

Mass Timber Construction Management: Design through Project Close Out

Sustainability of North American Wood Products

Presented by Melinda Gable



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Course Description

Sustainability of North American Wood Products

Responsibly sourced wood is the only renewable building material available; it is naturally grown and removes CO₂ from the atmosphere. Wood products then store the carbon that the growing trees have removed from the air. Certified forests and plantations will regrow to provide a wide range of other benefits such as further carbon storage, oxygen generation and forest habitat. Additionally, after decades or even centuries of use, wood buildings can be easily adapted or deconstructed and reused, which means they can continue to store carbon indefinitely. The production and processing of wood uses much less energy than most other building materials. Wood can be used to substitute for materials that require larger amounts of fossil fuels to be produced. Research has identified that the increased use of wood has measurable physiological and psychological health benefits. Wood is a natural insulator due to the air pockets within its cellular structure. As an insulator wood is 15 times better than masonry and concrete, 400 times better than steel, and 1,770 times better than aluminum. This helps to reduce the cost of heating and cooling a building.

Learning Objectives

1. Understand the difference in global forests vs. US forests
2. Understand types of forest owners and wood supply
3. Recognize the sustainability of U.S. forests
4. Role of forests in the climate solution
5. Carbon and the built environment: Benefits of building w wood
6. How wood markets *help not hurt* the sustainability of U.S. forests

TO **SUSTAIN** PRIVATE FOREST.

WE MUST **SUSTAIN** THE
PEOPLE WHO OWN THEM.



OUR UNIQUE POSITION



We are a landowner organization.



To protect the forests, you must promote the interests of those who own, manage and make a livelihood from their natural resources.

Only then will the ultimate goal of conservation of America's private forests be achieved.

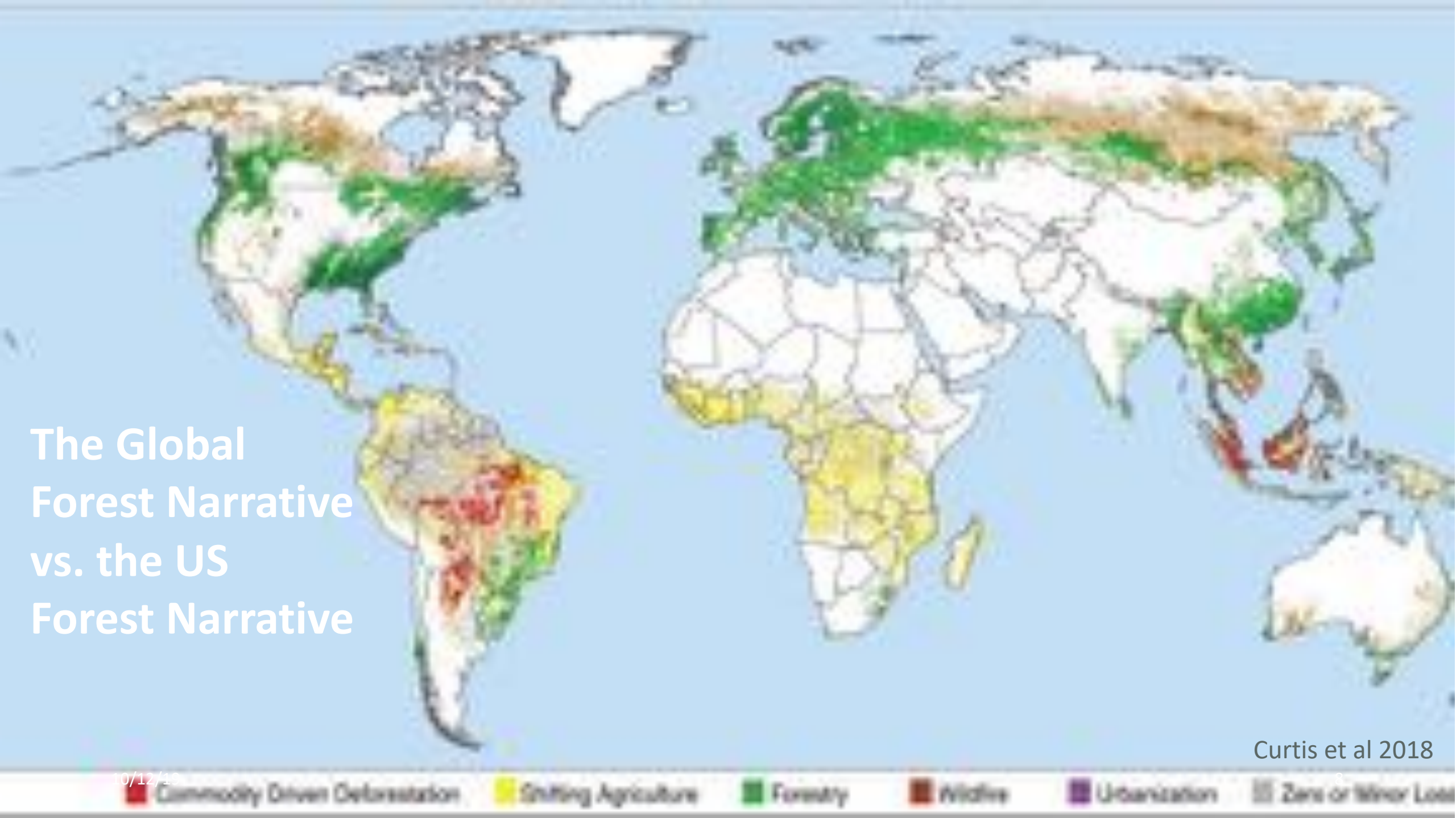
The US Forest Narrative

What's being said about US forests and their owners?

- ✓ MARKETS ARE NOT A CONCERN.
- ✓ PRIVATE FOREST LANDOWNERS LACK MANAGEMENT PLANS.
- ✓ PRIVATE LANDOWNERS DO NOT PRACTICE SUSTAINABLE FORESTRY.
- ✓ FORESTS ARE DISAPPEARING.



The Global Forest Narrative vs. the US Forest Narrative



Curtis et al 2018

10/12/18

8

Myth

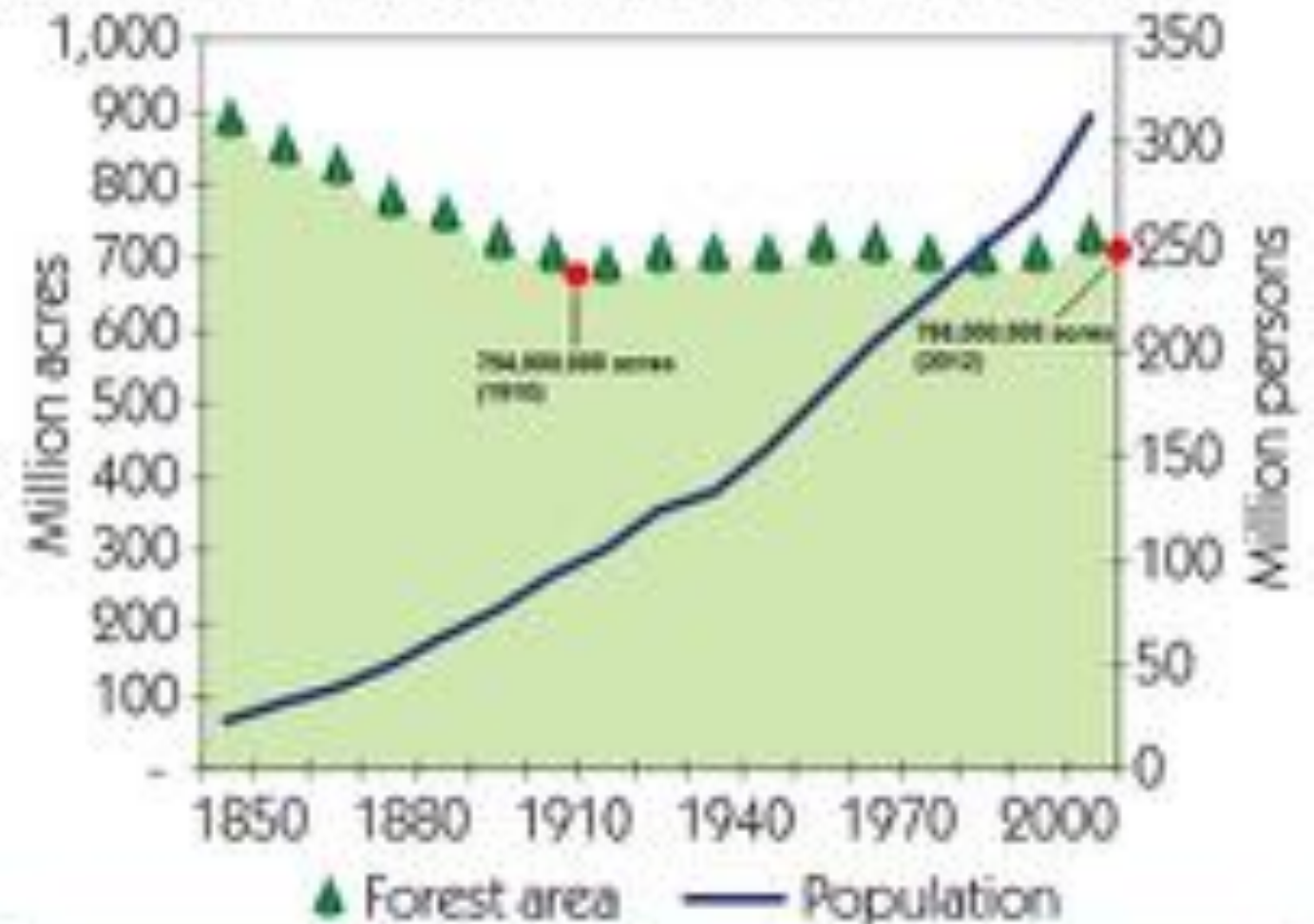
US Forests Are Disappearing

12/10/19

"U.S. Forest Resource Facts and Historical Trends"

United States Department of Agriculture (USDA) Brochure, August 2014

https://www.fia.fs.fed.us/library/brochures/docs/GS12ForestFacts_1982-2012_English.pdf



Forest area and population trends in the United States, 1850–2010.

