View of Lake Champlain from Mt. Philo State Park in Charlotte, Vermont.

Vermont Clean Water Initiative 2024 Performance Report

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VERMONT CLEAN WATER INITIATIVE

VERMONT

AGENCY OF ADMINISTRATION
AGENCY OF AGRICULTURE, FOOD & MARKETS
AGENCY OF COMMERCE & COMMUNITY DEVELOPMENT
AGENCY OF NATURAL RESOURCES
AGENCY OF TRANSPORTATION

VERMONT CLEAN WATER INITIATIVE 2024 PERFORMANCE REPORT

Submitted on behalf of the Vermont Agency of Administration
January 15, 2025

Relevant Reporting Requirements:	Fulfilled by:
10 V.S.A. § 1389a (a) The Report shall summarize all investments, including their cost-effectiveness, made by the Clean Water Board and other State agencies for clean water restoration over the prior fiscal year.	Chapter 2
10 V.S.A. § 1389a (b)(1) Documentation of progress or shortcomings in meeting established indicators for clean water restoration.	Chapter 3 & Chapter 4
10 V.S.A. § 1389a (b)(3) A summary of water quality problems or concerns in each watershed basin of the State, a list of water quality projects identified as necessary in each basin of the State, and how identified projects have been prioritized for implementation.	Refer to Tactical Basin Plans[1]
10 V.S.A. § 1389a (b)(4) & (d)(3) A summary of any changes to applicable federal law or policy related to the State's water quality improvement efforts, including any changes to requirements to implement total maximum daily load plans in the State; Submit to the Joint Fiscal Committee a summary of available federal funding related to or for water quality efforts in the State.	2024 Report on Federal Funding Related to Water Quality Improvement Efforts in Vermont[2]
10 V.S.A. § 1389a (b)(6) Beginning January 2024, a summary of the administration of the grant programs established under sections 925–928 of this title [Act 76 of 2019], including whether these grant programs are adequately funding implementation of the Clean Water Initiative and whether the funding limits for the Water Quality Enhancement Grants under subdivision 1389(e)(1)(D) of this title should be amended to improve State implementation of the Clean Water Initiative.	Appendix A
10 V.S.A. § 1389a (d)(2) The Secretary of Administration shall develop user-friendly issue briefs, tables, or executive summaries that make the information required under subdivision (b)(3) available to the public separately from the report required by this section.	Clean Water Interactive Dashboard[3] Executive Summary
10 V.S.A. § 1386(e) Report the status of Lake Champlain total maximum daily load implementation plan milestones, phase 2 and beyond, identified in tactical basin plan implementation tables for each basin due for a U.S. Environmental Protection Agency interim or final report card in accordance with the TMDL Accountability Framework schedule.	Chapter 3 & Appendix B–E
10 V.S.A. § 1264 (k)(1–3) Report on installation of stormwater treatment practices through operational stormwater permits, including: (1) permitted new development is achieving at least a 70 percent average phosphorus load reduction; (2) estimated total phosphorus load reduction from new development, redevelopment, and retrofit of impervious surface permitted; and (3) number and percentage of projects that implemented Tier 1, 2, or 3 stormwater treatment practices.	Appendix F

[1] To learn more about Tactical Basin Planning and view the plans for all 15 of Vermont's basins, visit: https://dec.vermont.gov/water-investment/watershed-planning

[2] 2024 Report on Federal Funding Related to Water Quality Improvement Efforts in Vermont, available at: https://dec.vermont.gov/sites/dec/files/WID/CWIP/2024_Vermont%20Federal%20Clean%20Water%20Funding%20Report_08222024.pdf

[3] For more ways to interact with the data presented in this report, visit the Clean Water Portal: https://anrweb.vt.gov/DEC/cleanWaterDashboard/

Acknowledgements

This report was prepared by the Vermont Agency of Natural Resources Department of Environmental Conservation (DEC) Clean Water Initiative Program (CWIP) on behalf of the Vermont Secretary of Administration with assistance from partner agencies. CWIP coordinates with staff of the Vermont Agency of Administration; Vermont Agency of Agriculture, Food & Markets; Vermont Agency of Commerce and Community Development; Vermont Agency of Transportation; Vermont Fish and Wildlife Department; Vermont Department of Forests, Parks and Recreation; DEC's Water Investment Division; DEC's Watershed Management Division; Vermont Housing and Conservation Board; U.S. Department of Agriculture Natural Resources Conservation Service; and Lake Champlain Basin Program to complete this report. Vermont Agency of Digital Services supported data management and database development.

Vermont Clean Water Initiative: https://dec.vermont.gov/water-investment/cwi

Vermont Clean Water Initiative Partner Agencies

Agency of Administration: aoa.vermont.gov

Agency of Agriculture, Food & Markets: agriculture.vermont.gov

Agency of Commerce and Community Development: accd.vermont.gov

Agency of Natural Resources: anr.vermont.gov

Agency of Transportation: vtrans.vermont.gov

Vermont Clean Water Initiative Affiliate and Partner Entities

Vermont Housing and Conservation Board: vhcb.org

Lake Champlain Basin Program: lcbp.org

U.S. Department of Agriculture Natural Resources Conservation Service: usda.nrcs.gov

Report available electronically at: dec.vermont.gov/water-investment/cwi/reports

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Vermont Clean Water Initiative 2024 Performance Report Executive Summary

Vermont's waterways are important environmental and economic resources for residents and visitors. The State of Vermont funds clean water projects to protect, enhance, and restore water quality across the state. Clean water projects are regulatory or non-regulatory practices or protections that address water pollution, focusing largely on sediment and excess nutrients like phosphorus and nitrogen. The Vermont Clean Water Initiative 2024 Performance Report, referred to hereafter as Report, summarizes efforts of state government, along with federal and local partners, to improve water quality across Vermont from State Fiscal Year (SFY) 2016 to 2024 (July 1, 2015–June 30, 2024).

Clean Water Investments

Vermont's clean water funding helps municipalities, farmers, landowners, and nonprofit organizations implement clean water projects statewide. State and federal funding programs, as well as regulatory requirements, drive clean water implementation efforts in Vermont.

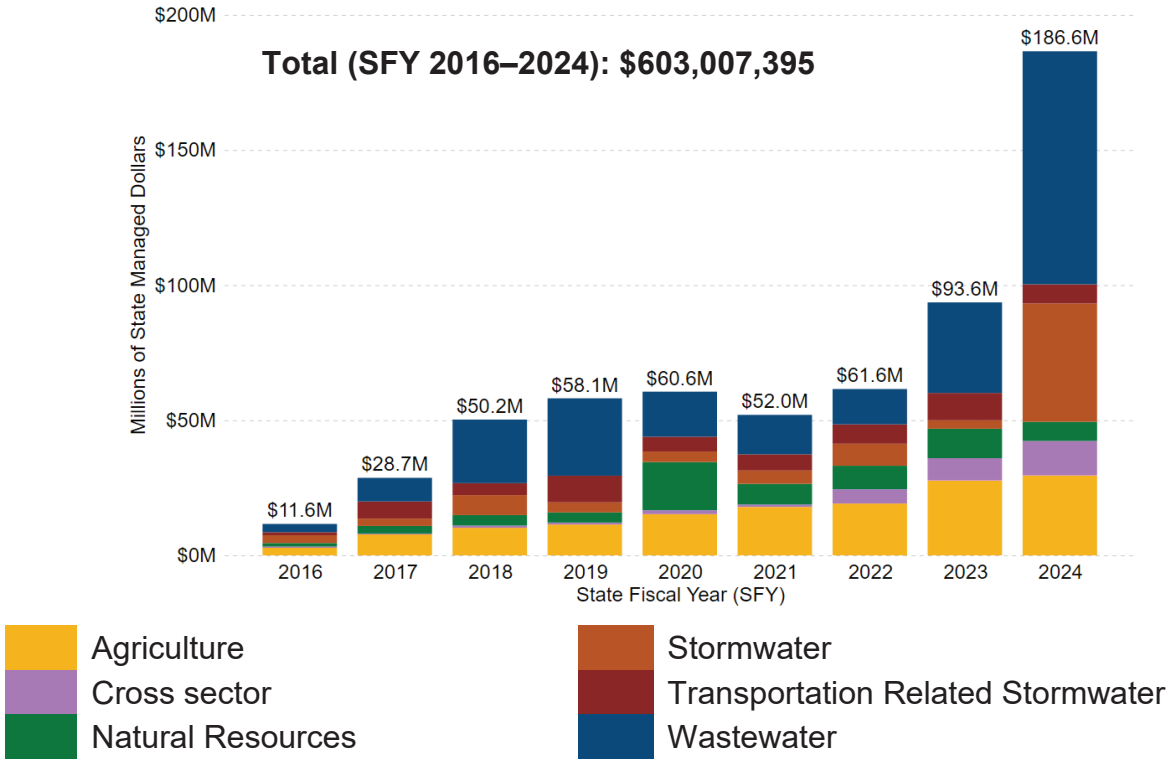
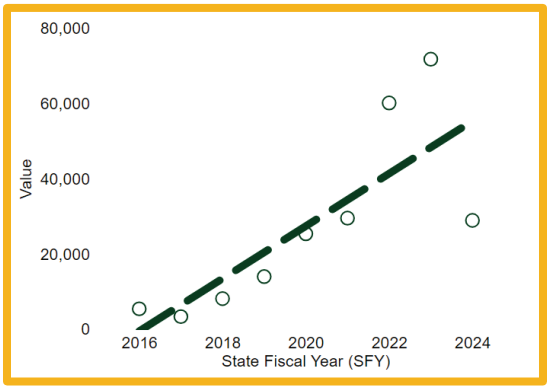


Figure ES-1: Total dollars awarded by State of Vermont agencies to clean water projects statewide by land use sector, SFY 2016–2024.

The State of Vermont invested over $600 million in clean water projects through grants, contracts, loans, and assistance programs from SFY 2016 to SFY 2024. The amount of funding awarded to clean water projects rose significantly between SFY 2016–2024. Project funding varies annually based on project readiness, award timing, and economic factors. Increased funding levels in SFY 2023 and 2024 are a result of the short-term influx in federal funding made available to Vermont by the American Rescue Plan Act (ARPA). The short-term availability of

ARPA funding is expected to continue through SFY 2025, but ARPA funding will not be available to support new awards after December 31, 2024. *See Report Chapter 2 to learn more about clean water funding and investments.*

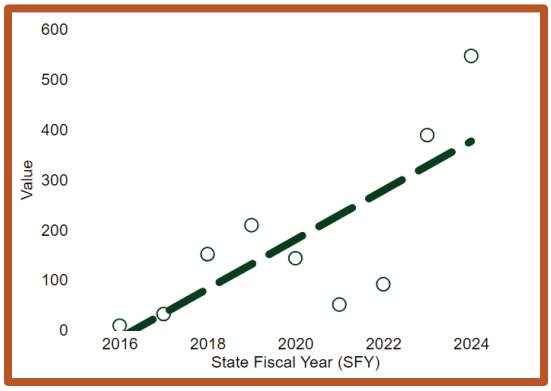
Results of State Funded Investments — Highlights



246,915 acres of agricultural conservation practices implemented

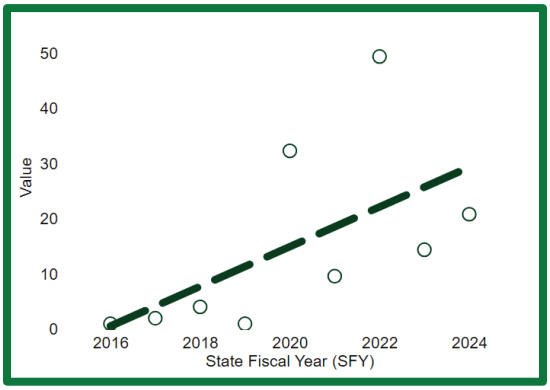
Recent increase is in part a result of the launch of the new innovative Vermont Pay for Performance Program.

Recent year's data may be incomplete and will be updated in future reports.



1,627 acres of existing impervious surface treated by stormwater treatment practices under stormwater permits

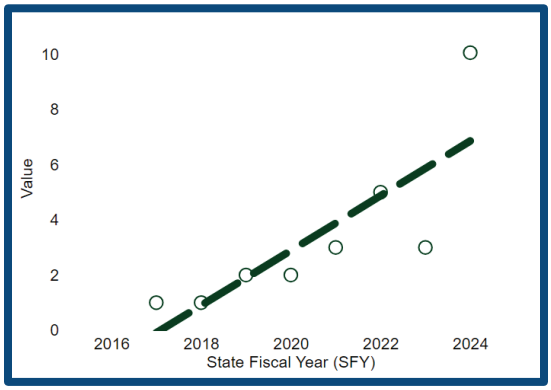
Results of stormwater permits are reported at the time of permit issuance, and permittees have five years to implement the required stormwater control measures. Recent increase is driven by the issuance of permits for Vermont's Three-Acre Sites.



135 acres of floodplain restored

Year-to-year variation is a result of the timing of project completion. Many acres may be restored by a single project.

Recent year's data may be incomplete and will be updated in future reports.



27 wastewater collection systems refurbished

Recent increase is a result of flood damage assessments, prompted by 2023 and 2024 flooding events, focused on identifying affected collection infrastructure.

Total Maximum Daily Load (TMDL) Progress

The 2024 Performance Report summarizes the state's progress in implementing the Lake Champlain and Lake Memphremagog phosphorus Total Maximum Daily Loads (TMDLs). TMDLs identify water pollution reductions required to restore water quality. The figures below show the estimated total phosphorus load reduction, in metric tons per year, achieved by clean water project implementation thus far in the Lake Champlain and Lake Memphremagog basins. Estimates include the results of projects implemented through state and federal funding programs and in response to regulatory requirements. *See Report Chapters 3 and 4 for more information.*

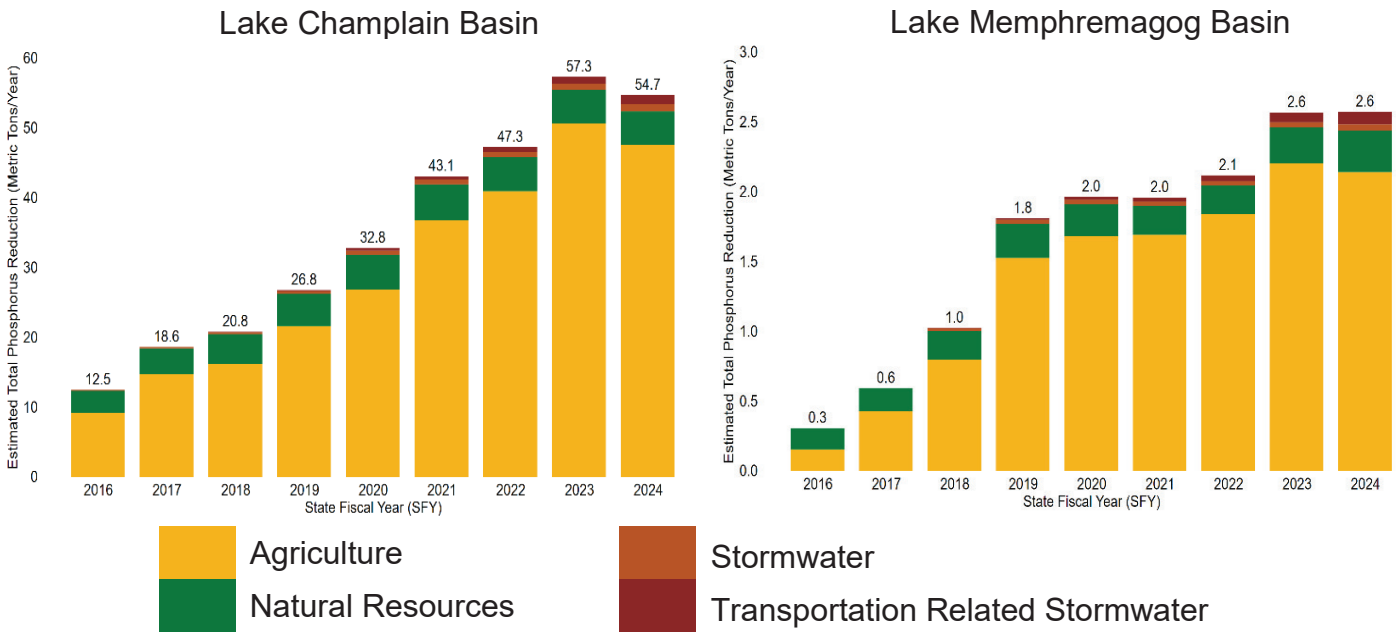


Figure ES-2: Annual estimated total phosphorus load reductions (metric tons per year) associated with reported clean water projects in the Lake Champlain (left) and Lake Memphremagog (right) basins during SFY 2016–2024 by land use sector.

Over the past nine state fiscal years, the state has made substantial progress towards reaching the water quality targets outlined in the state's large-scale phosphorus TMDLs, with 26% of the required reduction achieved to date in the Lake Champlain basin and 17% of the required reduction achieved to date in the Lake Memphremagog basin. Achieving the water quality goals outlined in the state's large-scale TMDLs is not a linear path — variance in the rate of progress is to be expected over the 20-year implementation period.

The magnitude and schedule of data collection for this Report necessarily introduces a lag in quantifying output and outcome metrics, resulting in annual estimated phosphorus reductions in the most recent state fiscal year being at or slightly below the penultimate year. This is akin to the true-ups seen in Federal economic indicator reporting, and is not indicative of a shifting trend in progress. As additional data becomes available, it is reflected in future years of reporting, with additional gains in progress reflecting expanded data availability. The figures below illustrate the difference in estimated phosphorus reductions across all reporting years as reported in SFY 2023, compared to SFY 2024, to demonstrate how data lags may contribute to incomplete results in the most recent few years of estimated phosphorus reduction data.

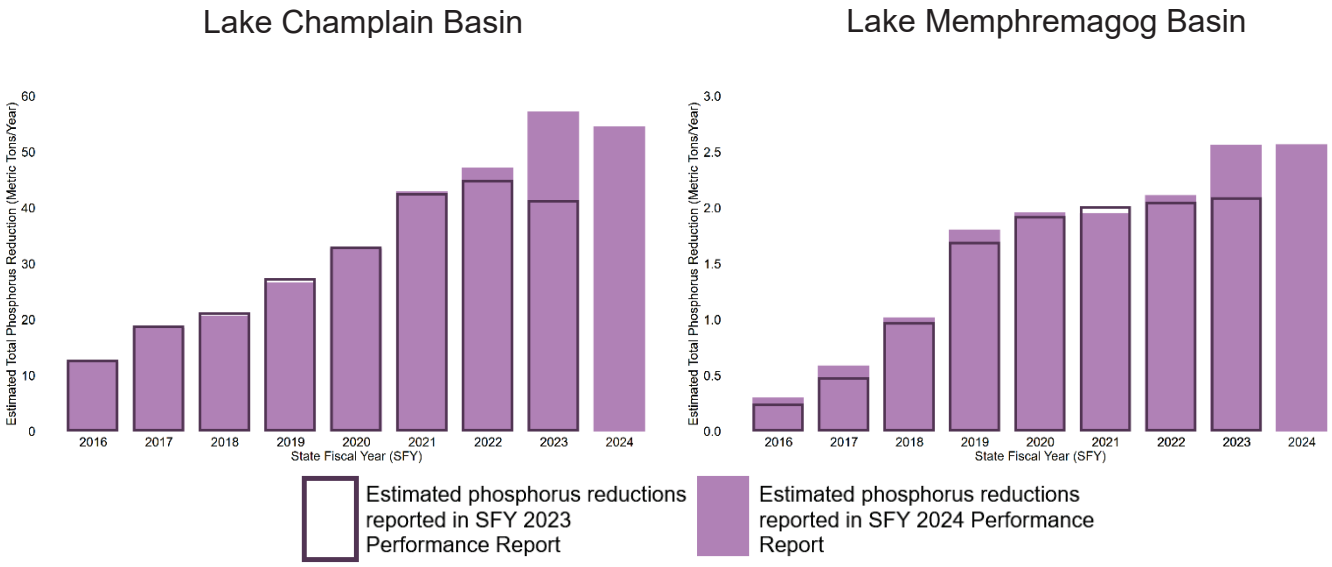


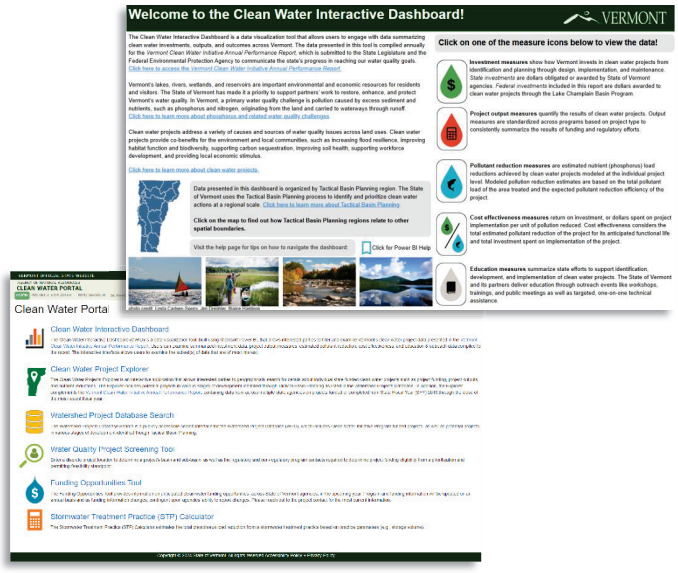
Figure ES-3: Estimated annual phosphorus reduction data in the Lake Champlain and Lake Memphremagog basins as reported in SFY 2023 compared to SFY 2024.

Continued effort, investment, and coordination are critical in the state's ability to reach its water quality goals. The Vermont Clean Water Initiative 2024 Performance Report serves as a useful tool to provide accountability on the state's clean water progress and to inform adaptive management. By taking an adaptive management approach, the state will continue to identify and prioritize its resources to break down barriers to project implementation and clean water progress. Clean water project implementation is an important piece of climate resilience work and clean water projects have co-benefits like increased flood resilience, improved carbon sequestration, better soil health, and improved habitat function and biodiversity. In addition to achieving water quality goals, Vermont's work to improve water quality directly supports climate adaptation and flood mitigation, which will increase the state's resilience to future climate related stressors.

Learn More and Explore the Data

Explore the data behind the Vermont Clean Water Initiative 2024 Performance Report, including investments, outputs, estimated phosphorus reductions, and much more in the online Clean Water Interactive Dashboard via the Clean Water Portal.

https://anrweb.vt.gov/DEC/cleanWaterDashboard/



Chapter 1: Introduction

Vermont's lakes, rivers, wetlands, and reservoirs are important environmental and economic resources for residents and visitors. Vermont's waterways provide safe drinking water and recreational opportunities for thousands of people and support local economies by fostering tourism. High-quality waterbodies also support wildlife habitat and increase flood resilience for local communities. The State of Vermont has made it a priority to support partners' work to restore, enhance, and protect Vermont's water quality. This includes work to address priority sources of nutrient and sediment pollution. This report summarizes the efforts of the state government and its partners to improve water quality across Vermont since the passage of Act 64, Vermont's Clean Water Act, in 2015.

Protecting and Restoring Clean Water in Vermont

Vermont's waterways vary in quality — some waters are of exceptional quality and require protection, and some waters suffer from excess pollution and require restoration. Impaired waters requiring restoration are a priority to mitigate adverse impacts on ecosystems, human health, and economic activity. In Vermont, a primary water quality challenge of concern is pollution caused by excess sediment and nutrients, such as phosphorus and nitrogen, originating from the land and carried to waterways through runoff. Nonpoint source pollution results from sediment and nutrients from the land being transported to waterways by rainfall and snowmelt traveling through agricultural fields, forests, parking lots, roads, and streambanks. Nonpoint source pollution is more difficult to manage than point source pollution, which enters waterways from an easily identified and confined place, such as a discharge pipe from a wastewater treatment facility.

Figure 1: Cyanobacteria blooms in Lake Champlain.
Credit: Lake Champlain Committee

Excess phosphorus loading can lead to cyanobacteria blooms in Vermont's lakes (Figure 1).[4] Cyanobacteria, also known as blue-green algae, are a natural component of surface waters and provide important ecological services, such as photosynthesis and the transfer of nitrogen from the atmosphere to the aquatic environment through nitrogen fixation. However, cyanobacteria blooms can produce toxins that may be harmful to people, animals, and the environment. The Vermont Department of Health, Vermont Department of Environmental Conservation (DEC), and partners monitor cyanobacteria blooms around the

[4] To learn more about phosphorus, water pollution, and cyanobacteria, read the Phosphorus and Water Pollution Plain Language Fact Sheet: https://dec.vermont.gov/document/phosphorus-and-water-pollution

state and notify the public when cyanobacteria blooms make it unsafe to recreate at designated monitoring locations.[5]

Federally-required clean water restoration plans, known as Total Maximum Daily Loads (TMDLs), estimate pollutant reductions required for an impaired waterbody to meet the State of Vermont's water quality standards. TMDLs set up long-term pollutant reduction targets to mitigate both nonpoint source and point source pollution. Most of the State of Vermont is covered by three large-scale TMDLs that require nutrient loading reductions, as shown in Figure 2. The Lake Champlain and Lake Memphremagog TMDLs target phosphorus pollution to address cyanobacteria blooms and other excess algae and aquatic plant growth. The five-state Long Island Sound TMDL targets nitrogen pollution, which causes low dissolved oxygen and dead zones in the Long Island Sound. The State of Vermont also has numerous small-scale TMDLs across the state.[6] Coordinated implementation of large-scale and small-scale TMDLs supports local and regional water quality restoration.

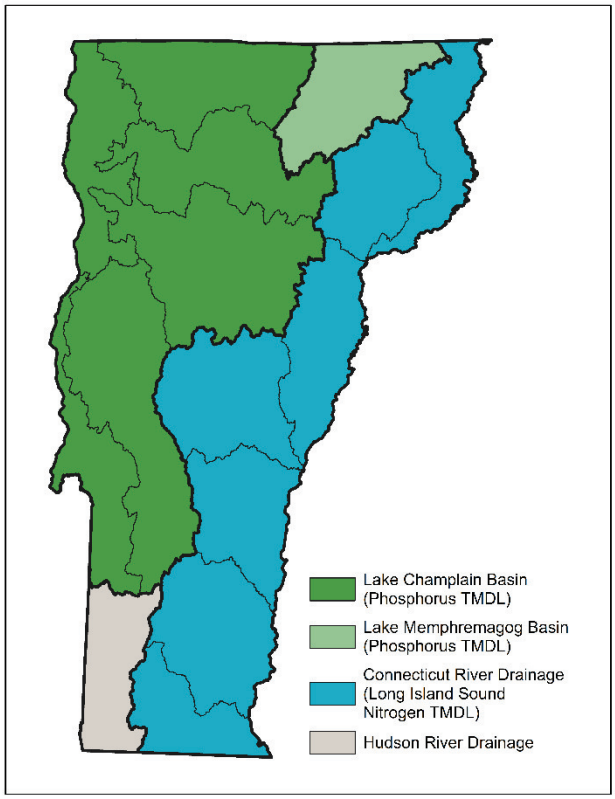


Figure 2: Vermont's large-scale TMDLs that require nutrient pollutant reductions. Tactical Planning Basins also shown.

Vermont's Clean Water Act (Act 64 of 2015)

To further the state's work to restore, enhance, and protect Vermont's water quality, and to provide reasonable assurance on the state's ability to meet nonpoint source pollution reduction targets outlined by the TMDLs, Vermont's Clean Water Act (Act 64 of 2015) was signed into law in June 2015. The Act strengthened the regulatory and financial structures available to address sources of water pollution, with a focus on sediment and nutrients (phosphorus and nitrogen). The Act established the Clean Water Fund to provide a financial mechanism to support clean water work statewide. Act 64 also initiated accountability and transparency requirements to track and report on the progress of water quality improvement efforts receiving state financial support and obligations through state regulatory requirements.

[5] Information related to public health and safety of recreating in Vermont's waterbodies is available through the Vermont Department of Health: https://www.healthvermont.gov/environment/tracking/cyanobacteria-blue-green-algae-tracker

[6] For more information on TMDLs in Vermont, visit: https://dec.vermont.gov/watershed/map/tmdl

Figure 3: Five-Year Tactical Basin Planning Process.

Prioritizing Clean Water Actions

The State of Vermont uses the Tactical Basin Planning process to identify and prioritize clean water projects that will provide the greatest return on investment through achievement of water quality restoration goals. Tactical Basin Plans identify and prioritize clean water projects across land use sectors (agriculture, natural resources, developed lands, and wastewater) based on scientific monitoring data and assessment results. Tactical Basin Plans are updated on a five-year cycle following a multi-stage process illustrated in Figure 3. The results of investments presented in this report are used to identify gaps and employ adaptive management to inform future project planning and prioritization efforts. Each Tactical Basin Plan contains a list of priority projects and strategies necessary to achieve clean water goals.[7]

Clean Water Projects

Clean water projects, described in Table 1 and throughout this report, refer to regulatory or non-regulatory practices or actions that restore, enhance, and protect Vermont's water quality, including addressing priority sources of nutrient and sediment pollution.[8,9] All land use sectors contribute to Vermont's water quality challenges and all sectors have opportunities for improvement. Clean water projects are categorized into land use sectors based on the dominant function or land use surrounding the project. Clean water projects help to support compliance with the Vermont and federal Clean Water Acts and may help to leverage additional federal funds. Examples of clean water projects by land use sector are provided in the table below, along with a summary of the benefits clean water projects provide. Additionally, clean water project co-benefits support the environment and local communities to:

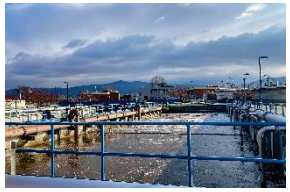
- Increase flood resilience;
- Improve habitat function and biodiversity;
- Support carbon sequestration;
- Improve soil health;
- Support workforce development; and
- Provide local economic stimulus.

[7] To learn more about Tactical Basin Planning in Vermont, visit: https://dec.vermont.gov/water-investment/watershed-planning

[8] To learn more about clean water projects, read the What is a Clean Water Project? Plain Language Fact Sheet: https://dec.vermont.gov/document/what-is-a-clean-water-project

[9] Clean water project may be defined differently or more narrowly in certain contexts, such as in relation to Act 76 of 2019.

Table 1: Clean water project land use sectors, objectives, examples, and benefits.

LAND USE SECTOR	PROJECT OBJECTIVES	EXAMPLE PROJECTS	PROJECT BENEFITS	FEATURED FLOOD RESILIENCE BENEFITS
AGRICULTURE	Reduce pollution by slowing and controlling rain or snowmelt runoff and soil erosion from farm production areas and farm fields	 	• Cost-effective • Supports agricultural economy • Improves soil health	• Cover crops and no-till practices reduce soil erosion and runoff, improve soil health, and increase the water holding capacity of agricultural lands
STORMWATER	Reduce pollution by slowing and controlling rain or snowmelt runoff from developed lands, such as parking lots, sidewalks, and rooftops	 	• May enhance aesthetic appeal • Publicly visible educational opportunity • Adds green space in residential and commercial areas	• Projects lower the volume and speed of rain or snowmelt runoff from the landscape, which reduces flash flooding during heavy rainfall events
NATURAL RESOURCES	Reduce pollution by restoring functions of natural infrastructure — river channels, floodplains, lakeshores, wetlands, and forests	 	• Cost-effective • Improves habitat • Enhances recreation • May improve public access	• Floodplains and wetlands help to slow down and absorb flood waters, reducing flood hazards downstream • Natural lakeshores are more resilient to erosion during severe weather and flood events
TRANSPORTATION RELATED STORMWATER	Reduce pollution by slowing and controlling rain or snowmelt runoff and erosion from roads	 	• Reduces future road maintenance costs • Improves public safety	• Improved road drainage and erosion prevention makes our transportation networks more resilient to erosion during heavy rainfall events and flooding
WASTEWATER	Reduce pollution by improving wastewater infrastructure	 	• Protects public health and safety	• Relocating infrastructure out of flood-prone areas improves community flood resilience • Improving infrastructure reduces likelihood of sewer overflows during heavy rainfall events

Report Purpose and Scope

The purpose of the *Vermont Clean Water Initiative 2024 Performance Report* is to summarize the results of the State of Vermont's clean water investments, educational opportunities, and regulatory programs from State Fiscal Year (SFY) 2016 through 2024 (July 1, 2015–June 30, 2024). The report also summarizes how state funding programs, federal funding programs, and regulatory requirements contribute to achieving the Lake Champlain and Lake Memphremagog TMDLs.[10] Data presented in this report are representative of the most complete available data at the close of the state fiscal year. Data reported in previous years is subject to change in future annual reports as additional information becomes available.

This report fulfills state statutory and federal reporting requirements outlined on Page 2. The *Vermont Clean Water Initiative 2024 Performance Report* is divided into chapters based on geographic region. The purpose of each geographically focused chapter is to report progress in each of Vermont's major nutrient TMDL watersheds. Figure 4 shows a map of the geographic regions with large-scale nutrient TMDLs and corresponding chapter numbers.[11]

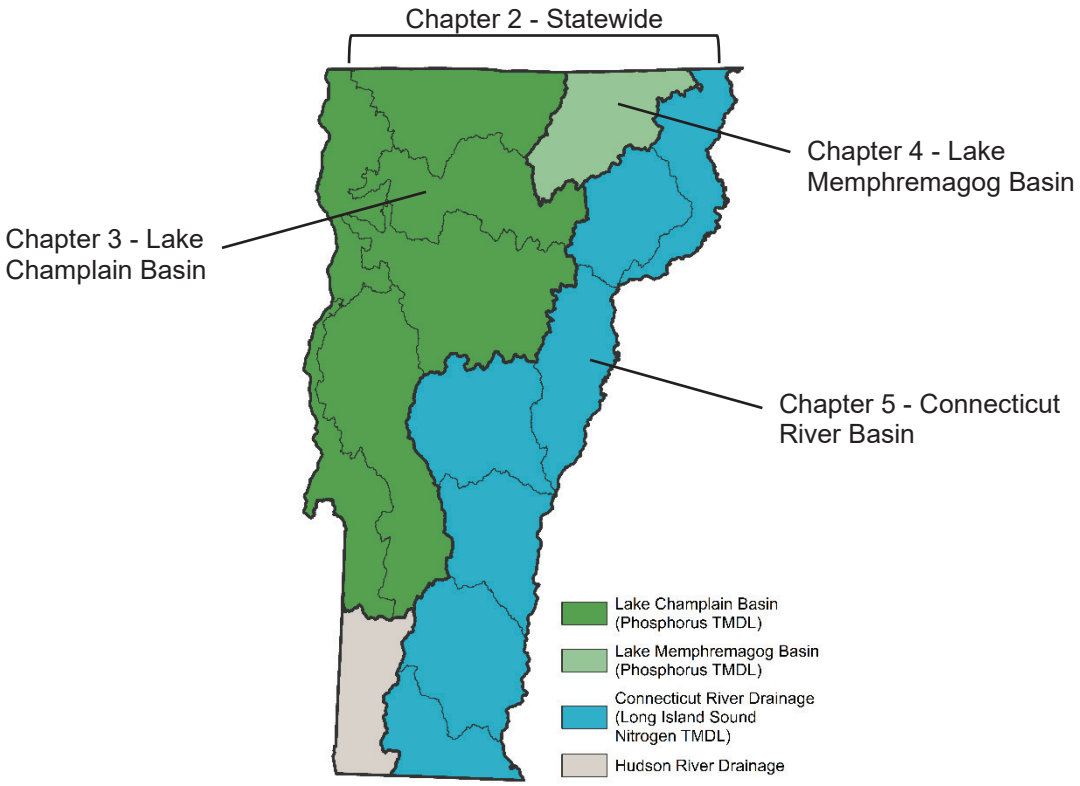


Figure 4: Geographic scope and focus of the *Vermont Clean Water Initiative 2024 Performance Report* chapters.

[10] The State of Vermont also has several small-scale TMDLs. For example, Lake Carmi in Franklin County is also impacted by cyanobacteria blooms and a Phosphorus Total Maximum Daily Load for Lake Carmi was established in 2009. Lake Carmi is located in the Lake Champlain basin, so actions to reduce phosphorus pollution in Lake Carmi support both the implementation of the Lake Carmi TMDL and Lake Champlain TMDL. Implementation of large-scale and small-scale TMDLs can support both local and regional water quality priorities.

[11] Results in the Hudson River drainage basin are included in the statewide results reported in Chapter 2 and can be viewed in the Clean Water Interactive Dashboard: https://anrweb.vt.gov/DEC/cleanWaterDashboard/

Collectively, state funding programs, federal funding programs, and regulatory requirements drive clean water efforts in Vermont. All three program categories work together to achieve water quality goals, and in some cases are complemented by additional funding from private sources and local contributions. For example, state funds leverage federal funds, and some funding programs support the cost of regulatory compliance. The following table summarizes clean water funding programs managed by the State of Vermont that are included in this report.

Table 2: State of Vermont funding programs reported by state agencies and affiliates.

Agency or Affiliate	Clean Water Funding Programs
Agency of Administration (AoA)	Stormwater Utility Incentive Payments
Agency of Agriculture, Food & Markets (AAFM)	Agricultural Clean Water Initiative Program (AgCWIP) Best Management Practice (BMP) Program Capital Equipment Assistance Program (CEAP) Conservation Reserve Enhancement Program (CREP) Farm Agronomic Practice (FAP) Program Grassed Waterway and Filter Strip (GWFS) Program Pasture and Surface Water Fencing (PSWF) Program Vermont Farmer Ecosystem Stewardship Program (VFESP) Vermont Phosphorus Innovation Challenge (VPIC) Vermont Pay for Performance (VPFP) Program Water Quality (WQ) Grants
Agency of Commerce and Community Development (ACCD)	Better Connections Planning Grant Downtown Transportation Fund Vermont Center for Geographic Information (VCGI)
Agency of Natural Resources (ANR)	Clean Water Initiative Program (CWIP) Funding Programs Clean Water State Revolving Fund (CWSRF) Loan Programs CWSRF Land Conservation Interim Financing Program Combined Sewer Overflow (CSO) Grant Program Department of Forests, Parks & Recreation Water Quality Forestry Programs Department of Fish & Wildlife Watershed Grants Healthy Homes Initiative Municipal Pollution Control Grants Municipal Roads Grants-in-Aid Program Three-Acre Funding and Support Programs Village Water & Wastewater Initiative Wastewater Pretreatment Program
Agency of Transportation (VTrans)	Better Roads Program Municipal Highway Stormwater Mitigation Program Municipal Roads Grants-in-Aid Program Transportation Alternatives Program (TAP)
Vermont Housing and Conservation Board (VHCB)	Conservation Grants Farmland Protection Grants Water Quality Grants

Federal Clean Water Funding

The United States Department of Agriculture Natural Resources Conservation Service (UDSA-NRCS) and the Lake Champlain Basin Program (LCBP) provide significant federal funding to support clean water projects in Vermont. The results of USDA-NRCS- and LCBP-funded clean water projects are included in this report to show TMDL progress. Funds administered directly by federal entities are not included in statewide investments as they are outside the scope of this report, which focuses on how funds directly administered by the state are being spent.[12]

Several state regulatory programs are in place to protect, maintain, and restore water quality by establishing land use and management requirements that minimize discharges and runoff to surface waters. Regulatory requirements that are in place to protect the state's natural resources but do not have a direct link to water quality improvement are outside the scope of this report. Table 3 summarizes which regulatory programs are included in this report and which programs will be included in the future.

Table 3: Clean water regulatory program results included in this report and planned future additions.

Agency	Included in this Report	Planned Future Additions
Agency of Natural Resources[13]	Municipal Roads General Permit (MRGP) Municipal Separate Storm Sewer System (MS4) General Permit Operational Stormwater Permits regulating new development, redevelopment, or three or more acres of existing impervious surfaces (General Permit 3-9050) Transportation Separate Storm Sewer System (TS4) General Permit (2022)[14] Wastewater National Pollutant Discharge Elimination System (NPDES) Permits	Transportation Separate Storm Sewer System (TS4) General Permit (all available reporting years)
Agency of Agriculture, Food & Markets[15]	Required Agricultural Practices (RAPs), Medium Farm General Permit, and Large Farm Operating Permits (production area compliance)	Required Agricultural Practices (RAPs), Medium Farm General Permit, and Large Farm Operating Permits (agricultural field and buffer compliance)

[12] Note that some LCBP funding is administered by the Vermont Department of Environmental Conservation as passthrough funding, and these dollars are included in data on statewide investments.

[13] For more information on regulatory stormwater programs, visit: https://dec.vermont.gov/watershed/stormwater. For more information on wastewater permits, visit: https://dec.vermont.gov/watershed/wastewater

[14] Reporting on TS4 permit compliance is limited to information available in the 2022 annual report. In the future, additional years of reporting will be reflected.

[15] For more information on agricultural water quality regulations, visit: https://agriculture.vermont.gov/water-quality/regulations

Accountability Measures

Clean water investments and results are presented throughout the report using the following four accountability measures:[16]

Investment measures show how Vermont invests in clean water projects from identification and planning through design, implementation, and maintenance.

State investments are defined as dollars obligated or awarded to clean water efforts by State of Vermont agencies through a variety of funding and financing mechanisms.

Funds are assigned to state fiscal years according to agreement execution date. When a project is completed, funding is retroactively updated to reflect the final expended amount.

Education measures summarize outreach and technical assistance to support, identify, develop, and maintain clean water projects.

The State of Vermont delivers clean water education through outreach (workshops, trainings, and public or stakeholder meetings) and technical assistance (targeted, one-on-one interactions).

Hours of education provided are assigned to state fiscal years based on the date of the event.

Project output measures quantify the results of clean water projects.

Output measures are standardized across all programs to consistently summarize results of funding and regulatory efforts.

Results are assigned to a state fiscal year based on the completion date of the project and are only reported once a project is completed.

Pollutant reduction measures are estimated nutrient load reductions achieved by clean water projects.[17]

Pollution reduction estimates are modeled at the project level based on the total pollutant load from the land being treated by a project and the average or expected pollutant reduction efficiency of the project type.[18]

Annual pollutant reductions apply throughout the expected lifespan of a project, beginning on the date the project is completed.[19]

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[16] To view available data on investment, project output, and pollution reduction measures supported by other funding and regulatory efforts, and by individual basin, please visit the Clean Water Interactive Dashboard: https://anrweb.vt.gov/DEC/cleanWaterDashboard/

[17] Current pollutant reduction accounting methodology is limited to phosphorus reductions in the Lake Champlain and Lake Memphremagog basins.

[18] Estimated pollutant reductions are presented in delivered loads, or the pollutant load reduction after accounting for estimated pollutant storage or deposition en route to the receiving waterbody. Beginning with the Vermont Clean Water Initiative 2021 Performance Report, reporting of total phosphorus load reduction was revised to be presented in terms of delivered load to increase the accuracy of reporting on progress compared to the TMDL. To learn more about source versus delivered phosphorus load, read the Source Versus Delivered Phosphorus Load Plain Language Fact Sheet: https://dec.vermont.gov/document/source-versus-delivered-phosphorus-load

[19] Additional information on the methods used to estimate pollutant reductions can be found on the Clean Water Tracking and Accounting webpage: https://dec.vermont.gov/water-investment/cwi/projects/tracking-accounting

Status of Pollutant Accounting Implementation

The state is at varying stages of establishing and implementing pollutant tracking and accounting methodologies to estimate phosphorus reductions of projects and practices. The following table summarizes the status of phosphorus accounting for projects implemented in the Lake Champlain and Lake Memphremagog basin by sector and project type. Continued implementation of phosphorus tracking and accounting systems to facilitate more complete reporting on TMDL progress will be reflected in future versions of this report. Tracking and accounting of other pollutants, like nitrogen in the Connecticut River Drainage, is anticipated to be developed and implemented in the future (see Chapter 5 for more information).

Table 4: Status of phosphorus accounting by project or practice type.

Sector	Project or Practice Type	Status of Phosphorus Accounting
Agriculture	Conservation crop rotation	Implemented
	No-till and reduced till	Implemented
	Cover crop	Implemented
	Crop to hay planting	Implemented
	Manure injection	Implemented
	Manure incorporation	Implemented
	Grazing management	Implemented
	Agricultural riparian buffer	Implemented
	Grassed waterways and filter strips	Implemented
	Livestock exclusion	Implemented
	Production area compliance	Implemented (regulatory only)
	Nutrient management	Implemented
	Easements with water quality protections	Not yet established
	Gully erosion in agricultural settings	Not yet established, in progress
Stormwater	Structural stormwater treatment	Implemented
	Non-structural stormwater treatment	Implemented (regulatory only)
	Outlet and gully stabilization	Implemented
	Tree canopy expansion	Implemented
	Native revegetation (‘no-mow zones’)	Implemented
Transportation Related Stormwater	Public road erosion remediation (MRGP and TS4)	Implemented
	Private road erosion remediation	Not yet fully implemented, in progress
Natural Resources	Forested riparian buffer	Implemented
	Bioengineered lakeshore stabilization	Implemented
	Forest road & trail erosion remediation	Not yet fully implemented, in progress
	Use Value Appraisal program enrollment	Implemented
	Floodplain and stream restoration	Not yet fully implemented, in progress
	River corridor easements	Not yet fully implemented, in progress
	Wetland restoration	Not yet fully implemented, in progress
	Wetland easements	Not yet fully implemented, in progress
	Land conservation easements	Not yet established
Wastewater	Wastewater treatment facility (WWTF) upgrades	Measured discharges from permitted WWTFs
	Private wastewater system upgrades	Not yet established
	Combined sewer overflow (CSO) abatement	Not yet established

Explore Clean Water Project Data with Online Tools

The State of Vermont coordinates across agencies to track clean water efforts in a centralized database known as the Clean Water Reporting Framework. The database is used to compile and summarize project data to produce this report. These data and many online tools are made available to the public through the Clean Water Portal.[20] The Portal's Clean Water Project Explorer allows people to search for and learn details about individual state-funded clean water projects (Figure 5). The Explorer also contains potential projects identified through Tactical Basin Planning. The Portal's Clean Water Interactive Dashboard allows people to view investment data, project output measures, and estimated pollutant reductions presented in this report by watershed (Figure 6).

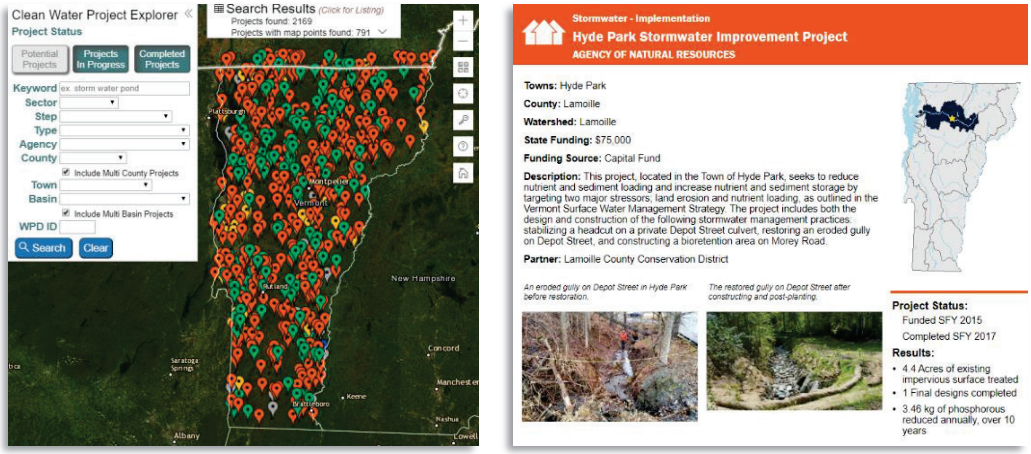


Figure 5: Sample Clean Water Project Explorer search results (left) and individual project report (right).

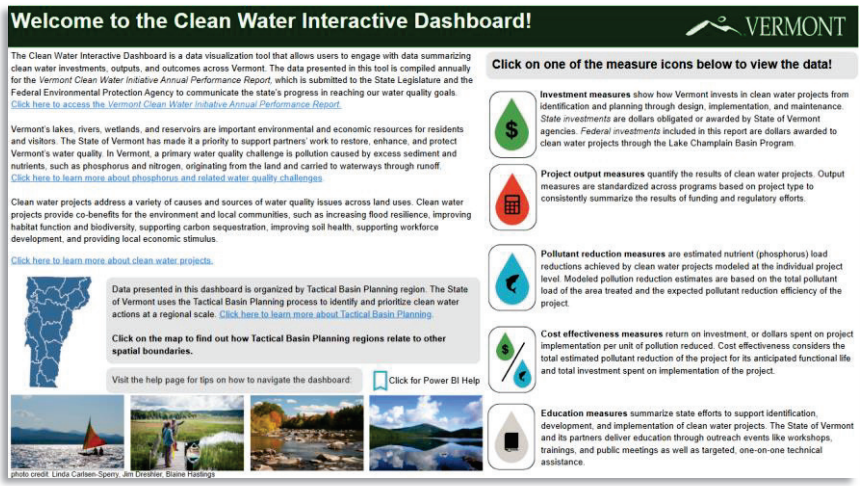


Figure 6: The Clean Water Interactive Dashboard homepage.

[20] The Project Explorer and Clean Water Interactive Dashboard can be accessed via the Clean Water Portal: https://anrweb.vt.gov/DEC/cleanWaterDashboard/

Chapter 2: Statewide Clean Water Investments and Results

The State of Vermont's clean water investments are channeled through grants, loans, contracts, and assistance programs to strategically restore and safeguard the state's rivers, streams, lakes, ponds, and wetlands. These funds are used to help identify and prioritize clean water projects, as well as to design, implement, and in some cases, maintain projects. The State of Vermont tracks outputs of state investments at the project level to quantify the impact of clean water efforts statewide. This chapter summarizes statewide investments awarded to clean water projects by State of Vermont agencies as well as project output measures achieved through completion of clean water projects funded by State of Vermont agencies.

Vermont's Clean Water Funding

The State of Vermont is committed to maintaining and improving water quality through financial and technical assistance and regulation. Vermont's clean water funding helps municipalities, farmers, landowners, and nonprofit organizations implement projects that will restore, enhance, and protect Vermont's water quality. Funds from state programs complement and leverage other funding sources to support clean water efforts statewide.

The Vermont Clean Water Board and Budget Process

The Clean Water Board was created as a result of Act 64 of 2015, Vermont's Clean Water Act, and is responsible for planning, coordinating, and financing the restoration, enhancement, and protection of Vermont's water quality. Composed of representatives from five state agencies and four members of the public, the Board recommends to the Governor an annual Clean Water Budget that is made up of Clean Water Fund, Capital Bill, and, most recently, American Rescue Plan Act (ARPA) dollars.[21] Once the budget is recommended and approved by the Legislature, the funds are awarded to multiple state agencies and affiliates that work to address water quality challenges across land use sectors.

The Clean Water Budget totals roughly $35 million per year, including about $25 million in revenues to the Clean Water Fund, and $10-12 million in Capital dollars from the Clean Water Section of the Capital Bill. The Clean Water Fund is made up of revenue from the Meals and Rooms Tax, Property Transfer Tax Clean Water Surcharge, and unclaimed bottle deposits. The state has committed to "funding the Clean Water Initiative in a manner that ensures the maintenance of effort and that provides an annual appropriation for clean water programs in a range of $50 million to $60 million as adjusted for inflation over the duration of the Initiative" (10 V.S.A. § 1387). The state relies on the Clean Water Budget, including the Clean Water Fund and each of its revenue streams, to meet this commitment and provide predictable, sustained funding for financial and technical assistance programs.

[21] To learn more, visit the Clean Water Board webpage: https://dec.vermont.gov/water-investment/cwi/board

The American Rescue Plan Act

The American Rescue Plan Act (ARPA) is part of the federal response to address economic impacts resulting from the COVID-19 pandemic. The State of Vermont received $1.026 billion in ARPA funds to invest in broadband infrastructure, clean water, climate action, housing, and economic development. ARPA funds must be expended by the end of calendar year 2026. The Vermont Agency of Natural Resources (ANR) is responsible for distributing a portion of these ARPA funds to support water and wastewater infrastructure programs.[22] A subset of ARPA funding was assigned for budgeting through the Clean Water Board from SFY 2022 to SFY 2024 to support new and existing clean water programs across multiple state agencies.[23] Because of the scale and time sensitivity of ARPA funds, there may be cases where awarding ARPA funds was temporarily prioritized over perennial funding sources to maximize ARPA investments in Vermont. No further ARPA funding is expected to be available beyond December 31, 2024 for the Clean Water budget.

While the Clean Water Budget is a major source for funding clean water efforts statewide, many state agencies and affiliates pair Clean Water Budget dollars with other state or federal funds to complement and expand upon their clean water efforts.

[22] Visit the ANR ARPA webpage for more information on types of water and wastewater infrastructure programs: https://anr.vermont.gov/special-topics/arpa-vermont

[23] View approved Clean Water Budget allocations for a full list of ARPA funding distributed by the Clean Water Board on the Clean Water Board's webpage: https://dec.vermont.gov/water-investment/cwi/board

Vermont's Statewide Clean Water Investments

The State of Vermont distributes funding through agencies to a wide range of organizations to support all phases of clean water work across land use sectors. The following sections summarize statewide investments in clean water projects by land use sector, funding source, and project step since State Fiscal Year 2016.[24]

Click symbol to view description of accountability measures.

