Southwest Mississippi Forest Inventory

MIFI
MISSISSIPPI INSTITUTE
FOR FOREST INVENTORY

State of Mississippi
Southwest District
Forest Inventory
2005

Acknowledgments

The Mississippi Institute for Forest Inventory acknowledges the Mississippi Forestry Commission for its role in collecting field data. MIFI also acknowledges the College of Forest Resources and the Forest and Wildlife Research Center at Mississippi State University for assistance with development of the timber inventory methodology and software. The inventory would not be possible without the cooperation of public agencies such as the Mississippi Automated Resource Information System (MARIS) for providing auxiliary data. Finally, MIFI extends a sincere debt of gratitude to private landowners in providing access to measurement plots.

Mississippi Institute for Forest Inventory Personnel

Wayne Tucker - Executive Director
Patrick A. Glass - Director of Operations
Annette Black - Office Manager

Board of Directors

Richard Thoms - Chairman
Everard Baker - Vice Chairman
Tom Woods
Dennis Turner
Kathy Shropshire
Jason Cutshall
Roy Thigpen
Chance Carter
Walter Dennis
Bob Karr
Jim Steil

Table of Contents

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 dated, only conducted every 10 years. 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. 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 USDA CSREES Wood Utilization Research Grant to initialize the inventory in 15 counties in the Southwest district of Mississippi. This district was inventoried first because of the recent 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.

Respectfully,

Mississippi Institute for Forest Inventory

Additional information about any aspect of this survey may be obtained from:
Mississippi Institute for Forest Inventory
P.O.Box 6350
MS State, MS 39762
662.325.5496
www.mifi.ms.gov

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.

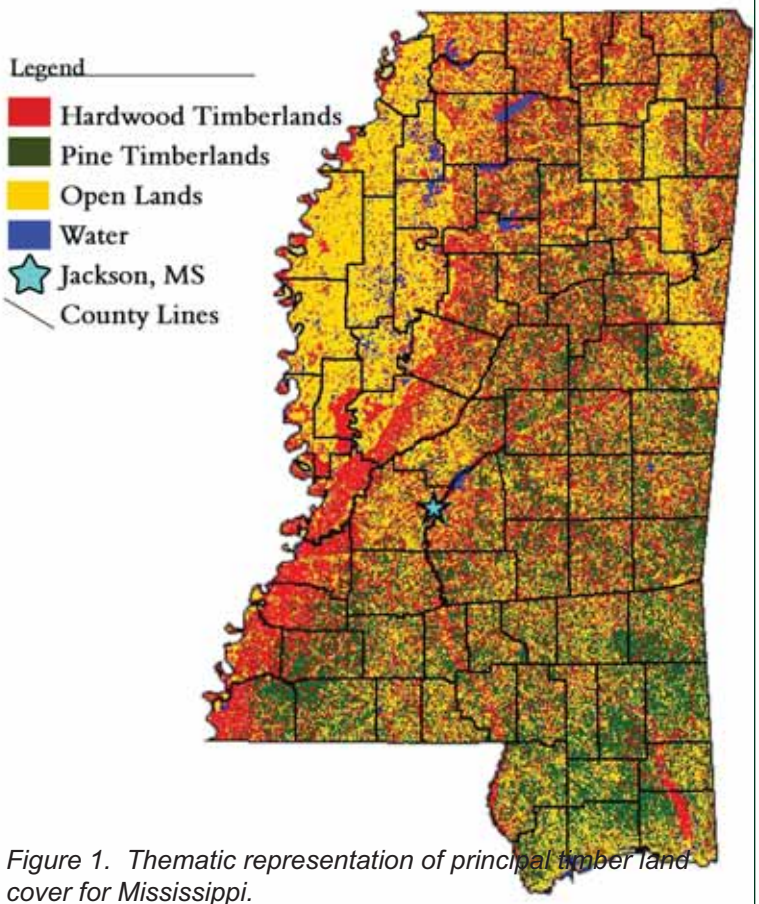


Figure 1. Thematic representation of principal timber land cover for Mississippi.