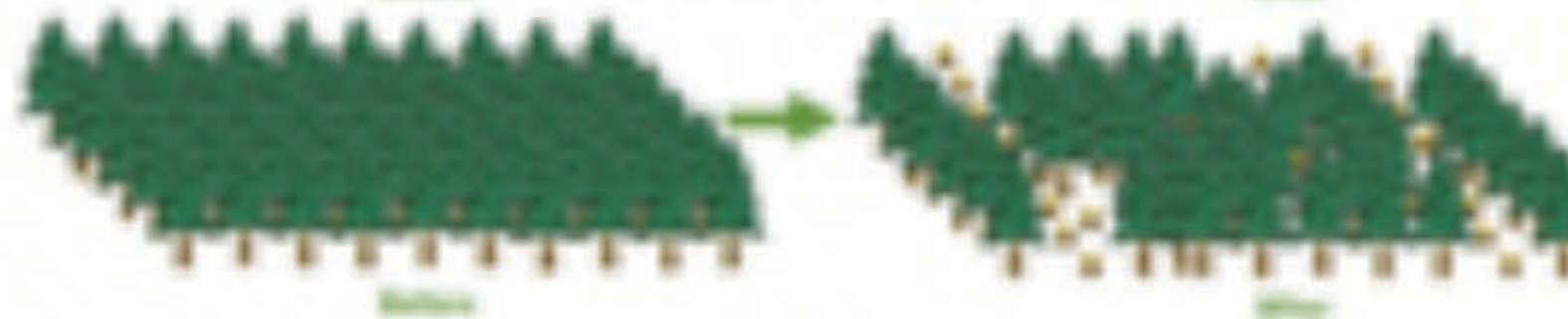
CLEAR CUTTING



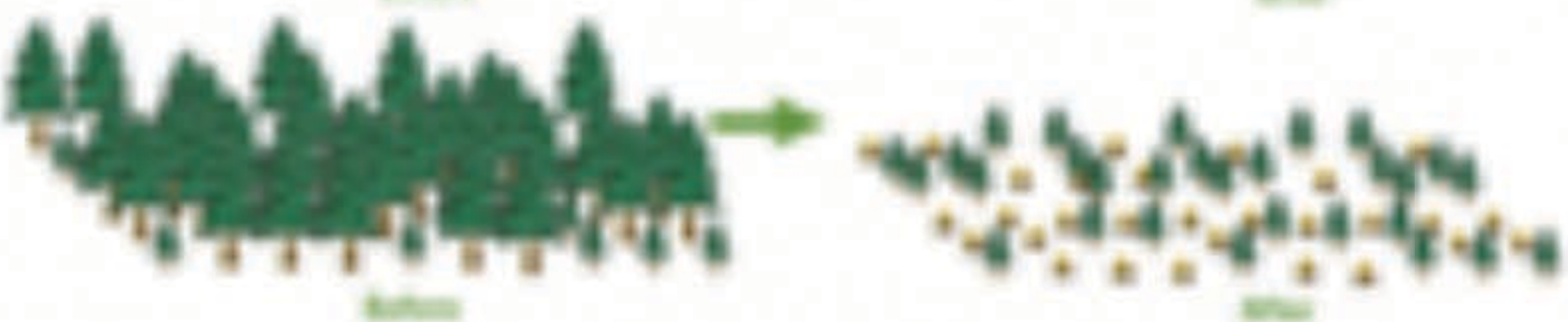
PATCHWORK HARVESTING

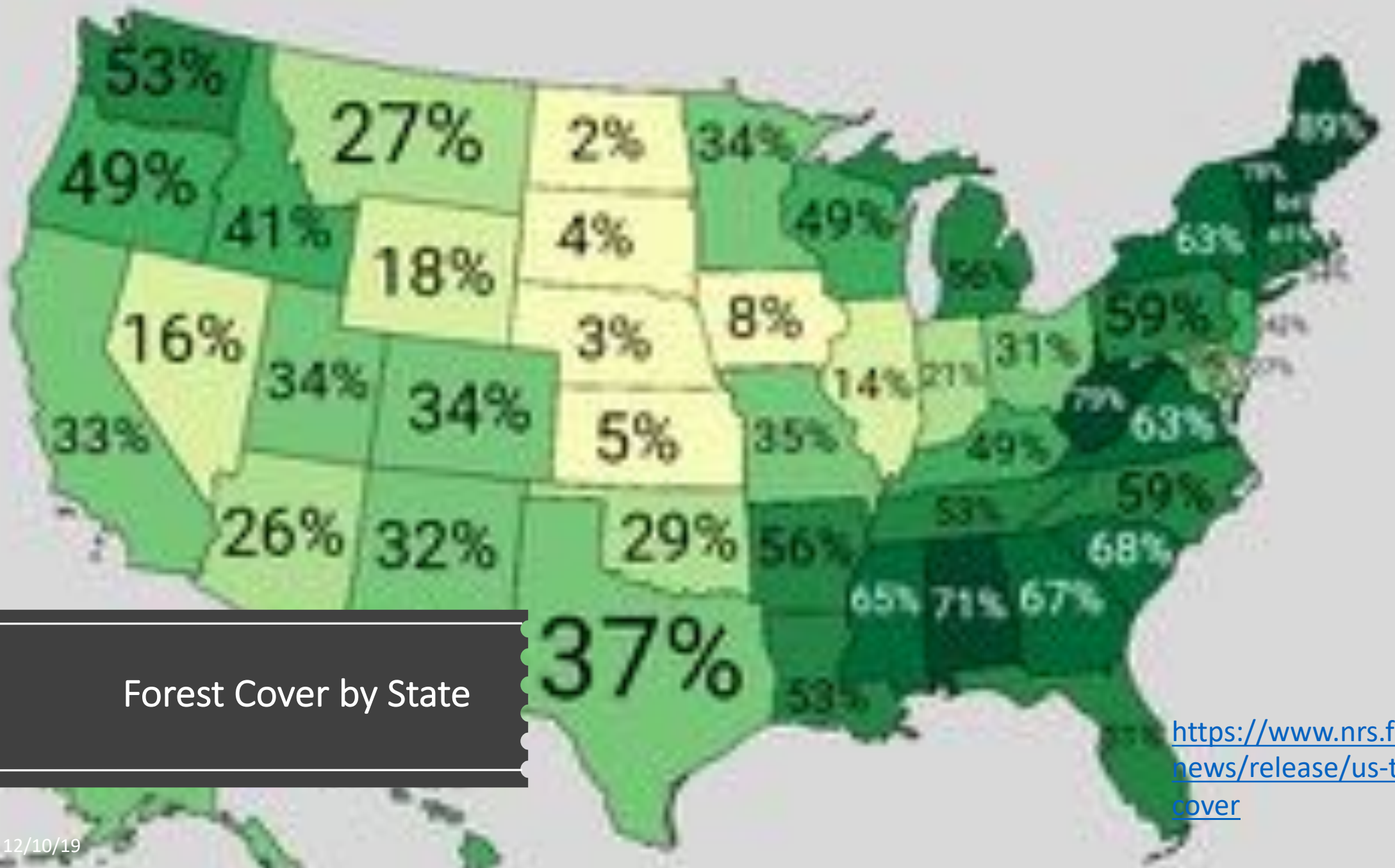


THINNING & SELECTION HARVESTING



SHELTERWOOD HARVESTING





Forest Cover by State

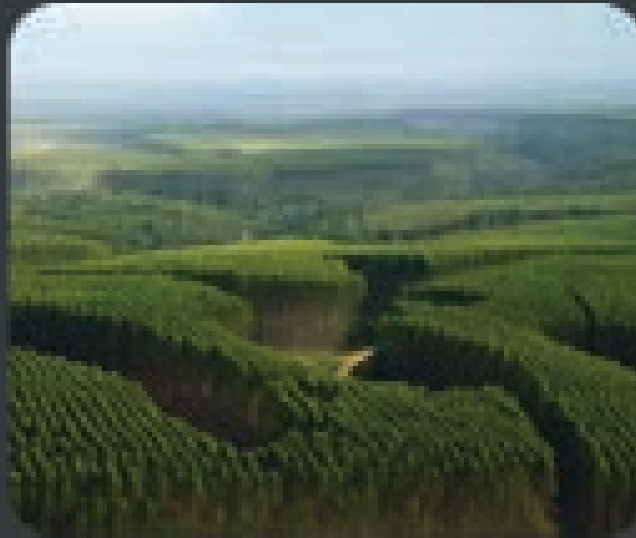
<https://www.nrs.fs.fed.us/news/release/us-tree-cover>

