Lake Champlain Basin Program
Draft Agenda - Executive Committee Meeting
March 21, 2019 9:45 A*M – 3:00 PM*

LCBP Office, Gordon Center House, Grand Isle, VT

9:45 AM Arrival, Networking

10:00 Introductions around the room, conference call participants

Present: Julie Moore (Chair, VT ANR), Daria Mazey (USACE), Joe Zalewski (NYS DEC, for Bob Stegemann), Stefanos Bitzikidis (QC MDDELCC, for Daniel Leblanc), Neil Kamman (Chair, TAC), John Krueger (Chair, HAPAC), Buzz Hoerr (Chair, E&O Committee) Phone: Tom Berry (Sen. Leahy), Christina Marts (NPS), MaryJo Feuerbach (EPA R1), Mario Paula (EPA R2), Joel Wood (Cong. Stefanik).

Staff: Bethany Sargent (VT ANR), Fred Dunlap (NYS DEC), Matt Cosby (USACE), Bryan Dore (EPA R1), Jane Ceraso (NEIWPCC), LCBP: Eric Howe, Meg Modley, Jim Brangan, Matt Vaughan, Ellen Kujawa, Lauren Jenness

10:15 Approval of minutes from previous meeting

ACTION ITEM: Approve Meeting Minutes from February 21, 2019 Executive Committee

- Motion By: Neil Kamman
- Second by: Buzz Hoerr
- Discussion on the motion: Neil
- Vote: All in favor.
- Abstentions: John Krueger, Julie Moore

- Congressional updates –
  - Tom Berry reported that the FY19 Appropriations Bill was signed, FY20 budget process is moving forward. The White House budget has eliminated funding in the FY20 budget for many EPA geographic programs. Joel Wood added that Congresswoman Stefanik will continue to work with her colleagues to ensure the Lake Champlain Programs are fully funded.
- Updates from partners around the table
  - Daria Mazey – Partner agreement for St. Albans Bay phosphorus study was signed. Daria added that USACE Section 542 still has funding in this program for new projects. The current unobligated balance in Section 542 is about $1.1 million, and USACE is requesting additional funds for this program.
  - Joe Zalewski – Gov. Cuomo recently announced awarding of nearly $8 million for water quality projects in the Lake Champlain basin. New funding opportunities are available for CAFO waste storage, source water buffer programs in agricultural lands, and NYS DEC and OPRHP are completing a unit management plan for the Crown Point State Park day use area.
  - Buzz Hoerr – E&O committee met to review the E&O tasks and
  - Julie Moore - SFY20 Clean Water budget continues to move through the State legislature. Many projects similar to those described by NY. S.96 is in consideration which will articulate how clean water funds will be managed. This bill does not identify long-term funding sources for the clean water fund.

Note – this agenda is a DRAFT. If you have suggestions regarding content, please communicate them to Eric Howe at ehowe@lcbp.org.

- Mario Paula - reported that VIDA (Vessel Incident Discharge Act) was passed in February. This applies to freshwater and marine water systems. There is a section within this Act that includes invasive species management in the Great Lakes and Champlain. There is an authorization for funding, but the FY19 appropriation for this authorization was zero. GLNPO needs to report to Congress by the end of the year to identify data and management gaps. Daria noted that USACE has a national AIS program and it would be good to connect on this program. Leahy asked to include Champlain in the VIDA bill. Expectation is there will be an appropriation through this authorization in FY20.
- Christina Marts– S.47 John D. Diggle Heritage Act, includes north country connector trail through northern VT. Connects trails in Addison into the Long Trail. Also established another Heritage area in the Northeast – the Finger Lakes Heritage Area, and established the "Every Kid in the Outdoors" Program, which gives families with 4th graders free access to all National parks.

- LCBP Updates – Eric welcomed Stefanos Bitzikidis, the new Lake Champlain Coordinator from Quebec Ministry of Environment (MDDELCC). Daniel Leblanc will be retiring in May and his supervisor, Nathalie Provost, will be stepping in to represent QC MDDELCC on the Steering Committee. Eric also introduced Lauren Jenness, a new LCBP staff person hired to support AIS and E&O programming and other projects as needed within LCBP. Staff also showed a recent World Water Day video

11:00 FY19 LCBP budget review

- **FY19 Process review** (LCBP staff)
  - Eric reviewed the budget development process. This process was initiated in September 2019 with the release of two Requests for Pre-Proposals (RFPP) for technical and heritage projects. Today's work will involve consideration of full proposals for both programs generated by those RFPPs.
- **FY18/19 budget adjustment** (LCBP staff)
  - Matt reviewed three projects that require additional time to complete, but would extend the project beyond the life of current funding grant agreements with EPA. MaryJo asked why NEIWPCC cannot simply request a no-cost extension on these funding grants. This option will be explored with NEIWPCC and EPA in advance of the April Steering Committee. If this is not an option then we will explore other avenues.
- **2016 Lake Champlain Phosphorus TMDL projects review (VT staff)**
  - Bethany reviewed the suite of ten projects summing to $6.6 million. Matt Cosby noted that many of these projects would be eligible for USACE Section 542 program, and that it would be worth discussing this conversation further.
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12:15 EXECUTIVE SESSION: FY19 Grant Award Review (LCBP staff)

ACTION ITEM: Motion to Enter into Executive Session to discuss FY19 Competitive Heritage grants

- Motion By: Buzz Hoerr
- Second by: Neil Kamman

Note – this agenda is a DRAFT. If you have suggestions regarding content, please communicate them to Eric Howe at ehowe@lcbp.org.

- Discussion on the motion: none
- Vote: all in favor
- Abstentions: none

- Enter into Executive Session.

- Exit Executive Session

ACTION ITEM: Approve Heritage Tasks as submitted with additional comments for Steering Committee consideration

- Motion By: Neil Kamman
- Second by: Buzz Hoerr
- Discussion on the motion: None
- Vote: all in favor
- Abstentions:

1:15 PM EXECUTIVE SESSION: FY19 Grant Award Review (LCBP staff)

- FY19 Technical Proposals
  - Reduce E&O grants by $70K to cover cost for AsRA road salt proposal.
- Exit Executive Session

ACTION ITEM: Approve Technical Tasks for Steering Committee consideration

- Motion By: Buzz Hoerr
- Second by: John Krueger
- Discussion on the motion: none
- Vote: all in favor
- Abstentions: none

2:30 PM EXECUTIVE SESSION: Committee Membership (LCBP staff)

- Heritage Committee membership nomination
- TAC Committee membership nomination

ACTION ITEM: Forward committee member nominations for Steering Committee consideration for appointment

- Motion By: Neil Kamman
- Second by: Daria Mazey
- Discussion on the motion: none
- Vote: all in favor
- Abstentions: none
- Exit Executive Session

Discussion of TAC Chairperson: Neil commented that he was appointed as interim chair until June 2019. He has enjoyed working in this capacity, and has worked to ensure that he does not demonstrate a bias toward his employer in this capacity. He works well with the TAC. Neil then exited the meeting space. Eric agreed with Neil's comments, and added that if the Committee is to consider a

government-employed person for Chair for one of the LCBP advisory committees, then the LCBP Guiding Principles document will need to be amended to allow for this.

ACTION ITEM: Motion to Enter into Executive Session to discuss nomination for TAC Chair.

- Motion By: Buzz Hoerr
- Second by: John Krueger
- Discussion on the motion: none
- Vote: all in favor
- Abstentions: none

ACTION ITEM: **Motion to change language in Opportunities for Action Appendix A, LCBP Guiding Principles, to remove limitation of Chairs of advisory committees to non-government organizations,** for Steering Committee consideration

- Motion By: Buzz Hoerr
- Second by: John Krueger
- Discussion on the motion: none
- Vote: all in favor
- Abstentions: Neil Kamman

ACTION ITEM: **Motion to nominate Neil Kamman for a 3-year TAC Chair appointment.**

- Motion By: John Krueger
- Second by: Buzz Hoerr
- Discussion on the motion:
- Vote: all in favor
- Abstentions: Neil Kamman

3:00 PM Executive Committee Meeting Adjourns

Outputs for this meeting include:

1. Approval of meeting summary from February 21, 2019 LCBP Executive Committee meeting
2. Preparation of FY19 Budget for the Lake Champlain Steering Committee
3. Advisory Committee nominations
4. Recommendation to Steering Committee to modify language the LCBP Guiding Principles document to allow government-employed advisory committee members to serve as Chairs of advisory committees.

Feb 2019 Draft FY2019 LCBP Budget

TASK #	Key Functions	Task Management	Draft 2019 TASK Request	FY2018 Approved Budget	DRAFT TASK Cumulative Total	NPS Allocation	EPA Allocation	GLFC Allocation
KF-1	VT Coordination	VERMONT	$ 161,427	$ 161,427	$161,427	$0	$161,427	$0
KF-2	NY Coordination	NEW YORK	$ 195,850	$ 195,850	$357,277	$0	$195,850	$0
KF-3	E&O Coordination	NEIWPCC	$ 180,000	$ 168,000	$537,277	$0	$126,000	$54,000
KF-4	Communication and Publications	NEIWPCC	$ 275,000	$ 258,500	$812,277	$0	$206,250	$68,750
KF-5	Technical Coordination	NEIWPCC	$ 245,000	$ 225,000	$1,057,277	$0	$220,500	$24,500
KF-6	ANS Coordination	NEIWPCC	$ 190,000	$ 161,000	$1,247,277	$0	$171,000	$19,000
KF-7	Administrative Assistance	NEIWPCC	$ 122,000	$ 105,500	$1,369,277	$15,000	$109,800	$0
KF-8	Program Direction	NEIWPCC	$ 160,000	$ 160,000	$1,529,277	$18,000	$128,000	$16,000
KF-9	Office Operations	NEIWPCC	$ 80,000	$ 80,000	$1,609,277	$1,600	$38,400	$40,000
KF-10	Resource Room	NEIWPCC	$ 185,000	$ 190,000	$1,794,277	$0	$185,000	$0
KF-11	NEI Administration	NEIWPCC	$ 195,000	$ 105,000	$1,989,277	$8,000	$156,000	$29,250
KF-12	CVNHP Coordination (includes NHA Direction)	NEIWPCC	$ 165,000	$ 165,000	$2,154,277	$172,000	$0	$16,500
KF-13	Gordon Center House rent	VERMONT	$ 18,500	$ 18,500	$2,172,777	$0	$18,500	$0
-	LCBP Computer Hardware Upgrades	NEIWPCC	$ -	$ 35,000	$2,172,777	$0	$0	$0
KF-14	**Local Implementation Grants** PP (300k) / AIS (200k) / OS (50k)	NEIWPCC	$ 550,000	$ 530,000	$2,722,777	$0	$275,000	$275,000
KF-15	Additional LCBP office space	NEIWPCC	$ 15,000	$ 15,000	$2,737,777	$0	$15,000	$0
	Funding Scenario FY2019	**EPA FY19 base**	**$4,395,000**	**$2,573,777**	Category Sum	$214,600	$2,006,727	$543,000
		EPA-2016 TMDL	**$6,600,000**					
		NPS (CVNHP)	**$299,000**					
		GLFC	**$2,400,000**					
		Total	**$13,694,000**					

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	Heritage Area Tasks	Task Management	Draft 2018 TASK Request	FY2018 Approved Budget	DRAFT TASK Cumulative Total	NPS Allocation	EPA Allocation	GLFC Allocation
H-1	CVNHP Proposals	**NEIWPCC**	**$ 175,000**	$ -	$2,912,777	$74,375	*$0*	*$100,625*
H-2	Local Heritage Grants*	**NEIWPCC**	**$ -**	$ 36,000	$2,912,777	$0	*$0*	*$0*
H-3	Interpretive Theme Grants*	**NEIWPCC**	**$ -**	$ 36,000	$2,912,777	$0	*$0*	*$0*
H-4	Quebec Regional Stakeholder Coordination*	**NEIWPCC**	**$ 2,200**	$ 2,200	$2,914,977	$0	*$0*	*$2,200*
H-5	Wayside Exhibit Program Continuation*	**NEIWPCC**	**$ 10,000**	$ 12,000	$2,924,977	$10,000	*$0*	*$0*
H-6	Annual International Heritage Summit*	**NEIWPCC**	**$ 8,000**	$ 7,200	$2,932,977	$0	*$0*	*$8,000*
		NHA Totals	**$195,200**		Category Sum	$84,375	$0	$110,825
					Balance	$25		

