Environment and Natural Resources Trust Fund

2022 Request for Proposal

General Information

Proposal ID: 2022-090

Proposal Title: Reforestation Projects for Carbon Markets

Project Manager Information

Name: CHRISTOPHER WRIGHT

Organization: U of MN - Duluth - NRRI

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Project Basic Information

Project Summary: With a modest public investment we will build the technical and institutional infrastructure required for a substantial tree planting effort to address climate change as a Minnesota-based, "Natural Climate Solution".

Funds Requested: $247,000

Proposed Project Completion: June 30 2024

LCCMR Funding Category: Air Quality, Climate Change, and Renewable Energy (E)

Project Location

What is the best scale for describing where your work will take place?

Region(s): NE

What is the best scale to describe the area impacted by your work?

Region(s): NE

When will the work impact occur?

During the Project

Narrative

Describe the opportunity or problem your proposal seeks to address. Include any relevant background information.

Tree planting has the potential to provide multiple benefits to the state of Minnesota, including: improved forest health, species re-composition for adaptation to climate change, long-term increases in the productivity of timber/non-timber forest resources, scenic beauty for recreation/tourism, watershed improvement, and carbon sequestration. Spatially, the reforestation potential in Minnesota is vast: an estimated 5 million acres of land is available for tree planting, with the potential to offset nearly 6% of Minnesota's annual greenhouse gas (GHG) emissions (Nature Conservancy, 2021). However, broad-scale tree planting is hampered by a.) a lack of understanding of the ideal tree species mixes and locations for planting and b.) the costs involved in obtaining nursery stock, forest site preparation, and the planting/tending of seedlings. Carbon markets offer one way to overcome reforestation expenses by linking GHG emitters with landowners who plant trees. But, at present, there is no infrastructure in place in Minnesota to facilitate broad-scale entry into reforestation carbon markets. We propose to address this challenge, collaboratively, through a partnership between the MN Association of Resource Conservation & Development Councils (MARCD), the UMN-Duluth Natural Resources Research Institute (NRRI), and the Department of Natural Resources (DNR) Forestry Resource Assessment Program.

What is your proposed solution to the problem or opportunity discussed above? i.e. What are you seeking funding to do? You will be asked to expand on this in Activities and Milestones.

In this project we propose three activities that will build carbon market awareness and participation in tree planting: (1) Develop a web-based, Geographic Information System (GIS) tool for landowners and conservation professionals to identify the potential for tree planting on particular properties, and the potential financial returns from carbon market participation; (2) Scale-up outreach activities currently underway to engage land owners seeking to plant trees, as well as engaging Minnesota-based companies seeking to offset their GHG emissions; and (3) Coordinate and implement tree planting projects financed through participation in the Climate Forward voluntary carbon market (https://climateforward.org/). Climate Forward is designed to accelerate action on climate change by encouraging companies to proactively invest in projects (like tree planting) in order to mitigate future GHG emissions. By awarding landowners saleable credits in year-one after tree planting, Climate Forward is uniquely able to overcome the prohibitive costs previously associated with reforestation.

What are the specific project outcomes as they relate to the public purpose of protection, conservation, preservation, and enhancement of the state's natural resources?

This project has several outcomes including technical resources that are simply unavailable at present, a systematic process for enrolling landowners in reforestation carbon markets, and the capacity to link Minnesota corporations to local, investment-ready tree planting projects. Broad-scale reforestation carbon market entry in Minnesota would also provide myriad ecological, economic, and social benefits, including revenue to forest landowners and communities who have experienced a loss of timber revenue due to recent mill closures. Lastly, the project's "Natural Climate Solutions" meet goals laid out by the Governor's Climate Change Subcabinet's Natural and Working Lands Action Team.