Who Owns the Forests

Federal and State
Owners

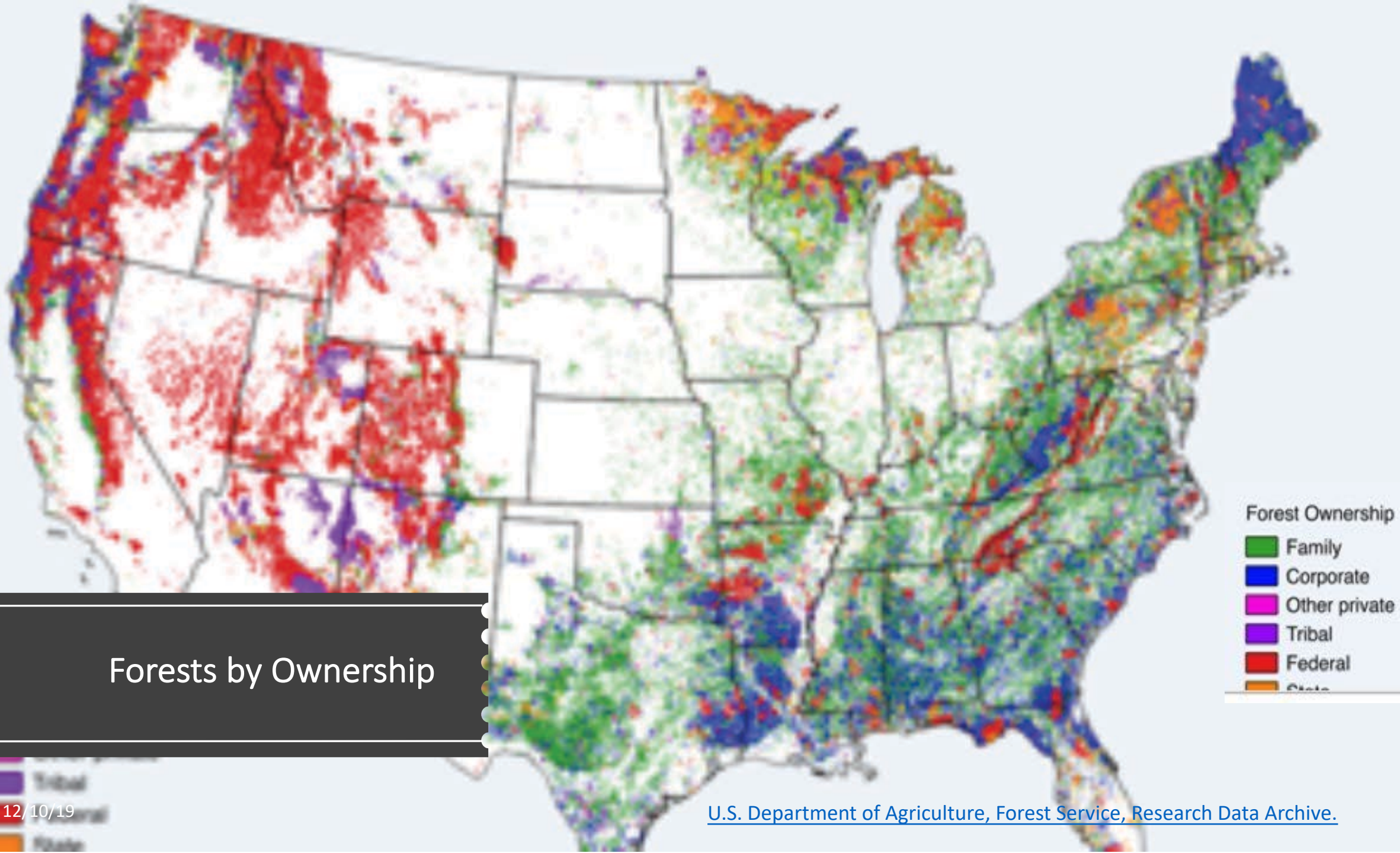


Corporate Owners



Family Forest Owners

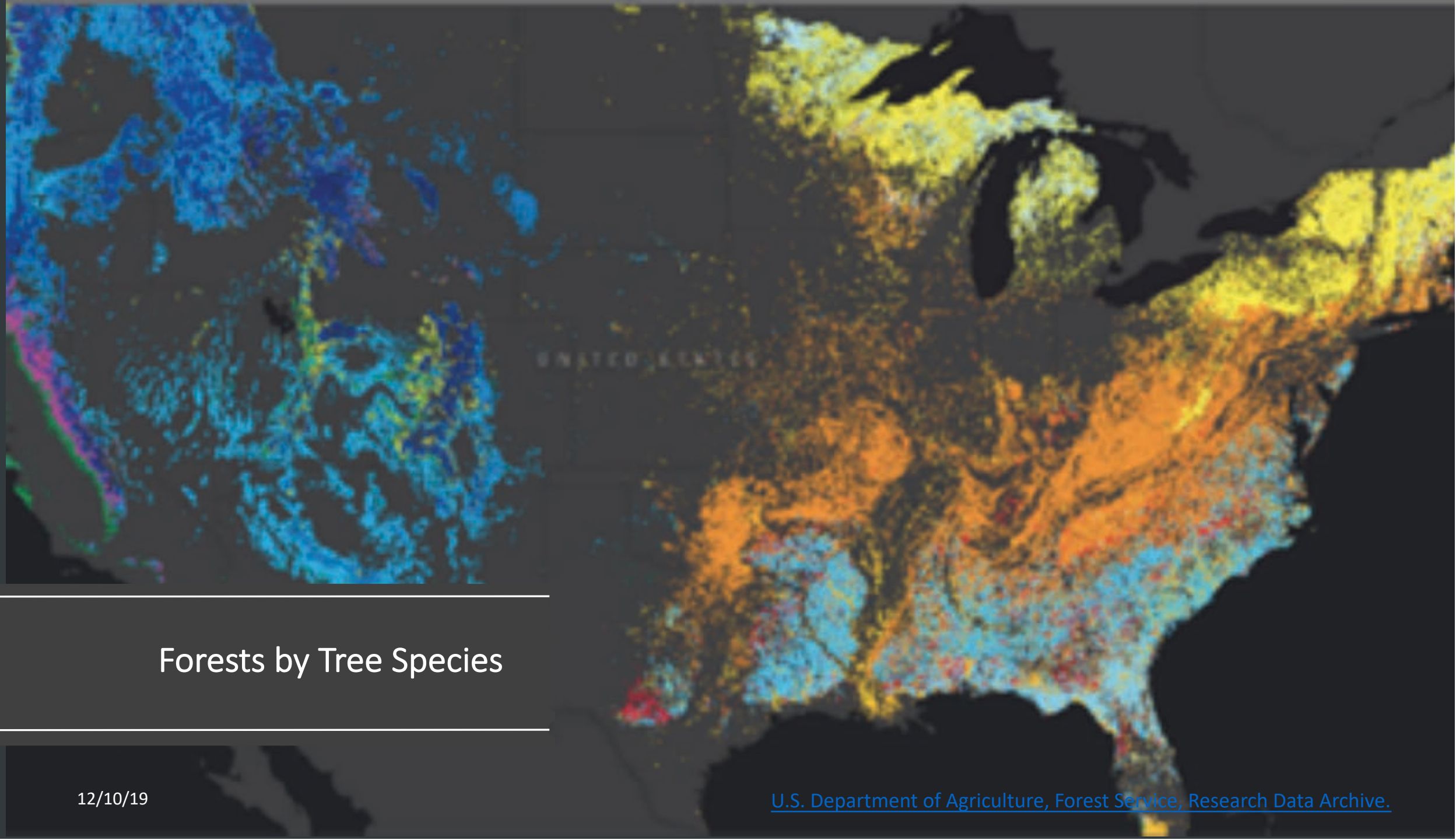




Forests by Ownership

12/10/19

[U.S. Department of Agriculture, Forest Service, Research Data Archive.](#)

