

2013 Conservation Innovation Grants

American Rivers (CA) \$561,438

The Central Valley Exchange: A Market-based Approach to Integrate Agriculture and Habitat

Increasing the area of frequently inundated floodplains is an important element in state and federal plans to restore endangered species and reduce flood risk in the Central Valley of California. Restoring some 100,000 acres of floodplain habitat is a major focus of these efforts because of the demonstrated benefit for juvenile salmon and the other ecosystem services that floodplains provide, including flood attenuation, nutrient cycling, groundwater recharge, and habitat for other fish species. Collaboration with private landowners is essential to achieving the massive restoration goals of these state and federal plans. Establishment of a market, called the Central Valley Habitat Exchange, will provide a mechanism to compensate growers and ranchers for land stewardship activities that create quantifiable floodplain habitat benefits. The model and practices developed by this Exchange will be broadly applicable to floodplains and agricultural lands across the United States.

Arkansas Land and Farm Development Corporation (AR) \$453,570

Outreach to Underserved Farmers and Landowners in Arkansas

Efforts to engage minority and limited resource farmers in conservation efforts often face unique challenges. These landowners and farm operators tend to be older and operate smaller farms with restricted earning capacity. These operators are often less aware of technical assistance opportunities and technical information on new developments, and they often have limited financial ability to invest in new practices that may have conservation benefits. To help surmount these challenges, this project aims to demonstrate the use of a case management model to design and deliver conservation services to enrolled participants. Under this model, the regional Arkansas Land and Farm Development Corporation Field Agent and farmer participants will assess current on-site operations and conditions and identify opportunities and priorities for improved resource conservation practices. Staff can then assist the farmer in developing and obtaining the needed management skills training as well as the required technical and financial resources to plan and implement identified actions. The project aims to help 300 limited resource and socially disadvantaged farmers and landowners develop and adopt a plan to conserve soil and water resources and to reduce, control and trap nutrient runoff.

Bat Conservation International, Inc (CA, NV, CO, AZ, NM, TX, OK, AR) \$139,495

Connecting Farmers & Ranchers to Innovative Technology in Bat Conservation

Bats are one of the most ecologically and economically important wildlife taxa worldwide, and also one of the most threatened. Bats are primary predators of night-flying insects, consuming countless agricultural and forest pests nightly and directly reducing pesticide use, while preventing North American agricultural losses estimated at more than \$3.7 billion per year. Project activities will bring bat conservation technologies, skills, and knowledge to partners and producers, simultaneously improving outcomes for pollinating and pest-consuming bat species in the United States with specific benefits to agricultural production. Comprehensive outreach will be conducted in eight targeted states with a collection of sound, tested, innovative bat conservation best practices for wind energy development,

biofuel crop production, mine/well closures, wildlife habitat monitoring, water for wildlife, and integrated pest management.

Cape Atlantic Soil Conservation District (NJ) \$91,705

Expanding Pollinator Species Habitat Sites Utilizing Compost Filter Socks

Decline of pollinator species such as the honeybee can have far reaching impacts on plant pollination and crop production. Often, farmers have a difficult time finding a plot of land on their farm suitable for creation of pollinator habitat without losing valuable agricultural production land. The time and energy cost it takes to prepare a field to plant a wildflower seed mix can also be prohibitive. The Cape Atlantic Soil Conservation District will expand or enhance pollinator species habitat areas by taking the technology of establishing a grass cover with vegetated compost filter socks and adapting it to establish on-farm pollinator habitat areas with native wildflowers.

Colorado State University (CO, NE, OK) \$326,710

The 4R Nutrient Stewardship with Proven Techniques and Technologies to Enhance Nutrient Use Efficiency, Productivity and Environmental Sustainability

This project will demonstrate, educate and empower producers to achieve 4R nutrient stewardship using tested and proven techniques of quantifying and managing variability in soil and crop properties. The overall goal of this is to integrate site-specific management zone and active remote sensing approaches to increase nitrogen use efficiency. The proposed technologies and techniques will be compatible with farming practices in the Western Great Plains region and will enhance nutrient use efficiency, improve water quality, and improve sustainability, productivity and profitability of irrigated crop production systems in the region.