Activities and Milestones

Activity 1: Reforestation Potential Assessment Tool

Activity Budget: $92,354

Activity Description:
Objective: Develop a GIS app, delivered on the web for public accessibility, that will estimate reforestation potential for landowners considering carbon market participation. Specific tasks include: (1) Compile geospatial data inputs for tree growth and forest carbon modeling; (2) Build reforestation tree growth model to estimate the current carbon stocking of a property and projected tree growth for different tree species plantings; (3) Build web interface for an interactive mapping tool that will allow land owners and resource professionals to visualize and explore the growth models and other forestry-relevant spatial data for specific forest parcels; allowing users to calculate carbon market value under different tree planting scenarios.

Activity Milestones:

Description	Completion Date
Gathering of spatial data	December 31 2022
Tree growth modeling	April 30 2023
Web-based property assessment tool beta release	June 30 2023
Web-based property assessment tool final release	September 30 2023

Activity 2: Outreach and Feasibility Testing

Activity Budget: $77,323

Activity Description:
Objective: (a) Identify forestland owners who are willing to plant trees, and for whom tree planting is ecologically, economically, and socially appropriate; (b) Identify Minnesota-based companies seeking to offset greenhouse gas emissions via tree planting and carbon market participation.

Tasks:
(1) Conduct an outreach program to individuals and entities to increase awareness of forest carbon offset programs via multi-stakeholder forestry meetings and distribution of fact sheets. Outreach will include bi-monthly webinars and two symposia to be held at NRRI. We will target landowners for whom carbon market entry is both potentially feasible and compatible with forest management objectives. The assessment tool developed in Activity 1 will be critical to demonstrating project feasibility and generating land owner interest; as well as demonstrating to Minnesota based companies how they might meet their carbon neutrality goals within the state.
(2) Conduct feasibility testing on 15 pilot properties from interested parties identified through public outreach. Feasibility testing using the assessment tool will yield expense and revenue information needed to bring landowners and corporate partners to the decision-making stage of the planning process and entering the carbon market.

Activity Milestones:

Description	Completion Date
Preparation of fact sheets for landowners and companies	December 31 2022
Bi-monthly webinars for landowners and companies interested in carbon market participation in Minnesota	June 30 2023
Yearly symposiums on reforestation and carbon markets at NRRI Feasibility studies on 15 pilot properties	June 30 2023
Yearly symposiums on reforestation and carbon markets at NRRI	October 31 2023

Activity 3: Implementation of Tree Planting Projects

Activity Budget: $77,323

Activity Description:
Objective: Begin and complete the design process for a reforestation project (or projects) to be submitted to the Climate Forward voluntary carbon market. Implement at least one carbon offset project.

Tasks:
Through feasibility testing and other public outreach we expect to implement a partnership between a landowner or landowners wanting to plant trees and a Minnesota based company(ies) seeking to offset future emissions. MARCD has extensive experience in implementing public-private conservation projects; and will take the lead in bringing together land owners and companies wishing to offset emissions. The assessment tool will be used in project design and in applications for carbon market certification. NRRI staff will provide additional silvicultural assistance in project design and certification.

Activity Milestones:

Description	Completion Date
Identify landowner(s) and company(ies) interested in developing tree planting projects	June 30 2023
Prepare application(s) to Climate Forward	December 31 2023
Identify suppliers and contractors	February 28 2024
Execute tree planting project	June 30 2024

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Paul Sandstrom	MN Association of Resources Conservation & Development Councils	Conduct public outreach, carbon feasibility assessment, design and execute carbon projects	Yes
Lucas Spaete	MN DNR, Division of Forestry - Resources Assessment	MN DNR will develop a web-based Geographic Information System (GIS) for estimating reforestation potential for landowners considering carbon market participation.	Yes

Long-Term Implementation and Funding

Describe how the results will be implemented and how any ongoing effort will be funded. If not already addressed as part of the project, how will findings, results, and products developed be implemented after project completion? If additional work is needed, how will this be funded?

