CPRG Tools and Technical Resources – Agriculture/Natural and Working Lands Sector

This webpage provides a list of tools and resources that support CPRG Planning Grantees meet the sector-based requirements for the Comprehensive Climate Action Plan (CCAP) and Priority Climate Action Plan (PCAP) if it includes the Agriculture (Ag) and Natural Working Lands (NWL) sector as a priority sector. These requirements are laid out in the Program Guidance for States, Municipalities, and Air Pollution Control Agencies and Federally Recognized Tribes, Tribal Consortia, and U.S. Territories.

EPA and other federal organizations publish and maintain a variety of resources that grantees may leverage to meet these requirements, including Agriculture/Natural and Working Lands Sector Activity Data, Agriculture/Natural and Working Lands Sector Emissions Quantification Methods and Tools, and on Understanding Agriculture/Natural and Working Lands Sector Emission Reduction Opportunities. These resources are further described below.

Note: EPA does not require the usage of a specific dataset or tool, or the inclusion of any particular measure type.

Visit the Greenhouse Gas (GHG) Inventory and Projections webpage for more information on GHG inventory and projections data, methods, tools, and resources.

Where to get started?

The resources below broadly describe Agriculture/Natural and Working Lands sector GHG emissions and strategies to reduce them. They can help grantees begin to consider approaches to reducing emissions in their jurisdiction.

- The NRCS Climate-Smart Mitigation Activities site provides descriptions of conservation activities. Each measure is grouped by category, including soil health, reforestation of disturbed lands, wetlands, and more. Many of the listed measures are coupled with videos that allow the user to learn about the benefits of conservation practices directly from the farmers, ranchers, and forestland owners applying them.
    - The Conservation at Work playlist houses the corresponding videos corresponding on the highlighted conservation practices.

- The Climate-Smart Agriculture and Forestry Mitigation Activities & other FY24 Conservation Opportunities is a webinar on the newly expanded list of Climate-Smart Agriculture and Forestry Mitigation Activities available for Inflation Reduction Act (IRA) funding through conservation programs offered by NRCS. It also covers the IRA and Farm Bill assistance available through USDA.
- EPA's Practices to Reduce Methane Emissions from Livestock Manure Management website summarizes several methods to reduce methane from livestock manure. It includes descriptions of the methods, potential resulting emission reductions, and cost considerations.
- EPA's Quantified Climate Action Measures Directory presents information on the quantified GHG emission reduction measures in state and local climate action plans published between January 2018 and August 2023. Grantees may use this tool to draw inspiration for PCAP and CCAP emissions reductions measures and understand how they were quantified by states, MSAs, and tribes of similar sizes, geographies, economic conditions, etc.
    - Access the State Quantified Measures Directory
    - Access the Local Quantified Measures Directory

Note: There are several other Agriculture/Natural and Working Lands sector training recordings and supplemental resources for CPRG Planning grantees located on the CPRG Technical Assistance Forum (TAF) Resource Library SharePoint site. If you are planning grantee, planning grantee partner, or TAF participant and would like access to the site, please contact cprg.epa@endyna.com.

Agriculture/Natural and Working Lands Sector Activity Data

This section can help equip grantees with critical information needed to meet PCAP and CCAP requirements. The emissions data resources below can help grantees identify emission reduction opportunities and build a solid data foundation for quantifying and assessing the impact of their GHG reduction measures.

- The U.S. Department of Agriculture (USDA) and National Agricultural Statistics Service (NASS) provides a quick stats query service that allows grantees to search for agricultural data by geographic region (e.g., zip code, county, reservation, state).
- The USDA NASS supports the CroplandCROS, a data visualization tool that allows users to view crops and cropland across the U.S. from 1997-2022. Data can be downloaded in GeoTiff, PNG, Meta Raster Format, or as a geodatabase in several different projections.
- The U.S. Geological Survey's GAP/LANDFIRE National Terrestrial Ecosystems Dataset provides a geospatial land cover data set to provide detailed information about the vegetation of the United States. Note that this dataset uses a combination of 2001 and 2011 data and does not measure change in land cover across the time series.
- The Crushed Stone Statistics and Information data site evaluates the use of agricultural lime consumption by state. The USGS publishes this data in an annual report.
- NASA's Land Cover and Land Use Change Program provides satellite data on land cover and land use change data over time for the US and the globe.

- The Rapid Carbon Assessment (RaCA) is a data set generated by the USDA to develop statistically reliable quantitative estimates of amounts and distribution of carbon stocks for U.S. soils under various land covers and management schemes.

Agriculture/Natural and Working Lands Sector Emissions Quantification Methods and Tools

The following resources provide tools and methods for quantifying GHG emission reductions for the Agriculture/Natural and Working Lands sector. These tools can be used by states, local governments, Tribes, and territories to quantify GHG reduction measures in their PCAPs and CCAPs.

Quantification Methods

The following resource provides methodologies for quantifying GHG emission reductions for the Agriculture/Natural and Working Lands sector. These methods can be used to quantify GHG reduction measures in climate action plans.