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.

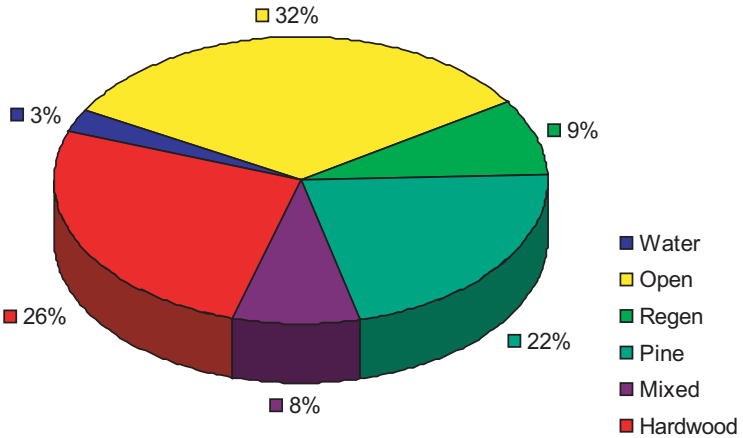


Figure 2. Mississippi land cover classification.

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.

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

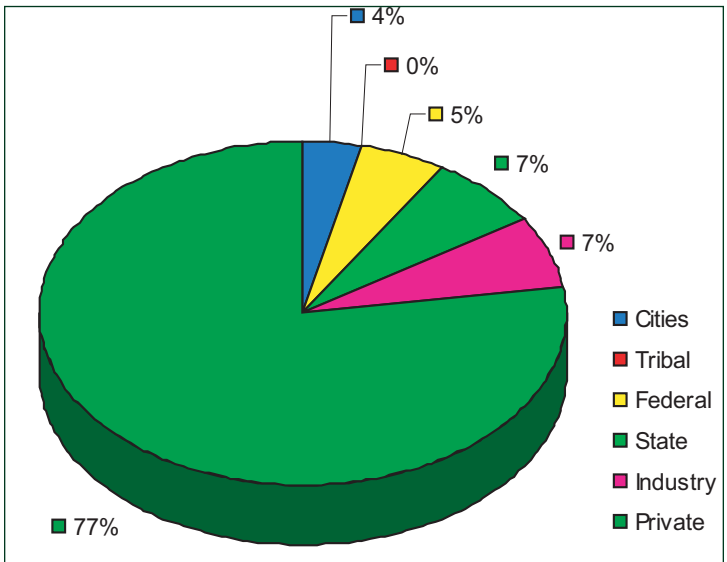


Figure 3. Mississippi land ownership patterns.

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 hinder those measurements.

