



United States Department of Agriculture

Criterion 6, Indicator 25: Value and Volume of Wood and Wood Products Production, Including Primary and Secondary Processing

James L. Howard
David B. McKeever
E.M. (Ted) Bilek



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Laboratory

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Abstract

Trend data through 2011 are provided on the value and volume of wood and wood products production for the United States to aid in assessing sustainability of socioeconomic benefits of forests. The volume of roundwood used to make products, the weight produced, and the value of U.S. shipments have fluctuated in recent years. But there have been decreases in the weight of oriented strandboard production and the value of furniture production. U.S. demand for products is likely to continue to increase with increasing population and gross domestic product. If the cost of providing wood products from the U.S. is high relative to other countries or alternative materials, this would limit increases in the level of U.S. harvest and the value that contributes to forest management, employment, and wages. Volume of roundwood harvest has increased in the South but declined in other regions, although value of shipments for wood and paper products (excluding furniture) has declined in all regions. If value of shipments continues to decline, revenues to forest landowners and employees will decrease. Maintaining revenues from forests would then require increased revenues from other sources including recreation, environmental services, or new products such as biomass for energy.

Keywords: production, sustainability, consumption

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Contents

Indicator Background.....	1
Indicator Development	1
Indicator Interpretation and Discussion.....	3
Cross-Cutting Issues and Relation to Other Indicators.....	5
Concluding Remarks	5
References	5
Appendix—Indicator 25: Value and Volume of Wood and Wood Products Production, Including Primary and Secondary Processing	7

SI conversion factors

Inch–pound unit	Conversion factor	SI unit
inch (in.)	25.4	millimeter (mm)
foot (ft)	0.3048	meter (m)
Btu	0.293	W (watts)
cubic foot	0.0283	cubic meter
ton	0.907	metric ton

In this report, 1 billion = 10⁹.

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Criterion 6, Indicator 25: Value and Volume of Wood and Wood Products Production, Including Primary and Secondary Processing

James L. Howard, Economist
David B. McKeever, Research Forester
E.M. (Ted) Bilek, Economist
Forest Products Laboratory, Madison, Wisconsin

Indicator Background

The purpose of this report is to provide information on the rationale and data provided for Indicator 25 for the *National Report on Sustainable Forests—2015*. This report updates a similar report published in 2010 (Howard et al. 2010), which provided similar information for the *National Report on Sustainable Forests—2010* (USDA Forest Service 2011). The rationale for Indicator 25 and the recommended data to be developed are taken from the report of the Technical Advisory Committee (TAC) of the Montréal Process Working Group (2014).

Verbatim Montréal Process Technical Advisory Committee Notes

Rationale

This indicator provides information on the value and volume of wood and wood products at various stages of processing. The value and volume of wood and wood products reflects one aspect of the importance of forests and the wood processing sector to domestic economies.

Approaches to Measurement

Value may be expressed as the market value at various stages in production from harvesting to finishing. It does not include value beyond the completion of secondary processing. Examples of wood products that require primary processing include pulp and paper, dimension lumber, and panel products. Examples of wood products that require secondary processing include coated papers, cardboard boxes, mouldings and joinery, and wooden furniture. Countries may wish to highlight products and types of processing that may be of particular importance to their own experience.

Measurement units may vary among products. The conversion of product volumes to roundwood equivalent will allow comparisons to be made with harvest volumes (Indicator 6.1) (Montréal Process Working Group 2014).

Comments and Clarifications

Additions and Clarifications to Rationale

We believe variables on volume or weight of production will meet the intent of the rationale to indicate one aspect of the size of timber and forest products sectors with time and by region. They also indicate an aspect of economic health of forest management because forest sector demand for timber is needed to support forest management and the variables directly indicate the economic health of the forest industry by the trends in amounts of product production.

Additions and Clarifications to Measurement

The measurements suggested for the indicator do not measure economic health of the wood products sector. Additional information would be needed on profits, employment, and other variables in addition to prices and production.

Indicator Development

Data Used To Address Indicator

The data provided for this indicator focus on timber and wood products production volume and value. Selected data are shown with time, by Resource Planning Act (RPA) Assessment Region, by land ownership, and by type of product produced (see Howard and Westby (2013) for Forest Service regional map).

General Description

Volume and value of production can be illustrated in several dimensions:

- by market level
 - production of roundwood (harvest) or production of primary products
 - roundwood and primary products sold for domestic use or for exports
- by region
- with time

We show a representative subset of available data that characterize volume and value in each of these dimensions.

The intent is to show data about production that may be compared with other indicators that characterize the capacity of forests to produce wood products (for example, growth rates, management intensity) and efforts to maintain and enhance that productive capacity of forests and forest industries (for example, investments, research, institutions).

To illustrate the relative importance of forests as a source of raw material, variables are shown that are available at least at the national and many times the regional level and are from long-term series that continue to be collected.

Specific Data Sources

All data for this report are from a variety of publicly available sources and fall into four distinct categories:

1. Measures of the volume of roundwood and fuelwood harvested nationally and regionally as reported by the USDA Forest Service in the periodic Resources Planning Act Assessment and its supporting documents.
2. Measures of the performance of the U.S. economy as reported by the U.S. Department of Commerce, Bureaus of the Census and of Economic Analysis. These measures include industry specific data from the periodic Censuses of Manufactures and annual Surveys of Manufactures and overall performance of the economy specific data from the National Income and Product Accounts database.
3. Measures of economic activity by the wood products industries as reported in specific and recurring USDA Forest Service economics research reports.
4. Measures of energy produced from wood from the U.S. Department of Energy, Energy Information Administration.

These data are reported in the following tables:

- Table 1. Volume of U.S. industrial roundwood and fuelwood harvested (produced), 1900–2011 (million cubic feet)
- Table 2. Volume of softwood industrial roundwood harvested by landowner and region, 1952–2011 (million cubic feet)
- Table 3. Volume of hardwood industrial roundwood harvested by landowner and region, 1952–2011 (million cubic feet)
- Table 4. Volume of all industrial roundwood harvested by landowner and region, 1952–2011 (million cubic feet)
- Table 5. Weight of U.S. industrial wood product production by product, 1950–2011 (thousand tons)
- Table 6. Energy produced from wood by end use and its roundwood equivalent, 1949–2011
- Table 7. Value of shipments for forest products industries by SIC Code 1961–1996, by NAICS code, 1997–2011 (million 2005\$)
- Table 8. Value of shipments in paper products industries (NAICS 322) by region (billion 2005\$)
- Table 9. Value of shipments in wood products industries (NAICS 321) by region (billion 2005\$)
- Table 10. Value of shipments in wood and paper products industries (NAICS 321, 322) by region (billion 2005\$)

Analysis Techniques

General Description

This report contains data through 2011. Some data were derived from mathematical calculations, and some include conversions to different units of measurement. (See Howard and Westby (2013) for wood products conversion factors.)

