



USDA NRCS 2015 Conservation Innovation Grant (CIG) Project Summaries

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*USDA NRCS awarded eight 2015 Innovative Conservation Finance CIGs. Only one project summary is included here, to provide C-AGG meeting participants with background for a project that will be discussed during the meeting.

Establishment of a Mid-South Environmental Stewardship Marketing Cooperative

Project Lead: White River Irrigation District

Project Partners: A team of Great Farmer Leaders | Winrock International | American Carbon Registry | Carbon Credit Solutions, Inc. | EDF | Entergy Corporation | Other local technical service providers

Goals and Objectives

Goal: To form a Farmer-Driven, Market-Based Sustainable Agriculture Cooperative to Market Agricultural-Based GHG Offsets and develop an Environmental Stewardship Branding Program

- 1) A group of like-minded agricultural producers with a shared vision that are committed to establishing and leading the formation of this cooperative which will serve members to promote, measure, and market environmental stewardship and sustainability efforts in agriculture
- 2) Winrock International will assist with initial formation of the CO-OP
- 3) Carbon Credit Solutions Inc. will transfer their extensive experience and expertise as a project developer such that the CO-OP can perform program development and aggregation tasks
- 4) The American Carbon Registry (ACR) team will develop methodologies and protocols that lead to the issuance of a “recognized seal of authenticity” for environmental branding
- 5) The Environmental Defense Fund will provide training and the promotion of environmental stewardship practices for environmental trading opportunities
- 6) Cooperation with Agri-businesses such as RiceTec, Entergy Corporation, and MARS foods have common environmental interests and compatible programs such as RiceTec’s SmartRice program and Entergy Corporation’s programs that reduce fossil fuel uses in agriculture production
- 7) The White River Irrigation District will facilitate the initial formation of the CO-OP with administrative, technical assistance, measurement tools, and monitoring technology

Greenhouse Gas Emissions (GHGe) Reduction Goal: We will generate California Air Resources Board (ARB) eligible credits for the 2015 (10,000 tons), 2016 (15,000 tons) and 2017 (25,000 tons) crop years however the main goal is to establish an economically sustainable process that works for the growers.

Key Project Elements

Project Location: Rice Growing Region of the mid-South in the states of Arkansas, Mississippi, Missouri, and Louisiana

Project Timeline: November 2015 - September 2018

Emission Source Targeted: CH₄ produced during the rice production cycle

GHGe Quantification Method: DeNitrification-DeComposition (DNDC) model with data monitored

Engagement Level: 25,000 acres 50 farms in the first 2 years with a goal of scaling

Crop(s) Targeted: Rice with other row crops considered over time

Technology Required: DNDC model, electronic sensors for measuring and tracking soil moisture and water depth, water flow rates, yield monitoring, and available data sets

Protocols/Methodologies Engaged: American Carbon Registry (ACR) Rice Protocol, California Air Resources Board

Summary

During our recently completed CIG, we identified the technologies involved, capability to monitor and measure the GHG reduction process, and willingness of growers to participate IF the reward matches the cost and time requirements. There are 4 key facts or findings that emerged from the first CIG:

1. We can reduce methane produced by about 50% with methods acceptable to most growers;
2. We can reduce water use more than 18% with a corresponding reduction in fossil fuel use;
3. Technical assistance and grower training, grower recruitment, program development, and aggregation cannot be accomplished from a remote location efficiently. Those services must be provided by people trusted by the growers and knowledgeable of rice production and technologies used within the respective region; and
4. There is not enough funding available under any reasonable, sustainable, publicly traded carbon market to pay for all “fingers in the pie”. We are asking growers to change their management systems, implement more intensive management and measurement techniques, and keep extensive records. It is not practical to pay for the project developer, the verifier, and the broker and have meaningful funds left for the generator of the benefits, the grower. This results in reduced levels of grower participation, lost environmental stewardship opportunities, and forgone marketing potentials at the farm level. A successful program requires a different approach than what is currently available.

Other techniques, including the use of Zero Grade (no slope) land, commercially available naturally cross-pollinated seeds, and the adoption of irrigation technology can further reduce water use, resulting in a cumulative water savings of as much as 40% from traditional rice production methods. Careful management of nitrogen fertilizers can also reduce unnecessary greenhouse gas emissions. Together, these techniques can contribute substantially to a more sustainable cultivation of rice, significantly lower water footprint, reductions in energy used during production, and a smaller GHG footprint.

To mitigate the cost and risk associated with adopting these techniques, farmers need to be able to partially monetize these activities. The available marketing opportunities for farmer created offsets are less than ideal. Though organizations do exist that can purchase these credits from farmers and aggregate them for sale to the buyer, the organizations do not have on-the-ground credibility with farmers, and are assumed by many to be at cross-purposes. At the same time, though markets for sustainably grown products exist, a lack of a verifying and certifying body limits the credibility and potential price premium associated with these products. A farmer operated body (Co-Op) with independent verification is one way to promote these activities with adequate credibility to encourage the broader adoption of these practices through these market-based approaches.

