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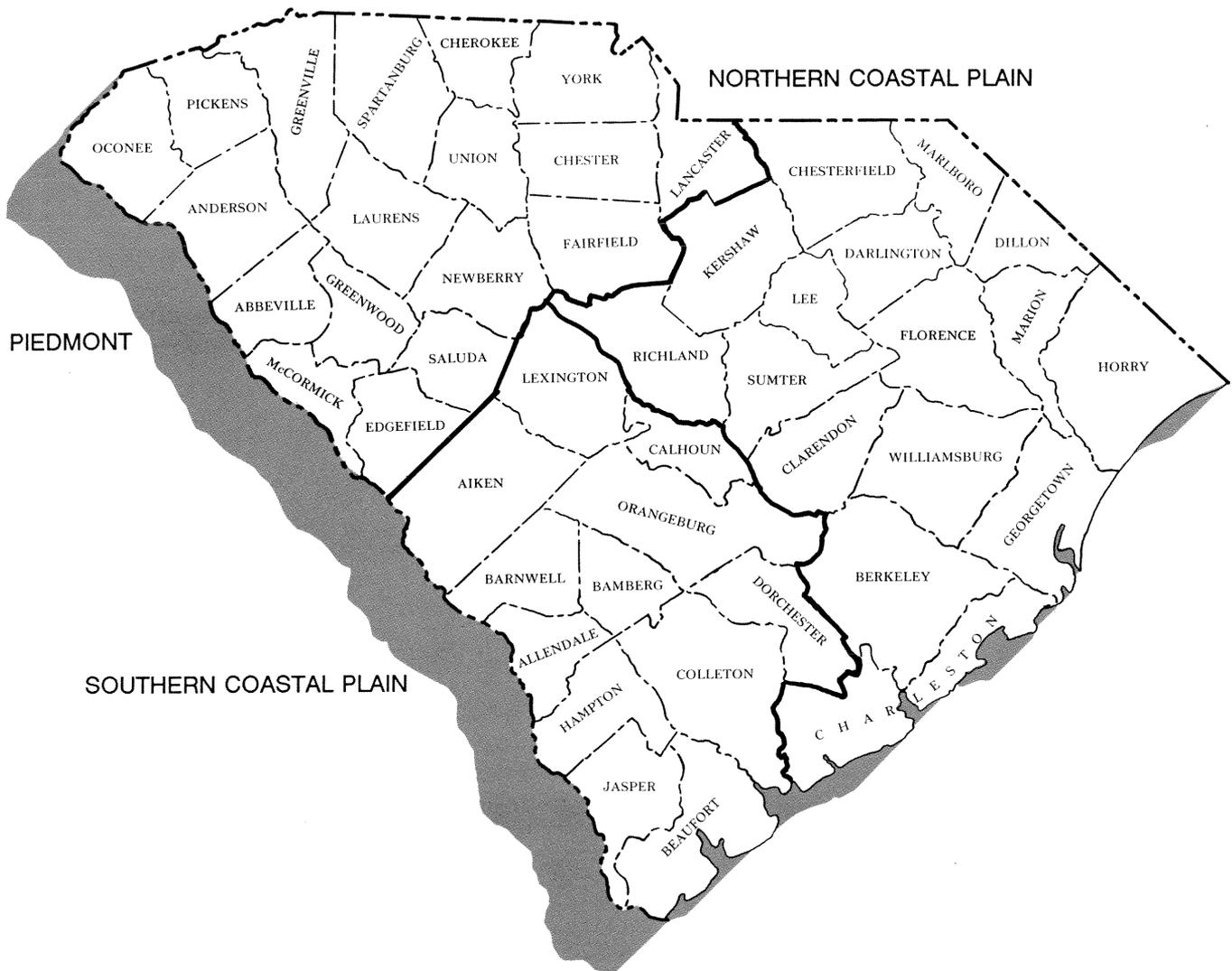
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Changes in South Carolina's Industrial Timber Products Output, 1988

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Southeastern Forest Experiment Station
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ABSTRACT

The roundwood output of industrial timber products from South Carolina's forests amounted to 605.1 million cubic feet in 1988, nearly 3 percent more than in 1987. Volume of industrial timber products generated from plant byproducts increased by nearly 1 percent to 205.9 million cubic feet in 1988. In 1988, residues used for fiber and fuel totaled 176.5 million cubic feet. Pulpwood was the State's leading roundwood product with 283.2 million cubic feet; next was saw logs with 253.7 cubic feet, and then veneer logs with 62.7 million cubic feet. The trend continues toward complete utilization of plant byproducts, with the volume of unused plant residues dropping by 4 percent, to 0.8 million cubic feet. Fewer mills had greater receipts, indicating increased utilization and processing efficiency.

Keywords: Roundwood receipts, roundwood output, plant byproducts, residues, wood movement.