Specific Steps Taken

The data were compiled from official government and trade association reports by state level, regional level, national level, and year. The data were then organized by primary product commodity with time. These primary products were then converted to their roundwood equivalents using government or industry approved conversion factors.

Data Issues

Prior to 1997, the Standard Industrial Classification (SIC) system was the standard used by federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy. In 1997, the SIC system was replaced by the North American Industry Classification System (NAICS) (USDC Bureau of the Census 2015c). NAICS was developed jointly by the U.S. Economic Classification Policy Committee (ECPC), Statistics Canada, and Mexico's Instituto Nacional de Estadística y Geografía to allow for a high level of comparability in business statistics among the North American countries. This change has created some problems with making direct comparisons between years and wood products types prior to and after the change from SIC to NAICS. However, NAICS, as a continuing federal government report, is considered to be replicable and readily available and to provide unbiased data with good precision.

Indicator Interpretation and Discussion

Indicator Results

What Does the Indicator Show?

The volume of total roundwood harvest (including fuelwood) in the United States increased fairly steadily from about 10 billion ft³ in the 1930s to 18.5 billion ft³ in 1989. Since 1989, harvest has declined, falling to 12.5 billion ft³ in 2011 (Fig. 1). Industrial roundwood production increased steadily between the mid-1930s and 1989 and has been roughly constant at about 17.0 billion ft³ through 2005. The mid-2000 recession resulted in harvest levels dropping below 12.0 billion ft³ in 2009. Harvest levels have subsequently increased through 2011. All regions experienced a decline in industrial roundwood harvested in 2011 compared with 2006 (Fig. 2).

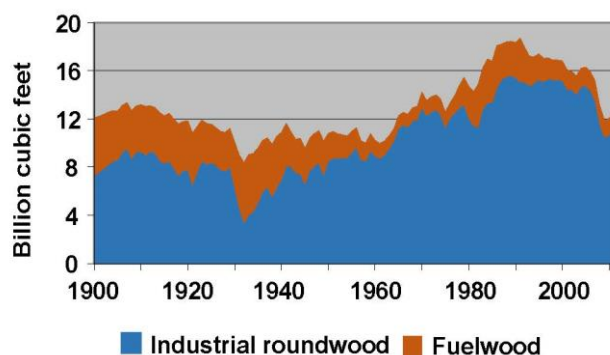


Figure 1. Volume of U.S. industrial roundwood and fuelwood production (harvest), 1900–2011 (billion ft³). Source: Table 1.

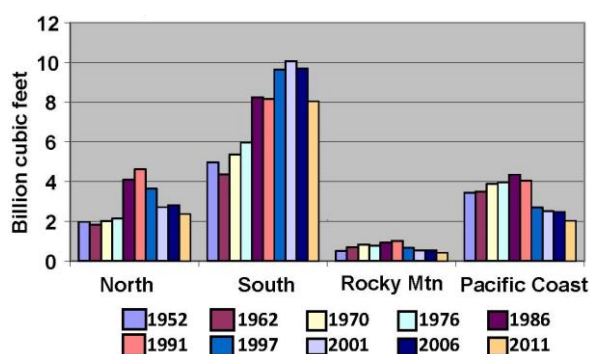


Figure 2. Volume of all industrial roundwood harvested by region, 1952–2011 (billion ft³). Source: Table 4.

The United States was one of the world's leading producers of industrial roundwood in 2011. More than 20% of all industrial roundwood harvested in the world in 2011 was from the United States (UN Food and Agriculture Organization 2015). Fuelwood harvested in the United States was much less at about 4% of world harvest.

The amount of primary wood and paper products produced in the United States increased relatively steadily from 82 million tons in 1950 to 196 million tons in 1999 and declined to 153 million tons in 2011 (Fig. 3). In comparison, in 2011, the U.S. produced 7.4 million tons of steel and 80 million tons of Portland cement.

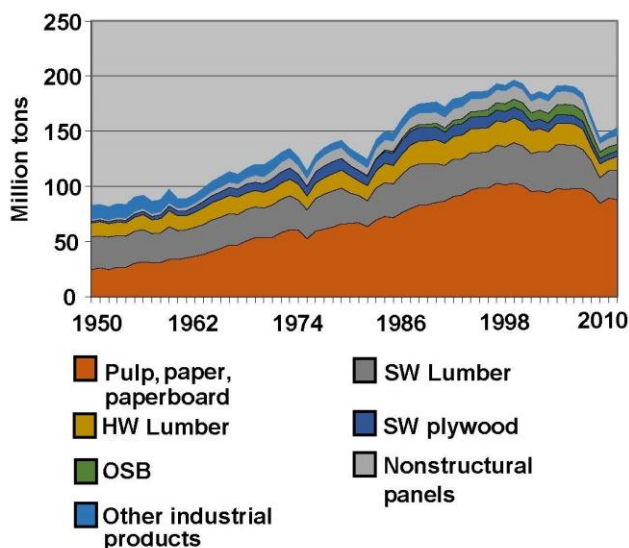


Figure 3. Weight of wood and paper products produced by product 1950–2011 (million tons) (HW, hardwood; OSB, oriented strandboard; SW, softwood). Source: Table 5.

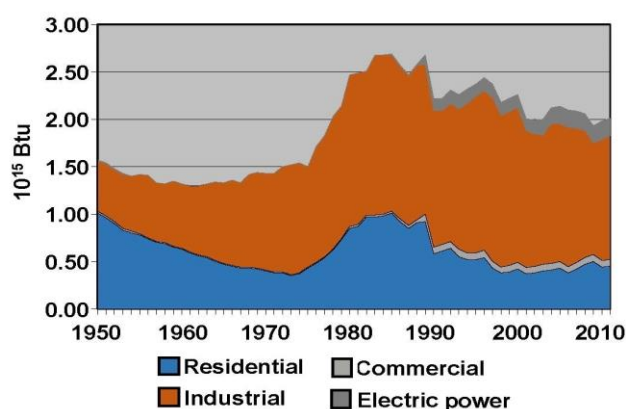


Figure 4. Wood energy produced, by consumer, 1950–2011 (10¹⁵ Btu). Source: Table 6.

The decline since 1999 is primarily due to declines in production of pulp and paper, hardwood lumber, and softwood plywood. These declines offset an increase of 29% in oriented strandboard (OSB) production. In 2011, the largest share of production, by weight, was for pulp and paper (57%), followed by softwood and laminated veneer lumber (LVL) (18%), hardwood lumber (8%), nonstructural panels (5%), OSB (4%), softwood plywood (3%), and other industrial products (5%) (Fig. 3).