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Promoting Rotational Grazing in the Chesapeake Bay Watershed and Quantifying Economic and Environmental Benefits

Project Lead: Chesapeake Bay Foundation

Project Partners: Future Harvest/Chesapeake Alliance for Sustainable Agriculture | Virginia Forage and Grassland Council | University of Maryland | Red Barn Consulting | World Resources Institute | Texas Institute for Applied Environmental Research | Water Stewardship, Inc | Capital Resource Conservation and Development Area Council, Inc.

Goals and Objectives

We propose to build on ongoing efforts to promote rotational grazing in the Chesapeake Bay watershed by developing a robust regional network of grazers in PA, VA and MD, quantifying the environmental and economic benefits of converting to a rotational grazing system, exploring related market-based opportunities for grazers (i.e., carbon and nutrient trading programs) and sharing this information via the network. Specific deliverables include:

- At least 35 farmers and 1,400 acres converted to rotational grazing;
- Estimates of nitrogen, phosphorus, and sediment loads, greenhouse gas emissions, soil health parameters, and economic benefits for 8 farms, pre- and post-conversion;
- Farmer case studies summarizing the results of the benefits analyses;
- Summary of factors influencing adoption and quantification of likely level of peak adoption;
- Summary of water quality and carbon credit generating potential and farmers attitudes toward these markets;
- Four two-day Grazing Schools, 1 regional conference, at least 8 field days, presentation of results at regional and national meetings, and miscellaneous outreach materials;
- 250 farmers involved in the Regional Network;
- Electronic newsletter that is distributed four times per year to 250 network participants; and
- Revised Chesapeake Bay Nutrient Trading Tool to simplify data entry for grazing systems and better capture the benefits

Greenhouse Gas Emissions (GHGe) Reduction Goal: We do not have a goal for GHG emissions reductions, but rather hope the pilot farms will serve as case studies about the potential emission reductions.

Key Project Elements

Project Location: Select counties in MD, VA and PA

Project Timeline: December 2015 – December 2018

Emission Source Targeted: Livestock farms mostly dairy and beef

GHGe Quantification Method: Using A-MICROSCALE, an Excel-based calculation tool that is included in the American Carbon Registry Methodology for Grazing Land and Livestock Management (GLLM). The methodology focuses on five primary greenhouse gas sources, sinks and reservoirs (SSRs): enteric methane, manure methane and nitrous oxide, nitrous oxide from fertilizer use, fossil fuel emissions,

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and biotic sequestration in above- and below-ground biomass and soils. Grazing land and livestock management activities will affect one or more of these SSRs.

Engagement Level: 35 farmers converting 1,200 acres to more intensive grazing systems

Protocols/Methodologies Engaged: As noted above, we will be using the ACR approved A-MICROSCALE to quantify greenhouse gas emissions before and after conversion to more intensive grazing system.

Summary

Collectively, the Bay jurisdictions have committed to rotational grazing on over 1.2 million acres within the Bay watershed by 2025 to help achieve the nitrogen, phosphorus, and sediment pollution reductions called for under the Chesapeake Bay Total Maximum Daily Load. Adoption of this practice also builds soil health, sequesters carbon dioxide and reduces emissions of other greenhouse gases. Yet, despite these benefits, adoption of this practice is relatively low among producers.

We propose to build on ongoing efforts to promote grazing by developing a robust regional network of grazers in PA, VA and MD, quantifying the environmental and economic benefits of converting to a rotational grazing system, exploring related market-based opportunities for grazers (i.e., carbon and nutrient trading programs) and sharing this information via the network. Outreach activities will include hosting 2-day Grazing Schools and field days, developing an annual state-specific planning calendar for grazers, hosting a regional conference, developing a quarterly electronic grazing newsletter, and updating the “Amazing Grazing” Directory for direct marketing of grass fed products. Water quality, greenhouse gas, soil health, and economic benefits of converting to rotational grazing will be quantified for 8 farms. Lastly, the project will identify factors that influence adoption of this practice and use this information to target additional farmers.

We will quantify water quality benefits and the potential to generate nutrient credits with the Chesapeake Bay Nutrient Trading Tool (CBNTT). The CBNTT is a field-scale model for calculating on-farm nutrient and sediment loads that is currently being used or proposed for use in nutrient trading programs in MD and PA. Part of this project will also include revising this tool to make it more applicable to grazing systems. Similarly, greenhouse gas (GHG) benefits will be quantified using A-MICROSCALE, an Excel-based calculation tool that is included in the American Carbon Registry GLLM Methodology. Assessment of the potential for carbon credits and leveraging private funds from the sale of the carbon offset credits is one innovative aspect of this project. Assessment of soil health parameters will include organic matter, active carbon, wet aggregate stability and water capacity. Economic analyses will include costs for feed, fertilizer, fuel, veterinary bills, income, milk production per cow, etc. Lastly, we will identify the factors that influence adoption of management-intensive grazing (MIG) and use this information to predict the likely level of adoption in the Bay watershed and to target additional farmers.

