# Vermont Soil Health and Payment for Ecosystem Services (PES)

# Working Group

Williston, Vermont

November 15, 2019 DRAFT Meeting Summary

# Next steps

* AAFM will post meeting materials, webinar recordings, and the October meeting summary to the website.
* AAFM will share public comments received via email with the Working Group
* CBI will work with the cochairs to develop components of a draft report
* CBI will plan future webinars, including one with Newtrient and potentially one on NRCS.

# Summary

The Working Group’s discussion focused on further elaborating PES program design criteria for a demonstration project; considering the applicability of and transferable lessons from related tools and projects, including the Conservation Effects Assessment Project (CEAP), the Resource Stewardship Evaluation Tool (RSET) and the Cornell Soil Health Test (CASH); and providing feedback regarding the direction and outline of a draft report.

## Program Design Criteria

The group continued its discussions to refine a potential demonstration project. Key questions surfaced and options considered included the following:

### What are the advantages and disadvantages of disaggregating the water quality benefits from other ecosystem services that may be provided by soil health, such as flood mitigation?

* + Beneficiaries of the water quality benefits are more broad-based, whereas the flood mitigation benefits are likely very localized. Therefore, likely payers could be different.
    - What role could municipalities play? Given municipal investment in flood mitigation, could municipalities become buyers of flood mitigation benefits?
  + Improving flood mitigation is a significant part of managing nutrient runoff.
  + Valuing soil health in an integrated way may be a key component of the paradigm shift sought by this group, as compared to a more siloed approach to ecosystem services.

### The relationship between soil health and nutrient retention is not yet well established. Multiple metrics to measure soil health may be needed to capture the aspects of soil health that this group is interested in measuring and valuing.

* + For example, if the CASH test is primarily measuring the capacity to produce viable crops, it is not yet clear if a certain threshold level on the CASH score (e.g. a high score such as 90) also implies significant nutrient retention benefits. One possible question a demonstration project could help answer is what CASH score, if any, indicates that the soil provides water quality (nutrient retention) benefits?
  + Could the nutrient management requirements of required agricultural practices (RAPs) address the question of overapplication of amendments/manure that would not be captured by a CASH score?
    - For fields with a medium or low P risk, farmers can apply above crop removal for P and still meet RAPs and pass RSET. There is latitude within existing regulations to build soil health with manure while being compliant with P loss standards.
  + If a field is passing in RSET, is it very likely to be meeting the RAPs? If this relationship could be established it could provide efficiencies by avoiding the need for a state visit.
    - RSET does not look at production area compliance, which is a part of RAPs.

### Given that much of the demonstration project may be focused on gathering information and establishing the relationships between soil health and desired ecosystem services, how should the project be structured?

* + Payments:
    - Could farmers be paid some fixed price for participating?
    - Could graduated payments be made for the quality of natural capital provided as the work is done to calibrate the relationship between quality of natural capital and the desired ecosystem services?
  + Since the VESP program includes RSET and CASH, could a payment element simply be added, and learning questions be defined that can be answered by the data gathered by VESP?
    - Where is the verification in such a model? CASH is more focused on healthy crops, and RSET is based on models and is only focused on a limited array of conservation practices meant to limit further degradation of resources rather than more generative practices.
    - The tools VESP uses are not articulated in the statute, so they could be changed.
  + Consider focusing on one key watershed, such as the Winooski, South Lake Champlain, or Rock River.
  + Avoid creating another program in which farmers can enroll. This should be a focused effort to correlate the relationship between soil health and desired outcomes.

### What other issues need to be resolved before proceeding?

* + How can measurements avoid penalizing participants for outside influence on their farm? If an upstream neighbor is polluting, how can that be considered?
  + To get the statewide buy-in needed to advance a program, it must demonstrate relevance and benefits for the eastern side of the state.
  + Natural capital or soil health, once well defined, could be an alternative to paying for practices or performance purely. While the natural capital model is attractive, it may not capture all the benefits the group wants to generate, so other things may need to be measured and paid for as well.
  + We need to be mindful that complexity in the program can be a barrier to participation for farmers. Additionally, if the bar is set too high, many farmers will be unable to participate.
  + Creative funding options beyond general funds from the legislature should be explored, including impact investment, low-cost forgivable loans, sponsorship money, and others.
  + If this Working Group were to continue, how can we engage more farmer input going forward?

## Watershed Monitoring and Conservation Effects Assessment Project (CEAP)[[1]](#footnote-1)

Joshua Faulkner, UVM Extension, presented an on overview of CEAP watershed assessment studies. The watershed assessment studies are tightly linked to NRCS programs and focused on understanding the aggregate impact of programs implemented on the watershed scale. CEAP uses a paired watershed experimental design. It begins with a calibration period of the pair, and then a treatment period with the implementation of conservation practices in one watershed and business as usual in the control watershed to monitors differences across the pair over time.

