

Cornell Cooperative Extension Tompkins County has convened a group of stakeholders over the past two years to discuss the development of a regional Payment for Ecosystem Services (PES) pilot program in the Finger Lakes. The PES Work Team includes 28 stakeholders and is a self-selected, volunteer group that is not fully representative of Tompkins County. The full Work Team meets once a month in addition to two separate subcommittee meetings (focused on Methodologies and Funding/Policy). The following comments were developed with stakeholders engaged with the Work Team.

CLCPA Draft Scoping Plan: Agriculture and Forestry Section

AF12: Adopt Soil Health Practices calls out the need to “increase adoption of soil health practices on rented land.” There is some evidence of the effectiveness of working with Non-Operating Landowners (NOLs) to increase knowledge and awareness of the environmental impacts of certain farming systems, and developing incentive structures to layer into traditional farmer-landowner agreements to promote regenerative agriculture. The report [Farmland Investment as a Vehicle for Environmental Conservation](#), concluded that despite a willingness by land owners to support more conservation practices on their land, there may be a discrepancy between landowner intentions and actions. There is also some evidence of the effectiveness of allocating funding to SWCDs for no-till and other equipment to borrow or developing a program that helps mid-sized farms who have invested in equipment to develop a side business to provide services to smaller farms. The State of Vermont provides an online database for farmers to search for conservation equipment to rent.¹

This section also states: “Increase perennial plant systems: AGM and SWCC should support converting annual cropland to perennial hay land/pasture and where appropriate (such as steep slopes and highly erodible lands).” Evidence indicates that including agroforestry among the perennial plant systems supported could be of benefit. Tree integration in cropping systems can improve soil nutrient availability, soil fertility, and enhance microbial dynamics which can have a positive effect on soil health.²

AF13: Increase Adoption of Agroforestry is well placed within this context, and contains recommendations as to how best to increase adoption of agroforestry, namely the increase of specific agroforestry practices like silvo-pasturing and alley-cropping, and calls for supporting business planning market infrastructure development.

Leveraging existing knowledge and experiences in agroforestry is crucial to increase the adoption of agroforestry systems in New York State. The Haudenosaunee and their ancestors have already been adopting agroforestry practices for thousands of years and continue to contribute with robust traditional knowledge that has been passed down for generations. In addition, there are a number of producers across the state who have

¹ See <https://agriculture.vermont.gov/equipment-rental>

² Dollinger, Jeanne, Jose, Shibu. Agroforestry for Soil Health. *Agroforest Syst* (2018) 92:213-219. <https://doi.org/10.1007/s10457-018-0223-9>

already adopted agroforestry systems whose leadership could be leveraged for farmer-to-farmer networks or mentorship for beginning farmers. Organizations such as Cornell's Center for Agroforestry at CCE Columbia/Greene, [Cornell Small Farms](#), the New York Tree Crops Alliance (NYTCA), the Agroforestry and Nut Cropping Educator at CCE Tompkins, and the Maple Program at Arnot Forest are all exploring additional agroforestry components and programming. It should also be noted that the NYS Agroforestry Awareness and Adoption survey was recently completed and once published, these results will provide a critical baseline on which to expand agroforestry adoption across the state. In 2022, Cornell Cooperative Extension Tompkins County hired an Agroforestry Educator to support producers interested in agroforestry. Dr. Samantha Bosco's work has included organizing the first Agroforestry session at the 2022 NY Producers Expo, offering webinar opportunities for producers, and working on an alley cropping demonstration site at the Cornell Willsboro Research Farm.

There is also much that has already been done in other parts of the country (i.e. [University of Missouri's Center for Agroforestry](#), [Virginia Tech](#) and [Savanna Institute](#)). The non-profit Pennsylvania Sustainable Agriculture (PASA) is developing [alley cropping demonstration sites](#) in Pennsylvania, and the [Appalachian Sustainable Development](#) organization is developing support and resources across the eastern half of the country for those interested in adopting agroforestry practices.