State Investments by Land Use Sector

Reaching Vermont's water quality goals requires investments across all land use sectors. The following figure summarizes state clean water investments by land use sector statewide over the past nine state fiscal years, from SFY 2016 to 2024.

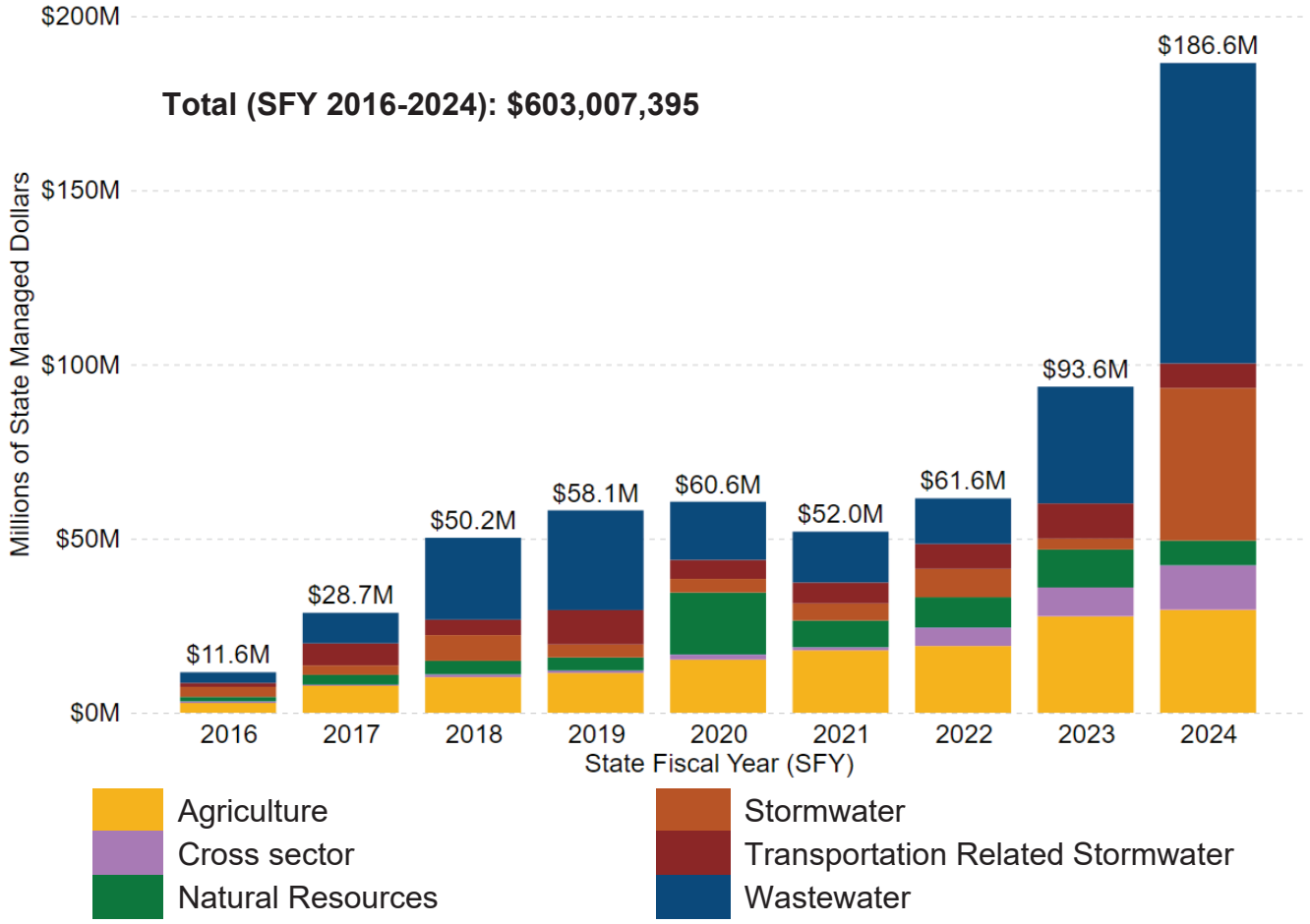


Figure 7: Total dollars awarded by State of Vermont agencies to clean water projects statewide by land use sector, SFY 2016–2024.

Explanation of Figure 7

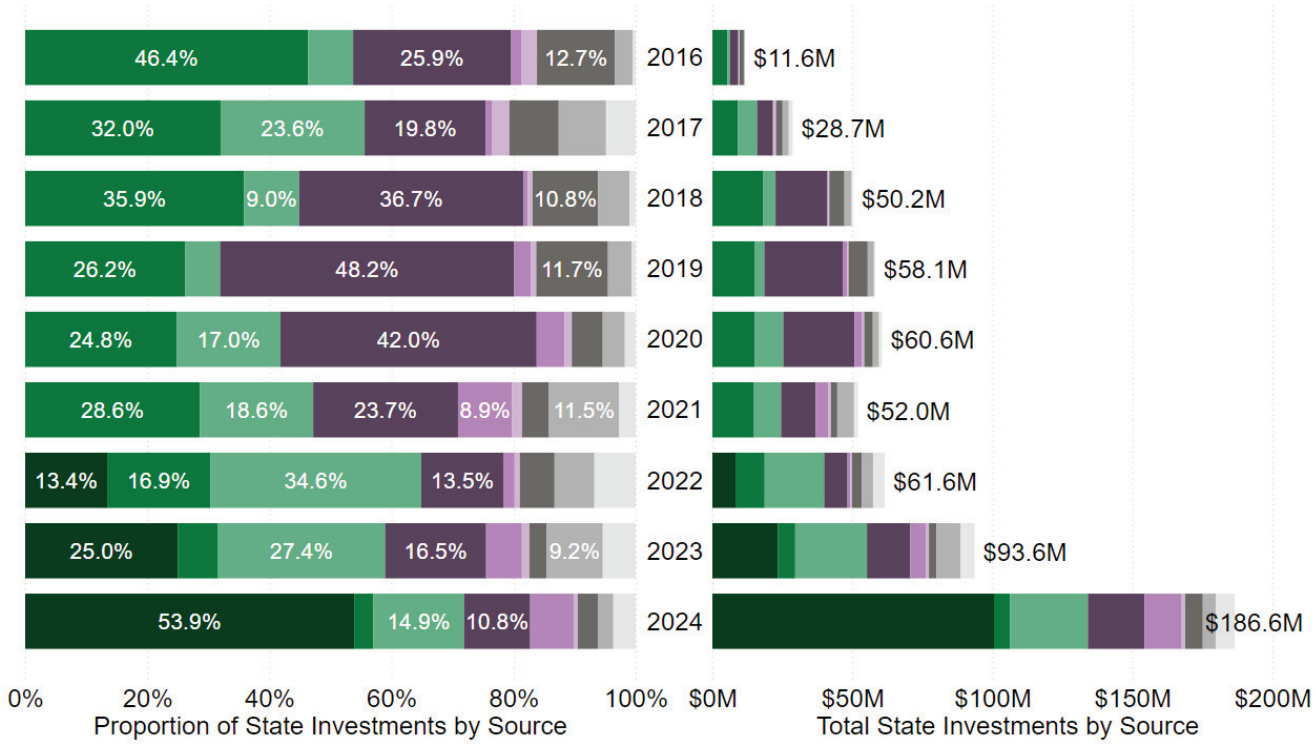
The State of Vermont has invested over $600 million in clean water projects statewide from SFY 2016 to 2024. Annual clean water investments have increased significantly since SFY 2016, but funding awarded to projects varies from year-to-year based on

[24] To view clean water investments by major river basin, visit the Clean Water Interactive Dashboard: https://anrweb.vt.gov/DEC/cleanWaterDashboard/

funding opportunities, project readiness, and the timing of awards. In the natural resources and wastewater sectors, large-scale investments in land conservation and infrastructure improvement contribute to more annual variations in funding compared to other sectors, because these project types tend to involve large capital expenditures and require multiple years of planning and preparation work to complete. In SFY 2021, COVID-19's economic impacts affected Clean Water Fund revenue sources and capacity to administer and implement projects, which led to a slight reduction in appropriation and a temporary slowdown of funding programs. The rebound in funding levels beginning in SFY 2022 has been bolstered by a short-term influx of ARPA dollars. ARPA funding programs subject to this report are primarily supporting clean water projects in the agriculture, stormwater, and wastewater sectors. Clean water funding is allocated to support work across land use sectors. Most of the cross-sector funding represents block grants awarded to Funding Program Administrators tasked with administering grant programs and issuing sub-grants to support clean water projects across a range of land use sectors. Once a block grant is completed, funding is recategorized to the appropriate sector based on the project types that were awarded funding.[25]

[25] To learn more about current CWIP funding programs, visit: https://dec.vermont.gov/water-investment/cwi/grants/opportunities

State Investments by Funding Source



* Short-term funding source that must be expended by the end of calendar year 2026.

**Other state funding programs include: AAFM Special Funds, Clean Water Fund Operating, Clean Water State Revolving Fund Administration, General Fund, Municipal Planning Grant Contribution, and Watershed Grant Funds.

Figure 8: Proportion of dollars awarded to clean water projects through State of Vermont agencies by funding or financing source, SFY 2016–2024.[26]

Explanation of Figure 8

State agencies' clean water investments are supported by a variety of funding sources. The proportion of state investments from each funding source varies annually based on availability of funding, identified priorities, and capacity to administer funds. The large proportion of ARPA dollars in recent years is short-term, as funding available through

[26] Investments reported include state and federal dollars awarded to projects by state agencies, but exclude federal funds awarded directly by federal agencies and the Lake Champlain Basin Program, as the focus of this report is state funding.

ARPA must be expended by the end of calendar year 2026. Several federal funding sources *administered by state agencies* are considered state investments, including Clean Water State Revolving Fund (CWSRF), Federal Transportation Funds, some U.S. Department of Agriculture Natural Resources Conservation Service (USDA-NRCS) funds, and some Lake Champlain Basin Program funds. Direct investments by federal agencies or other organizations are beyond the scope of this report.[27]

Investments and Leveraged Contributions by Land Use Sector

State-funded clean water projects leverage local and federal contributions to help cover project costs and to further clean water efforts in Vermont. Loans are considered leverage as they are mostly paid back to the state for continued lending. The following figure summarizes leveraged contributions from SFY 2016 to 2024 by land use sector.

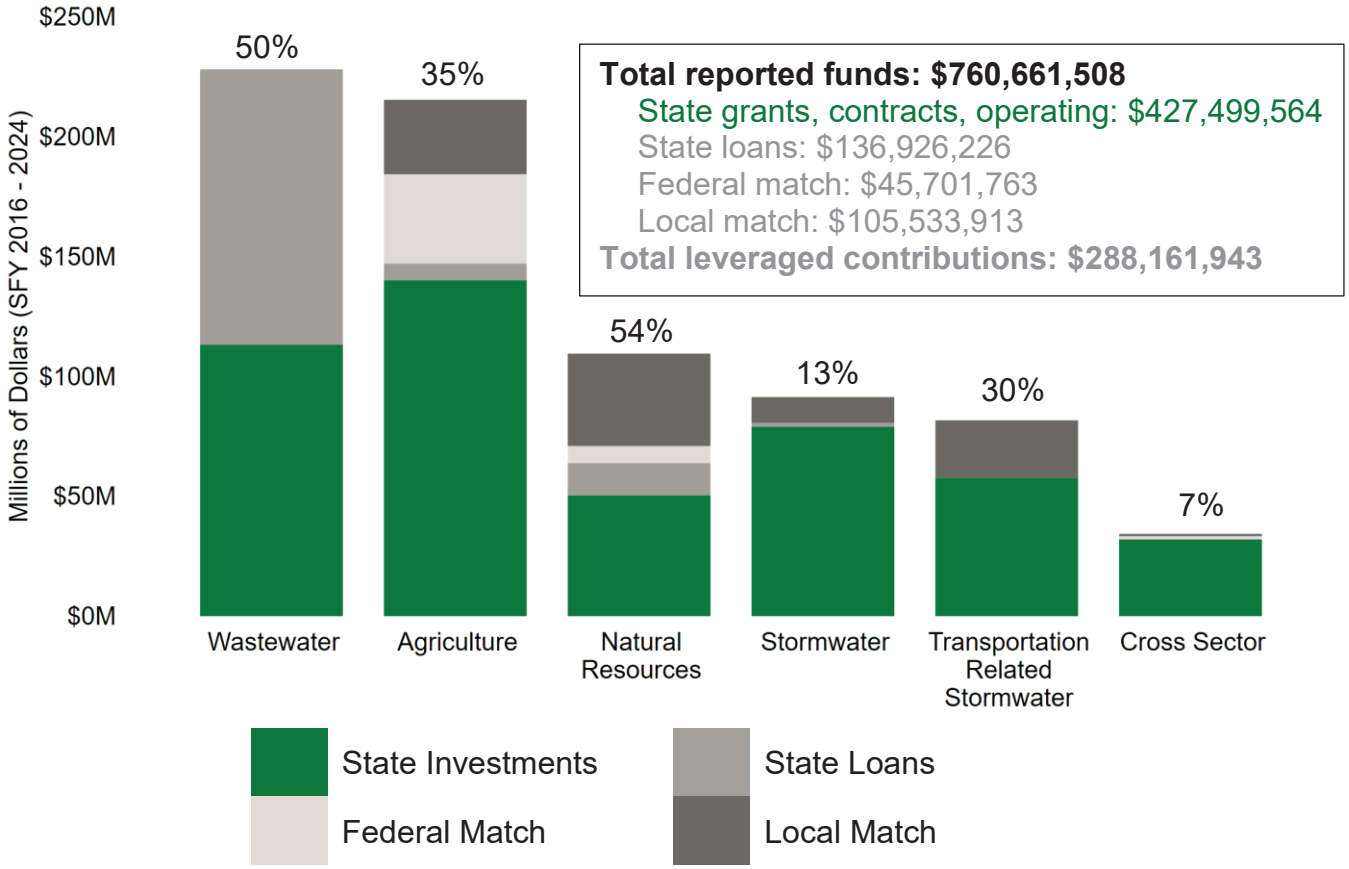


Figure 9: State investments (grants, contracts, and Clean Water Fund Operating) and leveraged contributions (local match, federal match, and state loans) reported through State of Vermont agencies by land use sector, SFY 2016–2024. Percent represents the proportion of leveraged contributions out of the total reported funds within each sector.

Explanation of Figure 9

State-funded clean water projects leverage local and federal contributions to help cover project costs and to further clean water efforts. Leveraged contributions (local match,

[27] Reports on Federal Funding Related to Water Quality Improvement Efforts in Vermont are available here: https://dec.vermont.gov/water-investment/cwi/reports#Legislative%20Reports

federal match, and state loans) since SFY 2016 total $288 million and represent 38 percent of the total $760 million in reported investments SFY 2016 through SFY 2024. A large portion of reported wastewater funds are low-interest loans made to municipalities through the Clean Water State Revolving Fund that will ultimately be paid back to the state (except for some loan subsidies).[28] Match contributions reported here only include local match (private contributions, municipal funds, volunteer labor, etc.) and federal match reported through State of Vermont grants and contracts, where data is available. Match requirements are determined at the funding program level. In some cases, funding awards made with ARPA dollars may have relatively low match requirements in order to support high need communities or to help maximize use and delivery of this time sensitive funding. Clean Water Fund Operating dollars included in state investments are limited to AAFM and ANR personnel funded through the Clean Water Fund to support implementation efforts. This investment is not considered leveraged contribution and represents only a fraction of the substantial staffing costs associated with clean water work. State agency investments in personnel, operating, and monitoring activities are beyond the scope of this report.

State Investments by Project Step

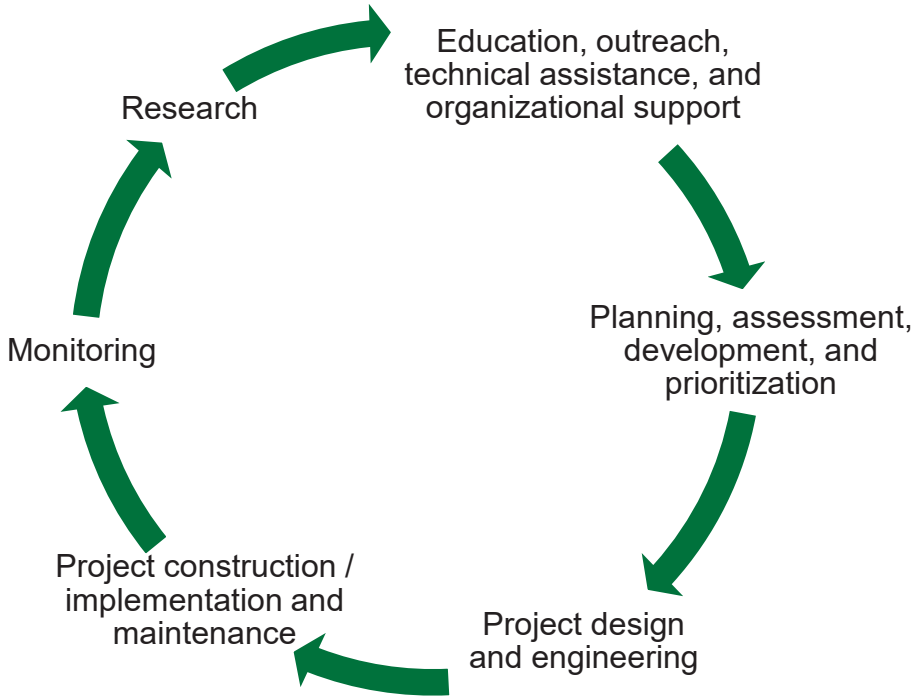


Figure 10: Project step cycle showing various phases of clean water work.

Making wise investments in cost-effective clean water projects requires thorough project planning, analysis, design, and implementation. In addition, operation and maintenance of existing projects is important to sustain project function and clean water outcomes. State investments in project maintenance will be reflected in future years of reporting. Investing in the project development process is key to ensuring state investments will yield the greatest water

[28] State loans are counted with state investments in all other funding figures presented in this chapter.

quality improvement per dollar, which includes de-prioritizing lower-value or non-viable projects early in development.

The following figure summarizes state funding awarded to various steps of the clean water project cycle during SFY 2016 to 2024.

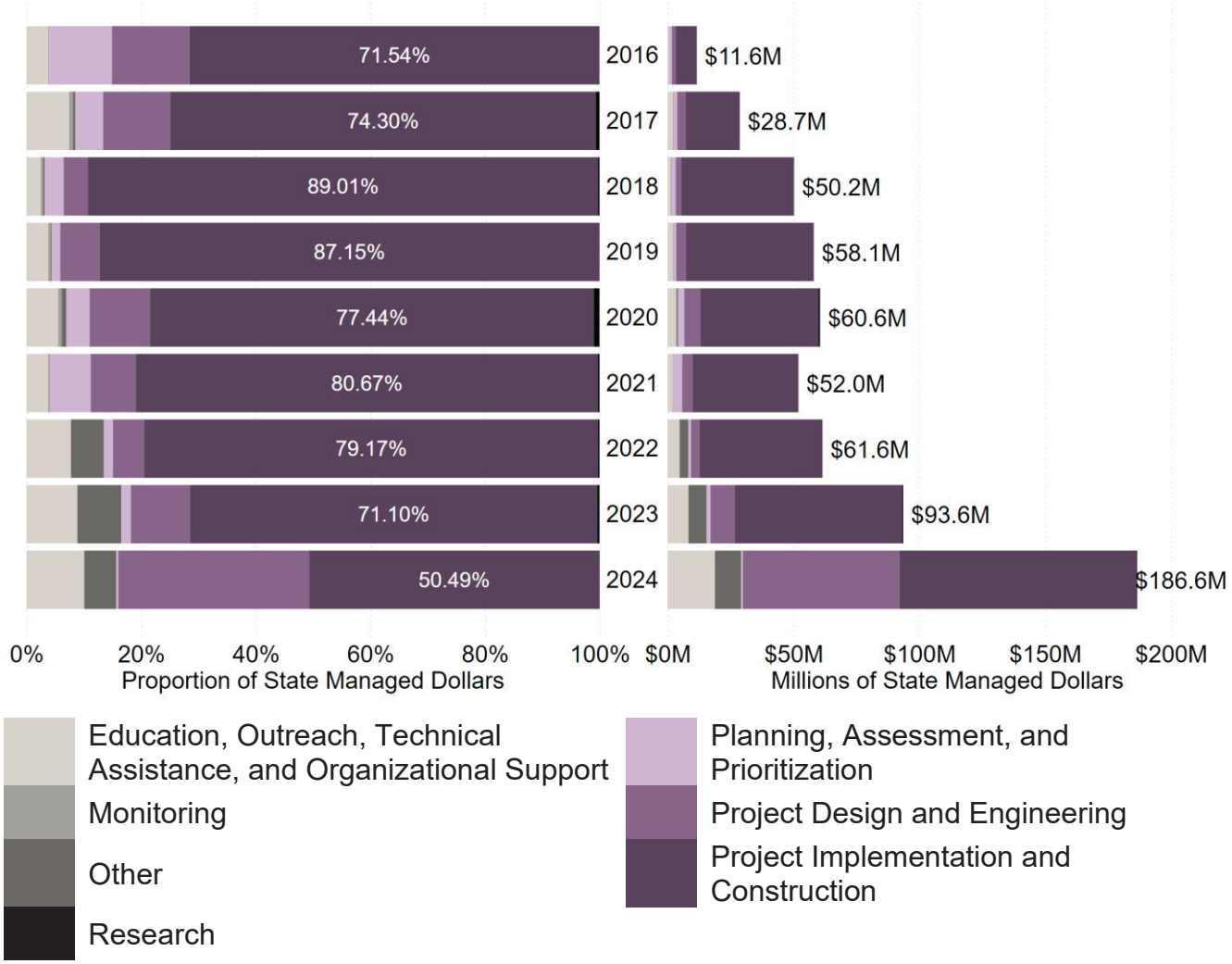


Figure 11: Dollars awarded by State of Vermont agencies to various steps of the clean water project cycle, SFY 2016–2024.

Explanation of Figure 11

While the state invests in all project steps, the majority of clean water investments each year are used to construct or implement clean water projects that restore, enhance, and protect Vermont's water quality. Across reported state fiscal years, approximately 20 percent of clean water investments are used in the planning, design, and engineering phases. State-funded monitoring included in this report represents passthrough funds that are used to support focused, small watershed scale water quality monitoring, but does not capture all water quality monitoring efforts in Vermont. The "other" category includes agreements that do not fit squarely into one project step, including multiple block grants issued to partners who will use the money to develop, design, and implement several projects. Once those projects are completed, dollars will be reallocated to the appropriate step. State-funded research is intended to align with and complement research conducted by partners like educational institutions and nonprofits. Early in the

reporting period (SFY 2016–2017), the proportion of state investments directed to assessment, planning, and design was higher as project opportunities were being assessed and pursued. The middle of the reporting period illustrates a focus on implementation, with between 75–90% of state investments going to implementation between SFY 2018–2022. In the most recent state fiscal years, a renewed focus in the design and engineering phase is in part reflective of large-scale funding initiatives for stormwater design and permit obtainment and regulatory compliance supported by ARPA dollars. Investments in design and engineering phase work occurring now will translate to future investments in construction and implementation phase work in the coming years.

Vermont's Statewide Education, Outreach, and Technical Assistance

Click symbol to view description of accountability measures.

Reducing nutrient and sediment pollution requires employing sound land management practices which can necessitate changes to our cities, towns, farms, forests, and natural spaces. Education and outreach related to clean water projects and programs is critical to achieve our water quality goals. The State of Vermont delivers clean water education through outreach (workshops, trainings, and public or stakeholder meetings) and technical assistance (targeted, one-on-one interactions). Clean water education, outreach, and technical assistance aim to:

- Increase public awareness and engagement in establishing and implementing clean water priorities;
- Increase landowner acceptance of new and changing policies and willingness to adopt best management practices;
- Support regulated entities in preparing to meet new regulatory requirements in the most cost-effective manner;
- Support clean water project proponents, including regulated entities, in building expertise to develop, plan, and secure resources to implement clean water projects; and
- Increase adoption and effectiveness of best management practices to improve water quality.

Educational efforts support all land use sectors in planning and securing resources to implement clean water projects. The following section summarizes education, outreach, and technical assistance efforts by land use sector.

Table 5: Hours of education provided and number of attendees by state fiscal year.

State Fiscal Year	Hours of Education Provided	Number of Attendees
2016	859	9,151
2017	1,047	10,164
2018	1,448	16,154
2019	1,659	13,185
2020	1,042	8,704
2021	578	7,045
2022	797	7,042
2023	555	4,987
2024	437	5,901
Total	**8,422**	**82,333**

Data is organized and presented differently than in previous reports. The Outreach by Organization and Outreach by Target Audience sections of the SFY 2016 to 2023 reports should not be compared with the SFY 2024 report. The two major changes are:

1. For the respective figures, we included additional categories to better represent the data.
2. The hours of education and number of attendees are characterized in a new way. For example, in the past, if a three-hour outreach event reached three target audiences, three hours would be attributed to each target audience (nine hours total); now, the total hours

provided is distributed among the number of target audiences, rather than duplicating the number of hours provided.

Clean Water Outreach by Organization

Reported outreach is provided by state reporting partners, as well as partners who receive clean water funding from state agencies to conduct outreach. The following figure summarizes the proportion of hours of education provided by outreach organization from SFY 2016 to 2024.

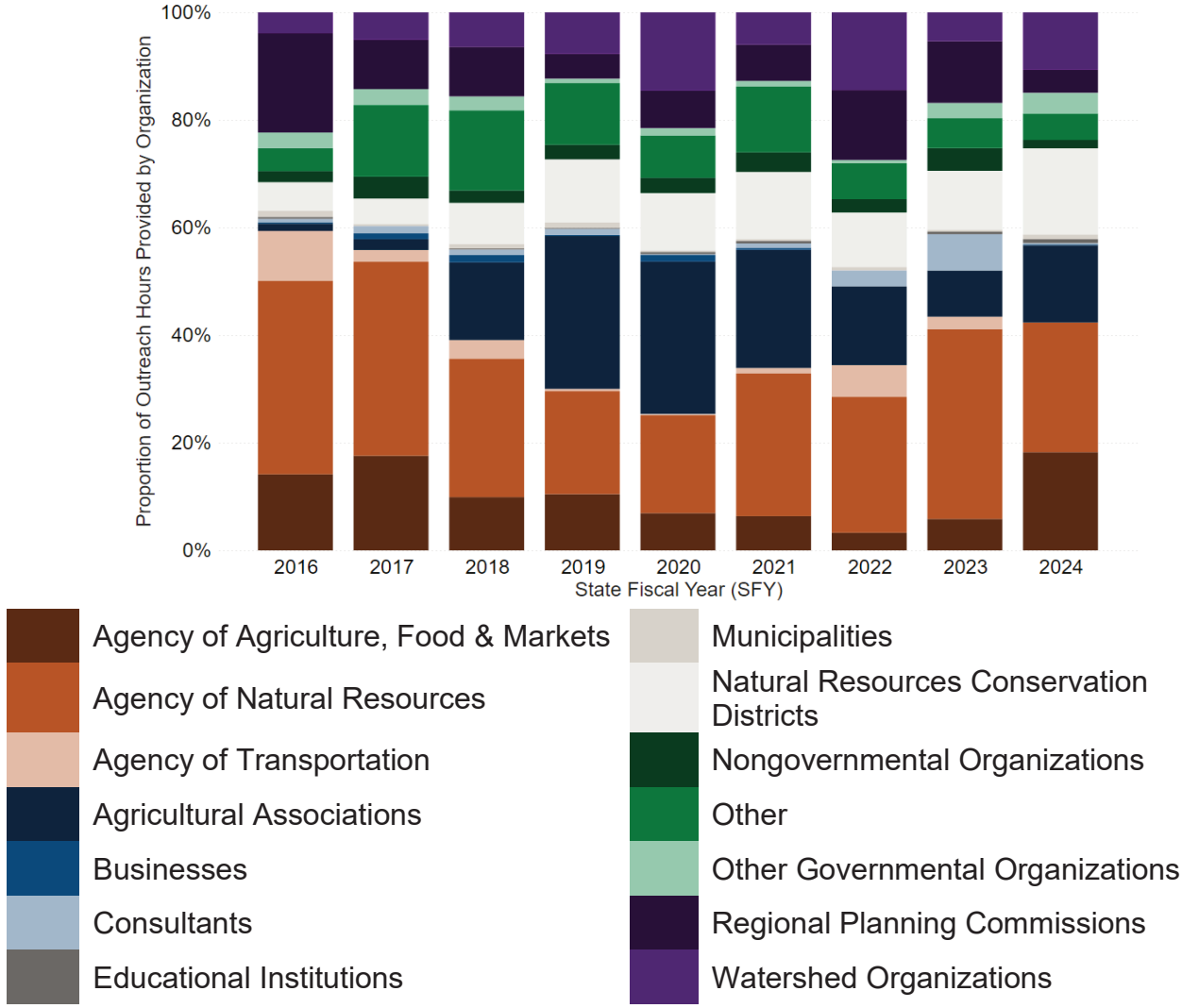


Figure 12: Outreaching organizations provided 8,422 hours of education to participants of State of Vermont-funded clean water outreach events via workshops, trainings, and public or stakeholder meetings, SFY 2016–2024. Percentages reflect the proportion of total hours provided by each outreach organization or category.[29]

[29] "Agricultural Associations" includes both regional and statewide organizations connecting and supporting the agricultural sector. "Consultants" includes engineering, environmental, stormwater, water, and wastewater-focused entities. "Municipalities" includes Conservation Commissions, cities, towns, and municipal officials. "Nongovernmental Organizations" spans sectors, from housing and energy to conservation and recreation. "Other Governmental Organizations" includes state and federal agencies other than those included in the legend above.

Explanation of Figure 12

In total, 3,119 outreach events have been reported, reaching 82,333 attendees, with 8,422 hours of education received by attendees since SFY 2016.[30] The need for, and the resources available to support, clean water outreach efforts fluctuate. For example, outreach efforts were critical in the development of foundational programs to drive Vermont's clean water efforts, including the initial phases of implementing the Lake Champlain TMDL and the Vermont Clean Water Act (Act 64 of 2015). More recently, outreach efforts have supported partners in the development and implementation of programs under Act 76 of 2019. As these programs move from development and launch into implementation, the need for continued education and outreach events on these topic areas may be reduced. The entities responsible for reporting outreach efforts are ANR, AAFM, VTrans, and external partners conducting outreach under the scope of a state grant or contract agreement, however many events include multiple outreaching organizations. Outreach not directly conducted by state agencies and/or supported by state funding are not included in these data.

[30] Refer to the explanation above on why numbers are different than previously reported.

Clean Water Outreach by Target Audience

State of Vermont outreach events reach a diverse range of audiences. The following figure summarizes the target audiences reached by State of Vermont-funded clean water outreach efforts (workshops, trainings, and public or stakeholder meetings), from SFY 2016 to 2024.

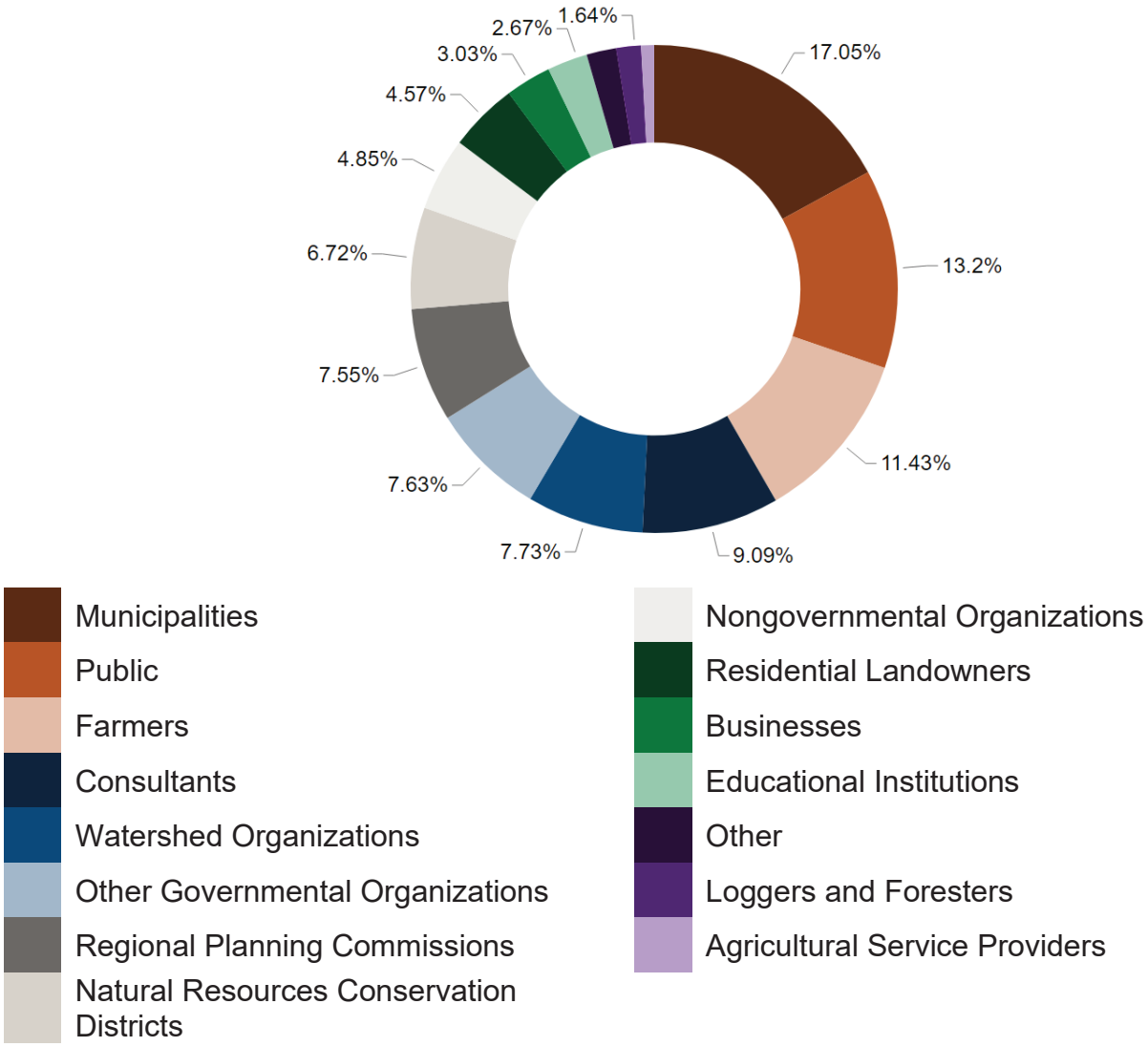


Figure 13: State of Vermont clean water outreach efforts between SFY 2016–2024 reached a total of 82,333 attendees. Percentages reflect the proportion of total attendees in each target audience.

Explanation of Figure 13

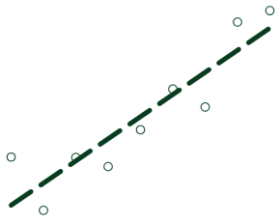
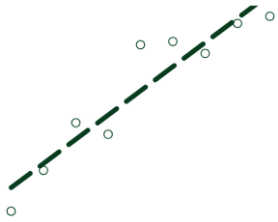
The state's outreach efforts target a wide range of sector- and organization-based audiences. One of the state's water quality priorities is to support municipalities and farmers in addressing stormwater, wastewater, and agricultural sources of nutrient pollution, which is why these audiences represent a large proportion of the pie chart above. Consultants, watershed organizations, governmental organizations, Regional Planning Commissions, Natural Resources Conservation Districts, and non-governmental organizations play an important role in implementing priority clean water projects; they also reach audiences via targeted technical assistance, which is not represented in this

figure. Continued engagement with the public is crucial to maintain and broaden support of the state's clean water efforts and bolster landowner willingness to adopt and implement voluntary, non-regulatory clean water projects.

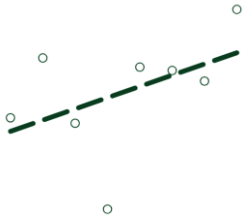
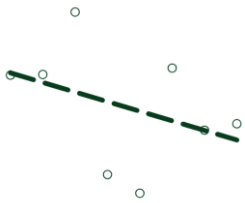
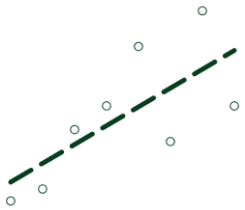
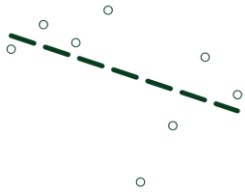
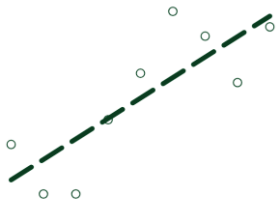
Technical Assistance by Land Use Sector

State of Vermont agencies and partners provide technical assistance to regulated and non-regulated audiences who implement clean water projects. In the natural resources sector, projects are voluntary and not driven by regulation. Education targeting the public and landowners increases the likelihood of natural resources restoration projects moving forward. While not all technical assistance provided by state agencies is tracked and reported for purposes of this report, the following table summarizes available data on technical assistance efforts by land use sector since SFY 2016.

Table 6: State of Vermont technical assistance efforts by sector.

Measures	Total SFY 2016–2024	Trend SFY 2016–2024	Data Notes
Agricultural Technical Assistance Measures			
Number of technical assistance visits conducted by AAFM and partners to support implementation of conservation practices	7,024		Technical assistance visits are conducted to support planning, efforts to identify and secure funding, implementation, and monitoring of clean water projects on farms. Generally, 50% of visits are supported by AAFM staff, while the remaining 50% of visits are conducted by local and regional assistance providers, such as UVM Extension and Natural Resources Conservation Districts.
Number of farms provided technical assistance	3,287[31]		Many farm operations are supported to identify and plan projects with local and regional technical assistance providers, which are later funded, implemented, and monitored by AAFM staff. Farms are also supported to improve, adopt, and trial new best management practices to improve water quality. Data collected prior to SFY 2019 may be incomplete.

[31] This is a cumulative value that does not factor duplicate operations from one year to the next.

Measures	Total SFY 2016–2024	Trend SFY 2016–2024	Data Notes
Developed Lands and Wastewater Technical Assistance Measures			
Approximate hours of technical assistance provided by DEC's Water Investment Division engineers on municipal stormwater and wastewater projects	46,189		No data available in SFY 2016. The dip in SFY 2020 is reflective of the COVID-19 pandemic. Recent increase is a result of technical assistance provided to support ARPA programs.
Hours of water quality municipal technical assistance provided by VTrans staff	9,562		No data available in SFY 2016. The dip in SFY 2020 and 2021 is reflective of the COVID-19 pandemic.
Natural Resources Technical Assistance Measures			
Number of logging operation site visits to provide Acceptable Management Practices (AMP) technical assistance[32]	145		Data are reported by calendar year rather than state fiscal year. Given the timeline of this report, calendar year 2024 data are not yet available.
Square miles of forestlands covered by Use Value Appraisal (UVA) Program site inspections	2,101		Data are reported by calendar year rather than state fiscal year. UVA inspections in SFY 2020 and 2021 were reduced as a result of the COVID-19 pandemic. Given the timeline of this report, calendar year 2024 data are not yet available and calendar year 2023 data are reported.
Number of communities receiving Urban and Community Forestry Program technical assistance	981		Data are reported by federal fiscal year (October 1–September 30), rather than state fiscal year.

[32] DFPR's annual statewide summary reports are available at: https://fpr.vermont.gov/forest/managing-your-woodlands/acceptable-management-practices

Figure 14: The Clean Water Initiative Program co-hosted a Verification Field Day with Lake Champlain Sea Grant in October 2024. The purpose of the event was to train certified verifiers on the process and tools needed to verify the functionality of a clean water project. Over 20 clean water partners from across the state attended the training. The group visited two implemented projects: a gravel wetland in South Burlington and a riparian buffer planting in Richmond. In the photo above, a person uses a field tape to measure the width of the buffer. At each site, attendees learned about project details, routine maintenance needs, and lessons learned from site managers. In smaller groups, participants worked together to answer questions in an ArcGIS Survey123 field app checklist to evaluate the condition and function of each project. Any necessary maintenance tasks were discussed. One attendee noted: "I appreciated the trainings, and I found using the app in the field very helpful, especially with people around to brainstorm and answer questions." Clean Water Fund dollars supported this successful training and collaboration day.

Statewide Results of Vermont's Clean Water Investments

Click symbol to view description of accountability measures.

Clean water projects restore, enhance, and protect water quality by addressing the sources and causes of sediment and nutrient pollution across land use sectors. The following section summarizes the results of state-funded and regulatory clean water projects completed statewide to improve water quality. Data is representative of the available results from completed and reported state-funded clean water work. Reporting on the results of state investments may lag based on the terms and duration of funding agreements, and results are likely incomplete for recent years covered in this report. The duration of project results reporting lag time varies by sector and funding source. Data for all years are updated each reporting cycle to more accurately reflect total results.[33]

Statewide Results of Agricultural Pollution Prevention Projects

Agricultural pollution prevention projects involve the installation or application of conservation practices that reduce sources of nutrient and sediment pollution from farm production areas and agricultural fields. Unlike in other sectors, many clean water practices implemented in the agricultural sector have an effective lifespan of one year and require continued implementation year-after-year to sustain results. Additionally, agricultural practices are inherently subject to seasonal weather and soil conditions. Fluctuating levels of voluntary implementation may be influenced by weather, farm business decisions, land management strategies, and ability to implement.

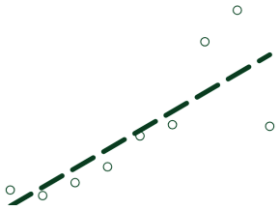
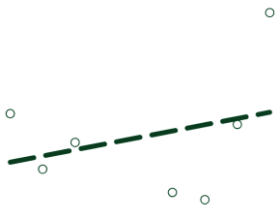
Data for this reporting are collected on a state fiscal year cycle (July–June), however July 1 is the middle of the growing season in Vermont. Many agricultural grant programs operate on a growing season cycle. Data available for the most recent state fiscal year are generally an under representation of total implementation, because of the timing of reporting cycles some results have not yet been captured. Annual implementation data are updated each year to more accurately reflect total implementation. For example, in the Clean Water Initiative 2023 Performance Report, acres of agricultural conservation practices implemented in SFY 2023 were reported as 26,905. However, once programs captured end of grant reporting from the recent field season, data for this year's report show 71,838 acres of agricultural conservation practices implemented in SFY 2023.

Agricultural project output measures can overlap if multiple practices were applied on the same field. For example, 10 acres of manure injection and 10 acres of cover crop applied on the same field will amount to 20 acres of agricultural conservation practices implemented in reported project outputs. Similarly, practices implemented on the same field over multiple years will be counted for each year implemented. For example, 10 acres of cover crop implemented on the same field in 2016, 2017, and 2018 will amount to 30 acres of agricultural conservation practices implemented in reported project outputs. The total agricultural project outputs column represents the total level of effort of state funding programs, rather than the number of distinct agricultural acres addressed.

[33] For a full record of project output measures by state fiscal year, visit the Clean Water Interactive Dashboard here: https://anrweb.vt.gov/DEC/cleanWaterDashboard/

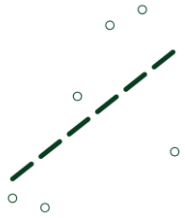
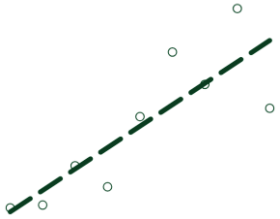
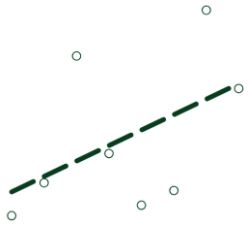
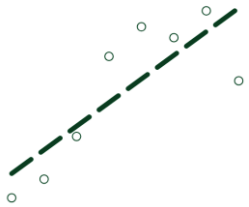
The following table summarizes project outputs associated with state-funded agricultural pollution prevention projects, technical assistance, and regulatory programs. The figures presented in the table show total outputs by SFY based on currently available data. Linear trend lines are provided to highlight the general rate of progress; however, trends are subject to change in future years based on increased data availability.

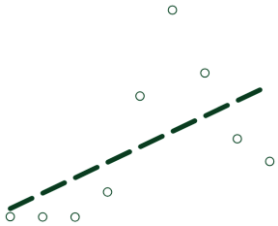
Table 7: Outputs of state-funded agricultural pollution prevention projects implemented statewide since SFY 2016.[34]

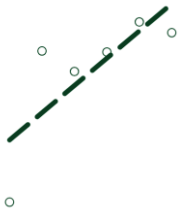
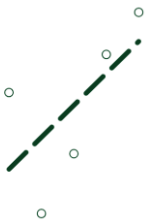
Project Output Measures	Total SFY 2016–2024	Trend SFY 2016–2024	Data Notes
Acres of agricultural conservation practices implemented (excluding practice types listed below)[35]	246,915		Increased acres of conservation practices in SFY 2022 and SFY 2023 are due to the development and launch of a new program, VPFP, which is currently funded through a federal USDA-NRCS grant. The continuation of this innovative performance-based conservation program is dependent on competitive funding being secured for the future.
Acres of agricultural forested and filter strip buffers installed	328		State funded riparian buffers are primarily supported through the CREP program. In SFY 2019 and SFY 2020, zero acres were enrolled in the CREP program due to federal statutes which affected Vermont agricultural land eligibility for this program. Changes in the 2018 Farm Bill resulted in an updated 2020 CREP program handbook, which once again enabled enrollment of Vermont lands in this program.

[34] Acronyms are defined in Appendix G: Glossary of Acronyms

[35] Acres of agricultural conservation practices includes aeration, conservation crop rotation, cover crop, crop to hay, grassed waterways, manure injection, manure incorporation, conservation tillage, pasture and hay planting, and rotational grazing.

Project Output Measures	Total SFY 2016–2024	Trend SFY 2016–2024	Data Notes
Acres of pasture with livestock excluded from surface water	476		Livestock exclusion occurs when landowners willingly install fence to ensure livestock cannot access adjacent surface water. It is often an outcome of PSWF and CREP projects. Tracking of this measure occurs after installation of fence and other associated infrastructure. Measures are expected to vary annually based on interest and capacity.
Number of structural agricultural practices installed in barnyard/production areas, fields, and pastures	1,037		Structural agricultural practices can include waste storage and management, barnyard improvements, access roads and livestock trails, fencing, and water infrastructure.
Acres of water quality protections within newly conserved agricultural lands	2,528		Acres of newly conserved agricultural lands vary year-to-year based on landowner willingness, readiness of agreements, and timing of execution.
Acres of agricultural land treated through innovative equipment	169,851		Innovative equipment includes manure injection, conservation tillage, cover crop planting, and precision agriculture technology that more accurately measures the application of nutrients.

Project Output Measures Supported by State Technical Assistance	Total SFY 2016–2024	Trend SFY 2016–2024	Data Notes
Acres of agricultural conservation practices implemented with support of state-funded technical assistance (includes acres of livestock excluded and acres of filter strip buffer installed)	39,047		Agricultural conservation practices supported by technical assistance represent practice implementation without direct financial assistance to farmers for practice installation from state and federal programs. These practices are reported through technical assistance efforts funded by state programs.

Agricultural Measures Reported Through Regulatory Programs	Total SFY 2016–2024	Trend SFY 2016–2024	Data Notes
Acres of production area inspected by AAFM for compliance with Required Agricultural Practices (RAPs)	15,743		Data not available SFY 2016-2018. Data reported in SFY 2019 is limited to the Lake Champlain basin only. Farms are inspected on a regular cycle depending on the farm size for compliance with agricultural water quality regulations. Production areas refer to the facilities and infrastructure utilized for waste storage, feed storage, animal housing and other associated infrastructure.
Number of water quality compliance assurance assessments conducted by AAFM to check compliance with Required Agricultural Practices (RAPs) and Medium Farm Operation (MFO) and Large Farm Operation (LFO) Rules[36]	1,328		Data not available SFY 2016-2019. Compliance assurance assessments include regulatory inspections, investigations, enforcement, other regulatory reviews and regulatory technical assistance. The reduction in SFY 2021 is a result of the COVID-19 pandemic.

[36] For more information on RAPs, visit: https://agriculture.vermont.gov/rap

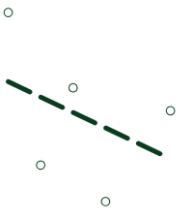
Figure 15: Installation of the above filter strips occurred in 2024. These 50-foot-wide vegetative filter strips were planted along the edges of an agricultural field, which borders surface waters in the Lake Memphremagog watershed. The filter strips will help to capture soil and nutrient runoff and prevent it from entering the neighboring stream. Filter strips are an extremely effective way to protect water quality. This project was supported through the Agency of Agriculture's Grassed Waterway and Filter Strip (GWFS) program in collaboration with the Orleans County NRCD.

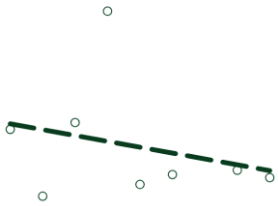
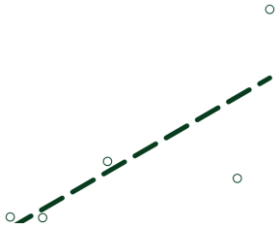
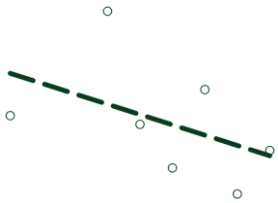
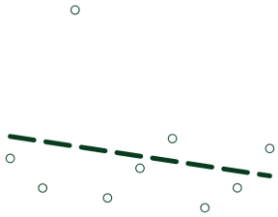
Figure 16: A barnyard improvement and cover was installed through the Best Management Practices (BMP) Program to reduce agricultural runoff to an adjacent stream from the farm's outdoor livestock area in the Connecticut River Watershed. Farms that are certified organic under the National Organic Program standards are required to ensure livestock have access to the outdoors every day. Covering those areas to prevent rainwater from mixing with animal waste can be an effective tool for reducing runoff and improving water quality on farms, especially during the winter months.

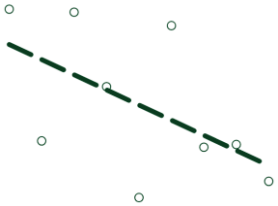
Statewide Results of Natural Resources Restoration Projects

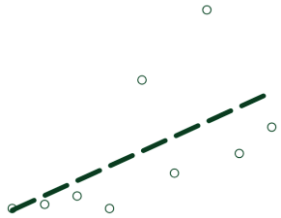
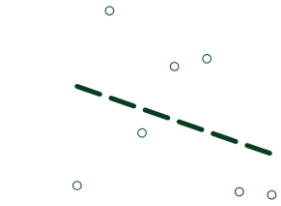
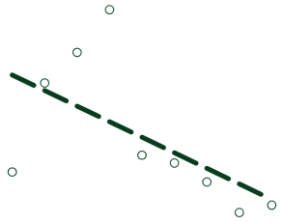
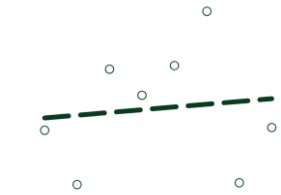
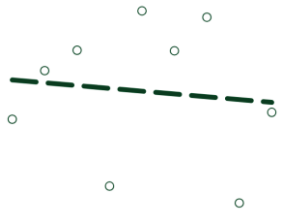
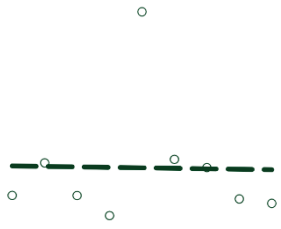
Natural resources restoration projects involve the restoration and protection of natural infrastructure functions that prevent and abate nutrient and sediment pollution. Natural infrastructure includes floodplains, river corridors, lakeshores, wetlands, and forests. Most natural resources restoration projects reflected in this report are voluntary, and results may vary year-to-year depending on landowner willingness to participate, partner capacity, the timing of reporting, and other factors. Landowner outreach and investment in partner capacity to complete these types of projects is a crucial component to continued progress in clean water work in the natural resources sector. Annual variation in the level of project outputs reported for some project types in the natural resources sector is expected, particularly when projects require multi-year planning and design work, legal agreements, and partner coordination. Trends for many measures in the natural resources sector are steady or slightly declining in recent years. Because projects in the natural resources sector are primarily voluntary and non-regulatory, rates of project completion may be affected by many factors, including a dearth of identified project opportunities and a need to build new relationships to increase landowner willingness to implement projects. There is a need for more analysis on this trend to determine the root cause(s) and identify and implement programmatic adjustments to further progress. The following table summarizes project outputs associated with state-funded natural resources restoration projects. Project development measures reflect efforts in the identification, prioritization, and design of projects. Project output measures reflect the impact of project implementation or construction. The figures presented in the table show total outputs by SFY based on currently available data. Linear trend lines are provided to highlight the general rate of progress; however, trends are subject to change in future years based on increased data availability.

Table 8: Outputs of state-funded natural resources restoration projects implemented statewide since SFY 2016.