Industrial Timber Products Output

Between 1987 and 1988, industrial timber products output from roundwood and plant byproducts combined increased by 2 percent to 811.0 million cubic feet. During this period the number of mills declined, indicating increased capacity and better utilization at remaining mills. Industrial timber products output from plant byproducts increased by nearly 1 percent to 205.9 million cubic feet, while that from roundwood increased by nearly 3 percent (tables 1, 2, and 6).

Softwood accounted for 78 percent of all industrial roundwood output in 1988 and hardwood made up 22 percent. This mix is about the same as in 1987 and for the years during the preceding decade.

Pulpwood was the leading roundwood product in 1988, as it has been for two decades, and accounted for nearly 47 percent of the total roundwood production (table 1). Pulpwood production was up by 4 percent since 1987 to 283.2 million cubic feet. Softwoods accounted for 71 percent of production in 1988, the same as in 1987, and hardwoods made up 29 percent of production. Although there was little change in pulpwood mix between 1987 and 1988, hardwoods now account for a larger portion of pulpwood furnish than in previous years. Hardwoods accounted for 25 percent of total production 10 years ago and for about 21 percent 20 years ago. Considering the availability of the resource, current prices, and developing technologies that allow increased use in certain applications, the trend toward increased hardwood use is expected to continue.

Saw logs was second in roundwood production with 253.7 million cubic feet, or 42 percent of the total. Since 1987, saw-log output has increased by nearly 5 percent. This increase is modest compared with the big gains in saw-log output between the early-1980's--when economic conditions dampened housing starts and influenced, to a lesser degree, home improvements--and the mid-1980's, when the economic picture improved somewhat. In 1978, saw-log output totaled only 172.5 million cubic feet.

Official figures show housing starts for 1989 down from 1988. Housing starts rebounded slightly in early 1990, primarily due to dry weather, but again slumped for the second quarter of 1990. The 1989 and 1990 drain surveys may therefore show saw-log output declining or at least not increasing from 1988 levels. Acceptance of parallel strand lumber and laminated

veneer lumber may also affect saw-log production. As of 1988, South Carolina had no facilities producing these products.

Softwood saw-log output was up 4 percent from 1987, and hardwood output was up 7 percent. Hardwoods accounted for about 16 percent of the total saw-log output in 1988, slightly more than in 1987 but less than the average 20 percent of the early 1980's.

Output of veneer logs totaled 62.7 million cubic feet in 1988, down 9 percent. Both hardwood and softwood output declined, softwoods by nearly 10 percent to 51.0 million cubic feet, and hardwoods by nearly 7 percent to 11.7 million cubic feet. Output, however, remains higher than in the early and mid eighties for both softwoods and hardwoods. As with lumber, the growing use of relatively new products in certain applications, such as oriented strand board, will no doubt have some influence on the volume of veneer logs produced for softwood plywood.

In 1988, the output of other miscellaneous industrial products from roundwood totaled 5.6 million cubic feet, down about 3 percent from 1987. Almost all of the current output is from softwoods. This category includes poles and pilings, posts, roundwood exported to North Carolina for oriented strand board, and roundwood exported to Georgia for excelsior.

Number of Mills and Receipts

The number of primary processing mills in the Southeast changes from year to year, usually in response to current economic conditions. Frequently, smaller mills shut down temporarily during periods of low product demand, and reopen when demand and economics improve. Occasionally, mills close permanently. South Carolina's forest industry continues to become smaller and more efficient. In 1978, 158 mills had receipts totaling 417.8 million cubic feet (Tansey 1984).¹ During 1988, 124 mills (table 2) had receipts in excess of 549 million cubic feet (table 3),

¹Tansey, John B. 1984. South Carolina's industrial timber products output, 1977-1981. Resour. Bull. SE-71. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southeastern Forest Experiment Station. 21 pp.

a gain of 31 percent in mill receipts with a corresponding 22-percent loss in number of mills over a decade.

Numbers of sawmills are more variable than those of other types of mills. Small sawmills often close when markets are poor. In contrast, veneer plants and pulpmills represent much larger capital expenditures, and they must operate continuously. Between 1987 and 1988 the number of sawmills declined from 99 to 93. This is a considerable reduction from the 121 sawmills in operation in 1978. All of the recent decline is attributed to closing of small mills with annual receipts of less than 2 million board feet; most had annual receipts totaling less than 800,000 board feet.

Number of veneer mills dropped from 20 in 1987 to 18 in 1988 (table 2). Several plants that remained in operation were involved in modernization and plant expansion. Still, veneer-log receipts declined over 7 percent--softwoods by 8 percent to 46.3 million cubic feet, and hardwoods by 4 percent to 11.8 million cubic feet. Some possible reasons for the reduction are competition with reconstituted panel products, such as oriented strand board and waferboard, and the availability of large-diameter quality pine sawtimber. Developing technology such as the spindleless lathe will help to address the availability problem.

