

The pressing challenge of achieving net-zero emissions is underscored by increasing global temperatures and rising concentrations of greenhouse gases (GHG) (UNEP, 2023), primarily carbon dioxide (CO<sub>2</sub>), from human activities which intensify the global climate crisis. The failure to attain net-zero emissions worsens the impacts of climate change, resulting in more frequent and severe heatwaves, droughts, storms, forest fires, and disruptions to ecosystems.

Achieving net-zero emissions will require emissions reduction and carbon sequestration for residual and historical emissions (Fankhauser, et al., 2021). Carbon sequestration is the process of capturing and storing CO<sub>2</sub> to prevent its release into the atmosphere. These anthropogenic, using energy-intensive carbon capture technologies or natural, cost-effective Nature-based Solutions (NbS) (CLEAR, 2019).

In this research, we will examine how Nova Scotia's small woodlot owners can be encouraged through monetization means to become key players in our net-zero future. Woodlots can act as carbon sinks (Ruehr, 2023), capturing and storing carbon dioxide from the atmosphere. Our research will also develop a predictive model, a modeling approach which utilizes data patterns to forecast future outcomes or trends, based on scenarios of business as usual, increasing emissions with a 5% annual increase, and decreasing emissions with a 5% annual decrease that will examine the potential and required actions of carbon sequestration of the land by evaluating the forestation required to reach net-zero and net-negative in all three scenarios. This will help us identify different actions for small woodlot owners to protect and improve their land through different land management techniques, including reforestation and afforestation. This approach could become a benchmark for other provinces.

## Bibliography

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