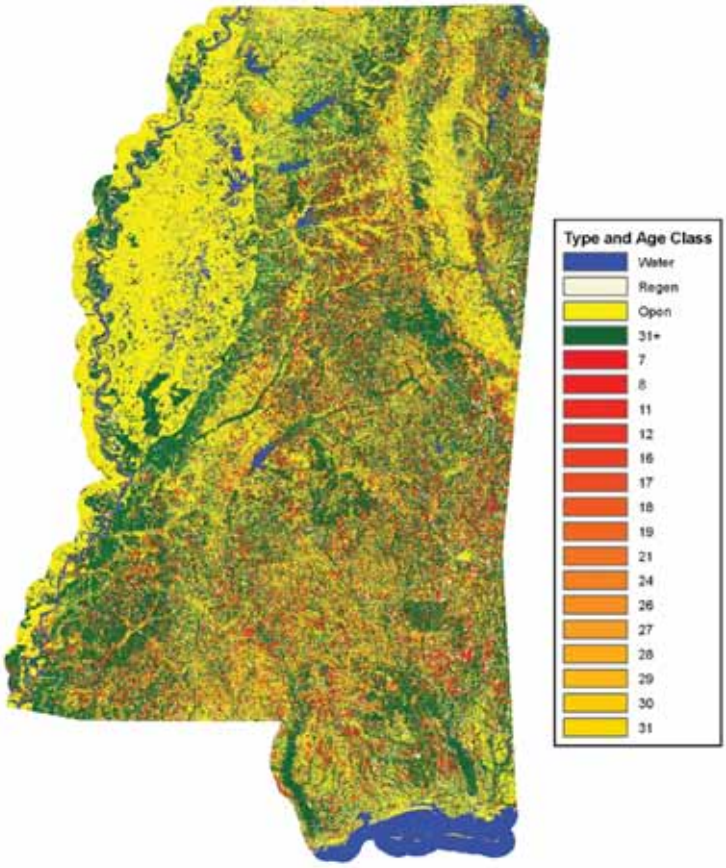


Figure 4. Type and ages of Mississippi forests.

- Softwood growth rate for the Southwest MIFI District is 8.4%.

- Hardwood growth rate for the Southwest MIFI District is 3.8%.

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 4.18%. 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.

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 Southwest Mississippi is 1.76. This number means that this region of the state is producing approximately 76% 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.

Human Population Growth

Increasing human population, the root cause of increased urbanization, can signal changes in demands on forest resources. The population of Mississippi in 1990 was approximately 2.57 million people. The population increased to 2.84 million people in 2000. The majority of this increase occurred in proximity to established metropolitan areas such as: 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.

Increasing human population can interfere with forest management by reducing the size of holdings and the management options available. Forest population density (FPD) is the number of people per square mile of forestland measured at the county level. Counties with an FPD of 0 to 100 are generally considered to be rural. An FPD approaching 1,000 indicates a saturated urban center. The Mississippi average FPD is 92 for the entire State.

FPD changes are not consistent throughout Mississippi due to varied changes in forest area and fluctuations in population within a county. Urban centers tend to establish and expand along transportation corridors. The exception to the utility of FPD as an indicator of urbanization is readily demonstrated when analyzing the "Delta" counties of Mississippi. Sunflower County has a total land area of 707 square miles and approximately 36,000 acres of forestland. The population for Sunflower County according to the 2000 census was 34,369. These statistics would compute to a FPD of 600, indicating a highly urbanized area.

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.

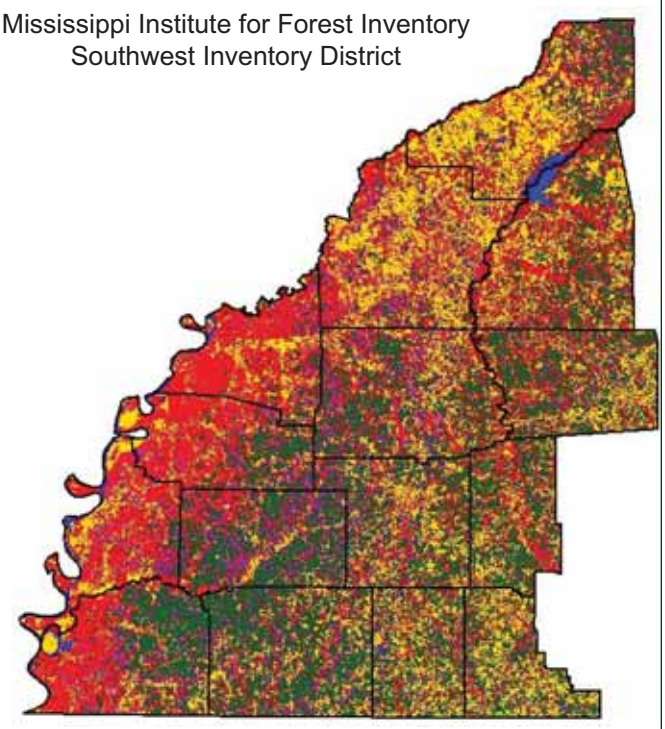


Figure 6. Thematic view of MIFI Southwest Inventory District depicting major land cover.

The following tables report the forest cover types, volumes, and sampling errors associated with the 15 counties of the Southwest 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 Southwest Inventory District.