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Demonstration of a Scalable Nutrient Management Project to Reduce Nitrous Oxide Emissions and Generate Voluntary or Compliance Carbon Credits

Project Lead: Environmental Defense Fund

Project Partners: Almond Board of California | American Carbon Registry | Applied Geosolutions | Carbon Credit Solutions | Climate Action Reserve | Coalition on Agricultural Greenhouse Gases | Delta Institute | K-Coe Isom | United Suppliers | UC Davis | Viresco Solutions

Goals and Objectives

The project has two primary goals:

- ✓ reduce nitrous oxide emissions and nitrate leaching from agriculture by incentivizing optimized nitrogen fertilizer applications; and
- ✓ help farmers participate in environmental markets and earn revenue for the environmental benefits they create

The objectives of the project are to:

1. reduce barriers for growers to participate in environmental markets (voluntary and CA compliance carbon markets) by refining and improving existing nitrogen fertilizer management protocols and quantification tools
 - a. refine at least one carbon protocol to be used in a large-scale fertilizer project
 - b. facilitate the development of a straightforward set of tools for quantifying emission reductions based on the latest science, and include them in the protocol(s) for both corn and almond growers
 - c. one summary article that assesses how methodologies and models are being expanded to quantify water quality impacts, emphasizing the relationship between nitrate leaching and nitrous oxide emissions
2. create a large-scale nitrogen fertilizer management project and increase access to environmental market incentives for U.S. corn farmers and almond growers; quantify co-benefits from optimizing nitrogen application and reducing losses to air and water. This includes:
 - a. 30 pilot participants or 75,000 acres implementing nitrogen optimization practices
 - b. at least 25,000 tons of CO₂e reduced and corresponding GHG credits under development from demonstration project(s)

Greenhouse Gas Emissions (GHGe) Reduction Goal: 25,000 tons of CO₂e

Key Project Elements

Project Location: Midwestern United States and California

Project Timeline: November 1, 2015-September 31, 2018

Emission Source Targeted: N₂O emissions from sub-optimal nitrogen fertilizer applications

GHG Quantification Method and Protocols/Methodologies Engaged:

Data availability will determine which quantification method and model are used for Midwestern corn. Options include:

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- American Carbon Registry's Methodology for N₂O Emission Reductions through Changes in Fertilizer Management (version 2.0)¹
- American Carbon Registry's Methodology for Quantifying Nitrous Oxide (N₂O) Emissions Reductions from Reduced Use of Nitrogen Fertilizer on Agricultural Crops (version 1.0)²
- Climate Action Reserve's Nitrogen Management Project Protocol (version 1.1)³
- Verified Carbon Standard's Quantifying N₂O Emissions Reductions in Agricultural Crops through Nitrogen Fertilizer Rate Reduction (version 1.1)⁴

The DeNitrification-DeComposition (DNDC) biogeochemical model will be used for California almonds and any necessary module changes will be made to American Carbon Registry's Methodology for N₂O Emission Reductions through Changes in Fertilizer Management (version 2.0).⁵

Project partners intend to work with the California Air Resources Board (CARB) on the development of an overarching Nitrogen Fertilizer Management Protocol that will likely include aspects of the above voluntary protocols. The model acceptable to CARB for this protocol has not yet been determined.

Engagement Level: Outreach will be conducted to reach 300,000 acres

Crop(s) Targeted: Corn and almonds

Summary

The project will follow two major work streams: infrastructure and implementation. The infrastructure work stream aims to undertake data flow and economic cost-benefit analyses to identify the data infrastructure needs when looking to connect data collection mechanisms to data analysis tools and carbon quantification models to protocols. The CIG team will identify cost-effective solutions for growers interested in participating in carbon markets for nitrogen (N) fertilizer efficiency. Additionally, project partners will contribute to the refinement of at least one current voluntary protocol and the development of a California Air Resources Board protocol. The infrastructure work stream efforts will streamline the process of generating agricultural carbon credits and reduce barriers to entry. This project will also facilitate the next generation of environmental markets by supporting the refinement of N-fertilizer management GHG protocols and the development of innovative quantification tools.

The implementation work stream includes a demonstration project with 30 participants on 75,000 acres. EDF and our partners will create outreach documentation and conduct training sessions for both growers and their trusted advisors. Partnerships with these pilot producers will demonstrate and quantify how almond and corn growers can increase fertilizer use efficiency by optimizing nitrogen applications, thus reducing N losses to air and water.

This CIG builds off of the efforts of previous CIG projects investigating and implementing incentives for nitrogen fertilizer optimization.

