Legislation Text

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To: Board of Supervisors of Sonoma County
Department or Agency Name(s): County Administrator's Office, Climate Action and Resiliency Division
Staff Name and Phone Number: Simone Albuquerque (707)565-2132
Vote Requirement: Majority
Supervisorial District(s): Countywide

Title:
Carbon Inventory and Potential Sequestration Study

Recommended Action:
Accept the County of Sonoma Carbon Inventory and Potential Sequestration Study Report.

Executive Summary:
The Board of Supervisors has set climate-related goals and objectives through its 5-Year Strategic Plan, including a target to achieve net-zero emissions by 2030, and goals and objectives to maximize carbon sequestration. Since reducing emissions to zero is not possible with current technology and other constraints, carbon sequestration - that is, strategies to remove carbon from the atmosphere - can play an important role in achieving net zero emissions. The biggest opportunity to sequester carbon in Sonoma County is through our natural and working lands, by protecting current carbon stocks (places where carbon is stored in soils, rocks, and plants) and sequestering additional carbon (when carbon is drawn from the atmosphere and into plants and soil). The Board is also committed to building resilience in the landscape and optimizing carbon sequestration to support healthy ecosystems. The County of Sonoma Carbon Inventory and Potential Sequestration Study establishes an inventory of current carbon stocks and evaluates the potential for Sonoma County's landscape to sustainably store more carbon. Developed with local partners, including local governments, Resource Conservation Districts, and non-profits, this study quantifies existing carbon stocks throughout the county. It presents recommendations for protecting significant carbon stocks and identifies available practices that can increase carbon sequestration county-wide.

Discussion:
On September 17, 2019, the Sonoma County Board of Supervisors formally joined cities, counties, and countries across the world in declaring a climate emergency and establishing the climate crisis as a top priority. In the 2021-2026 Board of Supervisors 5-year Strategic Plan <https://socostrategicplan.org/climate-action-and-resilienc>, approved on March 2, 2021, your Board identified a series of climate-related goals and objectives within the Plan's Climate Action and Resiliency (CAR) Pillar. The CAR Pillar sets targets to decrease greenhouse gas (GHG) emissions, increase carbon sequestration, and to ultimately achieve carbon neutrality by 2030. While the County is already making progress towards these targets, full achievement of many of the CAR goals and objectives hinges on acquiring a baseline understanding of the county's current carbon stocks and potential carbon sequestration capacity.
Carbon sequestration is the removal and storage of carbon from the atmosphere. This process occurs naturally

through plant photosynthesis, where carbon is drawn from the atmosphere and into plants and soil. Conservation practices can be strategically implemented to sequester carbon. Once current carbon stocks are identified, they can be protected and/or enhanced through sequestration practices.

PARTNERS

Key reports such as the Climate Resilient Lands Strategy, the Climate Action through Conservation Project, Regional Climate Protection Authority's (RCPA) Climate Mobilization Strategy (Mobilization Strategy), and the Vital Lands Initiative informed this study. These reports assessed the potential for climate impacts on land, identified potential climate resilience projects and initiatives, identified biodiversity and conservation priorities, and estimated carbon storage in natural lands. The County of Sonoma Carbon Inventory and Potential Sequestration Study (Study) builds upon this work by providing an assessment of carbon storage and sequestration potential across different land cover types including agricultural lands, natural lands, and urban spaces. The Study and data analysis were prepared by Rincon Consulting under a contract approved by Board on April 18, 2023.

The Sonoma County Agricultural Preservation and Open Space District (Ag+OS), Permit Sonoma, Sonoma County Regional Parks, RCPA, and Sonoma Water make up the Project Team that drafted the Scope of Work, selected the contractor, and reviewed the Study as it was drafted. Ten additional partners participated in two half-day Nature-Based Solution Workshops, including the Sonoma Resource Conservation District and Gold Ridge Resource Conservation District (RCDs), Carbon Cycle Institute (CCI), Occidental Arts and Ecology Center, and others. The RCDs and CCI reviewed the full Study to ensure alignment with on-going carbon sequestration practice planning and implementation efforts.