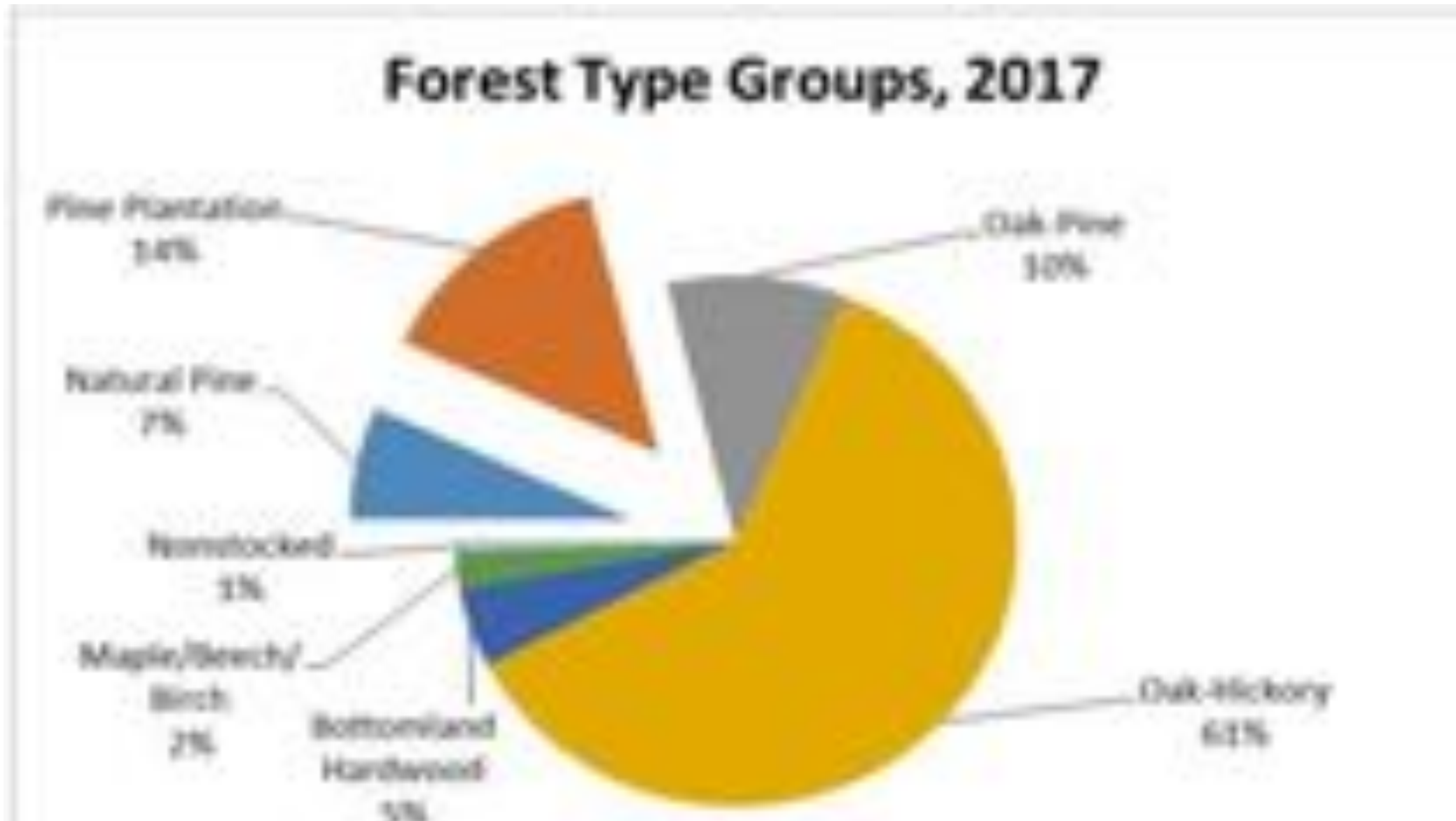


Forests by Tree Species

12/10/19

[U.S. Department of Agriculture, Forest Service, Research Data Archive.](#)