Project Development Measures	Total SFY 2016–2024	Trend SFY 2016–2024	Data Notes
Stream miles assessed by Stream Geomorphic Assessment, River Corridor Plan	282		Extensive work to complete Stream Geomorphic Assessments and River Corridor Plans occurred in the early 2000s, resulting in a substantial amount of data in most watersheds across the state and a limited need to complete additional assessments in recent years. Ongoing work to develop tools and resources to streamline these processes will support targeted re-assessments in priority areas of the state.

Project Development Measures	Total SFY 2016–2024	Trend SFY 2016–2024	Data Notes
Number of natural resources restoration projects identified	788		This metric includes projects identified through River Corridor Plans, Stream Geomorphic Assessments, and Lake Watershed Action Plans. The number of projects identified is a direct result of assessment efforts completed.
Acres of river corridor scoped for easement	1,511		Initial scoping efforts may involve a single property or multiple properties, and results are expected to vary annually based on interest and capacity.
Number of preliminary (30%) designs completed	65		Not all natural resources projects require formal design. If only one design phase is required, data are reflected in the final design phase.
Number of final (100%) designs completed	83		Not all natural resources projects require formal design. For example, forested riparian buffer plantings often move straight from identification to implementation. Other projects in the natural resources sector, such as dam removals, require extensive design and engineering prior to implementation.

Project Output Measures	Total SFY 2016–2024	Trend SFY 2016–2024	Data Notes
Acres of forested riparian buffer restored through buffer planting	457		Metric variation may be in part a result of granting cycles. Results in recent years may be under representative of implementation due to data reporting cycles.

Project Output Measures	Total SFY 2016–2024	Trend SFY 2016–2024	Data Notes
Acres of floodplain restored	135		Metric variation is a result of the timing of project completion. Many acres may be restored by a single project.
Linear feet of lakeshore restored	2,320		Metric variation is a result of the timing of project completion. Many linear feet may be restored by a single project.
Stream miles reconnected for restoring rivers to the least erosive condition and regaining fish passage	527		Metric is reported for barrier removal projects, like culvert replacements and dam removals. Not all river and stream projects result in a reconnection of stream miles.
Acres of wetland conserved and restored through easements	1,330		Metric variation is a result of the timing of project completion. Many acres may be conserved by a single project.
Acres of riparian corridor conserved and restored through easements	1,620		Metric variation is a result of the timing of project completion. Many acres may be conserved by a single project.
Acres of land conserved with natural resources protections	27,732		Spike in 2020 due to three large multi-thousand-acre conservation efforts. Individual projects more typically conserve in the tens or hundreds of acres.

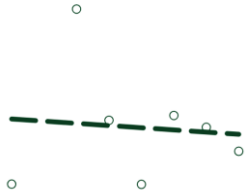
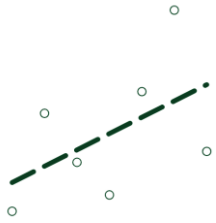
Project Output Measures	Total SFY 2016–2024	Trend SFY 2016–2024	Data Notes
Miles of forest road and trail drainage and erosion control improvements	22		Metric is primarily representative of work completed on ANR owned lands and reported to date. In future reports, this metric will include voluntary forest road and trail projects completed on private lands.
Number of stream crossings improved	107		Metric is associated primarily with forest road improvement projects. Annual results vary based on identified opportunities and project needs.

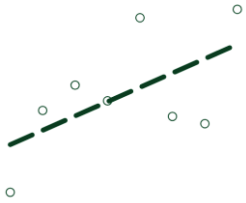
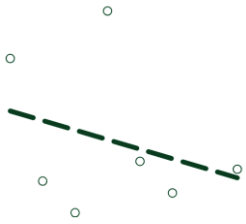
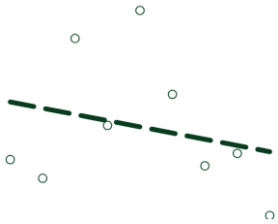
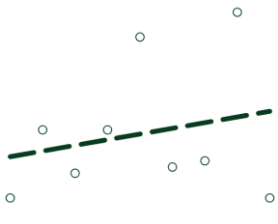
Figure 17: Before (left) and after (right) of a culvert crossing removal, ditch plug installation, and road decommissioning. These images depict one project among many of the Valley Brook restoration initiative on the former Farrow Farm in Morgan, Vermont. The initiative included implementation of stream, floodplain, wetland, and forestry restoration clean water projects. The work reconnected tributaries to historic flow paths, plugged and filled agricultural ditches, restored hydrology to wetland areas, and restored farm and forest roads to grassland and forest. The project was funded with Clean Water Fund dollars administered through the Memphremagog Clean Water Service Provider's (CWSP) Water Quality Restoration Formula Grant. VHCB serves as the CWSP for the Memphremagog basin. This multi-component project was implemented by the Memphremagog Watershed Association and the NorthWoods Stewardship Center. Match dollars were provided by The Nature Conservancy. Work was completed in the spring of 2024.

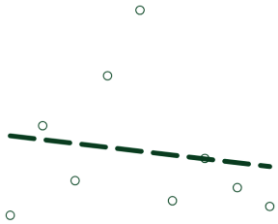
Figure 18: Before (left) and after (right) of a barrier removal and river channel restoration project on the Mettawee River in Dorset, Vermont. A concrete sill under a bridge created a large scour pool and severe bank erosion downstream of the structure. The sill was removed, and the bridge was widened to reduce further erosion. A support in the middle of the bridge was also removed, restoring 300 feet of the stream channel. Additionally, the upstream, river right, floodplain bench was lowered and a flood chute added so the river can better flow onto its floodplain when needed. The project was implemented by Trout Unlimited and funded with Clean Water Fund dollars administered through the South Lake Champlain CWSP's Water Quality Restoration Formula Grant. The Rutland Regional Planning Commission serves as the CWSP for South Lake Champlain basin in collaboration with Poultney-Mettowee Natural Resources Conservation District. Additional funding for the project was provided by the Lake Champlain Basin Program, U.S. Fish and Wildlife Service, U.S. Forest Service, and a private donor. Work was completed in the fall of 2023.

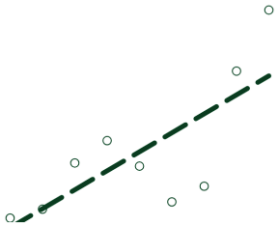
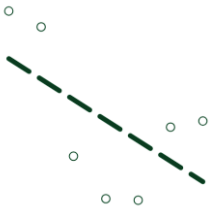
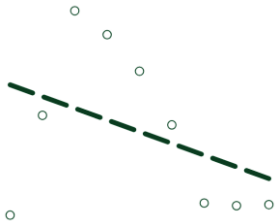
Statewide Results of Developed Lands Projects

Developed lands projects mitigate erosion and treat polluted stormwater runoff containing nutrient and sediment pollution from impervious surfaces. Stormwater treatment practices capture and treat flow from parking lots, sidewalks, and rooftops, while transportation-related stormwater projects reduce erosion and mitigate pollutants from road-related sources. The following table summarizes project outputs reported through state funding programs and regulatory programs. State funding programs provide funding to support project design and implementation/construction for both regulatory and non-regulatory projects. The figures presented in the table show total outputs by SFY based on currently available data. Linear trend lines are provided to highlight the general rate of progress; however, trends are subject to change in future years based on increased data availability.

Table 9: Outputs of stormwater treatment and road erosion remediation projects implemented statewide, reported through state funding programs or regulatory programs since SFY 2016.

Non-Regulatory Project Development and Output Measures	Total SFY 2016–2024	Trend SFY 2016–2024	Data Notes
Number of projects identified through Stormwater Master Plans	1,066		Results of identification are variable year-to-year, depending on the timing and magnitude of assessment work.
Number of illicit/unauthorized discharges confirmed (to be addressed by the responsible municipality or landowner)	134		The program supporting this work recently transitioned to a new structure. Work in recent years has focused on data development to support upcoming field-based investigations.
Number of preliminary (30%) designs completed	266		Results in recent years may be under representative of implementation due to data reporting cycles.
Number of final (100%) designs completed	174		Results in recent years may be under representative of implementation due to data reporting cycles.

Non-Regulatory Project Development and Output Measures	Total SFY 2016–2024	Trend SFY 2016–2024	Data Notes
Acres of existing impervious surface treated by stormwater treatment practices	559		Sub jurisdictional (non-regulatory) stormwater treatment is voluntary and subject to annual variation based on project readiness and landowner willingness.

Regulatory Project Development and Output Measures	Total SFY 2016–2024	Trend SFY 2016–2024	Data Notes
Acres of existing impervious surface treated by stormwater treatment practices under stormwater permits[37]	1,627		Results of stormwater permits are reported at the time of permit issuance, and permittees have five years to implement the required stormwater control measures. Recent increase is driven by the issuance of permits for Vermont's Three-Acre Sites.[38]
Acres of new impervious surface treated by stormwater treatment practices under stormwater permits[37]	1,181		Results of stormwater permits are reported at the time of permit issuance, and permittees must implement stormwater control measures at the same time impervious surfaces are constructed. Treatment of new impervious surfaces is dependent on the pace of new development.
Hydrologically connected municipal road miles inventoried[39]	6,137		Municipalities were required to submit initial Road Erosion Inventories (REIs) by the end of 2020. The number of hydrologically connected (adjacent to or intersecting surface waters) municipal road miles inventoried in each state fiscal year illustrates that permit compliance deadline, with most road miles inventoried between SFY 2017–2021.

[37] For more information on stormwater permits, see

Appendix F: Results of State Stormwater Regulations.

[38] For more information on three-acre sites, visit: https://dec.vermont.gov/watershed/stormwater/permit-information-applications-fees/operational-stormwater-permits-0

[39] State funding programs supported the completion of required Road Erosion Inventories (REIs), however this datapoint is drawn directly from the inventory results, rather than from funding program data.

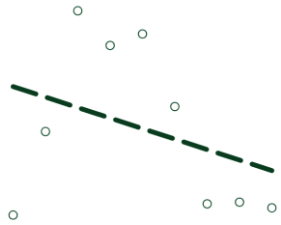
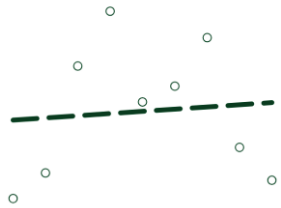
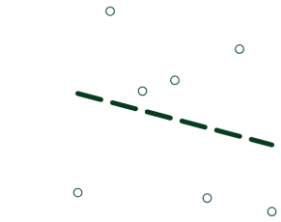
Regulatory Project Development and Output Measures	Total SFY 2016–2024	Trend SFY 2016–2024	Data Notes
Hydrologically connected municipal road miles identified as requiring water quality improvements[40]	2,599		As compliance with MRGP continues to progress, it is expected that road miles identified as requiring water quality improvements will be reduced.
Miles of municipal road drainage and erosion control improvements supported through state funding programs	372		Not all municipal road drainage and erosion control work is supported through state funding programs, therefore total implementation is likely higher than available data. Improvement work is expected to follow a similar trend to identification work, driven by the permit timeline.
Number of municipal road drainage and stream culverts replaced supported through state funding programs	1,080		Not all municipal road drainage and erosion control work is supported through state funding programs, therefore total implementation is likely higher than available data.

Figure 19: Before (left) and after (right) of a road and parking area stormwater erosion control project. The project area was identified as a high priority in the Stormwater Master Plan for the town of St. Johnsbury, Vermont. The designed practices manage almost 18 acres of impervious surface. The project was developed by the Caledonia County Natural Resources Conservation District (NRCD) with support from a Project Development Block Grant administered by the

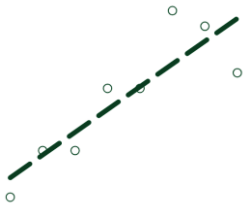
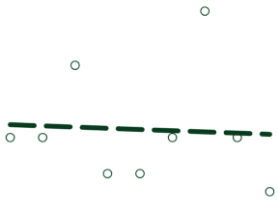
[40] The segment scoring methodology under the Municipal Roads General Permit was updated in March 2023. More information, including the updated scoring methods, is available here: https://dec.vermont.gov/watershed/stormwater/permit-information-applications-fees/municipal-roads-program

Natural Resources Conservation Council. Caledonia County NRCD received Clean Water Fund dollars for project design and implementation through the Design and Implementation Block Grants administered by Mount Ascutney Regional Commission (MARC) and Watersheds United Vermont (WUV). Implementation of this project was completed in the winter of 2024.

Statewide Results of Wastewater Projects

Wastewater projects decrease the amount of nutrients, like phosphorus and nitrogen, and other pollutants that reach our waterways from wastewater systems through treatment upgrades, combined sewer overflow (CSO) abatement, and refurbishment of aging infrastructure. Clean water projects completed in the wastewater sector are primarily compelled by regulations intended to address point sources of pollution, and some state funding programs provide financial assistance to support regulatory compliance. Clean water projects in the wastewater sector are capital intensive and can take many years to complete, resulting in variation in outputs from year-to-year. The following table summarizes project outputs associated with state-funded wastewater projects. Project development measures reflect efforts in the identification, prioritization, and design of projects. Project output measures reflect the impact of project implementation and construction. The figures presented in the table show total outputs by SFY based on currently available data. Linear trend lines are provided to highlight the general rate of progress; however, trends are subject to change in future years based on increased data availability.

Table 10: Outputs of state-funded wastewater projects implemented statewide since SFY 2016.

Project Development Measures	Total SFY 2016–2024	Trend SFY 2016–2024	Data Notes
Number of preliminary (30%) designs completed	59		Shortages in the local engineering labor force may be affecting the pace of planning and design work in recent years.
Number of final (100%) designs completed	40		Shortages in the local engineering labor force may be affecting the pace of planning and design work in recent years.

Project Output Measures	Total SFY 2016–2024	Trend SFY 2016–2024	Data Notes
Number of combined sewer overflow (CSO) abatements completed	7		Combined sewer overflows (CSOs) may require multiple abatement projects to achieve water quality standards or eliminate any potential discharge from the CSOs. ARPA funding is available to support this work and may result in increased results in future reporting.

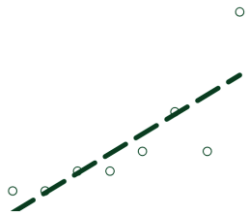
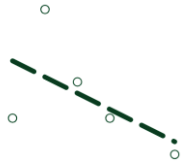
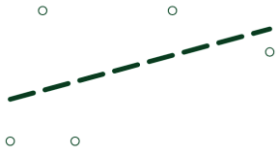
Project Output Measures	Total SFY 2016–2024	Trend SFY 2016–2024	Data Notes
Number of wastewater collection systems refurbished	27		Increase in SFY 2024 is a result of flood damage assessments focused on identifying affected collection infrastructure.
Number of wastewater treatment systems refurbished	13		A refurbished wastewater treatment facility refers to a facility with improvements or renovations that enable it to continue to operate efficiently.
Number of wastewater treatment system upgrades completed	13		An upgraded wastewater treatment facility refers to facility improvements to increase treatment capacity, which can include increased treatment types, volumes, or both.
Number of wastewater treatment systems constructed	50	No trend data available	New measure as of SFY 2024 reporting. This metric represents investments in private on-site wastewater systems, currently being supported by ARPA funding initiatives.

Figure 20: One of three wastewater treatment facilities operated by the City of Burlington. The city has partnered with the State of Vermont to finance several municipal wastewater treatment facility improvements and combined sewer overflow abatement projects. Financing this work has been possible in part by the low-interest loans available through the Clean Water State Revolving Fund.

Cost-Effectiveness of State Clean Water Investments

The previous section of this report summarizes the results of state-funded clean water projects completed from SFY 2016 to SFY 2024. Given the significant costs of restoring and protecting water quality, the state must efficiently and effectively spend its resources. The cost-effectiveness of clean water projects is expressed as state dollars invested per kilogram of estimated total phosphorus load reduction over the anticipated lifespan of the project.[41] If projects are maintained beyond their anticipated lifespan, the cost-effectiveness of the project improves. Cost-effectiveness can only be calculated for project types where estimated total phosphorus load reductions and cost data are available at the project level. Leveraged local and federal funds associated with state-funded projects are not included in the calculation of cost-effectiveness of state investments.[42] Some projects are fully funded with state funding sources. Projects that leverage local and federal funding offset the costs carried by the state to complete the project, increasing the cost-effectiveness of state investments. The figure and table below summarize the cost-effectiveness of state investments in reducing phosphorus pollution by sector.[43]

[41] Cost-effectiveness and project level cost rates related to the Water Quality Restoration Formula Grants are calculated differently than cost-effectiveness presented in this report based on program-specific considerations. For more information, see the Final Water Quality Restoration Formula Grant Targets and Fund Allocation Methodology, available here: https://dec.vermont.gov/water-investment/statues-rules-policies/act-76/background-law-rule-and-guidance

[42] To view total project cost-effectiveness including all reported funding sources, visit the Clean Water Interactive Dashboard: https://anrweb.vt.gov/DEC/cleanWaterDashboard/

[43] Cost-effectiveness data are presented in real dollars, adjusted to the end of SFY 2024 for comparison purposes. Inflation adjustments were calculated based on the United States Bureau of Labor Statistics Consumer Price Index for All Urban Consumers (CPI-U).

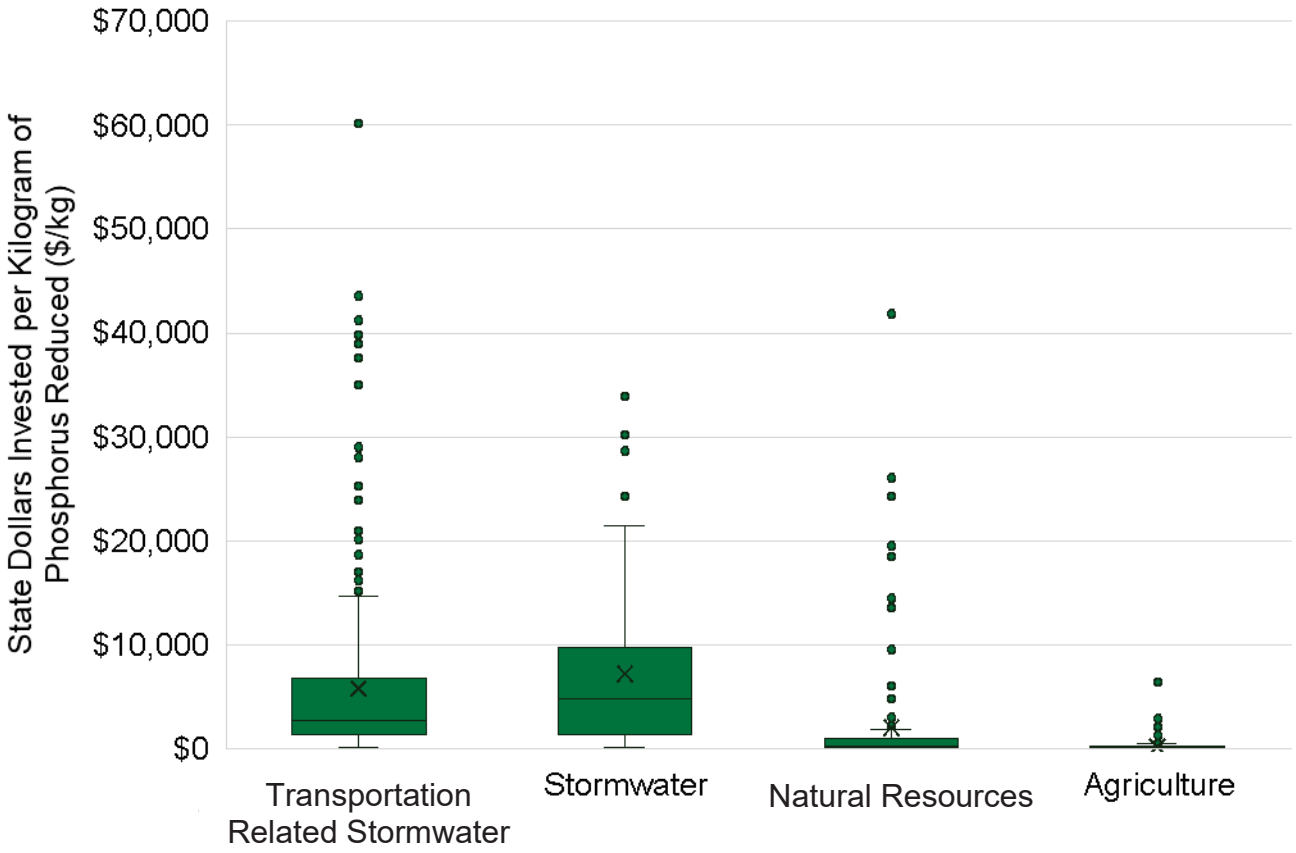


Figure 21: Dollars invested per estimated kilogram of total phosphorus load reduced over the lifespan of each project type, based on clean water projects funded through State of Vermont agencies completed in SFY 2016–2024.[44]

Table 11: Minimum, median, and maximum cost-effectiveness ($/kg of phosphorus reduced) of state investments in clean water projects by project type.

Metric	Transportation Related Stormwater	Stormwater	Natural Resources	Agriculture
Minimum	$158	$132	$28	$1
Median	$2,707	$4,845	$298	$104
Maximum	$60,208	$33,896	$41,865	$6,399
Sample size (n)	386	89	142	10,282

[44] Some projects were removed from the analysis due to project costs including work that is not directly associated with phosphorus reductions.

Metric	Transportation Related Stormwater	Stormwater	Natural Resources	Agriculture
Practices included in analysis	• Road erosion control on hydrologically connected municipal road segments	• Bioretention • Infiltration trench • Gravel wetland • Surface infiltration • Grass swale • Porous pavement • Wet pond • Hydrodynamic swirl separator • Sand filter • Extended dry detention pond • Gully stabilization	• Riparian buffer • Lakeshore restoration • Floodplain restoration • Stream restoration	• Crop rotation • Cover crop • Conservation tillage • Riparian buffer • Grassed waterway • Grazing management • Manure injection

Explanation of Figure 21 and Table 11

Achieving Vermont's water quality goals requires action across all land use sectors. It is expected that the range of cost-effectiveness varies by project type, but the key is to target funds to the most cost-effective projects within each land use sector to maximize the impact of investments. The State of Vermont employs science-based assessments to identify and prioritize projects and incorporates those prioritized actions in Tactical Basin Plans. The figure and table above show the distribution of cost-effectiveness across four land use sectors where project level cost and phosphorus reduction data required to calculate cost-effectiveness are available.

Clean water projects in the agricultural and natural resources sectors included in this analysis are among the most cost-effective practices in terms of dollars invested per unit of estimated phosphorus pollution reduced. In the agricultural sector, practices such as conservation tillage, cover crop, and manure injection are highly cost-effective annual practices, but must be implemented each year to sustain pollution reduction results. In the natural resources sector, project level cost-effectiveness includes more variability. Forested riparian buffers are highly cost-effective, and have a 10 to 20-year lifespan, which results in more sustained phosphorus reduction compared to annual agricultural field and pasture projects. Note that riparian buffers on agricultural lands are included under agricultural pollution prevention practices, while buffers planted on all other land uses are considered natural resources restoration projects. Small-scale projects in the natural resources sector tend to have a low total cost to implement, but may also contribute a small pollution reduction benefit, thus appearing as relatively less cost-effective. However, it is important to implement projects across a range of scales to meet the state's pollution reduction goals.

Stormwater and transportation infrastructure projects tend to be more expensive per unit of estimated phosphorus pollution reduced. Stormwater practices are generally engineered structural practices that can incur high construction costs, but these practices

are necessary to achieve required reductions from developed lands and have relatively long lifespans, achieving phosphorus load reductions for 20 years or more if properly maintained. The large range in the cost-effectiveness of road practices may be a result of some municipalities remediating the highest priority, most complex road segments (and therefore most expensive road segments) first to comply with the Municipal Roads General Permit (MRGP). Additionally, road project cost and complexity can vary based on what practices need to be installed to bring a road segment up to MRGP standards.

Chapter 3: Clean Water Investments and TMDL Progress in the Lake Champlain Basin

Lake Champlain TMDL

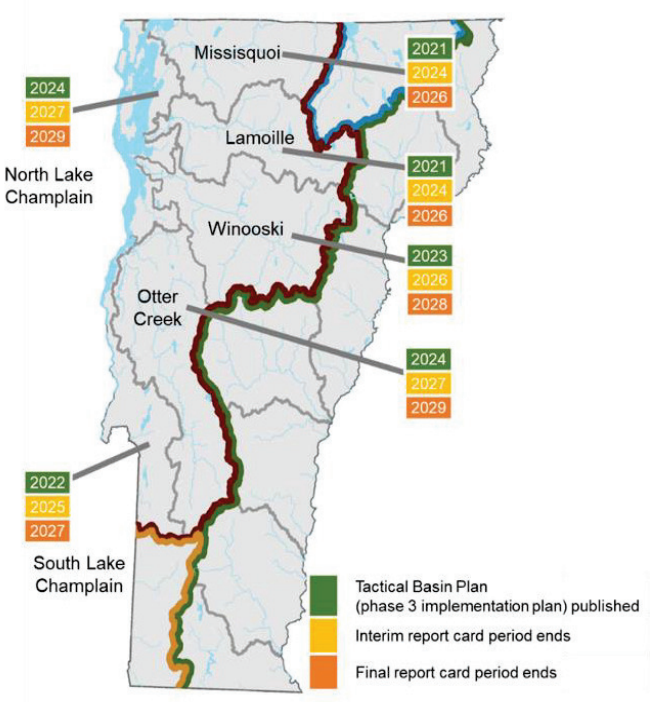


Figure 22: Lake Champlain TMDL Accountability Framework schedule by Tactical Basin Plan watershed.

Lake Champlain is one of the largest lakes in North America and its watershed drains nearly half the land area of Vermont, as well as portions of northeastern New York and southern Québec. Phosphorus levels in some portions of Lake Champlain regularly exceed Vermont's water quality standards, which contributes to cyanobacteria blooms, low dissolved oxygen concentrations, impaired aquatic life, and reduced recreational use. The Lake Champlain restoration plan, *Phosphorus Total Maximum Daily Loads for Vermont Segments of Lake Champlain* (Lake Champlain TMDL), identifies phosphorus load reductions that must be achieved in each of the 12 lake segment watersheds of the Lake Champlain basin in Vermont to meet State of Vermont water quality standards.[45] Total phosphorus loading to Lake Champlain from Vermont was modeled to be 630.6 metric tons per year (MT/year) during the TMDL baseline period of 2001 to 2010. The TMDL states total phosphorus loading to the lake must be reduced to 418.1 MT/year by the end of calendar year 2036 to achieve Vermont's water quality standards, a 212.4 metric ton net reduction from the baseline.[46] The following figure provides a visual representation of the TMDL baseline, load allocation, and required phosphorus load reduction.

[45] Tactical Basin Plan watersheds may include more than one lake segment watershed. See Figure 28 for a map of lake segment watersheds. *Phosphorus Total Maximum Daily Loads for Vermont Segments of Lake Champlain* available at: https://dec.vermont.gov/watershed/restoring/champlain

[46] TMDL allocations in the wastewater sector allow for an increase in loading from the baseline condition so gross reductions greater than 212.4 metric tons are needed to offset the potential increase in loading from the wastewater sector permitted maximum.

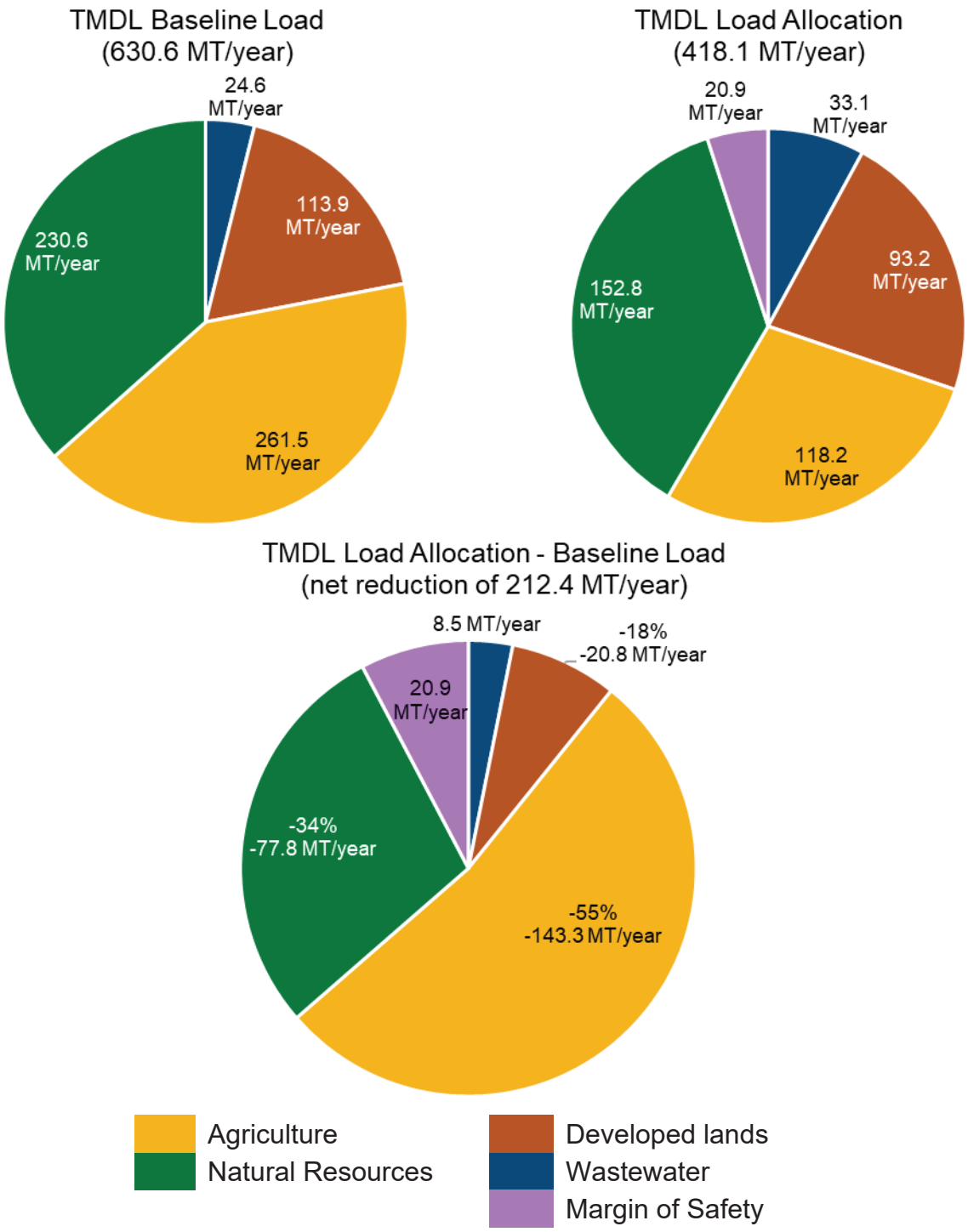


Figure 23: Lake Champlain TMDL baseline load, allocation, and modeled load increase (+) or reduction (-) by sector. Percentage indicates percent reduction from baseline for sectors with a required reduction.

Explanation of Figure 23

The Lake Champlain TMDL sets estimated phosphorus load reduction requirements for each land use sector by assessing baseline conditions and establishing TMDL load allocation representing modeled estimates of the maximum annual phosphorus loading to the lake without in-lake phosphorus concentrations exceeding water quality standards. Reductions are required across the agricultural, developed lands, and natural resources

(forests and streams) sectors. The TMDL load allocation accounts for a potential increase in loading from the wastewater sector, and includes a Margin of Safety allocation to account for the uncertainty of future loading associated with climate change. While implementation of the TMDL does not prescribe required reductions by sector, reaching the phosphorus load allocation established by the Lake Champlain TMDL by achieving required reductions in total loading will require efforts across all sectors, and the approach to water quality restoration involves both regulatory and voluntary actions. If one sector falls short of meeting its goals, there is limited opportunity for other sectors to pick up the slack. Successful implementation of the Lake Champlain TMDL is supported in large part by state and federal funding programs, however some regulations designed to implement the TMDL are expected to be achieved through private funding sources.

The Lake Champlain TMDL contains an Accountability Framework intended to ensure adequate progress toward reducing phosphorus pollution to Lake Champlain. The Framework sets a schedule for the U.S. Environmental Protection Agency (EPA) to issue report cards on the State of Vermont's progress throughout the 20-year implementation timeframe (2016–2036). Tactical Basin Plans are updated on a five-year rotating basis and include Implementation Tables with priority actions to implement the Lake Champlain TMDL. The EPA issues interim report cards halfway through the five-year planning cycle and final report cards at the end of the five-year planning cycle based on progress reports produced by DEC (Figure 22).[47] The EPA uses this chapter of the *Clean Water Initiative Annual Performance Report* and its appendices to help determine satisfactory progress for the Lake Champlain TMDL. Progress reports for the 2024 reporting cycle are included in Appendix B – E of this report.

The following sections of the report summarize available data on state and federal funding and regulatory programs' clean water efforts in the Lake Champlain basin that are contributing to Lake Champlain TMDL progress.

[47] Additional Lake Champlain TMDL Implementation Progress Report information available at: https://www.epa.gov/tmdl/lake-champlain-phosphorus-tmdl-commitment-clean-water

Vermont's Clean Water Investments in the Lake Champlain Basin

Reaching Lake Champlain's water quality goals requires investments across all land use sectors. The following figure summarizes state and Lake Champlain Basin Program investments in the Lake Champlain basin from SFY 2016 to 2024.

Click symbol to view description of accountability measures.

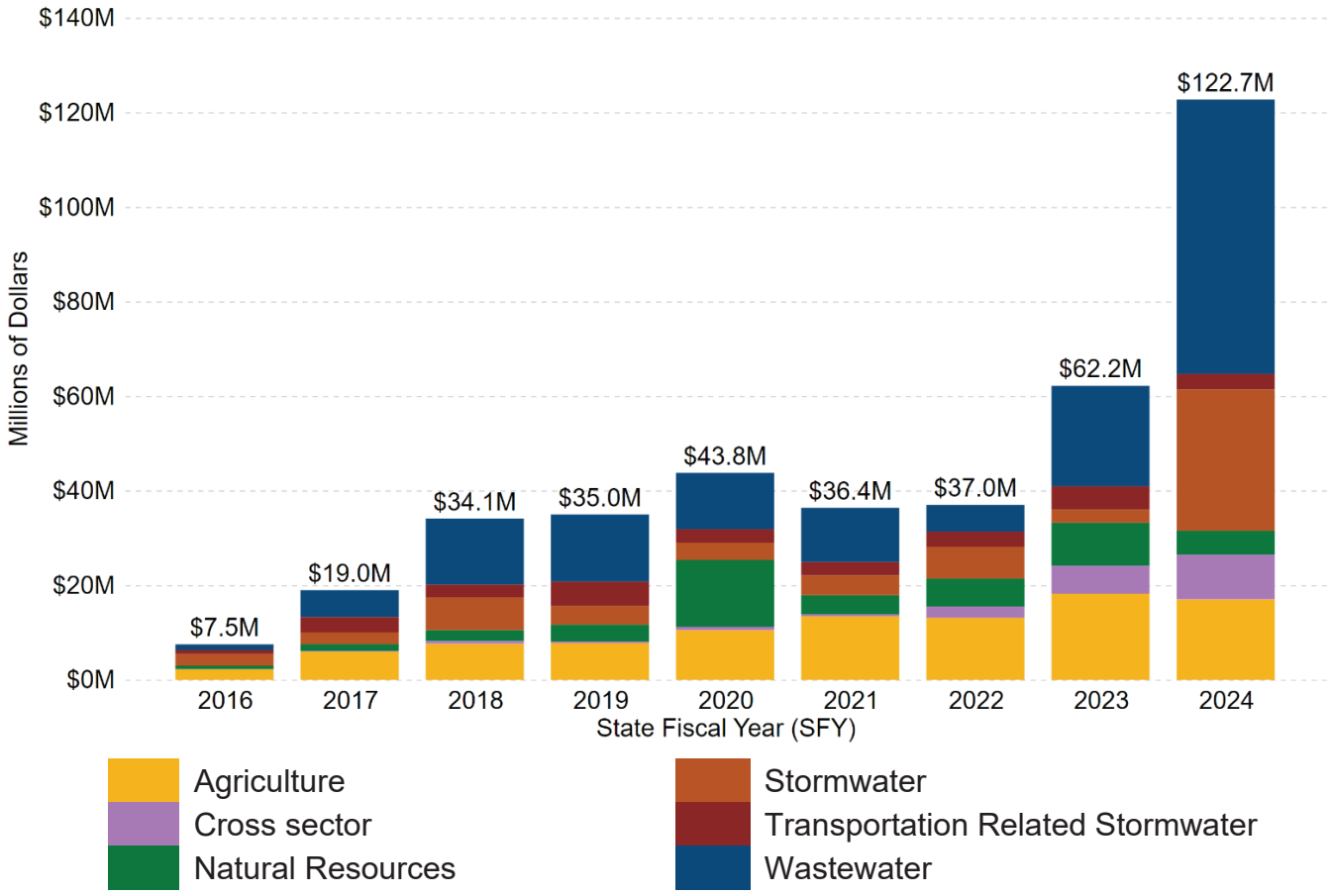


Figure 24: Total dollars awarded by State of Vermont agencies and the Lake Champlain Basin Program to clean water projects in the Lake Champlain basin by land use sector, SFY 2016–2024. *Federal funding data administered directly by USDA-NRCS are not included in this figure.*

Explanation of Figure 24

The State of Vermont and the Lake Champlain Basin Program have invested nearly $400 million in clean water projects in the Lake Champlain basin since SFY 2016. Each year during the reporting period, between 55–70% of state funding for clean water has been directed to projects located within the Lake Champlain basin. The Lake Champlain TMDL sets substantial targets for pollution reduction, and substantial commitment and investment at the state, federal, and local level are needed to achieve Vermont's water quality goals in the basin. Funding is reported as awards are issued, and results of funding may lag behind awards as projects move towards completion, and the associated data are reported. The large increase in funding awarded to the stormwater and wastewater sectors in SFY 2023 and 2024 is primarily driven by the short-term availability of ARPA funding administered by state agencies. Cross-sector funding awarded beginning in SFY 2022 is largely representative of the Water Quality Restoration Formula

Grants awarded to Clean Water Service Providers under Act 76. For more information on Act 76 funding programs, see Appendix A: Act 76 of 2019.

Estimated Total Phosphorus Load Reductions in Lake Champlain Basin

Click symbol to view description of accountability measures.

The State of Vermont estimates the pollutant load reductions associated with clean water projects to track progress towards achieving water quality goals. The following figure summarizes the estimated total phosphorus load reductions associated with projects implemented through state and federal funding and regulatory programs in the Lake Champlain basin from SFY 2016 to 2024 by sector.[48, 49]

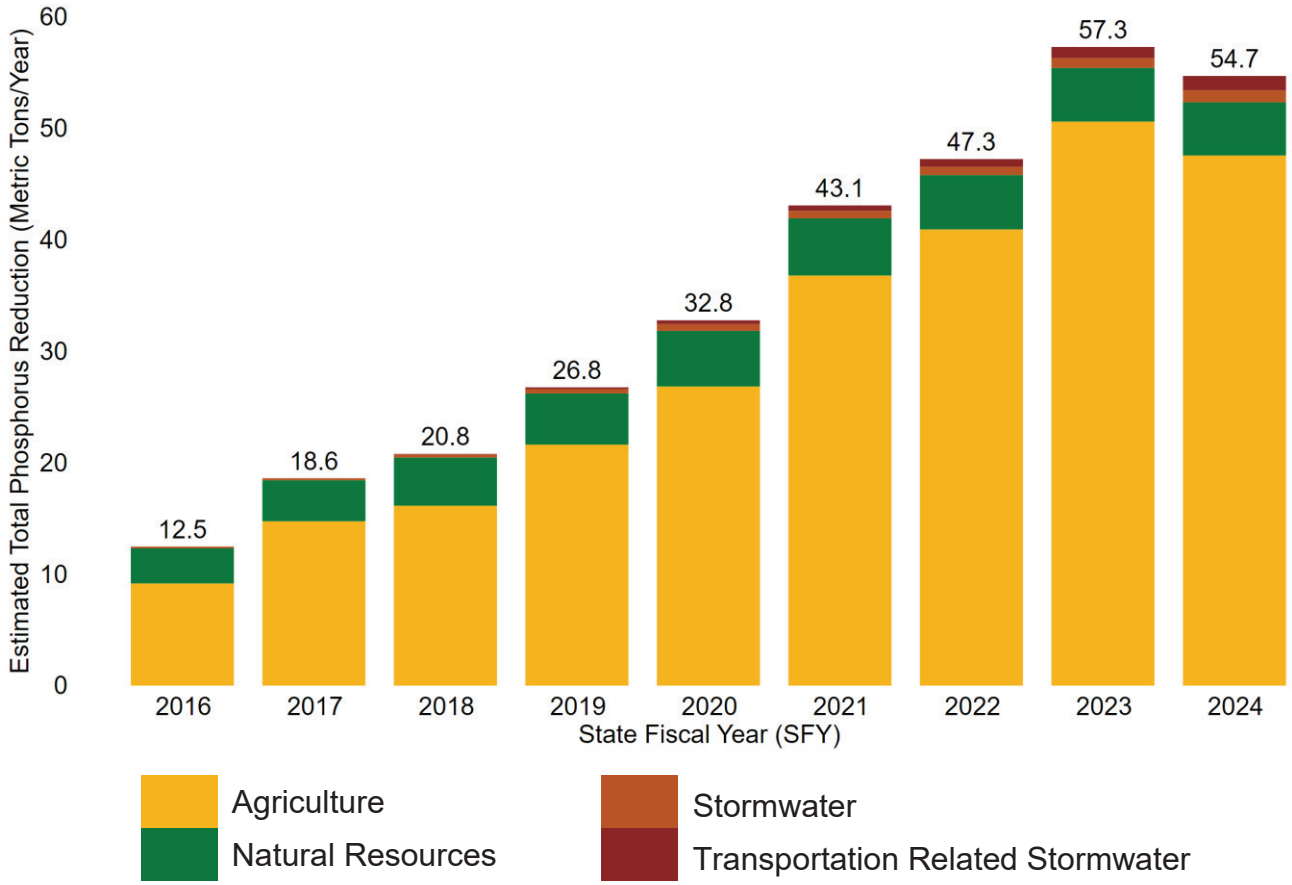


Figure 25: Annual estimated total phosphorus load reductions (MT/year) associated with projects implemented through state and federal funding and regulatory programs in the Lake Champlain basin in effect during SFY 2016–2024 by land use sector.[50]

[48] For more information on the methods used to estimate phosphorus load reductions, see documentation on Standard Operating Procedures (SOPs) for tracking and accounting of phosphorus reductions: https://dec.vermont.gov/water-investment/cwi/state-vermont-clean-water-projects/clean-water-project-tracking-accounting#SOP

[49] See Status of Pollutant Accounting Implementation section for current project/practice types accounted for in estimated phosphorus reductions.

[50] Annual phosphorus load reductions are cumulative for all completed/operational projects based on start date and anticipated lifespan. Results of USDA-NRCS funded projects completed since SFY 2010 that are still in effect SFY 2016–2024 are included to represent progress since the Lake Champlain TMDL baseline period.

Explanation of Figure 25

State funding programs, federal funding programs, and regulatory programs in the Lake Champlain basin implemented projects that reduced an estimated 54.7 metric tons of phosphorus at the close of SFY 2024. Phosphorus reductions in the most recent state fiscal year are often temporarily lower than in the penultimate year due to data reporting lags. For example, many agricultural grant programs operate to align with the growing season, while data collection for this report is conducted on a state fiscal year cycle (July – June). Data available for the most recent state fiscal year are generally under representative of total implementation because some results have not yet been captured. This is not necessarily indicative of a shifting trend in TMDL progress. As additional data become available, they are reflected in future years of reporting. The figure below illustrates the difference in estimated phosphorus reductions across all reporting years as reported in SFY 2023, compared to SFY 2024, to demonstrate how data lags may contribute to incomplete results in the most recent few years of estimated phosphorus reduction data.

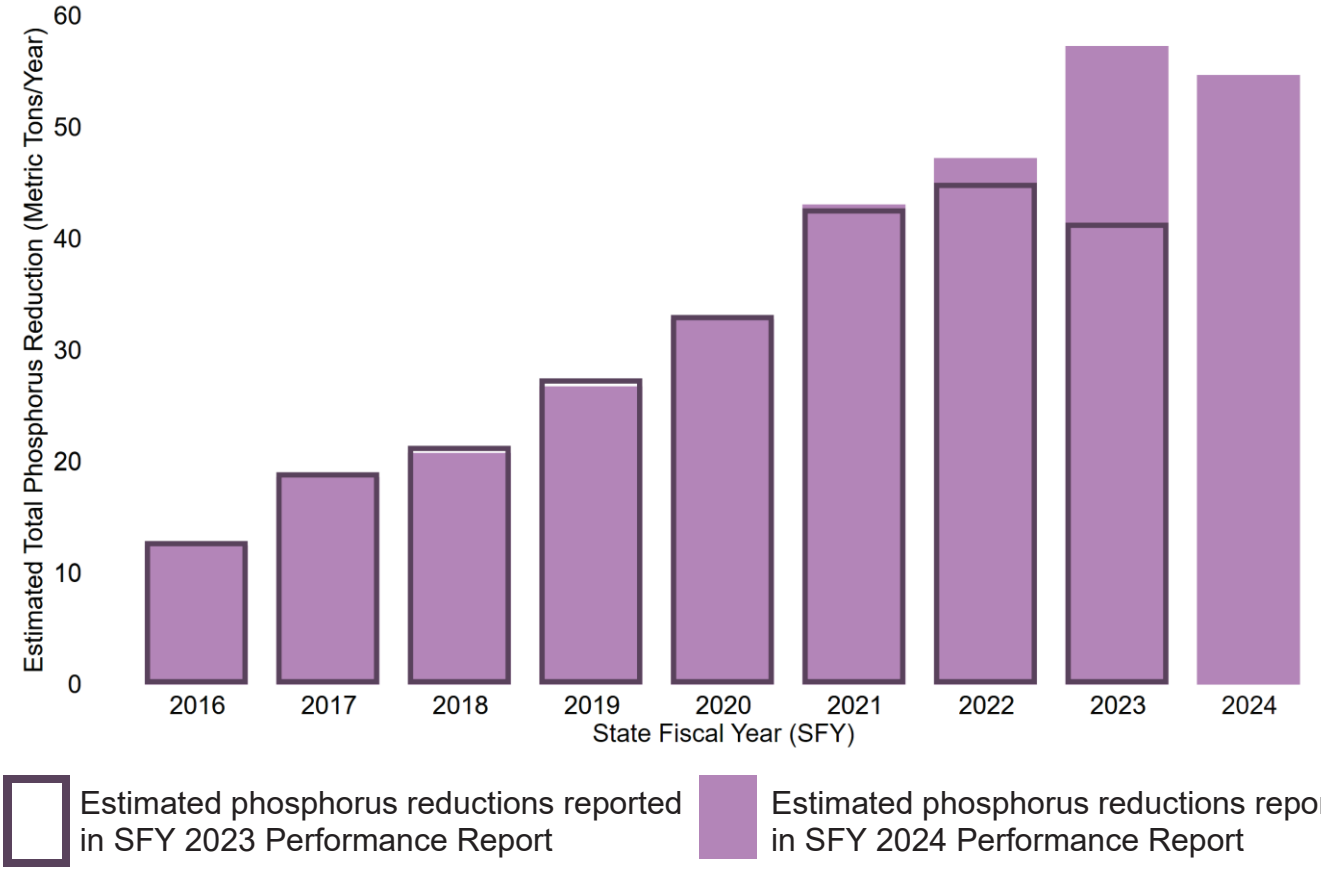


Figure 26: Estimated annual phosphorus reduction data in the Lake Champlain basin reported in SFY 2023 compared to SFY 2024.

The State acknowledges that implementation of the TMDL is not a linear path. Changing rates of progress over the 20-year implementation timeframe are to be expected and are associated with swings in financial assistance levels, and the capacity of agencies and partners to administer funds, implement projects, and report outcomes. The following paragraphs provide some context to explain TMDL implementation progress by sector.

Agriculture

Estimated phosphorus reductions presented in this report include, for the first time, the results of AAFM's Vermont Pay for Performance program, which provides performance-based payments to Vermont farmers for implementing practices to reduce phosphorus pollution from their agricultural fields. While most current conservation programs pay cost-share for practice implementation, the Pay for Performance program pays for the outcomes of practices; it recognizes that conservation practices generate value to the public and directly compensates farms for that value. This approach also allows AAFM to target water quality resources towards the highest impact farms and fields with respect to reducing Vermont's phosphorus.[51] This program is currently funded through a competitive USDA-NRCS grant, and continuation of this program is dependent on available funding in the future.

The estimated phosphorus reductions achieved to date in the agricultural sector are mostly from annual field practices, such as cover crops, reduced- or no-till, and manure injection and incorporation. Most of the phosphorus reductions required in the agricultural sector are tied to croplands, meaning that annual field practices are necessary to meet the TMDL. Annual practices must be implemented every year to sustain phosphorus reductions. Implementation of annual practices is dependent on a range of factors including weather, land management, and farm business decisions. The estimated annual phosphorus reductions associated with annual agricultural practice implementation are also influenced by a variety of external factors, including:

- Some practices can only be implemented for a limited number of years to be eligible for cost-share. Many programs are also subject to funding caps, which may limit the reported acres of practice implementation.
- Many farms implement agricultural conservation practices without the support of cost-share programs. The State is limited in its ability to capture the water quality benefits of practices implemented outside cost-share programs, and only some of these data are presented in this report.
- The multi-year federal Farm Bill governs much of the funding available to support agricultural practice implementation. Funds are often limited near the end of a Farm Bill cycle. The most recent Farm Bill, passed in 2018 and set to expire in 2023, was extended to authorize programs to continue through September 2024. However, the reauthorization did not increase specific program payment limitations, which restricts the amount of funding individual producers can receive during the current Farm Bill. As a result, many farms have been limited in their ability to access federal funds to support agricultural practice implementation in SFY 2024.
- Agricultural water quality programs have recently expanded in focus and now emphasize holistic planning and implementation on farms, the results of which may not be fully reflected in current available data.

Natural Resources

In the natural resources sector, the majority of estimated phosphorus reductions across all reporting years are attributable to phosphorus reduction accounting that captures the water quality benefits associated with the State of Vermont's Use Value Appraisal (UVA)

[51] To learn more about the Vermont Pay for Performance program, visit: https://agriculture.vermont.gov/VPFP

Program on forestland parcels.[52] Forestland parcels that are actively enrolled in the UVA Program and have been inspected for program compliance meet Vermont's Acceptable Management Practices (AMPs), a set of forestland management criteria designed to maintain and protect water quality.[53] Newly established phosphorus accounting methods for other practices in the natural resources sector are in the process of being implemented, and will be reflected in future years of reporting. These new methods will be applied to newly completed projects, as well as applied to fill gaps for previously completed projects as data availability allows.

Stormwater and Transportation Related Stormwater

Estimated phosphorus reductions in the stormwater and transportation related stormwater land use sectors have been incrementally growing. This progress is associated with increased implementation of several regulatory programs designed to reduce and mitigate stormwater pollution from developed lands and roads. Operational stormwater permits regulate stormwater discharges resulting from new development, redevelopment, and three-acre sites. Municipal Separate Storm Sewer System (MS4) permits regulate stormwater discharges in the most populous regions of the state. The Municipal Roads General Permit (MRGP) regulates stormwater related erosion on municipally owned roads.[54] Regulatory programs are at varying stages of implementation, and continued expansion of compliance will increase estimated phosphorus reductions in future years.[55]

Conclusions

Data reporting cycles vary by funding program, and some data used to estimate phosphorus reductions is subject to reporting lags. This particularly impacts the results reported for more recent state fiscal years. Data for previous years is updated each reporting cycle to comprehensively capture all available results. In some cases, administration of funding awards may take precedence over end of award reporting and data compilation, particularly in cases of time sensitive funding opportunities like those supported by ARPA funding. Changes in the pace of estimated annual phosphorus reduction progress may be in part a reflection of the completion of relatively easy to implement projects. Now that many of the ready-to-construct projects have been implemented, identification and implementation of projects that are in some cases more complex and involved, will need to be completed to reach Vermont's water quality goals in the basin. A key role of the clean water workforce includes engaging with landowners and the public to communicate the value of clean water projects, build relationships, and increase landowner willingness to engage in implementation of non-regulatory clean water projects. The variability of implementation rates across years also underscores the

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[52] For details on phosphorus accounting for UVA parcels, please see the Standard Operating Procedures for Tracking & Accounting of Natural Resources Restoration Projects: https://dec.vermont.gov/water-investment/cwi/projects/tracking-accounting#SOP

[53] Phosphorus reductions are only accounting for forestland parcels that enrolled in the UVA Program after the TMDL baseline periods. ANR is re-evaluating the methodology to account for estimated phosphorus reductions assigned to UVA Program compliance, and this review may result in changes to the estimated phosphorus reductions in the natural resources sector related to UVA Program compliance in the future.

