Overview:

- NRCS RCPP AFA Award
- Historical Background
- Payment for Performance
- Vermont Pay-for-Phosphorus Program
- Timeline & Next Steps
- Questions
NRCS Regional Conservation Partnership Program Projects – FY 2019-2020

Note: Map locations are approximate.

- RCPP Classic Projects
- RCPP Alternative Funding Arrangements Projects

Projects:
- Audubon Conservation Ranching Initiative
- Black River Watershed
- Improving Forest Health Through Aggregation
- Innovative Conservation: Vital Streams and Forests
- Nebraska Forest Restoration Partnership
- Recharge in the Upper Verde River Watershed
- Scaling Soil Health in the Prairie Pothole Region
- Sebago Watershed Protection Investment...
- Soil and Water Outcomes Fund
- Vermont Pay-for-Phosphorus Program
Vermont Pay-for-Phosphorus (VPFP) Program

**Lead Partner:** Vermont Agency of Agriculture, Food and Markets (AAFM)

**Project:** 5 years (mid 2021 – mid 2026)

**Award:** $7 million with $4.9 million directly to producers
Timeline:

- 2021: Conservation Innovation Grant (CIG) Research
- Late fall 2021: VPFP Application opens
- Winter 2022: First VPFP payments - for 2022 crop season P reductions
- 2023-2025: Annual VPFP application/re-enrollment
Pictured: Vermont's large-scale TMDLs that require nutrient pollutant reductions (nutrients noted in legend)

TMDL Methods

Corn

Other Hay/Non Alfalfa
### Table A-2. Agricultural practices for permanent corn crop

<table>
<thead>
<tr>
<th>Permanent Corn on poorly drained soils</th>
<th>Permanent Corn on moderate/well-drained soils</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/10 - Tillage (disk plow)</td>
<td>5/1 - Fertilizer application (6000 gals/ac of liquid dairy manure) (96 lb/ac N, 48 lb/ac P₂O₅)</td>
</tr>
<tr>
<td>5/15 - Fertilizer application (40 lbs/ac of nitrogen)</td>
<td>5/5 - Tillage (chisel plow)</td>
</tr>
<tr>
<td>5/15 - Fertilizer application (40 lbs/ac of P₂O₅)</td>
<td>5/10 - Tillage (disk plow)</td>
</tr>
<tr>
<td>5/15 - Begin plant growing season</td>
<td>5/15 - Fertilizer application (40 lbs/ac of nitrogen)</td>
</tr>
<tr>
<td>7/10 - Fertilizer application (95 lbs/ac of nitrogen)</td>
<td>5/15 - Fertilizer application (40 lbs/ac of P₂O₅)</td>
</tr>
<tr>
<td>10/1 - Harvest and kill</td>
<td>5/15 - Begin plant growing season</td>
</tr>
<tr>
<td>10/10 - Fertilizer application (8000 gals/ac of liquid dairy manure) (64 lb/ac N, 64 lb/ac P₂O₅)</td>
<td>7/10 - Fertilizer application (140 lbs/ac of nitrogen)</td>
</tr>
<tr>
<td>10/15 - Tillage (chisel plow)(moldboard plow)</td>
<td>10/1 - Harvest and kill</td>
</tr>
<tr>
<td></td>
<td>10/2 - Fertilizer application (3000 gals/ac of liquid dairy manure) (24 lb/ac N, 24 lb/ac P₂O₅)</td>
</tr>
<tr>
<td></td>
<td>10/15 - plant cover crop</td>
</tr>
</tbody>
</table>
Lake Champlain Basin TMDL - Required Reductions

Base Load
631 Metric Tons/Year

- Agriculture: 261 MT/yr (41%)
- WWTF: 25 MT/yr (4%)
- Developed: 134 MT/yr (21%)
- Forest: 101 MT/yr (16%)
- Streambank: 120 MT/yr (19%)

Vermont Reduction
Required = 213 mt/yr (34%)

- Agriculture: 118 MT/yr (28%)
- WWTF: 32 MT/yr (8%)
- Developed: 34 MT/yr (8%)
- Streambank: 21 MT/yr (5%)
- Forest: 52 MT/yr (12%)

TMDL Loading Capacity and Allocations
418 Metric Tons/yr
Table 8. Percent reductions needed to meet TMDL allocations.