Strata	Acres
Non-Forest	1,326,896
Reproduction	465,383
Pine	1,707,080
Mixed Pine-Hardwood	306,416
Hardwood	2,075,766
Total Forested	4,554,645
Total	5,881,541

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

				Sampling Error		
Strata	Weight Factor	Acres	Std. Error	97.5	95	90
Pine	0.946666667	1,618,874	15,817	2.2	1.9	1.6
Mixed Pine-Hardwood	0.937007874	291,499	3,410	2.6	2.3	1.9
Hardwood	0.974110032	2,024,324	12,867	1.4	1.2	1.0
Total	0.956521739	3,934,697	20,673	1.2	1.0	0.9

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

	Per Acre		Error %	Total[2]		Error %
	Pine	Hardwood		Pine	Hardwood	
Pulpwood	770.8	900.8	6.3	3,032,721.2	3,544,310.0	6.7
Sawtimber	537.2	611.6	8.5	2,113,577.7	2,406,281.0	9.1

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

Individual County Volume

Table 4. Individual county volume estimates by species group and product class.

Adams County

	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Pine	19,334	201,491	149,969	58.7%
Hardwood	153,368	3,163,183	2,149,279	15.9%
Forested	229,911	3,207,668	2,208,680	13.5%

Amite County

	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Pine	206,697	4,071,742	2,924,753	21.2%
Hardwood	71,611	1,892,864	1,081,961	28.3%
Forested	393,949	5,819,689	3,942,618	14.5%

Claiborne County

	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Pine	26,356	697,497	450,277	30.0%
Hardwood	189,635	3,633,155	2,964,929	14.4%
Forested	260,779	4,182,261	3,367,708	12.3%

Copiah County

	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Pine	127,024	2,836,710	1,654,093	21.7%
Hardwood	172,588	3,541,448	2,720,461	23.1%
Forested	397,977	6,010,868	4,302,724	14.5%

Franklin County

	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Pine	148,755	4,063,143	2,925,427	20.1%
Hardwood	82,006	1,483,379	772,271	23.8%
Forested	329,261	5,346,901	3,575,739	15.9%

Hinds County

	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Pine	43,784	970,992	704,490	34.3%
Hardwood	222,452	4,514,984	2,731,874	15.7%
Forested	349,582	5,197,767	3,281,013	14.4%

Jefferson County

	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Pine	57,142	990,939	751,333	29.4%
Hardwood	163,894	2,969,414	2,180,583	18.3%
Forested	286,930	3,407,038	2,581,794	14.7%

Lawrence County

	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Pine	94,111	2,336,358	1,790,606	20.3%
Hardwood	74,048	1,056,136	536,312	29.6%
Forested	223,798	2,928,441	1,937,161	14.9%

Lincoln County

	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Pine	113,823	2,404,960	1,414,079	24.0%
Hardwood	90,982	914,069	2,180,583	26.5%
Forested	288,282	3,224,624	1,738,783	17.9%

Madison County

	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Pine	73,484	1,555,439	998,608	22.9%
Hardwood	132,060	2,767,924	2,053,875	23.5%
Forested	276,964	3,925,655	2,829,861	14.7%

Pike County

	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Pine	74,816	1,961,298	1,542,439	23.1%
Hardwood	50,925	622,301	270,253	25.1%
Forested	185,404	2,375,453	1,650,799	15.4%

Rankin County

	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Pine	108,800	2,362,420	1,531,511	21.7%
Hardwood	179,459	3,198,806	1,898,642	22.2%
Forested	371,027	5,403,481	3,353,178	14.2%

Simpson County

	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Pine	113,220	2,410,142	1,867,192	16.3%
Hardwood	97,326	2,099,107	1,183,380	21.8%
Forested	291,850	3,882,728	2,490,059	12.5%

Walthall County

	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Pine	72,730	1,434,198	909,935	19.0%
Hardwood	41,542	558,723	282,688	22.0%
Forested	167,169	1,793,336	1,044,110	12.6%

