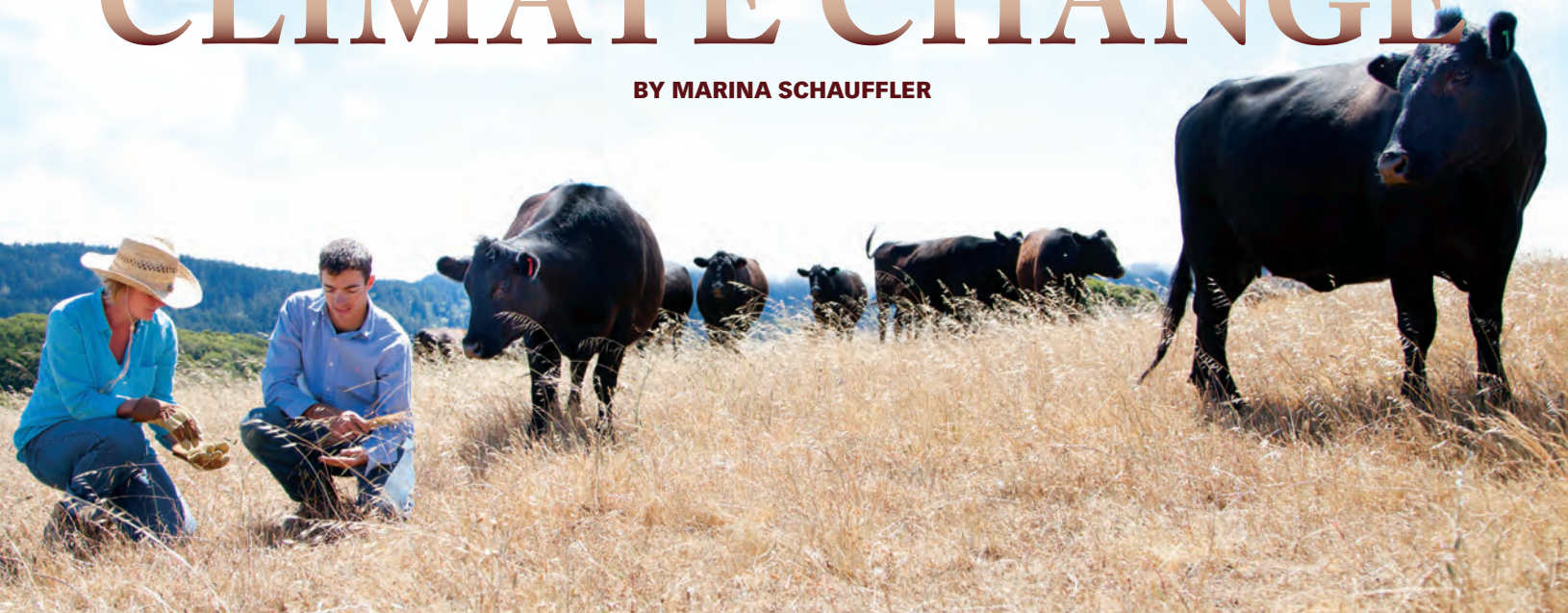


# LOOKING TO THE LAND TO MITIGATE CLIMATE CHANGE

BY MARINA SCHAUFFLER



**R**ecent reports that the planet had its hottest four years on record highlight the need for accelerated work to keep global warming below critical tipping points. While nations shift to carbon-neutral economies, Earth's forests, grasslands, wetlands and soils can help reduce atmospheric carbon dioxide (CO<sub>2</sub>) levels. "Land trust work is more vital than ever," says Kelly Watkinson, Land and Climate Program manager at the Land Trust Alliance, "because improved conservation, restoration and land management actions enhance the capacity of natural systems to absorb and hold carbon."

Two recent studies affirm the potential of natural ecosystems to scale back atmospheric CO<sub>2</sub>. New research published in *Nature* this January cites the "unexpectedly large impact" that forest management and grazing has on the planet and atmospheric carbon. "We have forgotten half of the story up to now," lead study author Karl-Heinz Erb told *The Washington Post*.

Another analysis is the culmination of a partnership between the accredited Nature Conservancy and the Doris Duke Charitable Foundation that brought together 32 leading natural scientists and economists from 15 research, educational and private institutions around the world.

Published in the *Proceedings of the National Academy of Sciences* (PNAS), the study examined the global carbon storage and reduction potential of 20 conservation, restoration and improved land management practices, collectively called "natural climate solutions." Their combined power was surprisingly high, providing 37% of the cost-effective CO<sub>2</sub> mitigation needed by 2030 for a greater than 66% chance of keeping warming below 2°C, the target agreed to at the 2015 Paris climate talks. The mitigation potential of natural climate solutions in 2030 represents 11.3 billion tons of greenhouse gases, equivalent to stopping burning oil globally.