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¹ <http://americancarbonregistry.org/carbon-accounting/standards-methodologies/emissions-reductions-through-changes-in-fertilizer-management>

² <http://americancarbonregistry.org/carbon-accounting/standards-methodologies/emissions-reductions-through-reduced-use-of-nitrogen-fertilizer-on-agricultural-crops>

³ <http://www.climateactionreserve.org/how/protocols/nitrogen-management/>

⁴ <http://www.v-c-s.org/methodologies/quantifying-n2o-emissions-reductions-agricultural-crops-through-nitrogen-fertilizer>

⁵ <http://americancarbonregistry.org/carbon-accounting/standards-methodologies/emissions-reductions-through-changes-in-fertilizer-management>

Using Carbon Markets to Finance Grassland Conservation and Rangeland Restoration on Tribal Lands

Project Lead: Indian Land Tenure Foundation

Project Partners: Spatial Informatics Group-Natural Assets Laboratory | Intertribal Agriculture Council

Goals and Objectives

The goal of this project is to expand the GHG market in Indian country by developing rangeland management carbon sequestration projects on Indian lands and publishing a carbon offset project guidance with the American Carbon Registry for registration of projects developed on various Indian land types. Another outcome of this project will be the creation of an aggregation program to enroll tribal and individual Indian lands.

Key Project Elements

Project Location: Comanche Nation, Southwest Oklahoma; Pe'Sla Lands of the Blackhills, Pennington County, South Dakota, Wind River Reservation, Fremont County, Wyoming; Santa Ana Pueblo, Sandoval County, New Mexico

Project Timeline: November 2015 - 2018

Emission Source Targeted: Grazing and Livestock Management

Engagement Level: Outreach and training activities will reach at least 90 tribes, 120 Indian farmers and ranchers, and 60 field staff from the BIA and USDA over the course of the three-year project. Trainings will take place at pilot project communities and annual intertribal conferences

Technology Required: Available spatial data and local knowledge will be used to map and analyze land cover, land use, and risks to soil and water resources within the four pilot project regions. This assessment will form the basis for evaluating the types of activities that could be implemented to improve the carbon sequestration value of agricultural and range lands. Once we have established the range of possible methodologies appropriate for agricultural and range lands in the pilot regions, we will begin to assess the potential credits that could be generated on a per-acre basis under the defined methods. The analysis of potential credits will also use scientific literature and existing data from published public summaries of offset projects that have already been completed under the various methodologies. The preliminary analysis of per-acre carbon credit generation will be used to develop a GIS-based carbon "hotspots" map of lands in the pilot region. This will be used to help the tribal partners prioritize carbon activities relative to other land use activities.

Protocols/Methodologies Engaged: For the Santa Ana Pueblo, we have already identified an opportunity to test the adaption of a methodology currently only approved for use in California. We will work with the Carbon Cycle Institute to adapt the existing ACR *Compost Additions to Grazed Grasslands* methodology, developed for California rangelands, to a New Mexico context. The Department of Natural Resources of the Pueblo of Santa Ana has indicated a willingness to test the methodology on trust lands under their management. The compost methodology adaptation will build on a 2014 USDA CIG-funded project (Marin Carbon Project and the Carbon Cycle Institute) in California. The Pueblo of Santa Ana has produced compost in the past from biosolids, horse manure, and wood

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chips. Production and use of compost within the Pueblo would provide an economic benefit by eliminating hauling and tipping fees currently incurred for disposal of organic material. The Carbon Cycle Institute will bring the technical expertise necessary to support the establishment of a compost facility and provide guidance on techniques and application rates for utilization on the Pueblo's rangeland. Funding from this grant will be used to establish the scientific baseline for the carbon benefits of this methodology in New Mexico.

Summary

By the end of the three-year project, we seek to meet the following objectives:

1. **Draft and Adopt Carbon Registry Policy Guidance:** Adoption by the American Carbon Registry of the first greenhouse gas offset market guidance specific to the land tenure status of tribal trust lands and individual Indian allotments. By the end of the project period, the policy guidance document will be used to facilitate the development of carbon offset projects on Indian lands in each of the four pilot areas.
2. **Develop Offset Projects in Pilot Areas on Indian Lands:** Complete carbon offset market transactions through the implementation of approved methodologies for grazing land and livestock management or rangeland soil amendments within four pilot project regions – the Pueblo of Santa Ana (New Mexico), Pe'Sla grasslands of the Black Hills intertribal partnership in South Dakota, Comanche Nation (Oklahoma), and the Northern Arapahoe Tribe (Wyoming). At least one transaction in each pilot area will demonstrate a cost efficient aggregation framework and new sources of revenue to tribal rangeland management programs and Indian agricultural producers from participation in greenhouse gas offset markets.
3. **Expand Outreach and Education Network:** Build upon the National Indian Carbon Coalition's outreach activities by developing a cultural exchange network regarding rangeland management practices amongst tribal entities, government agencies, and carbon market services. The network will educate tribal leaders, land managers, and Indian producers about conservation benefits and economic opportunities for managing carbon sequestration and greenhouse gas emissions in agricultural and rangeland systems (including USDA programs). Outcomes will include carbon offset project development materials and training sessions for tribal landowners and land staff (at least 120 Indian landowners, 90 tribes) and at least 60 field staff of BIA and USDA.

