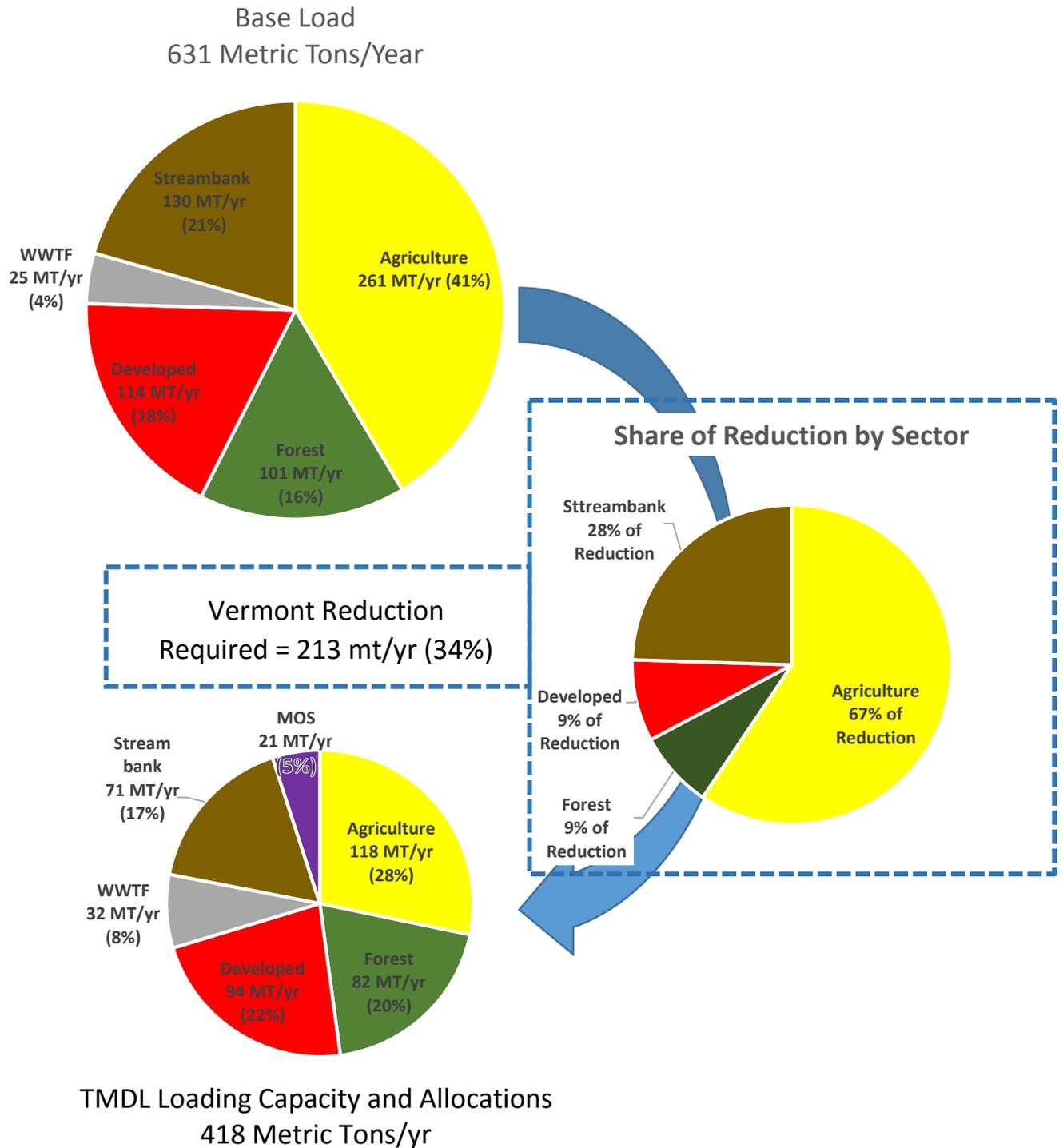


Vermont Lake Champlain Base Phosphorus Loads, 2001-2010, compared to Vermont Lake Champlain TMDL loading capacity and allocations, by sector, in MT/yr

Sources: Data for base loads are from TetraTech, 2015



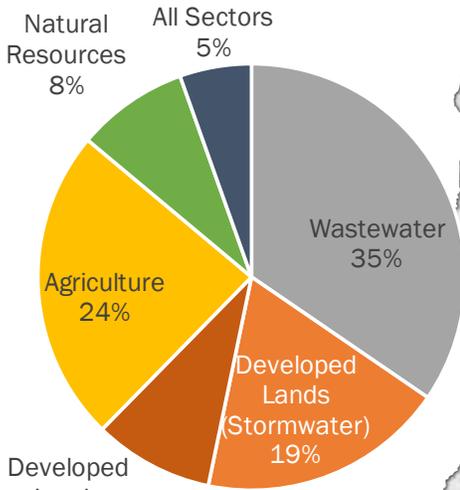
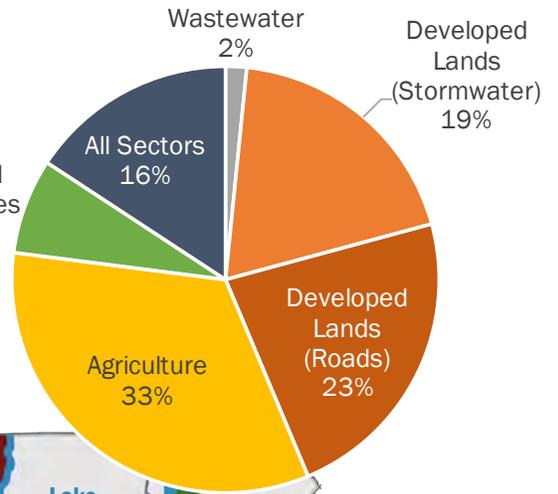
State Investments in Clean Water