The number of pulpmills operating in South Carolina remained the same between 1987 and 1988. Eight mills had receipts totaling 237.7 million cubic feet in 1987, and 248.7 million cubic feet in 1988, an increase of almost 5 percent (table 3). Daily pulping capacity for these mills combined stayed about the same at 9,000 tons. One new pulpmill is scheduled for completion in 1991.

Number of mills producing other industrial products, such as poles or posts, dropped by 1 to 5; roundwood receipts declined by nearly 6 percent to 4.0 million cubic feet.

Roundwood Movement in 1988

Statewide, South Carolina was a net exporter of all industrial roundwood in 1988. Production of industrial roundwood from South Carolina timberland amounted to 605.1 million cubic feet. About 82 percent, or 495.5 million cubic feet, was retained for consumption by mills within the State (table 4). Exports amounting to 109.6 million cubic feet accounted for the remaining

18 percent of roundwood cut for industrial products. All mills combined had receipts totaling 549.2 million cubic feet, of which 53.7 million cubic feet was imports.

Georgia received about 49 percent of all exports, principally saw logs, with a small volume of roundwood exported for veneer, poles, and miscellaneous products. The remaining exports went to North Carolina; saw logs and veneer logs each accounted for about one-half of these exports. Roundwood for poles and oriented strand board made up less than 1 percent of the exports to North Carolina. Export data in this report include movement to mills in the Midsouth, North Central, and Northeast regions of the United States. Exports of roundwood outside of the United States are not accounted for in this study since receiving mills cannot be adequately canvassed. Exports of roundwood chipped are not included since county origin cannot be adequately determined.

Mills in South Carolina imported roundwood from Georgia, Tennessee, North Carolina, Kentucky, and Mississippi. Almost 57 percent of all imported wood was from Georgia and 42 percent from North Carolina. About 74 percent of imported wood was softwood; 26 percent was hardwood.

For softwoods, roundwood production for industrial products exceeded mill receipts by 8 percent. For hardwoods, production of roundwood exceeded mill receipts by nearly 18 percent.

Mill Residues

In 1988, mills in South Carolina generated approximately 164.7 million cubic feet of softwood and 41.2 million cubic feet of hardwood residues during the primary processing of roundwood (table 5). The total residue generated was equivalent to about 2.7 million cords of pulpwood. Softwood species accounted for 80 percent of total residues generated. Primary wood-using mills in South Carolina generated 53.7 million cubic feet of bark, 67.5 million cubic feet of fine residues (including sawdust and planer shavings), and 84.7 million cubic feet of coarse residues (table 6). Seventy-two percent of the coarse residue was generated in the processing of saw logs, 25 percent in the processing of veneer logs (table 5). Coarse residue from veneer logs is down by 17 percent from 1987 due to less roundwood received and processed and to improved technology that increases recovery and reduces waste.

Pulpmills consumed 80 percent of the coarse residues, or about 67.7 million cubic feet, for fiber manufacture (table 6). Over 10.4 million cubic feet, or 12 percent, of coarse residues were used for sawn products such as landscape timbers. Industry and households consumed 6.3 million cubic feet, or 7 percent, of the coarse residues for fuel in 1988--an increase of nearly 120 percent from 1987. Less than 1 percent of coarse residues was not used.

Almost 90 percent of sawdust was used for industrial fuel; about 6 percent was used in charcoal manufacture, and 3 percent in the manufacture of miscellaneous products. An insignificant amount of sawdust went unused.

About 15.9 million cubic feet of shavings were generated at sawmills in 1988; 95 percent was softwood (table 5). Shavings used for fiber products amounted to 33 percent, particleboard 28 percent, industrial fuel 22 percent, and 16 percent for miscellaneous uses such as mulch and bedding (table 6).

In 1988, 47.3 million cubic feet of bark was used for industrial fuel (table 6). This accounts for 88 percent of the total bark residue generated. Another 6.1 million cubic feet was used in the manufacture of charcoal and other miscellaneous products such as pine bark mulch and nuggets. Most all of the bark was used in 1988.

The volume of unused residues dropped 4 percent between 1987 and 1988. Unused residues have dropped slightly for the last decade. There is little room for improvement in the volume of plant residues utilized. In 1988, only 1 percent of the sawdust and less than 0.5 percent of bark, coarse residues, and shavings were not utilized.

Regional Trends

Southern Coastal Plain

During 1988, 171.2 million cubic feet of industrial roundwood was cut in the 12 counties making up the Southern Coastal Plain of South Carolina (fig. 1) and was delivered to primary processing mills. This was an increase of 7 percent from 1987 (table 7). Softwoods accounted for 79 percent of the region's total roundwood output in 1988. The 93.0 million cubic feet of saw logs harvested in this region accounted for 54 percent of the production of all industrial products, with pulpwood accounting for 40 percent of the region's total roundwood output. Production of pulpwood was up by 2 percent from 1987. The Southern Coastal Plain produced 37 percent of the State's saw logs, 24 percent of the pulpwood, 14 percent of the veneer, and 15 percent of the State's roundwood used for other industrial products.

