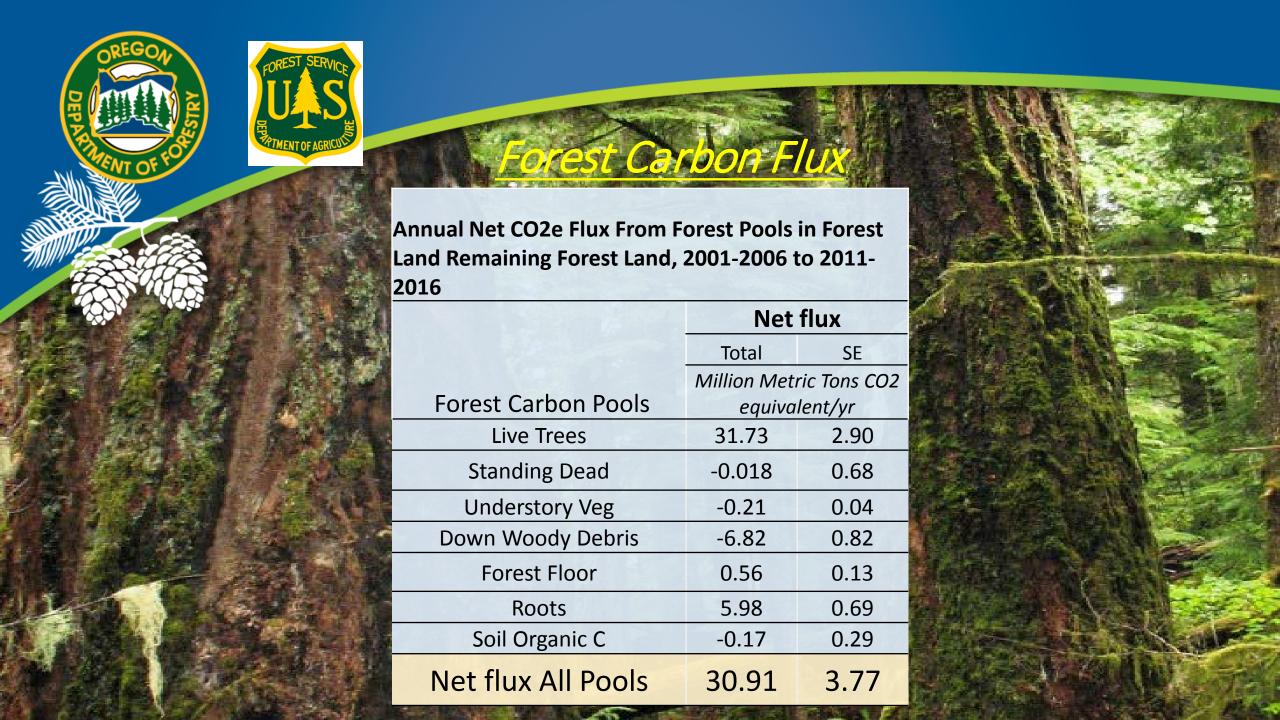
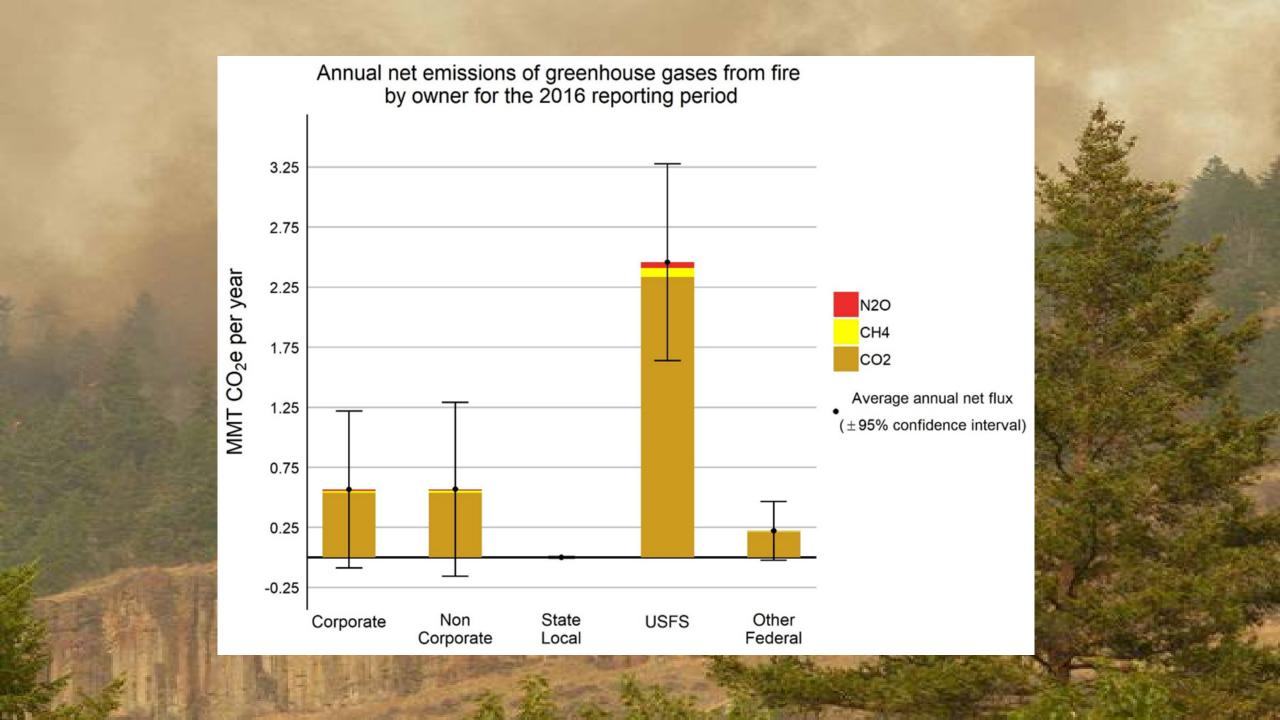