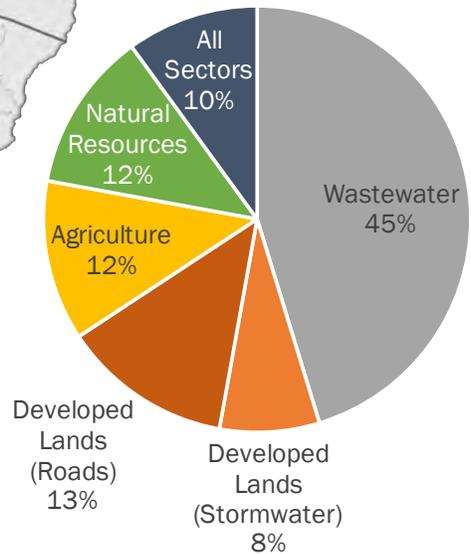
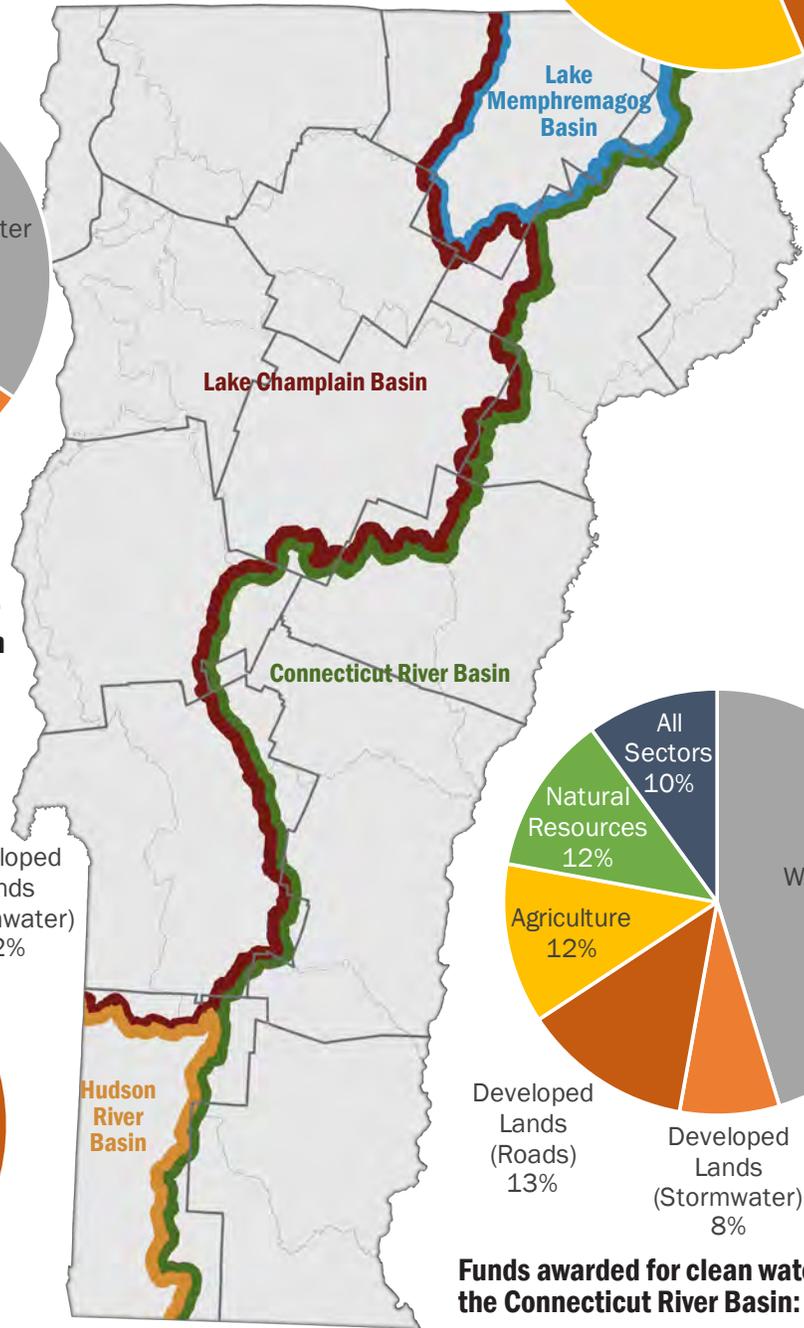
State funding awarded in SFY 2016-2018, by major basin.

260%
Increase in State of Vermont investments in clean water projects since SFY 2016

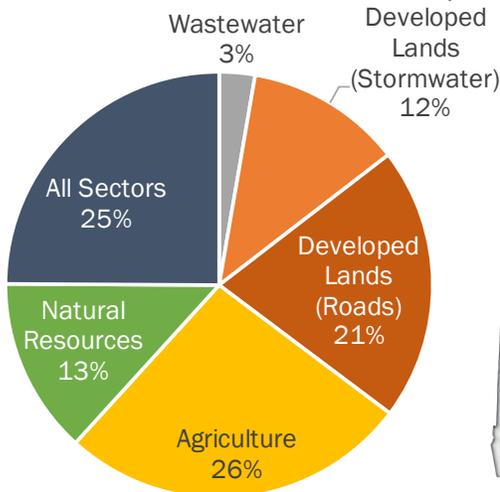
Funds awarded for clean water projects in the Lake Memphremagog Basin: \$2,661,522



Funds awarded for clean water projects in the Lake Champlain Basin: \$66,232,457



Funds awarded for clean water projects in the Connecticut River Basin: \$28,780,176



