

Testimony to the Vermont House Committee on Agriculture and Forestry

Regarding Soil4Climate, Soil as a Climate Solution, Regenerative Agriculture, and Benefits for Vermont Agriculture and Water Management

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Good Afternoon, distinguished members of the Vermont House Committee on Agriculture and Forestry. It is an honor and a pleasure to present before you today.

My name is Seth Itzkan, I am the co-founder and co-director of Soil4Climate, a Vermont-based educational nonprofit with chapters and influence around the globe. I am here with my colleague, Soil4Climate co-founder and co-director, Karl Thidemann.

Soil4Climate advocates for soil as a climate solution. As far as we know, we are the only organization that specifically focuses on the propagation of this core theme: Soil. For. Climate. We are blessed to have an advisory board comprised of several of the world's leading soil and climate scientists and regenerative farming practitioners.

Soil4Climate was born of the necessity to seek natural solutions to the problem of carbon dioxide overload in the atmosphere. Although emission reduction efforts are essential and laudable, they are not, on their own, adequate to avert a global warming catastrophe.

Research has shown we are already past the point of inevitable climate impacts. The emission reduction efforts must be complemented with extensive and sustained drawdown, that is, actively removing carbon dioxide from the atmosphere.

Fortunately, soil is a suitable reservoir for excess atmospheric carbon, and agricultural management practices are available to accelerate the necessary capture.

In addition, the enrichment of soil with carbon not only mitigates the climate threat, it also provides numerous environmental and farming benefits that would be of practical interest to the state. As one example, this would greatly increase the capacity of land to hold water.

According to the Natural Resources Defense Council (NRDC), and other sources, an 1% increase of soil organic matter enables an acre of land to hold an additional 20,000 gallons of water.

This same improvement to soil also corresponds to a drawdown of approximately 17 metric tonnes of carbon dioxide (CO₂), equivalent to eliminating 40,000 miles driven by an average car.

Again, these are the benefits from a 1% increase in soil organic matter *on just on one acre*.

Applied to a larger region, such as Franklin County, with an area of approximately 440,000 acres, the corresponding quantities quickly become quite large and the true benefits of increasing soil carbon become much more apparent.

For example, if the soil organic matter content of all of Franklin County were increased by one percent, this would correspond to an additional water holding capacity of 9 billion gallons and a drawdown of 7.5 million tonnes of carbon dioxide, equivalent to the emissions from 1.5 million cars per year.

How much is 9 billion gallons of water? It's about 150 times the yearly processing volume of the Montpelier water treatment plant, which handles 1 million gallons per day.

We can also look at this in terms of rates. Recent research has shown that with proper management practices, agricultural soils can add a tonne of carbon per acre per year.

According to data from 2012, Vermont's CO₂ footprint is 8.2 million tonnes per year. This equates to 2.3 million tonnes of carbon.

At a typical drawdown rate of 1 tonne of carbon per acre per year, Franklin County alone could offset 20% of all of Vermont's emissions -- transportation, residential, and industrial.

An additional benefit to increasing soil organic matter is that this improves the quality and quantity of food produced on farms as well as providing enhanced resilience during times of drought and flooding. It also makes crops more resistant to pests.

Thus, because of the many benefits of increasing soil organic carbon -- in addition to mitigating the climate threat, and in consideration of the relatively inexpensive and risk-free nature of this approach -- all measures to naturally increase Soil Organic Matter should be encouraged. Vermonters may rightly consider this, the *catamount's meow*.

Supportive Materials

Climate-Ready Soil: How Cover Crops Can Make Farms More Resilient to Extreme Weather Risks

<https://www.nrdc.org/sites/default/files/climate-ready-soil-IB.pdf>

<https://www.nrdc.org/sites/default/files/climate-ready-soil-appendix.pdf>

Emerging land use practices rapidly increase soil organic matter - Macmuller 2015

<http://www.nature.com/articles/ncomms7995>

The Role of Ruminants in Reducing Agriculture's Carbon Footprint in North America - Teague 2016

<http://www.jswnonline.org/content/71/2/156.abstract>

Young People's Burden: Requirement of Negative CO₂ Emissions - Hansen 2016

<https://arxiv.org/abs/1609.05878>

Irreversible climate change due to carbon dioxide emissions - Solomon 2009
<http://www.pnas.org/content/106/6/1704.abstract>

EPA Greenhouse Gas Equivalencies Calculator
<https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>

Climate Change in Vermont
<http://climatechange.vermont.gov/climate-pollution-goals>