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Lake Champlain Basin Program

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Lake assessment and watershed action planning for New York lakes

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Lake assessment and watershed action planning for New York lakes

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PROJECT SUMMARY

This project collected water quality data, through community-science and professional staff, on seventy-six unassessed or under-assessed waterbodies on the N.Y. side of the Lake Champlain Basin and developed watershed action plans for three priority water bodies; Lake Colby, Mirror Lake, and Lake Roxanne. The outcome of this work is a reduced number of unassessed waterbodies in the basin, increased community engagement in watershed issues, and action plans to guide projects in priority waterbodies.

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1. PROJECT INTRODUCTION

Regular water quality assessments not only help states meet the requirements of the Clean Water Act but are also fundamental to effective management. New York, with its thousands of water bodies, faces challenges in conducting regular, comprehensive assessments. The Waterbody Inventory (NYS DEC 2016) includes 194 lakes and ponds within the New York portion of the Lake Champlain Basin. As of 2020, when this project was initially proposed, 76% (148) of these lakes had not been assessed in the past 20 years, and 15% (30) were unassessed (Figure 1; ALSC 1986; CSLAP 2019; Laxson et al. 2018; NYS DEC 2016).

Many unassessed or not recently assessed lakes on private land are likely impacted by land use and development, which have changed substantially in the basin over the past two decades. As a result, older assessments are often no longer useful and likely fail to reflect current lake or watershed conditions (Troy et al. 2007). This lack of up-to-date assessments presents a significant barrier to identifying water quality impairments and implementing actions to address them. These lakes would benefit from new assessments to guide the development of watershed action plans and protect the long-term health of these freshwater ecosystems.

Many upland water bodies within the basin are located on New York State Forest Preserve land, which presumably limits stressors from land use and reduces the need for intensive management. However, the New York State Department of Environmental Conservation (NYS DEC) often relies on water quality data collected more than 30 years ago, primarily from the Adirondack Lake Survey, when drafting Unit Management Plans that include these waters (NYS DEC 1999, 2004, 2018, 2019, 2020). Updated assessments of these waters can provide valuable insights into the recovery from acidification at the scale of individual lakes and clarify how recent climate change is influencing lake chemistry and biology (Arseneau et al. 2016; Waller et al. 2012). Both stressors have direct implications for the recreational use of these water bodies, their management, and the protection of threatened or endangered species (OFA II.B.1.b).

Regular monitoring and assessment of water bodies are both costly and logistically challenging. For over 25 years, the Paul Smith's College Adirondack Watershed Institute's (PSC AWI) Adirondack Lake Assessment Program (ALAP) and New York State's Citizen Statewide Lake Assessment Program (CSLAP) have relied on volunteers to conduct water sampling and basic field observations. These efforts have helped fill assessment gaps while fostering a community of engaged environmental stewards (CSLAP 2019; Laxson et al. 2018). Together, these two programs monitor 16% (32) of the water bodies on the New York side of the Lake Champlain Basin.

This project expanded the number of assessed water bodies through targeted growth of AWI's ALAP program and strategic deployment of AWI field technicians (OFA 1.A.2.b). Our goal was to build capacity for regular assessments by empowering citizen volunteer monitoring, particularly in underserved and minority communities. In our experience, lakes with engaged citizen volunteers are more likely to address water quality concerns proactively (OFA IV.C.1.a). Additionally, citizen monitoring offers opportunities for non-personal interpretation through engagement with volunteer training resources and annual lake reports, fostering deeper understanding and appreciation of these water bodies (OFA IV.B.1.b).
Our objective was to increase citizen monitoring in the New York portion of the Lake Champlain Basin to a total of 52 lakes (27%) and to have AWI staff conduct assessments on an additional 30 lakes, bringing the total number of recently assessed lakes to 82 (42%).

During the second year of the project, we identified three priority water bodies based on current assessment data to develop watershed action plans. These water bodies were Lake

Colby, Mirror Lake, and Lake Roxanne. Additional assessments were conducted on these water bodies to fill information gaps, including water sampling and aquatic plant surveys. These plans identify priority projects for implementing best management practices to address water quality concerns. They also serve as templates for lake associations, local governments, and stakeholders to develop their own action plans. One of the significant barriers to effective watershed planning is the time, resources, and expertise required to create these plans. These model action plans will reduce these barriers, facilitating improved watershed planning throughout the Lake Champlain Basin.

2. Tasks Completed

Objective 1: Prioritize unassessed waterbodies based on land use, land cover, and advisory board input.

Task 1: Develop QAPP and form PAC

The Quality Assurance Project Plan (QAPP) covers both the community science component of this project and the PSC AWI field staff sampling. This has the added benefit of covering the entire Adirondack Lake Assessment Program, removing a barrier to the data being available to NYS DEC for their assessment work. PSC AWI has a full analytical lab capable of processing lake water samples. At the LCBP Technical Advisory Committee (TAC) and NYS DEC Division of Water's request, PSC AWI became New York State Department of Health Environmental Laboratory Approval Program (ELAP) certified before this project was executed. Achieving ELAP certification of our lab required a substantial investment in time and personnel resources. The PSC AWI lab has now been ELAP certified for two full years, having recently passed our second audit. To keep up with the additional workload and requirements we have hired two new full-time laboratory analysts. PSC AWI is a non-profit academic research laboratory; because of this, our lab processing costs historically ranged from one-half to one-sixth of commercial labs. ELAP certification has resulted in increased costs for our laboratory analysis which we have had to pass on to our partners. These cost increases have forced some of our private partners to reduce the scope of monitoring work with PSC AWI due to cost concerns. It is important to recognize that ELAP certification requirements mandated by granting agencies have cost impacts beyond the scope of an individual project. We suggest LCBP consider ways to support certified labs at academic institutions to help offset costs and keep laboratory pricing affordable for partners and projects utilizing other sources of funding that do not have certification requirements.

In addition to the QAPP development, we convened a project advisory committee (PAC) to provide input into the waterbody prioritization strategy for both assessment and action planning. The PAC was made up of members from LCBP, NYS DEC, local water quality coordinating committees, and soil and water conservation district staff, ensuring the broadest possible use and applicability of the data collected. The PAC considered land use, land cover, past water quality assessments, and other relevant data to rank the waterbodies for assessment. This ranking was used along with logistical considerations, such as access to private lands and remoteness of the waterbody, to determine the final list of lakes to be assessed. Additionally, the PAC provided input and guidance on which lakes to select for action plan development, as well as review of the action plans themselves.

Objective 2: Expand community-supported science to address water quality assessment gaps.

Task 2: Recruit, train, and support volunteers

Community science is an intentional practice that results in a more informed and engaged public. Volunteer-based sampling not only saves time and money but can also lead to more substantial benefits when volunteers develop personal knowledge of and relationships with the waterbodies they are monitoring. These connections can yield valuable qualitative information not captured through standard chemical and biological analyses of a discrete water sample (When & Almomani, 2019).

Many volunteer water quality monitoring programs, including ALAP, require volunteers to pay fees to participate. ALAP has worked hard over the program's life to keep these costs as low as possible, yet some local communities and small lake associations struggle to pay the low fee each year. This financial barrier to participation disproportionately affects underserved and minority communities that do not have the financial resources to participate. This project removed the direct cost barrier using grant funds to cover the equipment and laboratory fees for the first year of assessment. While this is not a long-term solution to more equitable access to community science, it is a significant step in the right direction. PSC AWI is committed to finding funding to support continued participation in ALAP for disadvantaged and underserved communities interested in being involved. We were able to recruit volunteers to sample a total of 18 new lakes in the basin during the first year of this project, 90% of our goal of 20 new lakes sampled by volunteers. AWI staff sampled an additional 32 lakes, meeting our target of assessing 50 lakes within the basin. Of the 18 new lakes sampled by volunteers, four self-enrolled to continue sampling in the second year of the project. By the third year of the project only one of the new lakes is still actively participating in the program. Though, two volunteers have continued with ALAP and have chosen to sample other lakes which are outside of the Lake Champlain Basin. Informal interviews with volunteers revealed that in many cases the cost of participating was a barrier to their continued involvement in the program. Overall, we are happy to see long-term participation in ALAP grow.

To help support the long-term success of ALAP, we held two in-person training workshops for volunteers participating in the program, which were open to both new volunteers and volunteers that are already enrolled in ALAP. Also, our ALAP coordinator provided ongoing support to volunteers through regular email and phone communication. We also updated the digital training materials currently available on our website (adkwatershed.org) and included more online training materials (Appendix 1, ALAP Sampling Manual) and opportunities for our volunteers.

Photo 1. ALAP volunteers participating in training on Lower St. Regis Lake at the Paul Smith's College campus. APIPP Aquatic Invasive Plant Coordinator, Brian Greene, is instructing them on the aquatic plan survey protocol.

Task 4-5: Fieldwork

Fieldwork followed standard limnological sampling methods, which are fully described in the approved project QAPP (Appendix 3). Each lake was sampled monthly from May through September to capture water chemistry and lake productivity within-year variation. Surface water samples were collected using a 2-meter integrated tube sampler. In the subset of lakes visited by AWI field staff, in-situ measurements of temperature, dissolved oxygen, specific conductance, and pH were made every meter through the water column.

Also, volunteers and staff monitored lakes for aquatic invasive species (AIS) following the Adirondack Park Invasive Plant Program (APIPP) protocols. We coordinated with APIPP to ensure that there was no duplication of effort in AIS surveys. To prevent the spread of aquatic invasive species between sites all field equipment was cleaned and manually inspected for the presence of aquatic invasive species and organic matter prior to use in the field, as well as rinsed with distilled water.

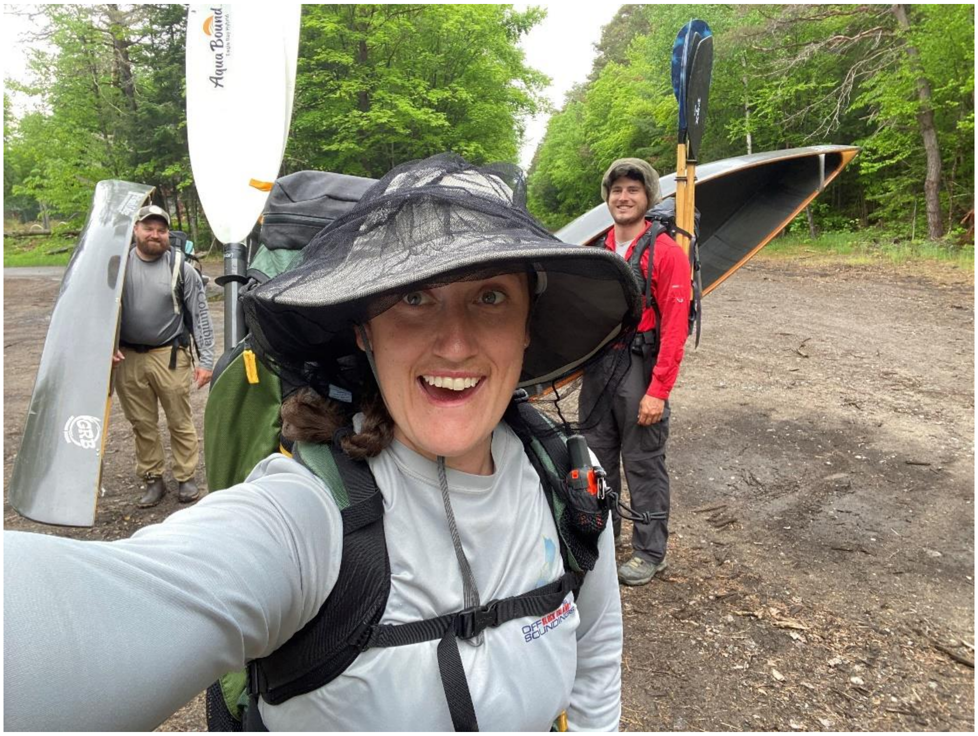


Photo 2. Paul Smith's College Adirondack Watershed Institute staff geared up to sample remote waterbodies in the basin. Left to right: Justin Sturtz, PSC undergraduate student (now PhD Candidate at South Dakota University), Lija Treibergs, Research Associate, and Connor Vara, Research Technician.

Photo 3. Paul Smith's College Adirondack Watershed Institute Research Technician, Carli Courville, waiting out a thunderstorm while sampling ponds in the St. Regis Canoe Area.

Photo 4. Paul Smith's College Adirondack Watershed Institute Research Technician, Connor Vara, collecting an integrated tube sample.

Task 6-7: Laboratory work

Each sample was analyzed for lab pH, specific conductance, dissolved organic carbon, apparent color, true color, chlorophyll-a, total phosphorus, nitrate+nitrite, ammonia, total nitrogen, alkalinity, sulfate, chloride, calcium, and sodium. Not all of these analytes are certifiable under ELAP, such as chlorophyll-a. Of the analytes listed above, PSC AWI is certified under ELAP for specific conductance, alkalinity, nitrate-nitrite, ammonia, sulfate, and chloride.

Objective 4: Prioritize waterbodies with recent assessment data for watershed action planning.

Task 8: Assessment report

At the end of the first field season, we developed a report for all water bodies assessed (Appendix 1). Assessment parameters included lake morphometric characteristics, watershed size and land cover classification, aquatic invasive species detections, and harmful algal bloom reports. Plots of the chemistry data were also included and show the observed data for each individual lake, as well as all of the data used in the assessment report. Density plots summarizing data from all of the lakes, as well as the mean for the specific lake being reports were also included. The comparative approach was intended to help inform the project advisory committee as they guided the selection of three lakes for action plan development.

The assessment report was combined with other publicly available data to prioritize water bodies for action plan development. The prioritization considered the most recent assessment results, the feasibility of implementing management actions, and whether a current lake or watershed management plan existed. AWI staff suggested action plan development for Lake Colby, Mirror Lake, and Lake Roxanne. Finally, we asked the PAC to provide input into the final selection of lakes for action plan development. PAC members discussed the pros and cons of each lake. There were reservations about the selection of Lake Roxanne due to not having public access. Members also discussed the feasibility of developing an action plan for the Cascade Lakes due to their high salt concentrations. Though the Cascade Lakes have minimal opportunity for community engagement as the source of salt to these lakes is entirely from State Route 73. The committee ultimately decided to support AWI staff recommendations.

Objective 5: Develop watershed action plans for the highest priority waterbodies.

Task 9-10: Fieldwork & outreach

In 2023, AWI staff conducted additional field work on Lake Colby, Mirror Lake, and Lake Roxanne. This included surface and bottom water sampling, vertical profiles of temperature, dissolved oxygen, specific conductance, and pH, monitoring for new AIS infestations and harmful algal blooms, and tributary or lake outlet sampling. Staff also visited areas within each watershed that were considered for work highlighted within the action plans or areas stakeholders highlighted as either a concern or project location.

AWI staff also conducted stakeholder outreach to gather input from individuals or organizations with an interest in the protection of the selected lakes. Our efforts to solicit broad public feedback had limited success. General information about the action plan process and forms for the public to share ideas or concerns were posted to the AWI website. These pages were advertised on AWI social media, our email list, and highlighted on our homepage. This resulted in a single phone call from a member of the public interested in the action plan being developed for Lake Roxanne.

To overcome the limited general public input in the action plans we focused our outreach efforts on established organizations with interest in each lake. We met with the Lake Colby Association twice during the project, first to receive initial input from the association and hear their concerns. In our second meeting we shared the results of the two years of sampling on the lake and discussed possible areas of concern. Representatives from the Town of Harrietstown and Adirondack Health were present at these meetings. We met with the Mirror Lake Watershed Association (MLWA) once at the beginning of the project to hear their concerns. Because of the close working relationship between AWI and MLWA several conversations occurred over email and through various other meetings over the course of the project. We also heard input from the Village of Lake Placid. Both associations were provided with copies of the draft action plans for comment prior to the plans being finalized. Outreach for the Lake Roxanne plan was more challenging. We heard concerns from the Blue Haven Campground and Resort staff through the course of two years of sampling on the lake.

One of our aspirations with this project was to pilot a rapid planning process that would allow for improved planning at scale across the basin and potentially beyond. Local lake associations or watershed groups are critical to building community engagement and interest around a planning process. This underscores the important role these groups play in public engagement and support for the protection of our water resources. This was particularly evident when comparing the level of engagement around the development of the plans for Lake Colby and Mirror Lake compared to Lake Roxanne. One of our key recommended actions for Lake Roxanne is the establishment of a Great Chazy River Association to focus on the protection and preservation of the watershed. More broadly, it may be helpful for the Lake Champlain Basin Program to assess gaps in local watershed organizations with the basin, i.e., identify areas of the basin that lack a local community group focused on watershed protection.

Task 11-12: Lab work

Additional laboratory work was conducted based on the fieldwork conducted in tasks 9 and 10. Analytes are the same as those discussed for tasks 6 and 7.

Task 13: Action plan development & reporting

As we worked through the development of the watershed action plans (Appendix 2), including conversations with community groups and stakeholders about the plans as they were being developed, we decided to closely align the plans with the Lake Champlain Basin Program's Opportunities for Action (OFA). We heard from community members, especially among volunteer lake associations, the challenges they face when trying to understand how the goals, objectives, strategies, and tasks outlined in OFA are relevant to their specific lake. Our goal was to scale down OFA to the individual watersheds of each of the lakes selected for action plan development. Our intent is to make as clear of a connection as possible between local watershed actions and OFA, while also giving local watershed and community groups a resource that will both guide their work and ease the burden of grant writing by directly associating actions with OFA's goals, objectives, strategies, and tasks.

The goals for each plan are pulled from OFA goals, again, to create strong alignment between local watershed actions and broader basin wide goals. Each plan includes an executive summary that describes the rationale for the plan, goals, and a high-level summary of important actions. Each plan also includes an introduction and summary of watershed and landscape characteristics to provide the reader with relevant background and contextual information. For each goal, a brief narrative summary is provided to give context to the recommendation actions. Following the narrative summary for each goal is a series of tables that outlines how actions align with OFA objectives, strategies, and tasks. At the end of each plan is a management actions summary that lists all of the recommended actions, timelines for implementation, estimated costs, and resources to support implementation.

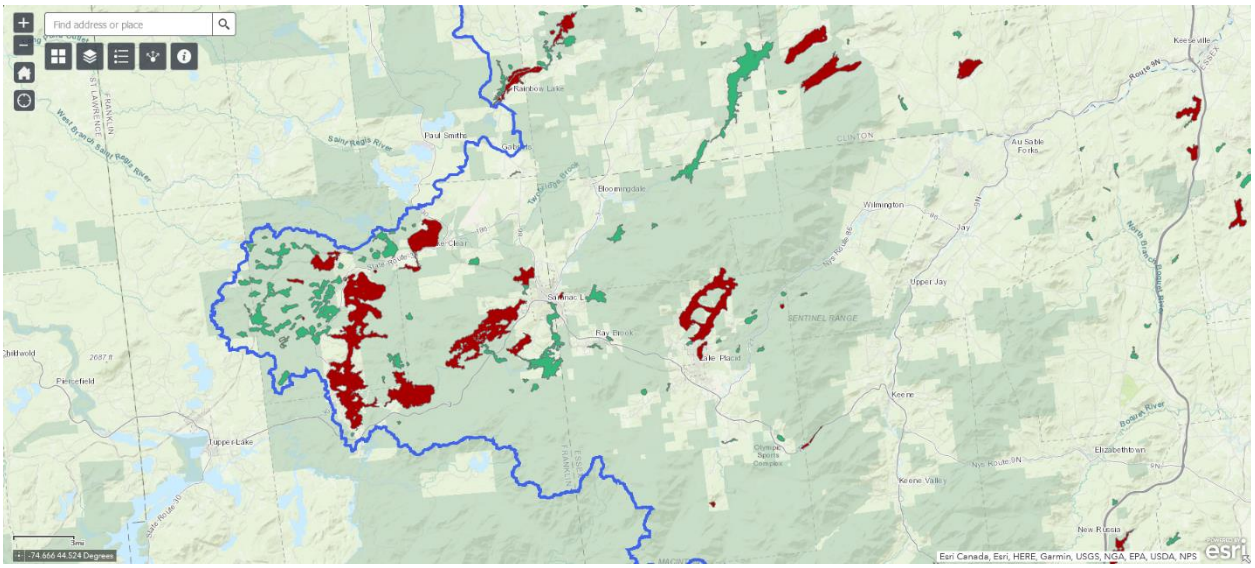
We believe this model could be scaled to other lakes within the Lake Champlain Basin to build a cohesive set of localized action plans that strongly align with and support OFA. This approach may also be used to identify regional coordination and partnerships among neighboring lake communities. As an example, the Town of Harrietstown, Town of North Elba, Village of Saranac Lake, and Village of Lake Placid would benefit from coordinating the implementation of de-icing salt best management practices, an action that is highlighted in both the Lake Colby and Mirror Lake plans. Regional coordination could help reduce implementation costs and build sustainable partnerships to support implementation.

3. Methodology

Initial Lake Selection for Assessment

All lakes that currently receive annual monitoring, either through a volunteer program or professionally, were ineligible. All other lakes were eligible.

Volunteer Samples Lakes - Any eligible lake a volunteer was interested in sampling was enrolled (Figure 2). Increased citizen engagement and a long-term reduction in assessment gaps were major outputs and outcomes of this project. In our experience, long-term volunteer retention is greater when volunteers have a personal or vested interest in the waterbody being sampled. If volunteers did not have a specific lake in mind, they will were advised using the selection criteria outlined below.



Map 1. Web map used by volunteers and PAC members to aid in site selection. Red lakes are currently sampled on an annual basis and are ineligible for enrollment, green lakes are eligible.

A website with frequently asked questions, an interactive web map, and an enrollment form was used to help volunteers select eligible lakes. This map was also used by the PAC to aid in the selection of lakes to be sampled by staff (more information below.)

Staff Sampled Lakes – A scoring matrix was used to identify candidate lakes. Only lakes or ponds greater than four hectares in size were considered for sampling. The following criteria were included in the matrix:

Criteria	**Justification**	**Scoring**
Priority Waterbody Listing Status	Waterbodies listed as needs verification or unassessed will receive a higher score.	On PWL – 20 points Not on PWL – 0 points
% Land Developed	% of land developed within a 500-meter buffer was evaluated, and lakes were scored based on the quartiles of the population distribution. The density of development near a waterbody is a strong predictor of overall stress, including from	1st Quartile – 5 points 2nd Quartile – 10 points 3rd Quartile – 15 points 4th Quartile – 20 points

Criteria	Justification	Scoring
	eutrophication, road salt, and aquatic invasive species.	
% Land in Agriculture	Same as above, but more strongly tied to eutrophication concerns.	1st Quartile – 5 points 2nd Quartile – 10 points 3rd Quartile – 15 points 4th Quartile – 20 points
Road Density	The density of state roads with a 500-meter buffer of the lake was evaluated. Previous work at AWI has demonstrated this to be a strong predictor of lake surface water sodium and chloride concentrations. Scoring was based on quartiles, as with development and agriculture.	1st Quartile – 5 points 2nd Quartile – 10 points 3rd Quartile – 15 points 4th Quartile – 20 points
pH	Last reported pH of less than 6.5, 5.5, and 4.5 was used as scoring criteria. The overwhelming majority of water quality data available is from the Adirondack Lake Survey. The survey identified 95 waterbodies in the Lake Champlain Basin with pH below 6.5; many of these waterbodies have not been resampled. Chemical recovery has been documented on a regional scale, but the status of many individual waterbodies remains undocumented.	>6.5 – 5 points 5.5 > and <=6.5 – 10 points 4.5> and <=5.5 – 15 points <=4.5 – 20 points

Five water samples were collected from each of the 50 lakes, totaling 250 samples. Volunteer sampled lakes were targeted for sampling during the following periods of each month in 2022: May 20 – 29, June 17 – 26, July 15 – 24, August 12 – 21, and September 9 – 11. Staff sampled lakes were targeted for sampling during the same period plus the four prior business days. Flexibility was given to both volunteers and staff in the event of logistical challenges, weather, etc. The primary goal was to collect one water sample from each lake during the calendar month from May through September. Water sampling occurred on all lakes following the sampling methods outlined below. AIS surveys were only conducted on lakes that have not been surveyed in the past three years.

The PAC utilized the scoring matrix to aid in the final lake selection. Logistical considerations such as travel time, accessibility, and field safety were also considered. Finally, any additional information that PAC members had about specific waterbodies was considered during the selection process. The total number of lakes sampled by the combination of volunteers and staff was fifty.

Field and Lab Work for 2022

The fifty selected lakes were sampled monthly from May to September. Sampling took place over the point of maximum depth and included collecting a 2-meter integrated surface water sample and Secchi reading, following the sampling protocol outlined in QAPP Appendix 2. Water samples were collected in 500mL HDPE wide-mouth bottles. For lakes visited by AWI staff, profiles of temperature, dissolved oxygen, specific conductance, and pH at 1-meter intervals were collected through the entire water column. Field data and notes during each sampling visit were recorded on the lake sampling field data sheet (volunteers) or an electronic equivalent (staff) (QAPP Appendix 2). Samples were analyzed at the Adirondack Watershed Institute for the following parameters: Lab pH, Specific Conductance, Dissolved Organic Carbon, Apparent & True Color, Chlorophyll-a, Total Phosphorus, Nitrate+Nitrite, Ammonia, Total Nitrogen, Alkalinity, Sulfate, Chloride, Calcium, and Sodium using standard protocols. Staff or volunteers manually cleaned all sampling equipment after visiting each lake to avoid transporting aquatic plants or animals between waterbodies.

If a lake was not scheduled to be surveyed in 2022 for AIS as part of APIPP's monitoring efforts, volunteers or staff surveyed the lake between July and September for a minimum of 1 hour. Volunteers & staff conducted shoreline perimeter surveys in depths of no more than 15 feet. Locations for sampling by rake-toss included inlets, outlets, existing native plant beds and other shallow areas. The sampling instruments were manually cleaned off in between locations to avoid the spread of AIS. Plants gathered during rake-toss sampling were collected and stored in a plastic bag during the survey and disposed of by spreading on dry ground at a distance of at least 200 feet from any waterbody. GPS units, and the iMapInvasives Mobile App (or marked hardcopy maps) were used to document the actual location of the sampling when suspected invasives were recovered. If there was an obstruction to sampling at the actual location, a nearby acceptable location was selected. GPS coordinates or iMapInvasives Mobile App (and marked hardcopy maps) were taken at the new location and a note in the location variable data field was made. Detailed survey methodology is outlined in QAPP Appendix 3. All AIS survey data was reported to and reviewed by APIPP.

Field and Lab Work for 2023

Lake Colby, Mirror Lake (north basin), and Lake Roxanne were sampled monthly from May to September. Sampling followed the same protocols outlined above for staff sampled lakes. Tributaries for each lake were sampled monthly. Sampling included a discrete water sample and discharge measurement. Sampling followed QAPP Appendix 3, SOP009 & SOP019. We had originally planned to sample three tributaries for each lake, but because of changes in aquatic plant sampling (see below) we expanded tributary sampling for both Lake Colby (8 sites) and Lake Roxanne (5 sites). Two tributaries and the outlet of Mirror Lake were sampled.

Aquatic plant surveys were originally planned to be conducted by AWI staff but upon review by APIPP it was determined that all three waterbodies were already planned to be surveyed as part of APIPP's early-detection and rapid-response team. In order to avoid duplicating efforts, resources were re-allocated to additional tributary sampling and outreach efforts.

Summary of Outreach for Action Plan Development

See notes above for Tasks 9-10 and Appendix 9.

Review of Project Outcomes and Outputs

OUTPUTS:

1) Water quality assessments of 50 unassessed or not recently assessed water bodies on the New York side of the Lake Champlain Basin.
    a. Completed – we hit our target of assessing 50 water bodies as part of this program.
2) Expanded citizen-science participation in the Adirondack Lake Assessment Program.
    a. Completed – Twenty volunteers were engaged, and several remained with the program after the initial survey effort.
3) Three watershed action plans developed for priority water bodies on the New York side of the Lake Champlain Basin.
    a. Completed – Action plans were developed for Lake Colby, Mirror Lake, and Lake Roxanne.

OUTCOMES:

1) A reduction in unassessed or not recently assessed water bodies on the New York side of the Lake Champlain Basin (OFA 1.A.2.b).

- Achieved – Data from the survey effort are available to support assessment and planning efforts across the New York side of the basin.

2) Increased citizens' engagement in watershed issues, including monitoring, stewardship, and action through hands-on participation and non-personnel interpretation (OFA IV.B.1.b).
    a. Achieved – As noted above, several volunteers have continued to sample lakes through the Adirondack Lake Assessment Program. In addition, the action planning process engaged lake associations and community groups. Mirror Lake Watershed Association and Lake Colby Association are already looking at the action plans for their lakes to guide future work and support grant applications to LCBP.
3) Improvement of water quality in priority waterbodies through the development of watershed action plans (OFA 1.A.2.b & IV.C.1).
    a. Ongoing – AWI and our partners are beginning work to support actions across the three plans.

4. Quality Assurance Tasks Completed

All quality control tasks were completed as outlined in the QAPP. There were a limited number of field blank failures during the course of the project. This included four blank failures for dissolved organic carbon (DOC), three blank failures for chloride, and one blank failure for calcium. These instances were investigated and in the case of DOC three of the four were determined to be the result of a poor analytical run and the samples are flagged appropriately. In the case of the other failures, we were not able to definitively determine the cause of the failure but suspect they were isolated incidents of field or bottle contamination.

Data with appropriate flagging has been submitted to the LCBP project officer.

5. Deliverables Submitted

Name	Completion Date	Submission Type
Assessment Report (Appendix 1)	April 2023	Emailed
Watershed Action Plans (Appendix 2)	October 2024	Submitted With Final Report
Quality Assurance Project Plan (Appendix 3)	April 2022	Emailed
Lake Selection Scoring Results (Appendix 4)	April 2022	Emailed
List of Volunteer Names and Seasonal Staff Names (Appendix 5)	October 2024	Submitted With Final Report
Field and lab data from 50 lakes sampled in 2022 (Appendix 6)	February 2023	Submitted With Final Report
Field and lab data from 3 lakes and associated tributaries in 2023 (Appendix 7)	January & October 2024	Submitted With Quarterly Report
Summary of outreach efforts and action plan feedback (Appendix 8)	October 2024	Submitted With Final Report

6. Project Metrics

Metric	**Final value**
Total number of volunteers engaged in project	20
Total number of volunteer hours	111
Value of volunteer hours	$3,682
Education: Number of students involved	1
Hours of staff time funded by the grant	3,124

7. Conclusions

This project succeeded in achieving the outcomes and outputs defined in the workplan. Sampling fifty waterbodies five times during the summer of 2022 was a substantial field effort, especially considering the need to train and support new volunteers with the Adirondack Lake Assessment Program. We anticipate the data from this effort to benefit projects in the region for many years and have already received data requests from graduate students, professors, and consultants working on projects, some funded by LCBP, on the New York side of the basin. Recent assessment data such as what was collected through this project can help improve project design and planning efforts for other research projects. The biggest challenge we faced was the development of the action plans and how to efficiently and effectively engage interested stakeholders. This was especially challenging for Lake Roxanne due to the lack of an engaged local community group focused on the lake. Our aspiration with this project was to pilot a novel approach to rapid planning that could be scaled to a large number of lakes at a lower cost than traditional and more intensive lake or watershed management plans. We feel we have made significant progress towards this aspiration. It is especially beneficial to align local plans with the larger LCBP Opportunities for Action, making a direct connection between basin scale planning and local action. We recommend a follow-up assessment of these plans be completed in 3-5 years to assess progress on implementation. If the plans prove effective at spurring and guiding local action, expansion of this model to other lakes within the basin should be considered.

8. References

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Cited Opportunities for Action

OFA I.A.2.b: Expand Sub-Watershed Monitoring to inform targeted watershed objectives. Focus subwatershed monitoring on 3-5 year rotations in collaboration with State and Provincial agencies to identify problem areas and document improvements from interventions at the sub-watershed level.

OFA II.B.1.b: Assess threatened and endangered species information gaps. Support state and provincial efforts to describe information gaps for threatened and endangered or Species of Greatest Conservation Need (SGCN) species to inform management restoration efforts.

OFA IV.B.1.b: Non-personal Interpretation. Develop wayside and interpretive exhibits, brochures, fact sheets, and other print materials that explain watershed issues and concepts.

OFA IV.C.1.a: Web/Social Media outreach. Connect citizens with local organizations' volunteer programs.

9. APPENDICES

Appended Documents:

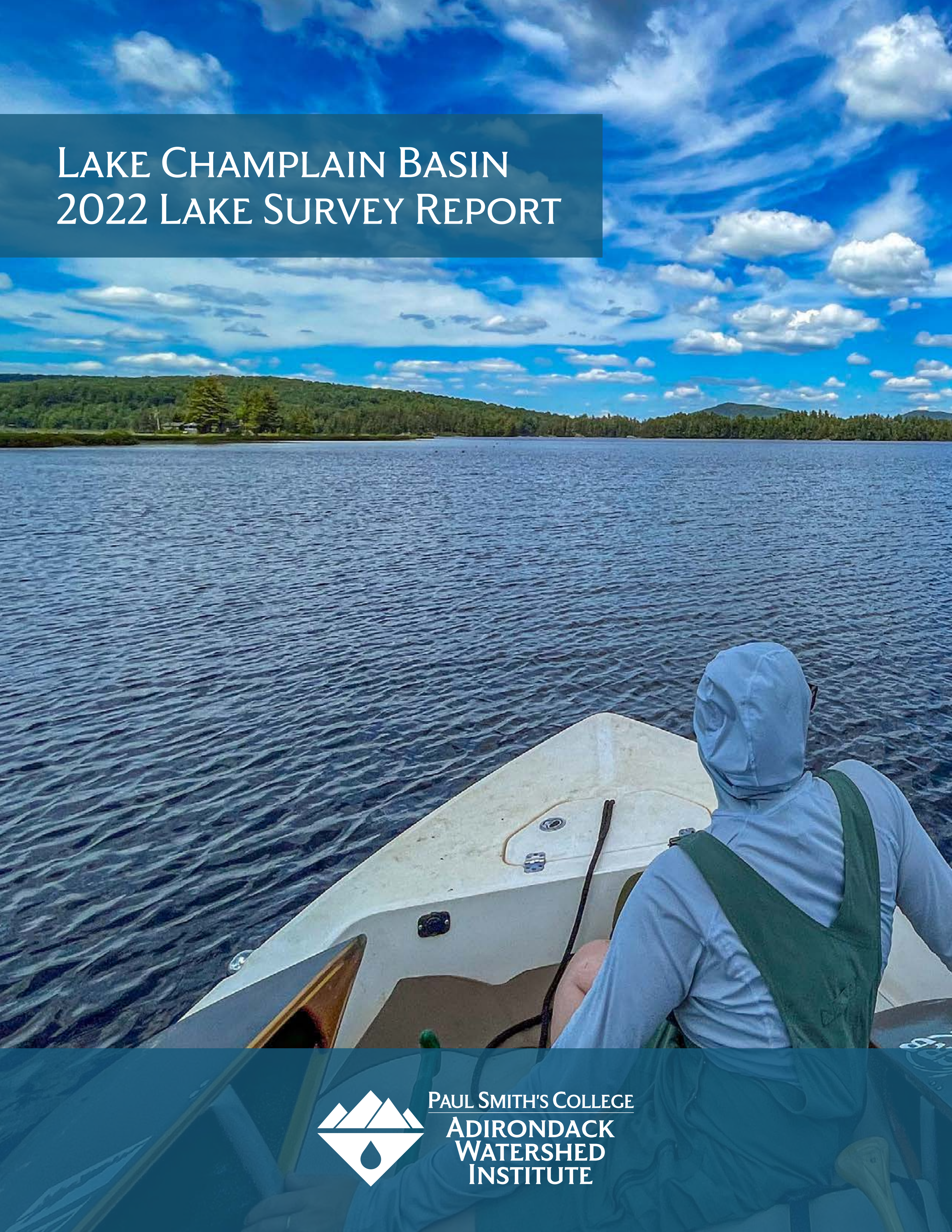
Appendices 1 and 2 are attached below for ease of review. Additional appendices, outlined in Section 5, were sent to the LCBP project officer.

Photos:

Project photos were submitted to the LCBP project officer.

Electronic Data:

Electronic datasets were submitted to the LCBP project officer.



Lake Champlain Basin 2022 Lake Survey Report

Paul Smith's College
Adirondack Watershed Institute

Lake Champlain Basin
2022 Lake Survey Report

Brendan Wiltse*, Elizabeth Yerger, Lija Treibergs, Joline Hall, Connor Vara, Carli Courville, & Justin Sturtz

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Acknowledgments

We would like to thank the Lake Champlain Basin Program and NEIWPCC for providing funding to support this effort. The following partners provided data that informed this report: aquatic invasive species data was pulled from the Adirondack Park Invasive Plant Program, harmful algal bloom occurrence was pulled from both New York State Department of Environmental Conservation and Adirondack Watershed Institute databases, lake characteristics were pulled from the Adirondack Watershed Institute, Adirondack Lake Survey Corporation, and New York State Department of Environmental Conservation. We also thank the Ausable River Association for data from their lake sampling program which is run in partnership with the Adirondack Watershed Institute.

We also thank the following volunteers for their time spent sampling lakes in the Adirondack Lake Assessment Program that are used in this report: Mary Abercrombie, Brian Bader, Iris Bader, Leis Bader, David Birdsall, Nancy Birdsall, Ken Brownell, Karl Butz, Tom Collins, Rick Conney, Jack Drury, Phyliss Drury, Lisa Dumas, Tim Dumas, David Ellison, Shane Garlock, Rozanne Gibeau, Brian Greene, Walter Greene, Lynn Johnson, Scott Johnson, S. Komiar, Alice LaDue, Tom LaDue, Stuart Lucks, Debbie Neill, Roger Neill, Tom Neuhard, Roseanne Neuhard, Betsy Miner, Ann Monroe, John Monroe, Sue O'Reilly, George Stowers, Leanna Thalmann, Chris Trombly, Keith Trombly, Connor Vara, Craig Von Bargen, Joe Webb, Stacy Webb, Scott Weller, Gwen Williams, Kevin Williams, & Brendan Wiltse.

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Executive Summary

Regular water quality assessment not only helps states meet the requirements of the Clean Water Act, but it is also fundamental to sound management. New York has thousands of water bodies, making regular comprehensive assessment challenging. There are 194 lakes and ponds on the New York side of the Lake Champlain Basin that are part of the Waterbody Inventory (NYS DEC 2016). Of these, 76% (148) have not been assessed in the past 20-years, and 15% (30) are unassessed (ALSC 1986; CSLAP 2019; Laxson et al. 2018; NYS DEC 2016).

Many unassessed or not recently assessed lakes on private land may be impacted by land use and development. Land use and development have changed substantially in the basin over the past 20-years, challenging the utility of several decades-old assessments and likely do not reflect current lake or watershed conditions (Troy et al. 2007). Lack of assessment poses a significant barrier to identifying water quality impairments and implementing actions to address them. Therefore, these lakes would benefit from some level of assessment to prioritize the development of watershed action plans and protect the long-term health of these freshwater resources. Many upland water bodies on the New York side of the basin exist on New York State Forest Preserve land, presumably limiting local stressors from land use and potential management actions. NYS Department of Environmental Conservation staff often relies on water quality data collected more than 30 years ago, as part of the Adirondack Lake Survey, when writing Unit Management Plans that cover these waters (NYS DEC 1999, 2004, 2018, 2019, 2020). Updated assessments of these waters would be informative in understanding recovery from acidification at the scale of individual lakes and the influence of recent climate change on lake chemistry and biology (Areseneau et al. 2016; Waller et al. 2012). Both stressors have direct implications for the recreational use of the water body and their management, as well as the protection of threatened or endangered species.

This report summarizes data collected by the Adirondack Watershed Institute and our partners on lakes within the Lake Champlain Basin during the summer of 2022. A total of 76 lakes were sampled by volunteers and professional staff. Most of the lakes assessed in this report have good water quality, though there are some waterbodies with challenges. Lake Alice and Lake Roxanne have high nutrient concentrations and have higher density of agricultural land use within their watersheds. The Cascade Lakes along Route 73, Lake Colby along Route 86, and Mirror Lake have high concentrations of chloride associated with high density of roads within their watersheds and proximity to state highways. Owl Pond and Gordon Pond have low pH, threatening aquatic life.

The results of this effort provide an important baseline for assessing stressors to our aquatic ecosystems, such as development, road salt, climate change, and the recovery from acid rain. The involvement of volunteers and the additional volunteer recruitment that was supported through this project, helps ensure that more waterbodies within the Lake Champlain Basin are regularly monitored and assessed.

Finally, data from this assessment effort will be used by the project advisory committee overseeing this effort to select three priority waterbodies for the development of watershed action plans. These plans will serve as a model for lake associations and community groups looking to protect and improve water quality in their lakes.

Methods

Each lake was sampled monthly from either May to September or June to August. The longer sampling period was used for lakes directly supported by the Lake Champlain Basin Program, lakes that are regularly enrolled in the Adirondack Lake Assessment Program were sampled based on volunteer enrollment.

During each sampling visit a 2-meter integrated tube sampler was used to collect a surface water sample for analysis at the Paul Smith's College Adirondack Watershed Institute lab. The tube sampler was field rinsed prior to sample collection and emptied into a 1-L field rinsed mixing bottle. A 250-mL aliquot was sub-sampled in the field for filtration through a 45-µm cellulose membrane filter for chlorophyll-a analysis. A 500-mL subsample was poured into a field rinsed sample bottle and immediately frozen prior to transport to the Paul Smith's College Adirondack Watershed Institute lab. Transparency was measured using a 20-cm Secchi disk.

Samples were analyzed at the Paul Smith's College Adirondack Watershed Institute Lab for pH, specific conductance, dissolved organic carbon, apparent color, chlorophyll-a, total phosphorus, nitrate+nitrite, ammonia, total nitrogen, alkalinity, chloride, calcium, and sodium.

Lakes sampled by Paul Smith's College Adirondack Watershed Institute staff also collected in-situ measurements of temperature, dissolved oxygen, specific conductance, and pH every meter through the water column.

Volunteers and staff monitored lakes for aquatic invasive species following the Adirondack Park Invasive Plan Program protocols.

Right: Adirondack Park Invasive Plant Program Aquatic Invasive Species Coordinator Brian Greene teaching ALAP volunteers how to identify aquatic invasive species.

Analytes

Trophic Status

Trophic status is used by limnologists to refer to the overall productivity of a lake. Lake productivity is influenced by nutrient supply, light availability, regional climate, watershed characteristics, and lake morphology. The term cultural eutrophication is often used to describe the process whereby human activities increase lake productivity through an increase in the nutrient supply. This process usually results in unwanted outcomes such as declines in lake aesthetics, increase chance of harmful algal blooms, and fish kills due to elevated bacterial decomposition utilizing all the available oxygen in the water column.

Lakes can be assigned to three main classification categories based on their overall productivity: oligotrophic, mesotrophic, and eutrophic. Oligotrophic lakes have the lowest productivity due to low nutrient content. These lakes are often characterized by clear, highly transparent water, with low phytoplankton biomass. The entire water column is often well oxygenated, making these lakes capable of supporting cold water fish species such as lake trout. Mesotrophic lakes are an intermediate state between oligotrophy and eutrophy. Eutrophic lakes are characterized by high productivity and high nutrient content. As a result, the water column is less clear due to increased phytoplankton production. The greater production of organic matter leads to higher rates of bacterial decomposition at the bottom of the lake. Bacteria utilize oxygen, resulting in a decrease in oxygen availability in the bottom waters during the summer stratified period. This reduction in oxygen is referred to as hypoxic (low oxygen) or anoxic (no oxygen) and is not conducive to supporting cold water fish (Wetzel 2001).

Total Phosphorus

Phosphorus is relatively common in igneous rocks such as those found in the Adirondacks and is also abundant in sediments. The concentration of phosphorus in natural waters is low however, because of the low solubility of these inorganic forms (Wetzel 2001). Phosphorus is also a component of wastewater which is, in turn, a primary source of phosphorus in many waters. Typical concentrations of phosphorus in surface water are a few micrograms per liter. Additions of phosphorus to the aquatic environment enhance algal growth and accelerate eutrophication that leads to depletion of dissolved oxygen (Schindler 1977; Wetzel 2001).

Phosphorus is also added to surface waters from non-point sources such as eroding soils, stormwater, runoff from fertilized fields, lawns, and gardens, and runoff from livestock areas or poorly managed manure pits. Poorly maintained or sited septic systems can also add phosphorus to surface waters. In addition, analyses of water chemistry in Adirondack upland streams shows that streams coming off old growth forest have higher phosphorus concentrations than those flowing off managed forests (Myers et. al, 2007).

Phosphorus plays an important role in biology and is an important nutrient in aquatic ecosystems. Phosphorus is often a limiting nutrient in lakes, meaning that it is a lack of phosphorus that limits aquatic primary production (Schindler 1977). Phosphorus normally enters a lake bound to soil and sediment through overland flow. In developed or urban areas, excess phosphorus can enter a lake due to application of fertilizer or through poor wastewater management. This increase in phosphorus may lead to increased primary production, resulting in aesthetic changes to the lake. If the increase in primary production is large enough, there may be subsequent problems with oxygen depletion because of decomposition. The reduction in oxygen can lead to fish kills and other negative impacts (Carpenter et al. 1998).

Quick Interpretation of Total Phosphorus

Total Phosphorus (µg/L)	Trophic Status
<10	Oligotrophic
10 - 20	Mesotrophic
>20	Eutrophic

Chlorophyll-a

Chlorophyll-*a* is the primary photosynthetic pigment in all photosynthetic organisms including algae and cyanobacteria. The concentration of chlorophyll-*a* is used as an index for algal biomass, or productivity. Nutrient concentrations, light, and water temperature all control algal productivity. Depending on the time of year, these three variables change and can limit algal production. Therefore, we expect to see variability in chlorophyll-*a* throughout the year. Major shifts in chlorophyll-*a* concentration over many years can usually be attributed to changes in nutrients (phosphorus, nitrogen, and silica) (Wetzel 2001).

Quick Interpretation of Chlorophyll-a

Chlorophyll-a (µg/L)	Trophic Status
<2	Oligotrophic
2 - 8	Mesotrophic
>8	Eutrophic

Secchi (Transparency)

Water column transparency is a simple measure of lake productivity. Generally, secchi depth is lower in highly productive eutrophic lakes and higher in less productive oligotrophic lakes. Secchi depth can also be influenced by other water quality parameters that impact clarity, such as dissolved organic carbon, total suspended solids, colloidal minerals, and water color. Therefore, it is valuable to keep other water quality parameters related to lake productivity, such as total phosphorus and chlorophyll-*a*, in mind when looking at changes in transparency. Changes in watershed characteristics, such as the amount of runoff from precipitation or the export of organic matter, can also influence transparency.

Quick Interpretation of Secchi

Transparency (m)	Trophic Status
>5	Oligotrophic
2 - 5	Mesotrophic
<2	Eutrophic

Nitrogen

Nitrogen is present in many forms in the atmosphere, hydrosphere, and biosphere, and is the most common gas in the earth's atmosphere. The behavior of nitrogen in surface waters is strongly influenced by its vital importance to plant and animal nutrition. Nitrogen occurs in water as nitrite (NO_2-) or nitrate (NO_3-) anions, ammonium (NH_4+) cations, or organic nitrogen. Excessive, or high levels of nitrite are an indicator of organic waste or sewage. Nitrate or ammonium may also be from a pollutant source, but, generally, are introduced at a site far removed from the sample point. This is because nitrate is stable over a range of conditions, but nitrite rapidly volatilizes in oxygenated water. Ammonium is an important nutrient for primary producers, but, at high concentrations, is a dangerous pollutant in lakes and rivers, because the bacterial conversion of NH_4 to NO_3 robs water of oxygen. Generally, nitrogen is not a limiting nutrient in aquatic ecosystems (Schindler 1977).

Nitrogen to Phosphorus Ratio

As the two primary nutrients in aquatic ecosystems, the ratio of nitrogen to phosphorus can influence nutrient limitation and which phytoplankton species are dominant. Increasing occurrence of harmful algal blooms has renewed interest in lake nutrient cycling and how that relates to the occurrence of toxic blooms. The importance of TN:TP to cyanobacterial blooms is debated, but there is evidence that low TN:TP mass ratios favor both nitrogen fixing and non-nitrogen fixing cyanobacteria (Smith 1983). A

TN:TP mass ratio of 22:1 appears to be a threshold under which lakes are more likely to be dominated by N-fixing cyanobacteria (Smith et al. 1985). Laboratory experiments have shown that the non-nitrogen fixing *Microcystis* dominates below ratios of 44:1 (Fujimoto & Sudo 1997). While TN:TP ratios may be an important driver of cyanobacterial blooms, it is important to recognize that other factors are important as well, such as temperature, salinity, NO_3:NH_4 mass ratios, and pH (Liu et al. 2011).

Quick Interpretation of TN:TP Ratio

TN:TP	Status
<22	Higher risk of cyanobacteria blooms

Conductivity

Conductivity—the ability of water to pass an electrical current because of the presence of dissolved ions—is often called the “watchdog” environmental test since it is informative and easy to perform. Calculations of specific conductance standardize conductivity measurements to the temperature of 25 °C for the purposes of comparison. Rain, erosion, snow melt, runoff carrying livestock waste, failing septic systems, and road salt raise conductivity because of the presence of ions such as chloride, phosphate, nitrite etc. Oil spills lower water conductivity. Temperature, shade, sunlight, and sampling depth all affect conductivity. A conductivity probe does not identify the specific ions in a water sample—it simply measures the level of total dissolved solids (TDS) in the water body.

Chloride

The element chlorine can occur in various forms or states of oxidation, but the chloride form (Cl-) is most common in surface waters. There are several natural sources of sodium and chloride, including various rocks that contain sodium- and chlorine-bearing minerals. The most abundant natural mineral form of sodium and chloride is NaCl or Halite, also known as rock salt. Large halite deposits form when ocean water evaporates and mineral deposits are buried, eventually becoming rock.

Chloride is present in most natural waters at very low concentrations, except where surface or groundwater mixes with ocean water. Minimally impacted Adirondack lakes have average chloride and sodium concentrations of 0.2 mg/L and 0.5 mg/L, respectively (Kelting et al. 2012). Another source of chloride is road runoff in regions where rock salt is used as a road deicing agent in winter. New York has one of the highest rock salt application rates per lane mile in the United States (Kelting & Laxson 2010). These application rates are mandated on state roads across the state, regardless of proximity to surface waters.

Quick Interpretation of Chloride

Chloride (mg/L)	Road Salt Influence
<1	None
1 - 9	Low
10 - 39	Moderate
>40	High

pH

pH is an index of the hydrogen ion activity in solution, it is defined as the logarithm of the reciprocal of the concentration of free hydrogen ions in solution. Therefore, high pH values represent lower hydrogen ion concentrations than low pH values, and there is a 10-fold difference in hydrogen ion concentration across a single pH unit. The pH scale extends from 0 to 14, with 7 being neutral. pH values below 7 indicate acidic conditions and pH values greater than 7 indicate alkaline conditions.

Acidity in Adirondack surface waters has two sources: acid deposition (rain, snow, and dry deposition) and organic acids from evergreen needles and other plant matter. Long-term monitoring by the Adirondack Lakes Survey Corporation showed that 25% of lakes in the Adirondacks have a pH of 5.0 or lower and another 25% are vulnerable to springtime acidification

(ALSC, 1990).

Shifts in pH can have major effects on the dominant biological and chemical process present within a lake. Many organisms have narrow pH tolerances, resulting in significant declines in individual health and population numbers if pH values stray outside of their tolerances. Changes in pH also influence the mobility of ions and heavy metals which can result in issues related to nutrient availability and toxicity (Driscoll 1985; Schindler et al. 1985).

Quick Interpretation of pH

pH	Status
<5	Acidic: critically impaired
5.0 - 5.9	Acidic: threatened
6.0 - 6.4	Acidic: acceptable
6.5 - 7.5	Circumneutral: not impaired
>7.5	Alkaline: not impaired

Alkalinity

Alkalinity is a measure of buffering capacity of a waterbody, typically expressed as mg/L of calcium carbonate ($CaCO_3$). The amount of calcium carbonate in a waterbody is primarily related to the bedrock geology of its watershed. Lakes with watersheds underlain by granitic bedrock tend to have low alkalinity due to slow rates of weathering of the bedrock and low amounts of calcium carbonate in the rock. Conversely, lakes underlain by sedimentary rocks such as limestone tend to both weather faster and contain more calcium carbonate. Many lakes in the Adirondacks are underlain by granitic bedrock, and therefore have lower alkalinity.

Quick Interpretation of Alkalinity

Alkalinity (mg/L)	Acid Neutralizing Capacity
0	None
0 - 2	Low
3 - 10	Moderate
11 - 25	Adequate
>25	High

Sulfate

Sulfate is an essential component of lake chemistry as it plays a significant role in various biogeochemical processes that occur within aquatic ecosystems. Sulfate is present in rainwater and enters lakes through atmospheric deposition, and it can also be released from bedrock weathering and human activities such as mining and industrial processes. Sulfate is an electron acceptor in microbial sulfate reduction, which is a critical process in the breakdown of organic matter and the cycling of carbon, sulfur, and nitrogen. Additionally, sulfate can influence the acidity of lakes by forming sulfuric acid through chemical reactions, which can have detrimental effects on aquatic life. Therefore, understanding the sources and dynamics of sulfate in lakes is crucial for the management and conservation of freshwater resources (Wetzel 2001).

Apparent Color

Color is an optical property of water that results from light scattering after absorption of water molecules, dissolved materials, and suspended materials. Blue-green wavelengths are often scattered in alkaline lakes giving them a turquoise appearance, whereas lakes rich in dissolved organic matter scatter longer wavelengths (red and yellow), making them appear brown in color.

The quantification of apparent color in water is done through comparison with standards of a platinum-cobalt solutions via spectroscopy. True color is the color of water after removal of suspended material and apparent color is the color of water without filtration. Color can be used to provide information about the quantify of dissolved organic mater (DOM) in water. Though, caution should be used when using color as a surrogate of DOM because it can behave differently, making it a crude predictor of DOM (Dillon and Molot 1997).

Dissolved Organic Carbon

Dissolved organic carbon (DOC) is the fraction of carbon in a water sample that can pass through filtration. It is an important substance in aquatic ecosystems. It is a source of food for microorganisms and can block or absorb ultraviolet radiation. The source of the carbon can come either from within the lake (autochthonous) or from outside of the lake (allochthonous). Many lakes in the Adirondacks are experiencing increasing DOC, this is thought to be primarily driven by recovery from acid deposition, but may also be a result of climate change (Driscoll et al. 2016). DOC solubility is decreased in soils that are acidic and have a high ionic strength. Therefore, a recovery from acid deposition that increases soil pH will increase DOC solubility. Climate change may also play an important role in increasing DOC. Warmer temperatures accelerate the breakdown of organic material and increased precipitation increases the leaching of DOC from forest soils. Because of the important role DOC plays in attenuating light, increasing DOC in lakes may help cold water fish species by limiting the warming of deeper waters.

Total Calcium

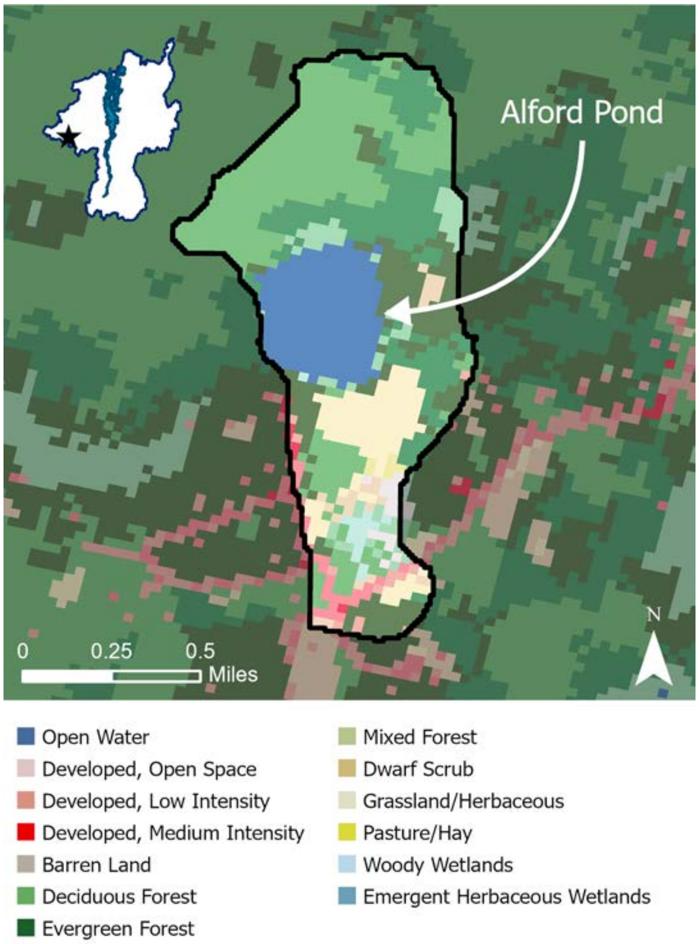
The primary source of calcium in lakes is $CaCO_3$, thus the discussion of calcium is closely tied to that of alkalinity. $CaCO_3$ is not very soluble in water, but in the presence of carbonic acid it is converted to more soluble forms. The primary source of calcium in lakes is from weathering of parent material. Calcium is an important element in biology because it serves a role in the structure and physiology of many organisms. In the Adirondacks, the granitic parent material contains little calcium, and therefore Adirondack lakes tend to be low in calcium. Regionally, lakes are showing calcium declines, in part because of acid deposition. Acid deposition resulted in increased calcium leaching from watershed soils, eventually reducing the pool available for export to lakes (Keller et al. 2001). Concentrations are low enough in some lakes (<2 mg/L) to cause declines in zooplankton that utilize calcium to build their carapace (Jeziorski et al. 2008).

Quick Interpretation of Calcium

Calcium (mg/L)	Status
<2	At Risk

Right: Holcomb Pond viewed from a nearby rock ledge.

Alford Pond



Location

Latitude:	44.2617
Longitude:	-74.0366
County:	Essex
Town:	North Elba
Watershed:	Sumner Brook-Saranac River

Lake Characteristics

Surface Area (ha):	15.5
Shoreline Length (km):	1.5
Max Depth (m):	0.6
Mean Depth (m):	0.5
Volume (m^3):	79,655
Flushing Rate (times/year):	9.2

Watershed Characteristics

Watershed Area (ha):	105
Open Water (%):	14.65
Developed, Open Space (%):	1.19
Developed, Low Intensity (%):	1.43
Developed, Medium Intensity (%):	1.55
Developed, High Intensity (%):	0.01
Barren Land (%):	0.05
Deciduous Forest (%):	44.82
Evergreen Forest (%):	15.94
Mixed Forest (%):	26.27
Dwarf Shrub (%):	1.76
Grassland/Herbaceous (%):	0.08
Pasture/Hay (%):	0.27
Cultivated Crops (%):	0.00
Woody Wetlands (%):	2.70
Emergent Herbaceous Wetlands (%):	0.32

Summary

Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Mesotrophic
Trophic Status (Secchi):	NA
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Moderate
Road Salt Influence:	Low

Notes: Secchi data is missing because the disc was visible on bottom during each sampling trip.

Profile data indicates that Alford Pond is isothermal with dissolved oxygen concentrations above 7 mg/L through the entire water column.

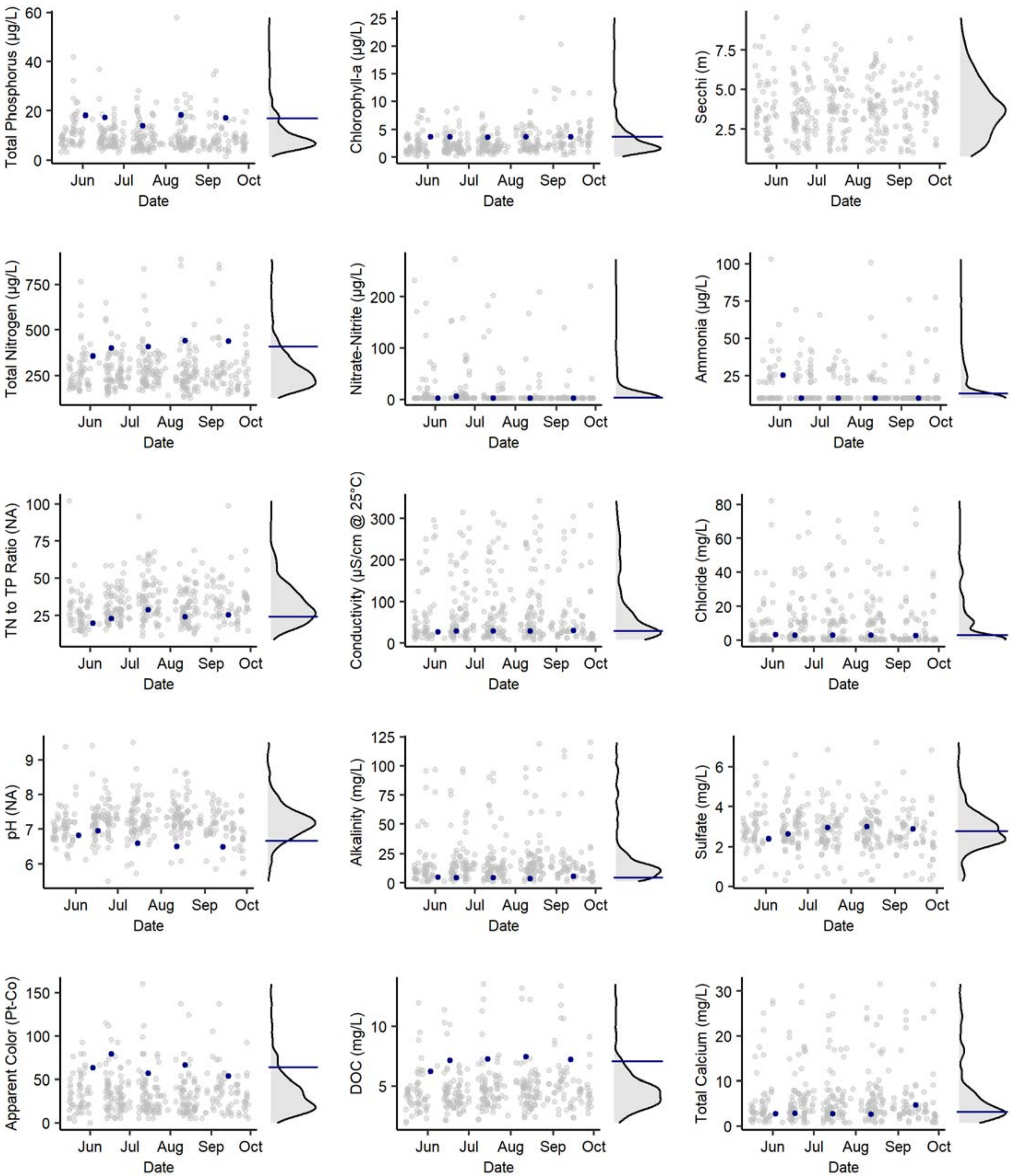
Aquatic Invasive Species Detections

None

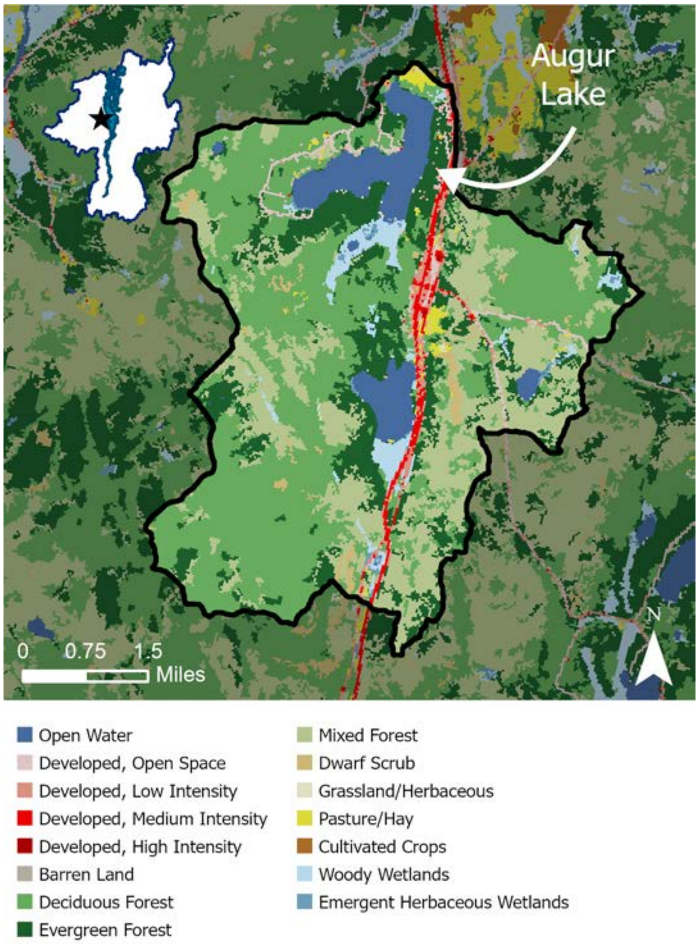
Harmful Algal Bloom Reports

None

Gray dots represent all data in the report, blue dots are the samples for the represented lake. The right sub-plot shows the density distribution for all data in gray and the mean for the represented lake as a blue line.



Augur Lake



Summary

Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Eutrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Alkaline: non-impacted
Acid Neutralizing Capacity:	High
Road Salt Influence:	High

Notes: None.

Location

Latitude:	44.4608
Longitude:	-73.4926
County:	Essex
Town:	Chesterfield
Watershed:	Ausable River

Lake Characteristics

Surface Area (ha):	152.7
Shoreline Length (km):	11.5
Max Depth (m):	6.4
Mean Depth (m):	NA
Volume (m^3):	4,242,477
Flushing Rate (times/year):	3.8

Watershed Characteristics

Watershed Area (ha):	3,141.4
Open Water (%):	7.08
Developed, Open Space (%):	1.66
Developed, Low Intensity (%):	1.77
Developed, Medium Intensity (%):	1.54
Developed, High Intensity (%):	0.04
Barren Land (%):	0.09
Deciduous Forest (%):	42.89
Evergreen Forest (%):	15.99
Mixed Forest (%):	23.31
Dwarf Shrub (%):	1.42
Grassland/Herbaceous (%):	0.15
Pasture/Hay (%):	0.93
Cultivated Crops (%):	0.00
Woody Wetlands (%):	2.74
Emergent Herbaceous Wetlands (%):	0.42

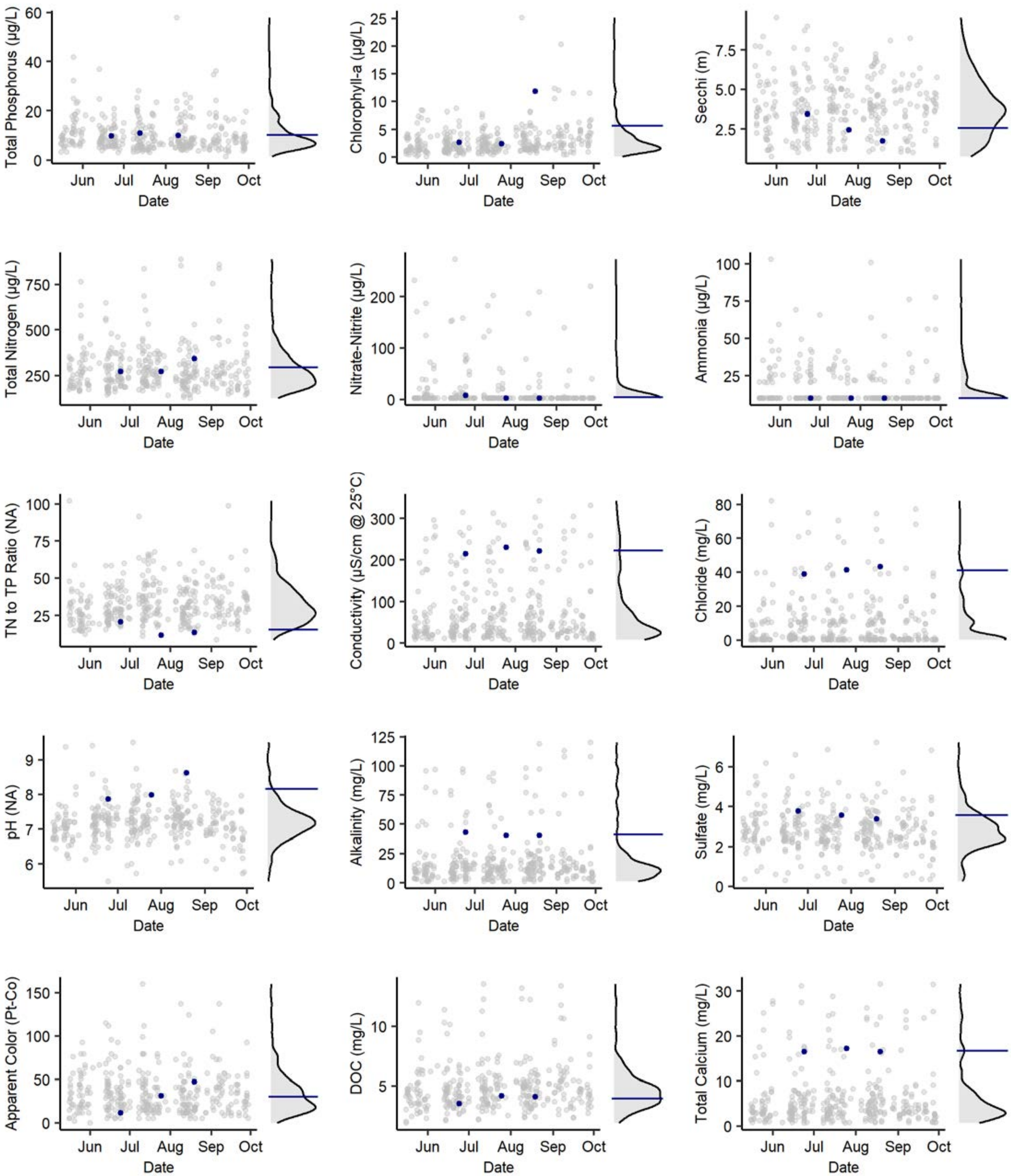
Aquatic Invasive Species Detections

Eurasian watermilfoil: 1990

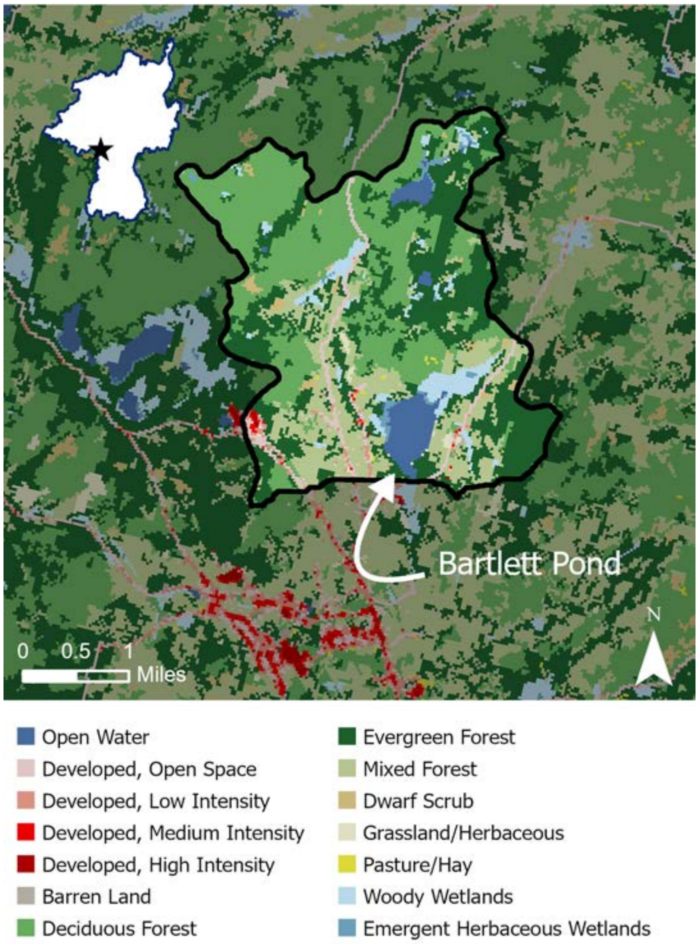
Harmful Algal Bloom Reports

None

Gray dots represent all data in the report, blue dots are the samples for the represented lake. The right sub-plot shows the density distribution for all data in gray and the mean for the represented lake as a blue line.



Bartlett Pond



Summary

Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Adequate
Road Salt Influence:	Low

Notes: Profile data indicates that Bartlett Pond is weakly stratified with most of the water column having dissolved oxygen concentrations above 7 mg/L with the exception of the bottom 1-2 meters which are anoxic for much of the season.

Location

Latitude:	44.1062
Longitude:	-73.5110
County:	Essex
Town:	Moriah
Watershed:	Northwest Bay-Lake Champlain

Lake Characteristics

Surface Area (ha):	40.0
Shoreline Length (km):	3.1
Max Depth (m):	6.1
Mean Depth (m):	5.0
Volume (m^3):	1,550,000
Flushing Rate (times/year):	4.6

Watershed Characteristics

Watershed Area (ha):	1,093.2
Open Water (%):	4.43
Developed, Open Space (%):	2.93
Developed, Low Intensity (%):	0.81
Developed, Medium Intensity (%):	0.21
Developed, High Intensity (%):	0.10
Barren Land (%):	0.07
Deciduous Forest (%):	35.00
Evergreen Forest (%):	32.21
Mixed Forest (%):	17.11
Dwarf Shrub (%):	1.12
Grassland/Herbaceous (%):	0.53
Pasture/Hay (%):	0.14
Cultivated Crops (%):	0.00
Woody Wetlands (%):	4.41
Emergent Herbaceous Wetlands (%):	1.02

Aquatic Invasive Species Detections

Eurasian watermilfoil:	1998
Chinese mystery snail:	2015

Harmful Algal Bloom Reports

None

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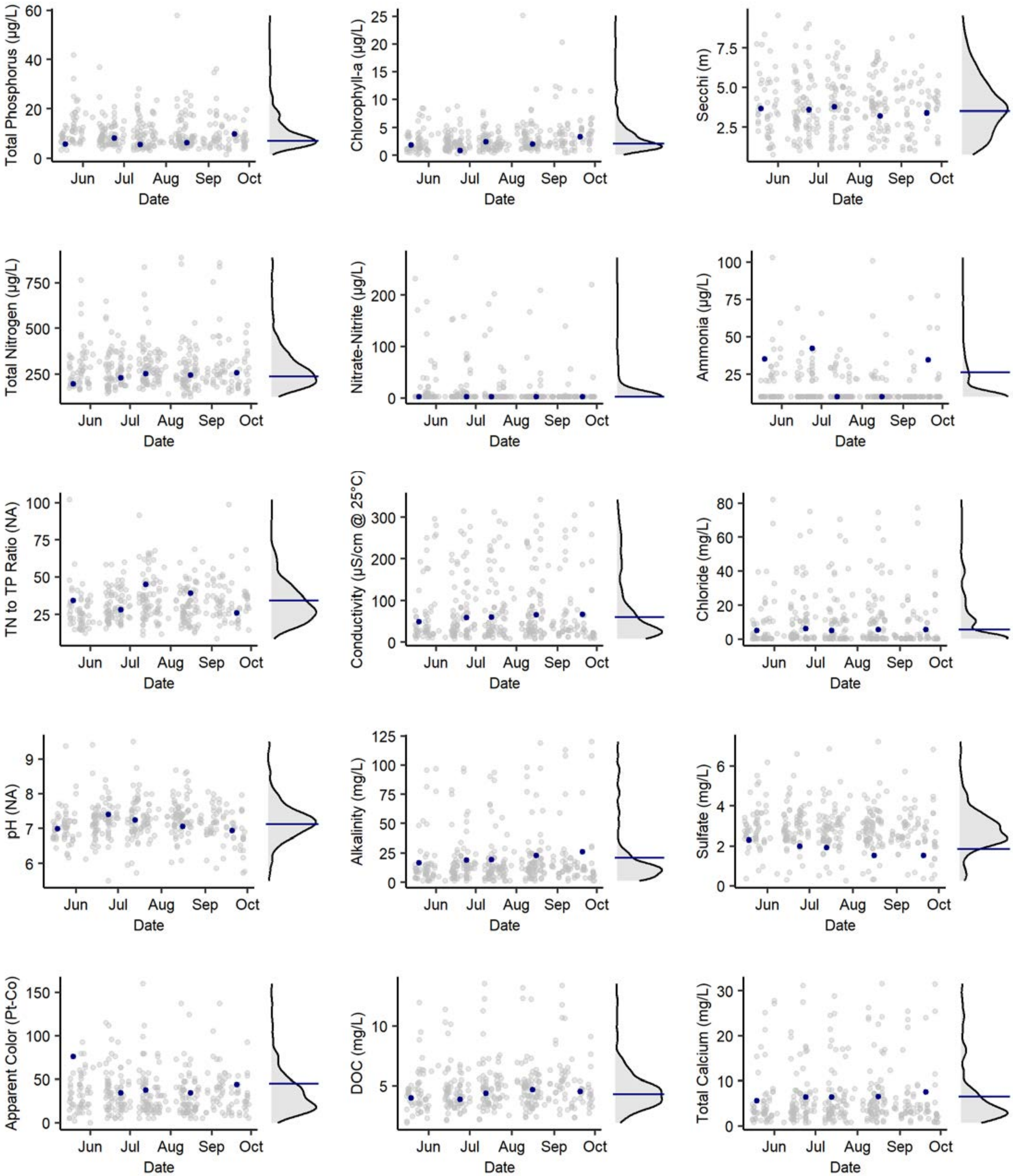
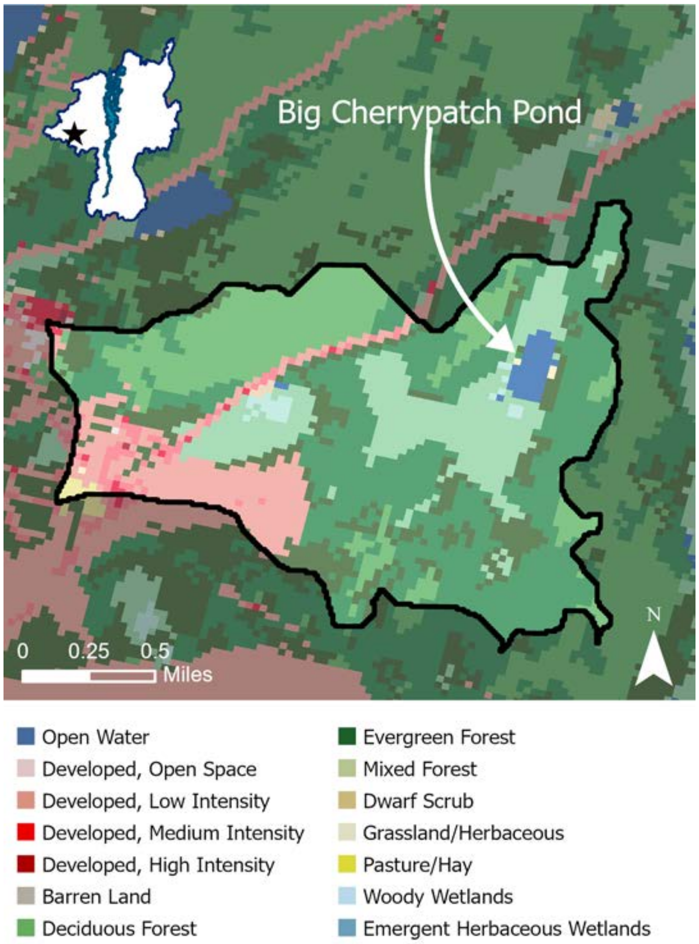


Big Cherry Patch Pond



Summary	
Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Mesotrophic
Trophic Status (Secchi):	Eutrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Adequate
Road Salt Influence:	High

Notes: Secchi data are missing for August and September due to challenges of boat access, other data from these months are from outlet grab samples.

Location	
Latitude:	44.2908
Longitude:	-73.9444
County:	Essex
Town:	North Elba
Watershed:	West Branch Ausable River

Lake Characteristics	
Surface Area (ha):	7.0
Shoreline Length (km):	1.7
Max Depth (m):	4.6
Mean Depth (m):	1.9
Volume (m^3):	100,632
Flushing Rate (times/year):	17.4

Watershed Characteristics	
Watershed Area (ha):	283.5
Open Water (%):	1.78
Developed, Open Space (%):	9.91
Developed, Low Intensity (%):	1.84
Developed, Medium Intensity (%):	0.38
Developed, High Intensity (%):	0.10
Barren Land (%):	0.06
Deciduous Forest (%):	17.69
Evergreen Forest (%):	12.73
Mixed Forest (%):	38.14
Dwarf Shrub (%):	0.16
Grassland/Herbaceous (%):	0.16
Pasture/Hay (%):	0.35
Cultivated Crops (%):	0.00
Woody Wetlands (%):	15.85
Emergent Herbaceous Wetlands (%):	0.86

Aquatic Invasive Species Detections
None

Harmful Algal Bloom Reports
None

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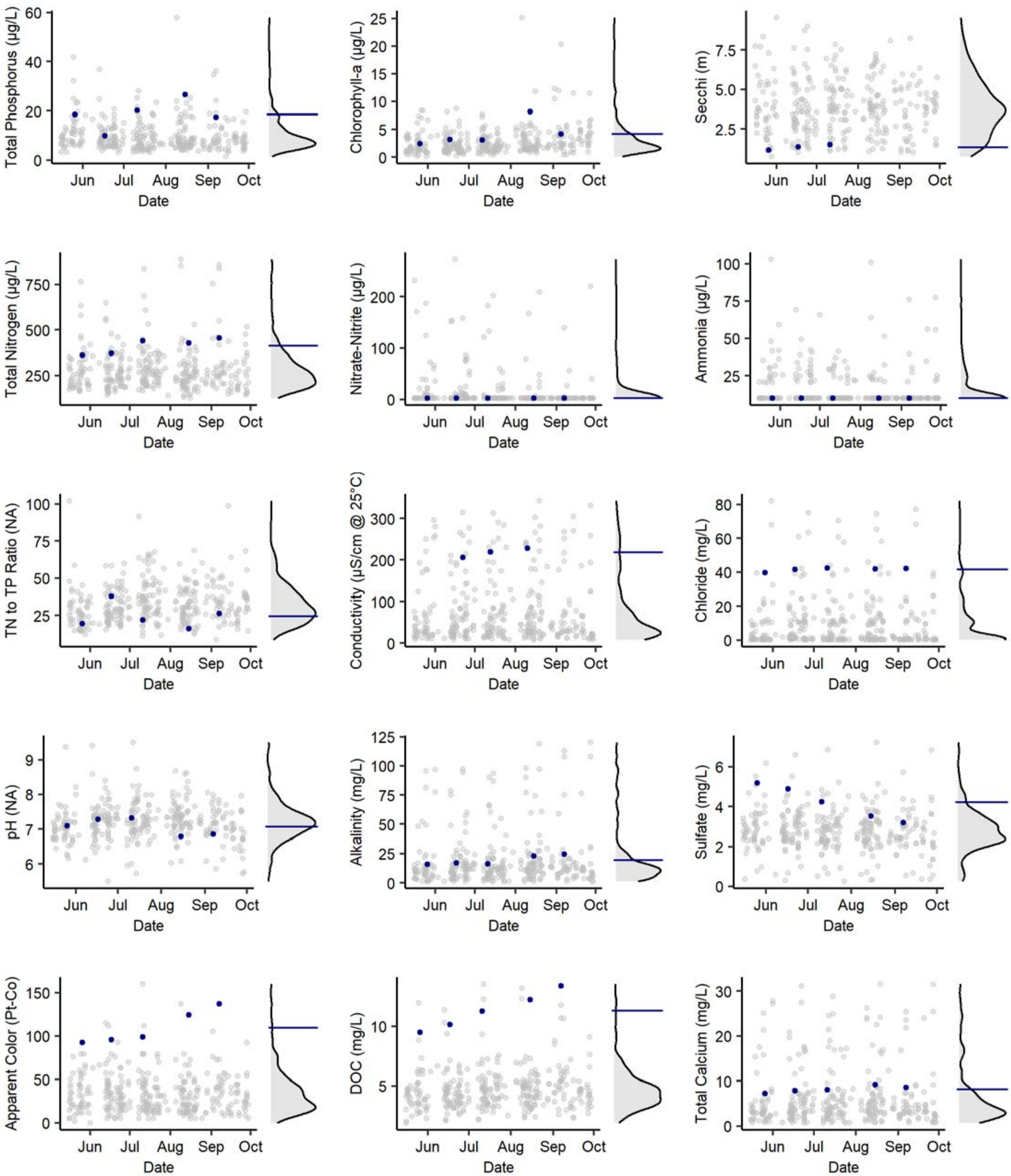
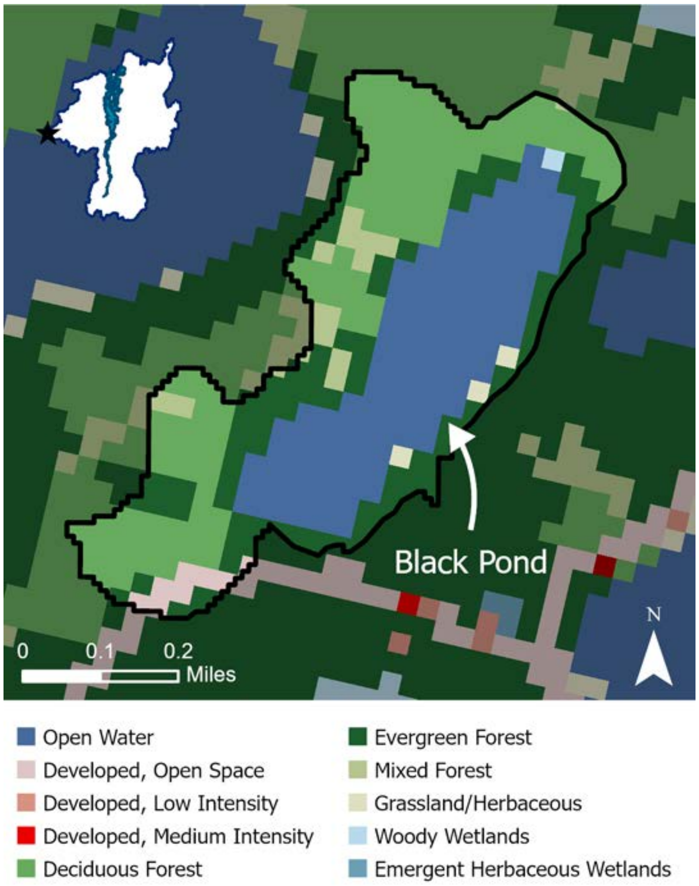


Black Pond



Location	
Latitude:	44.3075
Longitude:	-74.3815
County:	Franklin
Town:	Santa Clara
Watershed:	Saranac Lakes-Saranac River

Lake Characteristics	
Surface Area (ha):	10.1
Shoreline Length (km):	1.7
Max Depth (m):	13.4
Mean Depth (m):	6.2
Volume (m^3):	555,738
Flushing Rate (times/year):	0.4

Watershed Characteristics	
Watershed Area (ha):	24.5
Open Water (%):	38.69
Developed, Open Space (%):	2.55
Developed, Low Intensity (%):	0.00
Developed, Medium Intensity (%):	0.00
Developed, High Intensity (%):	0.00
Barren Land (%):	0.00
Deciduous Forest (%):	35.04
Evergreen Forest (%):	18.98
Mixed Forest (%):	4.38
Dwarf Shrub (%):	0.00
Grassland/Herbaceous (%):	0.36
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	0.00
Emergent Herbaceous Wetlands (%):	0.00

Summary	
Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Moderate
Road Salt Influence:	None

Notes: Profile data indicate that Black Pond is thermally stratified during the summer with the epilimnion having dissolved oxygen concentrations >7 mg/L. The hypolimnion is anoxic (<2 mg/L) for much of the summer.

Aquatic Invasive Species Detections
None

Harmful Algal Bloom Reports
None

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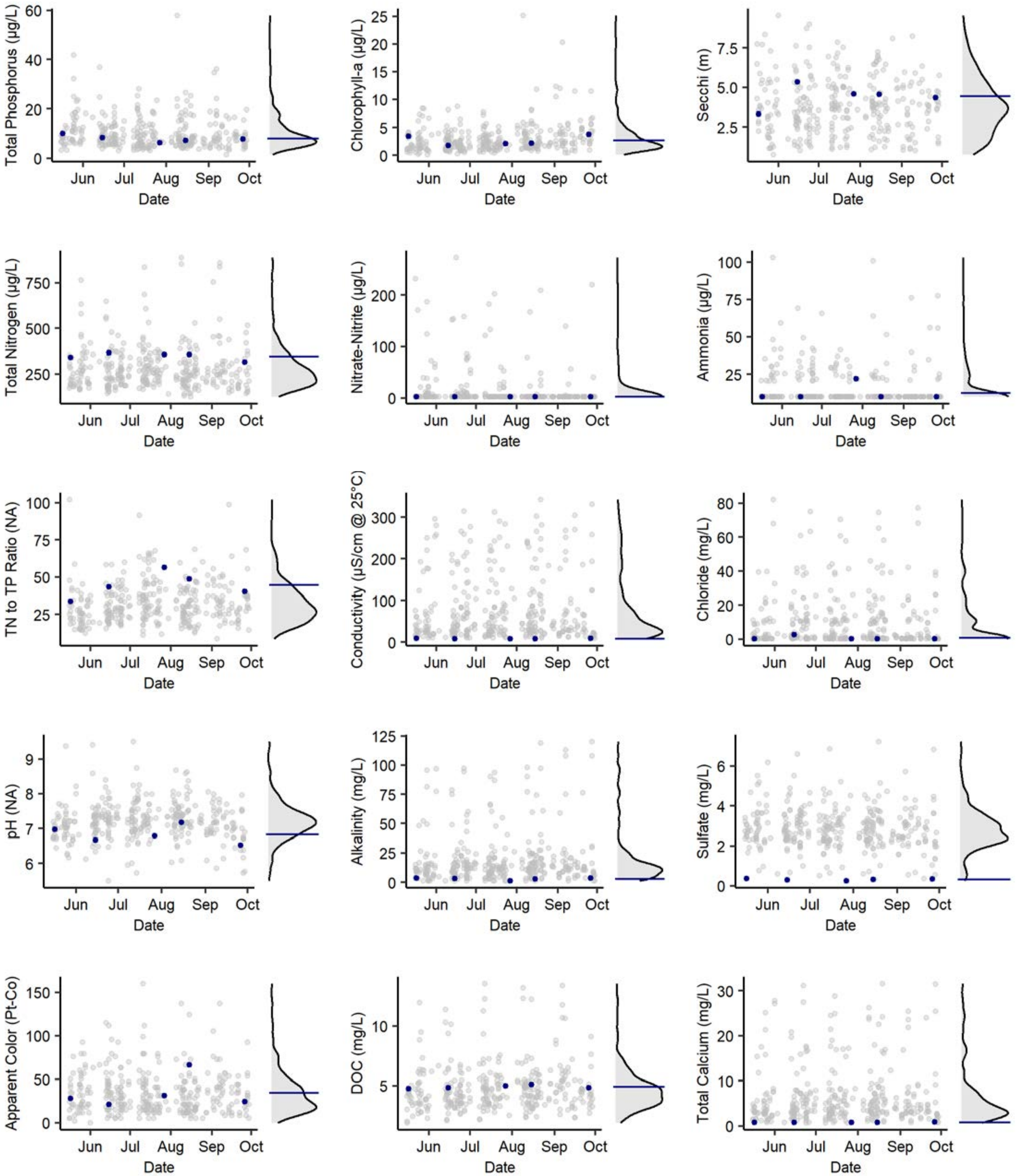
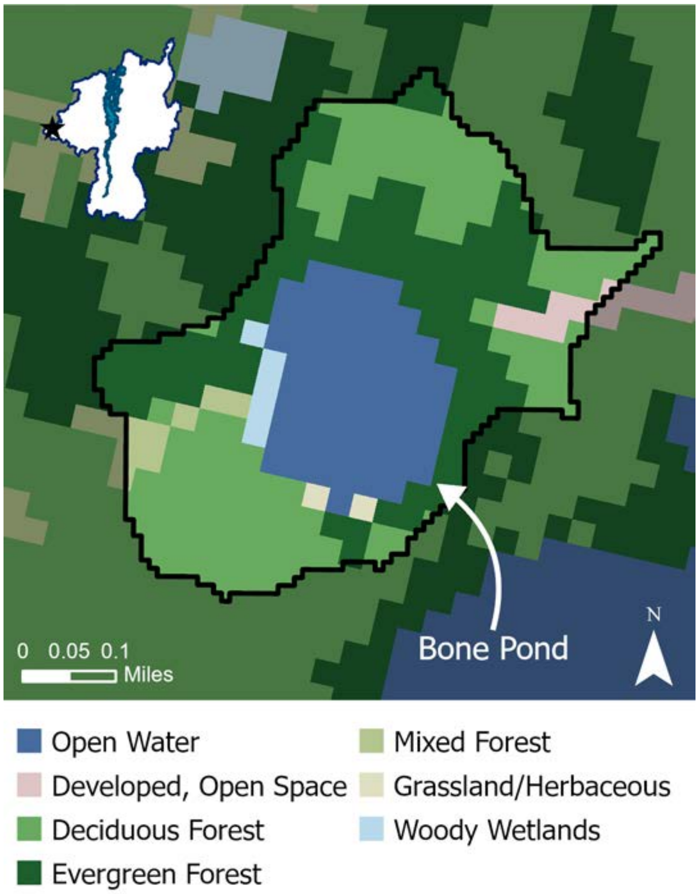


BONE POND



Summary	
Trophic Status (Chl-a):	Oligotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Moderate
Road Salt Influence:	None

Notes: None.

