

# Vermont's Clean Water Projects Tracking

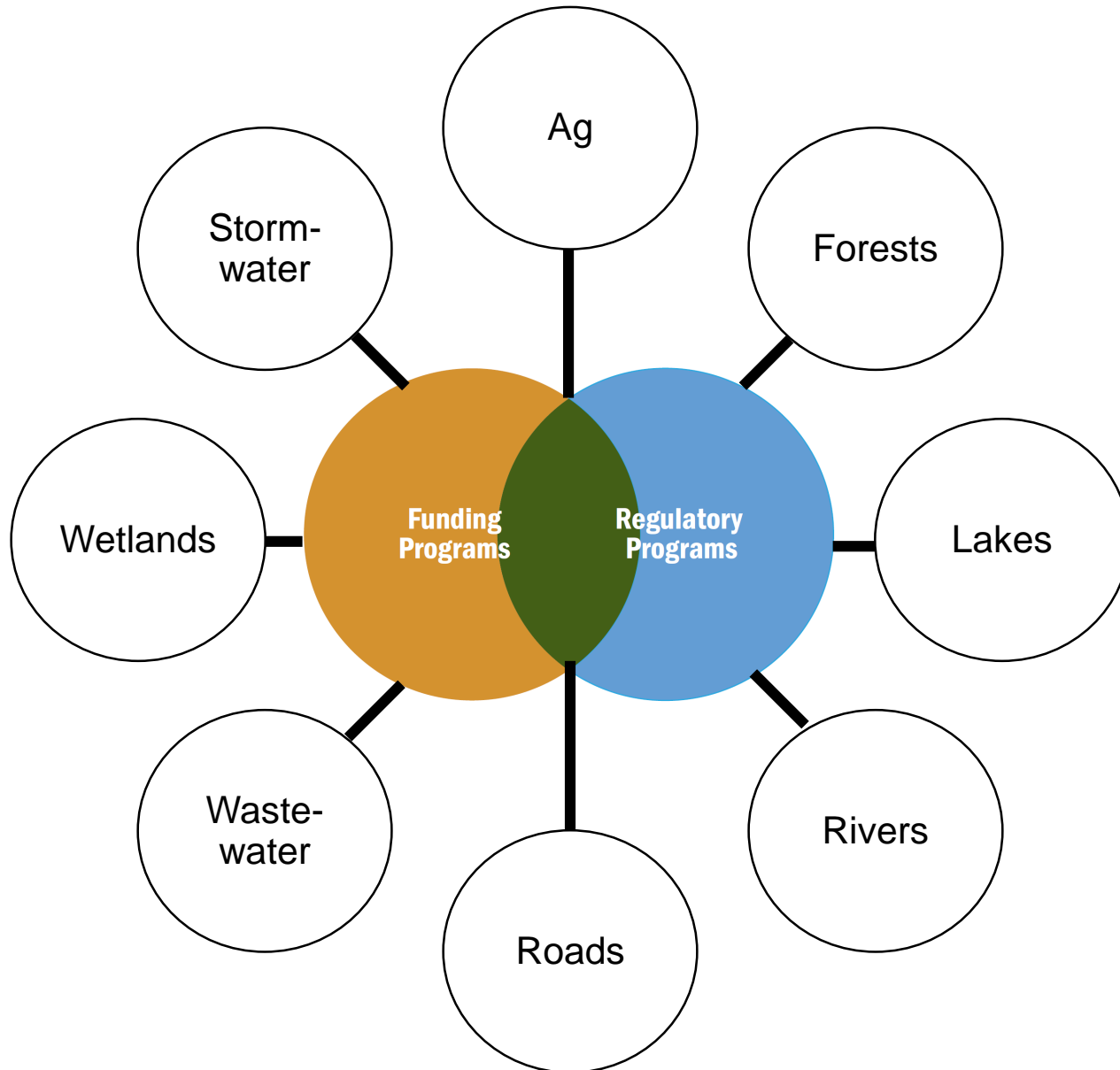
Kari Dolan  
DEC Clean Water Initiative  
Program Manager

January 18, 2018

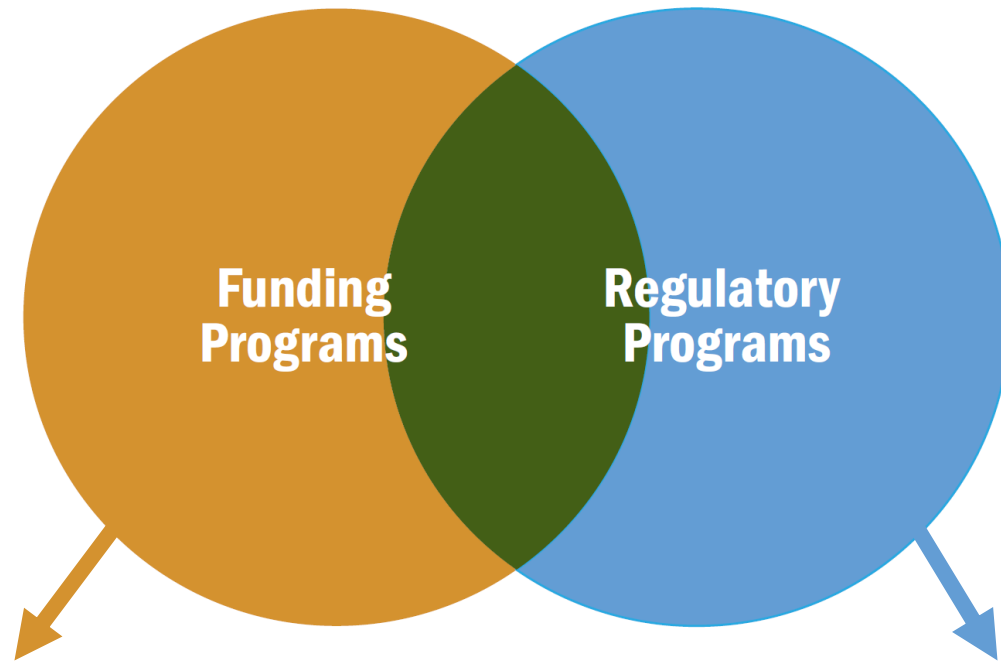


AGENCY OF ADMINISTRATION  
AGENCY OF AGRICULTURE, FOOD & MARKETS  
AGENCY OF COMMERCE & COMMUNITY DEVELOPMENT  
AGENCY OF NATURAL RESOURCES  
AGENCY OF TRANSPORTATION

