phillips to Farmington and Temple Stream and tributaries), which, in addition to Mt. Blue Stream, are also located within the Sandy River watershed. After reviewing data submitted during the public comment period for these two waterbodies, DEP now recommends that the portions of these two sub-watersheds that are predominantly forested be upgraded from Class B to Class A in the updated proposal. DEP's reasoning for not recommending a complete upgrade for the stretch of the Sandy River from Phillips to Farmington and Temple Stream is a lack of data.

Although we agree that data is limited for these two waterbodies (as it is for most waterbodies across Maine), we believe that there is sufficient data to support upgrading the entirety of these two sub-watersheds at this time and recommend that the BEP revise DEP's updated recommendation to do so. Some of this data is presented below, building off our written comments submitted on June 30, 2025.

<u>Temple Stream and Tributaries</u>
Temple Stream begins in the valley between Spruce Mountain and Day Mountain and flows southeast before converging with the Sandy River just downstream of downtown Farmington. A stretch of the lower stream was impounded by Walton's Mill Dam prior to 2023. Since then, the dam has been removed, and the stream has been returned to a free-flowing condition.

A substantial amount of data has been collected within Temple Stream in the last 10 years. This includes macroinvertebrate and algae at three DEP biomonitoring stations (stations 1110, 1242, and 1183) and dissolved oxygen and total phosphorus sampling, among other variables, at three continuous monitoring stations in the lower watershed (stations KSDTE29, KSDTE17, and KSDTE12; Figure A-1).

As with the Sandy River between Phillips and Farmington, the water quality collected at these stations overwhelmingly supports the upgrade of this segment from Class B to Class A. All biomonitoring results (with exception to algae at station 1183) show attainment of Class A criteria (Table 2). The non-attainment of algae at station 1183 in 2020 was likely in part influenced by the presence of warmer water in the impoundment upstream caused by Walton's Mill Dam, which has subsequently been removed. Of the more than 100,000 dissolved oxygen measurements that were collected at the three continuous monitoring stations in the lower watershed from 2021-2023, 88% attained the Class A criterion of 7 mg/L and 90% attained the criterion of 75% saturation (Appendix C; Figures C-1 and C-2). All data at station KSDTE29 above the impoundment area met the 7 mg/L criterion, and the few excursions below this criterion at stations KSDTE17 and KSDTE12 are likely due to stratification within the impoundment and construction operations, respectively (Figure C-3). The return of free-flowing conditions within the stream as a result of the dam removal will likely result in dissolved oxygen concentrations similar to those at station KSDTE29 at the other two sites. For total phosphorus, of the 31 samples collected from 2021-2023, only 3 exceeded the Class A criteria, meaning that 90% of samples were in attainment (Figure C-4). It is likely that these excellent water quality conditions will only improve in the years to come now that the dam has been removed.

Table 2. Biomonitoring results from the last 10 years for Temple Stream and its tributaries.

Station	Year	Sample Type	Sample Determination
Temple Stream and Tributaries – Class B			
1110	2017	Algae	A (attainment)
1242	2023	Macroinvertebrate	A (attainment)
1183	2020	Macroinvertebrate	A (attainment)
1183	2020	Algae	C (non-attainment)

Seeing that Maine's classification system is goal-oriented, we believe that the data presented above is more than sufficient to support the upgrade of both the Sandy River from Phillips to Farmington and Temple Stream from Class B to Class A. Protecting the water quality of these waterbodies is critical as they serve as high-quality habitat for endangered Atlantic salmon, especially in light of ongoing efforts to improve fish passage within the Sandy River watershed. If these waterbodies are indeed upgraded to Class A, it would allow for roughly 46% of the Sandy River watershed to be protected by Class A water quality standards or greater. This level of water quality protection would be a gamechanger for Atlantic salmon restoration in light of the outsized role that the Sandy River plays in the overall management strategy for the species and the prospect of additional river restoration downstream in the coming years.

MDEP Response:

The Department appreciates the support expressed for this recommendation, including the additional analysis provided by NRCM in support of the reclassification. The key points raised were addressed by the Department in prior public documents, including the Responses to Comments available for the May 28 through June 30, 2025, public comment period and the draft revised Triennial Review recommendations that were available for public comment between August 28 and October 22, 2025. Information is also included in the final Board recommendations,[7] dated December 18, 2025. In the interest of brevity, readers are referred to those documents for a complete response.

Prior to the formal public comment period initiated by the Board, the Department invited the public to provide initial input on draft recommendations. In those draft recommendations, the Department did not recommend an upgrade for Temple Stream and tributaries to Class A. After consideration of the comments received and further evaluation, Department staff revised the initial draft recommendations to recommend a partial upgrade for two predominantly forested areas of the watershed where little to no existing residential development exists and where future development pressures are likely minimal. This partial upgrade recommendation was included in the draft recommendations the Board invited public comment on.

Regarding freshwater nutrient criteria, as noted by NRCM, total phosphorous data from 2021-2023 are available for several monitoring stations in the watershed. However, for the majority of sites, only one sample result is available each year during the June 1 – September 30 timeframe required for Ch. 583 freshwater nutrient criteria evaluations. Additional data are needed for a complete evaluation, and the Department commits to collecting new data as resources allow, including additional phosphorus and environmental indicator data.

[7] Available on the Board's web page www.maine.gov/dep/bep/index.html.

The Department's position is that further investigation and supporting data are needed to allow for a comprehensive assessment of attainment for narrative and numeric criteria, including recently adopted freshwater nutrient criteria. The Department commits to evaluating other areas of the watershed that may be appropriate for a potential future upgrade to Class A and, as resources allow, will collect additional data to evaluate criteria attainment, particularly in developed areas of the watershed where there are data gaps.

Pleasant River Middle Branch and Tributaries, Ebeemee Twp., Katahdin Iron Works Twp., TB R11 WELS, and Other Towns and Townships (MDEP)

Comments from:

- Eliza Townsend, Appalachian Mountain Club (written comment)

The Appalachian Mountain Club supports the changes proposed by the Department. In particular, we enthusiastically support the proposal to reclassify the Pleasant River Middle Branch and tributaries to Class AA from Class A.

Restored habitat and improved water quality in the Pleasant River Watershed are exciting, but they are not sufficient to ensure the future of the endangered Atlantic salmon. Further, it is increasingly important to maintain low nutrient levels, since enrichment of phosphorus and nitrogen contribute to harmful algal blooms in freshwaters and oceans, particularly coupled with climate warming.

- Luke Frankel, Natural Resources Council of Maine (NRCM) (written and public hearing comment)

In the initial proposal released on May 28, 2025, DEP recommended that three waterbodies be upgraded from Class A to Class AA: (1) Abbott Brook and tributary, (2) Mt. Blue Stream and tributaries, and (3) Pleasant River Middle Branch and tributaries. NRCM supports these upgrades, as the three waterbodies are outstanding natural resources that are ecologically important due to the presence of high-quality salmonid habitat, and we are pleased that DEP continues to recommend these upgrades in the revised proposal released on August 11, 2025.

MDEP Response:

The Department appreciates the support expressed for this recommendation. No changes were made to the proposed recommendations posted for public comment between August 28 and October 22, 2025.

COMMENTS ON PROPOSALS FOR WATER CLASSIFICATION UPGRADE – NOT RECOMMENDED

Names provided in parentheses after each item identify the organization(s) that submitted the original proposal.

Androscoggin River from confluence with Ellis River to Worumbo Dam (Lisbon Falls), Auburn, Canton, Dixfield, Durham, Greene, Jay, Leeds, Lewiston, Lisbon, Livermore, Livermore Falls, Mexico, Peru, Rumford, Turner, and Other Towns and Townships (Androscoggin River Watershed Council);

Androscoggin River from Gulf Island Pond Dam to Worumbo Dam (Lisbon Falls), Lewiston, Auburn, Lisbon, Durham (Grow L+A)

MDEP Response on page 59

Comments from:

- Nate Libby, City of Lewiston (written comment)

For many years, river advocates and stakeholders have urged the Maine DEP to recognize the unique conditions of the Androscoggin River between Gulf Island Pond and the Worumbo Dam in Lisbon. This section of the river experiences lower flow rates than larger Maine rivers, licensed discharges are far below their maximum limits, and the unusually deep water at Gulf Island affects water quality readings—among other distinct factors.

Through its volunteer water quality monitoring program, the Androscoggin River Watershed Council has gathered and submitted several years of data to the DEP, demonstrating consistent attainment and ongoing improvement in dissolved oxygen levels in this stretch of the river. The Council has been a leading voice in advocating for reclassification from Class C to Class B, and their data strongly support this upgrade. The ARWC along with Grow L+A have submitted testimony and evidence supporting upgrade, and we agree with their findings.

Our Public Works leadership—responsible for combined sewer overflow (CSO), stormwater discharge, and related regulatory matters—have reviewed this mater and are supportive of the upgrade as well.

City officials strongly support the reclassification effort for this part of the Androscoggin. An upgrade in river classification supports our desire for improved water quality, a healthier river habitat, expanded recreational use, enhanced community image, and future riverfront redevelopment opportunities.

- William Sylvester, Citizen (public hearing comment)

I'm Bill Sylvester. I live in Auburn, Maine. I own 3,000 feet of riverfront on the Androscoggin. I lived at Clayton Lake for 40 years. That's between the Allagash and the St. John River. I own 2,000 acres up there and I own 300 or 400 down here. The St. John River runs through there. I've been the committee chairman and on the St. John River Advisory Committee for 40 years about, maybe 50, so I know a little bit about that stuff, but, boy, the legal things and the numbers are overwhelming. I have got the Board -- the DEP letter here and it says they mean to leave it alone. I say leave it alone. It's up for review every three years and it seems like people aren't remembering that this river has improved from me as a kid in the early '60s. It wasn't fit to be around and now it's clear. I wouldn't drink it but neither would I go up on the St. John River and drink some AA water in August out of a warm puddle either. So there is a limit to what we can afford. There is a limit to what DEP monitoring, the whole -- and that's in here. That's -- they tried *to weave that in here, the cost of this. I think the cost of saying this is a B may mean rewriting degradation and discharge permits and don't spend our time on that. Let it go. It's -- there is a new sewer tank being built in Lewiston, the IP mill, evidently that wasn't a polluter because it was built in '65 and that's when the river started to improve I think somebody just said. So evidently it wasn't IP in Livermore that polluted the river. They tried to clean it up and now they're even talking about using the sediment system up there for -- the sludge pools and what not for some other project for a transfer station purification plant.*

So anyway, I say don't bother to change it. If something needs to be changed there has got to be teeth and claws and nails and fangs in what you've got right now that won't allow degradation. I don't think degradation is a thing. I think PR-wise nobody is going to degrade a watershed and the -- that's another story, but nobody is going to degrade a watershed and live through business, but you've got to have business to survive. Agriculture, that section of river has got massive agriculture on it and it inundates -- a lot of that inundates and dust blows, it's sand, it's leggy soil, don't hurt our farmers either.

- Stephen Heinz, Trout Unlimited (public hearing comment)

Morning, Chairman Duchesne and members of the Board. I'm Stephen Heinz and I live in Cumberland Foreside and I represent Trout Unlimited and I'll be talking about the Androscoggin upgrade this morning.

I coordinate FERC-related action for the Maine Council at Trout Unlimited. Maine TU is a non-government organization whose stated mission is to conserve, protect, and restore Maine's cold water fisheries and their watersheds. Maine TU encompasses six chapters with over 1,700 members. Maine TU members use the Androscoggin River for recreation and aesthetic purposes. Its members fish, boat, and otherwise enjoy the watershed. Maine TU has been heavily involved with efforts to restore stream connectivity and improve water quality within the Androscoggin River watershed since early in 2019 when it became involved with the Lower Barkers Mill project. It is currently involved with ongoing FERC hydroelectric relicensing throughout the greater watershed from the Aziscohos project at the headwaters to the Worumbo project on the lower river. Further, Maine TU members have broad and deep organizational interest in Maine's statutory provisions that protect Maine's water quality. Maine TU and its members have a direct, substantial interest in the outcome of the reclassification of the waters under consideration.

Additionally, I have standing as an individual. As a citizen – I am a citizen, domiciliary, voter, and property owner of the State of Maine and since 2005 in addition to my TU duties, I have personally fished, hiked, recreated, and enjoyed the scenic benefits from multiple visits to the public lands and waters of the Androscoggin watershed from near its headwaters in the Rangeley area to the tidewater in Brunswick. My most frequent activities have been to fly fish for smallmouth bass in the reach above Worumbo Dam in Lisbon, which do I multiple times a year as well as the upper part of the reach above Gulf Island Pond and the section where the Wild River joins the Androscoggin at Gilead. Additionally, I participated as a volunteer in stream – in a stream clean up and habitat surveys within the watershed.

I have always been amazed that so much of the river even in the southern part of the state looks like it is a wilderness because of the lack of development. This is a result of its former conditions before the passage of the Clean Water Act when its primary use was as an industrial sewer. I witnessed personally when I lived in Topsham in the early 1970's there were obnoxious odors *and pink foam below the Brunswick Dam and this was the worst during the late summer low flow conditions. The change since then has been miraculous. And I have seen Bald Eagles in Lisbon every year since I started fishing there as well as numerous other water fowl. Usually -- initially there was a slight paper mill smell in the air when the wind was from the north, but since the explosion shut down the Androscoggin Mill in Jay in 2030, I'm sorry, in 2020, the air has been the same clean air for which Maine is ranked first in the nation. Reclassification will ensure that the water condition will not be allowed to degrade in coming years.*

The waters below Lewiston falls are classified as critical habitat for endangered Atlantic Salmon. As a TU member, I want to see the species restored and reclassification will protect the waters in the critical habitat. This is especially important now as relicensing for the three hydro projects, Worumbo, Pejepscot, and Brunswick, below Lewiston are underway or complete with improved fish passage measures that promise to put Atlantic Salmon below Lewiston Falls every year. Other relicensings in the Little Androscoggin watershed promised to give Atlantic Salmon access to their historic spawning habitat sometime in the 2030s.

It has been well established through years of study and sampling by the Friends of Merrymeeting Bay on the lower Androscoggin and most recently of the waters under consideration in the upgrade proposal by Grow L+A that the river meets Class B standards every year at nearly all times of the year as well as these standards are met anywhere. The only possible reason I could imagine for denying an upgrade is some vague, unfounded cargo cult notion that keeping the classification as Maine's lowest would encourage industrial development. This would be at the expense of what has been achieved and contrary to the Clean Water Act that Maine's own Edmund Muskie was responsible for passing. That the former site of the Androscoggin Mill is being redeveloped shows that those fears are unfounded. As the Board previously found fit to upgrade the lower section of the river between Worumbo Dam and Merrymeeting Bay, so too the section for Worumbo to Gulf Island Pond deserves to have its existing water quality locked in and codified by classification.

Please approve the reclassification from Class C to Class B to protect and enhance the fisheries restoration plans for the greater watershed and prevent future harm to the fishing that I so enjoy in the watershed. Thank you very much. I'm happy to answer questions about my testimony.

- Greg D’Augustine, Citizen (written comment)

It's my understanding that recent data collection during the recent low flow conditions on the river indicated that Class B standards were routinely met for the segment from Lisbon Falls to the Gulf Island Dam. Accordingly, as a property owner on the Androscoggin River, I respectfully suggest that you support the upgrade process as much as you can.

- Bryan Kaenrath, City of Lewiston (written comment)

On behalf of the City of Lewiston, I am writing to express our full support for the proposed reclassification of the Androscoggin River from Class C to Class B from Lisbon Falls through Lewiston-Auburn to the Gulf Island Dam. This request aligns with data-driven findings from recent and long-term water quality testing efforts and represents an important step forward in realizing the full environmental, recreational, and economic potential of the Androscoggin.

As a community with deep historical and economic ties to the river, Lewiston has long worked to shift the narrative of the Androscoggin from one of industrial pollution to one of revitalization and opportunity. The Lewiston City Council previously approved a resolution in support of this reclassification, recognizing that the river now meets Class B standards based on consistent testing by the Androscoggin River Watershed Council and, most recently, comprehensive data collection conducted via helicopter during the summer of 2025. These tests confirmed that even during 7Q10 low-flow conditions, water quality metrics remained consistent with Class B standards across all sampled sites.

Reclassification is not only scientifically warranted, but also necessary to reflect the progress that our region has made over the past several decades toward improving the Androscoggin's water quality. It will support our ongoing efforts to reimagine the river as a clean, accessible, and vibrant asset at the. heart of Lewiston's economic development and quality of life strategy. The river is a vital part of our downtown revitalization, recreational, and long-term public health planning.

We respectfully urge the Board of Environmental Protection to Edmund Muskie and reflects the collective work of countless local organizations, municipalities, and residents committed to restoring the river to its rightful condition in Maine's environmental landscape.

Thank you for your consideration and for the Department's continued stewardship of Maine's natural resources.

- Ferg Lea, Androscoggin River Watershed Council (ARWC) (written comment)

Classification of the Androscoggin River and Impact on Discharges if the river is upgraded to Class B below Gulf Island Dam
There is a proposal by others to upgrade the section of the Androscoggin below Gulf Island Dam to Class B. An upgrade, under the DEP staff proposal to use a daily average of 7mg/l, is reasonable. However, we do not believe that a reduction in licensed discharges is necessary as appears to be a strong potential according to DEP staff.

As we understand it, point source discharge licenses are based on a model of the Androscoggin River. Modeling of natural systems is extremely difficult, and the Androscoggin River is extremely complex with a number of dams, urban and agricultural runoff, rapids and large and small point source discharges. The current model used to determine discharge levels was calibrated years ago with discharge data considerably higher and DO levels lower than those of today. Modeling should be based on calibration under a number of varying conditions including data as near as possible to the extremes of both high and low flows and discharges. Either a new model should be developed, the preferred route, or the existing model recalibrated. Due to the limitations of the existing model, it should only be used as a rough guide and balanced with actual data.
The dissolved oxygen data between the Turner Center Bridge continuous monitor, located at the generally accepted head of Gulf Island Pond, and the Gulf Island Pond Deep Hole continuous monitor from the surface to a depth of 13 meters exhibit very similar characteristics. This indicates that the water above 13 meters in Gulf Island Pond is quite stable in terms of dissolved oxygen uptake throughout periods of low flow and high temperature. In addition, looking at data for the summer of 2023, when the Pixelle mill in Jay was closed, there are only minor differences in dissolved oxygen levels above 13 meters at the Deep Hole compared to dissolved oxygen levels

prior to the mill closure. This indicates that the water quality of the Androscoggin River below Turner Center Bridge is not strongly influenced by the paper mill discharges as the model suggests. Therefore, it seems inappropriate to require a lowering of the discharge quantities at the wastewater treatment facilities from Rumford to Merrymeeting Bay.

Attachment A presents dissolved oxygen data for the two continuous monitoring sites.

- Ed Friedman, Friends of Merrymeeting Bay (FOMB) (written and public hearing comment)

Summary

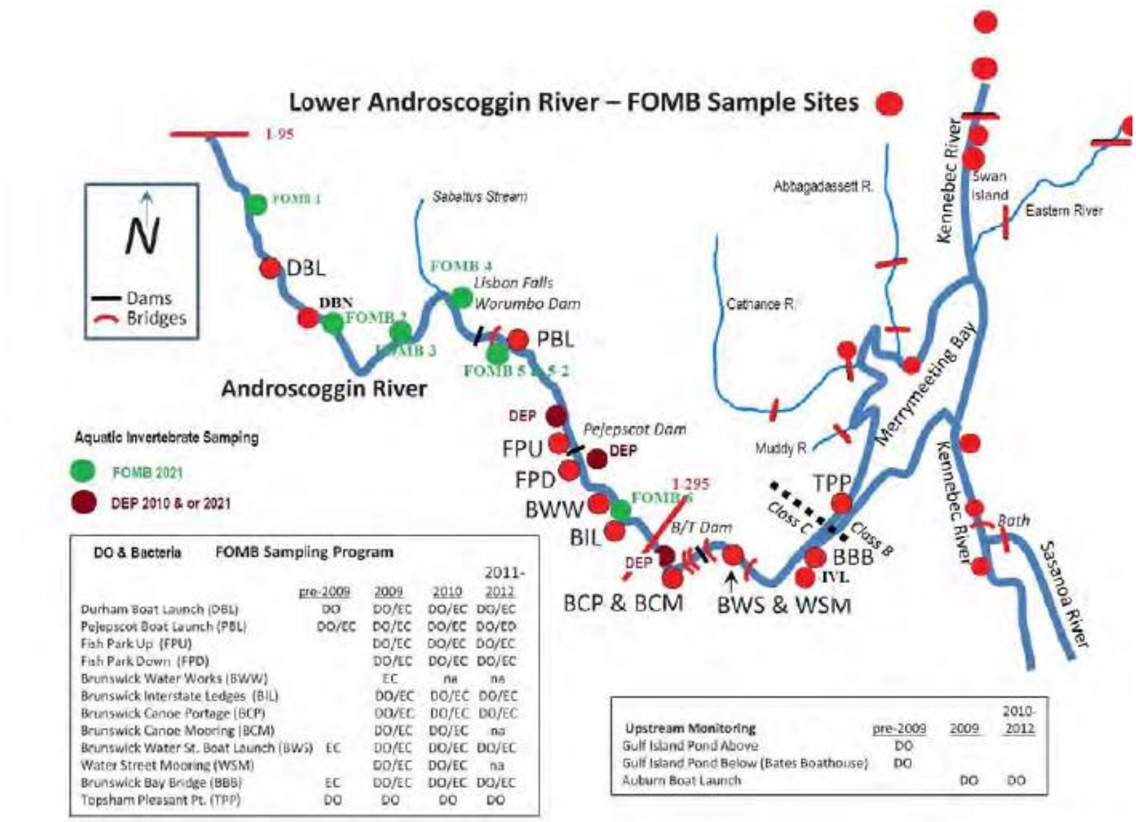
There has been a lack of comprehensive water quality data on the Androscoggin section from Worumbo dam to Gulf Island Pond proposed for an upgrade from Class C to Class B by Grow L+A. Friends of Merrymeeting Bay trialed the use of a float-equipped helicopter in 2024 to determine if this was a feasible sampling methodology to fill the data gap in a comprehensive fashion with minimal personnel. The trial was successful and in 2025 six sampling flights were undertaken to ascertain whether data supported the proposed upgrade. They did.

Sampling a longitudinal profile of 10 sites and one replicate on 6 dates from the upper Worumbo impoundment into Gulf Island Pond, all sites easily met Class B criteria for dissolved oxygen and bacteria. These totaled 198 samples for bacteria, dissolved oxygen in mg/l and dissolved oxygen in percent saturation. Other readings included specific conductivity, water temperature and air temperature. (Exhibit 5) Flows were extremely (even historically) low for the last four sampling events, well below 96 year medians so likely surpassing 7Q10 conditions. (Exhibit 3G)

Our sampling data easily support a classification upgrade for this reach to Class B.

Introduction

After years of water quality data gathering and reclassification attempts, Friends of Merrymeeting Bay (FOMB) data were used during the last Triennial despite DEP and industry objections, to successfully upgrade state classification of the lower Androscoggin River from Worumbo dam in Lisbon Falls to Merrymeeting Bay. The Board followed the law, the legislature concurred and contrary to some popular beliefs, the world did not end for industrial users of the river. FOMB data also supported the Kennebec River Class C to Class B upgrade back in 2002 from Augusta to Merrymeeting Bay.



DO & Bacteria FOMB Sampling Program	pre-2009	2009	2010	2011-2012
Durham Boat Launch (DBL)	DO	DO/EC	DO/EC	DO/EC
Pejepscot Boat Launch (PBL)	DO/EC	DO/EC	DO/EC	DO/ED
Fish Park Up (FPU)		DO/EC	DO/EC	DO/EC
Fish Park Down (FPD)		DO/EC	DO/EC	DO/EC
Brunswick Water Works (BWW)		EC	na	na
Brunswick Interstate Ledges (BIL)		DO/EC	DO/EC	DO/EC
Brunswick Canoe Portage (BCP)		DO/EC	DO/EC	DO/EC
Brunswick Canoe Mooring (BCM)		DO/EC	DO/EC	na
Brunswick Water St. Boat Launch (BWS)	EC	DO/EC	DO/EC	DO/EC
Water Street Mooring (WSM)		DO/EC	DO/EC	na
Brunswick Bay Bridge (BBB)	EC	DO/EC	DO/EC	DO/EC
Topsham Pleasant Pt. (TPP)	DO	DO	DO	DO

Upstream Monitoring	pre-2009	2009	2010-2012
Gulf Island Pond Above	DO		
Gulf Island Pond Below (Bates Boathouse)	DO		
Auburn Boat Launch		DO	DO

Figure 1. FOMB & DEP sampling sites on lower Androscoggin, Kennebec and Bay Tributaries

The lower river section from Worumbo to the Bay had been classified as Class C for many years, the state's lowest category while the actual water quality as measured by dissolved oxygen (DO), E. coli bacteria and aquatic life was that of Class B, with significantly higher standards. State and federal laws prohibit backsliding of water quality but this is measured by classification so having actual conditions surpass those of the classification means there is room to pollute and still meet the current and lower classification. This is now also the case for the upper lower section from Worumbo dam upstream into Gulf Island Pond (GIP).

If actual river conditions exceed that of the next lower classification (C in this case), Maine DEP has a nondiscretionary duty to recommend the upper lower Androscoggin for reclassification because it attains the Class B standard as our data show and as Grow L+A has proposed.

Under federal and Maine law, a water quality standard is composed of narrative or quantitative criteria, designated uses, and an anti-degradation policy. The Clean Water Act (CWA) and Maine's anti-degradation policy require that "[w]hen 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 that water be reclassified in the next higher classification."[8] Simply put, if actual data show that the upper lower

[8] 38 M.R.S. § 464.4.F.4 (emphasis added); see also 40 C.F.R. § 131.20(i) ("Where existing water quality standards specify designated uses less than those which are presently being attained, the State shall revise

Androscoggin in fact meets the standard for a Class B water, then the Maine Board of Environmental Protection has a non-discretionary duty to recommend to the legislature that it be so classified. Our attorney Scott Sells will elaborate on this and other legal requirements.

There is a great deal of interest in extending the upgrade up river from Worumbo but water quality data from this section between Worumbo and Gulf Island Pond (GIP) were somewhat sporadic. Grow L+A's upgrade nomination does a good job of detailing these varied data sets. There is a small amount of historic data from FOMB, more recent aquatic life data from FOMB (used in the last upgrade effort of the lower river), some Brookfield and some DEP data, largely focused on the Lewiston area. At last check, the DEP, like last time, does not support the proposed Worumbo to GIP upgrade from C to B. Perhaps our data may change this?

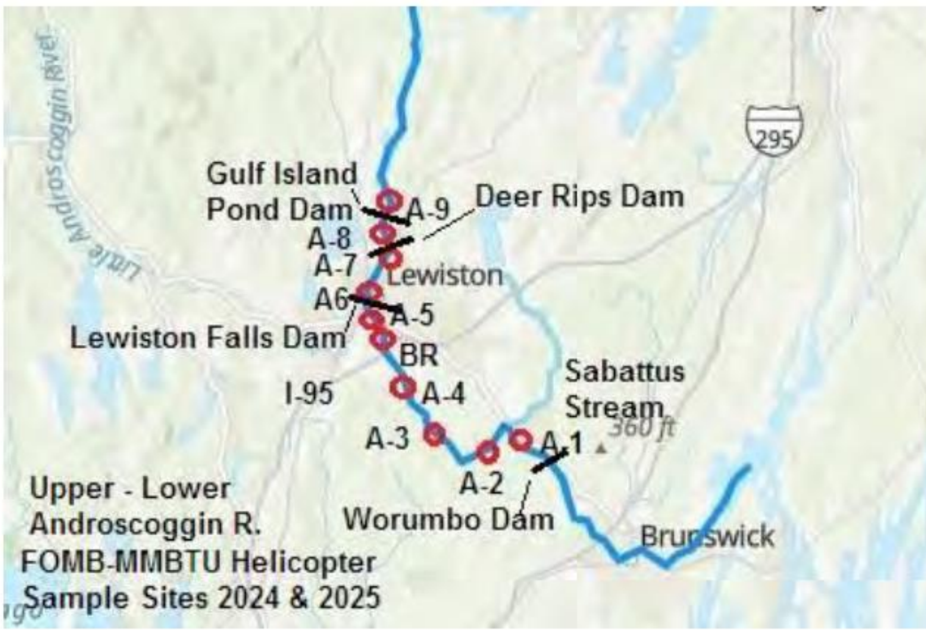


Figure 2. Helicopter sampling sites

Materials and Methods

In order for FOMB to possibly support this new upgrade proposal, we felt more rigorous and widespread water quality data were needed. Because most FOMB water quality volunteers live lower on the river and closer to the Bay, last year (2024) we looked at the possibility of using a Schweizer 300C helicopter with amphibious floats (www.pointofviewhelicopters.com)as a means with limited personnel, to gather comprehensive data in possible support of the upgrade if warranted. We did a trial flight in August, 2024 and were very successful at sampling a longitudinal profile of 10 sites from Lisbon Falls into GIP with two people in about 1 ½ hours. Measurements need to be completed by 8am to catch DO levels at the low point of their diurnal sag (DO levels rise daily as photosynthesis creates oxygen and fall each night as aquatic plants use the oxygen and give off CO2).

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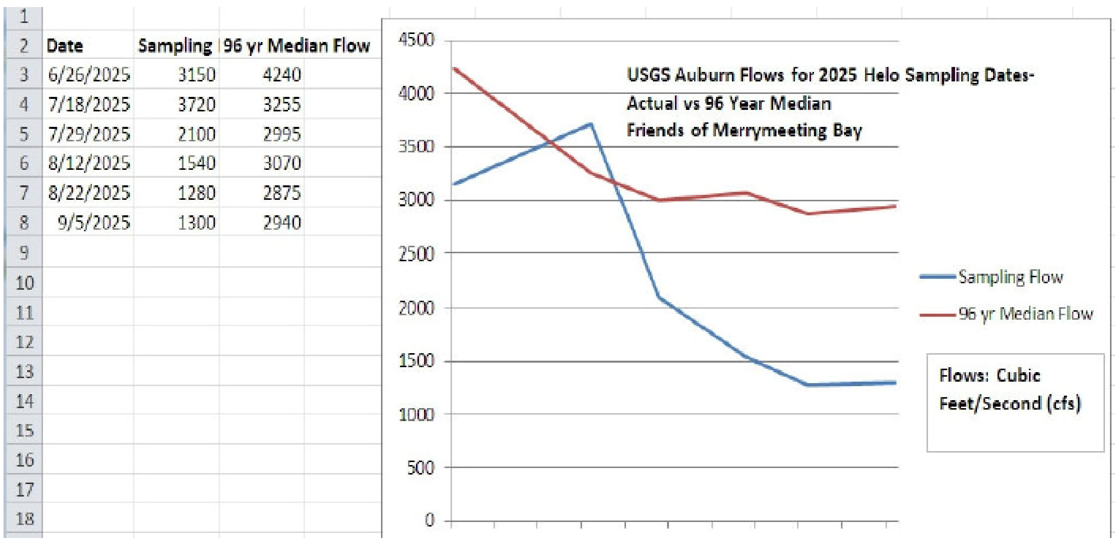
its standards to reflect the uses actually being attained."); accord Waste Discharge Program Guidance: Antidegradation (5/13/01) p.2.

In light of this, the Merrymeeting Bay Chapter of Trout Unlimited (MMBTU) and FOMB split the cost of six flights and sampling in 2025, one in June (6/26), two each in July (7/18 & 7/29) and August (8/12 & 8/22) and one in September on 9/5 (our focus is on hot and dry "worst case" low flow conditions) in an effort to provide the most comprehensive data to-date on this section to back up the upgrade proposal <u>if data warranted it</u>. We had exceptionally low flows this year and flows for the last four flights were well below the 96 year USGS medians for Auburn so probably meeting 7Q10 conditions which represent the lowest average river flow that occurs for seven consecutive days once every ten years, based on historical flow data (The 7Q10 low-flow condition is used by DEP to evaluate water quality. It represents the point where a river's ability to dilute pollutants is at its lowest, making it a critical measure for ensuring that pollution control measures are effective.). For example, river flows measured in cubic feet per second (cfs) on 8/22 were 1,280 cfs vs the median of 2,872 cfs and on 9/5 were 1,300 cfs vs 2,940 cfs for the median. See Exhibit 3 for USGS screen shots of real time and 96 year median flows on sample dates.



Date	Sampling	96 yr Median Flow
6/26/2025	3150	4240
7/18/2025	3720	3255
7/29/2025	2100	2995
8/12/2025	1540	3070
8/22/2025	1280	2875
9/5/2025	1300	2940

Figure 3. Sampling flows vs. 96 year median flows

For DO measurements a DEP YSI ProSolo meter was used with 12' cable marked in 1' intervals for easy gauge of probe depth. This meter was used all season in the Volunteer River Monitoring Program (VRMP) by the author who has been sampling for over 20 years. E. coli and total coliform samples were analyzed using the EPA certifies IDEXX Colilert system, the same as used by the Maine Health and Environmental Testing Lab. pH measurements were taken using a calibrated YSI Pro Quattro meter rented from Pine Environmental Services.

Figure 4. Sampling helicopter and sampler

The sampling procedures follow this sequence:
1. Pre-label E. coli sample bottles and what we could with data sheets

2. Turn on meter upon arrival at airport and let warm up at least 20 minutes while checking, preparing and warming up aircraft.

3. Calibrate meter, give instructions to sampler and depart.

4. Arrive at first sample site, open door (if on), and lower DO probe to appropriate depth to acclimate and stabilize

5. Rinse bacteria sample "throw bottle" three times and on the fourth time fill IDEXX sample bottle. Replace sample in cooler.

6. Sampler reads off meter readings (DO in mg/l, DO in %, Specific conductivity and water temperature) to pilot who records time, air temperature, depth and sampler water data.

7. Secure equipment, close door, insure controls are free and depart for next site where process is repeated.

8. Back at the lab; IDEXX tray sealer and oven are turned on, bottles are emptied to the 100 ml mark, reagent is added to bottles and dissolved, Quantitrays are marked for sample location, samples are poured into corresponding IDEXX Quantitray which are sealed and then incubated for 24 hours before bacteria presence is counted and recorded.

9. For each sampling flight one replicate samples recorded and gathered and at the lab one lab blank (distilled water) is processed, incubated and counted.

Results & Discussion

*Our results for 2025 have been outstanding with all stations easily meeting **Class B standards** which for **DO** are a minimum geometric mean of **7 parts per million** (ppm) or **75% saturation whichever is higher** and **E. coli** not to exceed a geometric mean of **64 colonies/100 ml** over a 90 day period. Of 198 total measurements for DO in mg/l, DO in percent saturation and E. coli bacteria, every individual DO and E. coli reading except once at A8 (Deer Rips impoundment on 9/5 at 6.7ppm DO) has met Class B standards of above 7ppm for dissolved oxygen and below 64 colonies for bacteria. Because % DO at Deer Rips was 76.6%, we went from 99.995% compliance to 100%. And Deer Rips falls under the hydropower exclusion anyway (Exhibit 6).*

Site	DO (ppm)	E. coli (col/100ml)
A1	8.4	19.9
A2	7.8	20
A3	8.1	29.5
A4	7.7	44.6
BR	7.7	35.1
A5	7.9	31.6
A6	7.6	15.7
A7	7.6	12.4
A8	7.3	9.1
A9	8.0	3.6
Geomean Totals	**7.8**	**18.1**

Figure 5. Combined geometric means by station

E. coli levels rise as we move upstream closer to the L/A wastewater plant (just above BR) mixing zone area (BR and A4) and then diminish upstream of the plant. ***Class C minimum for DO is 5ppm and maximum geomean for bacteria is 100 colonies/100ml.***

With no pH meter available from DEP, FOMB rented a pH meter for our last scheduled flight to get a sense of acidity readings and whether or not they were within the 6.5-9 acceptable range DEP proposes adding to the classification standards. Our results ranged from 6.86 in the Deer Rips impoundment (A8) to 7.6 in the upper Worumbo impoundment (A1). Rental cost for the meter was $150/day which along with possible requirements for freshwater nutrient (phosphorus) monitoring put surveillance out of reach for volunteer river monitoring program groups on which the Department depends.

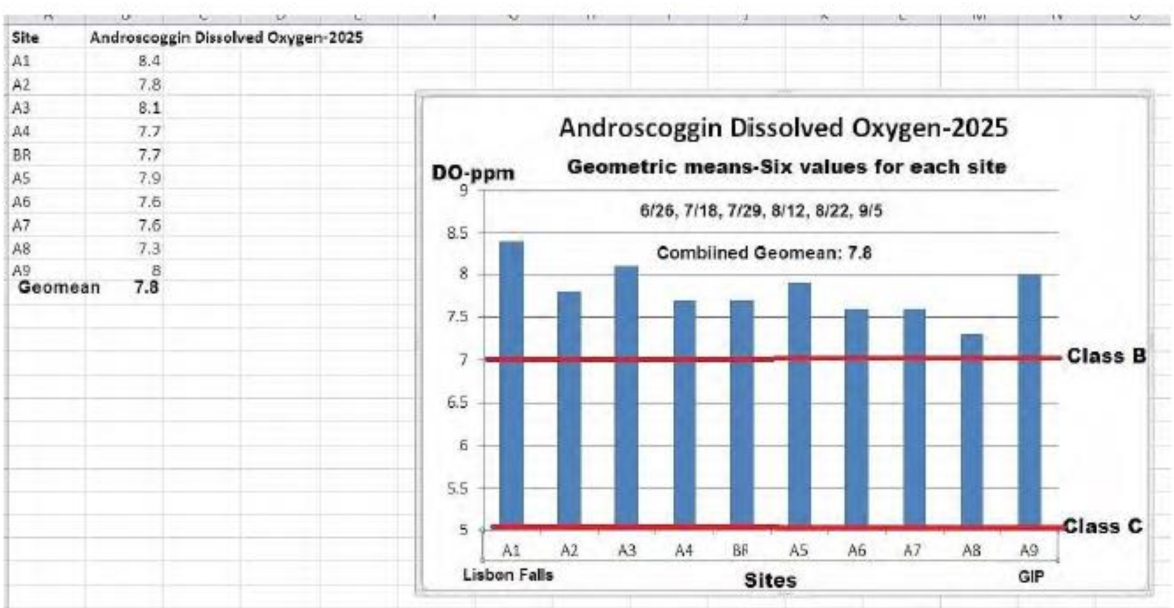
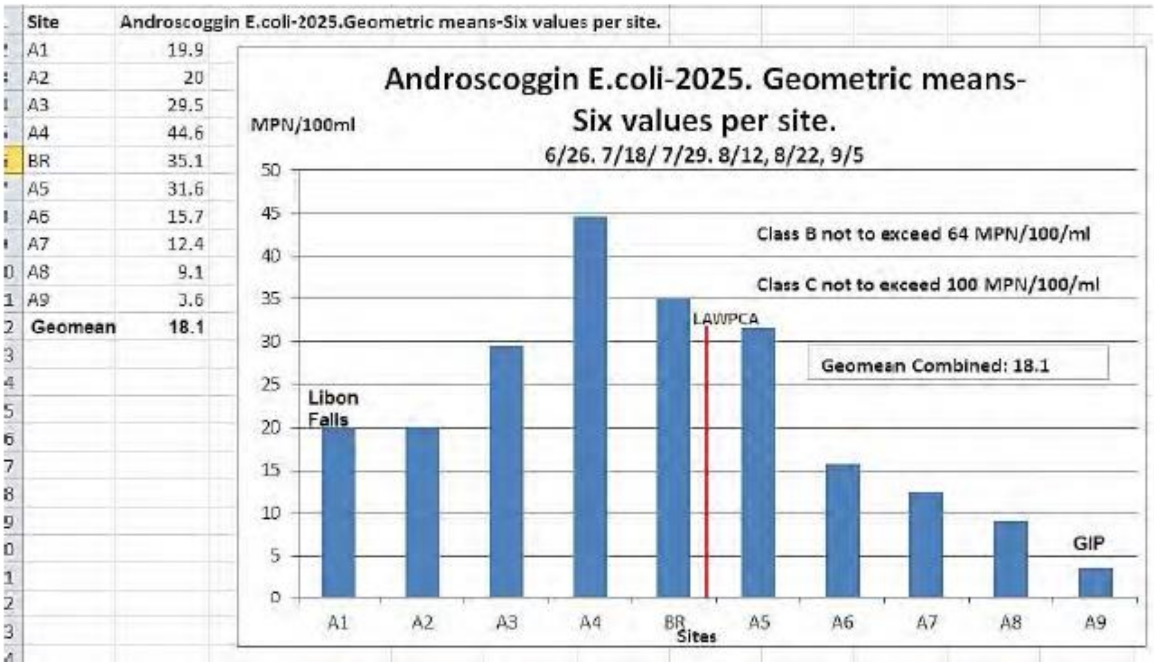
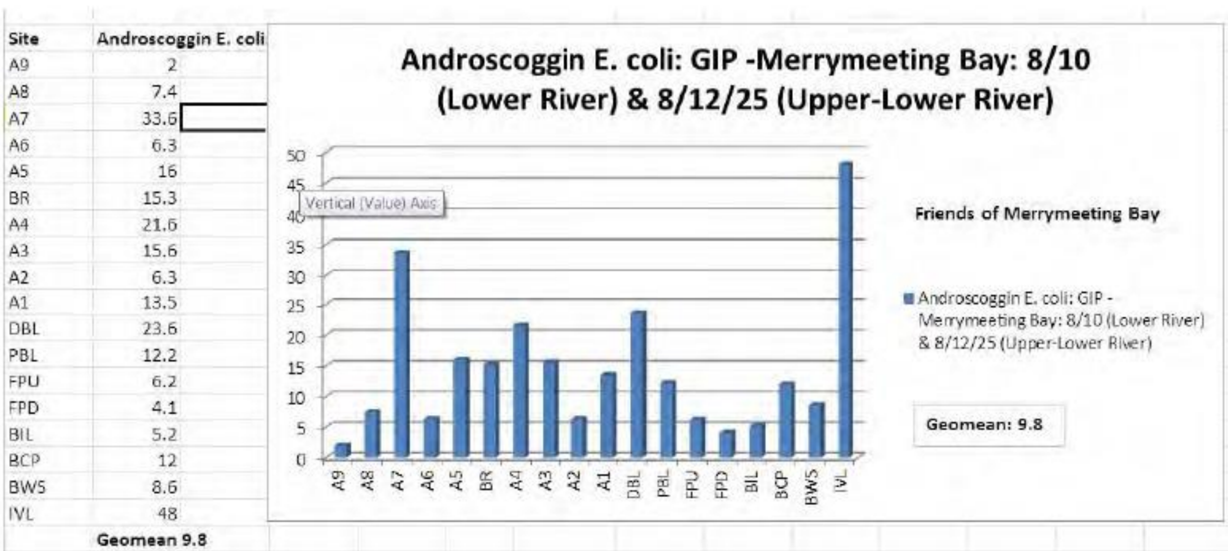


Figure 6. Geometric means for DO by station



Site	Androscoggin E.coli-2025.Geometric means-Six values per site.
A1	19.9
A2	20
A3	29.5
A4	44.6
BR	35.1
A5	31.6
A6	15.7
A7	12.4
A8	9.1
A9	3.6
Geomean	18.1

Figure 7. Geometric means for E. coli by station



Site	Androscoggin E. coli
A9	2
A8	7.4
A7	33.6
A6	6.3
A5	16
BR	15.3
A4	21.6
A3	15.6
A2	6.3
A1	13.5
DBL	23.6
PBL	12.2
FPU	6.2
FPD	4.1
BIL	5.2
BCP	12
BWS	8.6
IVL	48
Geomean 9.8	

Figure 8. E. coli for Helicopter and VRMP sites two days apart

Site	Androscoggin pH 9/5/25
A1	7.6
A2	7.33
A3	7.34
A4	7.22
BR	7.27
A5	7.42
A6	7.05
A7	6.98
A8	6.86
A9	7.04
A6 Replicate	7.01

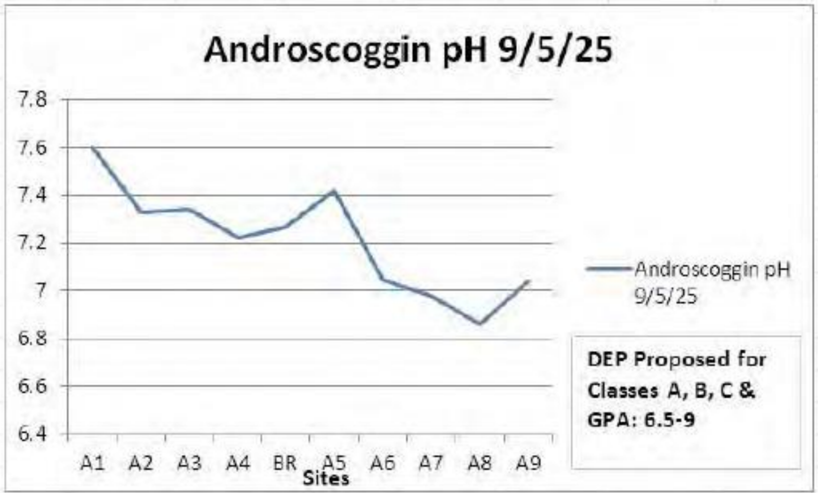


Figure 9. pH on 9/5/25 by station

Response to Comments

DEP: *Prior to our sampling effort the DEP submitted the following comment including that the section does not fully meet Class B criteria for aquatic life and DO and that bacteria data are limited but indicate neither Class B or Class C criteria may be met. Our sampling data clarify this section of river is in full compliance with Class B bacteria and DO criteria under normal and extremely low flow conditions. The DEP has already modeled (based on FOMB benthic macroinvertebrate work for the last Triennial) aquatic life as meeting Class B in the free-flowing reach of this section from Lewiston to the Worumbo impoundment. (Exhibit 4) Phosphorus criteria are not part of the current water quality standards.*

DEP proposals to include nutrient and pH requirements as well as continuous DO monitoring will have the unintended (or maybe intended?) effect of putting measurements of these criteria out of reach of virtually all citizen monitoring programs because of cost and technical capacity.

> *The Department agrees that water quality in the Androscoggin River has significantly improved and that segments proposed for upgrade meet most of their current Class C water quality criteria.* ***However, Class B criteria are not always met for bacteria, aquatic life (biomonitoring), DO, and phosphorus. Data for the lower river indicate that this segment largely meets its current Class C criteria, but it does not fully meet all Class B criteria for aquatic life and DO. Bacteria data for this segment are limited, but available data indicate this segment may not meet either Class B or Class C criteria****. Most of the available phosphorus data for the Androscoggin River was collected in 2010, and very little data have been collected since that time. Results indicate that the river segments proposed meet Class C freshwater nutrient criteria and mostly meets Class B criteria. However, data for several sites in both the upper and lower river segments were above the Class B phosphorus criteria of 30 ppb. Additional data are needed to determine phosphorus criteria attainment.*

> *If these waters are upgraded but do not attain Class B criteria, they may be listed as impaired in the Department's Integrated Report with a requirement to complete a Total Maximum Daily Load (TMDL). Such listings and TMDLs may also impact discharges if the discharges cause or contribute to such impairments.*

ARWC*: The Androscoggin River Watershed Council (ARWC) makes the following speculation about water quality and aquatic life standards in the GIP to Worumbo reach. While they are substantially correct on water quality as measured by DO and bacteria, their speculation on aquatic life is incorrect as existing sampling has shown.*

> *As previously noted, we do not believe the water quality below Gulf Island Dam varies between the dam and the Worumbo Dam, but rather the existing conditions of the river substrate and morphology make it improbable that the macroinvertebrate model criteria can be met*

Rumford-Mexico SD: *There has been quite a bit of speculation and seemingly definitive (but false) assertions over the years on what the influence of Gulf Island Pond aeration might be on points downstream? The comments below ("Without continuous operation of this oxygenation system, this reach of the Androscoggin would not be capable of meeting the existing or proposed Class B DO criteria. The attainment of DO thresholds in this reach is not a reflection of natural assimilative capacity but of sustained artificial intervention.") by the Rumford-Mexico Sewage District submitted on 6/30/25 are typical and as our actual sampling data show are 180 degrees off.*
https://www.maine.gov/dep/water/wqs/TR_DEP-PubComm_MayJune2025.pdf Page 46

I. **Artificial Oxygenation in the Androscoggin River: Gulf Island Pond System**

A clear example of this concern is the reach of the Androscoggin River between the confluence with the Ellis River at Rumford Point and the Worumbo Dam in Lisbon Falls. This stretch is heavily influenced by a mechanical oxygenation system located in Gulf Island Pond, which injects oxygen into the river during critical periods to maintain compliance with DO standards for Class C waterbodies. The system compensates for naturally low oxygen levels caused by the river's morphology (impounded, slow-moving waters), nutrient and organic loading, and warm summer temperatures.

Without continuous operation of this oxygenation system, this reach of the Androscoggin would not be capable of meeting the existing or proposed Class B DO criteria. The attainment of DO

thresholds in this reach is not a reflection of natural assimilative capacity but of sustained, artificial intervention. Simply put, the mechanical bubbler has effectively created artificial conditions that would not otherwise exist in this stretch of the river.

In fact our real-life sampling showed just the opposite. DO levels in GIP (A9) taken from 6-10' below the surface were high. But, DO levels just below in the Deer Rips impoundment (A8) consistently had the lowest levels of oxygen on the reach (although all within Class B). Below Deer Rips, DO levels rose. The only explanation for this is that at least during 2025, the waters flowing through the GIP turbines were coming from the deeper more anoxic layer in the Pond, settling into the Deer Rips impoundment and from Deer Rips on down mixing with surface atmosphere to bring their DO levels up. If what Rumford-Mexico asserts were true, we would see *the opposite-highest levels of DO in Deer Rips and trending down with distance from GIP, at least to some ambient level.*

Conclusion

A 7Q10 value represents the lowest average river flow that occurs for seven consecutive days once every ten years, based on historical flow data. The 7Q10 low-flow condition is used by DEP to evaluate water quality. It represents the point where a river's ability to dilute pollutants is at its lowest, making it one critical measure for ensuring that pollution control measures are effective. With record low flows this year of extended drought we believe sampling occurred multiple times under 7Q10 conditions.

To the best of our knowledge the FOMB/MMTU helicopter sampling program is the most comprehensive water quality sampling undertaken to date on this section of river proposed for an upgrade. Having easily met Class B criteria in the entire section and aquatic life criteria in the free-flowing reach, the BEP has a non-discretionary duty to recommend upgrading this section to the legislature.

Exhibits

1. *Sample site locations-Google Earth*
2. *Location Map-All FOMB Androscoggin sites*
3. *USGS Auburn flows for sampling dates*
4. *DEP Benthic macroinvertebrate reports from FOMB sampling 2021*
5. *2025 Helicopter sampling data and notes*

- Peter Rubins, Grow L+A (written and public hearing comment)

This is the story of DATA collection for restoration of the Androscoggin River to Class B. During the Industrial revolution, paper manufacturing found a perfect home on the Androscoggin with unlimited supply of wood and non-existent restrictions of polluting wastes into the Androscoggin River. In the early 1900s the River became one of the Top 10 polluted rivers in the country.

In 1942 the Attorney General submitted to the Maine Supreme Judicial Court complaints from Lewiston-Auburn of toxic unhealthy odors that actually peeled paint off of houses. The court proceeded to appoint Bates College chemistry professor Dr. Walter Lawrance as River Master with the job of collecting data and reducing the toxic waste from the mills. The first data collection was eight sniffing sites in L-A at different times of day and year to determine the toxic levels in the air and their content. This is the time that Lewiston-Auburn earned the not-enviable name of "THE DIRTY LOO". There was discolored toxic foam piles eight feet high below the Great Falls and the foam continued down the river. The Sulfite pulp method was determined to be the cause and it took until 1965 to convert to the less toxic Kraft pulping process.

In 1972, our Senator Ed Muskie passed the CLEAN WATER ACT, requiring rivers to clean up and be "Fishable and Swimmable". Since that time, thousands of us have dedicated our time and energy to push for Muskie's dream. We have come to Augusta and lobbied for legislation and we have worked through the DEP's volunteer testing programs to collect Data that shows the Androscoggin meets class B standards. In the last triennial, the Board approved Class B from

Brunswick up to Worumbo Dam. It only makes sense that if the water from LA is feeding into the water below LA, then the water above meets the same classification.

As chair of the GROW L+A RIVER WORKING GROUP, this is our third triennial review appeal to reclassify the Androscoggin to B from Lisbon Falls up to the Gulf Island Dam. The two cities have been fighting the image of the "Dirty Loo" way too long and want to Re-image the great River and the Great Falls for recreation and aesthetics and economic development.

We have the data that proves it meets Class B. The law says that it meets class B. Thanks to the Androscoggin River Water Council for their continual water testing from the shore for the past 15 years under the guidance of the DEP, shows that it meets Class B.

At our request, the DEP has run DO testing with electronic Sondes twice in the past two triennials in August-Sept, low water periods, and both have shown that the river meets 7PM DO.

This year, thanks to Friends of Merrymeeting Bay and Ed Friedman, and support from Trout Unlimited, we have commissioned the most compelling Helicopter data gathering possible during the lowest flow and 7Q10 parameters. This consisted of seven flights June though October, to nine specific sites starting at Worumbo Dam up through LA and finally on Gulf Island Pond. All showed above 7PM DO even with the lowest flows in 20 years.

Data collection is science and we feel that the Board of Environmental Protection has the responsibility to reclassify the Androscoggin up to Gulf Island Dam up to Class B. We hope the BEP will support Ed Muskie's dream, Clean water.

Supporters of the Upgrade

The towns: Brunswick: Topsham: Durham: Lewiston: Auburn: Lisbon: the Auburn Sewage Dist.: Friends of Merrymeeting Bay: GROW LA: Maine Rivers: Conservation Law Foundation: Trout Unlimited: Brunswick Topsham Land Trust: Friends of Casco Bay: Androscoggin Land Trust.

- Eric Cousens, City of Auburn (written comment)

On behalf of the Auburn City Council, I write to reaffirm our longstanding support for the reclassification of the Androscoggin River from Class C to Class B for the segment extending from Great Falls to Merrymeeting Bay.

The City of Auburn has consistently recognized the Androscoggin River as a critical environmental, recreational, and economic resource. Over the past several decades, the river has shown sustained improvement in water quality, supported by robust data and the success of modern wastewater treatment systems. These improvements warrant formal reclassification to Class B, which would more accurately reflect the river's current condition and reinforce our commitment to environmental stewardship and economic revitalization.

However, we also acknowledge the challenges associated with meeting the current Class B standard 100% of the time, particularly during periods of warm weather and low flow. In light of recent discussions with Maine DEP staff, including those held during the Government Paddle Day on September 30, we understand that the Department is considering a refined classification framework that would introduce a Class BB designation. This new standard would allow for minor *deviations from the 7-ppm dissolved oxygen threshold while still maintaining high water quality and supporting public use and ecological health.*

If a full reclassification to Class B is not feasible under the current criteria, the City of Auburn supports the adoption of the proposed Class BB standard as a practical and science-based alternative. This approach would recognize the river's substantial progress, provide a realistic permitting framework, and offer the public and our regional partners the recognition that the Androscoggin River deserves.

We appreciate the thoughtful work of the Board and the Department in considering these changes and remain committed to working collaboratively to ensure that the classification system reflects both the science and the aspirations of our communities.

- Krysta West, Maine Forest Products Council (MFPC) (written comment)[9]

V. Water Quality Classification Upgrades

MFPC strongly agrees with DEP's decisions not to recommend upgrades to water quality classifications for portions of the Androscoggin River Basin and the Presumpscot River Basin at this time. We agree with DEP's analysis that the available data do not conclusively demonstrate attainment of higher classifications under all conditions. Incomplete and inconsistent monitoring results, combined with observed exceedances under critical conditions such as low flows and warm temperatures, do not provide a sufficient scientific basis to justify upgrades. Making such changes without robust and comprehensive datasets risk undermining the credibility of Maine's classification system and exposing regulated entities to unattainable standards.

Just as importantly, DEP has an obligation under the Clean Water Act and Maine law to weigh not only the environmental criteria but also the practical implications for existing dischargers. Reclassification can carry significant consequences, including more stringent permit limits, additional monitoring obligations, and in many cases costly treatment upgrades. For the pulp and paper mills and other large employers that anchor Maine's rural economies, such outcomes would have ripple effects well beyond facility operations — jeopardizing jobs, tax revenues, and the economic stability of communities that depend on these facilities. It is therefore essential that classification decisions be grounded in conclusive data and a clear demonstration that the receiving waters can sustain higher standards under natural conditions.

There is a significant difference between monitoring the river conditions and modeling the water quality under critical conditions for temperature, low flow, and loading. DEP is obligated to conduct water quality modeling to assess attainment under critical conditions, which is likely to identify river segments that are not attaining the standards of the higher classification, contrary to the monitoring results. Premature upgrades also create the very real risk that upgraded waterbodies may subsequently fail to meet the new, more stringent standards. In that scenario, the waters would be listed as impaired in Maine's Integrated Report, triggering the requirement for the development of TMDLs. This process is not only resource-intensive for DEP, but it also carries cascading consequences for regulated entities, including tighter permit limits and compliance schedules. Moreover, the "impaired" designation itself carries a stigma that

[9] This comment was also shared at the public hearing by Kijana Plenderleith (Preti Flaherty on behalf of Maine Forest Products Council).

undermines public perception of both the waterbody and the industries that discharge into it, even when those industries are in full compliance with their permits. Such outcomes benefit no one — not the regulators, not the regulated community, and not the local communities whose economies rely on both healthy waterways and stable employers.

MFPC is particularly concerned about the prospect of upgrading the Androscoggin River. Notably, the reach between the confluence with the Ellis River at Rumford Point and the Worumbo Dam is heavily influenced by non-point sources as well as the artificial oxygenation system in Gulf Island Pond, which is impounded by Gulf Island Dam. This system must operate during critical summer periods to maintain compliance with current Class C standards. The need for such a system arises in large part due to the river's morphology—specifically, the impounded and slow-moving character of Gulf Island Pond—which, combined with seasonal high temperatures, legacy sediment oxygen demand, thermal stratification, and organic loading (including nutrient loading derived from agriculture and other nonpoint sources), results in naturally low dissolved oxygen levels. Without operation of the oxygenation system, this reach of the river could not continuously attain even Class C DO thresholds, much less those of Class B. Further, an upgrade to Class B may result in the designation of additional river segments as impaired due to the impounded water behind multiple dams on this stretch of river. In our view, any suggestion of reclassifying this stretch of river to Class B disregards the reality that compliance is only achieved through sustained mechanical intervention designed to offset these complicated physical conditions. MFPC does not support upgrades for waterbodies such as the Androscoggin where the requisite water quality criteria cannot be obtained absent artificial conditions.

Moving forward, we urge DEP and the Board to exercise extreme caution in considering future upgrades to the Androscoggin or other rivers with similar challenges. Artificial oxygenation is not evidence of natural assimilative capacity, and reliance on such systems should be seen as a limiting factor that precludes higher classification. Moreover, upgrading river segments based on monitoring alone can result in unintended consequences since the practical implementation requires water quality modeling to determine attainment and permit limitations. Upgrading waters under these circumstances would not advance the goals of the Clean Water Act and at the added cost of imposing unattainable obligations on dischargers, leading to significant economic and community harm with little to no environmental gain.

- Ed Friedman, Friends of Merrymeeting Bay (FOMB) (written comment)

We support the Grow L+A nomination for upgrading the (upper) lower Androscoggin between Worumbo dam and Gulf Island Pond from a C to a B however, it appears the actual past data for the section are a bit sporadic and we hope to change that with our longitudinal profiles from last year (one trial run), this year (expected six profiles) and probably next year. We do not support the idea of changing classifications to include something between the current C and B although if it were done, B should stay as is to avoid confusion. We support the upgrade for this section provided our data and others substantiate it and trust that by the time the Board and certainly the legislature consider this, further data of ours will be in hand.

Water Sampling

In the past, FOMB volunteers have done some sampling (see Site Map for years) above the Gulf Island Pond (GIP) oxygen diffusers (from 982 N. River Rd.) and below them (Bates Boathouse). This was in the early- mid- 2000's. Our years of water quality data are ***here*** *in the Chemical* *section of our Cybrary. We later did a few years of sampling from the Auburn Boat Launch but from the very early days we have sampled in Durham (for O2 and later total and fecal bacteria), first from the boat launch and when access there became a bit obscured, a mile or so down the road in the straight section of river across from the farmland. We have sampled at one of the Durham sites from 2004 through the present.*

In 2021 FOMB contracted with Moody Mountain Environmental for a survey of ***Benthic Macro Invertebrates (BMI) in the lower Androscoggin River****, deploying rock baskets at six locations with the first four being above Worumbo dam (1-4) in the current proposed upgrade area and last two (5, 6) between Worumbo dam and Brunswick dam. Aquatic life at Sites 1, 2, and 3 all were appropriate for Class B according to Moody Mountain and the DEP. Site 4 was more appropriate for Class C but being in the upper Worumbo impoundment falls under the hydropower exclusion which elevates the classification to B.*

Recognizing the paucity of comprehensive data for the proposed upgrade area (the Grow L+A proposal notes relevant Brookfield and DEP data), last summer FOMB, working with ***Point of View Helicopter Services****, trialed a comprehensive sampling run using a helicopter equipped with amphibious floats.*

Our helo sampling sites began below the mouth of Sabattus Stream at our BMI Site 4 and went up into GIP. They also included BMI Sites 1-3. FOMB and Merrymeeting Bay Trout Unlimited (MMBTU) are funding six sampling flights this year and hopefully in 2026. We are focused on times of low flows and hot weather with tentatively one flight in June, two in July, two in August and one in September. Just last week we made the first 2025 flight and data from this and the 2024 trial are attached. Of note from these two samplings are the relative homogeneity of DO and bacteria levels throughout, which does provide an argument for limited site sampling being sufficient.

Classification

Unfortunately the Department continues to misinterpret state and federal statute by insisting all sections of river must meet the proposed classification 100% of the time. The Department also conflates classification with discharge permitting and ignores the statutory language around allowance for natural conditions.

We have attached two legal opinions (Conservation Law Foundation [CLF] and ***Greenfire Law****), also presented during the previous upgrade efforts. Aside from particulars regarding data on the section from Worumbo to the Bay, the analyses regarding federal and state law remains the same.*

Maine DEP has a nondiscretionary duty to recommend the lower Androscoggin for reclassification because it attains the Class B standard.

Under federal and Maine law, a water quality standard is composed of narrative or quantitative criteria, designated uses, and an anti-degradation policy. The Clean Water Act (CWA) and Maine's anti-degradation policy require that "[w]hen 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 that water be reclassified in the next higher classification." Simply put, if actual data show that the lower Androscoggin in fact meets the standard for a Class B water, then the Maine Board of Environmental Protection has a non-discretionary duty to recommend to the legislature that it be so classified.

Field data demonstrates the lower Androscoggin meets Class B water quality criteria

First, there is no requirement to show even that the actual Class B water quality numeric standards need be attained one hundred percent of the time in every section of the reach being reviewed, much less that some remote, modeled scenario should dictate the classification of the reach. For example, some of the more stringent chemical criteria are stated as averages, meaning that measurements above and below that number are to be expected.

Additionally, instances of non-attainment are anticipated as a designated use is maintained by law, "whether or not that use is being attained." Finally, the EPA explicitly directs that "States are encouraged to designate uses that the State believes can be attained in the future."

Second, flexibility is allowed in assessing the proper classification based upon the unique natural features of the water at issue. For example, some natural conditions, such as the incoming tides from Merrymeeting Bay and Sediment Oxygen Demand may cause the lower Androscoggin to fail to achieve a water quality criterion from time to time. But these natural conditions expressly may not be used to determine non-attainment of a use.

DEP's interpretation would moor a reach to its lowest possibly quality days rather than pulling it towards its best uses attained since the Clean Water Act was adopted—and that is the exact opposite of what the law requires. After all, the purpose of the Clean Water Act is to eliminate water pollution, not to accommodate it by preventing progress towards more protective standards because of exceptionally rare hypothetical events.

DEP has relied on inappropriate factors to recommend against reclassification in the past.

In previous years DEP staff recommended against reclassification of the Androscoggin to Class B for the following reasons, none of which is appropriate in the face of actual attainment of the Class B standard:

a) Under modeled "critical" once-in-a-decade low flow, high temperature conditions, the lower Androscoggin might fail to meet Class B standard,

b) Waste discharge permits might have to be altered and might not be allowed at all under Class B designation because of the requirement to consider modeled once-in-a-decade low flow, high temperature conditions,

c) Impoundments create low dissolved oxygen concentrations, and

d) Upstream pollution.

Pollution assimilation modeling cannot be used to overcome classification based on demonstration of uses actually being attained.

DEP's recommendation against reclassification of the lower Androscoggin primarily was based on modeling. DEP determined that "the existing models provide sufficient information to support the Department's previous assessment that there is no feasible approach to ensure attainment of Class B. But the models DEP relied upon are used to minimize risk of harm to aquatic resources when permitting a discharge, not to determine whether a use is present in a river stretch. As such, they are designed to be conservative in permitting harmful impact to waters—emphasize worst-

case scenarios to build in a margin of safety to guard against degradation of the nations' waters. The models are not intended to be used to thwart the purpose of the anti-degradation policy.

Essentially, there is supposed to be a rebuttable presumption that water quality standards consistent with actual water quality should stand. And, there is no ability to constrain a reach at a lower classification where the water is actually attaining the designated uses and standards of a more protective classification. Thus, there is not properly room for a Use Attainability Analysis here. Anti-degradation policy—the ratcheting always towards improved quality--ensures that water quality is continually improved over time and that improvements are maintained. Effectively, DEP's attachment of proof of attainment under the most dire possible modeled scenario reverses the ratchet direction of the state and federal antidegradation policy and statute.

Use of the water body to receive waste water discharges is not a permissible consideration in establishing appropriate classification.

There are no other factors that should be considered in determining what class the lower Androscoggin is actually attaining. DEP expressly may not take into account industrial discharge capacity needs in determining uses. DEP improperly invited consideration of the waste-assimilative capacity of the River as part of the reclassification review, stating that waste permitting limits "is an important requirement [to consider] when a reclassification is being evaluated. It is highly recommended that the Legislature fully understands any new licensing requirements that will be imposed on any discharge prior to a reclassification decision being made."34 In short, the DEP was directing the legislature to be careful not to eliminate the ability of the water legally to support the waste disposal needs of industry, which is not allowed.

Naturally occurring conditions cannot be used as evidence of non-attainment of water quality standards.

DEP's analysis of dissolved oxygen deficiency relied on naturally occurring conditions. "Where natural conditions, including, but not limited to, marshes, bogs and abnormal concentrations of wildlife cause the dissolved oxygen or other water quality criteria to fall below the minimum standards specified in sections 465, 465-A and 465-B, those waters shall not be considered to be failing to attain their classification because of those natural conditions."

Upstream conditions must be ameliorated rather than used as an excuse to avoid protecting downstream water quality.

DEP concluded that "river sampling showed a nutrient loading from sources upstream."37 The States designation of those upstream sources should not negatively impact downstream waters.38 Further, "[n]o waste load allocation can be developed or NPDES permit issued that would result in standards being violated. With respect to antidegradation, that means existing uses must be protected, water quality may not be lowered in [Outstanding Natural Resource Waters], and in the case of waters whose quality exceeds that necessary for the section 101(a)(2) goals of the Act, an activity cannot result in a lowering of water quality unless the applicable public participation, intergovernmental review, and baseline control requirements of the antidegradation policy have been met."

Conclusion

In conclusion, the DEP should present to the Board of Environmental Protection and the legislature the factual basis for the lower Androscoggin's attainment of Class B criterion and character and refrain from including within that recommendation any argument that might be construed as a Use Attainability Analysis.

****************************** Greenfire Law*

Provided FOMB/MMBTU and other data show actual conditions of the upper lower Androscoggin reflect those of Class B most of the time, the Department should support the upgrade with the Board. If the Department continues in their refusal to support upgrades consistent with actual conditions, then the Board, as they did last time, should correctly follow the statutes and recommend this upgrade to the Joint Legislative Committee on Environment and Natural Resources, while also directing the Department to do so.

Exhibit List-Lower Androscoggin Upgrade Proposal 6/29/25
Exhibit 1 Greenfire Law Memo
Exhibit 2 CLF Memo
Exhibit 3 Sampling Map
Exhibit 4 FOMB Helicopter Sampling Results 2024 & 2025 to Date
Exhibit 5 Helicopter Sampling Sites
Exhibit 6 FOMB Historical Water Quality Data 1999-2024
Exhibit 7 Aquatic Life Determination Study of the Lower Androscoggin River (BMI Study)

- Luke Frankel, Natural Resources Council of Maine (NRCM) (written and public hearing comment)

Androscoggin River from Gulf Island Pond Dam to Worumbo Dam
Similar to the various segments within the Sandy River watershed, upgrading the section of the Androscoggin River from Gulf Island Pond Dam to Worumbo Dam from Class C to Class B would greatly complement ongoing and future fish restoration efforts in the watershed. Substantial amounts of data have already been brought forward by NRCM, Grow LA, Friends of Merrymeeting Bay, and others during this Triennial Review process demonstrating how this stretch of the Androscoggin River meets Class B water quality criteria in the vast majority of instances. We continue to believe that DEP has an obligation to proceed with an upgrade at this time because of these findings and wanted to provide additional context to the ecological benefits of an upgrade.

As one of the largest rivers in Maine, the Androscoggin River and its tributaries are vital to the populations of numerous diadromous fish species within the Gulf of Maine. In recent years, significant progress has been made toward improving fish passage along the lower Androscoggin River. This includes the recent relicensing of the Pejepscot Dam in Topsham in 2023 that incorporated conditions for improved fish passage, the ongoing relicensing of the Worumbo Dam in Lisbon Falls where stakeholders are pursuing similar fish passage conditions, and the anticipated relicensing of the Brunswick Dam in advance of a license expiration in 2029.

Additionally, there has also been progress in improving fish passage within the Little Androscoggin River, which joins the Androscoggin River in Auburn. This has included the relicensing of the Barker Mill Dam in Auburn in 2020, which included fish passage requirements to be implemented by 2031, the implementation of fish passage conditions at the Mechanic Falls

Dam due in 2027, and the anticipated future removal of several non-FERC dams along the Little Androscoggin River including the Littlefield Dam in Auburn and the Welchville Dam in Oxford.

Ensuring that the water quality of the mainstem of the Androscoggin River between Gulf Island Pond Dam and Worumbo Dam continues its current trajectory of improvement is vital to ensuring that these fish passage improvements are ultimately successful. When it comes to the restoration of a critical endangered species like the Gulf of Maine Distinct Population Segment of Atlantic salmon, we cannot afford to wait for additional information when there is ample evidence to support upgrading water quality conditions.

- Scott Sells, The Sells Law Firm (representing FOMB) (written and public hearing comment)

These comments are submitted on behalf of Friends of Merrymeeting Bay ("FOMB") for inclusion into the administrative record in this matter and in response to the Board of Environmental Protection ("BEP") review of recommendations submitted by the Department of Environmental Protection's (the "Department") recommending denial of reclassification for the Lower Androscoggin River between Gulf Island Pond and Worumbo dam from Class C to Class B. FOMB's comments here are in support of the proposal submitted by Grow L+A and not intended to supplant the full, detailed data and analysis FOMB has provided in the testimony given by Ed Friedman and Scott Sells on behalf of FOMB at the recent hearing on October 16, 2025, but to supplement and update that information. Accordingly, the FOMB October 16 hearing comments, June 29 written comments to the DEP and October 16 testimony are fully incorporated into these comments by this reference.

I. "It's the law" – why the Board is required to re-classify in this case.

1. FOMB has demonstrated that the Lower Androscoggin below Great Island Pond meets Class B standards through actual field data, accordingly the Board is required to recommend to the legislature that the segment be re-classified.

The law governing the Board's mandatory actions in this matter states:

> *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. Pursuant to subsection 3, paragraph Bb, the board shall recommend to the Legislature that that water be reclassified in the next higher classification. (emphasis supplied)*[10]

At the outset it must be noted that the Department is not disputing the Lower Androscoggin is actually meeting Class B standards. It is also not disputing the integrity or sufficiency of the field data collected by FOMB under the U.S. Environmental Protection Agency or the Department's protocols in any way. The Department even concedes that the riverine segment meets Class B standards but that "In-stream data for DO show that Class B criteria were not always attained."[11]

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[10] *38 M.R.S. § 464(4)(F)(4).*

[11] *Maine DEP 2025 Triennial Review of Water Quality Standards, Department Recommendations at page 72 https://www.maine.gov/dep/bep/2025/10-16-25/TR%20recommendations.pdf(the "Department Triennial Review Recommendations").*

The same "not always attained" observation can be said for any riverine segment under any classification. An unusually hot day or unpermitted discharge can easily accomplish this. This is also a somewhat questionable observation since there is simply no existing technology in place to continuously monitor river segments throughout the segment, and the statutory and regulatory scheme, including the language cited above, does not establish an "always" standard.

Setting aside for the moment the impracticality of requiring a river segment to attain its classification twenty-four hours a day, seven days a week in order to achieve re-classification[12] *there is an even more egregious flaw in this "not always" observation, particularly where modeled results are being used to justify the denial of re-classification. Taken to the extreme, there would never be any re-classifications under the statute as modeling parameters could continue to be adjusted to be inconsistent with the reality of actual field data. FOMB submits that this is not what the statute requires or intends.*

Further the Department asserts that: (1) exceeding the minimum standards of the next highest classification, such as for DO, must occur under critical water quality conditions to trigger the reclassification requirement; (2) modeling results which indicate that Class B DO criteria may not be attained in the segments in question during critical water quality conditions is a factor to consider in reclassification; or (3) consideration of critical flow conditions and full licensed loads or that any other condition in NPDES discharge permitting somehow can prevent mandatory reclassification.[13] *None of these pre-conditions are required under 38 M.R.S. § 464(4)(F)(4) or any other statutory requirement and if the legislature had intended to have these preconditions as a trigger to the Board's mandatory obligations it would have explicitly said so.*

2. The underlying reason why re-classification to a higher class is necessary.

The reason for re-classification here is pretty straightforward, for Androscoggin fisheries and wildlife to re-establish and thrive in the watershed, the water quality classification system under federal and state law has to work the way it is intended to work and not be subverted by pollutant dischargers, or misinformed or incorrect agency judgement. At the end of the day the objective is cleaner water – that is the basic outcome the law intends. This benefits recreational users as well and the economic benefits of clean water, including without limitation the positive economic benefits of recreational use, are well documented. As the statute clearly states it is actual reclassification to ambient conditions that is the mechanism for locking in improvements in water quality and preventing subsequent degradation.

As set forth in more detail below, under Maine law, when a riverine segment meets the water quality standards for a higher classification, re-classification is non-discretionary. Here the graphed actual field data FOMB has collected during one of the dryest, drought conditions in years, showing mean averages and individual sample results, submitted to the Department for

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[12] For example, if the Department was to undertake rulemaking and require 24 hour compliance as a re-classification requirement, and it was somehow measurable, each stream segment classified in the state of Maine, regardless of its current classification, would risk being out of compliance the moment it was found not meeting its classification standards and would presumably have to be downgraded. That is an outcome FOMB suggests is in no-one's interests and is contrary to the anti-degradation intent of the Clean Water Act and Maine's Water Quality laws.
[13] Department Triennial Review Recommendations at 72-74.

each specific site.[14] That is actual data for specific sites throughout the riverine segment in question that can be analyzed in connection with the Grow L+A proposed upgrade.

There is therefore no preclusion that prevents individual site data from being analyzed, and while the Department might take issue with the geometric mean ("Geomean") graphs FOMB has supplied which are based on actual field data, it must also consider that this protocol, or the averaging of data to determine compliance – is also typically used in the very NPDES program it administers and is specified in the state water quality standards. FOMB submits that here, where actual field data is demonstrating attainment, that the actual data are sufficient and uncontroverted and the Board must reclassify the Lower Androscoggin to Class B.[15]

Accordingly, there are therefore really only two legal issues for the Board to consider – what the law says it must do, and whether there is any statutory interpretation that provides for any exceptions, circumstances or judgement on the part of the Department that would prevent it from complying with the plain language of the law.

Here, these issues must be resolved in the context of the legal standard in the Clean Water Act and Maine statutes that requires a state to revise its water quality standards and classifications to reflect uses and water quality actually being attained.[16] There is also Maine statutory language that explicitly states what the Department must consider in reclassification, specifically:

> *1. Whether the actual data demonstrates the river segment in question meets Class B narrative and quantitative water quality criteria; and*
>
> *2. Whether the actual designated uses are consistent with Class B designation, and*
>
> *3. Whether re-classification is consistent with Maine's anti-degradation statute.*

The Department's analysis and recommendation is inconsistent with this standard and ignores these specific criteria in favor of other external factors that are inappropriate and arbitrary when Class B standards are being maintained by actual data and the actual uses of the river are consistent with Class B designation.

3. The Plain language of the statute is clear - the legal standard is mandatory and not discretionary.

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[14] *See FOMB October 16, 2025 Comments at pages 3, 5-9, 15, and 20-37.*

[15] The Department wishes to clarify that Maine's existing dissolved oxygen (DO) criterion for Class B waters (38 M.R.S. § 465(3)(B)) states that 'the dissolved oxygen content of Class B water may not be less than 7 parts per million (ppm) or 75% of saturation, whichever is higher.' The Department's existing and longstanding interpretation and practice with respect to the existing statutory language is that both components of the dissolved oxygen standard must be met at all times for criteria to be attained. Based on these statutory requirements, it is not appropriate to average dissolved oxygen data to determine criteria attainment. It is appropriate to use geometric averages when explicitly stated in criteria, as is the case with *E. coli* and Ch. 583 freshwater nutrient criteria.

[16] *See: 40 C.F.R. § 131.10(i) designated use requirement: "Where existing water quality standards specify designated uses less than those which are presently being attained, the State shall revise its standards to reflect the uses actually being attained." (emphasis supplied), and § 131.6(d) (anti-degradation required); and 38 M.R.S. § 464(4)(F)(4) "When the actual water quality of any classified water exceeds the minimum standards of the next highest classification, that higher water quality must be maintained and protected." (emphasis supplied).*

First, the plain language of the law itself is not ambiguous in any way. The Clean Water Act and Maine's anti-degradation policy require that "[w]hen 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 that water be reclassified in the next higher classification."[17] The use of the terms "must" and "shall" have commonly accepted meanings and are, in any normal context, non-discretionary and obligatory. The term "actual" is similarly commonly known as referring to "real" and not "theoretical".[18] Reclassification guidelines soliciting proposals for the Triennial Review go further noting: "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."[19]

a. The Department's own method of statutory interpretation results in an outcome consistent with the language of the statute – re-classification to Class B.

i. The Department's method of statutory interpretation and the language of 38 § 464 (4). *In June 3 of 2021 the Board received testimony from Kevin Martin, Compliance and Procedures Specialist for the Department in another matter involving the Department's interpretation of statutory language.[20] During that testimony, he specifically spoke of how the department interpreted statutory language and the interplay of classification statutes and the legislature.*

This is highly relevant here as there appear to be competing statutory arguments – the Department appears to assert or conclude that the statute is NOT mandatory, or if it is there are other laws or exceptions that must be considered; and FOMB and others assert that the circumstances warrant an exercise of the mandatory duty imposed on the Board based on the plain language of the law.

ii. The explicit language. *During his testimony, Mr. Martin testified that the Department first looks to the text of the statute, the "explicit language" and the use or non-use of explicit language in frequently used phrases throughout the statute to divine legislative intent.*

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[17] 38 M.R.S. § 464(4)(F)(4); see also 40 C.F.R. § 131.20 (a) "If such new information indicates that the uses specified in section 101(a)(2) of the Act are attainable, the State shall revise its standards accordingly…."

[18] The word "shall" in the context of a statute is defined in Black's Law Dictionary as "In common or ordinary parlance, and in its ordinary signification, the term 'shall' is a word of command and … must be given a compulsory meaning." Black's Law Dictionary 1233 (5th ed.1979) and as a generally imperative or mandatory term. The term "must" is universally accepted as an obligatory term and "actual" as is specifically defined by Black's Law Dictionary to mean "real; substantial; existing presently in act having a valid objective existence as opposed to that which is merely theoretical or possible." (emphasis supplied).

[19] Maine Department of Environmental Protection, 2024 "Submission Guidelines - Proposals to Change the Water Quality Classification of Maine Waters" at 4.

[20] Mr. Martin provided testimony at the June 3rd, 2021 Board of Environmental Protection meeting, all references and direct quotations from him were obtained from a recording of the meeting available from the Board of Environmental Protection.

Here, using that approach, the Department should be looking at the terms "must," "shall" and "actual" in the statute to determine whether there is any use or non-use that would suggest specific exemptions or differing circumstances that could be considered where the only condition explicitly stated uses those terms.

That choice of wording is explicit and exclusive, "actual" water quality is used by the legislature – not modeled or hypothetical or imagined or "full licensed waste discharge load" water quality tied to other considerations. Thus here, under Mr. Martin's guidelines - there is no evidence of any legislative intent that there is any discretion on the part of the Department to use hypothetical modeling or anything else besides actual data showing actual water quality to comply with the statute. Importantly – the Department doesn't even assert that there is any such legislative intent – only its own "guidance" somehow allows it to divine the legislative intent of 38 M.R.S.A §464 from other water quality statutes. That is not the law here.

iii. Other considerations. *Mr. Martin further testified that absent specific provisions there may be an argument that indicates a legislative intent to consider other circumstances. Clearly since the Department itself has not asserted ambiguity, this must be what the Department is relying on with its own interpretation of the statute – they appear to ask "Is this what the legislature means when they say "actual water quality" and that higher water quality "must be maintained and protected" and that the Board "shall recommend to the legislature the water be re-classified"? That is, after all the plain language used by the legislature in the statute.*

However, here there is no ambiguity or omission. There is no need to go elsewhere to determine what the legislature has done when it uses words like "actual," "shall," and "must" their plain meaning and intent are clear. The only circumstance when it is appropriate to consider other laws or divine some other legislative intent is if there is ambiguity or omission in the statute. Here there is none and there are clear words indicating a specific legislative intent.

iv. An important limitation. *Nevertheless, the Department frequently, and by its own admission, not only looks at the plain language but also "the circumstances surrounding individual cases." But it does so with an important caveat. As Mr. Martin further testified to the Board "the department is tasked with interpreting these classification statutes and identifying what the legislature intended when it wrote them. It is important that the department not interpret these statutes in such a manner that creates inconsistencies or absurdities." (emphasis supplied).*

v. The result here. *Therefore, under the Department's own stated method of statutory interpretation, the Department itself imposes an important limitation to looking beyond the plain language – no inconsistencies or absurdities. Unfortunately, here the Department has used the premise of looking elsewhere, specifically the NPDES discharge permit program and other environmental statutes, to find a basis to recommend denial. As set forth more fully below, this unfortunately has led the Board into the "inconsistent and absurd" territory it is now faced with. On one hand the plain, mandatory language of the statute, on the other, the Department's justification, not only in some cases outside the written mandates of the law, but those that will lead to the very inconsistencies and absurdities it professes must be avoided.*

b. The actual field data show the river segment meets Class B numeric criteria. *For example, FOMB has supplied undisputed data that has been collected during extreme drought conditions showing that for the overwhelming majority of time the segment of the Lower Androscoggin below Gulf Island Pond meets Class B standards. This includes Class B compliance with specific numeric water quality criteria. These data show that the specific Class B* *dissolved oxygen ("DO") standards*[21] *are met here.*[22] *Similarly E. coli requirements for Class B waters*[23] *also are met here,*[24] *aquatic life in free flowing, non-hydropower impoundments also met here.*[25] *These data are undisputed.*

c. The Class B designated use criteria are also met. *Again, there is explicit, plain language that states what the designated uses are and what the Department (and the Board) can consider. The explicit classification criteria are as follows:*

The Class C, current classification,[26] *and the Class B, proposed classification*[27] *designated uses differ only in whether the habitat supported in the reach is characterized as unimpaired. "Unimpaired" means "without a diminished capacity to support aquatic life."*[28] *The Lower Androscoggin has and does support unimpaired aquatic life and is not listed as impaired for any relevant parameter. Again, the Department does not dispute this.*

d. The Class B aquatic life standard is also met. *Extensive sampling for benthic invertebrates (BMI) was undertaken during 2021 at FOMB expense from Brunswick to Site A4 in the current proposal reach. BMI Index as modeled by DEP all show Class B attainment for Sites A2, A3 and A4 in the current proposal, the only free flowing sites. Other sites are covered under the hydropower exemption.*[29]

e. The anti-degradation factors are also met here. *Further, in determining what uses need to be protected and maintained, the Department may consider, on a case-by-case basis, certain antidegradation factors. Maine statute specifically provides that:*

> *In making its determination of uses to be protected and maintained, the department shall consider designated uses for that water body and:*

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[21] 38 M.R.S. § 465(3)(B) states "[t]he dissolved oxygen content of Class B waters may not be less than 7 parts per million or 75% of saturation, whichever is higher, except that for the period from October 1st to May 14th, in order to ensure spawning and egg incubation of indigenous fish species, the 7-day mean dissolved oxygen concentration may not be less than 9.5 parts per million and the one-day minimum dissolved oxygen concentration may not be less than 8.0 parts per million in identified fish spawning areas."

[22] FOMB October 16, 2025 Comments at pages 4-6.

[23] 38 M.R.S. § 465(3)(B) states that "[b]etween April 15th and October 31st, the number of Escherichia coli bacteria in these waters may not exceed a geometric mean of 64 CFU per 100 milliliters over a 90-day interval or 236 CFU per 100 milliliters in more than 10% of the samples in any 90-day interval.

[24] FOMB October 16, 2025 Comments at 5-7.

[25] FOMB October 16, 2025 Comments at pages 20-37.

[26] 38 M.R.S. § 465(4)(A) states "Class C waters must be of such quality that they are suitable for the designated uses of drinking water supply after treatment; fishing; agriculture; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation, except as prohibited under Title 12, section 403; navigation; and as a habitat for fish and other aquatic life."

[27] 38 M.R.S. § 465(3)(A) states "Class B waters must be of such quality that they are suitable for the designated uses of drinking water supply after treatment; fishing; agriculture; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation, except as prohibited under Title 12, section 403; navigation; and as habitat for fish and other aquatic life. The habitat must be characterized as unimpaired." (emphasis supplied).

[28] 38 M.R.S. § 466(11).

[29] See https://www.mainelegislature.org/legis/statutes/38/title38sec464.html and at FOMB October 16, 2025 Comments at pages 20-33.

(a) Aquatic, estuarine and marine life present in the water body;
(b) Wildlife that utilize the water body;
(c) Habitat, including significant wetlands, within a water body supporting existing populations of wildlife or aquatic, estuarine or marine life, or plant life that is maintained by the water body;
(d) The use of the water body for recreation in or on the water, fishing, water supply, or commercial activity that depends directly on the preservation of an existing level of water quality; [. . .] and
(e) Any other evidence that, for divisions (a), (b) and (c), demonstrates their ecological significance because of their role or importance in the functioning of the ecosystem or their rarity and, for division (d), demonstrates its historical or social significance.[30]

Here again, the Lower Androscoggin segment meets even these criteria and the Department does not dispute that it does. So even if the Department manages to avoid the reality of Class B numeric standards being met by actual field data, there is no dispute that the designated uses are also consistent with Class B designated uses. This fact, and the department's own statutory interpretation method completely ends any possible further analysis the Department should conduct under the law. There is absolutely no other indication of legislative intent to indicate it should consider anything other than the actual water quality. That is what is required to conform with the goals of classification standards as explicitly stated by the legislature, nothing more.

f. The unreasonable outcomes when inappropriate considerations are used. *The Department did not stop where its own analysis and method dictated it should. Instead, it layered hypothetical modeling results as a surrounding circumstance, even when actual data was and continues to be available. The purpose of the Clean Water Act is to prevent or eliminate water pollution, not to accommodate it by preventing reclassification towards more protective standards. This is particularly so where the basis for denial is a rare or exceptional occurrence such as modeled or imagined maximum pollutant loading. FOMB submits that it is patently unreasonable to use theoretical or hypothetical data that is inconsistent with the reality of actual facts and data to justify deviating from clear and explicit legal requirements. It also leads to an absurd and capricious result – willfully ignoring actual data and reality – and that is exactly the kind of inconsistency and absurd result that the Department itself professes it cannot do.*

Legal inconsistencies notwithstanding, the practical effect of this also means that those who have to obtain a NPDES permit to degrade water quality, i.e. pollute the river, somehow override the legislative intent to maintain and protect the higher water quality. That is also patently absurd, as set forth below, the Federal Clean Water Act (under which those point source discharge permits were issued) and Maine's anti-degradation statutes in no way intend for point source or non-point source pollution discharges to provide an exemption from water quality classification mandates.

FOMB asserts that even considering the economic impact that these waste dischargers might incur to come into compliance with the upgraded Class B standard, that impact has to be weighed against the positive economic benefits of cleaner water and its designated uses including the economic benefits of increased recreational use in the area.

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[30] *38 M.R.S. § 465(4)(F).*

4. The rationale given by the Department to recommend against re-classification is inappropriate and, in some cases, unlawful.

Simply put, the Department's "interpretation" of the statute is that certain other additional factors must be taken into account or considered. In summary these factors include:

- *Under modeled "critical" once-in-a-decade low flow, high temperature conditions, the lower Androscoggin might fail to meet Class B standard,*
- *Waste discharge permits might have to be altered and might not be allowed at all under Class B designation because of the requirement to consider modeled once-in-a-decade low flow, high temperature conditions, and*
- *Upstream and instream pollution (point and non-point source discharges) somehow can prevent lower reaches from being reclassified.*

Importantly, none of these factors are appropriate when confronted with a segment of water that is actually meeting water quality standards and designated uses. Again, there is nothing – nothing - in the statute that allows for this and the overwhelming legal basis for both the Federal Clean Water Act and Maine's Anti-degradation statute explicitly say so.

a. Hypothetical modeling for a once in a decade extreme event does not comply with the statute. *Pollution assimilation modeling, the same modeling used for NPDES permitting, cannot be used to avoid re-classification where there is actual data available. The models used and relied upon by the Department are used to minimize harm to aquatic resources when the department permits a pollutant discharge – not to determine whether a designated use is present in a particular riverine segment. This is an improper conflation of two very different statutes with two very different purposes and not unsurprisingly leads to inconsistent and absurd results.*

- *Discharge permit standards emphasize worst case scenarios to protect and build in a margin of safety for discharge permit purposes. Unlike re-classification statutes, their purpose is to limit the discharge of pollutants, not to deny reclassification of a riverine segment.*
- *There is no indication they are or were ever intended to thwart federal and state anti-degradation or reclassification laws.*

Anti-degradation policy is clear under federal and state law – the intentional movement towards improved water quality ensures that water quality is continually improved and that the improvements are maintained, not degraded or held hostage by imagined modeling scenarios.

The Department has also stated that proponents of re-classification must provide water quality data and modeling showing the likelihood of attainment of Class B water quality criteria at maximum NPDES licensed loads since the Department does not foresee the ability to ensure attainment of Class B standards under critical conditions.[31] This is also an absurd requirement – there is no evidence that any waste discharger operates at maximum licensed loads; rather a large, discretionary buffer is generally built into all NPDES discharge permits[32] to avoid violations

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[31] *See the Department's Triennial Review Recommendations at 73.*

[32] *See FOMB 2020 proposal for Reclassification of the Lower Androscoggin River, Exhibit 40*

that may occur under theoretical and extreme conditions. This is a permit requirement to prevent pollutant discharge, not a re-classification requirement involving the collection of actual field data. Unless all maximum licensed loads are actually discharged simultaneously under critical flow conditions[33] (defined as "7Q10"), there is no way to collect actual data to demonstrate compliance under these conditions. Thus, DEP is requesting an impossible and unnecessary showing, exactly the kind of absurd result it purports to find as unacceptable.

FOMB further suggests that the data collected in 2025 was under extreme drought conditions, suggested by some to be the third or fifth driest year in at least the last twenty years strongly suggesting that that the actual field data showing Class B attainment was collected under "7Q10" conditions. USGS actual Auburn flow levels vs 96 year median as documented in the FOMB October 16 testimony are quite clear. The failure to model compliance under such conditions is not relevant when there is actual field data to suggest Class B compliance.

b. The existence of waste discharge permits that may need to be altered or not allowed under Class B designation due to modeled results is not a requirement for re-classification. *This is a critical flaw in the Department's reclassification denial. The Department's analysis must be based on existing water quality-not hypothetical modeling with point sources operating at maximum NPDES licensed discharge. Further, the Department expressly must not take into account industrial discharge capacity needs in determining uses for a water segment reclassification. 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.*

For example, under Maine law the "[u]se of water body to receive or transport waste discharges is not considered for an existing use for the purposes of this anti-degradation policy."[34] Similarly, under federal law: "[i]n no case shall a state adopt waste transport or waste assimilation as a designated use for any waters of the United States."[35]

Here, the Department improperly used consideration of the waste assimilative capacity of the river, specifically waste NPDES permitting limits as expressed in point source discharge permits, as part of its re-classification review. This is expressly prohibited under federal and state statute and regulation.

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http://cybrary.fomb.org/pages/20210502%20Exhibit%2040%20Andro%20Dischargers%20Actual%20vs.%20Licensed%202012-2013.pdf.

[33] *To determine if a discharge to waters of the State of Maine could cause or contribute to non-attainment of water quality standards, the Department, relies on its existing statutory authority derived from 38 M.R.S. § 464(4)(D) which states: "Except as otherwise provided in this paragraph, for the purpose of computing whether a discharge will violate the classification of any river or stream, the assimilative capacity of the river or stream must be computed using the minimum 7-day low flow that can be expected to occur with a frequency of once in 10 years." Thus in writing a permit the Department typically uses in its reasonable potential analysis a "7Q10" standard, which is the lowest 7-day average that occurs (on average) once every 10 years as the maximum flow of the discharge allowed by permit. There is however, discretion built into the statute for certain toxic substances and nutrients discussed infra at note 26.*

[34] *38 § M.R.S. § 465(4)(F)(1)(d).*

[35] *40 CFR § 131.1 (a).*

c. Finally, upstream or instream pollution, such as nutrient loading, has no bearing whatsoever on denying reclassification of a specific segment under the Clean Water Act – it would result in exactly the opposite outcome intended.

The State of Maine administers its water quality program under the federal Clean Water Act, and as such the provisions and guidance under the CWA must also be adhered to. Under federal Law the state's responsibilities are explicit: "The state's designation of those upstream sources should not negatively impact downstream waters."[36] (emphasis supplied). Therefore, the Department cannot, under any circumstance, use negative impacts of upstream designations as justification for denying re-classification when the standards are met. That would be exactly the kind of "negative impact" the CWA explicitly forbids.

This is further confirmed in EPA Agency Guidance which states: "[n]o waste load allocation can be developed or NPDES permit issued that would result in standards being violated. With respect to antidegradation, that means existing uses must be protected, water quality may not be lowered in [Outstanding Natural Resource Waters], and in the case of waters whose quality exceeds that necessary for the section 101(a)(2) goals of the Act, an activity cannot result in a lowering of water quality unless the applicable public participation, intergovernmental review, and baseline control requirements of the antidegradation policy have been met." (emphasis supplied).
FOMB is unaware that the Department has untaken any such intergovernmental review, or reviewed whether baseline control requirements of Maine's anti-degradation policy have been met here. It appears that the Department has done just the opposite – used the NPDES discharge requirements and upstream water quality as the basis to deny re-classification to a higher, improved water quality classification downstream. It's clear from both the federal statute and guidance that the intent of the NPDES permit program is not intended to prevent water quality standards from being met or prevent improvement to water quality - here not to allow upstream or instream pollutants to negatively impact the improvement of downstream waters and by extension their potential reclassification to a higher class. Put simply, if the Department, as part of its guidance is going to consider other laws in re-classification under a mandatory statute, it must comply with the language and guidance of those other laws to make sure it does not result in an inconsistent or absurd outcome.

d. Accordingly, using the Department's own method of statutory interpretation, and the explicit language of federal and state statute, regulation and guidance – there is no reasonable legal interpretation that would justify denial. *There is no dispute over whether the Class B standards or the designated uses are being met here. However, the external considerations used by the Department in denying reclassification are not in accordance with the federal and state statute, regulation and guidance or the express purposes underlying those laws. Further, there is no assertion by the Department that the legislature intended to provide an exception for the rationale it has provided. It appears, on closer scrutiny to have done just the opposite. Here the Department's and the Board's inquiry is limited to only limited specific circumstances that must be examined – (1) whether the river segment meets the higher classification and (2) whether the designated uses are consistent with Class B designation and antidegradation laws. That's it. The Department has made no showing that the actual data is disputed or that the designated uses are inconsistent with Class B designation. Instead, it offers*

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[36] *40 C.F.R Sec. 131 (b).*

justification for denial that is inconsistent with the plain language and purpose of the very statutes and programs it itself administers.

5. There is a better, more practical alternative than exposing the Board to statutory liability.

a. The Department has more discretion under the NPDES point source discharge program to ease the transition to a higher classification standard. *As stated above,[37] rather than conflate the NPDES program with a non-discretionary statute, FOMB suggests the data, here the information reported by the permittees themselves,[38] confirm that there is room to adjust those permits so as to ease any economic impact reclassification might have over time. This is because (1) these permits typically have a 5 year time frame; (2) the NPDES permits requirements are based on a worse case discharge scenario; and (3) the Department has the discretion under the statute to adjust the discharge requirements over the permit duration to reflect the actual pollutant discharge, with a smaller, more realistic buffers based on actual discharges. While basing permits on a 7Q10 standard is required, there is no apparent reason why licensed discharge loads should not better reflect actual discharges with a smaller buffer.[39] For example, basing discharge permits on a rolling average or maximum actual discharge plus a reasonable buffer would more realistically reflect actual water quality impairment. Simply put, as long as there is a smaller buffer built in there is always room for expansion, but overall within any given permit period discharge permits would be closer aligned with reality. In this way an abrupt permit impact due to re-classification to a higher Class B (or any other class where there is significant impact on NPDES dischargers) could be avoided and the transition phased in over time.*

Stated another way, the Department has more discretion under the NPDES permit program it administers than it does where a mandatory statute requires re-classification under its plain language. FOMB asserts that when a segment is deemed to meet a higher water quality classification, the better approach is to re-classify the segment and take the 5 year NPDES permit window to transition upstream dischargers into compliance, revising the margin or buffer dischargers that are permitted under over time, thereby easing the economic impact. FOMB also notes that the upstream and instream NPDES discharge permits in question, are still operating on expired permits – making this an ideal time to transition to a higher classification. Eventually dischargers will need to meet Class B standards, the data show that, in most cases, there is ample room under existing discharge requirements to phase this in over the life of the permits.

II. Conclusion.

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[37] *See Paragraph 4 (a) above – NPDES discharge permit standards emphasize worst case scenarios to protect and build in a margin of safety for discharge permit purposes, this margin of safety will need to be adjusted so that dischargers can comply with new Class B water quality standards.*

[38] *See: NPDES permit data compiled as Exhibit 40 to FOMB 2020 Upgrade Proposal (which the Board recommended). The data are reported discharges for one year and typical of annual NPDES discharges.*

[39] *Unlike the mandatory language discussed at length in these comments, 38 §464(4)(D) contains the following discretionary language: "The department may use a different flow rate only for those toxic substances regulated under section 420 and for those nutrients specified in department rules. To use a different flow rate, the department must find that the flow rate is consistent with the risk being addressed." (emphasis supplied). Thus, unlike reclassification standards, the department has wide latitude to address nutrient discharges and toxic substances addressed under 38 §420 under different discharge parameters over the term of the permit.*

FOMB has submitted actual field data and continues to collect data confirming the Lower Androscoggin below Gulf Island Pond meets Class B criteria virtually all, if not all of the time. This is probably the fifth Triennial process it has participated in, in addition to numerous other formal and informal presentations to the Department and the legislature. By any reasonable standard, the actual field data FOMB has submitted in support of Grow L+A's upgrade proposal is no different, and in fact more compelling due to the conditions under which it was obtained than the data supplied to justify the upgrade from Worumbo Dam to Merrymeeting bay.

As with that last Lower Androscoggin upgrade, the Board is again face to face with a mandatory statute it must either adhere to or risk legal exposure in connection with its final agency action. Unfortunately, the law does not permit the kind of justification the Department is attempting, presumably to accommodate upstream or instream pollutant dischargers who are resisting re-classification on the basis of its potential economic impact. Environmental regulatory compliance is a cost of doing business – that has been the case since the Clean Water Act and Maine's anti-degradation water quality laws were enacted. Importantly the positive economic impacts of cleaner water must also be considered.

Here, however, the Department has (and has had) other options rather than putting the parties and the Board in this position. It can recommend reclassification of the segment to Class B and use the Department's discretion under the NPDES program, which it administers, to ease the transition for upstream dischargers to come into compliance with Class B standards. This is not to say FOMB is suggesting the Department abandon the requirements of that program either and allow non-compliance under those permits. Instead, it appears the actual data, reported by the very permitees opposed to re-classification, show there is room to adjust and gradually phase their permits into compliance with the higher classification. Particularly now, where these permits have not yet been renewed.

The river currently attains the higher bacteria, aquatic life and dissolved oxygen standards set forth in the Class B designation. As noted by the Department, it has no reason to question the data; and it has even relied upon data supplied by FOMB in prior reclassifications. There is also no dispute as to whether the designated uses of the segment of the river are somehow inconsistent with Class B designated uses or any antidegradation provisions. There is also no assertion that the legislature intended anything other than this result and it is confirmed using the statutory analysis of the Department's own expert. Further, the Department has not legally justified its deviation from that statutory language with the reasons it has given.

Therefore, under the circumstances presented here, the actual data obtained and the plain language and purpose of the re-classification statutes, the Board must recommend to the legislature the re-classification of the Lower Androscoggin from Gulf Island Pond to Worumbo Dam from Class C to Class B.

MDEP Response:

The Department appreciates the support expressed for proposals to upgrade portions of the Androscoggin River and acknowledges the concerns voiced by commenters opposing the upgrade proposals. The Department also appreciates the additional documentation and analyses submitted by several commenters in support of the upgrade proposals. Most of the key points raised were addressed by the Department in prior public documents, including the Responses to Comments available for the May 28 through June 30, 2025, public comment period and the draft revised Triennial Review recommendations that were available for public comment between

August 28 and October 22, 2025. Information is also included in the final Board recommendations,[40] dated December 18, 2025. In the interest of brevity, readers are referred to those documents for a complete response.

The Department recognizes that the Androscoggin River provides habitat for fish and other aquatic life and that water quality in the river has significantly improved. As explained in the draft revised Triennial Review recommendations discussed with the Board on November 20, 2025, based on the review of all available water quality data, including data collected by the Friends of Merrymeeting Bay (FOMB) in 2025, the lower Androscoggin River meets its current Class C criteria, but it does not fully meet all Class B water quality criteria for bacteria, aquatic life (biomonitoring), and dissolved oxygen. Although FOMB data collected in 2025 indicate this segment of the river largely met Class B criteria for dissolved oxygen and bacteria for the sites monitored, these data are limited and do not provide a complete assessment of all Class B water quality criteria. It is noted that these data did capture three days of critical low flows and one day of critical low flow and temperature. It is also important to note that the lowest daily dissolved oxygen values for a waterbody can vary and may occur within a range of several hours, making it challenging to capture with the discrete monitoring methods used in the FOMB study. It is possible that using continuous monitoring methods at these locations would have revealed additional values below Class B criteria.

Furthermore, the Department's analysis indicates that the river cannot meet Class B dissolved oxygen criteria at all times during critical conditions. The Department's longstanding interpretation of 38 M.R.S. § 464(4)(F)(4) is that it must generally be read in the full context of the water quality laws, including the sections of law that establish the conditions under which a discharge may be licensed. The Department's interpretation is that when any criterion of water quality (for example, dissolved oxygen) exceeds the minimum standards of the next highest classification under critical water quality conditions, then that higher water quality criterion must be maintained and protected. Critical water quality conditions include conditions of low flow, high water temperature, and licensed loading from point source discharges. Additionally, the artificial oxygenation and nonattainment of Class C dissolved oxygen criteria in Gulf Island Pond also impacts the ability of the lower Androscoggin River to meet Class B dissolved oxygen criteria.

In terms of freshwater nutrient criteria, the Department's analysis using limited available phosphorus data indicate that the lower segment of the river may meet Class B criteria under critical conditions, but additional data are needed for a full evaluation.

For these reasons, the Department does not recommend an upgrade to Class B for any segment of the Androscoggin River proposed as part of this Triennial Review.

Several commenters provided input or questions regarding specific actions or data clarifications. The Department offers the following responses for those items. Comments are shown in italics with the commenter identified in parentheses. The Department's responses are provided below each italicized item.

1) *Modeling should be based on calibration under a number of varying conditions including data as near as possible to the extremes of both high and low flows and discharges. Either a new model should be developed, the preferred route, or the existing model recalibrated.*

[40] Available on the Board's web page www.maine.gov/dep/bep/index.html.

Due to the limitations of the existing model, it should only be used as a rough guide and balanced with actual data. (ARWC)

The Department agrees that appropriate models should be used to determine attainment of water quality standards and for setting allowable limits in permitting situations. The Department will continue to evaluate and update existing models, when appropriate and as resources allow, with new data and discharge information.

2) *Phosphorus criteria are not part of the current water quality standards. (FOMB)*
Chapter 583, Nutrient Criteria for Class AA, A, B, and C Fresh Surface Waters, which provides numerical criteria for total phosphorus and environmental indicators (including percent nuisance algae cover and chlorophyll a) was approved by the Board of Environmental Protection and the U.S. Environmental Protection Agency and became effective as part of Maine's water quality standards on June 11, 2025, pursuant to 40 C.F.R. § 131.21.

3) *DEP proposals to include nutrient and pH requirements as well as continuous DO monitoring will have the unintended (or maybe intended?) effect of putting measurements of these criteria out of reach of virtually all citizen monitoring programs because of cost and technical capacity. (FOMB)*
If the pH and Class B dissolved oxygen criteria proposed as part of this Triennial Review process are adopted, the Department will work with partners to determine where it is feasible or necessary to conduct pH and/or continuous dissolved oxygen monitoring. The Department wishes to clarify that the proposed revision to Class B dissolved oxygen criteria does not require the use of continuous monitoring methods. The Department values and will continue to rely on citizen monitoring data, including data submitted by groups conducting discrete dissolved oxygen monitoring. Though continuous data are the most informative, discrete data are also useful and will be used by the Department alongside any available continuous data in water quality evaluations. For additional information regarding proposed revisions to existing freshwater Class B DO criteria and the proposed freshwater pH criteria additions, see the revised Triennial Review recommendations (pages 24-26 and 30-32).

4) *The same "not always attained" observation can be said for any riverine segment under any classification. An unusually hot day or unpermitted discharge can easily accomplish this. This is also a somewhat questionable observation since there is simply no existing technology in place to continuously monitor river segments throughout the segment, and the statutory and regulatory scheme, including the language cited above, does not establish an "always" standard. (The Sells Law Firm)*
Maine's existing dissolved oxygen (DO) criterion for Class B waters (38 M.R.S. § 465(3)(B)) states that "the dissolved oxygen content of Class B water may not be less than 7 parts per million (ppm) or 75% of saturation, whichever is higher." The Department's existing and longstanding interpretation and practice with respect to the existing statutory language is that both components of the dissolved oxygen standard must be met at all times for criteria to be attained. The Department recognizes that Maine's strict 7 ppm and 75% of saturation dissolved oxygen standard for Class B waters does not account for brief

expected excursions below the current standard for waters where there is a reasonable expectation that designated uses are being met.

As part of this Triennial Review process, the Department and two external partners submitted proposals to revise Class B dissolved oxygen criteria to clarify the Department's application of the criteria, reflect the now widespread use of continuous monitoring methods, and to account for naturally fluctuating dissolved oxygen conditions. For additional information regarding proposed revisions to existing freshwater Class B DO criteria, see the revised Triennial Review recommendations (pages 24-26). If the proposed revisions to Class B dissolved oxygen criteria are adopted, the Department's position regarding the upgrade of any segments of the Androscoggin River proposed for upgrade as part of this Triennial Review process remains unchanged. This position is based on attainment of all Class B water quality criteria including dissolved oxygen, bacteria, aquatic life (biomonitoring), and freshwater nutrients.

Presumpscot River from Saccarappa Falls to Head of Tide at Presumpscot Falls, Westbrook, Portland, and Falmouth (Friends of the Presumpscot River)

MDEP Response on page 65

Comments from:

- Jeannie Franceschi, City of Westbrook (written comment)

Westbrook's staff supports DEP's recommendation to keep the current Class C classification for the Presumpscot River for all the reasons listed in your report.

- Andrew Fisk, American Rivers (written and public hearing comment)

Lastly, I am here to reiterate our support for the goal-based reclassification of the Presumpscot River from Saccarappa Falls to Head of Tide at Presumpscot Falls (Westbrook, Portland, Falmouth) from Class C to Class B. American Rivers has been a long-time partner with the Friends of the Presumpscot River and appreciates the opportunity to re-start our work together. We understand that there are standards that do not meet Class B criteria. However the significant completed and on-going work in regard to wastewater infrastructure improvements demonstrates the need to lock in these trends with this upgrade. We do not see that the current operations at the SAPPI plant will be adversely affected by the reduction in the assimilative capacity of a Class B designation.

We understand that the Department has not recommended this upgrade, but ask that if you are unable to support this you forward it to the Legislature with no recommendation. This is an appropriate alternative and affords the Board an opportunity to seek Legislative guidance on goal-based classifications.

- Peter Stuckey, Friends of the Presumpscot River (public hearing comment)

Good morning. My name is Peter Stucky. I'm on the board of the Friends of Presumpscot River. My wife Michelle and I have lived on the Presumpscot just inside the Martin's Point bridge on the Portland side for over 50 years.

In the 1970s the river was disgusting. It was virtually dead. The clam flats were polluted, huge clumps of sludge from the paper mill and untreated solid waste from municipal and private and direct discharge routinely flowed downstream and into Casco Bay sometimes getting stuck on the mud to bake in the sun. Less visible but much more odoriferous, you know what I mean, and dangerous were the chemical pollutants in the water.

Today, thanks to the hard work of state and local government, business leaders, environmental organizations, and local citizens the river has made great strides. The clam flats are still closed, but dam removals at Smelt Hill and Saccarappa Falls have greatly improved the water quality in the flow in the lower river.

In recent years, we've seen routinely right in our back yard sturgeon and striper jumping, I saw one yesterday, Egrets and Heron fishing, Bald Eagles and Ospreys soaring high overhead then diving down to catch their lunch. We've seen fisherman, dory rowers, canoers, kayakers and water skiers. And this year we had a family of Night Heron nesting in a tree – in the trees in our yard. It's – it's a dangerous thing. They – they are in the trees during the day and I'll just leave it at that.

So I'm here today to ask you to please protect the raised floor. I know there is some debate about whether we're at B or just below. I like the word inspirational and what I'm really concerned about is that we don't want to backslide, so how do we best protect the gains we've made. We're so close, so I'm here to just ask you to please help us preserve those incredible changes we've witnessed.

- Stephanie Noyes, Friends of the Presumpscot River (public hearing comment)

Hi. My name is Stephanie Noyes. I am a resident of Falmouth just upriver from Peter and I'm also a board member of the Friends of Presumpscot River. I have lived on the river for the last 10 years and I have watched a lot of the wildlife and the marine life come back to the river. A couple other things besides what Peter has seen is we've got seals that come up, which is actually super fun to watch the pups learn to fish. And also besides the ecosystem improving over the last 10 years that I've been there is watching a lot of the people recreate. A lot of swimmers and boaters and lots more people fishing.

In terms of the whole picture of this river and what we're trying to do in the last 33 years of improving this river from completely dead to what the Clean Waters Act says is fishable and swimmable is how it's kind of deteriorated in the last -- in the 20th century and a lot of people, not just the Friends of Presumpscot, but the state also had been improving these water qualities over the last 33 years as I've known it and progressively improving it and we are showing that we're progressing this river to a healthier river and we have demonstrated that we had plans to improve things.

Looking more at the bigger picture and, you know, the topic of the economy has come up. If you look at the industrial side of it for Sappi and their industrial economical financial part of it versus the hospitality industry and the tourism of bringing a lot more of the Maine tourism economy to *the state on the other rivers and the other areas that have been brought up today so far but also the Presumpscot River is just as beneficial. So when you are looking at it as a state and, you know, you kind of question about the licensure of discharging versus the quality of water and then also just making that fishable and swimmable is really important and we should take every opportunity to improve the water protection.*

So I understand that we're not asking you guys to be for it or oppose it but that it gets hopefully supported by your Board and that it gets passed to the Legislature to make the choice that the Presumpscot River, the lower half, should be reclassified to a Class B. In my testimony I have a lot more of the data we've shared previously.

- Krysta West, Maine Forest Products Council (MFPC) (written comment)[41]

V. Water Quality Classification Upgrades

MFPC strongly agrees with DEP's decisions not to recommend upgrades to water quality classifications for portions of the Androscoggin River Basin and the Presumpscot River Basin at this time. We agree with DEP's analysis that the available data do not conclusively demonstrate attainment of higher classifications under all conditions. Incomplete and inconsistent monitoring results, combined with observed exceedances under critical conditions such as low flows and warm temperatures, do not provide a sufficient scientific basis to justify upgrades. Making such changes without robust and comprehensive datasets risk undermining the credibility of Maine's classification system and exposing regulated entities to unattainable standards.

Just as importantly, DEP has an obligation under the Clean Water Act and Maine law to weigh not only the environmental criteria but also the practical implications for existing dischargers. Reclassification can carry significant consequences, including more stringent permit limits, additional monitoring obligations, and in many cases costly treatment upgrades. For the pulp and paper mills and other large employers that anchor Maine's rural economies, such outcomes would have ripple effects well beyond facility operations — jeopardizing jobs, tax revenues, and the economic stability of communities that depend on these facilities. It is therefore essential that classification decisions be grounded in conclusive data and a clear demonstration that the receiving waters can sustain higher standards under natural conditions.

There is a significant difference between monitoring the river conditions and modeling the water quality under critical conditions for temperature, low flow, and loading. DEP is obligated to conduct water quality modeling to assess attainment under critical conditions, which is likely to identify river segments that are not attaining the standards of the higher classification, contrary to the monitoring results. Premature upgrades also create the very real risk that upgraded waterbodies may subsequently fail to meet the new, more stringent standards. In that scenario, the waters would be listed as impaired in Maine's Integrated Report, triggering the requirement for the development of TMDLs. This process is not only resource-intensive for DEP, but it also carries cascading consequences for regulated entities, including tighter permit limits and compliance schedules. Moreover, the "impaired" designation itself carries a stigma that undermines public perception of both the waterbody and the industries that discharge into it, even

[41] This comment was also shared at the public hearing by Kijana Plenderleith (Preti Flaherty on behalf of Maine Forest Products Council).

when those industries are in full compliance with their permits. Such outcomes benefit no one — not the regulators, not the regulated community, and not the local communities whose economies rely on both healthy waterways and stable employers.

MFPC is particularly concerned about the prospect of upgrading the Androscoggin River. Notably, the reach between the confluence with the Ellis River at Rumford Point and the Worumbo Dam is heavily influenced by non-point sources as well as the artificial oxygenation system in Gulf Island Pond, which is impounded by Gulf Island Dam. This system must operate during critical summer periods to maintain compliance with current Class C standards. The need for such a system arises in large part due to the river's morphology—specifically, the impounded and slow-moving character of Gulf Island Pond—which, combined with seasonal high temperatures, legacy sediment oxygen demand, thermal stratification, and organic loading (including nutrient loading derived from agriculture and other nonpoint sources), results in naturally low dissolved oxygen levels. Without operation of the oxygenation system, this reach of the river could not continuously attain even Class C DO thresholds, much less those of Class B. Further, an upgrade to Class B may result in the designation of additional river segments as impaired due to the impounded water behind multiple dams on this stretch of river. In our view, any suggestion of reclassifying this stretch of river to Class B disregards the reality that compliance is only achieved through sustained mechanical intervention designed to offset these complicated physical conditions. MFPC does not support upgrades for waterbodies such as the Androscoggin where the requisite water quality criteria cannot be obtained absent artificial conditions.

Moving forward, we urge DEP and the Board to exercise extreme caution in considering future upgrades to the Androscoggin or other rivers with similar challenges. Artificial oxygenation is not evidence of natural assimilative capacity, and reliance on such systems should be seen as a limiting factor that precludes higher classification. Moreover, upgrading river segments based on monitoring alone can result in unintended consequences since the practical implementation requires water quality modeling to determine attainment and permit limitations. Upgrading waters under these circumstances would not advance the goals of the Clean Water Act and at the added cost of imposing unattainable obligations on dischargers, leading to significant economic and community harm with little to no environmental gain.

