Central Mississippi Forest Inventory

MIFi
MISSISSIPPI INSTITUTE
FOR FOREST INVENTORY

State of Mississippi
Central District
Forest Inventory
2007

Acknowledgments

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Table of Contents

Acknowledgements i

Executive Summary 1

Remote Sensing 2

Area 2

Ownership 3

Growth 4

Economic Impact 5

Forces of Change 6

A Brief History of Mississippi Forests 6

The Continuing Role of Pine Plantations 7

Inventory Methods 8

Reliability of the Data 9

Central District Volume 10

Central District Biomass 12

Central District Individual County Volume 13

District Summaries 18

Obtaining Additional Information 20

Glossary of Terms 20

Executive Summary

The 2006-2007 inventory season as well as the 2007 calendar year presented significant challenges and opportunities for the Mississippi Institute for Forest Inventory. A veritable explosion of interest in the development of alternative energy sources for both domestic and foreign markets was the mainstay of activity throughout the year. MIFI received requests for 25 resource analyses with their primary interest focused on the establishment of cellulosic ethanol conversion facilities.

In addition to completion of the Central District Inventory, MIFI collaborated with Mississippi State University Industrial Outreach Program and Bluefire Ethanol to produce a Business Plan for the development of ethanol conversion facilities. Although, ethanol is a fast-growing interest it is not the only energy market emerging in the landscape. Serious exploration of the resource availability is being conducted by European and domestic firms investigating the possibilities of producing wood fuel pellets for residential and commercial consumption. Also, the potential for export of bulk wood chips for energy production is being investigated.

After the incorporation of MIFI into the Mississippi Forestry Commission, under the direction of the new State Forester, Charlie Morgan, MIFI experienced a realignment of responsibilities. The Executive Director's role was expanded to include oversight of the combined Forest Management and MIFI Division. The Director of Operations' role was expanded to strengthen the geo-spatial and inventory components of the MFC. MIFI's contribution to the MFC mission was acknowledged and reinforced when MFC was requested to design the inventory protocols to be utilized by the five southern states impacted by the 2005 hurricane season in implementing the Emergency Forest Conservation Reserve Program.

MIFI continues to exceed expectations in fostering cooperation with other agencies. As part of the joint mission of MIFI and MFC, Mississippi has renewed participation in the USDA-Forest Service Forest Inventory and Analysis (FIA) program. Joint efforts are being developed to survey and report on forest volumes and timber utilization. This will strengthen the understanding of how Mississippi's forest resources are being utilized not only for timber products but also for ecosystem services that are not typically associated with forest inventory efforts. Anticipating recent initiatives promoting alternative fuel development and biomass utilization, such as 25x'25, MIFI is now capable of reporting biomass metrics as well as the traditional volume metrics associated with timber production.

The inventory fore each district is delivered both in writing and via the World Wide Web. MIFI's website has undergone significant renovation and is now considered to be the first stop for understanding the forest resources of the state. Our Web site is the primary tool for retrieving inventory information for prospective economic development clients. Our interface allows the user to analyze inventory results and query specific geographic locations. To learn more about MIFI or access the inventory interface, visit our Web site at www.mifi.ms.gov.

Respectfully,
Mississippi Institute for Forest Inventory

Additional information about any aspect of this survey may be obtained from:
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Remote Sensing

MIFI represents an advancement of forest inventory philosophy, the first production scale integration of satellite remote sensing and forest inventory. Neither of the technologies can separately answer the two most important questions posed with forest resource assessment: 1) How much volume is present? and 2) Where is that volume located? These two technologies are brought together through the use of a Geographical Information System (GIS). By combining spatial data as derived from satellite imagery through classification, and Global Positioning System (GPS) linked attribute data obtained from ground measurements; the GIS answers the questions associated with the forest resource assessment.

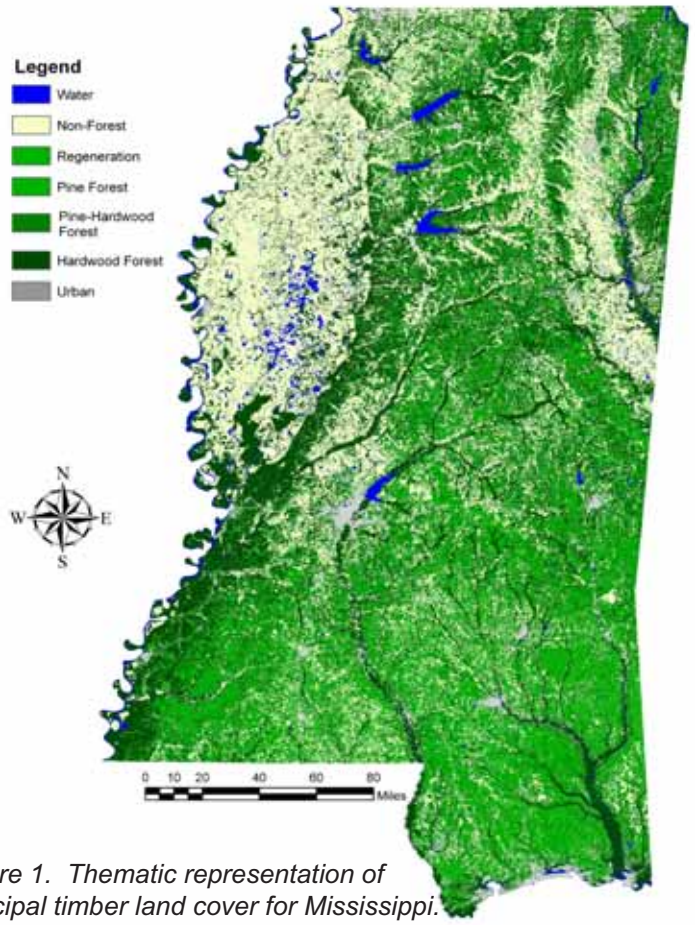

Figure 1. Thematic representation of principal timber land cover for Mississippi.

Area

The total productive land area of Mississippi is 30,521,018 acres. In 2003, the area of forestland totaled 19.79 million acres or 64.85% of the land area in MS. Pine forests cover 6.62 million acres or 33.45% of the forested area. Hardwood and oak-pine timber types combine to occupy over 53.11% of the state's timberland or 10.5 million acres. Land that is regenerating as forest area but is yet unclassified is 2.66 million acres or 13.45% of the current forested area.