# Tracking Clean Water Activities



# Tracking Clean Water Activities



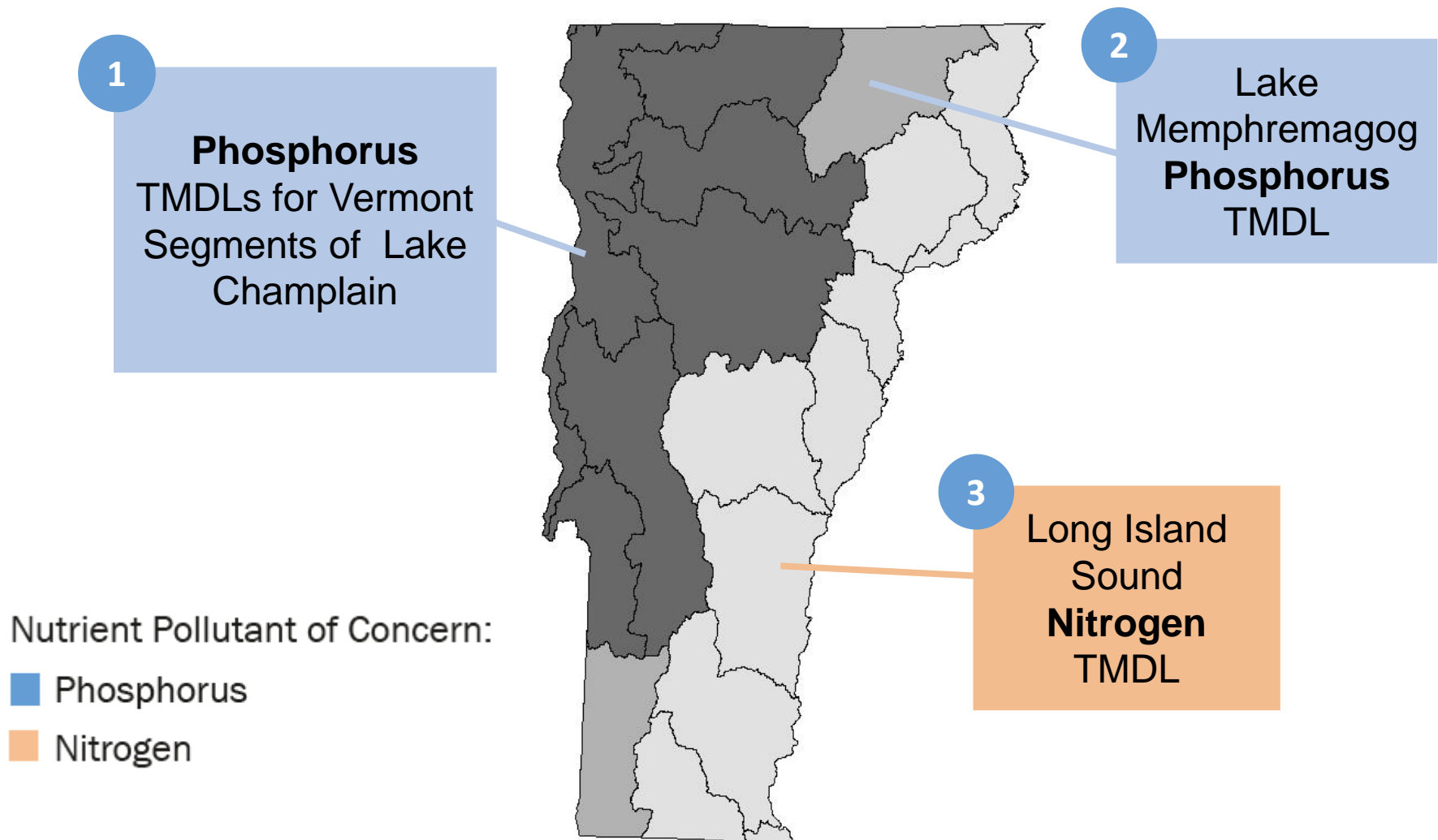
## **Funding Programs**

Projects/best management practices completed through state funding programs and other programs where data available (e.g., federal, local)

## **Regulatory Programs**

Projects/best management practices completed to comply with water quality regulations for agriculture, stormwater, and wastewater

# Nutrient Pollutant Reductions Required by Pollution Control Plans (i.e., TMDLs)



# SFY 2016

## Establishing our baseline

### VERMONT CLEAN WATER INITIATIVE 2016 INVESTMENT REPORT



Agency of Administration  
Agency of Agriculture, Food and Markets  
Agency of Commerce and Community Development  
Agency of Natural Resources  
Agency of Transportation

# SFY 2017

## Measuring progress over time

### VERMONT CLEAN WATER INITIATIVE 2017 INVESTMENT REPORT



AGENCY OF ADMINISTRATION  
AGENCY OF AGRICULTURE, FOOD & MARKETS  
AGENCY OF COMMERCE & COMMUNITY DEVELOPMENT  
AGENCY OF NATURAL RESOURCES  
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# Vermont Clean Water Initiative Annual Investment Report



**Outreach and technical assistance measures** to evaluate the level of clean water outreach and technical assistance provided by state agencies to support implementation of clean water funding and projects;