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		Education & Outreach	Task Management	Draft 2018 TASK Request	FY2018 Approved Budget	DRAFT TASK Cumulative Total	NPS Allocation	EPA Allocation	GLFC Allocation
1	EO-1	E&O Grant Programs (Annual EO local grants (240k), Professional Development (14k), Enhanced Outreach Grants (120k), Boots-n-Bugs 24k)	NEIWPCC	$ 478,000	$478,000	$3,410,977	*$0*	*$358,500*	*$119,500*
2	EO-2	Champlain Basin Education Initiative (CBEI) & Authentic Student Learning	NEIWPCC	$ 24,500	$24,500	$3,435,477	*$0*	*$0*	*$24,500*
3	EO-3	High School Watershed Steward Certification Program, Year 3	NEIWPCC	$ 15,000	$15,000	$3,450,477	*$0*	*$0*	*$15,000*
4	EO-4	Healthy Soils Phase 3	NEIWPCC	$ 72,000	$72,000	$3,522,477	*$0*	*$72,000*	*$0*
5	EO-5	Bioengineering and Shoreland Best Management Practices to Restore Living Shorelands and Protect Water Quality	VERMONT	$ 62,000	$62,000	$3,584,477	*$0*	*$62,000*	*$0*
6	EO-6	Production of Clean Water Videos	NEIWPCC	$ 35,000	$35,000	$3,619,477	*$0*	*$0*	*$35,000*
7	EO-7	Lake Champlain Education and Outreach Stewards	NEIWPCC	$ 60,000	$60,000	$3,679,477	*$0*	*$60,000*	*$0*
8	EO-8	StreamWise Stewardship	Vermont	$ 61,000	$61,000	$3,740,477	*$0*	*$0*	*$61,000*
9	EO-9	Economic Valuation of Clean Water and Healthy Watersheds	NEIWPCC	$ 150,000	$150,000	$3,890,477	*$0*	*$0*	*$150,000*
10	EO-10	Artist in Residence Program	NEIWPCC	$ 25,000	$25,000	$3,915,477	*$0*	*$0*	*$25,000*
			E&O Total	$ 982,500	$982,500	Category Sum	$0	$552,500	$430,000

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	Technical Tasks (Core Projects Approved 9/12/18)	Task Management	Draft 2018 TASK Request	FY2018 Approved Budget	DRAFT TASK Cumulative Total	NPS Allocation	EPA Allocation	GLFC Allocation
T-1	CORE PROJECT: Lake Champlain Boat Launch Steward Program 2018	NEIWPCC	$ 138,500	$135,000	$4,053,977	*$0*	*$121,880*	*$16,620*
T-2	CORE PROJECT: NEIWPCC-- Lake Champlain Long-Term Water Quality and Biological Monitoring	NEIWPCC	$ 150,000	$134,500	$4,203,977	*$0*	*$150,000*	*$0*
T-3	CORE PROJECT: VERMONT DEC - Lake Champlain Long-Term Water Quality and Biological Monitoring	VERMONT	$ 264,857	$239,478	$4,468,834	*$0*	*$264,857*	*$0*
T-4	CORE PROJECT: New York DEC - Lake Champlain Long-Term Water Quality and Biological Monitoring	NEW YORK & SUNY-Plattsburgh	$ 185,000	$185,000	$4,653,834	*$0*	*$185,000*	*$0*
T-5	CORE PROJECT: Monitoring Cyanobacteria in Lake Champlain	NEIWPCC-LCC	$ 80,000	$72,000	$4,733,834	*$0*	*$80,000*	*$0*
T-6	CORE PROJECT: Water Chestnut Management Partnership - Lake Champlain Basin	VERMONT	$ 90,000	$75,000	$4,823,834	*$0*	*$0*	*$90,000*
T-7	CORE PROJECT: LCBP Enhanced Grant Awards for Pollution Prevention	NEIWPCC	$ 750,000	$464,256	$5,573,834	*$0*	*$562,500*	*$187,500*
T-8	CORE PROJECT: Aquatic Invasive Species Rapid Response Fund	NEIWPCC	$ 69,900	$75,000	$5,643,734	*$0*	*$0*	*$69,900*
T-9	CORE PROJECT: WWTF Optimization in Lake Champlain Basin	VT/NY	$ 260,000	$125,000	$5,903,734	*$0*	*$260,000*	*$0*
T-10	CORE PROJECT: NY Lake Champlain Basin Agronomy Support and Agriculture BMP Implementation	NEIWPCC	$ 160,000	$158,000	$5,803,734	*$0*	*$160,000*	*$0*
T-10	Web-Hosting for Farm-Prep Tool	NEIWPCC-Stone Environmental	$ 26,400		$5,930,134	*$0*	*$0*	*$26,400*

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T-10	Tile Filtration Project - Year Two	**NEIWPCC-Watershed Consulting**	**$ 10,000**		$5,813,734	*$0*	*$0*	*$10,000*
T-11	Tile Filtration Project - Year Two	**NEIWPCC-Stone Environmental**	**$ 40,000**		$5,970,134	*$0*	*$0*	*$40,000*
	TECHNICAL PROJECTS TBD				$5,970,134	*$0*	*$0*	*$0*
	TECHNICAL PROJECTS TBD				$5,970,134	*$0*	*$0*	*$0*
	TECHNICAL PROJECTS TBD				$5,970,134	*$0*	*$0*	*$0*
	TECHNICAL PROJECTS TBD				$5,970,134	*$0*	*$0*	*$0*
		Tech Total	**$ 2,224,657**		Category Sum	*$0*	*$1,784,237*	*$440,420*

EPA FY19 base	**$4,395,000**	**$ 51,536**	Total Budget	$298,975	$4,343,464	$1,524,245
EPA-2016 TMDL	**$6,600,000**					
NPS (CVNHP)	**$299,000**	$25				
GLFC	**$2,400,000**	$875,755				

LCBP 2016 TMDL Implementation Funds Process

Timeline Updated January 30, 2019

Lake Champlain TMDL implementation projects will be developed and approved for funding through the following process:

- VT DEC's **Water Innovations Team**, with input from the Agency of Agriculture, Food, and Markets, and the DFW, and DFPR develops a package of priority TMDL implementation projects. LCBP SC will have an opportunity to provide selection criteria priorities for the projects – December 2018

- **LC TMDL Subcommittee** of the LCBP Steering Committee reviews the package to ensure projects meet the established TMDL implementation project criteria for EPA approval (see attached) – January 2018

- **LCBP TAC** (and other committees as appropriate) review the project package and provide comments/suggestions to promote alignment with the larger work of the Basin Program – February 2019

- **Water Innovations Team** updates project package based on committee review and prepares a final package of priority TMDL implementation projects. VT ANR will provide context (e.g., state resources available for TMDL implementation) for the projects selected for LCBP TMDL funding to EC and SC – March 2019

- **Executive Committee** reviews the project package and LCBP committee input and makes a recommendation for allocation of project lead, and attendant budget, between the State of Vermont and LCBP – March 2019

- **Steering Committee** reviews allocation of projects, and attendant budget, recommended by the Executive Committee and votes on final project package – April 9-10, 2018

LCBP 2016 TMDL Implementation Funds

Activities eligible for Lake Champlain Basin Program funding for Lake Champlain 2016 TMDL implementation

Expected appropriation language: The bill provides $X (may be up to $11M) for the Lake Champlain program. From within the amount provided, $4,399,000 shall be allocated in the same manner as fiscal year 2017 and $X (may be $6.6M) shall be for otherwise unmet needs, necessary to implement the Agency's 2016 Phosphorus Total Maximum Daily Load Plan for Lake Champlain for projects and work identified in the State implementation plan.

Priority should be given to cost-effective projects that are expected to significantly reduce phosphorus loading to Lake Champlain.

TMDL implementation activities must:

- Help achieve implementation of goals, objectives and strategies in Opportunities for Action, An Evolving Plan for the Future of the Lake Champlain Basin (2017);

- Help to achieve implementation activities in the Vermont Lake Champlain Phosphorus TMDL Phase 1 Implementation Plan (Phase 1 plan) or Lake Champlain TMDL-related measures in the Phase 2 Tactical Basin Plans (Phase 2 plans);

- Include measurable outputs and outcomes;

-Address unmet needs necessary to implement the Vermont Phase 1 or Phase2 plans.

Eligible activities include:

- Installation of best management practices, improvement to wastewater practices, or the restoration of natural processes that are expected to achieve a quantifiable reduction of phosphorus loading into Lake Champlain (Recommended priority for use of funds);

- Planning and/or design projects necessary to carry out activities in Phase 1 and Phase 2 plans that will lead to implementation and anticipated reductions;

- Education and outreach tasks that are identified in the Phase 1 plan, or that are included as a project component, if necessary, to carry out the installation or effective use of phosphorus reduction practices;

- Applied research to evaluate the effectiveness of, or further develop and demonstrate, promising new or innovative phosphorus reduction technologies or approaches, with preference for those that are likely to have immediate applicability for Lake Champlain.

Funds may not be used to implement activities required by a federal Order.

2019 VTANR TMDL IMPLEMENTATION PROJECT PRIORITY LIST - 3-13-2019

Project #	Project	Projected Cost	Project Summary
1	Floodplain Restoration and Functional Assessment	$ 600,000	Develop and apply an integrated tool to improve identification and prioritization of natural resource conservation and restoration projects in a publicly accessible mapping platform, culminating in a demonstration project in the Missisquoi River basin.
2	Using GSI (Green Stormwater Infrastructure) and Other Technologies to Reduce Combined Sewer Overflows (CSOs)	$ 1,100,000	Implementation of innovative practices to reduce the volume and frequency of CSOs, including: targeted infiltration-based stormwater treatment practices within existing CSO service areas, in order to reduce the frequency, duration and volume of CSO overflow events; and implementation of a "smart CSO management system" (e.g., data infrastructure, monitoring equipment) to maximize storage in existing pipe infrastructure and eventual treatment of combined wastewater within the CSO system. This project includes $187,500 for personnel to support grant management and adminstration.
3	Internal Loading Assessment and Modeling Study on Missisquoi Bay	$ 250,000	Identify phosphorus-rich areas within the riverine deltas and elsewhere in Missisquoi Bay and evaluate options for in-lake phosphorus management to reduce ongoing loading from these sediments.
4	Design and Construction of Green Stormwater Infrastructure at Public Schools in the Lake Champlain Basin in Vermont	$ 1,100,000	Public schools will be incentivized to comply with the state's upcoming 3-acre impervious surface stormwater general permit by designing and constructing green stormwater infrastructure (GSI), resulting in reduced phosphorous loading to Lake Champlain. Schools will be required to integrate into their teaching curriculum the role of GSI in improving water quality.
5	Implementation Support Program for Forestry Accepted Management Practices	$ 450,000	Enhance implementation of the Accepted Management Practices (AMPs) for forestry through: development handheld app and improved mapping for AMP implementation and tracking; expanding a cost share program for skidder bridges; targeted replacement of certain prioritized culverts and bridges; and related outreach/training work.
6	Nutrient Load Source Identification in the Lake Carmi Watershed	$ 200,000	Integrated monitoring and inventory program for identification and prioritization of potential sources of phosphorus loading in the Lake Carmi watershed, including: near-lakeshore groundwater sources, tributary streams, tile drains, and private roads.
7	Farm Agronomic Practices (FAP) Program	$ 475,000	Funding for farms to implement soil-based agronomic practices to improve soil quality, increase crop production and reduce erosion and agricultural discharges; this includes $100,000 for a CREP position and $100,000 for an Engineer position
8	Program to Expand and Accelerate Wetland Conservation and Restoration in Vermont's Champlain Basin	$ 1,325,000	Enhance implementation of land acquisition projects directed at sites in the Champlain Basin where land management changes can be made to enhance and restore wetlands that will have a myriad of co-benefits including but not limited to water quality enhancements, wildlife habitat improvements and increased public access opportunities. Includes $100,000 for personnel.
9	Municipal Grants-In-Aid Road-Runoff Reduction and Treatment Program	$ 1,000,000	Enhanced funding for a grant-in-aid program for use by towns to expedite implementation of BMPs necessary to meet the Municipal Roads General Permit.
10	Enhanced Implementation of Vermont Environmental Stewardship Program	$ 100,000	Enhance pilot program evaluation tools for VESP to ensure farm assessments and standards are tied to state water quality standards; add additional metrics to quantify associated ecosystem services, provide valuation for ecosystem services.
	TOTAL	**$ 6,600,000**	

	Project Management	**Funding Subtotals**	**FFY19 Personnel**
	LCBP (3, 6)	$ 450,000	
	AAFM (7, 10)	$ 575,000	$ 200,000 (35%)
	DEC (1, 2, 4, 9)	$ 3,800,000	$ 187,500 (5%)
	FWD (8)	$ 1,325,000	$ 100,000 (8%)
	FPR (5)	$ 450,000	
		$ 6,600,000	
	ANR	$ 5,575,000	$ 287,500 (5%)

Lake Champlain Basin Program
FFY19 LC TMDL Implementation Project Description

TITLE: Floodplain Restoration and Functional Assessment

ONE SENTENCE ABSTRACT: Develop and apply an integrated tool to improve identification and prioritization of natural resource conservation and restoration projects in a publicly accessible mapping platform, culminating in a demonstration project in the Missisquoi River basin.