Conservation Technology Information Center (IA, IL, IN, MI, OH, MN, SD) \$482,000

Economic, agronomic and environmental benefits of cover crops for new and established users

Producers plant grasses, legumes, brassicas and/or small grains between regular primary crop production periods to gain multiple conservation and sustainability benefits, including the protection and improvement of soil and water quality and improvement of wildlife and pollinator habitat. These cover crops offer many potential benefits to farming operations and the communities that surround them. Incorporating cover crops into farming systems incurs economic and management costs that may discourage some producers from adopting the conservation practice. Farmers must evaluate any practice for its contributions to the productivity, profitability and sustainability of their operations. This project will draw on data from a wide variety of cover crops planted in seven Midwest states – Iowa, Illinois, Indiana, Michigan, Ohio, southern Minnesota and South Dakota – and draw upon the insight of growers with a range of experience with cover crop management. The costs and benefits of cover crops will be assessed with proven tools, from mathematical models and cost/benefit assessments to nitrogen rate strip trials, documentation of pollinators in project fields, and extensive communications with participating producers on their choices and decision-making processes. At least 1,000 acres of cover crops will be planted on farms with no previous cover crops. Results and insight from the project will be shared throughout the Midwest via an annual workshop, detailed articles in leading farm magazines reaching more than 350,000 Midwest producers, and printed and online resources, including a Best Practices booklet and fact sheets.

Cornell University (NY) \$530,043*Managing Subsurface Drain Discharge Effluents with Bioreactors*

Nutrient pollution from agriculture, a by-product of excess chemical fertilizer and manure applications transported off-site from crop and livestock production operations, may impair the quality of many local and downstream receiving waters. These excess nutrients may also cause substantial direct or indirect drinking and recreational water quality impairments. One specific innovative tool to address nutrient loss from agricultural row crop operations is to “Require or provide heavy incentives to place constructed wetlands or bioreactors at tile drain outlets” (Nutrient Innovations Task Group 2009). Since many factors influence the rate of nutrient removal, the goal of this project is to demonstrate and optimize treatment effectiveness and efficiency for reducing nitrogen and phosphorus off-farm loss from tile drain discharges to sensitive receiving watersheds using bioreactor technology.

The Curators of the University of Missouri (MO) \$98,737*Using Precision Planting Techniques with Selected Cover Crops in Corn and Soybeans Planted in Three Tillage Production Systems*

Conservation tillage is defined as a system that leaves enough crop residue on the soil surface after planting to provide 30 percent soil cover, the amount needed to reduce erosion below tolerance levels. Today, however, many farmers aim for greater soil cover because of additional benefits of crop residue. Cover crops are critical to producing this residue and have the potential to maximize conservation tillage benefits. The objectives of this project are to: 1) evaluate the benefits and shortcomings of existing methods of cover crop seeding such as broadcast seeding compared with innovative techniques using precision planting equipment. Broadcast seeding is a common method for cover crop establishment; 2) demonstrate the potential of cover crop use and establishment over a range of tillage practices; 3) quantify the impact of cover crop placement relative to subsequent row crop growth and yield by measuring biomass production of the corn and soybean crops and final grain yield; 4) quantify the impact of cover crop placement on nutrient and moisture availability; 5) provide producer information on available cover crop establishment methods and specific benefits via newsletters, guides, videos and other media. A cost benefit analysis of seeding techniques will be developed.

Dogwood Alliance, Inc (WV) \$450,00*Carbon Canopy Project of Dogwood Alliance*

The purpose of this project is to implement a market-based approach to funding forestland conservation and stewardship practices through the creation and sale of high quality forest carbon offsets and Forest Stewardship Council certified timber management. This 2,000 acre pilot is an improved forest management project wherein the landowner commits to conserve and enhance existing forest carbon stocks on the property while planning to bring additional offsets to market as carbon stocks continue to accumulate through net growth supported by responsible forest management and ecological restoration efforts. This new, innovative model of forest conservation and management has potential to provide a viable funding mechanism from revenue produced from forest –based carbon offsets under the California carbon cap and trade program that enables landowners to expand protection, restoration and conservation of their forests.

