

Soil Health, Agriculture and Climate in New England:

Tufts GDAE - April 4th - Meeting Notes

Table of Contents ([Link to sections](#))

Abstract/Main Outcome:

I. First Session

Status of Science and Monitoring

[Discussion](#)

[Soil Health vs. Whole Ecosystem Health testing](#)

[Farmer utility of soil science](#)

[Is it worth paying farmers in the Northeast for land restoration efforts?](#)

II. Second Session

Healthy Soils Policy & a market mechanism

Discussion

[A Farm Tax vs. Incentives Scheme to encourage healthy soil management?](#)

[How to measure & monitor ecosystem services, so that farmers can be paid for them](#)

[The role Conventional, large farms can play](#)

[Gaps in existing Government soil health management programs](#)

[Existing potential fund streams for soil management policy & programming](#)

[Healthy Soil Policy Advocacy Opportunities](#)

[The modeling dilemma: measure & monitor farming practices or outcomes?](#)

[Expanding markets for local products, by bridging the urban-rural divide](#)

III. If we formed a Coalition, what actions could we take collectively to move forward?

Abstract/Main Outcome:

The biggest insight derived from our meeting was that those aiming to regulate the agricultural system have been patching holes in *ecosystem and market-based* problems of the food system rather than re-engineering it. Science shows that with improved farming practices and sustainable forestry, we can let the land re-engineer itself, a service that is worth paying for. Governments are already spending resources that could be efficiently re-directed to solve agro-environmental problems and save their local farming economies simultaneously.

We aim to launch a regional Soil Health initiative via a web platform and Email-list-based Coalition for all interested groups and individuals. Our goal as a Coalition won't be to pick a single strategy. Its to outline and support all the strategies that exist, to that members of the coalition can choose and work on the one that suits them. It was proposed during the last session to continue working together, following this event, as a collective on organizing efforts to address our top priority issues. To discuss or organize formal action on these issues we agreed it would be very productive to host a first conference of the Northeast Soil Health Coalition during a Symposium in February 2020.

I. First Session

- Paul Luu of 4per1000 presents, summarizing the framework of the 4per1000 Initiative, which is mobilizing international governments to reform their soil management systems, advocating for management to increase soil organic carbon, for food security, climate change adaptation, and climate change mitigation. (Slides posted on website)
 - Key message that 4per1000 creates space for discussion of: soil health is valuable in manifold ways - any C storage we can gain is an ancillary benefit. If we draw attention to the importance of soil health, and of more sustainable ways of farming and living in general, and by doing so gain increased international investment in soil health & agriculture.¹

¹ Brian Donahue, Brandeis

Status of Science and Monitoring

- Jon Sanderman presents on the opportunities related to reversing Soil Organic Carbon (SOC) loss, including Potential carbon stocks of NE soils vs. woody biomass, the limits to SOC building in soils, and the importance of focusing on soil health & sustainability **first**, then emphasizing climate mitigation as a co-benefit (*Slides posted on GDAE website*)
 - We shouldn't be aiming for the full unrealized potential of organic carbon storage, indicated in the "Soil carbon debt of New England map," because doing so would require conversion of more land to woody biomass than is needed.
 - Pushback between scientists and "soil regeneration" could be alleviated by passing more funding into monitoring efforts. We need to develop a standard test everyone can agree to use, with a built in low-tech modification for small farms
- Kayleigh Fay presents USDA materials of Brandon Smith. The USDA submitted their 6 indicators to the public Federal Register for comment (*posted on GDAE website*).² Developed 6 criteria to standardize (currently very complex and diverse) the field of soil health monitoring, accompany each criteria with corresponding management rec. Received 25 public comments when posted publicly, on the Federal Register.
 - NRCS has direct access to farmers, so why post on public register, not communicate info themselves? It is believed that no rule-making is intended making the Federal Register posting even more curious.
 - Indicator 3: Different enzymes are related to microbial functions. Looking at function rather than community composition (harder), concentration of enzymes breaking down SOM is easier to measure. Soil genomes can be taken, but we still understand very little about the microbes themselves.³
 - Benefit of outcome-based measurement: can gain useful info for farmers. Measure for enzyme content and organic matter breakdown. Carbon vs. active carbon in soil.