MDEP Response:

The Department appreciates the support expressed for this upgrade proposal and acknowledges the concerns voiced by commenters opposing the upgrade. Most of the key points raised were addressed by the Department in prior public documents, including the Responses to Comments available for the May 28 through June 30, 2025, public comment period and the draft revised Triennial Review recommendations that were available for public comment between August 28 and October 22, 2025. Information is also included in the final Board recommendations,[42] dated December 18, 2025. In the interest of brevity, readers are referred to those documents for a complete response.

As explained in the draft revised TR recommendations discussed with the Board on November 20, 2025, based on the review of all available water quality data, including data collected by Department staff in 2025, the lower Presumpscot River meets its current Class C criteria for aquatic life (biomonitoring) and dissolved oxygen but not for freshwater nutrient or bacteria

[42] Available on the Board's web page www.maine.gov/dep/bep/index.html.

criteria. Additionally, this segment of the river does not fully meet all Class B water quality criteria for bacteria, aquatic life (biomonitoring), dissolved oxygen, and freshwater nutrients.

Furthermore, the Department's analysis indicates that the river cannot meet Class B dissolved oxygen criteria at all times during critical conditions. The Department's longstanding interpretation of 38 M.R.S. § 464(4)(F)(4) is that this provision must generally be read in the full context of the water quality laws, including the sections of law that establish the conditions under which a discharge may be licensed. The Department's interpretation is that when any criterion of water quality (for example, dissolved oxygen) exceeds the minimum standards of the next highest classification under critical water quality conditions, then that higher water quality criterion must be maintained and protected. Critical water quality conditions include conditions of low flow, high water temperature, and licensed loading from point source discharges.

In terms of freshwater nutrient criteria, the Department's updated monitoring and analysis indicate that the lower Presumpscot River has little to no remaining assimilative capacity even under its current Class C designation, which may preclude the Department from issuing new or increased phosphorus discharges regardless of class.

For these reasons, the Department does not recommend an upgrade to Class B for the lower Presumpscot River.

Sheepscot River (Route 17 Crossing/Whitefield to Somerville/Palermo Town Line) (Midcoast Conservancy)

<u>Comment from:</u>

- Judith Camuso, Maine Department of Inland Fisheries and Wildlife (written comment)

After careful review of the proposals included in the current triennial review of Maine's water quality standards, The Maine Department of Inland Fisheries and Wildlife strongly opposes the proposal to upgrade the Sheepscot River to Class A Status. We wish to express significant concern over this unprecedented proposal that lacks data and nutria criteria to support the standards set for Class A waters.

The Department of Inland Fisheries and Wildlife currently owns and operates a fish rearing station in Palermo, located on the Sheepscot River. This facility produces and stocks over 110,000 fish annually into waters across the state. Maine's fish stocking programs play a vital role in supporting recreational fishing, contributing more than $350 million annually to the state's economy and serving over 360,000 licensed anglers.

Under 38 M.R.S. § 465(2)(C), direct discharges to Class A waters that were licensed prior to January 1, 1986, are permitted to continue only until practical alternatives exist. In 2024, the Department renewed its wastewater discharge permit for the Palermo Rearing Station, authorizing discharges to the current Class B segment of the Sheepscot River, just below the outlet of Sheepscot Pond—only a short distance upstream from the segment proposed for reclassification.

Maine's state-owned hatchery and rearing station infrastructure is critical to Maine's outdoor recreational economy, the Department's mission and to the long-term health of Maine's fisheries. Decommissioning existing facilities is not a feasible or practical option. In recognition of their value and the limited availability of suitable alternative sites, the Department is currently investing nearly $30 million in ARPA funds to upgrade infrastructure at three facilities around the state.

In closing, the Department supports the Department of Environmental Protection's recommendation not to reclassify the Sheepscot River to Class A. We appreciate the opportunity to comment and are happy to provide further information about the Palermo Rearing Station if needed.

MDEP Response:

The Department appreciates the support expressed for this recommendation. No changes were made to the proposed recommendations posted for public comment between August 28 and October 22, 2025.

Chandler Bay, Jonesport (Eastern Maine Conservation Initiative)

MDEP Response on page 89

Comments from:

- Carrie Peabody, Citizen (written comments)

Comment 1

*Chandler Bay in Washington County, Maine, was originally classified as a **Class SB water body** by default under Maine law. According to the Maine Revised Statutes Title 38, §469, all estuarine and marine waters in Washington County that were not otherwise specifically classified were automatically assigned **Class SB** status. This indicates that Chandler Bay received its SB classification at the time the statute was enacted or became effective, which corresponds to the establishment of Maine's water classification system.*

*From historical context provided in the Web results, Maine has maintained a water classification system **since the 1950s**, and SB waters were assigned as part of this framework. Therefore, **Chandler Bay was classified as a Class SB water body by default sometime after the 1950s**, in line with the original statutory assignment under §469. Title 38, §469 deemed eight towns in Washington County as being classified as SA and 3 being classified as SC. Jonesport is not mentioned.*

Whether Maine's classification of Chandler Bay produced testing results or scientific data to support the SB finding is unknown. From 2022 – 2024 detailed water quality testing was conducted on Chandler Bay by the Darling Marine Center (DMC). The DMC plays a crucial role as the accredited lab analyzing the data for our region. The DMC, through its Marine Water Quality Laboratory (MWQL), has been the primary accredited facility for analyzing ambient water quality samples collected in Chandler Bay, Maine. This monitoring effort was critical because, prior to recent initiatives, little comprehensive background water quality data existed for the bay.

*The DMC Reports specifically looked at Baseline Nutrient Findings in Chandler Bay. The ambient water quality monitoring conducted in Chandler Bay (from May through October in monitoring years 2022 - 2024), with laboratory analysis performed by the DMC, established a pre-development baseline for key nutrients. The findings confirm that the bay's current nutrient regime is typical of a **high-quality, unpolluted marine environment.***

DMC produced 3 years of consistent scientific data on Chandler Bay. Results were submitted to the DEP and to the Town of Jonesport on a scheduled basis to meet shoreland zone permit requirements for a local project. DMC's water quality test result data shows that Chandler Bay meets SB to SA reclassification requirements.

The monitoring program, with lab analysis conducted by the DMC, established baseline levels for key indicators of estuarine health. These included:

- *Nutrient Levels: Total Nitrogen (TN), Total Phosphorus (TP), Nitrate plus Nitrite (NOx), and Ammonia.*
- *Physical Parameters: Dissolved Oxygen (DO), Salinity, Water Temperature, and pH.*
- *Clarity: Secchi disk water clarity measurements and Chlorophyll-a levels.*
- *Ecological Significance: The high-water quality findings support the view that Chandler Bay is in a pristine state, meeting the criteria for outstanding ecological importance.*

The DMC's Marine Water Quality Laboratory (MWQL) provided the essential, quality-assured analytical services for the ambient monitoring program. This scientific backing is crucial for establishing reliable baseline data, assessing potential future impacts, and supporting state- level environmental reclassification initiatives. The water reclassification effort needs to take scientific data provided by reputable laboratories into serious consideration, especially with regard to Chandler Bay. Chandler has been lacking data for decades.

Chandler Bay has consistently exhibited very high-water quality. The parameters measured by DMC were found to exceed Class SA waterbody standards. In fact, maximum chlorophyll-a levels detected by DMC were approximately one-quarter of established limits, a prime indicator in high water classes.

Class SA represents the highest standard for Maine's estuarine and marine waters, designated for waters of outstanding ecological, social, scenic, economic, or recreational importance. Legislative statutes and guidelines governing the protection and reclassification of water quality are in place for a reason. No State entity should allow a discharge permit to override existing water quality laws. Yet, the DECD issued a letter of determination allowing for exception to water quality standards for the good of economic development and jobs while the Kingfish discharge permit was being reviewed by the DEP. Why would any state entity responsible to protect the environment allow such an exception?

Chandler Bay serves a multitude of communities by supporting a rich lobster fishing industry and other marine industries such as clamming, worms, scallops, mussels, periwinkles, razor clam, and seaweed/local aquaculture. The Bay is a recreational area for tourism, borders the intercoastal waterway, has several protected islands and beach areas, and most importantly serves as one of the few environments left for endangered eelgrass and the Atlantic Salmon.

We need to trust in the findings of the DMC. Chandler Bay deserves to be protected and its water quality upgraded from SB to its true SA status.

<u>*Comment 2*</u>

Please submit the attached Chandler Bay Water Qualify reports to the BEP/DEP for the Triennial Review public record.

From 2022 – 2024 detailed water quality testing was conducted on Chandler Bay by the Darling Marine Center (DMC). The DMC's Marine Water Quality Laboratory (MWQL) provides the essential, quality-assured analytical services for the ambient monitoring program.

The monitoring program, with lab analysis conducted by the DMC, establishes baseline levels for key indicators of estuarine health. These include:

- *Nutrient Levels: Total Nitrogen (TN), Total Phosphorus (TP), Nitrate plus Nitrite (NOx), and Ammonia.*
- *Physical Parameters: Dissolved Oxygen (DO), Salinity, Water Temperature, and pH.*
- *Clarity: Secchi disk water clarity measurements and Chlorophyll-a levels.*
- *Ecological Significance: The high water quality findings support the view that Chandler Bay is in a pristine state, meeting the criteria for outstanding ecological importance.*

This scientific backing is crucial for establishing reliable baseline data, assessing potential future impacts, and supporting state- level environmental reclassification initiatives.

- Jason Krumholz, Remote Ecologist, Inc. (public hearing comment)

My name is Dr. Jason Krumholz, I am an associate professor at the University of Connecticut and Stewardship Coordinator with the Connecticut National Estuarine Research Reserve. I am also the Director of Water Quality with Remote Ecologist, a non-profit organization dedicated to democratizing science and scientific data. As you may know, I, along with my colleagues, have participated in several aspects of the modeling analysis, and discussion pertaining to the Kingfish Maine permit, and the petition to reclassify Chandler Bay as SA waters. I was up here this week working on an Atlantic Sturgeon project in collaboration with DMR and so EMCI asked if I would come and speak on behalf of Chandler Bay.
Over the last 5 years, I have had the great privilege of working with many of Maine's state biologists and resource managers in DMR and DEP. I am thankful for these collaborations, and for the great work that DMR and DEP do to protect Maine's natural resources, which are truly one of a kind.

However, when it comes to this reclassification, I believe that DEP may be making a mistake. In previous testimony, DEP indicated that SA waters have coastlines typically associated with a large portion of state or federal conservation lands that lend recreational importance to those waters, and that the criteria for SA were not met because Chandler bay was not associated with those protected lands. I get it, resources are limited and you can't conserve everything, so best to focus on the places that need it most. But SA classification is meant to protect special WATERS, not special lands. And I would argue that, waters associated with already state or federally protected lands are probably the LEAST in need of additional legal protection. These waters are ALREADY protected ... nobody's getting anywhere trying to build a facility that will *discharge more nitrogen than the city of Portland in Acadia National Park. The language pertaining to the designation of SA waters also says nothing at all about a requirement for association with protected land, only that these waters have "outstanding natural resources and which should be preserved because of their ecological, social, scenic, economic or recreational importance." Using this classification to protect only waters already protected by legislation protecting the lands surrounding them seems to go against the spirit of the guiding legislation, which is to protect those waters that should be preserved.*

This previous testimony also notes the discharge permit for Kingfish, as a disqualifying reason, while simultaneously pointing out that this facility is not actually discharging. Not only is it not discharging, it has not even broken ground. Class SA waters must be 'as naturally occurs' with no direct discharge of pollutants. Chandler Bay meets this standard. There are currently no discharges that would preclude designation as SA. Refusal to designate waters otherwise deserving of class SA on the grounds that a future potential discharge might make them ineligible for that classification literally defeats the purpose of having such a designation, which is to protect deserving waters from future discharges which would reduce the water quality.

In terms of the quantitative requirements for SA: no direct discharges (other than those expressly allowed), dissolved oxygen "as naturally occurs", and a numeric enterococcus and fecal coliform standard (a geometric mean of 8 CPU or MPN per 100 milliliters in any 90-day interval or 54 CPU or MPN per 100 milliliters in more than 10% of the samples in any 90-day interval), there are no data suggesting that these waters do not meet this standard. Although Chandler Bay is relatively remote and data poor, the limited bacterial data I could find are all well below the standard, and oxygen concentrations are at or near saturation pretty consistently. These waters are pretty pristine ... despite limited data, it's reasonable to assume they consistently meet the standard, barring any data suggesting otherwise.

Those are the facts of the case, and so to me, if you'll briefly entertain my opinion, this decision comes down to whether these waters meet the qualitative standard of "outstanding natural resources which should be preserved". This, admittedly is subjective, and I can't answer that question for you. There's a lot of outstanding places in Maine, but I think Chandler Bay is one of them. Here's why:

This area is designated as EPH for 17 species of finfish and shellfish (salmon, cod, plaice, wolffish, haddock, ocean pout, pollack, white, silver, and red hake, windowpaine and winter flounder, smooth, thorny, little, and winter skate, Atlantic scallop, Atlantic herring), as well as HAPC for juvenile Atlantic Cod and critical habitat for Atlantic salmon under the ESA. I've written or reviewed close to 50 EFHA's and NMFS consultations on behalf of various action proponents, so I'm acutely aware that in many cases EFH encompasses large swaths of marine waters, and you'd be hard pressed to find an underwater spot in the US EEZ that's NOT EFH for SOMETHING. But what stands out to me in the FMC designation text is that the polyhaline and mesohaline portions of the Chandler/Englishman/Machias Bay region are specifically named in the language for the majority of those species, as it pertains to habitat value for specific life stages of the species in question. That's not that common. Not for that many species. You used to see it pretty often in Hawaii, but their "Reef Fish Complex" EFH had over 200 species. NEFMC only manages 28 species.

Although SA designation is primarily about waters, much of the lands surrounding the CEM complex are home to designated Rare or exemplary plants and natural communities by the MNAP, and the Maine Endangered Species Act designates essential wildlife habitat for migratory *bird species such as Roseate Tern and Piping plover, which are dependent on marine food webs. There are a lot of species of recreational, commercial, and socioeconomic importance which are dependent on the habitats of Chandler Bay and the surrounding areas. Is this enough to rise to the standard of "outstanding ecological, social, scenic, economic or recreational importance?" I don't know. In most states, it would be a slam dunk. But Maine has a lot of really beautiful places deserving of protection. As resource managers here, I'm sure this is both a blessing and a curse. I am sure that there are many difficult decisions which must be made, and this is likely one of them. I sincerely appreciate your consideration of my opinion on this matter, and I am sure you will carefully consider the pros and cons of this designation en route to your decision. Thank you again for your time.*

- Kat Haltiner, Natural Resources Consultant (written comment)

1. Introduction

This analysis is provided to definitively address previous testimony to the Department of Environmental Protection (DEP), where it was indicated that the Chandler Bay Region lacked extension surrounding conserved land and protected resources typically associated with an Outstanding Natural Resource designation and the corresponding Class SA water quality standard.

The primary purpose of this report is to compile and present a comprehensive, GIS-derived inventory of the conserved land, protected uplands and high-value recreational sites adjacent to and within the immediate watershed of Chandler Bay. This documentation quantitatively demonstrates the overwhelming presence of permanent conservation projects, including state-owned lands, municipal parks and high-protection of private easements in the vicinity of the proposed reclassification area.

This evidence confirms that the existing land-use pattern and the resulting high ecological integrity of the Chandler Bay watershed meet and exceed the statutory requirements for designation as an Outstanding Natural Resource. The data presented in the following sections establishes a clear and undeniable compatibility between the conserved terrestrial environment and the proposed Class SA water quality classification.

2. Purpose and Regional Setting Overview

*This supporting appendix provides detailed, GIS-derived documentation of the conservation lands, surrounding habitats, and recreational resources associated with Chandler Bay to support the proposed water reclassification from **Class SB to Class SA**.*

*The analysis focuses specifically on **land ownership, habitat connectivity, and the ecological and social value** of adjacent protected areas within three defined impact tiers, based on proximity and hydrologic influence. This data serves as critical supporting evidence that the region's existing land-use pattern meets the statutory requirement of being an "outstanding natural resource."*

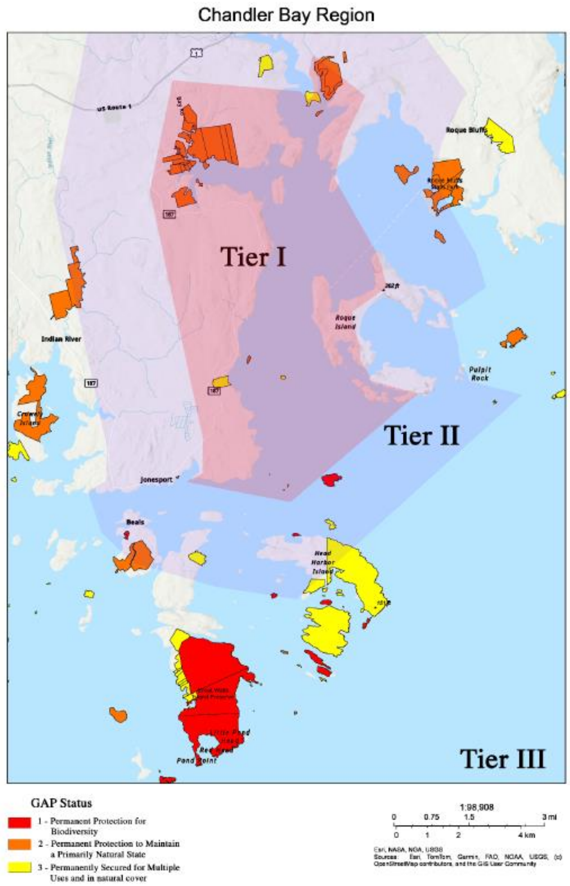
Regional Context: Chandler Bay is located on the Downeast coast of Washington County, a region characterized by a vast interconnected network of conserved coastal ecosystems. The area's ecological integrity is guaranteed by extensive land protection, including state-owned lands, municipal parks, and numerous private conservation easements. This high level of *terrestrial protection, combined with multiple public access points and recreational sites, underpins the region's pristine water quality.*

3. Geographic Scope and Tiered Analysis

For clarity and management purposes, the Chandler Bay region has been divided into three tiers of ecological and administrative relevance (Figure 1). This tiered framework employs a rigorous geographic analysis to spatially define the area of influence of the surrounding watershed on the bay's water quality, ensuring comprehensive ecological protection.

Tier	Definition	Description / Significance
Tier I	Within the proposed Chandler Bay reclassification polygon	Represents the immediate area proposed for SA designation; includes sensitive habitats, extensive eelgrass beds, and critical salmon-supporting waters, demanding the highest water quality standard.
Tier II	Within two miles of the Chandler Bay polygon	Encompasses adjacent coves, islands, and shorelines hydrologically connected to Chandler Bay. These areas provide essential ecological buffering, nursery habitats, and filter runoff.
Tier III	Beyond two miles, including connected bays	Represents the larger coastal system affected by currents, nutrient exchange, and the broader watershed. This tier is important for assessing cumulative habitat protection and long-term land-use stability.

Figure 1.



- Jason Krumholz, Jamie Vaudrey, Chris Kincaid, David Hudson, Remote Ecologist, Inc. (written)

We are writing in response to the testimony given by Kingfish Maine Council Mr. Kendall at the Triennial water quality public hearing on 10/16/2025. As Mr. Kendall correctly mentions, we have a long history together on this matter, one where we have consistently tried to take the high road, and encourage discussion and debate on the facts at hand. Mr. Kendall has consistently responded with ad hominem attacks on our credibility as scientists and experts. We have tried to be civil and discuss this matter respectfully, based on the science, and he continues to attack us personally, most likely because he has no other valid avenue to advance his agenda.

However, despite what Mr. Kendall would like you to think, the discussion about reclassification of Chandler Bay, at this point, no longer has anything at all to do with Kingfish. Kingfish has ceased US operations,[43] and has no plans to build in Maine at this time. Therefore, this decision must be made based on the current status quo in Chandler Bay; the quality of habitats therein, the ecosystem services those habitats provide, and the legitimate and nuanced discussion of whether or not these ecosystem services rise to the level of "outstanding natural

[43] https://thekingfishcompany.com/wp-content/uploads/2025/09/The-Kingfish-Company-N.V.-Interim-financial-statements-H1-2025.pdf

resources and which should be preserved because of their ecological, social, scenic, economic or recreational importance." That is the focus of our letter. We acknowledge this is a difficult and somewhat subjective decision, and we appreciate the board's careful consideration of this matter.

Contrary to Mr. Kendall's assertion, our position has not changed at all with respect to the ecology of Chandler Bay and the modeling work we did in support of this project. In earlier discussions, we made the point that our modeling results suggest that Chandler Bay's water quality, while excellent, was near the threshold for eelgrass (the seagrass species native to the Gulf of Maine) and additional nitrogen inputs could push the level over the limit supportive of eelgrass. Eelgrass, as we are sure you are aware, requires nearly pristine water quality to grow. The presence of eelgrass in Chandler Bay is an indication of excellent water quality.

However, seagrass habitats worldwide (including eelgrass) face cumulative stress from changing climate, turbidity, nitrogen, invasive species, and coastal development. As a result, eelgrass throughout New England is highly stressed and sensitive to decline. We are, unfortunately, seeing large-scale losses of seagrass, both globally,[44] and especially in Maine.[45] Our comment at that time pertained to Kingfish's MPDES permit, and our calculations suggesting that Chandler Bay does not have enough assimilative capacity to handle the amount of nitrogen Kingfish would output at full capacity without endangering eelgrass. Based on our modeling results, this would be true regardless of the nitrogen concentrations in Chandler Bay, but the area that would fall above the state's eelgrass threshold (0.35mg/l)[46] is substantially larger because of the background levels of nitrogen in Chandler Bay.

Whether Mr. Kendall simply misunderstood, or deliberately misrepresented our previous statements does not matter. This discussion is not about Kingfish's permits. This is about Chandler Bay. We never stated or implied that Chandler Bay has poor water quality. All coastal waters have background nitrogen levels as a result of inputs from land. Even pristine, completely undeveloped watersheds put nitrogen into the water.[47] Given the sensitivity of eelgrass and the array of stressors it faces, it is necessary to actively protect areas where eelgrass is present. That's what we said in 2019, and that's what we said last week. Our position on this matter has not changed in the slightest; it is driven by the best available science on the topic.

*Furthermore, at no point do or did we indicate, as asserted by Mr. Kendall, that the **ecology** of a water body is not dependent on the surrounding land. Anyone with a basic understanding of science would know that this statement is absurd. What we said, and what we stand by, is that the **protection status** of waters should not necessarily be exclusively coupled to the **protection status** of the surrounding lands… that sometimes there are special and important waters that are not associated with special lands (a great example of that is George's Bank), and that the legal statutes of the State of Maine say absolutely nothing about required proximity to conserved land in order to be eligible for class SA designation. Therefore, it is our opinion that the discussion of whether or not to reclassify Chandler Bay should be focused on the merits of the water body and the habitats it provides, while of course recognizing the importance of terrestrial/marine connections as a **part** this discussion.*

[44] https://www.pnas.org/doi/abs/10.1073/pnas.0905620106
[45] https://doi.org/10.1656/045.022.0305
[46] The Department wishes to clarify that the total nitrogen threshold value for protection of eelgrass is 0.32 mg/L.
[47] https://link.springer.com/book/10.1007/978-0-387-35299-2#page=116

If this discussion were *to be about Kingfish, we would point out that we are fully supportive of sustainable, environmentally responsible aquaculture. Aquaculture has the ability to bring well-paying and environmentally sustainable jobs to coastal communities and bridge the gap between supply and demand for seafood products. As demand continues to increase and the supply provided by wild fisheries has plateaued over the last several decades, we need aquaculture to fill that gap. All of us have worked closely in collaboration with aquaculture producers, and Drs. Vaudrey & Krumholz are currently involved in a project working with aquaculture operators to examine some regulations related to eelgrass in Connecticut with the potential to inform and eventually modify state restrictions on gear placement. Aquaculture will almost certainly be a key part of Maine's future. But aquaculture can (must?) be done profitably with minimal environmental impacts and the Kingfish proposal is dependent on substantial environmental harm in order to ensure profitability. The Principles at Kingfish Maine are aware that technologies are available (settling ponds, retention wetlands, denitrification treatment, etc.) that could reduce the nitrogen load produced by their operations; in fact, Kingfish deploys some of these technologies in other projects globally. But the truth is that, in this case, they cannot deploy nitrogen removal technology and remain profitable.*

When a proposed aquaculture operation's margins are so narrow as to be dependent on degrading the environment in order to ensure profitability, it is our opinion that this operation and the benefits provided, do not justify the costs. Particularly given the number of sustainable, profitable finfish and shellfish aquaculture operations presently in operation and/or development (including international operations by Kingfish). Kingfish appears to agree with us, as they have suspended US operations due to lack of profitability. And yet Mr. Kendall continues to show up at these meetings and attack us as "sellouts" because we are paid for our work (who isn't? Does he work for free?), while simultaneously being disingenuous under oath[48] in order to defend his client's theoretical potential future interests.

But at the end of the day, Mr. Kendall's opinion, and his conduct, are irrelevant to this discussion, ***because this discussion is not about Kingfish****. Kingfish has suspended its US operations. The Kingfish facility is not under construction, nor is construction planned for any finite time in the future. Discussion of hypothetical potential future development should not have bearing on the discussion of whether Chandler Bay is worthy of SA designation. This decision must be made based on the best available science with respect to the* ***present status*** *of Chandler Bay and whether it meets the established quantitative and qualitative standards for SA designation. There are substantial data which we have presented and discussed that suggest all quantitative standards are met. We have made our argument with respect to the qualitative standards. We acknowledge that it is a difficult decision, and we wish you the best of luck in your reviews. We appreciate your time and consideration.*

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[48] Mr. Kendall stated under oath that Kingfish was "waiting on the results of this reclassification petition to break ground" when on 6/30/2025 Kingfish stated in it's own biannual report (cited above) that it was suspending all US Operations indefinitely due to lack of profitability. Then, when asked by Councilman Duchesne if the Kingfish permit would prevent these waters from attaining SA in the future, he "I have to admit I'm not aware of that", when any competent environmental lawyer practicing in Maine would know that ANY point source discharge (regardless of volume or concentration) would disqualify these water from future consideration for class SA.

- Anastasia Fischer, Eastern Maine Conservation Initiative (EMCI) (written and public hearing comment)

Thank you, members of the Maine BEP Board, for your time and consideration of our petition to reclassify Chandler Bay as a marine water body that meets SA standards.

Per the requirements of the SA standards, we have empirically confirmed that Chandler Bay clearly meets the criteria established by the Maine State legislature.

This document contains the following additional information we are submitting in support of our request to reclassify Chandler Bay:

1. *A table that outlines significant supporting evidence that Chandler Bay meets the standards set for SA qualification. (TABLE 1)*
2. *Additional information to rebut the reasons the DEP has stated for denying the reclassification to date. (TABLE 2)*
3. *A final summary.*
4. *Appendices and attachments with supporting information.*

We understand that this is not an easy decision, with many factors to consider, and sincerely appreciate your consideration of our request.

TABLE 1

From the ME State Classification criteria for SA waters:

"Class SA is the highest classification of estuarine and marine waters. This classification is applied to waters that are outstanding natural resources and that should be preserved because of their ecological, social, scenic, economic or recreational importance. **By law –**

Table 4- 32 Maine's Estuarine and Marine Waters Classification Standards

Class	Designated Uses	Dissolved Oxygen	Bacteria[1]	Aquatic Life
SA	Recreation in and on the water (Primary and Secondary Contact Recreation) Fishing Aquaculture (excludes finfish) Propagation and harvesting of shellfish Navigation Habitat for fish and estuarine and marine life	As naturally occurs	As naturally occurs but *Enterococcus* may not exceed geometric mean of 8 CFU/100 mL in any 90-day interval or 54 CFU/100 mL in more than 10% of samples in any 90-day interval	As naturally occurs

Class SA waters shall be of such quality that they are suitable for the designated uses of

recreation in and on the water, (1)

fishing, aquaculture <u>(excluding finfish)</u>, propagation and harvesting of shellfish, and navigation, (2)

and as **habitat for fish and other estuarine and marine life.** (3)

The habitat shall be **characterized as free-flowing and natural.** (4)

There are a multitude of ways that Chandler Bay overwhelmingly meets these criteria:

<u>Recreation/scenic/fishing/economic/habitat importance (1,2,3)</u>

- As recognized by the **National Scenic Byway Foundation**: The Bold Coast, which <u>goes directly along Chandler Bay</u>, was designated as a National Scenic Byway in 2021due to its unique "place of wild beauty" ***(outstanding scenic and ecological importance)*** where travelers can find "the nation's last vestige of a natural resource-based maritime culture" ***(fishing)*** and "Byway travelers can swim, bike, hike, paddle, and cruise their way through a coastal landscape" ***(recreation)***. It describes this area by the following: "this byway connects a network of public conservation lands abundant with natural resources, coastal and riverine villages with well-preserved historic districts and working waterfronts, and the people that continue to inhabit, value, and depend upon these landscapes."***(habitat)*** (See **Appendix A**)
- Washington County's Sunrise County Economic Council, in their petition for the designation of the Bold Coast as a national byway states: "The Bold Coast Scenic Byway is ***nationally significant for its scenic beauty and outdoor recreation***. Both attributes exist year-round, but the most enjoyable time to travel the Byway is from May through October. During this time foliage brings lushness to the views; harbors bustle with fishermen; warmth and sunshine invite one outside to play on the water; and birds, whales, and other critters are most active." https://sunrisecounty.org/wp-content/uploads/2024/06/Bold-Coast-National-Nomination-reduced.pdf

Fishing, aquaculture <u>(excluding finfish)</u>, propagation and harvesting of shellfish (2,3)

The rich natural ecological diversity of Chandler Bay has actively supported multiple small fisheries for centuries and continues to do so. All the following rely on high-functioning, clean, marine waters to self-propagate:

- Legacy lobster and shellfish fisheries (The existing eelgrass in the bay has been critical to maintaining this fishery as it provides

	habitat for juveniles to support these fisheries and requires the protection of clean waters). • Small oyster and kelp farmers are using the pristine waters to grow and support their local businesses. • Chandler Bay has been document to support a significant number (20+) of species of finfish and shellfish. • Additionally, NOAA has designated the Chandler River and its drainage system (Chandler Bay) as Essential Fish Habitat (EFH) for endangered Atlantic salmon. Per NOAA "The designation of an area as critical habitat does not create a closed area, marine protected area, refuge, wilderness reserve, preservation, or other conservation area; nor does the designation affect land ownership. Rather, ***once critical habitat is designated, other federal agencies consult with NOAA Fisheries to ensure actions they fund, authorize, or undertake are not likely to destroy or adversely modify the critical habitat***." • Also, regarding endangered Atlantic Salmon, the ME DEP states their "commitment to supporting Water quality is an essential component of suitable habitat for spawning and rearing. DEP monitors the water quality and biological communities in Maine's Atlantic salmon rivers and streams in close collaboration with state and federal agencies and non-profit groups, with the goal to restore and enhance the populations of this endangered species. Work is guided by Maine's water quality standards (38 M.R.S. Section 464 4-A; for further information see Maine's water classifications) and the Collaborative Management Strategy's Atlantic Salmon Recovery Plan." This commitment was not mentioned in their reclassification denial. • As stated by the law, marine waters with SA criteria should support non-finfish types of aquaculture. **Chandler Bay clearly meets the criteria that the "habitat shall be characterized as free-flowing and natural"** (4) • The ME DEP defines this term to mean: no impoundments (dams or barriers), discharges of any kind, and minimal direct human alterations to the water's flow or surrounding habitat. • There are no impoundments, discharges, or other significant direct human alterations to the water flow or surrounding habitat.
"dissolved oxygen and bacteria content of Class SA waters shall be as naturally occurs"	We believe that the ME DEP, based on the 3 years of water quality monitoring done in Chandler Bay by the Darling Center (UMaine), **agrees with us that the water in Chandler Bay meets the criteria for being classified as SA**.
"no direct discharge of pollutants"	There are currently no identified "direct discharge of pollutants" into this unique marine environment.

TABLE 2

DEP Stated Reasons for Denying Reclassification	Rebuttal
"SA waters are, as I said, defined as those that have sort of outstanding designation, outstanding national and natural	• There is no statutory requirement in Maine for SA waters ONLY to be associated with state or federal conservation plans. • Chandler Bay, as indicated above, does have significant ecological, social, scenic, and recreational importance.

<table>
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<td>resource. They have ecological social scenic or recreational importance.

In the state of Maine, the majority of class SA waters, or their coastlines are associated in the large portion of either state or federal conservation plans that lends them to recreational importance to those waters.

After evaluating Chandler Bay, we determined that this criteria is not met. Those waters are not adjacent to a large proportion of those, these protected waters or these protected lands."</td>
<td>• We believe that the DEP did not take into consideration the extent of protected and conserved lands in and adjacent to Chandler Bay, which inherently would be impacted to degradation of its current pristine water quality. Please refer to the document submitted separately by Kat Haltiner, Natural Resources Consultant, "Justification for Class SA Designation: Documentation of Chandler Bay as an Outstanding Natural Resource through Geographic, Conservation, and Public Use Analysis" which outlines the incredible extent of the conserved lands that are supported by the overall ecological integrity of Chandler Bay.

<table>
<tr><td>Total Acres (by GIS)</td><td>Within CBay 938.76 acres</td><td>Adjacent to CBay 1353.58 acres</td><td>2 miles from CBay 2877.28 acres</td></tr>
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<td>"We also examined the watershed draining to the bay determine there are a number of problematic land uses, including some development pressures and also some agriculture. For those reasons, our position is that Chandler Bay does not meet statutory requirements for an SA water."</td>
<td>We have struggled to identify the development pressures the DEP is referring to, as there are no indications of any significant development in the Chandler Bay area. We did note that there is some development proposed on the border of Addison and Jonesport that is a great distance from the Bay, which because of this distance should not be considered to be impinging on the Bay.

Additionally, we do not believe the agricultural drainage (also not clearly specified by the DEP) into the watershed should be considered as a factor for denying our petition, as it clearly is not impacting the water quality in the Bay as evidenced by the monitoring results documented by the Darling Center (UMaine).</td>
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<td>"We'll also note that there is a licensed discharge permit for kingfish Maine in Chandler Bay. Though the facility has not been constructed, it's an aquaculture facility and is not currently discharging the presence of this permitted discharge in the bay.
Also in our position is that that precludes from meeting the statutory definition of the class SA water where discharges are only limited discharges are allowed."</td>
<td>We do not agree that the Kingfish permit should have any standing in determining the quality of the Chandler Bay. The reasons for this are:
• Because construction has not started on the facility (or near operational capacity), AND Kingfish has publicly declared their US based operations are on hold: "In light of the further increased import tariffs, an unfavorable USD exchange rate, and elevated logistics costs, Kingfish has decided to pause commercial efforts of fresh yellowtail kingfish in the United States (US), despite the strong volume growth achieved over recent quarters. While we continue to view the US as a strategically important and attractive market, current conditions do not support profitable operations. We will closely monitor developments and reassess our commercial strategy once the economic environment improves." (See the attached: The Kingfish Company N.V. Group Interim Condensed Consolidated Financial Report)
• We also believe,--as evidenced by the attached letter acquired through FOIA--from the NATIONAL MARINE FISHERIES SERVICE GREATER ATLANTIC REGIONAL FISHERIES OFFICE, that in granting the initial permit ME DEP may not have been in full compliance with the requirements of the federal agency. This letter clearly documents the outstanding qualities of Chandler Bay, which make it suited for classification as SA. (See the attached document for the full letter.)</td>
</tr>
</table>

Final Statement
We are very grateful for the BEP's consideration of our petition to reclassify Chandler Bay. Before our conclusion, we would like to make the following comments, which concern minor details in this discussion:

- *We want to correct—and apologize for—a previous misrepresentation in the document we presented at the public review on 10/16/2025. We had included details that implied the town of Jonesport had not renewed the Kingfish permit, which evidently was sourced from expired information. We would like to amend our previously stated comment to say that the town* ***did*** *amend its Shoreland Zoning rules by granting Kingfish a change to the town ordinances (this occurred just prior to the expiration date of their initial permit) that extended the construction start deadline. Kingfish requested extension, and assertion by their lawyer, Mr. Kendall, was correct in this matter.*

- *However, we would like to state for the record that there are other things Mr. Kendall said that we believe were false representations. Unfortunately, since he arrived late and presented last, we were not given opportunity to rebut his positions during the review. For the record, we would like to state the following in response to his comments:*

  1. *Fundamentally, our request for reclassification is* ***NOT*** *about Kingfish. Our organization has over 30 years of demonstrated engagement and support of this specific, unique area of the Maine coast. Yes, we would have preferred that Kingfish had been more transparent and willing to work with those of us who care about the health of this bay, its surrounding environs, and the future of both the legacy fisheries and emerging sustainable aquaculture businesses in this area. We would have requested that the DEP consider the upgrade regardless of this project.*

  2. *Our organization has never argued that the water quality in Chandler Bay was low; quite the opposite. We took issue with the outdated modeling techniques Kingfish used in their permit application and with their assumptions about the quality, given that they had not yet employed state of- the-art sampling and water-quality monitoring. The Darling Center subsequently did appropriate water monitoring* ***after*** *Kingfish was granted the discharge permit. We have, throughout our almost 30-year history, prioritized scientific rigor and evidence, and we reject suggestions that we have not been consistent in our reviews, analysis, and requests for transparency from the Kingfish project.*

  3. *The DEP permit granted to Kingfish clearly states that, according to their analysis, Kingfish's operations would negatively impact water quality in Chander Bay. Mr. Kendall, Kingfish's lawyer, clearly knows this as he has been involved in—and included in—all discussions since EMCI has been aware of this project, although he very clearly denied his awareness in the meeting. See reference in* ***Appendix B*** *for quotations and links to the DEP permit.*

Finally, we reiterate a perspective on which we all agree: we care deeply about preserving the water quality of our unique corner of the Gulf of Maine and the legacy fisheries, local small aquaculture, and coastal communities it supports. There are a multitude of economic and climate pressures that communities dependent on our physical environment are facing, and we sometimes feel desperate to grasp at solutions. The one obvious solution is to strive to protect existing natural resources, ones that are proven to be of the highest quality, and to have significant value economically, socially, environmentally, and recreationally. More than almost any area in the state of Maine, Chandler Bay, deserves this classification. The future of our marine waters depends on choosing long-term stewardship over short-term convenience and recognizing that some places—like Chandler Bay—are simply too valuable to compromise.

- Clare Soria, Conservation Law Foundation (written comment)

Thank you for the opportunity to comment on Triennial Water Quality Standards Review for Chandler Bay's water quality reclassification proposal. Conservation law Foundation, Inc. ("CLF"), on behalf of its members, protects New England's environment for the benefit of all people. CLF's advocates use law, policy, economics, and science to design and implement strategies that conserve natural resources, protect public health, and promote vital communities in our region. CLF respectfully submits the following comments on the Triennial Water Quality Standards Review.

Maine Department of Environmental Protection ("Maine DEP") should reclassify Chandler Bay's waters from Class SB to Class SA for 3 reasons: 1) Chandler Bay meets the minimum requirements for Class SA classification, 2) Kingfish's permit cycle is almost over with no progress thus far, and 3) Kingfish Company is not using the best technology to prevent water quality degradation.

I. Chandler Bay is a Pristine Water Body that Supports Vital Ecosystems

Chandler Bay lies on the eastern coast of Downeast Maine, running six miles long and 2.5 miles wide. It is surrounded by the Roque Islands and Englishman Bay to the north, Great and Little Spruce Islands to the south, and Jonesport, Maine to its west. The Bay is home to over 3,300 species and is an Essential Fish Habitat (EFH), solidifying it as an integral part of these ecosystems, economies, and communities.[49]

The Kingfish Company's proposed land-based aquaculture project would lie on the coast of Chandler Bay and use its waters to power their operations. Without a fully RAS facility, this project would degrade the bay's water quality by discharging wastewater back into the environment.

II. Maine DEP Should Reclassify Chandler Bay to Class SA.

In its current state, Chandler Bay far exceeds the minimum required standard of Class SA water. According to Maine Water Quality Standards, if the water exceeds the minimum standards of the higher classification, the MEDEP must treat uphold the higher-class standards. Me. Rev. Stat. 38 § 464(4)(F)(4). Chandler Bay fulfils all the requirements that would make it a class SA water body, and it is the responsibility of the Maine DEP to ensure the Kingfish permit must reflect the current state of the water conditions.

A. Chandler Bay Meets SA Classification Standards

To be considered Class SA water, a marine body must have specific levels of dissolved oxygen and bacteria content. The levels of dissolved oxygen and bacteria content must be as it naturally occurs. As of 2025, Chandler Bay's water quality meets the standards for class SA waters. In the comments made by the Eastern Maine Conservation Initiative ("EMCI"), they found that "maximum chlorophyll a levels detected were approximately ¼ of established thresholds for ecological impacts (15 ug/l)" and the number of enterococcus bacteria never exceeded "a

[49] *National Oceanic and Atmospheric Administration, Atlantic Salmon EFH,* *https://www.habitat.noaa.gov/application/efhmapper/atlanticSalmonEFH.pdf (last visited Oct. 22, 2025).*

geometric mean of 8 CFU (Colony Forming Units) or MPN per 100 milliliters."[50] This data indicates that the water in Chandler Bay has been exceeding Class SA standards for at least the last 17 years.[51] Maine's standards for classification are very clear in that the water quality only needs to exceed the minimum standards of the next highest classification to warrant increased protection. Chandler Bay has demonstrated a long-recorded history of pristine water conditions, meeting Class SA standards. The Maine DEP must abide by the classification standards set by Maine's government and grant Chandler Bay a classification that is consistent with the data.

Kingfish further promises their operations will not degrade the quality of Chandler Bay's waters; however, the current permit allows them to discharge waste far outside of the antidegradation threshold. According to Maine DEP anti-degradation standards, nitrogen discharges that exceed "20% of the remaining assimilative capacity" result in lowering water quality levels.[52] The standards of both SA and SB water, no new discharges may be made that "may not cause adverse impact to estuarine and marine life", of which Kingfish's permit directly violates. Me. Rev. Stat. Ann. tit. 38, § 465-B.

B. Chandler Bay is an Important Area of Recreation

Chandler Bay remains an important part of Jonesport's economy and a prominent destination for recreation.

Jonesport has invested significant town funds into cultivating a safe and inviting environment at Chandler Bay. In 2012, the town bought Sandy River Beach to accommodate more people frequenting the bay, and they continue to have a thriving hotel and rental business near the beach. Locally, Chandler Bay is a popular boating location for residents where they often picnic, walk, and host their annual July 4th Lobster Boat Race.

Chandler Bay also remains a large pillar of the Jonesport economy – in 2022, 46,896 Lobster Traps were fished by local residents and in 2020, the town reported 12.76M pounds of Lobster fished that season.[53] In the Jonesport and Beals Local Economy Project 2022–2024, a reported 20% of Jonesport residents worked in a fishing or fishing-adjacent industry.[54]

Chandler Bay clearly holds significant social, scenic, economic, and recreational importance.

C. Chandler Bay Provides a Pristine Habitat to Important Species

Jonesport, Maine hosts many endangered and rare species in Chandler Bay. Within the waters of Chandler Bay, the Atlantic Salmon is one of Maine's endangered species.[55] Atlantic Salmon requires access to clean, cold water, and nitrogen-rich waters negatively impact salmon's

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[50] Maine Department of Environmental Protection, 2024-TR Upgrade EMCI Chandler Bay 3, https://www.maine.gov/dep/water/wqs/ProposalDocs/2024-2026/2024-TR_Upgrade_EMCI_ChandlerBay_.pdf (last visited Oct. 22, 2025).

[51] Id.

[52] Maine Department of Environmental Protection, ME0037559_2021 Final with Attachments, 20-25, https://www.maine.gov/dep/ftp/projects/kingfish/ME0037559_2021%20FINAL%20with%20attachments.pdf (last visited Oct. 22, 2025).

[53] Town of Jonesport, Comprehensive Plan Chapter E: Employment and Economy 2-7, https://www.townofjonesport.com/_cmsupl/cmp/chapter-e-employment-and-economy.pdf?1761148018 (last visited Oct. 22, 2025).

[54] Id.

[55] NOAA Fisheries, Atlantic Salmon, https://www.fisheries.noaa.gov/species/atlantic-salmon (last visited Oct. 22, 2025).

reproductive development. The Harlequinn Duck and Peregrine Falcon is a threatened species congregate along the coastline of Chandler Bay and depend on it for food and shelter.[56] Jonesport also supports Black Spruce Woodland and the Maritime Huckleberry Bog, both of which are classified as Rare/Exemplary Natural Community species.[57] Maine Water Quality Standards hold that discharge permits may only be issued if it does not "[impair] the viability of the existing population, including significant impairment to growth and reproduction."[58] Maine DEP has issued Kingfish a permit with a nitrogen effluent level of 6.6 mg/L which is 3 times the allowed amount.[59] USA EPA set the Total Nitrogen discharge limit at 2.1 mg/L to avoid water quality degradation.[60] The permit's limit was based on math that Kingfish themselves submitted, and the excess was reconciled with an exception due to the economic gain it would bring to Jonesport.[61] In a system that is not fully closed, the Maine DEP is allowing extremely nitrogenated water to enter Chandler Bay, which will disrupt the natural environment because excessive nitrogen in the waters creates hypoxic conditions. This type of environment leads to algae blooms, decreasing essential food supplies, and suffocating fish.[62]

Maintaining and supporting the presence of rare and endangered species in Chandler Bay should be Maine DEP's top priority as the agency's mission is to "preserve, improve, and prevent the diminution of the natural environment of the State." The additional damage that Kingfish's facility would cause to these ecosystems is severe. Maine DEP should not prevent the preservation of an outstanding natural resource to maintain a permit for a facility that has not even been built, further explained in Section III.

III. Kingfish's Status is Uncertain.

Kingfish's current permit licenses them to discharge certain pollutants into Chandler Bay for a five-year period.[63] Since Kingfish Company acquired their permit in 2021, they have not started their aquaculture project and show no current signs of starting. Kingfish's permit is set to expire in June 2026, which means they have gone nearly a whole permit cycle without using their permit, nor have they positively contributed to Maine's economy. In their 2025 report released in September, Kingfish reported that "current conditions do not support profitable operations" due to increased import tariffs, an unfavorable USD exchange rate, and elevated logistics costs.[64] They

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[56] Town of Jonesport, Comprehensive Plan Chapter L: Natural Resources, https://www.townofjonesport.com/_cmsupl/cmp/chapter-l-natural-resources.pdf?1719725387(last visited Oct. 22, 2025). Town of Jonesport, Comprehensive Plan, https://www.townofjonesport.com/comprehensive-plan/ (last visited Oct. 22, 2025).
[57] Maine Department of Inland Fisheries and Wildlife, Special Concern Species: Fish, https://www.maine.gov/ifw/fish-wildlife/wildlife/endangered-threatened-species/special-concern.html(last visited Oct. 22, 2025).
[58] Me. Rev. Stat. Ann. tit. 38, § 465-1-A(a)(i).
[59] Maine Department of Environmental Protection, ME0037559_2021 Final with Attachments 20-25, https://www.maine.gov/dep/ftp/projects/kingfish/ME0037559_2021%20FINAL%20with%20attachments.pdf(last visited Oct. 22, 2025).
[60] Id. At 18.
[61] Id. At 25.
[62] Environmental Protection Agency, Basic Information About Nutrient Pollution, https://www.epa.gov/nutrientpollution/basic-information-nutrient-pollution(last visited Oct. 22, 2025).
[63] Environmental Protection Agency, Final Permit ME0037559, https://www3.epa.gov/region1/npdes/permits/2021/finalme0037559permit.pdf (last visited Oct. 22, 2025).
[64] The Kingfish Company, First Half Year 2025 Financial Results,

have since decided to scale back commercial activities in the US. Additionally, in August 2025, the CEO of The Kingfish Company announced his retirement for the end of 2025.[65] Maine DEP must consider the likelihood of Kingfish continuing to pursue such a large project with significant economic hurdles and impeding internal changes. Chandler Bay cannot be left waiting for a company without a stake in Maine and a project without a timeline.

IV. Fully Recirculating Systems Allow Both Economic Development and Natural Preservation

Despite Kingfish's claims, they do not have a fully reticulating aquaculture system (RAS). In the Kingfish permit, they are allowed 28.7 MGD of daily maximum flow.[66] A facility cannot be a fully RAS if there is discharge into the bay.

There are systems in the US that successfully made their systems fully, if not very nearly, RAS. Superior Fresh – a land-based aquaculture facility in Wisconsin – made their system 99.9% closed through a mixture of cleaning mechanisms and an incorporated hybrid farm and aquaponics system.[67] They turn the nitrogenated wastewater into compost, which is used to fertilize plants around their facility. Superior Fresh is able to recycle the nutrients instead of dumping them, creating a sustainable system that is economically beneficial

Superior Fresh provides clear evidence that Kingfish is not using the best technology and is not doing its due diligence to preserve the environment it wants to build on. It also proves that a closed system is possible in the US. If Kingfish is able to replicate this process, MEDEP could continue to reap the economic benefits of new employment while simultaneously protecting the integrity of Chandler Bay.

However, if a fully closed system is unattainable for Kingfish, it is Maine DEP's responsibility to terminate their lease and protect Chandler Bay.

V. Conclusion

Chandler Bay exceeds all requirements set by Maine's government and should immediately be reclassified as Class SA waters. The current quality of Chandler Bay's water and its value to the ecosystems and local community far outweigh any economic benefit the state could reap from this partnership. For these reasons, Chandler Bay should be reclassified as Class SA waters.

- Harry Fish, Town of Jonesport Select Board (written comment)

I support the DEP's decision to NOT reclassify Chandler Bay from SB to SA waters.

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https://thekingfishcompany.com/news/first-half-year-2025-financial-results/ (last visited Oct. 22, 2025).

[65] The Kingfish Company, The Kingfish Company Announces CEO Retirement Effective Year End, https://thekingfishcompany.com/news/the-kingfish-company-announces-ceo-retirement-effective-year-end/ (last visited Oct. 22, 2025).

[66] Maine Department of Environmental Protection, ME0037559_2021 Final with Attachments, https://www.maine.gov/dep/ftp/projects/kingfish/ME0037559_2021%20FINAL%20with%20attachments.pdf (last visited Oct. 22, 2025).

[67] Superior Fresh, Our Farm, https://www.superiorfresh.com/our-farm(last visited Oct. 22, 2025).

First, as the DEP's review of the reclassification request has already pointed out, Chandler Bay can't be reclassified because an NPDES permit has already been issued to Kingfish Maine. The existence of this permit disqualifies the bay from reclassification.

Second, any reclassification of Chandler Bay risks serious harm to our local economy:

- *By potentially banning everything from stormwater runoff to snowmelt, nutrient or pesticide leaching from farms or blueberry fields—even something as basic as tossing old bait overboard or rinsing fishing equipment—reclassification would have a significant impact on commercial, agricultural, and municipal activities around the bay.*
- *In addition, future residential, agricultural, commercial, or industrial projects would have to be barred if there's any potential for spillage or runoff, no matter how minor or innocuous. Except for short-term storm runoff during construction, no discharge is allowed in waterways that are classified SA.*
-

Third, Chandler Bay is a source of livelihood for hundreds of people who live on and near its shores. I've grown up here and have sailed the bay for more than sixty years among neighbors who fish for lobster, drag for scallops or mussels, fish for menhaden or alewives, net glass eels, raise salmon, dig for clams, and harvest seaweed. Ever since Native tribes began to fish, farm, and hunt in this area, down through the decades since it was settled by colonists in the mid-1700s, Chandler Bay has been a vital resource for the people who live here.

In summary, Chandler Bay doesn't—and should not—qualify as SA waters, not just because of the Kingfish permit, but also because of the negative impact of reclassification on a great number of vital activities.

As I understand it, SA classification is reserved for waters that are conspicuous for outstanding natural resources. Waters with this classification are usually found near conservation lands or parks with little to no commercial or industrial activity. SA classification simply doesn't fit active working waters like Chandler Bay.

- Matthew Cannon, Sierra Club (written comment)

Chandler Bay
The water classification system "is used to direct the State in the management of its surface waters, protect the quality of those waters for the purposes intended by the Legislature, and where standards are not achieved, restore the quality to achieve those purposes." (p. 4) Per the Clean Water Act, "the classification standards establish designated uses, related characteristics of those uses, the criteria necessary to protect those uses, and an antidegradation policy." (p. 4)

DEP explicitly states that the standards are intended to provide an antidegradation policy; degrading water quality is inherently in opposition to that stated goal. Maine has an opportunity to be a leader in both improving water quality and allowing for beneficial industries, yet this review seems to concede as inevitable a regression in water quality classification for Chandler Bay.

DEP admits in the analysis "Chandler Bay is an important ecosystem to protect in eastern Maine and an upgrade to Class SA would have a very beneficial effect on the immediate marine *environment and the communities that surround it." (p. 17) However, it bases its decision not to upgrade Chandler Bay due to the existing Kingfish permit. DEP says:*

"Based on the current status of the wastewater discharge permit held by Kingfish Maine, Chandler Bay does not meet statutory requirements in 38 M.R.S. Section 465-B.1.C stating there may be no direct discharges of pollutants to Class SA waters except for in certain cases. Therefore, the Department does not recommend that Chandler Bay be upgraded at this time." (p. 17)

But state statute is very clear in stating:

*"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. Pursuant to subsection 3, paragraph B, the board **shall** recommend to the Legislature that that water be reclassified in the next higher classification." 38 M.R.S. § 464(4)(F)(4) (emphasis added).*

Chandler Bay seems to have water quality that exceeds SA standards and it meets statute's qualification for outstanding ecological importance due to high water quality, abundance of eelgrass, and designation as an essential fish habitat by NOAA, among other reasons. as defined in 38 M.R.S. §§ 465- B.1.[68] The rationale provided by DEP in this triennial review for not upgrading is only focused on the granted permit for Kingfish to discharge, not the current minimum standards being met for reclassification. We think the Board has to recommend to the Legislature that Chandler Bay be upgraded.

***The words 'must' and 'shall' have legal meaning. DEP has acknowledged the current water quality could meet SA designations, currently. A project not yet built, though permitted, does not obviate DEP's legal responsibility to upgrade water quality in Chandler Bay.** We tried to interject in these permit proceedings to make the point that Kingfish should be a fully recirculating project, one with no discharge. That allows for economic development and protects our water. But, that did not occur, and now we are left knowing that the water quality classification could and should be higher, were it not for a permit granted to Kingfish. With nothing being built yet, there is still an opportunity to revise the permit.*

Per Kingfish's MEPDES permit, DEP can change limitations based on new information:

*L. REOPENING OF PERMIT FOR MODIFICATION In accordance with 38 M.R.S. § 414-A(5) and upon evaluation of the test results from tests required in the Special Conditions of this permit, new site specific information, or any other pertinent test results or information obtained during the term of this permit, the Department may, at any time and with notice to the permittee, modify this permit to: (1) include effluent limits necessary to control specific pollutants or whole effluent toxicity where there is a reasonable potential that the effluent may cause water quality criteria to be exceeded ; (2) require additional monitoring if results on file are inconclusive; or (3) **change monitoring requirements or limitations based on new information.** (emphasis added)[69]*

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[68] https://www.maine.gov/dep/water/wqs/ProposalDocs/2024-2026/2024-TR_Upgrade_EMCI_ChandlerBay_.pdf, page 3.
[69] https://www.maine.gov/dep/ftp/projects/kingfish/ME0037559_2021%20FINAL%20with%20attachments.pdf

We hope that DEP will upgrade the classification of water quality in Chandler Bay, and further consider revision of the Kingfish aquaculture permit in light of the real risks it poses to the health of Maine's waters.

We appreciate your consideration of our comments. Most importantly, we want to make sure we are supporting DEP. We believe the DEP needs more resources to fulfill its mandate to the people of Maine and to our natural environment, and hope to support any requests to the Legislature that close gaps in capacity.

- Adrian Kendall, Norman, Hanson, and DeTroy (on behalf of Kingfish Maine) (public hearing comment)

Good afternoon. Adrian Kendall of Norman, Hanson and DeTroy. I'm here on behalf of my client Kingfish Maine, which I've represented since 2019 when the project first started. Kingfish Maine is the owner of property located in Jonesport, 92 acres that is on Chandler Bay directly across from Roque Island. We are fully permitted. There was some discussion and noted in the part of the record that one of our permits might have expired. That's not correct. We are fully permitted. All permits are valid. That includes an array of permits from the state -- I mean, DEP and other submerged land leases, U.S. Army Corps of Engineers as well as permits issued by the town of Jonesport under their shoreland zoning and land use development ordinance.

I wrote down that I'm here neither for nor against because I'm here for the recommendation of DEP staff and we do oppose the proposed reclassification of Chandler Bay from SB to SA. We are in full agreement with staff with respect to the legal standard not having been met under the -- under the statute that this is not -- as beautiful as it is and as great as the water quality is, this is not an outstanding national resource and we share the concerns voiced by at least one of the Board members with respect to the land in the area and also by staff, of course, that the upland is not subject to adequate conservation. And in addition to our discharge permit, which its correct it's not active at this point, but there is another discharge permit further up, I think it was Beaver Brook was the mention of the watershed that affects and drains into Chandler Bay as well.

With respect to -- so that's simply pointed there is clearly a connection between the land use and water quality contrary to what might have been suggested by Dr. Krumholz. We're quite familiar with Dr. Krumholz and the Eastern Maine Conservation Initiative. We've been through years of permitting and his testimony featured before the town planning board on a variety of issues. There is -- you'll forgive me if I note an irony that during that entire process the claim was that the water quality was not adequate to support the limited capacity of the nitrogen due to a potential claimed eel grass issue and which -- and they were trying to discredit our data that showed the high quality of the water. We're here because of the high quality of the water naturally and to threaten that would be entirely contrary to our own interests, but so this philosophical discussion, you'll forgive me if I don't quite buy into that. The notion that now it's so high it's deserving of SA classification is a remarkable pivot, but it's not supported by the standards that are applicable and as staff has duly noted.

I would also just note that implicit there seems to be the position seem to be that SB somehow offers no protection and that, of course, is not the case. We've worked very closely with Commissioner Loyzim's staff and they've put us through a very rigorous honest process of analysis of holding us to the very high standards that are applicable to SB, not just in terms of the monitoring that's occurring now, which by the way Kingfish is entirely funding and momentarily added two additional testing points at the request of the municipality because of concerns from *the community and they -- this is -- it's always interesting where local lore and scientific knowledge mix and so the lobstermen said, hey, you know, we'd like a couple of extra ones, would you put in some in these locations and they actually sat there in the planning board hearing, I had Navionics on my phone and they spotted and we got the lat and longs and we put them in and we agreed to those. We would have happily added more had they been requested, but they were not.*

But so what we have here though is there is a regime in place for protection for maintaining the very high quality standard of water. It is -- right now it's monitoring without discharges by us. As it goes forward there will be continued monitoring and continued review of the standards to which we're being held on a variety of reams of pages of standards for various – for various effluent standards and reporting and action and so on. So this notion that -- that the suggestion that this – that life is at stake is just not true and is hyperbole to serve a purpose that we would suggest is not actually limited to protecting the bay, but is directed specifically at trying to further the interests to stop this project moving forward. I also want to address this notion that somehow because we haven't been able to -- we're not operational yet, we're not discharging and that renders our -- our position and our interests after these many years of working very hard with the community, which by the way overwhelmingly supports the project, that it's somehow invalid when, in fact, the entire strategy has been to oppose and now delay the project. We cannot responsibly go forward and start digging while any aspect of it is in question. We can't -- it just simply is not plausible for a project of this size, dimension, and importance to place that type of investment at risk until this is fully and finally resolved and that means addressed by the Legislature as was outlined at the outset by the Commissioner. So that's where we sit. We do think that -- we do value the bay, we do value the quality of it. This notion that it should have been classified long ago though, again, we're here because of Kingfish. There is a reason why it was -- there was mention of Fisherman's Bay, similar characteristics, quality, they're not here to protect that. Machias Bay, same thing. This is all about Kingfish and stopping this particular project. But unfortunately, and I think this was perhaps touched on by Mr. Duchesne and others, that that would come at a much larger cost and that is impeding economic opportunity within Washington County within the area of Jonesport, Jonesboro and other areas because there was also discussion of a buffer zone. If you establish this then there are also buffer zones around it, so it's larger than simply the area of the water body that we're talking about and that's simply not fair.

This notion -- I also need to make one additional point where it said that -- that where Miss Fischer stated that the -- this is about a heritage -- that she's here to protect a heritage industry and that fishermen and their families, they don't want to come clean tanks and that's clearly a reference to Kingfish. We -- as a land-based aquaculture culture facility, we grow fish in tanks on land and then filter, treat the water as it comes in and as it's discharged. I can tell you at every meeting that we had at the town of Jonesport we've been approached and asked when are we taking applications. This is about economic opportunity that isn't susceptible to the climate change issues that have already been touched on that we all face and are very dire that offer benefits and predictable wages and other -- and then a ripple effect within the community and help preserve and create opportunities so that families can stay in this area.

And I should mention I am on the Board of the MRDA, Maine Rural Development Authority, and economic development is a passion of mine not because I'm pro business but because of the opportunities that we so critically need in rural parts of this state to preserve that way of life. You can't do it on, you know, if you're just turning down beds on Airbnbs, you know, that's not sustainable. We need real jobs and we need sustainability opportunity.

Retaining the SB classification strikes that reasonable balance between responsible opportunity and responsible use of a pristine and wonderful natural resource. And I'm happy to take any questions.

MDEP Response:

The Department appreciates the support expressed for this upgrade proposal and acknowledges the concerns voiced by commenters opposing the upgrade. The Department also appreciates the additional documentation and analyses submitted by several commenters in support of the upgrade proposal. The key points raised by supporters were addressed by the Department in prior public documents, including the Responses to Comments available for the May 28 through June 30, 2025, public comment period and the draft revised Triennial Review recommendations that were available for public comment between August 28 and October 22, 2025. Information is also included in the final Board recommendations,[70] dated December 18, 2025. In the interest of brevity, readers are referred to those documents for a complete response.

According to Maine statute (38 M.R.S. § 465-B(1), Class SA waters are considered “outstanding natural resources and which should be preserved because of their ecological, social, scenic, economic or recreational importance.” Class SA criteria include “natural” habitat and aquatic life "as naturally occurs" (38 M.R.S. § 465-B(1)(A) and (B)). Additionally, in accordance with 38 M.R.S. § 464(4)(F)(2), all Class SA waters are considered outstanding national resources unless otherwise specified under Section 469. This highest estuarine and marine water classification is reserved for Maine’s most pristine waterbodies.

As one metric to determine Chandler Bay’s eligibility for the Class SA designation, the Department compared the amount and type of conserved coastline in Chandler Bay to the conserved coastline typical of most SA waters. As detailed in the draft revised Triennial Review recommendations, most Class SA waters share a significant portion of coastline with State and Federal conservation lands compared to Class SB and Class SC waters, while a few are associated with longstanding private preserves or other small preserves, lending significant scenic and recreational importance to these waters. A high percentage of conserved lands supports the current and future likelihood of those waters meeting Class SA statutory requirements. Chandler Bay, like much of Maine’s coastline, is adjacent to a variety of coastal conserved lands. However, Maine’s SA waters share a total of 80% of their coastline with conservation lands, while the amount of Chandler Bay’s coastline adjacent to any type of conservation land is much smaller (20.7%). Additionally, the amount of Chandler Bay’s coastline adjacent to State and Federal conservation lands, specifically 0.9%, is also much smaller than the percent of State and Federal coastline associated with Class SA waters (59%).

Commenters noted the presence of Essential Fish Habitat (EFH) for many species of finfish and shellfish in Chandler Bay, the designation of the Bay as a Habitat Area of Particular Concern (HAPC) for juvenile Atlantic cod, and its designation as EFH for endangered Atlantic salmon to support the position that Chandler Bay should be considered as an “outstanding natural resource” water under the Class SA designation. The Department recognizes that Chandler Bay provides essential habitat for a number of important marine species; however, many of Maine’s marine and estuarine waters provide these critical habitats. For example, 100% of Maine’s coastline is designated as EFH for at least one finfish or shellfish species and as a HAPC for juvenile Atlantic

[70] Available on the Board’s web page www.maine.gov/dep/bep/index.html.

cod. Of the 16 species of finfish and shellfish found in Chandler Bay,[71] 14 have EFH for at least one life stage in more than 50% of all Maine marine waters and seven species are found in greater than 90% of all Maine waters. Additionally, over 60% of Maine's marine waters are considered as an HAPC for Atlantic salmon. The Department's position is that waters do not meet statutory requirements for Class SA waters solely based on the presence of these critical habitats.

In addition to needing to reach the high bar to be considered an "outstanding natural resource" water, there can be no direct discharges of pollutants to Class SA waters, with specifically delineated exceptions that are not presently relevant to Chandler Bay. *See* 38 M.R.S. § 465-B(1)(C). Based on the current status of the wastewater discharge license and Maine Pollutant Discharge Elimination System permit held by Kingfish Maine to construct and operate a land-based aquaculture facility that would discharge to Chandler Bay, Chandler Bay is not compatible with statutory requirements for Class SA waters. If the Board chooses to recommend an upgrade for Chandler Bay to Class SA, such an upgrade would cause a conflict with the existing permit.

For these reasons, the Department's position remains that Chandler Bay does not meet statutory requirements for an upgrade to Class SA.

[71] The Department's analysis includes only species found in the Chandler Bay polygon proposed for upgrade, not those found in surrounding waters.

Appendix A: Supporting Material Submitted with Comments

Sandy River and Tributaries; Temple Stream and Tributaries

- Luke Frankel, Natural Resources Council of Maine (NRCM)

Supporting information submitted with Sandy River and tributaries upgrade comment (page 21) and Temple Stream and tributaries upgrade comment (page 24) above.

Appendix A: Map of DEP Water Quality Monitoring Stations

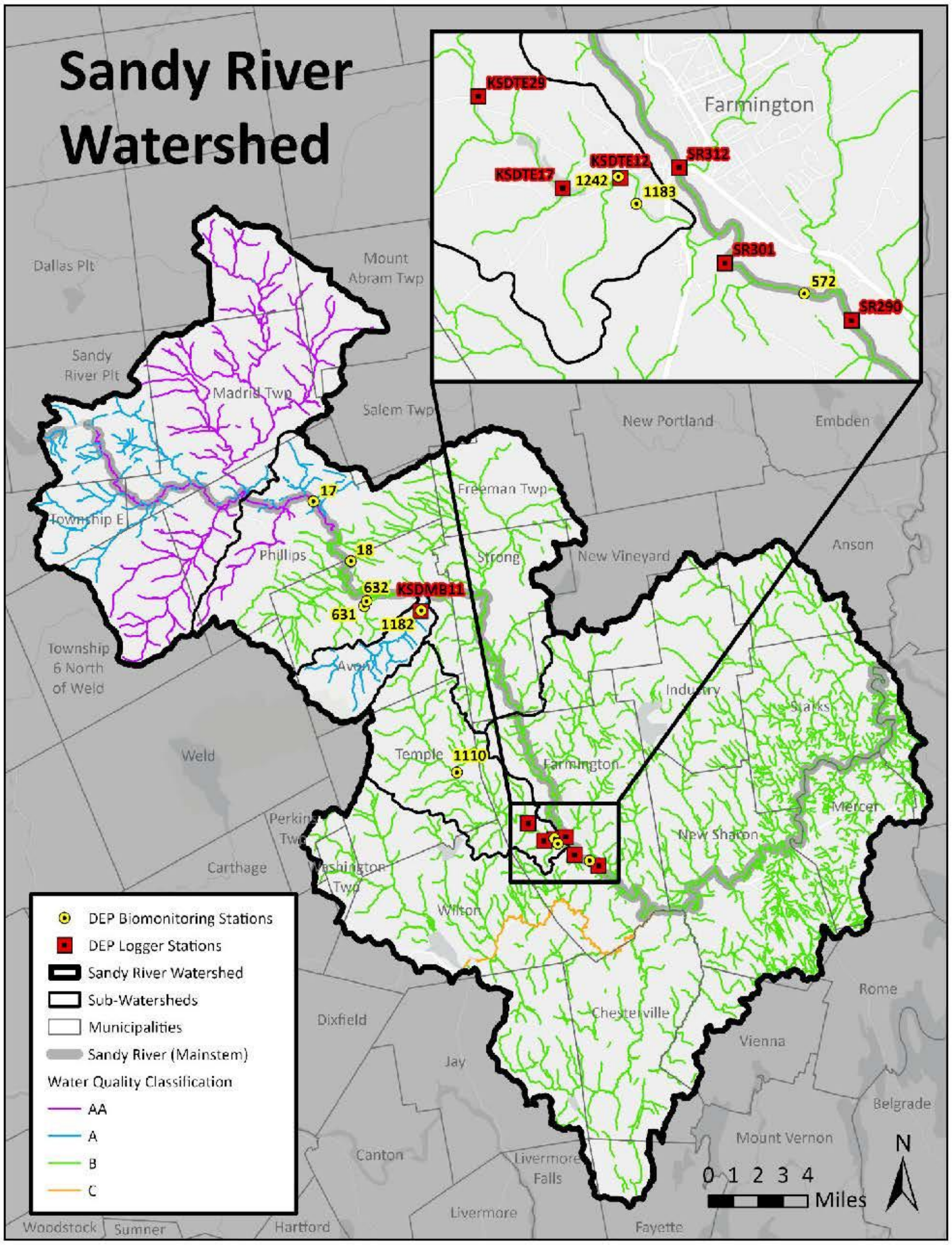

Figure A-1. Map of select DEP water quality monitoring stations in the Sandy River watershed.

7

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Appendix B: Water Quality Data for the Sandy River from Phillips to Farmington and Adjacent Segments

8

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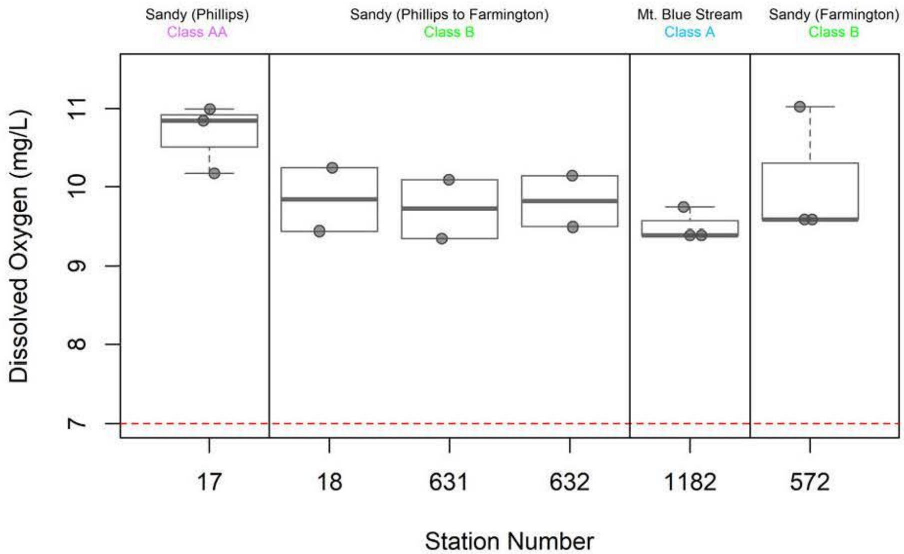

Figure B-1. Boxplots of dissolved oxygen concentrations within the Sandy River watershed collected from 2017-2022 by station, with horizontal lines indicating median values, boxes indicating the middle 50%, whiskers indicating the range, and points indicating individual values.

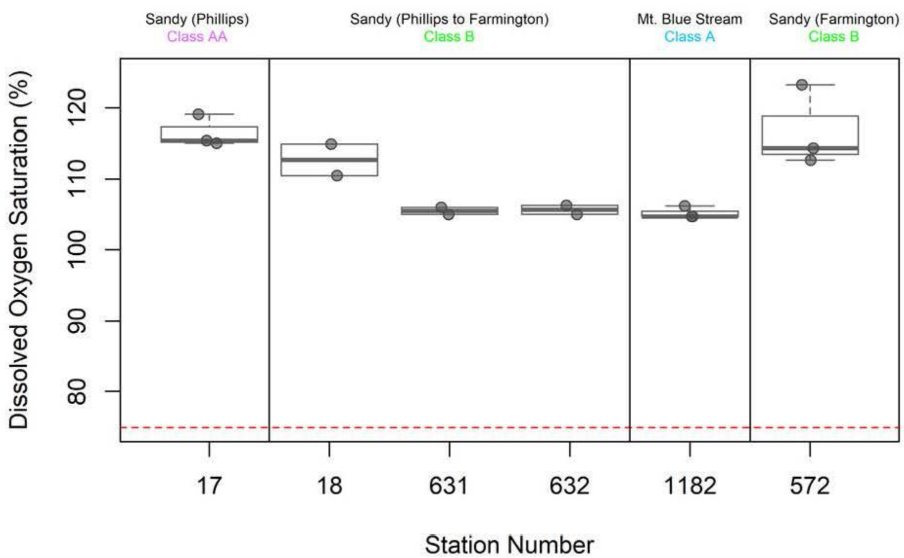

Figure B-2. Boxplots of dissolved oxygen saturations within the Sandy River watershed collected from 2017-2022 by station, with horizontal lines indicating median values, boxes indicating the middle 50%, whiskers indicating the range, and points indicating individual values.

9

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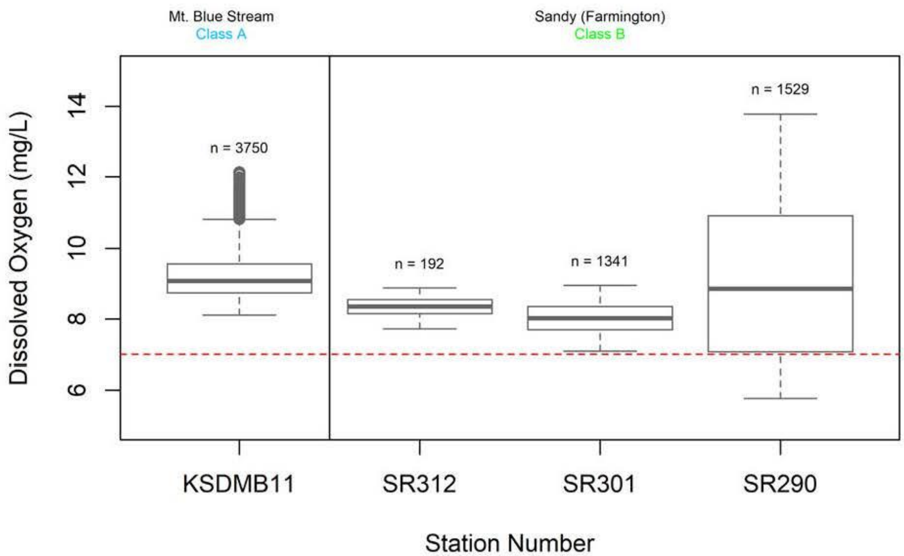

Figure B-3. Boxplots of dissolved oxygen concentrations collected via loggers within the Sandy River watershed from 2015-2020 by station, with horizontal lines indicating median values, boxes indicating the middle 50%, whiskers indicating the range, and points indicating outliers.

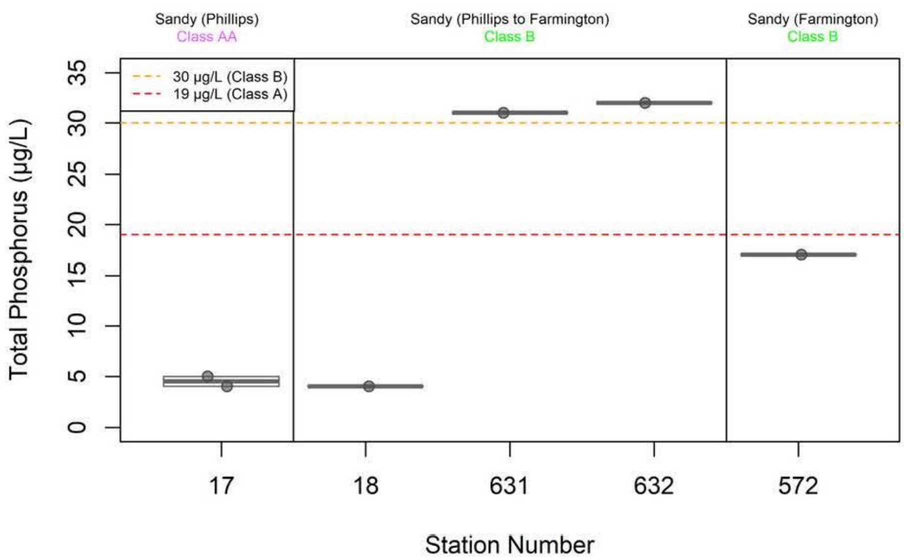

Figure B-4. Boxplots of total phosphorus concentrations within the Sandy River watershed collected from 2017-2022 by station, with horizontal lines indicating median values, boxes indicating the middle 50%, whiskers indicating the range, and points indicating individual values.

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Appendix C: Water Quality Data for Temple Stream

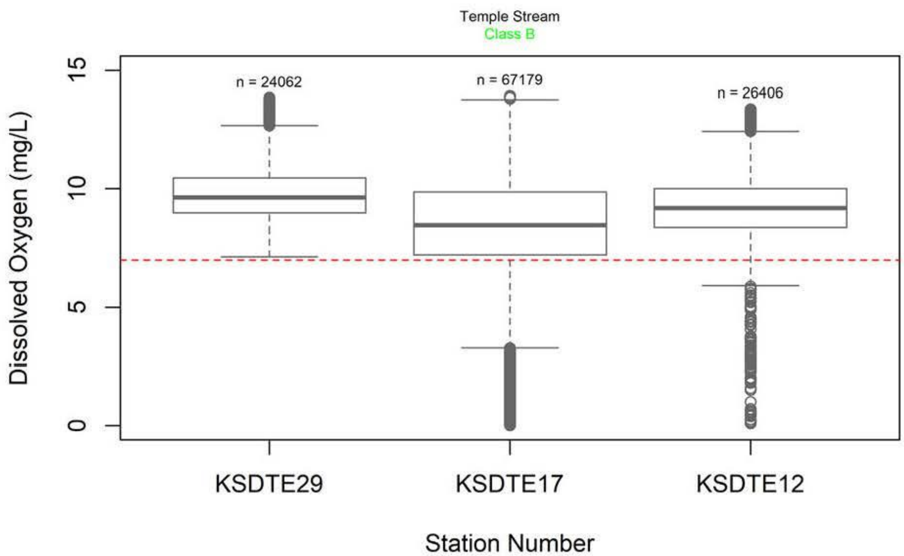

Figure C-1. Boxplots of dissolved oxygen concentrations collected via loggers within the Temple Stream watershed from 2021-2023 by station, with horizontal lines indicating median values, boxes indicating the middle 50%, whiskers indicating the range, and points indicating outliers.

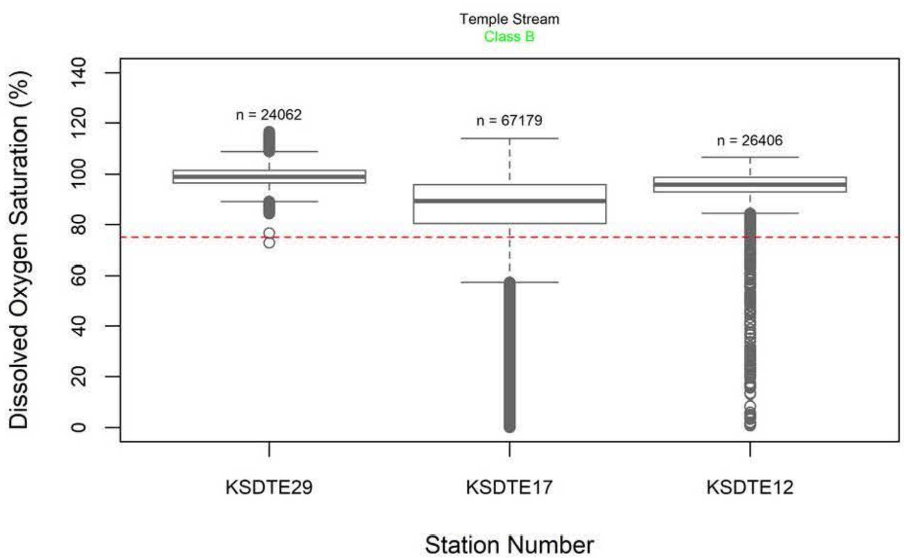

Figure C-2. Boxplots of dissolved oxygen saturation collected via loggers within the Temple Stream watershed from 2021-2023 by station, with horizontal lines indicating median values, boxes indicating the middle 50%, whiskers indicating the range, and points indicating outliers.

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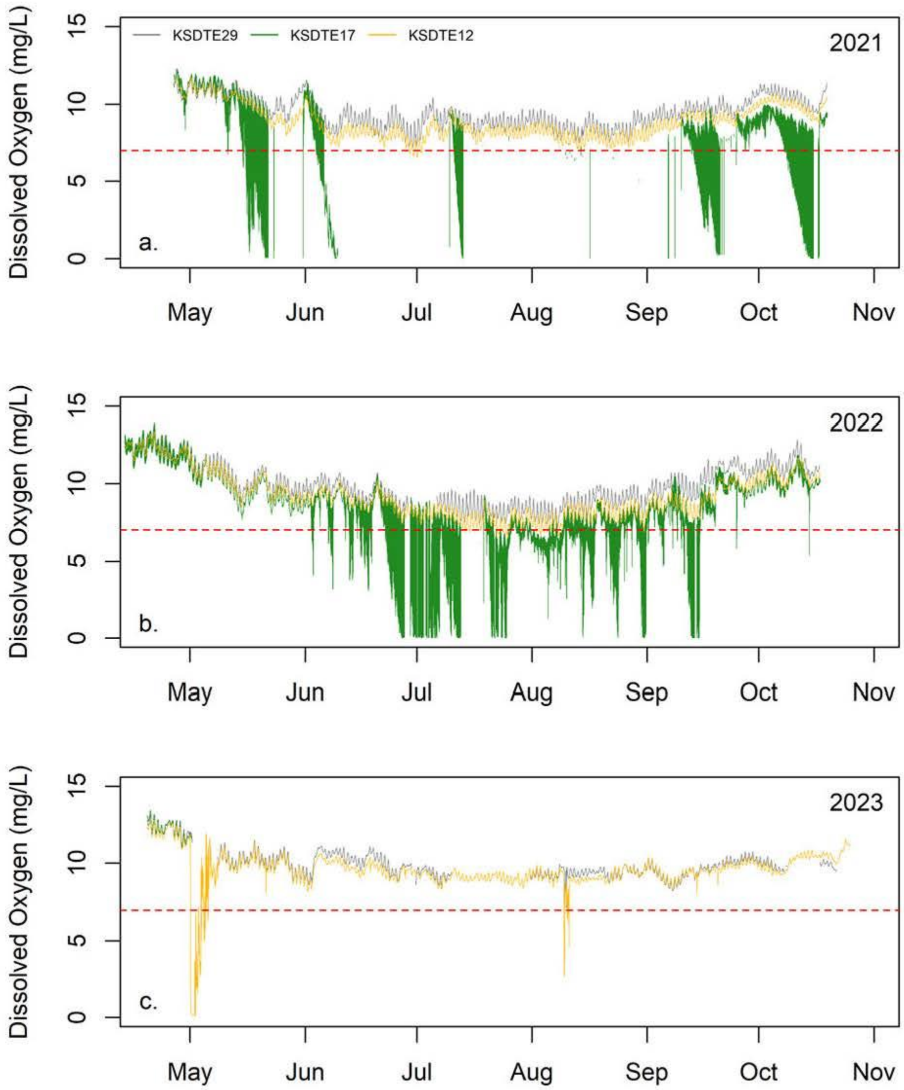

Figure C-3. Timeseries of dissolved oxygen concentrations collected via loggers at three stations (KSDTE29, KSDTE17, KSDTE12) within the Temple Stream watershed in (a) 2021, (b) 2022, and (c) 2023.

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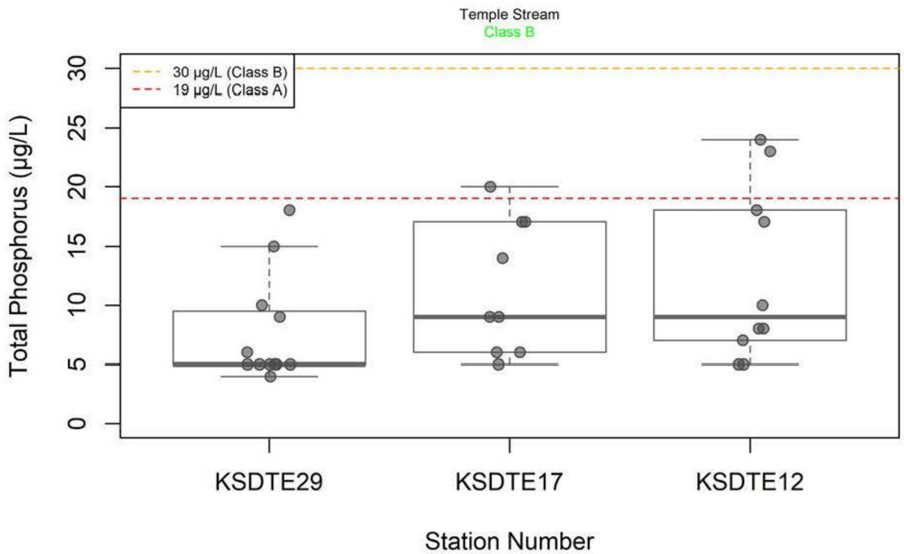

Figure C-4. Boxplots of total phosphorus concentrations within the Temple Stream watershed collected from 2021-2023 by station, with horizontal lines indicating median values, boxes indicating the middle 50%, whiskers indicating the range, and points indicating individual values.

Lower Androscoggin River

- Nate Libby, City of Lewiston

Resolve submitted with lower Androscoggin River upgrade comment on page 27 above.

LEWISTON ME

City Clerk

CERTIFICATION OF CITY COUNCIL ACTION

I, Kathleen M. Montejo, City Clerk of Lewiston, Maine, do hereby certify that the following action was taken by the Lewiston City Council at a public meeting of the City Council, held on Tuesday, June 17, 2025:

RESOLVE, EXPRESSION OF SUPPORT FOR RECLASSIFICATION OF THE ANDROSCOGGIN RIVER FROM GULF ISLAND POND TO WORUMBO DAM IN LISBON FALLS FROM CLASS C TO CLASS B

VOTE (166-2025)

Motion by Councilor Chittim, seconded by Councilor Nagine:

To adopt the Resolve, Expression of support for reclassification of the Androscoggin River from Gulf Island Pond to Worumbo Dam in Lisbon Falls from Class C to Class B:

Whereas, the Maine Department of Environmental Protection (DEP) is conducting its Triennial Review of Maine's Water Quality Standards; and

Whereas, they are receiving comments currently and will review those comments at their Triennial Review Public Meeting on June 23, 2025; and

Whereas, Maine's water quality standards describe what uses, such as recreation or fishing, are appropriate for which waterbodies, and which criteria and antidegradation measures are in place to protect those uses; and

Whereas, the federal Clean Water Act, which requires such state reviews, was authored by Rumford native and Bates College graduate Senator Ed Muskie, who was inspired to enact the landmark legislation having grown up near the Androscoggin River during a period of extreme pollution and degraded water quality; and

Whereas, significant progress has been made since the passage of the Clean Water Act to reduce pollution from runoff and discharge, increase flow, and improve river water quality for the benefit of wildlife, residents, recreation, and overall image and economic development efforts; and

Whereas, the Androscoggin River Watershed Council, through its volunteer water quality sampling program, has over a period of several years produced evidence that the Androscoggin River water quality at Gulf Island Pond meets class B requirements; and

27 Pine Street, Lewiston, ME 04240 PHONE: (207) 513-3124 cityclerkoffice@lewistonmaine.gov LewistonMaine.gov

Whereas, the City Council desires to improve the attractiveness, accessibility, environmental conditions, recreational opportunities, and the overall quality of Lewiston's historic riverfront;

Now, therefore, be it resolved by the City Council of the City of Lewiston, this expression of support for reclassification of the Androscoggin River from Gulf Island Pond to Worumbo Dam in Lisbon Falls from Class C to Class B is adopted, and further directs the City Administrator or their designee to submit a letter of support and supporting documentation to Maine DEP as part of its triannual review of water quality.

Passed - Vote 7-0

ATTEST:

Kathleen M. Montejo

Kathleen M. Montejo, City Clerk

June 23, 2025
Date

27 Pine Street, Lewiston, ME 04240 PHONE: (207) 513-3124 cityclerkoffice@lewistonmaine.gov LewistonMaine.g

- Ferg Lea, Androscoggin River Watershed Council (ARWC)

Data summary submitted with lower Androscoggin River upgrade comment on page 30 above.

Attachment A

Turner Center Bridge data

- In 2021
    - Dissolved oxygen fell below 7.0 mg/l on approximately 26 days
    - Dissolved oxygen never fell below 6.2 mg/l.
    - Only two days had readings below 6.3 mg/l
    - Of 2,803 readings, only 258 were below 7.0 mg/l (9.2%)
    - Only 31 (1.1%) were below 6.5 mg/l.
    - Very few days exhibited readings below 6.9 mg/l for long periods during the day.

- In 2022
    - Dissolved oxygen fell below 7.0 on 11 days.
    - Dissolved oxygen did not fall below 6.3 mg/l.
    - Of 2925 readings, only 103 (3.5%) fell below 7.0 mg/l

- In 2023
    - No readings fell below 7.0 mg/l.

The analysis at the Deep Hole in Gulf Island Pond is more complicated by the stratification that occurs at low flows and high temperatures. We have considered the readings from the 13-meter depth to the surface. The depth of thermal stratification and topographic stratification vary slightly and are dependent on flows. At higher flows, mixing becomes almost complete in the Deep Hole. We selected 13 meters as the depth at which the stratification occurs under low flow conditions. (DEP has additional information on the stratification based on flow and temperature). Some highlights of our analysis follow.

Gulf Island Pond data

- In 2015, only two (2) of 18,875 total readings above 14 meters were 6.9 mg/l and all other readings were 7.0 mg/l or higher.

- In 2016, again, only two (2) readings of 19,018 were below 7.0 at 6.6 and 6.8 mg/l.

- In 2017, water quality was not nearly as good as in any other year.
    - Of 18,835 readings above 14 meters, 230 (1.2%) were from 5.2 to 5.9 mg/l.
    - Of the total above 14 meters, 16.7% were below 7 mg/l.
    - From review of graphs of monthly average discharges for the two mills in Maine, the total BOD5 load from mills probably increased by 30% from the previous year.

- For 2018, dissolved oxygen levels improved significantly but was the second worse year for dissolved oxygen readings since 2015.
    - Only 2 readings were below 6.0 mg/l at 5.9 mg/l.
    - Approximately 9.7% of dissolved oxygen readings were below 7.0mg/l.
    - Total discharges from the mills appear similar to 2017.

- In 2019 the dissolved oxygen concentrations improved remarkably.
    - Only one reading at the 13-meter depth was 5.9 mg/l.
    - The percent from 6.0 to 6.9 mg/l dropped to 2.2% or 419 readings out of 18,674.
    - All readings above 12 meters were 7.0 mg/l or greater.

- In 2020
    - One reading at 13 meters was 5.9 mg/l with all other readings at 6.0 mg/l or above.
    - A total of 765 readings out of 18,849 or 4.1% were below 7 mg/l.

- In 2021
    - One reading at 13 meters was 5.9 mg/l and all other readings were 6.0 mg/l or above.
    - Of the readings at 13 meters, 12.5% were below 7.0 mg/l.
    - In the column from 13 meters to the top,3.1 % of readings were between 6.0 and 7.0 mg/l
    - Discharges appeared to be lower than in the previous year.

- In 2022
    - No dissolved oxygen readings below 7.0 mg/l occurred from the 12 meter depth to the surface.
    - Out of 19,003readings only 397 (2.1%) in the 13 meter depth profile were between 6.1 and 6.9 mg/lwith approximately 28% falling below 6.9.
    - At the 13 meter depth, 21 days were below 7.0 mg/l

- In 2023
    - No dissolved oxygen readings below 7.0 mg/l occurred from the 12 meter depth to the surface.
    - Out of 19,018 readings only 858 (4.5%) in the 13 meter depth profile were between 6.1 and 6.9 mg/lwith only 12.7% falling below 6.9 mg/l.
    - At the 13 meter depth, 17 days were below 7.0 mg/l

- Ed Friedman, Friends of Merrymeeting Bay (FOMB)

Data summary and supporting information submitted with lower Androscoggin River upgrade comment on page 31 above.

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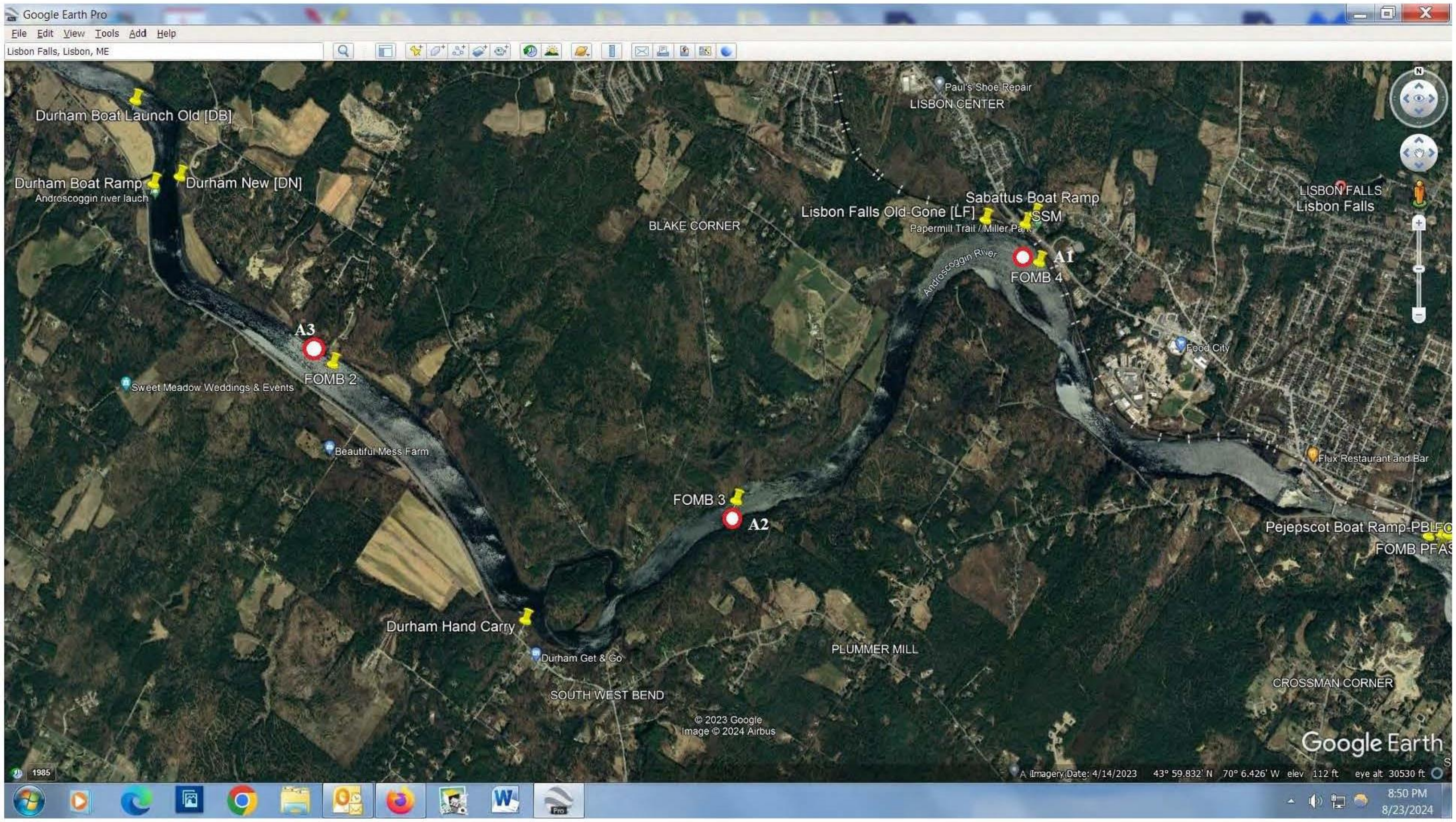
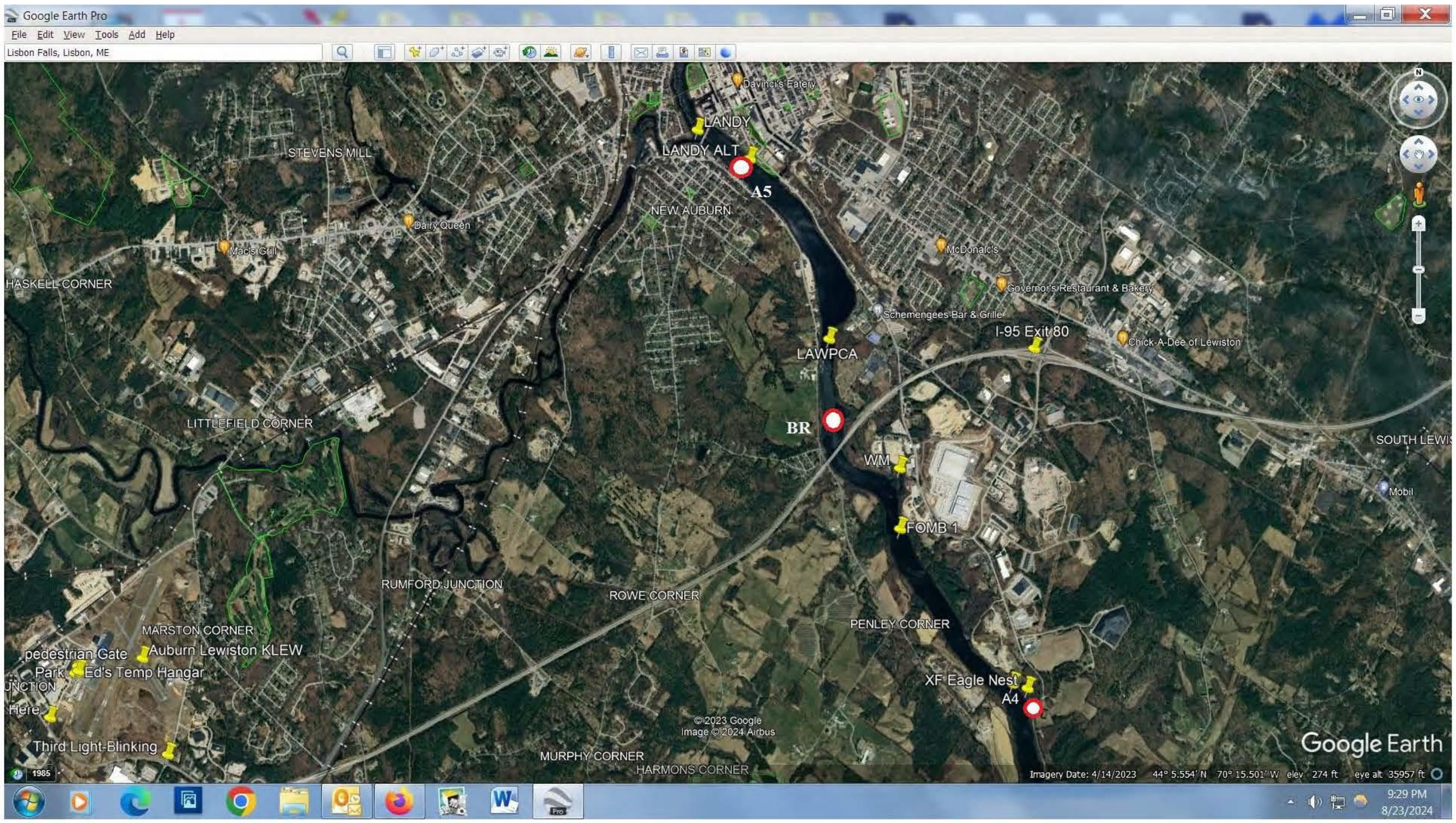
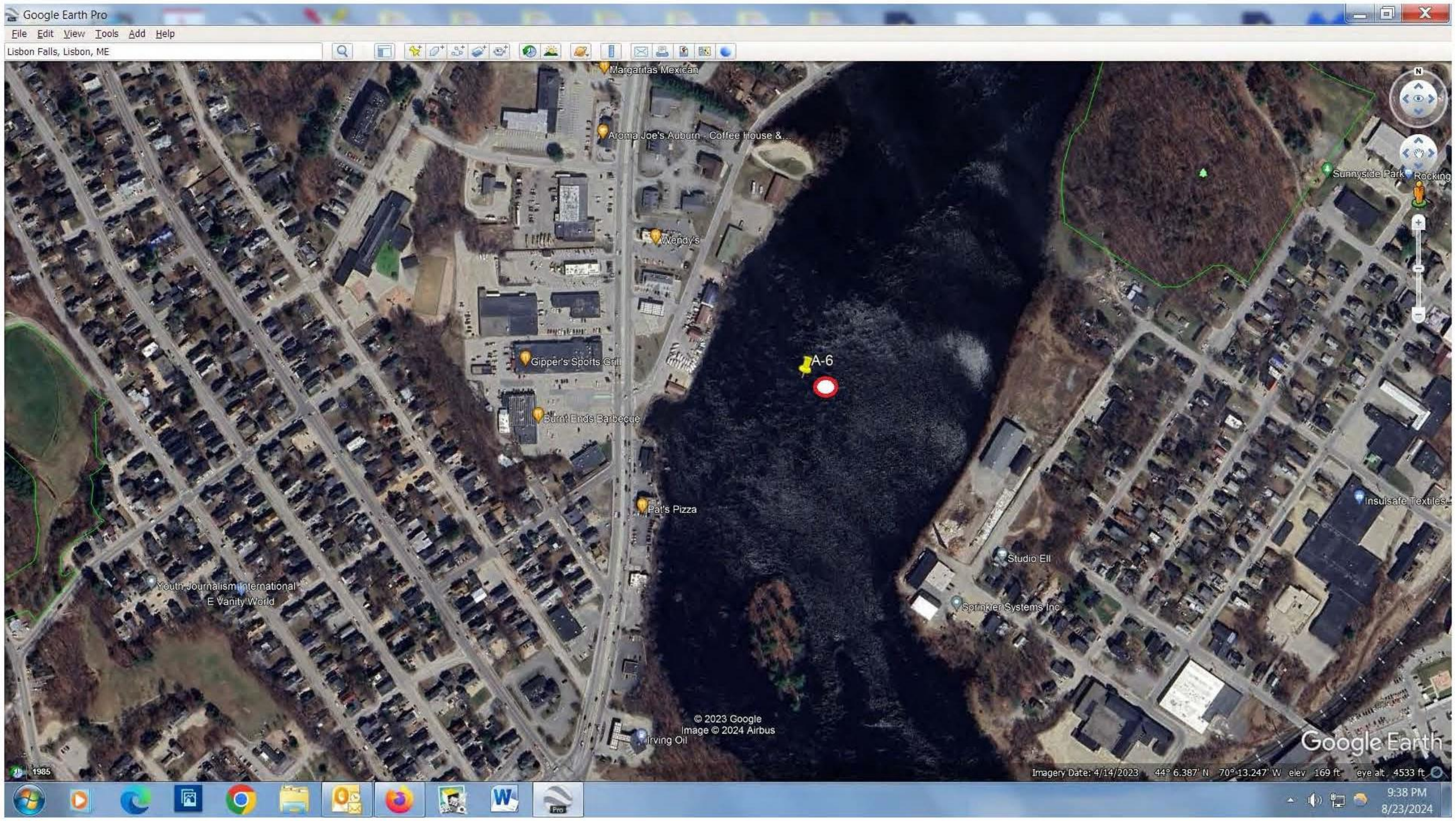
FOMB Exhibit 1A Sample Sites A1, A2, A3



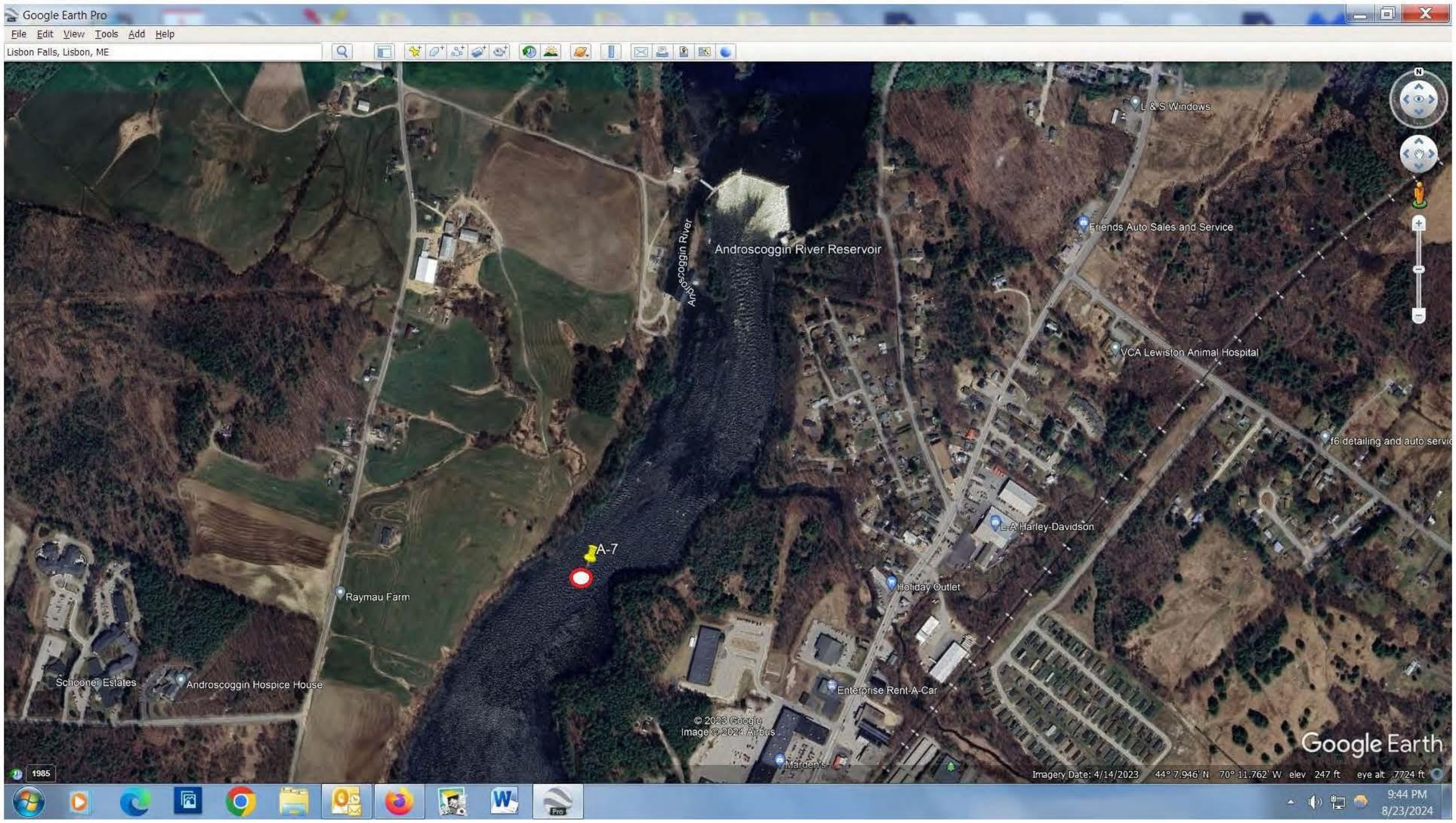
FOMB Exhibit 1B Sample Sites A4, BR (Benner Rips), A5



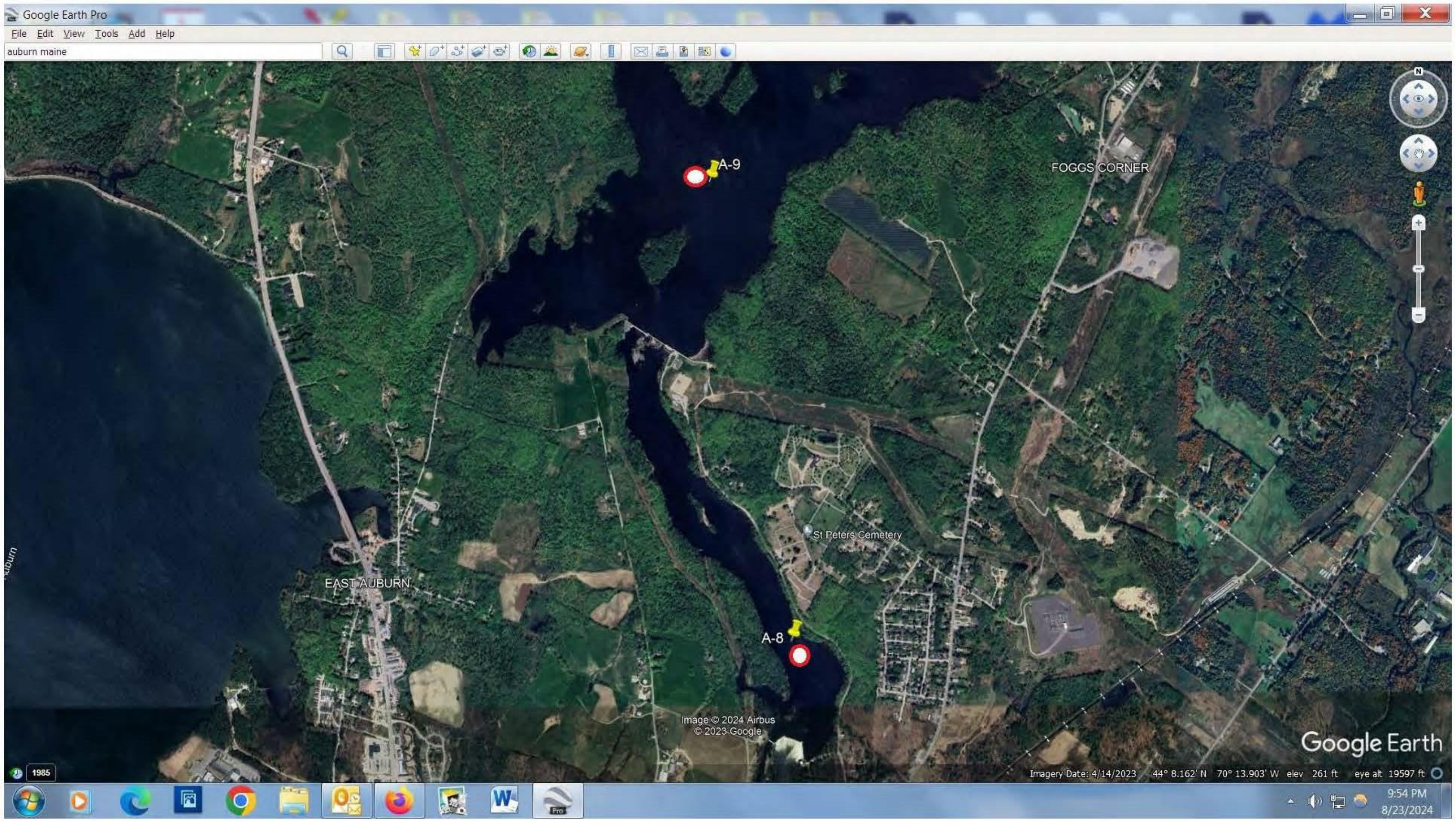
FOMB Exhibit 1C Sample Site A6



FOMB Exhibit 1D Sample Site A7

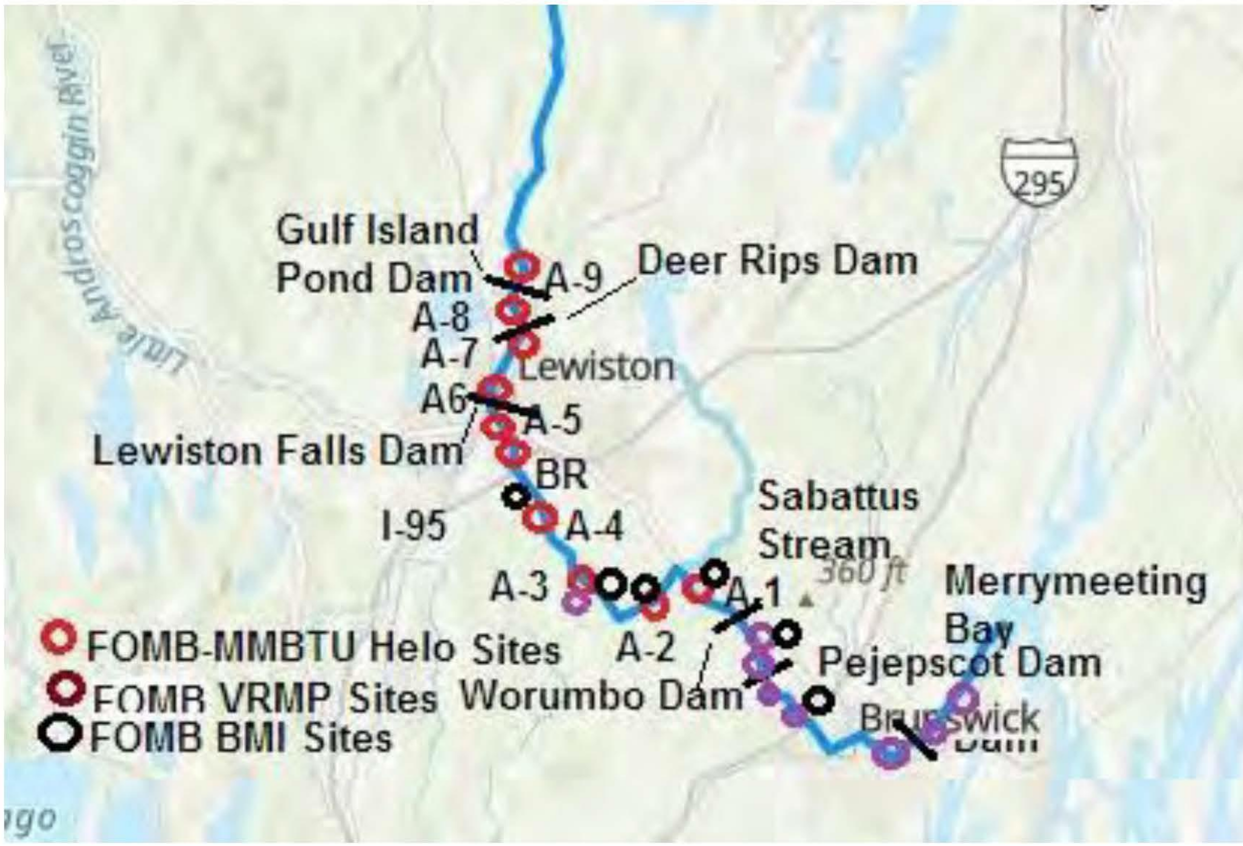


FOMB Exhibit 1E Sample Site A8, A9



15

FOMB Exhibit 2 All FOMB Sample Sites (VRMP & Helicopter)



Exhibits 3A & 3B

16

Exhibit 3 - USGS Auburn Flows

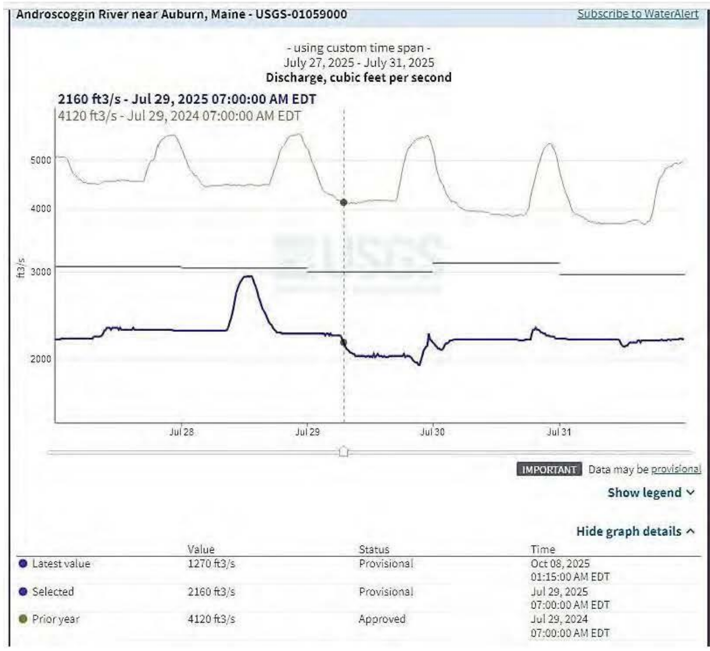
6/26 Flows

	Value	Status	Time
Latest value	1270 ft3/s	Provisional	Oct 08, 2025 01:15:00 AM EDT
Selected	3720 ft3/s	Provisional	Jul 18, 2025 07:00:00 AM EDT
Prior year	6950 ft3/s	Approved	Jul 18, 2024 07:00:00 AM EDT

7/18 Flows

Exhibits 3C & 3D

17

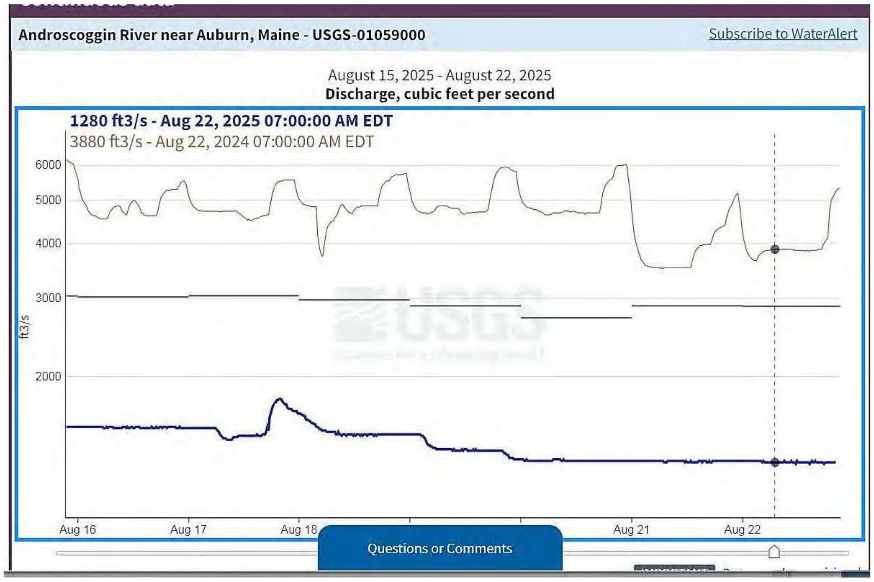


7/29 Flows

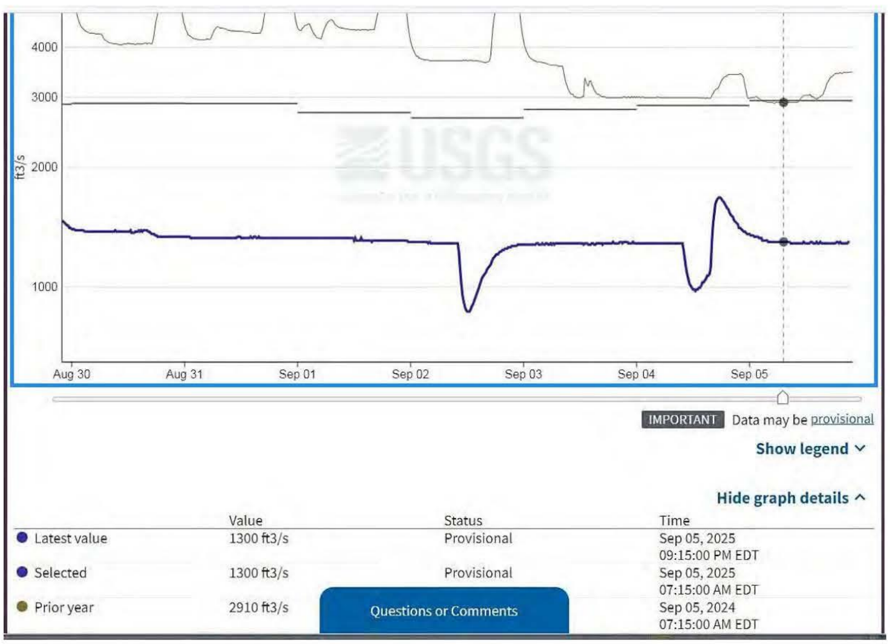
8/12 Flows

Exhibits 3 E & 3F

18



8/22 Flows



9/5 Flows

Exhibit 3 G

19

Auburn Flows April 1- October 8, 2025 (Gray line is 96 year median flow)

Exhibit 4A Site A4

20

Maine Department of Environmental Protection
Biological Monitoring Program
Aquatic Life Classification Attainment Report

Station Information

Station Number:	**S-1204**	River Basin:	Androscoggin
Waterbody:	Androscoggin River - Station 1204	HUC8 Name:	
Town:	Lewiston	Latitude:	44 3 28.97 N
Directions:	FROM DURHAM BOAT LAUNCH GO UPSTREAM 300 YDS DWNSTRM OF OLD DEP SAMPLING SITE "HELO BEACH"	Longitude:	70 12 0.98 W
		Stream Order:	

Sample Information

Log Number:	**2938**	Type of Sample:	ROCK BASKET	Date Deployed:	8/4/2021
Subsample Factor:	X1	Replicates:	3	Date Retrieved:	8/31/2021

Classification Attainment

Statutory Class:	**C**	**Final Determination:**	**B**	Date:	3/29/2022
Model Result with P≥0.6:	B	**Reason for Determination:**	**Model**		
Date Last Calculated:	3/23/2022	Comments:			

Model Probabilities

First Stage Model				C or Better Model	
Class A	0.32	Class C	0.04	Class A, B, or C	1.00
Class B	0.64	NA	0.00	Non-Attainment	0.00
B or Better Model				**A Model**	
Class A or B			0.99	Class A	0.16
Class C or Non-Attainment			0.01	Class B or C or Non-Attainment	0.84

Model Variables

01 Total Mean Abundance	2388.33	18 Relative Abundance Ephemeroptera	0.07
02 Generic Richness	27.00	19 EPT Generic Richness	13.00
03 Plecoptera Mean Abundance	2.67	21 Sum of Abundances: *Dicrotendipes, Micropsectra, Parachironomus, Helobdella*	0.00
04 Ephemeroptera Mean Abundance	169.00	23 Relative Generic Richness- Plecoptera	0.04
05 Shannon-Wiener Generic Diversity	2.85	25 Sum of Abundances: *Cheumatopsyche, Cricotopus, Tanytarsus, Ablabesmyia*	183.33
06 Hilsenhoff Biotic Index	3.21	26 Sum of Abundances: *Acroneuria, Maccaffertium, Stenonema*	0.67
07 Relative Abundance - Chironomidae	0.05	28 EP Generic Richness/14	0.29
08 Relative Generic Richness Diptera	0.22	30 Presence of Class A Indicator Taxa/7	0.29
09 *Hydropsyche* Abundance	32.33		
11 *Cheumatopsyche* Abundance	172.67		
12 EPT Generic Richness/ Diptera Generic Richness	2.17		
13 Relative Abundance - Oligochaeta	0.00		
15 Perlidae Mean Abundance (Family Functional Group)	2.67		
16 Tanypodinae Mean Abundance (Family Functional Group)	10.67		
17 Chironomini Abundance (Family Functional Group)	72.00		

Five Most Dominant Taxa

Rank	Taxon Name	Percent
1	*Chimarra*	41.95
2	Planariidae	16.43
3	Hydrobiidae	10.34
4	*Cheumatopsyche*	7.23
5	*Acerpenna*	6.73

Report Printed: 4/6/2022 Contact: biome@maine.gov or (207)287-7688 Page 1

Maine Department of Environmental Protection
Biological Monitoring Program
Aquatic Life Classification Attainment Report

Station Number: S-1204	Town: Lewiston		Date Deployed: 8/4/2021
Log Number: 2938	Waterbody: Androscoggin River - Station 1204		Date Retrieved: 8/31/2021

Sample Collection and Processing Information

Sampling Organization: MOODY MOUNTAIN ENVIRONMENTAL
Taxonomist: PAUL LEEPER (MOODY MOUNTAIN ENVIRONMENTAL)

Waterbody Information - Deployment		Waterbody Information - Retrieval	
Temperature:	23.3 deg C	Temperature:	
Dissolved Oxygen:	9.5 mg/l	Dissolved Oxygen:	
Dissolved Oxygen Saturation:		Dissolved Oxygen Saturation:	
Specific Conductance:		Specific Conductance:	
Velocity:	59 cm/s	Velocity:	
pH:		pH:	
Wetted Width:	152 m	Wetted Width:	152 m
Bankfull Width:		Bankfull Width:	
Depth:	55 cm	Depth:	55 cm

Water Chemistry

Summary of Habitat Characteristics

Landuse Name	Canopy Cover	Terrain	
Upland Conifer	Open	Rolling	
Upland Hardwood			
Potential Stressor	**Location**	**Substrate**	
Nps Pollution	Below POTW	Boulder	10 %
Urban Runoff	Below Urban NPS	Gravel	25 %
		Rubble/Cobble	55 %
		Sand	10 %

Landcover Summary - 2004 Data

Sample Comments

FILAMENTOUS ALGAE, AQ. PLANTS

Maine Department of Environmental Protection
Biological Monitoring Program
Aquatic Life Taxonomic Inventory Report

Station Number: S-1204 Waterbody: Androscoggin River - Station 1204 Town: Lewiston

Log Number: 2938 Subsample Factor: X1 Replicates: 3 Calculated: 3/23/2022

Taxon	Maine Taxonomic Code	Count (Mean of Samplers) Actual	Count (Mean of Samplers) Adjusted	Hilsenhoff Biotic Index	Functional Feeding Group	Relative Abundance % Actual	Relative Abundance % Adjusted
Planariidae	03010101	392.33	392.33		--	16.4	16.4
Annelida	08	2.67	2.67		--	0.1	0.1
Paragnetina	09020209049	2.67	2.67	1	PR	0.1	0.1
Boyeria	09020301004	0.33	0.33	2	PR	0.0	0.0
Acerpenna	09020401007	160.67	160.67	5	CG	6.7	6.7
Maccaffertium	09020402015	0.67	0.67	4	SC	0.0	0.0
Isonychia	09020404018	7.67	7.67	2	CF	0.3	0.3
Chimarra	09020601003	1002.00	1002.00	2	CF	42.0	42.0
Cheumatopsyche	09020604015	172.67	172.67	5	CF	7.2	7.2
Hydropsyche	09020604016	32.33	32.33	4	CF	1.4	1.4
Macrostemum	09020604018	55.67	55.67	3	CF	2.3	2.3
Ochrotrichia	09020607027	65.00	65.00	4	P	2.7	2.7
Oxyethira	09020607028	5.33	5.33	3	P	0.2	0.2
Brachycentrus	09020609043	3.00	3.00	0	CF	0.1	0.1
Nectopsyche	09020618074	9.00	9.00	3	SH	0.4	0.4
Oecetis	09020618078	20.00	20.00	8	PR	0.8	0.8
Pentaneura	09021011014	10.67	10.67	6	PR	0.4	0.4
Cricotopus	09021011037	2.67	2.67	7	SH	0.1	0.1
Eukiefferiella	09021011041	29.33	29.33	8	CG	1.2	1.2
Tanytarsus	09021011076	8.00	8.00	6	CF	0.3	0.3
Polypedilum	09021011102	72.00	72.00	6	SH	3.0	3.0
Simulium	09021012047	78.00	78.00	4	CF	3.3	3.3
Elmidae	09021113	2.67	2.67		--	0.1	0.1
Ancyronyx	09021113063	5.33	5.33	6	--	0.2	0.2
Hydrachna	09030103001	0.33	0.33		--	0.0	0.0
Hydrobiidae	10010104	247.00	247.00		--	10.3	10.3
Physidae	10010202	0.33	0.33		SC	0.0	0.0

Exhibit 4B, Site A3

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Maine Department of Environmental Protection
Biological Monitoring Program
Aquatic Life Classification Attainment Report

Station Information

Station Number:	**S-1205**	River Basin:	Androscoggin
Waterbody:	Androscoggin River - Station 1205	HUC8 Name:	
Town:	Durham	Latitude:	44° 00' 06.90221700" N
Directions:	FROM DURHAM BOAT LAUNCH GO DOWNSTREAM APPROX. 1 MILE UPSTREAMOFSAND BAR. CONSULTANT SITE NAME: ANDY 2	Longitude:	
		Stream Order:	

Sample Information

Log Number:	**2939**	Type of Sample:	ROCK BASKET	Date Deployed:	8/4/2021
Subsample Factor:	X1	Replicates:	3	Date Retrieved:	8/31/2021

Classification Attainment

Statutory Class: **C** — **Final Determination:** **B** — Date: 3/29/2022

Model Result with P≥0.6: C — **Reason for Determination: Best Professional Judgement**

Date Last Calculated: 3/23/2022 — Comments: Indeterminate for Class B (p = 0.51). Raised to Class B based on community structure.

