

Texas Forestry Chart Book



The Forests and Forest Economy of Texas

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I. Introduction

This Chart Book is a summary of salient facts about the forests and the business of forests in Texas. The purpose is to give the reader an overview of forestry resources and the forest products manufacturing sector in the state. For perspective, the performance of the Texas forestry sector is compared to that of other southern states.

The Chart Book is organized into three main sections. Texas Forests presents summary information about the forest of Texas. Forest inventory data for 1992 (USDA Forest Service 1992) are used, as that is the last year that the USDA Forest Service performed an inventory in East Texas and is thus the last year for which comprehensive data are available. The section titled Texas Forest Economy outlines the importance of the forest economy to the state of Texas. Texas Forests in the South contrasts the forest lands and forest economy of Texas with those of the twelve other southern states. The year 1996 is used as the base year for this information as this is the most recent year for which the full set of comparative information is available. For example, the economic impact multipliers for 1996 (USDA Forest Service and Minnesota IMPLAN Group, Inc.) became available in the early fall of 1999. A reference section and a short glossary of forestry terms follow some conclusions about the Texas forestry sector. Appendices contain selected detailed information.

Much of the material contained in this book is presented in chart form, as either pie charts or bar graphs. Text is limited to salient explanations and integrative conclusions.

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II. Texas Forests

The base year for the information on Texas forests presented in this report is 1992, because that is the year of the last detailed survey of forest resources in Texas conducted by the USDA Forest Service. The previous survey for Texas took place in 1986, and a comparison of the survey findings is presented.

The forested lands of Texas, other than those held by the federal government, comprise almost six percent of the total surface area of the state, land and water (Figure II.1).

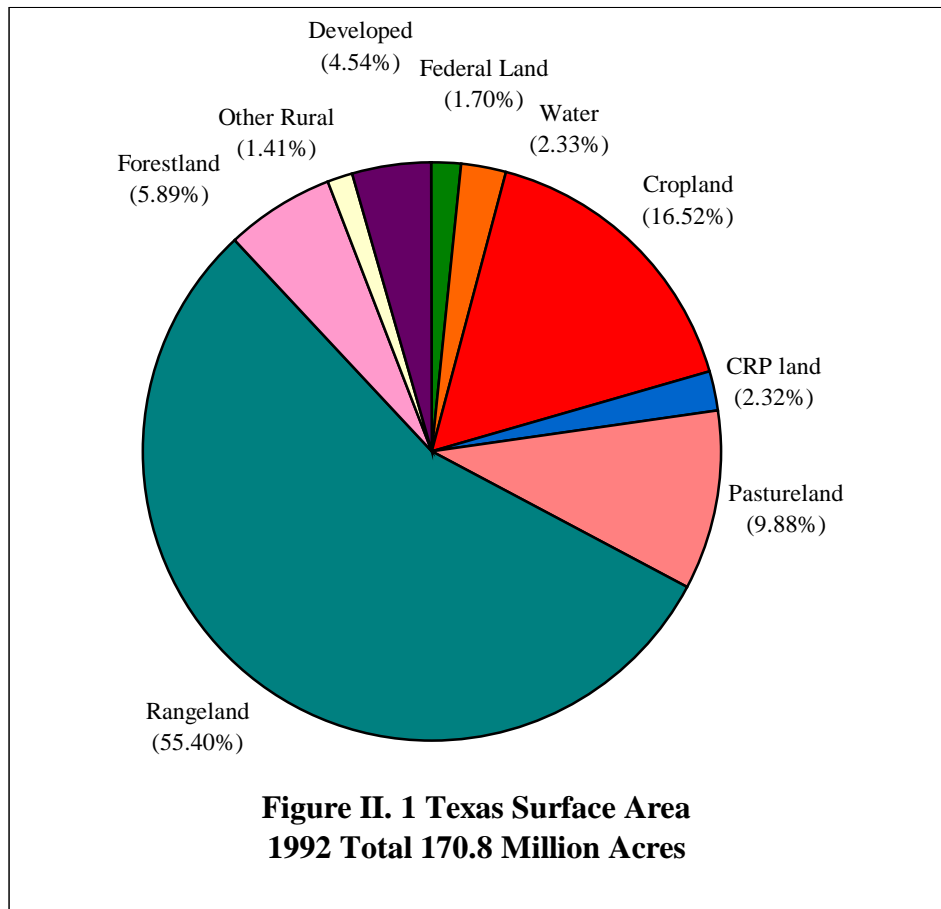


Figure II.1 Source: 1997 USDA Natural Resource Conservation Service Natural Resources Inventory

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The Natural Resources Conservation Service measures over one-half of the state as nonfederally owned rangeland, with an additional ten percent as pastureland. Agricultural cropland comprises about 17% of the state. The urban sprawl of Texas cities covered only five percent of surface area in 1992. The vast majority of the forests are located in East Texas. This part of the state is the home and heart of Texas forest industry as well.

Forest land dominates the landscape of East Texas (Figure II.2), where forests are 56% of the land. Timberland is defined as forested land capable of producing a commercial quantity and quality of timber. Timberland is most of the forested area of East Texas, covering 55% of the total land acreage. Reserved timberland is that set aside for nontimber uses, such as public timberland set aside for an endangered species. Other forests in East Texas are those forested lands that can not produce commercial quality and quantity timber. The nonforested lands in East Texas are mostly pasture and rangelands and urban areas.

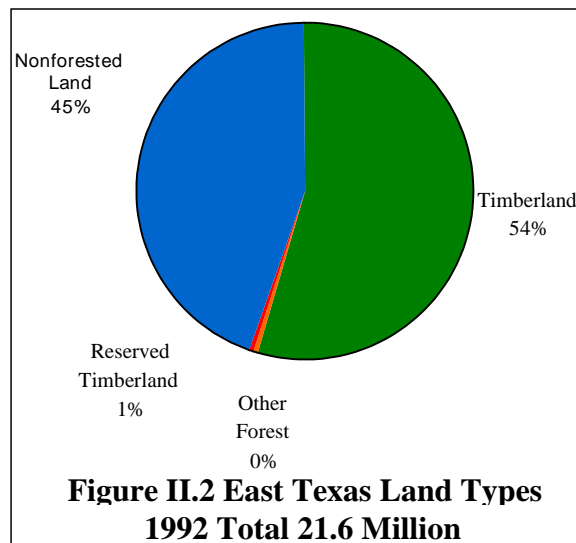


Figure II.2 Source: 1992 USDA Forest Service

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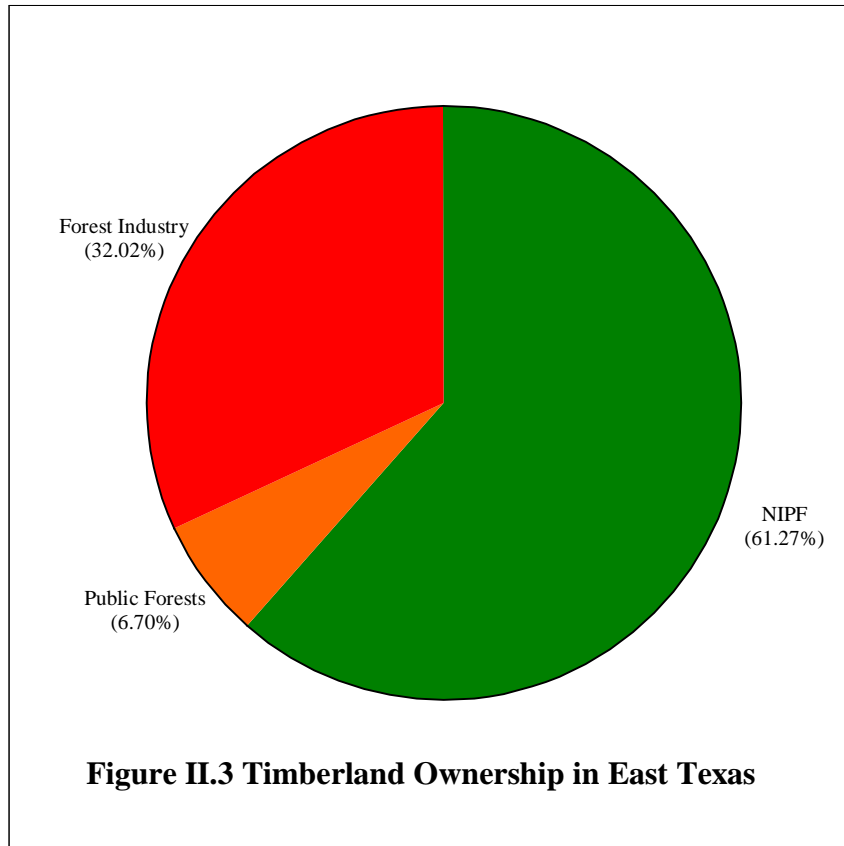


Figure II.3 Source: 1992 USDA Forest Service

The ownership of East Texas timberland is distributed among the public, forest industry and nonindustrial private forest (NIPF) owners (Figure II.3). NIPFs own just less than two-thirds of the timberland. Forest industry, meaning those landowners who also have processing facilities, owns about one-third and publicly held forests comprise about 7%.

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Nonindustrial private land in East Texas is divided into forest acres owned by farmers and ranchers, corporations (such as pension funds and timberland management companies), and individual owners. Private individuals own just over 70% of commercial quality NIPF timberland.

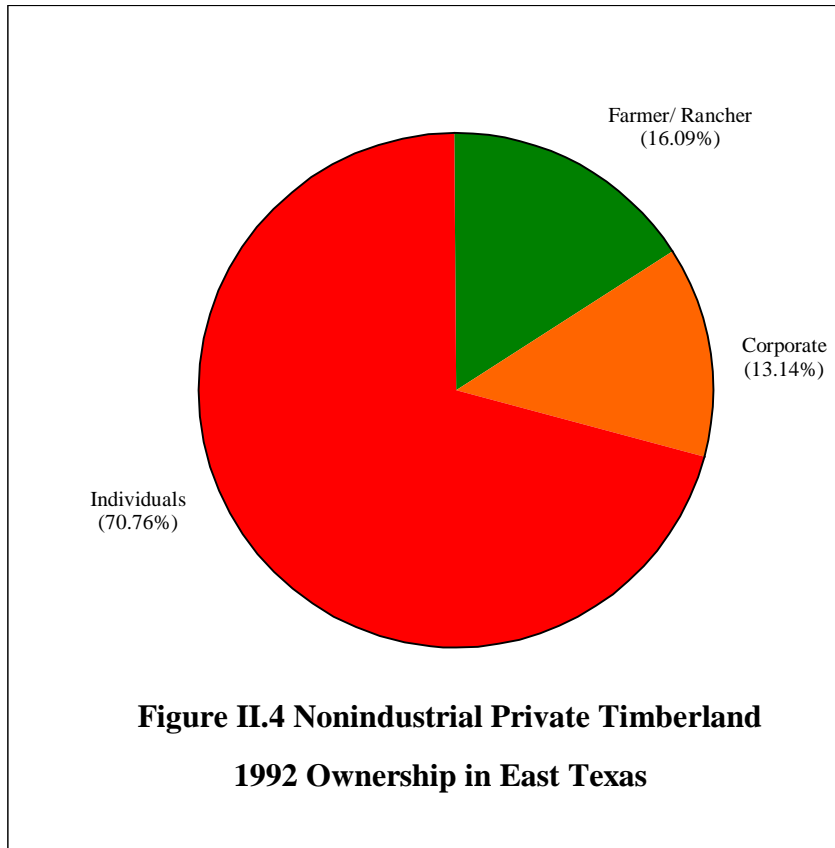


Figure II.4 Source: 1992 USDA Forest Service

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A picture of public timberland ownership in East Texas is shown in Figure II.5. Almost three-quarters of publicly owned forests are in the four national forests. Other federal timberlands comprise about 12% and state and local governments together own over 14% of the public timberland.