² <https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/newsroom/releases/?cid=NRCSEPRD1420430>

Didi Pershouse has expanded on the 6 Soil Health indicators. Her work can be found here: <https://www.didipershouse.com/soil-health-principles.html>

³ Wayne Roper (UCONN), Sanderman

- Shift from focusing on soil Carbon as an element to input, focus rather on soil as a living tissue that performs functions in a landscape. Rather than focus on “who’s in there,” the microbial communities in soil, far too complex to measure accurately. Rather: What is the biological work that needs to happen in landscape, is it happening?⁴

Discussion

We gathered to organize collective action, towards the goal of improve soil management. What is already being done, what are the roles/needs of the people in this room?

- **We already have the science, we have indicators, we have tests. But they aren’t farmer-oriented**, and many did not receive farmer input as they were developed, and as a result, don't align with farmer needs or business models. **We need to ask what elements of a farmers landscape they most consistently monitor for their business models sake** - those are elements we **should be measuring**. How do we push the NRCS to measure what counts to farmers? Then communicate those measurements to policymakers, and stimulate needed reform to management funding/incentive structures.

Soil Health vs. Whole Ecosystem Health testing

- We need to couple soil testing with outcomes of water infiltration, biodiversity as well as yields.
 - We need to determine the causes of Ag practices on large operations, to gain a sense of how they can be helped to make shifts⁵
- Studio Hill farm transitioned over to regenerative over the course of years, they lost lots of crops because they didn't know what they were doing.
 - Is it economically possible to transition? Most farmers will tell you: I want to do it, but can’t risk the transition period. Farmers who have transitioned, argue that once you make it, you’ll never turn back, it’s worth it.
 - Only a small percentage of food in VT is grown in VT. Reason: its priced higher than competing products at Price Chopper. *Economics* in town don’t allow him to sell to neighbors. Transportation costs of getting products to NY, Boston, very expensive.

⁴ Didi Pershouse

⁵ Phyllis Van Amburgh

- Every farmer that isn't in Dairy (which works through Coops), farmers do *their own distribution, marketing, customer relations, accounting, packaging, processing*. The Systems for doing these things are disappearing. VT has lost 2 USDA-certified processing units last year. They have to send their chicken to Rhode Island to have it processed according to Food Safety laws.
 - Transition insurance set up - once argument is made, convince entity insures acreages on farms. Good example: Greenwaves system, Ocean Freedom farming (Smith) NY, CT area, system of Regen Farming, biocrop guarantees
 - They are in need of practicality. The USDA tends to favor large farms⁶ even in States predominantly populated with small farms. He measures whether the soil is feeding the ecosystem: counts # birds, trees sprouting. Ecosystem, land health functioning are most important for him to monitor.⁷
- Jenn Colby is observing a transition from “bean counting” nutrient management per acre of soil to ecosystem management of land acreage. She is building a business out of making her land ecosystem healthier, an act which renders production more efficient to. The land ecosystem management shift is viable. We know from models that this works. The question is: how do we set up markets for products that are produced in collab with nature, allow people to buy them?
 - Caro supervises NOFA Mass Carbon Sequestration program. They offer technical assistance to farmers who'd like to increase soil carbon sequestration, teach farmers how to do their own soil health assessments. Collecting data on food nutrient content, to better support that argument. Real Organic Project, Regenerative Certification, communication is starting. Structuring of the degrees of ecological agriculture.⁸