Wilkinson County

	Acres	Pulpwood Volume	Sawtimber Volume	Sampling Error
Pine	115,716	1,953,925	1,448,670	26.1%
Hardwood	163,391	4,160,466	3,066,392	29.3%
Forested	376,566	5,665,631	4,227,651	22.0%

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

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
Adams	21,233	12,240	9,149	6,269	264,331	254,552	5.6%	11.2%
Amite	109,201	65,867	37,245	40,282	6,891,351	4,637,007	11.1%	9.7%
Claiborne	23,257	22,537	11,596	10,507	970,432	727,612	6.8%	10.1%
Copiah	61,523	36,708	25,617	13,493	3,978,856	2,670,589	7.0%	10.1%
Franklin	38,707	25,773	21,901	20,838	5,950,436	4,455,119	7.9%	8.8%
Hinds	33,655	26,291	23,093	15,998	1,367,697	1,139,578	7.1%	10.1%
Jefferson	21,626	23,699	13,945	9,374	1,477,248	1,112,893	8.3%	8.2%
Lawrence	31,863	17,620	13,165	10,717	3,483,465	2,815,918	8.3%	9.5%
Lincoln	60,467	28,432	15,713	15,573	3,676,306	2,660,639	8.9%	13.5%
Madison	31,216	23,277	19,761	10,701	2,336,905	1,799,069	8.5%	12.5%
Pike	32,538	11,351	6,615	9,693	2,854,581	2,275,123	7.8%	8.1%
Rankin	52,099	32,009	27,260	24,990	3,889,723	2,712,106	10.5%	12.1%
Simpson	58,482	38,031	27,798	19,426	3,823,446	2,951,606	9.7%	9.6%
Walthall	17,917	12,540	8,738	8,125	2,176,462	1,704,459	8.7%	13.4%
Wilkinson	35,413	27,952	23,605	21,964	3,189,592	2,179,959	10.3%	8.5%

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

District Summaries

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

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 districts are 4.35 million acres for the Southeast; 5.33 million acres for the Central; 3.93 million acres and 1.76 million acres for the North and Delta districts respectively.

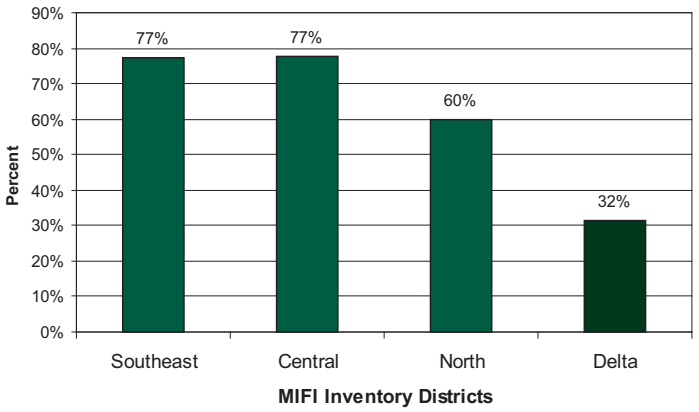


Figure7. Proportion of forested area to total area for each district.

Southeast District

Current inventory efforts are being conducted in the Southeast district. Although significant damage has been sustained from recent hurricane activity, the inventory methods are flexible enough to allow for the collection of additional damage measurements. Current imagery is being analyzed and will be incorporated with the inventory report for this district. However, the current proportions of major land cover classes and a district map indicating the included counties is presented.

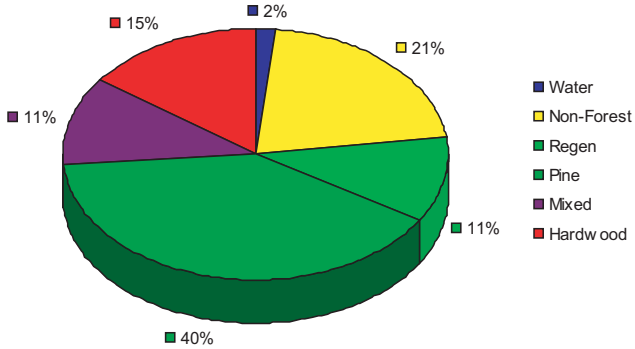


Figure 8. Southeast Mississippi land cover classification.