- The 2006 International Panel on Climate Change (IPCC) Guidelines for National GHG Inventories, Volume 4 - Agriculture, Forestry, and Other Land Use provides guidance for preparing annual GHG inventories in the Agriculture, Forestry and Other Land Use (AFOLU) Sector. This is the methodology employed by the U.S. EPA Inventory of GHG Emissions and Sinks and is ideal for maintaining the best "apples-to=apples" comparison with the national inventory.
    - This resource was updated with a 2019 Refinement that includes updated emissions factors and quantification methodologies.

Quantification Tools

The following resources provide tools for quantifying GHG emission reductions for the Agriculture/Natural and Working Lands sector. These tools can be used to quantify GHG reduction measures in climate action plans.

- The Agriculture and Land Use National GHG Inventory Software (ALU) is a tool that guides users through the process of estimating GHG emissions and removals related to agricultural and forestry activities following IPCC guidance and includes mitigation module allowing users to quantify potential emissions impacts of changing agriculture and land use practices.
    - The Introduction to ALU Software video provides a walkthrough of how to use the ALU software.
- The COMET-Farm™: Conservation Calculation is a carbon capture calculator developed by USDA-NRCS in partnership with Colorado State University. Based on simple inputs about land and management practices, the tool estimates the environmental benefits associated with conservation practices for cropland, pasture, rangeland, livestock operations and energy.
    - The COMET-Farm website provides PDF tutorials and a calendar of online trainings on the COMET-Farm tool.

    - The COMET-Planner tool evaluates potential carbon sequestration and GHG reductions associated with adopting NRCS conservation practices.
- The Non-CO2 GHG Mitigation Assessment Model provides projected emissions estimates and technical and economic mitigation estimates of non-CO2 GHGs from anthropogenic sources for all 50 states in the U.S. The tool allows users to filter by mitigation assessments or emissions, GHG, year, and national versus global to understand GHG projections and mitigation assessments.
    - The Non-CO2 Methodology Report guidance document provides methodology for the Non-CO2 GHG Mitigation Assessment Model.

Understanding Agriculture/Natural and Working Lands Sector Emission Reduction Opportunities

The resources below focus on areas of the Agriculture/Natural and Working Lands sector where opportunities for GHG emissions reductions might be found. The resources can help grantees refine emissions reduction strategies and select measures to implement their strategies in their PCAP and CCAP.

Anaerobic Digestion

Anaerobic digestion captures and converts methane from manure, food waste, and other organics to renewable energy. The following resources provide information and tools for helping identify and selecting GHG reduction measures for anaerobic digestion.

- AgSTAR is a collaborative program sponsored by EPA and USDA that promotes the use of biogas recovery systems in the Ag sector to reduce methane emissions from livestock waste. Contained on this website is a variety of useful resources to inform the development of emission reduction strategies in the agricultural sector for state, local, and tribal governments developing PCAPs and CCAPs. These resources include background knowledge and training resources, planning checklists, and potential strategies, projects, and implementation opportunities.
- The AgStar Training resources website provides recordings of webinars discussing technical issues and opportunities related to biogas recovery, a step-by step guide to determine the appropriate biogas system, and other helpful tools.

Soil, Crop, and Feed Management

Carbon storage can be enhanced through increasing the mass and quality of plant and animal inputs to soils; improving soil microbial diversity and abundance; maintaining living plant cover on soils year-round; and Enteric fermentation emissions from livestock can be reduced through feed management.

- The Agriculture Air Quality Conservation Guide – Crop and Land Management can be used to address agriculturally related air resource concerns in areas where agricultural emissions from cropping

systems and general land management are determined to be significant contributors to air quality impairment. Many of the measures provided in this guide also have additional resource benefits such as soil, water, or energy conservation, as well as carbon sequestration.

- The Agriculture Air Quality Conservation Guide – Livestock and Poultry can be used to address agriculturally related air resource concerns in areas where agricultural emissions from livestock operations are determined to be significant contributors to air quality impairment. Like the conservation guide for crop and land management listed above, many measures provided here also have additional resource benefits such as soil, water, or energy conservation, as well as carbon sequestration.

Composting

Composting converts organic materials into a nutrient-rich soil amendment or mulch and improves carbon sequestration. The following resources provide information and tools about composting, and application of carbon-based amendments that could be utilized as a part of a PCAP or CCAP. See the Waste TAF resource page for more information and other programs that may offer co-benefits.

- Composting turns organic materials, including food waste, yard trim, and manure, into valuable soil amendments. Composting food waste rather than sending it to landfills avoids methane emissions. Adding finished compost to compacted or depleted soils improves soil health and its ability to retain water, therefore building resilience to climate change impacts such as flooding and droughts and preventing soil erosion and mitigating the impacts of stormwater runoff. Importantly, compost sequesters carbon in the soil and helps absorb GHG emissions.
- The Regional Resources to Reduce and Divert Wasted Food Across the United States provides information about successful programs and regions specific resources on composting.

Forested Lands Preservation and Restoration

Carbon storage in the land use, land use change, and forestry (LULUCF) sector through productive use of forested land and by reducing conversion of land to settlements and agriculture can support GHG emission reductions.

- USDA's Natural Resources Conservation Service provides resources on conservation and forest preservation.
- USDA's Forest Service provides resources on land management.

Last updated on January 29, 2024

Chinese (traditional)

Asistans

Assistência

Tulong

Aide

Korean

Russian

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