2013 - 2014 Forest Inventory
Southeast Region, Mississippi

MISSISSIPPI INSTITUTE
for FOREST INVENTORY

ACKNOWLEDGMENTS

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About the Cover

Following the record storm surge of hurricane Katrina, Live oak remnants that populated the median of U.S. Highway 90 were transfomed from barren snags to inspired works of art representing the fierce spirit of the area impacted. The Friendship Oak located on the Longbeach campus of the University of Southern Mississippi has withstood hurricanes since the days of Columbus. It is a revered landmark and said to possess magic that allows friends that stand together in its shadow to remain so forever.

EXECUTIVE SUMMARY

The Mississippi Institute for Forest Inventory (MIFI) was created in 2002 to inventory the forest resources in the state and to promote the sector of Mississippi's economy based on these resources. While this information is currently provided by the United States Department of Agriculture Forest Service Forest Inventory and Analysis assessments, the inventory is only reliable at the state or half state level. In order to formulate sound forest policies and stimulate the forest resource economic sector, a real-time inventory of resources is necessary.

MIFI uses a contemporary inventory methodology that integrates satellite-based remote sensing, stratified random sampling theory, and innovative measurement technology to produce a near real-time inventory of the forest resources in the State. Emphasis is placed on the need for reliable estimates of the current timber volume and growth potential of the forest resources at the local level. Geographical constraints are incorporated in the inventory design for precision estimates in areas as small as an individual county.

The inventory design system was first introduced in a pilot-scale study of four counties within the states of Mississippi and Texas. To begin the process for the entire state, the state was divided into five inventory districts with a consecutive rotation. Funding was provided through the Mississippi Land, Water and Timber Resources Board Grant to re-inventory 15 counties in the Southeast district of Mississippi. This district was inventoried first in 2006 because of the losses of pulp, solid wood, and engineered wood product production facilities.

While current economic factors rely heavily on the production of timber-based products, the inventory information provides much more information. The inventory, either directly or indirectly, assesses non- timber production values related to wildlife, recreation, alternative fuels, climate change, and a myriad of other concerns at a scale ranging from local to global in perspective. The inventory provides a means for multi-use forest management and planning.

The inventory for each district is delivered both in writing and via the World Wide Web. Our Web site is the primary tool for retrieving inventory information. An 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 or www.mfc.ms.gov.

Respectfully,

Mississippi Institute for Forest Inventory/Mississippi Forestry Commission

Additional information about any aspect of this survey may be obtained from:
Mississippi Institute for Forest Inventory/Mississippi Forestry Commission
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Heavy Blows

If you ask a resident of Southeast Mississippi what they were doing August 18th, 1969; their answer would be either "...running away from Hurrican Camille," or "...having a hurricane party." Pose the question again, only change the date to August 29th, 2005 and you would get almost identical answers with the name of the hurricane changing to Katrina. The aftermath of these two storms was a forest landscape that demonstrated resiliency beyond expectation.

Unlike devastating wildfire where the fuel is consumed and the risk of wildfire decreases; the aftermath of a hurricane are conditions that increase the risk of wildfire because the fuel load is increased exponentially and the ability to conduct operations to prevent and contain wildfire is severly hampered by the same material that is increasing the risk. Fortunately, Mississippi's forests recover quickly because of combined effects from effective timber salvage, education and outreach programs that raise awareness of reforestation opportunity, and environmental conditions that promote rapid decomposition and nutrient recycling within the ecosystem.