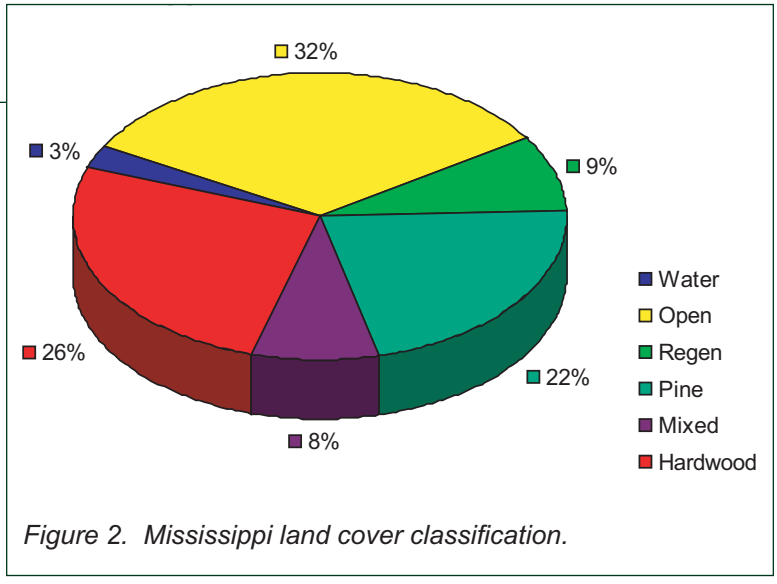

Figure 2. Mississippi land cover classification.

Ownership

Parcel ownership for land in Mississippi is predominated by family. Traditional family legacy subdivides large holdings into smaller parcels. Families acknowledge the legal distinction in ownership of the land but continue to manage the parcels as contiguous properties.

Mississippi has only recently begun transitioning to a digital format for property records. However, corporate and governmental ownership records are available in geo-referenced digital formats and MIFI has focused on the use of these records to create ownership descriptions. By process of elimination, the non-industrial private land ownership patterns can be discerned.

- Corporate timberland currently accounts for 3.1 million acres.
- Publicly owned federal timberland currently accounts for 2.2 million acres.
- Publicly owned state timberland currently accounts for approximately 1 million acres.
- Native American timberland in Mississippi amounts to approximately 25,000 acres.
- Almost 80% of the timberland in Mississippi is owned by private citizens.

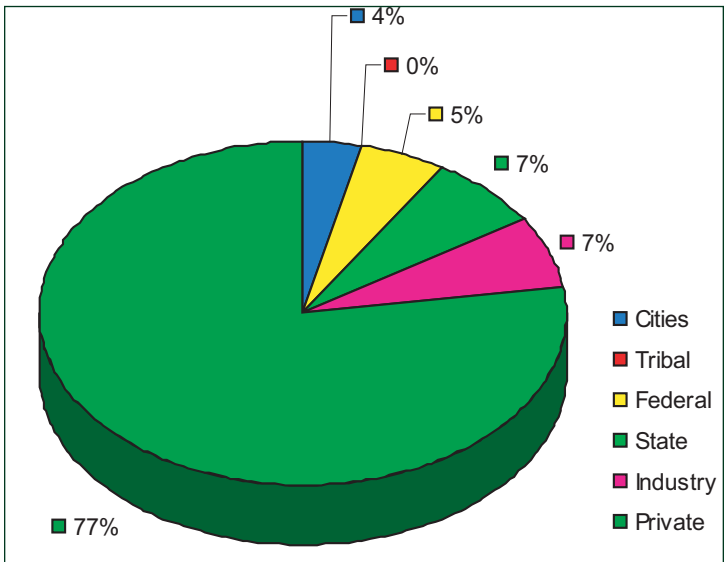

Figure 3. Mississippi land ownership patterns.

Growth

Sustainability of the forest resource is necessary to foster economic viability. Archival satellite imagery is used to assess the trend in resource utilization. The trend analysis utilizes satellite imagery that is classified into a forest/non-forest map of the state on an approximate 5-year cycle dating from 1973 to present.

Softwood growth rates represent a return on investment realized as the increase in volume over a given length of time and reported as an annualized percentage rate. The ability to quickly and repeatedly determine growth rates in pines, coupled with the dominance of pine volume in the market mandate the prevalence of softwood growth rates. This is not to say that hardwood growth rates are of less importance, but, the requirements to measure hardwood annual growth in the field are prohibitive and a legacy of hardwood growth and yield research obviates those measurements.

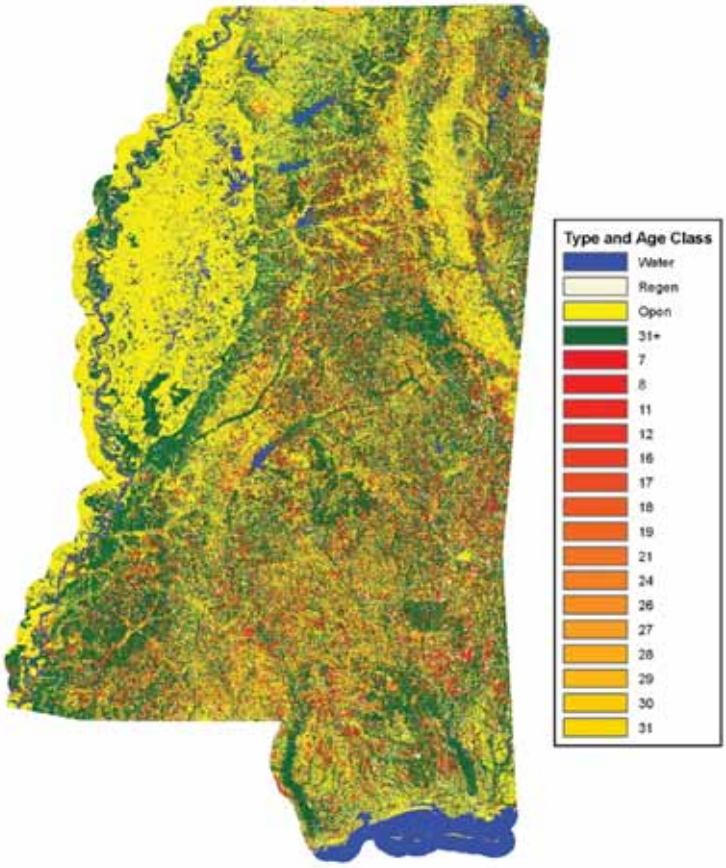

Figure 4. Type and ages of Mississippi forests.

- Softwood growth rate for the Central MIFI District is 14.3%.

- Hardwood growth rate for the Central MIFI District is 5.0%.

