Understanding Climate-Smart Forestry in Practice

Implementing & Scaling Climate-Smart Forestry

To deliver nationally significant carbon outcomes

NEFF/New England CSC Partnership Project

Forest School at the Yale School of the Environment Fall Seminar 2023

November 27, 2023

NEW ENGLAND FORESTRY FOUNDATION

In the Climate Emergency, Forests Offer Hope

Forests are a stabilizing force for the climate. They regulate ecosystems, protect biodiversity, play an integral part in the carbon cycle, support livelihoods, and supply goods and services that can drive sustainable growth.

New England holds the ingredients for hope through action

- **Forests can meet up to 30% of regional climate goals**
- **31.6 billion trees**
- **IPCC consistently finds that "sustainable forest management … will generate the largest sustained mitigation benefit."**
- **Ground-breaking $30 million opportunity to pilot forest-climate solutions**

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Lauren Owens Lambert

FORESTRY CAN BE GOOD FOR CLIMATE AND BIODIVERSITY

Production of Forest Products

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Production of Forest Products

Biodiversity and Wildlife

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Carbon in the Forest

Production of Forest Products

Biodiversity and Wildlife

FORESTRY CAN BE GOOD FOR CLIMATE AND BIODIVERSITY

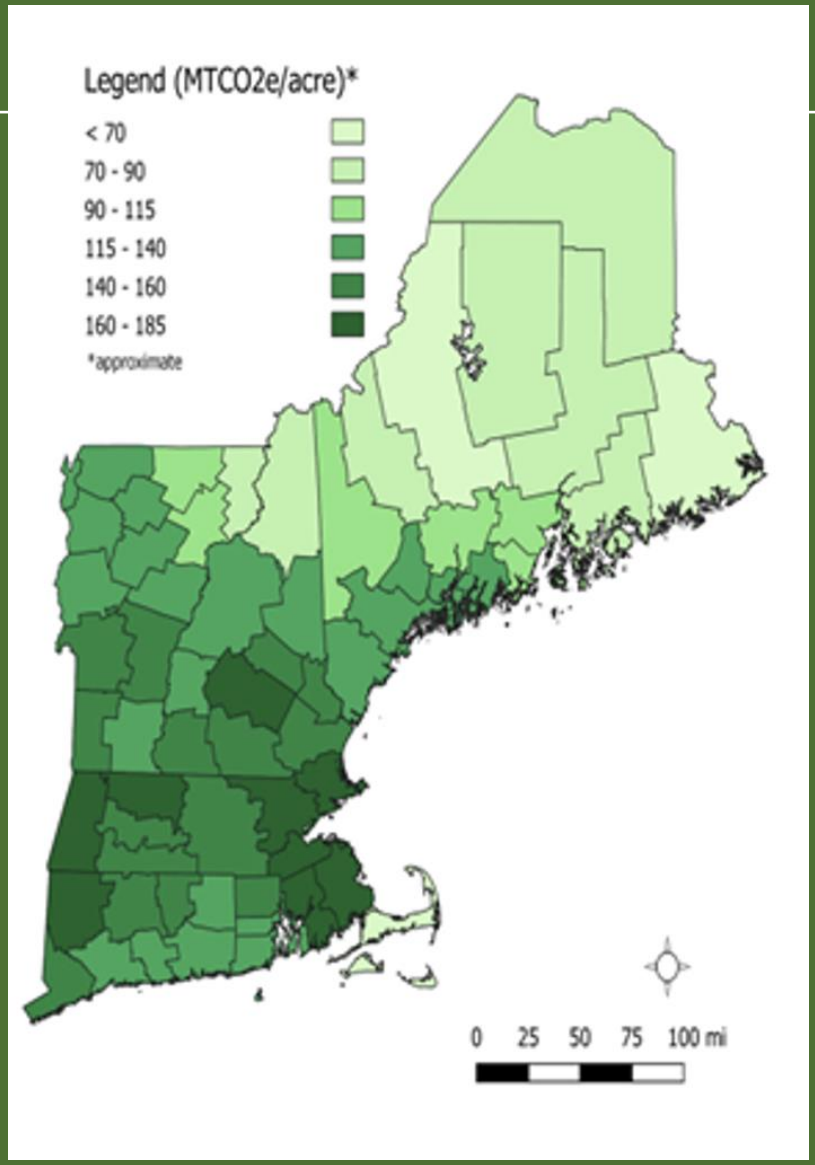
Carbon in the Forest

Production of Forest Products

Biodiversity and Wildlife

Carbon per acre of forest

(All carbon above mineral soil)