Eastern Nevada Landscape Coalition (NV) \$75,964

Nevada Biochar Field Demonstration Trials: Treatment Within Agricultural Pivots and Rehabilitation of Pivot Corners

Expansion and encroachment of pinyon-juniper woodlands into sagebrush steppe ecosystems can have negative impacts, including loss of wildlife habitat, increased erosion, and loss of herbaceous species. Field demonstration activities carried out through this project will assess the impact of applying biochar in production agriculture and rangeland restoration settings near pinyon-juniper encroachment areas. Turning woody biomass into biochar, and then returning biochar to the soil may be an effective method for maintaining or improving soil moisture and vegetative productivity, improve sage grouse habitat, and return soil carbon to historic levels. This technique is expected to reduce the overall cost of invasive pinyon-juniper treatment (by creating a value for invasive species woody biomass), helping stimulate the local economy.

Environmental Defense Fund, Inc (MN, IA, IN) \$992,022

The Watershed Approach: Demonstration of the Effectiveness of a Systemic and Strategic Approach to Nutrient Management in Priority HUC-12 Watersheds

Nutrient exports from agricultural landscapes are contributors to hypoxic zones in the Gulf of Mexico, Western Lake Erie Basin and elsewhere. The goal of this project is demonstrate and document how NRCS and partners can design and implement a systems approach to agricultural conservation that builds upon and connects current efforts to achieve greater water quality improvements. The value of organizing conservation efforts at a watershed scale will be demonstrated, as it bridges the field and farm scale of traditional conservation efforts with the community and/or regional scales at which drinking water impairments and downstream hypoxia must be solved. This is a systemic and strategic approach at a larger scale, which is better suited to addressing larger water quality challenges. By incorporating downstream practices that can improve the storage and management of water, such an approach creates increased resiliency to drought and flood, helping producers cope with climatic variability.

Flint River Soil and Water Conservation District (GA) \$725,000

Mobilizing Access to Low-Cost Irrigation Scheduling Technology and Tools in the Lower Flint River Basin of Georgia

With GPS-guided variable rate irrigation systems able to adapt application rates to field conditions in real-time, and new advanced irrigation scheduling tools that are cost-effective and built for both conservation and crop performance, irrigation management on the modern farm is set to make a quantum leap forward in water use efficiency. The next step in the evolution of on-farm irrigation water management is to reduce the cost of advanced irrigation scheduling from thousands of dollars to hundreds of dollars per site to make the approach accessible to all producers. The goal of the project is to develop and deploy a new low-cost tool to help agricultural producers optimize irrigation scheduling and build a conservation model for the future of agricultural water use in the United States.

Heidelberg University (OH) \$591,655

Verification and Enhancement of NRCS-USDA Nutrient Tracking Tool with a Suite of Best Management Practices (BMPs)

The National Center for Water Quality Research's Heidelberg Tributary Loading Program has one of the most detailed and long-term water quality data sets available in the United States, particularly for agriculture-dominated watersheds. The data show that sediment and particulate phosphorus runoff to Lake Erie has been reduced since the 1970's and is still decreasing while total phosphorus load has remained relatively constant. However, from the mid-1990's the dissolved reactive phosphorus loads have been rapidly increasing in the monitored tributaries. The overall goal of this proposed project is to improve soil health and reduce nutrient and sediment exports from agricultural farms. The specific objectives are: 1) demonstrate and quantify the economic and environmental benefits of a suite of best management practices (BMPs) through edge-of-field studies; 2) calibrate and verify the Agricultural Policy Environmental eXtender (APEX) model and the Soil and Water Assessment Tool (SWAT) and scale-up the BMP effects at different spatial scales in Northwest Ohio; 3) calibrate and verify the Nutrient Tracking Tool (NTT) for the Great Lakes basin; 4) promote and train the producers and stakeholders of NTT to estimate farm yield and nutrient loss. An innovative way to entice producers to adopt and implement BMPs is to make available user-friendly models (e.g., the web-based NTT) that help producers verify the effectiveness of BMPs and estimate the corresponding farm yields in their own fields and demonstration farms.

