



## C-AGG Briefing to Highlight Successes and Challenges with Environmental Markets

Wednesday, September 28, 2016  
2:30 PM – 4:00 PM  
Senate Dirksen Office Building (SD-G11)

### **Introduction and Context Setting**

Coalition on Agricultural Greenhouse Gases (C-AGG) Overview  
Debbie Reed, Executive Director

### **Greenhouse Gas Markets and Conservation Finance Project Overviews**

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

Shahira Esmail, Terra Global Capital (<http://www.terraglobalcapital.com/>)

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

Sara Kroopf, Environmental Defense Fund (<https://www.edf.org/>)

Establishment of a Mid-South Environmental Stewardship Marketing Cooperative

Dennis Carman, White River Irrigation District

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

Max DuBuisson, Climate Action Reserve (<http://www.climateactionreserve.org/>)

Working Lands Carbon Facility

Sheldon Zakreski, The Climate Trust (<https://www.climatetrust.org/>)

### **Successes and Challenges**

### **C-AGG Policy Relevant Findings**

### **Question and Answer Session**

## Table of Contents

USDA NRCS 2015 Conservation Innovation Grant (CIG) Projects .....	3
Avoided Rangeland Conversion: A carbon offset program in South Dakota and North Dakota.....	6
Creating Value for Producers and Impact Investors through Marketable GHG/Environmental Credits on Range/ Pasture Lands .....	7
Demonstration of a Scalable Nutrient Management Project to Reduce Nitrous Oxide Emissions and Generate Voluntary or Compliance Carbon Credits.....	9
Developing a Greenhouse Gas Protocol for Restored and/or Avoided Drainage of Wetlands in Agricultural Landscapes: Phase I.....	12
Establishment of a Mid-South Environmental Stewardship Marketing Cooperative .....	13
Expanding the Carbon Offset Market for Working Rangelands in the Northern Great Plains.....	17
Promoting Rotational Grazing in the Chesapeake Bay Watershed and Quantifying Economic and Environmental Benefits.....	19
Stimulating Grassland Conservation through Greenhouse Gas Emissions Markets (R-228) .....	22
Standardized Inventory Methodology and Analytical and Reporting Tools for Forest Carbon Projects .....	25
Using Carbon Markets to Finance Grassland Conservation and Rangeland Restoration on Tribal Lands .....	27
Working Lands Carbon Facility .....	29

# USDA NRCS 2015 Conservation Innovation Grant (CIG) Projects

## Greenhouse Gas Markets Projects \$3.9M awarded to 9 Projects

- **Chesapeake Bay Foundation\* (\$491,070)**—proposes to expand the use of management intensive grazing in the Chesapeake Bay watershed, enrolling at least 35 farmers to transition 1,400 acres of farmland to rotation grazing. CBF will quantify the nutrient and greenhouse gas benefits associated with the transition and explore opportunities for producers to participate in water quality trading and greenhouse gas markets.
- **Climate Action Reserve\* (CAR) (\$311,636)**—proposes to build on its recently developed avoided conversion of grassland protocol. In partnership with Environmental Defense Fund, the Climate Trust and others, CAR will develop a streamlined approach to lower barriers to entry for landowners – resulting in an initial pilot project generating substantial carbon credits.
- **Climate Action Reserve\* (\$109,014)**—proposes to increase participation in carbon markets by small forest landowners, through development a standardized forestland carbon forestry methodology and automated computer application that will streamline and simplify the development and submission of forest carbon offset projects.
- **Ducks Unlimited\* (\$219,073)**—proposes to scale up DU’s 2011 avoided conversion of grassland project that culminated in the 2014 purchase by Chevrolet of carbon credits from ranchers in North Dakota. DU will refine the American Carbon Registry protocol to streamline it for producers and will use the refined protocol to model the carbon credits for 16,000 acres in its portfolio – investing in new contracts on approximately 10,000 acres.
- **Ducks Unlimited\* (\$68,452)**—proposes to explore development of a greenhouse gas protocol for restored or avoided drainage of wetlands in agricultural landscapes. The generation of greenhouse gas credits from the avoided conversion of wetlands could help reduce incentives for wetland drainage by creating value for the ecosystem services wetlands provide.
- **Environmental Defense Fund\* (\$960,101)**—proposes to build on its strong relationships with United Suppliers, the Almond Board of California and farmer networks to create a large scale pilot generating the first aggregated nutrient management greenhouse gas credit project. This project will demonstrate how growers implementing enhanced nitrogen management processes on annual and perennial crops can participate in carbon markets. It sets the stage for significant reductions in nitrogen fertilizer pollution – a win for the environment and for growers’ bottom lines.
- **Indian Land Tenure\* (\$295,067)**—proposes to increase engagement and participation of Indian Tribes in greenhouse gas markets. ILT will adapt greenhouse gas protocols to address Tribal issues and complete pilot projects that generate carbon credits for sale in greenhouse gas markets.
- **The Nature Conservancy\* (\$498,477)** —proposes to demonstrate the potential of carbon markets as a viable financial instrument. TNC will enroll 50,000 acres of rangeland in North and South Dakota into a carbon offset program that offers permanent protection and the generation of approximately 750,000 tons of carbon offsets. These offsets will be sold on the voluntary market and net revenues will be used for additional conservation in the Prairie Pothole Region.
- **White River Irrigation District\* (\$927,000)**—proposes to form a farmer-owned and farmer-directed environmental stewardship co-op to promote resource conservation and sustainable agriculture methods

