**PROJECT TITLE: Monetizing Carbon Capture by Minnesota Forests**

**I. PROJECT STATEMENT**

Minnesota has made great strides in reducing its CO2 emissions from electricity generation. Less tapped has been the potential of Minnesota forests to capture and store excess CO2. Such capture, or carbon sequestration, combined with carbon-neutral power generation, would position the state as a global leader in climate change mitigation.

By some accounts, improved management of U.S. forests could reduce the nation’s net greenhouse gas emissions by 30%, with Minnesota’s forests poised to play a leading role. The economic challenge is to develop a means to compensate forest landowners for this ecosystem service. Recently, the so-called “cap-and-trade” carbon market run by the California Air Resources Board (CARB) has emerged as the leading mechanism for doing so. There, industrial emitters of greenhouse gases can reduce their net CO2 emissions by purchasing what are known as “forest carbon offsets”. In a nutshell, industrial sources in California pay land owners to capture and store atmospheric CO2 —using nature’s well-tested technologies of photosynthesis and forest growth.

In terms of participation on the CARB market, Minnesota has fallen well behind neighboring states. Jump-starting such participation is the goal of this project, starting with forest owners in northern Minnesota. The Natural Resources Research Institute (NRRI) has a unique combination of expertise in ecosystem modeling, spatial analysis, web-based delivery of environmental data, silviculture, and business development. Given these skills, and a modest investment, we believe that we can significantly encourage the development of a much-needed source of revenue for northern Minnesota’s forest sector, all the while advancing the state’s leadership role in advancing integrated climate change solutions.

**II. PROJECT ACTIVITIES AND OUTCOMES**

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| **Activity 1 Title:** *Lowering barriers-to-entry in the carbon offset market: Development of a web-based decision-support tool for estimating carbon offset potential of northern Minnesota forests.***ENRTF BUDGET: $80,919****Description:**The primary barrier-to-entry in the CARB market is the high cost of designing and certifying carbon offset projects. These costs discourage small- to medium-sized forest owners in northern Minnesota from even considering the CARB market as an additional revenue source. Therefore, it is critical to develop an easily accessible (i.e., web-based) decision-support tool, utilizing best available science, that would allow forest managers to “look”, i.e., estimate potential carbon capture on their lands, before they “leap” into the carbon offset market. We will utilize NRRI’s expertise in online delivery of environmental data for resource planning (e.g., the MN Natural Resource Atlas) to build a web-based system that will query data sets and simulation models located on a geospatial data server located at NRRI, returning maps of carbon capture potential at relatively high spatial resolution (30 meters) for specific forest land holdings. In building this tool, we will consult with the U.S. Forest Service, Forest Inventory and Analysis office in St. Paul for advice on data sources, simulation modeling, and associated best practices. Concurrent with software development, we will reach out to forest owners potentially interested in pursuing carbon offset projects, with the intent of incorporating user feedback into the decision-support system.

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| **Outcome** | **Completion Date** |
| *1. Develop beta version of web tool; reach out to forest land owners potentially interested in pursuing opportunities on the CARB offset market* | *Jan 1, 2021* |
| *2. Develop final version of web tool; incorporating feedback from interested parties identified above* | *Jul 1, 2021* |

**Activity 2 Title:** *Jump-starting a carbon offset market in northern Minnesota***ENRTF BUDGET: $80,919****Description:** In this activity we will reach out more broadly to forest land owners in northern Minnesota using the web tool to demonstrate offset potential. Under the CARB framework, land owners selling carbon offsets must implement forest management practices that increase carbon capture relative to business-as-usual practices. It is important to emphasize that carbon offset projects need not preclude continued resource use. For example, a timber producer may be eligible for a carbon credit simply by increasing the length of their forest rotation (number of years between timber harvests) relative to existing practice. Here we will utilize NRRI expertise in silviculture and business development to provide technical advice to interested parties in the early stages of engaging with the CARB offset market. |  |  |  |  | **ENRTF BUDGET: $** |  |

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| **Outcome** | **Completion Date** |
| *1. Reach out more broadly to forest owners using web tool to demonstrate offset potential* | *Jan 1, 2022* |
| 2.  *Assist interested parties in early stages of participation in the CARB offset market* | *Jun 30, 2022* |

**III. PROJECT PARTNERS AND COLLABORATORS:**

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| **Name** | **Title** | **Affiliation** | **Role** |
| Dr. Chris Wright | Landscape Ecology Program Mgr. | NRRI | PI |
| Tim White | Business Development & Intellectual Property Mgr. | NRRI | Collaborator |
| John DuPlissis | Silviculture Research Program Mgr. | NRRI | Collaborator |
| Will Bartsch | Senior Research Scientist | NRRI | Collaborator |
| Kristina Nixon | GIS Analyst | NRRI | Collaborator |

**IV. LONG-TERM IMPLEMENTATION AND FUNDING:**

In the short term, this project will build institutional capacity allowing NRRI to take a leading role in creating a robust market for forest carbon offsets in northern Minnesota. Acting as a business incubator, our expectation is that these activities will eventually be taken up by the private sector, consistent with NRRI’s mission to create employment opportunities in northern Minnesota. We also expect opportunities to monetize forest carbon capture to expand more broadly outside the region to other parts of the state.