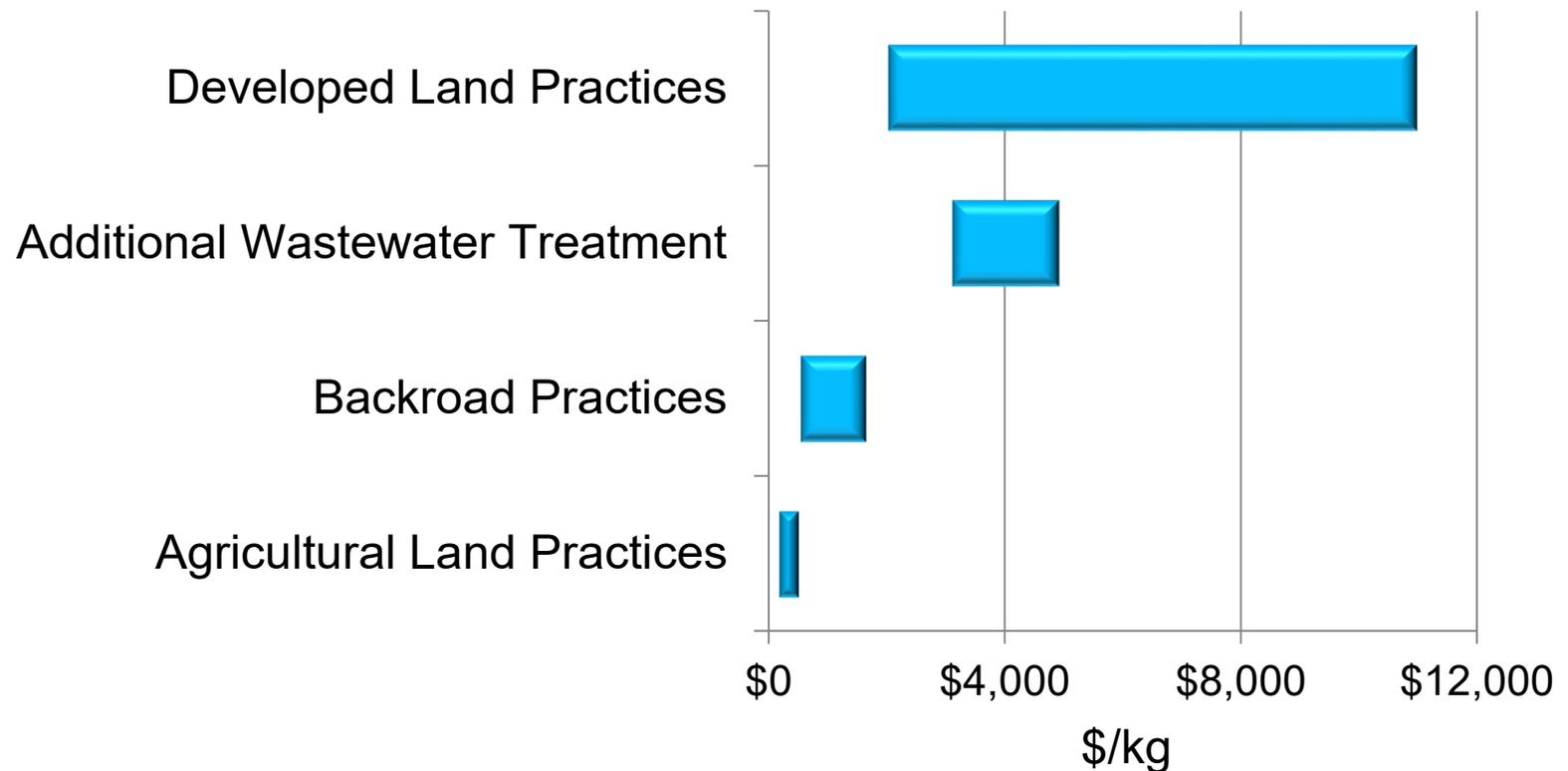
Funds awarded for clean water projects in the Hudson River Basin: \$1,620,651

\$200 – \$11,000

Range of cost-effectiveness of phosphorus reduction practices (dollars per kilogram of phosphorus reduced)

Relative Cost-Effectiveness of Phosphorus Reduction Practices

(Range of annualized cost per kilogram P reduced annually)



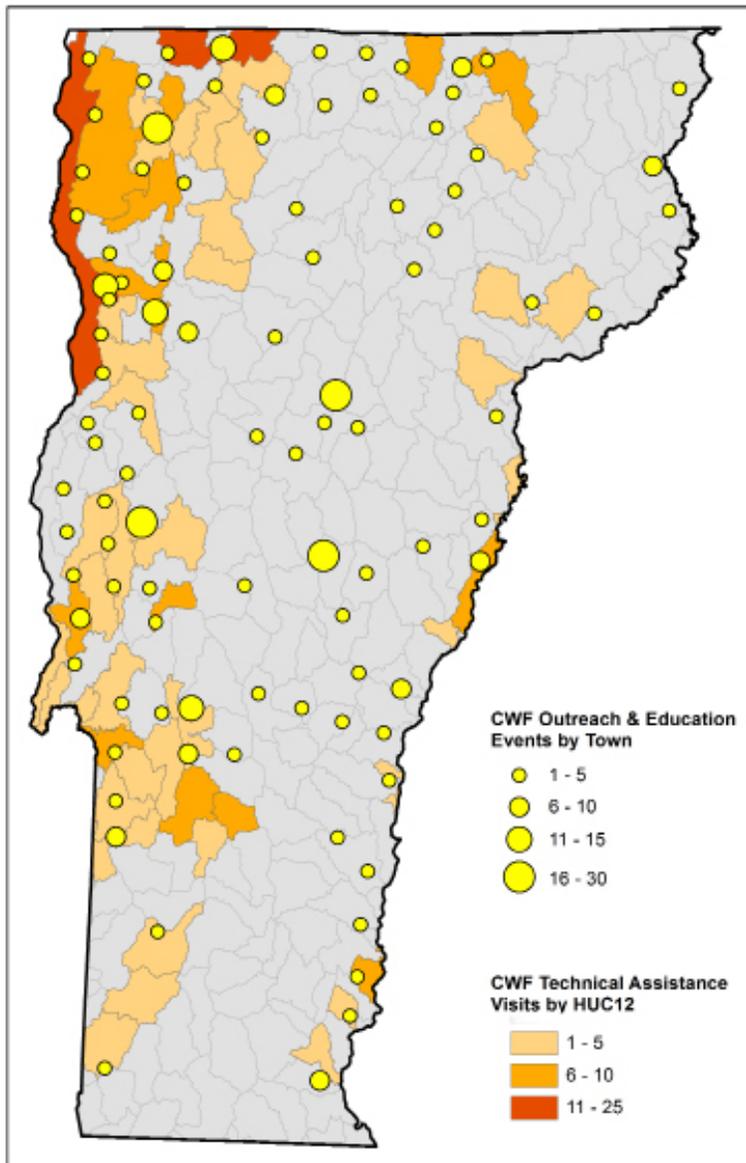
Nonpoint source practice costs are from preliminary EPA estimates for the Lake Champlain TMDL. Wastewater costs are from VT DEC. Estimates include capital costs only, annualized over 20 years at 2% interest.