[54] The segment scoring methodology under the Municipal Roads General Permit was updated in 2023. The results of MRGP compliance presented in this report represent updated scoring and revised phosphorus loading rates in the Lake Champlain basin to align with the current permit.

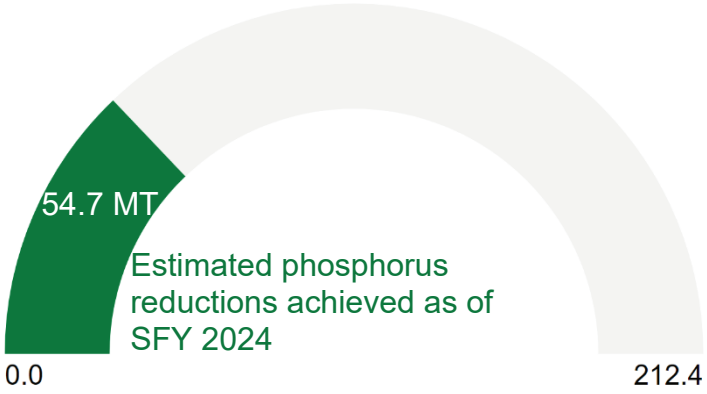
[55] For more information on regulatory stormwater programs in Vermont, visit: https://dec.vermont.gov/watershed/stormwater

importance of investing in program and partner capacity to broaden the reach and impact of clean water project implementation.

Lake Champlain TMDL Progress

Click symbol to view description of accountability measures.

Total phosphorus loading from Vermont watersheds to Lake Champlain was modeled to be 630.6 MT/year during the Lake Champlain TMDL baseline period of 2001 to 2010. The TMDL states that net phosphorus loading to Lake Champlain must be reduced by 212.4 MT/year to reach a target load of 418.1 MT/year by the end of calendar year 2036 to achieve Vermont's water quality standards. The following figure summarizes progress that has been made towards achieving the Lake Champlain TMDL as of SFY 2024.



25.8% of TMDL required reduction is reflected in reported estimated phosphorus reduction as of SFY 2024

Figure 27: Estimated total phosphorus load reductions (metric tons) achieved as of SFY 2024 relative to the Lake Champlain TMDL target total phosphorus load in MT/year.

Explanation of Figure 27

State, federal, and regulatory clean water programs have reduced an estimated 54.7 metric tons of phosphorus loading delivered to Lake Champlain in SFY 2024, which represents approximately 26 percent of the required TMDL reduction and represents a substantial increase in progress compared to previous reports. This result is expected to continue increasing in the coming years, for at least the following reasons:

- An influx in federal funding under ARPA, the Bipartisan Infrastructure Law, and the Inflation Reduction Act, an increase in Clean Water Fund revenue enacted under Act 76 of 2019, and investment in the capacity of clean water partners will drive project implementation across sectors.[56] While much of this funding is beginning to reflect in reported state investment figures, the results of these investments will not be fully reflected in estimated phosphorus reductions until projects are completed, which may take multiple years.
- The State of Vermont has been building and expanding clean water regulatory, financial, and technical assistance programs since SFY 2016. Many regulatory programs are now at a stage of implementation that will drive additional phosphorus reductions from agricultural and developed lands. Stormwater and

[56] For more information on the Clean Water Budget, visit: https://dec.vermont.gov/water-investment/cwi/board

transportation related stormwater regulatory programs in the Lake Champlain basin are anticipated to achieve an approximate 13.4 MT/year phosphorus reduction by 2036—representing 64% of reductions required from developed lands.

- The State has published methods for quantifying phosphorus reductions for agricultural, natural resources, and developed lands sector clean water practices.[57] New methods were recently established to fill gaps in capturing the phosphorus reduction benefit of several practices, particularly in the natural resources sector. These new methods are in the process of being implemented and will be reflected in future years of reporting for newly completed projects, as well as applied to fill gaps for prior completed projects.

Lake Champlain TMDL Progress by Lake Segment Watershed

The Lake Champlain TMDL allocates total phosphorus load reduction targets by lake segment watershed, which differ slightly from the boundaries of Tactical Planning Basins.

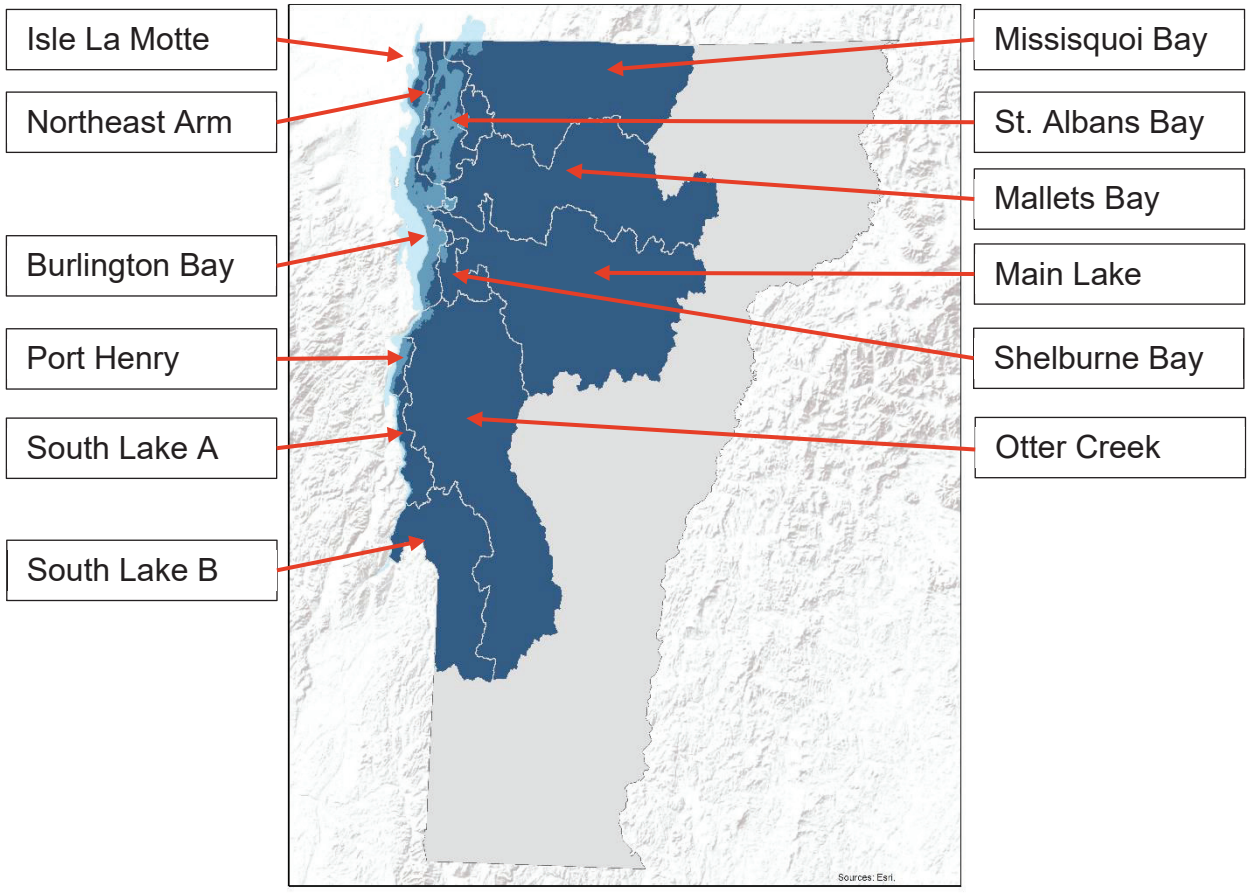


Figure 28: Lake Champlain TMDL lake segment watersheds.

[57] Standard Operating Procedures (SOPs) for tracking and accounting of phosphorus reductions are available here: https://dec.vermont.gov/water-investment/cwi/state-vermont-clean-water-projects/clean-water-project-tracking-accounting#SOP

The following figure presents estimated total phosphorus load reductions in effect in SFY 2024 by lake segment watershed compared to the target reduction established by the TMDL.

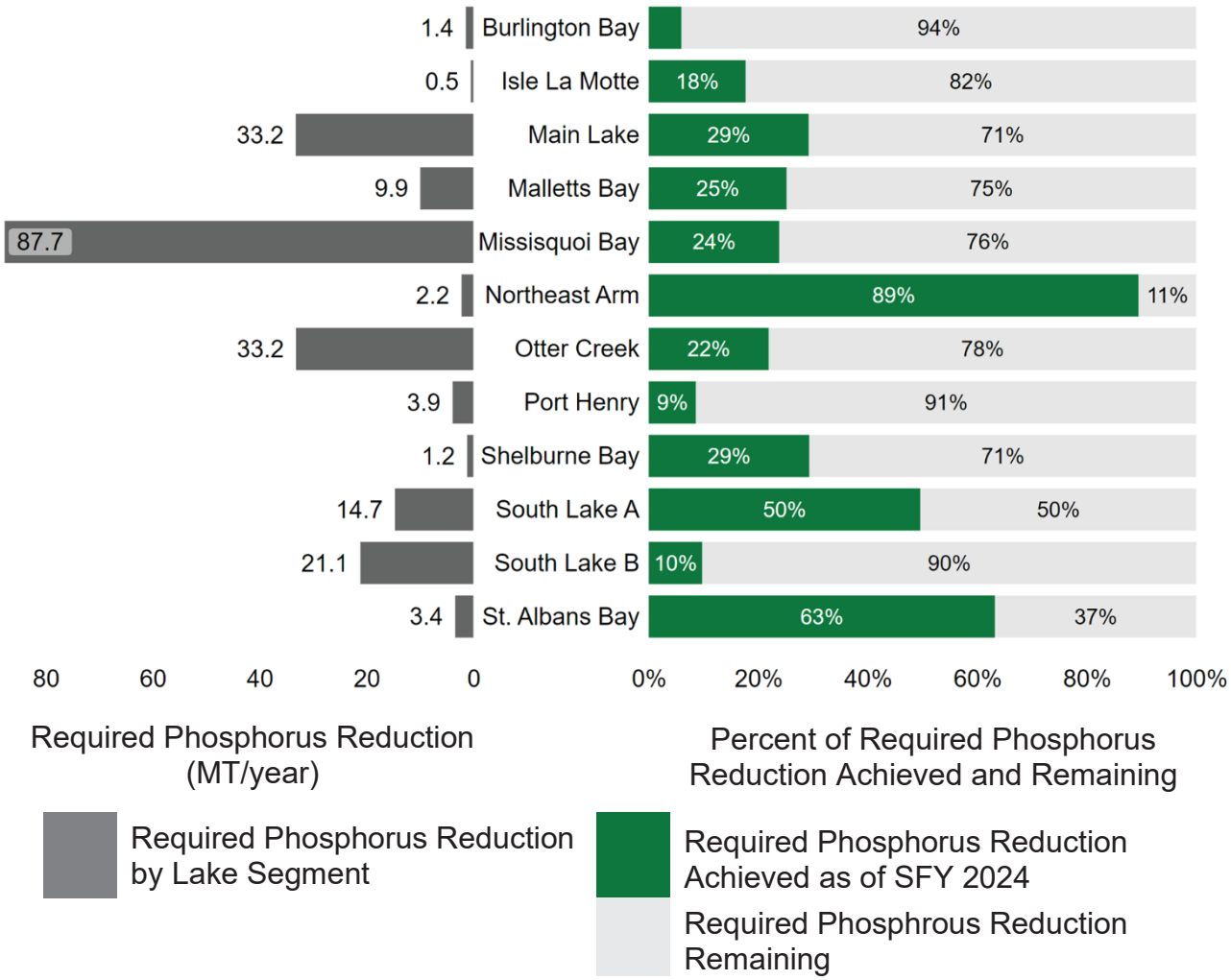


Figure 29: Estimated total phosphorus load reductions in effect during SFY 2024 by lake segment watershed (right) compared to total phosphorus load reduction targets (left) in metric tons per year. Percent represents the proportion of estimated total phosphorus load reductions achieved as of SFY 2024 compared to the lake segment target reduction.[58]

Explanation of Figure 29

The level of progress in phosphorus reductions relative to lake segment watershed target reductions in the Lake Champlain basin vary for the following reasons:

- **Lake segment size and level of phosphorus reduction required varies**: The TMDL allocated phosphorus loading capacity based on each lake segment's size, land uses, and in-lake characteristics. Phosphorus reductions required to meet Vermont water quality standards represent the difference between the baseline load

[58] To view a map of the lake segment watersheds, see Figure 28, or page three of the Lake Champlain TMDL, available at: https://dec.vermont.gov/watershed/restoring/champlain

and the loading capacity. The type and scale of project opportunities, the level of effort required, and the magnitude of phosphorus loading ranges by lake segment.

- **New phosphorus reduction accounting methods**: The State has published methods for quantifying phosphorus reductions for agricultural, natural resources, and developed lands sector clean water practices. Lake segments dominated by agricultural efforts show greater progress than lake segments targeting natural resources restoration because there are currently more comprehensive systems to quantify estimated reductions for agricultural projects compared to other sectors.

Monitored Total Phosphorus Load from Vermont Wastewater Treatment Facilities in the Lake Champlain Basin

The phosphorus load allocations in the Lake Champlain TMDL are separated into wastewater wasteload allocations and non-wastewater load allocations. Progress towards reaching the non-wastewater load allocation target is tracked through *modeled* results reflected in the other TMDL progress figures presented in this report. The wastewater wasteload allocation is tracked through *measured* water quality of effluent from the wastewater treatment facilities located within the Lake Champlain basin. The following figure shows the target wastewater wasteload allocation since the 2002 Lake Champlain TMDL and the measured total phosphorus from wastewater treatment facilities each year.

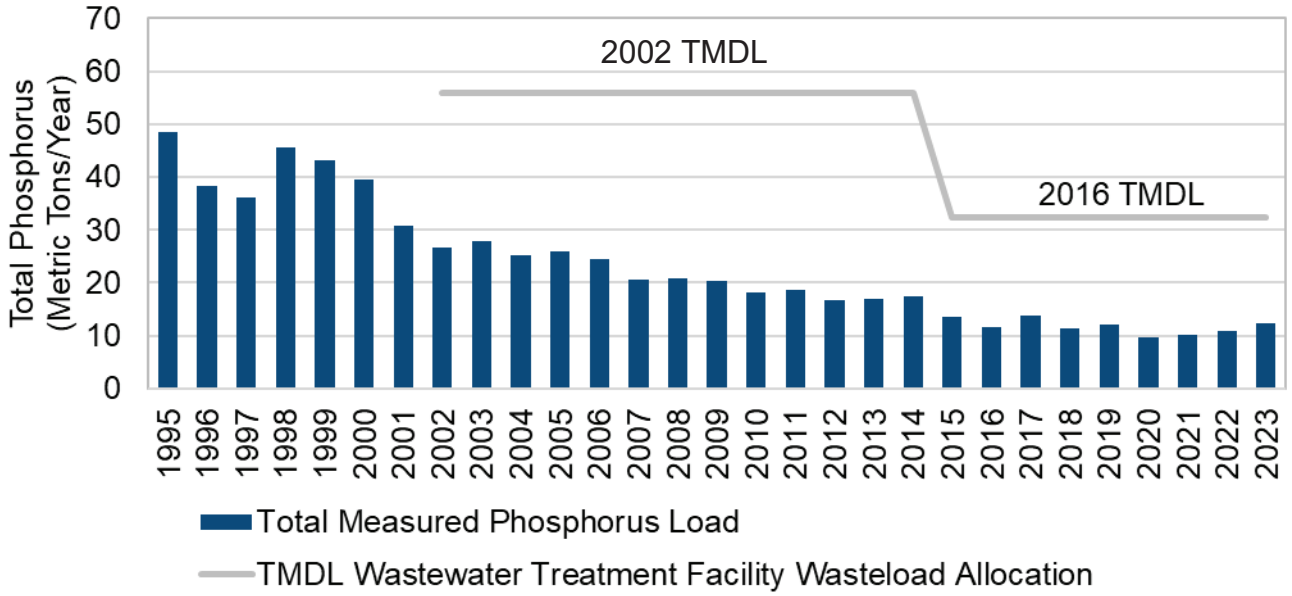


Figure 30: Measured total phosphorus load (MT/year) from Vermont wastewater treatment facilities discharging to Lake Champlain or tributaries and the Lake Champlain TMDL wastewater treatment facility wasteload allocation, calendar year 1995–2023.[59]

[59] Total measured phosphorus load does not include loading associated with combined sewer overflow (CSO) events. Untreated CSO flows contribute an extremely small proportion of total phosphorus loading to lakes in Vermont. In 2023, the Alburgh direct discharge permit was terminated and replaced with an indirect discharge permit. Discharge flows from the Alburgh treatment facility are not included in the total monitored phosphorus values for 2023.

Explanation of Figure 30

Total average annual phosphorus loading into Lake Champlain originating from Vermont wastewater treatment facilities was approximately 24.6 MT/year during the Lake Champlain TMDL baseline period of 2001–2010, representing approximately four percent of total phosphorus loading to Lake Champlain from Vermont sources. During the baseline period, measured total annual phosphorus loading from wastewater treatment facilities was well below the wasteload allocation (maximum permitted phosphorus limit) of 55.8 metric tons that was established under the 2002 Lake Champlain TMDL. The updated 2016 Lake Champlain TMDL for Vermont reduced the wastewater treatment facility wasteload allocation from 55.8 to 32.3 metric tons, which is intended to achieve the overall required phosphorus load allocation while allowing for some development and growth over the TMDL implementation timeframe. Discharge monitoring indicates Vermont wastewater treatment facilities in the Lake Champlain basin contributed approximately 12.4 metric tons of total phosphorus load to Lake Champlain in calendar year 2023, representing only 38 percent of the total wastewater treatment facility wasteload allocation under the current TMDL. These data demonstrate a consistent trend of measured total annual phosphorus load from Vermont wastewater treatment facilities, overall, well below the wasteload allocation.

Chapter 4: Clean Water Investments and TMDL Progress in the Lake Memphremagog Basin

Lake Memphremagog TMDL

Figure 31: Map of Vermont with the Lake Memphremagog, Tomifobia, and Coaticook Rivers Tactical Basin Planning region (Basin 17) highlighted in green.

Lake Memphremagog is an international waterbody with the majority of its watershed area in Vermont and a small portion in Québec. The Vermont portion of the watershed covers most of Orleans County including the three major lake tributaries: the Black, Barton, and Clyde Rivers, as well as the smaller Johns River. The Lake Memphremagog watershed is part of the larger Tactical Basin Planning region (Basin 17), which also includes the Tomifobia and Coaticook River basins that drain into Québec (Figure 31). Land use within the Vermont portion of the Lake Memphremagog watershed is largely forest or shrub with about 17 percent in agriculture, and five percent in developed lands.[60]

Phosphorus levels in the Vermont portion of Lake Memphremagog are higher than the water quality standard set for the lake. Elevated levels of phosphorus contribute to intermittent cyanobacteria blooms but also support excessive plant and algae growth that limits the quality of the lake for recreational use. The Lake Memphremagog TMDL was established in 2017 to specify the maximum amount of phosphorus that the waterbody can receive and still meet applicable water quality standards, and establish targets for reducing phosphorus loading to the lake from its watershed. Total phosphorus loading to Lake Memphremagog from Vermont was modeled to be 52.7 MT/year during the TMDL baseline period of 2009 to 2012. The TMDL states total phosphorus loading to Lake Memphremagog must be reduced by 29 percent to 37.4 MT/year by 2037 to achieve Vermont's water quality standards.[61]

[60] The Lake Memphremagog TMDL can be accessed here: https://dec.vermont.gov/sites/dec/files/wsm/mapp/docs/Memph%20TMDL%20Final%20EPA%20approved.pdf

[61] Table 10, Lake Memphremagog TMDL.

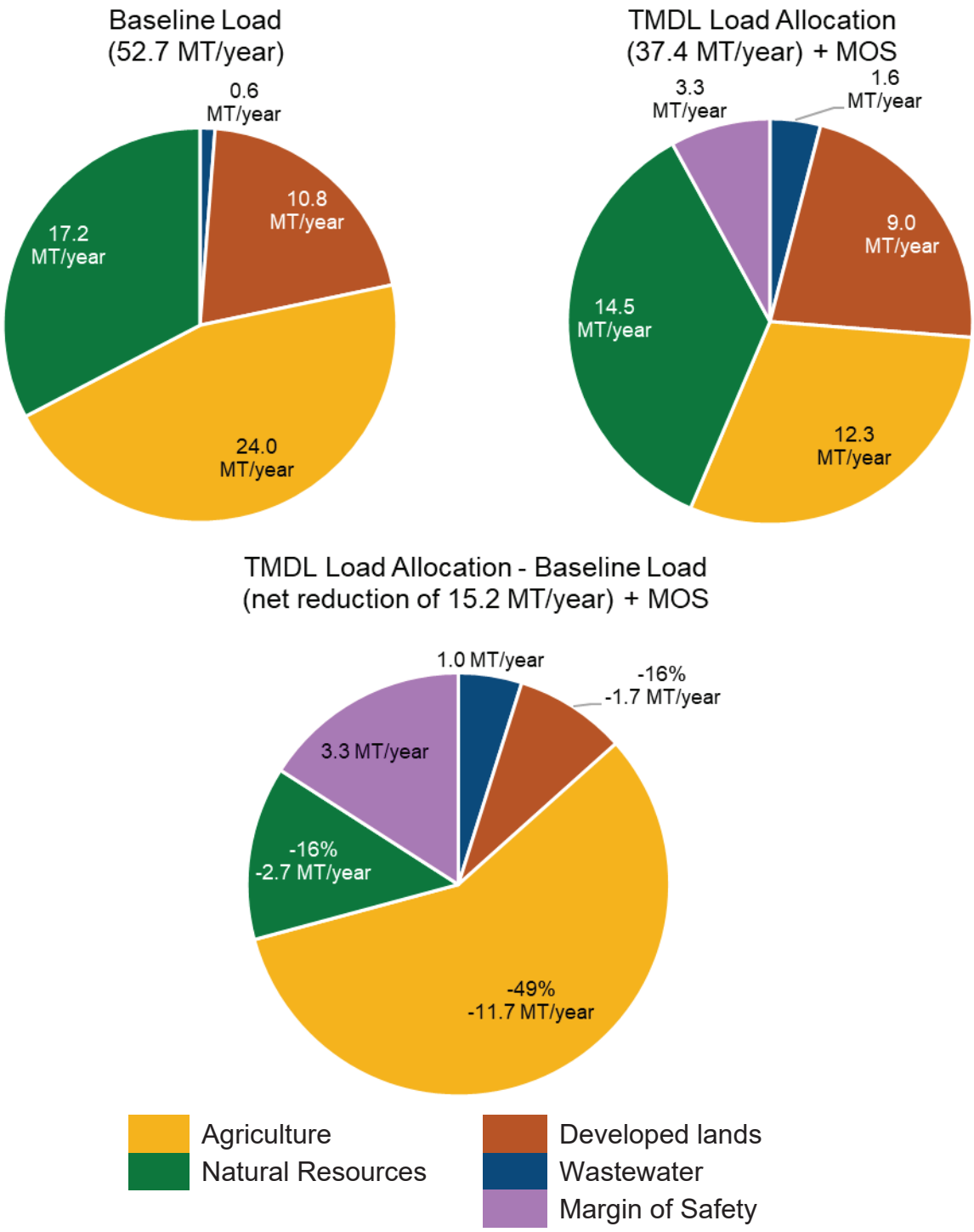


Figure 32: Lake Memphremagog TMDL baseline load, allocation, and modeled load increase (+) or reduction (-) by sector. Percentage indicates percent reduction from baseline for sectors with a required reduction.

Explanation of Figure 32

The Lake Memphremagog TMDL sets estimated phosphorus load reduction requirements for each land use sector by assessing baseline conditions and establishing TMDL load allocation representing modeled estimates of the maximum annual phosphorus loading to the lake without in-lake phosphorus concentrations exceeding water quality standards. Reductions are required across the agricultural, developed

lands, and natural resources (forests and streams) sectors. The TMDL load allocation accounts for a potential increase in loading from the wastewater sector, and includes a Margin of Safety allocation to account for the uncertainty of future loading associated with climate change. While implementation of the TMDL does not prescribe required reductions by sector, reaching the phosphorus load allocation established by the Lake Memphremagog TMDL by achieving required reductions in total loading will require efforts across all sectors, and the approach to water quality restoration involves both regulatory and voluntary actions. If one sector falls short of meeting its goals, there is limited opportunity for other sectors to pick up the slack. Successful implementation of the Lake Memphremagog TMDL is supported in large part by state and federal funding programs, however some regulations designed to implement the TMDL are expected to be achieved through private funding sources.

Tactical Basin Planning is integral to identifying priority projects to achieve water quality goals. The Lake Memphremagog, Tomifobia, and Coaticook Tactical Basin Plan (Basin 17) was updated in 2023. It provides an assessment of the health of the basin and defines ongoing and future strategies to address high-priority surface water stressors.[62] The purpose of the plan is to identify actions necessary to meet or exceed state water quality standards, and to achieve sustained ecological health and human use of surface waters. The plan sets priorities for meeting phosphorus load reduction targets for the Lake Memphremagog watershed as outlined in the Lake Memphremagog TMDL. The following section of the report summarizes the state investments in clean water efforts in Basin 17, which includes all the Vermont land that drains to the St. Francis River.[63]

[62] The 2023 Lake Memphremagog, Tomifobia, and Coaticook Tactical Basin Plan can be accessed here: https://dec.vermont.gov/water-investment/watershed-planning/tactical-basin-planning/basin17

[63] Funding presented in this chapter is representative of clean water project work across the entire Lake Memphremagog, Tomifobia, and Coaticook Rivers Tactical Planning Basin. Estimated phosphorus reductions presented in this chapter only include clean water project work that contributed to pollutant reductions in the Lake Memphremagog watershed covered by the TMDL.

Vermont's Clean Water Investments in the Lake Memphremagog, Tomifobia, and Coaticook Rivers Basin

Click symbol to view description of accountability measures.

Reaching Lake Memphremagog's water quality goals requires investments across all land use sectors. The following figure summarizes state clean water investments in the Lake Memphremagog, Tomifobia, and Coaticook basin from SFY 2016 to 2024. Federal funds awarded to projects directly by federal agencies are not included as they are outside the scope of this report.

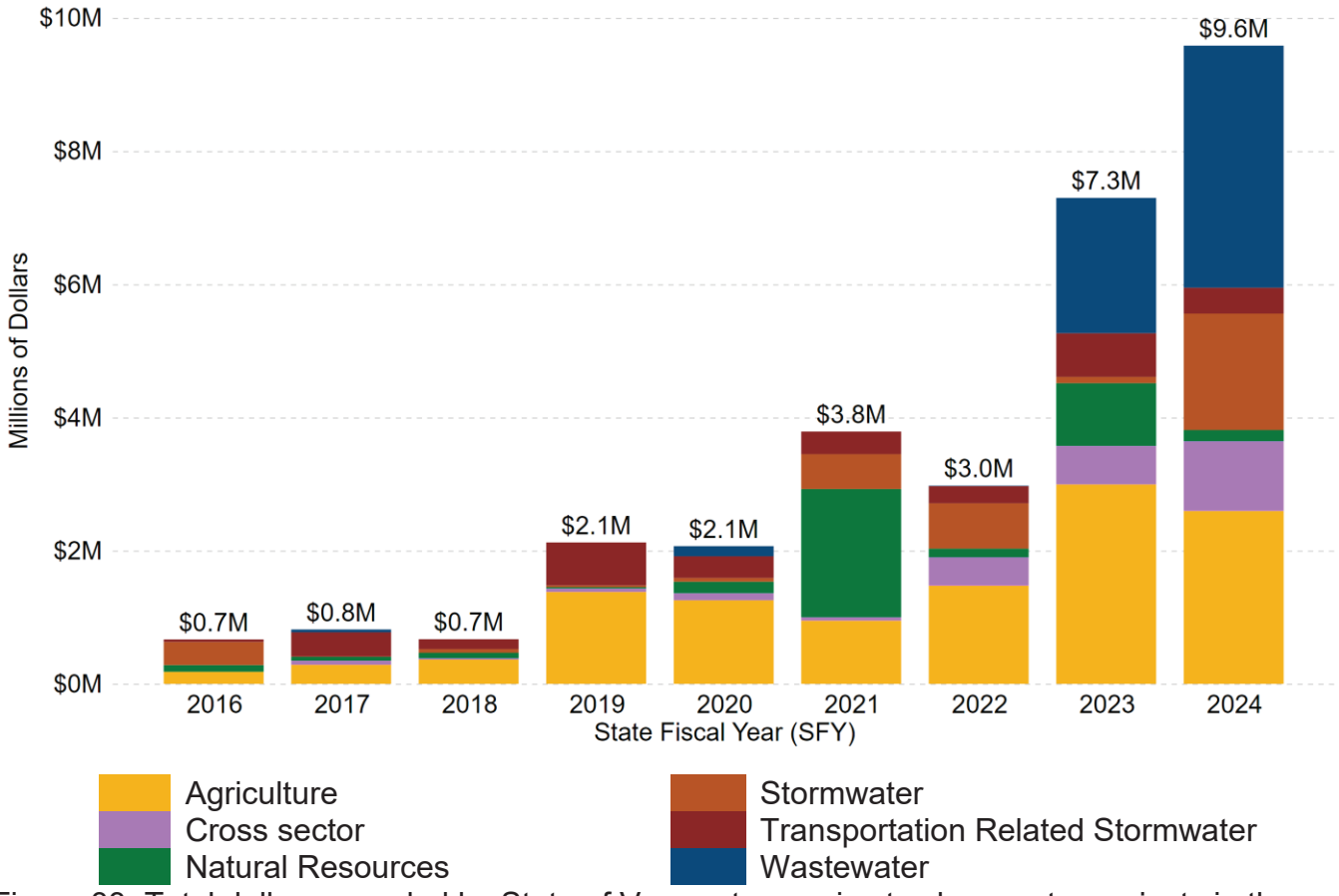


Figure 33: Total dollars awarded by State of Vermont agencies to clean water projects in the Lake Memphremagog, Tomifobia, and Coaticook Tactical Planning Basin by land use sector, SFY 2016–2024.

Explanation of Figure 33

The State of Vermont has invested $30 million in the Lake Memphremagog, Tomifobia, and Coaticook basin since SFY 2016. From SFY 2016 to 2020, the greatest investments in the basin occurred in the developed lands and agriculture sectors. Beginning in SFY 2022, the increase in cross-sector funding is largely a result of funding awarded to the Clean Water Service Provider in the Lake Memphremagog basin. Investments in SFY 2023 and 2024 in the stormwater and wastewater sectors have been bolstered by the short-term availability of ARPA funding administered through State of Vermont programs.

Estimated Total Phosphorus Load Reductions in Lake Memphremagog Basin

Click symbol to view description of accountability measures.

The State of Vermont estimates the pollutant load reductions associated with clean water projects to track progress towards achieving water quality goals. The following figure summarizes the estimated total phosphorus load reductions associated with projects implemented through state and federal funding and regulatory programs in the Lake Memphremagog basin from SFY 2016 to 2024 by sector.[64, 65, 66]

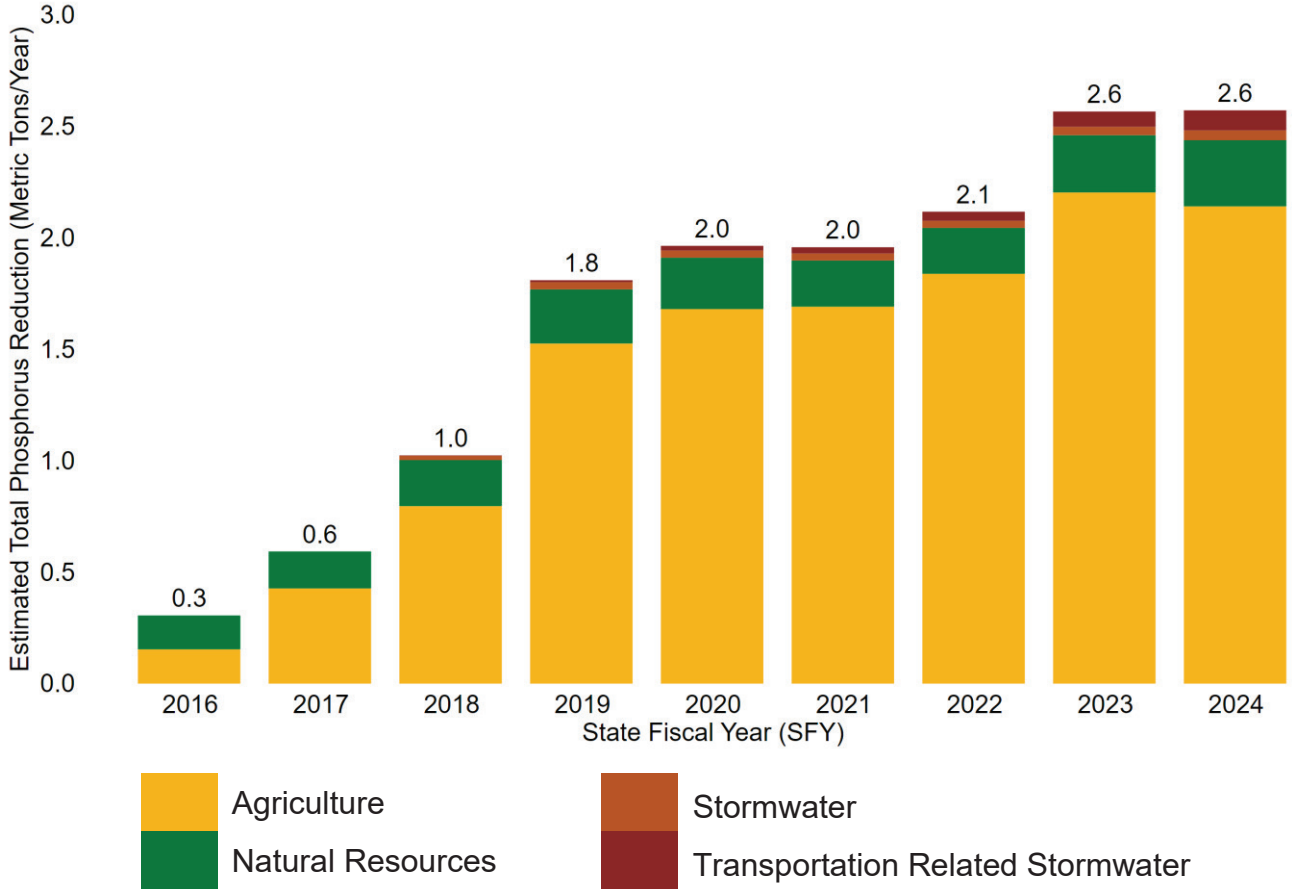


Figure 34: Annual estimated total phosphorus load reductions (MT/year) associated with projects implemented through state and federal funding and regulatory programs in the Lake Memphremagog basin in effect during SFY 2016–2024 by land use sector.[67]

[64] Phosphorus reductions can only be estimated for clean water projects that address pollution in the Lake Memphremagog basin that is covered by the Lake Memphremagog TMDL. Phosphorus reductions are not reported for clean water projects that treat pollution in the Tomifobia and Coaticook watersheds.

[65] For more information on the methods used to estimated phosphorus load reductions, see documentation on Standard Operating Procedures (SOPs) for tracking and accounting of phosphorus reductions: https://dec.vermont.gov/water-investment/cwi/state-vermont-clean-water-projects/clean-water-project-tracking-accounting#SOP

[66] See Status of Pollutant Accounting Implementation section for current project/practice types accounted for in estimated phosphorus reductions.

[67] Annual phosphorus load reductions are cumulative for all completed/operational projects based on start date and anticipated lifespan. Results of USDA-NRCS funded projects completed since SFY 2010 that are still in effect SFY 2016–2023 are included.

Explanation of Figure 34

Estimated phosphorus reductions have increased nearly ten times as a result of projects implemented by state funding programs, federal funding programs, and regulatory programs in the Lake Memphremagog basin from SFY 2016 to 2024. Estimated phosphorus reductions in SFY 2024 appear steady with results from SFY 2023, likely explained by data reporting lags. For example, many agricultural grant programs operate to align with the growing season, while data collection for this report is conducted on a state fiscal year cycle (July – June). Data available for the most recent state fiscal year are generally under representative of total implementation because some results have not yet been captured. This is not necessarily indicative of a shifting trend in TMDL progress. As additional data become available, they are reflected in future years of reporting. The figure below illustrates the difference in estimated phosphorus reductions across all reporting years as reported in SFY 2023, compared to SFY 2024, to demonstrate how data lags may contribute to incomplete results in the most recent few years of estimated phosphorus reduction data.

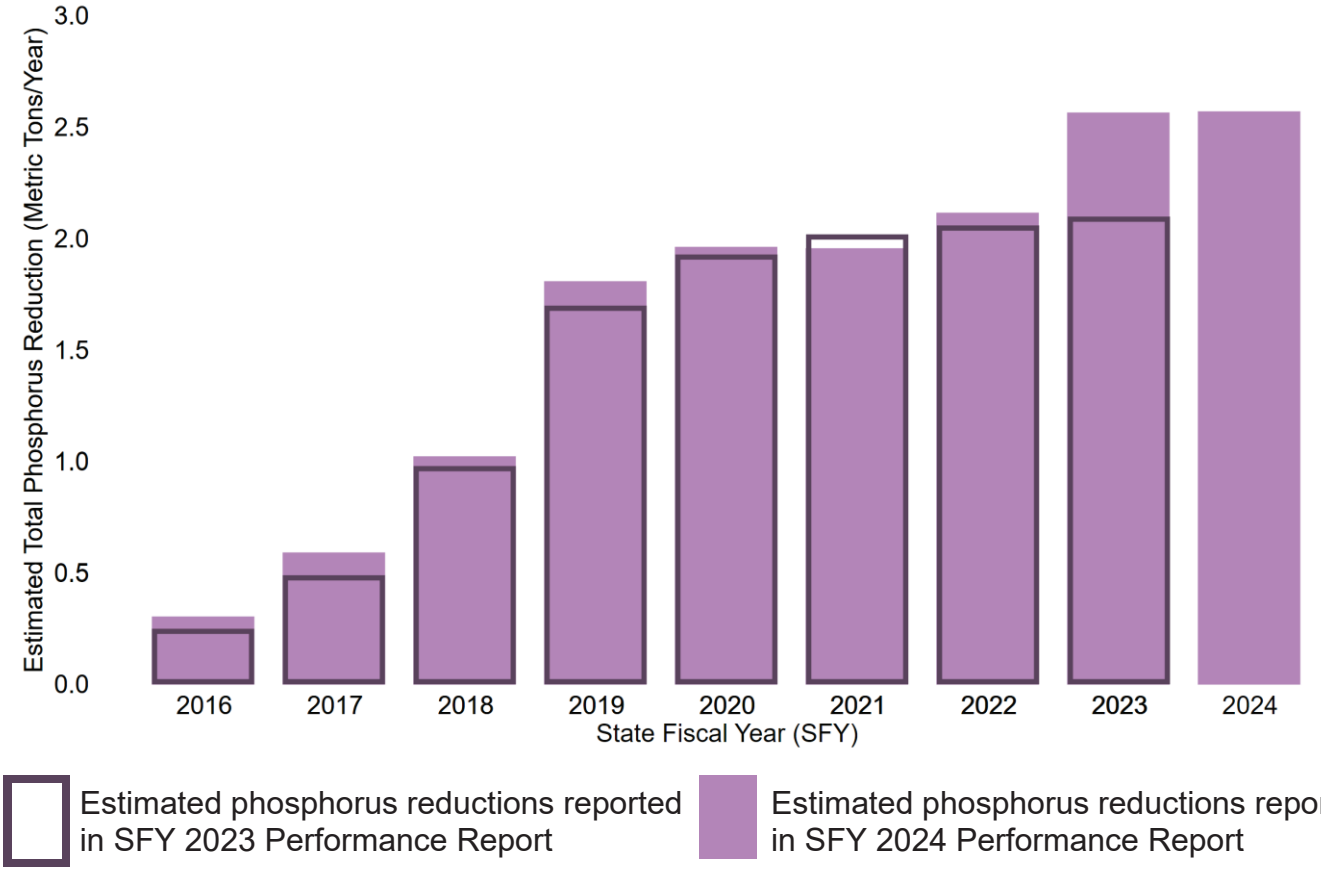


Figure 35: Estimated annual phosphorus reduction data in the Lake Memphremagog basin reported in SFY 2023 compared to SFY 2024.

Rates of progress are expected to vary over the 20-year implementation timeframe and are associated with fluctuations in financial assistance levels, as well as the capacity of agencies and partners to administer funds, implement projects, and report outcomes. The following paragraphs provide some context to explain TMDL implementation progress by sector.

Agriculture

Estimated phosphorus reductions presented in this report include, for the first time, the results of AAFM's Vermont Pay for Performance program, which provides performance-based payments to Vermont farmers for implementing practices to reduce phosphorus pollution from their agricultural fields. While most current conservation programs pay cost-share for practice implementation, the Pay for Performance program pays for the outcomes of practices; it recognizes that conservation practices generate value to the public and directly compensates farms for that value. This approach also allows AAFM to target water quality resources towards the highest impact farms and fields with respect to reducing Vermont's phosphorus.[68] This program is currently funded through a competitive USDA-NRCS grant, and continuation of this program is dependent on available funding in the future.

The estimated phosphorus reductions achieved to date in the agricultural sector are mostly from annual field practices, such as cover crops, reduced- or no-till, and manure injection and incorporation. Most of the phosphorus reductions required in the agricultural sector are tied to croplands, meaning that annual field practices are necessary to meet the TMDL. Annual practices must be implemented every year to sustain phosphorus reductions. Implementation of annual practices is dependent on a range of factors including weather, land management, and farm business decisions. The estimated annual phosphorus reductions associated with annual agricultural practice implementation are also influenced by a variety of external factors, including:

- Some practices can only be implemented for a limited number of years to be eligible for cost-share. Many programs are also subject to funding caps, which may limit the reported acres of practice implementation.
- Many farms implement agricultural conservation practices without the support of cost-share programs. The State is limited in its ability to capture the water quality benefits of practices implemented outside cost-share programs, and only some of these data are presented in this report.
- The multi-year federal Farm Bill governs much of the funding available to support agricultural practice implementation. Funds are often limited near the end of a Farm Bill cycle. The most recent Farm Bill, passed in 2018 and set to expire in 2023, was extended to authorize programs to continue through September 2024. However, the reauthorization did not increase specific program payment limitations, which restricts the amount of funding individual producers can receive during the current Farm Bill. As a result, many farms have been limited in their ability to access federal funds to support agricultural practice implementation in SFY 2024.
- Agricultural water quality programs have recently expanded in focus and now emphasize holistic planning and implementation on farms, the results of which may not be fully reflected in current available data.

Natural Resources

In the natural resources sector, the majority of estimated phosphorus reductions across all reporting years are attributable to phosphorus reduction accounting that captures the water quality benefits associated with the State of Vermont's Use Value Appraisal (UVA)

[68] To learn more about the Vermont Pay for Performance program, visit: https://agriculture.vermont.gov/VPFP

Program on forestland parcels.[69] Forestland parcels that are actively enrolled in the UVA Program and have been inspected for program compliance meet Vermont's Acceptable Management Practices (AMPs), a set of forestland management criteria designed to maintain and protect water quality.[70] Newly established phosphorus accounting methods for other practices in the natural resources sector are in the process of being implemented, and will be reflected in future years of reporting. These new methods will be applied to newly completed projects, as well as applied to fill gaps for previously completed projects as data availability allows.

Stormwater and Transportation Related Stormwater

Estimated phosphorus reductions in the stormwater and transportation related stormwater land use sectors have been incrementally growing. This progress is associated with increased implementation of several regulatory programs designed to reduce and mitigate stormwater pollution from developed lands and roads. Operational stormwater permits regulate stormwater discharges resulting from new development, redevelopment, and three-acre sites. The Municipal Roads General Permit (MRGP) regulates stormwater related erosion on municipally owned roads.[71] Regulatory programs are at varying stages of implementation, and continued expansion of compliance will increase estimated phosphorus reductions in future years.[72]

Conclusions

Data reporting cycles vary by funding program, and some data used to estimate phosphorus reductions is subject to reporting lags. This particularly impacts the results reported for more recent state fiscal years. Data for previous years is updated each reporting cycle to comprehensively capture all available results. In some cases, administration of funding awards may take precedence over end of award reporting and data compilation, particularly in cases of time sensitive funding opportunities like those supported by ARPA funding. Changes in the pace of estimated annual phosphorus reduction progress may be in part a reflection of the completion of relatively easy to implement projects. Now that many of the ready-to-construct projects have been implemented, identification and implementation of projects that are in some cases more complex and involved, will need to be completed to reach Vermont's water quality goals in the basin. A key role of the clean water workforce includes engaging with landowners and the public to communicate the value of clean water projects, build relationships, and increase landowner willingness to engage in implementation of non-regulatory clean water projects. The variability of implementation rates across years also underscores the importance of investing in program and partner capacity to broaden the reach and impact of clean water project implementation.

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[69] For details on phosphorus accounting for UVA parcels, please see the Standard Operating Procedures for Tracking & Accounting of Natural Resources Restoration Projects: https://dec.vermont.gov/water-investment/cwi/projects/tracking-accounting#SOP

[70] Phosphorus reductions are only accounting for forestland parcels that enrolled in the UVA Program after the TMDL baseline periods. ANR is re-evaluating the methodology to account for estimated phosphorus reductions assigned to UVA Program compliance, and this review may result in changes to the estimated phosphorus reductions in the natural resources sector related to UVA Program compliance in the future.

[71] The segment scoring methodology under the Municipal Roads General Permit was updated in 2023. The results of MRGP compliance presented in this report represent updated scoring and revised phosphorus loading rates in the Lake Champlain basin to align with the current permit.

[72] For more information on regulatory stormwater programs in Vermont, visit: https://dec.vermont.gov/watershed/stormwater

Lake Memphremagog TMDL Progress

Click symbol to view description of accountability measures.

The Lake Memphremagog TMDL states net phosphorus loading to Lake Memphremagog must be reduced by 15.2 MT/year to achieve a reduction from 52.7 MT/year baseline load to 37.4 MT/year by the end of calendar year 2037 to meet Vermont's water quality standards. The following figure summarizes progress made towards the Lake Memphremagog TMDL as of SFY 2024.

17.1% of TMDL required reduction is reflected in reported estimated phosphorus reduction as of SFY 2024

Figure 36: Estimated total phosphorus load reductions (metric tons) as of SFY 2024 in the context of the Lake Memphremagog TMDL total phosphorus reduction target in metric tons per year.

Explanation of Figure 36

State and federal funding programs, and regulatory programs have reduced an estimated 2.6 metric tons of phosphorus loading to Lake Memphremagog in SFY 2024, which represents approximately 17 percent of the required reduction. Phosphorus reductions are expected to increase in the coming years for at least the following reasons:

- An influx in federal funding under ARPA, the Bipartisan Infrastructure Law, and the Inflation Reduction Act, an increase in Clean Water Fund revenue enacted under Act 76 of 2019, and investment in the capacity of clean water partners will drive project implementation across sectors.[73] While much of this funding is beginning to reflect in reported state investment figures, the results of these investments will not be fully captured in estimated phosphorus reductions until projects are completed, which may take multiple years.
- The State of Vermont has been building and expanding clean water regulatory, financial, and technical assistance programs since SFY 2016. Many regulatory programs are now at a stage of implementation that will drive additional phosphorus reductions from agricultural and developed lands.
- The State has published methods for quantifying phosphorus reductions for agricultural, natural resources, and developed lands sector clean water practices.[74] New methods were recently established to fill gaps in capturing the phosphorus reduction benefit of several practices, particularly in the natural

[73] For more information on the Clean Water Budget, visit: https://dec.vermont.gov/water-investment/cwi/board

[74] Standard Operating Procedures (SOPs) for tracking and accounting of phosphorus reductions are available here: https://dec.vermont.gov/water-investment/cwi/state-vermont-clean-water-projects/clean-water-project-tracking-accounting#SOP

resources sector. These new methods are in the process of being implemented and will be reflected in future years of reporting for newly completed projects, as well as applied to fill gaps for prior completed projects.

Monitored Total Phosphorus Load from Vermont Wastewater Treatment Facilities in the Lake Memphremagog Basin

The phosphorus load allocations in the Lake Memphremagog TMDL are separated into wastewater wasteload and non-wastewater load allocations. Progress towards reaching the non-wastewater load allocation target is tracked through *modeled* results reflected in the previous TMDL progress figures. The wastewater wasteload allocation is tracked through *measured* water quality of effluent from the wastewater treatment facilities located within the Lake Memphremagog basin. The following figure shows the target wastewater wasteload allocation for the Lake Memphremagog TMDL and the measured total phosphorus from wastewater treatment facilities each year.

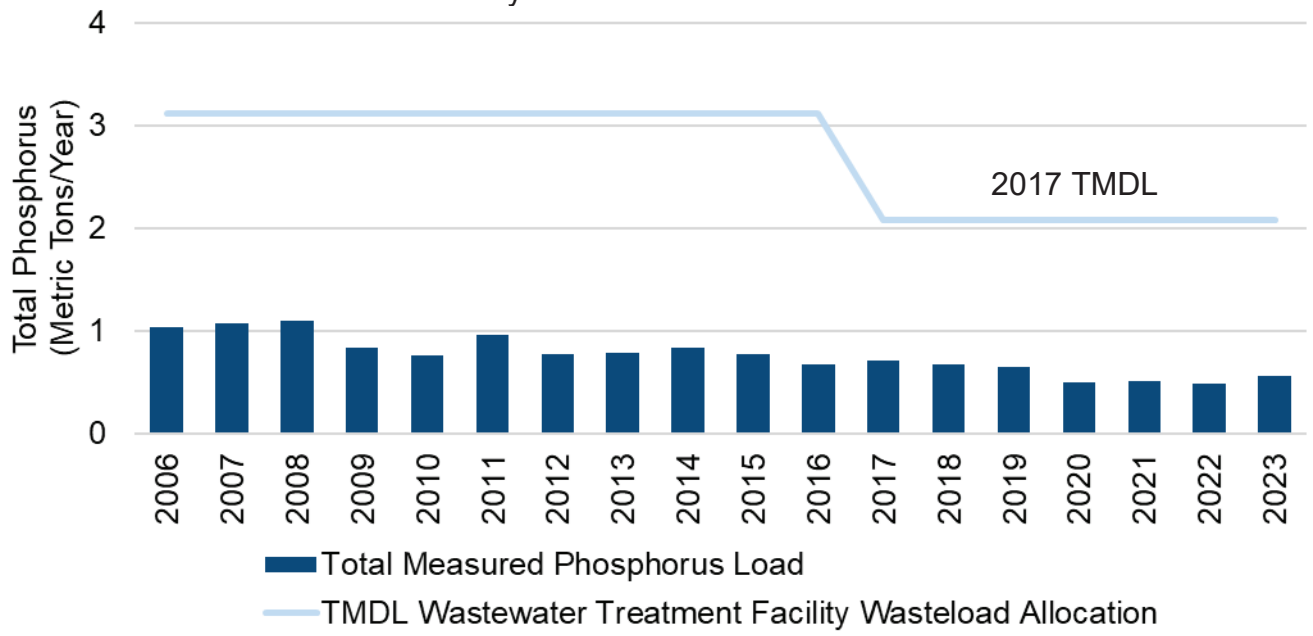

Figure 37: Measured total phosphorus load (MT/year) from Vermont wastewater treatment facilities draining to Lake Memphremagog and the permitted wasteload of wastewater treatment facilities in the Lake Memphremagog Basin, calendar year 2006–2023.

Explanation of Figure 37

The total average annual phosphorus loading into Lake Memphremagog originating from Vermont wastewater treatment facilities was approximately 3.1 MT/year during the Lake Memphremagog TMDL baseline period of 2009–2012, representing approximately four percent of total phosphorus loading to Lake Memphremagog from Vermont sources. During the baseline period, measured total annual phosphorus loading from wastewater treatment facilities was well below the permitted phosphorus limit of 3.1 metric tons. The 2017 Lake Memphremagog TMDL for Vermont reduced the wastewater treatment facility permitted wasteload to 2.08 metric tons, which is intended to achieve the overall required phosphorus load allocation while allowing for some development and growth over the

TMDL implementation timeframe. Discharge monitoring indicates Vermont wastewater treatment facilities in the Lake Memphremagog basin contributed approximately 0.56 metric tons of total phosphorus load to Lake Memphremagog in calendar year 2023, representing only 27 percent of the permitted wasteload under the current TMDL. These data demonstrate a consistent trend of measured total annual phosphorus load from Vermont wastewater treatment facilities, overall, well below the wasteload allocation.

Chapter 5: Connecticut River Basin Clean Water Investments and Results

Long Island Sound TMDL

The Connecticut River is New England's longest river. It runs through four states: Vermont, New Hampshire, Massachusetts, and Connecticut. Seven Tactical Planning Basins in the eastern portion of the State of Vermont drain to the Connecticut River, which eventually drains to the Long Island Sound. The Long Island Sound is a large estuary that drains a total watershed of over 16,000 square miles, including the Connecticut River basin and areas of Rhode Island and New York, according to the Long Island Sound TMDL (Figure 38).[75]

Figure 38: Map of the Long Island Sound watershed.
Credit: New England Interstate Water Pollution Control Commission (NEIWPCC).