Forest Carbon Stocks

Oregon Forest Carbon Stocks by Forest Pools, 2007-2016

	Total Carbon	SE
Forest Carbon Pools	million metric tons	
	1,039.0	9.6
Live Trees	1,033.0	9.0
Standing Dead	79.0	1.6
Understory Veg	34.0	2.1
Down Woody Debris	156.8	1.9
Forest Floor	117.19	0.55
Roots	238.0	2.2
Soil Organic C	1,575.27	7.55
All Pools	3,239.7	16.7







Harvested Wood Product Modeling Framework

Stockmann et al. Carbon Balance and Management 2012, 7:1 http://www.cbmioumal.com/content/7/1/1



RESEARCH

Estimates of carbon stored in harvested wood products from the United States forest service northern region, 1906-2010

Keith D Stockmann^{1*}, Nathaniel M Anderson², Kenneth E Skog³, Sean P Healey⁴, Dan R Loeffler⁵, Greg Jones² and James F Morrison¹

Abstract

Background: Global forests capture and store significant amounts of CO2 through photosynthesis. When carbon is removed from forests through harvest, a portion of the harvested carbon is stored in wood products, often for many decades. The United States Forest Service (USFS) and other agencies are interested in accurately accounting for carbon flux associated with harvested wood products (HWP) to meet greenhouse gas monitoring commitments and climate change adaptation and mitigation objectives. This paper uses the Intergovernmental Panel on Climate Change (IPCO production accounting approach and the California Forest Project Protocol (CFPP) to estimate HWP carbon storage from 1906 to 2010 for the USFS Northern Region, which includes forests in northern Idaho. Montana, South Dakota, and eastern Washington

Results: Based on the IPCC approach, carbon stocks in the HWP pool were increasing at one million megagrams of carbon (MgC) per year in the mid 1960s, with peak cumulative storage of 28 million MgC occurring in 1995. Net positive flux into the HWP pool over this period is primarily attributable to high harvest levels in the mid twentieth century. Harvest levels declined after 1970, resulting in less carbon entering the HWP pool. Since 1995, emissions from HWP at solid waste disposal sites have exceeded additions from harvesting, resulting in a decline in the total amount of carbon stored in the HWP pool. The CFPP approach shows a similar trend, with 100-year average carbon storage for each annual Northern Region harvest peaking in 1969 at 937,900 MgC, and fluctuating betwee 84,000 and 150,000 MgC over the last decade.

