

# Vermont Soil Health and Payment for Ecosystem Services Working Group

Waterbury, Vermont

September 30, 2019 **DRAFT** Meeting Summary

## Next steps

- The Co-chairs and CBI will schedule future meetings based on member availability
- Members will respond to a survey to help glean feedback on options before next meeting
- The Co-chairs and CBI will schedule webinars as soon as possible and make recordings available for those who cannot watch live.
- CBI will revise the ground rules/charter document per feedback from the Working Group
- AAFM will post meeting materials to <https://agriculture.vermont.gov/pes>

## Introductions and setting goals for the process

Working Group Co-Chair Deputy Secretary Alyson Eastman welcomed the group and reviewed the charge of the Working Group, as articulated in Act 83 of 2019 of the Vermont General Assembly. She explained the intention to develop a program to recognize farmers stewarding Vermont's landscape and helping achieve the goals of improved water and environmental quality in the state. She emphasized that agriculture can and should play a role in reaching these goals, and that the loss of farms and farmland is concerning for the state. Co-Chair Nancy Everhart also welcomed the group and expressed the hope that the Working Group would, over the course of its five-month process, be able to determine a framework for next steps for a payment for ecosystem services (PES) system and recommend one or more pilot programs.

The Co-Chairs introduced the facilitator, Pat Field of the Consensus Building Institute, and explained that his role was to strengthen the process and remain neutral to help the group incorporate multiple stakeholder perspectives to collectively guide the outcomes.

## Member introductions

Working Group members introduced themselves and the organizations or constituencies they represent. They shared hopes for outcomes of the process. Key goals Working Group members articulated included:

- Instituting an approach to land stewardship that encompasses the whole state.
- Catalyzing a paradigm shift that incents farmers to steward land rather than forcing them to exploit natural resources. Rewarding farmers for the range of environmental and social public goods they provide in addition to the private goods they produce.
- Increasing the viability and sustainability of farming in the state.
- Including broad problem-solving on the structure and functioning of the landscape in a PES program.
- Investigating innovative ideas with opportunities for increased rewards to address several elements of the land and soil health, not only more narrowly defined chemical/nutrient issues.
- Integrating the efforts of agriculture with that of other sectors working to improve water quality and environmental health.

- Balancing the efficiency and equity of a PES program. Recognizing farmers' efforts to improve while also acknowledging those who have instituted practices to improve ecological health.
- Avoiding a one-size-fits-all approach and respecting farmers' knowledge and ability to innovate to solve problems.

### Scope and key questions

Working Group members offered the following key questions to address in the process to develop a PES program:

- What is the definition of soil health?
- Would a market function internally to Vermont, or interact nationally and internationally?
- What is the appropriate scale or unit for the program to work with to measure performance and benefits?
- Where will money come from for payments?
- What metrics will be used to calculate efficacy? Will metrics be based on practices or performance (i.e. services being provided.)
- How would the program interact with existing regulations?
- What has made other PES programs successful or not?
- How to ensure equity among farmers starting at different baselines?
- Can the system be adjusted over time to encompass more goals?
- Can this program be tied to other costs and sources of funding? E.g. highway departments, property insurers, municipal DPWs, etc.
- How to ensure some do not take undue advantage of the system and avoid unintended consequences?

Working Group members suggested that success at the conclusion of the five-month process would include:

- A pilot program and resolution of key questions to educate legislators.
- A process that adequately accounted for the voices of stakeholders not in the room, particularly the diverse range of small farmers.
- At minimum, framing policy questions legislators will need to decide to advance a PES system so they can make good decisions.
- Reaching consensus on technologies to measure and quantify services.
- The outcomes of the Working Group are effectively communicated to a range of audiences, including the legislature.

### Working Group operating procedures and work planning

The group reviewed and suggested minor revisions to the operating procedures, which the Co-Chairs and facilitator agreed to make.

Working Group members will review technical and substantive material via several webinar presentations over the course of the process whenever possible, in order to maximize the time during meetings for group deliberation.