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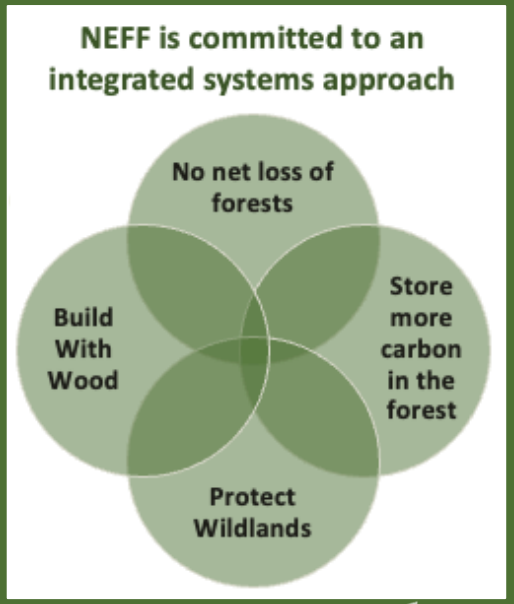
In New England, an Integrated Approach Yields Nationally Significant Carbon Reductions

The wedge diagram below indicates the New England potential to sequester 30% of regional carbon reduction goals or 646 million tons of carbon (aprox), mostly by improving forest management, while continuing to support biodiversity and producing low-carbon products for a sustainable bioeconomy.



(Additional program details can be found in the "NEFF 30 Percent Solution" 2-pager that was emailed with this slide-deck.)

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Scientific Confirmation

- Improved forest management could increase carbon storage by an estimated 488 million metric tons of CO2e (about 23% of emissions reductions for New England to reach net-zero emissions by 2050).
- New England forests could sequester at least 20% of the region's current emissions and, if states meet emissions-reduction goals, up to 97% of remaining emissions in 30 years.
- Maine's commercial forests can store up to 20% more carbon while maintaining harvest

forests

MDPI

Article

Storing More Carbon by Improving Forest Management in the Acadian Forest of New England, USA

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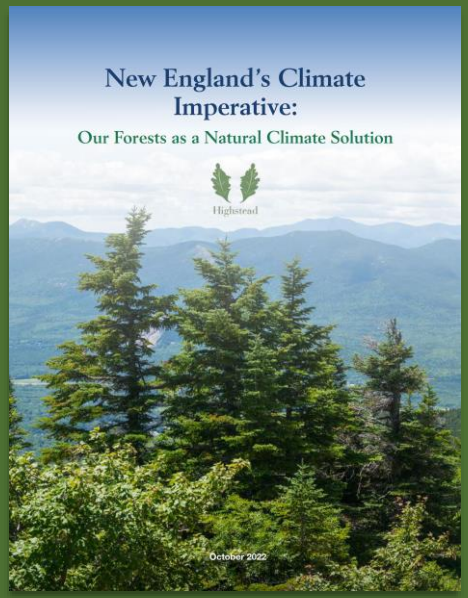
Abstract: The capacity of forests to store carbon, combined with time-tested approaches to managing forests, make forests a useful tool for atmospheric carbon mitigation. The primary goals of this study are to determine the amount of unrealized mitigation available from Improved Forest Management (IFM) in the Acadian Forest of New England in the northeastern U.S., and to demonstrate how this mitigation can feasibly be attained. This study used the Forest Vegetation Simulator (FVS) to model the impacts of IFM practices articulated by the New England Forestry Foundation on carbon storage in the Acadian Forest. Our results, together with empirical data from well-managed forests, show that if the modeled improved management is employed on privately owned timberland across the Acadian Forest of New England, carbon storage could be increased by 488 Tg CO_2e. Our financial modeling shows that IFM could be funded in this region by combining income from carbon markets with the philanthropic funding of conservation easements, timber revenues, and capital investments from private investors who prioritize social and economic goals alongside financial returns. This study adds to the body of evidence from around the world that the potential for managed forests to contribute to climate change mitigation has not been fully realized.

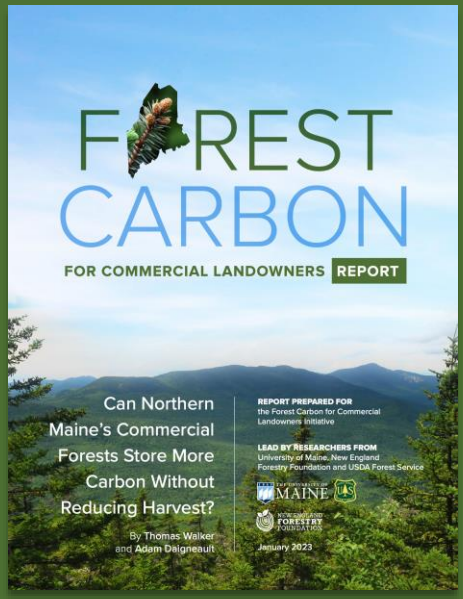
Keywords: carbon storage; forest management; mitigating climate change; natural climate solutions; improved forest management

1. Introduction

The world's forests play a key role in mitigating climate change by both storing and sequestering carbon. Global forest ecosystems are estimated to store 861 Pg C, with 363 Pg C in live biomass (above and below ground; [1]). In addition, managed forests produce durable wood products that can store carbon and reduce greenhouse gas (GHG) emissions when they are substituted for alternative products with higher embodied emissions [2].