These growth rates can be compared to the interest rate paid upon a savings account and provide useful tools for investment analysis. The average current rate for a 5-year IRA CD is 4.27%. Pine timber production that is twice as profitable when compared to a savings account represents a competitive alternative for investors.

Figure 4 demonstrates the age distribution of Mississippi's forests. It also depicts the focus of harvesting activity throughout the years. The majority of harvesting occurs in a band in the center of the state from North to South and in the lower portion of the state below the I-20 corridor.

Economic Impact

Roundwood production is the mainstay of Mississippi's forest-based economy. Hardwood and softwood production supply the markets for everything from furniture and flooring raw material to construction grade solid wood products.

- Forestry, logging, primary wood products, and furniture manufacturing contribute between $11 and $14 billion annually to the State's economy.
- Approximately 54,000 individuals are directly employed in logging, forestry and other wood-processing industries with a combined income of $ 1.1 billion.
- Approximately 66,000 individuals are indirectly employed in secondary value added and materials handling related positions.

Available information pertaining to growth rates, harvest volumes, regeneration practices was collected to develop a growth to drain ratio. This measure of sustainability is a way of determining if the forest is being utilized to its maximum potential without creating conditions that will result in the total loss of forest resources in the future. The growth to drain ratio for Central Mississippi is 1.3. This number means that this region of the state is producing approximately 30% more volume than is being utilized.

Forces of Change

Mississippi's forestland is dynamic and constantly changing. The primary driving force in change is the human element. Population centers are expanding and the resulting landscape is a mixture of forest and urban land cover often within close proximity to each other.

Natural forces typically do not result in loss of forestland. Insects and disease are always present and often influence stand structure throughout all stages of development. Other natural events can reshape the State's forest in a matter of hours. Fortunately, the 2004 hurricane season spared Mississippi the extensive damage incurred by neighboring states. Tornadic activity, though severe, is restricted to small areas and does not impact the forest at the landscape level.

Whether natural or human induced, long-term or short-term, permanent or temporary, Mississippi's forestlands are changing constantly. These changes are reflected in the current condition of the State's forests as evidenced by trends in land use; stand composition; estimates of wood volume; and rates of net annual growth, removals, and mortality. The effects extend to overall forest health, as well as water quality, recreation potential, future timber availability and other aspects of forestland use and condition.

A Brief History of Mississippi Forests

From the earliest occupation of Mississippi by Native Americans, the forests have been the primary livelihood. Wood products were used to manufacture dwellings and wildlife in the forest represented both a source of food and trade goods. If by definition a "virgin forest" is a forest that has been uninfluenced by humans, then virgin forests have not existed in Mississippi since the pre-Colombian era.

Agriculture was the major force that shaped early Mississippi landscapes. The practice of slash and burn agriculture practiced by early settlers resulted in a highly fragmented landscape of forests that exhibited all the stages of secession. At the beginning of the 20th century, large lumbering firms of the Northeast and Great Lakes regions were looking for new resources as the large growth timber of those regions became exhausted. The presence of rail networks and largely untapped reserves of timber in the Southeast attracted their attention. Thus, mechanized timber production began in Mississippi.

Until the late 1930's, the primary focus on forestry was the production of timber with little regard for scientific-based management. Professional foresters began to foster the concept of actively managing pine forestland that could meet the demand for timber related products. As environmental awareness increased, management of forestland began to take a multi-use approach. Aesthetics, recreation, and water quality are principles that professional foresters are now trained to incorporate into their management practices.

The Continuing Role of Pine Plantations

A little more than 40 years ago, planted pine stands occupied less than 2 million acres in the South. By the late 1990s pine plantations accounted for nearly half of all pine stands. The dramatic increase in pine plantations has become one of the defining issues in southern forest management and is an issue in Mississippi as well.

Pine stands are often mechanically regenerated after harvest to ensure the site remains in production as a pine forest type. Since the inception of the Conservation Reserve Program (CRP) in 1985, combined with the Forest Resource Development Program (FRDP) and the Forest Incentive Program (FIP) for cost sharing, establishment of plantations in Mississippi has totaled 2,146,254 acres.

This represents 11% of the total timberland area and nearly a third of the pine timber area in Mississippi. When well managed, planted pines have substantially lower mortality rates and higher rates of net annual growth, averaging nearly 128 cubic feet of wood growth per acre per year, compared to 76 cubic feet for natural pine stands.

Inventory Methods

The Mississippi Institute for Forest Inventory began the inventory in 2004. The sampling scheme is significantly different than traditional forest surveys, which produced estimates for an entire state. This type of analysis prohibits the estimates of areas equivalent to the size of a county. MIFI directs sampling in a two stage process: analysis of satellite-based remote sensing with statistical validation for depicting the land cover types and subsequent change through time; and intensive ground measurement of the forest timber for a region or district of the state. This information provides statistical precision for county level estimates that can be used for economic development.

The remote sensing effort utilizes the spectral reflectance of vegetation captured in 6 or 7 spectral bands by the LandSat satellite during both active and dormant seasons. Through a combination of band analyses and mathematical modeling, primary classifications of water, non-forest, pine, hardwood, and mixed pine-hardwood classes are obtained. Additional imagery from previous surveys is analyzed and then layered to represent the change in land cover over time. This stacking effect creates another classification, immature forest vegetation, which lacks maturity to allow for assignment in one of the dominant forestland cover classifications.

The ground-based measurements were implemented on a one-fifth acre fixed radius plot located randomly from the forest cover classification of the remotely sensed data. Saw timber, pole and veneer volume were sampled and characteristics associated with stand dynamics were measured. A one-tenth acre plot was incorporated to measure the volume of products classes used to produce fiber for the pulp industry. Finally, a one-twentieth acre plot was inventoried to measure non-merchantable stems that range from 1.0 to 4.5 inches in diameter at breast height.

In the event there was no merchantable material located on a plot, such as following a harvest, a one-hundredth acre plot was established to measure reproduction material that will develop into a future timber stand. A representative sample of the current forest conditions was obtained at each sample location for all timber species, from the smallest seedling to the largest tree encountered on any of the plots. Individual tree attributes measured include species, product, observable damage, diameter at breast height, total height, height to absolute diameter limits for pulpwood and saw timber volume, crown length, bark thickness, 5- and 10-year radial growth, and age. Stand level attributes recorded include slope, size class, apparent stand level damages, over story composition with reference to the remote sensing products, logging operability, physiographic position, Society of American Foresters forest cover type designation, litter depth, and USFS fuel model designation.