Conclusions: The Northern Region HWP pool is now in a period of negative net annual stock change because the decay of products harvested between 1906 and 2010 exceeds additions of carbon to the HWP pool through harvest. However, total forest carbon includes both HWP and ecosystem carbon, which may have increased over the study period. Though our emphasis is on the Northern Region, we provide a framework by which the IPCC and CFPP methods can be applied broadly at sub-national scales to other regions, land management units, or

[2], or the equivalent of about 30 years of US fossil fuel Recent estimates of net annual storage, or flux, indicate emissions at the 2008 rate. The US Environmental Prothat the world's forests are an important carbon sink, tection Agency (EPA) estimates that in 2010 net addiremoving more carbon from the atmosphere through tions to ecosystem and harvested wood products (HWP) photosynthesis than they emit through combustion and pools were 235 TgC yr⁻¹ [2]. Thus, US forests function decay [1]. The forest sector of the United States (US) as a carbon sink, annually offsetting about 15 percent of stored about 48,437 teragrams of carbon (TgC) in 2010 the country's carbon emissions from fossil fuel combustion.

About 5 percent of total US forest sector carbon

Northern Region USDA Forest Service Missoula MT USA

stocks and 6 percent of the annual flux is attributable to carbon in HWP [2]. Though the HWP fraction of the



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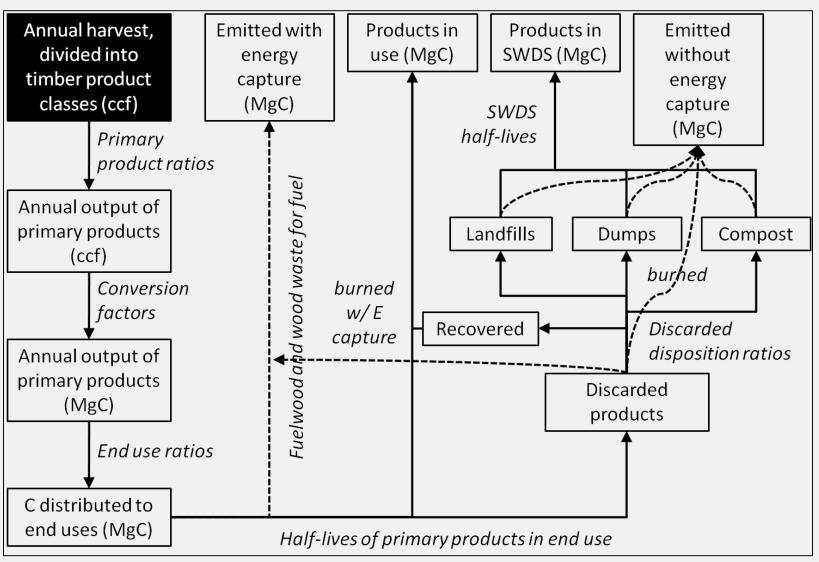
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The HWP framework

- Harvested timber
 - Board feet to cubic foot volume
- Timber products
 - sawtimber, poles, small roundwood, etc.
- Primary products
 - lumber, plywood, mill residue pulp, fuel, and non-structural panel, etc.
- End uses
 - New residential construction (single, multi family, mobile homes), new non-residential construction, manufacturing (household furniture, other furniture, other products), shipping, other uses