Forests already serve as a carbon sink globally, but recent work has demonstrated their capacity to do far more to mitigate climate change, and carbon markets are rapidly developing to incentivize a shift in management [3–5]. In contrast with other carbon sinks, such as blue carbon or peatlands, resource managers have more than a century of experience managing forests for a variety of outcomes, which can now include carbon storage [6,7]. Improved Forest Management (IFM) can lead to substantially increased carbon storage simultaneous with increased timber harvests, which allow for additional carbon storage in harvested wood products and reduced GHG emissions from substituting wood for more CO_2-emission-intensive materials [8]. This increase in carbon storage also produces a commodity product in terms of marketable carbon credits where markets exist, an increasingly common situation. While the specific opportunity will vary by forest type and region, studies indicate strong potential for increased climate mitigation in northeastern North America resulting from IFM in this region [9–11]. Additional analyses are needed to help document the scope and scale of such opportunities more broadly [7,12]. In this study,





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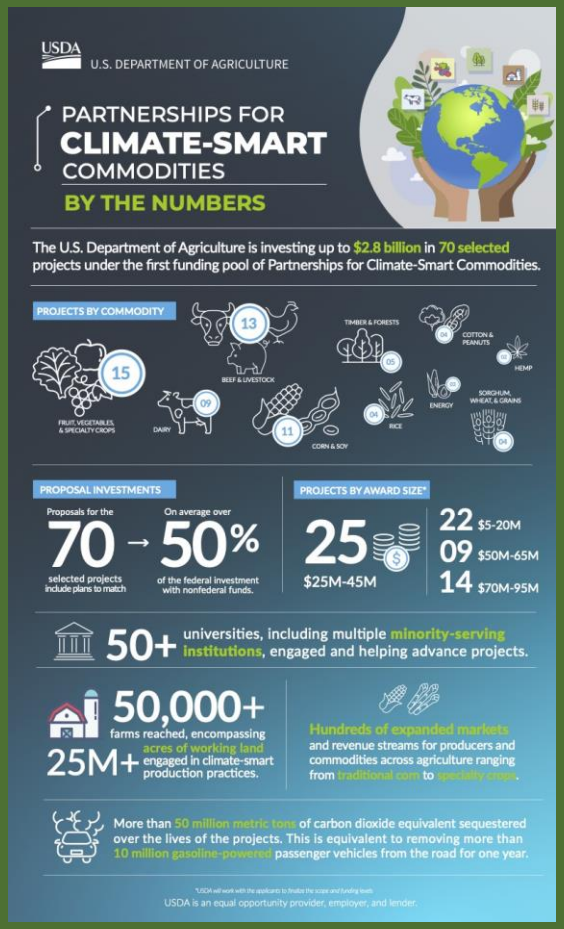
USDA Partnerships for Climate-Smart Commodities
$3.1 billion into 141 projects



Forestry related projects:

- New England Forestry Foundation
- American Forest Foundation
- Sustainable Northwest
- Oregon Climate Trust
- New York State Department of Environmental Conservation
- Adirondack North Country Association
- Clemson University

New England Forestry Foundation's USDA Climate Smart Commodities New England Climate-Smart Forest Partnership

$30 Million Forest-Based Incentive Program

Climate-Smart Forestry Incentives

- Climate-smart forestry incentives of approximately $15 million
- Commercial and smaller private forestland owners
- First Nations
- Foresters & loggers

Carbon Benefit Quantification

- Establish baselines for in-forest carbon benefits
- Model carbon stored in wood products and substitution benefits for other materials.
- Third-party verification of the GHG benefits

Climate-Smart Wood Markets

- Define mass timber market potential
- Determine regional climate-smart wood supply.
- Provide design specifications for mass timber affordable housing.
- Develop climate-smart wood sourcing criteria and supply chain tracking

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Michael Perlman

Program Partners

Landowners, Foresters, Loggers: Participating Producers

- Seven Islands
- Weyerhaeuser
- Wagner Forest Management, Ltd.
- Baskahegan Land Company
- Robbins Lumber
- Passamaquoddy Forestry Department
- Mi'kmaq Nation
- The Nature Conservancy (Maine lands)
- Mohawk Trail Woodlands Partnership
- Massachusetts Tree Farm Program
- Hull Forestlands, L.P.
- Heyes Family Forests LLC
- Appalachian Mountain Club

Participating Loggers & Foresters

- Professional Logging Contractors Maine
- Trust to Conserve Northeast Forestlands
- Professional foresters & loggers