The Water Quality Division within the Vermont Agency of Agriculture, Food and Markets (VAAFAM or the Agency) is responsible for ensuring farms meet the State agricultural water quality non-point source regulations. The Agency performs this task through the use of regulatory, technical, and financial assistance programs provided to farmers and partner organizations.

Made possible by the Vermont Clean Water Fund, The Agricultural Clean Water Initiative Program (Ag-CWIP) represents the Agency of Agriculture, Food & Markets' effort to reduce nonpoint source nutrient pollution from agricultural land through grant awards for educational programs, innovative phosphorus reduction strategies and technical assistance to agricultural landowners.

In FY2018, the Water Quality Program invested \$1.3 Million in funding for local conservation efforts, educational programs, as well as technical assistance for Vermont farmers.

AGRICULTURAL CLEAN WATER INITIATIVE PROGRAM EDUCATIONAL EVENTS AND TECHNICAL ASSISTANCE STATEWIDE



PROGRAM IMPACT*:

15,420 ATTENDEES

REACHED THROUGH EDUCATIONAL EVENTS

1,112 HOURS

OF EDUCATIONAL OPPORTUNITIES FOR VT FARMERS

366 EVENTS

EDUCATIONAL EVENTS HELD STATEWIDE

5.8 FTE

PARTNER FULL TIME EQUIVALENT (FTE) EMPLOYEE

CAPACITY INCREASE

80 SERVICES

NEW OR EXPANDED PARTNER PROVIDED SERVICES

AVAILABLE TO VT FARMERS

**Program impact includes results from FY16-FY18.*



VAAFAM Engineer provides educational outreach to members of the general public at Breakfast on the Farm event in the Lake Champlain Basin during the summer of 2018.



University of Vermont Extension Service and the Friends of Northern Lake Champlain hold a meeting in Franklin County to inform producers about regulatory requirements, best practices, and opportunities for technical and financial assistance.

AGRICULTURAL CLEAN WATER INITIATIVE PROGRAM GRANT SUMMARIES

UNIVERSITY OF VERMONT EXTENSION:

Comprehensive Extension Programming for education and outreach, certification programs, technical assistance for conservation implementation and funding opportunities, business planning, as well as research and development to support educational programs.

VERMONT ASSOCIATION OF CONSERVATION DISTRICTS:

Education and outreach, technical assistance, land treatment planning, and organizational capacity development.

NATURAL RESOURCES CONSERVATION COUNCIL:

Education and outreach for increased awareness of water quality regulations and best practices, technical assistance regarding conservation practices and funding opportunities, in addition to organizational development and capacity building to increase organizational effectiveness across ten state Natural Resource Conservation Districts.

VERMONT GRASS FARMERS ASSOCIATION:

Educational programming for Vermont farmers to undertake, improve and/or expand their grass-based livestock production, strategic planning and expanded membership benefits as well as outreach to increase Vermonters understanding, appreciation and adoption of livestock grazing best management practices that improve water quality.

VERMONT TECHNICAL COLLEGE: AGRICULTURAL INSTITUTE:

Education and outreach to Vermont Technical College students regarding nutrient management planning. This work will support regulatory compliance with Required Agricultural Practices and Medium and Large Farm Permits and Rules as applicable.

FARMERS WATERSHED ALLIANCE OF FRANKLIN AND GRAND ISLE:

Education and outreach activities to improve water quality focused on precision agricultural tools and technologies, conservation practices for water quality improvements, and regulatory compliance as well as organizational capacity development.

POULTNEY METOWEE NATURAL RESOURCES CONSERVATION DISTRICT:

Support for the Agronomy and Conservation Assistance Program (ACAP) in providing technical assistance in nutrient management planning and implementation of farm conservation practices, particularly targeted at small farms, to provide direct outreach to small producers who did not receive regular regulatory oversight prior to the Required Agricultural Practices, have limited on-farm labor and are less able to attend off-farm workshops or meetings.

FRANKLIN WATERSHED COMMITTEE:

Education and outreach regarding agricultural practices and their role in achieving TMDLs for Lake Carmi, the Pike River and Lake Champlain to help bring together a divided community of stakeholders, farmers, environmental entities, and the general public through enhanced understanding, goal setting, and improved communications about the role of agriculture and its ability to work in harmony with soil and water resources.

MISSISSQUOI RIVER BASIN ASSOCIATION:

Outreach programs to schools and community groups ensuring the importance of clean water is expressed to a wide range of watershed residents, one-on-one outreach through site visits, and focused on farm water sampling.

CHAMPLAIN VALLEY FARMERS COALITION:

Education and outreach, technical assistance, and leadership development and strategic planning to expand organizational capacity and development.

FRIENDS OF NORTHERN LAKE CHAMPLAIN:

Organizational capacity development to support existing and new services to farmers.

SCOTT MAGNAN'S CUSTOM SERVICE:

Education and outreach as well as technical assistance to producers in implementing and utilizing precision agricultural tools and technologies to more precisely apply and track nutrients applications.

Fiscal Year	State Expenditure
2016	\$112,000
2017	\$642,599
2018	\$1,321,928

Funding for education, outreach and technical assistance has significantly increased with the Clean Water Fund since FY2016.



Technical assistance provided by the Orleans County Natural Resources Conservation District to a small farmer in the Lake Memphremagog watershed.



University of Vermont Extension Service hosts an on-farm educational event to discuss conservation practices and results with agricultural operators.



Participants review outreach materials at an on-farm workshop in Fairfax, VT



Farmer participant enters data into the goCrop program as they develop their farm Nutrient Management Plan through the UVM Extension course.

