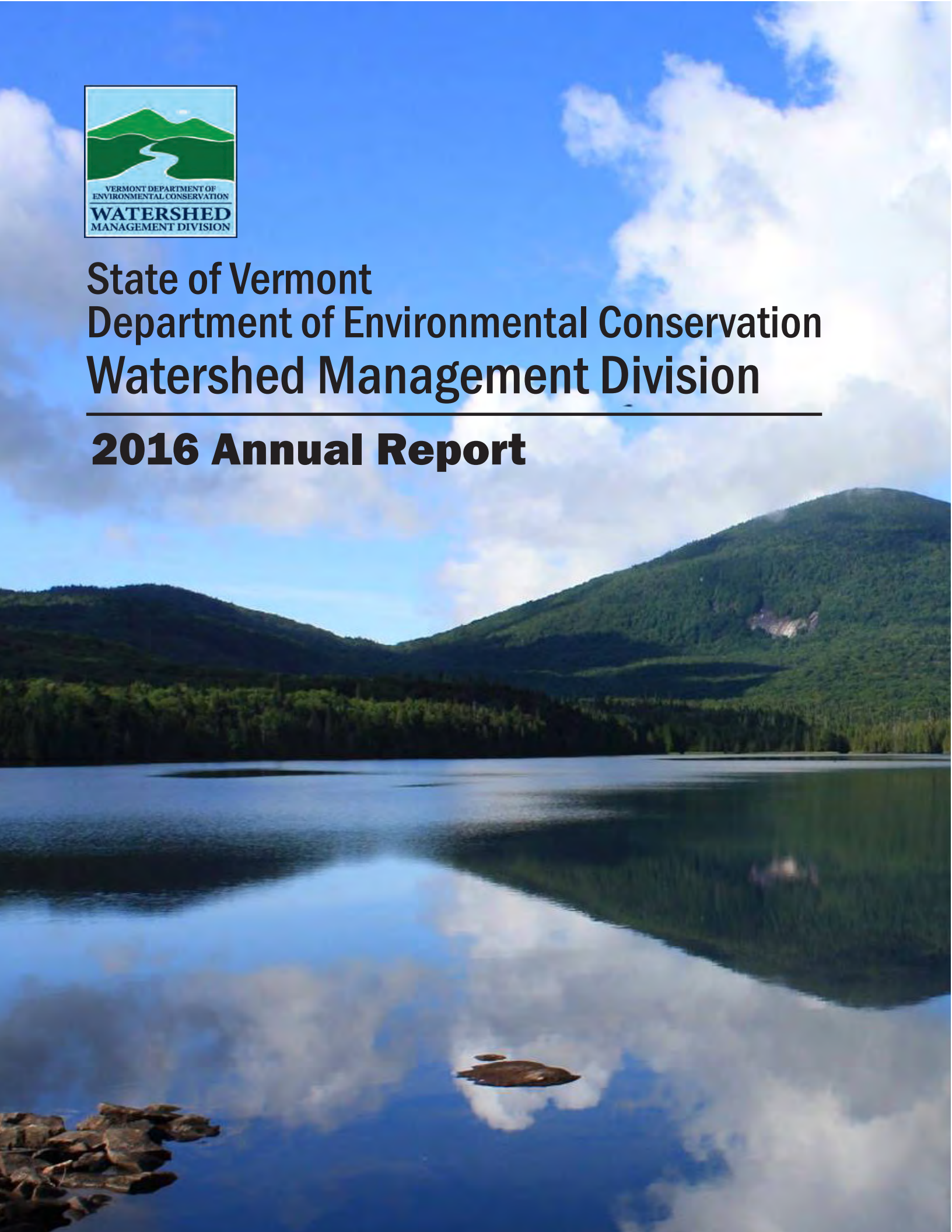

State of Vermont
Department of Environmental Conservation
Watershed Management Division

2016 Annual Report

Vermont Agency of Natural Resources
Department of Environmental Conservation
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Director's Message

Clean water is fundamental to who we are and what we value as Vermonters. High quality lakes and ponds, stable and ecologically intact rivers, fully functional wetlands, and healthy watersheds are critical elements to a robust economy, resilient communities, and a vibrant quality of life.

Culminating with passage of the Vermont Clean Water Act in 2015, we have charted a course to achieve a legacy of clean water for future generations. To fully accomplish this vision, we must now actively move forward with effective implementation—the longer we wait to act, the more difficult and costly restoration will become.

The urgency to act is even more apparent when our water resource challenges are viewed through the lens of increasingly extreme weather events. Over the past several years in Vermont, we have witnessed record high and near record low water levels in Lake Champlain, an increased frequency of intense rain events, and prolonged periods of drought. While we may not yet fully understand the implications of climate change for Vermont, we do know there is a need to reduce runoff and improve treatment infrastructure, as well as to protect, maintain, enhance, and restore our water resources to ensure intact river corridors, accessible floodplains, lake-friendly shorelands, and functional wetlands. These techniques will not only mitigate extreme weather impacts, but also serve to improve water quality and enhance the overall resilience of our built environment, including our roads, bridges, and buildings.

The Department of Environmental Conservation's Watershed Management Division is charged with implementing these efforts. This report presents the fundamentals of who we are, what we do, and how we set priorities. It also highlights our work in 2016 and describes our strategic priorities moving forward. The report is organized into four sections.

The first, **Watershed Management Division Overview**, introduces the Division by outlining our mission, vision, and goals. It also describes why we conduct our work on a watershed scale and how we are organized to best accomplish this work.

The second section highlights the **Guiding Documents and Principles** that direct and prioritize our work, including the Watershed Management Division Strategic Plan, the Vermont Surface Water Management Strategy, and the Tactical Basin Planning Process. We also describe how we frame our work—as protecting, maintaining, enhancing, and restoring our surface waters—and the tools we use to achieve these goals.

The third section, **Program Highlights**, details the work of our eight programs—three media-specific—Wetlands, Rivers, and Lakes and Ponds; two federally delegated—Stormwater and Wastewater; and three that integrate surface waters and media—Monitoring, Assessment, and Planning, Clean Water Initiative, and Business and Operational Support Services.

The final section summarizes how we **Measure and Track Progress**. It describes the current state of Vermont's water quality via population level indicators and environmental measures, as well as social, investment, and project output measures. It summarizes how we report our progress through the Vermont Clean Water Annual Investment Report and the Results Based Accountability Report.

Through the development of our Surface Water Management Strategy we have reaffirmed the inextricable relationship between water and land protection and thus the critical importance of being 'all in' on the solutions. While we still have a long way to go in achieving our ultimate vision, this report shows that we are making significant progress in both effectively and efficiently improving our waters. Finally, it is important to recognize that the many achievements of this past year would not have been possible without the remarkable contributions of our dedicated and talented management team and staff.

Thank you for your interest in Vermont's water resources. I encourage you to visit us online for more detailed information at dec.vermont.gov/watershed.

—Pete LaFlamme, Director
Watershed Management Division

Watershed Management Division

The Watershed Management Division is responsible for protecting, maintaining, enhancing, and restoring the quality of Vermont's surface water resources. Inherent in this effort is the support of both healthy ecosystems and public uses in and on Vermont's 800 lakes and ponds, 23,000 miles of rivers and streams, and 300,000 acres of wetlands. The Division has 103 full-time employees at its central Montpelier office and regional offices in St. Johnsbury, Rutland, Essex, and Springfield.

The Division's mission is to efficiently and effectively manage Vermont's surface waters through a comprehensive, integrated, and holistic watershed-based system. This mission is expressed through our four goals: to protect, maintain, enhance, and restore Vermont's surface waters. Our Division's Strategic Plan guides the collective work of the Division to meet these four goals. Progress is tracked via Results Based Accountability performance measures that summarize work across our Division, as well as through program-specific performance measures.

MISSION

To efficiently and effectively manage Vermont's surface water resources through a comprehensive, integrated, and holistic watershed-based system

VISION

To achieve full support of both healthy ecosystems and public uses in all of Vermont's waters

GOALS

Protect

Protect Vermont's pristine or 'special' waters from deleterious change over the long term

Maintain

Improve and expand the ongoing maintenance of Vermont's existing high quality waters

Enhance

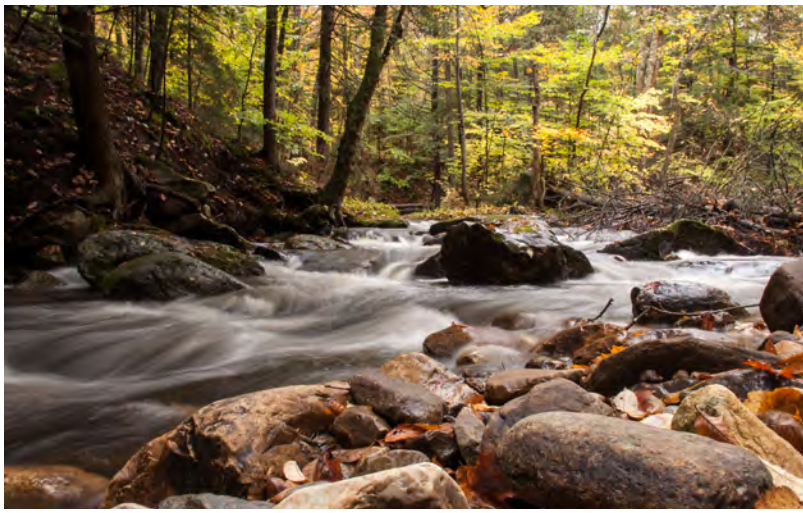
Increase opportunities to improve the condition of Vermont's high quality waters

Restore

Aggressively pursue restoration of currently impaired waters

WHY A WATERSHED MANAGEMENT DIVISION

A watershed is an area of land that drains downslope to its lowest point. Water moves through a watershed in a network of drainage pathways that generally converge in a stream or river system. Watersheds can be large or small. Watershed boundaries follow the major ridgeline around the channels and meet at the bottom where the water flows out of the watershed. Rainfall and snowmelt run off the land surface, and water flows into and out of a watershed.



The interrelationship of land use impacts and the connectivity of watershed resources are the primary reasons why surface water assessment, management, and restoration need to be conducted at a watershed scale. Since water moves downstream in a watershed, any activity that affects the water quality, quantity, or rate of movement at one location can change the characteristics of the watershed at locations downstream. All activities impacting watersheds must be managed simultaneously, with consideration of their cumulative impacts, to effectively manage the resource.

The best organizational design for a natural resources agency is one that closely parallels the resources it seeks to manage. Given the physical nature of watersheds, the consideration of land-based activities affecting watersheds, and the close alignment of the individual watershed elements (e.g., rivers, wetlands, and lakes), creating a corresponding management structure is the most predictable and comprehensive means of ensuring clear, efficient, and effective water resource management. The central goal driving the composition and design of the Division's organizational structure is to better leverage the concept of holistic watershed management.