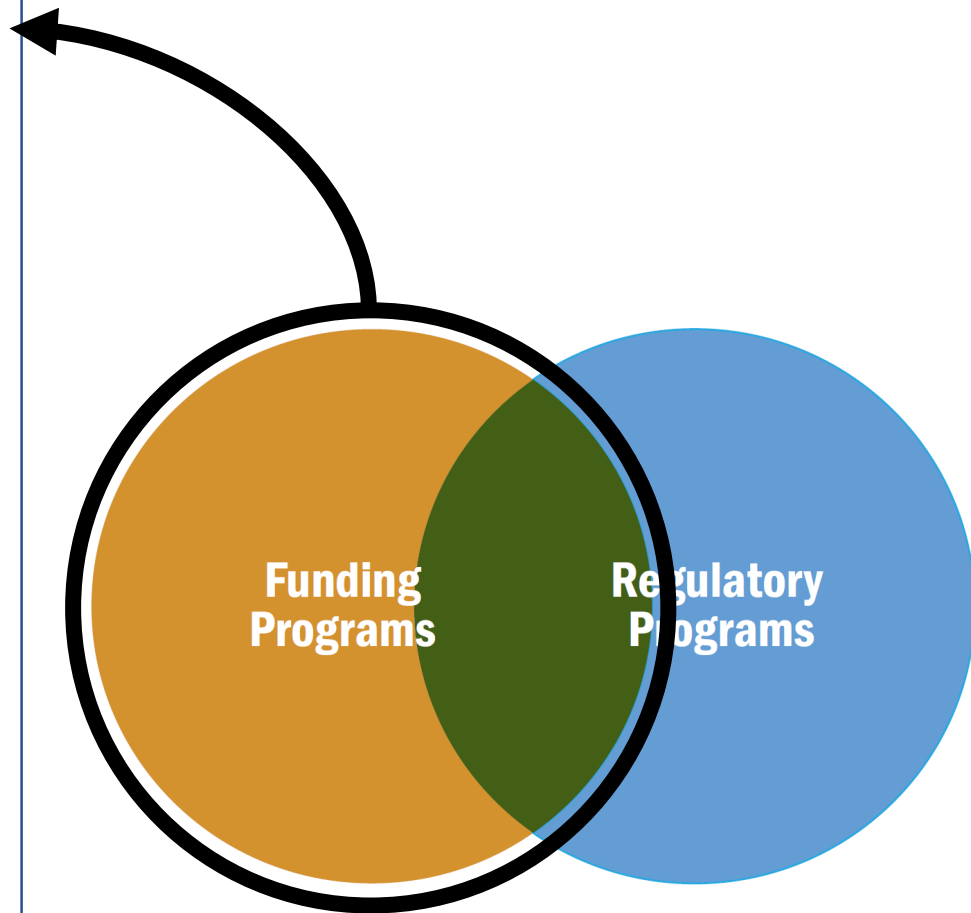
**Investment measures** on dollars invested in clean water restoration projects, addressing planning, design, and implementation of water quality improvement practices;



Measures of **project outputs**, quantifying the results of clean water restoration projects completed by project type; and



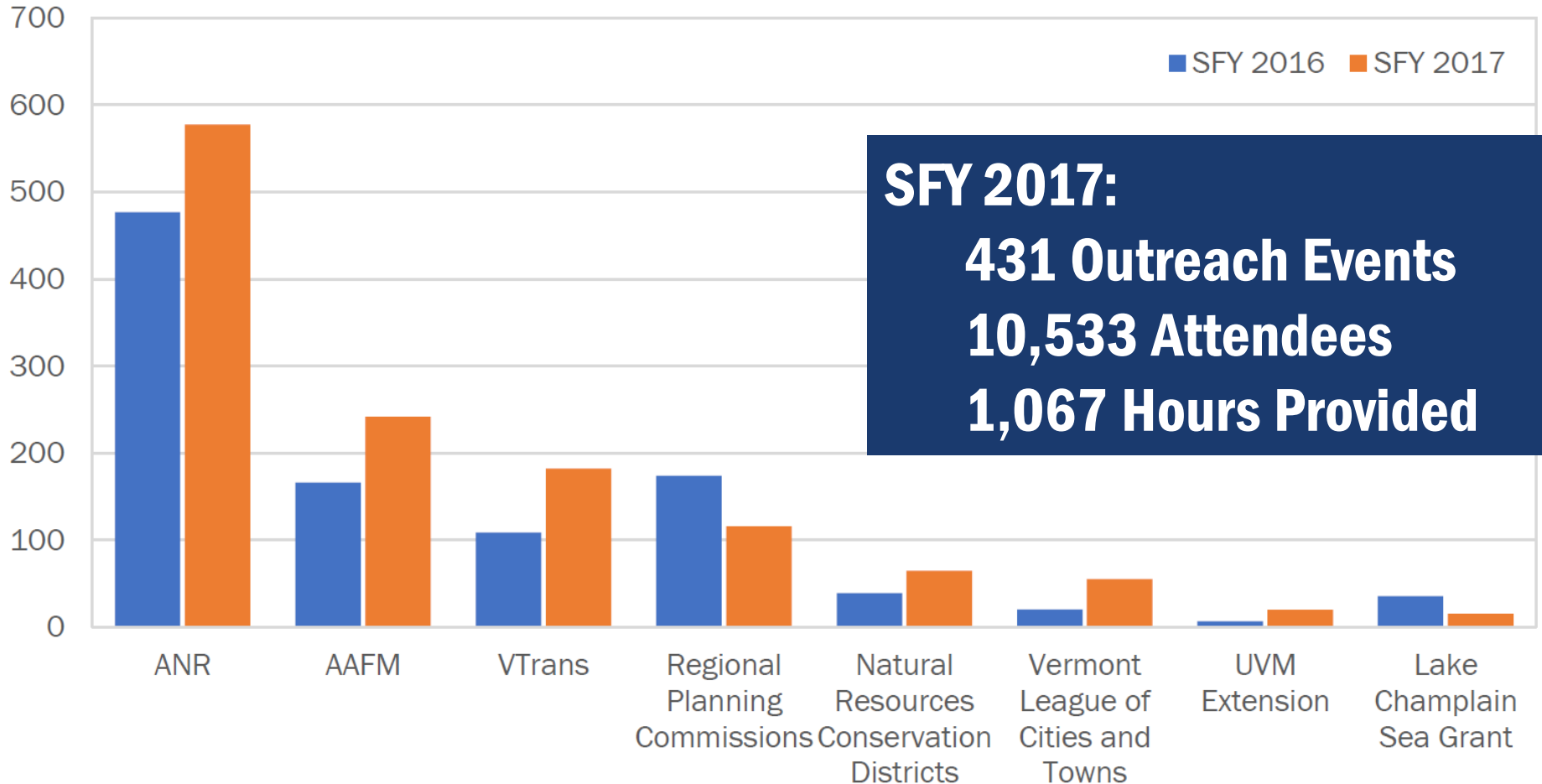
Measures of **environmental outcomes**, quantifying nutrient reductions achieved through State-funded clean water restoration projects.