The Long Island Sound is primarily impaired by excess nitrogen, which can cause cyanobacteria blooms and hypoxia (low dissolved oxygen concentrations in the water column) leading to "dead zones" that threaten marine life. To address the excess nitrogen and resulting hypoxia, the EPA approved *A Total Maximum Daily Load Analysis to Achieve Water Quality Standards for Dissolved Oxygen in Long Island Sound* in 2001 to define the nitrogen reductions necessary to meet water quality standards in the Sound.

Vermont's clean water efforts to restore, protect, and enhance water quality in the Connecticut River basin are also contributing to water quality progress for Long Island Sound. The following section of the report summarizes state investments in clean water efforts in the Connecticut River basin. Currently, there are no methods in place to estimate total nitrogen load reductions to the Connecticut River basin, but these are planned to be established in the coming years.

[75] A Total Maximum Daily Load Analysis to Achieve Water Quality Standards for Dissolved Oxygen in Long Island Sound can be accessed here: http://longislandsoundstudy.net/wp-content/uploads/2010/03/Tmdl.pdf

Vermont's Clean Water Investments in the Connecticut River Basin

Click symbol to view description of accountability measures.

Reaching the Connecticut River basin's water quality goals requires investments across all land use sectors. The following figure summarizes state clean water investments in the Connecticut River basin from SFY 2016 to 2024. Federal funds awarded to projects directly by federal agencies are not included as they are outside the scope of this report.

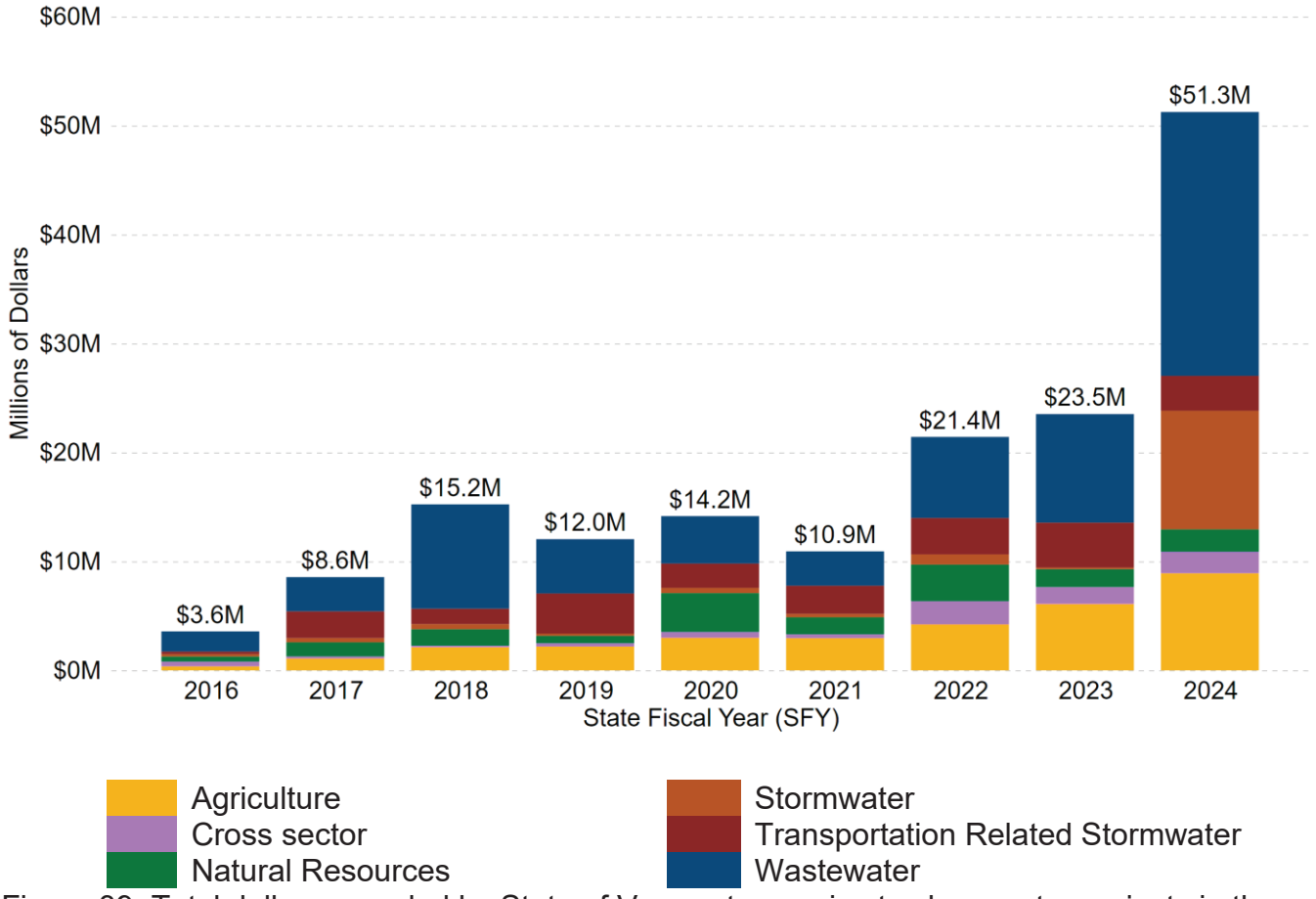

Figure 39: Total dollars awarded by State of Vermont agencies to clean water projects in the Connecticut River basin by land use sector, SFY 2016–2024.

Explanation of Figure 39

The State of Vermont has invested over $160 million in clean water projects in the Connecticut River basin since SFY 2016. Clean water funding in the Connecticut River basin varies from year-to-year based on project readiness and funding award rounds. Investments in SFY 2023 and 2024 in the stormwater and wastewater sectors have been bolstered by the short-term availability of ARPA funding administered through State of Vermont programs.

Future Total Nitrogen Load Reduction Tracking

Nitrogen reduction estimates cannot be reported for the Connecticut River basin, as the State of Vermont does not yet have baseline nitrogen loading rates or nitrogen reduction efficiencies for clean water projects in the Connecticut River basin. EPA-supported efforts are underway to develop consistent methods for all five states covered under the Long Island Sound TMDL to estimate nitrogen reductions for clean water projects. Vermont will set a schedule to publish methods to account for nitrogen reductions in the Connecticut River basin to comply with Vermont's Clean Water Service Delivery Act, Act 76 of 2019 (10 V.S.A. § 923) and to align with ongoing five state nitrogen tracking coordination efforts.

Chapter 6: Context and Takeaways

Pollutants that enter Vermont's waters, including excess nutrient and sediment, can lead to local and regional water quality issues. Excess phosphorus loading can result in potentially harmful cyanobacteria blooms in Lake Champlain, Lake Memphremagog, and inland lakes around the state. Excess nitrogen loading contributes to low dissolved oxygen and dead zones in the Long Island Sound.

Most sources of water pollution in Vermont are from nonpoint sources where rainfall and snowmelt carry pollution from the land surface into waterways. Due to the dispersed nature of nonpoint source pollution, realizing our water quality goals requires actions of various scales across all land uses to mitigate water pollution. The distribution of pollution sources from the landscape also means that many external landscape-scale factors can affect the rate of water quality progress. The success of this work also depends on the willingness of the public and a well-supported, diverse network of partners to develop and implement projects. The following sections provide important context for interpreting results summarized in this report and the outlook for clean water progress in Vermont.

Modeled vs. Measured

The State of Vermont estimates pollutant reductions associated with clean water projects. In the Lake Champlain and Lake Memphremagog basins, the state uses models to estimate phosphorus reductions from clean water projects. *Modeled* estimates of phosphorus reductions provide an incremental measure of progress in meeting the phosphorus TMDLs for Lakes Champlain and Memphremagog at the project-level, summarized in Chapters 3 and 4 of this report.

Vermont uses monitoring data to establish and calibrate models. For example, data from the Lake Champlain Long-Term Water Quality and Biological Monitoring Project served as inputs for the models that established the phosphorus TMDL for Lake Champlain. Data from the DEC-led Lake Memphremagog TMDL Tributary Monitoring Program served as primary inputs to calibrate the phosphorus TMDL modeling for Lake Memphremagog; LaRosa Partnership Program data were also used to calibrate the model. Models are a useful tool, but do not always capture on the ground factors that influence water quality conditions. Continuous monitoring is important to ensure that models accurately describe real-world conditions.

Measured water quality through monitoring is the ultimate indicator of clean water progress — whether the goal is protection of high-quality waters or the restoration of impaired waters.[76] The State of Vermont monitors water quality indicators to assess the status and trends of its surface waters, posts data online, and reports the status of Vermont's waters on a biennial basis.[77] The State of Vermont also supports local monitoring initiatives through its LaRosa Partnership Program and participates in the Lake Champlain Basin Program's Long-Term Water Quality and Biological Monitoring Project to monitor the water quality conditions of Lake Champlain,

[76] Monitoring data and results for lakes across Vermont are available here: https://dec.vermont.gov/watershed/lakes-ponds/data-maps/scorecard

[77] Visit the Department of Environmental Conservation's Monitoring and Assessment webpage for more information, available here: https://dec.vermont.gov/watershed/map

including the status and trends of phosphorus loading.[78,79] Monitoring data and water quality status and trends are integrated into State of Vermont Tactical Basin Plans, which inform clean water funding and project implementation strategies. Tactical Basin Plans employ an adaptive management approach by considering measures of clean water project progress, water quality status and trends, and changes in land use conditions impacting water quality. Modeling and measuring water quality are both key to managing Vermont's waters.[80] These tools help us understand how pollution impacts our waters, how waterbodies are responding to management efforts, and how we can further protect, enhance, and restore water quality across the state.

Factors Influencing Water Quality Progress

The state and federal funding programs and regulatory programs summarized in this report are designed to restore, enhance, and protect water quality, but there are many landscape-scale factors beyond our control that influence progress in reaching our water quality goals. Climate change and historical pollution are two primary challenges influencing water quality progress. In addition to landscape-level factors, the success of our clean water efforts depends on the capacity of Vermont's clean water workforce to develop, implement, and maintain projects. The following sections explain how these factors influence the outputs and outcomes summarized in this report.

Climate Change

Human-caused climate change is impacting temperature and precipitation patterns, which in turn affect water quality. This underscores the importance of continued assessment of water quality progress through monitoring data and consideration for external factors that may be impacting measured outcomes. Data for the past several decades show long-term shifts in temperature, precipitation, and the risks of severe weather in Vermont.[81,82] As climate change continues, it is important to understand the impacts on Vermont and its waters — climate change is increasing the frequency and intensity of storms and flooding events, and increasing air and water temperatures. Above average pollutant loads resulting from flood events and high temperatures can also increase the near-term incidence and severity of cyanobacteria blooms.

Climate Change and Cyanobacteria Blooms

Climate change is predicted to affect several key factors that regulate cyanobacteria growth — temperature, nutrient availability, and water stability. Warmer summer temperatures and shorter, warmer winters will increase the length of time that cyanobacteria can proliferate each year. The

[78] Visit the LaRosa Partnership Program webpage for more information, available here: https://dec.vermont.gov/watershed/map/monitor/larosa

[79] Visit the Lake Champlain Long-Term Water Quality and Biological Monitoring Project webpage for more information, available here: https://dec.vermont.gov/watershed/lakes-ponds/monitor/lake-champlain

[80] To learn more about modeled versus measured phosphorus, read the Modeled Versus Measured Phosphorus Plain Language Fact Sheet: https://dec.vermont.gov/document/modeled-versus-measured-phosphorus

[81] Vermont Climate Action Office (CAO) website: https://climatechange.vermont.gov/

[82] Read the Vermont State Climate Summary: https://outside.vermont.gov/agency/anr/climatecouncil/Shared%20Documents/(1)%20Vermont%20State%20Climate%20Summary.pdf

cyanobacteria monitoring program on Lake Champlain since 2003 has documented that blooms are occurring earlier in the summer and persisting later into the fall. The monitoring season now begins about two weeks earlier than it did in 2003 and recent data show blooms occurring into mid-October. Scientists in Vermont and elsewhere are noting the incidence of cyanobacteria blooms at lower-than-expected phosphorus concentrations, indicating that the factors noted above may contribute to the incidence of bloom condition. The State of Vermont will have little control over global factors that drive climate change-related weather patterns and precipitation. Therefore, Vermont will need to continue its focus on land-use management and control of nutrient pollution loading to surface waters to reduce the impact of cyanobacteria blooms.

Climate Change and Increased Precipitation

Climate data indicate statistically significant increase in frequency of intense storms and annual total precipitation since 1940. Water quality monitoring shows that storm events often correlate with peaks in sediment and nutrient loading to lakes. Change in precipitation patterns may increase water pollution by increasing:

- Erosion of unstable road networks;
- Erosion and hazards of unstable river and streambanks;
- Erosion of lakeshores;
- Volume of runoff from agricultural fields; and
- Volume of stormwater runoff from impervious surfaces, such as roads, parking lots, and rooftops.

Severe flooding in Vermont in 2023 and 2024 demonstrate the harms of climate-driven precipitation patterns on Vermont's communities and environment. In 2023, heavy, prolonged rainfall resulted in major flooding statewide. Three to nine inches of rainfall fell statewide over a 48-hour period in July.[83] During the following week, July 10–July 16, 2023, Lake Champlain received about half of the annual phosphorus load identified in the Lake Champlain TMDL.[84] During two distinct events in July 2024, localized regions of Vermont received between seven and eight inches of rain, but the events were short-lived compared to 2023.[85,86]

During these events, streams and rivers rose quickly — high waters and flood hazards led to loss of life, displacement of people, infrastructure failure, property damage and loss, crop loss, and peaks in water pollution. Flashy storms and high flow events, like those that Vermont has experienced in recent years, can deliver significant amounts of sediment and other pollutants to waterways.[87] In the hours and days following a severe flooding event, temporary reductions in water quality and high measurements of sediment and phosphorus in waters are expected. Longer term, this type of event delivers large amounts of phosphorus laden sediments, which settle to the lake bottom and may contribute to internal phosphorus loading in subsequent years, in the limited segments of Lake Champlain where conditions are favorable for this phenomenon.

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[83] National Weather Service: https://www.weather.gov/btv/The-Great-Vermont-Flood-of-10-11-July-2023-Preliminary-Meteorological-Summary and https://storymaps.arcgis.com/stories/1734322dab92443386f0a04a9ddbe857

[84] https://www.lcbp.org/wp-content/uploads/2024/06/2024-State-of-the-Lake-Report.pdf

[85] National Weather Service: https://www.weather.gov/btv/The-Significant-Flooding-and-Severe-Weather-Event-of-10-11-July-2024

[86] National Weather Service: https://www.weather.gov/btv/Extreme-Nocturnal-Rainfall-and-Flash-Flooding-in-Vermonts-Northeast-Kingdom-30-July-2024

[87] Lake Champlain Basin Program: https://www.lcbp.org/our-goals/thriving-communities/flooding/2023-flooding/

Climate-driven changes in precipitation patterns highlight the importance of climate adaptation and flood resilience. Clean water projects support climate adaptation and flood resilience in many ways, including projects that:

- Protect and restore natural resources, such as wetlands, floodplains, and lakeshores, to slow down, spread out, and soak up floodwaters;
- Support and improve soil health in agricultural fields in order to increase water infiltration and holding capacity, and carbon sequestration;
- Manage large forestland blocks to protect biodiversity, sequester carbon, and reduce runoff;
- Use updated road, bridge, and culvert design standards that are able to withstand higher river and stream flows and more intense storms;
- Implement Stormwater Management Manual standards to emphasize the importance of infiltrating stormwater runoff from developed lands into soils, where feasible; and
- Invest in wastewater infrastructure improvements to reduce flood related damage and limit the occurrence and duration of combined sewer overflow events.

The more clean water projects implemented, the more resilient our waterways will be to extreme weather events and floods, which also protects Vermont's communities and built infrastructure from flood hazards. Realizing our water quality goals requires sustained investment and will continue to yield multiple benefits, including climate adaptation and flood resilience.

Climate Change and TMDLs

It is important to consider climate change's impact on Vermont's clean water work when evaluating progress. The large-scale water quality restoration plans — TMDLs — in Vermont that guide clean water target setting and management actions consider the effects of climate change in the analysis of necessary management actions. The Lake Champlain TMDL model simulated climate change scenarios and added a five percent margin of safety within each lake segment's load allocation to account for the likely increase in phosphorus loading from climate change, and the Lake Memphremagog TMDL model includes an eight percent margin of safety.

While the TMDLs acknowledge some uncertainty in the effects that climate change will have on water quality, the state is also taking an adaptive management approach by analyzing available data and long-term trends to assess whether there are necessary changes to water quality management approaches in order to be more responsive and resilient to the impacts of climate change. The state remains optimistic that through sustained effort and investment, we will be able to reach our water quality goals despite the added complexity of protecting and managing water quality under a changing climate.

Legacy (Historical) Pollution, Internal Loading, and Lag Time

Clean water investments primarily address external loading, which is pollution originating from the land surface, to minimize the volume of nutrients and sediment deposited into adjacent waterways. Sediments and nutrients like phosphorus tend to accumulate at the bottom of lakes. Under certain circumstances, phosphorus stored in lakebed sediments may migrate back into the water column, which is called internal loading.[88] Vermont's long history of logging and

[88] James, W. (2016) "Internal P Loading: A Persistent Management Problem in Lake Recovery". North American Lake Management Society. Available at: https://www.nalms.org/wp-content/uploads/2017/01/36-1-3.pdf

agriculture as two dominant land management approaches have resulted in a build-up of legacy phosphorus in lake systems that in certain circumstances contributes to internal loading.[89]

For many nonpoint source pollution reduction approaches, there is lag time between the implementation of clean water projects and the realization of measurable water quality improvements. Lag time varies by site conditions and pollutant characteristics, but research indicates common lag times for projects that address phosphorus in soils is between years and decades.[90] This highlights the importance of sustained efforts to minimize nutrient and sediment pollution to ensure long-term health of Vermont's waters. In some cases, addressing internal loading from legacy phosphorus concentrations may be needed in combination with continued work to mitigate external loading to achieve desired water quality outcomes and reduce the occurrence of cyanobacteria blooms.

Vermont's Clean Water Workforce

Vermont's work to improve water quality is led by, and relies upon, a network of partner organizations and project implementers who:

- Participate in clean water project planning and identification efforts;
- Host clean water projects on their property;
- Provide and/or administer clean water funding;
- Complete clean water project work, including development, design, implementation, and maintenance; and
- Report back to the state on the outcomes of projects.

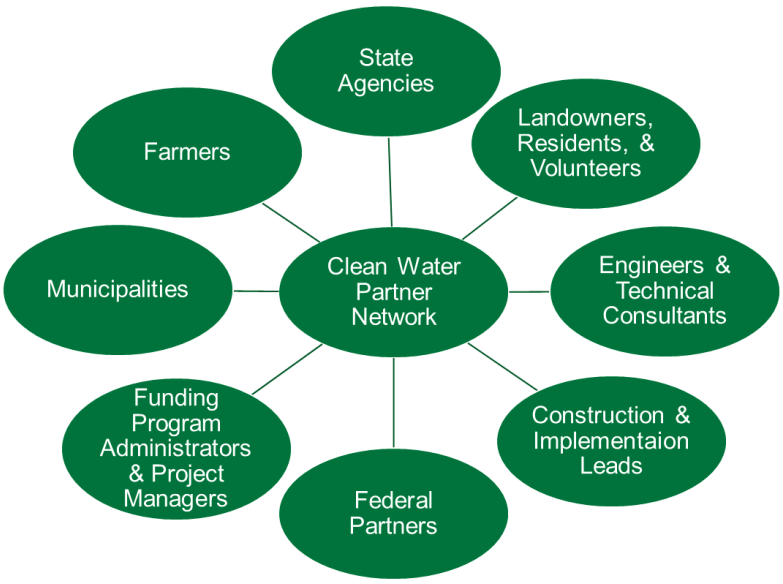

Figure 40: Vermont's Clean Water Partner Network

Recent unprecedented increases in state and federal funding for clean water efforts, combined with a need to increase the pace of progress to meet clean water goals, necessitates growth in the capacity of Vermont's clean water workforce. The success of the Clean Water Initiative and clean water projects across land use sectors requires the network of partners to be numerous, diverse, well-trained, and well-resourced.

For many years, the Lake Champlain Basin Program and AAFM have invested in partner capacity within the clean water network, although the focus has been limited geographically, or to the agricultural sector. In 2023, the ANR joined this effort by launching a complementary Clean Water Workforce Capacity Development Initiative with an initial investment of $1,000,000. Funds are being allocated across a range of clean water network partners with a demonstrated need to develop or expand organizational capacity to do more, or better, clean water work.

[89] To learn more about legacy phosphorus, read the Legacy Phosphorus Plain Language Fact Sheet: https://dec.vermont.gov/document/legacy-phosphorus

[90] Meals, D. W., Dressing, S. A., & Davenport, T. E. (2010). Lag Time in Water Quality Response to Best Management Practices: A Review. *Journal of Environmental Quality*, *39*(1), 85–96. https://doi.org/10.2134/jeq2009.0108

Through these investments, the state is committed to supporting the people and organizations that make impactful clean water work possible.

Outlook for Reaching Vermont's Water Quality Goals

Continued effort, investment, capacity building, and coordination are critical to the state reaching its water quality goals. The state is making a substantial investment in clean water projects that yield many additional benefits, including flood resilience and climate change mitigation and adaptation. Maintaining the level of clean water investment and regulation is critical to reach our water quality goals, as it will take time for impaired waterways to recover after decades of excess pollution. Trends in reported outputs and outcomes are expected to increase in the coming years for the following reasons:

- Some state funding programs have shifted to block grant structures that rely on regional partners to manage and administer funding of individual projects. The transition to regional administration of clean water funding is anticipated to empower community partners, reduce bottlenecks, and increase the impact of clean water investments.
- Vermont has received an influx in federal funding under ARPA, the Bipartisan Infrastructure Law, and the Inflation Reduction Act, as well as increased Clean Water Fund revenue enacted under Act 76 of 2019. Program expansion supported by this funding will drive clean water project implementation across sectors.
- The State of Vermont has been expanding clean water regulatory, financial, and technical assistance programs since SFY 2016. Many regulatory programs are now in place that will drive meaningful progress in the agriculture and developed lands sectors.
- Across land use sectors, there are areas where capacity constraints are resulting in lags in clean water investments, project work, and reported results. Indirect investments in network capacity are expected to mitigate some of these lag times and increase the demonstrated rate of progress.
- The State continues to work on expanding the implementation of tracking and accounting systems to more fully capture the results of clean water efforts. Enhanced tracking and reporting will provide a more complete picture of progress on the ground.

This report serves as a useful tool to provide accountability on the state's clean water progress and to inform adaptive management. By taking an adaptive management approach, the state will continue to identify and prioritize its resources to break down barriers to project implementation and clean water progress. Clean water project implementation is an important piece of climate resilience work and clean water projects have co-benefits like increased flood resilience, improved carbon sequestration, better soil health, and enhanced habitat function and biodiversity. In addition to achieving water quality goals, Vermont's work to improve water quality directly supports climate adaptation and flood mitigation, which will increase the state's resilience to future climate related stressors.

Appendix A: Act 76 of 2019

Vermont's Clean Water Service Delivery Act

Act 76 of 2019 established a water quality project delivery framework to support Vermont's clean water goals and secured a new long-term funding source for the Clean Water Fund. Act 76 established four complementary grant programs intended to support implementation of the Clean Water Initiative by addressing sources of pollution through both regulatory and non-regulatory mechanisms: Water Quality Restoration Formula Grants, Water Quality Enhancement Grants, Municipal Stormwater Implementation Grants, and Developed Lands Implementation Grants.[91] Act 76 also underscores continued support for other Clean Water Fund priorities, such as Agency of Agriculture, Food & Markets (AAFM) water quality programs. The grant programs created under Act 76 began in State Fiscal Year (SFY) 2023 and funding associated with these programs is integrated into the state investment figures presented in Chapters 2–5 of the report.

Act 76 of 2019 established a statutory requirement (10 V.S.A. § 1389a (b)(6)) to report to the legislature "a summary of the administration of the grant programs established under sections 925–928 of this title [Act 76 of 2019], including whether these grant programs are adequately funding implementation of the Clean Water Initiative and whether the funding limits for the Water Quality Enhancement Grants under subdivision 1389(e)(1)(D) of this title should be amended to improve State implementation of the Clean Water Initiative." Appendix A fulfills this reporting requirement. The following sections summarize the administration of each grant program.

Annual funding levels for all four grant programs established under Act 76 are set by the Clean Water Board through the annual Clean Water Budget development process.[92] Adequacy of funding levels per program are summarized here:

- **Water Quality Restoration Formula Grant:** Currently, the program is adequately funded factoring the available capacity of the clean water workforce to implement this work.
- **Water Quality Enhancement Grant:** Currently, the program is adequately funded factoring the available capacity of the clean water workforce to implement this work. No change is recommended to the Water Quality Enhancement Grants funding limit at this time.
- **Municipal Stormwater Implementation Grant:** Currently, the program is adequately funded factoring the recent influx of federal funds and availability of Clean Water State Revolving Fund (CWSRF) financing.
- **Developed Lands Implementation Grant:** The Clean Water Board received numerous requests for additional funding assistance under this Program. The State Fiscal Year 2026 Clean Water Budget includes a recommendation to seed a financing program to lower the cost of borrowing for private landowners subject to the Three-Acre General Permit. Additional resources are likely needed beyond the SFY 2026 Clean Water Budget to provide the level of financial support some communities and landowners may need to comply with this permit. To this end, DEC will begin by identifying CWSRF loan funds that may complement and amplify the Clean Water Fund investment.

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[91] Act 76 of 2019 as enacted is available here: https://legislature.vermont.gov/bill/status/2020/S.96

[92] For more information on the Clean Water Board and Budget process, visit: https://dec.vermont.gov/water-investment/cwi/board

Continued state funding is needed to implement the Clean Water Initiative. These costs have always been anticipated to include a mix of public and private costs, including not only the state but also municipalities, farms, private residences, and businesses. Based on the state's estimates of costs and intended share of the costs, the state has committed to "funding the Clean Water Initiative in a manner that ensures the maintenance of effort and that provides an annual appropriation for clean water programs in a range of $50 million to $60 million as adjusted for inflation over the duration of the Initiative" (10 V.S.A. § 1387).[93] Between the annual Clean Water Budget and other proposed state appropriations for clean water, the state is meeting this target. To maintain this level of effort, the Scott Administration and the Clean Water Board recommend maintaining existing Clean Water Fund revenue streams by repealing the July 1, 2027 sunset of the Property Transfer Tax Clean Water Surcharge. The sunset repeal is being proposed for consideration in the 2025–2026 legislative session. The State will continue to assess the adequacy of funding and report an annual recommendation.

Water Quality Restoration Formula Grant Program

Act 76 established regional organizations called Clean Water Service Providers (CWSPs) for each Tactical Planning Basin in the Lake Champlain and Lake Memphremagog basins. CWSPs are responsible for partnering with Basin Water Quality Councils and project implementers to oversee the identification, funding, implementation, operation, and maintenance of non-regulatory clean water projects to meet non-regulatory phosphorus reduction targets with funding provided through the Water Quality Restoration Formula Grant Program.

Water Quality Restoration Formula Grants are awarded annually to each CWSP. Formula Grant funds are allocated based on the Water Quality Restoration Formula Grant Targets and Fund Allocation Methodology. The Fund Allocation Methodology considers the annual pollutant reduction allocation established for the CWSP, multiplied by the standard cost for pollutant reduction, with phosphorus reduction allocations and award values scaled to available funds.[94] The standard cost for pollution reduction is determined by project type category and includes the costs of project design and construction. Pollution reduction allocations are further downsized to make room in the awards to cover costs associated with administration, reporting, project identification, development, inspection, verification, and operation and maintenance (O&M). Inspection and verification involves regularly visiting project sites and visually assessing the status and condition of a project to confirm its function. DEC has developed tools and resources to support standardization of verification site visits and data collection. O&M of clean water projects ensures installed practices continue to contribute phosphorus reductions for the duration of the project's functional life. Maintenance can look like a variety of tasks, such as addressing sediment accumulation, removing trash or natural debris from the practice, replanting dead vegetation, or mowing around the practice to maintain function and access.[95] Currently, state funding to support clean water project O&M is limited to Water Quality

[93] State of Vermont Office of the State Treasurer (2017) Clean Water Report Required by Act 64 of 2015, available here: https://www.vermonttreasurer.gov/sites/treasurer/files/committees-and-reports/_FINAL_CleanWaterReport_2017.pdf

[94] To learn more about and view the Water Quality Restoration Formula Grant Targets and Fund Allocation Methodology, visit: https://dec.vermont.gov/water-investment/statues-rules-policies/act-76/resources The Methodology will be refined periodically by DEC as improved information and data become available.

[95] To learn more about the O&M Program and upcoming trainings, visit the Verification and O&M webpage: https://dec.vermont.gov/water-investment/cwi/projects/verification

Restoration Formula Grant awards, which can be used to fund 'adoption' of prior constructed projects for the purpose of continued O&M activities. Total Formula Grant estimated need based on phosphorus reduction targets will be further refined in future Clean Water Budget cycles, with continued collection of data on project costs related to project outputs and phosphorus reductions. DEC will continue to work with O&M partners to improve O&M cost estimates and establish quantitative budget targets in future years.

Eligible non-regulatory clean water project types that can be funded under Water Quality Restoration Formula Grants are described in the CWIP Funding Policy.[96] This includes projects across a range of sectors including floodplain and stream restoration, riparian buffer plantings, stormwater management improvements, road erosion control measures, and lake shoreline restoration. CWSPs and their Basin Water Quality Councils are responsible for determining how Formula Grant funds are awarded at the project-level, within their respective basins, using state-derived guidance. In SFY 2023 and 2024, a total of $15.6 million has been awarded to CWSPs under Water Quality Restoration Formula Grants, and this level of funding is accompanied by total phosphorus reduction targets of 982.1 kilograms per year in the Lake Champlain basin and 91.8 kilograms per year in the Lake Memphremagog basin.[97] In SFY 2024, CWIP and Lake Champlain Sea Grant developed and co-hosted four online training courses and one in-person field training day to support partners performing verification and O&M. Over 55 people attended at least one of the four online training courses and a total of 30 completed all required trainings to be a certified verifier for CWSP projects.

CWSPs and project implementation partners are at various stages of implementation for projects funded under Water Quality Restoration Formula Grants, and results of this funding will continue to be incorporated into basin-wide accounting presented in Chapters 3 and 4 of this report and in the Lake Champlain Basin Interim and Final Reports located in subsequent appendices of this report.

Water Quality Restoration Formula Grants are administered by CWIP with technical project management from the Watershed Planning Program (WPP).

Water Quality Enhancement Grant Program

The statutory intent of the Water Quality Enhancement Grant Program established through Act 76 is to:

- Protect high quality waters;
- Maintain or improve water quality;
- Restore degraded or stressed waters;
- Create resilient watersheds and communities; and
- Support the public's use and enjoyment of the state's waters.

This is achieved in SFY 2024 through administration of multiple sub-initiatives, including: Dam Removal Design and Implementation Block Grant, Woody Riparian Buffer Block Grant, River Corridor Easements, Multi-Sector Assessments, Enhancement Development, Design & Implementation Block Grant, and Regional Conservation Partnership Program (RCPP) Wetland Incentives. Enhancement Grant Program sub-initiatives vary in structure between grants or

[96] The CWIP Funding Policy is available here: https://dec.vermont.gov/water-investment/cwi/grants

[97] One metric ton is equal to 1,000 kilograms.

contracts, depending on the scope of work; some funding is administered, allocated, and awarded at the project-level by a Funding Program Administrator through a block grant structure. The intent of the Water Quality Enhancement Grant Program suite of sub-initiatives is to support the life cycle of projects from identification to development through implementation. Eligible non-regulatory clean water project types that can be funded under Water Quality Enhancement Grants are described in the CWIP Funding Policy.[96]

The Water Quality Enhancement Grant's minimum funding level is 20 percent of the annual balance of the Clean Water Fund, provided that the maximum amount recommended shall not exceed $5,000,000. The SFY 2023 and 2024 budgets funded this grant category at the full $5,000,000 maximum.

Water Quality Enhancement Grants are administered by CWIP with technical project management from CWIP and the Watershed Management Division.

Developed Lands Implementation Grant Program

The Developed Lands Implementation Grant Program will provide grants or financing to support individuals required to comply with stormwater regulatory requirements that are necessary to achieve water quality standards. The program will support Three-Acre General Permit obtainment and compliance through design and implementation. Approximately $14 million in state ARPA investments have been allocated to support Manufactured Housing Communities and four Agricultural Fairgrounds to achieve Three-Acre General Permit compliance. A portion of $8.4 million available through DEC's Three-Acre Permit Obtainment Assistance program provides beneficiary payments to landowners to support the engineering and permitting costs associated with permit obtainment.[98] Ultimately, a financing structure will replace ARPA programs to serve as the Developed Lands Implementation Grant Program.

The Developed Lands Implementation Grant Program is administered and managed by CWIP.

Municipal Stormwater Implementation Grant Program

Act 76 established the Municipal Stormwater Implementation Grant Program to provide grants to municipalities to assist with their compliance efforts under regulatory stormwater permits. 10 V.S.A § 928 states: "The Secretary shall administer a Municipal Stormwater Implementation Grant Program to provide grants to any municipality required under section 1264 of this title to obtain or seek coverage under [1] the municipal roads general permit (MRGP), [2] the municipal separate storm sewer systems (MS4) permit, [3] a permit for impervious surface of three acres or more, or a permit required by the Secretary to reduce the adverse impacts to water quality of a discharge or stormwater runoff."

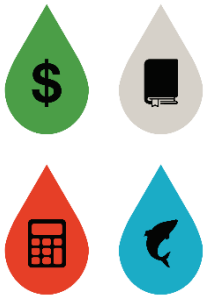
The statutory intent of the Municipal Stormwater Implementation Grant Program is met through several complementary initiatives. The VTrans *Municipal Roads Grants-in-Aid* and *Municipal Better Roads* programs will continue to support implementation of the Municipal Roads General Permit requirements ([1]), with over $8 million of state investments allocated for SFY 2023–2024. DEC's Municipal Separate Storm Sewer System (MS4) Community Formula Grant program has awarded $7.5 million to support implementation of the MS4 stormwater

[98] For more information on Three-Acre General Permit funding programs, visit: https://anr.vermont.gov/special-topics/arpa-vermont/treating-stormwater-runoff#POA

requirements ([2]). DEC's Green Schools Initiative has awarded over $32 million to support Vermont schools through permit obtainment and construction to meet Three-Acre General Permit requirements. An additional $4.4 million in state ARPA investments is allocated to DEC's Three-Acre Public Private Partnerships (P3) to support municipalities in meeting Three-Acre General Permit stormwater requirements. A portion of $8.4 million available through DEC's Three-Acre Permit Obtainment Assistance program supports municipalities in meeting Three-Acre General Permit stormwater requirements ([3]).

MRGP sub-initiatives are administered and managed by VTrans. MS4 and Three-Acre General Permit sub-initiatives are administered and managed by CWIP.

Appendix B: Otter Creek, Little Otter Creek, and Lewis Creek (Basin 3) TMDL Implementation 2024 Final Report



The Accountability Framework of the 2016 *Phosphorus Total Maximum Daily Loads (TMDL) for Vermont Segments of Lake Champlain* ensures TMDL implementation moves forward at a steady rate. A major driver of the Accountability Framework is the Vermont Department of Environmental Conservation's (DEC) development of basin-specific Tactical Basin Plans (TBP). The TBPs are developed on a five-year rotating basis and include Implementation Tables that identify priority actions needed to implement the TMDL. This report allows the U.S. Environmental Protection Agency (EPA) to track implementation progress in each basin through review of the progress made in accomplishing the tasks in the TBP Implementation Table. To facilitate EPA's evaluation of progress, DEC describes the status of each strategy at 2.5 years and at the conclusion of the five-year planning cycle in interim and final report cards, respectively.

Appendix B is the final report card for the 2019 Otter Creek TBP. The 5-year reporting period began coincident with the publication of the 2019 Otter Creek TBP and went through June 30, 2024. Data in this appendix align with the 5-year reporting period (SFY 2020–SFY 2024) available through the Clean Water Reporting Framework (CWRF).

The following sections describe progress towards completing strategies in the 2019 Otter Creek TBP Implementation Table. Each strategy is organized by one of five major sectors – agriculture, developed lands, natural resources, forestry, and wastewater. Progress described for each strategy includes status (defined in Table B-1) as well as an explanation of actions taken. The explanation describes how the Agency and partners supported the strategy and resulting outcomes that together show that meaningful results were achieved. The outcomes include performance measures for Agency-supported assistance that were collected as part of the Accountability Framework (see Accountability Measures).

Over the 5-year reporting period, phosphorus reductions for the Otter Creek basin were estimated to have met about 17 percent of the basin's total load reduction targets set by the TMDL, based on basin-level data summarized in the CWRF. While this report card does not discuss trends in annual phosphorus reductions, estimated trends since SFY 2016 can be found by basin and by sector in the TMDL reduction estimates interactive online report. Trends, as well future five-year phosphorus targets, are also further discussed in the 2024 Otter Creek Tactical Basin Plan's Lake Champlain TMDL Phase 3 content.

Basin 3 Update

The 2019 TBP strategies were evaluated, and their associated actions were assigned a status condition using the rationale described in Table B-1. To address strategies identified as ongoing in the 2024 Otter Creek Tactical Basin Plan, a status of complete, continued, or discontinued has been assigned to previously ongoing projects. Of the 52 strategies identified, to date 31 were completed, 13 are in progress, one is continued, and 4 were not started (Figure B-1).

Three strategies were considered alongside other strategies as denoted by “Crosswalk to plan strategy number” in Table 2 of the 2022 B3 Interim Report.

Table B-1: Status conditions assigned to strategies and actions in the TBP Implementation Table (Table B-2).

Strategy Status for Final Report Card	Description	Example(s)
Complete	A discrete action identified in a strategy with a clear end point that has been implemented. A strategy identified as ongoing in the interim report card that has been pursued and implemented throughout the TBP’s 5-year period.	Provided three trainings to partners to evaluate 5 properties for Lake Wise assessments. The Municipal General Permit was implemented and all or most towns are on schedule to meet permit requirements. Five priority projects were implemented that were identified in River Corridor Plans.
In Progress	A discrete action identified in a strategy with a clear end point that is in progress or in the queue.	A stormwater master plan that has been funded and is being implemented but is not yet completed.
Not Started	A discrete or programmatic strategy that has not been initiated.	No funding is currently available to support the project.
Continued	A discrete or programmatic strategy that was not initiated or formally pursued due to lack of interest, funding, or capacity gaps.	Strategy was carried over to the Watershed Projects Database to be implemented when there is interest and capacity. Strategy is still a high priority and carried over to the next basin plan.
Discontinued	A discrete or programmatic strategy that was removed as a strategy and is no longer a priority.	The project was superseded by a project further upstream that treated the problem effectively. The project is no longer a priority for the state program.

This report depicts a watershed community that is pursuing permit compliance and implementing voluntary practices that work towards meeting the state’s water quality and phosphorus reduction goals. This is achieved through the implementation of permit programs, installation of green stormwater practices, adoption of flood resilience measures, implementation of farm agronomic practices, and application of riparian restoration and conservation projects. As described in the final status report for the 2019 Otter Creek TBP Implementation Table (Table B-2), most of the actions associated with regulatory programs were completed or were in progress by the interim reporting period. A majority of those were

completed through Agency of Natural Resources (ANR) or Agency of Agriculture, Food and Markets (VAAFM) financial support to permit holders as well as partners who distributed education, outreach, and technical assistance. Regulatory compliance outcomes include increased implementation of Required Agricultural Practices (RAPs) and agricultural best management practices (BMPs) and stormwater BMPs on roads. In addition, there was a steady increase in resources provided by the state to communities and partners supporting natural resource restoration practices and stormwater management of developed land.

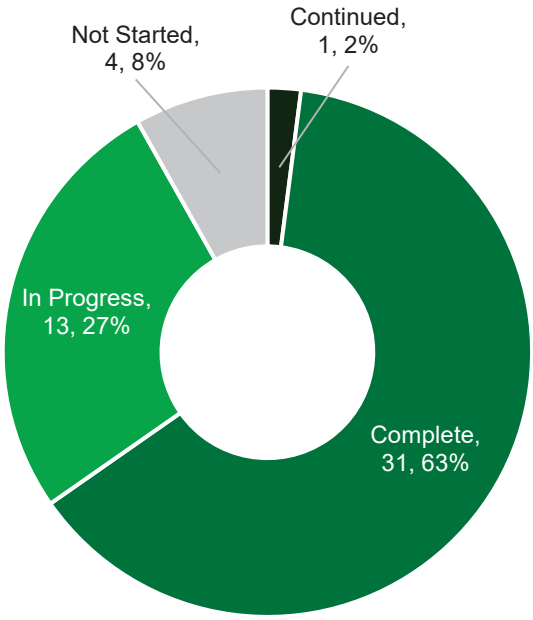


Figure B-1. Basin 3 Implementation Table action status of the 52 strategies in the 2019 TBP Implementation Table.

Available funding and advanced coordination played a critical role in allowing watershed partners and municipalities to work together to significantly advance 87% of the strategies from the 2019 Otter Creek TBP (Figure B-1). Phase 3 of the TMDL in the 2024 TBP provides additional information that explains sector-level progress on meeting TMDL goals to date as well as expectations for areas of accelerated progress. This progress is an outcome of strategy implementation in the 2019 TBP as 60% of the strategies were completed. Completed strategies were often related to either regulatory implementation as described above, the completion of discrete tasks, or the continued or accelerating implementation of programmatic strategies over the five-year period. The narrative in Table B-2 provides additional detail in the explanation column. 25% of the strategies are still in progress. Those strategies in progress that were pursued and then updated as a new strategy in the 2024 Otter Creek TBP will be reported on during the next planning cycle. Most projects in progress have completed the first phase of action, for example, a design may have been completed for a project, but the implementation of the project will be completed in the next year. Other “In Progress” strategies are those in which slightly revised approaches to the same goal warrant continued strategy tracking in the 2024 TBP. One lakes strategy and one agricultural strategy were not implemented because of a lack of community or staff capacity, respectively. One roads strategy was “Not started” because it is being accomplished informally among municipalities. One wetland strategy was “Not started” due to a lack of collective interest among municipalities to reclassify a Class I wetland candidate. One lake strategy was “Continued” and remains a priority to advance Lake Wise assessments and project implementation.

In the 2024 TBP, a new set of strategies are identified that represent the next phase of work associated with regulatory programs, or improved approaches that partners can take with agency resources to encourage implementation in the community. Additional accounting methodologies will capture information on more restoration and protection activities in the basin

and more accurately represent the total phosphorus reductions achieved. In addition, the Clean Water Service Delivery Act (Act 76) will increasingly support the delivery of clean water services and increase regional capacity to develop and implement projects that fulfill actions. The Addison County Regional Planning Commission (ACRPC) is the Otter Creek basin Clean Water Service Provider. In SFY 2023 DEC awarded ACRPC a grant for $1,094,817 to achieve an annual phosphorus reduction target of 83.3 kilograms by supporting the development, implementation, and maintenance of non-regulatory clean water projects. In SFY 2024, ACRPC received $1,152,517 to achieve an additional 83.3 kilograms. An explanation of DEC's expected progress based on these additional resources is included in the 2024 TBP's Chapter 3 (LC TMDL Phase 3) and Chapter 4. A recent analysis of ACRPC's efforts as a Clean Water Service Provider reveals excellent progress towards attainment of their first term-of-service targets. ACRPC was also reassigned to a second term of service as Clean Water Service Provider for the Otter Creek Basin, which will run from July 1, 2025, through June 30, 2030. DEC will submit the interim report for the 2024 Tactical Basin Plans in 2027 and the final report in 2029.

Basin 3 Implementation Table Status

The final status for each strategy (Table B-2) was compiled by the Water Investment Division's Watershed Planning Program using data from the DEC, NRCDs, RPCs, and watershed partners involved in project development and implementation for the 5-year reporting period.

The Implementation Table is not an exhaustive list of water quality strategies that lead to phosphorus reductions in a basin. A complete description of all the work that the state supports in the basin to meet water quality goals can be found in the 2021 Vermont Nonpoint Source Management Plan. Additional information about progress associated with each sector can be found in Chapter 3 of the *Vermont Clean Water Initiative 2024 Performance Report,* which provides comprehensive reporting of estimated total phosphorus load reductions associated with state funding, federal funding, and regulatory programs in the Lake Champlain basin. These data are also available to the public through the Clean Water Portal's Clean Water Interactive Dashboard — an online tool that allows interested parties to examine and filter Performance Report data on investments, project outputs, estimated pollutant load reductions and project cost effectiveness. Individual projects in the basin that are included or supported by strategies are described in the Clean Water Explorer, also found through the Portal.

Table B-2: Basin 3 Implementation Final Status Report includes data from SFY 2020 to SFY 2024 unless otherwise noted. Any referenced tables or appendices can be found in the 2019 Otter Creek Tactical Basin Plan (TBP).

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Final Status	Explanation
Support meetings and workshops between ACRWC, VAAFM, UVM Ext., CVFC, and local farmers.	Lewis Creek, Little Otter, Middlebury River, Dead Creek, Lemon Fair	Middlebury, Panton, Ripton, Cornwall, Bristol, Starksboro, and Ferrisburgh	Agriculture	Complete	Through the Agricultural Clean Water Initiative Program (AgCWIP), VAAFM provides financial support to partner organizations to provide education, outreach, and technical assistance to farms related to water quality regulations, RAPs, BMPs and cost-share programs. Beginning in 2019, the ACRWC hosts an annual Agricultural Partners and Water Quality meeting with VAAFM funding. In total, the four meetings had 58 attendees from the following groups: ACRWC, VAAFM, CVFC, UVM Ext., LCA, OCNRCD, DEC, and local farmers. The next meeting is scheduled for 12/10/2024.

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Final Status	Explanation
Host annual workshops on improving soil and water health, RAPs, implementing agronomic practices, and buffer plantings.	Basin wide with focus on Lewis Creek, Little Otter, Middlebury River, Upper Otter, Dead Creek, Lemon Fair	All towns	Agriculture	Complete	Workshops, trainings, field days, and webinars have been provided to farms in Basin 3 covering a range of topics, including soil health, RAPs, conservation tillage, cover cropping, and other conservation practices. During SFY 2020 - 2024, 29 events were hosted in Basin 3 by partners supported through the VAAFM AgCWIP. These events spanned 86 hours, had 439 attendees, and included partnership development workshops, Basin 3 farm field days showcasing conservation practice implementation, workshops highlighting the benefits of farm agronomic practices including conservation tillage and cover cropping, pasture and grazing practices, nutrient management planning, soil health, and more. Additional workshops and events may have occurred in the Basin beyond those supported, tracked, and reported by partners funded by VAAFM AgCWIP.

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Final Status	Explanation
Support farmers in developing NMPs through UVM Extension's Digging In course and the development of NMPs for all certified farms through NRCS CAPS funding.	Basin wide with focus on Lewis Creek, Little Otter, Middlebury River, Upper Otter, Dead Creek, Lemon Fair	All towns	Agriculture	Complete	State and federal funds support the work of OCNRCD, RNRCD, and UVM Extension to provide NMP courses and TA to farms developing and implementing NMPs. During SFY 2020-2024, 35 farms received NMP assistance supported by partner, state, and federal programs in the basin. NRCD staff provide support as needed for certified farms that are not interested in the Digging in course.
Track # of NMPs developed and implemented in priority sub-basins	Basin wide with focus on Lewis Creek, Little Otter, Middlebury River, Upper Otter, Dead Creek, Lemon Fair	All towns	Agriculture	Complete	During SFY 2020-2024, 13,789 acres of nutrient management occurred, and 35 farms received NMP assistance in the basin.
Track and inspect CSFOs that need NMPs or that have up to date NMPs, schedule to keep these up to date.	Basin wide	All towns	Agriculture	Complete	VAAFM RAPs require CSFOs to submit an annual certification form by January 31st of each year, which includes the status of the CSFO's NMP. This information is available to AgCWIP partners for the purpose of NMP E&O and TA. In addition to the annual reporting and NMP status information provided by farmers, VAAFM documents NMP status through routine inspections.

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Final Status	Explanation
Install practices on agricultural lands that will reduce runoff in areas where bacteria and nutrient levels are above the VWQS and/or have been identified in NMP or LTPs. Ground truth to reconcile modeled P source areas with field data.	Lewis Creek, Little Otter, Middlebury River, Upper Otter, Dead Creek, Lemon Fair	All towns	Agriculture	Complete	During SFY 2020-2024, a total of 71,228 acres of agricultural land were treated in the basin. During the same period, 51,229 kgs P were reduced from these acres. See strategy #14 for information regarding an ongoing Conservation Effects Assessment Program (CEAP) paired watershed study in the Dead Creek and Little Otter Creek watersheds.
Provide technical assistance to farmers to ensure tile drain systems comply with RAPs.	Basin wide	All towns	Agriculture	Complete	In November 2018, the RAPs were amended to include requirements for reducing nutrient contributions to waters of the State from subsurface tile drainage on agricultural fields. Following this amendment, Agency of Agriculture RAP educational materials have been updated to include the tile drain rules and regulations.
Implement regional equipment sharing programs to support the implementation of conservation practices	Basin wide	All towns	Agriculture	Complete	During 2020 & 2021, UVM Extension offered the following pieces of equipment to farms: no-till drills: 35 farms, soil probes & penetrometers, truck scales (used for calibrating manure spreaders and weighing forage trucks for yield records): approximately 20 farms. UVM Extension also paid a contractor to use a manure injector on interested farmers' land (approximately 5,000 acres treated).

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Final Status	Explanation
Establish vegetated riparian buffers and/or filter strips above and beyond existing compliance standards (i.e., RAPs or shoreline protection).	Basin wide	All towns	Agriculture	Complete	During SFY 2020-2024, 42 acres of agricultural forested buffer were installed in the basin. Currently, it is not possible to track all acres that are above and beyond compliance standards especially when installed outside of state and federal standards.

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Final Status	Explanation
Develop practical stormwater BMPs for farms and provide technical and financial support for farms to implement these to address stormwater runoff from impervious surfaces in farm production areas.	Basin wide	All towns	Agriculture	Complete	The RAPs Section 6.01(b) requires production areas, barnyards, animal holding or feedlot areas, manure storage areas, and feed storage areas utilize runoff and leachate collection systems, diversion, or other management strategies to prevent the discharge of agricultural wastes to surface water or groundwater. Technical and financial assistance is available to farmers to reduce production area runoff of agricultural wastes through the VAAFM BMP Program and NRCS EQIP. Examples of barnyard and production area practices implemented on farms to address agricultural waste runoff are heavy use area protection, waste storage facilities, clean water diversions, and roof runoff structures. These are important and commonly used practices by farmers to manage runoff from impervious surfaces and protect nearby surface waters. During SFY 2020-2024, 611 structural agricultural practices were installed in the basin. While most of these structural practices are located within a farm's production area, pasture infrastructure such as fencing and animal trails are also included in this total number.

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Final Status	Explanation
Complete water quality monitoring on/near farms to help identify source areas and evaluate nutrient reductions achieved through BMP implementation.	Lewis Creek, Little Otter, Middlebury River, Upper Otter, Dead Creek, Lemon Fair	All towns	Agriculture	Complete	The ACRWC monitors streams draining the prioritized subbasins and presents their findings at their annual Agricultural Partners and Water Quality meeting (#1 above). CEAP is an ongoing USDA funded paired watershed study that began in September 2019. The treatment watershed is a combination of the East and West Branch of Dead Creek in Addison County and the control watershed is Headwaters of Little Otter Creek. This project is collecting water chemistry, flow, and soil health data from each watershed as well as evaluating individual practices, as well as synergies obtained through stacking practices at the field scale. The VT DEC/USDA Regional Conservation Partnership Program provided funding in 2024 for practice implementation on farms in the treatment watershed that will provide the ability to evaluate effectiveness and impact.

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Final Status	Explanation
Conduct outreach to farmers with potential natural resource protection opportunities (e.g., river corridor or wetlands)	Lewis Creek, Little Otter, Middlebury River, Upper Otter, Dead Creek, Lemon Fair, Clarendon River	All towns	Agriculture	Complete	In December 2022, the Basin 3 Clean Water Service Provider (ACRPC) released the first RFP to distribute formula grants and that includes projects on agricultural land if the farm in question does not meet the minimum eligibility criteria for the Required Agricultural Practices. They have completed 4 funding rounds to date. Beginning in 2019, the ACRWC hosts an annual Agricultural Partners and Water Quality meeting. In total, the four meetings had 58 attendees from the following groups: ACRWC, VAAFM, CVFC, UVM Ext., LCA, OCNRCD, DEC, and local farmers. The next meeting is scheduled for 12/10/2024. The VT DEC/USDA Regional Conservation Partnership Program provided funding for the VT Association of Conservation Districts and Redstart Consulting to conduct outreach to farmers and foresters in this area, doing resource assessments, assisting with applications for funding through the RCPP program, and assisting with practice implementation. 22 landowners were funded with RCPP funds in SFY 2023-2024 (Note: funding was for farm and forest landowners in all of Addison County).