To avoid statistical confounding, plots were located within a strictly homogenous stand condition. In the event an operational or management activity has disrupted the proposed plot site (e.g. the establishment of a right-of-way, property thinning, etc.), the plot was shifted a specified distance to the stand that exhibited the higher heterogeneity in volume. Estimates of timber volume and forest classifications were derived from tree measurements and classifications made at these locations. Volumes for individual tally trees were computed using profile equations for each of the 60 major species in Mississippi.

Reliability of Data

The measure of reliability of inventory statistics is provided by sampling errors. MIFI inventories supported by all the allocated sample plots are designed to achieve reliable statistical precision (± 15% at 95% confidence) at the county level for total cubic foot volume outside bark. However, users should note that sampling error increases at the same level of confidence, as the number of plots is lowered by reducing the area. Sampling errors are often unacceptably high for small components of the total resource. The opposite occurs when estimates are derived from larger areas. Sampling errors and confidence limits mean that the chances are 95 times out of 100 that the true population value is within the limits indicated by the range of the sampling error.

District Volume

Mississippi was divided into five districts based on geography, physiography, economic and political characteristics. The loss of several primary wood using facilities in the Southwest portion of the state dictated that priority should be given to this region for conducting the initial inventory. The primary reason for this selection was the need to obtain a current inventory of available timber to entice new industry into the region.

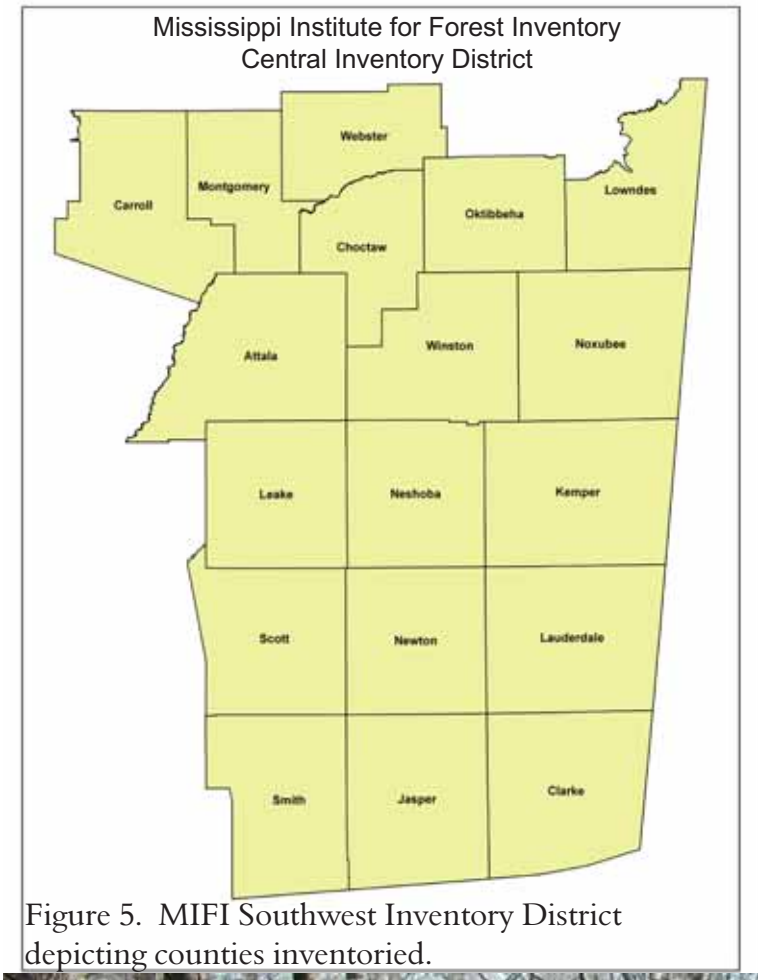

Figure 5. MIFI Southwest Inventory District depicting counties inventoried.

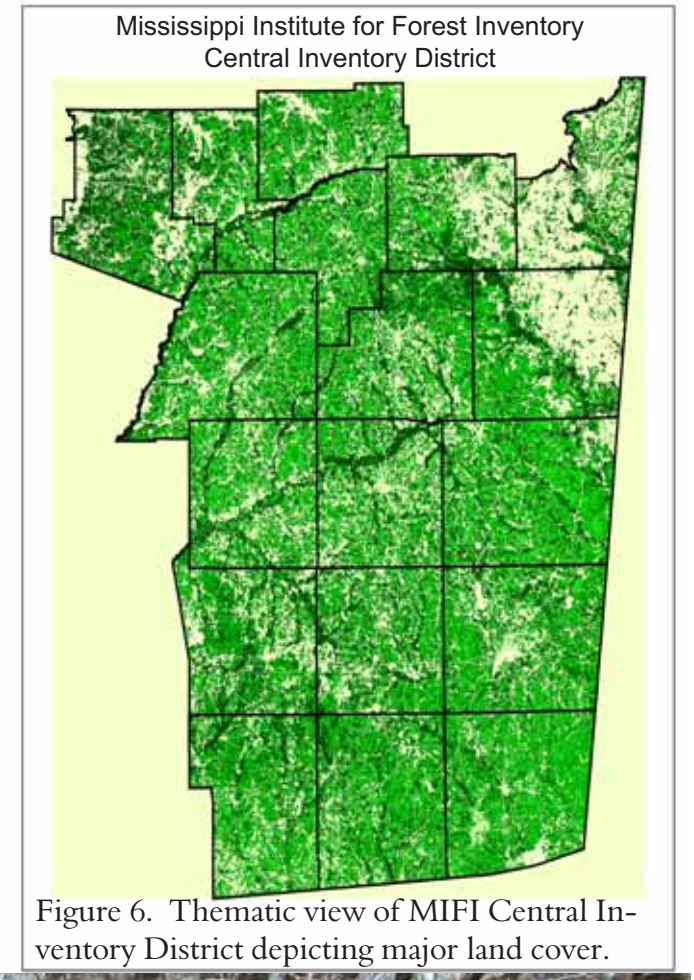

Figure 6. Thematic view of MIFI Central Inventory District depicting major land cover.

The following tables report the forest cover types, volumes, and sampling errors associated with the 18 counties of the Central MIFI district. Also included are the estimates for pine growth and non-commercial forest regeneration that will provide the future timber supply.

Table 1. Major stratification land cover acreages for MIFI Central Inventory District.