# Outreach and Technical Assistance Measures

Figure 2. Total hours of outreach provided to participants of workshops, trainings, and public/stakeholder meetings in SFY 2016 and 2017, by organization (excludes organizations reported as “other”)





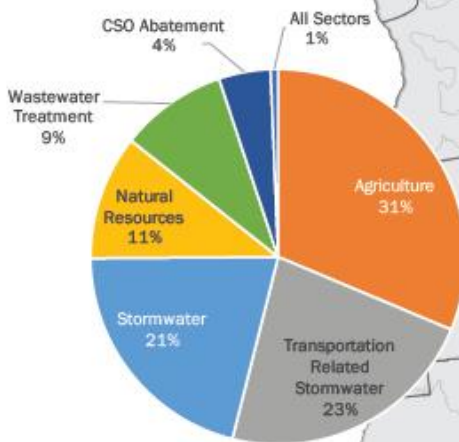
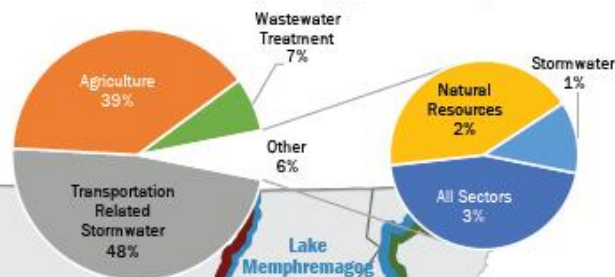
# Investment Measures

# 114%

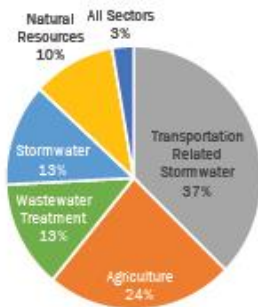
Increase in funds invested in clean water projects from 2016 to 2017

Total state funds invested in clean water projects in SFY 2017: \$22,976,188

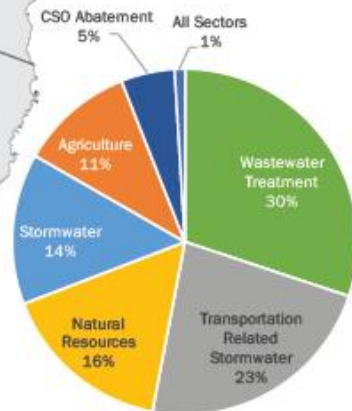
Funds awarded for clean water projects in the Lake Memphremagog Basin: \$607,164



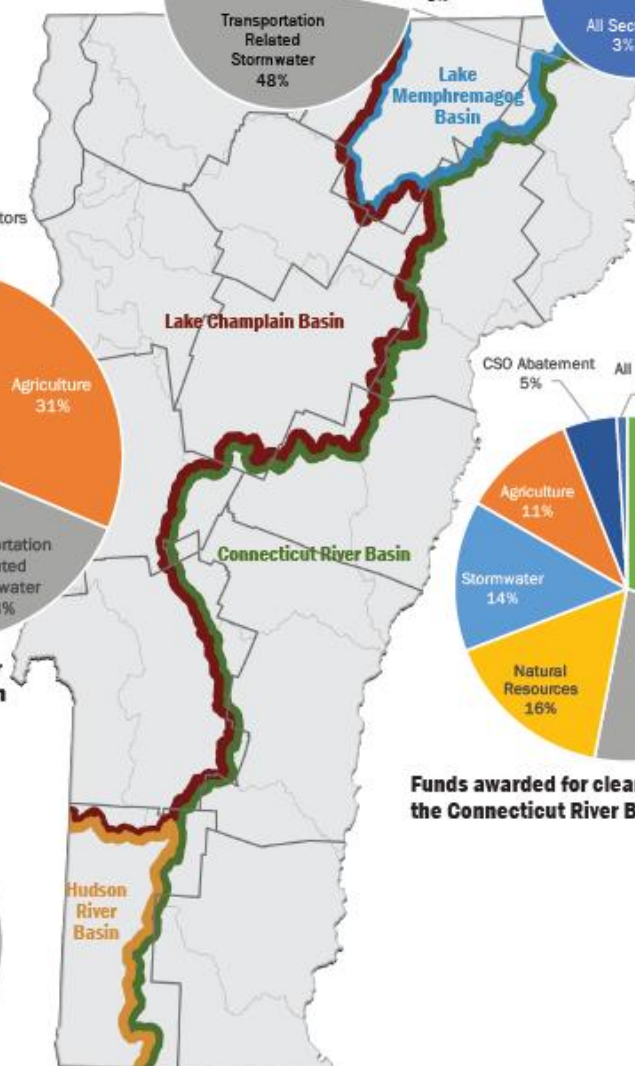
Funds awarded for clean water projects in the Lake Champlain Basin: \$14,303,867



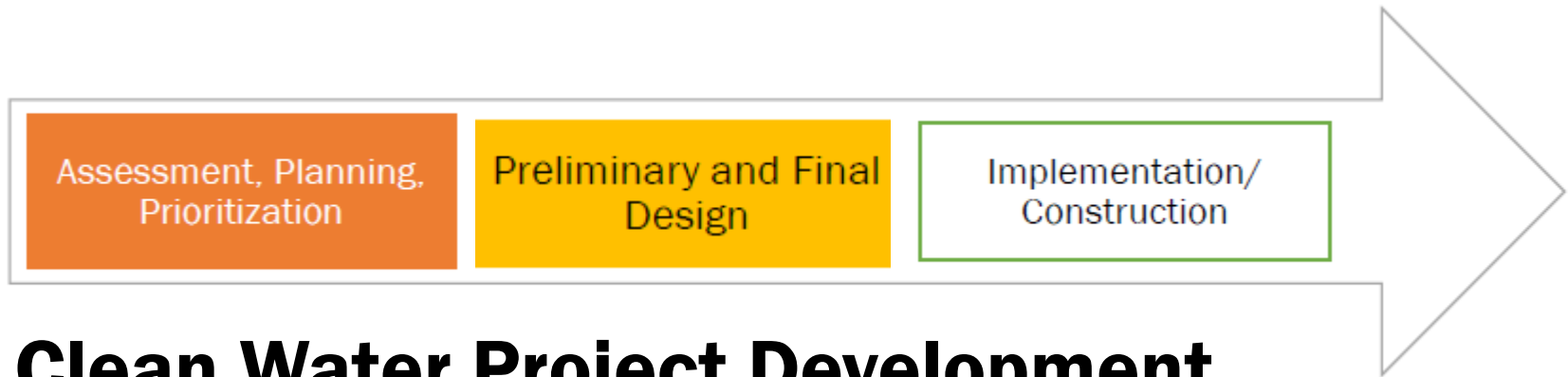
Funds awarded for clean water projects in the Hudson River Basin: \$331,243