### Questions, comments, and discussion *(direct responses from Mr. Faulkner are in italics)*

* *The infrastructure costs approximately $18,000 per station, and total costs are around $300,000 per station for six to seven years.*
* *The project is not currently using CASH tests.*
* We need to be able to quantify the soil reconstruction value for water quality. There is a lot still not well understood. Some conservation practices can result in more runoff, though some of those conservation practices may not actually be improving soil health as this group conceptualizes it but are rather seeking to compensate for the lack of qualities that healthy soil provides (e.g. slit aeration trying to compensate for lack of infiltration ability that healthy soil would provide.)
* How is research such as this being used to set objectives for the TMDL?
  + Ryan Patch, AAFM: Whenever the RAPs are amended, the AAFM reviews research and information available. Rules are supported by documentation of research that can demonstrate the efficacy of regulations and are vetted by the public and committees.
* What treatment practices are of the highest interest? Where else are paired experiments happening like these?
  + *The project has learned a lot from Ohio, where a lot of work is being done. With more no till, we saw improved soil health. This resulted in a decrease in particulate P loss, but an overall increase in soluble P loss. These results are confounding. Tile injection is of interest to explore.*
* This program seems geared towards tweaking the traditional conservation programs we have now. It seems relevant for information exchange to guide stewards who may need that help rebuilding natural capital, though not sufficient alone to get us on the path to the ambitions of this group. Linking this project with CASH to monitor soil growing practices could help test the idea that a well-structured, functional, chemically active, and biologically diverse soil would create the outcomes we are seeking.

## Resource Stewardship Evaluation Tool (RSET) in Detail

Judson Peck, AAFM, provided an overview of RSET to give additional detail about the tool, building on the introduction provided in the VESP presentation at the first Working Group meeting[[2]](#footnote-2). RSET is an online web-based tool developed by NRCS. RSET

* Streamlines multiple tools into one integrated tool
* Is a holistic assessment across multiple natural resource concerns
* Is compared to science-based thresholds set by NRCS
* Incorporates site-specific data of each field (slope, soils, climate)
* Incorporates nutrient application data of P-Index
* Models management and practice changes – farmer see effects and plan accordingly

RSET incorporates five resource concerns: soil management, water quality, water quantity, air quality, and wildlife habitat. It determines the appropriate threshold specific to characteristics of the site to meet a national target.

The group discussed the interactions between RSET, CASH, and other metrics including the P index and observed that though there is some overlap in the metrics of these tools, a field could score well on one while poorly on another. The group discussed the possibility of using CASH and RSET in combination for a demonstration project, as the VESP program does. For example, the group discussed that RSET may be able to capture some dimensions around nutrient management plans that CASH may not address.

## NRCS Programs

Vicky Drew, NRCS, provided a brief overview of NRCS programs that may be relevant to the efforts of the Working Group including EQIP, CSP payments, and the RCCP program. She mentioned that Congress directed NRCS to look further into ecosystem services and that this topic could rank more highly in future grant rounds. She mentioned that an RCCP alternative funding mechanism would likely come out in winter or early spring 2020.

# Public Comment

* Tom Berry, Office of Senator Leahy: The opportunities laid out by Vicky Drew from NRCS may be the best way to seek federal support in the near term, since there will not be a new farm bill for five years.
* Tom Stoddard, Native Energy: I encourage the group to consider non-farm providers of ecosystem services in the development of a PES program.
* Erica Campbell, Office of Senator Sanders: I encourage the group to look at a new report out on climate change looking at current and potential federal programs *[need reference to report.]*
* Matt Gardner, AAFM: Regarding the discussion of decoupling water quality from flood mitigation: other than stream erosion, those are largely the same thing since flood mitigation is a primary driver of water quality improvements for nutrients going into the lake.
* Graham Unangst-Rufenacht, Rural Vermont: I encourage the group to keep the emphasis on natural capital and landscape function. Soil requires healthy plans, and plants require healthy animal management.
* David Miskell, Real Organic Project: I encourage the group to make sure that the pilots that are suggested by this group have broad enough political support and that you consider where they are located when determining this. This effort is critical to organic farmers, among others.

1. For details on Mr. Faulkner’s CEAP presentation, see the presentation slides posted at <https://agriculture.vermont.gov/pes> [↑](#footnote-ref-1)
2. For details on Mr. Peck’s RSET presentation, see the presentation slides posted at <https://agriculture.vermont.gov/pes> [↑](#footnote-ref-2)