Wood energy use was 2.01 quadrillion Btu (Quad) in 2011 (roughly 2.6% of U.S. total energy consumption), down from 2.68 Quad in 1983. Industrial use (primarily by forest products firms) was 1.31 Quad Btu in 2011, which is somewhat lower than the highs in 1983 and 2000. Residential

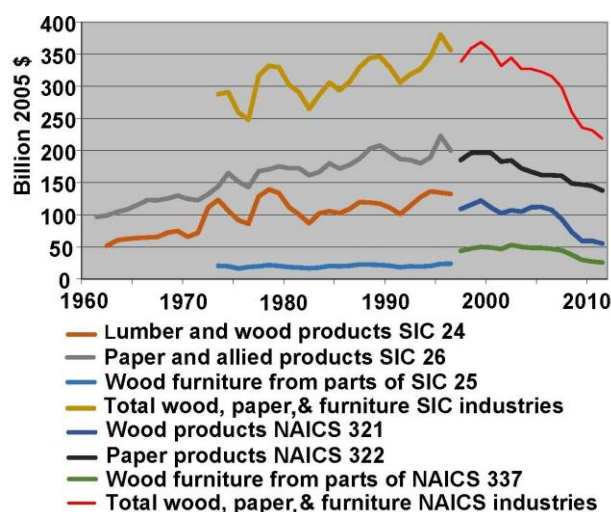


Figure 5. Value of shipments for forest products industries by Standard Industrial Classification (SIC) Code 1961–1996, by North American Industry Classification System (NAICS) code, 1997–2011 (billion 2005\$). Source: Table 7.

wood energy use has also declined but wood use for electric power has increased from 0.10 Quad in 1989 to 0.18 Quad in 2011 (Fig. 4) (see also Indicator 24).

The demand for U.S.-produced wood pellets is partially domestic but is being increasingly driven by the export market. U.S. domestic demand is mainly for residential heating with some commercial heat and combined heat and power applications (CHP) (Goetzl 2015). In 2013, an estimated 123 wood pellet manufacturing plants were operating in the United States with a total capacity of 9.4 million tons. Production was about two-thirds of capacity with about one-half being exported. Pellet manufacturing is concentrated in the southern United States where more than three-quarters of U.S. wood pellet capacity is located and from where more than 98% of wood pellet exports are shipped. Wood pellets have become the third largest wood products export from the U.S. South, behind softwood and hardwood lumber. Total value of shipments for wood, paper, and furniture industries, using SIC industry codes, increased between 1973 and 1996 from \$288 to \$356 million (all values adjusted for inflation and presented in 2005\$). Between 1997 and 2006, using NAICS industry codes, shipments decreased from \$338 million to \$315 million. Between 2006 and 2011 using NAICS industry codes, shipments decreased from \$315 million to \$219 million (Fig. 5). The decrease was caused by a decline across all sectors of the wood products industries.

How Has it Changed Since 2006?

Volume of roundwood harvest and total weight of primary products production declined between 2006 and 2011 in part because of the decline in wood products production associated with the recession of 2007–2009. The weight of production decreased for softwood lumber, OSB, miscellaneous products, and other primary products—pulp and paper, hardwood lumber, softwood plywood, and nonstructural panels (Skog et al. 2012).

The value of paper industry shipments decreased 31% between 2006 and 2011 from \$316 to \$219 million. Values also declined between 2006 and 2011 for wood products and wood furniture shipments (Fig. 5).

Regional Variation and Associated Issues

The most important development in wood products production from a regional standpoint has been the marked increase in roundwood harvests in the South along with concurrent decreases in the North and Pacific Coast regions. Industrial roundwood harvest volume increased 50% in the South between 1970 and 2011, accounting for nearly two-thirds (63%) of total U.S. harvest in 2011. In 2011, the North provided 18%, followed by the Pacific Coast at 16%, and the Rocky Mountains at 3%. As a result of the 2007–2009 recession, timber harvest decreased between 2006 and 2011 in all regions (Fig. 2).

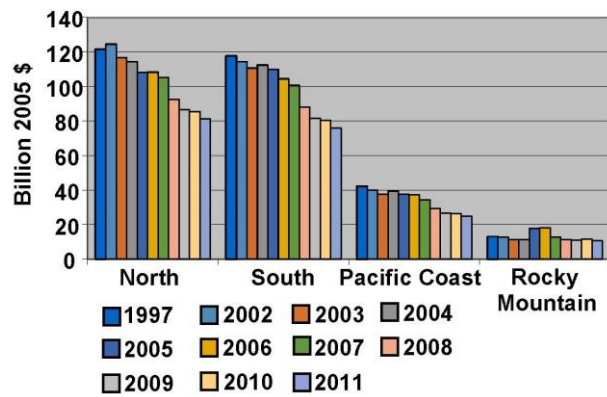


Figure 6. Value of shipments in wood and paper products industries (North American Industry Classification System (NAICS) 321, 322) by region, 1997–2011 (billion 2005\$). Source: Table 10.

Percentage changes in harvest are reflected in the value of final product shipments, which have declined across the regions (Fig. 6). Although the South had the largest volume of harvest in 2011, the value of shipments for wood and paper industries was highest for the North, at \$81 billion, followed by the South, at \$76 billion. Value of shipments has declined since 2006 in the North, South, Pacific Coast, and Rocky Mountains. The region with the highest total value of primary product shipments may have changed if wood furniture industries were included. But state-level wood furniture values were not available for this report.

Assessment of Ability to Measure Underlying Concern

General Assessment

The change of the SIC to the NAICS system made it difficult to track value changes with time prior to 1997. Since 1997, the direct comparison of values for 2006 to those for 2011 has improved. The ability to track volume changes with time is a strength for this indicator. The ability to track value changes since 1997 is also a strength of this indicator.

Congruence of U.S. Results with TAC Recommendations

Because the availability of national data for this indicator is good, the U.S. results are consistent with the TAC recommendations. National data sources are available, enabling the compilation of volume and value of wood products production.

Cross-Cutting Issues and Relation to Other Indicators

The level of and trend in wood and paper production are key factors in sustaining certain benefits from forests — benefits of employment and wages (Indicators 36 and 37), benefits in

revenue to various groups (Distribution of Revenues, Indicator 40), and contribution to community resiliency (Indicator 38). Levels of wood and paper production are determined by the competitiveness of U.S. industries in relation to foreign industries, which in turn, is influenced in the long run by the level of capital investment in new technology (Indicator 34), levels of research and education in the United States (Indicator 35), and the productivity of U.S. forests (Indicator 11).

Concluding Remarks

What does the information on import share of consumption and export share of production of wood products indicate about sustainable forestry and sustaining benefits of forests?