Funds awarded for clean water projects in the Connecticut River Basin: \$7,734,114





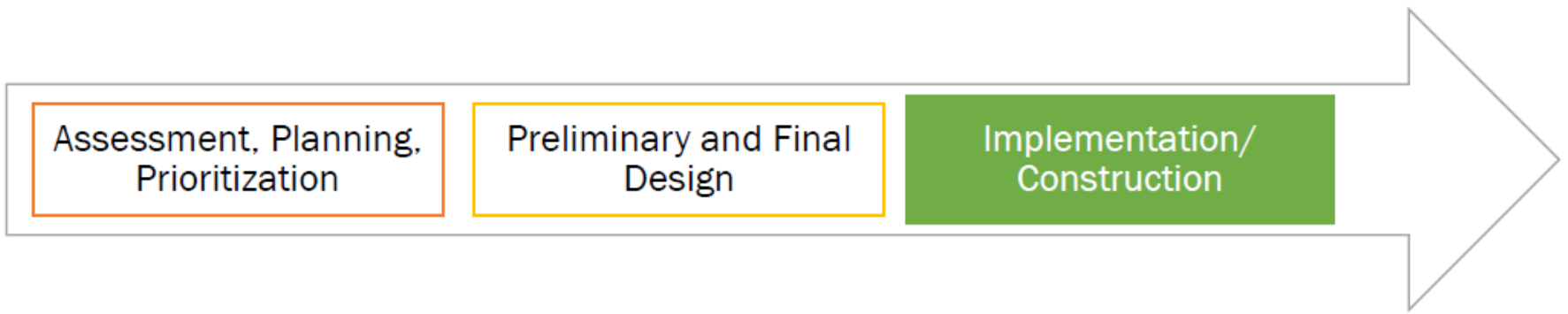


## **Clean Water Project Development**

176 priority projects recommended for future design and/or implementation

116 road miles assessed and identified for future improvements

22 preliminary and 44 final designs completed for future implementation work



## Why are these measures important?

- ✓ Implementation of TMDL requirements
- ✓ Implementation of Vermont Clean Water Act (Act 64 of 2015) requirements
- ✓ Compliance with Required Agricultural Practices
- ✓ Compliance with municipal stormwater permits
- ✓ Compliance with Municipal Roads General Permit
- ✓ Compliance with municipal wastewater discharge permits
- ✓ Compliance with the 2016 Combined Sewer Overflow (CSO) Rule
- ✓ Improved flood resiliency and flood hazard mitigation for public health and safety
- ✓ Support outdoor recreation, tourism, and property values
- ✓ Supports agricultural working lands
- ✓ Improved habitat function



# Results of Agricultural Projects

## Results of agricultural pollution prevention projects implemented in SFY 2017, statewide.

PROJECT RESULTS			BENEFITS					
Performance Measures	2016	2017	TMDL <sup>1</sup> Implementation	Act 64 (2015) Implementation	RAP <sup>1</sup> Compliance	Flood Resiliency	Working Landscape	Habitat Function
Acres of cropland and pasture treated by annual conservation practices	3,865	2,486*	✓	✓	✓		✓	
Acres of cropland and pasture treated by crop rotation and associated practices	572	0*	✓	✓	✓		✓	
Acres of cropland and pasture treated by forested buffers	366	178*	✓	✓	✓	✓	✓	✓
Number of barnyard/production area practices installed	39	87	✓	✓	✓		✓	
Acres of water quality protections within conserved agricultural lands	New in 2017	89	✓	✓	✓	✓	✓	✓

\* USDA NRCS prioritized federal funding for field-based practices in SFY 2017, therefore, state-funded field practices decreased relative to SFY 2016, while state-funded barnyard/production area practices increased by more than 50 percent relative to SFY 2016. Federally funded projects are outside the scope of this report.



# Results of Agricultural Projects

Results of agricultural pollution prevention projects implemented in SFY 2017, statewide.

POLLUTANT REDUCTION				
Total Phosphorus Reduced (Kilograms per Year)	2016	2017	Cumulative	Extent of Load Reduction Quantified
Annual agricultural conservation practices (active for at least 1 year)	443	283	283	53 percent of acres quantified in 2017 (projects in the Lake Champlain basin)
Agricultural crop rotation and associated practices (active for at least 5 years)	271	0	271	100 percent of acres quantified (cumulative) (projects in the Lake Champlain basin)
Forested riparian buffer restoration on agricultural lands (active for at least 15 years)	199	34	234	69 percent of acres quantified (cumulative) (projects in the Lake Champlain basin)

Figure 20. Before (left) and after (right) restoration of a forested riparian buffer on agricultural lands one year after implementation (will mature into fully forested buffer over time)



Figure 21. Before (left) and after (right) installation of livestock exclusion fencing and improved laneway and water crossing, completed by Poultney Mettewee Conservation District with ANR funding





# Results of Natural Resources Projects

Results of natural resources restoration projects implemented in SFY 2017, statewide.

PROJECT RESULTS			BENEFITS			
Performance Measures	2016	2017	TMDL <sup>1</sup> Implementation	Flood Resiliency	Outdoor Recreation	Habitat Function
Acres of forested riparian buffer restored through buffer planting	88	16	✓	✓	✓	✓
Acres of river corridor conserved through easements	141	209	✓	✓	✓	✓
Acres of floodplain restored	0	2	✓	✓	✓	✓
Stream miles enhanced and reconnected due to dam removal (also supports aquatic organism passage)	0	98	✓	✓	✓	✓
Acres protected for public access, recreation, forest conservation, and water quality	New in 2017	4,906		✓	✓	✓
Acres of water quality protections within conserved land (forested buffer area and wetland protection zones)	New in 2017	98	✓	✓	✓	✓



# Results of Natural Resources Projects

Results of natural resources restoration projects implemented in SFY 2017, statewide.