⁶ <http://ageconsearch.umn.edu/bitstream/122572/2/FarmDefinition.pdf>

⁷ Jesse MacDougall, Studio Hill Farm VT

⁸ Caro Roszell, NOFA Mass

Farmer utility of soil science

- As an organization working with farmers that don't have time to deeply engage with soil science, question is: "how should I best carry this information back to farmers?"⁹ Can we draft a communication plan outlining good management practices, explain why they work with summary of the literature?
- Elephant in the room: The economics that drive the Ag industry. It's hard for any farmer to attempt to shift direction.
 - **Example:** farmers know that cover cropping is an ecologically superior method, but there's no market for this management option. Maybe I can feed my cows with cover crops, but I can't afford to be a guinea pig for whether or not that will work. Soil testing should be done, but don't couple it with outcomes. We have data on soil profiles and yields. When you have money for proper fertilization, with compost, you'll improve your yields. The problem is: we don't always have the funds.¹⁰
- The big question of farmer utility: How do we solve gap in cost of production-price by getting farmers **paid for the benefits they create through good soil management, as ecosystem managers?**
 - Can we say to them: if you farmers make these changes, can we ensure you will maintain the benefit? Every time they create the benefits, they prove the merit of what we're asking for. So how do we maintain this value at the production level by getting them money for what they do? Cost of production needs to always be circled back to.¹¹

⁹ Karen Schwalbe, SEMAP

¹⁰ Phyllis Van Amburgh

¹¹ Phyllis Van Amburgh, Dharma Lea Farm NY

Is it worth paying farmers in the Northeast for land restoration efforts?

- All boils down to bringing the rest of society into the conversation. People are willing to pay more for their food, but it has to be for deep-seated emotional or health levels. Can we tie in how we all will benefit from caring for the earth in the long-run? Food is too cheap in this country.¹²
- If Farmers are going to *survive* in this region, let alone implement sustainable soil management, they **cannot only be paid through the cost of their food**. We need some form of direct ecosystem service payment system that's paying farmers for what we need them to do for climate change mitigation. We need new structures, new ways of compensating farmers for the work they do, recognizing their impact on more than just food we end up eating.¹³
- The top 3 foods we produce: lobster, scallops and milk. The other produce we grow here, cranberries, potatoes, none consist of even 5% of the foods we consume as a region. Dairy controls ½ the Ag land in New England, incredibly important industry for impacting change on the land in New England. If we're looking for ways to make an impact in the region, looking at dairy is a good one
 - In the last 17 years, to 2017, we lost 60% of dairy farms with under 100 cows. The number of farms with over 1,000 cows in the U.S. has grown by 300%. We only need 5,000 dairies in the country with 2,000 cows each to meet our milk needs... We have 40,000 now, USDA predicts we'll have 18,000 in 2036. They're an industry facing cost of production 16-18\$ and getting prices more like 13-14\$ per unit product.
 - Their industry is ripe for change, they want to change. Doesn't matter if you pay 95% of costs for new tech, they can't pay their current bills with the price margin they face!
 - **(Again stressing, we can't sustain smallholder farming through payments for their products alone, cant only help pay for practice reform, need to increase payments through at least another stream - the market, ideally, or direct payment for ecosystem management services!)**
 - If we can do what Brian mentioned earlier, find a way to pay farmers for these services, the New England market has proved time and time again it will outproduce any market. Give them a carbon payment model to use, and they will outproduce that market fast.

¹² Jack Lazor, Butterworks Farm VT

¹³ Brian Donahue, Brandeis

- Didi fills role of co-chairing the Soil Carbon Coalition, of which 3 other board members are in the room (Jenn Colby, Cat Buxton, Juan Alvez). Cat help teach a low-tech, citizen science version of the USDA soil health testing methodology. **Our governments are already spending the taxpayer money we need to restore ecosystem function. They spend it on cleaning up lakes., on insurance premiums for flood damage, on road repairs, cleaning silt out of dams. Crop insurance subsidies that are paying farmers when they fail, rather than helping them to succeed (etc).**
 - The public are already paying those costs. There are 2 farms at the top of Didi's road, and for the past years, when it rains that road floods out. Perhaps the 20 families on that road should pay to help move cows, in order to restore soil to a sponge-like State. If that's done, the brook won't experience that peak flow. The road won't need repairs. There will be less money going to property taxes. 75% of roads are damaged once per year in Thetford.
 - As the science shows, healthy soil is more than capable of building and maintaining healthy ecosystems that are highly resilient and productive.
 - It's **expensive to not build soil sponges, and comparatively very inexpensive to build them.**

At this point it's clear, we have a transition problem: We have farmers that are providing services with values that are *just now* starting to be recognized, in an economic context, by governments & communities, and farmers are not getting paid for doing them. We're spending more on remediation from damages rather than spending money on land management to prevent the damages. Farmers are suffering the consequences. Much of our infrastructure has disappeared.