In aggregate, the volume of industrial roundwood used to make products, the weight produced, and the value of U.S. shipments has been stable to declining in recent years. But for some industries there have been consistent decreases, such as OSB weight of production and furniture value. U.S. demand for products is likely to continue to increase in the long run with increasing population and gross domestic product.

If the cost of providing wood products from the United States is high relative to other countries or alternative materials, this would tend to limit increases in the levels of U.S. harvest and the value that contributes to U.S. forest management, employment, and wages.

Volume of roundwood harvest has increased in the South in recent years but declined in other regions, although value of shipments for wood and paper products (excluding furniture) has declined in all regions in recent years.

If the value of shipments continues to decline, this would tend to decrease revenues to forest landowners and employees from these traditional products. Maintaining revenues from forests would require increased revenues from other sources such as recreation, environmental services, or potential new products such as biomass for energy.

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Appendix—Indicator 25: Value and Volume of Wood and Wood Products Production, Including Primary and Secondary Processing

Table 1. Volume of U.S industrial roundwood and fuelwood harvested (produced), 1900–2011 (million cubic feet)^a

Year	Industrial roundwood	Fuelwood	Total	Year	Industrial roundwood	Fuelwood	Total	Year	Industrial roundwood	Fuelwood	Total
1900	7,280	4,800	12,080	1940	6,990	3,890	10,880	1980	12,073	2,645	14,718
1901	7,580	4,650	12,230	1941	8,055	3,595	11,650	1981	11,456	2,817	14,273
1902	7,880	4,500	12,380	1942	8,085	2,865	10,950	1982	11,316	3,540	14,856
1903	8,215	4,350	12,565	1943	7,560	2,785	10,345	1983	12,866	3,397	16,263
1904	8,490	4,200	12,690	1944	7,455	2,915	10,370	1984	13,346	3,626	16,972
1905	8,625	4,050	12,675	1945	6,605	2,975	9,580	1985	13,358	3,454	16,812
1906	9,225	3,900	13,125	1946	7,705	2,675	10,380	1986	14,569	3,533	18,102
1907	9,555	3,825	13,380	1947	8,090	2,685	10,775	1987	15,290	2,929	18,219
1908	8,725	3,975	12,700	1948	8,375	2,665	11,040	1988	15,514	2,901	18,415
1909	9,275	3,825	13,100	1949	7,355	2,820	10,175	1989	15,611	2,850	18,461
1910	9,295	3,910	13,205	1950	8,530	2,270	10,800	1990	15,459	2,900	18,359
1911	9,020	4,035	13,055	1951	8,745	2,230	10,975	1991	15,065	3,636	18,701
1912	9,330	3,760	13,090	1952	8,775	2,010	10,785	1992	15,067	2,850	17,917
1913	9,170	3,780	12,950	1953	8,790	1,920	10,710	1993	14,756	2,444	17,200
1914	8,565	3,975	12,540	1954	8,755	1,835	10,590	1994	14,991	2,201	17,192
1915	8,285	3,975	12,260	1955	9,225	1,745	10,970	1995	15,265	2,150	17,415
1916	8,530	3,955	12,485	1956	9,620	1,655	11,275	1996	15,107	1,924	17,031
1917	7,940	4,040	11,980	1957	8,615	1,565	10,180	1997	15,368	1,700	17,068
1918	7,310	4,290	11,600	1958	8,530	1,480	10,010	1998	15,264	1,632	16,896
1919	7,725	4,075	11,800	1959	9,390	1,390	10,780	1999	15,260	1,625	16,885
1920	7,770	4,065	11,835	1960	8,925	1,300	10,225	2000	15,199	1,622	16,821
1921	6,565	4,270	10,835	1961	8,745	1,215	9,960	2001	14,465	1,621	16,086
1922	7,605	3,760	11,365	1962	9,035	1,125	10,160	2002	14,416	1,520	15,936
1923	8,535	3,375	11,910	1963	9,560	1,055	10,615	2003	14,074	1,515	15,589
1924	8,245	3,380	11,625	1964	10,170	985	11,155	2004	14,697	1,540	16,237
1925	8,350	3,225	11,575	1965	11,230	1,038	12,268	2005	14,750	1,550	16,300
1926	8,220	3,065	11,285	1966	11,520	1,040	12,560	2006	14,356	1,555	15,911
1927	7,775	3,200	10,975	1967	11,332	1,066	12,398	2007	13,560	1,605	15,165
1928	7,670	3,225	10,895	1968	11,814	1,098	12,912	2008	11,549	1,510	13,059
1929	8,045	3,170	11,215	1969	11,963	1,100	13,063	2009	10,478	1,400	11,878
1930	6,305	3,790	10,095	1970	12,963	1,265	14,228	2010	10,660	1,400	12,060
1931	4,610	4,390	9,000	1971	12,300	1,233	13,533	2011	11,094	1,400	12,494
1932	3,400	4,980	8,380	1972	12,567	1,270	13,837				
1933	4,040	5,005	9,045	1973	12,795	1,202	13,997				
1934	4,340	4,825	9,165	1974	12,352	1,316	13,668				
1935	5,095	4,510	9,605	1975	11,317	1,259	12,576				
1936	5,980	4,265	10,245	1976	12,102	1,232	13,334				
1937	6,370	4,075	10,445	1977	12,529	1,428	13,957				
1938	5,570	4,325	9,895	1978	12,930	1,857	14,787				
1939	6,370	4,190	10,560	1979	13,221	2,230	15,451				

^aSources: 1900–1964: USDC Bureau of the Census (1975); 1965–2011: Howard and Westby (2013).

Table 2. Volume of softwood industrial roundwood harvested by landowner and region, 1952–2011 (million cubic feet)^a

Year	Industrial land					Other private land				
	North	South	Rocky Mtn.	Pacific Coast	Total	North	South	Rocky Mtn.	Pacific Coast	Total
1952	129	802	128	1,737	2,796	400	1,998	79	885	3,362
1962	109	580	145	1,455	2,289	321	1,937	74	504	2,836
1970	153	960	138	1,645	2,896	314	2,286	118	460	3,178
1976	196	1,366	115	1,740	3,417	352	2,511	147	393	3,403
1986	397	1,785	178	1,862	4,222	415	3,147	154	393	4,109
1991	433	1,843	198	1,658	4,132	383	3,039	200	680	4,302
1997	178	2,119	152	1,174	3,623	519	3,736	221	783	5,259
2001	143	2,229	150	1,158	3,680	412	4,063	231	866	5,572
2006	189	2,144	134	1,270	3,737	350	3,982	248	684	5,264
2011 ^b	NA	NA	NA	NA	NA	502	5,130	264	1,476	7,372