Watershed Management Division Strategic Plan

The Watershed Management Division Strategic Plan will guide the work of the Division and its eight programs over a three-year period (2016–2018). The Strategic Plan is designed to ensure that federal and state requirements are met, surface water resources are protected and impaired waters restored, and that the Division is responsive to citizen needs and concerns.

Vermont has substantially improved water quality by significantly reducing pollutant discharges to its lakes, rivers, and wetlands through controls of discrete sources of pollution or point sources, such as wastewater treatment facility and industrial discharges. While these point sources require continual control, sources of nonpoint pollution need increasing attention. Nonpoint pollution sources include stormwater runoff from developed lands, road ways, and agricultural land, sediment pollution from unstable streambanks, loss of protective buffers and wetlands, and aquatic invasive species.

Over the past several years, the Division has reorganized internally to most efficiently and effectively manage threats from these pollutant sources and other stressors on water quality. As reflected in the Strategic Plan, the work of the Division as a whole, and its eight programs, is designed to promote the Division goals of protecting, maintaining, enhancing, and restoring Vermont's surface waters.

Inherent to our success over the past year and necessary for future success are:

- Using Lean to garner efficiencies and promote consistency
- Leveraging technology to streamline business and permitting processes
- Enhancing federal, state, and local partnerships
- Strategically targeting projects and funding

Progress in implementing the Strategic Plan will be measured through a Results Based Accountability (RBA) framework. In addition to annual RBA reporting, the Division is developing a comprehensive database to track our efforts in meeting Act 64 requirements (Vermont Clean Water Act), and implementing the Lake Champlain TMDL and Phase 1 Plan, and tactical basin plans.

The Strategic Plan is posted online at dec.vermont.gov/ business-support/reports.

KEY INITIATIVES

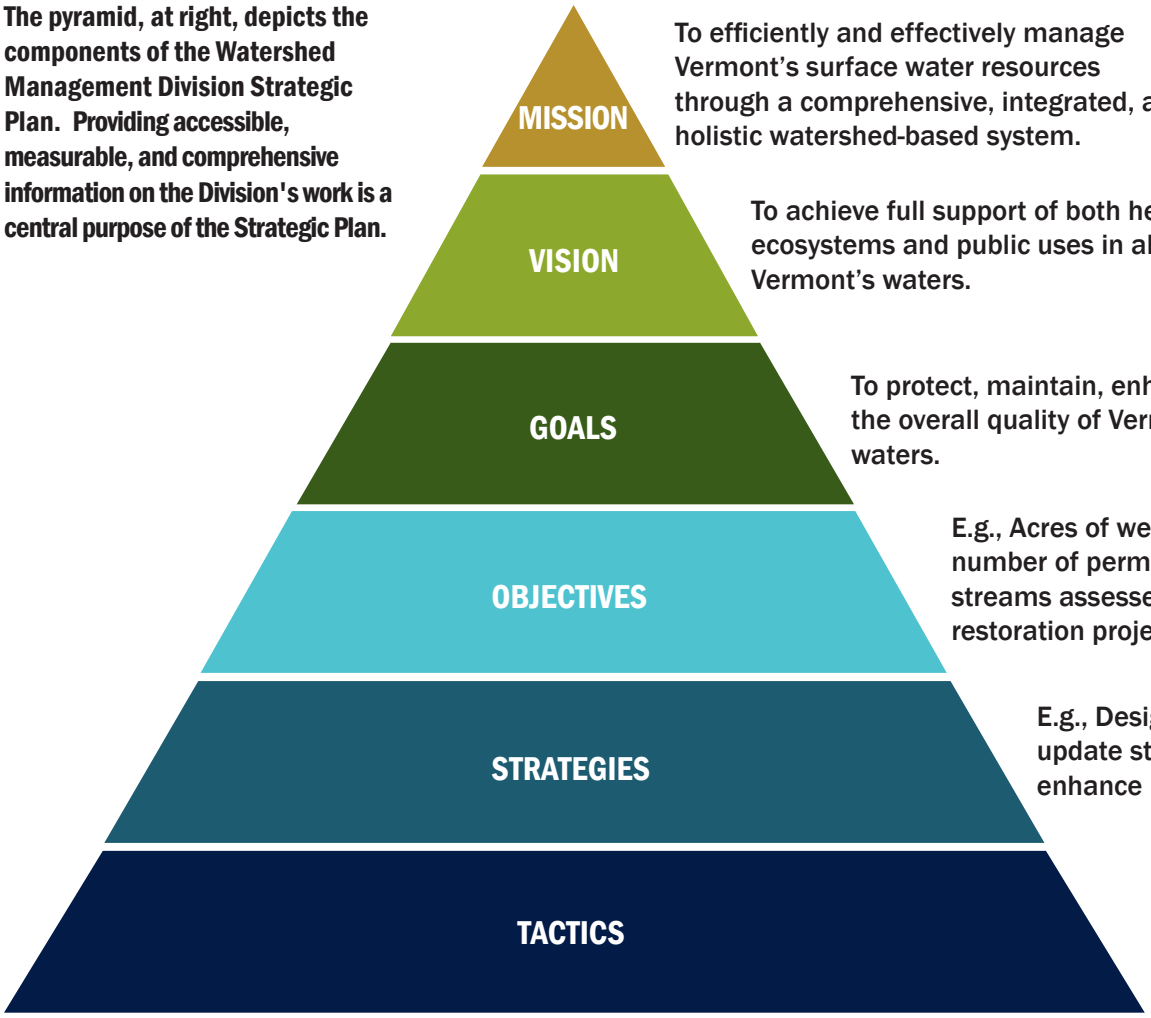
Accomplished:

- Refined tactical basin planning process to identify the highest priority projects
- Streamlined the project-identification to project-funding continuum
- Promoted proactive resource protection through surface water reclassifications, Class I Wetland designation, and revisions to Vermont Water Quality Standards
- Finalized Lake Champlain Phosphorus TMDL Phase 1 Implementation Plan
- Updated Combined Sewer Overflow (CSO) Rule and launched a public notice system for CSOs and unpermitted discharges

Upcoming:

- Ensure timely implementation of requirements under Act 64, and the Lake Champlain TMDL and Phase 1 Implementation Plan, including development of tracking systems
- Promote electronic submission of permit applications, monitoring, and reporting forms
- Develop clear and consistent 'decision records' for permitting decisions to increase transparency
- Initiate priority rulemaking efforts, including updating Vermont's NPDES Rule and developing an Anti-Degradation Rule

The pyramid, at right, depicts the components of the Watershed Management Division Strategic Plan. Providing accessible, measurable, and comprehensive information on the Division's work is a central purpose of the Strategic Plan.



A CULTURE OF CONTINUOUS IMPROVEMENT

Faced with an ever-increasing workload, expanding regulatory jurisdictions, and rapid changes in technology and customer expectations, the Division has embraced the use of Lean. Lean principles and tools are used to decrease waste and improve efficiency to grow the capabilities and services of an organization. Lean was initially developed for the manufacturing sector, but has been successfully applied in governmental organizations.

Division management and staff have participated in numerous Lean events (week-long traditional Lean events as well as shorter events) to improve our processes.

Division staff, the regulated community, and the general public are already seeing the benefits of increased efficiency and productivity. Results include catching up on backlogs, keeping pace with increased workloads, and shifting staff resources to higher value work.

As a Division, we aim to nurture a culture of continuous improvement. When examining a process, we do not allow the answer "we have always done it this way." Instead, we constantly challenge our processes through the application of Lean tools and work to better leverage technology and improve our processes to garner internal and external benefits.

Surface Water Management Strategy

The Surface Water Management Strategy describes the management of pollutants and stressors that affect the uses and values of Vermont's surface waters. It also presents the Division's goals, objectives, and approaches for the protection and management of Vermont's surface waters. This guides the Division's decision-making to ensure efficient, predictable, consistent, and coordinated management actions. Specifically, this strategy:

1. Sets forth goals and objectives for managing Vermont's surface waters in light of the goals of the federal Clean Water Act and Vermont's surface water quality policy.

2. Describes pollutants and stressors that affect the uses and values of Vermont's surface waters, approaches to address stressors, and appendices describing regulations, funding, and technical assistance programs.

3. Sets forth the Division's approach to protecting and improving surface waters by managing stressors rather than individual pollutants.

4. Evaluates program effectiveness in managing stressors, including an identification of regulatory 'gaps' that impede effective stressor management.

5. Describes the Division's updated Ambient Surface Water Monitoring and Assessment Strategy that will work hand-in-hand with watershed management planning at a statewide and basin-specific scale to identify and prioritize waters in need of protection, restoration, and management.

6. Recommends a new, more focused approach to watershed management planning to guide the development of tactical basin plans that provide the geographic specificity necessary to effectively implement the strategy.

To effectively translate the strategy into on-the-ground actions, the document describes a coordinated statewide planning process and presents recommendations for a focused, basin-specific planning approach designed to enhance the protection, maintenance, and restoration of surface waters. The strategy reflects experience gained and lessons learned by the Watershed Management Division in working with partner programs and watershed stakeholders, drawing upon over 30 years of experience in watershed planning, project implementation, and surface water restoration.

The Surface Water Management Strategy describes the Division's approach to protecting and improving Vermont's surface waters.

PROTECTING AND IMPROVING SURFACE WATERS BY MANAGING STRESSORS

In developing the strategy, the Division engaged in an intensive evaluation process aimed at identifying areas of program duplication and program 'gaps,' as a way to ensure program efficiency in meeting goals and objectives. A key element of this approach is the recognition that individual pollutants (often more than one) can be simultaneously mitigated by managing surface water stressors.

The Division has identified ten major stressors with unique causes and sources, and sometimes overlapping effects, which result in surface water

impacts. By identifying stressors and approaches to their management, the Surface Water Management Strategy sets the stage for the Division's approach to multi-agency planning and implementation to meet Division goals. These stressors are of interest not only to the Division, but also to federal, state, and local agencies and organizations with an interest in surface water management.

METHODS USED TO DOCUMENT AND ADDRESS STRESSORS

The Division works with federal, state, and local partners to address stressors through activities in five specific areas:

- **Monitoring and assessment** activities to document locations of stressor impacts and identify areas to protect or remediate. Monitoring includes biological, chemical, and physical parameters, which are assessed to determine compliance with Vermont Water Quality Standards.
- **Technical support** programs to assist individuals and organizations with the development of projects to address the stressor.
- **Funding** programs that provide cost-share assistance or complete funding for projects.
- **Rules and regulations** that address the stressor, including permitting programs.
- **Education and outreach** efforts that increase awareness and knowledge of the stressor and promote activities to minimize the stressor's impacts to surface waters.