By advancing natural climate solutions, land trusts can provide a wealth of ecological and economic benefits that extend beyond cost-effective climate mitigation. Lands managed with the climate in mind also filter and protect water supplies, increase soil fertility and forest productivity, foster biodiversity and strengthen ecosystems' capacity to withstand drought and extreme weather—reducing flooding, runoff and erosion.

## Seeing Land Through New Eyes

Natural processes for transferring carbon from the atmosphere into vegetation and soil are highly efficient, economical and available nearly everywhere. While these paths of carbon storage are all well-established, their potential for global climate mitigation has "clearly been underappreciated," observes Joseph Fargione, science director for The Nature Conservancy's North American Region and one of the study's authors. With a follow-up report on natural climate solutions' potential in North America due out this year, he expects that more conservation

groups—while maintaining long-standing priorities—will begin asking how their work can further climate mitigation.

Fargione sees “a lot of opportunities for adoption” of natural climate solutions and expects funding opportunities to increase (in part due to growing carbon markets). “The climate mitigation need is so great that we should have investments in the land sector as well as the energy sector.”

### Realizing the Potential of Carbon Farming

The vast carbon storage potential of natural ecosystems worldwide is just now coming to light, but one local land trust has already spent a decade deliberately increasing the carbon held in its conserved grasslands. The accredited Marin Agricultural Land Trust (MALT) in California helped launch the Marin Carbon Project (MCP) to see whether improved agricultural management practices, such as managed grazing and spreading compost on rangeland, could help soil take up more atmospheric CO<sub>2</sub>.

Data from the past nine years show that a single compost application led treated soils to store one metric ton more carbon per hectare per year—a much greater increase than expected. Their findings confirm extensive research that such practices as fertility management, cover cropping and rotational grazing increase soil’s capacity to absorb and hold carbon.

At MCP’s first demonstration project, Stemple Creek Ranch, soils already had relatively high carbon levels from decades of sound stewardship. But owner Loren Poncia saw further increases as an important means to minimize runoff and ameliorate the effects of drought: “I want my ranch to be a sponge when it rains, and [soil]carbon is essentially a sponge.” Soil with 5% organic matter can absorb six times more water than soil with only 1% organic matter. With more extended droughts interspersed by deluges, increasing capacity for water retention can help keep ranches like Poncia’s more resilient and productive.

A new “Carbon Farm Planning” process developed by MALT and MCP identifies up

to 35 agricultural management practices that benefit the climate—either by absorbing and storing carbon or helping make the land more resilient to climate change. Carbon farming has become so popular that MALT Director of Conservation Jeff Stump says there are “twice as many applicants each year as we can complete plans for.” The MCP model is now replicated by Resource Conservation Districts in 20 California counties and several states.

MALT raises private funds to offer more local ranchers incentives for adopting and implementing Carbon Farm Plans. Fundraising for stewardship work is always challenging but donors find the

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carbon-climate link inspiring, and several have made large dedicated gifts. According to Stump, “This is the first time our donors are saying, ‘I get it. There is something I can do at the local level to address climate change.’”

Carbon farming is also strengthening MALT’s ties to farmers and ranchers who now see firsthand both the personal and planetary benefits of conservation stewardship. “It is really improving long-term relationships with landowners,” Stump says, “and helping move their operations toward more economic and ecological sustainability.”

### Venturing into Forest Carbon Markets

The carbon storage potential inherent in conserved lands now has value in carbon markets, both voluntary ones (involving buyers motivated by social responsibility or marketing potential) and regulated ones (involving buyers who must comply with legislation, which in the United States currently applies primarily to businesses subject to California’s cap-and-trade program). These expanding

markets offer enterprising and persistent land trusts a chance to sell forest carbon offsets, potentially generating significant revenues to bolster land acquisition and stewardship programs.

The accredited Nisqually Land Trust in Washington recently completed that state’s first-ever carbon credit transaction, relying on the verification, registration and transaction process of the regulated California market but collaborating with a voluntary buyer. This approach involved less risk for the land trust than entering the voluntary market, where roughly half of credits went unsold in 2016.

As part of a voluntary commitment to offset its worldwide carbon emissions, Microsoft paid the land trust for carbon stored in its Mount Rainier Gateway Reserve, purchasing 38,000 carbon credits. Simple as that transaction might sound, the process was marked by “insane complexity,” says Nisqually Land Trust Executive Director Joe Kane.

“One reason we went with the highly rigorous verification process that California demands,” Kane explains, “is that once you register those credits, you’re virtually guaranteed to have buyers and at a guaranteed price minimum. We also wanted to be able to say that we had met the highest possible standard.” Alongside its conservation mission, he notes, the board maintains “a secondary assignment to ourselves—to innovate.” But for most land trusts, he acknowledges, “There’s little incentive to do this until the barriers come down.”