Year	National Forest					Other public land					Total				
	North	South	Rocky Mtn.	Pacific Coast	Total	North	South	Rocky Mtn.	Pacific Coast	Total	North	South	Rocky Mtn.	Pacific Coast	Total
1952	27	155	218	561	961	40	81	72	210	403	596	3,036	497	3,393	7,522
1962	31	117	387	1,100	1,635	40	73	78	371	562	501	2,707	684	3,430	7,322
1970	37	180	480	1,221	1,918	45	101	78	478	702	549	3,527	814	3,804	8,694
1976	34	235	426	1,172	1,867	54	139	85	544	822	636	4,251	773	3,849	9,509
1986	35	222	465	1,431	2,153	61	164	79	510	814	908	5,318	876	4,196	11,298
1991	63	217	425	1,084	1,789	58	183	173	355	769	937	5,282	996	3,777	10,992
1997	34	177	186	316	713	94	166	54	263	577	825	6,198	613	2,536	10,172
2001	15	47	79	109	250	73	174	51	254	552	643	6,513	511	2,387	10,054
2006	37	42	76	147	302	100	149	63	242	554	676	6,317	521	2,343	9,857
2011	18	70	73	147	307	119	134	72	311	636	639	5,334	409	1,934	8,316

^aSources: Haynes (2003); Smith et al. (2004, 2009); Oswalt et al. (2014).^bIndustrial land included with other private land for 2011.

Table 3. Volume of hardwood industrial roundwood harvested by landowner and region, 1952–2011 (million cubic feet)^a

Year	Industrial land					Other private land				
	North	South	Rocky Mtn.	Pacific Coast	Total	North	South	Rocky Mtn.	Pacific Coast	Total
1952	117	284	0	20	421	1,155	1,554	1	8	2,718
1962	86	323	0	25	434	1,123	1,253	1	28	2,405
1970	126	321	1	40	488	1,186	1,414	1	23	2,624
1976	144	291	1	37	473	1,199	1,299	1	44	2,543
1986	417	499	27	81	1,024	2,567	2,255	17	17	4,856
1991	511	527	0	83	1,121	2,857	2,224	9	130	5,220
1997	312	687	3	67	1,069	2,078	2,570	29	68	4,745
2001	251	628	3	45	927	1,504	2,793	18	58	4,373
2006	286	527	3	51	867	1,501	2,764	17	64	4,346
2011 ^b	NA	NA	NA	NA	NA	1,377	2,593	11	68	4,050

Year	National Forest				Other public land					Total					
	North	South	West ^c	Total	North	South	Rocky Mtn.	Pacific Coast	Total	North	South	Rocky Mtn.	Pacific Coast	NF West ^c	Total
1952	41	50	9	100	68	45	2	7	122	1,381	1,933	3	35	9	3,361
1962	43	40	14	97	77	46	2	5	130	1,329	1,662	3	58	14	3,066
1970	55	49	19	123	98	56	1	15	170	1,465	1,840	3	78	19	3,405
1976	64	33	4	101	95	84	1	19	199	1,502	1,707	3	100	4	3,316
1986	102	49	16	167	104	128	1	43	276	3,190	2,931	45	141	16	6,323
1991	137	48	12	197	179	86	2	43	310	3,684	2,885	11	256	12	6,848
1997	87	99	32	218	341	83	3	17	444	2,818	3,439	35	152	32	6,476
2001	56	31	4	91	257	105	2	14	378	2,068	3,557	23	117	4	5,770
2006	55	18	2	75	301	69	1	15	386	2,143	3,378	21	130	2	5,675
2011	41	30	5	76	301	90	2	15	408	1,720	2,714	14	84	5	4,536

^aSources: Haynes (2003); Smith et al. (2004, 2009); Oswalt et al. (2014).

^bIndustrial land included with other private land for 2011.

^cNational Forest West includes Rocky Mountain and Pacific Coast regions.

Table 4. Volume of all industrial roundwood harvested by landowner and region, 1952–2011 (million cubic feet)^a

Year	Industrial land					Other private land				
	North	South	Rocky Mtn	Pacific Coast	Total	North	South	Rocky Mtn	Pacific Coast	Total
1952	246	1,086	128	1,757	3,217	1,555	3,552	80	893	6,080
1962	195	903	145	1,480	2,723	1,444	3,190	75	532	5,241
1970	279	1,281	139	1,685	3,384	1,500	3,700	119	483	5,802
1976	340	1,657	116	1,777	3,890	1,551	3,810	148	437	5,946
1986	814	2,284	205	1,943	5,246	2,982	5,402	171	410	8,965
1991	944	2,370	198	1,741	5,253	3,240	5,263	209	810	9,522
1997	490	2,806	155	1,241	4,692	2,597	6,306	250	851	10,004
2001	394	2,857	153	1,203	4,607	1,916	6,856	249	924	9,945
2006	475	2,671	137	1,321	4,604	1,851	6,746	265	748	9,610
2011 ^b	NA	NA	NA	NA	NA	1,879	7,723	275	1,544	11,422

Year	National Forest					Other public land					Total				
	North	South	Rocky Mtn	Pacific Coast	Total	North	South	Rocky Mtn	Pacific Coast	Total	North	South	Rocky Mtn	Pacific Coast	Total
1952	68	205	223	566	1,061	108	126	74	217	525	1,977	4,969	505	3,433	10,883
1962	74	157	394	1,107	1,732	117	119	80	376	692	1,830	4,369	694	3,495	10,388
1970	92	229	490	1,231	2,041	143	157	79	493	872	2,014	5,367	827	3,892	12,099
1976	98	268	428	1,174	1,968	149	223	86	563	1,021	2,138	5,958	778	3,951	12,825
1986	137	271	473	1,439	2,320	165	292	80	553	1,090	4,098	8,249	929	4,345	17,621
1991	200	265	431	1,090	1,986	237	269	175	398	1,079	4,621	8,167	1,013	4,039	17,840
1997	121	276	202	332	931	435	249	57	280	1,021	3,643	9,637	664	2,704	16,648
2001	71	78	81	111	341	330	279	53	268	930	2,711	10,070	536	2,506	15,823
2006	92	60	77	148	377	401	218	64	257	940	2,819	9,695	543	2,474	15,531
2011	59	100	76	150	384	420	224	74	326	1,044	2,358	8,047	425	2,020	12,850

^aSources: Haynes (2003); Smith et al. (2004,2009); Oswalt et al. (2014).^bIndustrial land included with other private land for 2011.