We will engage private investment in projects that both meet investors and credit buyers' interest in high-quality carbon offsets, and Tribes' interest in promoting appropriate conservation practices and economic development. Engaging in the marketplace will allow Native American communities to improve management of agricultural lands by reducing soil erosion, surface compaction, and maintaining the content of organic matter in the soils. Important components of this work include outreach to Indian producers and the establishment of a pilot carbon offset aggregation program.

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Avoided Rangeland Conversion: A carbon offset program in South Dakota and North Dakota

Project Lead: The Nature Conservancy

Goals and Objectives

- Enroll 50,000 acres of rangeland, encompassing approximately 100 ranches, into a carbon offset program by layering perpetual conservation easements and direct carbon payments
- Generate new revenue for additional rangeland conservation – up to \$7 million over 20 years
- Target perpetual conservation easements to areas most threatened by conversion and areas with highest carbon storage in soil
- Complete market assessments required by ACoGS methodology to extend carbon offset programs to nine additional counties in North Dakota
- Certify first round of carbon offsets for sale on the voluntary market
- Avert approximately 750,000 t CO₂e emissions over 20 years

Greenhouse Gas Emissions (GHGe) Reduction Goal: 750,000 t CO₂e

Key Project Elements

Project Location: Prairie Pothole Region of North Dakota and South Dakota

Project Timeline: November 2015 – October 2018

Emission Source Targeted: Soil Carbon

GHGe Quantification Method: Biogeochemical model of emissions following conversion of grasslands to row-crops

Engagement Level: 100 private ranches encompassing 50,000 acres

Crop(s) Targeted: Native rangeland

Technology Required: NA

Protocols/Methodologies Engaged: The project will implement a methodology recently adopted by the American Carbon Registry for quantifying carbon stores in undisturbed native prairie soils

Summary

Grasslands are the most converted and least protected habitat type both globally and within the United States. This project will demonstrate the ability of carbon offset markets to generate new revenues to accelerate rangeland conservation and contribute to climate change mitigation. Building upon a methodology developed with financial assistance from a 2011 Conservation Innovation Grant, the project will begin testing the implementation of a market-based conservation incentive system for avoided rangeland conversion similar to those commonly used in the forestry sector.

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Stimulating Grassland Conservation through Greenhouse Gas Emissions Markets (R-228)

Project Lead: Climate Action Reserve

Project Partners: Environmental Defense Fund | K·Coe Isom | SCS Global Services | The Climate Trust | C-AGG

Goals and Objectives

This CIG builds on the work recently completed by the Climate Action Reserve to develop a standardized offset project protocol for the avoided conversion of grassland to cropland. We will expand adoption of this protocol and greatly reduce barriers to implementation of this project activity by: (1) developing tools and procedures to assist landowners and project developers; (2) conducting outreach and education; (3) identifying and implementing a pilot project; and (4) translating any lessons learned into updates and improvements to the protocol. This will result in greenhouse gas emissions reductions on agricultural lands in the United States, both immediately and for decades into the future. In addition to the reduction of carbon emissions, this project has potential to provide additional environmental benefits such as enhanced wildlife habitat and improved watershed health.

Greenhouse Gas Emissions (GHGe) Reduction Goal: Hundreds of thousands of tCO₂e

Key Project Elements

Project Location: Continental U.S., mainly states in the Midwest and West

Project Timeline: November 1, 2015 through October 31, 2017

Emission Source Targeted: Loss of soil organic carbon, as well as N₂O and CO₂ associated with cultivation

GHGe Quantification Method: Climate Action Reserve Grassland Project Protocol v1.0 (default emission factors created with DAYCENT model)

Engagement Level: At least six targeted educational workshops, aiming for dozens of attendees at each

Crop(s) Targeted: Row crops

Technology Required: Remote sensing, as well as other tools, for project development and verification

Protocols/Methodologies Engaged: Climate Action Reserve Grassland Project Protocol v1.0 (<http://www.climateactionreserve.org/how/protocols/grassland/>)

Summary

This project seeks to expand adoption of grassland conservation by lowering the barriers to entry for landowners seeking to participate in greenhouse gas (GHG) emission markets. These barriers include:

- Complexity and effort required for project development and verification
- Landowner education
- Lack of applied experience implementing projects
- Unavailability of tools to streamline credit generation

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This project seeks to solve all four of these problems, leading to large reductions in GHG emissions as landowners choose to pursue long-term conservation of threatened grasslands. Solutions will be achieved through the following deliverables:

- Development of tools to reduce effort of project development and verification
- Outreach workshops to educate landowners and project developers
- Development of a pilot project to test the protocol and tools
- Updated protocol version to address issues discovered through the pilot project

Due to the GHG benefits of grassland conservation, there have been multiple efforts in recent years to develop the policies and market infrastructure necessary for the generation of GHG offset credits to incentivize it. Highlights of recent work include:

- 2010: **CIG awarded** to Environmental Defense Fund, Inc. for the “Development of Protocols and Accounting Methods for Carbon Sequestration on US Rangelands” (NRCS 69-3A75-10-172)
- 2011: **CIG awarded** to Ducks Unlimited (DU) to develop a grassland avoided conversion project in North and South Dakota
- 2012: Issue paper studying the options for standardized protocol development around grassland conservation published by the Climate Action Reserve⁶
- 2013: Methodology for Avoided Conversion of Grasslands and Shrublands to Crop Production⁷ adopted by the American Carbon Registry (developed through the DU CIG)
- 2014: DU negotiates purchase of GHG offset credits with Chevrolet generated by their innovative CIG-funded grassland conservation project, signaling market interest in credits generated by grassland projects⁸
- 2015: Grassland Project Protocol v1.0 to be adopted by the Climate Action Reserve (expected July 2015)⁹

This work has laid the foundation for the development of a robust market in GHG offset credits from the avoided conversion of grasslands. Unfortunately, the DU project remains the only example of this project activity, and through that project a number of technical and policy issues were identified with the existing methodology that make implementation more difficult. The Reserve protocol development effort focused on creating a streamlined and standardized project protocol, but barriers still exist to the widespread entry of landowners into the GHG market for grassland conservation projects. That is where the opportunity exists for this CIG-funded project. This project will advance the tools and implementation experience needed to streamline the process for generating offsets through grassland conservation. The project partners are recognized leaders in the development of policies and solutions for GHG markets, offset project methodologies, and environmental conservation.

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⁶ Available at: <http://www.climateactionreserve.org/wp-content/uploads/2012/12/Grasslands-Issue-Paper.pdf>

⁷ Available at: <http://americancarbonregistry.org/carbon-accounting/standards-methodologies/methodology-for-avoided-conversion-of-grasslands-and-shrublands-to-crop-production>

⁸ Press release: <http://www.ducks.org/conservation/ecoassets/chevrolet-invests-in-ducks-unlimited-carbon-offsets-to-protect-grasslands>

⁹ The draft protocol and development information can be found at: <http://www.climateactionreserve.org/how/protocols/grassland/>

Expanding the Carbon Offset Market for Working Rangelands in the Northern Great Plains

Project Lead: Ducks Unlimited

Project Partners: American Carbon Registry | The Nature Conservancy

Project Summary

Led by Ducks Unlimited, Inc. (DU), this project, titled, *Expanding the Carbon Offset Market for Working Rangelands in the Northern Great Plains*, looks to leverage experience from a 2010 CIG funded effort in which the Avoided Conversion of Grasslands and Shrublands (ACoGS) methodology was developed and certified offsets were generated. The overarching objective of this new CIG-funded project is to continue to improve carbon offset opportunities for grassland-based producers and, through innovation, ensure the provision of important ecosystem services. Specifically, the project team—Ducks Unlimited, American Carbon Registry (ACR), and The Nature Conservancy—will reevaluate and refine the current ACoGS methodology, strategically identifying ways in which transaction costs and project development burdens can be reduced while maintaining scientific rigor. The next phase of the project will utilize the methodology revisions and bring additional grassland-based carbon credits to market. DU will look to model multiple vintages worth of carbon offsets on 26,000 grassland acres in its portfolio. Furthermore, DU will invest in acquiring new contracts on upwards of 10,000 working grassland acres from EQIP-eligible producers in waterfowl sensitive areas in North Dakota. DU will lead all landowner engagement, modeling, report writing, and certification efforts. Market expansion efforts will be limited to the Northern Great Plains region given the amount of conversion taking place, the carbon emission implications, and overall habitat values to migratory waterfowl.

Greenhouse Gas Emissions (GHGe) Reduction Goal: 50,000+ t CO₂e

Key Project Elements

Project Location: Northern Great Plains, Prairie Pothole Region, North Dakota

Project Timeline: November 2015 – September 2018

Emission Source Targeted: Below-ground soil carbon reserves; avoided tillage

GHGe Quantification Method: Following ACR's ACoGS methodology, likely DayCent Biogeochemical model

Engagement Level: Modeling at least 16,000 grassland acres, will also engage with farmers to protect and model an additional 10,000 acres

Crop(s) Targeted: Rangelands

Technology Required: Biogeochemical models, remote sensing

Protocols/Methodologies Engaged: ACR, Avoided Conversion of Grasslands and Shrublands (ACoGS)

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Developing a Greenhouse Gas Protocol for Restored and/or Avoided Drainage of Wetlands in Agricultural Landscapes: Phase I

Project Lead: Ducks Unlimited

Project Partners: American Carbon Registry | Tierra Resources | Colorado State University

Summary

The objective of this project is to investigate the feasibility and potential application of a new GHG protocol based on the restoration of wetlands and/or avoided drainage of wetlands, with a concentration on the Northern Great Plains. Protocol development is the foundation of any emerging carbon offset trading opportunity. To date, no wetland-based carbon offsets have ever been registered, yet wetland drainage in agricultural systems continues to be a significant contributor to GHG emissions in the U.S. This project will develop an expert working group that will help identify the science gaps or other potential hindrances to market development for such a protocol. A formal summary report of the working group efforts will be developed and submitted to the USDA. In doing so, it is the aim of this effort to provide assurance to the USDA (and any others financially supporting emerging market opportunities) on whether or not a sustainable GHG wetland-based market can take effect in the NGP and provide financial compensation for producers facing economic decisions associated with wetlands. A partnership with Colorado State University's new Master of Greenhouse Gas Management & Accounting program will be integral to the effort. A Phase II in which a modular protocol is developed will be pursued if market potential is identified and additional funding is secured.

