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Cover photos: Groundwater trading program in Ventura County California, Edgar Terry, Terry Farms Inc. (*upper left*); Bare Ranch compost as a component of the climate-beneficial wool project, photo credit Paige Green (*lower left*); Dr. Jeff Creque in the field, developing a carbon farm plan that builds on the NRCS 9 Steps of Planning and provides environmental market opportunities (*right*).

Acknowledgments

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Environmental Markets: A Guide to Tools and Resources to Expand Conservation Practice Adoption

Introduction

Environmental markets can be leveraged by the Natural Resources Conservation Service (NRCS) to help accomplish the agency's mission of delivering conservation solutions so agricultural producers can protect natural resources and feed a growing world. This technical note has been developed to explain how environmental markets can help get more conservation on the ground. NRCS has been actively involved in environmental market activities since September 1, 2006, when the Agency released a guidance document titled *A Market Based Strategy for Environmental Stewardship*. The Agency has been a Federal leader in environmental market investments and implementation since 2006. However, prior to NRCS involvement in environmental markets, there were a number of successful environmental market activities in the United States and numerous books have been published on the topic. Environmental markets can be used as an economically efficient mechanism that helps identify the least-cost options for addressing some of our Nation's most challenging environmental problems. These markets take the form of carbon markets, water quality markets, water quantity markets, and wildlife habitat markets.

One of the most successful Federal environmental market opportunities in the United States is the atmospheric sulfur dioxide market implemented by the Environmental Protection Agency (EPA), referred to as the Acid Rain Program. The Acid Rain Program is a traditional cap-and-trade program; the environmental threshold and ecosystem carrying capacity (the "cap") is determined by EPA through complex atmospheric modeling. With the "cap" established by EPA, the regulated entities (power plants) were provided allowances and permitted to trade allowances among polluting entities, provided that the total number of allowances did not exceed the cap. Under the Acid Rain Program, certain regulated entities decided to become "sellers" of surplus credits and other regulated entities became "buyers"; the overall environmental goals of the Program were achieved, and regulated entities were provided transactional flexibility to achieve compliance. The Acid Rain Program empowers regulated entities to make their own economic decisions based on internal economic factors and the company's internal cost/benefit assessment.

Cap-and-trade market mechanisms, like the Acid Rain Program, strive to find least-cost options and leverage fundamental market principles to achieve cost-effective solutions that restore ecosystem function. There is a complex relationship between humans and the environment. Humans influence the environment (anthropogenic activities) and the environment provides humans with benefits, such as clean air, clean and plentiful water, a stable climate, productive soils, etc. The services provided to humans by the environment are commonly referred to as **ecosystem services**. **Working lands agriculture provides numerous ecosystem services to humans and the environment.**

Ecosystem services are a valuable commodity to humans. In addition to providing food, fiber, and fuel, working lands agriculture can generate ecosystem services and help solve some of our Nation's most challenging environmental problems. In certain geographic locations, ecosystem services are assigned a market value. Other geographies treat ecosystem services as economic externalities. In a Nation of a growing population and scarce environmental resources, assigning a value to ecosystem services provides more efficient use of the finite natural resources. Farmers, ranchers, and private forest landowners control the majority of land in the continental United States. NRCS can work with these agricultural producers to protect natural resources and feed a growing world. The Agency can also highlight the value of conservation agriculture and help disclose the full value of NRCS conservation activities. In addition to producing bushels of agricultural products, conservation agriculture can also deliver "bushels of nature"¹. NRCS environmental market activities are intended to help agricultural producers voluntarily implement conservation practices and help producers capitalize on the economic benefits of delivering "bushels of nature" if they choose.

The Agency does not administer environmental markets. However, the NRCS staff support environmental market activities through science-based efforts like:

- Providing the best available science and quantification tools to the marketplace.
- Supporting agricultural producers and serving as trusted technical experts.
- Advocating for agricultural producers and ensuring that producers have access to voluntarily participate in environmental markets.
- Utilizing innovative techniques and financial programs like the Conservation Innovation Grants (CIG) to demonstrate the market opportunities for working lands agriculture.