- A number of things at multiple levels could be addressed with policies. We'll spend time discussing these policy issues during our next session. We need to hear from you.

II. Second Session

Healthy Soils Policy & a market mechanism

- Steven Keleti presents about the work currently being done in numerous State Houses surrounding Healthy Soil legislation (*Slides posted on website*)
- Regen Network aims to imbue the economy with ecological sentience. Will Szal presents on the group's strategy, involving whole ecosystem restoration modeling, data collection and blockchain communication to investors. Regen Network's org mission is to expand land under regenerative management by linking farmers to payments for ecosystem services markets. Their Strategy of ecosystem restoration modeling provides grounds for an exciting market mechanism, through which funds could be raised in international carbon markets to pay farmland managers for ecosystem services they provide. (*Slides posted on website*)

Discussion

A Farm Tax vs. Incentives Scheme to encourage healthy soil management?

- Nathaniel says the economist in him loves the idea of taxing externalities rather than the source, but in terms of practical realities, every example you gave would tax farmers.¹⁴
 - Steven responds that State programs have seen huge reduction in cost within natural gas programs, its hard for them to argue that they have to pass costs, in the same way, onto farmers.
 - The Healthy Soils program aims less to monitor farmer activities in order to tax them, the legislation is rather establishing a system of documenting practices farmers are doing *anyway*, without any incentives, which are *already* providing services, and petitioning to create a fund *if there is money available for the Ag sector*, it proposed to create a fund - if fines, fees come out, or judgement, a rep can say that money should be channeled to the Healthy Soils Program fund, and be used to pay for restoration.¹⁵

¹⁴ Nathaniel, AFT New England

¹⁵ Steven Keleti

- Reality of the U.S. food system is farmers are going to bear costs, their cost of production is going to rise. The Investor buying that stock is still looking for 10% return, those tax costs are going to be born by the farmer. That's where we see breakdown between people in Ag being fearful of terms like Regenerative Agriculture.¹⁶
- Illinois, and some of the Western States have fees in place (for what?), and have set up a fund to increase efficiency of farmers, who are facing water quality issues, if you do this work via a fertilizer efficiency fund (nutrient management program), there isn't as much blowback - context of how to advocate for the soil legislation will vary by State context.¹⁷
- Another reality of agricultural production, is that the more consolidated through-put model dairies, and other crop-production places, are not getting the 11\$ milk, but cost-plus. The externalities will fall back on the markets, because they have their hand on the larger linear operations. The reason you see more regenerative practices happening on smallholder farms is they don't have the ability to externalize. They have control of a specific plot of land that's owned or leased. When you get to a 12,000 acre plot of land, they're buying their feed from thousands of miles away, the externalities don't fall on them. There isn't anywhere for the economics to go anymore. Producers are going to get hit with more of the tax burden. The cost-plus model, may be something that will work itself out, it may actually be a good thing.¹⁸
 - Steveni has thought about the value of placing a tax on food transportation, given that it produces many externalities
 - Phyllis agrees, yes. There are all kinds of externalities that are not currently taxed, whereas a farmer's every action is always first to be

¹⁶ Nathaniel, AFT

¹⁷ Steven Keleti

¹⁸ Phyllis Van Amburgh, Dharma Lea

How to measure & monitor ecosystem services, so that farmers can be paid for them