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Final Status	Explanation
Analyze LCBP 1m data to identify agricultural lands lacking riparian buffers and use these to prioritize BMP implementation and outreach on RAPs.	Basin wide	All towns	Agriculture	Not started	The project stalled due to lack of capacity.
Provide technical support to farmers and assistance tracking BMP practices implemented with(out) state or federal funding.	Basin wide	All towns	Agriculture	Complete	During SFY 2020-2024, AgCWIP funded 30 E&O and TA events related water quality topics and BMPs that had 439 attendees.
Publish success stories where farmers have installed BMP practices and seen improved farm operations and improved water quality conditions.	Basin wide	All towns	Agriculture	Complete	Organizations providing technical and financial assistance to farmers, as well as organizations representing farmers in this Basin feature farms and farm projects that are having positive impacts to water quality and the community. Organizations that provide project stories, farmer highlights, and community engagement in the basin include Champlain Valley Farmer Coalition (CVFC), UVM Extension – Champlain Valley Crops, Soils and Pasture Team, NRCS, VAAFM, OCNRCD, RNRCD, and ACRWC.

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Final Status	Explanation
Develop stormwater master reports or plans.	Basin wide	Addison, Bridport, Chittenden, Cornwall, Goshen, Leicester, Mendon, Mount Tabor, Monkton, New Haven, Panton, Ripton, Shrewsbury, Salisbury, Tinmouth, Waltham, Weybridge, Whiting	Developed Lands-Other	In Progress	RRPC worked with RNRCD and DEC to get Chittenden, Mendon, and Pittsford to be part of a block SWMP grant that was funded and administered by the State. This SWMP effort is underway with the overall goal of identifying and developing opportunities to mitigate stormwater runoff thereby improving water quality and flood resiliency. To date, 18 projects were identified in Chittenden, 19 in Mendon, and 22 in Pittsford. In 2022, the RNRCD received funding through LCBP to hire a consultant to complete a SWMP for the Town of Proctor. The consultant completed 30% designs for Proctor High School, Proctor Library, Proctor Elementary School and Riverside Cemetery and provided the designs, a final report and all deliverables. The deadline for this agreement was August 31, 2024. Efforts continue to encourage Mount Tabor, Shrewsbury and Tinmouth to seek funding for SWMPs.

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Final Status	Explanation
Outreach to landowners that will come under the 3-acre stormwater permit.	Basin wide	Rutland city, Rutland town, and Middlebury	Developed Lands - Other	Complete	The WSMD Stormwater Program has identified and notified affected three-acre site owners that they will need to apply for permit coverage by 2023. Currently, the Agency is making available grant funding in the form of rebates for individual landowners, while municipalities can access Clean Water funding and/or subsidized loans, to obtain permit coverage. When requested, RRPC helps the City of Rutland, Town of Rutland, and other municipalities.
Determine if high priority practices identified in Stormwater Mapping Reports should be carried out singularly or through multi-town Stormwater Master Planning.	Basin wide	Bristol, Charlotte, Danby, Dorset, Ferrisburgh, Hinesburg, Ira, Killington, Lincoln, Mount Holly, Pittsford, Proctor, Orwell, Shoreham	Developed Lands - Other	In Progress	A singular approach was taken with Pittsford and its Mapping Report. Since the town did not have a SWMP, RRPC secured a block grant to address one of the priority projects in the report. Pittsford subsequently has decided to be part of a block SWMP with seven other municipalities (including Chittenden and Mendon) around the State. In 2022, the RNRCD received funding through LCBP to hire a consultant to complete a SWMP for the Town of Proctor. The consultant completed 30% designs for Proctor High School, Proctor Library, Proctor Elementary School and Riverside Cemetery and provided the designs, a final report and all deliverables. The deadline for this agreement was August 31, 2024. Outreach continues with Danby, Ira, Killington, and Mount Holly.

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Final Status	Explanation
Develop and implement GSI practices at local schools	Basin wide	All towns	Developed Lands - Other	In Progress	RNRCD completed a final design for the stormwater BMP at Wallingford Elementary School on March 29, 2022. Implementation is delayed, because the school owns the property, and they are asking the Town to take ownership of the Stormwater practice.
Provide outreach and education for development of stormwater bylaws.	Basin wide	All towns	Developed Lands - Other	Complete	To date no municipalities have expressed interest in developing stormwater bylaws. RPCs offer this assistance whenever a municipality begins updating its bylaws. Appendix B in the 2024 Basin 3 Tactical Basin Plan details surface-water related protections adopted by municipalities in the Otter Creek basin.
Complete REIs for all towns in the basin by 12/31/2020.	Basin wide	All towns	Developed Lands - Other	Complete	The Municipal Stormwater Implementation Grant Program funds REIs. REIs for all municipalities in this basin are complete.
Provide support to towns to upload REI data into MRGP database by 2020.	Basin wide	All towns	Developed Lands - Roads	Complete	Towns were required to submit their implementation requirements (15% of noncompliant segments upgraded to meet the MRGP standards) by April 1, 2023. Support was provided to all municipalities in this basin as ongoing assistance through the Grants in Aid program. All information is tracked in the online MRGP Implementation Table Portal.

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Final Status	Explanation
Implement high priority road projects across the basin to meet MRGP requirements.	Basin wide	All towns	Developed Lands - Roads	In Progress	During SFY 2020-2024, 2,460 hydrologically connected road were segments inventoried, 895 hydrologically connected municipal road miles were identified that require water quality improvements. During this time, 49 municipal road drainage and stream culverts were replaced, and 131,698 feet of road drainage and erosion control improvements were implemented in the basin. Towns are using a combination of Regional Transportation Funds, VTrans Better Roads grants, DEC Grants-in-Aid funds, and their own municipal funds to implement projects to meet MRGP standards.
Provide technical assistance to towns for developing project proposals, budgets, and funding opportunities for implementing priority projects that have the largest water quality benefits.	Basin wide	All towns	Developed Lands - Roads	Complete	This assistance is available to all municipalities in this basin. The State provides technical and financial assistance for MRGP planning and implementation through the Clean Water-funded VTrans Municipal Grants-in-Aid and Better Roads programs. To meet the next phase of the MRGP (reissued in 2023), the RRPC and ACRPC with Clean Water Funding administered by VTrans are currently assisting towns in conducting another road inventory.
Host workshops and peer to peer sharing on best practices for using new equipment to meet MRGP standards and support equipment purchase.	Basin wide	All towns	Developed Lands - Roads	Complete	At the RPCs this is being provided as part of ongoing assistance through the Grants-in-Aid program and through quarterly road foremen meetings for all municipalities in the basin.

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Final Status	Explanation
Create an equipment sharing program and track use of equipment used to meet MRGP requirements.	Basin wide	All towns	Developed Lands - Roads	Not Started	This is being done informally among most municipalities, and it seems to be working using this approach.
Support the development and implementation of Phosphorus Control Plans (PCP) and the Flow Restoration Plans (FRP).	MS4 entities	MS4 entities	Developed Lands - Other	In progress	RNRCD received funding through the LCBP to hire Fitzgerald Engineering to complete a PCP for the City of Rutland. RRPC is assisting the Town of Rutland in the implementation of its SWMP, PCP, and FRP by finding funding and administering grants. Two (out of 17) priority BMPs in its FRP that have been implemented: An outlet retrofit at Hitzel Terrace, and an outlet retrofit at Wynnmere has been designed.

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Final Status	Explanation
Implement six minimum control measures required in the State TS4 permit.	Basin wide	All towns	Developed Lands - Other	In Progress	DEC reissued the TS4 General Permit in 2022. • Final TS4 General Permit (2022) • TS4 Factsheet Per the 2022 TS4 Permit, VTrans implemented and enforced a SWMP, which includes six MCMs designed to reduce the discharge of pollutants from the TS4 to the maximum extent practicable, to protect water quality, and to satisfy the appropriate water quality requirements of the CWA. The BMPs that are being implemented by VTrans to address these six minimum control measures are included in Part 6.0 of the SWMP. A summary of annual reporting requirements and progress for each MCM is provided in the Annual Report Workbook.

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Final Status	Explanation
Reissue permits to 9 WWTFs in the basin in 2021 that meet the P limits. Support municipalities pursuing P optimization, expansion projects, and upgrades.	Basin wide	Brandon, Middlebury, Otter valley Union High School, Pittsford, Proctor, Rutland, Vergennes, Wallingford, West Rutland	Wastewater	In Progress	Since 2021, DEC has reissued 7 of 9 municipal wastewater discharge permits in Basin 3. Permit expiration dates are: Brandon – 3/31/2027 Middlebury – Permit under Title 3 administrative continuance until renewed. Otter valley Union High School – 3/31/2028 Pittsford- 3/31/2027 Proctor – 12/31/2027 Rutland - 3/31/2027 Vergennes – Permit under Title 3 administrative continuance until renewed. Wallingford - 3/31/2027 West Rutland – 9/30/2027 All the facilities are required to optimize TP removal in their renewed permits under the 2016 LC TMDL. None of the Otter Creek municipal WWTFs have exceeded 80% of their LC TMDL limit.
Increase education and outreach on minimizing water quality impacts of maple sugaring operations.	Basin wide	All towns	Forests	Complete	The VT Maple Sugar Makers' Association partners with UVM Extension to host 3 workshops per year reaching approximately 200 attendees/event. At the workshops, they offer sessions and information on sugar house RO water discharges.

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Final Status	Explanation
Provide outreach, technical assistance and workshops to private forestland owners, foresters, and loggers on AMPs, use of skidder bridges, and voluntary harvesting guidelines.	Basin wide	All towns	Forests	Complete	Starting in 2018, the DFPR has been providing cost-share funding for loggers and foresters to receive temporary portable skidder bridges. Statewide, the DFPR distributed 12 free wooden bridges and administered 9 cost share grants for bridges. From SFY 2019 to 2024, one E&O/TA event focused on AMPs, and it had 16 attendees.
Map and assess forest access networks on state lands.	Basin wide	All towns with state lands	Forests	Complete	In SFY 2024, clean water funds are available for planning/design and implementation of road and trail BMPs to reduce erosion and nutrient and sediment pollution on ANR's road and trail networks, including State Forests, Wildlife Management Areas, State Parks, and recreational access points. Road and trail segments are identified and prioritized for BMP implementation using a modified Municipal Roads General Permit (MRGP) inventory methodology, a field application for data collection, and a companion database to gather and store data (inventory work is funded with prior year Clean Water Fund dollars). BMPs implemented bring whole road segments up to standards for water quality improvement.

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Final Status	Explanation
Natural resource assessments of state lands should explicitly identify flood resiliency as a management objective and be included in Long Range Management Plans (LRMP).	Basin wide	All towns with state lands	Forests	Complete	Watershed Planners increasingly seek to bring flood resiliency elements into the Water Resources section of LRMPs. For example, the 2024 Castleton Management Unit LRMP includes the following strategies: 1. Enhance forest cover in riparian areas & wetland buffers to maintain natural stream temperatures, wildlife corridors, & to mitigate flooding impacts. 2. Follow riparian guidance to protect all wetlands, seeps, streams, & vernal pools. 3. Design roads, trails, & other infrastructure for aquatic organism passage & flood resiliency. Improve exiting road and trail infrastructure to minimize erosion.
Provide outreach to communities around Chipman Lake and Richville Pond to generate interest in Lake Wise Program	Chipman Lake, Richville Pond	Tinmouth, Shoreham	Lakes	Complete	Chipman Lake is a possible LWAP candidate in the basin because it has a poor shoreland habitat condition rating and a significant number of lakeshore residents. However, the lake does not have an active lake association, despite a significant number of shoreline residents. Partner outreach was completed in 2023 and 2024 from the Vermont Lakes and Ponds Program and the Rutland Regional Planning Commission. These partners will continue to encourage local community support for assessment and lake and watershed restoration to slow increasing nutrient trends.

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Final Status	Explanation
Complete Lake Wise planning for lakes where there is community support for such efforts.	Chipman Lake, Richville Pond	Tinmouth, Shoreham	Lakes	Continued	RRPC will reach out again to DEC LPP Lake Wise staff to coordinate work and priorities.
Implement priority projects identified in Lake Wise assessments.	Chipman Lake, Lake Dunmore, Fern Lake, Richville Pond	Tinmouth, Shoreham, Salisbury, Leicester	Lakes	In Progress	The Lake Dunmore Fern Lake Association hired Fitzgerald Environmental Associates to complete a Lake Watershed Action Plan in 2021. The LWAP identified 17 out of 62 projects as high priority projects. To-date, three of these have been implemented and others will be pursued as funding and capacity become available.
Establish Lay Monitor on lakes recommended by the Lakes and Ponds Program (e.g., on lakes with significant shoreline development and potential water quality issues).	Cedar Lake (Monkton Pond), Silver Lake, Winona Lake (Bristol Pond)	Monkton, Leicester, Bristol	Lakes	Not started	No progress has been made on this strategy due to lack of community interest.
Implement high priority projects recommended in the Moon Brook River Corridor Plan.	Moon Brook	Rutland City and town	Rivers	In progress	The 2008 Moon Brook RCP identified 22 project opportunities on Moon and Mussey Brook and was uploaded into the watershed Projects Database in 2023 by RRPC. High priority projects at Combination and Piedmont Ponds on Moon Brook are being implemented in Rutland City and others will follow as funding become available.

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Final Status	Explanation
Develop and implement priority river corridor protection projects and floodplain/channel restoration projects where there is landowner support.	Basin wide	All towns	Rivers	Complete	RNRCD received DEC funding to purchase river corridor easements from 2 landowners along the Cold River in the Town of Clarendon. In 2022, a berm was removed so that the river can access its floodplain, which will assist the Town of Clarendon with flooding issues. In 2024, RNRCD hired a consultant to work on the Sargent Brook-Cold River Floodplain Restoration/Berm Removal project. The consultant provided a draft of the 30% design along with a report regarding Hydraulic Analysis of the Proposed Floodplain Restoration Alternatives for review. The deadline for this agreement is January 31, 2025. In 2023, the RNRCD hired a consultant to complete a SWMP for the Clarendon River Watershed. The SWMP will provide the Town of West Rutland with a plan that the Town can use to develop strategies to minimize stormwater caused degradation of the Clarendon River. The consultant is prioritizing the list of potential BMP projects to be shared in late 2024. The deadline for this agreement is June 30, 2025. Projects will be pursued as funding and capacity become available.

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Final Status	Explanation
Provide information on the benefits of the NFIP program and technical support for towns that are interested in joining the program.	Basin wide	Tinmouth, Mount Tabor, Killington	Rivers	In Progress	Tinmouth adopted the NFIP. Killington, Mount Tabor, Waltham, and Whiting have not adopted the NFIP, but the Killington town plan suggests adopting or taking steps towards adoption of flood hazard bylaws adequate for NFIP participation. Outreach will continue to be focused on these towns when the opportunity allows.

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Final Status	Explanation
Work with towns to retrofit or replace culverts and/or bridges to restore AOP.	Basin wide	All towns	Rivers	Complete	All towns are replacing culverts as local or State funding becomes available. In addition, as culverts are replaced on State and town roads, they are reviewed by the Rivers Program to ensure structures meet current standards for geomorphic compatibility. In discussions with municipalities, RRPC now has a new tool for considering AOP. Using AOP data from the VCGI database called “Stream Crossings” and developed through ANR and VT Dept. of Fish and Wildlife, we have begun to add AOP information to our culvert inventory maps. Not every bridge/culvert was included in the ANR/VT Dept. of Fish and Wildlife data, but it’s a starting point for addressing problem culverts. RRPC has completed maps for Chittenden, Danby, Poultney, Shrewsbury, and Wallingford to include AOP data. During SFY 2020-2024, 49 municipal road drainage and stream culverts were replaced, and 131,698 feet of road drainage and erosion control improvements were implemented in the basin.

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Final Status	Explanation
Strategic additions of large wood material to restore aquatic habitat in streams which were historically impacted by logging operations.	USFS lands in the Green Mtn. National Forest identified in the next Integrated Resource Project (IRP)	The IRP will include the Basin 3 towns of Chittenden, Mendon, and Goshen	Rivers	In Progress	There are opportunities in the Otter Creek drainage within the Middlebury Ranger District for large woody material (LWM) addition. Specifically, Sparks Brook, Brandy Brook, and the middle and south branches of the Middlebury River. Sucker Brook also offers opportunities for additional LWM efforts. There have been two AOP culverts replaced on Brandy Brook since 2019, and one more is planned, designed, and funded. This will be the final of 5 structures replaced on Brandy Brook. This culvert will be the last culvert to upgrade before reaching Breadloaf Dam. Breadloaf Dam is the final barrier on Brandy Brook. The Breadloaf Dam is planned for removal in summer 2025 and the project is under development (VNRC, USFWS, USFS). The USFS is also looking for opportunities to implement beaver dam analogs in low gradient portions of streams in this area. Currently, the Forest and partners are modelling high probability beaver habitat in this area utilizing the Beaver Restoration Action Tool (BRAT Model). A portion of the Telephone Gap area has been modeled and additional model runs are underway to assess this area again as well all the lands adjacent to the GMNF.

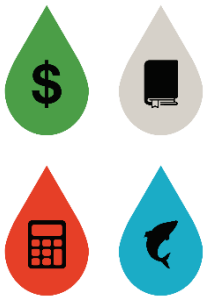
Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Final Status	Explanation
Continue and expand riparian buffer programs. Prioritize buffer plantings based upon recommendations in completed River Corridor Plans, P reduction potential, and known water quality issues.	Basin wide	All towns	Rivers	Complete	From SFY 2020 to 2024, 22 acres of forested riparian buffer were restored through buffer planting. Additional funding is available for riparian buffer plantings through Formula Grants in Lake Champlain Basins.
Municipal outreach to towns without river corridor protection in town plans/by-laws	Basin wide	All towns	Rivers	In Progress	7/40 municipalities have adopted river corridor protections. See Appendix B in the 2024 Basin 3 TBP for a complete list. RRPC and ACRPC will continue to conduct outreach to Basin 3 towns.

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Final Status	Explanation
Continue work on dam removal prioritization, design, and implementation on high priority sites	Basin wide	All towns	Rivers	Complete	In 2021, VNRC, DEC, and other partners removed the Dunklee Pond Dam on Tenney Brook in Rutland, which restored 2 acres of floodplain, reconnected 13 miles of riverine habitat and restored 900 lineal feet of instream channel. The restoration planting took place in spring 2022. PMNRCD completed a 2-acre planting and installed 718 bareroot plants, 230 live stakes, and 27 willow fascines. Other dam removal projects in the basin include: Youngs Brook Dam, the Breadloaf Dam (removal planned in 2025), Wainwright Mill Dam (removed 2024), Connolly Pond Dam, Moon Brook Dam, Austin Pond, Tenney Brook Court, and GMNF Dam in Chittenden.

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Final Status	Explanation
Identify high priority sites for wetland restoration based on P reduction ranking	Dead Creek, Lower Lemon Fair, and Pleasant Brook-Otter Creek watersheds	Brandon, Pittsford, Addison, Bridport, Panton, Cornwall, Shoreham, Weybridge	Wetlands	Complete	Updated Lake Champlain wetland restoration site prioritization modeling was completed in 2018 utilizing RCPP funds. The updated maps identify potential wetland restoration areas with the highest likelihood of P attenuation and are available on the ANR Atlas and the Wetland Inventory Mapper. Partners such as NRCDs, NRCS, VLT, TNC and FWD are using these maps and a subset of project packets to help target wetland restoration outreach. For example, FWD has initiated a wetland restoration and acquisition initiative with funding from EPA through the Lake Champlain Basin Program. The primary focus of this project is wetland restoration on new and existing FWD acquisitions. During SFY 2020- 2024, 639 acres of wetland were restored in the basin.
Reclassify wetlands recommended for Class 1 status to protect their key functions and values.	Otter Creek Wetland Complex	Cornwall, Salisbury, Middlebury, Sudbury, Whiting, Leicester, Brandon	Wetlands	Not started	This project is apparently stalled due to a lack of interest among municipalities.

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Final Status	Explanation
Outreach to landowners of wetlands identified as restoration priorities– with a focus on lands with new landowners, actively being conserved or where landowners are making changes in land management.	Basin wide	All towns	Wetlands	Complete	From SFY 2020 to 2024, 639 acres of wetland were conserved and restored and 4 E&O and TA events reached 63 attendees. If time allows, RRPC would be willing to add this work to its TBP workplan.
Review new natural resource mapping and make recommendations for improving wetland mapping in target towns.	Basin wide	All towns	Wetlands	In progress	A comprehensive remapping effort is in progress within this Basin and is to be completed in 2025. A General Determination is also moving forward to identify wetlands that are Class II wetlands based on the presumptions of significance under the Vermont Wetland Rules.

Appendix C: Northern Lake Champlain Direct Drainages (Basin 5) TMDL Implementation 2024 Final Report



The Accountability Framework of the 2016 *Phosphorus Total Maximum Daily Loads (TMDL) for Vermont Segments of Lake Champlain* ensures TMDL implementation moves forward at a steady rate. A major driver of the Accountability Framework is the Vermont Department of Environmental Conservation's (DEC) development of basin-specific Tactical Basin Plans (TBP). TBPs are developed on a five-year rotating basis and include Implementation Tables that identify priority actions needed to implement the TMDL. It is through review of the Implementation Tables, and the progress made in accomplishing the tasks, that U.S. Environmental Protection Agency (EPA) tracks implementation progress in each basin. To facilitate EPA's evaluation of progress, DEC describes the status of each strategy at 2.5 years and at the conclusion of the five-year planning cycle in interim and final report cards, respectively.

Appendix C is the final report card for the 2020 Northern Lake Champlain Direct Drainages (Basin 5) TBP. DEC accelerated the development of this TBP for completion in 2024 instead of 2025 to improve work distribution among program staff. As a result, the reporting period has been curtailed from a 5-year period to a 4-year period. Going forward, the subsequent Basin 5 TBP development will progress on a 5-year cycle with the next iteration of the plan completed in 2029 instead of 2030.

The 4-year reporting period began coincident with the publication of the TBP and goes through June 30, 2024. Data in this appendix align with the 4-year reporting period (SFY 2021–SFY 2024) available through the Clean Water Reporting Framework (CWRF).

The following sections describe progress towards completing strategies in the 2020 Basin 5 Implementation Table. Each strategy is organized by one of five major sectors – agriculture, developed lands, natural resources, forestry, and wastewater. Progress described for each strategy includes status (defined in Table C-1) as well as an explanation of actions taken. The explanation describes how the Agency and partners supported the strategy and resulting outcomes that together show that meaningful results were achieved. The outcomes include performance measures for Agency-supported assistance that were collected as part of the Accountability Framework (see Accountability Measures).

In SFY 2023, 30.5% of the overall TMDL reduction goal was met in the North Lake basin across all land use sectors. While this report card does not discuss trends in annual phosphorus reductions, estimated trends between SFY 2016 and SFY 2024 can be found by basin and by sector in the TMDL reduction estimates interactive online report. Trends and five-year phosphorus reduction targets are also published and further discussed in the 2024 Basin 5 TBP's Lake Champlain TMDL Phase 3 content.

Basin 5 Update

The 2020 TBP strategies were evaluated, and their associated actions were assigned a status condition using the rationale described in Table C-1. Of the 56 strategies identified, 53 were completed, one is in progress, one is continued and one is discontinued (Figure C-1).

Table C-1: Status conditions assigned to strategies and actions in the TBP Implementation Table (Table C-2).

Strategy Status for Final Report Card	Description	Example(s)
Complete	A discrete action identified in a strategy with a clear end point that has been implemented. A strategy identified as ongoing in the interim report card that has been pursued and implemented throughout the TBP's 5-year period.	Provided three trainings to partners to evaluate 5 properties for Lake Wise assessments. The Municipal General Permit was implemented and all or most towns are on schedule to meet permit requirements. Five priority projects were implemented that were identified in River Corridor Plans.
In Progress	A discrete action identified in a strategy with a clear end point that is in progress or in the queue.	A stormwater master plan that has been funded and is being implemented but is not yet completed.
Not Started	A discrete or programmatic strategy that has not been initiated.	No funding is currently available to support the project.
Continued	A discrete or programmatic strategy that was not initiated or formally pursued due to lack of interest, funding, or capacity gaps.	Strategy was carried over to the Watershed Projects Database to be implemented when there is interest and capacity. Strategy is still a high priority and carried over to the next basin plan.
Discontinued	A discrete or programmatic strategy that was removed as a strategy and is no longer a priority.	The project was superseded by a project further upstream that treated the problem effectively. The project is no longer a priority for the state program.

This final report describes a community that is well on its way to meeting permit compliance and implementing voluntary projects that will work towards meeting water quality goals.

All but one of the strategies is complete or in progress. A majority of those were completed through the Agency of Natural Resources (ANR) or Agency of Agriculture Food and Market's (AAFM) financial support to permit holders, as well as partners who distributed education,

outreach, and technical assistance (Programs listed in Table 2 of the 2024 Performance Report). Regulatory compliance outcomes include increased implementation of Required Agricultural Practices and stormwater best management practices on developed lands, including roads. In addition, there was a steady increase in resources provided by the state to the community and partners, which in turn supported adoption of natural resource restoration practices, and voluntary stormwater management of developed land. Available funding and advanced coordination played a critical role in allowing watershed partners and municipalities to work together to complete 95% of strategies from the 2020 Northern Lake Champlain Direct Drainages TBP to date.

The one strategy in progress will continue to be pursued as part of a 2024 TBP strategy. The discontinued strategy is no longer considered a priority. The continued strategy is associated with the MRGP permit where DEC will continue to assist permittees in meeting compliance. The narrative in Table C-2 provides additional detail in the explanation column for strategies.

In the 2024 TBP, a new set of strategies are identified that represent the next phase of work associated with regulatory programs, or improved approaches that partners can take with agency resources to encourage BMP adoption in the community. Additional accounting methodologies will capture information on more restoration and protection activities on the landscape and show a more accurate representative of Phosphorus reductions achieved.

In addition, as of SFY 2023, additional resources became available to support non-regulatory actions in the plan through the Clean Water Service Delivery Act (Act 76).[99] The act is increasingly supporting the delivery of clean water services and increase regional capacity to develop and implement non regulatory projects. The Chittenden County Regional Planning Commission (CCRPC) is the Northern Lake Champlain Basin Clean Water Service Provider. In SFY 2023 DEC awarded CCRPC a grant for $548,539 to achieve an annual phosphorus reduction target of 41.9 kg by supporting the development, implementation, and maintenance of non-regulatory clean water projects. In SFY 2024, CCRPC received $630,537 to achieve an additional 45.1 kg. In SFY 2025, CCRPC received $428,400 to achieve an additional 34.9 kg. Additional funding and phosphorus reduction targets will be provided each year of this initial CWSP assignment term through June 30, 2028. An explanation of DEC's expected progress based on these additional resources is included in the 2024 TBP's Chapter 3 (LC TMDL Phase 3) and Chapter 4. DEC will submit the interim report for the 2024 Tactical Basin Plans in 2027 and the final report in 2029.

Basin 5 Implementation Table Status

The final status for each strategy (Table C-2) was compiled by the Water Investment Division's Watershed Planning Program using data from the DEC, NRCDs, RPCs, and additional watershed partners involved in project development and implementation for the five-year planning period.

[99] Act 76 website available here: https://dec.vermont.gov/water-investment/statues-rules-policies/act-76

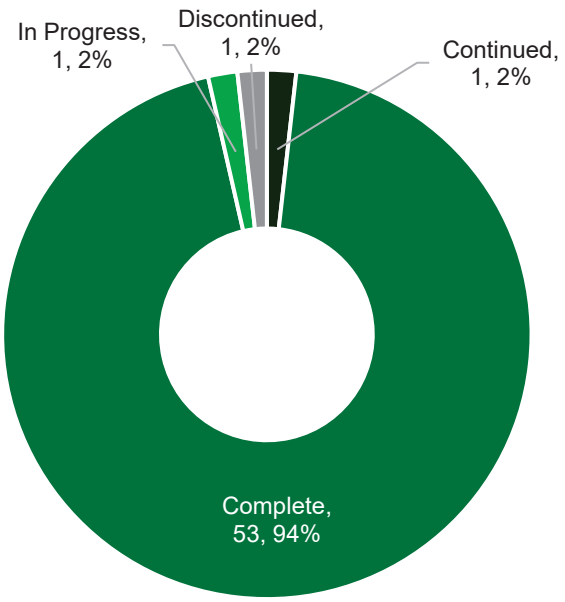


Figure C-1. Basin 5 Implementation Table action status of the 56 strategies in the 2020 TBP Implementation Table.

The Implementation Table is not an exhaustive list of water quality strategies that lead to phosphorus reductions in a basin. A complete description of all the work that the state supports in the basin to meet water quality goals can be found in the 2021 Vermont Nonpoint Source Management Plan.[100] Additional information about progress associated with each sector can be found in Chapter 3 of the *Vermont Clean Water Initiative 2024 Performance Report*, which provides comprehensive reporting of estimated total phosphorus load reductions associated with state funding, federal funding, and regulatory programs in the Lake Champlain Basin. These data are also available to the public through the Clean Water Portal's Clean Water Interactive Dashboard — an online tool that allows interested parties to examine and filter Performance Report data at both the state and basin level on investments, project outputs, estimated pollutant-load reductions and project-cost effectiveness. Individual projects in the basin that are included or supported by strategies are described in the Clean Water Explorer, also found through The Portal.[101] Additionally, for the agricultural sector, investments and outcomes of VAAFM-funded education, outreach, technical and financial assistance programs can be explored by basin in the VAAFM Water Quality Division Interactive Report[102].

[100] Vermont Nonpoint Source Management Plan 2021-2025 available here: https://dec.vermont.gov/sites/dec/files/wsm/erp/docs/Vermont%20NPS%20Management%20Plan%202021-2025.pdf

[101] Clean Water Portal can be accessed here: https://anrweb.vt.gov/DEC/cleanWaterDashboard/

[102] The VAAFM report can be accessed here: https://app.powerbigov.us/view?r=eyJrIjoiNzkyNWFhNTMtNTAyNy00M2IyLWE5NzMtMzVmZGZmZGM4OWMwIiwidCI6IjIwYjQ5MzNiLWJhYWQtNDMzYy05YzAyLTcwZWRjYzc1NTljNiJ9

Table C-2: Basin 5 Implementation Final Status Report covers the time period a) SFY 2021 to SFY 2024 and b) calendar year 2021-2024, unless otherwise noted. The target date for strategy completion is December 31, 2024, the end of the time period covered by the 2020 Basin 5 plan.

Strategy Description	Priority Subbasin(s) [103]	Priority Towns	Sector	Final Status	Explanation (data associated with Basin 5 unless otherwise noted)
1. Provide education, outreach, and technical assistance to farms on water quality regulations, RAPs, agricultural BMPs and cost-share programs:	Mud Creek, St. Albans Bay and Jewett Brook (critical[5]), Lake Champlain, LaPlatte River, Hoisington Brook		Agriculture	Complete	Through the Agricultural Clean Water Initiative Program (AgCWIP), AAFM provides financial support to partner organizations to provide education, outreach, and technical assistance to farms related to water quality regulations, RAPs, BMPs and cost-share programs. Basin 5 Partners supported by AgCWIP include: UVM Extension, Franklin County Natural Resources Conservation District (FCNRCD), Winooski Natural Resources Conservation District (WCNRCD), Vermont Association of Conservation Districts, Farmer Watershed Alliance (FWA), Friends of Northern Lake Champlain (FNLC), Northeast Organic Farmer Association, and Scott Magnan Custom Services. In addition, USDA NRCS Field Office staff assist farms in enrolling in cost-share programs to implement BMPs. DEC also manages USDA/NRCS funding through the Regional Conservation Partnership Program (RCPP), which includes additional technical and financial assistance to landowners to access federal funding for water quality improvement projects.

[103] Tables noted are located in the 2020 Basin 5 TBP, see DEC Basin 5 webpage

Strategy Description	Priority Subbasin(s) 103	Priority Towns	Sector	Final Status	Explanation (data associated with Basin 5 unless otherwise noted)
a. Make available to farmers at least one workshop or training annually	See above		Agriculture	Complete	Between SFY2020 and SFY2024, 56 agricultural outreach and educational events available to Basin 5 communities were conducted by AAFM and partner organization with AgCWIP funding. Examples follow: Annually, FCNRCD offers 4-6 workshops, GINRCD offers 2 workshops and the FNLC and Farmers Watershed Alliance (FWA) with UVM Extension assistance host 2 farm meetings.
b. Provide technical assistance (TA) visits	See above		Agriculture	Complete	Between SFY2020 and SFY2024, 365 on-farm TA visits were provided by AAFM staff and partner organizations with AgCWIP funds. During the same timeframe, AAFM regulatory staff conducted 64 regulatory visits (enforcement, investigations, inspections, or regulatory assistance visits). Both AAFM technical and regulatory staff access geospatial data, including surface water layers and AAFM's Critical Source Area map layer, to prioritize review of higher risk fields.
c. Support partners in development and distribution of education materials	See above		Agriculture	Complete	See Strategy 1a for events where educational materials were developed. An example of development of educational materials with state support includes the annually updated FCNRCD's Guide to Assistance for Agricultural Producers in Vermont. It includes details about private, state, and federal funding and TA programs available to Vermont farmers.

Strategy Description	Priority Subbasin(s) [103]	Priority Towns	Sector	Final Status	Explanation (data associated with Basin 5 unless otherwise noted)
2. Inspect approximately 70% of CSFOs at least once, per the 7-year inspection cycle outlined in the RAPs	Mud Creek, St. Albans Bay and Jewett Brook (critical), Lake Champlain, LaPlatte River, Hoisington Brook		Agriculture	Complete	VAAFM is on track to inspect 100% of CSFOs, per the 7-year inspection cycle. As of the writing of this plan approximately 44% of CSFOs have received at least one inspection.

Strategy Description	Priority Subbasin(s) 103	Priority Towns	Sector	Final Status	Explanation (data associated with Basin 5 unless otherwise noted)
3. Promote nutrient management: a. Expand offerings of small farm nutrient management plan (NMP) development courses and workshops, trainings for farmers, manure applicators and technical service providers	Mud Creek, St. Albans Bay and Jewett Brook (critical), Lake Champlain, LaPlatte River, Hoisington Brook		Agriculture	Complete	Partners, primarily, FNRCD, WNRCD and UVM Extension, provide NMP TA to farms, leading to NMP adoption and implementation. Most CSFO have full NMP, and AAFM and partners are focused on supporting plan implementation. UVM Extension offers classes to farmers to create their own NMPs. AAFM AgCWIP fund the FCNRCD and the WNRCD in providing additional support to farmers and to custom manure applicators to enhance nutrient management. To support farms in plan implementation, AAFM and UVM Extension coordinate training and certification opportunities for custom applicators. In 2024, there were 69 Certified Custom Applicators. Applicators are required to attend 8 hours of educational training in each 5-year certification period to maintain certification. In total, nutrient management and soil health related course subjects that were available statewide or in the Lake Champlain Region came to 14 events between 2019-2024. As Vermont is a small state, there are likely attendees from all over.

Strategy Description	Priority Subbasin(s) [103]	Priority Towns	Sector	Final Status	Explanation (data associated with Basin 5 unless otherwise noted)
4. Increase BMP implementation, including conversion to reduced tillage and no till crop management; cover crops; winter feedlot management and other pasture management BMPs; and grassland manure injection:	Mud Creek, St. Albans Bay and Jewett Brook (critical), Lake Champlain, LaPlatte River, Hoisington Brook		Agriculture	Complete	Phosphorus reductions have increased presumably due to an increase in BMP installation (acreage) from 3789 kg/yr in 2020 to 4916 kg/yr in 2024 (source load reduction). A more detailed depiction of trends for each BMP is found in the Basin 5 Agricultural PowerBI. TP reductions have been used as the performance measure instead of acreage because tracking of acreage has been found by ANR and AAFM to be difficult and therefore less accurate than TP reduction estimates. See Basin 5 TBP Phase 3 for additional explanation.

Strategy Description	Priority Subbasin(s) 103	Priority Towns	Sector	Final Status	Explanation (data associated with Basin 5 unless otherwise noted)
a. Continue and expand technical and financial assistance (TA and FA) available through state and partner programs	Mud Creek, St. Albans Bay and Jewett Brook (critical), Lake Champlain, LaPlatte River, Hoisington Brook		Agriculture	Complete	The AAFM and NRCS provide multiple TA and FA programs that support soil-based agronomic practices to improve soil quality, increase crop production, and reduce erosion and surface runoff from agricultural fields. NRCDs, UVM Extension and other partner organizations (see Strategy 1) help direct farmers to funding, including through a farmer-peer-learning network. TA and FA investments and outcomes can be explored in the CWRF annual report, and activities by the VAAFM can be explored in the VAAFM Water Quality Division Interactive Report and through the USDA Natural Resources Conservation Service programs, including the Regional Conservation Partnership Program (RCPP). Between 2020 and 2024, the VAAFM alone has invested $2.7 million into agricultural water quality TA and FA programs and initiatives in Basin 5.
5. Improve agricultural partner coordination and cross trainings to increase productivity and effectiveness of outreach efforts:	All, Swanton shoreline		Agriculture	Complete	Agricultural partner coordination and cross training has been enhanced with NRCDs supported as regional coordinators through Vermont Agricultural Water Quality Partnership (VAWQP). They host agricultural partner meetings and webinars to share information and provide trainings. Also see the above strategies.
a. Hold a meeting with partners annually	All		Agriculture	Complete	Covering Basin 5, the FCNRCD, the Northwest regional coordinator and the WCNRCD Central regional coordinator host 1 to 2 meetings a year.

Strategy Description	Priority Subbasin(s) [103]	Priority Towns	Sector	Final Status	Explanation (data associated with Basin 5 unless otherwise noted)
6.Identify potential agricultural sources of E. coli and address using Bacterial TMDL as guide: a. Survey stream for locations of potential inputs and identify agricultural activity in watershed	Mud Hollow Brook, LaPlatte River		Agriculture	Complete	With DEC LaRosa Partnership Program funds and TA, LCA sampled Mud Hollow Brook, a bacterial impaired stream, in 2021 and 2022; and the FNLC sampled a stream outlet on Maquam Shore that drained primarily agricultural land. Results suggest agricultural inputs. FNLC and FCNRCD have informed farmers about results and available TA to reduce pollutant loading. WID-supported discussions were held in 2021 with LCA and AAFM regarding previous TP sampling results on Mud Hollow Brook and followed up by a AAFM review of agricultural activity.
7. Continue the development and support of alternative conservation incentive programs to incentivize and support land stewardship for clean water through innovative approaches outside of the historical pay for practice models:	All		Agriculture	Complete	Since 2022, AAFM has supported the Vermont Pay-for-Performance Program, which provides performance-based payments to Vermont farmers for reductions in phosphorus losses from their agricultural fields. 8 Basin 5 farms completed Phase 1 (Data Entry) and 6 farms remain enrolled in Phase 2 (Phosphorus Reduction Payment) of the program. The FCNRCD provides TA to participating farms.

Strategy Description	Priority Subbasin(s) [103]	Priority Towns	Sector	Final Status	Explanation (data associated with Basin 5 unless otherwise noted)
8. Increase adoption of field agronomic practices for reducing gully and rill erosion, such as grassed waterways, strip cropping, or crop to hay conversions:	Mud Creek, St. Albans Bay and Jewett Brook (critical), Lake Champlain, LaPlatte River, Hoisington Brook		Agriculture	Complete	The FCNRCD's soil health workshops (Strategy 4a) have increased farmer's knowledge and provided incentives for using practices to address erosion. TP reductions have increased presumably due to increase in BMPs installation (acreage). Overall, TP reductions from field agronomic practices have increased from 3027 kg/yr in 2020 to 3418 kg/yr in 2024 (source load reduction). A more detailed depiction of BMP installation trends is found in a Basin 5 agricultural PowerBI. See Strategy 8 for further explanation.
a. Increase workshops and targeted outreach	Mud Creek, St. Albans Bay and Jewett Brook (critical), Lake Champlain, LaPlatte River, Hoisington Brook		Agriculture	Complete	Additional workshops focused on soil health have been offered and include easily accessible webinars. To help farmers adopt practices that reduce field erosion through improving soil health, UVM extension has recently begun to support a healthy soils program that supports workshops. In partnership with the WCNRCD and FCNRCD, they are coordinating a farmer soil health peer learning network in 2023-2025. Within the reporting period, FCNRCD's Soil Health Training Program has hosted 12 webinars and 5 in-field workshops. The FCNRCD currently works directly with 2 farms in the basin on soil health plan development.

Strategy Description	Priority Subbasin(s) [103]	Priority Towns	Sector	Final Status	Explanation (data associated with Basin 5 unless otherwise noted)
9. Assist all municipalities in developing a Road Erosion Inventory (REI) by 12/2020[6]	All		Developed lands - roads	Complete	For P reductions achieved in the road and stormwater sectors and programs associated with reductions, please see this Power BI:https://tinyurl.com/3cdmrvyu The Municipal Stormwater Implementation Grant Program funds REI, (see strategy below and description in the Clean Water Initiative 2024 Performance Report). With assistance from CCRPC and NRPC, all towns are compliant in terms of both completing their required inventory (either in 2016 or 2017) and in filing Annual Reports to DEC. Town progress reports are available through the MRGP Implementation Table Portal.
10. Assist municipalities in meeting the Municipal Roads General Permit:	All		Developed Lands - roads	Complete	Vermont provides TA and FA for MRGP planning and implementation through the Clean Water Fund supported VTrans Municipal Grants-in-Aid and Better Roads Programs. To meet the next phase of the MRGP (reissued in 2023), the CCRPC with Metropolitan Planning Organization funding and NRPC with Clean Water Funding administered by VTrans are currently assisting towns in conducting another road inventory.
a. Towns will address at least 15% of their connected non-compliant municipal road segments' by 12/31/22.			Developed Lands - roads	In Progress	As of 2023, all but 4 Basin 5 towns had met this permit requirement, with some well beyond the 15% threshold. DEC, VTrans and RPCs will provide TA over next year to assist these towns in meeting permit requirements. See town progress reports (Strategy 9).

Strategy Description	Priority Subbasin(s) [103]	Priority Towns	Sector	Final Status	Explanation (data associated with Basin 5 unless otherwise noted)
b. Towns will bring their Very High Priority (VHP) segments up to standards by 12/31/25 and Class 4 Very High Priority segments up to standards by 12/31/28.			Developed Lands - roads	Continued	All towns are in the process of addressing this strategy. In Chittenden County, 21 of 69 road segments identified as very high priority have been brought up to standard. The majority of remaining segments to be upgraded are in Huntington and Underhill, towns outside of the basin. Flooding in 2023 and 2024 have hindered their progress. See town progress reports (Strategy 9).

Strategy Description	Priority Subbasin(s) [103]	Priority Towns	Sector	Final Status	Explanation (data associated with Basin 5 unless otherwise noted)
11. Promote best winter ice and snow management practices on public, private roads and parking lots by providing technical assistance			Developed Lands - roads	Complete	Lake Champlain Sea Grant has provided TA to property managers, including municipal and UVM staff in the Basin 5 region, as well as online outreach materials. Several outreach events, remote or in-person, available to Basin 5 community and promoted by partners follow: • 2021 - Remote - Parking lot and side walk training, targeting property owners. 26 attendees from 4 states. • 2022 - Burlington, VT - Road Salt Use and Consideration Trainings, 26 UVM custodians. • 2024 - Hyde Park, VT - Road Salt Education Workshop, 32 municipal staff from 15 Vt. Communities. NRPC promoted and attended. In addition, the Basin 5 MS4 communities' Rethink Runoff campaign provides residential TA and those with a Chloride-impaired waterbody (South Burlington, Burlington, and Shelburne) as well as VTrans have developed and implemented Chloride Response Plans as part of permit requirements. Strategies typically include reducing the amounts of road salt applied by utilizing well maintained and calibrated spreading equipment and focusing applications at temperatures when road salt is most effective.

Strategy Description	Priority Subbasin(s) [103]	Priority Towns	Sector	Final Status	Explanation (data associated with Basin 5 unless otherwise noted)
12. Provide technical assistance (TA) to road crews on culvert replacements, and installation and road maintenance BMPs:			Developed Lands - roads	Complete	The ANR and VTrans Local Roads Program provide TA to municipal staff through annual Roads and River Trainings. CCRPC assists towns with grant applications, and funds consultants to prepare conceptual designs for a few town roads each year. NRPC staff are available to answer questions relating to culvert replacements and road BMPs.
a. Hold one training annually			Developed Lands - roads	Complete	See Roads and River Trainings above.
13. Identify priority stormwater management projects a. Support development of a Stormwater Master Plan (SWMP) for the impervious areas draining to Keeler Bay and Georgia shoreline. Also identify contributing stormwater from other land uses as well as IDDE outcomes	Keeler Bay, Georgia shoreline		Developed Lands	Complete	Stormwater plans with projects were developed for all 2020 TBP identified priority areas and two other areas: DEC and NRPC TA and LCBP funds supported GINRCD in developing a multi-sector stormwater plans for Keeler Bay and the FNLC for Georgia and Swanton (Maquam Bay) shoreline. In 2024, St. Albans Town also identified stormwater inputs to Maquam Bay through a CWF Scoping Study for Stormwater improvements along Maquam Shore Road. In 2023 with DEC funding, LCA prioritized and developed conceptual designs for stormwater projects previously identified in the McCabe's Brook watershed. DEC supported CCRPC in developing a SWMP for Milton South Hero and St. Albans Town (MS4 annual reports) addressed discharges identified in DEC-supported IDDE surveys.

Strategy Description	Priority Subbasin(s) [103]	Priority Towns	Sector	Final Status	Explanation (data associated with Basin 5 unless otherwise noted)
14. Assist municipalities in meeting the April 1, 2021 deadline for development of Phosphorus Control Plans (PCP)	MS4s, Milton		Developed Lands	Complete	CCRPC, NRPC, DEC, and VTrans support the MS4 communities in developing and implementing projects from Phosphorus Control Plans (PCP) and Flow Restoration Plans. PCP were completed and submitted on April 1, 2021 to DEC for the following MS4 municipalities with significant land area within Basin 5: Burlington, Colchester, Essex Junction, Shelburne, and South Burlington and St. Albans. Town of St. Albans completed their plan in April 2022. Also CCRPC and DEC supported Milton in developing a PCP, including a Stormwater Master Plan (SWMP) that was used to develop the elements of PCP.
15. Support implementation of priority projects, based on cost benefit of phosphorus removal, identified in SWMPs and Phosphorus Reduction Plans (PRP)	Towns with stormwater master plans, PRP or similar noted in Table 14		Developed Lands	Complete	DEC's and partners' criteria for prioritizing projects is likely to include cost benefit for phosphorus removal. Partner support to municipalities included CCRPC's scoping/design work for municipalities' PCP projects and NRPC assistance to Georgia in reviewing and updating P reduction estimates in their SWMP. In addition, ANR's MS4 Community Formula Grant program funds (ARPA and CWF) assisted MS4 communities with design and implementation to address 3-acre permits (see strategy below), MRGP (see strategy above) and PCP requirements.

Strategy Description	Priority Subbasin(s) [103]	Priority Towns	Sector	Final Status	Explanation (data associated with Basin 5 unless otherwise noted)
16. Encourage adoption of residential and landscaping practices by providing technical assistance and using social marketing practices	All		Developed Lands	Complete	The Chittenden and Franklin County MS4s are supporting outreach programs (Rethink Runoff and Franklin County Stormwater Collaborative, RSEP) to encourage residential stormwater management with assistance from their RPCs, the WCNRCD and FCNRD. Both conservation districts provide TA during workshops. In a separate stormwater education program, Blue BTV, the city of Burlington provides technical assistance and incentivizes the installation of small-scale residential stormwater practices by offering rebates. In its first year (2022-2023), 60 residential site assessments were conducted resulting in 13 BMPs implemented at 12 sites. In keeping with social marketing processes, the MS4 will improve outreach based on results from a 2023 public Rethink Runoff survey. Social marketing campaigns (*Don't P on Your Lawn* and *Raise the Blade*) to encourage lake friendly lawn care habits are supported by the LCBP Lawn to Lake collaboration that includes DEC. In addition, the LCA and WCNCRD support residential outreach campaigns that include TA to manage stormwater: Ahead of the Storm and StormSmart respectively. In 2022, LCA developed a landowner manual for property assessment and direction to existing guides using LCBP funds. In 2024, LCBP-funded discussion involving most of the above partners led to a plan for the Lake Champlain Basin to strengthen the impact of outreach by multiple parties.

Strategy Description	Priority Subbasin(s) [103]	Priority Towns	Sector	Final Status	Explanation (data associated with Basin 5 unless otherwise noted)
17. Assist landowners in managing stormwater off private roads and making progress in priority areas:	Priority HUC12s are identified in Table 19 or road erosion inventory results		Developed Lands	Complete	In 2020, with LCBP support and ANR TA, the WCNRCD developed a process to inventory road erosion (REI) on private roads and piloted it as part of the Lake Iroquois Watershed Action Plan. In addition, LCA and WNCRD provide landowners with TA to address stormwater off private roads through their residential outreach programs (see strategy above).
a. (and b.) Develop methods and tools to inventory private roads and pilot and complete	Priority HUC12s are identified in Table 19 or road erosion inventory results		Developed Lands	Complete	WCNRCD's inventory (Strategy 17) was followed by NRPC's development of a Lake Carmi (Basin 6) private road REI in 2021. In 2023, NRPC developed an alternative approach to identify and prioritize private roads for stormwater management in Grand Isle and Franklin County with Basin 5 CWSP formula grant funding. In 2024, DEC contracted with NRPC to develop a state-wide method to inventory private roads.
18. Assist municipalities with obtaining "Three-acre" permit coverage and making progress in priority areas	Main Lake, Shelburne Bay		Developed Lands	Complete	The WSMD Stormwater Program has identified and notified three-acre site owners who will need to apply for permit coverage by 2023. Currently, ANR provides rebates to individual landowners, while municipalities can access CWF and/or subsidized loans to obtain permit coverage, see Strategy 15 above.

Strategy Description	Priority Subbasin(s) 103	Priority Towns	Sector	Final Status	Explanation (data associated with Basin 5 unless otherwise noted)
19. Assist schools with obtaining “Three-acre” permit coverage and making progress in priority areas.	Following lake segment by 2021: Main, Burlington, Shelburne Bay		Developed Lands	Complete	DEC funds a Green Schools Funding Initiative to assist schools in the Lake Champlain and Memphremagog Basins to comply with the state's three-acre permit. Phase 1 provided assistance to participating schools to obtain permit coverage and complete stormwater design and Phase 2 provides implementation assistance. By 2024, 7 schools had scheduled construction, including the following North Lake basin schools: Charlotte Central, Burlington's Lyman Hunt schools and St. Albans BFA Fairfax. The 14 Basin 5 schools requiring a permit are identified in the GreenPrint Partners website[1].
20. Facilitate public private partnership to improve stormwater management of large parcels that fall under the three-acre permit by conducting a pilot project	Private lands, whose runoff contributes to public land stormwater issues		Developed Lands	Complete	In 2020, DEC supported a pilot project in Chittenden and Franklin counties to pay for designs that managed stormwater originating from both public and private lands (Public Private Partnership, PPP). CCRPC assisted South Burlington and a private property owner to design and implement stormwater practices on Potash Brook. CCRPC is assisting the Town of Hinesburg with the management of its PPP Final Design, Permitting and Construction grant for a Hinesburg property on the LaPlatte River.

Strategy Description	Priority Subbasin(s) 103	Priority Towns	Sector	Final Status	Explanation (data associated with Basin 5 unless otherwise noted)
21. Ensure wastewater treatment facility (WWTF) meet their TMDL allocations and optimize phosphorus reductions through facility operations by providing financial and technical assistance to municipalities	Hinesburg (high priority), Burlington, Shelburne		Wastewater	Complete	DEC WIFP helped Hinesburg, Shelburne and Burlington secure state grants and low-interest loans capitalized through state and U.S. EPA CWSRF to support WWTF improvements to meet permit requirements. In addition, DEC supports training of WWTF operators. See SFY 2024/2025 CWSRF Intended Use Plan for current list of municipal projects eligible for funding.
22. Assist communities in addressing inadequate individual onsite wastewater treatment on small, challenging sites through the planning and development of solutions, including community wastewater systems or innovative/alternative onsite systems in addition to use of WWTF.	Interested community including Colchester, Lake Iroquois, and Champlain Islands		Wastewater	See below	DEC WIFP has provided TA and FA for planning in both Colchester and South Hero to address inadequate onsite wastewater treatment systems. NRPC is updating the text of a regional guide to onsite wastewater with ANR TA.

Strategy Description	Priority Subbasin(s) [103]	Priority Towns	Sector	Final Status	Explanation (data associated with Basin 5 unless otherwise noted)
a. Continue to support Colchester's access to State Revolving Loan Funds and related funds to support the preferred solution to documented failing septic systems in Malletts Bay, which may include construction of the Malletts Bay Sewer Project.			Wastewater	Complete	Supported in part by CWSRF funding, the Colchester Malletts Bay sewer extension is currently in construction.
b. Discuss support available through the ANR Village Wastewater Solutions Initiative with one priority municipality annually.	Champlain Islands		Wastewater	Complete	WID-WIFD annually disseminates information to towns about this program. In response to WIFD outreach, South Hero in Champlain Islands applied for and received a CWSRF loan supporting Community Wastewater Feasibility and Preliminary Engineering Investigation and a preliminary design. Partner assistance included NRPC's support at committee meetings to garner community support, including assisting with a survey, and creation of an ArcGIS storymap.