Working Lands Agriculture Example

Voluntary working lands conservation has been recognized to provide numerous ecosystem services that may be valued by environmental markets. For example, if a newly installed Herbaceous Wind Barrier (CPS 603) is installed, NRCS conservation planners recognize the multiple co-benefits of that Wind Barrier. As that Wind Barrier matures, it provides numerous ecosystem services, such as:

- ❖ reducing/avoiding wind erosion of **soils**,
- ❖ herbaceous biomass filters **water** and consumes excess nutrients that could otherwise contaminate a water body,
- ❖ avoiding airborne soil (wind erosion) protects **air** quality,
- ❖ perennial biomass (trees and herbaceous matter) remove CO₂ from the **atmosphere** as they grow,
- ❖ as the wind barrier matures, it can also provide habitat for **wildlife** and **pollinators**.

A properly planned and installed NRCS Conservation Practice, Herbaceous Wind Barrier, provides numerous ecosystem services that improve both the human and natural environment. These ecosystem services are beneficial to humans and nature alike. Environmental markets strive to assign an economic value to the ecosystem services generated by NRCS conservation practices and develop a new revenue stream for farmers, ranchers, and forest landowners.

¹ Quantified: Redefining Conservation for the Next Economy, Joe Whitworth, Island Press, 2015

NRCS's Role in Helping Agricultural Producers Voluntarily Participate in Environmental Markets

Conservation agriculture often makes economic sense when all variables are included in full-cost accounting. **NRCS's environmental market activities are intended to support agricultural producers being compensated for providing society with the numerous ecosystem services that working land conservation practices provide.** NRCS's Working Lands Conservation Practices are entirely voluntary (not regulatory); the voluntary nature of NRCS Conservation Practices is often complementary to environmental market objectives.

Environmental markets:

- ✓ *provide a framework for assigning an economic value to ecosystem services generated through voluntary NRCS conservation activities,*
- ✓ *help agricultural producers develop additional revenue streams, and*
- ✓ *enable society to compensate the producer for providing working lands solutions that are economically efficient.*

Currently, NRCS does not administer environmental markets. The Agency enables and supports voluntary environmental market participation by farmers, ranchers, and private forest landowners. **There is often clear alignment between environmental markets and NRCS's conservation mission.** Environmental markets are similar to agricultural commodity markets; environmental markets have a variety of rules that can vary by geographic region and by the ecosystem services generated by NRCS conservation actions. This technical note has been developed to de-mystify environmental markets for the NRCS field staff and describe NRCS's role in expanding environmental market opportunities for farmers, ranchers, and private forest landowners in the United States.

Here's what District and Field Offices Need to Know About Environmental Markets:

Environmental markets and NRCS conservation practices have a common mission of striving to protect and generate ecosystem services on working lands. Ecosystem services are the benefits that humanity derives from the Earth's ecosystem (clean air, clean water, healthy soils, a habitable climate, etc.). The term 'environmental markets' can be viewed as a framework, or trading platform, for quantifiable ecosystem services. Quantifiable ecosystem services are the benefits that the natural environment delivers when natural ecosystems are fully functional, and the mosaic of the ecosystem is fully operational.

NRCS has supported numerous environmental market activities for more than a decade. The Agency is working to develop new economic opportunities for working lands agriculture. Voluntary conservation practices often provide quantifiable environmental benefits. The Agency has invested in numerous quantification platforms that can help field staff quantify the ecosystem services associated with conservation practice implementation. These tools and resources include:

- **COMET-Farm Tool:** A whole farm and ranch carbon and greenhouse accounting system that is freely available. Developed through a strong partnership between NRCS and Colorado State University and located at www.comet-farm.com.
- **COMET-Planner Tool:** An NRCS conservation practice evaluation tool that is designed to provide generalized estimates of greenhouse gas impacts and intended for initial planning purposes.