A stream channel erodes causing the bank and adjacent road surface to collapse.

The Surface Water Management Strategy is posted online at dec.vermont.gov/watershed/map/strategy.

STRESSORS

- Acidity
- Channel Erosion
- Flow Alteration
- Encroachment
- Invasive Species
- Land Erosion
- Nutrient Loading
- Pathogens
- Toxic Substances
- Thermal Stress

Tactical Basin Planning

Tactical basin planning uses monitoring and assessment results, combined with sector-specific planning processes, to identify and prioritize implementation projects.

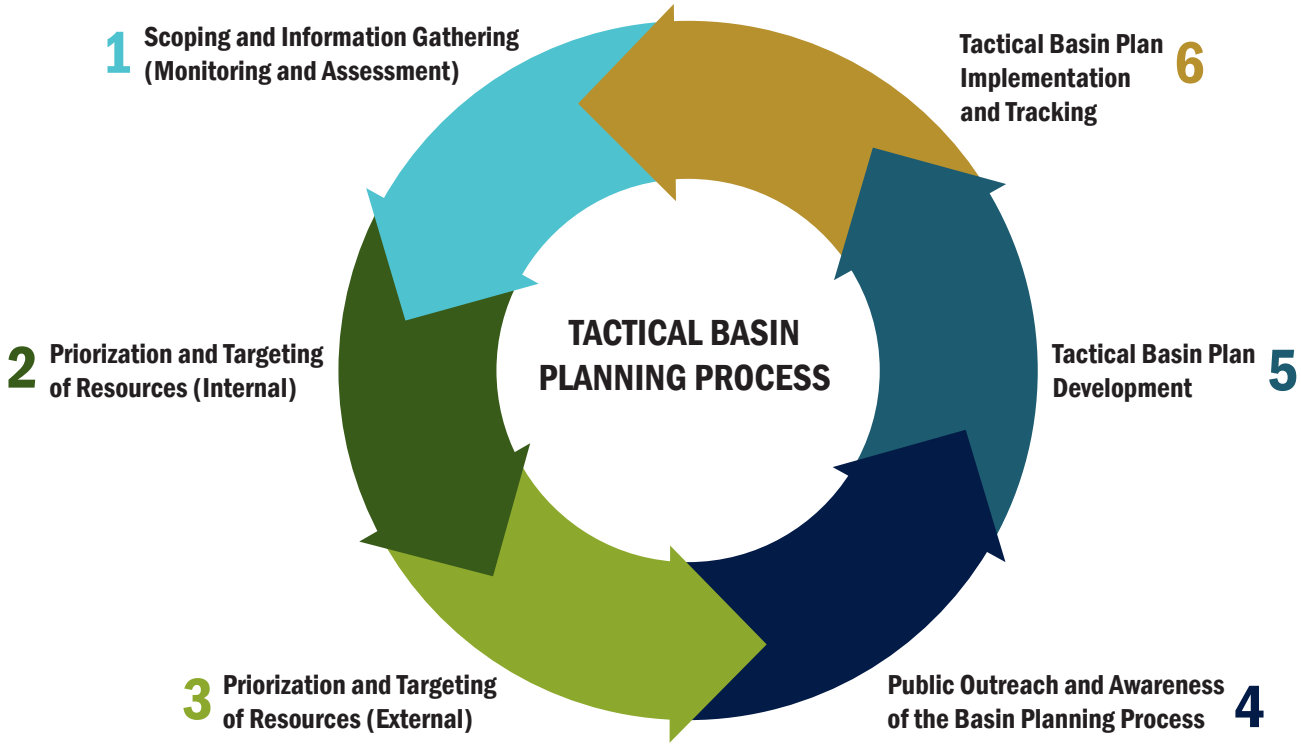
The Watershed Management Division relies on tactical basin plans to ensure that funds are directed to the highest-merit implementation opportunities based on identification, targeting, and treatment of specific sites at greatest risk of delivering excess nutrients and sediment to surface waters.

These critical sources are identified within land use categories including agricultural land, urban and developed land, road networks, and river corridors. Tactical basin planning is carried out by Watershed Management Division planners, each of whom is assigned a district comprised of three planning areas based on Vermont's major watersheds. Within each planning area, the planner develops a tactical basin plan on a five-year recurring cycle, in partnership with the Agency of Agriculture, Regional Planning Commissions, Natural Resources Conservation Districts, and others. Tactical basin planning is the Division's approach to integrate and focus TMDL implementation for all watersheds in Vermont that are subject to TMDLs.

For each plan, an online implementation table identifies the priorities of the Division and partner organizations for protection or restoration of specific stream segments or lakes and ponds affected by stressors outlined in the Surface Water Management Strategy. It also notifies municipalities and partner organizations, such as conservation districts, regional planning commissions, and watershed associations, of the types and locations of projects that the Division will support with Ecosystem Restoration Grants or promote to other funding sources.

The implementation table is regularly updated to support implementation in each basin. The planners continually review the progress attained in the implementation of specific projects, conduct public outreach to revisit the projects identified, and insert new priority items that were more recently identified.

For more information, visit dec.vermont.gov/watershed/map/basin-planning.



Protecting, Maintaining, Enhancing, and Restoring Vermont's Surface Waters

Our state's natural ecosystems, and the functions and values they provide, are a finite resource. The Watershed Management Division has a responsibility to safeguard these water resources for future generations. We ensure Vermont's surface water quality through a variety of protection, maintenance, enhancement, and restoration tools and efforts.

PROTECT

We aim to protect Vermont's pristine or 'special' waters from deleterious change through the proactive use of tools such as easements, designations, and outreach and training efforts. Easements and designations place restrictions on development or other activities to reduce flood hazards, protect water quality, and restore wetland and riparian habitats. Examples include river corridor easements, parcel buyouts, designations of Outstanding Resource Waters and Class I Wetlands, and classification of surface water uses. Outreach and training efforts increase environmental awareness and promote environmental stewardship. Efforts include the Rivers and Roads training on smart road development and culvert design, training on wetland habitats and functions, workshops to help prevent the spread of aquatic invasive species, presentations on regulations and permit requirements, webinars on water resource management, Lake Wise outreach to landowners, and training on lake-friendly development for contractors.

Through monitoring and assessment, we establish baseline conditions, track long-term changes, and make more informed management decisions. Here a field scientist on Lake Champlain readies equipment to collect a water sample, which will be analyzed for phosphorus and other chemical parameters.

Division staff trains volunteers to identify aquatic invasive species during a half day workshop on Lake Memphremagog.

MAINTAIN

Improving and expanding the need for ongoing maintenance of Vermont's existing high quality waters is a Division priority. We work to maintain surface water quality through monitoring and assessment, permitting, and technical assistance efforts. Monitoring and assessment efforts establish baseline conditions, track long-term changes in water quality and uses, and guide management efforts. It allows us to evaluate the impacts of stressors (e.g., encroachments, nutrient loading, invasive species, and erosion), prioritize mitigation and restoration efforts, and evaluate their effectiveness. Our monitoring and assessment efforts identify where protection, restoration, enhancement, and maintenance efforts should be targeted to best ensure the quality of Vermont's surface waters in a cost-effective manner.

Permit coverage is required for a variety of activities that potentially impact water resources, such as aquatic nuisance control, shoreland development, lake encroachments, stream alterations, construction and operational stormwater management, wastewater discharges, and wetland alterations. Permits often require monitoring to ensure water quality is maintained after permit issuance. The Division also regularly provides technical assistance to municipalities, landowners, developers, and partner organizations (e.g., lake and watershed organizations) to ensure that Water Quality Standards are maintained. The technical assistance we provide serves a critical function in maintaining watershed health.

ECO AmeriCorps Members assist with a riparian tree planting in Rockingham.

ENHANCE

The Division continuously works to identify tools to better manage impacts to surface waters, particularly since waters can, over time, become more stressed or even impaired through cumulative impacts. A Division goal is to increase opportunities for the enhancement of water quality.

We proactively identify, promote the use of, and fund measures and projects to improve existing water quality. This is done through the development of programs, policies, outreach and education efforts, and other tools. Process improvements and best management practices aimed at improving ecological and hydrologic functions are key ways to help improve water quality. Examples include implementation of best management practices on lakeshore properties, riparian buffer plantings and in-stream improvements, flow protection and culvert enhancement projects, removal of invasive species from wetlands, installation of green stormwater infrastructure practices, and optimization of wastewater treatment processes.

RESTORE

The Vermont Water Quality Standards are regulations that require the classification of each waterbody according to uses that must be protected and sets chemical, physical, and biological criteria that must be met to protect those uses. Every two years, lakes, ponds, rivers, and streams with Water Quality Standards violations are identified and listed as impaired. These priority listings guide the development of pollution source control strategies, cleanup plans known as Total Maximum Daily Loads (TMDLs), restoration actions, and targeted monitoring and assessment efforts.

Total Maximum Daily Load or TMDL

A TMDL is a legally binding document that identifies the surface water use that is impaired, the pollutant that caused the impairment, and the total maximum discharge of that pollutant that may be allowed to enter the waterbody and still maintain the use. TMDLs are unique to each waterbody. The general process by which they are developed can be summarized as follows:

- **Problem identification**: The pollutant for which the TMDL is developed must be identified. Examples include sediment that impacts habitat for aquatic organisms, nutrients that cause excessive algal growth, or bacteria that create unsafe swimming conditions.

- **Identification of target values**: This element establishes water quality goals for the TMDL. Target values may be stated explicitly in the Water Quality Standards or they may need to be interpreted.
- **Source assessment**: All significant sources of the pollutant in question must be identified in the watershed. This often requires additional water quality monitoring.
- **Linkage between targets and sources**: This element of the process establishes how much pollutant loading can occur while still meeting the Water Quality Standards. This step can vary in complexity from simple calculations to development of complex watershed models.
- **Allocations**: Once the maximum pollutant load is established, the needed reductions must be divided among the various sources. This is done for both point sources and nonpoint sources.
- **Public participation**: Stakeholder involvement is critical for the successful outcome of any TMDL. Draft TMDLs are released for public comment prior to their completion.
- **Environmental Protection Agency (EPA) approval**: EPA approval is needed for all TMDLs as required by the Federal Clean Water Act.
- **Follow-up monitoring**: Additional monitoring may be needed to ensure the TMDL, once implemented, is effective in restoring the waters.

Vermont's TMDLs

There are three significant TMDLs that apply to approximately 94% of Vermont's landmass—Lake Champlain Phosphorus TMDL, Long Island Sound Nitrogen TMDL, and Lake Memphremagog Phosphorus TMDL. Implementation of these TMDLs is a critical part of the Division's work and implicates numerous sectors, including urban and road runoff, agriculture, forestry, and wastewater treatment facilities. Additional TMDLs implemented by the Division include, among others, Lake Carmi Phosphorus TMDL, statewide bacteria TMDL, stormwater-impaired water TMDLs, and acid rain TMDLs. The Division works with federal, state, and local partners to ensure implementation of TMDLs, as well as with Quebec, New York, and other jurisdictions as needed.