Table 5. Weight of U.S. industrial wood products production by product, 1950–2011 (thousand tons)^a

Year	Total	Softwood plywood	Oriented strandboard	Laminated veneer	Hardwood plywood & veneer	Softwood lumber	Hardwood lumber	Lumber made at pallet plants	Particleboard production	Hardboard production	Medium density fiberboard production	Pulp, paper and board	Other industrial products	Insulating board
1950	82,814	1,463	-	-	781	29,905	12,444	0	30	336	0	24,375	12,705	774
1951	83,472	1,638	-	-	786	28,793	13,012	0	42	306	0	26,048	12,045	803
1952	81,464	1,738	-	-	803	29,516	12,197	0	46	360	0	24,423	11,550	830
1953	84,182	2,104	-	-	806	28,912	12,116	0	59	371	0	26,567	12,375	871
1954	83,469	2,181	-	-	732	28,588	11,937	0	68	408	0	26,411	12,210	934
1955	90,273	2,890	-	-	889	29,107	12,766	0	98	465	0	30,154	12,870	1,033
1956	91,858	2,971	-	-	884	29,413	13,446	0	156	474	0	31,428	12,045	1,041
1957	86,501	3,091	-	-	772	26,456	12,550	0	257	500	0	30,666	11,220	988
1958	87,827	3,548	-	-	755	26,729	12,975	0	352	535	0	30,823	11,055	1,056
1959	97,302	4,231	-	-	883	29,784	14,399	0	359	645	0	33,748	12,045	1,208
1960	88,651	4,243	-	-	723	26,039	13,498	0	326	603	0	33,758	8,415	1,046
1961	88,943	4,646	-	-	856	25,447	12,842	0	410	673	0	34,937	8,085	1,046
1962	92,674	5,094	-	-	995	26,182	13,714	0	515	764	0	36,678	7,673	1,059
1963	98,468	5,674	-	-	1,104	26,898	15,419	0	641	847	0	38,272	8,498	1,116
1964	104,539	6,264	-	-	1,255	28,589	15,690	0	832	840	0	40,961	8,910	1,198
1965	108,868	6,807	-	-	1,345	28,599	15,929	171	1,059	913	105	43,465	9,240	1,234
1966	113,194	7,140	-	-	1,362	28,162	16,488	203	1,333	964	117	46,971	9,323	1,131
1967	110,997	7,086	-	-	1,257	27,503	15,712	204	1,510	949	130	46,969	8,498	1,178
1968	116,505	8,036	-	-	1,318	28,589	14,794	225	1,956	1,160	145	50,561	8,498	1,276
1969	119,987	7,489	-	-	1,227	27,669	14,727	262	2,365	1,327	161	53,530	9,900	1,330
1970	119,523	7,842	-	-	1,179	26,876	14,057	247	2,434	1,370	179	53,408	10,758	1,173
1971	124,453	9,097	-	-	1,263	29,326	14,254	270	3,317	1,633	198	53,753	9,933	1,410
1972	130,569	10,021	-	-	1,332	30,239	14,334	303	4,330	1,812	220	58,009	8,531	1,439
1973	134,386	10,011	-	-	1,186	30,836	14,837	363	4,866	1,891	245	60,548	8,168	1,437
1974	126,340	8,683	-	-	919	27,046	14,257	402	4,324	1,767	272	60,403	7,062	1,205
1975	113,646	8,777	-	-	690	26,112	12,325	312	3,520	1,775	302	52,393	6,353	1,087
1976	128,233	10,084	-	-	711	29,873	13,462	383	4,485	2,120	394	59,283	6,188	1,251
1977	134,926	10,596	-	-	779	31,923	14,343	462	5,019	2,411	620	61,149	6,353	1,271
1978	139,305	10,918	-	-	778	32,704	15,120	529	5,231	2,445	714	63,085	6,518	1,262
1979	141,932	10,748	-	-	755	32,509	15,706	580	4,748	2,402	713	65,873	6,683	1,215
1980	134,084	8,932	84	53	681	27,530	15,452	505	4,148	1,919	693	66,217	6,848	1,021
1981	129,344	9,161	169	70	641	24,797	12,622	494	4,035	1,908	726	66,931	7,013	780
1982	124,212	8,666	348	70	909	23,222	13,494	447	3,365	1,746	627	63,483	7,178	657
1983	141,762	10,653	838	88	971	29,020	14,794	505	4,231	2,282	849	69,352	7,343	836
1984	150,006	10,897	1,276	88	988	30,434	17,027	591	4,494	2,137	892	72,742	7,508	934
1985	148,775	11,030	1,668	123	881	30,577	16,196	650	4,684	1,969	963	71,459	7,673	904
1986	160,772	12,096	2,196	140	912	34,435	17,680	721	5,067	1,819	1,098	75,964	7,838	806
1987	170,449	12,523	2,548	158	1,000	37,415	19,006	797	5,212	1,705	1,264	79,830	8,168	823
1988	174,787	12,359	2,878	193	1,019	37,224	19,813	876	5,385	1,599	1,320	82,847	8,415	859
1989	175,777	11,695	3,191	210	1,011	36,653	20,345	943	5,425	1,624	1,364	83,257	9,158	901
1990	176,550	11,440	3,386	280	1,009	34,941	20,792	996	5,352	1,570	1,336	85,307	9,273	868
1991	171,867	10,200	3,508	280	982	32,373	18,847	1,005	5,304	1,530	1,347	86,546	9,092	853
1992	179,502	10,572	4,158	298	934	33,706	19,276	1,046	5,597	1,648	1,499	90,885	9,016	868
1993	180,831	10,563	4,376	368	992	32,165	20,620	960	5,964	1,640	1,633	92,154	8,532	866
1994	185,905	10,740	4,679	403	1,182	33,297	20,900	863	6,387	1,627	1,759	96,595	6,617	857
1995	185,630	10,591	4,939	490	1,209	31,467	21,337	768	5,906	1,541	1,557	98,582	6,386	857
1996	186,758	10,490	5,821	560	1,171	32,476	21,074	660	6,270	1,650	1,752	98,334	5,643	857
1997	193,114	9,824	6,584	665	1,229	33,844	21,386	733	6,372	1,407	1,948	102,822	5,445	857
1998	191,746	9,721	7,017	718	1,288	33,853	21,480	744	6,459	1,344	1,970	101,262	5,033	857
1999	196,307	9,743	7,258	838	1,323	35,736	21,814	735	6,773	1,371	1,987	102,955	4,917	857
2000	193,159	9,557	7,441	833	1,487	35,110	21,259	735	6,756	1,182	2,093	100,900	4,950	857
2001	182,836	8,269	7,833	935	1,381	33,760	19,970	735	5,760	1,038	1,946	95,080	5,273	857
2002	185,987	8,313	8,391	982	1,376	34,979	19,828	735	6,207	912	2,280	95,890	5,238	857
2003	182,803	8,042	8,509	1,181	1,343	35,738	17,709	735	5,603	1,345	2,261	94,232	5,247	857
2004	191,271	8,020	8,919	1,510	1,327	38,147	18,662	735	6,053	1,212	2,457	98,124	5,247	857
2005	191,576	7,837	9,366	1,586	1,311	38,825	18,829	735	5,781	1,358	2,588	97,256	5,247	857
2006	190,236	7,343	9,350	1,544	1,188	37,806	18,586	735	5,702	1,209	2,610	98,025	5,280	857
2007	184,048	6,695	9,227	1,316	1,162	34,323	17,901	735	4,982	1,035	2,656	97,795	5,363	857
2008	163,319	5,598	8,127	908	1,115	28,484	11,453	735	4,101	911	2,400	93,844	4,785	857
2009	143,890	4,708	5,999	572	1,040	22,688	11,794	735	3,085	696	2,350	84,524	4,843	857
2010	148,590	4,994	6,437	719	985	24,213	9,550	735	3,216	849	2,000	89,193	4,843	857
2011	153,244	4,911	6,274	728	1,051	26,119	11,644	735	3,221	788	2,053	87,744	7,119	857