Iowa State University of Science and Technology (IA) \$485,850

Demonstrating Cover Crop Mixtures on Iowa Farmland: Management, Soil Health, and Water Quality Benefits

Research shows that Iowa contributes 10 to 17 percent of nitrogen and 5 to 10 percent of phosphorus delivery to the Gulf of Mexico. The Iowa Nutrient Reduction Strategy's science assessment has indicated cover crops have the potential to mitigate nitrate-nitrogen losses by up to 31 percent as the living cover crops will readily take up residual fertilizer nitrogen and mineralized soil nitrogen between maturity and planting of cash crops. Cover crops also have the potential to reduce phosphorus export by up to 29 percent through reduced soil erosion. This project will demonstrate and evaluate cover crop mixtures using emerging technologies and implement on 15 demonstration sites throughout Iowa; identify and address cover crop establishment and management challenges to help farmers achieve concurrent goals of a healthy ecosystem and maintaining top-end cash grain crop yields and profitability; and educate extension and outreach specialists, state and federal agency field staff, crop consultants and farmers about the soil and water quality benefits of cover crops.

Mississippi State University (MS) \$120,530

Demonstrating and enhancing risk assessment tools to determine efficiency and cost-effectiveness of innovative nutrient reduction strategies in the Mississippi Delta

Nutrient and sediment runoff from agricultural lands is associated with impairment of waterbodies in the Mississippi River Basin. There is a need to identify the most suitable practices and improve nutrient management plans to avoid, control or trap sediment and nutrients before they leave farm fields. The major objective of the project is to test and validate existing risk assessment tools and newly developed components on risk assessment tools, to demonstrate their accuracy in assessing the magnitude, extent and risk of soil and nutrient losses, and their use in facilitating decision support for water quality and quantity improvement and cost-effectiveness of conservation practices at both field and watershed

scales in the Mississippi Delta. The performance of the most representative quantitative and qualitative risk assessment tools used to help producers apply conservation practices, or evaluate other action plans to perform nutrient management, will be evaluated under similar scenario conditions in the Mississippi Delta. The evaluation of the group of risk assessment tools under similar scenarios conditions has never been performed, and will generate important insights about the level of precision inherent to each individual tool.

National Network of Forest Practitioners (MS, AL, GA) \$399,200

Peer-Based Outreach to Underserved Landowners in the Black Belt for Longleaf Restoration and Prescribed Fire

Historically underserved landowners have not participated in USDA programs at the same rates as their counterparts. Current efforts by USDA to improve outreach to historically underserved producers will be complemented by this project. Community-based outreach techniques will be used to engage underserved landowners in Longleaf Pine restoration and management, including use of controlled burning. Project methods include development of 18 Woodland Advocates with intensive training on longleaf production and management, including controlled burning. Two educational videos will be produced as motivational and educational tools for use in workshops, and available online for absentee landowners. One hundred twenty landowners will be supported in applying for EQIP, forest management plans, or other tangible steps to improve their forest management. In addition, a landowner targeting approach focused on Longleaf restoration related activities and opportunities will be piloted.

National Fish and Wildlife Foundation (MD, PA, NY, DE, VA) \$821,384

SAM Initiative: Achieving Subsurface Application of Manures in the Chesapeake Bay Basin

This project will build on efforts by researchers, cooperative extension specialists and Bay area farmers to advance the deployment of both liquid and solid manure injection technologies in high-density animal production regions of the Chesapeake Bay watershed. Manure injection technology- including the subsurface application of both solid and liquid manures - couples enhanced soil health and fertility with water quality improvements through reduced emissions of valuable nutrients to the environment. The project will also seek to engage the private sector to expand adoption of manure injection systems through collaboration with nutrient management planners and custom manure applicators. Partners will build on previous successes and base next steps on lessons learned to address technical barriers in a promising solid manure injection technology and expand demonstration and producer outreach for liquid manure injection systems that have been successfully reengineered for use in rocky soils characteristic of upland areas of the Chesapeake Bay watershed.

