Clean Water Initiative 2017 Investment Report: Executive Summary

Clean water supports fishing, swimming, boating, and other recreational uses, bolsters tourism, helps to maintain property values and provides access to safe drinking water. Vermont's residents, visitors, and businesses care about clean water and benefit from continued investments in restoring and protecting our waters.

The Vermont Clean Water Initiative 2017 Investment Report summarizes: (a) state investments made in clean water improvement projects through grants, contracts, and loans, and (b) the results of state-funded clean water restoration activities completed within State Fiscal Year (SFY) 2017, covering July 1, 2016 through June 30, 2017.

The Vermont Clean Water Initiative Investment Report uses four categories of accountability measures:



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 of dollars invested in clean water projects, addressing planning, design, and implementation of clean water improvement practices;



Project output measures that quantify the results of state-funded clean water restoration projects completed; and



Environmental outcome measures that quantify water pollution reductions achieved through statefunded clean water projects.

This executive summary of the SFY 2017 Investment Report summarizes state investments in clean water projects in SFY 2017 and results achieved by clean water projects implemented or constructed in SFY 2017 by sector:

Agricultural Pollution Prevention Projects

Installation or application of conservation practices that reduce sources of nutrient and sediment pollution from agricultural lands.

Natural Resources Restoration Projects

Restoration of floodplains, rivers/streams, lakeshore, wetlands, and forest lands to natural conditions that prevent and abate nutrient and sediment pollution.

Developed Lands Stormwater Treatment Projects

Installation of stormwater practices that treat sources of nutrient and sediment pollution caused by stormwater runoff from developed lands.

Transportation-Related Stormwater Treatment Projects

Installation of stormwater and roadside erosion control practices that prevent erosion and treat road-related sources of nutrient and sediment pollution.

The Investment Report also contains results of project development work, addressing project planning, design, and engineering that leads to high priority and cost effective clean water implementation or construction projects. The report also summarizes the extent of stateprovided outreach and technical assistance. Highlights of project development work and outreach/technical assistance are summarized below.

Executive Summary



Outreach and Technical Assistance Highlights

Extent of state-provided clean water outreach and technical assistance

State agencies and partners conducting Statefunded outreach held 431 outreach events in SFY 2017, including workshops, trainings, and public/stakeholder meetings. Outreach efforts reached 10,533 attendees and provided 1,067 hours of education on clean water. Agency staff reviewed 4,857 projects to maximize water quality improvements and minimize water quality impact; provided 5,300 hours of engineering and technical assistance for stormwater and wastewater projects; conducted 700 farm visits farms; provided technical assistance on 1,032 logging operations/forest properties; assisted 78 communities in urban and community forestry; and provided 1,483 hours of technical assistance to municipalities on transportation-related stormwater projects.



Project Development Highlights

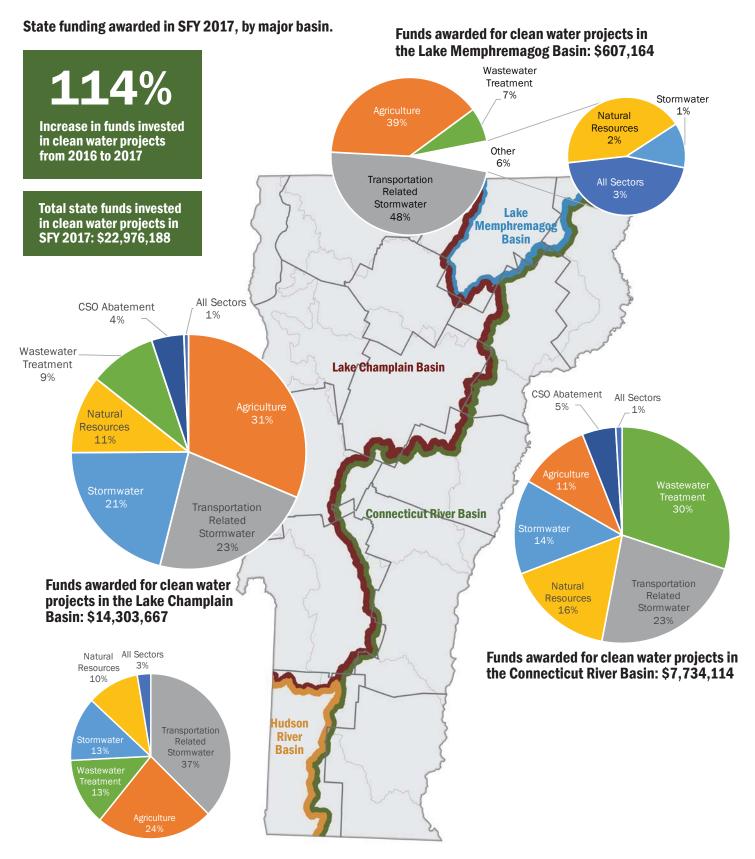
Extent of state-provided clean water outreach and technical assistance