Location	
Latitude:	44.3612
Longitude:	-74.3044
County:	Franklin
Town:	Santa Clara
Watershed:	Saranac Lakes-Saranac River

Lake Characteristics	
Surface Area (ha):	5.6
Shoreline Length (km):	0.9
Max Depth (m):	NA
Mean Depth (m):	NA
Volume (m^3):	NA
Flushing Rate (times/year):	NA

Watershed Characteristics	
Watershed Area (ha):	23.8
Open Water (%):	22.81
Developed, Open Space (%):	1.90
Developed, Low Intensity (%):	0.00
Developed, Medium Intensity (%):	0.00
Developed, High Intensity (%):	0.00
Barren Land (%):	0.00
Deciduous Forest (%):	36.88
Evergreen Forest (%):	33.08
Mixed Forest (%):	2.66
Dwarf Shrub (%):	0.00
Grassland/Herbaceous (%):	0.76
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	1.90
Emergent Herbaceous Wetlands (%):	0.00

Aquatic Invasive Species Detections
None

Harmful Algal Bloom Reports
None

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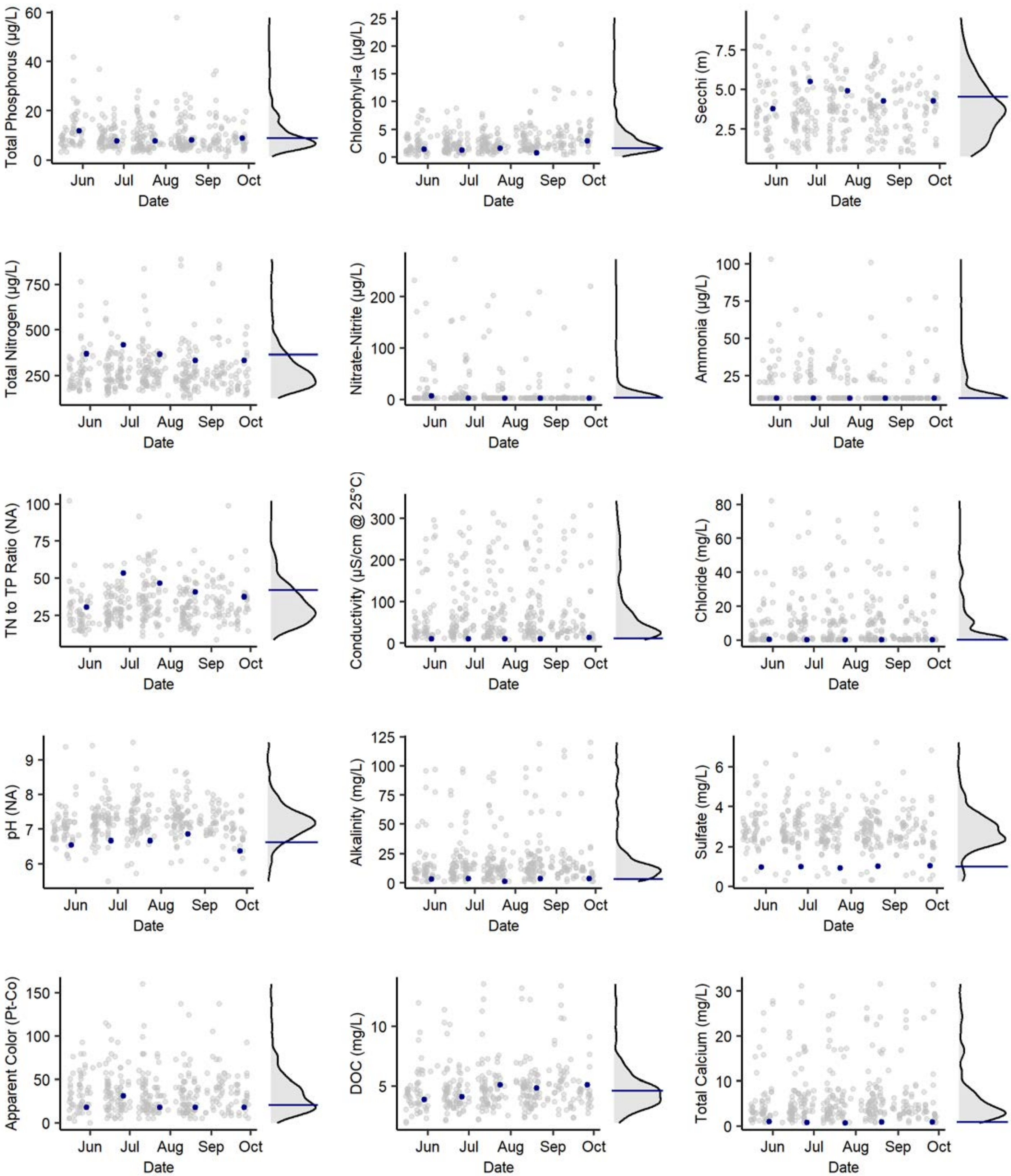
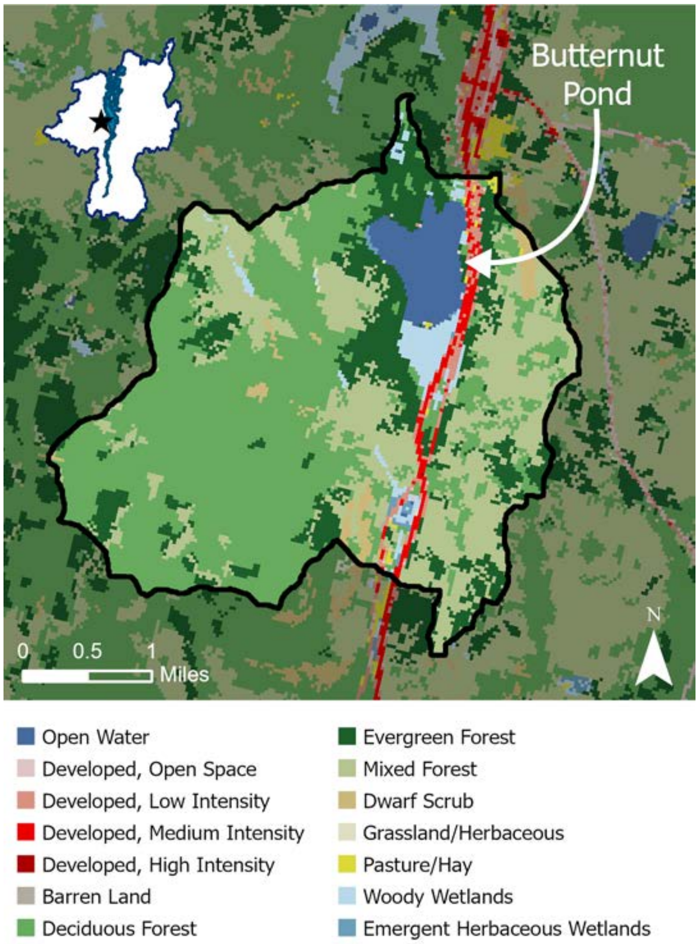


Butternut Pond



Summary	
Trophic Status (Chl-a):	Oligotrophic
Trophic Status (TP):	Mesotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Alkaline: non-impacted
Acid Neutralizing Capacity:	High
Road Salt Influence:	High

Notes: None.

Location	
Latitude:	44.4307
Longitude:	-73.4957
County:	Essex
Towns:	Chesterfield
Watershed:	Ausable River

Lake Characteristics	
Surface Area (ha):	65.8
Shoreline Length (km):	4.3
Max Depth (m):	6.3
Mean Depth (m):	5.8
Volume (m^3):	261,000
Flushing Rate (times/year):	3.9

Watershed Characteristics	
Watershed Area (ha):	1,344.5
Open Water (%):	4.63
Developed, Open Space (%):	0.15
Developed, Low Intensity (%):	1.43
Developed, Medium Intensity (%):	1.55
Developed, High Intensity (%):	0.01
Barren Land (%):	0.05
Deciduous Forest (%):	44.82
Evergreen Forest (%):	15.94
Mixed Forest (%):	26.27
Dwarf Shrub (%):	1.76
Grassland/Herbaceous (%):	0.08
Pasture/Hay (%):	0.27
Cultivated Crops (%):	0.00
Woody Wetlands (%):	2.70
Emergent Herbaceous Wetlands (%):	0.32

Aquatic Invasive Species Detections	
Eurasian watermilfoil:	2010

Harmful Algal Bloom Reports
None

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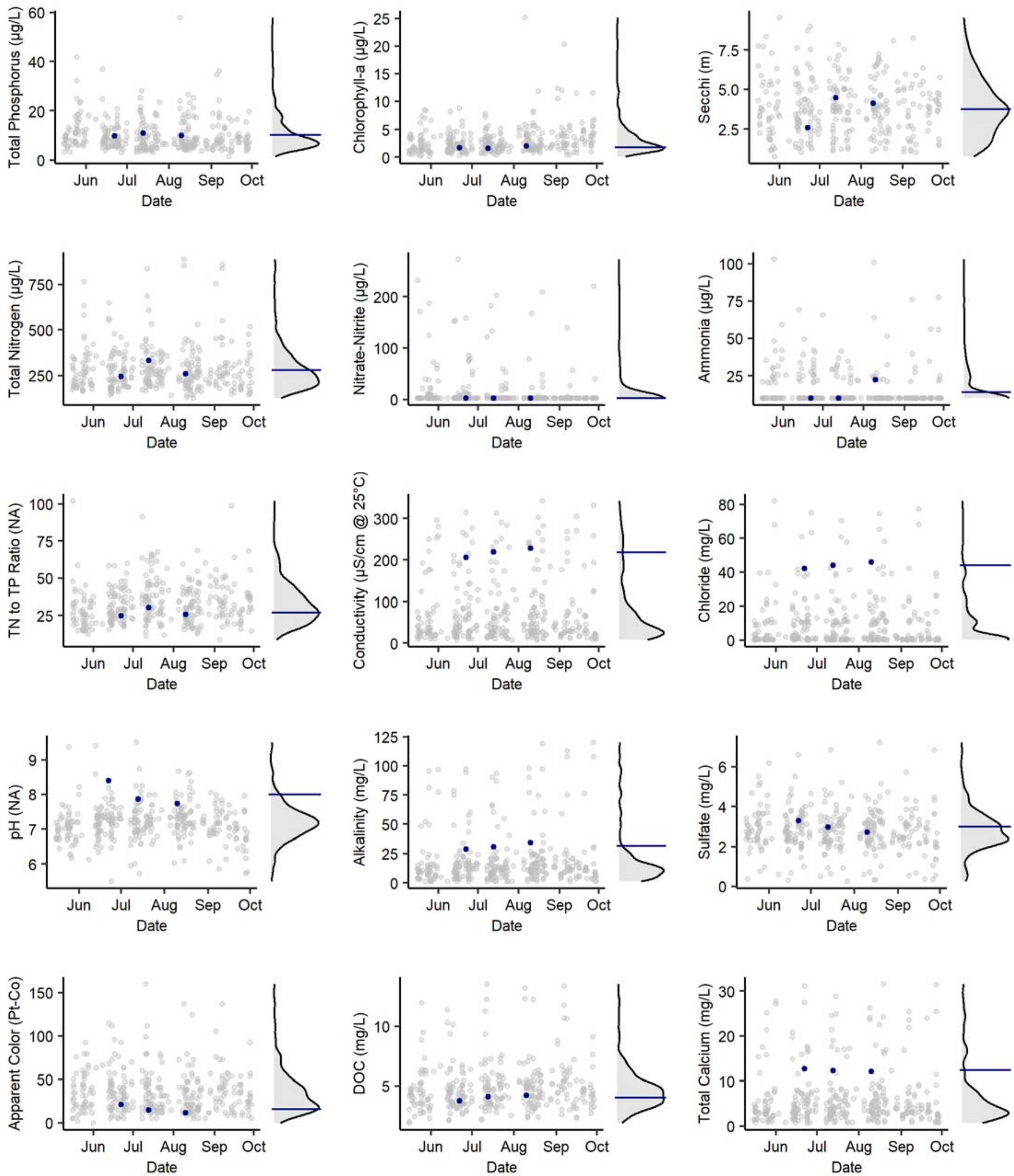
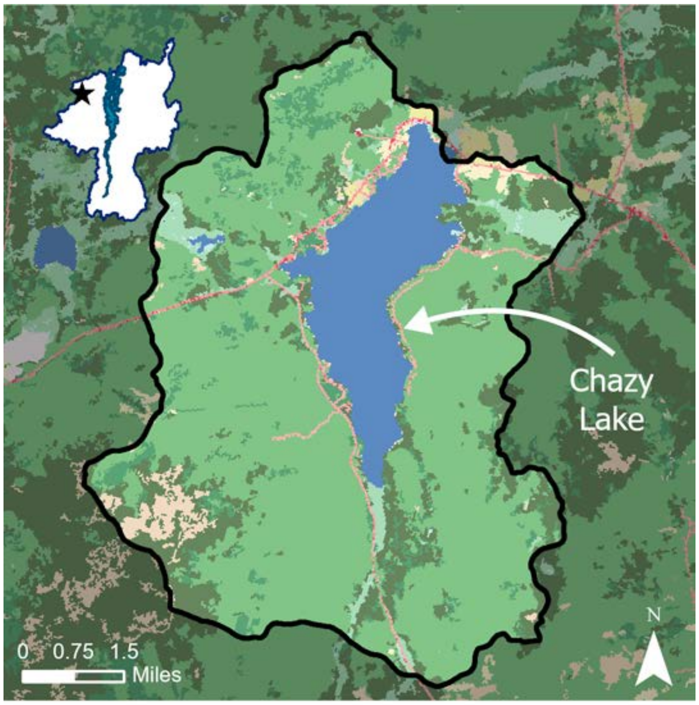


Chazy Lake



- Open Water
- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, High Intensity
- Barren Land
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Dwarf Scrub
- Grassland/Herbaceous
- Pasture/Hay
- Woody Wetlands
- Emergent Herbaceous Wetlands

Location

Latitude:	44.7471
Longitude:	-73.8240
County:	Clinton
Town:	Dannemora
Watershed:	Great Chazy River

Lake Characteristics

Surface Area (ha):	746.6
Shoreline Length (km):	20.7
Max Depth (m):	21.9
Mean Depth (m):	15.9
Volume (m^3):	65,399,532
Flushing Rate (times/year):	0.33

Watershed Characteristics

Watershed Area (ha):	5,910.5
Open Water (%):	12.67
Developed, Open Space (%):	1.40
Developed, Low Intensity (%):	0.76
Developed, Medium Intensity (%):	0.15
Developed, High Intensity (%):	0.02
Barren Land (%):	0.07
Deciduous Forest (%):	59.23
Evergreen Forest (%):	13.47
Mixed Forest (%):	5.76
Dwarf Shrub (%):	1.96
Grassland/Herbaceous (%):	0.78
Pasture/Hay (%):	0.36
Cultivated Crops (%):	0.00
Woody Wetlands (%):	3.14
Emergent Herbaceous Wetlands (%):	0.22

Summary

Trophic Status (Chl-a):	Oligotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Oligotrophic
Acidity:	Alkaline: non-impacted
Acid Neutralizing Capacity:	Adequate
Road Salt Influence:	Moderate

Notes: Three sites are sampled on Chazy Lake.

Aquatic Invasive Species Detections

Eurasian watermilfoil:	2006
Chinese mystery snail:	Unknown

Harmful Algal Bloom Reports

None

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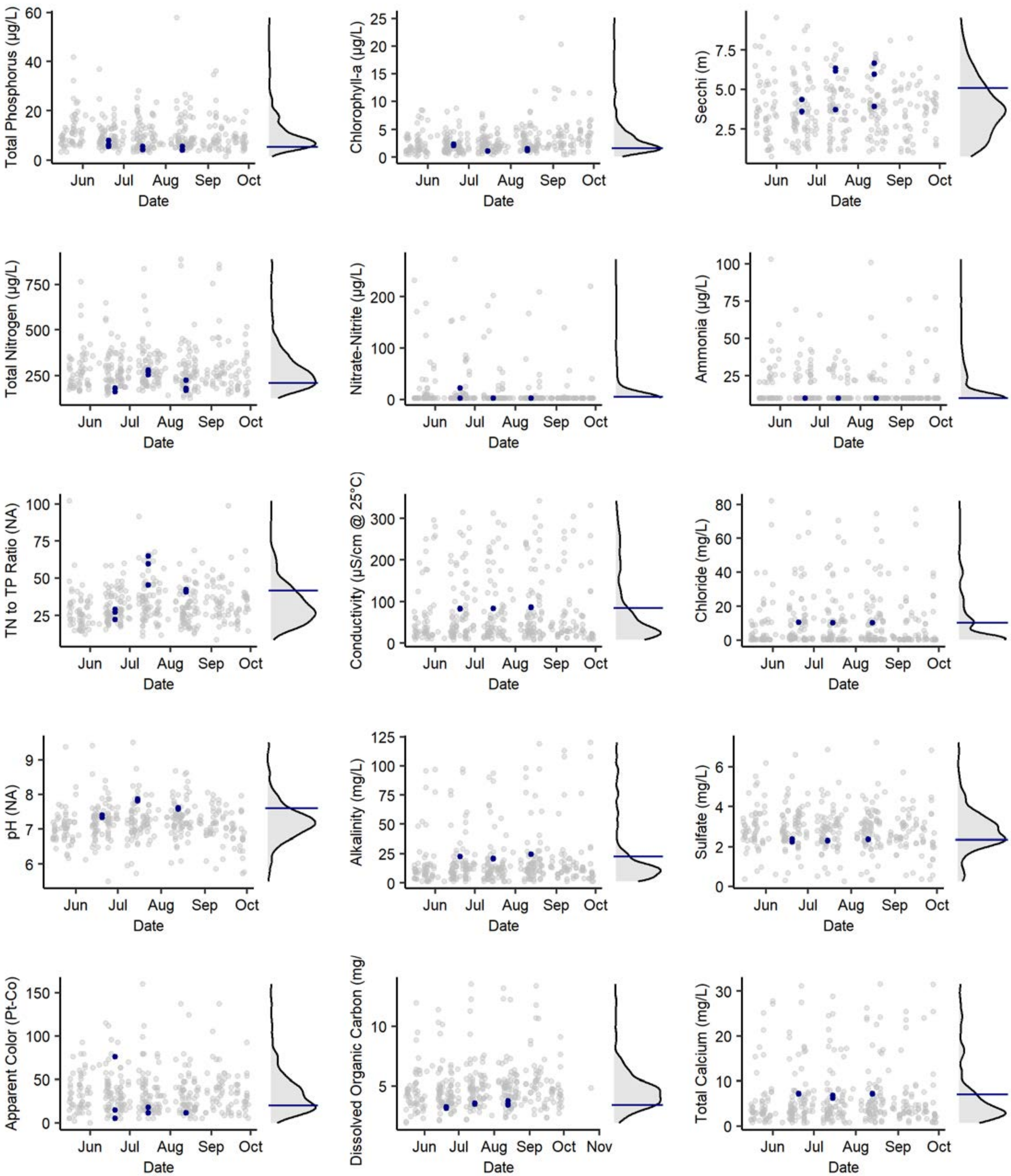
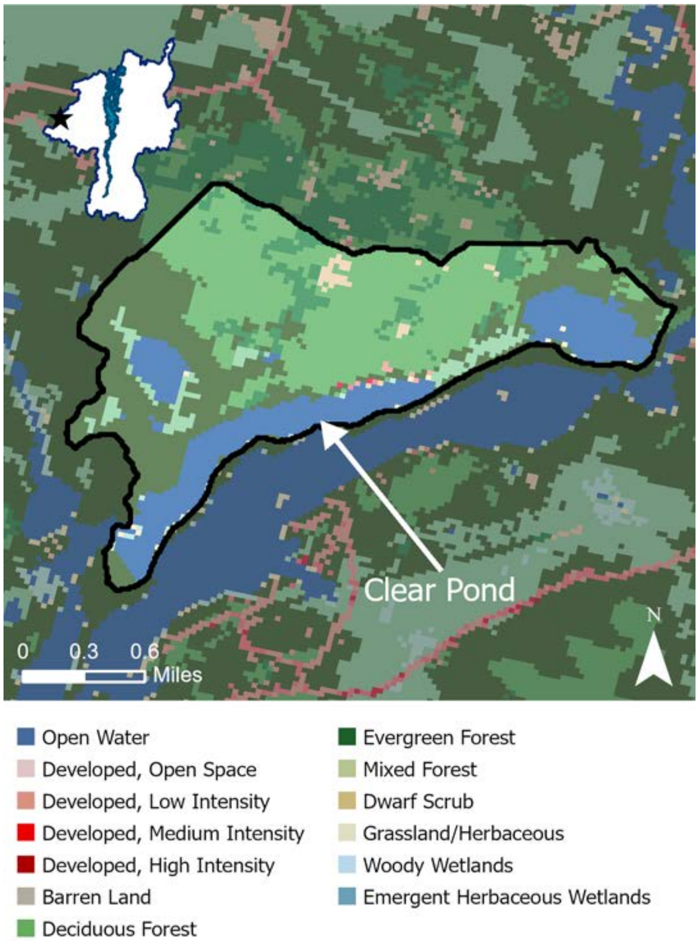


CLEAR POND



Summary

Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Adequate
Road Salt Influence:	None

Notes: Profile data indicate that Clear Pond is thermally stratified during the summer with the epilimnion having dissolved oxygen concentrations >7 mg/L. The hypolimnion is anoxic (<2 mg/L) for much of the summer.

Location

Latitude:	44.4866
Longitude:	-74.1607
County:	Franklin
Towns:	Brighton, Franklin
Watershed:	North Branch Saranac River

Lake Characteristics

Surface Area (ha):	42.1
Shoreline Length (km):	5.1
Max Depth (m):	16.8
Mean Depth (m):	7.3
Volume (m^3):	2,840,976
Flushing Rate (times/year):	0.7

Watershed Characteristics

Watershed Area (ha):	329.0
Open Water (%):	20.80
Developed, Open Space (%):	0.19
Developed, Low Intensity (%):	0.11
Developed, Medium Intensity (%):	0.05
Developed, High Intensity (%):	0.00
Barren Land (%):	0.00
Deciduous Forest (%):	37.06
Evergreen Forest (%):	29.91
Mixed Forest (%):	6.13
Dwarf Shrub (%):	0.90
Grassland/Herbaceous (%):	0.68
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	3.89
Emergent Herbaceous Wetlands (%):	0.27

Aquatic Invasive Species Detections

None

Harmful Algal Bloom Reports

None

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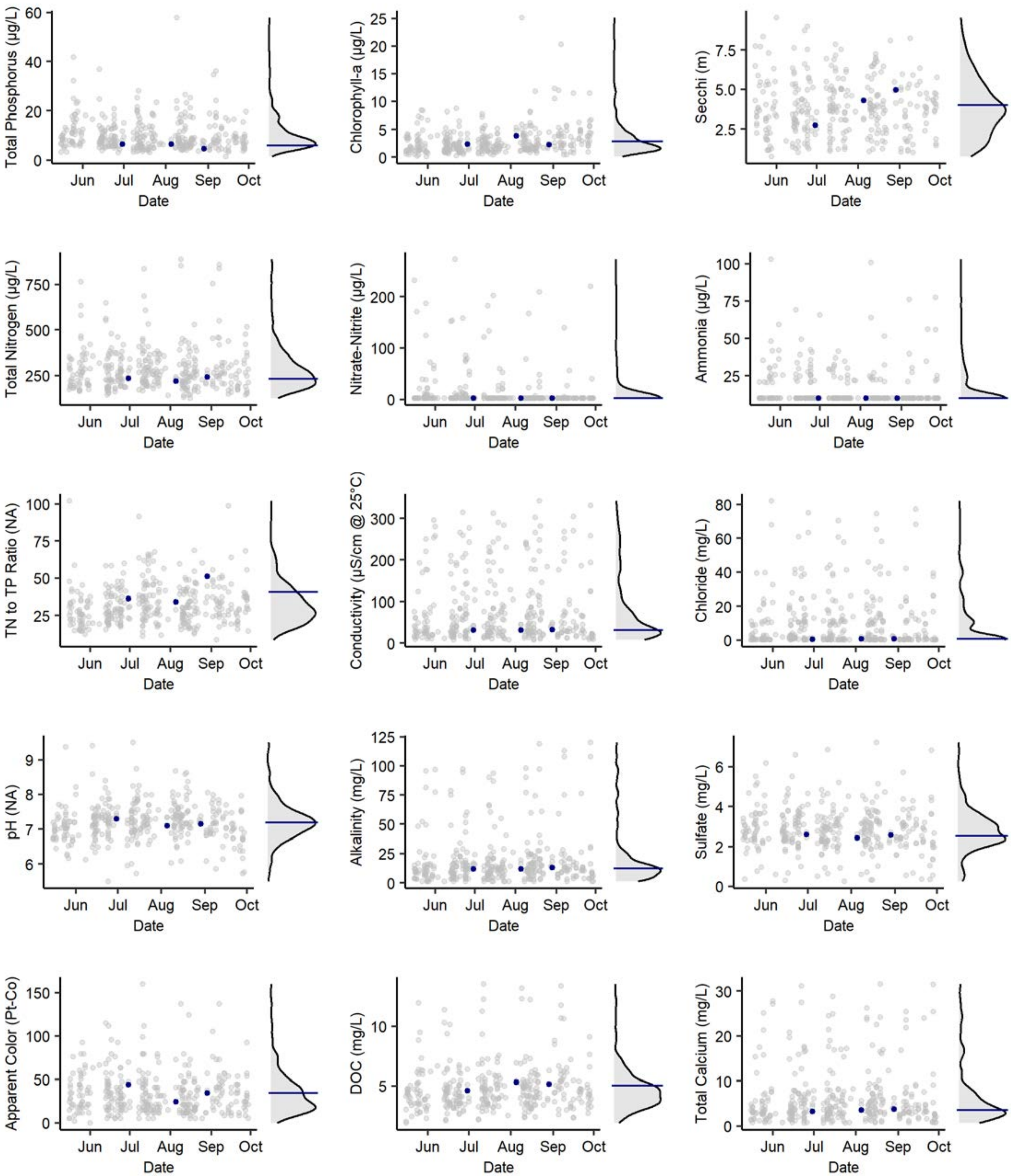
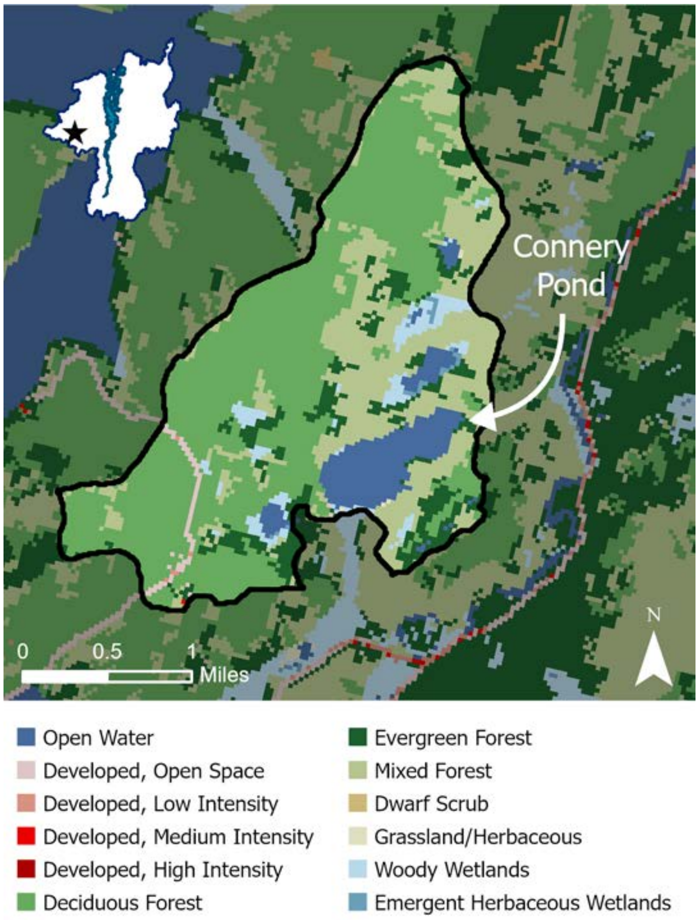


Connery Pond



Summary

Trophic Status (Chl-a):	Oligotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Adequate
Road Salt Influence:	None

Notes: None.

Location

Latitude:	44.3118
Longitude:	-73.9340
County:	Essex
Town:	North Elba
Watershed:	West Branch Ausable River

Lake Characteristics

Surface Area (ha):	34.3
Shoreline Length (km):	3.1
Max Depth (m):	15.2
Mean Depth (m):	5.3
Volume (m^3):	1,736,936
Flushing Rate (times/year):	2.0

Watershed Characteristics

Watershed Area (ha):	584.7
Open Water (%):	7.75
Developed, Open Space (%):	0.96
Developed, Low Intensity (%):	0.08
Developed, Medium Intensity (%):	0.02
Developed, High Intensity (%):	0.00
Barren Land (%):	0.00
Deciduous Forest (%):	51.09
Evergreen Forest (%):	9.80
Mixed Forest (%):	26.08
Dwarf Shrub (%):	0.00
Grassland/Herbaceous (%):	0.08
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	3.70
Emergent Herbaceous Wetlands (%):	0.46

Aquatic Invasive Species Detections

None

Harmful Algal Bloom Reports

None

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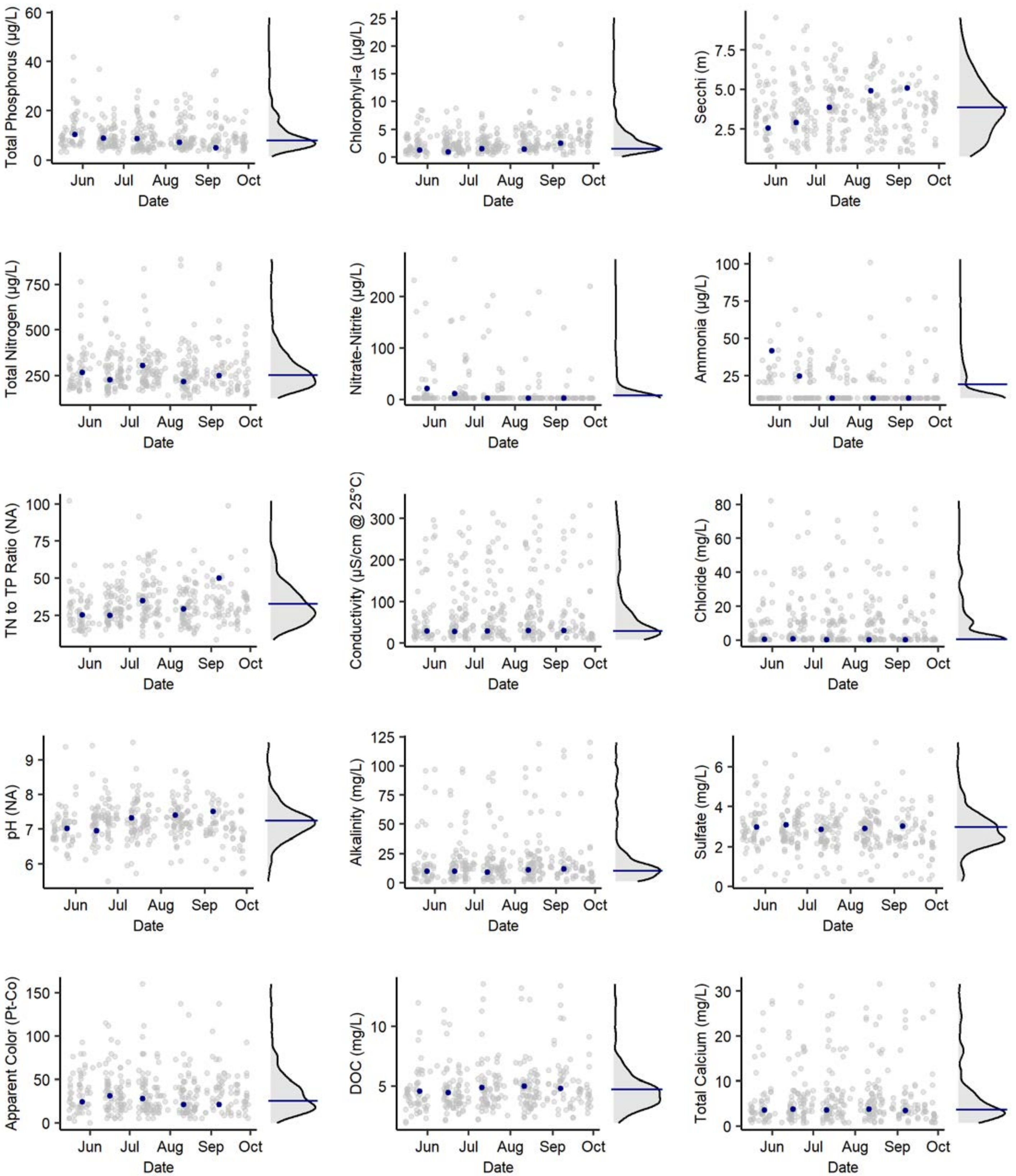
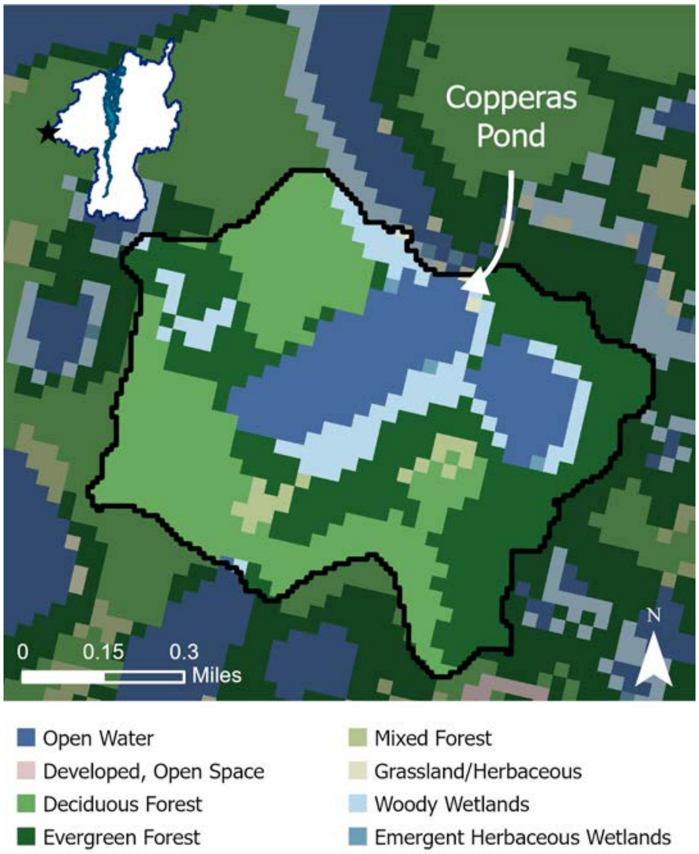


Copperas Pond



Location

Latitude:	44.3140
Longitude:	-74.3763
County:	Franklin
Town:	Santa Clara
Watershed:	Saranac Lakes-Saranac River

Lake Characteristics

Surface Area (ha):	10.0
Shoreline Length (km):	1.4
Max Depth (m):	5.8
Mean Depth (m):	2.7
Volume (m^3):	250,642
Flushing Rate (times/year):	1.7

Watershed Characteristics

Watershed Area (ha):	75.4
Open Water (%):	18.47
Developed, Open Space (%):	0.00
Developed, Low Intensity (%):	0.00
Developed, Medium Intensity (%):	0.00
Developed, High Intensity (%):	0.00
Barren Land (%):	0.00
Deciduous Forest (%):	33.81
Evergreen Forest (%):	34.53
Mixed Forest (%):	2.16
Dwarf Shrub (%):	0.00
Grassland/Herbaceous (%):	0.12
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	10.55
Emergent Herbaceous Wetlands (%):	0.36

Summary

Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Adequate
Road Salt Influence:	None

Notes: Profile data indicate that Copperas Pond is thermally stratified during the summer with the epilimnion having dissolved oxygen concentrations >7 mg/L. The hypolimnion is anoxic (<2 mg/L) for much of the summer.

Aquatic Invasive Species Detections

Eurasian watermilfoil:	2002

Harmful Algal Bloom Reports

2022

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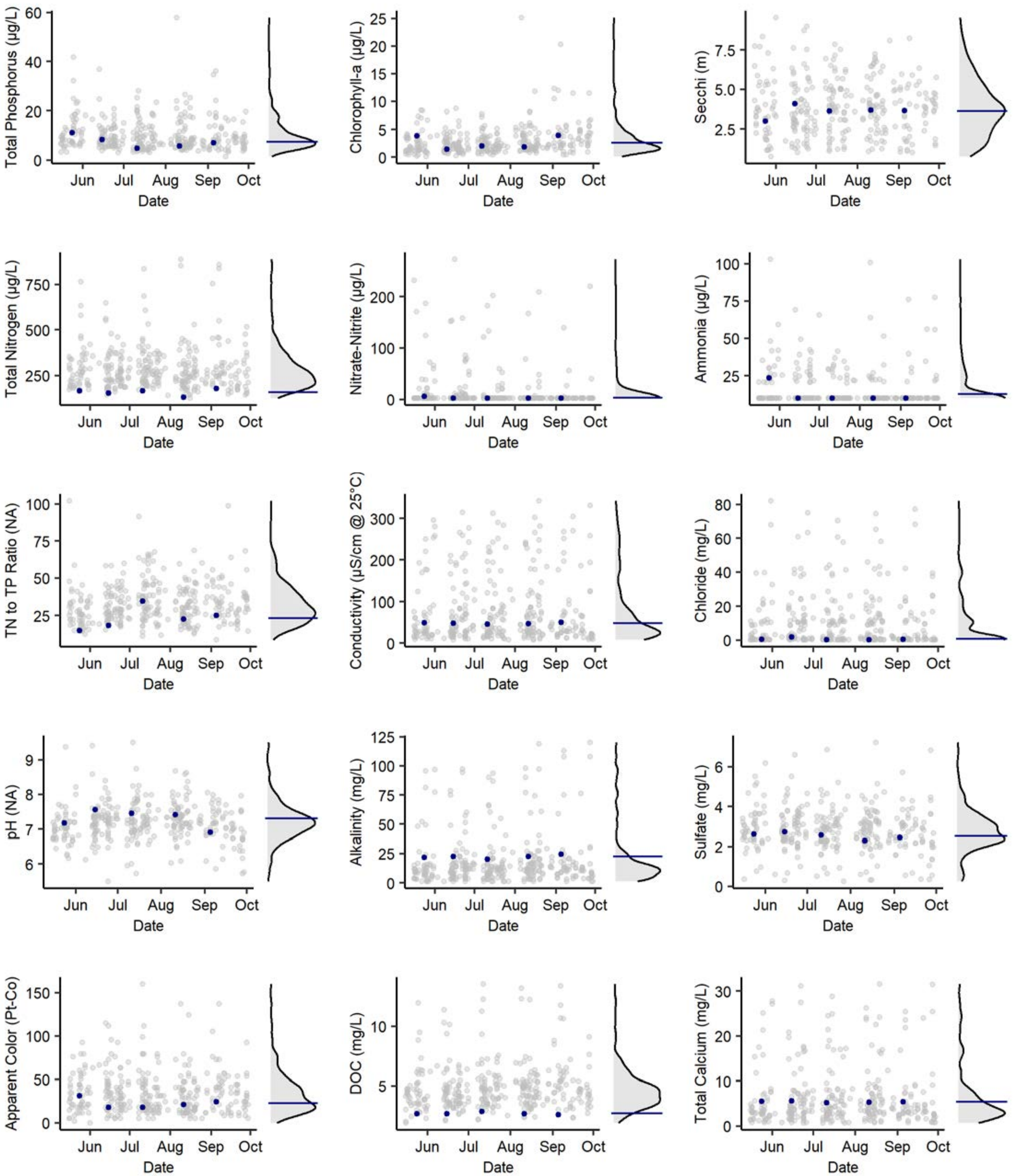
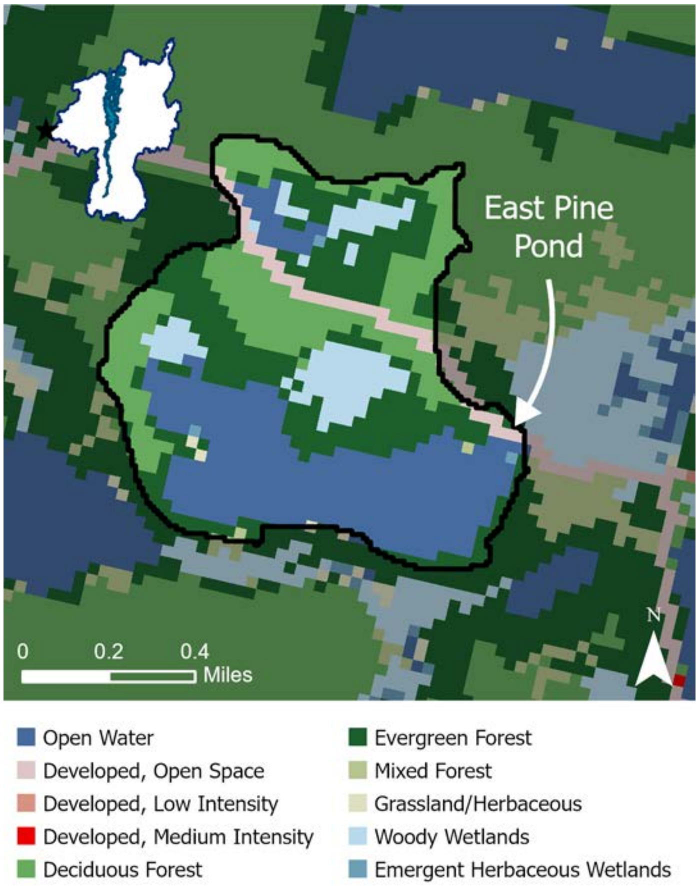


East Pine Pond



Location

Latitude:	44.3390
Longitude:	-74.4190
County:	Franklin
Town:	Santa Clara, Tupper Lake
Watershed:	Saranac Lakes-Saranac River

Lake Characteristics

Surface Area (ha):	27.1
Shoreline Length (km):	3.3
Max Depth (m):	10.1
Mean Depth (m):	4.8
Volume (m^3):	1,233,197
Flushing Rate (times/year):	0.6

Watershed Characteristics

Watershed Area (ha):	86.6
Open Water (%):	33.06
Developed, Open Space (%):	4.07
Developed, Low Intensity (%):	0.00
Developed, Medium Intensity (%):	0.00
Developed, High Intensity (%):	0.00
Barren Land (%):	0.00
Deciduous Forest (%):	22.73
Evergreen Forest (%):	30.03
Mixed Forest (%):	0.21
Dwarf Shrub (%):	0.00
Grassland/Herbaceous (%):	0.21
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	9.38
Emergent Herbaceous Wetlands (%):	0.31

Summary

Trophic Status (Chl-a):	Oligotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Adequate
Road Salt Influence:	None

Notes: None.

Aquatic Invasive Species Detections

None

Harmful Algal Bloom Reports

None

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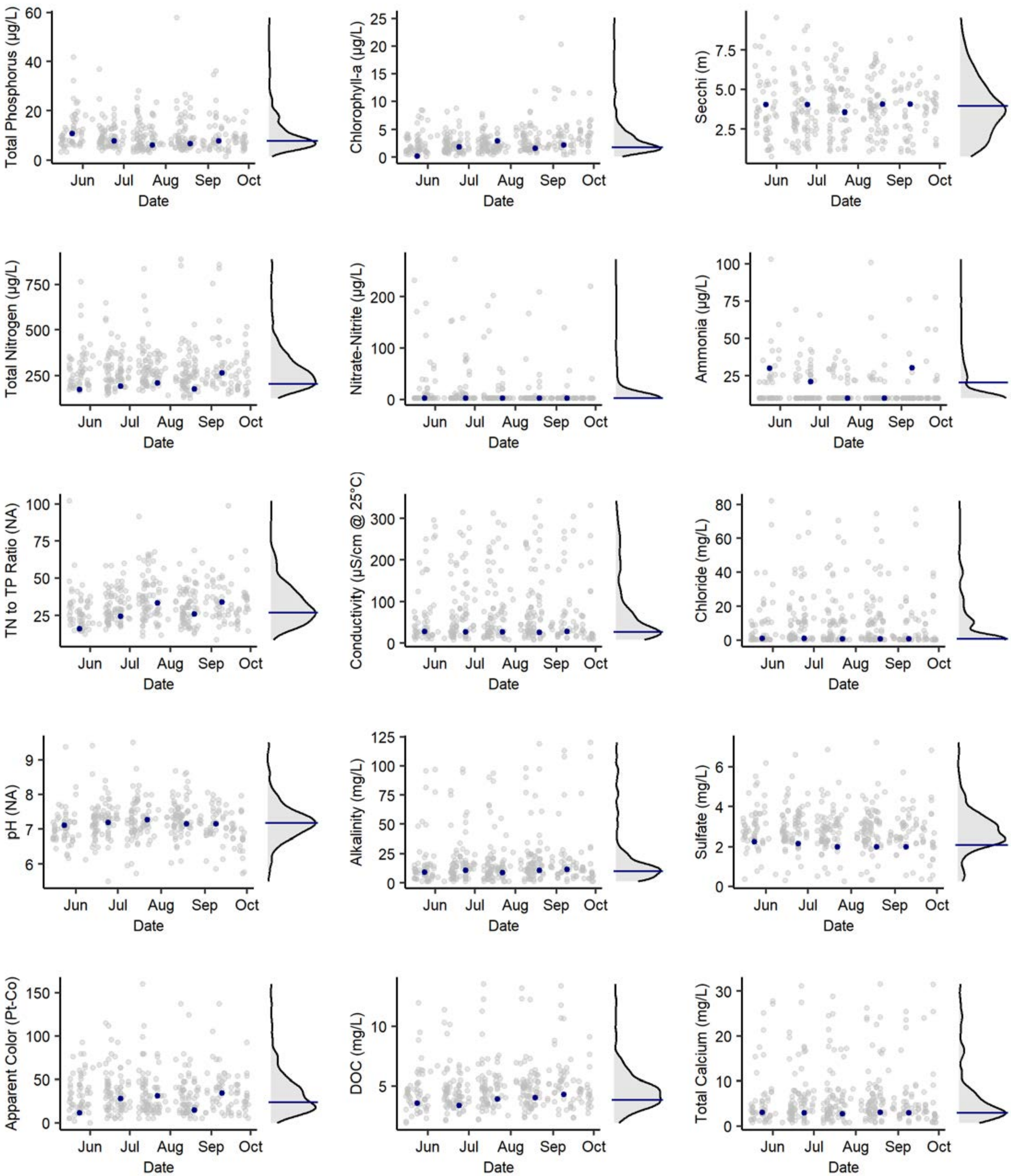
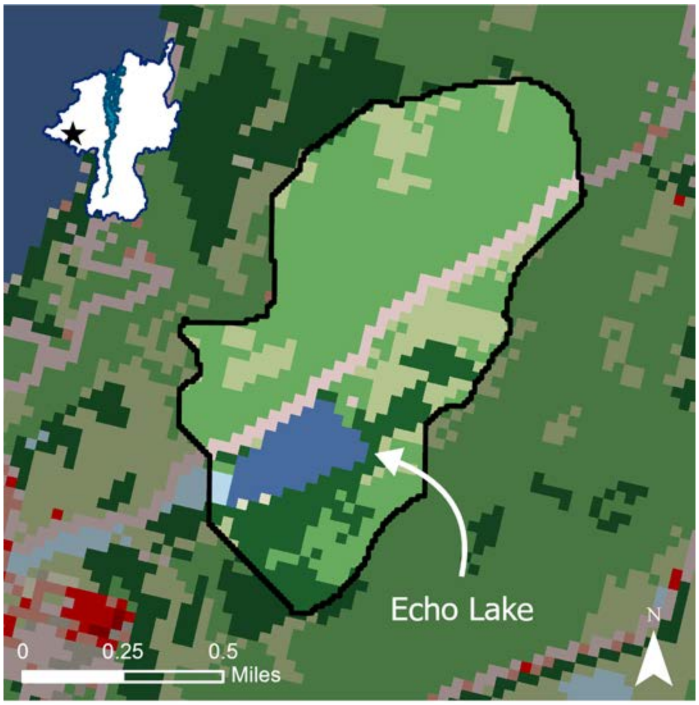


Echo Lake



- Open Water
- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, High Intensity
- Barren Land
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Grassland/Herbaceous
- Woody Wetlands

Summary

Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Mesotrophic
Trophic Status (Secchi):	Eutrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Adequate
Road Salt Influence:	Low

Notes: None.

Location

Latitude:	44.2972
Longitude:	-73.9637
County:	Essex
Town:	North Elba
Watershed:	West Branch Ausable River

Lake Characteristics

Surface Area (ha):	7.0
Shoreline Length (km):	1.2
Max Depth (m):	1.8
Mean Depth (m):	1.0
Volume (m^3):	70,572
Flushing Rate (times/year):	6.5

Watershed Characteristics

Watershed Area (ha):	99.3
Open Water (%):	6.62
Developed, Open Space (%):	5.80
Developed, Low Intensity (%):	0.00
Developed, Medium Intensity (%):	0.00
Developed, High Intensity (%):	0.00
Barren Land (%):	0.00
Deciduous Forest (%):	57.75
Evergreen Forest (%):	13.33
Mixed Forest (%):	15.78
Dwarf Shrub (%):	0.00
Grassland/Herbaceous (%):	0.18
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	0.54
Emergent Herbaceous Wetlands (%):	0.00

Aquatic Invasive Species Detections

None

Harmful Algal Bloom Reports

None

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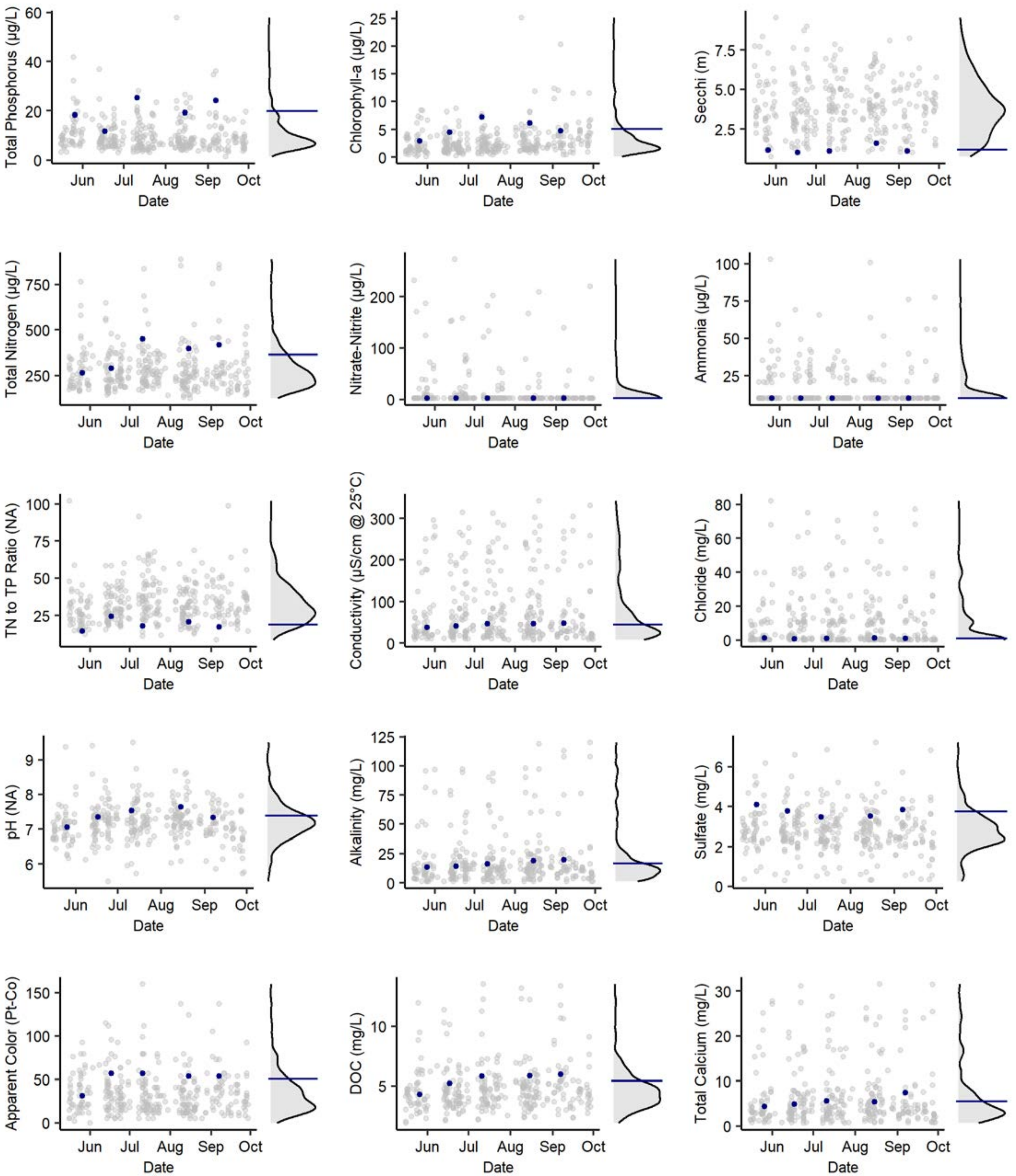
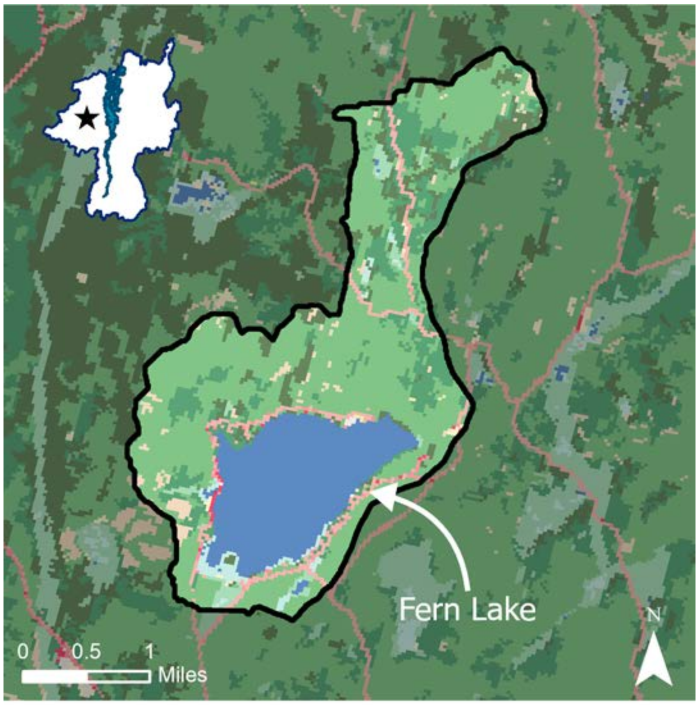


Fern Lake



- Open Water
- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, High Intensity
- Barren Land
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Dwarf Scrub
- Grassland/Herbaceous
- Pasture/Hay
- Woody Wetlands
- Emergent Herbaceous Wetlands

Summary

Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Mesotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Adequate
Road Salt Influence:	Low

Notes: None.

Location

Latitude:	44.4887
Longitude:	-73.7185
County:	Clinton
Town:	Black Brook
Watershed:	West Branch Ausable River

Lake Characteristics

Surface Area (ha):	172.4
Shoreline Length (km):	7.4
Max Depth (m):	NA
Mean Depth (m):	NA
Volume (m^3):	3,887513
Flushing Rate (times/year):	1.9

Watershed Characteristics

Watershed Area (ha):	840.7
Open Water (%):	19.59
Developed, Open Space (%):	4.13
Developed, Low Intensity (%):	0.67
Developed, Medium Intensity (%):	0.30
Developed, High Intensity (%):	0.01
Barren Land (%):	0.07
Deciduous Forest (%):	48.42
Evergreen Forest (%):	7.27
Mixed Forest (%):	12.83
Dwarf Shrub (%):	2.60
Grassland/Herbaceous (%):	0.22
Pasture/Hay (%):	0.09
Cultivated Crops (%):	0.00
Woody Wetlands (%):	2.10
Emergent Herbaceous Wetlands (%):	1.70

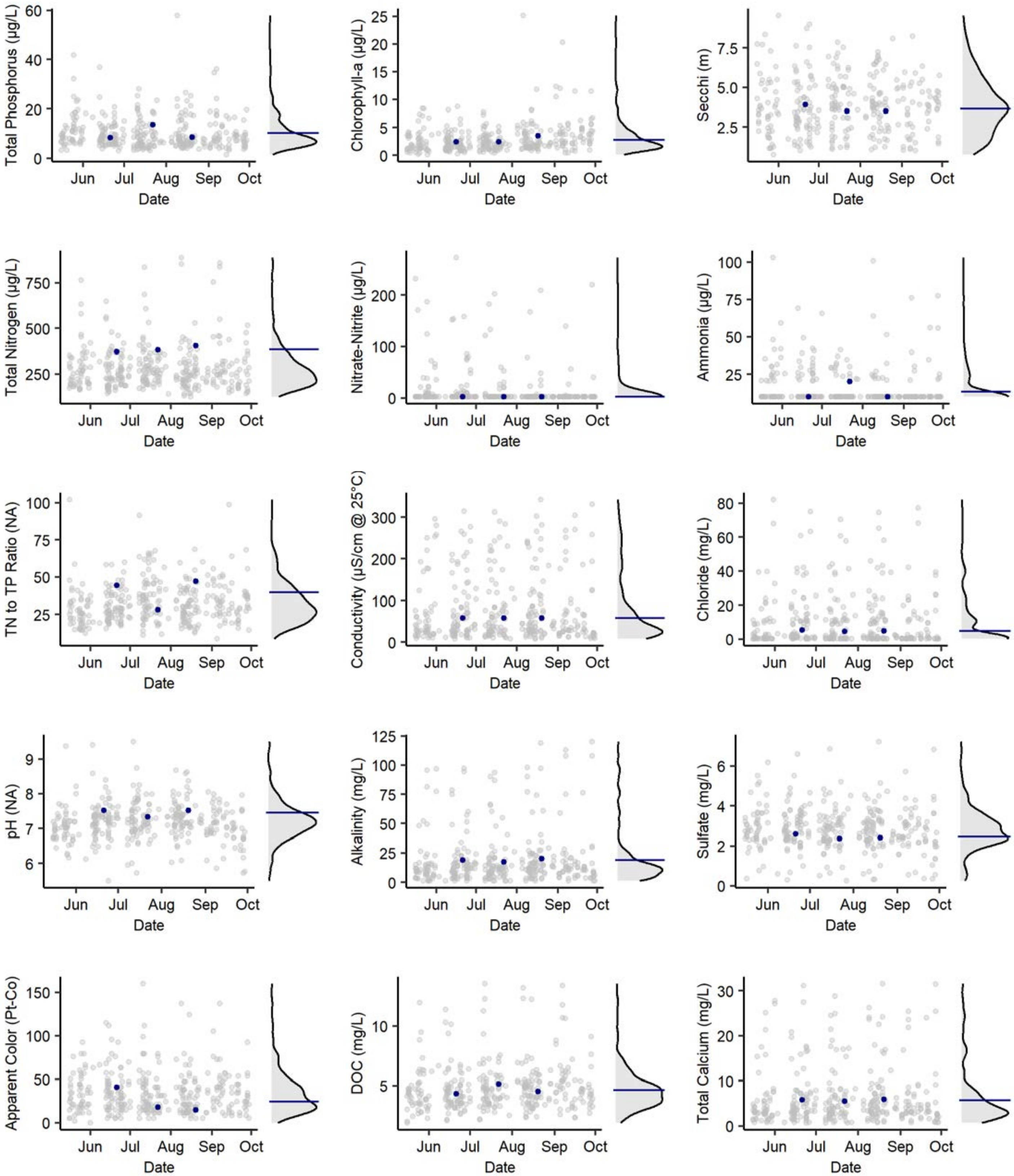
Aquatic Invasive Species Detections

None

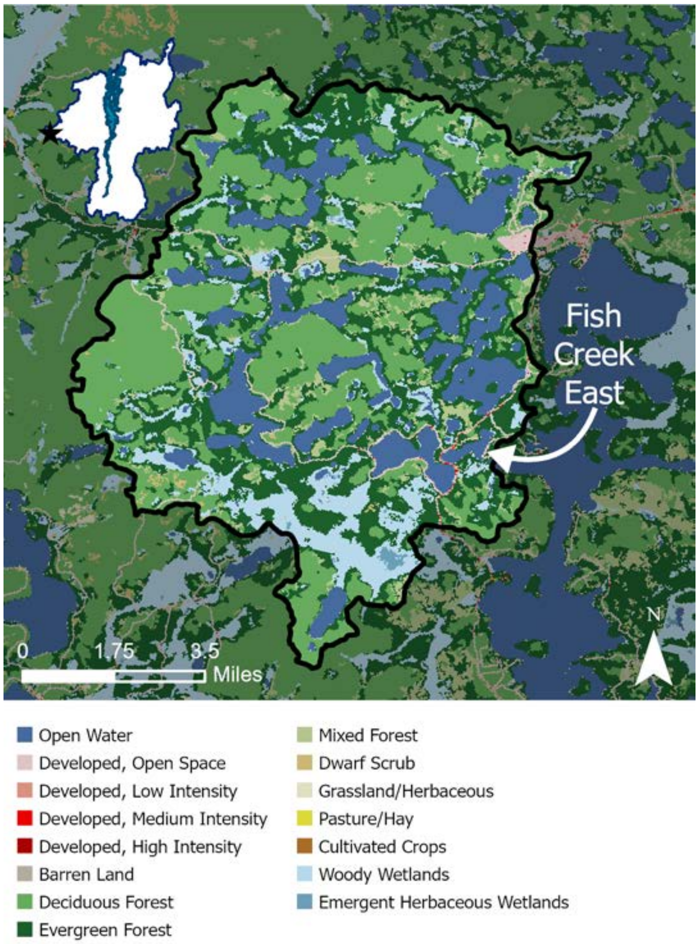
Harmful Algal Bloom Reports

2022

Gray dots represent all data in the report, blue dots are the samples for the represented lake. The right sub-plot shows the density distribution for all data in gray and the mean for the represented lake as a blue line.



Fish Creek East



Summary

Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Mesotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Adequate
Road Salt Influence:	Low

Notes: Profile data indicate that Fish Creek East is thermally stratified during the summer with the epilimnion having dissolved oxygen concentrations >7 mg/L. The hypolimnion is anoxic (<2 mg/L) for much of the summer.

Location

Latitude:	44.3040
Longitude:	-74.3517
County:	Franklin
Town:	Santa Clara
Watershed:	Saranac Lakes-Saranac River

Lake Characteristics

Surface Area (ha):	35.0
Shoreline Length (km):	4.8
Max Depth (m):	5.3
Mean Depth (m):	NA
Volume (m^3):	NA
Flushing Rate (times/year):	NA

Watershed Characteristics

Watershed Area (ha):	8,816.5
Open Water (%):	18.01
Developed, Open Space (%):	1.90
Developed, Low Intensity (%):	0.10
Developed, Medium Intensity (%):	0.04
Developed, High Intensity (%):	0.01
Barren Land (%):	0.02
Deciduous Forest (%):	36.71
Evergreen Forest (%):	27.43
Mixed Forest (%):	4.71
Dwarf Shrub (%):	0.25
Grassland/Herbaceous (%):	0.47
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	9.78
Emergent Herbaceous Wetlands (%):	0.57

Aquatic Invasive Species Detections

Eurasian watermilfoil:	2002
Variable-leaf milfoil:	2014

Harmful Algal Bloom Reports

None

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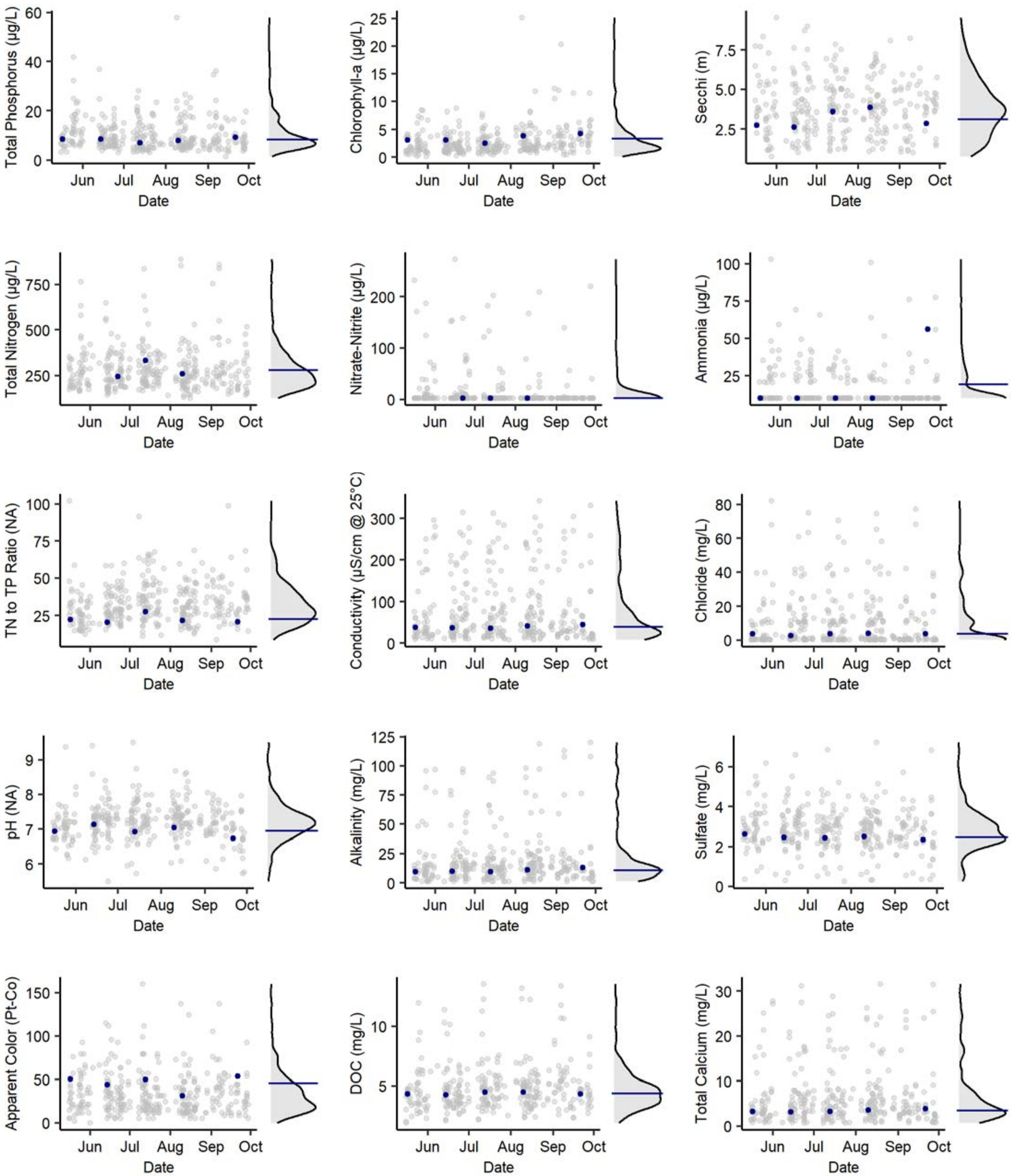
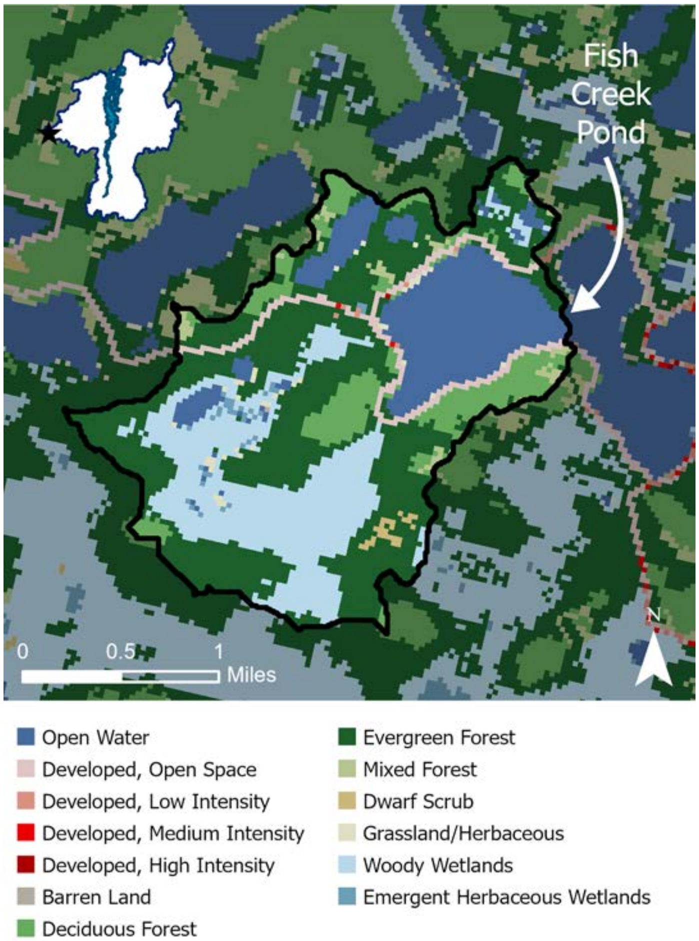


Fish Creek Pond



Summary	
Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Moderate
Road Salt Influence:	Low

Notes: Profile data indicate that Fish Creek Pond is thermally stratified during the summer with the epilimnion having dissolved oxygen concentrations >7 mg/L. The hypolimnion is anoxic (<2 mg/L) for the later part of the summer.

Location	
Latitude:	44.3034
Longitude:	-74.3726
County:	Franklin
Town:	Santa Clara
Watershed:	Saranac Lakes-Saranac River

Lake Characteristics	
Surface Area (ha):	85.7
Shoreline Length (km):	5.6
Max Depth (m):	15.6
Mean Depth (m):	NA
Volume (m^3):	NA
Flushing Rate (times/year):	NA

Watershed Characteristics	
Watershed Area (ha):	444.8
Open Water (%):	18.49
Developed, Open Space (%):	3.86
Developed, Low Intensity (%):	0.14
Developed, Medium Intensity (%):	0.04
Developed, High Intensity (%):	0.02
Barren Land (%):	0.02
Deciduous Forest (%):	11.05
Evergreen Forest (%):	40.34
Mixed Forest (%):	1.66
Dwarf Shrub (%):	0.53
Grassland/Herbaceous (%):	0.89
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	22.21
Emergent Herbaceous Wetlands (%):	0.75

Aquatic Invasive Species Detections	
Eurasian watermilfoil:	2015
Variable-leaf milfoil:	2015

Harmful Algal Bloom Reports
None

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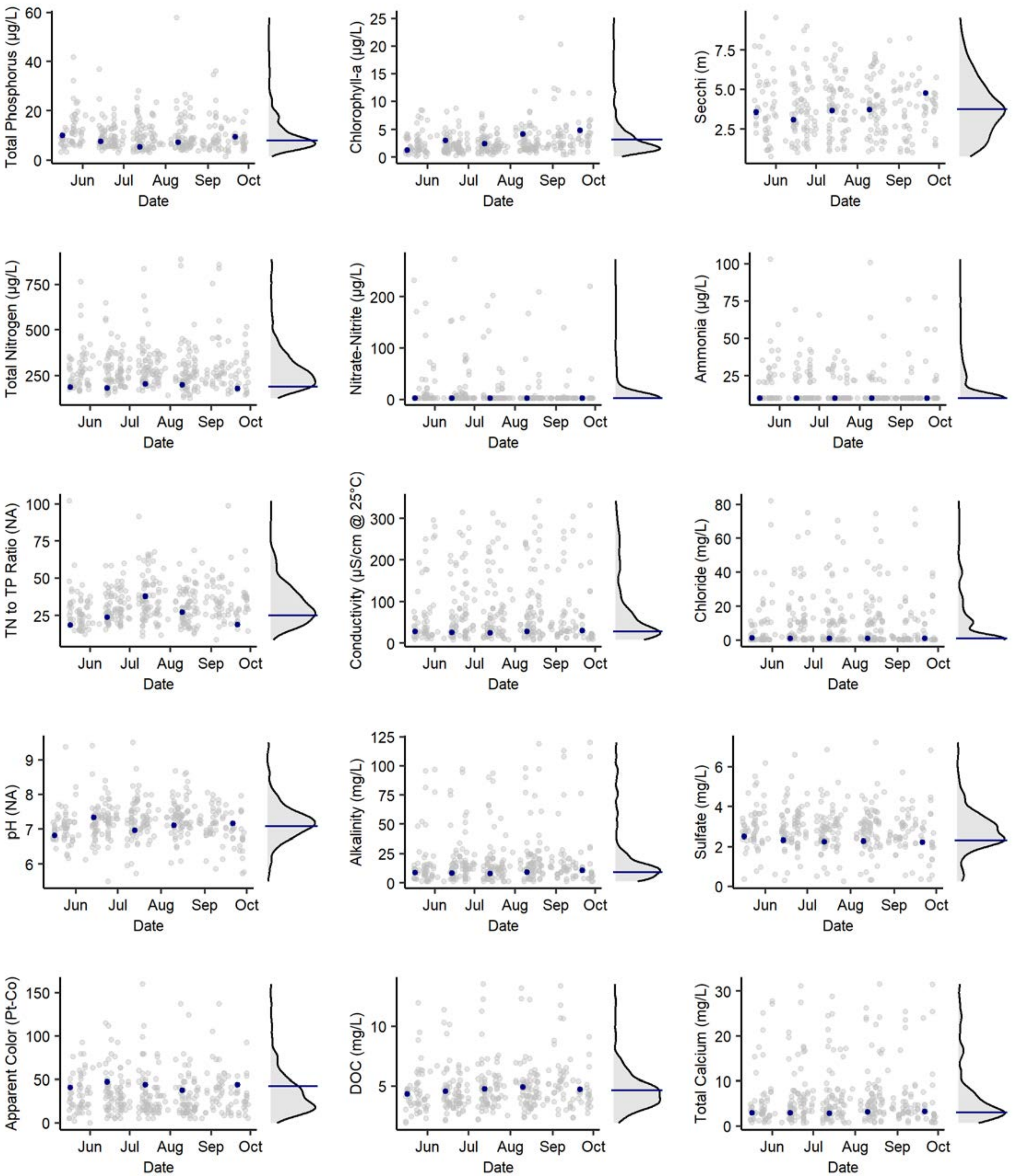
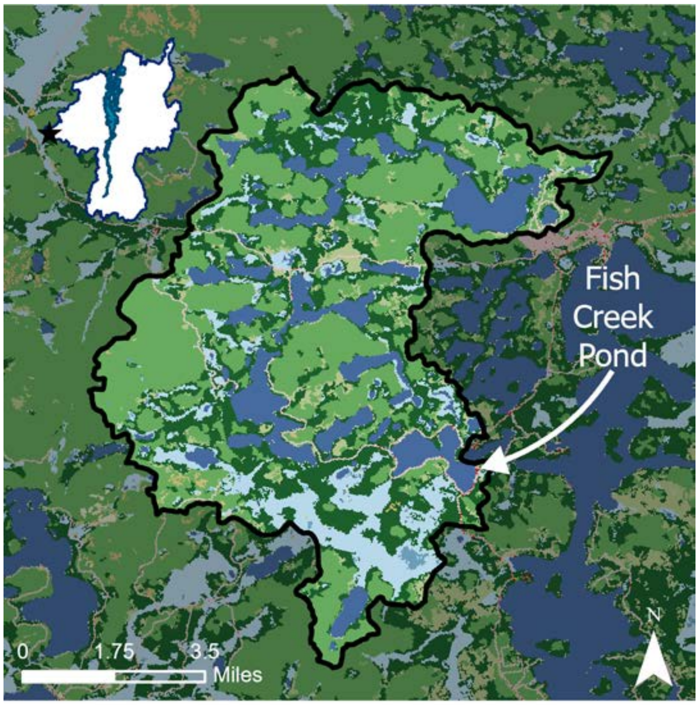


Fish Creek West



Open Water
Developed, Open Space
Developed, Low Intensity
Developed, Medium Intensity
Developed, High Intensity
Barren Land
Deciduous Forest
Evergreen Forest
Mixed Forest
Dwarf Scrub
Grassland/Herbaceous
Pasture/Hay
Cultivated Crops
Woody Wetlands
Emergent Herbaceous Wetlands

Summary	
Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Mesotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Moderate
Road Salt Influence:	Low

Notes: Profile data indicate that Fish Creek West is thermally stratified during the summer with the epilimnion having dissolved oxygen concentrations >7 mg/L. The hypolimnion is anoxic (<2 mg/L) for much of the summer.

Location	
Latitude:	44.2987
Longitude:	-74.3595
County:	Franklin
Town:	Santa Clara
Watershed:	Saranac Lakes-Saranac River

Lake Characteristics	
Surface Area (ha):	30.3
Shoreline Length (km):	2.6
Max Depth (m):	9.3
Mean Depth (m):	NA
Volume (m^3):	NA
Flushing Rate (times/year):	NA

Watershed Characteristics	
Watershed Area (ha):	7,464.7
Open Water (%):	15.87
Developed, Open Space (%):	1.49
Developed, Low Intensity (%):	0.06
Developed, Medium Intensity (%):	0.03
Developed, High Intensity (%):	0.00
Barren Land (%):	0.03
Deciduous Forest (%):	39.54
Evergreen Forest (%):	26.25
Mixed Forest (%):	4.52
Dwarf Shrub (%):	0.28
Grassland/Herbaceous (%):	0.43
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	10.85
Emergent Herbaceous Wetlands (%):	0.65

Aquatic Invasive Species Detections	
Eurasian watermilfoil:	2002
Variable-leaf milfoil:	2014

Harmful Algal Bloom Reports
None

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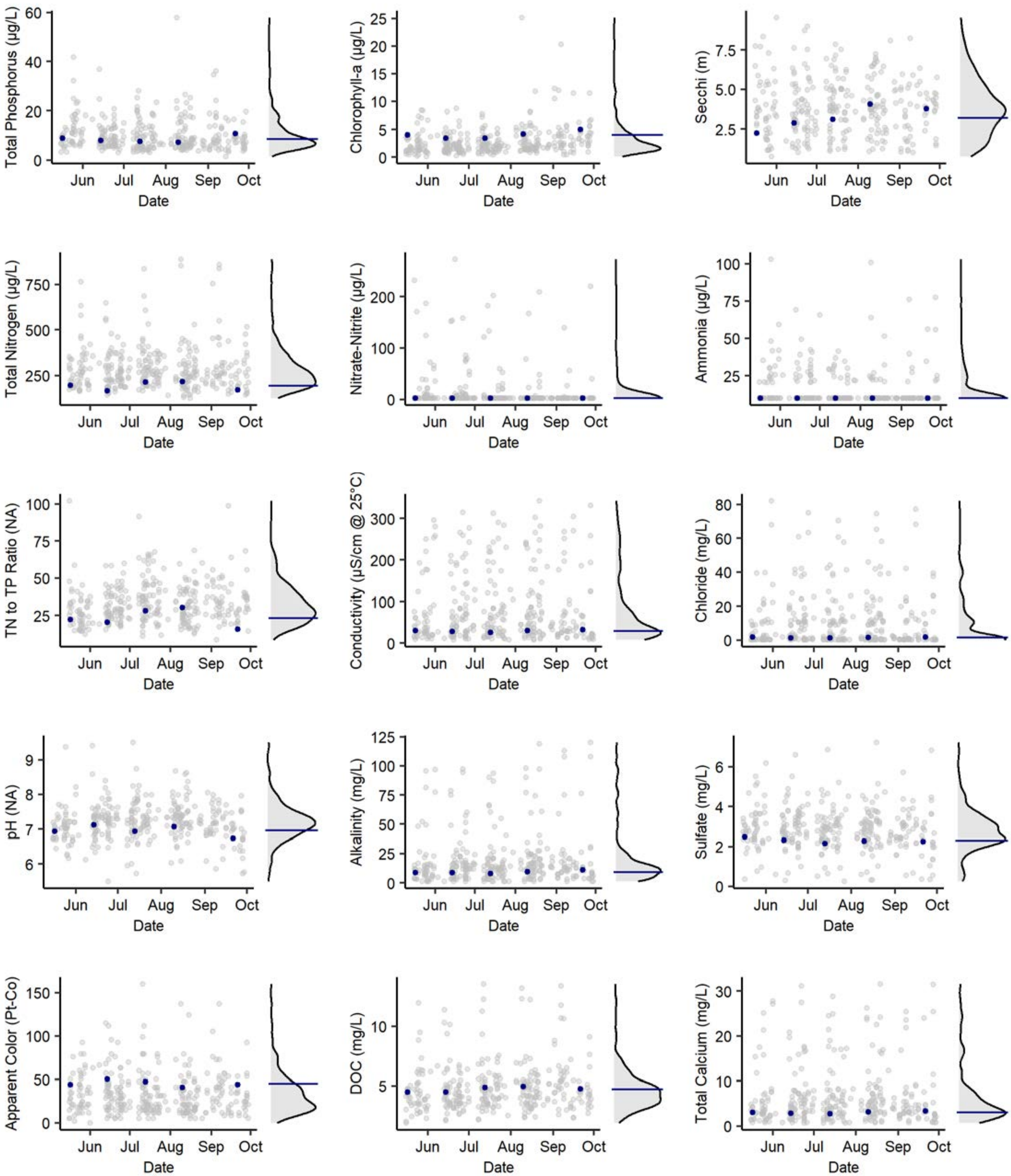
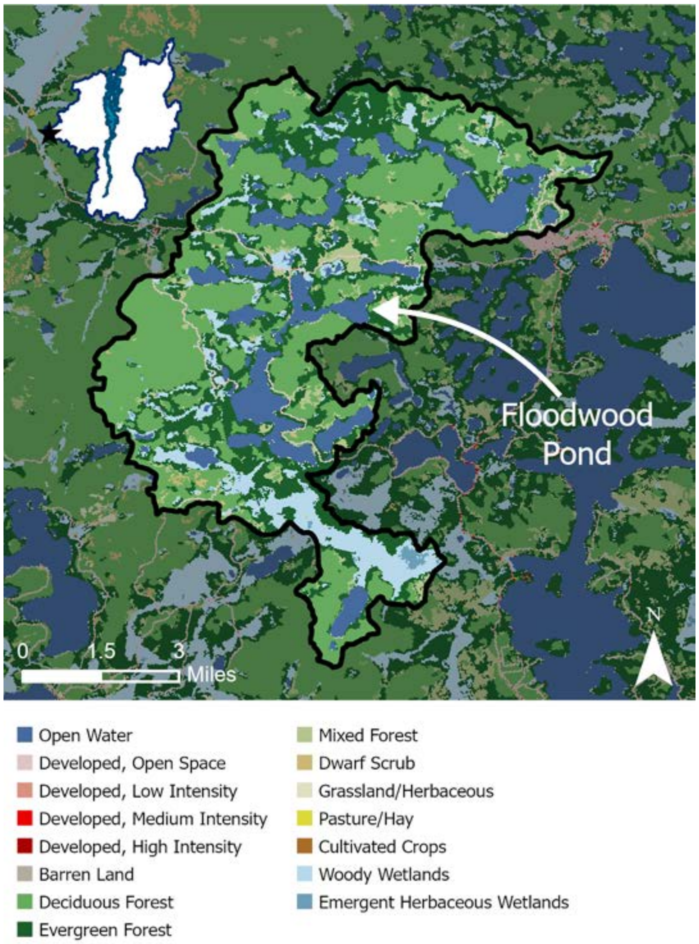


Floodwood Pond



Summary

Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Eutrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Moderate
Road Salt Influence:	None

Notes: Profile data indicate that Floodwood Pond is thermally stratified during the summer with the epilimnion having dissolved oxygen concentrations >7 mg/L. The hypolimnion is anoxic (<2 mg/L) for the later part of the summer.

Location

Latitude:	44.3339
Longitude:	-74.4037
County:	Franklin
Town:	Santa Clara
Watershed:	Saranac Lakes-Saranac River

Lake Characteristics

Surface Area (ha):	94.4
Shoreline Length (km):	10.2
Max Depth (m):	9.5
Mean Depth (m):	NA
Volume (m^3):	NA
Flushing Rate (times/year):	NA

Watershed Characteristics

Watershed Area (ha):	6,521.9
Open Water (%):	15.46
Developed, Open Space (%):	1.30
Developed, Low Intensity (%):	0.01
Developed, Medium Intensity (%):	0.00
Developed, High Intensity (%):	0.00
Barren Land (%):	0.02
Deciduous Forest (%):	42.76
Evergreen Forest (%):	24.93
Mixed Forest (%):	4.66
Dwarf Shrub (%):	0.30
Grassland/Herbaceous (%):	0.38
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	9.50
Emergent Herbaceous Wetlands (%):	0.67

Aquatic Invasive Species Detections

Eurasian watermilfoil:	2002

Harmful Algal Bloom Reports

None

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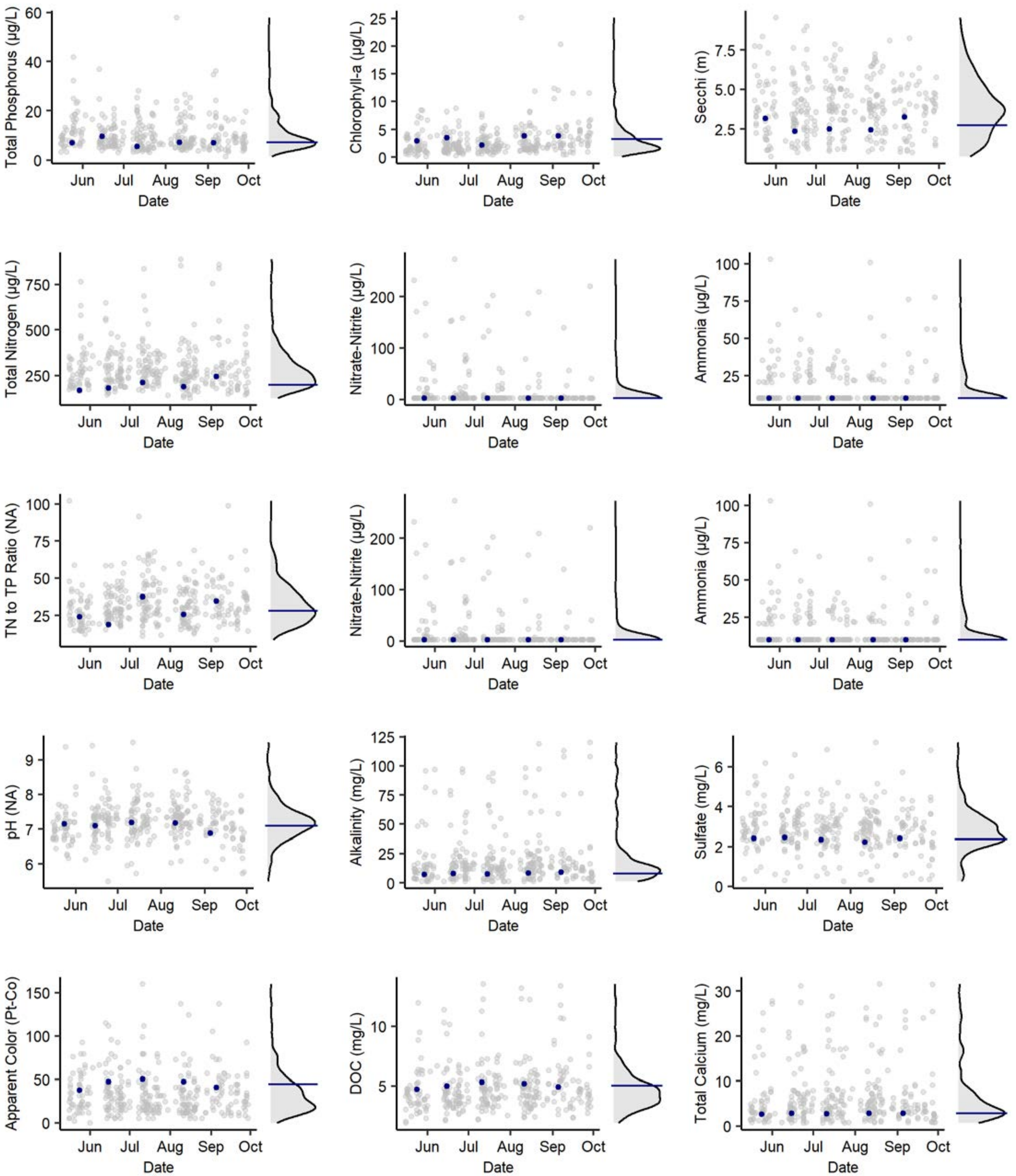
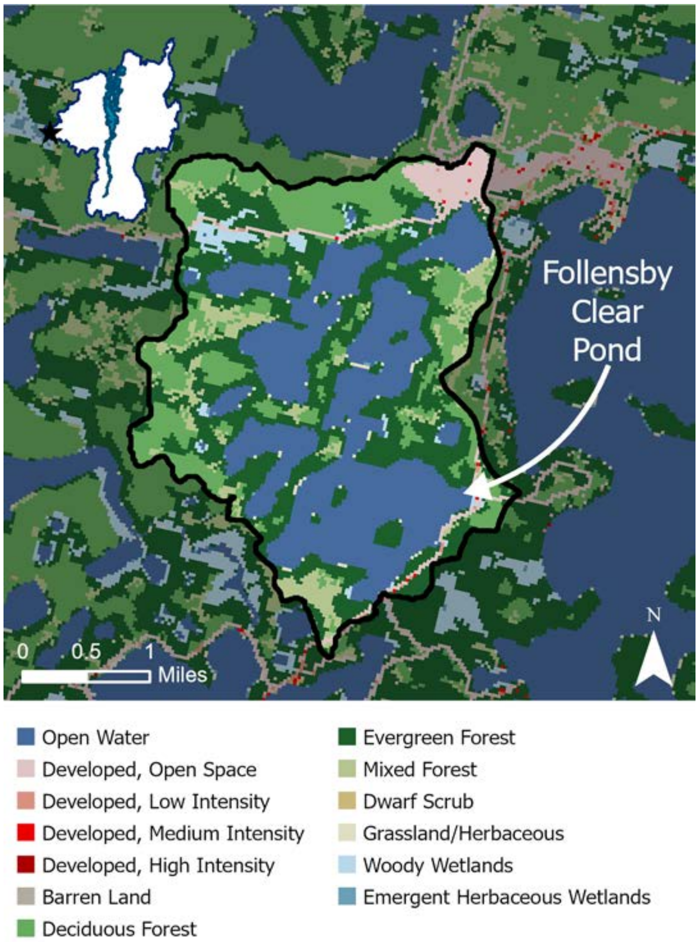


Follensby Clear Pond



Location

Latitude:	44.3191
Longitude:	-74.3469
County:	Franklin
Town:	Santa Clara
Watershed:	Saranac River

Lake Characteristics

Surface Area (ha):	200.4
Shoreline Length (km):	14.7
Max Depth (m):	18.3
Mean Depth (m):	6.4
Volume (m^3):	12,428,120
Flushing Rate (times/year):	0.5

Watershed Characteristics

Watershed Area (ha):	1,047.4
Open Water (%):	34.95
Developed, Open Space (%):	4.29
Developed, Low Intensity (%):	0.24
Developed, Medium Intensity (%):	0.10
Developed, High Intensity (%):	0.00
Barren Land (%):	0.00
Deciduous Forest (%):	20.27
Evergreen Forest (%):	30.62
Mixed Forest (%):	6.81
Dwarf Shrub (%):	0.00
Grassland/Herbaceous (%):	0.70
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	1.88
Emergent Herbaceous Wetlands (%):	0.15

Summary

Trophic Status (Chl-a):	Oligotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Oligotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Adequate
Road Salt Influence:	Moderate

Notes: Profile data indicate that Follensby Clear Pond is thermally stratified during the summer with the epilimnion having dissolved oxygen concentrations >7 mg/L. The hypolimnion is anoxic (<2 mg/L) for much of the summer.

Aquatic Invasive Species Detections

Eurasian watermilfoil:	2002

Harmful Algal Bloom Reports

None

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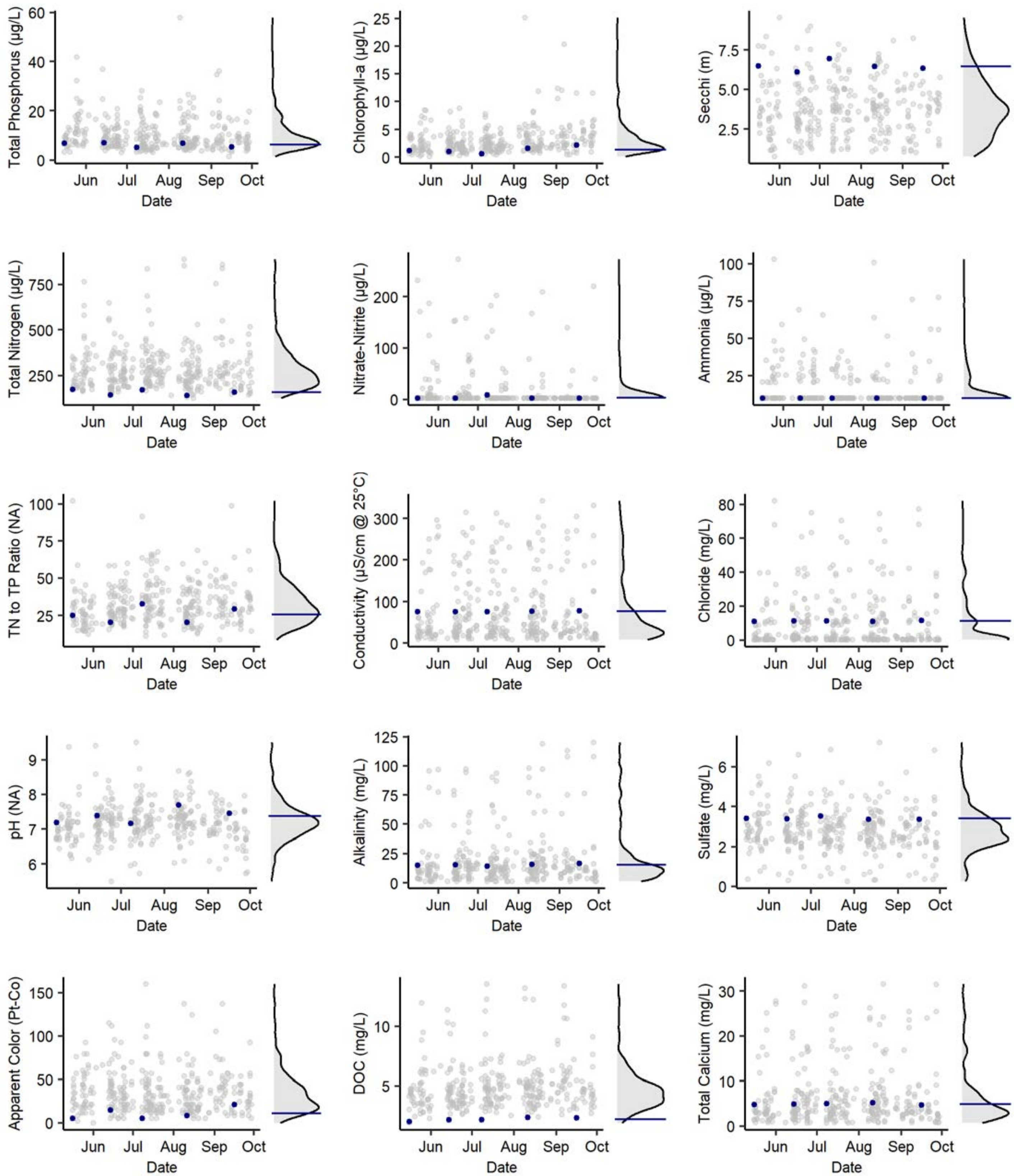
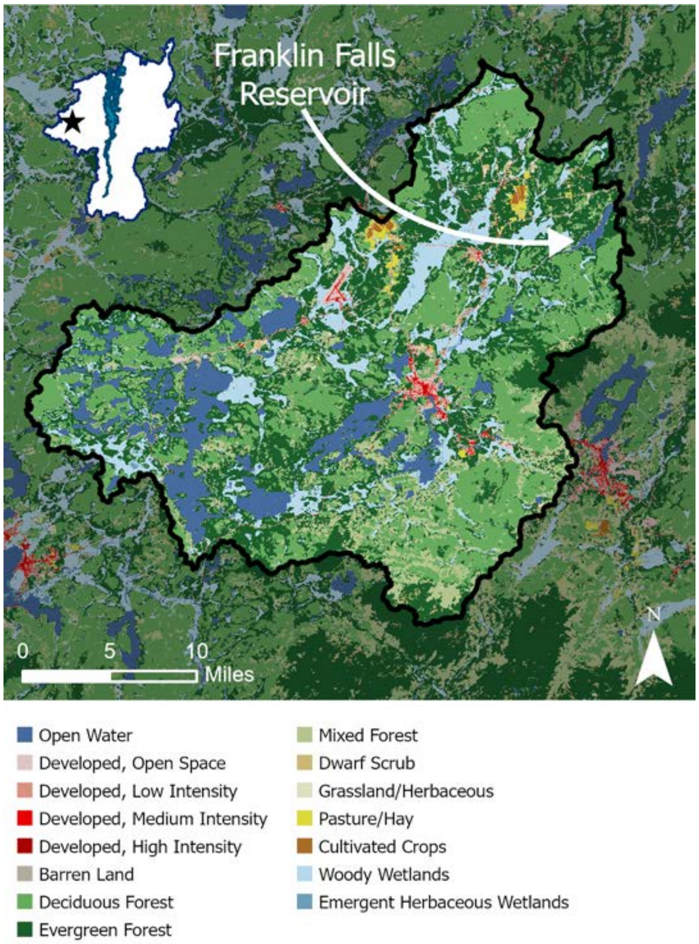


Franklin Falls Reservoir



Summary

Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Mesotrophic
Trophic Status (Secchi):	Eutrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Adequate
Road Salt Influence:	Moderate

Notes: None.