Nisqually Land Trust invested significant funds in the initial verification



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of stored carbon, which Kane describes as “the most vigorous timber cruise you could imagine,” a forest carbon inventory involving upward of 1,000 protocols. Kane hopes that technological improvements over time, like aerial monitoring, might streamline the verification process and reduce costs.

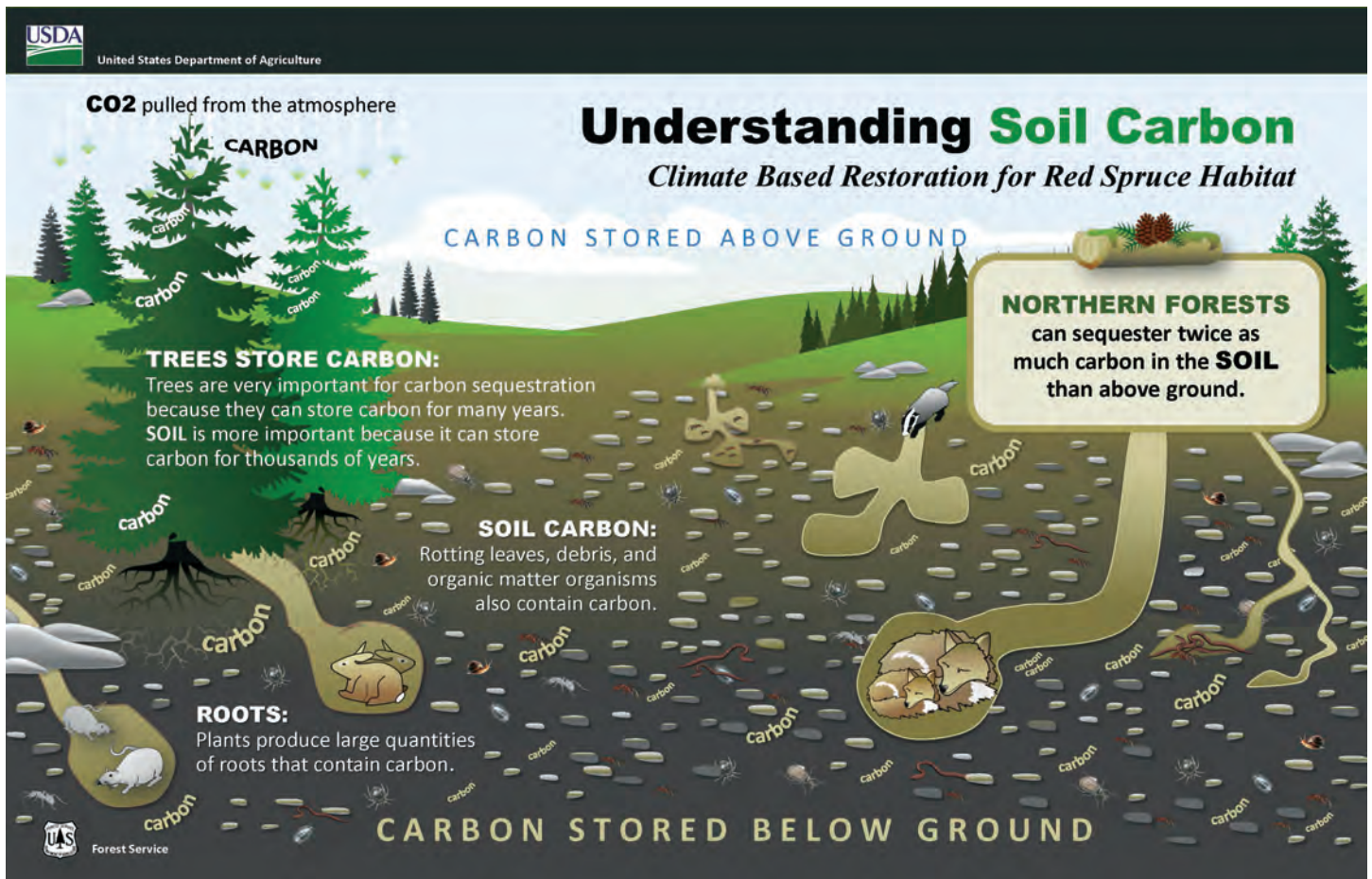
The 520-acre Nisqually Land Trust project became part of a larger Microsoft portfolio of carbon credits, but small-scale projects are not typically financially viable in current carbon markets. That limitation may not change for a while due to high fixed-entry costs, warns Dylan Jenkins, vice president of portfolio development for Finite Carbon, which develops compliance

forest offset projects (and is a partner with the Land Trust Alliance in its Land and Climate Program). Unless development and operations costs are subsidized, he notes, “you need half a million dollars in carbon revenues to break even, and no one is in this business to break even.” To achieve the surplus that land trusts typically seek, Jenkins suggests a minimum viable project size of at least 5,000 acres.