Strategy Description	Priority Subbasin(s) [103]	Priority Towns	Sector	Final Status	Explanation (data associated with Basin 5 unless otherwise noted)
23. Identify river and floodplain restoration opportunities through stream geomorphic assessments (SGA):	St. Albans Bay, Jewett Brook, Lake Champlain, Malletts Bay, LaPlatte River, Hoisington Brook. When criteria developed, river segments meeting Functioning Floodplain criteria		Rivers	See below	See below
a. Update existing stream geomorphic assessments (SGA) where community interest exists.			Rivers	Complete	Basin 5 CWSP formula grants supported reviews of existing SGA data in 2023 for multiple streams that was then augmented with information available through use of the Functioning Floodplain Initiative Tool to identify potential projects.
b. Develop a stream geomorphic assessment for Jewett Brook			Rivers	Discontinued	A full SGA for Jewitt Brook would require support from the DEC Rivers Program; however, reduced program capacity has limited strategy implementation. In the 2024 TBP, this strategy was replaced with one that requires less DEC support: adding potential projects to existing SGA where partners are available to support the work, including Holmes Brook, LaPlatte Watershed and other streams in non-MS4 towns.

Strategy Description	Priority Subbasin(s) 103	Priority Towns	Sector	Final Status	Explanation (data associated with Basin 5 unless otherwise noted)
c. Develop Functioning Floodplain (FFI) criteria and support training			Rivers	Complete	On completion of the FFI guidance in 2023, DEC immediately released consultant-developed materials and offered training. In 2024, an FFI Webinar was provided by CWIP and the Rivers Program and made available on the WID engagement and resources webpage.
24. Support floodplain restoration, including nature-based floodplain restoration practices: a. provide trainings annually	St. Albans Bay and Jewett Brook (critical), Lake Champlain, LaPlatte River (upper), Hoisington Brook, Malletts Bay		Rivers	Complete	In addition to Strategy 23, the DEC River Program and WPP staff released guidance in 2024 to support effective Stream Wood Addition projects. Partners, including the CCRPC, NRPC and the FCNRCD use the FFI tool and DEC TA to implement projects (outcome of Strategy 23a) with Basin 5 CWSP Formula Grant funding.These include nature-based practices on McCabes, Rugg, Potash and Pond Brooks.
25. Support reforestation of riparian buffers	All		Rivers	Complete	The CWF supports Trees for Streams program used by the NRCDs. In 2023, the FCNRCD plantings in the basin include the Missisquoi National Wildlife Refuge and Stevens Brook. They also serve as Funding Program Administrator for DEC/LCBP funds to continue stewardship of past riparian plantings. Additional riparian buffers were planted by VLT at Philo Ridge Farms, Charlotte and along LaPlatte tributaries in Hinesburg.

Strategy Description	Priority Subbasin(s) [103]	Priority Towns	Sector	Final Status	Explanation (data associated with Basin 5 unless otherwise noted)
26. Support municipal efforts to increase number of geomorphologically compatible culvert and bridges:	All		Rivers	Complete	NRPC and CCRPC staff assist municipalities in the replacement of undersized culverts, including applying for CWF. Examples include CWF VTrans Better Roads Category D grant applications for the towns of Swanton and St. Albans Town. The CWSP formula grants have also supported a culvert enhancement in Fairfax. FCNRCD conducted a culvert analysis for all Basin 5 towns to identify priority culverts for future project development. The Rivers Program provides TA in its review of all grant-funded projects to ensure the structure meet current standards for geomorphic compatibility.
a. Meeting with municipalities to review opportunities and assist with funding through capital budget development	All		Rivers	Complete	The CCRPC and NRPC's discussions with towns note the benefit of considering river geomorphology as well as capital budget development. NRPC is considering an initiative to encourage capital budget development. FCNRCD conducted outreach to the planning commissions in Swanton, St. Albans Town and City and Georgia Conservation Commission to review conservation priorities and opportunities, including those associated with protecting stream geomorphology.

Strategy Description	Priority Subbasin(s) [103]	Priority Towns	Sector	Final Status	Explanation (data associated with Basin 5 unless otherwise noted)
27. Remove nonfunctional dams that will result in ecological benefits where there is landowner interest	See Table 18 of the 2020 TBP		Rivers	Complete	The VLT with CWF removed a dam on Crooked Creek in 2022. The Basin 5 CWSP contributed funding to a partial dam removal on Potash Brook in 2024.
28. Provide assistance to towns to increase adoption of local protection to protect and improve surface water quality and decrease fluvial erosion	All		Rivers	Complete	Both CCRPC and NRPC contract with DEC to inventory/assess flood hazard regulations and potentially stream corridor regulations in all towns in anticipation of updated FEMA flood maps. They also provide TA, for example, CCRPC is working with Hinesburg to investigate possible improvements to their bylaws. Other partners also provide encouragement as the LCA did in 2022 during presentations on river corridor protection adoption to Shelburne Bay watershed towns.
a. Work with towns identified in Table 8 in the 2020 TBP			Rivers	Complete	The NRPC and CCRPC provide this support. While Georgia and Swanton are still interested in river corridor protection, other planning work has been prioritized. The NRPC was notified by Alburgh's fire chief that he has approached selectboard about update of Hazard Mitigation Plan.

Strategy Description	Priority Subbasin(s) 103	Priority Towns	Sector	Final Status	Explanation (data associated with Basin 5 unless otherwise noted)
29. Provide technical and financial assistance to landowners to address erosional features on logging roads and landings. Prioritize based on contribution of erosion features to water quality impairment using ANR assessment tools	Mill River, Malletts Creek, LaPlatte River		Forests	Complete	ANR DFPR Chittenden and Franklin County foresters provide TA to landowners to help them reduce erosion, primarily through implementing AMPs. Assistance is provided during sites visit, publications and presentations. FNCRCD provided additional outreach, often partnering with DFPR staff: They distribute AMP manuals, offer skidder bridge rental program, write and distribute newsletter articles. A 2021 article about AMPs was distributed to 3900 people. In addition, a new ANR assessment tool for forest roads and trails is in development based on the ANR supported Forestlands Critical Source Area mapping project to support Acceptable Management Practices compliance as well as additional voluntary forestry BMP implementation.
30. Increase usage of forest skidder bridges	Mill River, Malletts Creek, LaPlatte River		Forests	Complete	The FCNRCD and the WCNRCD offered portable wooden skidder bridge rentals through the DFPR skidder bridge program, from 2018 to 2021. In 2023 DFPR re-launched with CWFs and by 2024, the WCNRCD and FCNRCD began managing rentals covering Basin 5.

Strategy Description	Priority Subbasin(s) 103	Priority Towns	Sector	Final Status	Explanation (data associated with Basin 5 unless otherwise noted)
31. Increase number of forest management plans that include Ecologically Sensitive Treatment Areas (ESTA).	All		Forests	Complete	DFPR promotes the use of ESTA in forest management plans through county foresters and outreach materials, and some county foresters anecdotally note their increased use. However, some foresters also note that adherence to AMPs in riparian areas is viewed by some landowners as a less administratively complicated way to achieve similar forest and watershed health. Actual numbers are not available for the basin; however, about 15 Franklin and Grand Isle County properties include riparian ESTAs, suggesting that the practice is accepted by landowners in the basin.
32. Hold workshops or provide other technical assistance to sugaring operations on AMP compliance, and benefits of adopting forest management plans.	Malletts Creek, LaPlatte, Mill River		Forests	Complete	DFPR watershed forester presented on AMP compliance with focus towards sugaring operations at the 2023 Franklin County Sugarmakers Association Annual Meeting (25 attendees). The FCNRCD gave a talk on skidder bridge program. The DFPR watershed forester has also developed AMP guidance specific to sugaring operations. In addition, DFPR hosts general workshops on AMPs. At least 7 workshops with 280 forest landowners, foresters and loggers were educated on AMP compliance in central and western Vermont. FCNRCD coordinated a workshop series in Fall 2024 for maple producers, with topics that focus on Forest Management Plans and AMPs and water quality.

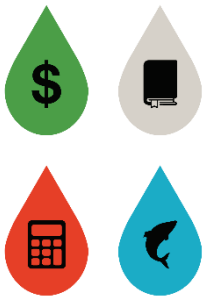
Strategy Description	Priority Subbasin(s) 103	Priority Towns	Sector	Final Status	Explanation (data associated with Basin 5 unless otherwise noted)
34. Increase number of boat launch sites with stewards who provide education and outreach efforts to reduce spread of AIS*			Lakes	Complete	Lake Champlain boat launch stewards are stationed at the Converse Bay launch in Charlotte, the Shelburne Bay launch in Shelburne, Perkins Pier and USCG station launches in Burlington, the Colchester Point launch and Malletts Bay launch in Colchester, the John Guilmette in South Hero, and the Larry Greene launch in Swanton. Colchester Pond and Lake Iroquois are the only inland lakes in the North Lake basin with an active greeter program. A map locating active greeter programs and presence of AIS is available online. The need for additional boat launch sites with stewards has not been identified. Instead, effectiveness to reduce spread was enhanced within the reporting time period with the addition of high-pressure hot water decontamination station that stewards can use to decontaminate watercraft at the Converse Bay, Shelburne Bay, Malletts Bay, and John Guilmette launches.

Strategy Description	Priority Subbasin(s) 103	Priority Towns	Sector	Final Status	Explanation (data associated with Basin 5 unless otherwise noted)
35. Hold workshops and trainings to promote lake-friendly shoreline property maintenance	Lake Iroquois, Lake Champlain shoreline		Lakes	Complete	These types of trainings were provided at workshops initiated and coordinated by partners with DEC Lakes and Ponds contributing TA as well as the 2022 Shoreland Best Management Practices guidance: WCNRCD and LCA at Lake Iroquois, and FNLC with shoreline socials in Georgia, Swanton and North Hero (135 attendees) and the GINRCD with block parties in Grand Isle (34 attendees) and North Hero (22 attendees). DEC also trained WCNRCD, GINRCD and FNLC staff to become Lake Wise evaluators and to support bioengineering techniques. These partners then went on to help support 90 lake wise assessments within the basin, followed by 35 awards, 38 recognition certificates presented to landowners. WCNRC's efforts have helped Lake Iroquois receive a Gold Lake Wise Award, where 15% or more of all the properties on the lake have earned the Lake Wise award.The outcomes are a result of the intensive outreach described above. See Lake Wise database and map here.
36. Stabilize eroding shorelines or gullies by addressing stormwater runoff followed by use of bioengineering techniques where necessary.	Lake Iroquois, Georgia shorelines, Island shorelines and see VT Geologic Survey Land slide Inventories		Lakes	Complete	DEC promotes and conducts bioengineering trainings with partners, including WCNRCD, a basin 5 partner, who hosted the 2019 Summer Erosion Control Field Day in the Winooski Basin. At least 150 linear feet of shoreline has been stabilized with bioengineering techniques since 2021.

Strategy Description	Priority Subbasin(s) [103]	Priority Towns	Sector	Final Status	Explanation (data associated with Basin 5 unless otherwise noted)
37. Promote improved maintenance of on-site wastewater systems: Conduct septic socials			Lakes	Complete	WCNRCD hosted a statewide conference and two septic socials reaching roughly 100 individuals. In addition, NRPC has updated the text of a regional guide to onsite wastewater with ANR TA.
38. Conserve wetlands			Wetlands	Complete	See Strategies 39 and 40.
39. Restore wetland			Wetlands	Complete	VFWD supports wetland restoration and acquisition to enhance Wildlife Management Areas with state and EPA funding. The FCNRCD targeted the Lake Champlain Islands in 2021 for outreach to landowners. LCA managed a wetland restoration project in Hinesburg with completion expected spring of 2025. In the basin, 19 acres of wetlands were restored.
40. Support conservation easements or land purchases that protect existing condition of surface waters by protecting natural communities as well as river corridors	Specific waterbodies: Trout River, Upper LaPlatte River, including Lake Iroquois and see Table 7 in the 2020 TBP.		Wetlands	Complete	DEC River Program provides TA as well as manages the CWF for River Corridor Easements. The VLT, VRC, LCA and FCNRCD support outreach and project implementation in this area. DEC is currently working with Town of Hinesburg to protect LaPlatte River Floodplain using WISPr. Basin wide, 44 acres of riparian corridor were conserved. The VHCB using CWFs supports additional land conservation, including protection of Pringle Brook, Charlotte with a purchase of 61 acres for ecological protection in the watershed that includes 16.5 acres of mesic-clayplain forest and 11 acres of wetlands.

Strategy Description	Priority Subbasin(s) [103]	Priority Towns	Sector	Final Status	Explanation (data associated with Basin 5 unless otherwise noted)
41. Provide technical support to parties interested in submitting petitions for wetlands that meet Class I criteria.	Mud Creek		Wetlands	Complete	The DEC Wetlands Program has conducted wetland surveys and collected species list data for Mud Creek, a proposed candidate for Class 1. The next step is for the program to assess potential impact that the VFWD's water level management to support waterfowl habitat has on the Class 1's management goals and therefore appropriateness of reclassification. In 2024, the Colchester Bog's value as a Class I became the focus of a UVM Capstone class of seniors in environmental studies. Both the Wetlands Program and the WPP staff provided support. Both these efforts will contribute information towards any future Class 1 petition.

Appendix D: Missisquoi Bay (Basin 6) TMDL Implementation 2024 Progress Report



The Accountability Framework of the 2016 *Phosphorus Total Maximum Daily Loads (TMDL) for Vermont Segments of Lake Champlain* ensures TMDL implementation moves forward at a steady rate. A major driver of the Accountability Framework is the Vermont Department of Environmental Conservation's (DEC) development of basin-specific Tactical Basin Plans (TBP). The TBPs are developed on a five-year rotating basis and include Implementation Tables that identify priority actions needed to implement the TMDL. It is through review of the Implementation Tables, and the progress made in accomplishing the tasks that U.S. Environmental Protection Agency (EPA) tracks implementation progress in each basin. To facilitate EPA's evaluation of progress, DEC describes the status of each strategy midway through (2.5 years) and at the conclusion of the five-year planning cycle in interim and final report cards, respectively.

Appendix D is the interim report card for the Missisquoi Bay TBP. The 2.5-year reporting period began coincidently with the publication of the 2021 TBP and goes through June 30, 2024. Data in this appendix align with the 2-year reporting period (SFY 2022–SFY 2024) available through the Clean Water Reporting Framework (CWRF).

The following sections describe progress towards completing strategies in the 2021 Basin 6 Implementation Table. Each strategy is organized by one of five major sectors – agriculture, developed lands, natural resources, forestry, and wastewater. Progress described for each strategy includes status (defined in Table D-1) as well as an explanation of actions taken. The explanation describes how the Agency and partners supported the strategy and resulting outcomes that together show that meaningful results were achieved. The outcomes include performance measures for Agency-supported assistance that were collected as part of the Accountability Framework (see Accountability Measures).

In SFY 2023, 15% of the overall TMDL reduction goal was met in the Missisquoi Bay basin across all land use sectors. While this report card does not discuss trends in annual phosphorus reductions, estimated trends since SFY 2016 can be found by basin and by sector in the TMDL reduction estimates interactive online report. Trends and five-year phosphorus reduction targets are also published and further discussed in the 2021 Basin 6 TBP's Lake Champlain TMDL Phase 3. The Phase 4, as part of the 2026 TBP, will provide an assessment of progress towards the 5-year target.

Basin 6 Update

The 2021 TBP strategies were evaluated, and their associated actions were assigned a status condition using the rationale described in Table D-1. Of the 38 strategies identified, to date, 4 have been completed, 33 are ongoing and one has not yet been started (Figure D-1).

Table D-1: Status conditions assigned to strategies and actions in the TBP Implementation Table (Table D-2).

Strategy Status for Interim Report Card	Description	Example(s)
Complete	A discrete action identified in a strategy with a clear end point that has been implemented. A strategy identified as ongoing in the interim report card that has been pursued and implemented throughout the TBP's 5-year period.	Provided three trainings to partners to evaluate 5 properties for Lake Wise assessments. The Municipal General Permit was implemented and all or most towns are on schedule to meet permit requirements. Five priority projects were implemented that were identified in River Corridor Plans.
In Progress	A discrete action identified in a strategy with a clear end point that is in progress or in the queue.	A stormwater master plan that has been funded and is being implemented but is not yet completed.
Ongoing	A programmatic strategy that the state or partners expect to continue to support	Provide technical assistance to support BMP adoption
Not Started	A discrete or programmatic strategy that has not been initiated.	No funding is currently available to support the project.
Continued	A discrete or programmatic strategy that was not initiated or formally pursued due to lack of interest, funding, or capacity gaps.	Strategy was carried over to the Watershed Projects Database to be implemented when there is interest and capacity. Strategy is still a high priority and carried over to the next basin plan.
Discontinued	A discrete or programmatic strategy that was removed as a strategy and is no longer a priority.	The project was superseded by a project further upstream that treated the problem effectively. The project is no longer a priority for the state program.

This interim report describes a community that is well on its way to meeting permit compliance and implementing voluntary projects that will work towards meeting water quality goals.

Most of the actions are ongoing or complete by 2024. A majority of those were completed through Agency of Natural Resources (ANR) or Agency of Agriculture Food and Market's (AAFM) financial support to permit holders as well as partners who distributed education, outreach, and technical assistance (Programs listed in Table 2 of the 2024 Performance Report). Regulatory compliance outcomes include increased implementation of Required Agricultural Practices and stormwater best management practices on developed lands, including roads. In addition, there was a steady increase in resources provided by the state to the community and partners, which in turn supported a steady increase of adoption of natural

resource restoration practices, and voluntary stormwater management of developed land. Available funding and advanced coordination played a critical role in allowing watershed partners and municipalities to work together to pursue strategies from the 2021 Missisquoi Bay TBP to date. The majority of the strategies (87%) are ongoing, with meaningful progress made towards the completion of the strategies. Four or 10% are already complete. Only 1 of the strategies has not yet been started. The narrative in Table D-2 provides additional detail in the explanation column for strategies

As of SFY 2023, additional resources became available to support non-regulatory actions in the plan through the Clean Water Service Delivery Act (Act 76).[104] The act will increasingly support the delivery of clean water services and increase regional capacity to develop and implement non regulatory projects. The Northwest Regional Planning Commission (NRPC) is the Missisquoi Basin Clean Water Service Provider. In SFY 2023 DEC awarded NRPC a grant for $1,657,731 to achieve an annual phosphorus reduction target of 145.3 kg by supporting the development, implementation, and maintenance of non-regulatory clean water projects. In SFY 2024, NRPC received $2,424,433,97 to achieve an additional 205 kg. In SFY 2025, NRPC received $1,679,038.51 to achieve an additional 158.7 kg. Additional funding and phosphorus reduction targets will be provided each year of this initial CWSP assignment term through June 30, 2028.

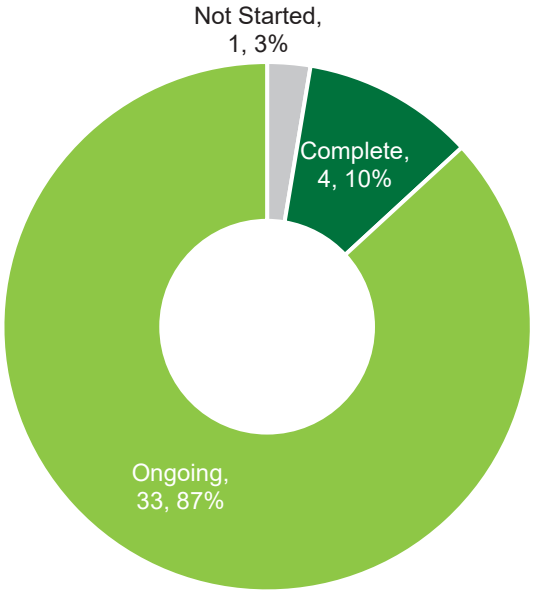


Figure D-1. Basin 6 Implementation Table action status of the 38 strategies in the 2021 TBP.

Basin 6 Implementation Table Status

The interim status for each strategy (Table D-2) was compiled by the Water Investment Division's Watershed Planning Program using data from the DEC, NRCDs, RPCs, and watershed partners involved in project development and implementation for the 2.5-year interim period.

The Implementation Table is not an exhaustive list of water quality strategies that lead to phosphorus reductions in a basin. A complete description of all the work that the state supports in the basin to meet water quality goals can be found in the 2021 Vermont Nonpoint Source Management Plan.[105] Additional information about progress associated with each sector can be

[104] Act 76 website available here: https://dec.vermont.gov/water-investment/statues-rules-policies/act-76

[105] Vermont Nonpoint Source Management Plan 2021-2025 available here: https://dec.vermont.gov/sites/dec/files/wsm/erp/docs/Vermont%20NPS%20Management%20Plan%202021-2025.pdf

found in Chapter 3 of the *Vermont Clean Water Initiative 2024 Performance Report,* which provides comprehensive reporting of estimated total phosphorus load reductions associated with state funding, federal funding, and regulatory programs in the Lake Champlain basin. These data are also available to the public through the Clean Water Portal's Clean Water Interactive Dashboard — an online tool that allows interested parties to examine and filter Performance Report data on investments, project outputs, estimated pollutant load reductions and project cost effectiveness. Individual projects in the basin that are included or supported by strategies are described in the Clean Water Explorer, also found through the Portal. [106]

Additionally, for the agricultural sector, investments and outcomes of VAAFM-funded education, outreach, technical and financial assistance programs can be explored by basin in the VAAFM Water Quality Division Interactive Report[107].

[106] Clean Water Portal can be accessed here: https://anrweb.vt.gov/DEC/cleanWaterDashboard/
[107] The VAAFM report can be accessed here: https://app.powerbigov.us/view?r=eyJrIjoiNzkyNWFhNTMtNTAyNy00M2IyLWE5NzMtMzVmZGZmZGM4OWMwIiwidCI6IjIwYjQ5MzNiLWJhYWQtNDMzYy05YzAyLTcwZWRjYzc1NTljNiJ9

Table D-2. Basin 6 Implementation Interim Status Report addresses just those strategies that result in phosphorus reductions. It covers the time period a) SFY 2022 to SFY 2024 and b) calendar year 2022-2024, unless otherwise noted. The target date for strategy completion is December 31, 2026, the end of the time period covered by the 2021 Basin 6 plan.

Strategy Description	Priority Subbasin(s) or Town (s)	Sector	Status	Explanation (numbers associated with Basin 6 unless otherwise noted)	Likelihood of completion [108]
1. Conduct soil health assessments; and assist farmers in identifying and implementing BMPs to improve soil health	Rock River, Enosburgh Falls-Missisquoi, Headwaters Pike River (Lake Carmi), Black Creek, Fairfield River, Hungerford Brook; agric-impaired streams	Agriculture	Ongoing	FCNRCD facilitated a Soil Health Training Program for NRCD staff, with participation by OCNRCD to improve knowledge of these practices amongst technical assistance (TA) providers. Through this program, FCNRCD hosted 12 webinars and 5 in-field workshops. FCNRCD followed this with a soil health testing for farmers through AFT's CASH program. FCNRCD and UVM Extension also supported a farmer soil health peer learning network. Applicable to this strategy and several BMP implementation strategies below, the AAFM and NRCS provide multiple TA and financial assistance (FA) programs that support soil-based agronomic practices to improve soil quality, increase crop production, and reduce erosion and surface runoff from agricultural fields. NRCDs and partner organizations help direct farmers to funding. Funding to support this work includes, AAFM's $8.4 million investment between 2021 and 2024.This TA and FA investment as well as outcomes by the AAFM can be explored in the VAAFM Water Quality Division Interactive Report. TA and FA were also provided through the USDA-NRCS, including the DEC-managed Regional Conservation Partnership Program (RCPP) and Locally Led Funding Pool initiatives.	

[108] Only for strategies with in progress, not started, or continued status

Strategy Description	Priority Subbasin(s) or Town (s)	Sector	Status	Explanation (numbers associated with Basin 6 unless otherwise noted)	Likelihood of completion [108]
2. Develop and distribute information to farmers about economic advantages of BMP implementation	Rock River, Enosburgh Falls-Missisquoi, Headwaters Pike River (Lake Carmi), Black Creek, Fairfield River, Hungerford Brook; agric-impaired streams	Agriculture	Ongoing	State and partner organizations develop and distribute education materials related to water quality and soil health Best Management Practices, which may include cost-analysis and budget considerations during project development. For example, the FCNRCD does this during farm visits and MRBA does this when in conversation with farmers about tree plantings or during water quality testing program. Partner organizations also consult with or refer farms to the VHCB Farm and Forest Viability Program.	
3. Implement agricultural production-area BMP projects for preventing heavy use area, manure and feed runoff to surface waters	Basin wide focus on RAP compliance	Agriculture	Ongoing	Basin farmers installed 327 structural practices that represent production area projects. NRCS and AAFM provide TA and FA programs to support implementation. FCNRCD and AAFM refer farmers to these programs. MRBA encourages efforts like this during conversations stemming from their water quality sampling analyses. FCNRCD also helps coordinate Farm Teams when appropriate. These practices were included in FY25 NRCS Local-Led Funding Pool. The resulting increase in Phosphorus (P) reduction based on implementation of these practices is shown in this Basin 6 agricultural summary PowerBI.	

Strategy Description	Priority Subbasin(s) or Town (s)	Sector	Status	Explanation (numbers associated with Basin 6 unless otherwise noted)	Likelihood of completion [108]
4. Increase adoption of cover cropping systems by supporting practices that will enhance performance, including reduced tillage practices (inter-seeding, manure injection, use of innovative equipment) and shorter day corn varieties, multi-species cover crops	Rock River, Enosburgh Falls-Missisquoi, Headwaters Pike River (Lake Carmi), Black Creek, Fairfield River, Hungerford Brook; agric-impaired streams	Agriculture	Ongoing	FCNRCD does this during farm visits and through referrals to other programs. These practices were included in FY25 NRCS Local-Led Funding Pool. The resulting increase in P reduction based on implementation of these practices is shown in the Basin 6 agricultural summary PowerBI.	

Strategy Description	Priority Subbasin(s) or Town (s)	Sector	Status	Explanation (numbers associated with Basin 6 unless otherwise noted)	Likelihood of completion [108]
5. Increase pasture and hayland BMPs implementation and enhance performance by supporting appropriate harvest management (e.g., increased mower height), grassland injection, aeration, nutrient application timing, manure calibration, and soil health practices that in turn address compaction, erosion, and nutrient runoff	Rock River, Enosburgh Falls-Missisquoi, Headwaters Pike River (Lake Carmi), Black Creek, Fairfield River, Hungerford Brook; agric-impaired stream	Agriculture	Ongoing	OCNRCD with a DEC RCPP contract plans grazing practices and includes work with upper Missisquoi River farms. FCNRCD and UVM extension coordinate a farmer soil health peer learning network in 2023-2025, which will support farmers in adopting strategy practices. FCNRCD also hosted the Soil Health Training Program that helped train TA providers to be able to better assist their farms in this type of practice trial and adoption. Regarding funding, AAFM's CEAP now offers cost share on practices that increase mower height. These practices were included in FY25 NRCS Local Led Funding Pool. The resulting increase in P reduction based on implementation of these practices is shown in this agricultural reduction PowerBI.	

Strategy Description	Priority Subbasin(s) or Town (s)	Sector	Status	Explanation (numbers associated with Basin 6 unless otherwise noted)	Likelihood of completion [108]
6. Support farms in nutrient management plan (NMP) implementation and maintenance	Basin wide	Agriculture	Ongoing	Partners, primarily, the FNRCD and the OCNRCD and UVM extension, provide NMP TA to farms, leading to NMP adoption and plan implementation. Most CSFO have full NMP, and AAFM and partners are focused on supporting plan implementation. As an example, OCNRCD is working with 6 farms on NMP updates, while only working with one farm to create an NMP. Thirty-five farms have received assistance. UVM extension offers free classes to create plans. AAFM AgCWIP funds support the FCNRCD and the OCNRCD in providing additional support to farmers and to custom manure applicators related to nutrient management. WCNRCD and FCNRCD have extended NMP outreach with the addition of additional staff since 2020. To support farms in plan implementation, AAFM and UVM Extension has provided trainings to 69 individual certified custom applicators statewide. Applicators are required to attend 8 hours of educational training in each 5-year certification period to maintain certification. In total, NMP-related course subjects that were available statewide or in the Lake Champlain Region came to 14 events between 2019-2024.	

Strategy Description	Priority Subbasin(s) or Town (s)	Sector	Status	Explanation (numbers associated with Basin 6 unless otherwise noted)	Likelihood of completion [108]
7. Support the distribution and use of AAFM critical source area (CSA) maps or similar to prioritize field erosion sites for regulatory field inspection and for identifying and developing opportunities for voluntary BMP adoption	Rock River and other areas identified on CSA map. Prioritize small tributaries	Agriculture	Ongoing	Between SFY2021 and SFY2024, AAFM technical staff provided 444 TA visits with farms and AAFM regulatory staff conducted 193 regulatory visits (enforcement, investigations, inspections, or regulatory assistance visits). Both AAFM technical and regulatory staff access geospatial data, including surface water layers and AAFM's Critical Source Area map layer, to prioritize review of higher risk fields.	
8. Develop process to identify and prioritize areas where farm field and farm road stormwater enters road ditches and/or streams and address through field and road BMPs	Basin wide	Agriculture	Not Started	ANR partners, including NRCDs may be interested in addressing this strategy.	Medium

Strategy Description	Priority Subbasin(s) or Town (s)	Sector	Status	Explanation (numbers associated with Basin 6 unless otherwise noted)	Likelihood of completion [108]
9. Support collaborative efforts among partners to enhance service to the agricultural community.	Basin wide	Agriculture	Ongoing	The FCNRCD and OCNRCD are regional coordinators for VAWQP and host up to 2 meetings/year. FCNRCD has also supported and worked with the Farmers Watershed Alliance (FWA) as their interim program coordinator for the past year. Annually, FNLC coordinates the Summer and Winter Farm Meetings, which are co-hosted by UVM Extension and the Farmer's Watershed Alliance. These meetings are meant to convene farmers in the region to learn about recent research, programs, and opportunities that are relevant. OCNRCD and MRBA held a partners' meeting to discuss areas of opportunity. OCNRCD and UVM Extension held a farm worker educational class at an upper Missisquoi farm on water quality practices. DEC staff and 10 agricultural producers attended.	
10. Improve farming community's understanding of water quality response to land treatment through bracketed water quality sampling above and below BMP and presentation of results	Rock River, Mud Creek	Agriculture	Ongoing	In 2023, FNLC conducted bracketed water quality sampling along the Rock River at 10 sites and in 2024 at 4 sites. FNLC will meet with farmers to discuss the results and suggest P reduction practices. At their 2024 Winter farmers meeting (see strategy above), the FNLC presented results and future research plans. Funding included LCBP, RCPP, DEC's CWFs, and AAFM's AgCWIP.	

Strategy Description	Priority Subbasin(s) or Town (s)	Sector	Status	Explanation (numbers associated with Basin 6 unless otherwise noted)	Likelihood of completion [108]
11. Improve delivery and effectiveness of education to farmers in basin by identifying specific gaps in information made available to farmers	Basin wide	Agriculture	Ongoing	The OCNRCD is crafting a farm community survey that includes a question related to this strategy. FCNRCD annually produces the *Guide to Assistance for Agricultural Producers in VT* and updates it to address identified gaps. The VAWQP regional meetings coordinated by FCNRCD and OCNRCD have provided opportunities to address farmers' information needs. Funding includes CWF.	
12. Identify priority stormwater management projects through development of Stormwater Master Plans or similar in Priority Towns	Bakersfield, Lowell, Montgomery, Jay, and Troy	Developed Land	Ongoing	In 2022, FNLC began work on the Fairfield Pond LWAP with LCBP and DEC support, which will result in five 30% designs and include stormwater projec]ts. They also completed the Swanton and Highgate Shoreline Assessment in 2022. The FCNRCD with assistance from FWC identified stormwater projects in a CWF-supported BMP project in Lake Carmi watershed that included reviewing and prioritizing remaining Franklin Town SWMP projects. NRPC has reviewed existing Basin 6 SWMPs and identified needed updates as well as project barriers. For P reductions achieved in the road and stormwater sectors and programs associated with reductions, please see this Power BI:https://tinyurl.com/3cdmrvy	

Strategy Description	Priority Subbasin(s) or Town (s)	Sector	Status	Explanation (numbers associated with Basin 6 unless otherwise noted)	Likelihood of completion [108]
13. Implement priority stormwater projects	Giddings Brook, Towns with SWMP (Swanton, Sheldon, Highgate, Enosburgh Richford, Fairfield) Towns with CSO (Enosburgh)	Developed Land	Ongoing	In 2022, NRPC supported a bioretention design, FWC reviewed Franklin SWMP project feasibility. MRBA pursued these SWMP projects. FNLC, FCNRCD and FWC supported implementation of stormwater management on lake shores, see Lake strategy section below.	
14. Support social marketing-based programs (e.g., Lake Wise and Stream Wise) to encourage residential communities to adopt BMPs	Lake Carmi, Fairfield Pond; villages and other areas of concentrate d development	Developed Land	Ongoing	With CWF, FCNRCD and assisted by FWC, continued Lake Wise Program outreach to the Lake Carmi community, resulting in 14 Lake Wise assessments in 2023. Outreach efforts included an initial kick off meeting with NRPC in attendance and FWC's distribution of Lake Wise material. See Lake Wise map and database here. With LCBP support, FCNRCD completed 9 Stream Wise visits in 2023, 9 Stream Wise visits in 2024. In the upper Missisquoi, MRBA completed 4 Stream Wise visits in 2023 and 6 in 2024. FWC completed 6 Stream Wise visits around Lake Carmi in 2023. OCNRCD's new community engagement staff develops social media outreach on BMPs.	

Strategy Description	Priority Subbasin(s) or Town (s)	Sector	Status	Explanation (numbers associated with Basin 6 unless otherwise noted)	Likelihood of completion [108]
15. Improve functionality of existing stormwater infrastructure by developing training program for partners and municipalities to maintain, operate and assess	Village areas All towns with DEC funded stormwater practices	Developed Land	Ongoing	CWIP has developed a program and guidance, supported through CWF, see the website.	
16. Assist municipalities and schools with obtaining Three-acre permit* coverage including supporting opportunities to address stormwater in partnership with private landowners	Enosburgh (Missisquoi Valley High School, Enosburg Falls Central School), Swanton Elementary School, Jay, Highgate, Richford,	Developed Land	Ongoing	The Stormwater Program has identified and notified three-acre site owners about permit requirements. ANR has provided rebates for individual landowners, while municipalities can access Clean Water funding and/or subsidized loans, to obtain permit coverage. NRPC identified a potential public private partnership with Swanton Village. DEC has funded a Green Schools Funding Initiative to assist schools in the Lake Champlain and Memphremagog meet compliance with the state's Three-acre permit. Phase 1 provided assistance to participating schools to obtain permit coverage and complete stormwater design and Phase 2 provides implementation assistance. In the summer of 2024, seven schools in Lake Champlain Basin have scheduled construction. In the Missisquoi Basin, Swanton Elementary, Missisquoi Valley High School and Enosburg Falls Central School are eligible to participate in DEC's Green School Initiative, see also the GreenPrint Partners website.	

Strategy Description	Priority Subbasin(s) or Town (s)	Sector	Status	Explanation (numbers associated with Basin 6 unless otherwise noted)	Likelihood of completion [108]
17. Facilitate collaborative solutions where private road or farmland drainage contributes to town road stormwater	Bakersfield	Developed Lands-Roads	Ongoing	NRPC, a basin 6 partner, completed an initial mapping exercise investigating locations along Maquam Bay (Basin 5) The mapping protocol was initially developed using a test location in the Town of Richford (Basin 6). UMATR's Town Infrastructure Grants would support this type of project.	
18. Assist municipalities and private road owners in replacing culverts to achieve Aquatic Organism Passage (AOP) and geomorphic compatibility	Upper Missisquoi, Trout Tyler Branch, Montgomery, Richford, Enosburg, Bakersfield, and Orleans County towns	Developed Lands-Roads	Ongoing	Basin partners coordinate their work as part of an AOP work group. Current work include: 1) OCNRCD assisted the town of Westfield in applying for an implementation grant for culvert replacement on a Taft Brook tributary; 2) NRPC applied for and has received grants to prepare designs for and replace a culvert on Black Falls Road, Montgomery. NRPC is currently supporting development of preliminary and final designs for five other projects in Montgomery, Richford, and Bakersfield. These projects will also work to enhance geomorphic compatibility. CWFs support much of this work. UMATR town Infrastructure Grants also fund this work.	
19. Assist municipalities in inventorying (REI) and improving roads to meet the Municipal Roads General Permit: *	Very high and high priority ranked sections in REI, Giddings Brook, Bakersfield	Developed Lands-Roads	Ongoing	NRPC and NVDA have supported towns in the development of REIs. All Franklin Towns have an REI. Since then, NRPC has reviewed priority sites and preliminary results with local staff and completed a draft narrative summary report. CWF Better Roads grants fund this work. In addition, UMATR provides Town Infrastructure Grants that can be used for such efforts. Town progress reports are available through the MRGP Implementation Table Portal. For P reductions achieved in the road and stormwater sectors and programs associated with reductions, please see this Power BI:https://tinyurl.com/3cdmrvyu	

Strategy Description	Priority Subbasin(s) or Town (s)	Sector	Status	Explanation (numbers associated with Basin 6 unless otherwise noted)	Likelihood of completion [108]
19. Support towns in purchase or rental of equipment needed to comply with MRGP	Basin wide	Developed Lands-Roads	Ongoing	In Franklin County, NRPC helped 12 communities obtain equipment such as screeners and compactors. NRPC helped enroll 20 communities in BMP construction. In addition to enrollment, NRPC staff provided TA with project identification, BMP selection, design, and scoping to 20 towns. CWF supported VTrans grants fund this work.	
20. Assist landowners in managing stormwater off 8 private road segments to meet MRGP or Back Roads manual methods	Priority HUC12s based on loading for roads, Priority Lake Carmi road erosion inventory results	Developed Lands-Roads	Ongoing	Mullen Shore, Westcott and Patten Shore Roads around Lake Carmi were improved to meet MRGP criteria with CWF and EPA funding: NRPC conducted the road erosion inventory, WPP supported project implementation on Mullen Shore Road and NRPC supported project implementation on Sandy Bay Road.	
21. Ensure wastewater treatment facilities (WWTF) meet their TMDL allocations and optimize phosphorus reductions through facility operations and address CSOs by providing financial and technical assistance to municipalities *	Municipalities with WWTF, Enosburgh (CSO)	Wastewater	Ongoing	DEC WIFP worked with municipalities including Swanton Village and Enosburgh Falls Village to secure State grants and low interest loans capitalized through the Vermont, EPA Clean Water State Revolving Fund (CWSRF) and ARPA funding. See SFY 2024/2025 CWSRF Intended Use Plan for prioritized list of eligible municipal projects.	

Strategy Description	Priority Subbasin(s) or Town (s)	Sector	Status	Explanation (numbers associated with Basin 6 unless otherwise noted)	Likelihood of completion [108]
22. Assist communities in addressing inadequate individual onsite wastewater treatment on small, challenging sites through the planning and development of solutions, including community wastewater systems or innovative onsite systems	Franklin, Fairfield, Highgate, Montgomery, and any other interested municipality	Wastewater	Ongoing	WID assisted communities in applying for CWSRF, including work by Highgate and Montgomery to complete one or more phases of a community onsite wastewater system installation. See SFY 2024/2025 CWSRF Intended Use Plan for current prioritized list of municipal projects eligible for funding.	

Strategy Description	Priority Subbasin(s) or Town (s)	Sector	Status	Explanation (numbers associated with Basin 6 unless otherwise noted)	Likelihood of completion [108]
23. Identify and prioritize forest road sections for BMP installations	Very high and high priority road segments identified in road erosion inventory	Forest	Ongoing	ANR DFPR Lamoille and Franklin County foresters assist lando]wners in reducing forest road erosion, primarily through implementing AMP. Assistance is provided during sites visit, publications and presentations. ANR is developing new assessment tools for prioritizing forest road management. Beginning with the Forestlands Critical Source Area mapping project, ANR is now conducting Road Erosion Inventories on state forest roads and will be piloting a Trail Erosion Inventory. With these new tools, the ANR will be better able to support Acceptable Management Practices compliance as well as additional voluntary forestry BMP implementation. FCNRCD worked with DFPR to conduct outreach to towns on Class IV roads used for logging. FCNRCD has also provided TA to a few forest landowners to access resources.	
24. Provide outreach and training on properly implementing the AMPs, including the use of the new AMP App.	Basin wide	Forest	Ongoing	DFPR foresters provide this assistance, see above. In addition to writing and distributing an AMP article in their newsletter (2500 copies), FCNRCD staff have contributed outreach including distribution of AMP Manuals and Portable Skidder Bridge Manuals to landowners in Summer 2024. FCNRCD also hosted a workshop for maple producers on AMPs and water quality in November 2024. FCNRCD staff conducted AMP water quality site visits with maple producers in Fall 2024 in partnership with DFPR.	

Strategy Description	Priority Subbasin(s) or Town (s)	Sector	Status	Explanation (numbers associated with Basin 6 unless otherwise noted)	Likelihood of completion [108]
25. Identify and properly close out inactive logging roads	Prioritize forest areas based on runoff potential for assessment and projects, BMP. Montgomery, Enosburg, Richford	Forest	Ongoing	With assistance from the DFPR County Forester and UMATR funding, the Montgomery Conservation Commission supported trail work in the Town Forest, including retiring (close out) a portion of an old road, and re-routing and establishing a new crossing. In addition, County and State Watershed Forestry Program Foresters have supported this work on both lands enrolled in UVA and municipal forests. In the Jay State Forest, DFPR has closed out inactive logging road in the Black Falls Brook watershed to reduce erosion.	
26. Increase enrollment of forest acres in UVA through outreach to forestland owners	In HUC12 with low concentration of protected forest land (Hungerford, Lower Missisquoi Tributaries, Pike and Rock Rivers as identified in Figure 19), and sugaring operations	Forest	Ongoing	ANR DFPR county foresters assist landowners in meeting AMPs as well as understanding benefits of UVA. Assistance is provided during sites visit, publications and presentations. Additional UVA outreach is provided by FCNRCD, including a 2021 article on UVA in newsletter distributed to 3900 people, and a 2024 presentation with DFPR county forester at Christmas Tree Producers workshop. 111,726 new acres of inspected forestland in the basin has been enrolled in the Use Value Appraisal Program.	

Strategy Description	Priority Subbasin(s) or Town (s)	Sector	Status	Explanation (numbers associated with Basin 6 unless otherwise noted)	Likelihood of completion [108]
27. Improve road placement and stream crossing to meet AMPs by providing technical and financial resources, include support for engineering costs	Sugaring operations, State Forest roads, high and very high priority on forest road erosion inventory	Forest	Complete	DFPR foresters provide TA and DFPR has developed AMP guidance and an App. FCNRCD conducted a 2024 AMP workshop for sugaring operations. Roads in sugaring woods are highly concentrated. CWF and UMATR funds support enhanced stream crossings.	
28. Assist interested towns in acquiring and maintaining forested parcels	Jay and other interested towns	Forest	Complete	DFPR county forester presented on town forest acquisitions at a Berkshire town meeting, with participation by MRBA. A group of conservation commissions are discussing how to support town forest acquisitions in their 2025 meeting. VHCB has funding available to assist with Town/Community Forest acquisition and conservation.	
29. Conduct Lake Watershed Assessments and Lake Wise assessments and implement strategies	Fairfield Pond: Lake Carmi (Lake in Crisis Response Plan)	Lakes	Complete	DEC provides TA and LCBP provides funding to partners to implement LWAPs and Lake Wise programs. Parter involvement includes: FNLC's development of the Fairfield Pond LWAP; FCNRCD conducted 28 Lake Wise visits, assisted by FWC. The FWC also delivered Lake Wise BMP informational flyers. This outreach supported the following projects: FCNRCD partnered with FWC and VYCC to install plantings on 3 properties, 3 infiltration trenches and 1 installation of pervious pavers.	

Strategy Description	Priority Subbasin(s) or Town (s)	Sector	Status	Explanation (numbers associated with Basin 6 unless otherwise noted)	Likelihood of completion [108]
30. Implement bioengineered shoreland BMPs and add woody vegetation where shoreline erosion needs to be addressed	Basin wide	Lakes	Complete	FCNRCD implemented a Lake Carmi bioengineering lakeshore restoration project and is working on a design for a second. See strategy above for plantings.	
31. Support community efforts to manage and control invasive species	Lake Carmi; Fairfield Pond	Lakes	Ongoing	This strategy is focused on aquatic invasives. FCNRCD's 28 Lake Wise visits included identification and distribution of TA to lake shore property owners about managing invasive species. LCBP and DEC support outreach at boat launches to reduce introduction of aquatic invasives to lakes and ponds.	
32. Provide education to homeowner to improve maintenance of on-site wastewater systems	Lake Carmi, Fairfield Pond	Lakes	Ongoing	Information about proper septic maintenance was shared by FCNRCD and FWC during 28 Lake Wise visits and in the Lake Carmi Campers Association newsletter. FWC also offers a $75 rebate for septic system pump outs/inspection and a $25 rebate for port-o-let rentals for large gatherings. In 2022, 17 septic rebates were issued by the FWC.	

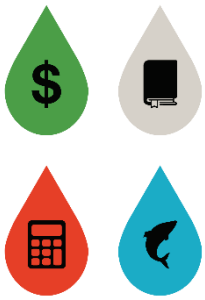
Strategy Description	Priority Subbasin(s) or Town (s)	Sector	Status	Explanation (numbers associated with Basin 6 unless otherwise noted)	Likelihood of completion [108]
33. Conduct stream geomorphic assessments (SGA)	streams that are impaired by sediment or nutrients due to in part from channel erosion processes; agricultural drainage networks, Rock and Pike Rivers, see Appendix B	Rivers	Ongoing	In 2024, environmental consultants working with the Lake Champlain Basin Program (LCBP) and DEC completed the Rock River SGA to include Canada's portion of the watershed. Sixty-nine possible restoration projects were identified. With help of watershed groups including FNLC, 15 high-priority projects were identified with six located in Vermont.	

Strategy Description	Priority Subbasin(s) or Town (s)	Sector	Status	Explanation (numbers associated with Basin 6 unless otherwise noted)	Likelihood of completion [108]
34. Enhance (beyond RAPs) riparian buffers through plantings of woody vegetation and controlling invasive species	Black Creek, Fairfield River and sites identified in SGA corridor plans (Appendix B) or by DEC River Program	Rivers	Ongoing	Plantings by partners that exceed the RAP requirements include FCNRCD and MRBA's work on 11 sites across the basin: In 2023, FCNRCD planted on the Missisquoi National Refuge and on the Hungerford. MRBA planted 1.5 acres along the Missisquoi in Sheldon, and ~3.5 acres along Coburn Brook in Troy. In 2024, FCNRCD completed 5 tree plantings in Basin 6 and is continuing maintenance at these sites. MRBA planted 0.5 acres in Troy along unnamed trib; 1.5 acres in Lowell along trib and mainstem of the Missisquoi. FCNRCD is continuing a project development grant to use various tools to identify areas of potential future tree plantings and strategically reach out to landowners to determine interest for future years. Serving as Funding Program Administrator for DEC/LCBP funds to continue stewardship of past riparian plantings. Regarding the control of invasives to allow successful reforestation of buffers: 1) OCNRCD launched the NRCS local fund pool to assist farmers manage invasives. 2) The FWC has created a map of Japanese Knotweed stand around Lake Carmi and will be monitoring their growth. Information about knotweed has been added to the FWC website. In the Upper Winooski, MRBA conducts outreach and participates in the the Orleans County CISMA (funded through ONCRD NRCS funds). The TBP-support grants help to support MRBA outreach efforts.	

Strategy Description	Priority Subbasin(s) or Town (s)	Sector	Status	Explanation (numbers associated with Basin 6 unless otherwise noted)	Likelihood of completion [108]
35. Enhance floodplain connection through implementation of active restoration and protection through river corridor easements	Prioritize areas based on outcome of the Functioning Floodplain Initiative Program, flood-vulnerable property lists, and other SGA and Dam inventories	Rivers	Ongoing	FCNRCD has 30% design funding for 1 floodplain restoration project on Marsh Brook and 1 floodplain restoration project on The Branch. FCNRCD is also pursuing 30% design funding for a floodplain restoration project on Sandy Bay Tributary, Lake Carmi. OCNRCD is working in Lowell with CREP/floodplain project development. 1 acre of floodplain has been restored. VLT and VRC are primarily the partners that identify and develop river corridor easements in the basin. In the basin, 370 acres of river corridor were protected through easements.	
36. Encourage municipal adoption of river corridor protection or strengthened existing river protection by-laws, setbacks, and zoning by providing technical assistance	Basin wide and interested municipalities	Rivers	Ongoing	The RPCs provide TA with support from the DEC RIvers Program. NRPC staff have begun updating the organization's "Municipal Review Floodplain-River Corridor Protections" spreadsheet and will be prioritizing work to be performed as part of DEC's Coordination of Flood Hazard Bylaw Update Services RFP. NVDA and MRBA are working with town of Jay on river corridor protection.	

Strategy Description	Priority Subbasin(s) or Town (s)	Sector	Status	Explanation (numbers associated with Basin 6 unless otherwise noted)	Likelihood of completion [108]
37. Restore degraded wetlands and protect through acquisition	DFW Wildlife Management Areas– Rock River (Wetland Packets #87, 88.), Fairfield Swamp. see the DEC RCPP Wetland Restoration Site Prioritization Map	Wetlands	Ongoing	NRCS, ANR and ACCD provide resources towards restoring and protecting wetlands. Funding sources include RCPP, CWF, WISPr and USDA. In 2024, ANR, FCNRCD and FWC worked together to bring a wetland acquisition proposal to a landowner. In the basin, 6 acres of wetlands were restored.	

Appendix E: Lamoille River (Basin 7) TMDL Implementation 2024 Progress Report



The Accountability Framework of the 2016 *Phosphorus Total Maximum Daily Loads (TMDL) for Vermont Segments of Lake Champlain* ensures TMDL implementation moves forward at a steady rate. A major driver of the Accountability Framework is the Vermont Department of Environmental Conservation's (DEC) development of basin-specific Tactical Basin Plans (TBP). The TBPs are developed on a five-year rotating basis and include Implementation Tables that identify priority actions needed to implement the TMDL. It is through review of the Implementation Tables, and the progress made in accomplishing the tasks that U.S. Environmental Protection Agency (EPA) tracks implementation progress in each basin. To facilitate EPA's evaluation of progress, DEC describes the status of each strategy midway through (2.5 years) and at the conclusion of the five-year planning cycle in interim and final report cards, respectively.

Appendix E is the interim report card for the Lamoille River TBP. The 2.5-year reporting period began coincidently with the publication of the 2021 TBP and goes through June 30, 2024. Data in this appendix align with the 2-year reporting period (SFY 2022–SFY 2024) available through the Clean Water Reporting Framework (CWRF).

The following sections describe progress towards completing strategies in the 2020 Basin 5 Implementation Table. Each strategy is organized by one of five major sectors – agriculture, developed lands, natural resources, forestry, and wastewater. Progress described for each strategy includes status (defined in Table E-1) as well as an explanation of actions taken. The explanation describes how the Agency and partners supported the strategy and resulting outcomes that together show that meaningful results were achieved. The outcomes include performance measures for Agency-supported assistance that were collected as part of the Accountability Framework (see Accountability Measures).

In SFY 2023, 15% of the overall TMDL reduction goal was met in the Lamoille River basin across all land use sectors. While this report card does not discuss trends in annual phosphorus reductions, estimated trends since SFY 2016 can be found by basin and by sector in the TMDL reduction estimates interactive online report. Trends and five-year phosphorus reduction targets are also published and further discussed in the 2021 Basin 7 TBP's Lake Champlain TMDL Phase 3. The Phase 4, as part of the 2026 TBP will provide an assessment of progress towards the 5-year target.

Basin 7 Update

The 2021 TBP strategies were evaluated, and their associated actions were assigned a status condition using the rationale described in Table E-1. Of the 51 strategies identified, 2 were completed, 41 are ongoing, 7 are in progress, and one is not started (Figure E-1).

Table E-1: Status conditions assigned to strategies and actions in the TBP Implementation Table (Table E-2).