Developed through a partnership between NRCS and Colorado State University and located at www.comet-planner.com.

- **Nutrient Tracking Tool (NTT):** A tool to estimate nutrient and sediment losses from crop and pasture. The NTT tool was developed by the Texas Institute for Applied Environmental Research at Tarleton State University with funding and technical support from USDA. The tool is located at <https://ntt.tiaer.tarleton.edu/>.
- **NRCS Environmental Markets Website:** The NRCS Environmental Markets website provides an introductory video and numerous examples of Water Quality Trading and Greenhouse Gas Market demonstration projects. The NRCS Environmental Markets website provides resources and contact information for NRCS technical experts and is located at <https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/emkts/?cid=nrcseprd1396024>.
- **NRCS Conservation Finance Website:** Conservation finance is the practice of investing capital to support conservation. The core of conservation finance is a belief that it is possible to align conservation and economic outcomes. A series of analyses in recent years has revealed a growing appetite for impact investments—those that provide a financial return to the investor, but also make a positive impact on the environment. Conservation finance vehicles may rely on environmental markets, the development of value-added agricultural products, or increased profits or equity resulting from conservation actions. The NRCS Conservation Finance website provides resources and contact information for NRCS technical experts and is located at <https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/emkts/?cid=nrcseprd1396025>.

This list of NRCS environmental market resources is not comprehensive. There are technical support resources that are readily available for NRCS staff and conservation partners. Specific questions and direct technical assistance can be directed to Dr. Adam Chambers, National Environmental Markets Leader at the West National Technology Support Center (WNTSC), at adam.chambers@usda.gov and 503-320-9114.

Taking a Deeper Dive: Environmental Market Assessment of NRCS Conservation Practice Standard (CPS) 340 – Cover Crops

The NRCS CPS 340 - Cover Crops provides numerous working lands ecosystem services. Cover crops protect soils from wind and water erosion; they also photosynthesize atmospheric carbon and begin moving atmospheric carbon (in the form of carbon dioxide) into roots and, ultimately, soil carbon stocks. Cover crops improve soil health and scavenge residual nitrogen. Leguminous cover crops can fix nitrogen for future cash crops, and cover crops can also provide benefits to animals (forage and habitat). A single NRCS conservation practice (CPS 340) provides multiple ecosystem services for **Soil, Water, Air, Plants, and Animals.**

The above example provides a qualitative assessment of the numerous ecosystem services provided by cover crops (CPS 340). NRCS conservation planners fully understand these ecosystem services. However, environmental markets require the quantification of ecosystem services through standardized science-based methodology. Acreage or linear feet of conservation practices are typically not sufficient for utilization within environmental markets. Thereby, ecosystem services are typically quantified utilizing a science-based tool like the COMET tools or the NTT tool listed above. Ecosystem benefits

must be quantified through a transparent methodology; the environmental benefits also undergo a third-party verification process prior to becoming marketable (i.e. bought, sold, traded, retired, etc.).

In the case of Cover Crops (CPS 340), as well as many other NRCS conservation practices, environmental market criteria must align with the NRCS conservation practice in order for a farmer, rancher, and/or private forestland owner to capitalize on and monetize, the ecosystem services. Agricultural producers can capitalize on environmental markets when two conditions are present, 1) an environmental market exists for the ecosystem services being generated through the conservation practice installation, and 2) all environmental market requirements are satisfied by the agricultural producer. NRCS does not control or administer environmental markets. The agency views environmental markets as complementary to the NRCS conservation mission of 'getting more conservation on the ground'.