Lake Champlain TMDL and Phase 1 Implementation Plan

The Lake Champlain TMDL will be foundational to the Division's management of surface waters over the next two decades. The Lake Champlain Phase 1 Implementation Plan outlines the policy commitments requested by EPA to ensure success. These policy commitments address all major sources of phosphorus to the lake, and include:

- Wastewater treatment facility discharges
- Untreated/unmanaged runoff from existing developed lands
- Discharges from farmsteads and agricultural production areas, poorly managed cropland, and unmanaged or poorly managed pastures
- River and stream channel modifications
- Floodplain, river corridor, and lakeshore encroachments
- Stormwater runoff from developed lands and construction sites
- Road construction and maintenance
- Forests and forestry management practices
- Wetland alteration and loss
- Legacy effects of historic phosphorus loading
- Additional phosphorus contributions anticipated due to climate change

The commitments presented in the Phase 1 Plan include new and enhanced regulation, funding and

Lake Champlain is an important economic, environmental, and recreational asset for Vermont.

financial incentives, and technical assistance. It builds on work already done by the State over the past 10 years to reduce phosphorus contributions to the lake. They will require new and increased efforts from nearly every sector of society, including state government, municipalities, farmers, developers, businesses, and homeowners. The Division is employing a twenty-year implementation schedule to allow for communities to plan and stage necessary improvements to roads, stormwater, and wastewater infrastructure into long-term capital funding plans as a means of keeping costs and funding burdens down.

Long Island Sound TMDL

The Long Island Sound Nitrogen TMDL was completed by the Connecticut Department of Energy and Environmental Protection and New York State Department of Environmental Conservation and approved by EPA in 2001 to address oxygen deficiency in the western regions of the Sound. Since that time, Connecticut and New York have made significant reductions in point source nitrogen loading—enough to actually detect improvements in the oxygen concentration over the long-term. Vermont, along with other 'upper basin' states, including New Hampshire and Massachusetts, have also been working toward nitrogen reductions from point sources. For example, wastewater treatment facilities in Vermont capped their current nitrogen loading to the Connecticut River and continue to work toward optimizing their facility processes to better remove nitrogen. Through tactical basin planning, the Division targets and funds nitrogen reduction projects to improve both local water quality and water quality in the Sound. The Division continues to work with the other states and EPA to further refine the TMDL and to look for ways to efficiently reduce nitrogen flowing to Long Island Sound.

Lake Memphremagog TMDL

Phosphorus levels in the Vermont portion of Lake Memphremagog are over 20% higher than that lake's Water Quality Standard. Elevated levels of phosphorus contribute to occasional cyanobacteria (also called blue-green algae) blooms, but also support excessive plant and algae growth that can limit recreational use of the lake. Modeling suggests that a 21% phosphorus load reduction is necessary for the Vermont portions of the Lake Memphremagog watershed. A tactical basin plan for the Lake Memphremagog, Tomifobia, and Coaticook watersheds is being developed. The plan will include strategies to provide technical and financial resources for this effort as well as a list of specific projects for meeting phosphorus reduction targets.

Fishing on Lake Carmi.

Vermont Clean Water Act (Act 64)

The Vermont Clean Water Act was signed into law by Governor Peter Shumlin in June, 2015. The Act represents a major step forward in Vermont's ability to reduce sediment and nutrient pollution (phosphorus and nitrogen) across the state. The Act requires new or augmented efforts to control runoff from agricultural and developed lands and roads, and also supports restoration and protection of river corridors, floodplains, wetlands, and lakeshores.

The Act also established a Clean Water Fund to support implementation of water quality improvement projects. While the fund is supported for the first three years using Vermont's Property Transfer Tax, the act compels the State Treasurer to submit a report on the total need and long-term financing options to implement the Vermont Clean Water Act, the Lake Champlain TMDL, and other pollution control plans to the Vermont General Assembly in January, 2017.

For more information on the Clean Water Fund, visit dec.vermont.gov/watershed/cwi/cwf.

Our Programs

The Division includes three media-specific programs—Wetlands, Rivers, and Lakes—that holistically manage these resources through monitoring and assessment, regulatory programs, and outreach and education. The Division also administers federally delegated Stormwater and Wastewater permitting programs that regulate discharges to surface waters. The Monitoring, Assessment, and Planning Program integrates the Division's programmatic work through strategic monitoring and the development of tactical basin plans that identify priority implementation projects to protect high quality waters and restore impaired waters. The newly reorganized and renamed Clean Water Initiative Program (formerly the Ecosystem Restoration Program) is responsible for outreach, implementation, funding, and tracking and reporting activities associated with Vermont's new Clean Water Act (Act 64) and Clean Water Fund, and cleanup plans for Lake Champlain, Lake Memphremagog, and Long Island Sound. The Division also recently consolidated its administrative, financial, and compliance services into a new Business Operational and Support Services Program to promote efficiency, enhance consistency, and better leverage technology.

This section details each program's work and key initiatives, and highlights a Results Based Accountability metric for the last year. A specific accomplishment is also described in detail to better illustrate the scope of programs' efforts.

Business and Operational Support Services

The Business and Operational Support Services (BOSS) Program provides administrative and technical assistance for the Division's permitting and resource-based programs as well as general advanced operational support. The BOSS team administratively reviews and processes permit applications, tracks permit compliance, performs permit billing and account receivable functions, coordinates database and website development work, and provides high level internal and external assistance. BOSS staff supports the Division in achieving the overall mission of protecting, maintaining, enhancing, and restoring Vermont's surface water resources by promoting efficiency, enhancing consistency, and leveraging technology.

The BOSS Program supports the Division's work to protect, maintain, enhance, and restore Vermont's surface waters through administrative and technical assistance.

KEY INITIATIVES

Accomplished:

- **Leveraged technology to streamline and automate permit issuance, renewal notification, and operating fee invoice processes**
- **Launched a new website, including a centralized public notice resource page, and enhanced records management to increase transparency**
- **Revised permit application and compliance forms to improve ease of use**

Upcoming:

- **Implement an electronic permit compliance report submittal system**
- **Launch electronic permit application forms**
- **Centralize Department public noticing processes and create a personalized notification service**

Number of permits issued:

1,452

Quicker, Better, More Efficient: Improving Our Processes

Every year the number of permits issued rises due to increased regulatory jurisdiction as well as continued economic growth and development in Vermont. Nearly every permit issued by the Division flows through the Business and Operational Support Services (BOSS) team, which assists with permit application review, compliance review, and application and operating fee collection and processing. Improving our processes is essential to our ability to keep pace with the rising volume of permits while continuing to provide a high level of service to applicants, permittees, the public, and internal Division staff.

External improvements such as updating application and compliance forms and increasing public access to information has allowed us to receive higher quality permit applications and become more transparent. Specific examples of external improvements include:

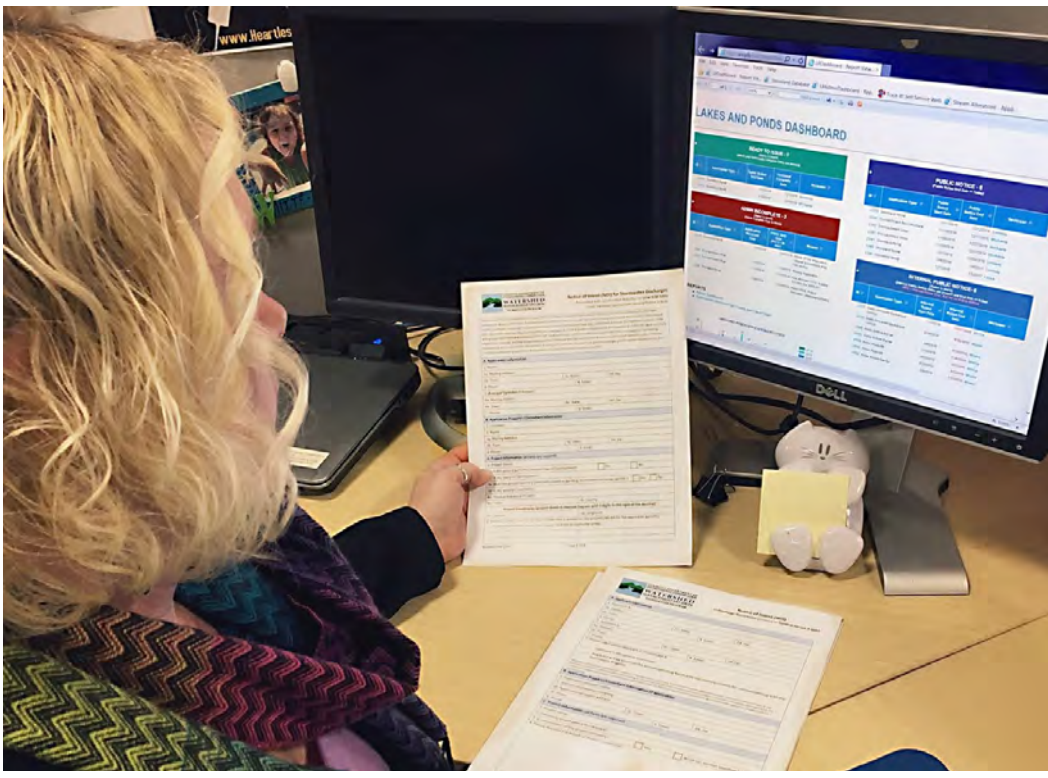
- Creating a new Division website with enhanced capabilities and navigation, making it easier for the public to find information
- Revising and improving permit application and compliance forms, including the addition of tools to auto-calculate fees, making the forms clearer, more intuitive, and easier for applicants to complete
- Launching a public alert subscription service for notifications of discharges to waters posing a possible threat to human health and the environment
- Creating a Class I Wetland story map to bring to life the value of protecting these fragile and irreplaceable ecosystems

Internal improvements through streamlining our business processes and increased leverage of technology have allowed us to enhance data quality and make our work more efficient. Specific examples include:

- Creating workflow dashboards that better track critical data and permitting processes
- Autogenerating letters and forms from databases, eliminating duplicative data entry
- Enhancing reporting abilities on milestones and permitting statistics, making reporting easier and more accurate
- Improving our account receivable processes, making processing payment and requests for refunds quicker
- Establishing reports to better identify permit non-compliance and hold permittees accountable

By increasing our efficiency and transparency, we have not only kept pace with the rise in permit applications, but also enhanced our public assistance. We remain open to feedback while we continue to critically examine our processes to benefit the public and internal operations.