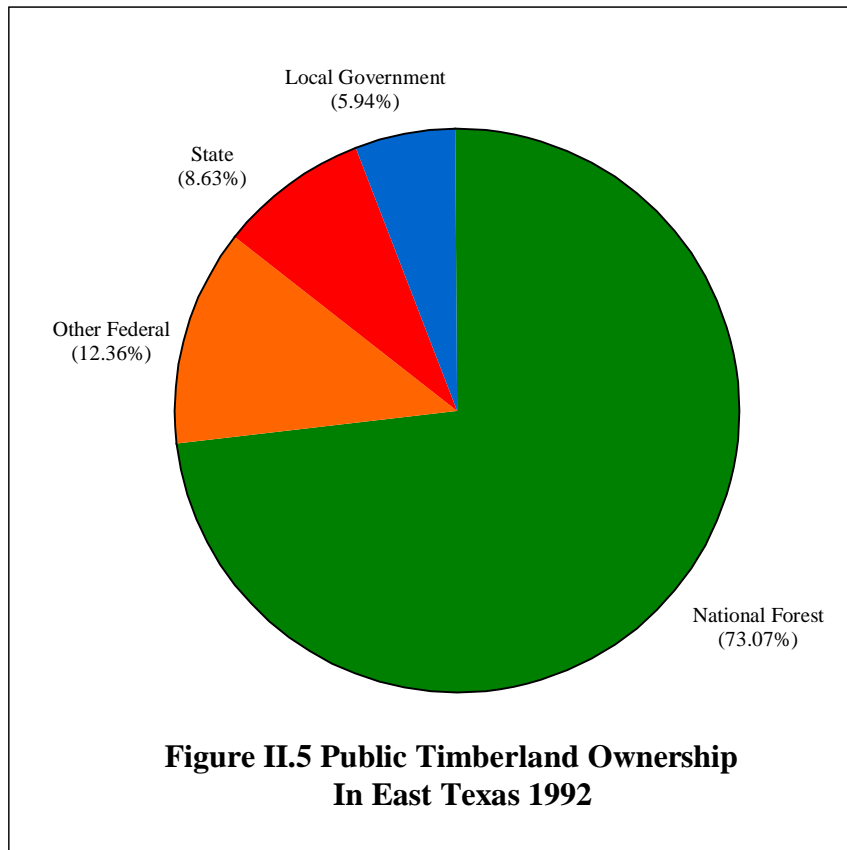


Figure II.5 Source: 1992 USDA Forest Service

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East Texas forest types are separated by size class in Figure II.6. The bulk of East Texas timberland, over five million acres, is in sawtimber, or the timber used to make lumber or plywood. Just under half of that is in pine forests and an additional million acres is in mixed forests of pine and oaks. Poletimber is younger than sawtimber but beyond the sapling/seedling years. This wood will either be allowed to grow into sawtimber or cut and processed into poles, pulpwood for paper or other forest products. Nonstocked forest is land that has been harvested but not replanted.

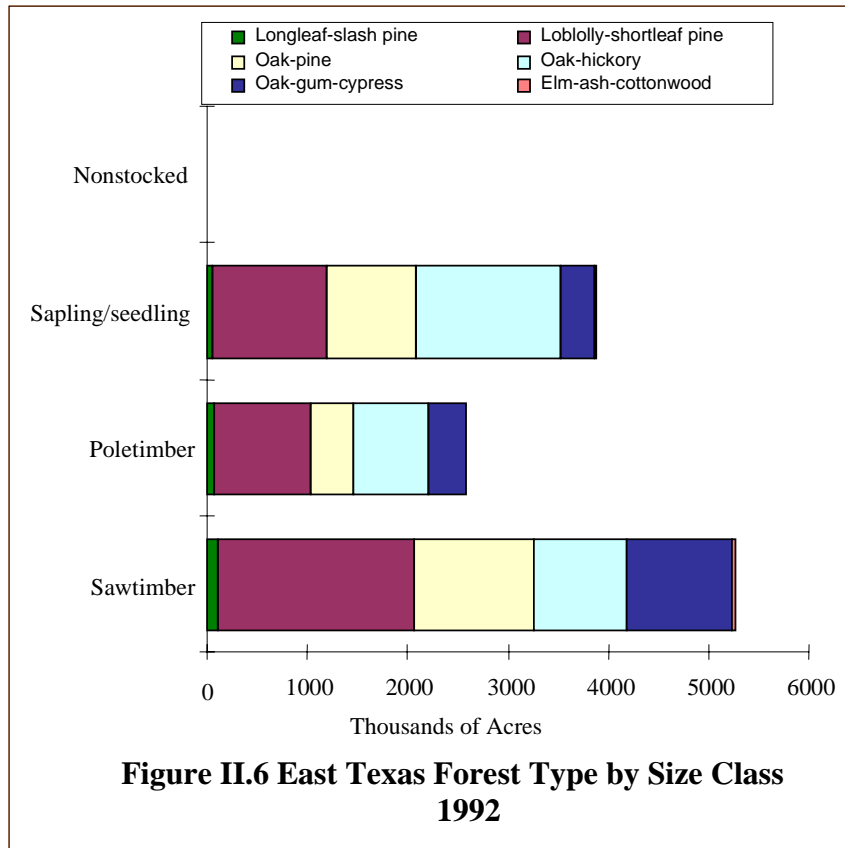


Figure II.6 Source: 1992 USDA Forest Service

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Total acreage in timberland increased between 1986 and 1992 by almost 150,000 acres in East Texas (Figure II.7). Nonforested lands and other forests declined in acreage. Reserved timberland rose slightly, but commercial timberland grew 200,000 acres between 1986 and 1992.

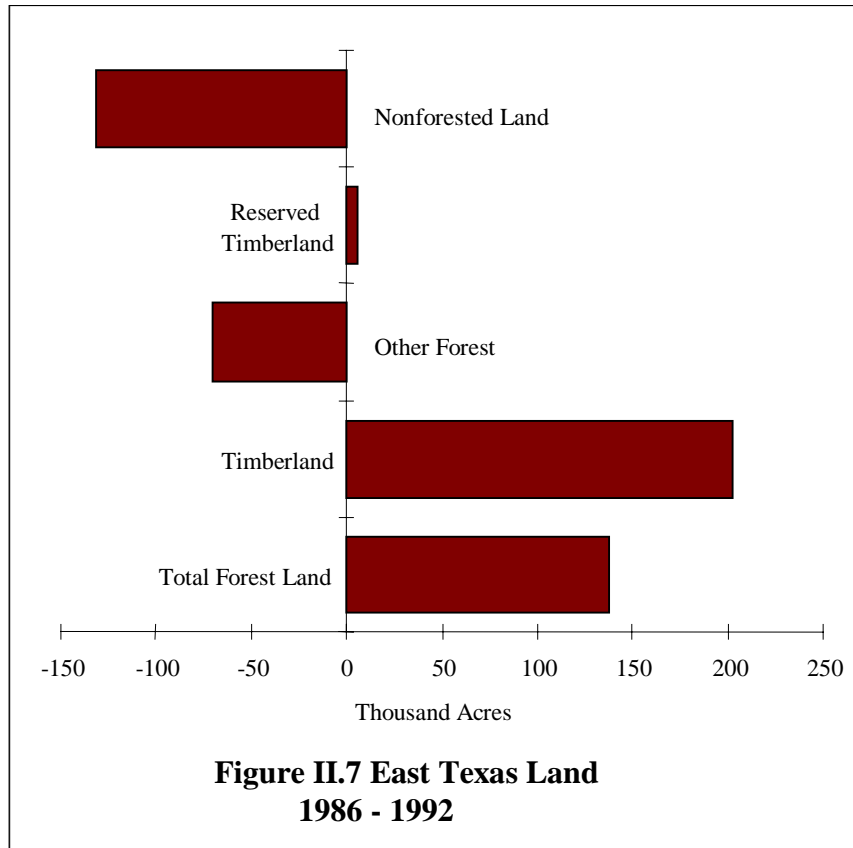


Figure II.7 Source: 1986, 1992 USDA Forest Service

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Timberland ownership in East Texas changed in the six years between Forest Service surveys (Figure II.8). Government ownership of timberland increased slightly. Forest industry divested 50,000 acres. Most of the increase in total timberland acreage came through the purchase of timberland by NIPF owners or the conversion of land to timberland by these owners.

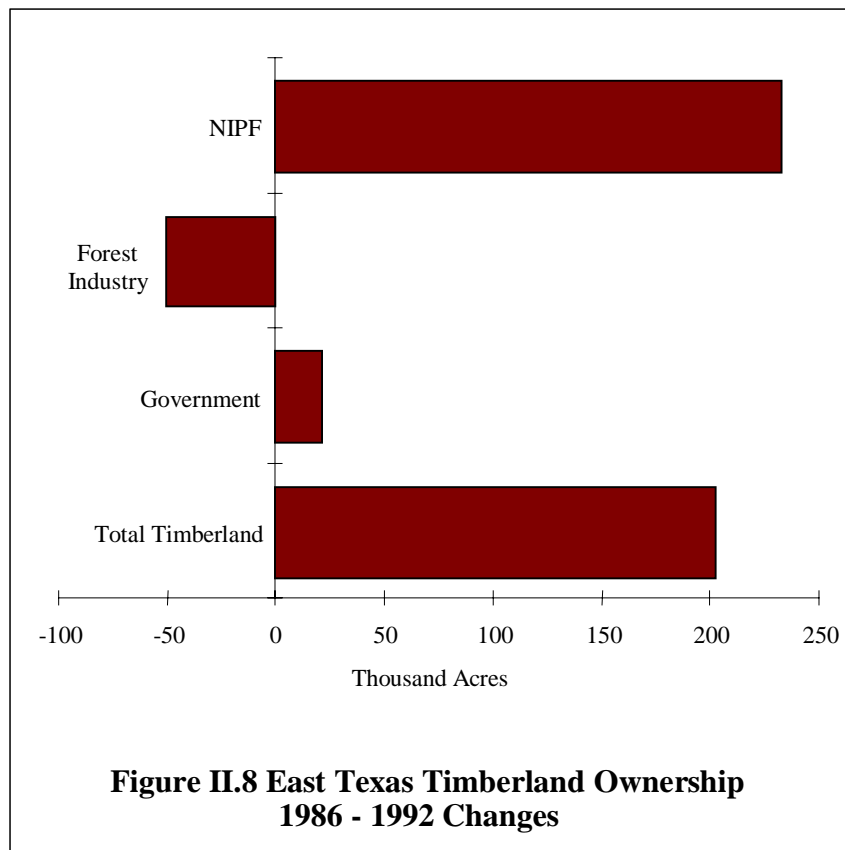


Figure II.8 Source: 1986, 1992 USDA Forest Service

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Volume of growing stock for the last five Forest Service surveys of East Texas is shown in Figure II.9. In 1952, roughly half of the volume was in softwood and half was in hardwoods. The volume of growing stock in East Texas forests has increased substantially over the years and was at more than twelve billion cubic feet in 1992. Almost two-thirds of that volume is in softwood.