Model Probabilities

First Stage Model

Class A	0.12	Class C	0.29
Class B	0.59	NA	0.00

C or Better Model

Class A, B, or C	1.00
Non-Attainment	0.00

B or Better Model

Class A or B	0.51
Class C or Non-Attainment	0.49

A Model

Class A	0.01
Class B or C or Non-Attainment	0.99

Model Variables

01 Total Mean Abundance	677.33
02 Generic Richness	37.00
03 Plecoptera Mean Abundance	1.00
04 Ephemeroptera Mean Abundance	138.33
05 Shannon-Wiener Generic Diversity	3.71
06 Hilsenhoff Biotic Index	5.18
07 Relative Abundance - Chironomidae	0.13
08 Relative Generic Richness Diptera	0.30
09 *Hydropsyche* Abundance	0.33
11 *Cheumatopsyche* Abundance	185.67
12 EPT Generic Richness/ Diptera Generic Richness	1.45
13 Relative Abundance - Oligochaeta	0.00
15 Perlidae Mean Abundance (Family Functional Group)	1.00
16 Tanypodinae Mean Abundance (Family Functional Group)	61.67
17 Chironomini Abundance (Family Functional Group)	18.67
18 Relative Abundance Ephemeroptera	0.20
19 EPT Generic Richness	16.00
21 Sum of Abundances: *Dicrotendipes, Micropsectra, Parachironomus, Helobdella*	8.00
23 Relative Generic Richness- Plecoptera	0.03
25 Sum of Abundances: *Cheumatopsyche, Cricotopus, Tanytarsus, Ablabesmyia*	195.33
26 Sum of Abundances: *Acroneuria, Maccaffertium, Stenonema*	23.33
28 EP Generic Richness/14	0.36
30 Presence of Class A Indicator Taxa/7	0.00

Five Most Dominant Taxa

Rank	Taxon Name	Percent
1	*Cheumatopsyche*	27.41
2	*Acerpenna*	16.58
3	Planariidae	8.42
4	*Pentaneura*	6.84
5	Hydrobiidae	5.36

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Maine Department of Environmental Protection
Biological Monitoring Program
Aquatic Life Classification Attainment Report

Station Number: **S-1205**	Town: Durham		Date Deployed: 8/4/2021
Log Number: **2939**	Waterbody: Androscoggin River - Station 1205		Date Retrieved: 8/31/2021

Sample Collection and Processing Information

Sampling Organization: PAUL LEEPER (MOODY MOUNTAIN ENVIRONMENTAL)
Taxonomist: PAUL LEEPER (MOODY MOUNTAIN ENVIRONMENTAL)

Waterbody Information - Deployment		Waterbody Information - Retrieval	
Temperature:	24.8 deg C	Temperature:	24.9 deg C
Dissolved Oxygen:	11 mg/l	Dissolved Oxygen:	10 mg/l
Dissolved Oxygen Saturation:		Dissolved Oxygen Saturation:	
Specific Conductance:		Specific Conductance:	
Velocity:	21 cm/s	Velocity:	
pH:		pH:	
Wetted Width:	252 m	Wetted Width:	252 m
Bankfull Width:		Bankfull Width:	
Depth:	52 cm	Depth:	46 cm

Water Chemistry

Summary of Habitat Characteristics

Landuse Name	Canopy Cover	Terrain	
Upland Conifer	Open	Flat	
Upland Hardwood			

Potential Stressor	Location	Substrate	
Nps Pollution	Below Agriculture NPS	Gravel	15 %
Urban Runoff	Below POTW	Rubble/Cobble	5 %
	Below Urban NPS	Sand	80 %

Landcover Summary - 2004 Data

Sample Comments

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Maine Department of Environmental Protection
Biological Monitoring Program
Aquatic Life Taxonomic Inventory Report

Station Number: S-1205	Waterbody: Androscoggin River - Station 1205		Town: Durham
Log Number: 2939	Subsample Factor: X1	Replicates: 3	Calculated: 3/23/2022

Taxon	Maine Taxonomic Code	Count (Mean of Samplers) Actual	Adjusted	Hilsenhoff Biotic Index	Functional Feeding Group	Relative Abundance % Actual	Adjusted
Planariidae	03010101	57.00	57.00		--	8.4	8.4
Annelida	08	0.33	0.33		--	0.0	0.0
Hyalella	09010203006	3.00	3.00	8	CG	0.4	0.4
Orconectes	09010301008		1.00		CG		0.1
Orconectes limosus	09010301008013	1.00			--	0.1	
Acroneuria	09020209042	1.00	1.00	0	PR	0.1	0.1
Amphiagrion	09020309046	11.00	11.00	9	PR	1.6	1.6
Chromagrion	09020309049	0.33	0.33	4	PR	0.0	0.0
Acerpenna	09020401007	112.33	112.33	5	CG	16.6	16.6
Maccaffertium	09020402015	22.33	22.33	4	SC	3.3	3.3
Isonychia	09020404018	0.33	0.33	2	CF	0.0	0.0
Tricorythodes	09020411038	3.33	3.33	4	CG	0.5	0.5
Chimarra	09020601003	7.33	7.33	2	CF	1.1	1.1
Neureclipsis	09020603008	0.33	0.33	7	CF	0.0	0.0
Polycentropus	09020603010	7.00	7.00	6	PR	1.0	1.0
Cheumatopsyche	09020604015	185.67	185.67	5	CF	27.4	27.4
Hydropsyche	09020604016	0.33	0.33	4	CF	0.0	0.0
Macrostemum	09020604018	1.33	1.33	3	CF	0.2	0.2
Ochrotrichia	09020607027	35.33	35.33	4	P	5.2	5.2
Oxyethira	09020607028	13.67	13.67	3	P	2.0	2.0
Ceraclea	09020618072	1.00	1.00	3	CG	0.1	0.1
Nectopsyche	09020618074	9.67	9.67	3	SH	1.4	1.4
Oecetis	09020618078	28.00	28.00	8	PR	4.1	4.1
Ablabesmyia	09021011001	8.33	8.33	8	PR	1.2	1.2
Pentaneura	09021011014	46.33	46.33	6	PR	6.8	6.8
Thienemannimyia	09021011020	7.00	7.00	3	PR	1.0	1.0
Nanocladius	09021011049	1.33	1.33	3	CG	0.2	0.2
Rheotanytarsus	09021011072	1.67	1.67	6	CF	0.2	0.2
Tanytarsus	09021011076	1.33	1.33	6	CF	0.2	0.2
Dicrotendipes	09021011085	8.00	8.00	8	CG	1.2	1.2
Microtendipes	09021011094	2.67	2.67	6	CF	0.4	0.4
Polypedilum	09021011102	7.67	7.67	6	SH	1.1	1.1
Robackia	09021011103	0.33	0.33		CG	0.0	0.0
Simuliidae	09021012	1.33	1.33		--	0.2	0.2
Hydrobiidae	10010104	36.33	36.33		--	5.4	5.4
Physidae	10010202	31.00	31.00		SC	4.6	4.6
Planorbidae	10010203	10.33	10.33		--	1.5	1.5

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Maine Department of Environmental Protection
Biological Monitoring Program
Aquatic Life Taxonomic Inventory Report

Station Number: S-1205 Waterbody: Androscoggin River - Station 1205 Town: Durham

Log Number: 2939 Subsample Factor: X1 Replicates: 3 Calculated: 3/23/2022

Taxon	Maine Taxonomic Code	Count (Mean of Samplers)		Hilsenhoff Biotic Index	Functional Feeding Group	Relative Abundance %	
		Actual	Adjusted			Actual	Adjusted
Ancylidae	10010204	12.00	12.00		SC	1.8	1.8

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Exhibit 4C, Site A2

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Maine Department of Environmental Protection
Biological Monitoring Program
Aquatic Life Classification Attainment Report

Station Information

Station Number:	**S-1206**	River Basin:	Androscoggin
Waterbody:	Androscoggin River - Station 1206	HUC8 Name:	
Town:	Lisbon	Latitude:	43° 59' 34.17243456" N
Directions:	FROM SABATTUS STREAM LAUNCH GO UPSTREAM APPROX. 2 MILE TO BOULDER FIELD. CONSULTANT SITE NAME: ANDY 3	Longitude:	
		Stream Order:	

Sample Information

Log Number:	**2940**	Type of Sample:	ROCK BASKET	Date Deployed:	8/4/2021
Subsample Factor:	X1	Replicates:	3	Date Retrieved:	8/31/2021

Classification Attainment

Statutory Class:	**C**	**Final Determination:**	**B**	Date:	3/29/2022
Model Result with P≥0.6:	B	**Reason for Determination:**	**Model**		
Date Last Calculated:	3/23/2022	Comments:			

Model Probabilities

First Stage Model				C or Better Model	
Class A	0.29	Class C	0.05	Class A, B, or C	1.00
Class B	0.66	NA	0.00	Non-Attainment	0.00

B or Better Model		A Model	
Class A or B	0.97	Class A	0.06
Class C or Non-Attainment	0.03	Class B or C or Non-Attainment	0.94

Model Variables

01 Total Mean Abundance	1359.00
02 Generic Richness	30.00
03 Plecoptera Mean Abundance	7.00
04 Ephemeroptera Mean Abundance	213.67
05 Shannon-Wiener Generic Diversity	3.68
06 Hilsenhoff Biotic Index	4.06
07 Relative Abundance - Chironomidae	0.13
08 Relative Generic Richness Diptera	0.30
09 *Hydropsyche* Abundance	40.33
11 *Cheumatopsyche* Abundance	161.33
12 EPT Generic Richness/ Diptera Generic Richness	1.67
13 Relative Abundance - Oligochaeta	0.00
15 Perlidae Mean Abundance (Family Functional Group)	7.00
16 Tanypodinae Mean Abundance (Family Functional Group)	22.67
17 Chironomini Abundance (Family Functional Group)	114.67
18 Relative Abundance Ephemeroptera	0.16
19 EPT Generic Richness	15.00
21 Sum of Abundances: *Dicrotendipes, Micropsectra, Parachironomus, Helobdella*	5.33
23 Relative Generic Richness- Plecoptera	0.03
25 Sum of Abundances: *Cheumatopsyche, Cricotopus, Tanytarsus, Ablabesmyia*	194.67
26 Sum of Abundances: *Acroneuria, Maccaffertium, Stenonema*	38.00
28 EP Generic Richness/14	0.43
30 Presence of Class A Indicator Taxa/7	0.14

Five Most Dominant Taxa

Rank	Taxon Name	Percent
1	*Chimarra*	24.60
2	Planariidae	13.47
3	*Cheumatopsyche*	11.87
4	*Acerpenna*	11.63
5	*Ochrotrichia*	6.99

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Maine Department of Environmental Protection
Biological Monitoring Program
Aquatic Life Classification Attainment Report

Station Number: S-1206	Town: Lisbon		Date Deployed: 8/4/2021
Log Number: 2940	Waterbody: Androscoggin River - Station 1206		Date Retrieved: 8/31/2021

Sample Collection and Processing Information

Sampling Organization: PAUL LEEPER (MOODY MOUNTAIN ENVIRONMENTAL)

Taxonomist: PAUL LEEPER (MOODY MOUNTAIN ENVIRONMENTAL)

Waterbody Information - Deployment		Waterbody Information - Retrieval	
Temperature:	24.3 deg C	Temperature:	25.5 deg C
Dissolved Oxygen:	10.6 mg/l	Dissolved Oxygen:	9.4 mg/l
Dissolved Oxygen Saturation:		Dissolved Oxygen Saturation:	
Specific Conductance:		Specific Conductance:	
Velocity:	27 cm/s	Velocity:	11 cm/s
pH:		pH:	
Wetted Width:	139 m	Wetted Width:	139 m
Bankfull Width:		Bankfull Width:	
Depth:	30 cm	Depth:	37 cm

Water Chemistry

Summary of Habitat Characteristics

Landuse Name	Canopy Cover	Terrain	
Upland Conifer	Open	Rolling	
Upland Hardwood			
Potential Stressor	**Location**	**Substrate**	
Nps Pollution	Below Agriculture NPS	Boulder	80 %
Urban Runoff	Below POTW	Gravel	10 %
	Below Urban NPS	Sand	10 %

Landcover Summary - 2004 Data

Sample Comments

BOULDER FIELD

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Maine Department of Environmental Protection
Biological Monitoring Program
Aquatic Life Taxonomic Inventory Report

Station Number: S-1206 Waterbody: Androscoggin River - Station 1206 Town: Lisbon

Log Number: 2940 Subsample Factor: X1 Replicates: 3 Calculated: 3/23/2022

Taxon	Maine Taxonomic Code	Count (Mean of Samplers) Actual	Count (Mean of Samplers) Adjusted	Hilsenhoff Biotic Index	Functional Feeding Group	Relative Abundance % Actual	Relative Abundance % Adjusted
Planariidae	03010101	183.00	183.00		--	13.5	13.5
Acroneuria	09020209042	7.00	7.00	0	PR	0.5	0.5
Acerpenna	09020401007	158.00	158.00	5	CG	11.6	11.6
Plauditus	09020401012	13.33	13.33		CG	1.0	1.0
Maccaffertium	09020402015	31.00	31.00	4	SC	2.3	2.3
Isonychia	09020404018	7.33	7.33	2	CF	0.5	0.5
Tricorythodes	09020411038	4.00	4.00	4	CG	0.3	0.3
Chimarra	09020601003	334.33	334.33	2	CF	24.6	24.6
Neureclipsis	09020603008	22.67	22.67	7	CF	1.7	1.7
Cheumatopsyche	09020604015	161.33	161.33	5	CF	11.9	11.9
Hydropsyche	09020604016	40.33	40.33	4	CF	3.0	3.0
Macrostemum	09020604018	46.00	46.00	3	CF	3.4	3.4
Ochrotrichia	09020607027	95.00	95.00	4	P	7.0	7.0
Brachycentrus	09020609043	2.67	2.67	0	CF	0.2	0.2
Nectopsyche	09020618074	9.33	9.33	3	SH	0.7	0.7
Oecetis	09020618078	25.33	25.33	8	PR	1.9	1.9
Petrophila	09020901004	1.00	1.00	5	SC	0.1	0.1
Pentaneura	09021011014	14.67	14.67	6	PR	1.1	1.1
Thienemannimyia	09021011020	8.00	8.00	3	PR	0.6	0.6
Cricotopus	09021011037	17.33	17.33	7	SH	1.3	1.3
Paratanytarsus	09021011071	2.67	2.67	6	--	0.2	0.2
Tanytarsus	09021011076	16.00	16.00	6	CF	1.2	1.2
Dicrotendipes	09021011085	5.33	5.33	8	CG	0.4	0.4
Microtendipes	09021011094	30.67	30.67	6	CF	2.3	2.3
Polypedilum	09021011102	78.67	78.67	6	SH	5.8	5.8
Simulium	09021012047	13.33	13.33	4	CF	1.0	1.0
Elmidae	09021113	4.00	4.00		--	0.3	0.3
Macronychus	09021113065	12.00	12.00	4	--	0.9	0.9
Hydrobiidae	10010104	12.33	12.33		--	0.9	0.9
Physidae	10010202	2.33	2.33		SC	0.2	0.2

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Exhibit 4D, SIte A1
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Maine Department of Environmental Protection
Biological Monitoring Program
Aquatic Life Classification Attainment Report

Station Information

Station Number:	**S-1207**	River Basin:	Androscoggin
Waterbody:	Androscoggin River - Station 1207	HUC8 Name:	
Town:	Lisbon	Latitude:	44° 00' 31.44009501" N
Directions:	FROM SABATTUS STREAM LAUNCH GO DOWNTREAM APPROX. 350 YDS. CONSULTANT SITE NAME: ANDY 4	Longitude:	
		Stream Order:	

Sample Information

Log Number:	**2941**	Type of Sample:	ROCK BASKET	Date Deployed:	8/4/2021
Subsample Factor:	X1	Replicates:	3	Date Retrieved:	8/31/2021

Classification Attainment

Statutory Class:	**C**	**Final Determination:**	**C**	Date:	3/29/2022
Model Result with P≥0.6:	C	**Reason for Determination:**	**Model**		
Date Last Calculated:	3/23/2022	Comments:			

Model Probabilities

First Stage Model				C or Better Model	
Class A	0.00	Class C	0.94	Class A, B, or C	1.00
Class B	0.01	NA	0.05	Non-Attainment	0.00

B or Better Model		A Model	
Class A or B	0.00	Class A	0.00
Class C or Non-Attainment	1.00	Class B or C or Non-Attainment	1.00

Model Variables

01 Total Mean Abundance	295.00
02 Generic Richness	40.00
03 Plecoptera Mean Abundance	0.00
04 Ephemeroptera Mean Abundance	31.00
05 Shannon-Wiener Generic Diversity	3.71
06 Hilsenhoff Biotic Index	6.40
07 Relative Abundance - Chironomidae	0.34
08 Relative Generic Richness Diptera	0.28
09 *Hydropsyche* Abundance	0.67
11 *Cheumatopsyche* Abundance	2.00
12 EPT Generic Richness/ Diptera Generic Richness	1.45
13 Relative Abundance - Oligochaeta	0.00
15 Perlidae Mean Abundance (Family Functional Group)	0.00
16 Tanypodinae Mean Abundance (Family Functional Group)	11.33
17 Chironomini Abundance (Family Functional Group)	85.33
18 Relative Abundance Ephemeroptera	0.11
19 EPT Generic Richness	16.00
21 Sum of Abundances: *Dicrotendipes, Micropsectra, Parachironomus, Helobdella*	1.00
23 Relative Generic Richness- Plecoptera	0.00
25 Sum of Abundances: *Cheumatopsyche, Cricotopus, Tanytarsus, Ablabesmyia*	13.00
26 Sum of Abundances: *Acroneuria, Maccaffertium, Stenonema*	11.67
28 EP Generic Richness/14	0.36
30 Presence of Class A Indicator Taxa/7	0.00

Five Most Dominant Taxa

Rank	Taxon Name	Percent
1	*Microtendipes*	27.34
2	*Polycentropus*	12.54
3	*Hyalella*	11.19
4	*Oecetis*	9.49
5	Physidae	6.10

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Maine Department of Environmental Protection
Biological Monitoring Program
Aquatic Life Classification Attainment Report

Station Number: **S-1207** Town: Lisbon Date Deployed: 8/4/2021
Log Number: **2941** Waterbody: Androscoggin River - Station 1207 Date Retrieved: 8/31/2021

Sample Collection and Processing Information

Sampling Organization: PAUL LEEPER (MOODY MOUNTAIN ENVIRONMENTAL)
Taxonomist: PAUL LEEPER (MOODY MOUNTAIN ENVIRONMENTAL)

Waterbody Information - Deployment		**Waterbody Information - Retrieval**	
Temperature:	23.6 deg C	Temperature:	24.9 deg C
Dissolved Oxygen:	9.4 mg/l	Dissolved Oxygen:	8.1 mg/l
Dissolved Oxygen Saturation:		Dissolved Oxygen Saturation:	
Specific Conductance:		Specific Conductance:	
Velocity:	8.5 cm/s	Velocity:	5 cm/s
pH:		pH:	
Wetted Width:	396 m	Wetted Width:	396 m
Bankfull Width:		Bankfull Width:	
Depth:	314 cm	Depth:	320 cm

Water Chemistry

Summary of Habitat Characteristics

Landuse Name	Canopy Cover	Terrain	
Upland Conifer	Open	Rolling	
Upland Hardwood			
Potential Stressor	**Location**	**Substrate**	
Impounded	Below Agriculture NPS	Sand	100 %
Nps Pollution	Below POTW		
Nutrients	Below Urban NPS		
Urban Runoff			

Landcover Summary - 2004 Data

Sample Comments

Report Printed: 4/6/2022 Contact: biome@maine.gov or (207)287-7688 Page 2

Maine Department of Environmental Protection
Biological Monitoring Program
Aquatic Life Taxonomic Inventory Report

Station Number: S-1207 Waterbody: Androscoggin River - Station 1207 Town: Lisbon
Log Number: 2941 Subsample Factor: X1 Replicates: 3 Calculated: 3/23/2022

Taxon	Maine Taxonomic Code	Count (Mean of Samplers) Actual	Count (Mean of Samplers) Adjusted	Hilsenhoff Biotic Index	Functional Feeding Group	Relative Abundance % Actual	Relative Abundance % Adjusted
Planariidae	03010101	15.00	15.00		--	5.1	5.1
Annelida	08	0.33	0.33		--	0.1	0.1
Hirudinidae	08030201	1.67	1.67		--	0.6	0.6
Amphipoda	090102	0.33	0.33	8	--	0.1	0.1
Hyalella	09010203006	33.00	33.00	8	CG	11.2	11.2
Orconectes	09010301008		0.67		CG		0.2
Orconectes limosus	09010301008013	0.67			--	0.2	
Somatochlora	09020305027	0.33	0.33	1	PR	0.1	0.1
Argia	09020309048	1.00	1.00	7	PR	0.3	0.3
Coenagrion	09020309050	1.00	1.00	8	PR	0.3	0.3
Acerpenna	09020401007	1.00	1.00	5	CG	0.3	0.3
Plauditus	09020401012	0.33	0.33		CG	0.1	0.1
Stenacron	09020402014	14.67	14.67	7	SC	5.0	5.0
Maccaffertium	09020402015	11.67	11.67	4	SC	4.0	4.0
Caenis	09020412040	3.33	3.33	7	CG	1.1	1.1
Chimarra	09020601003	0.67	0.67	2	CF	0.2	0.2
Neureclipsis	09020603008	0.33	0.33	7	CF	0.1	0.1
Polycentropus	09020603010	37.00	37.00	6	PR	12.5	12.5
Cheumatopsyche	09020604015	2.00	2.00	5	CF	0.7	0.7
Hydropsyche	09020604016	0.67	0.67	4	CF	0.2	0.2
Ochrotrichia	09020607027	2.00	2.00	4	P	0.7	0.7
Oxyethira	09020607028	0.33	0.33	3	P	0.1	0.1
Brachycentridae	09020609	1.00	1.00		--	0.3	0.3
Nectopsyche	09020618074	8.33	8.33	3	SH	2.8	2.8
Triaenodes	09020618077	0.33	0.33	6	SH	0.1	0.1
Oecetis	09020618078	28.00	28.00	8	PR	9.5	9.5
Ablabesmyia	09021011001	9.00	9.00	8	PR	3.1	3.1
Nilotanypus	09021011012	0.33	0.33	6	PR	0.1	0.1
Pentaneura	09021011014	0.67	0.67	6	PR	0.2	0.2
Thienemannimyia	09021011020	1.33	1.33	3	PR	0.5	0.5
Cricotopus	09021011037	0.67	0.67	7	SH	0.2	0.2
Eukiefferiella	09021011041	0.67	0.67	8	CG	0.2	0.2
Rheotanytarsus	09021011072	1.33	1.33	6	CF	0.5	0.5
Tanytarsus	09021011076	1.33	1.33	6	CF	0.5	0.5
Dicrotendipes	09021011085	1.00	1.00	8	CG	0.3	0.3
Microtendipes	09021011094	80.67	80.67	6	CF	27.3	27.3
Polypedilum	09021011102	3.67	3.67	6	SH	1.2	1.2

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Maine Department of Environmental Protection
Biological Monitoring Program
Aquatic Life Taxonomic Inventory Report

Station Number: S-1207 Waterbody: Androscoggin River - Station 1207 Town: Lisbon

Log Number: 2941 Subsample Factor: X1 Replicates: 3 Calculated: 3/23/2022

Taxon	Maine Taxonomic Code	Count (Mean of Samplers) Actual	Count (Mean of Samplers) Adjusted	Hilsenhoff Biotic Index	Functional Feeding Group	Relative Abundance % Actual	Relative Abundance % Adjusted
Elmidae	09021113	0.33	0.33		--	0.1	0.1
Ancyronyx	09021113063	0.33	0.33	6	--	0.1	0.1
Hydrobiidae	10010104	2.67	2.67		--	0.9	0.9
Physidae	10010202	18.00	18.00		SC	6.1	6.1
Planorbidae	10010203	1.00	1.00		--	0.3	0.3
Pisidium	10020201002	7.00	7.00		CF	2.4	2.4

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Exhibit 5A Data

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Upper Lower Androscoggin Helicopter Water Sampling Profiles 2024-2025-FOMB

Date	Site	Lat	Long	Time	DO mg/l	DO %	Spec Cond	H2O Temp	Depth Ft.	Air Temp	E. coli	Total Col.
6/26/2025	A1	44° 0.524N	70° 5.169W	6:37	8	92.9	75.2	23.1	4	19	42.2	1986
7/18/2025	A1	44° 0.524N	70° 5.169W	6:47	7.6	91.8	74.4	24.9	4	20	28.3	>2419.6
7/29/2025	A1	44° 0.524N	70° 5.169W	6:31	8.1	98.2	75.7	25.1	4	19.9	18.5	1732.9
8/12/2025	A1	44° 0.524N	70° 5.169W	6:24	8.6	107	90.3	26.1	6	19.5	13.5	1986.3
8/22/2025	A1	44° 0.524N	70° 5.169W	6:35	9.9	116	101.5	23.1	6	12	17.2	1732.9
9/5/2025	A1	44° 0.524N	70° 5.169W	6:45	8.6	101.2	104.5	23	6	18	12.1	>2419.6
				Geomean	**8.4**						**19.9**	
6/26/2025	A2	43° 59.573N	70° 6.839W	6:52	7.9	91.5	74.7	22.7	2	19	22.8	2419.6
7/18/2025	A2	43° 59.573N	70° 6.839W	6:55	7.7	92.2	74.1	24.6	2	22	25.3	>2419.6
7/29/2025	A2	43° 59.573N	70° 6.839W	6:38	7.9	95.2	75.8	24.9	2	18.5	29.5	>2419.6
8/12/2025	A2	43° 59.573N	70° 6.839W	6:33	7.9	96.2	91.1	25.2	4	19	6.3	1553.1
8/22/2025	A2	43° 59.573N	70° 6.839W	6:43	7.8	90.1	101.8	22.2	2	15	13.4	>2419.6
9/5/2025	A2	43° 59.573N	70° 6.839W	6:54	7.9	90.3	104.9	22	2	18	44.1	>2419.6
				Geomean	**7.8**						**20**	
6/26/2025	A3	44° 0.116N	70° 9.076W	7:00	7.9	91.6	74.2	22.6	2	19	50.4	>2419.6
7/18/2025	A3	44° 0.116N	70° 9.076W	7:05	7.7	92.6	73.3	24.6	3	22	22.8	>2419.6
7/29/2025	A3	44° 0.116N	70° 9.076W	6:44	7.6	92.7	77.2	25	2	19	23.8	2419.5
8/12/2025	A3	44° 0.116N	70° 9.076W	6:40	8.4	102.7	91.8	25.4	1	19	15.6	1732.9
8/22/2025	A3	44° 0.116N	70° 9.076W	6:50	8.5	98.4	107	22.8	2	12	37.7	1986.3
9/5/2025	A3	44° 0.116N	70° 9.076W	7:00	8.3	95.5	105.9	22.4	2	18	40.8	>2419.6
				Geomean	**8.1**						**29.5**	

Exhibit 5B Data

35

Date	Site	Lat	Long	Time	DO mg/l	DO %	Spec Cond	H2O Temp	Depth Ft.	Air Temp	E. coli	Total Col.
6/26/2025	A4	44° 2.744N	70° 11.278W	7:12	8	93.9	74.1	22.7	2	19	58.1	816.4
7/18/2025	A4	44° 2.744N	70° 11.278W	7:15	7.9	94	74	24.4	2.5	20.2	31.3	>2419.6
7/29/2025	A4	44° 2.744N	70° 11.278W	6:53	7.4	88.5	76.9	24.3	2	19	34.5	>2419.6
8/12/2025	A4	44° 2.744N	70° 11.278W	6:47	7.3	88.6	94.1	25	1	19	21.6	1986.3
8/22/2025	A4	44° 2.744N	70° 11.278W	6:58	7.6	87.9	102.4	23	2	12	108.6	2419.6
9/5/2025	A4	44° 2.744N	70° 11.278W	7:09	8.2	94	107	22	2	18	53.8	1986.3
				Geomean	**7.7**						**44.6**	
6/26/2025	BR	44° 3.917N	70° 12.457W	7:18	7.9	91.6	74.2	22.5	4	19	47.8	571.7
7/18/2025	BR	44° 3.917N	70° 12.457W	7:23	7.8	92.7	74.6	24.3	4	22	36.4	>2419.6
7/29/2025	BR	44° 3.917N	70° 12.457W	6:58	7.4	89.7	76	24.8	4	24.8	30.5	2419.5
8/12/2025	BR	44° 3.917N	70° 12.457W	6:53	7.4	88.9	92.2	24.9	6	19.5	12.2	1732.9
8/22/2025	BR	44° 3.917N	70° 12.457W	7:06	7.4	86.1	99.7	23.1	6	12	38.8	1986.3
9/5/2025	BR	44° 3.917N	70° 12.457W	7:20	8.3	94.4	108.5	22	6	18	74.9	2419.6
				Geomean	**7.7**						**35.1**	
6/26/2025	A5	44° 13.010N	70° 13.010W	7:25	7.9	92.1	68.5	22.6	4	19	59.8	640.5
7/18/2025	A5	44° 13.010N	70° 13.010W	7:30	7.9	94.3	69.4	24.5	4	22	32.3	2419.6
7/29/2025	A5	44° 13.010N	70° 13.010W	7:03	7.5	91.5	69.9	25	4	22	18.3	1986.3
8/12/2025	A5	44° 13.010N	70° 13.010W	7:00	7.9	95.8	85.6	25.2	6	20	16	1119.9
8/22/2025	A5	44° 13.010N	70° 13.010W	7:12	7.7	91.8	90.8	23.9	4	16	20.1	1986.3
9/5/2025	A5	44° 13.010N	70° 13.010W	7:29	8.8	101.6	101.6	22.3	6	18	88.2	2419.6
				Geomean	**7.9**						**31.6**	

Exhibit 5C Data
36

Date	Site	Lat	Long	Time	DO mg/l	DO %	Spec Cond	H2O Temp	Depth Ft.	Air Temp	E. coli	Total Col.
6/26/2025	A6	44° 6.364N	70° 13.406W	7:28	7.9	91.2	68.3	22.6	4	19	51.2	980.4
7/18/2025	A6	44° 6.364N	70° 13.406W	7:35	7.7	92.1	68.9	24.6	4	21	13.5	>2419.6
7/29/2025	A6	44° 6.364N	70° 13.406W	7:08	7.3	88.7	69.7	25	6	22	6.3	1732.9
8/12/2025	A6	44° 6.364N	70° 13.406W	7:06	7.7	92.8	85.2	25.1	6	20	6.3	1203.3
8/22/2025	A6	44° 6.364N	70° 13.406W	7:20	7.6	91	90.3	24.2	6	16	15.6	1986.3
9/5/2025	A6	44° 6.364N	70° 13.406W	7:33	7.5	86	101.7	22	6	18	35	980.4
				Geomean	**7.6**						**15.7**	
6/26/2025	A7	44° 7.791N	70° 12.358W	7:42	8	92.6	67.6	22.8	4	19	32.8	1986.3
7/18/2025	A7	44° 7.791N	44° 7.791N	7:40	7.6	91.5	68.3	24.7	6	20	4.1	1553.1
7/29/2025	A7	44° 7.791N	44° 7.791N	7:14	7.3	88.3	68.8	24.6	6	22	3.1	>2419.6
8/12/2025	A7	44° 7.791N	70° 12.358W	7:11	7.6	91.3	85.9	24.8	6	20	33.6	1986.3
8/22/2025	A7	44° 7.791N	44° 7.791N	7:25	7.5	89.3	90.1	24.1	6	14	24.1	2419.6
9/5/2025	A7	44° 7.791N	44° 7.791N	7:42	7.4	84.5	103	21.8	6	18	11	1986.3
				Geomean	**7.6**						**12.4**	
6/26/2025	A8	44° 8.421N	70° 12.125W	7:47	7.9	92.5	67.7	22.9	4	19	31.8	436.2
7/18/2025	A8	44° 8.421N	70° 12.125W	7:46	7.4	89.6	68.2	24.9	6	20	7.5	1986.3
7/29/2025	A8	44° 8.421N	70° 12.125W	7:18	7.3	87.3	68.5	24.6	6	21	4	>2419.6
8/12/2025	A8	44° 8.421N	70° 12.125W	7:15	7.3	87.6	84.8	24.8	6	20	7.4	980.4
8/22/2025	A8	44° 8.421N	70° 12.125W	7:30	7.1	85	89.6	24.2	6	15	8.4	1203.3
9/5/2025	A8	44° 8.421N	70° 12.125W	7:46	6.7	76.6	103.1	21.8	6	18	9.7	1119.9
				Geomean	**7.3**						**9.1**	

Exhibit 5D Data
37

Date	Site	Lat	Long	Time	DO mg/l	DO %	Spec Cond	H2O Temp	Depth Ft.	Air Temp	E. coli	Total Col.
6/26/2025	A9	44° 9.586N	70° 12.415W	7:53	8.8	107.2	68.7	25.7	4	19	37.9	238.2
7/18/2025	A9	44° 9.586N	70° 12.415W	7:50	8	98.7	68.2	26	6	19	5.2	>2419.6
7/29/2025	A9	44° 9.586N	70° 12.415W	7:22	7.9	96.3	69.8	25.3	6	21	<1	>2419.6
8/12/2025	A9	44° 9.586N	70° 12.415W	7:20	8.3	101.9	86.4	25.7	6	20.5	2	920.8
8/22/2025	A9	44° 9.586N	70° 12.415W	7:38	7.5	89.8	91	24.5	6	16	5.2	1119.9
9/5/2025	A9	44° 9.586N	70° 12.415W	7:55	7.6	87.1	95	22	6	18	>1	1553.1
				Geomean	**8**						**3.6**	
				Geomean Combined-7.8						**Geomean Combined-18.1**		
Replicates												
6/26/2025	A1	Replicate	As Above	6:46	8	92.9	75.2	23.1	4	19	30.5	2419.6
7/18/2025	A2	Replicate	As Above	6:57	7.7	91.9	74.1	24.6	2	22	28.2	>2419.6
7/29/2025	A3	Replicate	As Above	6:46	7.6	91.9	77.3	25	2	25	26.9	1732.9
8/12/2025	BR	Replicate	As Above	6:55	7.4	89.5	92.2	25	6	20	18.3	1732.9
8/22/2025	A5	Replicate	As Above	7:14	7.7	91.5	90.8	24	4	16	26.2	1533.1
9/5/2025	A6	Replicate	As Above	7:35	7.5	85.8	101.7	22	6	18	32.3	1203.3
				Geomean	**7.7**						**26.7**	
6/26/2025	Lab Blank			9:30							<1	<1
7/18/2025	Lab Blank			10:00							<1	<1
7/29/2025	Lab Blank	`		9:05							<1	<1
8/12/2025	Lab Blank			8:45							<1	<1
8/22/2025	Lab Blank			9:25							<1	<1
9/5/2025	Lab Blank			10:25							<1	<1

§464. Classification of Maine waters

https://www.mainelegislature.org/legis/statutes/38/title38sec464.html

10. Existing hydropower impoundments managed under riverine classifications; habitat and aquatic life criteria. For the purposes of water quality certification under the Federal Water Pollution Control Act, Public Law 92-500, Section 401, as amended, and the licensing of modifications under section 636, hydropower projects in existence on the effective date of this subsection, the impoundments of which are classified under section 465, are subject to the provisions of this subsection in recognition of some changes to aquatic life and habitat that have occurred due to the existing impoundments of these projects.

A. Except as provided in paragraphs B and D, the habitat characteristics and aquatic life criteria of Classes A and B are deemed to be met in the existing impoundments classified A or B of those projects if:

(1) The impounded waters achieve the aquatic life criteria of section 465, subsection 4, paragraph C. [PL 1991, c. 813, Pt. B, §1 (NEW).]

B. The habitat characteristics and aquatic life criteria of Classes A and B are not deemed to be met in the existing impoundments of those projects referred to in paragraph A if:

(1) Reasonable changes can be implemented that do not significantly affect existing energy generation capability; and

(2) Those changes would result in improvement in the habitat and aquatic life of the impounded waters.

If the conditions described in subparagraphs (1) and (2) occur, those changes must be implemented and the resulting improvement in habitat and aquatic life must be achieved and maintained. [PL 1991, c. 813, Pt. B, §1 (NEW).]

C. If the conditions described in paragraph B, subparagraphs (1) and (2) occur at a project in existence on the effective date of this subsection, the impoundment of which is classified C, the changes described in paragraph B, subparagraphs (1) and (2) must be implemented and the resulting improvement in habitat and aquatic life must be achieved and maintained. [PL 1991, c. 813, Pt. B, §1 (NEW).]

D. When the actual water quality of waters affected by this subsection attains any more stringent characteristic or criteria of those waters' classification under sections 465, 467 and 468, that water quality must be maintained and protected. [PL 1991, c. 813, Pt. B, §1 (NEW).]
[RR 2021, c. 2, Pt. A, §130 (COR).]

11. Downstream stretches affected by existing hydropower projects. Hydropower projects in existence on the effective date of this subsection that are located on water bodies referenced in section 467, subsection 4, paragraph A, subparagraphs (1) and (7), and section 467, subsection 12, paragraph A, subparagraphs (7) and (9) are subject to the provisions of this subsection.

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For the purposes of water quality certification of hydropower projects under the Federal Water Pollution Control Act, Public Law 92-500, Section 401, as amended, and licensing of modifications to these hydropower projects under section 636, the habitat characteristics and aquatic life criteria of Class A are deemed to be met in the waters immediately downstream of and measurably affected by the projects listed in this subsection if the criteria contained in section 465, subsection 4, paragraph C are met.

- Peter Rubins, Grow L+A

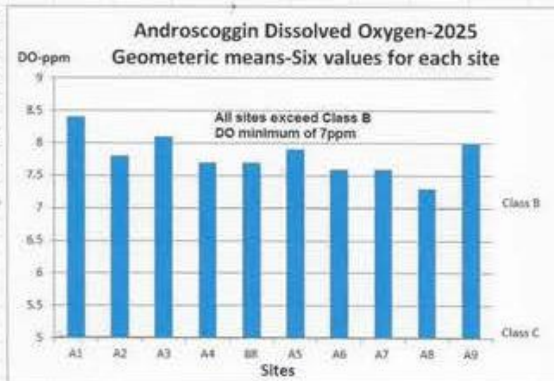
Data summary submitted with lower Androscoggin River upgrade comment on page 40 above.

FOMB/MMBTU Upper lower Androscoggin 2025 Sampling Summary Charts*

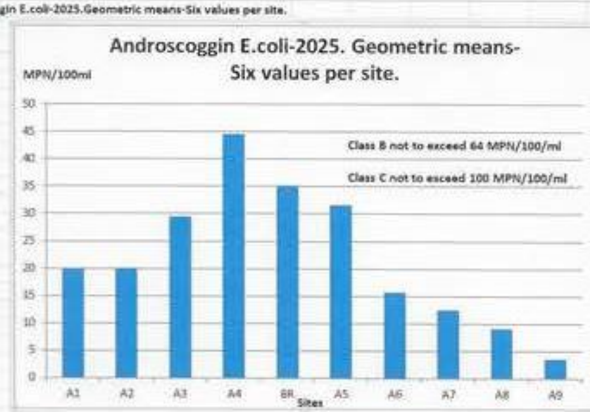
Lisbon Falls (A1) into Gulf Island Pond (A9)

Sampling Dates: 6/26, 7/18, 7/29, 8/12, 9/5

Site	DO-2025
A1	8.4
A2	7.8
A3	8.1
A4	7.7
BR	7.7
A5	7.9
A6	7.6
A7	7.6
A8	7.3
A9	8

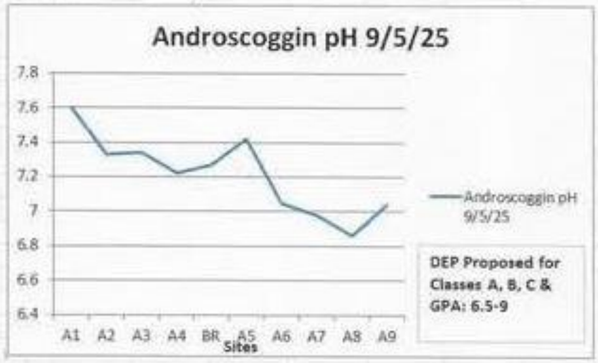


Site	Androscoggin E.coli-2025.Geometric means-Six values per site.
A1	19.9
A2	20
A3	29.5
A4	44.6
BR	35.1
A5	31.6
A6	15.7
A7	12.4
A8	9.1
A9	3.6

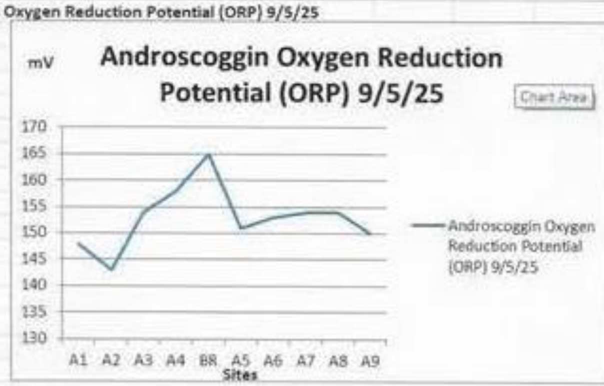


USGS Auburn flows 1,300 cfs; median flows for this date based on 96 years of data: 2,940 cfs

Site	Androscoggin pH 9/5/25
A1	7.6
A2	7.33
A3	7.34
A4	7.22
BR	7.27
A5	7.42
A6	7.05
A7	6.98
A8	6.86
A9	7.04
A6 Replicate	7.01



Site	Androscoggin Oxygen Reduction Potential (ORP) 9/5/25
A1	148
A2	143
A3	154
A4	158
BR	165
A5	151
A6	153
A7	154
A8	154
A9	150



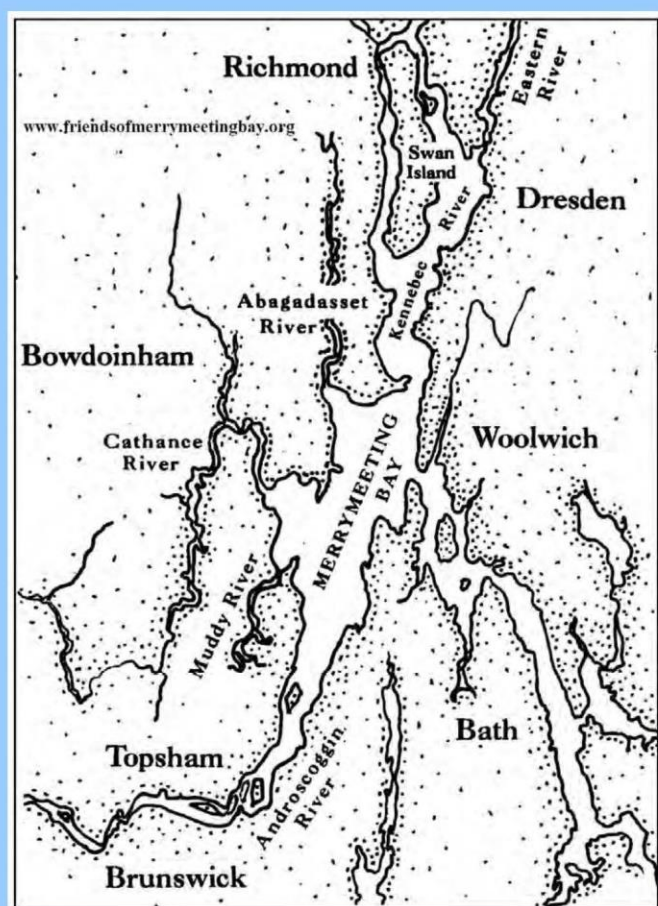
* pH and ORP readings taken with calibrated YSI Pro Quattro meter rented from Pine Environmental Services

- Ed Friedman, Friends of Merrymeeting Bay (FOMB)

Data summary and supporting information submitted with lower Androscoggin River upgrade comment on page 43 above.

Friends of Merrymeeting Bay
DEP Triennial Review Comments

6/29/2025



The Department's own 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*."

Friends of Merrymeeting Bay

P.O. Box 233, Richmond, ME 04357 [*www.fomb.org*](http://www.fomb.org)

6/29/25

Megan Sims
Maine Department of Environmental Protection
Water Quality Standards Coordinator
508-8776
Meagan.Sims@maine.gov

Via Email

Megan,

Please accept these comments from Friends of Merrymeeting Bay (FOMB) in regards to the 2026 Triennial Review of water quality proposals.

We support the Grow L+A nomination for upgrading the (upper) lower Androscoggin between Worumbo dam and Gulf Island Pond from a C to a B however, it appears the actual past data for the section are a bit sporadic and we hope to change that with our longitudinal profiles from last year (one trial run), this year (expected six profiles) and probably next year. We do not support the idea of changing classifications to include something between the current C and B although if it were done, B should stay as is to avoid confusion. We support the upgrade for this section provided our data and others substantiate it and trust that by the time the Board and certainly the legislature consider this, further data of ours will be in hand.

Water Sampling

In the past, FOMB volunteers have done some sampling (see Site Map for years) above the Gulf Island Pond (GIP) oxygen diffusers (from 982 N. River Rd.) and below them (Bates Boathouse). This was in the early- mid-2000's. Our years of water quality data are **here** in the Chemical section of our Cybrary. We later did a few years of sampling from the Auburn Boat Launch but from the very early days we have sampled in Durham (for O2 and later total and fecal bacteria), first from the boat launch and when access there became a bit obscured, a mile or so down the road in the straight section of river across from the farmland. When FOMB became part of the VRMP program we were asked to stop using Winkler Titration methodology for dissolved oxygen and so the Durham monitor continued as bacteria (by this time E.coli and total coliform using IDEXX Colilert) only. We have sampled at one of the Durham sites from 2004 through the present.

In 2021 FOMB contracted with Moody Mountain Environmental for a survey of **Benthic Macro Invertebrates (BMI) in the lower Androscoggin River**, deploying rock baskets at six locations with the first four being above Worumbo dam (1-4) in the current proposed upgrade area and last two (5, 6) between Worumbo dam and Brunswick dam. Aquatic life at Sites 1, 2, and 3 all were appropriate for Class B according to Moody Mountain and the DEP. Site 4 was more appropriate for Class C but being in the upper Worumbo impoundment falls under the hydropower exclusion which elevates the classification to B.

Recognizing the paucity of comprehensive data for the proposed upgrade area (the Grow L+A proposal notes relevant Brookfield and DEP data), last summer FOMB, working with **Point of View Helicopter Services**, trialed a comprehensive sampling run using a helicopter equipped with amphibious floats. Because FOMB membership is concentrated closer to the Bay, getting enough volunteers to sample the upper lower river particularly in coordination with our existing sampling program, is not feasible using standard ground-based methods. In contrast, the helicopter worked very well, allowing two people (pilot and sampler) to land on the water, get DO meter readings and capture a water sample for bacteria analysis. Two people could cover 10 sites in about 1.5 hours from leaving the Auburn airport to returning there.

Our helo sampling sites began below the mouth of Sabattus Stream at our BMI Site 4 and went up into GIP. They also included BMI Sites 1-3. FOMB and Merrymeeting Bay Trout Unlimited (MMBTU) are funding six sampling flights this year and hopefully in 2026. We are focused on times of low flows and hot weather with tentatively one flight in June, two in July, two in August and one in September. Just last week we made the first 2025 flight and data from this and the 2024 trial are attached. Of note from these two samplings are the relative homogeneity of DO and bacteria levels throughout, which does provide an argument for limited site sampling being sufficient.

Classification

Unfortunately the Department continues to misinterpret state and federal statute by insisting all sections of river must meet the proposed classification 100% of the time. The Department also conflates classification with discharge permitting and ignores the statutory language around allowance for natural conditions.

We have attached two legal opinions (Conservation Law Foundation [CLF] and **Greenfire Law**), also presented during the previous upgrade efforts. Aside from particulars regarding data on the section from Worumbo to the Bay, the analyses regarding federal and state law remains the same. A few excerpts and areas covered from Greenfire are below:

Maine DEP has a nondiscretionary duty to recommend the lower Androscoggin for reclassification because it attains the Class B standard.
Under federal and Maine law, a water quality standard is composed of narrative or quantitative criteria, designated uses, and an anti-degradation policy. The Clean Water Act (CWA) and Maine's anti-degradation policy require that "[w]hen 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 that water be reclassified in the next higher classification."[2] Simply put, if actual data show that the lower Androscoggin in fact meets the standard for a Class B water, then the Maine Board of Environmental Protection has a non-discretionary duty to recommend to the legislature that it be so classified.

Field data demonstrates the lower Androscoggin meets Class B water quality criteria

First, there is no requirement to show even that the *actual* Class B water quality numeric standards need be attained one hundred percent of the time in every section of the reach being reviewed, much less that some remote, modeled scenario should dictate the classification of the reach. For example, some of the more stringent chemical criteria are stated as averages, meaning that measurements above and below that number are to be expected.[11]

Additionally, instances of non-attainment are anticipated as a designated use is maintained by law, "whether or not that use is being attained."[12] Finally, the EPA explicitly directs that "States are encouraged to designate uses that the State believes can be attained in the future."[13]

Second, flexibility is allowed in assessing the proper classification based upon the unique natural features of the water at issue. For example, some natural conditions, such as the incoming tides from Merrymeeting Bay and Sediment Oxygen Demand may cause the lower Androscoggin to fail to achieve a water quality criterion from time to time. But these natural conditions expressly may not be used to determine non-attainment of a use.[14]

DEP's interpretation would moor a reach to its lowest possibly quality days rather than pulling it towards its best uses attained since the Clean Water Act was adopted—and that is the exact opposite of what the law requires. After all, the purpose of the Clean Water Act is to eliminate water pollution, not to accommodate it by preventing progress towards more protective standards because of exceptionally rare hypothetical events.[15]

DEP has relied on inappropriate factors to recommend against reclassification in the past.

In previous years DEP staff recommended against reclassification of the Androscoggin to Class B for the following reasons, none of which is appropriate in the face of actual attainment of the Class B standard:
a) Under modeled "critical" once-in-a-decade low flow, high temperature conditions, the lower Androscoggin might fail to meet Class B standard,

b) Waste discharge permits might have to be altered and might not be allowed at all under Class B designation because of the requirement to consider modeled once-in-a-decade low flow, high temperature conditions,

c) Impoundments create low dissolved oxygen concentrations, and

d) Upstream pollution.

Pollution assimilation modeling cannot be used to overcome classification based on demonstration of uses actually being attained.

DEP's recommendation against reclassification of the lower Androscoggin primarily was based on modeling. DEP determined that "the existing models provide sufficient information to support the Department's previous assessment that there is no feasible approach to ensure attainment of Class B. But the models DEP relied upon are used to minimize risk of harm to aquatic resources when permitting a discharge, not to determine whether a use is present in a river stretch. As such, they are designed to be conservative in permitting harmful impact to waters—emphasize worst-case scenarios to build in a margin of safety to guard against degradation of the nations' waters. The models are not intended to be used to thwart the purpose of the anti-degradation policy.

Essentially, there is *supposed to be* a rebuttable presumption that water quality standards consistent with actual water quality should stand.[31] And, there is no ability to constrain a reach at a lower classification where the water is actually attaining the designated uses and standards of a more protective classification.[32] Thus, there is not properly room for a Use Attainability Analysis here. Anti-degradation policy—the ratcheting always towards improved quality--ensures that water quality is continually improved over time and that improvements are maintained. Effectively, DEP's attachment of proof of attainment under the most dire possible modeled scenario reverses the ratchet direction of the state and federal anti-degradation policy and statute.

Use of the water body to receive waste water discharges is not a permissible consideration in establishing appropriate classification.

There are no other factors that should be considered in determining what class the lower Androscoggin is actually attaining. DEP expressly may not take into account industrial discharge capacity needs in determining uses.[33]
DEP improperly invited consideration of the waste-assimilative capacity of the River as part of the reclassification review, stating that waste permitting limits "is an important requirement [to consider] when a reclassification is being evaluated. It is highly recommended that the Legislature fully understands any new licensing requirements that will be imposed on any discharge prior to a reclassification decision being made."[34] In short, the DEP was directing the legislature to be careful not to eliminate the ability of the water legally to support the waste disposal needs of industry, which is not allowed.[35]

Naturally occurring conditions cannot be used as evidence of non-attainment of water quality standards.

DEP's analysis of dissolved oxygen deficiency relied on naturally occurring conditions. "Where natural conditions, including, but not limited to, marshes, bogs and abnormal concentrations of wildlife cause the dissolved oxygen or other water quality criteria to fall below the minimum standards specified in sections 465, 465-A and 465-B, those waters shall not be considered to be failing to attain their classification because of those natural conditions."[36]

Upstream conditions must be ameliorated rather than used as an excuse to avoid protecting downstream water quality.

DEP concluded that "river sampling showed a nutrient loading from sources upstream."[37] The States designation of those upstream sources should not negatively impact downstream waters.[38] Further, "[n]o waste load allocation can be developed or NPDES permit issued that would result in standards being violated. With respect to antidegradation, that means existing uses must be protected, water quality may not be lowered in [Outstanding Natural Resource Waters], and in the case of waters whose quality exceeds that necessary for the section 101(a)(2) goals of the Act, an activity cannot result in a lowering of water quality unless the applicable public participation, intergovernmental review, and baseline control requirements of the antidegradation policy have been met."[39]

Conclusion

In conclusion, the DEP should present to the Board of Environmental Protection and the legislature the factual basis for the lower Androscoggin's attainment of Class B criterion and character and refrain from including within that recommendation any argument that might be construed as a Use Attainability Analysis.

***************************** Greenfire Law

Provided FOMB/MMBTU and other data show actual conditions of the upper lower Androscoggin reflect those of Class B most of the time, the Department should support the upgrade with the Board. If the Department continues in their refusal to support upgrades consistent with actual conditions, then the Board, as they did last time, should correctly follow the statutes and recommend this upgrade to the Joint Legislative Committee on Environment and Natural Resources, while also directing the Department to do so.

Thank you for your consideration,

Ed Friedman, Chair
207-666-3372

Exhibit 1	Greenfire Law Memo
Exhibit 2	CLF Memo
Exhibit 3	Sampling Map
Exhibit 4	FOMB Helicopter Sampling Results 2024 & 2025 to Date
Exhibit 5	Helicopter Sampling Sites
Exhibit 6	FOMB Historical Water Quality Data 1999-2024
Exhibit 7	Aquatic Life Determination Study of the Lower Androscoggin River (BMI Study)

Exhibit 1

<u>Why Upgrade?</u>

1. The Legislature declares it is the State's objective to restore and maintain the chemical, physical and biological integrity of the State's waters… (§464.1.)

2. Anti-degradation language prohibits backsliding in water quality. (§464 (F)(4))

3. An upgrade locks in water quality improvements.

4. A cleaner river has well-documented economic and quality of life benefits.

5. Sixty percent of our wildlife species inhabit river corridors and benefit as do we.

6. <u>It is the law!</u>

Memorandum of Law

RE: Reclassification of the Lower Androscoggin River to Class B

From: Rachel Doughty, Greenfire Law, PC

Date: March 31, 2020

The lower Androscoggin must be designated Class B because of its demonstrated achievement of the minimum standards for that classification. Maine has for many years resisted upgrading the water quality classification of the Lower Androscoggin from Class C to Class B by eliding the non-discretionary state and federal anti-degradation policy with the use attainability analysis, which can only be used to remove legally-designated uses.

Contents

GREENFIRE LAW, PC

Rachel Doughty • Greenfire Law • 2550 9th Street • Berkeley • California • 94710
510.900.9502 x 2 • rdoughty@greenfirelaw.com

Analysis

Maine Department of Environmental Protection (DEP) is presently preparing recommendations to the legislature as part of the State's triennial mandatory review of water quality standards.[1] Under the federal and Maine anti-degradation laws, DEP must recommend a change in use classification for the lower Androscoggin from Class C to Class B because that is the standard of water quality it is actually achieving the overwhelming majority of the time. Maine may not avoid reclassification of the lower reach based on hypothetical, once-in-a-decade modeled events. Nor may the lower Androscoggin be kept in Class C to permit the greatest flexibility to accommodate industrial waste assimilation as a priority.

I. Maine DEP has a nondiscretionary duty to recommend the lower Androscoggin for reclassification because it attains the Class B standard.

Under federal and Maine law, a water quality standard is composed of narrative or quantitative criteria, designated uses, and an anti-degradation policy. The Clean Water Act (CWA) and Maine's anti-degradation policy require that "[w]hen 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 that water be reclassified in the next higher classification."[2] Simply put, if actual data show that the lower Androscoggin in fact meets the standard for a Class B water, then the Maine Board of Environmental Protection has a non-discretionary duty to recommend to the legislature that it be so classified.

A. Field data demonstrates the lower Androscoggin meets Class B water quality criteria.

Actual field data shows the lower Androscoggin achieves Class B water quality criterion for dissolved oxygen (DO). Maine's dissolved oxygen criterion for Class B is:

> The dissolved oxygen content of Class B waters may not be less than 7 parts per million or 75% of saturation, whichever is higher, except that for the period from October 1st to May 14th, in order to ensure spawning and egg incubation of indigenous fish species, the 7-day mean dissolved oxygen concentration may not be less than 9.5 parts per million and the 1-day minimum dissolved oxygen concentration may not be less than 8.0 parts per million in identified fish spawning areas.[3]

FOMB has monitored the River since 1999 following EPA and or DEP protocols.[4] Using these DEP-approved protocols FOMB collected data spanning the years 1999 to present--731 individual DO

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[1] 33 U.S.C.S. § 1313(c)(1).

[2] 38 M.R.S. § 464.4.F.4 (emphasis added); see also 40 C.F.R. § 131.20(i) ("Where existing water quality standards specify designated uses less than those which are presently being attained, the State shall revise its standards to reflect the uses actually being attained.").

[3] 38 M.R.S. § 465.3.B.

[4] Exhibit 29, *Friends of Casco Bay EPA Quality Assurance Plan* under which FOMB operated until 2018, Exhibit 34, *MDEP VRMP Sampling Protocols* also used since 2009, Exhibit 28 FOMB, *Volunteer River Monitoring Program 2009-2018* (including DO and *E. coli* data) *See also* Exhibits 30 (Auburn Boat Launch DO data 2010-

samples--on the lower Androscoggin.[5] Of these samples, only 16--two percent--fell below the Class B 7mg/L criterion for DO, mostly within the acceptable range of calibration error of 0.6 mg/L.[6] Thus, actual sampling of the lower Androscoggin demonstrates attainment with the DO criterion for Class B 98% of the time.[7]

Likewise, field data shows the lower Androscoggin achieves Class B water quality criterion for *E. coli*. Maine's *E. coli* criterion for Class B is:

> Between May 15th and September 30th, the number of *Escherichia coli* bacteria of human and domestic animal origin in these waters may not exceed a geometric mean of 64 per 100 milliliters or an instantaneous level of 236 per 100 milliliters. In determining human and domestic animal origin, the department shall assess licensed and unlicensed sources using available diagnostic procedures.[8]

E. coli sampling has been done since 2006. Again, the results were overwhelmingly above the Class B criterion.[9]

DEP, in its 2018 Proposed Reclassifications seemed to imply that if a scenario can be imagined and modeled demonstrating a once in ten year failure to meet a criterion of a water quality standard for a particular class, then the reach cannot be reclassified to the standard it meets the overwhelming majority of the time.[10] The law is not that inflexible—certainly not in the direction implied.

First, there is no requirement to show even that the *actual* Class B water quality numeric standards need be attained one hundred percent of the time in every section of the reach being reviewed, much less that some remote, modeled scenario should dictate the classification of the reach. For example, some of the more stringent chemical criteria are stated as averages, meaning that measurements above and below that

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2011), 35, 36, 37 (Applied Biomonitoring-FOMB Reports covering DO and E. coli for years 2009-2012) and 38 (Complete FOMB raw data.1999-2019.

[5] *See* Exhibit 38 (FOMB Complete WQ Data Files and Exhibits).

[6] *See* Exhibit 27, Peter Milholland, *Quality Assurance Project Plan for Friends of Casco Bay Citizen Stewards Water Quality Monitoring Program* (Sept. 15, 2006) p. 52 (describing calibration protocol) and Table 2. Under the federal EPA Quality Assurance Plan governing DO sampling for Friends of Merrymeeting Bay and Friend of Casco Bay, during annual refreshers there was an allowance of 0.6 mg/L leeway between test reading and calibrated sample. In other words, a DO test result of as low as 6.4 would be within acceptable parameters for attainment of 7mg/L, the Class B standard. The occasional low DO reading over the years has generally been on the order of 6.8 or 6.9 well within the allowed margin of error.

[7] Calculated from Exhibit 38 (FOMB Complete WQ Data Files and Exhibits).

[8] 38 M.R.S. § 465.3.B.

[9] *See* attached, Exhibit 26: *Geomeric means chart for 2006-2019*; *See also*, Exhibit 38: FOMB Complete WQ Data Files and Exhibits 35, 36, 37: Applied Biomonitoring Reports 2010, 2011, 2013

[10] In a October 25, 2019, letter to Senators Libby and Claxton (Exhibit 30), the DEP stated at page 3 that it considered the anti-degradation mandate "in the full context of the water quality laws including the sections of law that establish the conditions under which a discharge may be licensed." So, citing findings made when determining the waste assimilative capacity of the water, the DEP concluded that a water cannot be recommended for a more protected classification if it cannot meet that standard in a modeled "7-day low flow that can be expected to occur with a frequency of once in 10 years."

number are to be expected.[11] Additionally, instances of non-attainment are anticipated as a designated use is maintained by law, "whether or not that use is being attained."[12] Finally, the EPA explicitly directs that "States are encouraged to designate uses that the State believes can be attained in the future."[13]

Second, flexibility is allowed in assessing the proper classification based upon the unique natural features of the water at issue. For example, some natural conditions, such as the incoming tides from Merrymeeting Bay and Sediment Oxygen Demand may cause the lower Androscoggin to fail to achieve a water quality criterion from time to time. But these natural conditions expressly may <u>not</u> be used to determine non-attainment of a use.[14]

DEP's interpretation would moor a reach to its lowest possibly quality days rather than pulling it towards its best uses attained since the Clean Water Act was adopted—and that is the exact opposite of what the law requires. After all, the purpose of the Clean Water Act is to eliminate water pollution, not to accommodate it by preventing progress towards more protective standards because of exceptionally rare hypothetical events.[15]

B. The actual uses of the lower Androscoggin are consistent with Class B designation.

Currently, the lower Androscoggin "[f]rom its confluence with the Ellis River to a line formed by the extension of the Bath-Brunswick boundary across Merrymeeting Bay in a northwesterly direction" is designated Class C.[16] The designated uses of Class B and Class C are substantially the same, <u>differing only in whether the habitat supported by the reach is characterized as unimpaired</u>:

> **Class B:** waters must be of such quality that they are suitable for the designated uses of drinking water supply after treatment; fishing; agriculture; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation, except as prohibited under

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[11] *See, e.g.*, 38 M.R.S. § 465.3.B (describing even the most stringent criterion for Class B dissolved oxygen as a 7-day *mean*).

[12] 38 M.R.S. § 464.2-A.F.

[13] Section 2.4

[14]

> Where natural conditions, including, but not limited to, marshes, bogs and abnormal concentrations of wildlife cause the dissolved oxygen or other water quality criteria to fall below the minimum standards specified in section 465, 465-A and 465-B, those waters shall not be considered to be failing to attain their classification because of those natural conditions.

38 M.R.S. § 464.4.C.

[15] *See* 33 U.S.C. § 1251(a) ("The objective of this Act is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. In order to achieve this objective it is hereby declared that, consistent with the provisions of this Act—**(1)** it is the national goal that the discharge of pollutants into the navigable waters be eliminated by 1985.")

[16] 38 M.R.S. § 467.1.A(2).

> Title 12, section 403; navigation; and as habitat for fish and other aquatic life. The habitat must be characterized as unimpaired.[17]

"'Unimpaired' means without a diminished capacity to support aquatic life." 38 M.R.S. § 466.11. The lower Androscoggin has and does support unimpaired aquatic life, and is not listed as impaired on this section for any relevant parameter.[18] Biological monitoring of the freeflowing sections of the Lower Androscoggin demonstrates attainment of Class B aquatic life standards.[19]

In determining what uses must be protected and maintained, the DEP may consider the actually designated uses contained in the Class B and C standards, as well as:

> (a) Aquatic, estuarine and marine life present in the water body;
>
> (b) Wildlife that utilize the water body;
>
> (c) Habitat, including significant wetlands, within a water body supporting existing populations of wildlife or aquatic, estuarine or marine life, or plant life that is maintained by the water body;
>
> (d) The use of the water body for recreation in or on the water, fishing, water supply, or commercial activity that depends directly on the preservation of an existing level of water quality; [. . .] and
>
> (e) Any other evidence that, for divisions (a), (b) and (c), demonstrates their ecological significance because of their role or importance in the functioning of the ecosystem or their rarity and, for division (d), demonstrates its historical or social significance.[20]

The lower Androscoggin provides exceptional and unique habitat. It feeds tidal wetlands that have been recognized by the U.S. Fish and Wildlife Service "highest value habitat," including for multiple rare inter-tidal plants and endangered, threatened and species of special concern (e.g., creeper, tidewater mucket, yellow lamp mussels, dry land sedge, etc.). It sustains, silver maple floodplain and birch-oak rocky communities. It is a spawning and nursery area for endangered short nose sturgeon, and Atlantic salmon

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[17] 38 M.R.S. § 465.3.A (emphasis added)Compare:

> **Class C:** Class C waters must be of such quality that they are suitable for the designated uses of drinking water supply after treatment; fishing; agriculture; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation, except as prohibited under Title 12, section 403; navigation; and as a habitat for fish and other aquatic life.

38 M.R.S. § 465.4.A.

[18] It is listed as impaired for PCBs, but so are other reaches that are designated Class B.

[19] *See* Exhibit 31, Maine Department of Environmental Protection, *Lower Androscoggin River Basin Water Quality Study Modeling Report* (March 2011), Appendix D (Station 954 (below Pejepscot Dam, free-flowing) attained Class B aquatic life standard.) Other stations were taken from impoundments and impoundments attained Class C aquatic life criteria, which by law must be treated as attaining A or B criteria in these locations. 38 M.R.S. § 464. 10.A(1). *See also* Exhibit 32 (FOMB annotations to Exhibit 31, *Appendix D* (Aquatic Life)).

[20] 38 M.R.S. § 465.4.F.

and threatened Atlantic sturgeon. Other significant diadromous fish including alewives, blueback herring, sea lamprey, American eel striped bass, rainbow smelt and American shad. The river provides sites for multiple bald eagle nests [13 to GIP], and several Peregrine falcon nests. [21]

The maintenance of a clean and lower Androscoggin is a critical economic resource to Maine as well.[22] It is well loved for recreation-fishing, hiking and paddling.[23] As a result, there is overwhelming support for reclassifying the Lower Androscoggin to protect it as an economic and recreational asset.[24]

And, even if water has degraded since the Clean Water Act was adopted, any "uses which have actually occurred on or after November 28, 1975, in or on a water body whether or not the uses are included in the standard for classification of the particular water body" must be protected in the absence of a use attainability analysis and a specific finding to eliminate a use.[25]

The lower Androscoggin clearly meets the use, criteria, and anti-degradation components for Class B waters and DEP's analysis should end here with a recommended change to that classification for the Board.

II. DEP has relied on inappropriate factors to recommend against reclassification in the past.

In previous years DEP staff recommended against reclassification of the Androscoggin to Class B for the following reasons, none of which is appropriate in the face of actual attainment of the Class B standard:

a) Under modeled "critical" once-in-a-decade low flow, high temperature conditions, the lower Androscoggin might fail to meet Class B standard,

b) Waste discharge permits might have to be altered and might not be allowed at all under Class B designation because of the requirement to consider modeled once-in-a-decade low flow, high temperature conditions,

c) Impoundments create low dissolved oxygen concentrations, and

d) Upstream pollution.

A. Pollution assimilation modeling cannot be used to overcome classification based on demonstration of uses actually being attained.

DEP's recommendation against reclassification of the lower Androscoggin primarily was based on modeling. DEP determined that "the existing models provide sufficient information to support the Department's previous assessment that there is no feasible approach to ensure attainment of Class B

[21] *See* Exhibits 9 to 18

[22] *See* Exhibits 8,15, 16, and 17.

[23] *See id.* and Exhibits 18-22 (describing protected lands and trails along the River).

[24] Exhibit 7 (compiled support letters); Exhibit 8 (Economic Benefit Articles), Exhibit 6 (Comprehensive Plan Excerpts).

[25] *See* 38 M.R.S. § 464.F.(1).

dissolved oxygen criteria in the lower Androscoggin River."[26] But the models DEP relied upon are used to minimize risk of harm to aquatic resources when permitting a discharge, not to determine whether a use is present in a river stretch. As such, they are designed to be conservative in permitting harmful impact to waters—emphasize worst-case scenarios to build in a margin of safety to guard against degradation of the nations' waters. The models are not intended to be used to thwart the purpose of the anti-degradation policy.

What DEP essentially did was perform a perfunctory Use Attainability Analysis to argue that the River should not be classified as the law would otherwise require.[27] But, a Use Attainability Analysis is appropriate in only two circumstances: when designating a use not included in the CWA and if removing a designated use.[28] DEP has been called upon to do neither of these things with regard to the lower Androscoggin, and the DEP may not use a use attainability analysis to avoid its *non-discretionary obligation* to recommend reclassification to a higher standard reflective of actual use and water quality.[29] Only *after* a use has been designated may the DEP perform a Use Attainability Analysis and consider the sort of things put before the Board here (e.g., economic effect on permits of reclassifying the River).[30]

Essentially, there is *supposed to be* a rebuttable presumption that water quality standards consistent with actual water quality should stand.[31] And, there is no ability to constrain a reach at a lower classification where the water is actually attaining the designated uses and standards of a more protective classification.[32] Thus, there is not properly room for a Use Attainability Analysis here. Anti-degradation policy—the ratcheting always towards improved quality--ensures that water quality is continually improved over time and that improvements are maintained. Effectively, DEP's attachment of proof of attainment under the most dire possible modeled scenario reverses the ratchet direction of the state and federal anti-degradation policy and statute.

[26] Oct. 25, 2019 Kavanaugh letter at pp. 7-8.

[27] To remove a designated use, DEP must make a number of findings demonstrating why that use is not attainable, hold a public hearing, and demonstrate that the conditions of 40 C.F.R. § 131.10(g) are met.[27]

[28] 38 M.R.S. § 464.2-A.A; *see also* 40 C.F.R § 131.10(h).

"'Use attainability analysis' means a structured scientific assessment of the factors affecting the attainment of a designated use in a water body. The assessment may include consideration of physical, chemical, biological and economic factors." 38 M.R.S. § 466.11-A.

[29] 38 M.R.S. § 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 that water be reclassified in the next higher classification.") (emphasis added).

[30] *See* above, Section I, discussing what the Board can consider in making its classification recommendation.

[31] *Idaho Mining Ass'n v. Browner*, 90 F. Supp. 2d 1078, 1097-98 (D. Idaho 2000).

[32] *Kan. Nat. Res. Council, Inc. v. Whitman*, 255 F. Supp. 2d 1208, 1209 (D. Kan. 2003)

B. Use of the water body to receive waste water discharges is not a permissible consideration in establishing appropriate classification.

There are no other factors that should be considered in determining what class the lower Androscoggin is actually attaining. DEP expressly may not take into account industrial discharge capacity needs in determining uses.[33]

DEP improperly invited consideration of the waste-assimilative capacity of the River as part of the reclassification review, stating that waste permitting limits "is an important requirement [to consider] when a reclassification is being evaluated. . . It is highly recommended that the Legislature fully understands any new licensing requirements that will be imposed on any discharge prior to a reclassification decision being made."[34] In short, the DEP was directing the legislature to be careful not to eliminate the ability of the water legally to support the waste disposal needs of industry, which is not allowed.[35]

C. Naturally occurring conditions cannot be used as evidence of non-attainment of water quality standards.

DEP's analysis of dissolved oxygen deficiency relied on naturally occurring conditions. "Where natural conditions, including, but not limited to, marshes, bogs and abnormal concentrations of wildlife cause the dissolved oxygen or other water quality criteria to fall below the minimum standards specified in sections 465, 465-A and 465-B, those waters shall not be considered to be failing to attain their classification because of those natural conditions."[36]

D. Upstream conditions must be ameliorated rather than used as an excuse to avoid protecting downstream water quality.

DEP concluded that "river sampling showed a nutrient loading from sources upstream."[37] The States designation of those upstream sources should not negatively impact downstream waters.[38] Further, "[n]o waste load allocation can be developed or NPDES permit issued that would result in standards being violated. With respect to antidegradation, that means existing uses must be protected, water quality may not be lowered in [Outstanding Natural Resource Waters], and in the case of waters whose quality exceeds that necessary for the section 101(a)(2) goals of the Act, an activity cannot result in a lowering of

[33] 38 M.R.S. § 465.4.F (d) ("Use of the water body to receive or transport waste water discharges is not considered an existing use for purposes of this antidegradation policy"); 40 C.F.R. § 131.10 ("In no case shall a State adopt waste transport or waste assimilation as a designated use for any waters of the United States.")

[34] Exhibit 33, Oct. 25, 2019 letter at p. 5.

[35] *See* above, n. 33.

[36] 38 M.R.S. § 464.4.C.

[37] Oct. 25, 2019 letter at 7.

[38] 40 C.F.R. § 131.10(b).

water quality unless the applicable public participation, intergovernmental review, and baseline control requirements of the antidegradation policy have been met.'"[39]

III. Conclusion

In conclusion, the DEP should present to the Board of Environmental Protection and the legislature the factual basis for the lower Androscoggin's attainment of Class B criterion and character and refrain from including within that recommendation any argument that might be construed as a Use Attainability Analysis.

[39] U.S. EPA, Clean Water Act Handbook, Chapter 4, p. 14.

Exhibit 2

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**. The board **shall recommend** to the Legislature that water be reclassified in the next higher classification."*

A Legal Opinion: Excerpt from Conservation Law Foundation BEP Comments 10/2/2008
The Lower Androscoggin River

"The Department's refusal to recommend an upgrade 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 Committee's [or Board's] analysis must be based on existing water quality-not hypothetical modeling with point sources operating at maximum licensed discharge. Indeed, the Committee [or 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).

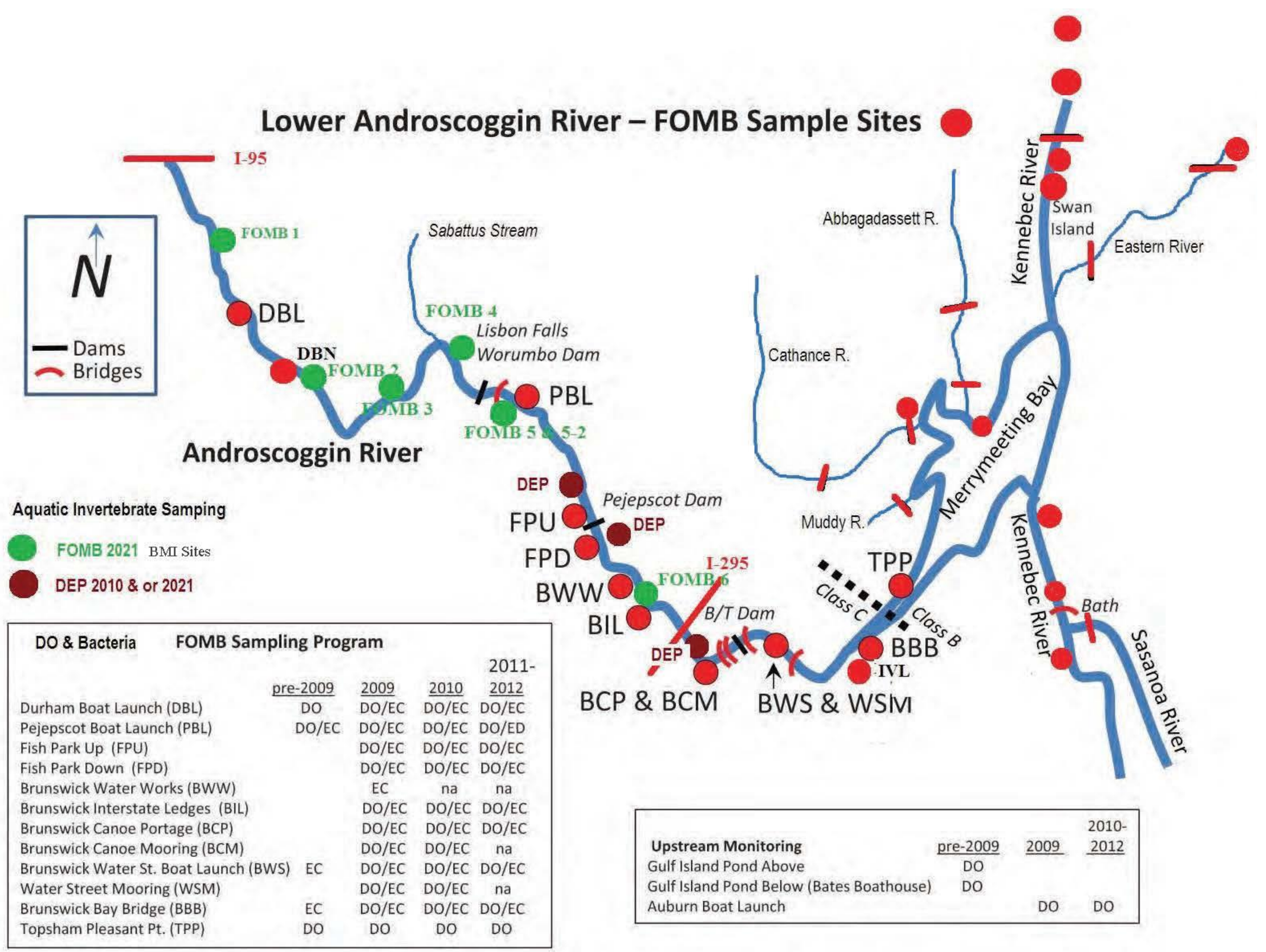
CLF strongly disagrees with the Department's recommendation and rationale for not upgrading this river segment. The Department has stated that proponents must provide water quality data and modeling showing "the likelihood of attainment of Class B water quality criteria at maximum licensed loads." See 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)(l)(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."

Exhibit 3



DO & Bacteria **FOMB Sampling Program**

	pre-2009	2009	2010	2011-2012
Durham Boat Launch (DBL)	DO	DO/EC	DO/EC	DO/EC
Pejepscot Boat Launch (PBL)	DO/EC	DO/EC	DO/EC	DO/ED
Fish Park Up (FPU)		DO/EC	DO/EC	DO/EC
Fish Park Down (FPD)		DO/EC	DO/EC	DO/EC
Brunswick Water Works (BWW)		EC	na	na
Brunswick Interstate Ledges (BIL)		DO/EC	DO/EC	DO/EC
Brunswick Canoe Portage (BCP)		DO/EC	DO/EC	DO/EC
Brunswick Canoe Mooring (BCM)		DO/EC	DO/EC	na
Brunswick Water St. Boat Launch (BWS)	EC	DO/EC	DO/EC	DO/EC
Water Street Mooring (WSM)		DO/EC	DO/EC	na
Brunswick Bay Bridge (BBB)	EC	DO/EC	DO/EC	DO/EC
Topsham Pleasant Pt. (TPP)	DO	DO	DO	DO

Upstream Monitoring	pre-2009	2009	2010-2012
Gulf Island Pond Above	DO		
Gulf Island Pond Below (Bates Boathouse)	DO		
Auburn Boat Launch		DO	DO

Exhibit 4

Upper Lower Androscoggin Helicopter Water Sampling Profile 8/24/24-FOMB

Site	Lat	Long	Time	DO mg/l	DO %	Spec Cond	H2O Temp	Depth Ft.	Air Temp	E. coli	Total Col.
A1	44° 0.524N	70° 5.169W	6:22	7.8	90.2	61.6	21.5	6	15	18.5	1119.9
A2	43° 59.573N	70° 6.839W	6:31	7.8	89	61	21.4	4	15	23.8	1299.7
A3	44° 0.116N	70° 9.076W	6:40	7.7	88.9	60.5	21.5	3	12	24.3	980.4
A4	44° 2.744N	70° 11.278W	6:51	7.8	89.6	60.7	21.4	4	13	20.1	816.4
BR	44° 3.917N	70° 12.457W	6:55	7.8	98.1	61.5	21.2				
A5	44° 13.010N	70° 13.010W	7:03	7.7	88.8	55.3	21.5	4	15	24.6	727
A6	44° 6.364N	70° 13.406W	7:10	7.7	88.8	54.8	21.5	8	15	9.7	613.1
A7	44° 7.791N	70° 12.358W	7:19	7.8	90.1	54.9	21.5	9	16	13.5	547.5
A8	44° 8.421N	70° 12.125W	7:24	7.8	89.9	55.2	21.5	7	16	13.5	648.8
A9	44° 9.586N	70° 12.415W	7:29	7.9	92.9	54.5	22.1	8	16	10.8	547.5

Site Notes

A1-FOMB Site 4 from BMI study-below Sabbatus mouth
A2-FOMB Site 3 from BMI study-in westerly rapid below Durham
A3-FOMB Site 2 from BMI study-Shallows opposite FOMB DBN
A4-FOMB eagle nest site XF
BR-Bottom of Benner Rips-done to see if rapids elevated DO
A5-Little Andy alt site below bridge
A6-Upstream of island between O'Reilly's and long building on east
A7-Below Deer Rips upstream of double points-east bank
A8-Start of narrows above Deer Rips dam
A9-GIP 850' above first island opposite west point, below rocks

Notes

DEP YSI ProSOLO meter #46- Calibrated (99.7%) Used in FOMB VRMP program. Bacteria samples analyzed with IDEXX Colilert.
Air temperatures from helicopter thermometer-no idea of accuracy
Helicopter-Schweizer 300C with amphibious floats
Had not pre-planned to do Benton Rips so no bacteria and forgot depth
USGS Auburn Flows-3,840 cfs, median- 2,920 cfs. Checked 4:15 am & 9:15 am-same readings
Ed Friedman & Mauricio Handler
Engine start 6am. Depart KLEW 6:15. End sampling 7:33. Back at KLEW 7:50

Upper Lower Androscoggin Helicopter Water Sampling Profile 6/26/25-FOMB

Site	Lat	Long	Time	DO mg/l	DO %	Spec Cond	H2O Temp	Depth Ft.	Air Temp	E. coli	Total Col.
A1	44° 0.524N	70° 5.169V	6:37	8	92.9	75.2	23.1	4	19	42.2	1986
A2	43° 59.573	70° 6.839V	6:52	7.9	91.5	74.7	22.7	2	19	22.8	2419.6
A3	44° 0.116N	70° 9.076V	7:00	7.9	91.6	74.2	22.6	2	19	50.4	2419.6
A4	44° 2.744N	70° 11.278	7:12	8	93.9	74.1	22.7	2	19	58.1	816.4
BR	44° 3.917N	70° 12.457	7:18	7.9	91.6	74.2	22.5	4	19	47.8	571.7
A5	44° 13.010	70° 13.010	7:25	7.9	92.1	68.5	22.6	4	19	59.8	640.5
A6	44° 6.364N	70° 13.406	7:28	7.9	91.2	68.3	22.6	4	19	51.2	980.4
A7	44° 7.791N	70° 12.358	7:42	8	92.6	7.6	22.8	4	19	32.8	1986.3
A8	44° 8.421N	70° 12.125	7:47	7.9	92.5	67.7	22.9	4	19	31.8	436.2
A9	44° 9.586N	70° 12.415	7:53	8.8	107.2	68.7	25.7	4	19	37.9	238.2
A1	Replicate		6:46	8	92.9	75.2	23.1	4	19	30.5	2419.6
Lab Blank			9:30							0	0

Site Notes

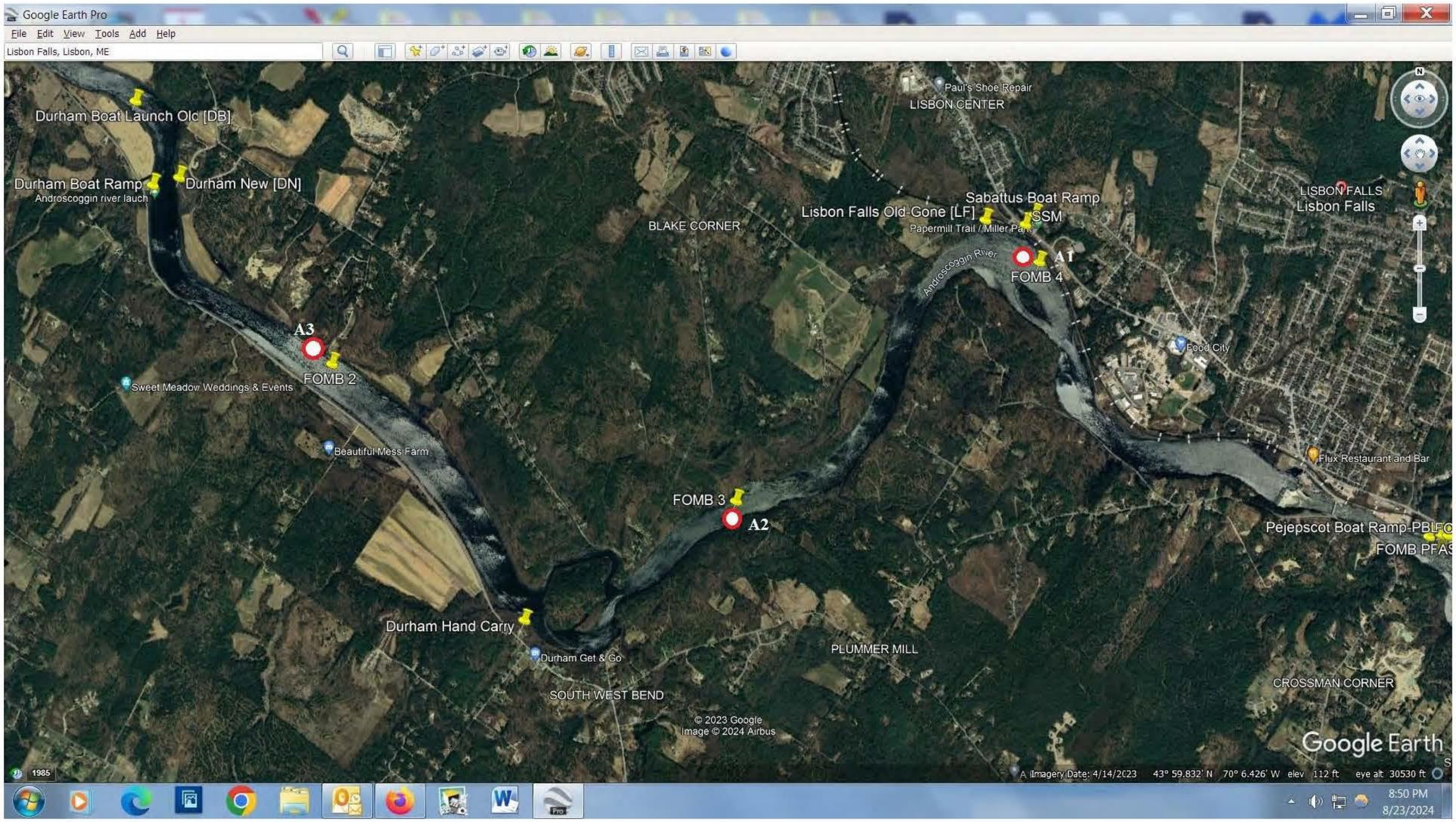
A1-FOMB Site 4 from BMI study-below Sabbatus mouth
A2-FOMB Site 3 from BMI study-in westerly rapid below Durham
A3-FOMB Site 2 from BMI study-Shallows opposite FOMB DBN
A4-FOMB Site 4 from BMI study. Eagle nest site XF
Br-Bottom of Benner Rips-below LAPCA
A5-Little Andy alt site below bridge
A6-Upstream of island between O'Reilly's and long building on east
A7-Below Deer Rips upstream of double points-east bank
A8-Start of narrows above Deer Rips dam. At 10'-same readings
A9-GIP 850' above first island opposite west point, below rocks (A8)

Notes

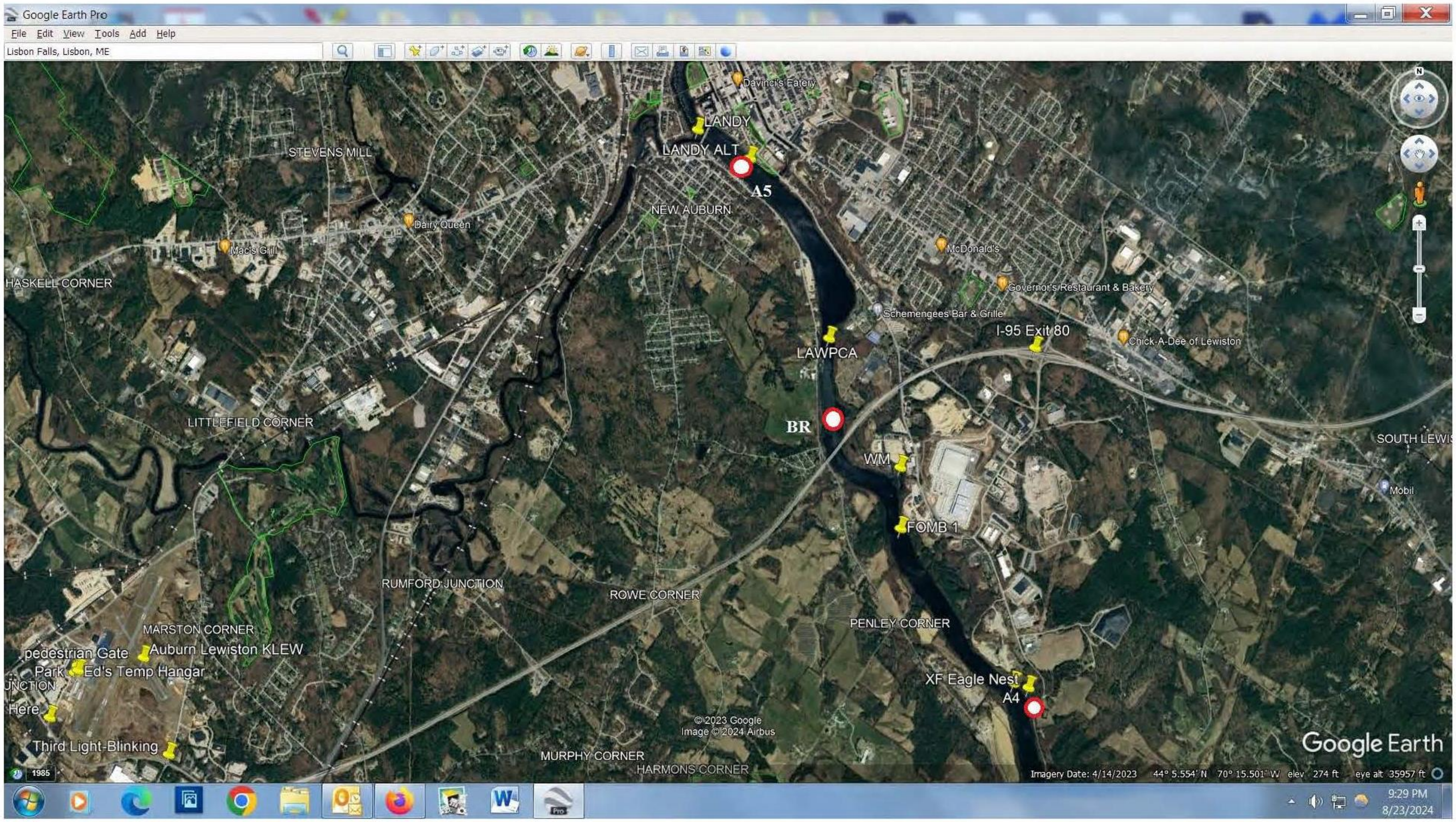
DEP YSI ProSOLO meter #46- Calibrated ((99.9%) used in FOMB VRMP program. Bacteria samples analyzed with IDEXX Colilert.
Air temperatures from helicopter thermometer-no idea of accuracy
Helicopter-Schweizer 300C with amphibious floats
USGS Auburn Flows-3,150 cfs, median-4,240 cfs. Checked 6:45 am & 8:00 am-same readings. 3,25 at 4:15am.
Ed Friedman & Kathy Claerr
Engine start 6:17am. Depart KLEW 6:30. End sampling 7:57. Back at KLEW 8:10

Exhibit 5

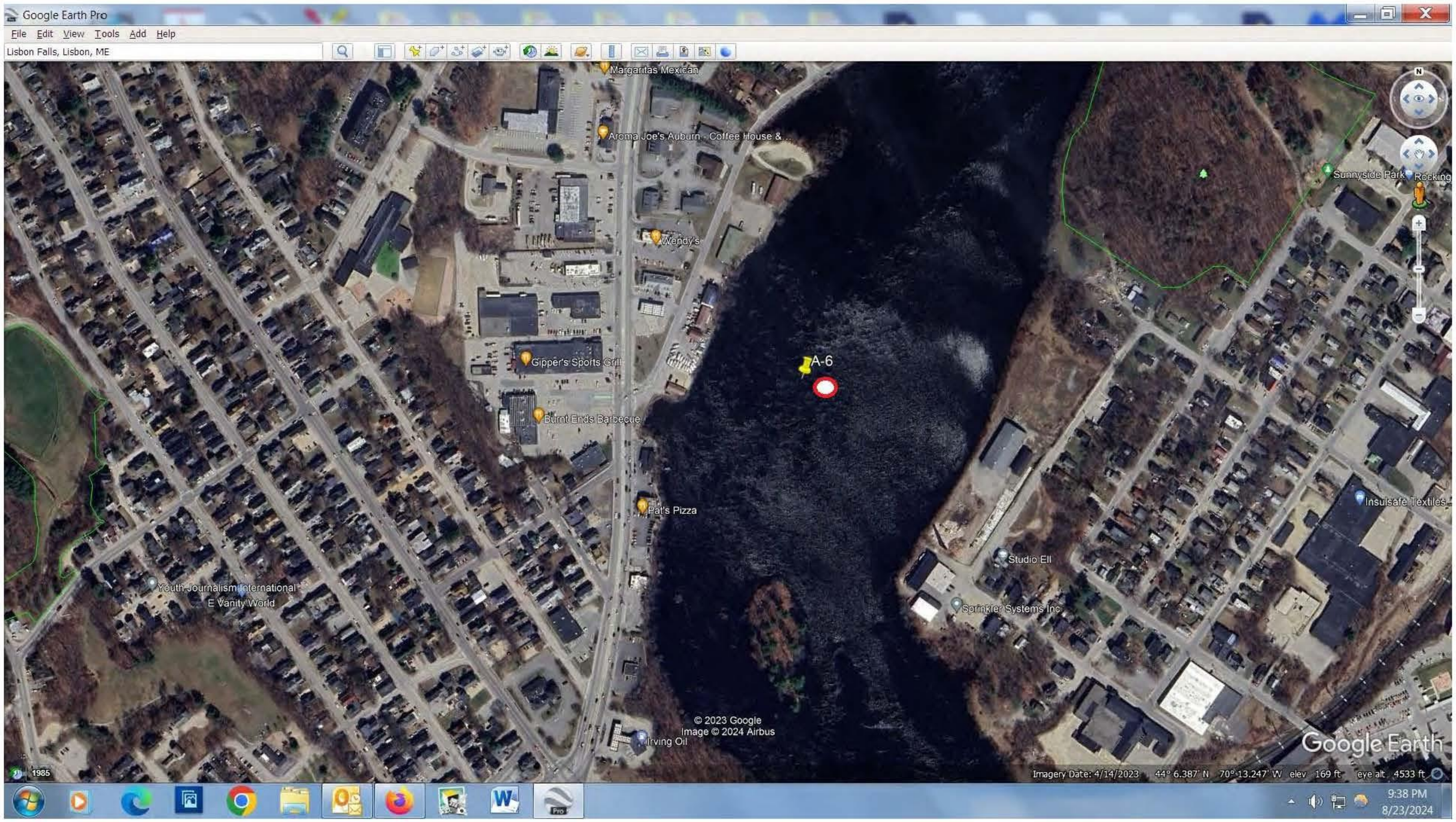
FOMB Helicopter Sampling Sites A1, A2, A3



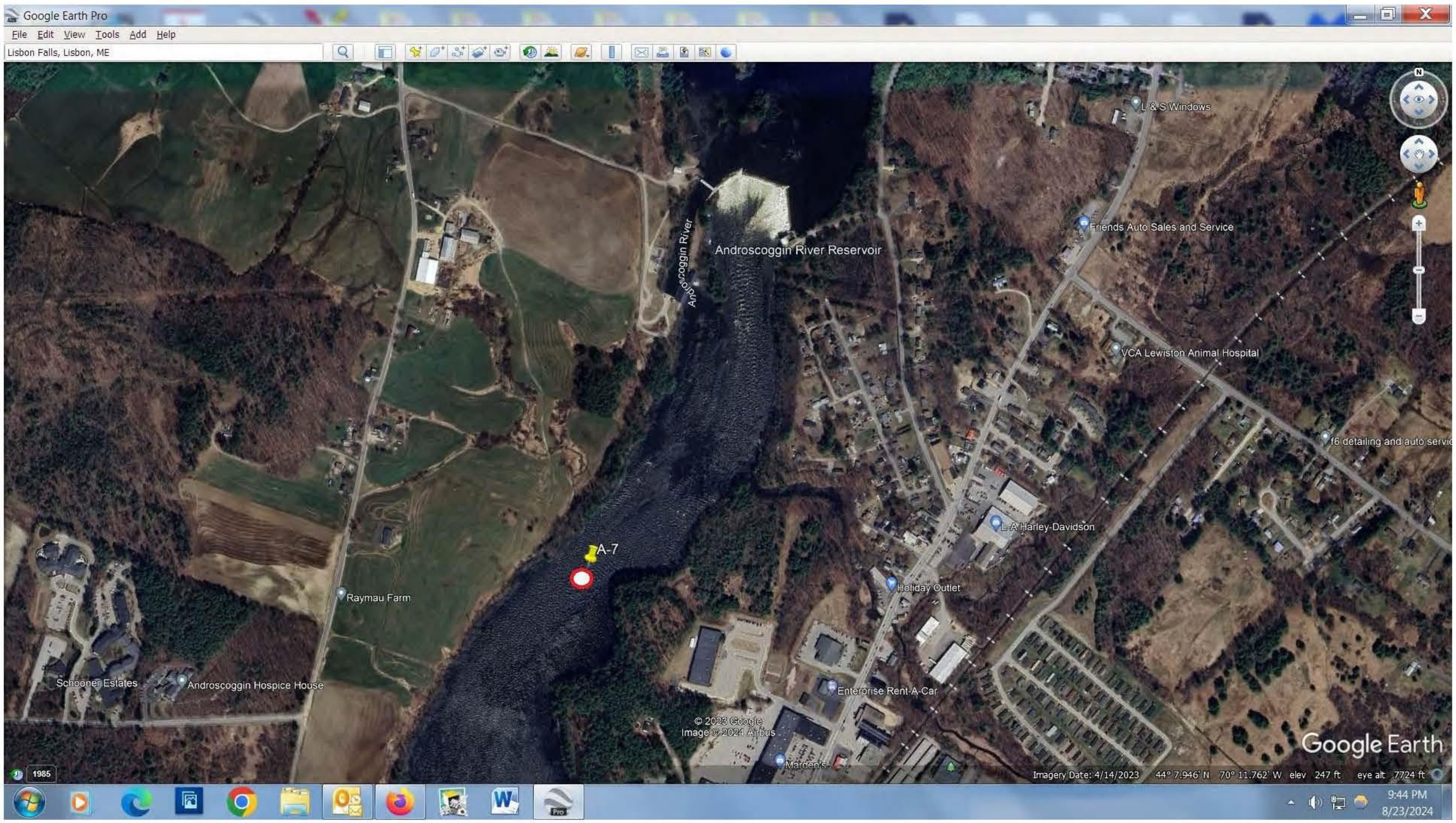
FOMB Helicopter Sampling Sites A4, BR, A5



FOMB Helicopter Sampling Site A6



FOMB Helicopter Sampling Site A7



FOMB Helicopter Sampling Sites A8, A9

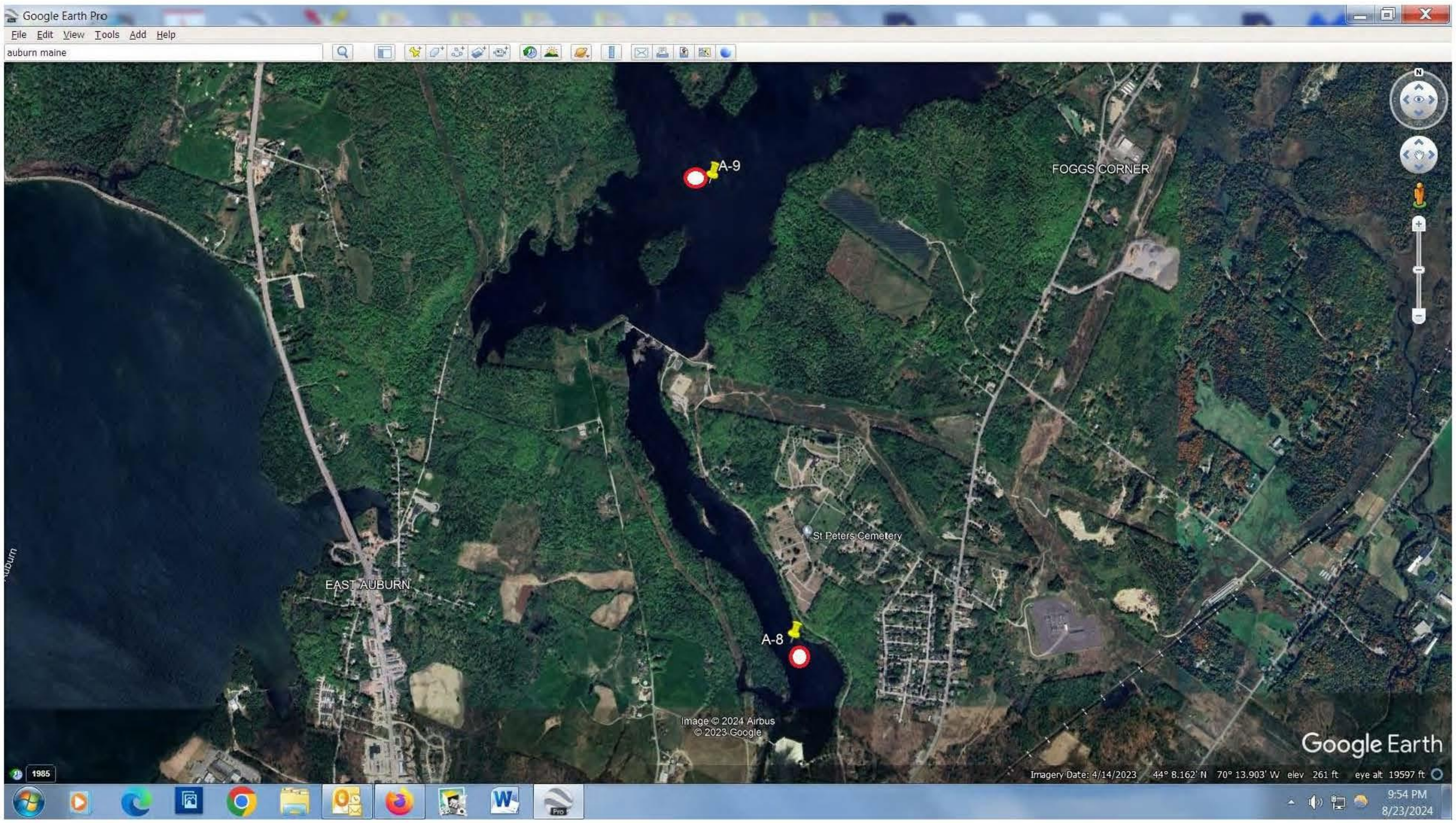


Exhibit 6

FOMB Water Quality Monitoring Data.
http://cybrary.friendsofmerrymeetingbay.org/WaterQualityProgram.cfm

- • 1999_chartdata (XLS File 13 KB)
- 1999_data_ss (XLS File 17 KB)
- 1999_WQ_Complete (XLS File 17 KB)
- 1999_WQData (XLS File 13 KB)
- 1999_WQMFullData (XLS File 17 KB)
- 2000_Chartdata (XLS File 16 KB)
- 2000_MMBDO (XLS File 17 KB)
- 2000_WQ_Complete (XLS File 40 KB)
- 2001_chartdata (XLS File 17 KB)
- 2001_WQ (XLS File 42 KB)
- 2001_WQ_Abbrev (XLS File 36 KB)
- 2002_Complete (XLS File 42 KB)
- 2002_DO (XLS File 18 KB)
- 2002_WQ_Summary (XLS File 22 KB)
- 2003_WQ_data (XLS File 55 KB)
- 2004_WQ_data (XLS File 47 KB)
- 2005_fecal_coliform_rain_events (XLS File 20 KB)
- 2005_WQ_Data (XLS File 142 KB)
- 2006_DO_Data (XLS File 59 KB)
- 2006_Fecal_ Data(complete_set) (XLS File 40 KB)
- 2007_ColiformData (XLS File 24 KB)
- 2007_DO_Data (XLS File 46 KB)
- 2008_DO_Data (XLS File 50 KB)
- 2008_Fecal_Data (XLS File 38 KB)
- 2008_Fecal_replicates (XLS File 28 KB)
- 2008_Fecal_YTDApril-June (XLS File 25 KB)
- 2008_LowerAndroDO_dataThrough June (XLS File 15 KB)
- 2009 Dissolved O2 Data (XLS File 37 KB)
- 2009 Ordered Andro data _Geomeans (XLS File 178 KB)
- 2009-Coliscan_Bacteria (XLS File 28 KB)
- 2010 Andro data with E coli & DO Geomeans (XLS File 36 KB)
- 2010 Dissolved O2 Data La Motte(version 1) (XLS File 44 KB)
- 20100000-Coliform-Final (XLS File 58 KB)
- 2011-FOMB_Ecoli (XLS File 16 KB)
- 2011_Dissolved_O2_Data_(version_1) (XLS File 53 KB)
- 2012_Dissolved_O2_Data_(version_1) (XLS File 47 KB)
- 2013_Dissolved_O2_Data_(version_1) (XLS File 42 KB)
- 20140000-Coliform-Final (XLS File 34 KB)
- 20140000-Dissolved_O2_Data_(version_1) (XLS File 44 KB)
- 20150000_Coliform_Final (XLS File 36 KB)
- 20160414_Update_Dissolved_O2_Data_HW_Data_Sheets (XLS File 47 KB)
- 20161231_Coliform_Data (XLS File 37 KB)
- 20161231_Coliform_Final (XLS File 37 KB)
- 20161231_Dissolved_O2_Data (XLS File 47 KB)
- 20171231_Androscoggin_and_Misc_Coliform_Data (XLS File 54 KB)
- 20171231_Dissolved_O2_Data (XLS File 48 KB)

- 20181201_FOMB_Coliform_and_DO_Data (XLS File 56 KB)
- 20191230-Coliform DO Final (XLS File 59 KB)
- 2020_WQ_Data_Complete (XLS File 62 KB)
- 2021 Colliform and Dissolved O2 Data (XLS File 60 KB)
- 2022 Colliform and Dissolved O2 Data (XLS File 62 KB)
- 2023 Colliform and Dissolved O2 Data (XLS File 63 KB)
- 2024 Coliform and Dissolved O2 Data (XLS File 61 KB)
- DataSheet (DOC File 46 KB)
- DMRDataSheet (DOC File 34 KB)
- FOMBFecalColiformFieldDataSheet2008 (DOC File 27 KB)
- Water Quality 03-05 (DOC File 1.72 MB)
- WQ.htm (HTM-OLD File 2 KB)
- WS_FTP (LOG File 12 KB)

Exhibit 7

2021 Aquatic Life Determination Macroinvertebrate Sampling Study of the Androscoggin River, Lewiston to Brunswick

Submitted by:

Paul C. Leeper
Moody Mountain Environmental
137 Diamond Str
Searsmont Maine 04973

Submitted to:

Friends of Merrymeeting Bay
P.O. Box 233
Richmond, Maine 04357
Date: May 4 2022

Introduction

This macroinvertebrate sampling study was conducted to determine what Maine Aquatic Life Water Quality Standards the lower Androscoggin River currently attains, between Lewiston and Brunswick. Rock bags/baskets were deployed at six sites during August and September, 2021 providing standardized substrates for macroinvertebrate colonization. Samples were retrieved, and the organisms were identified and enumerated. These data were submitted to the DEP for classification modeling and decisions on water quality class attainment in terms of Aquatic Life. The project was funded by Friends of Merrymeeting Bay (FOMB).