The BOSS Program promotes efficiency, improves consistency, and leverages technology.



Clean Water Initiative Program

The Clean Water Initiative Program—formerly the Ecosystem Restoration Program—coordinates implementation of clean water restoration activities and provides financial resources to support nonpoint source pollution controls. The Program also promotes and funds natural resources restoration, including floodplains, river corridors, wetlands, and riparian areas for flood resilience, water quality, and habitat benefits. In addition, the Program tracks and communicates progress toward achieving and maintaining clean water statewide.

With support from an Ecosystem Restoration Grant, the Vermont River Conservancy and landowners restored nearly 24 acres of floodplain along 1,800 feet of the Lamoille River in the Town of Fairfax. The project will enhance flood resilience and improve water quality by providing sediment and nutrient storage during flood events.

KEY INITIATIVES

Accomplished:

- Implemented nearly $4.5M of projects through a 5-year $16M grant from the Natural Resources Conservation Service
- Coordinated an extensive stakeholder involvement process for input to Clean Water Fund allocations
- Developed a tracking system for water quality projects
- Committed $101,888 for wetland incentives in high priority areas

Upcoming:

- Establish and implement long-term funding for clean water efforts
- Reorganize grant program to coordinate with priority basin plan projects
- Quantify environmental benefits of outreach and technical assistance
- Continue implementation of critical on-farm improvements with the Agency of Agriculture

Amount of funding provided for priority clean water improvement projects:

$4.4M

Lake Iroquois Recreation District Addresses Stormwater Runoff and Erosion

The swimming beach at Lake Iroquois is an important resource for residents of the four towns that make up the Lake Iroquois Recreation District (LIRD) and other Vermonters. An ecological landscape design, erosion control, and stormwater management project to protect the beach and adjacent lake's water quality was recently funded through a Clean Water Initiative Program Ecosystem Restoration Grant.

The project consisted of the construction of a bioretention stormwater treatment and groundwater diversion facility to minimize stormwater runoff and associated erosion. It also provided plantings and restoration work along the shoreline to further mitigate erosion and enhance habitat.

Prior to the project's implementation, each significant rainfall would send water gushing across the parking lot and the beach. This torrent of water pushed road gravel and beach sand into the lake and carved deep trenches in the shoreland. This erosion added phosphorus to the lake from the finer particles in the sand and decreased the lake's clarity, which adversely impacted aquatic habitat. About 16 yards of sand, on average, were added each season, which by some accounts contributed as much as 6.4 kg of phosphorus to the lake from beach erosion alone.

The newly installed bioretention stormwater treatment structure will filter phosphorus and other nutrients and decrease the volume of runoff flowing into Lake Iroquois, and thereby runoff-related erosion. Trees planted along the lakeshore will stabilize the bank, reduce erosion, and improve habitat.

The completed project will help improve the lake's water quality and allow the LIRD to continue to provide a valuable recreational resource for years to come.

Trees planted along the shoreline stablize the bank and reduce erosion.

Before, left, and after, right, the installation of a bioretention stormwater treatment structure at the Lake Iroquois public beach parking lot. The project was completed by the Lake Iroquois Recreation District with support from an Ecosystem Restoration Grant.

Lakes and Ponds Program

The Lakes and Ponds Management and Protection Program works to protect, maintain, enhance, and restore the health of Vermont lakes and the public uses that healthy lake ecosystems provide. We do this through education and outreach, assessment and monitoring, and regulatory programs. One of our long-term goals is to preserve or restore the natural lakeshore for the protection and improvement of water quality, aquatic and terrestrial wildlife habitat, and lake ecosystem functions.

A natural, forested shoreline protects water quality, wildlife habitat, and lake ecosystem functions.

KEY INITIATIVES

Accomplished:

- Integrated Lakes and Ponds priorities into the tactical basin planning process
- Developed and launched a contractor training course to support the use of lake-friendly practices in the protected shoreland zone

Upcoming:

- Prioritize monitoring and assessment strategies for measuring compliance with the newly revised Water Quality Standards
- Update the Lakes Score Card to better communicate with the public about current water quality conditions
- Update existing regulations to protect against the spread of aquatic invasive species

Total number of attendees at nine Natural Shoreland Erosion Control Certification Courses:

288

Spotlight on the Public Access Greeter Program

Visitors to Waterbury Reservoir may have encountered something new at the lake this year: a nice young man wearing a yellow 'Public Access Greeter' shirt. This summer was the inaugural year for a Public Access Greeter Program at Waterbury Reservoir, which was established by Friends of Waterbury Reservoir (FWR) with assistance from the Watershed Management Division's aquatic nuisance control grant-in-aid program. A part-time greeter, along with a motivated group of volunteers from FWR, offered invasive species education and boat inspections at multiple launch sites around this aquatic gem in central Vermont.

The 860-acre reservoir receives over 60,000 total visitors to the state parks on the shores of the lake, as well as three public access sites. This year, the greeter and volunteers focused their efforts on the heavily used Blush Hill boat access area. They kept a keen eye out for watercraft and trailers that might be bearing Eurasian watermilfoil, which is not present in the reservoir. Another goal was to contain the spread of brittle naiad, an easily spread invasive plant currently found in portions of the reservoir, but rare in other Vermont waterbodies.

During the course of the summer, the greeter and FWR volunteers had over 400 individual interactions with boaters. In three instances, boats were intercepted before leaving the reservoir with live plants attached, and in two

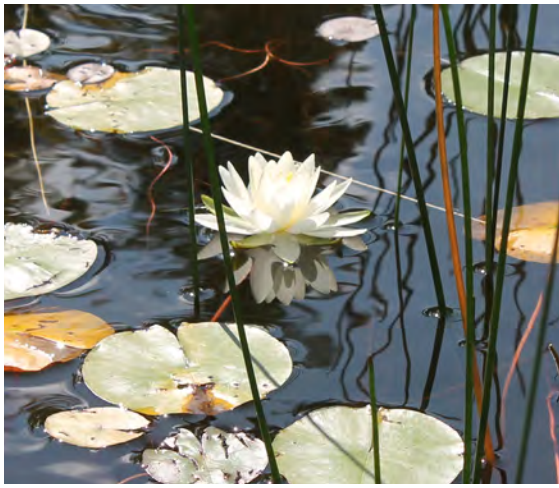
Greeter Zach Johnson chats with boaters about invasive species at a Waterbury Reservoir access area.

of those instances, the species in question were invasive. Luckily, no plant material was found on boats or trailers launching into the reservoir, but there were four occasions when excessive water was drained from boats coming from other lakes. Small-bodied invasive organisms, such as spiny waterfleas and juvenile zebra mussels, can be transported in very small amounts of water, so ensuring boats enter the lake drained of water is a primary concern of any public access greeter program.

According to FWR, the inaugural year of the program was highly successful. The part-time greeter did a great job engaging people in conversations and answering questions about the program. FWR noted that they were happily surprised by how interested and appreciative folks were that a greeter was present at the reservoir, and that many had further questions about invasive species in general and were interested in the printed material handed out.

Chuck Kletecka of FWR praised the program. “Overall, the program went really well for our first year. Although we did not have many interceptions, we were able to educate many people and introduce them to the dangers of invasive species. One common thread between all the people we interacted with was the love of Waterbury Reservoir. We hope this summer was just the start of future efforts by the State and FWR to share the ‘love’ and keep our beloved reservoir the beautiful resource it is for years to come."

Native plants like this white waterlily provide important habitat for fish and wildlife.



Monitoring, Assessment, and Planning Program

The Monitoring, Assessment, and Planning Program (MAPP) integrates three components of the Vermont water pollution control program. MAPP measures water quality indicators and evaluates these indicators in light of applicable standards or thresholds. Information about the condition of waters is then used to develop watershed plans that target waters for protection or remediation. MAPP also conducts water quality modeling, oversees water quality remediation planning for regulated entities, and maintains a comprehensive water quality database representing Vermont's surface waters.

A senior environmental technician collects biological specimens to document the high quality of this Green Mountain National Forest stream.

KEY INITIATIVES

Accomplished:

- **Tested water at over 200 sites statewide and supported citizen scientists' water monitoring efforts**
- **Updated Water Quality Standards Rule**
- **Developed a robust tracking system for implementation projects and associated nutrient reductions**
- **Released Lamoille and Missisquoi Tactical Basin Plans**

Upcoming:

- **Issue Lake Memphremagog Phosphorus TMDL**
- **Release South Lake Champlain watershed and Ottauquechee/Black River tactical basin plans**

Number of stream, lake, and wetland locations tested for surface water pollution:

860

Introducing the Vermont Integrated Watershed Information System

Welcome to V-IWIS, Vermont's new Integrated Watershed Information System. V-IWIS was built to provide users access to all sorts of water chemistry, quality, and biomonitoring data from the Watershed Management Division's data archives, and the online reporting websites of partner organizations.

To access data using V-IWIS, go to https://anrweb.vt.gov/DEC/IWIS/. From there you can search by site name or water quality test, or browse locations using the Agency of Natural Resources (ANR) Atlas. As users explore, they will discover the capability to obtain overall monitoring site summaries and detailed individual data that come from within the Division's archives.

Specifically, users can obtain:

- Site lists derived using robust search tools
- Site locations using Google Maps and the ANR Atlas
- Overall monitoring site summaries of biological, chemical, and physical information
- Macroinvertebrate monitoring site summaries
- Water quality summaries, and access to detailed, searchable data

When accessing these reports, please look for "More Info" buttons, which provide incrementally more detailed data, and "For More Details" links to factsheets describing the data being displayed.

The Monitoring, Assessment, and Planning Program's data analysis staff are developing additional search tools and augmented reporting capabilities, including multi-site summaries.

For more information on the Monitoring, Assessment, and Planning Program, visit dec.vermont.gov/watershed/map.

Macroinvertebrates such as the stonefly larva pictured above are important indicators of a stream's biological health. Macroinvertebrate site summaries produced by V-IWIS make monitoring and assessment results easily accessible.

Rivers Program

The Rivers Program provides technical and regulatory assistance for projects affecting the flows and physical integrity of streams, rivers, river corridors, and floodplains. Two primary objectives guide this work: (1) to avoid and mitigate flood and erosion hazards, and (2) to restore and protect stream processes, floodplain functions, and critical habitat. The Rivers Program carries out stream geomorphic assessments and river corridor planning to support river diagnostics, river corridor easements, channel maintenance and restoration designs, and technical assistance during flood recovery operations. The program also maintains and restores natural stream flows by regulating water withdrawals and hydropower projects, and manages the National Flood Insurance Program (NFIP) for Vermont.

Rivers staff provides technical assistance to landowners.