There is evidence of opportunities in developing more synergistic systems that incorporate the perennialization of annual systems, nutrient & water quality management and bioeconomy (bioenergy production, sustainable building materials, etc). For example, increased use of wood products in construction provides revenue for land managers and an incentive to keep areas forested while harvesting sustainably.^{3 4} Strategy **AF19: Expand Markets for Sustainably Harvested Durable Wood Products** could be integrated with a long-term agroforestry approach, diversifying forest products and promoting specialty crops from forested land uses.

AF14: Develop Agricultural Environmental Management Planning for Climate change Mitigation and Adaptation: Evidence indicates that above-ground woody biomass is a real and verifiable indicator that could be used to report carbon sequestration on agricultural lands, specifically where agroforestry systems have been implemented. See [New York Agriculture and Climate Change: Key Opportunities for Mitigation, Resilience, and Adaptation](#) for Jenifer Wightman and Peter Woodbury's analysis of carbon farming mechanisms.

With **AF15: Monitor and Benchmark Agricultural GHG Emissions**, there is likely an opportunity here to help define the right approach to "benchmarking" or baselining GHGs in NYS, i.e. using the right blend of modeling, remote sensing, and direct

³ Bergman, Richard, Ritter, Michael A., Skog, Kenneth. Science Supporting the Economic and Environmental Benefits of Using Wood and Wood Products in Green Building Construction. United States Department of Agriculture Forest Service. 2011. https://www.fpl.fs.fed.us/documnts/fplgtr/fpl_gtr206.pdf

⁴ Watershed Agricultural Council promotes sustainable forestry as a means of economically securing forested land uses, which has critical conservation benefits for New York City's drinking water.

measurement. Established protocols from organizations such as the USDA/Forest Service⁵ have benchmarking methods that could be utilized in NYS to ensure compatibility with other state and federal initiatives or with tools such as COMET-Farm or COMET-Planner.

There is likewise an opportunity for AGM, SWCC, the SWCDs and other stakeholders in New York's various watersheds to play a role in designing a PES market, as noted in **AF16: Establish a Payment for Ecosystem Services Program**. Emphasis on co-benefits is strong here. "Program can be designed to address multiple services and evolve with changing needs and priorities of the State." There is evidence that an increase in soil carbon may also positively impact co-benefits such as water quality, flooding resiliency, and biodiversity. Soil organic carbon is important for physical stability, chemical composition, and biological productivity in the soil. As carbon is stored in the soil, the risk of nutrient loss from erosion and leaching is reduced. See Cornell's Agronomy Fact Sheet Series, [The Carbon Cycle and Soil Organic Carbon](#).

Other considerations for the PES Strategy:

- Watershed approach: Although efforts must be coordinated at the state level to ensure consistent funding and measurement baselines, there is evidence that the management, monitoring and "marketing" of ecosystem services can be effectively organized at the watershed level, as the impacts of farm and forestry management are felt by surrounding communities in the form of water quality.⁶ To this end, a statewide network of recognized Watershed Alliances could be formed, each including the SWCDs, counties, municipalities, Indigenous Nations, farmers, foresters, universities and other stakeholders in the watershed. This effort could build upon and empower the work already being done at the watershed level by alliances of SWCDs and other stakeholders including, but not limited to:
 - the Finger Lakes - Lake Ontario Watershed Protection Alliance (FOLLOWPA),
 - the New York City Watershed Agricultural Council (WAC),
 - the Skaneateles Lake Watershed Agricultural Program,

⁵ The USDA greenhouse gas inventory methodology is outlined in this report: Eve, M., D. Pape, M. Flugge, R. Steele, D. Man, M. Riley-Gilbert, and S. Biggar, (Eds), 2014. Quantifying Greenhouse Gas Fluxes in Agriculture and Forestry: Methods for Entity-Scale Inventory. Technical Bulletin Number 1939. Office of the Chief Economist, U.S. Department of Agriculture, Washington, DC. 606 pages. July 2014. The Forest Inventory & Analysis Program in the US. Forest Service has outlined their contributions to forest carbon accounting and methodologies at <https://www.fia.fs.fed.us/forestcarbon/>