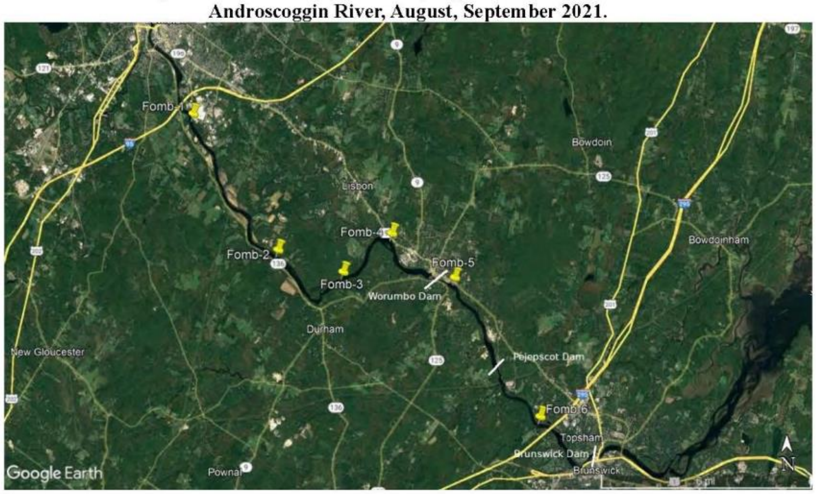
Study Objectives

The goal of the macroinvertebrate sampling study was to generate data on the aquatic macroinvertebrate communities in the Androscoggin River between Lewiston and Brunswick and assess these communities in terms of Maine's Aquatic Life Standards. The study was undertaken to better inform current reclassification efforts.

Study Area

In 2021 we placed samples at six (6) sites in the Androscoggin River to study aquatic macroinvertebrates (Figure 1). Table 1 shows the locations of the sample sites.

Figure 1. Location of aquatic macroinvertebrate sampling sites between Lewiston and Brunswick on the Androscoggin River, August, September 2021.



Moody Mountain Environmental 137 Diamond Str Searsmont ME 04973 ph.207-592-8540 moodymtn@tidewater.net

Table 1. Location of six (6) macroinvertebrate sample sites on the Androscoggin River in 2021 with notes.

Site	Town	Latitude	Longitude	Notes
1	Lewiston	44.058082	70.20023	
2	Durham	44.001923	70.15123	
3	Lisbon	43.992786	70.11391	
4	Lisbon	44.008722	70.08600	Worumbo Impoundment
5	Lisbon Falls	43.990480	70.04998	Pejepscot Impoundment
6	Brunswick	43.932984	70.00109	possibly impounded by Brunswick Dam at times

Water Classification

The Androscoggin River between Lewiston and Brunswick, during the time of the study, was classified Class C ((38 M.R.S.A § 467(1)(B)(1)(b))). With respect to designated uses, the Maine Water Quality Law requires that "Class C waters must be of such quality that they are suitable for the designated uses of drinking water supply after treatment; fishing; agriculture; recreation in and on the water; industrial process and cooling water supply; hydroelectric power generation, except as prohibited under Title 12, section 403; navigation; and as habitat for fish and other aquatic life." (38 M.R.S.A. § 465(4)(A)). In addition, for Class C waters, "Discharges to Class C waters may cause some changes to aquatic life, except that the receiving waters must be of sufficient quality to support all species of fish indigenous to the receiving waters and maintain the structure and function of the resident biological community..." (38 M.R.S.A. § 465(4)(C). The term "community function" means mechanisms of uptake, storage and transfer of life-sustaining materials available to a biological community which determines the efficiency of use and the amount of export of the materials from the community" ((38 M.R.S.A. § 466(3)). The term "community structure" means the organization of a biological community based on numbers of individuals within different taxonomic groups and the proportion each taxonomic group represents of the total community" ((38 M.R.S.A. § 466(4)). The term "resident biological community" is defined as "aquatic life expected to exist in a habitat which is free from the influence of the discharge of any pollutant" ((38 M.R.S.A. § 466(10)).

Study Methods

The objective of the macroinvertebrate sampling study was to determine if the aquatic life, in this case the macroinvertebrate community, attained these Class C standards or; was the aquatic

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life attaining a higher class? The Maine Department of Environmental Protection (DEP) "Methods for Biological Sampling and Analysis of Maine's Inland Waters" (Davies and Tsomides Revised 2014) were used as the basis of the field and laboratory procedures in the macroinvertebrate sampling study. A summary of these methods is given below.

The DEP standard rock bag/basket samplers were used for this study. These samplers hold approximately 16 lbs. of clean, washed, bank-run cobble, graded to uniform diameter range of 1.5 to 3 inches. Three (3) samplers were placed at each sample site; samplers are left in the river for approximately 28 days (± 4 days) to allow for invertebrate colonization. Retrieval of the samplers was done using an aquatic D-net at sites 1, 2, and 3. The net was placed directly downstream of a sampler; the sampler was then picked up and placed in the net. The contents of each sampler and the net were washed through a sieve bucket and preserved in labeled jars. Samplers at Sites 4, 5, and 6 were deployed and retrieved by certified SCUBA diver. At these deeper, non-wadeable, sites a diver is required in order to observe the conditions on the bottom and ensure proper placement and retrieval of the samplers. The diver retrieved the samplers using fine mesh collection bags. After enclosing the samplers, the samplers were brought to the surface.

Habitat measurements including substrate type, depth, current velocity and temperature were collected at sampler collection and retrieval.

The samplers were collected, preserved, and transported to the Moody Mountain Environmental laboratory. The three (3) samplers (replicates) were sorted, identified, and enumerated.

The Maine DEP, Division of Environmental Assessment (DEA) uses a linear discriminant water quality model (LDM) and professional judgment to determine water quality class attainment of aquatic macroinvertebrate communities. The LDM results are percentages indicating the probability of a site attaining water quality classes A, and AA (the biocriteria requirements are the same), B, or C. The LDM numeric criteria results can be supplanted by professional judgment if conditions are such that the data sets are unsuitable for LDM analysis.

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The Method outlines a number of conditions that can trigger the use of professional judgment to analyze data. Among these are:

1. Minimum Provisions - if the sample Mean Total Abundance is less than 50 individuals or Generic Richness is less than 15 genera.
2. Atypical Conditions - where atypical conditions could result in uncharacteristic findings, professional judgment can be used to make adjustments. Examples of these atypical conditions are:

a. - Habitat Factors

Lake Outlets
Impounded Waters
Substrate Characteristics
Tidal Waters

b. - Sampling Factors

Disturbed Samples
Unusual Taxa Assemblages
Human Error in Sampling

c. - Analytical Factors

Subsample versus Whole Sample analysis
Human Error in Processing

In cases where professional judgment is used the Method outlines a process by which adjustments should occur. These are:

a. **Resample** the site if specific sampling factors may have influenced the results
b. **Raise the Finding** of the LDM from non-attainment to indeterminate or attainment of Class C;
c. **Raise the Finding** of the LDM from one class to the next higher class;
d. **Lower the Finding** of the LDM to indeterminate or the next lower class. This would be based on evidence that the narrative aquatic life criteria for the assigned class are not met;
e. **Determination of Non-Attainment**: Minimum Provisions not met by samples for which no evidence exists of atypical conditions.
f. **Determination of Attainment**: Minimum Provisions not met by samples for which there is evidence of factors that could result in minimum provisions not being met, professional judgment may be used to make a professional finding of attainment of the aquatic life criteria for any class. Such decisions will be provisional until appropriate resampling is carried out.

Moody Mountain Environmental 137 Diamond Str Searsmont ME 04973 ph.207-592-8540 moodymtn@tidewater.net

Results

The samplers were placed in the river on August 4 and 5, 2022. Samplers were retrieved on August 31 (Sites 1-4) and September 3 (Site 5-6). At Site 5 it was found that the samplers had been disturbed so 3 new samplers were deployed and retrieved on September 29, 2022. Habitat measurements are shown in Table 2. Underwater photos of the substrate and sampler placement are included below.

Table 2. Site Information and habitat measurements at six (6) sites in the Androscoggin River between Lewiston and Brunswick for aquatic macroinvertebrate sampling. August, September 2021

Site	Town	Sample Method	Deployment Date	Deployment Time	Number Deployed	Deployed Depth (cm)	Retrieval Date	Retrieval Time	Number Retrieved
1	Lewiston	Rock Bag	8/4/2021	12:10 PM	3	55	8/31/2021	12:40 PM	3
2	Durham	Rock Bag	8/4/2021	1:50 PM	3	52	8/31/2021	10:30 AM	3
3	Lisbon	Rock Bag	8/4/2021	2:45 PM	3	30	8/31/2021	3:20 PM	3
4	Lisbon	RB-Rock Basket	8/4/2021	3:45 PM	3	314	8/31/2021	4:00 PM	3
5	Lisbon Falls	RB-Rock Basket	9/3/2021	11:00 AM	3	344	9/29/2021	9:45 AM	3
6	Brunswick	Rock Bag	8/5/2021	3:45 PM	3	317	9/3/2021	9:45 AM	3

	Physical Characteristics								
Site	Land Use 1	Land Use 2	Land Use 3	Terrain	Canopy Cover	Notes	Notes	Notes	Notes
1	Upland hardwood	Upland conifer		Rolling	Open	Below Urban NPS		Below POTW	
2	Upland hardwood	Upland conifer		Flat	Open	Below Urban NPS		Below POTW	Below Agriculture NPS
3	Upland hardwood	Upland conifer		Rolling	Open	Below Urban NPS		Below POTW	Below Agriculture NPS
4	Upland hardwood	Upland conifer		Rolling	Open	Below Urban NPS	Above Dam	Below POTW	Below Agriculture NPS
5	Upland hardwood	Upland conifer	Urban	Rolling	Open	Below Urban NPS	Above Dam	Below POTW	Below Dam
6	Upland hardwood	Upland conifer		Rolling	Open	Above Dam			

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	Potential Stressor(s)			
Site	Stressor 1	Stressor 2	Stressor 3	Stressor 4
1	NPS Pollution	Urban Runoff		
2	NPS Pollution	Urban Runoff		
3	NPS Pollution	Urban Runoff		
4	NPS Pollution	Urban Runoff	Impounded	Nutrients
5	Impounded	NPS Pollution	Urban Runoff	
6				

	Physical Characteristics of Bottom (%)				
Site	Bedrock	Boulders (>10”)	Rubble/Cobble (2.5” – 10”)	Gravel (1/8” – 2.5”)	Sand (<1/8”)
1		10	55	25	10
2			5	15	80
3		80		10	10
4					100
5			50	40	10
6	50	10	40		

	Habitat Characteristics at Placement				
Site	Wetted Width (m)	Depth (cm)	Velocity (cm/sec)	DO (mg/l)	Temperature (°C)
1	152	55	59	9.5	23.3
2	252	52	21	11	24.8
3	139	30	27	10.6	24.3
4	396	314	8.5	9.4	23.6
5	185	344	18	7.9	22
6	176	317	30	8.3	23.5

	Habitat Characteristics at Retrieval				
Site	Wetted Width (m)	Depth (cm)	Velocity (cm/sec)	DO (mg/l)	Temperature (°C)
1	152	40	45	8.4	23.3
2	252	46	21	10	24.9
3	139	37	11	9.4	25.5
4	396	320	5	8.1	24.9
5	185	393	18	8.5	19.5
6	176	310	34	7.6	23.2

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Photo 1. Rock baskets and rock bag samplers before deployment. August, 2021

Photo 2. Deploying rock bags, Androscoggin River. August, 2021 (Site 1).

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Photo 3. Site 1 substrate and typical sample placement and condition at retrieval. Androscoggin R. August, 2021.

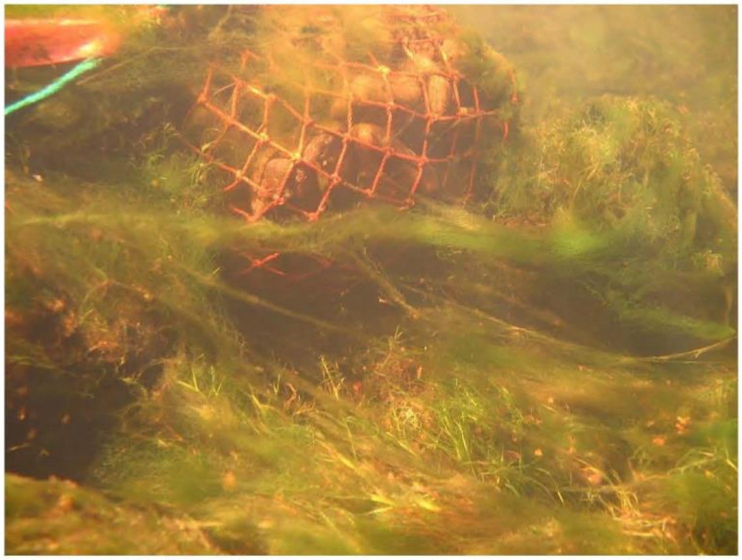

Photo 4. Site 2 substrate and typical sample placement and condition at retrieval. Androscoggin R. August, 2021.

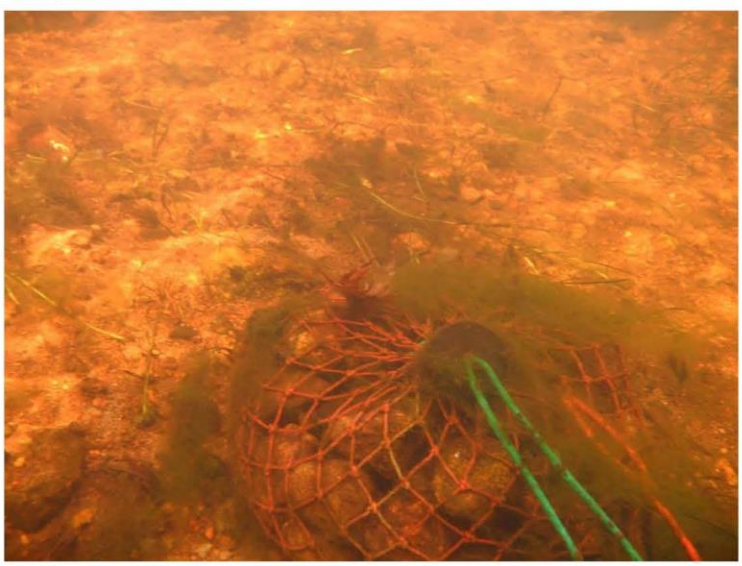

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Photo 5. Site 3 substrate and typical sample placement and condition at retrieval. Androscoggin R. August, 2021.

Photo 6. Site 4 substrate and typical sample placement and condition at retrieval. Androscoggin R. August, 2021.

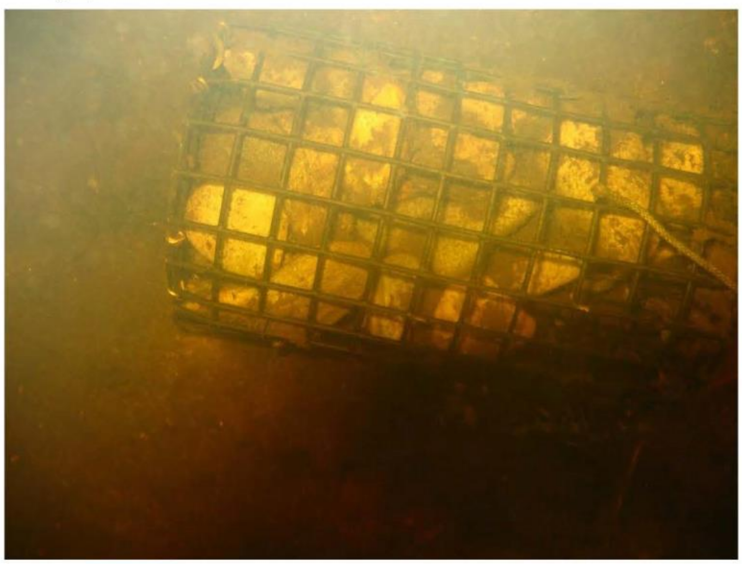

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Photo 7. Site 4 typical substrate. Androscoggin R. August, 2021.

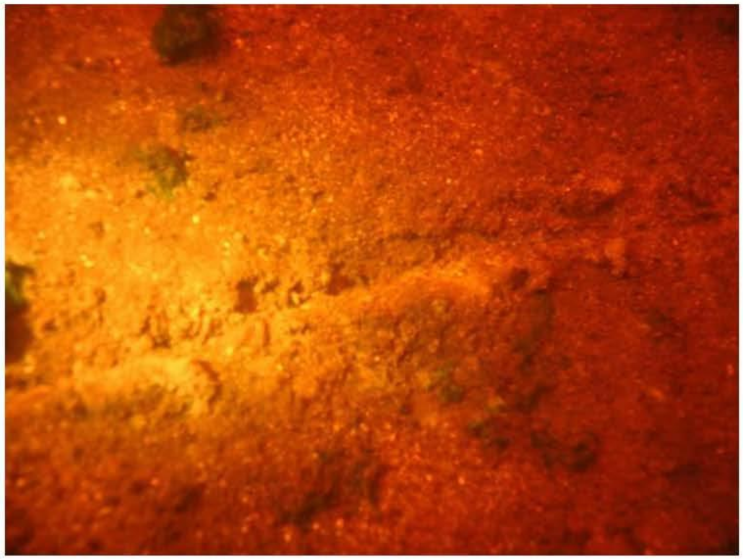

Photo 8. Site 5 substrate and typical sample placement and condition at retrieval. Androscoggin R. September, 2021.

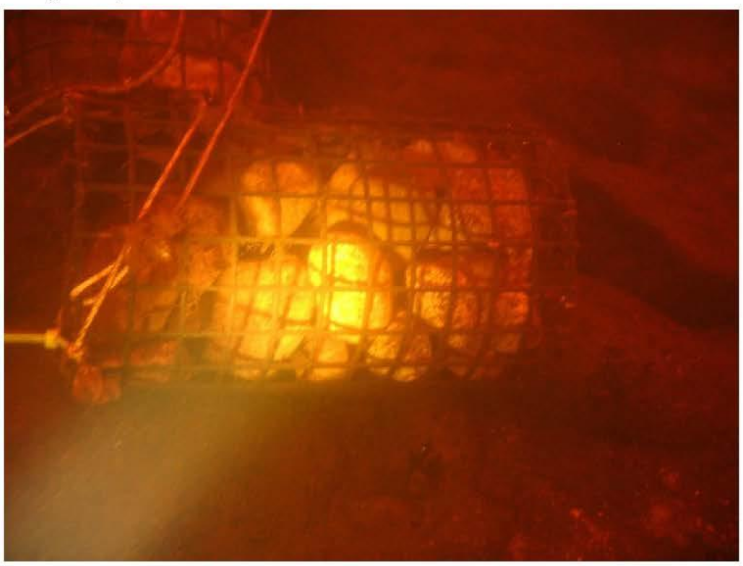

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Photo 9. Site 5 substrate. Androscoggin R. September, 2021.

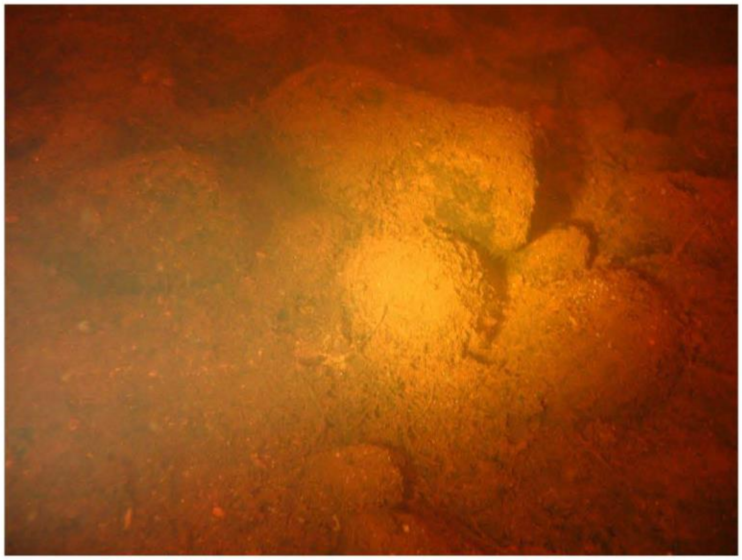

Photo 10. Site 6 substrate and typical sample placement and condition at retrieval. Androscoggin R. September, 2021.

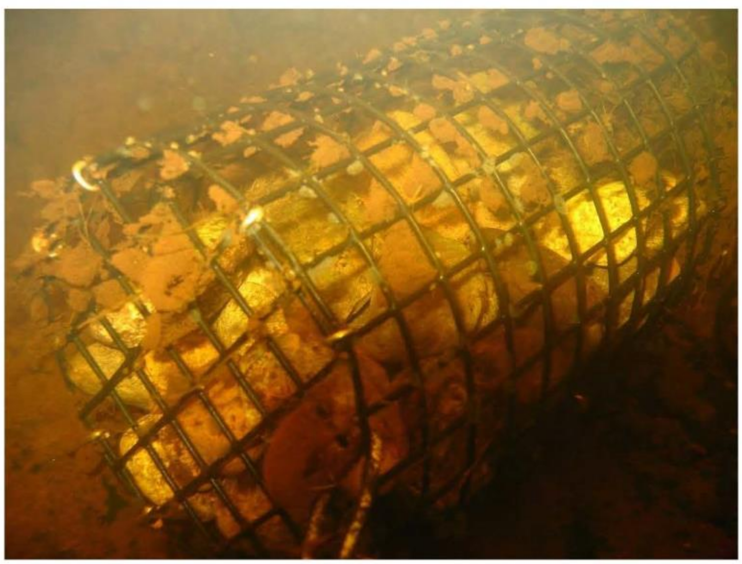

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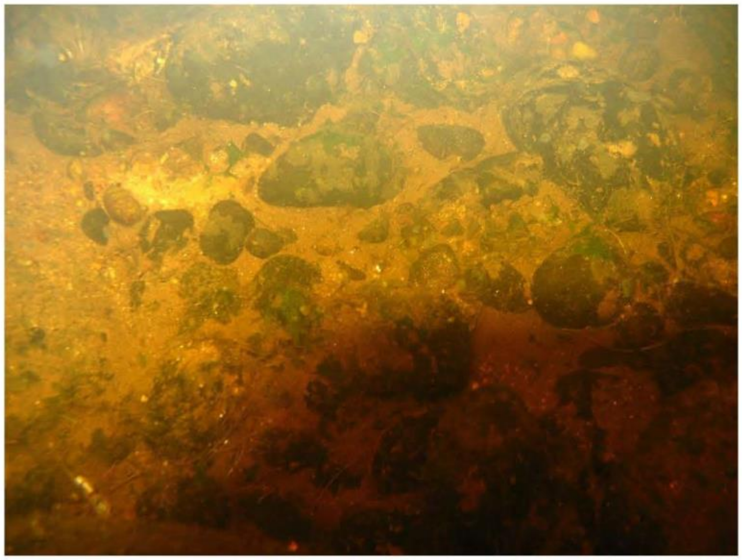
Photo 11. Site 6 substrate. Androscoggin R. September, 2021.



Community Analysis

Structural indices for the sampled communities are shown in Table 3. Dominant organisms (representing over 5% of the Total Abundance) in the communities are shown in Table 4 arranged from the most sensitive organisms to the organisms most tolerant of poor water quality conditions. The make-up of these communities and a discussion of the results are presented below.

Table 3. Indices of community structure for the aquatic invertebrate communities at six (6) sites in the Androscoggin River between Lewiston and Brunswick. August, September 2021.

Site	Tot. Abund.	Taxa Richness	S-W Div.	Hils. Biotic Index (HBN)	Water Quality indication from HBN	Mayfly, Stonefly, Caddisfly (EPT) Richness	Mayfly, Stonefly (EP)		Midge		Worms & Snails
							Rich	% Ab	Rich	% Ab	% Ab
1	2388.3	27	2.85	3.21	Excellent	13	4	7.2%	5	5.1%	26.9%
2	677.3	37	3.71	5.18	Good	16	5	20.6%	10	12.5%	19.9%
3	1359.0	30	3.68	4.06	V. Good	15	6	16.2%	8	12.8%	14.5%
4	295.0	40	3.71	6.4	Fair	16	5	10.5%	11	34.1%	12.5%
5	279.0	34	3.63	6.43	Fair	16	6	21.4%	8	16.2%	7.6%
6	312.7	33	3.55	5.6	Fair	13	4	7.8%	10	4.3%	25.6%

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Table 4. Dominant aquatic invertebrate organisms at six (6) sites in the Androscoggin River between Lewiston and Brunswick. August, September 2021. Organisms are ranked from most sensitive to most tolerant.

Sensitivity to Poor Water Quality		Site 1	Site 2	Site 3	Site 4	Site 5	Site 6
Sensitive	Caddisfly *Chimarra*	42.0%		24.6%			
	Caddisfly *Ochrotrichia*		6.8%				
Intermediate	Caddisfly *Cheumatopsyche*	7.2%	27.4%	11.9%			
	Mayfly Acerpenna	6.7%	16.6%	11.6%			
	Midge *Pentaneura*						20.5%
	Midge *Polypedilum*		5.2%	7.0%			
	Midge *Microtendipes*			5.8%			
	Caddisfly *Polycentropus*				27.3%	6.7%	
Tolerant	Mayfly *Stenacron*				6.1%	13.1%	13.0%
	Caddisfly *Neureclipsis*				5.0%	35.2%	
	Amphipod *Hyalella*				12.5%		
	Caddisfly *Oecetis*				11.2%		
	Midge *Dicrotendipes*					6.0%	27.0%
	Flatworm Planariidae	16.4%	8.4%	13.5%	5.1%		
	Snail Hydrobiidae	10.3%	5.4%				6.2%
	Mussel Physidae				9.5%		

Site 1-

The Site 1 was located in riffle habitat with moderate current velocities and predominantly cobble and gravel substrates. It was just downstream of the Walmart distribution Center in Lewiston. Aquatic vegetation and attached filamentous algae were common. The invertebrate community was numerous and moderately rich and diverse. Indexes measuring the tolerance to poor water quality conditions revealed that sensitive organisms accounted for a large portion of the community. The EPT richness index showed that sensitive mayfly (**E**phemeroptera), stonefly (**P**lecoptera), and caddisfly (**T**richoptera) taxa were well represented. Of those 3 orders, the mayflies and stoneflies are generally more sensitive to environmental stressors. The number of taxa from these 2 orders (EP richness) however, represented 15% of the taxa richness and just 7% of the total abundance. Hilsenhoff's Biotic Index value, 3.2, indicated excellent water quality (Hilsenhoff 1987). The sensitive caddisfly *Chimarra* made up 42% of the community.

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Site-2

Site 2 to was located in a shallow run with predominantly sandy substrates. Attached filamentous algae was present. The invertebrate community was abundant, rich and diverse. EPT taxa were well represented and EP taxa represented 21% of the total abundance. Hilsenhoff's Biotic Index value, 5.2, indicated good water quality. The community was dominated by sensitive or intermediate organisms representing 56% of the community. This site was mid-river near FOMB's water monitoring site DBN.

Site-3

Site-3 was located in boulder strewn riffle midway between the Durham Carry-in Launch and the outlet of Sabbatus Stream. There was less attached filamentous algae at this site compared to the upstream sites. The invertebrate community was very abundant, moderately rich in taxa, and diverse. EPT taxa were well represented and EP taxa represented 16% of the total abundance. Hilsenhoff's Biotic Index value, 4.1, indicated very good water quality. The sensitive caddisfly *Chimarra* made up a quarter of the community and sensitive or intermediate organisms represented 61% of the community.

Site 4-

Site 4 was located approximately 1.75 miles upstream of the Worumbo Dam just downstream of the outlet of Sabbatus Stream. The site was within the impoundment and had a predominantly sandy substrate and low current. The invertebrate community had relatively low abundance compared to upstream, free-flowing communities but was rich in taxa and diverse. EPT taxa were well represented but EP taxa represented just 11% of the total abundance. Hilsenhoff's Biotic Index value, 6.4, indicated fair water quality. The caddisfly *Polycentropus*, an intermediately tolerant organism, represented 27% of the community. The remainder of the dominant organisms fell into the tolerant category and represented almost half of the community.

Site-5

Site 5 was located approximately a half mile downstream of the Worumbo Dam just upstream of the Pejepscot Boat Launch, FOMB's water monitoring site PBL. This site was impounded by the Pejepscot Dam located over 2 miles downstream. This invertebrate community was also less abundant than the upstream, free-flowing communities. The community was

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moderately rich in taxa and diverse. EPT taxa were well represented and EP taxa represented 21% of the total abundance. Hilsenhoff's Biotic Index value, 6.4, indicated fair water quality. The caddisfly *Polycentropus*, an intermediately tolerant organism, represented just 7% of the community. The remainder of the dominant organisms fell into the tolerant category and represented over half of the community.

Site-6

Site 6, at the time of deployment and retrieval, was free-flowing run habitat approximately 2.4 mile upstream of the Brunswick Dam. There is some question whether this location is within the impoundment at higher head pond levels. It is outboard of the ledges marking FOMB monitoring site BIL. The substrates were a combination of ledge, boulders and cobble. Similar to sites 4 and 5 the invertebrate community was less abundant than the upstream, free-flowing communities at site 1, 2, and 3. The community was moderately rich in taxa and diverse. EPT taxa were well represented but EP taxa represented just 8% of the total abundance. Hilsenhoff's Biotic Index value, 5.6, indicated fair water quality. The midge *Pentaneura*, an intermediately tolerant organism, represented over 20% of the community. The remainder of the dominant organisms fell into the tolerant category and represented 46% of the community.

LDM Results

The LDM biocriteria results and DEP determinations are shown in Table 5 and Appendix 1. As mentioned previously, to attain a particular class a site must have a 60% or greater score in the test for that class and Professional Judgement can be used to raise or lower a finding. DEP determined that Sites 1 through 3 attained Class B standards and the downstream site (4-6) attained Class C standards. DEP used professional judgement to raise the finding at Site 2 to Class B based on the community structure. In addition, as mentioned above, Sites 4 and 5 are impounded and it is unclear if Site 6 is impounded at certain head pond water levels. DEP methodology allows for extended sampler exposure periods of 56 days ± 4 days to allow for adequate colonization in the case of assessments of low velocity or impounded. If Sites 4 and 5 are sampled again it is the authors recommendation that samplers remain in the water for the extended exposure period. In addition, if the community in the vicinity of Site 6 is sampled again the location should be changed to a documented free flowing area or a documented impounded area. If the new location is in a documented impounded area then the extended exposure period should be used.

Table 5. Results of the DEP linear discriminant model (LDM) and DEP determinations for six (6) sites on the Androscoggin River between Lewiston and Brunswick.

Site	Probability of Class A	Probability of Class B	Probability of Class C	Probability of Non-Attainment	DEP Final Determination
1	16%	**99%**	100%	0%	**B**
2	1%	**51%**	100%	0%	**B***
3	6%	**97%**	100%	0%	**B**
4	0%	0%	**100%**	0%	**C**
5	2%	4%	**100%**	0%	**C**
6	1%	31%	**100%**	0%	**C**

*** DEP used Best Professional Judgement: Indeterminate for Class B (p = 0.51), Raised to Class B based on community structure.**

Summary

1. The objective of the macroinvertebrate sampling study was to generate data on the aquatic macroinvertebrate community in the Androscoggin River between Lewiston and Brunswick and assess this community in terms of Maine's Aquatic Life Standards. The river downstream of Lewiston's Great Falls dam at the time of the study was classified Class C. Six (6) sites were sampled on the river.
2. The Maine Department of Environmental Protection (DEP) "Methods for Biological Sampling and Analysis of Maine's Inland Waters" (Davies and Tsomides 2014) were used as the basis of the field and laboratory procedures in this study.
3. Samplers were retrieved on August 31 (Sites 1-4) and September 3 (Site 6). At Site 5 it was found that the samplers had been disturbed so 3 new samplers were deployed and retrieved on September 29, 2022.
4. Sites 1-3 were located in free-flowing habitat. Sites 4 and 5 were located in impoundments. Site 6 appeared free-flowing during deployment and retrieval but may be impounded when the Brunswick head pond is at higher water levels.
5. The macroinvertebrate communities sampled between Lewiston and Brunswick were rich in taxa. The communities at Site 1, 2, 3 were more numerous than downstream communities and populated with more organisms that are intolerant of poor water quality.

6. Maine DEP found the sites 1, 2, and 3 attained Class B Aquatic Life Standards and sites 4, 5, and 6 attained class C standards.
7. On March 31, 2022 Governor Mills signed into law LD 1964, the DEP triennial water reclassification bill. LD 1964 included an upgrade of the lower Androscoggin River from Worumbo dam in Lisbon Falls to Merrymeeting Bay from Class C to B, encompassing Sites 5 and 6. While DEP found these sites attained Class C, the river as a whole was found to meet Class B conditions including dissolved oxygen and *E. coli* bacteria levels.

   Because of their unique characteristics, hydropower impoundments are granted certain exemptions by the legislature under §464 (See Appendix 2). In summary the statute says that recognizing the aquatic life differences of impoundments, if a river with impoundments is classified as A or B, the impoundment shall also be considered to meet that standard provided it at least meets C criteria; unless:

   > (1) Reasonable changes can be implemented that do not significantly affect existing energy generation capability; and
   >
   > (2) Those changes would result in improvement in the habitat and aquatic life of the impounded waters.

   If the conditions described in (1) and (2) occur, those changes must be implemented and the resulting improvement in habitat and aquatic life must be achieved and maintained. According to statute, a determination should be made whether above conditions 1 or 2 apply to river sections encompassing Sites 4, 5 & 6 and if so, improvements must be implemented (to meet Class B conditions). If 1 and 2 do not apply, Class B conditions are deemed to have been met in these impoundments.

References

Davies, S.P. and L. Tsomides. 2014. Methods for biological sampling and analysis of Maine's rivers and streams. ME Dept. of Env. Prot. Augusta, ME. 31p.

Hilsenhoff, W.L. 1987. An improved biotic index of organic stream pollution. The Great Lake Entomologist. Pgs. 31-39.

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Appendix 1 DEP Classification Attainment Reports

MDEP S-1204 = FOMB Site 1

Maine Department of Environmental Protection
Biological Monitoring Program
Aquatic Life Classification Attainment Report

Station Information

Station Number:	**S-1204**	River Basin:	Androscoggin
Waterbody:	Androscoggin River - Station 1204	HUC8 Name:	
Town:	Lewiston	Latitude:	44 3 28.97 N
Directions:	FROM DURHAM BOAT LAUNCH GO UPSTREAM 300 YDS DWNSTRM OF OLD DEP SAMPLING SITE "HELO BEACH"	Longitude:	70 12 0.98 W
		Stream Order:	

Sample Information

Log Number:	**2938**	Type of Sample:	ROCK BASKET	Date Deployed:	8/4/2021
Subsample Factor:	X1	Replicates:	3	Date Retrieved:	8/31/2021

Classification Attainment

Statutory Class:	**C**	**Final Determination:**	**B**	Date: 3/29/2022
Model Result with P≥0.6:	B	**Reason for Determination:**	**Model**	
Date Last Calculated:	3/23/2022	Comments:		

Model Probabilities

First Stage Model

Class A	0.32	Class C	0.04
Class B	0.64	NA	0.00

C or Better Model

Class A, B, or C	1.00
Non-Attainment	0.00

B or Better Model

Class A or B	0.99
Class C or Non-Attainment	0.01

A Model

Class A	0.16
Class B or C or Non-Attainment	0.84

Model Variables

01 Total Mean Abundance	2388.33
02 Generic Richness	27.00
03 Plecoptera Mean Abundance	2.67
04 Ephemeroptera Mean Abundance	169.00
05 Shannon-Wiener Generic Diversity	2.85
06 Hilsenhoff Biotic Index	3.21
07 Relative Abundance - Chironomidae	0.05
08 Relative Generic Richness Diptera	0.22
09 *Hydropsyche* Abundance	32.33
11 *Cheumatopsyche* Abundance	172.67
12 EPT Generic Richness/ Diptera Generic Richness	2.17
13 Relative Abundance - Oligochaeta	0.00
15 Perlidae Mean Abundance (Family Functional Group)	2.67
16 Tanypodinae Mean Abundance (Family Functional Group)	10.67
17 Chironomini Abundance (Family Functional Group)	72.00
18 Relative Abundance Ephemeroptera	0.07
19 EPT Generic Richness	13.00
21 Sum of Abundances: *Dicrotendipes, Micropsectra, Parachironomus, Helobdella*	0.00
23 Relative Generic Richness- Plecoptera	0.04
25 Sum of Abundances: *Cheumatopsyche, Cricotopus, Tanytarsus, Ablabesmyia*	183.33
26 Sum of Abundances: *Acroneuria, Maccaffertium, Stenonema*	0.67
28 EP Generic Richness/14	0.29
30 Presence of Class A Indicator Taxa/7	0.29

Five Most Dominant Taxa

Rank	Taxon Name	Percent
1	*Chimarra*	41.95
2	Planariidae	16.43
3	Hydrobiidae	10.34
4	*Cheumatopsyche*	7.23
5	*Acerpenna*	6.73

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Appendix 1 continued MDEP S-1204 = FOMB Site 1

Maine Department of Environmental Protection
Biological Monitoring Program
Aquatic Life Classification Attainment Report

Station Number: S-1204	Town: Lewiston		Date Deployed: 8/4/2021
Log Number: 2938	Waterbody: Androscoggin River - Station 1204		Date Retrieved: 8/31/2021

Sample Collection and Processing Information

Sampling Organization: MOODY MOUNTAIN ENVIRONMENTAL

Taxonomist: PAUL LEEPER (MOODY MOUNTAIN ENVIRONMENTAL)

Waterbody Information - Deployment		**Waterbody Information - Retrieval**	
Temperature:	23.3 deg C	Temperature:	
Dissolved Oxygen:	9.5 mg/l	Dissolved Oxygen:	
Dissolved Oxygen Saturation:		Dissolved Oxygen Saturation:	
Specific Conductance:		Specific Conductance:	
Velocity:	59 cm/s	Velocity:	
pH:		pH:	
Wetted Width:	152 m	Wetted Width:	152 m
Bankfull Width:		Bankfull Width:	
Depth:	55 cm	Depth:	55 cm

Water Chemistry

Summary of Habitat Characteristics

Landuse Name	Canopy Cover	Terrain	
Upland Conifer	Open	Rolling	
Upland Hardwood			
Potential Stressor	Location	Substrate	
Nps Pollution	Below POTW	Boulder	10 %
Urban Runoff	Below Urban NPS	Gravel	25 %
		Rubble/Cobble	55 %
		Sand	10 %

Landcover Summary - 2004 Data

Sample Comments

FILAMENTOUS ALGAE, AQ. PLANTS

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Appendix 1 continued MDEP S-1204 = FOMB Site 1

Maine Department of Environmental Protection
Biological Monitoring Program
Aquatic Life Taxonomic Inventory Report

Station Number: S-1204 Waterbody: Androscoggin River - Station 1204 Town: Lewiston
Log Number: 2938 Subsample Factor: X1 Replicates: 3 Calculated: 3/23/2022

Taxon	Maine Taxonomic Code	Count (Mean of Samplers) Actual	Count (Mean of Samplers) Adjusted	Hilsenhoff Biotic Index	Functional Feeding Group	Relative Abundance % Actual	Relative Abundance % Adjusted
Planariidae	03010101	392.33	392.33		--	16.4	16.4
Annelida	08	2.67	2.67		--	0.1	0.1
Paragnetina	09020209049	2.67	2.67	1	PR	0.1	0.1
Boyeria	09020301004	0.33	0.33	2	PR	0.0	0.0
Acerpenna	09020401007	160.67	160.67	5	CG	6.7	6.7
Maccaffertium	09020402015	0.67	0.67	4	SC	0.0	0.0
Isonychia	09020404018	7.67	7.67	2	CF	0.3	0.3
Chimarra	09020601003	1002.00	1002.00	2	CF	42.0	42.0
Cheumatopsyche	09020604015	172.67	172.67	5	CF	7.2	7.2
Hydropsyche	09020604016	32.33	32.33	4	CF	1.4	1.4
Macrostemum	09020604018	55.67	55.67	3	CF	2.3	2.3
Ochrotrichia	09020607027	65.00	65.00	4	P	2.7	2.7
Oxyethira	09020607028	5.33	5.33	3	P	0.2	0.2
Brachycentrus	09020609043	3.00	3.00	0	CF	0.1	0.1
Nectopsyche	09020618074	9.00	9.00	3	SH	0.4	0.4
Oecetis	09020618078	20.00	20.00	8	PR	0.8	0.8
Pentaneura	09021011014	10.67	10.67	6	PR	0.4	0.4
Cricotopus	09021011037	2.67	2.67	7	SH	0.1	0.1
Eukiefferiella	09021011041	29.33	29.33	8	CG	1.2	1.2
Tanytarsus	09021011076	8.00	8.00	6	CF	0.3	0.3
Polypedilum	09021011102	72.00	72.00	6	SH	3.0	3.0
Simulium	09021012047	78.00	78.00	4	CF	3.3	3.3
Elmidae	09021113	2.67	2.67		--	0.1	0.1
Ancyronyx	09021113063	5.33	5.33	6	--	0.2	0.2
Hydrachna	09030103001	0.33	0.33		--	0.0	0.0
Hydrobiidae	10010104	247.00	247.00		--	10.3	10.3
Physidae	10010202	0.33	0.33		SC	0.0	0.0

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Appendix 1 continued MDEP S-1205 = FOMB Site 2

Maine Department of Environmental Protection
Biological Monitoring Program
Aquatic Life Classification Attainment Report

Station Information

Station Number: S-1205
Waterbody: Androscoggin River - Station 1205
Town: Durham
Directions: FROM DURHAM BOAT LAUNCH GO DOWNSTREAM APPROX. 1 MILE UPSTREAMOFSAND BAR. CONSULTANT SITE NAME: ANDY 2

River Basin: Androscoggin
HUC8 Name:
Latitude: 44° 00' 06.90221700" N
Longitude:
Stream Order:

Sample Information

Log Number: 2939
Subsample Factor: X1
Type of Sample: ROCK BASKET
Replicates: 3
Date Deployed: 8/4/2021
Date Retrieved: 8/31/2021

Classification Attainment

Statutory Class: C
Model Result with P≥0.6: C
Date Last Calculated: 3/23/2022
Final Determination: B Date: 3/29/2022
Reason for Determination: Best Professional Judgement
Comments: Indeterminate for Class B (p = 0.51). Raised to Class B based on community structure.

Model Probabilities

First Stage Model

Class A	0.12	Class C	0.29
Class B	0.59	NA	0.00

C or Better Model

Class A, B, or C	1.00
Non-Attainment	0.00

B or Better Model

Class A or B	0.51
Class C or Non-Attainment	0.49

A Model

Class A	0.01
Class B or C or Non-Attainment	0.99

Model Variables

01 Total Mean Abundance	677.33
02 Generic Richness	37.00
03 Plecoptera Mean Abundance	1.00
04 Ephemeroptera Mean Abundance	138.33
05 Shannon-Wiener Generic Diversity	3.71
06 Hilsenhoff Biotic Index	5.18
07 Relative Abundance - Chironomidae	0.13
08 Relative Generic Richness Diptera	0.30
09 *Hydropsyche* Abundance	0.33
11 *Cheumatopsyche* Abundance	185.67
12 EPT Generic Richness/ Diptera Generic Richness	1.45
13 Relative Abundance - Oligochaeta	0.00
15 Perlidae Mean Abundance (Family Functional Group)	1.00
16 Tanypodinae Mean Abundance (Family Functional Group)	61.67
17 Chironomini Abundance (Family Functional Group)	18.67
18 Relative Abundance Ephemeroptera	0.20
19 EPT Generic Richness	16.00
21 Sum of Abundances: *Dicrotendipes, Micropsectra, Parachironomus, Helobdella*	8.00
23 Relative Generic Richness- Plecoptera	0.03
25 Sum of Abundances: *Cheumatopsyche, Cricotopus, Tanytarsus, Ablabesmyia*	195.33
26 Sum of Abundances: *Acroneuria, Maccaffertium, Stenonema*	23.33
28 EP Generic Richness/14	0.36
30 Presence of Class A Indicator Taxa/7	0.00

Five Most Dominant Taxa

Rank	Taxon Name	Percent
1	*Cheumatopsyche*	27.41
2	*Acerpenna*	16.58
3	Planariidae	8.42
4	*Pentaneura*	6.84
5	Hydrobiidae	5.36

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Appendix 1 continued MDEP S-1205 = FOMB Site 2

Maine Department of Environmental Protection
Biological Monitoring Program
Aquatic Life Classification Attainment Report

Station Number: S-1205 Town: Durham Date Deployed: 8/4/2021
Log Number: 2939 Waterbody: Androscoggin River - Station 1205 Date Retrieved: 8/31/2021

Sample Collection and Processing Information

Sampling Organization: PAUL LEEPER (MOODY MOUNTAIN ENVIRONMENTAL) Taxonomist: PAUL LEEPER (MOODY MOUNTAIN ENVIRONMENTAL)

Waterbody Information - Deployment		**Waterbody Information - Retrieval**	
Temperature:	24.8 deg C	Temperature:	24.9 deg C
Dissolved Oxygen:	11 mg/l	Dissolved Oxygen:	10 mg/l
Dissolved Oxygen Saturation:		Dissolved Oxygen Saturation:	
Specific Conductance:		Specific Conductance:	
Velocity:	21 cm/s	Velocity:	
pH:		pH:	
Wetted Width:	252 m	Wetted Width:	252 m
Bankfull Width:		Bankfull Width:	
Depth:	52 cm	Depth:	46 cm

Water Chemistry

Summary of Habitat Characteristics

Landuse Name	Canopy Cover	Terrain	
Upland Conifer	Open	Flat	
Upland Hardwood			
Potential Stressor	**Location**	**Substrate**	
Nps Pollution	Below Agriculture NPS	Gravel	15 %
Urban Runoff	Below POTW	Rubble/Cobble	5 %
	Below Urban NPS	Sand	80 %

Landcover Summary - 2004 Data

Sample Comments

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Appendix 1 continued MDEP S-1205 = FOMB Site 2

Maine Department of Environmental Protection
Biological Monitoring Program
Aquatic Life Taxonomic Inventory Report

Station Number: S-1205 Waterbody: Androscoggin River - Station 1205 Town: Durham
Log Number: 2939 Subsample Factor: X1 Replicates: 3 Calculated: 3/23/2022

Taxon	Maine Taxonomic Code	Count (Mean of Samplers) Actual	Count (Mean of Samplers) Adjusted	Hilsenhoff Biotic Index	Functional Feeding Group	Relative Abundance % Actual	Relative Abundance % Adjusted
Planariidae	03010101	57.00	57.00		--	8.4	8.4
Annelida	08	0.33	0.33		--	0.0	0.0
Hyalella	09010203006	3.00	3.00	8	CG	0.4	0.4
Orconectes	09010301008		1.00		CG		0.1
Orconectes limosus	09010301008013	1.00			--	0.1	
Acroneuria	09020209042	1.00	1.00	0	PR	0.1	0.1
Amphiagrion	09020309046	11.00	11.00	9	PR	1.6	1.6
Chromagrion	09020309049	0.33	0.33	4	PR	0.0	0.0
Acerpenna	09020401007	112.33	112.33	5	CG	16.6	16.6
Maccaffertium	09020402015	22.33	22.33	4	SC	3.3	3.3
Isonychia	09020404018	0.33	0.33	2	CF	0.0	0.0
Tricorythodes	09020411038	3.33	3.33	4	CG	0.5	0.5
Chimarra	09020601003	7.33	7.33	2	CF	1.1	1.1
Neureclipsis	09020603008	0.33	0.33	7	CF	0.0	0.0
Polycentropus	09020603010	7.00	7.00	6	PR	1.0	1.0
Cheumatopsyche	09020604015	185.67	185.67	5	CF	27.4	27.4
Hydropsyche	09020604016	0.33	0.33	4	CF	0.0	0.0
Macrostemum	09020604018	1.33	1.33	3	CF	0.2	0.2
Ochrotrichia	09020607027	35.33	35.33	4	P	5.2	5.2
Oxyethira	09020607028	13.67	13.67	3	P	2.0	2.0
Ceraclea	09020618072	1.00	1.00	3	CG	0.1	0.1
Nectopsyche	09020618074	9.67	9.67	3	SH	1.4	1.4
Oecetis	09020618078	28.00	28.00	8	PR	4.1	4.1
Ablabesmyia	09021011001	8.33	8.33	8	PR	1.2	1.2
Pentaneura	09021011014	46.33	46.33	6	PR	6.8	6.8
Thienemannimyia	09021011020	7.00	7.00	3	PR	1.0	1.0
Nanocladius	09021011049	1.33	1.33	3	CG	0.2	0.2
Rheotanytarsus	09021011072	1.67	1.67	6	CF	0.2	0.2
Tanytarsus	09021011076	1.33	1.33	6	CF	0.2	0.2
Dicrotendipes	09021011085	8.00	8.00	8	CG	1.2	1.2
Microtendipes	09021011094	2.67	2.67	6	CF	0.4	0.4
Polypedilum	09021011102	7.67	7.67	6	SH	1.1	1.1
Robackia	09021011103	0.33	0.33		CG	0.0	0.0
Simuliidae	09021012	1.33	1.33		--	0.2	0.2
Hydrobiidae	10010104	36.33	36.33		--	5.4	5.4
Physidae	10010202	31.00	31.00		SC	4.6	4.6
Planorbidae	10010203	10.33	10.33		--	1.5	1.5

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Appendix 1 continued MDEP S-1205 = FOMB Site 2

Maine Department of Environmental Protection
Biological Monitoring Program
Aquatic Life Taxonomic Inventory Report

Station Number: S-1205 Waterbody: Androscoggin River - Station 1205 Town: Durham
Log Number: 2939 Subsample Factor: X1 Replicates: 3 Calculated: 3/23/2022

Taxon	Maine Taxonomic Code	Count (Mean of Samplers) Actual	Adjusted	Hilsenhoff Biotic Index	Functional Feeding Group	Relative Abundance % Actual	Adjusted
Ancylidae	10010204	12.00	12.00		SC	1.8	1.8

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Appendix 1 continued MDEP S-1206 = FOMB Site 3

Maine Department of Environmental Protection
Biological Monitoring Program
Aquatic Life Classification Attainment Report

Station Information

Station Number:	**S-1206**	River Basin:	Androscoggin
Waterbody:	Androscoggin River - Station 1206	HUC8 Name:	
Town:	Lisbon	Latitude:	43° 59' 34.17243456" N
Directions:	FROM SABATTUS STREAM LAUNCH GO UPSTREAM APPROX. 2 MILE TO BOULDER FIELD. CONSULTANT SITE NAME: ANDY 3	Longitude:	
		Stream Order:	

Sample Information

Log Number:	**2940**	Type of Sample:	ROCK BASKET	Date Deployed:	8/4/2021
Subsample Factor:	X1	Replicates:	3	Date Retrieved:	8/31/2021

Classification Attainment

Statutory Class:	**C**	**Final Determination:**	**B**	Date: 3/29/2022
Model Result with P≥0.6:	B	**Reason for Determination:**	**Model**	
Date Last Calculated:	3/23/2022	Comments:		

Model Probabilities

First Stage Model				C or Better Model	
Class A	0.29	Class C	0.05	Class A, B, or C	1.00
Class B	0.66	NA	0.00	Non-Attainment	0.00
B or Better Model				**A Model**	
Class A or B			0.97	Class A	0.06
Class C or Non-Attainment			0.03	Class B or C or Non-Attainment	0.94

Model Variables

01 Total Mean Abundance	1359.00	18 Relative Abundance Ephemeroptera	0.16
02 Generic Richness	30.00	19 EPT Generic Richness	15.00
03 Plecoptera Mean Abundance	7.00	21 Sum of Abundances: *Dicrotendipes, Micropsectra, Parachironomus, Helobdella*	5.33
04 Ephemeroptera Mean Abundance	213.67	23 Relative Generic Richness- Plecoptera	0.03
05 Shannon-Wiener Generic Diversity	3.68	25 Sum of Abundances: *Cheumatopsyche, Cricotopus, Tanytarsus, Ablabesmyia*	194.67
06 Hilsenhoff Biotic Index	4.06	26 Sum of Abundances: *Acroneuria, Maccaffertium, Stenonema*	38.00
07 Relative Abundance - Chironomidae	0.13	28 EP Generic Richness/14	0.43
08 Relative Generic Richness Diptera	0.30	30 Presence of Class A Indicator Taxa/7	0.14
09 *Hydropsyche* Abundance	40.33		
11 *Cheumatopsyche* Abundance	161.33		
12 EPT Generic Richness/ Diptera Generic Richness	1.67		
13 Relative Abundance - Oligochaeta	0.00		
15 Perlidae Mean Abundance (Family Functional Group)	7.00		
16 Tanypodinae Mean Abundance (Family Functional Group)	22.67		
17 Chironomini Abundance (Family Functional Group)	114.67		

Five Most Dominant Taxa

Rank	Taxon Name	Percent
1	*Chimarra*	24.60
2	Planariidae	13.47
3	*Cheumatopsyche*	11.87
4	*Acerpenna*	11.63
5	*Ochrotrichia*	6.99

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Appendix 1 continued MDEP S-1206 = FOMB Site 3

Maine Department of Environmental Protection
Biological Monitoring Program
Aquatic Life Classification Attainment Report

Station Number: S-1206	Town: Lisbon		Date Deployed: 8/4/2021
Log Number: 2940	Waterbody: Androscoggin River - Station 1206		Date Retrieved: 8/31/2021

Sample Collection and Processing Information

Sampling Organization: PAUL LEEPER (MOODY MOUNTAIN ENVIRONMENTAL) Taxonomist: PAUL LEEPER (MOODY MOUNTAIN ENVIRONMENTAL)

Waterbody Information - Deployment		**Waterbody Information - Retrieval**	
Temperature:	24.3 deg C	Temperature:	25.5 deg C
Dissolved Oxygen:	10.6 mg/l	Dissolved Oxygen:	9.4 mg/l
Dissolved Oxygen Saturation:		Dissolved Oxygen Saturation:	
Specific Conductance:		Specific Conductance:	
Velocity:	27 cm/s	Velocity:	11 cm/s
pH:		pH:	
Wetted Width:	139 m	Wetted Width:	139 m
Bankfull Width:		Bankfull Width:	
Depth:	30 cm	Depth:	37 cm

Water Chemistry

Summary of Habitat Characteristics

Landuse Name	Canopy Cover	Terrain	
Upland Conifer	Open	Rolling	
Upland Hardwood			
Potential Stressor	Location	Substrate	
Nps Pollution	Below Agriculture NPS	Boulder	80 %
Urban Runoff	Below POTW	Gravel	10 %
	Below Urban NPS	Sand	10 %

Landcover Summary - 2004 Data

Sample Comments

BOULDER FIELD

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Appendix 1 continued MDEP S-1206 = FOMB Site 3

Maine Department of Environmental Protection
Biological Monitoring Program
Aquatic Life Taxonomic Inventory Report

Station Number: S-1206 Waterbody: Androscoggin River - Station 1206 Town: Lisbon

Log Number: 2940 Subsample Factor: X1 Replicates: 3 Calculated: 3/23/2022

Taxon	Maine Taxonomic Code	Count (Mean of Samplers) Actual	Count (Mean of Samplers) Adjusted	Hilsenhoff Biotic Index	Functional Feeding Group	Relative Abundance % Actual	Relative Abundance % Adjusted
Planariidae	03010101	183.00	183.00		--	13.5	13.5
Acroneuria	09020209042	7.00	7.00	0	PR	0.5	0.5
Acerpenna	09020401007	158.00	158.00	5	CG	11.6	11.6
Plauditus	09020401012	13.33	13.33		CG	1.0	1.0
Maccaffertium	09020402015	31.00	31.00	4	SC	2.3	2.3
Isonychia	09020404018	7.33	7.33	2	CF	0.5	0.5
Tricorythodes	09020411038	4.00	4.00	4	CG	0.3	0.3
Chimarra	09020601003	334.33	334.33	2	CF	24.6	24.6
Neureclipsis	09020603008	22.67	22.67	7	CF	1.7	1.7
Cheumatopsyche	09020604015	161.33	161.33	5	CF	11.9	11.9
Hydropsyche	09020604016	40.33	40.33	4	CF	3.0	3.0
Macrostemum	09020604018	46.00	46.00	3	CF	3.4	3.4
Ochrotrichia	09020607027	95.00	95.00	4	P	7.0	7.0
Brachycentrus	09020609043	2.67	2.67	0	CF	0.2	0.2
Nectopsyche	09020618074	9.33	9.33	3	SH	0.7	0.7
Oecetis	09020618078	25.33	25.33	8	PR	1.9	1.9
Petrophila	09020901004	1.00	1.00	5	SC	0.1	0.1
Pentaneura	09021011014	14.67	14.67	6	PR	1.1	1.1
Thienemannimyia	09021011020	8.00	8.00	3	PR	0.6	0.6
Cricotopus	09021011037	17.33	17.33	7	SH	1.3	1.3
Paratanytarsus	09021011071	2.67	2.67	6	--	0.2	0.2
Tanytarsus	09021011076	16.00	16.00	6	CF	1.2	1.2
Dicrotendipes	09021011085	5.33	5.33	8	CG	0.4	0.4
Microtendipes	09021011094	30.67	30.67	6	CF	2.3	2.3
Polypedilum	09021011102	78.67	78.67	6	SH	5.8	5.8
Simulium	09021012047	13.33	13.33	4	CF	1.0	1.0
Elmidae	09021113	4.00	4.00		--	0.3	0.3
Macronychus	09021113065	12.00	12.00	4	--	0.9	0.9
Hydrobiidae	10010104	12.33	12.33		--	0.9	0.9
Physidae	10010202	2.33	2.33		SC	0.2	0.2

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Appendix 1 continued MDEP S-1207 = FOMB Site 4

Maine Department of Environmental Protection
Biological Monitoring Program
Aquatic Life Classification Attainment Report

Station Information

Station Number:	**S-1207**	River Basin:	Androscoggin
Waterbody:	Androscoggin River - Station 1207	HUC8 Name:	
Town:	Lisbon	Latitude:	44° 00' 31.44009501" N
Directions:	FROM SABATTUS STREAM LAUNCH GO DOWNTREAM APPROX. 350 YDS. CONSULTANT SITE NAME: ANDY 4	Longitude:	
		Stream Order:	

Sample Information

Log Number: **2941**	Type of Sample: ROCK BASKET	Date Deployed:	8/4/2021
Subsample Factor: X1	Replicates: 3	Date Retrieved:	8/31/2021

Classification Attainment

Statutory Class:	**C**	**Final Determination:** **C**	Date: 3/29/2022
Model Result with P≥0.6:	C	**Reason for Determination: Model**	
Date Last Calculated:	3/23/2022	Comments:	

Model Probabilities

First Stage Model				C or Better Model	
Class A	0.00	Class C	0.94	Class A, B, or C	1.00
Class B	0.01	NA	0.05	Non-Attainment	0.00

B or Better Model		A Model	
Class A or B	0.00	Class A	0.00
Class C or Non-Attainment	1.00	Class B or C or Non-Attainment	1.00

Model Variables

01 Total Mean Abundance	295.00	18 Relative Abundance Ephemeroptera	0.11
02 Generic Richness	40.00	19 EPT Generic Richness	16.00
03 Plecoptera Mean Abundance	0.00	21 Sum of Abundances: *Dicrotendipes, Micropsectra, Parachironomus, Helobdella*	1.00
04 Ephemeroptera Mean Abundance	31.00	23 Relative Generic Richness- Plecoptera	0.00
05 Shannon-Wiener Generic Diversity	3.71	25 Sum of Abundances: *Cheumatopsyche, Cricotopus, Tanytarsus, Ablabesmyia*	13.00
06 Hilsenhoff Biotic Index	6.40	26 Sum of Abundances: *Acroneuria, Maccaffertium, Stenonema*	11.67
07 Relative Abundance - Chironomidae	0.34	28 EP Generic Richness/14	0.36
08 Relative Generic Richness Diptera	0.28	30 Presence of Class A Indicator Taxa/7	0.00
09 *Hydropsyche* Abundance	0.67		
11 *Cheumatopsyche* Abundance	2.00		
12 EPT Generic Richness/ Diptera Generic Richness	1.45		
13 Relative Abundance - Oligochaeta	0.00		
15 Perlidae Mean Abundance (Family Functional Group)	0.00		
16 Tanypodinae Mean Abundance (Family Functional Group)	11.33		
17 Chironomini Abundance (Family Functional Group)	85.33		

Five Most Dominant Taxa

Rank	Taxon Name	Percent
1	*Microtendipes*	27.34
2	*Polycentropus*	12.54
3	*Hyalella*	11.19
4	*Oecetis*	9.49
5	Physidae	6.10

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Appendix 1 continued MDEP S-1207 = FOMB Site 4

Maine Department of Environmental Protection
Biological Monitoring Program
Aquatic Life Classification Attainment Report

Station Number: S-1207	Town: Lisbon	Date Deployed: 8/4/2021
Log Number: 2941	Waterbody: Androscoggin River - Station 1207	Date Retrieved: 8/31/2021

Sample Collection and Processing Information

Sampling Organization: PAUL LEEPER (MOODY MOUNTAIN ENVIRONMENTAL) Taxonomist: PAUL LEEPER (MOODY MOUNTAIN ENVIRONMENTAL)

Waterbody Information - Deployment		**Waterbody Information - Retrieval**	
Temperature:	23.6 deg C	Temperature:	24.9 deg C
Dissolved Oxygen:	9.4 mg/l	Dissolved Oxygen:	8.1 mg/l
Dissolved Oxygen Saturation:		Dissolved Oxygen Saturation:	
Specific Conductance:		Specific Conductance:	
Velocity:	8.5 cm/s	Velocity:	5 cm/s
pH:		pH:	
Wetted Width:	396 m	Wetted Width:	396 m
Bankfull Width:		Bankfull Width:	
Depth:	314 cm	Depth:	320 cm

Water Chemistry

Summary of Habitat Characteristics

Landuse Name	Canopy Cover	Terrain	
Upland Conifer	Open	Rolling	
Upland Hardwood			
Potential Stressor	**Location**	**Substrate**	
Impounded	Below Agriculture NPS	Sand	100 %
Nps Pollution	Below POTW		
Nutrients	Below Urban NPS		
Urban Runoff			

Landcover Summary - 2004 Data

Sample Comments

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Appendix 1 continued MDEP S-1207 = FOMB Site 4

Maine Department of Environmental Protection
Biological Monitoring Program
Aquatic Life Taxonomic Inventory Report

Station Number: S-1207 Waterbody: Androscoggin River - Station 1207 Town: Lisbon

Log Number: 2941 Subsample Factor: X1 Replicates: 3 Calculated: 3/23/2022

Taxon	Maine Taxonomic Code	Count (Mean of Samplers) Actual	Adjusted	Hilsenhoff Biotic Index	Functional Feeding Group	Relative Abundance % Actual	Adjusted
Planariidae	03010101	15.00	15.00		--	5.1	5.1
Annelida	08	0.33	0.33		--	0.1	0.1
Hirudinidae	08030201	1.67	1.67		--	0.6	0.6
Amphipoda	090102	0.33	0.33	8	--	0.1	0.1
Hyalella	09010203006	33.00	33.00	8	CG	11.2	11.2
Orconectes	09010301008		0.67		CG		0.2
Orconectes limosus	09010301008013	0.67			--	0.2	
Somatochlora	09020305027	0.33	0.33	1	PR	0.1	0.1
Argia	09020309048	1.00	1.00	7	PR	0.3	0.3
Coenagrion	09020309050	1.00	1.00	8	PR	0.3	0.3
Acerpenna	09020401007	1.00	1.00	5	CG	0.3	0.3
Plauditus	09020401012	0.33	0.33		CG	0.1	0.1
Stenacron	09020402014	14.67	14.67	7	SC	5.0	5.0
Maccaffertium	09020402015	11.67	11.67	4	SC	4.0	4.0
Caenis	09020412040	3.33	3.33	7	CG	1.1	1.1
Chimarra	09020601003	0.67	0.67	2	CF	0.2	0.2
Neureclipsis	09020603008	0.33	0.33	7	CF	0.1	0.1
Polycentropus	09020603010	37.00	37.00	6	PR	12.5	12.5
Cheumatopsyche	09020604015	2.00	2.00	5	CF	0.7	0.7
Hydropsyche	09020604016	0.67	0.67	4	CF	0.2	0.2
Ochrotrichia	09020607027	2.00	2.00	4	P	0.7	0.7
Oxyethira	09020607028	0.33	0.33	3	P	0.1	0.1
Brachycentridae	09020609	1.00	1.00		--	0.3	0.3
Nectopsyche	09020618074	8.33	8.33	3	SH	2.8	2.8
Triaenodes	09020618077	0.33	0.33	6	SH	0.1	0.1
Oecetis	09020618078	28.00	28.00	8	PR	9.5	9.5
Ablabesmyia	09021011001	9.00	9.00	8	PR	3.1	3.1
Nilotanypus	09021011012	0.33	0.33	6	PR	0.1	0.1
Pentaneura	09021011014	0.67	0.67	6	PR	0.2	0.2
Thienemannimyia	09021011020	1.33	1.33	3	PR	0.5	0.5
Cricotopus	09021011037	0.67	0.67	7	SH	0.2	0.2
Eukiefferiella	09021011041	0.67	0.67	8	CG	0.2	0.2
Rheotanytarsus	09021011072	1.33	1.33	6	CF	0.5	0.5
Tanytarsus	09021011076	1.33	1.33	6	CF	0.5	0.5
Dicrotendipes	09021011085	1.00	1.00	8	CG	0.3	0.3
Microtendipes	09021011094	80.67	80.67	6	CF	27.3	27.3
Polypedilum	09021011102	3.67	3.67	6	SH	1.2	1.2

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Appendix 1 continued MDEP S-1207 = FOMB Site 4

Maine Department of Environmental Protection
Biological Monitoring Program
Aquatic Life Taxonomic Inventory Report

Station Number: S-1207 Waterbody: Androscoggin River - Station 1207 Town: Lisbon

Log Number: 2941 Subsample Factor: X1 Replicates: 3 Calculated: 3/23/2022

Taxon	Maine Taxonomic Code	Count (Mean of Samplers) Actual	Count (Mean of Samplers) Adjusted	Hilsenhoff Biotic Index	Functional Feeding Group	Relative Abundance % Actual	Relative Abundance % Adjusted
Elmidae	09021113	0.33	0.33		--	0.1	0.1
Ancyronyx	09021113063	0.33	0.33	6	--	0.1	0.1
Hydrobiidae	10010104	2.67	2.67		--	0.9	0.9
Physidae	10010202	18.00	18.00		SC	6.1	6.1
Planorbidae	10010203	1.00	1.00		--	0.3	0.3
Pisidium	10020201002	7.00	7.00		CF	2.4	2.4

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Appendix 1 continued MDEP S-1202 = FOMB Site 5

Maine Department of Environmental Protection
Biological Monitoring Program
Aquatic Life Classification Attainment Report

Station Information

Station Number:	**S-1202**	River Basin:	Androscoggin
Waterbody:	Androscoggin River - Station 1202	HUC8 Name:	Lower Androscoggin
Town:	Lisbon	Latitude:	43° 59' 25.812" N
Directions:	FROM PEJEPSCOT BOAT RAMP IN LISBON FALLS, UPSTREAM 100YDS, MID CHANNEL	Longitude:	70° 2' 59.882" W
		Stream Order:	

Sample Information

Log Number: **2936**	Type of Sample: ROCK BASKET	Date Deployed: 9/3/2021
Subsample Factor: X1	Replicates: 3	Date Retrieved: 9/29/2021

Classification Attainment

Statutory Class:	C	**Final Determination:**	C	Date: 1/28/2022
Model Result with P≥0.6:	C	**Reason for Determination:**	**Model**	
Date Last Calculated:	1/27/2022	Comments:		

Model Probabilities

First Stage Model

Class A	0.03	Class C	0.65
Class B	0.32	NA	0.00

C or Better Model

Class A, B, or C	1.00
Non-Attainment	0.00

B or Better Model

Class A or B	0.04
Class C or Non-Attainment	0.96

A Model

Class A	0.02
Class B or C or Non-Attainment	0.98

Model Variables

01 Total Mean Abundance	279.00
02 Generic Richness	34.00
03 Plecoptera Mean Abundance	1.00
04 Ephemeroptera Mean Abundance	58.67
05 Shannon-Wiener Generic Diversity	3.63
06 Hilsenhoff Biotic Index	6.43
07 Relative Abundance - Chironomidae	0.16
08 Relative Generic Richness Diptera	0.24
09 *Hydropsyche* Abundance	0.67
11 *Cheumatopsyche* Abundance	8.33
12 EPT Generic Richness/ Diptera Generic Richness	2.00
13 Relative Abundance - Oligochaeta	0.00
15 Perlidae Mean Abundance (Family Functional Group)	1.00
16 Tanypodinae Mean Abundance (Family Functional Group)	1.33
17 Chironomini Abundance (Family Functional Group)	21.33
18 Relative Abundance Ephemeroptera	0.21
19 EPT Generic Richness	16.00
21 Sum of Abundances: *Dicrotendipes, Micropsectra, Parachironomus, Helobdella*	16.67
23 Relative Generic Richness- Plecoptera	0.03
25 Sum of Abundances: *Cheumatopsyche, Cricotopus, Tanytarsus, Ablabesmyia*	14.00
26 Sum of Abundances: *Acroneuria, Maccaffertium, Stenonema*	14.37
28 EP Generic Richness/14	0.43
30 Presence of Class A Indicator Taxa/7	0.14

Five Most Dominant Taxa

Rank	Taxon Name	Percent
1	*Neureclipsis*	35.24
2	*Stenacron*	13.13
3	*Polycentropus*	6.69
4	*Dicrotendipes*	5.97
5	*Maccaffertium*	4.79

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Appendix 1 continued MDEP S-1202 = FOMB Site 5

Maine Department of Environmental Protection
Biological Monitoring Program
Aquatic Life Classification Attainment Report

Station Number: S-1202	Town: Lisbon		Date Deployed: 9/3/2021
Log Number: 2936	Waterbody: Androscoggin River - Station 1202		Date Retrieved: 9/29/2021

Sample Collection and Processing Information

Sampling Organization: PAUL LEEPER (MOODY MOUNTAIN ENVIRONMENTAL) Taxonomist: PAUL LEEPER (MOODY MOUNTAIN ENVIRONMENTAL)

Waterbody Information - Deployment		Waterbody Information - Retrieval	
Temperature:	22 deg C	Temperature:	19.5 deg C
Dissolved Oxygen:	7.9 mg/l	Dissolved Oxygen:	8.5 mg/l
Dissolved Oxygen Saturation:		Dissolved Oxygen Saturation:	
Specific Conductance:		Specific Conductance:	90 uS/cm
Velocity:	18 cm/s	Velocity:	
pH:		pH:	
Wetted Width:	185 m	Wetted Width:	185 m
Bankfull Width:		Bankfull Width:	
Depth:	344 cm	Depth:	393 cm

Water Chemistry

Summary of Habitat Characteristics

Landuse Name	Canopy Cover	Terrain	
Upland Conifer	Open	Rolling	
Upland Hardwood			
Urban			
Potential Stressor	**Location**	**Substrate**	
Impounded	Below Dam	Gravel	40 %
Nps Pollution	Below POTW	Rubble/Cobble	50 %
Urban Runoff	Below Urban NPS	Sand	10 %

Landcover Summary - 2004 Data

Sample Comments

MIDCHANNEL 100 YDS UPSTREAM OF PEJEPSCOT BOAT LAUNCH

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Appendix 1 continued MDEP S-1202 = FOMB Site 5

Maine Department of Environmental Protection
Biological Monitoring Program
Aquatic Life Taxonomic Inventory Report

Station Number: S-1202 Waterbody: Androscoggin River - Station 1202 Town: Lisbon
Log Number: 2936 Subsample Factor: X1 Replicates: 3 Calculated: 1/27/2022

Taxon	Maine Taxonomic Code	Count (Mean of Samplers)		Hilsenhoff Biotic Index	Functional Feeding Group	Relative Abundance %	
		Actual	Adjusted			Actual	Adjusted
Planariidae	03010101	8.00	8.00		--	2.9	2.9
Annelida	08	10.00	10.00		--	3.6	3.6
Hyalella	09010203006	0.67	0.67	8	CG	0.2	0.2
Orconectes	09010301008		0.33		CG		0.1
Orconectes limosus	09010301008013	0.33			--	0.1	
Acroneuria	09020209042	1.00	1.00	0	PR	0.4	0.4
Chromagrion	09020309049	6.33	6.33	4	PR	2.3	2.3
Acerpenna	09020401007	7.33	7.33	5	CG	2.6	2.6
Heptageniidae	09020402	21.33			--	7.6	
Stenacron	09020402014	21.00	36.63	7	SC	7.5	13.1
Maccaffertium	09020402015	7.67	13.37	4	SC	2.7	4.8
Leptophlebiidae	09020406	0.67	0.67		--	0.2	0.2
Eurylophella	09020410036	0.67	0.67	3	CG	0.2	0.2
Chimarra	09020601003	0.67	0.67	2	CF	0.2	0.2
Neureclipsis	09020603008	98.33	98.33	7	CF	35.2	35.2
Polycentropus	09020603010	18.67	18.67	6	PR	6.7	6.7
Cheumatopsyche	09020604015	8.33	8.33	5	CF	3.0	3.0
Hydropsyche	09020604016	0.67	0.67	4	CF	0.2	0.2
Agraylea	09020607024	2.67	2.67	8	P	1.0	1.0
Hydroptila	09020607026	4.00	4.00	6	P	1.4	1.4
Oxyethira	09020607028	4.00	4.00	3	P	1.4	1.4
Mystacides	09020618075	0.67	0.67	4	CG	0.2	0.2
Oecetis	09020618078	5.33	5.33	8	PR	1.9	1.9
Thienemannimyia	09021011020	1.33	1.33	3	PR	0.5	0.5
Cricotopus	09021011037	5.67	5.67	7	SH	2.0	2.0
Eukiefferiella	09021011041	7.00	7.00	8	CG	2.5	2.5
Nanocladius	09021011049	5.33	5.33	3	CG	1.9	1.9
Psectrocladius	09021011056	2.00	2.00	8	CG	0.7	0.7
Paratanytarsus	09021011071	2.67	2.67	6	--	1.0	1.0
Dicrotendipes	09021011085	16.67	16.67	8	CG	6.0	6.0
Microtendipes	09021011094	4.67	4.67	6	CF	1.7	1.7
Hydrobiidae	10010104	1.33	1.33		--	0.5	0.5
Physidae	10010202	1.33	1.33		SC	0.5	0.5
Planorbidae	10010203	0.67	0.67		--	0.2	0.2
Elliptio	10020102009	0.33	0.33		CF	0.1	0.1
Sphaeriidae	10020201	1.67	1.67		CF	0.6	0.6

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Appendix 1 continued MDEP S-1203 = FOMB Site 6

Maine Department of Environmental Protection
Biological Monitoring Program
Aquatic Life Classification Attainment Report

Station Information

Station Number:	**S-1203**	River Basin:	Androscoggin
Waterbody:	Androscoggin River - Station 1203	HUC8 Name:	Lower Androscoggin
Town:	Brunswick	Latitude:	43° 55' 58.841" N
Directions:	FROM CARRY IN ACCESS IN BRUNSWICK, PROCEED UP RIVER, UNDER 295 TO LEDGE RIVER LEFT	Longitude:	70° 0' 3.895" W
		Stream Order:	

Sample Information

Log Number:	**2937**	Type of Sample:	ROCK BASKET	Date Deployed:	8/5/2021
Subsample Factor:	X1	Replicates:	3	Date Retrieved:	9/3/2021

Classification Attainment

Statutory Class:	C	**Final Determination:**	C	Date: 1/28/2022
Model Result with P≥0.6:	C	**Reason for Determination:**	**Model**	
Date Last Calculated:	1/27/2022	Comments:		

Model Probabilities

First Stage Model				C or Better Model	
Class A	0.16	Class C	0.28	Class A, B, or C	1.00
Class B	0.56	NA	0.00	Non-Attainment	0.00
B or Better Model				**A Model**	
Class A or B			0.31	Class A	0.01
Class C or Non-Attainment			0.69	Class B or C or Non-Attainment	0.99

Model Variables

01 Total Mean Abundance	312.67	18 Relative Abundance Ephemeroptera	0.07
02 Generic Richness	33.00	19 EPT Generic Richness	13.00
03 Plecoptera Mean Abundance	3.33	21 Sum of Abundances: *Dicrotendipes, Micropsectra, Parachironomus, Helobdella*	1.00
04 Ephemeroptera Mean Abundance	21.00	23 Relative Generic Richness- Plecoptera	0.03
05 Shannon-Wiener Generic Diversity	3.55	25 Sum of Abundances: *Cheumatopsyche, Cricotopus, Tanytarsus, Ablabesmyia*	66.33
06 Hilsenhoff Biotic Index	5.60	26 Sum of Abundances: *Acroneuria, Maccaffertium, Stenonema*	8.68
07 Relative Abundance - Chironomidae	0.04	28 EP Generic Richness/14	0.29
08 Relative Generic Richness Diptera	0.36	30 Presence of Class A Indicator Taxa/7	0.00
09 *Hydropsyche* Abundance	11.33		
11 *Cheumatopsyche* Abundance	64.00		
12 EPT Generic Richness/ Diptera Generic Richness	1.08		
13 Relative Abundance - Oligochaeta	0.00		
15 Perlidae Mean Abundance (Family Functional Group)	3.33		
16 Tanypodinae Mean Abundance (Family Functional Group)	3.00		
17 Chironomini Abundance (Family Functional Group)	3.33		

Five Most Dominant Taxa

Rank	Taxon Name	Percent
1	*Neureclipsis*	26.97
2	*Cheumatopsyche*	20.47
3	Physidae	13.01
4	Hydrobiidae	6.18
5	*Hydropsyche*	3.62

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Appendix 1 continued MDEP S-1203 = FOMB Site 6

Maine Department of Environmental Protection
Biological Monitoring Program
Aquatic Life Classification Attainment Report

Station Number: **S-1203**	Town: Brunswick		Date Deployed: 8/5/2021
Log Number: **2937**	Waterbody: Androscoggin River - Station 1203		Date Retrieved: 9/3/2021

Sample Collection and Processing Information

Sampling Organization: PAUL LEEPER (MOODY MOUNTAIN ENVIRONMENTAL) Taxonomist: PAUL LEEPER (MOODY MOUNTAIN ENVIRONMENTAL)

Waterbody Information - Deployment		Waterbody Information - Retrieval	
Temperature:	23.5 deg C	Temperature:	23.2 deg C
Dissolved Oxygen:	8.3 mg/l	Dissolved Oxygen:	7.6 mg/l
Dissolved Oxygen Saturation:		Dissolved Oxygen Saturation:	
Specific Conductance:		Specific Conductance:	
Velocity:	30 cm/s	Velocity:	34 cm/s
pH:		pH:	
Wetted Width:	176 m	Wetted Width:	176 m
Bankfull Width:		Bankfull Width:	
Depth:	317 cm	Depth:	310 cm

Water Chemistry

Summary of Habitat Characteristics

Landuse Name	Canopy Cover	Terrain	
Upland Conifer	Open	Rolling	
Upland Hardwood			
Potential Stressor	Location	Substrate	
	Above Dam	Bedrock	50 %
		Boulder	10 %
		Rubble/Cobble	40 %

Landcover Summary - 2004 Data

Sample Comments

WATCH OUT FOR CRIPBS UNDERWATER

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Appendix 1 continued MDEP S-1203 = FOMB Site 6

Maine Department of Environmental Protection
Biological Monitoring Program
Aquatic Life Taxonomic Inventory Report

Station Number: S-1203 Waterbody: Androscoggin River - Station 1203 Town: Brunswick
Log Number: 2937 Subsample Factor: X1 Replicates: 3 Calculated: 1/27/2022

Taxon	Maine Taxonomic Code	Count (Mean of Samplers) Actual	Count (Mean of Samplers) Adjusted	Hilsenhoff Biotic Index	Functional Feeding Group	Relative Abundance % Actual	Relative Abundance % Adjusted
Planariidae	03010101	11.00	11.00		--	3.5	3.5
Annelida	08	9.00	9.00		--	2.9	2.9
Hyalella	09010203006	0.33	0.33	8	CG	0.1	0.1
Acroneuria	09020209042	3.33	3.33	0	PR	1.1	1.1
Somatochlora	09020305027	1.67	1.67	1	PR	0.5	0.5
Chromagrion	09020309049	10.67	10.67	4	PR	3.4	3.4
Acerpenna	09020401007	5.33	5.33	5	CG	1.7	1.7
Heptageniidae	09020402	2.00			--	0.6	
Stenacron	09020402014	9.00	10.32	7	SC	2.9	3.3
Maccaffertium	09020402015	4.67	5.35	4	SC	1.5	1.7
Chimarra	09020601003	5.33	5.33	2	CF	1.7	1.7
Neureclipsis	09020603008	84.33	84.33	7	CF	27.0	27.0
Polycentropus	09020603010	4.33	4.33	6	PR	1.4	1.4
Cheumatopsyche	09020604015	64.00	64.00	5	CF	20.5	20.5
Hydropsyche	09020604016	11.33	11.33	4	CF	3.6	3.6
Macrostemum	09020604018	0.67	0.67	3	CF	0.2	0.2
Ceraclea	09020618072	0.33	0.33	3	CG	0.1	0.1
Mystacides	09020618075	1.33	1.33	4	CG	0.4	0.4
Oecetis	09020618078	4.67	4.67	8	PR	1.5	1.5
Tipulidae	09021001	1.00	1.00		--	0.3	0.3
Ablabesmyia	09021011001	0.33	0.33	8	PR	0.1	0.1
Pentaneura	09021011014	2.00	2.00	6	PR	0.6	0.6
Thienemannimyia	09021011020	0.67	0.67	3	PR	0.2	0.2
Cricotopus	09021011037	1.67	1.67	7	SH	0.5	0.5
Eukiefferiella	09021011041	2.33	2.33	8	CG	0.7	0.7
Paratanytarsus	09021011071	2.67	2.67	6	--	0.9	0.9
Tanytarsus	09021011076	0.33	0.33	6	CF	0.1	0.1
Microtendipes	09021011094	1.33	1.33	6	CF	0.4	0.4
Parachironomus	09021011097	1.00	1.00	10	PR	0.3	0.3
Polypedilum	09021011102	1.00	1.00	6	SH	0.3	0.3
Cnephia	09021012046	4.33	4.33	0	CF	1.4	1.4
Elmidae	09021113	0.67	0.67		--	0.2	0.2
Hydrobiidae	10010104	19.33	19.33		--	6.2	6.2
Physidae	10010202	40.67	40.67		SC	13.0	13.0

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Appendix 2. Hydropower Impoundment Classification Exceptions for Aquatic Life Standards- Title 38 Sections 464 and 465

https://www.mainelegislature.org/legis/statutes/38/title38sec464.html

https://www.mainelegislature.org/legis/statutes/38/title38sec465.html

Summary: *The statute says that recognizing the aquatic life differences of impoundments, if a river with impoundments is classified as A or B, the impoundment shall also be considered to meet that standard provided it at least meets C criteria; unless, (1) Reasonable changes can be implemented that do not significantly affect existing energy generation capability; and (2) Those changes would result in improvement in the habitat and aquatic life of the impounded waters. If the conditions described in (1) and (2) occur, those changes must be implemented and the resulting improvement in habitat and aquatic life must be achieved and maintained.*

§464. Classification of Maine waters

10. Existing hydropower impoundments managed under riverine classifications; habitat and aquatic life criteria. For the purposes of water quality certification under the Federal Water Pollution Control Act, Public Law 92-500, section 401, as amended, and the licensing of modifications under section 636, hydropower projects in existence on the effective date of this subsection, the impoundments of which are classified under section 465, are subject to the provisions of this subsection in recognition of some changes to aquatic life and habitat that have occurred due to the existing impoundments of these projects.

A. Except as provided in paragraphs B and D, the habitat characteristics and aquatic life criteria of Classes A and B are deemed to be met in the existing impoundments classified A or B of those projects if:

(1) The impounded waters achieve the aquatic life criteria of section 465, subsection 4, paragraph C. [PL 1991, c. 813, Pt. B, §1 (NEW).] (author's note- underlined and boldfaced, see section 465, subsection 4, paragraph C below)

B. The habitat characteristics and aquatic life criteria of Classes A and B are not deemed to be met in the existing impoundments of those projects referred to in paragraph A if:

(1) Reasonable changes can be implemented that do not significantly affect existing energy generation capability; and

(2) Those changes would result in improvement in the habitat and aquatic life of the impounded waters.

If the conditions described in subparagraphs (1) and (2) occur, those changes must be implemented and the resulting improvement in habitat and aquatic life must be achieved and maintained. [PL 1991, c. 813, Pt. B, §1 (NEW).]

C. If the conditions described in paragraph B, subparagraphs (1) and (2) occur at a project in existence on the effective date of this subsection, the impoundment of which is classified C, the changes described in paragraph B, subparagraphs (1) and (2) must be implemented and the resulting improvement in habitat and aquatic life must be achieved and maintained. [PL 1991, c. 813, Pt. B, §1 (NEW).]

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D. When the actual water quality of waters affected by this subsection attains any more stringent characteristic or criteria of those waters' classification under sections 465, 467 and 468, that water quality must be maintained and protected. [PL 1991, c. 813, Pt. B, §1 (NEW).]
[PL 1991, c. 813, Pt. B, §1 (NEW).]
11. Downstream stretches affected by existing hydropower projects. Hydropower projects in existence on the effective date of this subsection that are located on water bodies referenced in section 467, subsection 4, paragraph A, subparagraphs (1) and (7), and section 467, subsection 12, paragraph A, subparagraphs (7) and (9) are subject to the provisions of this subsection.
For the purposes of water quality certification of hydropower projects under the Federal Water Pollution Control Act, Public Law 92-500, Section 401, as amended, and licensing of modifications to these hydropower projects under section 636, the habitat characteristics and aquatic life criteria of Class A are deemed to be met in the waters immediately downstream of and measurably affected by the projects listed in this subsection if the criteria contained in section 465, subsection 4, paragraph C are met.
[RR 1993, c. 1, §114 (COR).]

Section 465, subsection 4, paragraph C

C. Discharges to Class C waters may cause some changes to aquatic life, except that the receiving waters must be of sufficient quality to support all species of fish indigenous to the receiving waters and maintain the structure and function of the resident biological community. For the purpose of allowing the discharge of aquatic pesticides or chemicals approved by the department and conducted by the department, the Department of Inland Fisheries and Wildlife or an agent of either agency to restore biological communities affected by an invasive species, the department may find that the discharged effluent will not cause unacceptable changes to aquatic life as long as the materials and methods used will ensure the support of all species of indigenous fish and the structure and function of the resident biological community and will allow restoration of nontarget species. [PL 2017, c. 319, §9 (AMD).]

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Chandler Bay

- Carrie Peabody, Citizen

Attachment A submitted with Chandler Bay upgrade comment on page 67 above.

Attachment A - Baseline Nutrient Findings by DMC for Chandler Bay

The ambient water quality monitoring conducted in Chandler Bay (from May through October in monitoring years like 2022 and 2023), with laboratory analysis performed by the Darling Marine Center (DMC), established a pre-development baseline for key nutrients.

The findings confirm that the bay's current nutrient regime is typical of a high-quality, unpolluted marine environment.

Chlorophyll a (Indicator of Algal Biomass)

Chlorophyll a concentrations are a key metric, as high levels indicate excessive nutrient loading (eutrophication) which can lead to algal blooms and low dissolved oxygen.

Parameter	Darling Center Findings (Qualitative)	Implication
Maximum Chlorophyll a	Maximum levels detected were approximately **one-quarter (\sim 25\%) of established state limits**.	The bay has very low phytoplankton biomass, indicating **no excessive nutrient pollution** (eutrophication is absent).

- **Context:** While the exact numerical threshold for Class SA waters is complex, the finding that chlorophyll a peaks are consistently far below the failure point is the strongest indication of the bay's pristine status. The data provided the scientific basis to argue that the water quality ***exceeded*** the aspirational standards for Class SA (the highest water classification in Maine).

Total Nitrogen (TN) and Component Nutrients

Total Nitrogen is a measure of all nitrogen compounds (like nitrate, nitrite, and ammonia) that can act as fertilizer for algae. The DMC's analysis of TN and its components established the baseline nutrient concentration ***before*** any large-scale activity in the area.

Parameter	Monitoring Focus	Implication
Total Nitrogen (TN)	Baseline levels were established via measurement of Total Kjeldahl Nitrogen (TKN) and Nitrate + Nitrite (NOx).	Ambient TN levels are characteristic of a high-quality Class SB/SA estuarine system, which is crucial for protecting habitats like eelgrass beds.
Nutrient Trends	The monitoring assessed the spatial and temporal variability of nutrient fluxes in the bay.	Data showed the bay was consistently meeting or exceeding water quality standards, suggesting that existing human activities in the watershed were not causing excessive nutrient loading.

Summary of DMC's Data Interpretation

The DMC's role in processing the samples provided the rigorous, quality-assured data that led to the conclusion that Chandler Bay's waters are exceptionally clean and low in nutrient and algal biomass indicators. This data formed the core scientific argument that the bay deserves the highest environmental classification due to its "pristine nature" and **existing water quality throughout the 2023 season exceeded SA waterbody standards.**

References:

University Of Maine Ambient Water Quality Monitoring Plan- Mar 16 2023 1:00 PM

Maine Revised Statutes- Title 38, §469

Chandler Bay Water Quality Re-Classification Proposal- 27 June 2024

DECD Letter of Determination- DECD Statement on Economic Impact Kingfish.pdf

- Carrie Peabody, Citizen

Three monitoring reports submitted with Chandler Bay upgrade comment on page 69 above.

Version 2, 12/19/2022

THE UNIVERSITY OF MAINE

Report for 2022 Ambient Water Quality Monitoring Plan for Kingfish Maine, Land Based Aquaculture Project Jonesport, Washington County, Maine, USA

Contents

Kingfish Maine AWQMP Report 2022

Version 2, 12/19/2022

Background

Kingfish Maine, was issued a Maine Pollutant Discharge Elimination System (MEPDES) Permit #ME0037559 and Maine Waste Discharge License (WDL) (W009238-6F-A-N) on June 25, 2021, for a proposed land-based aquaculture project in Jonesport, Maine. Special Condition H of these approvals requires that Kingfish Maine, starting in 2022, monitor ambient water quality both prior to and continuing through the buildout and operation of the permitted facility. This effort significantly increases the ambient water quality dataset for Chandler Bay, as little background water quality data has been collected prior to this effort. The pre-buildout ambient monitoring provides an assessment of the background nutrient levels of the ambient waters surrounding and expected to be affected by the facility outflow. This document describes the results of 2022 Ambient Water Quality Monitoring season.

Project Organization

Tom Sorby	Tom Sorby Operational Manager Kingfish Maine 33 Salmon Farm Road Franklin, ME. 04634 (502) 614 9078, t.sorby@kinfish-maine.com	Representative of the MEPDES/WDL permittee. Responsible for oversight of the AWQMP and vendor management
Damian Brady	Damian C. Brady, PhD School of Marine Sciences Ira C. Darling Marine Center University of Maine 193 Clarks Cove Road Walpole, ME 04573 207-312-8752, Damian.brady@maine.edu	Responsible for AWQMP implementation, including oversight of sample collection and analysis, data management and security, report production.
Angela Brewer	Section Leader, Marine Unit, Bureau of Water Quality Maine Department of Environmental Protection 17 State House Station, 32 Blossom Lane Augusta, ME 04330 (207) 592-2352, angela.d.brewer@maine.gov	Acts as MEDEP Program lead for all monitoring and data management activities covered under the AWQMP.
Clarissa G. Trasko	Wastewater Compliance Supervisor, Maine Department of Environmental Protection, 106 Hogan Road Bangor, ME 04401, (207) 592-1389, clarissa.trasko@maine.gov	Maine DEP compliance staff person for Kingfish Maine permit.

Other personnel: Trained and experienced University of Maine staff carried out all field sampling, sample collection, sample analysis, data compilation, data visualization and report production. Staff may be assisted by trained interns, graduate students, or other personnel, but in all cases, those assisting will be properly trained for the tasks performed and will act in accordance with the AWQMP.

Data Distribution Statement

Only data that has undergone quality testing and has been verified ready for distribution, will be distributed. An exception may be made for the entities listed in the above "Project Organization" section. Any data distributed to those entities before quality testing and verification would be watermarked "unverified, preliminary data, not for distribution".

3

Ambient Water Quality Monitoring Plan Overview

Stations:

The University of Maine team sampled ambient water quality at 4 pre-determined stations designated by Maine DEP (Figure 1, Table 1). Stations established in the MEPDES permit are shown on the map in Figure 1. One station (R1-3) is a previously established ambient monitoring station and is located off Chandler Bay. Station 1 is located near Great Bar. Station 2 is located near Bar Island, Station 3, off the southwest shore of Ballast Island Ledge, near the proposed outfall, and Station 4 is near Bay Ledge. These sites were monitored in the same order on each sampling date; Station 1 was sampled first, then Station 2, 3 and 4, in that order.

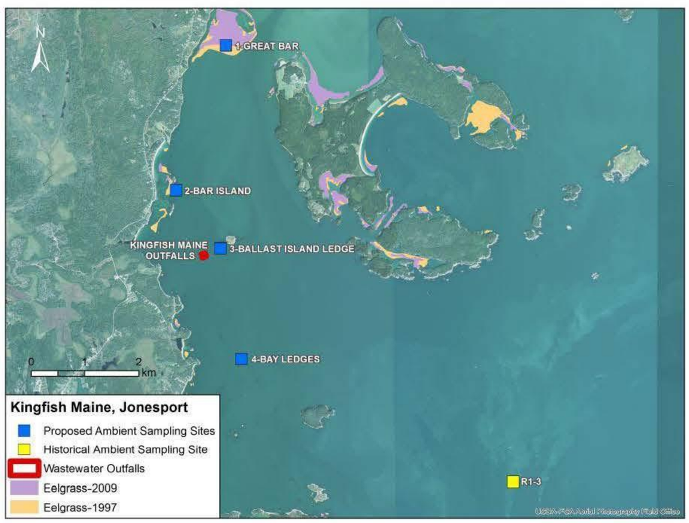

Figure. 1. Ambient monitoring stations established in the MEPDES permit.

Station	Latitude	Longitude
1-GREAT BAR	44.59209	-67.55317
2-BAR ISLAND	44.569433	-67.565643
3-BALLAST ISLAND LEDGE	44.559541	-67.556639
4-BAY LEDGES	44.540773	-67.550927

Table 1. Coordinates of Kingfish Maine ambient water quality monitoring stations

Time of Sampling

The stations were sampled at 3-week intervals beginning in May of 2022 and extending through October, 2022. Each sampling occurred on the second half of alternating ebb and flood tides within a four-hour sampling window, including 1 hour of slack. Kingfish Maine provided the vessel and captain for the sampling trips. For sampling dates and times, see Table 2. For Field Data Sheet, see Appendix F.

Date	Window
May 10	9:15-13:15
May 31	9:20-13:20
June 21	8:05-12:05
July 13	7:41-11:41
August 5	7:24-11:24
August 25	7:28-11:28
September 21	11:24-15:24
October 11	9:11-13:11

Table 2. Sampling dates for 2022 ambient monitoring. The samplings were scheduled to alternate the 4-hour sampling window between the 2nd half of ebb and flood tides.

Parameters measured

Temperature, depth, salinity, dissolved oxygen, pH, chlorophyll *in situ* fluorescence, and turbidity were measured by multiparameter sonde. Total Kjeldahl Nitrogen (TKN), Total Phosphorus (TP), Nitrate plus Nitrite (NOx) and extracted chlorophyll *a* and phaeopigment samples were collected as grab samples and analyzed in the Marine Water Quality Laboratory (MWQL) at the Darling Marine Center (DMC) which is accredited by the State of Maine to perform the above laboratory analyses. The sum of TKN and NOx provide a measure of Total Nitrogen (TN). A Secchi measurement of water clarity was also made at each station.

Sampling Methods

Sampling methods followed established SOPs (See Appendices). Deviations from or amendments to existing SOPs will be identified in this report, along with justification for such changes.

Preparation for sampling

Sonde Calibration

Prior to deployment, the multiparameter sonde was calibrated following the procedure in Appendix A.

Labware preparation for TKN, TP, NOx, and chlorophyll a samples

For TKN. TP and NOx, grab sample bottles and caps, tubes and caps, syringes and plungers were acid washed, rinsed with milliQ water (> 18.0 megohm resistivity) and dried. Preservative (sulfuric acid) was added to the sample vessels for TKN, TP and NOx in the laboratory, prior to sampling. Extracted

chlorophyll samples were collected in brown, HDPE or LDPE bottles which were cleaned with Sparkleen, a general use laboratory cleaner, and rinsed a minimum of 6 times with milliQ water. Cleaning procedures for all labware are documented in the laboratory records. Coolers were cleaned and dried prior to use. Sample bottles and tubes were labeled with the project name, station name or #, depth (surface (S), just below thermocline (T), bottom (B)), date, analyte, and the samplers initials.
Enroute to the site, ice was purchased for coolers to maintain the proper temperature of the samples.

Sonde profiles

Instrumentation

The University of Maine provided experienced technicians to conduct sonde profiles and collect grab samples for each sampling. A UM owned YSI EXO II multiparameter sonde with handheld computer for user manipulation of settings, parameter readouts, data logging and display, SN: 20E101357, was used for profiles of water column parameters. The YSI EXO II is equipped with the following sensors (QC specifications from manufacturer):

Parameter	Range	Resolution	Accuracy
Pressure/Depth	0-100 m	0.001 m	± 0.004%.
Temperature (SN: 20D101816)	-0.5 – 50 °C	0.001 °C	0.01 °C
Conductivity (SN: 20D101816)	0-200 mS/cm	0.1 mS/cm	±0.5 % or 0.001 mS/cm w. i. g.
Turbidity (SN: 19M102348)	0 - 4000 FNU	0.01 FNU	± 2% or 0.1 FNU
Chlorophyll fluorescence (SN: 18C105672):	0 - 400 µg/L	0.1 µg/L	0.1 µg/L
pH (SN: 19B102402)	0 - 14	0.01	± 0.1
Dissolved Oxygen	0 - 500 % Air Saturation/0 - 50 mg/l	0.1% Air Saturation/0.01 mg/l	± 1% Air Saturation/± 0.1 mg/L

Table 3. Manufacturers specifications for sonde parameters.

Profile Details:

At each site, the sonde was submerged and allowed to equilibrate at approximately 1 meter depth. The sonde was then raised to just below the surface to begin the profile. Measurements were taken at the following depths at each site, allowing the readings to stabilize a minimum of 2 minutes at each depth sampled:

- 0.5 meters
- 1 meter followed by 1-meter increments to 10 meters total depth.
- At depths greater than 10 meters measurements were taken in 2-meter increments to a total depth of 20 meters or within 0.5 meters of the bottom.
- If the water column is less than 5 m at a station, data was recorded in 0.5-meter increments instead of 1-meter increments to provide more data points.

Care was taken not to disturb the bottom, as resuspended sediment can interfere with readings and the sonde can be damaged if it contacts the bottom. A window weight was attached to the sonde line and hung below the sonde to provide an indicator of proximity to the bottom by touching the substrate before the sonde. Total depth at the station was determined by the boat depth finder.
Sonde data was saved in real time on the attached handheld control. Each profile had its own file and was labeled with the station name, date and time. All readings were taken on the descent of the sonde

with the exception of the samplings on 9/21/22 and 10/11/22 when the readings were taken on the upcast of the sonde. A field log was used to record weather conditions, sea conditions, sampling personnel, sample time and provided an independent verification of the time, as well as any unusual circumstances surrounding the station sampling. In the lab, environmental as well as calibration data was uploaded on a MWQL computer using YSI KORexo software, to be eventually manipulated in Microsoft Excel or other spreadsheet software.

Grab Sample Collection

Equipment

A weighted 1.7-liter HDPE Niskin bottle with a metered nylon line and tripping weight was used for collecting grab samples.

Niskin preparation

The Niskin bottle was rinsed with milliQ water after use and stored dry in the lab. The bottle was rinsed with ambient water before samples were collected.

Depth of Sampling

The Field Data Sheet was used to record sampling related data and conditions (see Appendix F). Samples were collected at 1 m and at 0.5-2 meters above the bottom. The goal was to sample 0.5 meters from the bottom, but in rough seas where it is difficult to maintain that distance, samples may be taken at up to 2 meters above the bottom to prevent the bottle from coming in contact with the bottom or with resuspended sediment directly above the bottom. The actual depths that the surface and bottom samples were taken will be recorded on the field data sheet. In addition to surface and near bottom samples, if a thermocline is observed in the sonde samples, a grab sample will also be taken just below the thermocline. The thermocline for the purposes of this plan is defined as a drop of more than one degree Centigrade in temperature from one meter to the next. This grab sample will be labeled depth "T" and the actual depth will be recorded in the field data sheet. The thermocline sample will be analyzed for the same parameters as the surface and bottom samples. Note that for Site 4, if there is a thermocline, a bottom sample need not be taken.

Collection of Grab Samples

TKN, TP, NOx, and chlorophyll *a* samples were collected from the Niskin bottle, which was gently mixed between draws from the bottle to resuspend any settling particles. Sonde profiles were collected first. The profile was examined to determine if a thermocline was present which was defined as a change of more than 1 degree Centigrade per meter of depth. No thermocline was seen for any of the sampling dates in 2022. Water samplers wore gloves and took care not to touch other surfaces while wearing gloves. If gloves were contaminated, they were removed, and a new pair utilized. When handling sample bottles and tubes, the caps and bottle were handled in such a way as to prevent gloves from touching the inside of the cap or bottle or the rim of the bottle. Bottles were filled as quickly as possible and capped immediately. TKN and TP samples will be collected in the same bottle. The bottle contained preservatives and was not rinsed with the sample. The NOx samples were collected in acid washed syringes and filtered through 0.45-micron cartridge filters into acid washed 50 ml centrifuge tube; sample was passed through the filter to waste, before collecting 40 ml of sample in the 50 ml tube. The tubes contained preservatives and were not rinsed. Tubes will be capped immediately, and the sample will be stored in the cooler on ice. Chlorophyll sample bottles were rinsed three times with sample water before collecting the sample. To rinse chlorophyll bottles, up to 50 ml of sample water was collected in the bottle. The Bottles were capped and shaken to rinse inside the bottle and cap. The rinse water was dumped downstream of the sampling site. The rinsing was repeated two more times, after which the bottle was filled, capped, and stored in a dark cooler on ice.

Labeling of Grab Samples/Recording of Field Data

The project name, station, date and time of sampling, the depth of sampling, weather, sea conditions, names of staff collecting samples, volume of samples collected, and any unusual circumstances were recorded on waterproof field data sheets. Field sheets were scanned and manually digitized in the laboratory. Bottles were labeled with project, date, station, time of sampling, depth, sampler's initials, and analyte.

Replicate Samples

For each parameter, at least one duplicate sample was taken for every ten samples collected.

Grab Sample Field Storage and Transport

Immediately after collection in the field, sample bottles were placed in Ziploc bags and stored in coolers surrounded by loose ice, in the dark. Samples remained in the coolers until arrival at the MWQL. Temperature of the coolers was monitored by measuring the temperature of a water sample that has been stored with the environmental samples during transit. Samples were stored between 0 ºC and 6 ºC.

Sample Handling in the MWQL

Standard operating procedures (SOPs) were followed for the sampling, preservation, transportation, and storage of surface water grab samples. Special permission was granted for the MWQL to allow an 8-hour period between collection and filtration for the Kingfish Maine (Chandler Bay) chlorophyll samples due to the long travel distance required and the availability of test data showing no significant differences in chlorophyll or phaeophytin data obtained from test samples filtered at 6 and 8 hours after collection. Each sample was given a unique MWQL identification which consisted of MWQL batch code which includes the date and project, station code, depth, and replicate number (if more than 1 sample is taken). This unique identification was traced to the field data sheet and the Chain of Custody form, which contained further information. Samples were kept within temperature parameters specified by the laboratory SOPs and this document, until analysis. Temperatures of refrigerators and freezers used to store MWQL samples were monitored on each day that the MWQL was in operation, and the readings recorded in a log.

Method	Analytes	Holding Time (days)	MDL (12/31/22)	RL (12/31/22)	Units
SM10200H	Chlorophyll a and Phaeophytin	21	0.009	0.018	µg/l
EPA 351.2	Total Kjeldahl Nitrogen	28	0.1712	0.1929	mg/l
EPA 365.4	Total Phosphorus	28	0.0754	0.0845	mg/l
EPA 353.2	Nitrate plus Nitrite	28	0.0120	0.0230	mg/l

Table 3. Methods, holding times, minimum detection limit (MDL0 and reporting limit (RL) of MWQL methods.

Chain of Custody

A chain-of-custody form was completed the day of sampling and documented the following:
Date and time of collection, person collecting the samples, station, depth, parameter to be analyzed, project name, unique MWQL batch code, filtered/not filtered, volume of sample collected, temperature of cooler upon arrival at the laboratory, time and date of arrival at the laboratory, receiving and relinquishing staff members, storage location in laboratory, time of placement in laboratory storage, date of any processing or analysis of the samples (details of each action will be contained in laboratory notebooks or forms specific to the actions being performed), date and time of any transfer of samples to outside facilities, any deviations from the SOPs or unusual field conditions which may impact the quality of the sample as well as identifying information for any instruments, such as thermometers used in samples monitoring.

Quality Objectives

Sonde data

All uploaded sonde data spreadsheets were quality-checked and formatted, at which point the raw data files on the handheld computer or sonde were deleted from the file directory. Criteria used to validate raw profile data from discrete sampling followed Table 6 of MDEP's marine monitoring program (MDEP 2017). For raw profile data from discrete sampling, if a data value falls outside of the relevant acceptable range, best professional judgment may override these criteria when supporting data or information suggests a real aberration. If no reasonable explanation exists for an aberration, the data value is flagged in the raw data file and not included in subsequent analyses and reporting.
Sonde data will be checked for extreme values using conditional formatting in an Excel spreadsheet. See Table 4 for ranges. In the event data is outside of these limits, it will be examined further and flagged.

Parameter	Minimum Value	Maximum Value	
Depth	0.05 m	20 m	Range based on expected conditions within Maine marine surface waters and protocol maximum
Temperature	5 °C	25 °C	Range based on expected seasonality of sampling
Salinity	0 psu	35 psu	Range based on expected location of sampling in Maine marine waters
Dissolved Oxygen	20% saturation	150% saturation	Range based on expected seasonality and location of sampling in Maine marine waters, including extremes based on primary productivity
pH	6.5	9.5	Extremes based on algal bloom conditions, should be verified with dissolved oxygen data and time of da
Turbidity	0 FNU	25 FNU	Negative values should be corrected to 0.0, high values should be verified with adjacent data values and proper functioning of probe wiper
Chlorophyll a	0 µg/L	25 µg/L	Max. value based on algal bloom

Table 4. Ranges of acceptable data for sonde measurements. Data outside of these ranges will be flagged if no reasonable explanation exists for the aberration.

Grab Samples

Precision: For activities covered under this AWQMP, precision is measured through an assessment of duplicate spiked matrix samples and replicate field samples. The variability of laboratory blanks and standards are used to evaluate the precision of the analytical method. The variability of both the blank and spiked matrix sample were used to calculate the minimum detection limit and the reporting limit of the analytical method. Specific procedures are available in the specific protocol SOPs.

Accuracy: To determine the accuracy of the laboratory procedures, certified standard solutions (laboratory control samples (LCS)) are analyzed with each sample run, with the exception of chlorophyll a in which a solid standard is analyzed with each run, to determine the if the readings have drifted from the values obtained during the last calibration with certified standard. The chlorophyll fluorometer was calibrated with liquid certified standard prior to the sampling season.

Representativeness: Sampling stations are chosen based on the current knowledge of the movement of water in the vicinity of the proposed outflow. MEDEP selected stations based on the monitoring goals and objectives. The sampling took place in a 4-hour window around the second half of alternating ebb and flood tides with 1 hour of slack tide in the sampling window. This schedule allowed for sampling at both high and low tide to document any variability with the tide cycle. Sampling took place in May through October to capture seasonal variability. The assessment of duplicate grab samples for each sampling event (1 duplicate for each 10 samples collected) provides an assessment of sampling variability.

Comparability: Comparability is addressed by making and recording observations and collecting samples using methodology approved by the MDEP, by using field staff trained and experienced in the sampling methods, and by using methods approved by the MDEP performed by a laboratory accredited by the State of Maine for those methods. Additionally, comparability with historical MDEP datasets will be maintained as much as possible by maintaining regular communication with the MDEP Marine Unit. MDEP Marine Unit staff accompanied the UM sampling team on August 25, 2022.

Reporting QC Data

Quality control data included in the laboratory reports include, at a minimum, equipment blanks, field duplicates, laboratory control samples, and matrix spikes for nutrient analyses. Laboratory reports also contain a case narrative or equivalent notation, list of qualifiers and definitions, copies of COC form that includes a cooler receipt and preservation check form indicating sample temperature. The samples were in the possession of University of Maine staff from the time of collection to arrival in the laboratory.

Special Training/Certification

Field sampling staff using sonde equipment are trained and monitored by Damian C. Brady, PhD, or qualified staff member under his supervision and in accordance with University of Maine requirements. All data analysis and reporting is subject to the review and approval of Damian C. Brady, PhD, University of Maine. The surface water grab samples were analyzed at the University of Maine Marine Water Quality Laboratory (MWQL), a Maine State certified laboratory. All staff are trained in relevant SOPs and protocols, all required UM safety training as well as data integrity training.

Documents and Records

Changes to AWQMP

Proposed changes to this AWQMP may result from field conditions, equipment failure or other extenuating circumstances. All sampling events occurred on the scheduled primary dates listed in the AWQMP.

Standard Operating Procedures

Standard Operating Procedures are a part of Kingfish Maine's and UM's quality assurance program. For vertical sonde profiling, instruments were calibrated according to manufacturer's instructions prior to each sampling event and the SOP (Appendix A) was followed

Data Management

Record Keeping

Records include equipment calibration information and logs, field data sheets, chain-of custody forms, laboratory forms and notebooks, lab reports, field notes, sonde field data and field notes. All information, including lab-generated data, are kept in digital files maintained by the University of Maine MWQL. Lab-generated grab sample data will be submitted in EDD format to MEDEP. Files were not deleted or removed from hand-held devices until an electronic or hard copy of the data has been saved appropriately and subjected to data QA/QC screening. In the field, the sonde data were recorded on the instrument and with a secondary method; either hand-written or a screenshot of the sonde handheld data. Anomalous or inconsistent field or lab results have not been deleted but have, instead, been flagged in data sets.

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All data is backed up to secure cloud storage. The MWQL uses role-based data access control principles which limit access to data and documents to those specifically authorized as outlined in the MWQL Quality Assurance Manual.

All data resulting from this monitoring program is managed by the University of Maine. The University of Maine field measurements and the lab results are maintained at the Darling Marine Center.
All hard copies of lab and field data sheets, forms and logs have been electronically duplicated and preserved. Sonde data were logged to internal memory on either the handheld computer or sonde, and then raw files were uploaded to spreadsheets upon return to the office and prior to a subsequent sampling event

Reporting

Kingfish Maine will provide the MDEP with an annual report of the monitoring results on or before December 31st of each year. In addition to data tables, graphs, and figures, the report will compare results with previous sampling data (beginning after the second sampling season) and note any anomalous or unusual results. As appropriate, the annual report identifies and clarifies necessary changes to field sampling methods, this AWQMP, or other elements of the monitoring program and, potentially, exclusion from reporting results. Flagged data, if any, will be described in annual reports submitted to MDEP.