Strata	Acres
Non-Forest	1,502,848
Reproduction	668,761
Pine	2,024,771
Mixed Pine-Hardwood	779,006
Hardwood	1,858,441
Total Forested	5,330,979
Total	6,880,884

Table 2. Corrected forested strata acreage estimates with associated sampling errors.

			Sampling Error		
Strata	Acres	Std. Error	97.5	95	90
Pine	2,105,981	18,426	2.0	1.7	1.4
Mixed Pine-Hardwood	490,521	9,983	4.6	4.0	3.4
Hardwood	1,943,431	39,075	4.5	3.9	3.3
Total	4,539,932	44,341	2.2	1.9	1.6

Table 3. Strata level per acre and total area estimates of pulpwood and sawtimber volumes[1] for pine and hardwood species groups with sampling errors.

	Per Acre		Total[2]			
	Pulpwood	Sawtimber	Pulpwood	Error %	Sawtimber	Error %
Pine	893.8	1,385.9	2,329,700.9	6.5	1,985,151.5	6.6
Mixed Pine-Hardwood	781.1	1,682.2	282,900.6	13.7	609,090.4	11.7
Hardwood	1,420.4	1,048.9	1,614,807.8	6.6	2,065,572.3	9.2

1 Volumes are expressed in cubic feet outside bark.
2 Total volumes are expressed in 1,000s.

District Biomass

Biomass is the term applied to any organic structure naturally produced on a site. In forestry, biomass typically refers to the trees and their component parts: main stem, branches, and foliage. The importance of estimating biomass relates to the future markets that are being developed for alternative fuel compounds and the current trade markets established for carbon credits. These markets, though common in European countries are just beginning to emerge in the US and Mississippi possesses a sizeable resource base positioned to fully utilize these markets to the economic benefit of its residents.

Table 4. Strata level per acre and total are estimates of stem, branch and foliage weight.[1]

	Per Acre			Total[2]		
Covertype	Stem	Branch	Foliage	Stem	Branch	Foliage
Pine	147,981	18,813	9,035	155,708.1	19,795.3	9,506.5
Mixed Pine-Hardwood	131,089	18,058	4,556	32,151.0	4,428.9	1,117.5
Hardwood	147,269	31,061	5,636	155,708.1	29,117.3	5,283.4

1 Weights are expressed as green pounds outside bark per acre and green tons outside bark for total.
2 Totals are expressed in 1,000s.

Individual County Volume

Table 5. Individual county volume estimates by species group and product class.

Attala County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	76,191			
Reproduction	45,988			
Pine	164,887	2,217,910	113,501	19.3%
Mixed Pine-Hardwood	29,093	252,108	250,578	38.0%
Hardwood	149,850	1,788,416	1,229,073	27.0%
Forested	343,829	4,258,434	2,811,152	15.7%

Carroll County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	115,151			
Reproduction	42,818			
Pine	98,610	1,192,427	783,924	22.3%
Mixed Pine-Hardwood	13,611	112,376	95,251	37.3%
Hardwood	146,378	1,708,279	1,229,073	27.0%
Forested	258,594	3,013,082	2,143,921	15.5%

Choctaw County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	34,348			
Reproduction	26,667			
Pine	93,254	785,512	1,149,975	26.1%
Mixed Pine-Hardwood	15,222	43,115	186,900	52.1%
Hardwood	110,130	626,678	2,113,378	28.3%
Forested	218,607	1,455,306	3,450,253	19.5%

Clarke County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	58,997			
Reproduction	56,175			
Pine	220,618	2,667,115	1,796,241	21.2%
Mixed Pine-Hardwood	31,071	161,589	307,192	39.0%
Hardwood	58,195	402,097	427,884	60.7%
Forested	309,833	3,231,800	2,531,318	19.6%

Volume is reported in hundreds (100's) of cubic feet outside bark.

Jasper County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	61,145			
Reproduction	45,128			
Pine	167,013	2,083,607	1,769,735	20.7%
Mixed Pine-Hardwood	51,138	213,850	294,807	42.6%
Hardwood	73,029	601,186	298,403	40.7%
Forested	291,180	2,898,643	2,362,945	17.9%

Kemper County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	66,864			
Reproduction	61,204			
Pine	167,332	1,386,139	1,023,281	27.4%
Mixed Pine-Hardwood	34,404	151,604	268,808	38.9%
Hardwood	97,364	473,103	520,996	44.5%
Forested	299,100	2,010,846	1,813,085	22.2%

Lauderdale County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	74,006			
Reproduction	50,921			
Pine	145,730	1,557,791	1,114,667	21.3%
Mixed Pine-Hardwood	35,788	148,059	253,344	39.8%
Hardwood	101,743	783,540	375,807	31.3%
Forested	283,262	2,489,390	1,743,818	17.0%

Leake County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	79,991			
Reproduction	36,221			
Pine	118,798	1,698,045	1,393,430	20.8%
Mixed Pine-Hardwood	25,876	96,432	178,850	42.1%
Hardwood	100,065	1,484,474	797,295	29.7%
Forested	244,739	3,278,950	2,369,576	17.2%

Volume is reported in hundreds (100's) of cubic feet outside bark.

Lowndes County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	142,146			
Reproduction	30,858			
Pine	21,629	180,905	189,918	31.0%
Mixed Pine-Hardwood	5,802	20,538	59,578	72.6%
Hardwood	122,347	557,087	2,207,570	16.2%
Forested	149,777	758,530	2,457,066	14.7%

Montgomery County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	68,899			
Reproduction	24,676			
Pine	65,829	885,007	608,829	20.2%
Mixed Pine-Hardwood	12,833	70,438	142,896	27.6%
Hardwood	81,011	839,429	641,783	22.1%
Forested	159,674	1,794,875	1,393,508	14.4%

Neshoba County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	86,453			
Reproduction	33,606			
Pine	94,525	1,224,611	819,515	24.5%
Mixed Pine-Hardwood	21,532	99,060	267,648	40.6%
Hardwood	99,101	917,348	1,065,354	32.2%
Forested	215,158	2,241,019	2,152,517	19.2%

Newton County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	78,417			
Reproduction	39,052			
Pine	122,816	1,432,905	1,371,738	21.9%
Mixed Pine-Hardwood	27,429	135,961	170,207	51.8%
Hardwood	95,641	839,718	804,041	27.2%
Forested	245,949	2,408,586	2,345,985	16.9%

Volume is reported in hundreds (100's) of cubic feet outside bark.