During 1988, 25 sawmills, 6 veneer mills, and 2 mills producing miscellaneous products were in operation

(fig. 2). One small mill closed in 1988, and two additional mills began operation. Almost all mills had increased receipts. For all mills combined, receipts totaled 112.3 million cubic feet, up about 10 percent from 1987. During 1988, roundwood exports, including out-of-State exports and wood movement to other regions within State, totaled 85.4 million cubic feet. Imports of roundwood from all other sources totaled 26.5 million cubic feet.

Northern Coastal Plain

Between 1987 and 1988, roundwood output from the 16 counties that make up the Northern Coastal Plain of South Carolina (fig. 1) increased by 6 percent to 234.0 million cubic feet (table 8). Softwood accounted for 76 percent of this total. Roundwood cut for pulpwood was the leading product in the region during 1987 and also in 1988. In 1988, pulpwood output soared to nearly 111.6 million cubic feet, an increase of almost 14 percent from the previous

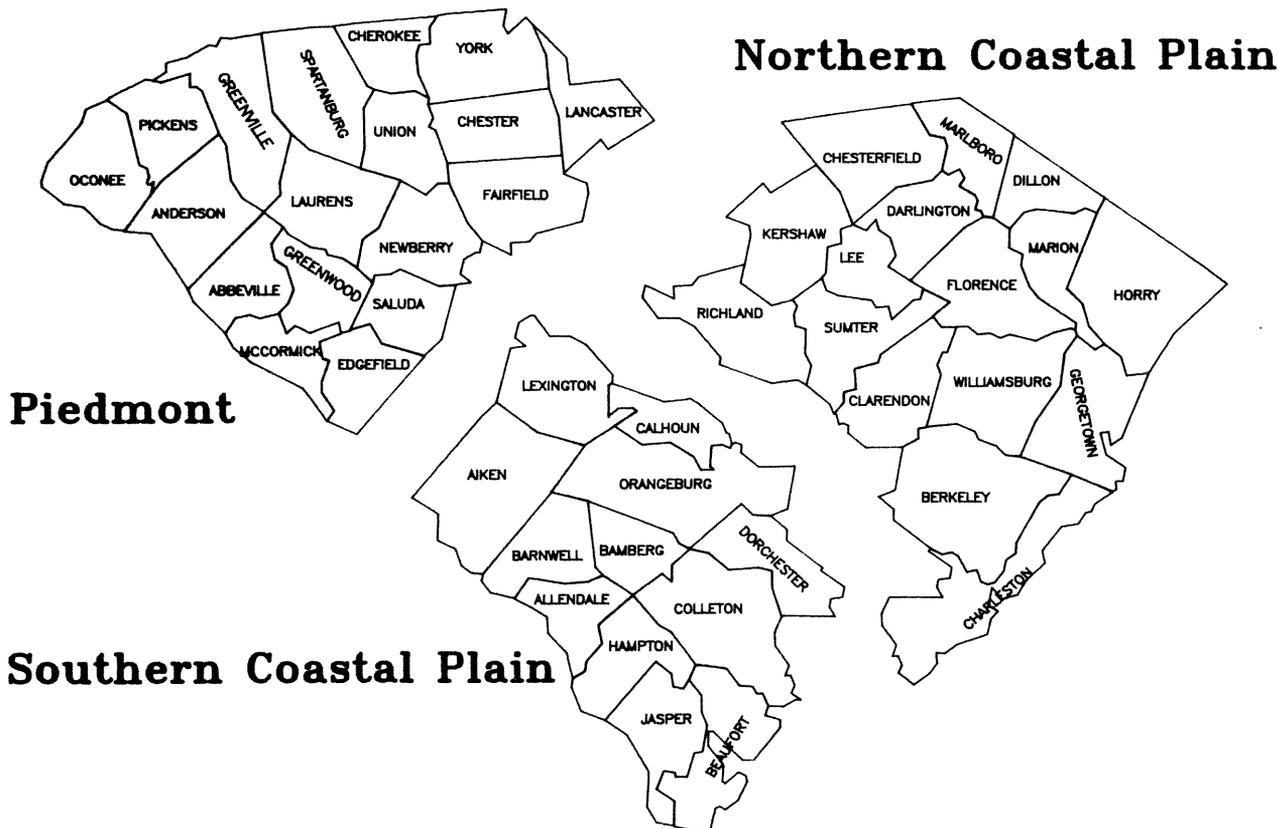


Figure 1--Location of counties within regions in South Carolina, 1988.

year. Hardwood roundwood cut for pulpwood increased by more than 16 percent; hardwood accounted for 30 percent of pulpwood in 1988. Including both species, roundwood cut for pulpwood accounts for 48 percent of the region's total roundwood output (table 8) and for 18 percent of the State's output (table 1). Saw-log roundwood output increased to 91.9 million cubic feet, or by about 4 percent from the previous year; saw logs account for 39 percent of the region's total roundwood output. Softwood species made up 81 percent of saw logs cut.