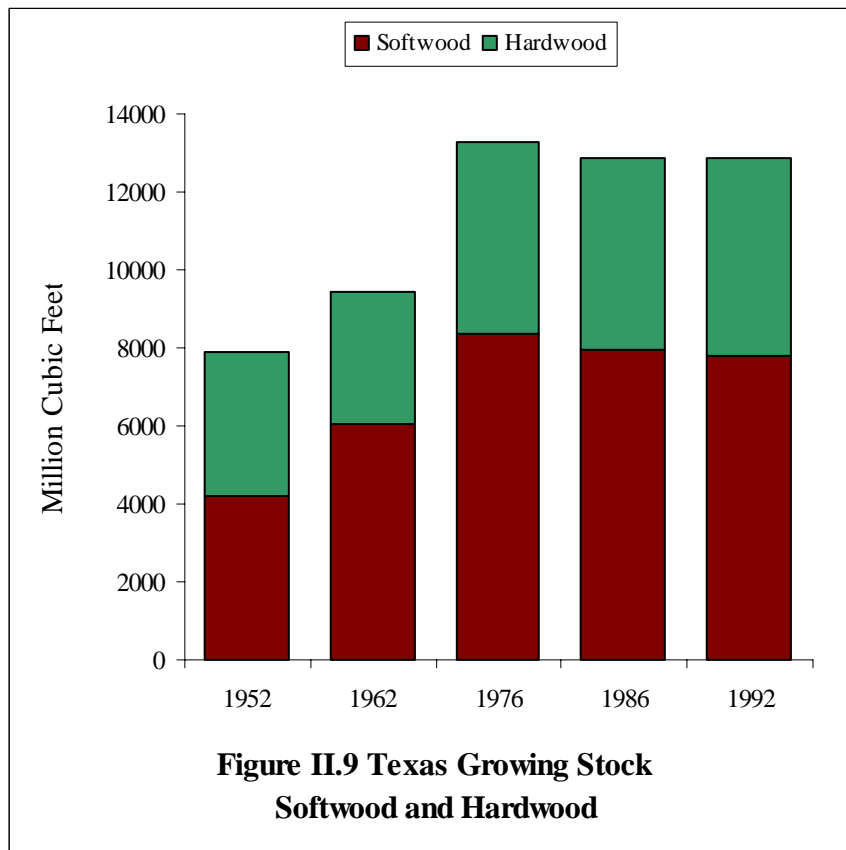


Figure II.9 Source: 1993 USDA Forest Service RPA

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Reforestation has fallen between 1991 and 1996 (Figure II.10). The maintenance of a high volume of growing stock is aided by the emphasis placed on reforestation after harvesting. Acres reforested are detailed by ownership in the early 1990s. Forest industry reforests the bulk of the land, but NIPF lands are also being reforested.

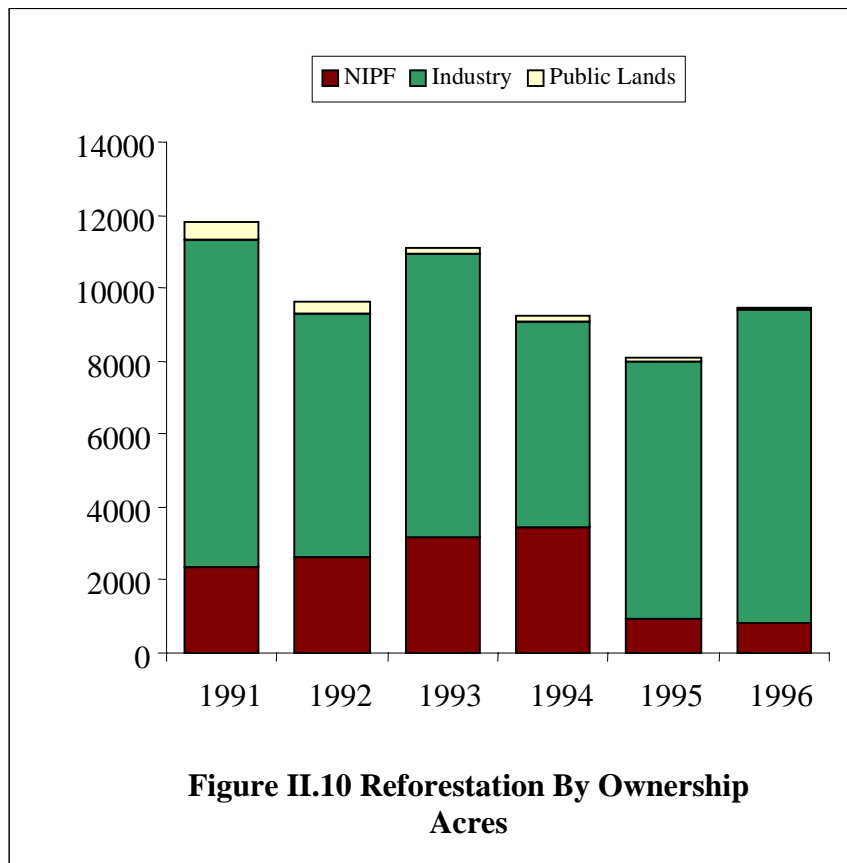
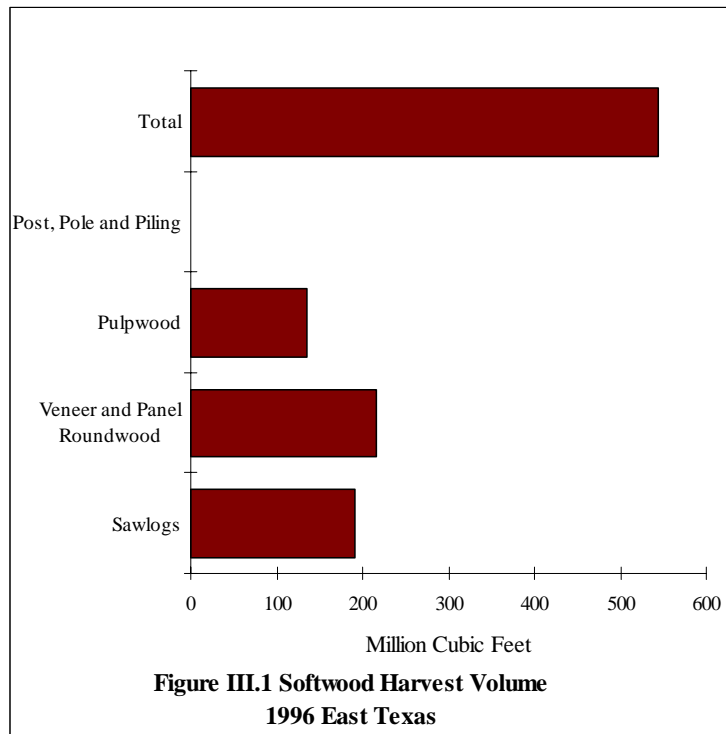


Figure II.10 Source: Texas Forest Service

III. Texas Forest Economy

The economic health of East Texas forest industry is largely dependent on how much wood is harvested and how effectively the industry turns that wood into product and profits. Figures III.1 and III.2 show softwood (Figure III.1) and hardwood (Figure III.2) harvest volumes for 1996. In that year, most softwood harvested went to veneer and panels. Almost 200 million cubic feet went to sawmills to be cut into lumber and roughly 150 million cubic feet of softwood went to pulp mills to be turned into paper and paper products. In contrast, most of the hardwood went into the pulping process, over 60 million cubic feet. Hardwood sawtimber harvested was roughly 50 million cubic feet.



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Figure III.1 Source: Texas Forest Service

About four times as much softwood volume as hardwood volume was harvested in 1996.

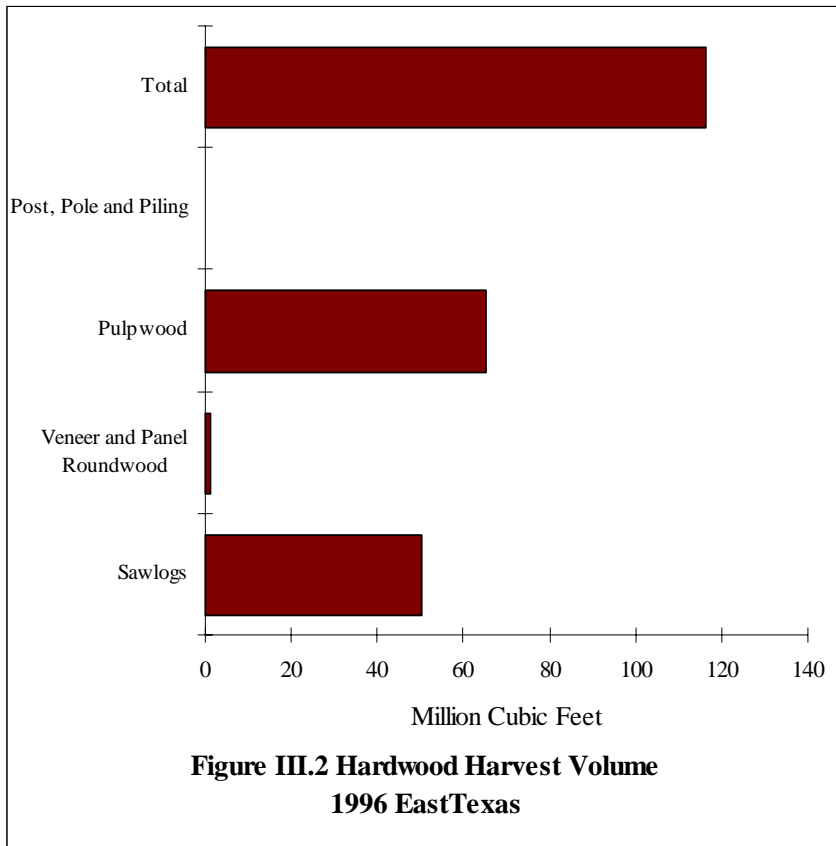


Figure III.2 Source: Texas Forest Service

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In the economic accounts for the Texas economy, the contributions of the forest products industry to the gross state product appear in two places (Figure III.3). First, the woods activities are the “forestry” in agriculture, forestry and fisheries and are a very small part of the Texas gross state product (GSP). The year 1996 is chosen as the base year for economic comparisons because it is the last year that complete data are available. Pulp and paper, lumber, and wood furniture and fixtures are the three categories of wood-based manufacturing, part of the almost 16% that manufacturing industries contribute to the gross state product of Texas. As with many states, the biggest contributor to the Texas economy is the service industry. Financial and related industries are the third largest contributor, generating over 14% of Texas GSP in 1996. Government generates almost 12% of GSP and includes all levels of government in the state and schools as well.