State-funded planning and assessment work resulted in identification of 176 priority projects recommended for future design and/ or implementation in SFY 2017, covering agricultural pollution prevention, river/ floodplain restoration, and stormwater treatment projects. More than 116 road miles were assessed and identified for future improvements to comply with clean water regulations. 22 preliminary and 44 final clean water project designs were completed for future implementation work.

Investments made in clean water projects and results of clean water projects implemented in SFY 2017 are summarized by sector in the following sections.

State Investments in Clean Water

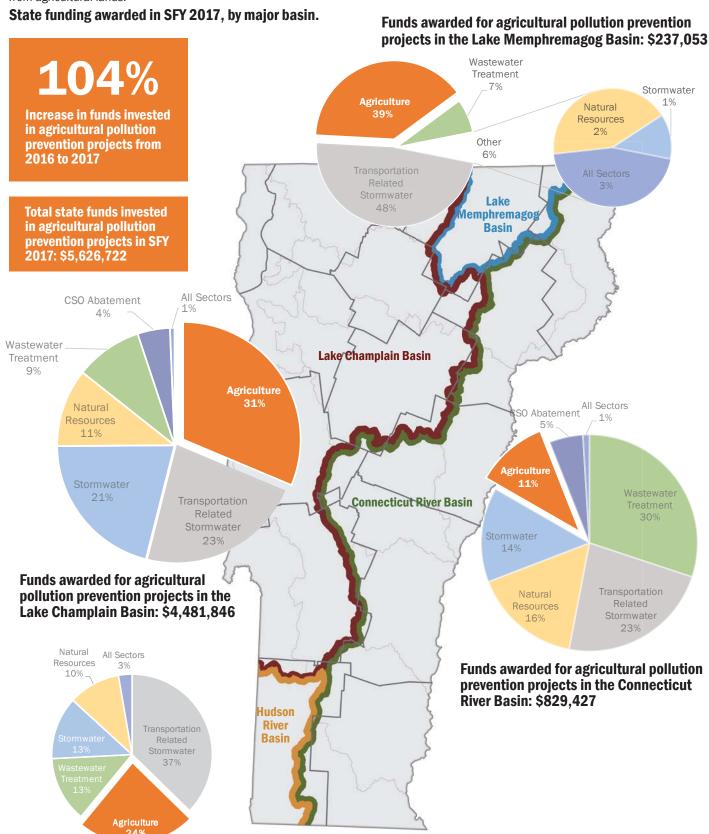




Funds awarded for clean water projects in the Hudson River Basin: \$331,243

Investments in Agricultural Pollution Prevention

Agricultural Pollution Projects: Installation or application of conservation practices that reduce sources of nutrient and sediment pollution from agricultural lands.



Funds awarded for agricultural pollution prevention projects in the Hudson River Basin: \$78,396

Results of Agricultural Projects



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

PROJECT RESULTS		BENEFITS							
Performance Measures	2016	2017	TMDL ¹ Implementation	Act 64 (2015) Implementation	RAP¹ 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.