Location

Latitude:	44.3191
Longitude:	-74.3469
Counties:	Essex, Franklin
Towns:	St. Armand, Franklin
Watershed:	Union Falls Pond-Saranac River

Lake Characteristics

Surface Area (ha):	181.6
Shoreline Length (km):	15.3
Max Depth (m):	6.1
Mean Depth (m):	3.2
Volume (m^3):	5,840,244
Flushing Rate (times/year):	66.8

Watershed Characteristics

Watershed Area (ha):	75,458.9
Open Water (%):	9.41
Developed, Open Space (%):	1.87
Developed, Low Intensity (%):	0.85
Developed, Medium Intensity (%):	0.42
Developed, High Intensity (%):	0.08
Barren Land (%):	0.12
Deciduous Forest (%):	29.77
Evergreen Forest (%):	33.65
Mixed Forest (%):	9.72
Dwarf Shrub (%):	0.79
Grassland/Herbaceous (%):	0.59
Pasture/Hay (%):	0.50
Cultivated Crops (%):	0.23
Woody Wetlands (%):	11.62
Emergent Herbaceous Wetlands (%):	0.38

Aquatic Invasive Species Detections

Eurasian water milfoil:	2003
Curly leaf pondweed:	2003
Variable-leaf milfoil:	2015

Harmful Algal Bloom Reports

None

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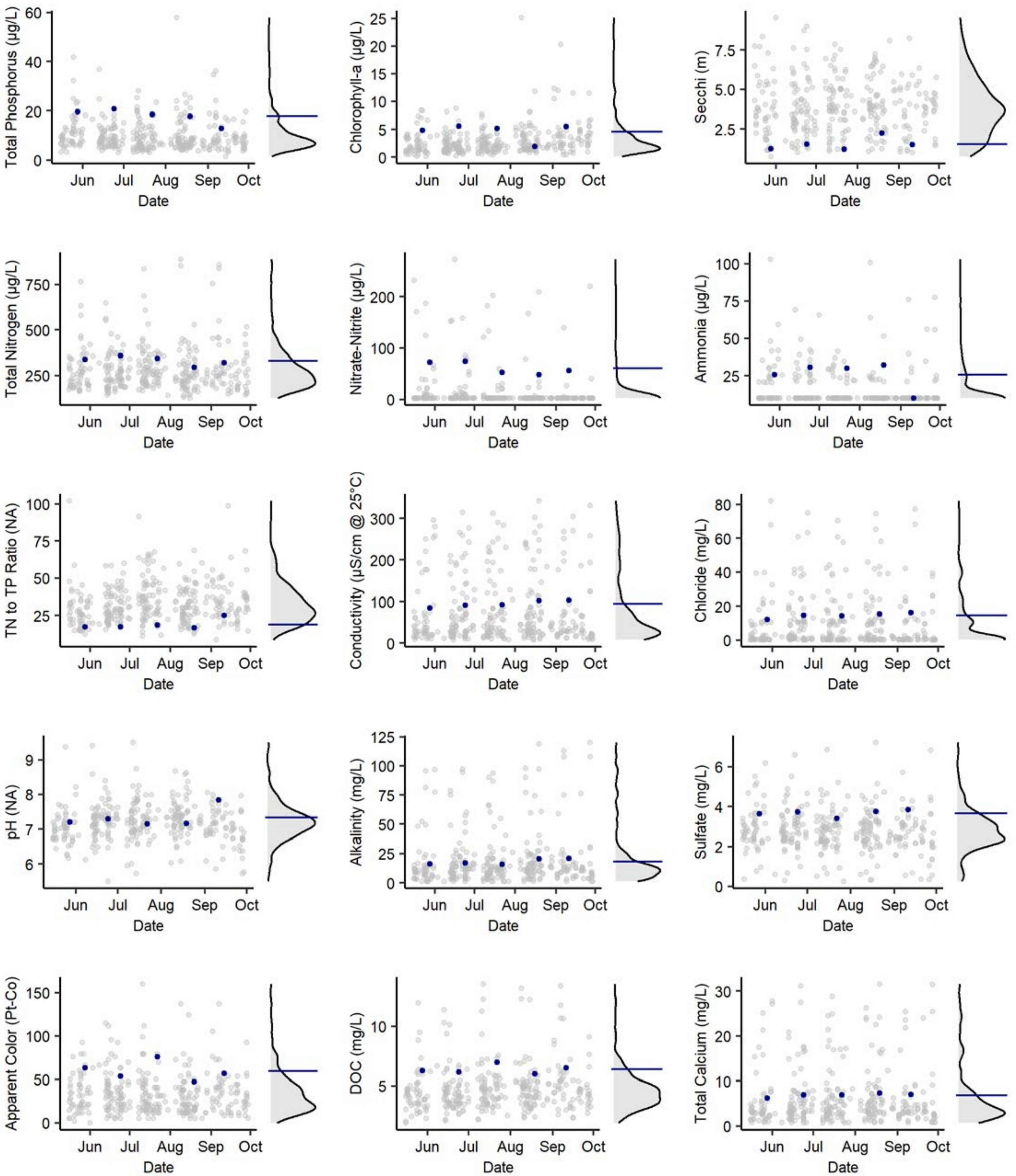
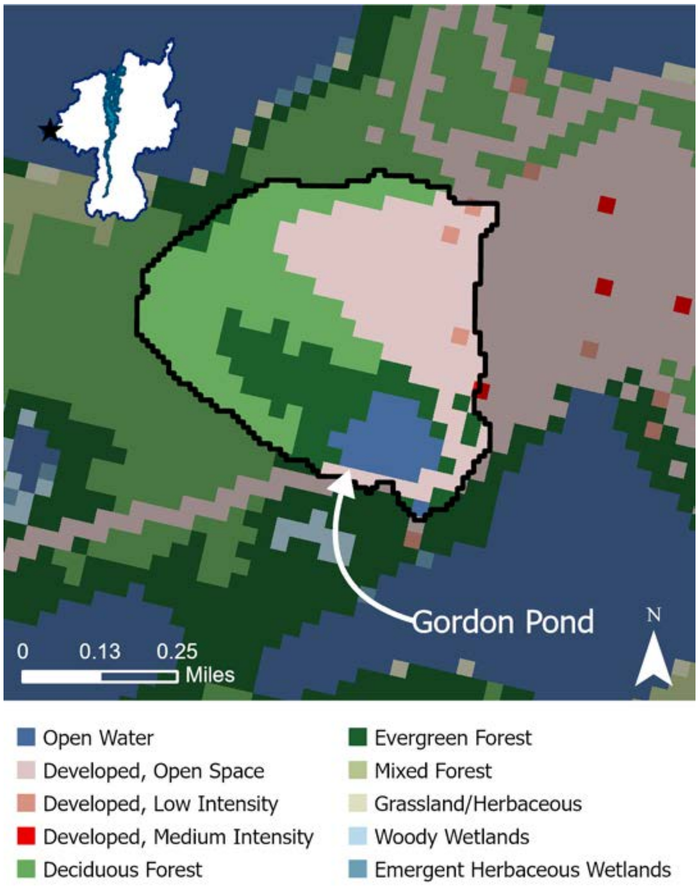


Gordon Pond



Location	
Latitude:	44.3422
Longitude:	-74.3408
County:	Franklin
Town:	Santa Clara
Watershed:	Saranac Lakes-Saranac River

Lake Characteristics	
Surface Area (ha):	2.1
Shoreline Length (km):	0.5
Max Depth (m):	NA
Mean Depth (m):	NA
Volume (m^3):	NA
Flushing Rate (times/year):	NA

Watershed Characteristics	
Watershed Area (ha):	30.0
Open Water (%):	7.83
Developed, Open Space (%):	37.05
Developed, Low Intensity (%):	0.90
Developed, Medium Intensity (%):	0.00
Developed, High Intensity (%):	0.00
Barren Land (%):	0.00
Deciduous Forest (%):	35.24
Evergreen Forest (%):	18.98
Mixed Forest (%):	0.00
Dwarf Shrub (%):	0.00
Grassland/Herbaceous (%):	0.00
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	0.00
Emergent Herbaceous Wetlands (%):	0.00

Summary	
Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Mesotrophic
Trophic Status (Secchi):	Eutrophic
Acidity:	Acidic: threatened
Acid Neutralizing Capacity:	Low
Road Salt Influence:	Low

Notes: July Secchi data missing from volunteer sampling form.

Aquatic Invasive Species Detections
None

Harmful Algal Bloom Reports
None

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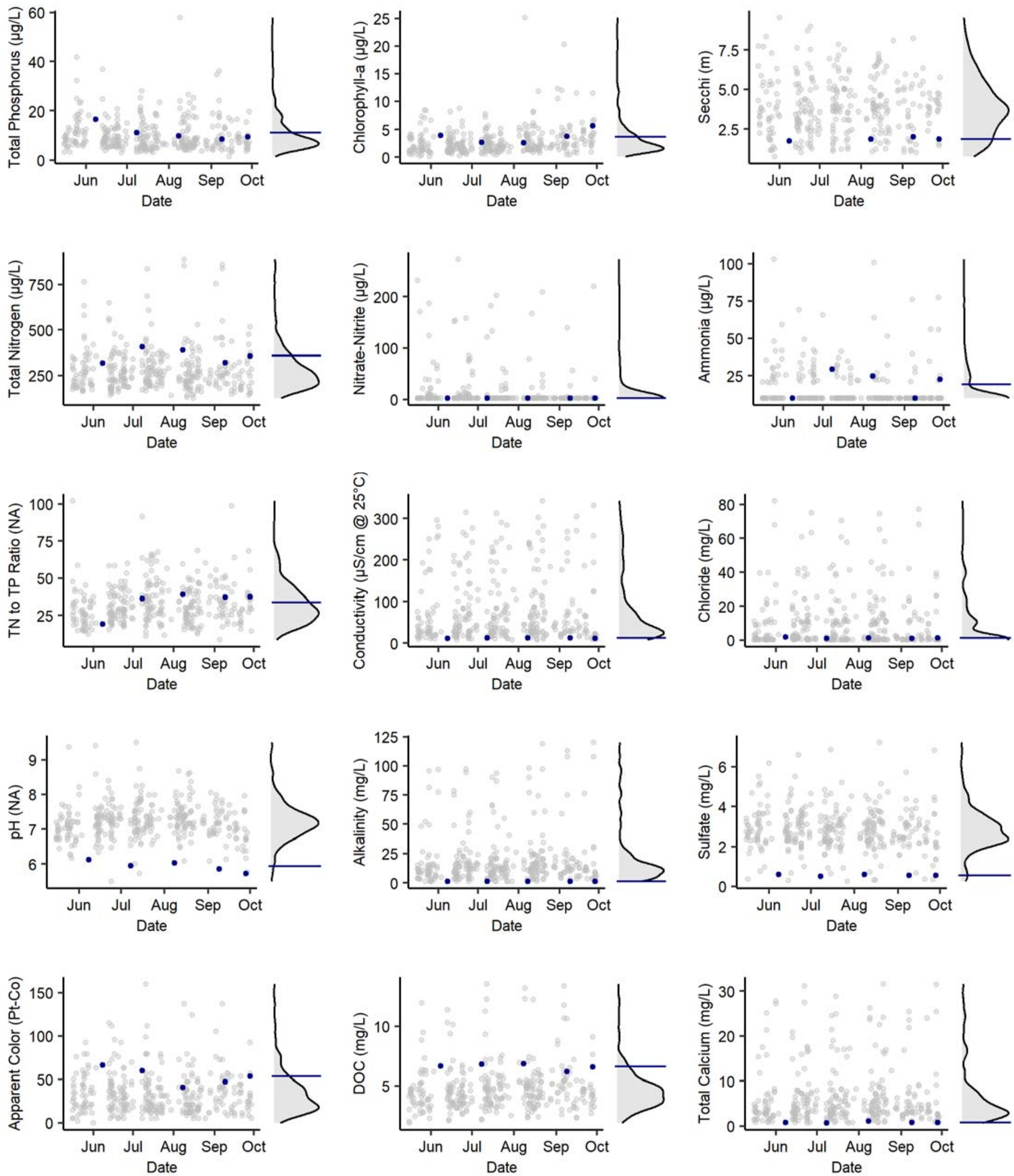
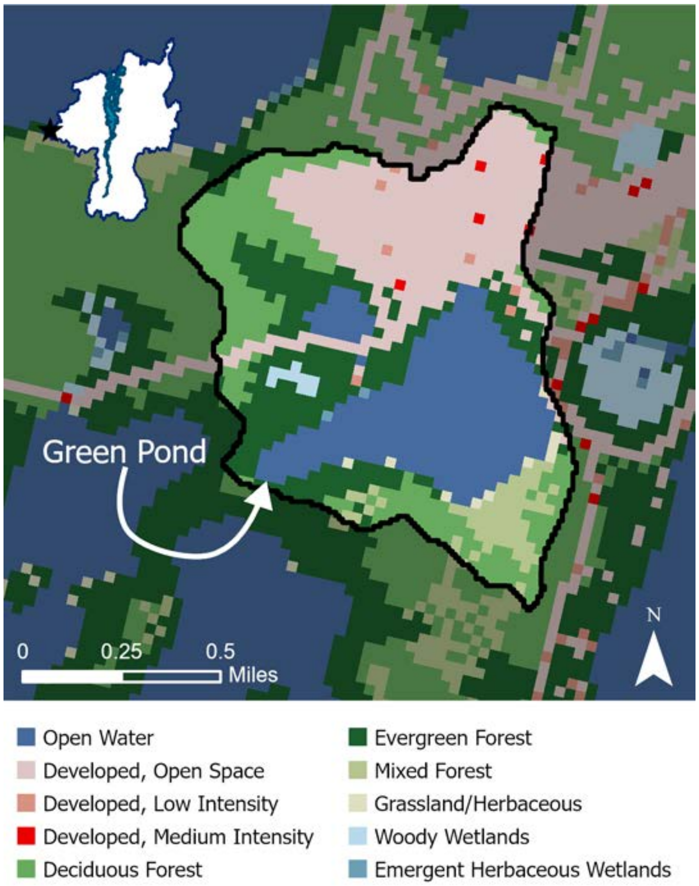


Green Pond



Location	
Latitude:	44.3397
Longitude:	-74.3371
County:	Franklin
Town:	Santa Clara
Watershed:	Saranac Lakes-Saranac River

Lake Characteristics	
Surface Area (ha):	26.1
Shoreline Length (km):	2.6
Max Depth (m):	18.3
Mean Depth (m):	9.4
Volume (m^3):	2,387,882
Flushing Rate (times/year):	0.4

Watershed Characteristics	
Watershed Area (ha):	108.6
Open Water (%):	25.79
Developed, Open Space (%):	27.53
Developed, Low Intensity (%):	0.58
Developed, Medium Intensity (%):	0.41
Developed, High Intensity (%):	0.00
Barren Land (%):	0.00
Deciduous Forest (%):	20.15
Evergreen Forest (%):	18.91
Mixed Forest (%):	4.89
Dwarf Shrub (%):	0.00
Grassland/Herbaceous (%):	0.83
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	0.75
Emergent Herbaceous Wetlands (%):	0.17

Summary	
Trophic Status (Chl-a):	Oligotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Oligotrophic
Acidity:	Alkaline: non-impacted
Acid Neutralizing Capacity:	Adequate
Road Salt Influence:	Low

Aquatic Invasive Species Detections
None

Harmful Algal Bloom Reports
None

Notes: Profile data indicate that Green Pond is thermally stratified during the summer with the epilimnion having dissolved oxygen concentrations >7 mg/L. The hypolimnion is anoxic (<2 mg/L) for the later part of the summer.

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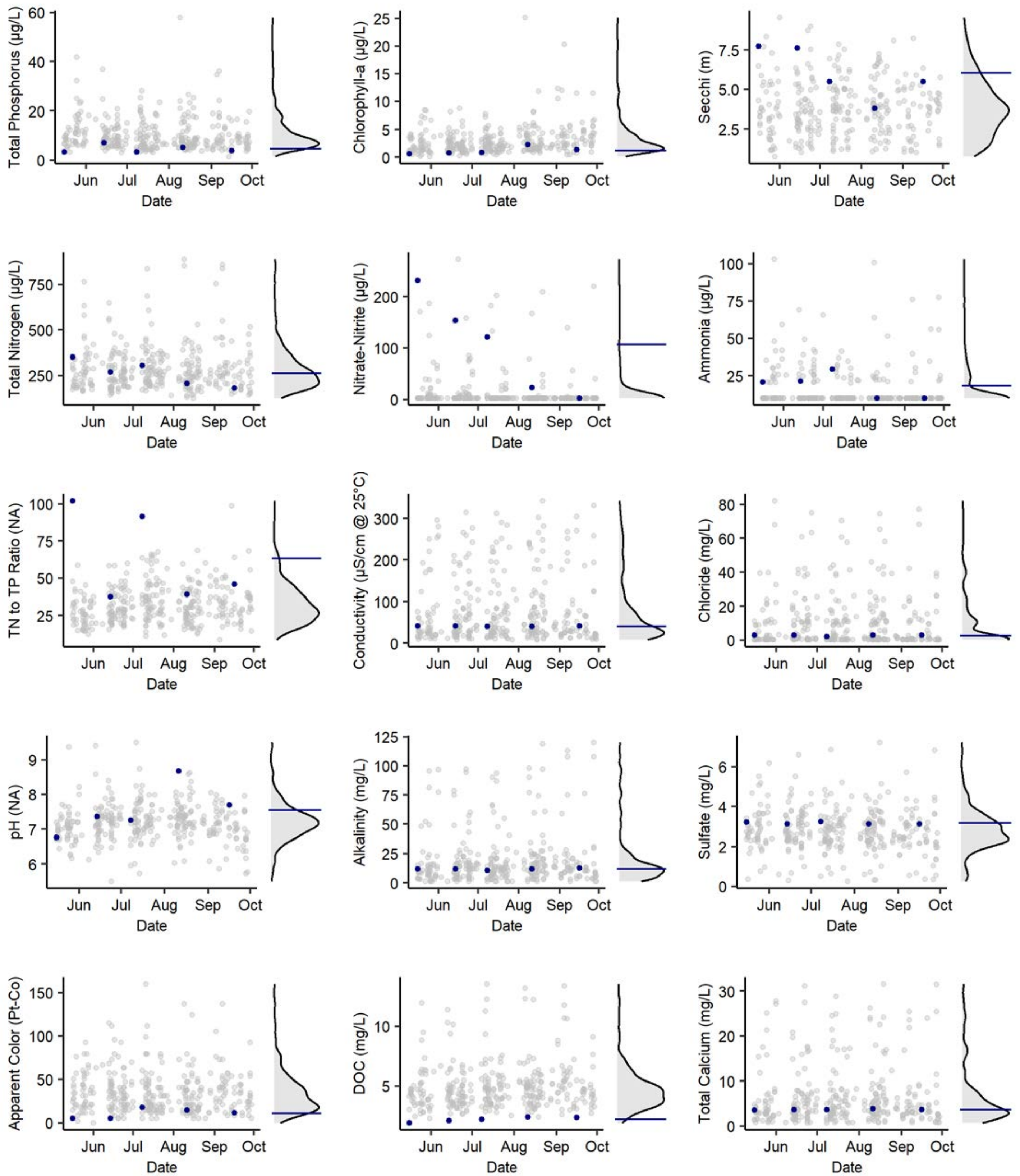
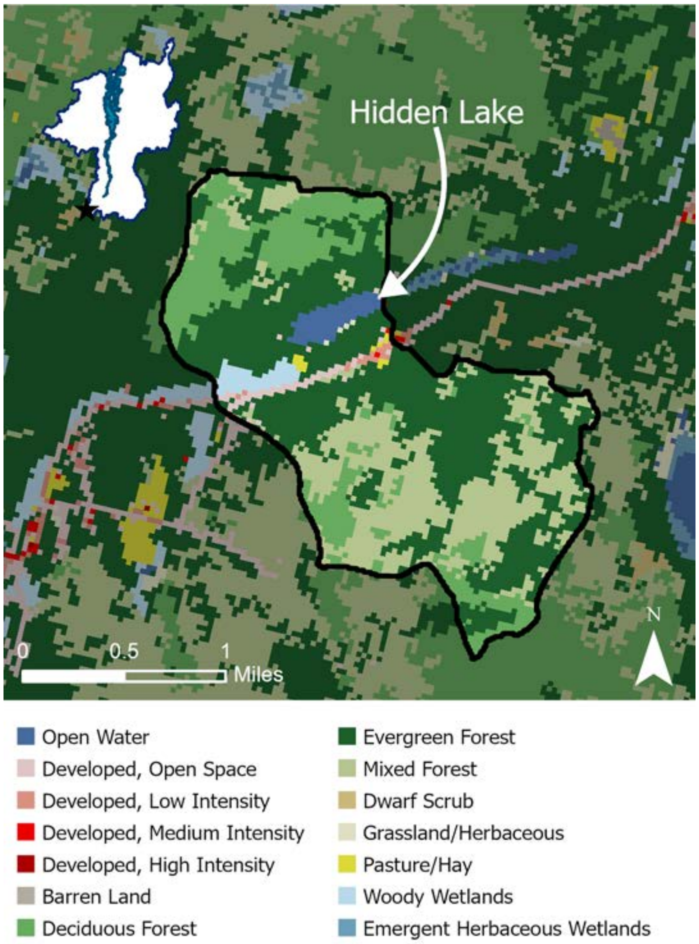


Hidden Lake



Summary

Trophic Status (Chl-a):	Oligotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Alkaline: non-impacted
Acid Neutralizing Capacity:	High
Road Salt Influence:	Moderate

Notes: August Secchi data missing from volunteer sampling form, September Secchi visible on bottom.

Location

Latitude:	43.3836
Longitude:	-73.7633
County:	Warren
Town:	Lake George
Watershed:	Lake George-La Chute

Lake Characteristics

Surface Area (ha):	8.0
Shoreline Length (km):	1.5
Max Depth (m):	7.6
Mean Depth (m):	3.2
Volume (m^3):	268,980
Flushing Rate (times/year):	5.0

Watershed Characteristics

Watershed Area (ha):	352.9
Open Water (%):	2.32
Developed, Open Space (%):	1.33
Developed, Low Intensity (%):	0.48
Developed, Medium Intensity (%):	0.05
Developed, High Intensity (%):	0.00
Barren Land (%):	0.00
Deciduous Forest (%):	20.18
Evergreen Forest (%):	46.82
Mixed Forest (%):	26.61
Dwarf Shrub (%):	0.00
Grassland/Herbaceous (%):	0.10
Pasture/Hay (%):	0.36
Cultivated Crops (%):	0.00
Woody Wetlands (%):	1.74
Emergent Herbaceous Wetlands (%):	0.00

Aquatic Invasive Species Detections

None

Harmful Algal Bloom Reports

None

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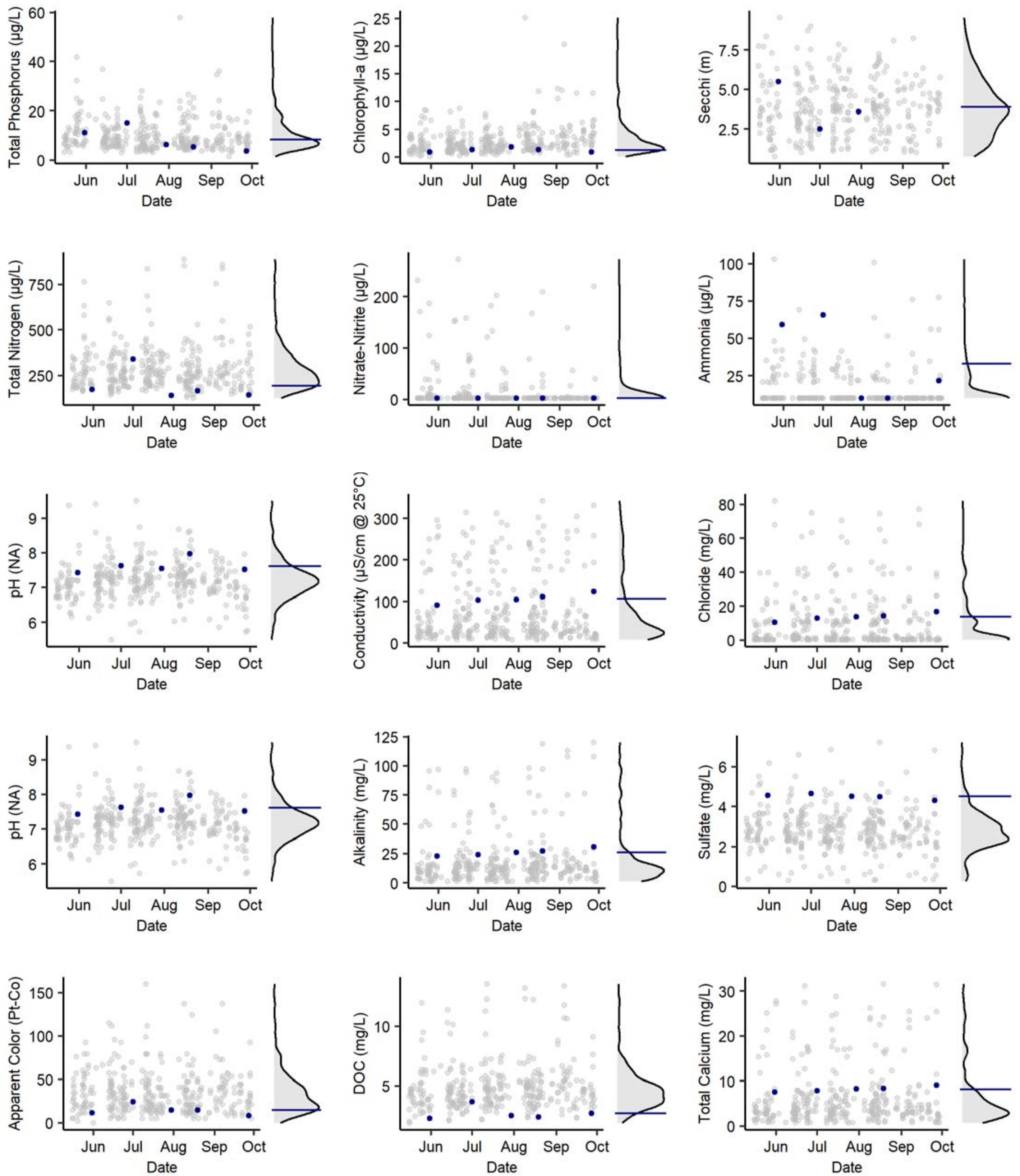
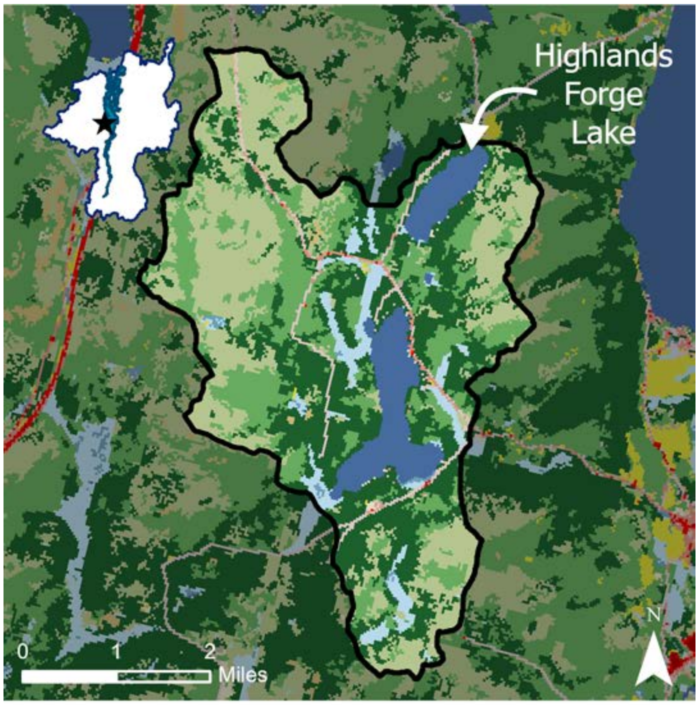


Highlands Forge Lake



- Open Water
- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, High Intensity
- Barren Land
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Dwarf Scrub
- Grassland/Herbaceous
- Pasture/Hay
- Woody Wetlands
- Emergent Herbaceous Wetlands

Summary

Trophic Status (Chl-a):	Oligotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Oligotrophic
Acidity:	Alkaline: non-impacted
Acid Neutralizing Capacity:	High
Road Salt Influence:	Moderate

Notes: None.

Location

Latitude:	44.4101
Longitude:	-73.4448
County:	Essex
Town:	Willsboro
Watershed:	Lake Champlain

Lake Characteristics

Surface Area (ha):	50.3
Shoreline Length (km):	3.4
Max Depth (m):	NA
Mean Depth (m):	5.9
Volume (m^3):	2,240,000
Flushing Rate (times/year):	6.1

Watershed Characteristics

Watershed Area (ha):	1,672.3
Open Water (%):	8.73
Developed, Open Space (%):	2.18
Developed, Low Intensity (%):	0.76
Developed, Medium Intensity (%):	0.05
Developed, High Intensity (%):	0.00
Barren Land (%):	0.05
Deciduous Forest (%):	22.05
Evergreen Forest (%):	30.14
Mixed Forest (%):	30.04
Dwarf Shrub (%):	0.36
Grassland/Herbaceous (%):	0.15
Pasture/Hay (%):	0.09
Cultivated Crops (%):	0.00
Woody Wetlands (%):	5.00
Emergent Herbaceous Wetlands (%):	0.39

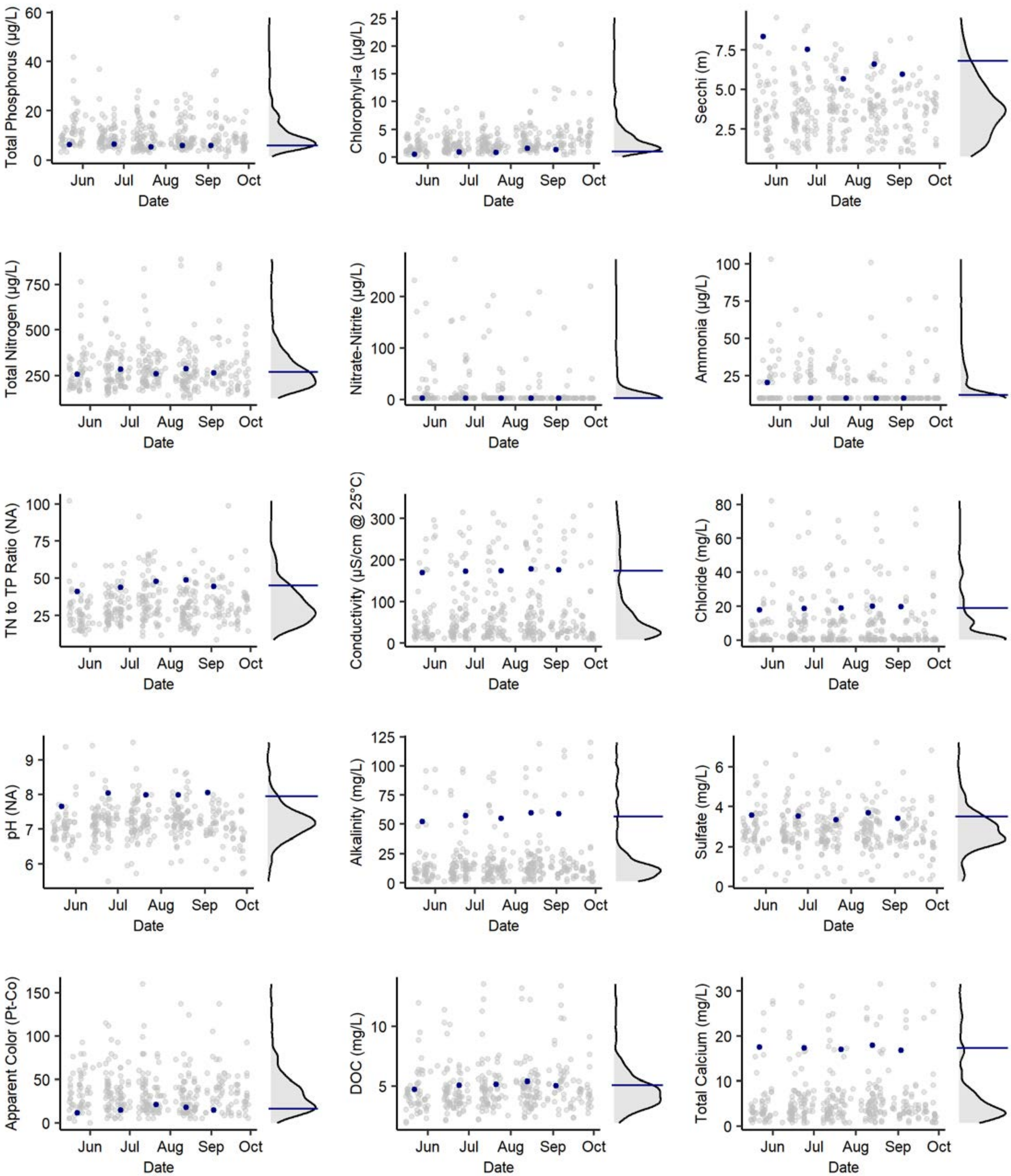
Aquatic Invasive Species Detections

Eurasian watermilfoil:	2008

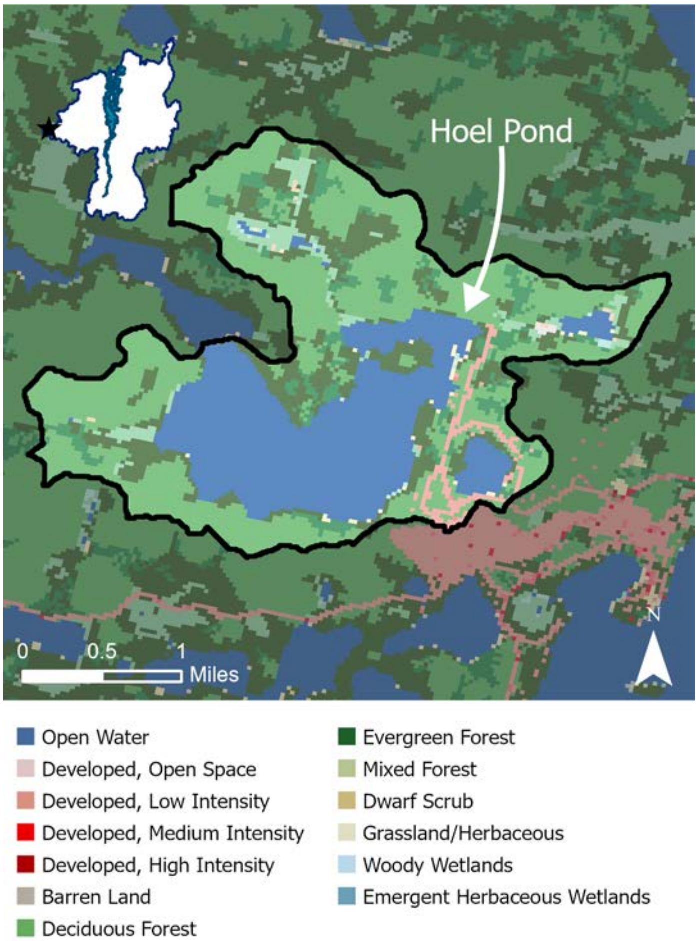
Harmful Algal Bloom Reports

None

Gray dots represent all data in the report, blue dots are the samples for the represented lake. The right sub-plot shows the density distribution for all data in gray and the mean for the represented lake as a blue line.



Hoel Pond



Summary

Trophic Status (Chl-a):	Oligotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Oligotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Moderate
Road Salt Influence:	None

Notes: None.

Location

Latitude:	44.3508
Longitude:	-74.3551
County:	Franklin
Town:	Santa Clara
Watershed:	Saranac Lakes-Saranac River

Lake Characteristics

Surface Area (ha):	187.1
Shoreline Length (km):	10.4
Max Depth (m):	24.2
Mean Depth (m):	8.1
Volume (m^3):	14,777,670
Flushing Rate (times/year):	0.3

Watershed Characteristics

Watershed Area (ha):	724.2
Open Water (%):	28.46
Developed, Open Space (%):	2.35
Developed, Low Intensity (%):	0.04
Developed, Medium Intensity (%):	0.00
Developed, High Intensity (%):	0.00
Barren Land (%):	0.07
Deciduous Forest (%):	43.34
Evergreen Forest (%):	14.89
Mixed Forest (%):	6.23
Dwarf Shrub (%):	0.19
Grassland/Herbaceous (%):	0.45
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	3.65
Emergent Herbaceous Wetlands (%):	0.34

Aquatic Invasive Species Detections

None

Harmful Algal Bloom Reports

None

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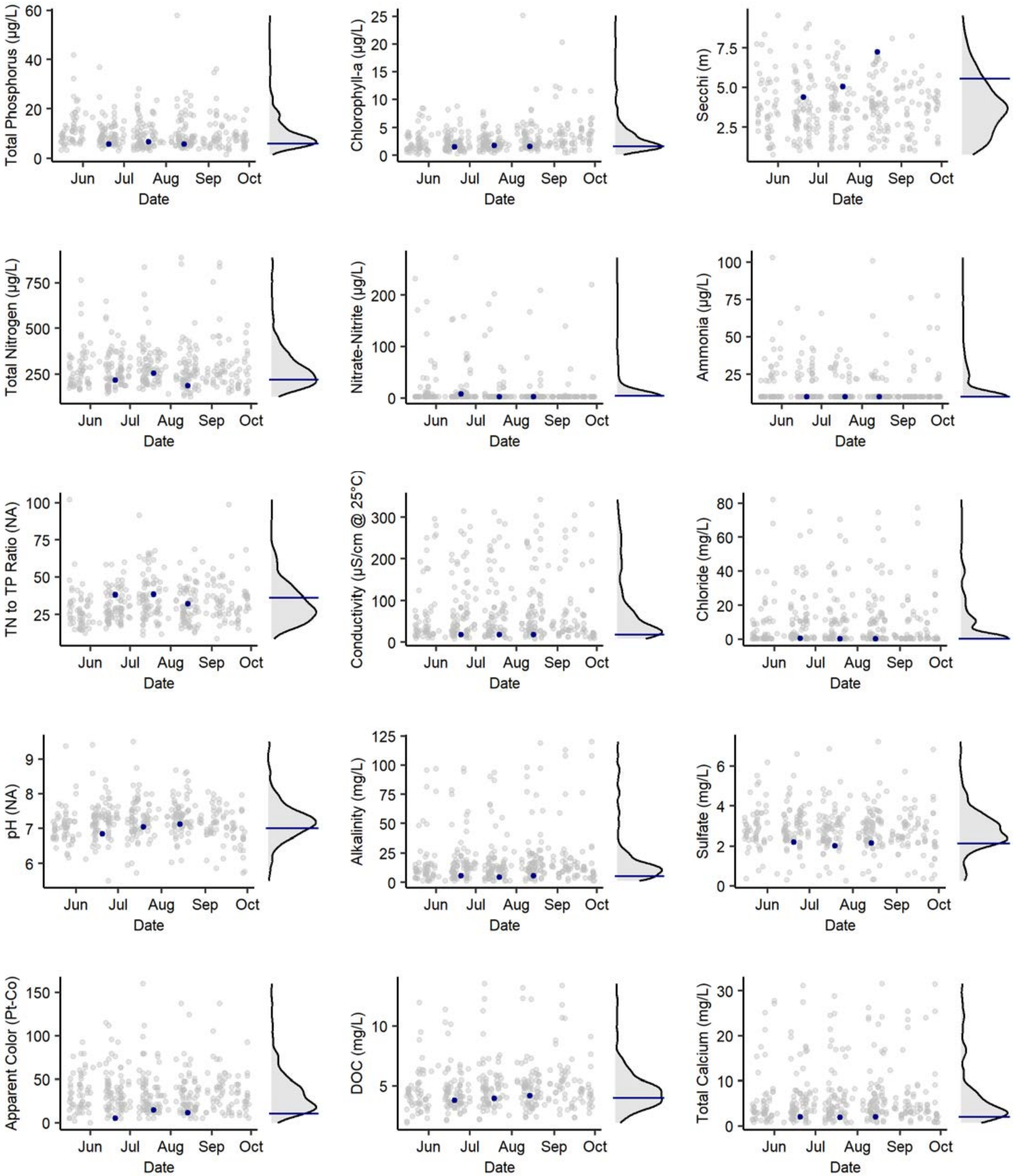
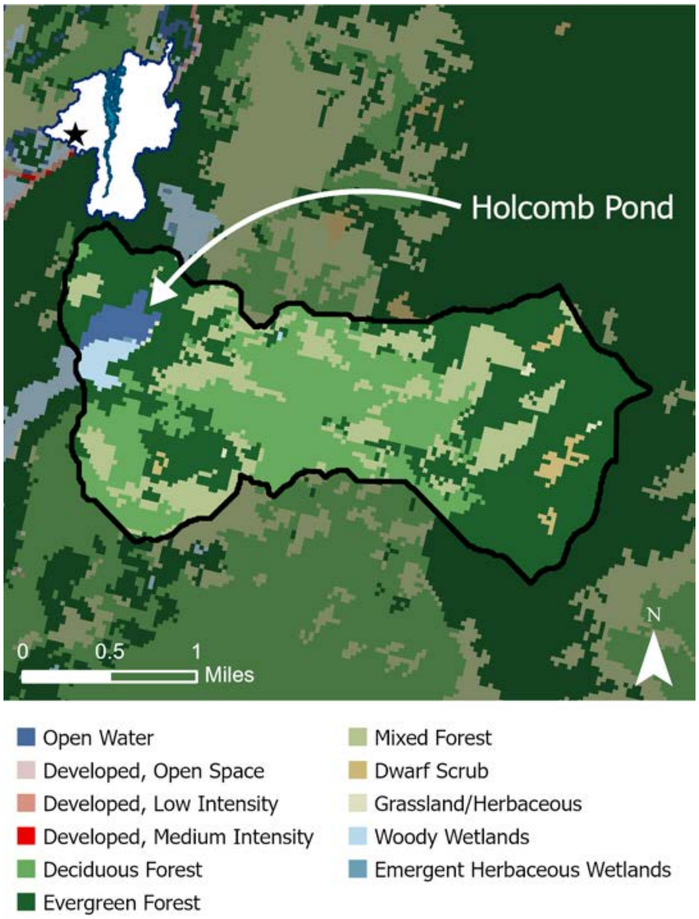


Holcomb Pond



Summary	
Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Mesotrophic
Trophic Status (Secchi):	NA
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Adequate
Road Salt Influence:	None

Notes: Secchi was visible on bottom for all sampling trips.

Location	
Latitude:	44.2914
Longitude:	-73.9219
County:	Essex
Town:	North Elba
Watershed:	West Branch Ausable River

Lake Characteristics	
Surface Area (ha):	11.8
Shoreline Length (km):	1.9
Max Depth (m):	0.6
Mean Depth (m):	0.6
Volume (m^3):	44,513
Flushing Rate (times/year):	10.9

Watershed Characteristics	
Watershed Area (ha):	519.3
Open Water (%):	2.01
Developed, Open Space (%):	0.00
Developed, Low Intensity (%):	0.00
Developed, Medium Intensity (%):	0.00
Developed, High Intensity (%):	0.00
Barren Land (%):	0.00
Deciduous Forest (%):	29.83
Evergreen Forest (%):	45.02
Mixed Forest (%):	19.81
Dwarf Shrub (%):	1.40
Grassland/Herbaceous (%):	0.26
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	1.63
Emergent Herbaceous Wetlands (%):	0.03

Aquatic Invasive Species Detections
None

Harmful Algal Bloom Reports
None

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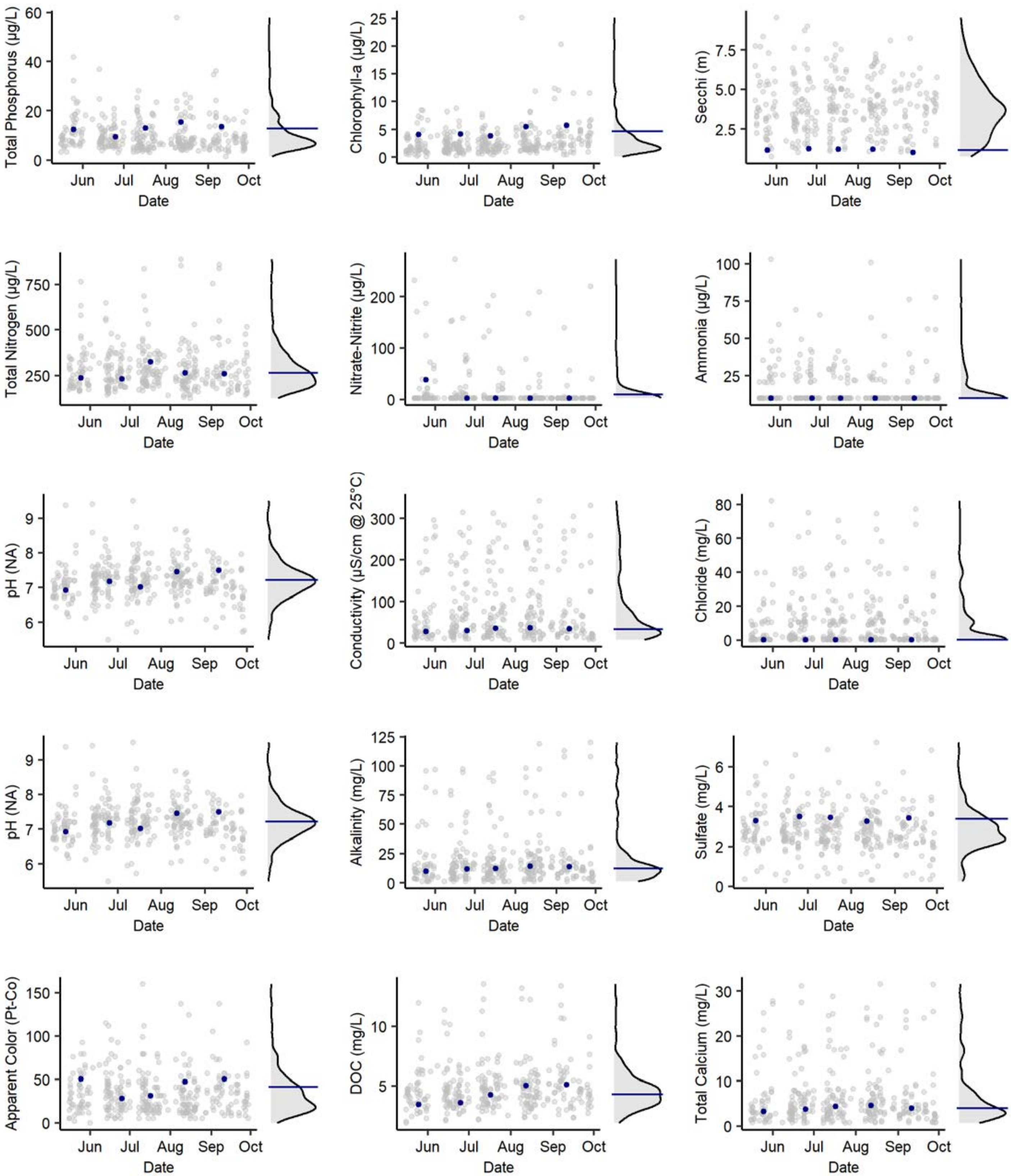
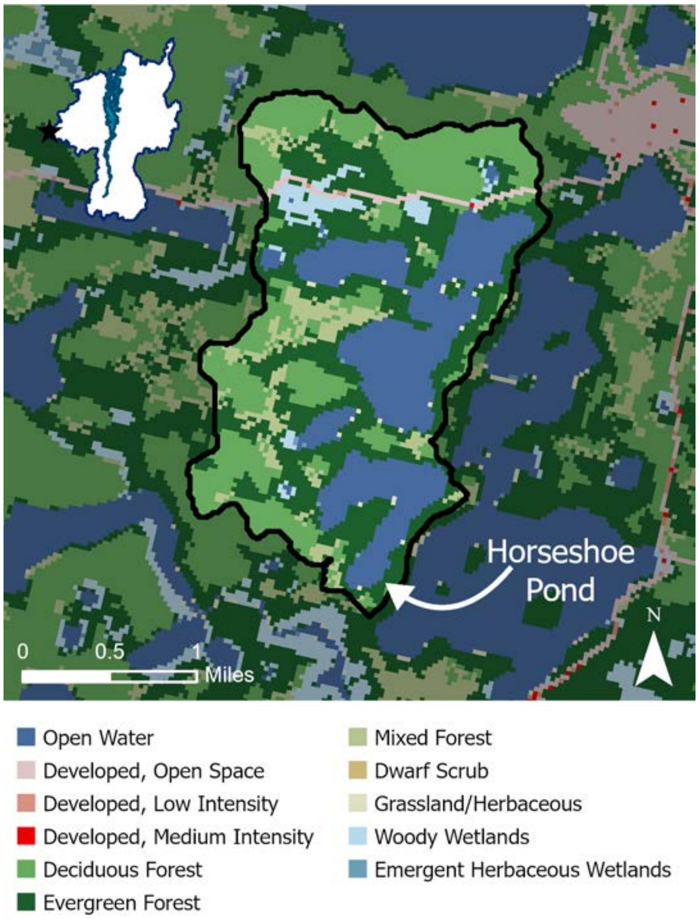


Horseshoe Pond



Summary	
Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Oligotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Moderate
Road Salt Influence:	None

Notes: Profile data indicate that Horseshoe Pond is thermally stratified during the summer with the epilimnion having dissolved oxygen concentrations >7 mg/L. The hypolimnion is hypoxic (<4 mg/L) for the later part of the summer.

Location	
Latitude:	44.3211
Longitude:	-74.3574
County:	Franklin
Town:	Santa Clara
Watershed:	Saranac Lakes-Saranac River

Lake Characteristics	
Surface Area (ha):	35.6
Shoreline Length (km):	4.1
Max Depth (m):	7.9
Mean Depth (m):	4.7
Volume (m^3):	1,616,528
Flushing Rate (times/year):	0.6

Watershed Characteristics	
Watershed Area (ha):	498.9
Open Water (%):	26.39
Developed, Open Space (%):	1.37
Developed, Low Intensity (%):	0.05
Developed, Medium Intensity (%):	0.02
Developed, High Intensity (%):	0.00
Barren Land (%):	0.00
Deciduous Forest (%):	28.95
Evergreen Forest (%):	32.34
Mixed Forest (%):	7.18
Dwarf Shrub (%):	0.00
Grassland/Herbaceous (%):	0.49
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	3.07
Emergent Herbaceous Wetlands (%):	0.14

Aquatic Invasive Species Detections
None

Harmful Algal Bloom Reports
None

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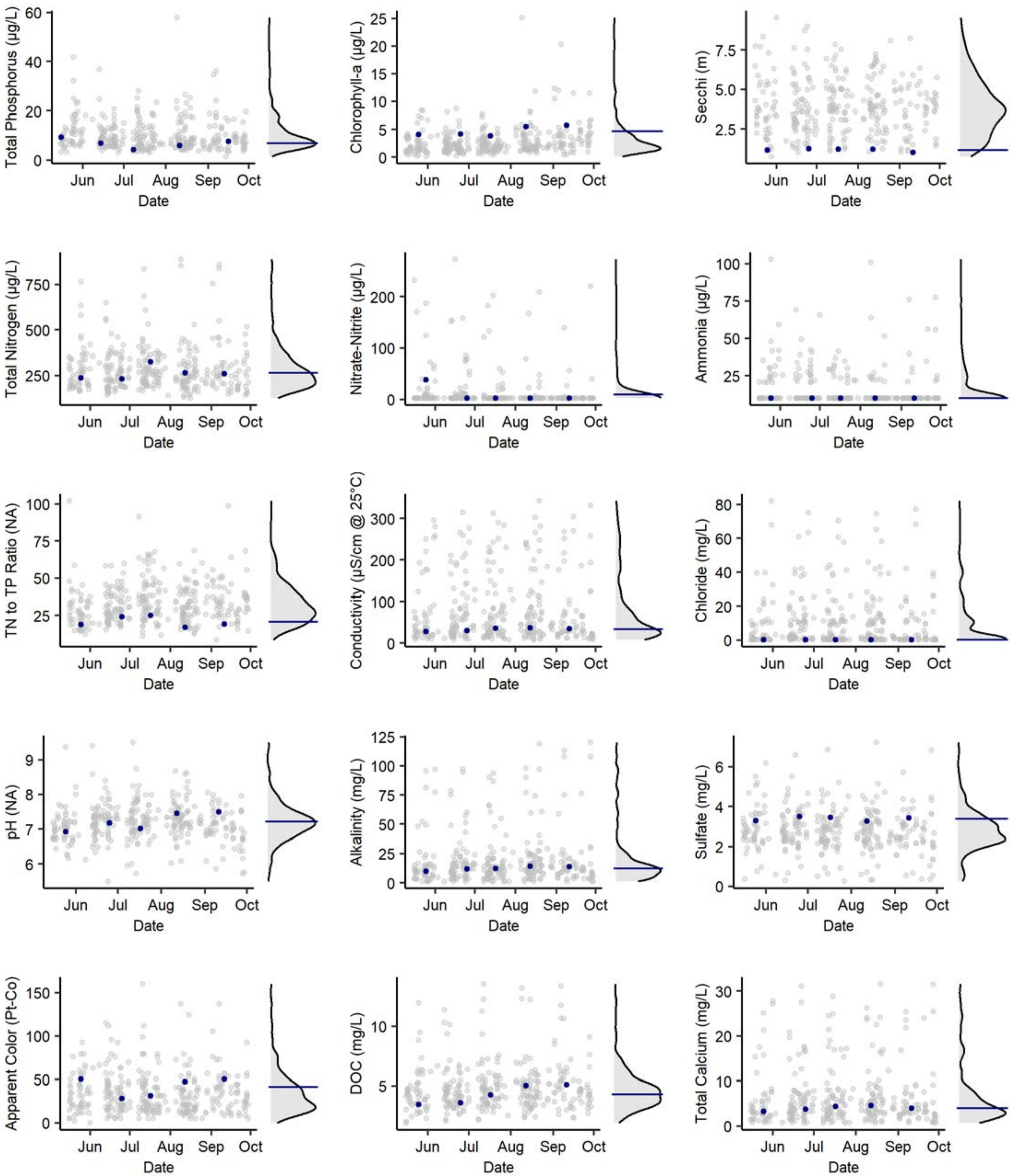
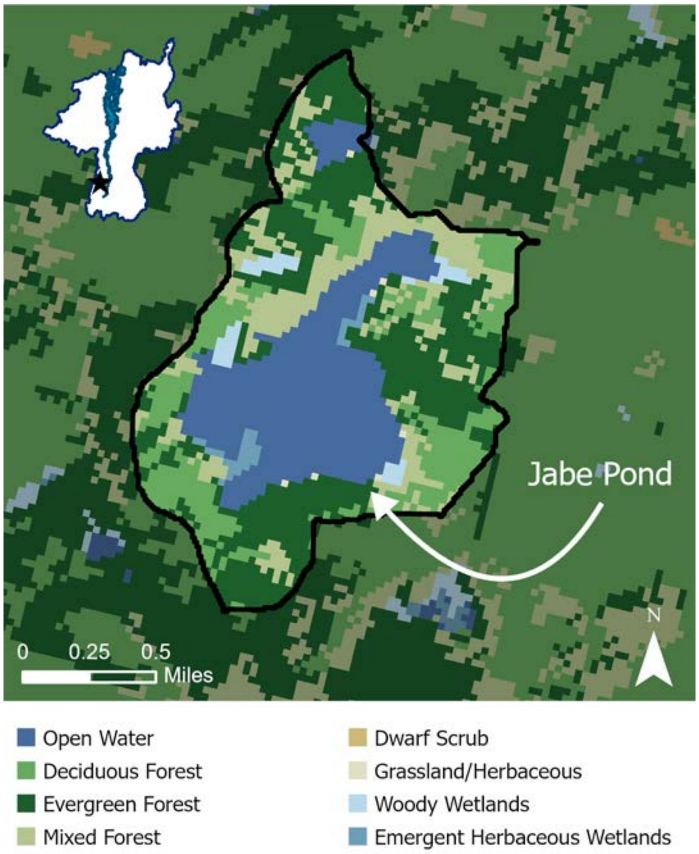


Jabe Pond



Summary

Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Moderate
Road Salt Influence:	None

Notes: Profile data indicate that Jabe Pond is thermally stratified during the summer with the epilimnion having dissolved oxygen concentrations >7 mg/L. The hypolimnion is anoxic (<2 mg/L) for the later part of the summer.

Location

Latitude:	44.7038
Longitude:	-73.5396
County:	Warren
Town:	Haque
Watershed:	Lake George-La Chute

Lake Characteristics

Surface Area (ha):	59.3
Shoreline Length (km):	6.0
Max Depth (m):	22.9
Mean Depth (m):	5.8
Volume (m^3):	3,459,018
Flushing Rate (times/year):	0.3

Watershed Characteristics

Watershed Area (ha):	227.9
Open Water (%):	27.55
Developed, Open Space (%):	0.00
Developed, Low Intensity (%):	0.00
Developed, Medium Intensity (%):	0.00
Developed, High Intensity (%):	0.00
Barren Land (%):	0.00
Deciduous Forest (%):	18.66
Evergreen Forest (%):	32.25
Mixed Forest (%):	17.35
Dwarf Shrub (%):	0.00
Grassland/Herbaceous (%):	0.28
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	2.41
Emergent Herbaceous Wetlands (%):	1.50

Aquatic Invasive Species Detections

None

Harmful Algal Bloom Reports

None

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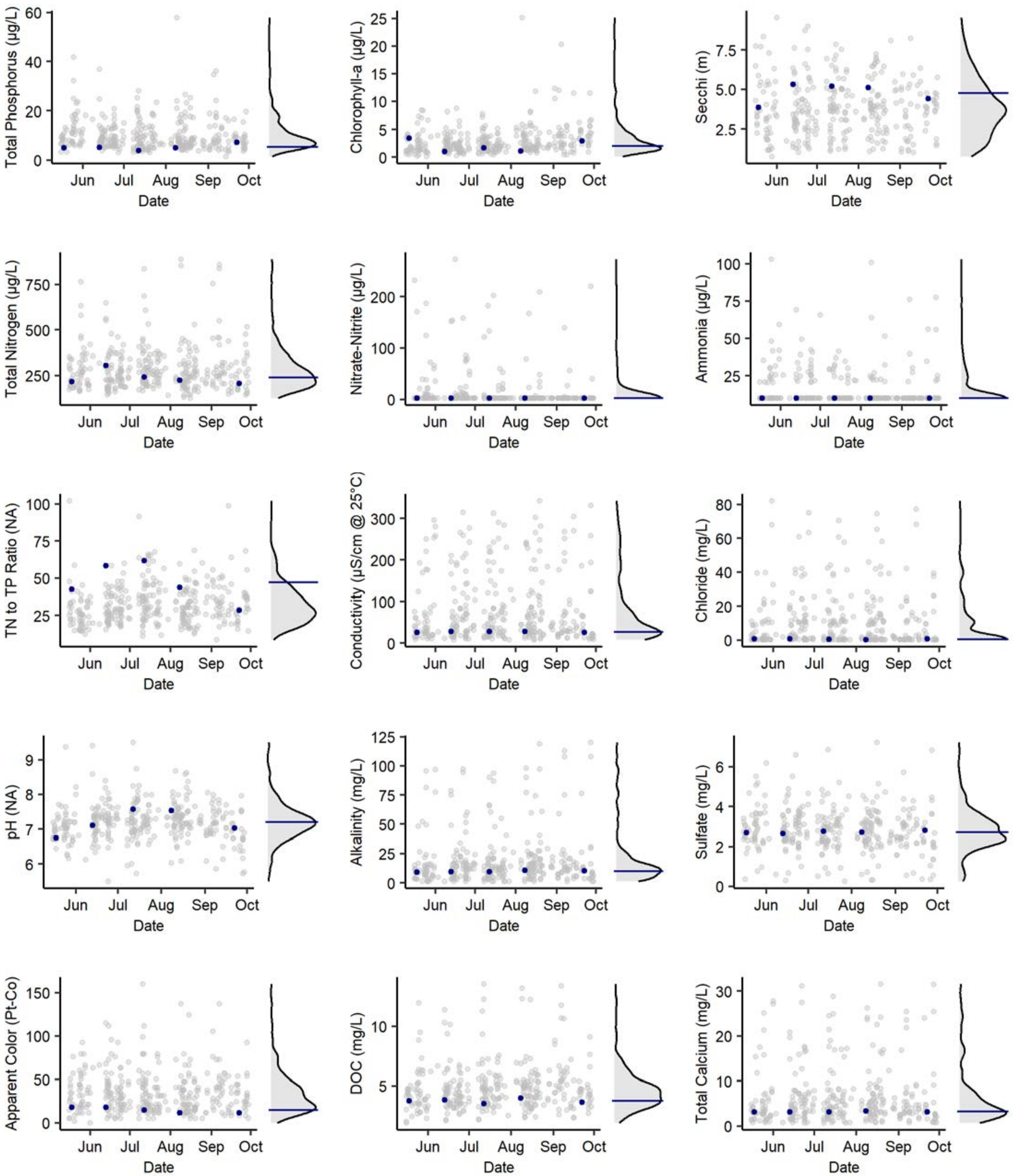

Kiwassa Lake

Summary

Trophic Status (Chl-a):	Oligotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Oligotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Adequate
Road Salt Influence:	Low

Notes: None.

Location

Latitude:	44.2957
Longitude:	-74.1569
County:	Franklin
Town:	Harrietstown
Watershed:	Sumner Brook-Saranac River

Lake Characteristics

Surface Area (ha):	114.3
Shoreline Length (km):	7.8
Max Depth (m):	13.7
Mean Depth (m):	NA
Volume (m^3):	7,307,748
Flushing Rate (times/year):	0.1

Watershed Characteristics

Watershed Area (ha):	529.4
Open Water (%):	21.74
Developed, Open Space (%):	4.98
Developed, Low Intensity (%):	0.32
Developed, Medium Intensity (%):	0.37
Developed, High Intensity (%):	0.00
Barren Land (%):	0.00
Deciduous Forest (%):	34.56
Evergreen Forest (%):	20.58
Mixed Forest (%):	15.92
Dwarf Shrub (%):	0.00
Grassland/Herbaceous (%):	0.34
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	1.07
Emergent Herbaceous Wetlands (%):	0.10

Aquatic Invasive Species Detections

Eurasian watermilfoil:	Unknown
Variable-leaf milfoil:	2017
Curly leaf pondweed:	2017

Harmful Algal Bloom Reports

None

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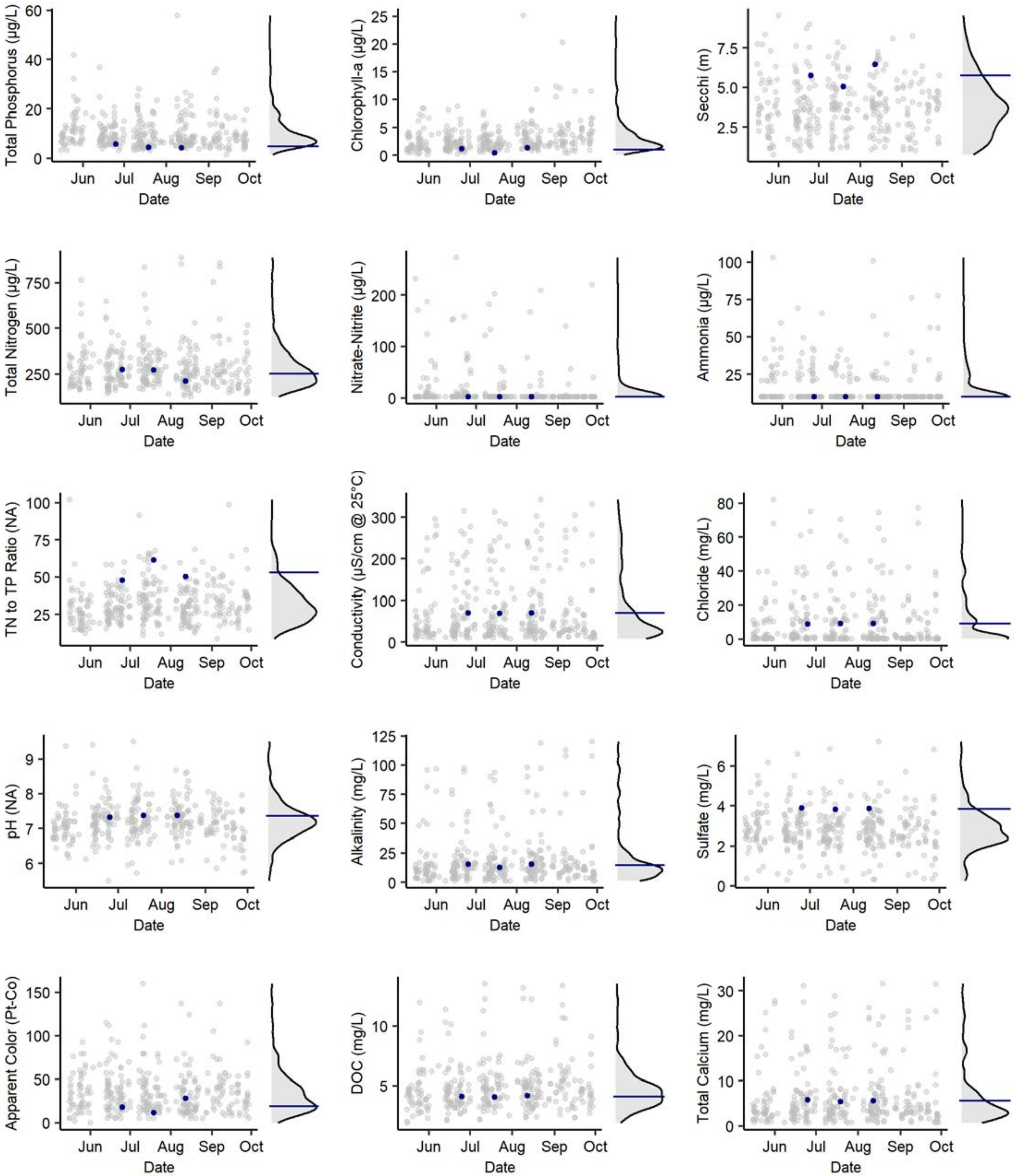
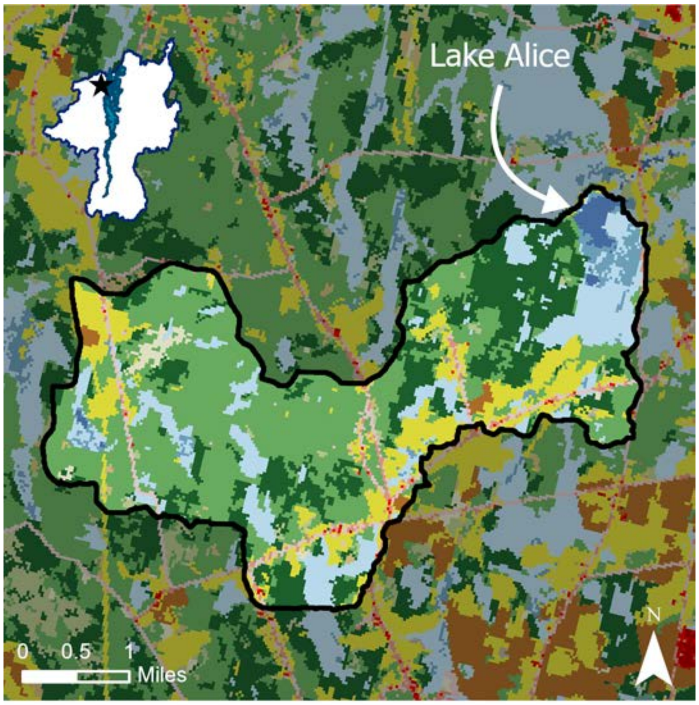


Lake Alice



Summary

Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Mesotrophic
Trophic Status (Secchi):	NA
Acidity:	Alkaline: non-impacted
Acid Neutralizing Capacity:	High
Road Salt Influence:	Moderate

Notes: Secchi was visible on bottom for all sampling trips.

Profile data indicate that Lake Alice is isothermal during the summer with dissolved oxygen concentrations >7 mg/L with the exception of August when concentrations dropped below 7 mg/L.

Location

Latitude:	44.8687
Longitude:	-73.4864
County:	Clinton
Town:	Chazy
Watershed:	Lake Champlain

Lake Characteristics

Surface Area (ha):	27.9
Shoreline Length (km):	3.8
Max Depth (m):	1.6
Mean Depth (m):	NA
Volume (m^3):	NA
Flushing Rate (times/year):	NA

Watershed Characteristics

Watershed Area (ha):	1,436.9
Open Water (%):	1.32
Developed, Open Space (%):	2.57
Developed, Low Intensity (%):	1.42
Developed, Medium Intensity (%):	0.19
Developed, High Intensity (%):	0.03
Barren Land (%):	0.08
Deciduous Forest (%):	40.87
Evergreen Forest (%):	20.22
Mixed Forest (%):	0.98
Dwarf Shrub (%):	0.29
Grassland/Herbaceous (%):	1.05
Pasture/Hay (%):	12.72
Cultivated Crops (%):	0.71
Woody Wetlands (%):	15.16
Emergent Herbaceous Wetlands (%):	2.38

Aquatic Invasive Species Detections

Water chestnut:	2016
Variable-leaf milfoil:	2017
Eurasian watermilfoil:	2017
European frogbit:	2019

Harmful Algal Bloom Reports

None

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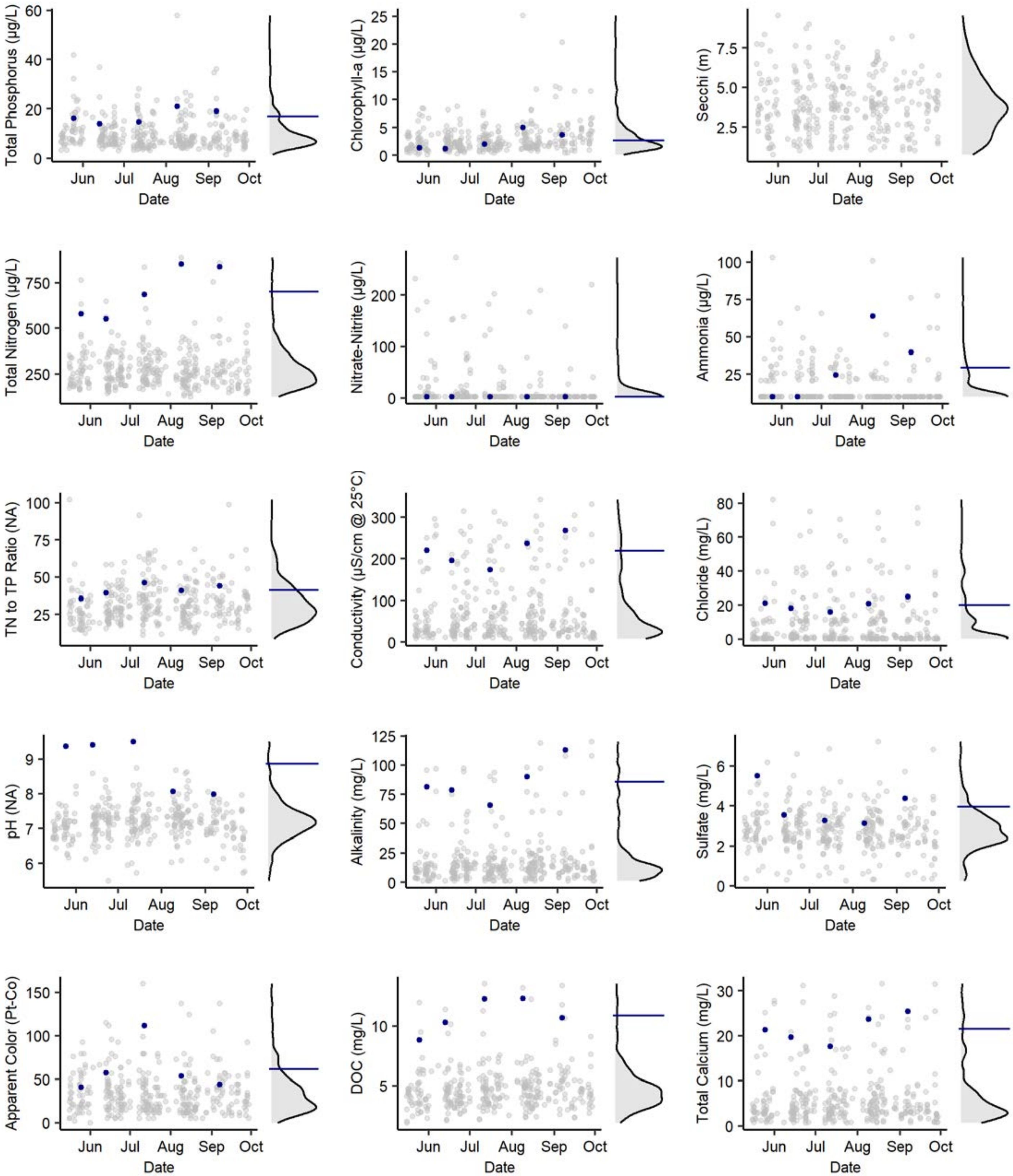
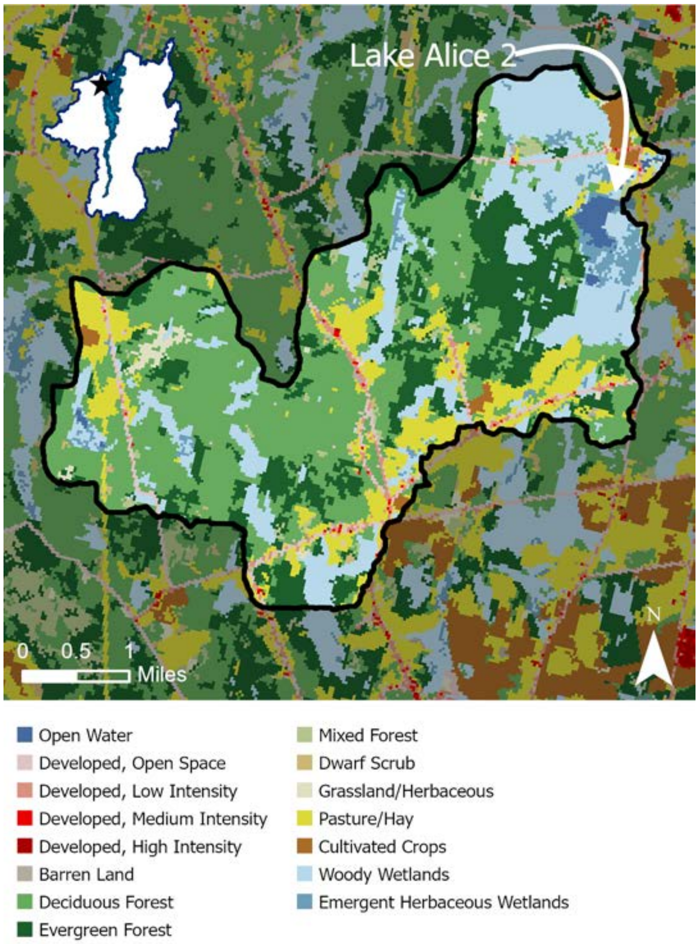


LAKE ALICE 2



Summary

Trophic Status (Chl-a):	Eutrophic
Trophic Status (TP):	Eutrophic
Trophic Status (Secchi):	Eutrophic
Acidity:	Alkaline: non-impacted
Acid Neutralizing Capacity:	High
Road Salt Influence:	Moderate

Notes: Secchi was visible on bottom in May and July.

Profile data indicate that Lake Alice 2 is isothermal with dissolved oxygen concentrations <7 mg/L for most of the summer.

Location

Latitude:	44.8749
Longitude:	-73.4784
County:	Clinton
Town:	Chazy
Watershed:	Lake Champlain

Lake Characteristics

Surface Area (ha):	3.3
Shoreline Length (km):	1.2
Max Depth (m):	1.6
Mean Depth (m):	NA
Volume (m^3):	NA
Flushing Rate (times/year):	NA

Watershed Characteristics

Watershed Area (ha):	1,946.2
Open Water (%):	1.05
Developed, Open Space (%):	2.37
Developed, Low Intensity (%):	1.42
Developed, Medium Intensity (%):	0.20
Developed, High Intensity (%):	0.04
Barren Land (%):	0.15
Deciduous Forest (%):	37.85
Evergreen Forest (%):	18.80
Mixed Forest (%):	1.39
Dwarf Shrub (%):	0.28
Grassland/Herbaceous (%):	1.02
Pasture/Hay (%):	11.34
Cultivated Crops (%):	1.33
Woody Wetlands (%):	20.16
Emergent Herbaceous Wetlands (%):	2.59

Aquatic Invasive Species Detections

Eurasian watermilfoil:	2022

Harmful Algal Bloom Reports

None

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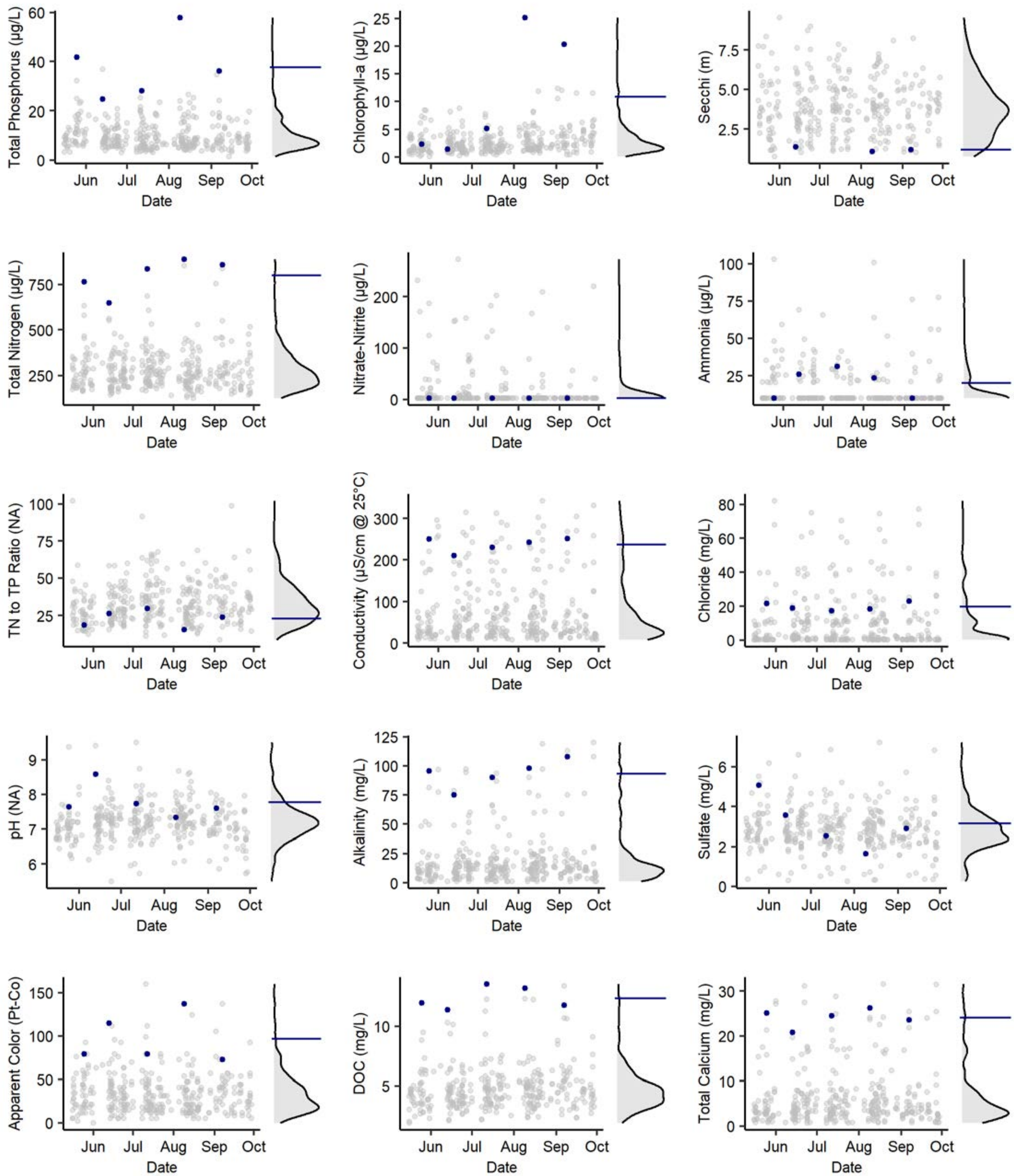
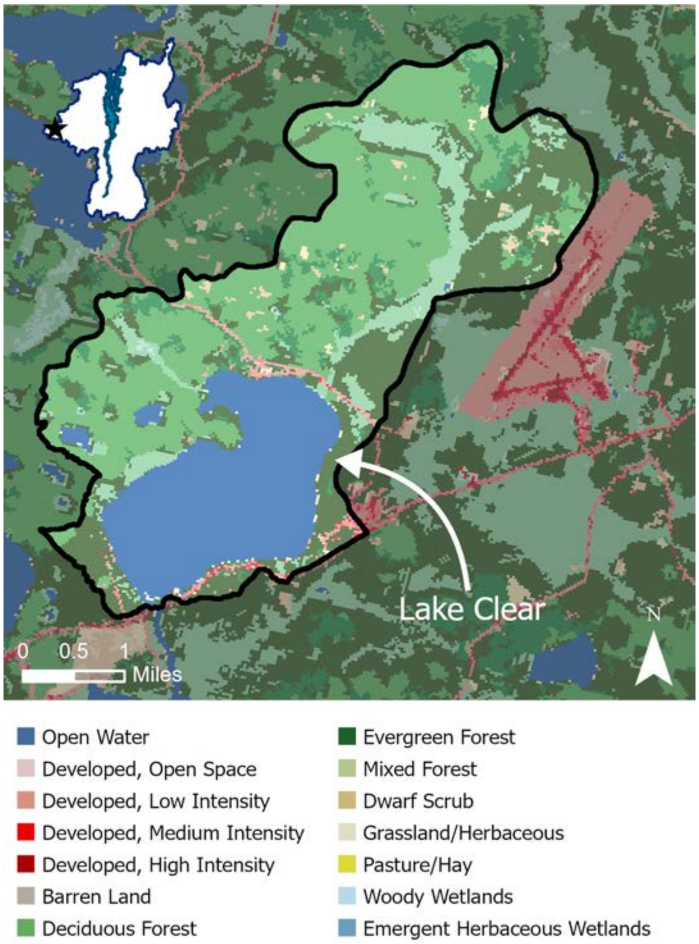


Lake Clear



Location

Latitude:	44.3686
Longitude:	-74.2526
County:	Franklin
Town:	Harrietstown
Watershed:	Saranac Lakes-Saranac River

Lake Characteristics

Surface Area (ha):	448.5
Shoreline Length (km):	17.7
Max Depth (m):	8.5
Mean Depth (m):	NA
Volume (m^3):	34,482,896
Flushing Rate (times/year):	0.35

Summary

Trophic Status (Chl-a):	Oligotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Oligotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Adequate
Road Salt Influence:	Moderate

Notes: None.

Watershed Characteristics

Watershed Area (ha):	1,918.6
Open Water (%):	21.66
Developed, Open Space (%):	1.28
Developed, Low Intensity (%):	0.50
Developed, Medium Intensity (%):	0.23
Developed, High Intensity (%):	0.00
Barren Land (%):	0.02
Deciduous Forest (%):	37.31
Evergreen Forest (%):	22.45
Mixed Forest (%):	5.67
Dwarf Shrub (%):	0.90
Grassland/Herbaceous (%):	0.55
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	9.25
Emergent Herbaceous Wetlands (%):	0.18

Aquatic Invasive Species Detections

None

Harmful Algal Bloom Reports

2018, 2020, 2021

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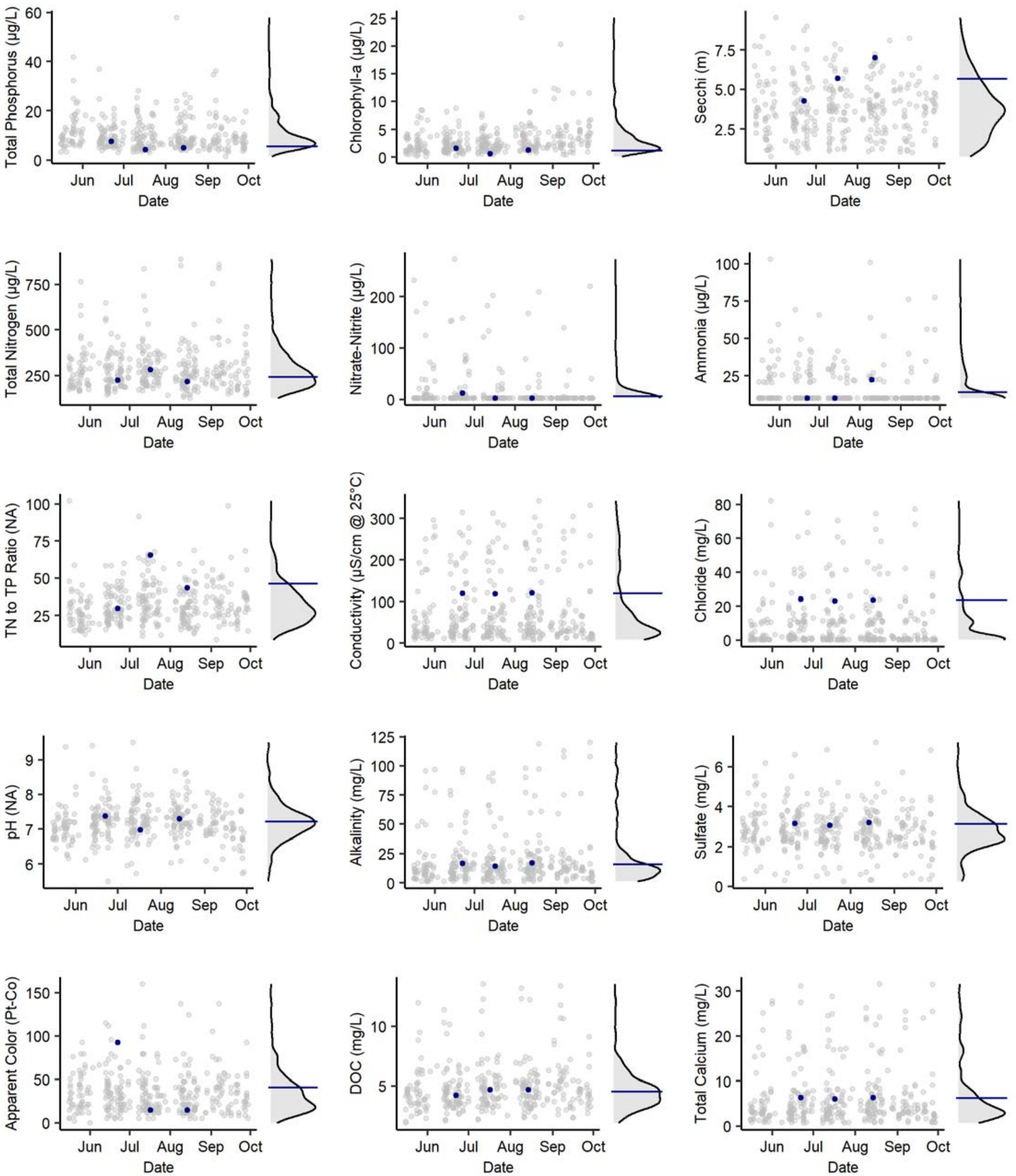
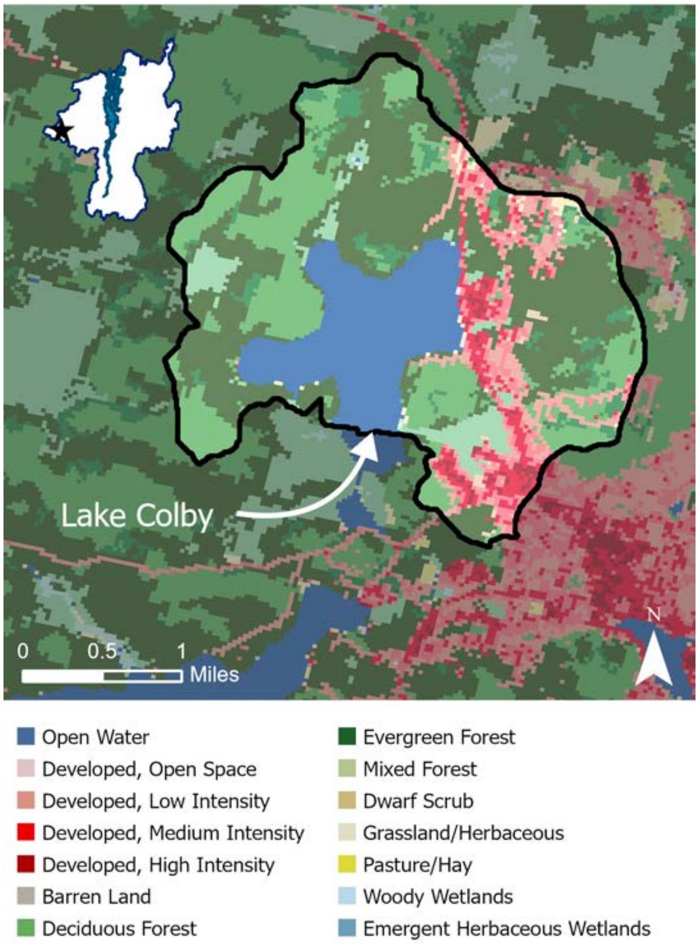


Lake Colby



Summary

Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Mesotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Alkaline: non-impacted
Acid Neutralizing Capacity:	High
Road Salt Influence:	High

Notes: None.

Location

Latitude:	44.3418
Longitude:	-74.1538
County:	Franklin
Town:	Harrietstown
Watershed:	Saranac Lakes-Saranac River

Lake Characteristics

Surface Area (ha):	125.6
Shoreline Length (km):	6.8
Max Depth (m):	14.3
Mean Depth (m):	7.2
Volume (m^3):	7,873,631
Flushing Rate (times/year):	0.7

Watershed Characteristics

Watershed Area (ha):	921.3
Open Water (%):	16.84
Developed, Open Space (%):	5.27
Developed, Low Intensity (%):	4.55
Developed, Medium Intensity (%):	3.88
Developed, High Intensity (%):	0.95
Barren Land (%):	0.12
Deciduous Forest (%):	23.50
Evergreen Forest (%):	34.24
Mixed Forest (%):	4.53
Dwarf Shrub (%):	0.48
Grassland/Herbaceous (%):	0.71
Pasture/Hay (%):	0.02
Cultivated Crops (%):	0.00
Woody Wetlands (%):	4.82
Emergent Herbaceous Wetlands (%):	0.07

Aquatic Invasive Species Detections

Eurasian watermilfoil: 1999

Harmful Algal Bloom Reports

2022

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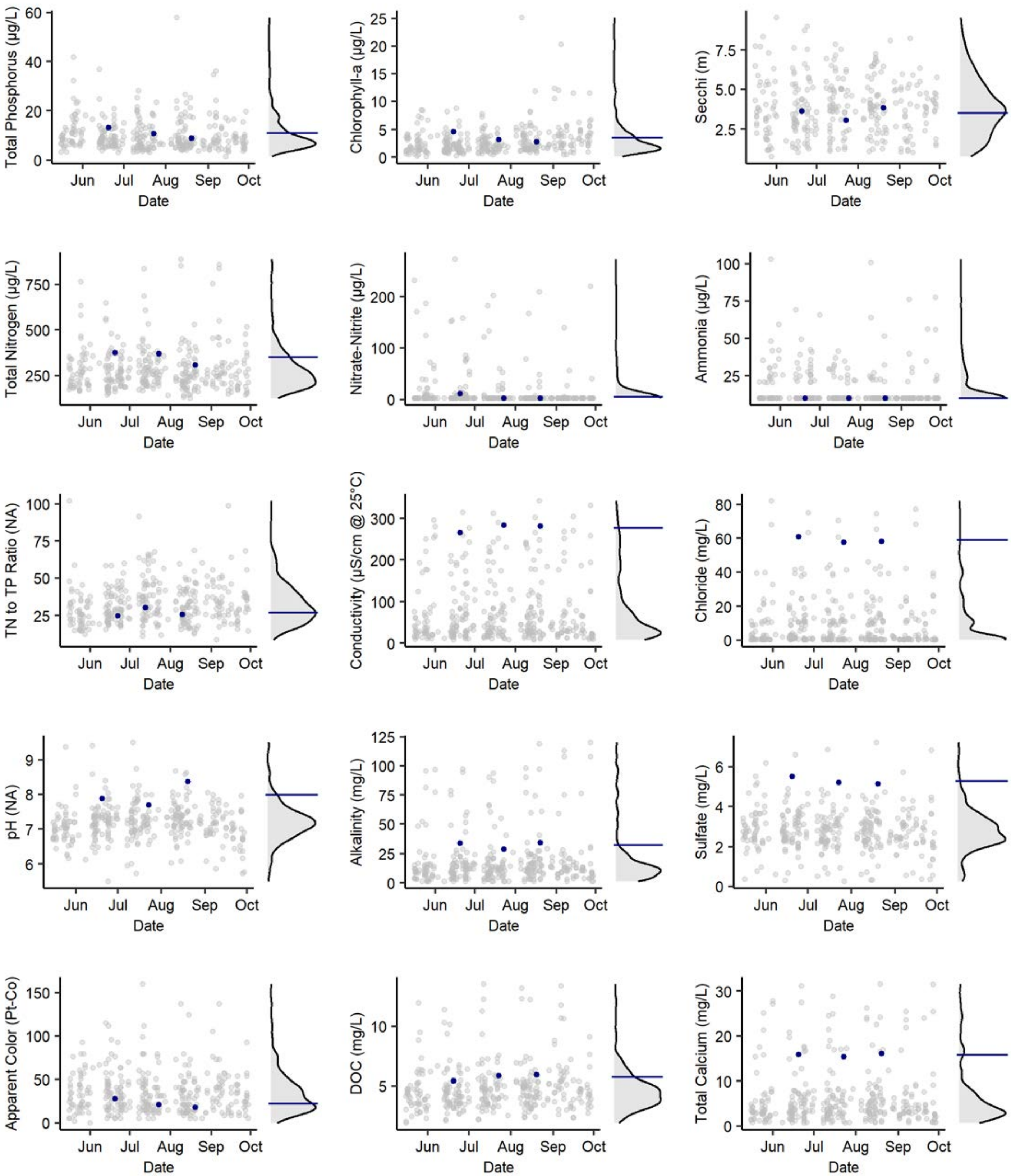
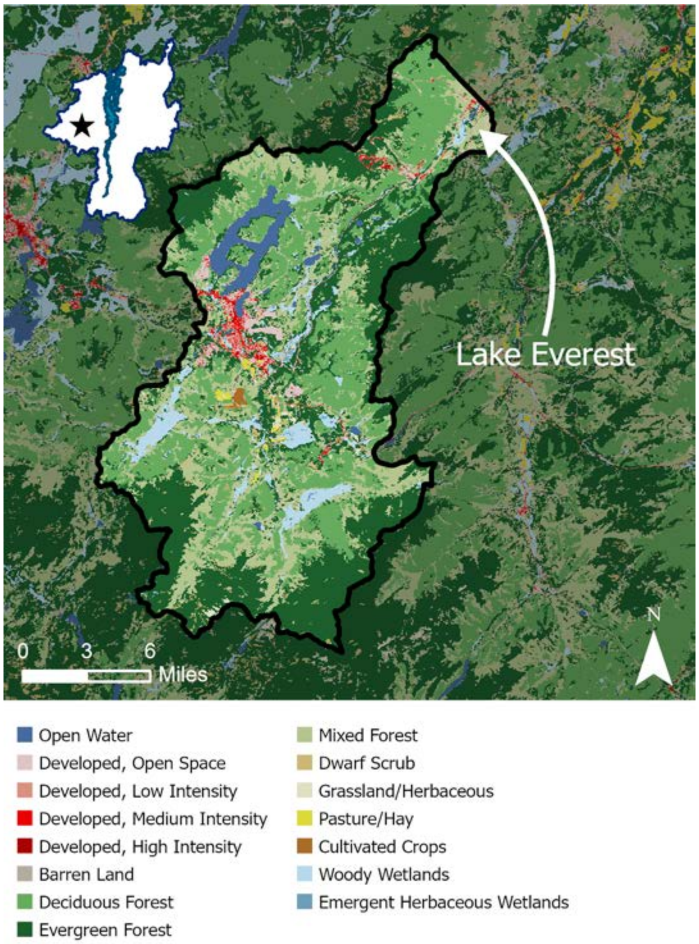


Lake Everest



Summary	
Trophic Status (Chl-a):	Oligotrophic
Trophic Status (TP):	Mesotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Adequate
Road Salt Influence:	Moderate

Notes: None.