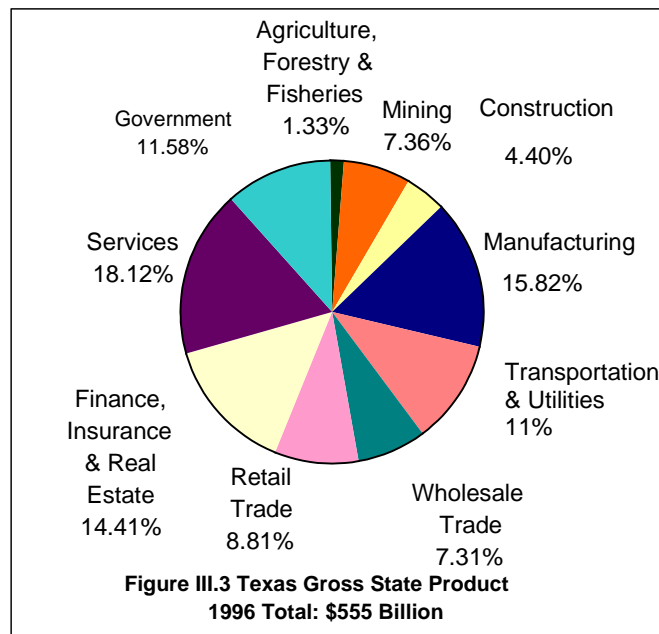


Figure III.3 Source: UDC BEA

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Texas employment in 1996 was 10.8 million jobs (Figure III.4). Services provide over a quarter of the jobs in the state. The retail trade is the state's second largest employer, with almost 17%. Manufacturing hires just over 10% of the Texas workforce.

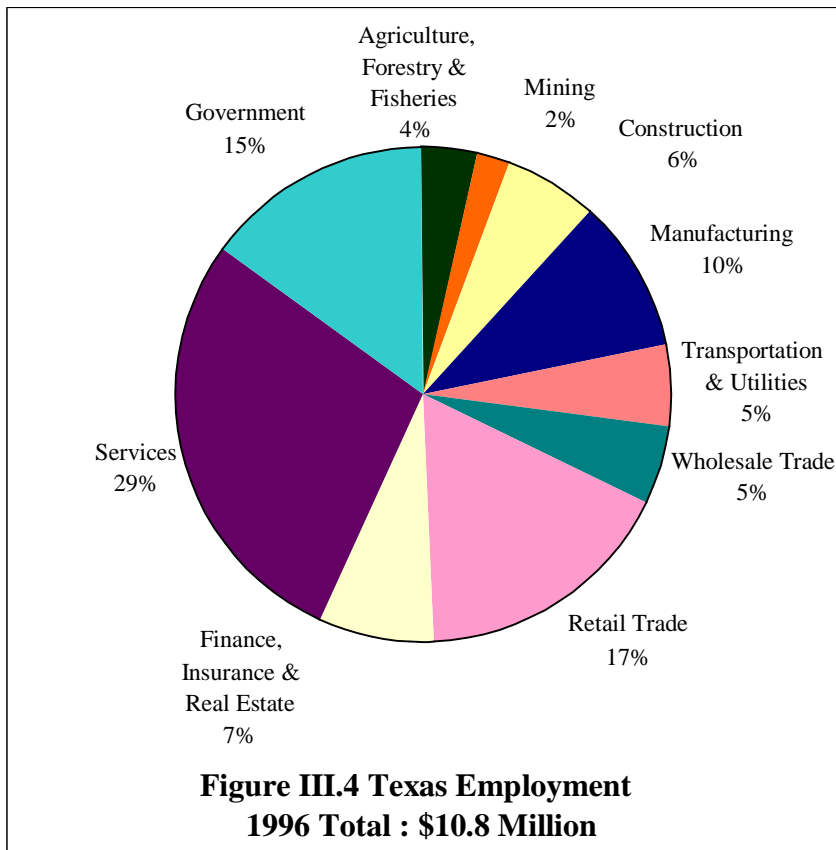


Figure III.4 Source: UDC BEA

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Wages and salaries in Texas reported here exclude proprietorship compensation (Figure III.5). In 1996, services paid almost a quarter of the wages and salary total. Government paid over 17% and manufacturing paid almost 16%.

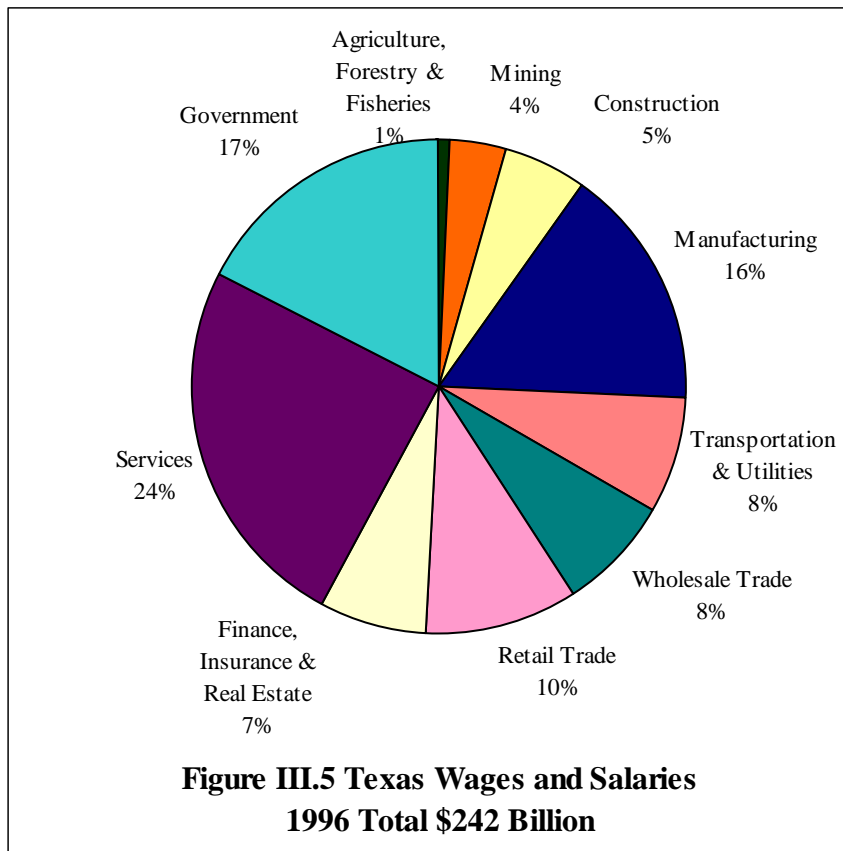


Figure III.5 Source: UDC BEA

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An examination of the Texas manufacturing sector shows that manufacturing employment in 1996 is just over one million (Figures III.6 and III.7). Wood-based manufacturing industries (paper and allied products, lumber and wood products and furniture and fixtures) hire nine percent, but pay just under seven percent of the wages and salaries.

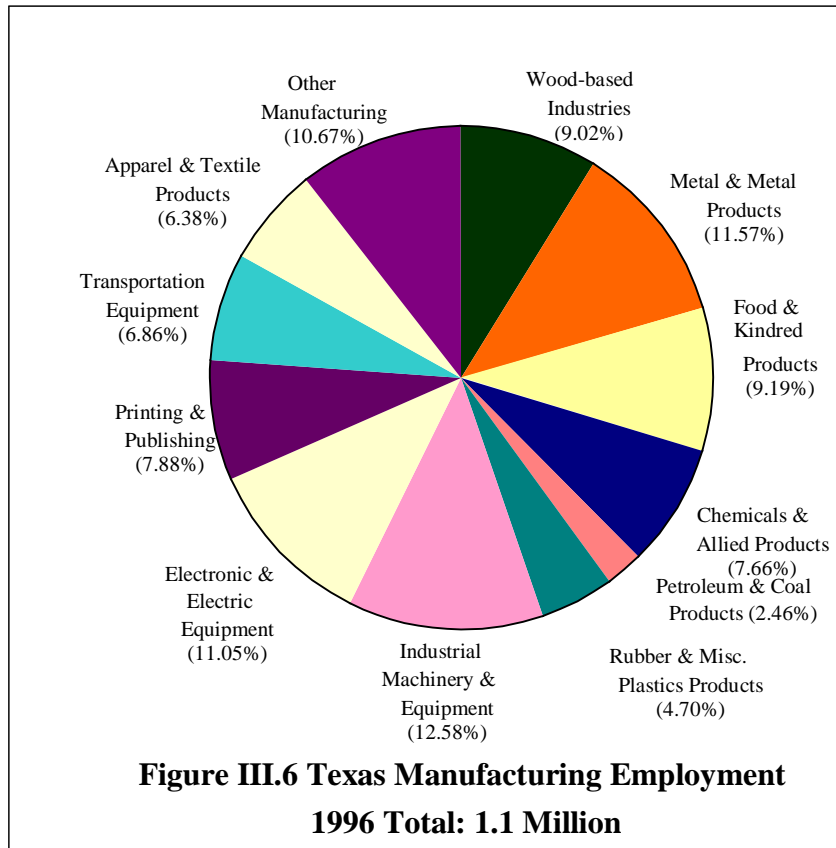


Figure III.6 Source: UDC BEA

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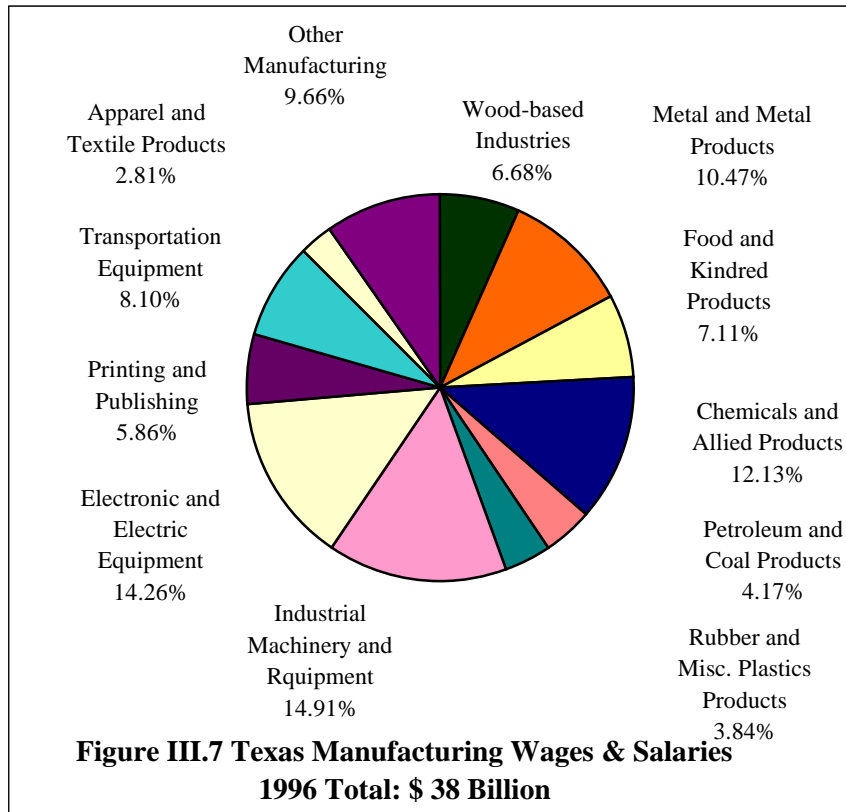
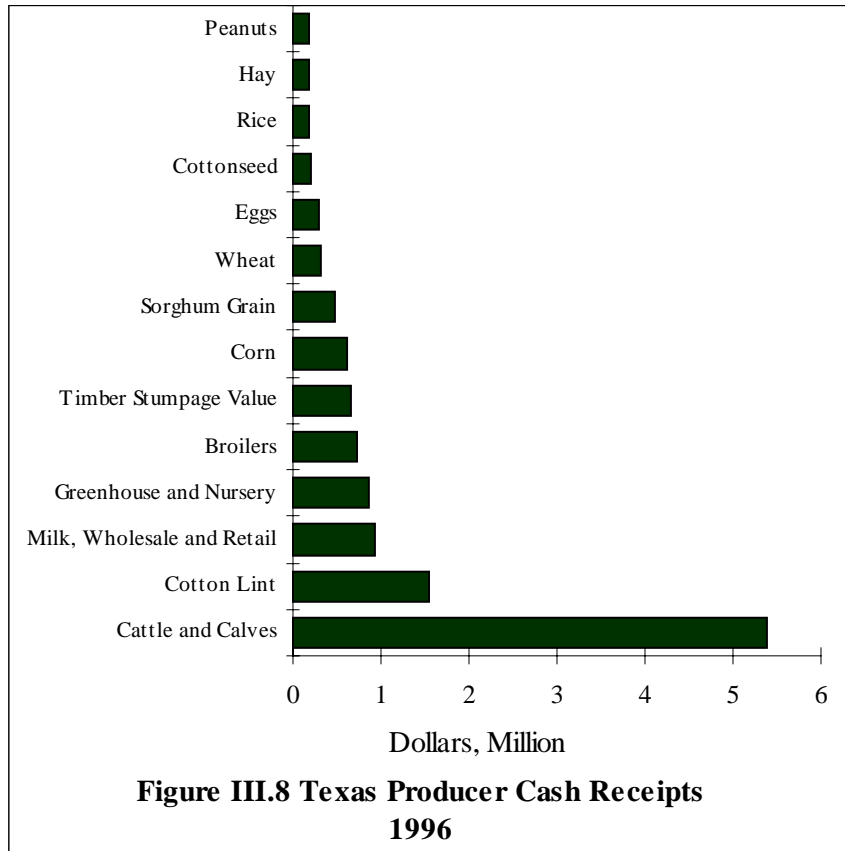