Noxubee County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	177,509			
Reproduction	29,851			
Pine	94,273	1,063,334	1,014,871	21.9%
Mixed Pine-Hardwood	25,064	133,307	329,963	34.6%
Hardwood	121,162	1,287,050	1,289,902	21.3%
Forested	240,499	2,483,690	2,634,736	14.7%

Oktibbeha County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	81,899			
Reproduction	25,297			
Pine	51,069	405,671	544,445	26.7%
Mixed Pine-Hardwood	13,473	41,707	219,264	38.2%
Hardwood	123,370	636,258	2,173,695	20.8%
Forested	187,912	1,083,636	2,937,404	16.8%

Scott County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	93,153			
Reproduction	27,863			
Pine	99,634	1,468,991	912,639	24.4%
Mixed Pine-Hardwood	53,264	571,211	1,766,657	20.3%
Hardwood	100,865	1,048,404	1,208,618	21.7%
Forested	253,763	3,088,607	3,887,913	13.1%

Smith County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	77,208			
Reproduction	36,797			
Pine	179,610	1,574,116	1,735,651	26.1%
Mixed Pine-Hardwood	47,781	472,917	751,902	37.7%
Hardwood	74,470	729,589	906,132	31.1%
Forested	301,861	2,776,622	3,393,685	18.1%

Volume is reported in hundreds (100's) of cubic feet outside bark.

Webster County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	60,402			
Reproduction	21,281			
Pine	82,679	453,511	1,243,465	29.1%
Mixed Pine-Hardwood	16,767	50,125	172,578	28.8%
Hardwood	96,450	543,421	1,400,458	25.0%
Forested	195,896	1,047,057	2,816,501	18.3%

Winston County

Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Non-Forest	68,921			
Reproduction	34,053			
Pine	116,131	1,420,645	1,059,661	25.1%
Mixed Pine-Hardwood	30,309	141,714	410,320	41.7%
Hardwood	123,695	1,329,622	2,080,510	27.1%
Forested	270,134	2,891,982	3,550,490	18.1%

Volume is reported in hundreds (100's) of cubic feet outside bark.

Table 5. Estimates of pre-commercial stem counts for all species and projected pine productivity.

	Number of Stems Diameter Class				5-yr Projected Pine Volume		Annual Growth Rate	
County	1-inch	2-inch	3-inch	4-inch	Pulpwood	Sawtimber	Pulpwood	Sawtimber
Attala	57,651	34,226	24,545	18,193	3,405,542	4,186,143	9.0%	25.7%
Carroll	33,110	25,026	21,334	13,971	1,976,737	2,382,247	10.6%	24.9%
Choctaw	42,865	27,236	17,462	19,361	2,413,919	2,405,473	25.2%	15.9%
Clarke	92,492	43,374	40,614	37,780	6,636,983	5,316,144	20.0%	24.2%
Jasper	76,228	39,932	40,882	35,049	5,174,796	4,370,262	20.0%	19.8%
Kemper	36,413	18,422	14,175	13,066	2,280,777	2,953,132	10.5%	23.6%
Lauderdale	38,258	27,465	17,973	18,729	2,574,907	3,288,218	10.6%	24.2%
Leake	28,247	32,138	22,242	15,207	3,165,233	3,499,165	13.3%	20.2%
Lowndes	21,639	13,061	10,942	7,419	351,820	474,467	14.2%	20.1%
Montgomery	31,161	20,680	13,216	8,451	1,381,821	1,816,880	9.3%	24.4%
Neshoba	30,233	13,919	12,599	18,059	2,230,912	2,415,473	12.7%	24.1%
Newton	73,071	36,000	27,573	27,238	3,048,630	3,353,282	16.3%	19.6%
Noxubee	33,034	17,808	14,757	16,105	1,943,009	2,403,848	12.8%	18.8%
Oktibbeha	35,240	18,600	14,852	10,748	1,032,477	1,139,492	20.5%	15.9%
Scott	29,129	32,401	21,450	17,237	3,377,799	2,640,782	18.1%	23.7%
Smith	43,556	48,306	30,381	9,904	3,069,907	3,879,480	14.3%	17.5%
Webster	38,275	24,398	22,592	12,090	1,485,635	2,036,008	26.8%	10.4%
Winston	74,614	22,990	25,420	29,067	3,294,732	2,906,288	18.3%	22.4%

Volume is reported in hundreds (100's) of cubic feet outside bark.
Number of stems is reported in thousands (1,000's).

District Summaries

The five districts in the state are designated for inventory according to the following schedule:

Southwest - 2004 - 2005
Southeast - 2005-2006
Central - 2006-2007
North - 2007-2008
Delta - 2008-2009.

The inventory cycle will then repeat itself starting with the Southwest district in the year 2009.

The utilization of GIS and remote sensing technology has provided a description of the current forest conditions in the remaining districts. Forested acreage for the remaining districts are 3.93 million acres and 1.76 million acres for the North and Delta districts respectively.

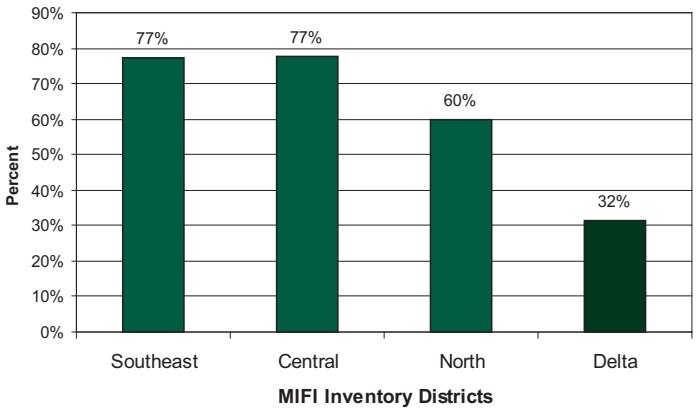

Figure7. Proportion of forested area to total area for each district.

North District

The North inventory district has the highest number of counties, for any district, to inventory and is scheduled to begin in 2007. This district also has some of the most difficult terrain to cross because of its geological age having allowed for the formation of steep sided river courses.

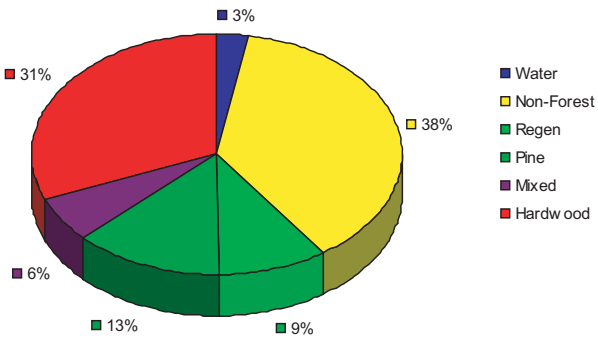

Figure 12. North Mississippi land cover classification.

