

CARBON STORED IN HARVESTED WOOD PRODUCTS FROM CALIFORNIA TIMBERLANDS: 1952-2017

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California Forests Capture and Store Significant Amounts of Carbon

In 2010, California Assembly Bill 1504 was signed into law requiring the state Board of Forestry and Fire Protection to “ensure that its rules and regulations that govern the harvesting of commercial forest tree species consider the capacity of forest resources to sequester carbon dioxide emissions sufficient to meet or exceed the state’s greenhouse gas reduction requirements for the forestry sector.”

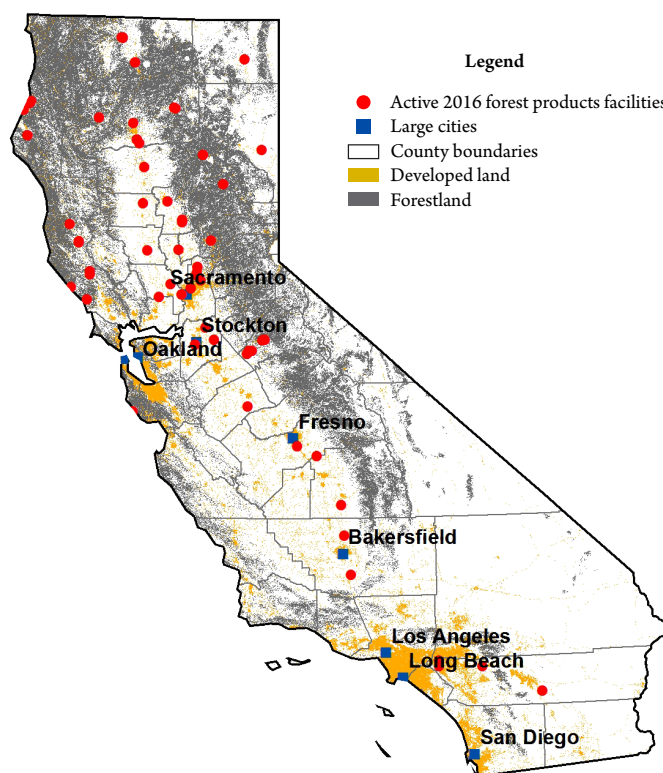
The Legislature declared that the board “should strive to go beyond the status quo sequestration rate” of “the current 5 MMT CO₂ annual sequestration rate through 2020.” This is equivalent to 1.36 million metric tons (MMTC) of carbon per year and includes carbon stored in harvested wood products.

Carbon Accounting in California Forestlands: Harvested Wood Products

At the request of the California Department of Forestry and Fire Protection, the University of Montana’s Forest Industry Research Program was contracted to provide estimates of carbon stored in harvested wood products (HWP C) using state-specific data within the framework of the Intergovernmental Panel on Climate Change (IPCC) Tier 3 Production Approach. Together with estimates of ecosystem carbon, state level estimates of forest carbon flux can be used to inform management decisions and guide climate change adaptation and mitigation efforts by the state.

The authors developed a web-based model for the California’s Board of Forestry and Fire Protection to develop cumulative estimates of harvested wood products carbon stocks and flux from 1952 to 2017. The IPCC method oper-

Figure 1. Map of California showing land cover and forest product facilities.



ationalized in the model does not apply simple storage ratios to the harvest; rather it tracks carbon through the product life cycle from harvest to timber products to primary wood products to end use to disposal, applying best estimates for product ratios and half-lives at each stage.

Total California Harvested Wood Products Carbon Stock and Flux

Presently the average harvest in California is 1.7 billion board feet (3.2 MMT C) per year, resulting in less carbon entering the HWP pool than in many prior years.

The cumulative carbon stored in California HWP since 1952 is currently peaking at 135.2 million metric tons carbon (MMT C) or 4.2% of forest ecosystem carbon.

Overall, California's HWP pool is now in a period of positive carbon sequestration because additions to HWP C from 1952 through 2017 exceed emissions of HWP C.

From 1952 until present, net annual additions to the HWP C pools remained positive except in 2010 when HWP C emissions exceeded additions to the products in use pool, releasing about 313,000 MT C.

Net positive additions into the HWP C pool is primarily attributable to high harvest levels during the 1950s through the 1980s, with the high harvest of over 6 billion board feet (7.4 MMT C) in 1955.

Timber harvested from privately owned forestlands have stored more HWP C than any other ownership group. Presently, HWP harvested from privately owned California forestland since 1952 are cumulatively storing nearly 91.5 MMT C.