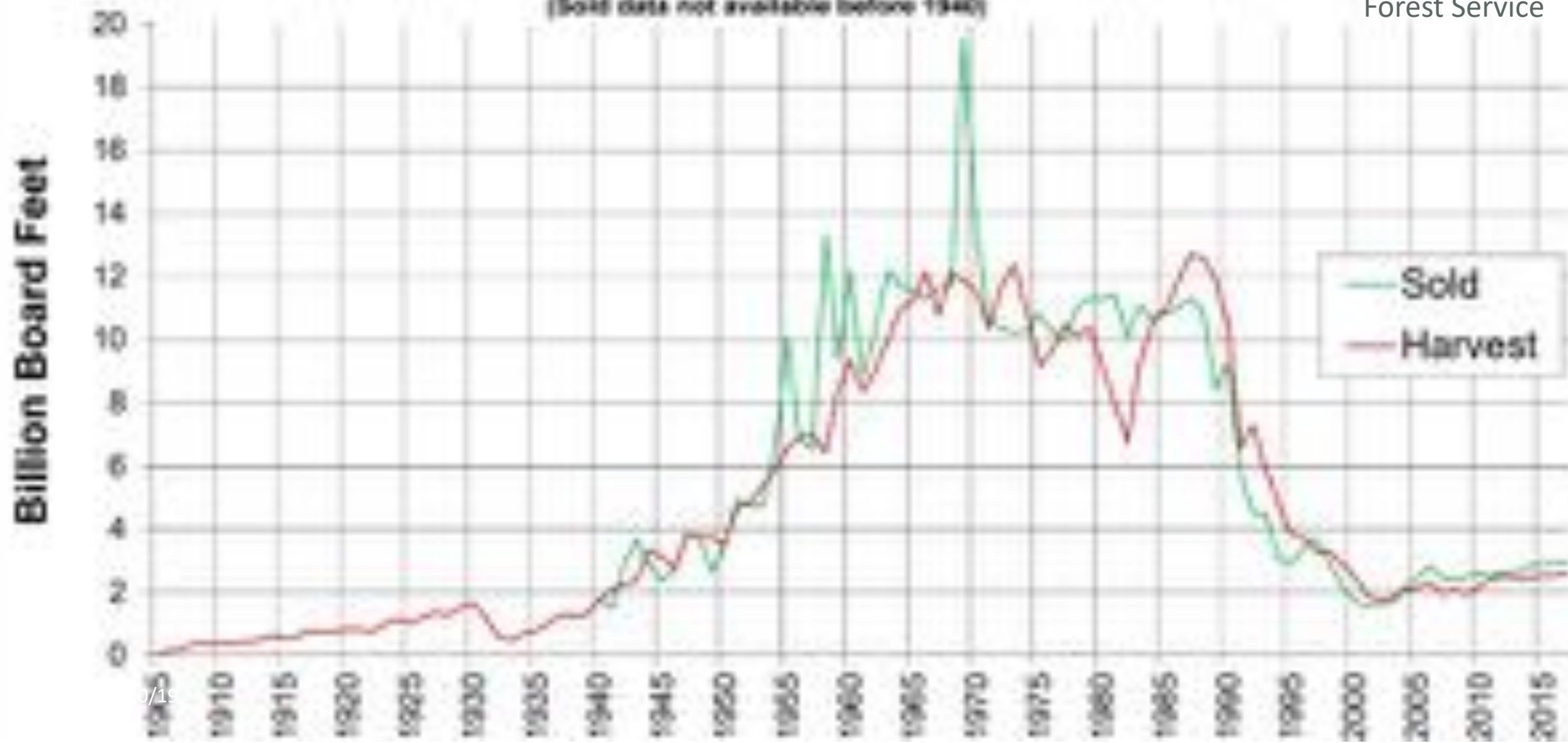
Virginia

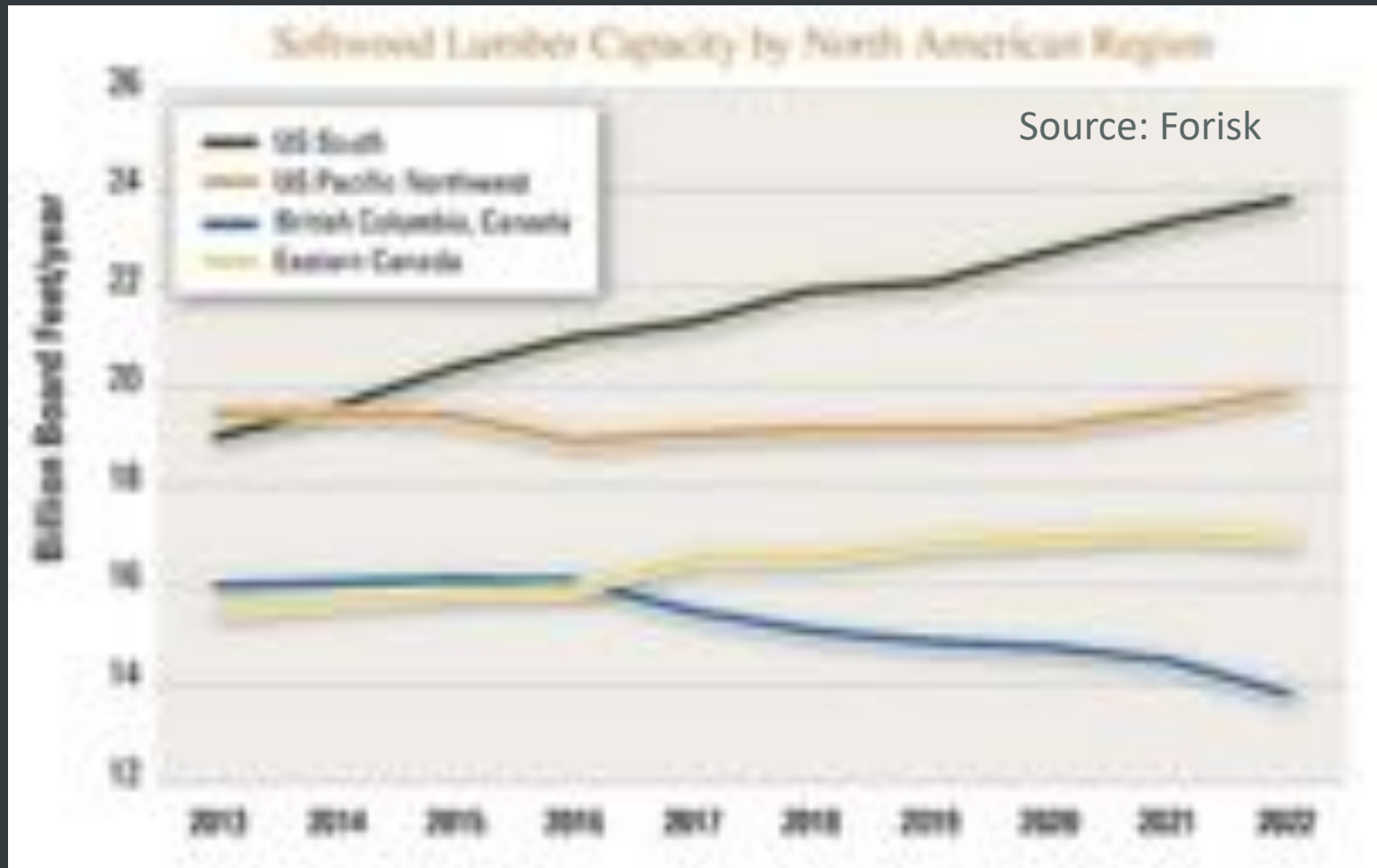


TIMBER SOLD AND HARVESTED 1905-2017

National Forest System
(Sold data not available before 1940)

FY 1905-2017
National Summary
Cut and Sold Data
and Graphs USDA
Forest Service





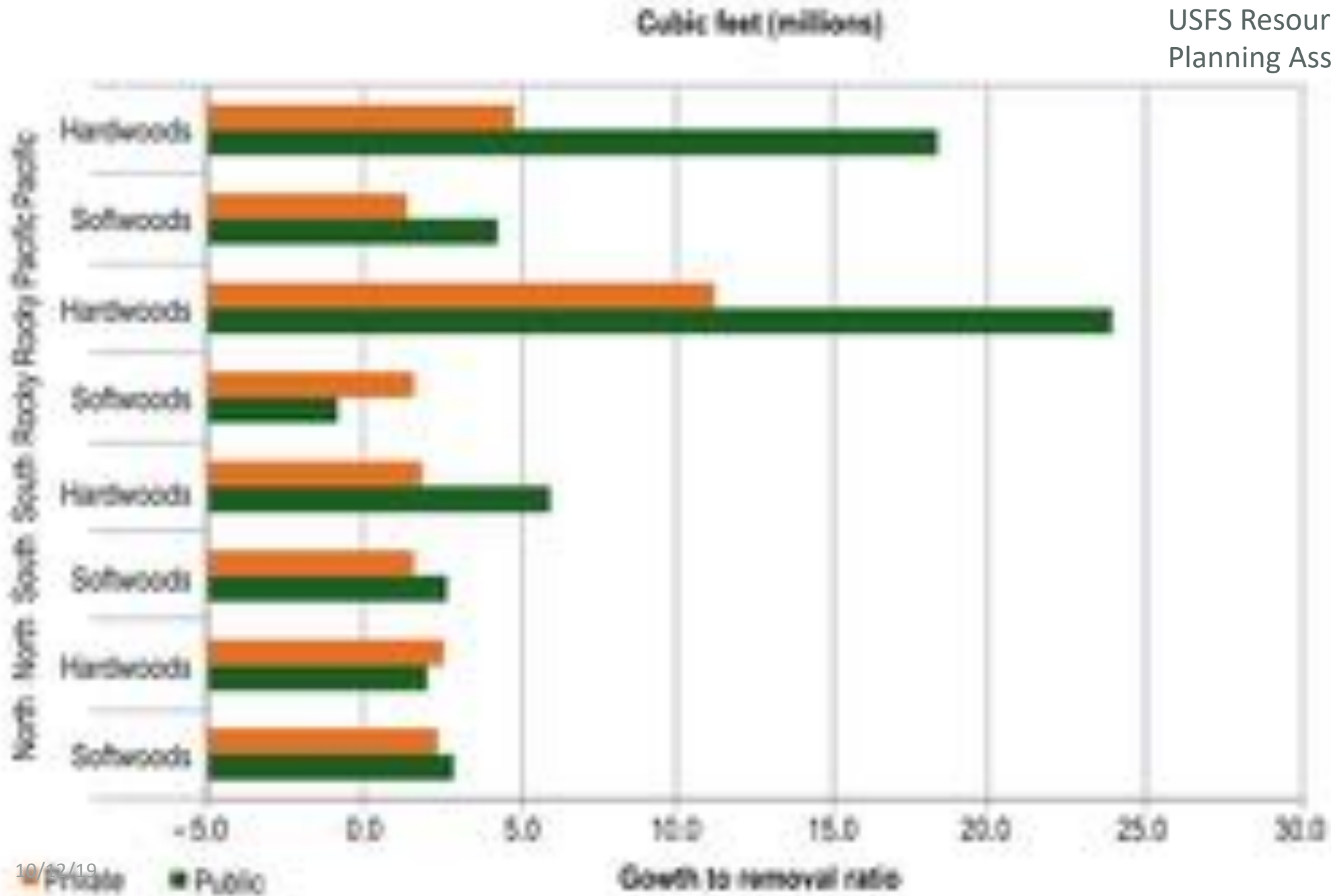
Forests vs. Timber

- Forest Inventory
- Commercially available timber supply
- Age Classes
- Harvests removals

Timber vs. Forest

Timberland is land

- 1) with at least 10 percent canopy cover by live trees of any size, including land that formerly had such tree cover and that will be naturally or artificially regenerated,
- 2) not withdrawn by statute or administrative regulation prohibiting the management for production of wood products, and
- 3) capable of growing at least 20 cubic feet per acre per year.