<table>
<thead>
<tr>
<th>Lake Segment</th>
<th>Total Overall</th>
<th>Wastewater$^1$</th>
<th>CSO</th>
<th>Developed Land$^2$</th>
<th>Agricultural Production Areas</th>
<th>Forest</th>
<th>Streams</th>
<th>Agricultural Nonpoint</th>
</tr>
</thead>
<tbody>
<tr>
<td>01. South Lake B</td>
<td>41.4%</td>
<td>0.0%</td>
<td></td>
<td>21.1%</td>
<td>80.0%</td>
<td>40.0%</td>
<td>46.7%</td>
<td>62.9%</td>
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<tr>
<td>02. South Lake A</td>
<td>55.5%</td>
<td>0.0%</td>
<td></td>
<td>18.1%</td>
<td>80.0%</td>
<td>5.0%</td>
<td></td>
<td>62.9%</td>
</tr>
<tr>
<td>03. Port Henry</td>
<td>55.4%</td>
<td>0.0%</td>
<td></td>
<td>7.6%</td>
<td>80.0%</td>
<td>5.0%</td>
<td></td>
<td>62.9%</td>
</tr>
<tr>
<td>04. Otter Creek</td>
<td>23.6%</td>
<td>0.0%</td>
<td></td>
<td>15.0%</td>
<td>80.0%</td>
<td>5.0%</td>
<td>40.1%</td>
<td>46.9%</td>
</tr>
<tr>
<td>05. Main Lake</td>
<td>20.5%</td>
<td>61.1%</td>
<td></td>
<td>20.2%</td>
<td>80.0%</td>
<td>5.0%</td>
<td>28.9%</td>
<td>46.9%</td>
</tr>
<tr>
<td>06. Shelburne Bay</td>
<td>11.6%</td>
<td>64.1%</td>
<td></td>
<td>20.2%</td>
<td>80.0%</td>
<td>5.0%</td>
<td>55.0%</td>
<td>20.0%</td>
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<tr>
<td>07. Burlington Bay</td>
<td>31.2%</td>
<td>66.7%</td>
<td>11.8%</td>
<td>24.2%</td>
<td>0.0%</td>
<td>0.0%</td>
<td></td>
<td>0.0%</td>
</tr>
<tr>
<td>09. Malletts Bay</td>
<td>17.6%</td>
<td>0.2%</td>
<td></td>
<td>20.5%</td>
<td>80.0%</td>
<td>5.0%</td>
<td>44.9%</td>
<td>28.6%</td>
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<tr>
<td>10. Northeast Arm</td>
<td>12.5%</td>
<td></td>
<td></td>
<td>7.2%</td>
<td>80.0%</td>
<td>5.0%</td>
<td></td>
<td>20.0%</td>
</tr>
<tr>
<td>11. St. Albans Bay</td>
<td>24.5%</td>
<td>59.4%</td>
<td></td>
<td>21.7%</td>
<td>80.0%</td>
<td>5.0%</td>
<td>55.0%</td>
<td>34.5%</td>
</tr>
<tr>
<td>12. Missisquoi Bay</td>
<td>64.3%</td>
<td>51.9%</td>
<td></td>
<td>34.2%</td>
<td>80.0%</td>
<td>50.0%</td>
<td>68.5%</td>
<td>82.8%</td>
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<tr>
<td>13. Isle La Motte</td>
<td>11.7%</td>
<td>0.0%</td>
<td></td>
<td>8.9%</td>
<td>80.0%</td>
<td>5.0%</td>
<td></td>
<td>20.0%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>33.7%</strong></td>
<td><strong>42.1%</strong></td>
<td><strong>11.8%</strong></td>
<td><strong>20.9%</strong></td>
<td><strong>80.0%</strong></td>
<td><strong>18.7%</strong></td>
<td><strong>45.4%</strong></td>
<td><strong>53.6%</strong></td>
</tr>
</tbody>
</table>