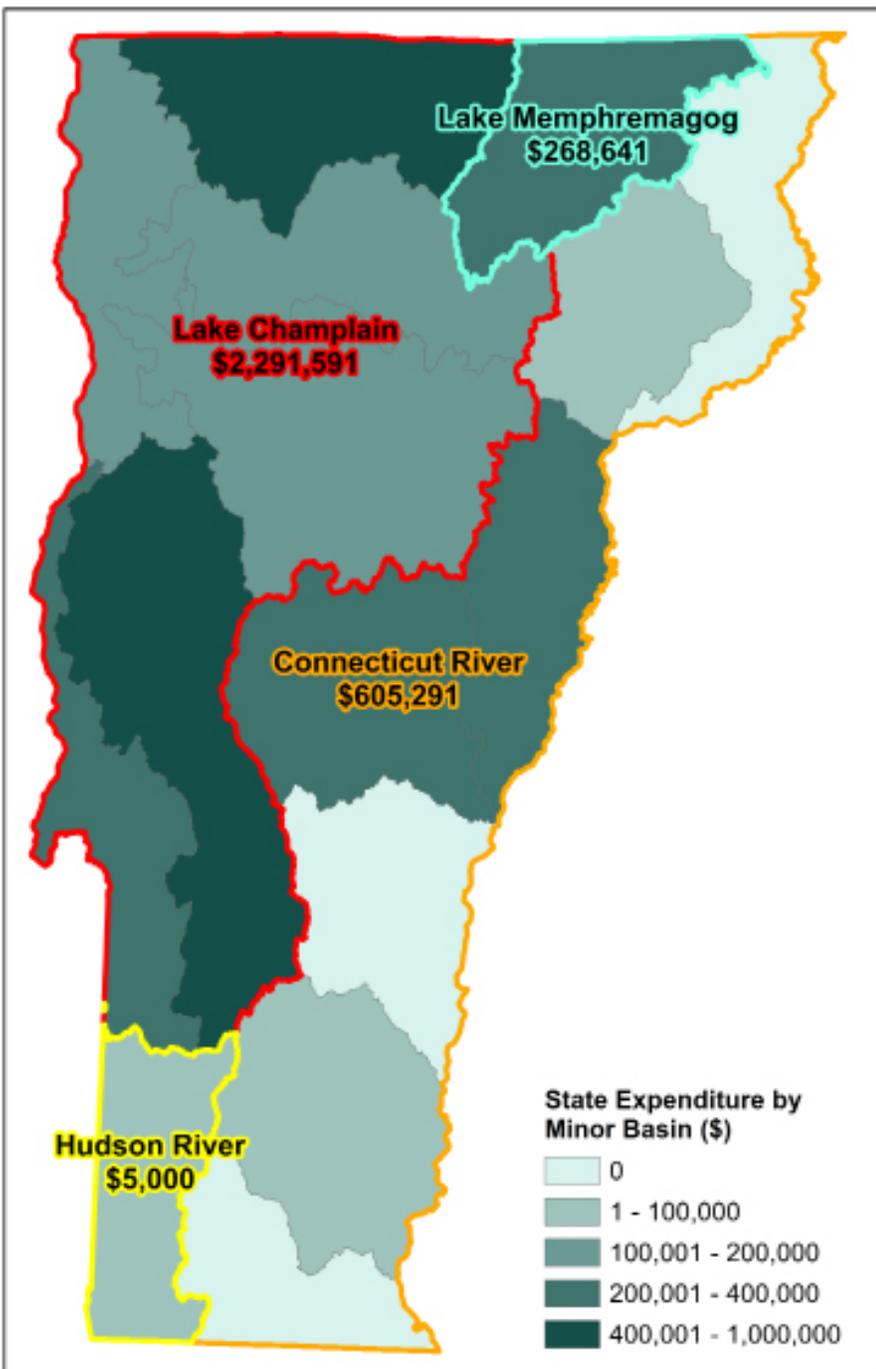
Vermont Agency of Agriculture, Food & Markets Water Quality Division

FY 2018 Financial Assistance for Farmers Summary

The Water Quality Division within the Agency of Agriculture, Food and Markets (VAAFAM) utilizes farmer assistance, education, research, regulations, monitoring, and compliance and enforcement programs that are designed to improve farm management in order to meet the State's goals in improving and protecting water quality.

In FY 2018, the Water Quality Program invested more than \$3.2 million of State funds in on-farm implementation of conservation practices to improve water quality. Vermont farmers invested just under \$1 million in cost-share contributions towards implementation of these projects.

FY18 ON-FARM IMPLEMENTATION BY MAJOR AND MINOR BASIN



7162 ACRES
IMPROVED WITH FARM AGRONOMIC PRACTICES

87 PRACTICES
BEST MANAGEMENT PRACTICES INSTALLED

\$3.2 MILLION
STATE EXPENDITURE FOR ON-FARM IMPLEMENTATION

NEARLY \$1 MILLION
INVESTED BY VERMONT FARMERS



Before (above) and after (below) installation of heavy use area protection and clean water diversion project on a small farm in Swanton, VT completed through the BMP Program.



Implementation (below) of cover cropping after corn harvest with a No-Till Grain Drill acquired by a group of small farms in Craftsbury, VT, through the CEAP Program.



FINANCIAL ASSISTANCE PROGRAM DESCRIPTIONS

Farm Agronomic Practices FAP:

Financial assistance to Vermont farms for implementation of soil-based agronomic practices that improve soil quality, and reduce erosion.

BEST MANAGEMENT PRACTICES BMP:

Technical and financial assistance program to assist farmers with on-farm improvements designed to abate agricultural waste discharges into state waters.

CONSERVATION RESERVE ENHANCEMENT PROGRAM CREP:

Technical and financial assistance program designed to reduce sediment runoff and improve water quality by removing land from agricultural production and establishing vegetative buffers.

CAPITAL EQUIPMENT ASSISTANCE PROGRAM CEAP:

Financial assistance for new or innovative equipment that will aid in the reduction of surface runoff of agricultural wastes to state waters, improve water quality of state waters, improve manure management, separate phosphorus (P) from manure, and decrease greenhouse gas emissions.

GRASSED WATERWAY AND FILTER STRIP PROGRAM GWFS:

Technical and financial assistance to Vermont farmers for in-field agronomic best practices to address critical source areas, erosion, and surface runoff through establishment of perennially vegetated grassed waterways, filter strips, critical source area seeding, and associated infrastructure.

PASTURE AND SURFACE WATER FENCING PROGRAM PSWF:

Pasture management technical and financial assistance to Vermont farmers to improve water quality and on-farm livestock exclusion from surface waters statewide.



Before (above) and after (below) installation of heavy use area protection and clean water diversion project on a small farm in Georgia, VT through the BMP Program.