The HWP framework

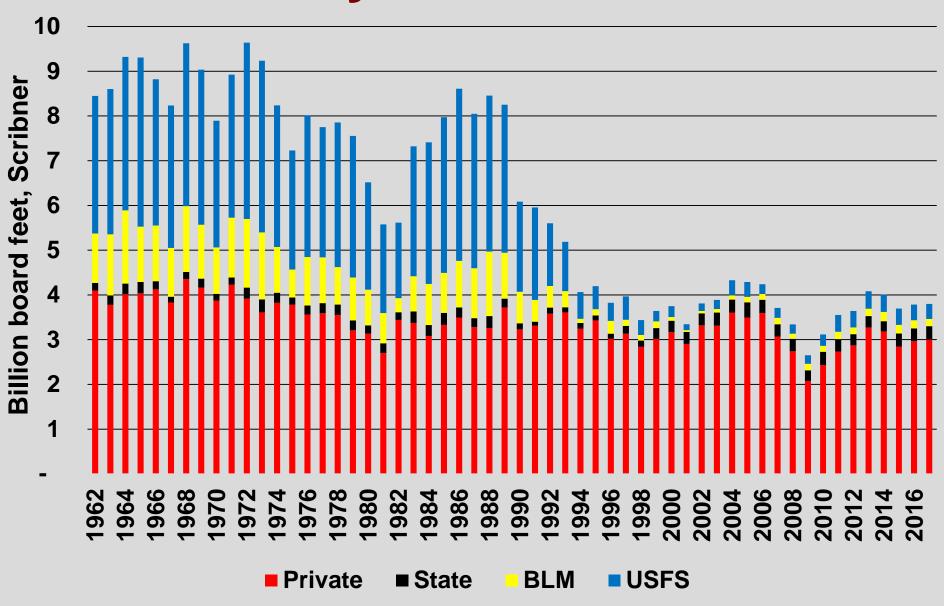


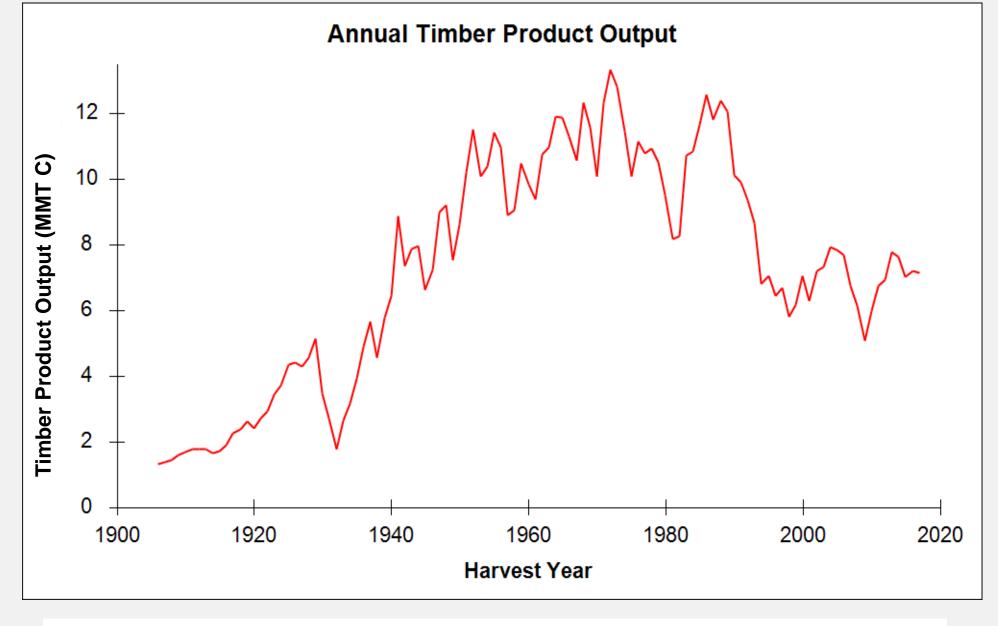
SWDS = Solid Waste Disposal Sites

ccf = 100 cubic feet

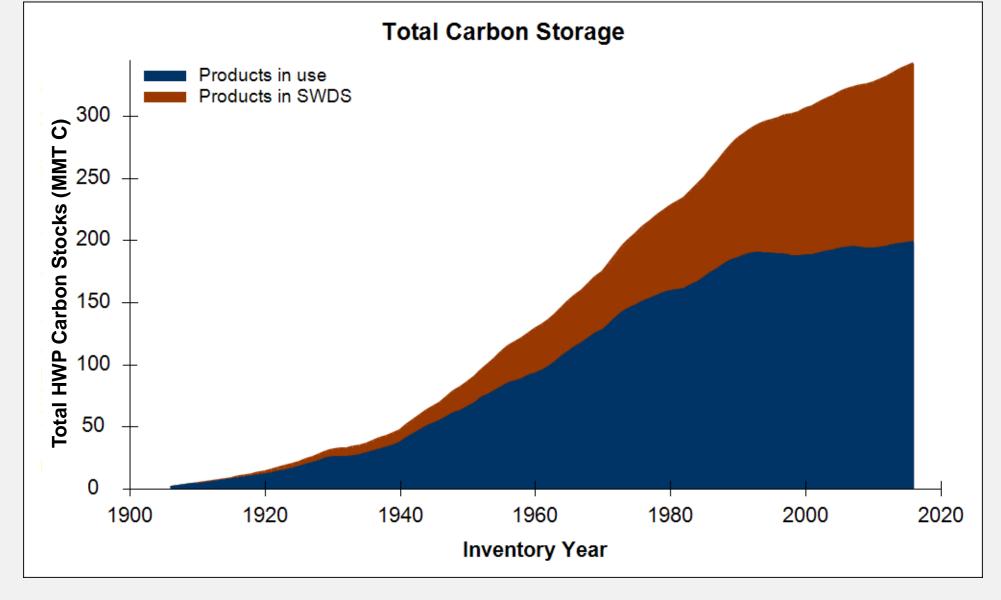
MgC = Megagram of Carbon = metric ton