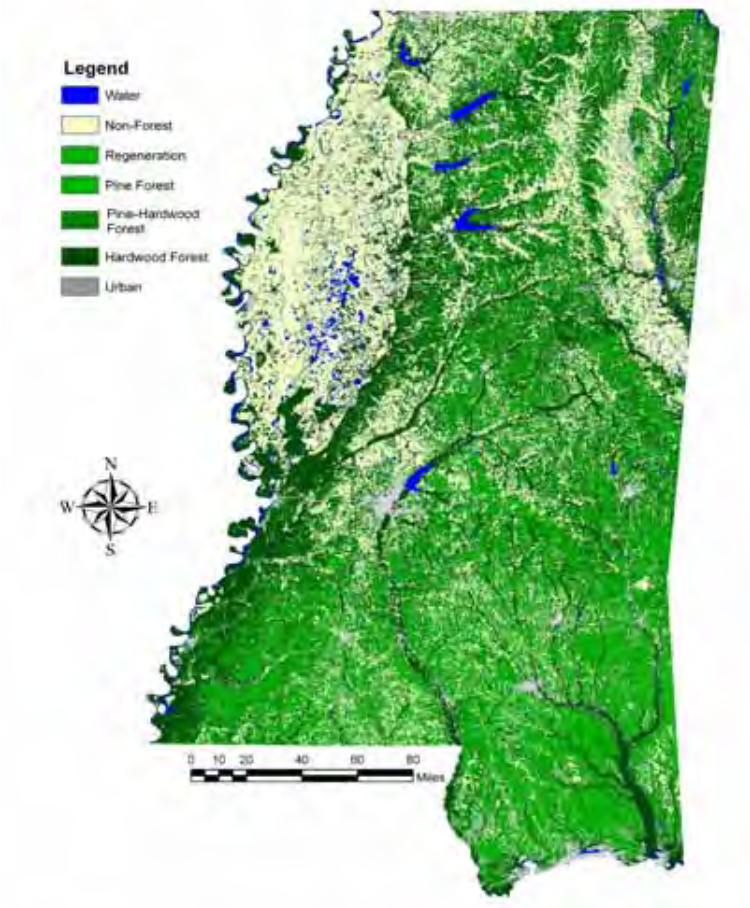
REMOTE SENSING

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:

- How much volume is present?
- 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.

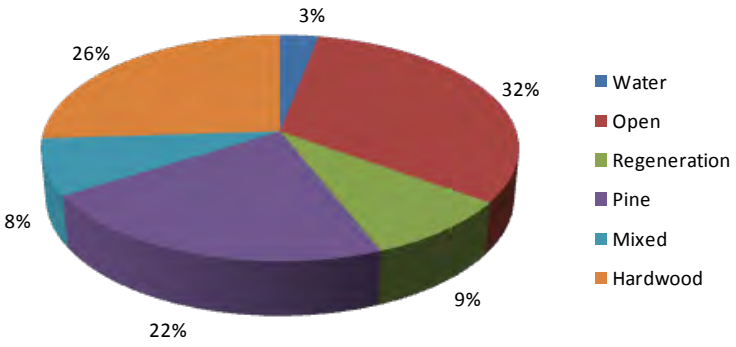
Mississippi Forest Land Cover Classification



LAND COVER

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

State Forest Land Cover Classification Percentages



OWNERSHIP

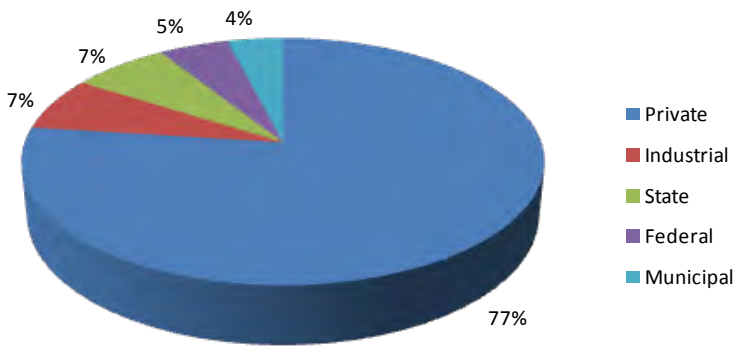
Parcel ownership for land in Mississippi is predominated by family. Traditional family legacy subdivides large holdings into smaller parcels. Families acknowledge the legal distinction in ownership of the land but continue to manage the parcels as contiguous properties.

Mississippi recently began transitioning to a digital format for property records. However, only corporate and governmental ownership records are available in geo-referenced digital formats. MIFI focuses 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.

Family forest owners dominate the private ownership group with 350,000 landowners who control parcels of 10 acres or greater.