⁶ Climate-smart agricultural practices and systems, such as cover crops, riparian buffers, alley cropping, and silvopasture, can improve water quality, an effect that is felt directly by local communities. See [New York Agriculture and Climate Change: Key Opportunities for Mitigation, Resilience, and Adaptation](#) for a complete analysis of the ecosystem service benefits provided by agricultural practices and systems. Opportunities to mimic perennial and native vegetation patterns in agroecosystems include methods that ensure canopy cover and living roots such as in agroforestry systems. Agroecosystems are more embedded in the surrounding landscape and can improve agricultural land's resilience to climate change and increased rainfall availability. See [Improving water resilience with more perennially based agriculture](#).

- the Upper Susquehanna Coalition (USC),
- the Lake Erie Watershed Protection Alliance (LEWPA),
- the Adirondacks Lake Alliance (ALA),
- the St. Lawrence River Watershed Partnership (SLRWP), and
- the Cayuga Lake Watershed Intermunicipal Organization.

Partnership with other SWCDs and stakeholders in state-recognized and funded watershed-based alliances can give local SWCDs the support and empowerment necessary to promote the health and resiliency of New York’s agricultural soils via PES and the broader Soil Health Initiative established by the Soil Health and Climate Resiliency Act.

- Equity considerations and expanding program participation to marginalized groups is stated in several of the strategies in the Agriculture & Forestry section. Evidence indicates that PES programs that solely focus on economic efficiency and fail to integrate equity subsequently favor land owners and resource managers who own a high amount of acreage. Prioritizing economic efficiency may exclude accounting for broader ecological functions and social equity dimensions that PES programs have the potential to alter positively.⁷ There are opportunities to engage with organizations in NYS such as the National Black Farmers Association, the Black Farmer Fund, the Northeast Farmers of Color, Soul Fire Farm, and Groundswell Center in the entire process to plan, pilot, and implement a state PES pilot in order to develop equitable programming.
- There is evidence that beginning and young farmers may face unique challenges when participating in ecosystem service provisioning programs in comparison to established farms. The report [Ecosystem Services in Working Lands Practice and Policy of the Northeast: Success, Challenges, and Opportunities for Producers and Extension](#), concludes that “Ecosystem service provisioning programs for young and beginner farmers, while important, may not be enough to entice young people into working lands-related careers. Programs that couple ecosystem service provisioning with incentives that directly support livelihood provisioning, such as cash-in-hand (basic income), land access/acquisition, free education/professional development, childcare and health care, may help.” Their recommendations are the following:

⁷ Unai Pascual, Jacob Phelps, Eneko Garmendia, Katrina Brown, Esteve Corbera, Adrian Martin, Erik Gomez-Baggethun, Roldan Muradian, Social Equity Matters in Payments for Ecosystem Services, *BioScience*, Volume 64, Issue 11, November 2014, Pages 1027–1036, <https://doi.org/10.1093/biosci/biu146>

- Evaluate the regionally specific factors inhibiting youth from working-lands careers in the U.S. Northeast, with a particular eye on issues of land tenure, childcare, health care, and higher education.
 - Evaluate the role of cash-transfer and basic income programs to supplement conventional, market-based systems.
- Research shows that there may be potential conflicts between rented and owned land in a PES program. Resource tenure, or “a complex system of rights, rules, authority and procedures that govern how persons gain access and control over land and natural resources,”⁸ can have direct implications on the ownership of ecosystem service credits generated on land such as ‘carbon rights.’ For carbon buyers, stable, long-term contracts with confirmed carbon rights holders are needed in order to have someone that can be held accountable for the performance on their land.⁹ This may be prevented by the fluidity or turnover associated with rental contracts.