POINT OF CONTACT: Mike Kline, VTDEC Rivers Program Manager, (802) 490-6155, mike.kline@vermont.gov

DESCRIPTION OF PROJECT SCOPE, OUTPUTS, OUTCOMES, AND TIMEFRAME:

The Lake Champlain TMDL identifies unstable streams as the source of approximately 20% of the nutrient loading causing water quality impairment in segments of the lake. Vermont's extensive stream geomorphic assessments indicate channel incision and the loss of floodplain and wetland function are the primary causes of stream instability. Nutrient loading is attributable to both the reduction in fine sediment deposition on floodplains at or above the annual flood stage and the increased vertical and lateral channel adjustments that occur when larger floods are contained within incised and steepened streams.

Tens of millions in public and private dollars are spent on an average annual basis in the Lake Champlain Basin trying to keep streams and rivers from moving and contain them within the channel during floods to keep adjacent lands dry and protect property and infrastructure placed in the river corridor. The socio-economic drivers that led to these drainage practices have been the settlement of riversides for arable land and the development of mill works, roadways, and other settlements. This decades-long effort to reduce inundation flooding by blocking floodplains and draining the land has significantly increased fluvial erosion.

Resource managers have seen the benefit-cost of stream channelization shift in recent decades – the benefits of functioning floodplains, such as hazard mitigation, fish and wildlife habitat, and water quality benefits have become clearer as the costs of repeated channel dredging, berming, and armoring have become untenable to the landowner. An innovative application of the natural and social sciences is being proposed in Vermont, as an advancement of its Lake Champlain TMDL Phase 1 Implementation Plan, with the goal of shifting annual public and private expenditures in river and floodplain management from post-flood channelization and structural stormwater practices to the reconnection of streams and rivers with functioning floodplains and wetlands. The strategic divestiture and restoration of key floodplains and riparian wetlands to reduce flood damage and attenuate storm-related sediment and nutrient loads will be accelerated through this project.

The River and Floodplain Management Section of the Phase 1 Implementation Plan centers on resolving conflicts between human investments and the dynamics of rivers in an environmentally and economically sustainable manner (see pp. 70-76). It specifically identifies "managing rivers toward equilibrium conditions and allowing access to floodplains by avoiding the development of buildings, roads, and other investments in the floodplain or river corridor, provides for climate adaptation and reduces sediment transport and phosphorus pollution." In addition, this project directly aligns with the 2016 Missisquoi Bay Tactical Basin Plan, Table 16. Summary of Implementation Actions, River Corridors Section (see p. 100).

This project contributes to OFA goals IA1a. Increase accessibility of data on Lake Champlain – by increasing accessibility to much needed improved floodplain data. Additionally, goals IC1a. Fund projects to improve bank stability in critical areas of the watershed and IC1b. Fund programs to

protect or enhance river corridors for nutrient reduction and flood resilience – will be addressed by identifying areas in need of restoration and implementing two demonstration projects.

Outputs:

- **Develop floodplain functions maps.** Using remote sensing, field, and modelling data[1] develop four base map products for the Lake Champlain Basin in Vermont: (1) Floodplain (Vertical/Lateral) Connectivity; (2) Stream (Longitudinal) Connectivity; (3) Floodplain-Channel Hydrology and Hydraulics; and (4) Floodplain Wetlands, Soils, and Geology). These layers will facilitate the evaluation of the ten natural floodplain functions[2] and their associated socio-economic values.
- **Identify strategic floodplain/wetland restoration and protection practices.** Further parameterize the floodplain functions base maps to identify key watershed opportunities to reconnect rivers and floodplains and restore the natural landscape processes that attenuate stormwater, sediments, and nutrients.
- **Conduct socio-economic evaluations and public outreach.** Develop, using ARC-GIS, those metrics that would allow the public to see and understand the existing status and potential value of functioning floodplain, wetlands and equilibrium (stable-least erosive) stream conditions in their watershed and the benefit-cost of strategic restoration and protection practices[3].
- **Implement two floodplain/wetland restoration and protection practices** in cooperation with VTrans and a municipality in meeting their obligations to remediate stormwater-related nutrient loading. These projects could serve as proof of concept for a program that would provide stormwater treatment credits through the restoration of natural floodplain and wetland functions, which could be an innovative mechanism in Vermont's efforts to retrofit existing impervious surfaces and implement nutrient TMDLs.
- **Estimated phosphorus load reductions achieved through floodplain/wetland restoration and protection.** While we do not yet have the capacity to account for the phosphorus load reduction achieved through floodplain and wetlands restoration, we will track the necessary data and anticipate this capacity within the project timeline.

Outcomes:

Anticipated environmental outcomes include a reduction in phosphorus loading, increased flood resilience, improved fish and wildlife habitat, and enhanced public recreational opportunities. In addition, this project will improve public and partner knowledge of the benefits of implementing strategic floodplain/wetland restoration and protection practices.

Timeline: October 1, 2019 – September 30, 2022

REQUEST AMOUNT: $600,000

[1] Research is either underway or conceptualized (seeking additional funding) to provide the correlations between modelled floodplain and channel hydraulics data, the erosion and deposition of sediments (and nutrients), and more readily available stream geomorphic data. With these relationships, Vermont may be able to infer hydraulic characteristics with less expensive remote sensing and field collected data.

[2] Ten natural floodplain functions include: 1) maintaining water quality, 2) connecting organisms, 3) moving materials, 4) mitigating flood stage, 5) dissipating energy, 6) stabilizing riverbanks, 7) groundwater exchange, 8) accommodating movement, 9) habitat mosaics, 10) carbon storage

[3] This has been previously described in part as the "*Reconnect Vermont Rivers Campaign."*

BRIEF BUDGET EXPLANATION:

	Federal Funds Requested	Ecosystem Restoration Funds (State) Secured
• Develop Floodplain Functions Maps	$200,000	$50,000
• Identify Strategic Floodplain/Wetland Restoration and Protection Practices	$50,000	$50,000
• Conduct Socio-Economic Evaluations and Public Outreach	$75,000	
• Implement Two Floodplain/Wetland Restoration and Protection Practices	$275,000	

Lake Champlain Basin Program
FFY19 LC TMDL Implementation Project Description

TITLE: Using GSI (Green Stormwater Infrastructure) and Other Technologies to Reduce Combined Sewer Overflows (CSOs)

ONE SENTENCE ABSTRACT: The purpose of this project is to employ new best management and technological approaches to reduce or improve the quality of stormwater runoff from developed lands that drain into or from combined sewer systems (CSS) areas.

POINT OF CONTACT: Vermont Department of Environmental Conservation, Terisa Thomas, Water Infrastructure Finance Supervisor, 802-249-2413, terisa.thomas@vermont.gov

DESCRIPTION OF PROJECT SCOPE, OUTPUTS, OUTCOMES, AND TIMEFRAME:
The purpose of this project is to employ new best management and technological approaches to reduce or improve the quality of stormwater runoff from developed lands that drain into or from combined sewer systems (CSS) areas. Stormwater treatment practices designed to treat runoff separated in conjunction with or after CSS separation projects or Sanitary Sewer Overflow (SSO) remediation projects also would be eligible for funding assistance on a competitive basis. Finally, technologies such as Smart Data Infrastructure/real time control (RTC) or Hydraulics and Hydrology (H&H) studies to inform RTC, roof disconnection surveys as well as associated green roofs, blue roofs or cisterns/alternate roof drain plumbing would be eligible for funding assistance. Typical grey infrastructure such as underground detention tanks and associated piping would not be eligible for funding under this RFP.

Combined sewer separation is expensive and CSO Long Term Control Plans (LTCP) can utilize GSI to disconnect and infiltrate stormwater runoff before runoff enters CSSs, which can minimize risk of CSOs in a cost-effective manner. Green roofs and blue roofs can hold and detain rainfall releasing it slowly into a CSS decreasing the frequency of CSO events. RTC monitoring can lead to collection system optimization again reducing or eliminating the occurrence of CSO events.

All projects supported with these funds serve the primary purpose of implementing the 2016 Lake Champlain TMDLs to reduce phosphorus. An average 20% developed land phosphorus reduction is required in these Lake Champlain segments from developed lands and this RFP will help achieve that reduction by providing stormwater treatment for developed lands currently untreated. The City of Burlington is required to reduce their CSO phosphorus load from the Main WWTP by 11%. Table 12 of the Phase 1 Implementation Plan summarizes the TMDL implementation activities to be tracked and accounted for in the Wasteload and Load Allocation categories. Included among these are the annual average load reduction achieved through stormwater best management practice implementation in CSO drainage areas relative to the Developed Lands Baseload and CSO Wasteload Allocation. This project will provide funding for a second two-year period following a first RFP: *Using Green Stormwater Infrastructure (GSI) to address Combined Sewer Overflow (CSO) Mitigation.*

This project will target developed lands draining to CSSs. Seven of the 14 towns with CSOs or SSOs in Vermont are in the Lake Champlain basin. In 2017 (last full year of record) 159 of 161 (99%) CSO or SSO events statewide occurred in the Lake Champlain basin. As of 9/1/2018 114 of 118 events (97%) occurred in the Lake Champlain Basin. CSO events release phosphorus and pathogen pollution into Vermont's surface waters, trigger beach closures, increase the health risk to the public, and violate Vermont Water Quality Standards.

Outputs

- Complete final design plans and specifications (as needed) and bid and construct GSI or other rainwater harvesting stormwater treatment practices that slow, infiltrate, and/or treat stormwater runoff from roads and other impervious developed lands and/or disconnect impervious surfaces from CSS areas.
- Acquire and install monitoring and smart valve equipment for RTC.
- Conduct H&H studies or roof top disconnection studies to inform LTCPs.
- Report stormwater treatment practice construction to the State using the State-provided reporting templates.
- Identify responsible party to operate and maintain stormwater treatment practices for a minimum of ten years and submit signed operation and maintenance agreement to the State for approval.

Municipalities would be eligible to respond to the RFP, with the State prioritizing municipal proposals that utilize existing CSO LTCPs, H&H studies or stormwater assessments for project selection; involve construction of projects with the greatest phosphorus pollutant reduction potential; comprehensively integrate GSI into the practice design; and are cost-effective. The State would track projects constructed and estimate phosphorus pollutant reductions accomplished by stormwater treatment practices.

Pollutant reductions would count toward the State's phosphorus reduction targets and support municipalities implementing CSO Long Term Control Plans under the Vermont Lake Champlain Phosphorus Total Maximum Daily Loads (TMDLs) Phase I Implementation Plan (Phase 1 Plan). This proposal also aligns with the Phase 1 Plan, Table 1b. Vermont Phase 1 TMDL Plan Summary of Vermont Commitments, Section B. Non-regulatory Stormwater Management, task Use Green Stormwater Infrastructure to reduce impacts from stormwater runoff on page 14.

This proposal supports the Lake Champlain Basin Program Opportunities for Action (OFA) objective 1.C. to reduce nutrient loading through strategy I.C.3. to fund programs to reduce nutrient inputs from developed lands under the following task areas:

- I.C.3.b: Fund research and implementation programs to reduce effective impervious surface area. Address nutrient runoff from impervious surface areas in critical watersheds, incorporating predicted effects of climate change on precipitation events.
- I.C.3.c: Fund design and implementation of GSI/low impact development (LID) projects in critical areas. Support a grant program targeting design and installation of GSI projects in critical watersheds.