Location	
Latitude:	44.3894
Longitude:	-73.8170
County:	Essex
Town:	Wilmington
Watershed:	West Branch Ausable River

Lake Characteristics	
Surface Area (ha):	18.1
Shoreline Length (km):	5.1
Max Depth (m):	3.4
Mean Depth (m):	NA
Volume (m^3):	NA
Flushing Rate (times/year):	NA

Watershed Characteristics	
Watershed Area (ha):	35,939.1
Open Water (%):	3.06
Developed, Open Space (%):	0.00
Developed, Low Intensity (%):	2.33
Developed, Medium Intensity (%):	1.22
Developed, High Intensity (%):	0.77
Barren Land (%):	0.20
Deciduous Forest (%):	28.84
Evergreen Forest (%):	34.09
Mixed Forest (%):	21.24
Dwarf Shrub (%):	1.55
Grassland/Herbaceous (%):	0.73
Pasture/Hay (%):	0.37
Cultivated Crops (%):	0.17
Woody Wetlands (%):	4.96
Emergent Herbaceous Wetlands (%):	0.26

Aquatic Invasive Species Detections
None

Harmful Algal Bloom Reports
None

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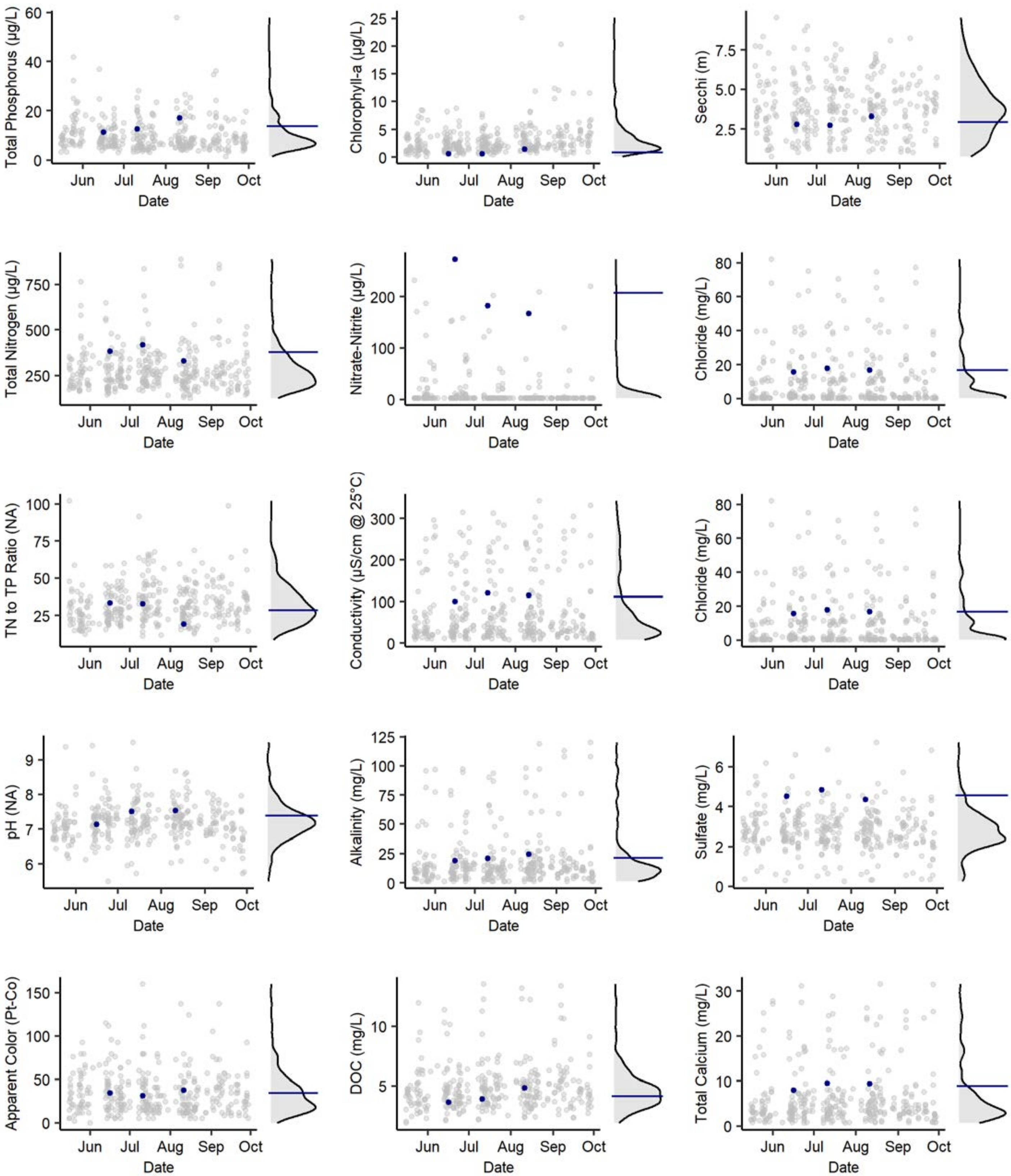
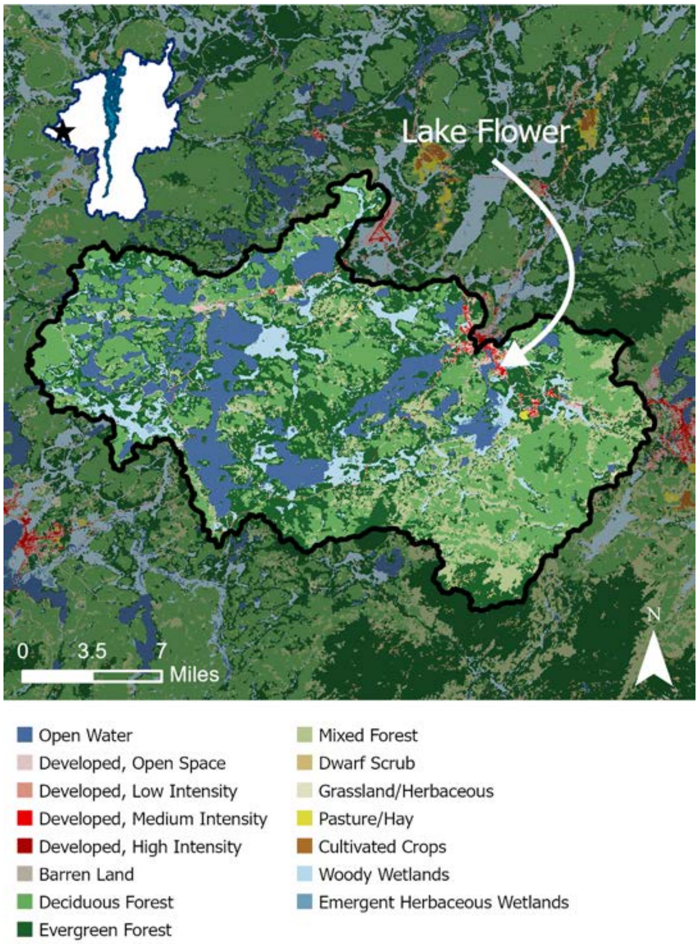


Lake Flower



Location	
Latitude:	44.3145
Longitude:	-74.1265
County:	Essex, Franklin
Town:	North Elba, Harrietstown
Watershed:	Sumner Brook-Saranac River

Lake Characteristics	
Surface Area (ha):	131.1
Shoreline Length (km):	14.9
Max Depth (m):	3.7
Mean Depth (m):	1.6
Volume (m^3):	1,069,890
Flushing Rate (times/year):	290.9

Watershed Characteristics	
Watershed Area (ha):	47,913.7
Open Water (%):	14.15
Developed, Open Space (%):	1.73
Developed, Low Intensity (%):	0.61
Developed, Medium Intensity (%):	0.36
Developed, High Intensity (%):	0.07
Barren Land (%):	0.03
Deciduous Forest (%):	30.84
Evergreen Forest (%):	29.89
Mixed Forest (%):	12.61
Dwarf Shrub (%):	0.45
Grassland/Herbaceous (%):	0.46
Pasture/Hay (%):	0.08
Cultivated Crops (%):	0.00
Woody Wetlands (%):	8.35
Emergent Herbaceous Wetlands (%):	0.37

Summary	
Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Mesotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Adequate
Road Salt Influence:	Moderate

Notes: None.

Aquatic Invasive Species Detections	
Eurasian watermilfoil:	2003
Curly leaf pondweed:	2003
Variable-leaf milfoil:	2005

Harmful Algal Bloom Reports
None

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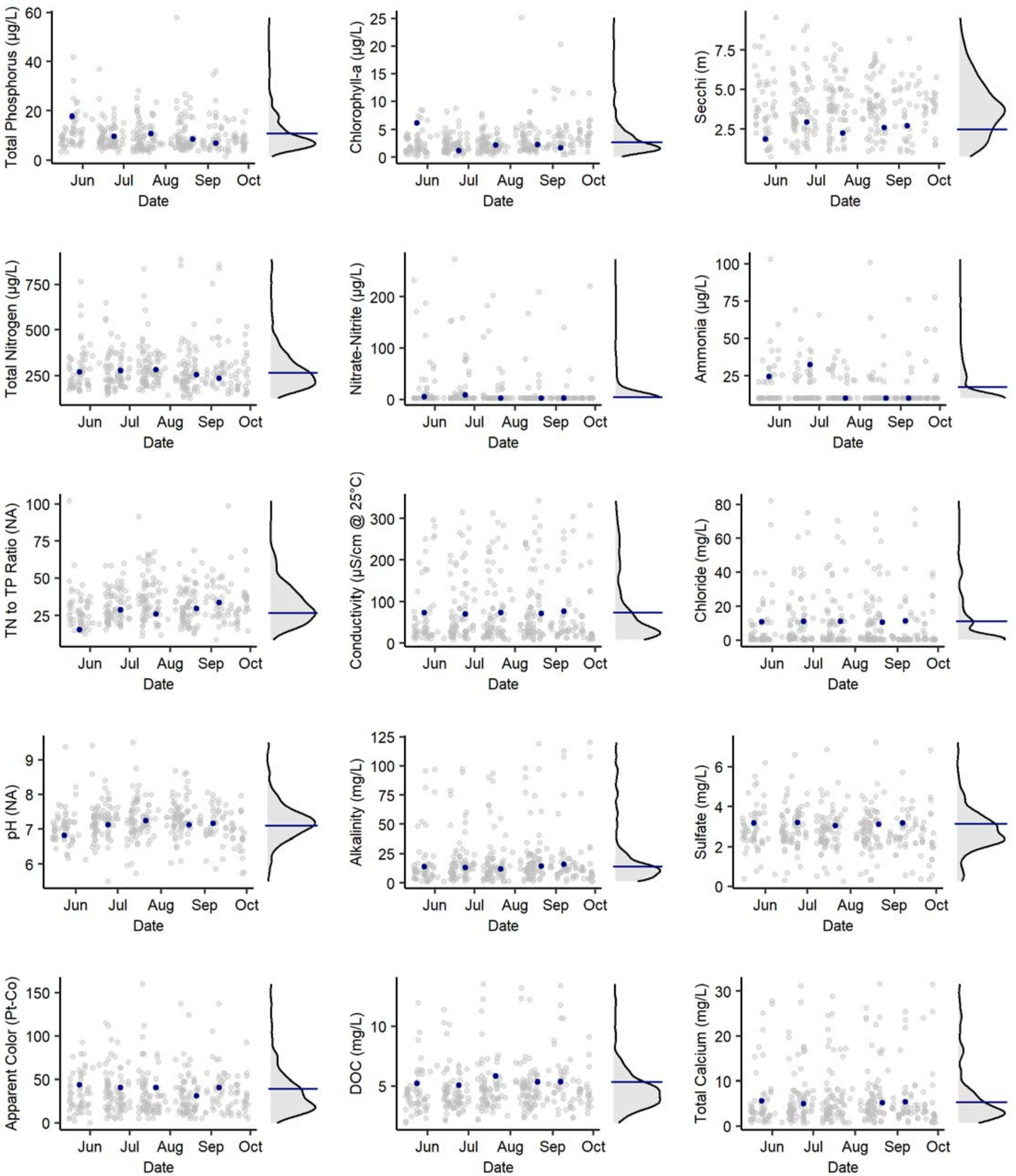
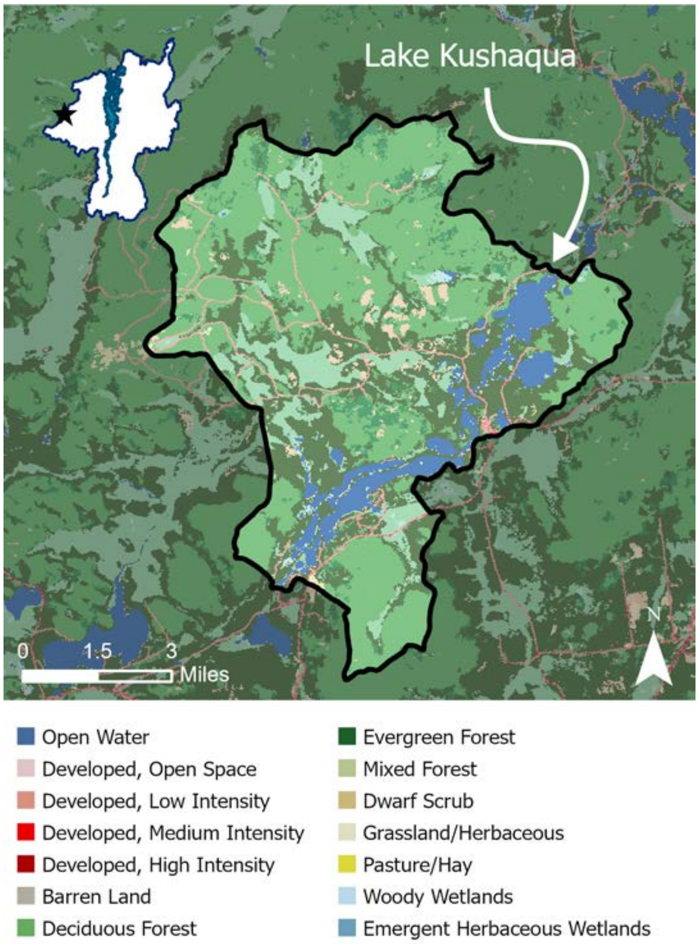


Lake Kushaqua



Summary

Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Adequate
Road Salt Influence:	None

Notes: Profile data indicate that Lake Kushaqua is thermally stratified during the summer with the epilimnion having dissolved oxygen concentrations >7 mg/L. The hypolimnion is anoxic (<2 mg/L) for the later part of the summer.

Location

Latitude:	44.5208
Longitude:	-74.1123
County:	Franklin
Town:	Franklin
Watershed:	North Branch Saranac River

Lake Characteristics

Surface Area (ha):	153.9
Shoreline Length (km):	13.7
Max Depth (m):	27.4
Mean Depth (m):	13.4
Volume (m^3):	NA
Flushing Rate (times/year):	NA

Watershed Characteristics

Watershed Area (ha):	7,406.4
Open Water (%):	7.54
Developed, Open Space (%):	2.59
Developed, Low Intensity (%):	0.35
Developed, Medium Intensity (%):	0.08
Developed, High Intensity (%):	0.00
Barren Land (%):	0.00
Deciduous Forest (%):	45.75
Evergreen Forest (%):	26.18
Mixed Forest (%):	4.47
Dwarf Shrub (%):	1.95
Grassland/Herbaceous (%):	0.45
Pasture/Hay (%):	0.03
Cultivated Crops (%):	0.00
Woody Wetlands (%):	10.1
Emergent Herbaceous Wetlands (%):	0.51

Aquatic Invasive Species Detections

None

Harmful Algal Bloom Reports

None

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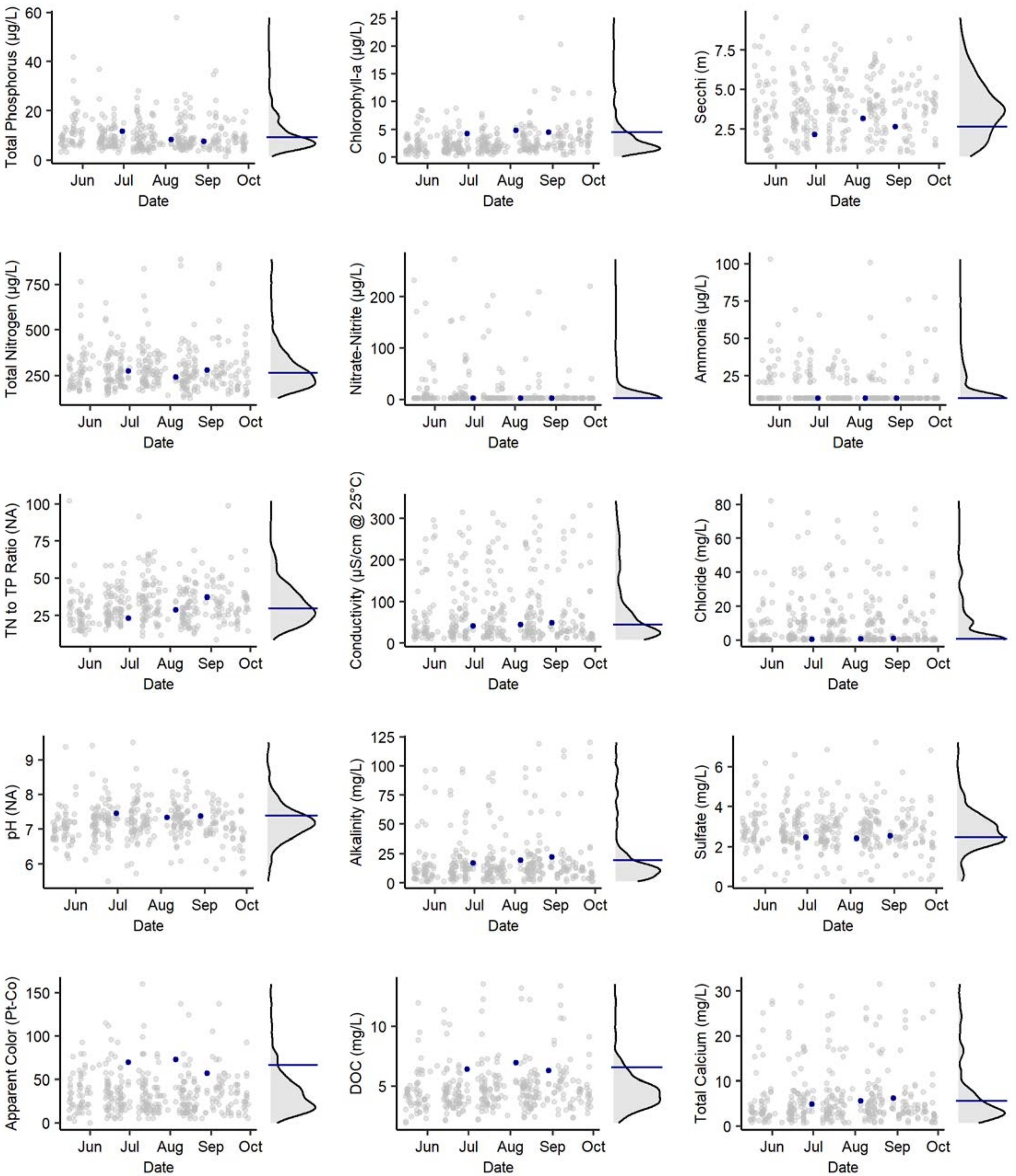
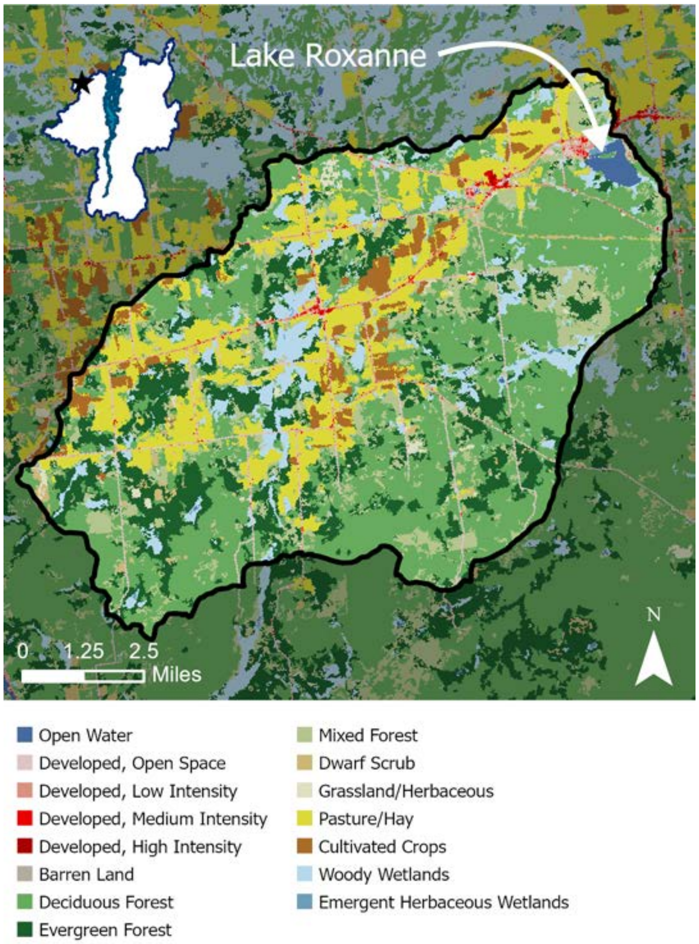


Lake Roxanne



Summary

Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Eutrophic
Trophic Status (Secchi):	Eutrophic
Acidity:	Alkaline: non-impacted
Acid Neutralizing Capacity:	High
Road Salt Influence:	Moderate

Notes: Profile data indicate that Lake Roxanne is isothermal with dissolved oxygen concentrations >7 mg/L.

Location

Latitude:	44.8953
Longitude:	-73.8047
County:	Clinton
Town:	Ellenburg
Watershed:	Great Chazy River

Lake Characteristics

Surface Area (ha):	80.7
Shoreline Length (km):	5.2
Max Depth (m):	2.4
Mean Depth (m):	0.7
Volume (m^3):	537,948
Flushing Rate (times/year):	74.2

Watershed Characteristics

Watershed Area (ha):	11,754.4
Open Water (%):	0.67
Developed, Open Space (%):	2.47
Developed, Low Intensity (%):	1.29
Developed, Medium Intensity (%):	0.38
Developed, High Intensity (%):	0.08
Barren Land (%):	0.01
Deciduous Forest (%):	38.12
Evergreen Forest (%):	16.04
Mixed Forest (%):	12.6
Dwarf Shrub (%):	0.99
Grassland/Herbaceous (%):	0.85
Pasture/Hay (%):	15.14
Cultivated Crops (%):	3.62
Woody Wetlands (%):	7.56
Emergent Herbaceous Wetlands (%):	0.18

Aquatic Invasive Species Detections

Eurasian watermilfoil:	2022
Water chestnut:	2022

Harmful Algal Bloom Reports

None

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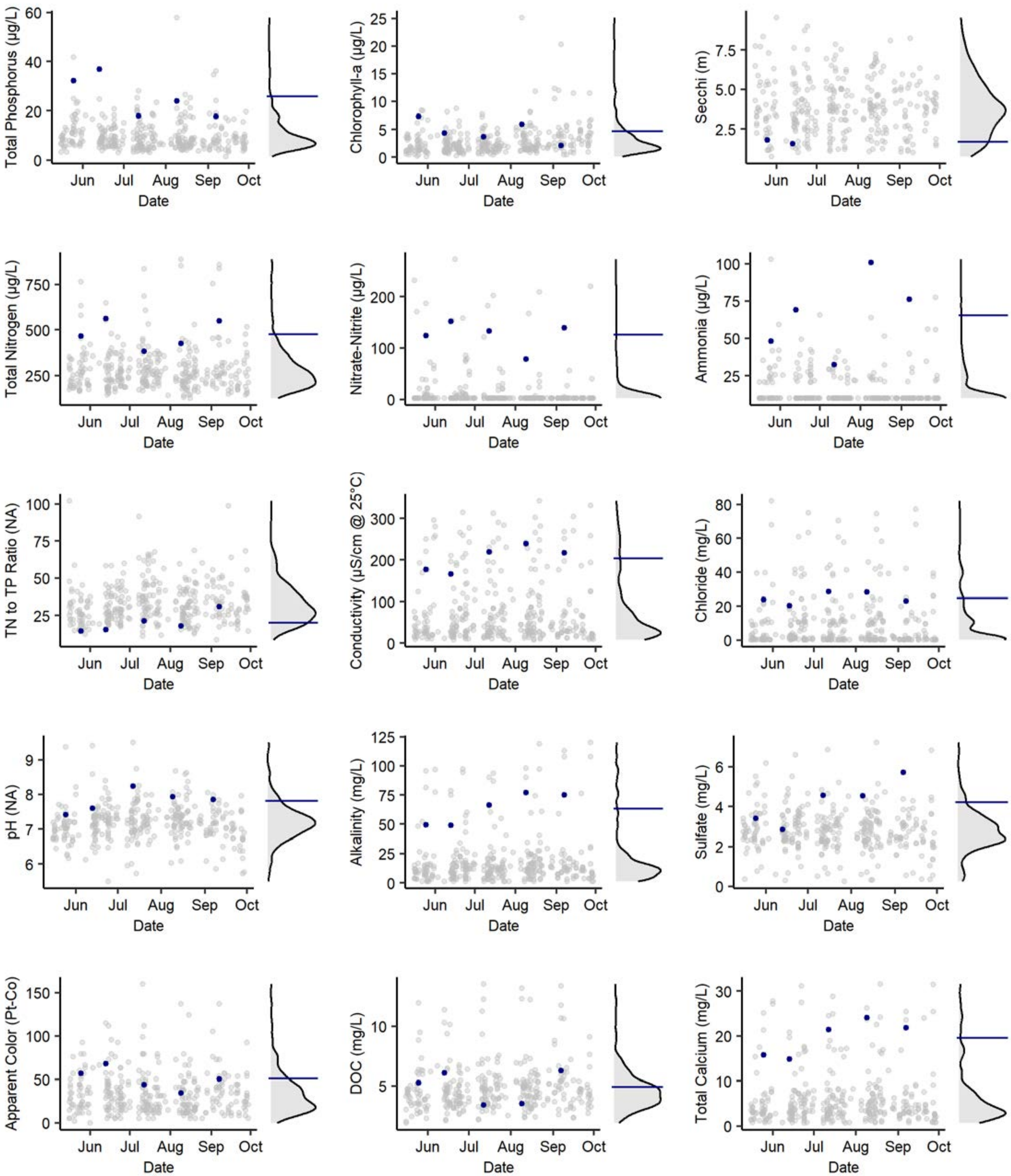
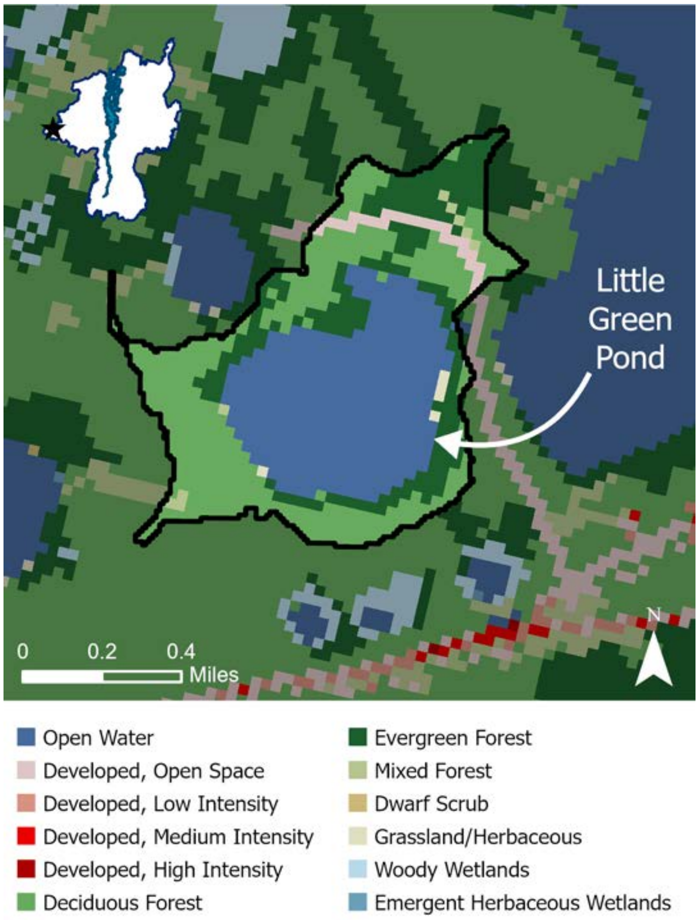


Little Green Pond



Location

Latitude:	44.3573
Longitude:	-74.3001
County:	Franklin
Town:	Santa Clara
Watershed:	Saranac Lakes-Saranac River

Lake Characteristics

Surface Area (ha):	29.8
Shoreline Length (km):	2.4
Max Depth (m):	12.2
Mean Depth (m):	5.6
Volume (m^3):	1,553,386
Flushing Rate (times/year):	0.3

Watershed Characteristics

Watershed Area (ha):	78.3
Open Water (%):	37.92
Developed, Open Space (%):	2.86
Developed, Low Intensity (%):	0.00
Developed, Medium Intensity (%):	0.00
Developed, High Intensity (%):	0.00
Barren Land (%):	0.00
Deciduous Forest (%):	36.54
Evergreen Forest (%):	20.96
Mixed Forest (%):	1.15
Dwarf Shrub (%):	0.00
Grassland/Herbaceous (%):	0.57
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	0.00
Emergent Herbaceous Wetlands (%):	0.00

Summary

Trophic Status (Chl-a):	Oligotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Oligotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Adequate
Road Salt Influence:	None

Notes: None.

Aquatic Invasive Species Detections

None

Harmful Algal Bloom Reports

None

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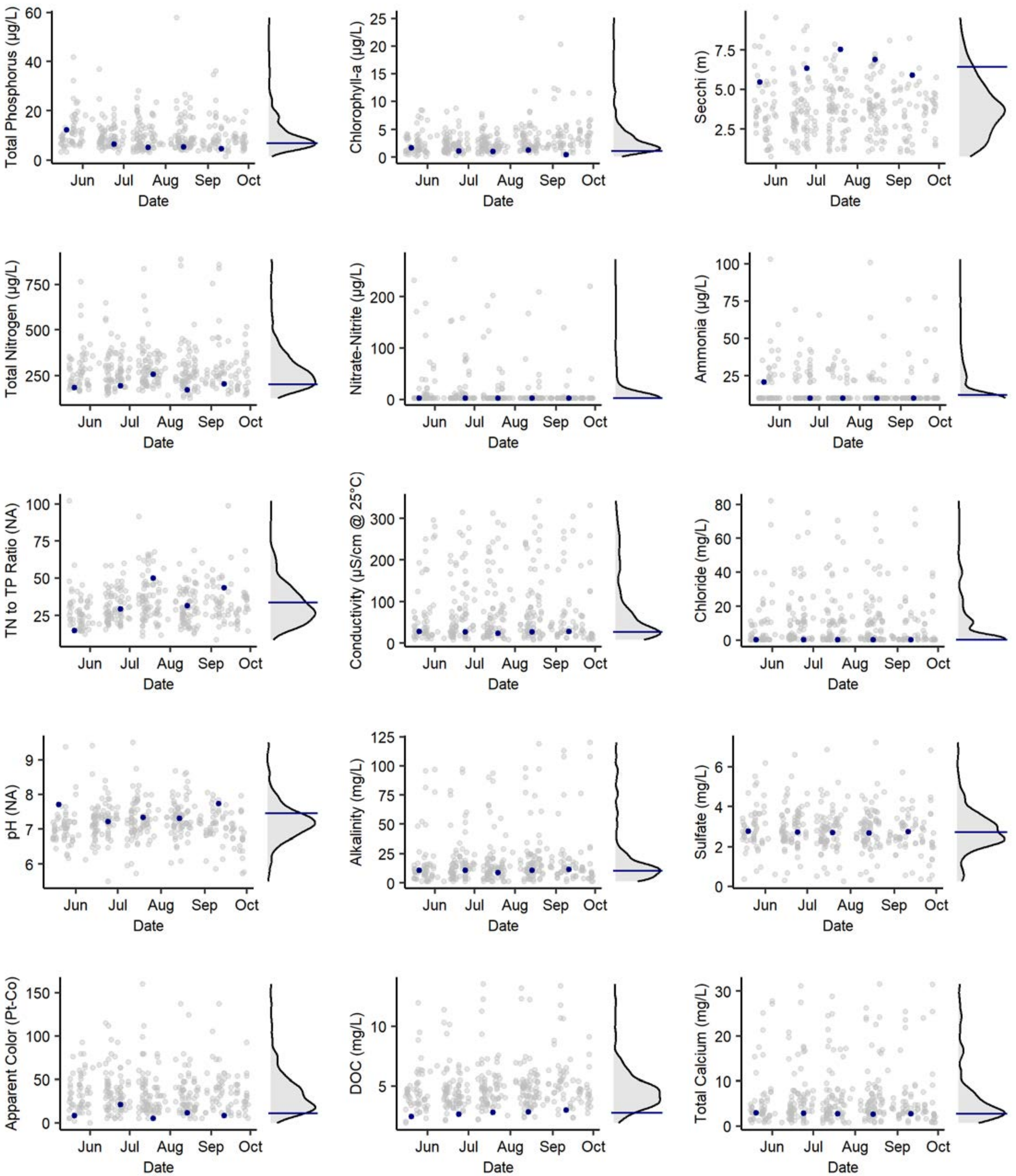
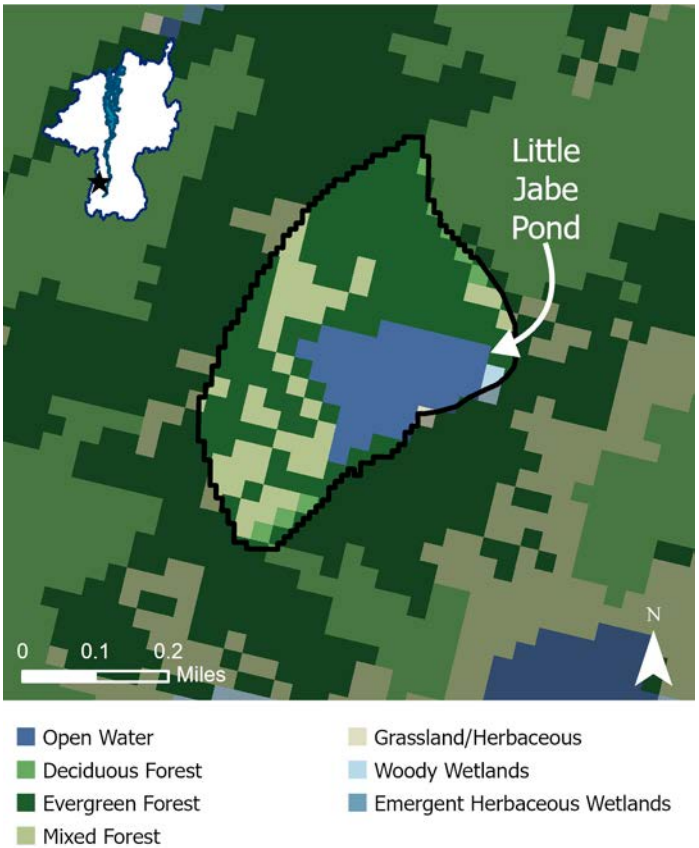


Little Jabe Pond



Location

Latitude:	44.7140
Longitude:	-73.5372
County:	Warren
Town:	Haque
Watershed:	Lake George-La Chute

Lake Characteristics

Surface Area (ha):	3.8
Shoreline Length (km):	1.0
Max Depth (m):	6.7
Mean Depth (m):	2.3
Volume (m^3):	56,626
Flushing Rate (times/year):	1.8

Watershed Characteristics

Watershed Area (ha):	17.2
Open Water (%):	20.53
Developed, Open Space (%):	0.00
Developed, Low Intensity (%):	0.00
Developed, Medium Intensity (%):	0.00
Developed, High Intensity (%):	0.00
Barren Land (%):	0.00
Deciduous Forest (%):	2.63
Evergreen Forest (%):	55.26
Mixed Forest (%):	21.58
Dwarf Shrub (%):	0.00
Grassland/Herbaceous (%):	0.00
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	0.00
Emergent Herbaceous Wetlands (%):	0.00

Summary

Trophic Status (Chl-a):	Oligotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Oligotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Moderate
Road Salt Influence:	None

Notes: Profile data indicate that Little Jabe Pond is thermally stratified during the summer with the entire water column having dissolved oxygen concentrations >7 mg/L.

Aquatic Invasive Species Detections

None

Harmful Algal Bloom Reports

None

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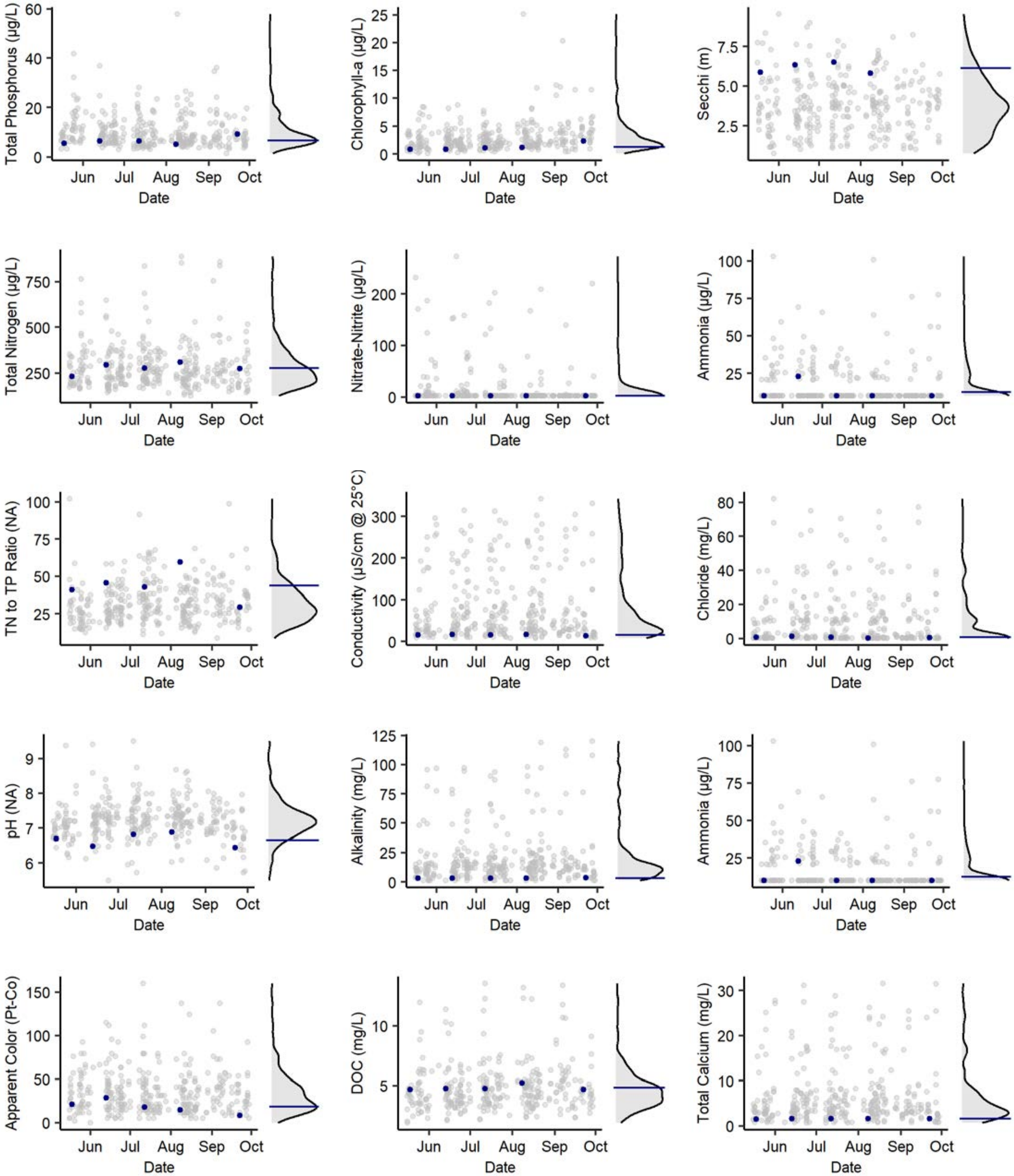
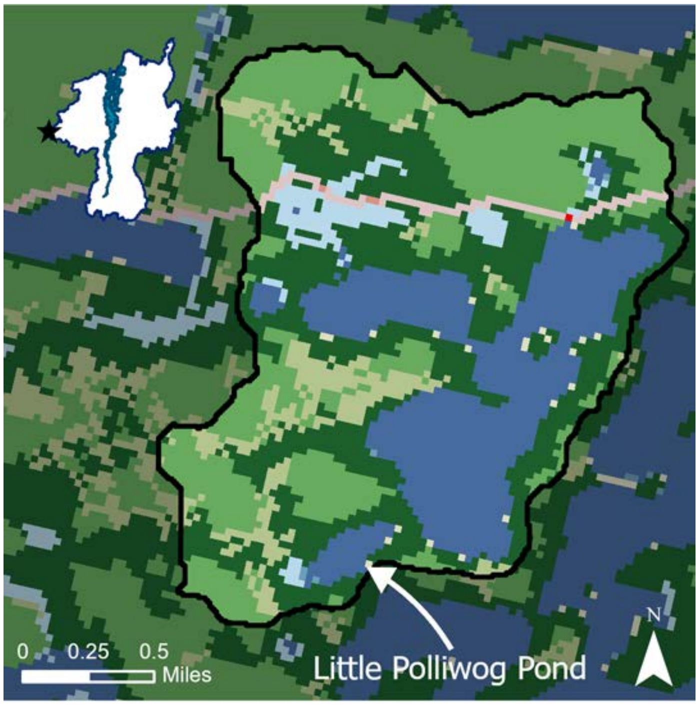


Little Polliwog Pond



Summary

Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Mesotrophic
Trophic Status (Secchi):	NA
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Moderate
Road Salt Influence:	None

Notes: Profile data indicate that Lake Roxanne is isothermal with dissolved oxygen concentrations >7 mg/L.

Location

Latitude:	44.3269
Longitude:	-74.3635
County:	Franklin
Town:	Santa Clara
Watershed:	Saranac Lakes-Saranac River

Lake Characteristics

Surface Area (ha):	8.2
Shoreline Length (km):	1.3
Max Depth (m):	1.8
Mean Depth (m):	0.8
Volume (m^3):	53,540
Flushing Rate (times/year):	6.1

Watershed Characteristics

Watershed Area (ha):	387.1
Open Water (%):	24.73
Developed, Open Space (%):	1.77
Developed, Low Intensity (%):	0.07
Developed, Medium Intensity (%):	0.02
Developed, High Intensity (%):	0.00
Barren Land (%):	0.00
Deciduous Forest (%):	29.92
Evergreen Forest (%):	31.45
Mixed Forest (%):	7.62
Dwarf Shrub (%):	0.00
Grassland/Herbaceous (%):	0.51
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	3.77
Emergent Herbaceous Wetlands (%):	0.14

Aquatic Invasive Species Detections

None

Harmful Algal Bloom Reports

None

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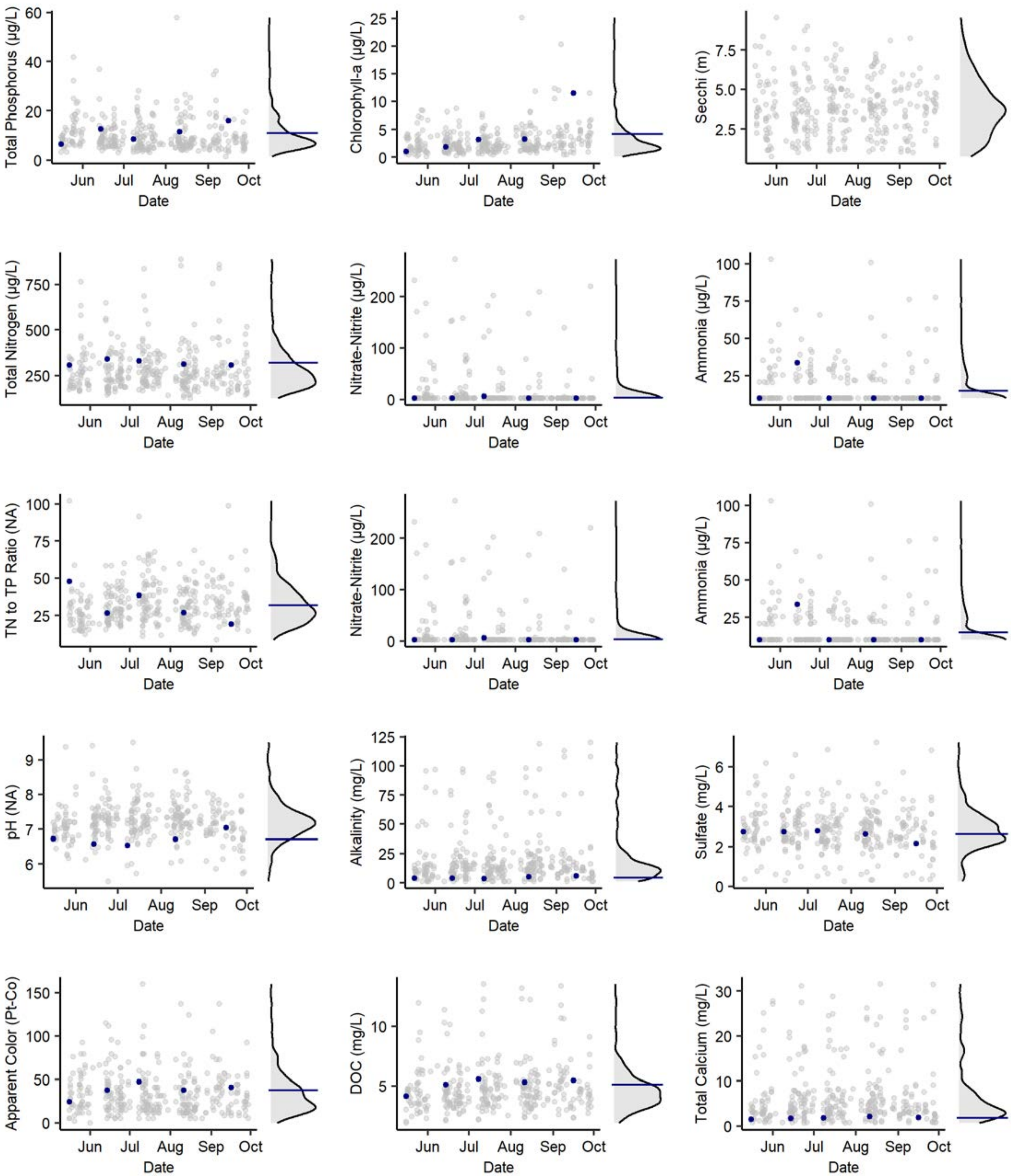
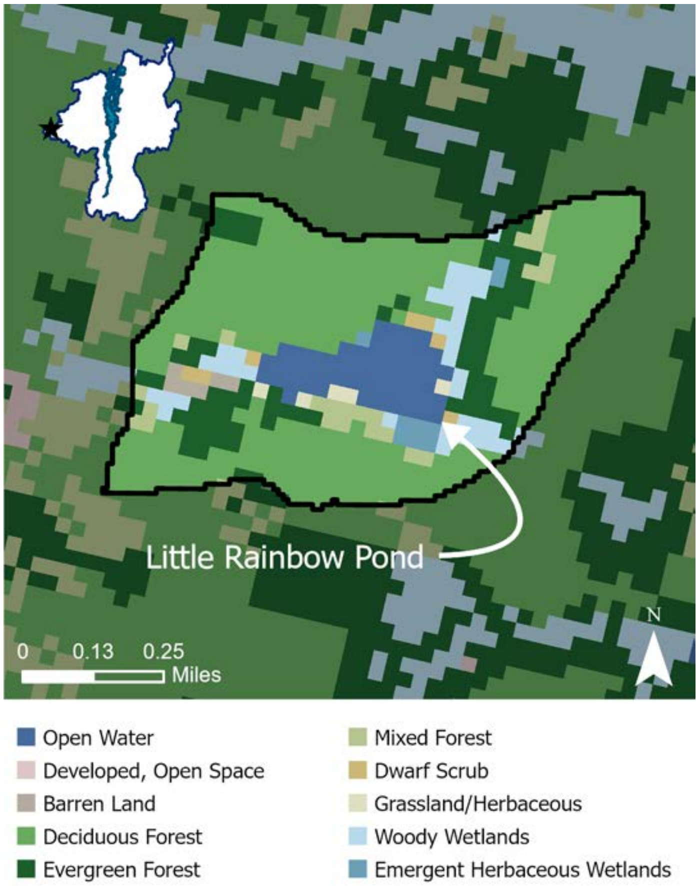


Little Rainbow Pond



Summary

Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Mesotrophic
Trophic Status (Secchi):	Eutrophic
Acidity:	Acidic: acceptable
Acid Neutralizing Capacity:	Moderate
Road Salt Influence:	Low

Notes: Profile data indicate that Little Rainbow Pond is weakly stratified with surface water dissolved oxygen typically >7 mg/L and periods of anoxia in the bottom waters.

Location

Latitude:	44.35935
Longitude:	-74.3255
County:	Franklin
Town:	Santa Clara
Watershed:	Saranac Lakes-Saranac River

Lake Characteristics

Surface Area (ha):	5.0
Shoreline Length (km):	1.1
Max Depth (m):	2.1
Mean Depth (m):	0.8
Volume (m^3):	33,244
Flushing Rate (times/year):	9.7

Watershed Characteristics

Watershed Area (ha):	48.3
Open Water (%):	9.93
Developed, Open Space (%):	0.00
Developed, Low Intensity (%):	0.00
Developed, Medium Intensity (%):	0.00
Developed, High Intensity (%):	0.00
Barren Land (%):	1.12
Deciduous Forest (%):	58.99
Evergreen Forest (%):	14.42
Mixed Forest (%):	4.49
Dwarf Shrub (%):	1.31
Grassland/Herbaceous (%):	0.94
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	7.12
Emergent Herbaceous Wetlands (%):	1.69

Aquatic Invasive Species Detections

None

Harmful Algal Bloom Reports

None

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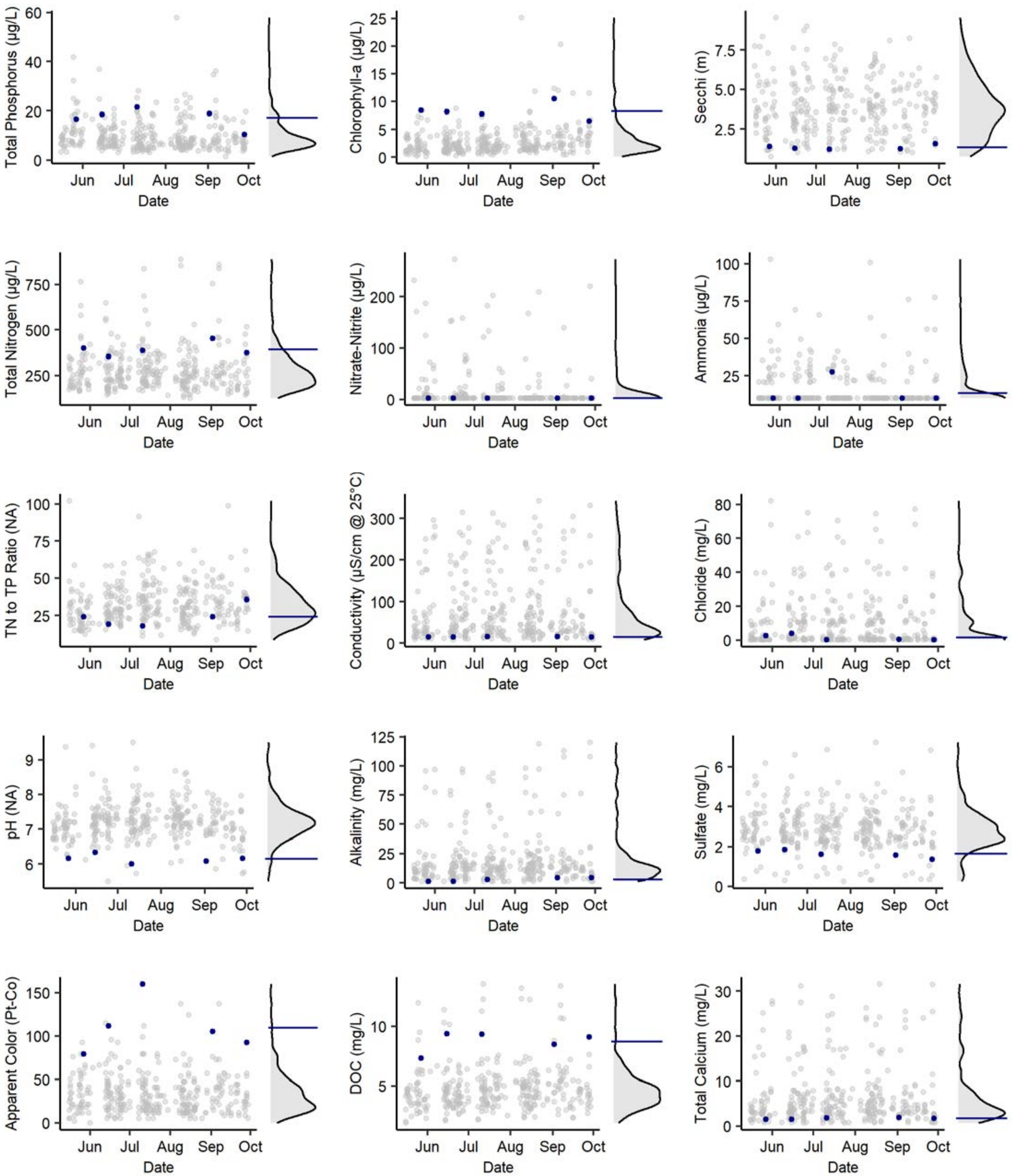
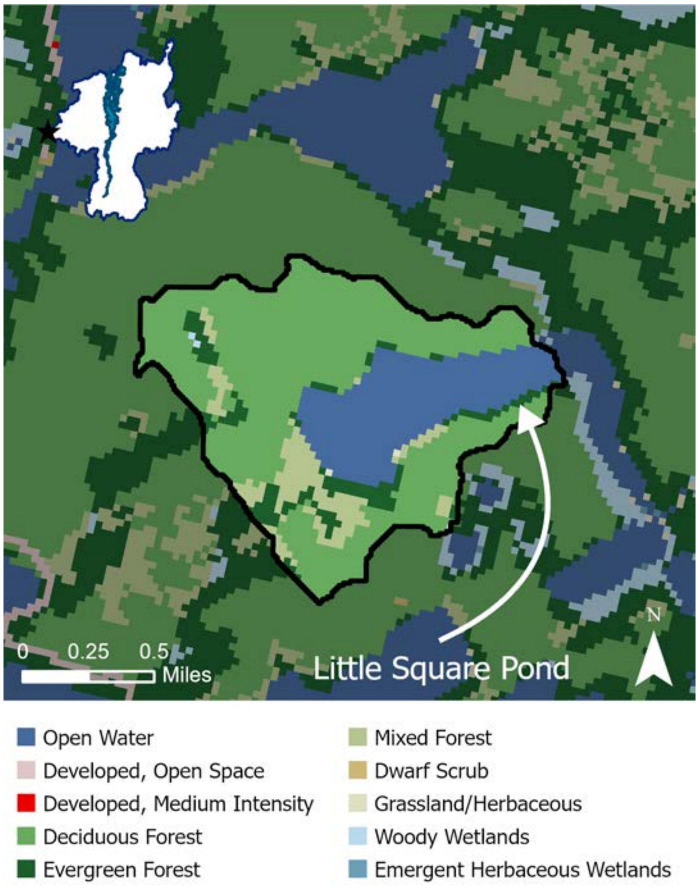


Little Square Pond



Summary

Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Moderate
Road Salt Influence:	None

Notes: Profile data indicate that Little Square Pond is thermally stratified during the summer with the epilimnion having dissolved oxygen concentrations >7 mg/L. The hypolimnion is anoxic (<2 mg/L) for the later part of the summer.

Location

Latitude:	44.3203
Longitude:	-74.3878
County:	Franklin
Town:	Santa Clara
Watershed:	Saranac Lakes-Saranac River

Lake Characteristics

Surface Area (ha):	41.3
Shoreline Length (km):	3.6
Max Depth (m):	8.8
Mean Depth (m):	3.2
Volume (m^3):	1,506,074
Flushing Rate (times/year):	27.5

Watershed Characteristics

Watershed Area (ha):	158.5
Open Water (%):	22.94
Developed, Open Space (%):	0.00
Developed, Low Intensity (%):	0.00
Developed, Medium Intensity (%):	0.00
Developed, High Intensity (%):	0.00
Barren Land (%):	0.00
Deciduous Forest (%):	59.91
Evergreen Forest (%):	7.89
Mixed Forest (%):	8.97
Dwarf Shrub (%):	0.00
Grassland/Herbaceous (%):	0.11
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	0.17
Emergent Herbaceous Wetlands (%):	0.00

Aquatic Invasive Species Detections

Eurasian watermilfoil:	2002

Harmful Algal Bloom Reports

None

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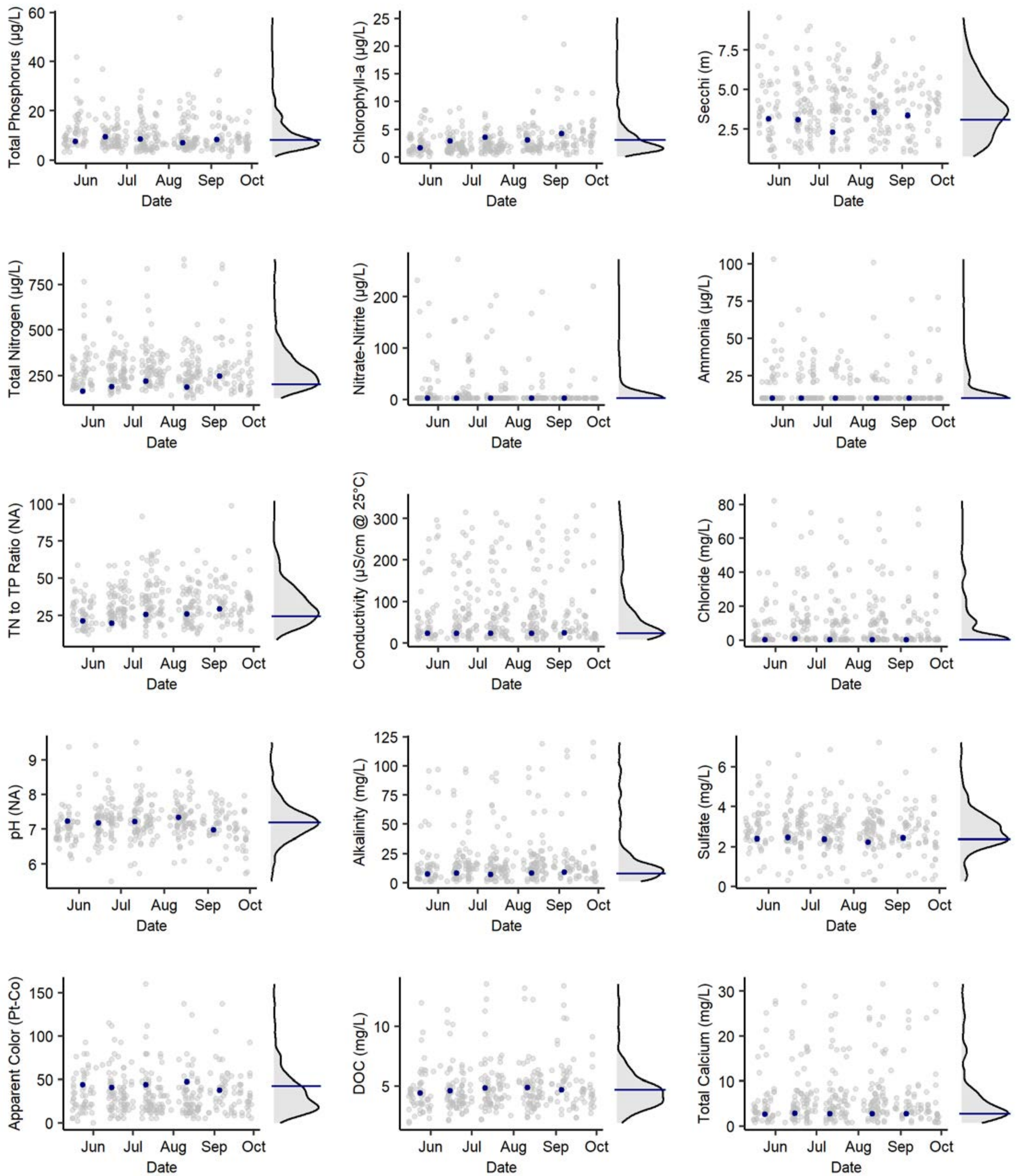
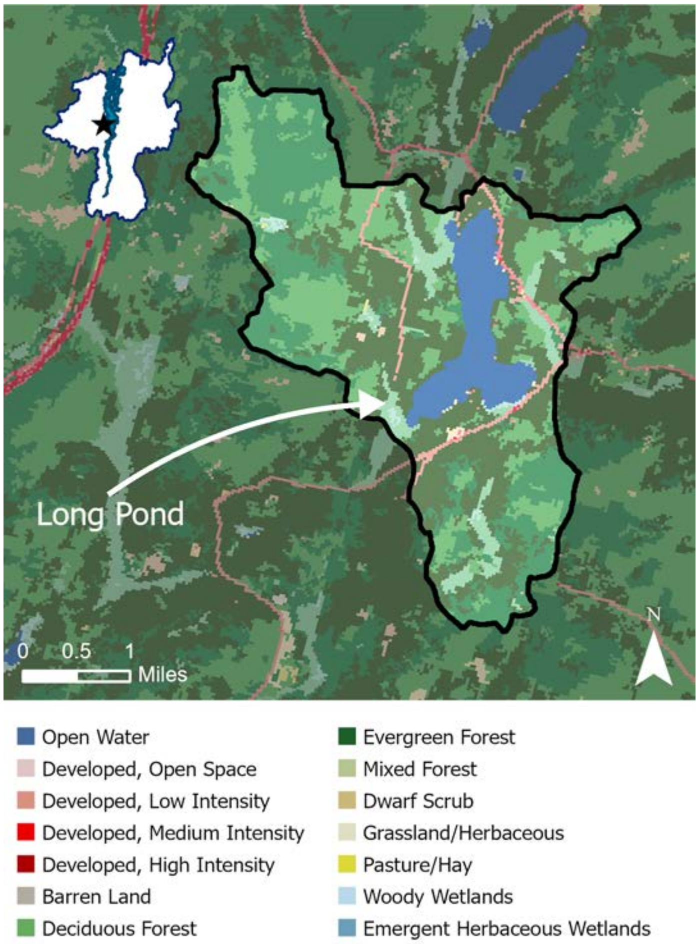


Long Pond



Summary

Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Mesotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Alkaline: non-impacted
Acid Neutralizing Capacity:	High
Road Salt Influence:	Moderate

Notes: None.

Location

Latitude:	44.3810
Longitude:	-73.4537
County:	Essex
Town:	Willsboro
Watershed:	Lake Champlain

Lake Characteristics

Surface Area (ha):	120.3
Shoreline Length (km):	8.1
Max Depth (m):	NA
Mean Depth (m):	NA
Volume (m^3):	2,767,201
Flushing Rate (times/year):	3.7

Watershed Characteristics

Watershed Area (ha):	1,288.1
Open Water (%):	9.44
Developed, Open Space (%):	2.04
Developed, Low Intensity (%):	0.52
Developed, Medium Intensity (%):	0.06
Developed, High Intensity (%):	0.00
Barren Land (%):	0.06
Deciduous Forest (%):	22.92
Evergreen Forest (%):	31.87
Mixed Forest (%):	26.31
Dwarf Shrub (%):	0.14
Grassland/Herbaceous (%):	0.16
Pasture/Hay (%):	0.10
Cultivated Crops (%):	0.00
Woody Wetlands (%):	5.82
Emergent Herbaceous Wetlands (%):	0.57

Aquatic Invasive Species Detections

Eurasian watermilfoil:	2002

Harmful Algal Bloom Reports

None

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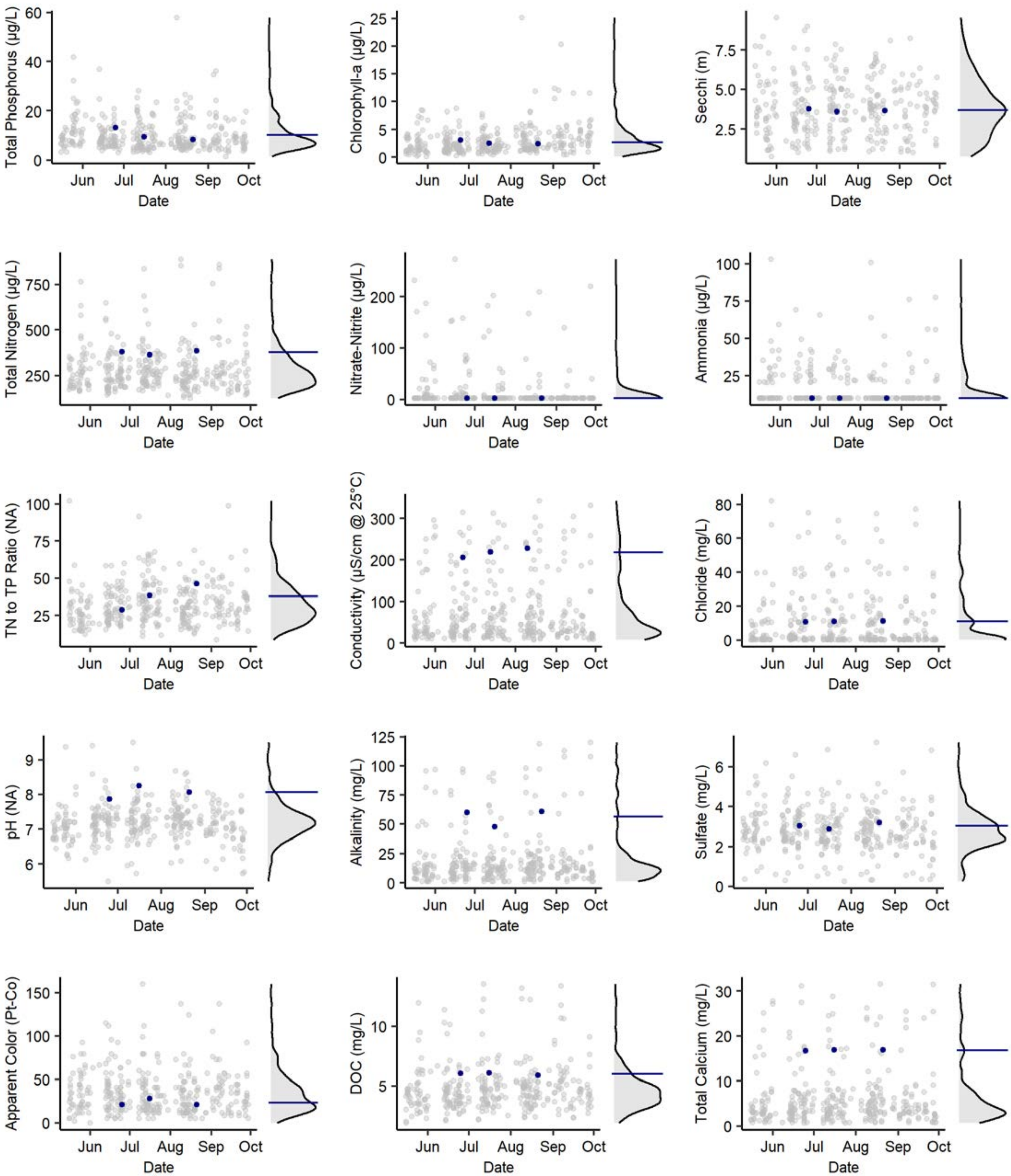
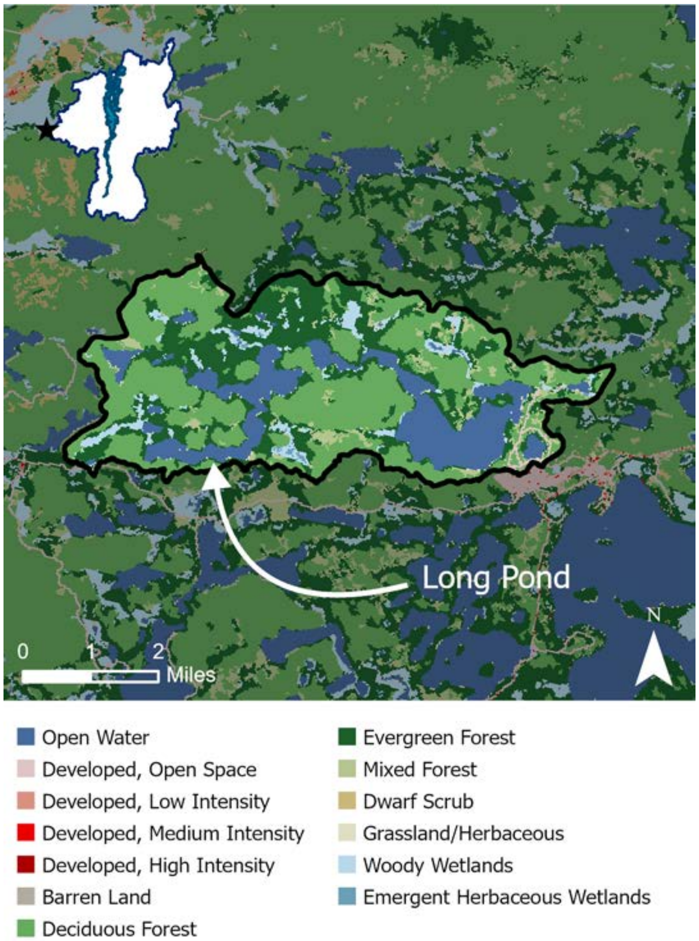


Long Pond



Summary

Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Moderate
Road Salt Influence:	None

Notes: Profile data indicate that Long Pond is thermally stratified during the summer with the epilimnion having dissolved oxygen concentrations >7 mg/L. The hypolimnion is anoxic (<2 mg/L) for the entire summer.

Location

Latitude:	44.3597
Longitude:	-74.3930
County:	Franklin
Town:	Santa Clara
Watershed:	Saranac Lakes-Saranac River

Lake Characteristics

Surface Area (ha):	139.3
Shoreline Length (km):	14.0
Max Depth (m):	15.2
Mean Depth (m):	3.8
Volume (m^3):	5,230,388
Flushing Rate (times/year):	2.7

Watershed Characteristics

Watershed Area (ha):	2,316.3
Open Water (%):	18.70
Developed, Open Space (%):	0.77
Developed, Low Intensity (%):	0.01
Developed, Medium Intensity (%):	0.00
Developed, High Intensity (%):	0.00
Barren Land (%):	0.04
Deciduous Forest (%):	44.46
Evergreen Forest (%):	26.02
Mixed Forest (%):	4.24
Dwarf Shrub (%):	0.13
Grassland/Herbaceous (%):	0.46
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	4.79
Emergent Herbaceous Wetlands (%):	0.38

Aquatic Invasive Species Detections

None

Harmful Algal Bloom Reports

None

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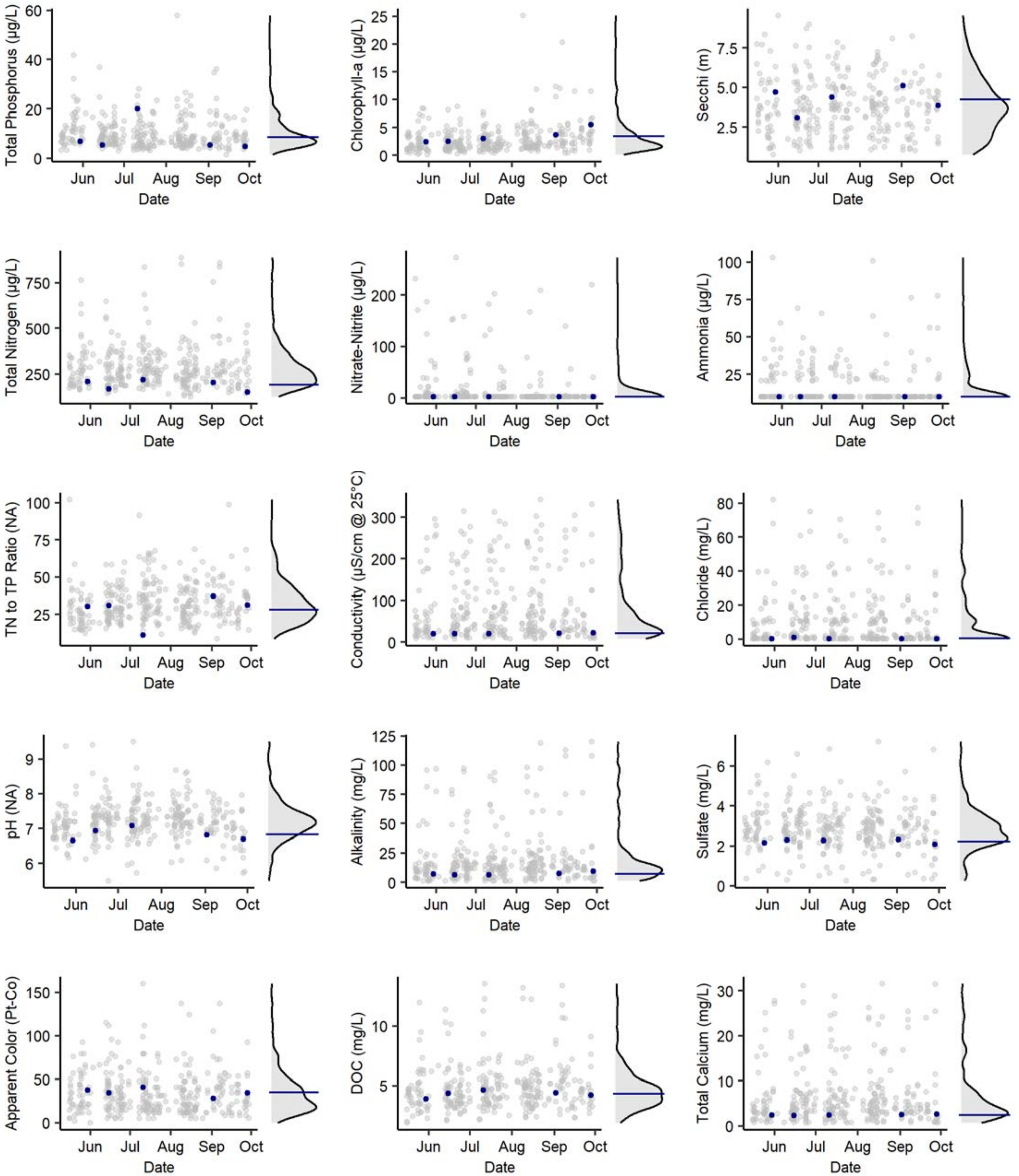
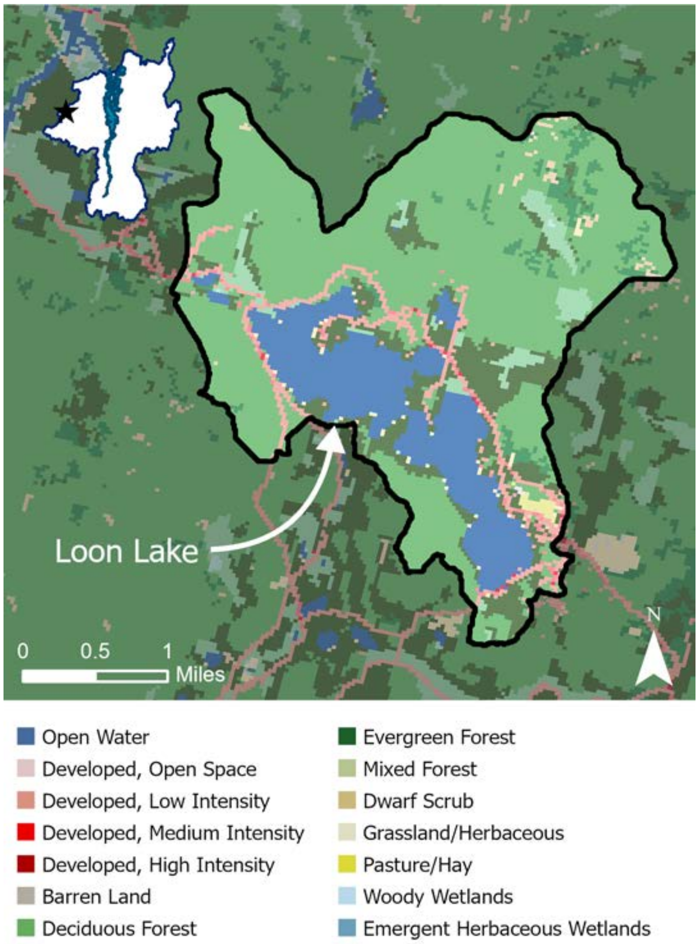


Loon Lake



Summary

Trophic Status (Chl-a):	Oligotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Alkaline: non-impacted
Acid Neutralizing Capacity:	Adequate
Road Salt Influence:	Low

Notes: Two sites are sampled on Loon Lake.

Location

Latitude:	44.5634
Longitude:	-74.0806
County:	Franklin
Town:	Franklin
Watershed:	North Branch Saranac River

Lake Characteristics

Surface Area (ha):	143.9
Shoreline Length (km):	13.4
Max Depth (m):	16.5
Mean Depth (m):	5.2
Volume (m^3):	7,399,735
Flushing Rate (times/year):	0.7

Watershed Characteristics

Watershed Area (ha):	931.6
Open Water (%):	16.63
Developed, Open Space (%):	4.66
Developed, Low Intensity (%):	0.96
Developed, Medium Intensity (%):	0.13
Developed, High Intensity (%):	0.04
Barren Land (%):	0.06
Deciduous Forest (%):	57.28
Evergreen Forest (%):	12.00
Mixed Forest (%):	3.30
Dwarf Shrub (%):	0.65
Grassland/Herbaceous (%):	0.52
Pasture/Hay (%):	0.38
Cultivated Crops (%):	0.00
Woody Wetlands (%):	3.36
Emergent Herbaceous Wetlands (%):	0.05

Aquatic Invasive Species Detections

None

Harmful Algal Bloom Reports

None

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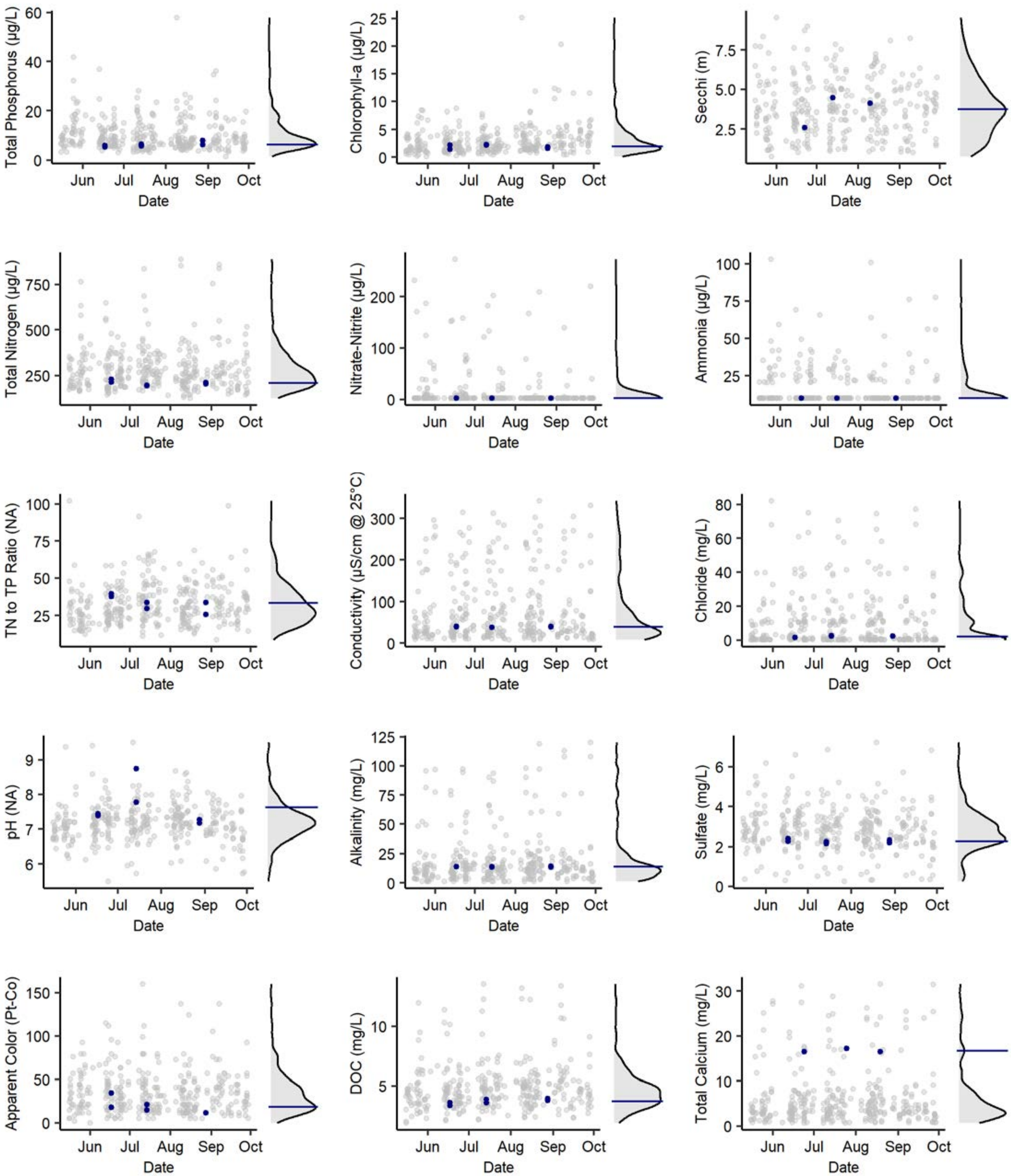
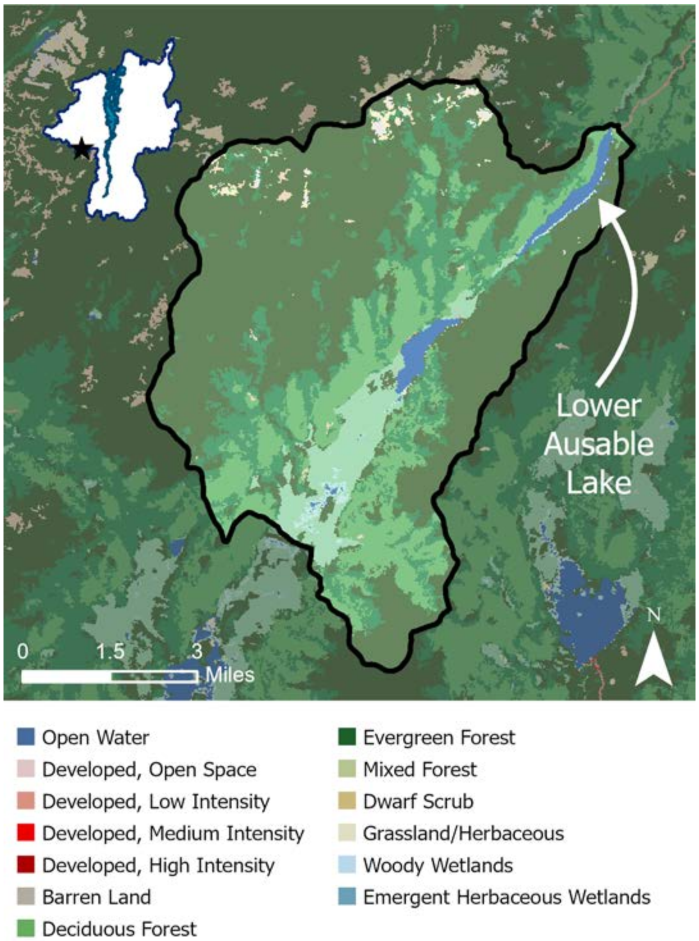


Lower Ausable Lake



Summary

Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Moderate
Road Salt Influence:	None

Notes: None.

Location

Latitude:	44.1055
Longitude:	-73.8335
County:	Essex
Town:	Keene
Watershed:	East Branch Ausable River

Lake Characteristics

Surface Area (ha):	58.2
Shoreline Length (km):	8.4
Max Depth (m):	6.1
Mean Depth (m):	2.9
Volume (m^3):	1,722,556
Flushing Rate (times/year):	23.0

Watershed Characteristics

Watershed Area (ha):	6,208.4
Open Water (%):	4.24
Developed, Open Space (%):	1.10
Developed, Low Intensity (%):	0.89
Developed, Medium Intensity (%):	0.58
Developed, High Intensity (%):	0.15
Barren Land (%):	0.00
Deciduous Forest (%):	45.00
Evergreen Forest (%):	22.41
Mixed Forest (%):	24.35
Dwarf Shrub (%):	0.39
Grassland/Herbaceous (%):	0.51
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	0.15
Emergent Herbaceous Wetlands (%):	0.23

Aquatic Invasive Species Detections

None

Harmful Algal Bloom Reports

None

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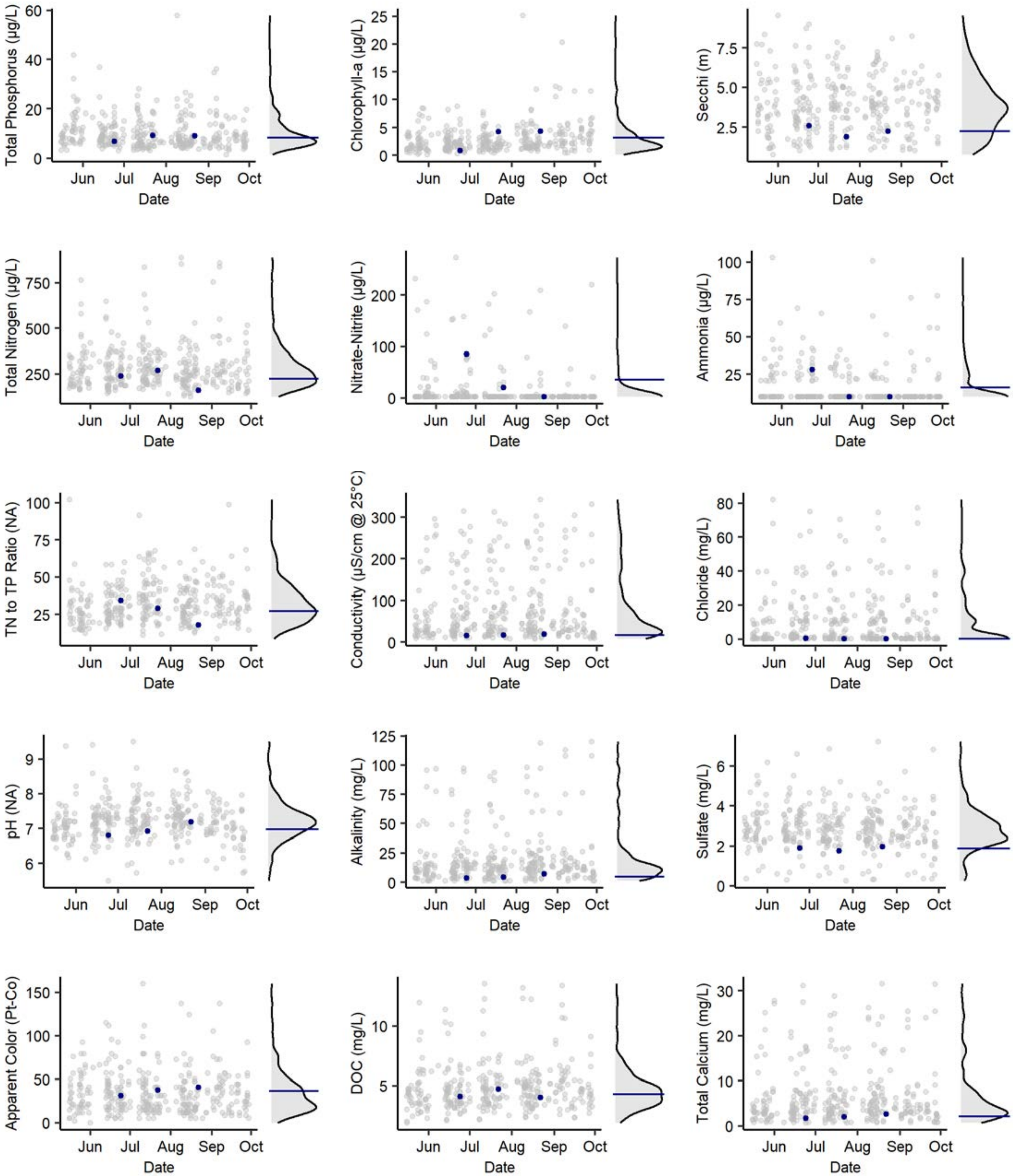
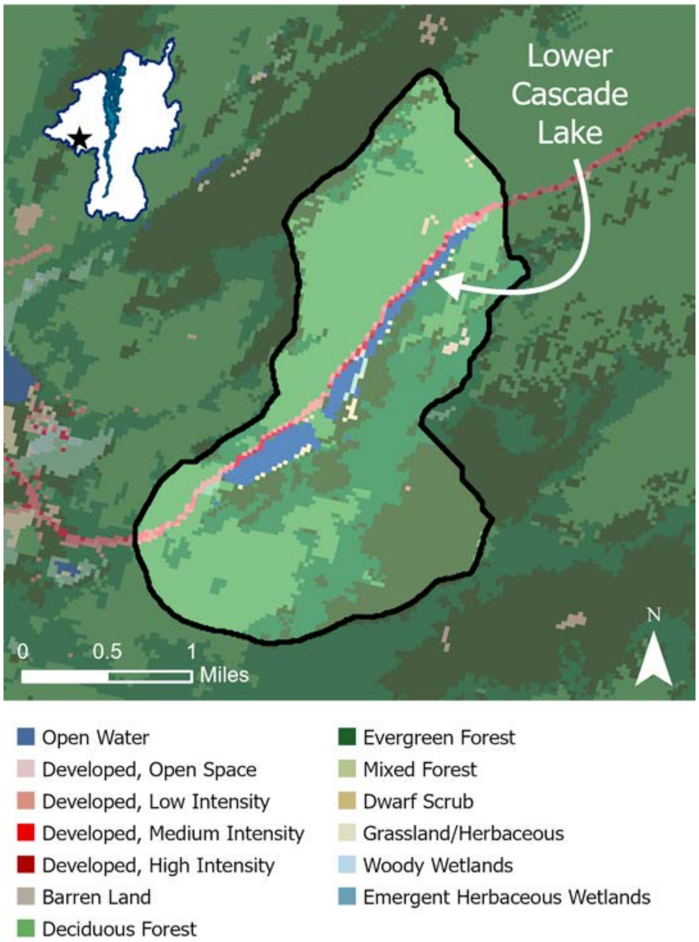


Lower Cascade Lake



Location	
Latitude:	44.2282
Longitude:	-73.8718
County:	Essex
Town:	Keene
Watershed:	East Branch Ausable River

Lake Characteristics	
Surface Area (ha):	11.1
Shoreline Length (km):	3.5
Max Depth (m):	12.5
Mean Depth (m):	3.4
Volume (m^3):	345,522
Flushing Rate (times/year):	11.1

Watershed Characteristics	
Watershed Area (ha):	548.3
Open Water (%):	4.24
Developed, Open Space (%):	1.10
Developed, Low Intensity (%):	0.89
Developed, Medium Intensity (%):	0.58
Developed, High Intensity (%):	0.15
Barren Land (%):	0.00
Deciduous Forest (%):	45.00
Evergreen Forest (%):	22.41
Mixed Forest (%):	24.35
Dwarf Shrub (%):	0.39
Grassland/Herbaceous (%):	0.51
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	0.15
Emergent Herbaceous Wetlands (%):	0.23

Summary	
Trophic Status (Chl-a):	Oligotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Adequate
Road Salt Influence:	High

Notes: None.