- On ecosystem services: wants to drive home the message that farmers don't even need services to be regulated via a government incentives program. Studio Hill has benefited from Agrotourism, they are capitalizing on people's interest to come and stay on their farm in an Airbnb, they are willing to pay for the benefits of ecosystem restoration. We've realized bigger benefits of soil management without figuring out what enzymes are in our soil¹⁹
- Abe founded Landstream in 2005, apparently termed the phrase "Carbon farming." They work on advanced soil monitoring, at Gabe Brown's - they've mapped the soil with high confidence to 4 feet deep. They have calculated 181 ("180.7") tonnes of carbon per hectare. A literature review suggests 30-50 tonnes C/ha, and these findings inform much of current modeling of soil-C potential.
 - The century models only measure 20 cm of soil.²⁰
 - When his team compares predicted soil carbon potential with advanced measurement on regeneratively managed land, the findings do not coincide. Vermont is seeing a new development that creates the opportunity for policy advocacy from farmers: humans built civilizations by cashing in on *biological capital*. Now we have the opportunity to hire land managers to *grow natural/biological capital* - topsoil and biodiversity - and all the ecosystem services that are derivatives of it. To have real economic supply/demand, and we have to accurately measure it. Practically speaking, there is bottomless demand. Their Whole-Ecosystem models track the whole *plant, soil, animal, atmosphere* continuum. To capture that mathematically, you need environmental biophysics, agronomy, agroforestry, biophysics, hydrology, geology... the measurement-synthesis relies on every discipline. We have the tools of measurement, we have the energy, we have the crisis in farm country, the movement is ready. The most inspiring example I've seen is: Vermont. The farmers are rising up and demanding measurement of the services they provide. We can move beyond prescriptive approaches that mandata practices and focus on measured outcomes. Farmers and their collaborators can accurately measure energy, water, biomass, soil nutrient to 4 feet of depth, hydrology, hydrogeology, water tables, using these models, and we will manage our own system. You should pay us for it: Create a new fund stream for farmers. **Hire farmers to grow natural capital and ecosystem services.**²¹

¹⁹ Jesse M, StudioHill

²⁰ Jon Sanderman, WoodsHole

²¹ Abe Collins

- We've touched on forestry, soils, and there's no doubt that soils store the most carbon between the two land uses, they cover both land types. But wetlands should not be overlooked, as they store more carbon than the rest of the land mass in the U.S. combined. It takes a long time to restore Carbon storage in wetlands. There's a lot there but it took until the end of the last ice age to build up. We need to understand these asymmetries, because farmers own land that include forest, wetlands and agricultural land. We need to ensure they are paid for protecting or enhancing those ecosystem service providers.²²

The role Conventional, large farms can play

- We've mostly been discussing smallfarmers, when it seems large farmers are in a position to be taxed. They're degrading their soils, a large fund stream could be generated from taxing them.²³
 - There's also a lot of political power to push against - (40 million lobbyist dollars spent on crop, dairy, livestock, general ag spending)²⁴
 - We're funding them through subsidies to continue doing what they're doing. We as taxpayers can rally together to agree to stop paying for these destructive practices. It isn't economic to do what they're doing, outside of the incentive of the subsidy²⁵
- Kayleigh asks if anyone has thoughts on how we could convert more conventional Ag operations to using more sustainable practices?
 - Nathan: I'd make the argument that every farmer in the country is already involved in doing them. Under the term: Ecopractices. If you talk about soil carbon, regenerative Ag, they'll run. If you hand out an Eco-Ag fact sheet. We should indeed take out language of regenerative agriculture from the legislation, talk simply about healthy soils, good water quality. Using the right terminology goes along way. [The State of Maryland did an assessment of healthy soil practices](#), did an assessment of the soil management practices funded by their Healthy Soils legislation, and found out that the program, intended to be a Chesapeake bay water quality management program by paying for cover cropping and no-till, is one of the top-4 carbon sequestrations in Maryland; it has a bigger impact than RGGI, and they weren't considering carbon offset when they implemented. That's an effective way to do it, because farmers are comfortable with that kind of

²² Moomaw

²³ Neva Goodwin, GDAE

²⁴ Phyllis Van Amburgh

²⁵ Bill Moomaw, GDAE

programming. Once you get that kind of work in play, the last hurdle is cost to farmers of implementing those practices. What fund stream can mitigate that cost?