POLLUTANT REDUCTION				EXTENT OF LOAD REDUCTION QUANTIFIED
Total Phosphorus Reduced (Kilograms per Year)	2016	2017	Cumulative	Pollutant reductions quantified for 25 percent of buffer acres in 2016 and 34 percent in 2017 (projects in the Lake Champlain and Memphremagog basins)
Forested riparian buffer restoration on non-agricultural lands	74	12	86	

Figure 24. Before (left) and after (right) relocation of 1,100 feet of Stowe's Recreation Path outside of fluvial erosion hazard zone and restoration and planting of 2 acres of floodplain, completed by Town of Stowe





# Results of Transportation Related Stormwater Projects

## Results of transportation related stormwater projects implemented in SFY 2017, statewide.<sup>1</sup>

PROJECT RESULTS			BENEFITS					
Performance Measures	2016	2017	TMDL <sup>2</sup> Implementation	Act 64 (2015) Implementation	MRGP <sup>2</sup> Compliance	Municipal Stormwater Compliance	Flood Resiliency	Habitat Function
Miles of municipal road drainage improvements	1*	13**	✓	✓	✓	✓	✓	
Number of municipal road drainage structures installed	176*	68	✓	✓	✓	✓	✓	
Number of municipal road drainage and stream culverts replaced	4*	109**	✓	✓	✓	✓	✓	✓
Stream miles enhanced and reconnected due to replaced stream culverts (also supports aquatic organism passage)	27*	2.4*					✓	✓

\* Represents results of ANR-funded projects only, therefore, results are likely underreported. Data were not tracked/reported by VTrans for applicable reporting periods.

\*\* Data available for, and represent, two-thirds of projects completed in SFY 2017.



# Results of Transportation Related Stormwater Projects

Results of transportation related stormwater projects implemented in SFY 2017, statewide.<sup>1</sup>

POLLUTANT REDUCTION				EXTENT OF LOAD REDUCTION QUANTIFIED
Total Phosphorus Reduced (Kilograms per Year)	2016	2017	Cumulative	Pollutant reductions quantified for 38 percent of municipal road miles improved (projects in the Lake Champlain basin)
Road erosion control practices	4	22	26	

Figure 28. Before (left) and after (right) installation of a stone-lined ditch along Finel Hollow, Highland Gray, and Watkins Hill Roads in Poultney, completed by the Town of Poultney.







# Results of Stormwater Projects

Results of stormwater treatment projects implemented in SFY 2017, statewide.

PROJECT RESULTS			BENEFITS		
Performance Measures	2016	2017	TMDL <sup>1</sup> Implementation	Act 64 (2015) Implementation	Municipal Stormwater Compliance
Acres of impervious surface treated	0.3	86.3	✓	✓	✓

Figure 26. Before (top) and after (bottom) installation of bioretention system on Center Street in Northfield, completed by Central Vermont Regional Planning Commission





# Results of Stormwater Projects

Results of stormwater treatment projects implemented in SFY 2017, statewide.

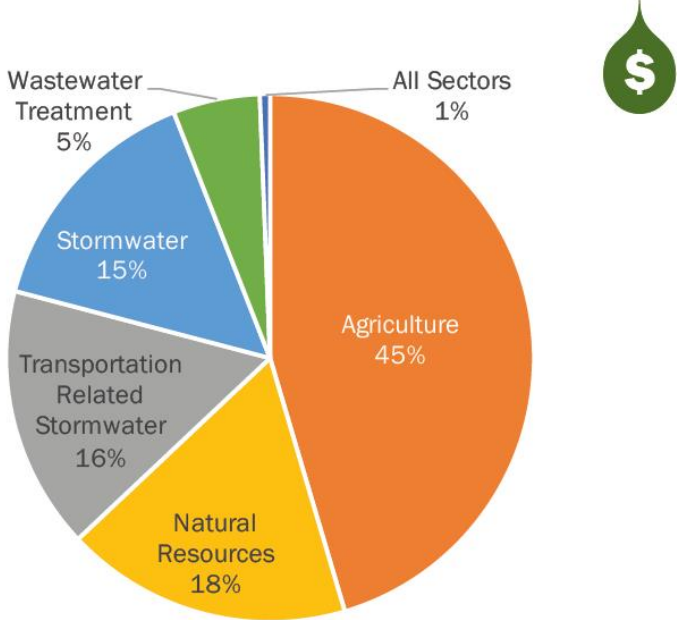
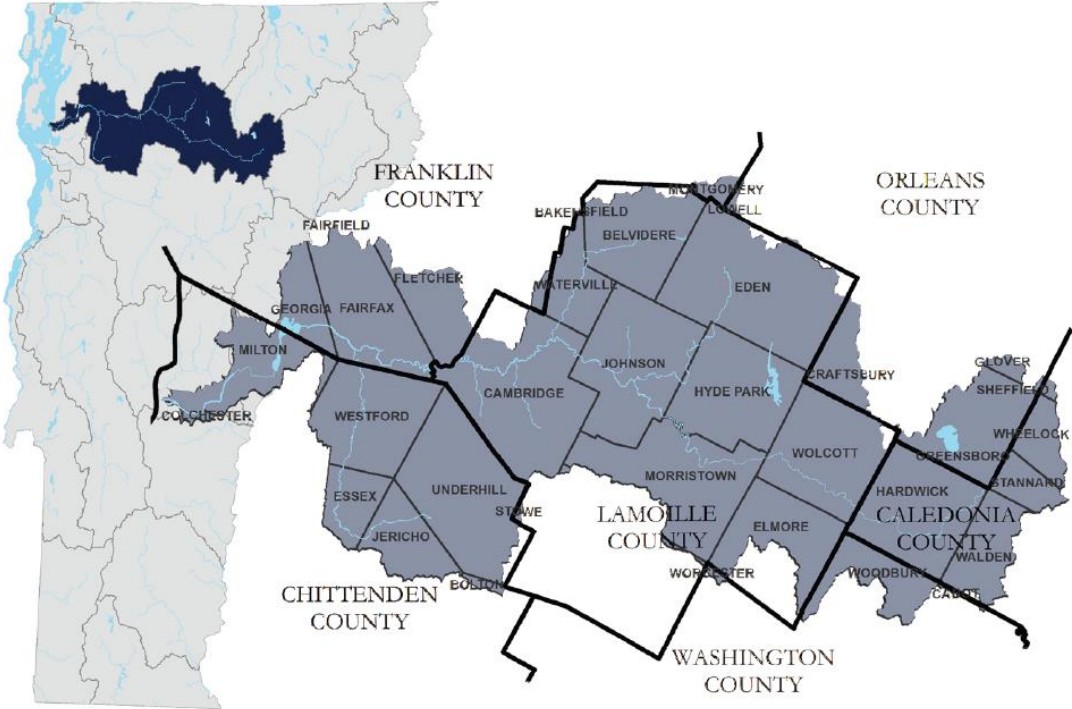
LOAD REDUCTION				EXTENT OF LOAD REDUCTION QUANTIFIED
Total Phosphorus Reduced (Kilograms per Year)	2016	2017	Cumulative	Pollutant reductions quantified for 41 percent of impervious acres treated (projects in the Lake Champlain basin)
Stormwater treatment practices	0.3	15.0	15.3	