Figure III.7 Source: UDC BEA

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As a commodity, timber ranks sixth in Texas in return to the initial producer. Figure III.8 shows Texas producer cash receipts. Cattle and calves are by far the largest in sales, generating between five and six million dollars for cattle producers in 1996. Cotton lint, the next largest commodity, generated \$1.5 million. Milk, greenhouse and nursery items, broilers, timber stumpage and corn all generated between half and one million dollars for initial producers. Care must be taken, however, in comparing across commodities because the amount of processing performed on the commodity before the first sale and thus the cash receipts to the initial producer vary greatly across commodities. Timber is traditionally sold on the stump, very early in processing.



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Figure III.8 Source: Texas Agricultural Extension Service and Texas Forest Service

Wood-based manufacturing takes timber and turns it into finished product. The gross state product generated by the three wood-based manufacturing industries in Texas over the years 1992 through 1996 are shown for comparison in 1996 real dollars (Figure III.9). All three industries grew over the interim. Paper products were just slightly larger than lumber and wood in 1996, but both were significantly larger than furniture and fixtures.

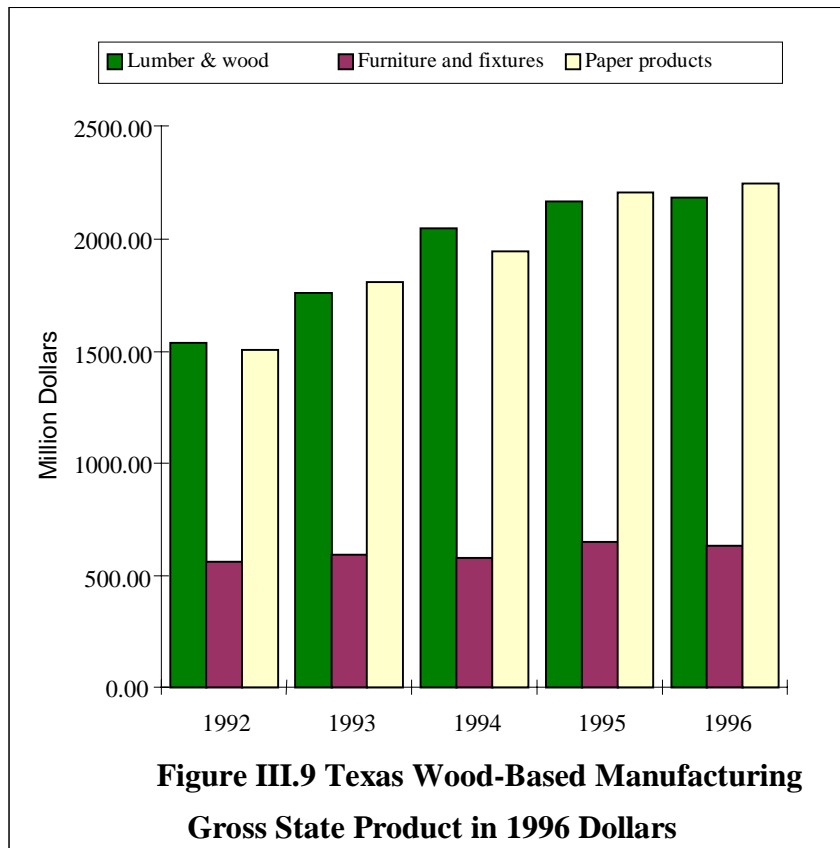


Figure III.9 Source: UDC BEA

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Texas wood-based employment and wages and salaries are compared for the five years 1992 through 1996 (Figures III.10 and III.11). These charts include the three wood-based manufacturing industries plus the forestry wood activities. Both charts also include a total for each year. Lumber and wood products manufacturing clearly hired the most workers over the years.

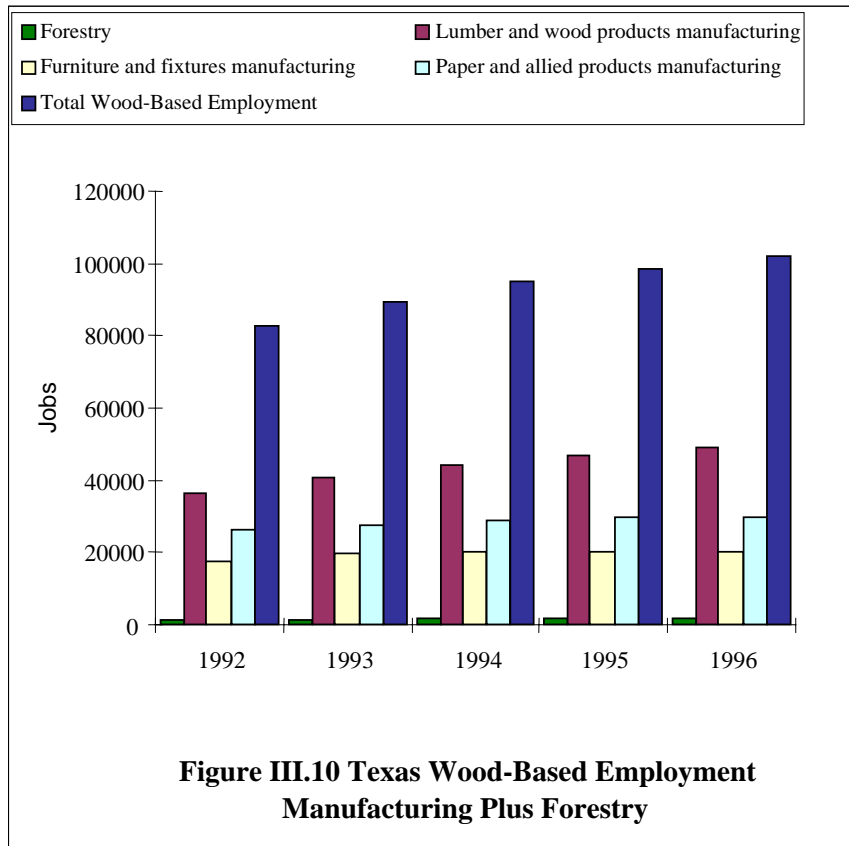


Figure III.10 Source: UDC BEA

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Wages and salaries for lumber and wood products manufacturing and for paper and allied products manufacturing are quite comparable, however.

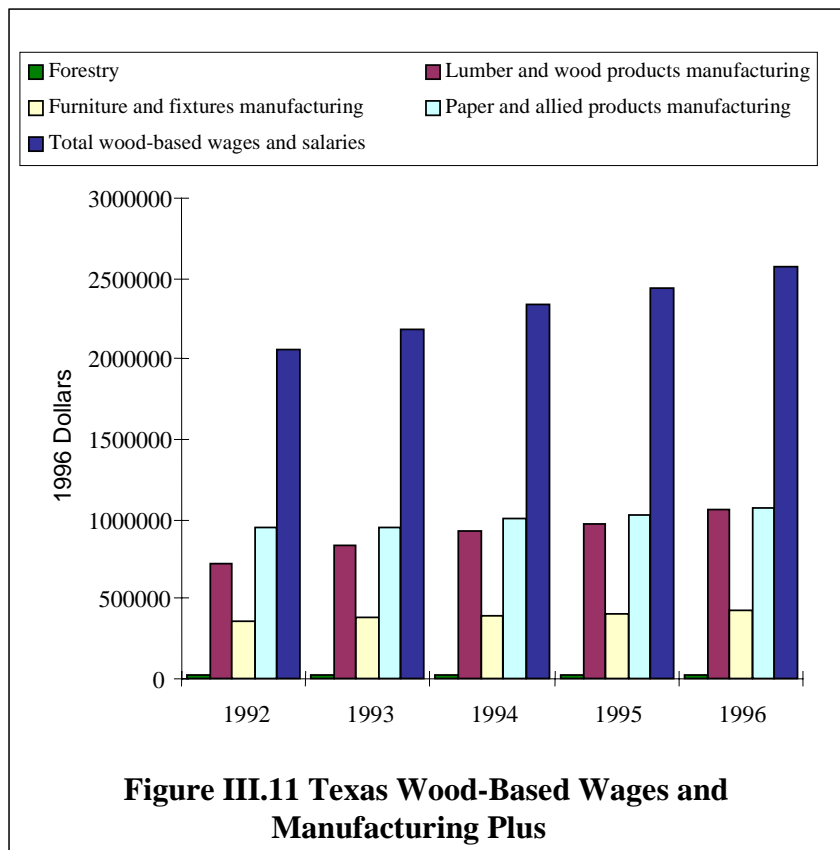


Figure III.11 Source: UDC BEA

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IV. Texas Forests in the South

There are thirteen states in the southern forestry region, as defined by the USDA Forest Service: Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, East Oklahoma, South Carolina, Tennessee, East Texas and Virginia. Because only the eastern parts of Oklahoma and Texas contain any significant amount of forested land, only the eastern parts of those states have traditionally been included in the Forest Service inventory of forest resources. This part of the Chart Book compares the forest and forest economy of Texas with that of the other twelve states.

Forested lands and the amount of timberland in terms of acres are compared by state (Figure IV.1). Beside the name of each state is the year of the most recent Forest Service inventory for that state from which the data are taken. Note that the acreage for East Texas and East Oklahoma represent only the forested regions of those states. Georgia is the largest state in the region and has the most timberland. East Texas has the second smallest amount of timberland, having more only than East Oklahoma.