Now let's take a close look at Cover Crops (CPS 340) through the lens of environmental markets and NRCS resource concerns. Cover crops provide ecosystem benefits through:

- **Soils** – cover crops improve soil health by providing winter cover, helping reduce wind and water erosion, rebuilding soil structure and organic matter, scavenging residual nutrients, and providing livestock forage in certain regions.
 - **Environmental Market Opportunity:** There are limited opportunities for agricultural producers to directly monetize the ecosystem services of soil health, but there are emerging opportunities for agricultural producers to monetize the water and atmospheric carbon benefits of soil health. Cover crops can provide improved soil structure, increase soil organic matter (carbon), reduce soil compaction, enhance soil nutrients, and provide farmers/ranchers with opportunities to reduce input expenses (fertilizer) and protect their precious topsoil.
There are emerging ecosystem service payments that are associated with carbon (air resource concern) and water (quantity and quality).
- **Water** – cover crops reduce rainwater runoff, reduce soil losses (erosion) to water bodies (turbidity), reduce the off-field transport of nitrogen and phosphorous to water bodies, and enhance the soil's ability to absorb water.
 - **Environmental Market Opportunity:** There are limited opportunities for agricultural producers to directly monetize the ecosystem services of water quantity and quality, but this segment of ecosystem services is growing. As of October 2021, there are several market-based efforts under development that are interested in quantifying the water quantity and water quality benefits (ecosystem services) of cover crops. It is likely that water-focused environmental markets will be watershed-specific and emerge in regions like the Chesapeake Bay Watershed and the Mississippi River Watershed along with regionally sensitive watersheds.
There are a number of environmental market developers seeking to develop a water quality market.
- **Air** - cover crops reduce the potential for wind erosion, are effective at photosynthesizing atmospheric carbon dioxide, and ultimately build soil carbon stocks.
 - **Environmental Market Opportunity:** The atmospheric benefits of cover crops are quantifiable, and the conservation practice is easily verified. Cover crops photosynthesize atmospheric carbon dioxide and transform that carbon dioxide into biomass (root and shoot). However, cover crops provide a temporary intervention in the global carbon cycle and do not sequester carbon permanently in soils and biomass. Many of the existing carbon markets require a 40- to 100-year 'permanence' that reduces the ability for cover crops (and associated ecosystem services) to be recognized

within the carbon markets. Several environmental market platforms are working to address this carbon market ‘permanence’ requirement.

There is close alignment between the NRCS cover crop practice (CPS 340) and the environmental markets. Cover crops clearly provide beneficial carbon cycle interventions and generate atmospheric ecosystem services. However, cover crops are temporary and encounter challenges when trying to demonstrate and ensure the ‘permanence’ of the carbon sequestration in the carbon markets.

- **Plants** – cover crops are not harvested as a cash crop; they are beneficial plant species that provide soil protection and enhancement during the interim period between cash crops.
 - **Environmental Market Opportunity:** Future cash crops benefit from the presence of cover crops in most systems, provided the cover crops are properly terminated. The benefits of cover crops on future plants are integrated into the soil health benefits and are less likely to receive an ecosystem service payment for the ‘plant’ resource concern. *The ecosystem services within the context of the plants resource concern are internalized within the soil health benefits. Future cash crops benefit from cover crop conservation practices; those benefits are internalized within the soil health metric. Enhancing soil water holding capacity and increased carbon stocks can build plant resilience.*
- **Animals** – cover crops can provide forage for livestock and provide temporary food and habitat for wildlife and pollinators.
 - **Environmental Market Opportunity:** There can be migratory bird and animal forage benefits provided by cover crops. These ecosystem benefits through conservation payments (i.e. BirdReturns) are rare, they can provide ecosystem service payments to farmers/ranchers for providing temporary animal habitat. *Cover crops can provide animal forage and numerous ecosystem services. However, the potential for direct ‘animal’ ecosystem service payments is less likely due to the integration of cover crops into soil health, as well as the likelihood of carbon payments and/or water quality/quantity payments being more appropriate compensation for voluntary cover crop installations.*

The ecosystem services and environmental market opportunities discussed above are applicable for Cover Crops (CPS 340). Each NRCS conservation practice has a unique environmental market function that is similar to the analysis completed for cover crops. The ecosystem service benefit associated with Windbreak/Shelterbelt Establishment (CPS 380) are very different than cover crops and the environmental market opportunity analysis is unique for every NRCS conservation practice.