University of Maine Assistance With Program Design and Implementation

- University of Maine: Dr. John Daigle, Liaison to Maine's Penobscot Nation, Passamaquoddy Tribe and Mi'kmaq Nation
- University of Maine Advanced Structures & Composites Center
- Forest Policy & Economics – School of Forest Resources
- School of Forest Resources and Climate Change Institute
- Office of Innovation and Economic Development

Monitoring, Verification & Reporting

- American Forest Foundation – Family Forest Carbon Program
- Spatial Informatics Group
- Thomas Walker, Resource Economist
- Innovative Natural Resource Solutions

Commodity Markets

- Spiritos Properties, LLC (Mass Timber Developer)
- Leers Weinzapfel Associates (Architects)
- Quantified Ventures (Finance)
- WoodWorks (Mass Timber)

Supporting Organizations

- Forest Stewards Guild
- Mass Audubon
- Our Climate Common
- Highstead Foundation
- Massachusetts Forest Alliance
- Connecticut Forest & Park Association

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Climate-Smart Forestry: Silvicultural Approach

Integrated Approach: Climate-smart forestry will integrate forest ecological health with increased absorption and storage of carbon, serving three combined outcomes:

- Improved wildlife habitat and biodiversity
- Increased carbon sequestration and storage
- Harvesting more sustainably produced wood

Practices: The forestry practices applied through the program will be informed by:

- NEFF's Exemplary Forestry standards
- Management standards developed for the Family Forest Carbon Program
- Modeling conducted for the Forest Carbon for Commercial Landowners effort.

Incentives: Climate-smart forestry incentive payments of approximately $15 million available to:

- Large and small private forestland owners
- First Nations
- Foresters & loggers

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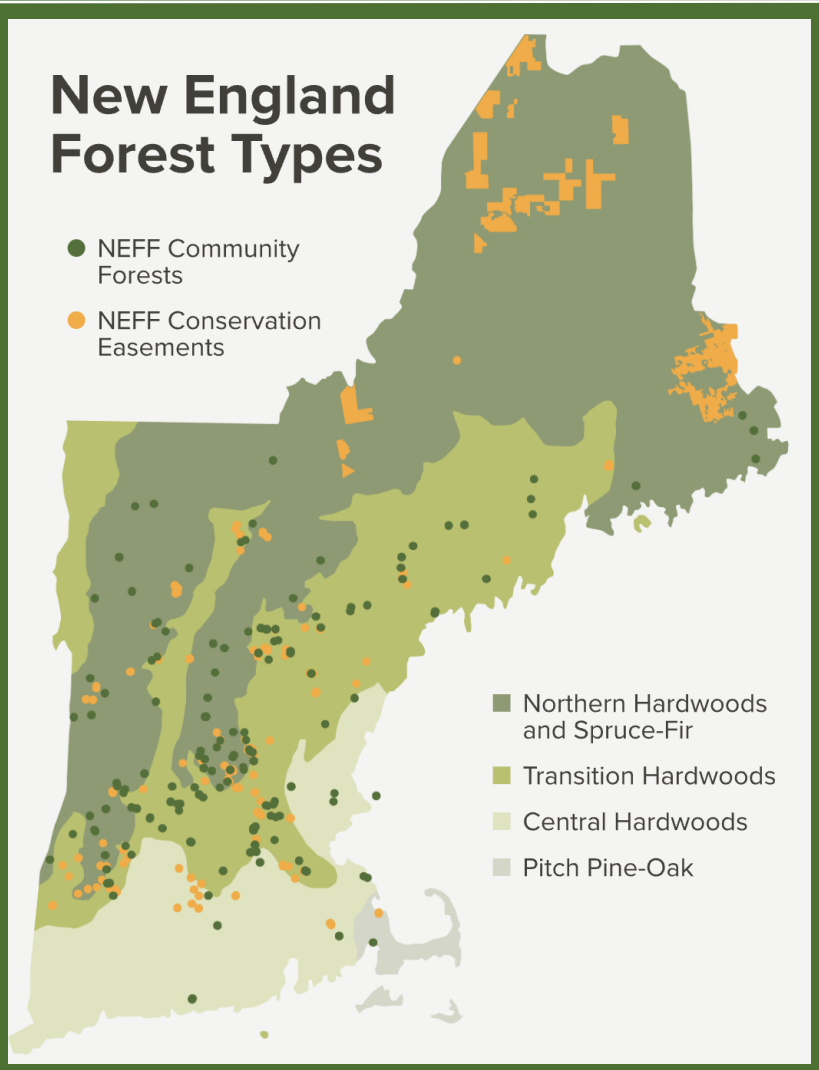
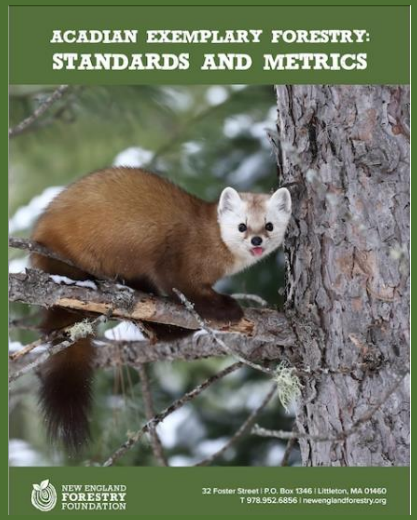
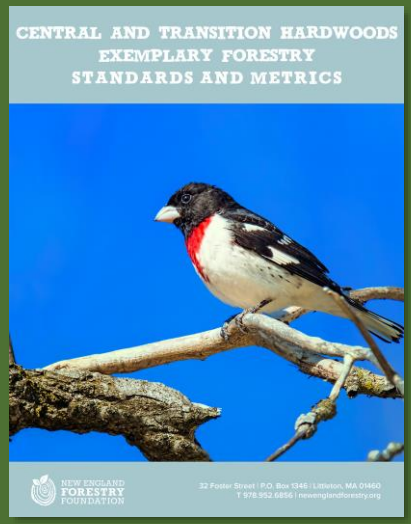
Exemplary Forestry Standards