Figure 13. MIFI North Inventory District.

Delta District

The Delta district presents some difficulties in inventory applications because of the nature of the forests following sloughs and stream courses. Although this district has the fewest number of acres of forest, the linear nature of these forests will cause the sampling layout to be modified.

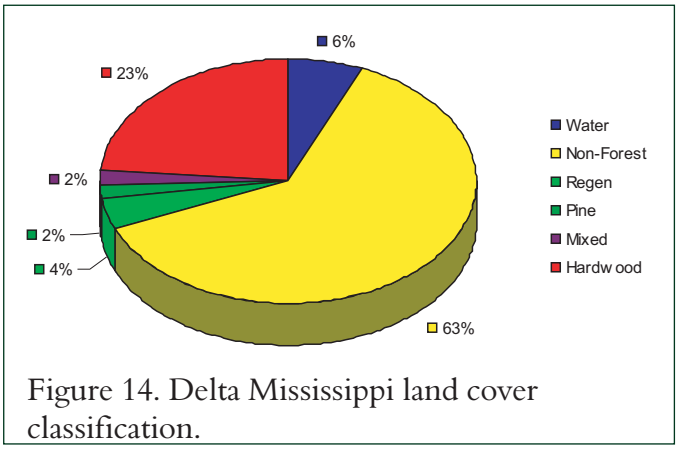

Figure 14. Delta Mississippi land cover classification.

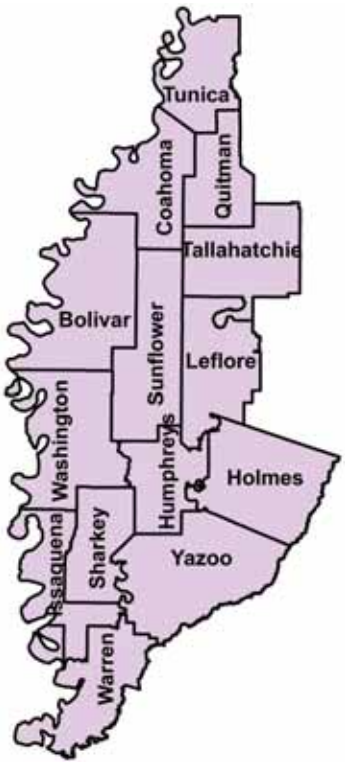

Figure 13. MIFI Delta Inventory District.

Obtaining Additional Information

To obtain additional assistance with the Dynamic Reporter software, the MIFI web site or to obtain a copy of the Dynamic Reporter Installation on Compact Disc then use the following information to contact the Director of Operations at the Mississippi Institute for Forest Inventory;

Director of Operations
MIFI
301 North Lamar Street, Suite 300
Jackson, Mississippi 39201-1404
(601) 359-2808
e-mail: pglass@mifi.state.ms.us

Glossary of Terms

All terms and phrases utilized on the Dynamic Reporter Interface are explained in the Technical specifications located on the MIFI web site at the following link: www.mifi.ms.gov/Documents/Inventory_Guidelines.pdf

Basal area. The area in square feet of the cross section at breast height of a single tree or of all the trees in a stand, usually expressed in square feet per acre.

Commercial species. Tree species currently or potentially suitable for industrial wood products.

CRP. The Conservation Reserve Program, a major Federal afforestation program authorized by the 1985 Farm Bill.

D.b.h. Tree diameter in inches (outside bark) at breast height (4.5 feet aboveground).

Diameter Class. A classification of trees based on tree d.b.h. One-inch diameter classes are commonly used. For example, the 6-inch class includes trees 5.6 through 6.5 inches d.b.h.

D.o.b. (diameter outside bark) Stem diameter including bark.

Forest Land. Land at least 10 percent stocked by forest trees of any size, or formerly having had such tree cover and not currently developed for nonforest use. The minimum area considered for classification is 1 acre.

Forest management type. A classification of timberland based on forest type and stand origin.

Forest type. A classification of forest land based on the species forming a plurality of live-tree stocking. Major Mississippi forest-type groups are:

Longleaf-slash pine. Forests in which longleaf or slash pine, singly or in combination, constitute a plurality of the stocking. (Common associates include oak, hickory, and gum).

Loblolly-shortleaf pine. Forests in which loblolly pine, shortleaf pine, or other southern yellow pines, except longleaf or slash pine, singly or in combination, constitute a plurality of

the stocking. (Common associates include oak, hickory and gum).

Oak-pine. Forests in which hardwoods (usually upland oaks) constitute a plurality of the stocking but in which pines account for 25 to 50 percent of the stocking. (Common associates include gum, hickory, and yellow-poplar).

Oak-hickory. Forests in which upland oaks or hickory, singly or in combination, constitutes a plurality of the stocking, except where pines account for 25 to 50 percent, in which case the stand would be classified oak-pine. (Common associates include yellow-poplar elm, maple, and black walnut).

Oak-gum-cypress. Bottom-land forests in which tupelo, blackgum, sweetgum, oaks, or southern cypress, singly or in combination, constitutes a plurality of the stocking, except where pines account for 25 to 50 percent, in which case the stand would be classified oak-pine. (Common associates include cottonwood, willow, ash, elm, hackberry, and maple).

Elm-ash-cottonwood. Forests in which elm, ash, or cottonwood, singly or in combination, constitutes a plurality of the stocking. (Common associates include willow, sycamore, beech, and maple).

Maple-beech-birch. Forests in which maple, beech, or yellow birch, singly or in combination, constitute a plurality of the stocking. (Common associates include hemlock, elm, basswood, and white pine).

Nonstocked stands. Stands less than 10 percent stocked with live trees.
Pine plantation. Stands that (a) have been artificially regenerated by planting or direct seeding, (b) are classed as a pine or other softwood forest type, and (c) have at least 10 percent stocking.

Natural pine. Stands that (a) have not been artificially regenerated, (b) are classed as a pine or other softwood forest type, and (c) have at least 10 percent stocking.

Oak-pine. Stands that (a) have at least 10 percent stocking and classed as a forest type of oak-pine.

Upland hardwood. Stands that have at least 10 percent stocking and classed as an oak-hickory or maple-beech-birch forest type.

Lowland hardwood. Stands that have at least 10 percent stocking with a forest type of oak-gum-cypress, elm-ash-cottonwood, palm, or other tropical.

Nonstocked stand. Stands less than 10 percent stocked with live trees.