Aquatic Invasive Species Detections
None

Harmful Algal Bloom Reports
None

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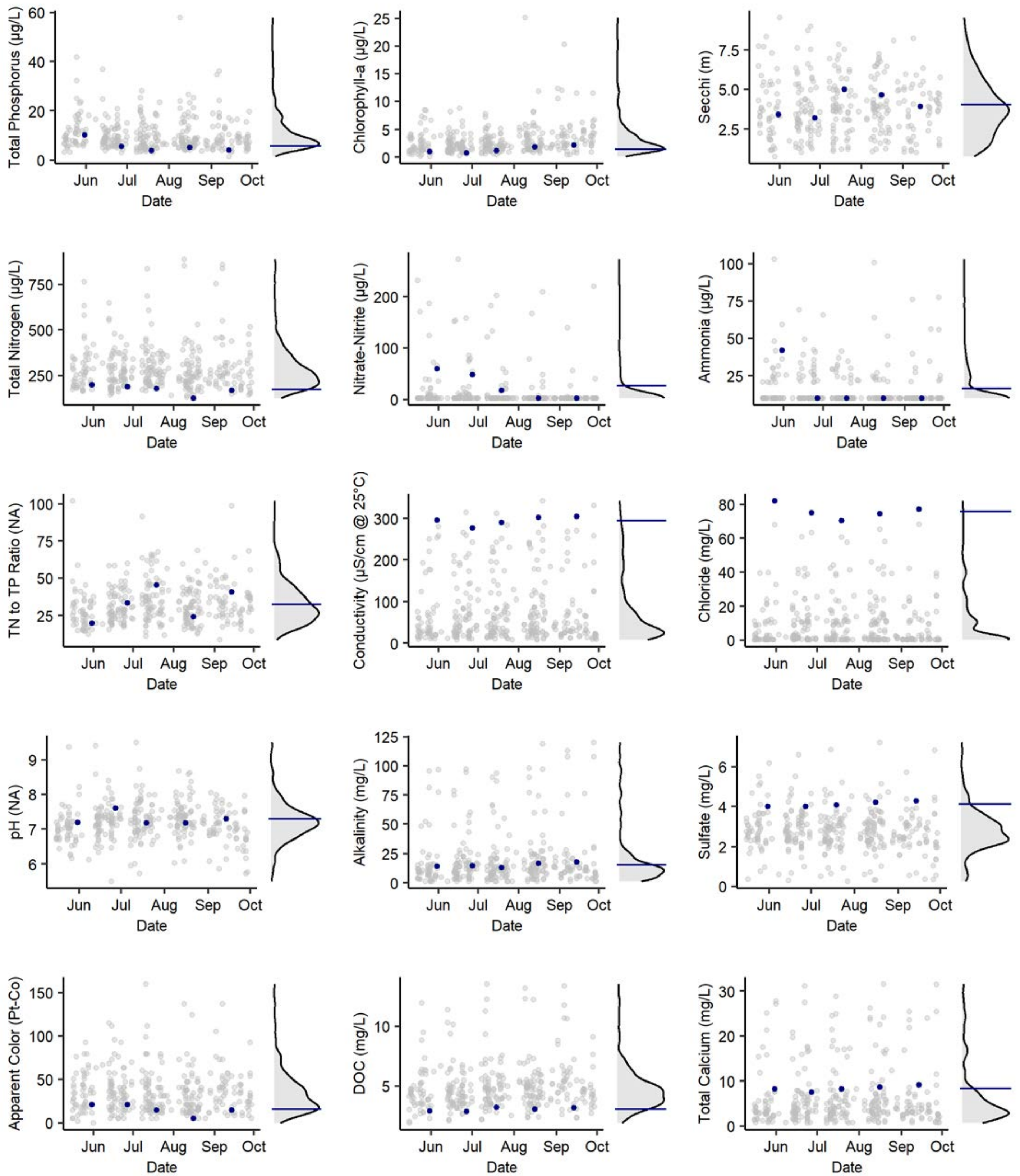
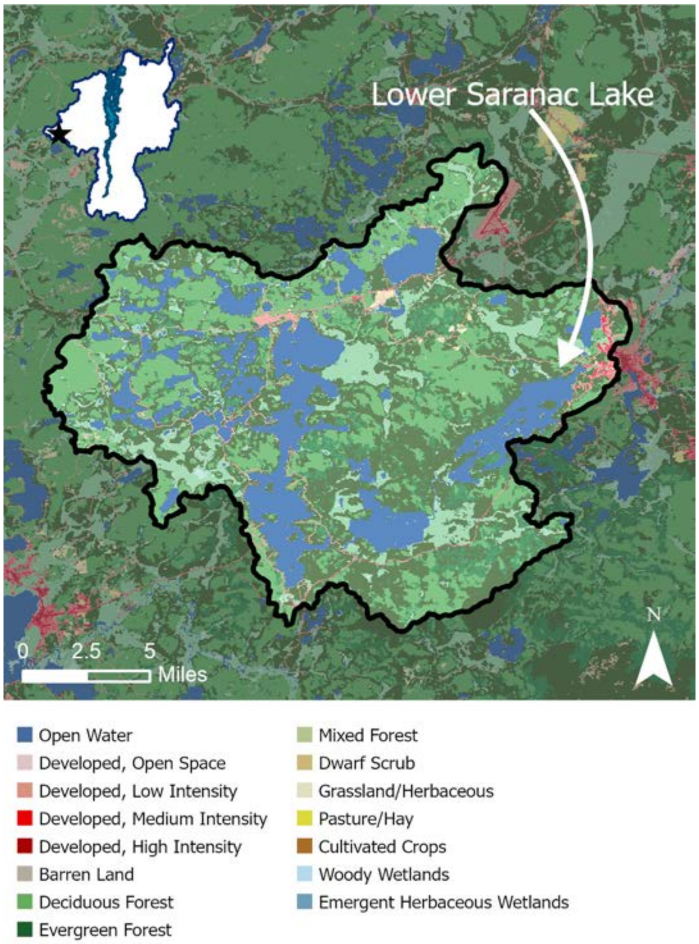


Lower Saranac Lake



Location

Latitude:	44.3154
Longitude:	-74.1795
County:	Franklin
Town:	Harrietstown
Watershed:	Saranac Lakes-Saranac River

Lake Characteristics

Surface Area (ha):	870.5
Shoreline Length (km):	47.5
Max Depth (m):	18.3
Mean Depth (m):	9.1
Volume (m^3):	78,985,872
Flushing Rate (times/year):	2.5

Watershed Characteristics

Watershed Area (ha):	32,059
Open Water (%):	18.83
Developed, Open Space (%):	1.86
Developed, Low Intensity (%):	0.50
Developed, Medium Intensity (%):	0.28
Developed, High Intensity (%):	0.04
Barren Land (%):	0.03
Deciduous Forest (%):	27.03
Evergreen Forest (%):	32.96
Mixed Forest (%):	7.69
Dwarf Shrub (%):	0.30
Grassland/Herbaceous (%):	0.48
Pasture/Hay (%):	0.02
Cultivated Crops (%):	0.00
Woody Wetlands (%):	9.62
Emergent Herbaceous Wetlands (%):	0.36

Summary

Trophic Status (Chl-a):	Oligotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Adequate
Road Salt Influence:	Moderate

Notes: None.

Aquatic Invasive Species Detections

Eurasian watermilfoil:	2002
Curly-leaf pondweed:	2010
Variable-leaf milfoil:	2015

Harmful Algal Bloom Reports

2022

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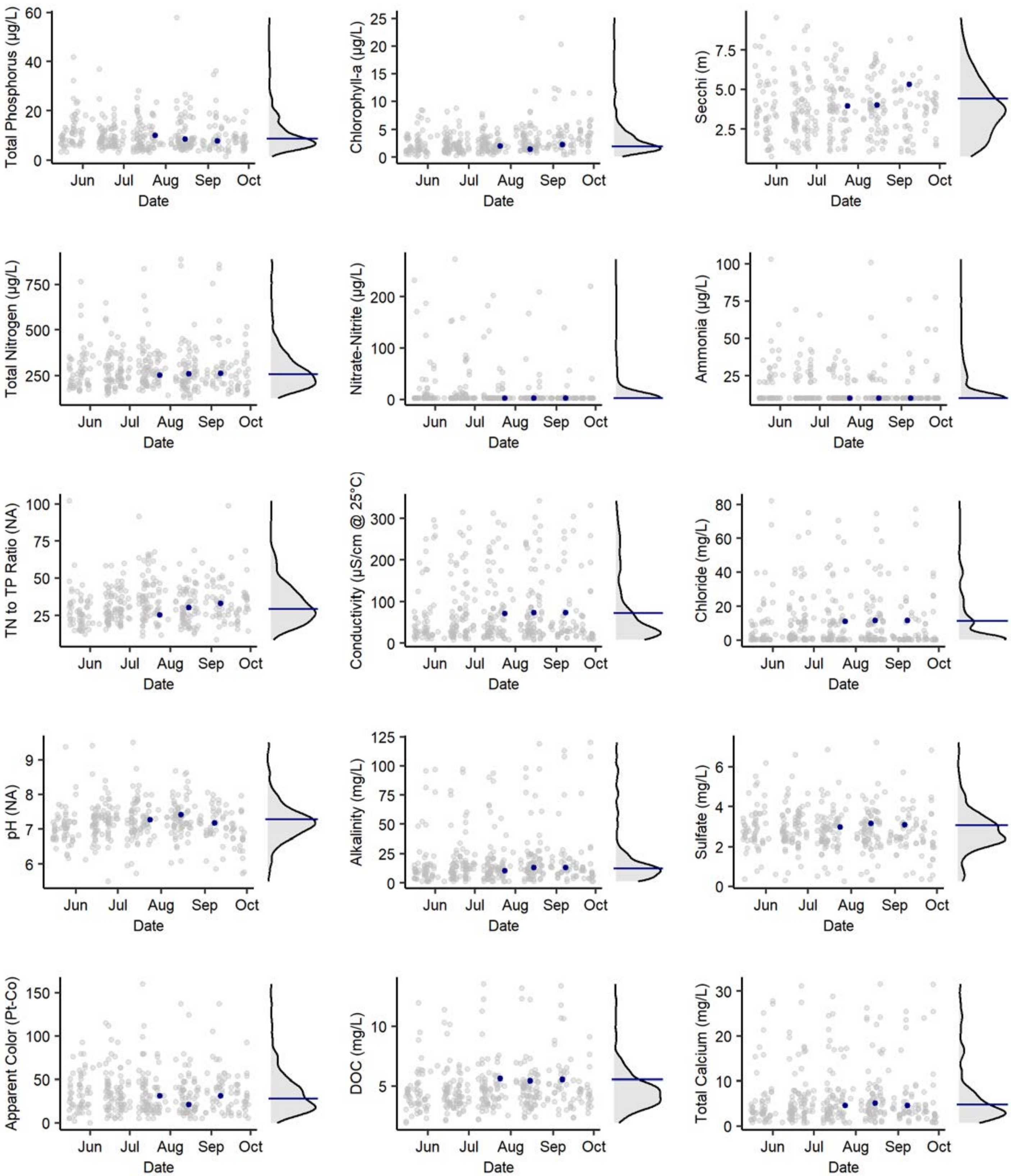
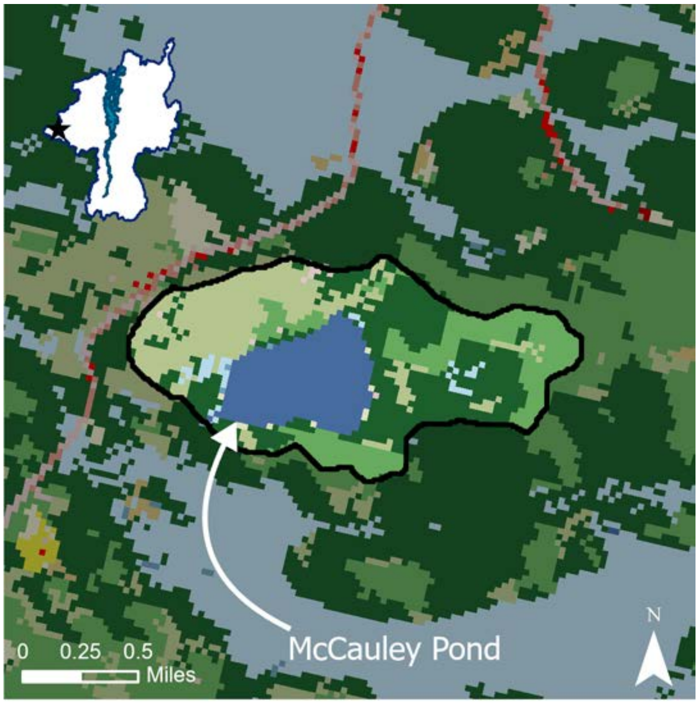


McCauley Pond



- Open Water
- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, High Intensity
- Barren Land
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Dwarf Scrub
- Grassland/Herbaceous
- Pasture/Hay
- Woody Wetlands
- Emergent Herbaceous Wetlands

Summary

Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Mesotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Moderate
Road Salt Influence:	Low

Notes: None.

Location

Latitude:	44.3530
Longitude:	-74.2034
County:	Franklin
Town:	Harrietstown
Watershed:	Saranac Lakes-Saranac River

Lake Characteristics

Surface Area (ha):	32.8
Shoreline Length (km):	2.6
Max Depth (m):	3.6
Mean Depth (m):	2.3
Volume (m^3):	728,901
Flushing Rate (times/year):	1.4

Watershed Characteristics

Watershed Area (ha):	160.2
Open Water (%):	19.70
Developed, Open Space (%):	0.51
Developed, Low Intensity (%):	0.00
Developed, Medium Intensity (%):	0.00
Developed, High Intensity (%):	0.00
Barren Land (%):	0.00
Deciduous Forest (%):	20.88
Evergreen Forest (%):	32.51
Mixed Forest (%):	23.59
Dwarf Shrub (%):	0.00
Grassland/Herbaceous (%):	0.51
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	2.14
Emergent Herbaceous Wetlands (%):	0.17

Aquatic Invasive Species Detections

None

Harmful Algal Bloom Reports

None

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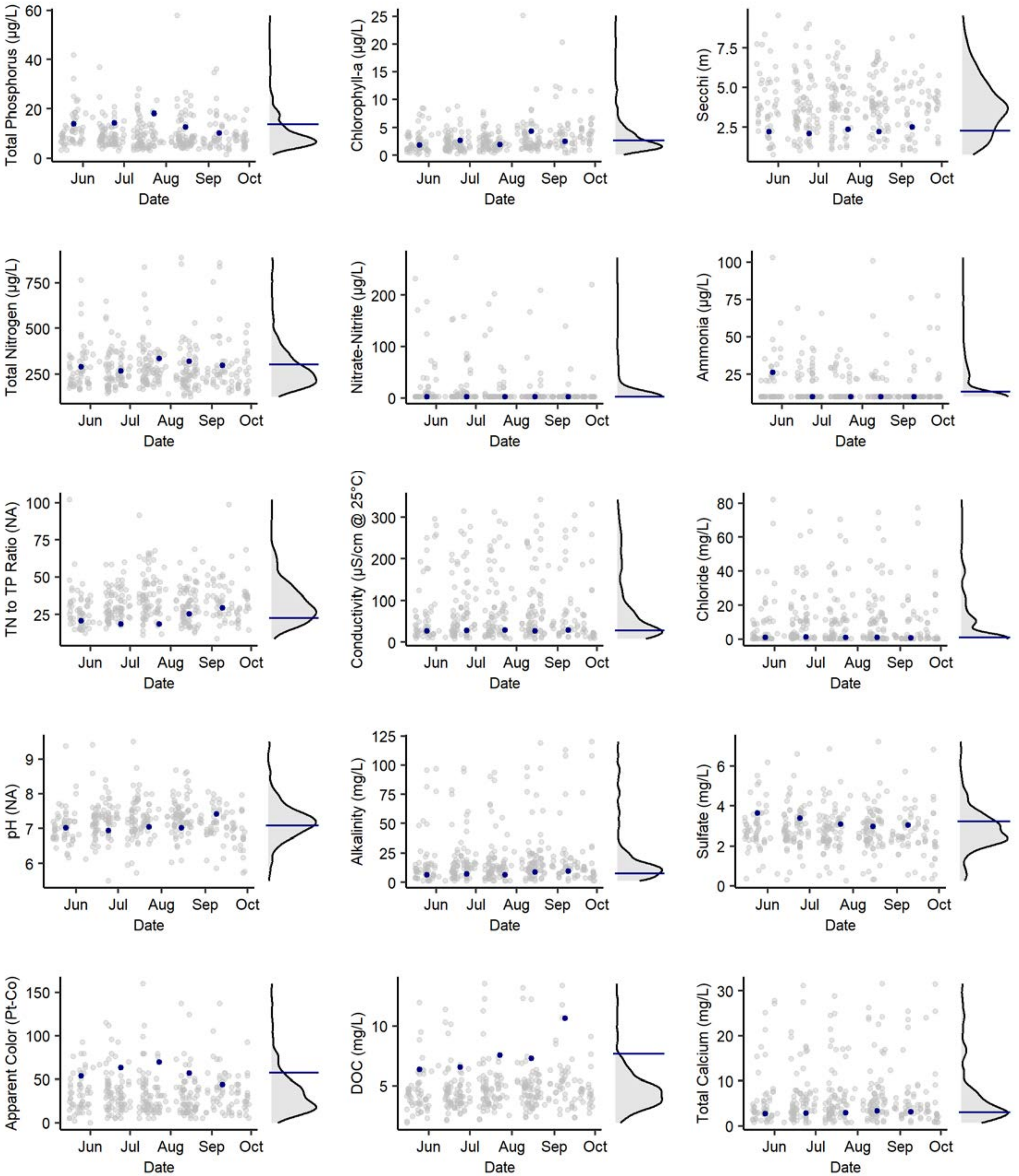
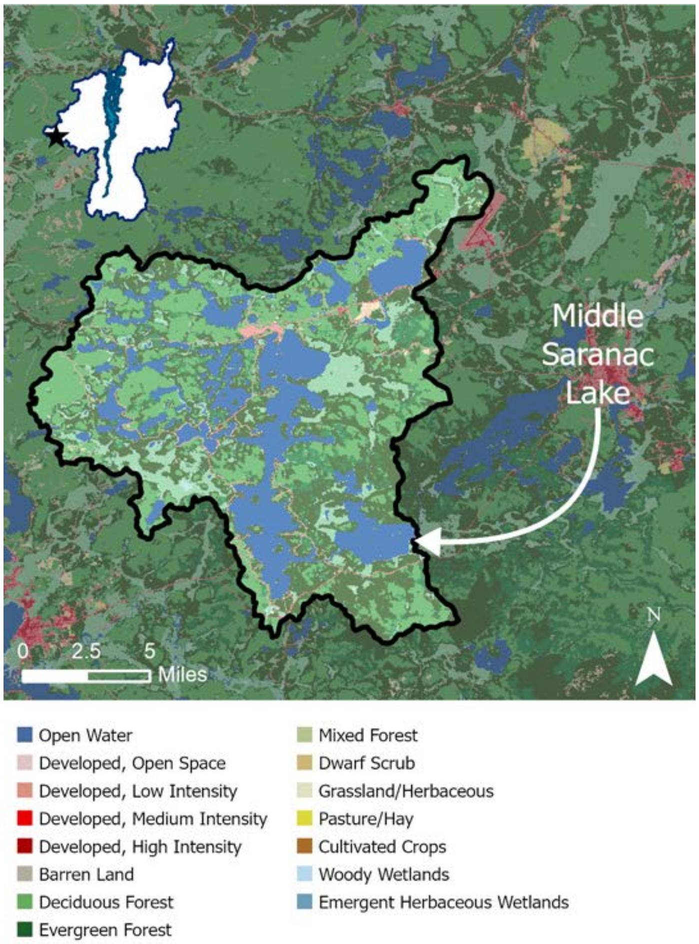


Middle Saranac Lake



Location

Latitude:	44.2594
Longitude:	-74.2672
County:	Franklin
Towns:	Harrietstown, Santa Clara
Watershed:	Saranac Lakes-Saranac River

Lake Characteristics

Surface Area (ha):	572.6
Shoreline Length (km):	18.3
Max Depth (m):	6.1
Mean Depth (m):	2.7
Volume (m^3):	15,370,704
Flushing Rate (times/year):	10.0

Watershed Characteristics

Watershed Area (ha):	23,412.1
Open Water (%):	21.05
Developed, Open Space (%):	1.93
Developed, Low Intensity (%):	0.32
Developed, Medium Intensity (%):	0.13
Developed, High Intensity (%):	0.01
Barren Land (%):	0.02
Deciduous Forest (%):	28.99
Evergreen Forest (%):	30.71
Mixed Forest (%):	6.20
Dwarf Shrub (%):	0.34
Grassland/Herbaceous (%):	0.48
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	9.45
Emergent Herbaceous Wetlands (%):	0.38

Summary

Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Mesotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Adequate
Road Salt Influence:	Low

Notes: None.

Aquatic Invasive Species Detections

Eurasian watermilfoil:	2002

Harmful Algal Bloom Reports

None

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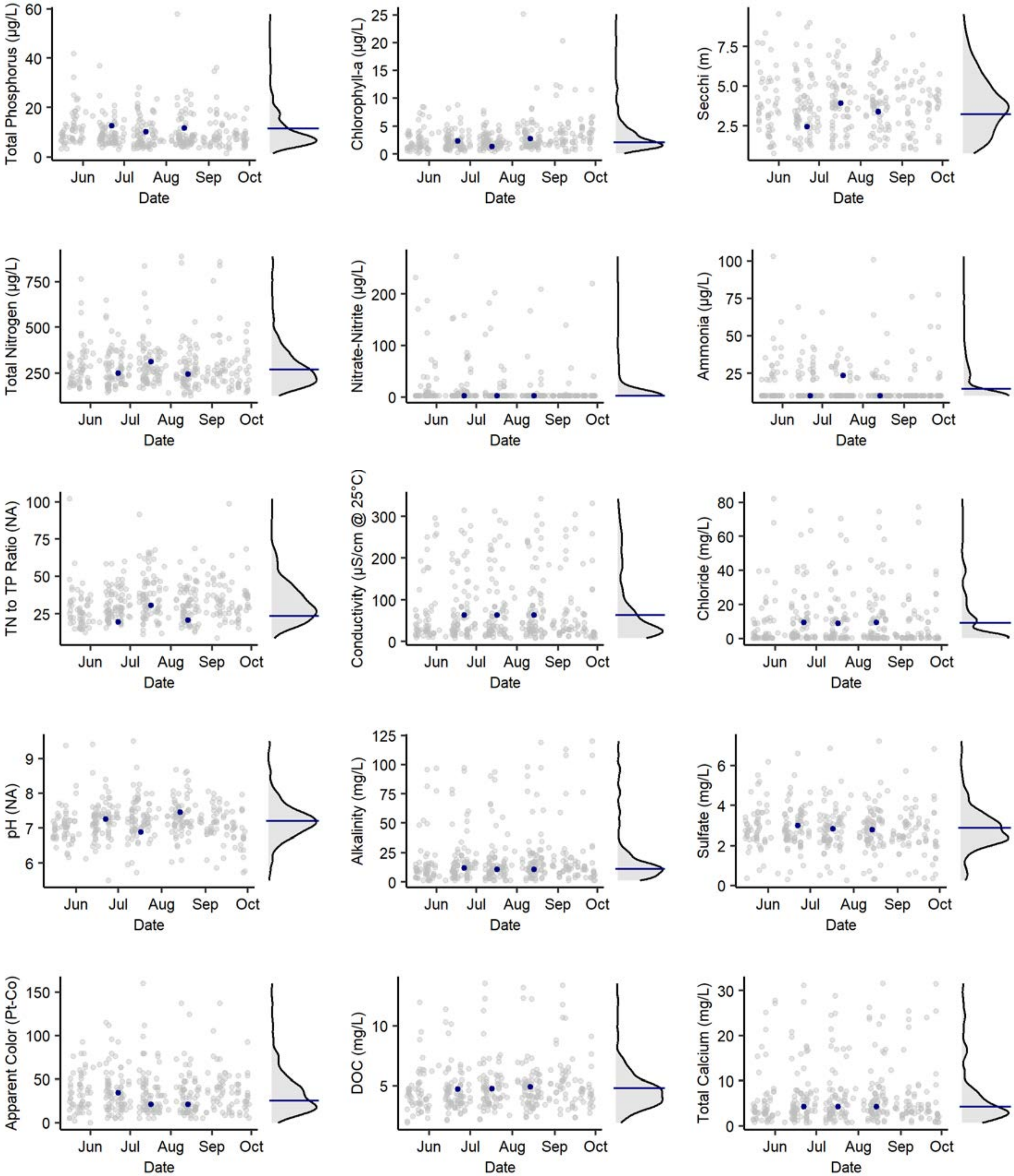
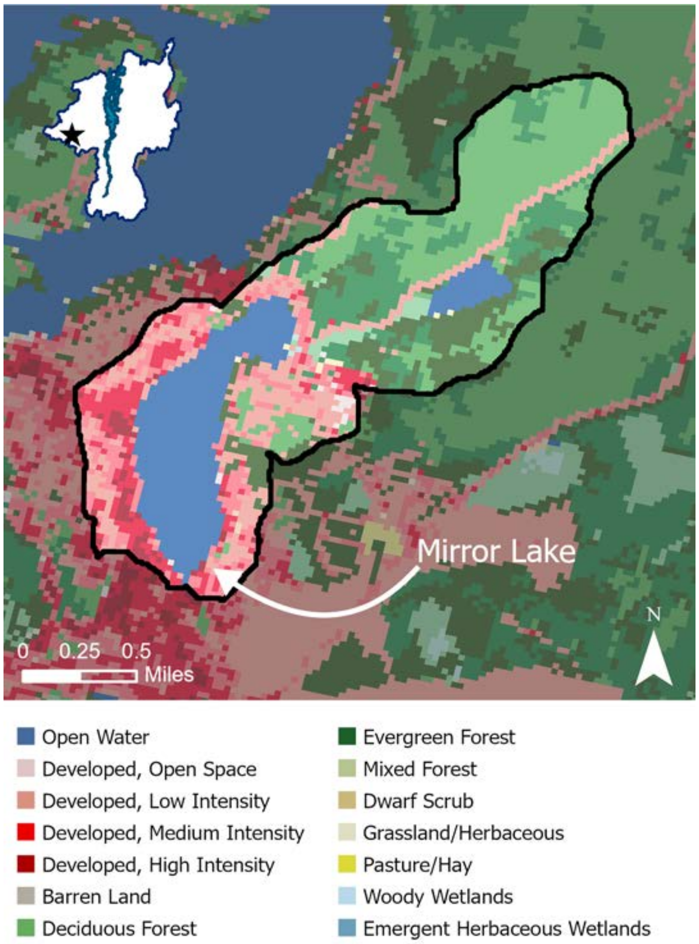


Mirror Lake



Summary	
Trophic Status (Chl-a):	Oligotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Oligotrophic
Acidity:	Alkaline: non-impacted
Acid Neutralizing Capacity:	High
Road Salt Influence:	Moderate

Notes: Profile data indicate that Mirror Lake is thermally stratified during the summer with the epilimnion having dissolved oxygen concentrations >7 mg/L. The hypolimnion is anoxic (<2 mg/L) for the later part of the summer.

Location	
Latitude:	44.2891
Longitude:	-73.9822
County:	Essex
Town:	North Elba
Watershed:	West Branch Ausable River

Lake Characteristics	
Surface Area (ha):	50.5
Shoreline Length (km):	4.0
Max Depth (m):	18.3
Mean Depth (m):	4.4
Volume (m^3):	2,211,328
Flushing Rate (times/year):	0.6

Watershed Characteristics	
Watershed Area (ha):	301.1
Open Water (%):	18.78
Developed, Open Space (%):	14.6
Developed, Low Intensity (%):	8.48
Developed, Medium Intensity (%):	6.09
Developed, High Intensity (%):	2.03
Barren Land (%):	0.69
Deciduous Forest (%):	24.84
Evergreen Forest (%):	10.75
Mixed Forest (%):	11.88
Dwarf Shrub (%):	0.12
Grassland/Herbaceous (%):	0.30
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	1.34
Emergent Herbaceous Wetlands (%):	0.09

Aquatic Invasive Species Detections
None

Harmful Algal Bloom Reports
2020, 2022

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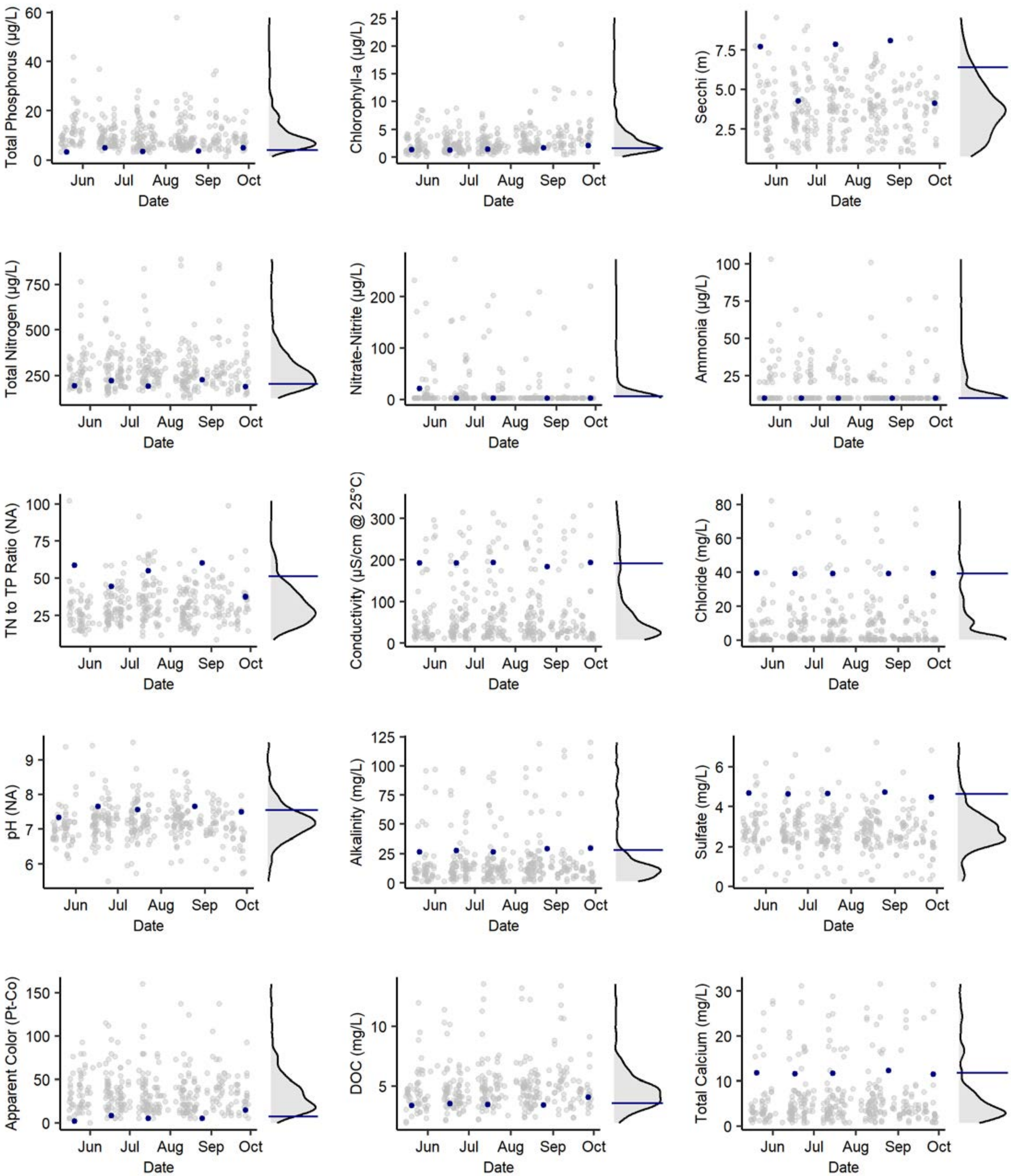
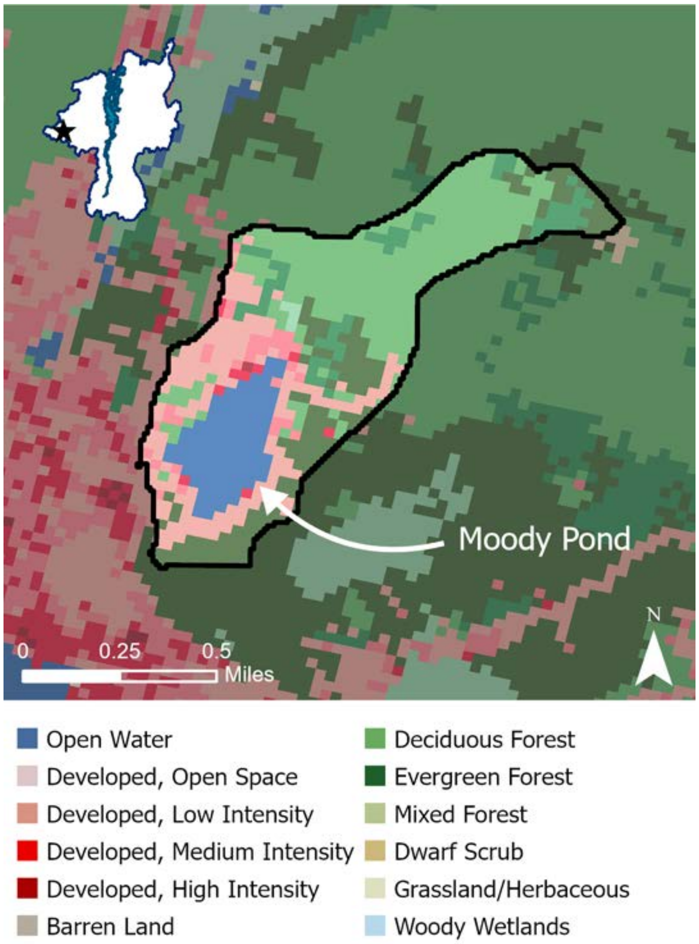


Moody Pond



Summary	
Trophic Status (Chl-a):	Oligotrophic
Trophic Status (TP):	Mesotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Adequate
Road Salt Influence:	Moderate

Notes: None.

Location	
Latitude:	44.3291
Longitude:	-74.1181
Counties:	Essex, Franlkin
Towns:	North Elba, St. Armand
Watershed:	Sumner Brook-Saranac River

Lake Characteristics	
Surface Area (ha):	10.8
Shoreline Length (km):	1.5
Max Depth (m):	5.2
Mean Depth (m):	2.6
Volume (m^3):	239,559
Flushing Rate (times/year):	1.5

Watershed Characteristics	
Watershed Area (ha):	70.0
Open Water (%):	12.55
Developed, Open Space (%):	18.05
Developed, Low Intensity (%):	3.84
Developed, Medium Intensity (%):	1.28
Developed, High Intensity (%):	0.13
Barren Land (%):	0.00
Deciduous Forest (%):	37.52
Evergreen Forest (%):	18.44
Mixed Forest (%):	7.68
Dwarf Shrub (%):	0.00
Grassland/Herbaceous (%):	0.00
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	0.51
Emergent Herbaceous Wetlands (%):	0.00

Aquatic Invasive Species Detections	
Eurasian watermilfoil:	2018

Harmful Algal Bloom Reports
None

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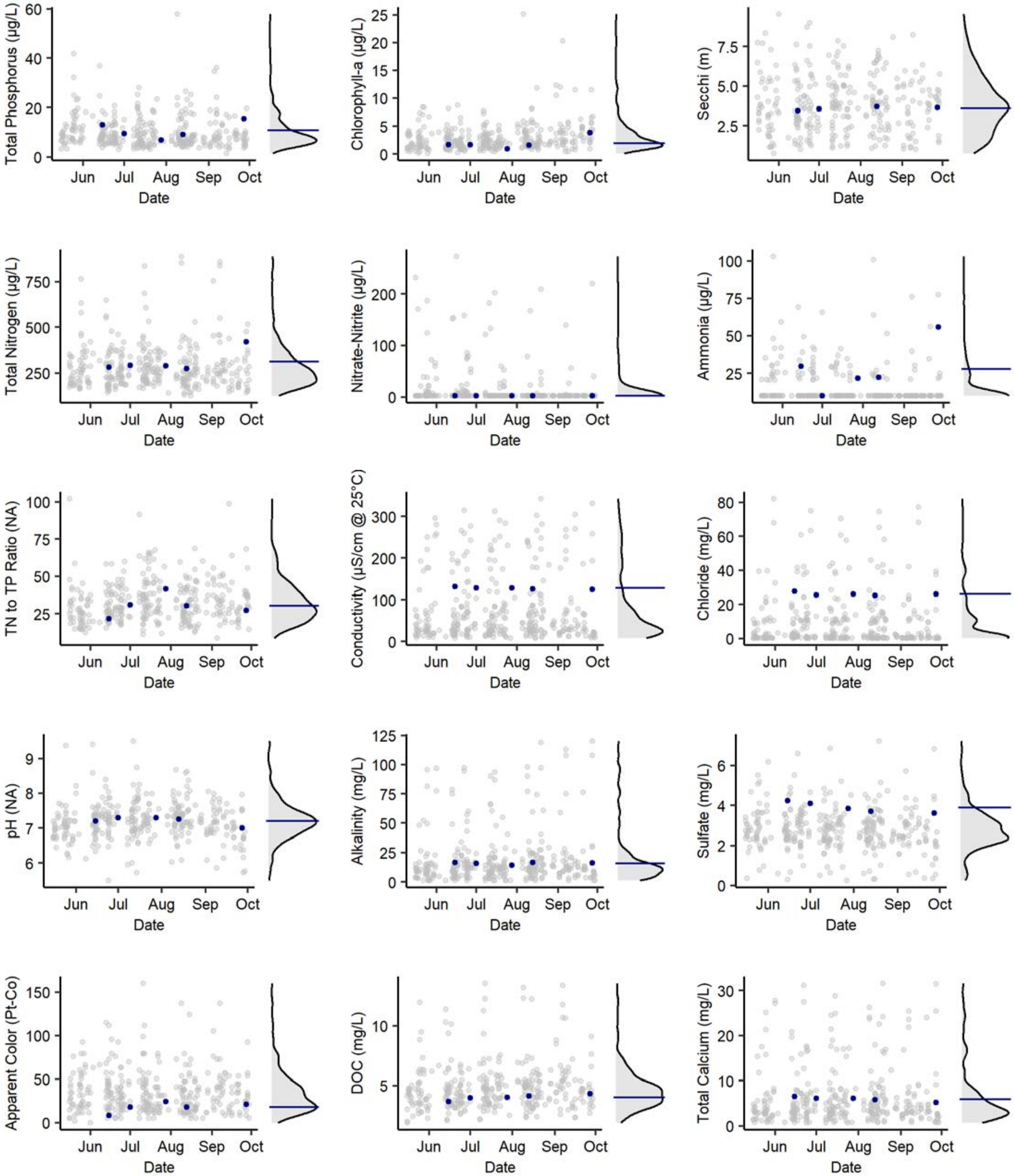
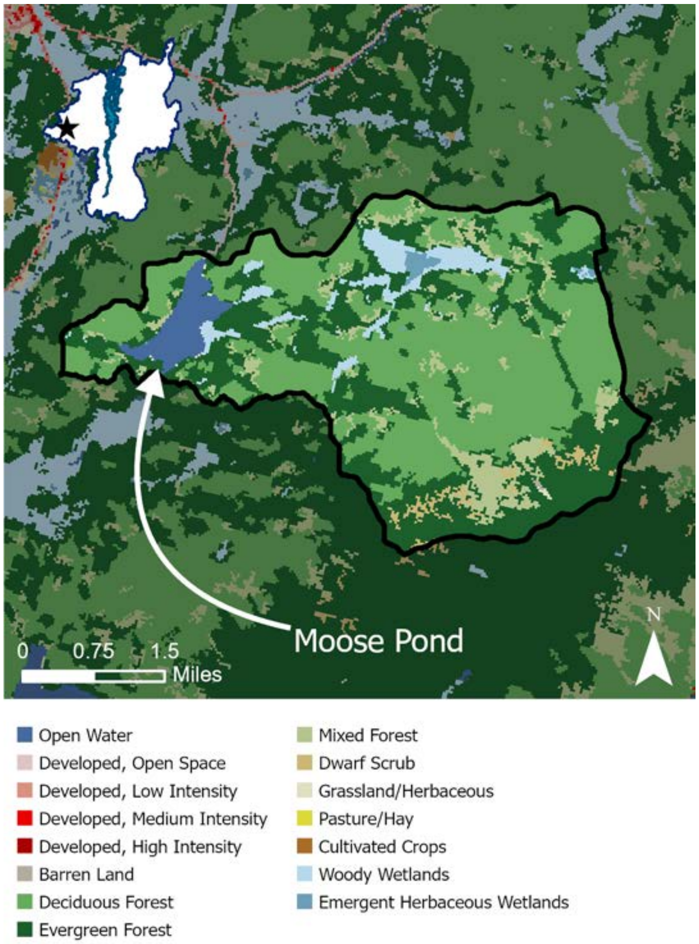


Moose Pond



Location	
Latitude:	44.3720
Longitude:	-74.0627
County:	Essex
Town:	St. Armand
Watershed:	Sumner Brook-Saranac River

Lake Characteristics	
Surface Area (ha):	66.0
Shoreline Length (km):	6.0
Max Depth (m):	21.3
Mean Depth (m):	8.7
Volume (m^3):	4,922,230
Flushing Rate (times/year):	2.9

Watershed Characteristics	
Watershed Area (ha):	1,800.7
Open Water (%):	3.52
Developed, Open Space (%):	0.01
Developed, Low Intensity (%):	0.00
Developed, Medium Intensity (%):	0.00
Developed, High Intensity (%):	0.00
Barren Land (%):	0.05
Deciduous Forest (%):	47.82
Evergreen Forest (%):	33.54
Mixed Forest (%):	8.24
Dwarf Shrub (%):	1.39
Grassland/Herbaceous (%):	0.12
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	4.71
Emergent Herbaceous Wetlands (%):	0.61

Summary	
Trophic Status (Chl-a):	Oligotrophic
Trophic Status (TP):	Mesotrophic
Trophic Status (Secchi):	NA
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Moderate
Road Salt Influence:	None

Notes: Secchi data didn't pass quality checks.

Aquatic Invasive Species Detections
None

Harmful Algal Bloom Reports
2022

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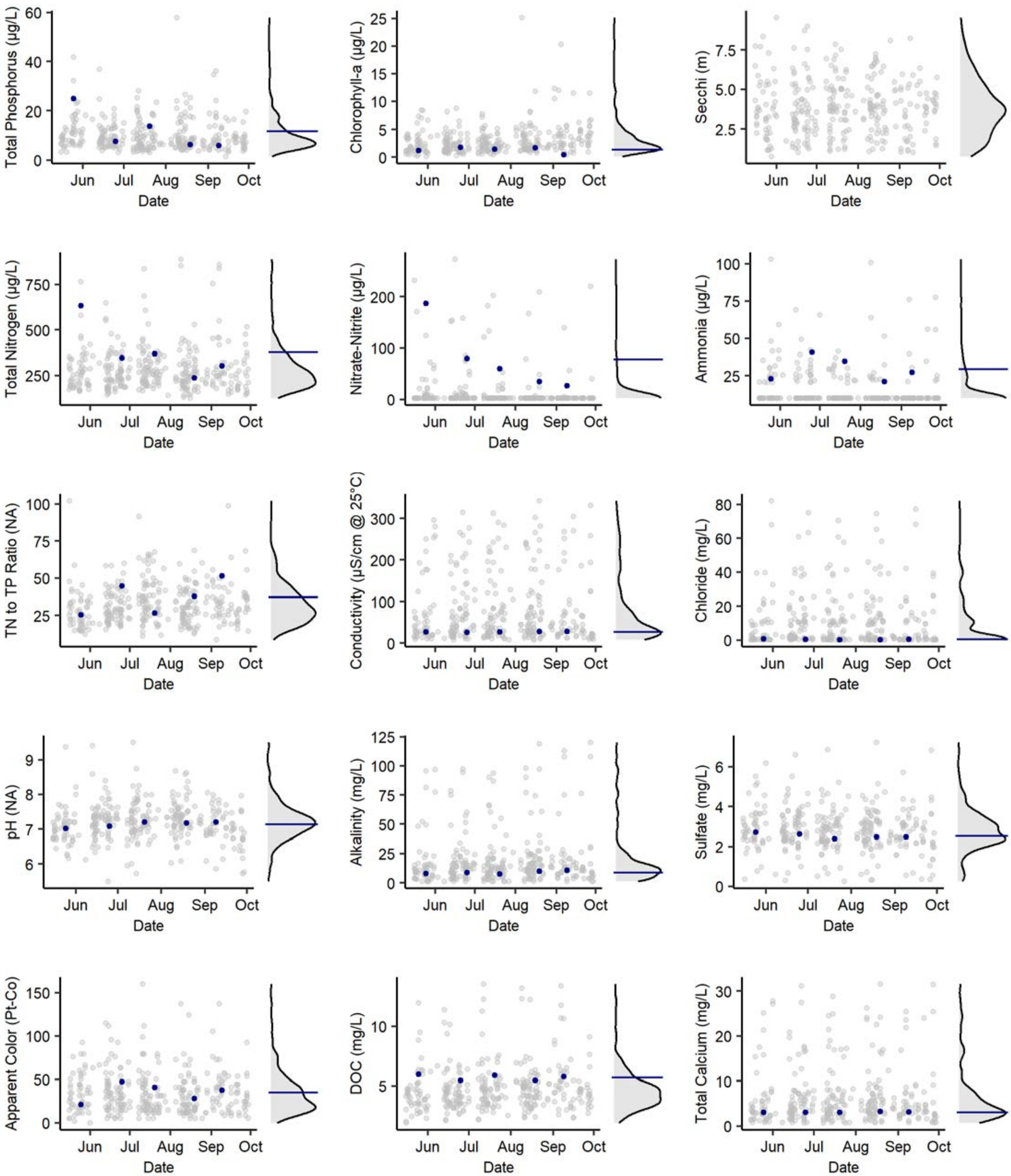
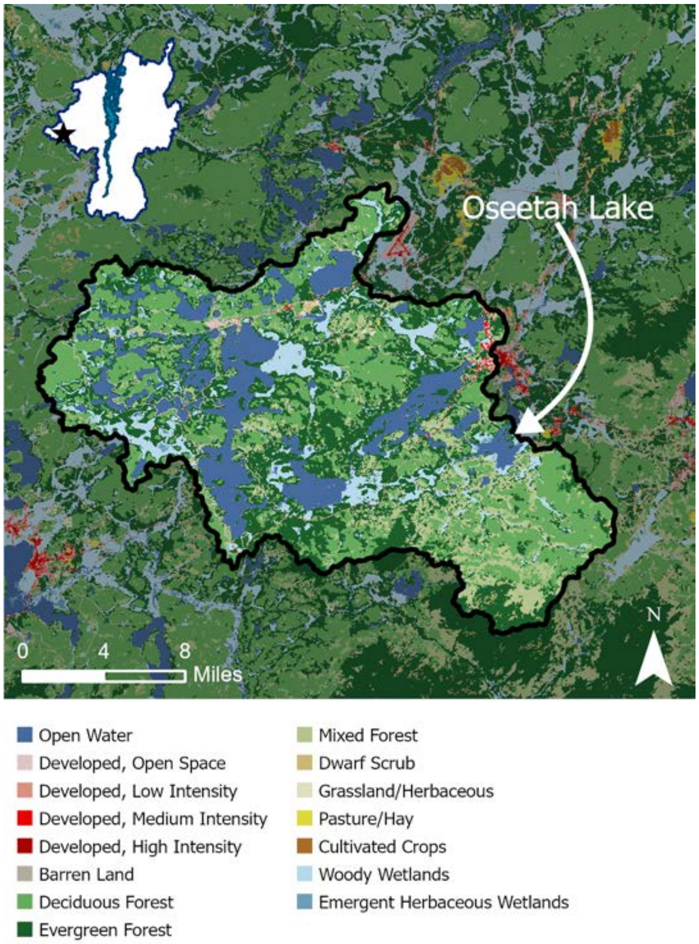


OSEETAH LAKE



Summary

Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Mesotrophic
Trophic Status (Secchi):	NA
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Adequate
Road Salt Influence:	Moderate

Notes: Secchi visible on bottom during all sampling trips.

Location

Latitude:	44.2815
Longitude:	-74.1329
County:	Franlkin, Essex
Town:	Harrietstown, North Elba
Watershed:	Sumner Brook-Saranac River

Lake Characteristics

Surface Area (ha):	306.0
Shoreline Length (km):	24.0
Max Depth (m):	NA
Mean Depth (m):	0.9
Volume (m^3):	2,754,000
Flushing Rate (times/year):	NA

Watershed Characteristics

Watershed Area (ha):	41,367.0
Open Water (%):	15.76
Developed, Open Space (%):	1.53
Developed, Low Intensity (%):	0.40
Developed, Medium Intensity (%):	0.23
Developed, High Intensity (%):	0.03
Barren Land (%):	0.02
Deciduous Forest (%):	29.65
Evergreen Forest (%):	30.61
Mixed Forest (%):	11.95
Dwarf Shrub (%):	0.45
Grassland/Herbaceous (%):	0.43
Pasture/Hay (%):	0.02
Cultivated Crops (%):	0.00
Woody Wetlands (%):	8.54
Emergent Herbaceous Wetlands (%):	0.38

Aquatic Invasive Species Detections

Eurasian watermilfoil:	1991
Variable-leaf milfoil:	Unknown

Harmful Algal Bloom Reports

None

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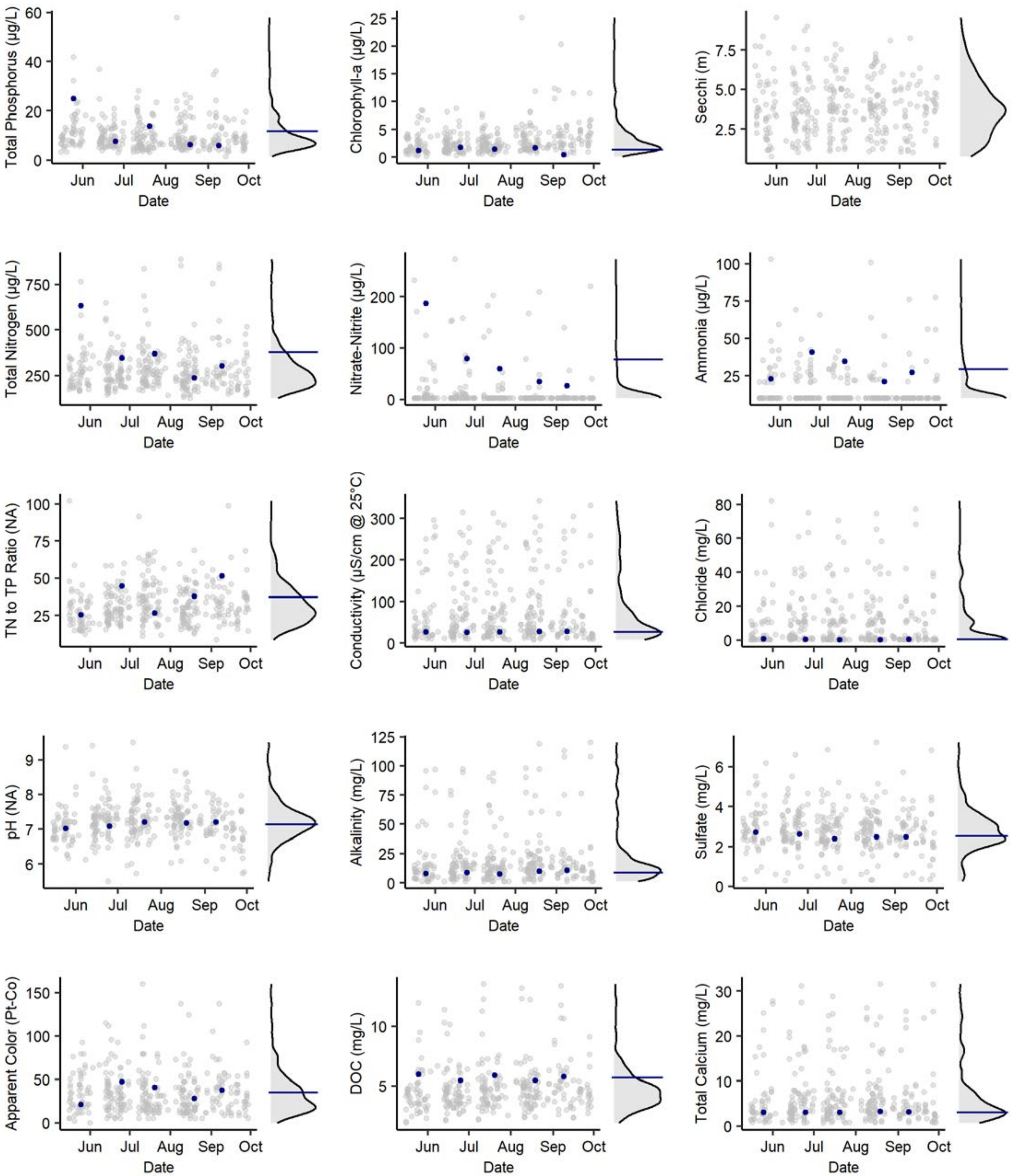
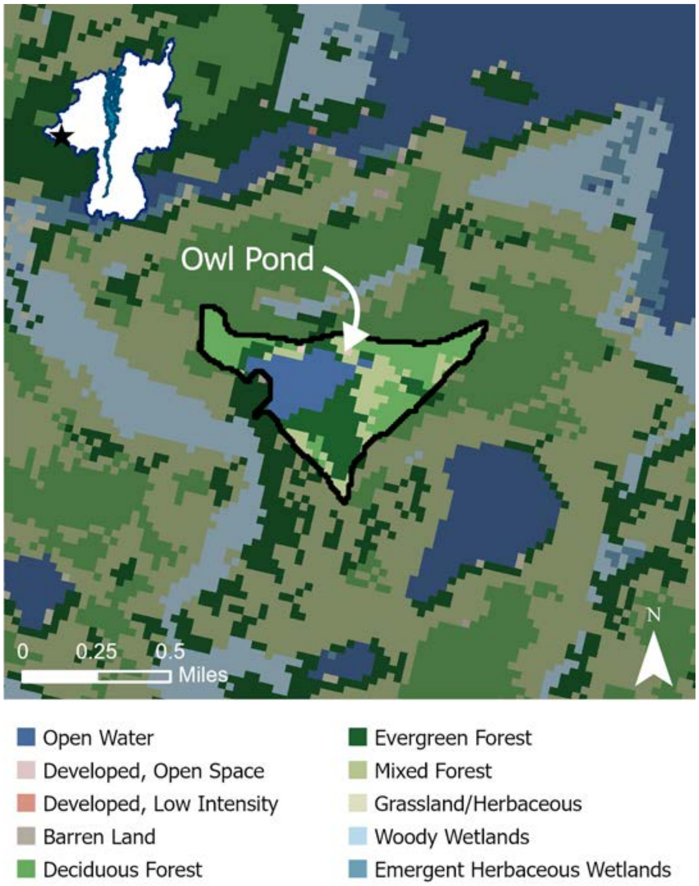


Owl Pond



Summary	
Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Mesotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Acidic: threatened
Acid Neutralizing Capacity:	Low
Road Salt Influence:	None

Notes: Profile data indicate that Owl Pond is isothermal during the summer with dissolved oxygen concentrations >7 mg/L.

Location	
Latitude:	44.2695
Longitude:	-74.1531
County:	Franklin
Town:	Harrietstown
Watershed:	Saranac Lakes-Saranac River

Lake Characteristics	
Surface Area (ha):	7.0
Shoreline Length (km):	1.5
Max Depth (m):	4.0
Mean Depth (m):	2.6
Volume (m^3):	147,082
Flushing Rate (times/year):	1.9

Watershed Characteristics	
Watershed Area (ha):	33.2
Open Water (%):	20.87
Developed, Open Space (%):	0.54
Developed, Low Intensity (%):	0.00
Developed, Medium Intensity (%):	0.00
Developed, High Intensity (%):	0.00
Barren Land (%):	0.00
Deciduous Forest (%):	34.42
Evergreen Forest (%):	25.2
Mixed Forest (%):	18.97
Dwarf Shrub (%):	0.00
Grassland/Herbaceous (%):	0.00
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	0.00
Emergent Herbaceous Wetlands (%):	0.00

Aquatic Invasive Species Detections
None

Harmful Algal Bloom Reports
None

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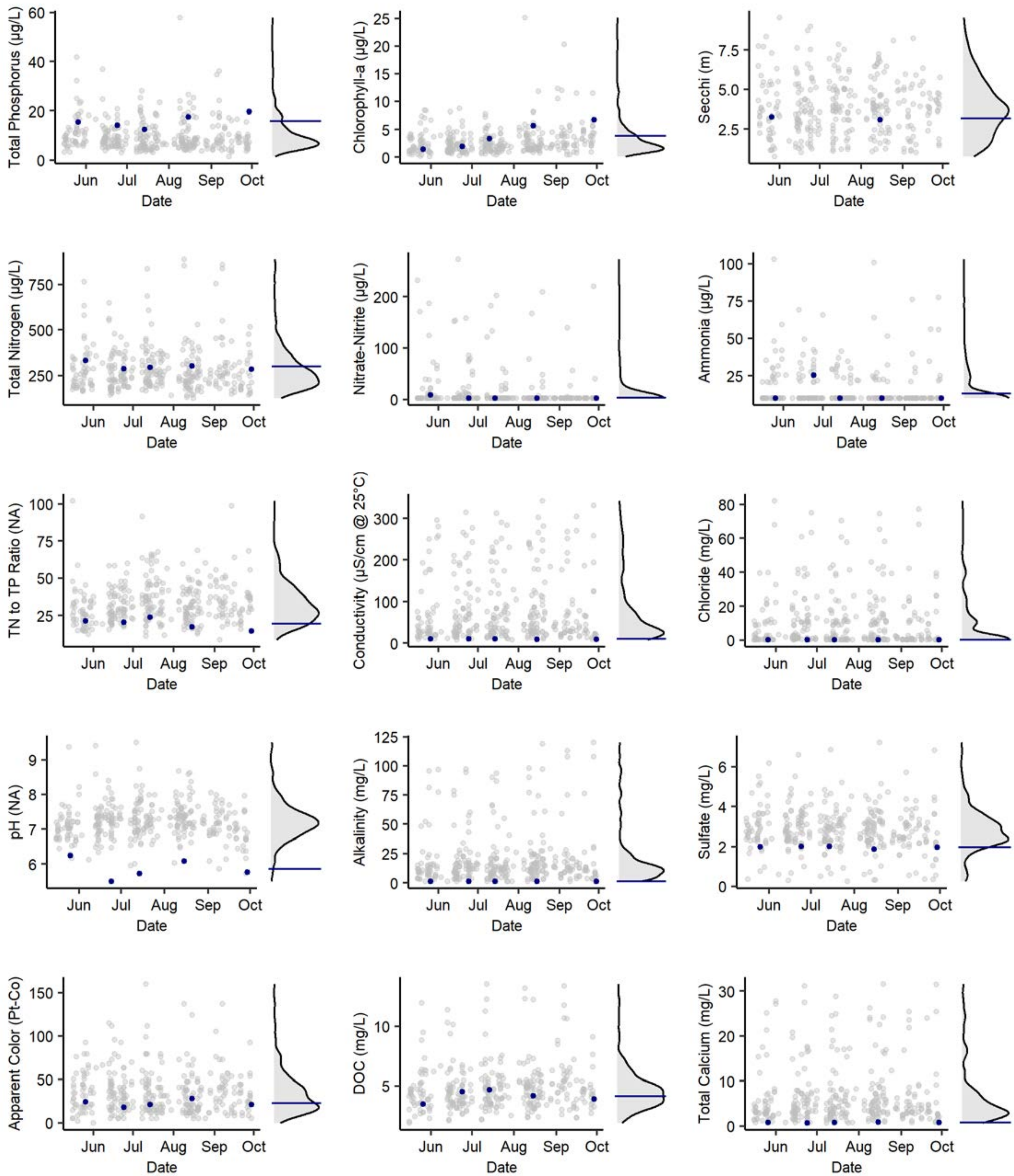
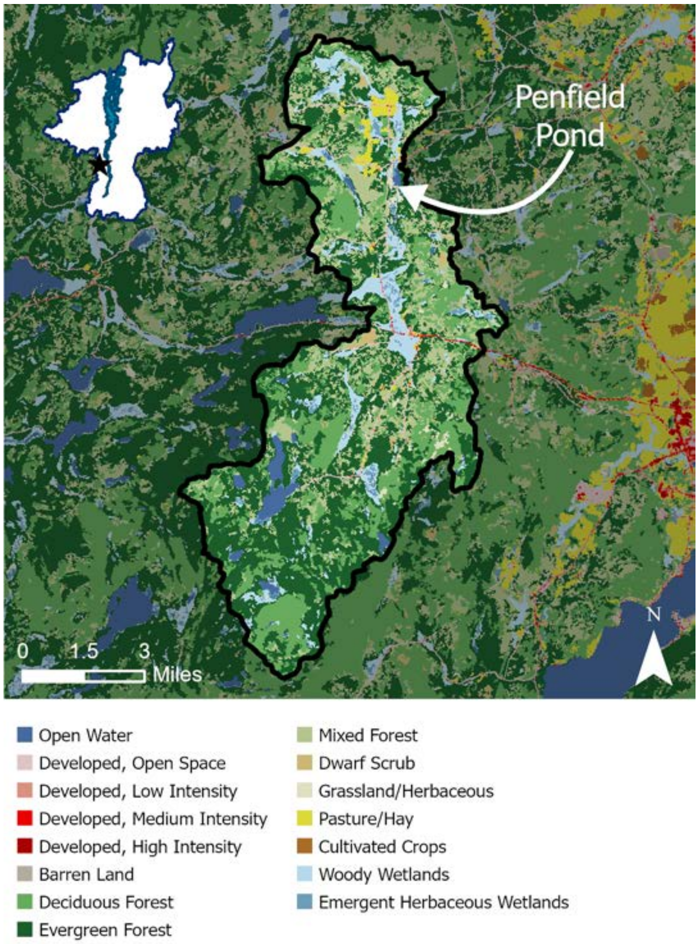


Penfield Pond



Summary

Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Mesotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	High
Road Salt Influence:	Moderate

Notes: Secchi was visible on bottom for all months except September.

Profile data indicate that Penfield Pond is isothermal during the summer dissolved oxygen concentrations typically <7 mg/L and periods of anoxia (<2 mg/L) in the bottom waters.

Location

Latitude:	43.9178
Longitude:	-73.5387
County:	Essex
Towns:	Crown Point, Ticonderoga
Watershed:	Putnam Creek-Lake Champlain

Lake Characteristics

Surface Area (ha):	72.4
Shoreline Length (km):	9.0
Max Depth (m):	2.5
Mean Depth (m):	NA
Volume (m^3):	4,030,000
Flushing Rate (times/year):	9.6

Watershed Characteristics

Watershed Area (ha):	7,682.8
Open Water (%):	2.48
Developed, Open Space (%):	1.50
Developed, Low Intensity (%):	0.33
Developed, Medium Intensity (%):	0.14
Developed, High Intensity (%):	0.01
Barren Land (%):	0.06
Deciduous Forest (%):	24.19
Evergreen Forest (%):	39.58
Mixed Forest (%):	18.87
Dwarf Shrub (%):	0.98
Grassland/Herbaceous (%):	1.07
Pasture/Hay (%):	1.50
Cultivated Crops (%):	0.00
Woody Wetlands (%):	7.71
Emergent Herbaceous Wetlands (%):	1.59

Aquatic Invasive Species Detections

Eurasian watermilfoil:	2018

Harmful Algal Bloom Reports

None

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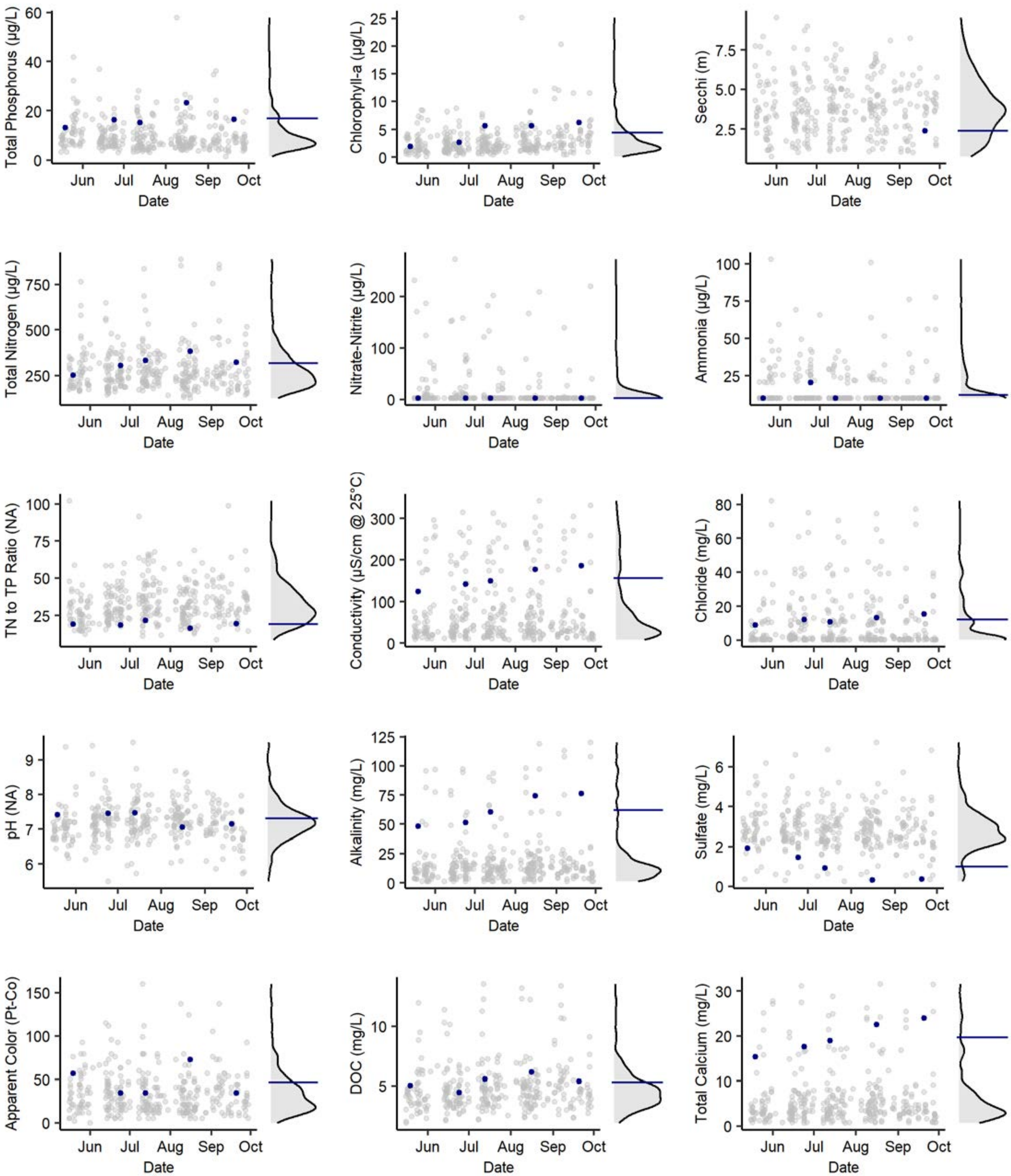
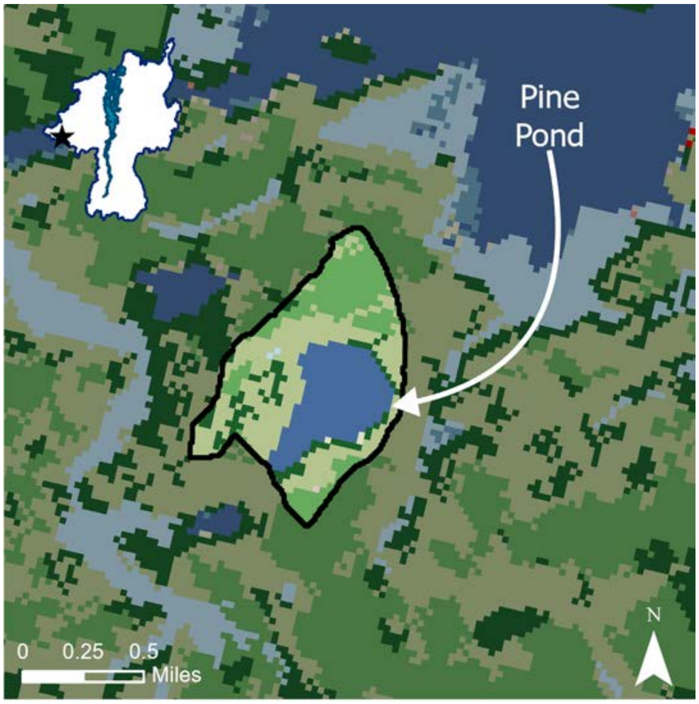


Pine Pond



Open Water	Evergreen Forest
Developed, Open Space	Mixed Forest
Developed, Low Intensity	Grassland/Herbaceous
Developed, Medium Intensity	Woody Wetlands
Deciduous Forest	Emergent Herbaceous Wetlands

Summary	
Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Oligotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Moderate
Road Salt Influence:	None

Notes: Profile data indicate that Pine Pond is thermally stratified during the summer with the epilimnion having dissolved oxygen concentrations >7 mg/L. The hypolimnion is anoxic (<2 mg/L) for most of the summer.

Location	
Latitude:	44.2647
Longitude:	-74.1438
County:	Franklin
Town:	Harrietstown
Watershed:	Saranac Lakes-Saranac River

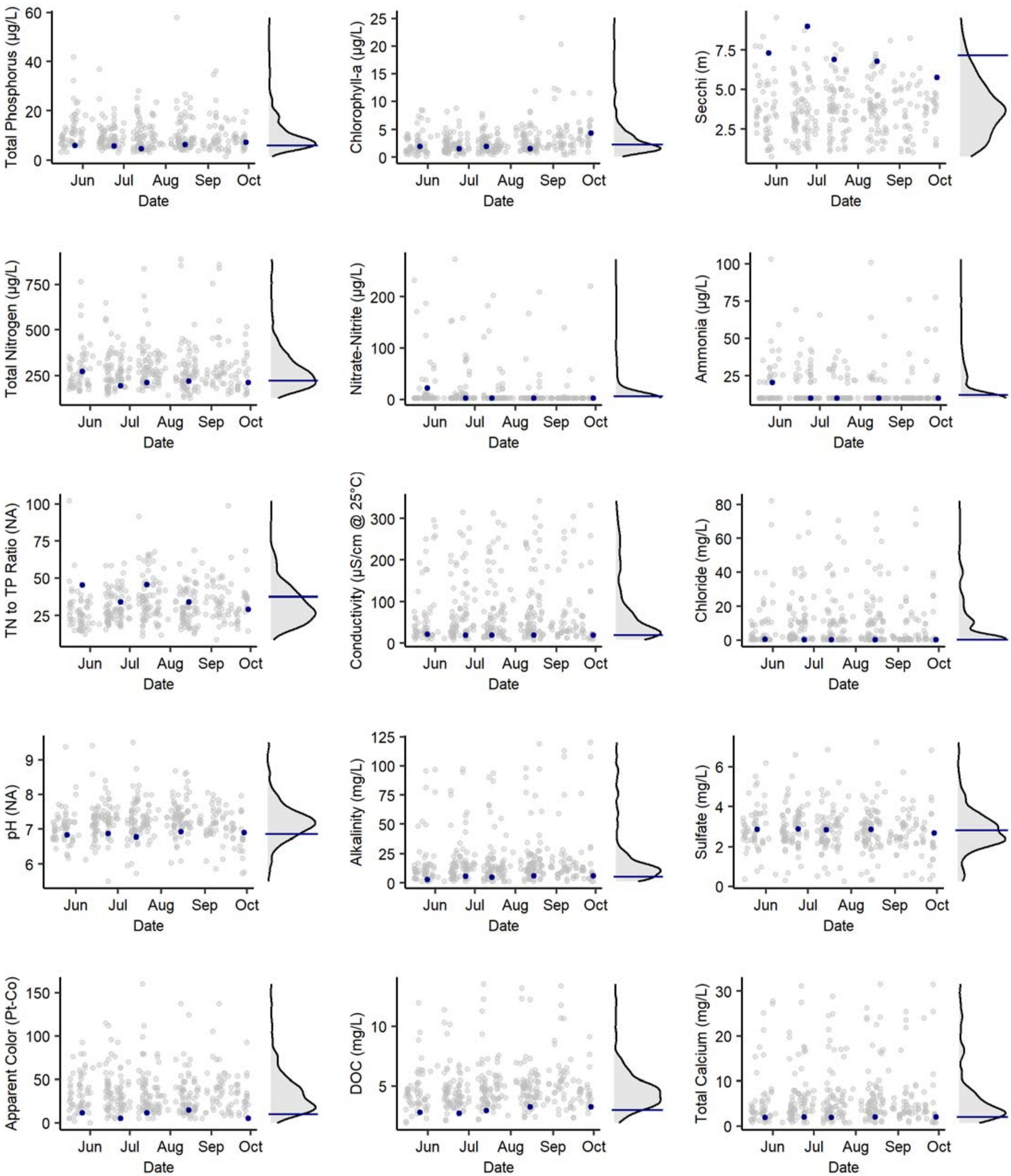
Lake Characteristics	
Surface Area (ha):	20.3
Shoreline Length (km):	2.1
Max Depth (m):	19.8
Mean Depth (m):	7.9
Volume (m^3):	1,465,479
Flushing Rate (times/year):	0.4

Watershed Characteristics	
Watershed Area (ha):	79.7
Open Water (%):	25.2
Developed, Open Space (%):	0.11
Developed, Low Intensity (%):	0.00
Developed, Medium Intensity (%):	0.00
Developed, High Intensity (%):	0.00
Barren Land (%):	0.00
Deciduous Forest (%):	25.42
Evergreen Forest (%):	9.38
Mixed Forest (%):	39.32
Dwarf Shrub (%):	0.00
Grassland/Herbaceous (%):	0.34
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	0.23
Emergent Herbaceous Wetlands (%):	0.00

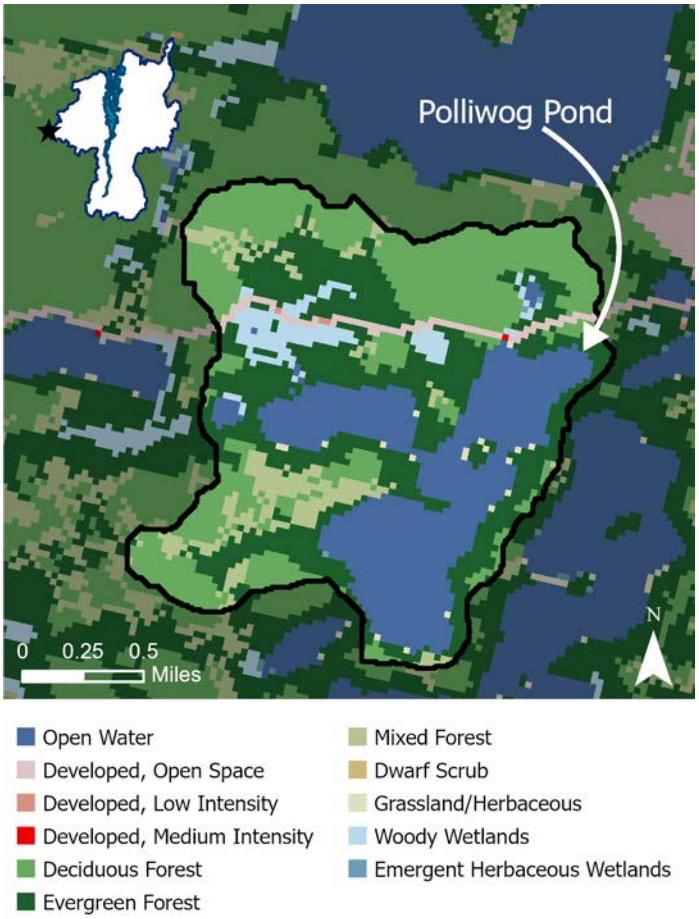
Aquatic Invasive Species Detections
None

Harmful Algal Bloom Reports
None

Gray dots represent all data in the report, blue dots are the samples for the represented lake. The right sub-plot shows the density distribution for all data in gray and the mean for the represented lake as a blue line.



Polliwog Pond



Summary

Trophic Status (Chl-a):	Oligotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Oligotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Moderate
Road Salt Influence:	None

Notes: None.

Location

Latitude:	44.3340
Longitude:	-74.3537
County:	Franklin
Town:	Santa Clara
Watershed:	Saranac Lakes-Saranac River

Lake Characteristics

Surface Area (ha):	86.5
Shoreline Length (km):	8.0
Max Depth (m):	24.4
Mean Depth (m):	7.0
Volume (m^3):	5,833,691
Flushing Rate (times/year):	0.4

Watershed Characteristics

Watershed Area (ha):	341.2
Open Water (%):	26.37
Developed, Open Space (%):	2.01
Developed, Low Intensity (%):	0.08
Developed, Medium Intensity (%):	0.03
Developed, High Intensity (%):	0.00
Barren Land (%):	0.00
Deciduous Forest (%):	29.59
Evergreen Forest (%):	30.27
Mixed Forest (%):	7.07
Dwarf Shrub (%):	0.00
Grassland/Herbaceous (%):	0.50
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	4.01
Emergent Herbaceous Wetlands (%):	0.08

Aquatic Invasive Species Detections

None

Harmful Algal Bloom Reports

None

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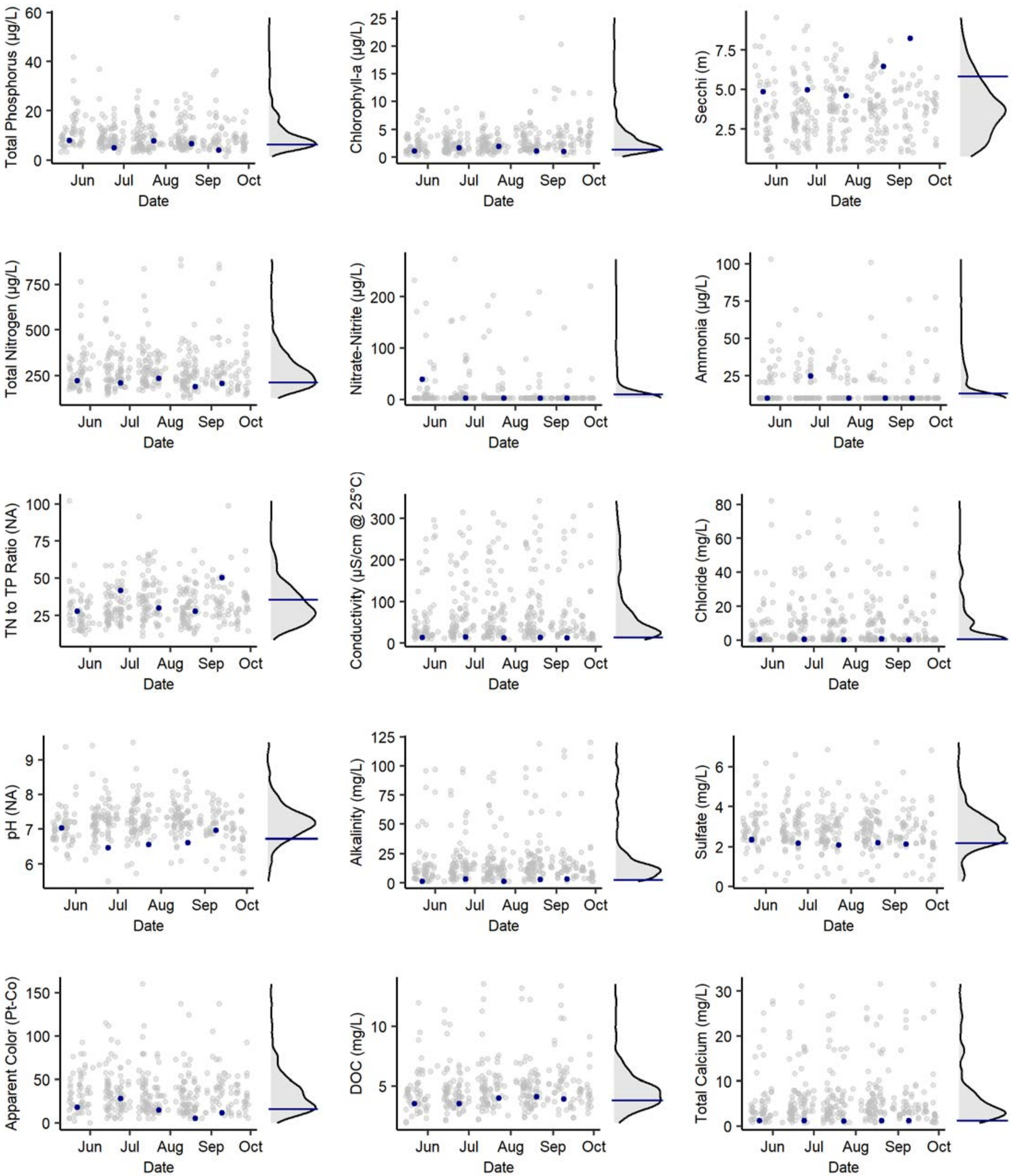
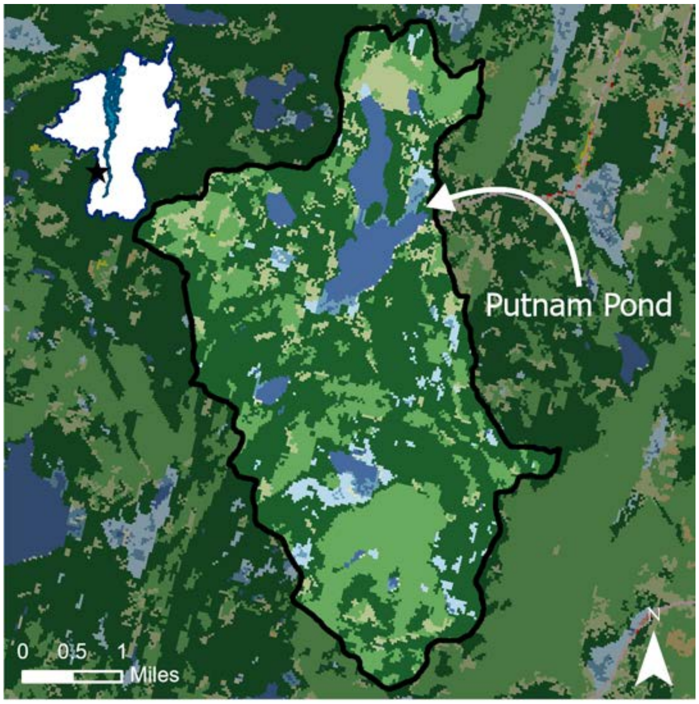


Putnam Pond



Open Water
Developed, Open Space
Developed, Low Intensity
Developed, Medium Intensity
Developed, High Intensity
Barren Land
Deciduous Forest
Evergreen Forest
Mixed Forest
Dwarf Scrub
Grassland/Herbaceous
Pasture/Hay
Woody Wetlands
Emergent Herbaceous Wetlands

Location	
Latitude:	43.8360
Longitude:	-73.5802
County:	Essex
Town:	Ticonderoga
Watershed:	Putnam Creek-Lake Chamlpain

Lake Characteristics	
Surface Area (ha):	114.6
Shoreline Length (km):	10.0
Max Depth (m):	10.4
Mean Depth (m):	3.2
Volume (m^3):	2,259,559
Flushing Rate (times/year):	4.4

Watershed Characteristics	
Watershed Area (ha):	1,887.5
Open Water (%):	7.29
Developed, Open Space (%):	0.02
Developed, Low Intensity (%):	0.00
Developed, Medium Intensity (%):	0.00
Developed, High Intensity (%):	0.00
Barren Land (%):	0.00
Deciduous Forest (%):	25.53
Evergreen Forest (%):	53.13
Mixed Forest (%):	8.13
Dwarf Shrub (%):	0.01
Grassland/Herbaceous (%):	0.37
Pasture/Hay (%):	0.01
Cultivated Crops (%):	0.00
Woody Wetlands (%):	4.02
Emergent Herbaceous Wetlands (%):	1.48

Summary	
Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Moderate
Road Salt Influence:	None

Aquatic Invasive Species Detections	
Eurasian watermilfoil:	2004

Harmful Algal Bloom Reports
None

Notes: Profile data indicate that Putnam Pond is thermally stratified during the summer with the epilimnion having dissolved oxygen concentrations >7 mg/L. The hypolimnion is anoxic (<2 mg/L) for the later part of the summer.

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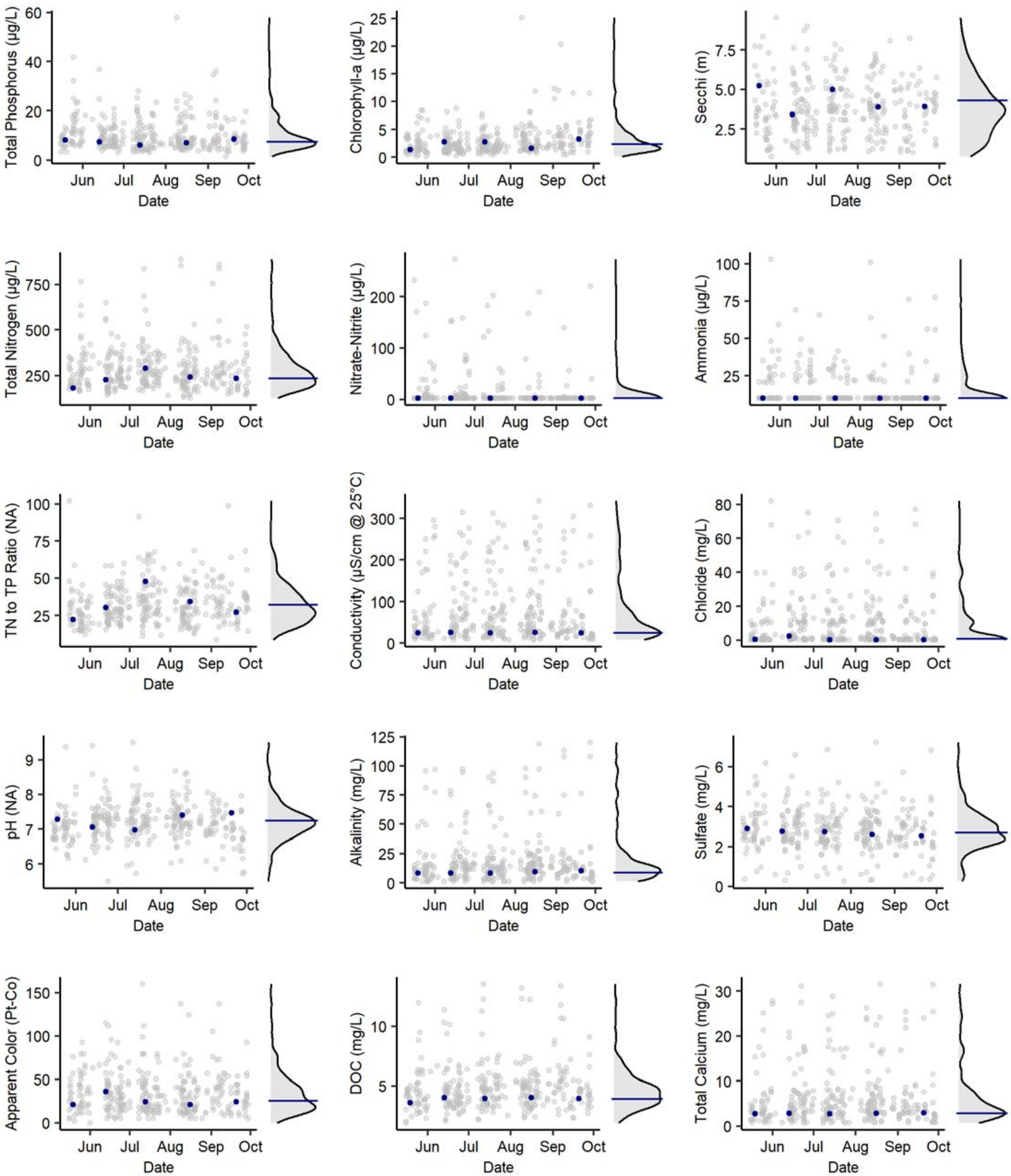
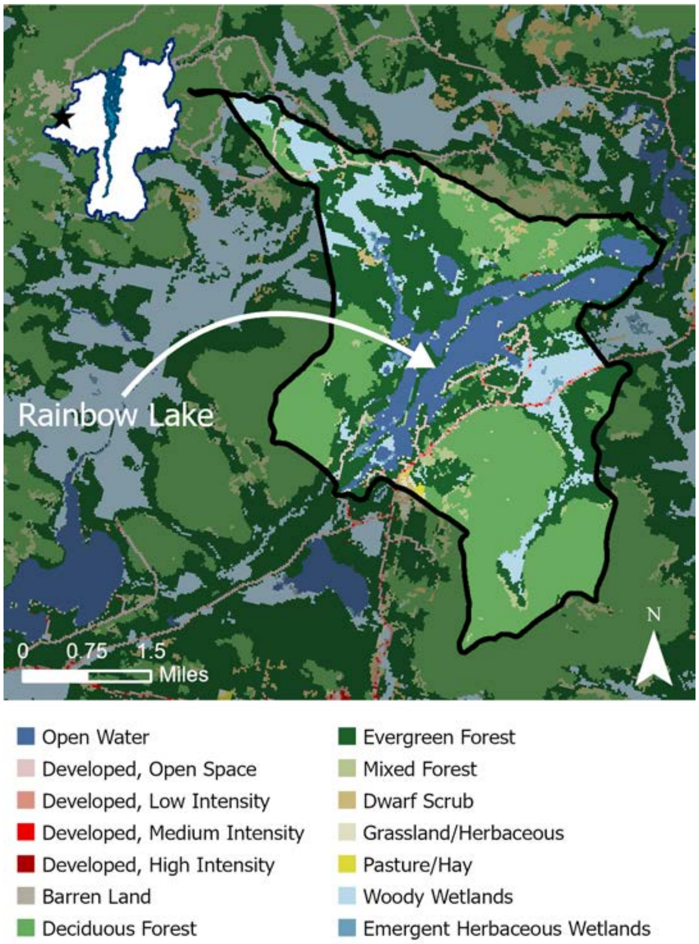


Rainbow Lake



Summary

Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Adequate
Road Salt Influence:	Low

Notes: Profile data indicate that Rainbow Lake is thermally stratified during the summer with the epilimnion having dissolved oxygen concentrations >7 mg/L. The hypolimnion is anoxic (<2 mg/L) for much of the summer.

Location

Latitude:	44.4844
Longitude:	-74.1571
County:	Franklin
Towns:	Brighton, Franklin
Watershed:	North Branch Saranac River

Lake Characteristics

Surface Area (ha):	149.6
Shoreline Length (km):	19.0
Max Depth (m):	17.7
Mean Depth (m):	4.6
Volume (m^3):	6,535,932
Flushing Rate (times/year):	1.7

Watershed Characteristics

Watershed Area (ha):	2,114.9
Open Water (%):	12.62
Developed, Open Space (%):	2.09
Developed, Low Intensity (%):	0.57
Developed, Medium Intensity (%):	0.11
Developed, High Intensity (%):	0.00
Barren Land (%):	0.00
Deciduous Forest (%):	37.11
Evergreen Forest (%):	31.65
Mixed Forest (%):	2.76
Dwarf Shrub (%):	0.46
Grassland/Herbaceous (%):	0.74
Pasture/Hay (%):	0.11
Cultivated Crops (%):	0.00
Woody Wetlands (%):	10.76
Emergent Herbaceous Wetlands (%):	1.00

Aquatic Invasive Species Detections

None

Harmful Algal Bloom Reports

None

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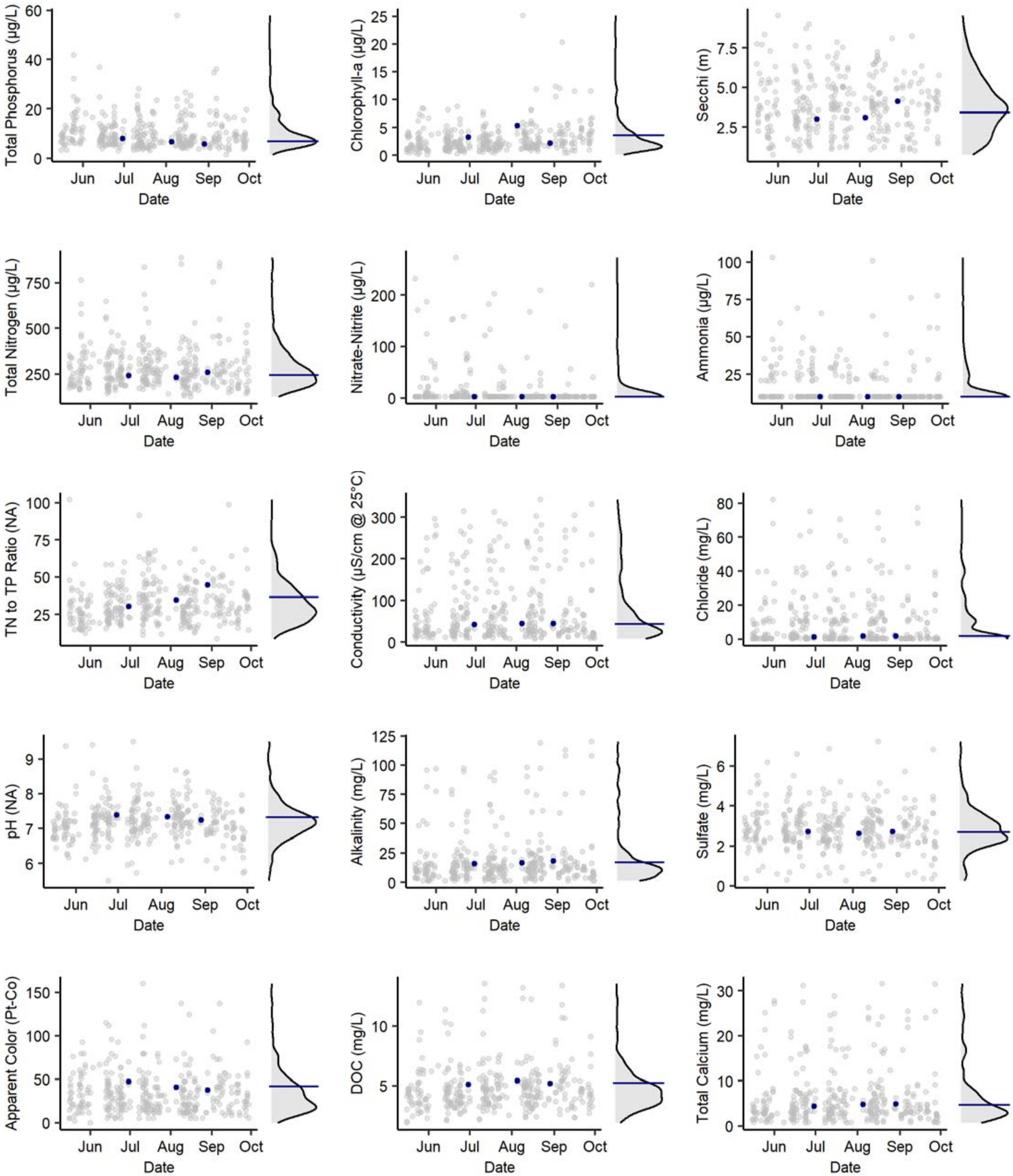
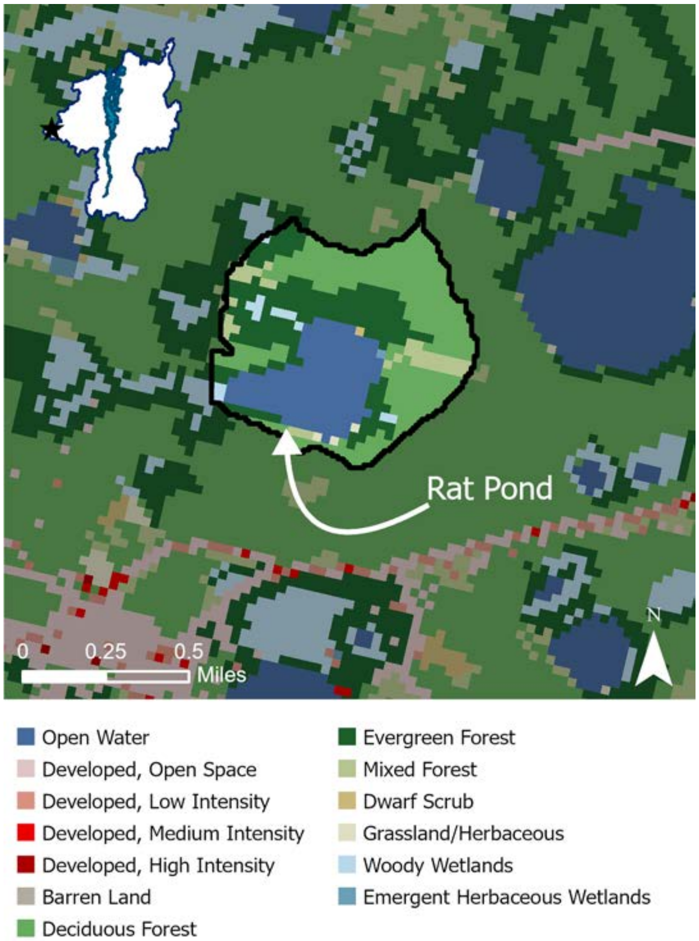


Rat Pond



Location

Latitude:	44.3546
Longitude:	-74.3124
County:	Franklin
Town:	Santa Clara
Watershed:	Saranac Lakes-Saranac River

Lake Characteristics

Surface Area (ha):	13.7
Shoreline Length (km):	1.9
Max Depth (m):	8.8
Mean Depth (m):	3.7
Volume (m^3):	433,336
Flushing Rate (times/year):	1.2

Watershed Characteristics

Watershed Area (ha):	56.3
Open Water (%):	23.51
Developed, Open Space (%):	0.00
Developed, Low Intensity (%):	0.00
Developed, Medium Intensity (%):	0.00
Developed, High Intensity (%):	0.00
Barren Land (%):	0.00
Deciduous Forest (%):	39.94
Evergreen Forest (%):	27.54
Mixed Forest (%):	5.96
Dwarf Shrub (%):	0.16
Grassland/Herbaceous (%):	0.48
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	2.25
Emergent Herbaceous Wetlands (%):	0.16

Summary

Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Mesotrophic
Trophic Status (Secchi):	Eutrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Moderate
Road Salt Influence:	None

Notes: Profile data indicate that Rat Pond is thermally stratified during the summer with the epilimnion having dissolved oxygen concentrations >7 mg/L. The hypolimnion is anoxic (<2 mg/L) for the entire summer.