KEY INITIATIVES

Accomplished:

- **Revised Stream Alteration Rule to ensure that municipalities are eligible for FEMA post-disaster funding**
- **Published web-based river corridor maps to assist land use planning that will minimize floodplain and stream stability impacts**

Upcoming:

- **Update and clarify stream flow procedures to maintain or restore aquatic habitat**
- **Develop and prioritize potential floodplain restoration and river corridor easement projects to support flood resiliency and Lake Champlain cleanup**

Number of projects that received technical assistance:

2,487

Only 321 projects were permitted to maintain river and floodplain encroachments. The other 2,166 instances of technical and regulatory assistance restored stream flows and stability while avoiding future water quality and flood impacts.

Flood Resilience Improving After Irene

Since 2011 most communities across Vermont have taken important steps to become more flood resilient. A third of our communities (84) have protected river corridors or floodplains from further losses. Over half have Local Hazard Mitigation Plans adopted or in process (up from 35% in 2014), and 80% have Emergency Operations Plans in place (up from 36% in 2014).

Vermont Agency of Transportation (VTrans) and the Department of Emergency Management have come to rely on the Rivers Program during post-flood emergency operations to provide technical assistance to towns and VTrans district operations. Implementation of the Program's Standard River Management Principles and Practices (2013) has been critical to the reduction of future vulnerability. The design of projects resilient to flood and fluvial erosion saves millions of dollars annually and tens of millions during major flood disasters.

The Flood Ready Vermont website (floodready.vermont.gov) was launched in July 2014 and features community reports, peer stories from community efforts around the state, and planning, training, and grant information.

River corridor maps have been available statewide since January, 2015 and posted on the Flood Ready Atlas (tinyurl.com/floodreadyatlas). When river corridors are not protected, the high flows can become increasingly powerful and damaging. Vermont municipalities, regions, and state agencies have the shared goal of river corridor protection for flood resilience.

Since October, 2014 the Vermont Emergency Relief and Assistance Fund has benefited communities that take specific steps to reduce flood damage. The majority of municipalities now qualify for additional aid to supplement federal disaster assistance.

Additional resources including information about Municipally Authorized Emergency Protective Measures and the Rivers and Roads training for municipal road workers are available at dec.vermont.gov/watershed/rivers/river-management#training.

Rivers and Roads students learn about stream dynamics in the classroom with a flume, a model river system, above, and in the field, below.

Stormwater Program

The Stormwater Management Program provides regulatory oversight and technical assistance to ensure proper design and construction of stormwater treatment and control practices, as well as construction-related erosion prevention and sediment control practices, necessary to minimize the adverse impacts of stormwater runoff to surface waters throughout Vermont. Stormwater Program regulations address discharges from new and existing development, roads, industrial sites, municipal stormwater systems, and construction sites.

Erosion prevention and operational stormwater control practices, at Okemo.

KEY INITIATIVES

Accomplished:

- **Revised Stormwater Management Manual (December, 2016)**
- **Issued draft VTrans Stormwater General Permit (TS4) (November, 2016)**

Upcoming:

- **Revise Stormwater Rule (December, 2017)**
- **Issue new Operational General Permit for 3-acre impervious sites (December, 2017)**
- **Issue new Municipal Roads General Permit (December, 2017)**

Acres of impervious surface managed by operational stormwater permits:

7,059

Operational stormwater permits require best management practices that filter, infiltrate, and detain stormwater runoff for the life of the project.

New Transportation Separate Storm Sewer System (TS4) General Permit

The Transportation Separate Storm Sewer System (TS4) General Permit is a new general permit for stormwater discharges from all Vermont Agency of Transportation owned or controlled impervious surfaces. The TS4 is one of several new initiatives with its basis in the Vermont Clean Water Act (Act 64) and the Lake Champlain TMDL.

The TS4 combines Vermont Agency of Transportation (VTrans) stormwater permit requirements into one permit, allowing for a comprehensive approach to stormwater management across all VTrans infrastructure, and replaces roughly 90 separate stormwater permit authorizations.

VTrans owns and maintains a diverse set of infrastructure including existing highways, airports, gravel pits, welcome centers, maintenance facilities, and multi-use pedestrian paths. These facilities are dispersed throughout the state and based on activity, location, or size of impervious surface, are required to implement multiple state stormwater permits.

Combining the various stormwater requirements into one permit creates both program management and administrative efficiencies for VTrans and the Department of Environmental Conservation.

VTrans, through the TS4 General Permit, will develop a comprehensive Phosphorus Control Plan for the TS4 in the Lake Champlain Basin. The plan will identify erosion mitigation opportunities and impervious surface retrofits that coincide with their ongoing operations and maintenance program. VTrans will prioritize retrofit opportunities during new construction and redevelopment projects.

Erosion prevention and sediment control practices associated with a VTrans bridge-replacement project.

This approach gives VTrans the ability to effectively budget and plan to achieve the TMDL targets in conjunction with maintaining the statewide transportation network. The TS4 General Permit will also require VTrans to continue with implementation of the Flow Restoration Plans for stormwater-impaired waters that were required under VTrans MS4 General Permit authorization.

Stormwater swales, Bennington By-Pass.

Wastewater Section

The Wastewater Section is responsible for protecting Vermont's surface waters from discharges of industrial and municipal wastewater and other direct discharges. These discharges can carry chemicals, toxics, and pathogens that are harmful to water quality, fish and wildlife habitat, and public health. If not properly treated and controlled, these discharges can negatively impact surface water quality and limit recreational opportunities. The Section's Core Work includes:

Direct Discharge and Pretreatment Permitting: Administers the federal Clean Water Act's NPDES program (delegated by EPA) for permitting direct discharges to surface waters, including wastewater treatment facility discharges, industrial facility discharges, and other direct discharges. The Section is also delegated by EPA to administer the NPDES program for the permitting of industrial wastewater generators that discharge to municipal wastewater treatment facility collection systems.

Inspection and Compliance Oversight: Responsible for conducting facility inspections of wastewater and industrial facilities as mandated by federal and state regulation. Staff provides compliance oversight of facilities and ensures compliance with permit limits and conditions. Staff also provides technical assistance to facilities as needed.

Wastewater treatment facility in Vermont.

KEY INITIATIVES

Accomplished:

- Completed rulemaking for new Combined Sewer Overflow (CSO) Rule
- Deployed CSO and unpermitted discharge alert system
- Finalized schedule for reissuance of Wastewater Treatment Facility permits in the Lake Champlain Basin
- Reorganized staff on a regional basis to better serve regulated facilities

Upcoming:

- Work with CSO-municipalities to implement new CSO Rule
- Rollout new Electronic Reporting System for permittees to submit monitoring data
- Apply Lean principles to facility inspections
- Complete all EPA FY17 priority permit and facility inspection commitments

Active wastewater permits:

464

Alert System Deployed for Increased Public Awareness

The Department of Environmental Conservation (DEC) has launched a new public alert system that enables subscribers to receive email or text message notifications when untreated or inadequately treated sewage and unpermitted discharges are released into Vermont's lakes, ponds, rivers, and wetlands.

"We are pleased to launch this new system. It will allow Vermonters to have prompt notification of potential threats to public health and the environment, and to immediately adjust their recreation plans if necessary," states DEC Commissioner Alyssa Schuren.

The subscription system was created as a result of Act 86, a bill signed this past May to strengthen the public's right to know when contaminants enter waterbodies unexpectedly. Water system operators are now required to issue public notices immediately upon a release, and issue a full incident report with details on the nature of the discharge or spill within 12 hours of discovery.

Subscribers can choose to sign up for three different types of notification: public alerts of sewage discharges, full incident reports following a sewage release, and public alerts of unpermitted discharges (e.g., dumping or spills) to Vermont's surface waters.

Users can opt to receive notifications for the entire state or limit notifications to a specific water drainage basin, such as where the user lives or recreates. Subscribe to receive email or text notifications at anrweb.vt.gov/DEC/WWInventory/Subscriptions.aspx.

Other new mandatory statewide practices to keep the public informed of threats to surface water use include posting permanent signs at combined sewer overflow discharge points, and posting temporary signs at public access areas downstream of a release of sewage or other unpermitted discharge that poses a risk to public health or the environment.

Treatment processes at wastewater treatment plants.

Wetlands Program

Wetlands, commonly called swamps, marshes, or bogs, are transitional areas between open water and land. Wetlands provide important ecosystem services such as flood protection, water quality improvement, and wildlife habitat.

The mission of the Wetlands Program is to identify, monitor, and protect wetlands that provide significant functions and values; to encourage the restoration and enhancement of impaired wetlands; and to teach the citizens of Vermont about wetland issues and the importance of wetland stewardship. The Program also has a goal of no net loss of wetland acreage, function, or value.

The Wetlands Program is responsible for the administration and implementation of the Vermont Wetland Rules, which require permitting for certain activities within wetlands or their buffer zone. Using the Vermont Wetland Rules as a guide, the Program provides advisory recommendations on Act 250 projects with potential wetland impacts to the District Environmental Commissions, and reviews wetland projects that fall under federal jurisdiction (Section 404 of the Clean Water Act) to ensure that State Water Quality Standards are met.

KEY INITIATIVES

Accomplished:

- **Improved Wetland Program processes through the use of Lean**
- **Completed National Wetlands Assessment**

Upcoming:

- **Increase protection for irreplaceable wetlands with Class I designation**
- **Increase voluntary wetland restoration**

Percent of projects reviewed that resulted in the avoidance of wetlands:

88%

Wetlands provide recreational value for hunting, fishing, trapping, boating, and wildlife viewing.

Four Unique Vermont Wetlands Slated For Class I Protection

Press Release — October 19, 2016

The Agency of Natural Resources is starting a process to provide special protections for four unique Vermont wetlands by designating them Class I. The four wetlands vary in size, region, and function, but all have been determined to be irreplaceable or exceptional in their contribution to Vermont's natural heritage.

The Agency has reviewed over 20 wetlands with potential for Class I status and is focusing on the following four: Black Gum Swamps in Vernon, Dennis Pond Wetlands in Brunswick, Chickering Fen in Calais, and Sandbar Wetlands in Milton and Colchester. Three wetlands are currently designated as Class I, with the most recent being designated over ten years ago.

"Class I designation has historically been an underutilized tool for managing the state's highest value wetlands. In this effort, we are putting a spotlight on these special wetlands to conserve them, and emphasize the importance of their remarkable natural features and functions," said Agency Secretary Deb Markowitz.

The Black Gum Swamps in Vernon are seven distinct areas of Red Maple-Black Gum Swamp communities, a rare natural community found at the northern edge of the normal range for this type of wetland. These pocket swamps contain some black gum trees aged at over 400 years. Members of the Town of Vernon actively support the proposal.

The 370-acre Dennis Pond wetland complex includes two relatively small open water areas, Mud Pond and Dennis Pond, and about 140 acres of peatland. The diverse habitat is exceptional for wildlife and hosts a number of rare and threatened species and natural community types. Much of this wetland is part of the West Mountain Wildlife Management Area.