for rice production in the Mid-South. With an initial focus on methane emissions reductions, the co-op will create, aggregate, and market carbon offsets and pursue verification and certification of rice conservation activities for sustainable branding opportunities.

### **Water Quality Trading Projects**

#### **\$2.1M Awarded to 6 Projects**

- **Conservation Marketplace Midwest (\$243,933)**—proposes to develop and pilot a Field Stewards program, an innovative conservation credit system designed to allow companies in the food industry to buy “offsets” for water quality and agricultural conservation. Through the purchase of certification credits, food companies can demonstrate sustainability to their customers without having to create a new chain-of-custody supply chain for agricultural commodities, keeping costs low for retailers and the consumer.
- **Electric Power Research Institute (\$300,000)**—proposes to develop and execute, for the first time, trades of “stacked” ecosystem services for water quality and greenhouse gas emissions reduction credits. EPRI administers the Ohio River Basin nutrient trading program – the only multi-state trading program in the country.
- **Great Lakes Commission (\$400,000)**—substantial water quality issues plague the Western Lake Erie Basin (WLEB), leading to harmful algal blooms each summer in Lake Erie. The Great Lakes Commission proposes to develop a framework for water quality trading in the WLEB.
- **Iowa League of Cities (\$700,000)**—proposes to develop a framework for water quality trading in Iowa to support the state’s Nutrient Reduction Strategy.
- **National Association of Conservation Districts (\$116,725)**—proposes to develop guidance materials and engage in outreach and training to increase participation of soil and water conservation districts in nutrient trading programs. In many water-quality trading programs, district employees are the conservation experts interacting with agricultural producers – generating credits from the installation of conservation practices.
- **Virginia Tech University (\$285,729)**—proposes to develop the information and tools required to incorporate agroforestry into Virginia’s nutrient trading program, which currently depends on the retirement of marginal agricultural lands for credit generation. In December 2014, USDA, EPA and the State of Virginia celebrated a first-of-its-kind transaction when the Virginia Department of Transportation purchased phosphorous credits generated by a Virginia farmer.

### **Innovative Conservation Finance Projects**

#### **\$4.1M Awarded to 8 Projects**

- **American Farmland Trust (AFT) (\$306,118)**—proposes to establish a pollinator habitat credit program in Michigan. AFT will engage at least 15 business entities to fund the establishment of pollinator habitat through this ‘Payment for Ecosystem Services’ program.
- **EcoTrust (\$528,000)**—proposes to test a ‘Forest Bank’ model to channel private investment capital for forest management and landscape-level conservation across the Swinomish Indian Reservation.
- **Island Press-Center for Resource Economics (\$487,000)**—proposes establishment of a ‘Conservation Finance Roundtable’ to support implementation of the cohort of conservation finance CIG projects. The Roundtable will also explore models and mechanisms for conservation finance projects, and provide program and policy recommendations to NRCS.