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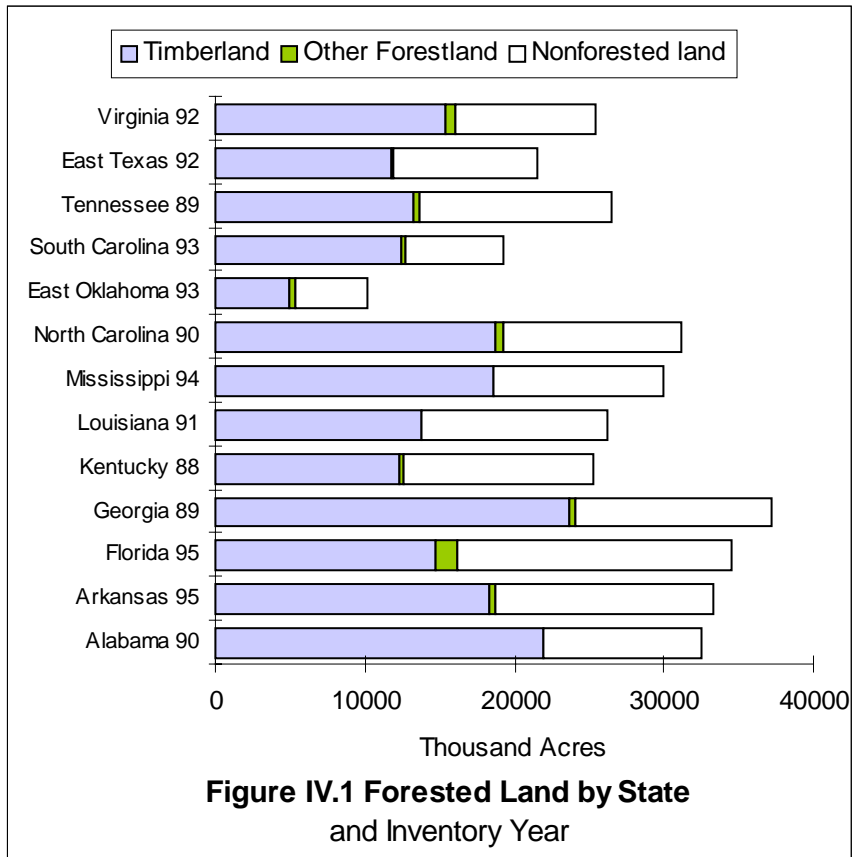


Figure IV.1 Source: USDA Forest Service

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Ownership of commercial grade forestland is dominated by nonindustrial private landowners in all southern states (Figure IV.2). Industry also owns significant portions of timberland in all states except Kentucky. NIPFs own almost 70% of southern timberland (Figure IV.3). Forest industry owns 20% and public forests constitute just over 10% of the acreage.

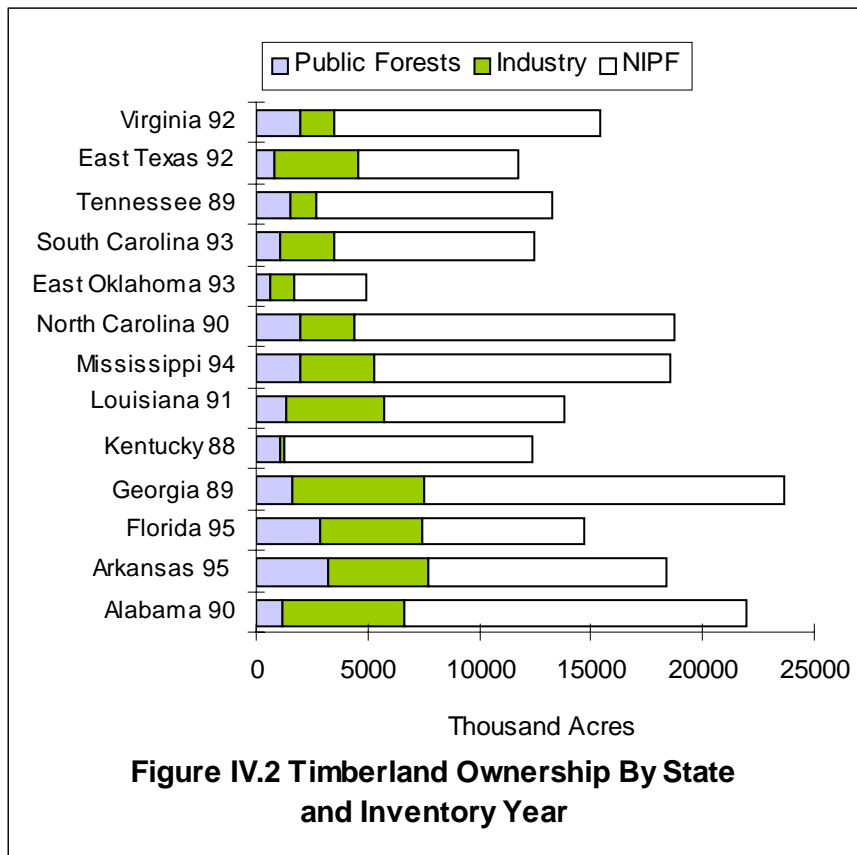


Figure IV.2 Source: USDA Forest Service

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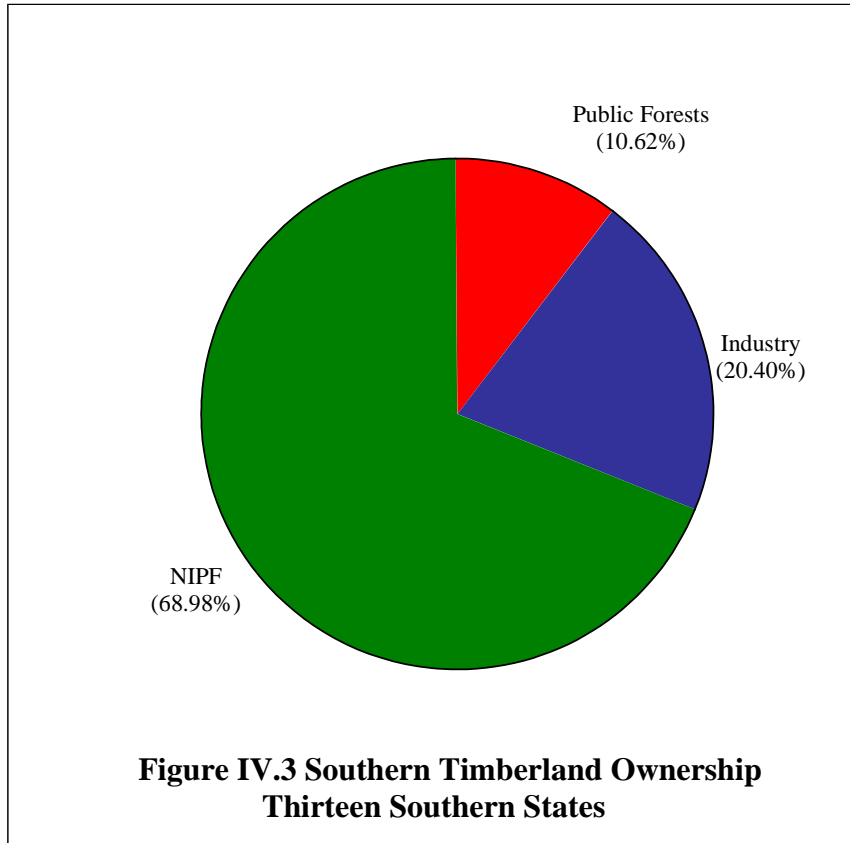


Figure IV.3 Source: USDA Forest Service

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The distribution of timberland ownership across the southern states (Figure IV.4) shows that Georgia has about 12% of the timberland, followed by Alabama, with 11%. East Texas represents roughly 6% of southern timberland. Industrial ownership across the south has a slightly different distribution (Figure IV.5). Fourteen percent of industrially owned southern timberland is in Georgia, 13% in Alabama and 11% each in Arkansas and Florida. East Texas has fairly heavy industrial ownership, with 9%.

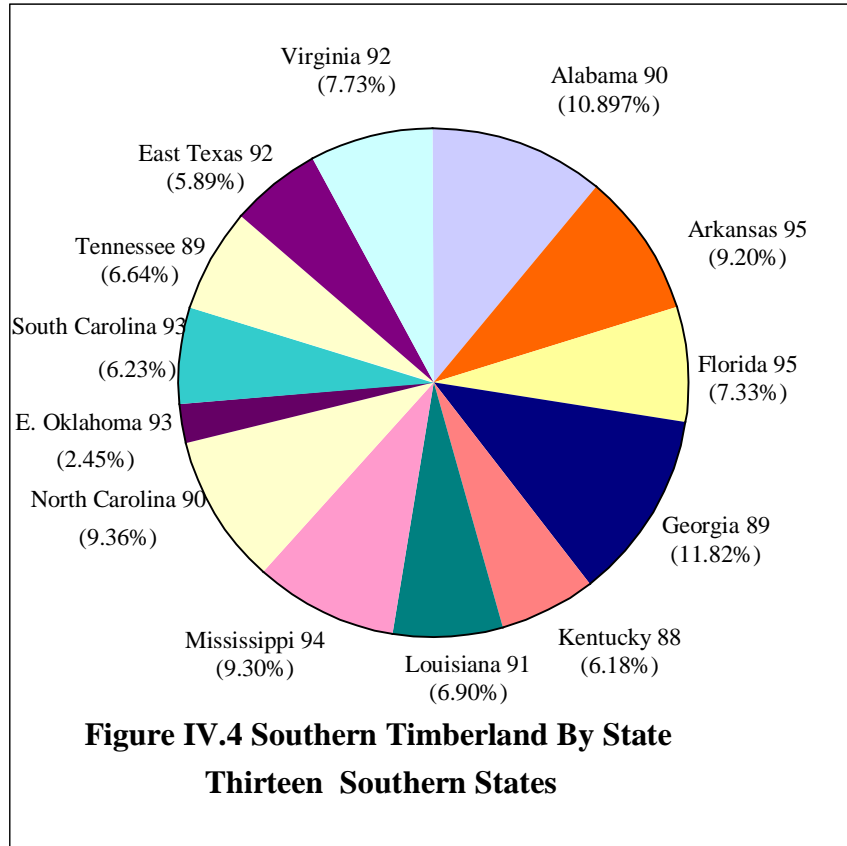


Figure IV.4 Source: USDA Forest Service

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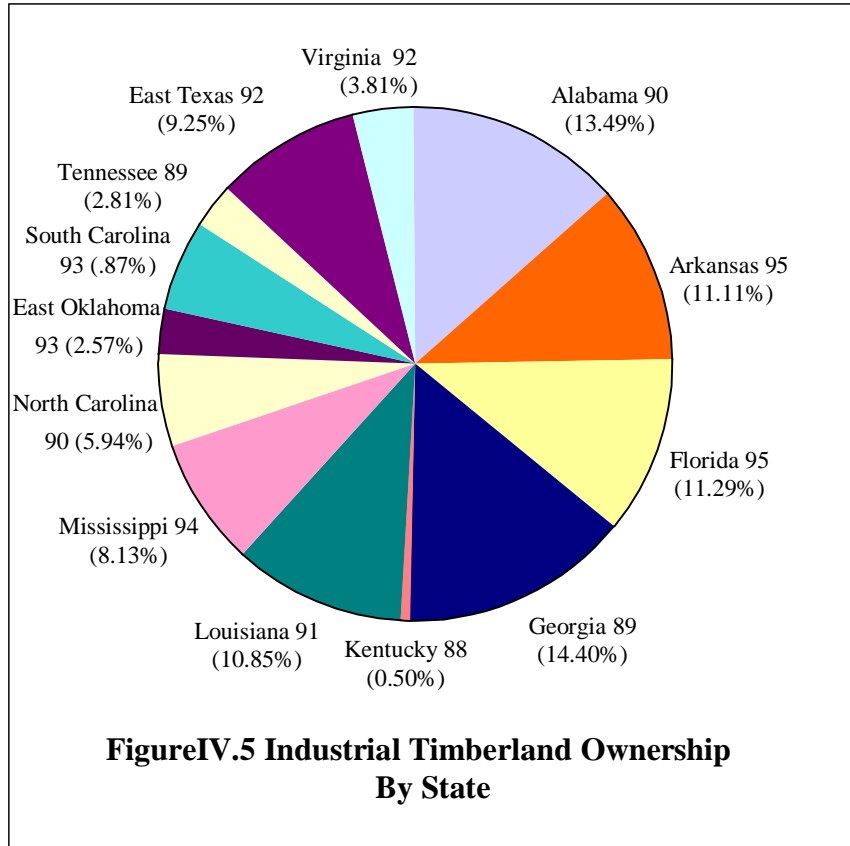