(CSC Program will use a sub-set of Climate-Smart Forestry Practices)







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Exemplary Forestry: Quick check-list

(CSC Program will use a sub-set of Climate-Smart Forestry Practices)

The Forest will:

- Have more or as much carbon stored per acre in 30 years compared to today.
- Meet certain size distributions of sapling, pole, sawtimber and large diameter multi-storied timber stands.
- Be composed of stands of trees with more structural and age diversity.
- Consist of native species best adapted to the site and changing climate conditions.
- Contain habitat to support the identified keystone wildlife species which will also cover up to 85% of all species.
- Have wildlife habitat that is managed within the context of a landscape approach and attempt to create necessary habitat conditions not provided elsewhere in the landscape.
- Produce more long-lived forest products and less material that is used for short lived products, while it sequesters and stores more carbon.

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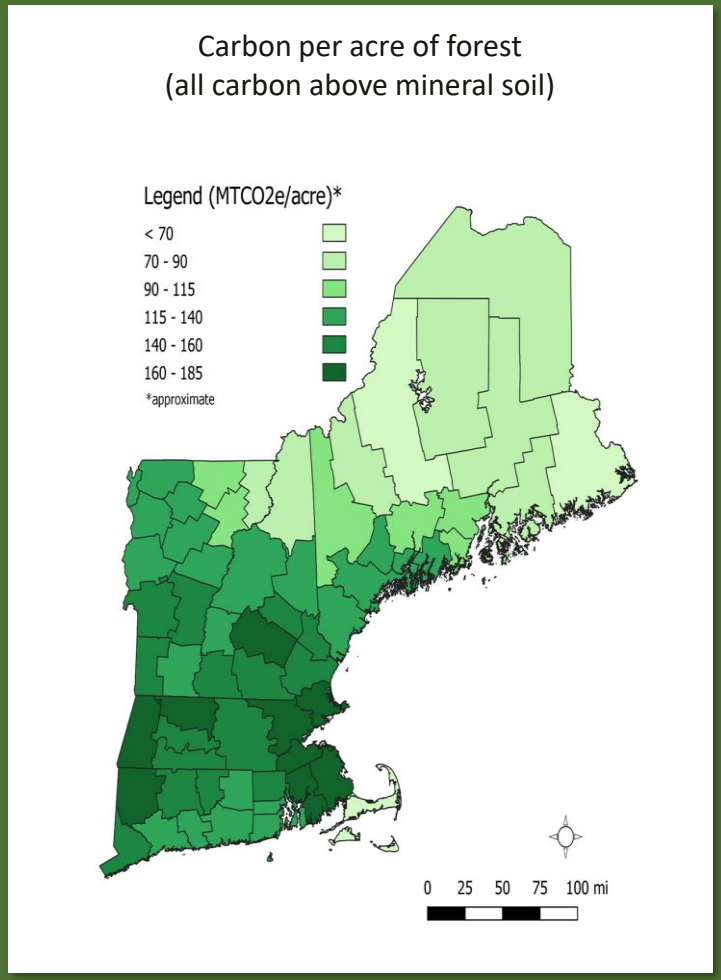
Major Carbon Sequestration & Storage Opportunity



Northern New England: Commodity production of pulp for bioenergy and paper has reduced average stocking and degraded many forest lands.

Southern New England: Decline of wood products industry has resulted in reduced harvests, with greater and greater carbon stocking, particularly near developed areas.