Figure 27. Before (top) and after (bottom) installation of bioretention system on Morey Road in Hyde Park, completed by Lamoille County Conservation District



# Watershed Summaries – New this Year

## Lamoille River Watershed Summary



**State funding awarded in the Lamoille River watershed in SFY 2017, by sector**  
**Total: \$1,589,446**

**STATE FUNDS AWARDED IN SFY 2017**

# Watershed Summaries – New this Year

## RESULTS OF PROJECTS COMPLETED IN SFY 2017



Results of projects completed in SFY 2017, by sector, in the Lamoille River watershed.

### AGRICULTURE PROJECT RESULTS

Acres of cropland and pasture treated by annual conservation practices	87
Acres of cropland and pasture treated by crop rotation and associated practices	NA
Acres of cropland and pasture treated by forested buffers	14
Number of barnyard/production area practices installed	29
Acres of water quality protections within conserved agricultural lands	NA

### TOTAL PHOSPHORUS REDUCED (kilograms per year)

Annual agricultural conservation practices	21
Agricultural crop rotation and associated practices	NA
Forested riparian buffer restoration on agricultural lands	9

### NATURAL RESOURCES PROJECT RESULTS

Acres of forested riparian buffer restored through buffer planting	NA
Acres of river corridor conserved through easements	35
Acres of floodplain restored	NA
Stream miles enhanced and reconnected due to dam removal (also supports aquatic organism passage)	NA
Acres protected for public access, recreation, forest conservation, and water quality	179
Acres of water quality protections within conserved land (forested buffer area and wetland protection zones)	15

### TOTAL PHOSPHORUS REDUCED (kilograms per year)

Forested riparian buffer restoration on non-agricultural lands	NA
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### TRANSPORTATION RELATED STORMWATER PROJECT RESULTS

Miles of municipal road drainage improvements	0.4
Number of municipal road drainage structures installed	NA
Number of municipal road drainage and stream culverts replaced	2
Stream miles enhanced and reconnected due to replaced stream culverts (also supports aquatic organism passage)	NA

### TOTAL PHOSPHORUS REDUCED (kilograms per year)

Road erosion control practices	2
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### PROJECT RESULTS: STORMWATER

Acres of impervious surface treated	4
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### TOTAL PHOSPHORUS REDUCED (kilograms per year)

Stormwater treatment practices	4
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# Vermont Clean Water Tracking Systems

- Tactical Basin Plan Implementation Tables
- Work completed through funding and regulatory programs
- BMP Accounting and Tracking Tool (BATT)

Ag Partners Database

VTrans Project Database



**Projects**

Name  Status  Grant Number

Project Type  County  Project ID

Basin Plan  Town

Grade Type  Grade

		ID	Project Name	Project Type	Status	Grant Number(s)
<a href="#">Edit</a>	<a href="#">View</a>	89	Better Back Roads projects	Road Project	Implementation Funded	MOA-2015-ERP-01
<a href="#">Edit</a>	<a href="#">View</a>	155	Upper Winooski River Illicit Discharge Detection and Elimination - Follow-up Investigation	Stormwater - IDDE	Scoping Funded	Contract-31083
<a href="#">Edit</a>	<a href="#">View</a>	154	Crooked Creek Gully Restoration	Agricultural Pollution Prevention	Implementation Funded	Contract-31018
<a href="#">Edit</a>	<a href="#">View</a>	153	Montpelier Illicit Discharge Detection and Elimination	Stormwater - IDDE	Scoping Funded	Contract-30772
<a href="#">Edit</a>	<a href="#">View</a>	152	White River Illicit Discharge Detection and Elimination	Stormwater - IDDE	Scoping Funded	Contract-30768
<a href="#">Edit</a>	<a href="#">View</a>	66	Upper and Middle Connecticut River and Pasumpsic River Illicit Discharge Detection and Elimination	Stormwater - IDDE	Scoping Funded	Contract-29218
<a href="#">Edit</a>	<a href="#">View</a>	65	Memphagog Illicit Discharge Detection and Elimination Completion	Stormwater - IDDE	Scoping Completed	Contract-28937
<a href="#">Edit</a>	<a href="#">View</a>	46	Crooked Creek Gully Restoration Designs	Agricultural Pollution Prevention	Design Completed	Contract-28911
<a href="#">Edit</a>	<a href="#">View</a>	69	Project Prioritization and Design for Implementation of the Cold River Corridor Plan	Floodplain/Stream Restoration	Design Completed	Contract-28843
<a href="#">Edit</a>	<a href="#">View</a>	35	Bennington and Pawlet Illicit Discharge Detection and Elimination Study	Stormwater - IDDE	Completed	Contract-28665
<a href="#">Edit</a>	<a href="#">View</a>	34	Bennington Infrastructure Stormwater Mapping Project	Stormwater - IDDE	Scoping Completed	Contract-27744
<a href="#">Edit</a>	<a href="#">View</a>	91	Follow-up on Illicit Discharges in the Otter Creek, Poultney River, and Lamoille River	Stormwater - IDDE	Scoping Funded	Contract-27743
<a href="#">Edit</a>	<a href="#">View</a>	2054	McKenzie Brook Nutrient Management Planning Project- UVM Extension (2016)	Technical Assistance	Completed	29109
<a href="#">Edit</a>	<a href="#">View</a>	2130	Green River Floodplain Attenuation Enhancement	Floodplain/Stream Restoration	Implementation Funded	2017-ERP-2-10
<a href="#">Edit</a>	<a href="#">View</a>	2129	Blackberry Ridge Streambank Erosion Grant	Road Project	Implementation Funded	2017-ERP-2-07
<a href="#">Edit</a>	<a href="#">View</a>	2128	Gully Stabilization, Mill Brook	Floodplain/Stream Restoration	Implementation Funded	2017-ERP-2-02
<a href="#">Edit</a>	<a href="#">View</a>	2145	Town Highway Garage Stormwater - Franklin	Stormwater	Scoping Funded	2017-ERP-1-22
<a href="#">Edit</a>	<a href="#">View</a>	2127	Dishmill Brook Stormwater Master Plan Phase 2	Stormwater Master Planning	Scoping Funded	2017-ERP-1-21

