



Conservation Evaluation and Monitoring Activity

Carbon Sequestration and Greenhouse Gas Mitigation Assessment

CEMA 218

Definition

A Conservation Evaluation and Monitoring Activity (CEMA) is the assessment, monitoring, or recordkeeping activities required to plan, implement, or determine the effectiveness of conservation practices as described herein.

This CEMA is in reference to the quantitative assessment of the carbon sequestration and greenhouse gas (GHG) mitigation scenarios for an operation with a conservation plan using COMET-Farm.

REQUIREMENTS

Qualified Individual Requirements

The Natural Resources Conservation Service (NRCS) strongly encourages participants to know the following Qualified Individual (QI) Requirements to ensure the person they hire is a good match for their needs and objectives.

A QI for this CEMA has one of the qualifications listed below:

- The QI will have completed at least one previous COMET-Farm assessment for the type of operation to be evaluated (e.g., if the CEMA application will be for an agroforestry operation, the QI will have completed at least one previous COMET-Farm agroforestry assessment), or
- The QI will have completed the “COMET Farm & COMET Planner Introduction Presentation” and the “Carbon Farm Planning using COMET-Farm” series (Parts 1-5) videos on the COMET YouTube channel (<https://www.youtube.com/channel/UCQKxUt7MtFKeXTN94CDVZaQ/videos>)

General Requirements

- 1) This CEMA includes the performance of work and documentation of the tasks, results, interpretations, and other activities described herein by a QI.
- 2) Prior to initiation of the CEMA, the QI must arrange a pre-work conference to ensure all parties understand the participant’s objectives, required deliverables, and characteristics of the CEMA tasks.
 - a) The parties in the pre-work conference must include the participant, the QI, and the NRCS field office staff. The parties should agree whether they will join in-person or join via phone, web-meeting, etc.
 - b) If the participant will employ a Technical Service Provider (TSP) to implement a Conservation Planning Activity (CPA) or Design and Implementation Activity (DIA) that will be supported by results of this CEMA, it is recommended to invite them to the pre-work

conference too.

- 3) A QI may use any reference information, resource concerns, conservation practice standards and related documents served in the NRCS Field Office Technical Guide (FOTG) for the state where this CEMA is performed. The FOTG home page hyperlink is: <https://efotg.sc.egov.usda.gov/#/>
- 4) This CEMA is used to estimate the GHG mitigation and carbon sequestration potential of conservation practice implementation on an agricultural operation, and the potential of a conservation plan focused on the participant's short- and long-term goals for their operation including GHG emissions reduction, carbon sequestration in soils and perennial biomass, and voluntarily participating in ecosystem service markets.

Technical Requirements

The Carbon Sequestration and Greenhouse Gas Mitigation Assessment CEMA can be used concurrently or consecutively with a conservation plan to support a conservation plan focused on reducing GHG emissions and sequestering atmospheric carbon in soils and/or perennial biomass. The CEMA is intended to be comprehensive and evaluate the NRCS conservation practices and activities that provide the operations with carbon sequestration and GHG mitigation solutions. A list of these practices and activities is available at:

https://www.nrcs.usda.gov/wps/PA_NRCSCconsumption/download?cid=nrcseprd1881025&ext=pdf

Establish a baseline of GHG emissions and sinks, expressed in the common units of metric tons carbon dioxide equivalents (CO₂e) and estimate the potential effect of a conservation plan with the preferred mitigation and sequestration alternatives using COMET-Farm.

COMET-Farm requires the parcel location, historic management before the year 2000, baseline management from 2000-2020, and scenario management which would include a conservation plan. Management history can be adjusted to include as many years of history as is available, but better results will be generated with 20 years of history.

The COMET-Farm website has a variety of video resources on the COMET YouTube channel ([COMET-Farm Training Videos](#)) and tutorials available on the Help Page (<http://comet-farm.com/HelpPage>).

- 1) **Additional Requirements for Cropland, Pasture, Rangeland, Orchards and Vineyards.**
 - a) In addition to the historic, baseline, and conservation scenario management history and plan, Cropland, Pasture, Rangeland, Orchard and Vineyard management categories should include, as applicable:
 - i) Crops (annuals, seasonal cover, orchard/vineyard, forage), planting and harvest dates, harvest and grazing removal estimates.
 - ii) Tillage type and frequency.
 - iii) Irrigation type and frequency.
 - iv) Manure/compost application, type, characteristics and amount.
 - v) Fertilizer application, type and amount.
 - vi) Liming application.
 - vii) Burning management practices.

2) **Additional Requirements for Animal Agriculture.**

- a) For animal agriculture and production, details of animal production of GHG emissions include the following information, as applicable:
- i) Animal type(s).
 - ii) Herd size/number of animals, monthly.
 - iii) Animal characteristics.
 - iv) Feed and feeding situation.
 - v) Manure system type and management details.

3) **Additional Requirements for Agroforestry and Forestry**

- a) For agroforestry and forestland estimates of GHG mitigation and soil carbon sequestration (soils and perennial biomass) include the following information:
- i) Agroforestry and Forest location and type (general species/family).
 - ii) Diameter at breast height (DBH) or age.
 - iii) Number of trees.
 - iv) Historic land cover.
 - v) Age or total volume in m³/ha or merchantable volume in m³/ha.
 - vi) Management Prescription (grow or clear cut).