STUDY

This study includes land-based carbon inventories for 2013 and 2022, and an analysis of how carbon stocks have changed over this time period. The Sonoma County carbon inventories methodology is based on the California Department of Conservation Resilient Counties Guide <https://maps.conservation.ca.gov/TerraCount/downloads/>, which provides a widely used county-level natural and working lands analysis in line with the State's 2018 natural and working lands inventory. To create the 2013 inventory, the study utilizes the Sonoma County Vegetation Map (Veg Map) from the Vegetation Mapping & Lidar Program <https://sonomavegmap.org/> developed by the Ag + OS and Sonoma Water along with the many state and federal partners. This data provides a high-resolution map of county-wide land use cover in 2013.

The inventory for 2022 used the 2022 LANDFIRE dataset <https://landfire.gov/>; it was identified by subject matter experts because more recent Veg Map data was not available. There are important differences between the two datasets, however, that had to be addressed before a rigorous comparison could be made between them. Consultants created a methodology to align 2022 LANDFIRE data with the 2013 Veg Map to support the comparison of land cover between years. It is important to note that there are some gaps in the available land cover data, and scientific understanding of the impact of wildfire and drought on the county's landscape is still evolving, including the associated impacts on carbon stocks, and how climate-driven trends in drought and wildfire may impact carbon stocks in the future. This study relied on the best available science at this time, and the methodology used in this study will allow the County to update the carbon sequestration inventory as improved data becomes available.

Sonoma County's diverse landscapes held approximately 117,593,161 MT CO_2e in 2013 and 105,365,590 MT CO_2e in 2022, providing critical co-benefits like healthy ecosystems and watersheds, recreation areas, and local food production. The land-based carbon inventories quantify the amount of carbon stored in different land cover classes, such as forests, grasslands, rangelands, and others. The study captures carbon stock

changes based on vegetation type, cover, and height. This land cover data and trends over time was combined with soils data to calculate carbon stocks. The study found that the most carbon is stored in Sonoma County's forests, followed by grasslands, and then by developed land (due to urban forests).

The amount of carbon stored in the landscape can change over time, with some land types changing more, and others changing very little. Between 2013 and 2022, there was a decline in carbon storage within the county's forest (21%) and wetland (20%). Decreases in forest and wetland carbon stocks in the county may be due to climate-induced shifts due to the intensity and frequency of wildfires and extended drought between the two inventory years. Actions that promote forest health and mitigate fire risk can reduce the amount of carbon lost to climate hazards. Even with the decreases observed, the amount of carbon stored in Sonoma County's natural and working lands in 2022 is the equivalent of the amount of carbon emitted to supply electricity to the population of the Bay Area for more than two years. This emphasizes the importance of protecting carbon stocks on natural and working lands.

In addition to the Carbon Stock Inventory, the study estimates the maximum capacity of Sonoma County's landscape to store carbon - this is the landscape's "carbon sequestration potential" - and identifies options to reach that maximum potential. The study includes a list of practices that enhance carbon sequestration and protect carbon stored in soils and vegetation. To estimate the sequestration potential for each practice, that is, how much more carbon could be stored if the practice were fully implemented wherever beneficial, the study evaluated: (1) the potential acreage a practice could be applied upon in the county; (2) the potential carbon sequestration of that practice; and (3) the lifetime of the practice - that is, how long it will continue to sequester carbon. The study then estimated Sonoma County's maximum carbon sequestration potential by adding up the benefits (in increased carbon sequestration) from full implementation of each available practice across the county if 100% of the practices were fully implemented until 2030. Recognizing that the maximum scenario is not realistic, the study also provides estimates for adoption of each practice were implemented on 1% of the suitable acreage, which is scalable and supports development of realistic planning scenarios. Staff will use these estimates to identify and quantify sequestration measures and actions in the upcoming Climate Resiliency Master Action Plan and will work with partners and stakeholders to evaluate feasibility and costs to prioritize recommendations to the Board. Staff is also engaged in ongoing studies that will verify on-the-ground results in Sonoma County and derive county-specific formulas for more locally accurate predictions of benefit.

