

1

Course Description

This presentation will address the environmental impacts of harvesting wood, and answer many questions about forests and forest products, such as: What makes wood a green building material? Where do our trees and forests grow? Why is wood an environmental-friendly choice? How are forests and forest products sustainable?

2

Learning Objectives

1. Describe the abundant ecological capacity of North America to support a wide distribution of forests and forest types.
2. Understand how the symbiotic relationship between forests and the people of North America have evolved over the past centuries.
3. Discuss how the use of a variety of forest products can economically support sustainable management of forest lands.
4. Describe how to quantify environmental choices in the selection of materials through the use of LCA and carbon accounting.

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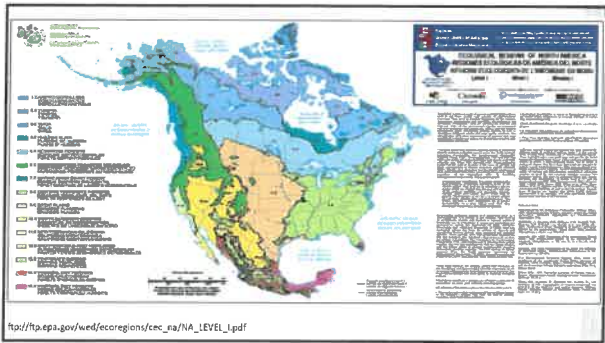
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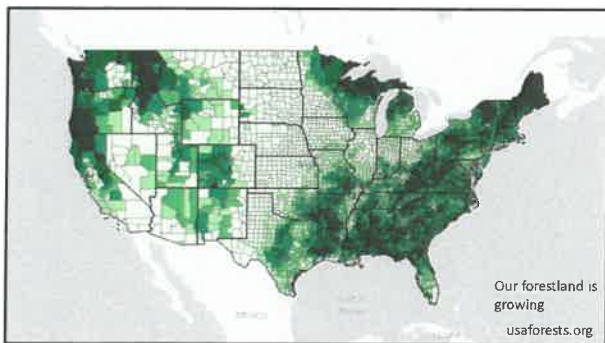
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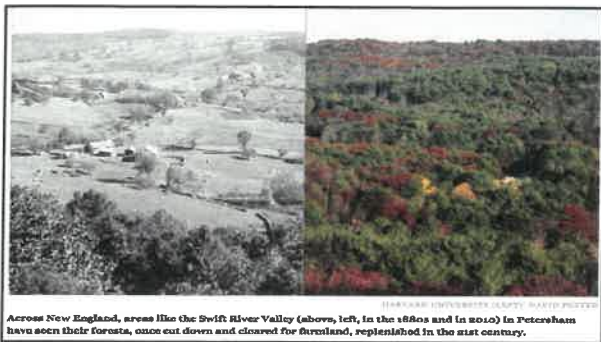
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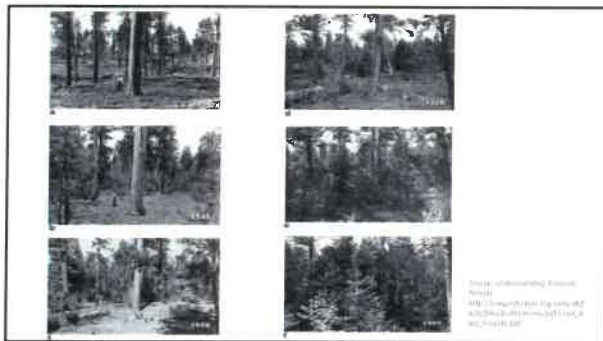
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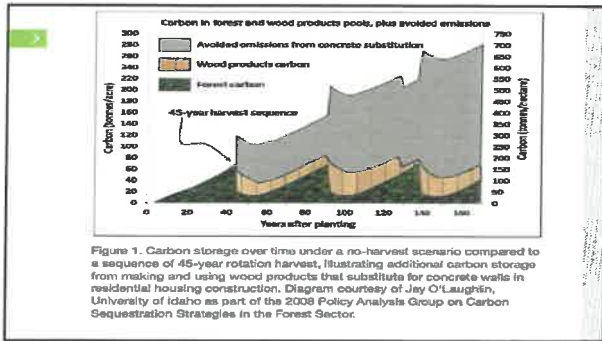
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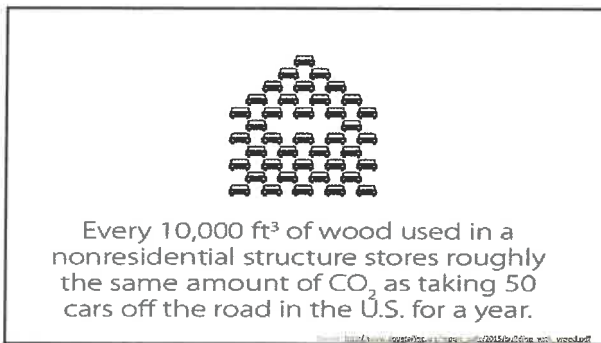
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23

From Accelerating Restoration To Creating and Maintaining Resilient Landscapes and Communities Across the Nation
17th Anniversary Report 2012

- Need restoration on 65 to 82 million acres
- Doing 4-5 million acres of restoration per year

Annually:

- 1.256 bbf of timber,
- \$661 million in local labor income, and
- 4,360 jobs

Source: <http://www.fs.fed.us/restoration/>

24

Tuffa, Marina del Rey, CA

Over 1.5 million board feet of wood

Over 1.5 million board feet of wood

Over 1.5 million board feet of wood

Over 1.5 million board feet of wood

Over 1.5 million board feet of wood



25

Marina del Rey, CA

1.256 bbf of timber

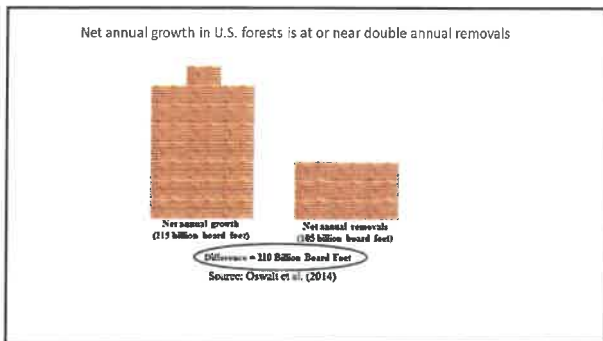
= 546 of these projects annually

1.256 bbf of timber

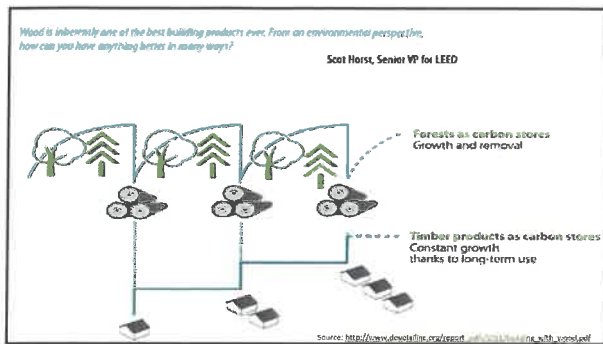
= 546 of these projects annually



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Comparative Effluents in Manufacturing Steel vs. Wood-Framed Interior Wall^{1,2}

Emission/Effluent	Wood Wall	Steel Wall	Difference
CO ₂ (kg)	305	965	3.2x
CO (g)	2,450	11,800	4.8x
SO _x (g)	400	3,700	9.3x
NO _x (g)	1,150	1,800	1.6x
Particulates (g)	100	335	3.4x
VOCs (g)	390	1,800	4.6x
Methane (g)	4	45	11.1x
Suspended solids (g)	12,180	495,640	41.0x
Non-ferrous metals (mg)	62	2,532	41.0x
Cyanide (mg)	99	4,051	41.0x
Phenols (mg)	17,715	725,994	41.0x
Ammonia (mg)	1,310	53,665	41.0x
Halogenated organics (mg)	507	20,758	41.0x
Oil and grease (mg)	1,421	58,222	41.0x
Sulfides (mg)	13	507	39.0x

The walls examined here are 3 meters (10 feet) x 3.0 meters (100 feet), and are framed in non-structural steel studs (galvanized) and wood studs, both of nominal 2 x 4 cross-section.
¹ Source: Meli, J. (1994).
² <http://www.douglasfir.org/foia/>

29

Environmental Performance Indices for Above-Grade Wall Designs and for Floor and Roof Assemblies for a Home Built to Minneapolis Code Standards¹

Environmental Performance Index	Above-Grade Exterior Walls			Floor ² and Roof Assemblies		
	Wood ³	Steel ⁴	Diff.	Wood	Steel	Diff.
Embodied Energy (Gj)	250	296	18%	109	182	67%
Global warming potential (kg CO ₂ e)	13,009	17,262	33%	3,763	9,650	157%
Air emission index (index scale)	3,820	4,222	11%	981	1,813	85%
Water emission index (index scale)	3	29	867%	17	70	312%
Solid waste (kg)	3,496	3,181	-9%	13,766	13,641	-0.9%

¹ Source: Perez-Garcia et al. (2005).
² All walls with 1/4-inch plywood sheathing and vinyl siding.
³ 2 x 6 kiln-dried SPF.
⁴ 20-gauge, 2x6, galvanized studs containing average recycled content for steel framing produced in North America.
⁵ Floor joists are 2x10 for both steel and wood, with the steel of 18-gauge.

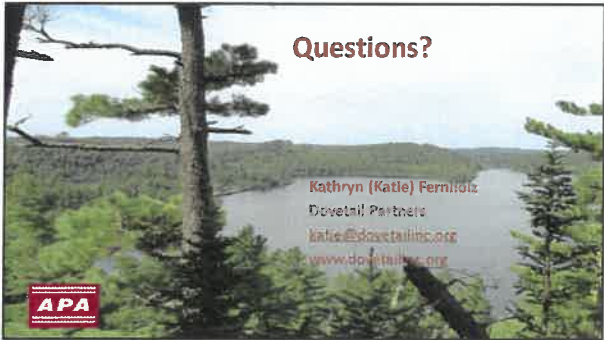
<http://www.douglasfir.org/foia/foia%20request%2020050701.pdf>

30

> *“Wood products are manufactured from renewable raw material; they are reusable and biodegradable, and they continue to store carbon throughout their lifetime. These characteristics make wood an excellent alternative to many of the materials that are now widely used in construction and consumer goods, which leave a much larger ‘carbon footprint’ and include concrete, steel, aluminum and plastic. Increasing production and consumption of wood products will therefore be part of a sustainable future.”*

- State of the World's Forests – 2012
United Nations Food and Agriculture Organization

31



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