Gaps in existing Government soil health management programs

- Do farmers feel that EQIP support is efficient, or is there a gap?
 - The support is sufficient, good cost-share, the gaps surround risk. Trying to convince someone to put down cover crops in spring, risk of not being able to kill that crop in time is meaningful. Losing an entire crop possibly.²⁶
 - At MFT they work with all types of growers on conservation. Conventional farmers that they see in ME employing these practices are doing it for savings, to cost of production. But there are incredible results. One of the larger dairy farms in ME has employed these practices and seen chemical usage reduced by a factor of 10. They're doing it because those are huge production cost savings for them. The way you talk about these actions matters. This farmer used EQIP funding to cover up-front costs of implementation, but something we have to think about: the fact that EQIP funding was not cut during this Farm Bill cycle, there are major cuts slated over a ten-year cycle. We need to think about other funding streams that will be able to compensate farmers for these up-front costs²⁷
 - We've been working with the NRCS in ME to get payments for ecosystem services on the forestry side of things. There are a lot of gaps in the EQIP program of increasing carbon storage through forestry. NRCS does not have a cost-share practices/scenario for paying farmers to keep trees on landscape.²⁸
 - An interface UVM extension has struggled with is small, grass-based farmers do not create a problem, but are already the solution, don't get paid for it through EQIP. They don't score highly enough. It has worked well for getting bigger farms to transition. But what I like about measuring the whole system, rather than just practices, outcomes rather than practices, is that helps get past the catch-22 of how a program that pays farmers to *transition* to good practices, should handle farmers who are *already using* good practices. They

²⁶ Nathan, AFT

²⁷ Ellen Griswold

²⁸ Frank, NE Forestry Foundation

do need money, but not to transition. Can we pay them for what they do now?
29

- Creating an overt value for these practices will pull farmers towards transitioning, no doubt about it, right now the value lies in getting a manure pit, as we heard.³⁰
- Another thing I hear discussed a lot is cost-of-entry, the costs of applying for EQIP funding.
- Phyllis: Yes, it takes too long, the process is cumbersome. Most farmers are managing their business and field, so have no time.
- Jenn: It's easier to apply for a manure pit in VT than get a grazing subdivision for livestock management. A perimeter fence. Or silvopasture funding.
- Jack's farm (Butterworks) is 17 miles from Newport, VT, the nearest town. Between my town and Newport, there have been 4 Manure pits erected, for the cost of 600,000\$ a piece, they're all paid for by EQIP. Jack has been applying for a second covered barnyard to do *more and better* composting on his farm, where he's been able to prove he has raised organic matter in his soils 8-9% using compost. When he sees liquid manure being applied, the organic matter goes down.³¹ Jack went to Vicky Drew, State conservationist, and said can you help me get to the top of the list? They helped but after 3 years I was about to give up - thank God I could go to the top. Maybe you can do that in other places, in VT you can.³²
- In MA, MDAR has 2 programs to help ease transition costs, one being the Agriculture Environmental Enhancement program, the other being ACRES (the Ag climate resiliency efficiencies), they are using grant money to invest in equipment (no till, seed drill). Soil conservation districts are also allowed to apply for them. It could be a shared resource. Even though we don't have our Healthy Soil policy passed, MDAR is trying to get out ahead of that conversation. That's another avenue you can use in other States.³³
 - One of the things I like about ACRE; it really is providing grants at multiple scales. From a grain drill to a system for BCS, the last two fiscal years they gave out millions of dollars in equipment grants. That's been significant.³⁴

²⁹ Jenn Colby, UVM extension

³⁰ Phyllis Van Amburgh

³¹ <https://suscon.org/pdfs/compostreport.pdf> "COMPOST: ENHANCING THE VALUE OF MANURE" Sustainable Conservation, California.

³² Jack Lazor

³³ Karen, SEMAP

³⁴ Caro, NOFA MA

Existing *potential* fund streams for soil management policy & programming

- I want to point out opportunities that aren't coming from conventional Ag fund streams; several cities in the States needed to pay for reconstructing their stormwater systems, instead of doing that right away they first implemented a tax on impermeable surfaces, roads and paved driveways. Once we start framing soil, we can frame it: as when healthy, it filters and stores water. The water angle is a low-hanging fruit. In terms of generating a funding stream, and in terms of enlarging public perception of the potential for soils. Watersheds are expansive, there's an opportunity to connect the people interested in a watershed to the uphill groups, farmers etc, who are equally involved. We can target subject areas that are salient. Constituents won't know the air has less carbon in it due to Jack's farming, but they will know how often their land floods, or whether streams or lakes are clearer.