Aquatic Invasive Species Detections

None

Harmful Algal Bloom Reports

2022

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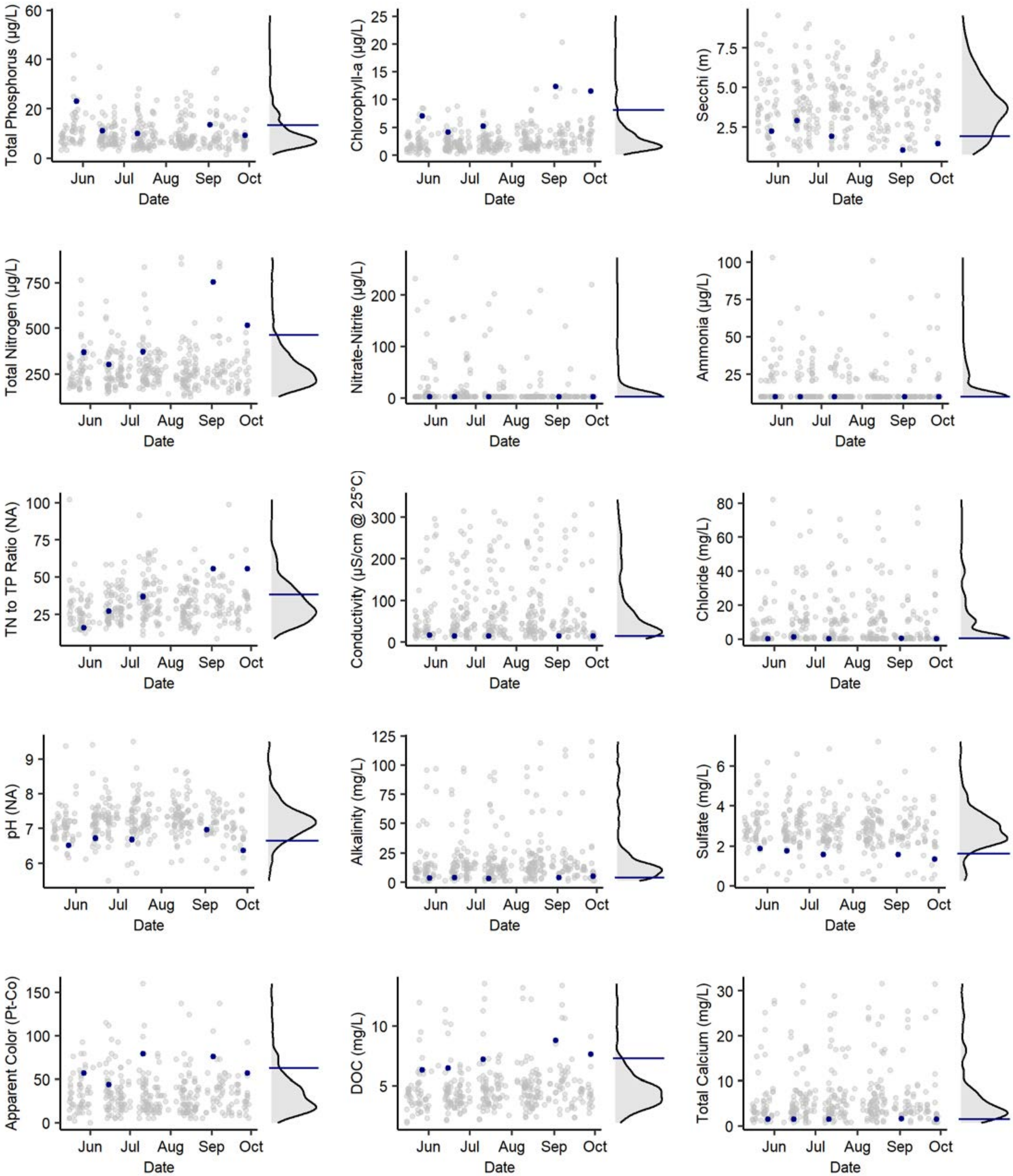
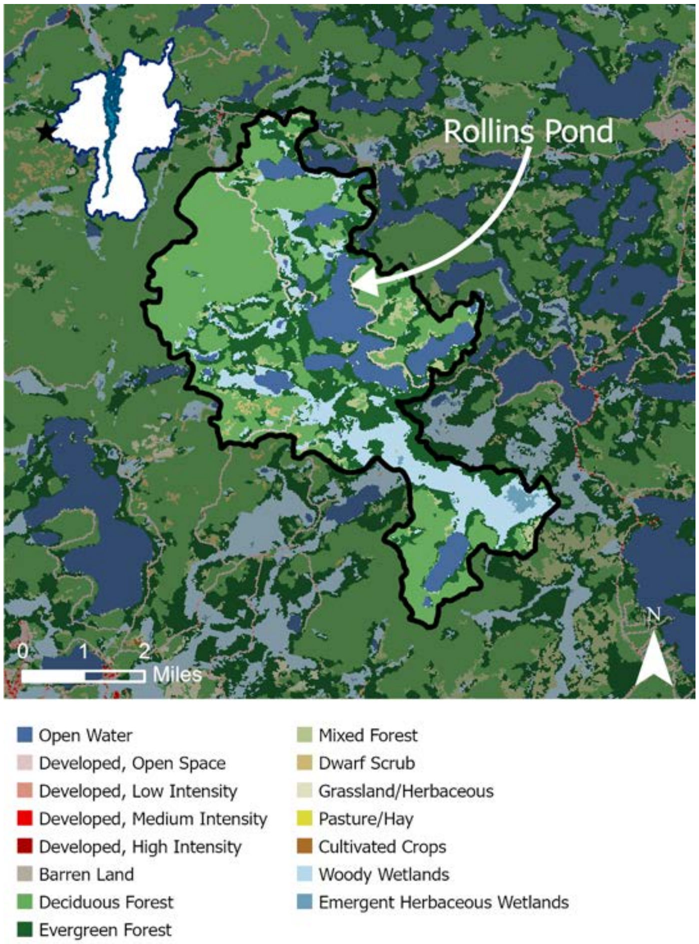


Rollins Pond



Summary

Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Mesotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Moderate
Road Salt Influence:	None

Notes: Profile data indicate that Rollins Pond is thermally stratified during the summer with the epilimnion having dissolved oxygen concentrations >7 mg/L. The hypolimnion is anoxic (<2 mg/L) for the later part of the summer.

Location

Latitude:	44.3127
Longitude:	-74.4168
County:	Franklin
Town:	Santa Clara, Tupper Lake
Watershed:	Saranac Lakes-Saranac River

Lake Characteristics

Surface Area (ha):	183.5
Shoreline Length (km):	13.8
Max Depth (m):	23.5
Mean Depth (m):	6.9
Volume (m^3):	12,483,230
Flushing Rate (times/year):	1.5

Watershed Characteristics

Watershed Area (ha):	3,043.3
Open Water (%):	12.26
Developed, Open Space (%):	1.42
Developed, Low Intensity (%):	0.00
Developed, Medium Intensity (%):	0.00
Developed, High Intensity (%):	0.00
Barren Land (%):	0.01
Deciduous Forest (%):	43.40
Evergreen Forest (%):	23.65
Mixed Forest (%):	3.46
Dwarf Shrub (%):	0.49
Grassland/Herbaceous (%):	0.31
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	14.03
Emergent Herbaceous Wetlands (%):	0.97

Aquatic Invasive Species Detections

None

Harmful Algal Bloom Reports

None

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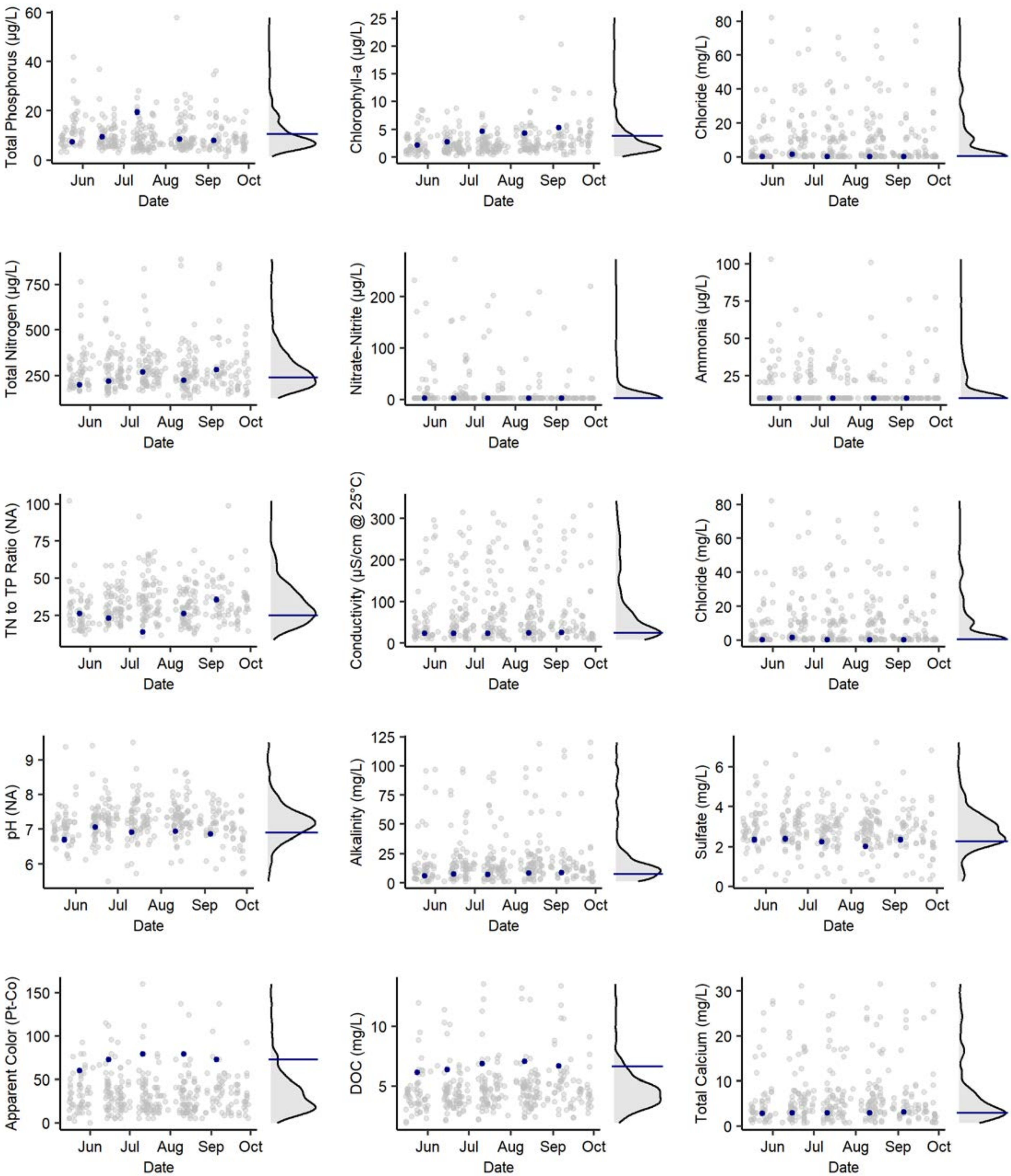
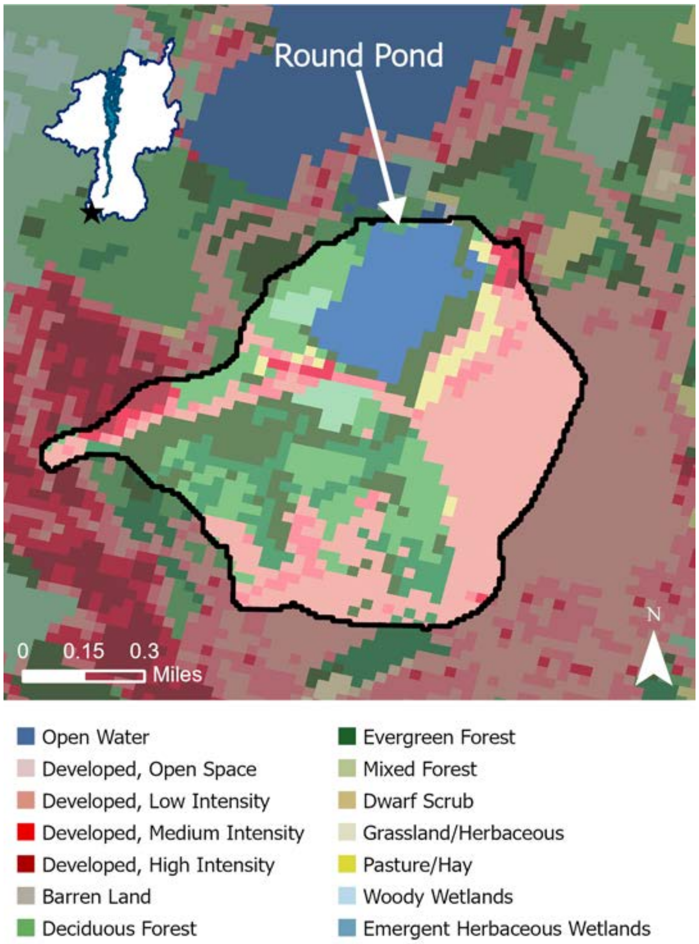


Round Pond



Summary	
Trophic Status (Chl-a):	Oligotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Oligotrophic
Acidity:	Alkaline: non-impacted
Acid Neutralizing Capacity:	High
Road Salt Influence:	Moderate

Notes: The Secchi measurement for August was lost due to a an error with the field form.

Profile data indicate that Round Pond is thermally stratified during the summer with the epilimnion having dissolved oxygen concentrations >7 mg/L. The hypolimnion is anoxic (<2 mg/L) for the later part of the summer.

Location	
Latitude:	43.3523
Longitude:	-73.6769
County:	Warren
Town:	Queensbury
Watershed:	Halfway Creek-Lake Champlain Canal

Lake Characteristics	
Surface Area (ha):	15.0
Shoreline Length (km):	1.8
Max Depth (m):	14.3
Mean Depth (m):	3.6
Volume (m^3):	430,000
Flushing Rate (times/year):	1.8

Watershed Characteristics	
Watershed Area (ha):	108.6
Open Water (%):	12.85
Developed, Open Space (%):	33.33
Developed, Low Intensity (%):	5.22
Developed, Medium Intensity (%):	1.99
Developed, High Intensity (%):	1.41
Barren Land (%):	0.00
Deciduous Forest (%):	16.92
Evergreen Forest (%):	13.52
Mixed Forest (%):	9.37
Dwarf Shrub (%):	0.00
Grassland/Herbaceous (%):	0.00
Pasture/Hay (%):	2.74
Cultivated Crops (%):	0.00
Woody Wetlands (%):	2.65
Emergent Herbaceous Wetlands (%):	0.00

Aquatic Invasive Species Detections
None

Harmful Algal Bloom Reports
None

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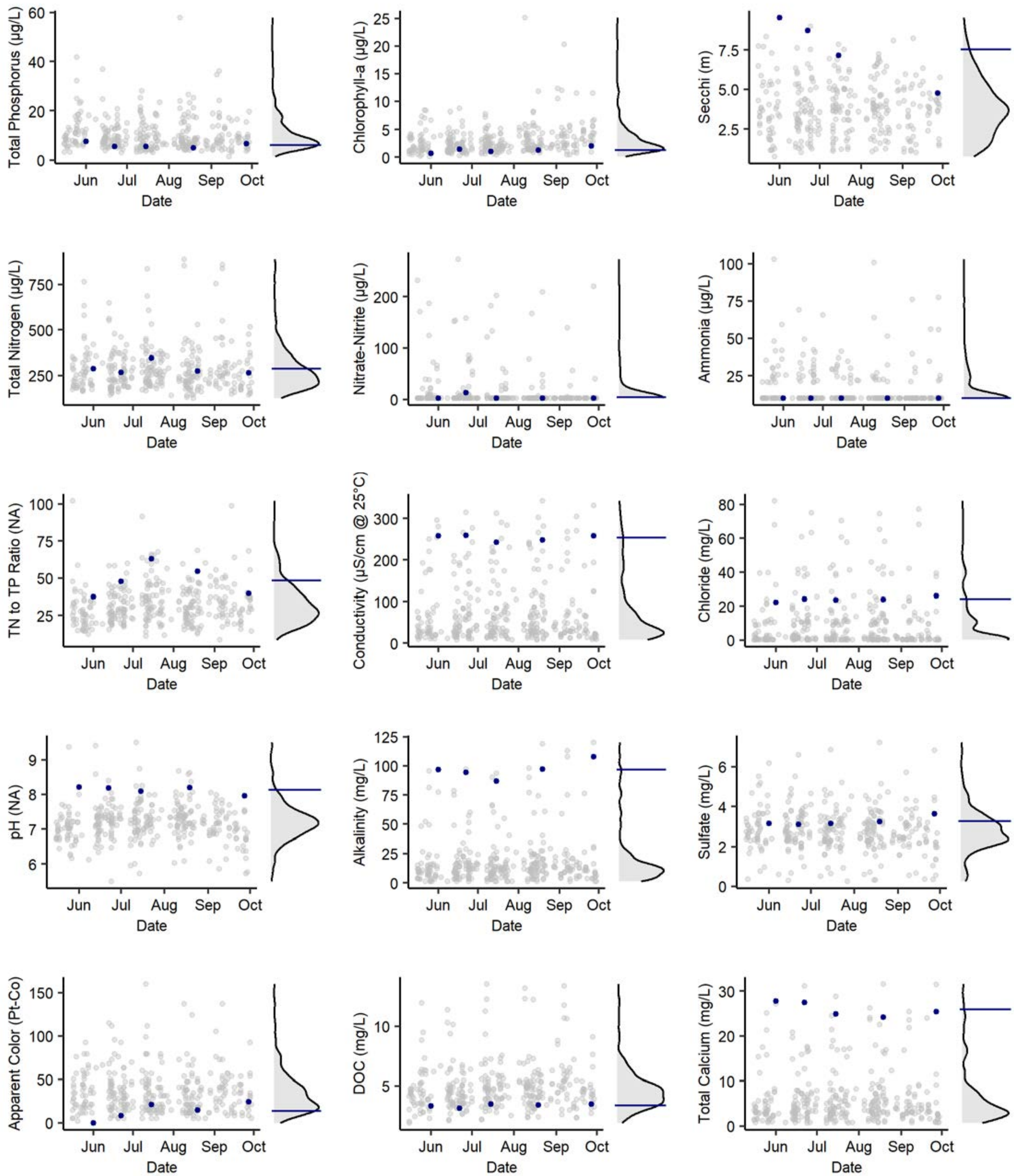
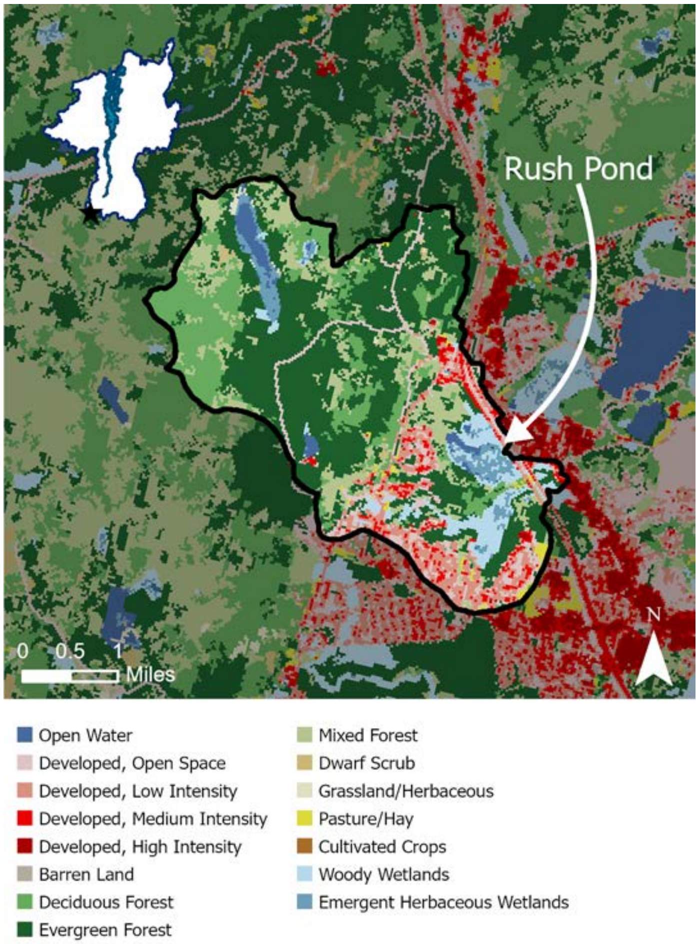


Rush Pond



Summary

Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Alkaline: non-impacted
Acid Neutralizing Capacity:	High
Road Salt Influence:	Moderate

Notes: Profile data indicate that Rush Pond is thermally stratified during the summer with the epilimnion having dissolved oxygen concentrations >7 mg/L. The hypolimnion is intermittently anoxic (<2 mg/L).

Location

Latitude:	43.3495
Longitude:	-73.7033
County:	Warren
Town:	Queensbury
Watershed:	Halfway Creek-Lake Champlain Canal

Lake Characteristics

Surface Area (ha):	12.2
Shoreline Length (km):	3.6
Max Depth (m):	4.0
Mean Depth (m):	NA
Volume (m^3):	NA
Flushing Rate (times/year):	NA

Watershed Characteristics

Watershed Area (ha):	1,456.8
Open Water (%):	2.01
Developed, Open Space (%):	6.30
Developed, Low Intensity (%):	7.80
Developed, Medium Intensity (%):	3.03
Developed, High Intensity (%):	0.27
Barren Land (%):	0.03
Deciduous Forest (%):	16.41
Evergreen Forest (%):	39.94
Mixed Forest (%):	14.32
Dwarf Shrub (%):	0.27
Grassland/Herbaceous (%):	0.35
Pasture/Hay (%):	0.85
Cultivated Crops (%):	0.00
Woody Wetlands (%):	5.39
Emergent Herbaceous Wetlands (%):	3.04

Aquatic Invasive Species Detections

None

Harmful Algal Bloom Reports

None

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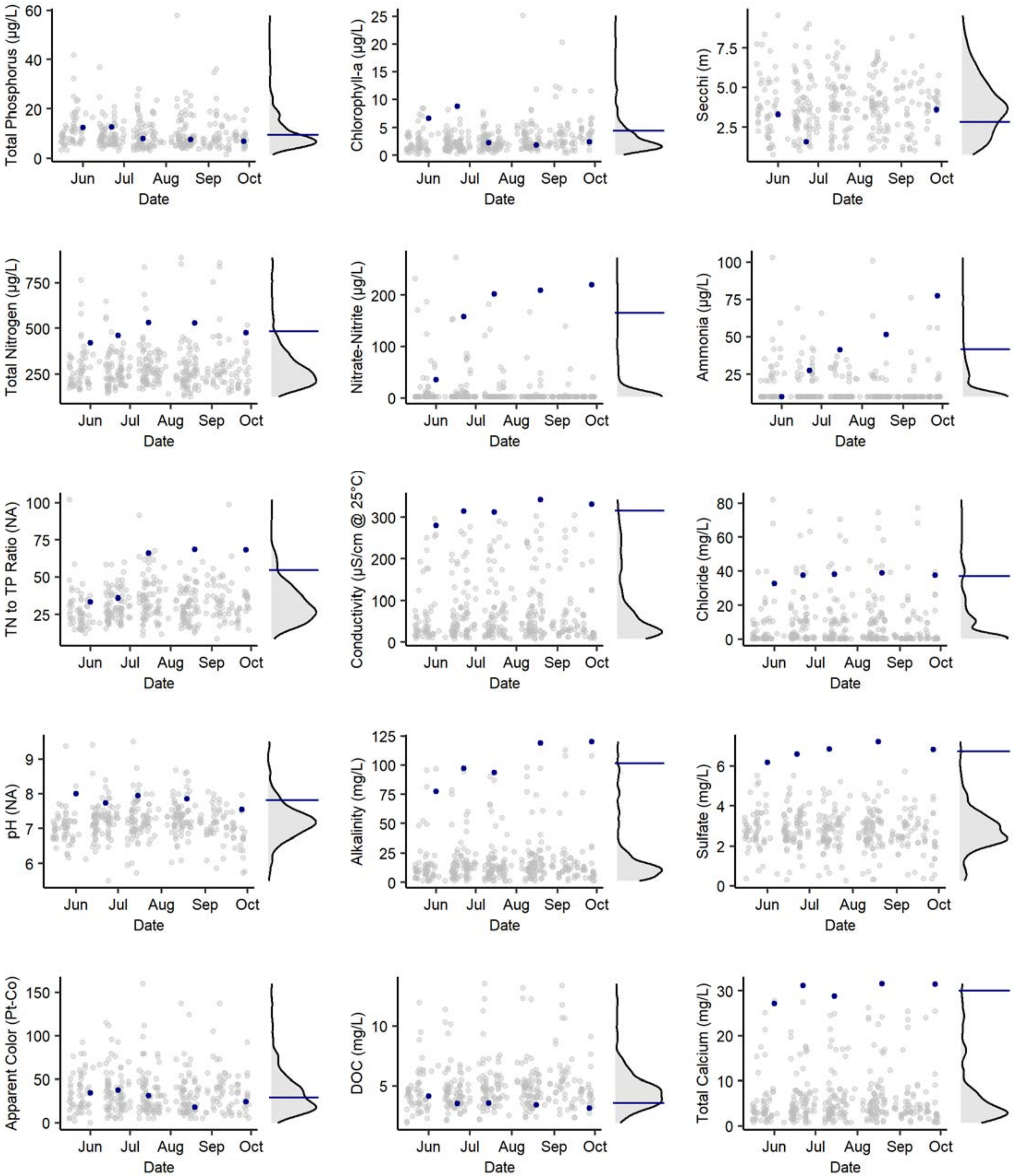
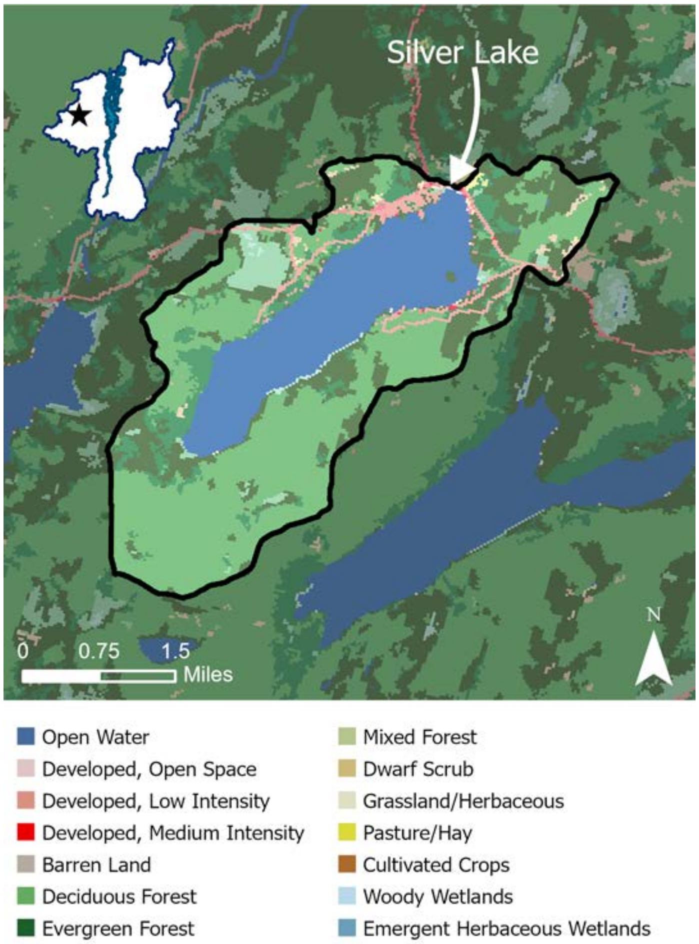


Silver Lake



Summary

Trophic Status (Chl-a):	Oligotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Oligotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Adequate
Road Salt Influence:	Low

Notes: August Secchi data missing from volunteer sampling form.

Location

Latitude:	44.5058
Longitude:	-73.8767
County:	Clinton
Town:	Black Brook
Watershed:	Union Falls Pond-Saranac River

Lake Characteristics

Surface Area (ha):	324.9
Shoreline Length (km):	10.9
Max Depth (m):	NA
Mean Depth (m):	11.1
Volume (m^3):	32,750,000
Flushing Rate (times/year):	0.3

Watershed Characteristics

Watershed Area (ha):	1,411.9
Open Water (%):	23.01
Developed, Open Space (%):	3.46
Developed, Low Intensity (%):	0.50
Developed, Medium Intensity (%):	0.14
Developed, High Intensity (%):	0.00
Barren Land (%):	0.08
Deciduous Forest (%):	42.36
Evergreen Forest (%):	18.14
Mixed Forest (%):	7.66
Dwarf Shrub (%):	0.82
Grassland/Herbaceous (%):	0.26
Pasture/Hay (%):	0.04
Cultivated Crops (%):	0.15
Woody Wetlands (%):	2.99
Emergent Herbaceous Wetlands (%):	0.4

Aquatic Invasive Species Detections

None

Harmful Algal Bloom Reports

None

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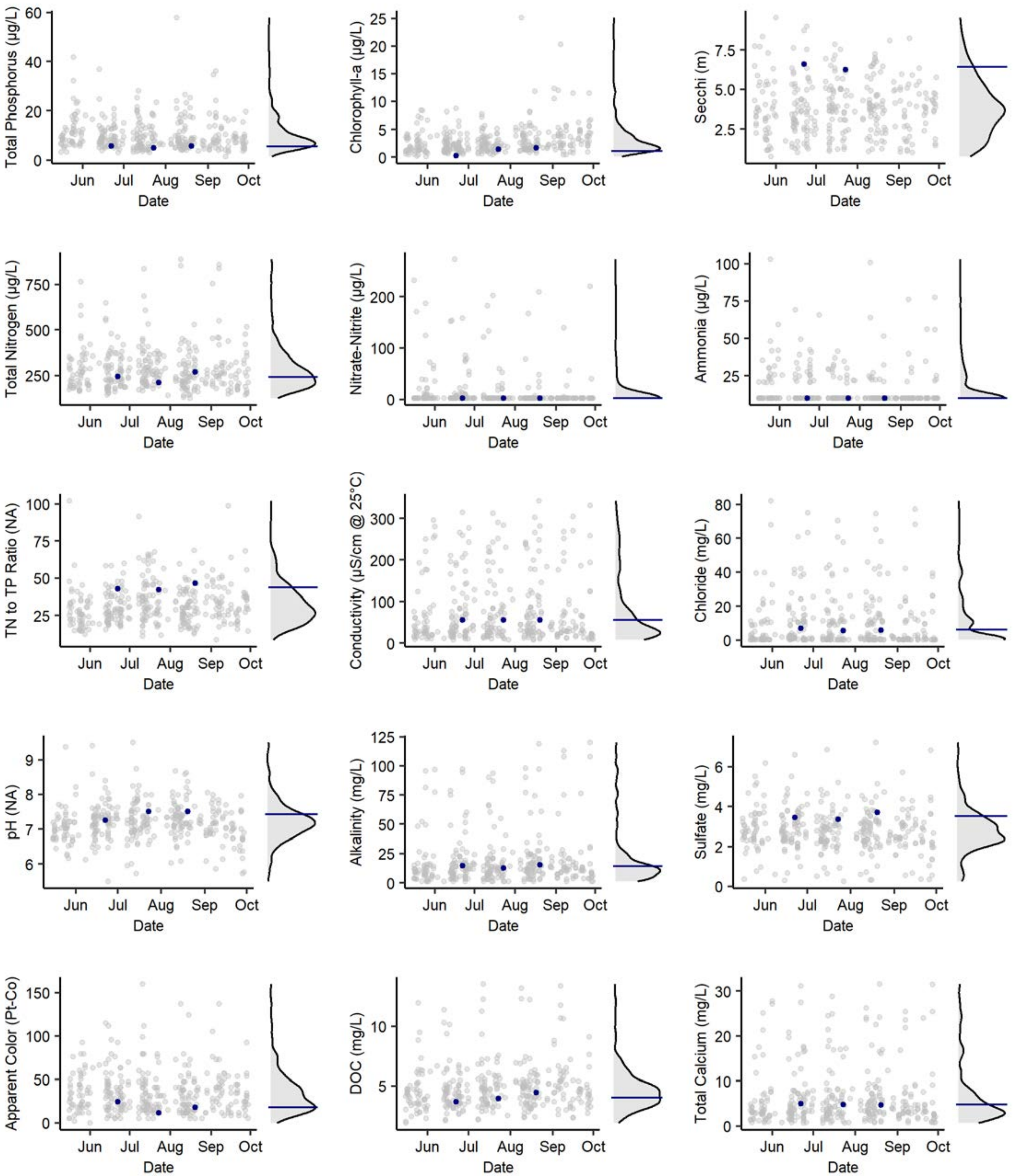
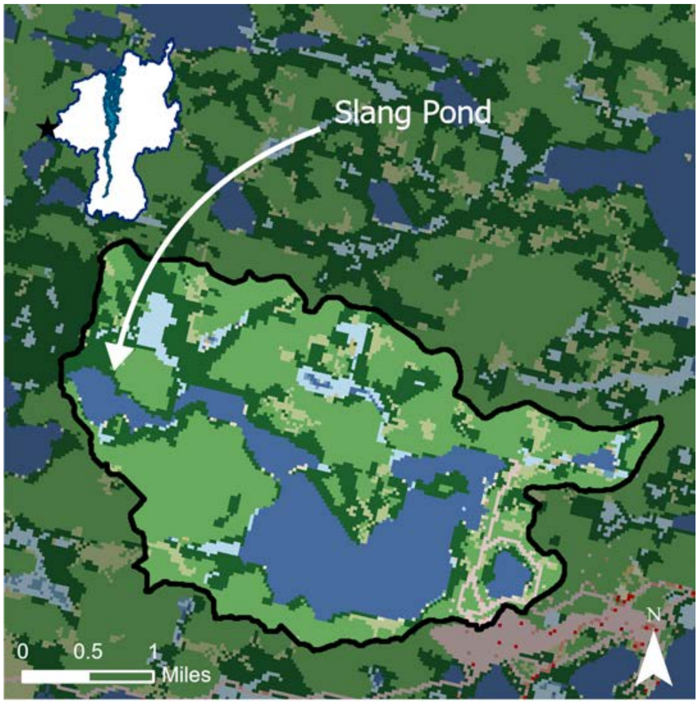


Slang Pond



- Open Water
- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, High Intensity
- Barren Land
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Dwarf Scrub
- Grassland/Herbaceous
- Woody Wetlands
- Emergent Herbaceous Wetlands

Location

Latitude:	44.3638
Longitude:	-74.3797
County:	Franklin
Town:	Santa Clara
Watershed:	Saranac Lakes-Saranac River

Lake Characteristics

Surface Area (ha):	21.2
Shoreline Length (km):	3.0
Max Depth (m):	7.0
Mean Depth (m):	3.8
Volume (m^3):	743,799
Flushing Rate (times/year):	8.7

Watershed Characteristics

Watershed Area (ha):	1,089.6
Open Water (%):	23.5
Developed, Open Space (%):	1.56
Developed, Low Intensity (%):	0.02
Developed, Medium Intensity (%):	0.00
Developed, High Intensity (%):	0.00
Barren Land (%):	0.08
Deciduous Forest (%):	43.92
Evergreen Forest (%):	20.31
Mixed Forest (%):	5.48
Dwarf Shrub (%):	0.12
Grassland/Herbaceous (%):	0.52
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	4.24
Emergent Herbaceous Wetlands (%):	0.24

Summary

Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Moderate
Road Salt Influence:	None

Notes: Profile data indicate that Slang Pond is thermally stratified during the summer with the epilimnion having dissolved oxygen concentrations >7 mg/L. The hypolimnion is anoxic (<2 mg/L) for the later part of the summer.

Aquatic Invasive Species Detections

None

Harmful Algal Bloom Reports

None

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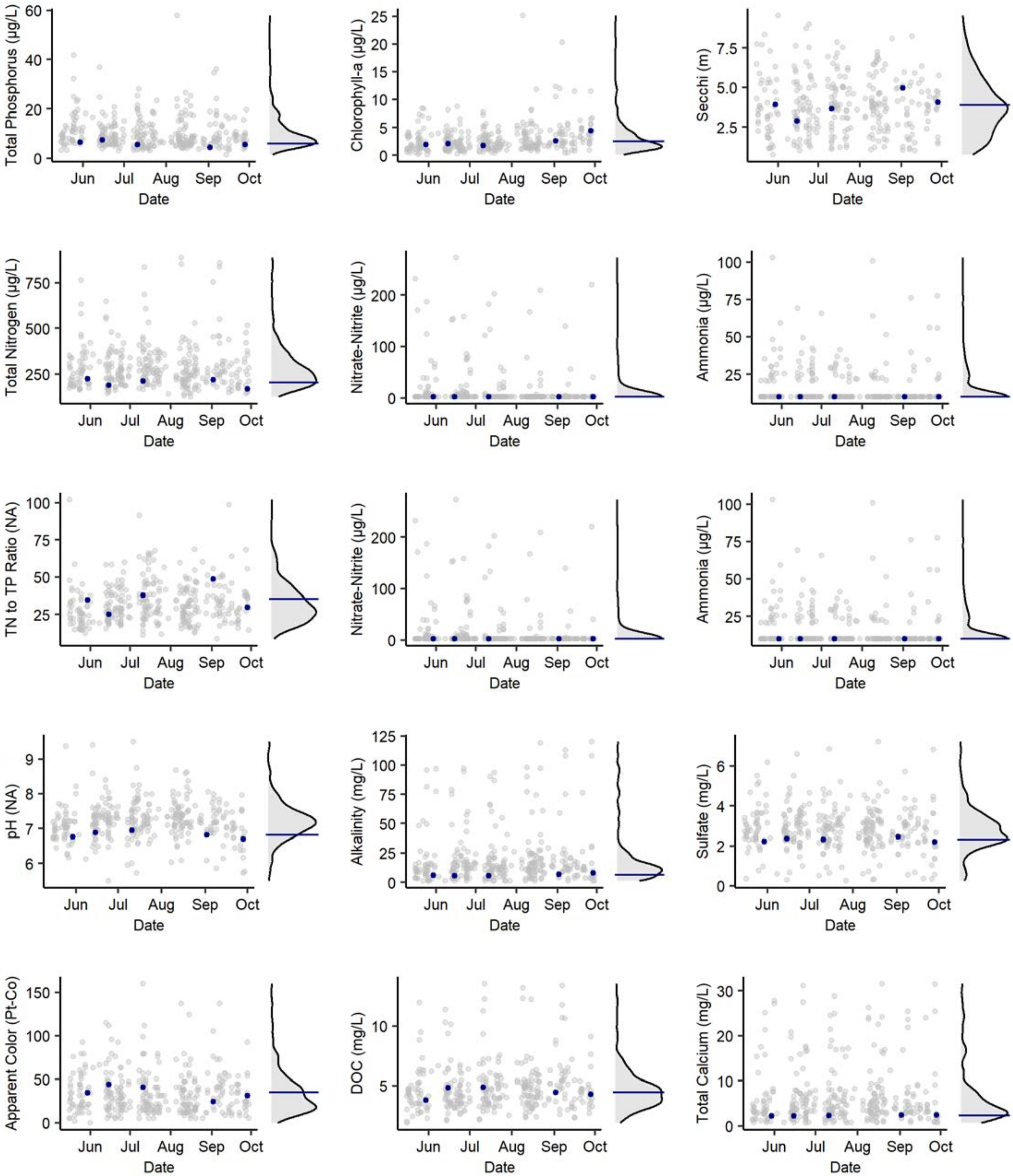
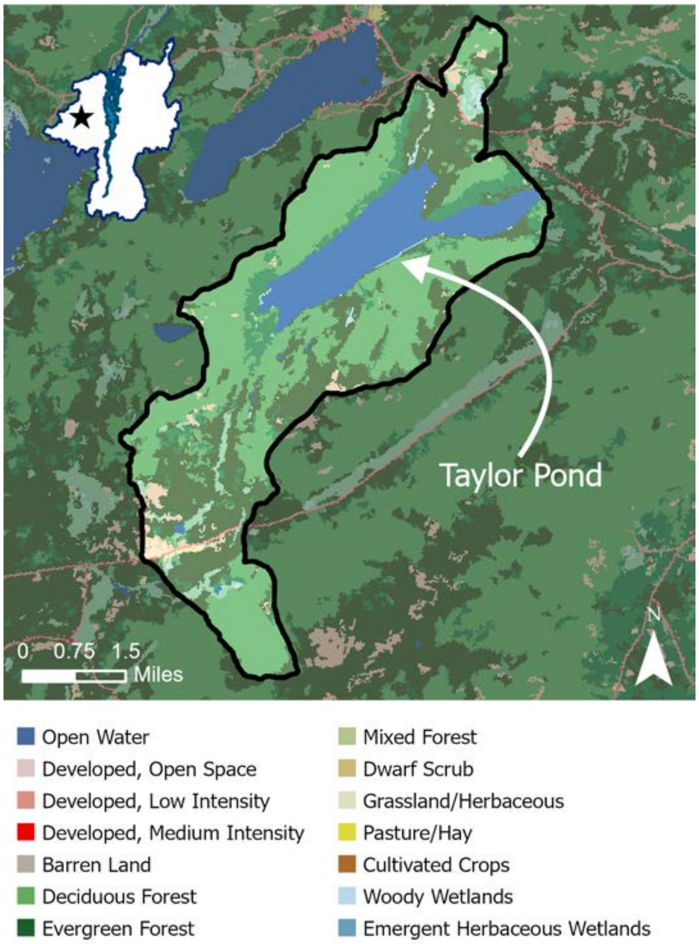


Taylor Pond



Location

Latitude:	44.4843
Longitude:	-73.8635
County:	Clinton
Town:	Black Brook
Watershed:	West Branch Ausable River

Lake Characteristics

Surface Area (ha):	358.0
Shoreline Length (km):	15.7
Max Depth (m):	29.0
Mean Depth (m):	13.4
Volume (m^3):	43,599,688
Flushing Rate (times/year):	0.3

Watershed Characteristics

Watershed Area (ha):	2,796.2
Open Water (%):	12.9
Developed, Open Space (%):	0.29
Developed, Low Intensity (%):	0.15
Developed, Medium Intensity (%):	0.03
Developed, High Intensity (%):	0.00
Barren Land (%):	0.00
Deciduous Forest (%):	43.34
Evergreen Forest (%):	28.12
Mixed Forest (%):	8.71
Dwarf Shrub (%):	2.07
Grassland/Herbaceous (%):	0.63
Pasture/Hay (%):	0.10
Cultivated Crops (%):	0.00
Woody Wetlands (%):	2.95
Emergent Herbaceous Wetlands (%):	0.72

Summary

Trophic Status (Chl-a):	Oligotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Oligotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Adequate
Road Salt Influence:	Low

Notes: None.

Aquatic Invasive Species Detections

Eurasian watermilfoil:	2002

Harmful Algal Bloom Reports

None

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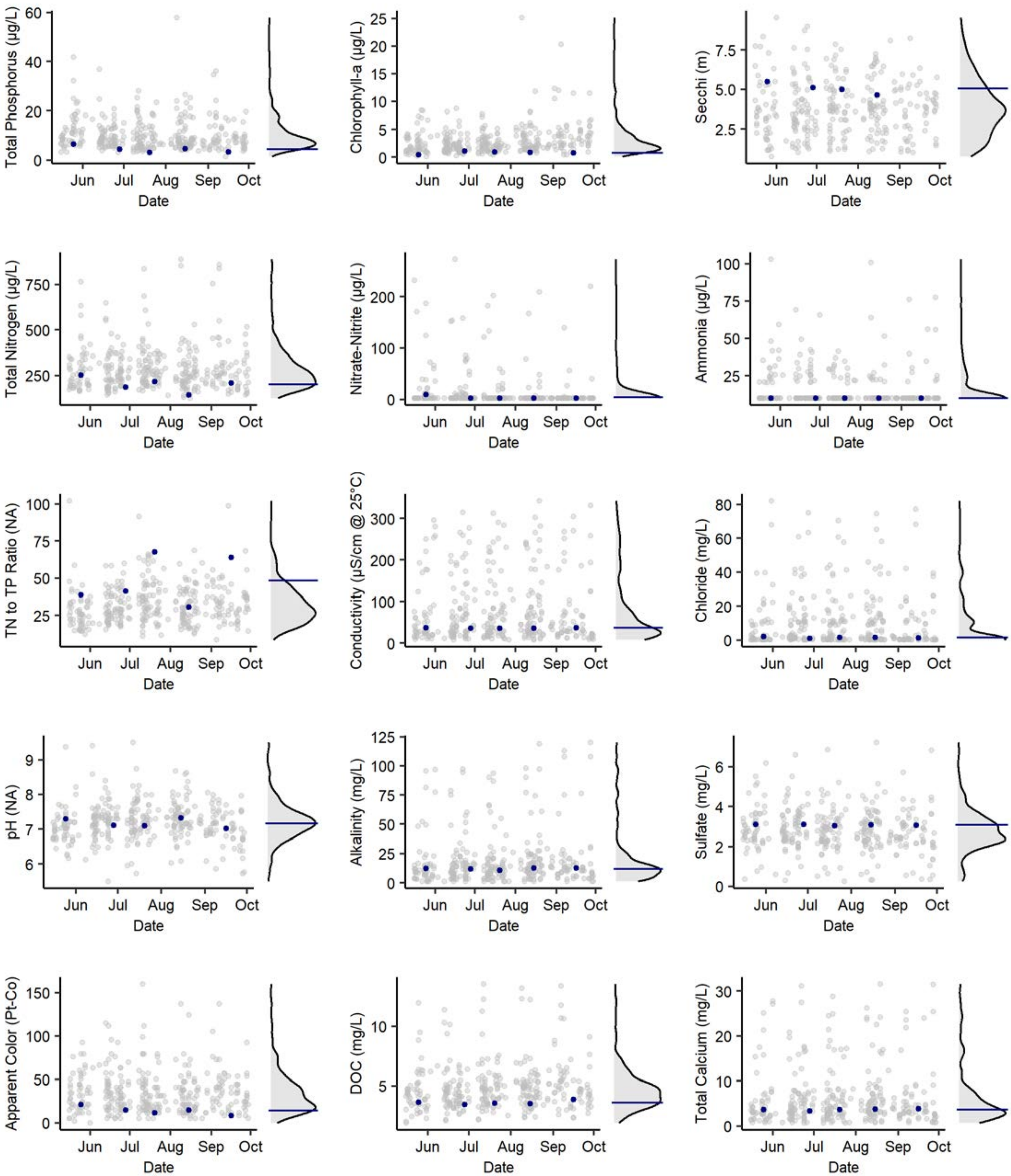
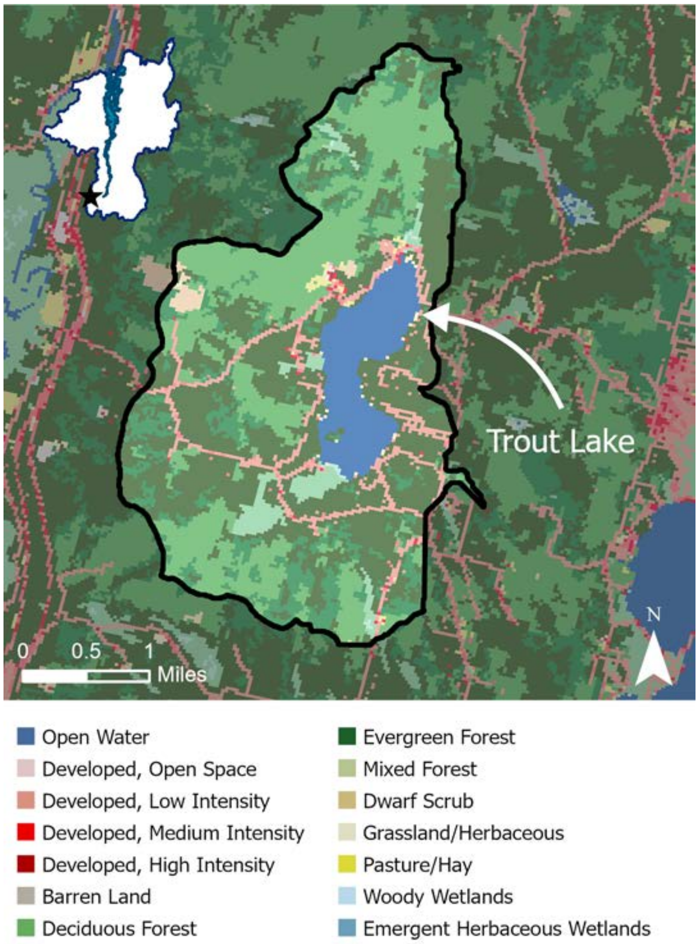


Trout Lake



Summary

Trophic Status (Chl-a):	Oligotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Oligotrophic
Acidity:	Alkaline: non-impacted
Acid Neutralizing Capacity:	Adequate
Road Salt Influence:	Moderate

Notes: None.

Location

Latitude:	43.5448
Longitude:	-73.6998
County:	Warren
Town:	Bolton
Watershed:	Lake George-La Chute

Lake Characteristics

Surface Area (ha):	104.6
Shoreline Length (km):	6.6
Max Depth (m):	22.9
Mean Depth (m):	6.4
Volume (m^3):	6,646,143
Flushing Rate (times/year):	0.9

Watershed Characteristics

Watershed Area (ha):	1,141.3
Open Water (%):	8.93
Developed, Open Space (%):	5.53
Developed, Low Intensity (%):	0.80
Developed, Medium Intensity (%):	0.27
Developed, High Intensity (%):	0.01
Barren Land (%):	0.05
Deciduous Forest (%):	28.24
Evergreen Forest (%):	37.32
Mixed Forest (%):	13.92
Dwarf Shrub (%):	0.69
Grassland/Herbaceous (%):	0.24
Pasture/Hay (%):	0.44
Cultivated Crops (%):	0.00
Woody Wetlands (%):	3.37
Emergent Herbaceous Wetlands (%):	0.17

Aquatic Invasive Species Detections

None

Harmful Algal Bloom Reports

None

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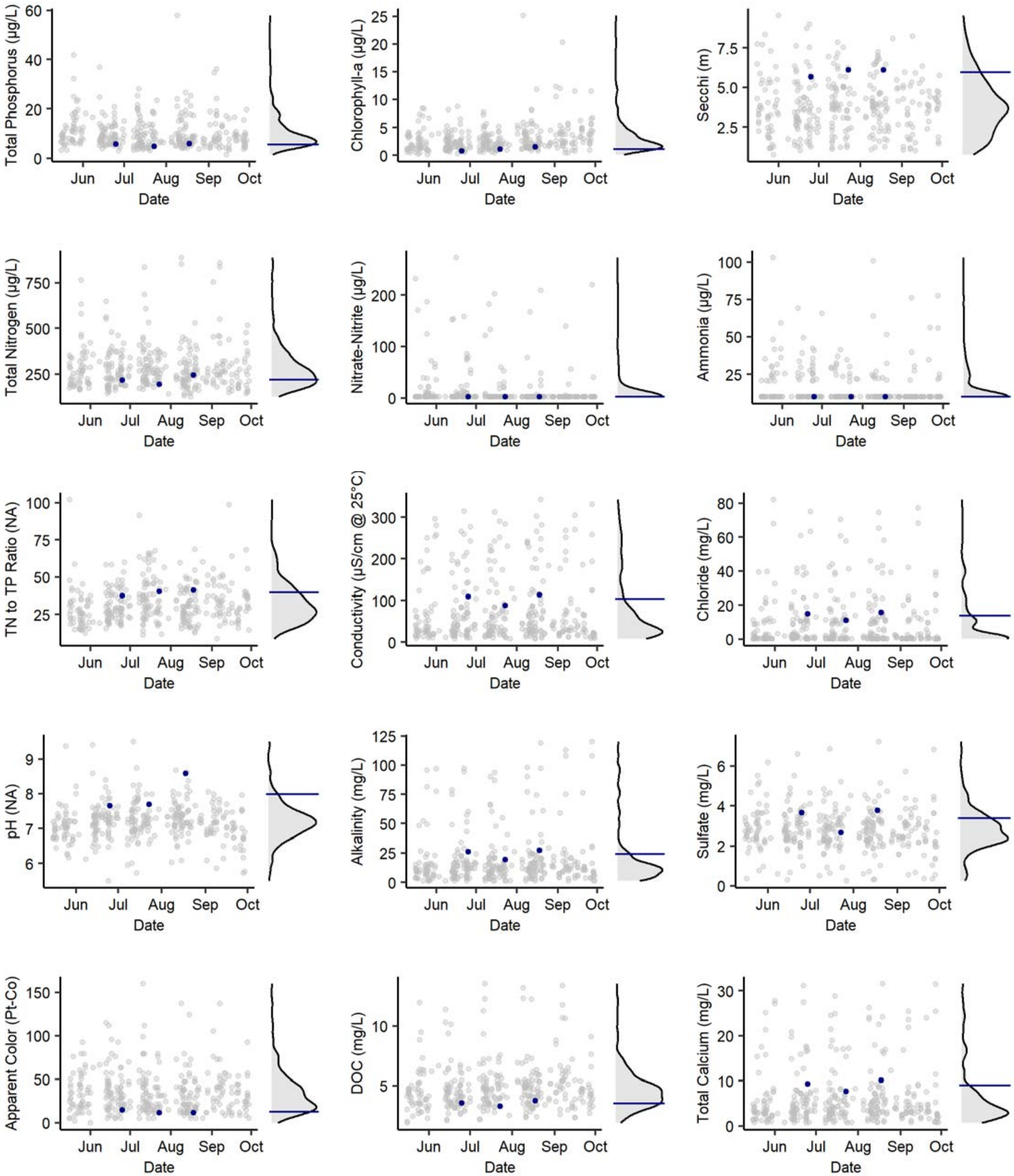
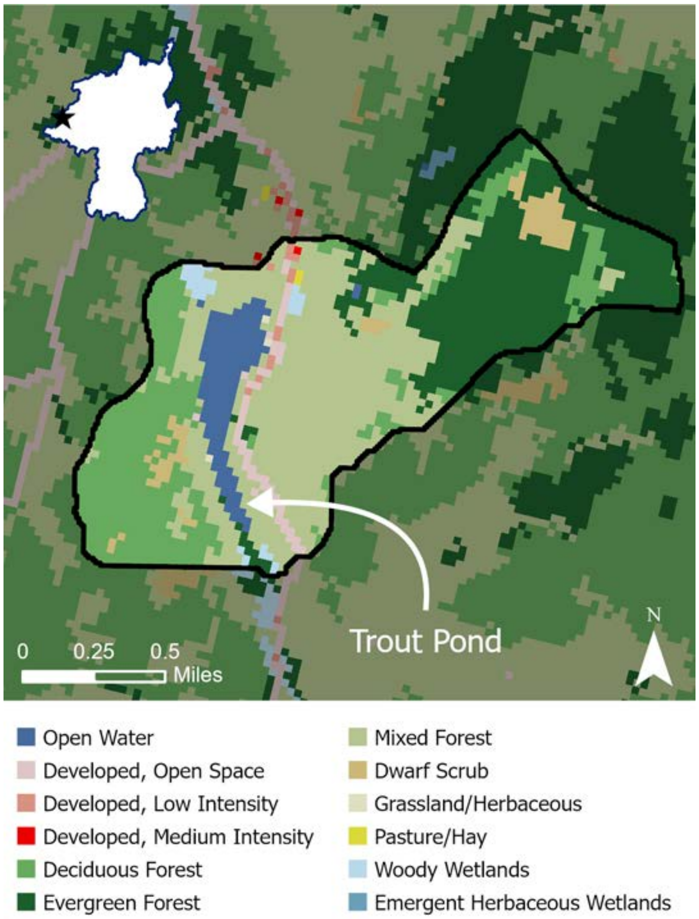


Trout Pond



Location

Latitude:	44.4197
Longitude:	-73.5732
County:	Essex
Town:	Chessterfield
Watershed:	Bouquet River

Lake Characteristics

Surface Area (ha):	13.5
Shoreline Length (km):	2.9
Max Depth (m):	2.1
Mean Depth (m):	1.2
Volume (m^3):	163,602
Flushing Rate (times/year):	4.5

Watershed Characteristics

Watershed Area (ha):	200.6
Open Water (%):	6.24
Developed, Open Space (%):	2.38
Developed, Low Intensity (%):	0.58
Developed, Medium Intensity (%):	0.04
Developed, High Intensity (%):	0.00
Barren Land (%):	0.00
Deciduous Forest (%):	22.63
Evergreen Forest (%):	26.45
Mixed Forest (%):	36.24
Dwarf Shrub (%):	3.73
Grassland/Herbaceous (%):	0.13
Pasture/Hay (%):	0.09
Cultivated Crops (%):	0.00
Woody Wetlands (%):	1.48
Emergent Herbaceous Wetlands (%):	0.00

Summary

Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Mesotrophic
Trophic Status (Secchi):	Eutrophic
Acidity:	Alkaline: non-impacted
Acid Neutralizing Capacity:	High
Road Salt Influence:	Low

Notes: None.

Aquatic Invasive Species Detections

None

Harmful Algal Bloom Reports

None

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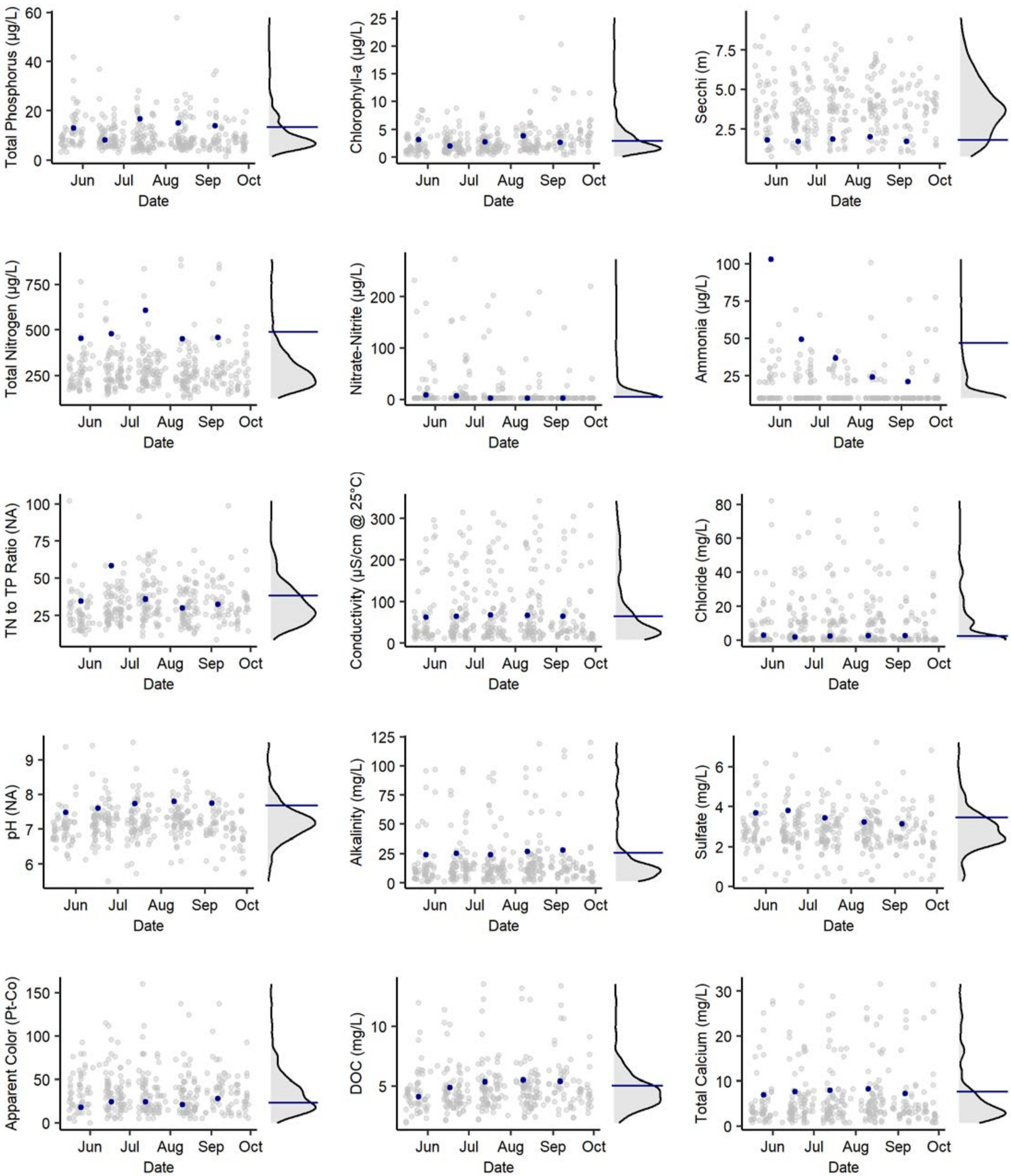
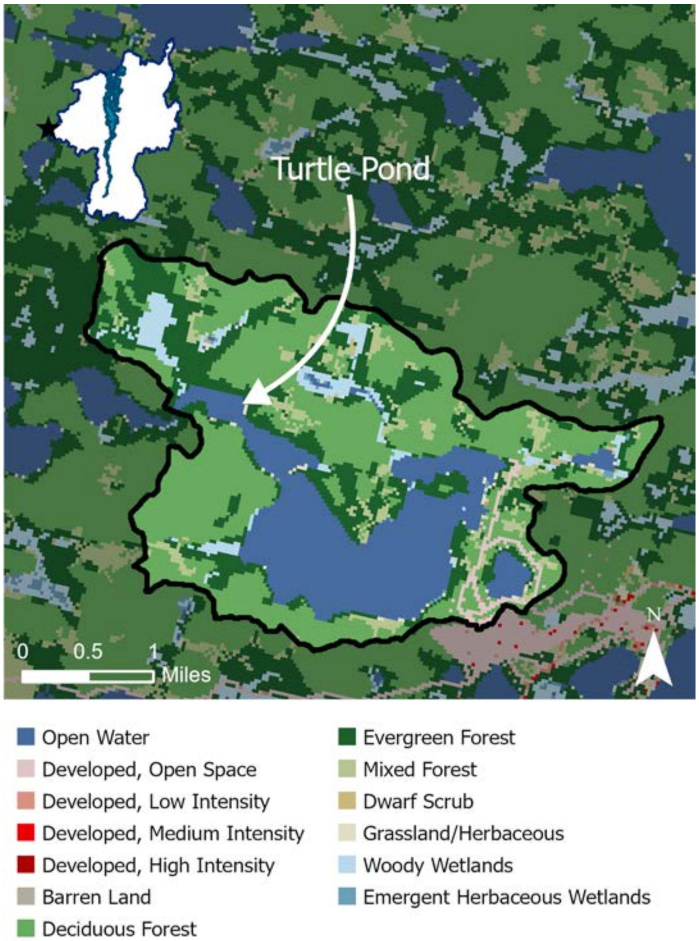


Turtle Pond



Summary	
Trophic Status (Chl-a):	Oligotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Oligotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Moderate
Road Salt Influence:	None

Notes: Profile data indicate that Turtle Pond is thermally stratified during the summer with the epilimnion having dissolved oxygen concentrations >7 mg/L. The hypolimnion is anoxic (<2 mg/L) for the later part of the summer.

Location	
Latitude:	44.3601
Longitude:	-74.3613
County:	Franklin
Town:	Santa Clara
Watershed:	Saranac Lakes-Saranac River

Lake Characteristics	
Surface Area (ha):	28.7
Shoreline Length (km):	3.6
Max Depth (m):	10.0
Mean Depth (m):	3.1
Volume (m^3):	868,309
Flushing Rate (times/year):	6.7

Watershed Characteristics	
Watershed Area (ha):	996.3
Open Water (%):	23.58
Developed, Open Space (%):	1.71
Developed, Low Intensity (%):	0.03
Developed, Medium Intensity (%):	0.00
Developed, High Intensity (%):	0.00
Barren Land (%):	0.09
Deciduous Forest (%):	43.61
Evergreen Forest (%):	19.76
Mixed Forest (%):	5.86
Dwarf Shrub (%):	0.14
Grassland/Herbaceous (%):	0.51
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	4.46
Emergent Herbaceous Wetlands (%):	0.26

Aquatic Invasive Species Detections
None

Harmful Algal Bloom Reports
None

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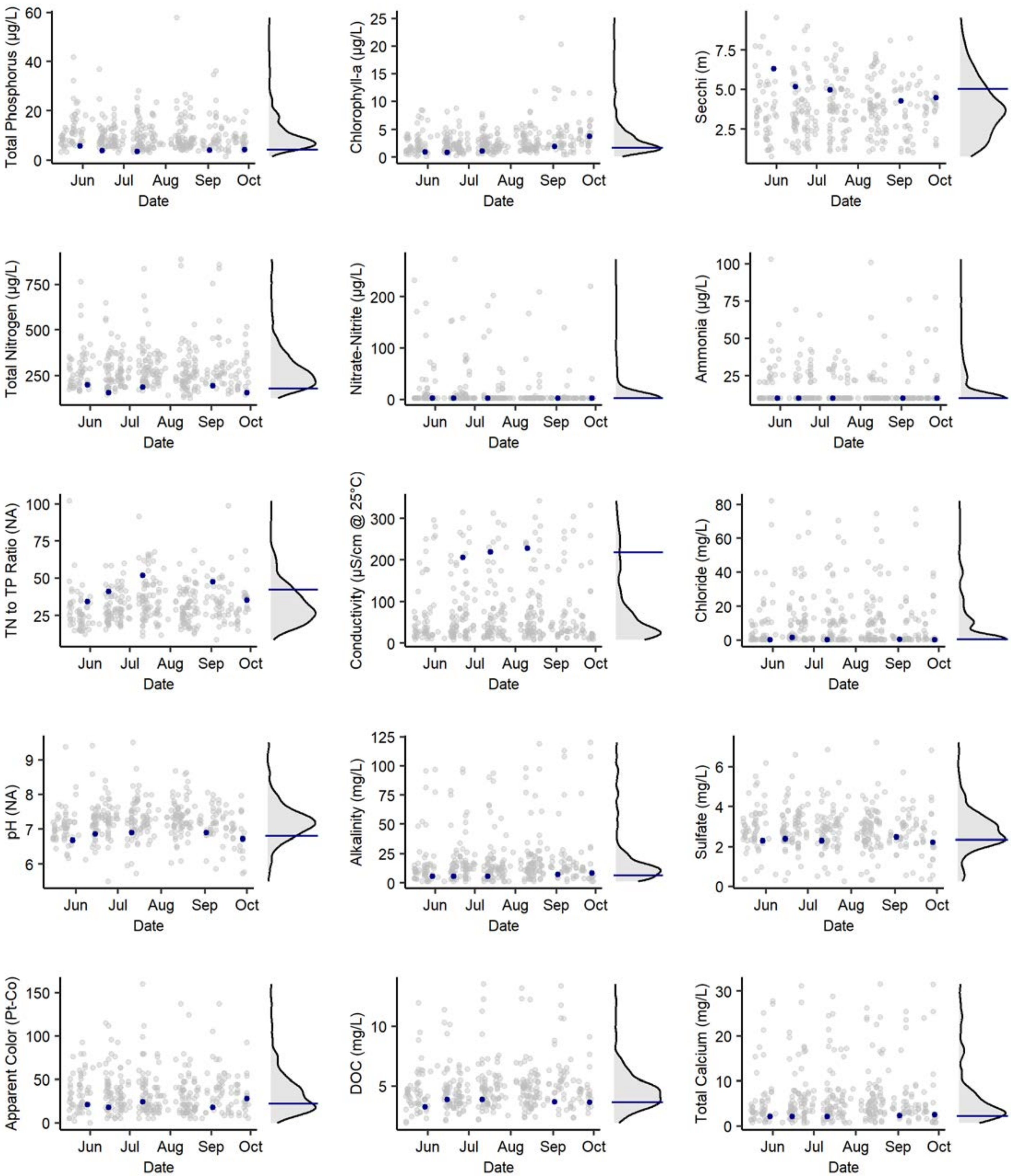
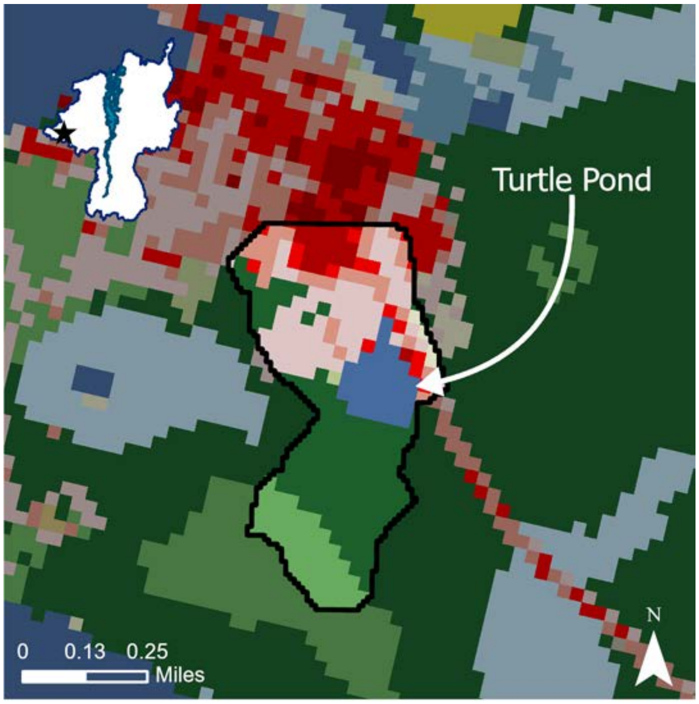


Turtle Pond



Open Water
Developed, Open Space
Developed, Low Intensity
Developed, Medium Intensity
Developed, High Intensity
Barren Land
Deciduous Forest
Evergreen Forest
Mixed Forest
Dwarf Scrub
Grassland/Herbaceous
Pasture/Hay
Woody Wetlands
Emergent Herbaceous Wetlands

Summary	
Trophic Status (Chl-a):	Oligotrophic
Trophic Status (TP):	Mesotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Acidic: acceptable
Acid Neutralizing Capacity:	Low
Road Salt Influence:	Moderate

Notes: Profile data indicate that Turtle Pond is thermally stratified during the summer with the epilimnion having dissolved oxygen concentrations >7 mg/L. The hypolimnion is anoxic (<2 mg/L) for much of the summer.

Location	
Latitude:	44.3079
Longitude:	-74.1146
County:	Essex
Town:	North Elba
Watershed:	Sumner Brook-Saranac River

Lake Characteristics	
Surface Area (ha):	3.0
Shoreline Length (km):	0.8
Max Depth (m):	11.4
Mean Depth (m):	NA
Volume (m^3):	NA
Flushing Rate (times/year):	NA

Watershed Characteristics	
Watershed Area (ha):	28.4
Open Water (%):	9.75
Developed, Open Space (%):	20.13
Developed, Low Intensity (%):	9.75
Developed, Medium Intensity (%):	4.72
Developed, High Intensity (%):	5.03
Barren Land (%):	0.00
Deciduous Forest (%):	13.52
Evergreen Forest (%):	35.53
Mixed Forest (%):	0.31
Dwarf Shrub (%):	0.00
Grassland/Herbaceous (%):	1.26
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	0.00
Emergent Herbaceous Wetlands (%):	0.00

Aquatic Invasive Species Detections
None

Harmful Algal Bloom Reports
None

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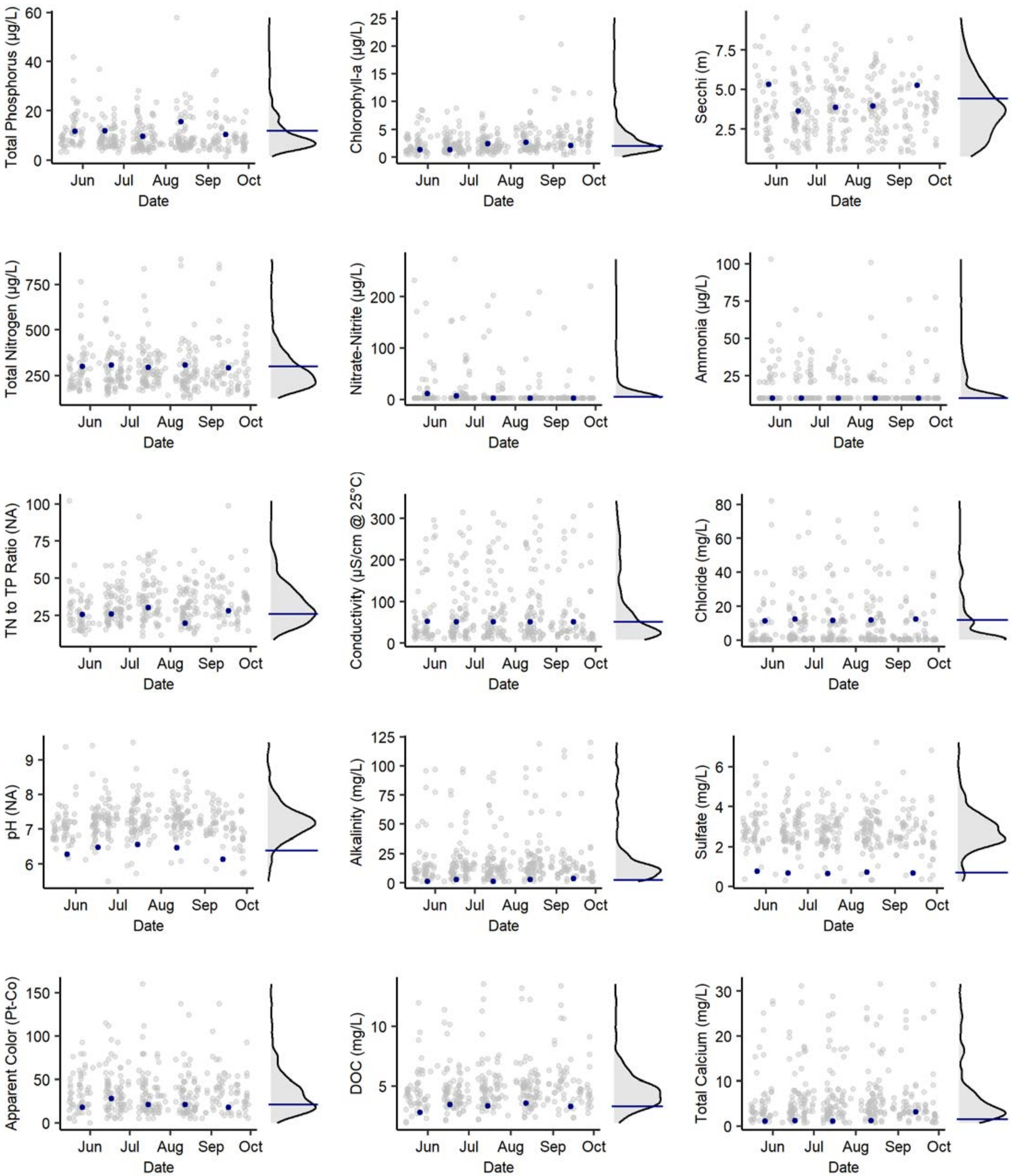
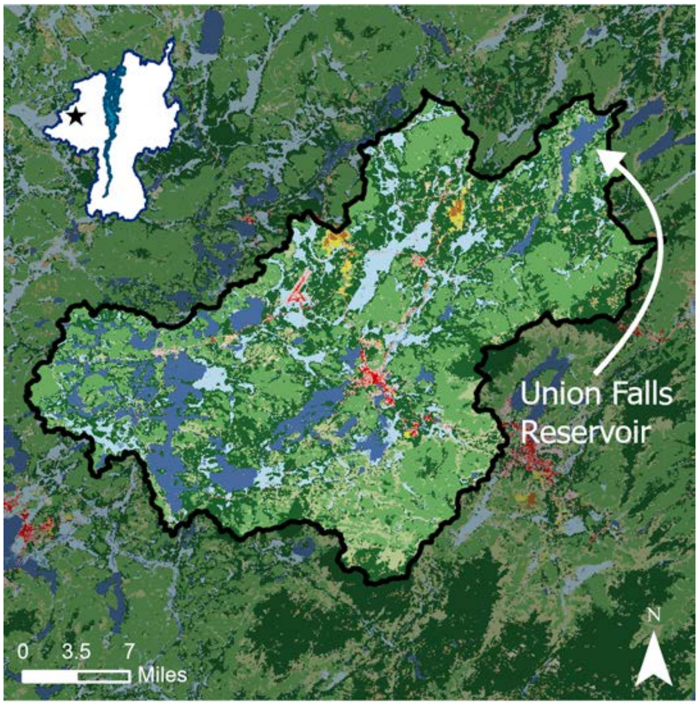


Union Falls Reservoir



Open Water	Mixed Forest
Developed, Open Space	Dwarf Scrub
Developed, Low Intensity	Grassland/Herbaceous
Developed, Medium Intensity	Pasture/Hay
Developed, High Intensity	Cultivated Crops
Barren Land	Woody Wetlands
Deciduous Forest	Emergent Herbaceous Wetlands
Evergreen Forest	

Summary	
Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Mesotrophic
Trophic Status (Secchi):	Eutrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Adequate
Road Salt Influence:	Moderate

Notes: Secchi measurement missing from volunteer field form.

Location	
Latitude:	44.4919
Longitude:	-73.9354
Counties:	Clinton, Franklin
Towns:	Black Brook, Franklin
Watershed:	Union Falls Pond-Saranac River

Lake Characteristics	
Surface Area (ha):	660.0
Shoreline Length (km):	36.4
Max Depth (m):	7.6
Mean Depth (m):	2.4
Volume (m^3):	359,624
Flushing Rate (times/year):	45.6

Watershed Characteristics	
Watershed Area (ha):	85,309.9
Open Water (%):	9.08
Developed, Open Space (%):	1.80
Developed, Low Intensity (%):	0.77
Developed, Medium Intensity (%):	0.38
Developed, High Intensity (%):	0.07
Barren Land (%):	0.11
Deciduous Forest (%):	30.02
Evergreen Forest (%):	34.69
Mixed Forest (%):	9.62
Dwarf Shrub (%):	1.03
Grassland/Herbaceous (%):	0.59
Pasture/Hay (%):	0.44
Cultivated Crops (%):	0.21
Woody Wetlands (%):	10.82
Emergent Herbaceous Wetlands (%):	0.37

Aquatic Invasive Species Detections	
Eurasian watermilfoil:	2003
Variable-leaf milfoil:	2009

Harmful Algal Bloom Reports
None

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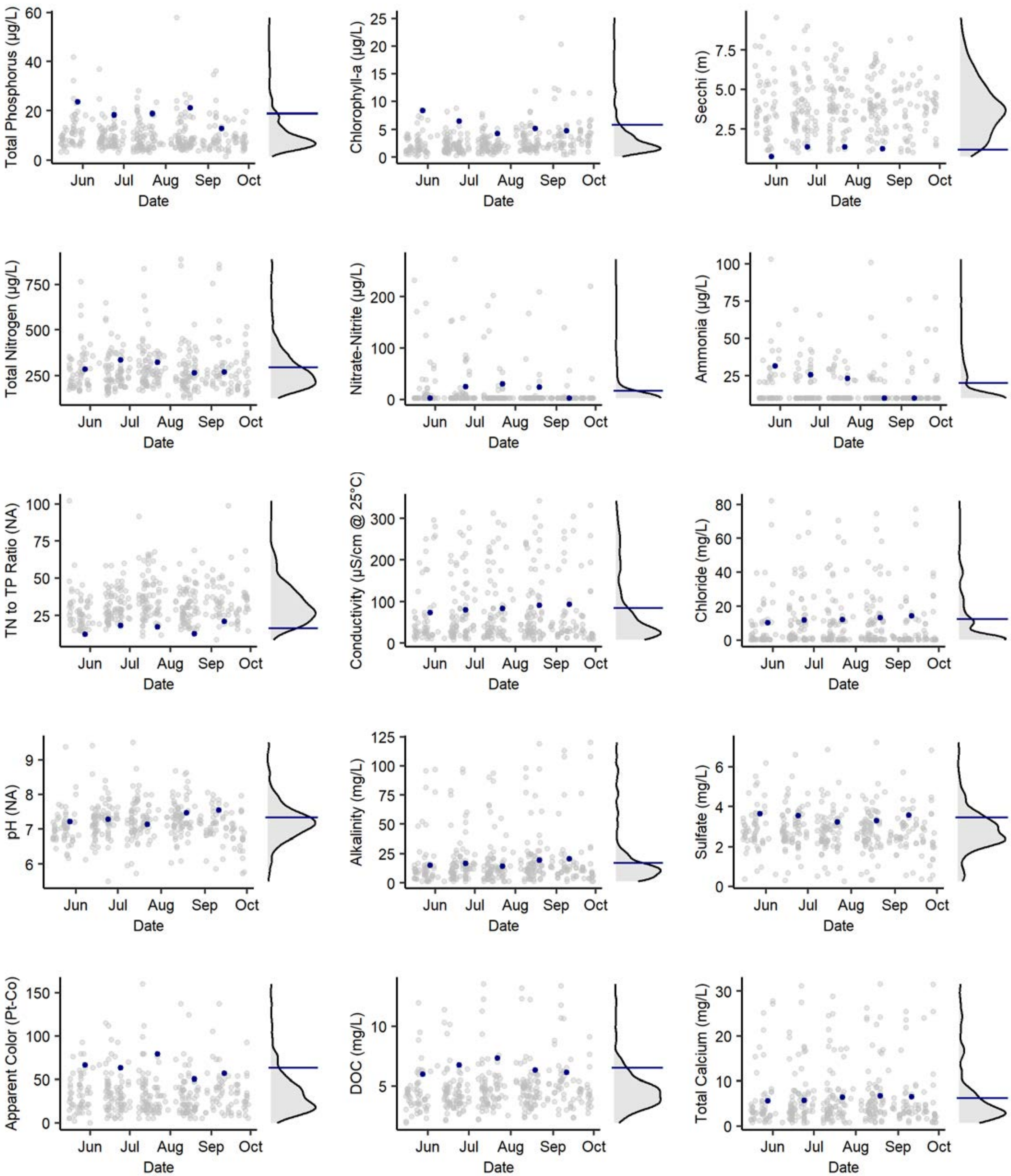
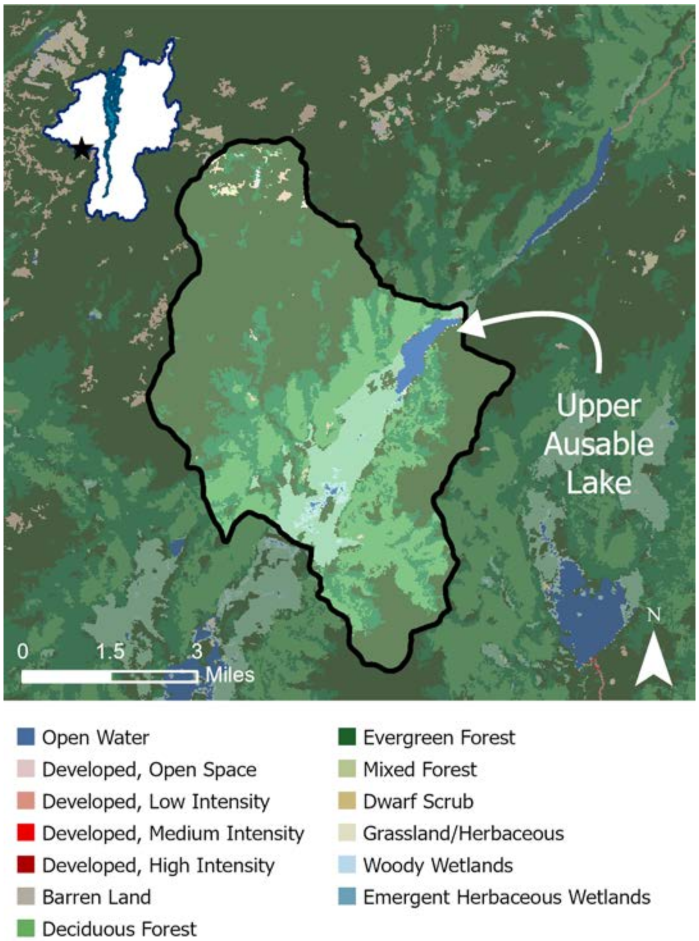


UPPER AUSABLE LAKE



Summary

Trophic Status (Chl-a):	Oligotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Moderate
Road Salt Influence:	None

Notes: None.

Location

Latitude:	44.0772
Longitude:	-73.8737
County:	Essex
Town:	Keene, North Hudson
Watershed:	East Branch Ausable River

Lake Characteristics

Surface Area (ha):	60.5
Shoreline Length (km):	5.1
Max Depth (m):	14.6
Mean Depth (m):	4.4
Volume (m^3):	2,702,942
Flushing Rate (times/year):	9.8

Watershed Characteristics

Watershed Area (ha):	4,125.6
Open Water (%):	1.56
Developed, Open Space (%):	0.00
Developed, Low Intensity (%):	0.07
Developed, Medium Intensity (%):	0.00
Developed, High Intensity (%):	0.00
Barren Land (%):	0.20
Deciduous Forest (%):	19.65
Evergreen Forest (%):	52.61
Mixed Forest (%):	15.86
Dwarf Shrub (%):	0.37
Grassland/Herbaceous (%):	0.29
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	8.69
Emergent Herbaceous Wetlands (%):	0.69

Aquatic Invasive Species Detections

None

Harmful Algal Bloom Reports

None

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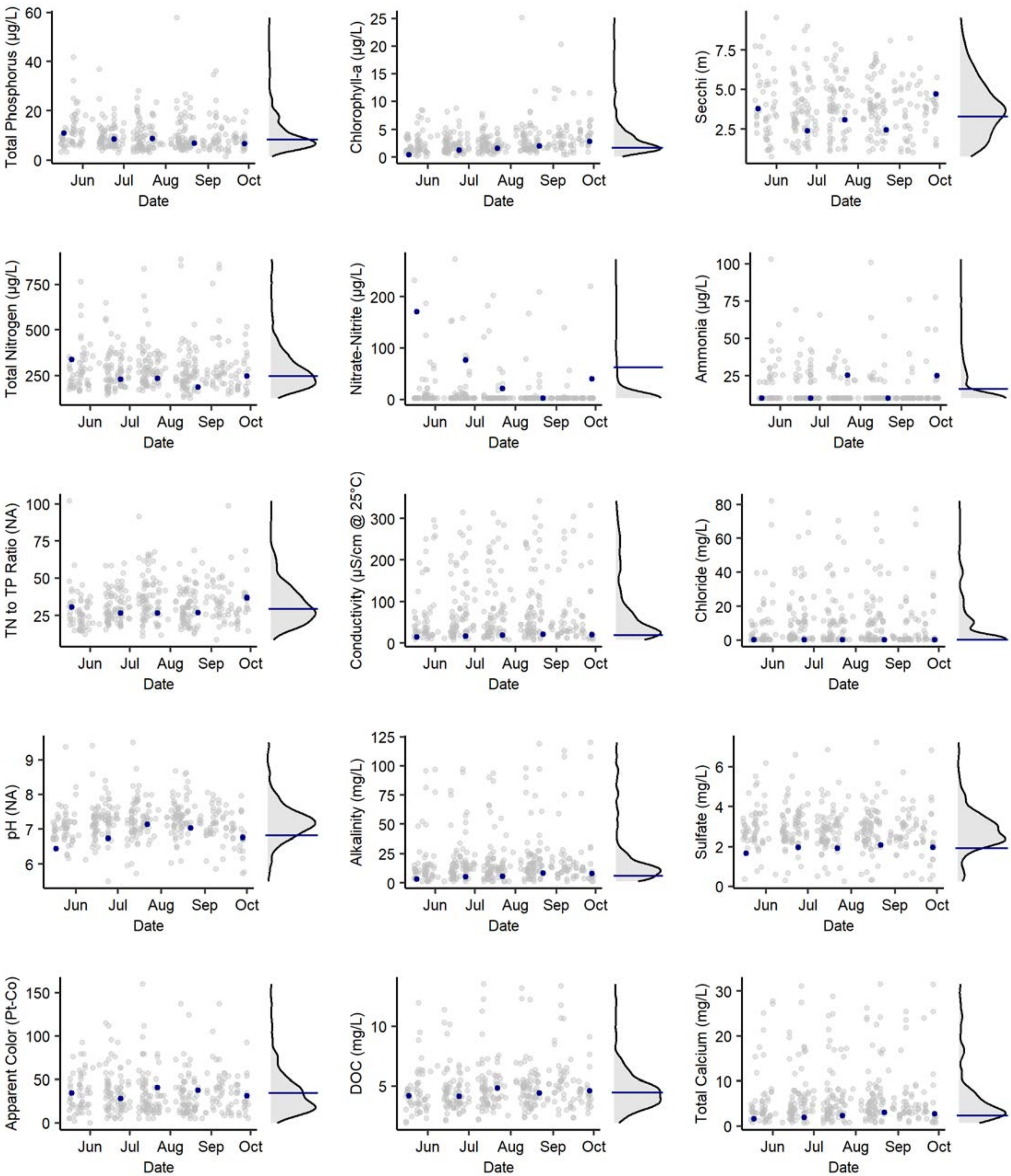
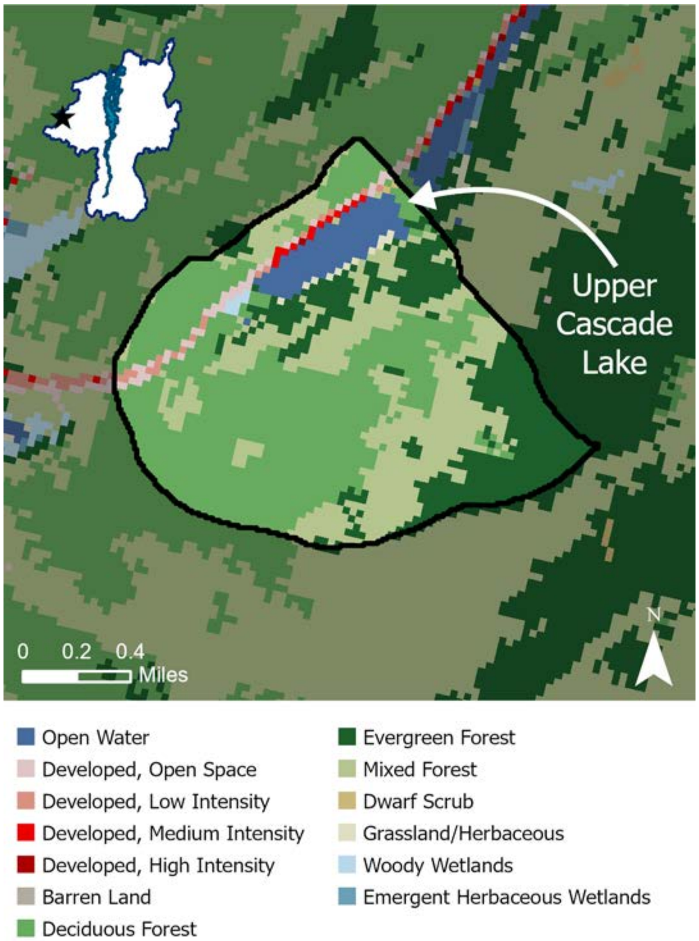


Upper Cascade Lake



Summary

Trophic Status (Chl-a):	Oligotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Adequate
Road Salt Influence:	High

Notes: None.