Key Project Elements

Project Location: Northern Great Plains

Project Timeline: November 2015 – October 2017

Emission Source Targeted: Wetland drainage and/or restoration (sequestration)

GHGe Quantification Method: Scientific review, biogeochemical models, expert working group

Engagement Level: TBD

Crop(s) Targeted: Wetlands in all agricultural systems at risk of drainage

Protocols/Methodologies Engaged: All existing wetland protocols, modular methodologies

Contact

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Standardized Inventory Methodology and Analytical and Reporting Tools for Forest Carbon Projects

Project Lead: Climate Action Reserve

Project Partners: The Climate Trust | The Walt Disney Company | Redwood Forest Foundation, Incorporated

Goals and Objectives

The goal of this project is to increase participation in California's cap and trade market among small and medium-size forest landowners. Under this project, the Reserve will develop a highly standardized inventory methodology and provide data management and reporting tools, which is anticipated to reduce implementation barriers for forest carbon projects.

Specific objectives include:

1. Develop an inventory methodology that will reduce development and implementation costs, lowering barriers to entry to carbon markets for small to mid-size forest and range landowners. This will include a proof of concept pilot testing with the assistance of collaborating organizations.
2. Develop analytical and reporting tools to standardize and streamline verification, reducing verification costs. These tools will also be road tested through pilot testing.
3. Demonstrate the efficacy and cost reduction due to use of the developed methodology and tools through application via pilot testing.

It is anticipated that projects utilizing the standardized quantification tools will result in at least 3,000,000 metric tonnes of CO₂-e reductions/enhancements over the next 10 years.

Key Project Elements

Project Location: The standardized inventory approach will benefit forest carbon projects throughout the United States.

Project Timeline: The standardized inventory and reporting tools will be completed by February, 2017.

Emission Source Targeted: CO₂ is targeted for both reduced emissions and enhancements through increased carbon stocks in forests and harvested wood products.

GHGe Quantification Method: Emissions reductions and enhancements will be quantified according to the Climate Action Reserve's Forest Carbon Protocol and the California Air Resources Board Compliance Forest Protocol. The protocol aims to standardize a quantification methodology and develop monitoring tools relevant to both protocols.

Engagement Level: The project could result in hundreds of additional landowners, representing many thousands of acres, engaging in forest carbon projects, having the effect of removing or reducing over a million tonnes of CO₂-e. Much of the response will depend on market signals for additional/ongoing demand for forest carbon offsets.

Crop(s) Targeted: Emissions reductions and removals will be developed from forests and wood products.

2015 USDA NRCS Conservation Innovation Grant (CIG) Projects: Greenhouse Gas (GHG) Markets Projects

Technology Required: The standardized methodology will require users to operate and engage in Microsoft Access and Visual Basic for Applications.

Protocols/Methodologies Engaged: The forest inventory methodologies and reporting tools will be developed to satisfy requirements for the Climate Action Reserve's Forest Carbon Protocol and the California Air Resources Board Compliance Protocol.

Summary

Development of the inventory methodology as well as the analytical and reporting tools will be primarily handled by the Climate Action Reserve. Design of the inventory methodology will build off of the institutional knowledge gained through the implementation of the California Cap-and-Trade program to craft a methodology that will be statistically robust and the most cost efficient for both implementation and verification. Additional tools for the streamlining of monitoring, reporting, and verification processes will be based on past experience with offset project registration through the Reserve as well as targeted consultation with expert stakeholders. **Success for this CIG is defined as the submission of new small to mid-sized forest projects to the California cap-and-trade program.**

The development of an inventory methodology is a long process as it must incorporate multiple considerations with significant associated conditions. For example, the inventory methodology must provide a standardized method of locating and establishing plots in a randomized manner that both minimizes the labor cost while maximizing statistical accuracy. Further, once a method for locating and establishing plots is developed, the methodology must provide the explicit instructions around plot monumentation and a step by step process for taking measurements on the plot itself, with a wide range of feasible and accepted forest practices available. The Reserve's depth of knowledge in reviewing numerous unique inventory methodologies provides a strong foundation from which to develop a cost efficient and statistically sound methodology that is applicable across all forest project profiles.