Outcomes

- Reduced stormflows and associated phosphorus pollution from developed lands.
    - 15-20 acres of impervious surface treated[1], with a reduction of 7-9 kilograms of total phosphorus load delivered to Lake Champlain per year[2]
- Reduced CSO events and associated beach closures, bacteria pollution, and violation of Vermont Water Quality Standards.
- Reduced flooding associated with stormflows from developed lands.
- Reduced urban heat effect.
- Improved urban environmental quality.

[1] Estimated by assuming cost of $50,000 per acre of impervious treated and based on $912,500 available.

[2] Estimated by assuming treatment of 15-20 acres of impervious treated based on developed lands impervious pollutant loading rates in the Main Lake segment with stormwater treatment practices designed to achieve minimum of 50% annual average reduction in total phosphorus load. Actual estimated phosphorus pollutant reductions will range depending on practice type, specifications (e.g., storage volume, area treated, infiltration rates), and location.

Timeframe: October 1, 2019 – December 31, 2021

REQUEST AMOUNT: $1,100,000

BRIEF BUDGET EXPLANATION: $912,500 would be available through the RFP, with the remaining $187,500 for personnel to support LC TMDL implementation project management and administration.

Lake Champlain Basin Program
FFY19 LC TMDL Implementation Project Description

TITLE: Internal Loading Assessment and Modeling Study on Missisquoi Bay

ONE SENTENCE ABSTRACT: Identify phosphorus-rich areas within the riverine deltas and elsewhere in Missisquoi Bay and evaluate options for in-lake phosphorus management to reduce ongoing loading from these sediments.

POINT OF CONTACT: Perry Thomas, VTDEC Lakes and Ponds Program Manager, perry.thomas@vermont.gov, (802) 490-6198

DESCRIPTION OF PROJECT SCOPE, OUTPUTS, OUTCOMES, AND TIMEFRAME:
Intense, prolonged cyanobacteria blooms in Lake Champlain's Missisquoi Bay during the summers of 2017 and 2018 not only caused major disruptions to recreation but also produced cyanotoxins that are a threat to the health of humans, domestic animals, and wildlife in both the U.S. and Canada. High phosphorus concentrations are likely the primary cause of these cyanobacteria blooms. Limnotech's (2012)[1] mass balance model for Missisquoi Bay indicated a substantial phosphorus release from the sediment each summer (26 metric tons, see below).

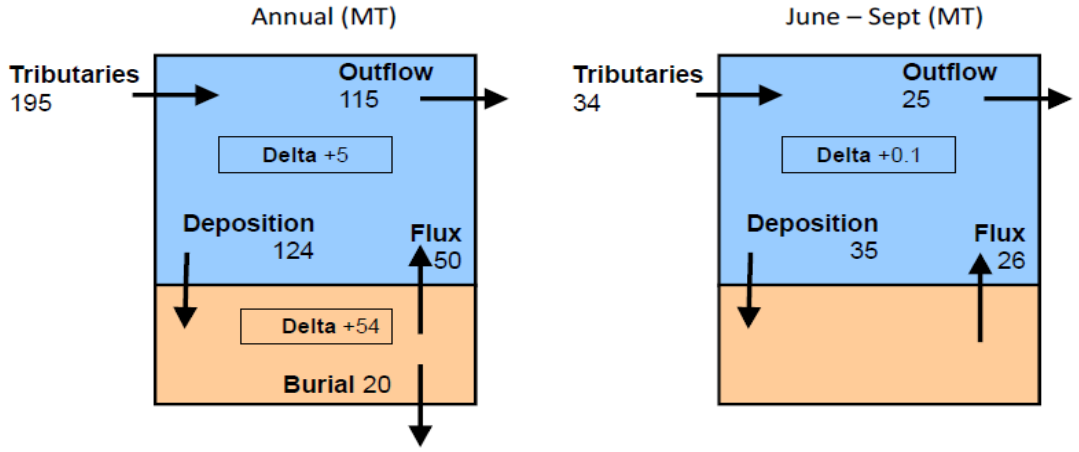

Figure 1. Summary of average mass balance model for 2001 - 2010 (from Limnotech 2012).

VTDEC proposes a scoping study to: 1) evaluate alternative approaches to managing internal phosphorus loading in Missisquoi Bay and 2) provide estimates of when in-bay treatments would be appropriate given projections for reduction of watershed loading.

This project is similar in concept to the phosphorus management study of inner St. Albans Bay, as recently contracted with the U.S. Army Corps of Engineers and described in the Lake Champlain TMDL Phase 1 Implementation Plan, Chapter 6, Section G, pages 123–125. In the case of Missisquoi Bay, the plan of approach is informed by Limnotech's 2012 analysis and recommendations.

Outputs

1. A map of potential phosphorus hotspots in the bay based on expanded water sampling data and sediment core analyses.
2. Hydrologic and hydraulic analyses of the Missisquoi River and Bay to support modeling of phosphorus dynamics.

[1] Limnotech (2012). Development of a phosphorus mass balance model for Missisquoi Bay. Technical Report No. 65. Lake Champlain Basin Program.

3. Determination of how high phosphorus concentrations are attenuated through the bay, based on intensive monitoring during high flow events.
4. An integrated model, linking the watershed model with the bay model.
5. Evaluation of alternative approaches for removal/treatment of phosphorus.
6. Assessment of external load reduction scenarios to determine a practical timeline for deployment of in-bay phosphorus removal/treatment approach(es).

Outcomes
Visualization tool(s) that allow(s) lake managers to select and optimize strategies for mitigation of internal phosphorus loading in Missisquoi Bay under different watershed loading scenarios.

Timeline
October 1, 2019 – September 30, 2021
Year 1: Field and laboratory work, analysis of data, initial modeling
Year 2: Modeling, visualization, and reporting

This project aligns with Opportunities for Action Objective I.A. Improve scientific knowledge and understanding of water quality conditions and trends in Lake Champlain and the effectiveness of management approaches, Strategy I.A.1: Fund and Interpret Management-oriented Research, Task Areas I.A.1.a: Increase accessibility of data on Lake Champlain and I.A.1.b: Support innovative management approaches likely to achieve results.

The Lake Champlain TMDL Phase 1 Implementation Plan describes the need for enhanced implementation in the Missisquoi Bay watershed to achieve the 25 µ/L water quality criterion in the bay due to high rates of present-day phosphorus loading from the watershed and legacy phosphorus in the bay's sediment. This study would allow lake managers to select and optimize strategies to mitigate this internal phosphorus loading. In addition, this project aligns with the 2016 Missisquoi Bay Tactical Basin Plan Table 16. Summary of Implementation Actions, Other: Monitor and assess surface waters to gain better understanding of condition and potential pollution sources, including internal phosphorus loading in lakes (see page 102).

REQUEST AMOUNT: $250,000

BRIEF BUDGET EXPLANATION:

Fieldwork:	10% or $25,000
Laboratory analyses:	20% or $50,000
Analysis:	20% or $50,000
Modeling:	30% or $75,000
Visualization:	10% or $25,000
Reporting:	10% or $25,000

Lake Champlain Basin Program
FFY19 LC TMDL Implementation Project Description

TITLE: Design and Construction of Green Stormwater Infrastructure at Public Schools in the Lake Champlain Basin in Vermont

ONE SENTENCE ABSTRACT: Public schools will be incentivized to comply with the state's upcoming 3-acre impervious surface stormwater general permit by designing and constructing green stormwater infrastructure (GSI), resulting in reduced phosphorous loading to Lake Champlain. Schools will be required to integrate into their teaching curriculum the role of GSI in improving water quality.

POINT OF CONTACT: Vermont Department of Environmental Conservation, Terisa Thomas, Water Infrastructure Finance Supervisor, 802-249-2413; Terisa.Thomas@vermont.gov

DESCRIPTION OF PROJECT SCOPE, OUTPUTS, OUTCOMES, AND TIMEFRAME:

The State of Vermont is preparing to release the three-acre or greater impervious surface stormwater permit for managing phosphorus and sediment discharges from properties in the Lake Champlain Basin. Over eighty K-12 public schools may be affected and therefore would need to start complying with the permit requirements by 2023. Developing the general permit to address stormwater from existing developed lands equal to or greater than three acres is a commitment outlined in Table 1a of the Phase 1 Implementation Plan.

To help schools prepare, VTDEC has allocated $100,000 to conduct stormwater assessments in 2019 at "early adopter" schools that wish to take advantage of this funding. At no cost to the schools, these assessments will collect stormwater-related information about the entire property and determine what next steps, if any, would be needed to comply with the 3-acre permit.

This LCBP funding would support additional assessment and preliminary design and final design and construction of green stormwater infrastructure (GSI) at schools in the Lake Champlain Basin in Vermont that are ready to proceed with meeting the permit requirements. Some schools may already have designs in place and therefore only need funds for implementation; other schools may be starting from scratch.

The Facilities Engineering Division (FED) within DEC will manage the Green Stormwater Schools Initiative, providing outreach and technical assistance based on each school's needs for permit compliance. The program will also work with schools and their partners to explore educational opportunities related to the installation of green stormwater infrastructure, such as an outdoor classroom.

Outputs

- 26 schools in the Lake Champlain Basin in Vermont make progress toward complying with the 3-acre permit through design and/or construction of GSI
    - Assessment and preliminary design
    - Final design and construction of stormwater treatment practices for a minimum of 6 public school systems

Outcomes
The resulting outcomes will be phosphorus reduction at those schools where construction is completed, and progress toward phosphorus reduction at schools that complete stormwater designs in compliance with the 3-acre permit. An anticipated total phosphorus load reduction achieved, once all projects are constructed, for 25 schools treating a minimum of 3 impervious acres (75 impervious acres total minimum) is estimated at 70 kg/year baseload (based on Main Lake direct drainage loading rate for developed impervious), assuming a minimum BMP efficiency of 50% would result in a minimum of 35 kg/yr total phosphorus reduction once all projects are constructed.

An additional outcome is students, teachers, and administrators increase knowledge of GSI as a means to address stormwater runoff.

This proposal supports the Lake Champlain Basin Program Opportunities for Action (OFA) objective 1.C. to reduce nutrient loading through strategy I.C.3. to fund programs to reduce nutrient inputs from developed lands under the following task areas:

- I.C.3.b: Fund research and implementation programs to reduce effective impervious surface area. Address nutrient runoff from impervious surface areas in critical watersheds, incorporating predicted effects of climate change on precipitation events.
- I.C.3.c: Fund design and implementation of GSI/low impact development (LID) projects in critical areas. Support a grant program targeting design and installation of GSI projects in critical watersheds.

Timeframe
October 1, 2019 – September 30, 2022

REQUEST AMOUNT: $1,100,000

BRIEF BUDGET EXPLANATION:

Assessment and Preliminary Design[1] – $200,000
Final Design and Construction[2] – $900,000

[1] Estimated using an average of $10,000 for assessment and preliminary design per school.
[2] Estimated by assuming a cost of $50,000 per acre of impervious treated.

Lake Champlain Basin Program
FFY19 LC TMDL Implementation Project Description

TITLE: Implementation Support Program for Forestry Accepted Management Practices for the Lake Champlain Watershed

ONE SENTENCE ABSTRACT: Enhance implementation of the Accepted Management Practices (AMPs) for forestry through: development handheld mobile application and improved mapping for AMP implementation and tracking; expanding a cost share program for skidder bridges; targeted replacement of certain prioritized culverts and bridges; and related outreach/training work.

POINT OF CONTACT: Vermont Department of Forests, Parks and Recreation (FPR), Dave Wilcox, Watershed Forester, 802-793-0265, david.wilcox@vermont.gov

DESCRIPTION OF PROJECT SCOPE, OUTPUTS, OUTCOMES, AND TIMEFRAME:

This support program will augment existing outreach, education and grant programs available to Vermont's forest economy. There are three main target areas for increasing implementation of AMPs.

1. Equip logging contractors, foresters and landowners to increase the understanding, skill and accuracy with which they implement practices and standards. This will be accomplished by use of technology, physical equipment such as temporary skidder bridges and training in practices that promote protection of water quality in terms of hazardous materials used in logging operations.

2. Improve landowner, forester, and logging contractor awareness of forestry practices that protect water quality through contracted outreach by partners.

3. Replace undersized culverts, bridges and other infrastructure that are currently causing erosion on state forestland to reduce risks of future discharges and improve stream habitat, while maintaining public access for recreation and forest management operations.