Same original stand regenerated at 40 years ago after a clearcut, on the same site within 100 yards of one another

No Treatment

Pre-Commercial Thinning 20 Years Ago

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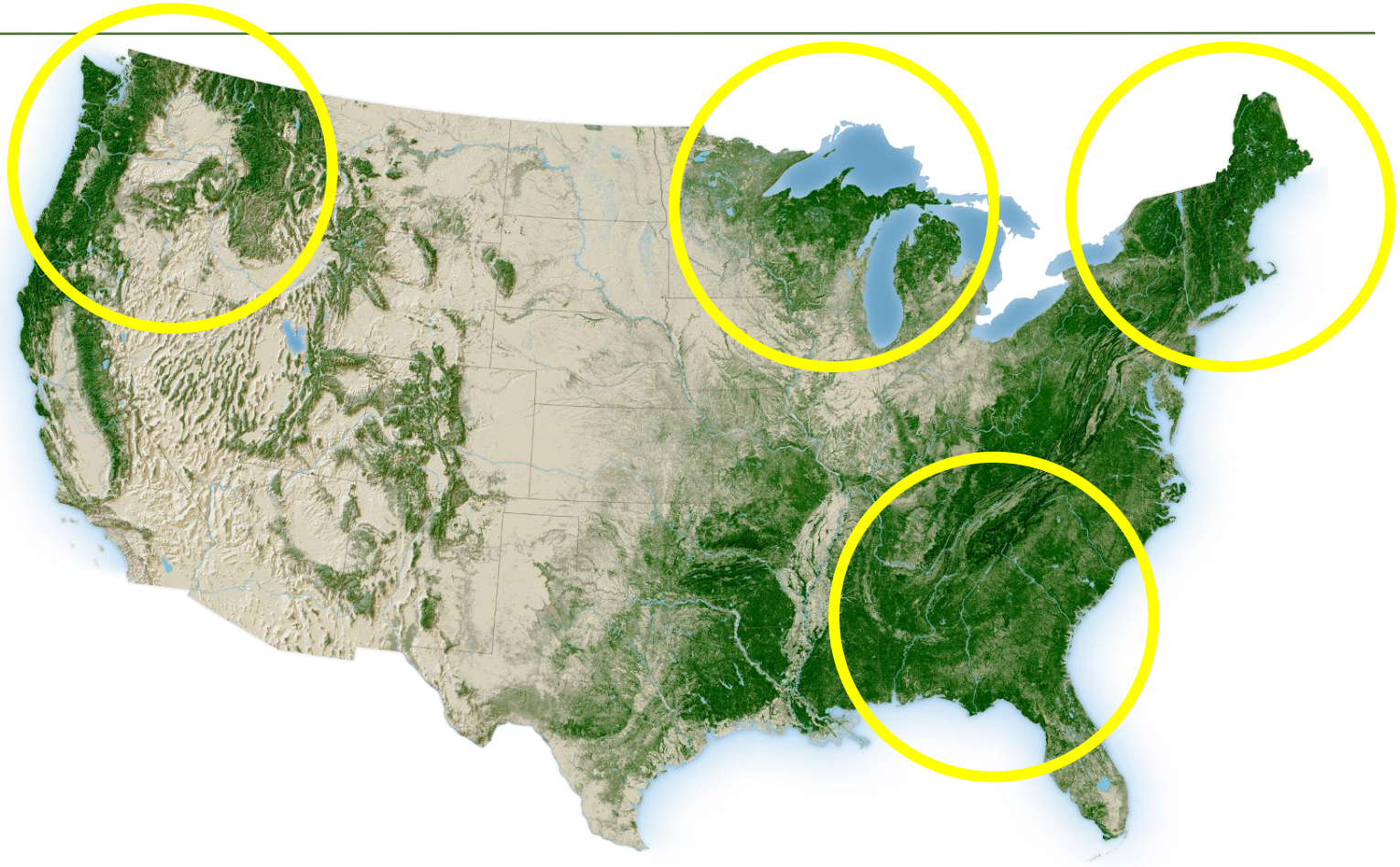
Forest Canopy Cover in the Contiguous United States