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)					

AGRICULTURAL HIGHLIGHTS

Updated Required Agricultural Practices (RAPs) regulations became effective December 2016, and are expected to drive demand for additional projects in 2018

Before (left) and after (right) installation of livestock exclusion fencing and improved laneway and water crossing in Pawlet, completed by Poultney Mettowee **Conservation District with Agency of Natural Resources funding**

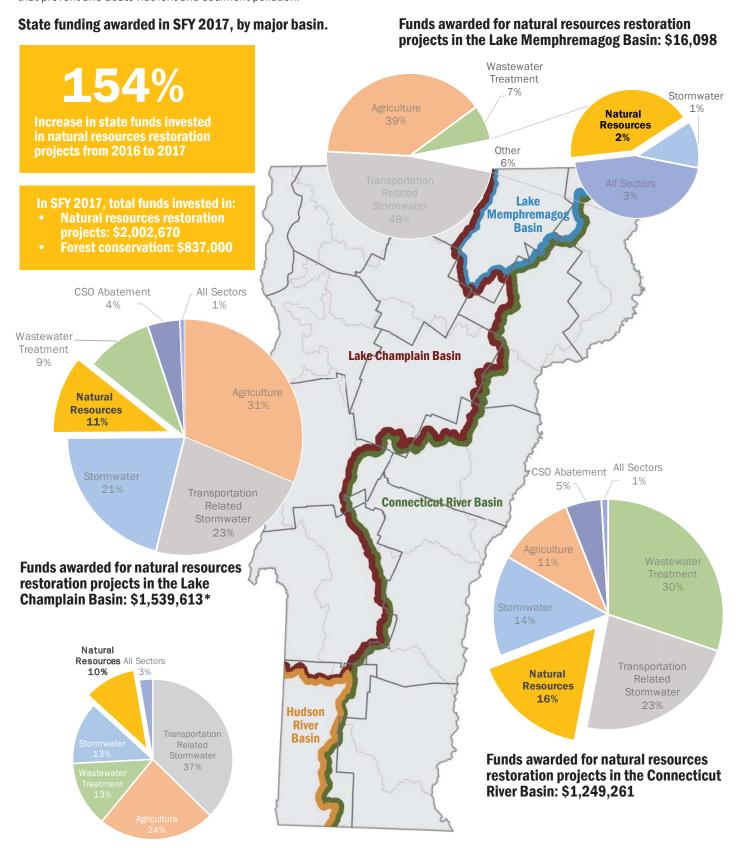




Investments in Natural Resources Restoration



Natural Resources Restoration Projects: Restoration of floodplains, rivers/streams, lakeshore, wetlands, and forest lands to natural conditions that prevent and abate nutrient and sediment pollution.



Funds awarded for natural resources restoration projects in the Hudson River Basin: \$34,698

^{*} Forest conservation represents 2% of total funds awarded in the Lake Champlain basin

Results of Natural Resources Projects



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

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

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

NATURAL RESOURCES HIGHLIGHTS

Natural resources restoration projects reduce nutrient and sediment resiliency, support outdoor recreational opportunities, and improve habitat

> Before (above, right) and after (below, right) relocation of 1,100 feet of Stowe's **Recreation Path outside of** the river hazard zone and restoration/planting of two acres of floodplain, completed by Town of Stowe with Agency of Natural Resources funding