Yearly harvest data

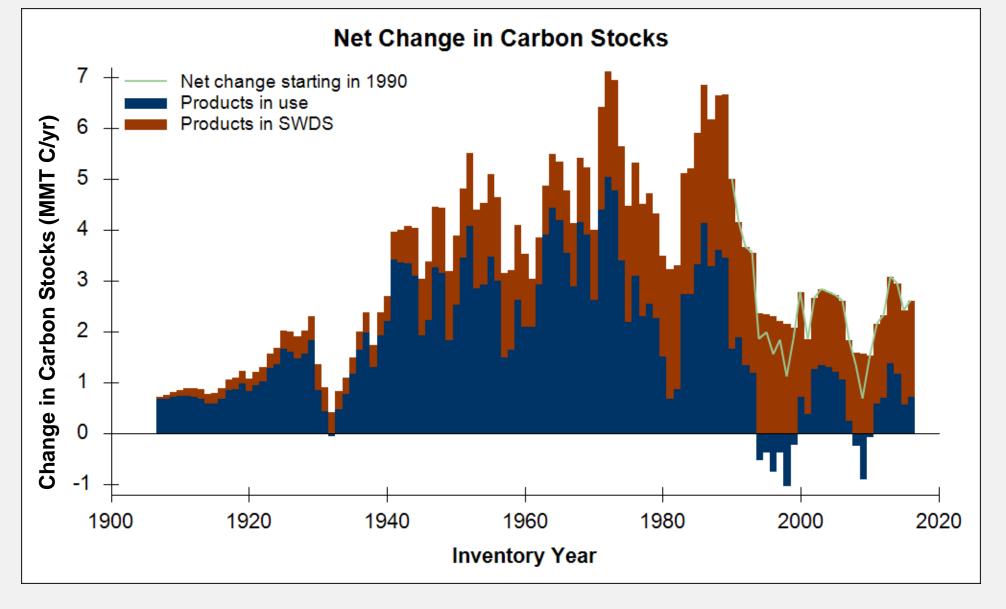




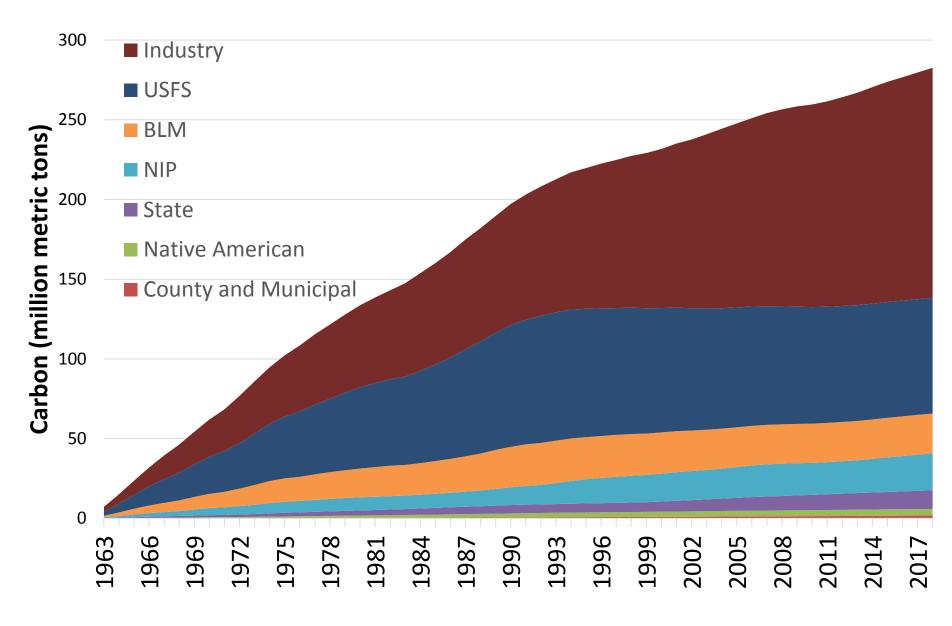
Annual timber product output in Oregon, converted to Million Metric Tons of Carbon, 1906 to 2017.



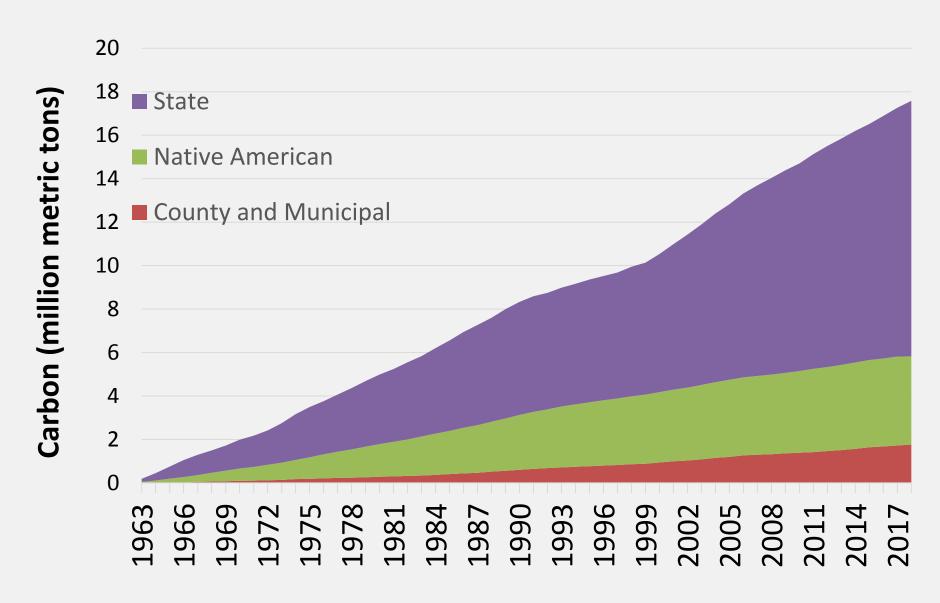
Cumulative total carbon stored in HWP manufactured from timber harvested from Oregon forests 1906 to 2017. Carbon in HWP includes both products that are still in use and carbon stored at solid waste disposal sites.