This project is intended to jump-start an ambitious tree planting movement in the state of Minnesota. There is tremendous potential to plant trees and an urgent need to do so. Initial public investment is required to build capacity, educate landowners, develop public-private partnerships, and implement initial projects. Thereafter, leveraging carbon markets will create a system to continuously fund reforestation, through new corporate investments in tree planting. This project would build capacity within the MN DNR, MARCD, and NRRI to provide reforestation/carbon market entry technical assistance, providing a lower-cost alternative to traditional carbon project developers, including web-tool hosting at NRRI.

Project Manager and Organization Qualifications

Project Manager Name: CHRISTOPHER WRIGHT

Job Title: Program Manager in Landscape Ecology

Provide description of the project manager's qualifications to manage the proposed project.

Dr. Chris Wright is the Program Manager in Landscape Ecology at the UMN-Duluth Natural Resources Research Institute (NRRI), where he leads a research program in Natural Climate Solutions. He is lead PI on a grant from the UMN Institute on the Environment, "Forest Carbon Markets: Empowering Access for Economically Marginal Landowners". There, his team has examined opportunities for carbon market expansion across a range of carbon market types (regulatory and voluntary markets) in Minnesota, with a focus on non-industrial forest land owners. This proposal builds on those activities. Dr. Wright has technical expertise in geospatial data analysis and forest carbon modeling, and has previously hosted a regional meeting on Natural Climate Solutions at NRRI.

Organization: U of MN - Duluth - NRRI

Organization Description:

The Natural Resources Research Institute (NRRI) is a part of the University of Minnesota Duluth and employs over 130 scientists, engineers and technicians. Its mission is to deliver integrated research solutions that value our resources, environment and economy for a sustainable and resilient future. NRRI collaborates broadly across the University system, the state and the region to address the challenges of a natural resource-based economy.

By partnering with industry, business leaders, agency decision-makers and many others, NRRI researchers frame and deliver on real-world solutions. NRRI scientists have extensive experience in managing large, interdisciplinary projects. Major objectives include the development of tools for environmental assessment and resource management. NRRI's role is as a impartial, science-based resource that develops and translates knowledge by characterizing and defining value-resource opportunities, minimizing waste and environmental impact, maximizing value from natural resource utilization and maintaining/restoring ecosystem function.

Major outcomes from NRRI projects include informing environmental management and policy and assisting industry and communities in defining and maintaining the social license to operate in natural systems. NRRI has an established mechanisms for sharing outcomes through press releases, publication in peer-reviewed journals, annual reports, periodicals, and through social media channels.

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	$ Amount
Personnel								
GIS Lead		Lead NRRI side of assessment tool development			26.7%	0.06		$5,717
GIS Analyst		Analyze geospatial data			24.1%	0.08		$6,567
GIS Programmer		Client- and server-side of assessment tool			26.7%	0.16		$14,458
GIS Programmer		Website and client-side development of assessment tool			24.1%	0.16		$12,242
Project Lead		Coordinate project, conduct public outreach, assist in carbon project design			26.7%	0.5		$57,048
Silviculturalist		Provide silvicultural expertise across project			26.7%	0.2		$27,673
							Sub Total	**$123,705**
Contracts and Services								
Minnesota Association of Resource Conservation and Development Councils	Sub award	MARCD will collaborate in public outreach effort, development of feasibility studies, and carbon project design.				0.48		$68,888
MN DNR Division of Forestry, Resources Assessment (RA)	Sub award	MN DNR, RA staff will compile geospatial data inputs and build reforestation tree growth model				0.25		$50,000
University of Minnesota Duluth	Internal services or fees (uncommon)	GIS Lab fee (hourly). Fee charged for GIS computing services (480 hours at $5.52 per hour)				-		$2,650
							Sub Total	**$121,538**
Equipment, Tools, and Supplies								