SUMMARY OF FY2018 FINANCIAL ASSISTANCE PROGRAMS

PROGRAM	STATE EXPENDITURE	TOTAL OBLIGATION	IMPACT
FAP	\$175,552	\$249,905	7162 Acres Improved
Sample FAP Practices Installed	3796 Acres : Cover Crop		Average 28% reduction in total P ¹
	716 Acres : Conservation Tillage		Average 27.5% reduction in total P ¹
BMP	\$2,516,842	\$2,875,230	87 Practices Installed
Sample BMP Practices Installed	20 Waste Storage Structures		42% reduction in total P ²
	2 Silage Leachate		1 acre of feed storage can lose as much nutrients as 120 acres of cropland ³
	15 Heavy Use Area Protection & 8 Clean Water Diversion		53% reduction in total P for barnyard runoff management ²
CREP	\$48,297	\$48,297	41.57 Acres of Cropland Buffer
Sample CREP Practices	22.1 Acres of Cropland Converted to Riparian Forest Buffer		40% reduction in total P, plus reduction from converting cropland to forest ¹
CEAP	\$469,275	\$902,400	43 Pieces of Equipment/Technology
Sample CEAP Equipment Aquired	6 Conservation Tillage Equipment		Average 27.5% reduction in total P ¹
	2 Silage Management Equipment		1 acre of feed storage can lose as much nutrients as 120 acres of cropland ³
	5 Cover Crop Equipment		Average 28% reduction in total P ¹
	1 Phosphorus Removal Technology		Estimated 86.7% removal by concentration of total P ⁴
GWFS	*New in 2018		
PSWF	*New in 2018		

¹Vermont Agency of Natural Resources, Department of Environmental Conservation - Current Methods to Measure Nutrient Pollutant Reductions

²A tool for estimating best management practice effectiveness for phosphorus pollution control. MW Gitau, WJ Gburek, AR Jarrett - Journal of Soil and Water Conservation, 2005.

³Evaluation of silage leachate and runoff collection systems on three Wisconsin dairy farms. A Wunderlin, E Cooley, B Larson, C Herron, D Frame, A Radatz, K Klingberg, T Radatz, and M Holly - Discovery Farms Wisconsin, 2016.

⁴DVO Phosphorus Recovery System Case Study-Edaleen Dairy. C Frear - Newtrient LLC, 2017.

Vermont Agency of Agriculture, Food & Markets FY 2018 Inspection and Enforcement Summary

The Vermont Agency of Agriculture, Food and Markets (VAAFAM) has developed a comprehensive approach to the regulation of farms in the State in order to best protect water resources. The approach to regulating Vermont farms addresses all size farms, providing size specific regulatory oversight from a small farm subject to regulation under the Required Agricultural Practices (RAPs) Regulations, to a Medium Farm Operation (MFO) regulated under the state's MFO General Permit, to a Large Farm Operation (LFO) regulated under a LFO Individual Permit.

In fiscal year 2018, the Regulatory Program in the Water Quality Division at the Vermont Agency of Agriculture, Food & Markets made 652 water quality compliance visits and issued 118 enforcement actions for alleged violations.



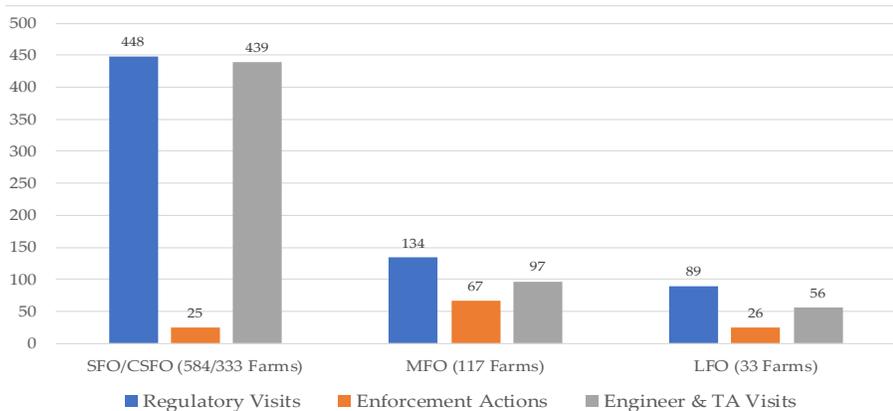
VAAFAM water quality farm specialist discusses farm practices with a farmer during an inspection.

SUMMARY OF ENFORCEMENT ACTIONS AND REFERRALS 2016-2018

YEAR	INVESTIGATIONS & INSPECTIONS	ENFORCEMENT ACTIONS	REFERRALS TO ATTORNEY GENERAL'S OFFICE	REFERRALS TO AGENCY OF NATURAL RESOURCES
2016*	379	38	1	1
2017*	505	82	2	18
2018	652	118	7	30

**Data reported for 2016 and 2017 reflect calendar year reporting, whereas 2018 data reflects state fiscal year data. Previous reporting for this work was done on a calendar year basis and is now transitioned into fiscal year reporting.*

FISCAL YEAR 2018 FARM VISITS AND ENFORCEMENT BY FARM SIZE



MONETARY PENALTIES ASSOCIATED WITH ENFORCEMENT ACTIONS

In FY 2018, VAAFAM issued 118 enforcement actions of which 30 were Notice of Violations (NOVs) which assessed associated monetary penalties totaling \$69,000.

Thirty individual cases were referred to the Agency of Natural Resources, Department of Environmental Conservation (DEC). For accurate updates on penalty amounts it is best if you contact DEC directly as AAFM coordinates on the violation and solution as opposed to the penalty amounts being assessed by ANR.

In FY 2018, VAAFAM referred 7 individual cases to the Vermont Attorney General's Office (AGO) which assessed associated monetary penalties of \$115,831.