## Review of Vermont's Agricultural Water Quality Regulatory Framework and Programs

Ryan Patch, AAFM Water Quality Division, provided an overview of existing agricultural and water quality regulations with which a new PES program would interact<sup>1</sup>. He explained that current regulations provide a definition of healthy soil: "Healthy soil" means soil that has a well-developed, porous structure, is chemically balanced, supports diverse microbial communities, and has abundant organic matter [6 V.S.A. § 4802(3)]. The regulations also establish standards for nutrient management on farms, including: recommended practices for improving and maintaining soil quality and healthy soils in order to increase the capacity of soil to retain water, improve flood resiliency, reduce sedimentation, reduce reliance on fertilizers and pesticides, and prevent agricultural stormwater runoff [6 V.S.A. § 4810a(4)(B)]. He also traced the evolution of water quality and agricultural regulations that led to the formation of this Working Group.

2016 amendments to required agricultural practices (RAPs) increased the responsibility of the agricultural sector to reduce nutrient loading to meet the total maximum daily load (TMDL) requirements. For example, agricultural contributions of phosphorous (P) are 41% of the total in the Lake Champlain Basin, but because agriculture can cost-effectively reduce P, the sector is responsible for 67% of reductions in the TMDL reduction requirements equation. The baseline outlined in the RAPs will meet many required standards, but farmers can do more and take some pressure off of other sectors to help meet water quality goals.

The state is aiming to reach TMDL goals as quickly as possible. The revision of the RAPs contributes towards that goal, as do other actions such as the creation of a Small Farm Operation certification program. To meet US Environmental Protection Agency (EPA) water quality requirements, under a regulatory framework, the state is working to implement education and outreach, technical and finance assistance, and inspection and enforcement programs.

To work towards these goals, AAFM collaborates with the Natural Resources Conservation Service (NRCS) and works to leverage federal and state funds through the Capital Equipment Assistance Program (CEAP), the Farm Agronomic Practices Program (FAP), and other programs.

The state is also working to advance processes that recognize and quantify the voluntary efforts of farmers exceeding RAPs and/or implementing best management practices (BMPs). AAFM entered into a grant agreement with Newtrient to develop a preliminary model of an eight-step process to certify practices on a farm that reduce P and could generate credits to be traded or sold.

The Vermont Environmental Stewardship Program (VESP) is a voluntary program that adopts a holistic, comprehensive view of environmental quality standards and provides incentives to farmers through social-based recognition.

Questions and comments from Working Group members (*direct responses from AAFM staff are in italics*)

- Are you suggesting the Working Group make RAPs the baseline for a PES program?
  - *The program will ensure that water quality standards are met throughout the state. Setting enhancements or incentives beyond RAPs may be best. This could be done either*

---

<sup>1</sup> See slides found at <https://agriculture.vermont.gov/pes> for additional detail.

*through a temporal difference to incent the achievement of water quality standards faster, or by setting standards past RAPs.*

- The additionality beyond RAPs could either be implementation of different practices, or implementation of RAPs practices to a higher standard.
  - *There is no standard for soil carbon or organic matter. Different metrics that are discretely regulated in RAPs, or soil erosion rates, could be options. It would be important to set goals past RAPs standards.*
- What portion of farmers are in compliance with RAPs? What happens if they are not compliant?
  - *Of assessments done thus far, there is a 67%<sup>2</sup> compliance rate. Since certified small farms are a new area of regulation, we are two years in to a seven-year process to assess small farms. The goal of enforcement is to fix the problem. Farmers must develop plans to implement practices.*
  - *The Revised Secretary's Decision outlines a compliance schedule whereby farms under the decision would be given one year to fix one problem, and 10 years to address all other issues. If there is not sufficient financial assistance, they may be granted an additional five years, since the costs can be high. The Agency's WQ Enforcement process has a much shorter timeframe for compliance than 10 years.*
- Are RAPs measuring practices or performance?
  - *Both. A lot of discretion is left to farmers—e.g. the no discharge requirement. However, requirements are more prescriptive in some contexts, such as the requirement for cover crops in the floodplain.*
- What other baselines can we draw on besides RAPs, considering that only some metrics are tied to erosion and water quality?
- What about certified small farmers that have not yet been certified? Will they be ineligible for PES?
- RAPs have come about in response to producers using or exploiting natural resources to create a single commodity. However, we are interested in whole other ways of stewarding the land and reaching goals such as climate resilience, clean water, clean air. We should consider a focus on the metrics and desired outcomes, rather than getting bogged down in the details of baselines for the process.
  - *The holistic perspective for lands is important. Using a baseline of what is already required is helpful from an efficiency perspective given finite resources to avoid "paying twice."*
- As we consider services beyond reducing P, the complexity will increase regarding what baselines to use.

