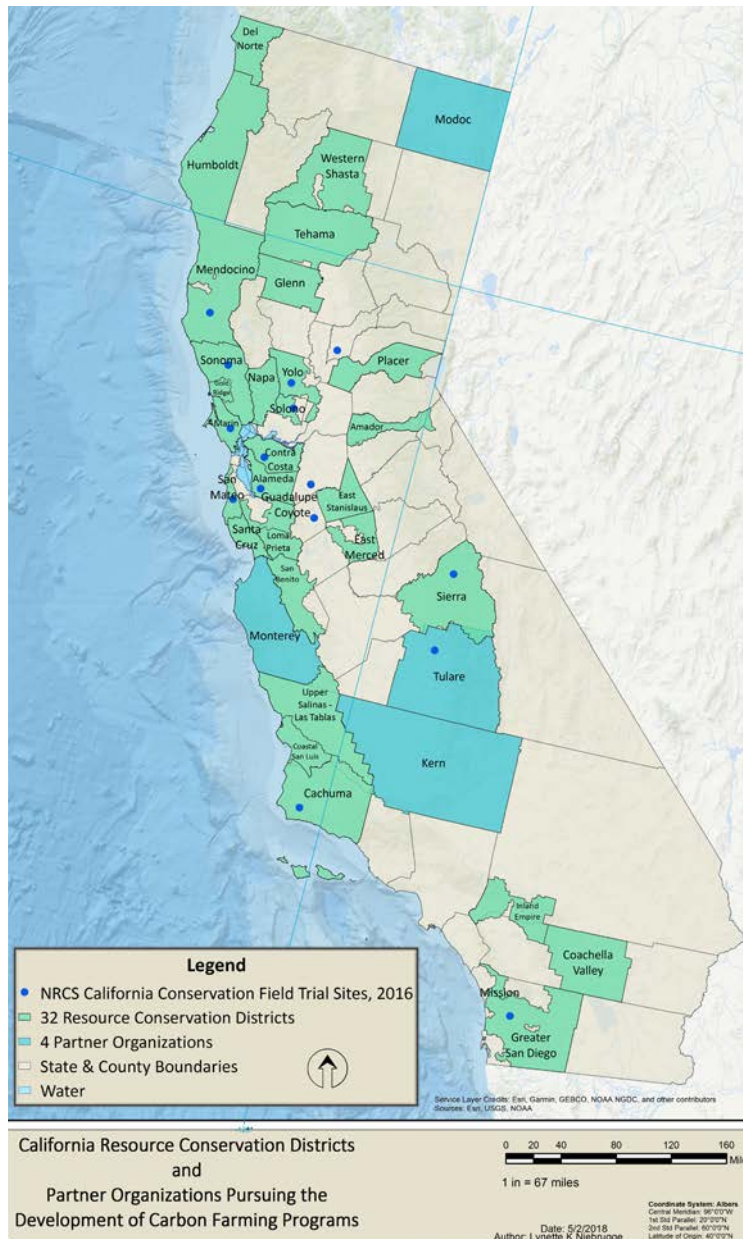


The Carbon Farming Network



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Carbon Cycle Institute

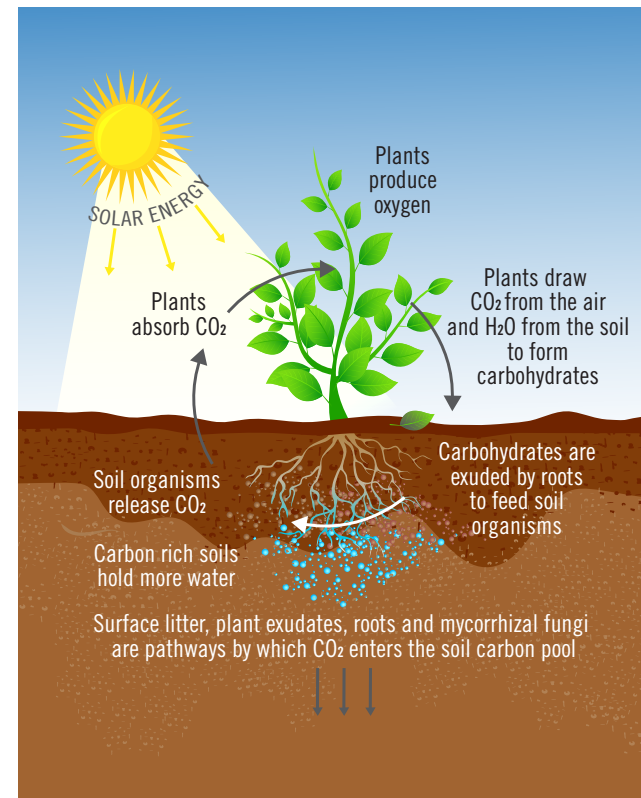
Carbon Farming

Improving soil fertility & water holding capacity through increasing soil carbon

Providing solutions for climate change through agricultural resilience

Agriculture as a Solution to Climate Change

Agriculture and working lands play a significant role in climate change, both as a source of roughly one-quarter of global emissions, but maybe more importantly as a potential sink to reduce atmospheric CO₂ through sequestration in agricultural soils and biomass. Building upon existing programs in the agricultural sector, climate-beneficial agricultural practices, as identified through a comprehensive Carbon Farm Planning process, can play a key role in significantly reducing atmospheric GHG, while simultaneously improving the productivity, resilience and ecological sustainability of agricultural landscapes and improving environmental health.