Documentation

Quantify the amount of GHG reduction and/or enhanced carbon sequestration using COMET-Farm. Evaluate a minimum of two future emission reduction and/or enhanced carbon sequestration scenarios and include a copy of COMET-Farm final report (see **a**) below) selecting the final atmospheric-beneficial alternatives.

- a) A copy of COMET-Farm report that includes the historic and baseline estimates of climate benefits and the estimates based on the final selected alternatives of a conservation plan focused on soil carbon sequestration and GHG mitigation.

Definitions

Carbon Sequestration is the process by which atmospheric carbon dioxide is captured and stored in perennial biomass and soils of agricultural, agroforestry and forestry systems.

COMET-Farm is a whole farm and ranch carbon sequestration and greenhouse gas accounting system developed through a long-standing strategic partnership between NRCS and Colorado State University. COMET-Farm is a computer modeling platform utilized to evaluate the atmospheric impacts of various NRCS conservation practices on crop, range, pasture, forest, and agroforestry land uses.

Greenhouse Gases - Carbon dioxide (CO₂), nitrous oxide (N₂O), and methane (CH₄) are the three main greenhouse gases associated with agricultural production and land management that have contributed to the continued increase in global temperatures and changing climate conditions since the Industrial Revolution. All greenhouse gases are typically presented in units of CO₂e. Global Warming Potentials are utilized to convert non-CO₂ greenhouse gases to CO₂e units. Additional information can be found on the U.S. Environmental Protection Agency's

website.

Mitigation is the act of decreasing human-induced sources of GHGs that change the earth's energy balance, contributing to climate change.

DELIVERABLES

The QI must provide documentation showing all the tasks indicated in the **General Requirements** section, the **Technical Requirements** section, and the following sections:

Cover Page

Cover page reporting the technical services provided by the QI. Cover page(s) must include the following:

- 1) CEMA name and number.
- 2) Participant information: Name, farm bill program name, contract number (QI obtains contract number from participant), land identification (e.g., state, county, farm, and tract number).
- 3) QI name, address, phone number, email.
- 4) A statement by the QI explaining how they currently meet the Qualified Individual Requirements for this CEMA.
- 5) A statement by the QI that services provided meet NRCS requirements, such as:
 - I certify the work completed and delivered for this CEMA:*
 - *Complies with all applicable Federal, State, Tribal, and local laws and regulations.*
 - *Meets the general requirements, technical requirements and deliverables for this CEMA.*
 - *Is consistent with and meets the conservation objectives for which the program contract was entered into by the participant.*
 - *Addresses the participant's conservation objectives for this CEMA.*

QI Signature: _____ *Date:* _____

- 6) A Participant's acceptance statement, such as:

I accept the completed CEMA deliverables as thorough and satisfying my objectives.

Participant Signature: _____ *Date:* _____

- 7) A space for an NRCS reviewer to certify the agency's acceptance of the completed CEMA and, such as:

NRCS administrative review completion by:

Signature: _____ *Title:* _____ *Date:* _____

Notes and Correspondence

- 1) Document each site visit, its participants, the activity completed in the field, and results of each site visit.
- 2) Copies of correspondence between the QI and the participant relating to decision-making and completion of this CEMA.

- 3) Copies of the COMET-Farm report, as well as other observations, data, technology tool output, or test results prepared during completion of this CEMA.

Maps

- 1) Maps to include, but not be limited to:
 - a) General location map of the assessment area(s) showing access roads to the location.
 - b) A map to account for the entire COMET-Farm assessment area. This map may be obtained from the participant.
 - c) Other maps, as needed, with appropriate interpretations.
- 2) At a minimum, all maps developed for the CEMA will include:
 - a) Title block showing:
 - i) Map title.
 - ii) Participant's name (individual or business).
 - iii) Prepared with assistance from NRCS.
 - iv) Assisted By [QI planner's name].
 - v) Name of applicable conservation district, county, and State.
 - vi) Date prepared.
 - b) Map scale.
 - c) Information needed to locate the assessment or monitoring area, such as geographic coordinates, public land survey coordinates, etc.
 - d) North arrow.
 - e) Appropriate map unit symbols and a map symbol legend on the map or as an attachment.

Deliver Completed Work

- 1) The QI must prepare and provide the participant two sets of all of the items listed in the **General Requirements**, the **Technical Requirements** and the **Deliverables** sections of this document.
- 2) One set is for the participant to keep.
- 3) The other set is for the local NRCS Office.
- 4) The QI may transmit a set of the completed work to the local NRCS Office, if their participant has authorized it.

It is recommended to provide the NRCS field office an opportunity to review the CEMA deliverables, prior to asking for their acceptance.

References

USDA Natural Resources Conservation Service. Field Office Technical Guide.

<https://efotg.sc.egov.usda.gov/#/>

USDA Natural Resources Conservation Service. National TSP Resources.

<https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/technical/tsp/?cid=nrceprd1417414>

USDA Natural Resources Conservation Service. National TSP Website.

<https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/technical/tsp/>