---

<sup>2</sup> The compliance rates for farm production areas specifically, based on Agency of Ag inspections of farms in the Lake Champlain Basin from 7/13/2016 – 7/16/2019, is that the production area compliance rate for SFOs, CSFOs, MFOs and LFOs inspected in the Lake Champlain Basin by AAFM is 67%.

In SFY 2018, the AAFM Water Quality Division completed 652 inspections or investigations of farms throughout Vermont and issued 101 enforcement actions to farms.

## Considering a framework for a Vermont PES program

Taylor Ricketts, Gund Institute, UVM, provided a review of ecosystem services (ES) and PES concepts, discussed key design elements, and shared an initial proposed design for a program developed by members of a graduate course he taught.

### Defining and conceptualizing ecosystem services

Taylor provided the following definition for ecosystem services: “The conditions and processes through which natural ecosystems, and the species that make them up, sustain and fulfill human life” (Daily 1997). ES are generally grouped into four categories: cultural, provisioning, supporting, and regulating. Ecosystems provide bundles of multiple services. Ecosystems and species contain forms of natural capital (e.g. healthy soil, forests, etc.) which allow the ecosystem to function. ES are those functions which benefit people. By adding other forms of capital, people may amplify the benefits provided and may glean value from the ES.

Those who supply the ES (or those whose land provides the service) are not always those who benefit. The benefits may be monetized, but could also be measured in satisfaction, avoided hospitalizations, or other benefits.

### Key concepts of payments for ecosystem services

ES often provide public goods, but they are influenced by private decisions. The market often externalizes these benefits and does not provide for ES effectively. Regulation can address this problem by requiring practices to mitigate pollution. Incentives (i.e., PES) can be used to motivate farmers and landowners to act as environmental stewards.

A formal definition of PES contains five components:

1. A **voluntary** transaction where
2. a **well-defined** ES (or a land-use likely to secure that service)
3. is being ‘bought’ by at least one ES **buyer**
4. from at least one ES **provider**
5. if and only if the ES provider secures ES provision (**conditionality**)

### PES proposal for Vermont

There are a number of key questions to answer in designing a PES program. Members of a graduate course Taylor taught developed a proposal for a PES program for the state, addressing key design questions in the following ways

1. *What are the goals of the program?*
  - a. Measured contributions to environmental goals
  - b. Enhanced farm viability and public trust
  - c. Voluntary and equitable participation
  - d. Innovative and sustainable agriculture

II. *What ecosystem services will be involved?*

They selected P retention and carbon sequestration as the primary services to target, considering that these outcomes are closely linked to the state's comprehensive energy plan and EPA TMDL requirements.

III. *How will we measure them? Practice or performance?*

They determined they would measure services based on performance rather than practice, for several reasons

- a. Focus on outcomes
- b. Encourages innovation
- c. RAPs already exist
- d. Uncertain effectiveness of practice-based.

They acknowledged risks of a performance-based approach: it is more complicated, potentially costly, and practices aiming to achieve performance may not work.

They proposed that measurements could be made on a "farmgate" basis, measuring whole farm nutrient balance by gauging total P imports to and exports from a farm, and/or by using the state's P index (which has the benefit of using existing data and being supported by Extension.)

IV. *Who gets paid and how much?*

The class proposed that payees must be in compliance with RAPs and would receive an average of \$10-100/pound P/year. Payments would be differentiated based on farm size and location, acknowledging that P reductions are more valuable/needed in some locations and that larger abatement costs may be faced by smaller farms.