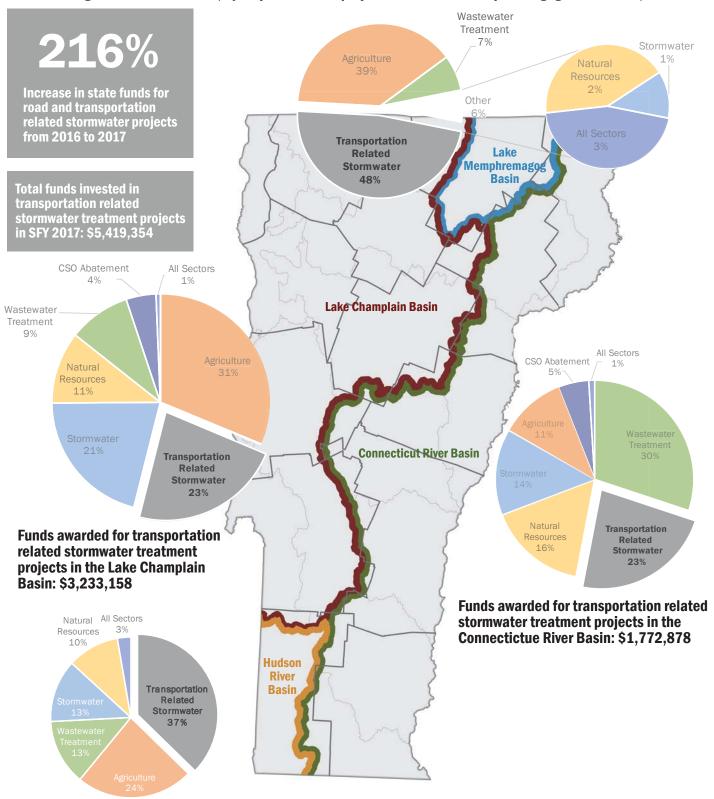
Investments in Transportation Related Stormwater Treatment



Transportation Related Stormwater Treatment Projects: Installation of stormwater and roadside erosion control practices that prevent erosion and treat road-related sources of nutrient and sediment pollution.

State funding awarded in SFY2017, by major basin.

Funds awarded for transportation related stormwater treatment projects in the Lake Memphremagog Basin: \$289,788



Funds awarded for transportation related stormwater treatment projects in the **Hudson River Basin \$123,531**





Results of transportation related stormwater projects implemented in SFY 2017, statewide.¹

PROJECT RESULTS	BENEFITS							
Performance Measures	2016	2017	TMDL ² Implementation	Act 64 (2015) Implementation	MRGP ² 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.

POLLUTANT RE	DUCTION		EXTENT OF LOAD REDUCTION QUANTIFIED	
Total Phosphorus Reduced (Kilograms per Year)	2016	2017	Cumulative	Foliutant reductions quantined for 30 percent of municipal
Road erosion control practices	4	22	26	road miles improved (projects in the Lake Champlain basin)

TRANSPORTATION RELATED STORMWATER HIGHLIGHTS

Roadside erosion/nutrient pollution controls required by the Municipal Roads General Permit are expected to drive implementation of additional projects in future years





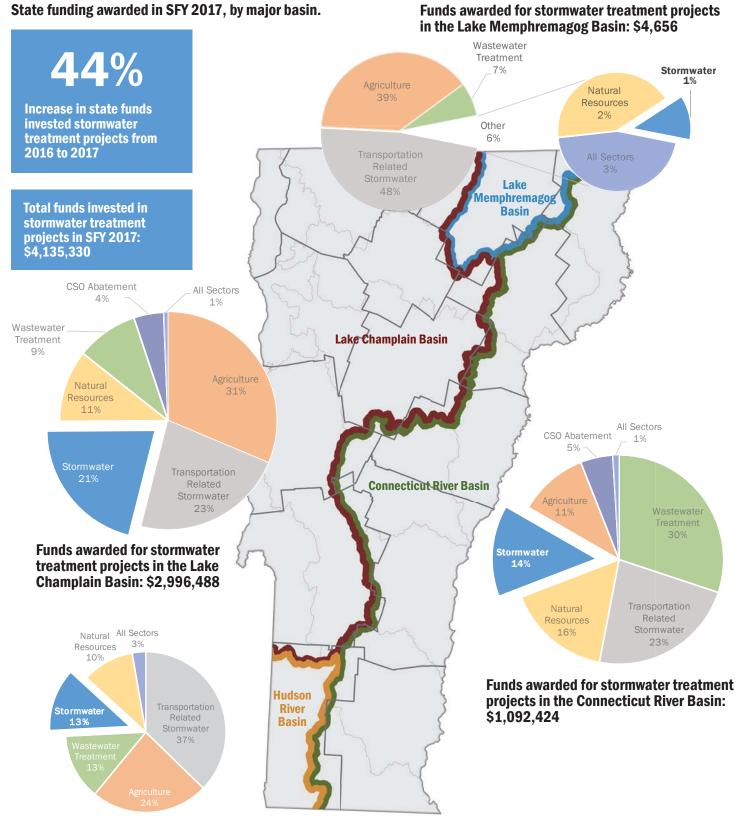
Before (left) and after (right) installation of a stone-lined ditch along Finel Hollow, Highland Gray, and Watkins Hill Roads in Poultney, completed by the Town of Poultney with VTrans funding