APPENDIX 1: Farm Bill and Presidential Support for NRCS Involvement in Environmental Markets

The 2008, 2014, and 2018 Farm Bills have all been very supportive of NRCS involvement in environmental markets. The following language from the 2018 Farm Bill clarifies that agricultural producers are permitted to receive NRCS conservation assistance (technical assistance and financial assistance) and receive payments for ecosystem services within Environmental Service Markets.

2018 Farm Bill, Subtitle E, Section 2503 states:

UNDER SUBTITLE E: Funding and Administration

SEC. 2503. ADMINISTRATIVE REQUIREMENTS FOR CONSERVATION PROGRAMS.

(e) ENVIRONMENTAL SERVICES MARKET—Section 1244 of the Food Security Act of 1985 (16 U.S.C. 3844) (as amended by subsection (d)) is amended by adding at the end the following:

ENVIRONMENTAL SERVICES MARKET—The Secretary may not prohibit, through a contract, easement, or agreement under this title, a participant in a conservation program administered by the Secretary under this title from participating in, and receiving compensation from, an environmental services market if one of the purposes of the market is the facilitation of additional conservation benefits that are consistent with the purposes of the conservation program administered by the Secretary.

2014 Farm Bill and the NRCS Conservation Programs Manual: NRCS Guidance for EQIP ([Conservation Programs Manual, Part 515, Subpart K, Section 515.101](#)), CSP ([Conservation Programs Manual, Part 507, Subpart K, Section 507.111](#)), ACEP ([Conservation Programs Manual, Part 528, Subpart J, Section 528.93](#)) and WRP specifies the following:

EQIP:

515.101 Environmental Services Credits for Conservation Improvements

A. NRCS recognizes that environmental benefits will be achieved by implementing conservation practices funded through EQIP. These environmental benefits may result in opportunities for the program participant to sell environmental credits. These environmental credits must be compatible with the purposes of the program contract. NRCS asserts no direct or indirect interest in these credits. However, NRCS retains the authority to ensure that operation and maintenance (O&M) requirements for EQIP-funded improvements are met.

B. When activities may impact the land and conservation practices under an EQIP contract, participants are highly encouraged to request an O&M compatibility assessment from NRCS prior to entering into any credit agreement. This assessment would be a simple evaluation to determine if the actions to be taken would jeopardize compliance with an EQIP contract, including O&M requirements of a practice or system funded by NRCS. This assessment will be documented in the assistance notes and a letter (see sample letter in [Title 440, Conservation Programs Manual \(CPM\), Part 512, Subpart J, Section 512.91](#))

provided to the client. These assessments should be conducted the same as those done for contract reviews (see [440-CPM, Part 512, Subpart F, Section 512.55](#)).

CSP:

507.111 Environmental Service Credits for Conservation Improvements

A. A participant in CSP may achieve environmental benefits that qualify for environmental credits under an environmental credit trading program. NRCS asserts no direct or indirect interest in these credits. However, NRCS retains authority to ensure that CSP purposes are met. In particular, any requirements or standards of an environmental market program in which a CSP participant simultaneously enrolls to receive environmental credits must be compatible with the purposes and requirements of the CSP contract.

B. The participant must meet all operation and maintenance requirements for CSP-funded activities consistent with 7 CFR Sections 1470.21 and 1470.23. Where activities required under an environmental credit agreement may affect the land and conservation activities under a CSP contract, NRCS recommends that the participant request assistance with the development of a compatibility assessment prior to entering into any credit agreement. The CSP contract may be modified in accordance with policies outlined in section 507.101 provided the modification meets CSP purposes and is in compliance with the program regulations.

C. CSP participants may not use CSP funds to implement conservation activities that the participant is required to establish as a result of a court order. Conservation activities funded with Federal funds will not be used to meet participant or third-party mitigation or environmental compensatory requirements.