5 FARM VISITS EVERY DAY

WATER QUALITY VISITS EVERY DAY ON AVERAGE

240 VIOLATIONS

ALLEGED VIOLATIONS ASSOCIATED WITH
118 ENFORCEMENT ACTIONS

333 CSFOs

UNDER THE NEW CERTIFIED
SMALL FARM OPERATION PROGRAM

88 APPLICATORS

CERTIFIED CUSTOM MANURE APPLICATORS

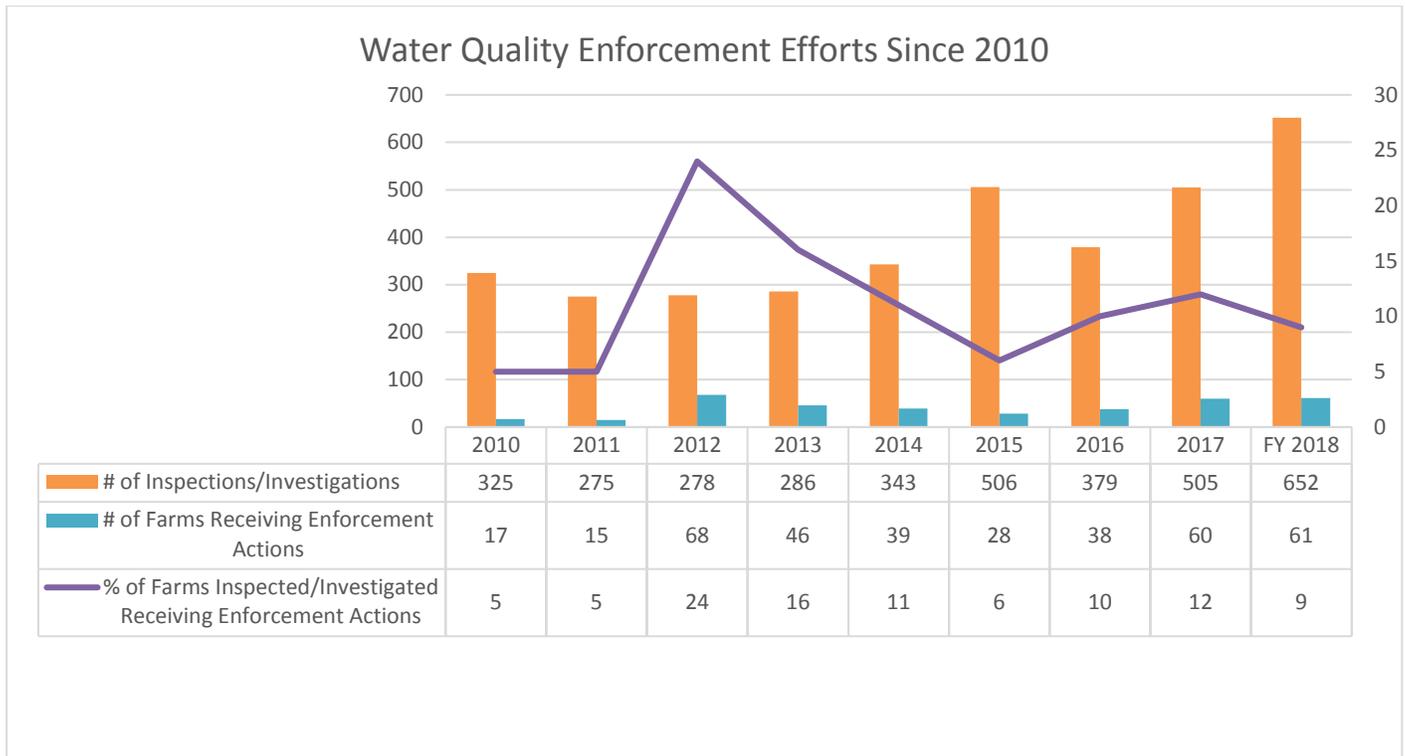
\$69,000 IN PENALTIES

PROPOSED PENALTIES FOR VIOLATIONS
ASSOCIATED WITH 30 NOTICES



VAAFAM water quality farm specialist measures the distance of an annual crop field perennial buffer during an inspection.

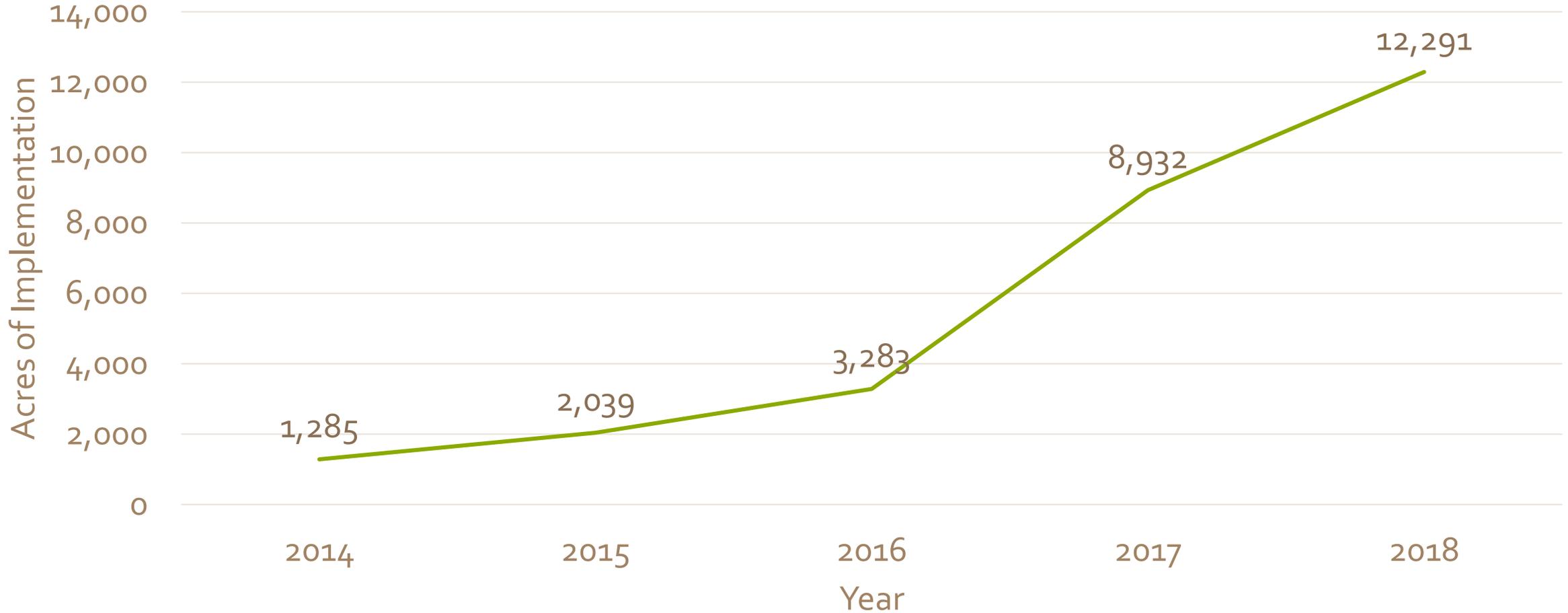
Figure 1. Water Quality Enforcement Efforts From 2010 through FY 2018.