During 1988, 42 mills, including 6 pulpmills, 25 sawmills, 8 veneer mills, and 3 mills producing other products operated in the Northern Coastal Plain (fig. 2). During 1988, the Northern Coastal Plain produced 36 percent of the State's roundwood saw logs, 44 percent of the veneer, 39 percent of the pulpwood, and 57 percent of the roundwood used for other industrial products. The region's total receipts amounted to 264.6 million cubic feet, 13 percent more than production. Exports totaled 57.2 million cubic feet, while roundwood imports amounted to nearly 87.9 million cubic feet. About 85 percent of roundwood imported was pulpwood.

Piedmont

Between 1987 and 1988, roundwood output from all products except other industrial from the 18 counties of South Carolina's Piedmont decreased when combined. Total output decreased by 5 percent to 199.9 million cubic feet (table 9). Pulpwood accounted for nearly 52 percent of the roundwood output followed by saw logs with 34 percent and veneer logs with 13 percent.

In 1988, 49 mills operated in the Piedmont (fig. 2); this is nearly 40 percent of all mills operating in the State (table 2). The 43 sawmills operating in the region had receipts totaling 71.2 million cubic feet, 30 percent of the State's total saw-log consumption. Four veneer mills processed 34.9 million cubic feet, 60 percent of the State's total veneer consumption. Total receipts for the region amounted to 172.3 million cubic feet. Roundwood exports of 71.5 million cubic feet exceeded imports by 63 percent.

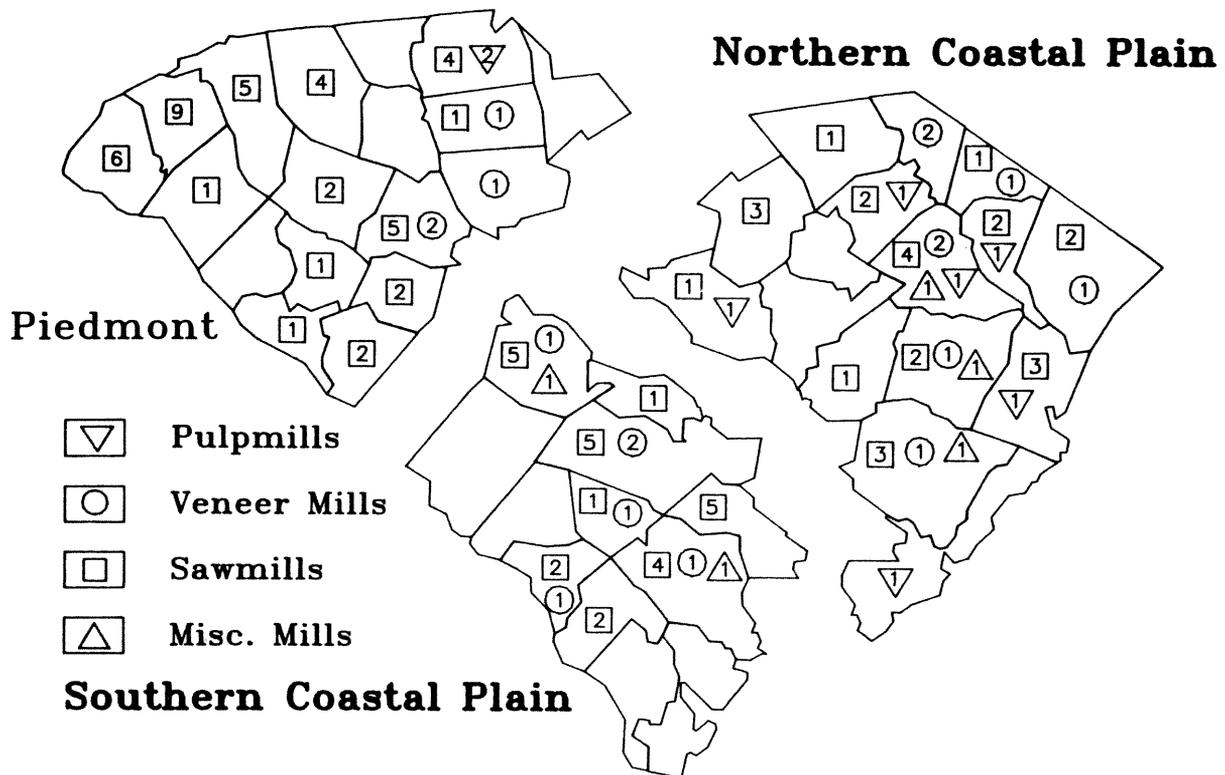


Figure 2--Location of primary wood-using industries in South Carolina, 1988.