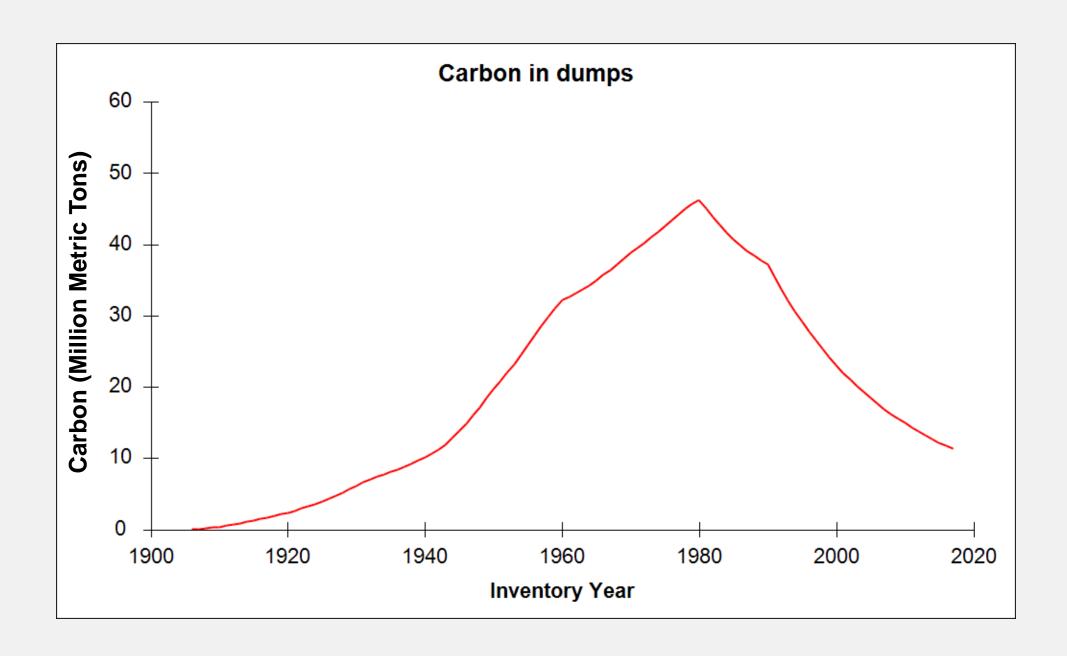
The net change in Oregon timber carbon stocks in HWP from the previous year. The net stock change is the sum of net change for SWDS (red bar) and products in use (blue bar).