^aSources: 1950–1964: Ince (2000); 1965–2013: Howard and Westby (2013).

Table 6. Energy produced from wood by end use and its roundwood equivalent, 1949–2011^a

Year	Electric						Year	Electric					
	Residential ($\times 10^{15}$ Btu)	Commercial ($\times 10^{15}$ Btu)	Industrial ($\times 10^{15}$ Btu)	power ($\times 10^{15}$ Btu)	Quads ($\times 10^{15}$ Btu)	Roundwood equivalent ($\times 10^6$ ft ³)		Residential ($\times 10^{15}$ Btu)	Commercial ($\times 10^{15}$ Btu)	Industrial ($\times 10^{15}$ Btu)	power ($\times 10^{15}$ Btu)	Quads ($\times 10^{15}$ Btu)	Roundwood equivalent ($\times 10^6$ ft ³)
1949	1.06	0.02	0.47	0.01	1.56	6.24	1981	0.87	0.02	1.60	0.00	2.49	9.96
1950	1.01	0.02	0.53	0.01	1.57	6.28	1982	0.97	0.02	1.52	0.00	2.51	10.04
1951	0.96	0.02	0.55	0.01	1.54	6.16	1983	0.97	0.02	1.69	0.00	2.68	10.72
1952	0.90	0.02	0.55	0.01	1.48	5.92	1984	0.98	0.02	1.68	0.00	2.68	10.72
1953	0.83	0.02	0.57	0.01	1.43	5.72	1985	1.01	0.02	1.65	0.01	2.69	10.76
1954	0.80	0.02	0.58	0.00	1.40	5.60	1986	0.92	0.03	1.61	0.01	2.57	10.28
1955	0.78	0.01	0.63	0.00	1.42	5.68	1987	0.85	0.03	1.58	0.01	2.47	9.88
1956	0.74	0.01	0.66	0.00	1.41	5.64	1988	0.91	0.03	1.63	0.01	2.58	10.32
1957	0.70	0.01	0.62	0.00	1.33	5.32	1989	0.92	0.08	1.58	0.10	2.68	10.72
1958	0.69	0.01	0.62	0.00	1.32	5.28	1990	0.58	0.07	1.44	0.13	2.22	8.88
1959	0.65	0.01	0.69	0.00	1.35	5.40	1991	0.61	0.07	1.41	0.13	2.22	8.88
1960	0.63	0.01	0.68	0.00	1.32	5.28	1992	0.64	0.07	1.46	0.14	2.31	9.24
1961	0.59	0.01	0.70	0.00	1.30	5.20	1993	0.55	0.08	1.48	0.15	2.26	9.04
1962	0.56	0.01	0.73	0.00	1.30	5.20	1994	0.52	0.07	1.58	0.15	2.32	9.28
1963	0.54	0.01	0.77	0.00	1.32	5.28	1995	0.52	0.07	1.65	0.13	2.37	9.48
1964	0.50	0.01	0.83	0.00	1.34	5.36	1996	0.54	0.08	1.68	0.14	2.44	9.76
1965	0.47	0.01	0.85	0.00	1.33	5.32	1997	0.43	0.07	1.73	0.14	2.37	9.48
1966	0.45	0.01	0.90	0.00	1.36	5.44	1998	0.38	0.06	1.60	0.14	2.18	8.72
1967	0.43	0.01	0.89	0.00	1.33	5.32	1999	0.39	0.07	1.62	0.14	2.22	8.88
1968	0.43	0.01	0.98	0.00	1.42	5.68	2000	0.42	0.07	1.64	0.13	2.26	9.04
1969	0.42	0.01	1.01	0.00	1.44	5.76	2001	0.37	0.07	1.44	0.13	2.01	8.02
1970	0.40	0.01	1.02	0.00	1.43	5.72	2002	0.38	0.07	1.40	0.15	2.00	7.98
1971	0.38	0.01	1.04	0.00	1.43	5.72	2003	0.40	0.07	1.36	0.17	2.00	8.00
1972	0.38	0.01	1.11	0.00	1.50	6.00	2004	0.41	0.07	1.48	0.17	2.12	8.48
1973	0.35	0.01	1.16	0.00	1.52	6.08	2005	0.43	0.07	1.45	0.19	2.14	8.55
1974	0.37	0.01	1.16	0.00	1.54	6.16	2006	0.38	0.07	1.47	0.18	2.10	8.40
1975	0.43	0.01	1.06	0.00	1.50	6.00	2007	0.42	0.07	1.41	0.19	2.09	8.36
1976	0.48	0.01	1.22	0.00	1.71	6.84	2008	0.47	0.07	1.34	0.18	2.06	8.24
1977	0.54	0.01	1.28	0.00	1.83	7.32	2009	0.50	0.07	1.18	0.18	1.93	7.72
1978	0.62	0.01	1.40	0.00	2.03	8.12	2010	0.44	0.07	1.27	0.20	1.98	7.92
1979	0.73	0.01	1.40	0.00	2.14	8.56	2011	0.45	0.07	1.31	0.18	2.01	8.04
1980	0.85	0.02	1.60	0.00	2.47	9.88							

^aResidential use is primarily roundwood with some waste wood from other sources. Commercial use is a mix of roundwood and wood waste. Industrial use is from pulp liquor and wood waste. Energy is converted to roundwood equivalent using 4 billion cubic feet per Quadrillion Btus.

Sources: USDOE Energy Information Administration (2012, 2015).

