

Carbon storage in harvested wood products

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Wood is infinitely useful. Critically important for our changing climate, trees store carbon. When trees are harvested for wood products like lumber, some of that carbon continues to be stored. Even after a wood product is discarded, it keeps storing carbon.

More than 90% of new single-family homes in the U.S. are built with

wood. About 400,000 homes, [apartment buildings](#), and other [housing units](#) are lost to floods and other natural disasters or decay every year. Houses are also torn down to make way for new development.

Houses store so much [carbon](#) that figuring out how many houses will be built in the future is important for understanding the total U.S. carbon storage capacity.

Harvested wood products in residential structures will continue to increase carbon storage for the next 50 years, according to a new USDA Forest Service study published in the journal *PLOS ONE*.

"Forests sequester carbon, and wood produced by forests can hold onto that carbon for decades or centuries," says Jeff Prestemon, lead author of the study and research economist with the Southern Research Station. "Harvested wood provides an important service to consumers for decades: shelter."

Even after residential structures reach the end of their useful life, wood that is stored in landfills, a typical practice in the U.S., does not immediately release its carbon. In this way, wood retains its storage capacity for several more decades.

Prestemon and colleagues, Prakash Nepal with the Forest Products Laboratory and Kamalakanta Sahoo with the University of Wisconsin-Madison, examined how [population growth](#) and income can be combined to project rates of new housing construction at multiple scales (county and region) and for different futures as defined by the Intergovernmental Panel on Climate Change (IPCC). Further, they set out to understand how possible future trends in housing starts and housing inventory maintained through repairs and renovations could influence carbon storage in wood products.

"Until now, fine spatial scale projections of carbon in harvested wood products have not been described for the U.S.," says Prestemon.

"Locating future stored carbon will help us better understand emissions risks from structure-destroying disturbances like hurricanes and wildfires."

The research considers five possible futures for social and economic conditions in the country. Called Shared Socioeconomic Pathways (or SSPs), the futures include changes in population and income growth. High (SSP5) and low (SSP3) futures served as brackets for a plausible range of carbon in harvested wood products in coming decades.

Researchers described how future construction rates would vary widely across U.S. counties. They translated these construction futures into trends in carbon stored in harvested wood products. These projections show increases in carbon stocks across much of the U.S. Furthermore, carbon additions from construction activities more than offset carbon lost or emitted from structure destruction/demolition. Although housing starts are projected to decline in the future, residential housing and the need to maintain structures will continue to increase carbon storage in wood products for the next several decades.

The study's projections of both single-family and multifamily housing starts at the county level across the five possible futures can also help to answer questions about future demand for [wood products](#) for construction and where forests and other wildlands are more likely to be replaced by new residential housing development.

"The [wood](#) used to build houses will remain an increasing, significant component of the overall forest carbon sink for the next 50 years—regardless of whether the U.S. population grows or shrinks, and regardless of high or low economic growth," adds Prestemon.

More information: Housing Starts and the Associated Wood Products Carbon Storage by County by Shared Socioeconomic Pathway in the United States, *PLoS ONE* (2022). [journals.plos.org/plosone/arti ...
journal.pone.0270025](https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0270025)

Provided by USDA Forest Service

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