Location

Latitude:	44.2234
Longitude:	-73.8792
County:	Essex
Town:	Keene, North Elba
Watershed:	East Branch Ausable River

Lake Characteristics

Surface Area (ha):	10.6
Shoreline Length (km):	1.7
Max Depth (m):	19.2
Mean Depth (m):	11.8
Volume (m^3):	1,144,425
Flushing Rate (times/year):	1.5

Watershed Characteristics

Watershed Area (ha):	217.7
Open Water (%):	5.37
Developed, Open Space (%):	1.74
Developed, Low Intensity (%):	0.83
Developed, Medium Intensity (%):	0.54
Developed, High Intensity (%):	0.04
Barren Land (%):	0.00
Deciduous Forest (%):	43.32
Evergreen Forest (%):	20.42
Mixed Forest (%):	26.87
Dwarf Shrub (%):	0.08
Grassland/Herbaceous (%):	0.50
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	0.29
Emergent Herbaceous Wetlands (%):	0.00

Aquatic Invasive Species Detections

None

Harmful Algal Bloom Reports

None

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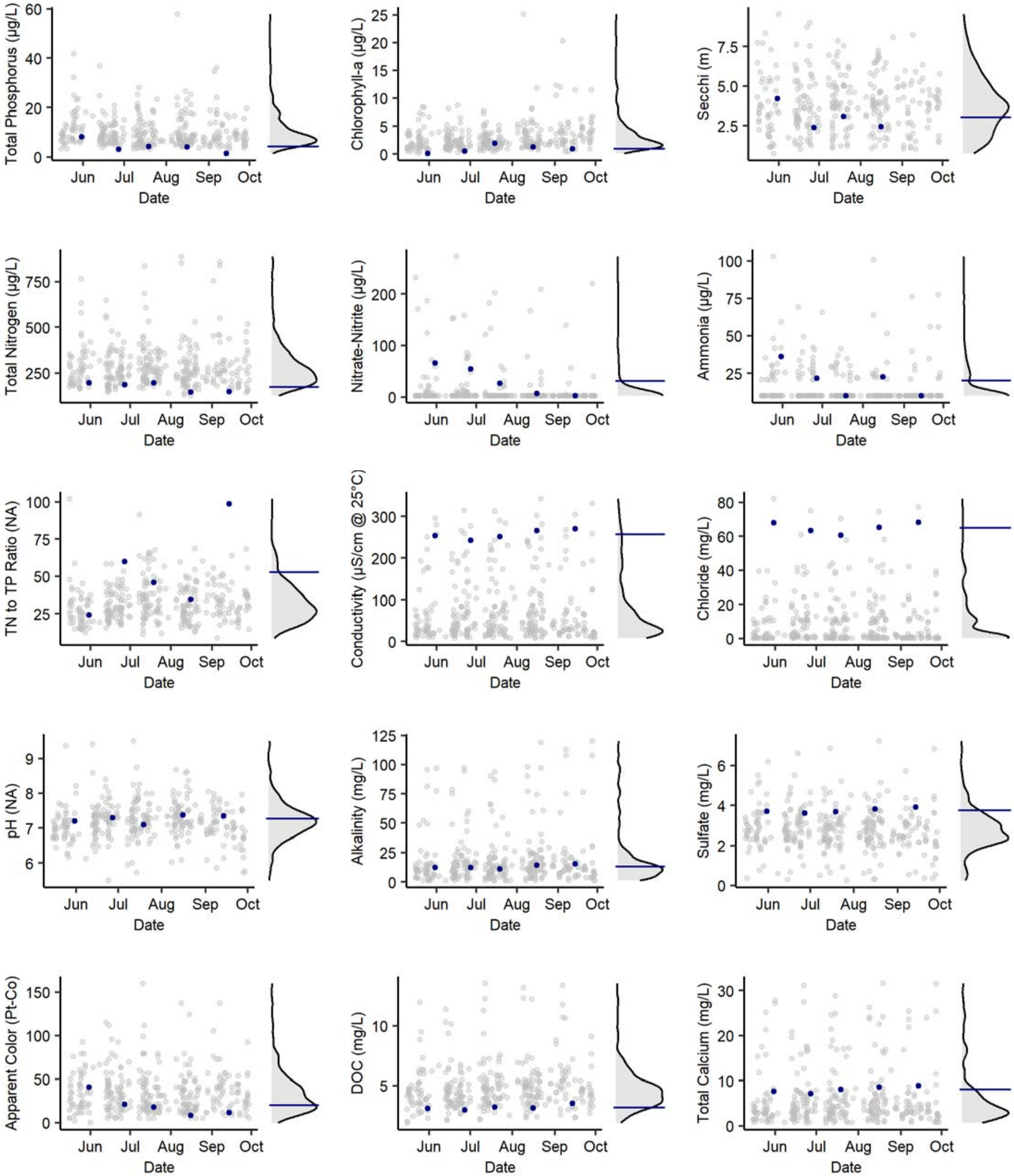
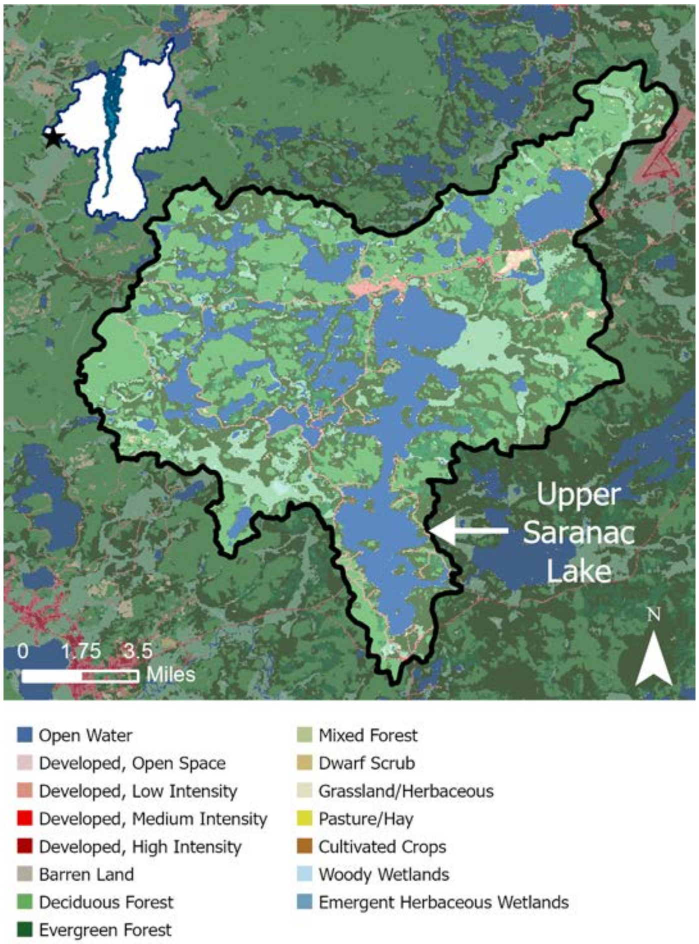


Upper Saranac Lake



Summary

Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Oligotrophic
Trophic Status (Secchi):	Mesotrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Adequate
Road Salt Influence:	Low

Notes: There are two sets of points in the figures representing samples from both the north and south basins.

Profile data indicate that Upper Saranac Lake is thermally stratified during the summer with the epilimnion having dissolved oxygen concentrations >7 mg/L. The hypolimnion is anoxic (<2 mg/L) for much of the summer.

Location

Latitude:	44.3243
Longitude:	-74.3219
County:	Franklin
Town:	Harrietstown, Santa Clara
Watershed:	Saranac Lakes-Saranac River

Lake Characteristics

Surface Area (ha):	1,970.6
Shoreline Length (km):	76.8
Max Depth (m):	26.0
Mean Depth (m):	10.1
Volume (m^3):	150,000,00
Flushing Rate (times/year):	0.9

Watershed Characteristics

Watershed Area (ha):	
Open Water (%):	21.71
Developed, Open Space (%):	2.21
Developed, Low Intensity (%):	0.33
Developed, Medium Intensity (%):	0.13
Developed, High Intensity (%):	0.01
Barren Land (%):	0.03
Deciduous Forest (%):	31.06
Evergreen Forest (%):	27.44
Mixed Forest (%):	5.97
Dwarf Shrub (%):	0.39
Grassland/Herbaceous (%):	0.53
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	9.81
Emergent Herbaceous Wetlands (%):	0.37

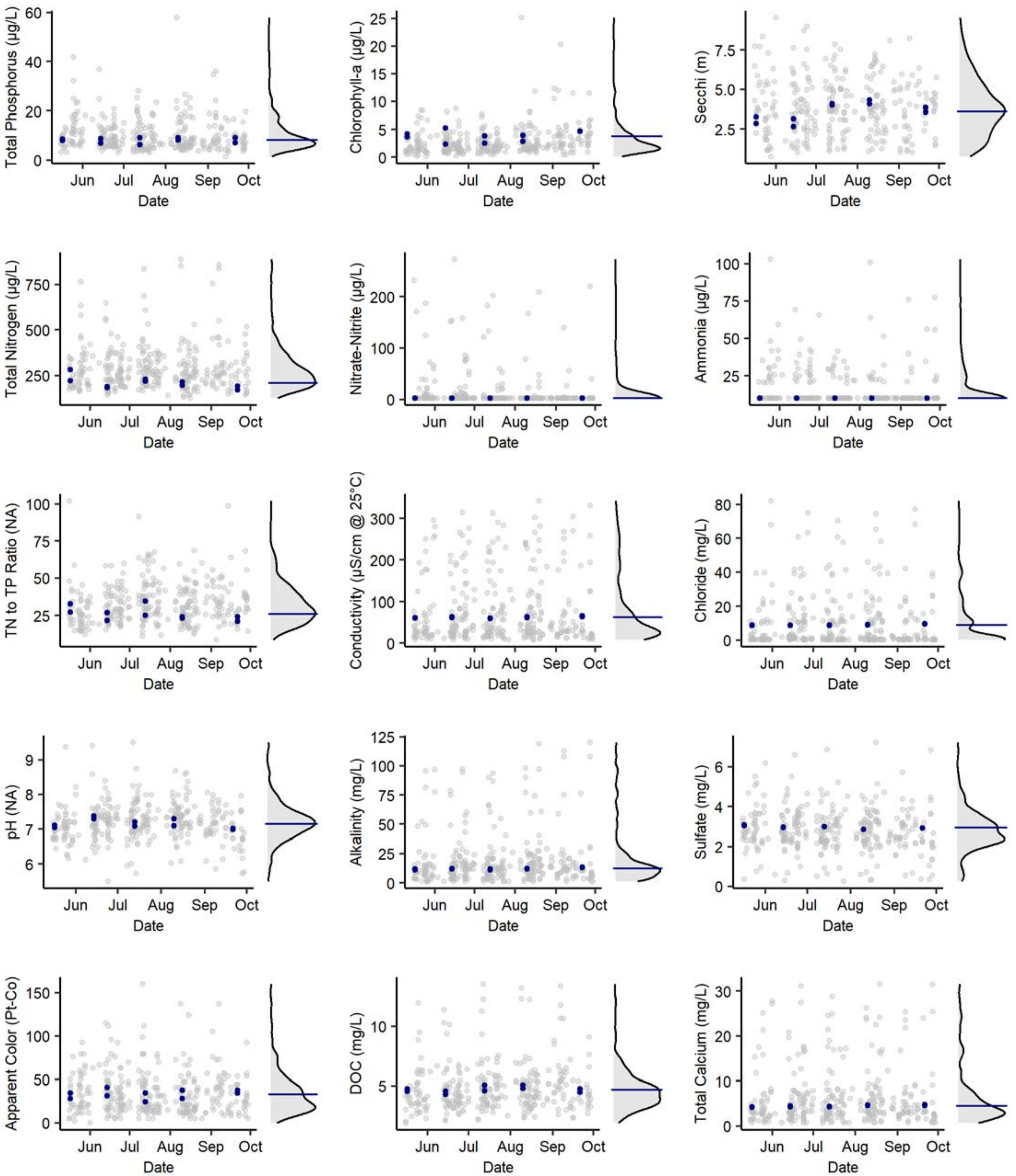
Aquatic Invasive Species Detections

Eurasian watermilfoil:	Unknown
Variable-leaf milfoil:	Unknown

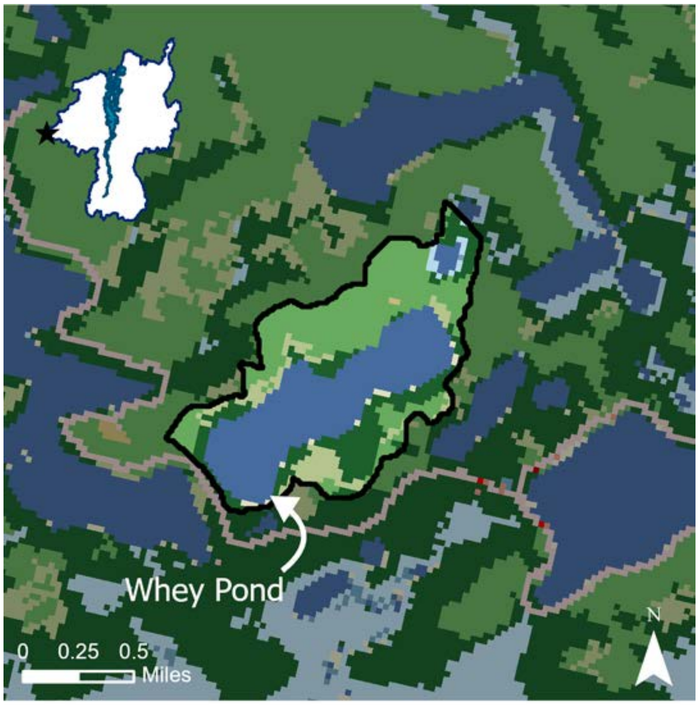
Harmful Algal Bloom Reports

1990, 2022

Gray dots represent all data in the report, blue dots are the samples for the represented lake. The right sub-plot shows the density distribution for all data in gray and the mean for the represented lake as a blue line.



Whey Pond



Open Water	Evergreen Forest
Developed, Open Space	Mixed Forest
Developed, Low Intensity	Dwarf Scrub
Developed, Medium Intensity	Grassland/Herbaceous
Developed, High Intensity	Woody Wetlands
Barren Land	Emergent Herbaceous Wetlands
Deciduous Forest	

Summary

Trophic Status (Chl-a):	Mesotrophic
Trophic Status (TP):	Mesotrophic
Trophic Status (Secchi):	Eutrophic
Acidity:	Circumneutral: non-impacted
Acid Neutralizing Capacity:	Adequate
Road Salt Influence:	None

Notes: Profile data indicate that When Pond is weakly stratified during the summer with the surface having dissolved oxygen concentrations >7 mg/L. The very bottom is anoxic (<2 mg/L) for much of the summer.

Location

Latitude:	44.3077
Longitude:	-74.3929
County:	Franklin
Town:	Santa Clara
Watershed:	Saranac Lakes-Saranac River

Lake Characteristics

Surface Area (ha):	47.4
Shoreline Length (km):	3.9
Max Depth (m):	6.1
Mean Depth (m):	3.8
Volume (m^3):	1,645,927
Flushing Rate (times/year):	0.5

Watershed Characteristics

Watershed Area (ha):	130.1
Open Water (%):	37.77
Developed, Open Space (%):	0.00
Developed, Low Intensity (%):	0.00
Developed, Medium Intensity (%):	0.00
Developed, High Intensity (%):	0.00
Barren Land (%):	0.00
Deciduous Forest (%):	32.85
Evergreen Forest (%):	18.36
Mixed Forest (%):	8.59
Dwarf Shrub (%):	0.14
Grassland/Herbaceous (%):	1.04
Pasture/Hay (%):	0.00
Cultivated Crops (%):	0.00
Woody Wetlands (%):	1.18
Emergent Herbaceous Wetlands (%):	0.07

Aquatic Invasive Species Detections

None

Harmful Algal Bloom Reports

2020, 2022

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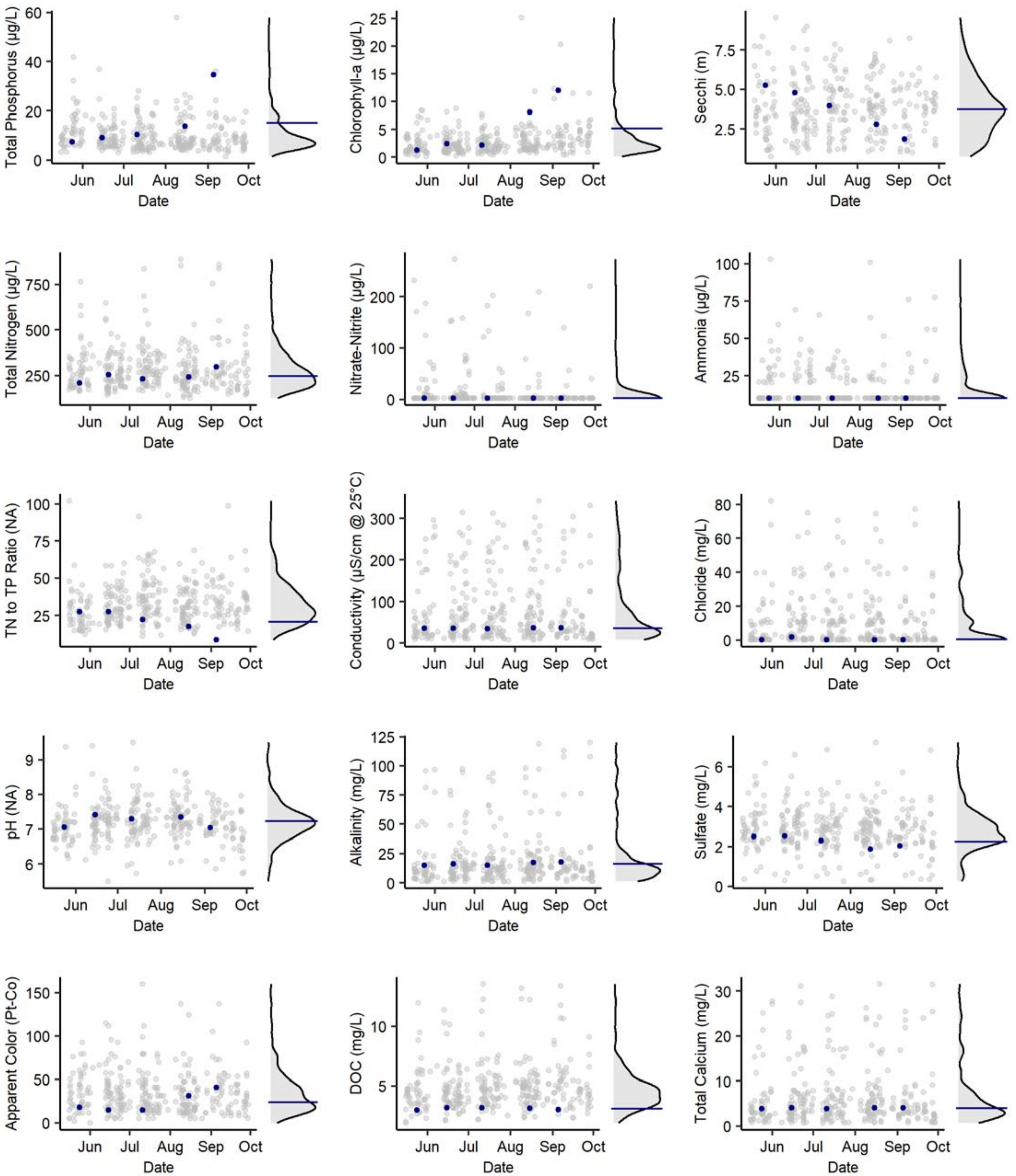

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Lake Colby Watershed Action Plan

Patrick Leahy Lake Champlain Basin Program

NEIWPCC

Paul Smith's College Adirondack Watershed Institute

Lake Colby Watershed Action Plan

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FORWARD & ACKNOWLEDGMENTS

The Lake Colby Watershed Action Plan summarizes goals and actions to protect and preserve the ecological and cultural values of Lake Colby and its watershed. The action plan aligns with the *Lake Champlain Basin Program's Opportunities for Action.*

Lake Colby was selected for the development of an action plan after an extensive survey of lakes and ponds across the New York side of the Lake Champlain Basin conducted in 2022. Lake Colby was selected due to the high chloride concentrations found in the lake, the presence of aquatic invasive species (AIS), as well as it being a popular destination for residents and visitors.

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Executive Summary

The Lake Colby Action Plan outlines a framework to protect Lake Colby and its watershed. The plan's goals, objectives, and tasks draw from the ***Lake Champlain Basin Program's Opportunities for Action*** (LCBP OFA). ***Opportunities for Action*** is a comprehensive management plan guiding the Lake Champlain Basin Program's work. The individual actions identified in this plan are mapped onto the LCBP OFA to provide synergistic alignment between the two plans and specifically highlight actions that will advance the protection of Lake Colby and its watershed while also supporting the goals of the Lake Champlain Basin Program.

Lake Colby was selected for the development of an action plan after an extensive survey and assessment of lakes and ponds on the New York side of the Lake Champlain Basin. Lake Colby was selected because it has high road salt influence, invasive species are present in the lake, and the lake serves as a highly visible and popular hub for recreation in the Saranac Lake area.

The Lake Colby Action Plan identifies four goals for the lake and its watershed:

1. Lake Colby will provide safe recreational opportunities, and sustain a diverse ecosystem, vibrant community, and a working landscape.
2. The Lake Colby ecosystem will provide intact habitats for diverse fish and wildlife populations that are resilient to disturbance and free of aquatic invasive species, and will provide natural functions to sustain clean water and a vibrant community.
3. The Lake Colby community has an appreciation and understanding of the lake's natural and cultural resources, and has the capacity to implement actions that will result in sound stewardship of these resources while maintaining a strong local economy.
4. Lake Colby residents and visitors will understand and appreciate Lake Colby watershed resources, and will possess a sense of personal responsibility that results in behavior changes and action to reduce pollution.

The action plan identifies work to address road salt pollution through the implementation of best management practices, as well as stormwater and green stormwater infrastructure improvements along the Route 86 corridor. The plan highlights the importance of managing invasive species in the lake, reducing their spread to other waterbodies, and preventing new introductions. Finally, the plan highlights the important role of the local community in the protection of Lake Colby and opportunities for increasing public awareness of the Lake Colby ecosystem.

In conclusion, the Lake Colby Action Plan is a proactive and collaborative approach to preserving this important watershed. By aligning its goals with the ***Lake Champlain Basin Program's Opportunities for Action***, the plan ensures that targeted efforts to reduce pollution, manage invasive species, and enhance community stewardship will not only benefit Lake Colby but also contribute to the broader ecological health of the Lake Champlain Basin. Through committed action and community engagement, the plan aims to safeguard Lake Colby as a natural, recreational, and cultural asset for future generations.


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Introduction

The Lake Colby Watershed lies within the ancestral lands of the Mohawk people, one of the original five nations of the Haudenosaunee Confederacy, also known as "The People of the Long House." The Haudenosaunee Confederacy, a participatory democracy, influenced the creation of the American Constitution and upheld the belief that law, society, and nature are interconnected and equal partners. The Mohawk people have been in the Adirondack region for between 1,200 to 4,000 years, with evidence of earlier human presence dating back to 9,000 B.C. with Paleo-Indian sites. Today, the St. Regis Mohawk Tribe, a federally recognized tribe, represents the Mohawk people in the region, whose stewardship of the Lake Colby Watershed predates European colonization.

Lake Colby is a vital centerpiece of the Saranac Lake region and the broader Adirondack Park, serving not only as a picturesque natural resource but also as a beloved hub for recreational activities. Its waters and surrounding landscapes provide year-round opportunities for fishing, boating, swimming, and ice skating, drawing residents and visitors alike to experience the lake's beauty. As a popular destination, Lake Colby plays an essential role in supporting the local economy, fostering community engagement, and offering a critical space for outdoor education and connection to nature. Its health and vitality are intrinsically linked to the quality of life in the region, making the stewardship of Lake Colby a priority for the Saranac Lake community.

Lake Colby sits in the headwaters of the Lake Champlain Basin, playing a important role in the larger hydrological network that connects the Adirondacks to one of the most significant freshwater ecosystems in North America. As part of the basin's network of streams, rivers, and lakes, Lake Colby contributes to the water quality and ecological health of downstream habitats, including the vital waters of Lake Champlain. Its location at the headwaters means that actions taken to protect and manage Lake Colby have far-reaching impacts, influencing not just local conditions but the broader environmental integrity of the basin. Protecting Lake Colby's water quality is, therefore, a crucial step in safeguarding the entire watershed, highlighting the interconnectedness of our local lakes with regional and international waters.

Stewardship, education, and community involvement are vital to the protection of Lake Colby and its watershed. Engaging the community in these efforts not only fosters a deeper appreciation for the lake's ecological and cultural significance but also empowers individuals to contribute directly to its conservation. Programs that connect residents and visitors with hands-on experiences, such as educational workshops, volunteer initiatives, and outreach activities, help cultivate a sense of responsibility and pride in protecting the lake. By promoting awareness and encouraging sustainable practices, the Lake Colby Watershed Action Plan can inspire collective action that supports the long-term health and resilience of the lake and its surrounding environment, echoing the broader goals of the Lake Champlain Basin Program.

The Lake Colby Watershed Action Plan recognizes the lake's cultural heritage, ecological value, and role in the community and serves as a guide for efforts to protect and restore this vital resource. Emphasizing collaborative stewardship, the plan recognizes the importance of traditional knowledge, scientific research, and community action to ensure Lake Colby's health and resilience for future generations. Through commitment and partnership, we can preserve Lake Colby as a vibrant natural asset that enriches the Saranac Lake region and beyond.

Lake Colby Watershed Action Plan Goals

The watershed action plan is organized under four main goals for the management and protection of the Lake Colby watershed. These goals and associated objectives are designed to align closely with the *Lake Champlain Basin Program's Opportunities for Action*.

1 Lake Colby will provide safe recreational opportunities, and sustain a diverse ecosystem, vibrant community, and a working landscape.

2 The Lake Colby ecosystem will provide intact habitats for diverse fish and wildlife populations that are resilient to disturbance and free of aquatic invasive species, and will provide natural functions to sustain clean water and a vibrant community.

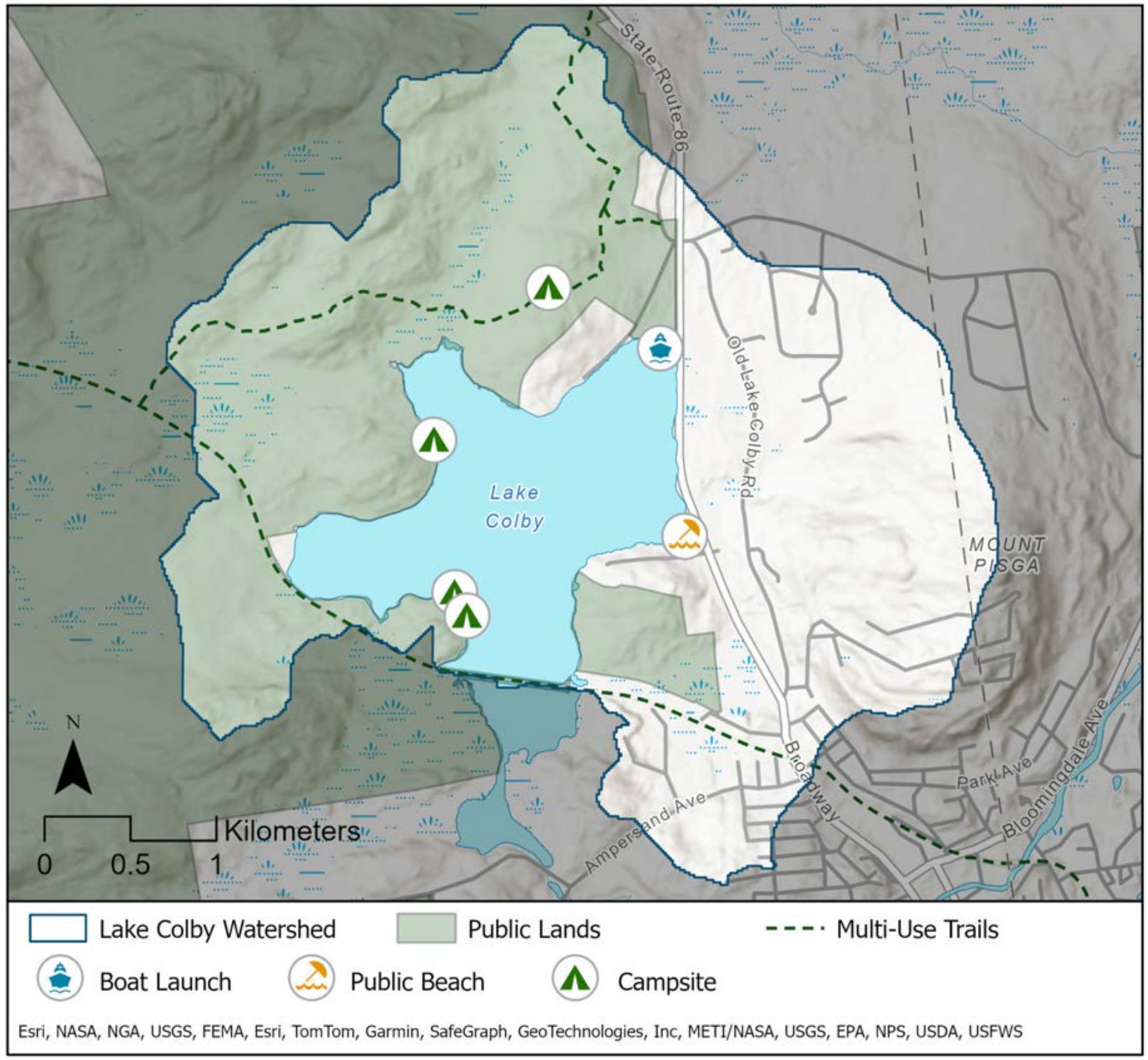
3 The Lake Colby community has an appreciation and understanding of the lake's natural and cultural resources, and has the capacity to implement actions that will result in sound stewardship of these resources while maintaining a strong local economy.

4 Lake Colby residents and visitors will understand and appreciate Lake Colby watershed resources, and will possess a sense of personal responsibility that results in behavior changes and action to reduce pollution.

WATERSHED & LANDSCAPE CHARACTERISTICS

The Lake Colby watershed, covering 2,276 acres (921 hectares), is located in the headwaters of the Lake Champlain Basin. Lake Colby's outlet flows through Lower Saranac Lake, Oseetah Lake, Lake Flower, and the Saranac River. There are three main tributaries entering the lake from the north, west, and east. The watershed is 14% developed, primarily near State Route 86, which runs 3.5 kilometers adjacent to the lake. The remaining area is largely forested (62%) with significant woody wetlands (5%), and the lake itself occupies 17% of the watershed. Lake Colby is designated by NYS DEC as class A(T), indicating the waterbody is suitable for use as a water supply, public bathing beach, general recreation, aquatic life support, and may support trout.

The watershed and shoreline consist of both public and private lands, with large portions owned by the New York State Department of Environmental Conservation. Smaller parcels are owned by the Town of Harrietstown and the Village of Saranac Lake, including a public beach. A limited number of private camps and homes are found along Moir Road on the southeastern shore and additional camps are found along a small portion of the western shore.



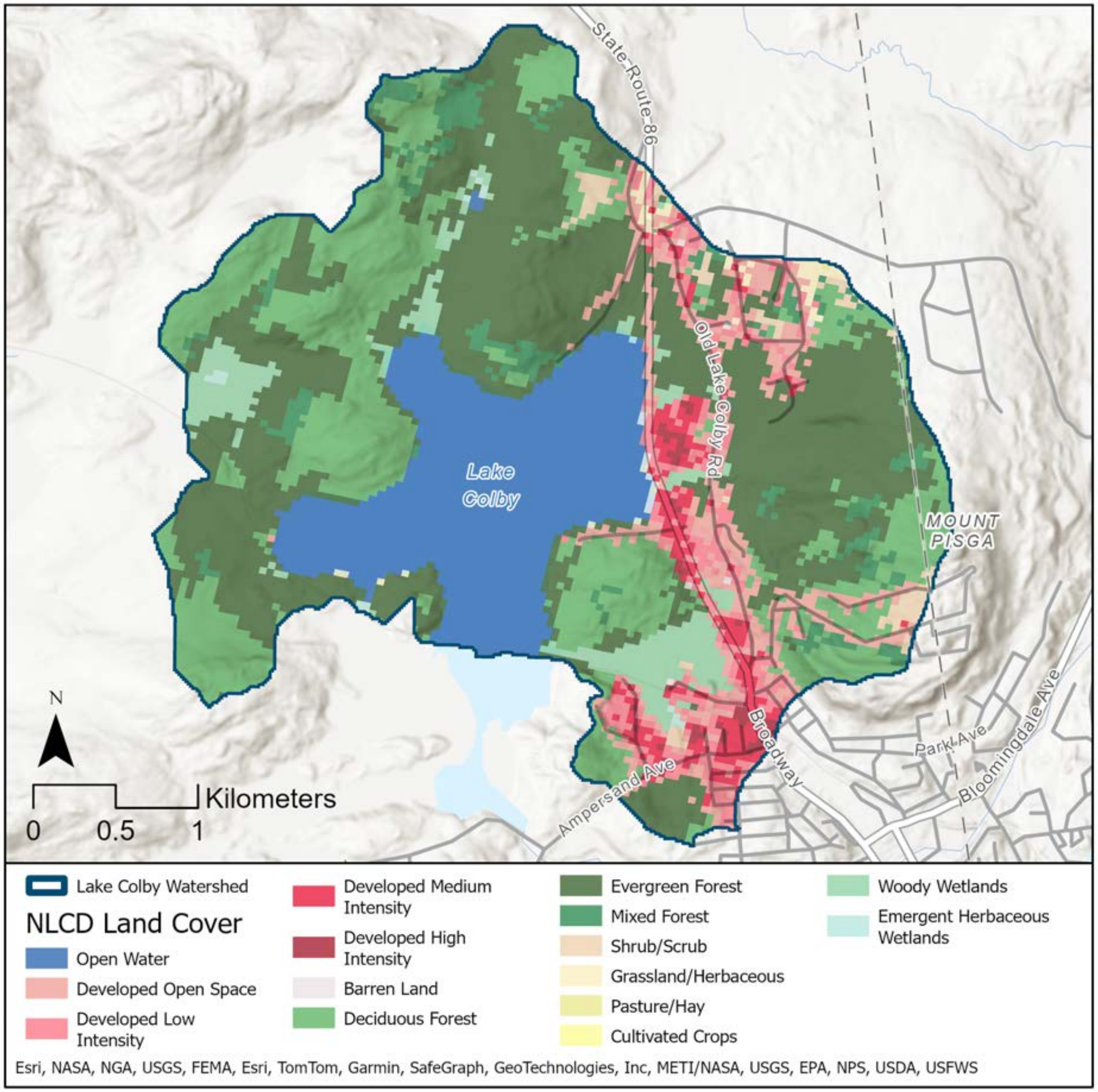
Overview map of the Lake Colby watershed showing the location of public lands and notable recreational assets.

Lake Colby is classified as mesotrophic, indicating moderate productivity. The lake's alkaline waters have high acid-neutralizing capacity, making it resistant to acid deposition, but it is heavily influenced by road salt runoff, resulting in some of the highest chloride concentrations among lakes in New York's Champlain Basin.

The lake is home to several invasive species, including Eurasian watermilfoil (*Myriophyllum spicatum*), first identified in 1999, and well established in the lake's primary bays. Other invasive species include the banded mystery snail (*Viviparus georgianus*, detected in 2016) and the Chinese mystery snail (*Cipangopaludina chinensis*, detected in 2017), which pose a threat to native species and disrupt the ecological health of the lake.

Recent harmful algal blooms (HABs) have been reported through NYS DEC's NYHABS, first observed in 2022 and again in 2023, although earlier blooms likely occurred unreported. These blooms underscore the need for continued monitoring and management to protect the lake's water quality.

Lake Colby's accessibility and proximity to the Adirondack Rail Trail make it a popular hub for recreation, drawing residents and visitors for boating, fishing, swimming, and wildlife observation. These activities enhance the lake's role as a community asset, contributing to the area's social and economic vitality while highlighting the importance of sustainable management to preserve its ecological health and recreational value for future generations.

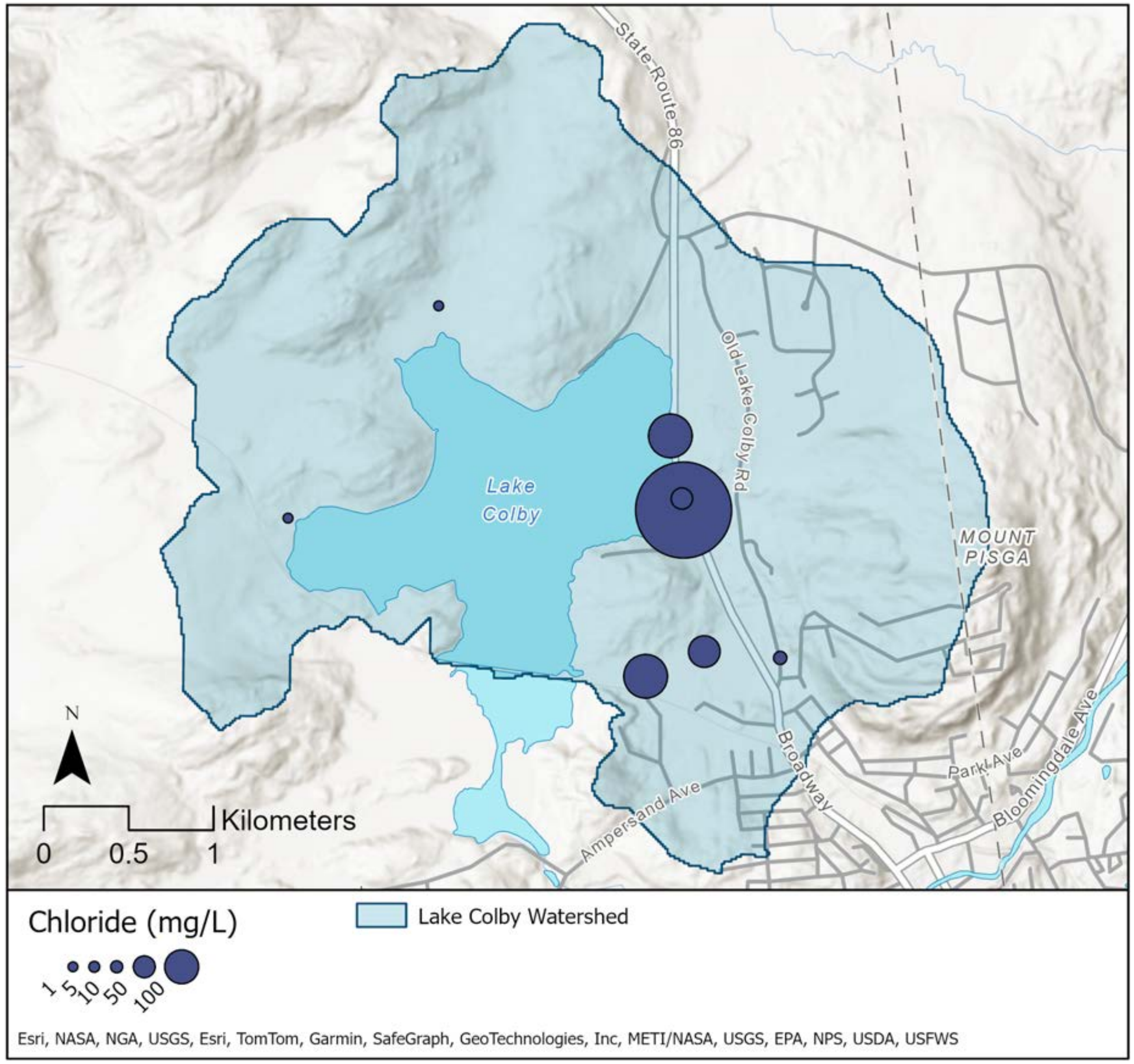


National Land Covered (NLD) data for the Lake Colby watershed shows the distribution of different land cover types across the watershed.

Goal 1: Lake Colby will provide safe recreational opportunities, and sustain a diverse ecosystem, vibrant community, and a working landscape.

Lake Colby's water quality has been consistently monitored by the Citizen Statewide Lake Assessment Program (1999-2001) and the Adirondack Lake Assessment Program (2003-present). A significant issue affecting the lake is the elevated chloride and sodium levels caused by road salt runoff, particularly from State Route 86. In 2023, the median surface water chloride concentration was 58.1 mg/L, which is 242 times higher than the median concentration in Adirondack lakes not impacted by road salt. Tributary sampling in 2023 revealed high chloride levels in the tributaries draining the eastern portion of the watershed, especially downstream of State Route 86. One small tributary near the public beach had a median chloride concentration of 352 mg/L, exceeding the EPA's chronic toxicity threshold for aquatic life (240 mg/L).

The tributary entering the lake near the Adirondack Rail Trail showed the highest chloride export, with a median of 63 kg/day. Export is a measure of the total mass of a pollutant moving through a stream, it is a product of the concentration of



Median tributary chloride concentration from sampling conducted in 2023.

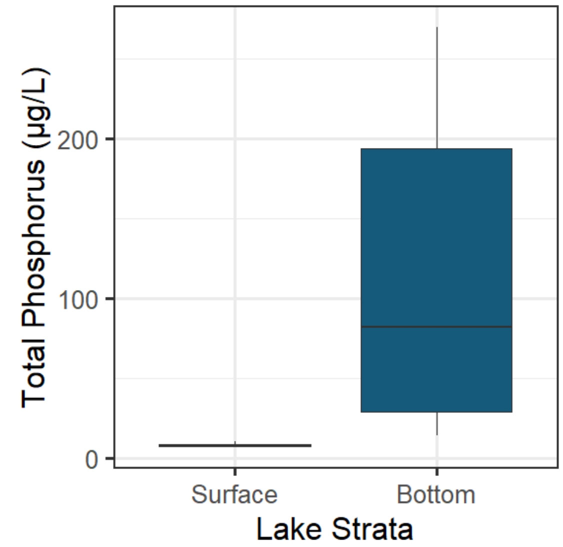
the pollutant in the water and total volume of water moving through the stream. This tributary drains a significant portion of State Route 86 and passes two municipal salt storage sheds, persistently high concentrations in the summer indicate that shallow groundwater in this area is likely contaminated by road salt. Addressing these elevated chloride concentrations requires a combination of road salt reduction, green stormwater infrastructure, and stormwater improvements along State Route 86. The section of the road adjacent to Lake Colby should be prioritized for salt reduction measures, as recommended by the Adirondack Road Salt Reduction Task Force.

Lake Colby is characterized as bordering between mesotrophic and oligotrophic, reflecting moderate to low productivity. The lake's bottom waters typically become anoxic (less than 2 mg/L of dissolved oxygen) by June, and by September, the entire hypolimnion is devoid of oxygen. This prolonged anoxic state triggers the release of phosphorus from lake sediments, leading to internal nutrient loading. By late summer, phosphorus levels in the bottom waters can be nearly 100 times higher than surface levels, contributing to water quality concerns.

In 2022 and 2023, Lake Colby experienced harmful algal blooms (HABs) between late August and mid-October, coinciding with peak internal nutrient loading periods. While further investigation is needed, there is evidence linking internal nutrient loading, fall turnover, and HAB formation, as observed in similar regional lakes such as Mirror Lake and Lake George.

Managing internal nutrient loading is both challenging and costly. The most practical approach involves reducing nutrient inputs through wetland restoration, green stormwater infrastructure, and stormwater management along State Route 86. The inlet stream just north of the public beach should be a priority for wetland restoration. The Lake Champlain Phosphorus TMDL and the NYS DEC Lake Champlain TMDL Watershed Implementation Plan also serve as important guides for the implementation of nutrient reduction strategies within the watershed. The NYS DEC plan specifically highlights implementing a county roadside erosion control program in the Lower Saranac Lake-Saranac River watershed.

Lake Colby's shoreline is largely forested, except for areas around NYS DEC Camp Colby and the stretch along State Route 86. These sites are ideal for targeted riparian planting and shoreline restoration, which would enhance the lake's ecological health. Engaging summer campers at Camp Colby in these restoration activities offers a valuable hands-on learning experience, teaching the importance of maintaining healthy riparian buffers.



Total phosphorus concentrations measured in the surface and bottom waters of Lake Colby in 2023.

As one of the most visible and popular lakes in the region, Lake Colby provides a unique opportunity for implementing projects that protect and improve water quality. Such initiatives not only enhance the local environment but also serve as highly visible demonstrations that can raise public awareness of the importance of clean water conservation. These efforts can inspire similar actions in other watersheds, showcasing the broader value of investing in environmental protection.

Objective I.A - Improve understanding of water quality conditions and trends; determine the effectiveness of past management and inform future management decisions.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
I.A.1 – Fund and interpret monitoring and management oriented research.	I.A.1.e – Support and promote programs that expand sub-watershed monitoring to inform targeted watershed objectives.	Continue participation in the Adirondack Lake Assessment Program. Encourage participating in the NYS DEC Water Assessment by Volunteer Evaluators (WAVE) program.
I.A.2 – Fund and interpret research on management decisions and best management practices (BMPs).	I.A.2.a – Support research to develop innovative management approaches likely to improve water quality.	Improve stormwater management along Route 86 and from the Adirondack Health complex.
	I.A.2.b – Support research to increase understanding of factors affecting BMP performance and efficiency, including potential effects of climate change.	Assess the efficacy of the stormwater retention pond at the Adirondack Health complex.
	I.A.2.c – Support research to assess progress of existing water quality management programs to inform new decisions, priorities, and management trajectories.	Integrate monitoring and assessment into water quality improvement projects implemented within the watershed.
I.A.4 – Fund and interpret research on contaminants in the Lake Champlain Basin.	I.A.4.b – Support research to improve understanding of road de-icing salt impacts and effective management strategies.	Establish gaged stream sampling stations to assess road salt export from Route 86 and from below the municipal salt storage facilities. Use data to assess efficacy of management improvements.

Objective I.B - Reduce contaminants of concern and pathogens.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
I.B.1 – Reduce contaminant pollution.	I.B.1.c – Fund and promote programs that reduce de-icing salt application and limit their transport to waterways.	Support the Town of Harrietstown and Village of Saranac Lake's participation in AdkAction's Clean Water, Safe Roads program. Support the Adirondack Road Salt Reduction Task Force recommendations.

Objective I.C - Reduce nutrient loading.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
I.C.3 – Reduce nutrient inputs from developed lands.	I.C.3.a – Fund and promote programs to reduce effective impervious surface area, especially in critical watersheds.	Support and encourage the installation of permeable surfaces and green stormwater infrastructure along the Route 86 corridor. Implement county roadside erosion control program.
	I.C.3.c - Fund and promote programs and interventions aimed at reducing nutrient pollution from high-density shoreland areas around lakes and ponds.	Establish a program to conduct routine septic system inspection and maintenance.
I.C.4 – Reduce nutrient inputs from forested lands.	I.C.4.a – Support programs to restore and protect riparian forests and corridors.	Conduct a shoreline restoration project along the Camp Colby shoreline that incorporates service learning with the campers. Plant trees and riparian vegetation along Route 86.

Objective I.D – Support research to understand the impact of climate change on clean water and act to adapt to climate change impacts.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
I.D.1 – Fund and interpret climate-change-oriented research.	I.D.1.a – Support research to assess the impacts of climate change on nutrient loading from watershed and internal sources.	Assess nutrient loading from stormwater runoff. Assess internal nutrient loading.
	I.D.1.c – Support research to quantify the impacts of climate change on phytoplankton communities.	Establish a program to monitor and assess phytoplankton community composition over time.
	I.D.1.d – Support research to improve understanding of impacts of climate change on cyanobacteria bloom dynamics.	Establish a HAB monitoring program that regularly reports on bloom presence/absence and the extent of blooms when present and that aligns with the NYS DEC HAB Research Guide. Test HABs for cyanotoxins.
	I.D.1.g – Support research to improve understanding of the impacts of climate change on de-icing salt application and salinization.	Utilize gaged stream sites to assess road salt export under a variety of winter conditions.
I.D.2 – Adapt to climate-change-caused water resource impacts.	I.D.2.a – Fund and promote clean water implementation programs that have co-benefits for adapting to climate change.	Explore wetland restoration and green stormwater infrastructure projects along the Route 86 corridor.

Goal 2. The Lake Colby ecosystem will provide intact habitats for diverse fish and wildlife populations that are resilient to disturbance and free of aquatic invasive species, and will provide natural functions to sustain clean water and a vibrant community.

Lake Colby is a popular fishing destination in the region, supporting a wide range of both warm and coldwater fish species, including rainbow trout, brown trout, landlocked Atlantic salmon, largemouth and smallmouth bass, yellow perch, rock bass, brown bullhead, and pumpkinseed. The lake's numerous access points and diverse fishing opportunities make it especially attractive for ice fishing during the winter months.

In addition to its fishery, Lake Colby provides important habitat for a diverse array of wildlife. Common loons frequently nest on the lake, bald eagles have established nesting sites along the southeastern shore, and the wetlands associated with the lake's outlet and Little Colby Pond support a rich variety of plant and animal life, including some of the rarest and most climate imperiled birds in the state. However, the lake faces challenges from aquatic invasive species, including Eurasian watermilfoil, Chinese mystery snail, and banded mystery snail. Eurasian watermilfoil, first documented in 1999, is now established throughout much of the lake's littoral zone, where it competes with native plants, reduces biodiversity, and impacts the growth of native fish species. This invasive plant's dense growth also affects recreational activities such as motorboating, paddling, and swimming, which can lead to declines in local property values and reduced economic activity related to recreation.

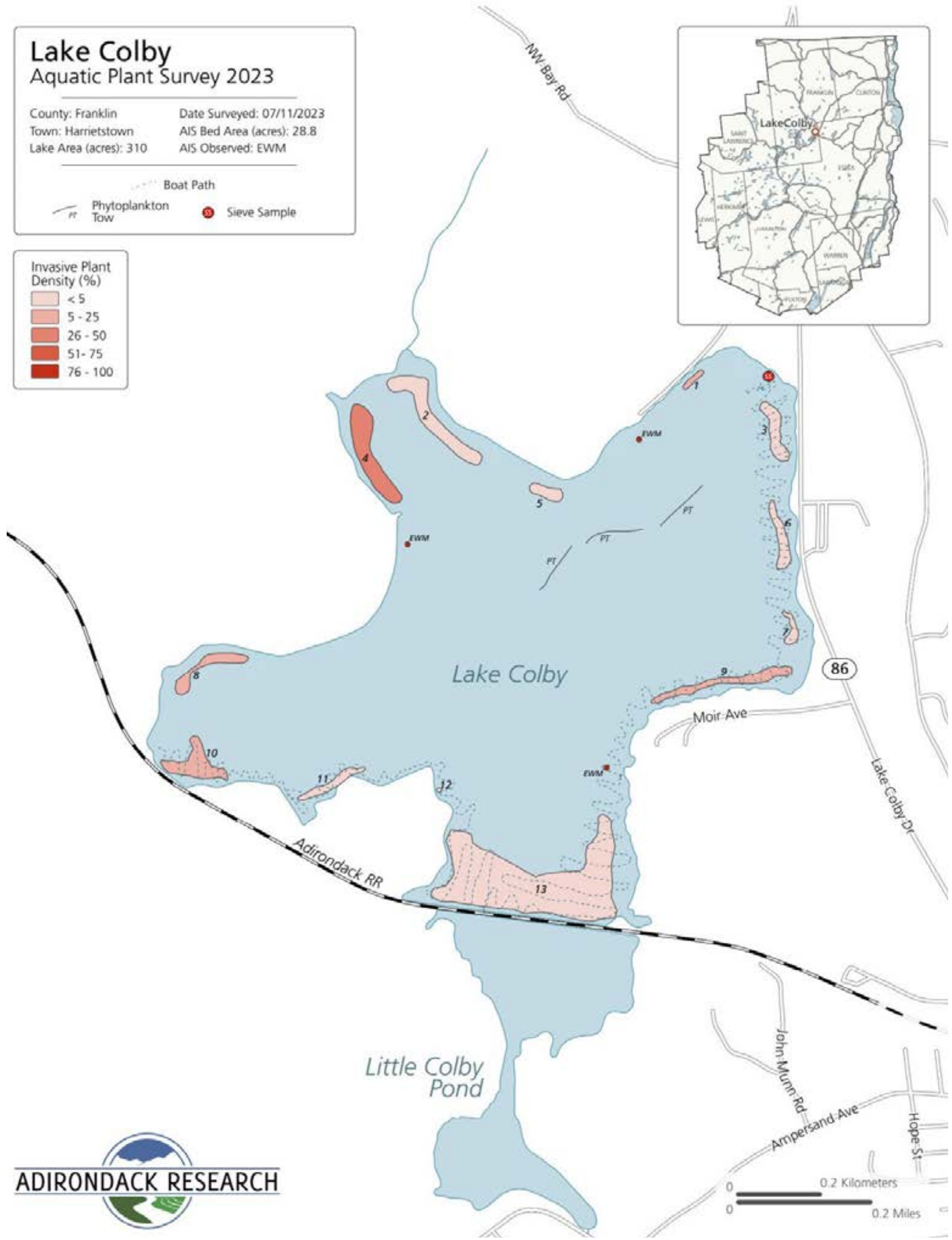
Efforts to manage Eurasian watermilfoil began in 2002, using a combination of hand harvesting and benthic matting, but these efforts have waned in recent years with no consistent management currently in place. Although Watercraft Inspection Stewards have occasionally been stationed at the Lake Colby boat launch to educate boaters, consistent coverage has not been maintained, leaving the lake vulnerable to the introduction of new AIS to the lake and the spread of

Bog along Little Colby Pond at the outlet of Lake Colby.

invasives to other water bodies..

Maintaining Lake Colby's sport fishing opportunities remains a high priority and is explicitly recognized in the NYS Department of Environmental Conservation's (NYS DEC) Saranac Lakes Wild Forest Unit Management Plan. Continued support for NYS DEC fisheries staff is essential, as are ongoing efforts to conserve the common loon and bald eagle populations that rely on the lake. A more comprehensive strategy for managing aquatic invasive species in Lake Colby would greatly benefit both the lake's ecosystem and its recreational value. The Lake Colby Association has been actively involved in managing invasive species, but expanding these efforts through a more robust plan, possibly incorporating advanced control technologies like ProcellaCOR, would enhance these conservation efforts.

Given Lake Colby's popularity for fishing and other recreational uses, increasing Watercraft Inspection Steward coverage would provide significant benefits by preventing the spread of invasive species and raising public awareness. Enhanced steward presence would educate boaters on the importance of Clean, Drain, Dry protocols, reinforcing responsible recreation and protecting Lake Colby's ecological integrity for future generations.



Aquatic plant survey of Lake Colby conducted in 2023 by Adirondack Research, funded by the Adirondack Park Invasive Plant Program.

Objective II.A – Support research and understanding of predicted impacts of a changing climate in the Lake Champlain Basin.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
II.A.1 – Fund and interpret climate change research.	II.A.1.b – Support research and understanding of AIS impacts to the Lake's ecosystem and economy under changing climate predictions.	Conduct routine aquatic plant surveys to assess changes in abundance and composition.

Objective II.B – Evaluate ecosystem management programs and policies (support research to assess current ecosystem management programs).

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
II.B.1 – Support research to align policy with ecosystem management goals in the basin.	II.B.1.a – Assess state and local policies to identify those that align, contradict, or pose obstacles to healthy ecosystems goals.	Review local laws and policies as they pertain to clean water and healthy ecosystems.

Objective II.C – Support conservation of habitat for ecosystem function.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
II.C.1 – Work with Lake Champlain management partners to prioritize, protect and restore important riparian, shoreland, and wetland habitat areas.	II.C.1.b – Fund and promote projects that protect and restore shorelands.	Plant trees and other suitable riparian vegetation along the Camp Colby shoreline.
	II.C.1.c – Fund and promote projects that protect and restore wetlands.	Explore wetland restoration and green stormwater infrastructure projects along the Route 86 corridor.

Objective II.D – Preserve and enhance aquatic and riparian biological diversity.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
II.D.1 – Conduct research to improve our understanding of the functions and threats to the Lake Champlain ecosystem and develop and support programs that improve diversity of aquatic and riparian species in the Basin and work toward protection and restoration of native species.	II.D.1.c – Promote and support fish community research, including juvenile lake trout, brook trout, and landlocked Atlantic salmon, and management of sea lamprey to enhance the fishery.	Work in coordination with NYS DEC Fisheries staff to monitor and assess the fish population.
	II.C.1.c – Fund and promote projects that protect and restore wetlands.	Explore wetland restoration and green stormwater infrastructure projects along the Route 86 corridor.

Objective II.E – Prevent the spread of aquatic invasive species.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
II.E.1 – Work with Lake Champlain management partners to monitor and respond to new aquatic invasions via early detection and rapid response (EDRR) and to educate different stakeholders about how their behavior can affect the spread of AIS.	II.E.1.a – Conduct and coordinate AIS monitoring and implement the Great Lakes and Lake Champlain Invasive Species Program (GLLCISP) which supports the early detection of the spread of existing AIS to new bodies of water in the basin or new arrivals of AIS to Basin waters.	Conduct routine aquatic plant surveys to assess changes in abundance and composition from APIPP's Lake Management Tracker program.
	II.E.1.b – Support and implement the Lake Champlain AIS Rapid Response Management Plan to respond to new AIS infestations and mobilize resources to prevent spread.	Conduct routine aquatic plant surveys to assess changes in abundance and composition from APIPP's Lake Management Tracker program.
II.E.2 – Work with Lake Champlain management partners to reduce the risk of AIS transport along pathways such as the Champlain and Chambly canal systems, overland transport on boats and trailers, illegal stocking and bait.	II.E.2.a – Intercept AIS transportation on watercraft and equipment by expanding the Boat Launch Steward Program and decontamination station coverage.	Expand steward coverage at the public boat launch.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
II.E.3 – Support and conduct AIS management and research in the Basin.	II.E.3.a - Eliminate, reduce, contain, or prevent the expansion of AIS populations in the Basin, including water chestnut and sea lamprey in Lake Champlain, using control techniques such hand pulling, benthic barrier matting, suction harvesting, and pesticides.	Develop an integrated AIS management plan for Lake Colby.
	II.E.3.b – Research and remain connected to new and innovative research, spread prevention programs and control technologies capable of addressing real and potential AIS species impacts, including sea lamprey, to the Lake Champlain ecosystem and fishery, human health, and the regional economy.	Assess new AIS control technologies as they become available.
II.E.4 - Work with Lake Champlain management partners to deliver and conduct multilingual AIS education and outreach behavior change campaigns targeted at the general public and water user groups.	II.E.4 a – Fund, support, and develop multi-lingual AIS spread prevention initiatives that address pathways (water gardening, aquarium and spiritual releases, bait, etc.) and promote the national "Clean, Drain, and Dry" and "Stop Aquatic Hitchhikers" messaging program.	Expand steward coverage at the public boat launch. Add interpretive educational signage at the public boat launch and at public access points along the east shore of the lake.

Goal 3: The Lake Colby community has an appreciation and understanding of the lake's natural and cultural resources, and has the capacity to implement actions that will result in sound stewardship of these resources while maintaining a strong local economy.

A healthy and vibrant community is integral to the protection of Lake Colby and its watershed. The community extends beyond the lake's immediate shores, encompassing all who value and utilize its natural resources. While limited private landownership and shoreline development restrict the number of shore owners, the lake's proximity to the Village of Saranac Lake and multiple public access points significantly expand the broader community's interest in conserving and protecting Lake Colby and its watershed.

The Lake Colby Association is the primary organization focused on protecting and conserving the lake. As a 501(c)4 organization, its voting membership is limited to property owners within 300 feet of the lake's shore, but it also welcomes non-voting members. Additionally, the Lake Colby Foundation, a 501(c)3, provides an avenue for tax-deductible donations to support conservation efforts, paralleling

A common loon plying the waters of Lake Colby.

the successful organizational structure at Upper Saranac Lake, which has been highly effective in its protective measures.

There is limited documentation of Lake Colby's cultural history, including the origin of its name and its Indigenous heritage, which are not well understood. However, the history of Camp Colby, formerly Camp Impression, and the railroad that once crossed the causeway at the lake's outlet are well documented. Expanding the understanding and documentation of Lake Colby's cultural and natural history would deepen the sense of community and belonging among both residents and visitors.

The development of the Adirondack Rail Trail has created new opportunities for the public to access and enjoy Lake Colby. The trail crosses a causeway at the lake's outlet, offering spectacular wildlife viewing and fishing access. Efforts to promote the Adirondack Rail Trail should highlight Lake Colby as a key destination along the route, including interpretive information about the lake's cultural and natural history. The lake's public beach and boat launch also serve as valuable access points that further enhance recreational opportunities.

Projects along the State Route 86 corridor offer significant opportunities to highlight the importance of protecting water quality. For example, the stormwater retention pond adjacent to the Adirondack Health complex already serves as a demonstration of effective stormwater management. Installing interpretive signage and public messaging at these sites could educate visitors about the importance of these projects and further connect them to the natural and cultural heritage of Lake Colby.

Addressing the challenges facing Lake Colby, especially those related to road salt pollution, requires ongoing technical training on best management practices and understanding the benefits of investing in lake protection. AdkAction's Clean Water, Safe Roads partnership is a valuable regional outreach and training program that helps local highway departments implement road salt reduction techniques. This program, along with others like it, should be promoted within the watershed, and local businesses, government, and community members should be made aware of these training opportunities to ensure Lake Colby's continued protection.

A person fishing along the shore of Lake Colby at sunset.

Objective III.A – Engage and support community and management partners.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
III.A.2 – Facilitate and coordinate public messaging with management partners.	III.A.2.c – Strengthen the feedback loop between resource managers and community members. Ensure that managers are answering questions relevant to communities.	Evaluate the potential to expand public involvement in the Lake Colby Association.
III.A.4 – Serve as a conduit for information, build professional capacity among stakeholders, and foster strong working relationships among the partners of the LCBP and CVNHP, and Champlain-Adirondack Biosphere Network (CABN).	III.A.4.c – Fund and promote technical training programs for technical and outreach staff working with stakeholders in the Basin.	Support technical training and outreach programs for local government staff, non-profit partners, schools, and community groups.
	III.A.4.d – Support seminars, workshops, and conferences to deliver technical information on topics such as BMPs, LID, stormwater management technologies, roads management, and adaptive management to municipal and state staff.	Support and encourage local government staff, non-profit partners, schools, and community groups to participate in regional training opportunities.
	III.A.4.e –Educate stakeholders on the benefits and outcomes of completed projects for water quality, to encourage local support for community-level investments in water quality projects that benefit the Lake.	Develop an interpretive signage plan for the watershed to include signage at the Lake Colby beach, public boat launch, and along the Adirondack Rail Trail.

Objective III.B – Support water-wise economic development.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
III.B.1 – Support business innovations that improve water quality.	III.B.1.a –Work with key partners to develop industry-specific outreach.	Develop outreach materials to local plow companies.
	III.B.1.b –Provide support to local businesses to develop and showcase new and innovative practices that support clean water.	Develop a public messaging campaign for Adirondack Health highlighting the natural and cultural history of Lake Colby, as well as their role in protecting the lake.

Objective III.C – Support awareness and conservation of cultural heritage resources.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
III.C.1— Build on existing knowledge, make new discoveries of the history, culture, and special resources of the CVNHP, and make this information accessible to all.	III.C.1.a - Support research and interpretation of our past and the cultural heritage resources of the CVNHP.	Research the cultural heritage of the Lake Colby watershed and incorporate findings in outreach and educational programing.
	III.C.1.c - Document cultural components of the region, including Abenaki, Mohegan, Mohawk, and Onita cultures, Franco-American culture, and new American communities to research, restore and maintain these cultural identities in the Basin and CVNHP region.	Work with local Indigenous communities and scholars to document the Indigenous history of the watershed and identify ways to maintain cultural identities.

Objective III.D – Support Lake and Basin recreation.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
III.D.1—Provide sustainable and accessible recreational opportunities for everyone within the CVNHP, with a focus on access for underserved communities.	III.D.1.a - Support initiatives that promote sustainable recreational activities that feature the natural, cultural, and historical resources in the CVNHP, including Lake Champlain Bikeways and the Western New England Greenways.	Promote the Adirondack Rail Trail and explore opportunities to deepen the connection between the trail and Lake Colby.
	III.D.1.b - Increase and improve public access opportunities to the waterbodies of the Basin and interconnected waterways of the CVNHP for diverse recreational activities.	Continue to support public access to Lake Colby along the Adirondack Rail Trail, at the beach, and the boat launch.
	III.D.1.c - Support a public information program that emphasizes recreational ethics, public safety, sustainable use, and stewardship of cultural and natural resources.	Incorporate Leave No Trace educational programming and interpretative signage along the Adirondack Rail Trail.

Goal 4. Lake Colby residents and visitors will understand and appreciate Lake Colby watershed resources, and will possess a sense of personal responsibility that results in behavior changes and action to reduce pollution.

Lake Colby is ideally positioned to enhance local education and outreach efforts due to its accessibility, proximity to local schools, presence of a summer camp, and diverse recreational opportunities. The lake's outlet flows through the Saranac Lake High School campus, offering students unique opportunities to engage in hands-on, field-based learning focused on natural sciences and environmental stewardship. By partnering with organizations like Paul Smith's College Adirondack Watershed Institute and AdkAction, students can participate in real-world conservation efforts such as road salt reduction projects, monitoring salt concentrations at the lake's outlet, and addressing other critical water quality threats like stormwater runoff, nutrient pollution, and microplastics.

Lake Colby is a prominent destination for recreational activities, such as a public beach, boat launch, and extensive hiking trails that circle the lake and extend into the surrounding watershed. The Adirondack Rail Trail, which crosses the lake's outlet, provides spectacular views of the lake and nearby mountains, making it a key attraction. According to the New York State Department of Environmental Conservation (DEC), the trail is expected to attract between 56,000 and 800,000 visitors annually. The DEC Saranac Lakes Wild Forest Unit Management Plan proposes further trail development along the southeastern shore, enhancing the range of recreational experiences available to visitors.

To further enrich the visitor experience, the development of a comprehensive interpretive signage plan for the Lake Colby watershed would be beneficial. Such signage would not only provide insights into the natural and cultural history of the lake but also educate the public on current environmental challenges and the ongoing efforts to mitigate these issues. By informing visitors about the importance of the lake's ecosystem and the steps being taken to protect it, interpretive signage can play a crucial role in fostering environmental awareness and stewardship.

Additionally, there are many opportunities to educate residents and visitors through social and digital media platforms. Social media accounts dedicated to Lake Colby and those of organizations that highlight the lake's recreational opportunities can be instrumental in promoting responsible stewardship. Platforms managed by the Adirondack Rail Trail Association, Colby Classic Ice Fishing Derby, and the Village of Saranac Lake can share engaging content that encourages the public to adopt lake-friendly practices, participate in community science projects, and contribute to the conservation of Lake Colby. By leveraging these digital tools, local organizations can reach a broad audience, inspiring a collective commitment to preserving this valuable natural resource.

Right: The Adirondack Rail Trail where it crosses the outlet of Lake Colby.


SLOW

Objective IV.A – Enhance formal learning at all educational levels.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
IV.A.1 – Implement programs for K-12 students.	IV.A.1.b –Conduct field-based instruction and activities that provide hands-on knowledge of watershed science, recreation, and cultural heritage among K-12 students.	Support programming at local schools that engages students on watershed issues.
IV.A.4 – Engage youth in watershed management and stewardship opportunities.	IV.A.4.a – Fund and promote community service projects and mentorship programs focused on clean water and healthy ecosystems, with an emphasis on traditionally underserved communities.	Work with local schools and youth groups to support environmental stewardship.
	IV.A.4.d – Fund, promote, and deliver summer camp programs focused on hands-on water quality education and conservation practices.	Support watershed education and programming at Camp Colby.

Objective IV.B – Build awareness of the Lake Champlain Basin through informal learning across all communities.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
IV.B.1 – Communicate watershed science and stewardship information for the public and stakeholders.	IV.B.1.b – Develop wayside and interpretive exhibits, brochures, fact sheets, and other print materials that explain natural and cultural resources, including watershed issues and concepts and CVNHP interpretive themes.	Develop an interpretive signage plan for the watershed to include signage at the Lake Colby beach, public boat launch, and along the Adirondack Rail Trail.

Objective IV.C – Facilitate changes in behavior and actions of individuals for their communities.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
IV.C.1 – Promote individual stewardship action.	IV.C.1.a – Use web and social media channels to encourage action at home or with local organizations' volunteer programs.	Explore the possibility of establishing social media accounts focused on Lake Colby.
	IV.C.1.b – Promote lake-friendly products and practices.	Distribute outreach materials to local residents and businesses.
IV.C.2 – Promote community stewardship action.	IV.C.2.d – Increase community science to engage and develop stewardship for the Basin.	Continue participation in the Adirondack Lake Assessment Program.

Summary of management actions for the Lake Colby Watershed. Cost estimates are generalized into the following categories based on either one-time or annual expense; A < $5,000, B = $5,000-$10,000, C = $10,000-$25,000, D = $25,000-$50,000, E = $50,000-$100,000, F = $100,000-$250,000, G = $250,000-$500,000, H = $500,000-$1,000,000, I > $1,000,000. Timelines are generalized into the following categories; Ongoing = action is underway, Short < 1 year, Near = 1 to 3 years, Long > 3 years.

Goal 1: Clean Water

Action	Timeline	Cost	Resources
Continue participation in the Adirondack Lake Assessment Program.*	Ongoing	A	AWI/LCA
Encourage participating in the NYS DEC WAVE program.	Near	A	LCA/DEC
Improve stormwater management along Route 86 and from the Adirondack Health complex.	Long	H	TH/VSL/FCSWCD/DOT/DEC/AH/LCBP
Assess the efficacy of the stormwater retention pond at the Adirondack Health complex.	Near	C	AH/AWI/FCSWCD/LCBP
Integrate monitoring and assessment into water quality improvement projects implemented within the watershed.	Long	E	AWI/TH/VSL/DOT/DEC/AH/LCBP
Establish gaged stream sampling stations to assess road salt export from Route 86 and from below the municipal salt storage facilities. Use data to assess efficacy of management improvements.	Near	E	AWI/DEC/LCBP
Support the Town of Harrietstown and Village of Saranac Lake's participation in AdkAction's Clean Water, Safe Roads program.	Ongoing	D	TH/VSL/AdkA/DEC
Support the Adirondack Road Salt Reduction Task Force recommendations.	Near	A	DOT/DEC/WQIP
Support and encourage the installation of permeable surfaces and green stormwater infrastructure along the Route 86 corridor.	Long	H	TH/DOT/AH/FCSWCD
Implement county roadside erosion control program.	Long	H	FCSWCD/DEC/WQIP
Establish a program to conduct routine septic system inspection and maintenance.	Near	C	TH/LCA
Conduct a shoreline restoration project along the Camp Colby shoreline that incorporates service learning with the campers.	Near	A	LCA/FCSWCD/DEC
Plant trees and riparian vegetation along Route 86.	Near	A	LCA/TH/VSL/FCSWCD DOT/DEC
Assess nutrient loading from stormwater runoff.	Near	D	AWI/LCBP/FCSWCD
Assess internal nutrient loading.	Near	C	AWI/DEC/LCBP
Establish a program to monitor and assess phytoplankton community composition over time.	Long	C	AWI

Establish a HAB monitoring program that regularly reports on bloom presence/absence and the extent of blooms when present and that aligns with the NYS DEC HAB Research Guide.	Near	B	LCA/AWI/DEC/LCBP
Test HABs for cyanotoxins.	Short	A	LCA/AWI/DEC
Utilize gaged stream sites to assess road salt export under a variety of winter conditions.	Long	E	AWI/DEC/LCBP
Explore wetland restoration and green stormwater infrastructure projects along the Route 86 corridor.*	Long	F	TH/VSL/FCSWCD/DOT/DEC/WQIP

Goal 2: Healthy Ecosystems

Action	Timeline	Cost	Resources
Conduct routine aquatic plant surveys to assess changes in abundance and composition from APIPP's Lake Management Tracker program.	Ongoing	B	LCA/APIPP
Review local laws and policies as they pertain to clean water and healthy ecosystems.	Near	A	LCA/TH/VSL
Plant trees and other suitable riparian vegetation along the Camp Colby shoreline.	Near	A	DEC/AWI
Explore wetland restoration and green stormwater infrastructure projects along the Route 86 corridor.*	Long	F	TH/VSL/DOT/DEC
Work in coordination with NYS DEC Fisheries staff to monitor and assess fish populations.	Ongoing	A	LCA/AWI/DEC
Expand steward coverage at the public boat launch.	Near	C	LCA/AWI/DEC/LCBP
Develop an integrated AIS management plan for Lake Colby.	Near	C	LCA/AWI/APIPP/LCBP
Assess new AIS control technologies as they become available.	Long	B	LCA/AWI/DEC/APA
Add interpretive educational signage at the public boat launch and at public access points along the east shore of the lake.	Near	B	LCA/TH/APIPP/AWI/DEC/LCBP

Goal 3: A Thriving Community

Action	Timeline	Cost	Resources
Evaluate the potential to expand public involvement in the Lake Colby Association.	Near	A	LCA
Support technical training and outreach programs for local government staff, non-profit partners, schools, and community groups.	Near	A	TH/VSL/DOT/DEC/AdkA/LCBP

Support and encourage local government staff, non-profit partners, schools, and community groups to participate in regional training opportunities.	Near	A	TH/VSL/FCSWCD/DOT/DEC/AdkA/LCBP
Develop an interpretive signage plan for the watershed to include signage at the Lake Colby beach, public boat launch, and along the Adirondack Rail Trail.*	Long	E	TH/VSL/ FCSWCD/DOT/DEC/AWI/TWC/LCBP
Develop outreach materials to local plow companies.	Ongoing	A	AdkA/AWI/LCBP
Develop a public messaging campaign for Adirondack Health highlighting the natural and cultural history of Lake Colby, as well as their role in protecting the lake.	Long	D	LCA/AH/LCBP/CVNHP
Research the cultural heritage of the Lake Colby watershed and incorporate findings in outreach and educational programing.	Long	B	ADI/HSL/SNICC/TWC/CVNHP
Work with local Indigenous communities and scholars to document the Indigenous history of the watershed and identify ways to maintain cultural identities.	Near	B	ADI/HSL/SNICC/TWC/CVNHP
Promote the Adirondack Rail Trail and explore opportunities to deepen the connection between the trail and Lake Colby.	Near	B	ARTA/TH/VSL/DEC
Continue to support public access to Lake Colby along the Adirondack Rail Trail, at the beach, and the boat launch.	Ongoing	A	ARTA/TH/VSL/DEC
Incorporate Leave No Trace educational programming and interpretative signage along the Adirondack Rail Trail.	Near	B	ARTA/TH/VSL/DEC

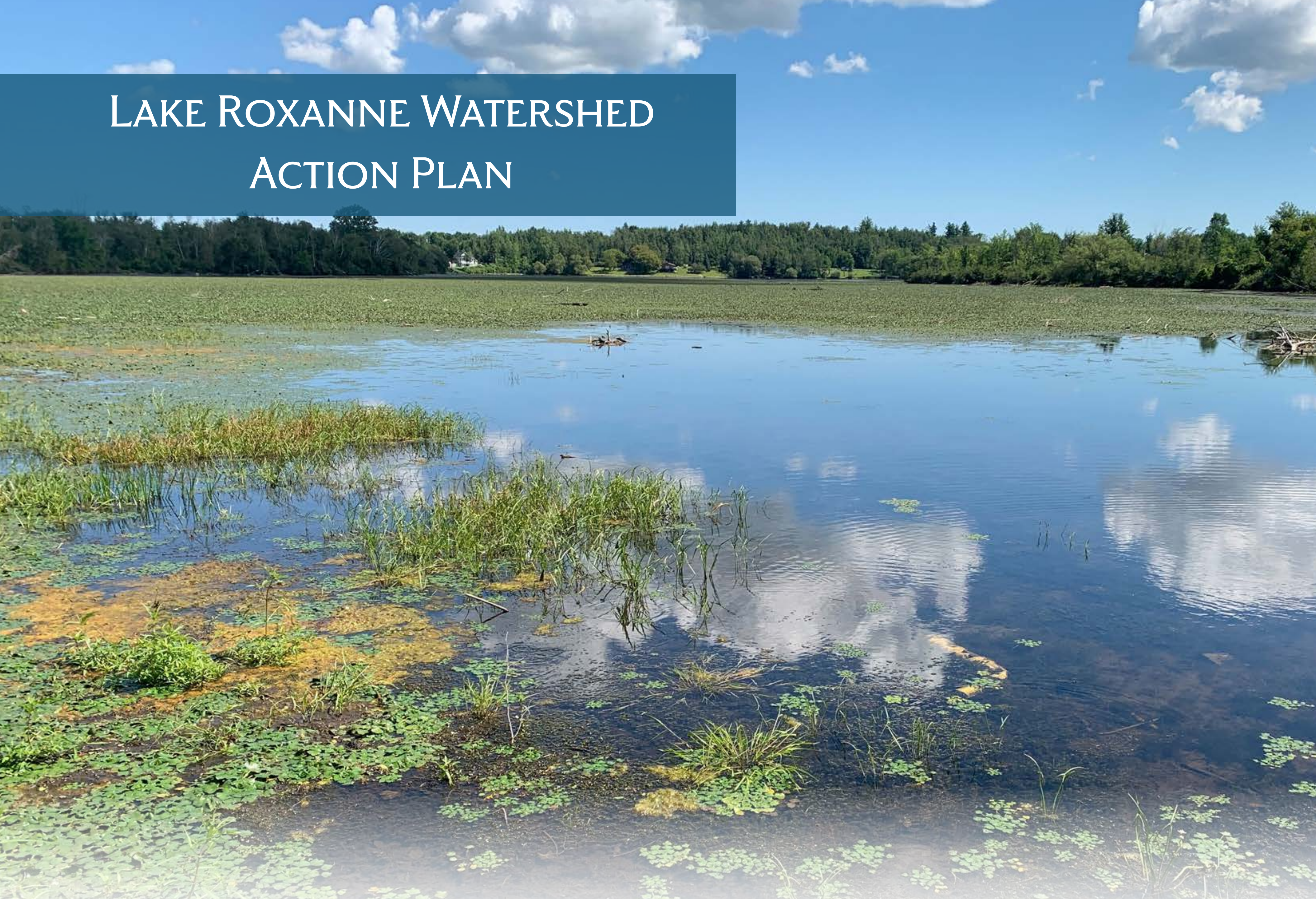
Goal 4: Informed And Involved Public

Action	Timeline	Cost	Resources
Support programming at local schools that engages students on watershed issues.	Ongoing	C	SLSD/AWI/TWC/LCBP
Work with local schools and youth groups to support environmental stewardship.	Ongoing	C	SLSD/AWI/TWC/LCBP
Support watershed education and programming at Camp Colby.	Ongoing	A	DEC/AWI/LCBP
Develop an interpretive signage plan for the watershed to include signage at the Lake Colby beach, public boat launch, and along the Adirondack Rail Trail.*	Long	E	TH/VSL/DOT/DEC/AWI/TWC/LCBP
Explore the possibility of establishing social media accounts focused on Lake Colby.	Near	A	LCA/TH/VSL/AWI
Distribute outreach materials to local residents and businesses.	Near	A	LCA/AWI
Continue participation in the Adirondack Lake Assessment Program.*	Ongoing	A	AWI/LCA/LCBP

* Indicates actions that appear under more than one goal.

Resources To Provide Assistance, Collaboration, And Funding For Actions	
Abbreviation	**Name**
ADI	Adirondack Diversity Initiative
AH	Adirondack Health
AdkA	ADK Action
APA	Adirondack Park Agency
ARTA	Adirondack Rail Trail Association
AWI	Paul Smith's College Adirondack Watershed Institute
APIPP	Adirondack Park Invasive Plant Program
CVNHP	Champlain Valley National Heritage Program
DEC	New York State Department of Environmental Conservation
DOT	New York State Department of Transportation
FCSWCD	Franklin County Soil and Water Conservation District
HSL	Historic Saranac Lake
LCA	Lake Colby Association
LCBP	Lake Champlain Basin Program
TH	Town of Harrietstown
TWC	The Wild Center
SLCSD	Saranac Lake Central School District
SNICC	Six Nations Iroquois Cultural Center
VLS	Village of Saranac Lake
WQIP	Water Quality Improvement Program (DEC)

Lake Roxanne Watershed Action Plan



Patrick Leahy Lake Champlain Basin Program

NEIWPCC

Paul Smith's College Adirondack Watershed Institute

Lake Roxanne Watershed Action Plan

Brendan Wiltse, Joline Hall, Lija Treibergs, Connor Vara, Elizabeth Yerger

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Paul Smith's College Adirondack Watershed Institute, Paul Smiths, NY

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FORWARD & ACKNOWLEDGMENTS

The Lake Roxanne Watershed Action Plan summarizes goals and actions to protect and preserve the ecological and cultural values of Lake Roxanne and its watershed. The action plan aligns with the *Lake Champlain Basin Program's Opportunities for Action.*

Lake Roxanne was selected for the development of an action plan after an extensive survey of lakes and ponds across the New York side of the Lake Champlain Basin conducted in 2022. Lake Roxanne was chosen due to the size and density of the water chestnut infestation that was discovered in 2022 during the lake survey, as well as elevated nutrient concentrations found in the Lake and throughout the watershed.

Funding for the development of the Lake Roxanne Watershed Action Plan was provided by the Lake Champlain Basin Program and NEIWPCC.

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Executive Summary

The Lake Roxanne Watershed Action Plan outlines a framework to protect Lake Roxanne and its watershed. The plan's goals, objectives, and tasks draw from the *Lake Champlain Basin Program's Opportunities for Action* (LCBP OFA). *Opportunities for Action* is a comprehensive management plan guiding the Lake Champlain Basin Program's work. The individual actions identified in this plan are mapped onto the LCBP OFA to provide synergistic alignment between the two plans and specifically highlight actions that will advance the protection of Lake Roxanne and its watershed while also supporting the goals of the Lake Champlain Basin Program.

Lake Roxanne was selected for the development of an action plan after an extensive survey and assessment of lakes and ponds on the New York side of the Lake Champlain Basin. Lake Roxanne was selected due to the water chestnut infestation that was discovered in 2022 and the elevated nutrient concentrations found in the Lake.

The Lake Roxanne Watershed Action Plan identifies four goals for the lake and its watershed:

1. Lake Roxanne will provide safe recreational opportunities, and sustain a diverse ecosystem, vibrant community, and a working landscape.
2. The Lake Roxanne ecosystem will provide intact habitats for diverse fish and wildlife populations that are resilient to disturbance and free of aquatic invasive species, and will provide natural functions to sustain clean water and a vibrant community.
3. The Lake Roxanne community has an appreciation and understanding of the Lake's natural and cultural resources, and has the capacity to implement actions that will result in sound stewardship of these resources while maintaining a strong local economy.
4. Lake Roxanne residents and visitors will understand and appreciate Lake Roxanne watershed resources, and will possess a sense of personal responsibility that results in behavior changes and action to reduce pollution.

The action plan identifies the need to establish routine monitoring to assess the fate and transport of nutrients within the watershed. The plan also emphasizes the importance of containing water chestnut and Eurasian watermilfoil to the Lake and preventing their spread downstream. The plan identifies the need to establish a watershed or river association focused on the protection of the Great Chazy River. Finally, the plan underscores the significant role of the local community in protecting Lake Roxanne and identifies opportunities to increase support and awareness of natural resource protection efforts in the region.

In conclusion, the Lake Roxanne Watershed Action Plan is a proactive and collaborative approach to preserving this important watershed. By aligning its goals with the *Lake Champlain Basin Program's Opportunities for Action*, the plan ensures that targeted efforts to reduce pollution, prevent invasive species, and enhance community stewardship will not only benefit Lake Roxanne but also contribute to the broader ecological health of the Lake Champlain Basin. Through committed action and community engagement, the plan aims to safeguard Lake Roxanne and its watershed as a natural, recreational, and cultural asset for future generations.

Introduction

The Lake Roxanne watershed lies within the ancestral lands of the Mohawk people, one of the original five nations of the Haudenosaunee Confederacy, known as "The People of the Long House." The Haudenosaunee Confederacy, a participatory democracy, influenced the creation of the American Constitution and upheld the belief that law, society, and nature are interconnected. The Mohawk people have inhabited the Adirondack region for 1,200 to 4,000 years, with archaeological evidence of earlier human presence dating back to 9,000 B.C. Today, the St. Regis Mohawk Tribe, a federally recognized tribe, represents the Mohawk people in the region, whose stewardship of the Lake Roxanne watershed predates European colonization.

Lake Roxanne is an impoundment along the North Branch Great Chazy River. Its shoreline is privately owned, limiting public access. Despite this, Lake Roxanne plays an important role in the headwaters of the Lake Champlain Basin, a key hydrological network that connects the region to one of North America's most significant freshwater ecosystems. As part of the basin's system of streams, rivers, and lakes, Lake Roxanne contributes to downstream water quality and ecological health, including Lake Champlain. Its location in the headwaters means that actions to protect and manage Lake Roxanne have far-reaching impacts, influencing both local conditions and the broader environmental integrity of the basin. Protecting Lake Roxanne's water quality is critical to safeguarding the entire watershed and highlighting the interconnectedness of local and regional water systems.

Stewardship, education, and community engagement are essential to Lake Roxanne's protection. Involving the community fosters a deeper appreciation of the Lake's ecological and cultural significance and empowers individuals to contribute to its conservation. Programs like educational workshops, volunteer initiatives, and outreach activities cultivate a sense of responsibility and pride in protecting the Lake. These efforts raise awareness and promote sustainable practices, and the Lake Roxanne Watershed Action Plan can inspire collective action that supports the long-term health of the Lake and its surrounding environment. These initiatives also align with the broader goals of the Lake Champlain Basin Program, which emphasizes protecting the basin through cooperation and science-based strategies.

The Lake Roxanne Watershed Action Plan recognizes the Lake's cultural heritage, ecological value, and role in the community. It serves as a guide for efforts to protect and restore this critical resource. The plan emphasizes collaborative stewardship, integrating traditional knowledge, scientific research, and community involvement to ensure Lake Roxanne's health and resilience for future generations. Through commitment and partnership, we can preserve Lake Roxanne and its watershed as a vibrant natural asset that enriches the region and beyond.

Lake Roxanne Watershed Action Plan Goals

The watershed action plan is organized under four main goals for the management and protection of the Lake Roxanne watershed. These goals and associated objectives are designed to align closely with the *Lake Champlain Basin Program's Opportunities for Action*.

1 Lake Roxanne will provide safe recreational opportunities, and sustain a diverse ecosystem, vibrant community, and a working landscape.

2 The Lake Roxanne ecosystem will provide intact habitats for diverse fish and wildlife populations that are resilient to disturbance and free of aquatic invasive species, and will provide natural functions to sustain clean water and a vibrant community.

3 The Lake Roxanne community has an appreciation and understanding of the Lake's natural and cultural resources, and has the capacity to implement actions that will result in sound stewardship of these resources while maintaining a strong local economy.

4 Lake Roxanne residents and visitors will understand and appreciate Lake Roxanne watershed resources, and will possess a sense of personal responsibility that results in behavior changes and action to reduce pollution.

Watershed & Landscape Characteristics

Lake Roxanne is an impoundment along the North Branch of the Great Chazy River in the Town of Ellenburg, located in northwestern Clinton County. The Lake has a surface area of 199 acres (81 hectares) and a watershed area of 29,045 acres (11,754 hectares). The watershed is predominantly forested (67%), with a variety of forest types. Agricultural lands make up 19% of the watershed. Development in the watershed is primarily found in Ellenburg Depot and Ellenburg Center.

Lake Roxanne is sustained by a 17-foot-tall concrete dam on the North Branch of the Great Chazy River. The most recent inspection of the dam, conducted by NYS DEC in 2022, rated it as an intermediate hazard with recognized deficiencies, deeming it unsound. Several smaller dams are located upstream of Lake Roxanne. The Lake has a large watershed relative to its size, and combined with its shallow depth (8 feet), it experiences a high flushing rate (74 times per year).

The shore of Lake Roxanne is entirely privately owned, with no public access. The most notable development on the Lake is the Blue Haven Campground and Resort, situated on the northwestern shore and along the North Branch of the Great Chazy River. Despite the lack of public access, the health of Lake Roxanne and its watershed is of interest to the broader community.

The headwaters of the Lake Roxanne watershed are mostly forested, with portions located in the Chazy Highlands Wild Forest and the Moon Pond State Forest. The lower elevations are dominated by wetlands along the main river channel and its tributaries. Agricultural lands are also present in these lower elevations, often adjacent to wetlands and river corridors.

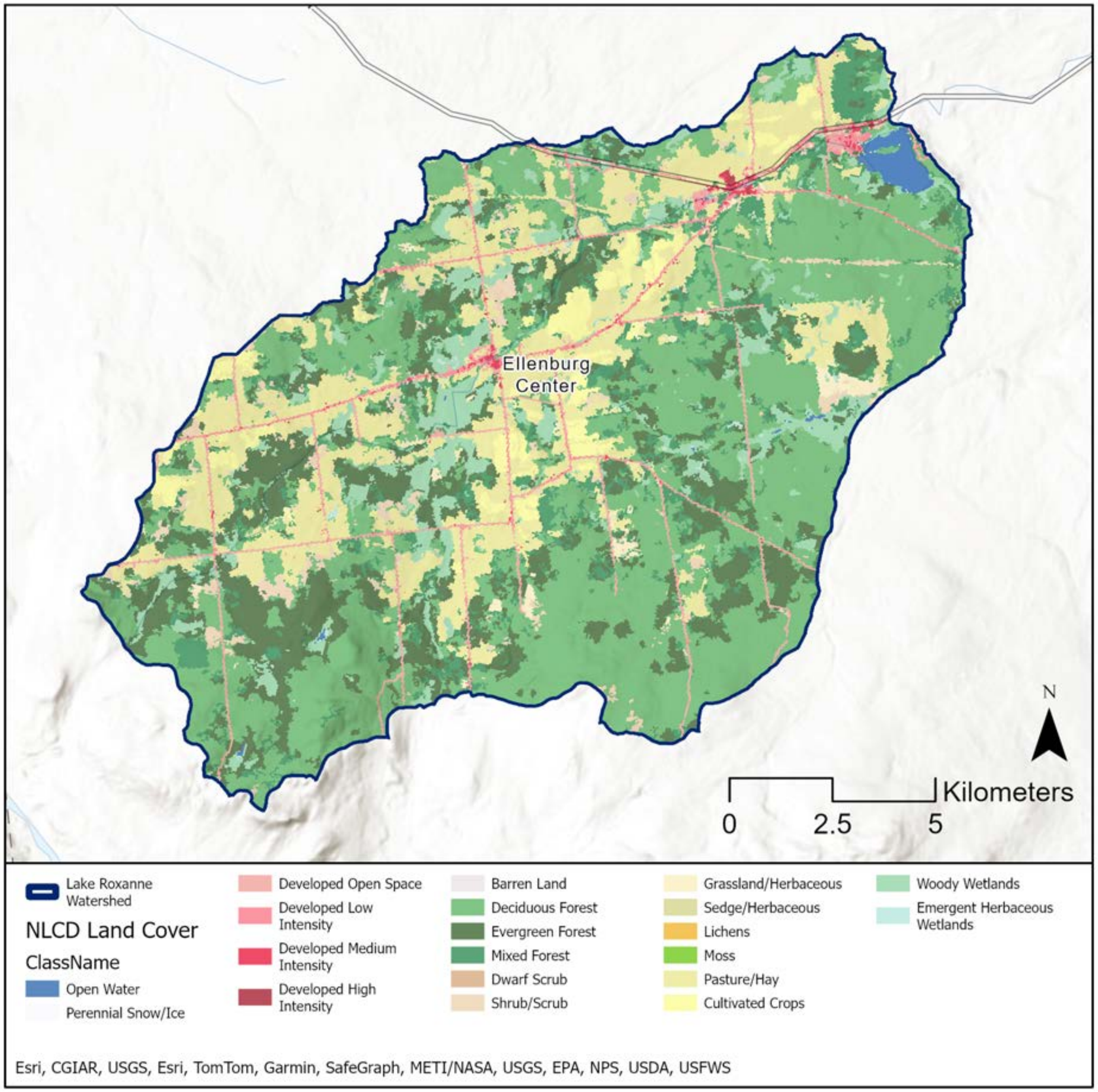
Lake Roxanne is classified as a mesotrophic, or moderately productive, lake based on chlorophyll-a concentrations. However, based on nutrient levels, it is classified as eutrophic, indicating high productivity. The Lake has elevated concentrations of total phosphorus and all forms of nitrogen (total nitrogen, nitrate-nitrite, and ammonia) compared to other lakes in the New York portion of the Lake Champlain Basin. Lake Roxanne is designated by NYS DEC as class C, indicating the waterbody is suitable for fishing and non-contact recreation.

Root system of a water chestnut plant pulled from Lake Roxanne.

The Lake has alkaline conditions with high acid neutralizing capacity, meaning its water quality is not threatened by low pH or acid deposition. However, elevated salt concentrations suggest a moderate influence from de-icing salt application within the watershed.

During the 2022 lake survey, both Eurasian watermilfoil and water chestnut were found in Lake Roxanne. Water chestnut covers large portions of the Lake's surface area at the height of the growing season. Both invasive species have also been detected in a small impoundment just downstream of Lake Roxanne.

Lake Roxanne's location within the Great Chazy watershed, the presence of invasive species, and concerns over the dam's safety underscore the importance of developing a watershed action plan for the Lake and its surroundings. The lack of public access may contribute to limited public awareness and stewardship of the Lake's ecological health. However, recognizing the Lake's interconnectedness within the broader watershed highlights the importance of addressing the challenges it faces.



National Land Covered (NLD) data for the Lake Roxanne watershed shows the distribution of different land cover types across the watershed.