Table 7. Value of shipments for forest products industries by SIC Code 1961–1996, by NAICS code, 1997–2011 (million 2005\$)^a

Year	Lumber and wood products SIC 24	Paper and allied products SIC 26	Wood furniture from parts of SIC 25	Total wood, paper & furniture SIC industries	Wood products NAICS 321	Paper products NAICS 322	Wood furniture from parts of NAICS 337	Total wood, paper & furniture NAICS industries
1960								
1961		96,592						
1962	51,657	98,898						
1963	60,166	104,396						
1964	62,257	108,329						
1965	63,848	115,190						
1966	64,618	123,051						
1967	65,519	122,618						
1968	72,227	125,194						
1969	74,709	129,989						
1970	65,657	124,836						
1971	72,001	122,764						
1972	111,274	132,047						
1973	123,079	144,065	20,625	287,768				
1974	106,377	165,054	19,704	291,136				
1975	91,457	151,532	16,328	259,317				
1976	86,135	143,170	18,603	247,907				
1977	128,727	167,861	19,862	316,450				
1978	139,349	170,741	21,693	331,782				
1979	134,111	175,396	20,235	329,742				
1980	111,738	172,532	18,399	302,670				
1981	100,566	172,388	17,775	290,728				
1982	86,893	161,593	16,632	265,118				
1983	101,976	166,631	17,706	286,313				
1984	105,569	179,847	20,248	305,664				
1985	102,280	171,882	19,806	293,968				
1986	108,896	177,668	20,471	307,034				
1987	119,810	187,380	22,750	329,940				
1988	118,940	202,866	22,275	344,081				
1989	117,194	207,736	21,768	346,698				
1990	110,916	197,878	20,465	329,259				
1991	101,079	186,598	18,268	305,944				
1992	113,821	185,226	19,715	318,762				
1993	127,411	180,111	19,191	326,713				
1994	136,398	189,303	20,330	346,030				
1995	134,487	222,619	23,460	380,566				
1996	132,590	199,983	23,758	356,331				
1997					109,132	185,396	43,746	338,274
1998					115,361	196,097	47,493	358,951
1999					122,047	196,800	50,053	368,900
2000					111,104	196,065	49,052	356,220
2001					102,333	182,788	46,699	331,820
2002					106,877	184,599	52,986	344,462
2003					104,936	172,215	49,894	327,045
2004					111,731	166,714	48,509	326,953
2005					112,095	161,928	48,470	322,494
2006					107,421	161,541	46,847	315,809
2007					93,044	160,599	44,460	298,103
2008					72,860	148,807	37,518	259,184
2009					59,173	147,146	29,674	235,993
2010					59,284	144,910	27,258	231,451
2011					55,253	137,727	25,619	218,599

^aSources: Value of shipments: USDC Bureau of the Census (2015a, 2015b, 2015c); GDP deflator: USDC Bureau of Economic Analysis (2015).

Definitions of SIC groups changed somewhat in 1987; therefore, data prior to 1987 are not strictly comparable with data for 1987 and later.

Value of shipments for SIC groups and NAICS groups are not strictly comparable.

Codes used under SIC 25 are 2511, 2517, 2521, and 2541. Codes used under NAICS 337 are 337110, 337121, 337122, 337212, and 33% of 33721N.

Table 8. Value of shipments in paper products industries (NAICS 322) by region (billion 2005\$)^a

Year	North	South	Pacific Coast	Rocky Mountains	Not specified	Total
1997	89.2	71.2	19.0	5.0	1.0	185.4
1998						196.1
1999						196.8
2000						196.1
2001						182.8
2002	86.9	72.8	18.5	5.4	1.1	184.6
2003	81.0	67.9	17.2	5.1	1.0	172.2
2004	76.8	67.7	17.2	4.0	1.0	166.7
2005	71.4	63.2	16.2	9.5	1.6	161.9
2006	72.3	59.5	16.8	9.9	2.0	161.5
2007	73.6	62.7	16.3	6.5	1.3	160.6
2008	67.8	58.0	15.1	6.4	1.3	148.8
2009	66.6	57.2	15.0	6.7	1.3	147.1
2010	65.4	55.9	14.8	7.2	1.4	144.9
2011	62.4	53.0	14.1	6.6	1.3	137.7

Sources: value of shipments: USDC Bureau of the Census (2015a, 2015b, 2015c); GDP deflator: USDC Bureau of Economic Analysis (2015).

Table 9. Value of shipments in wood products industries (NAICS 321) by region (billion 2005\$)^a

Year	North	South	Pacific Coast	Rocky Mountains	Not specified	Total
1997	32.0	46.1	23.0	8.0	0.0	109.1
1998	--	--	--	--	--	115.4
1999	--	--	--	--	--	122.0
2000	--	--	--	--	--	111.1
2001	--	--	--	--	--	102.3
2002	36.0	40.0	21.0	7.0	3.0	106.9
2003	35.3	42.4	20.2	6.1	0.0	104.9
2004	37.2	44.3	22.1	7.0	0.0	111.7
2005	36.0	46.0	21.0	8.0	0.0	112.1
2006	35.1	44.2	20.1	8.0	0.0	107.4
2007	30.8	37.1	17.9	6.2	0.5	93.0
2008	24.0	29.5	13.9	4.9	0.1	72.9
2009	19.4	23.9	11.3	4.1	0.1	59.2
2010	19.4	24.1	11.3	4.1	0.1	59.3
2011	18.2	22.4	10.5	3.8	0.1	55.3

^aSources: value of shipments: USDC Bureau of the Census (2015a, 2015b, 2015c); GDP deflator: USDC Bureau of Economic Analysis (2015).

Table 10. Value of shipments in wood and paper products industries (NAICS 321, 322) by region (billion 2005\$)^a

Year	North	South	Pacific Coast	Rocky Mountains	Not specified	Total
1997	121.6	117.6	42.2	13.1	1.0	294.5
1998	--	--	--	--	--	311.5
1999	--	--	--	--	--	318.8
2000	--	--	--	--	--	307.2
2001	--	--	--	--	--	285.1
2002	124.5	114.3	40.0	12.6	4.1	291.5
2003	116.8	110.7	37.5	11.2	1.0	276.1
2004	114.4	112.4	39.5	11.1	1.0	277.4
2005	108.1	109.8	37.4	17.6	1.6	273.0
2006	108.3	104.4	37.2	18.1	2.0	268.0
2007	105.1	100.6	34.4	12.8	1.8	252.9
2008	92.4	88.0	29.3	11.3	1.3	221.0
2009	86.6	81.7	26.5	10.8	1.4	205.7
2010	85.4	80.5	26.2	11.4	1.5	203.6
2011	81.2	75.9	24.8	10.5	1.4	192.4

^aSources: value of shipments: USDC Bureau of the Census (2015a, 2015b, 2015c); GDP deflator: USDC Bureau of Economic Analysis (2015).