They proposed upfront payments to incentivize enrollment, followed by annual payments based on performance. They proposed an initial baseline would be calculated by average P levels for the three years preceding enrollment. They also discussed the possibility of using RAPs as a baseline.

V. *Who pays?*

The class suggested a publicly funded model.

- Option 1 would reallocate current funding sources. This would require considering the cost effectiveness of PES versus other existing programs in reducing P.
- Option 2 would expand funding sources. This would require assessing the political feasibility of expanding sources (e.g., is a new tax a viable option?)

VI. *Who will administer the program?*

The class determined an intermediary between the public beneficiaries and farmers should be trusted by all stakeholders and experienced in administering conservation incentives. They discussed the possibility of empowering an existing entity, and posed as potential options: Vermont Housing and Conservation Board, Vermont Land Trust, or Natural Resources Conservation Service.

VII. *How do we balance fairness and efficiency?*

The class acknowledged a central tradeoff between rewarding past good behavior (e.g. of early adopters of ecological practices) and maximizing environmental improvements (by targeting those with most

room for improvement.) They suggested the differentiated payments and use of baselines as key levers to balance this tradeoff. They also suggested that seeking equity can improve efficiency by increasing participation and support for the program and enhancing legitimacy.

Questions and comments from Working Group members (*direct responses from Taylor are in italics*)

- Overlapping benefits are complex. How can we assess the value of a broad array of ES, especially if they overlap? Will social and cultural ES be included in what this Working Group considers?
  - *Often each benefit has its own buyers. They are sometimes sold individually and are sometimes bundled together. The specificity or fuzziness of each approach come with tradeoffs.*
- All four models of ES benefits (cultural, provisioning, regulating, and supporting) are relevant and will financially benefit the farmer.
- Who pays matters. Who pays for the costs to land, people's health, and society at multiple levels of producing items like high-fructose corn syrup is different from who pays for organic beef. We're all paying for the damages of products like high-fructose corn syrup through the production and consumption cycle, whereas only a few of us are paying for all the benefits of organic farming.
- How can the metrics discussed account for agronomic practices to improve soil biology to reduce P contributions?
  - *This can be accounted for the in farmgate model where, for example, how much P-laden feed needs to be trucked in. This can provide an incentive to disrupt problematic supply chains.*
- Some of what is called performance seems to be a more refined practice model. There is a balance between practice and performance, but either type of measurement costs money.
  - *Some metrics are an attempt to walk between practice and performance by accurately predicting performance from practices in specific land contexts.*
- We should measure what is actually happening rather than model it based on research. Biology is always adapting and changing. The saying "all models are incorrect; some are useful" is apt. It would be helpful to identify one thing or a small number of things to measure from which all other necessary improvements flow. I would posit the structure and structural integrity of soil could be that metric. Clod tests or infiltration tests could be useful metrics in this regard. It may be more efficient to measure and reward the creation of natural capital.
- Soil health is also a useful metric because it benefits the farmer. Something that benefits the farmer is helpful because it may mean that payments are not required indefinitely if they ultimately are beneficial enough to the landowner/farmer.

### Vermont Environmental Stewardship Program (VESP)

Judson Peck, AAFM Water Quality Division, provided an overview of VESP, reviewed the VESP pilot study, and discussed the possibility of VESP administering a PES program.<sup>3</sup>

---

<sup>3</sup> For more detailed information on VESP, including information about the assessment tools it uses, see slide found here: <https://agriculture.vermont.gov/pes>.

## VESP overview

VESP's goal is to accelerate water quality improvements through additional voluntary efforts and provide recognition for farmers who strive for environmental excellence. It currently provides social recognition to program participants, but could potentially provide financial payments in the future.

The program's development began in 2013, with funding originally coming from an NRCS Vermont Conservation Innovation Grant. AAFM, Department of Environmental Conservation (DEC), USDA Natural Resources Conservation Service (NRCS), Vermont Association of Conservation Districts (VACD), and University of Vermont Cooperative Extension (UVM) partner on the program.