- **Partners for Western Conservation (\$279,400)**—proposes, with partners including Colorado Cattlemen’s Association and the states of Nevada and Utah, to develop a pay-for-success investment instrument for wildlife habitat and water quality conservation. The state of Nevada will pilot the instrument as part of its efforts to conserve greater sage-grouse habitat.
- **Terra Global Capital, LLC\* (\$730,647)**—proposes to improve the viability of greenhouse gas markets for range and pasture lands through a variety of activities across five states (CA, OR, WA, TX, HI). Development of a comprehensive range and pasture land greenhouse gas protocol through Climate Action Reserve is a key deliverable.
- **The Climate Trust\* (\$1,000,000)**—proposes to establish the Working Lands Carbon Facility, an entity designed to attract private capital to invest in agricultural systems that value and generate carbon credits. \$4 million in private capital will be invested in agricultural and forestry projects that reduce greenhouse gas emissions and sequester carbon through proven conservation practices.
- **Vital Farmland LP (\$260,398)** —proposes to develop tools and metrics to evaluate ecosystem services generated on sustainably farmed agricultural lands, in service of catalyzing impact investments in sustainable agriculture. Farmland LP is an investment group that purchases farmland and transitions it to organic production.
- **World Resources Institute (\$500,000)**—proposes to develop the frameworks and partnerships needed to stimulate the issuance of green bonds, and other innovative financing mechanisms, for natural infrastructure. This project connects investors, utilities, water-dependent companies, municipalities, EQIP eligible landowners, and environmental groups to build replicable templates and processes that unlock private sector financing for conservation, restoration and enhanced stewardship on America’s farms, forests and ranches.

\*Indicates additional project information can be found in the body of this briefing packet

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

The Nature Conservancy (November 2015 update)

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## 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 program to nine additional counties in North Dakota
- Certify first round of carbon offsets for sale on voluntary market
- Avert approximately 750,000 t CO<sub>2</sub>e emissions over 20 years

**Greenhouse Gas Emissions (GHGe) Reduction Goal:** 750,000 t CO<sub>2</sub>e

## 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.

## Contact

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

**Terra Global Capital** (September 2016 update)

**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**

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## 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
- 7) Increase value to producers by building demand for GHG and environmental credits with 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

**Protocols/Methodologies Engaged:** Terra, in partnership with UC Davis, and support from 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 engage a diverse group of range and pasture land managers across five states, including veteran and other historically underserved ranchers. It links those implementing NRCS conservation practices with the technical support to understand the opportunities and gain access to GHG markets, where possible, stacking credits for water quality and conservation banking. An innovative and modular GHG quantification protocol to be developed to more efficiently support generating emissions reductions from a broad set of NRCS practices relevant to range and pasture lands. Educational support is provided to demonstrate the viability of GHG markets through the verification of credits for an aggregated group of ranches. In addition, this project will facilitate development of conservation-based metrics used to attract new investment capital for range and pasture lands to quantify impact and investment value. Through partnering directly with range and pasture land managers, as well as with a board spectrum of organizations who support land managers, this CIG ensures meaningful participation, coordination and adoption across the ranching community.

## Project Status

This project has made considerable strides towards accomplishing the objectives. Working with our engagement partners California Rangeland Trust, Farmers Veteran Coalition, Multinational Exchange for Sustainable Agriculture and Carbon Cycle Institute, we have been developing an extension strategy with the goal of increasing awareness amongst their constituents of the various environmental benefits of applicable conservation practices, our project activities and the potential opportunities for these growers to participate. In addition, we are building capacity within these organizations with a workshop to ensure consistency in messaging and collaboration between institutions. Collaborating with UC Davis, we have initiated the scoping exercise for the comprehensive protocol. This has included completing an extensive inventory of applicable practices, evaluating them from a GHG perspective and addressing further considerations such as additionality, quantification, monitoring parameters etc. A survey conducted by Dr. Emilio Laca from UC Davis received 45 responses from extension agents, land managers and farm advisors detailing the level of adoption and barriers to adoption for the proposed practices. On average the two most common barriers to adoption were; a) costs to implement are too high and b) practice is not well understood. Understanding the barriers to adoption can help us target extension and project activities.