$^1$Percent change from current permitted loads  
$^2$Includes reductions needed to offset future growth

Estimated Total Phosphorus Load Reductions by Program Category

- SFY 2016: 10.1 Metric Tons/Year
- SFY 2017: 16.2 Metric Tons/Year
- SFY 2018: 17.8 Metric Tons/Year
- SFY 2019: 23.8 Metric Tons/Year
- SFY 2020: 28.2 Metric Tons/Year

Legend:
- Blue: Federal Funding Programs
- Green: State Funding Programs
- Orange: Regulatory Programs
Results of Lake Champlain Basin Cleanup to Date

Estimated Total Phosphorus Load Reductions by Land Use Sector

- SFY 2016: 10.1 Metric Tons/Year
- SFY 2017: 16.2 Metric Tons/Year
- SFY 2018: 17.8 Metric Tons/Year
- SFY 2019: 23.8 Metric Tons/Year
- SFY 2020: 28.2 Metric Tons/Year

Agriculture, Natural Resources, Developed Lands (Stormwater), Developed Lands (Roads)
Payment for Ecosystem Services (PES)

“Created by the interactions of living organisms with their environment, ecosystem services provide the conditions and processes that sustain human life...

In its simplest form, PES is a transaction between landholders and the beneficiaries of the services their land provides.”

Ecosystem Services

Source: Taylor Ricketts, Gund Institute, UVM
PES Initiatives in Vermont

➢ Farmer Watershed Groups:
  ➢ Champlain Valley Farmer Coalition (CVFC)
  ➢ Connecticut River Watershed Farmers Alliance (CRWFA)
  ➢ Franklin Grand Isle Farmer’s Watershed Alliance (FWA)

➢ PES Working Group: agriculture.vermont.gov/pes

➢ Vermont Land Trust Soil Health CIG initiative

➢ Jon Winsten Pay-for-Performance CIG initiative
Targeted Approach:
Focus on just one aspect of Ecosystem Services (e.g. P reductions)
➢ More narrow
➢ Simpler
➢ Easier to calculate

Broad Approach:
Capture many aspects of Ecosystem Services (e.g. Soil Health)
➢ More holistic
➢ More complex
➢ Hard to calculate
Pay-for-Practice:  
Based on implementation
➢ Simpler
➢ Easy to project payments
➢ Risk held by the program manager
➢ Payment assumed to result in benefit

Pay-for-Performance:  
Based on outcomes
➢ More complex
➢ Hard to project payments
➢ Risk held by the farmer/land manager
➢ Payment tied to actual benefit
Vermont Pay-for-Phosphorus (VPFP) Program
Current PES Systems in Vermont

Pay-for-Practice:

➢ Farm Agronomic Practices Program (AAFM)
➢ Best Management Practices Program (AAFM)
➢ Pasture and Surface Water Fencing Program (AAFM)
➢ Environmental Quality Incentives Program (NRCS)
➢ Conservation Reserve Enhancement Program (FSA)

Pay-for-Performance:

➢ Conservation Stewardship Program (NRCS)