Outputs

- The development of a technical mobile application that would allow digital access to the AMP manual in the field, as well as allow the user to complete calculations for permanent and temporary bridge and culvert installations and water-bars using a smart phone for readings, measurements and GPS capabilities. Additionally, it will also include a mapping component to increase AMP planning and implementation.
- Increase availability and ownership of temporary skidder bridges by logging contractors by adding more steel bridges that have a longer lifespan and can be utilized in diverse applications.
- Provide supplies and training in materials that are related to the safe use, storage and cleanup of hazardous materials. These materials will include oil spill kits, compost filter socks, straw wattles, and straw stabilization mats.
- Contracted outreach by partners to increase awareness of forestry practices that protect water quality.
- FPR's watershed forester has identified five priority projects in the Lake Champlain drainage area with aging or inadequate infrastructure that are currently causing erosion on state forestland and will be replaced.

Outcomes

- Increase the understanding, skill, and accuracy of logging contractors, foresters and landowners in forestry practices and standards by using technology to improve adherence with AMPs along with improved equipment.
- Promote a culture of the safe use, storage, and cleanup of hazardous materials used in logging operations by logging contractors so that water quality is protected.
- Improve landowner, forester, and logging contractor awareness of forestry practices that protect water quality.
- Reduce risks of future discharges and improve stream habitat while maintaining public access for recreation and forest management operations on state forestland by upgrading infrastructure.

Timeframe

October 1, 2019 – September 30, 2022

This project is aligned with OFA Task Areas I.C.4.a: Fund programs to promote forestry practices with water quality benefits and III.B.3.b: Support working landscapes the protect water quality – Outreach Assistance. The Lake Champlain TMDL Phase 1 Implementation Plan highlights forests as an important area for reducing phosphorus loading to state waters, representing 75% of Vermont's total land base. The AMPs and the portable skidder bridge initiative area are described in the Vermont Lake Champlain Phosphorus Total Maximum Daily Loads (TMDLs) Phase I Implementation Plan Table 1b. Vermont Phase 1 TMDL Plan Summary of Vermont Commitments, Section D. Forest Management, for the following tasks: provide education on AMPs and enhance forest cover to improve watershed health (see page 16). The revised AMPs became effective in August 2018.

REQUEST AMOUNT: $443,600

BRIEF BUDGET EXPLANATION:

- Technical mobile application for AMPs – $100,000
- Temporary skidder bridges cost share programs and replace deteriorating bridges currently in service – $87,600
- Hazardous materials training and supplies – $10,000
- Contracted outreach by partners – $10,000
- Replace infrastructure on state forestland – $236,000

Lake Champlain Basin Program
FFY19 LC TMDL Implementation Project Description

TITLE: Nutrient Load Source Identification in Lake Carmi Watershed

ONE SENTENCE ABSTRACT: Integrated monitoring and inventory program for identification and prioritization of potential sources of phosphorus loading in the Lake Carmi watershed, including: near-lakeshore groundwater sources, tributary streams, tile drains, and private roads.

POINT OF CONTACT: VTDEC, Perry Thomas, Lakes and Program Manager

DESCRIPTION OF PROJECT SCOPE, OUTPUTS, OUTCOMES, AND TIMEFRAME:

Ten years into the Carmi TMDL, we need to reevaluate the state of implementation. It is important to have current data to measure the relative phosphorus contributions from such sources as agricultural land, forested areas, and inputs from shoreline development and to assess the effects of best management practices implemented over the last decade.

Groundwater Monitoring
This project will build on work from a preliminary study (Phase 1) that will test the hypothesis that phosphorus input from groundwater is negligible. Initial results of the Phase 1 study are anticipated this summer. If the Phase 1 study shows greater phosphorus concentrations than previously assumed, then Phase 2 would involve a installing a second, expanded set of test wells designed to allow an accurate assessment of relative phosphorus contributions from shoreland properties and the larger watershed. One of the main objectives is to further clarify the difference between 'natural' and anthropogenically influenced phosphorus in groundwater. The results of this study will inform not only work on Lake Carmi, but also work on other lakes in the basin where groundwater comes into play.

Ambient and Surface Water Monitoring
Through expanded, targeted monitoring of tributaries, we anticipate developing a more nuanced accounting of phosphorus sources across the watershed to support prioritization of actions across the landscape. DEC and local volunteers have performed extensive in-lake monitoring at established sites for 40 years. In addition, during the 2018 field season, DEC partnered with the University of Vermont to deploy and maintain buoys at two sites on the lake to monitor temperature and dissolved oxygen concentrations at 15-minute intervals.

Volunteers from the Franklin Watershed Committee (FWC) regularly collect samples from 19 sites on nine tributaries of Lake Carmi, with support from the LaRosa Partnership Program, which provides sample analysis services to the volunteer group through a grant program. In 2018 and 2019, FWC began to expand this sampling program to collect samples above and below newly installed best management practices.

We propose collaborating with FWC to continue expansion of tributary monitoring above and below potential phosphorus and sediment loading sites throughout the watershed, including tile drains.

Private Road Erosion Inventory
The third component of this project is to develop a road erosion inventory (REI) survey form for privately owned lake roads. The inventory entails the following steps:

1) Review the Stone Environmental road segmentation process so that privately owned roads in close proximity to Lake Carmi's shores will be fully "segmented" into 100-meter segments with unique identification numbers.
2) Develop an REI survey form app to evaluate the condition of these roads. A Survey123 application has previously been developed by the Agency of Digital Services (ADS) and DEC

for the DEC Municipal Roads General Permit. The MRGP Survey form will be slightly modified for this purpose.

3) Using DEC's P-tracking and load reduction estimates based on REI scores, private road improvement projects will be prioritized for funding and P-reductions tracked.

Development of the Private Road Erosion Inventory app is a high priority of watershed associations within the Lake Champlain Basin, and piloting its use in the Lake Carmi watershed will be an important step toward making it more widely available.

Mapping and Prioritization

Finally, data from enhanced monitoring and inventorying will be aggregated as layers on the new digital watershed map (developed as a Critical Path Project—see the Carmi Crisis Response Plan).

Outputs

- Ongoing source identification and prioritization
- Private Road Erosion Inventory app
- Prioritized map of phosphorus/sediment sources for remediation

Outcomes

- Refined understanding of phosphorus loading from groundwater
- Clear priorities for funding of restoration and remediation projects in the Lake Carmi watershed
- New tools for use in achieving targets of the Lake Champlain phosphorus TMDLs

Timeframe

October 1, 2019 – September 30, 2022

This proposal aligns with OFA Task Areas 1.A.1.c. Increase understanding of factors affecting BMP performance and efficiency; I.A.2.b: Expand sub-watershed monitoring to inform targeted watershed objectives; and 1.A.2.c: Assess progress of existing water quality management programs. It also aligns with the Lake Champlain TMDL Phase 1 Implementation Plan Chapter 4, Section H and Chapter 6, Section F, which address current and future commitments for upland lake protection and management. Also, the project supports the implementation of the 2016 Missisquoi Bay Tactical Basin Plan. See Table 16. Summary of Implementation Actions, Lake and Shoreline: Monitor and assess surface waters to gain better understanding of condition and potential pollution sources, including internal phosphorus loading in lakes (page 102).

REQUEST AMOUNT: $200,000

BRIEF BUDGET EXPLANATION:

Expanded Groundwater Monitoring: $70,000 (drilling) + $29,000 (sample analysis) = $99,000
Expanded Tributary Monitoring: $25,000 (time and travel) + $36,000 (sample analysis) = $61,000
Private Road Erosion Inventory: $10,000 (app development) + $15,000 (time and travel) = $25,000
Mapping and Prioritization: $15,000

Lake Champlain Basin Program
FFY19 LC TMDL Implementation Project Description

TITLE: Increased Support for Farm Agronomic Practices (FAP) Program

ONE SENTENCE ABSTRACT: This project would provide funding for farms to implement soil-based agronomic practices to improve soil quality, increase crop production, and reduce erosion and agricultural discharges; additional services for expanded program opportunities and implementation of the Conservation Reserve Enhancement Program (CREP) on critical agricultural lands; and additional engineering services to increase installation of production area practices such as manure storage facilities, heavy use areas, barnyards and silage leachate treatment.

POINT OF CONTACT: Agency of Agriculture, Food, and Markets, Laura DiPietro, Director of Water Quality, laura.dipietro@vermont.gov, 802-595-1990

DESCRIPTION OF PROJECT SCOPE, OUTPUTS, OUTCOMES, AND TIMEFRAME:

The objectives of this project are to provide:

1. Additional services for expanded program opportunities and implementation of the Conservation Reserve Enhancement Program (CREP) on critical agricultural lands;
2. Increased implementation of Farm Agronomic Practices (FAP) such as cover crops, reduced tillage, alternative manure incorporation, and crop rotation; and
3. Additional engineering services to increase installation of production area practices such as manure storage facilities, heavy use areas, barnyards and silage leachate treatment.

Conservation Reserve Enhancement Program (CREP)
The CREP program is administered through the USDA Farm Service Agency. In Vermont, CREP is targeted to streamside agricultural land and compensates producers for removing this land from production and converting it primarily to riparian forested buffers as well as grass filter strips and grass waterways, under 15-year contracts. Over 2,500 acres have been enrolled in CREP since its inception, mostly with forested buffers.

The state Required Agricultural Practice updates, put into law in December 2015, require expanded vegetative buffers on many streams and new buffers on ditches. This workplan will result in additional farmer implementation of riparian forested buffers which will increase the phosphorus reduction value above the regulatory vegetative requirement. Funding will be used to work with farmers to finalize contracts to remove streamside agricultural land from production and cover those lands to riparian forested buffers. In addition, AAFM will broaden the use of CREP in Vermont beyond the current practices, expanding beyond riparian buffers, and increasing the protection of environmentally sensitive land.

Farm Agronomic Practices (FAP) Program
The Farm Agronomic Practices (FAP) Program utilizes state funding to help Vermont farms implement soil-based agronomic practices that improve soil quality, increase crop production, and reduce erosion and agricultural waste discharges. Eligible practices include cover cropping, crop rotation, strip cropping, cross-slope tillage, conservation tillage, and manure injection.

NRCS Engineering Services
USDA/Natural Resources Conservation Service funding is the primary source of cost-share assistance available to farmers, and is especially essential when larger, more complex projects such as manure storage facilities, barnyards, or silage leachate treatment systems are required. NRCS engineers must develop a Manure and Waste Water Handling Plan (MWWHP – a key part of a full

Comprehensive Nutrient Management Plan) to evaluate the resource needs, priorities and costs, design practices that are contracted for funding, and oversee contract implementation. Due to federal restrictions on rehiring of NRCS staff, NRCS is missing several key engineering positions and has developed an extensive backlog of engineering need. Currently more than 60 MWWHPs are needed and over 1,300 engineering practices are waiting engineering with over $11 million in committed funding. Providing additional engineering support will increase design and implementation of practices, as well as higher quality applications. This will reduce the likelihood of contract cancellation by farmers, which can result in critical NRCS funds being returned to the federal level. During this time of high-water quality improvement needs, it is essential that all available funds are contracted and implemented in a timely and successful manner.

Outputs
Anticipated outputs include increased implementation of verified and critical best management practices for nutrient reduction and prevention from farms. Estimated target outputs include:

- A minimum of 30 acres of riparian agricultural land will be removed from production and converted to riparian forested buffers and/or grassed filter strips.
- 1 FTE of engineering support resulting in 8 practice installations,10 designs, and 3 manure and wastewater handling plans.
- An additional 2,500 acres of conservation practices on agricultural fields. Conservation practices will include cover crops, reduced tillage, crop rotations, grassed waterways, and alternative manure incorporation, all of which have proven effective in reducing phosphorus from entering Lake Champlain, and for which interest exceeds available resources.

The phosphorus load reduction achieved through these activities will be estimated.

Outcomes
Outcomes are improved water quality through implementation of production area and field best management practices and reduced nutrient loading to surface waters.

Timeline
October 1, 2020 – September 30, 2021

The activities that will be carried out through this workplan support the following LCBP goals, strategies and tasks in Opportunities for Action: OFA I.C.2.a.: Provide technical assistance for Land Treatment Plans and Nutrient Management Plans; 1.C.2.d.: help farmers meet Clean Water regulations with targeted cost-share support for small farms; 1.C.2.f.: Research and support sustainable agricultural practices that address water quality concerns and are also economically sustainable.