## Contact

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

**Environmental Defense Fund** (September 2016 update)

**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

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## Goals and Objectives

The project has two primary goals:

- ✓ reduce nitrous oxide emissions and nitrate leaching from agriculture by incentivizing optimized nitrogen fertilizer applications
- ✓ 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 CO<sub>2</sub>e reduced and corresponding GHG credits under development from demonstration project(s)

**Greenhouse Gas Emissions (GHGe) Reduction Goal:** 25,000 tons of CO<sub>2</sub>e

## Key Project Elements

**Project Location:** Midwestern United States and California

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

**Emission Source Targeted:** N<sub>2</sub>O 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:

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

The DNDC biogeochemical model will be used for California almonds and any necessary module changes will be made to American Carbon Registry’s Methodology for N<sub>2</sub>O Emission Reductions through Changes in Fertilizer Management (version 2.0).<sup>5</sup>

Project partners intend to work with the California Air Resources Board 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 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 nitrogen 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.

## Project Status

Over the last 10 months, Fertilizer CIG partners and consultant Prassack Advisors conducted a “Data Flow Analysis.” This deliverable moves us closer to achieving our first objective of reducing barriers for growers to

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

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

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

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

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

participate in environmental markets by refining and improving existing nitrogen fertilizer management protocols and quantification tools. This analysis identified the top 5-10 software technologies (farm-level data collection technologies) that collect nitrogen application information (nitrogen field prescriptions and/or as-applied data) and compared these data sources to the input requirements for nitrous oxide calculation models (COMET-Farm and USDA Methodologies, DNDC, Adapt-N and the PNM model, and the MSU-EPRI calculation).

While nitrogen prescriptions and as-applied map data may be recorded by hand, significant efficiencies can be realized through the use of data collection software that gathers the information needed for nitrous oxide quantification methodologies. We shared the results of the Data Flow Analysis with key partners to collect feedback and learn more about the status of various nitrous oxide quantification models and their ability to ingest data directly from on-farm management tools. This analysis is helping the team to understand potential targets for outreach or mechanisms to streamline necessary data collection from growers to significantly reduce the time required to calculate emissions reductions. We are slowly reaching out to both the on-farm management tools and nitrous oxide models to facilitate introductions and promote the development of APIs or other data transfer tools.

Additional work has been done to review the various quantification models from a scientific and policy basis. This review takes into account various characteristics of the models and how they have been or can be incorporated into a carbon protocol. For example, the scientific assessment investigated the status of model calibration, validation, and uncertainty analysis, while the policy analysis reviewed the current acceptability according to a few carbon standards. Carbon registries have initiated efforts to develop guidance materials for project developers and others looking to use the revised N<sub>2</sub>O protocols.

As part of the economic analysis, consultants are currently interviewing corn and almond growers on their perceptions of the program. This report will provide qualitative and behavioral economic insights into grower understanding of and likely reaction to carbon credit programs for nitrogen optimization. The process will explore the potential cognitive biases and barriers relating to the producers themselves that would limit participation in these projects and carbon credit markets. The results of the report will be incorporated into our overall economic analysis of the various project costs and benefits and will likely influence marketing and outreach material messaging.

Outreach by project partners has continued to identify ideal project participants. Five documents have been created: (1) Eligibility screening document, (2) Nitrogen fertilizer management project FAQ, (3) Summary of data movement, (4) Carbon credit agreement, and (5) Carbon credits data requirements “cookbook” based off of the framework used for collecting data for rice methane credit generation. Climate Smart Group developed and began using an online form for data intake that will be used with interested growers. These documents and forms have been reviewed by project partners who are conducting outreach and education to potential pilot participants and modified and revised according to each specific group’s needs. As pilot producers enroll, project partners are collecting feedback on the protocols and the project development process to ensure project success. These deliverables move us closer to achieving our second objective of creating a large-scale nitrogen fertilizer management project and increase access to environmental market incentives for U.S. corn farmers and almond growers.