Results

Field Observations:

RESULTS

Date	*Site*	*Time grab samples started*	*Max water depth (m)*	*Cloud cover, air temperature, and wind speed and direction*	*Notes*
10MAY22	CB1	*9:35*	*4.9*	*20% CC, high, hazy clouds,* *Wind: slight wind*	*Secchi depth (m): 2.3, 1-2' seas*
	CB2	*10:50*	*8.8*	*10%CC high clouds* *slight wind*	*Secchi depth (m): 2.5, 1-2' seas*
	CB3	*11:50*	*12*	*10%CC high clouds* *slight wind*	*Secchi depth (m): 2.35, 2-3' seas*
	CB4	*13:08*	*9.5*	*0% CC, 1-1.5' chop, slight wind*	*Secchi depth (m): 2.3, 2-3' seas*

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31MAY22	CB1	***11:08***	***4.9***	***30% CC, sunny*** ***Wind: 3-5 kts N***	***Secchi depth (m): 3.1*** ***Current 1 kt to the N, flat water***
	CB2	***11:58***	***11***	***70% CC, partly sunny,*** ***Wind: 8-10 kts N***	***Secchi depth (m): 3.6*** ***Current 1 kt to the N, 0.5' waves***
	CB3	***12:58***	***15.2***	***70% CC, partly sunny,*** ***Wind: 12-14 kts N***	***Secchi depth (m): 3.6*** ***Current 0.5 kt to the N, 1' waves***
	CB4	***13:40***	***12***	***30% CC, partly sunny,*** ***Wind: 10-12 kts N***	***Secchi depth (m): 5.0*** ***No current, 0.66' waves***
21JUN22	CB1	***8:35***	***4.0***	***0% CC, Sunny*** ***Wind 5-10 kts NE***	***Secchi depth (m): 2.3*** ***Flat water, no current***
	CB2	***9:33***	***8.5***	***Sunny with some clouds*** ***Wind: 2 kts NE***	***Secchi depth (m): 2.7*** ***Flat water, light current***
	CB3	***10:29***	***12.3***	***Wind: 5 kts NE***	***Secchi depth (m): 2.9*** ***Flat water, light current***
	CB4	***11:20***	***10.5***	***Sunny with some clouds*** ***Wind: 5 kts NE***	***Secchi depth (m): 3.3*** ***Flat water, light current***
13JUL22	CB1	***8:07***	***4.0***	***0% CC, sunny, 65°F*** ***Wind: 0-3 kts S***	***Secchi depth (m): 2.75*** ***Gentle <1' rolling waves, 0.5 kt to the S current.***
	CB2	***9:07***	***12***	***0% CC, sunny, 65°F*** ***Wind: 5-8 kts NW***	***Secchi depth (m): 5.0*** ***Gentle 1' rolling waves, little to no current***

	CB3	*9:53*	*14.5*	*0% CC, sunny, 62°F* *Wind: 8-10 kts S*	*Secchi depth (m): 5.0* *Gentle 1' rolling waves, no current*
	CB4	*10:44*	*14*	*0% CC, sunny, 63°F* *Wind: 8-10 kts S*	*Secchi depth (m): 4.3* *Gentle 1' rolling waves, no current*
5AUG22	CB1	*8:06*	*4.2*	*100% CC, foggy, sunny peaking though occasionally* *Wind: 2 kts E*	*Secchi depth (m): 2* *Calm, very small rolling waves, strong current that eased after 10 min*
	CB2	*9:03*	*8.8*	*95% CC, foggy but starting to clear* *Wind: 2 kts E*	*Secchi depth (m): 3.4* *Calm, small rolling waves, mild current*
	CB3	*10:14*	*12.5*	*100% CC cloudy* *Wind: 5 kts E*	*Secchi depth (m): 4.5* *Calm, small rolling waves, mild current* *Air temp dropped, rain is coming in*
	CB4	*11:20*	*10.3*	*100% CC cloudy* *Wind: 5 kts E*	*Secchi depth (m): 4.35* *Calm, decrease in rolling waves, mild current* *Some boat fluid floating around us, coming in from open water. Weather started to improve by end of the bottom sample collection, 97% CC*
25AUG22	CB1	*8:11*	*4.1*	*85% CC, Sunny, fog clearing* *Wind: 10 kts N*	*Secchi depth (m): 2.25* *Calm, moderate current*

	CB2	*9:13*	*11.0*	*20%CC, Sunny* *Wind 2 kts N*	*Secchi depth (m): 2.8* *Calm, light to no current*
	CB3	*10:12*	*15.0*	*20%CC, Sunny* *Wind 2 kts N*	*Secchi depth (m): 3.3* *Calm, no current*
	CB4	*11:01*	*14.0*	*0%CC, Sunny* *Wind 0 kts*	*Secchi depth (m): 3.6* *Calm, no current*
21SEP22	CB1	*11:46*	*4.3*	*100% CC clearing to 90% by end of station* *Wind: 5 kts*	*Secchi depth (m): 2* *Calm, southern current*
	CB2	*12:37*	*8.9*	*100% CC* *Wind: 3- 5 kts SE*	*Secchi depth (m): 2* *Calm, slight northern current*
	CB3	*13:12*	*12.5*	*95% CC* *Wind 7-8 kts NW*	*Secchi depth (m): 2.1* *Slight northern rollers*
	CB4	*13:50*	*10*	*100% CC* *Wind 7-9 kts NW*	*Secchi depth (m): 2.2* *Slight chop, tide out, current from N*
11OCT22	CB1	*9:28*	*3.0*	*0% CC, Sunny* *Wind 1 kts S*	*Secchi depth (m): 2* *Calm, mild current*
	CB2	*10:20*	*10*	*2% CC, Sunny* *Wind 1 kts S*	*Secchi depth (m): 3.4* *Calm, mild current*
	CB3	*11:06*	*13.4*	*2% CC, Sunny* *Wind 4 kts S*	*Secchi depth (m): 4.4* *light surface chop, mild current*
	CB4	*11:52*	*12.5*	*3% CC, Sunny*	*Secchi depth (m): 4.4*

				Wind 6 kts WSW	***light surface chop, mild current***

Table 5. Field observations.

Salinity Profiles:

- Salinity ranged from 31.74 to 33.71 psu, with a mean over all stations and depths of 32.64 psu.
- Salinity did not vary with depth (< 1 psu difference between surface and bottom) at any sight or date; salinity was well mixed in the water column.

Water Temperature:

- Water temperature varied by less than 2 °C difference between surface and bottom at all stations and dates.
- Water temperature ranged from 7.23 - 15.70°C with a mean of 12.06°C.

Dissolved Oxygen (% Saturation)

- The minimum dissolved oxygen 92.7 % saturation (%) was observed in September at CB3 at 12 m.
- For CB1 and CB3, the lowest dissolved oxygen % saturation was observed in September and was between 92.7% and 100.8%. For CB2 and CB4, the lowest dissolved oxygen % saturation was observed in October and was between 93.2% and 99.9%.
- Dissolved oxygen % saturation varied from 92.7 % to 124.3% with a mean of 107%.

pH

- pH was between 7.69 to 8.17 with a mean of 7.97.
- The lowest pH was recorded at CB1 at 0.4 m in July.

Turbidity

- The highest turbidity was 3.76 FNU, observed at CB1 at the bottom in October
- The lowest turbidity was 0.64 FNU, recorded in August at CB3 at 12 m.
- The highest mean turbidity was 2.37 FNU at CB1.

Chlorophyll

- The chlorophyll ranged from 0.66 to 14.96 with a mean of 3.29.
- The 8/25/22 sampling had the highest overall chlorophyll at all sites, doubling the concentrations of any other sampling dates.
- Most dates showed a slight increase in chlorophyll with increasing depth, but this trend was strong for the 8/25/22 sampling.

Site Specific Notes:

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CB1: Maximum depth of 4.471 Near Great Bar

- No salinity stratification was present at CB1 on any sampling dates. Salinity ranged from 31.76 to 33.64 psu with a mean of 32.57 psu.
- No temperature stratification was present at CB1 on any sampling dates. Temperature ranged from 8.256 to 15.099°C with a mean of 12.18 °C.
- Turbidity was the highest of all stations at CB1, but still very low. Turbidity ranged from 1.53 to 3.76 FNU, with a mean of 2.37 FNU. Turbidity did not vary greatly with depth, but did tend to be slightly higher lower in the water column. The turbidity was anomalously high (4.26 FNU) on 8/5/22 at the bottom most sample, likely indicating the instrument resuspended sediment. This value has been removed from analysis.
- pH ranged from 7.69 to 8.12 with a mean of 7.91. pH varied little from surface to bottom on all sampling dates with the exception of 7/13/22 when it was 7.69 at the surface and 7.93 at the bottom.
- Dissolved oxygen was above 100% for all sampling dates except September where it reached a minimum of 99.5.
- Chlorophyll ranged from 0.9 to 7.62 $\mu g\ l^{-1}$ with a mean of 3.25 $\mu g\ l^{-1}$. Chlorophyll tended to be slightly higher lower in the water column at CB1, with a difference of 2 $\mu g\ l^{-1}$ on average between surface and bottom. The exception was 8/25/22 when the difference was 4 $\mu g\ l^{-1}$.

CB2: The maximum depth was 11.418 m, Near Bar Island, north of the Kingfish outfall

- No salinity stratification was present at CB2 on any sampling dates. Salinity ranged from 31.74 to 33.62 psu with a mean of 32.63 psu.
- No temperature stratification was present at CB2 on any sampling dates, max temperature difference between surface and bottom was 1.5 °C. Temperature ranged from 8.408 to 15.188°C with a mean of 12.39 °C.
- Turbidity ranged from 0.92 to 2.40 FNU, with a mean of 1.55 FNU. Turbidity did not vary greatly with depth, but did tend to be slightly higher in the bottom half of the water column. The bottom reading on both 7/13/22 and 8/5/22 were anomalously high (3.5 and 11.08 FNU, respectively) and were removed from further analysis.
- pH ranged from 7.87 to 8.17 with a mean of 7.98. pH varied little from surface to bottom on all sampling dates.
- Dissolved oxygen was above 100% for all sampling dates except September and October where it reached a minimum of 98.4. DO reached a maximum of 123.6 in early May.
- Chlorophyll ranged from 0.97 to 11.85 $\mu g\ l^{-1}$ with a mean of 3.41 $\mu g\ l^{-1}$. Chlorophyll tended to be slightly higher lower in the water column at CB1, with a difference of 2 $\mu g\ l^{-1}$ on average between surface and bottom. The exception was 8/25/22 when the difference was 8 $\mu g\ l^{-1}$. Chlorophyll was anomalously high (9.48 $\mu g\ l^{-1}$) in the bottom most reading on 8/5/22 and was removed from further analysis.

CB3: The maximum depth was 15.037 m, Located NE of the Kingfish outfall near Ballast Island. This is the closest station to the proposed outfall.

- No salinity stratification was present at CB3 on any sampling dates. Salinity ranged from 31.75 to 33.66 psu with a mean of 32.68 psu.
- No temperature stratification was present at CB3 on any sampling dates, max temperature difference between surface and bottom was 1.5 °C. Temperature ranged from 7.225 to 15.702°C with a mean of 11.93 °C.
- Turbidity ranged from 0.64 to 2.84 FNU, with a mean of 1.33 FNU. Turbidity did not vary greatly with depth. The turbidity was anomalously high (4.82 FNU) on 5/10/22 at the bottom most sample, likely indicating the instrument resuspended sediment. This value has been removed from analysis.
- pH ranged from 7.83 to 8.11 with a mean of 7.98. pH varied little from surface to bottom on all sampling dates.
- Dissolved oxygen was above 100% for all sampling dates except September and October where it reached a minimum of 92.7 in September in the bottom water. DO reached a maximum of 124.3 in early May.
- Chlorophyll ranged from 0.95 to 14.96 µg l^{-1} with a mean of 3.46 µg l^{-1}. Chlorophyll did not vary much with depth at CB3 with the exception of 5/10/22 and 8/25/22 when chlorophyll increased with depth. The maximum concentration occurred in the bottom water on 8/25/22.

CB4: The maximum depth was 14.171 m, located SE of proposed outfall.

- No salinity stratification was present at CB4 on any sampling dates. Salinity ranged from 31.86 to 33.71 psu with a mean of 32.65 psu.
- No temperature stratification was present at CB4 on any sampling dates, max temperature difference between surface and bottom was 1.5 °C. Temperature ranged from 7.927 to 15.609°C with a mean of 11.83 °C.
- Turbidity ranged from 0.75 to 2.47 FNU, with a mean of 1.26 FNU. Turbidity did not vary greatly with depth, but in early May, and late August through October, turbidity was higher in the bottom half of the water column, with an average difference of about 1 FNU.
- pH ranged from 7.86 to 8.15 with a mean of 7.98. pH varied little from surface to bottom on all sampling dates.
- Dissolved oxygen was above 100% for all sampling dates except September and October where it reached a minimum of 93.2 in September in the bottom water. DO reached a maximum of 123.5 in early May.
- Chlorophyll ranged from 0.66 to 11.96 µg l^{-1} with a mean of 3.03 µg l^{-1}. Chlorophyll did not vary much with depth at CB3 with the exception of 8/25/22 when chlorophyll increased with depth. The maximum concentration occurred in the bottom water (14 m) and at 5 m on 8/25/22.

Secchi Depth Measurements (See Appendix G):

- Secchi Depth was lower at CB1 than at the other three stations.
- There were no significant differences between CB2, CB3 and CB4 and no discernable trend in secchi depth over the course of the sampling season.

Surface Nutrients and Extracted Chlorophyll a (see Appendix C for tabular data, Appendix D for plots of NOx, Appendix E for plots of chlorophyll-a and phaeopphytin, Appendix F for field replicates and Appendix G for plots of secchi depth)

Total Kjeldahl Nitrogen (TKN - organic nitrogen plus ammonia)

- Overall TKN was low, with less than 10% of the samples collected having a measured TKN concentration above 0.159 mg/l, the minimum detection limit (MDL) of the method.
- The highest average TKN was seen on July 13th, but of the 8 samples collected that day, only 3 had TKN concentrations above the MDL.
- Because of the lack of data points above the detection limit, trends among the stations or over time were impossible to discern. The only clear trend was that TKN was consistently below 0.159 mg/l.
- The highest TKN concentration was 0.712 mg/l measured on 5/31/22 at the surface at station CB3. The sample collected on the same day near the bottom was very low. This station is near a large seal haul out area. On the day this sample was taken there were seals near the vessel. On all other sampling dates, the TKN measured in both surface and bottom samples from station CB3 were below the MDL. It is possible that this anomalously high TKN concentration originated from seal excrement.
- The October 11 TKN samples were digested 9 days after receipt but were analyzed after the 28 day hold time had expired. The samples were first analyzed within the hold time, but because of a software glitch, the run file was not saved. As soon as the error was discovered the samples were analyzed again. To discern the impact of the hold time exceedance on the data, a second set of marine samples that had previously been analyzed were re-analyzed after being held for a similar amount of time as the Kingfish 10/11/22 sample. The only observed difference between first and second analysis of that set of samples was that the TKN blank had a negative peak area on the second run. When the samples were blank corrected, the values were similar to the original values. The TKN data is included in the report but is flagged for a hold time exceedance. See Appendix H for the results of the hold time test.

Total phosphorus (TP)

- Overall the TP concentrations were low, with the mean TP concentrations over all stations, depths and dates being 0.045 mg/l. For the purpose of averaging the data, any samples below the detection limit of the method were considered to be 0.
- About half of the samples measured had a TP concentration that was below the MDL.
- On 6/21/22. 9/21/22 and 10/11/22 there was only one sample out of the 8 taken for each date that had a TP concentration above the MDL.
- THe samples collected on 8/25/22 had the highest average concentration of any of the sampling dates at 0.109 mg/l. In that date, all samples collected had TP concentrations above the MDL.
- The maximum TP measured was at station CB3 at the surface on 5/31/22. This is also the station and date of the highest TKN sample (see note in TKN section).
- The station with the highest TP averaged over all dates was CB1. The station average TP concentration over all sampling dates decreased in order, from CB1 to CB4.
- The October 11 TP samples were digested 9 days after receipt but were analyzed after the 28 day hold time had expired. The samples were first analyzed within the hold time, but because of a software glitch, the run file was not saved. As soon as the error was discovered the samples were analyzed again. To discern the impact of the hold time exceedance on the data, a second set of marine samples that had previously been analyzed for TKN and TP were re-analyzed after being held for a similar amount of time as the Kingfish 10/11/22 samples. The only observed difference between first and second analysis was that the TKN blank had a negative peak area on the second run. When the samples were blank corrected, the values were similar to the original values. The TKN data is included in the report but is flagged for a hold time exceedance. See Appendix H for the results of the hold time test.

Nitrate plus nitrite (NOx):

- The mean NOx averaged 0.023 mg/l following the trend of low nitrogen concentration seen in the TKN results.
- Station CB3 had the highest NOx concentration averaged over all dates and CB1 had the lowest.
- About 50% of the samples had measured NOx concentrations below the minimum detection limit of 0.11 mg/l.
- October and May had the highest mean NOx averaged over all stations. Figure 2 indicates increased rainfall in May and October which could have been the source of the increased NOx -N but the increase could also have been from bottom water upwelling. In October the measured salinity was high, indicating that the increased NOx concentrations at that time may originate from ocean upwelling. But the distribution of the NOx in Chandler Bay indicates that NOx is well mixed between surface and bottom samples in the Bay for the majority of the sampling season.
- The lowest monthly average NOx concentration was in August.
- The maximum NOx was 0.100 mg/l and occurred at CB4 in the bottom sample on 10/11/22. On that date, the surface sample from CB4 was also high with a concentration of 0.094 mg/l.

Extracted chlorophyll a and phaeophytin:

- Overall, the chlorophyll a concentrations were low with the mean chlorophyll concentration across all stations and dates being 2.5 micrograms/l.
- The highest monthly extracted chlorophyll concentrations averaged across all stations were on 5/10/22 and 10/11/22.
- The lowest monthly extracted chlorophyll concentrations averaged across all stations were on 7/13/22 and 8/5/22.
- CB1 had the highest station chlorophyll averaged across all dates and CB4 had the lowest.
- The maximum extracted chlorophyll concentration measured was 9.39 micrograms per liter measured on 5/10/22 at station CB3 at the surface.
- Interestingly, 60% of the time, the chlorophyll concentration at a given station was higher in the sample collected at the bottom than at the sample collected at the surface.
- Phaeophytin was present in lower concentrations than chlorophyll for most sampling dates and stations.
- The maximum phaeophytin concentration was 2.8 micrograms/l on 6/21/22 at station CB2 at the surface.
- The station with the highest average phaeophytin across all dates was CB1 and the lowest was CB3.
- The 6/21/22 sampling had the highest average concentration of phaeophytin and 5/31/22 had the lowest.

Total Nitrogen (TN): (The sum of TKN plus NOx).*

- *Because TN is not measured directly but is the sum of the TKN and the NOx concentrations, the MDL and RL of combined values reported are equivalent to the MDL and RL of TKN and not the lower MDL and RL of the NOx method. Therefore, only data that is above 0.159 mg/l (the MDL of the TKN method) is discussed here.

- There were only 5 occurrences where the calculated TN was above the MDL for TKN:
    - In May at CB3 which is the station near the seal haul-out (see note in the TKN section)
    - In June at CB1 (0.27 at the surface, 0.22 at the bottom)
    - In July in the bottom samples from CB1, CB2 and CB4.
  - Except for the one high TN at the surface at CB3, all TN concentrations were below 0.3 mg/l.

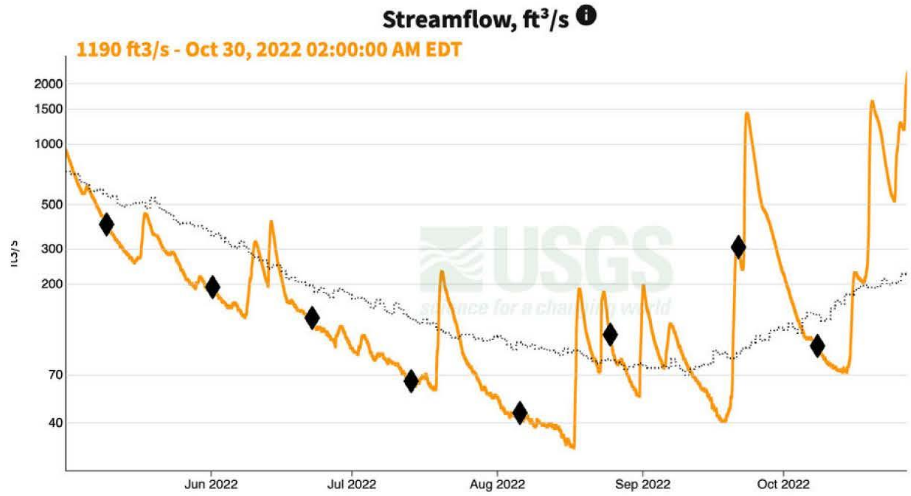


Figure 2. Freshwater flow from Cherryfield, ME on the Narraguagus River during the Kingfish Ambient Water Quality Monitoring time period. Annual river flow was below average for the season with the exception of large storms which caused sharp periodic increases in flow, particularly in the fall. The black diamonds represent the days sampled in Chandler Bay.

Appendix A

Summary of Chlorophyll Tests SM10200H

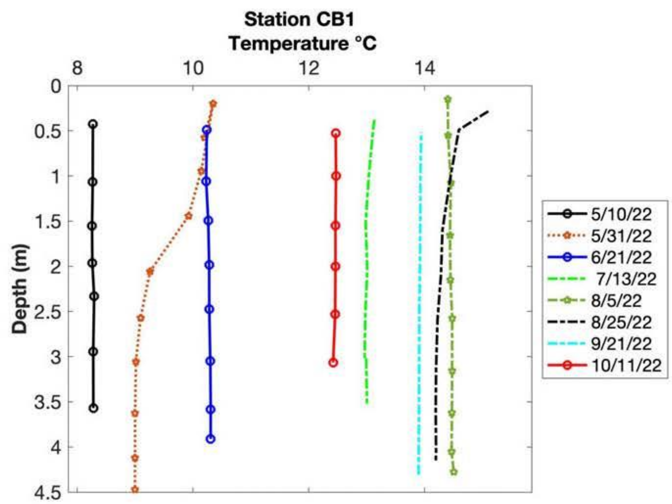
4/27/22: Seawater samples collected from the DMC dock at 8:30 am on 4/27/22	Time Elapsed Betwwen Collection and Filtration (min.)	Chlor a (µg/l) In Sample	Phaeophytin (µg/l) In Sample
Blank	NA	0.004	0.0382
27APR22KT-1-1	343	2.203	0.671
27APR22KT-1 -2	346	2.671	1.642
27APR22KT-1- 3	347	2.910	1.540
27APR22KT-1 -4	483	3.393	0.810
27APR22KT-1 -5	486	3.030	1.226
27APR22KT-1 -6	488	3.192	1.089
27APR22KT-1- 7	489	2.413	1.754

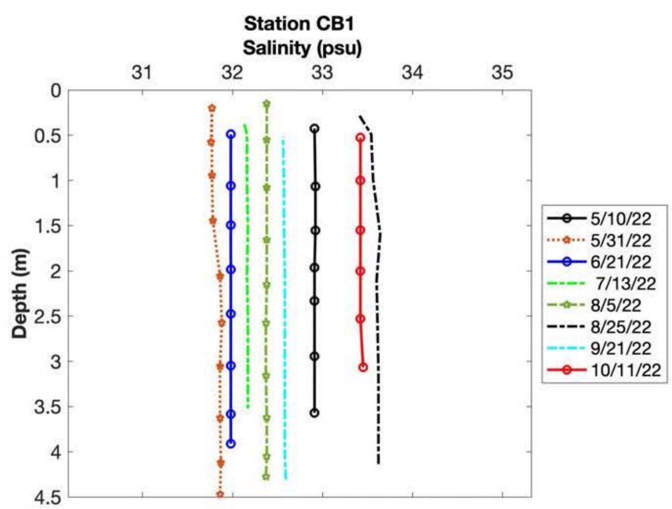
5/24/22: Seawater samples collected from the DMC dock at 8:15 am on 5/24/22	Betwwen Collection and Filtration (min.)	Chlor a (µg/l) In Sample	Phaeophytin (µg/l) In Sample
24MAY22 Chlor Test 6 hr 1	375	3.446	-0.3910
24MAY22 Chlor Test 6 hr 2	376	1.986	0.5238
24MAY22 Chlor Test 6 hr 3	377	1.840	0.7392
24MAY22 Chlor Test 6 hr 4	378	2.701	1.2741
24MAY22 Chlor Test 8 hr 1	479	3.064	0.8692
24MAY22 Chlor Test 8 hr 2	481	2.324	1.8630
24MAY22 Chlor Test 8 hr 3	482	2.124	0.6118
24MAY22 Chlor Test 8 hr 4	484	3.178	0.8349
24MAY22 Chlor Test 6 hr Bk	NA	0.007	0.0244
24MAY22 Chlor Test 8 hr Bk	NA	0.000	0.0411

Appendix A. Data from two tests of chlorophyll sample holding times. Samples were processed and analyzed using the MWQL Chlorophyll SOP for SM10200H.

Appendix B

Sonde profile for each site (See next page)





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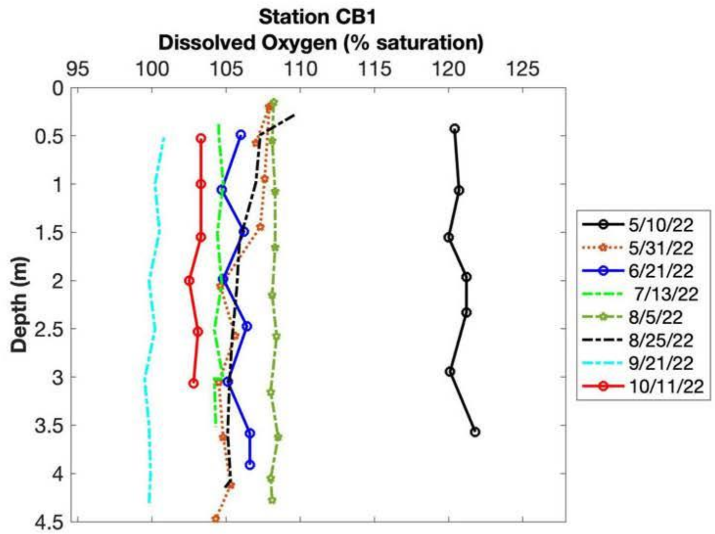
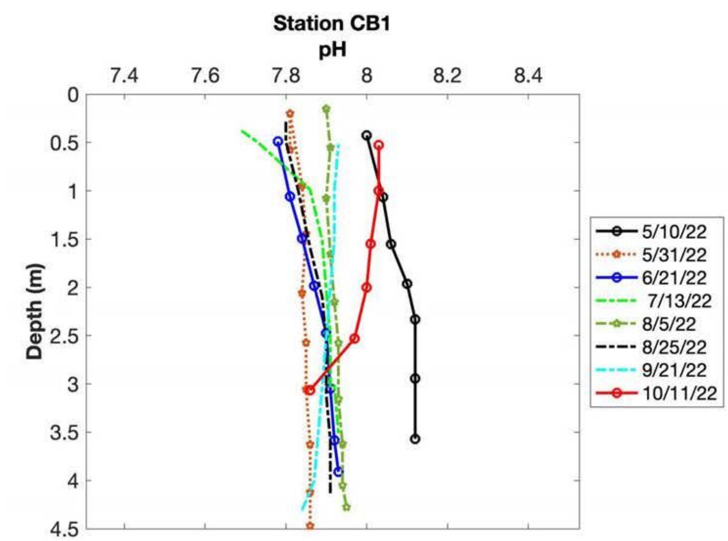

Station CB1
Dissolved Oxygen (% saturation)
95
100
105
110
115
120
125
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
Depth (m)
5/10/22
5/31/22
6/21/22
7/13/22
8/5/22
8/25/22
9/21/22
10/11/22


Station CB1
pH
7.4
7.6
7.8
8
8.2
8.4
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
Depth (m)
5/10/22
5/31/22
6/21/22
7/13/22
8/5/22
8/25/22
9/21/22
10/11/22

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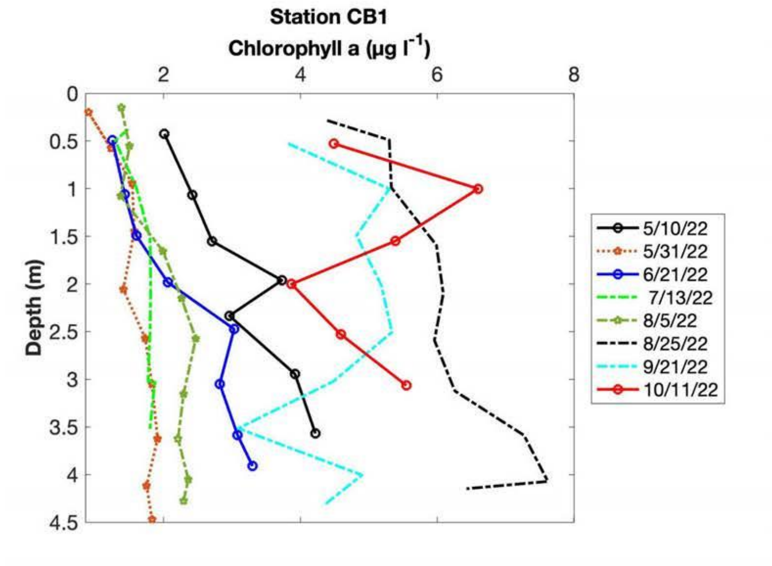

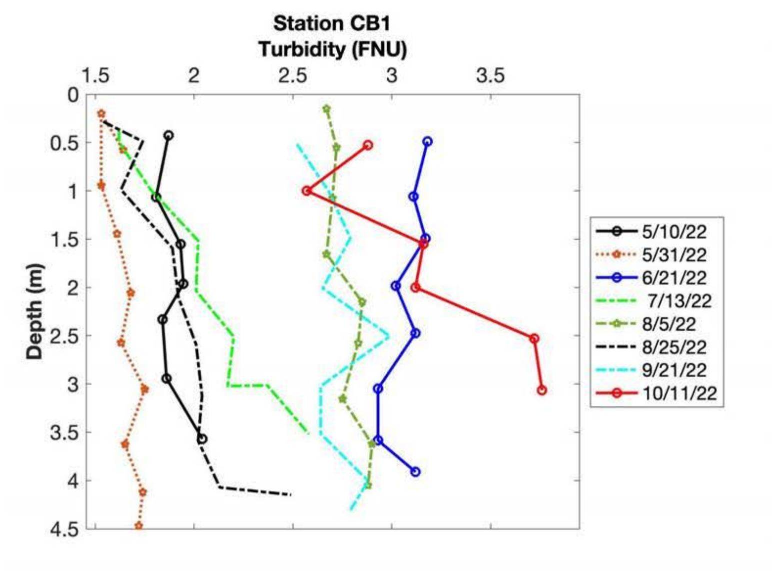

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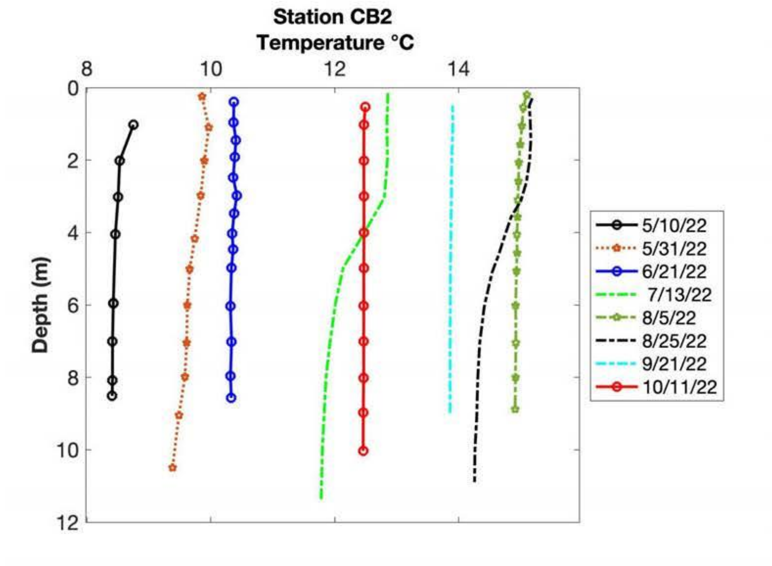
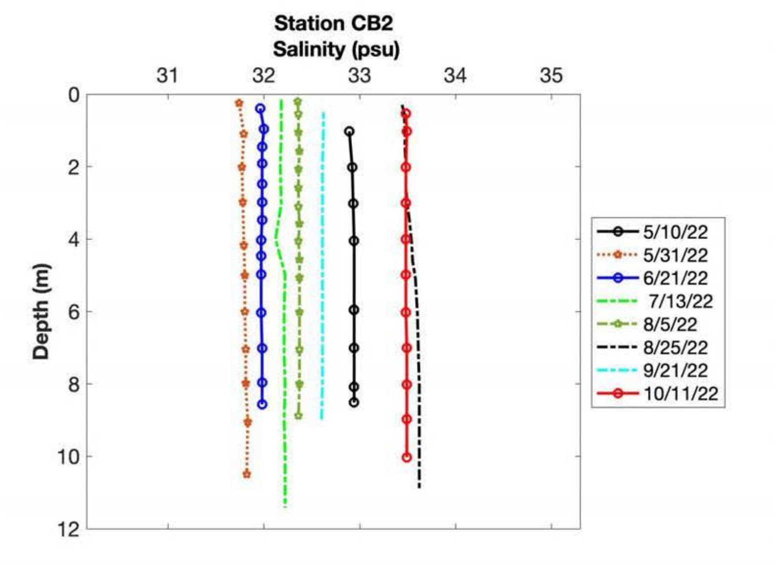

Station CB2
Temperature °C
8
10
12
14
0
2
4
6
8
10
12
Depth (m)
5/10/22
5/31/22
6/21/22
7/13/22
8/5/22
8/25/22
9/21/22
10/11/22


Station CB2
Salinity (psu)
31
32
33
34
35
0
2
4
6
8
10
12
Depth (m)
5/10/22
5/31/22
6/21/22
7/13/22
8/5/22
8/25/22
9/21/22
10/11/22

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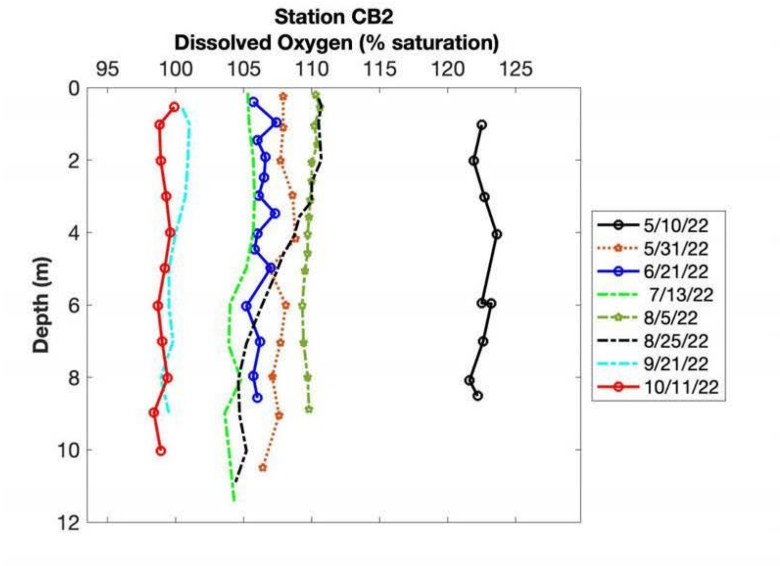

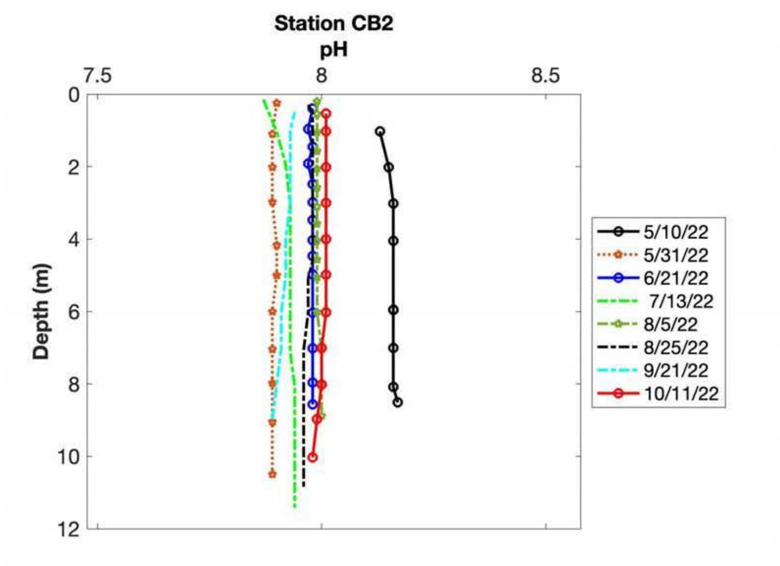

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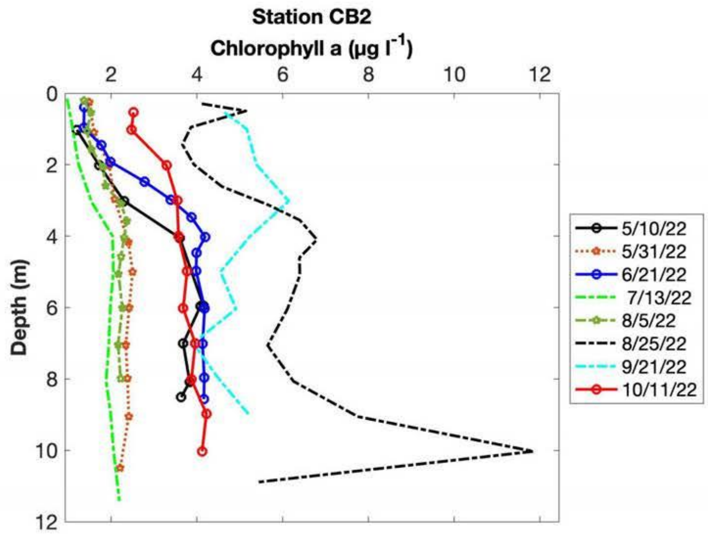
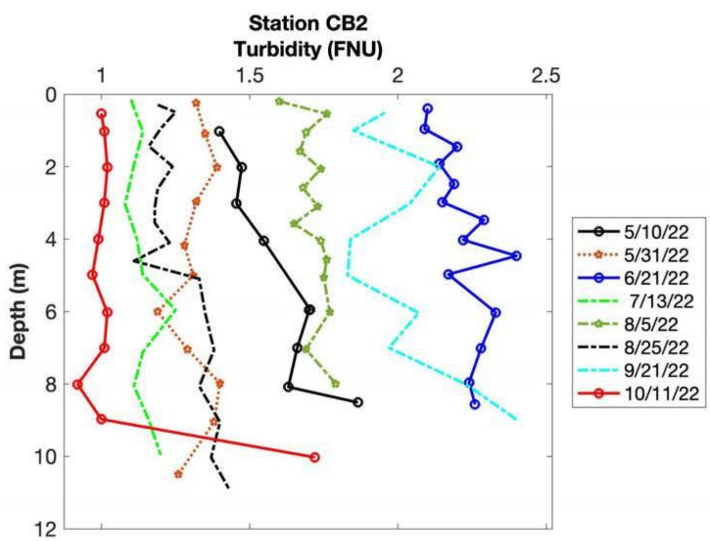

Station CB2
Chlorophyll a (µg l^{-1})
2
4
6
8
10
12
0
2
4
6
8
10
12
Depth (m)
5/10/22
5/31/22
6/21/22
7/13/22
8/5/22
8/25/22
9/21/22
10/11/22


Station CB2
Turbidity (FNU)
1
1.5
2
2.5
0
2
4
6
8
10
12
Depth (m)
5/10/22
5/31/22
6/21/22
7/13/22
8/5/22
8/25/22
9/21/22
10/11/22

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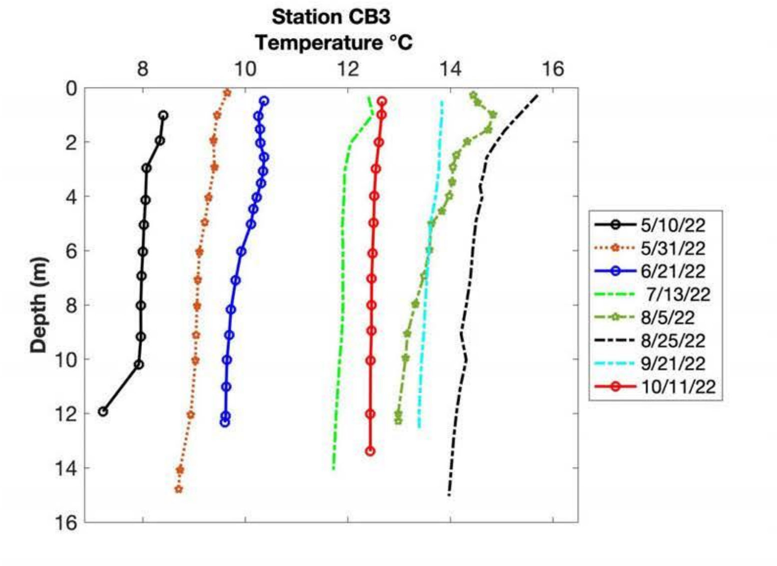

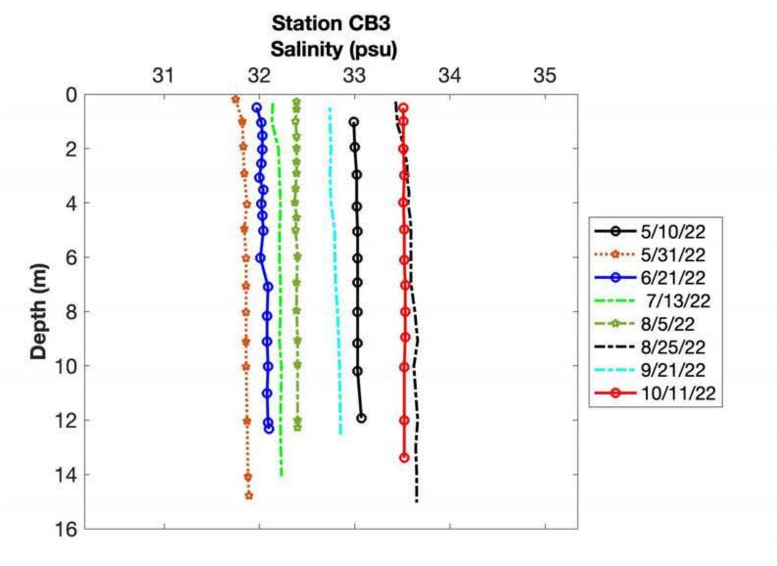

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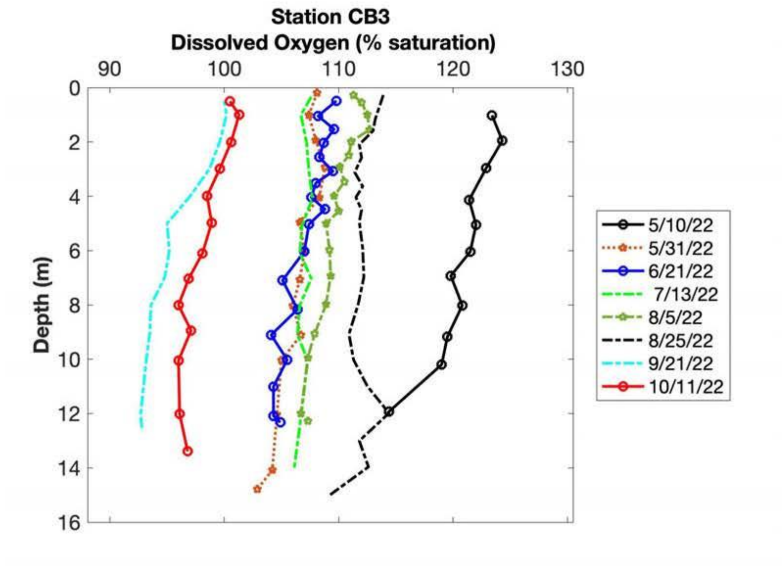
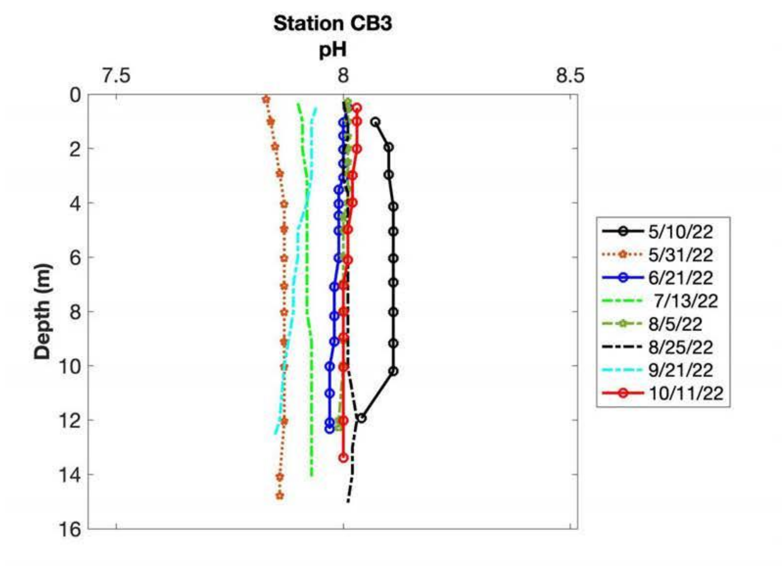

Station CB3
Dissolved Oxygen (% saturation)
90
100
110
120
130
0
2
4
6
8
10
12
14
16
Depth (m)
5/10/22
5/31/22
6/21/22
7/13/22
8/5/22
8/25/22
9/21/22
10/11/22


Station CB3
pH
7.5
8
8.5
0
2
4
6
8
10
12
14
16
Depth (m)
5/10/22
5/31/22
6/21/22
7/13/22
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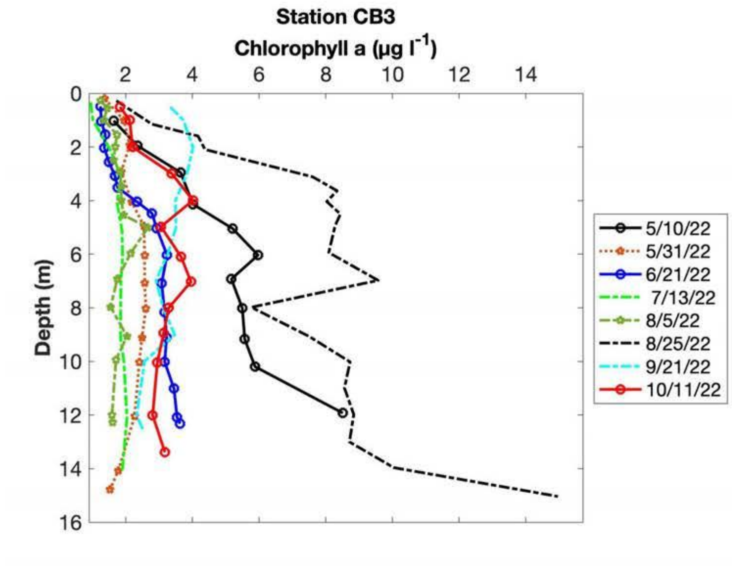
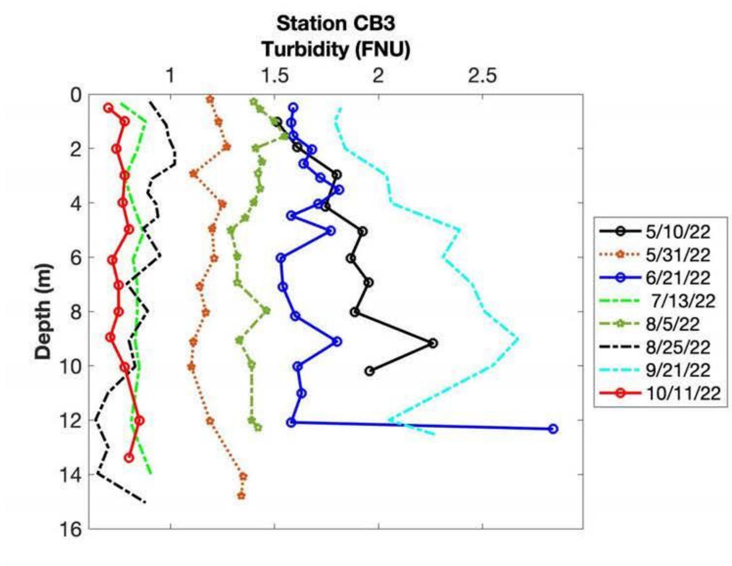
8/25/22
9/21/22
10/11/22


Station CB3
Chlorophyll a (μg l^{-1})
2
4
6
8
10
12
14
0
2
4
6
8
10
12
14
16
Depth (m)
5/10/22
5/31/22
6/21/22
7/13/22
8/5/22
8/25/22
9/21/22
10/11/22


Station CB3
Turbidity (FNU)
1
1.5
2
2.5
0
2
4
6
8
10
12
14
16
Depth (m)
5/10/22
5/31/22
6/21/22
7/13/22
8/5/22
8/25/22
9/21/22
10/11/22

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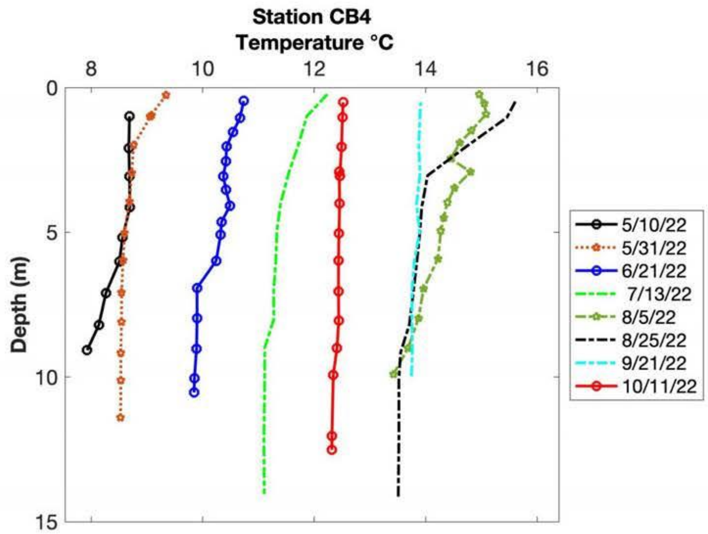

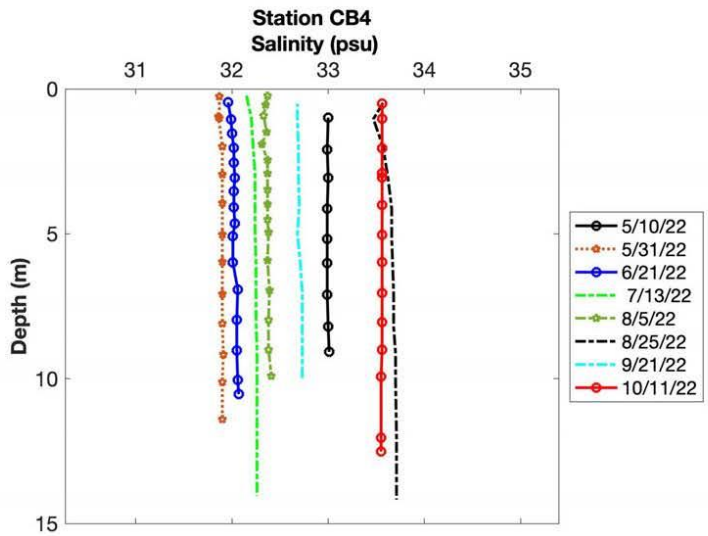

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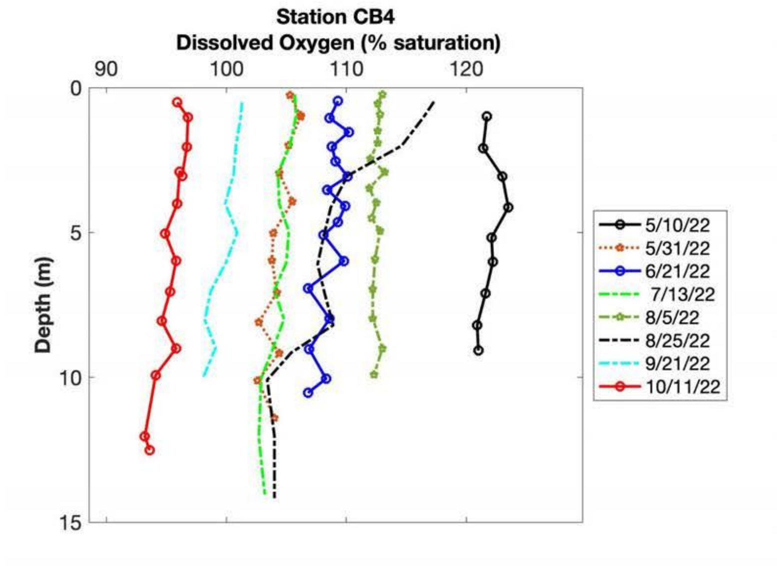
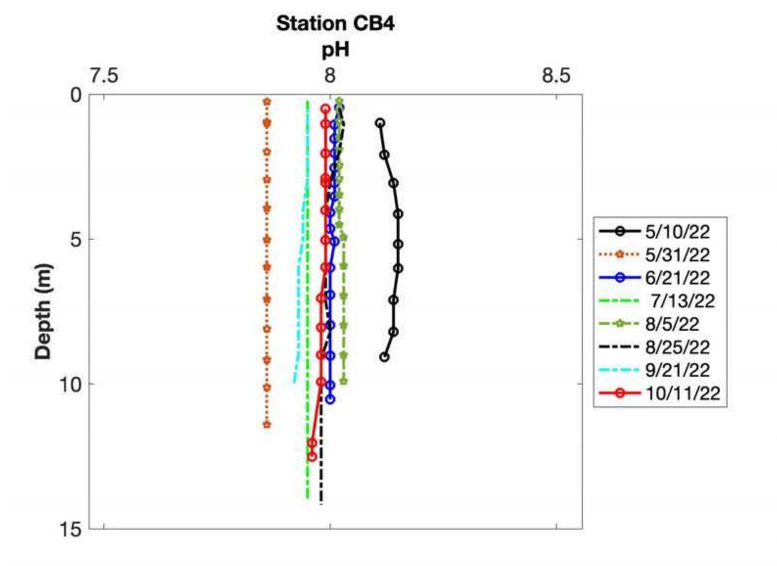

Station CB4
Dissolved Oxygen (% saturation)
90
100
110
120
0
5
10
15
Depth (m)
5/10/22
5/31/22
6/21/22
7/13/22
8/5/22
8/25/22
9/21/22
10/11/22


Station CB4
pH
7.5
8
8.5
0
5
10
15
Depth (m)
5/10/22
5/31/22
6/21/22
7/13/22
8/5/22
8/25/22
9/21/22
10/11/22

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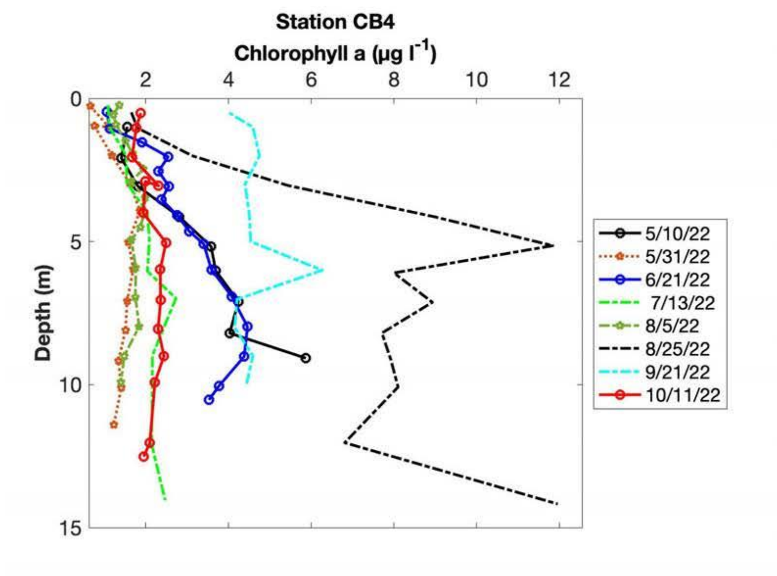

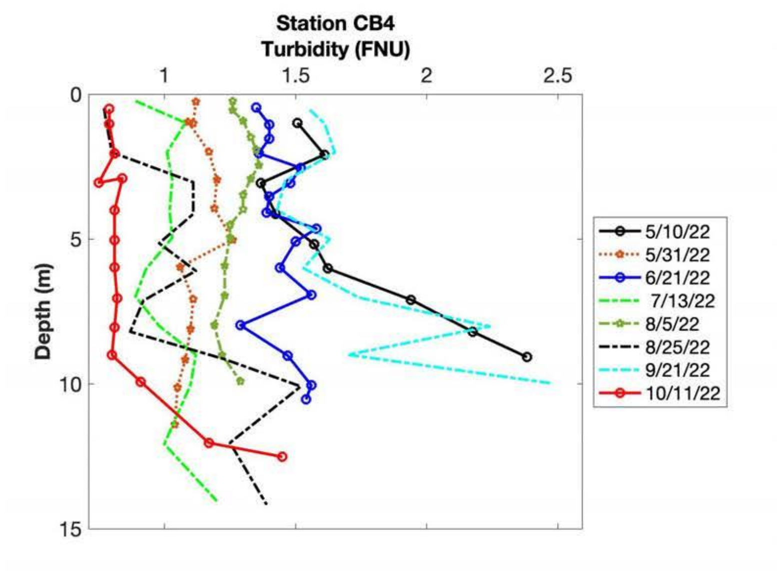

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Appendix C - Results of Laboratory Analysis

Table of Data

Note: For information on QC data for nutrient analysis, please see detailed laboratory reports. Replicate samples data is included in Appendix F but is not included in Appendix C or graphs of NOx, Chlorophyll a or Phaeophytin

Summary	TKN (mg l^{-1})							
Station	5/10/22	5/31/22	6/21/22	7/13/22	8/5/22	8/25/22	9/21/22	10/11/22
CB1S	U	U	0.2362	U	U	U	U	U, H
CB1B	U	U	0.1924	0.1885	U	U	U	U, H
CB2S	U	U	U	U	U	U	U	U, H
CB2B	U	U	U	0.1635,J	U	U	U	U, H
CB3S	U	0.7120	U	U	U	U	U	U, H
CB3B	U	U	U	U	U	U	U	U, H
CB4S	U	U	U	U	U	U	U	U, H
CB4B	U	U	U	0.1674,J	U	U	U	U, H

Total Kjeldahl Nitrogen (TKN) - Note: U - Parameter was not detected in the sample. J - Measurement below RL but above MDL, H - Analysis was performed out of hold time (see note in narrative)..

Summary	TP (mg l^{-1})							
Station	5/10/22	5/31/22	6/21/22	7/13/22	8/5/22	8/25/22	9/21/22	10/11/22
CB1S	0.0785, J	0.0871	0.0736, J	U	U	0.1141	U	U, H
CB1B	U	0.0960	U	0.0875	0.0858	0.1569	0.0757, J	0.0974, H
CB2S	0.1008	0.0789, J	U	U	0.0775, J	0.1016	U	U, H
CB2B	U	0.0916	U	0.1167	0.0853	0.1551	U	U, H
CB3S	0.0785, J	0.1700	U	U	0.0826	0.0943	U	U, H
CB3B	0.0925	0.0810, J	U	U	U	0.0741, J	U	U, H
CB4S	U	0.0905	U	U	U	0.0871	U	U, H
CB4B	0.0757, J	0.0874	U	0.0801, J	U	0.0892	U	U, H

Total Phosphorus (TP) - Note: U - Parameter was not detected in the sample. J - Measurement below RL but above MDL. H - Analysis was performed out of hold time (See note in narrative)..

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Summary	NOx (mg l^{-1})							
Station	5/10/22	5/31/22	6/21/22	7/13/22	8/5/22	8/25/22	9/21/22	10/11/22
CB1S	U	0.0480	0.0380	U	0.0125,J	U	U	0.0346
CB1B	U	0.0753	0.0275	U	0.0114,J	U	U	0.0310
CB2S	U	0.0523	0.0155, J	U	U	U	0.0219,J	0.0597
CB2B	U	0.0625	0.0148,J	0.0216,J	U	U	U	0.0646
CB3S	U	0.0619	0.0222	0.0153,J	U	U	0.0256	0.0775
CB3B	0.0241	0.0809	U	0.0176,J	0.0124,J	U	0.0690	0.0800
CB4S	U	0.0764	0.0258	0.0124,J	U	U	U	0.0938
CB4B	U	0.0834	U	0.0340	U	U	U	0.1001

Nitrate plus Nitrite (NOx) - Note: U - Parameter not detected in the sample. J - Measurement below RL but above MDL.

Summary	Chlorophyll (µg l^{-1})							
Station-Depth	5/10/22	5/31/22	6/21/22	7/13/22	8/5/22	8/25/22	9/21/22	10/11/22
CB1S	5.8213	1.5135	1.3475	0.3892	1.6854	4.3915	1.7932	6.7261
CB1B	5.0948	2.2961	1.2972	0.9430	1.0033	3.5948	3.5516	7.2251
CB2S	1.5333	1.3347	1.1049	0.6727	0.9985	2.2411	3.5187	4.2074
CB2B	3.8647	2.7146	2.1284	1.0850	2.3011	2.7410	2.7393	4.1190
CB3S	9.3945	1.5816	0.6537	1.5163	0.6461	2.8236	4.3349	2.7302
CB3B	6.2798	1.7568	1.0601	1.1034	0.7408	2.6741	1.6678	4.1295
CB4S	1.8763	1.0550	2.7038	0.5585	0.6932	1.1765	2.9126	2.9541
CB4B	6.6410	0.4723	0.6016	1.4690	0.7605	2.1890	3.2805	2.3861

Chlorophyll a - Note: U - Parameter was not detected in the sample. J - Measurement below RL but above MDL.

Summary	Phaeophytin (µg l^{-1})							
Station-Depth	5/10/22	5/31/22	6/21/22	7/13/22	8/5/22	8/25/22	9/21/22	10/11/22
CB1S	0.9284	0.6669	0.5924	0.8285	0.5009	1.0268	0.7032	1.9059
CB1B	1.5826	U	2.6231	0.9860	0.2966	0.8895	0.7893	0.3422
CB2S	1.0470	0.6104	2.8207	0.4059	0.2087	0.5670	1.3997	0.6259
CB2B	1.6027	U	0.7653	0.5881	0.4981	0.6183	0.6877	0.5594
CB3S	U	0.3096	1.2740	0.6804	0.1718	0.4468	1.0655	0.2523
CB3B	U	U	1.6984	0.3545	0.2215	0.3873	0.8679	0.4261
CB4S	1.7515	U	1.1605	0.2634	0.1584	0.2019	0.7484	0.2859
CB4B	1.3139	0.2091	2.1626	1.6926	0.1707	0.2580	0.7937	0.3286

Phaeophytin - Note: U - Parameter was not detected in the sample. J - Measurement below RL but above MDL.

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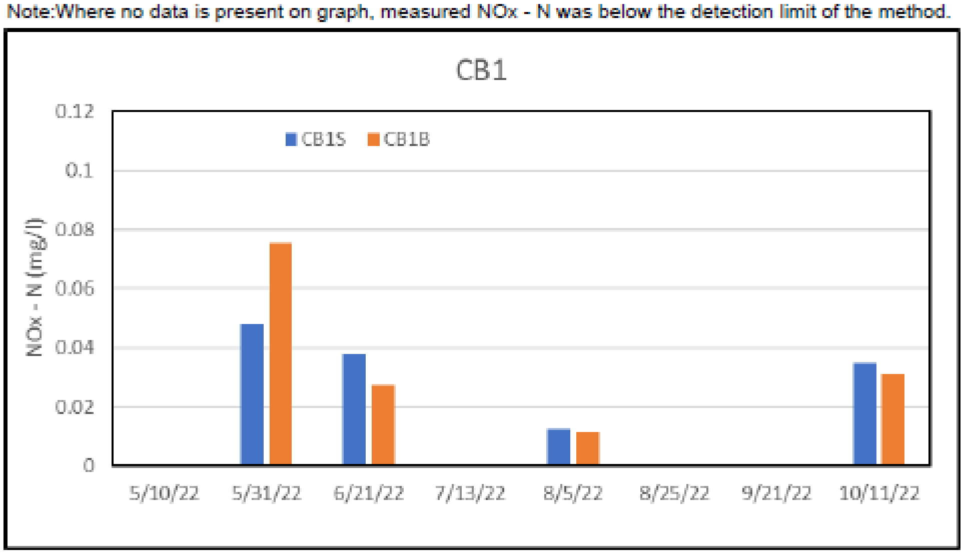
TN (mg/l)	5/10/2022	5/31/2022	6/21/2022	7/13/2022	8/5/2022	8/25/2022	9/21/2022	10/11/2022
Station								
CB1S	U	U	0.2742	U	U	U	U	U
CB1B	U	U	0.2199	0.1885	U	U	U	U
CB2S	U	U	U	U	U	U	U	U
CB2B	U	U	U	0.1851	U	U	U	U
CB3S	U	0.7739	U	U	U	U	U	U
CB3B	U	U	U	U	U	U	U	U
CB4S	U	U	U	U	U	U	U	U
CB4B	U	U	U	0.2014	U	U	U	U

Total Nitrogen (TN).- Note: U - Parameter was not detected in the sample. J - Measurement below RL but above MDL.

Appendix D - Graphs of NOx - N concentrations

Note:Where no data is present on graph, measured NOx - N was below the detection limit of the method.



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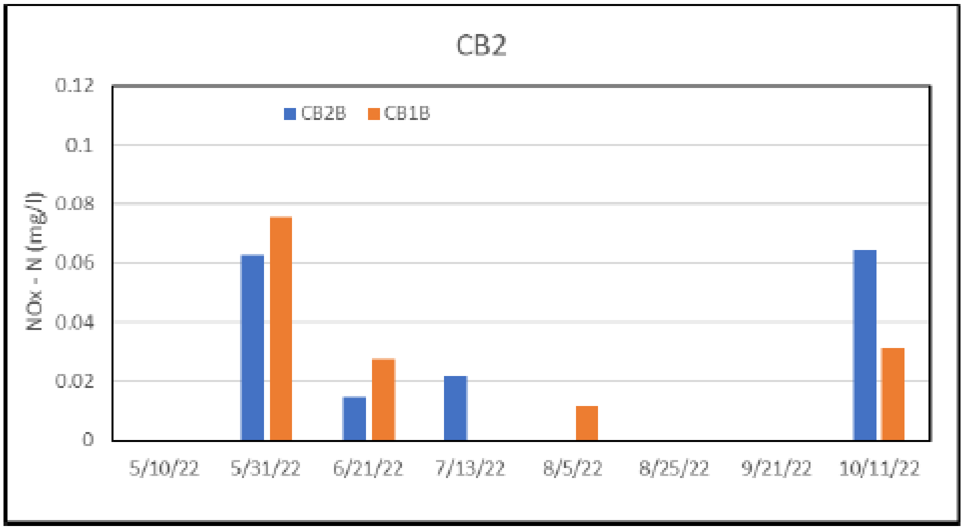

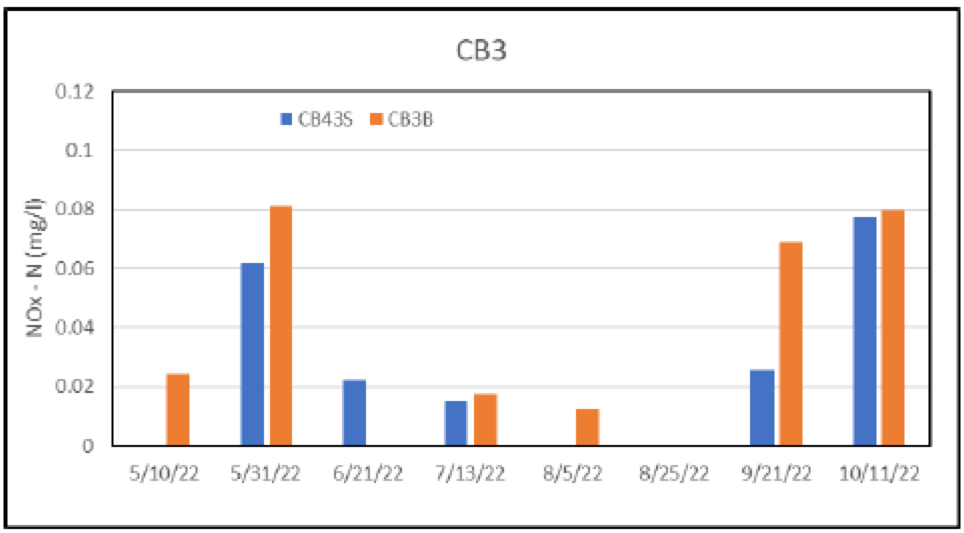

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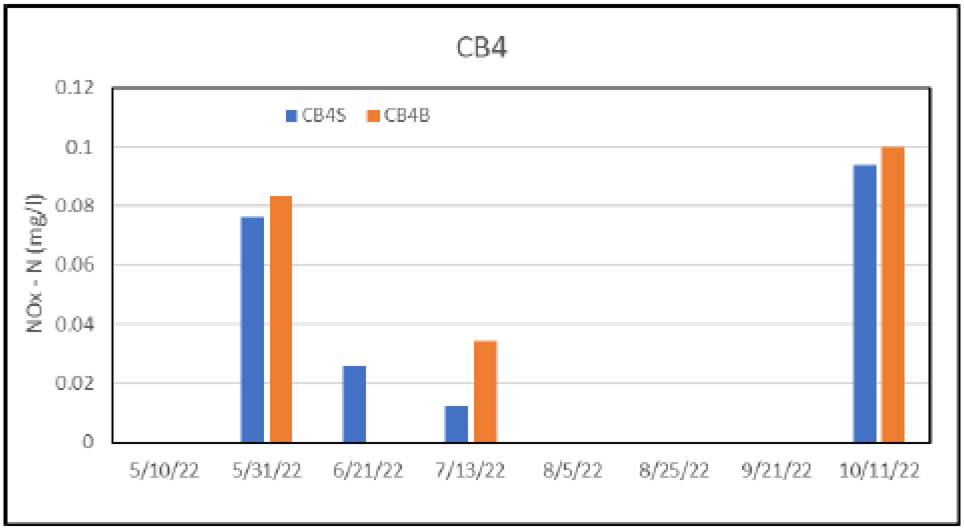
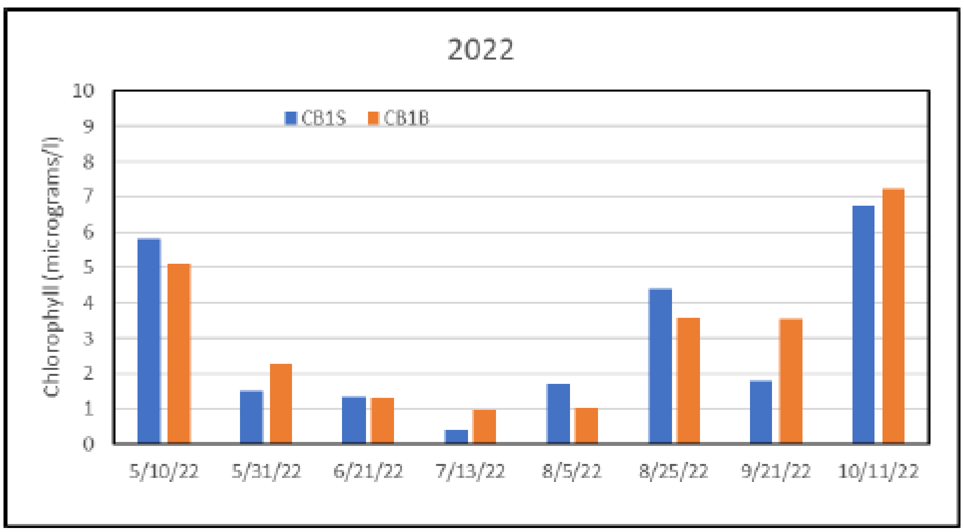


Appendix E - Graph of Chlorophyll a and PHaeophytin Concentration



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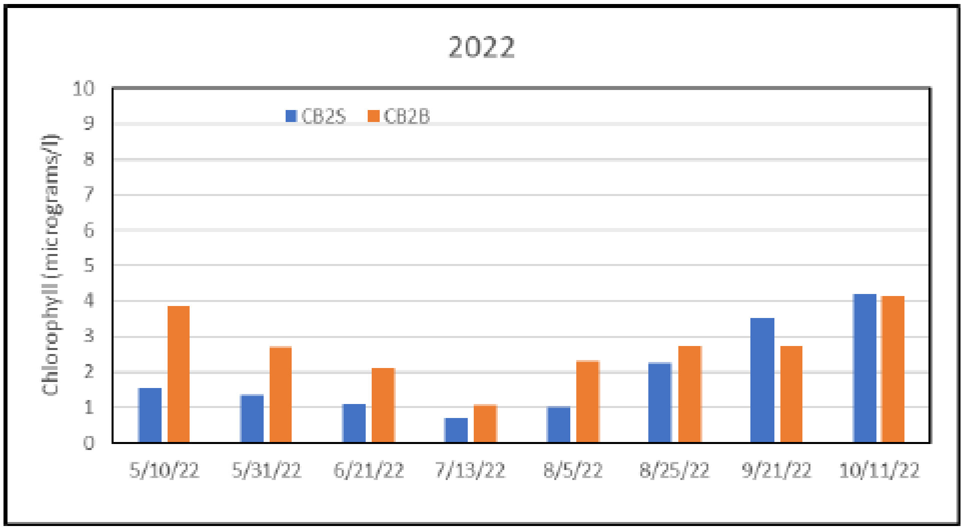

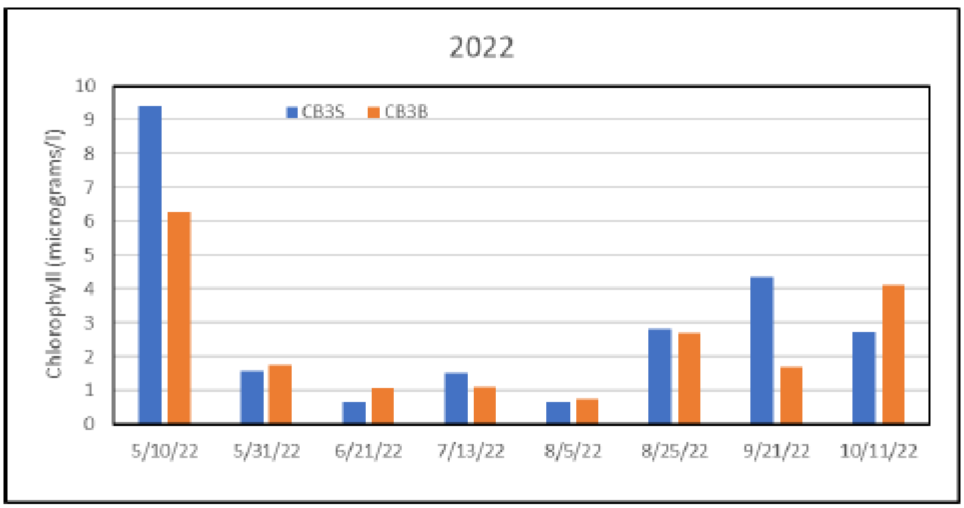

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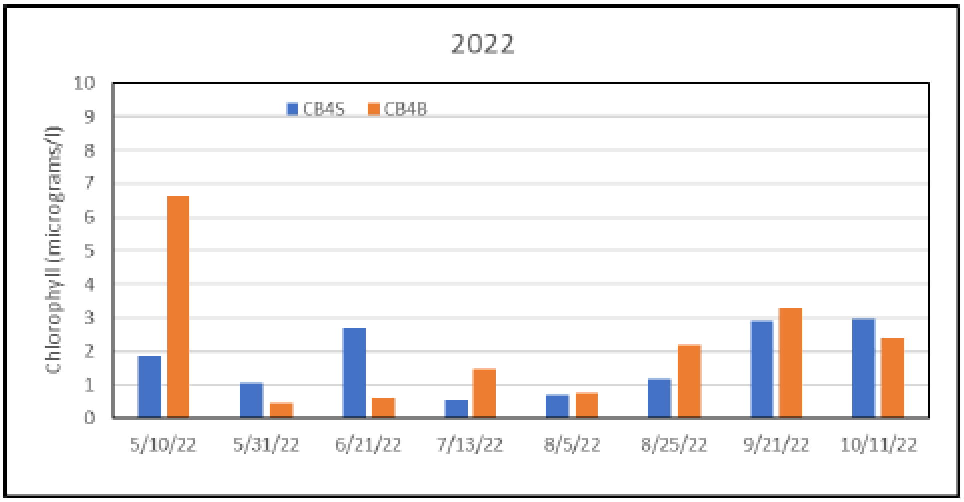

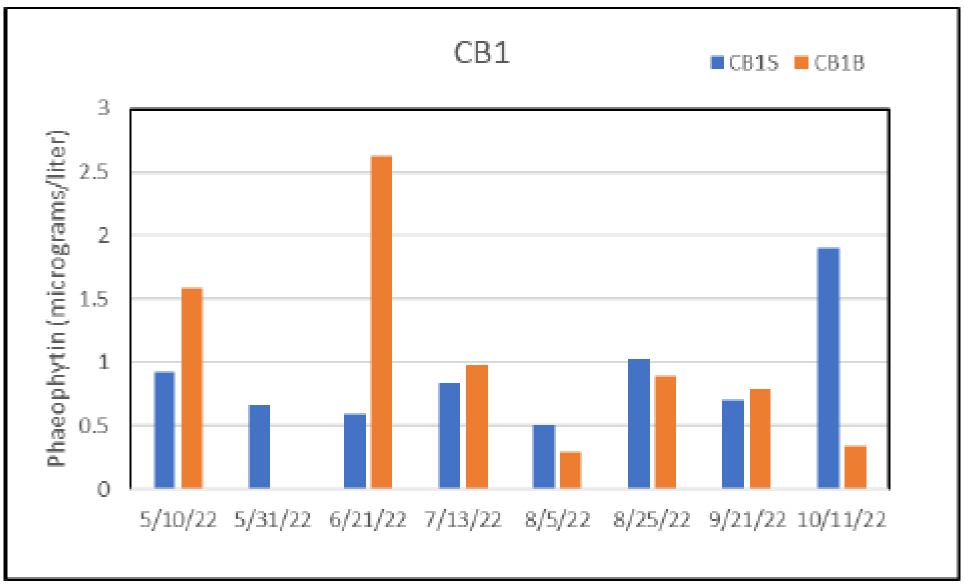

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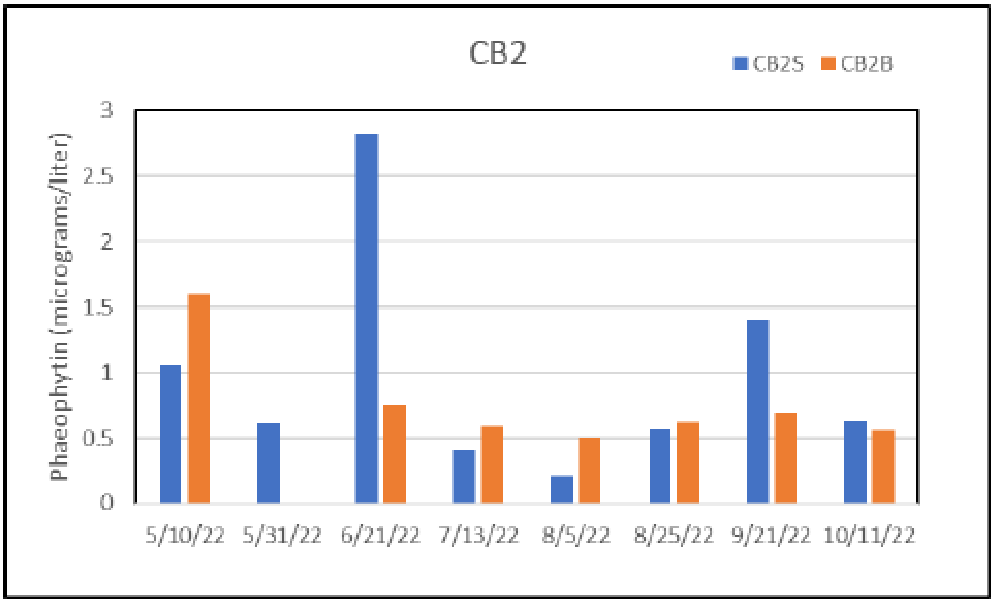

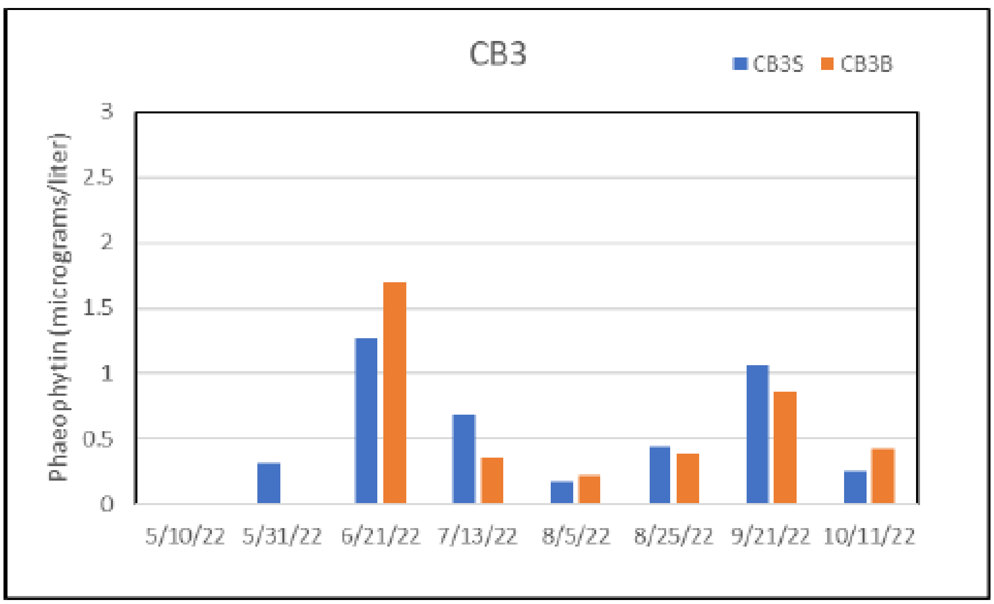

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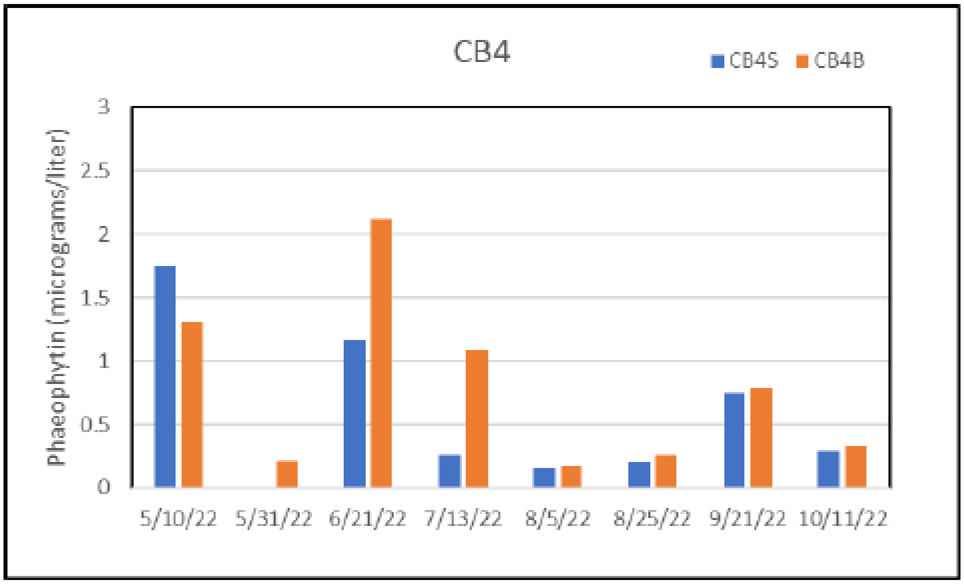


Appendix F - Replicate Samples:

10MAY22

Sample Code: CB3S Rep						
Analyte	**Results**	**Flag**	**MDL**	**RL**	**Units**	**Method**
NOx - N	U	U	0.011	0.022	mg/L	353.2

TKN	U	U	0.1659	0.1871	mg/L	351.2
TP	0.0897		0.0754	0.0845	mg/L	365.4
Chlorophyll *a*	6.5989		0.009	0.018	Microgram/L	SM10200H
Phaeophytin	U	U	0.009	0.018	Microgram/L	SM10200H

31MAY22

Sample Code: CB4B Rep						
Analyte	**Results**	**Flag**	**MDL**	**RL**	**Units**	**Method**
NOx - N	0.0841		0.011	0.022	mg/L	353.2
TKN	U	U	0.159	0.179	mg/L	351.2

TP	0.0855		0.073	0.082	mg/L	365.4
Chlorophyll *a*	0.6490		0.009	0.018	Microgram/L	SM10200H
Phaeophytin	0.2842		0.009	0.018	Microgram/L	SM10200H

21JUN22

Sample Code: CB1S Rep						
Analyte	**Results**	**Flag**	**MDL**	**RL**	**Units**	**Method**
NOx - N	0.0344		0.011	0.022	mg/L	353.2
TKN	0.1797		0.1659	0.1871	mg/L	351.2

TP	U	U	0.0754	0.0845	mg/L	365.4
Chlorophyll *a*	0.7958	*	0.009	0.018	Microgram/ L	SM10200H
Phaeophytin	0.9575	*	0.009	0.018	Microgram/ L	SM10200H
Chlorophyll *a* Uncorrected	1.3575		0.009	0.018	Microgram/ L	SM10200H

13JUL22

Sample Code: CB2B Rep						
Analyte	**Results**	**Flag**	**MDL**	**RL**	**Units**	**Method**
NOx - N	0.0172	J	0.011	0.022	mg/L	353.2

TKN	U	U	0.159	0.179	mg/L	351.2
TP	U	U	0.073	0.082	mg/L	365.4
Chlorophyll *a*	0.6887	*	0.009	0.018	Microgram/L	SM10200H
Phaeophytin	1.036	*	0.009	0.018	Microgram/L	SM10200H
Chlorophyll *a* Uncorrected	1.2963		0.009	0.018	Microgram/L	SM10200H

5AUG22

Sample Code: CB3B Rep						
Analyte	**Results**	**Flag**	**MDL**	**RL**	**Units**	**Method**

NOx - N	0.0288		0.011	0.022	mg/L	353.2
TKN	0.1817		0.159	0.179	mg/L	351.2
TP	0.0738	J	0.073	0.082	mg/L	365.4
Chlorophyll *a*	0.9167		0.009	0.018	Microgram/ L	SM10200H
Phaeophytin	0.3451		0.009	0.018	Microgram/ L	SM10200H

25AUG22

Sample Code: CB4S Rep						
Analyte	**Results**	**Flag**	**MDL**	**RL**	**Units**	**Method**
NOx - N	U	U	0.011	0.022	mg/L	353.2

TKN	U	U	0.159	0.179	mg/L	351.2
TP	0.093		0.073	0.082	mg/L	365.4
Chlorophyll *a*	2.4525		0.009	0.018	Microgram/ L	SM10200H
Phaeophytin	0.4048		0.009	0.018	Microgram/ L	SM10200H

21SEP22

Sample Code: CB1B Rep						
Analyte	**Results**	**Flag**	**MDL**	**RL**	**Units**	**Method**
NOx - N	U	U	0.011	0.022	mg/L	353.2
TKN	U	U	0.159	0.179	mg/L	351.2

TP	U	U	0.073	0.082	mg/L	365.4
Chlorophyll *a*	3.5066		0.009	0.018	Microgram/L	SM10200H
Phaeophytin	0.9032		0.009	0.018	Microgram/L	SM10200H

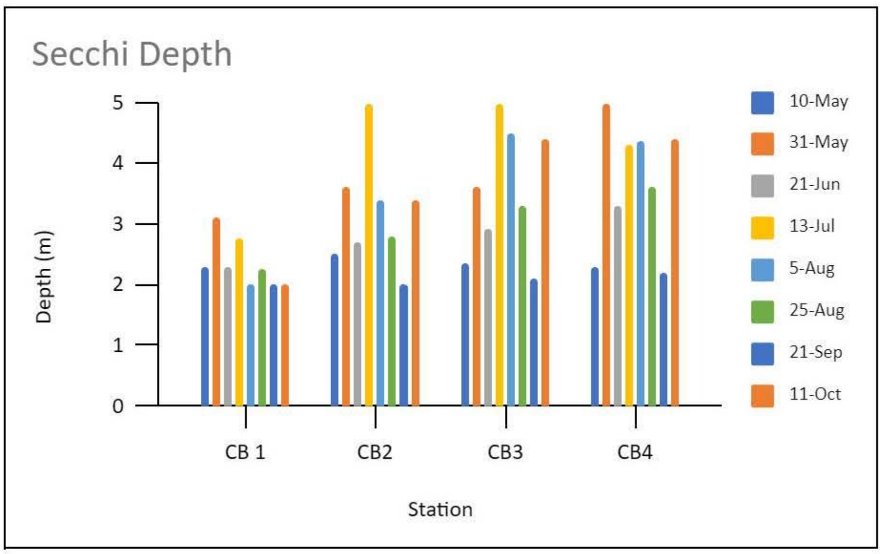
11OCT22

Sample Code: CB2S Rep						
Analyte	**Results**	**Flag**	**MDL**	**RL**	**Units**	**Method**
NOx - N	0.0629		0.011	0.022	mg/L	353.2
TKN	U	H	0.159	0.179	mg/L	351.2
TP	0.0795	H	0.073	0.082	mg/L	365.4

Chlorophyll *a*	4.1423		0.009	0.018	Microgram/L	SM10200H
Phaeophytin	0.6222		0.009	0.018	Microgram/L	SM10200H

H - Analysis was performed out of hold time.

Appendix G. Secchi Depth



Appendix H. Results of Holding Time Test for TKN and TP

	Analysis Date	Analysis Date	Analysis Date	Analysis Date
	11/1/2022	12/15/2022	11/1/2022	12/15/2022
	TKN	TKN	TP	TP
Sample #	(mg/l)	(mg/l)	(mg/l)	(mg/l)
1	0.2331	0.2787	U	U
2	U	U	0.1333	0.0927
3	0.3337	0.4061	U	0.1245
4	U	U	U	U
5	0.167, J	U	U	U
6	U	0.1868	0.0890	0.0855
7	0.1707, J	0.2789	U	U
8	U	U	U	0.0913
9	0.2585	0.3031	0.0866	0.1220
10	0.4913	0.3064	U	U

Results of holding time test on seawater samples analyzed for TKN and TP. Samples were collected on 10/17/22 and digested on 10/24/22.

THE UNIVERSITY OF MAINE

Report for 2023 Ambient Water Quality Monitoring Plan for Kingfish Maine, Land Based Aquaculture Project Jonesport, Washington County, Maine, USA

Background

Kingfish Maine, was issued a Maine Pollutant Discharge Elimination System (MEPDES) Permit #ME0037559 and Maine Waste Discharge License (WDL) (W009238-6F-A-N) on June 25, 2021, for a proposed land-based aquaculture project in Jonesport, Maine. Special Condition H of these approvals requires that Kingfish Maine, starting in 2022, monitor ambient water quality both prior to and continuing through the buildout and operation of the permitted facility. This effort significantly increases the ambient water quality dataset for Chandler Bay, as little background water quality data has been collected prior to this effort. The pre-buildout ambient monitoring provides an assessment of the background nutrient levels of the ambient waters surrounding and expected to be affected by the facility outflow. This document describes the results of 2023 Ambient Water Quality Monitoring season.

Project Organization

Tom Sorby	Tom Sorby Operational Manager Kingfish Maine 33 Salmon Farm Road Franklin, ME. 04634 (502) 614 9078, t.sorby@kinfish-maine.com	Representative of the MEPDES/WDL permittee. Responsible for oversight of the AWQMP and vendor management
Damian Brady	Damian C. Brady, PhD School of Marine Sciences Ira C. Darling Marine Center University of Maine 193 Clarks Cove Road Walpole, ME 04573 207-312-8752, Damian.brady@maine.edu	Responsible for AWQMP implementation, including oversight of sample collection and analysis, data management and security, report production.
Angela Brewer	Section Leader, Marine Unit, Bureau of Water Quality Maine Department of Environmental Protection 17 State House Station, 32 Blossom Lane Augusta, ME 04330 (207) 592-2352, angela.d.brewer@maine.gov	Acts as MDEP Program lead for all monitoring and data management activities covered under the AWQMP.
Clarissa G. Trasko	Wastewater Compliance Supervisor, Maine Department of Environmental Protection, 106 Hogan Road Bangor, ME 04401, (207) 592-1389, clarissa.trasko@maine.gov	Maine DEP compliance staff person for Kingfish Maine permit.

Other personnel: Trained and experienced University of Maine staff carried out all field sampling, sample collection, sample analysis, data compilation, data visualization and report production. Staff may be assisted by trained interns, graduate students, or other personnel, but in all cases, those assisting will be properly trained for the tasks performed and will act in accordance with the AWQMP.

Data Distribution Statement

Only data that has undergone quality testing and has been verified ready for distribution, will be distributed. An exception may be made for the entities listed in the above "Project Organization" section. Any data distributed to those entities before quality testing and verification would be watermarked "unverified, preliminary data, not for distribution".

Ambient Water Quality Monitoring Plan Overview

Stations:

The University of Maine team sampled ambient water quality at 4 pre-determined stations designated by Maine DEP (CB1- 4) and 2 stations determined by the Town of Jonesport planning board (CB5 - 6) in 2023 (Figure 1, Table 1). Station CB1 is located south of Great Bar. Station CB2 is located near Bar Island, Station CB3, off the southwest shore of Ballast Island Ledge, near the proposed outfall, and Station CB4 is near Bay Ledge. Station CB5 is located north of Great Bar and southeast of Flake Point Bar. Station CB6 is located north of Roque Island. CB5 and CB6 were sampled on alternating cruises, with one of the two being sampled each time. These sites were monitored in the same order on each sampling date; Station CB5 or CB6, followed by CB1, CB2, CB3, and CB4.

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Version 1, 11/16/23

Figure. 1. Ambient monitoring stations established in the MEPDES permit.

Station	Latitude	Longitude
CB1-GREAT BAR	44.59209	-67.55317
CB2-BAR ISLAND	44.569433	-67.565643
CB3-BALLAST ISLAND LEDGE	44.559541	-67.556639
CB4-BAY LEDGES	44.540773	-67.550927
CB5-FLAKE POINT	44.60785	-67.55619
CB6-ROQUE ISLAND NORTH	44.59461	-67.52935

Table 1. Coordinates of Kingfish Maine ambient water quality monitoring stations

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Time of Sampling

The stations were sampled at 3-week intervals beginning in May of 2023 and extending through October, 2023. Each sampling occurred on the second half of alternating ebb and flood tides within a four-hour sampling window, including 1 hour of slack. Kingfish Maine provided the vessel and captain for the sampling trips. For sampling dates and times, see Table 2.

Date	Window
May 4	7:35 - 11:35
May 25	6:43 - 10:43
June 15	6:25 - 10:25
July 24*	6:46 - 10:46
August 2	8:44 - 12:44
August 23	6:36 - 10:36
September 13	7:14 - 11:14
October 4	5:49- 9:49

Table 2. Sampling dates for 2023 ambient monitoring. The samplings were scheduled to alternate the 4-hour sampling window between the 2nd half of ebb and flood tides. The original sampling date for July was July, 11th, 2023, however the vessel experienced severe flooding the morning of the sampling and the captain was unable to provide an alternate vessel in time to complete sampling.

Parameters measured

Temperature, depth, salinity, dissolved oxygen, pH, chlorophyll *in situ* fluorescence, and turbidity were measured by multiparameter sonde. Total Nitrogen (TN), Total Phosphorus (TP), Nitrate plus Nitrite (NOx), and extracted chlorophyll *a* and phaeopigment samples were collected as grab samples and analyzed in the Marine Water Quality Laboratory (MWQL) at the Darling Marine Center (DMC) which is accredited by the State of Maine to perform the above laboratory analyses. Ammonia grab samples were also taken and sent to ALS Environmental Laboratory in Rochester, NY for analysis as they are accredited by the State of Maine for this analyte. Secchi measurements of water clarity were also made at each station.

Sampling Methods

Sampling methods followed established SOPs (See AWQMP). Deviations from or amendments to existing SOPs will be identified in this report, along with justification for such changes.

Preparation for sampling

Sonde Calibration

Prior to deployment, the multiparameter sonde was calibrated following the procedure in Appendix A of the Ambient Water Quality Monitoring Plan.

Labware preparation for TN, TP, NOx, and chlorophyll a samples

For TN. TP and NOx, grab sample bottles and caps, tubes and caps, syringes and plungers were acid washed, rinsed with milliQ water (> 18.0 megohm resistivity) and dried. Preservative (sulfuric acid) was added to the sample vessels for TP and NOx in the laboratory, prior to sampling. TN bottles did not receive acid preservative. Extracted chlorophyll samples were collected in brown, HDPE or LDPE bottles which were cleaned with Sparkleen, a general use laboratory cleaner, and rinsed a minimum of 6 times with milliQ water. Cleaning procedures for all labware are documented in the laboratory records. Coolers were cleaned and dried prior to use. Sample bottles and tubes were labeled with the project name, station name or #, depth (surface (S), just below thermocline (T), bottom (B)), date, analyte, and the samplers initials.Enroute to the site, ice was purchased for coolers to maintain the proper temperature of the samples.

Sonde profiles

Instrumentation

The University of Maine provided experienced technicians to conduct sonde profiles and collect grab samples for each sampling. A UM owned YSI EXO II multiparameter sonde with handheld computer for user manipulation of settings, parameter readouts, data logging and display, SN: 20E101357, was used for profiles of water column parameters. The YSI EXO II is equipped with the following sensors (QC specifications from manufacturer):

Parameter	Range	Resolution	Accuracy
Pressure/Depth	0-100 m	0.001 m	± 0.004%.
Temperature	-0.5 – 50 °C	0.001 °C	0.01 °C
Conductivity	0-200 mS/cm	0.1 mS/cm	±0.5 % or 0.001 mS/cm w. i. g.
Turbidity	0 - 4000 FNU	0.01 FNU	± 2% or 0.1 FNU
Chlorophyll fluorescence	0 - 400 µg/L	0.1 µg/L	0.1 µg/L
pH	0 - 14	0.01	± 0.1
Dissolved Oxygen	0 - 500 % Air Saturation/0 - 50 mg/l	0.1% Air Saturation/0.01 mg/l	± 1% Air Saturation/± 0.1 mg/L

Table 3. Manufacturers specifications for sonde parameters.

Profile Details:

At each site, the sonde was submerged and allowed to equilibrate at approximately 1 meter depth. The sonde was then raised to just below the surface to begin the profile. Measurements were taken at the following depths at each site, allowing the readings to stabilize a minimum of 2 minutes at each depth sampled:

- 0.5 meters
- 1 meter followed by 1-meter increments to 10 meters total depth.
- At depths greater than 10 meters measurements were taken in 2-meter increments to a total depth of 20 meters or within 0.5 meters of the bottom.
- If the water column is less than 5 m at a station, data was recorded in 0.5-meter increments instead of 1-meter increments to provide more data points.

Care was taken not to disturb the bottom, as resuspended sediment can interfere with readings and the sonde can be damaged if it contacts the bottom. A window weight was attached to the sonde line and hung below the sonde to provide an indicator of proximity to the bottom by touching the substrate before the sonde. Total depth at the station was determined by the bottom depth reading on the sonde, plus 0.5m to account for the distance from the bottom to the sonde.

Sonde data was saved in real time on the attached handheld control. Each profile had its own file and was labeled with the station name, date and time. All readings were taken on the descent of the sonde. A field log was used to record weather conditions, sea conditions, sampling personnel, sample time and provided an independent verification of the time, as well as any unusual circumstances surrounding the station sampling. In the lab, environmental as well as calibration data was uploaded on a MWQL computer using YSI EXO software, to be manipulated in Microsoft Excel or other spreadsheet software.

Grab Sample Collection

Equipment

A weighted 1.7-liter HDPE Niskin bottle with a metered dacron line and tripping weight was used for collecting grab samples.

Niskin preparation

The Niskin bottle was rinsed with tap water after use and stored dry in the lab. The bottle was rinsed with ambient water before samples were collected.

Collection of Grab Samples

TN, TP, NOx, ammonia, and chlorophyll *a* samples were collected from the Niskin bottle, which was gently mixed between draws from the bottle to resuspend any settling particles. Sonde profiles were collected first. The profile was examined to determine if a thermocline was present which was defined as a change of more than 1 degree Centigrade per meter of depth. No thermocline was seen for any of the sampling dates in 2023. Water samplers wore gloves and took care not to touch other surfaces while wearing gloves. If gloves were contaminated, they were removed, and a new pair utilized. When handling sample bottles and tubes, the caps and bottle were handled in such a way as to prevent gloves from touching the inside of the cap or bottle or the rim of the bottle. Bottles were filled as quickly as possible and capped immediately. The TP and Ammonia bottles contained preservatives and were not rinsed with the sample. The NOx samples were collected in acid washed syringes and filtered through 0.45-micron cartridge filters into acid washed 50 ml centrifuge tube; sample was passed through the filter to waste, before collecting 40 ml of sample in the 50 ml tube. The tubes contained preservatives and were not rinsed. Tubes were capped immediately, and the sample stored in the cooler on ice. TN and chlorophyll sample bottles were rinsed three times with sample water before collecting the sample. To rinse bottles, up to 50 ml of sample water was collected in the bottle. The Bottles were capped and shaken to rinse inside the bottle and cap. The rinse water was dumped downstream of the sampling site. The rinsing was repeated two more times, after which the bottle was filled, capped, and stored in a dark cooler on ice.

Labeling of Grab Samples/Recording of Field Data

The project name, station, date and time of sampling, the depth of sampling, weather, sea conditions, names of staff collecting samples, volume of samples collected, and any unusual circumstances were recorded on waterproof field data sheets. Field sheets were scanned and manually digitized in the laboratory. Bottles were labeled with project, date, station, time of sampling, depth, sampler's initials, and analyte.

Replicate Samples

For each parameter, at least one duplicate sample was taken for every ten samples collected.

Grab Sample Field Storage and Transport

Immediately after collection in the field, sample bottles were placed in Ziploc bags and stored in coolers surrounded by loose ice, in the dark. Samples remained in the coolers until arrival at the MWQL. Temperature of the coolers was monitored by measuring the temperature of a water sample that had been stored with the environmental samples during transit. Samples were stored between 0 °C and 6 °C. All sample transported sample temperatures were within target range for the 2023 sampling.

Sample Handling in the MWQL

Standard operating procedures (SOPs) were followed for the sampling, preservation, transportation, and storage of surface water grab samples. Special permission was granted for the MWQL to allow an 8-hour period between collection and filtration for the Kingfish Maine (Chandler Bay) chlorophyll samples due to the long travel distance required and the availability of test data showing no significant differences in chlorophyll or phaeophytin data obtained from test samples filtered at 6 and 8 hours after collection. Each sample was given a unique MWQL identification which consisted of MWQL batch code which includes the date and project, station code, depth, and replicate number (if more than 1 sample is taken). This unique identification was traced to the field data sheet and the Chain of Custody form, which contained further information. Samples were kept within temperature parameters specified by the laboratory SOPs and this document, until analysis. Temperatures of refrigerators and freezers used to store MWQL samples were monitored on each day that the MWQL was in operation, and the readings recorded in a log.

Method	Analytes	Holding Time (days)	MDL	RL	Units

SM10200H	Chlorophyll a and Phaeophytin	21	0.003	0.01	µg/l
MWQL-HTCCL	Total Nitrogen	28	0.0733	0.0813	mg/l
EPA 365.4	Total Phosphorus	28	0.074	0.083	mg/l
EPA 353.2	Nitrate plus Nitrite	28	0.011	0.013	mg/l
EPA 350.1	Ammonia (Analyzed by ALS)	28	0.003 - See data notes	0.01 - See data notes	mg/l

Table 3. Methods, holding times, minimum detection limit (MDL) and reporting limit (RL) of MWQL methods.

Chain of Custody

A chain-of-custody form was completed the day of sampling and documented the following:
Date and time of collection, person collecting the samples, station, depth, parameter to be analyzed, project name, unique MWQL batch code, filtered/not filtered, volume of sample collected, temperature of cooler upon arrival at the laboratory, time and date of arrival at the laboratory, receiving and relinquishing staff members, storage location in laboratory, time of placement in laboratory storage, date of any processing or analysis of the samples (details of each action will be contained in laboratory notebooks or forms specific to the actions being performed), date and time of any transfer of samples to outside facilities, any deviations from the SOPs or unusual field conditions which may impact the quality of the sample as well as identifying information for any instruments, such as thermometers used in samples monitoring.

Quality Objectives

Sonde data

All uploaded sonde data spreadsheets were quality-checked and formatted, at which point the raw data files on the handheld computer or sonde were deleted from the file directory. Criteria used to validate raw profile data from discrete sampling followed Table 6 of MDEP's marine monitoring program (MDEP 2017). For raw profile data from discrete sampling, if a data value falls outside of the relevant acceptable range, best professional judgment may override these criteria when supporting data or information suggests a real aberration. If no reasonable explanation exists for an aberration, the data value is flagged in the raw data file and not included in subsequent analyses and reporting.
Sonde data will be checked for extreme values using conditional formatting in an Excel spreadsheet. See Table 4 for ranges. In the event data is outside of these limits, it will be examined further and flagged.

Parameter	Minimum Value	Maximum Value	
Depth	0.05 m	20 m	Range based on expected conditions within Maine marine surface waters and protocol maximum
Temperature	5 °C	25 °C	Range based on expected seasonality of sampling
Salinity	0 psu	35 psu	Range based on expected location of sampling in Maine marine waters
Dissolved Oxygen	20% saturation	150% saturation	Range based on expected seasonality and location of sampling in Maine marine waters, including extremes based on primary productivity
pH	6.5	9.5	Extremes based on algal bloom conditions, should be verified with dissolved oxygen data and time of day
Turbidity	0 FNU	25 FNU	Negative values should be corrected to 0.0, high values should be verified with adjacent data values and proper functioning of probe wiper
Chlorophyll a	0 µg/L	25 µg/L	Max. value based on algal bloom

Table 4. Ranges of acceptable data for sonde measurements. Data outside of these ranges will be flagged if no reasonable explanation exists for the aberration.

Grab Samples

Precision: For activities covered under this AWQMP, precision is measured through an assessment of duplicate spiked matrix samples and replicate field samples. The variability of laboratory blanks and standards are used to evaluate the precision of the analytical method. The variability of both the blank and spiked matrix samples were used to calculate the minimum detection limit and the reporting limit of the analytical method. Specific procedures are available in the specific protocol SOPs.

Accuracy: To determine the accuracy of the laboratory procedures, certified standard solutions (laboratory control samples (LCS)) are analyzed with each sample run, with the exception of chlorophyll a in which a solid standard is analyzed with each run, to determine if the readings have drifted from the values obtained during the last calibration with certified standard. The chlorophyll fluorometer was calibrated with liquid certified standard prior to the sampling season and every 6 months..

Representativeness: Sampling stations are chosen based on the current knowledge of the movement of water in the vicinity of the proposed outflow. MDEP selected stations based on the monitoring goals and objectives. The sampling took place in a 4-hour window around the second half of alternating ebb and flood tides with 1 hour of slack tide in the sampling window. This schedule allowed for sampling at both high and low tide to document any variability with the tide cycle. Sampling took place in May through

October to capture seasonal variability. The assessment of duplicate grab samples for each sampling event (1 duplicate for each 10 samples collected) provides an assessment of sampling variability.

Comparability: Comparability is addressed by making and recording observations and collecting samples using methodology approved by the MDEP, by using field staff trained and experienced in the sampling methods, and by using methods approved by the MDEP performed by a laboratory accredited by the State of Maine for those methods. Additionally, comparability with historical MDEP datasets will be maintained as much as possible by maintaining regular communication with the MDEP Marine Unit.

Reporting QC Data

Quality control data included in the laboratory reports include, at a minimum, equipment blanks, field duplicates, laboratory control samples, and matrix spikes for nutrient analyses. Laboratory reports also contain a case narrative or equivalent notation, list of qualifiers and definitions, copies of COC form that includes a cooler receipt and preservation check form indicating sample temperature. The samples were in the possession of University of Maine staff from the time of collection to arrival in the laboratory.

Special Training/Certification

Field sampling staff using sonde equipment are trained and monitored by Damian C. Brady, PhD, or qualified staff member under his supervision and in accordance with University of Maine requirements. All data analysis and reporting is subject to the review and approval of Damian C. Brady, PhD, University of Maine. The surface water grab samples were analyzed at the University of Maine Marine Water Quality Laboratory (MWQL), a Maine State accredited laboratory. All staff are trained in relevant SOPs and protocols, all required UM safety training as well as data integrity training. Ammonia samples were analyzed by ALS in Rochester, New York which is accredited by the State of Maine for that protocol.

Documents and Records

Changes to AWQMP

Proposed changes to the AWQMP may result from field conditions, equipment failure or other extenuating circumstances.

Standard Operating Procedures

Standard Operating Procedures are a part of Kingfish Maine's and UM's quality assurance program. For vertical sonde profiling, instruments were calibrated according to manufacturer's instructions prior to each sampling event and the SOP was followed

Data Management

Record Keeping

Records include equipment calibration information and logs, field data sheets, chain-of custody forms, laboratory forms and notebooks, lab reports, field notes, sonde field data and field notes. All information, including lab-generated data, are kept in digital files maintained by the University of Maine MWQL. Lab-generated grab sample data will be submitted in EDD format to MDEP. Files were not deleted or removed from hand-held devices until an electronic or hard copy of the data has been saved appropriately and subjected to data QA/QC screening. In the field, the sonde data were recorded on the instrument and with a secondary method; either hand-written or a screenshot of the sonde handheld data. Anomalous or inconsistent field or lab results have not been deleted but have, instead, been flagged in data sets.

All data is backed up to secure cloud storage. The MWQL uses role-based data access control principles which limit access to data and documents to those specifically authorized as outlined in the MWQL Quality Assurance Manual.

All data resulting from this monitoring program is managed by the University of Maine. The University of Maine field measurements and the lab results are maintained at the Darling Marine Center.
All hard copies of lab and field data sheets, forms and logs have been electronically duplicated and preserved. Sonde data were logged to internal memory on either the handheld computer or sonde, and then raw files were uploaded to spreadsheets upon return to the office and prior to a subsequent sampling event

Reporting

Kingfish Maine will provide the MDEP with an annual report of the monitoring results on or before December 31st of each year. In addition to data tables, graphs, and figures, the report will compare results with previous sampling data (beginning after the second sampling season) and note any anomalous or unusual results. As appropriate, the annual report identifies and clarifies necessary changes to field sampling methods, this AWQMP, or other elements of the monitoring program and, potentially, exclusion from reporting results. Flagged data, if any, will be described in annual reports submitted to MDEP.

Results

See Appendix A2 for field observations

Sonde profile results (See Appendix B for sonde data plots):

Chandler Bay was slightly cooler (0.4°C) and fresher (0.6 psu) than in 2022, with slightly lower dissolved oxygen (4%), pH (0.11), chlorophyll (1.2 µg L^{-1}), and turbidity (0.2 FNU). These comparisons do not include the two new sites added in 2023 in the averages (CB5 and CB6).

Salinity Profiles:

- Salinity ranged from 30.65 to 32.8 psu, with a mean over all stations and depths of 31.98 psu.
- Salinity did not vary with depth (< 1 psu difference between surface and bottom) at any site or date; salinity was well mixed in the water column.

Water Temperature:

- Water temperature ranged from 6.262 to 14.965°C with a mean of 11.40°C.
- Water temperature varied by less than 2 °C difference between surface and bottom at all stations and dates.
- Significant warming occurred between the June 15th and July 24th sampling dates; all sites and

depths were below 10.3°C in May and June, while all sites and depths were above 11.6°C with the majority of depths at all sites above 13°C.

Dissolved Oxygen (% Saturation)

- Dissolved oxygen % saturation varied from 89.0 % to 112.0% with a mean of 102.62%.
- The minimum dissolved oxygen of 89 % saturation was observed in October at CB3 at 12 m.
- For all sites, the lowest dissolved oxygen % saturation was observed in October and was between 90 and 95% for the whole water column.

pH

- pH was between 7.77 to 8.01 with a mean of 7.88.
- The lowest pH was recorded at CB1 at 2.5 m in September.
- The pH was lowest in September at all sites.

Turbidity

- The highest turbidity was 3.51 FNU, observed at CB1 at 2.5m in October
- The lowest turbidity was 0.38 FNU, recorded in July at CB4 at 1 m.
- The highest mean turbidity was 1.81 FNU at CB1.

Chlorophyll

- The chlorophyll ranged from 0.3 to 4.05 $\mu g\ L^{-1}$ with a mean of 2.05 $\mu g\ L^{-1}$.
- May 4th had the highest chlorophyll content at every site, with high variability throughout the water column.
- Most dates showed no consistent trend with depth.

Site Specific Notes:

These site specific notes consider CB5 and CB6.

CB1: Maximum depth of 5.066 located south of Great Bar

- No salinity stratification was present at CB1 on any sampling dates. Salinity ranged from 31.05 to 32.8 psu with a mean of 31.96 psu. CB1 was 0.6 psu fresher than 2022 on average.
- No temperature stratification was present at CB1 on any sampling dates. Temperature ranged from 7.102 to 14.189°C with a mean of 11.58 °C. CB1 was 0.5 °C cooler than in 2022.
- Turbidity was the third highest at CB1, with an average of 1.82 FNU (CB5 and CB6 were higher on average). Turbidity ranged from 0.75 to 3.11 FNU. Turbidity did not vary greatly with depth except for the 9/13/23 sampling when turbidity increased with depth.
- pH ranged from 7.77 to 7.98 with a mean of 7.87. The mean was similar to 2022 (7.91), however the range was 0.2 units larger in 2022.
- Dissolved oxygen was above 100% for all sampling dates except 8/2/23, 9/13/23, and 10/4/23 where it reached a minimum of 93.0%.

- Chlorophyll ranged from 0.3 to 4.05 µg l^{-1} with a mean of 2.05 µg l^{-1}, 1.2 units less than 2022 on average. Chlorophyll tended to be slightly higher lower in the water column at CB1, with a difference of 1 µg l^{-1} on average between surface and bottom.

CB2: The maximum depth was 11.08 m, Near Bar Island, north of the Kingfish outfall

- No salinity stratification was present at CB2 on any sampling dates. Salinity ranged from 30.86 to 32.49 psu with a mean of 31.93 psu, 0.7 psu lower than 2022 on average.
- No temperature stratification was present at CB2 on any sampling dates, max temperature difference between surface and bottom was 1.0 °C. Temperature ranged from 6.477 to 14.004°C with a mean of 11.64 °C, 0.8°C cooler than 2022 on average.
- Turbidity ranged from 0.55 to 3.48 FNU, with a mean of 1.45 FNU, similar to 2022. Turbidity did not vary greatly with depth on any sampling except 9/13/23, where turbidity was highest in the surface reading, decreased and then stayed constant with depth.
- pH ranged from 7.80 to 7.98 with a mean of 7.88, 0.1 lower than 2022 on average. pH varied little from surface to bottom on all sampling dates except 5/4/23 where pH increased with depth.
- Dissolved oxygen was above 100% for all sampling dates except September and October where it reached a minimum of 94.0%. DO reached a maximum of 109.5 on 7/24/23. The DO was lower on average in 2023 than in 2022.
- Chlorophyll ranged from 0.31 to 6.87 µg l^{-1} with a mean of 2.31 µg l^{-1}. Chlorophyll tended to be slightly higher lower in the water column at CB2, with a difference of 1 µg l^{-1} on average between surface and bottom. The 5/4/23 sampling had the highest chlorophyll content and variability with depth. Almost all depths on 5/4/23 were above 3.5 µg l^{-1} whereas all other sampling dates and depths were below 3.5 µg l^{-1}.

CB3: The maximum depth was 15.004 m, Located NE of the Kingfish outfall near Ballast Island. This is the closest station to the proposed outfall.

- No salinity stratification was present at CB3 on any sampling dates. Salinity ranged from 30.65 to 32.55 psu with a mean of 32.00 psu, 0.6 psu lower than 2022. On 5/4/23, all salinities were less than 31.1, all other dates were between 31.7 and 32.55 psu.
- Temperature did not vary significantly with depth at CB3 except for 7/24/23 when the difference between surface and bottom was 2.17°C, otherwise max temperature difference between surface and bottom was < 1.0 °C. Temperature ranged from 6.262 to 14.073°C with a mean of 11.21 °C, 0.7°C less than 2022.
- Turbidity ranged from 0.44 to 2.37 FNU, with a mean of 1.15 FNU. Turbidity increased with depth on 5/4/23, 8/23/23, 9/13/23, and 10/4/23, it was constant with depth the other four dates.
- pH ranged from 7.80 to 7.98 with a mean of 7.88. pH varied little from surface to bottom on all sampling dates except 5/4/23 where it increased with depth.
- Dissolved oxygen was above 100% for all sampling dates except the end of August, September, and October where it reached a minimum of 89 in October in the bottom water. DO reached a maximum of 110.0 in early July.