This project addresses the Vermont Lake Champlain Phosphorus TMDL Phase 1 Implementation Plan Table 1b. Vermont Phase 1 TMDL Plan Summary of Vermont Commitments, Section A. Agriculture, Nutrient Management Planning and Additional Efforts in Critical watersheds for the following tasks: increase NMP efforts, expand implementation efforts, increase implementation in critical watersheds, increase technical assistance in critical watersheds (see pages 12 and 13).

REQUEST AMOUNT: $475,000

BRIEF BUDGET EXPLANATION:

- $100,000 for a CREP position
- $275,000 for FAP
- $100,000 for an Engineer position

Lake Champlain Basin Program
FFY19 LC TMDL Implementation Project Description

TITLE: Program to Expand and Accelerate Wetland Conservation and Restoration in Vermont's Lake Champlain Basin

ONE SENTENCE ABSTRACT: Enhance implementation of land conservation projects directed at sites in the Lake Champlain Basin where land management changes can be made to enhance and restore wetlands that will have a myriad of benefits including but not limited to water quality enhancements, wildlife habitat improvements and increased public access opportunities.

POINT OF CONTACT: Vermont Fish and Wildlife Department (VFWD), Jane Lazorchak, Land Acquisition Coordinator, 802-505-0561, jane.lazorchak@vermont.gov

DESCRIPTION OF PROJECT SCOPE, OUTPUTS, OUTCOMES, AND TIMEFRAME:

The VFWD has a long, successful history of conserving, managing and restoring wetland habitat in Vermont. In fact, the first state-owned Wildlife Management Area (WMA) established in the eastern United States was Sandbar WMA, established as a refuge for migratory waterfowl in Milton, Vermont in 1920. Nearly 100 years later, VFWD has conserved nearly 30,000 acres of some of the largest, most significant wetland systems in Vermont and is the largest owner of wetland habitat in the state. In 1986 VFWD established the Vermont Duck Stamp Program to enhance the Department's wetland conservation efforts. The Vermont Duck Stamp program has been responsible for some of our state's greatest wetland conservation success stories, raising $4.5 million for the conservation of nearly 12,000 acres on 93 separate projects. Over the past 10 years, VFWD, in conjunction with partners such as the federal Natural Resources Conservation Service (NRCS) and US Fish & Wildlife Service (USFWS), has restored nearly 50 acres of wetlands on WMAs. However, hundreds of acres of wetlands restored through NRCS via the Wetland Reserve Program, with the critical support of USFWS and Partners in Fish and Wildlife, have been added to WMAs to ensure long-term, effective stewardship. VFWD owns 98 WMAs constituting 145,000 acres of outstanding wildlife habitat with the majority of those areas supporting wetland habitat. This illustrates a long-standing commitment by the VFWD for conserving, restoring and stewarding wetland habitat throughout Vermont.

The VFWD plans to develop a focused land acquisition program around wetland acquisition and restoration with these funds in order to advance projects which will include land management changes. This will include projects such as state acquisition of farms in strategic areas where the farms are retired to implement wetland restoration in collaboration with our partners. Currently, VFWD supports one full-time employee whose primary responsibility is to acquire land. Many other Department staff work on this effort as well and other land conservation efforts. While many of these projects are focused on wetland conservation, there are a wide range of conservation projects and needs. VFWD proposes to create staff capacity through existing limited service positions and contractual services to work under the guidance of the land acquisition coordinator and a project management team. VFWD staff and contractors responsible for implementing this effort will focus specifically on wetland conservation and restoration projects in priority areas in the Lake Champlain Basin. VFWD staff responsible for this effort will coordinate closely with a range of partners to identify, develop and implement wetland conservation and restoration projects that would ultimately result in VFWD ownership and long-term management.

Some projects are already underway and will be accelerated towards completion through additional staff capacity and contractual services supported by these funds. VFWD staff currently close between 7-10 land acquisition projects a year. We anticipate by creating a focused program, we can close an additional 3-5 projects annually. VFWD anticipates that a minimum of 40% of those projects land area

will include changes in land management practices (e.g. corn production to floodplain forest).

Tasks

- Create a focused wetland acquisition program within the VFWD to enhance wetland acquisition projects in the Lake Champlain Basin, building off a successful track record of wetland conservation and management for the past 100 years.
- Implement necessary contractual agreements to advance land acquisition projects in the Lake Champlain Basin including but not limited to appraisals, surveys, title work and administrative support.
- Coordinate with key wetland conservation partners to strategically identify and acquire wetland conservation projects such as Vermont Department of Environmental Conservation, The Nature Conservancy, NRCS, Ducks Unlimited and the USFWS.
- Implement wetland restoration projects on VFWD-owned land through the development of a wetland restoration program, in coordination with our partners. This work will be done both in-house and through contractual agreements managed with our partners to bring added capacity.

Outputs

- Completion of 3-5 wetland acquisition projects in the Lake Champlain Basin with a minimum of 40% of the total land acquired including a change in land management strategy.
- Hydrologically restore 100 acres through the implementation of a restoration program by the VFWD. While we are not yet able to estimate phosphorus load reductions from wetlands restoration, we will track the data necessary to do this in future.

Outcomes

Anticipated outcomes of the project include:

- Improving functions and values of existing, degraded wetland acres in the Lake Champlain Basin, such as surface water nutrient retention, stormwater retention, filtration, and gradual discharge, groundwater recharge, reduced soil erosion, floodwater attenuation, and habitat for diverse communities of wildlife, fish, and plants.
- Improving coordination of wetland acquisition and restoration projects for efficiency and more effective use of federal and state resources.
- Increasing the myriad of benefits these projects have on the landscape including enhancement of wildlife habitat, public access, flood protection, and wildlife-based recreation.

Timeframe

October 1, 2019 – September 30, 2020

This project supports the Lake Champlain Basin Program Opportunities for Action (OFA) Objectives I.C. Reduce Nutrient Loading (Strategies I.C.1. and I.C.4.); II.A. Support Conservation of Vulnerable Habitat (II.A.1.); and II.B.1. Preserve and Enhance Biodiversity (II.B.1.c); III.D.1 Provide sustainable and accessible recreational opportunities for everyone within the CVNHP (III.D.1.b).

This project aligns with the Vermont Lake Champlain Phosphorus Total Maximum Daily Loads (TMDLs) Phase I Implementation Plan Table 1b. Vermont Phase 1 TMDL Plan Summary of Vermont Commitments, Section E. Wetland Protection and Restoration, for the following tasks: Coordinate wetland restoration projects and expand technical, educational and regulatory assistance (see page 16).

REQUEST AMOUNT: $1.325 million

BRIEF BUDGET EXPLANATION:

The total LCBP TMDL implementation budget for this project is $1.75 million, which includes $425,000 remaining in the Wetlands Easements and Restoration Project (FFY18 Lake Champlain TMDL Implementation).

- VFWD Staff Capacity – $100,000
- Contractual Services to Administer Land Acquisition Projects – $100,000
- Land Acquisition of sites by the FWD – $1,200,000
- Restoration Planning and Implementation of Sites – $350,000

Lake Champlain Basin Program
FFY19 LC TMDL Implementation Project Description

TITLE: Municipal Roads Grants-In-Aid Program

ONE SENTENCE ABSTRACT: Enhanced funding for an existing grants-in-aid program to bolster funds for municipalities in the Lake Champlain Basin in Vermont to expedite implementation of road runoff and erosion remediation best management practices (BMPs) necessary to meet the Municipal Roads General Permit and implement the Phosphorus Total Maximum Daily Loads for Vermont Segments of Lake Champlain.

POINT OF CONTACT: Emily Bird, VTDEC, Clean Water Initiative Program, Assistant Program Manager and Nonpoint Source Coordinator, 802-490-4083, emily.bird@vermont.gov

DESCRIPTION OF PROJECT SCOPE, OUTPUTS, OUTCOMES, AND TIMEFRAME:

The Municipal Roads Grants-In-Aid Program is a new and innovative funding initiative to provide funding to municipalities through regional planning commission, without reliance on a grant program, to implement BMPs on municipal roads for compliance with the state Municipal Roads General Permit (MRGP). For the first two years, the program has achieved municipality participation rates of 75% and 81%. The initiative provides funds directly, via Vermont's regional planning commissions, to those Vermont municipalities who voluntarily sign up to participate and be reimbursed 80% of their project costs to implement the road-related BMPs. Projects eligible for funding are located on hydrologically connected road segments (i.e., adjacent to or intersecting surface waters) that bring whole road segments into full compliance with the MRGP. The standards and prioritization elements of the Program will help jumpstart restoration efforts to address the high priority road segments that have become large and chronic sources of phosphorus pollution.

The program has familiarized municipalities with road BMPs and equipment necessary for compliance expectations associated with the MRGP. DEC data demonstrates road runoff is one of the largest phosphorus sources per acre, and road-related projects are among the most phosphorus-reducing and cost-effective actions to implement. The BMPs supported by the project also improve local resilience to large storm events and will help save municipalities money in the long run in operations and maintenance needs.

Two years of piloting this program have demonstrated numerous advantages. Municipalities do not need to submit a grant application to participate, which helps small, rural communities with limited staff capacity. DEC makes funds available to all 260 municipalities required to comply with the MRGP, of which approximately 129 are in the Lake Champlain Basin.[1] Funds are dispersed based on a formula and hydrologically connected municipal road segments. Municipalities enroll voluntarily through local regional planning commissions. Regional planning commissions assist participating municipalities with project and BMP selection and track and report BMP data to DEC, which allows DEC to fully quantify phosphorus reductions achieved by the participating municipalities.

While the BMPs are cost-effective in achieving pollutant reductions, DEC anticipates that municipalities will need to significantly augment their level of implementation to be compliant with the MRGP. Additional funding will enhance municipalities' understanding of and capacity to comply with the MRGP. The MRGP is also one of the first stormwater regulatory programs rolled out under the Lake Champlain TMDL Phase 1 Implementation Plan and providing regulatory financial and technical assistance is key to its success. This project addresses the Vermont Lake Champlain TMDL Phase 1

[1] Estimated based on municipalities with majority area in the Lake Champlain Basin. Additional municipalities that overlap the Lake Champlain Basin may be eligible to enroll for Lake Champlain Basin program funds.

Implementation Plan, Table 1a. Vermont Phase 1 TMDL Plan Summary of Point Source Commitments, Section B. Stormwater Management, Task: Implement Municipal Roads Stormwater General Permit (see page 9).

Only municipalities located in the Lake Champlain Basin in Vermont would be eligible for these funds.

This project contributes toward Lake Champlain Basin Program's *Opportunities for Action (OFA)* through the following objectives, strategies and task areas:

I. Objective I.C: Reduce Nutrient Loading
   a. Strategy I.C.3: Fund Programs to Reduce Nutrient Inputs from Developed Lands
II. Objective III.B: Support Water-Wise Economic Development
   a. Task Area III.B.3.a: BMP Implementation Provide Financial and Technical Assistance to Support Practices that Help Protect Water Quality.

Outputs

- Approximately 129 municipalities in the Lake Champlain basin are eligible to enroll.
- 16 miles of road drainage improvements completed[2]

Outcome

- 90 kilograms per year total phosphorus load reduction achieved by road best management practices[2]

Timeframe:
January 1, 2020 – September 30, 2021 (aligns with State Fiscal Year 2021 Grants-in-Aid Program July 1, 2020 – June 30, 2021)

REQUEST AMOUNT: $1,000,000 to complement state funds (for reference: approximately $3.2 million state funds planned for State Fiscal Year 2020)

BRIEF BUDGET EXPLANATION: $850,000 (85%) will fund BMPs to municipal road segments into full compliance with the MRGP and address stormwater abatement goals; $150,000 (15%) for program delivery. Minimum 20% local match/in-kind requirement would raise additional $212,500 toward BMPs for a total minimum of $1,062,500 toward BMP construction.

[2] Estimated based on proposed Lake Champlain Basin Program dollars and cost effectiveness of year 1 of the Grants-in-Aid Program results.

Lake Champlain Basin Program
FFY19 LC TMDL Implementation Project Description

TITLE: Enhanced Implementation of Vermont Environmental Stewardship Program (VESP)

ONE SENTENCE ABSTRACT: Enhance pilot program evaluation tools for VESP to ensure farm assessments and standards are tied to state water quality standards; add additional metrics to quantify associated ecosystem services, provide valuation for ecosystem services.