Strategy Status for Interim Report Card	Description	Example(s)
Complete	A discrete action identified in a strategy with a clear end point that has been implemented. A strategy identified as ongoing in the interim report card that has been pursued and implemented throughout the TBP's 5-year period.	Provided three trainings to partners to evaluate 5 properties for Lake Wise assessments. The Municipal General Permit was implemented and all or most towns are on schedule to meet permit requirements. Five priority projects were implemented that were identified in River Corridor Plans.
In Progress	A discrete action identified in a strategy with a clear end point that is in progress or in the queue.	A stormwater master plan that has been funded and is being implemented but is not yet completed.
Ongoing	A programmatic strategy that the state or partners expect to continue to support	Provide technical assistance to support BMP adoption
Not Started	A discrete or programmatic strategy that has not been initiated.	No funding is currently available to support the project.
Continued	A discrete or programmatic strategy that was not initiated or formally pursued due to lack of interest, funding, or capacity gaps.	Strategy was carried over to the Watershed Projects Database to be implemented when there is interest and capacity. Strategy is still a high priority and carried over to the next basin plan.
Discontinued	A discrete or programmatic strategy that was removed as a strategy and is no longer a priority.	The project was superseded by a project further upstream that treated the problem effectively. The project is no longer a priority for the state program.

This interim report describes a community that is well on its way to meeting permit compliance and implementing voluntary projects that will work towards meeting water quality goals.

Most of the actions are ongoing or complete in 2024. A majority of those were completed through the Agency of Natural Resources (ANR) or Agency of Agriculture Food and Market's (AAFM) financial support to permit holders as well as partners who distributed education, outreach, and technical assistance (programs listed in Table 2 of the 2024 Performance

Report). Regulatory compliance outcomes include increased implementation of Required Agricultural Practices and stormwater best management practices on developed lands, including roads. In addition, there was a steady increase in resources provided by the state to community and partners, which in turn supported adoption of natural resource restoration practices, and stormwater management of developed land. Available funding and advanced coordination played a critical role in allowing watershed partners and municipalities to work together to complete and pursue 98% of strategies from the 2021 Lamoille River TBP to date. The majority of the strategies (73%) are ongoing, with meaningful progress made towards the completion of the strategies.

Thirteen percent of the 51 strategies are still in progress with either a medium or high likelihood of completion. Only one of the strategies has not been started with a medium likelihood that it will be completed. The difference between medium and high is most often the presence of an interested partner in pursuing the strategy.

Most projects in progress have completed the first phase of action, for example, planning or discussions towards completion of the strategy have occurred with no barriers identified towards completion. The narrative in Table E-2 provides additional detail in the explanation column for strategies.

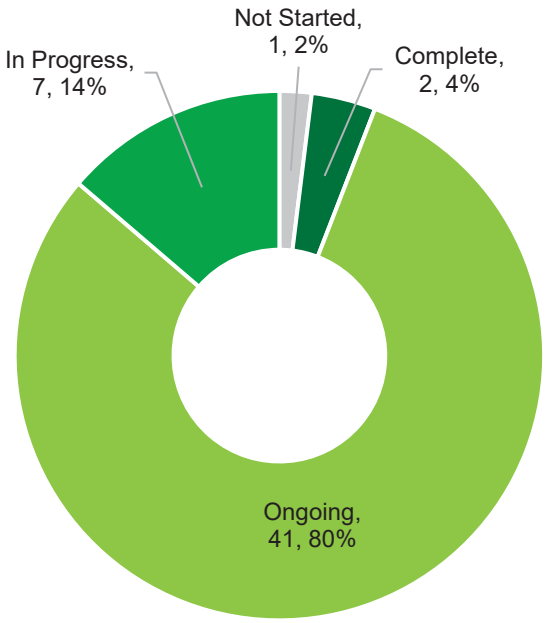


Figure E-1. Basin 7 Implementation Table action status of the 38 strategies in the 2021 TBP Implementation Table.

As of SFY 2023, additional resources became available to support non-regulatory actions in the plan through the Clean Water Service Delivery Act (Act 76).[109] The act will increasingly support the delivery of clean water services and increase regional capacity to develop and implement non regulatory projects. The Northwest Regional Planning Commission (NRPC) is the Lamoille Basin Clean Water Service Provider. In SFY 2023 DEC awarded NRPC a grant for $546,830 to achieve an annual phosphorus reduction target of 39.8 kg by supporting the development, implementation, and maintenance of non-regulatory clean water projects. In SFY 2024, NRPC received $628,652.72 to achieve an additional 42.9 kg. In SFY 2025, NRPC received $428,400.00 to achieve an additional 33.2 kg.

[109] Act 76 website available here: https://dec.vermont.gov/water-investment/statues-rules-policies/act-76

Additional funding and phosphorus reduction targets will be provided each year of this initial CWSP assignment term through June 30, 2028.

Basin 7 Implementation Table Status

The interim status for each strategy (Table E-2) was compiled by the Water Investment Division's Watershed Planning Program using data from the DEC, NRCDs, RPCs, and watershed partners involved in project development and implementation for the 2.5-year interim period.

The Implementation Table is not an exhaustive list of water quality strategies that lead to phosphorus reductions in a basin. A complete description of all the work that the state supports in the basin to meet water quality goals can be found in the 2021 Vermont Nonpoint Source Management Plan.[110] Additional information about progress associated with each sector can be found in Chapter 3 of the *Vermont Clean Water Initiative 2024 Performance Report,* which provides comprehensive reporting of estimated total phosphorus load reductions associated with state funding, federal funding, and regulatory programs in the Lake Champlain Basin. These data are also available to the public through the Clean Water Portal's Clean Water Interactive Dashboard — an online tool that allows interested parties to examine and filter Performance Report data on investments, project outputs, estimated pollutant load reductions and project cost effectiveness. Individual projects in the basin that are included or supported by strategies are described in the Clean Water Explorer, also found through the Portal. [111]

Additionally, for the agricultural sector, investments and outcomes of VAAFM-funded education, outreach, technical and financial assistance programs can be explored by basin in the VAAFM Water Quality Division Interactive Report[112].

[110] Vermont Nonpoint Source Management Plan 2021-2025 available here: https://dec.vermont.gov/sites/dec/files/wsm/erp/docs/Vermont%20NPS%20Management%20Plan%202021-2025.pdf

[111] Clean Water Portal can be accessed here: https://anrweb.vt.gov/DEC/cleanWaterDashboard/

[112] The VAAFM report can be accessed here: https://app.powerbigov.us/view?r=eyJrIjoiNzkyNWFhNTMtNTAyNy00M2IyLWE5NzMtMzVmZGZmZGM4OWMwIiwidCI6IjIwYjQ5MzNiLWJhYWQtNDMzYy05YzAyLTcwZWRjYzc1NTljNiJ9

Table E-2. Basin 7 Implementation Interim Status Report includes data for just those strategies that result in phosphorus reductions. It covers the time period a) SFY 2022 to SFY 2024 and b) calendar year 2022-2024, unless otherwise noted. The target date for strategy completion is December 31, 2026, the end of the time period covered by the 2021 Basin 7 plan.

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Status	Explanation (data associated with Basin 7 unless otherwise noted)	Likelihood of Completion [113]
1. Identify projects with significant sources of nutrient input in priority sub-basins through Critical Source Area (CSA) maps, AAFM inspections to help achieve RAP compliance, and landowner outreach.	Lamoille Mainstem, Centerville Brook, Lower Gihon, Wild Branch, Seymour River, Beaver Meadow Brook, Deer Brook, Stones Brook, Mill Brook, Browns River	Hardwick, Johnson, Hyde Park, Wolcott, Eden, Craftsbury, Cambridge Underhill, Jericho, Essex, Westford, Fletcher, Fairfax, Milton	Agriculture	Ongoing	Between SFY2021 and SFY2024, AAFM technical staff provided 156 TA visits with farms and AAFM regulatory staff conducted 73 regulatory visits (enforcement, investigations, inspections, or regulatory assistance visits). Projects are identified as a result of these visits. Both AAFM technical and regulatory staff access geospatial data, including surface water layers and AAFM's Critical Source Area map layer, to prioritize review of higher risk fields. Partners also provided TA with support from AAFM's AgCWIP, resulting in 116 visits, covering all priority watersheds. Partners include UVM extension, LCNRCD, FCNRCD, OCNRCD, and Northeast Organic Farmers Association.	

[113] Only for strategies with in progress, not started, or continued status

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Status	Explanation (data associated with Basin 7 unless otherwise noted)	Likelihood of Completion [113]
2. Implement projects that address significant sources of nutrient input in priority sub-basins with a focus on cover cropping, manure injection, and agricultural production-area BMP projects for preventing manure and feed runoffto surface waters that will help to achieve RAP compliance and agriculture phosphorus reduction targets.	Lamoille Mainstem, Centerville Brook, Lower Gihon, Wild Branch, Seymour River, Beaver Meadow Brook, Deer Brook, Stones Brook, Mill Brook, Browns River	Hardwick, Johnson, Hyde Park, Wolcott, Eden, Craftsbury, Cambridge, Underhill, Jericho, Essex, Westford, Fletcher, Fairfax, Milton	Agriculture	Ongoing	In addition to the information provided below, USDA NRCS Field Office staff provide this assistance to farmers, with a focus on cost-share programs to implement BMPs. All NRCDs refer farmers to NRCS and AAFM TA and FA cost-share programs. LCCD is supported through state and federal funding to manage the leasing of no-till equipment. The resulting P reduction associated with the implementation of BMPs are identified in the Basin 7 agricultural accounting PowerBI report.	

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Status	Explanation (data associated with Basin 7 unless otherwise noted)	Likelihood of Completion [113]
3. Implement Nutrient Management Plan recommendations in priority sub-basins.	Lamoille Mainstem, Centerville Brook, Lower Gihon, Wild Branch, Seymour River, Beaver Meadow Brook, Deer Brook, Stones Brook, Mill Brook, Browns River	Hardwick, Johnson, Hyde Park, Wolcott, Eden, Craftsbury, Cambridge, Underhill, Jericho, Essex, Westford, Fletcher, Fairfax, Milton	Agriculture	Ongoing	Partners, primarily, LCCD, FCNRCD, CCNRCD and UVM extension, provide NMP TA to farms, leading to NMP adoption and plan implementation. Most CSFO have full NMP, and AAFM and partners are currently focused on supporting plan implementation. UVM extension offers free classes to create plans. AAFM AgCWIP funds support the LCCD, FCNRCD and CCNRCD in providing additional support to farmers and to custom manure applicators related to Nutrient Management. Since 2020, FCNRCD have extended NMP outreach with the addition of additional staff. To support farms in plan implementation, statewide, AAFM and UVM Extension have provided trainings to 69 individual certified custom applicators. Applicators are required to attend 8 hours of educational training in each 5-year certification period to maintain certification. In total, nutrient management and soil health related course subjects that were available statewide or Lake Champlain Region came to 14 events between 2019-2024.	

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Status	Explanation (data associated with Basin 7 unless otherwise noted)	Likelihood of Completion [113]
4. Form and convene agricultural sector workgroups for priority sub-basins to carry out and track strategies identified in the 2021 Lamoille Tactical Basin Plan.	Lamoille Mainstem, Centerville Brook, Lower Gihon, Wild Branch, Seymour River, Beaver Meadow Brook, Deer Brook, Stones Brook, Mill Brook, Streeter Brook, Browns River	Georgia, Fairfax, Milton, Fletcher, Jericho, Underhill, Cambridge, Johnson, Hyde Park, Wolcott, Hardwick, Craftsbury, Eden	Agriculture	Ongoing	LCCD and FCNRCD coordinate to support farms through the Local Work Group agreement with NRCS to rank priority BMPs. FCNRCD is also helping to coordinate a farmer soil health peer learning network in partnership with UVM Extension in 2023-2025. CCNRCD is the coordinator for the NEK Vermont Ag Water Quality Partnership bi-annual meetings, where agricultural priorities in some of the listed towns is discussed	

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Status	Explanation (data associated with Basin 7 unless otherwise noted)	Likelihood of Completion [113]
5. Provide education, outreach, and technical assistance to agricultural communities in priority sub-basins.	Lamoille Mainstem, Centerville Brook, Lower Gihon, Wild Branch, Seymour River, Beaver Meadow Brook, Deer Brook, Stones Brook, Mill Brook, Browns River	Hardwick, Johnson, Hyde Park, Wolcott, Eden, Craftsbury, Cambridge, Underhill, Jericho, Essex, Westford, Fletcher, Fairfax, Milton	Agriculture	Ongoing	Between 2021-2024, 7 water quality educational events were hosted in the Lamoille Watershed with VAAFM AgCWIP support. These educational events cover topics such as water quality, soil health, agronomic practices, nutrient management planning, and nutrient management planning implementation. LCCD Provides at least 2 workshops a year. This will change to 4-6 with new hires expected for FY25. LCCD will provide outreach and technical assistance to all farms within Lamoille County. CCNRCD offers 2 + workshops per year on various topics of interest to agricultural producers in Caledonia County. FCNRCD provides technical assistance to farmers in Franklin County and offers 4-6 workshops annually that are open to all farmers. FCNRCD annually compiles The Guide to Assistance for Agricultural Producers in Vermont with details about financial and technical assistant programs.	

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Status	Explanation (data associated with Basin 7 unless otherwise noted)	Likelihood of Completion [113]
6. Continue funding to support the AAFM Farm Agronomic Practices (FAP) Program, Conservation Reserve Easement Program (CREP), Grazing Technical Assistance (TA), and NRCS investments in soil- based agronomic practices to improve soil health, increase crop production, and reduce erosion and surface runoff from agricultural fields and to support the agriculture phosphorus reduction targets in fields and pastures.	Basin wide	All towns	Agriculture	Ongoing	Funding for these programs have continued, see “State Investments by Land Use Sector” in the Clean Water Investment 2024 Performance Report (USDA-NRCS funds included). The NRCDs direct farmers to these funding sources. VAAFM TA and FA cost-share program investments and outcomes can also be explored in the VAAFM Water Quality Division Interactive Data Report.]	

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Status	Explanation (data associated with Basin 7 unless otherwise noted)	Likelihood of Completion [113]
7. Support monitoring efforts to identify water quality issues related to agricultural land use and track results of practices implemented to address issues.	Deer Brook, Stones Brook, Streeter Brook, Mill Brook, Browns River, Lower and Middle Lamoille River, Centerville Brook, Wild Branch, Beaver Meadow Brook, Perkins Meadow Brook, Porter Brook	Georgia, Fairfax, Milton, Fletcher, Jericho, Underhill, Cambridge, Johnson, Hyde Park, Wolcott, Hardwick, Craftsbury, Eden, Walden, Hardwick	Agriculture	Ongoing	DEC Biomonitoring data points now include two sites that bracket agricultural practices on Stone Brook. DEC reviewed results with AAFM staff in 2023.	

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Status	Explanation (data associated with Basin 7 unless otherwise noted)	Likelihood of Completion [113]
8. Support, provide technical assistance to, and encourage local town and residential efforts to reduce stormwater runoff on private properties using initiatives such as *Raise the Blade*, *Lawn to Meadow, Lake Wise, Rethink Runoff,* or other established programs and techniques.	Lamoille Mainstem, Centerville Brook, Greensboro Brook	Hyde Park, Morristown, Hardwick, Greensboro, Milton, Essex	Developed Lands	Ongoing	With LCBP support, the Hyde Park conservation commission and LCCD enhanced community's knowledge of *Raise the Blade* campaign. DEC provides TA and FA to partners through its Lake Wise Program: LCCD uses Lake Wise materials and assistance from VYCC to assess and implement BMPs on Lake Elmore and Eden lakeshore properties. The OCNRCD and the Greensboro Association are supporting Lake Wise practices on Caspian Lake. FCNRCD will conduct Lake Wise assessments at Arrowhead Mountain Lake in 2024-25. For Lake Wise project database and map see here.	

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Status	Explanation (data associated with Basin 7 unless otherwise noted)	Likelihood of Completion [113]
9. Provide technical and funding support to develop high priority projects from recently completed stormwater master plans and Phosphorus Control Plans with a focus on priority subbasins and NRCS Type A soils.	Lamoille mainstem, Centerville Brook, Ryder Brook, Lower Gihon River, Streeter Brook, Lamoille Tributary #4, Browns River	Hyde Park, Morrisville, Johnson, Cambridge, Fairfax, Underhill, Jericho, Hardwick, Milton, Essex	Developed Lands	Ongoing	With CWF, partners are implementing priority projects from stormwater plans, including: NRPC assisting Fairfax Town on potential redesign of municipal office stormwater project; CCNRCD facilitated the implementation of the North Main St. stormwater system in Hardwick in 2022; and LCPC is supporting the implementation of 2021 Town of Johnson SWMP projects (targeted Type A soils) including the Railroad Street project infiltration; and In addition, the LCPC supported the Jeffersonville SWMP's design of the Dorothy Smith Access Area Floodplain Restoration. The Agency's MS4 Community Formula Grant program (ARPA and CWF) is assisting communities with design and implementation to meet PCP requirements. Essex, the MS4 in the basin includes Type A soils and a plan would prioritize projects in these soils as they tend to provide the greatest P reduction for cost. For P reductions achieved in the road and stormwater sectors and programs associated with reductions, please see this Power BI:https://tinyurl.com/3cdmrvy	

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Status	Explanation (data associated with Basin 7 unless otherwise noted)	Likelihood of Completion [113]
10. Encourage participation in the Green Schools Block Grant and support three-acre schools (primary and secondary schools) with funding and technical assistance for project development, implementation, and design, to achieve compliance with the three-acre rule.	Basin Target schools[114]	Johnson, Hardwick, Fairfax, Morristown, Jericho, Underhill, Milton, Essex, Westford	Developed Lands	Ongoing	DEC is supporting a Green Schools Funding Initiative to assist schools in the Lake Champlain and Memphremagog meet compliance with the state's Three-acre permit. Phase 1 provided assistance to participating schools to obtain permit coverage and complete stormwater design and Phase 2 provides implementation assistance. In the summer of 2024, seven schools in Lake Champlain Basin have scheduled construction. Basin 7 schools eligible to participate in DEC's Green School Initiative are identified on the GreenPrint Partners website and include schools located in priority subbasins.	

[114] Northern Vermont University, Bellows Falls Academy, Hazen Union High School (HS), Lamoille Union HS, Mt. Mansfield Union HS, Jericho Elementary, BrownsRiver Middle School, Milton Elementary/Middle, Milton HS,Essex Elementary School, Peoples Academy and Morristown Elementary, and Westford Elementary

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Status	Explanation (data associated with Basin 7 unless otherwise noted)	Likelihood of Completion [113]
11. Complete implementation of the Deer Brook Gully Stabilization and Stormwater Mitigation Project.	Deer Brook - mouth to 2.5 miles upstream	Georgia	Developed Lands	In Progress	Phase 1 of implementation on the Deer Brook Gully is complete (https://www.stone-env.com/news-and-insights/resource-library/detail/deer-brook-gully-restoration-georgia-vermont). 12 stormwater final designs were completed as part of the Deer Brook Gully Project. With LCBP and CWSP funding and TA from DEC, the FNLC implemented one of the projects and received funding to implement the remaining designs. The projects located in the VTrans ROW would be completed by VTrans and therefore the completion of this strategy will depend on VTrans statewide funding priorities.	Medium
12. Support the development of stormwater retrofits in priority sub-basins.	Streeter Brook, Deer Brook	Milton, Georgia, Fairfax	Developed Lands	Ongoing	ARPA funding is supporting Milton's work to upgrade existing stormwater systems, see Strategy 9. See also Strategies 10 and 11.	

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Status	Explanation (data associated with Basin 7 unless otherwise noted)	Likelihood of Completion [113]
13. Complete IDDE studies and mapping in Basin 7, follow-up on recommended actions from previous studies, and eliminate discharges identified by new studies.	Basin wide	Cambridge, Westford, North Wolcott, Hyde Park, Morristown	Developed Lands	In Progress	In Basin 7, most illicit discharges were identified and eliminated. Follow-up actions were identified in the Illicit Discharge Detection and Elimination Reports (IDDE). Those left to address include sources difficult to locate, difficult compliance, or the infrastructure that is no longer in use and therefore not a priority. At this date, remaining discharges identified on IDDE surveys include 2 in Cambridge and 1 in Hyde Park. All discharges identified in Wolcott and Morriston have been addressed. While ANR takes on responsibility of identifying and addressing IDDE study needs, addressing identified projects include work on private land and will require private funding, which is not under the control of ANR.	Medium
14. Provide technical support for an alternatives analysis for town garage relocation and support recommendations that improve water quality.	Lake Elmore	Elmore	Developed Lands	Complete	Based on the completed alternatives analysis, the LCPC assisted the town in the relocation of the Elmore Town Garage off Route 12 in 2023. In addition, the town salt pile is being relocated to the new town garage site.	

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Status	Explanation (data associated with Basin 7 unless otherwise noted)	Likelihood of Completion [113]
15. Identify and develop priority stormwater projects from stormwater mapping reports.	Segments receiving stormwater runoff in priority catchments	Wolcott	Developed Lands	Ongoing	Using Stormwater Master Plans that used stormwater mapping reports for project identification, LCPC is supporting the following projects: 10 implementation, 18 final designs, and 27 preliminary designs. Projects in Wolcott are included. NRPC reviewed Franklin County stormwater mapping projects to identify projects. FCNRCD will review as part of a Franklin County project development project. In 2023, FCNRCD had identified the Steeple Market in Fairfax as potential site and conducted outreach.	
16. Provide information and funding to municipalities and watershed partners on DEC standards and training opportunities for operations and maintenance of installed stormwater BMPs.	Basin wide	All towns with DEC funded stormwater practices	Developed Lands	Ongoing	CWIP has developed a program and guidance, supported through CWF, see the website.	

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Status	Explanation (data associated with Basin 7 unless otherwise noted)	Likelihood of Completion [113]
17. Provide outreach to towns on the Green Stormwater Infrastructure toolkit to consider changes to bylaws and municipal regulations in growth centers.	Lamoille mainstem	Morristown, Cambridge, Jericho, Milton, Georgia, Johnson, Wolcott, Hardwick, Greensboro, Hyde Park, Essex, Fairfax	Developed Lands	Ongoing	UVM Sea Grant's Green stormwater coordinator hosts outreach/events partnering with municipalities to share success stories for managing GSI as a way to encourage use. Otherwise, RPCs provide one-on-one support when requested. For example, the town of Fairfax is currently pursuing bylaw modernization with NRPC TA. As the toolkit has been augmented by additional tools and approaches as described above, this strategy will also encompass any newer tools.	
18. Provide technical support and funding for the implementation of Private Public Partnership (PPP) projects to achieve compliance with the three-acre rule.	Lamoille mainstem, Centerville Brook, Ryder Brook, Lower Gihon River, Streeter Brook, Lamoille Tributary #4, Browns River, Brewster River	Johnson, Morristown, Cambridge, Milton, Essex, and future P3 communities	Developed Lands	Ongoing	While DEC is no longer supporting the PPP, DEC has provided ARPA and CWF to support municipalities and private entities in addressing 3-acre permit requirements. An example includes the use of ARPA funds to support the installation of the Vermont Electric Coop (VEC) Underground Sand Filter Chamber System. Partners providing TA include LCCD's work with Mt Norris Scout Camp to help towards its 3-acre permit needs and has been working with Lamoille Union High School to address its 3-acre permit.	

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Status	Explanation (data associated with Basin 7 unless otherwise noted)	Likelihood of Completion [113]
19. Implement projects addressing vulnerabilities from flooding and fluvial erosion from county and municipal All-Hazards Mitigation Plans where water quality improvements are present.	Basin wide	Milton, Colchester, Westford, Jericho, Underhill, Essex, Belvidere, Eden, Elmore, Jeffersonville, Hyde Park, Morristown, Johnson, Waterville, Wolcott	Developed Lands	Ongoing	LCPC supported this work as follows: 1. North Wolcott Recreation Fields Floodplain Restoration Project, Wild Branch – in final design. The project will reduce flooding and associated damage locally as well as provide relief from erosion, ice jamming, and debris damage elsewhere on North Wolcott Road. 2. Knowles Flat Culvert #13-1, #13-2 Replacement in Town of Eden in 2019. Asbestos Group matching funds (US FW) and VEM funding was used. Work by other partners included LCCD's assistance to draft a pre-application for Hazard Mitigation Funding to benefit the Town of Hyde Park, 10 Bends Association and neighbors. LCCD also submitted a pre-application for Smuggler's Notch to get an alternative watering system in order to remove the Morse Reservoir Dam.	
20. Support town to evaluate the town sand storage area for a stormwater management project.	Stannard Brook - all connected surface waters	Stannard	Developed Lands	Complete	CCNRCD evaluated the Stannard sand storage area and determined that it was not a priority restoration site as it does not appear that sand from the storage pile is making it across the road into Stannard Brook.	

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Status	Explanation (data associated with Basin 7 unless otherwise noted)	Likelihood of Completion [113]
21. Provide general support and technical assistance to towns for MRGP compliance.	Basin wide	All towns	Developed Lands-Roads	Ongoing	VTrans CWF grant-in-aid program and staff support this work. LCPC continues to provide TA to Lamoille County towns regarding MRGP compliance and updating REIs, including assisting Morristown with an REI in 2023. In accordance with MRGP requirements and deadlines, all Lamoille County towns completed their REIs. All Franklin and Lamoille County towns participated in VTrans grant programs to achieve compliance with DEC-MRGP requirements. NVDA supports Orleans County towns in this area and CCNRCD has primarily worked with the town of Stannard on MRGP compliance. Town progress reports are available through the MRGP Implementation Table Portal For P reductions achieved in the road and stormwater sectors and programs associated with reductions, please see this Power BI:https://tinyurl.com/3cdmrvyu	
22. Support Regional Hydroseeder and Vactor sharing programs through training, outreach, and funding.	Middle Lamoille	All towns	Developed Lands-Roads	Ongoing	In Lamoille County, LCCD administers a 5-town MOU for the use of a Hydoseeder. In Orleans County, CCNRCD facilitates and Hydroseeder share program with Danville, St. Johnsbury, Walden, Ryegate, and Groton (Walden is partially in Basin 7)	

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Status	Explanation (data associated with Basin 7 unless otherwise noted)	Likelihood of Completion [113]
23. Support outreach and funding for MRGP equipment for towns.	Basin wide	All towns	Developed Lands-Roads	Ongoing	VTrans provides outreach relating to funding programs it administers to support towns in meeting MRGP through a website, TA visits and presentations.	
24. Implement high priority road projects identified in MRGP road erosion inventories, lake watershed action plans, and stormwater master plans basin wide with a focus on priority subbasins and very steep slopes, to achieve compliance with the MRGP and meet phosphorus reduction targets for the roads sector.	Caspian Lake, Streeter Brook, Deer Brook, Stannard Brook, Lake Eden, Lake Elmore, Kate Brook	Greensboro, Milton, Georgia, Fairfax, Stannard, Eden, Elmore, Hardwick, Hyde Park Wolcott, Woodbury	Developed Lands-Roads	Ongoing	The NRPC's, NVDA's and LCPC's TA to towns help the towns address road erosion, primarily to meet the MRGP. The NRCDs have assisted towns in identifying and funding road projects identified in LWAPs and elsewhere. . During the first half of 2022 FCNRD with NRPC staff assistance identified potential road related projects in the Stones Brook Watershed in Fletcher and Fairfax. LCCD has worked with Lake Eden property owners on improving roads identified in LWAP. OCNRCD helped Greensboro identify roads in the Lake Caspian LWAP.	

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Status	Explanation (data associated with Basin 7 unless otherwise noted)	Likelihood of Completion [113]
25. Provide outreach and support to towns and contractors to attend Road Roundtable Forums.	Basin wide	All towns	Developed Lands-Roads	Ongoing	DEC Stormwater Program staff supports outreach to towns through regional meetings. LCPC facilitates a Lamoille County Road Foreman Network. LCCD plans, attend and assists as needed. NRPC announces these events by email blasts or newsletters.	
26. Support towns to adopt the Vermont Road and Bridge Standards to increase ERAF rating.	Basin wide	Stannard, Eden, Elmore, Morristown, Waterville	Developed Lands-Roads	Ongoing	The RPCs provide this assistance and use The Municipal Protectiveness Table appendix in the 2021 Lamoille Tactical Basin Plan to identify towns that have not yet adopted these standards. The majority of towns have adopted.	

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Status	Explanation (data associated with Basin 7 unless otherwise noted)	Likelihood of Completion [113]
27. Provide information on the ANR Village Wastewater Solutions to any communities that have inadequate individual onsite wastewater treatment on small, challenging sites, and funding for planning and implementation of priority projects that are identified and have community support.	Village centers along the Lamoille mainstem	Cambridge, Craftsbury, Elmore, Georgia, Greensboro, Jericho, North Hyde Park, Westford, Wolcott, North Wolcott	Wastewater	Ongoing	DEC and RPCs inform communities about the ANR Village Wastewater Solutions and the availability of CWRF funds to support the work. The towns of Wolcott and Westford have both expressed interest. The Town of Wolcott's community wastewater system is now in final design. LCPC staff helped support the Wolcott Wastewater Committee in raising 5 million dollars in grants and ARPA funds to install the wastewater system for Wolcott Village. The Town of Wolcott passed two bond votes in favor of moving project forward. Westford voted to support the scoping of the community system, but voted down subsequent steps.	
28. Support relocation of septic systems and/or floodproofing of on-site septic systems.	Village centers along the Lamoille mainstem	Cambridge, Hyde Park	Wastewater	Ongoing	The Wolcott community onsite septic system will eliminate some septic systems currently located in floodplain.	

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Status	Explanation (data associated with Basin 7 unless otherwise noted)	Likelihood of Completion [113]
29. Support upgrades to public wastewater treatment facilities.	Upper Lamoille River, Lower Mid-Lamoille River	Hardwick, Fairfax	Wastewater	Ongoing	DEC WIFP is working with towns, including Fairfax, Milton, Westford, Wolcott and Johnson to secure State grants and low interest loans capitalized through the Vermont and EPA Clean Water State Revolving Fund (CWSRF) as well as ARPA funding to address wastewater. See SFY 2024/2025 CWSRF Intended Use Plan for current list of prioritized municipal projects eligible for funding. .	
30. Provide support and materials to lake communities to host Septic Socials.	Lake Eden, Lake Elmore, Caspian Lake	Eden, Elmore, Greensboro	Wastewater	Ongoing	The Greensboro Association has held 2 Septic Socials around Caspian Lake with DEC support.	
31. Support municipal adoption of flood hazard by-law.	Upper and Middle Lamoille Waters	Wheelock, Walden, Eden, Waterville	Rivers	Ongoing	LCPC has begun to work with Johnson and Belvidere regarding Flood Hazard Area Bylaw updates. LCPC and NVDA cover the priority towns and will provide TA, see Strategy 34.	
32. Conduct a study to identify correct conservation flow levels through appropriate state regulatory processes and Hardwick Electric.	Lamoille River	Hardwick, Wolcott	Rivers	In Progress	Annual water fluctuations behind Jackson Dam in Hardwick impacts aquatic communities in Alder Brook and Hardwick Lake. The feasibility study to remove Jackson Dam, see strategy below, and subsequent dam removal would eliminate need for a study.	High

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Status	Explanation (data associated with Basin 7 unless otherwise noted)	Likelihood of Completion [113]
33. Support the development of and provide technical assistance for an alternatives analysis study for Jackson Dam	Hardwick Lake and Lamoille River	Hardwick	Rivers	In Progress	CCNRCD has approval from the Hardwick Selectboard to move forward with a Jackson Dam removal feasibility study. Funding has likely been secured, and CCNRCD will collaborate with a town advisory committee and other partners to work out a timeline. Based on existing collaboration and available funding, this strategy is expected to be completed	High
34. Support towns to adopt river corridor protection or strengthen existing river protection by-laws, setbacks, and zoning by providing technical assistance and outreach.	Brewster River, Seymour River, Gihon River, Browns River, Lamoille Mainstem, Mill Brook, Stones Brook, Deer Brook, Stannard Brook, Lamoille Mainstem	Stannard, Eden, Johnson, Cambridge, Georgia, Westford, Underhill, Fairfax, Greensboro	Rivers	Ongoing	DEC funding including TBP-support grants and Coordination of Flood Hazard Bylaw Update Services RFP supports RPC's work for strategies 31, 34-37. LCPC is providing TA to Johnson Planning Commission to update flood hazard bylaws and adopt the River Corridor template.	

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Status	Explanation (data associated with Basin 7 unless otherwise noted)	Likelihood of Completion [113]
35. Work with towns to consider joining the NFIP as part of an effort to increase ERAF rating.	Lamoille Basin	Wheelock, Walden, Eden, Waterville	Rivers	Ongoing	LCPC (Waterville, Eden) and NVDA (Wheelock, Walden) provide towns with information about benefits to the community. The priority towns have not joined the NFIP to date.	
37. Work with towns to add approved RPC Flood Resiliency Section to town plan.	Upper Lamoille watershed	Stannard, Walden	Rivers	In Progress	NVDA staff scheduled to contact towns in 2025. All Lamoille Town Plans meet the Flood Resiliency Town Plan requirement. The RPCs will update this required chapter as part of the town plan update.	High
38. Support the removal of the streamside earthen dam on Mud Brook.	Mud Brook	Morristown	Rivers	Not Started	While multiple partners in the basin manage dam removal projects, this one has not yet been identified as a priority.	Medium
39. Develop projects identified in the FWD Riparian Lands Assessment report.	Upper Lamoille River, Greensboro Brook, Stannard Brook	Elmore, Greensboro, Hardwick, Stannard, Wolcott	Rivers	Ongoing	Partners are in the process of implementing projects from the VFWD Riparian Lands Assessment report projects, including: The LCPC supporting the Elmore Pond Road Berm Removal & Floodplain Restoration, now in final design. LCCD and VFWD are planning for the riparian buffer restoration (10 acres total) with Japanese Knotweed Control begun in 2022.	

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Status	Explanation (data associated with Basin 7 unless otherwise noted)	Likelihood of Completion [113]
40. Implement priority projects from the Lamoille River Flood Study to reduce ice jams and improve flood resiliency and water quality.	Middle Lamoille River	Cambridge, Johnson, Wolcott	Rivers	Ongoing	LCPC supported the VFWD Upper Lamoille River Floodplain Restoration Project (Berm Removal) implemented in spring of 2024. LCCD and Northwoods Stewardship Center supported riparian planting in fall of 2023 and will complete spring of 2025. Additional associated projects are described in Strategies 19 and 39.	

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Status	Explanation (data associated with Basin 7 unless otherwise noted)	Likelihood of Completion [113]
41. Scope, design, and implement high priority dam removals and bridge and culvert replacements to improve aquatic organism passage, stream geomorphic compatibility, and flood resilience as identified in statewide and local assessments (e.g., river corridor plans, culvert inventories, hazard mitigation plans).	Basin wide with a focus on streams stressed or impaired by encroachment and channel erosion.	All towns, State Lands	Rivers	Ongoing	Partners are part of the of the VT Dam Task Force and Lamoille AOP Committee, where projects are identified and prioritized. 1. LCCD and VNRC are involved in 3 dam removals on the Brewster River with LCCD working on one other: 2.. VLT is managing removal of Stone Brook dam and 3. VNRC is managing removal of Jericho Forest Dam 4. CCNRCD will support a feasibility study for removal of Jackson Dam; 5.The LCPC and town are supporting a flood mitigation alternative analysis and subsequent steps for removal of Scribner Bridge over Gihon River, with VTrans Transportation Alternatives grant awarded. For preliminary design; 6. The Nature Conservancy managed Fort Hill Bridge removal on the Wild Branch in Wolcott with completion in 2021; 7. FCNRCD is performing a small scoping effort on Stones Brook watershed for project identification with input from NRPC. They are currently working on grant applications for culvert assessments in Fletcher.	

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Status	Explanation (data associated with Basin 7 unless otherwise noted)	Likelihood of Completion [113]
42. Develop and implement priority projects and actions identified in the River Corridor Plans and supported by the Functioning Floodplain Initiative tool.	RCPs: Brewster River, Browns River, Centerville Brook, Gihon River, Wild Branch, Seymour Brook, Settlement Brook, Lamoille River. FFI: Basin wide	Cambridge, Hyde Park, Eden, Johnson, Morristown, Wolcott, Craftsbury, Westford, Jericho, Underhill, Essex	Rivers	Ongoing	Partners are involved in addressing the DEC-supported Lamoille River Corridor Plan with work completed on the Brewster and Wild Branch. Work continues with a focus on Brewster, Gihon River, and Wild Branch for corridor easements and floodplain connection projects. Examples of projects with CWF support include 1. the Seymour/Settlement Brook project where scoping and development were completed in 2022. 2. the VRC supported the Nuzzo River Corridor Easement in Jeffersonville that covered 23.2 acres along the Lamoille River & Brewster River and was completed by 2020; and 3. Riparian Buffer Plantings along Wild Branch at North Wolcott Road, completed in 2022. The FCNRCD is serving as Funding Program Administrator for DEC/LCBP funds to continue stewardship of past riparian plantings.	
46. Initiate stakeholder meeting to discuss lay monitoring and Lake Wise on target lakes with fair to poor shoreland scores.	Round Pond, East Long Pond, Nichols Pond	Milton, Woodbury	Lakes	Ongoing	Milton conservation commission supported a “Love the Lake” program at the Milton town library that included this information. FCNRCD supported a meeting with stakeholders regarding Arrowhead Lake.	

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Status	Explanation (data associated with Basin 7 unless otherwise noted)	Likelihood of Completion [113]
50. Develop Lake Watershed Action Plan (LWAP) and provide outreach to the community on the plan and proposed actions, including installation of riparian buffers on lake tributaries.	Caspian Lake	Greensboro	Lakes	Ongoing	LCBP funded and DEC provided technical support for 3 LWAPs: Caspian Lake LWAP was completed by OCNRCD staff in 2023, LCCD assisted with the Lake Eden and Elmore LWAPs and project implementation with additional funding from the Vermont Asbestos funding. The Greensboro Association also identified and completed additional projects associated with riparian plantings. They were supported by LCBP to conduct Stream Wise assessments. They did 16 assessments of landowners primarily on the upper Lamoille River, issued 11 Stream Wise Awards and planted trees on 2 properties, one with 430 trees, the other with 45. They also developed planting plans for 5 other properties CCNRCD has assisted group in identifying additional properties and is working on increasing capacity to facilitate projects at those sites.	

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Status	Explanation (data associated with Basin 7 unless otherwise noted)	Likelihood of Completion [113]
55. Increase wetland acreage and function through restoration of previously drained and degraded wetlands identified in assessments - River Corridor Plans and Wetland Restoration Assessments - and field surveys.	Basin wide	All towns	Wetlands	Ongoing	Six acres of wetland in the basin have been restored.	

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Status	Explanation (data associated with Basin 7 unless otherwise noted)	Likelihood of Completion [113]
56. Maintain and increase UVA enrolled forestland among eligible parcels by providing outreach and technical assistance to private landowners and foresters to equip them with tools to apply, enroll and manage their land in accordance with program standards, including implementation of AMPs.	Upper Browns River, Lower Lamoille River, Tributaries to Lower Mid-Lamoille, Lower Browns River	Underhill, Jericho, Milton, Fairfax, Fletcher	Forest	Ongoing	ANR DFPR county foresters assist landowners in meeting AMPs, as well as understanding benefits of UVA. Assistance is provided during sites visit, publications and presentations. Additional UVA and AMP outreach is provided by FCNRCD, including a 2021 article on UVA in newsletter distributed to 3900 people, and a 2024 presentation with DFPR county forester at Christmas Tree Producers workshop. 79501 acres of new acres of inspected forestland has been enrolled in the Use Value Appraisal Program in the basin.	

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Status	Explanation (data associated with Basin 7 unless otherwise noted)	Likelihood of Completion [113]
57. Develop a workgroup for forestland collaborative efforts in priority watersheds to carry out strategies in the 2021 Lamoille TBP.	Upper Browns River, Lower Lamoille River, Tributaries to Lower Mid-Lamoille, Lower Browns River, Headwaters North Branch Lamoille, Headwaters Lake Eden	Underhill, Jericho, Milton, Fairfax, Fletcher, Eden, Belvidere	Forest	In Progress	Existing groups that support forestland collaboration efforts include the Lamoille Aquatic Organism Passage team where work to enhance Brook Trout passage is focused in forested areas. Cold Hollow to Canada is a nonprofit of community partners that supports forest landowners in activities that address TBP strategies. The organization's range in the Lamoille include Belvidere and Watervillle. Discussions with partners going forward will include need to develop new group or strengthen existing groups.	Medium
58. Provide basin wide outreach through towns on information on temporary skidder bridges and forestry AMPs.	Basin wide	All Towns	Forest	Ongoing	LCCD manages the rental of 1 skidder bridge. FCNRCD also has 2 bridges available to foresters in Franklin and Lamoille counties. They promote the use of skidder bridges and Forestry AMPs through their listserv, which includes towns, website and newsletters. The DFPR supports the work of these partners as well as their own.	

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Status	Explanation (data associated with Basin 7 unless otherwise noted)	Likelihood of Completion [113]
59. Implement forestry AMPs on high priority state lands through ANR road inventory, prioritization, and implementation.	Stevensville Brook (Mt. Mansfield State Forest), Lake Elmore (Elmore State Park), Beaver Meadow Brook and Mud Brook (Mt Mansfield State Forest), Sandbar wetland complex (Sandbar State Park and Wildlife Management Area), Green River (Green River Reservoir State Park)	Underhill, Elmore, Morristown, Hyde Park, Eden, Milton	Forest	Ongoing	The Agency supported Forestlands Critical Source Area mapping project is currently underway. The Agency has been actively conducting Road Erosion Inventories on state forest roads and will be piloting a Trail Erosion Inventory, where projects can be prioritized. With these new tools, the Agency will be better able to support Acceptable Management Practices compliance, as well as additional voluntary forestry BMP implementation.	

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Status	Explanation (data associated with Basin 7 unless otherwise noted)	Likelihood of Completion [113]
60. Provide focused outreach to forestland managers on the use of the ANR Road Erosion Inventory App in target watersheds.	Headwaters North Branch Lamoille, Headwaters Lake Eden	Eden, Belvidere	Forest	In Progress	See above for progress update on inventory. The ANR will provide training to forestland managers when App is ready.	High

Strategy Description	Priority Subbasin(s)	Priority Towns	Sector	Status	Explanation (data associated with Basin 7 unless otherwise noted)	Likelihood of Completion [113]
61. Identify headwaters and sensitive surface waters in large forest blocks for protection through conservation easement and land acquisition.	Basin wide	Belvidere, Waterville, Lowell, Eden, Johnson, Hyde Park, Underhill, Jericho, Elmore, Wheelock, Stannard, Walden, Woodbury	Forest	Ongoing	The following headwater parcels or parcels with sensitive surface waters in large forest blocks were identified and conserved: 1, Nuzzo River Corridor Easement, Jeffersonville, Lamoille River & Brewster River, 23.2 acres, completed 2020; 2. The Northeast Wilderness Trust with assistance from VLT, protected the headwaters of the North Branch of the Winooski and Elmore Branch of the Lamoille, 6250 acres total as part of the Woodbury Mountain Preserve ("Forever Wild" Conservation Easement); 3. The town of Wolcott recently acquired a town forest (700 acres) for conservation. The LCPC worked on outreach for town support. With the Act 171 Vermont Planning Statues amendment to encourage and allow municipalities to address protection of forest blocks and the DFPR planning resources, additional forest is expected to be identified during town planning processes.	
62. Implement forest land conservation practices and land conservation projects.	Basin wide	All towns	Forest	Ongoing	See parcels above. The LCCD helped conserve forested floodplain in Johnson on the Ten Bends Farm through a Hazard Mitigation Grant. The Vermont Land Trust has also been active in forest conservation.	

Appendix F: Results of State Stormwater Regulations

This appendix summarizes the contributions that Operational Stormwater Permits have made toward meeting Vermont's water quality goals.

Scope of Data	
Data include:	Stormwater permit data includes new or amended operational stormwater permits issued in State Fiscal Year (SFY) 2018–2024. Permits authorize new, redeveloped, and existing impervious surfaces meeting regulatory thresholds. DEC tracks permit issuance, not actual construction of impervious. Actual construction and change in phosphorus load may occur one to several years behind authorization under the permit.
Data does not include:	Phosphorus load data from outside the Lake Champlain and Lake Memphremagog basins.

Table F-1. Stormwater treatment practice types installed to comply with new operational stormwater permits in SFY 2024, total of permitted practices since SFY 2018, and average estimated phosphorus removal rates.

Practice Tier	Definition and examples	Average Phosphorus Removal	Permitted in SFY 2024	Total since SFY 2018
Tier 1 practices	Infiltrating practices, impervious disconnection	>80%	197	1119
Tier 2 practices	Gravel wetlands and bioretention with underdrains	60-80%	92	390
Tier 3 practices	Wet ponds, filters and dry swales not designed to infiltrate	50-60%	0	119
2002 VSMM[115] practices	Grass lined channels, non-structural credits	<50%	0	48
Total number of practices permitted			289	1,676
Average total phosphorus load removal of permitted practices[116]			70.5%	

[115] VSMM is the Vermont Stormwater Management Manual.

[116] Phosphorus removal efficiencies were assigned to each practice assuming that it was sized to meet the water quality volume. See Standard Operating Procedures for Tracking & Accounting of Developed Lands Regulatory Projects & Non-Regulatory Clean Water Projects for phosphorus removal efficiencies: https://dec.vermont.gov/water-investment/cwi/projects/tracking-accounting#SOP

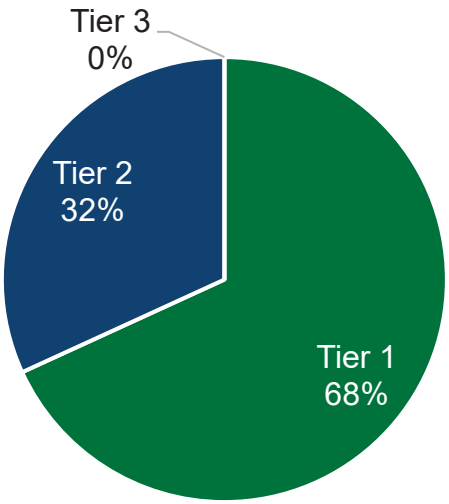


Figure F-1. Percent stormwater treatment practices by tier for new operational stormwater permits issued in SFY 2024.

Table F-2. Impervious surface area covered by operational stormwater permits issued in SFY 2024, and totals since SFY 2018, by large drainage areas.

Permitted Impervious Surface Type	SFY 2024	Total since SFY 2018
Lake Champlain		
New impervious (acres)	**134.4**	**720.2**
Redeveloped impervious (acres)	**165.1**	**301.2**
Existing impervious (acres)	**315.8**	**479.5**
Total impervious (acres)	**615.3**	**1,465**
Percent of impervious permitted	**88.6%**	
Lake Memphremagog		
New impervious (acres)	**1.4**	**32.5**
Redeveloped impervious (acres)	**9.1**	**12.8**
Existing impervious (acres)	**19.9**	**22.1**
Total impervious (acres)	**30.4**	**67.4**
Percent of impervious permitted	**4.4%**	
Other Drainage Areas		
New impervious (acres)	**30.4**	**140.1**
Redeveloped impervious (acres)	**7.4**	**43.6**
Existing impervious (acres)	**10.8**	**75.4**
Total impervious (acres)	**48.6**	**218.3**
Percent of impervious permitted	**7.0%**	

Figure F-2. Vermont's Large-Scale Drainage Areas

Table F-3. Estimated change in total phosphorus load associated with operational stormwater permits in the Lake Champlain and Lake Memphremagog basins (kilograms/year), SFY 2018–2024.

Estimated Change in Total Phosphorus Load	SFY 2024	Total since SFY 2018
Lake Champlain		
Increase in phosphorus from operational permits, prior to treatment[117] (kilograms/year)	159.3	772.9
Phosphorus reduced by treatment practices (kilograms/year)	409.0	1,199.3
Net change in phosphorus of operational permits (kilograms/year)	-249.7	-439.0
Lake Memphremagog		
Increase in phosphorus from operational permits, prior to treatment[117] (kilograms/year)	1.2	147.7
Phosphorus reduced by treatment practices (kilograms/year)	12.7	129.3
Net change in phosphorus of operational permits (kilograms/year)	-11.5	18.4

[117] Permitted impervious and phosphorus load calculations include both new and amended permit authorizations. For amended permits, only the increased impervious acres and phosphorus load relative to the previous permit are summarized here. Phosphorus increases from new development assumed that the permitted area was forested prior to development. Redeveloped and existing impervious does not result in a phosphorus change related to change in land use.

Appendix G: Glossary of Acronyms

AAFM	Agency of Agriculture, Food & Markets
ACCD	Agency of Commerce and Community Development
AgCWIP	Agricultural Clean Water Initiative Program, in the Agency of Agriculture, Food & Markets
AIS	Aquatic Invasive Species
AMP	Acceptable Management Practices
ANR	Agency of Natural Resources
AoA	Agency of Administration
AOP	Aquatic Organism Passage
ARPA	American Rescue Plan Act
BMP	Best Management Practice
BRAT	Beaver Restoration Action Tool
BTV	Burlington, Vermont
CCNRCD	Caledonia County Natural Resources Conservation District
CCRPC	Chittenden County Regional Planning Commission
CEAP	Conservation Equipment Assistance Program
COVID-19	Coronavirus disease
CREP	Conservation Reserve Enhancement Program
CSFO	Certified Small Farm Operation
CSO	Combined Sewer Overflow
CWA	Clean Water Act
CWF	Clean Water Fund
CWIP	Clean Water Initiative Program, in the Water Investment Division of ANR-DEC
CWRF	Clean Water Reporting Framework
CWSP	Clean Water Service Provider
CWSRF	Clean Water State Revolving Fund
DEC	Department of Environmental Conservation, in the Agency of Natural Resources
DFPR	Department of Forests, Parks and Recreation, in the Agency of Natural Resources
E&O	Education and Outreach
EPA	United States Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
ERAF	Emergency Relief and Assistance Fund
ESTA	Ecologically Significant Treatment Areas
FA	Financial Assistance
FAP	Farm Agronomic Practice
FCNRCD	Franklin County Natural Resources Conservation District
FEMA	Federal Emergency Management Agency
FFI	Functioning Floodplain Initiative
FNLC	Friends of Northern Lake Champlain
FRP	Flow Restoration Plans
FWC	Franklin Watershed Committee
FWD	Department of Fish and Wildlife, in the Agency of Natural Resources
GINRCD	Grand Isle Natural Resources Conservation District
GSI	Green Stormwater Infrastructure
GWFS	Grassed Waterway and Filter Strip

HUC	Hydrologic Unit Code
IDDE	Illicit Discharge Detection and Elimination
IRP	Integrated Resource Project
LC	Lake Champlain
LCA	Lewis Creek Association
LCBP	Lake Champlain Basin Program
LCCD	Lamoille County Conservation District
LCPC	Lamoille County Planning Commission
LFO	Large Farm Operation
LPP	LaRosa Partnership Program
LWAP	Lake Watershed Action Plan
LWM	Large Woody Material
MCM	Minimum Control Measures
MFO	Medium Farm Operation
MRBA	Missisquoi River Basin Association
MRGP	Municipal Roads General Permit
MS4	Municipal Separate Storm Sewer System
NMP	Nutrient Management Plan
NPDES	National Pollutant Discharge Elimination System
NRCD	Natural Resources Conservation District
NRCS	Natural Resources Conservation Service
NRPC	Northwest Regional Planning Commission
O&M	Operation and Maintenance
OCNRCD	Orleans County Natural Resources Conservation District
P	Phosphorus
PCP	Phosphorus Control Plans
PMNRCD	Poultney Mettowee Natural Resources Conservation District
PPP	Public Private Partnership
PSWF	Pasture and Surface Water Fencing
RAP	Required Agricultural Practice
RCP	River Corridor Plan
RCPP	Regional Conservation Partnership Program
REI	Road Erosion Inventory
RNRCD	Rutland Natural Resources Conservation District
RPC	Regional Planning Commission
RSEP	Regional Stormwater Education Program
SFY	State Fiscal Year
SGA	Stream Geomorphic Assessment
SWMP	Stormwater Master Plan
TA	Technical Assistance
TAP	Transportation Alternatives Program
TBP	Tactical Basin Plan
TBPSG	Tactical Basin Planning Support Grant
TMDL	Total Maximum Daily Load
TNC	The Nature Conservancy
TP	Total Phosphorus
TS4	Transportation Separate Storm Sewer System

U.S. EPA	United States Environmental Protection Agency
UMATR	Upper Missisquoi and Trout Rivers
USDA	United States Department of Agriculture
USDA-NRCS	United States Department of Agriculture - Natural Resources Conservation Service
USFS	United States Forest Service
USFWS	U.S. Fish and Wildlife Service
UVA	Use Value Appraisal
UVM	University of Vermont
V.S.A.	Vermont Statutes Annotated
VAAFM	Vermont Agency of Agriculture, Food & Markets
VAWQP	Vermont Agricultural Water Quality Partnership
VFESP	Vermont Farmer Ecosystem Stewardship Program
VHCB	Vermont Housing and Conservation Board
VHP	Very High Priority
VLT	Vermont Land Trust
VNRC	Vermont Natural Resources Council
VPFP	Vermont Pay for Performance
VPIC	Vermont Phosphorus Innovation Challenge
VRC	Vermont River Conservancy
VSMM	Vermont Stormwater Management Manual
VT	Vermont
Vtrans	Vermont Agency of Transportation
VWQS	Vermont Water Quality Standards
WISPr	Water Infrastructure Sponsorship Program
WNRCD	Winooski Natural Resources Conservation District
WPP	Watershed Planning Program, in the Water Investment Division of ANR-DEC
WWTF	Wastewater Treatment Facility