To be eligible to participate in VESP (which is a voluntary program), farms must

- Be actively farming in the state
- Be a farm size as defined in the RAPs
- Submit all land managed by the farm, whether owned or leased, to assessment and certification
- Meet existing regulations, including RAPs

## Assessment and tools

Participating farms are assessed according to the following criteria using the NRCS Resource Stewardship Evaluation Tool (RSET) and the Cornell Comprehensive Soil Health Tests.

- Nutrient management
- Sediment and erosion control
- Soil health
- Air quality
- Carbon sequestration
- Pasture health

RSET streamlines the assessment of multiple resource concerns in an integrated tool: soil management, water quality, water quantity, air quality, and wildlife habitat. It evaluates site-specific risks and applies thresholds to meet a unified national target (i.e., higher-risk fields require a higher level of stewardship to meet the national target.) The Cornell tool is a comprehensive test that measures multiple indicators of physical, chemical, and biological soil health.

## Process

Farmers who meet baseline requirements may apply to VESP. VESP contracts with conservation planners who conduct the farm assessment. If the farm does not meet the thresholds, the farmer works with the conservation planner to develop a conservation plan. If thresholds are met, the farm receives the VESP sign and is certified for five years. Follow-up monitoring is conducted and farmers may reapply for additional certification periods.

## Pilot study

VESP is currently conducting a pilot with 10-12 diverse farm types to vet the process and assessment tools. The majority of farms tested so far in the pilot are doing quite well relative to the threshold indicators of both tools.

## VESP and PES

VESP is a nearly full functional program, currently in a pilot, that provides a framework to objectively quantify multiple ES.

Act 83 of 2019 of the Vermont General Assembly, which called for the creation of this Working Group, identifies similar goals to those identified in Act 64 of 2019, which called for the creation of the Environmental Stewardship program. Namely, they seek to

- Improve soil health
- Enhance crop resilience
- Increase carbon storage and stormwater storage capacity
- Reduce agricultural runoff to waters

Additionally, there is good alignment on principles between VESP and best practices for a PES program:

1. Voluntary – participation based on additional benefit of PES program; no legal requirement
2. Beneficiary Pays – land managers are stewards (not polluters)
3. Direct Payment – beneficiary (public) to provider (land managers); or through intermediary (VAAFAM)
4. Additionality – provision of services not occur without PES program (pay for additional services)
5. Conditionality – payment dependent on delivery of services

In the current VESP program, there is no baseline (e.g. reducing from a three-year average of P loads.)

AAFAM submits to the Working Group for consideration the possibility of building on or incorporating VESP into a PES program.

Questions and comments from Working Group members (*direct responses from AAFAM staff are in italics*)

- What are you testing in the pilot? Are you actively checking farms?
  - *Part of the effort is to calibrate the standards. If all farms easily pass, maybe the threshold is too low.*
- How significant is the social recognition alone to farmers?
  - *A number of farms reached out to VESP to express interest. Social recognition is important, though financial compensation would obviously be preferred. VESP has the authority to manage payments, though it does not have a means or methodology to do so currently.*
- Should there be financial incentives lasting five years that a producer can obtain from a snapshot assessment done in one day? Perhaps other assessment tools that provide more ongoing accountability should be considered. For example, there are technologies using satellites to measure growth every day.
  - *Annual spot-checking & verification of implementation is a part of maintaining VESP Certification and is built into the framework for the full VESP program.*
- How much could VESP be adapted in response to what this group develops for measurement, methodology, etc.?

- *This program is flexible and still in pilot. Use of RSET aims to balance accuracy and costs, but other technologies could be considered.*
- Could the program accommodate a lot of farmers who wanted to join?
  - *The pilot is evaluating how much work evaluation requires, particularly for larger farms.*
- Does VESP show additionality, e.g. requirements to go beyond RAPs?
  - *It varies by field and by farm, since requirements are dependent on site-specific risks.*
- An expanded pilot could answer some additional questions and test some other tools.
  - Vicky Drew, NRCS: RSET is not that flexible of a tool. Moving the threshold for water quality is something we have been discussing and the developers could modify for Vermont.
- Does the VESP soil health test capture the soil sponge/soil structure and integrity metric? Mass balance could be added to VESP if so.
- BMPs and the RSET assessment tools are helpful to prevent further erosion of soil capital, but they may not incentivize the building of natural capital. We need to think creatively about different tools and technologies available to incent a shift from tolerable soil loss to building healthy soil. VESP seems to be acknowledging something less bad, rather than outlining where we want to go. It looks like most thresholds are met already.
- The 3 lb. P/acre national number should be translated into a Vermont number.