The data management and analytical tools will automate calculations of carbon inventories, annual inventory updates, and required reports submitted to the oversight body, whether compliance-based or voluntary. The suite of analytical tools will be managed by the Reserve and made available to users at no cost. The methodology and reporting tools will set the standard of accuracy, be highly transparent, and therefore, improve verification efficiency.

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Creating Value for Producers and Impact Investors through Marketable GHG/Environmental Credits on Range/Pasture Lands

Project Lead: Terra Global Capital

Project Partners: Five Dot Land and Cattle Company | California Rangeland Trust | Farmer Veteran Coalition | Multinational Exchange for Sustainable Agriculture | The Nature Conservancy | Carbon Cycle Institute | Vitality Farms LLC | University of California-Davis Department of Plant Sciences | Climate Action Reserve | Farmland Fund

Goals and Objectives

The purpose of this project is to work with a broad spectrum of range and pastureland managers, environmental market participants, and impact investors to achieve seven main objectives:

- 1) Increase awareness and adoption of GHG/environmental credit markets and conservation practices among a targeted, diverse and underserved group of range/pasture land managers across five states in the western US, and strengthen collaboration on GHG-related activities between key organizations engaging ranchers with complementary objectives;
- 2) Provide a holistic and efficient market-accepted protocol to generate GHG credits covering a diverse set of range/pasture land conservation management practices;
- 3) Improve the viability of GHG markets for range/pasture lands through verification of GHG credits for two to ten adopters in an aggregated project;
- 4) Develop at least one demonstration of stacking environmental credits such as water, species, and/or habitat, with GHG credits;
- 5) Expand existing producer-facing technical platforms to streamline data requirements for market-based GHG protocols and impact investor metrics;
- 6) Facilitate new investment capital for the sector by establishing metrics to quantify impact and investment value and by pilot branding for sustainably produced range/pasture land, such as food and fiber; and
- 7) Increase value to producers by building demand for GHG and environmental credits within voluntary markets, California Air Resources Board (CARB), California Air Pollution Control Officers Association (CAPCOA)/air districts, and other local regulatory programs.

Greenhouse Gas Emissions (GHGe) Reduction Goal: To be determined once the project has commenced.

Key Project Elements

Project Location: Participating EQIP-eligible ranchers and land managers will be engaged in California, Oregon, Washington, Texas and Hawai'i

Project Timeline: November 2015 through October 2018

Emission Source Targeted: GHG emissions from rangeland and pastureland. The specific boundaries will be determined during the methodology development stage.

GHGe Quantification Method: This will be determined during the methodology development stage.

Engagement Level: Twenty to thirty ranches and farms will be selected for assessments of their range and pasturelands, and will include public and private lands, large, small and underserved ranchers, and owned and leased lands in order to engage a variety of producers. Of these, two to ten ranches or farms will be selected to be aggregated and to validate and verify the first monitoring period using the new protocol. As well, fifteen training sessions with producer engagement organizations will be completed.

Crop(s) Targeted: Range and/or pastureland

Technology Required: N/A

Protocols/Methodologies Engaged: Terra, in partnership with Carbon Cycle Institute (CCI), will lead the creation of a modular range and pasture lands greenhouse gas protocol under Climate Action Reserve (CAR) that will be efficiently applied to quantify GHG credits from a broad spectrum of NRCS practices. This will leverage the market's more than ten existing range and pastureland oriented methodologies/protocols.

Summary

This project will build market-based approaches to conservation for range/pasture land managers in CA, OR, WA, TX, and HI. This will be achieved through increased awareness, outreach materials and fifteen training workshops to a diverse and underserved group of range/pasture land managers to demonstrate the benefits of GHG/other environmental markets for adoption of conservation practices. The project will remove the current inefficiencies in the market protocols by providing a modular range/pasture land protocol under the CAR that can support the broad spectrum of practices used for holistic range/pasture land management which will improve the economics for participating producers. Through bringing to market an aggregated group of 2 to 10 diverse set of early adopter producers, this project will pave the way for sale of verified range/pasture land GHG credits to the market, which will provide the critical mass of required knowledge and information to build demand through promoting wider adoption at the state and county level. At least one of the GHG projects that are brought to market will stack the development and monetization of another environmental credit, demonstrating opportunities for stacked credits on range/pasture lands. The leverage and integration of existing producer facing tools, including the CIG funded Producers Environmental Sustainability Tool (PRESTO) and COMET-FARM, will reduce data collection costs and preparation of the requirements for market validation and verification. This will also serve as the basis for collection and reporting on the data required for the impact investment metrics for range/pasture lands created by the project. By using the impact metrics created under the project, the project will facilitate new investment capital for the sector and increase producers' value by participating in GHG/environmental markets. The GHG/environmental markets development work and the impact metrics will support the piloting of consumer branding with Five Dot Land and Cattle Company. Overall, the project will show how GHG/environmental markets and application of creditable impact metrics can provide incentives for producers to improve soil health, increase agroforestry systems and promote energy efficiency alongside sustainable production and habitat protection.

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