



Below-ground carbon storage (in roots & soil) is about 50% of forest carbon

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#### Management and Distubance in FOREST-ATMOSPHERE INTERACTIONS

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Wood products can store carbon and can substitute for emission-intensive products such as concrete and steel.

Bioenergy from forest biomass can substitute for fossil fuel energy.

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Fires and decomposition following disturbance events release carbon into the atmosphere.

**CO** 

**Growing forests** 

remove carbon

from the

atmosphere.

Forest Service Office of Sustainability and Climate April 2023

BIOMASS

## Various pathways of FOREST CARBON into the ATMOSPHERE



### The Change from a Wood-based to a Fossil **Fuel**-based Economy

## Carbon **Stocks**

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1915

The United States lost 60% of its pre-European forest carbon stocks during settlement and into the industrial revolution.

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#### RB

About 40% of the carbon lost during the industrial revolution has been recovered via re-growth.

注意

**Fossil fuel-based** 

#### Wood-based

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# A spatial and Carbon in temporal view Time and Space

**Carbon stocks** in forests are **always in flux** due to variations in age, disturbance, and environmental factors. Detecting patterns and trends **requires taking a broad view** in both space and time.

Forests can be carbon sources, sinks, or neutral, depending on the spatial and temporal scale being viewed.

Carbon BENEFITS in the Broad View

# How Carbon Stacks Up



#### The importance of **KEEPING FORESTS** as forests **Carbon & Land Use Changes**

**CO2** Even if a forest is disturbed or harvested, carbon is exchanged in a **CLOSED SYSTEM** as long as it remains forest. **CO2** 

Conversion of forests to non-forest land uses is an **OPEN SYSTEM** where CO<sub>2</sub> remains in the atmosphere.

**CO**<sub>2</sub>

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