Figure IV.5 Source: USDA Forest Service

Wood-based manufacturing gross state product in each of the southern states is shown as a percentage of total gross state product for each state for the five years 1992 through 1996 (Figure IV.6). The relative importance of forest products manufacturing to the total state economy varies

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across the thirteen states. Mississippi shows the largest percentages, with roughly six to seven percent of gross state product coming from forest products manufacturing. In diversified states with large economies, such as Florida and Texas, forest products manufacturing is a much smaller percentage of GSP.

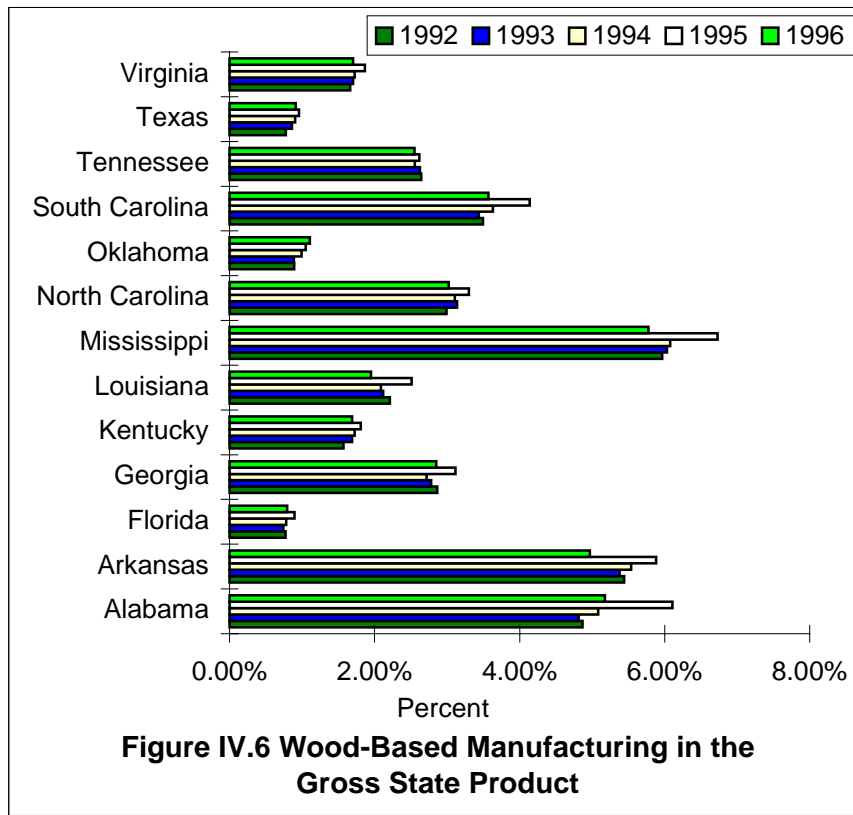


Figure IV.6 Source: USDC BEA

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The 1996 wood-based manufacturing gross state product is shown for each state (Figure IV.7). While the Mississippi forest products manufacturing sector is a large percentage of GSP in 1996, the total dollars generated in that state are not large compared to other states. North Carolina and Georgia produce the most in dollar terms. Texas and Alabama are also quite large. Within Texas, paper products manufacturing and lumber and wood manufacturing are large. Furniture and fixtures manufacturing is relatively small. In contrast, in North Carolina, furniture and fixtures manufacturing dominates.

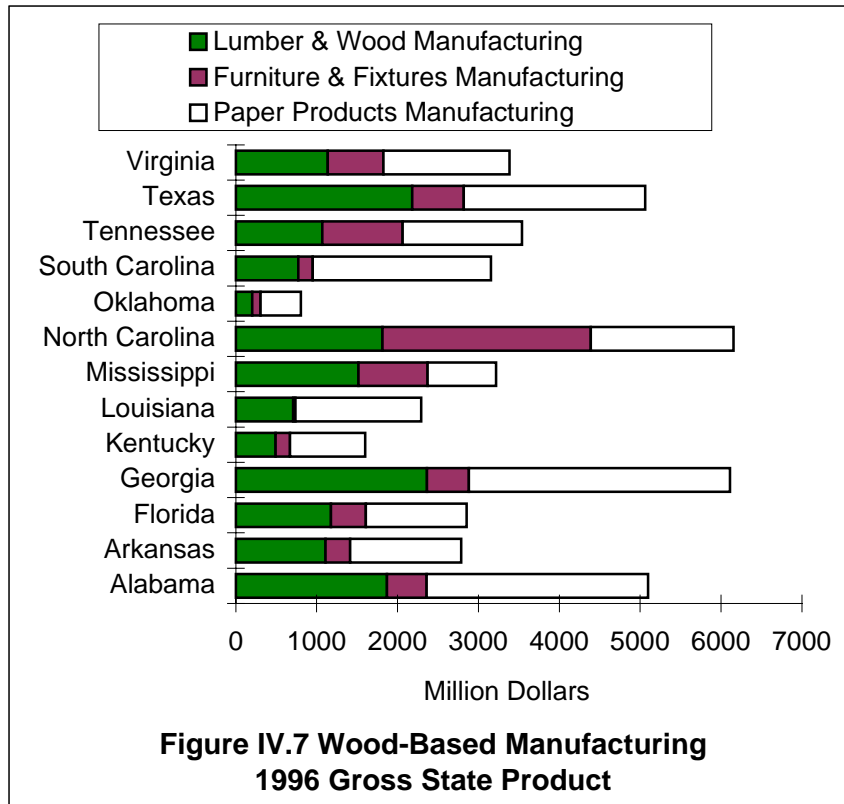


Figure IV.7 Source: USDC BEA

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The 1996 wood-based manufacturing employment and employment in forestry (woods activities) show that, in terms of numbers of jobs, North Carolina is the largest employer, with furniture and fixtures providing the bulk of the employment (Figure IV.8). Texas is the second largest employer of the thirteen states, with most of the jobs in lumber and wood manufacturing.

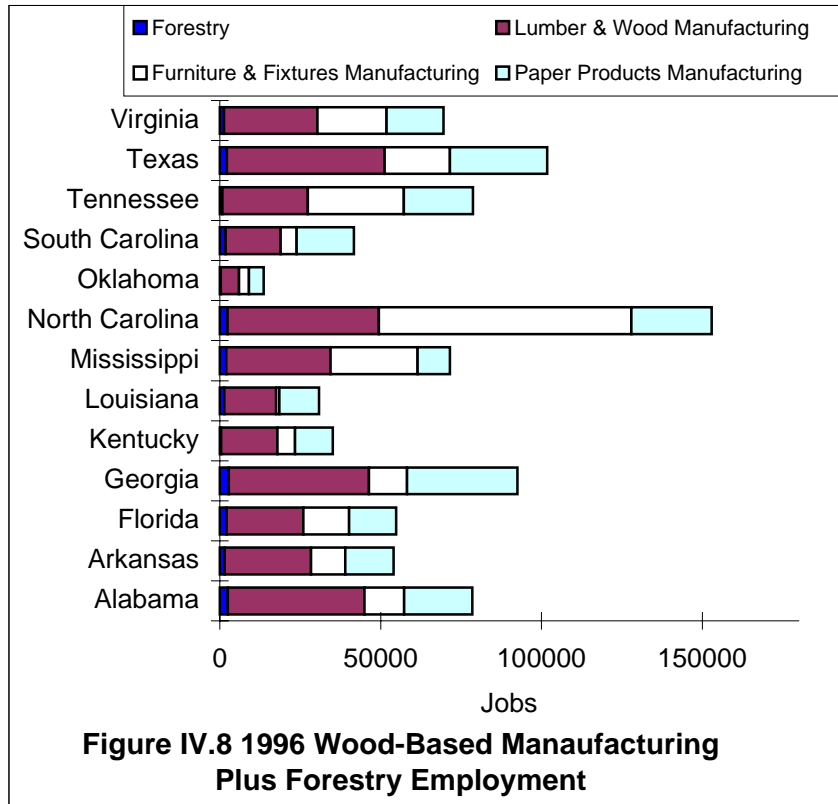


Figure IV.8 Source: USDC BEA

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IMPLAN Multipliers

An input-output model, IMPLAN, generates economic impact multipliers (Table IV.1). The IMPLAN multipliers for the thirteen southern states are for output, value-added and employment for each of the three wood-based manufacturing sectors and are based on 1996 data. IMPLAN (Alward and Palmer, 1986) is an economic input-output model used by the USDA Forest Service to estimate the economic impacts of the forest resources sector on local economies. These multipliers are Type II, meaning they include both direct industry interactions and the induced effects due to increased personal income (O’Laughlin and Williams, 1988). These multipliers are produced by the USDA Forest Service and are reproduced here by permission from Minnesota IMPLAN Group, Inc., who own and maintain the IMPLAN model. One way to interpret these multipliers is that they measure how many times an extra dollar in that category turns over before leaving the area. So, a large diverse economy will likely have a larger Type II multiplier for an industry than a small single industry economy.

Care must be taken in comparing multipliers across states or economies of different sizes, across years and from different sources. Of course, all multipliers reflect IMPLAN model structure, which includes many necessary simplifying assumptions, such as exogenously determined demand for goods and services, fixed proportion technologies for generating those goods and services and the inability of the model to accommodate changes in production decisions, or changing relative prices of inputs and outputs. In addition, while the geographic boundaries of states are clearly delineated, the boundaries between the economies of adjoining states are not so easily separated as state-level summary numbers might imply.