The accredited Lakes Region Conservation Trust (LRCT) in New Hampshire overcame that hurdle through a unique and creative project that aggregates its own holdings with that of another landowner, and it will soon sell carbon credits in the California market.

LRCT devised its project as a means to accommodate the need of a landowner with whom it had been negotiating an easement, explains Operations Director Lisetta Silvestri. Working with Finite Carbon as the project developer, the land trust (which serves as the project owner in the eyes of the California Air Resources Board) drafted an operating agreement with the other landowner. Silvestri hopes that their agreement can become a model other land trusts might use, enabling multiple owners of smaller parcels to share in the benefits of carbon offsets.

A collaborative approach involves lower up-front costs for the land trust (as the project developer bears those, in exchange for a cut of the credits issued). But as with



Sustainably managed forests, grasslands and rangelands help absorb atmospheric CO<sub>2</sub> through photosynthesis. Growing roots and decomposing organic matter hold significant amounts of carbon in the soil so long as the sites remain undisturbed.



(Top) On a site visit to the Nisqually Land Trust Mount Rainier Gateway Reserve, where Microsoft carbon credits funded a 520-acre acquisition, land trust Executive Director Joe Kane explains the property's many natural and cultural benefits.

(Bottom) Lisetta Silvestri (LRCT operations director), David White (LRCT board member) and David Mallard (LRCT land and stewardship director) visit one of the LRCT properties that is part of an innovative aggregated forest carbon offset project being registered this spring with the California Air Resources Board.

conservation easements, partners must be committed long term. The California market agreements span a century so the crucial question becomes, in Jenkins' words, "How do you keep private landowners glued together for 100 years?"

Carbon forest offset projects require land trusts to invest significant staff and board time, engaging people who can dive deeply into project complexities and understand the technical requirements of carbon markets. LRCT's project, three years in the making, involved a lot of decisions and lessons learned. Staff and board members gained valuable background through informational interviews done at the project outset: "Research your project developer thoroughly," Silvestri advises, "because you have to have a lot of trust in that partner and a good working relationship."

Land trusts that want to obtain forest carbon payments without direct market involvement can consider participating in a program like Working Woodlands, notes Campbell Moore, The Nature Conservancy's Central Appalachians Whole Systems director. This program works to make forest carbon credits more accessible to smaller landowners. The cutoff now, Moore says, is 1,500 acres, but he hopes projects in the 500-acre range might be eligible within a few years.

Increasingly, Jenkins explains, "Carbon can be thought of as a forest protection tool, falling somewhere on the spectrum between permanent conservation easements and Forest Stewardship Council certification." Carbon offset projects help ensure that forests are sustainably managed and that higher-than-average carbon stocks are maintained for a long time. Unlike easements, though, they are not designed to protect forests from subdivision or limited conversion to non-forest use.

### Looking to the Future

As daunting as the world of carbon markets can be, land trust professionals who have ventured there urge others to learn about



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this arena, even if they don't want to develop a project. "Innovation is happening," Kane says, and there is growing potential for land trusts to generate significant revenues for conservation and stewardship.

As quickly as the economics are changing, the ecological understanding of natural climate solutions' potential is growing, Moore notes. That knowledge about how best to manage soils in forests, grasslands and wetlands can be incorporated on land trust preserves and, as MALT is doing, disseminated through communities.

In addition to their impressive potential to drawdown atmospheric carbon, natural climate solutions can engage landowners and donors as never before. "You really are creating a big lift," Stump observes. "This is a roadmap to better stewardship." 🌱

MARINA SCHAUFFLER IS A FREQUENT CONTRIBUTOR TO SAVING LAND.

## Resources

"Natural Climate Solutions" in *PNAS*  
[www.pnas.org/content/114/44/11645](http://www.pnas.org/content/114/44/11645)

"Unexpectedly Large Contribution of Forest Management and Grazing on Global Vegetation Biomass" in *Nature*  
[www.nature.com/articles/nature25138](http://www.nature.com/articles/nature25138)

Marin Agricultural Land Trust's carbon farming website [www.marincarbonproject.org/carbon-farming](http://www.marincarbonproject.org/carbon-farming)

Carbon offsets article by Dylan Jenkins in *The Consultant* [www.nxtbook.com/naylor/AFFA/AFFA0017/index.php#22](http://www.nxtbook.com/naylor/AFFA/AFFA0017/index.php#22)