In the United States, 98% of farmland is owned by white landowners, and marginalized groups face more land access challenges.¹⁰ Evidence shows that structural racism has increased barriers to land access and startup capital for BIPOC (Black, Indigenous, People of Color) farmers.¹¹ In addition, young farmers generally rent a large number of the acres that they operate¹² with a third of them relying exclusively on rented land.¹³ This discrepancy in land ownership could pose challenges for these groups to enter existing PES programs, such as carbon markets, where long-term contracts may be required. For example, Nori requires a ten-year contract commitment with verification of land management completed every three years.¹⁴

⁸ Caron, Cynthia, Goldstein, Allyson, Knox, Anna, Miner, Jonathan. Land tenure and payment for environmental services: Challenges and Opportunities for REDD+. *Land Tenure Journal*; 2011.

⁹ Ibid.

¹⁰ Horst M, Marion A. Racial, ethnic and gender inequities in farmland ownership and farming in the U.S. *Agric Hum Values*. 2019;36(1):1-16. doi:10.1007/s10460-018-9883-3.

¹¹ Ibid.

¹² Bigelow D, Borchers A, Hubbs T. U.S. Farmland Ownership, Tenure, and Transfer. USDA; Economic Research Service; 2016.

¹³ Rippon-Butler H. Land Policy; Towards a More Equitable Farming Future. National Young Farmers Coalition; 2020.

¹⁴ See

<https://noricarbonremoval.freshdesk.com/support/solutions/articles/69000336813-what-happens-after-verification-> for more information about Nori’s requirements.

- There are existing and widespread PES frameworks whose elements, such as methodologies to quantify ecosystem service provision, could be utilized or adopted in NYS. For example, the State of Vermont¹⁵ and American Farmland Trust (AFT)¹⁶ have both developed watershed PES pilot programs aimed to decrease nutrient runoff. These may have relevant program parameters for a NYS pilot program. In addition, there are significant efforts in NYS at the regional and watershed level where further collaboration could avoid 'hyper localized' methodologies or redundancy in partner program efforts. The efforts to develop a statewide 'baseline,' see **strategy AF15**, and the Carbon Farming Program, **strategy AF14**, could be integrated with the PES pilot program's development.
- The efforts to develop a Finger Lakes pilot program are focused on BIPOC and beginning farmers who have already adopted regenerative¹⁷ practices or systems. The group aims to develop a program that first fits the needs of these groups before scaling it out to the rest of the farming community with the understanding that some farms, generally with more acreage and late-adopters, are already able to access existing PES programs. Efforts by other programs, such as the [Vermont Payment for Ecosystem Services and Soil Health Working Group](#) and the Vermont Pay For Phosphorus Program, have been reviewed to determine parameters that could be included in a New York context. Lessons learned from this effort and from others across the state engaging in conversations and planning around development of Payment for Ecosystem Services programs could inform a network of regional pilots or a state-level program. Other organizations engaged in this work in NYS include Scenic Hudson, Hudson Carbon, Northeast Carbon Alliance (NECA), American Farmland Trust, and the Northeast Organic Farming Alliance in NYS (NOFA-NY).

¹⁵ The State of Vermont's [Pay for Phosphorus Program](#) is a new, outcomes-based program facilitated by the Vermont Agency of Agriculture, Food, and Markets.

¹⁶ More information on AFT's program can be found at: [Upper Scioto River Watershed - Farming for Cleaner Water](#).

¹⁷ We define regenerative agriculture to be agriculture implemented using the soil health practices outlined in the amended Agriculture & Markets law in Section 151-L of Article 11-B: *Soil Health and Climate Resiliency*. The principles of soil health include least disturbance of the soil, keeping the ground covered, diversity in plant and animal species, keeping living roots in the soil as much as possible, and the importance of integrating animals. See Guo, M. (2021). Soil Health Assessment and Management: Recent Development in Science and Practices. *Soil Systems*, 5(4), 61. <https://doi.org/10.3390/soilsystems5040061>.