- Chlorophyll ranged from 0.4 to 8.26 µg l^{-1} with a mean of 2.18 µg l^{-1}. Chlorophyll was slightly higher below 2m on most sampling dates. Chlorophyll was below 3 µg l^{-1} for most sampling dates. In September, the surface 3 meters were between 3 and 4.5 µg l^{-1}, and less than 3 µg l^{-1} below 3m. In early May, the Chlorophyll was above 3 µg l^{-1} at all depths.

CB4: The maximum depth was 12.114 m, located SE of proposed outfall.

- No salinity stratification was present at CB4 on any sampling dates. Salinity ranged from 30.67 to 32.57 psu with a mean of 32.01 psu. On 5/4/23, all salinities were less than 31.0 psu, all other dates were above 31.7 psu.
- Temperature did not vary significantly with depth at CB4 except for 7/24/23 when the difference between surface and bottom was 2.5°C, otherwise max temperature difference between surface and bottom was < 1.0 °C. Temperature ranged from 6.304 to 14.965°C with a mean of 11.29 °C.
- Turbidity ranged from 0.38 to 3.46 FNU, with a mean of 1.21 FNU. Turbidity did not vary greatly with depth except for 8/2/23 and 9/13/23, where turbidity increased with depth. On 8/23/23, turbidity was constant until the bottom 2m where it increased sharply.
- pH ranged from 7.81 to 8.01 with a mean of 7.89. pH varied little from surface to bottom on all sampling dates.
- Dissolved oxygen was above 105% for the first 4 sampling dates with a maximum of 112% in July. DO was above 100% in the surface waters during both August sampling dates and between 95 and 100% in the bottom waters. In September and October, the DO was between 90.3 and 97.5%.
- Chlorophyll ranged from 0.12 to 8.69 µg l^{-1} with a mean of 1.90 µg l^{-1}, 1.1 less than 2022. Chlorophyll was higher below 2m on all sampling dates except September, where it decreased with depth. May 4th had the highest chlorophyll at all depths.

CB5: The maximum depth was 5.732 meters. Located North of Great Bar

- Salinity did not vary with depth on any sampling date. Salinity ranged from 31.24 to 32.37 psu with an average of 31.92 psu.
- Temperature did not vary with depth except on 8/23/23 when temperature decreased with depth, however difference between surface and bottom was <1 °C. Temperature was below 10°C at all depths on 5/25/23, while above 13°C in July, August, and October.
- Turbidity ranged from 1.5 to 18.09 FNU, with an average of 3.87. However, the 10/4/23 sampling skewed this average because the bottom waters were very turbid. All other dates were below 3 FNU.
- pH ranged from 7.65 to 7.89 with an average of 7.79. pH increased with depth on all sampling dates.
- Dissolved oxygen was between 93.4 and 106.6 % with an average of 100.5 %. Do did not vary with depth, except on 8/23/23 when it decreased slightly with depth. DO was above 100% except for in October.
- Chlorophyll ranged from 0.59 to 5.97 µg l^{-1} with an average of 2.83 µg l^{-1}.

CB6: The maximum depth was 7.90. Located North of Roque Island

- Salinity did not vary with depth on any sampling date. Salinity ranged from 31.16 to 32.77 psu with an average of 31.98 psu.
- Temperature did not vary with depth on any sampling date. Temperature ranged from 7.368 to 14.154 °C with an average of 11.45°C.
- Turbidity ranged from 0.98 to 3.99 FNU, with an average of 2.11. Turbidity was constant with depth except on 9/13/23 when it increased with depth.
- pH ranged from 7.63 to 7.93 with an average of 7.79. pH increased with depth on all sampling dates except June when it decreased with depth.
- Dissolved oxygen was between 96.3 and 107.7 % with an average of 102.4 %. Do did not vary with depth and was above 100 for all dates except September.
- Chlorophyll ranged from 0.61 to 7.3 µg l^{-1} with an average of 2.34 µg l^{-1}. Chlorophyll increased very slightly with depth on all dates except May 4th where it was the highest at the surface, and overall higher than any other date.

Secchi Depth Measurements:

See Appendix I for Secchi depth plots.

- Secchi depth increased as the distance from the head of the bay increased. The lowest values were at CB5, followed by CB6, CB1, CB2, and CB3 and CB4 which did not have a discernible difference.

- Secchi depth was deepest in the middle of the season, with the highest values observed in June - August. The deepest depth was observed at CB4 on July 24th.

Surface Nutrients and Extracted Chlorophyll a (see Appendix C for tabular data, Appendix D-G for plots of grab sample data, and Appendix H for field replicates)

Total Nitrogen (TN)

- Overall TN was low, with a mean concentration for 2023 of 0.135 mg/l.
- The lowest concentrations of TN were seen on the 2 sampling dates in August with a mean of 0.106 mg/l on 8/2/23 and a mean of 0.126 mg/l on 8/23/23.
- Of the 80 samples taken in 2023, 13 samples (16%) were below the method reporting limit of 0.082 mg/l. Of those 13 samples, all but three were collected in August.
- The mean concentration of TN averaged over all stations was significantly higher in September and October than in August.
- The maximum TN was 0.195 mg/l which occurred in October in CB5 at the surface.
- Although all stations showed a decrease in TN during the month of August, all values of TN collected were very low, with no measurements of a concentration over 0.2 mg/l.

- In previous years TN was derived from adding Total Kjeldahl Nitrogen (TKN) to NOx Nitrogen. Since the detection limit of TKN was very high, most samples were below the detection limit and could not be used to calculate TN. Because the TN concentration for 2022 used this different method, it is not feasible to directly compare the two years other than to say that the nitrogen levels were also very low in 2022, most were below the detection limit of 0.159 mg/l of the previous method.
- An extensive comparison being impossible, it is worth noting that TN concentrations did not increase in 2023 even though significantly more rain fell on the landscape in 2023 as compared to 2022.
- Some stations showed higher mean concentrations when averaged over the entire sampling season, but variability of TN at each station over the course of the season rendered the differences between station means to be insignificant.

Total phosphorus (TP)

- Overall the TP concentrations were low, with only 24% of the samples falling above the method reporting limit of 0.083 mg/l.
- May and September had the highest TP levels. Of the 80 samples collected, 19 had TP concentrations above the reporting limit, of those 19 samples, 12 samples were collected in May and 6 samples were collected in September.
- The mean TP concentration over all stations, depths and dates was 0.096 mg/l compared to 0.045 mg/l in 2022. For the purpose of averaging the data, any samples below the detection limit of the method were considered to be 0.083 mg/l.
- The highest concentration of TP (0.406 mg/l) was measured in the sample collected at CB4 at the surface on May 4th.

Nitrate plus nitrite (NOx):

- Fifty one of the eighty samples collected (64%) had NOx-N concentrations below the reporting limit of 0.013 mg/l.
- The mean of all samples, giving the samples below the reporting limit as value of 0.013 mg/l was 0.023 mg/l.
- The mean of the NOx samples which were above the reporting limit was 0.042 mg/l following the trend of low NOx concentration seen in 2022 (0.023 mg/l).
- All samples collected on 5/25/23, 7/24/23 or 8/23/23 were below the reporting limit of 0.013 mg/l.
- The mean of the NOx concentrations at the individual stations averaged over the season were not significantly different.
- All stations had low NOx concentrations in May through August.
- In September and October NOx concentrations rose significantly at all stations. Unlike 2022, there was no elevation of NOx in the May samples.

- The increase in NOx in September and October of 2023 may have been caused by bottom water upwelling. In September and October the measured salinity was high, indicating that there was no large input of freshwater to account for the increased NOx. NOx concentrations in coastal areas typically increase in the fall due to upwelling.
- The similarity in NOx concentrations between surface and bottom samples at all stations indicates a well mixed water column.
- The lack of significant differences in NOx concentration between stations indicates that the waters are well mixed in Chandler Bay.
- The maximum NOx was 0.091 mg/l and was recorded in October at CB3 at the bottom but was not significantly different from other samples collected in October. This is consistent with the maximum concentration measured in 2022 which was 0.100 mg/l and occurred at CB4 in the bottom sample on 10/11/22.

Ammonia:

- Ammonia levels were generally low. The exception was on 5/25/23 when every sample had a significantly elevated ammonia concentration. The uniformity of the elevated ammonia (all stations and depths hovered around 0.3 mg/l) and the fact that this ammonia concentration was significantly higher than the corresponding TN concentration, which includes ammonia, point to contamination of the ammonia samples. These samples are collected and shipped to a laboratory external to the MWQL. These anomalously high samples were not included in the data averages.
- For the KF23AUG23 batch of samples, ALS notified us that the reporting limit for ammonia was higher than normal, at 0.07 mg/l, due to the company that supplies ALS with sample bottles, preparing the sample bottles with the wrong amount of sulfuric acid preservative. The ammonia concentrations of all samples from that batch were below the reporting limit.
- Excepting the May 25th samples, the highest ammonia concentration averaged across all stations was in September. The mean TN concentration (0.046 mg/l) for September was significantly higher than on the other sampling dates.
- Ammonia was highly variable at each station over the course of the season. Mean ammonia concentrations were not significantly different between stations when seasonally averaged..

Extracted chlorophyll *a* and phaeophytin:

- Overall, the chlorophyll *a* concentrations were low with the mean chlorophyll *a* concentration across all stations and dates being 1.84 micrograms/l compared to 2.5 micrograms/l in 2022.
- The highest monthly extracted chlorophyll *a* concentrations was 5.11 mg/l which was at CB6 in the bottom sample in May.
- Chlorophyll *a* concentrations were significantly higher in May than in all other months. Interestingly chlorophyll was also elevated on the 24th of July and August 25th of 2023. These

increases may have been a result of rainfall events increasing nutrient input and leading to phytoplankton growth, but further investigation is needed. The elevated concentrations on August 25th were significantly higher than all other months except May and July. In 2022 mean chlorophyll concentrations were also higher in May and also in October.

- The lowest monthly extracted chlorophyll *a* concentration averaged across all stations was on August 2nd at 0.83 microg/l. The lowest chlorophyll occurred in 2022 in July and August.
- The highest seasonal mean station concentration occurred at CB5 at the surface. That mean may have been biased because that station was only sampled four times, and three of the dates were dates which averaged higher concentrations over all stations. Of the 4 stations sampled every sampling trip (CB1-CB4), CB3 had the highest chlorophyll *a* but the station means were not significantly different from one another. Of those four stations, the highest single chlorophyll *a* concentration was at CB3 at the surface in May.
- The mean chlorophyll *a* concentration over the entire season at a given station was higher in the sample collected at the bottom than at the sample collected at the surface at CB1, CB2, CB4 and CB6. Stations CB3 and CB5 had a seasonal mean chlorophyll *a* concentration that was higher at the surface than at the bottom. This pattern was also seen in a majority of the stations in 2022.
- The maximum phaeophytin concentration amongst CB1 through CB4 was 1.2 microg/l at CB1 at the surface on August 23rd.
- The station with the highest average phaeophytin across all dates was CB5 and the lowest was CB4.
- Phaeophytin concentrations were elevated on May 4th, June 13th, and September 13th. May had the highest mean concentration across stations.

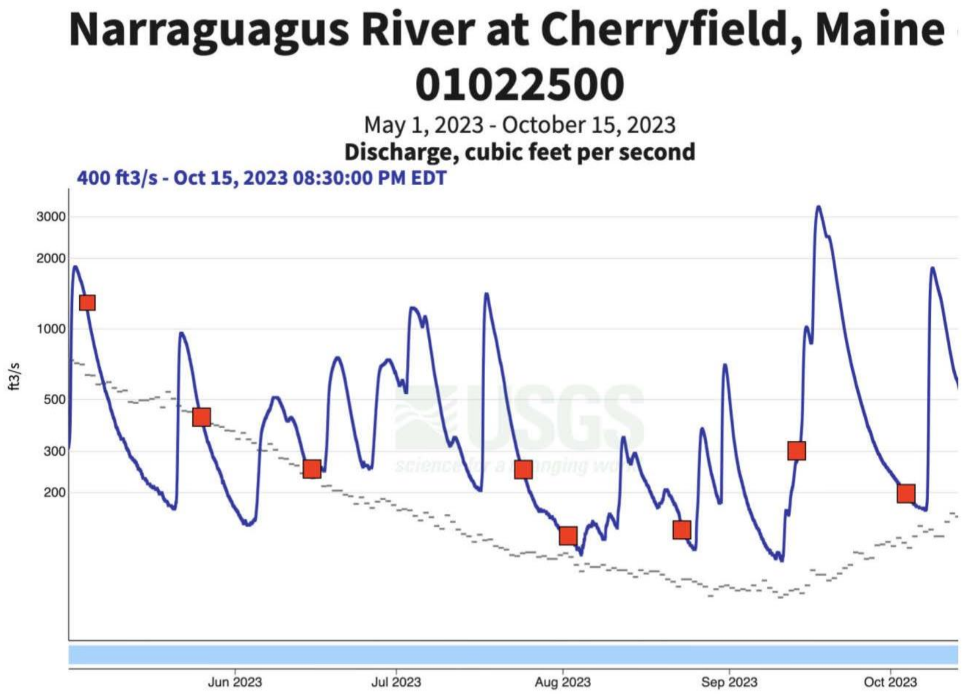

Figure 2. Freshwater flow from Cherryfield, ME on the Narraguagus River during the Kingfish Ambient Water Quality Monitoring time period in 2023. Annual river flow (blue solid line) was above average (gray dashed line) for the whole season after early June. The red squares represent the days sampled in Chandler Bay.

Appendix A

Summary of Chlorophyll Tests	SM10200H		
4/27/22: Seawater samples collected from the DMC dock at 8:30 am on 4/27/22	Time Elapsed Betwwen Collection and Filtration (min.)	Chlor a (µg/l) In Sample	Phaeophytin (µg/l) In Sample
Blank	NA	0.004	0.0382
27APR22KT-1-1	343	2.203	0.671
27APR22KT-1 -2	346	2.671	1.642
27APR22KT-1- 3	347	2.910	1.540
27APR22KT-1 -4	483	3.393	0.810
27APR22KT-1 -5	486	3.030	1.226
27APR22KT-1 -6	488	3.192	1.089
27APR22KT-1- 7	489	2.413	1.754

5/24/22: Seawater samples collected from the DMC dock at 8:15 am on 5/24/22	Betwwen Collection and Filtration (min.)	Chlor a (µg/l) In Sample	Phaeophytin (µg/l) In Sample
24MAY22 Chlor Test 6 hr 1	375	3.446	-0.3910
24MAY22 Chlor Test 6 hr 2	376	1.986	0.5238
24MAY22 Chlor Test 6 hr 3	377	1.840	0.7392
24MAY22 Chlor Test 6 hr 4	378	2.701	1.2741
24MAY22 Chlor Test 8 hr 1	479	3.064	0.8692
24MAY22 Chlor Test 8 hr 2	481	2.324	1.8630
24MAY22 Chlor Test 8 hr 3	482	2.124	0.6118
24MAY22 Chlor Test 8 hr 4	484	3.178	0.8349
24MAY22 Chlor Test 6 hr Bk	NA	0.007	0.0244
24MAY22 Chlor Test 8 hr Bk	NA	0.000	0.0411

Appendix A2

Date	Site	Start time of grab samples	Maximum station depth (m)	Cloud cover (%)	Air temperture (°F)	Air temperture (°C)	Wind speed (knots)	Wind Direction	Seas (ft)	Current (m/s)	Secchi downcast depth (m)	Secchi upcast depth (m)	Notes	Observers
5/4/23	CB6	7:55	8.1	100	39	3.9	9	NNE	1	0	1.75	1.5		Colby Johns, Kyle Shehata Oliveria
5/4/23	CB1	8:45	4.85	100	39	3.9	9	NE	0.5	0	2.5	2.25	2 birds ~ 20feet from boat	Colby Johns, Kyle Shehata Oliveria
5/4/23	CB2	9:27	11	100	39	3.9	5	NE	1	0	2.5	2.25	4 birds ~35 feet from boat	Colby Johns, Kyle Shehata Oliveria
5/4/23	CB3	10:12	15	100	40	4.4	5	ENE	1	0.2	2.75	2.5	2 birds, Ascophyllum	Colby Johns, Kyle Shehata Oliveria
5/4/23	CB4	10:47	11.5	100	43	6.1	3	ENE	1	0	2.5	2.25	9 birds	Colby Johns, Kyle Shehata Oliveria
5/25/23	CB5	7:14	5.1	70	60	15.6	10	N	0	0.25	1.8	1.7		Kate Liberti, Rob Cuddy
5/25/23	CB1	8:02	3.5	90	65	18.3	12	N	0	0.25	2.5	2.5		Kate Liberti, Rob Cuddy
5/25/23	CB2	8:54	8	90	65	18.3	12	N	0	0.25	3.2	3.3		Kate Liberti, Rob Cuddy
5/25/23	CB3	9:34	12	85	65	18.3	10	NE	0	0.25	3	3.2	Lots of seals on the rocks	Kate Liberti, Rob Cuddy
5/25/23	CB4	10:09	9	85	60	15.6	10	NE	0	0.25	2.8	2.9		Kate Liberti, Rob Cuddy
6/15/23	CB6	6:53	7.7	90	48	8.9	0		0	0	3.25	3		Colby Johns, Kyle Shehata Oliveria
6/15/23	CB1	7:35	5	100	52	11.1	0		0	0	4	3.75		Colby Johns, Kyle Shehata Oliveria
6/15/23	CB2	8:21	11.2	100	52	11.1	0		0	0	4	3.75	*See note at bottom	Colby Johns, Kyle Shehata Oliveria
6/15/23	CB3	9:18	15.5	100	54	12.2	0		0.5	0	4	3.5		Colby Johns, Kyle Shehata Oliveria
6/15/23	CB4	9:55	11.8	100	54	12.2	2	SE	0.5	0	4.1	4		Colby Johns, Kyle Shehata Oliveria
7/24/23	CB5	7:28	5.9	50	70	21.1	3	N	0	0.25	2.1	2	Lots of seals and pogies	Kate Liberti, Leila Avery
7/24/23	CB1	8:12	3.5	50	70	21.1	3	N	0	0	3.1	3.1	Secchi hit bottom at 3.2m at the end of sampling	Kate Liberti, Leila Avery
7/24/23	CB2	8:49	7.5	30	72	22.2	0		0	0	4.3	4		Kate Liberti, Leila Avery
7/24/23	CB3	9:35	12	50	70	21.1	0		1	0	3.7	3.8		Kate Liberti, Leila Avery
7/24/23	CB4	10:09	10.7	30	75	23.9	0		0	0	5.5	5.2		Kate Liberti, Leila Avery
8/2/23	CB6	9:06	8.4	0	70	21.1	0		0	0	2.1	2		Kate Liberti, Corinne Noufi
8/2/23	CB1	9:47	5.5	0	70	21.1	0		0	0.2	2.5	2.5		Kate Liberti, Corinne Noufi
8/2/23	CB2	10:26	11.3	0	72	22.2	0		0	0.2	3.6	3.5		Kate Liberti, Corinne Noufi
8/2/23	CB3	11:07	14.1	15	72	22.2	3	S	0	0	4.3	4.3		Kate Liberti, Corinne Noufi
8/2/23	CB4	11:58	12.6	50	70	21.1	5	S	0	0	4.1	4		Kate Liberti, Corinne Noufi
8/23/23	CB5	7:04	5.7	0	48	8.9	2	N	0	0	2	1.5		Colby Johns, Corinne Noufi
8/23/23	CB1	7:49	4.5	0	55	12.8	2	N	0	0	2.5	2.3		Colby Johns, Corinne Noufi
8/23/23	CB2	8:28	8.5	0	57	13.9	0		0	0	2.6	2.5		Colby Johns, Corinne Noufi
8/23/23	CB3	9:08	12.5	0	57	13.9	0		0	0	4.7	4.6		Colby Johns, Corinne Noufi
8/23/23	CB4	9:50	10.7	0	57	13.9	2	SE	0	0	3.4	3.4		Colby Johns, Corinne Noufi
9/13/23	CB6	7:27	7.2	100	65	18.3	8	E	0	0.5	2.2	2		Kate Liberti, Kyle Oliveria
9/13/23	CB1	8:03	4	100	65	18.3	0		0	0.5	2.5	2.25		Kate Liberti, Kyle Oliveria
9/13/23	CB2	8:39	10.3	100	65	18.3	0		0	0.5	2.7	2.4		Kate Liberti, Kyle Oliveria
9/13/23	CB3	9:18	14.1	100	65	18.3	0		1	0.5	2.75	2.5		Kate Liberti, Kyle Oliveria
9/13/23	CB4	9:52	12	100	65	18.3	5	E	1	0	3.25	3		Kate Liberti, Kyle Oliveria

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Date	Site	Start time of grab samples	Maximum station depth (m)	Cloud cover (%)	Air temperture (°F)	Air temperture (°C)	Wind speed (knots)	Wind Direction	Seas (ft)	Current (m/s)	Secchi downcast depth (m)	Secchi upcast depth (m)	Notes	Observers
10/4/23	CB5	6:22	5.6	0	60	15.6	3	E	0	0	1.5	1.5	Secchi reading taken at 6:35, sunrise 6:32	Kate Liberti, Corinne Noufi
10/4/23	CB1	7:00	3.7	0	60	15.6	3	E	0	0	2.1	2	Bottom niskin cast may have hit bottom	Kate Liberti, Corinne Noufi
10/4/23	CB2	7:33	8.4	0	62	16.7	3	E	0	0	2.1	2		Kate Liberti, Corinne Noufi
10/4/23	CB3	8:15	12.2	0	65	18.3	3	E	1	0	3	2.8		Kate Liberti, Corinne Noufi
10/4/23	CB4	8:51	9.8	10	65	18.3	8	E	0	0	2.5	2.3	Chlorophyll and NOx rep samples taken from second niskin cast	Kate Liberti, Corinne Noufi
		*Not enough water to get full NOx surface rep. No spare filter for NOx bottle, filtering back at lab: used extra vial that did not have acid added, adding acid in the lab												

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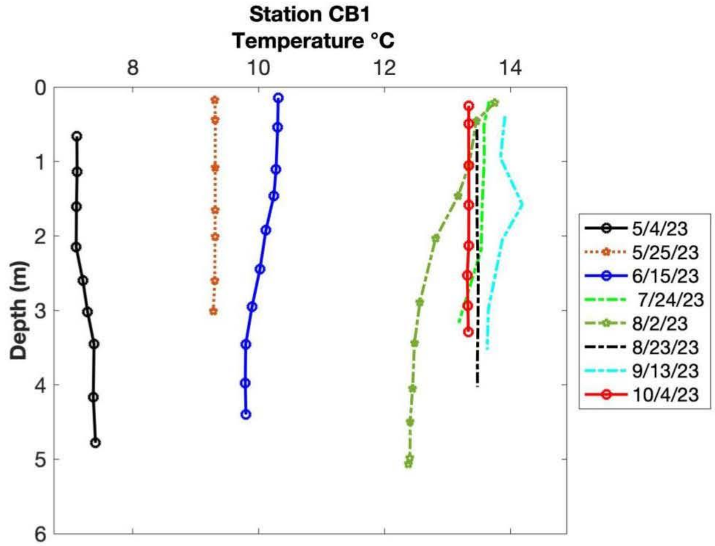
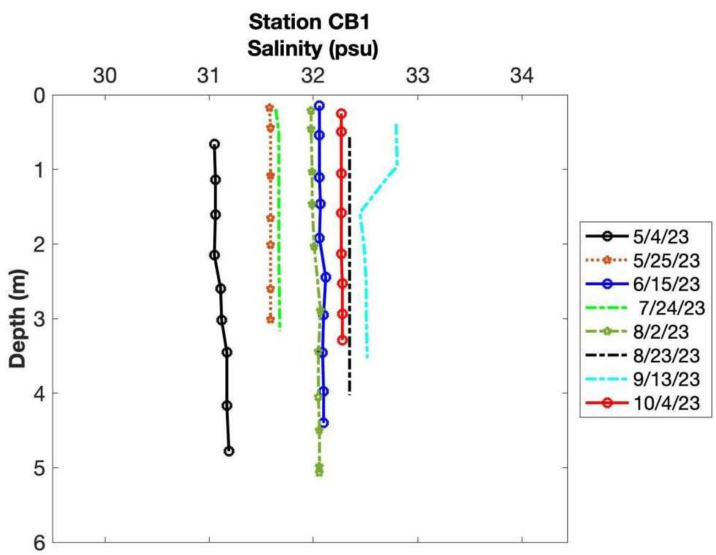
Appendix B





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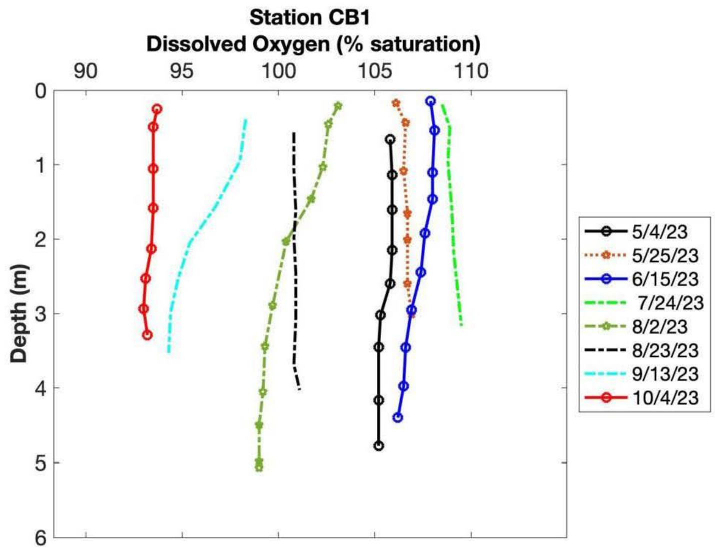
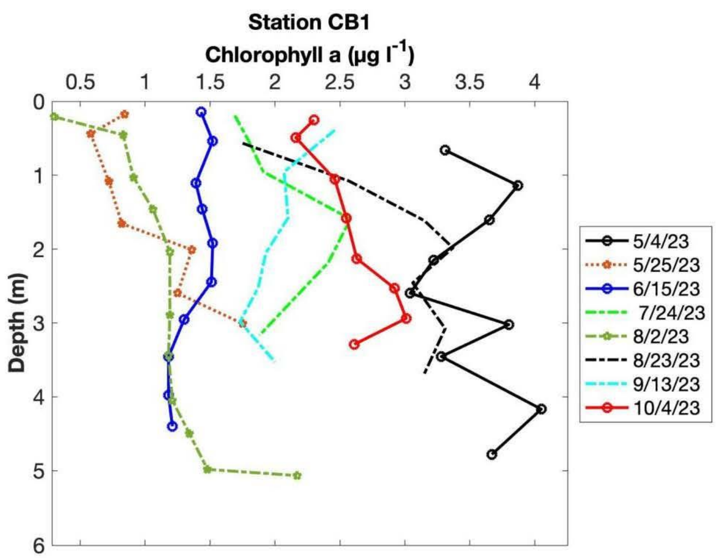
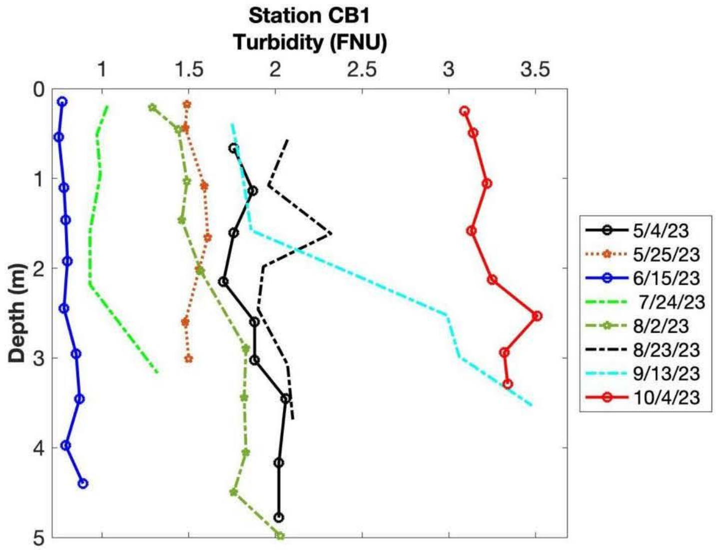
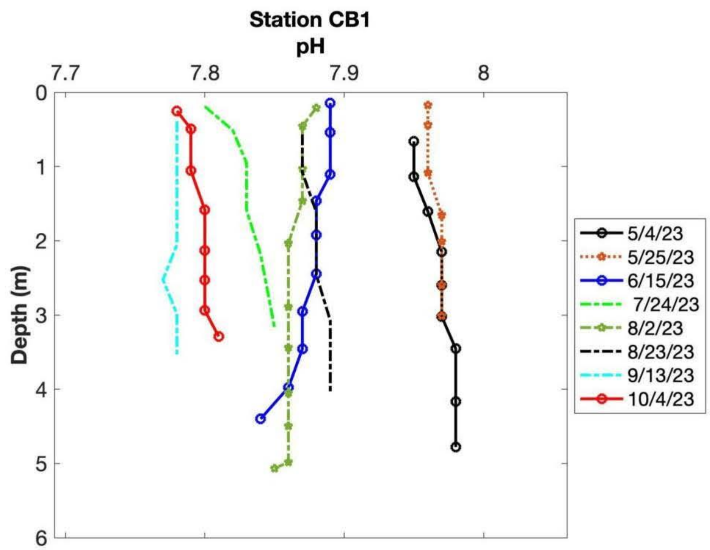
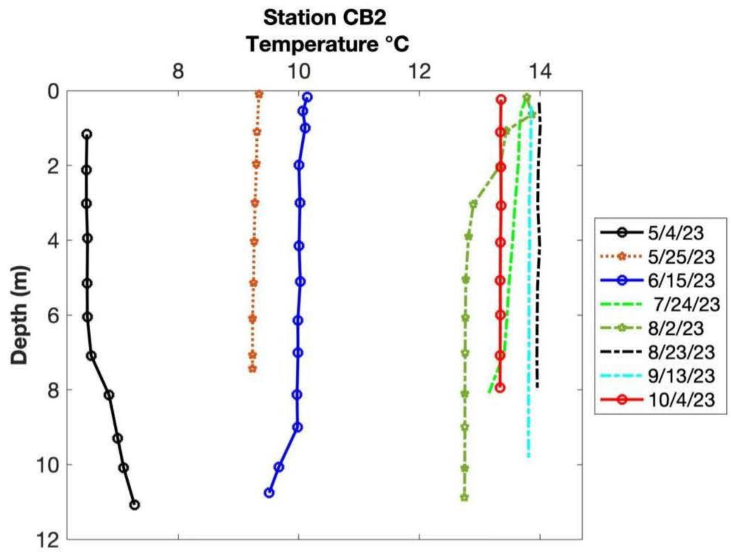
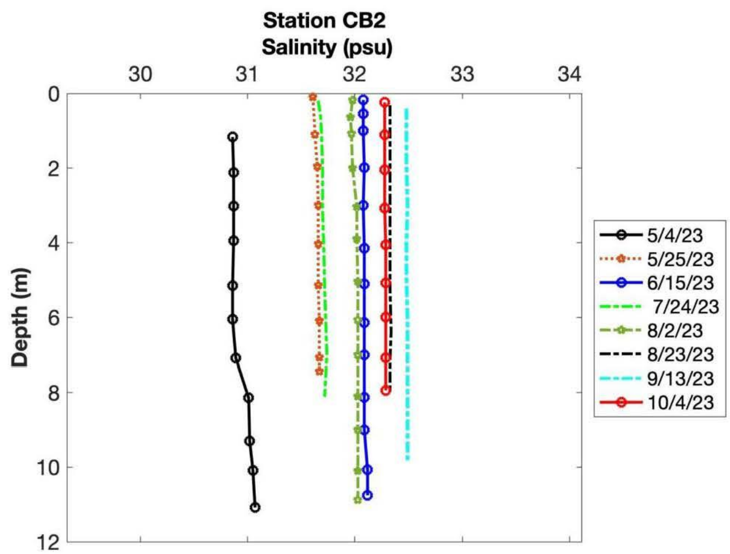

Station CB1
Dissolved Oxygen (% saturation)
90
95
100
105
110
Depth (m)
0
1
2
3
4
5
6
5/4/23
5/25/23
6/15/23
7/24/23
8/2/23
8/23/23
9/13/23
10/4/23

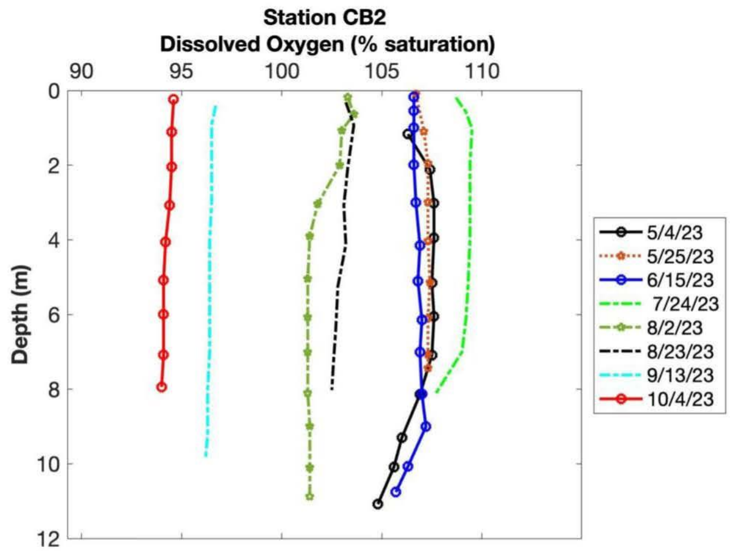

Station CB1
Chlorophyll a (µg l^{-1})
0.5
1
1.5
2
2.5
3
3.5
4
Depth (m)
0
1
2
3
4
5
6
5/4/23
5/25/23
6/15/23
7/24/23
8/2/23
8/23/23
9/13/23
10/4/23

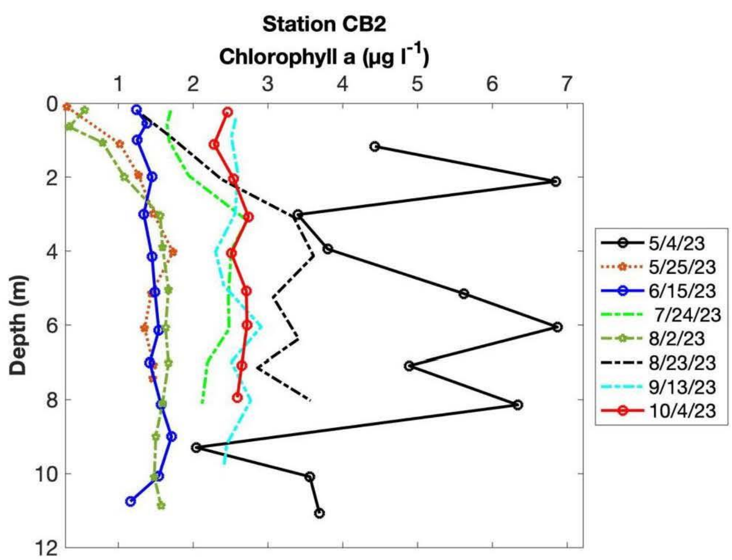

Station CB1
Turbidity (FNU)
Depth (m)
5/4/23
5/25/23
6/15/23
7/24/23
8/2/23
8/23/23
9/13/23
10/4/23

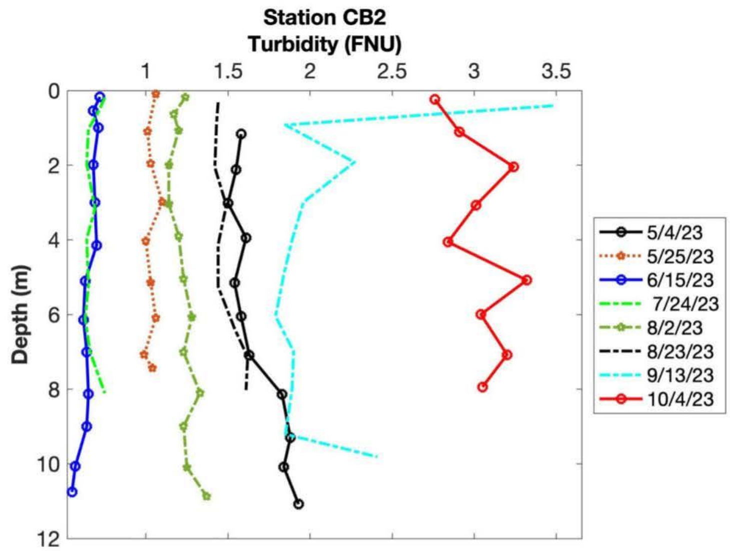

Station CB1
pH
Depth (m)
5/4/23
5/25/23
6/15/23
7/24/23
8/2/23
8/23/23
9/13/23
10/4/23

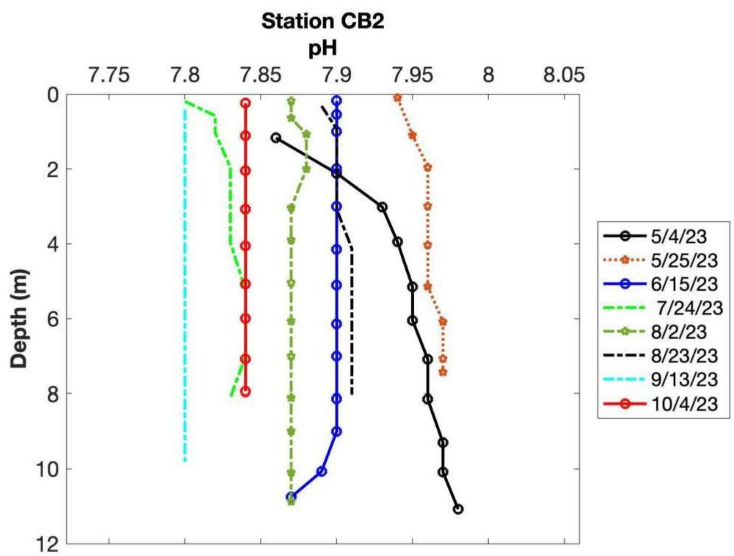

Station CB2
Temperature °C
8
10
12
14
0
2
4
6
8
10
12
Depth (m)
5/4/23
5/25/23
6/15/23
7/24/23
8/2/23
8/23/23
9/13/23
10/4/23


Station CB2
Salinity (psu)
30
31
32
33
34
0
2
4
6
8
10
12
Depth (m)
5/4/23
5/25/23
6/15/23
7/24/23
8/2/23
8/23/23
9/13/23
10/4/23


Station CB2
Dissolved Oxygen (% saturation)
90
95
100
105
110
Depth (m)
0
2
4
6
8
10
12
5/4/23
5/25/23
6/15/23
7/24/23
8/2/23
8/23/23
9/13/23
10/4/23


Station CB2
Chlorophyll a (μg l^{-1})
1
2
3
4
5
6
7
Depth (m)
0
2
4
6
8
10
12
5/4/23
5/25/23
6/15/23
7/24/23
8/2/23
8/23/23
9/13/23
10/4/23


Station CB2
Turbidity (FNU)
1
1.5
2
2.5
3
3.5
0
2
4
6
8
10
12
Depth (m)
5/4/23
5/25/23
6/15/23
7/24/23
8/2/23
8/23/23
9/13/23
10/4/23


Station CB2
pH
7.75
7.8
7.85
7.9
7.95
8
8.05
0
2
4
6
8
10
12
Depth (m)
5/4/23
5/25/23
6/15/23
7/24/23
8/2/23
8/23/23
9/13/23
10/4/23

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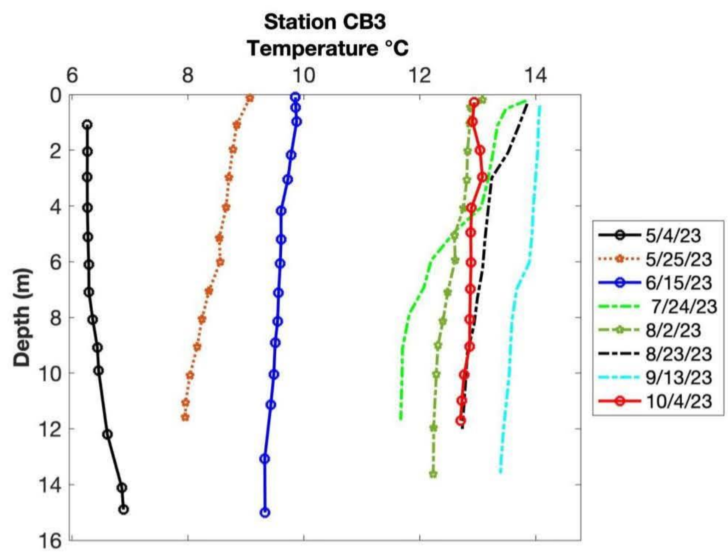
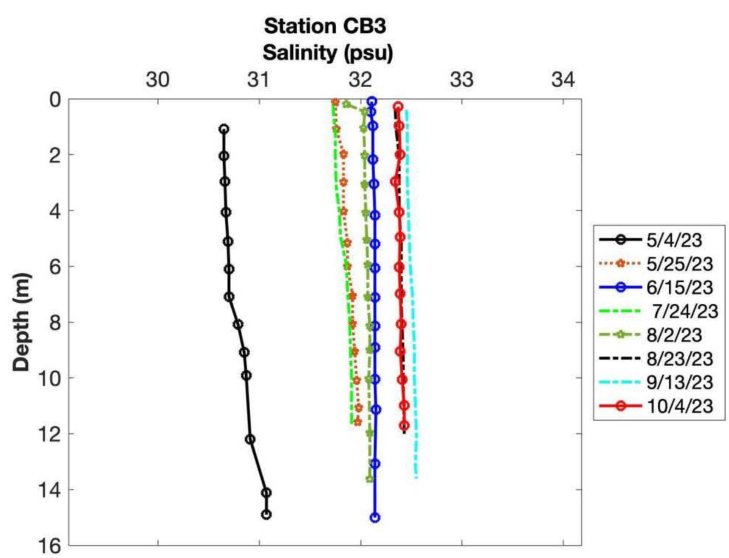

Station CB3
Temperature °C
6
8
10
12
14
0
2
4
6
8
10
12
14
16
Depth (m)
5/4/23
5/25/23
6/15/23
7/24/23
8/2/23
8/23/23
9/13/23
10/4/23


Station CB3
Salinity (psu)
30
31
32
33
34
0
2
4
6
8
10
12
14
16
Depth (m)
5/4/23
5/25/23
6/15/23
7/24/23
8/2/23
8/23/23
9/13/23
10/4/23

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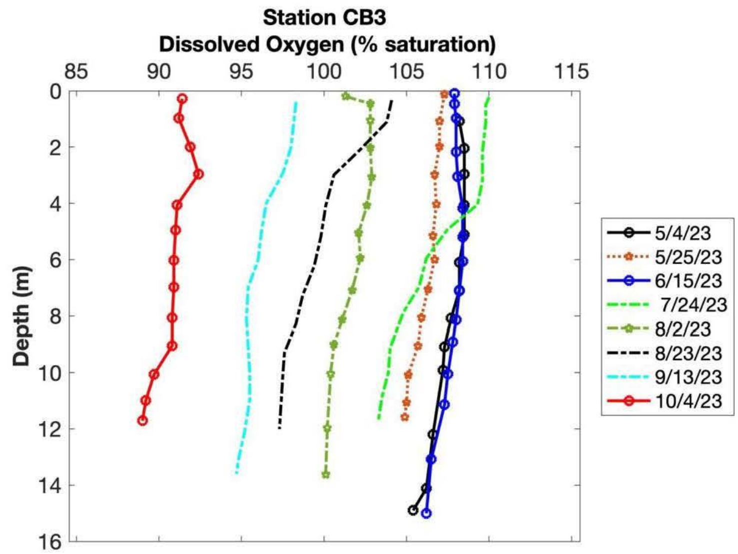

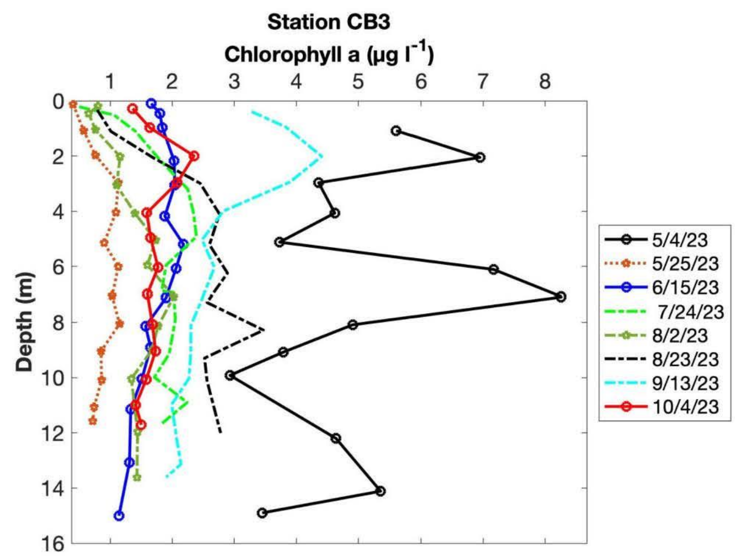

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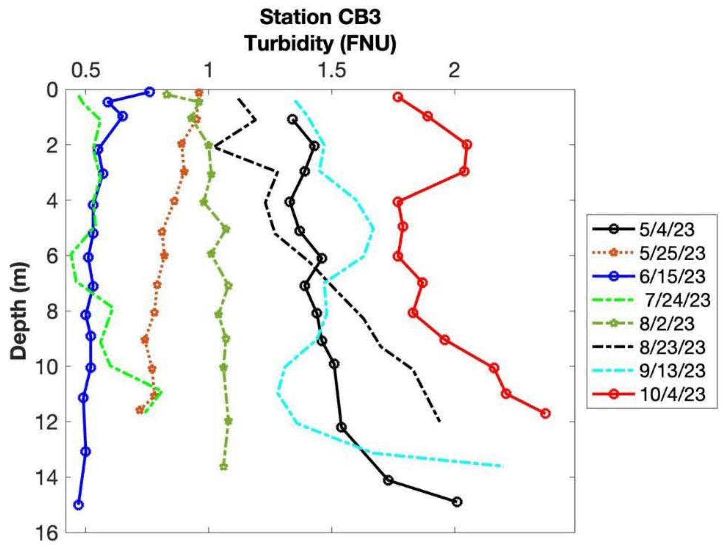
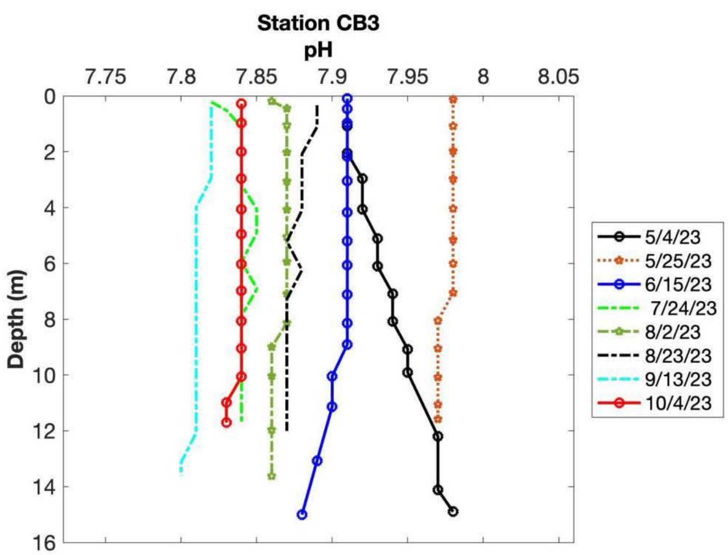
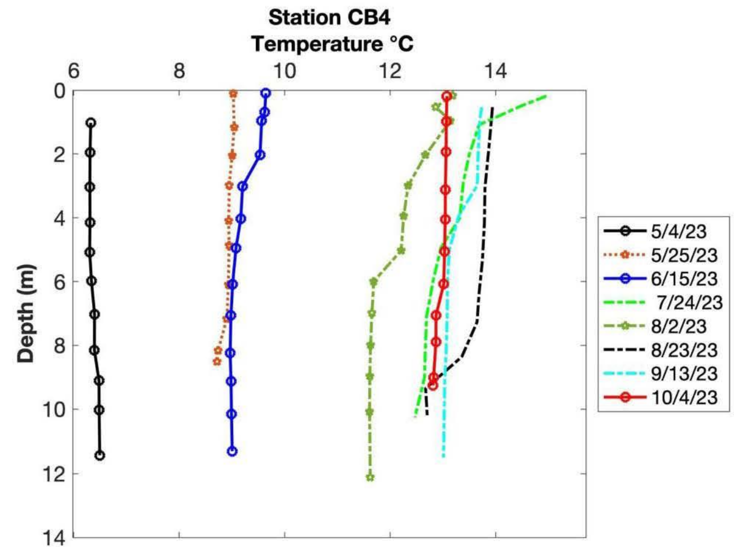
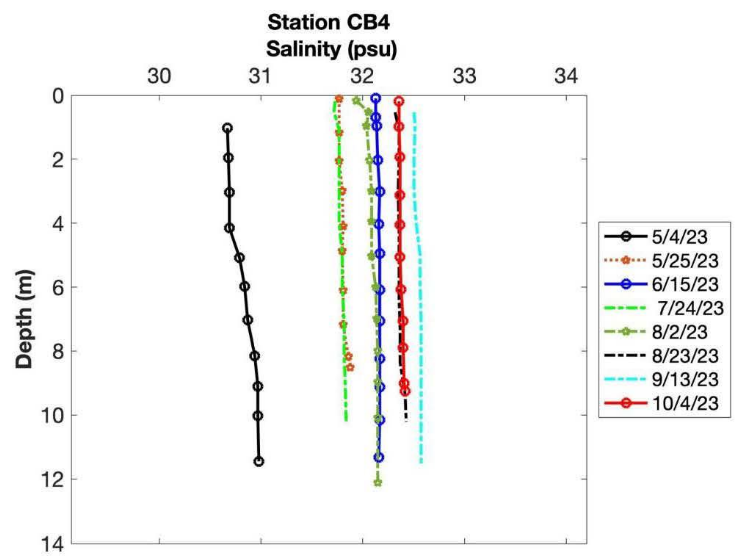

Station CB3
Turbidity (FNU)
Depth (m)
5/4/23
5/25/23
6/15/23
7/24/23
8/2/23
8/23/23
9/13/23
10/4/23


Station CB3
pH
Depth (m)
5/4/23
5/25/23
6/15/23
7/24/23
8/2/23
8/23/23
9/13/23
10/4/23


Station CB4
Temperature °C
6
8
10
12
14
0
2
4
6
8
10
12
14
Depth (m)
5/4/23
5/25/23
6/15/23
7/24/23
8/2/23
8/23/23
9/13/23
10/4/23


Station CB4
Salinity (psu)
30
31
32
33
34
0
2
4
6
8
10
12
14
Depth (m)
5/4/23
5/25/23
6/15/23
7/24/23
8/2/23
8/23/23
9/13/23
10/4/23

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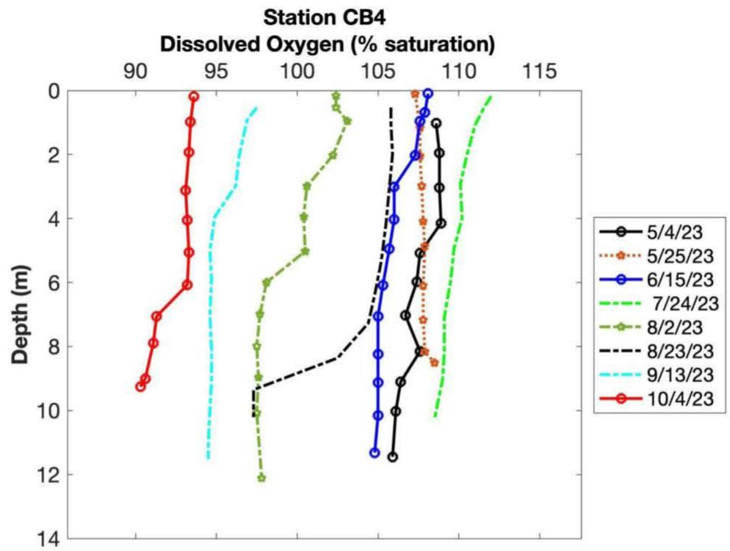

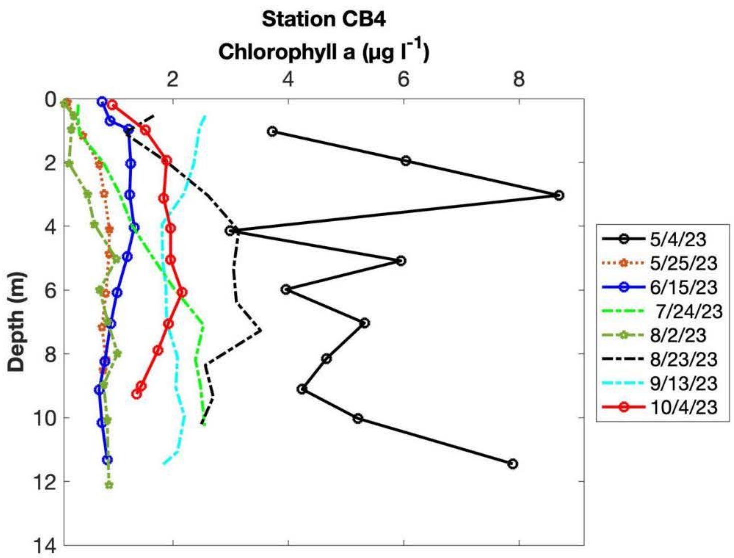

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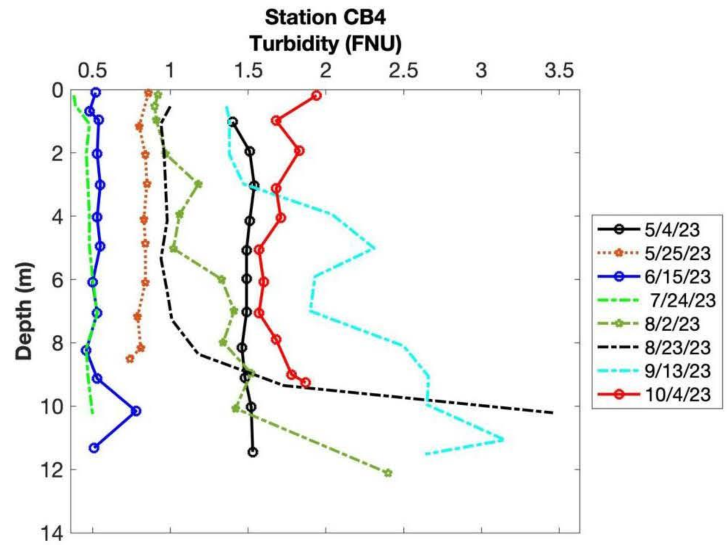
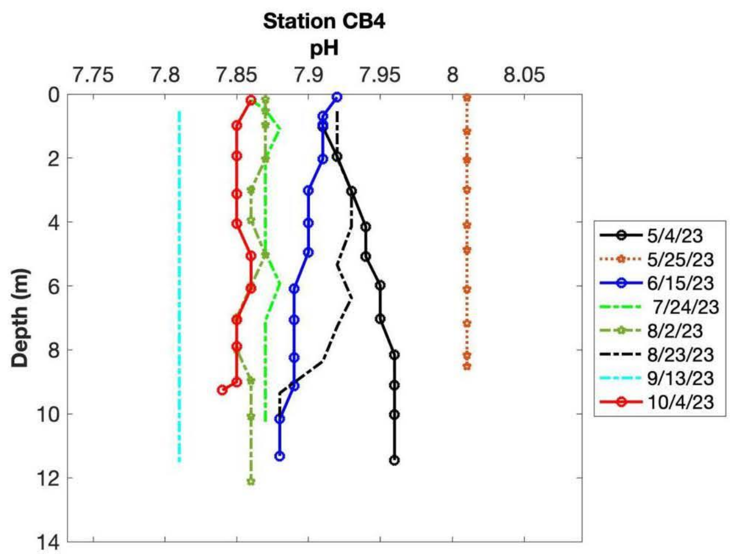
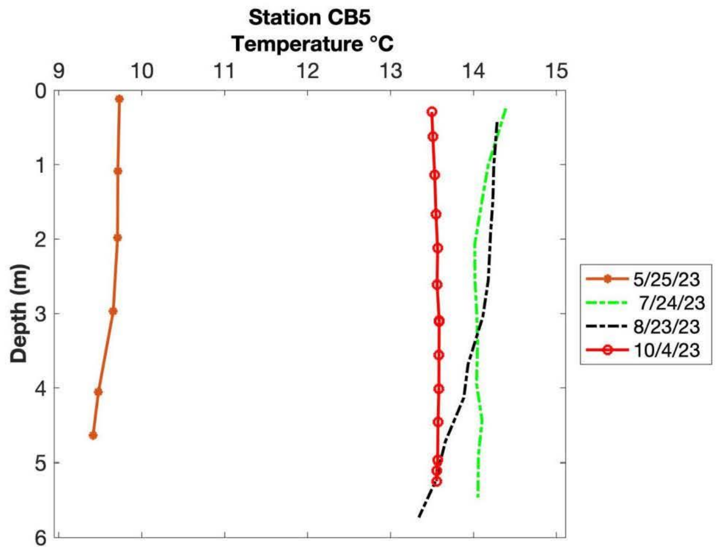
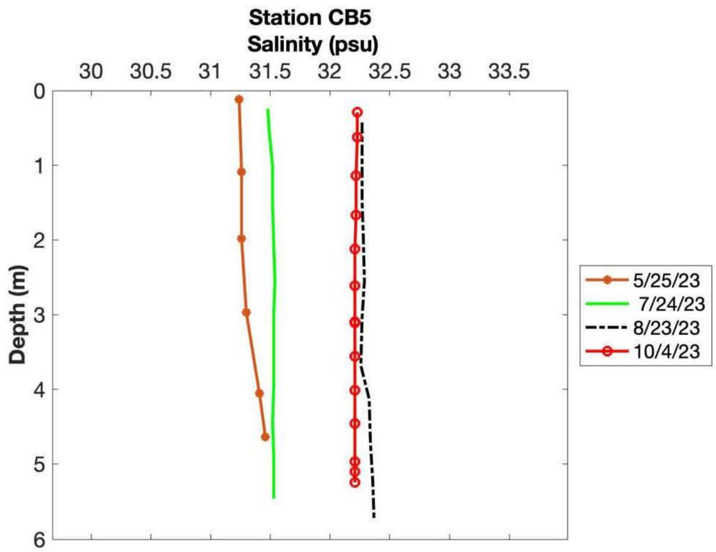
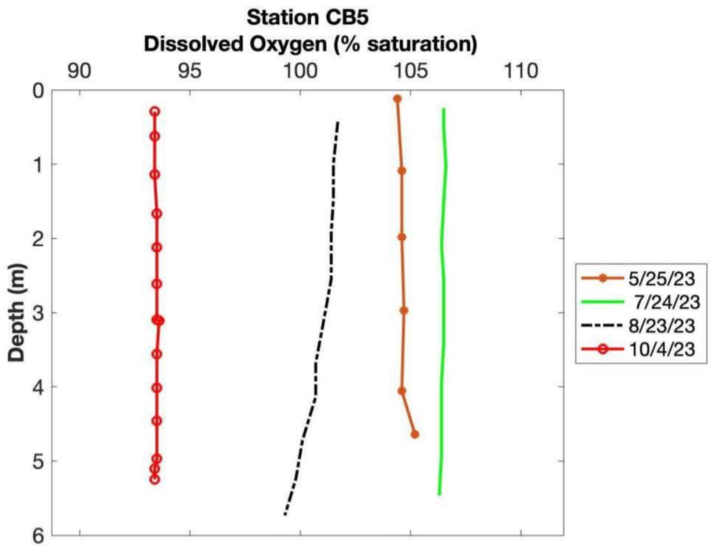
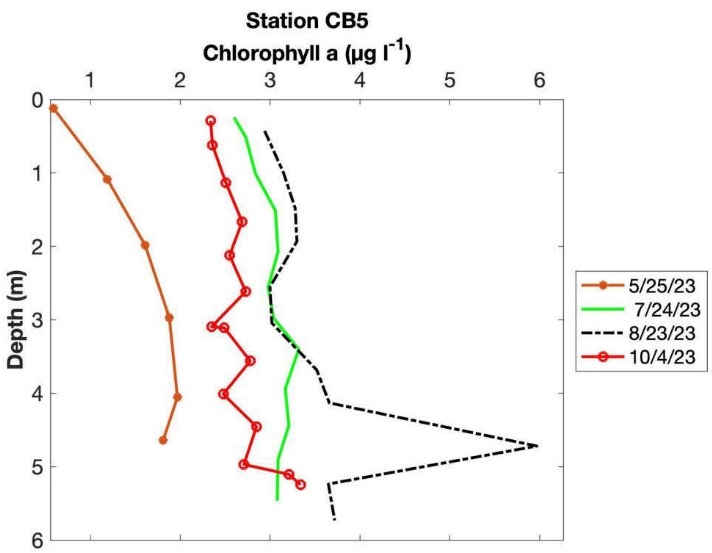

Station CB4
Turbidity (FNU)
0.5
1
1.5
2
2.5
3
3.5
0
2
4
6
8
10
12
14
Depth (m)
5/4/23
5/25/23
6/15/23
7/24/23
8/2/23
8/23/23
9/13/23
10/4/23

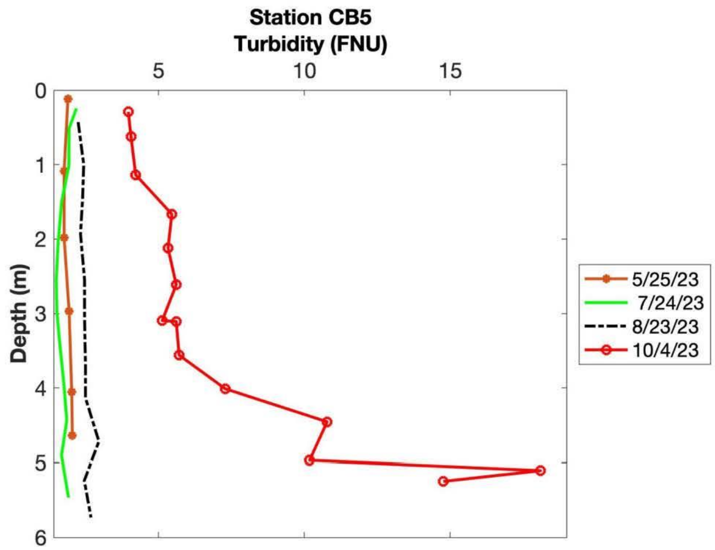

Station CB4
pH
7.75
7.8
7.85
7.9
7.95
8
8.05
0
2
4
6
8
10
12
14
Depth (m)
5/4/23
5/25/23
6/15/23
7/24/23
8/2/23
8/23/23
9/13/23
10/4/23

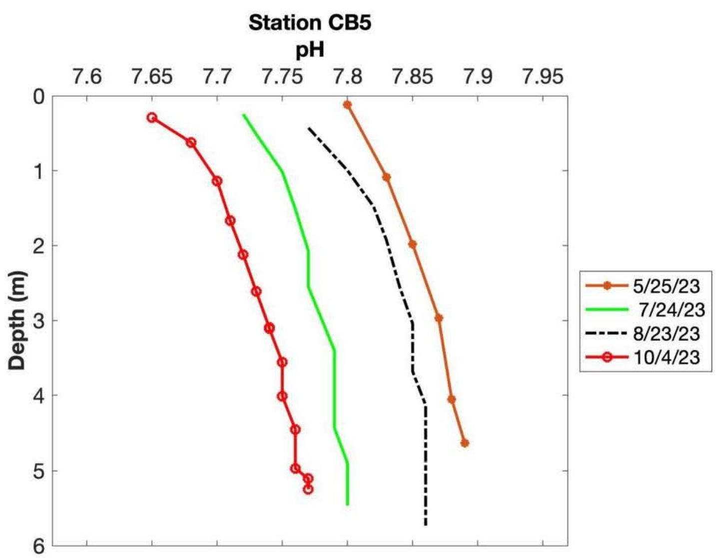

Station CB5
Temperature °C
9 10 11 12 13 14 15
0 1 2 3 4 5 6
Depth (m)
5/25/23
7/24/23
8/23/23
10/4/23

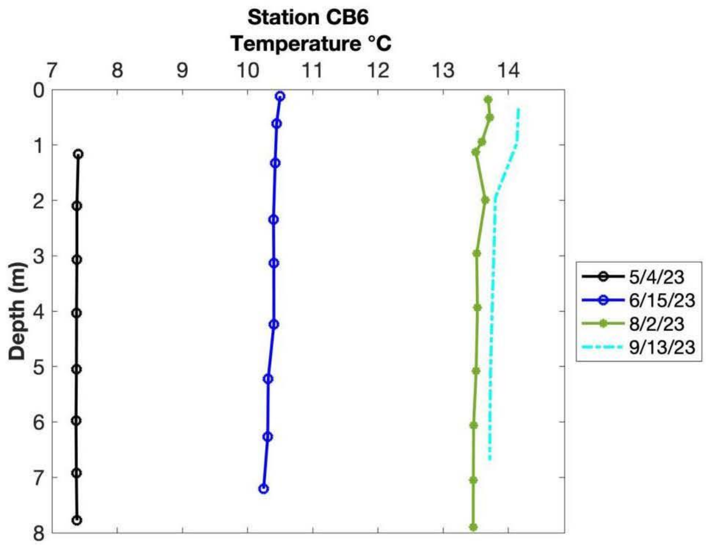

Station CB5
Salinity (psu)
30 30.5 31 31.5 32 32.5 33 33.5
0 1 2 3 4 5 6
Depth (m)
5/25/23
7/24/23
8/23/23
10/4/23

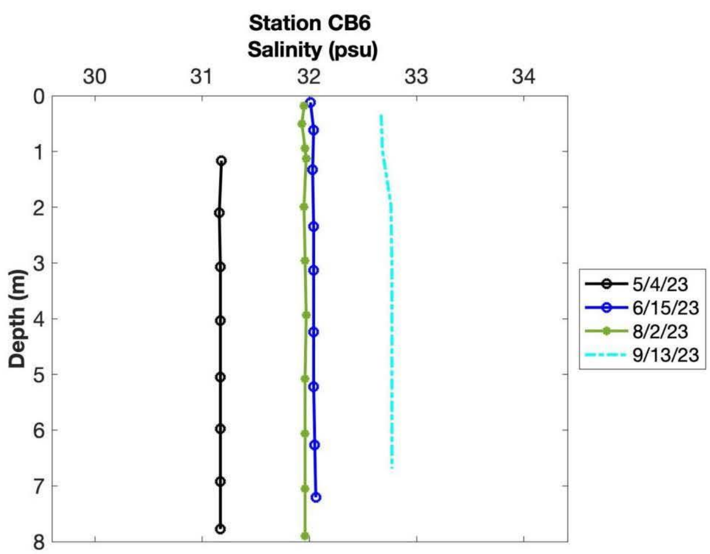

Station CB5
Dissolved Oxygen (% saturation)
90
95
100
105
110
0
1
2
3
4
5
6
Depth (m)
5/25/23
7/24/23
8/23/23
10/4/23

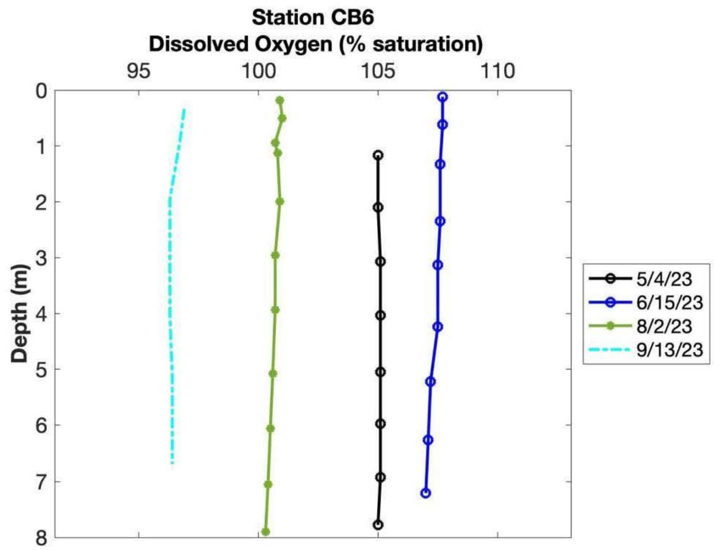

Station CB5
Chlorophyll a ($\mu g\ l^{-1}$)
1
2
3
4
5
6
0
1
2
3
4
5
6
Depth (m)
5/25/23
7/24/23
8/23/23
10/4/23

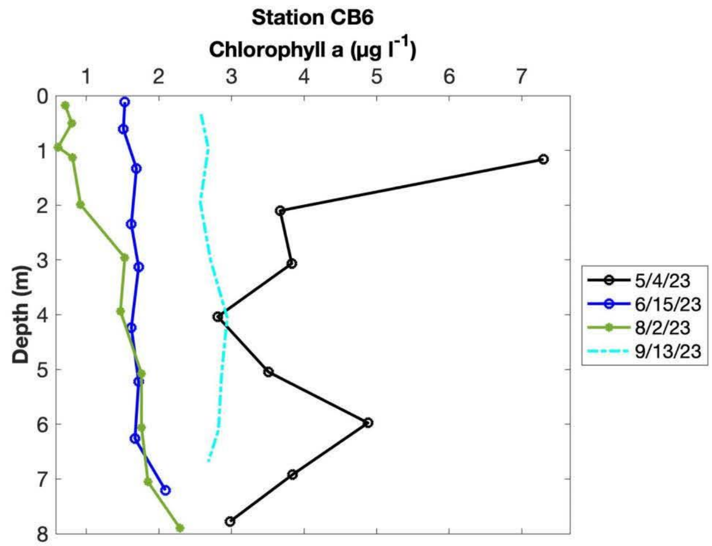

Station CB5
Turbidity (FNU)
5
10
15
0
1
2
3
4
5
6
Depth (m)
5/25/23
7/24/23
8/23/23
10/4/23


Station CB5
pH
7.6
7.65
7.7
7.75
7.8
7.85
7.9
7.95
0
1
2
3
4
5
6
Depth (m)
5/25/23
7/24/23
8/23/23
10/4/23


Station CB6
Temperature °C
7 8 9 10 11 12 13 14
Depth (m)
0 1 2 3 4 5 6 7 8
5/4/23
6/15/23
8/2/23
9/13/23


Station CB6
Salinity (psu)
30 31 32 33 34
Depth (m)
0 1 2 3 4 5 6 7 8
5/4/23
6/15/23
8/2/23
9/13/23


Station CB6
Dissolved Oxygen (% saturation)
95
100
105
110
0
1
2
3
4
5
6
7
8
Depth (m)
5/4/23
6/15/23
8/2/23
9/13/23


Station CB6
Chlorophyll a ($\mu g\ l^{-1}$)
1
2
3
4
5
6
7
0
1
2
3
4
5
6
7
8
Depth (m)
5/4/23
6/15/23
8/2/23
9/13/23

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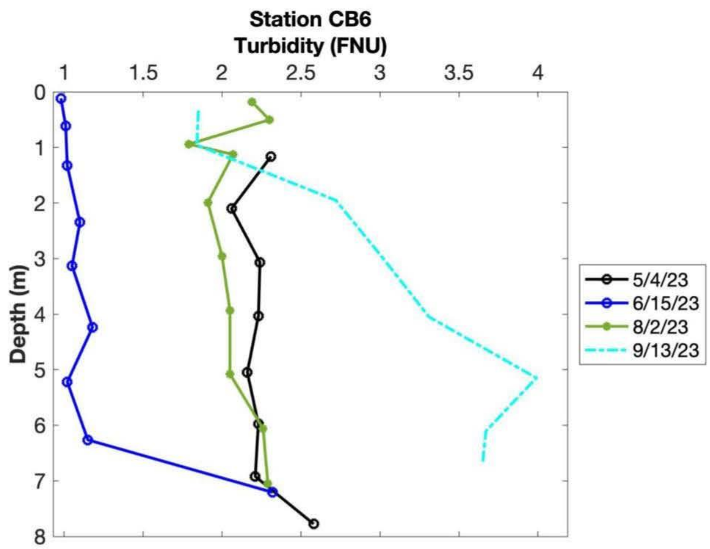

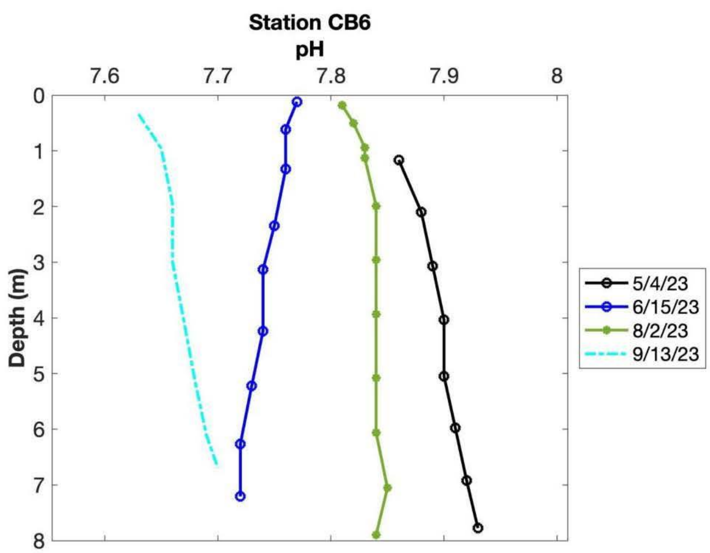

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Appendix C - Results of Laboratory Analysis

Table of Data

Note: For information on QC data for nutrient analysis, please see detailed laboratory reports. Replicate sample data are included in Appendix H but are not included in the following graphs.

Chlorophyll a (microg/l)	4MAY23	25MAY23	15JUN23	24JUL23	2AUG23	23AUG23	13SEP23	4OCT23
CB1S	3.372	1.463	1.021	2.048	0.65	2.457	1.266	1.158
CB1B	3.59	1.534	1.219	2.044	0.999	3.216	1.474	1.004
CB2S	4.225	2.16	0.858	1.915	0.797	2.184	1.53	1.664
CB2B	3.216	1.473	1.274	1.921	1.057	2.01	1.485	1.710
CB3S	4.983	1.194	2.054	2.016	0.511	2.467	2.152	1.283
CB3B	3.703	0.99	1.054	1.721	0.935	2.352	1.406	1.276
CB4S	3.095	1.015	1.212	1.175	0.738	2.308	1.453	1.518
CB4B	3.244	1.137	0.627	1.851	0.73	3.027	1.293	1.376
CB5S	NA	1.287	NA	2.44	NA	3.654	NA	2.075
CB5B	NA	1.946	NA	2.659	NA	2.309	NA	2.114
CB6S	2.633	NA	1.092	NA	1.082	NA	1.427	NA
CB6B	5.105	NA	1.029	NA	0.846	NA	2.049	NA

Chlorophyll a (microg/l) - Note: U - Parameter was not detected in the sample. J - Measurement below RL but above MDL, H - Analysis was performed out of hold time (see note in narrative)..

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Phaeophytin (microg/l)	4MAY23	25MAY23	15JUN23	24JUL23	2AUG23	23AUG23	13SEP23	4OCT23
CB1S	1.0491	0.3998	0.2615	0.4745	0.2296	1.2114	0.5685	0.420
CB1B	0.916	0.2639	0.2754	0.6174	0.4994	0.6162	0.8035	0.257
CB2S	0.9337	U	0.3512	0.5619	0.2736	0.3446	0.7019	0.540
CB2B	0.8157	0.2071	0.2535	0.5755	0.3614	0.4472	0.7017	0.454
CB3S	0.5027	0.2618	0.4709	0.4980	0.2623	U	0.7413	0.183
CB3B	0.4647	0.4765	0.2740	0.5664	0.4207	0.3492	0.5981	0.314
CB4S	0.3903	0.1588	0.2101	0.3821	0.2032	0.3668	0.5098	0.231
CB4B	0.5105	0.3875	0.2158	0.5141	0.2344	U	0.6663	0.318
CB5S	NA	0.1485	NA	0.6644	NA	1.0653	NA	0.765
CB5B	NA	0.2070	NA	0.7904	NA	0.6591	NA	1.713
CB6S	0.9708	NA	0.3524	NA	0.3942	NA	0.5204	NA
CB6B	U	NA	0.2501	NA	0.3766	NA	0.9924	NA

Phaeophytin (microg/l) - Note: U - Parameter was not detected in the sample. J - Measurement below RL but above MDL, H - Analysis was performed out of hold time (see note in narrative)..

TP (mg l^{-1})	4MAY23	25MAY23	15JUN23	24JUL23	2AUG23	23AUG23	13SEP23	4OCT23
CB1S	0.0933	0.0901	U	U	U	U	0.1354	U
CB1B	U	U	U	U	U	U	0.1075	U
CB2S	0.1865	U	U	U	U	U	0.1223	U
CB2B	0.0771 J	U	U	U	U	U	U	0.0776 J
CB3S	0.0862	0.1677	U	U	U	U	U	U
CB3B	0.0830 J	U	U	U	U	U	0.1058	U
CB4S	0.4030	U	U	U	U	U	U	U
CB4B	U	0.1709	U	U	U	U	0.1017	U

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CB5S	NA	0.1644	NA	U	NA	U	NA	U
CB5B	NA	0.1230	NA	U	NA	U	NA	0.1274
CB6S	0.1011	NA	0.0764 J	NA	0.0751 J	NA	0.0886	NA
CB6B	0.1102	NA	U	NA	0.0952	NA	U	NA

Total Phosphorus (TP) - Note: U - Parameter was not detected in the sample. J - Measurement below RL but above MDL. H - Analysis was performed out of hold time (See note in narrative)..

NOx (mg l^{-1})	4MAY23	25MAY23	15JUN23	24JUL23	2AUG23	23AUG23	13SEP23	4OCT23
CB1S	U	U	U	U	U	U	0.0187	0.0805
CB1B	U	U	0.0150	U	0.0176	U	0.0300	0.0829
CB2S	U	U	U	U	U	U	0.0273	0.0700
CB2B	U	U	U	U	U	U	0.0263	0.0746
CB3S	0.0155	U	U	U	U	U	0.0191	0.0816
CB3B	U	U	0.0191	U	0.0138	U	0.0362	0.0908
CB4S	0.0163	U	0.0143	U	U	U	0.0299	0.0807
CB4B	U	U	0.0256	U	0.0239	0.0127 J	0.0484	0.0893
CB5S	NA	U	NA	U	NA	U	NA	0.0696
CB5B	NA	U	NA	U	NA	U	NA	0.0701
CB6S	U	NA	U	NA	U	NA	0.0229	NA
CB6B	U	NA	U	NA	U	NA	0.0214	NA

Nitrate plus Nitrite (NOx) - Note: U - Parameter not detected in the sample. J - Measurement below RL but above MDL.

TN (mg/l)	4MAY23	25MAY23	15JUN23	24JUL23	2AUG23	23AUG23	13SEP23	4OCT23
CB1S	0.1280	0.1078	0.1254	0.1330	U	0.1254	0.1603	0.1783
CB1B	0.1344	0.0976	0.1185	0.1269	U	0.1222	0.1714	0.1694
CB2S	0.1349	0.0873	0.1213	0.1146	0.0996	0.1305	0.1520	0.1553
CB2B	0.1263	0.0967	0.1118	0.1119	0.0986	0.1265	0.1654	0.1465

CB3S	0.1595	0.1002	0.1357	0.1171	U	0.1156	0.1610	0.1477
CB3B	0.1440	0.0766 J	0.1321	0.0976	0.0777 J	0.1216	0.1525	0.1473
CB4S	0.1534	0.0816	0.1253	0.0981	U	0.1076	0.1670	0.1905
CB4B	0.1476	0.1037	0.1227	0.1116	U	0.1195	0.1791	0.1605
CB5S	NA	0.1334	NA	0.1449	NA	0.1331	NA	0.1949
CB5B	NA	0.1172	NA	0.1326	NA	0.1448	NA	0.1944
CB6S	0.1268	NA	0.1768	NA	0.1255	NA	0.1682	NA
CB6B	0.1525	NA	0.1356	NA	0.1015	NA	0.1624	NA

Total Nitrogen (TN).- Note: U - Parameter was not detected in the sample. J - Measurement below RL but above MD

Ammonia (mg l^{-1})	**4MAY23**	**25MAY23**	**15JUN23**	**24JUL23**	**2AUG23**	**23AUG23**	**13SEP23**	**4OCT23**
CB1S	U	0.313	0.021	U	0.015	U	0.043	0.026
CB1B	U	0.304	0.024	U	0.017	U	0.049	0.027
CB2S	U	0.304	0.022	U	0.015	U	0.046	0.013
CB2B	U	0.297	0.015	U	0.016	U	0.045	0.012
CB3S	U	0.304	0.017	U	0.043	U	0.043	0.016
CB3B	U	0.305	0.019	U	0.017	U	0.048	U
CB4S	U	0.311	0.015	U	0.016	U	0.045	0.022
CB4B	U	0.309	0.018	U	0.017	U	0.045	0.015
CB5S	NA	0.302	NA	0.011	NA	U	NA	0.017
CB5B	NA	0.3	NA	0.01	NA	U	NA	0.018

CB6S	U	NA	0.021	NA	0.016	NA	0.049	NA
CB6B	U	NA	0.024	NA	0.017	NA	0.051	NA

Appendix D - Graphs of NOx - N concentrations

Note: Where no data is present on graph, measured NOx - N was below the reporting limit of the method.

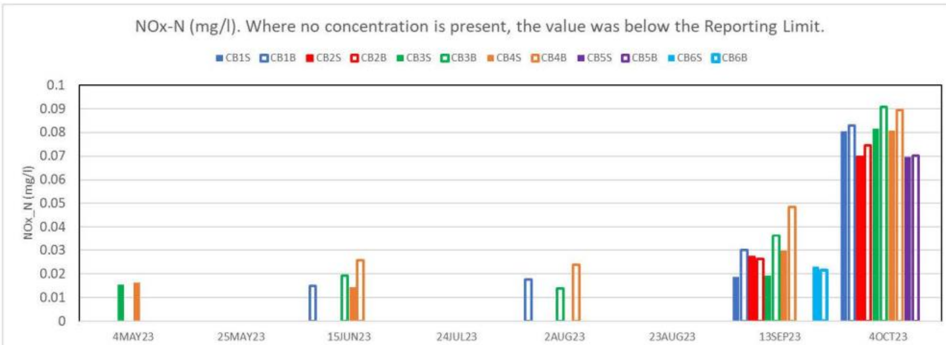

Figure D.1: NOx-N concentrations for all stations and depths.
Concentrations below the reporting limit are not shown

Appendix E - Graphs of Chlorophyll a and Phaeophytin concentrations

Note: Where no data is present the measured analyte was below the reporting limit of the method.

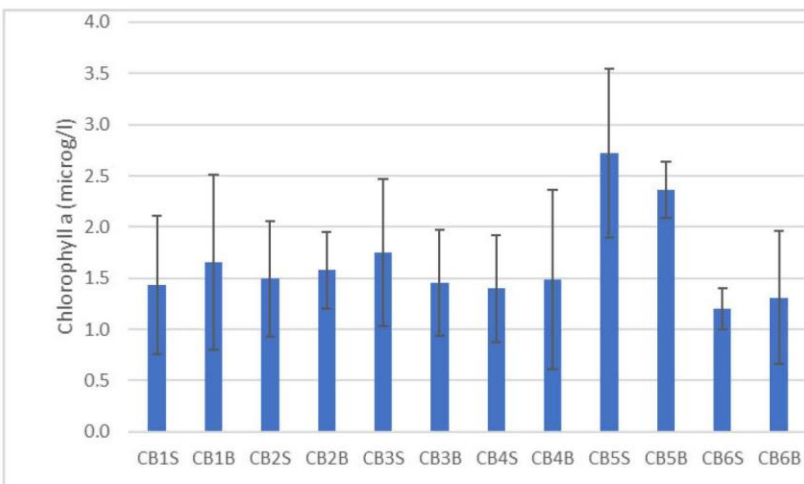

Figure E.1: Seasonally averaged chlorophyll concentrations for each station and depth.
Error bars are standard deviation.

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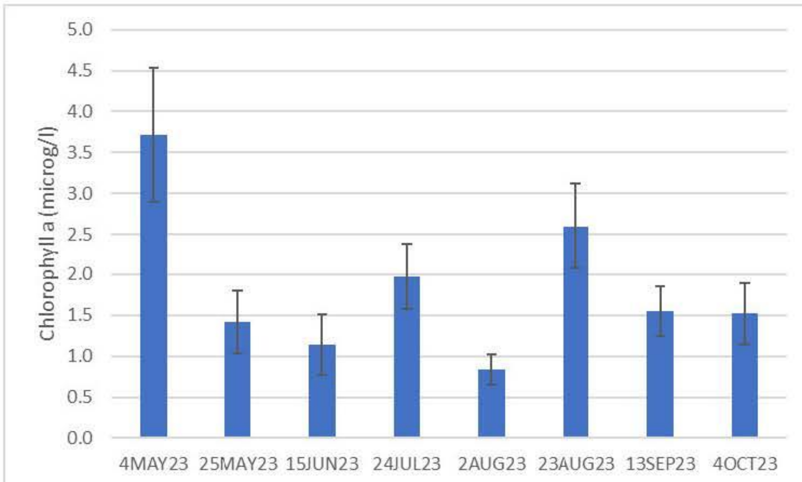

Figure E.2. Chlorophyll concentrations averaged across all stations for each sampling date. Error bars are standard deviation.

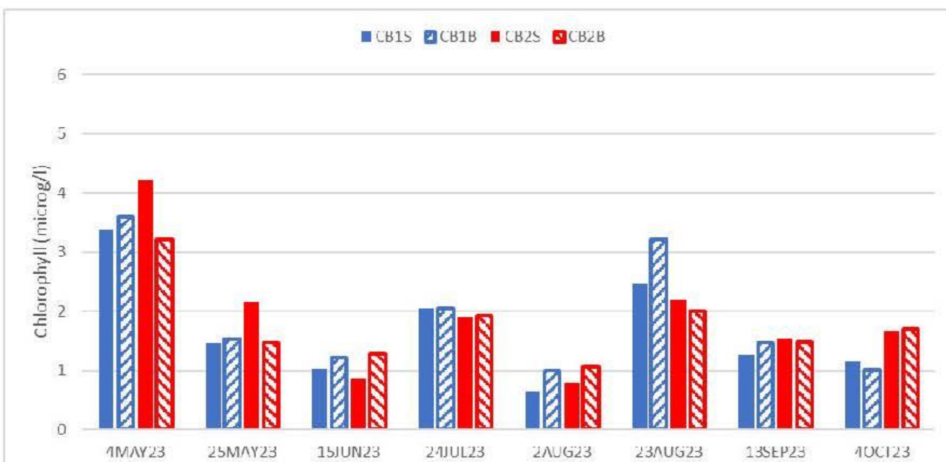

Figure E.3: Chlorophyll concentrations during each sampling for each station and depth for CB1 and CB2.

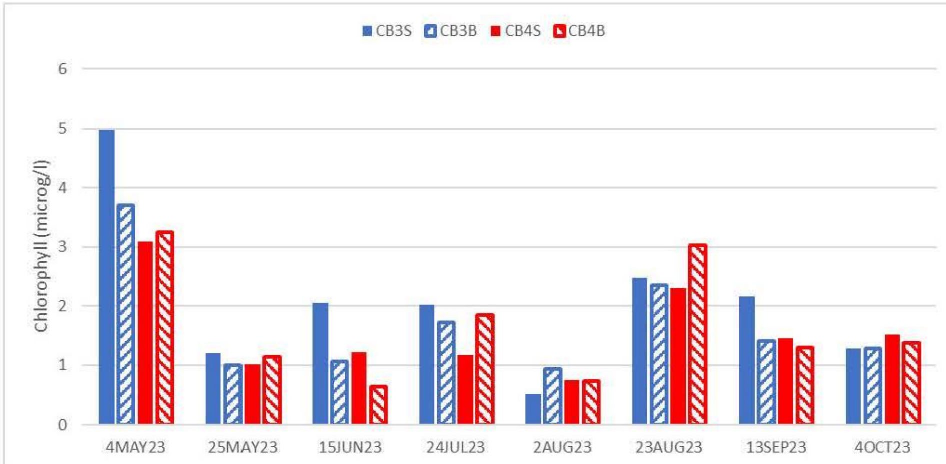

Figure E.4: Chlorophyll concentrations during each sampling for each station and depth for CB3 and CB4.

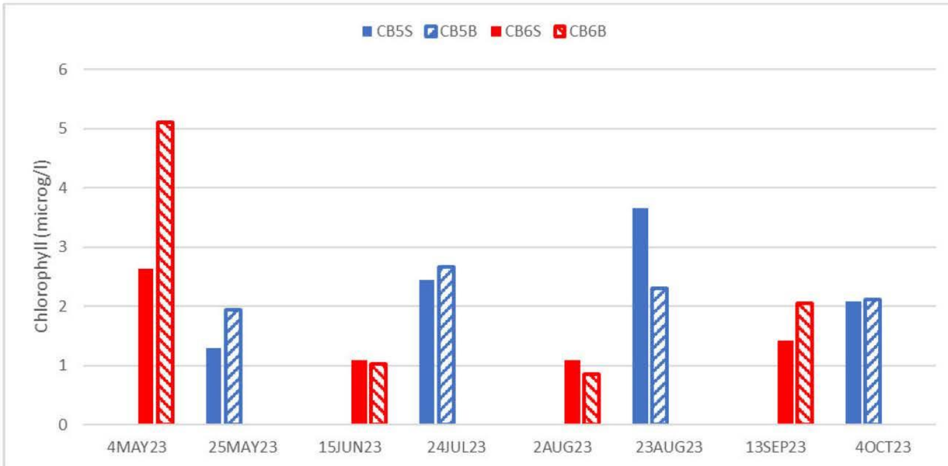

Figure E.5: Chlorophyll concentrations during each sampling for each station and depth for CB5 and CB6.

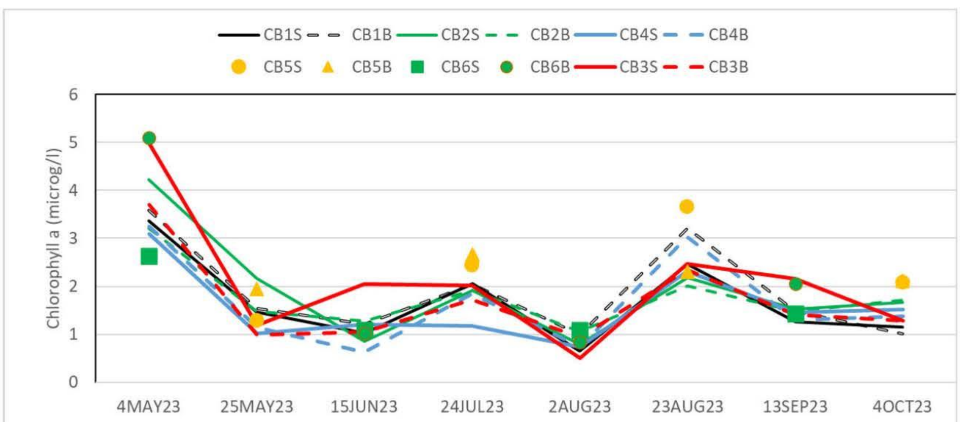

Figure E.6: Chlorophyll a concentrations during each sampling for each station and depth showing the overall trend in chlorophyll a.

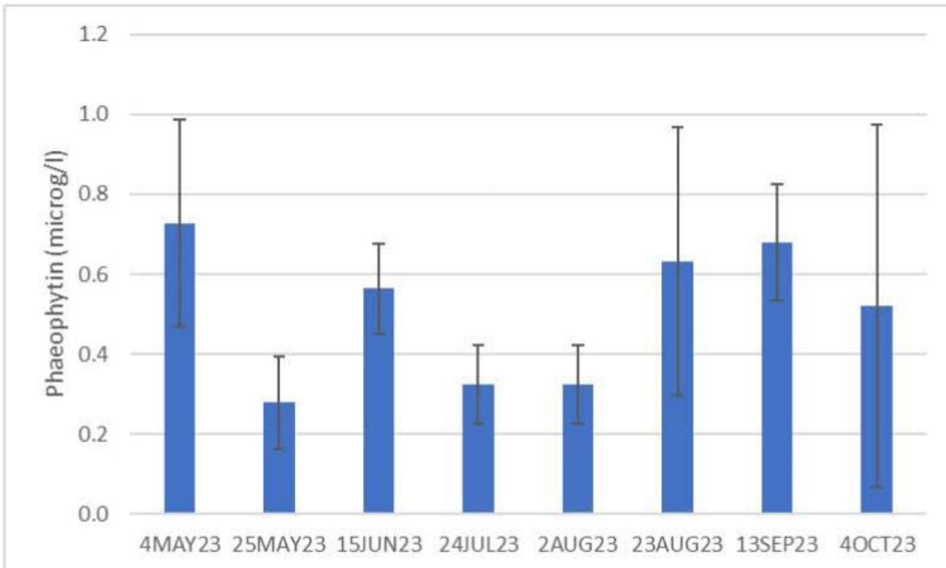

Figure E.6: Phaeophytin concentrations averaged over all stations for each sampling date. Error bars are standard deviation.

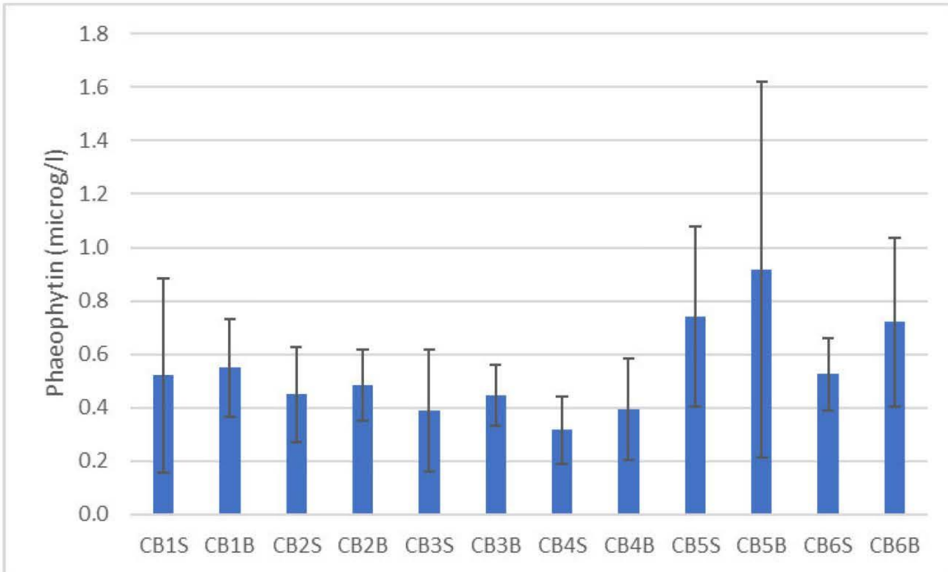

Figure E.7: Seasonally averaged phaeophytin concentrations for each station and depth. Error bars are standard deviation.

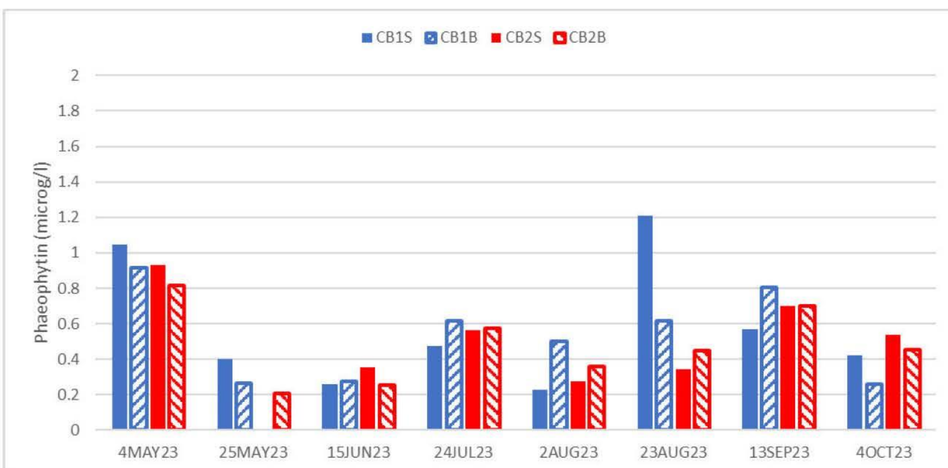

Figure E.8: Chlorophyll concentrations during each sampling for each station and depth for CB1 and CB2.

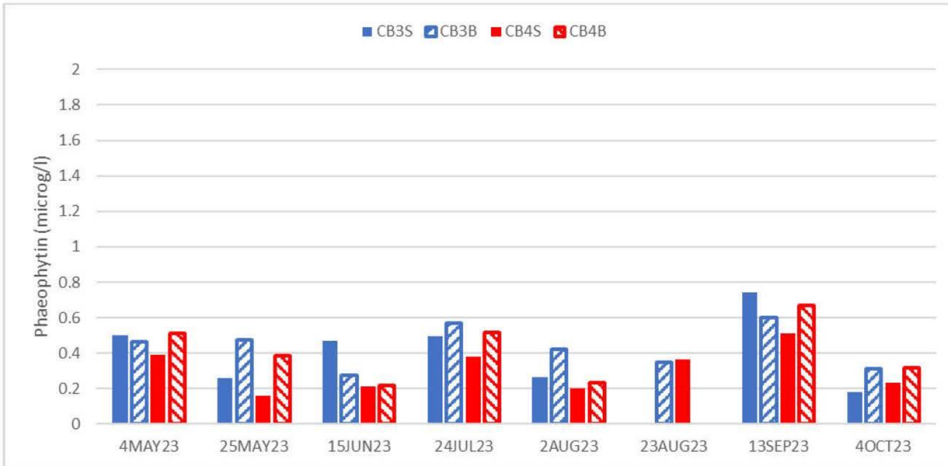

Figure E.9 Chlorophyll concentrations during each sampling for each station and depth for CB3 and CB4.

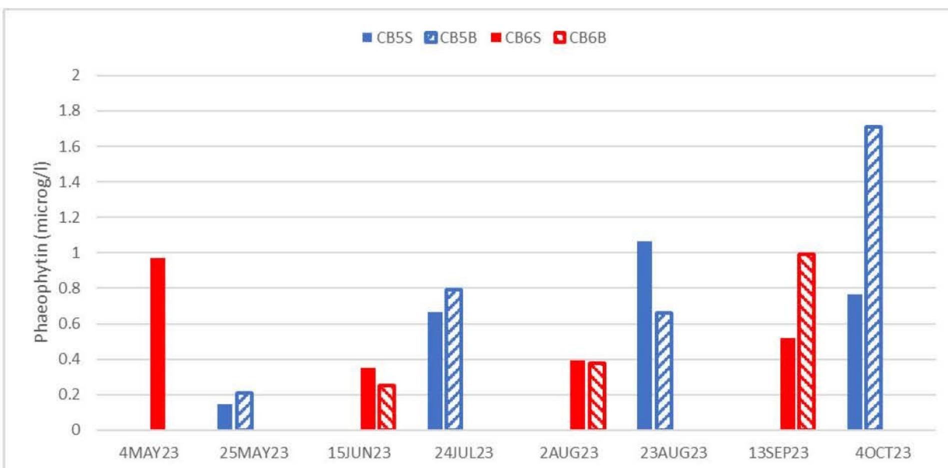

Figure E.10: Chlorophyll concentrations during each sampling for each station and depth for CB5 and CB6.

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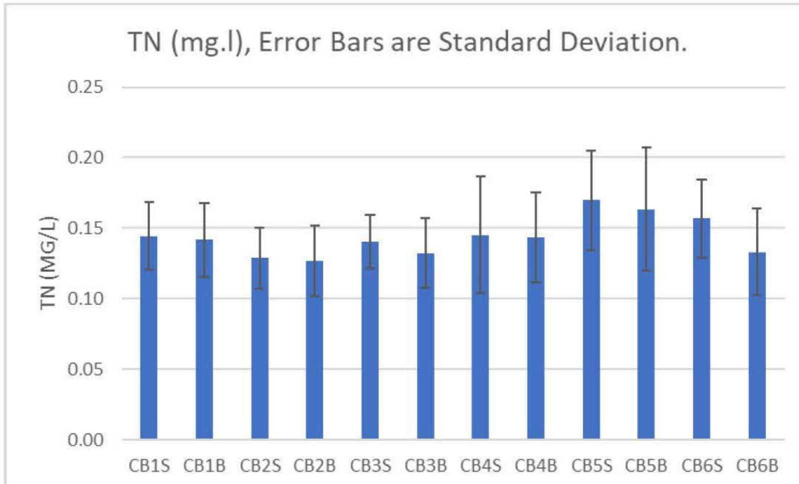

Figure F.1: Seasonally average TN concentrations for each stations/depth. Error bars are standard deviation.

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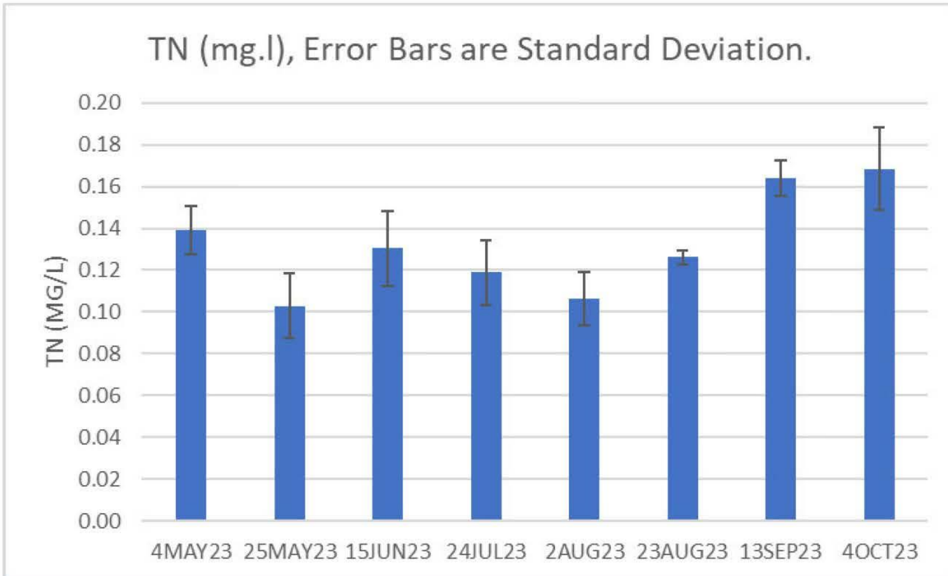


Figure F.2: TN concentrations averaged over all stations for each sampling date. Error bars are standard deviation.

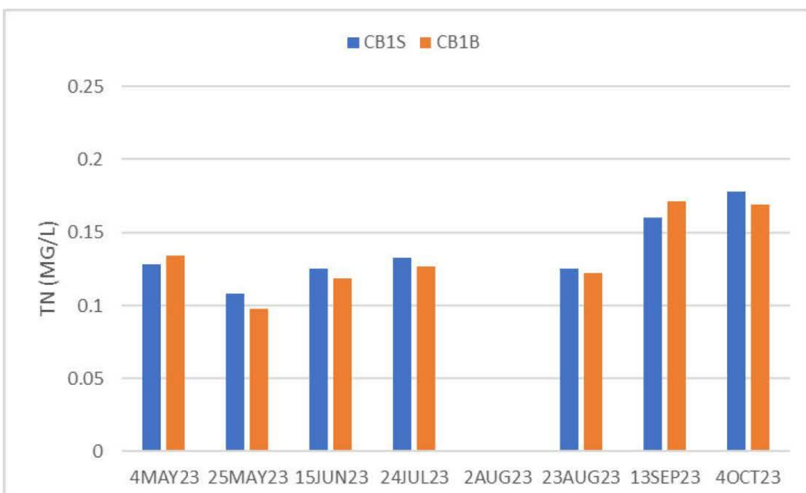


Figure F.3: TN concentration for CB1 for each sampling date.

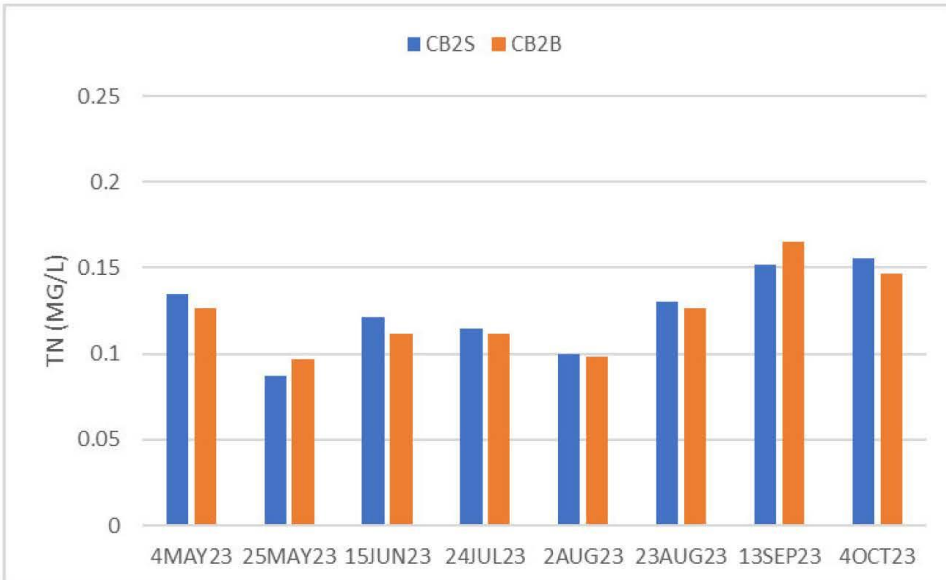


Figure F.4: TN concentration for CB2 for each sampling date.

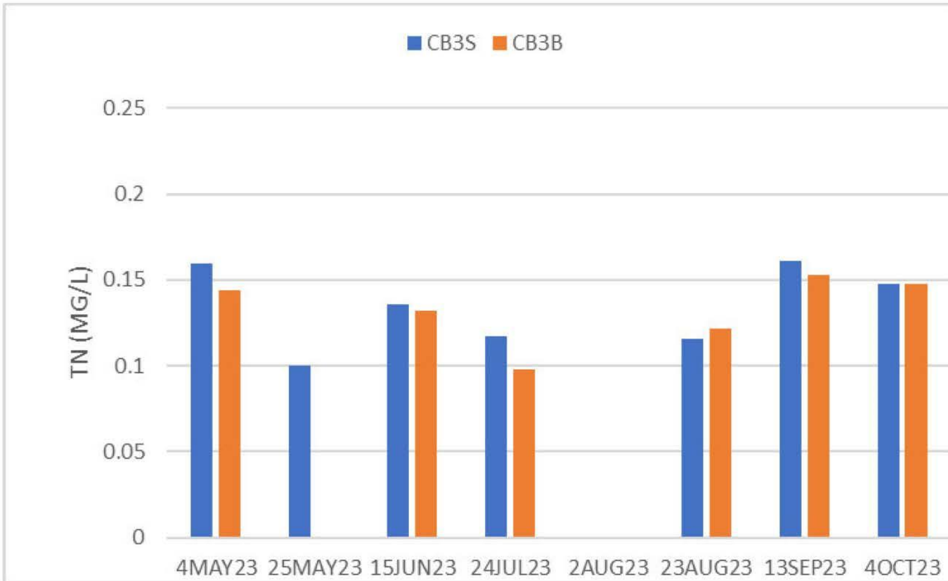


Figure F.5: TN concentration for CB3 for each sampling date.

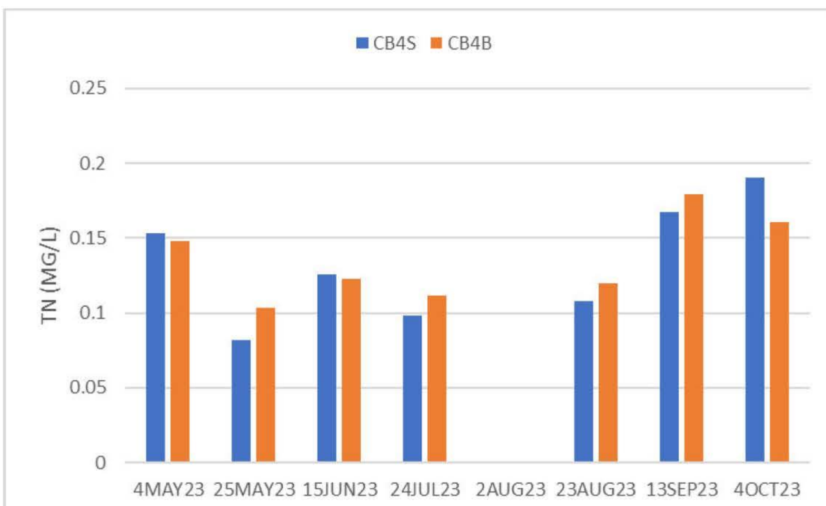


Figure F.6: TN concentration for CB4 for each sampling date.

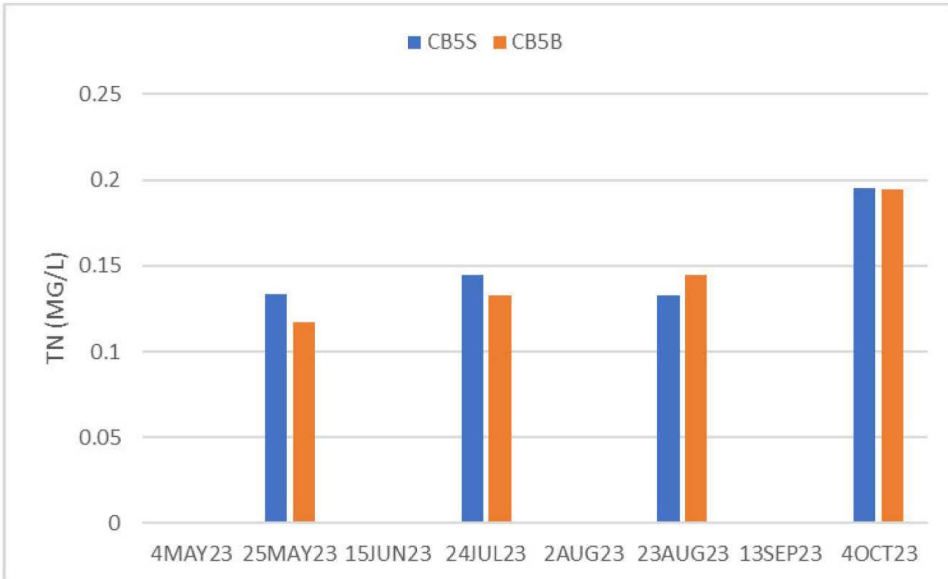


Figure F.:7 TN concentration for CB5 for each sampling date.

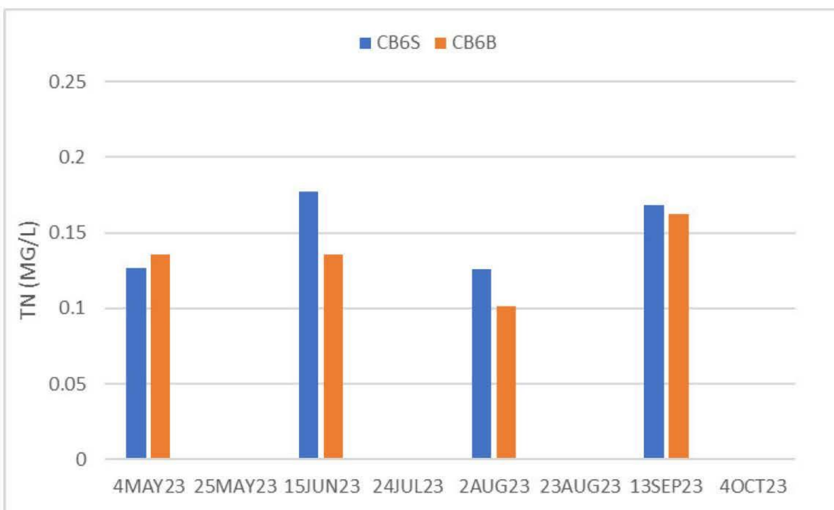


Figure F.8: TN concentration for CB6 for each sampling date.

Appendix G - Graphs of Ammonia concentrations

Note: Where no data is present the measured analyte was below the reporting limit of the method.

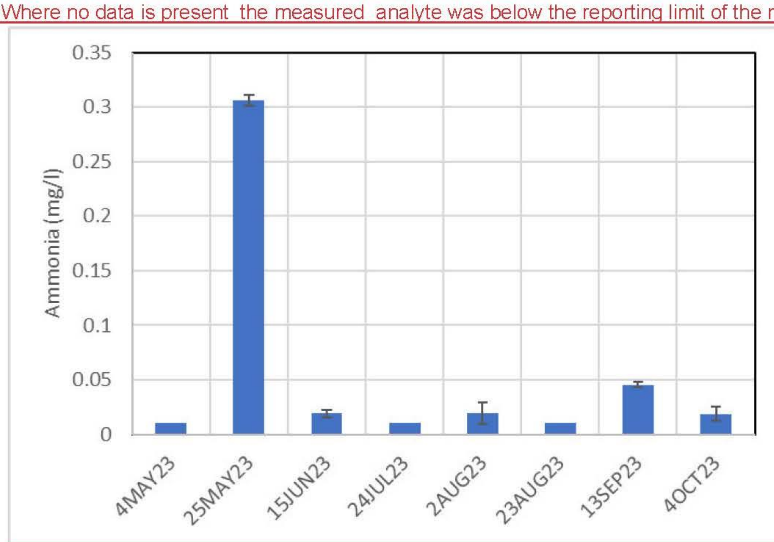


Figure G.1: Ammonia concentration averaged over all stations for each sampling date. Note: Please see text for description of unusually high ammonia concentration on May 25th

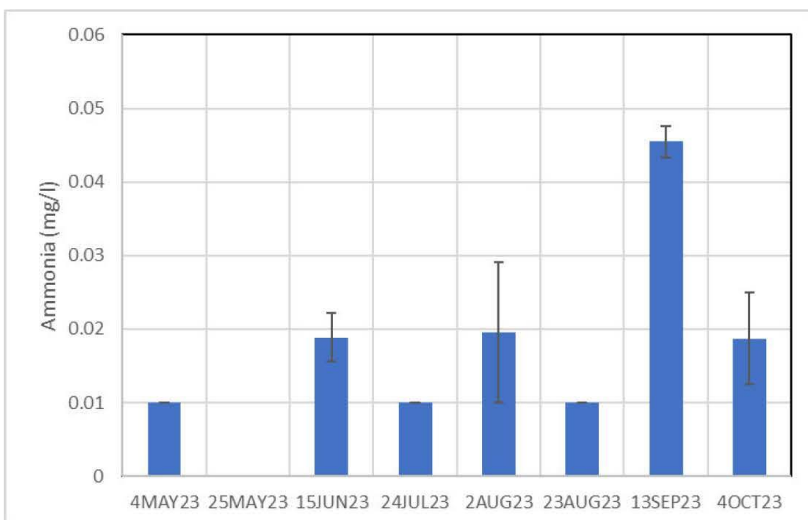


Figure G.1: Ammonia concentration averaged over all stations for each sampling date with removal of May 25th samples. Error bars are standard deviation.