POINT OF CONTACT: Agency of Agriculture, Food, and Markets, Ryan Patch, Deputy Director of Water Quality, ryan.patch@vermont.gov, 802-272-0323

DESCRIPTION OF PROJECT SCOPE, OUTPUTS, OUTCOMES, AND TIMEFRAME:

The Vermont Environmental Stewardship Program (VESP) is a voluntary program that encourages and supports local agricultural producers to achieve environmental and agricultural excellence. VESP's goal is to accelerate water-quality improvements through additional voluntary implementation efforts, and to honor farmers who have already embraced a high level of land stewardship.

The State of Vermont has launched a pilot program enrolling 10 farms across the state to conduct on-farm natural resource assessments and Cornell soil health tests. VESP applicants will be evaluated by a team of conservation planners and technical service providers to ascertain current land-use practices. The resulting data is used to set customized environmental goals for the farm and to enact a long-range plan encompassing a full range of regenerative farming practices.

Outputs
Funding is needed to expand the VESP pilot. The pilot program needs to integrate a secondary evaluation tool and methodology to ensure participant farms are meeting State water quality goals. The output of this pilot program will include water quality and ecosystem service valuation criteria and proposals for incentives - or payment for ecosystem services - tied with a farms level of achievement as an environmental steward.

Outcomes
The anticipated outcomes of VESP are to (1) enhance the economic viability of farms in Vermont; (2) improve the health and productivity of the soils of Vermont; (3) encourage farmers to implement regenerative farming practices; (4) reduce the amount of agricultural waste entering the waters of Vermont; (5) enhance crop resilience to rainfall fluctuations and mitigate water damage to crops, land, and surrounding infrastructure; (6) promote cost-effective farming practices; (7) reinvigorate the rural economy; (8) sequester carbon in Vermont's agricultural soils; and (8) help the next generation of Vermont farmers learn regenerative farming practices so that farming remains integral to the economy, landscape, and culture of Vermont.

This project contributes toward the Lake Champlain Basin Program's *Opportunities for Action (OFA)* through the following objectives, strategies and task areas:

I. **Objective I.C:** Reduce Nutrient Loading
   a. **Strategy I.C.2:** Fund Programs to Reduce Nutrient Inputs from Agriculture Refine mechanisms to reduce pollutant loads from agricultural sources
      i. **Task Area ** I.C.2.b:** Research and Promote Programs to Optimize Fertilizer Applications to Reduce Nutrient Load.
      ii. **Task Area I.C.2.d:** Help farmers meet Clean Water regulations with targeted cost-share support for small farms.

iii. **Task Area I.C.2.f:** Research and support sustainable agricultural practices that address water quality concerns and also are economically sustainable.

II. **Objective III.B:** Support Water-Wise Economic Development
   a. **Strategy III.B.3:** Support working landscapes that help protect water quality
      i. **Task Area III.B.3.a:** BMP Implementation.
      ii. **Task Area III.B.3.c:** Awards Program.
   b. **Strategy III.B.6:** Foster a sustainable relationship between people and the natural and cultural resources of the CVNHP
      i. **Task Area III.B.6.c:** Promote sustainable agriculture practices in the CVNHP.

This project addresses the Vermont Lake Champlain Phosphorus TMDL Phase 1 Implementation Plan Chapter 4, Current program capacity to reduce nonpoint source pollution, Section D, "Vermont Agency of Agriculture, Food and Markets" and Chapter 6, Vermont commitments to further reduce nonpoint source pollution, Section A, Agricultural programs, "Agricultural Management." A specific reference to successful piloting of VESP is also included in Table 1b. Vermont Phase 1 TMDL Plan Summary of Vermont Commitments on page 13 of the Phase 1 Plan.

Funding is needed to expand the VESP pilot, to enroll new farms in the program and ensure successful completion of the pilot project so VESP can be launched in a full program within two years.

Timeline
October 1, 2019 – September 30, 2021

REQUEST AMOUNT: $100,000

BRIEF BUDGET EXPLANATION:

P Model Enhancement	
Calibration	
Model Implementation	
Data Analysis	
Total:	$100,000

Lake Champlain Basin Program
(A) Conceptual Education and Outreach Task
Description FY2019 Budget

1. **Task Title:** Production and Distribution of Clean Water Videos

2. **One-sentence abstract of task:** The task would support the production of video shorts (less than 3 minutes each) on the value of clean water, along with target audience actions to protect clean water, and a plan for distributing the films.

3. **Submitted by:** Bethany Sargent, VT DEC and Ken Kosinski, NY DEC

4. **Describe the task and the specific work-product(s) or output that might result.**

   This task would support the production of four to six short videos (less than 3 minutes each) on the value of clean water and target audience actions (e.g. homeowners, municipal officials, boaters, businesses) to protect clean water, and a plan for distributing the videos. Specific topics would be determined based on the results of an assessment of current needs and resources but could include: why wetland buffers are important and how to improve them; managing stormwater at your home or small business; and reconnecting rivers – actions that support connected, healthy rivers and floodplains. For additional examples, see the Chesapeake Bay Program videos at https://www.chesapeakebay.net/discover/videos/recent.
   Vermont and New York are proposing that LCBP manage the contract for video production and distribution, with support from a project committee.

   This project addresses Opportunities for Action Goal IV: Informed and Involved Public, Objective IV.C.2.a: Outreach materials: Produce web content and print materials that describe lake-friendly products and practices; IV.B.1.e: Web/Electronic Outreach: Produce video and other dynamic media for LCBP website; and IV.C.1.a Web/Social Media outreach: Connect citizens with local organizations' volunteer programs.

   Outcomes of the videos would be improved awareness and knowledge of actions that support clean water and the value of clean water in Vermont and New York.

5. **Please provide the estimated cost of this task, a timeframe (# months or years), and explain why this can't be supported by state funds.**

   $35,000 over 24 months (for production and distribution).

   Vermont governmental agencies prioritize funding for clean water project implementation that involves nutrient and sediment pollution reduction. For more information, see the Ecosystem Restoration Funding Policy posted at: https://dec.vermont.gov/watershed/cwi/grants/ecosystem-restoration.

6. **Post-Project monitoring:** [Please provide a brief description of how the success of this program could be monitored/measured after the project is complete.]

   Tracking analytics on LCBP webpage, YouTube channel, and other websites linked from videos.

Lake Champlain Basin Program
(C) Conceptual Education and Outreach Task
Description FY2019 Budget

1. **Task Title:** Encouraging communities to be Stream Wise by supporting good stewardship of lands along shared streams and rivers

2. **One-sentence abstract of task:** Develop and pilot social marketing campaign to educate and incentivize communities to engage in activities that support enhancement and protection of riparian water quality and aquatic habitat as well as the community's flood resilience.

3. **Submitted by:** Will Eldridge, VTDFW and Karen Bates, WSMD-VTDEC

4. **Describe the task and the specific work-product(s) or output that might result.**

Similar to the successful Lake Wise program administered by the VTDEC, the goal of Stream Wise is to establish a new normal of riparian landscaping that is proven to help protect streams and rivers. Social science research has shown that people are most influenced by their neighbors. An award program will be developed that presents properties that meet certain management conditions a Stream Wise award. These properties will then represent a "model" property that will in turn inspire others to make improvements so they too can earn the award and help protect their shared rivers and streams.

This program most closely aligns with OFA Task Area IV.C.3.a: Social Marketing - Implement social marketing techniques to foster sharing of information and stewardship ethic, and IV.C.2.a: Outreach materials - Produce web content and print materials that describe lake-friendly products and practices. Because this program would cross developed, agricultural and forestry lands, it would also touch on a number of other OFA task areas: II.A.1.a Support programs to expand protection of river corridors; I.C.1.b fund programs to protect or enhance river corridors for nutrient reduction and flood resilience; IC4c Educate and Assist Landowners to Promote Clean Water Regulations on Forested Lands; III.A.1.b: Technical Resources Provide technical assistance through meetings, workshops, and presentation; III.A.3.a: Outreach - Support and advise municipalities' efforts to educate residents about sound river/ floodplain management

Tasks and work products:

a) Facilitate a team of experts who will develop criteria for award program as well as provide input in development of b-d. The work product would be meeting minutes and draft award criteria and the stream and community for the piloting of the program.
b) Develop a social marketing campaign that will result in behavior change. It will include best management practices and fact sheets, education and technical assistance materials, lists of resources, and slogans that can be used across New York and Vermont
    i) Identify audience and needed behavior change. The community as a whole will be one audience, while riparian landowners would be the second.
    ii) Develop slogan, graphics (branding) for campaign
    iii) Develop list of actions that could become part of an award program
c) Develop communication plan to include social media and pilot the campaign in one area.

The Stream Wise materials, standards and criteria will be developed by a team of experts. The program itself will be run by local organizations (e.g., watershed groups or conservation districts)

who are well positioned to foster Stream Wise communities within the areas they serve. The project would include development of an outreach plan to connect with landowners. Municipalities will be encouraged to support the program by delivering Stream Wise material and other information that provides education and technical assistance on the social, ecological and economic value of Stream Wise, such as through revenue from anglers, or enhancing co-benefits like flood resilience or protection of swimming holes.

5. **Please provide the estimated cost of this task, a timeframe (# months or years), and why this can't be supported with state funds.**

1. Coordinating and facilitating meetings of self-selected committee of volunteers to include scientists, environmental interests, fisheries related businesses to identify audience and develop award criteria - $20,000 – 6 months
2. Development of marketing materials - 8 months
   a. focus group and data analysis - $5,000
   b. Outreach plan, marketing outreach materials, outline of slogans - $10,000
   c. development of branding - $5,000
3. Printing of marketing materials - $1,000
4. Piloting of a program in community where brook trout habitat is used by fishing guides, tourists, locals in New Y and in Vermont (- $10,000 X 2) – 1 year

Total estimated cost: $61,000

Vermont governmental agencies prioritize funding for clean water project implementation that involves nutrient and sediment pollution reduction. For more information, see the Ecosystem Restoration Funding Policy posted at: https://dec.vermont.gov/watershed/cwi/grants/ecosystem-restoration.

6. **Post-Project monitoring:**

Success of the development of the program would include:

1. Engagement of State, federal and NGOs in development of program: number of meetings, number of attendees and number of organizations represented.
2. Sufficient recruitment for focus group
3. Development of outreach plan, slogan and development of branding
4. Number of landowners who have increased forested riparian buffer and miles of riparian buffer increased in focus communities.
5. Number of landowners who have participated in award program, and number who have received awards.
6. Number of municipalities who recognize awards program in some way (to be determined)

Lake Champlain Basin Program
(D) Pre-Proposal to Implement *Opportunities for Action*
Submitted by Amy Picotte, VTDEC, Watershed Management Division Lakeshore Manager
Nov 2, 2018

Title: Bioengineering and Shoreland Best Management Practices to Restore Living Shorelands and Protect Water Quality.

Abstract: This proposal continues the momentum, interest, and training opportunities for restoring living shorelands and protecting water quality through bioengineering and shoreland best management practices and the maintenance and monitoring of these projects.

Contact:
Amy Picotte, VTDEC, Watershed Management Division
1 National Life Drive, Main 2
Montpelier, VT 05620
Amy.Picotte@Vermont.gov
This proposal is from the Lake Wise Program, which develops and coordinates science-based, lake friendly, shoreland methods for protecting water quality and habitat. The Lake Wise Program leads and partners with 100s of contractors, shoreland owners, NRCD Staff, Regional Planning Commissions, and Watershed Groups to teach and promote these practices for shoreland protection and restoration.

Project Description:
By 2019, several first time ever Bioengineering Projects and shoreland Best Management Practices will have been installed along Vermont shorelands. These practices, ecological techniques to protect water quality and wildlife habitat, will need monitoring and maintenance, and continued replication to spread awareness and understanding of their benefits.

This proposal aims to monitor and maintain existing installed bioengineering practices, while continuing to offer classroom as well as field opportunities to train and teach contractors, engineers, and landscape designers how to construct and install these ecological approaches to prevent erosion and manage stormwater runoff. There are multiple benefits to using bioengineering methods for water quality and ecosystem restoration, and more and more contractors, consultants, engineers, and shoreland owners (State Parks, Town Beaches, businesses and private shoreland owners) are eager to learn these techniques as noted by the full enrollment in the Natural Shoreland Erosion Control Certification trainings of which the LCBP is a partner and by 100 percent of all the participants (300+) highly recommending this training opportunity to others. Additionally, a common request from NSECC participants is for field opportunities in project installations to fully understand the construction of these restorative practices. Many partners have learned the importance of and the techniques for improved shoreland management through the Lake Wise Program's outreach opportunities such as the NSECC trainings, and the LCBP funds have been critical in supporting our leadership role with consistent, science-based methods and outreach to partners for restoring and

protecting living shorelands. The state commits funding to one full time employee, my Lakeshore Manager Position, to coordinate the Lake Wise Program and the NSECC trainings, but temporary staff is essential to achieving increased awareness of and participation in all aspects of lake-friendly shoreland development and management. The tasks outlined in this proposal are specific and discrete and not supported by general state funding and seem ideal for LCBP funding support.