Source: United States Department of Agriculture (USDA) Forest Service

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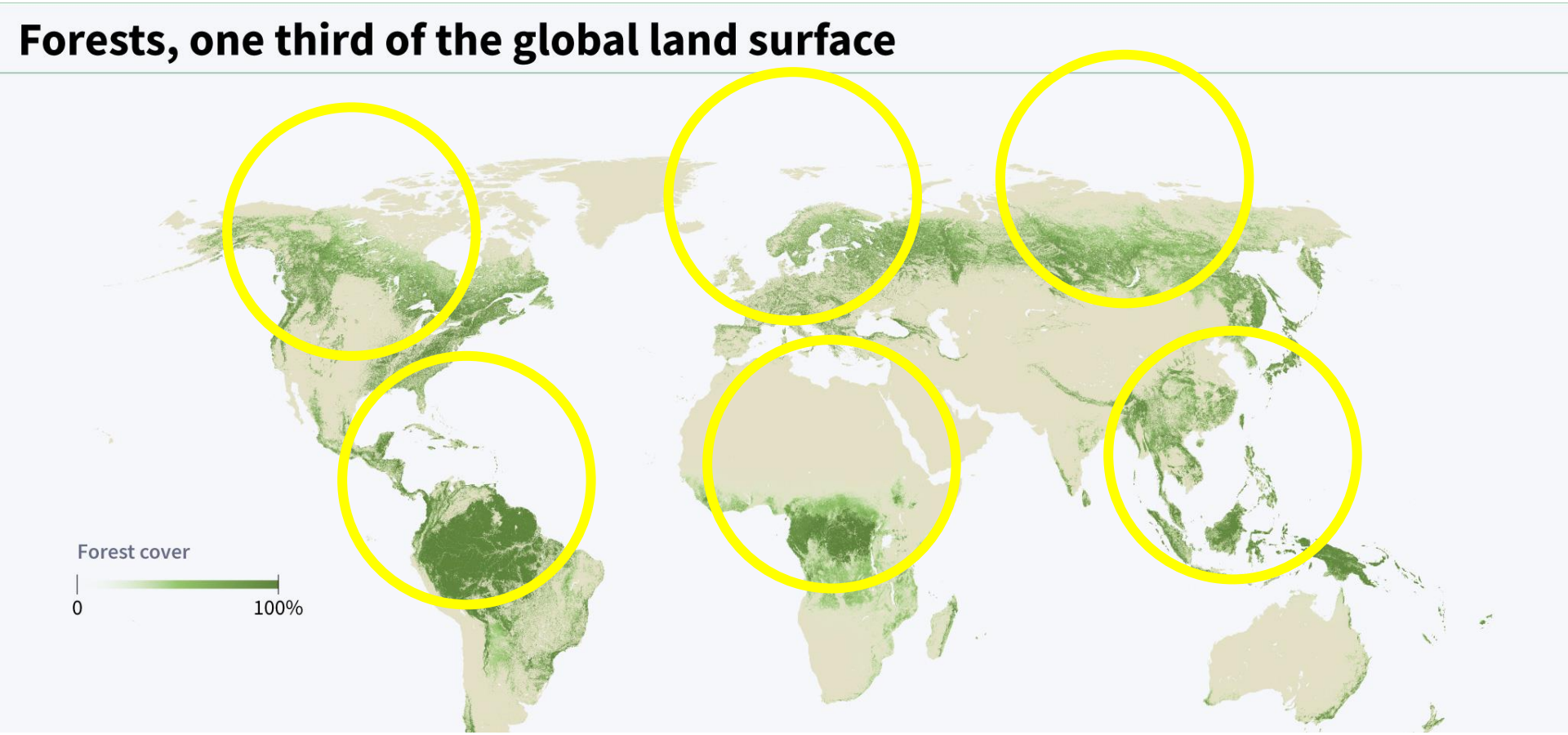
International Forest Canopy Cover



Source: Food and Agriculture Organization (FAO) of the United Nations

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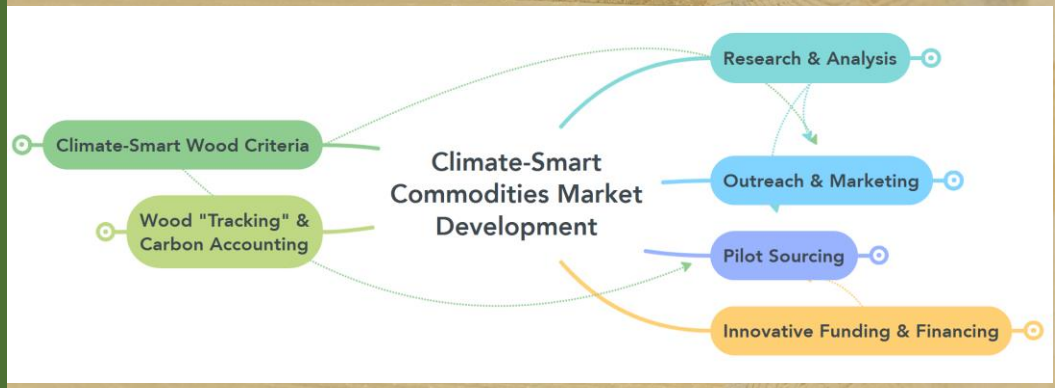
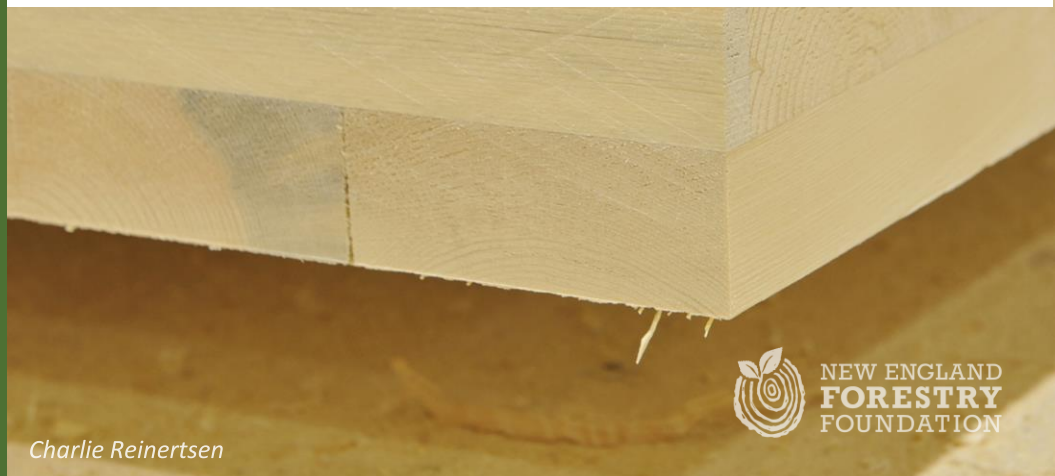
Program Area 2

