2019 Project Abstract
For the Period Ending June 30, 2022

PROJECT TITLE: Forest and Bioeconomy Research - Subproject 1: Optimizing management of Minnesota's forest landscapes
PROJECT MANAGER: Rolf Weberg
AFFILIATION: University of Minnesota Duluth Natural Resources Research Institute
MAILING ADDRESS: 5013 Miller Trunk Hwy
CITY/STATE/ZIP: Duluth, MN 55811
PHONE: 218-788-2697
E-MAIL: rtweberg@d.umn.edu
WEBSITE: https://nrri.umn.edu
FUNDING SOURCE: Environment and Natural Resources Trust Fund
LEGAL CITATION: M.L. 2019, First Special Session, Chp. 4, Art. 2, Sec. 2, Subd. 3 (q)

APPROPRIATION AMOUNT: $500,000
AMOUNT SPENT: $500,000
AMOUNT REMAINING: $0

Sound bite of Project Outcomes and Results
Projections of Minnesota forest composition and associated ecosystem services were developed under different climate and management scenarios from 2020 to 2100. This information was made freely available through a custom website and interactive mapping tool, providing resource managers with critical information for planning.

Overall Project Outcome and Results
Forest management is an increasingly complex discipline that requires the balancing of economics and ecology in the face of changing markets and climate. Beyond providing lumber, pulp, and other forest products, forests provide many additional goods and services that benefit society. Known as "ecosystem goods and services," these include sequestering carbon, providing habitat for wildlife, maintaining water quality and quantity, and others. Understanding both how forests will change over time and how society values the goods and services they provide is critical to the successful management of Minnesota's forests.

This project was designed to provide projections of how forest composition and the goods and services that forests provide will change from 2020 to 2100 under different management and climate scenarios on 3,800,000 acres in northern Minnesota. It also helps users understand how Minnesotans value those forest goods and services. Foundational landscape change modeling was done using the LANDIS-II model, allowing for a better understanding of forest composition and carbon. Subsequent wildlife habitat and water quality and quantity modeling were done using the WHINGS and HSPF models, respectively. All models were run for each of the 12 unique combinations of our management and climate scenarios. Focus groups and surveys were used to quantify value.

Minnesota's forest managers indicated that they would like to consider ecosystem services when making harvest and management decisions but lack the information to do so. The primary deliverable of this project is the Forest Change Assessment Simulation Tool, or ForCAST. This interactive mapping and decision support tool contains all of our projections of forest composition and associated ecosystem services and estimates of value, allowing for the development of informed, long-term management strategies that aren't exclusively driven by the economics of timber markets.

Project Results Use and Dissemination

ForCAST, an interactive mapping and decision support tool developed as the main deliverable of this project, is freely and publicly available through the project website. The website also provides access to comprehensive project and methodology documentation. During development, awareness was raised about the project through presentations at the Minnesota GIS/LIS conference and a combined meeting of the Minnesota Society of American Foresters and the Sustainable Forests Education Cooperative's (SFEC) Forestry and Wildlife Research Review. ForCAST was launched through a SFEC webinar in July 2022 with a subsequent training event scheduled through SFEC in September.