The Carbon Cycle

Carbon constantly cycles through five pools on planet Earth. More carbon dioxide is now being released from our combustion of fossil fuels than the earth's plant life and ocean waters can absorb. The excess carbon dioxide has formed a blanket in our atmosphere—trapping the sun's heat and changing our climate, as seen in shifts in our earth's jet stream, ocean currents, and air temperature. Rainfall patterns are changing and glaciers (water storage for many communities) and polar ice caps are melting quickly.

Restoring balance to the carbon cycle can ameliorate climate change, build resilience to drought and increase agricultural productivity naturally.

Carbon Cycle Institute's Work

The Carbon Cycle Institute provides technical training, capacity-building, policy, and revenue development support to RCDs, land trusts, land managers, and other organizations supporting producers to establish Carbon Farm Programs and implement carbon farming projects in targeted regions throughout California. CCI and our partners are dedicated to raising the overall capacity of RCDs through leadership training, providing funding opportunities, and creating alliances on a state-wide basis.

Why Carbon Farming?

Land management is the second largest contributor to carbon dioxide emissions on planet Earth. Yet, land management can transform itself from a net emitter of CO₂ to a net sequesterer of CO₂.

Common agricultural practices, including driving a tractor, tilling the soil, over-grazing, using fossil fuel based fertilizers, pesticides and herbicides, result in significant CO₂ release. Alternatively, carbon can be stored long term (decades to centuries or more) beneficially in soils in a process called soil carbon sequestration.

Carbon Farming involves implementing practices that are known to improve the rate at which CO₂ is removed from the atmosphere and converted to plant material and/or soil organic matter.

Carbon farming is successful when soil carbon gains resulting from enhanced land management and/or conservation practices exceed soil carbon losses.

Carbon Farming Practices

Agriculture is the one sector that has the ability to transform from a net source of CO₂ to a net sink of CO₂—there is no other human managed realm with this potential. Recent studies demonstrate the efficacy of several carbon-beneficial agricultural practices in increasing soil carbon sequestration. Compost use has been shown to increase the amount of carbon stored in both grassland and cropland soils and has important co-benefits, such as increased primary productivity and water-holding capacity. Restoration of riparian areas on working lands has the capacity to sequester significant amounts of carbon. There are at least thirty-two on-farm Natural Resource

Conservation Service (NRCS) conservation practices that are known to improve soil health and sequester carbon, while producing important co-benefits: increased water retention, hydrological function, biodiversity, and resilience.

Carbon Farm Planning

We start with the creation a Carbon Farm Plan (CFP), where our team works with a farmer or rancher to assess all the opportunities for GHG reduction and carbon sequestration on their property. A set of online tools (COMET) developed by researchers at Colorado State University, NRCS, CCI and the Marin Carbon Project, allows the quantification of GHG benefits. When we implement carbon farming, we also address many of ecosystem health impacts related to agriculture, including groundwater and surface water degradation. Converting manure and other organic waste into high-quality compost avoids the methane and air quality issues of conventional on-farm nutrient and waste management, and, improving soil health and soil organic matter directly improves the water holding capacity of soils, as we have seen first-hand on our demonstration farms across California.

Carbon Farming Implementation

The Carbon Cycle Institute has developed a model framework for land management that emphasizes carbon as the organizing principle. Land management within this framework leads to enhanced rates of carbon capture, increases the provision of important ecosystem services (especially water), and mitigates climate change. The framework relies on sound policies, public-private partnerships, quantification methodologies and innovative financing mechanisms that ultimately empower local organizations to efficiently implement on-the-ground, science-based solutions. Resource Conservation Districts (RCDs) are an essential component of this framework. RCDs act as hubs that foster local partnerships to develop and implement carbon farming plans and practices in their districts—several RCDs across California are building local partnerships, creating Carbon Farm Plans and engaging producers in carbon farming. It is critical to strengthen the capacity of RCDs and local agricultural support organizations to scale carbon farming to achieve measurable carbon capture, and address climate change and agricultural resilience, through both mitigation and adaptation.

Carbon Farming Practices

Compost application

Residue and Tillage Management,
No Till/Strip Till/Direct Seed

Anaerobic Digester

Multi-Story Cropping

Windbreak/Shelterbelt Establishment

Silvopasture Establishment

Forage and Biomass Planting

Nutrient Management

Tree/Shrub Establishment

Forest Stand Improvement

Contour Buffer Strips

Vegetative Barrier

Windbreak/Shelterbelt Renovation

Alley Cropping

Riparian Herbaceous Cover

Range Planting

Herbaceous Wind Barriers

Critical Area Planting

Residue and Tillage Management

Forest Slash Treatment

Filter Strip

Grassed Waterway

Hedgerow Planting

Cross Wind Trap Strips Conservation Cover

Wetland Restoration