Mississippi Land Ownership



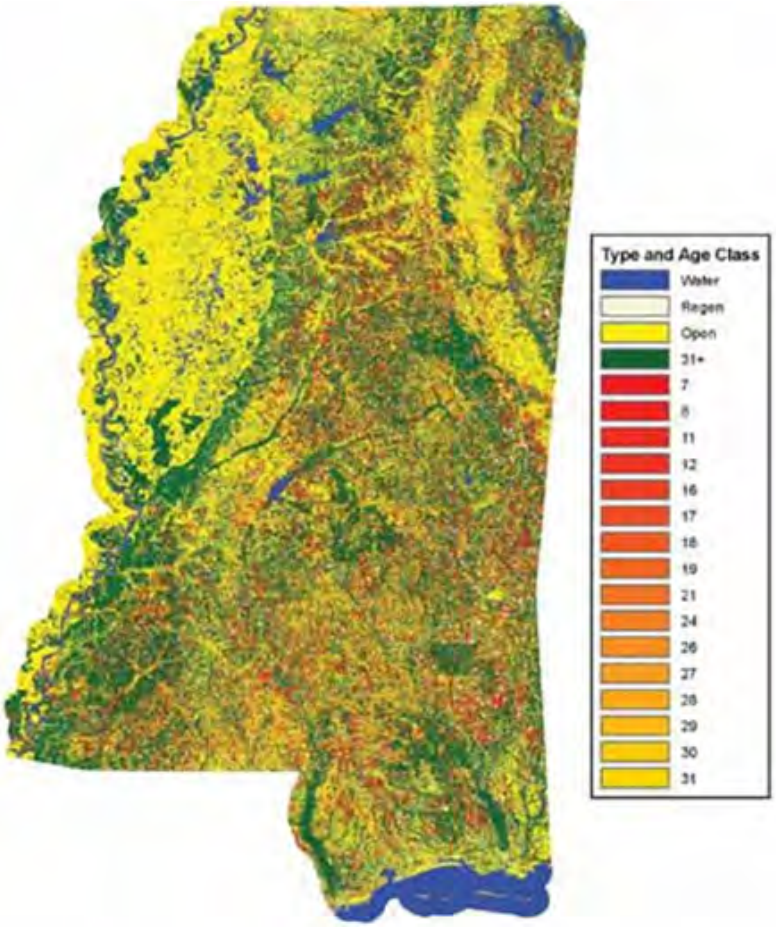
GROWTH

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 five-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. However, the requirements to measure hardwood annual growth in the field are prohibitive and a legacy of hardwood growth and yield research hinder those measurements.

- Softwood growth rate for the Southeast MIFI District is 8.9%.
- Hardwood growth rate for the Southeast MIFI District is 7.0%.

Mississippi Land Cover Age Classification



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 five-year certificate of deposit is 1.84%. Pine timber production that is six times as profitable when compared to a savings account represents a competitive alternative for investors.

The forest land cover age classification map shows 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. The latest economic impact analysis available (Henderson, J.E., I.A. Munn. 2013) indicate the contribution of the forestry in Mississippi as:

- Forestry, logging, primary wood products, and furniture manufacturing contributes $10.9 billion in product output, and $4.07 billion in value added production;

- 59,157 individuals are directly employed in logging, forestry and other wood-processing industries generating, a combined wage income of $ 2.71 billion.

A rapid and reliable measure of sustainability is the growth-to-drain ratio calculated by dividing the total annual volume growth by the total annul volume removals. This measure of sustainability is a way of determining if the forest is being utilized to its current maximum potential without creating conditions that will result in reduction or total loss of forest resources in the future. The current growth-to-drain ratio for Southeast Mississippi is greater than 1.3. This number means that this region of the state is producing approximately 30% more volume than is being utilized. Implications of growth/drain ratios greater than 1.5 include greater risks of wildfire, forest health issues related to insect and disease outbreaks, and obvious economic challenges related to reduced industrial utilization.

For further information pertaining to utilization or to obtain specific growth/drain ratio estimates for counties or portions of the SE Region please contact a MIFI representative or the Mississippi Forestry Commission.

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, the U.S. Census Bureau estimates Mississippi's 2014 population is 2.99 million people. The majority of this increase occurred in proximity to established metropolitan areas including: DeSoto County near Memphis, TN; the counties surrounding the Jackson metroplex of Hinds, Madison, and Rankin; the vicinity of Hattiesburg; and the Mississippi Gulf Coast. 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. Timber damaged by hurricanes, tornadoes, ice storms, wildfires, or outbreaks of insects or diseases is quickly replaced because of the resilience of the forest and underlying land base maintaining forest sustainability.

As a force of change, man does not always have a detrimental impact on the forest. Two current efforts demonstrate how man can have a positive impact on forests. Longleaf ecosystem restoration and Cogongrass eradication programs being implemented are examples of the beneficial actions that increase forest productivity and sustainability. Longleaf restoration is intended to rebuild the ecosystem prevalent in southeast mississippi before major settlement occurred. Advances in research and genetics now have an improved tree that is competitive with traditional timber production but has additional benefits for wildfire mitigation, hurricane resilience, and threatened or endangered species habitat. Cogongrass, as an invasive plant, is a severe threat to forest ecosystems. It very quickly establishes itself and then prolificly spreads choking out all native vegetation. Efforts are underway, similar to a military campaign to establish a border of spread and then methodically work to reduce that boundary. However, treatement has to be repeated and eradication is going to be a slow process.