The Nature Conservancy (OR, NV, ID) \$324,851

Sage-Grouse Conservation: Linking Practices to Habitat Metrics Land managers in the Interior West's sagebrush landscape have made significant efforts to improve habitat for the greater sage-grouse and all sagebrush-obligate species. However, there is a serious lack of information about the best conservation practices to implement in sagebrush ecosystems, due to their complexity in terms of factors such as soil, microclimate, invasive species, fire regimes, current habitat state, historical impacts, and more. All of these factors play a role in what conservation practices should be implemented at each site. Yet land

managers often have no tools to determine which actions at each site would provide the most benefits to sagebrush habitat at the least cost. This project will develop new tools for land managers to more effectively and efficiently conserve and restore sagebrush habitat in the Interior West by merging and refining existing models linked to important ecological sites; reviewing and summarizing existing literature about the effectiveness and benefits of key conservation practices for sage-steppe ecosystems and sage-grouse habitat; and incorporating findings into existing models. The literature review will also identify knowledge gaps.

The Nature Conservancy (MD) \$184,560

Demonstrating the efficacy of floodplain restorations identified as optimal for enhancing hydrology and improving water quality in the Chesapeake Bay watershed

Floodplain forests provide critical water quality and sediment/nutrient storage functions when hydrologically connected to adjacent streams and rivers. Floodplain reconnections provide ideal opportunities to store floodwaters, and enhance instream water quality and habitat conditions. This project will demonstrate and quantify the efficacy of reconnected bottomland hardwood floodplains to improve water quality by trapping nutrients and sediment and also to enhance habitat and flood water storage by restoring wetland hydrology. An innovative targeting tool, which predicts 1) where floodplain functions can be restored throughout a watershed; and 2) the mass of sediment and nutrients potentially captured or retained in candidate restoration sites, will be evaluated. This analysis of the ability of restored wetlands to provide targeted ecosystem functions will inform recommendations for targeting and designing floodplain reconnections, providing decision support tools for implementing the most cost-effective practices to improve flood protection, water quality, and wildlife habitat benefits while maximizing crop production.

North Carolina Foundation for Soil and Water Conservation, Inc. (NC) \$207,267

Determine Certainty Program Framework of a Market Based Conservation Initiative for Longleaf Pine Habitat Improvements in Eastern North Carolina

This project will focus on the development of a habitat exchange system framework for wildlife species mitigation at an ecosystem level with an emphasis on market-based conservation and Certainty Program models within the traditional range of the longleaf pine ecosystem in eastern North Carolina. The integration of these approaches will present a substantial innovation in the delivery of wildlife habitat conservation on a landscape scale and provide a pilot model approach that can be expanded and replicated regionally within the ecosystem and nationally to address other ecosystem needs.

North Carolina State University (NC) \$45,0750

Refining Nitrogen Rates for Corn in North Carolina using Producer-based Tools: Adapt-N and Yield Database

Nitrogen management on corn silage and grain acres is costly and risky for producers. Inefficient crop nitrogen use limits yield and results in increased water and air pollution. Nitrogen application is generally the largest fossil fuel input on corn grain acres. Excessive nitrate levels in groundwater and nitrogen-induced hypoxia in estuarine areas from agricultural sources are persistent concerns for human and ecosystem health. Nitrous oxide lost from soil, which traps about 300 times more heat per molecule than CO₂, constitutes agriculture's largest global warming source. As the largest user of nitrogen

fertilizer, corn production is the principal contributor to these problems from cropping systems. The primary project objectives are threefold: 1) to improve the accuracy and value of NRCS nutrient management investments through the 590 Standard in NC by updating the data upon which recommendations for nitrogen (N) rates are made--the realistic yield expectation (RYE) table for corn; 2) to determine whether Adapt-N, an in-season tool developed in the Northeast United States, can be used to make improved corn N-rate recommendations in the South and thereby reduce N loss to the environment; 3) to provide expanded corn N-rate information to the Multistate Coordination Committee and Information Exchange Group, NEERA-1002 (Adaptive Management for Improved Nutrient Management), as the group moves towards its vision of developing a national database that will use meta-data analysis to increase the reliability of N-rate recommendations for corn.