GIS - Geographical Information System. Combines traditional mapping skills with spatially referenced data in a computer to provide advanced maps.

Hardwoods. Dicotyledonous trees, usually broadleaf and deciduous.

Hard hardwoods. Hardwood species with an average specific gravity greater than 0.50 such as oaks, hard maples, hickories, and beech.

Soft hardwoods. Hardwood species with an average specific gravity of .50 or less, such as gums, yellow poplar, cottonwoods, red maple, basswoods, and willows.

Industrial wood. All roundwood products except fuelwood.

Land area. The area of dry land and land temporarily or partly covered by water,

such as marshes, swamps, and river floodplains (omitting tidal flats below mean high tide), streams sloughs, estuaries, and canals less than 200 feet wide, and lakes, reservoirs, and ponds less than 4.5 acres in area.

Live trees. All living trees, all size classes, all tree classes, and both commercial and noncommercial species are included.

Log Grade. A classification of logs based on external characteristics indicating quality or value.

Logging residues. The unused merchantable portion of growing-stock trees cut or destroyed during logging operations.

Noncommercial species. Tree species of typically small size, poor form, or inferior quality that normally do not develop into trees suitable for industrial wood products.

Nonforest land. Land that has never supported forests and land formerly forested where timber production is precluded by development for other uses.

Nonstocked stands. Stands less than 10 percent stocked with live trees.

Ownership. The property owned by one ownership unit, including all parcels of land in the United States.

National forest land. Forest land that has been legally designated as national forests or purchase units, and other land under the administration of the Forest Service, including experimental areas and Bank head-Jones Title III land.

Forest industry land. Land owned by companies or individuals operating primary wood-using plants.

Nonindustrial private forest (NIPF) land. Privately owned land excluding forest industry land or forest industry-leased land.
Corporate. Owned by corporations, including incorporated farm ownerships.

State, county, and municipal land. Land owned by States, counties, and local public agencies or municipalities or land leased to these governmental units for 50 years or more.

Primary wood-using plants. Industries receiving roundwood or chips from roundwood for the manufacture of products, such as veneer, pulp, and lumber.

Reforestation. Area of land previously classified as forest that is regenerated by planting trees or natural regeneration.

Remote Sensing. The use of aircraft or satellite imagery to identify and describe the land cover and land use.

Roundwood (roundwood logs). Logs, bolts, or other round sections cut from trees for industrial or consumer uses.

Roundwood chipped. Any timber cut primarily for pulpwood, delivered to non-pulp mills, chipped, and then sold to pulp mills as residues, including chipped tops, jump sections, whole trees, and pulpwood sticks.

Roundwood products. Any primary product such as lumber, poles, pilings, pulp, or fuelwood, that is produced from roundwood.

Saw Log. A log meeting minimum standards of diameter, length, and defect, including logs at least 8 feet long, sound and straight, with a minimum diameter inside bark for softwoods of six inches (8 inches for hardwoods).

Saw log portion. The part of the bole of sawtimber trees between a 1-foot stump and the saw-log top.

Saw-log top. The point on the bole of sawtimber trees above which a conventional saw log cannot be produced. The minimum saw-log top is 7.0 inches d.o.b. for softwoods and 9.0 inches d.o.b for hardwoods.

Sawtimber-size trees. Softwoods 8.0 inches d.b.h and larger and hardwoods 11.0 inches d.b.h. and larger.

Sawtimber volume. Growing-stock volume in the sawlog portion of sawtimber-size trees in board feet.

Seedlings. Trees less than 1.0 inch d.b.h. and greater than 1 foot tall for hardwoods, greater than 6 inches tall for softwood, and greater than .5 inch in diameter at ground level for longleaf pine.

Select red oaks. A group of several red oak species composed of cherrybark, Shumard, and northern red oaks. Other red oak species are included in the "other red oaks" group.

Select white oaks. A group of several white oak species composed of white, swamp chestnut, swamp white, chinkapin, Durand, and bur oaks. Other white oak species are included in the "other white oaks@" group.

Site class. A classification of forest land in terms of potential capacity to grow crops of industrial wood based on fully stocked natural stands.

Softwoods. Coniferous trees, usually evergreen, having leaves that are needles or scalelike.

Yellow pines. Loblolly, longleaf, slash, pond, shortleaf pitch, Virginia, sand, spruce, and Table Mountain pines.

Other softwoods. Cypress, eastern red-cedar, white-cedar, eastern white pine, eastern hemlock, spruce and fir.

Spectral reflectance. Sunlight reflected from the ground or canopy of the forest that is recorded by the sensor in the satellite or aircraft that is separated into small classes (bands).

Stand age. The average age of dominant and co-dominant trees in the stand.

Stand origin. A classification of forest stands describing their means of origin.

Planted. Planted or artificially seeded.

Natural. No evidence of artificial regeneration.

Stand-size class. A classification of forest land based on the diameter class distribution of live trees in the stand.

Statistical Precision. The ability to achieve the same results with repeated measurements.

Sawtimber stands. Stands at least 10 percent stocked with live trees, with half or more of total stocking in sawtimber and poletimber trees, and with sawtimber stocking at least equal to poletimber stocking.

Stocking. The degree of occupancy of land by trees, measured by basal area or the number of trees in a stand and spacing in the stand, compared with a minimum standard, depending on tree size, required to fully utilize the growth potential of the land.

Thematic map. Displays complex map data using classes that combine similar data.

Timberland. Forest land capable of producing 20 cubic feet of industrial wood per acre per year and not withdrawn from timber utilization.

Timber products. Roundwood products and byproducts.

Tree. Woody plants having one erect perennial stem or trunk at least 3-inches d.b.h. a more or less definitely formed crown for foliage and a height of at least 13 feet (at maturity).

Tree Grade. A classification of the saw-log portion of sawtimber trees based on: (1) the grade of the butt log or (2) the ability to produce at least one 12-foot or two 8-foot logs in the upper section of the saw-log portion. Tree grade is an indicator of quality; grade 1 is the best quality.

Upper-stem portion. The part of the main stem or fork of sawtimber trees above the saw-log top to minimum top diameter 4.0 inches outside bark or to the point where the main stem or fork breaks into limbs.

Volume of live trees. The cubic-foot volume of sound wood in live trees at least 4.6 inches d.b.h from a 1-foot stump to a minimum 3.0 inch top d.o.b of the central stem for softwood and 4.0 inches for hardwoods.

Credits

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Photos by Patrick Glass
Jeff DeMatteis
Philip Steele

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