#### Meeting reflections: weighing options and key design considerations for a PES program

- The group has several options:
  - Fill out the matrix “homework” and then mix and match options
  - Develop an approach focusing on soil/natural capital
  - Use VESP as a scaffold on which to attach baseline values, determine eligibility, relationship to RAPs, etc.
  - Farmgate model (suggested by UVM students)
- Among key design questions, there seems to be relative consensus on measuring performance.
- It is possible to pay for good baseline levels for those who have adopted good practices, while also paying for additional improvements.
- Equity improves efficiency. This was reflected in hearing from farmers during legislative sessions that they want to be sure those who have been doing it right all along will be rewarded.
- The Working Group should imagine would communities, landscapes, economies, budgets, quality of life would look like with robust soil capital. This is a different approach than identifying benchmarks.
- What would be a “baseline” for natural capital? Would it be BMPs, a score on RSET, etc.? How would we incentivize the construction of more natural capital?
- How could a program allow farmers to get recognition and differentiate themselves in the market? Rewards in the marketplace could help replace transitional payments.
- A challenge with relying on product differentiation is that, once market penetration is reached, the price does not hold. We are also seeking a model that recognizes that the benefits are public goods. If farmers were paid an adequate price for their products, there would be no need for PES, but then only milk purchasers would be paying for it. By hoping that the marketplace will pay the price for the service, we’re stuck in the “maximizing product” paradigm.

## Public comment

- Andrew Davis, Northeast Organic Farmers Association Vermont: Measurements should reflect a sustainable ecosystem, not just the value the ecosystem provides. Otherwise, we risk getting stuck in the same paradigm of seeking high “productivity” on a metric, which may not be sustainable. Farmers are part of the ecosystem. If we incentivize decreased production of a commodity on a farm in favor of another ES, that may externalize the production methods into something out of control of the system, which could be less sustainable than the current production was.
- Brian Beckage, UVM: The VESP option sounds expeditious. I am concerned about the variability from a one-time snapshot. Also, how does a well-managed farm translate into quantifiable ES? For carbon sequestration, why not link to existing external markets for carbon offsets, etc. rather than creating a new market internal to Vermont? For P, what does 3 lb./acre of P removed translate into for downstream effects?
- Phil Huffman, The Nature Conservancy (TNC): TNC advocated for the creation of this group. We are heartened to see it has been created and to hear this discussion. TNC has been involved nationally and globally in efforts to develop PES frameworks. We hope this could be a resource to you. We support the overarching goals of moving towards enhanced environmental outcomes on critical farm resources, and recognizing support of farmers for environmental outcomes.
- Abe Collins, Landstream: the most viable path forward is to hire farmers to rebuild the natural capital we used to build Vermont. As important as measuring performance is the ability of land managers to use feedback to gauge their efforts. One ES is nutrient retention. A lot of P will be needed to increase organic matter one foot of depth.
- Abbey Willard, AAFM: The group could consider product differentiation for Vermont farms that participate in PES. It could have social value and eventually, through a customer base, financial value.
- Lauryn Sherman, VLS Student: We need to move beyond old models that seek to minimize damage, and instead seek actual regeneration of natural capital.
- John Winsten, Winrock: the focus on soil health will have private benefits for the farmer, and won't require a perpetual subsidy. On the other hand, if the ES requires a cost to the farmer, a program has to keep paying the cost or it won't realize the benefit.

## Working Group attendees

1. Jill Arace
2. Paul Doton
3. Vicky Drew
4. Alyson Eastman
5. Nancy Everhart
6. Eric Howe
7. Brian Kemp
8. Maddie Kempner
9. Didi Pershouse
10. Taylor Ricketts
11. Chuck Ross
12. Marli Rupe
13. Tyler Webb