Table 1--Roundwood timber products output, by product and species group, South Carolina, 1987-88

Product and species group	Year		Change
	1987	1988	
	<u>Thousand cubic feet</u>		<u>Percent</u>
Saw logs			
Softwood	205,428	213,792	+4.1
Hardwood	37,228	39,876	+7.1
Total	242,656	253,668	+4.5
Veneer logs			
Softwood	56,413	51,011	-9.6
Hardwood	12,523	11,665	-6.9
Total	68,936	62,676	-9.1
Pulpwood^a			
Softwood	193,216	202,198	+4.6
Hardwood	79,418	80,975	+2.0
Total	272,634	283,173	+3.9
Other industrial			
Softwood	5,735	5,453	-4.9
Hardwood	--	127	--
Total	5,735	5,580	-2.7
All industrial			
Softwood	460,792	472,454	+2.5
Hardwood	129,169	132,643	+2.7
Total	589,961	605,097	+2.6

-- = negligible.

^aIncludes roundwood that was delivered to nonpulp mills and then chipped and sold to pulp mills (19,701 thousand cubic feet in 1987 and 24,357 thousand cubic feet in 1988).

Table 2--Number of primary wood-using plants, by industry, South Carolina, 1987-88

Industry	Year		Change
	1987	1988	
	<u>Number</u>		<u>Percent</u>
Sawmills	99	93	-6.1
Veneer mills	20	18	-10.0
Pulpmills	8	8	--
Other	6	5	-16.7
All plants	133	124	-6.8

-- = negligible.

Table 3--Roundwood receipts, by product and species group, South Carolina, 1987-88

Product and species group	Year		Change
	1987	1988	
	<u>Thousand cubic feet</u>		<u>Percent</u>
Saw logs			
Softwood	189,457	199,058	+5.1
Hardwood	36,255	39,393	+8.7
Total	225,712	238,451	+5.6
Veneer logs			
Softwood	50,507	46,291	-8.3
Hardwood	12,296	11,808	-4.0
Total	62,803	58,099	-7.5
Pulpwood^a			
Softwood	175,609	187,058	+6.5
Hardwood	62,045	61,608	-0.7
Total	237,654	248,666	+4.6
Other industrial			
Softwood	4,228	3,993	-5.6
Hardwood	--	--	--
Total	4,228	3,993	-5.6
All industrial			
Softwood	419,801	436,400	+4.0
Hardwood	110,596	112,809	+2.0
Total	530,397	549,209	+3.5

-- = negligible.

^aIncludes roundwood that was delivered to nonpulpmills and then chipped and sold to pulpmills (20,475 thousand cubic feet in 1987 and 25,979 thousand cubic feet in 1988).

Table 4--Industrial roundwood movement, by species group, South Carolina, 1988

Movement	All species	Softwood	Hardwood
	<u>Thousand cubic feet</u>		
Output	605,097	472,454	132,643
Retained	495,538	393,215	102,323
Exported	109,559	79,239	30,320
Imported	53,671	43,185	10,486
Receipts	549,209	436,400	112,809

Table 5--Primary mill residue, by roundwood type and species group, and residue type, South Carolina, 1988

Roundwood type and species group	Residue type				
	All types	Bark	Coarse	Sawdust	Shavings
	<u>Thousand cubic feet</u>				
Saw logs					
Softwood	110,759	17,401	49,291	28,958	15,109
Hardwood	24,865	4,321	11,862	7,936	746
Total	135,624	21,722	61,153	36,894	15,855
Veneer logs					
Softwood	32,000	4,167	16,478	11,355	--
Hardwood	9,108	1,324	4,360	3,424	--
Total	41,108	5,491	20,838	14,779	--
Pulpwood					
Softwood	15,567	15,567	--	--	--
Hardwood	7,199	7,199	--	--	--
Total	22,766	22,766	--	--	--
Other industrial^a					
Softwood	6,412	3,728	2,684	--	--
Hardwood	--	--	--	--	--
Total	6,412	3,728	2,684	--	--
Total					
Softwood	164,738	40,863	68,453	40,313	15,109
Hardwood	41,172	12,844	16,222	11,360	746
Total	205,910	53,707	84,675	51,673	15,855

-- = negligible.

^aIncludes poles, piling, posts, and other industrial products.