Virginia Forest Cover

62% Forest

Forests = 16 million acres

Timber = 15.3 million acres

Reserved = 500,000 acres

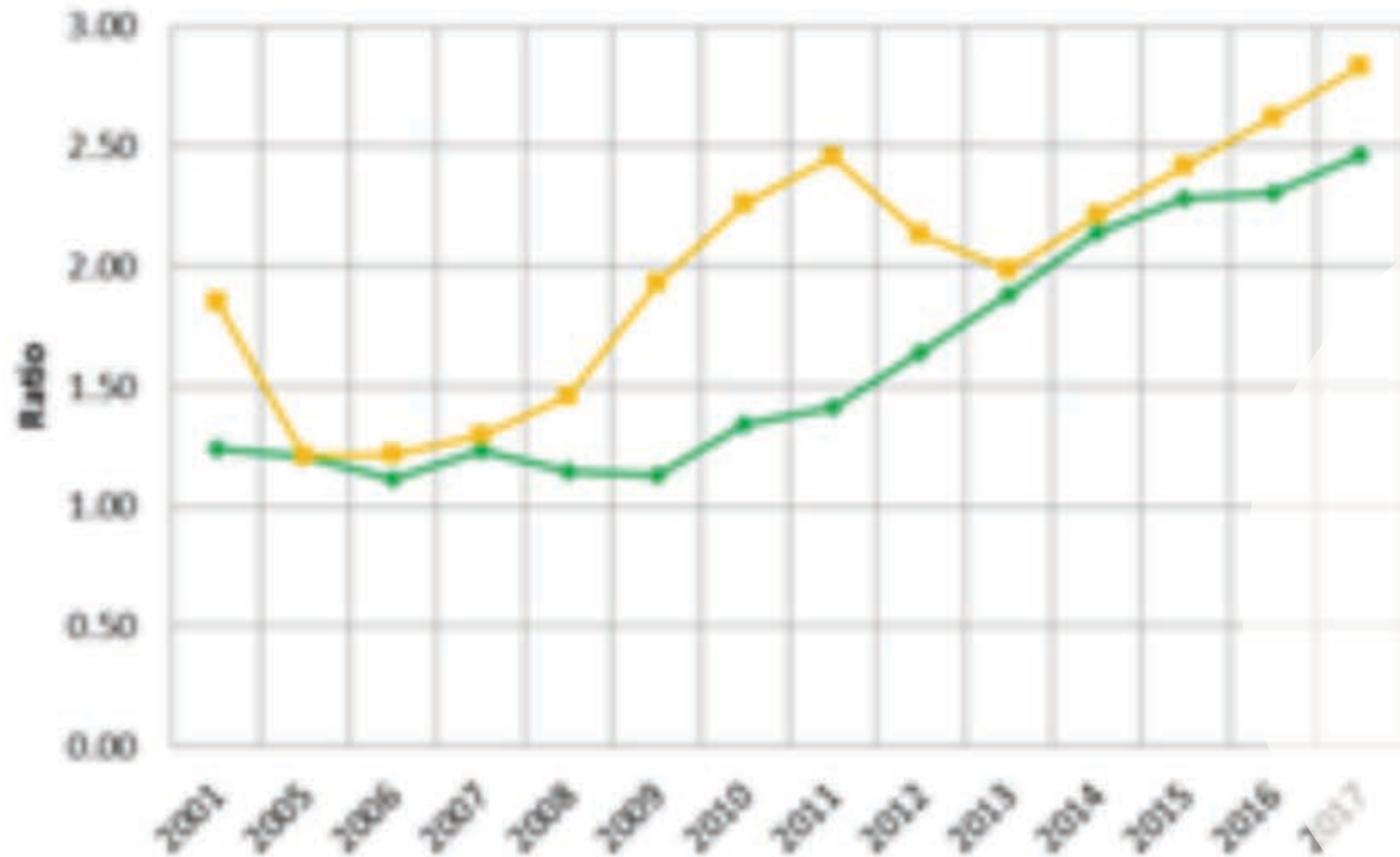
Private ownership = 13 million

Family ownership – 9.8 million



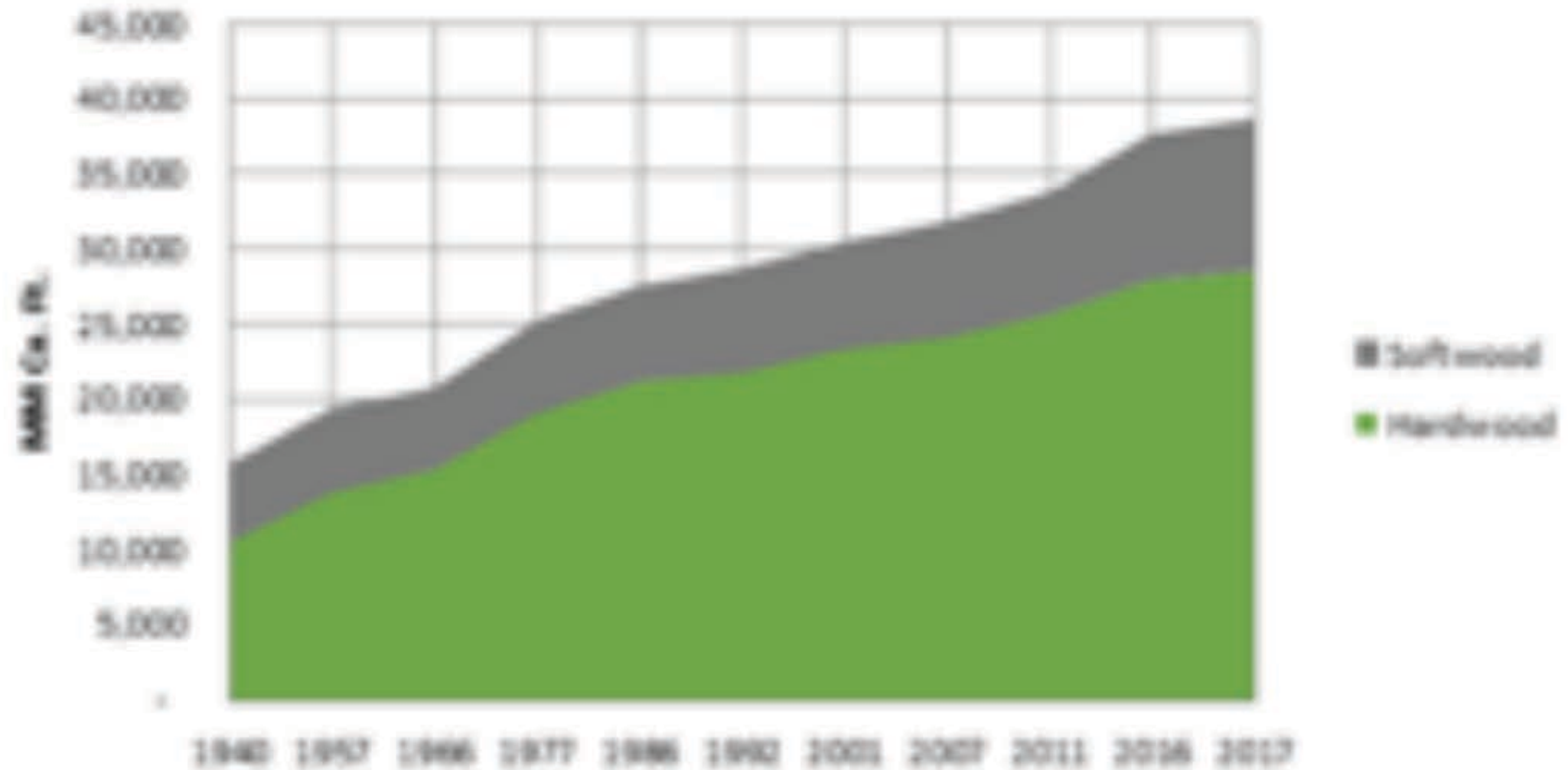
2011 National Land Cover Dataset (NLCD)

Net Growth to Removals Ratio for Softwood & Hardwood on Timberland, Statewide



Virginia has annual surplus of 10.5 million tons of softwood and 17.6 million tons of hardwood statewide on commercial

Volume of Softwood & Hardwood on Timberland in VA, 1940-2017





MYTH

We do not practice sustainable forestry



Sustainable Forestry in the United States



US Forests Are Sustainably Managed

Federal and State Laws



Opt-in Certification Programs



Best Mgmt. Practices

- › State Forestry Divisions
- › Began in 1970s
- › 91% Compliance



Timber Assurance



Sustainable Forestry + Markets = Keeping Forests as Forests




Wood Markets Underpin Everything



TOP 5 REASONS FOR OWNING FORESTLAND

- 1 Timber
- 2 Land Investment
- 3 Wildlife
- 4 Legacy
- 5 Beauty

THE WALL STREET JOURNAL

A photograph of a man with white hair and glasses, wearing a light blue button-down shirt, standing in a forest. He is looking upwards with a thoughtful expression. The background is filled with tall, thin trees and green foliage.

Thousands of Southerners Planted Trees for Retirement. It Didn't Work.

Tax breaks for planting trees were supposed to encourage retirement savings. But many people never planted a tree.







12/10/19



All farmers need markets




The Role of Forests in the Climate Solution





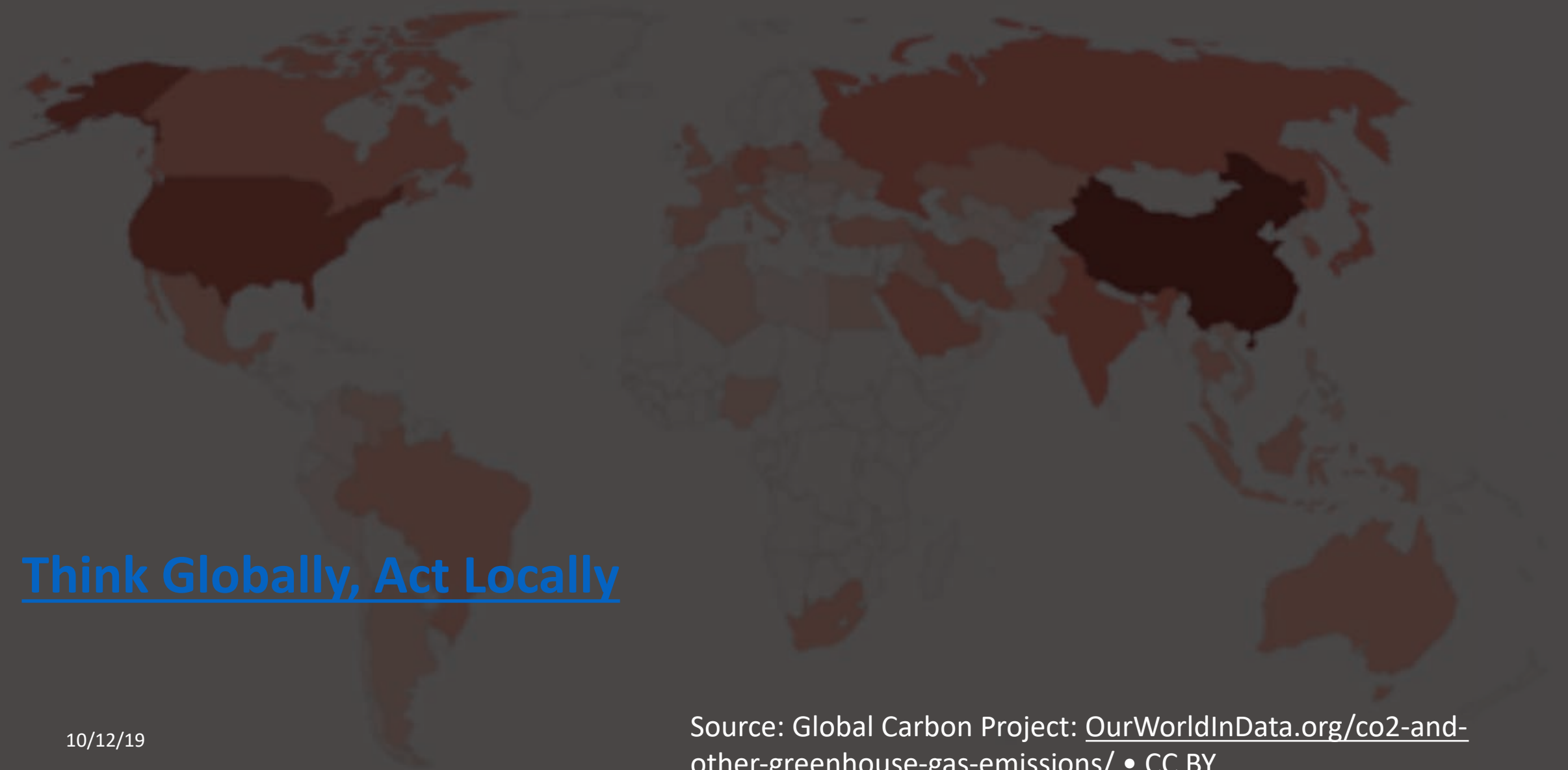
The US Forest Carbon Accounting Framework: Stocks and Stock change 1990-2016. Gen. Tech. Rep. NRS-154. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 49 pp.