- 1 Results of projects completed by VTrans to comply with water quality regulations on state highways and VTrans non-road developed lands are outside the scope of this report.
- 2 Definition of acronyms: Total Maximum Daily Load (TMDL); Municipal Roads General Permit (MRGP)

Investments in Stormwater Treatment



Stormwater Treatment Projects: Installation of stormwater practices that treat sources of nutrient and sediment pollution caused by stormwater runoff from developed lands.



Funds awarded for stormwater treatment projects in the Hudson **River Basin: \$41,763**

Results of Stormwater Projects



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

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

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

STORMWATER HIGHLIGHTS

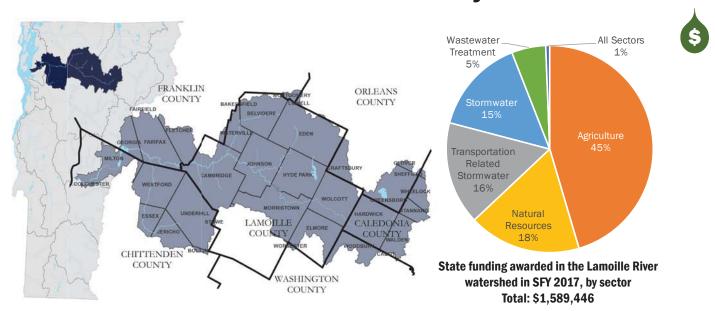
Nutrient pollution controls, required by updated/new stormwater permits are expected to drive demand for additional projects in future years





Before (left) and after (right) installation of bioretention system on Morey Road in Hyde Park, completed by Lamoille **County Conservation District**

Lamoille River Watershed Summary



STATE FUNDS AWARDED IN SFY 2017

RESULTS OF PROJECTS COMPLETED IN SFY 2017





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NA

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
١		
Į	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)

NA

Forested riparian buffer restoration on non-agricultural

lands

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
PROJECT RESULTS: STORMWATER	
Acres of impervious surface treated	4
TOTAL PHOSPHORUS REDUCED (kilograms per year)	
Stormwater treatment practices	4

TRANSPORTATION RELATED STORMWATER PROJECT RESULTS

Miles of municipal road drainage improvements

Number of municipal road drainage structures installed

Lamoille River Watershed Projects



Clean water projects funded by state agencies in SFY 2017 in the Lamoille River watershed.