Appendix H - Replicate Samples

4MAY23

Sample Code: CB1B Rep						
Analyte	**Results**	**Flag**	**MDL**	**RL**	**Units**	**Method**
NOx - N	U	U	0.012	0.013	mg/L	353.2
TN	0.1525		0.0733	0.0833	mg/L	MWQLHTCCL
TP	0.1417		0.0740	0.0830	mg/L	365.4
Chlorophyll *a*	2.706		0.0380	0.0770	Microgram/L	SM10200H
Phaeophytin	0.6174	U	0.0380	0.0770	Microgram/L	SM10200H
Ammonia		U	0.003	0.01	mg/L	350.1

25MAY23

Sample Code: CB1B Rep						
Analyte	**Results**	**Flag**	**MDL**	**RL**	**Units**	**Method**
NOx - N	U	U	0.012	0.013	mg/L	353.2
TN	0.1008		0.0733	0.0833	mg/L	MWQLHTCCL
TP	U	U	0.0740	0.0830	mg/L	365.4
Chlorophyll *a*	1.304		0.0380	0.0770	Microgram/L	SM10200H
Phaeophytin	0.4743		0.0380	0.0770	Microgram/L	SM10200H
Ammonia	0.309		0.003	0.01	mg/L	350.1

15JUN23

Sample Code: CB2S Rep						
Analyte	**Results**	**Flag**	**MDL**	**RL**	**Units**	**Method**
NOx - N	U	U	0.011	0.022	mg/L	353.2
TN	0.1398		0.012	0.013	mg/L	MWQLHTCCL
TP	U	U	0.0733	0.0833	mg/L	365.4
Chlorophyll *a*	0.984		0.0740	0.0830	Microgram/L	SM10200H
Phaeophytin	0.2617		0.0380	0.0770	Microgram/L	SM10200H
Ammonia		U	0.003	0.01	mg/L	350.1

24JUL23

Sample Code: CB2B Rep						
Analyte	**Results**	**Flag**	**MDL**	**RL**	**Units**	**Method**
NOx - N	U	U	0.011	0.022	mg/L	353.2
TN	0.1475		0.012	0.013	mg/L	MWQLHTCCL
TP	U	U	0.0733	0.0833	mg/L	365.4

Chlorophyll *a*	1.893		0.0740	0.0830	Microgram/L	SM10200H
Phaeophytin	0.5715		0.0380	0.0770	Microgram/L	SM10200H
Ammonia		U	0.003	0.01	mg/L	350.1

2AUG22

Sample Code: CB3S Rep						
Analyte	**Results**	**Flag**	**MDL**	**RL**	**Units**	**Method**
NOx - N	U	U	0.012	0.013	mg/L	353.2
TN	0.1309		0.0733	0.0833	mg/L	MWQLHTCCL
TP	U	U	0.0740	0.0830	mg/L	365.4
Chlorophyll *a*	1.412		0.0380	0.0770	Microgram/L	SM10200H
Phaeophytin	0.4888		0.0380	0.0770	Microgram/L	SM10200H
Ammonia		U	0.003	0.01	mg/L	350.1

23AUG23

Sample Code: CB3B Rep						
Analyte	**Results**	**Flag**	**MDL**	**RL**	**Units**	**Method**

NOx - N	U	U	0.012	0.013	mg/L	353.2
TN	0.1219	U	0.0733	0.0833	mg/L	MWQLHTCCL
TP	U	U	0.0740	0.0830	mg/L	365.4
Chlorophyll *a*	2.444		0.0380	0.0770	Microgram/L	SM10200H
Phaeophytin	0.6487		0.0380	0.0770	Microgram/L	SM10200H
Ammonia		U	0.003	0.01	mg/L	350.1

13SEP23

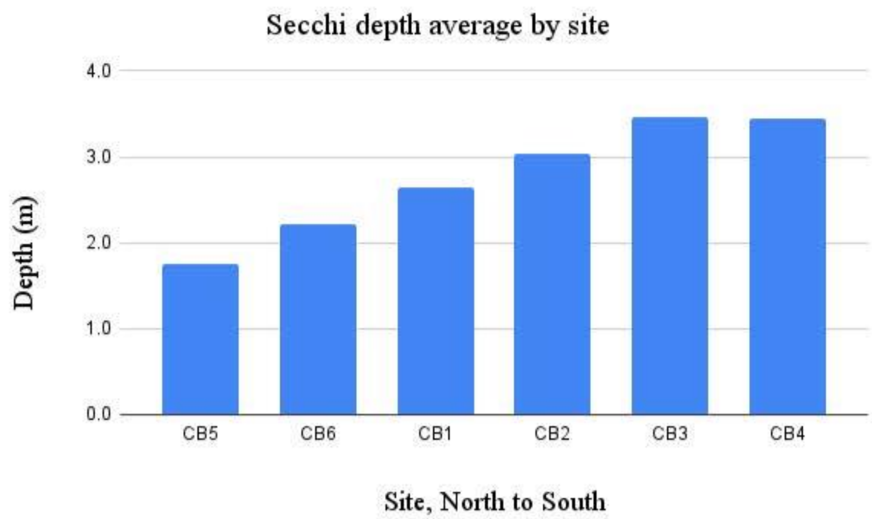
Sample Code: CB4S Rep						
Analyte	**Results**	**Flag**	**MDL**	**RL**	**Units**	**Method**
NOx - N	0.0276		0.012	0.013	mg/L	353.2
TN	0.1670		0.0733	0.0833	mg/L	MWQLHTCCL
TP	U	U	0.0740	0.0830	mg/L	365.4
Chlorophyll *a*	2.444		0.0380	0.0770	Microgram/L	SM10200H
Phaeophytin	0.6487		0.0380	0.0770	Microgram/L	SM10200H

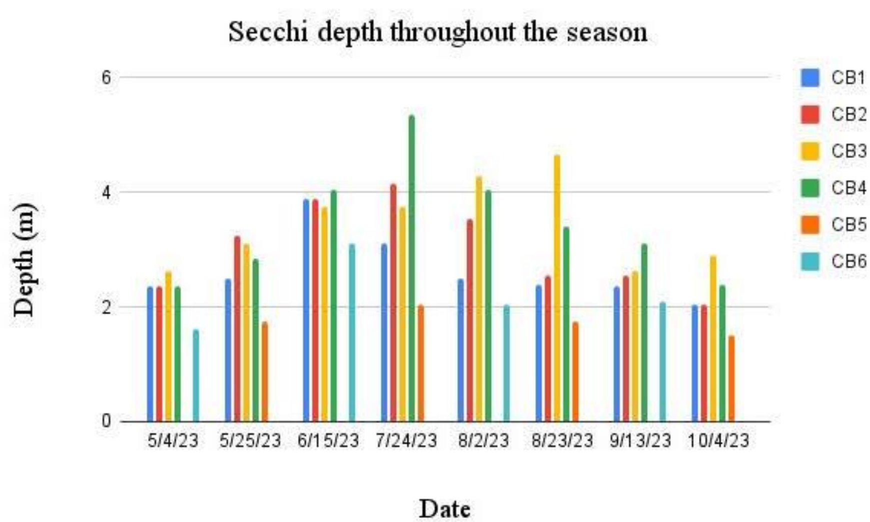
Ammonia	0.044		0.003	0.01	mg/L	350.1

4OCT23

Sample Code: CB4B Rep						
Analyte	**Results**	**Flag**	**MDL**	**RL**	**Units**	**Method**
NOx - N	0.0838		0.012	0.013	mg/L	353.2
TN	0.2741		0.0733	0.0833	mg/L	MWQLHTCCL
TP	U	U	0.0740	0.0830	mg/L	365.4
Chlorophyll *a*	1.200		0.0380	0.0770	Microgram/L	SM10200H
Phaeophytin	0.290		0.0380	0.0770	Microgram/L	SM10200H
Ammonia		U	0.003	0.01	mg/L	350.1

Appendix I
Secchi depth measurements





Report for 2024 Ambient Water Quality Monitoring Plan for Kingfish Maine, Land Based Aquaculture Project Jonesport, Washington County, Maine, USA

1865 THE UNIVERSITY OF MAINE

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Background and Task Description

Kingfish Maine, was issued a Maine Pollutant Discharge Elimination System (MEPDES) Permit #ME0037559 and Maine Waste Discharge License (WDL) (W009238-6F-A-N) on June 25, 2021, for a proposed land-based aquaculture project in Jonesport, Maine. Special Condition H of these approvals requires that Kingfish Maine, starting in 2022, monitor ambient water quality both prior to and continuing through the buildout and operation of the permitted facility. This effort significantly increases the ambient water quality dataset for Chandler Bay, as little background water quality data has been collected prior to this effort. The pre-buildout ambient monitoring provides an assessment of the background nutrient levels of the ambient waters surrounding and expected to be affected by the facility outflow. This document describes the results of 2024 Ambient Water Quality Monitoring season.

Project Organization

Tom Sorby	Tom Sorby Operational Manager Kingfish Maine 33 Salmon Farm Road Franklin, ME. 04634 (502) 614 9078, t.sorby@kinfish-maine.com	Representative of the MEPDES/WDL permittee. Responsible for oversight of the AWQMP and vendor management
Damian Brady	Damian C. Brady, PhD School of Marine Sciences Ira C. Darling Marine Center University of Maine 193 Clarks Cove Road Walpole, ME 04573 207-312-8752, Damian.brady@maine.edu	Responsible for AWQMP implementation, including oversight of sample collection and analysis, data management and security, report production.
Angela Brewer	Section Leader, Marine Unit, Bureau of Water Quality Maine Department of Environmental Protection 17 State House Station, 32 Blossom Lane Augusta, ME 04330 (207) 592-2352, angela.d.brewer@maine.gov	Acts as MDEP Program lead for all monitoring and data management activities covered under the AWQMP.
Gary R. Brooks	Bureau of Water Quality Eastern Maine Regional Office Maine Department of Environmental Protection (207) 592-2795 Gary.R.Brooks@maine.gov	Maine DEP compliance staff person for Kingfish Maine permit.

Other personnel: Trained and experienced University of Maine staff carried out all field sampling, sample collection, sample analysis, data compilation, data visualization and report production. Staff may be assisted by trained interns, graduate students, or other personnel, but in all cases, those assisting will be properly trained for the tasks performed and will act in accordance with the AWQMP.

Data Distribution Statement

Only data that has undergone quality testing and has been verified ready for distribution, will be distributed. An exception may be made for the entities listed in the above "Project Organization" section. Any data distributed to those entities before quality testing and verification would be watermarked "unverified, preliminary data, not for distribution".

Ambient Water Quality Monitoring Plan Overview

Stations

The University of Maine team sampled ambient water quality at 4 pre-determined stations designated by Maine DEP (CB1- 4) and 2 stations determined by the Town of Jonesport planning board (CB5 and CB6) in 2024 (Figure 1, Table 1). Station CB1 is located south of Great Bar. Station CB2 is located near Bar Island, Station CB3, off the southwest shore of Ballast Island Ledge, near the proposed outfall, and Station CB4 is near Bay Ledge. Station CB5 is located north of Great Bar and southeast of Flake Point Bar. Station CB6 is located north of Roque Island. CB5 and CB6 were sampled on alternating cruises, with one of the two being sampled each time. These sites were monitored in the same order on each sampling date; Station CB5 or CB6, followed by CB1, CB2, CB3, and CB4.

Figure 1. Ambient monitoring stations established in the MEPDES permit.

Table 1: Description and geographic coordinates of sampling sites.				
Station:	Coordinates (DD):	Station description:	Maximum depth (m):	Notes:
CB1	44.59209, -67.55317	Great Bar	5	
CB2	44.569433, -67.565643	Bar Island	12	
CB3	44.559541, -67.556639	Ballast Island Ledge	16	
CB4	44.540773, -67.550927	Bay Ledges	14	
CB5	44.60785, -67.55619	Flake Point	6.7	Sampled on flood tides
CB6	44.59461, -67.52935	Roque Island North	8	Sampled on ebb tides

Time of Sampling

As in 2022 and 2023, ambient water quality was monitored at a frequency of once every three weeks between May 1st and October 31st in 2024. Each sampling occurred on the second half of alternating ebb and flood tides within a four-hour sampling window, including 1 hour of slack. Kingfish Maine provided the vessel and captain for the sampling trips. For sampling dates and times, see Table 2.

Date	Sample Window
May 8, 2024	08:31 - 12:31
May 29, 2024	06:54 - 10:54
June 19, 2024	06:36 - 10:36
July 10, 2024	05:38 - 09:38
July 31, 2024	Rescheduled to October 24, 2024 due to vehicle breakdown en route to sampling.
August 21, 2024	09:29 - 13:29
September 11, 2024	07:46 - 11:46
October 2, 2024	08:15 - 12:15
October 24, 2024	08:00 - 12:00

Table 2: Sampling dates for 2024 ambient monitoring. The samplings were scheduled to alternate the 4-hour sampling window between the 2nd half of ebb and flood tides. The July 31st

sample date was rescheduled to October 24th because the UMaine sampling team experienced a vehicle breakdown en route to the sampling location.

Parameters measured

Temperature, depth, salinity, dissolved oxygen, pH, chlorophyll in situ fluorescence, and turbidity were measured by multiparameter sonde. Total Nitrogen (TN), Total Phosphorus (TP), Nitrate plus Nitrite (NOx), and extracted chlorophyll a and phaeopigment samples were collected as grab samples and analyzed in the Marine Water Quality Laboratory (MWQL) at the Darling Marine Center (DMC) which is accredited by the State of Maine to perform the above laboratory analyses. Ammonia grab samples were also taken and sent to ALS Environmental Laboratory in Rochester, NY for analysis as they are accredited by the State of Maine for this analyte. Secchi measurements of water clarity were also made at each station.

Sampling Methods

Sampling methods followed established SOPs (See AWQMP). Deviations from or amendments to existing SOPs will be identified in this report, along with justification for such changes.

Preparation for sampling

Sonde Calibration

The sonde was calibrated 1 business day prior to each sampling event using the recommended solutions or procedures from the manufacturer. New solutions were used for each calibration day. Details of the calibration procedure can be found in Appendix A of the Ambient Water Quality Monitoring Plan.

Labware preparation for TN, TP, NOx, and chlorophyll a samples

For TN. TP and NOx, grab sample bottles and caps, tubes and caps, syringes and plungers were acid washed, rinsed with milliQ water (> 18.0 megohm resistivity) and dried or certified pre-cleaned bottles were purchased for use. Preservative (sulfuric acid) was added to the sample vessels for TP and NOx in the laboratory, prior to sampling. TN bottles did not receive the acid preservative. Extracted chlorophyll samples were collected in brown, HDPE or LDPE bottles which were cleaned with Sparkleen, a general use laboratory cleaner, and rinsed a minimum of 6 times with milliQ water. Cleaning procedures for all labware are documented in the laboratory records. Coolers were cleaned and dried prior to use. Sample bottles and tubes were labeled with the project name, station name or #, depth (surface (S), just below thermocline (T), bottom (B)), date, analyte, and the samplers initials. Enroute to the site, ice was purchased for coolers to maintain the proper temperature of the samples.

Field Sampling

Sonde Profiles

The University of Maine provided experienced technicians to conduct sonde profiles and collect grab samples for each sampling. Ambient water quality was monitored in the field using a YSI EXO 2 multiparameter sonde (Serial number: 20E101357) with an EXO handheld computer for user manipulation of settings, parameter readouts, data logging and display. The sonde was used to measure temperature (°C), salinity (psu), dissolved oxygen (% saturation and mg/L), pH, chlorophyll a (RFU and µg/L), and turbidity (FNU). The YSI EXO II is equipped with the following sensors (QC specifications from manufacturer):

Parameter	Range	Resolution	Accuracy
Pressure/Depth	0-100 m	0.001 m	± 0.004%.
Temperature	-0.5 – 50 °C	0.001 °C	0.01 °C
Conductivity	0-200 mS/cm	0.1 mS/cm	±0.5 % or 0.001 mS/cm w. i. g.
Turbidity	0 - 4000 FNU	0.01 FNU	± 2% or 0.1 FNU
Chlorophyll fluorescence	0 - 400 µg/L	0.1 µg/L	0.1 µg/L
pH	0 - 14	0.01	± 0.1
Dissolved Oxygen	0 - 500 % Air Saturation/0 - 50 mg/l	0.1% Air Saturation/0.01 mg/l	± 1% Air Saturation/± 0.1 mg/L

Table 3: Manufacturers specifications for sonde parameters.

Profile Details

At each site, the sonde was submerged and allowed to equilibrate at approximately 1 meter depth. The sonde was then raised to just below the surface to begin the profile. Measurements were taken at the following depths at each site, allowing the readings to stabilize at each depth sampled:

- 0.2 meters
- 1 meter, followed by 1-meter increments to 10 meters total depth.
- At depths greater than 10 meters measurements were taken in 2-meter increments to a total depth of 20 meters or within 0.5 meters of the bottom.
- If the water column is less than 5 m at a station, data was recorded in 0.5-meter increments instead of 1-meter increments to provide more data points.

Care was taken not to disturb the bottom, as resuspended sediment can interfere with readings and the sonde can be damaged if it contacts the bottom. A window weight was attached to the sonde line and hung below the sonde to provide an indicator of proximity to the bottom by touching the substrate before the sonde. Total depth at the station was determined by the bottom depth reading on the sonde, plus 0.5m to account for the distance from the bottom to the sonde.

Sonde data was saved in real time on the attached handheld control. Each profile had its own file and was labeled with the station name, date and time. All readings were recorded on the downcast of the sonde. A field log was used to record weather conditions, sea conditions, sampling personnel, sample time, as well as any unusual circumstances surrounding the station sampling. In the lab, environmental as well as calibration data was uploaded on a MWQL computer using KOR EXO software, to be manipulated in Microsoft Excel or other spreadsheet software.

Grab Sample Collection

Equipment

All water samples were collected using a weighted 1.7 L Niskin bottle on a measured line.

Niskin preparation

The Niskin bottle was rinsed with tap water after use and stored dry in the lab. The bottle was rinsed with ambient water before samples were collected.

Collection of Grab Samples

The Niskin bottle was lowered to 0.5 m for the surface samples, or 0.5 m above the bottom for bottom samples. If a thermocline, defined as a change of more than 1 degree Centigrade per meter of depth, was present, a sample was collected just above the thermocline. Sonde profiles were collected before the grab samples and the profile was examined to determine if a thermocline was present. A thermocline was present at one station on one sampling date in 2024, occurring on July 10th at CB6.

Water samplers wore gloves and took care not to touch other surfaces while wearing gloves. If gloves were contaminated, they were removed, and a new pair utilized. When handling sample bottles and tubes, the caps and bottle were handled in such a way as to prevent gloves from touching the inside of the cap or bottle or the rim of the bottle. Bottles were filled as quickly as possible and capped immediately. The Niskin bottle was gently mixed between draws from the bottle to resuspend any settling particles. The TP and ammonia samples were drawn from the Niskin bottle directly into the sample bottles which were pre-acidified with sulfuric acid (H_2SO_4). The TN bottles were tripled rinsed with site water prior to filling from the Niskin bottle. The NOx samples were filtered into acid washed 50 ml vials in the field using acid washed and MilliQ rinsed syringes and plungers and disposable 0.45-micron polycarbonate filters. Sulfuric acid was added to the NOx vials prior to collection to acidify the samples for preservation. The brown Chlorophyll bottles were triple rinsed with site water and filled.

Labeling of Grab Samples/Recording of Field Data

The project name, station, date and time of sampling, the depth of sampling, weather, sea conditions, names of staff collecting samples, volume of samples collected, and any unusual circumstances were recorded on waterproof field data sheets. Field sheets were scanned and manually digitized in the laboratory. Bottles were labeled with project, date, station, time of sampling, depth, sampler's initials, and analyte.

Replicate Samples

For each parameter, at least one duplicate sample was taken for every ten samples collected.

Grab Sample Field Storage and Transport

Immediately after collection in the field, sample bottles were placed in Ziploc bags and stored in coolers surrounded by loose ice, in the dark. Samples remained in the coolers until arrival at the MWQL. Temperature of the coolers was monitored by measuring the temperature of a water sample that had been stored with the environmental samples during transit. Samples were stored between 0 ºC and 6 ºC. All transported sample temperatures were within target range for the 2024 sampling.

Sample Handling in the MWQL

Standard operating procedures (SOPs) were followed for the sampling, preservation, transportation, and storage of surface water grab samples. Special permission was granted for the MWQL to allow an 8-hour period between collection and filtration for the Kingfish Maine (Chandler Bay) chlorophyll samples due to the long travel distance required and the availability of test data showing no significant differences in chlorophyll or phaeophytin data obtained from test samples filtered at 6 and 8 hours after collection. Each sample was given a unique MWQL identification which consisted of MWQL batch code which includes the date and project, station code, depth, and replicate number (if more than 1 sample was taken). This unique identification was traced to the field data sheet and the Chain of Custody form, which contained further information. Samples were kept within temperature parameters specified by the laboratory SOPs and this document, until analysis. Temperatures of refrigerators and freezers used to store MWQL samples were monitored on each day that the MWQL was in operation, and the readings recorded in a log.

Method	Analytes	Holding Time (days)	MDL	RL	Units
SM10200H	Chlorophyll a and Phaeophytin	21	0.0173	0.0346	µg/l
MWQL-HTCCL	Total Nitrogen	28	0.053	0.0589	mg/l
EPA 365.4	Total Phosphorus	28	0.0646	0.0730	mg/l
EPA 353.2	Nitrate plus Nitrite	28	0.010	0.011	mg/l
EPA 350.1	Ammonia (Analyzed by ALS)	28	0.006	0.01	mg/l

Table 4: Methods, holding times, minimum detection limit (MDL) and reporting limit (RL) of MWQL methods.

Quality Objectives

Sonde data

All uploaded sonde data spreadsheets were quality-checked and formatted, at which point the raw data files on the handheld computer or sonde were deleted from the file directory. Criteria used to validate raw profile data from discrete sampling followed Table 6 of MDEP's marine monitoring program (MDEP 2017). For raw profile data from discrete sampling, if a data value falls outside of the relevant acceptable range, best professional judgment may override these criteria when supporting data or information suggests a real aberration. If no reasonable explanation exists for an aberration, the data value was flagged in the raw data file and not included in subsequent analyses and reporting.

Parameter	Minimum Value	Maximum Value	
Depth	0.05 m	20 m	Range based on expected conditions within Maine marine surface waters and protocol maximum
Temperature	5 °C	25 °C	Range based on expected seasonality of sampling
Salinity	0 psu	35 psu	Range based on expected location of sampling in Maine marine waters
Dissolved Oxygen	20% saturation	150% saturation	Range based on expected seasonality and location of sampling in Maine marine waters, including extremes based on primary productivity
pH	6.5	9.5	Extremes based on algal bloom conditions, should be verified with dissolved oxygen data and time of day
Turbidity	0 FNU	25 FNU	Negative values should be corrected to 0.0, high values should be verified with adjacent data values and proper functioning of probe wiper
Chlorophyll a	0 µg/L	25 µg/L	Max. value based on algal bloom

Table 5: Ranges of acceptable data for sonde measurements based on Table 6 from MDEP's Marine Monitoring Program. Data outside of these ranges will be flagged if no reasonable explanation exists for the aberration.

Grab Samples

Precision: For activities covered under this AWQMP, precision is measured through an assessment of duplicate spiked matrix samples and replicate field samples. The variability of laboratory blanks and standards are used to evaluate the precision of the analytical method. The variability of both the blank and spiked matrix samples were used to calculate the minimum detection limit and the reporting limit of the analytical method. Specific procedures are available in the specific protocol SOPs.

Accuracy: To determine the accuracy of the laboratory procedures, certified standard solutions (laboratory control samples (LCS)) are analyzed with each sample batch, with the exception of chlorophyll a in which a solid standard is analyzed with each batch, to determine if the readings have drifted from the values obtained during the last calibration with certified standard. The chlorophyll fluorometer was calibrated with liquid certified standard prior to the sampling season and every 6 months..

Representativeness: Sampling stations are chosen based on the current knowledge of the movement of water in the vicinity of the proposed outflow. MDEP selected stations based on the monitoring goals and objectives. The sampling took place in a 4-hour window around the second half of alternating ebb and flood tides with 1 hour of slack tide in the sampling window. This schedule allowed for sampling at both high and low tide to document any variability with the tide cycle. Sampling took place in May through October to capture seasonal variability. The assessment of duplicate grab samples for each sampling event (1 duplicate for each 10 samples collected) provides an assessment of sampling variability.

Comparability: Comparability is addressed by making and recording observations and collecting samples using methodology approved by the MDEP, by using field staff trained and experienced in the sampling methods, and by using methods approved by the MDEP performed by a laboratory accredited by the State of Maine for those methods. Additionally, comparability with historical MDEP datasets will be maintained as much as possible by maintaining regular communication with the MDEP Marine Unit.

Reporting QC Data

Quality control data included in the laboratory reports include, at a minimum, equipment blanks, field duplicates, laboratory control samples, and matrix spikes for nutrient analyses. Laboratory reports also contain a case narrative or equivalent notation, list of qualifiers and definitions, copies of COC form that includes a cooler receipt and preservation check form indicating sample temperature. The samples were in the possession of University of Maine staff from the time of collection to arrival in the laboratory.

Special Training/Certification

Field sampling staff using sonde equipment are trained and monitored by Damian C. Brady, PhD, or qualified staff member under his supervision and in accordance with University of Maine requirements. All data analysis and reporting is subject to the review and approval of Damian C. Brady, PhD, University of Maine. The surface water grab samples were analyzed at the University of Maine Marine Water Quality Laboratory (MWQL), a Maine State accredited laboratory. All staff are trained in relevant SOPs and protocols, all required UM safety training as well as data integrity training. Ammonia samples were analyzed by ALS in Rochester, New York which is accredited by the State of Maine for that protocol.

Documents and Records

Changes to AWQMP

Proposed changes to the AWQMP may result from field conditions, equipment failure or other extenuating circumstances.

Standard Operating Procedures

Standard Operating Procedures are a part of Kingfish Maine's and UM's quality assurance program. For vertical sonde profiling, instruments were calibrated according to manufacturer's instructions prior to each sampling event and the SOP was followed

Data Management

Record Keeping

Records include equipment calibration information and logs, field data sheets, chain-of custody forms, laboratory forms and notebooks, lab reports, field notes, sonde field data and field notes. All information, including lab-generated data, are kept in digital files maintained by the University of Maine MWQL. Lab-generated grab sample data will be submitted in EDD format to MDEP. Files were not deleted or removed from hand-held devices until an electronic or hard copy of the data has been saved appropriately and subjected to data QA/QC screening. In the field, the sonde data were recorded on the instrument and with a secondary method; either hand-written or a screenshot of the sonde handheld data. Anomalous or inconsistent field or lab results have not been deleted but have, instead, been flagged in data sets.
All data is backed up to secure cloud storage. The MWQL uses role-based data access control principles which limit access to data and documents to those specifically authorized as outlined in the MWQL Quality Assurance Manual.

All data resulting from this monitoring program is managed by the University of Maine. The University of Maine field measurements and the lab results are maintained at the Darling Marine Center.
All hard copies of lab and field data sheets, forms and logs have been electronically duplicated and preserved. Sonde data were logged to internal memory on either the handheld computer or sonde, and then raw files were uploaded to spreadsheets upon return to the office and prior to a subsequent sampling event

Reporting

Kingfish Maine will provide the MDEP with an annual report of the monitoring results on or before December 31st of each year. In addition to data tables, graphs, and figures, the report will compare results with previous sampling data (beginning after the second sampling season) and note any anomalous or unusual results. As appropriate, the annual report identifies and clarifies necessary changes to field sampling methods, this AWQMP, or other elements of the monitoring program and, potentially, exclusion from reporting results. Flagged data, if any, will be described in annual reports submitted to MDEP.

Results

Field Sampling

Eight (8) sampling trips were completed in 2024, with five (5) stations sampled during each trip (Table 6). The first sampling trip was on 8 May 2024 and the last trip was on 24 October 2024. The earliest sampling window started at 05:58 AM and the latest started at 09:41 AM (Appendix B). Overall, weather was moderate with air temperatures ranging between 8.9°C to 21.1°C and no notable precipitation occurring during the sampling windows (Appendix B).

One field replicate sample was collected during each trip and rotated through each station and depth (Table 6; Appendix H). A thermocline was only observed once during the sampling season and only occurred at one station (CB6; 10 July 2024).

Table 6: Sampling dates for the 2024 season for the 6 designated sites.

Sampling event	Date	Stations Sampled	Replicate Station & Depth
1	5/8/2024	CB1, CB2, CB3, CB4, CB5	CB4, bottom
2	5/29/2024	CB1, CB2, CB3, CB4, CB6	CB4, surface
3	6/19/2024	CB1, CB2, CB3, CB4, CB5	CB3, bottom
4	7/10/2024	CB1, CB2, CB3, CB4, CB6*	CB3, surface
5	8/21/2024	CB1, CB2, CB3, CB4, CB5	CB2, bottom
6	9/11/2024	CB1, CB2, CB3, CB4, CB6	CB2, surface
7	10/2/2024	CB1, CB2, CB3, CB4, CB5	CB1, bottom
8	10/24/2024	CB1, CB2, CB3, CB4, CB6	CB1, surface

* A thermocline was observed at 2 meters for station CB6 on 7/10/2024. This was the only thermocline observed during sampling trips for the 2024 season.

Sonde profile results

Sonde profile data indicates that all sites were well mixed throughout the season. Most parameters were consistent throughout the profile for each station, with chlorophyll *a* and turbidity showing the most variation (See Appendix B for plots). Chlorophyll values ranged from 0.21 to 12.45 µg/L (Table 7). Maximum site depth ranged from 4.75 to 15.58 meters (Table 8). Dissolved oxygen values ranged from 95.9 to 120.9 % saturation (Table 9). Salinity values ranged from 31.17 to 32.6 PSU (Table 11). Turbidity values ranged from 0.9 to 7.07 FNU (Table 12). pH values ranged from 7.54 to 8.11 (Table 13). Water temperature values ranged from 6.33 to 14.37 °C (Table 14).

Table 7: Statistics for chlorophyll *a* (µg/L) values recorded during sonde profiles			
Station:	Minimum value:	Maximum value:	Average value:
CB1 (n=8)	0.7	8.95	3.86
CB2 (n=8)	0.54	9.48	4.06
CB3 (n=8)	0.21	11.96	3.85
CB4 (n=8)	0.64	10.25	3.31
CB5 (n=4)	1.04	12.45	4.81
CB6 (n=4)	2.25	8.28	4.09

Table 8: Statistics for depth (m) values recorded during sonde profiles			
Station:	Minimum value:	Maximum value:	Average value:
CB1 (n=8)	0.19	4.75	2.16
CB2 (n=8)	0.20	11.43	4.66
CB3 (n=8)	0.20	15.58	6.28
CB4 (n=8)	0.20	12.85	5.42
CB5 (n=4)	0.20	6.17	2.92
CB6 (n=4)	0.13	7.50	3.59

Table 9: Statistics for optical dissolved oxygen (% saturation) values recorded during sonde profiles			
Station:	Minimum value:	Maximum value:	Average value:
CB1 (n=8)	98.3	117.9	104.80
CB2 (n=8)	95.10	118.00	107.39
CB3 (n=8)	98.60	112.70	108.30
CB4 (n=8)	96.00	120.90	106.74
CB5 (n=4)	95.9	118.00	105.82
CB6 (n=4)	98.00	115.30	104.27

Table 10: Statistics for optical dissolved oxygen (mg/L) values recorded during sonde profiles			
Station:	Minimum value:	Maximum value:	Average value:
CB1 (n=8)	8.49	11.09	9.34
CB2 (n=8)	8.27	11.39	9.62
CB3 (n=8)	8.60	11.29	9.92
CB4 (n=8)	8.33	11.22	9.74
CB5 (n=4)	8.12	10.89	9.30
CB6 (n=4)	8.50	9.98	9.22

Table 11: Statistics for salinity (PSU) values recorded during sonde profiles			
Station:	Minimum value:	Maximum value:	Average value:
CB1 (n=8)	31.41	32.55	32.12
CB2 (n=8)	31.40	32.57	32.02
CB3 (n=8)	31.44	32.46	31.98
CB4 (n=8)	31.47	32.60	32.03
CB5 (n=4)	31.17	32.43	31.96
CB6 (n=4)	31.42	32.51	32.15

Table 12: Statistics for turbidity (FNU) values recorded during sonde profiles			
Station:	Minimum value:	Maximum value:	Average value:
CB1 (n=8)	1.49	7.07	3.53
CB2 (n=8)	1.03	3.86	2.17
CB3 (n=8)	0.90	2.88	1.77
CB4 (n=8)	0.98	2.68	1.77
CB5 (n=4)	2.47	7.06	4.50
CB6 (n=4)	1.34	3.02	2.12

Table 13: Statistics for pH values recorded during sonde profiles			
Station:	Minimum value:	Maximum value:	Average value:
CB1 (n=8)	7.65	8.11	7.89
CB2 (n=8)	7.67	8.03	7.89
CB3 (n=8)	7.80	7.98	7.90
CB4 (n=8)	7.66	7.97	7.89
CB5 (n=4)	7.54	8.00	7.77
CB6 (n=4)	7.78	8.03	7.87

Table 14: Statistics for temperature (°C) values recorded during sonde profiles			
Station:	Minimum value:	Maximum value:	Average value:
CB1 (n=8)	7.20	13.56	11.61
CB2 (n=8)	7.52	14.37	11.43
CB3 (n=8)	6.65	13.95	10.39
CB4 (n=8)	6.33	13.41	10.54
CB5 (n=4)	8.20	14.21	12.40
CB6 (n=4)	9.38	13.77	11.87

Nutrient and Chlorophyll Analysis

See Appendix D for tabular data, Appendix E-I for plots of TN, TP, NOx, TN and chlorophyll-a, and Appendix J for field replicate data. For statistical analysis all data values below the MDL were equated to the current MDL for each parameter.

Total Phosphorus (TP)

- IN 2024, mean TP concentrations averaged across all stations were above 0.1 mg/l only in October and May. In 2023, the highest TP occurred in September.
- The overall mean TP for 2024 was 0.09 mg/l, similar to 2023, which was 0.096 mg/l. In 2022 the mean TP was lower at 0.045 mg/l.
- Forty three percent of samples were below the MDL of the method (0.064 mg/l). This compares to only 24% in 2023.
- As in previous years, TP was low in June, July, and August.
- The maximum TP concentration was 0.3030 which occurred on October 24th at the bottom at CB2. The highest concentration of TP in 2023 (0.406 mg/l) was measured in the sample collected at CB4 at the surface on May 4th. In 2022 The maximum TP measured was at station CB3 at the surface on May 31st.
- On July 10th, a thermocline was observed at CB6.. A sample was collected just above the thermocline which had a concentration of TP which was below the MDL of the method.

Nitrate plus Nitrite (NOx)

- The mean NOx for all stations and depths for 2024, was 0.026 mg/L. This was similar to the 2023 mean of 0.023 mg/l.
- Thirty percent of the samples collected in 2024 (excluding replicates) were below the detection limit of the method. In 2023, 64% of samples had NOx-N concentrations below the detection limit.
- NOx concentrations in 2024 were higher in early May and in August, September and October than in late May, June and July. This is similar to 2023 and 2022, except that in 2023 there was no elevation in NOx in early May.
- Increases in NOx in September and October are often caused by bottom water upwelling.
- Differences between the surface and bottom means for each station were not significant when averaged over the year, but were generally lower at the surface than the bottom.
- The mean NOx concentration was significantly higher on October 24th (0.061 mg/l) than in other months.
- The maximum NOx concentration was 0.082 mg/l at CB4 at the bottom on May 8th. The maximum NOx in 2023 was 0.091 mg/l and was recorded in October at CB3 at the bottom. The maximum concentration measured in 2022 was 0.100 mg/l and occurred at CB4 in the bottom sample in October..
- On July 10th, a thermocline was observed at CB6. A sample was collected just above the thermocline which had a concentration of NOx which was below the MDL of the method.

Extracted Chlorophyll *a* and Phaeophytin

- The extracted chlorophyll *a* concentrations were generally low as in previous years. Although, no chlorophyll concentration was below the MDL of the method.
- Mean chlorophyll *a* averaged over all dates, stations and depths was 2.12 micrograms/liter in 2024. Mean chlorophyll *a* was 1.84 micrograms/l in 2023, 2.5 micrograms/l in 2022.
- The lowest mean chlorophyll a concentration averaged across all stations in 2024 was 0.66 microg/l on July 10th. Means for remaining sampling dates ranged between 1.4 and the reported maximum. The lowest monthly extracted chlorophyll concentration averaged across all stations in 2023 was on August 2nd at 0.83 microg/l. The lowest chlorophyll in 2022 also occurred in July and August.
- As in previous years, in 2024 there was no significant difference in mean chlorophyll a concentration between stations.
- The maximum chlorophyll concentration was 5.22 micrograms/l collected at CB4 at the surface on September 11th. The maximum extracted chlorophyll concentrations in 2023 was 5.11 mg/l which was at CB6 in the bottom sample in May. The maximum extracted chlorophyll concentration measured in 2022 was 9.39 micrograms per liter measured on May 10th at station CB3 at the surface.
- In 2022 and 2023, chlorophyll concentrations trended higher at the bottom sample than the surface sample for most stations. In 2024 that pattern was not observed with the bottom sample being slightly lower or equal to the surface sample in most stations.
- The extracted phaeophytin concentrations were overall very low as in previous years. Only one sample was below the method detection limit.
- Mean phaeophytin averaged over all dates, stations and depths was 0.84 micrograms/l. The remaining samples ranged between the MDL and the maximum of 2.34 micrograms/l which occurred at CB2 at the bottom on August 21st.
- On July 10th, a thermocline was observed at CB6.. A sample was collected just above the thermocline which had a chlorophyll a concentration of 1.12 microg/l and a phaeophytin concentration of 0.093 microg/l.
- On October 24, 2024 the chlorophyll sample was inadvertently missed when samples were collected from the Niskin bottle.

Ammonia (NH4)

- Overall ammonia concentrations were low in 2024. The first 4 sampling dates of the season, between 80 - 90 % of the samples were below the detection limit of 0.006 mg/l.
- In 2024, the mean ammonia measured over all stations was 0.015 mg/l. Mean ammonia concentration for all stations, dates and depths in 2023 was 0.033 mg/l. Ammonia was not measured in 2022.
- The months of August and October had the highest average ammonia concentrations.
- There was no clear trend of ammonia concentration between the surface and bottom samples at the stations.
- The maximum ammonia concentration for 2024 was 0.184 mg/l and occurred and CB2 at the bottom on August 21st.

- On July 10th, a thermocline was observed at CB6.. A sample was collected just above the thermocline which had a concentration of ammonia below the detection limit of the method.

Total Nitrogen (TN)

- In general the TN was low over all stations at dates at the stations sampled.
- The mean TN concentration over all stations and dates in 2024 was 0.143 mg/l. The mean TN calculated for all stations in 2023 was 0.135 mg/l. mg/l.
- A note about comparisons of 2023 and 2024 TN data with data from previous years. TN concentrations from 2024 and 2023 are not directly comparable to the measurements of Total Nitrogen from previous years although they are comparable with each other. In previous years TN was derived from adding Total Kjeldahl Nitrogen (TKN) to NOx Nitrogen. Since the detection limit of TKN was very high, most samples were below the detection limit and could not be used to calculate TN.
- TN concentrations were remarkably stable from the end of May through September with the range of the mean concentration over all stations during that time varying from a low of 0.1205 mg/l to a high of 0.1404 mg/l. On May 8th, the overall station mean was 0.159 mg/l and the October sampling date means were 0.164 mg/l on October 2nd and 0.168 mg/l on October 24th.
- In 2024, no sample concentration was below the MDL of the method (0.053 mg/l).
- The maximum TN was 0.2476 mg/l which occurred on May 29th at CB1 at the bottom. This was the only sample collected in 2024 that was above 0.2 mg/l. The maximum TN in 2023 was 0.195 mg/l which occurred in October in CB5 at the surface.
- Some stations showed higher mean concentrations when averaged over the entire sampling season, but variability of TN at each station over the course of the season rendered the differences between station means to be insignificant.
- Three samples, CB1 at the bottom on June 19th, CB4 at the bottom on July 10th, and CB3 at the surface on August 8th were below 0.1 mg/l. All other samples were above 0.1 mg/l.
- On July 10th, a thermocline was observed at CB6. A sample was collected just above the thermocline which had a TN concentration of 0.1139 mg/l.

Appendix A: Narraguagus River Discharge

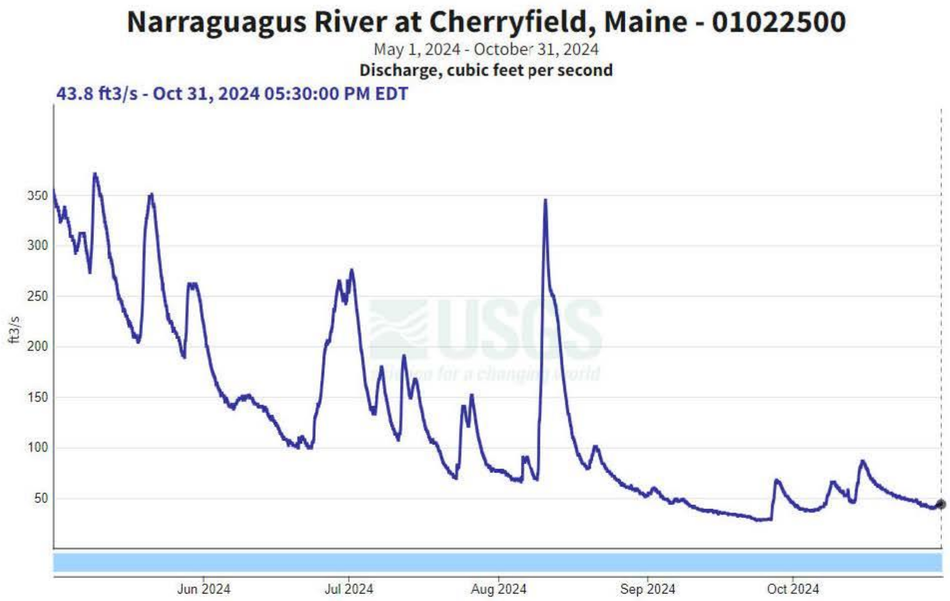


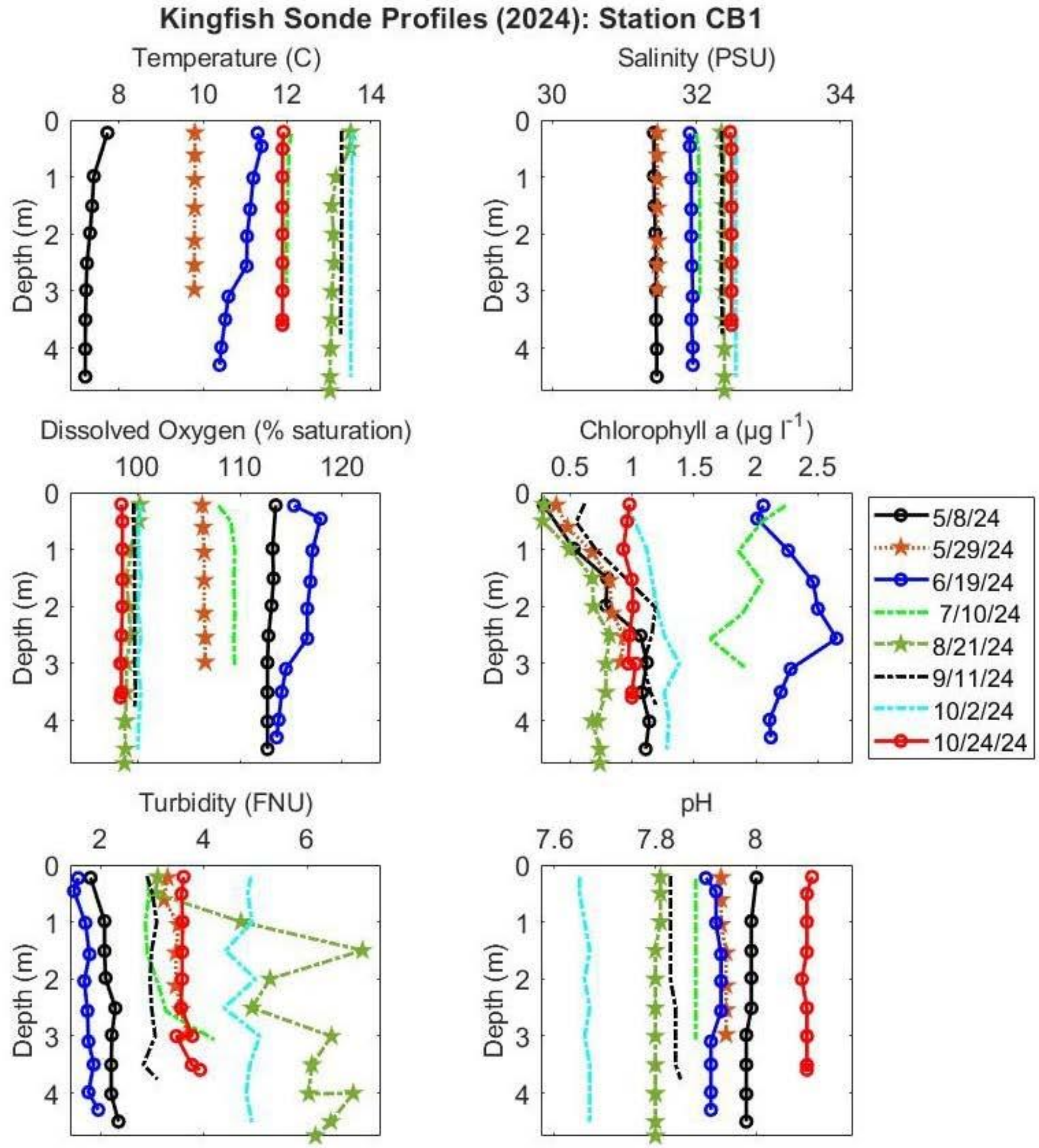
Figure 1. Provisional freshwater flow from Narraguagus River at Cherryfield, ME during the Kingfish Ambient Water Quality Monitoring time period of 2024. Figure downloaded from: https://waterdata.usgs.gov/monitoring-location/01022500.

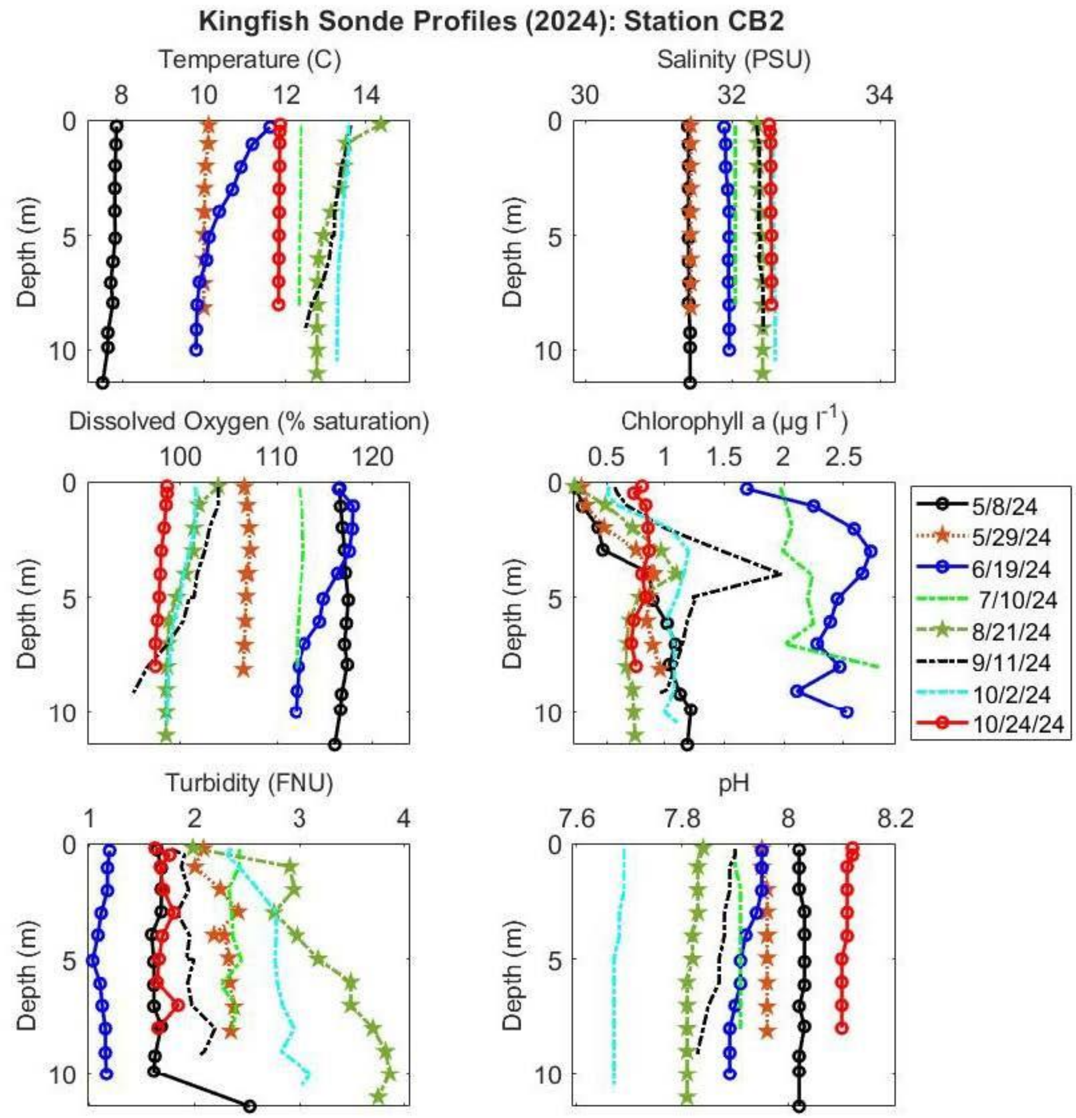
Appendix B: Field Sampling Notes

Date	Sampling window	Site	Time of niskin grab	Maximum station depth (m)	Cloud cover (%)	Air temperature (°F)	Wind speed (knots)	Wind direction (°)	Seas (ft)	Current (m/s)	Secchi time	Secchi average (m)	Observers	Notes
5/8/2024	08:31 - 12:31	CB5	8:44	6.70	30	50	5	135	0	0	9:02	1.55	KL; CN	
		CB1	9:28	5.00	60	52	8	135	0	0.2	9:45	3.20	KL; CN	
		CB2	10:10	12.00	50	55	10	135	0	0.1	10:22	2.80	KL; CN	
		CB3	10:50	16.00	50	57	8	135	0	0	11:04	3.10	KL; CN	
		CB4	11:29	13.20	60	57	8	135	0	0	11:45	2.65	KL; CN	
5/29/2024	06:54 - 10:54	CB6	7:04	7.30	70	58	3	270	0	0	7:20	2.75	KL; KO	
		CB1	7:41	3.50	50	60	1	180	0	0.1	7:56	1.65	KL; KO	
		CB2	8:19	8.60	0	58	12	270	2	0	8:31	2.13	KL; KO	
		CB3	8:51	12.00	0	62	10	180	2	0	9:05	2.00	KL; KO	
		CB4	9:29	11.70	0	60	12	270	1	0	9:46	2.25	KL; KO	
6/19/2024	06:36 - 10:36	CB5	6:48	6.30	50	62	0	NA	0	0	7:03	1.83	KL; KO	
		CB1	7:24	4.80	50	65	0	NA	0	0.2	7:36	3.38	KL; KO	
		CB2	7:56	10.50	10	65	0	NA	0	0.1	8:07	2.95	KL; KO	
		CB3	8:26	14.60	10	65	3	180	0	0	8:46	3.00	KL; KO	
		CB4	9:09	11.00	50	67	8	225	0	0	9:20	3.13	KL; KO	
7/10/2024	05:38 - 09:38	CB6	5:58	7.90	100	60	0	NA	0	0	6:19	1.75	KL; EM	Fog
		CB1	6:45	3.50	100	62	2	90	0	0.1	6:57	1.75	KL; EM	Fog lifting by end of station
		CB2	7:18	8.50	100	62	0	NA	0	0.2	7:33	2.10	KL; EM	Fog
		CB3	7:56	12.10	90	65	1	202.5	0.5	0	8:16	2.50	KL; EM	
		CB4	8:38	9.60	90	65	3	225	0.5	0	8:52	2.15	KL; EM	
8/21/2024	09:29 - 13:29	CB5	9:41	6.50	98	64	0	NA	0	0	10:02	1.38	EM; CJ	
		CB1	10:31	4.70	90	66	1	180	0	0.1	10:45	1.45	EM; CJ	
		CB2	11:14	11.50	80	66	1	180	0	0.1	11:32	1.95	EM; CJ	
		CB3	12:02	15.50	70	70	2	135	0	0.1	12:19	2.50	EM; CJ	
		CB4	12:44	13.00	90	70	1	90	0	0.1	12:57	3.05	EM; CJ	
9/11/2024	07:46 - 11:46	CB6	8:08	8.00	0	52	2	315	0	0.1	8:22	2.38	EM; KO	Large private vessel ~100 yds away. Two mackerel caught off stern while on station.
		CB1	8:42	4.25	0	54	2	315	0	0.2	8:55	1.85	EM; KO	
		CB2	9:21	9.75	0	56	2	315	0	0.1	9:46	2.15	EM; KO	New NOx filter between S1 and S2 - clog?
		CB3	10:09	13.25	0	58	2	292.5	0	0.1	10:23	3.00	EM; KO	Two seagulls nearby.
		CB4	10:47	10.75	0	60	2	292.5	0	0.1	11:03	2.95	EM; KO	
10/2/2024	08:15 - 12:15	CB5	8:25	6.25	50	48	0	NA	0	0.1	8:39	1.35	EM; CN	Dixon said water is more murky here than usual, possibly due to recent rain.
		CB1	9:01	5.00	40	50	5	90	0	0.2	9:23	1.80	EM; CN	
		CB2	9:46	11.00	50	50	8	45	0	0.1	9:58	1.95	EM; CN	
		CB3	10:22	15.00	70	52	8	90	0.5	0.2	10:36	2.50	EM; CN	
		CB4	10:57	14.00	90	52	2	112.5	0.5	0.1	11:09	2.60	EM; CN	
10/24/2024	08:00 - 12:00	CB6	8:11	7.90	85	53	2	315	0	0	8:23	2.20	EM; KO	Little to no wildlife present, no nearby vessels
		CB1	8:44	4.10	90	54	2	337.5	0	0.1	8:57	2.00	EM; KO	No nearby wildlife, no nearby vessels.
		CB2	9:23	8.50	65	56	2	0	<1	0.1	9:36	2.90	EM; KO	No nearby wildlife, no nearby vessels.
		CB3	10:02	12.90	25	57	2	0	<1	<0.1	10:14	3.15	EM; KO	Seals on rocks, no boat traffic, temporarily lost connection to sonde (regained).
		CB4	10:33	8.80	10	58	2	0	<1	0	10:44	3.50	EM; KO	No nearby wildlife, no nearby vessels.

Observers: Kate Liberti (KL), Kyle Oliveira (KO), Elisabeth Maxwell (EM), Corinne Noufi (CN), Colby Johns (CJ)

Appendix C: Sonde Profiles




Kingfish Sonde Profiles (2024): Station CB2
Temperature (C)
Salinity (PSU)
Dissolved Oxygen (% saturation)
Chlorophyll a (µg l-1)
Turbidity (FNU)
pH
Depth (m)
5/8/24
5/29/24
6/19/24
7/10/24
8/21/24
9/11/24
10/2/24
10/24/24

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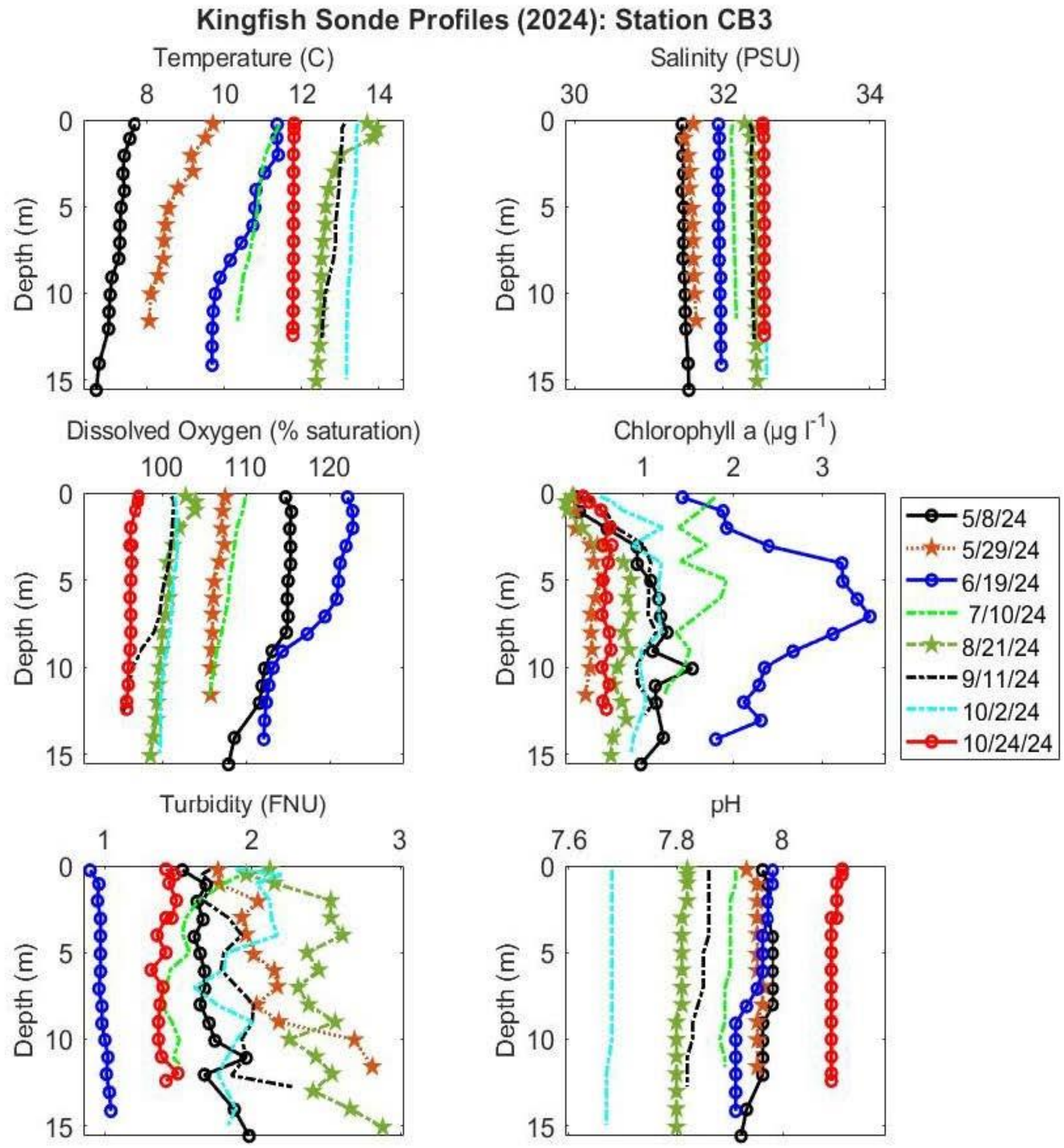
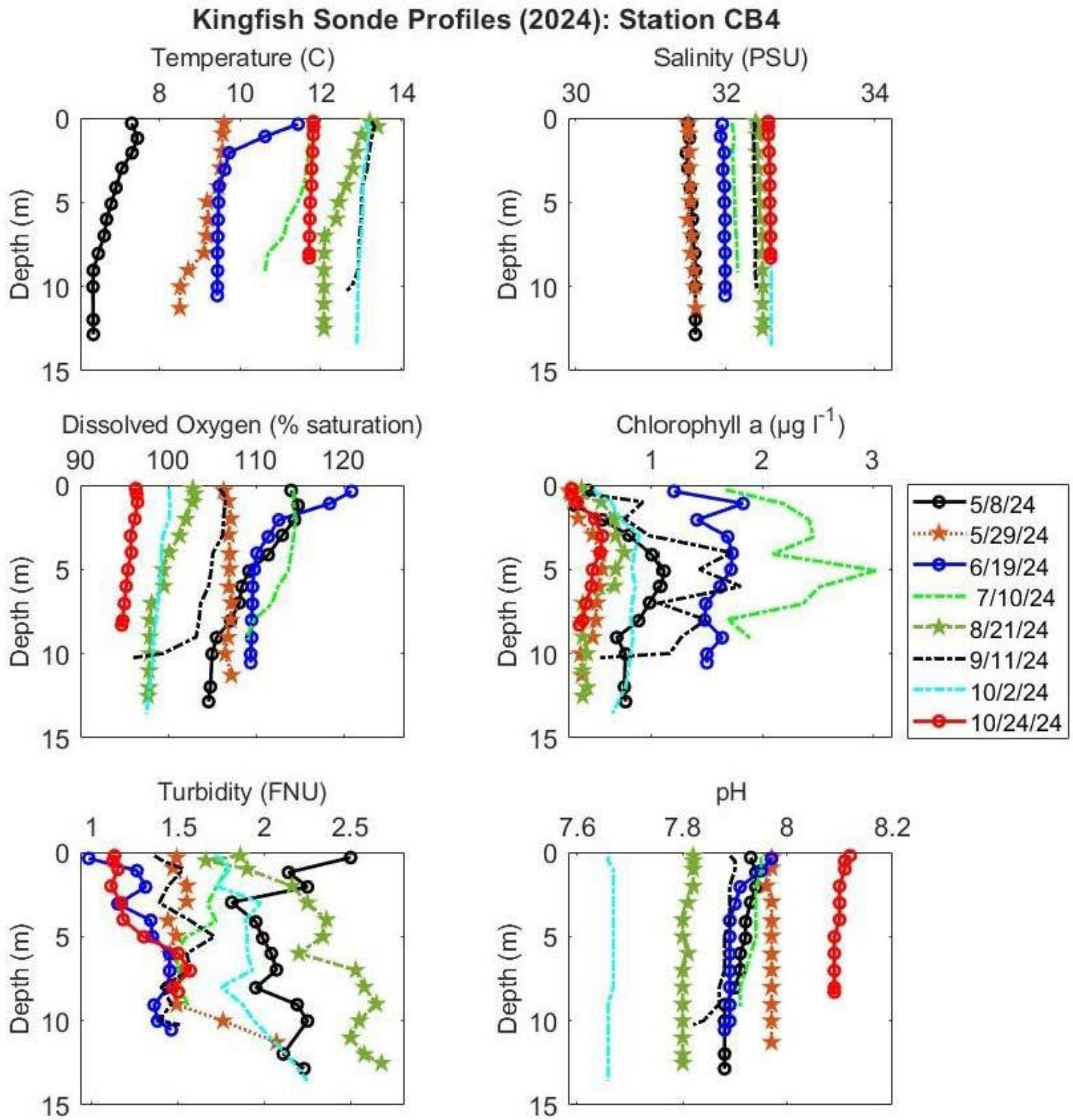

Kingfish Sonde Profiles (2024): Station CB3
Temperature (C)
Salinity (PSU)
Dissolved Oxygen (% saturation)
Chlorophyll a (μg l^{-1})
Turbidity (FNU)
pH
Depth (m)
5/8/24
5/29/24
6/19/24
7/10/24
8/21/24
9/11/24
10/2/24
10/24/24


Kingfish Sonde Profiles (2024): Station CB4
Temperature (C)
8 10 12 14
Depth (m)
0 5 10 15
Salinity (PSU)
30 32 34
Dissolved Oxygen (% saturation)
90 100 110 120
Chlorophyll a (µg l-1)
1 2 3
5/8/24
5/29/24
6/19/24
7/10/24
8/21/24
9/11/24
10/2/24
10/24/24
Turbidity (FNU)
1 1.5 2 2.5
pH
7.6 7.8 8 8.2

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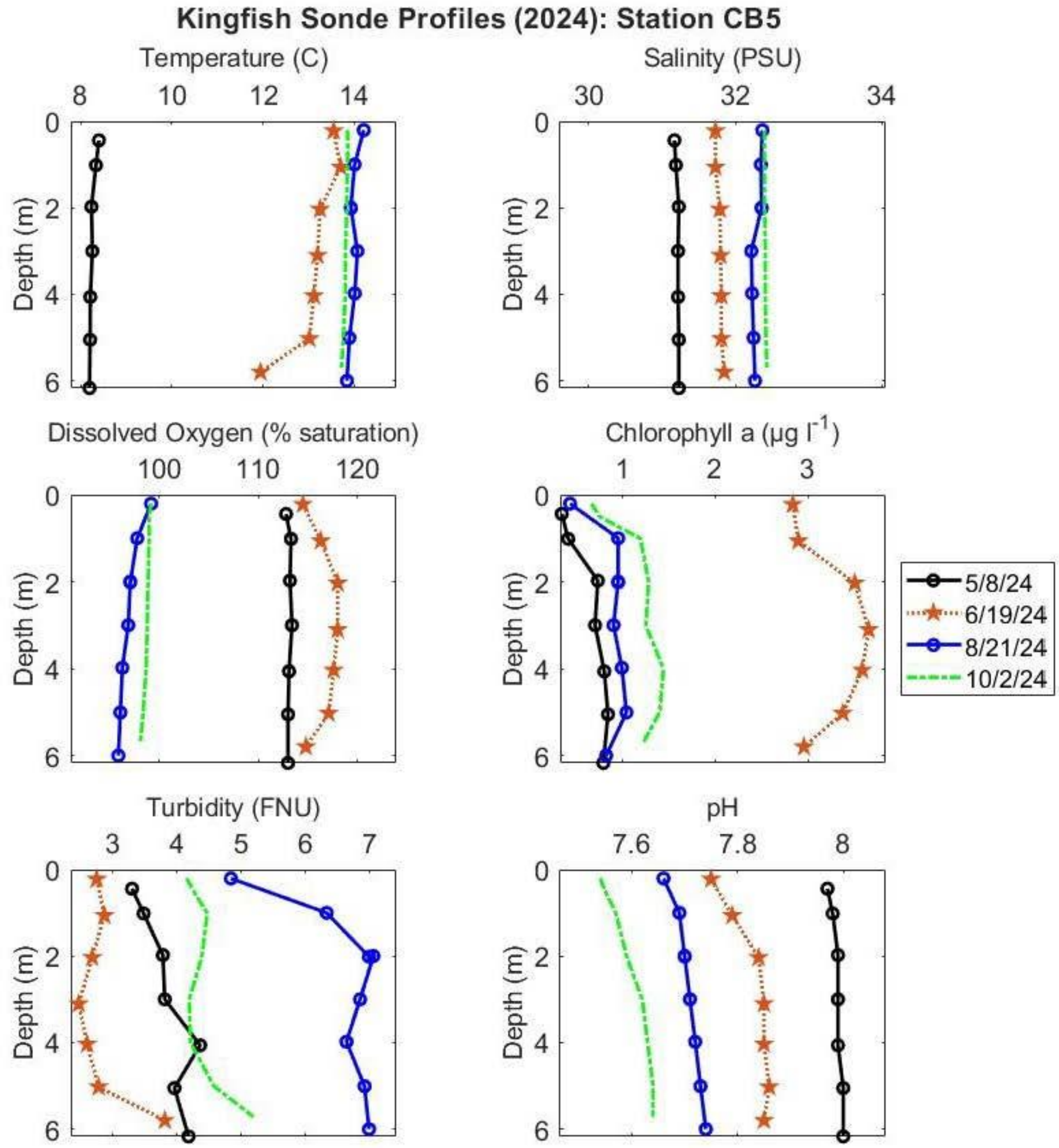
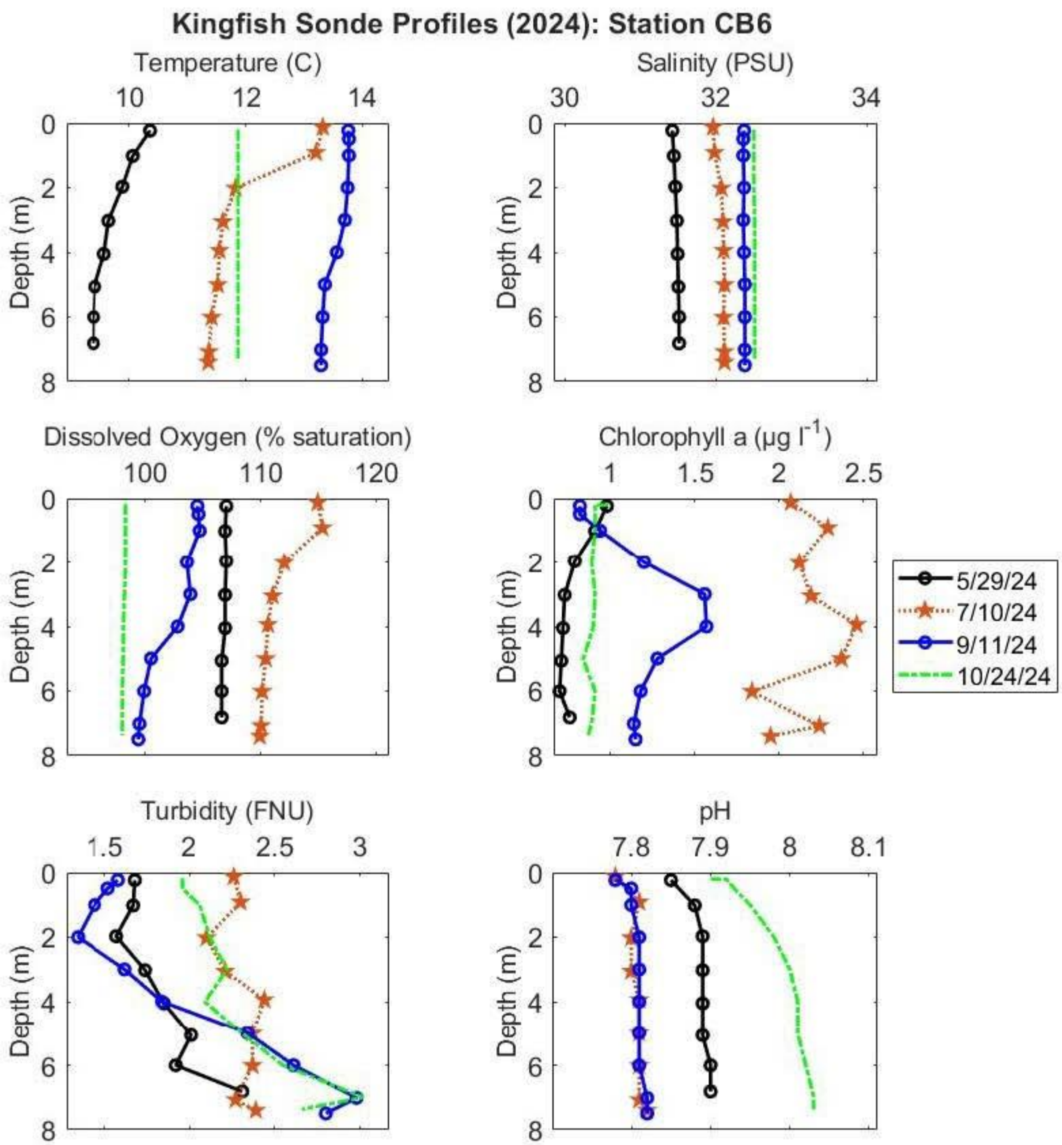

Kingfish Sonde Profiles (2024): Station CB5
Temperature (C)
Salinity (PSU)
Dissolved Oxygen (% saturation)
Chlorophyll a (µg l^{-1})
Turbidity (FNU)
pH
Depth (m)
5/8/24
6/19/24
8/21/24
10/2/24


Kingfish Sonde Profiles (2024): Station CB6
Temperature (C)
Salinity (PSU)
Dissolved Oxygen (% saturation)
Chlorophyll a (µg l^{-1})
Turbidity (FNU)
pH
Depth (m)
5/29/24
7/10/24
9/11/24
10/24/24

Appendix D: Results of Laboratory Analysis

Table of Data

Note: For information on QC data for nutrient analysis, please see detailed laboratory reports.
Note: U - Parameter was not detected in the sample.

TP (mg/l)								
Sample Code	**5/8/2024**	**5/29/2024**	**6/19/2024**	**7/10/2024**	**8/21/2024**	**9/11/2024**	**10/2/24**	**10/24/24**
CB1S	0.0724	0.095	U	0.074	U	U	0.0900	0.2400
CB1B	0.1930	0.106	U	U	0.0867	U	0.1200	0.1970
CB2S	0.1720	0.069	U	U	U	U	0.0800	0.1130
CB2B	0.1150	U	U	0.166	U	U	0.1080	0.3030
CB3S	0.0830	0.069	U	U	U	U	0.0750	0.0670
CB3B	0.0854	0.0690	0.0880	U	U	U	0.0870	0.0750
CB4S	0.0867	U	0.067	U	U	U	0.0910	0.1510
CB4B	0.0992	U	U	0.0753	U	U	0.0900	0.2050
CB5S	0.07522		0.08		0.0839		0.0820	
CB5B	0.1065		U		U		0.0990	
CB6S		0.074		U		U		0.1440
CB6B		0.0760		U		U		0.1670

Ammonia (mg/l)								
Sample Code	**5/8/2024**	**5/29/2024**	**6/19/2024**	**7/10/2024**	**8/21/2024**	**9/11/2024**	**10/2/24**	**10/24/24**
CB1S	0.0240	U	U	U	0.0780	U	0.0130	0.0220
CB1B	U	U	U	U	0.0210	0.0060	0.0130	0.0350
CB2S	U	U	U	U	U	U	0.0190	0.0220
CB2B	U	U	U	U	0.1840	0.0220	0.0130	0.0200
CB3S	U	U	U	U	U	U	0.0150	0.0200
CB3B	U	U	U	U	U	0.0080	0.0150	0.0180
CB4S	U	U	U	U	0.0120	0.0070	0.0150	0.0230
CB4B	U	U	U	0.1030	0.0120	U	0.0160	0.0270
CB5S	0.0180		U		0.0130		0.0160	
CB5B	U		0.0130		0.0270		0.0230	
CB6S		0.0220		U		U		0.0170
CB6B		U		U		0.0070		0.0260

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TN (mg/l)								
Sample Code	5/8/2024	5/29/2024	6/19/2024	7/10/2024	8/21/2024	9/11/2024	10/2/24	10/24/24
CB1S	0.1325	0.1257	0.1158	0.1488	0.1329	0.1389	0.1511	0.1690
CB1B	0.1578	0.2746	0.0911	0.1074	0.1658	0.1490	0.1779	0.1594
CB2S	0.1503	0.1089	0.1201	0.1303	0.1405	0.1191	0.1638	0.1295
CB2B	0.1708	0.1230	0.1186	0.1431	0.1517	0.1273	0.1530	0.1864
CB3S	0.1526	0.1135	0.1055	0.1320	0.0797	0.1333	0.1587	0.1650
CB3B	0.1714	0.1270	0.1198	0.1076	0.1476	0.1588	0.1510	0.1725
CB4S	0.1671	0.1080	0.1102	0.1368	0.1331	0.1354	0.1541	0.1846
CB4B	0.1785	0.1315	0.1248	0.0909	0.1519	0.1221	0.1792	0.1681
CB5S	0.1643		0.1571		0.1342		0.1786	
CB5B	0.1469		0.1420		0.1667		0.1688	
CB6S		0.1095		0.1402		0.1243		0.1770
CB6B		0.1165		0.1404		0.1328		0.1645

NOx (mg/l)								
Sample Code	5/8/2024	5/29/2024	6/19/2024	7/10/2024	8/21/2024	9/11/2024	10/2/24	10/24/24
CB1S	0.0193	U	U	U	0.0190	0.0150	0.0310	0.0490
CB1B	0.0356	U	U	U	0.0310	0.0150	0.0320	0.0500
CB2S	0.0154	U	U	U	0.0140	U	0.0280	0.0570
CB2B	0.0141	U	0.0130	U	0.0290	0.0250	0.0390	0.0590
CB3S	0.0264	U	U	U	0.0210	0.0200	0.0340	0.0640
CB3B	0.0655	0.0350	0.0170	0.0310	0.0370	0.0450	0.0420	0.0690
CB4S	0.0269	0.0130	U	U	0.0260	U	0.0470	0.0730
CB4B	0.0825	0.0230	0.0320	0.0150	0.0480	0.0120	0.0560	0.0780
CB5S	U		U		0.0150		0.0240	
CB5B	0.0139		U		0.0160		0.0260	
CB6S		U		U		U		0.0550
CB6B		0.0160		U		0.0130		0.0530

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Chlorophyll (microg/l)	5/8/2024	5/29/2024	6/19/2024	7/10/2024	8/21/2024	9/11/2024	10/2/24	10/24/24
Sample Code								
CB1S	2.5696	1.7868	3.5221	0.5179	1.6234	3.0169	2.7664	2.0186
CB1B	3.0626	1.5357	3.0760	0.4321	1.3930	1.5800	3.6410	2.7504
CB2S	3.3443	1.4048	3.5668	0.7380	1.9760	4.4250	3.0666	2.5443
CB2B	3.3189	1.4722	1.9922	0.5932	1.8454	1.3044	1.9699	1.8636
CB3S	3.2570	1.3918	2.1913	0.6528	1.3241	3.5881	2.7417	1.8993
CB3B	1.7986	1.4208	2.0320	0.3738	1.6095	3.4791	1.8925	1.6147
CB4S	4.6849	1.1600	3.0567	0.5261	1.4198	5.2207	2.1389	0.8891
CB4B	2.4889	1.0100	1.7740	0.8782	1.2396	4.6269	1.4223	2.7990
CB5S	1.6126		2.1123		2.5017		3.0933	
CB5B	2.7493		2.2942		1.9774		2.2767	
CB6S		1.8894		1.0074		3.7523		2.7990
CB6B		1.6850		0.9019		1.9824		2.5583

Phaeophytin (microg/l)	5/8/2024	5/29/2024	6/19/2024	7/10/2024	8/21/2024	9/11/2024	10/2/24	10/24/24
Sample Code								
CB1S	0.5040	0.7694	0.9273	0.2276	1.5498	1.7596	1.9395	1.5764
CB1B	2.2830	0.8862	0.8552	0.0880	1.1862	0.8019	0.9841	1.3091
CB2S	0.7884	0.2735	0.7748	0.1118	0.8175	0.9679	1.0257	0.7969
CB2B	0.5101	0.5801	0.8378	0.2285	2.3596	1.6917	1.5302	1.8596
CB3S	0.4947	1.0025	0.4974	0.0370	0.7824	1.3860	0.9988	0.7126
CB3B	0.4524	0.6419	0.3184	0.0798	0.7775	1.0420	0.5792	0.4161
CB4S	0.5002	0.6051	1.1000	0.1642	1.1740	0.5012	0.8962	0.9285
CB4B	1.3653	0.2994	0.3649	0.1161	0.7889	0.7387	0.4984	-0.0860
CB5S	0.8580		0.3432		1.0004		0.2011	
CB5B	1.0638		0.7785		2.0683		2.3470	
CB6S		0.8058		0.1068		0.8721		-0.0860
CB6B		0.9008		0.2145		1.3266		0.9024

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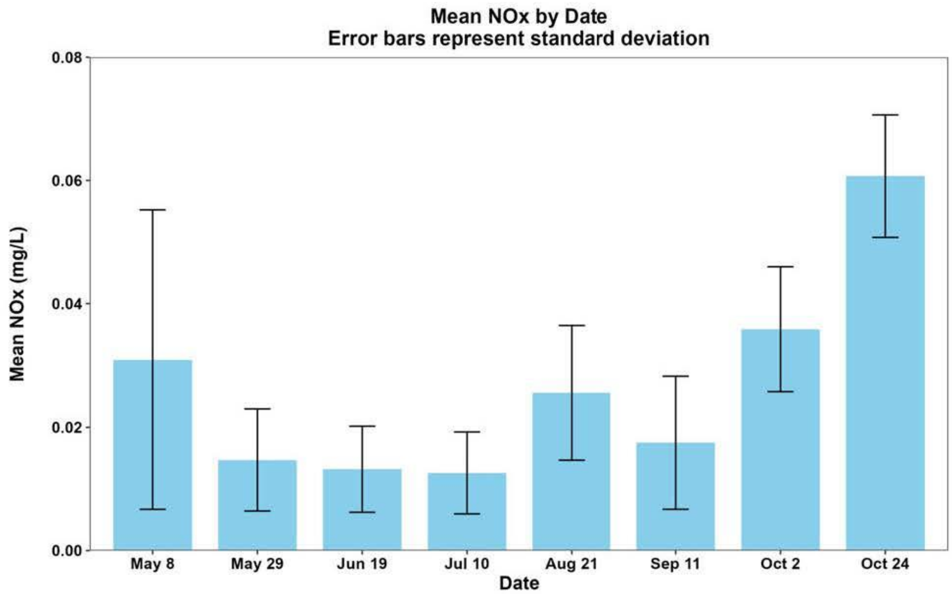
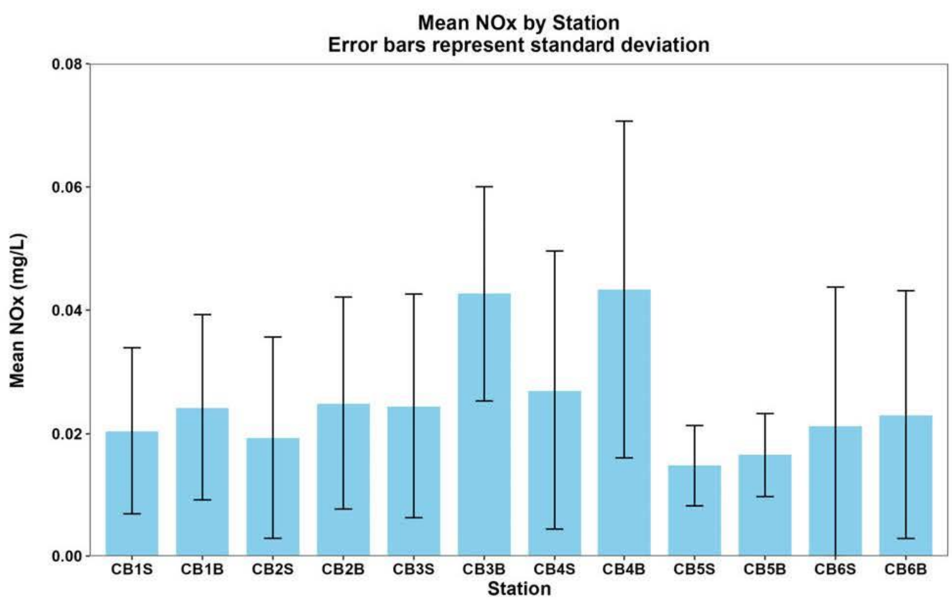
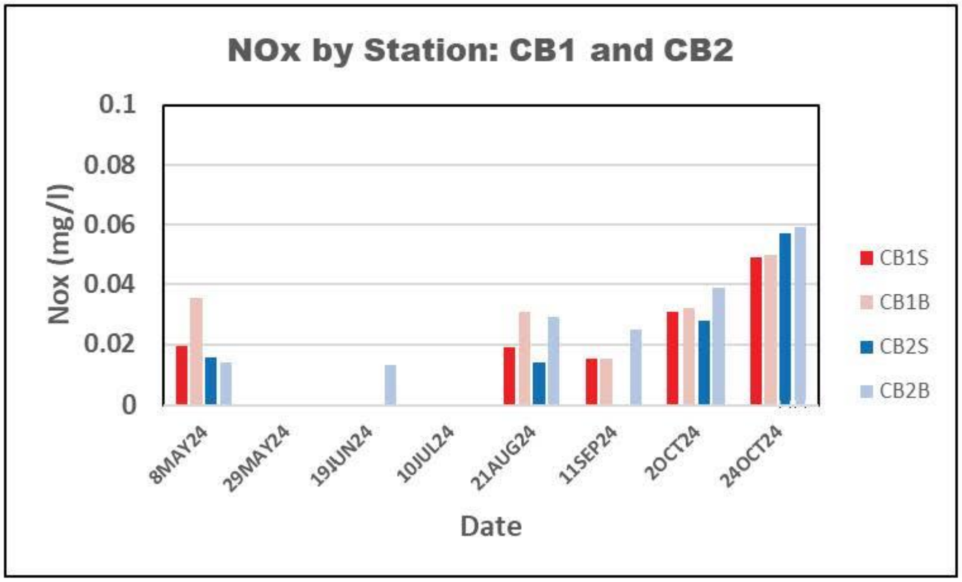
Appendix E: Graphs of NOx - N Concentrations



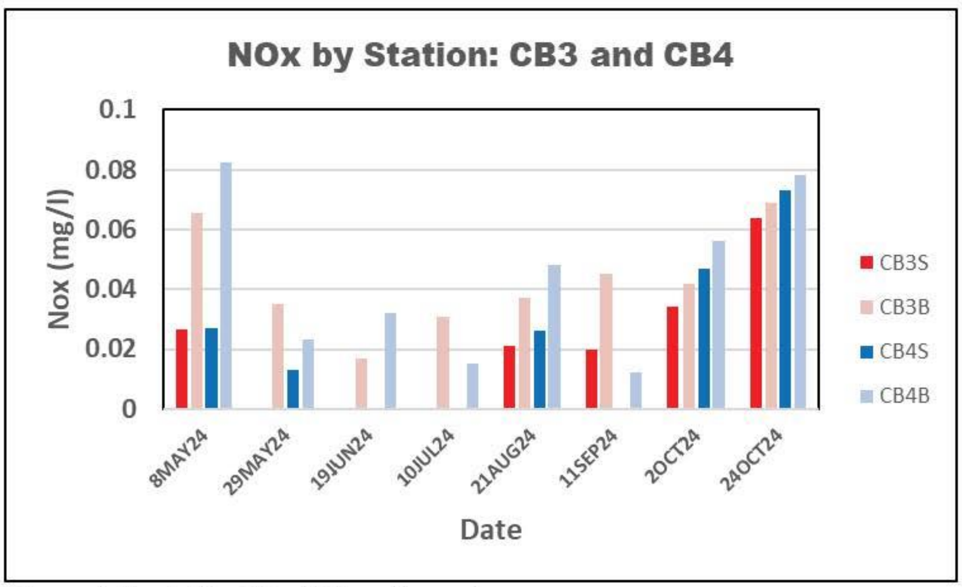
Mean concentration of NOx-N over all KF stations for each 2024 sampling date.



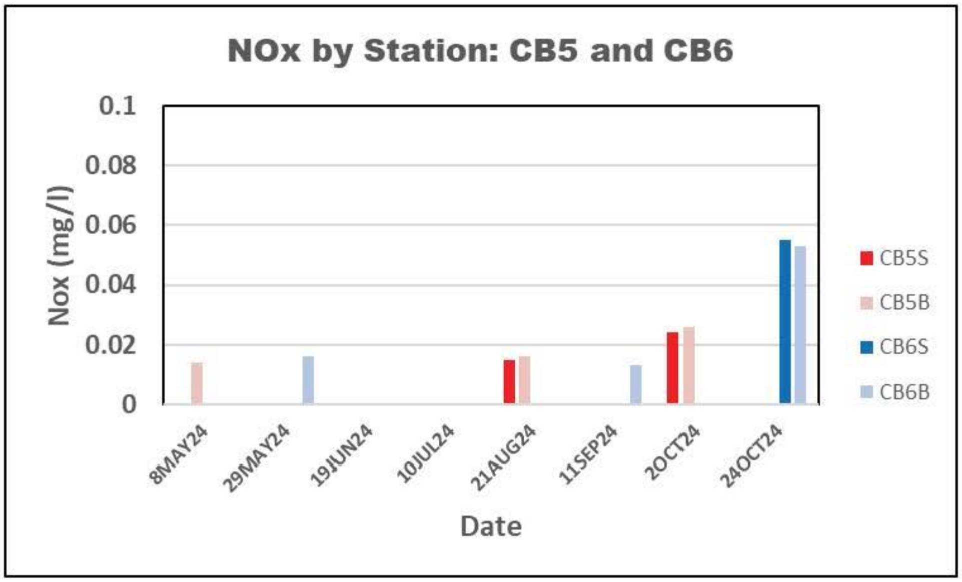
Concentration of NOx-N at each KF Station and Depth averaged over all sampling dates.



NOx concentrations at station CB1 and CB2 over the sampling season.

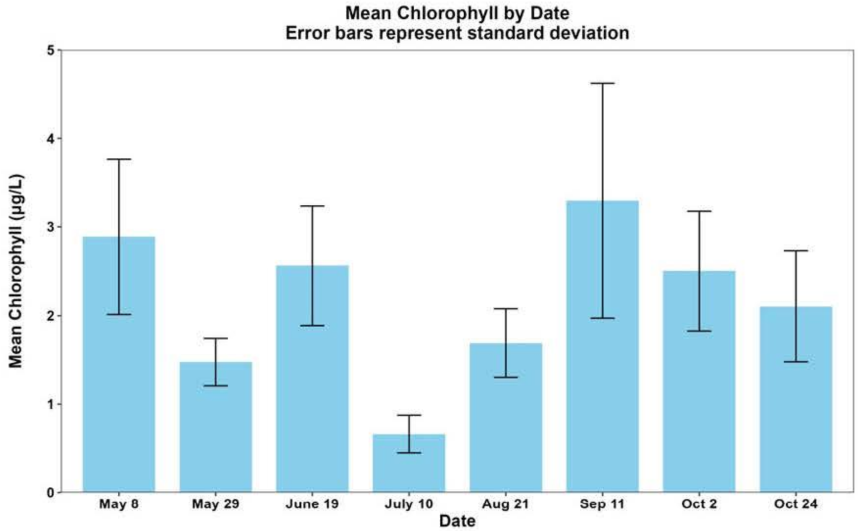


NOx concentration at station CB3 and CB4 over the sampling season.

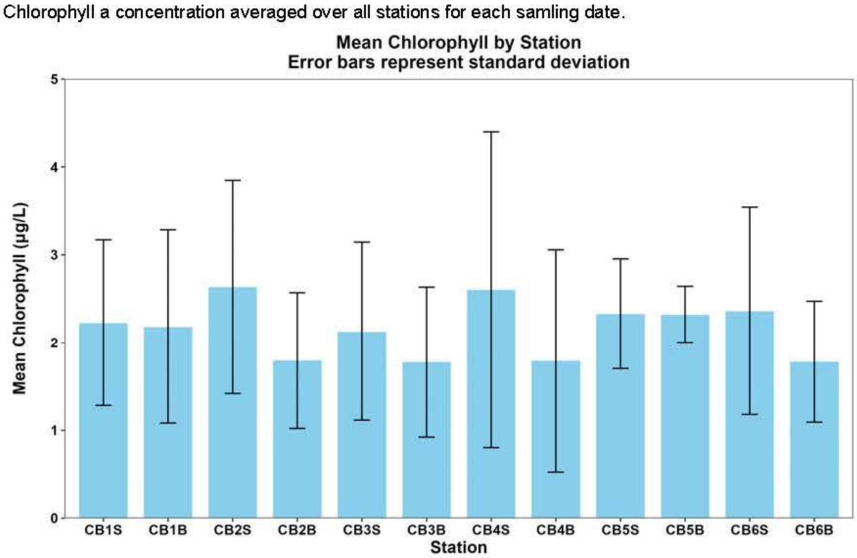


NOx concentrations at CB5 and CB6 over the sampling season.

Appendix F: Graph of Extracted Chlorophyll a and Phaeophytin Concentration



Chlorophyll a concentration averaged over all stations for each samling date.



Chlorophyll a concentration averaged over all dates for each station and depth.

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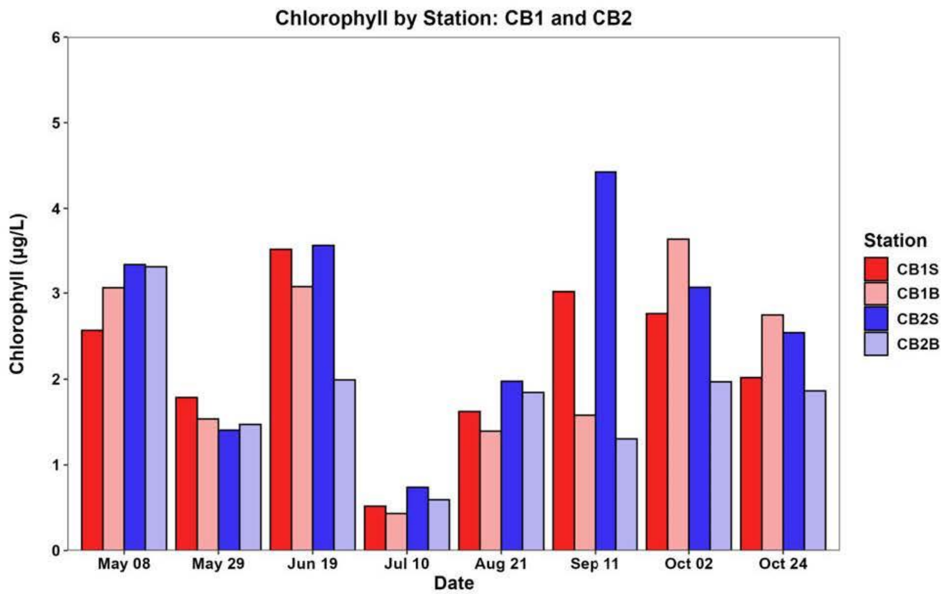
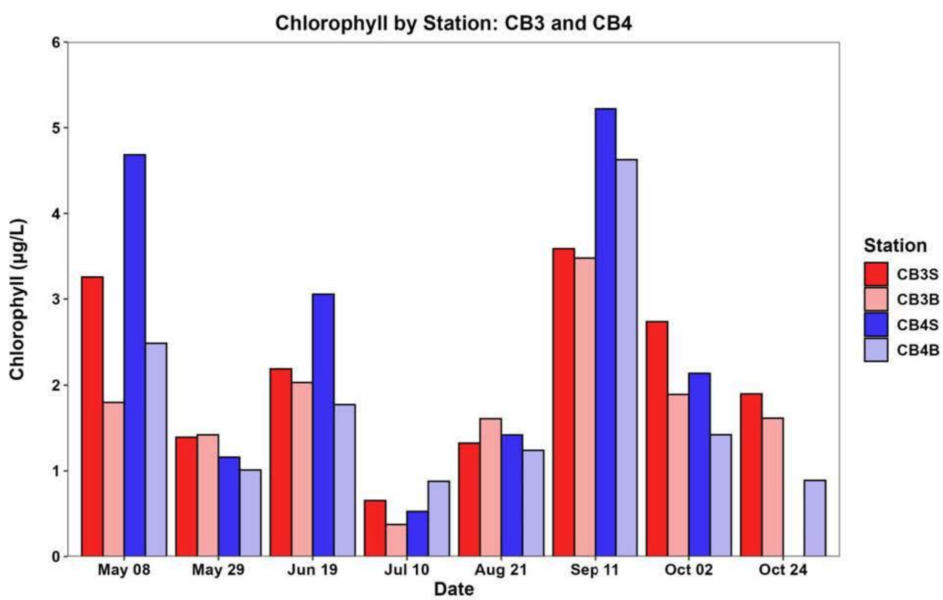


Chlorophyll a concentrations at CB1 and CB2.over the sampling season.



Chlorophyll a concentration at CB3 and CB4 over the sampling season.

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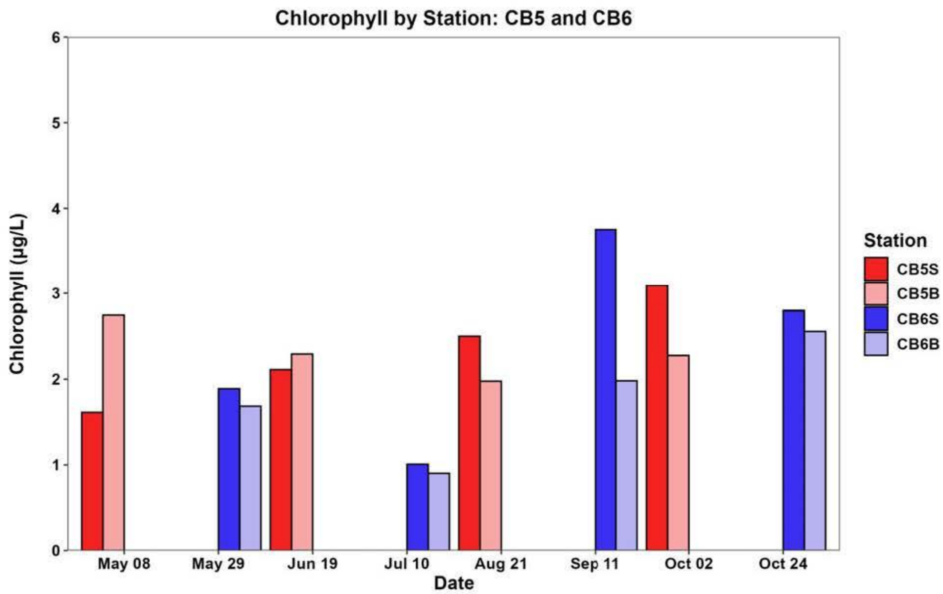
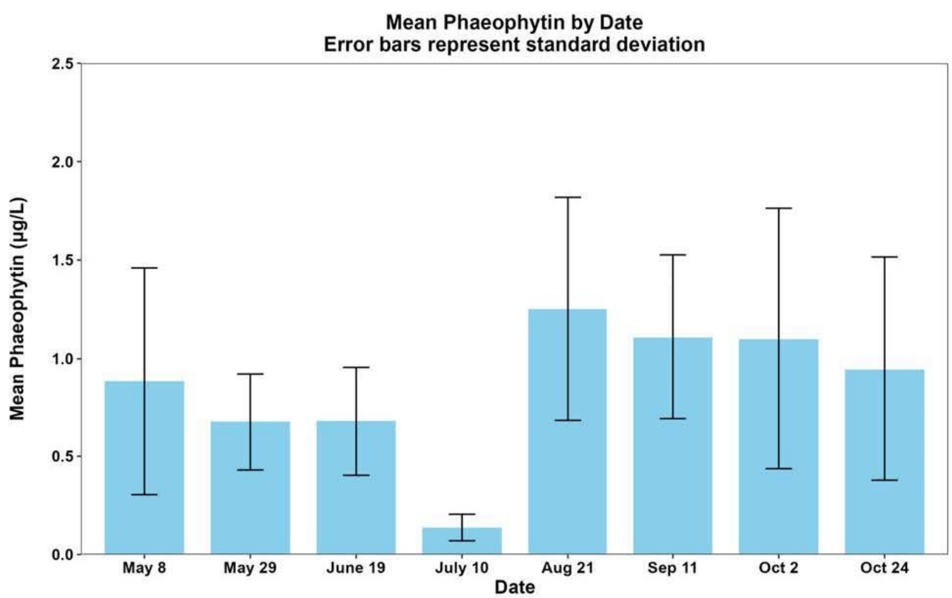


Chlorophyll a concentration at CB5 and CB6 over the sampling season.



Phaeophytin concentrations averaged over all stations for each samling date.

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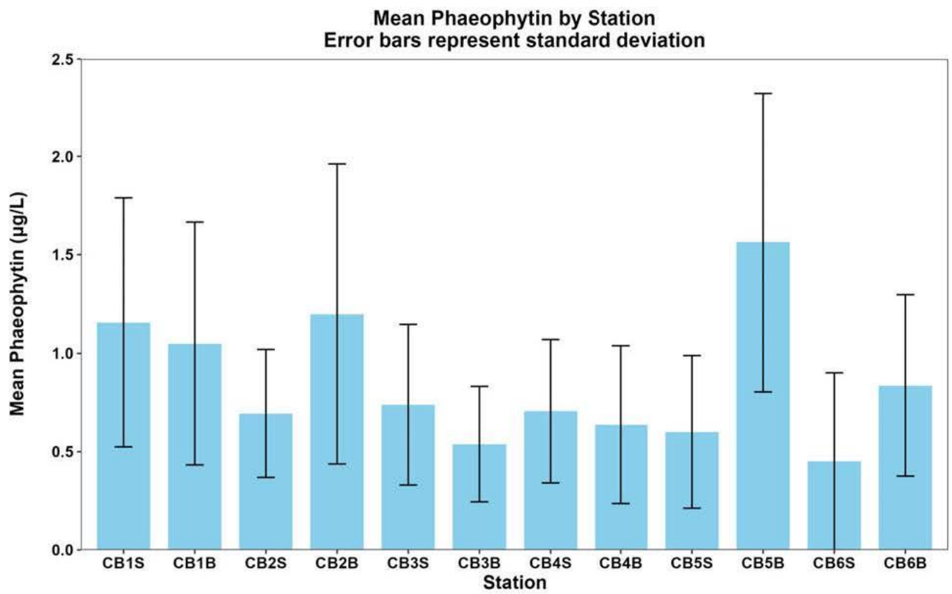
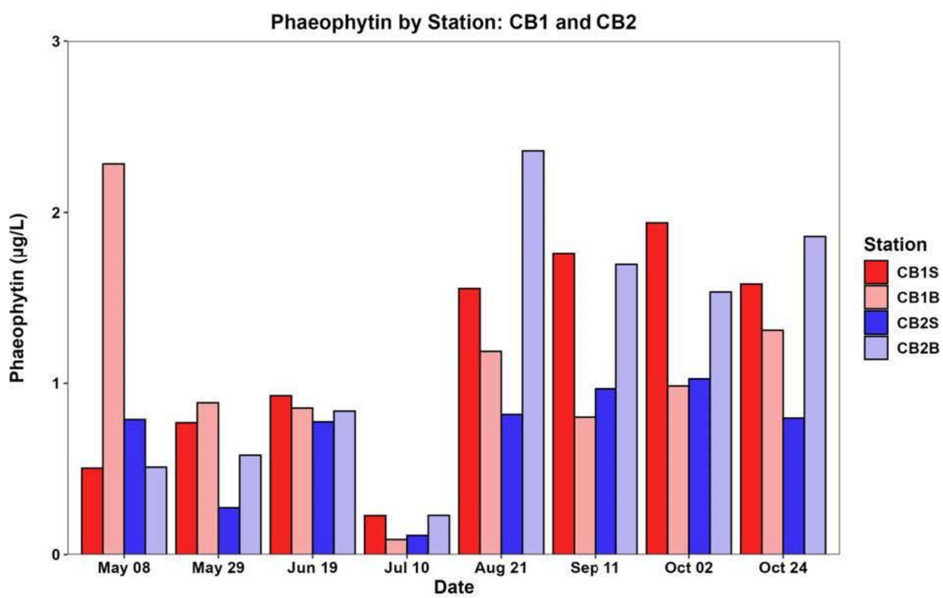
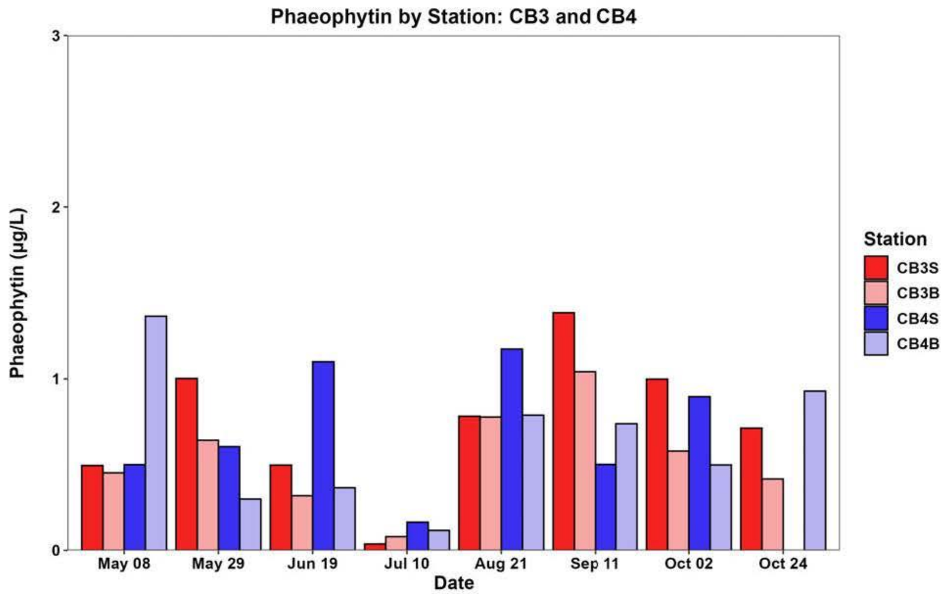


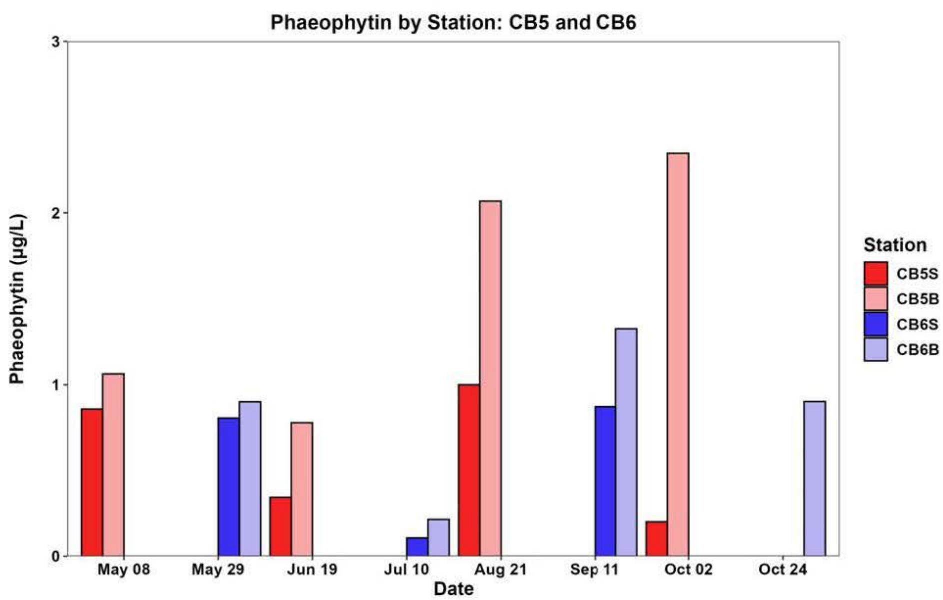
Phaeophytin concentration averaged for each station and depth over all dates.



Phaeophytin concentration for CB1 and CB2 on each sampling date.

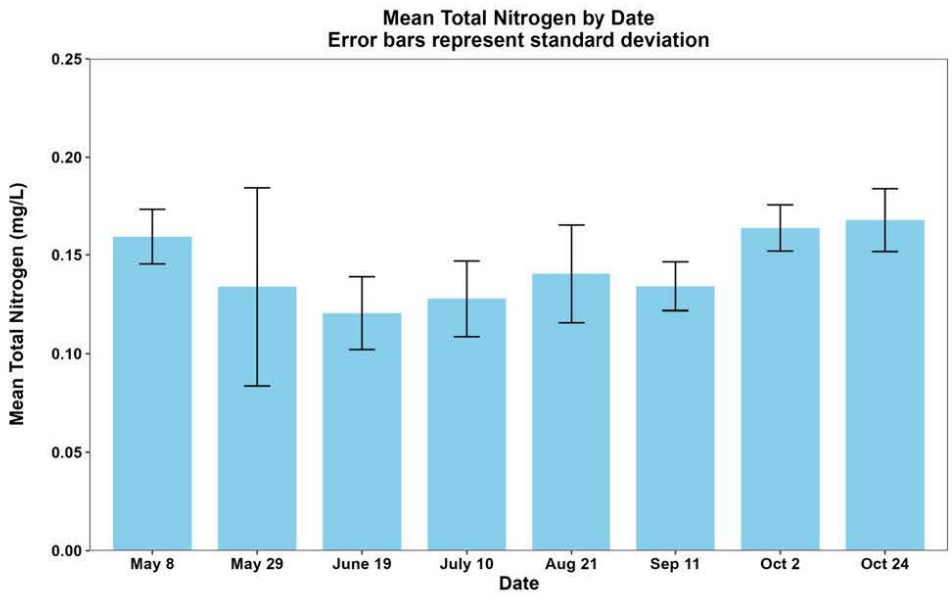


Phaeophytin concentration for CB3 and CB4 on each sampling date.

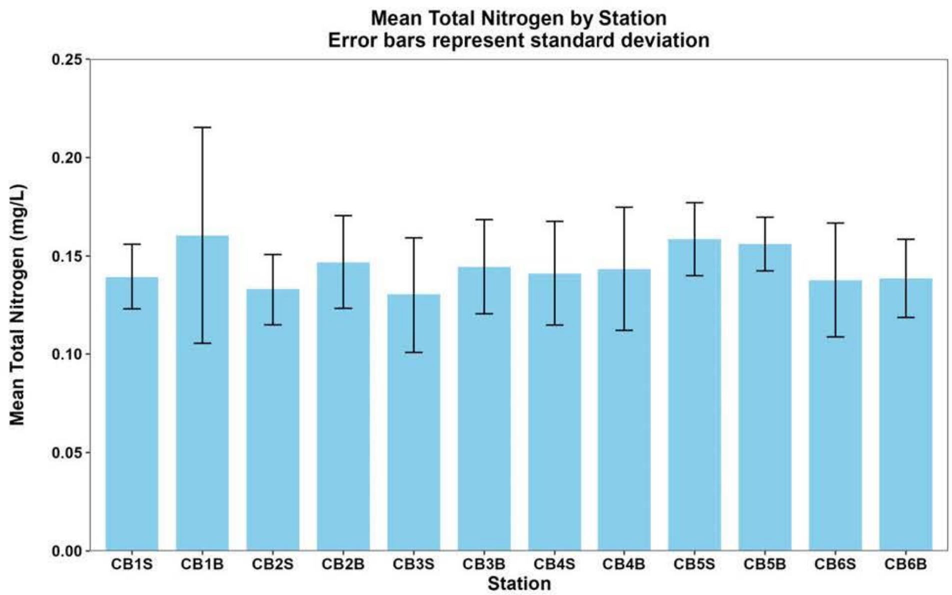


Phaeophytin concentration for CB5 and CB6 at each sampling date.

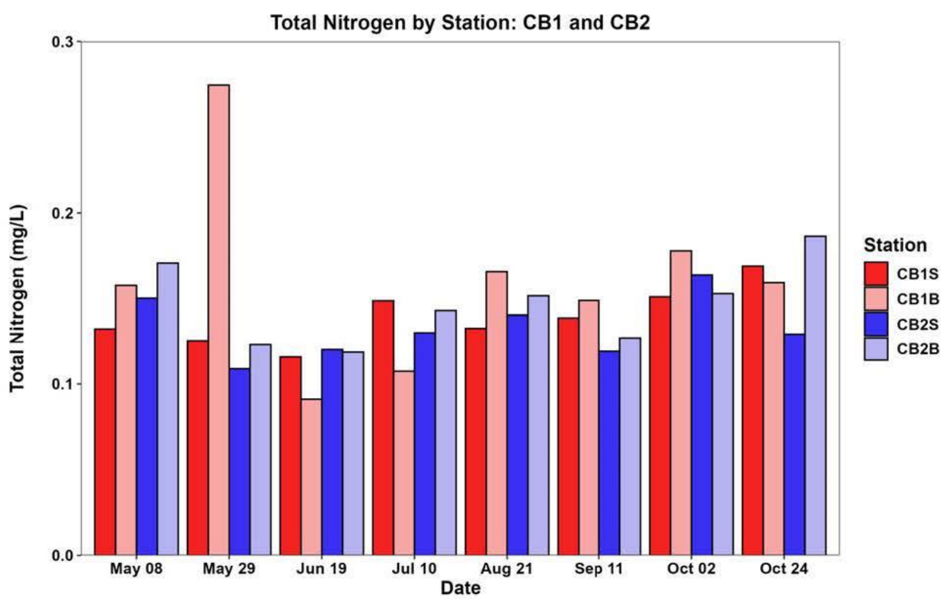
Appendix G: Graphs of Total Nitrogen



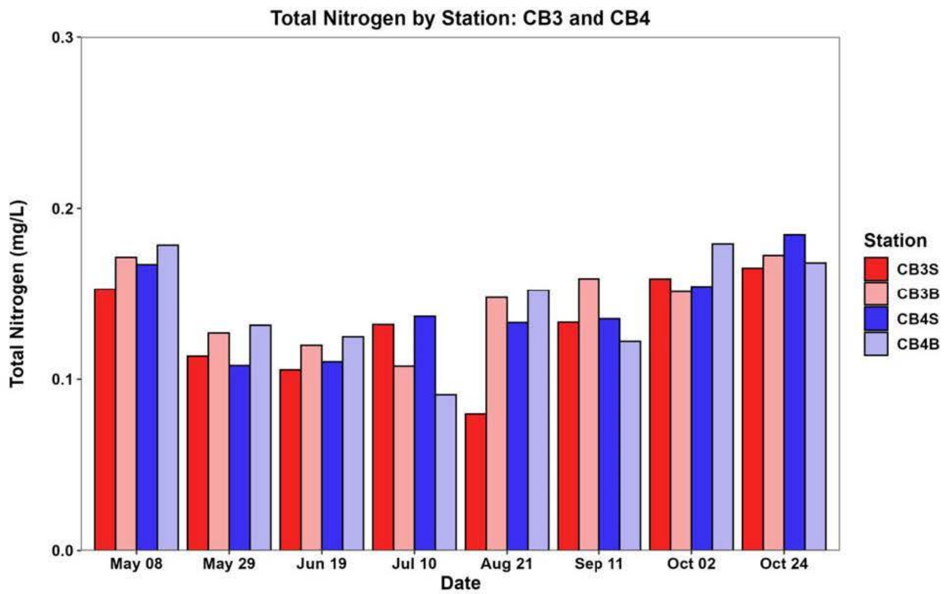
TN concentrations averaged over all stations for each sampling date.



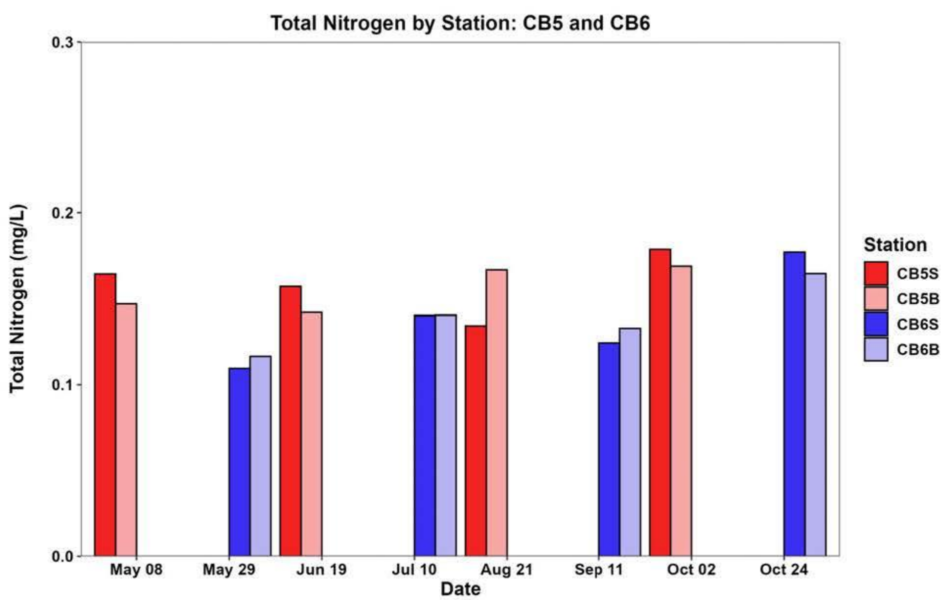
TN concentrations averaged over all dates for each station and depth.



TN concentrations at CB1 and CB2 for each sampling date.

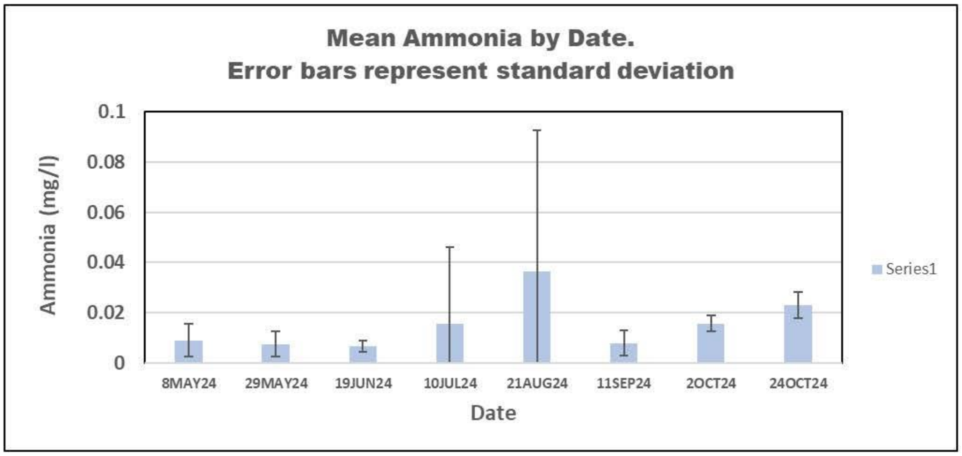


TN concentrations at CB3 and CB4 for each sampling date.

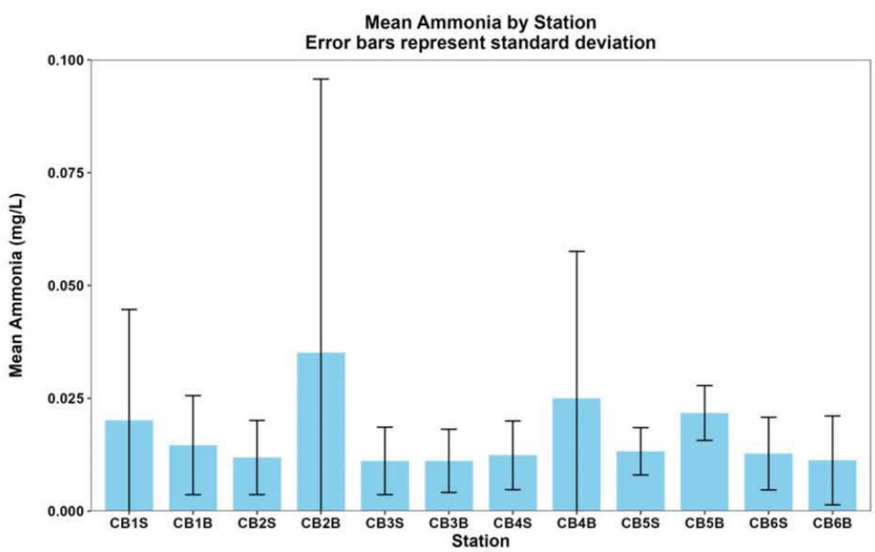


TN concentrations at CB5 and CB6 for each sampling date.