Total cumulative HWP carbon storage from U.S. Forest Service lands is about 41.2 MMT C.

Figure 2. Annual total timber product output in California, converted to metric tons of carbon, from 1952 to 2017.

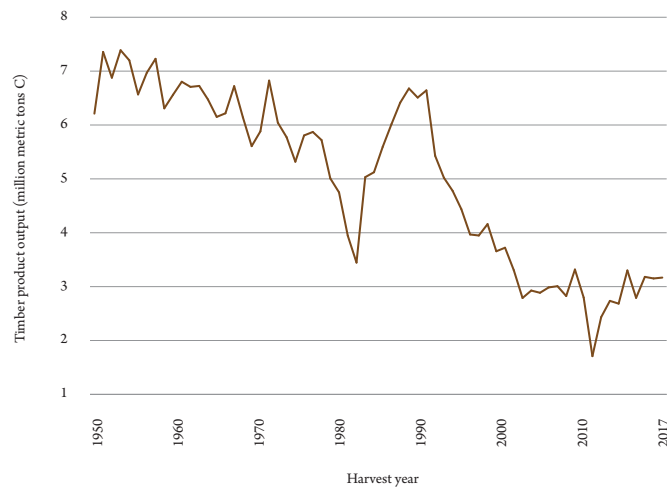


Figure 3. Total cumulative metric tons of carbon stocks in harvested wood products (HWP) from total timber harvested in California from 1952 to 2017.

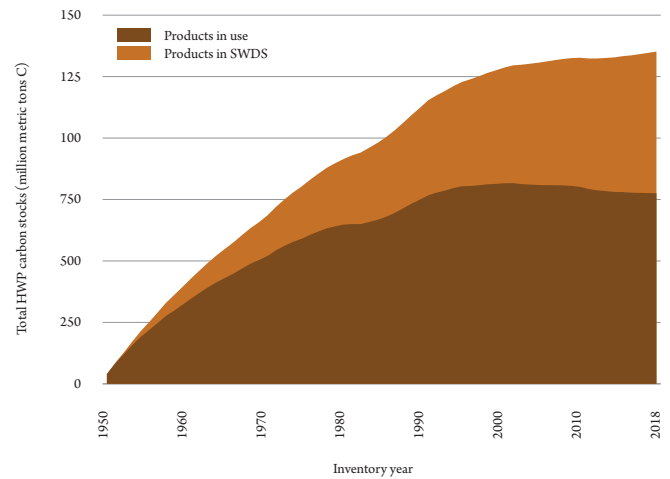
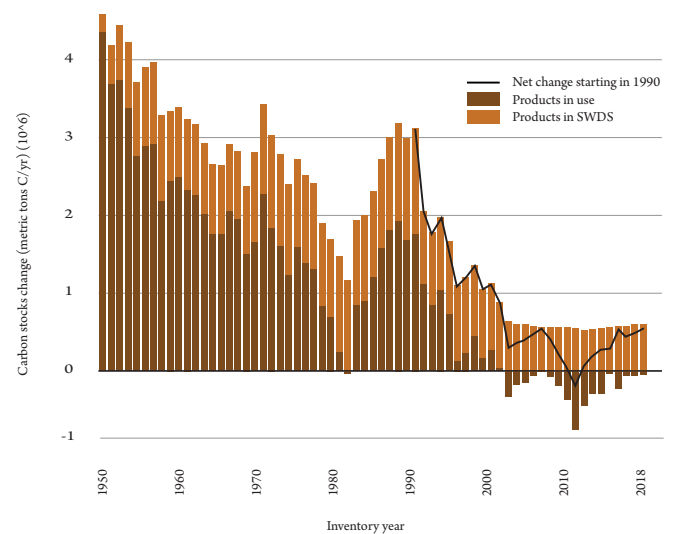


Figure 4. The annual net change in total California harvested wood products carbon stocks, in metric tones, from 1952 to 2017.



References

Christensen, G.A.; Gray, A.N.; Kuegler, O.; Tase, N.A.; Rosenberg, M.; Loeffler, D.; Anderson, N.; Stockmann, K.; Morgan, T.A. 2018. AB 1504 California Forest Ecosystem and Harvested Wood Product Carbon Inventory: 2017 Reporting Period. Final Report. Sacramento, CA: California Department of Forestry and Fire Protection and California Board of Forestry and Fire Protection. 539 p.