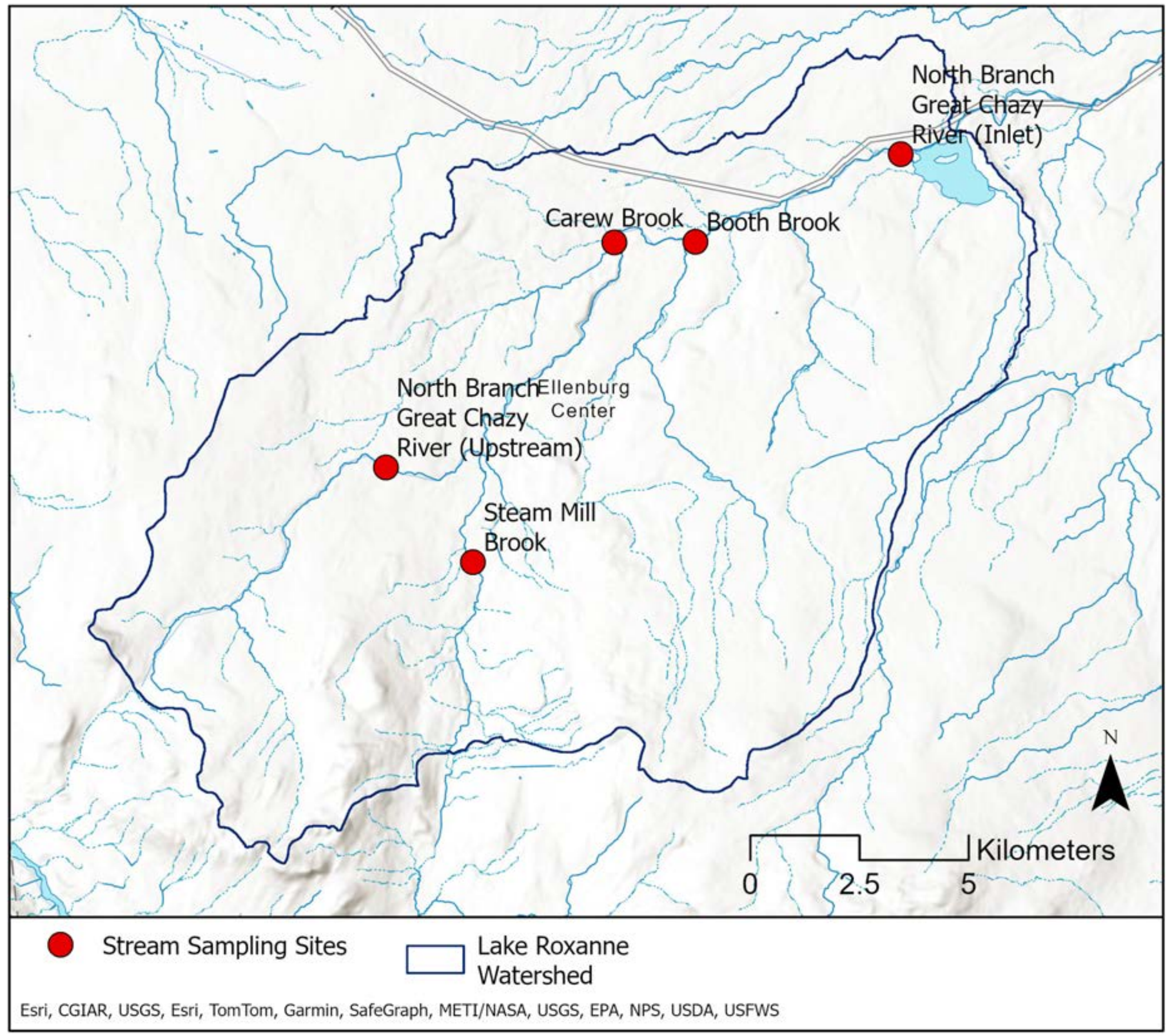
Goal 1: Lake Roxanne will provide safe recreational opportunities, and sustain a diverse ecosystem, vibrant community, and a working landscape.

Lake Roxanne has experienced limited water quality monitoring over the years. The Lake was initially surveyed in 1986 during the Adirondack Lake Survey effort and again in 2004 by NYS DEC. More recently, the Paul Smith's College Adirondack Watershed Institute sampled it in 2022 and 2023 as part of this watershed action plan.

Lake Roxanne is classified as mesotrophic to eutrophic, reflecting moderate productivity and high nutrient concentrations. Elevated nutrient levels have also been detected in tributaries. Unlike some lakes, it does not thermally stratify and remains well-oxygenated. However, the primary concern is the high concentration of nutrients.

The watershed includes significant agricultural land use, especially near river corridors. Further research is needed to assess nutrient transport from these areas. Elevated phosphorus and nitrogen levels have been detected in Carew Brook and Booth Brook, emphasizing the need for regular monitoring to better understand nutrient movement and other pollutants.

The Clinton County Soil and



Location of stream sampling sites within the Lake Roxanne watershed that were sampled in 2023.

Median nutrient concentrations in Lake Roxanne tributaries from monthly sampling conducted between May 2023 and September 2023. The range of concentrations observed are in parentheses.

Site	Total Phosphorus (µg/L)	Total Nitrogen (µg/L)	Nitrate-Nitrite (µg/L)	Ammonia (µg/L)
North Branch Great Chazy River (Upstream)	10.7 (6.8 - 14.1)	317 (281 - 554)	199 (133 - 248)	11.3 (9.0 - 20.4)
Steam Mill Brook	10.6 (6.7 - 37.8)	366 (269 - 423)	151 (90 - 293)	11.9 (9.9 - 18.0)
Carew Brook	24.6 (14.1 - 45.2)	724 (603 - 779)	566 (258 - 678)	14.6 (11.9 - 23.1)
Booth Brook	34.2 (13.8 - 40.3)	840 (647 - 940)	555 (547 - 816)	15.1 (12.2 - 20.6)
North Branch Great Chazy River (Inlet)	12.6 (8.8 - 29.7)	569 (407 - 678)	348 (245 - 501)	13.3 (12.5 - 27.7)

Water Conservation District provides agricultural services, helping farmers implement best management practices. These services should continue and expand where feasible. Collaborations with local universities, including SUNY Plattsburgh, SUNY Potsdam, Clarkson University, and Paul Smith's College, should be explored for targeted research on agricultural practices.

Lake Roxanne also has elevated chloride concentrations compared to other lakes on the NY side of the Lake Champlain Basin. Efforts to reduce salt use and promote best practices for winter road maintenance should be supported throughout the watershed. AdkAction's Clean Water, Safe Roads partnership provides valuable resources and training for local highway departments.

The Great Chazy River Flood & Resilience Report recommends that the Lake Roxanne dam be repaired or rehabilitated. If these options are not viable, dam removal is advised. Currently, no engineering assessment or emergency action plan exists for the dam, and completing these evaluations is strongly recommended.

Lake Roxanne faces challenges from nutrient loading, chloride concentrations, and infrastructure concerns. Addressing these issues will require continued monitoring, collaboration with agricultural stakeholders, and investment in dam safety. Expanding partnerships with local universities and conservation groups will help find sustainable solutions to protect Lake Roxanne's water quality. Immediate action to reduce nutrient and chloride inputs, along with strategic dam management, is essential to preserve the health of the Lake and its ecosystem.

Objective I.A - Improve understanding of water quality conditions and trends; determine the effectiveness of past management and inform future management decisions.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
I.A.1 – Fund and interpret monitoring and management oriented research.	I.A.1.b – Support research to increase understanding of groundwater transport of nutrients and contaminants in the Lake Champlain Basin through monitoring and modeling efforts	Assess groundwater transport of nutrients from agricultural areas to tributaries.
	I.A.1.e – Support and promote programs that expand sub-watershed monitoring to inform targeted watershed objectives.	Conduct routine monitoring of Lake Roxanne tributaries.
I.A.2 – Fund and interpret research on management decisions and best management practices (BMPs).	I.A.2.b – Support research to increase understanding of factors affecting BMP performance and efficiency, including potential effects of climate change.	Assess the efficacy of agricultural BMPs as they are implemented within the watershed.
I.A.3 – Fund and interpret research to better understand nutrient dynamics and limit their impact.	I.A.3.a – Support research to quantify the mass balance, forms, and transportation routes of phosphorus for the entire Lake Champlain Basin.	Conduct routine monitoring of Lake Roxanne tributaries.
I.A.4 – Fund and interpret research on contaminants in the Lake Champlain Basin.	I.A.4.a – Support research to reduce agrochemical application and runoff of pesticides, herbicides, and other agrochemicals.	Collaborate with universities and other partners to conducted targeted research focused on agricultural BMPs in the Lake Roxanne watershed.

Objective I.B - Reduce contaminants of concern and pathogens.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
I.B.1 – Reduce contaminant pollution.	I.B.1.b – Fund and promote programs that increase the efficiency of use of pesticides, herbicides, and other agrochemicals, and limit their transport to waterways.	Support CCSWCD's agricultural service programs. Collaborate with universities and other partners to conduct targeted research focused on agricultural BMPs in the Lake Roxanne watershed.
	I.B.1.c – Fund and promote programs that reduce de-icing salt application and limit their transport to waterways.	Support the Town of Ellenburg and Clinton County's participation in AdkAction's Clean Water, Safe Roads program. Support the Adirondack Road Salt Reduction Task Force recommendations.

Objective I.C - Reduce nutrient loading.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
I.C.1 – Reduce nutrient inputs from streambanks.	I.C.1.a – Fund and promote programs to improve stream equilibrium and connect rivers to their floodplains in critical areas of the Lake Champlain Basin.	Implement recommendations of the Great Chazy River Flood Mitigation & Resilience Report
	I.C.1.b – Fund and promote programs to protect or enhance river corridors for nutrient reduction and flood resilience.	Conduct a geomorphic assessment of rivers and streams within the Lake Roxanne watershed.
I.C.2 – Reduce nutrient inputs from agriculture.	I.C.2.a – Fund and promote programs that install recommended BMPs, provide technical assistance, improve soil health, and optimize farm operations to reduce nutrient load and improve water quality.	Support CCSWCD's agricultural service programs.
	I.C.2.b – Fund and promote programs that recover agricultural land in floodplains to restore floodplain function, reduce nutrient inputs, and increase flood resilience.	Conduct a GIS assessment of agricultural lands within floodplains and develop a prioritization framework for recovery of agricultural lands to increase flood resilience.
	I.C.2.c – Fund and promote programs that help farmers meet water quality regulations with targeted cost-share support for small farms, especially in critical sub-watersheds.	Support CCSWCD's agricultural service programs.
	I.C.2.d – Fund and promote programs that remove phosphorus from tile drains and agricultural ditches.	Support CCSWCD's agricultural service programs.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
	I.C.2.e – Fund and promote economical and sustainable agricultural practices that address water quality concerns.	Support CCSWCD's agricultural service programs.

Objective I.D – Support research to understand the impact of climate change on clean water and act to adapt to climate change impacts.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
I.D.1 – Fund and interpret climate-change-oriented research.	I.D.1.a – Support research to assess the impacts of climate change on nutrient loading from watershed and internal sources.	Assess changes in nutrient loading due to changes in discharge, especially from large storm events.
	I.D.1.h – Support research to assess the impact of climate change on water availability and water use.	Monitor long-term changes in discharge at the USGS Great Chazy gage station.

Goal 2. The Lake Roxanne ecosystem will provide intact habitats for diverse fish and wildlife populations that are resilient to disturbance and free of aquatic invasive species, and will provide natural functions to sustain clean water and a vibrant community.

In 1986, the Adirondack Lake Survey Corporation conducted a survey of the fish population in Lake Roxanne as part of the Adirondack Lake Survey. They identified rainbow trout, brown trout, golden shiner, creek chub, fallfish, white sucker, brown bullhead, and pumpkinseed in the Lake. The current fish community in the Lake is unknown.

Lake Roxanne is known to host three aquatic invasive species (AIS): Eurasian watermilfoil and water chestnut, both of which cover a substantial portion of the Lake and curly-leaf pondweed which was detected along the western shore. These species were first detected in 2022, given the extent of these populations, it is likely that they have been present in the Lake for several years prior to detection. Though, a follow up survey in 2023 did not report finding curly-leaf pondweed.

Eurasian watermilfoil (*Myriophyllum spicatum*) is a common aquatic invasive plant widespread across New York State. It is a submerged plant recognized by its long stems and feather-like leaves, which are arranged in whorls of four around the stem. Eurasian watermilfoil is highly invasive and competes aggressively with native aquatic plants, reducing biodiversity. A single fragment of stem or leaves can take root and form a new colony, and plants can grow up to two inches per day. Eurasian watermilfoil can thrive in a variety of waterbodies and on almost any substrate. Due to its dense growth, it creates poor fish spawning habitats, and excessive cover may lead to stunted fish populations. Dense surface mats can also interfere with boating, fishing, swimming, and other recreational activities, while lowering lakefront property values.

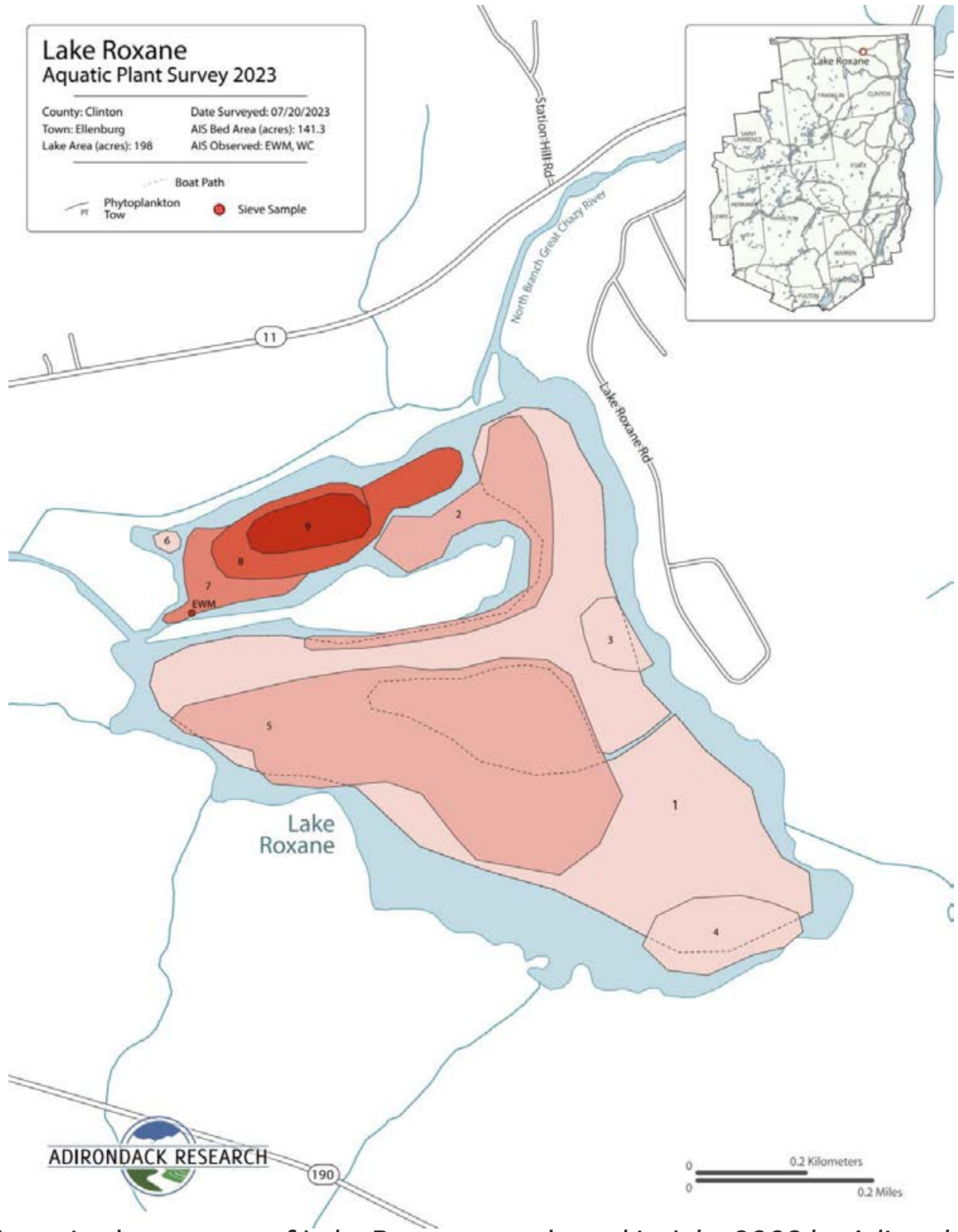
Water chestnut (*Trapa natans*) is a submerged aquatic macrophyte with both floating and submerged leaves, best suited to shallow, nutrient-rich lakes and slow-flowing rivers. The submerged leaves are feathery and whorled around a spongy stem, while the floating leaves are triangular with toothed edges, forming a rosette at the stem's tip. A small white flower appears in the center of the rosette. The plant produces hard, nut-like seeds with four sharp spines that fall to the sediment and sprout new plants. Each rosette can produce 10 to 15 seeds, which can overwinter and propagate new plants the following growing season. The dense, floating foliage of water chestnut can outcompete native aquatic plants for light and space. In high-density areas, plant cover can reach 100%, and within five years, a diverse flora bed can turn into a monoculture of water chestnut.

Both Eurasian watermilfoil and water chestnut have been detected in a small impoundment downstream of Lake Roxanne. The size and density of the infestation in Lake Roxanne make management challenging. The primary focus should be on containing the spread of both species. Given Lake Roxanne's high flushing rate and its position along a major river system, the transport of water chestnut seeds to downstream environments is a particular concern. It is important to establish monitoring efforts to track the downstream movement of both invasive species.

The Lake Roxanne dam acts as a barrier to aquatic organism passage within the North Branch Great Chazy watershed, as do several other small dams and culverts. An assessment of the potential for cold-water refugia in the headwaters of the watershed could help determine the priority areas for restoring aquatic organism passage.

The Lake Roxanne watershed would also benefit from expanded outreach through the Lake Champlain Basin Program and NEIWPCC's Stream Wise program, which engages landowners to protect and enhance vegetated stream buffers. These efforts improve flood resilience, protect water quality, and enhance natural habitat.

PLANT BED	EURASIAN WATERMILFOIL (% COVER)	WATER CHESTNUT (% COVER)
1	0	5 - 25
2	5 - 25	0
3	<5	0
4	<5	0
5	5 - 25	0
6	<5	0
7	0	26 - 50
8	0	51 - 75
9	0	76 - 100



Above: Aquatic plant survey of Lake Roxanne conducted in July, 2023 by Adirondack Research, funded by the Adirondack Park Invasive Plant Program.
Left: Table reflecting % cover of Eurasian watermilfoil and water chestnut for the plant bed delineated in the map above.

Objective II.A – Support research and understanding of predicted impacts of a changing climate in the Lake Champlain Basin.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
II.A.1 – Fund and interpret climate change research.	II.A.1.a – Support research and understanding of predicted impacts of a changing climate on the Basin including frequency of floods (lake levels), increased air and water temperatures, and changing land use on the lake's ecosystem.	Implement recommendations of the Great Chazy River Flood Mitigation & Resilience Report.
	II.A.1.b – Support research and understanding of AIS impacts to the Lake's ecosystem and economy under changing climate predictions.	Conduct routine aquatic plant surveys to assess changes in abundance and composition though APIPP's Lake Management Tracker program.
	II.A.1.c – Support identification of refugia sites for aquatic species of concern (adapt in place or move in space).	Assess the potential for cold water refugia for brook trout and other species of concern within the headwaters of the watershed.

Objective II.B – Evaluate ecosystem management programs and policies (support research to assess current ecosystem management programs).

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
II.B.1 – Support research to align policy with ecosystem management goals in the basin.	II.B.1.a – Assess state and local policies to identify those that align, contradict, or pose obstacles to healthy ecosystems goals.	Review local laws and policies as they pertain to maintaining clean water and healthy ecosystems.

Objective II.C – Support conservation of habitat for ecosystem function.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
II.C.1 – Work with Lake Champlain management partners to prioritize, protect and restore important riparian, shoreland, and wetland habitat areas.	II.C.1.a – Fund and promote projects that protect and restore riparian corridors and floodplains.	Promote Stream Wise within the Lake Roxanne watershed.

Objective II.D – Preserve and enhance aquatic and riparian biological diversity.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
II.D.2 – Reduce species fragmentation by preserving and connecting critical aquatic and riparian habitats.	II.D.2.a – Fund projects that prioritize and/or reduce fragmentation created by infrastructure, such as roads, dams, and culverts for native species such as brook trout, Atlantic salmon, mudpuppies, and salamanders.	Assess opportunities to improve aquatic organism passage within the Lake Roxanne watershed.

Objective II.E – Prevent the spread of aquatic invasive species.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
II.E.1 – Work with Lake Champlain management partners to monitor and respond to new aquatic invasions via early detection and rapid response (EDRR) and to educate different stakeholders about how their behavior can affect the spread of AIS.	II.E.1.a – Conduct and coordinate AIS monitoring and implement the Great Lakes and Lake Champlain Invasive Species Program (GLLCISP) which supports the early detection of the spread of existing AIS to new bodies of water in the basin or new arrivals of AIS to Basin waters.	Focus on containment of water chestnut and monitor downstream of Lake Roxanne for movement and expansion.
	II.E.1.b – Support and implement the Lake Champlain AIS Rapid Response Management Plan to respond to new AIS infestations and mobilize resources to prevent spread.	Focus on containment of water chestnut and monitor downstream of Lake Roxanne for movement and expansion.
II.E.3 – Support and conduct AIS management and research in the Basin.	II.E.3.a – Eliminate, reduce, contain, or prevent the expansion of AIS populations in the Basin, including water chestnut and sea lamprey in Lake Champlain, using control techniques such hand pulling, benthic barrier matting, suction harvesting, and pesticides.	Focus on containment of water chestnut and monitor downstream of Lake Roxanne for movement and expansion.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
	II.E.3.b – Research and remain connected to new and innovative research, spread prevention programs and control technologies capable of addressing real and potential AIS species impacts, including sea lamprey, to the Lake Champlain ecosystem and fishery, human health, and the regional economy.	Assess new AIS control technologies as they become available.

Goal 3: The Lake Roxanne community has an appreciation and understanding of the Lake's natural and cultural resources, and has the capacity to implement actions that will result in sound stewardship of these resources while maintaining a strong local economy.

A healthy and vibrant community is essential to the protection of Lake Roxanne and its watershed. This community extends beyond the Lake's immediate shores, encompassing all who value and utilize its natural resources. While the Lake's shoreline is privately owned, the broader community benefits from the protection of both Lake Roxanne and its watershed.

There is no dedicated watershed group or river association solely focused on protecting the Great Chazy River watershed. The Chazy Lake Watershed Initiative (CLWI) is active in the southern portion of the watershed. CLWI is an excellent local watershed group with an engaged and active membership. The Clinton County Water Quality Coordinating Committee is also involved across the watershed, bringing together interested stakeholders. Additionally, the Ausable Freshwater Center, formerly the Ausable River Association, and the Boquet River Association, which are active to the south, have proven valuable for the long-term protection and stewardship of their respective watersheds. Establishing a watershed group or river association for the Great Chazy River would bring much-needed focus to protecting this vital watershed, including Lake Roxanne and its surrounding area. Moreover, such a group would help build a stronger sense of community around the protection of the Great Chazy River and its watershed.

The development and distribution of outreach materials to specific groups, such as local plow companies and farms, are crucial in addressing challenges to protecting clean water. Plow companies, for example, can benefit from guidelines on reducing salt application during winter maintenance to minimize runoff, which degrades water quality. Farmers, whose practices impact local waterways, can be informed about sustainable techniques, such as buffer zones or cover cropping, that reduce nutrient runoff into the watershed. Tailored educational materials can help bridge the gap between daily operations and broader conservation goals, ensuring that every sector of the community contributes to the protection of Lake Roxanne.

Increasing community appreciation and understanding of Lake Roxanne and its watershed partially depends on public access to the water resources within the area. There is currently no public access to Lake Roxanne, though visitors to the Blue Haven Campground and Resort can access the Lake. The Ellenburg Recreation Park is adjacent to the North Branch of the Great Chazy River but has limited direct access to the river. Expanding public access to the river and water resources within the watershed will help boost public interest and engagement in protecting the watershed.

Right: Photograph showing the dense cover of water chestnut on Lake Roxanne.

Objective III.A – Engage and support community and management partners.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
III.A.4 – Serve as a conduit for information, build professional capacity among stakeholders, and foster strong working relationships among the partners of the LCBP and CVNHP, and Champlain-Adirondack Biosphere Network (CABN).	III.A.1.a – Provide funds for local watershed groups to implement projects.	Establish a Great Chazy River Association to focus on the protection and preservation of the Great Chazy River watershed.
	III.A.4.c – Fund and promote technical training programs for technical and outreach staff working with stakeholders in the Basin.	Support technical training and outreach programs for local government staff, non-profit partners, schools, and community groups.
	III.A.4.d – Support seminars, workshops, and conferences to deliver technical information on topics such as BMPs, LID, stormwater management technologies, roads management, and adaptive management to municipal and state staff.	Support and encourage local government staff, non-profit partners, schools, and community groups to participate in regional training opportunities.

Objective III.B – Support water-wise economic development.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
III.B.1 – Support business innovations that improve water quality.	III.B.1.a –Work with key partners to develop industry-specific outreach.	Develop and distribute outreach materials to local plow companies and farms.

Objective III.C – Support awareness and conservation of cultural heritage resources.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
III.C.1— Build on existing knowledge, make new discoveries of the history, culture, and special resources of the CVNHP, and make this information accessible to all.	III.C.1.a - Support research and interpretation of our past and the cultural heritage resources of the CVNHP.	Research the cultural heritage of the Lake Roxanne watershed and incorporate findings in outreach and educational programing.
	III.C.1.c - Document cultural components of the region, including Abenaki, Mohegan, Mohawk, and Onita cultures, FrancoAmerican culture, and new American communities to research, restore and maintain these cultural identities in the Basin and CVNHP region.	Work with local Indigenous communities and scholars to document the Indigenous history of the watershed and identify ways to maintain cultural identities.

Objective III.D – Support Lake and Basin recreation.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
III.D.1—Provide sustainable and accessible recreational opportunities for everyone within the CVNHP, with a focus on access for underserved communities.	III.D.1.b - Increase and improve public access opportunities to the waterbodies of the Basin and interconnected waterways of the CVNHP for diverse recreational activities.	Assess opportunities to increase public access to Lake Roxanne. Develop recreational trails on NYS DEC lands within the watershed.

Goal 4. Lake Roxanne residents and visitors will understand and appreciate Lake Roxanne watershed resources, and will possess a sense of personal responsibility that results in behavior changes and action to reduce pollution.

The private ownership of Lake Roxanne and its shoreline presents challenges in building community interest and engagement for the Lake's protection. Since Lake Roxanne is an impoundment along the North Branch of the Great Chazy River, efforts to increase public involvement should focus on the broader watershed. Expanding the scope to include the entire Great Chazy River watershed, along with its connection to the Lake Champlain Basin, would create more opportunities for residents and visitors to understand and appreciate the vital resources of the Great Chazy River.

The North Branch of the Great Chazy River has the potential to serve as a valuable outdoor learning environment for Northern Adirondack Middle & High Schools. The river is just across State Route 11 from the school and 3.5 miles down Ellenburg Center Road is the Ellenburg Recreation Park, which also provides access to the river. Developing hands-on, field-based educational programming in partnership with regional organizations would enrich the educational experience for local students while fostering a deeper connection to the watershed.

The Blue Haven Campground and Resort, located on the northwestern shore of Lake Roxanne, offers various activities and programs throughout its season. The campground has supported AWI's efforts to monitor and assess Lake Roxanne in 2022 and 2023. Both staff and visitors have expressed interest in learning more about the Lake and how to manage the invasive species present. Local watershed groups and educational organizations should explore opportunities to engage this community further through educational programs and volunteer initiatives.

Stream and riparian stewardship is especially important within the Lake Roxanne watershed. The North Branch of the Great Chazy River and its tributaries flow through a mix of agricultural and forested lands. In some areas, particularly along Booth Brook, there is minimal or no riparian buffer between agricultural lands and surface waters. The watershed would benefit from a focused effort within the Stream Wise program to engage more landowners. Stream Wise works with property owners in the Lake Champlain Basin to protect and enhance vegetated stream buffers. The program recognizes landowners who maintain healthy streamside buffers and offers personalized assessments to guide better watershed stewardship.

There is a great opportunity to expand public understanding and appreciation of Lake Roxanne and the North Branch of the Great Chazy River. By focusing outreach efforts on local schools, community groups, and landowners, a stronger sense of personal responsibility and stewardship for these vital resources can be cultivated within the watershed.

Right: View of Lake Roxanne and its shoreline.

Objective IV.A – Enhance formal learning at all educational levels.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
IV.A.1 – Implement programs for K-12 students.	IV.A.1.b –Conduct field-based instruction and activities that provide hands-on knowledge of watershed science, recreation, and cultural heritage among K-12 students.	Support programing at local schools that engage students on watershed issues.
IV.A.4 – Engage youth in watershed management and stewardship opportunities.	IV.A.4.a – Fund and promote community service projects and mentorship programs focused on clean water and healthy ecosystems, with an emphasis on traditionally underserved communities.	Work with local schools and youth groups to support environmental stewardship.

Objective IV.B – Build awareness of the Lake Champlain Basin through informal learning across all communities.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
IV.B.1 – Communicate watershed science and stewardship information for the public and stakeholders.	IV.B.1.c – Deliver face-to-face, small group, and interactive interpretation to the public.	Assess interest and identify opportunities to offer interpretive programing at the Blue Haven Campground and Resort.

Objective IV.C – Facilitate changes in behavior and actions of individuals for their communities.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
IV.C.1 – Promote individual stewardship action.	IV.C.1.b – Promote lake-friendly products and practices.	Distribute outreach materials to local residents and businesses. Encourage participation in NYS DEC Citizen Statewide Lake Assessment Program (CSLAP) and Water Assessment by Volunteer Evaluators (WAVE) program.
IV.C.2 – Promote community stewardship action.	IV.C.2.a – Implement social marketing techniques to foster sharing of information and stewardship ethic.	Promote Stream Wise within the Lake Roxanne watershed.

Summary of management actions for the Lake Roxanne Watershed. Cost estimates are generalized into the following categories based on either one-time or annual expense; A < $5,000, B = $5,000-$10,000, C = $10,000-$25,000, D = $25,000-$50,000, E = $50,000-$100,000, F = $100,000-$250,000, G = $250,000-$500,000, H = $500,000-$1,000,000, I > $1,000,000. Timelines are generalized into the following categories; Ongoing = action is underway, Short < 1 year, Near = 1 to 3 years, Long > 3 years.

Goal 1: Clean Water

Action	Timeline	Cost	Resources
Assess groundwater transport of nutrients from agricultural areas to tributaries.	Near	D	AWI/CCSWCD/Uni/LCBP
Conduct routine monitoring of Lake Roxanne tributaries.	Near	C	AWI/CCSWCD/LCBP
Assess the efficacy of agricultural BMPs as they are implemented within the watershed.	Long	B	AWI/CCSWCD/LCBP
Collaborate with universities and other partners to conduct targeted research focused on agricultural BMPs in the Lake Roxanne watershed.	Long	F	CCSWCD/Uni/LCBP
Support CCSWCD's agricultural service programs.	Ongoing	C	CCSWCD/LCBP/WQIP
Support the Town of Ellenburg and Clinton County's participation in AdkAction's Clean Water, Safe Roads program.	Near	B	AdkA/TE/CC/LCBP
Support the Adirondack Road Salt Reduction Task Force recommendations.	Long	D	DOT/DEC/TW/CC/LCBP
Implement recommendations of the Great Chazy River Flood Mitigation & Resilience Report.*	Long	I	DOS/DEC/TE/CC/LCBP
Conduct a geomorphic assessment of rivers and streams within the Lake Roxanne watershed.	Long	F	CCSWCD/LCBP
Conduct a GIS assessment of agricultural lands within floodplains and develop a prioritization framework for recovery of agricultural lands to increase flood resilience.	Near	B	AWI/CCSWCD/Uni/LCBP
Assess changes in nutrient loading due to changes in discharge, especially from large storm events.	Long	F	AWI/CCSWCD/Uni/LCBP
Monitor long-term changes in discharge at the USGS Great Chazy gage station.	Ongoing	D	USGS/AWI/LCBP

Goal 2: Healthy Ecosystems

Action	Timeline	Cost	Resources
Implement recommendations of the Great Chazy River Flood Mitigation & Resilience Report.*	Long	I	DOS/DEC/TE/CC/LCBP
Conduct routine aquatic plant surveys to assess changes in plant abundance and composition from APIPP's Lake Management Tracker program.	Near	B	APIPP
Assess the potential for cold water refugia for brook trout and other species of concern within the headwaters of the watershed.	Long	E	AWI/TU/DEC/FWS/LCBP
Review local laws and policies as they pertain to maintaining clean water and healthy ecosystems.	Near	A	TE/CC
Promote Stream Wise within the Lake Roxanne watershed.	Near	A	AWI/CCSWCD/LCBP
Assess opportunities to improve aquatic organism passage within the Lake Roxanne watershed.	Long	F	CCSWCD/TU/FWS/DEC/ LCBP/WQIP
Focus on containment of water chestnut and monitor downstream of Lake Roxanne for movement and expansion.	Ongoing	A	APIPP/DEC/LCBP
Assess new AIS control technologies as they become available.	Long	B	APIPP/AWI/DEC/APA

Goal 3: A Thriving Community

Action	Timeline	Cost	Resources
Establish a Great Chazy River Association to focus on the protection and preservation of the Great Chazy River watershed.	Near	C	CCSWCD/LCBP
Support technical training and outreach programs for local government staff, non-profit partners, schools, and community groups.	Near	A	TE/CC/CCSWCD/DOT/ DEC/AdkA/LCBP
Support and encourage local government staff, non-profit partners, schools, and community groups to participate in regional training opportunities.	Near	A	TE/CC/CCSWCD/DOT/ DEC/AdkA/LCBP
Develop outreach materials to local plow companies.	Ongoing	A	AdkA/AWI/LCBP
Research the cultural heritage of the Lake Roxanne watershed and incorporate findings in outreach and educational programing.	Near	B	ADI/SNICC/CVNHP
Work with local Indigenous communities and scholars to document the Indigenous history of the watershed and identify ways to maintain cultural identities.	Near	B	ADI/SNICC/CVNHP

Assess opportunities to increase public access to Lake Roxanne.	Long	A	TE/BHCR
Develop recreational trails on NYS DEC lands within the watershed.	Long	F	DEC

Goal 4: Informed And Involved Public

Action	Timeline	Cost	Resources
Support programming at local schools that engage students on watershed issues.	Near	B	AWI/CCSWCD/NACSD/ LCBP
Work with schools and youth groups to support environmental stewardship.	Near	B	AWI/CCSWCD/NACSD/ LCBP
Assess interest and identify opportunities to offer interpretive programming at the Blue Have Campground and Resort.	Near	A	AWI/BHCR/LCBP
Distribute outreach materials to local residents and businesses.	Near	A	CCSWCD/AWI/LCBP
Encourage participation in NYS DEC CSLAP and WAVE programs.	Near	A	DEC
Promote Stream Wise within the Lake Roxanne watershed.*	Near	A	AWI/CCSWCD/LCBP

* Indicates actions that appear under more than one goal.

Resources To Provide Assistance, Collaboration, And Funding For Actions	
Abbreviation	**Name**
ADI	Adirondack Diversity Initiative
AdkA	ADK Action
AWI	Paul Smith's College Adirondack Watershed Institute
APA	Adirondack Park Agency
APIPP	Adirondack Park Invasive Plant Program
BHCR	Blue Haven Campground and Resort
CC	Clinton County
CCSWCD	Clinton County Soil and Water Conservation District
CVNHP	Champlain Valley National Heritage Program
DEC	New York State Department of Environmental Conservation
DOT	New York State Department of Transportation
DOS	New York State Department of State
FWS	United States Fish and Wildlife Service
LCBP	Lake Champlain Basin Program
NACSD	Northern Adirondack Central School District
SNICC	Six Nations Iroquois Cultural Center
TE	Town of Ellenburg
TU	Trout Unlimited
Uni	Universities (SUNY Plattsburgh, SUNY Potsdam, Clarkson University, Paul Smith's College)
WQIP	Water Quality Improvement Program (DEC)

Mirror Lake Watershed Action Plan

Patrick Leahy Lake Champlain Basin Program

NEIWPCC

Paul Smith's College Adirondack Watershed Institute

Mirror Lake Watershed Action Plan

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Paul Smith's College Adirondack Watershed Institute, Paul Smiths, NY

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FORWARD & ACKNOWLEDGMENTS

The Mirror Lake Watershed Action Plan summarizes goals and actions to protect and preserve the ecological and cultural values of Mirror Lake and its watershed. The action plan aligns with the *Lake Champlain Basin Program's Opportunities for Action.*

Mirror Lake was selected for the development of an action plan after an extensive survey of lakes and ponds across the New York side of the Lake Champlain Basin conducted in 2022. Mirror Lake was chosen due to the high chloride concentrations found in the Lake, the dense urban development around the Lake, and it being a popular tourism destination.

Efforts to protect and monitor Mirror Lake have been ongoing for decades, led by the Mirror Lake Watershed Association. This association is highly engaged and active community group that has pulled together numerous partners to advance efforts to protect Mirror Lake. The association works closely with the Village of Lake Placid and Town of North Elba to guide local laws and decision-making as they relate to the protection of the lake. Since 2015, the Ausable Freshwater Center and Paul Smith's College Adirondack Watershed Institute have worked with the Mirror Lake Watershed Association and local governments to enhance the monitoring on the lake and provide professional guidance on lake protection efforts.

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We'd like to acknowledge the project advisory committee who guided the overall project and provided important feedback:

- Peter Bauer
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- Brian Greene
- Peter Hagar
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Executive Summary

The Mirror Lake Watershed Action Plan outlines a framework to protect Mirror Lake and its watershed. The plan's goals, objectives, and tasks draw from the ***Lake Champlain Basin Program's Opportunities for Action*** (LCBP OFA). *Opportunities for Action* is a comprehensive management plan guiding the Lake Champlain Basin Program's work. The individual actions identified in this plan are mapped onto the LCBP OFA to provide synergistic alignment between the two plans and specifically highlight actions that will advance the protection of Mirror Lake and its watershed while also supporting the goals of the Lake Champlain Basin Program.

Mirror Lake was selected for the development of an action plan after an extensive survey and assessment of lakes and ponds on the New York side of the Lake Champlain Basin. Mirror Lake was selected because it has high road salt influence, dense urban development around the Lake, and is highly popular as a tourism destination.

The Mirror Lake Watershed Action Plan identifies four goals for the Lake and its watershed:

1. Mirror Lake will provide safe recreational opportunities, and sustain a diverse ecosystem, vibrant community, and a working landscape.
2. The Mirror Lake ecosystem will provide intact habitats for diverse fish and wildlife populations that are resilient to disturbance and free of aquatic invasive species, and will provide natural functions to sustain clean water and a vibrant community.
3. The Mirror Lake community has an appreciation and understanding of the Lake's natural and cultural resources, and has the capacity to implement actions that will result in sound stewardship of these resources while maintaining a strong local economy.
4. Mirror Lake residents and visitors will understand and appreciate Mirror Lake watershed resources, and will possess a sense of personal responsibility that results in behavior changes and action to reduce pollution.

The action plan identifies the need to continue long-term monitoring to assess the efficacy of stormwater improvements and the implementation of best management practices for de-icing salt reduction. The plan also emphasizes the importance of Watercraft Inspection Stewards in preventing the introduction of aquatic invasive species and enhancing public outreach. The critical role of Mirror Lake in local school programs and educational efforts is highlighted as well. Finally, the plan underscores the significant role of the local community in protecting Mirror Lake and identifies opportunities to increase support and awareness of the Mirror Lake Watershed Association.

In conclusion, the Mirror Lake Watershed Action Plan is a proactive and collaborative approach to preserving this important watershed. By aligning its goals with the ***Lake Champlain Basin Program's Opportunities for Action***, the plan ensures that targeted efforts to reduce pollution, prevent invasive species, and enhance community stewardship will not only benefit Mirror Lake but also contribute to the broader ecological health of the Lake Champlain Basin. Through committed action and community engagement, the plan aims to safeguard Mirror Lake as a natural, recreational, and cultural asset for future generations.

Introduction

The Mirror Lake watershed lies within the ancestral lands of the Mohawk people, one of the original five nations of the Haudenosaunee Confederacy, also known as "The People of the Long House." The Haudenosaunee Confederacy, a participatory democracy, influenced the creation of the American Constitution and upheld the belief that law, society, and nature are interconnected and equal partners. The Mohawk people have been in the Adirondack region for between 1,200 and 4,000 years, with evidence of earlier human presence dating back to 9,000 B.C. with Paleo-Indian sites. Today, the St. Regis Mohawk Tribe, a federally recognized tribe, represents the Mohawk people in the region, whose stewardship of the Mirror Lake Watershed predates European colonization.

Mirror Lake is often referred to as the gem, or jewel of Lake Placid. The Lake sits directly adjacent to downtown Lake Placid and is a hub of recreational activity. The Lake Placid community strongly identifies with Mirror Lake and is passionate about its stewardship. Residents and visitors recreate on Mirror Lake at all times of the year. In the summer, Mirror Lake hosts the swim portion of the IRONMAN Triathlon and in the winter it is host to the CAN-AM Pond Hockey tournament. Thousands of visitors each year swim, paddle, and fish on the Lake. Equal numbers come to skate, ski, and ride dogsleds. When ice and snow conditions allow visitors can be see rocketing out across the Lake from a custom toboggan run that sends thrill seekers out across the ice.

Mirror Lake sits in the headwaters of the Chubb River watershed, which flows into the West Branch Ausable River and eventually to Lake Champlain. As part of Lake Champlain Basin's network of streams, rivers, and lakes, Mirror Lake contributes to the water quality and ecological health of downstream habitats, including the vital waters of Lake Champlain. Its location in the headwaters means that actions taken to protect and manage Mirror Lake have far-reaching impacts, influencing not just local conditions but the broader environmental integrity of the basin. Protecting Mirror Lake's water quality is, therefore, a crucial step in safeguarding the entire watershed, highlighting the interconnectedness of our local lakes with regional and international waters.

Stewardship, education, and community involvement are vital to the protection of Mirror Lake and its watershed. Engaging the community in these efforts not only fosters a deeper appreciation for the Lake's ecological and cultural significance but also empowers individuals to contribute directly to its conservation. Programs that connect residents and visitors with hands-on experiences, such as educational workshops, volunteer initiatives, and outreach activities, help cultivate a sense of responsibility and pride in protecting the Lake. By promoting awareness and encouraging sustainable practices, the Mirror Lake Watershed Action Plan can inspire collective action that supports the long-term health and resilience of the Lake and its surrounding environment, echoing the broader goals of the Lake Champlain Basin Program.

The Mirror Lake Watershed Action Plan recognizes the Lake's cultural heritage, ecological value, and role in the community and serves as a guide for efforts to protect and restore this vital resource. Emphasizing collaborative stewardship, the plan recognizes the importance of traditional knowledge, scientific research, and community action to ensure Mirror Lake's health and resilience for future generations. Through commitment and partnership, we can preserve Mirror Lake as a vibrant natural asset that enriches the Lake Placid region and beyond.

Mirror Lake Watershed Action Plan Goals

The watershed action plan is organized under four main goals for the management and protection of the Mirror Lake watershed. These goals and associated objectives are designed to align closely with the *Lake Champlain Basin Program's Opportunities for Action*.

1 Mirror Lake will provide safe recreational opportunities, and sustain a diverse ecosystem, vibrant community, and a working landscape.

2 The Mirror Lake ecosystem will provide intact habitats for diverse fish and wildlife populations that are resilient to disturbance and free of aquatic invasive species, and will provide natural functions to sustain clean water and a vibrant community.

3 The Mirror Lake community has an appreciation and understanding of the Lake's natural and cultural resources, and has the capacity to implement actions that will result in sound stewardship of these resources while maintaining a strong local economy.

4 Mirror Lake residents and visitors will understand and appreciate Mirror Lake watershed resources, and will possess a sense of personal responsibility that results in behavior changes and action to reduce pollution.

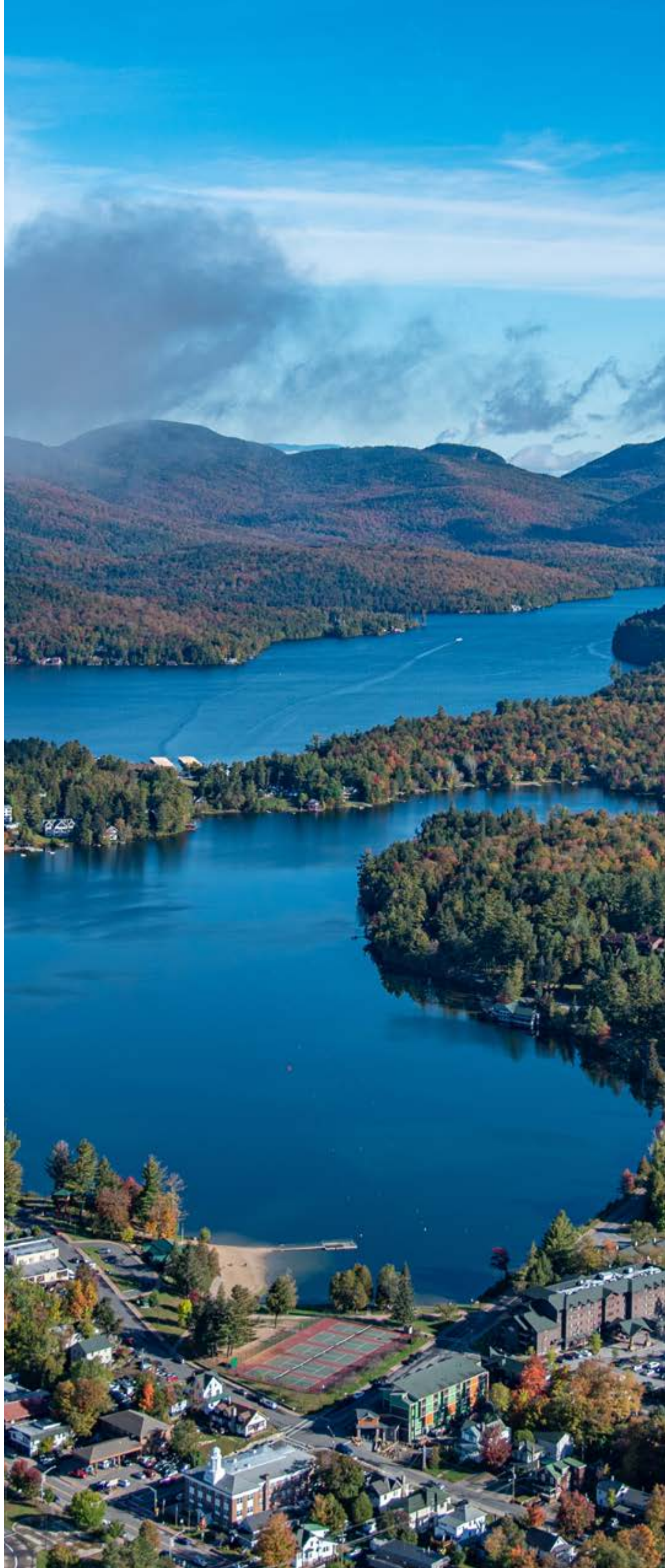
Watershed & Landscape Characteristics

Mirror Lake is located in western Essex County within the Town of North Elba and the Village of Lake Placid. The Lake spans a surface area of 50 hectares (124 acres) with a watershed area of 301 hectares (741 acres), and is predominantly forested, though 27% of the watershed is developed. When considering only land area, this figure rises to 34%, with much of the developed land covered by impervious surfaces. Mirror Lake has nearly twice the percentage of developed land compared to any other lake in the Adirondack Lake Assessment Program (ALAP). For comparison, only 1% of Lake Placid's watershed and 8% of Lake George's watershed are developed. In the broader context of Adirondack lakes, Mirror Lake stands out as one of the most developed lakes in the Adirondack Park. Mirror Lake is designated by NYS DEC as class B(T), indicating the waterbody is suitable for use for swimming and other recreation, fish, and may support trout.

The headwaters of the watershed, including Echo Lake, drain into the north bay of Mirror Lake, an area that remains mostly forested. In contrast, much of the land surrounding Mirror Lake itself is developed. The Lake drains southward into the Chubb River, which flows into the West Branch of the Ausable River. Mirror Lake's outlet stream has been significantly altered, running underground for much of its length and connecting to a network of storm drains before emerging near its confluence with the Chubb River at Mill Pond.

Nearly the entire shoreline of Mirror Lake is developed and encircled by roads, with 1.1 km (0.68 mi) of state roads and 7.6 km (4.72 mi) of local roads draining into the Lake. Historically, stormwater from these roads flowed directly into the Lake through more than 20 outfalls. In response, the Village of Lake Placid, encouraged by the Mirror Lake Watershed Association, has proactively installed hydrodynamic separator units to filter stormwater from the streets around the Lake. Several outfalls along Main Street have been retrofitted, and further efforts have consolidated stormwater collection, diverting it away from the Lake. A significant stormwater consolidation project on the southeast side of Mirror Lake was completed in July 2017, directing stormwater into the Chubb River just below the municipal wastewater treatment plant.

The water quality and health of Mirror Lake have been longstanding concerns for residents and scientists. The first known water quality report was published by Ray Oglesby in 1971,

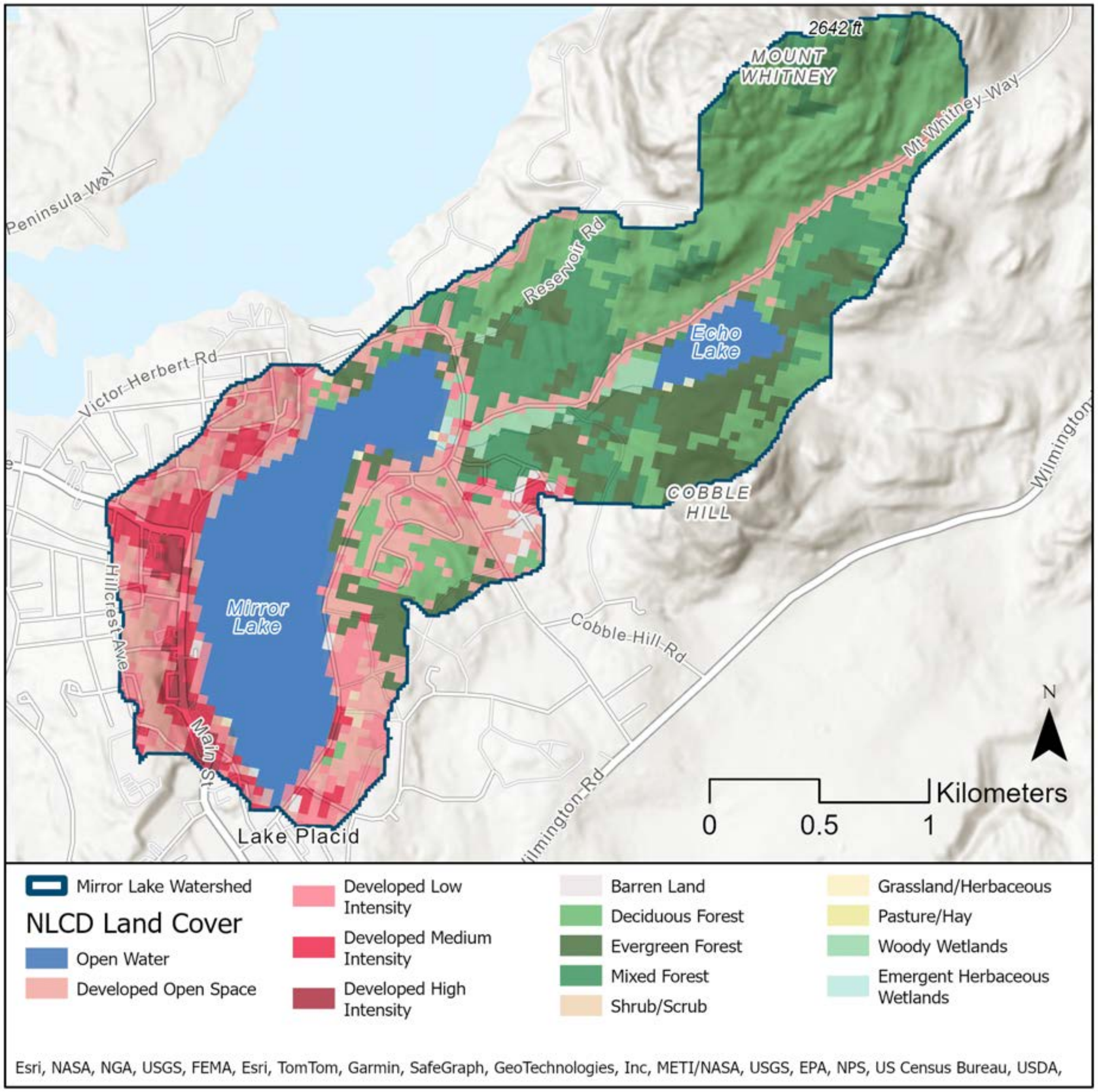


commissioned by the Lake Placid Shore Owners' Association as part of a broader study of Lake Placid. The study aimed to establish a baseline scientific description of both lakes, identify factors contributing to algal growth, and provide recommendations for protecting and improving water quality. Oglesby's initial 1971 study, followed by a second report in 1974, set the stage for ongoing efforts to safeguard the water quality of Mirror Lake and its surroundings.

Mirror Lake is classified as oligotrophic, or a low-nutrient lake. The Lake's alkaline waters have high acid-neutralizing capacity making it resistant to acid deposition, but the Lake is heavily influenced by road salt runoff. The only known invasive species present in the Lake is the banded mystery snail (*Viviparus georgianus*), detected in 2018.

The first reported harmful algal bloom on the Lake occurred in 2020, with additional blooms forming in 2022. The blooms in 2022 persisted for several days, necessitating signage to warn individuals recreating on the Lake of the potential danger of coming into contact with the bloom.

Mirror Lake's relation to the Village of Lake Placid and its popularity as a destination for recreational activity underscore the importance of protecting the Lake and its watershed. The Lake is recognized as the gem of Lake Placid highlighting the importance of



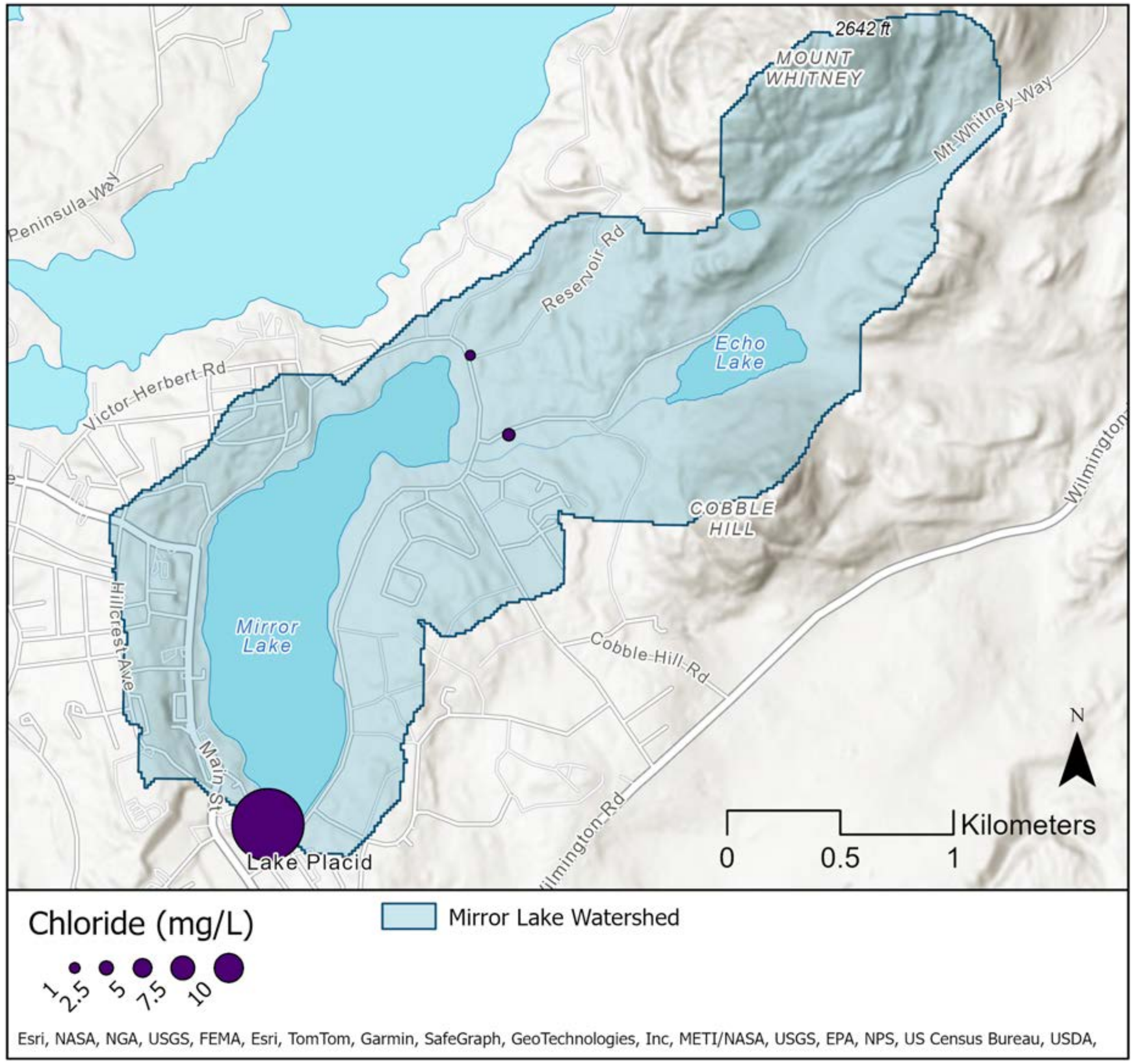
National Land Covered (NLD) data for the Mirror Lake watershed shows the distribution of different land cover types across the watershed.

sustainable management to preserve its ecological health and recreational value for future generations.

Goal 1: Mirror Lake will provide safe recreational opportunities, and sustain a diverse ecosystem, vibrant community, and a working landscape.

Mirror Lake has been monitored by a variety of programs over the past several decades. The biggest threat to the water quality and health of the Lake has been elevated chloride and sodium concentrations due to de-icing salt runoff entering the Lake. For many years, stormwater runoff flowed directly to the Lake through more than 20 stormwater outfall pipes. Salt runoff from the impervious surfaces within the watershed would flow to the Lake through the stormwater system at concentrations many thousands of times higher than background concentrations. Due to density differences with the receiving lake water, this runoff would accumulate at the lake bottom, causing salt-induced density differences in the water column. As a result of the salt gradient in the Lake, the natural mixing regime of the Lake was altered.

Efforts to reduce de-icing salt use by the Lake Placid community, notably the Village of Lake Placid and Town of North Elba, have resulted in a decline in the chloride retention since 2020. Tributary monitoring conducted in 2023 showed that the two inlet streams



Median tributary chloride concentration from sampling conducted in 2023.

flowing into the north basin of Mirror Lake have low chloride concentrations (median of 0.5 and 1.7 mg/L). The median concentration at the lake outlet during this period was 31.5 mg/L, which reflects the de-icing salt contribution from stormwater runoff, direct runoff to the Lake, and groundwater. The Lake Placid community should continue to support and invest in de-icing salt reduction efforts to continue to drive salt concentrations downward.

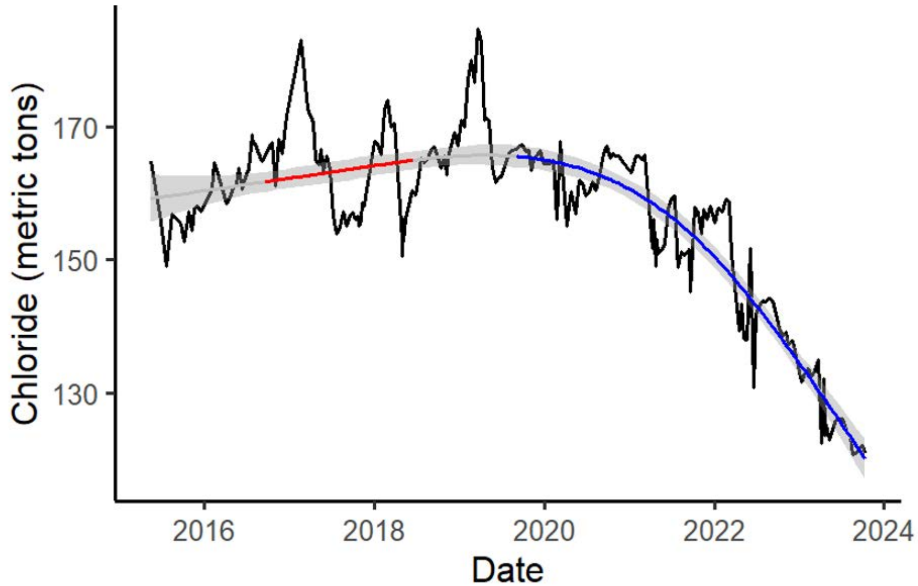
Mirror Lake is characterized as an oligotrophic lake, reflecting low nutrient concentrations and productivity. The Lake's bottom waters typically become anoxic (less than 2 mg/L of dissolved oxygen) in June, and by August or September the entire hypolimnion is devoid of oxygen. This prolonged anoxic state triggers the release of phosphorus from lake sediments, leading to internal nutrient loading. By late summer, phosphorus levels in the bottom waters can be more than ten times higher than surface levels.

Mirror Lake experienced its first reported harmful algal bloom (HAB) in 2020. In 2022, four HABs were reported on the Lake, spanning a two week period in early November. Researchers at RPI have used temperature and oxygen data from a monitoring buoy on the Lake, along with lake models, to link the formation of HABs to internal nutrient loading and fall turnover. Similar work has been conducted on Lake George. Given the popularity of Mirror Lake as a destination for swimming and other forms of recreation, increased efforts to monitor and test HABs is warranted.

Managing internal nutrient loading is both challenging and costly. Efforts should focus on reducing nutrient inputs through wetland restoration, green stormwater infrastructure, and stormwater management. Significant improvements to the stormwater management along Main Street have already been made. Further investments to reduce direct discharge of stormwater to the Lake should be made along the northern portion of the Lake.

Many of the challenges Mirror Lake faces (road salt, stormwater runoff, HABs) may be exacerbated by a changing climate. Efforts to integrate climate into the long-term monitoring on the Lake will help inform strategies to build resilience within the community.

As a highly visible and popular destination for residents and visitors, as well as being one of the most developed lakes on the NY side of the Lake Champlain Basin, the long-term protection of the Lake requires active stewardship and engagement. Successes can serve to inspire similar efforts in other watersheds, highlighting the value of investing in environmental protection.



Long-term chloride retention in Mirror Lake. The fit line indicates the long-term trend. The red indicates an increase and blue indicated a decrease in long-term chloride retention.

Objective I.A - Improve understanding of water quality conditions and trends; determine the effectiveness of past management and inform future management decisions.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
I.A.1 – Fund and interpret monitoring and management oriented research.	I.A.1.a – Support programs and initiatives that increase accessibility of Lake Champlain Basin data to foster new management-oriented research and collaboration.	Develop an on-line dashboard that represents long-term water quality and watercraft inspection steward data.
	I.A.1.c – Support research to understand root causes of in-lake tributary loading, and other environmental trends to effectively focus restoration resources.	Support long-term monitoring of Mirror Lake by the Paul Smith's College Adirondack Watershed Institute and Ausable Freshwater Center.
	I.A.1.e – Support and promote programs that expand sub-watershed monitoring to inform targeted watershed objectives.	Support long-term monitoring of Mirror Lake by the Paul Smith's College Adirondack Watershed Institute and Ausable Freshwater Center.
I.A.2 – Fund and interpret research on management decisions and best management practices (BMPs).	I.A.2.a – Support research to develop innovative management approaches likely to improve water quality.	Continually evaluate new de-icing salt reduction strategies, assess their feasibility for use within the watershed, and where possible utilize long-term monitoring data to assess their efficacy.
	I.A.2.b – Support research to increase understanding of factors affecting BMP performance and efficiency, including potential effects of climate change.	Develop a program to continually assess the efficacy of stormwater improvements along Main St.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
	I.A.2.c – Support research to assess progress of existing water quality management programs to inform new decisions, priorities, and management trajectories.	Utilize long-term monitoring data to assess current and future water quality management programs.
I.A.4 – Fund and interpret research on contaminants in the Lake Champlain Basin.	I.A.4.b – Support research to improve understanding of road de-icing salt impacts and effective management strategies.	Continued long-term monitoring of Mirror Lake and continue partnerships to reduce road de-icing salt use within the watershed.
	I.A.4.c – Support research to improve understanding of emerging contaminants and points of control.	Establish a program to assess emerging contaminants of concern (mercury, PFAS, perchlorate, microplastics).

Objective I.B - Reduce contaminants of concern and pathogens.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
I.B.1 – Reduce contaminant pollution.	I.B.1.c – Fund and promote programs that reduce de-icing salt application and limit their transport to waterways.	Support long-term monitoring of Mirror Lake by the Paul Smith's College Adirondack Watershed Institute and Ausable Freshwater Center. Support the Adirondack Road Salt Reducation Task Force recommendations.

Objective I.C - Reduce nutrient loading.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
I.C.3 – Reduce nutrient inputs from developed lands.	I.C.3.a – Fund and promote programs to reduce effective impervious surface area, especially in critical watersheds.	Improve stormwater drainage along the north end of Mirror Lake to reduce effective impervious surface area.
	I.C.3.c – Fund and promote programs and interventions aimed at reducing nutrient pollution from high-density shoreland areas around lakes and ponds.	Support ongoing efforts to improve stormwater management along Main St.

Objective I.D – Support research to understand the impact of climate change on clean water and act to adapt to climate change impacts.

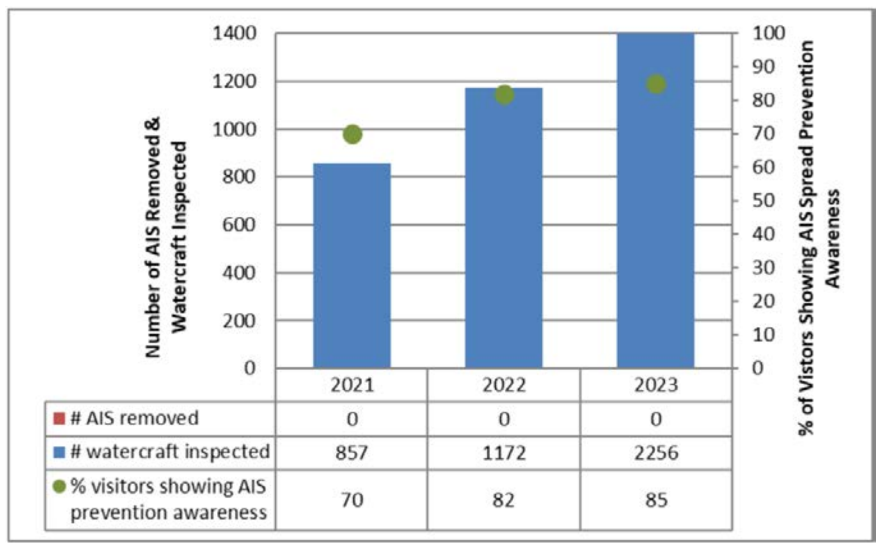
LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
I.D.1 – Fund and interpret climate-change-oriented research.	I.D.1.a – Support research to assess the impacts of climate change on nutrient loading from watershed and internal sources.	Assess nutrient loading from stormwater runoff. Assess internal nutrient loading.
	I.D.1.c – Support research to quantify the impacts of climate change on phytoplankton communities.	Establish a program to monitor and assess phytoplankton community composition over time.
	I.D.1.d – Support research to improve understanding of impacts of climate change on cyanobacteria bloom dynamics.	Establish a HAB monitoring program that regularly reports on bloom presence/absence and the extent of blooms when present and that aligns with the NYS DEC HAB Research Guide. Test HABs for cyanotoxins.
	I.D.1.f – Support research to quantify the impacts of climate change on contaminant sources and transport.	Integrate long-term climate data into monitoring efforts and climate-related changes in water quality.
	I.D.1.g – Support research to improve understanding of the impacts of climate change on de-icing salt application and salinization.	Integrate long-term climate data into monitoring efforts and climate-related changes in water quality.

Goal 2. The Mirror Lake ecosystem will provide intact habitats for diverse fish and wildlife populations that are resilient to disturbance and free of aquatic invasive species, and will provide natural functions to sustain clean water and a vibrant community.

Mirror Lake currently has one known aquatic invasive species (AIS), the banded mystery snail, which was detected in 2018. Historically, curly-leaf pondweed was also reported in the Lake, but recent surveys have not confirmed its continued presence. Nearby Lake Placid has a population of variable-leaf milfoil, which poses a risk to Mirror Lake due to canoes and kayaks being transported across the 700-foot carry between the two lakes.

Several thousand boats launch into Mirror Lake each year from the public launch at the south end of the Lake, adjacent to the public beach. Since 2021, Adirondack Watershed Institute Watercraft Inspection Stewards have been stationed at the launch to inspect boats and educate the public about the threat of invasive species, as well as the importance of following Clean, Drain, Dry protocols. To date, stewards have not detected aquatic invasive species (AIS) on boats launching from or retrieving at Mirror Lake. However, boats often arrive after being in waterbodies known to contain AIS, such as Lake Placid and the St. Lawrence River. The stewards have also documented an increasing percentage of visitors demonstrating awareness of AIS spread prevention, indicating the success of their outreach efforts at this launch.

The presence of Watercraft Inspection Stewards at Mirror Lake not only protects the Lake but also serves as a valuable opportunity to reach a broad audience and raise awareness of the threat of aquatic invasive species. Steward presence at the launch should continue, and opportunities to enhance their outreach efforts should be

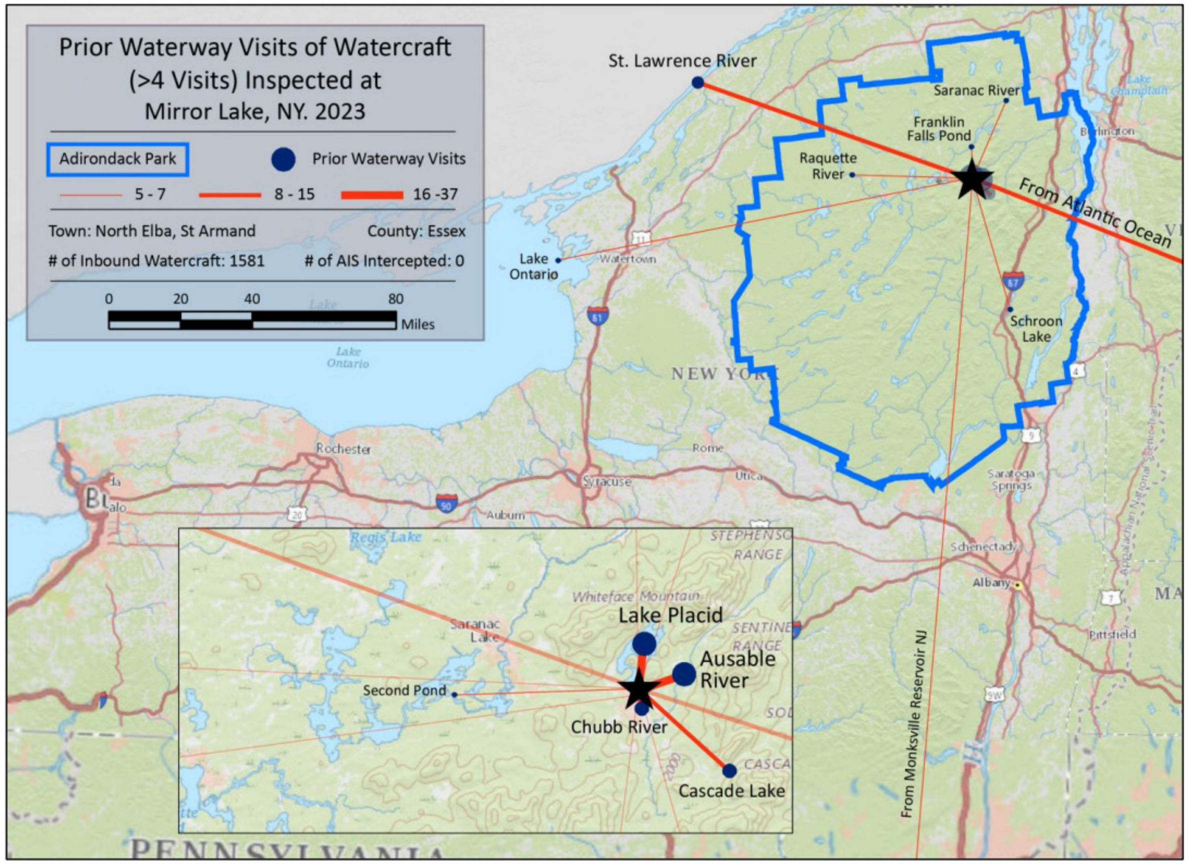


Watercraft Inspection Steward data for Mirror Lake.

explored.

Mirror Lake is home to a population of lake trout, which is recognized as a species of greatest conservation need in New York State. The lake trout population in Mirror Lake is supported by regular stocking by NYS DEC Fisheries staff. However, lake trout experience less-than-ideal temperature and oxygen conditions later in the summer, as their habitat is squeezed by warm temperatures above and low oxygen levels below. The extent to which these conditions impose physiological stress on the fish or impact their growth and reproduction is not well understood. The long-term monitoring of Mirror Lake, particularly related to de-icing salt impacts, provides a rich dataset of temperature and oxygen data that can help inform management decisions for the lake trout population. Further research on fish populations in the Lake, including rainbow trout, a popular sport fish, would be beneficial.

With much of Mirror Lake's watershed altered by development, especially near the Lake, opportunities for functional restoration of the watershed should be explored. There are opportunities to plant trees and riparian vegetation at various locations around the Lake, particularly along the southeastern shore. Trees and riparian vegetation provide critical shade to help maintain cool water temperatures,



Map depicting prior waterways visited by watercraft launching into Mirror Lake in 2023. For more detailed information see the AWI Stewardship Program 2023 Location Use Summaries report.

and woody debris serves as important fish habitat. Thoughtful planning of tree plantings could provide ecological benefits to the Lake while preserving scenic vistas and lake access for residents and visitors.

The primary inlet stream to Mirror Lake would also benefit from restoration. Currently, the stream flows underground from Mirror Lake Drive to the point where it enters the Lake. The restriction at the road crossing has altered the upstream channel's geomorphology. A carefully planned restoration of the stream, with stakeholder engagement, could restore aquatic organism passage to the headwaters of Mirror Lake and serve as a valuable demonstration site for the community, including local schools.

Objective II.A – Support research and understanding of predicted impacts of a changing climate in the Lake Champlain Basin.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
II.A.1 – Fund and interpret climate change research.	II.A.1.b – Support research and understanding of AIS impacts to the Lake's ecosystem and economy under changing climate predictions.	Conduct routine aquatic plant surveys to monitor for new invasive species and document long-term changes in native plant community structure.
	II.A.1.d – Study the impacts of climate on the lake trout population in the Basin.	Assess the impact of the oxythermal squeeze on lake trout habitat availability within the Lake.

Objective II.B – Evaluate ecosystem management programs and policies (support research to assess current ecosystem management programs).

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
II.B.1 – Support research to align policy with ecosystem management goals in the basin.	II.B.1.a – Assess state and local policies to identify those that align, contradict, or pose obstacles to healthy ecosystems goals.	Review local laws and policies as they pertain to maintaining clean water and healthy ecosystems.

Objective II.C – Support conservation of habitat for ecosystem function.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
II.C.1 – Work with Lake Champlain management partners to prioritize, protect and restore important riparian, shoreland, and wetland habitat areas.	II.C.1.b – Fund and promote projects that protect and restore shorelands.	Plant trees and other suitable vegetation along the southeastern shore of Mirror Lake.

Objective II.D – Preserve and enhance aquatic and riparian biological diversity.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
II.D.1 – Conduct research to improve our understanding of the functions and threats to the Lake Champlain ecosystem and develop and support programs that improve diversity of aquatic and riparian species in the Basin and work toward protection and restoration of native species.	II.D.1.c – Promote and support fish community research, including juvenile lake trout, brook trout, and landlocked Atlantic salmon, and management of sea lamprey to enhance the fishery.	Work in coordination with NYS DEC Fisheries staff to monitor and assess fish populations.
II.D.2 – Reduce species fragmentation by preserving and connecting critical aquatic and riparian habitats.	II.D.2.a – Fund projects that prioritize and/or reduce fragmentation created by infrastructure, such as roads, dams, and culverts for native species such as brook trout, Atlantic salmon, mudpuppies, and salamanders.	Evaluate options for the restoration of the Mirror Lake inlet stream.

Objective II.E – Prevent the spread of aquatic invasive species.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
II.E.1 – Work with Lake Champlain management partners to monitor and respond to new aquatic invasions via early detection and rapid response (EDRR) and to educate different stakeholders about how their behavior can affect the spread of AIS.	II.E.1.b – Support and implement the Lake Champlain AIS Rapid Response Management Plan to respond to new AIS infestations and mobilize resources to prevent spread.	Conduct routine aquatic plant surveys to monitor for new invasive species and document long-term changes in plant community structure.
II.E.2 – Work with Lake Champlain management partners to reduce the risk of AIS transport along pathways such as the Champlain and Chambly canal systems, overland transport on boats and trailers, illegal stocking and bait.	II.E.2.a – Intercept AIS transportation on watercraft and equipment by expanding the Boat Launch Steward Program and decontamination station coverage.	Continue staffing a watercraft inspection steward at the public beach and hand launch.
II.E.4 - Work with Lake Champlain management partners to deliver and conduct multilingual AIS education and outreach behavior change campaigns targeted at the general public and water user groups.	II.E.4 a – Fund, support, and develop multi-lingual AIS spread prevention initiatives that address pathways (water gardening, aquarium and spiritual releases, bait, etc.) and promote the national "Clean, Drain, and Dry" and "Stop Aquatic Hitchhikers" messaging program.	Add interpretive educational signage at the kiosk near the public beach and hand launch.

Goal 3: The Mirror Lake community has an appreciation and understanding of the Lake's natural and cultural resources, and has the capacity to implement actions that will result in sound stewardship of these resources while maintaining a strong local economy.

A healthy and vibrant community is integral to the protection of Mirror Lake and its watershed. This community extends beyond the Lake's immediate shores, encompassing all who value and utilize its natural resources. While the majority of the Lake's shoreline is privately owned, several parks managed by the Village of Lake Placid and a canoe carry at the north end of the Lake, owned by New York State, are publicly accessible. The broader Lake Placid community benefits from Mirror Lake and takes pride in its protection.

The Mirror Lake Watershed Association (MLWA) is the primary organization focused on conserving and protecting Mirror Lake. MLWA is a 501(c)(3) nonprofit organization open to everyone. They are an active and engaged group that holds monthly meetings. MLWA has spearheaded numerous efforts to safeguard Mirror Lake, including stormwater management, reducing road salt use, and preventing the introduction of

Participants in an educational program on Mirror Lake that is run by the Ausable Freshwater Center and Adirondack Mountain Club.

aquatic invasive species. Their members also participate in lake monitoring through the Citizen Statewide Lake Assessment Program (CSLAP) and engage in stewardship activities such as trash cleanups. Given the highly involved local community, an annual public input survey would be beneficial to ensure that MLWA and its partner organizations are addressing community concerns. Such a survey could also help increase MLWA membership and foster greater community engagement.

The Lake Placid community has made significant investments to address threats to Mirror Lake. Coupled with the fact that Lake Placid is a highly popular tourist destination, this presents an opportunity to showcase these protection efforts as visible demonstration projects for visitors and residents alike.

Many businesses and residents within the watershed have adopted alternative de-icing practices. For example, the Mirror Lake Inn has installed heated walkways and parking lot surfaces, while the Golden Arrow Lakeside Resort has implemented several best practices to reduce its use of chloride-based de-icing salts.

Additionally, the Village of Lake Placid and the Town of North Elba have made substantial efforts to change their winter road and sidewalk maintenance practices to reduce salt use and have invested in green stormwater infrastructure to minimize stormwater runoff. Highlighting these projects through interpretive signage, informational campaigns, and public messaging could raise awareness of the benefits of these practices and encourage further investments in environmental protection.

Addressing the challenges facing Mirror Lake, especially those related to road salt pollution, requires ongoing technical training on best management practices and an understanding of the benefits of investing in lake protection. Programs like AdkAction's Clean Water, Safe Roads initiative should continue, and new opportunities for technical training should be identified and offered to local stakeholders.

There is significant documentation of the cultural history of Mirror Lake and the surrounding area, but more effort could be made to share this history and further explore the important role Indigenous communities played in it. Engaging with organizations such as the Six Nations Indian Museum, the Lake Placid-North Elba Historical Society, and John Brown Lives! could enrich the story of Mirror Lake and provide the historical context for the current challenges facing the Lake and its watershed.

A person walking across the frozen surface of Mirror Lake in the winter.

Objective III.A – Engage and support community and management partners.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
III.A.2 – Facilitate and coordinate public messaging with management partners.	III.A.2.c – Strengthen the feedback loop between resource managers and community members. Ensure the managers are answering questions relevant to communities.	Establish a routine public input survey to continually assess community concerns and evaluate perceptions of management actions.
III.A.4 – Serve as a conduit for information, build professional capacity among stakeholders, and foster strong working relationships among the partners of the LCBP and CVNHP, and Champlain-Adirondack Biosphere Network (CABN).	III.A.4.c – Fund and promote technical training programs for technical and outreach staff working with stakeholders in the Basin.	Support technical training and outreach programs for local government staff, non-profit partners, schools, and community groups.
	III.A.4.d – Support seminars, workshops, and conferences to deliver technical information on topics such as BMPs, LID, stormwater management technologies, roads management, and adaptive management to municipal and state staff.	Support and encourage local government staff, non-profit partners, schools, and community groups to participate in regional training opportunities.

Objective III.B – Support water-wise economic development.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
III.B.1 – Support business innovations that improve water quality.	III.B.1.a –Work with key partners to develop industry-specific outreach.	Develop and distribute outreach materials to local plow companies and farms.
	III.B.1.b –Provide support to local businesses to develop and showcase new and innovative practices that support clean water.	Showcase local businesses that have implemented innovative de-icing salt reduction efforts.
III.B.3 – Support implementation of green stormwater infrastructure (GSI).	III.B.3.a – Initiate a program that recognizes effective implementation of GSI.	Utilize stormwater improvements along Main St. to highlight the effectiveness of green stormwater infrastructure.

Objective III.C – Support awareness and conservation of cultural heritage resources.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
III.C.1— Build on existing knowledge, make new discoveries of the history, culture, and special resources of the CVNHP, and make this information accessible to all.	III.C.1.a - Support research and interpretation of our past and the cultural heritage resources of the CVNHP.	Research the cultural heritage of the Mirror Lake watershed and incorporate findings in outreach and educational programming.
	III.C.1.c - Document cultural components of the region, including Abenaki, Mohegan, Mohawk, and Onita cultures, FrancoAmerican culture, and new American communities to research, restore and maintain these cultural identities in the Basin and CVNHP region.	Work with local Indigenous communities and scholars to document the Indigenous history of the watershed and identify ways to maintain cultural identities.

Objective III.D – Support Lake and Basin recreation.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
III.D.1—Provide sustainable and accessible recreational opportunities for everyone within the CVNHP, with a focus on access for underserved communities.	III.D.1.a - Support initiatives that promote sustainable recreational activities that feature the natural, cultural, and historical resources in the CVNHP, including Lake Champlain Bikeways and the Western New England Greenways.	Promote Mirror Lake as a hub for recreation in the area.

Goal 4. Mirror Lake residents and visitors will understand and appreciate Mirror Lake watershed resources, and will possess a sense of personal responsibility that results in behavior changes and action to reduce pollution.

Mirror Lake is ideally located to enhance local education and outreach efforts due to its position within the Village of Lake Placid and its proximity to local schools. Lake Placid High School is just three-tenths of a mile south of the Lake, while Northwood School is similarly close to the east. The proximity to the Lake, combined with the diversity of challenges it faces, provides an ideal learning environment for local schools. The Paul Smith's College Adirondack Watershed Institute has a long history of collaborating with both schools to support STEM education and offer students hands-on field experiences. By immersing students in real-world environmental issues, these programs foster not only academic growth but also a deeper sense of responsibility for natural resource stewardship. These programs should continue, and opportunities to further engage students on watershed issues should be explored, potentially integrating new technologies and citizen science initiatives into the curriculum.

Given that Mirror Lake is a prominent tourist destination, developing outreach materials targeted at a variety of audiences would help build awareness and inspire stewardship of our water resources. Informational kiosks, interactive displays, and digital platforms could educate both visitors and residents about the Lake's unique ecology and the challenges it faces. Local tourism agencies could leverage and promote the work of organizations like the Mirror Lake Watershed Association, aligning with the Lake Placid Destination Management Plan, which highlights the importance of using local environmental organizations to inform visitor and resident education efforts. These partnerships could ensure that visitors not only enjoy the recreational offerings of Lake Placid but also leave with a greater understanding of the region's environmental conservation efforts.

The strong environmental stewardship within the Lake Placid community, particularly regarding the protection of Mirror Lake, presents a unique opportunity to incorporate this message into regional marketing efforts. Positioning Lake Placid not only as a leader in recreation-based tourism, but also in environmental stewardship, would benefit both the local tourism economy and support for environmental protection efforts. This dual focus on recreation and conservation could set Lake Placid apart from other destinations, encouraging environmentally conscious tourism and deepening community pride.

As new and emerging threats to Mirror Lake are identified, opportunities to engage the community should be explored. The recent reports of harmful algal blooms provide a chance to increase community involvement through the creation of a dedicated monitoring program. With many residents visiting the Lake daily, a community science initiative to monitor for harmful algal blooms could enable more timely identification of blooms and improve messaging to visitors. This initiative could also raise public awareness about the broader issue of water quality in the Adirondacks, fostering a more informed and vigilant community.

A wealth of data on Mirror Lake and its watershed exists thanks to a decade-long effort to study the Lake intensively. Increasing public access to these data through a dashboard would enhance informal learning opportunities. Such a dashboard could allow the public to track the long-term reduction of chloride retention in the Lake as a result of best management practices and stormwater improvements. By making these data more accessible and user-friendly, local organizations could spark greater community involvement in monitoring and maintaining the health of the watershed. This level of transparency would highlight community successes while also increasing accountability for resource managers and public officials. Additionally, it could serve as a model for other communities looking to balance environmental conservation with economic and recreational growth.

Aerial view of Mirror Lake and its watershed.

Objective IV.A – Enhance formal learning at all educational levels.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
IV.A.1 – Implement programs for K-12 students.	IV.A.1.a – Deliver classroom instruction that increases knowledge of watershed science, recreation, and cultural heritage among K-12 students.	Support LPSCD and Northwoods School environmental science classes and programs.
	IV.A.1.b –Conduct field-based instruction and activities that provide hands-on knowledge of watershed science, recreation, and cultural heritage among K-12 students.	Support programing at local schools that engage students on watershed issues.
IV.A.2 – Maintain and expand digital/ online tools and resources.	IV.A.2.b – Amplify social media presence for education efforts.	Encourage partner organizations to share and promote MLWA social media accounts.
IV.A.4 – Engage youth in watershed management and stewardship opportunities.	IV.A.4.a – Fund and promote community service projects and mentorship programs focused on clean water and healthy ecosystems, with an emphasis on traditionally underserved communities.	Work with local schools and youth groups to support environmental stewardship.

Objective IV.B – Build awareness of the Lake Champlain Basin through informal learning across all communities.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
IV.B.1 – Communicate watershed science and stewardship information for the public and stakeholders.	IV.B.1.f – Develop, support, and promote digital tools for sharing and interpreting Lake and Basin data, including dashboards, story maps, and portals.	Develop an online dashboard that represents long-term water quality and watercraft inspection steward data.
	IV.B.1.g - Design and develop print materials to inform public of issues and progress made by stakeholders to address issues.	Develop an interpretive brochure highlighting de-icing salt concentrations as a result of best practices and stormwater improvements.

Objective IV.C – Facilitate changes in behavior and actions of individuals for their communities.

LCBP OFA STRATEGY	LCBP OFA TASK	ACTION
IV.C.1 – Promote individual stewardship action.	IV.C.1.a – Use web and social media channels to encourage action at home or with local organizations' volunteer programs.	Continue MLWA social media accounts.
	IV.C.1.b – Promote lake-friendly products and practices.	Distribute outreach materials to local residents and businesses.
IV.C.2 – Promote community stewardship action.	IV.C.2.d – Increase community science to engage and develop stewardship for the Basin.	Develop a community based harmful algal bloom monitoring program.

Summary of management actions for the Mirror Lake Watershed. Cost estimates are generalized into the following categories based on either one-time or annual expense; A < $5,000, B = $5,000-$10,000, C = $10,000-$25,000, D = $25,000-$50,000, E = $50,000-$100,000, F = $100,000-$250,000, G = $250,000-$500,000, H = $500,000-$1,000,000, I > $1,000,000. Timelines are generalized into the following categories; Ongoing = action is underway, Short < 1 year, Near = 1 to 3 years, Long > 3 years.

Goal 1: Clean Water

Action	Timeline	Cost	Resources
Develop an online dashboard that represents long-term water quality and watercraft inspection steward data.*	Near	A	AWI
Support long-term monitoring of Mirror Lake by the Paul Smith's College Adirondack Watershed Institute and Ausable Freshwater Center.	Ongoing	C	AWI/AFC/MLWA/TNE/VLP/LCBP
Continually evaluate new de-icing salt reduction strategies, assess their feasibility for use within the watershed, and where possible utilize long-term monitoring data to assess their efficacy.	Long	C	AWI/AFC/AdkA/DOT/TNE/VLP/LCBP
Develop a program to continually assess the efficacy of stormwater improvements along Main St.	Near	B	AWI/VLP/LCBP
Utilize long-term monitoring data to assess current and future water quality management programs.	Near	A	AWI/AFC/MLWA
Continue long-term monitoring of Mirror Lake and continue partnerships to reduce road de-icing salt use within the watershed.	Ongoing	C	AWI/AFC/AdkA/DOT/TNE/VLP
Establish a program to assess emerging contaminants of concern (mercury, PFAS, perchlorate, microplastics).	Long	C	AWI/AFC/MLWA/DEC/LCBP
Support the Adirondack Road Salt Reduction Task Force recommendations.	Long	D	DOT/DEC/TNE/VLP/LCBP
Improve stormwater drainage along the north end of Mirror Lake to reduce effective impervious surface area.	Long	F	TNE/WQIP/LCBP
Support ongoing efforts to improve stormwater management along Main St.	Long	D	VLP/DOT/WQIP/LCBP
Assess nutrient loading from stormwater runoff.	Near	D	AWI/LCBP
Assess internal nutrient loading.	Near	C	AWI/DEC/LCBP
Establish a program to monitor and assess phytoplankton community composition over time.	Long	C	AWI
Establish a HAB monitoring program that regularly reports on bloom presence/absence and the extent of blooms when present and that aligns with the NYS DEC HAB Research Guide.	Near	B	MLWA/AWI/DEC/LCBP

Test HABs for cyanotoxins.	Short	A	MLWA/AWI/DEC
Integrate long-term climate data into monitoring efforts and climate-related changes in water quality.	Long	A	AWI/AFC/LCBP

Goal 2: Healthy Ecosystems

Action	Timeline	Cost	Resources
Conduct routine aquatic plant surveys to assess changes in abundance and composition.	Ongoing	B	MLWA/AWI/APIPP
Participate in APIPP's Lake Protectors program.	Short	A	APIPP
Assess the impact of the oxythermal squeeze on lake trout habitat availability within the Lake.	Near	E	MLWA/AWI/SO/CU/DEC/LCBP
Review local laws and policies as they pertain to maintaining clean water and healthy ecosystems.	Near	A	MLWA/TNE/VLP
Plants trees and other suitable vegetation along the southeastern shore of Mirror Lake.	Near	A	MLWA/AFC/VLP
Work in coordination with NYS DEC Fisheries staff to monitor and assess fish populations.	Near	C	MLWA/AWI/SO/CU/DEC/LCBP
Evaluate options for the restoration of the Mirror Lake inlet stream.	Long	F	MLWA/AWI/AFC/TNE/NWS
Continue staffing a watercraft inspection steward at the public beach and hand launch.	Ongoing	C	AWI/MLWA/VLP/TNE/LCBP
And interpretive educational signage at the kiosk near the public beach and hand launch.	Near	B	MLWA/AWI/VLP/LCBP

Goal 3: A Thriving Community

Action	Timeline	Cost	Resources
Establish a routine public input survey to continually assess community concerns and evaluate perceptions of management actions.	Near	A	MLWA/AWI/AFC/LCBP
Support technical training and outreach programs for local government staff, non-profit partners, schools, and community groups.	Near	A	TNE/VLP/ECSWCD/DOT/DEC/AdkA/LCBP
Support and encourage local government staff, non-profit partners, schools, and community groups to participate in regional training opportunities.	Near	A	TNE/VLP/ECSWCD/DOT/DEC/AdkA/LCBP

Develop outreach materials to local plow companies.	Ongoing	A	AdkA/AFC/AWI/LCBP
Showcase local businesses that have implemented innovative de-icing salt reduction efforts.	Long	A	AdkA/AFC/AWI/MLWA/LCBP
Utilize stormwater improvements along Main St. to highlight the effectiveness of green stormwater infrastructure.	Long	B	AWI/AFC/VLP/LCBP
Research the cultural heritage of the Mirror Lake watershed and incorporate findings in outreach and educational programing.	Near	B	ADI/LPNEHS/JBL/SNICC/TWC/CVNHP
Work with local Indigenous communities and scholars to document the Indigenous history of the watershed and identify ways to maintain cultural identities.	Near	B	ADI/LPNEHS/JBL/SNICC/TWC/CVNHP
Promote Mirror Lake as a hub for recreation in the area.	Ongoing	A	ROOST/MLWA/VLP

Goal 4: Informed And Involved Public

Action	Timeline	Cost	Resources
Support Lake Placid Central School District and Northwoods School environmental science classes and programs.	Ongoing	C	LPCSD/NS/AWI/LCBP
Support programing at local schools that engage students on watershed issues.	Ongoing	C	LPCSD/NS/AWI/LCBP
Encourage partner organizations to share and promote MLWA social media accounts.	Ongoing	A	MLWA/AWI/AFC/APIPP/AdkA/ROOST
Work with local schools and youth groups to support environmental stewardship.	Ongoing	C	LPCSD/NS/AWI/LCBP
Develop an online dashboard that represents long-term water quality and watercraft inspection steward data.*	Near	A	AWI
Develop an interpretive brochure highlighting declining salt concentrations as a result of de-icing salt best practices and stormwater improvements.	Near	A	AWI/AFC/AdkA/MLWA/LCBP
Continue MLWA social media accounts.	Ongoing	A	AWI/LCA/LCBP
Distribute outreach materials to local residents and businesses.	Near	A	MLWA/AFC/AWI
Develop a community based harmful algal bloom monitoring program.	Near	B	AWI/MLWA

* Indicates actions that appear under more than one goal.

Resources To Provide Assistance, Collaboration, And Funding For Actions	
Abbreviation	**Name**
ADI	Adirondack Diversity Initiative
AdkA	ADK Action
AFC	Ausable Freshwater Center
AWI	Paul Smith's College Adirondack Watershed Institute
APIPP	Adirondack Park Invasive Plant Program
CU	Cornell University
CVNHP	Champlain Valley National Heritage Program
DEC	New York State Department of Environmental Conservation
DOT	New York State Department of Transportation
ECSWCD	Essex County Soil and Water Conservation District
JBL	John Brown Lives
LCBP	Lake Champlain Basin Program
LPCSD	Lake Placid Central School District
LPNEHS	Lake Placid-North Elba Historical Society
MLWA	Mirror Lake Watershed Association
NS	Northwood School
ROOST	Regional Office of Sustainable Tourism
SNICC	Six Nations Iroquois Cultural Center
SO	SUNY Oswego
TNE	Town of North Elba
VLP	Village of Lake Placid
WQIP	Water Quality Improvement Program (DEC)