Chickering Fen, locally known as Chickering Bog, is a 10-acre fen wetland, a size that is large and rare in Vermont. The wetland provides a home for rare and threatened species, and is exceptional in its value for natural science education and research. The owner of this wetland, The Nature Conservancy, supports the designation.

The Sandbar Wetland is a 1,359-acre wetland delta complex composed of special natural communities that span the shores of Lake Champlain and the Lamoille River, and is home to many rare wildlife and plant species. This wetland provides a large area for flood waters to be stored where sediments and nutrients are used by wetland vegetation rather than heading straight into Lake Champlain. The dense vegetation prevents erosion along the lake and river, and provides spawning habitat for fish such as Northern Pike.

To designate a new wetland as Class I, the Vermont Wetland Rules need to be amended.

To learn more about Class I designations and how your town may help protect these vital resources, visit the Wetlands Program website at dec.vermont.gov/watershed/wetlands.

The Sandbar Wetland is a 1,359-acre wetland delta complex along the shores of Lake Champlain and the Lamoille River.

Tracking Clean Water Progress

To provide greater accountability and transparency, the Watershed Management Division has developed a tracking system to monitor progress meeting clean water restoration goals. The tracking system will be used to measure the results of work accomplished through State funding and regulatory programs. The same tracking system database will contain tactical basin plan implementation tables, which consist of priority projects to address water quality issues that are identified through scientific assessments. As actions listed in the implementation tables move through various stages toward completion, the environmental benefits of the projects will be tracked and quantified.

The Division is working with the Clean Water Initiative partner agencies that represent the Clean Water Fund Board, including the Agency of Administration, Agency of Agriculture, Agency of Commerce and Community Development, Agency of Natural Resources, and Agency of Transportation, in tracking clean water restoration work statewide. The results of clean water restoration work will be communicated through a variety of reporting mechanisms, including the interagency annual Clean Water Initiative Investment Report, as well as reporting on implementation of the Lake Champlain TMDL and other major TMDLs in Vermont.

Kayakers enjoy clear skies and still water on Lake Memphremagog.

CLEAN WATER INITIATIVE INVESTMENT REPORT

Pursuant to Act 64, Division staff have supported the Clean Water Fund Board in the preparation of the annual Clean Water Initiative Investment Report. The report summarizes annual State investments across agencies and funding programs to address priority water quality problems statewide. Tracking the connection in clean water dollars invested, actions taken, and outcomes achieved enables the State to provide meaningful information to the public on the value of clean water restoration activities. Moreover, tracking actions and outcomes is consistent with the State of Vermont's adoption of a results-based accountability framework to measure governmental performance.

Clean water investment reporting addresses:

- **Social measures** on the level of clean water outreach and technical assistance provided by partner agencies to support implementation of clean water restoration projects;
- **Investment measures** on dollars invested in clean water restoration projects, addressing planning, design, and implementation of water quality improvement projects;
- Measures of **project outputs**, quantifying the results of clean water restoration projects completed by project type; and
- Measures of **environmental outcomes**, quantifying nutrient reductions achieved through State-funded clean water restoration projects.

View the first Clean Water Initiative Investment Report at dec.vermont.gov/watershed/cwi/cwf#report.

TRACKING TMDL IMPLEMENTATION PROGRESS

In addition to reporting on State investments in clean water, the Division is coordinating with our partner agencies to track broader progress implementing TMDLs and restoring water quality. A TMDL, or Total Maximum Daily Load, is a restoration plan that identifies the total amount of a pollutant a waterbody can receive while still meeting Vermont Water Quality Standards. TMDL pollutant reduction targets are designed to restore water quality. The Division will use TMDLs as the basis for tracking progress meeting nutrient pollution reduction goals.

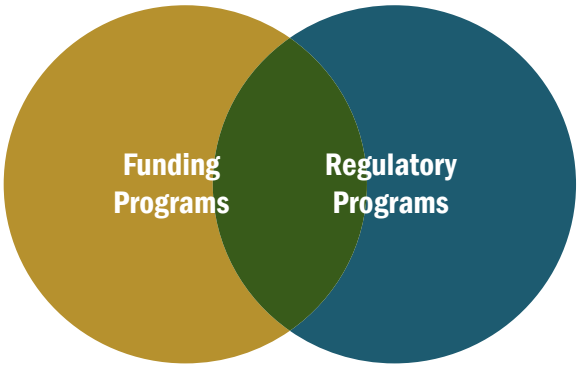
Both funding and regulatory programs are important mechanisms for implementing TMDLs. The State is developing systems and building capacity to capture the results in monitoring TMDL progress. The collective results of funding and regulatory programs in reducing nutrient pollution and meeting TMDL targets will be captured through the Division's tracking and reporting.

The scope of tracking and reporting efforts includes the results of TMDL implementation work completed with State funding, along with other funding sources where feasible (e.g., federal funding). In addition, the Division will develop procedures to capture the results of TMDL implementation work completed under the following regulatory programs:

- Stormwater controls for municipal and private developed lands and roads
- Required agricultural practices on farms
- Adjusted wastewater treatment facility permit limits for phosphorus

ENHANCING TRACKING AND REPORTING

It is important to note that these tracking and reporting enhancements represent a significant improvement in accountability for State investments in clean water. In the past, the Division's reporting addressed dollars invested by individual agencies and water quality monitoring data separately. This report represents the start of Vermont's enhanced tracking,



Funding and regulatory programs are important and overlapping mechanisms for implementing TMDLs. The Watershed Management Division is developing capacity to measure the results of both.

allowing the Division to connect environmental outcomes to specific projects.

In this first year of clean water tracking and reporting, the Watershed Management Division and partner agencies are establishing a baseline for evaluating future investments in clean water, as well as progress implementing TMDLs. As the Division is establishing its tracking system and processes, there are data and information gaps, as well as limitations in the capacity to account for nutrient pollution reductions associated with all clean water activities statewide. The Division will work to address these gaps and limitations in the coming years.

Results Based Accountability: Indicators

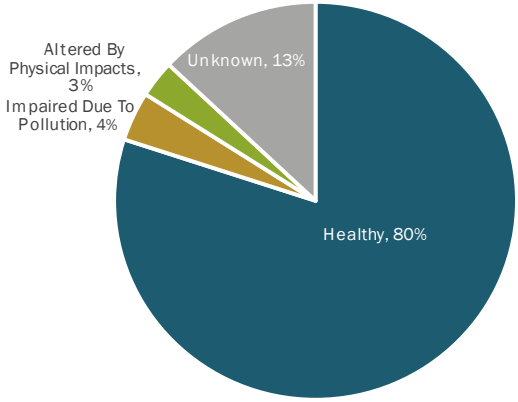
Results Based Accountability (RBA) is used to measure how well an agency, department, division, or program is performing. RBA answers three primary questions:

1. **How much did we do?**
2. **How well did we do it?**
3. **Is anyone better off?**

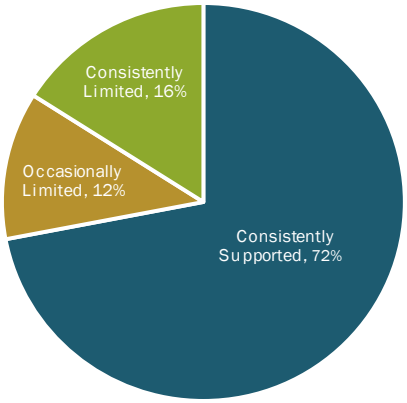
POPULATION BASED OUTCOMES AND INDICATORS

At a high (or population) level, the Watershed Management Division strives to ensure that Vermont's environment is clean and sustainable (outcome). We measure progress toward achieving this outcome with indicators or measures of the overall condition of Vermont's surface waters.

Percent of Vermont's Inland Waters Meeting Water Quality Standards



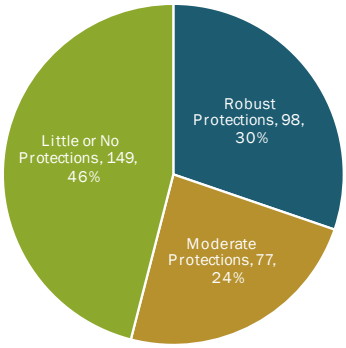
Aquatic (fishable) water quality of rivers and streams



Recreational (swimmable) water quality of inland lakes

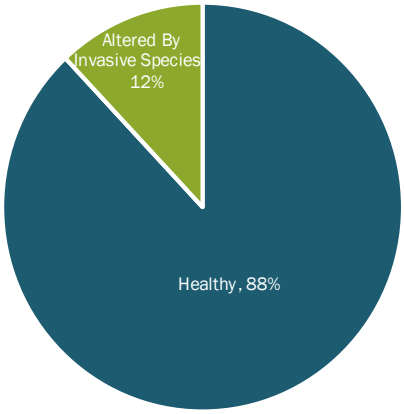
Our rivers, streams, and inland lakes can suffer from the stresses of pollution, invasive species, and cyanobacteria blooms. However the majority of Vermont's inland waters continue to support fishing and swimming uses at all times. The Division works to protect, maintain, enhance, and restore our rivers, streams, and lakes by avoiding or minimizing pollution and other stresses on Vermont's waters.

Square Miles of River Corridor Preserved to Reduce Flood and Fluvial Erosion Hazards

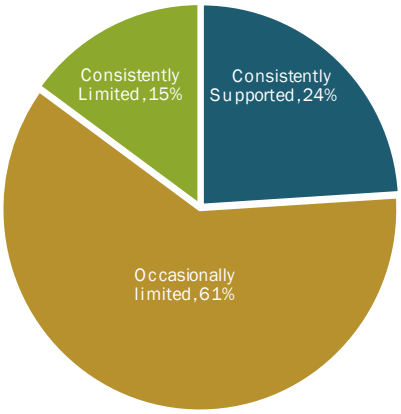


River corridors are protected in Vermont to promote natural floodplain functions and achieve stream equilibrium, which together will reduce flood and fluvial erosion hazards. The Division has delineated river corridors for streams with a drainage area greater than two square miles, which encompasses 324 square miles of land statewide. Over half the river corridor area (175 square miles) has some type(s) of protection; however not all types of protection are equal.