							Sub Total	**-**
Capital Expenditures								
							Sub Total	**-**
Acquisitions and Stewardship								
							Sub Total	**-**
Travel In Minnesota								
	Miles/ Meals/ Lodging	1,800 miles at $0.56 per mile	Travel to meet with Minnesota landowners and companies interested in reforestation projects and carbon market participation					$1,007
							Sub Total	**$1,007**
Travel Outside Minnesota								
							Sub Total	**-**
Printing and Publication								
							Sub Total	**-**
Other Expenses								
		Virtual Server Fees (Annual)	Data storage and general computing fee (2 years at $250 per year). Annual cost for computing time on server and data storage for this project. This fee is project specific.					$500
		Domain Fees and Web Hosting (Annual)	This is domain fees and web hosting fees as an assessment tool for the project. It is a fee for hosting web app (2 years at $125 per year). This cost is project specific.					$250

							Sub Total	**$750**
							Grand Total	**$247,000**

Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request

Non ENRTF Funds

Category	Specific Source	Use	Status	Amount
State				
			State Sub Total	**-**
Non-State				
In-Kind	UMN unrecovered indirect costs are calculated at the UMN negotiated rate for research of 55% modified total direct costs.	Indirect costs are those costs incurred for common or joint objectives that cannot be readily identified with a specific sponsored program or institutional activity. Examples include utilities, building maintenance, clerical salaries, and general supplies. (https://research.umn.edu/units/oca/fa-costs/direct-indirect-costs)	Secured	$97,961
			Non State Sub Total	**$97,961**
			Funds Total	**$97,961**

Attachments

Required Attachments

Visual Component

File: 89bb8ac3-d6f.docx

Alternate Text for Visual Component

Humanity must reduce atmospheric greenhouse gas concentrations to avoid catastrophic climate change. Through photosynthesis, trees are a proven way to remove carbon-dioxide from the atmosphere. Tree planting has the potential to offset up to 6% of Minnesota's annual greenhouse gas emissions....

Optional Attachments

Support Letter or Other

Title	File
UMD Sponsored Projects Transmittal Letter	9a71f2de-45f.pdf
MARCD Support Letter	031bd5c5-d43.pdf

Administrative Use

Does your project include restoration or acquisition of land rights?

No

Does your project have potential for royalties, copyrights, patents, or sale of products and assets?

No

Do you understand and acknowledge IP and revenue-return and sharing requirements in 116P.10?

N/A

Do you wish to request reinvestment of any revenues into your project instead of returning revenue to the ENRTF?

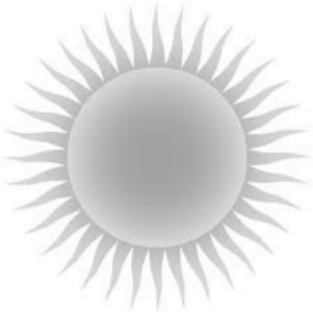
N/A

Does your project include original, hypothesis-driven research?

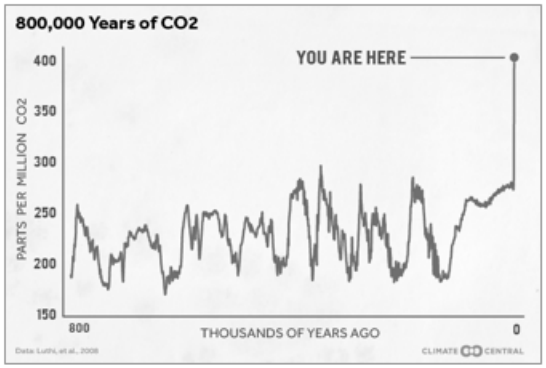
No

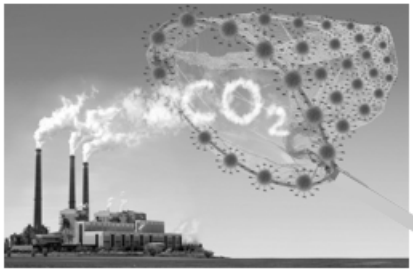
Does the organization have a fiscal agent for this project?

Yes, Sponsored Projects Administration



+ CO_2 + H_2O + Nutrients





Photosynthesis: proven technology for removing excess CO_2 from the atmosphere

Tree planting has the potential to offset up to 6% of Minnesota's greenhouse gas emissions