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

**Ducks Unlimited** (September 2016 update)

**Winrock International | Tierra Resources | Colorado State University**

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## 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)

**GHG 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

## Project Status

The literature review and data investigation for this protocol are nearly completed. Researchers at Colorado State University have begun to populate analytical models to simulate GHG dynamics of wetlands restoration and wetland drainage for the Northern Great Plains. A scientific workshop will be convening in September in Fort Collins, CO to further discuss field data collection, remaining data gaps, market scalability, and overall market potential for agricultural producers weighing such land use decisions. The results of the workshop in conjunction with the literature review/data analysis will be presented in a formal report to the USDA in the coming year.

## Contact

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# Establishment of a Mid-South Environmental Stewardship Marketing Cooperative

**White River Irrigation District** (September 2016 update)

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

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## 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 program 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 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:** The area served by the project is the Rice Growing Region of the mid-South in the states of Arkansas, Mississippi, Missouri, and Louisiana.

**Project Timeline:** Start Date: November 2015. End Date: September, 2018

**Emission Source Targeted:** CH<sub>4</sub> produced during the rice production cycle

**GHGe Quantification Method:** DNDC model with data monitored

**Engagement Level:** 25000 acres 50 farms the first 2 years and growing

**Crop(s) Targeted:** Rice targeted specifically 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:** 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:

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.
4. There is not enough funding available under any reasonable, sustainable, publicly traded carbon market to pay for all “fingers in the pie”. For production agriculture utilizing conservation practices that require increased management interaction to implement, the scale is simply wrong. We are asking growers to change their management, 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 emissions. Together, these techniques can contribute substantially to a more sustainable cultivation of rice, significantly lower water use, reducing energy used during production, and resulting in a smaller GHG (carbon) 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 sale 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.

## Project Status

As of September 2016, approximately one year into this activity, significant progress has been made toward achieving the established goals. Key Items completed include:

1. **Key Item completed:** Established the framework for technical and organizational support including the formation of a steering committee led by the rice growers and composed of leaders from all sectors of the rice industry including representatives from research, marketing, buyers, seed suppliers, state department of agriculture, Ducks Unlimited, USA Rice, and university researchers.
2. Additional field measurements have been taken that clearly document the water savings achieved by practicing the recommended conservation practices. As much as 18% water savings can be achieved by

practicing Alternate Wetting and Drying. Converting from traditional contour levee flood irrigation to zero graded fields with automated control structures can achieve an additional 30%.

3. Data collected supports the conclusion previously reached (see item 4. In above summary) that the current Carbon Market economics and dynamics do not properly compensate for the efforts required to document, verify and trade carbon. The cost for implementation and administration far outpaces the potential financial reward obtainable thru current markets.
4. The conclusion reached previously that other marketing beyond “the Carbon Market” are necessary if market forces will play a significant role in future conservation acceleration were correct.
5. **Key Item Completed:** The legal framework for cooperation and sales of “environmentally grown rice” has been completed in the formation of NATURES STEWARDS LLC.
6. **Key Item Completed:** A preliminary logo and seal has been developed to represent the grower’s brand and conservation ethic.
7. **Key Item completed, but not processed for 2016:** Additional growers have been recruited to participate in the water savings practices and carbon market efforts totaling approximately 20 growers (farms), totaling 65,000 acres of farm land involved in rice production. Approximately 50% of those acres or 35,000 acres produce rice in any single year. Some growers’ rotations include continuous rice while other growers are in a rice/soybean rotation. **Approximately 35,000 acres will meet the voluntary carbon market requirements established by ACR and will result in a single year Carbon reduction of about 15,000 ton, the 2016 goal.** It is estimated that 25,000 acres will meet the CARB requirements but the cost of verification and other extreme administrative requirements will most likely preclude interest in pursuing that alternative.
8. **Key Item:** A Rice Sustainability market survey has been initiated to assess the industry interest in purchasing **verified, environmentally sustainable rice**. This survey is directed at industry buyers, major rice cooperatives, and key market players and will be completed by December 2016. The survey is intended to assess industry interest in sustainability, interest in paying a premium for the product, and key terms to avoid or promote to market sustainable rice.
9. **Key finding or observation: Help is needed on the marketing side.** At this stage, the public interest in “green grown rice” appears to be real. However, few buyers want to pay for the added production costs associated with production, documentation, and marketing required to produce verified environmentally grown and certified rice. It is cheaper to just put a label on the bag, claim benefits, and promote thru advertising.