Percent of Lake Champlain Meeting Water Quality Standards



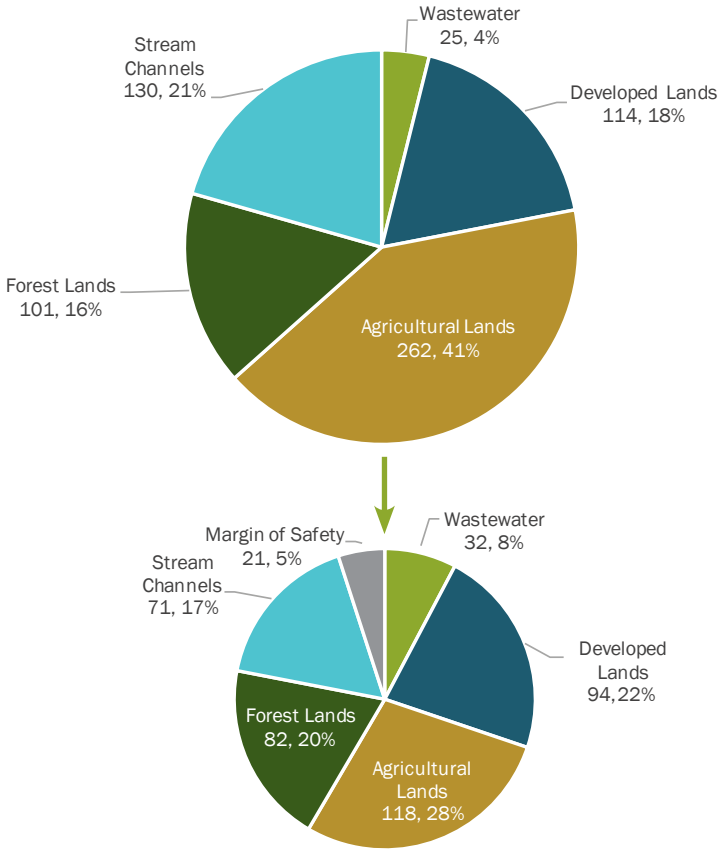
Aquatic (fishable) water quality of Lake Champlain



Recreational (swimmable) water quality of Lake Champlain

Lake Champlain, Vermont's largest waterbody, is stressed due to phosphorus loading, invasive species, and cyanobacteria blooms. The passage of the Vermont Clean Water Act will greatly assist in our efforts to aggressively reduce in-lake phosphorus concentrations, and improve Lake Champlain's overall water quality.

Reduction Needed in Phosphorus Loading to Lake Champlain



Through the work of our permitting programs we have reduced the annual phosphorus loads flowing to our surface waters. The current phosphorus load to Lake Champlain from Vermont sources is 631 metric tons/year and our target based on the Lake Champlain TMDL is 417. With the passage of the Vermont Clean Water Act (Act 64), we now have additional permitting and funding tools necessary to reduce phosphorus loads to our rivers, streams, and lakes.

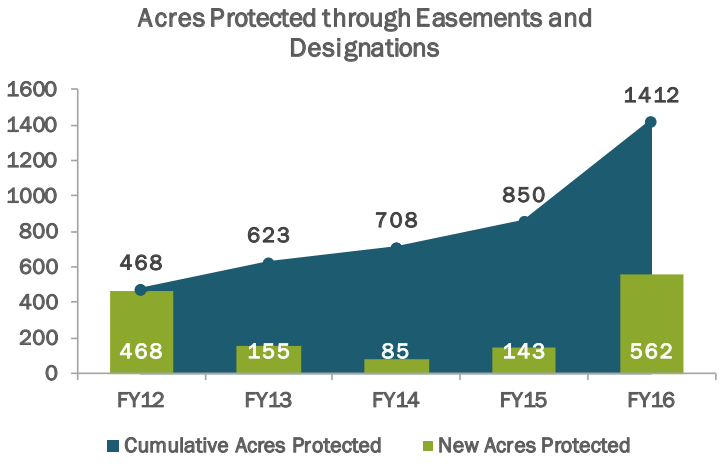
The sun sets behind the Adirondacks, reflecting onto Lake Champlain.

Results Based Accountability: Performance Measures

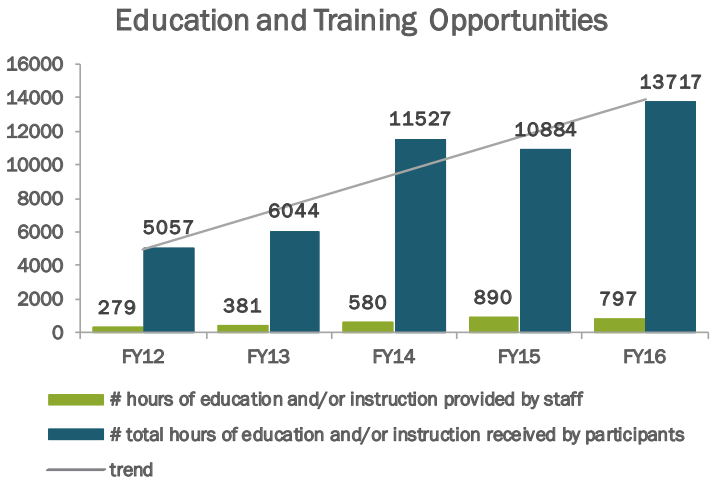
A performance measure is a measure of the quantity and quality of our work. These are things that we control, and how we influence the population-based outcomes and indicators. We have both Division-wide and Program-level performance measures. More information on our performance measures, including specific Program-level measures, can be found in the RBA Report at dec.vermont.gov/watershed/business-support/reports.

PROTECT

Safeguarding Vermont's pristine or 'special' waters from deleterious change through proactive protection tools.



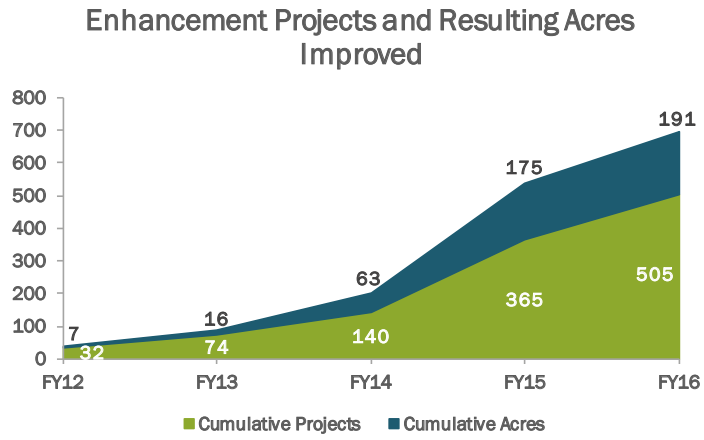
Easements and designations are tools to protect water quality and increase flood resiliency.



Increasing environmental awareness and stewardship through education and training opportunities.

ENHANCE

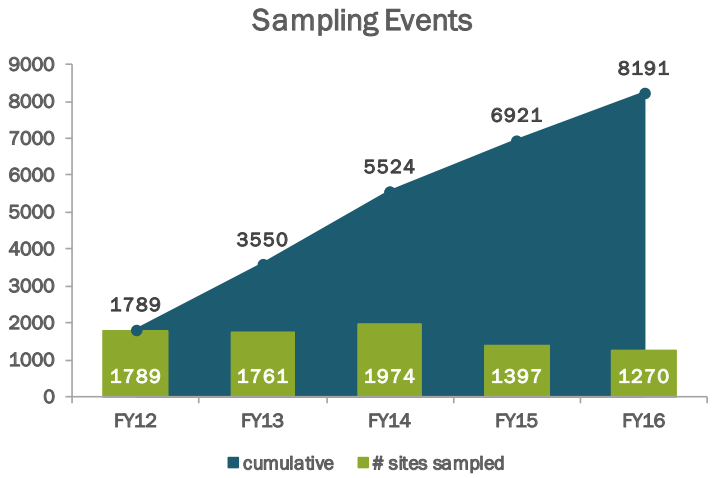
Improving the condition of Vermont's high quality waters by managing cumulative and legacy impacts.



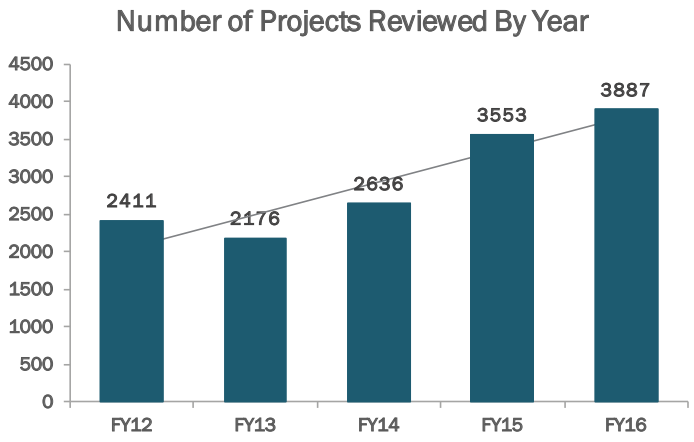
Enhancing ecological and hydrologic function through Best Management Practices project implementation.

MAINTAIN

Improving and expanding ongoing maintenance of Vermont's existing high quality waters is a Division priority.



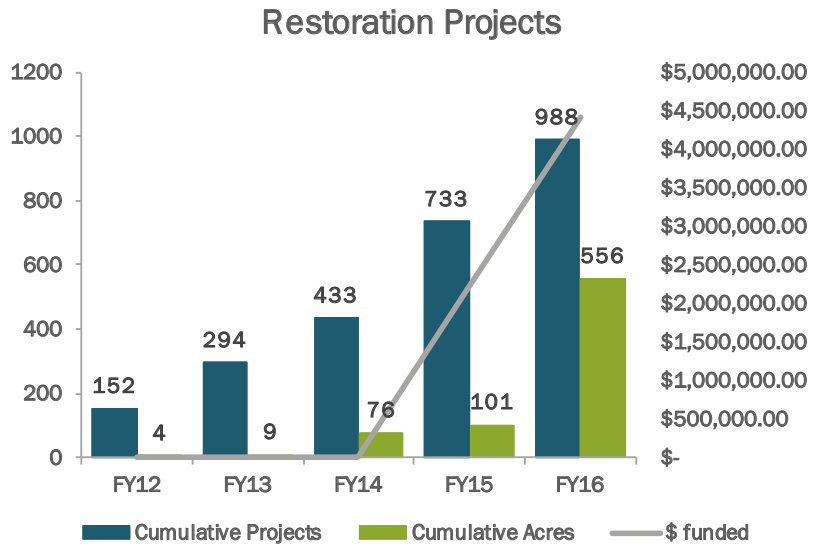
Monitoring and assessment establishes baseline conditions, tracks trends, and measures effectiveness of water quality improvement projects.



Technical assistance and project review help mitigate impacts to surface waters through sound advice and scientific knowledge.

RESTORE

Aggressively pursuing restoration of impaired waters.



Restoring ecological and hydrologic function to impaired waters through restoration project implementation.

The Watershed Management Division's mission is to efficiently and effectively manage Vermont's surface water resources through a comprehensive, integrated, and holistic watershed-based system.

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