This proposal meets all four of the key priorities for this grant funding as it will produce demonstration projects to reduce nutrient loading to Lake Champlain; is based on the Vermont Lake Score and Lake Wise Assessments, data supported by the LCBP and used to prioritize projects for mitigating stormwater and erosion; will restore living shorelands with native plants; and monitor existing and create new research sites for Bioengineering Best Management Practices.

Bioengineering practices are designed to protect water quality and habitat, which address the priorities listed in the Clean Water and Healthy Ecosystems Sections of the *Opportunities for Action*. These trainings are solutions for preventing stormwater runoff and erosion while restoring critical shoreland habitat because they connect contractors with new research in Green Stormwater Infrastructure, shoreland BMPs and Bioengineering, and with the methods, materials and skills to improve shoreland and lake management and protect water quality.

Outputs: Two Classroom Natural Shoreland Erosion Control Certification Trainings; One Field Erosion Control Training; Vermont's First Living Shoreland Webinar Series on Restoring Shorelands to Protect Water Quality; 10 Shoreland Sites Assessed; 10 Project Sites Identified; One Demonstration Project Installed; 20 Contractors Trained

Outcomes: Increased Partnership for Living Shorelands both in Vermont and Regionally; Web-Based Network for Living Shorelands; One Shoreland Site Restored; 20 Contractors Capable of Repeating Methods along Other Shores.

Total Request Amount: $62,000

Budget Explanation:
November 2019 – December 2020

Personnel *(Field Work, Analysis and Design, Communication and Coordination, Instructional Training, Implementation, Reporting)*	28,000
Fringe	2,184
Travel	4,500
Supplies	12,120
Indirect	15,196

Technical References Cited:
Please visit the Science of lakes and shorelands, listed on the Vermont Lake Wise Program's web site and the Natural Shoreland Erosion Control Certification Program.

Lake Champlain Basin Program
(E) Conceptual Education and Outreach Task Description
FY2019 Budget

1. **Task Title:**

   Education and Outreach Grants

2. **One-sentence abstract of task:**

   The task will support grants to support education and outreach efforts of partner organizations throughout the Basin.

3. **Submitted by:**

   LCBP Staff

4. **Describe the task and the <u>specific work-product(s)</u> or output that might result.**

   Four categories of grants will support education and outreach efforts within LCBP and by partner organizations in the Basin:

   i) <u>Local Implementation Grants</u>: Up to $10,000 for general education and outreach projects that support objectives of Opportunities for Action. *Total: $240,000.*

   ii) <u>Professional Development Mini-grants to watershed organizations</u>: Up to $500/year. Total: 14,400.

   iii) <u>Boots and Bugs:</u> Fund a program for teachers/classrooms in grades K-8 for classroom supplies for studying the watershed. (waders, bug nets, etc). Total: $24,000

   iv) <u>Enhanced E&O Grants</u>: Larger grant awards for $20,000-$75,000, for areas where larger sums of funding would help build better watershed connections and offer outreach opportunities for the public. Total: $200,000.

5. **Please provide the <u>estimated cost</u> of this task, and a timeframe (# months or years).**

   $478,000

6. **Post-Project monitoring:** [Please provide a brief description of how the success of this program could be monitored/measured after the project is complete.]

   Success of projects will be measured using a variety of methods, depending on specific programs. The ability of grant recipients to assess the effectiveness of their outreach efforts will be enhanced through implementation of proposed Task K: Outreach Evaluation Workshop for Outreach Partners.

Lake Champlain Basin Program
(F) Conceptual Education and Outreach Task Description
FY2019 Budget

1. **Task Title:** ***High School Watershed Steward Certification Program – Year 3***

2. **1-Sentence abstract of project:** *This watershed steward certification would help students, grades 9-10, explore 10+ elements of the Lake Champlain watershed over two years.*

3. **Submitted by:** *LCBP Staff*

4. **Describe the project and the <u>specific work-product(s)</u> or output that would result.**

   By the time they enter their junior year of high school (which is when they begin to explore career paths and/or complete college applications), this experience will help students make informed decisions regarding watersheds in their communities. Based on similar Adirondack programs, a series of programs, trainings and meetings will help build experience with water quality management issues. LCBP ECO Americorps member is working on a possible framework. UVM Extension/ Lake Champlain Sea Grant are possible partners. High School Career and Guidance counselors and teachers could also assist.

   This task will fund the certification of 20 students resulting in 20 community-based projects to improve watersheds while creating a more informed student base.

   This task addresses Task Areas IV.A.4.a (Community Service) and IV.A.4.b (Youth Volunteers)of OFA.

5. **Please provide the <u>estimated cost</u> of this task, and a timeframe (# months or years).**
   $15,000 over one year – expected to be part-time contractual along with stipends for key partners.

6. **Post-Project monitoring:** *Participants will be asked to complete a two-page narrative summarizing their experience upon certification. By then, they will have also completed a culminating service project in their own community and agree to brief follow-up in 2 years.*

Lake Champlain Basin Program
(G) Conceptual Education and Outreach Task Description
FY2019 Budget

1. **Task Title:** CBEI K-12 teacher training and Authentic Student Learning - One day teacher training summit (80 teachers) + 4 workshops (15 per workshop) + World Water Day Student Celebration 2020

2. **One-sentence abstract of task:** Champlain Basin Education and Outreach Initiative will train up to 140 teachers about watershed issues through a one day multi-track summit and 3-5 individual workshops (2 of which will be in New York.)

3. **Anticipated out puts:** One Multi-track summit for up to 80 teachers and four workshops with up to 15 participants will be developed and implemented with CBEI partners.

4. **Submitted by: LCBP**.

5. **Describe the task and the specific work-product(s) or output that might result.**
   Task Areas in Opportunities for Action Informed and Involved Public

   Expected outputs from the summit will be three fold: 1) linking teachers directly with field experts and resources about Lake Champlain watershed issues, 2) providing educators with hands-on opportunities to explore water quality, fish and wildlife, and heritage connections in the Champlain valley, and 3) to encourage and recruit teachers for additional watershed trainings through CBEI or partnerships. Expected outputs from the 4 workshops: 1) providing a deeper understanding of place basic education within specific communities, and how they link to appreciation and the Lake Champlain watershed and 2) linking teachers with local experts and scientists within their community.

6. **Please provide the estimated cost of this task, and a timeframe (# months or years).**
   4,000 summit + 8,000 for workshops + $2500 World Water Day 2020 + 6,000 for evaluation = 20,500 plus indirect =
   $24,500

7. **Post-Project monitoring:** CBEI events include an evaluation at the end of every teaching session. Key participants provided feedback through World Water day as well.

Lake Champlain Basin Program
(H) Conceptual Education and Outreach Task Description
FY2019 Budget

1. **Task Title:**

   Artist in Residence

2. **One-sentence abstract of task:**

   This task will fund the interpretation of watershed data and science through art.

3. **Submitted by:**

   LCBP Staff

4. **Describe the task and the specific work-product(s) or output that might result.**
   Creating opportunities to match at least two local artists with lake communities, utilizing artistic interpretation of science and data to share with the public and create dialogue with the public about watershed issues. Funding could be provided through an RFP or other mechanism to the artist. This could be implemented in NY, VT or Quebec. (will create a lasting community piece). Pertains to OFA IV.C.3.b: (Citizen Media Competition) and IV.B.1.c: (Personal Interpretation – face to face)

5. **Please provide the estimated cost of this task, and a timeframe (# months or years).** [Please note that funding for this task will likely not be available until at least 12 months from now.]

   $25,000 over 12-18 months.

6. **Post-Project monitoring:**

   The success of the task could possibly be assessed, in part, through a web based mechanism…e.g. capturing public opinion or knowledge influenced by the art/dialogue with the artist.

Lake Champlain Basin Program
(I) Conceptual Education and Outreach Task Description
FY2019 Budget

1. **Task Title:**

   Healthy Soils Phase 3

2. **One-sentence abstract of task:**

   This project will build upon the LCBP-led initiative to promote healthy soil development continuing outreach to landscaping companies, and to at least one additional community in Vermont and one in New York. (Edited description to be added by the E&O Committee in December after additional input..)

3. **Submitted by:**

   LCBP/Lake Champlain Sea Grant

4. **Describe the task and the <u>specific work-product(s)</u> or output that might result.**

   This supports OFA task 4.5.5 to "use education to empower the general public to reduce phosphorus contributions." After initially researching two specific audiences: landscaping company staff and people from Winooski, targeted social marketing campaigns will be developed to help promote development of healthy soils with these audiences. This can help reduce runoff, and therefore minimize phosphorus runoff to Lake Champlain. Deliverables will include written campaign plans as well as educational products that are developed as a component of each.

5. **Please provide the <u>estimated cost</u> of this task, and a timeframe (# months or years).** [Please note that funding for this task will likely not be available until at least 12 months from now.]

   $72,000

6. **Post-Project monitoring:** [Please provide a brief description of how the success of this program could be monitored/measured after the project is complete.]

   Pre-assessment is necessary to be able to track behavior changes that may result. For the landscapers, the contact list will be a manageable size, thus a census of the population should be able to be completed before and after implementing outreach activities. For the next two communities, pre and post evaluations will be conducted for a subset of the population.(subject to edited description provided by the E&O Committee in December.)

Lake Champlain Basin Program
(J) Conceptual Education and Outreach Task Description
FY2019 Budget

1. **Task Title:**

   Economic Valuation of Clean Water/Healthy Watershed

2. **One-sentence abstract of task:**

   This task will support an assessment of the value of clean water across multiple economic sectors in the Lake Champlain Basin.

3. **Submitted by:**

   LCBP

4. **Describe the task and the <u>specific work-product(s)</u> or output that might result.**

   [Note: This task is very preliminary. If there is consensus to pursue it in the FY2019 budget cycle, staff will scope and refine the concept more fully.]

   A key component of the Thriving Communities goal of *Opportunities for Action* is an assessment of the value of clean water to the regional economy (Strategy III.B.2). This task will support a contract to conduct a comprehensive analysis of the economic impact of a healthy watershed in a variety of industries, including recreation and tourism, agriculture, timber, manufacturing, etc.

5. **Please provide the <u>estimated cost</u> of this task, and a timeframe (# months or years).**

   $150,000

6. **Post-Project monitoring:** [Please provide a brief description of how the success of this program could be monitored/measured after the project is complete.]

Lake Champlain Basin Program
(K) Conceptual Education and Outreach Task Description
FY2019 Budget

1. **Task Title:** ***Lake Champlain Education and Outreach Stewards***

2. **One-sentence abstract of task:**

   Lake Champlain education and outreach stewards will conduct outreach at public events in NY, VT and Quebec to inform the public and answer watershed questions and provide them with opportunities to take positive steps on behalf of Lake Champlain and its tributaries.

3. **Submitted by:** [Include name(s) and organization(s).

   LCBP Staff

4. **Describe the task and the <u>specific work-product(s)</u> or output that might result.**

   Up to 4 individuals would be hired to expand the LCBP lake outreach from Memorial Day – Labor Day. There are many opportunities for expanding our reach, including farmers' markets, municipal, and lake events. They can visit state parks, river events, upper reaches of the watershed and downtown locations, answering questions about Lake Champlain and offering opportunities for citizen action. They might be recruited through AARP, work force development, watershed groups, etc. (e.g. Summit Stewards and similar programs.) they should be able to discuss a variety of watershed issues with the public and provide resources for getting involved or changing behavior to benefit the watershed. Outputs might include representation at 20 farmers markets, 80 additional summer events reaching up to 4,000 individuals over the summer period.

   This task addresses Task Areas IV.B.1.c: Personal Interpretation of OFA.

5. **Please provide the <u>estimated cost</u> of this task, and a timeframe (# months or years).**

   Estimate: $60,000

6. **Post-Project monitoring:**

   The success of the task would be assessed by tracking analytics (numbers greeted, etc) and possibly reported out on LCBP social media through YouTube or other mechanisms.