TOWN	AGENCY	PARTNER	SUMMARY TITLE	SECTOR	FUNDING SOURCE	AMOUNT
Belvidere	AAFM	The Green Mountain Maple Sugar	Waste Treatment	Ag	Capital	\$20,000
Cambridge	AAFM	Gillilan, Kenneth	Heavy Use Area Protection	Ag	Capital	\$25,000
Cambridge	AAFM	Gillilan, Kenneth	Waste Storage Structure	Ag	Capital	\$50,000
Cambridge	ANR	Jeffersonville	Jeffersonville Wastewater Treatment Facility Refurbishment – Preliminary Design	WW	CWSRF	\$24,800
Cambridge	ANR	Lamoille County Conservation District	Town of Cambridge/Brewster River Floodplain Restoration – Preliminary Design	NR	CWF	\$21,250
Cambridge	ANR	Vermont Land Trust	North Branch Lamoille River Corridor Easement (Barup Farm) – Implementation	NR	CWF	\$46,494
Cambridge	VHCB	Vermont Land Trust	H & C Barup Farm Agricultural Easement with Riparian Buffers	Ag	Capital, Other	\$282,000
Cambridge	VTrans	Cambridge	TH 25 Junction Hill Road – Municipal Roads Culvert Upgrade	Roads	VTTF	\$40,000
Cambridge, Underhill	ANR	Lamoille County Planning Commission	Seymour River Stream Geomorphic Assessment/River Corridor Plan – Project Identification	NR	CWF	\$34,713
Craftsbury	VTrans	Craftsbury	TH 6 Collinsville Road - Correction of Stream Bank Erosion	Roads	VTTF	\$9,600
Elmore	VTrans	Elmore	TH 7 Beach Road - Municipal Roads Erosion Control	Roads	CWF	\$10,684
Fletcher	VTrans	Fletcher	Municipal Culvert and Road Erosion Inventory	Roads	VTTF	\$8,000
Fletcher	VTrans	Fletcher	TH 33 River Road - Municipal Roads Erosion Control	Roads	VTTF	\$20,000
Georgia	ANR	Friends of Northern Lake Champlain	Deer Brook/Route 7 and Route 104A, Georgia Gully Remediation – Preliminary Design	SW	CWF	\$86,700
Georgia	VHCB	Vermont Land Trust	Georgia Town Forest with Wetland/Riparian Protection	NR	Capital	\$132,500
Hardwick	AAFM	Lady Bug Farm Partnership	Underground Outlet	Ag	Capital	\$76
Hardwick	AAFM	Lady Bug Farm Partnership	Mulching	Ag	Capital	\$151
Hardwick	AAFM	Lady Bug Farm Partnership	Critical Area Planting	Ag	Capital	\$166
Hardwick	AAFM	Lady Bug Farm Partnership	Roof Runoff Management	Ag	Capital	\$231
Hardwick	AAFM	Lady Bug Farm Partnership	Underground Outlet	Ag	Capital	\$253
Hardwick	AAFM	Lady Bug Farm Partnership	Access Road	Ag	Capital	\$282
Hardwick	AAFM	Lady Bug Farm Partnership	Underground Outlet	Ag	Capital	\$342
Hardwick	AAFM	Lady Bug Farm Partnership	Fencing	Ag	Capital	\$371
Hardwick	AAFM	Lady Bug Farm Partnership	Roof Runoff Management	Ag	Capital	\$416

Note: Multi-watershed and statewide projects are listed in separate tables at the end of this appendix.

Lamoille River Watershed Projects



Clean water projects funded by state agencies in SFY 2017 in the Lamoille River watershed.

TOWN	AGENCY	PARTNER	SUMMARY TITLE	SECTOR	FUNDING SOURCE	AMOUNT
Hardwick	AAFM	Lady Bug Farm Partnership	Heavy Use Area Protection	Ag	Capital	\$712
Hardwick	AAFM	Lady Bug Farm Partnership	Waste Transfer	Ag	Capital	\$714
Hardwick	AAFM	Lady Bug Farm Partnership	Underground Outlet	Ag	Capital	\$812
Hardwick	AAFM	Lady Bug Farm Partnership	Waste Transfer	Ag	Capital	\$1,031
Hardwick	AAFM	Lady Bug Farm Partnership	Pumping Plant	Ag	Capital	\$1,148
Hardwick	AAFM	Lady Bug Farm Partnership	Subsurface Drain	Ag	Capital	\$1,346
Hardwick	AAFM	Lady Bug Farm Partnership	Fencing	Ag	Capital	\$1,630
Hardwick	AAFM	Lady Bug Farm Partnership	Access Road	Ag	Capital	\$2,068
Hardwick	AAFM	Lady Bug Farm Partnership	Access Road	Ag	Capital	\$2,583
Hardwick	AAFM	Lady Bug Farm Partnership	Heavy Use Area Protection	Ag	Capital	\$3,890
Hardwick	AAFM	Lady Bug Farm Partnership	Waste Transfer	Ag	Capital	\$5,301
Hardwick	AAFM	Lady Bug Farm Partnership	Waste Storage Structure	Ag	Capital	\$9,583
Hardwick	AAFM	Lady Bug Farm Partnership	Heavy Use Area Protection	Ag	Capital	\$9,963
Hardwick	AAFM	Lady Bug Farm Partnership	Waste Storage Structure	Ag	Capital	\$12,259
Hardwick	AAFM	Lady Bug Farm Partnership	Waste Storage Structure	Ag	Capital	\$19,674
Hardwick	VTrans	Hardwick	Municipal Culvert and Road Erosion Inventory	Roads	FTF	\$7,861
Hyde Park	ANR	Hyde Park	Hyde Park Wastewater Treatment Facility and Collection System Refurbishment/Expansion – Preliminary Design	WW	CWSRF	\$42,700
Hyde Park	VTrans	Hyde Park	Municipal Road Erosion Inventory	Roads	FTF	\$7,680
Hyde Park	VTrans	Hyde Park	TH 17 Bornemann Road - Municipal Roads Erosion Control	Roads	VTTF	\$20,000
Hyde Park, Morristown	ANR	Lamoille County Conservation District	Hyde Park and Morristown Stormwater Master Plan – Project Identification	SW	CWF	\$30,000
Jericho	VTrans	Chittenden County Regional Planning Commission	Municipal Road Erosion Inventory	Roads	CWF	\$4,000
Johnson	AAFM	Rankin, Warren	Forested Riparian Buffer Restoration	Ag	Capital	\$539
Johnson	AAFM	Rankin, Warren	Forested Riparian Buffer Restoration	Ag	Capital	\$2,153