## Future key work Items

1. We will continue efforts to recruit new growers, implement conservation measures and research market opportunities as initially proposed.
2. Partners continue to be added on the production side and on the implementation side to participate or support the goals of this project. We have one partner expressing interest in financially supporting the land grading required to achieve the highest water savings, water quality improvements and GHG reductions. This conservation practice is an enduring, long term sustainable conservation practice and the industry interest is certainly encouraging.
3. **Key Item: Defining sustainability.** A **U.S. Sustainable Rice Certification Standard** is being developed by Winrock International. The basis for this Certification Standard is the Sustainable Rice Platform (SRP)

Standard on Sustainable Rice Cultivation.<sup>6</sup> This standard has been adopted internationally and is being modified for U.S. conditions with significant stakeholder involvement.

4. Project partners, Carbon Credit Solutions and EDF, will work with model developers to streamline and simplify the Denitrification-Decomposition (DNDC) process model for field use in the county. This will decrease the level of effort required to quantify environmental improvements required as part of the Sustainable Rice Certification Standard to certify the rice has been sustainably produced.

## Contact

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<sup>6</sup> SRP (2015). The SRP Standard for Sustainable Rice Cultivation, Sustainable Rice Platform. Bangkok: 2015. Available at <http://www.sustainablerice.org>

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

**Ducks Unlimited** (September 2016 update)

American Carbon Registry | The Nature Conservancy

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## 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, 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+

## 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:** American Carbon Registry, Avoided Conversion of Grasslands and Shrublands (ACoGS)

## Project Status

Significant effort has been devoted to protocol revisions in the first year of this grant. Project team members from the American Carbon Registry, The Nature Conservancy, and Ducks Unlimited have identified numerous solutions to protocol requirements that unjustly raise costs and hamper market activity. A revised protocol is on track to be released for public comment by the end of the calendar year.

Greenhouse gas modeling is also underway on 17,000 acres of grasslands in the program. It is anticipated that as many as 60,000 carbon offsets could be verified and certified in the next 6-8 months. DU's program staff has been hard at discussion and promoting GHG market opportunities with private producers, as supported through the CIG. Since project inception, DU has been able to sign up four new landowners, equating to 1,200 acres of at-risk grasslands.

## **Contact**

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

**Chesapeake Bay Foundation** (September 2016 update)

**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.**

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## 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, miscellaneous outreach materials.
- 250 farmers involved in the Regional Network
- Electronic newsletter that is distributed four times per year to 250 network participants
- 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. 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, 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

**Crop(s) Targeted:** NA

**Technology Required:** NA

**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 Methodology. Assessment of the potential for carbon credits is relevant as one of innovative aspects of this project is leveraging private funds from the sale of carbon offset credits. 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.

## Project Status

- We developed and have distributed three quarterly newsletters for the regional grazers’ network that we have named the “Mountains-to-Bay Grazing Alliance.” The email distribution list is currently 250 members and growing.
- One of our partners, Future Harvest – Chesapeake Alliance for Sustainable Agriculture has created a web page for the Alliance, that includes resources such as the newsletter, contact info, upcoming events, etc. <https://www.futureharvestcasa.org/resources/mountains-bay-grazing-alliance>
- The Amazing Grazing directory, a consumer’s guide to grass-fed products, was completed and published. In addition, an electronic version is available on the web page and we are actively soliciting new members.
- We have hosted 3 pasture field days and/or workshops.
- We have identified 6 of the 8 “pilot” farms that will be used to quantify environmental and economic benefits of converting to more intensive grazing systems. Two producers are in MD, 3 in PA and 1 in VA.

- We have collected “pre-conversion” soil samples from three of the pilot farms and have received the results from the Cornell Soil Health Laboratory. Results have been shared with the producer. We have also collected information needed to run A-Microscale and the CBNTT on these farms.
- Colorado State hosted a webinar for us on the use of COMET-Farm and we are considering also running our pilot farms through this tool and comparing the results with those of A-Microscale.
- WRI hosted a meeting with select grazers and conservation district staff to get feedback on revisions to the CBNTT designed to make it more user-friendly for grazing systems and also to better model nitrogen and phosphorus emissions from these operations.