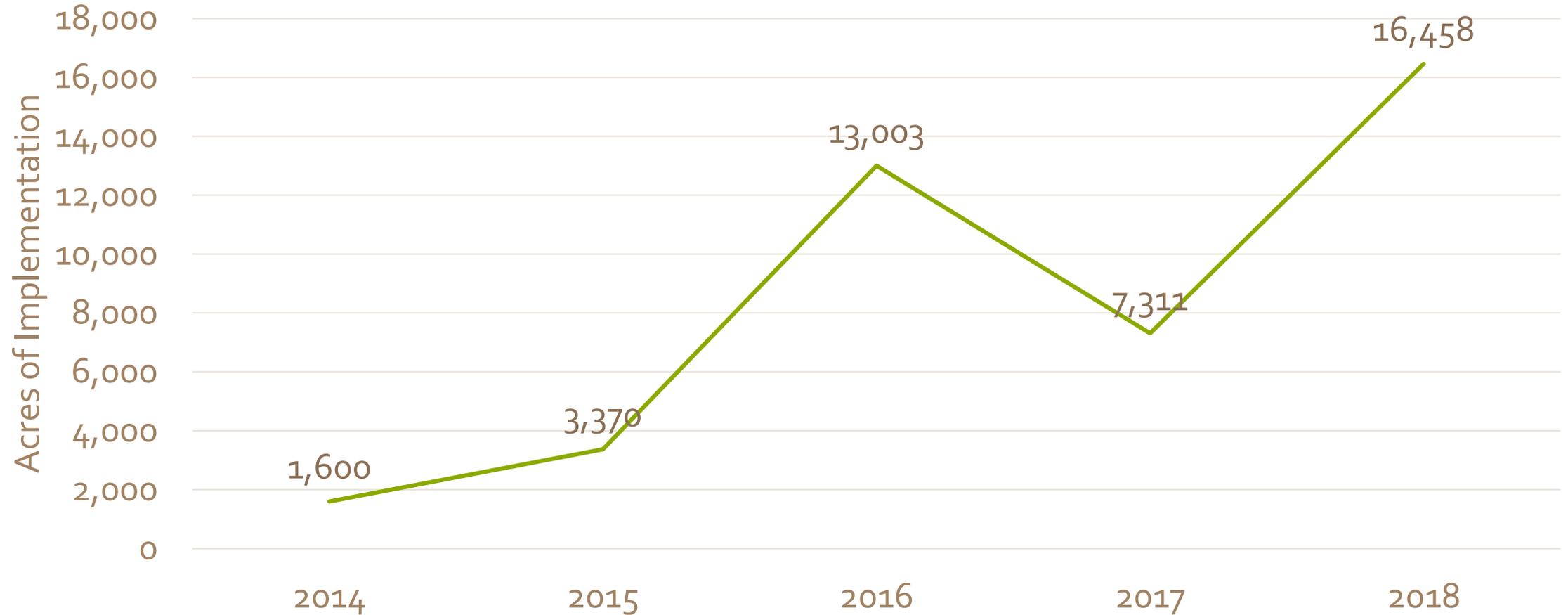


2014 - 2018
State & Federal FA For
Conservation Practice
Implementation

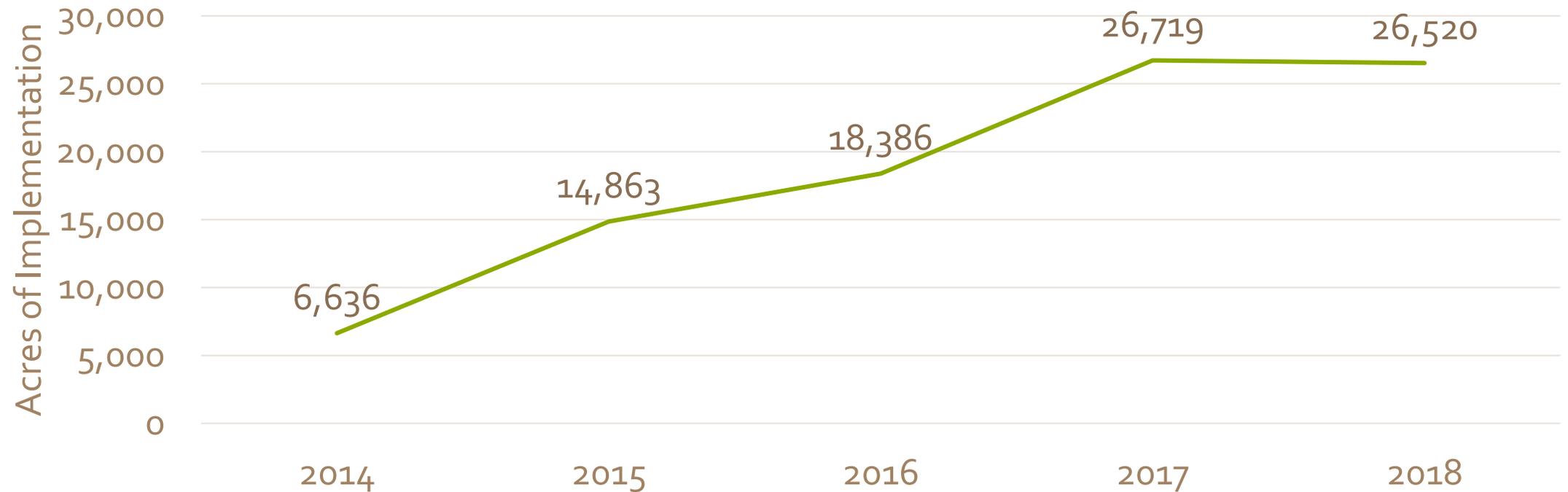
Conservation Crop Rotation



Reduced & No-Till Implementation



Cover Crop



Manure Injection