**How much
carbon is
stored in U.S.
forests?**

Annual CO₂ emissions, 2017

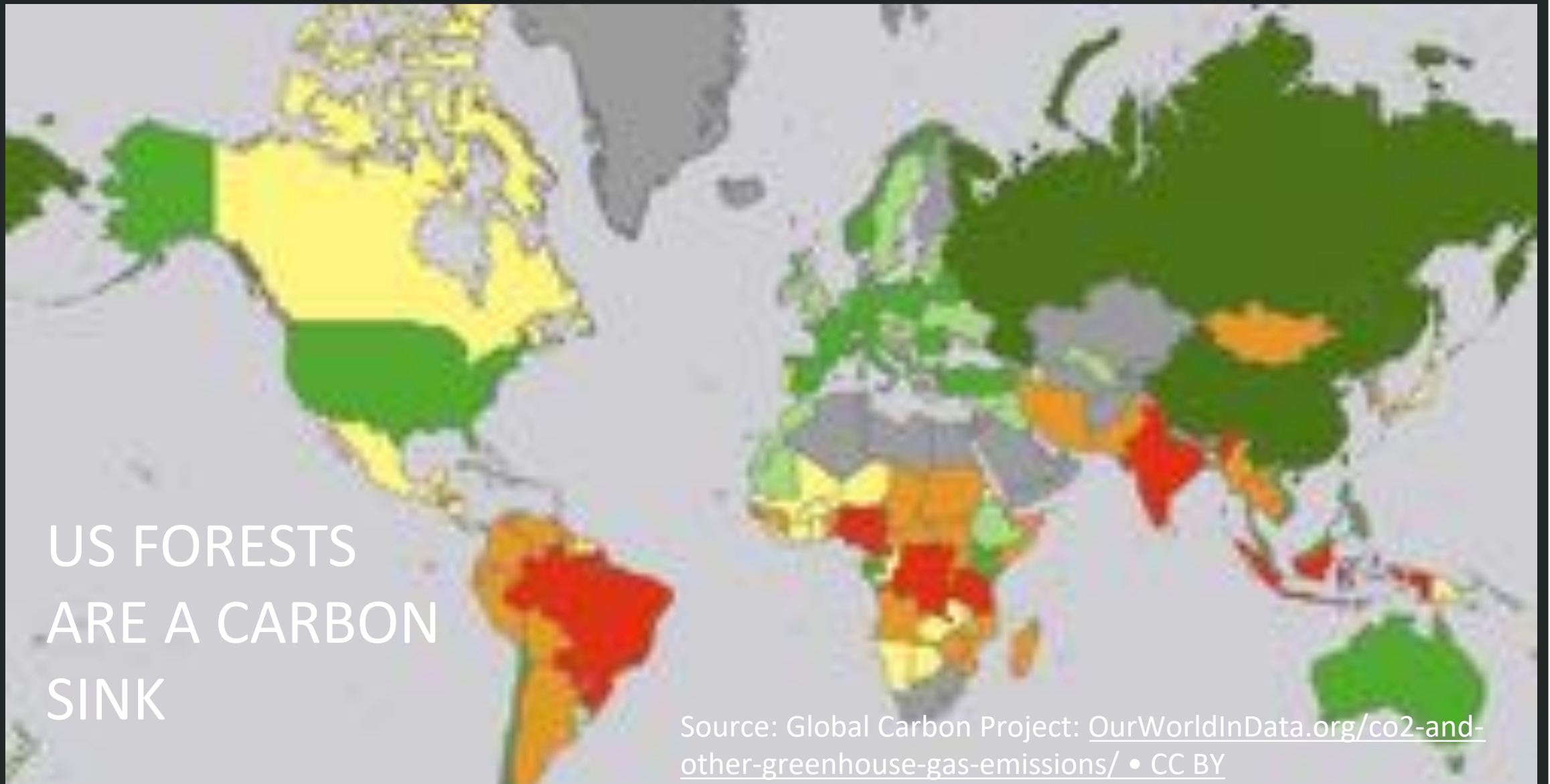
Annual carbon dioxide (CO₂) emissions, measured in tonnes per year



Think Globally, Act Locally

10/12/19

Source: Global Carbon Project: OurWorldInData.org/co2-and-other-greenhouse-gas-emissions/ • CC BY