Lamoille River Watershed Projects



Clean water projects funded by state agencies in SFY 2017 in the Lamoille River watershed.

TOWN	AGENCY	PARTNER	SUMMARY TITLE	SECTOR	FUNDING SOURCE	AMOUNT
Johnson	ANR	Lamoille County Planning Commission	Gihon River Tributary/Johnson State College Stormwater Treatment – Implementation	SW	Capital	\$84,500
Johnson	VTrans	Johnson	TH 25/26 Tree Farm/Ober Hill Road - Municipal Roads Erosion Control	Roads	CWF	\$4,380
Johnson	VTrans	Johnson	Th 10 Foote Brook Road - Correction of Stream Bank Erosion and Road Erosion Control	Roads	CWF	\$15,937
Johnson	VTrans	Johnson	TH 1 Plot Road – Municipal Roads Erosion Control and Culvert Upgrade	Roads	CWF	\$17,874
Morristown	AAFM	Greaves Farms Corp.	Cover Crop	Ag	General	\$2,580
Underhill	ANR	Chittenden County Regional Planning Commission	Underhill Stormwater Master Plan – Project Identification	SW	CWF	\$16,105
Underhill	VTrans	Chittenden County Regional Planning Commission	Municipal Road Erosion Inventory	Roads	CWF	\$8,000
Walden	AAFM	Lynd, Geordie	Heavy Use Area Protection	Ag	Capital	\$6,400
Walden	AAFM	Lynd, Geordie	Waste Transfer	Ag	Capital	\$6,700
Walden	AAFM	Lynd, Geordie	Waste Storage Structure	Ag	Capital	\$12,900
Walden	AAFM	Lynd, Geordie	Waste Transfer	Ag	Capital	\$49,000
Walden	VTrans	Walden	Municipal Road Erosion Inventory	Roads	FTF	\$6,400
Wolcott	ANR	Vermont River Conservancy	Wild Branch Lamoille River Corridor Easement (McCrumb Property) – Implementation	NR	Capital	\$37,961
Wolcott	ANR	Wolcott	Lamoille River/Wolcott Town Garage and Fire Station Stormwater Treatment – Implementation	SW	Capital	\$15,888
Wolcott	VTrans	Wolcott	TH 19 Sand Hill Road - Municipal Roads Erosion Control and Culvert Upgrade	Roads	VTTF	\$20,000
Woodbury	VTrans	Woodbury	TH 36 East Hill Road - Municipal Roads Erosion Control	Roads	VTTF	\$20,000