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

**Climate Action Reserve** (September 2016 update)

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

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## 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 tCO<sub>2</sub>e

## 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 N<sub>2</sub>O and CO<sub>2</sub> associated with cultivation

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

**Engagement Level:** Four 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

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 Reserve<sup>7</sup>
- 2013: Methodology for Avoided Conversion of Grasslands and Shrublands to Crop Production<sup>8</sup> 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 projects<sup>9</sup>
- 2015: Grassland Project Protocol v1.0 to be adopted by the Climate Action Reserve (approved July 2015)<sup>10</sup>

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.

## Project Status (August 2016)

The first stage of the project involved work by the Reserve to create a handbook for project development, which is now available online.<sup>11</sup> This handbook can be seen as a “plain language” companion to the official protocol document, offering the type guidance that Reserve staff would give over the phone. It is meant to serve a preemptive, in-depth FAQ of sorts, in order to help project developers and verifiers to understand how the protocol is meant to be applied, and what tools are available for that application. Reserve staff also updated and refined the Excel-based quantification tool, known as GrassTool, which is freely available by request, and is currently in revision f.

<sup>7</sup> Available at: <http://www.climateactionreserve.org/wp-content/uploads/2012/12/Grasslands-Issue-Paper.pdf>

<sup>8</sup> Available at: <http://americancarbonregistry.org/carbon-accounting/standards-methodologies/methodology-for-avoided-conversion-of-grasslands-and-shrublands-to-crop-production>

<sup>9</sup> Press release: <http://www.ducks.org/conservation/ecoassets/chevrolet-invests-in-ducks-unlimited-carbon-offsets-to-protect-grasslands>

<sup>10</sup> The protocol and development information can be found at: <http://www.climateactionreserve.org/how/protocols/grassland/>

<sup>11</sup> The handbook for project development may be downloaded from the Grassland Project Protocol page of the Reserve’s website: <http://www.climateactionreserve.org/how/protocols/grassland/>.

EDF led an effort to develop a mapping tool to target specific areas of the country for outreach. K-Coe Isom led the efforts to conduct initial stakeholder outreach and contacts in promising regions. The results of this outreach were then used to inform the location of the initial in-person workshops. The first of these workshops was held in Omaha, NE on April 7, at the Papio-Missouri River Natural Resources District. This half-day workshop was attended by several land trusts and project developers. An additional stakeholder outreach session was held via webinar on April 27, introducing the handbook for project development and walking attendees through the process of quickly assessing the potential GHG reductions from a parcel of land.<sup>12</sup> A second in-person stakeholder outreach presentation and lunch was held at the headquarters of the California Cattlemen's Association in Sacramento, for the Board of Directors of the California Rangelands Trust, on June 22. Two additional in-person workshops are planned for the fall of 2016, dates and locations TBD.

To prepare for the verification of the pilot projects, and others, the Reserve held the first Grassland lead verifier training in Hartford, CT on April 21. Grassland verification services are now available from SCS Global Services and ESI, Inc.

Through the stakeholder outreach process, the team identified a land trust in CO which was interested in participating in the pilot. The Southern Plains Land Trust will be submitting projects on three properties in Southeastern CO, to be managed together as a single grassland cooperative. The cooperative will initially be managed by EDF, with assistance from The Climate Trust, with funding from the CIG. The initial forms were submitted in July and the projects were publicly listed in the Climate Action Reserve's project registry in August. The Reserve is continuing to work with APX, the software provider for the project registry, to build the functionality to allow for projects to be managed in cooperatives, which is expected to happen in late summer/early fall.

At this point the partners are continuing to seek additional projects to add to the pilot cooperative. Verification is intended to begin in late-2016, which initial CRT issuance to occur in early-2017. Reserve staff will also soon be initiating the process to update the protocol to Version 2.0, based on lessons learned through the CIG thus far. Adoption of the updated protocol is expected in winter 2017, prior to initial registration of the pilot projects.