# Clean Water Initiative Projects Dashboard

## Prior State (Pre-January 2018)

Listing of projects with basic identifiers

VERMONT OFFICIAL STATE WEBSITE

### Watershed Projects

Name  Status  Grade   
 Project Type  County  Pro:   
 Basin Plan  Town  ID   
 Grade Type  Grade


ID	Project Name	Project Type
1	St. Johnsbury Stormwater Master Planning	Stormwater Master Planning
7	Towle Neighborhood Road Erosion Control - Planning and Design	Road Project - Final Design
9	Erosion Reduction at Hayes Road Stream Crossing	Floodplain/Stream Restoration - Implementation
11	Preparing Local Watersheds for Flood Resilience and Reducing Runoff in Lewis Creek	Stormwater - Preliminary Design
12	Whitney Brook and Black River Riparian Buffer Restoration	River - Planting
13	Lake Bomoseen Stormwater Master Planning	Stormwater Master Planning
15	Constructing Green Stormwater Infrastructure at the Waitsfield Town Office	Stormwater - Implementation
19	Enhancing Nutrient Management Plan Implementation with goCrop Software	Agricultural Pollution Prevention - Implementation
24	Moulton River Corridor Easement	River Corridor Easement Implementation
25	Nulhegan River Confluence Easements	River Corridor Easement Implementation

## Good State/Phase 1 (Complete)

Individual project summaries

Stormwater - Implementation

### Northfield Village Green Bioretention Installation





**Town:** Northfield  
**County:** Washington  
**Watershed:** Winooski  
**Funding Amount:** \$110,695  
**Funding Source:** DEC Ecosystem Restoration Grant (Capital Fund, SFY 2016)  
**Description:** This project is located behind the Village Green in Northfield. The result is the construction of a large bioretention basin which captures and treats surface stormwater runoff from 14 acres of the downtown, including 5 acres of impervious surface.  
**Partners:** Central Vermont Regional Planning Commission

**Project Status:** Completed

**Results:**

- 4 kg/year phosphorus reduction
- 5 acres of impervious area treated

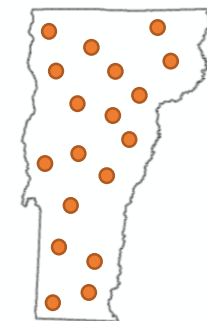
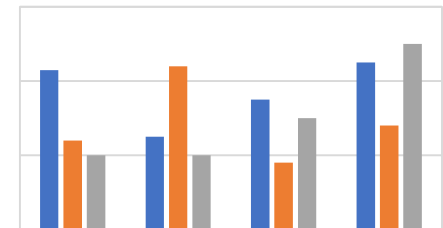
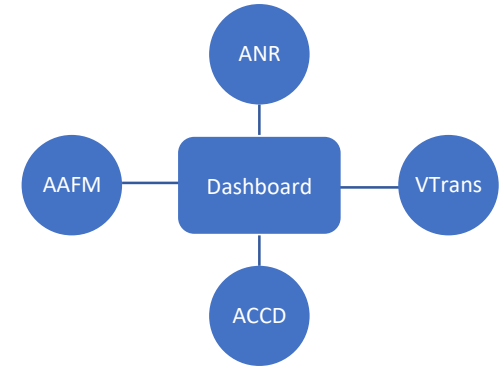
The back third of the parking lot covered by pavement before construction of the bio-retention area, behind the American Legion Hall.

After construction of the bio-retention area, with grass established, guardrail installed, and willow trees planted to capture and treat stormwater from in and around Northfield Commons.

For more information visit: <http://dec.vermont.gov/watershed/cwi/projects>

## Great State/Phase 2-3 (2018)

Interagency data and data visualization






# Clean Water Initiative Projects Dashboard

## Good State/Phase 1 (Complete): Individual project summaries

**Stormwater - Implementation**

**Northfield Village Green Bioretention Installation**





**Town:** Northfield  
**County:** Washington  
**Watershed:** Winooski  
**Funding Amount:** \$110,695  
**Funding Source:** DEC Ecosystem Restoration Grant (Capital Fund, SFY 2016)  
**Description:** This project is located behind the Village Green in Northfield. The result is the construction of a large bioretention basin which captures and treats surface stormwater runoff from 14 acres of the downtown, including 5 acres of impervious surface.  
**Partners:** Central Vermont Regional Planning Commission

**Project Status:**  
Completed

**Results:**

- 4 kg/year phosphorus reduction
- 5 acres of impervious area treated

**Northfield Parking Lot Before**



The back third of the parking lot covered by pavement before construction of the bio-retention area, behind the American Legion Hall.

After construction of the bio-retention area, with grass established, guardrail installed, and willow trees planted to capture and treat stormwater from in and around Northfield Commons.

For more information visit: <http://dec.vermont.gov/watershed/cwi/projects>

## 2017 Ecosystem Restoration Project Summaries

Access one-page summaries of Ecosystem Restoration projects funded or completed during State Fiscal Year 2017 (July 1, 2016 - June 30, 2017)

Available here: <http://dec.vermont.gov/watershed/cwi/projects>

# For more information:

Website [cleanwater.vermont.gov](http://cleanwater.vermont.gov)

Reports <http://dec.vermont.gov/watershed/cwi/cwf#reports>

Projects <http://dec.vermont.gov/watershed/cwi/projects>

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