Oklahoma Black Historical Research Project (OK) \$600,000

Enhancing Agricultural Production for Native American and Socially Disadvantaged Farmers and Ranchers

Native American and Socially Disadvantaged Farmers and Ranchers (NA&SDFR) in Oklahoma face many challenges including: high costs of production with poor economies of scale due to their small sizes; difficulty accessing government programs, such as field crop/commodity programs; and less access to farm credit both public and private. USDA has introduced a number of programs to address these farmers' needs, and is working to raise awareness of the USDA and its programs by sharing information. This project has a dual purpose: to further enhance NA&SDFR access to USDA programs; and to improve NA&SDFR's agricultural production capacity and drought resilience. Project methods include enhancing networks and collaborations with NA&SDFR in Oklahoma; identifying NA&SDFR needs; identifying NA&SDFR's obstacles to participation in USDA programs; developing culturally sensitive outreach and training programs to enhance NA&SDFR awareness of and participation in USDA programs; developing a culturally appropriate protocol for building trust and enhancing NA&SDFR access to USDA programs; and enhancing NA&SDFR adoption of solar water pumps and other green technology to help improve drought resilience.

Pacific Gateway Center (HI) \$180,922

Sustainable Solar for Beginning Farmers (SSBF) with Limited Resources

Sustainable Solar for Beginning Farmers (SSBF) with Limited Resources, in collaboration with Solar Wave (SW), will design and build an affordable solar-powered refrigeration container system. This project utilizes technology created by NASA that has been successfully applied especially in the military context but SSBF has re-engineered the concept using affordable components that has potential applications for agricultural operations. These units are particularly designed with disadvantaged farmers in mind who lack effective refrigeration systems on site because of the exorbitant start-up costs of solar powered energy systems. Solar panel installation on storage containers will provide not only essential lighting for predawn hours access but also sufficient power for a drip irrigation monitoring system. For smaller farm operations, lacking access to on site refrigeration, sunlight can wilt produce and degrade cardboard boxes used for produce storage. With on-site refrigeration, product competitiveness is enhanced vis-à-vis comparable mainland products and post-harvest crop losses reduced. A demonstration model that consists of a 24' long x 8' wide x 8'6" tall used, recycled shipping container and a DC cooling system that

will be powered by 8-12 solar panels and/or rechargeable battery will be created. Four additional containers will be assembled by the farmers themselves, with assistance, so that they become invested and stakeholders in this process. Education and training on the technology and understanding of energy conservation by the farmers will be provided, reducing agricultural fossil fuel dependency, enhancing financial viability of beginning farmers with limited resources, and introducing innovative, cost-saving measures.

Pheasants Forever, Inc. (VA) \$631,218

Integrating Pollinators into Bioenergy Crops

The dramatic decline of native and managed pollinator populations has been well documented in the past decade. Population declines are attributed to several factors, but chief among them is the continued loss of specific pollinator habitat needs. The establishment of pollinator field borders associated with dedicated energy crops is not a common practice that is currently used or promoted. This project will help determine the pollinator habitat value differences between placing the habitat on unharvested field edges vs. incorporating throughout a field that will be harvested for dedicated energy crops. This project will begin to address the critical pollinator habitat needs by integrating pollinator habitat into bioenergy production fields. Pollinator habitat will be designed and established using seeding mixtures designed to produce: 1) A diversity of flowering species throughout the entire growing season; 2) Species with different size, shape and color of flowering parts; 3) Habitat structures that provide access to bare ground for native pollinator nesting sites.

Texas A&M AgriLife Research (TX, OK) \$275,108

The impacts of cover crops and management-intensive grazing management with no inorganic inputs on soil chemical, physical, and biological properties and their relations with nutrient cycling, soil biological activity, soil water availability, and plant growth

This project will demonstrate effectiveness and incorporation into local farming systems of management practices that have been shown to work in other parts of the country but have not been widely adopted in sub-tropical, semi-arid regions of Texas and Oklahoma. Cover crops will be used to enhance nutrient deficient soils and suppress weeds to the point where productive perennial forages can be established. In addition the use of cover crops sown into established perennial Bermuda grass pastures to enhance soil organic content, soil water holding capacity and soil fertility will be explored.