Federal Register, Vol 75, No 106, § 1470.37, p31661

§ 1470.37 Environmental credits for conservation improvements. NRCS believes that environmental benefits will be achieved by implementing conservation activities funded through CSP. These environmental benefits may result in opportunities for the program participant to sell environmental credits. Any requirements related to these environmental credits must be compatible with the purposes of the contract. NRCS asserts no direct or indirect interest on these credits. However, NRCS retains the authority to ensure that operation and maintenance (O&M) requirements for CSP-funded improvements are met, consistent with § 1470.21 and § 1470.23. Where actions may impact the land and conservation activities under a CSP contract, NRCS will at the request of the participant, assist with the development of an O&M compatibility assessment prior to the participant entering into any credit agreement. Signed this 21st day of May in Washington, DC.

ACEP:

ACEP-Agriculture Land Easement (ALE):

528.93 Other Considerations

A. Mitigation.—ACEP funds may not be used to acquire easements to establish protections or to implement conservation practices that the landowner is required to establish as a result of a court order or to satisfy any mitigation requirement for which the ACEP landowner is otherwise responsible.

B. Ecosystem Service Credits Related to ACEP-ALE.—Landowners may obtain environmental credits under other programs if one of the purposes of such program is the facilitation of additional conservation benefits that are consistent with the conservation purposes for which the easement was acquired, and such action does not adversely affect the interests granted under the easement to the grantee or to the United States right of enforcement.

ACEP-Wetland Reserve Easement (WRE):

B. Ecosystem Services Credits for Conservation Improvements

(1) USDA recognizes that environmental benefits will be achieved by implementing conservation practices, components, measures, and activities funded through ACEPWRE, and that environmental credits may be gained as a result of implementing activities compatible with the purposes of an ACEP-WRE easement or contract.

- (i) Landowners may obtain environmental credits under other programs if one of the purposes of such program is the facilitation of additional conservation benefits that are consistent with the conservation purposes for which the easement was acquired, and such action does not adversely affect the rights or interests granted under the easement to the United States. NRCS asserts no direct or indirect interest in credits generated by activities not funded through ACEP-WRE.
- (ii) Activities required under an environmental credit agreement that affect land cover, vegetation, or hydrology on an ACEP-WRE easement or 30-year contract may require an amendment to the WRPO, to the 30-year contract, or a CUA.
- (iii) All agreements and instruments filed on the land for environmental credits are subordinate to the ACEP-WRE and are not binding to the United States.
- (iv) Landowners should be cautioned that any applicable credits may be subject to additional requirements and may not be possible on certain ACEP-WRE lands.

(2) Amendments to the WRPO and any applicable CUAs are at the sole discretion of NRCS. The agency will only consider such amendments when the amendment does not infringe on the rights of the United States and when the amendment furthers the wetland and wildlife functions and values being achieved on the easement or 30-year contract area.

WRP:

7 C.F.R. § 1467.20(b)(1)

Sec. 1467.20 Market-based conservation initiatives.

(a) Acceptance and use of contributions. Section 1241(e) of the Food Security Act of 1985, as amended, (16 U.S.C. 3841(e)), allows the Chief to accept and use contributions of non-Federal funds to support the purposes of the program. These funds shall be available without further appropriation and until expended, to carry out the program.

(b) Ecosystem Services Credits for Conservation Improvements. (1) USDA recognizes that environmental benefits will be achieved by implementing conservation practices and activities funded through WRP, and that environmental credits may be gained as a result of implementing activities

compatible with the purposes of a WRP easement, 30-year contract, or restoration cost-share agreement. NRCS asserts no direct or indirect interest in these credits. However, NRCS retains the authority to ensure that the requirements of the WRPO, contract, and easement deed are met. Where activities required under an environmental credit agreement may affect land covered under a WRP easement, 30-year contract, or restoration cost-share agreement, participants are highly encouraged to request a compatibility assessment from NRCS prior to entering into such agreements.