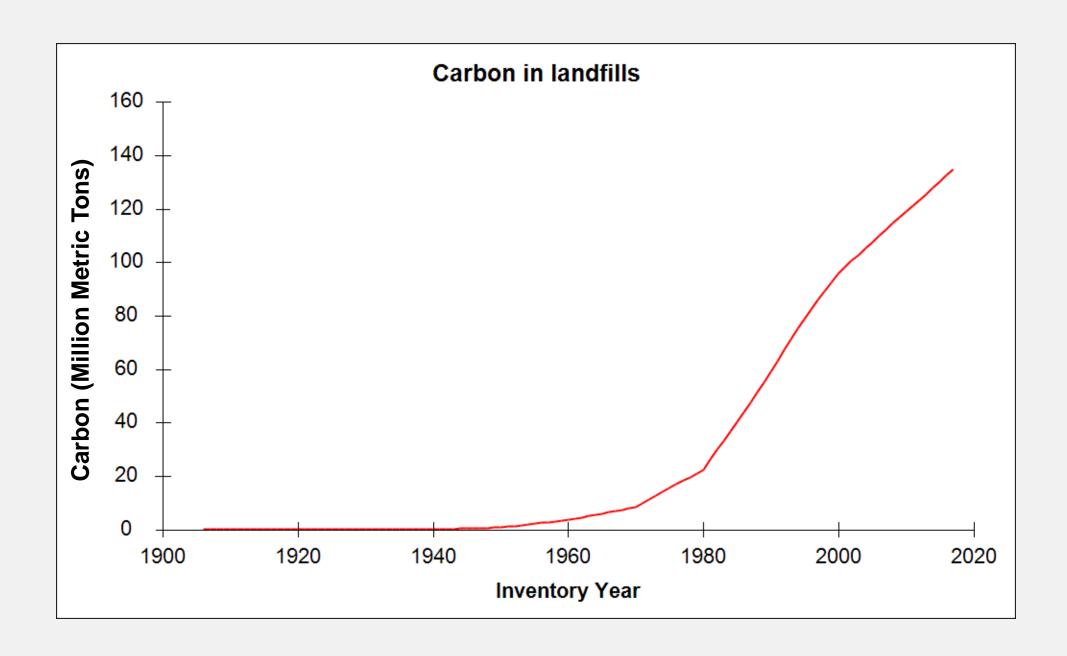


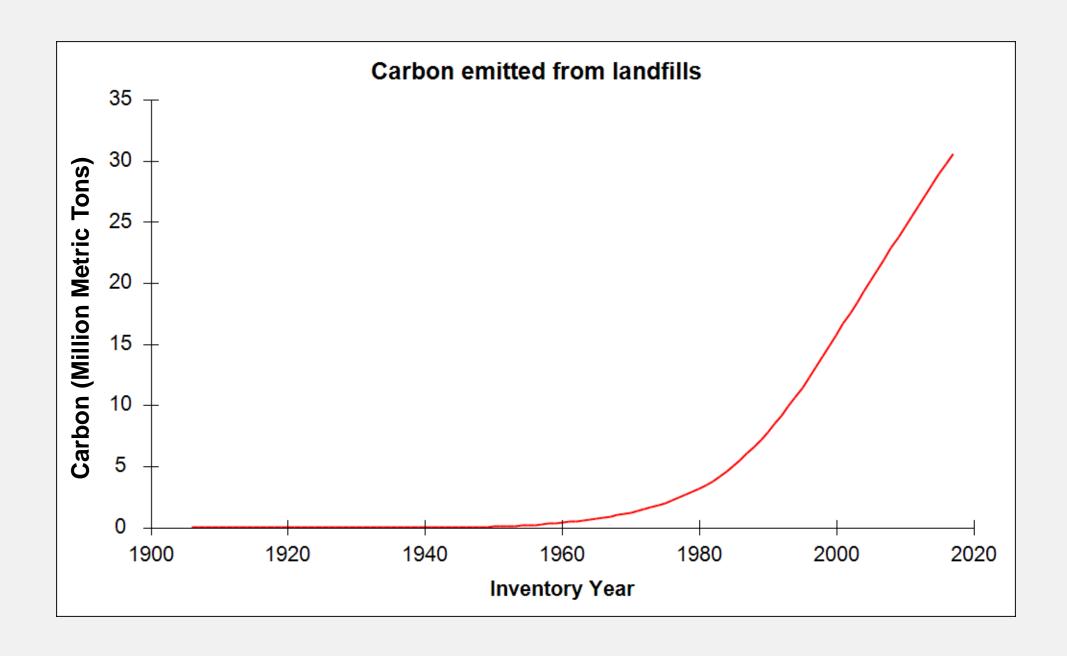
All ownership HWP C disposition of products in use and in SWDS



State, Tribal, County and Municipal ownership HWP C disposition of products in use and in SWDS







Oregon Harvested Wood Product Carbon Report

- Currently working to integrate Oregon harvest data prior to 1962.
- Analysis on schedule and draft report expected to be completed by the end of October 2019 and final report by June 2020.