A new and exciting space!
<table>
<thead>
<tr>
<th>Project Output Measures</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acres of agricultural conservation practices implemented</td>
<td>5,466</td>
<td>3,261</td>
<td>7,908</td>
<td>14,566</td>
<td>19,619</td>
<td>50,820</td>
</tr>
<tr>
<td>(excluding other practices listed below)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acres of agricultural land treated through innovative equipment</td>
<td>-</td>
<td>2,043</td>
<td>5,415</td>
<td>14,022</td>
<td>14,521</td>
<td>36,001</td>
</tr>
<tr>
<td>Acres of agricultural land treated by forest and grass buffers</td>
<td>258</td>
<td>200</td>
<td>228</td>
<td>0</td>
<td>0</td>
<td>686</td>
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<tr>
<td>adjacent to surface waters (i.e., riparian areas)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acres of pasture with livestock excluded from surface waters</td>
<td>258</td>
<td>117</td>
<td>97</td>
<td>47</td>
<td>15</td>
<td>534</td>
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<tr>
<td>Acres of water quality protections within newly conserved</td>
<td>-</td>
<td>116</td>
<td>200</td>
<td>513</td>
<td>250</td>
<td>1,079</td>
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<tr>
<td>agricultural lands</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Acres of agricultural conservation practices reported through</td>
<td>-</td>
<td>-</td>
<td>17</td>
<td>1,556</td>
<td>1,689</td>
<td>3,262</td>
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<tr>
<td>technical assistance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of barnyard and production area practices installed</td>
<td>59</td>
<td>86</td>
<td>96</td>
<td>77</td>
<td>119</td>
<td>437</td>
</tr>
</tbody>
</table>
Pay-for-Practice: Based on implementation
- Simpler
- Easy to project payments
- Risk held by the program manager
- Payment assumed to result in environmental benefit

Pay-for-Performance: Based on outcomes
- More complex
- Hard to project payments
- Risk held by the farmer/land manager
- Payment tied to actual environmental benefit
Targeted Approach:
Focus on just one Ecosystem Service (e.g. P reductions)
- More narrow
- Simpler
- Easier to calculate
- Can be easier to value

Broad Approach:
Capture many Ecosystem Services (e.g. Soil Health)
- More holistic
- More complex
- Hard to calculate
- Generally harder to value
Cost Effectiveness of State Clean Water Investments

Payment for Ecosystem Services (PES)

“Created by the interactions of living organisms with their environment, ecosystem services provide the conditions and processes that sustain human life...

In its simplest form, PES is a transaction between landholders and the beneficiaries of the services their land provides.”

Pay-For-Phosphorus is an innovative pay-for-performance approach that pays farmers for the pounds of phosphorus reduced by implementing conservation practices, as opposed to paying farmers a portion of the cost to install a practice.

- **Pays on results** improving cost-effectiveness and accelerating implementation
- **Flexibility for farms** to manage fields how they choose
- **Complements** existing State and Federal assistance programs (e.g. EQIP, FAP)
- **Statewide** voluntary program available to eligible farms
- **Incentive payments** for program enrollment regardless of farm performance
Goals:
Goals:

➢ Farmer buy-in
Goals:

➢ Farmer buy-in

➢ Verifiable, calculable, location-specific outcomes
Implementation of a Farm Phosphorus Management Optimization Web-based Tool in the Vermont Portion of the Lake Champlain Basin

<table>
<thead>
<tr>
<th>Farm Practices Scenario</th>
<th>Total P Reduction from Baseline (%)</th>
<th>Total P Reduction from Current (%)</th>
<th>Total P (lbs/acre)</th>
<th>Soluble P (lbs/acre)</th>
<th>Sediment P (lbs/acre)</th>
<th>Tile P (lbs/acre)</th>
<th>P Input Reduction (%)</th>
<th>Compare</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline:</td>
<td></td>
<td></td>
<td>2.67</td>
<td>1.92</td>
<td>0.75</td>
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<tr>
<td>Current:</td>
<td>7.24</td>
<td>2.48</td>
<td>1.76</td>
<td>0.72</td>
<td>0</td>
<td>0</td>
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<tr>
<td>F1_Corn</td>
<td></td>
<td></td>
<td>4.01</td>
<td>2.52</td>
<td>1.49</td>
<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>F2_Corn</td>
<td></td>
<td></td>
<td>3.55</td>
<td>2.71</td>
<td>0.85</td>
<td>0</td>
<td>0</td>
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<tr>
<td>F3_Hay</td>
<td>0</td>
<td>0</td>
<td>0.49</td>
<td>0.36</td>
<td>0.13</td>
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<tr>
<td>F4_CornHay</td>
<td>0</td>
<td>0</td>
<td>1.62</td>
<td>1.39</td>
<td>0.22</td>
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<td>F5_CornHay</td>
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<td>0</td>
<td>1.62</td>
<td>1.3</td>
<td>0.32</td>
<td>0</td>
<td>0</td>
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</tr>
</tbody>
</table>
Goals:

➢ Farmer buy-in
➢ Verifiable, calculable, location-specific outcomes
➢ TMDL reductions and stewardship
Goals:

- Farmer buy-in
- Verifiable, measurable, location-specific outcomes
- TMDL reductions and stewardship
- Additionality of stewardship
**Base Farm P Runoff** will be modeled based on historic TMDL management scenarios and will act as the baseline from which P runoff reductions are calculated.

Reductions can be achieved via improved nutrient management or conservation practices.

**Base Reductions/Threshold** corresponds to the P reductions that are estimated to be met through existing programs.

**Additional Reductions** beyond the threshold will be paid through the VPFP program based on a set price per pound of P.

**Current Farm P Runoff** based on a farm’s current management.
Goals:

- Farmer buy-in
- Verifiable, calculable, location-specific outcomes
- TMDL reductions
- Additionality of stewardship
- Sufficiency of payment
Goals:

➢ Farmer buy-in
➢ Verifiable, calculable, location-specific outcomes
➢ TMDL reductions
➢ Additionality of stewardship
➢ Sufficiency of payment
➢ Equity and Efficiency of program funding
(1) **Data Entry Payment:** for data entry into the FarmPREP software.
- $15/acre, max $4000, one-time only

(2) **Payment for Phosphorus:** for phosphorus reductions resulting from the year’s management.
- Paid per pound of phosphorus. Price will consider existing cost to the state of P-reductions.
- Verification: field implementation matches FarmPREP data, meets program standards
Annual Timeline

**Farms:**
- VPFP paperwork for upcoming year
- FarmPREP data entry
- (Payment received for past year)

**Partners:**
- Assist with FarmPREP data entry

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**Farms:**
- Fall practice implementation
- (Apply for following year VPFP)

**Partners:**
- Fall field verification cont.
- Data “clean-up” with farms
- End-of-season reporting to AAFM

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**Farms:**
- Summer/Fall implementation

**Partners:**
- Spring field verification cont.
- Data “clean-up” with farms
- Fall field verification

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**Farms:**
- FarmPREP data entry
- Spring practice implementation

**Partners:**
- Assist with FarmPREP Data entry
- Spring field verification
AAFM Conservation Innovation Grant (CIG) Research Initiative

12-14 farms will work with AAFM staff to enter their data in FarmPREP.

These farms will offer feedback on important questions relating to setting up the VPFP program.
Key CIG Questions:

- What is a reasonable price for a pound of phosphorus?

- How do loading, potential reductions, and potential payments in FarmPREP differ by:
  - land use (e.g. corn, hay, other crops)?
  - field characteristics (e.g. soil type, slope)?

- What decisions do we need to make to ensure that the VPFP program meets our program goals?
Year-by-Year Timeline

- 2021
  - NRCS VPFP grant executed (March)
  - CIG Initiative
  - VPFP Rollout (Nov/Dec)

- 2022
  - First year of Farm enrollment in VPFP

- 2023
  - Second year of Farm enrollment in VPFP

- 2024
  - Third year of Farm enrollment in VPFP

- 2025
  - Final year of Farm enrollment in VPFP

- 2026
  - End of VPFP grant period
  - Closeout/Reporting
Visit the webpage:
https://agriculture.vermont.gov/vpfp

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