In addition, there is an October 7, 2015, Presidential Memo with the subject, *Incorporating Ecosystem Services into Federal Decision Making*, that remains applicable. This memo states the purpose:

Purpose. The goal of this memorandum and subsequent implementation guidance is to better integrate into Federal decision-making due consideration of the full range of benefits and tradeoffs among ecosystem services associated with potential Federal actions, including benefits and costs that may not be recognized in private markets because of the public-good nature of some ecosystem services. An ecosystem-services approach can: (1) more completely inform planning and decisions, (2) preserve and enhance the benefits provided by ecosystems to society, (3) reduce the likelihood of unintended consequences, and (4) where monetization is appropriate and feasible, promote cost efficiencies and increase returns on investment. Adoption of an ecosystem-services approach is one way to organize potential effects of an action within a framework that explicitly recognizes the interconnectedness of environmental, social, and, in some cases, economic considerations, and fosters consideration of both quantified and unquantified information. This memorandum sets a course to implement this approach.

APPENDIX 2: Examples of NRCS Environmental Market Successes

NRCS environmental market leadership has proven many successes over the past decade. Below are a few examples of projects that exemplify NRCS environmental market activities.

Grassland Conservation in North Dakota:

Project: The Prairie Pothole region has seen an expansion of cropland into former grazing lands as producers have sought to take advantage of high commodity prices. Avoiding conversion to cropland and maintaining lands in grass can provide a multitude of environmental benefits, including the permanent storage of carbon in soils. Ducks Unlimited and partners developed a protocol for measuring and quantifying the amount of carbon stored through the avoided conversion of grasslands to cropland. The ability to measure and quantify this carbon storage allows landowners to generate carbon credits for potential sale in voluntary carbon markets.

Results: The [Avoided Conversion of Grasslands and Shrublands protocol](#) 

[Chevrolet purchased credits generated using this protocol](#) as part of its corporate sustainability initiative.

Nitrogen Management on Corn Crops in the Corn Belt:

Project: Nitrous oxide is a potent greenhouse gas and is emitted when nitrogen fertilizers are added to soil. The Delta Institute and partners (including American Farmland Trust, Conservation Technology Information Center, Environmental Defense Fund, and agricultural retailers) developed a program to allow farmers to generate quantifiable nitrous oxide emission reductions through voluntary implementation of more efficient nitrogen fertilizer management techniques.


Result: The Delta Institute developed its [Nitrogen Credit Program](#) 

[the Climate Trust purchased nitrous oxide emissions reduction credits](#) from farmers participating in the program, providing a new income stream for the farmers and reducing their greenhouse gas impacts.

Non-Point Source Water Quality Trading in the Chesapeake Bay Watershed:

Project: In 2010, Maryland State law authorized the Maryland Department of Agriculture (MDA) to develop and implement an agricultural nutrient trading program to allow for the offset of nutrient loads from both point and nonpoint sources. Through this CIG award, MDA partnered with the World Resources Institute (WRI) to develop an online trading platform to implement the trading program and its policies.


Results: The [Maryland trading platform](#) 

[A video on the NutrientNet webpage](#)  explains nutrient trading in Maryland.

Water Temperature Management in Oregon:

Project: [The Freshwater Trust](#) 

[Willamette Partnership](#) 

Results: TFT and its partners were successful in [developing a trading program for water temperature credits](#). 

President Obama, in remarks at a White House Summit on Conservation, mentioned this project as an example of a progressive, forward thinking conservation effort. It was the first time a standing President addressed the issue of emerging markets for ecosystem services, and the first time a President mentioned a CIG project.

In addition to these project-level examples, NRCS has partnered with several corporations and non-governmental organizations to further advance the agency's conservation mission. There are several entities that have mission alignments with NRCS; some entities can provide additional economic incentives for agricultural producers while other entities are interested in helping producers apply for Farm Bill programs. The NRCS "conservation toolbox" can be

leveraged by all types of organizations. The comprehensive suite of conservation practices and decision support tools have been leveraged by farmers, ranchers, food companies, environmental organizations, State and local governments, and the many other conservation-minded entities.

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