A key example of ongoing work that will help refine data about local impacts of sequestration practices is the Sonoma-Marin Ag and County Climate Coalition (SMACCC) project. The SMACCC project is a partnership across multiple organizations from the counties of Marin and Sonoma, with the County of Sonoma acting as the lead entity. The SMACCC partnership will increase the pace and scale of carbon sequestration practices in Sonoma County. The work includes evaluation of the benefits of specific practices when implemented in Sonoma County's landscape and climate. The coalition is using over $10 million in grant funding and leverage successful carbon farming and local and regional food systems partnerships and programs develop 50 new carbon farm plans (plans identify potential practices across an entire farm, ranch, dairy or vineyard), implement 124 projects deploying beneficial across approximately 45,890 acres and sequester an estimated 253,612 metric tons of CO_2e over 20 years. This project, with the Carbon Inventory and Potential Sequestration Study results, will advance carbon sequestration practice planning and validate local carbon sequestration successes.

NEXT STEPS

County staff will work with partners and stakeholders over the next few months to better understand the feasibility and costs of the available projects and actions identified in the study to increase carbon sequestration. Expanded engagement will focus on landowners and land managers, tribes, and underserved

and under-resourced communities, to identify high priority projects and actions to increase carbon sequestration in Sonoma County. Staff will recommend the highest priority actions to the Board in the Master Climate Resilience Master Action Plan next spring.
Staff will also work with partners to implement the SMACCC project and other projects designed to increase carbon sequestration. Using data from the SMACCC project, staff will update, as appropriate, estimates of the carbon sequestration benefits of individual practices based their measured effectiveness in specific Sonoma County locations. In the future, when the next Veg Map data set becomes available, staff will use the new data, in combination with refined data from the SMACCC project, to update the Sonoma County carbon inventory and sequestration targets.

Strategic Plan:
This Study provides prerequisite information to inform the development of a comprehensive plan for the County of Sonoma to achieve net carbon neutrality.

This item directly supports the County's Five-year Strategic Plan and is aligned with the following pillar, goal, and objective.

Pillar: Climate Action and Resiliency
Goal: Goal 2: Invest in the community to enhance resiliency and become carbon neutral by 2030.
Objective: Partner with educational institutions, trade associations, businesses, and non-profit organizations to establish workforce development programs that focus on carbon neutral and resilient building technologies by 2023.
Pillar: Climate Action and Resiliency
Goal: Goal 5: Maximize opportunities for mitigation of climate change and adaptation through land conservation work and land use policies
Objective: Objective 1: By 2025, update the County General Plan and other county/special district planning documents to incorporate policy language and identify areas within the County that have the potential to maximize carbon sequestration and provide opportunities
and
Objective 2: Develop policies to maximize carbon sequestration and minimize loss of natural carbon sinks including old growth forests, the Laguna de Santa Rosa, and rangelands. Encourage agricultural and open space land management to maximize sequestration

Racial Equity:

Was this item identified as an opportunity to apply the Racial Equity Toolkit?
Yes
See Attachment 5.

Prior Board Actions:
April 18, 2023 - Board authorized the professional service agreement with Rincon Consultants, Inc. to conduct a Sonoma County Carbon Inventory and Sequestration Potential Study through December 31, 2023, in the not-to-exceed amount of $279,265.
August 29, 2023 - Climate Action and Resiliency Workshop - Board received a presentation on preliminary results of County of Sonoma Carbon inventory and Potential Sequestration Study, among other climate action and resiliency topics.

FISCAL SUMMARY
N/A

Narrative Explanation of Fiscal Impacts:
N/A

Narrative Explanation of Staffing Impacts (If Required):
N/A

Attachments:
Attachment 1: The County of Sonoma Carbon Inventory and Potential Sequestration Study with Executive Summary -in English
Attachment 2: Executive Summary of the County of Sonoma Carbon Inventory and Potential Sequestration Study - English
Attachment 3: Executive Summary of the County of Sonoma Carbon Inventory and Potential Sequestration Study - Spanish
Attachment 4: Presentation of the County of Sonoma Carbon inventory and Potential Sequestration Study
Attachment 5: Racial Equity Analysis.

Related Items "On File" with the Clerk of the Board:
N/A