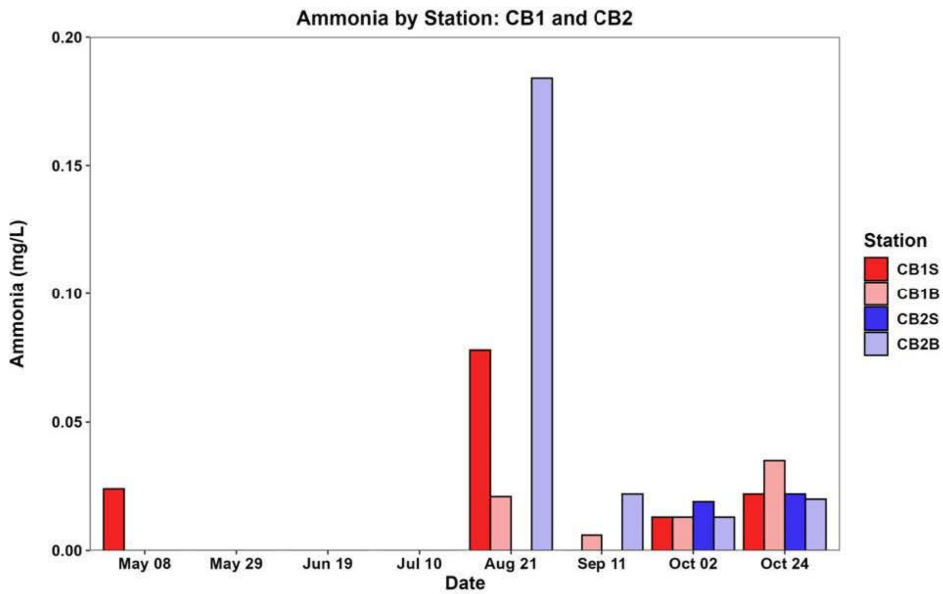
Appendix H: Graphs of Ammonia



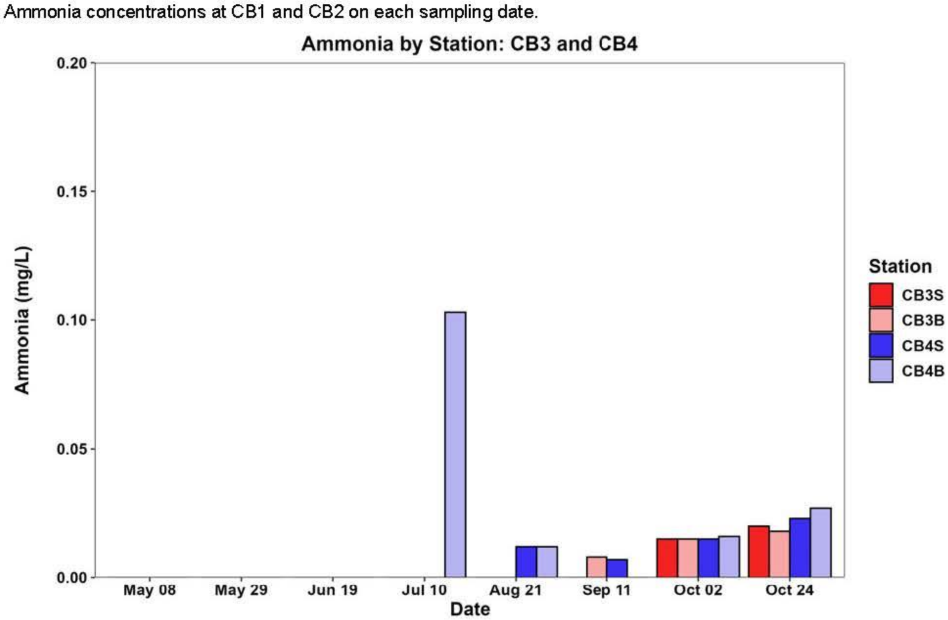
Ammonia concentrations averaged across all stations for each sampling date.



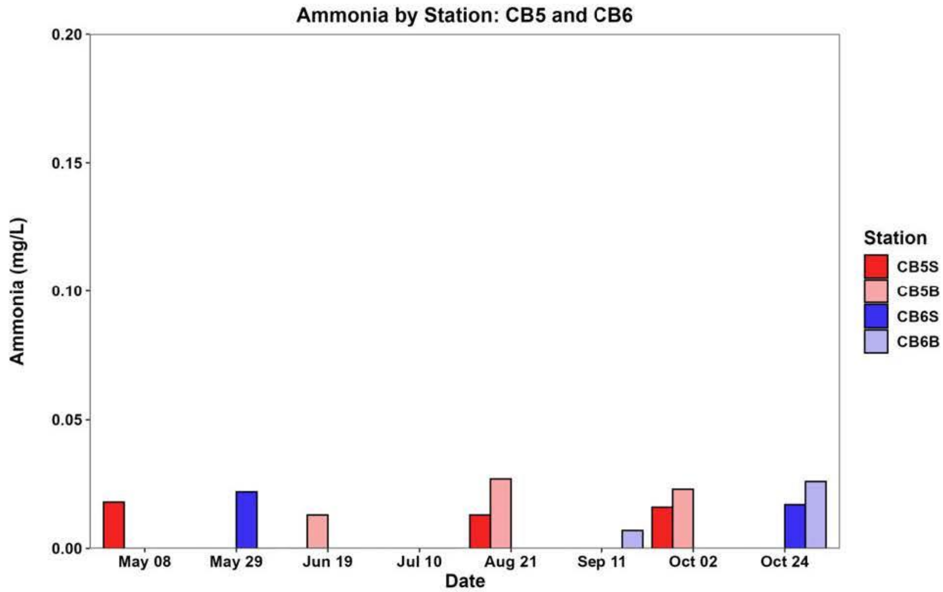
Ammonia concentration averaged across all sampling dates for each station/depth combination.



Ammonia concentrations at CB1 and CB2 on each sampling date.

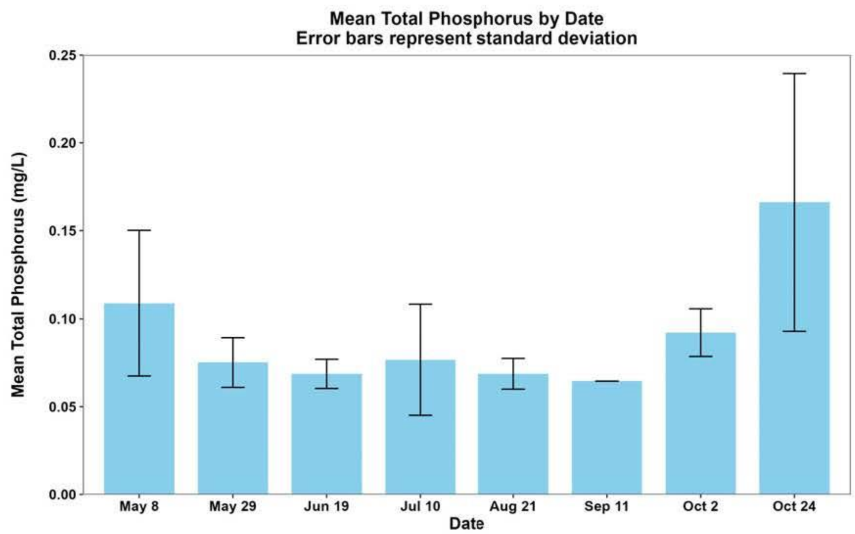


Ammonia concentrations at CB3 and CB4 on each sampling date.

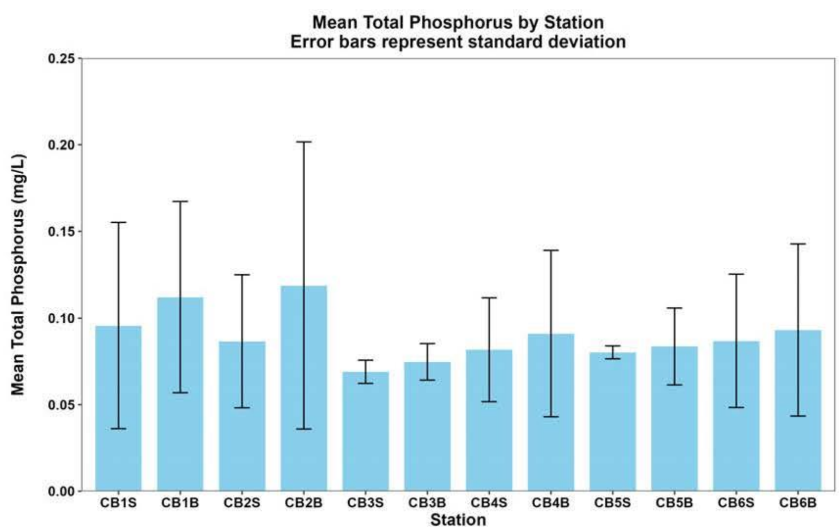


Ammonia concentrations at CB5 and CB6 on each sampling date.

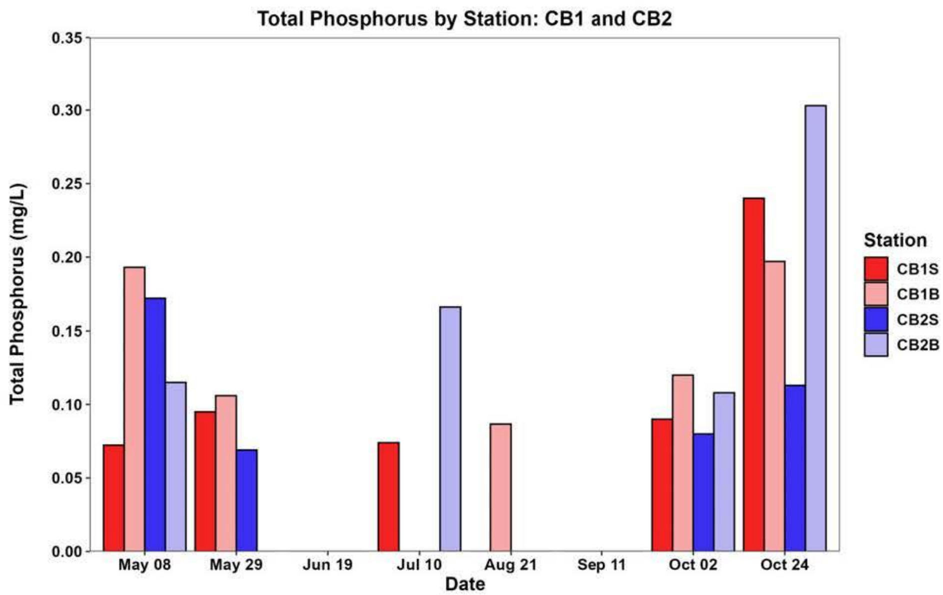
Appendix I: Graphs of Total Phosphorus



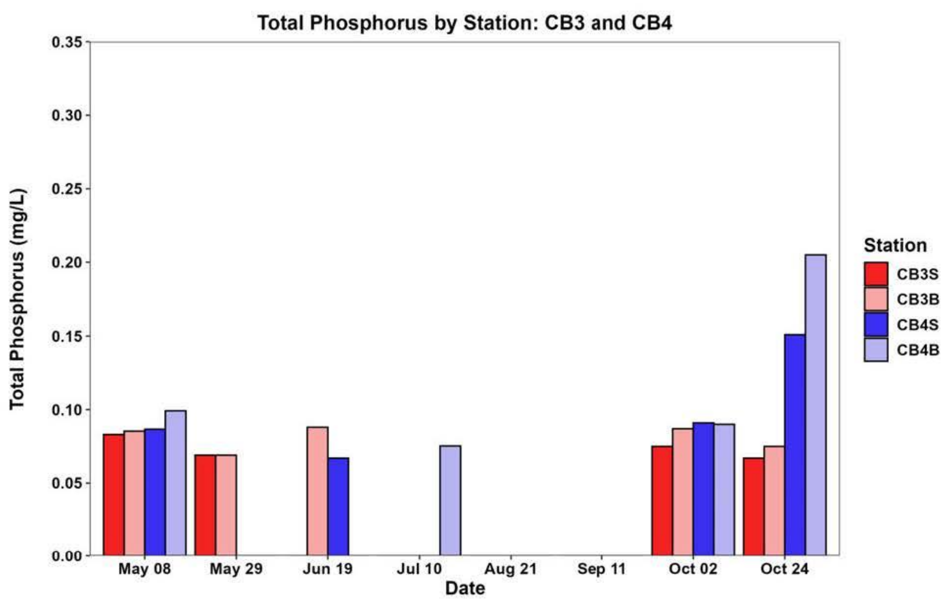
Total Phosphorus averaged over all stations and depths for each sampling date.



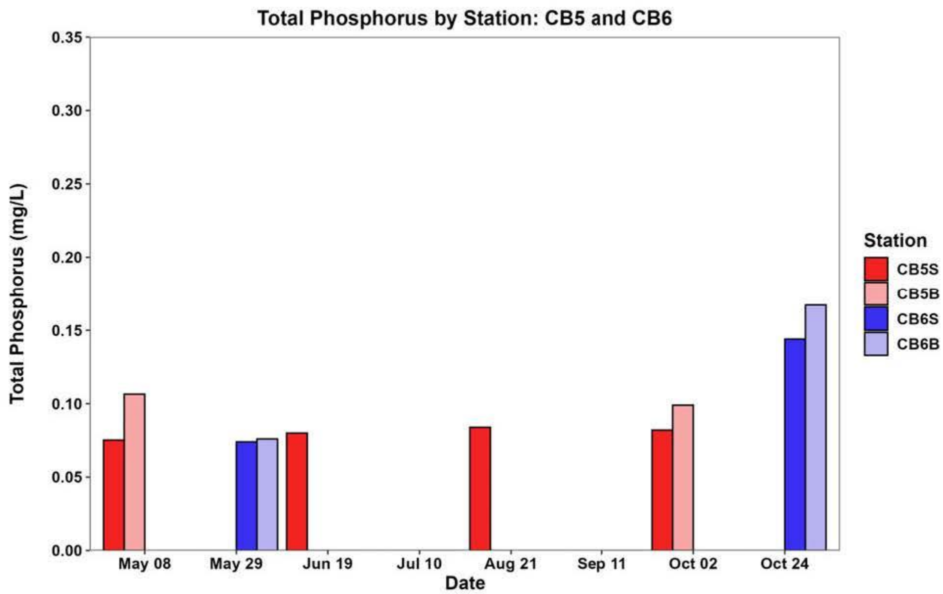
Total Phosphorus averaged over all dates for each sampling station and depth.



Total Phosphorus at CB1 and CB2 on each sampling date.



Total Phosphorus at CB3 and CB4 on each sampling date.



Total Phosphorus at CB5 and CB6 on each sampling date.

Appendix J: Replicate Samples

Replicate Samples								
Analyte	**Sample Station**	**Sample Date**	**Results**	**Flag**	**MDL**	**RL**	**Units**	**Method**
NOx - N	CB4B REP	5/8/24	0.0853		0.0100	0.0110	mg/L	353.2
TN	CB4B REP	5/8/24	0.191		0.0100	0.0110	mg/L	MWQLHTCCL
TP	CB4B REP	5/8/24	0.10336		0.0646	0.0730	mg/L	365.4
Chlorophyll a	CB4B REP	5/8/24	1.425		0.0100	0.0110	Microgram/L	SM10200H
Phaeophytin	CB4B REP	5/8/24	0.305		0.0646	0.0730	Microgram/L	SM10200H
Ammonia	CB4B REP	5/8/24	U	U	0.0060	0.0100	Microgram/L	EPA 350.1
Analyte	**Sample Station**	**Sample Date**	**Results**	**Flag**	**MDL**	**RL**	**Units**	**Method**
NOx - N	CB4S REP	5/29/24	0.013		0.0100	0.0110	mg/L	353.2
TN	CB4S REP	5/29/24	0.1116		0.0100	0.0110	mg/L	MWQLHTCCL
TP	CB4S REP	5/29/24	0.087		0.0646	0.0730	mg/L	365.4
Chlorophyll a	CB4S REP	5/29/24	1.216		0.0100	0.0110	Microgram/L	SM10200H
Phaeophytin	CB4S REP	5/29/24	0.5601		0.0646	0.0730	Microgram/L	SM10200H
Ammonia	CB4S REP	5/29/24	U	U	0.0060	0.0100	Microgram/L	EPA 350.1
Analyte	**Sample Station**	**Sample Date**	**Results**	**Flag**	**MDL**	**RL**	**Units**	**Method**
NOx - N	CB3B REP	6/19/24	0.016		0.0100	0.0110	mg/L	353.2
TN	CB3B REP	6/19/24	0.1254		0.0100	0.0110	mg/L	MWQLHTCCL
TP	CB3B REP	6/19/24	0.072	J	0.0646	0.0730	mg/L	365.4
Chlorophyll a	CB3B REP	6/19/24	1.782		0.0100	0.0110	Microgram/L	SM10200H
Phaeophytin	CB3B REP	6/19/24	0.3935		0.0646	0.0730	Microgram/L	SM10200H

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Ammonia	CB3B REP	6/19/24	0.012		0.0060	0.0100	Microgram/L	EPA 350.1
Analyte	Sample Station	Sample Date	Results	Flag	MDL	RL	Units	Method
NOx - N	CB3S REP2	7/10/24	0.029		0.0100	0.0110	mg/L	353.2
TN	CB3S REP2	7/10/24	0.1031		0.0100	0.0110	mg/L	MWQLHTCCL
TP	CB3S REP2	7/10/24	U	U	0.0646	0.0730	mg/L	365.4
Chlorophyll a	CB3S REP2	7/10/24	1.064		0.0100	0.0110	Microgram/L	SM10200H
Phaeophytin	CB3S REP2	7/10/24	0.1699		0.0646	0.0730	Microgram/L	SM10200H
Ammonia	CB3S REP2	7/10/24	U	U	0.0060	0.0100	Microgram/L	EPA 350.1
Analyte	Sample Station	Sample Date	Results	Flag	MDL	RL	Units	Method
NOx - N	CB2B REP	8/21/24	0.029		0.0100	0.0110	mg/L	353.2
TN	CB2B REP	8/21/24	0.1544		0.0100	0.0110	mg/L	MWQLHTCCL
TP	CB2B REP	8/21/24	0.0792		0.0646	0.0730	mg/L	365.4
Chlorophyll a	CB2B REP	8/21/24	1.939		0.0100	0.0110	Microgram/L	SM10200H
Phaeophytin	CB2B REP	8/21/24	1.5166		0.0646	0.0730	Microgram/L	SM10200H
Ammonia	CB2B REP	8/21/24	0.18		0.0060	0.0100	Microgram/L	EPA 350.1
Analyte	Sample Station	Sample Date	Results	Flag	MDL	RL	Units	Method
NOx - N	CB2S REP2	9/11/24	U	U	0.0100	0.0110	mg/L	353.2
TN	CB2S REP2	9/11/24	0.1346		0.0646	0.0730	mg/L	MWQLHTCCL
TP	CB2S REP2	9/11/24	U	U	0.0646	0.0730	mg/L	365.4
Chlorophyll a	CB2S REP2	9/11/24	4.759		0.0646	0.0730	Microgram/L	SM10200H
Phaeophytin	CB2S REP2	9/11/24	1.1686		0.0646	0.0730	Microgram/L	SM10200H
Ammonia	CB2S REP2	9/11/24	U	U	0.0060	0.0100	Microgram/L	EPA 350.1

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Analyte	Sample Station	Sample Date	Results	Flag	MDL	RL	Units	Method
NOx - N	CB1B Rep 2	10/2/24	0.032		0.0100	0.0110	mg/L	353.2
TN	CB1B Rep 2	10/2/24	0.1804		0.0100	0.0110	mg/L	MWQLHTCCL
TP	CB1B Rep 2	10/2/24	0.104		0.0646	0.0730	mg/L	365.4
Chlorophyll a	CB1B Rep 2	10/2/24	2.632		0.0100	0.0110	Microgram/L	SM10200H
Phaeophytin	CB1B Rep 2	10/2/24	1.0828		0.0646	0.0730	Microgram/L	SM10200H
Ammonia	CB1B Rep 2	10/2/24	0.025		0.0060	0.0100	Microgram/L	EPA 350.1
Analyte	Sample Station	Sample Date	Results	Flag	MDL	RL	Units	Method
NOx - N	CB1S Rep 2	10/24/24	0.05		0.01	0.011	mg/L	353.2
TN	CB1S Rep 2	10/24/24	0.1862		0.0531	0.0589	mg/L	MWQLHTCCL
TP	CB1S Rep 2	10/24/24	0.129		0.0646	0.0730	mg/L	365.4
Chlorophyll a	CB1S Rep 2	10/24/24	2.334		0.01	0.006	Microgram/L	SM10200H
Phaeophytin	CB1S Rep 2	10/24/24	1.6663		0.0174	0.0348	Microgram/L	SM10200H
Ammonia	CB1S Rep 2	10/24/24	0.021		0.0060	0.0100	Microgram/L	EPA 350.1

- Kat Haltiner, Natural Resources Consultant

Data summary submitted with Chandler Bay upgrade comment on page 71 above.

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4. Appendix A: Conservation Lands Data Summary (GIS-Derived Totals)

This table summarizes the total conserved acreage and protection status within each tier, demonstrating the overwhelming land-use compatibility with SA standards.

Data Field	Tier 1: Immediate Zone (Within Reclassification Polygon)	Tier 2: Intermediate Zone (Within 2 Miles)	Tier 3: Extended Zone (Potential Impact Zone)
Total Projects	30	22	46
Total Acres (by GIS)	938.76 acres	1353.58 acres	2877.28 acres
Projects with GAP Status 1 or 2 (High Protection)	26 (87% of Projects)	14	23
Interest Type: Private	25	14	30
Interest Type: State	10	9	24
Interest Type: Federal	0	1	1
Interest Type: Municipal	0	1	0

GAP Status Definitions:
GAP Status 1: Areas managed for biodiversity where natural disturbances are allowed to proceed (Highest Protection).
GAP Status 2: Areas managed for biodiversity where natural disturbance is suppressed.
GAP Status 3: Areas protected from land cover conversion but subject to extractive uses such as logging and mining.

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5. Detailed Conservation Lands Parcel Data

The comprehensive, parcel-by-parcel data for all conservation lands, including Landholder, GIS Acreage, Tier, GAP Status, and Interest Type, is provided in a separate, complete table located at the end of the main report (Appendix B).

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6. Public Recreation Sites in the Area of Influence (Near Kingfish Site)

These recreational sites highlight the social value of the area and the necessity of the SA designation. They are situated in the area of influence of the proposed reclassification and near the Kingfish Maine project site.

Recreation Site	Ownership / Management	Description /Relation to Chandler Bay
Roque Bluffs State Park & Beach	State of Maine	Key protected natural resource providing beaches (including Roque Bluffs Beach), trails, and conserved uplands. Represents a primary public

		destination for swimming and coastal access.
Sandy River Beach & Picnic Area	Municipally Owned (Town of Jonesport)	Highly utilized public access point for swimming, picnicking, and hand-carry boat launching on the adjacent shorefront.
Little Pond Beach/ Pobblestone Cove	Municipally Owned (Town of Jonesport)	Two additional locally-known beach and swimming areas, demonstrating high utilization of the nearshore coastal environment.
Henry Point	Municipally Owned (Town of Jonesport)	Coastal site used for public camping and fishing access, with permanent facilities and shorefront access.
Beals Town Park	Municipally Owned (Town of Beals)	A local community park and public access point that contributes to the regional recreational network.
Sawyer Cover Boat Ramp	State / Town	Primary public boat launch providing recreational access to Chandler Bay.
Chandler Bay & Alley Bay Launches	Various / Local Access	Additional public and private boat launch points providing critical water access for commercial fishing, recreation, and regional navigation.
Great Wass Island Preserve	The Nature Conservancy (Private conservation)	Large, permanently conserved area offering miles of hiking trails and undeveloped shorefront adjacent to the proposed SA waters.

Appendix B.

Tier	Object ID	Project	Parcel Name	Designation	Interest 1 Name	Interest 1 Type	GIS Acreage	GAP Status	Public Access	Purpose 1	Purpose 2	Interest 2 Name	Interest 2 Type
1	132	Virgin's Breast			DCC	Private	0.28	2	Contact landowner				
1	337	Alan E. Hutchinson WMA	Ballast Island Farnsworth Lot	State Wildlife Management Area	MDIFW	State	3.47	3	Contact landowner	Conservation /Wildlife			
1	400	Mason Bay	LaBelle-Upper White	Private Conservation Lands	MCHT	Private	26.95	2	Allowed for general uses	Conservation /Wildlife	Open Space		
1	580	Mason Bay	Gardner	Private Conservation Lands	MCHT	Private	16.07	2	Allowed for general uses	Conservation /Wildlife	Open Space		
1	861	Windrise Farm			DCC	Private	33.12	3	Contact landowner				
1	2943	Mason Bay	Waite-Southwest Creek	Private Conservation Lands	MCHT	Private	70.30	2	Allowed for general uses	Conservation /Wildlife	Open Space		
1	4255	Mason Bay	Dougherty	Private Conservation Lands	MCHT	Private	2.19	2	Contact landowner	Conservation /Wildlife	Open Space		
1	4542	Mason Bay	Virginia Beal	Private Conservation Lands	MCHT	Private	18.69	2	Allowed for general uses	Conservation /Wildlife	Open Space		

1	5022	Tide Mill Creek		Nature Preserve / Reserve / Sanctuary	DCC	Private	112.26	2	Allowed for general uses				
1	5043	Mason Bay	Blueberry Shores	Private Conservation Lands	MCHT	Private	2.24	2	Contact landowner	Conservation /Wildlife	Open Space		
1	5257	Mason Bay	Kennedy-Meadow Brook	Private Conservation Lands	MCHT	Private	26.17	2	Allowed for general uses	Conservation /Wildlife	Open Space		
1	7365	Virgin Island		Coastal Island	BPL	State	0.12	3					
1	8219	Mason Bay	Bernard Beal	Private Conservation Lands	MCHT	Private	21.47	2	Allowed for general uses,	Conservation /Wildlife	Open Space		
1	8432	Mason Bay	B Beal Shorefront	Private Conservation Lands	MCHT	Private	3.84	2	Allowed for general uses	Conservation /Wildlife	Open Space		
1	9641	Mason Bay	LaBelle-Jonesboro Beaver Meadows	Private Conservation Lands	MCHT	Private	49.65	2	Allowed for general uses	Conservation /Wildlife	Open Space		
1	30482	Popplestone Beach	Popplestone Beach		MCHT	Private	38.62	3	Allowed for general uses	Recreational	Conservation/Wildlife		
1	54715	Tide Mill Creek	Poverty Island		DCC	Other	4.25	2	Contact landowner for additional information				
1	54717	Virgin's Breast			DCC	Other	0.56	2	Contact landowner				
1	59734	Mason Bay	Dowling	Private Conservation Lands	MCHT	Private	59.98	2	Allowed for general uses	Conservation /Wildlife	Open Space	MDIFW	State
1	59924	Tide Mill Creek		Nature Preserve / Reserve / Sanctuary	DCC	Private	73.13	2	Allowed for general uses			MDIFW	State
1	59944	Mason Bay	Bronfeld	Private Conservation Lands	MCHT	Private	54.42	2	Allowed for general uses	Conservation /Wildlife	Open Space	MDIFW	State
1	59966	Mason Bay	Chartier-Clay Point	Private Conservation Lands	MCHT	Private	7.01	2	Allowed for general uses	Conservation /Wildlife	Open Space:	MDIFW	State

1	59977	Mason Bay	Cormo	Private Conservation Lands	MCHT	Private	103.87	2	Allowed for general uses	Conservation /Wildlife	Open Space	MDIFW	State
1	60058	Mason Bay	Boncore	Private Conservation Lands	MCHT	Private	151.15	2	Allowed for general uses	Conservation /Wildlife	Open Space	MDIFW	State
1	65343	Mason Bay	Spakowski	Private Conservation Lands	MCHT	Private	8.80	2	Allowed for general uses	Conservation /Wildlife	Open Space		
1	65344	Mason Bay	Elsner-Skillin	Private Conservation Lands	MCHT	Private	26.28	2	Allowed for general uses	Conservation /Wildlife	Open Space		
1	65345	Mason Bay	Harris	Private Conservation Lands	MCHT	Private	5.38	2	Allowed for general uses	Conservation /Wildlife	Open Space		
1	65346	Mason Bay	Elsner	Private Conservation Lands	MCHT	Private	8.91	2	Allowed for general uses	Conservation /Wildlife	Open Space:		
1	68578	Mason Bay	Rowse-Bay Ridge Point	Private Conservation Lands	MCHT	Private	5.91	2	Allowed for general uses	Conservation /Wildlife	Open Space:	MDIFW	State
1	75472	Bar Island Jonesport	Bar Island Jonesport	Private Conservation Lands	MCHT	State	3.67	2	Allowed	Community	Conservati on/Wildlife		
2	2169	Little Hardwood Island Preserve		Nature Preserve / Reserve / Sanctuary	The Nature Conservancy	Private	5.24	1	Contact landowner for additional information	Conservation /Wildlife			
2	4697	Tide Mill Creek Preserve	Tide Mill Creek 2		DCC	Private	8.14	2	Allowed for general uses				
2	6699	Head Harbor Island 1 and 2 Easements		Private Conservation Lands	The Nature Conservancy	Private	564.79	3	Contact landowner	Conservation /Wildlife			
2	7195	GWI Archipelago, Seguin Island Easement		Private Conservation Lands	The Nature Conservancy	Private	13.15	3	Contact landowner	Conservation /Wildlife			
2	7586	Frost Homestead			DCC	Private	6.55	3	Contact landowner				
2	8641	Head Harbor Island 1 and 2 Easements		Private Conservation Lands	The Nature Conservancy	Private	47.04	3	Contact landowner	Conservation /Wildlife			
2	8772	Great Wass Island Macrosite,		Nature Preserve / Reserve / Sanctuary	The Nature Conservancy	Private	39.17	1	Contact landowner	Conservation /Wildlife			

		Mark Island Preserve											
2	9432	Helliwell Park		Nature Preserve / Reserve / Sanctuary	Maine Minor Civil Division	Municipal	37.79	3	Allowed for general uses			The Nature Conservancy	Private
2	10769	Head Harbor Island Preserve	Maine Coast Heritage Trust		The Nature Conservancy	Private	4.35	1	Contact landowner				
2	21104	Seaduck Point	Seaduck Point.(E)	Private Conservation Lands	MCHT	Private	112.49	2	Allowed for general uses. Restricted	Ecological	Recreational		
2	21105	Seaduck Point	Seaduck Point.(W)	Private Conservation Lands	Maine Coast Heritage Trust	Private	60.62	2	Allowed for general uses. Restricted	Ecological	Recreational		
2	67372	Pond Cove Island	Pond Cove Island	State Park Property	BPL	State	52.64	2	Allowed for general uses				
2	76167	Dowling	Dowling	Conservation Easement	DCC	Private	48.53	3	Contact landowner for additional information: Do not promote/publish without permission				
2	76168	Dowling	Dowling	Conservation Easement	DCC	Private	1.21	3	Contact the landowner. Do not promote /publish without permission			BPL	State
2	7656	Roque Bluffs State Park	Delia Houghton	State Park	BPL	State	143.39	2	Allowed for general uses				
2	8777	Roque Bluffs State Park	Robert Adam	State Park	BPL	State	25.61	2	Allowed for general uses				
2	7818	Roque Bluffs State Park	Barbara Messer	State Park	BPL	State	1.64	2	Allowed for general uses				
2	8916	Roque Bluffs State Park	Clayton and Paula Morse	State Park	BPL	State	0.37	2	Allowed for general uses				

2	9101	Roque Bluffs State Park	Pine Acres Inc	State Park	BPL	State	2.09	2	Allowed for general uses				
2	3764	Maine Coastal Islands NWR	Tract 304	National Wildlife Refuge	US Fish and Wildlife Service	Federal	16.57	2	Contact landowner				
2	8476	Alan E. Hutchinson WMA	Pulpit Rock	State Wildlife Management Area	MDIFW	State	1.65	3	Contact landowner	Conservation /Wildlife		BPL	State
2	68981	Indian River Conservation Area	Farnsworth		DCC	Private	141.09	2					
2	68983	Indian River Conservation Area	Farmsworth North		DCC	Private	19.46	2					
3	1132	Treasure Devils Island		Coastal Island	BPL	State	0.30	3					
3	1450	GWI Macrosite, Mistake Island Preserve		Nature Preserve / Reserve / Sanctuary	The Nature Conservancy	Private	20.90	1	Contact landowner	Conservation /Wildlife			
3	1898	Great Wass Island Archipelago, Cows Yard Easement		Private Conservation Lands	The Nature Conservancy	Private	3.56	3	Contact landowner	Conservation /Wildlife			
3	2733	Great Wass Island Preserve	Little Cape Point	Nature Preserve / Reserve / Sanctuary	The Nature Conservancy	Private	410.64	1	Allowed for general uses	Conservation /Wildlife			
3	2748	Little Cape		Coastal Island	BPL	State	0.41	3					
3	2888	Great Wass Island Preserve		Nature Preserve / Reserve / Sanctuary	The Nature Conservancy	Private	441.46	1	Allowed for general uses	Conservation /Wildlife			
3	3720	Great Wass Island Archipelago, Cows Yard Easement		Private Conservation Lands	The Nature Conservancy	Private	3.89	3	Contact landowner	Conservation /Wildlife			
3	4283	GWI, Inner and Outer Man Islands Preserve		Nature Preserve / Reserve / Sanctuary	The Nature Conservancy	Private	0.04	1	Contact landowner				
3	4793	Head Harbor Island Preserve		Nature Preserve / Reserve / Sanctuary	The Nature Conservancy	Private	2.40	3	Contact landowner	Conservation /Wildlife			
3	5361	GWI Archipelago, Black Island Preserve		Nature Preserve / Reserve / Sanctuary	The Nature Conservancy	Private	10.62	1	Contact landowner	Conservation /Wildlife			

3	5777	GWI, Inner and Outer Man Islands Preserve		Nature Preserve / Reserve / Sanctuary	The Nature Conservancy	Private	4.44	1	Contact landowner				
3	5888	Great Wass Island Preserve		Nature Preserve / Reserve / Sanctuary	The Nature Conservancy	Private	600.52	1	Allowed for general uses	Conservation /Wildlife			
3	5927	Island		Coastal Island	BPL	State	0.79	3					
3	6895	Steele Harbor Island Easement		Private Conservation Lands	The Nature Conservancy	Private	422.82	3	Contact landowner	Conservation /Wildlife			
3	7566	GWI, Inner and Outer Man Islands Preserve		Nature Preserve / Reserve / Sanctuary	The Nature Conservancy	Private	2.86	1	Contact landowner				
3	8286	Alan E. Hutchinson WMA	Freeman Rock	State Wildlife Management Area	MDIFW	State	1.52	3	Contact landowner	Conservation /Wildlife		BPL	State
3	8327	Little Water Island	Little Water Island	Public Land	BPL	State	1.21	3					
3	8333	Island		Coastal Island	BPL	State	2.76	3					
3	8541	Great Wass Island Archipelago, Cows Yard Easement		Private Conservation Lands	The Nature Conservancy	Private	0.43	3	Contact landowner	Conservation /Wildlife			
3	8786	GWI, Inner and Outer Man Islands Preserve		Nature Preserve / Reserve / Sanctuary	The Nature Conservancy	Private	0.16	1	Contact landowner				
3	8984	Great Wass Island Easements (Pres.)		Private Conservation Lands	The Nature Conservancy	Private	57.30	3	Contact landowner	Conservation /Wildlife			
3	9003	Browney Island	Browney Island	Coastal Island	DCC	Private	39.76	2	Contact landowner	Ecological		MCHT	Private
3	9584	GWI Macrosite, Knight Island Preserve		Nature Preserve / Reserve / Sanctuary	The Nature Conservancy	Private	29.17	1	Contact landowner	Conservation /Wildlife			
3	9789	Great Wass Island Archipelago, Cows Yard Easement		Private Conservation Lands	The Nature Conservancy	Private	1.77	3	Contact landowner	Conservation /Wildlife			
3	10297	Little Cape		Coastal Island	BPL	State	0.10	3					
3	68178	Green Island	Green Island	Private Conservation Lands	MCHT	Private	3.75	2	Allowed for general uses	Conservation /Wildlife	Open Space		

3	2915	Roque Bluffs State Park	Unice Watts	State Park	BPL	State	0.62	2	Allowed for general uses				
3	1123	Roque Bluffs State Park	Howard Watts	State Park	BPL	State	1.54	2	Allowed for general uses				
3	7757	Roque Bluffs State Park	William Parker	State Park	BPL	State	42.15	2	Allowed for general uses				
3	417	Englishman's River	Duck Cove Lot	State Wildlife Management Area	MDIFW	State	132.89	3	Allowed for general uses				
3	3703	Maine Coastal Islands NWR	Halifax	National Wildlife Refuge	US Fish and Wildlife Service	Federal	59.62	2	Contact landowner	Conservation /Wildlife	Ecological	The Nature Conservacy	Private
3	10017	Alan E. Hutchinson WMA	Green Island	State Wildlife Management Area	MDIFW	State	1.97	3	Contact landowner	Conservation /Wildlife		BPL	State
3	1213	Alan E. Hutchinson WMA	West Brothers Island	State Wildlife Management Area	MDIFW	State	15.48	3	Contact landowner	Conservation /Wildlife			
3	9657	Alan E. Hutchinson WMA	Inner (Little) Ram Island	State Wildlife Management Area	MDIFW	State	13.09	3	Contact landowner	Conservation /Wildlife			
3	9003	Browney Island	Browney Island	Coastal Island	DCC	Private	39.76	2	Contact landowner	Conservation /Wildlife		MCHT	Private
3	10856	Alan E. Hutchinson WMA	Crumple Island Ledge	State Wildlife Management Area	MDIFW	State	0.53	1	Contact landowner	Conservation /Wildlife		BPL	State
3	7169	GWI Macrosite, Crumple Island Preserve		Nature Preserve / Reserve / Sanctuary	The Nature Conservancy	Private	1.39	1	Contact landowner	Conservation /Wildlife			
3	4864	GWI Macrosite, Crumple Island Preserve		Nature Preserve / Reserve / Sanctuary	The Nature Conservancy	Private	24.29	1	Contact landowner	Conservation /Wildlife			
3	9741	Alan E. Hutchinson WMA		State Wildlife Management Area	MDIFW	State	0.68	3	Contact landowner]	Conservation /Wildlife		BPL	State
3	2170	Alan E. Hutchinson WMA	Sea Duck Rock	State Wildlife Management Area	MDIFW	State	0.72	3	Contact landowner	Conservation /Wildlife		BPL	State
3	8861	Alan E. Hutchinson WMA	Sevens Island Ledge	State Wildlife Management Area	MDIFW	State	0.64	3	Contact landowner	Conservation /Wildlife		BPL	State

Key of Abbreviations and Shortened Text

Interest name:

DCC	Downeast Coastal Conservancy
DEP	Maine Department of Environmental Protection
MDIFW	Maine Department of Inland Fisheries and Wildlife
MCHT	Maine Coast Heritage Trust
BPL	Maine Bureau of Parks and Lands

Public Access:

Allowed for general uses	Allowed for general uses, contact owner for details: Certain restrictions may apply - time, activity
Allowed for general uses. Restricted	allowed for general use, contact owner for details: Restricted by time of year - seasonal use, wildlife breeding seasons, environmental degradation during spring or wet season,

Purpose:

Open Space: Provides open space in developed area

Ecological: Ecological preservation

Conservation/Wildlife: Seeks to protect ecosystem or specific wildlife

Recreational: Used for outdoor recreation, including hiking, water activities, hunting, ATVs, or Snowmobiles

- Anastasia Fischer, Eastern Maine Conservation Initiative (EMCI)

Supporting information submitted with Chandler Bay upgrade comment on page 76 above.

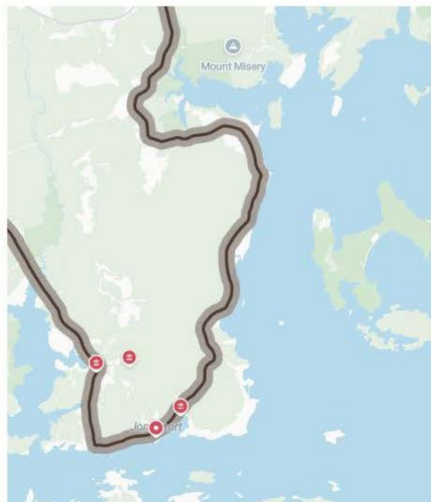
EASTERN MAINE CONSERVATION INTITIATIVE

APPENDIX A: Bold Coast National Scenic Byway – Designated in 2021

- Route is directly on Chandler Bay
- Description in National Designation clearly designated the area as significant for recreation and heritage fishing (and other industries) that depend on the health of existing natural resources.

https://nsbfoundation.com/nb/bold-coast-national-scenic-byway/

The Bold Coast National Scenic Byway perches at the nation's raw and rugged easternmost edge, a place of wild beauty with a history of human settlement dating back 12,000 years. Travelers can explore diverse recreation opportunities within breathtaking natural settings that provide a physical timeline of the Native American and settlement history that shaped America's eastern seaboard. Byway travelers can swim, bike, hike, paddle, and cruise their way through a coastal landscape created by molten lava then sheared off by grinding ice. Deep mossy forests and high coastal ledges contain rare or unusual habitats and species. Unspoiled rivers support wild Atlantic salmon. Night skies remain brilliant with stars. People harvest wild blueberries, as they have since glaciers receded. Descendants of early Passamaquoddy, founding settlers, and Revolution heroes keep our ancestry alive; here, history is celebrated, held sacred, and perseveres over time. The Bold Coast National Scenic Byway connects travelers with the nation's last vestige of a natural resource-based maritime culture, where turning tides and changing seasons dictate daily life. Today, this byway **connects a network of public conservation lands abundant with natural resources, coastal and riverine villages with well-preserved historic districts and working waterfronts, and the people that continue to inhabit, value, and depend upon these landscapes.** Byway travelers can stretch their legs on trails traversing bold coastlines shaped by glaciers, view the island where European explorers including Samuel Champlain first settled, visit the site of the first naval battle of the American Revolution, and paddle rivers that once transported native Americans, European explorers, and the "King's pines."

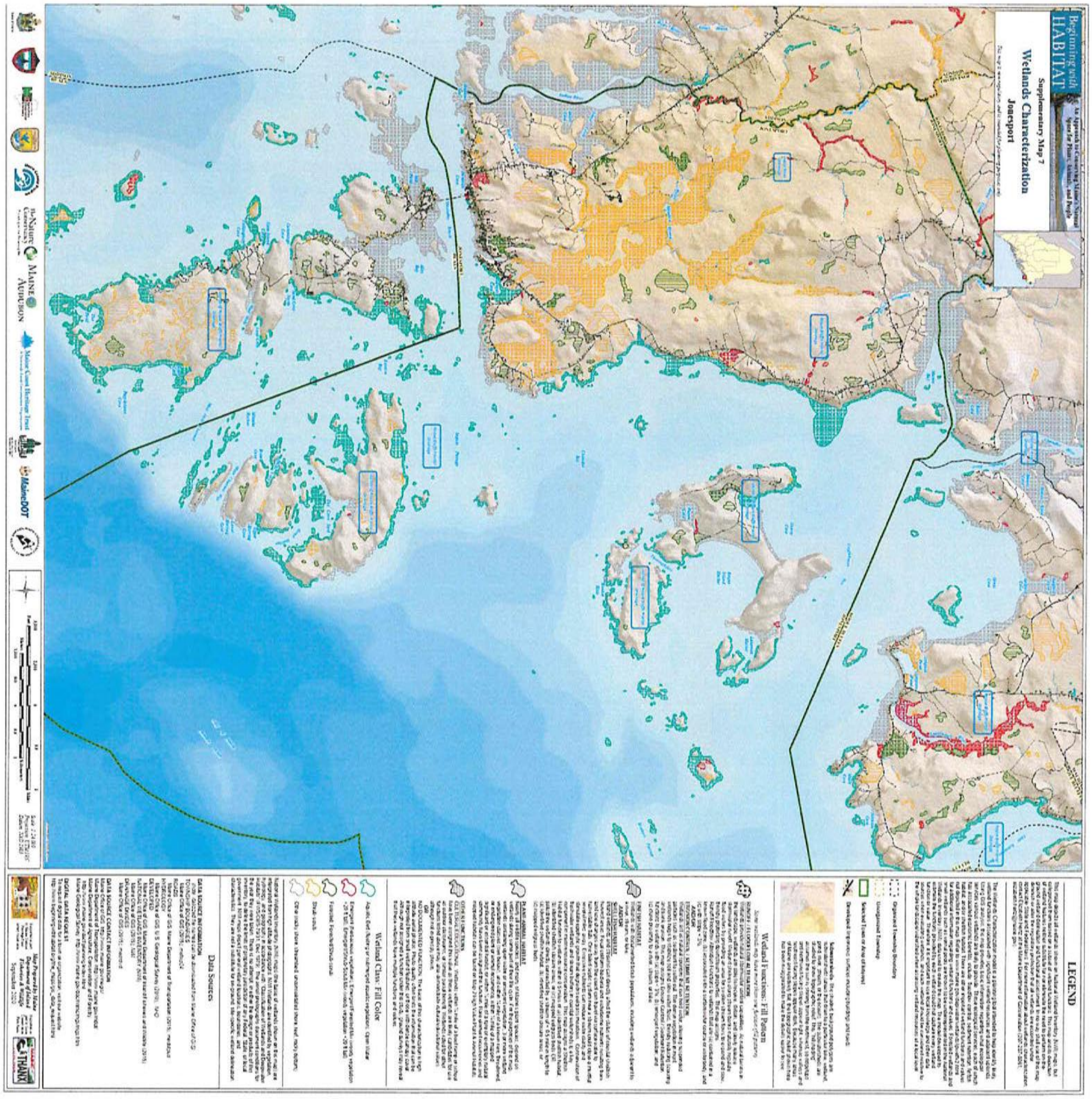


APPENDIX B – DEP Permit for Kingfish

(https://www.maine.gov/dep/ftp/projects/kingfish/ME0037559_2021%20FINAL%20with%20attachments.pdf)

As stated in the permit:

- *"The threshold for performing anti-deg analysis for this discharge is 2.1 mg/L.Kingfish is proposing to discharge at 6.6 mg/L, therefore, Kingfish has triggered the anti-degradation provision threshold of 20% of the RAC for their discharge."*
- *"At 6.6 mg/L, according to the State's antidegradation policy and the staff's historical practice and best professional experience and judgment, **this discharge concentration is considered a lowering of water quality** and the applicant can meet the standard if it establishes and the Department makes the findings required by 38 M.R.S. § 464(4)(F)(5)."*
- *"Where **a discharge will result in lowering the existing water quality of any waterbody**, the Department has made the finding, following opportunity for public participation, that this action is necessary to achieve important economic or social benefits to the State."*


Beginning with HABITAT
Supplementary Map 7
Wetlands Characterization
Jonesport
LEGEND
Wetland Functions: Fill Pattern
Wetland Class: Fill Color
Data Sources

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
55 Great Republic Drive
Gloucester, MA 01930

June 6, 2022

Frank J. DelGuidice
Chief, Permits and Enforcement Branch
Regulatory Division
U.S. Army Corps of Engineers
New England District
696 Virginia Road Concord, MA 01742-2751

Re: Kingfish Maine, Inc. NAE-2020-1651

Dear Mr. DelGuidice,

We have reviewed your EFH worksheet and additional information for the proposed Kingfish Maine land-based aquaculture facility in Jonesport, Maine. Specifically, the proposed work involves construction, operation and maintenance of a land-based yellowtail amberjack (*Seriola lalandi)* aquaculture facility utilizing a recirculating aquaculture system (RAS). The goal of the proposed project is to produce 8000 metric tons of farm-raised yellowtail amberjack for market per year. The proposal also involves constructing a trench in the intertidal and shallow-subtidal zones to install two pipes to discharge treated facility water and two pipelines serving as saltwater intakes. At full operational capacity the facility will discharge 28.7 million gallons per day (mgd) of treated wastewater, which includes 6.5 mgd of fish culture or process water and 22.2 mgd of water used for heat recovery in the facility. The facility will withdraw 19,812 gallons per minute (gpm) of seawater, which equates to ~28.53 mgd. According to the information provided, the proposed project would impact wetlands, mud, gravel/cobble intertidal and subtidal habitats in order to install the seawater intake and discharge pipes. The project also will contribute to elevated nutrient levels within Chandler Bay and result in entrainment/ impingement of resident larval and potentially juvenile fish from intake operations.

According to the information you provided, installation of the pipelines will necessitate excavating a trench through the intertidal and subtidal zones. The trenching and placement of the seawater pipelines would impact a total of 44,366 square feet (sf) of benthic habitat in the intertidal/ subtidal zones, including 8620 sf of intertidal and subtidal zones for trenching and back filling the intake/outfall pipes, 7136 sf of subtidal substrate for the install of precast Econcrete collars to hold the pipes in place and 28,610 sf from laying pipe on the bottom in subtidal mud, sand, and gravel/cobble habitat. A total of 7136 sf of subtidal mud, sand, and gravel/cobble habitat will be displaced by the concrete collars, which project proponents plan to monitor for recolonization.

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As you are aware, the Magnuson-Stevens Fishery Conservation and Management Act (MSA) and the Fish and Wildlife Coordination Act require federal agencies to consult with one another on projects such as this. Insofar as a project involves essential fish habitat (EFH), as this project does, this process is guided by the requirements of our EFH regulation at 50 CFR 600.905, which mandates the preparation of EFH assessments and generally outlines each agency's obligations in this consultation procedure. We appreciate your response to our information request and offer the following comments and recommendations on this project pursuant to the above referenced regulatory process.

Resources in the Project Area

Chandler Bay supports species and habitats that are critical to a healthy marine ecosystem. The area supports wetlands, intertidal mudflat and rocky bottom habitats, and subtidal habitats including eelgrass beds. Federally-managed species containing EFH in the project area include, but not limited to, all life stages of; winter flounder, Atlantic cod, windowpane flounder, red hake, and Atlantic wolffish, and at least one or more life stages of little skate, ocean pout, Atlantic herring, pollock, silver hake, ocean pout and Atlantic sea scallop. In addition, gravel, cobble, and structurally-complex rock bottom habitats with attached macroalgae and epifauna present in the project area are important habitats for a number of life stages of federally-managed species, including juvenile Atlantic cod and juvenile sea scallops (Packer et al. 1999). American lobster also use cobble substrate (ASMFC 1997) for shelter from predation and for feeding during early benthic phases (Barshaw and Bryant-Rich 1988; Wahle and Steneck 1991). The project area is considered a Habitat Area of Particular Concern (HAPC) for inshore juvenile cod in the Gulf of Maine, which is defined as structurally-complex, rocky-bottom habitat from mean high water to water depths of 20 meters (NEFMC 2018). This habitat type provides two key ecological functions for juvenile cod: protection from predation, and readily available prey. Based on our most current stock assessment, the Gulf of Maine Atlantic cod stock is overfished and below the target biomass level, and there were no indication of positive trends in recruitment of juveniles into the fishery (NMFS 2021). Given the poor condition of Gulf of Maine cod stock, we believe a risk averse approach to protecting spawning and juvenile cod EFH and HAPC related to this project is warranted.

The nearshore vegetated and unconsolidated bottom habitat in the project area are important habitat for adults and early life stages of federally-managed species. Larvae of species with demersal eggs are less likely to be transported away from nearshore nursery grounds than those species with pelagic eggs, suggesting that the shallow-water habitats of Chandler Bay play an important role in spawning and egg development, but also as nursery areas for a number of important recreational and commercial species. A study by Lazzari and Stone (2006) found direct evidence of shallow water habitat (<6 m depth) in the Gulf of Maine, as critical facultative nursery habitat for economically and ecologically important species. This study also reported larvae and young-of-year juveniles of species that also spawn in deeper, offshore areas, such as Atlantic cod, Atlantic herring, and windowpane flounder, utilize shallow water habitats as nursery areas.

Comments Related to Proposed Pipeline Installation
According to the information you provided, the trenching for the seawater pipelines would impact approximately 44,366 sf of mud, sand, and gravel/cobble habitats in the intertidal and subtidal transition zones. Furthermore, the applicant's agent indicated impacts from the pipeline trenching in the intertidal zone are temporary and the elevation of the intertidal zone will be restored to pre-project conditions. The applicant should provide a detailed monitoring plan of the gravel/cobble rocky habitat impacted by the pipeline installation, with a pre- and post-construction assessment and photo documentation. The assessment should include a comparison of the pre- and post-construction rocky bottom habitat area, grain size, and complexity. Compensatory mitigation for temporal losses and for any reduction in the area and the grain size and complexity of the rocky bottom habitats should be required.

According to the information provided, the four pipelines will emerge from the subsurface in the transition zone and will be supported by concrete collars over the remaining length in the subtidal zone. Depending on scour post installation, the additional fill (e.g., concrete mats, riprap) may be needed to protect the pipes from scour and erosion in areas where the pipelines emerge from the subsurface bottom and is only shallowly buried or resting close to the bottom. These areas may be subjected to scour and erosion, especially during storms and strong currents. Therefore, an assessment of potential scour and erosion should take place and if deemed necessary, mitigation should be provided for excess fill associated with pipe protection.

A geotechnical survey of this area was performed, showing basalt and granite rock at varying depths below the surface. The applicant anticipates that blasting will not be required for pipeline installation. However, should blasting be required for this project, a blasting plan should be developed by the applicant and the USACE should re-initiate EFH consultation in order for us to review and comment on the blasting plan. In addition, all surficial rocky bottom habitat that is removed from the pipeline corridor should be offset with compensatory mitigation.

Regarding turbidity and sedimentation control during trench excavation and backfilling, the EFH worksheet states that, "increased turbidity is expected during construction. This effect will rapidly diminish upon project completion". However, details regarding the use of turbidity controls, or when and how turbidity monitoring will be conducted, have not been provided. A detailed plan for how turbidity and sedimentation will be controlled should be prepared and employed during trenching, backfilling and all turbidity and sedimentation producing activities.

The proposed in-water work window for this project is from November 8 to April 30 of any year for trenching and backfilling, and between November 8 and May 7 pf any given year
For placement of pipes and concrete collars. Winter flounder adults spawn in the Gulf of Maine region from March to May. Demersal eggs could be directly affected by elevated suspended sediments, turbidity, and by mechanical impacts from dredging, including delayed hatching, developmental defects on larvae, and mortality (Klein-MacPhee 2004; Berry et al. 2004, 2011; Wilber et al. 2005). In addition, the proposed in-water work window could adversely affect spawning and egg development habitat for winter flounder. Therefore, the work window should be modified to end on March 14, rather than May 7.

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Comments Related to Aquaculture Operations
Entrainment Impacts

The proposed seawater access piping includes two intake pipes that at full operational capacity will withdraw 28.53 mgd of seawater. The EFH assessment states that the intake is designed to minimize impingement of fish and invertebrates by installing wedgewire intake screens with a 1-inch slot size and a maximum through-screen velocity of less than 0.5 ft/sec. While this configuration may minimize impingement, it will not avoid entrainment of eggs and larvae. Ichthyoplankton studies have not been conducted for this project to quantify the numbers of eggs and larvae that will be entrained, or the species and life stages that will be impacted by the proposed project. In an attempt to assess the entrainment impacts to fish and bivalve eggs and larvae, we compared the entrainment data from the Seabrook Station Nuclear Power Plant (Seabrook Station) for 2019 (Nextera Energy 2019). With a volume of 592 mgd, the Seabrook Station cooling water intake system is approximately 20 times greater than the proposed Kingfish aquaculture facility. Assuming a linear relationship between water intake volume and incidents of egg and larvae entrainment, we calculated the projected annual entrainment impacts for the Kingfish aquaculture project, shown in the table below.

Taxa/Life Stage	Seabrook Station 2019 Entrainment Data	NMFS Estimated Annual Kingfish aquaculture Entrainment
Fish Eggs	575 million	20 million
Fish Larvae	253 million	8.87 million
Bivalve Larvae	$1,435 \times 10^9$	50×10^9

While the fish and invertebrate populations offshore of Seabrook Station are arguably distinct from those in the Kingfish project area, this estimate provides a reasonable, although conservative estimate for Kingfish entrainment impacts, given that Chandler Bay is a highly diverse and productive estuary that supports large fish and invertebrate populations, as well as several species of diadromous fish that spawn in the Chandler River and nearby Machias River. Furthermore, the marine fish and invertebrate populations in Chandler Bay are likely of higher in density and productivity than those in the offshore area where the Seabrook Station cooling water intake is located. As discussed above, Chandler Bay represents important spawning and nursery areas for species such as winter flounder, windowpane flounder and Atlantic herring. In addition, the larvae and young-of-year juveniles of species that also spawn in deeper, offshore areas utilize shallow water habitats in Chandler Bay as nursery areas (Lazzari and Stone 2006). These estimates for entrainment suggests the impacts are not trivial, and we believe the applicant should conduct an assessment of entrainment impacts based on the productivity of fish and invertebrate populations in the Chandler Bay. We are available to assist the applicant in providing relevant ichthyofauna information.

Discharge Outfall Impacts

We have remaining concerns regarding the potential impact to habitats from the proposed aquaculture wastewater discharge. The assumed background concentration of nitrogen is 0.26 mg/l per information provided by Maine Department of Environmental Protection (MEDEP). Given the critical water quality threshold protective of eelgrass is set at 0.32 mg/L, MEDEP has determined that the proposed nitrogen discharge from the Kingfish facility will result in a

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lowering of water quality as it relates to eelgrass habitat.

According to the Maine Pollutant Discharge Elimination System Permit and Waste Discharge License Proposed Draft Fact Sheet, the projected nitrogen concentrations in the area of discharge is 6.6 mg/l. These projected nitrogen concentrations from the discharge effluent appear to be 25x higher than ambient levels. Higher nutrient levels in estuaries are associated with higher biological oxygen demands and lower dissolved oxygen concentrations (Kennish 1998), can trigger macroalgae blooms (Shaw et al. 2018), fish kills, reduced water clarity (O'Reilly 1994; Johnson et al. 2007), and can lead to eelgrass bed mortality and disease (Short and Burdick 1996; Goldsborough 1997). While the response to early coordination comments provided by Kingfish indicated that denitrification via upflow sludge bioreactors (USBs) will be employed, specifics on the quantitative nitrogen reductions achieved by this process were not provided.

The Maine Department of Environmental Protection's Pollutant Discharge Elimination System permit and Waste Discharge License requires the following monitoring requirements:

1. Technology-based numeric limitations for flow, biochemical oxygen demand (BOD), total suspended solids (TSS) and pH;
2. A requirement to seasonally (May – October) monitor the effluent for total phosphorus, total ammonia (as N), total kjeldahl nitrogen, nitrate + nitrite nitrogen;
3. A monthly average water quality-based mass limitation for total nitrogen;
4. A requirement for the permittee to conduct a dye study to more accurately determine the mixing characteristics of the treated effluent discharge from the facility with the receiving water;
5. A requirement to conduct seasonal (May – October) ambient water quality monitoring in Chandler Bay;
6. A requirement for the facility to develop and maintain an Operations & Maintenance (O&M) Plan for the production facility and the wastewater treatment facility;
7. Daily maximum concentration limits for formalin based off of 1-hour or 24-hour treatment types; and
8. A finding by the Department pursuant to the antidegradation provisions under Classification of Maine waters, 38 M.R.S. § 464(4)(F), for nitrogen as it pertains to eelgrass as an indicator.

Essential Fish Habitat Conservation Recommendations
Section 305(b)(2) of the MSA requires all federal agencies to consult with us on any action authorized, funded, or undertaken by that agency that may adversely affect EFH. The proposed project area in Chandler Bay and adjacent areas have been identified as EFH under the MSA for several federally-managed species. We recommend, pursuant to Section 305(b)(a)(A) of the MSA, that you adopt the following EFH conservation recommendations:

1. Compensatory mitigation should be provided for all temporary and permanent adverse effects resulting from the trenching and backfilling for the installation of the intake and

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outfall pipes in the intertidal and subtidal zone (44,366 sf adverse effects to EFH and HAPC).

2. Monitoring plans that incorporate an undisturbed control and ECOncrete sites should be developed and shared with resource agencies for review and comment. Compensatory mitigation should be provided for areas that do not meet established mitigation targets. The monitoring program should include an assessment of pre- and post-construction conditions to determine the effects of the pipeline on the marine ecosystem, including physical and biological effects. Data should be collected to characterize the benthic habitat(s) as it is now (e.g., predominant sediment grain size, bottom uniformity, vegetation, etc.) as well as the existing benthic biological community (epi and infaunal organisms). The organisms should be classified (by species, preferably, and also whether they're resident or non-resident/invasive) and quantified to understand changes in both absolute abundance and relative abundance as a result of the project. The monitoring plan should include an invasive species monitoring plan and contingencies for case-specific control of invasive species.
3. To estimate the entrainment impacts to eggs and larvae from the proposed project, an assessment should be conducted based on the ichthyofauna of Chandler Bay and the proposed recirculating aquaculture system. We are available to provide information on relevant fish and invertebrate ichthyofauna present in Chandler Bay, and request an opportunity to review the assessment prior to issuance of any permits.
4. To protect spawning and egg development habitat for winter flounder, the work window should be modified to end on March 14, rather than May 7 and a time-of-year restriction should be required for in-water work between March 15 and June 30.
5. An assessment of potential scour and erosion in the areas where the buried section of the pipeline transitions to the exposed and anchored section, and measures to mitigate scour and erosion should be required. Any areas of additional fill should require compensatory mitigation.
6. Should blasting be required for this project, a blasting plan should be developed by the applicant and the USACE should re-initiate EFH consultation in order for us to review and comment on the blasting plan.
7. A detailed plan for how turbidity and sedimentation will be controlled should be prepared and employed during trenching, backfilling and all turbidity and sedimentation producing activities.

Please note that Section 305(b)(4)(B) of the MSA requires you to provide us with a detailed written response to these EFH conservation recommendations, including a description of measures you have adopted that avoid, mitigate, or offset the impact of the project on EFH. In the case of a response that is inconsistent with our recommendations, Section 305(b)(4)(B) of the MSA also indicates that you must explain your reasons for not following the recommendations. Included in such reasoning would be the scientific justification for any disagreements with us over the anticipated effects of the proposed action and the measures needed to avoid, minimize, mitigate, or offset such effects pursuant to 50 CFR 600.920(k). Please also note that a distinct and further EFH consultation must be reinitiated pursuant to 50 CFR 600.920(1) if new information becomes available or the project is revised in such a manner that affects the basis for the above EFH conservation recommendations.

Endangered Species Act
Threatened and endangered species under our jurisdiction may be present in the action area, and consultation pursuant to section 7 of the Endangered Species Act of 1973 is required. If you have any questions regarding the status of this consultation, please contact Roosevelt Mesa at 978-281-9186 or roosevelt.mesa@noaa.gov.

We appreciate the opportunity to provide these EFH conservation recommendations. If you have any questions regarding our conservation recommendations or information in this letter, please contact Kaitlyn Shaw at 978-282-8457 or at kaitlyn.shaw@noaa.gov.

Sincerely,

Louis A. Chiarella
Assistant Regional Administrator
for Habitat and Ecosystems Services

cc: Roosevelt Mesa, PRD
Shawn Mahaney, USACE
Mike Marsh, USEPA
Tom Nies, NEFMC

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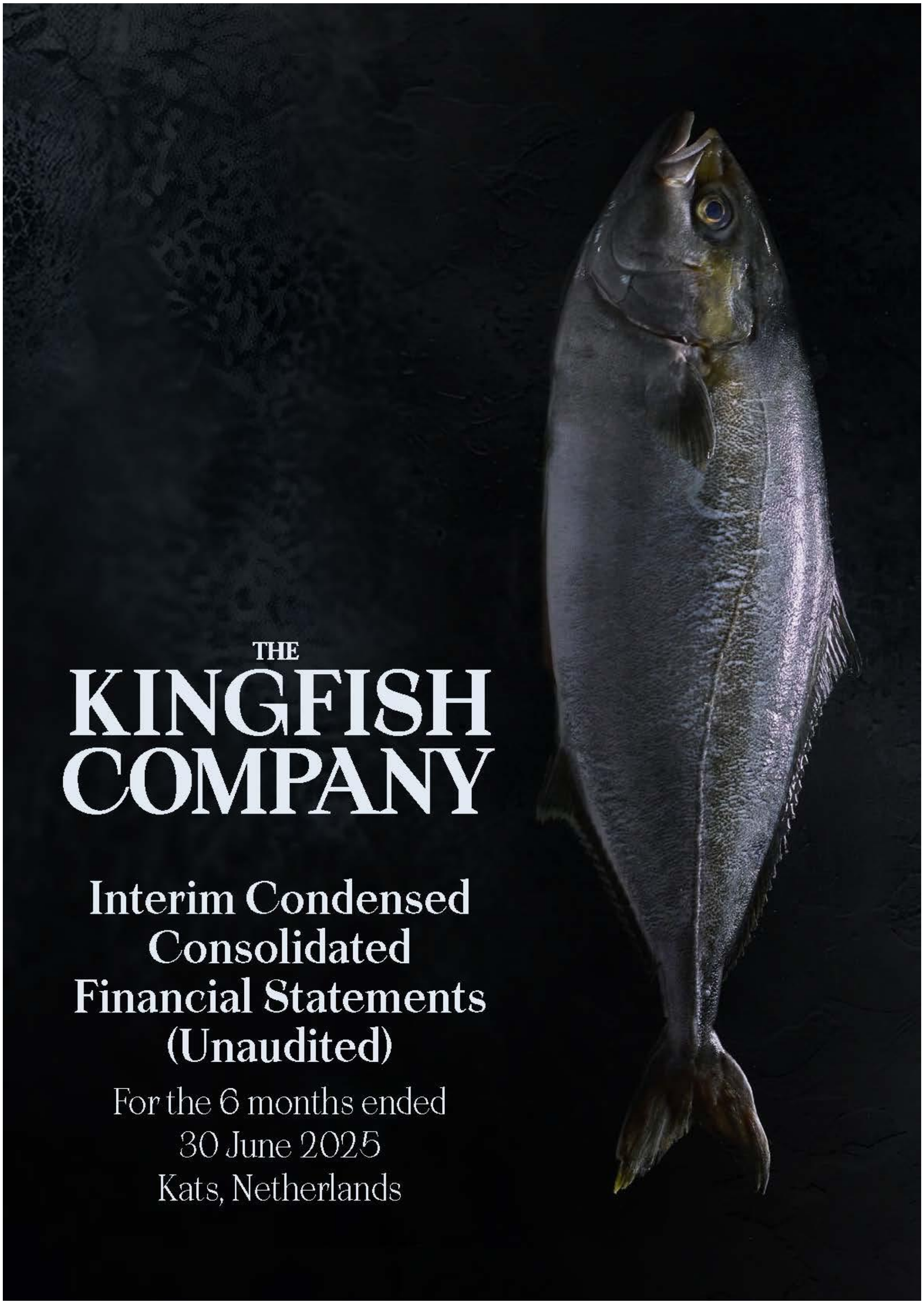
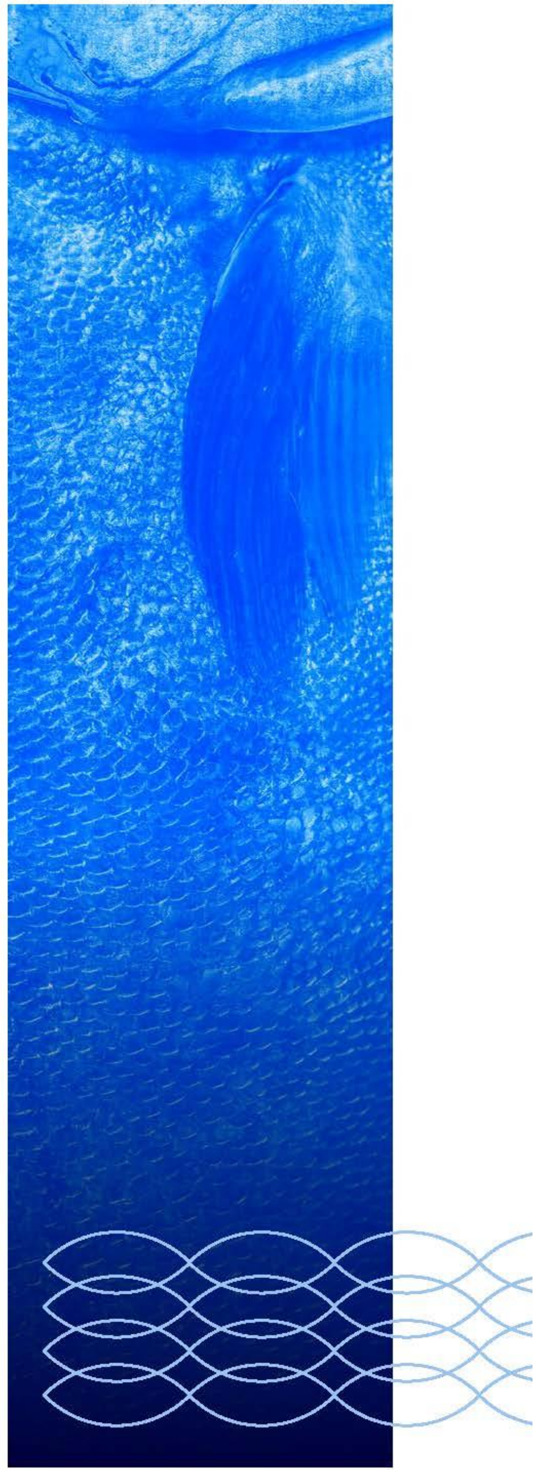

THE
KINGFISH
COMPANY
Interim Condensed
Consolidated
Financial Statements
(Unaudited)
For the 6 months ended
30 June 2025
Kats, Netherlands

THE KINGFISH COMPANY

Interim Condensed Consolidated Financial Statements (Unaudited)

For the 6 months ended 30 June 2025
Kats, Netherlands

Contents



Interim management report

Company introduction

The Kingfish Company is a pioneer and world leader in the production of sustainable yellowtail kingfish using land-based RAS. We have been producing premium yellowtail kingfish since 2017. They are also known in the marketplace as Seriola lalandi, Pacific Yellowtail, Ricciola, Greater Amberjack or Hiramasa, and often used interchangeably with Hamachi, a close cousin. Our company is on a mission to promote sustainable aquaculture, offering responsible choices to the consumer and growing awareness and care for the planet and its people.

The Kingfish Company ("the Company") is listed on Euronext Growth in Oslo (Norway), under the ticker "KING". The Kingfish Company N.V. is the parent company of the Kingfish group of companies, owning 100% of Kingfish (Netherlands) Holdings B.V., of Yellowtail Hatchery USA Inc and of Kingfish Maine Inc. Kingfish (Netherlands) Holdings B.V. owns 100% of the issued share capital of Kingfish Zeeland B.V. and Kingfish Property One B.V. The Kingfish Company owns 50% of the shares in Windfish Assets B.V. and 51% in Windfish Management B.V.

Performance overview

In the first half of 2025, The Kingfish Company achieved a new sales record with volumes reaching 1301 tons, representing a 41% increase year-on-year, reflecting successful execution of the Company's new commercial strategy.

Revenue for the first half of the year amounted to EUR 17.0 million, a 31% increase compared to H1 2024. This growth was primarily driven by higher sales volumes. The average revenue per kilogram was temporarily lower at EUR 13.1, down from EUR 14.3 in the same period last year. This decline reflects the impact of targeted promotional pricing and a higher proportion of frozen product sales to reduce inventory levels.

Gross margin per kilogram was EUR 1.7 compared to EUR 3.6 in H1 2024. The reduction is mainly explained by the lower revenue per kilogram and temporarily elevated farming costs due to a higher FCR.

Operational EBITDA came in at EUR –2.0 per kilogram, versus EUR –1.1 per kilogram in H1 2024. This is driven by a lower gross margin partially compensated by a reduction in SG&A per kilogram as a result of higher volumes, while at the same time making significant strategic investments in commercial capabilities.

The net loss after tax for the first half of 2025 was EUR –18.5 million, compared to EUR –13.3 million in the same period of the previous year. This increase is primarily due to higher financing costs.

In light of the further increased import tariffs, an unfavorable USD exchange rate, and elevated logistics costs, Kingfish has decided to pause commercial efforts of fresh yellowtail kingfish in the United States (US), despite the strong volume growth achieved over recent quarters. While we continue to view the US as a strategically important and attractive market, current conditions do not support profitable operations. We will closely monitor developments and reassess our commercial strategy once the economic environment improves. Our long-term commitment to the US market remains unchanged, supported by our fully permitted Kingfish Maine project. Fresh sales in the US accounted for approximately 6% of total Fresh revenue.

In the first half of 2025, Kingfish reported an operating cash outflow of EUR 3.6 million. Furthermore, farm capex amounted to EUR 0.9 million. Financing activities contributed EUR 11.3 million, primarily driven by the successful EUR 14 million equity raise completed in January 2025. This was partially offset by EUR 1.7 million in interest payments during the second quarter. Interest on the PCP loan for the first quarter was capitalized and added to the loan balance with cash interest payments resuming in Q2.

As of 30 June, 2025, the Company maintained total liquidity of EUR 15.3 million, consisting of EUR 10.3 million in cash and cash equivalents and EUR 5.0 million in available financing facilities.

Financial instruments and risk management

The Group's financial instruments primarily consist of cash, current receivables, payables, interest-bearing debt, and financial and operational leases. Credit risk resulting from customer non-payment is largely mitigated through an insurance contract. Similarly, all property and equipment are insured against relevant risks.

Most borrowing is at an Euribor rate plus a fixed mark up. Since May 2022, the Company had an interest rate cap in place to hedge its interest rate risks. On 30 June 2025 the interest cap came to the end of the term. The primary non-financial risk pertains to health and safety, with an ongoing emphasis on both personal and operational safety.

Employees

As of 30 June 2025, the number of full-time equivalent (FTE) personnel remained stable at 134, unchanged from 31 December 2024. This figure includes employees of the Group's U.S. entities.

Outlook

As The Kingfish Company continues to navigate through its sales and market development phase, we remain optimistic about the opportunities ahead. The Company is focusing on accelerating revenue growth to achieve full utilization of the production capacity, while optimizing operations and making substantial investments in sales and marketing to expand its customer base.

While the Company delivered a robust 31% increase in revenue during the first six months of 2025 compared to the same period last year, average revenue per kilogram came in below expectations. Consequently, the Company now anticipates achieving positive operational EBITDA and cash flow in 2026, representing a one- to two-quarter shift compared with its earlier expectation. The Kingfish Company continues to evaluate the timing of its expansion plans in the US and the Netherlands.

Interim condensed statement of financial position
as at 30 June 2025

Figures in Euro thousand	Notes	30 June 2025	31 December 2024
Assets			
Non-Current Assets			
Property, plant and equipment	3	115.971	123.098
Right-of-use assets	4	2.176	2.364
Biological assets	5	1.728	1.804
Financial assets	7	–	172
Deferred tax	8	17.771	14.422
		137.646	**141.860**
Current Assets			
Biological assets	5	9.688	11.223
Inventories	9	6.084	7.318
Trade and other receivables	10	4.729	4.184
Cash and cash equivalents	11	10.315	3.570
		30.816	**26.295**
Total Assets		**168.462**	**168.155**
Equity and Liabilities			
Equity			
Share capital	12	124.672	111.225
Reserves		5.069	4.284
Accumulated loss		(83.422)	(64.968)
		46.319	**50.541**
Liabilities			
Non-Current Liabilities			
Borrowings	15	114.208	108.457
Lease liabilities	4	1.217	1.413
		115.425	**109.870**
Current Liabilities			
Trade and other payables	16	4.622	5.573
Borrowings	15	1.354	1.391
Lease liabilities	4	612	597
Deferred income	17	85	97
Provisions	18	45	86
		6.718	**7.744**
Total Liabilities		**122.143**	**117.614**
Total Equity and Liabilities		**168.462**	**168.155**

Interim condensed statement of profit or loss and other comprehensive income

Figures in Euro thousand	Notes	6 months ended 30 June 2025	6 months ended 30 June 2024
Continuing operations			
Revenue	19	17.046	13.049
Other operating income	20	44	84
Other operating gains (losses)	21	(360)	36
Stock movements and transport and logistics cost	22	(4.023)	2.271
Raw materials	22	(8.466)	(8.410)
Employee costs	23	(5.876)	(5.379)
Lease expenses	23	(142)	(233)
Depreciation, amortization and impairment expenses	23	(7.150)	(7.159)
Other operating expenses		(3.791)	(3.526)
Operating loss	23	**(12.718)**	**(9.267)**
Finance costs	24	(8.680)	(5.928)
Loss before taxation		**(21.398)**	**(15.195)**
Taxation	25	3.350	2.087
Loss for the period from continuing operations		(18.048)	(13.108)
Discontinued operations			
Loss for the period from discontinued operations	26	(406)	(204)
Loss for the 6 months		**(18.454)**	**(13.312)**
Other comprehensive income:			
Items that may be reclassified to profit or loss:			
Exchange differences on translating foreign operations		762	(63)
Deferred cost of hedging on cash flow hedges not subject to basis adjustments		(56)	(11)
Total items that may be reclassified to profit or loss		**706**	**(74)**
Other comprehensive income for the 6 months net of taxation	28	**706**	**(74)**
Total comprehensive loss for the 6 months		**(17.748)**	**(13.386)**
Earnings per share			
From continuing operations			
Basic loss per share (c)	30	(0,12)	(0,11)
Diluted loss per share (c)	30	(0,12)	(0,11)
From discontinuing operations			
Basic loss per share (c)	30	(0,01)	(0,01)
Diluted loss per share (c)	30	(0,01)	(0,01)

Interim condensed statement of changes in equity

Figures in Euro thousand	Share capital	Share premium	Total share capital	Foreign currency translation reserve	Cash flow hedging reserve	Share option reserve	Convertible instruments reserve	Total reserves	Accumulated loss	Total equity
Balance at 1 January 2024	**1.108**	**110.117**	**111.225**	**(1)**	**798**	**1.284**	**2.981**	**5.062**	**(34.185)**	**82.102**
Loss for the 6 months	–	–	–	–	–	–	–	–	(13.312)	(13.312)
Other comprehensive income	–	–	–	(63)	(11)	–	–	(74)	–	(74)
Total comprehensive Loss for the 6 months ending 30 June 2024	**–**	**–**	**–**	**(63)**	**(11)**	**–**	**–**	**(74)**	**–**	**(74)**
Employees share option expense until 30 June 2024	–	–	–	–	–	58	–	58	–	58
Employees share option expense until 31 December 2024	–	–	–	–	–	155	–	155	–	155
Loss for the 6 months ending 31 December 2024	–	–	–	–	–	–	–	–	(17.417)	(17.471)
Other comprehensive income for the 6 months ending 31 December 2024	–	–	–	(186)	(731)	–	–	(917)	–	(917)
Total contributions by and distributions to owners of group recognized directly in equity	**–**	**–**	**–**	**(186)**	**(731)**	**213**	**–**	**(704)**	**(17.471)**	**(18.175)**
Balance at 1 January 2025	**1.108**	**110.117**	**111.225**	**(250)**	**56**	**1.497**	**2.981**	**4.284**	**(64.968)**	**50.541**
Loss for the 6 months	–	–	–	–	–	–	–	–	(18.454)	(18.454)
Other comprehensive income	–	–	–	762	(56)	–	–	706	–	706
Total comprehensive Loss for the 6 months ending 30 June 2025	**–**	**–**	**–**	**762**	**(56)**	**–**	**–**	**706**	**(18.454)**	**(17.748)**
Issue of shares	319	14.011	14.330							14.330
Employees share option expense	–	–	–	–	–	79	–	79	–	79
Funding Fee	–	(883)	(883)	–	–	–	–	–	–	(883)
Total contributions by and distributions to owners of group recognized directly in equity	**319**	**13.128**	**13.447**	**–**	**–**	**79**	**–**	**79**	**–**	**13.526**
Balance at 30 June 2025	**1.427**	**123.245**	**124.672**	**512**	**–**	**1.576**	**2.981**	**5.069**	**(83.422)**	**46.319**
Notes	12	12	12	14&28	28	13				

Interim condensed statement of cash flows

Figures in Euro thousand	Notes	6 months ended 30 June 2025	6 months ended 30 June 2024
Cash flows from operating activities			
Cash receipts from customers		16.283	12.855
Cash paid to suppliers and employees		(19.904)	(18.378)
Cash utilized in operations	29	**(3.621)**	**(5.523)**
Net cash from operating activities		**(3.621)**	**(5.523)**
Cash flows from investing activities			
Investment in property, plant and equipment	3	(951)	(3.343)
Net cash from investing activities		**(951)**	**(3.343)**
Cash flows from financing activities			
Net proceeds on share issue	12	13.447	–
Proceeds/(Repayment) of borrowings		(1.921)	1.792
Net movement of lease liabilities		(181)	229
Finance costs on leases		(28)	(31)
Net cash from financing activities		**11.317**	**1.990**
Total cash movement for the 6 months		**6.745**	**(6.876)**
Cash at the beginning of the 6 months		3.570	19.533
Total cash at end of the 6 months	11	**10.315**	**12.657**

Notes to the Interim Condensed Consolidated Financial Statements (unaudited)

1. Group information

The Kingfish Company N.V. group engages in the production and supply of sustainable, safe and high quality seafood in its target markets.

Fingerlings are produced all year around and are not exposed to seasonality. Growth performance varies per batch grown on the farm.

The interim condensed consolidated financial statements of The Kingfish Company N.V. group for the 6 months ended 30 June 2025 were authorized for issue by the Executive Board on 3 September 2025.

1.1 Basis of preparation

The unaudited interim condensed consolidated financial statements have been prepared in accordance with the accounting principles IAS 34 Interim Financial Reporting. The accompanying interim condensed consolidated financial statements are unaudited and reflect all material adjustments necessary for a fair statement of the financial position, results of operations and cash flows for the interim period presented in conformity with IAS 34.

The 31 December 2024 condensed consolidated balance sheet data was derived from audited consolidated financial statements for the year ended 31 December 2024, which include all disclosures required by IFRS. Therefore, these interim condensed consolidated financial statements should be read in conjunction with the audited consolidated financial statements of the Company. The results of operations for the six months ended 30 June 2025 are not necessarily indicative of the results for any subsequent periods or the entire fiscal year ending 31 December 2025.

The preparation of financial statements in conformity with IFRS requires the Company to make estimates and assumptions that affect the amounts reported in the interim condensed consolidated financial statements and accompanying notes. Amounts based on such estimates involve numerous assumptions subject to varying and potentially significant degrees of judgement and uncertainty, particularly related to the future performance of the underlying business. Actual experience could materially differ from these estimates and assumptions. The most significant estimates are those used in calculating the fair market value of the biological assets.

The unaudited interim condensed consolidated financial statements have been prepared on the basis that the Company will continue to operate as a going concern. Refer to Note 31 for additional details regarding the going concern assumption.

2. New Standards and Interpretations

2.1 Standards and interpretations effective and adopted in the current 6 months

The accounting policies adopted in the preparation of the group's annual consolidated financial statements are consistent with those followed in the preparation of the group's annual consolidated financial statements for the year ended 31 December 2024, except for the adoption of new standards effective as of 1 January 2025.

The below newly effective IFRS Accounting Standards have been evaluated by the group to determine whether and if, to what extend the expected impact will be on the group. The group has not adopted any standard, interpretation or amendment that has been issued but is not yet effective.

Standard/Interpretation:	Effective date: Years beginning on or after	Expected impact:
Lack of Exchangeability - Amendments to IAS 21	1 January 2025	The amendments to IAS 21 regarding the lack of exchangeability are unlikely to have a material impact, as the group primarily operate in Europe and the US, transacting in stable and freely exchangeable currencies.

2.2 Standards and interpretations not yet effective

The group has chosen not to early adopt the following standards and interpretations, which have been published and are mandatory for the group's accounting periods beginning on or after 1 January 2026 or later periods:

Standard/Interpretation:	Effective date: Years beginning on or after	Expected impact:
Classification and Measurement of Financial Instruments - Amendments to IFRS 9 and IFRS 7	1 January 2026	These amendments clarify derecognition timing for financial assets and liabilities and introduce guidance for evaluating contractual cash flow characteristics, including ESG-linked features. New disclosure requirements are also introduced. The group does not expect a material impact as its financial instruments are not significantly affected by the changes.
Nature-dependent Electricity Contracts - Amendments to IFRS 9 and IFRS 7	1 January 2026	These amendments address the treatment of "own use" electricity contracts and related hedge accounting under IFRS 9. The group does not expect the impact to be material.

Notes to the Interim Condensed Consolidated Financial Statements (unaudited)

3. Property, plant and equipment

	2025			2024		
	Cost or revaluation	Accumulated depreciation	Carrying value	Cost or revaluation	Accumulated depreciation	Carrying value
Land and buildings	63.327	(9.253)	54.074	60.089	(7.723)	52.366
Equipment	75.903	(23.705)	52.198	77.937	(18.558)	59.379
Motor vehicles	53	(45)	8	53	(42)	11
Office equipment	1.208	(749)	459	1.187	(649)	538
Assets under construction	9.232	–	9.232	10.804	–	10.804
Total	**149.723**	**(33.752)**	**115.971**	**150.070**	**(26.972)**	**123.098**

Reconciliation of property, plant and equipment – 2025

	Opening balance	Additions	Reclassification	Forex adjustment	Depreciation	Total
Land and buildings	52.366	724	2.514	–	(1.530)	54.074
Equipment	59.379	159	(2.158)	–	(5.182)	52.198
Motor vehicles	11	–	–	–	(3)	8
Office equipment	538	9	12	–	(100)	459
Assets under construction	10.804	59	(368)	(1.263)	–	9.232
	123.098	**951**	**–**	**(1.263)**	**(6.815)**	**115.971**

Reconciliation of property, plant and equipment – 2024

	Opening balance	Additions	Disposals	Forex adjustment	Depreciation	Total
Land and buildings	54.961	415	–	–	(3.010)	52.366
Equipment	67.601	2.622	(560)	138	(10.422)	59.379
Motor vehicles	17	–	–	–	(6)	11
Office equipment	732	4	–	–	(198)	538
Assets under construction	8.055	2.112	–	637	–	10.804
	131.366	**5.153**	**(560)**	**775**	**(13.636)**	**123.098**

Property, plant and equipment encumbered as security

Assets have been pledged as security for the secured long-term borrowings. Refer to note 15.

Assets under construction

Assets under construction as of 30 June 2025 mainly relates to the initial investments for a farm in the USA (9.205k EUR) and the remainder relates to our operations in Netherlands.

Notes to the Interim Condensed Consolidated Financial Statements (unaudited)

Figures in Euro thousand	6 months ended 30 June 2025	12 months ended 31 December 2024

4. Leases (group as lessee)

The group has lease contracts for various motor vehicles, production equipment and buildings in its operations. Leases of motor vehicles and production equipment generally have lease terms of between 5 and 7 years and buildings between 3 and 20 years. The group's obligations under its leases are secured by the lessor's title to the leased assets. Generally, the group is restricted from assigning and subleasing the leased assets.

Details pertaining to leasing arrangements, where the group is lessee are presented below:

Net carrying amounts of right-of-use assets		
The carrying amounts of right-of-use assets are as follows:		
Buildings	57	64
Equipment	1.684	1.916
Motor vehicles	435	384
	2.176	**2.364**
Lease liabilities		
The maturity analysis of lease liabilities are as follows:		
Within one year	657	646
Two to five years	1.142	1.342
More than five years	169	180
	1.968	2.168
Less finance charges component	(139)	(158)
	1.829	**2.010**
Non-current liabilities	1.217	1.413
Current liabilities	612	597
	1.829	**2.010**
	2025	**2024**
As at 1 January	2.010	1.920
Additions	127	802
Interest	28	62
Payments	(336)	(774)
As at 30 June/31 December	**1.829**	**2.010**

Notes to the Interim Condensed Consolidated Financial Statements (unaudited)

5. Biological assets

	2025			2024		
	Cost or Valuation	Accumulated depreciation	Carrying value	Cost or Valuation	Accumulated depreciation	Carrying value
Live stock fish	9.688	–	9.688	11.223	–	11.223
Broodstock	1.728	–	1.728	1.804	–	1.804
Total	**11.416**	**–**	**11.416**	**13.027**	**–**	**13.027**

Reconciliation of biological assets – 2025

	Opening balance	Increase due to production	Decreases due to harvest/sales	Decreases due to mortality and selection	Gains (losses) arising from changes in fair value	Total
Live fish stock	11.223	16.969	(17.354)	(438)	(712)	9.688
Broodstock	1.804	–	–	–	(76)	1.728
	13.027	**16.969**	**(17.354)**	**(438)**	**(788)**	**11.416**

Reconciliation of biological assets – 2024

	Opening balance	Increase due to production	Decreases due to harvest/sales	Decreases due to mortality and selection	Gains (losses) arising from changes in fair value	Total
Live fish stock	13.402	33.611	(32.252)	(1.974)	(1.564)	11.223
Broodstock	1.382	196	–	–	226	1.804
	14.784	**33.807**	**(32.252)**	**(1.974)**	**(1.338)**	**13.027**

As of 30 June 2025 and 31 December 2024, the group's physical volumes of biological assets consisted of the following:

	2025	2024
Live fish weight (in tons)	972	1 118
Number of fish (in thousands)	1 238	1 430
Volume of fish harvested during the 6 months/year (tons whole round weight)	1 362	2 323
Net biological assets		
Non-current assets	1.728	1.804
Current assets	9.688	11.223
	11.416	**13.027**

Notes to the Interim Condensed Consolidated Financial Statements (unaudited)

Figures in Euro thousand	6 months ended 30 June 2025	12 months ended 31 December 2024

6. Fair value information

Fair value hierarchy

The table below analyses assets carried at fair value. The different levels are defined as follows:

Level 1: Quoted unadjusted prices in active markets for identical assets or liabilities that the group can access at measurement date.

Level 2: Inputs other than quoted prices included in level 1 that are observable for the asset or liability either directly or indirectly.

Level 3: Unobservable inputs for the asset or liability.

Levels of fair value measurements

Level 3

Recurring fair value measurements

Assets	Note		
Biological assets	5		
Live fish stock		9.688	11.223
Broodstock		1.728	1.804
Total biological assets		**11.416**	**13.027**
Total		**11.416**	**13.027**

Reconciliation of assets and liabilities measured at level 3

30 June 2025/31 December 2024

Refer to note 5 for the movement in fair value.

Movements within the fair value of live fish stock is recognized within cost of sale and movements within broodstock is recognized in fair value adjustments.

Information about valuation techniques and inputs used to derive level 3 fair values

Biological assets – live fish stock

The key unobservable inputs, together with the weighted average range of probabilities, are as follows:

Biomass quantity is recorded upon grading of fish at younger ages into individual tanks and adjusted for actual mortalities recorded per tank. Total weight is calculated upon grading of fish and continually adjusted based on a feed intake based model. The average weight of fish per tank is regularly controlled by way of sampling of fish from each tank, where after adjustments are made to reflect the sample results. Although some degree of variation is expected, actual fish size is not expected to deviate substantially from the average sampling size.

Notes to the Interim Condensed Consolidated Financial Statements (unaudited)

Figures in Euro thousand	6 months ended 30 June 2025	12 months ended 31 December 2024

6. Fair value information *(continued)*

The fair value of the group's biological assets was calculated based on different parameters. The key element in the fair value model of biological assets is the price that is expected to be received in the future when the fish is harvested. This fair value calculation is based on realized sales and cost to sell per size-category around balance sheet date. The average fair value per kilogram as of 30 June 2025 and 31 December 2024 was as follows:

	Price range in €/kg		Counts(thousand units)	
	2025	2024	2025	2024
Average fair value of live stock fish per kg	9,97	10,04	1,238	1,430

Fish under 700 grams are valued between EUR 3 and EUR 5.60 each.

Incident based Mortality

No significant mortality incidents were noted for the period ended 30 June 2025 and 31 December 2024.

7. Financial assets

	6 months ended 30 June 2025	12 months ended 31 December 2024
Hedging derivatives		
Rabobank interest cap	–	172
Split between non-current and current portions		
Non-current assets	–	172

Rabobank interest cap

The Kingfish Company N.V group entered into an interest cap transaction with Rabobank on 27 May 2022 and paid a fixed premium of EUR 841.000. The notional amount is EUR 75.000.000 and the transaction is for a period of 3 years.

The transaction caps EURIBOR at 2% on the loan with P Capital Partner AB and the floating amount payment dates commence on 30 September 2022 and then every 3 months thereafter on the last day of the month up to and including the termination date.

On 30 June 2025 the interest cap with Rabobank came to the end of the term.

Notes to the Interim Condensed Consolidated Financial Statements (unaudited)

Figures in Euro thousand	6 months ended 30 June 2025	12 months ended 31 December 2024

8. Deferred tax

Deferred tax asset		
Deferred tax losses available for offsetting against future taxable income	17.771	14.422
The deferred tax assets and the deferred tax liability relate to income tax in the same jurisdiction, and the law allows net settlement. Therefore, they have been offset in the statement of financial position as follows:		
Deferred tax asset	17.771	14.422
Reconciliation of deferred tax asset/(liability)		
At beginning of year	14.422	9.234
Increases (decrease) in tax loss available for set off against future taxable income – gross of valuation allowance (US and NL)	3.349	5.188
	17.771	**14.422**

Recognition of deferred tax asset

Deferred income tax assets relate to unutilized tax losses. These losses are expected to be offset with future profits.

9. Inventories

Raw materials and consumables	2.598	2.438
Finished goods – frozen fish	3.486	4.880
	6.084	**7.318**

Write-downs of inventories were minimal. The write-downs were recognized as an expense during the period ended 30 June 2025 and 31 December 2024 and included in cost of sales in the statement of profit or loss. All inventories are reviewed regularly to ensure that it is measured at the lower of cost or net realizable value.

Notes to the Interim Condensed Consolidated Financial Statements (unaudited)

Figures in Euro thousand	6 months ended 30 June 2025	12 months ended 31 December 2024

10. Trade and other receivables

Financial instruments:		
Trade receivables	4.218	3.311
Accrued income	–	6
Loss allowance	(106)	(113)
Trade receivables at amortized cost	**4.112**	**3.204**
Deposits	43	62
Non-financial instruments:		
VAT	204	204
Prepayments	370	714
Total trade and other receivables	**4.729**	**4.184**

Exposure to credit risk

Trade receivables inherently expose the company to credit risk, being the risk that the company will incur financial loss if customers fail to make payments as they fall due.

	2025	2025	2024	2024
Credit risk exposure by aging category	**Estimated gross carrying amount at default**	**Loss allowance (Lifetime expected credit loss)**	**Estimated gross carrying amount at default**	**Loss allowance (Lifetime expected credit loss)**
Not past due:	3.343	42	2.661	40
Less than 30 days past due:	879	38	601	10
31–60 days past due:	137	12	57	1
61–90 days past due:	12	2	37	1
91–120 days past due:	12	12	61	61
Total	**4.383**	**106**	**3.417**	**113**

Reconciliation of loss allowances

The following table shows the movement in the loss allowance (lifetime expected credit losses) for lease receivables:

Opening balance	**(113)**	**(82)**
Remeasurement of loss allowance – comparative	7	(31)
Closing balance	(106)	(113)

Notes to the Interim Condensed Consolidated Financial Statements (unaudited)

Figures in Euro thousand	6 months ended 30 June 2025	12 months ended 31 December 2024

11. Cash and cash equivalents

Cash and cash equivalents consist of:		
Bank balances	10.315	3.570

12. Share capital

Authorized		
550.000.000 Ordinary shares of par value of EUR 0,01	5.500	5.500
Reconciliation of number of shares issued:		
Reported as at 1 January 2025/2024	110.850	110.850
Issue of shares – ordinary shares	31.844	–
	142.694	110.850
Issued		
Ordinary	1.427	1.108
Share premium	128.305	114.294
Share issue costs written off against share premium	(5.060)	(4.177)
	124.672	111.225

During 2025 31.111.112 common shares with a nominal value of EUR 0,01 were issued for EUR 14 million. Costs of EUR 883k were offset against this equity raise. There was also an underwriting commitment fee resulting in the issuance of a further 733.333 common shares.

All issued shares are fully paid.

The shareholders shall have the right to vote in respect of the Shares in which an usufruct has been created. However, the beneficiary of an usufruct shall be entitled to vote, if this was so provided for at the creation of the usufruct. Shares may be pledged as security. The Shareholder shall have the right to vote in respect of the Shares which have been pledged. However, the voting rights shall accrue to the pledgee, if this was provided for at the creation of the pledge. The Receipt Holder's Right shall vest in a Shareholder who in consequence of usufruct or a pledge created on his Shares is not entitled to vote, and in usufructuaries and pledges who are entitled to vote. The Receipt Holder's Rights shall not vest in usufructuaries and pledgees who are not entitled to vote.

Notes to the Interim Condensed Consolidated Financial Statements (unaudited)

Figures in Euro thousand	6 months ended 30 June 2025	12 months ended 31 December 2024

13. Share based payments

Details	Total Options @ Eur 1,2788	Vested	Total Options @ Eur 2,53	Vested	Total Options @ Eur 1,90	Vested	Total Options @ Eur 1,00	Vested
O. Maiman	591.908	591.908	–	–	–	–	–	–
C.J. Kloet	607.717	607.717	–	–	–	–	–	–
Senior management	300.508	300.508	–	–	–	–	120.000	60.000
J.C. Valette	–	–	–	–	180.000	110.000	–	–
Direct reports to senior management	–	–	170.000	170.000	–	–	225.000	112.500
Other eligible employees	–	–	20.000	20.000	–	–	–	–
	1.500.133	**1.500.133**	**190.000**	**190.000**	**180.000**	**110.000**	**345.000**	**172.500**

Details	Total Options @ Eur 0,93	Vested	Total Options @ Eur 0,77	Vested	Total Options @ Eur 0,85	Vested	Total Options @ Eur 0,60	Vested
V. Erenst	200.000	94.444	–	–	–	–	100.000	–
J.C. Valette	–	–	90.000	40.000	–	–	100.000	–
Senior management	–	–	150.254	66.780	–	–	270.000	–
Direct reports to senior management	–	–	60.000	26.667	50.000	19.444	650.000	–
Other eligible employees	–	–	–	–	–	–	85.000	–
	200.000	**94.444**	**300.254**	**133.447**	**50.000**	**19.444**	**1.205.000**	**–**

On 30 October 2020, at an extraordinary general meeting an employee stock option plan (ESOP) was approved, pursuant to which options for a total of 4.006.762 common shares may be awarded to members of the mid- and senior management and key employees, equivalent to approximately 8,8% of the then issued share capital on a fully diluted basis. On 19 June 2024, at an annual general meeting there was an increase in the common shares, which may be awarded to members of the mid- and senior management and key employees, to 6.000.000 common shares. This decision led to an equivalent to approximately 5,5% of the issued share capital on a fully diluted basis. Options are granted to key employees based on their role, seniority, and specific expertise considered critical to the Group, particularly in aquaculture and business development, with the primary objective of retaining essential talent. A four year vesting schedule applies to each grant under the ESOP including an one-year cliff during which no options vest. After the one-year cliff awarded options vest in 36 equal monthly numbers. Vesting is based on the recipient remaining in service and contains bad leaver provisions. The clawback provision in the ESOP allows the company to reclaim or cancel share options under specific circumstances. If an employee leaves the company under certain conditions (such as resignation or dismissal for cause), their vested options may be forfeited, and in some cases, exercised options may also be subject to reimbursement by the employee. As at the reporting date 3.970.387 options were issued with 2.219.968 already being vested.

Notes to the Interim Condensed Consolidated Financial Statements (unaudited)

Figures in Euro thousand	6 months ended 30 June 2025	12 months ended 31 December 2024

13. Share based payments *(continued)*

The exercise price is based on the value of the shares when capital was raised or latest average price on the exchange. The expected volatility is 40% based on similar companies listed for a couple of years. The model is based on a 10 year expiration date with no expected dividends, the risk-free interest rate is assumed at 1,55%, the average fair value is EUR 0,46 at the end of June 2025 and the last options vesting 30 June 2028.

Based on the Binomial compensation model, an amount of EUR 78.714 (2024: 58.028) was recognized in the P&L versus equity under Share options reserve. This amount represents the potential cost of the ESOP and has not been paid.

14. Foreign currency translation reserve

Translation reserve comprises exchange differences on consolidation of foreign subsidiaries.		
Kingfish Maine Inc.	212	(54)
Kingfish Yellowtail USA Inc.	300	(196)
	512	**(250)**

15. Borrowings

Held at amortized cost		
P Capital Partner AB	75.357	73.063
Convertible loan	38.851	35.394
Machias loan	1.354	1.391
	115.562	**109.848**
Split between non-current and current portions		
Non-current liabilities	114.208	108.457
Current liabilities	1.354	1.391
	115.562	**109.848**

P Capital Partners AB

The loan with P Capital Partners AB consists of facility A, B and C. Facility A is EUR 19.000.000 and this facility was used to repay the loans and leases with Rabobank. Facility B is for an amount of EUR 45.000.000 and is used to cover capex of phase 2 and working capital and facility C is EUR 11.000.000 and this is used to cover the interest and commitment fees payable on both facility A and B.

Interest is the aggregate of 8%, minus a maximum of 1.5% for meeting the sustainability targets, and EURIBOR 3 months (with a minimum of 0%) and is payable on a quarterly basis. A commitment fee of 2% is payable on the part of the loan that is not utilized and are payable on the last day of each successive period of three months. An arrangement fee of 1% is payable on every amount requested.

Property, plant and equipment, biological assets, inventory, trade and other receivables, cash and cash equivalents and share capital have been pledged as security.

Notes to the Interim Condensed Consolidated Financial Statements (unaudited)

Figures in Euro thousand	6 months ended 30 June 2025	12 months ended 31 December 2024

15. Borrowings *(continued)*

Convertible loan

The Kingfish Company N.V. successfully raised EUR 32 million in an unsecured convertible loan in 2023. The majority of the convertible loan was allocated to existing key shareholders, while EUR 11 million was allocated to a new investor. The duration of the convertible loan is 4 years.

The Convertible Loan is split into two tranches:

- Tranche 1 consists of EUR 10 million, based on the authorization granted by the company's annual general meeting held on June 20, 2023. The supervisory board has resolved to grant 10,763,182 rights to subscribe for shares (of which each right gives a right to subscribe for one new share) to the lenders (excluding Ocean 14); and
- Tranche 2 consists of EUR 22 million. At the EGM held on July 24, 2023, the supervisory board was granted the right to issue and/or grant rights to subscribe for up to a maximum of 70 million shares.

On June 29, 2023, The Kingfish Company entered into a EUR 5 million loan agreement. On July 5, 2023, this loan amount was settled with the issuance of Tranche 1 of the convertible loan agreement of EUR 32 million. The convertible loan carries a fixed interest rate of 15% per annum.

The drawdown date for Tranche 1 was July 5, 2023, for Tranche 2 the drawdown date was August 17, 2023.

At any time following the relevant drawdown date, each lender may convert its part of the convertible loan, including any accrued and unpaid interest and any underwriting commission, into shares, each with a nominal value of EUR 0.01, at a strike price of EUR 0.929 (approximately NOK 11) per share. Upon full conversion, at maturity, of all amounts under the convertible loan (including accrued but unpaid interest and underwriting commission), up to a maximum of 61 million new shares shall be issued in the capital of the company.

The equity component of the convertible loan amounts to EUR 2.981.207 as of June 30, 2025 and December 31, 2024 based on the interest rate of comparable non-convertible loans with a mark-up of 2%. This equity portion relates to the loan agreement entered into with the group as stated above for the total amount of EUR 32.000k.

Machias loan

Kingfish Maine Inc. has entered into a loan agreement with Machias Savings Bank for an amount of up to 2 million dollars ($2.000.000) with a loan term of 24 months.

The purpose of the loan is for funds to be used as a bridge loan for working capital.

The loan has an interest rate which is linked to the Wall Street Journal prime rate or a rate equal to the floor rate (if applicable) whichever is greater. Interest is calculated on a 365/360-day basis. During the term of the loan, a Floor shall apply, and the interest rate shall not be lower than six and one quarter percent (6.25%).

Notes to the Interim Condensed Consolidated Financial Statements (unaudited)

Figures in Euro thousand	6 months ended 30 June 2025	12 months ended 31 December 2024

16. Trade and other payables

Financial instruments:		
Trade payables	2.145	2.130
Payables relating to taxes and social security contributions	589	535
Accrued leave pay and holiday allowance	336	518
Accrued bonus	111	10
Accrued expenses and fees to be paid	125	156
Other accruals	1.316	2.224
	4.622	**5.573**

17. Deferred income

Government grants have been received for the reimbursement of costs	2025	2024
As at 1 January	97	91
Forex adjustment	(12)	6
As at 30 June/31 December	85	97
	85	**97**

There are no unfulfilled conditions or contingencies attached to these grants and no significant decreases are expected in the level of government grants.

Notes to the Interim Condensed Consolidated Financial Statements (unaudited)

Figures in Euro thousand	6 months ended 30 June 2025	12 months ended 31 December 2024

18. Provisions

Reconciliation of provisions – 2025	Opening balance	Utilized during the year	Total
Provision for closure costs	86	(41)	45

Reconciliation of provisions – 2024	Opening balance	Additions	Total
Provision for closure costs	–	86	86

The group has recognized a provision for closure related costs due to the decision taken at year end 2024 to cease its hatchery operation in Maine, USA. The provision includes estimates for employee severance payments, legal and regulatory costs, professional services fees, communication and notification costs.

The provision is recognized in accordance with IAS 37 (provisions, contingent liabilities and asset). The estimated closure costs are 86k Euro, and these costs are expected to be incurred during the 2025 financial year.

Provision for closure costs	
Employee severance, legal, professional services, and communication costs	86

The provision has been recognized based on the best estimates of costs at 31 December 2024. The timing of these outflows of cash is uncertain but it is expected to occur within the next 12 months. Any revision to the estimated costs will be recognized as an adjustment to the provision in the future periods.

Notes to the Interim Condensed Consolidated Financial Statements (unaudited)

Figures in Euro thousand		6 months ended 30 June 2025	6 months ended 30 June 2024

19. Revenue

Revenue from contracts with customers			
Sale of goods		17.046	13.049
Disaggregation of revenue from contracts with customers			
The company disaggregates revenue from customers as follows:			
Sale of goods			
Fish		17.046	13.049
Timing of revenue recognition			
At a point in time			
Sale of goods		17.046	13.049
Geographical markets			
Western Europe		4.780	3.470
Southern Europe		8.781	6.078
Rest of the World		3.485	3.501
		17.046	**13.049**

20. Other operating income

Compensation received from claims		44	84

21. Other operating gains (losses)

Foreign exchange gains (losses)			
Net foreign exchange (losses) gains		(166)	3
Fair value gains (losses)			
Biological assets	5	(77)	173
Cash flow hedging ineffectiveness loss		(117)	(140)
		(194)	**33**
Total other operating gains (losses)		**(360)**	**36**

Notes to the Interim Condensed Consolidated Financial Statements (unaudited)

Figures in Euro thousand	6 months ended 30 June 2025	6 months ended 30 June 2024

22. Cost of sales

Transport and logistic cost	1.283	679
Stock movements	1.277	(2.415)
Live fish stock movements	1.463	(535)
Raw materials	8.467	8.410
	12.490	**6.139**

23. Operating profit (loss)

Operating loss for the 6 months is stated after charging (crediting) the following, amongst others:

Auditor's remuneration – external		
Audit fees	145	93
Tax and secretarial services	7	–
	152	**93**
Employee costs		
Salaries, wages and other benefits	5.262	4.878
Share based compensation expense	123	67
Retirement benefit plans: defined contribution expense	491	434
Total employee costs	**5.876**	**5.379**
Leases		
Leases of short term and low value assets	**142**	**233**
Depreciation and amortization		
Depreciation of property, plant and equipment	6.815	6.631
Depreciation of right-of-use assets	315	508
Amortization of intangible assets	20	20
Total depreciation and amortization	**7.150**	**7.159**

24. Finance costs

Net foreign exchange losses (gains) on foreign currency borrowings	1.426	(282)
Lease liabilities	27	31
Borrowings – convertible loan	3.457	2.869
Borrowings – other	3.770	3.310
Total finance costs	**8.680**	**5.928**

Notes to the Interim Condensed Consolidated Financial Statements (unaudited)

Figures in Euro thousand	6 months ended 30 June 2025	6 months ended 30 June 2024

25. Taxation

Major components of the tax income		
Deferred		
Originating and reversing temporary differences	(3.350)	(2.087)
Reconciliation of the tax expense		
Reconciliation between accounting profit and tax expense.		
Accounting loss	(21.804)	(15.399)
Tax at the applicable tax rate of 25,8% (2024: 25,8%)	(5.625)	(3.973)
Tax effect of adjustments on taxable income		
Non-deductible expenses	2.559	1.872
Difference between tax and IFRS accounting policies	218	84
US participants included	(516)	(84)
Effect of lower tax bracket	14	14
	(3.350)	**(2.087)**

26. Discontinued operations

On 31 December 2024, the group made a decision to cease operations and consolidate its hatchery (Yellowtail Hatchery Inc.) subsidiary located in Maine, United States of America, with its hatchery in the Netherlands. This strategic move enables the group to fully leverage advanced capabilities of the Dutch facility, ensuring high standards of quality, efficiency, and cost optimization across all operations. The group's commitment to U.S. expansion and the establishment of a farm in Jonesport remains unchanged. By centralizing hatchery operations, they can ensure that the future U.S. farm will receive the latest- generation fingerlings upon its launch. The consolidation was completed and finalized by early 2025. The hatchery business is classified as a discontinued operation under IFRS 5 (non-current assets held for sale and discontinued operations), as it represents a significant geographical area of operations and a separate major line of business.

The results of the discontinued operations, which have been included in the loss for the year, were as follows:

Profit and loss		
Revenue	–	–
Expenses	(406)	(204)
Impairment of assets	–	–
Net loss after impairment	(406)	(204)
Attributable tax expense	–	–
Net loss attributable to discontinued operations	**(406)**	**(204)**

Notes to the Interim Condensed Consolidated Financial Statements (unaudited)

Figures in Euro thousand	6 months ended 30 June 2025	6 months ended 30 June 2024

27. Cash flows from discontinued operations

Cash flows from operating activities	(1)	(40)
Cash flows from investing activities	–	(9)
Cash flows from financing activities	–	–
Net cash flows from discontinued operations	**(1)**	**(49)**

28. Other comprehensive income

Components of other comprehensive income – 2025	**Gross**	**Tax**	**Net**
Items that may be reclassified to profit (loss)			
Exchange differences on translating foreign operations			
Exchange differences arising during the year	762	–	762
Deferred cost of hedging on cash flow hedges not subject to basis adjustments			
Deferred cost of hedging	(56)	–	(56)
Total items that may be reclassified to profit (loss)	**706**	**–**	**706**

Components of other comprehensive income – 2024	**Gross**	**Tax**	**Net**
Items that may be reclassified to profit (loss)			
Exchange differences on translating foreign operations			
Exchange differences arising during the year	(63)	–	(63)
Deferred cost of hedging on cash flow hedges not subject to basis adjustments			
Deferred cost of hedging	(11)	–	(11)
Total items that may be reclassified to profit (loss)	**(74)**	**–**	**(74)**

Notes to the Interim Condensed Consolidated Financial Statements (unaudited)

Figures in Euro thousand	6 months ended 30 June 2025	6 months ended 30 June 2024

29. Cash utilized in operations

Loss before taxation	(21.804)	(15.399)
Adjustments for:		
Depreciation	7.149	7.246
Amortization on interest rate hedge	117	140
Losses (gains) on foreign exchange	1.700	(499)
Finance costs	7.570	7.200
Fair value losses (gains)	1.612	(708)
Non-cash movement in right-of-use assets	188	(67)
Employee share option expense	79	58
Movement in provisions	43	–
Changes in working capital:		
Inventories	1.234	(2.135)
Trade and other receivables	(619)	(193)
Trade and other payables	(878)	(1.168)
Deferred income	(12)	2
	(3.621)	**(5.523)**

Notes to the Interim Condensed Consolidated Financial Statements (unaudited)

Figures in Euro thousand	6 months ended 30 June 2025	6 months ended 30 June 2024

30. Earnings per share

Basic earnings per share

Basic earnings per share is determined by dividing profit (loss) attributable to the ordinary equity holders of the parent by the weighted average number of ordinary shares outstanding during the 6 months.

Where there is a discontinued operation, earnings per share is determined for both continuing and discontinued operations.

	6 months ended 30 June 2025	6 months ended 30 June 2024
Basic loss per share		
From continuing operations (c per share)	(0,12)	(0,11)
From discontinued operations (c per share)	(0,01)	(0,01)
	(0,13)	**(0,12)**

Basic earnings per share was based on weighted average number of ordinary shares of 138.471.539 (2024: 110.849.291).

	6 months ended 30 June 2025	6 months ended 30 June 2024
Reconciliation of profit (loss) for the 6 months to basic earnings		
Profit (loss) for the 6 months attributable to equity holders of the parent	(18.454)	(13.312)

Diluted earnings per share

In the determination of diluted earnings per share, profit (loss) attributable to the equity holders of the parent and the weighted average number of ordinary shares are adjusted for the effects of all dilutive potential ordinary shares.

Where there is a discontinued operation, diluted earnings per share is determined for both continuing and discontinued operations.

	6 months ended 30 June 2025	6 months ended 30 June 2024
Diluted loss per share		
From continuing operations (c per share)	(0,12)	(0,11)
From discontinued operations (c per share)	(0,01)	(0,01)
	(0,13)	**(0,12)**

Diluted earnings per share was based on a weighted average number of ordinary shares of 133.722.059 (2024: 107.760.555).

	6 months ended 30 June 2025	6 months ended 30 June 2024
Reconciliation of basic earnings to earnings used to determine diluted earnings per share		
Basic loss	(18.454)	(13.312)
Reconciliation of weighted average number of ordinary shares used for earnings per share to weighted average number of ordinary shares used for diluted earnings per share		
Weighted average number of ordinary shares used for basic earnings per share	138.471	110.849
Adjusted for:		
Options	(4.749)	(3.089)
	133.722	107.760

Notes to the Interim Condensed Consolidated Financial Statements (unaudited)

Figures in Euro thousand	6 months ended 30 June 2025	6 months ended 30 June 2024

31. Going concern

The interim condensed consolidated financial statements (unaudited) have been prepared on the basis of accounting policies applicable to a going concern. This basis presumes that funds will be available to finance future operations and that the realization of assets and settlement of liabilities, contingent obligations and commitments will occur in the ordinary course of business.

The directors have considered the Group's financial position, cash flow forecast, and operational outlook, and are of the view that the Group will have access to sufficient funding to meet its obligations as they fall due. While the Group continues to comply with its financial covenants as at the reporting date, there is a possibility that certain covenants could come under pressure or potentially be breached over the next 12 month in certain circumstances. In response, the Group is actively exploring a number of mitigation options. The mitigation options include, but not limited to, pricing optimization, growth acceleration in certain territories, operational efficiencies, cost-saving initiative, and potential adjustments to its financial structure.

We draw attention to the fact that at 30 June 2025, the Group had accumulated losses of EUR (83.422) and that the company's total assets exceed its liabilities by EUR 46.319. The financial results for the period reflect continued investment in scaling operations, and a notable increase in revenue compared to the prior year, signaling positive commercial momentum.

Management remains confident that the Group is well-positioned to continue as a going concern, based on the progress in revenue growth, stakeholder support, and its ability to adapt its financial strategy to support ongoing covenant compliance and liquidity needs.

32. Events after the reporting period

The Machias loan, originally maturing in July 2025, was extended with a new maturity date of 21 July 2040. Under the revised terms, the loan bears interest at 9.50% (fixed for the first 5 years) and there will be monthly principal and interest payments of approximately 17k EUR. This change alters the loan repayment structure and extends the duration of the liability. The revised terms are expected to reduce current liabilities and increase non-current liabilities.

33. Comparative figures

Certain comparative figures have been reclassified for presentation purposes.

34. Commitments

Electricity hedge

The group has committed to purchase electricity at a fixed rate from ENGIE from 2024, for a period of 3 years, at a price of EUR 242k per annum, capped to 5 megawatt hours.

THE KINGFISH COMPANY

The Kingfish Company N.V.
Oost-Zeedijk 13, 4485 PM Kats
The Netherlands

+31 (0) 113 74 54 61
www.thekingfishcompany.com