Help people make connections between things they can see, to increase their willingness to pay, in the form of a tax, or advocating for a shift in funding from something we're already paying for, to something more holistic in providing benefits.³⁵

- Commercial ag has tapped into the image of a farm, using it for leveraging. The Regen Network has created a system of tying a crowd-sourced funding campaign to create payments to farmers for services to society. You could do that simply, create a mechanism by way of which there is a flow of funding, independent of governments or regs, to pay for the kind of things that most benefit healthy soils. He thinks that same mechanism should be applied to forests, he thinks the local food and wood product movement are tied. Farm woodlots aren't doing as much as they could for the farm or ecosystems. **Gov. thread, State policy thread., marketing and direct-funding, crowd-sourcing thread we haven't heard as much about**³⁶.
- Could we use some of the tools Will was talking about to establish greater market relationships between urban and rural areas? (AnneMarie)
 - Once you build that effort, you are building a coalition that can advocate for the policy dimensions of this.
- On the urban-rural connection frontier: We have the opportunity to give people a way to participate in ecosystem restoration, if our labels don't simply indicate how a food was grown/no labels even exist for wood, but capture how a food or wood product contributed to ecosystem restoration.

³⁵ Didi Pershouse

³⁶ NE Forestry Foundation

Healthy Soil Policy Advocacy Opportunities

- EarthJustice gave a presentation to NOFA New York that went into detail about some of the existing pending State Healthy Soil Laws and some of the data of what they're advocating for. They have a 2-pager explaining why movement on this in NY is a good idea, they would be willing to work on a similar 2-pager to disseminate through other States.³⁷
 - Steven is interested in working on this for all States.
- One slide I didn't show; slide that shows how farmers have the fiduciary obligation to maintain the resources under their care. So one could think of having a piece of legislation similar to a lead duration on a renters lease (?) in a land lease maybe there needs to be a soil management declaration requirement³⁸
- Under the new Farm Bill that passed, there's a new provision that allows States to select 10 practices that are particularly effective to get up to a 90% cost-share. There's at least the possibility to ensure those 10 selected practices are the right ones. Is that a big deal? NRCS did a study of 100 EQIP practices, some are good and some are actively bad.³⁹

The modeling dilemma: measure & monitor farming practices or outcomes?

- Second question, on measuring: we're looking into establishing payment for outcomes, but at least what we've seen in NY, is most measurements for outcomes are just models of practices. Can't go into the field and actually measure. Measuring outcomes: question, are we measuring outcomes or because measuring is difficult, are we pretending to due to insufficiencies of existing models?⁴⁰
 - This is a big question. There are 2 types of models in environmental modeling - calibrated models vs. uncalibrated, you don't need to calibrate these models. That means you adjust the equation to match whatever measurement you have. SWAT, APEX, Century, all farm system models now, these models lack the rigor to accurately quantify provision of ecosystem services. The measurement and modeling systems I'm talking about involve half measuring and half modeling. Most models work by taking a value and

³⁷ Peter Lehner, EarthJustice

³⁸ Steven Keleti

³⁹ Peter Lehner, EarthJustice

⁴⁰ Peter Lehner, EarthJustice

extending it out over 25 years. It's more coarse resolution. They don't serve us, by recognizing management.⁴¹

- Agrees that the models are deeply challenged, by environmental biophysics is not a niche field, there are 10s of 1000s of papers published looking at energy fluxes in the environment⁴²
- Models are made to answer questions, but their answers create more questions. The tools are not always bad, but they can be badly used. The best models we have should be used for policymaking, but we need to pair good models, with wise decision-making, and willingness to evolve and adapt existing models.⁴³