U. S. Endowment for Forestry and Communities (SC, AL, NC) \$700,000

Demonstrating Transferable Sustainable Forestry Technologies, Outreach, Landowner Support Systems, Capital, and Market Access to Conserve Land for Socially Disadvantaged and Limited Resource Landowners in the Southeast

Forestland in the Southeastern U.S. is threatened by alternative land uses and historically underserved landowners are in some cases losing ownership of historic rural family land. Through introduction of new forestry technologies, creation of comprehensive systems of land owner outreach and support, increased access to Farm Bill programs such as those administered by NRCS, and increased access to traditional and emerging forest products markets, the project will restore, enhance, and conserve privately-owned African American forestland in the southern U. S. Well-managed forests increase

income, asset value, and long-term land retention. Land returned to healthy forests will also have beneficial conservation and environmental benefits.

U. S. Endowment for Forestry and Communities (US) \$100,000

Assessing CIG Source Water Protection in Forested Watersheds: Synthesizing Lessons Learned to Improve the Effectiveness of Future Projects

Recognizing that conserving forests is a cost-effective, common-sense strategy for securing clean drinking water and other watershed services, stakeholders nationwide seek to harness the power of incentives to promote conservation, restoration, and sustainable management of forests and other working lands. A comparative assessment is essential for developing a collective understanding of best practices in the use of incentives for source water. This project will meet a strong demand from watershed stakeholders nationwide for tools and guidance to improve the success and financial sustainability of incentive-based approaches to forested watershed conservation. This will, in turn, increase the likelihood of positive engagement in such programs by EQIP-eligible landowners. Project results will also be useful for NRCS grantmaking and technical assistance programs. Improving the success of source water protection projects will provide new revenue streams for landowners, protect drinking water sources, and conserve important wildlife habitat. Results from this analysis of previously-funded NRCS projects will enhance the success of future efforts, saving time and money and accelerating conservation outcomes.

University of Georgia (GA) \$132,764

Improving Nutrient Management by Beginning Farmers by Predicting Nitrogen Release from Cover Crops

The current inability to develop credible, accurate nutrient budgets when using cover crops in a rotation limits adoption and use of cover crops, resulting in continued soil health degradation and excessive fertilization/water quality impacts. This project will demonstrate the effectiveness of a new tool (**MinImob**) to manage nitrogen from cover crops. MinImob calculates how much nitrogen should be available based on soil type and other localized parameters. Demonstrations will be established at five farms over two years. The benefits of using MinImob will be transferred and communicated to producers using factsheets, field days, workshops, newsletters, and websites.

University of Tennessee (TN) \$634,107

Long-Term Impacts of Cover Crops, Crop Rotations, and Conservation Tillage Systems on Soil Properties, Nutrient Cycling, Soil Water Availability, and Crop Productivity

Cotton, soybean, and corn are the major crops in Tennessee and the Mid-South region. Increasing the competitiveness of these crops in global markets and minimizing the adverse impacts of their production on the natural resources and environment remains a big challenge. The objectives of this project are to: 1) demonstrate and quantify the long-term impacts of cover crops, crop rotations, and no-tillage systems and their interactions on soil chemical, physical, and biological properties; 2) quantify the impact of cover crops on nutrient cycling, soil water availability, and cotton, soybean, and corn productivity; 3) demonstrate and quantify the differences in nutrient and available water holding capacity of soil systems under long-term no-tillage with cover crops compared with systems using tillage with no cover crop; and 4) disseminate the results of this project to NRCS, farmers, university extension agents, private consultants, and other interested groups and individuals in Tennessee and other mid-

southern states. The long-term goal is to encourage the adoption of conservation management practices and systems to improve soil health, environmental quality, crop productivity, and grower profitability.