The Reserve is aware of several other groups working on projects and/or cooperatives under the Grassland Project Protocol. Due to the funding from this CIG, the Reserve has been able to provide enhanced support and guidance for these other projects, leading to the potential for additional, indirect successes outside of the work of the CIG partners.

## Contact

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<sup>12</sup> A video recording of this webinar is available at: <https://vimeo.com/164797351>. A PDF of the presentation slides is also available at: <http://www.climateactionreserve.org/wp-content/uploads/2009/05/Developing-Grassland-Carbon-Projects-4.27.16.pdf>.

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

Climate Action Reserve (September 2016 update)

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

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## 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 CO<sub>2</sub>-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:** CO<sub>2</sub> 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 CO<sub>2</sub>-e. Much of the response will depend on market signals for additional/ongoing demand for forest carbon offsets.

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

**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.

## Project Status

Substantial progress has been made on the development of the database and the computer application. The database design allows for the inventory management of multiple forest carbon projects and maintains project records throughout the project life. Carbon inventory reports have been developed that present summary data at the plot, stand, and project levels. Project sampling errors are also automated.

We are currently polishing a link of the project data in the database to the United States Forest Service’s Forest Vegetation Simulator (FVS). The application will extend project data to FVS and ‘grow’ project plot data to a current reporting year, regardless of the actual measurement year of the plot. This utility will provide a credible methodology for plot updates that is compliant with the California Air Resources Board program. Users will be able to specify the FVS variant most applicable for growing the project data.

The documentation of the inventory sampling methodology and the user’s guide to the computer application are not as far developed. We can demonstrate the utility of the computer application but are not in a position to share the project documentation at this point. These will be developed over the course of the next few months.

## Contact

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

Indian Land Tenure Foundation (November 2015 update)

Spatial Informatics Group-Natural Assets Laboratory | Intertribal Agriculture Council

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## 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 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) that benefit carbon sequestration. 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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# Working Lands Carbon Facility

The Climate Trust (September 2016 update)

David and Lucille Packard Foundation

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## Goals and Objectives

The Climate Trust proposes to develop the Working Lands Carbon Facility (WLCF) to provide \$5.5 million in upfront investments to conservation project developers to implement agricultural and forestry projects that depend upon revenues from carbon markets. To catalyze these projects, the WLCF will pre-purchase the ten-year stream of carbon offsets that projects will generate as a form of upfront financing. These projects can use the pre-purchase as a source of capital for construction, land acquisition, and development work.

**Greenhouse Gas Emissions (GHGe) Reduction Goal:** 990,000 metric tons of CO<sub>2</sub>e

## Key Project Elements

**Project Location:** United States

**Project Timeline:** November, 2015-November, 2019

**Emission Source Targeted:** Carbon Dioxide and Methane from dairies, forests, and grasslands

**GHGe Quantification Method:** Process model

**Engagement Level:** Over 20,000 acres

**Crop(s) Targeted:** N/A

**Technology Required:** Anaerobic digesters for dairy sector projects

**Protocols/Methodologies Engaged:** Climate Action Reserve grasslands project protocol, California Air Resources Board Forestry and Livestock protocols.

## Summary

To launch the WLCF, The Climate Trust will pledge \$2.75 million to Packard to act as a guarantee for the \$5.5 million Program Related Investment from Packard. These pledged funds will establish a minimum (floor) price at which The Climate Trust will purchase the carbon offsets generated by projects under this CIG.

By using The Climate Trust's programs to mitigate the policy and market risks associated with emerging environmental markets, The Climate Trust's investment fund will demonstrate how limited public support can be used to mitigate risks in order to leverage the investment of private capital at scale. Because investments are repaid through credits that represent a verified reduction in greenhouse gas emissions, The Climate Trust's carbon investment fund will tie financial performance directly to verified environmental performance.

## Project Status

The Climate Trust launched a Request for Proposals in early 2016 and we received \$10 million in responses from 18 potential projects. The Climate Trust has augmented the RFP projects to its pipeline to where we're considering \$21 million in investments from 21 projects. We also expect to execute two agreements in the next several weeks for a livestock digester project and a grasslands project.

The Program Related Investment Agreement with Packard will go into effect in September. Additionally, we have hired a Director of Investments to scale this fund model.

### **Contact**

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