Market Building

- Define mass timber market potential in the affordable housing sector.
- Provide mass timber technical guidance framework for affordable housing market.
- Design specifications for mass timber affordable housing.
- Conduct outreach to AEC industry and regional affordable housing agencies.
- Pilot climate-smart wood sourcing criteria and supply chain tracking (integrated w/ or complementing existing forest & building cert. programs).





Charlie Reinertsen

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Building a Low-Carbon Bioeconomy

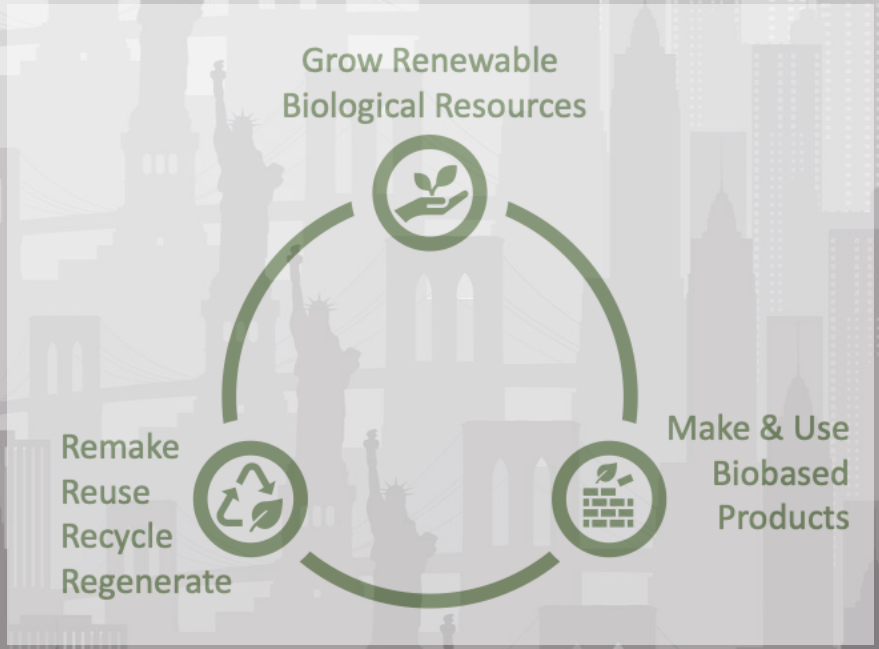

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Photo courtesy of TimberHP

Program Area 3

Measurement, Monitoring, Reporting & Verification (MMRV)

- In-forest carbon – Measure current and project future carbon and GHG benefits associated with climate smart forestry through Establishing a baseline for longer-term forest monitoring beyond the 5-year project period. Utilize FVS and LANDIS to model carbon benefits of improved forest management practices.
- Climate-smart forestry practices – NEFF will employ real time monitoring and verification of on-the- ground practices in collaboration with participating loggers, landowners, foresters and MLCP.
- Forest-based commodities – Quantify GHG benefits from wood products produced through this project

Lauren Owens Lambert

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From Pilot to Scale

USDA Pilot → Public/Private Funds → Implement at Scale

Build

(Design CS funding/financing)

- USDA CSC pilot program
  - Pilot CS incentives 70k acres
  - CS sourcing standards
  - GHG MRV
  - Mass timber markets
- Financial product design

Fund

(Secure funds/financing for CS incentives at scale)

- IRA, GHGRF, corporate investment
- Policy, outreach, stakeholders, communications
- Work at state, regional, national levels

Implement

(Implement at scale across NE)

- Commercial landowners
- Smaller landowners
- Loggers, foresters
- Wood products & markets
- MRV GHG outcomes
- Regional partnerships across US

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