Table 6--Disposal of residue at primary wood-using plants, by product and species group and type of residue, South Carolina, 1987-88

Product and species group	All types		Bark		Coarse		Sawdust		Shavings	
	1987	1988	1987	1988	1987	1988	1987	1988	1987	1988
	Thousand cubic feet									
Fiber products										
Softwood	62,965	61,950	--	--	57,195	56,796	--	--	5,770	5,154
Hardwood	12,107	11,033	--	--	11,158	10,892	--	--	949	141
Total	75,072	72,983	--	--	68,353	67,688	--	--	6,719	5,295
Particleboard										
Softwood	4,755	4,554	--	--	--	--	377	178	4,378	4,376
Hardwood	1,931	152	--	--	1,366	--	564	40	1	112
Total	6,686	4,706	--	--	1,366	--	941	218	4,379	4,488
Charcoal										
Softwood	917	4,734	550	2,035	14	--	351	2,699	2	--
Hardwood	626	443	171	75	6	--	427	346	22	22
Total	1,543	5,177	721	2,110	20	--	778	3,045	24	22
Sawn products										
Softwood	12,294	9,084	--	--	12,294	9,084	--	--	--	--
Hardwood	189	1,353	--	--	189	1,353	--	--	--	--
Total	12,483	10,437	--	--	12,483	10,437	--	--	--	--
Fuel										
Softwood	75,901	76,838	33,923	35,228	1,207	2,442	37,159	36,080	3,612	3,088
Hardwood	22,617	26,657	10,570	12,115	1,680	3,895	10,058	10,225	309	422
Total	98,518	103,495	44,493	47,343	2,887	6,337	47,217	46,305	3,921	3,510
Miscellaneous										
Softwood	8,388	7,351	4,382	3,488	--	80	2,055	1,293	1,951	2,490
Hardwood	989	930	548	506	39	82	271	293	131	49
Total	9,377	8,281	4,930	3,994	39	162	2,326	1,586	2,082	2,539
Not used										
Softwood	250	227	92	112	127	51	28	63	3	1
Hardwood	617	604	552	148	6	--	58	456	1	--
Total	867	831	644	260	133	51	86	519	4	1
All products										
Softwood	165,470	164,738	38,947	40,863	70,837	68,453	39,970	40,313	15,716	15,109
Hardwood	39,076	41,172	11,841	12,844	14,444	16,222	11,378	11,360	1,413	746
Total	204,546	205,910	50,788	53,707	85,281	84,675	51,348	51,673	17,129	15,855

-- = negligible.

Table 7--Volume of roundwood output of industrial timber products, by product and species group, Southern Coastal Plain, 1987-88

Product and species group	Year		Change
	1987	1988	
	<u>Thousand cubic feet</u>		<u>Percent</u>
Saw logs			
Softwood	74,694	82,694	+10.7
Hardwood	7,887	10,312	+30.7
Total	82,581	93,006	+12.6
Veneer logs			
Softwood	5,178	4,978	-3.9
Hardwood	4,227	3,832	-9.3
Total	9,405	8,810	-6.3
Pulpwood^a			
Softwood	44,438	46,974	+5.7
Hardwood	22,816	21,602	-5.3
Total	67,254	68,576	+2.0
Other industrial			
Softwood	914	832	-9.0
Hardwood	--	--	--
Total	914	832	-9.0
All industrial			
Softwood	125,224	135,478	+8.2
Hardwood	34,930	35,746	+2.3
Total	160,154	171,224	+6.9

-- = negligible.

^aIncludes roundwood that was delivered to nonpulpmills and then chipped and sold to pulpmills (8,615 thousand cubic feet in 1987 and 8,820 thousand cubic feet in 1988).

Table 8--Volume of roundwood output of industrial timber products, by product and species group, Northern Coastal Plain, 1987-88

Product and species group	Year		Change
	1987	1988	
	<u>Thousand cubic feet</u>		<u>Percent</u>
Saw logs			
Softwood	71,633	74,629	+4.2
Hardwood	17,139	17,281	+0.8
Total	88,772	91,910	+3.5
Veneer logs			
Softwood	23,622	22,304	-5.6
Hardwood	5,966	4,967	-16.7
Total	29,588	27,271	-7.8
Pulpwood^a			
Softwood	69,751	78,497	+12.5
Hardwood	28,430	33,087	+16.4
Total	98,181	111,584	+13.7
Other industrial			
Softwood	3,768	3,197	-15.2
Hardwood	--	--	--
Total	3,768	3,197	-15.2
All industrial			
Softwood	168,774	178,627	+5.8
Hardwood	51,535	55,335	+7.4
Total	220,309	233,962	+6.2

-- = negligible.

^aIncludes roundwood that was delivered to nonpulpmills and then chipped and sold to pulpmills (5,826 thousand cubic feet in 1987 and 8,212 thousand cubic feet in 1988).