Carbon and the Built Environment

Built Environment Statistics

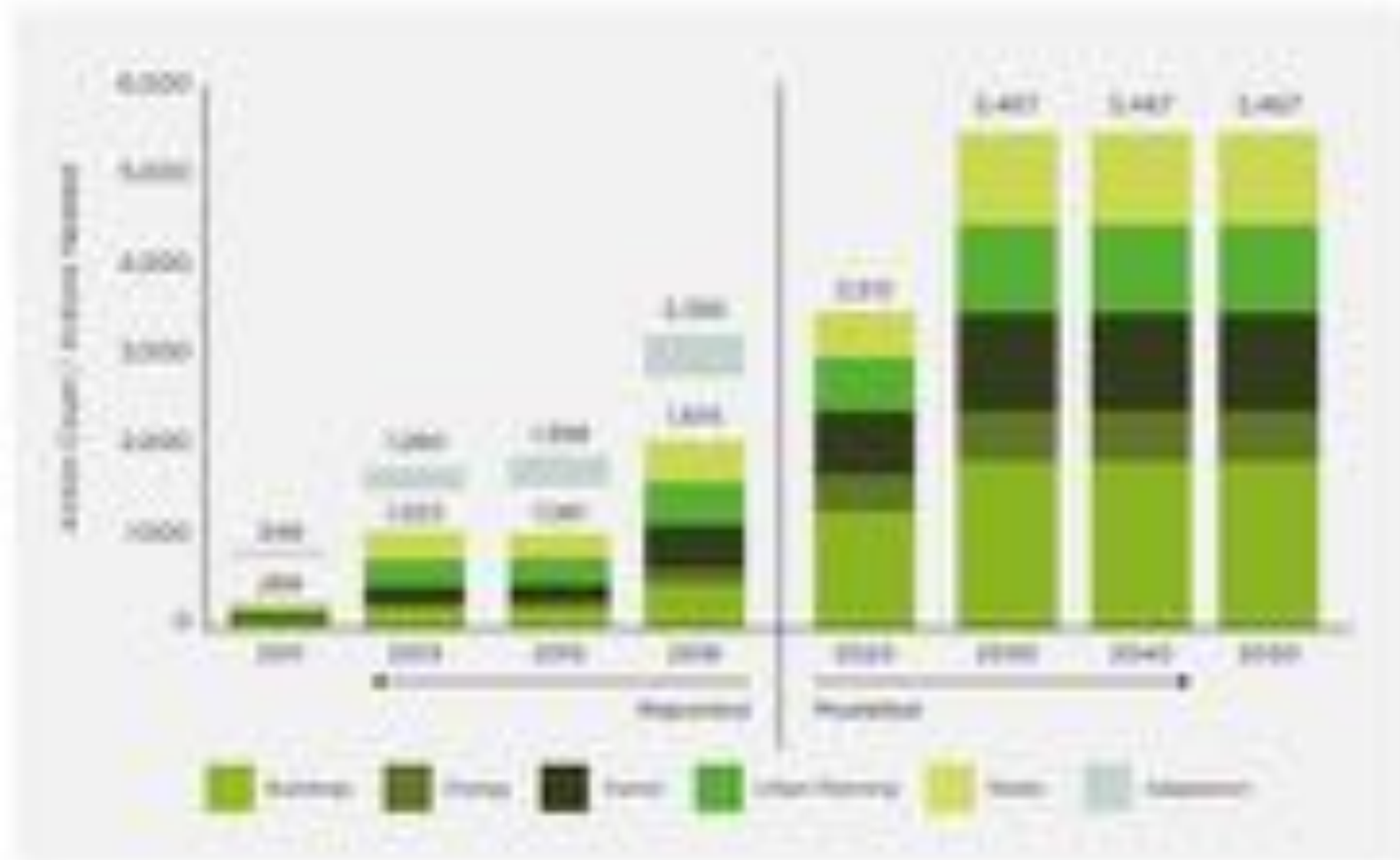


Buildings represent
28% of global
energy-related CO2
emissions

Building construction
represents another
11% of energy-related
CO2 emissions

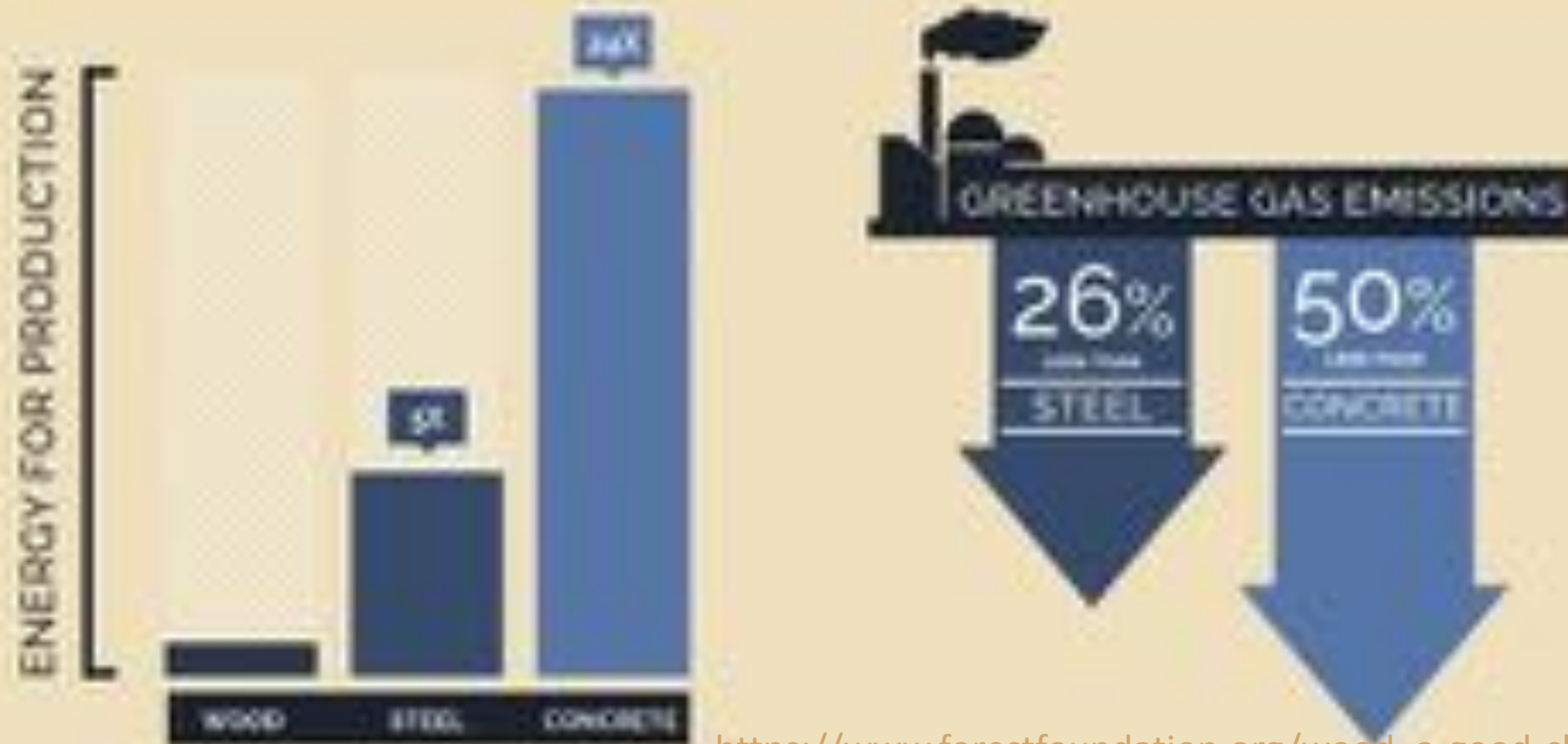
Global building stock
is expected to double
before 2050

Figure 1. Historic reported action profile for U.S. cities, and the scale of action required over the next years.



BENEFITS OF BUILDING WITH **WOOD**

Wood and wood products need the least amount of energy to manufacture and has the lowest impact on air and water quality.



<https://www.forestfoundation.org/wood-a-good-choice-for-energy-efficiency-and-the-environment>

Life Cycle Assessment is potentially the most important method for assessing the overall environmental impact of products, processes or services



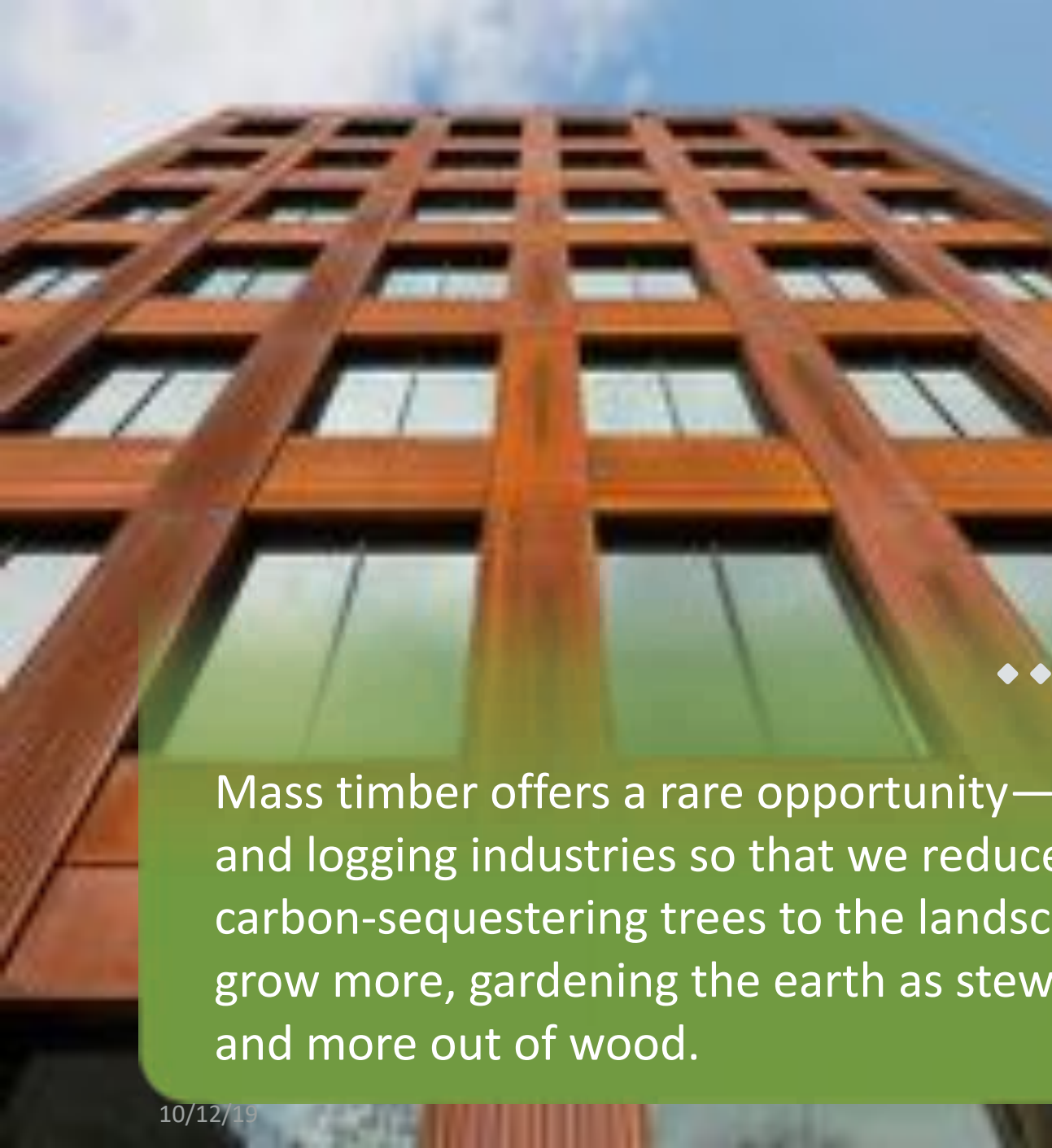


Why Build With Wood?

Renewable Resource

It's a solution not a problem

- Exceeds other building materials in several areas
 - Environment
 - Cost savings (construction and energy)
 - Well beingness all the way around



Mass timber offers a rare opportunity—a chance to transform the construction and logging industries so that we reduce emissions while adding millions of carbon-sequestering trees to the landscape. We'll cut them down and then grow more, gardening the earth as stewards living in a built world made more and more out of wood.

America's oldest standing
wooden home is still
holding 400-year old
carbon. Dedham, MA

YOU can be part of the
carbon solution.

Build with WOOD!

TO **SUSTAIN** PRIVATE FOREST.

WE MUST **SUSTAIN** THE
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> QUESTIONS?

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