Whether natural or human induced, long-term or short-term, permanent or temporary, Mississippi's forestlands are constantly changing. 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's Forests

From the earliest occupation of Mississippi by Native Americans, the forests have been the primary livelihood of its residents. 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 of 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 looked for new resources as the large growth timber of those regions was 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 1930s, the primary focus of 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 fewer 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 produce estimates for an entire state. That traditional 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 six or seven 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. Sawtimber, 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 product 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 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.

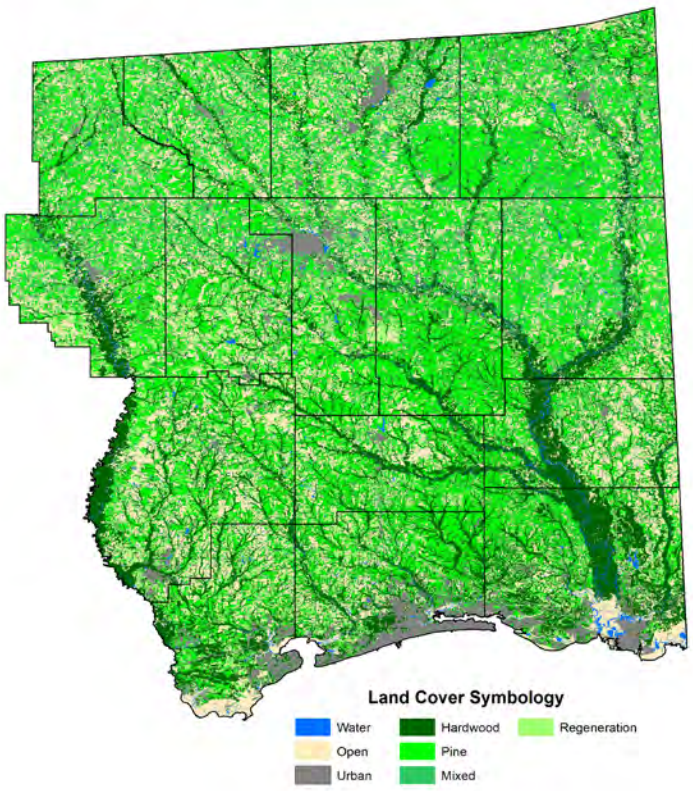
Reliability of Data

The reliability of a forest inventory is measured by the statistical sampling error. Sampling error increases, indicating reduced reliability, when the sample size is decreased. At a 95% confidence level, this inventory has less than 5.5% error for estimates of total cubic-foot volume outside bark at the district level (fifteen counties). This means that 95 out of 100 times the estimated values will be within 5.5% of the true values when considering the entire district. Reducing the sample size from the district level to five counties increases the sampling error to approximately 9%. When considering only three counties the sampling error increases to approximately 11.5%.

District Volume

Mississippi was divided into five districts based on geography, physiography, economic and political characteristics. Following upon the survey conducted immediately after hurrican Katrina this new inventory provides a baseline for estimating how the forest has re-established itself. This report presents the results of the second assessment of the resources eight years after the first inventory was completed.

Southeast Region Land Cover Classification



Southeast Region Inventory Counties

The following tables report the forest cover types, volumes, and acreage sampling errors associated with the 15 counties of the Southeast MIFI district. Also included are the estimates for pine growth and non-commercial forest regeneration that will provide the future timber supply. All volumes are expressed in 100s of cubic feet outside bark. Stem counts are expressed in 1,000s.

MIFI Southeast Region Summary				
Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error %
Non-Forest	1,651,303			
Pine	3,273,607	62,948,786	43,316,754	4.0
Hardwood	658,867	10,196,042	6,473,763	10.5
Forested	3,961,852	73,741,030	50,205,013	3.7
Total	5,613,155			

Covington County				
Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error %
Pine	100,287	3,314,496	1,932,422	14.0
Hardwood	33,216	682,264	347,231	31.9
Forested	134,237	4,013,627	2,286,560	12.9

Forrest County				
Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error %
Pine	171,739	4,008,076	2,418,440	10.4
Hardwood	11,809	272,648	167,389	57.8
Forested	183,659	4,281,492	2,586,394	10.2

George County				
Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error %
Pine	165,168	4,089,650	3,011,974	9.6
Hardwood	33,587	1,002,175	846,819	20.1
Forested	198,746	5,091,825	3,858,793	8.6