Table 9--Volume of roundwood output of industrial timber products, by product and species group, Piedmont, 1987-88

Product and species group	Year		Change
	1987	1988	
	<u>Thousand cubic feet</u>		<u>Percent</u>
Saw logs			
Softwood	59,101	56,469	-4.5
Hardwood	12,202	12,283	+0.7
Total	71,303	68,752	-3.6
Veneer logs			
Softwood	27,613	23,729	-14.1
Hardwood	2,330	2,866	+23.0
Total	29,943	26,595	-11.2
Pulpwood^a			
Softwood	79,027	76,727	-2.9
Hardwood	28,172	26,286	-6.7
Total	107,199	103,013	-3.9
Other industrial			
Softwood	1,053	1,424	+35.2
Hardwood	--	127	--
Total	1,053	1,551	+47.3
All industrial			
Softwood	166,794	158,349	-5.1
Hardwood	42,704	41,562	-2.7
Total	209,498	199,911	-4.6

-- = negligible.

^aIncludes roundwood that was delivered to nonpulpmills and then chipped and sold to pulpmills (5,260 thousand cubic feet in 1987 and 7,325 thousand cubic feet in 1988).



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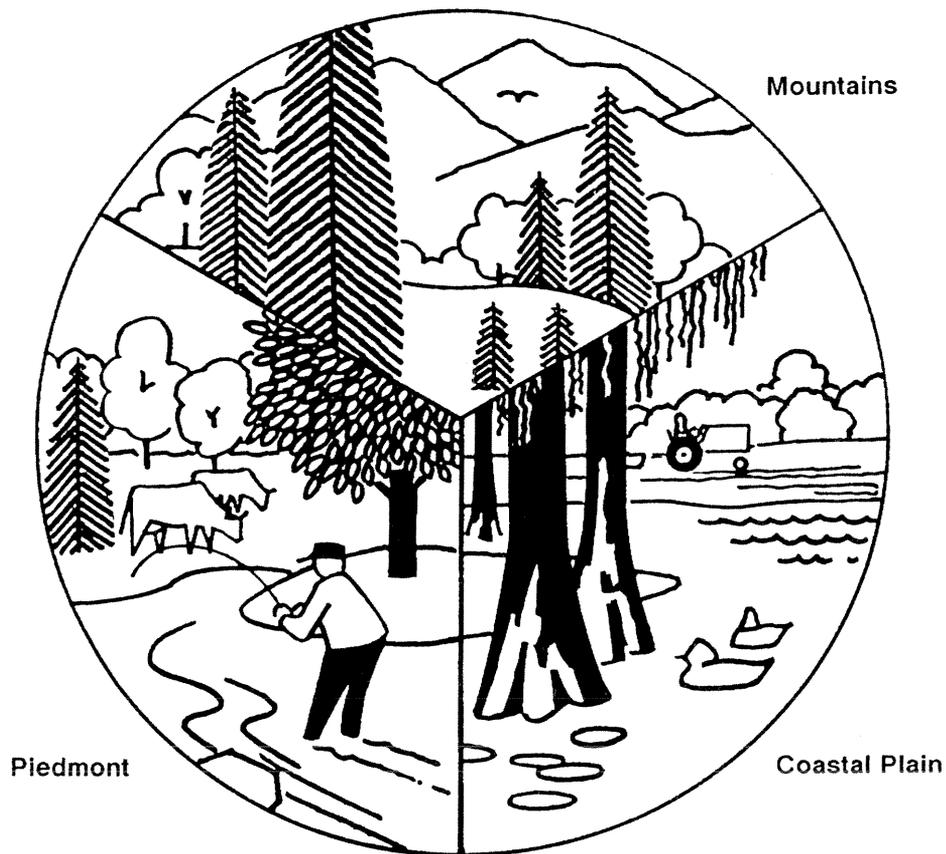
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KEYWORDS: Roundwood receipts, roundwood output, plant byproducts, residues, wood movement.

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Southeastern Forest Experiment Station

Established 1921

The Southeastern Forest Experiment Station, headquartered in Asheville, North Carolina, is one of the eight regional Experiment Stations, and the Forest Products Laboratory, that make up the Forest Service research organization.

RESEARCH MISSION:

To acquire the knowledge, develop the technology, and disseminate the research findings required to manage the Southeast's forest resources in ways that satisfy demands of goods and services while maintaining a quality environment.

RESEARCH LOCATIONS:

Blacksburg, VA
 Research Triangle Park, NC
 Franklin, NC
 Clemson, SC
 Charleston, SC
 Athens, GA
 Macon, GA
 Olustee/Gainesville, FL

EXPERIMENTAL FORESTS:

Chipola, Marianna, FL
 Holt Walton, Vienna, GA
 Cowetta, Otto, NC
 Bent Creek, Asheville, NC
 Santee, Moncks Corner, SC
 Scull Shoals, Athens, GA
 Hitchiti, Juliette, GA
 Olustee, Olustee, FL