Virginia Polytechnic Institute and State University (DE, VA, MD) \$748,648

Decreasing nitrogen and phosphorus in drainage waters using a comprehensive drainage management approach

The Chesapeake Bay and its watershed have been the focus of much public attention and substantial conservation efforts. However, despite four decades of efforts to reduce non-point source nutrient pollution, excess nutrient delivery continues to persist in many parts of the watershed. Controlling nutrient loss from artificially drained agricultural lands on the Atlantic Coastal Plain requires a comprehensive approach that includes field and drainage management practices to address production and water quality concerns. This project seeks to integrate field and drainage management practices to develop, demonstrate and test a comprehensive approach to drainage management that can be readily adopted by producers on the Coastal Plain. Working closely with conservation personnel and producers, comprehensive drainage/ditch management systems will be installed and effectiveness demonstrated on the Coastal Plain of Delaware, Maryland and Virginia. Technologies to be incorporated include gypsum curtains, biofilter curtains, biofilter reactors, active drainage management, and low-disturbance ditch maintenance practices. These field activities will be closely coupled with educational activities aimed at producers, drainage districts and conservation personnel. Feedback from producers, drainage districts and conservation personnel will be used to adjust the practice development and implementation.

Wes-Mon-Ty RC&D (WV) \$48,728

Historically Underserved Specialty Crop Farmer Demonstration of Scale Appropriate Winter Cover Crop Rolling/crimping Technologies for Improved Soil Health

Killing a cover crop can provide a mulch on the soil surface, helping retain soil moisture and making soils more resilient to drought conditions. Farmers can kill cover crops using herbicides, but they can also kill them by “rolling and crimping” the plants. Many beginning farmers and limited resource farmers lack capital for simple machinery. Many such farmers may only own hand tools and/or simple garden tillers. The lack of access to appropriate technology to enhance soil health will be addressed by demonstrating and transferring innovative, scaled down cover crop crimping alternatives such as foot powered crimpers, and providing a blueprint for the on-farm construction of this technology. This project may have wide-spread application to promote adoption of cover cropping on small-scale specialty crop operations.

White River Irrigation District (AR, MO, MS, LA) \$663,500

Adopting Emerging Conservation Practices for Rice Production in the Mississippi River Basin Rice Growing Region

About 2.5 million acres of rice is produced in the lower portion of the Mississippi River Basin. This represents approximately 75 percent of the Nation's rice production. 100 percent of these acres utilize flood irrigation methods to manage nutrients, control weeds, and provide water to meet plant requirements. Production practices, irrigation water management methods, drainage water management practices, and nutrient management methods are similar across the region. Researchers

have been testing alternative rice-growing practices that are common in the Far East but have so far seen limited adoption in the lower Mississippi Valley rice growing region. The goals of this project are to: 1) Implement the new rice production practices on 10 percent (200,000 acres) of the rice production acres by 2016; 2) develop an analysis tool that assesses rice production practice options and economic risks; 3) Develop a record keeping tool that tracks farmer decisions that is acceptable for carbon trading; 4) Develop an automated mapping capability using satellite imagery to map soil moisture, water use, and track rice practice adoption across the region.

Women, Food and Agriculture Network (IA, NE, MN, WI, IL, IN, MO) \$525,043

Women Caring for the Land: Engaging Midwest Women Farmland Owners in Improving Conservation and Soil Health

Women now own or co-own 50 percent of the farmland in Iowa, and the percentage of those who are sole landowners is rising as they inherit land from spouses and fathers. Comparable data are not available in neighboring states, but similar demographics and agricultural systems are present. A typical Midwestern female farmland owner is 65 and older, leases farmland to a tenant, and is highly interested in conservation and preserving her farm for the next generation. Women, Food and Agriculture Network has been working with Midwest women farmland owners for 16 years. The project goal is to improve soil health across seven states in the upper Midwest by increasing soil health literacy among area women farmland owners, and supporting them improve soil health on the land they own and lease. The women landowners will learn the basics of what constitutes healthy soil, some simple soil testing methods, , and best management practices to support healthy soil that they can discuss and adopt with their tenants. A set of publications for women farmland owners about managing for healthy soil will also be developed in consultation with an advisory group of women farmland owners.