Expanding markets for local products, by bridging the urban-rural divide

- What are your opinions on farm-to-Institution work?
 - It's a question of scale. Larger farms can provide more volume, a lot of transactional energy happens in bringing small batches to schools, especially those not equipped to process fresh foods. Maybe in the MA, CT valley it would work better, where farmers are at scale.⁴⁴
 - There already is an urban-rural connection in existing Ag legislation, the recent Farm Bill was controversial as it was being discussed between House and Senate *because* of the urban-rural connection. The issue is the easiest foods used to bridge that divide are corn and soybeans. The core products are easiest, they can be stored indefinitely. The same funding can't exist for dairy products, which are perishable.
- On urban-rural interaction: The Eco-Health network, based out of St. Louis, is working towards a large area that includes the city of St. Louis, to increase the interaction between communities. One thing we're monitoring is human health, the human health benefit of sustainable soil management is significant in large cities.

III. If we **formed a Coalition**, what actions could we take collectively to move forward?

⁴¹ Abe Collins

⁴² Jon Sanderman

⁴³ Sylvain M.

⁴⁴ Karen, SEMAP

- Keith Zaltzberg was selected to continue this conversation through **the Healthy Soils Action plan, funded by the Office of Energy and Environmental Affairs**. They want to hear more of this conversation from farmers and members of all other land-use sectors, to make recommendations that are relevant to both policy and practitioners, that inform legislation in State.⁴⁵
- To touch again on **advocating for those 10 EQIP practices...** The 2019 Farm Bill is open to a comment period, its open and supposed to be concluded, by law, until October 2019, it won't be finished, but we can push for it to be. A coalition of a broad group of voices pushing together can be incredibly persuasive.
- Most difficult question we've touched on is **whether we will reward practices, or outcomes of practices**. That is a tough thing to figure out how to do effectively.⁴⁶
 - The practices vs. outcome dilemma. All models are wrong, some are useful. If we produce a model, come up with numbers then eval. A farm using those numbers and they don't match, we tell a farmer they are wrong. We already know those numbers will not always be accurate. Biology is inherent in soil health variables. But overall, it can be said that some soil management strategies *are more effective* than others. It depends on how you want to balance measuring whether a farmer is doing something eco-beneficial, or not beneficial. Two farmers in two different environments will need to use two different practices to get the same result. Question shouldn't be *practices-specific*. Our model need to **address the question of how to improve their impact. They should be outcome based**. Yes we need to quantify something, perhaps we can eval in terms of is your impact Positive or Negative, focus on whole-farm monitoring⁴⁷
- He's been listening to the difficulties of outcome verification. But warns there are larger **corporate actors** who will recognize this same opportunity and greenwash it. We need to prevent funding from flowing to the wrong places, make sure it funds the processes/practices we're are discussing.⁴⁸
- I would love to see the **formation of cross-disciplinary partnerships** that try to do some actual **specific-farm modeling of practices and economics**, to show how practices would play out on specific farms. Choose some farms that stand out in a community, and model the economics, based on their existing options, of

⁴⁵ Keith Zaltzberg

⁴⁶ Brian Donahue

⁴⁷ Wayne Roper

⁴⁸ Jeff Cole

implementing practices. Explore the social outcomes in the community around it. Determine how to push and pull the system to generate the outcomes we want.⁴⁹

- We need to include **lawns in this conversation**, which occupy the most land out of all other uses. The people that live on those lands need to start buying products...⁵⁰
- We do need to **look at food prices/farmer profit margins**. A bold action is needed to get farmers a fair price, or the farms we aim to help won't survive economically.⁵¹
- I agree, we are in a State of emergency here. There are existing programs that could help us jump-start the process of reform, mitigate some of the risks, these programs will help with transitions to jump in. But we need to consider the stumbling blocks that will appear within the greater economy. Immediately: we can work on regulating this **flow of carbon around the country**, shipping of products from midwestern or Cali States to others should be reconsidered. Perhaps angling the system to keep carbon regional could prevent undercutting of price that happens during interstate Trade. We need to **speed up the labeling bureaucracy** so these labels can start actually demonstrating the **higher ecosystem-caretaking quality** of some products vs. others.⁵²

⁴⁹ Nathan L'Etoile

⁵⁰ Cat Buxton

⁵¹ Julie Davenson

⁵² Phyllis Van Amburgh