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Table IV.1 Type II Multipliers from IMPLAN Using 1996 Data

State	Output			Value-Added			Employment		
	Lumber and Wood Products	Furniture and Fixtures	Paper and Allied Products	Lumber and Wood Products	Furniture and Fixtures	Paper and Allied Products	Lumber and Wood Products	Furniture and Fixtures	Paper and Allied Products
Alabama	1.69	1.62	1.52	1.98	2.02	1.78	1.98	1.66	1.61
Arkansas	1.71	1.63	1.53	2.03	2.09	1.84	2.06	1.91	2.68
Florida	1.64	1.65	1.56	1.99	2.07	1.95	1.91	1.85	2.85
Georgia	1.77	1.75	1.63	2.07	2.20	2.05	2.15	1.90	2.93
Kentucky	1.69	1.64	1.58	2.08	1.99	1.91	1.86	1.85	2.46
Louisiana	1.62	1.55	1.57	1.87	1.96	1.88	2.09	1.64	2.70
Mississippi	1.69	1.61	1.53	1.97	1.95	1.80	2.02	1.76	2.45
North Carolina	1.71	1.69	1.58	2.03	2.02	2.00	1.96	1.76	2.61
Oklahoma	1.61	1.64	1.53	2.00	1.94	1.87	1.84	1.79	3.18
South Carolina	1.61	1.59	1.52	1.89	1.89	1.82	1.98	1.72	2.68
Tennessee	1.77	1.74	1.64	2.09	2.22	2.01	1.94	2.04	2.73
Texas	1.70	1.72	1.69	2.02	2.28	2.19	1.85	1.93	2.70
Virginia	1.68	1.64	1.58	2.03	2.00	1.98	1.96	1.71	2.70

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V. Conclusions

This Chart Book has described the forests in Texas, the forest economy of Texas and compared them to those of the other southern states. Forests in Texas are in the eastern part of the state and are primarily owned by NIPFs, though industry has a larger presence in Texas than in other states. As a percent of GSP, the forest products sector in Texas is relatively small. In terms of dollars, however, it is one of the largest in the southern region.

The age of the data for the forest inventory highlights a critical need for an ongoing effort to collect and analyze information about state-wide forest resources. This information is critical to an understanding of the long-term viability of timber supply for the state. The USDA Forest Service is no longer solely responsible for periodic state inventories, but is working with states to develop an annualized inventory process in each state. An annualized statistically-driven process will make natural resource information about Texas forests immediately available to support analyses required by decision makers who must make natural resource and forest policy decisions in an increasingly complex and regulated business and social environment.

The Texas forest economy is not a large part of the gross state product when compared to the other twelve southern states. However, the immense size of the Texas economy can make these statistics misleading. The forest products sector generated \$5 billion in gross state product in 1996 (Figure III.9) and employs over 100,000 (Figure III.10). The potential for this industry to expand its

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contribution to the state economy exists, but is somewhat dependent on the decisions of nonindustrial private forest owners. Most manufacturers of wood products are not totally self-sufficient in the wood supply needed to keep sawmills and paper mills running to meet product demand. Industry has traditionally relied heavily on NIPFs to supply needed timber. However, reforestation by NIPFs has not been adequate to maintain total state forest resources (Figure II.10), which may cause a shortfall in timber supply in the future. Without a reliable periodic inventory of the state's forest resources, it will not be possible for policy makers to understand the impact of state and federal programs designed to increase forest stewardship by NIPFs, nor to forecast the extent and characteristics of future timber supply.

In addition to benefits from forest products production, the forests of Texas provide many other important services to the citizens of Texas not covered in this report. Wildlife habitat and watershed are critical functions provided by Texas forests. As the state's population grows, forests will provide an ever-increasing number of Texans with unique recreational opportunities. The health of Texas forests is important to many Texans.

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GLOSSARY

Note: Cross-referencing to other definitions is indicated by *italics*.

Forest type. A category of forest usually defined by its vegetation, particularly its dominant vegetation as based on percentage cover of trees, e.g., spruce-fir, longleaf-slash pine, Douglas-fir--*synonym* forest cover type

Forest land. Land at least 10 percent stocked by forest trees of any size, including land that formerly had such tree cover and that will be naturally or artificially regenerated. Forestland includes (a) transition zones, such as areas between forested and nonforested lands that are at least 10 percent stocked with forest trees, and forest areas adjacent to urban and built-up lands, (b) pinon-juniper and chaparral areas. The minimum area for classification of forest land is 1 acre (0.4 ha); roadside, streamside, and shelterbelt strips of trees must have a crown width of at least 120 ft (36.6 m); unimproved roads and trails, streams, and clearings in forest areas are classified as forest if less than 120 ft (36.6 m) wide.

Forest land ownership classifications.

(adapted from USDA Forest Service 1982).

Private:

Non-industrial private forest (NIPF). Forest land that is privately owned by individuals or corporations other than forest industry and where management may include objectives other than timber production. There are three subclassifications:

Farmer (NIPF). Owned by a person who operates a farm, doing the work or directly

supervising the work.

Corporate (NIPF). Business organizations that own forestland but do not have wood using processing plants.

Individual (NIPF). All other non-industrial privately owned forest lands.

Forest industry. Individuals or business organizations that own wood-using processing plants to process timber.

Public:

National forest. A federal reservation, generally forest, range, or other wildland, that is designated by Executive Order or statute as a national forest or purchase unit, and other lands under the administration of the USDA Forest Service. The Forest Service administers national forests under a program of ecosystem management with objectives for multiple use and sustained yield for timber, range, watershed, wildlife and fish, and outdoor recreation.

Other public. Other federal forest lands, including Indian reservations; and state, county, and municipal forestlands.

Growing-stock. All the trees growing in a forest or in a specified part of it, usually commercial species, meeting specified standards of size, quality, and vigor, and generally expressed in terms of number or volume.

Growth. See *net annual growth*.

Harvest. Amount of timber products removed from the forest by *harvesting* activities. Distinctly different from timber *removals*.

Harvesting. The felling, skidding, on-site processing and loading of trees or logs onto trucks--*synonym* logging.

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Hardwoods. Trees belonging to the botanical group Angiospermae 2. The xylem of Angiospermae--*note* hardwood shows extreme variation in vertical and horizontal (radial) systems of elements but, with few exceptions, is composed of vessels and rays--*note* the wood of hardwoods may be either physically hard (high specific gravity) or soft (low specific gravity)--*see softwood*.

Industrial wood. All commercial roundwood products except fuelwood.

Industry. Generally defined as a group of *establishments* producing a single product or a closely related group of products

Net annual growth. The average annual net increase in the volume of trees during the period between inventories--*note* components of net annual growth include the increment in net volume of trees at the beginning of the period surviving to the end of the period, plus the net volume of trees reaching the minimum size class during the year, minus the volume of trees that died and the net volume of trees that became cull during the period.

NIPF. An acronym for non-industrial private forests. See *forest land ownership classifications*.

Plywood. A panel made by gluing layers of veneer together such that the grain of alternate veneers is perpendicular--*note* plywood is composed typically of three, four, or five veneers (plies).

Poletimber. Trees of commercially valuable species at least 5.0 inches *DBH* but smaller than

sawtimber size, and of good form and vigor (USDA Forest Service 1982).

Primary manufacture. Activities involved in the processing of logs and related products into lumber, *plywood*, *veneer*, pulp and paper, turpentine, and other products. An *establishment* is classified by the Census of Manufactures into a Standard Industrial Classification group according to the products manufactured. Wood-based industry segments of primary manufacture include the following, listed by *SIC* code:

SIC24: Lumber and wood products, includes: logging, sawmills, hardwood veneer, and softwood veneer.

SIC25: Furniture and Fixtures

SIC26: Paper and allied products, includes: pulp mills, paper mills, paperboard mills, and building paper mills.

See USDC BEA.

Productivity class. A classification of forestland in terms of potential annual cubic volume growth per unit area at culmination of mean annual increment in fully stocked natural stands.

Pulpwood. Roundwood, whole-tree chips, or wood residues that are used for the production of wood pulp.

Removals. The net volume of *growing-stock* or *sawtimber* trees removed from the inventory by *harvesting*; cultural operations, such as timber stand improvement; land clearings; or changes in land use (USDA Forest Service 1982).

Roundwood. A length of cut tree generally having a round cross section, such as a log or bolt.

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Sapling. A usually young tree larger than a seedling but smaller than a pole--*note* size varies by region.

Sawlog. A log that meets minimum regional standards of diameter, length, and defect, intended for sawing.

Sawtimber. Trees or logs cut from trees with minimum diameter and length and with stem quality suitable for conversion to lumber--*see sawlog*.

Seedlings. Established live trees of commercial species less than 1.0 inches *DBH* and of good form and vigor (USDA Forest Service 1982).

SIC (Standard Industrial Classification). A system of classifying *establishments* into *industries*, based on considerations such as similarity of manufacturing processes, types of materials used, types of customers, etc. See USDC BEA.

Site productivity class. A classification of *forest land* based on the potential cubic-foot volume of wood growth per acre at the culmination of mean annual increment in fully stocked natural *stands* (USDA Forest Service 1982).

Softwoods. The xylem and trees of the *Gymnospermae*--*note 1*. Commercial softwood timbers are practically confined to the order *Coniferales*--*note 2*. Softwood is relatively uniform in structure and is composed mostly of longitudinal tracheids and a small amount of rays and resin ducts.

Stand. **1.** *Ecology* a contiguous group of similar plants. **2.** *Silviculture* a contiguous group of trees sufficiently uniform in age-class distribution, composition, and structure, and growing on a site of sufficiently uniform quality, to be a distinguishable unit--*note 1*. A mixed stand is composed of a mixture of species--*note 2*. A pure stand is composed of essentially a single species--*note 3*. In a stratified mixture stand different species occupy different strata of the total crown canopy **3.** *Wildlife* a place from which game is shot (at) and past which game is generally driven--*synonym* hide.

Stumpage. **1.** Standing timber as viewed by a commercial cutter **2.** The value of timber as it stands uncut in terms of an amount per unit area--*synonym* stumpage value.

Timber. **1.** Forest crops and stands containing timber **2.** Wood, other than fuelwood, potentially usable for lumber.

Timber inventory. **1.** A set of objective sampling methods designed to quantify the spatial distribution, composition, and rates of change of forest parameters within specified levels of precision for the purpose of management **2.** The listing (enumeration) of data from such a survey--*synonym* cruise, forest survey--*note* inventories may be made of all forest resources including trees and other vegetation, fish, insects, and wildlife, as well as street trees and urban forest trees.

Timberland. *Forestland* that is producing, or is capable of producing, crops of *industrial wood* and is not withdrawn from timber production -- *synonym* commercial forest land.

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Value added. A measure of manufacturing activity derived by subtracting the costs of materials, supplies, containers, fuel, purchased electricity, and contract work from the *value of shipments* for the products manufactured. See USDC BEA. The remainder (value added) is the amount available for salaries, wages, and profits in that particular *establishment* or *industry*.

Veneer. A thin sheet of wood of uniform thickness, produced by rotary cutting (peeling) or by slicing, and sometimes by sawing.

Wood-based industry. Another term for *the forest products industry* used by some economists. The industry is also variously referred to as timber-based industry, forest-based industry, paper and forest products industry, and

forest industry.

Woodland. 1. A forest area **2.** A plant community in which, in contrast to a typical forest, the trees are often small, characteristically short-boled relative to their crown depth, and forming only an open canopy with the intervening area being occupied by lower vegetation, commonly grass.

Wood pulp. Wood fibers separated by mechanical or chemical means for use in manufacturing paper, textiles, and many other products derived from cellulose.