Greene County				
Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error %
Pine	277,626	7,559,877	5,348,559	11.8
Hardwood	29,800	704,066	402,855	48.5
Forested	307,425	8,263,942	5,751,413	11.5

Hancock County				
Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error %
Pine	97,336	1,923,569	1,535,377	23.5
Hardwood	6,012	234,904	217,553	348.9
Forested	103,615	2,160,722	1,755,168	24.0

Harrison County				
Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error %
Pine	121,583	2,519,023	1,959,634	20.7
Hardwood	12,113	161,541	108,641	74.2
Forested	133,696	2,680,565	2,068,275	19.6

Jackson County				
Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error %
Pine	197,180	3,746,563	2,060,563	18.4
Hardwood	19,015	977,792	373,298	83.6
Forested	216,195	4,724,355	2,434,150	17.9

Jefferson Davis County				
Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error %
Pine	94,317	2,759,498	1,835,764	20.2
Hardwood	44,348	1,347,568	865,478	22.9
Forested	139,265	4,122,556	2,712,295	17.0

Jones County				
Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error %
Pine	176,442	4,453,818	3,550,964	17.9
Hardwood	37,974	679,031	435,616	44.3
Forested	214,416	5,132,849	3,986,581	16.5

Lamar County				
Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error %
Pine	152,340	3,589,972	2,024,556	13.9
Hardwood	14,578	223,076	137,792	36.7
Forested	169,520	3,867,541	2,191,627	12.8

Marion County				
Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error %
Pine	157,740	4,331,147	2,845,964	12.3
Hardwood	36,552	812,896	412,320	17.6
Forested	210,790	5,612,864	3,596,608	9.7

Pearl River County				
Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error %
Pine	223,207	4,587,749	3,398,706	14.6
Hardwood	21,587	360,810	283,506	43.8
Forested	246,840	4,986,075	3,708,340	13.7

Perry County				
Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error %
Pine	251,814	5,736,579	3,517,342	14.0
Hardwood	19,823	388,821	228,747	59.2
Forested	271,636	6,125,399	3,746,089	13.5

Stone County				
Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error %
Pine	155,661	3,145,543	2,373,730	8.6
Hardwood	23,827	385,229	297,876	23.8
Forested	179,488	3,530,773	2,671,607	8.1

Wayne County				
Strata	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error %
Pine	239,146	7,183,225	5,502,469	17.9
Hardwood	69,249	1,963,220	1,348,642	35.7
Forested	308,395	9,146,445	6,851,111	15.8

	Number of Stems by Diameter Class				5-yr Projected Pine Volume		Annual Growth Rate (%)	
County	1-inch	2-inch	3-inch	4-inch	Pulpwood	Sawtimber	Pulpwood	Sawtimber
Covington	18,344	17,934	10,333	11,064	4,853,591	3,946,809	7.9	15.4
Forrest	17,340	17,873	8,922	10,217	5,642,371	4,205,666	7.1	11.7
George	57,501	33,692	19,636	16,011	5,996,015	4,308,708	7.9	7.4
Greene	101,032	63,942	41,815	20,469	11,260,784	8,236,534	8.3	9.0
Hancock	17,774	16,574	10,989	7,227	2,985,719	2,210,654	9.2	7.6
Harrison	11,438	14,959	9,940	8,505	3,769,806	2,913,035	8.4	8.3
Jackson	11,052	22,397	15,081	13,828	5,896,536	4,290,882	9.5	15.8
Jefferson Davis	19,810	20,624	15,191	8,508	4,238,405	3,175,752	9.0	11.6
Jones	26,275	20,092	13,925	12,148	6,944,056	5,707,559	9.3	10.0
Lamar	20,325	20,285	13,473	11,666	5,198,829	3,750,750	7.7	13.1
Marion	18,399	19,984	13,785	10,915	6,114,728	4,702,534	7.1	10.6
Pearl River	34,469	39,854	22,867	19,806	6,904,332	5,027,239	8.5	8.1
Perry	26,253	16,396	19,289	15,016	8,697,419	6,165,096	8.7	11.9
Stone	23,166	23,538	15,961	14,044	4,658,262	3,416,599	8.2	7.6
Wayne	33,395	18,688	27,548	12,769	9,850,372	7,822,497	6.5	7.3
Total	438,572	366,833	258,754	192,194	93,011,225	69,880,315	8.1	10.0

Obtaining Additional Help

For additional assistance with the Dynamic Reporter software, the MIFI website, or for a compact disc copy of the Dynamic Reporter Installation, contact:

Brian Wharton,
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660 North Street, Suite 300
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Glossary of Terms

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 above ground).

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 saw-log 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.

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