Figure 9. MIFI Southeast Inventory District.

Central District

Scheduled for inventory efforts to begin in 2006, the Central inventory district has the second highest number of counties to inventory. It is also the most variable in terrain.

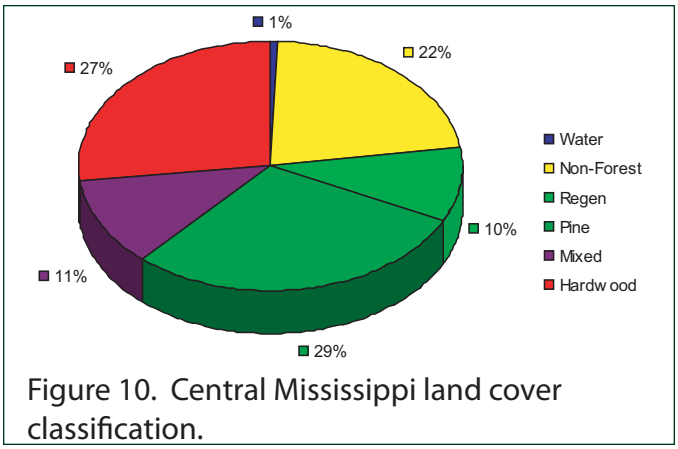


Figure 10. Central Mississippi land cover classification.

Figure 11. MIFI Central Inventory 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.

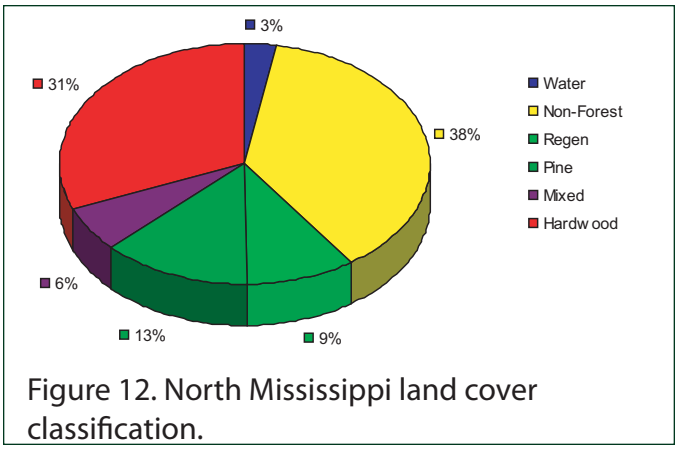


Figure 12. North Mississippi land cover classification.

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.

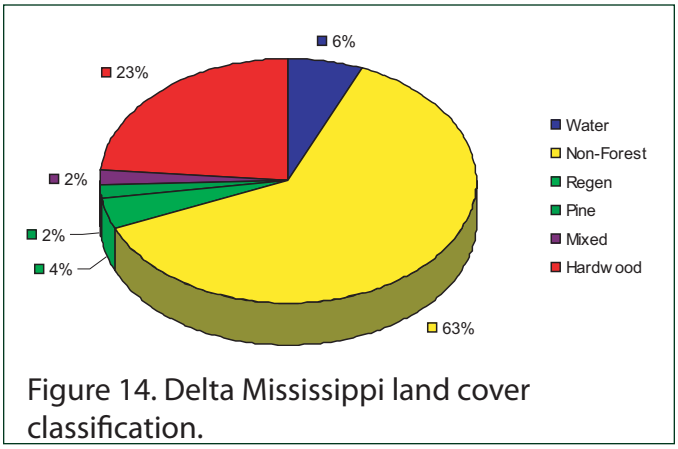


Figure 14. Delta Mississippi land cover classification.

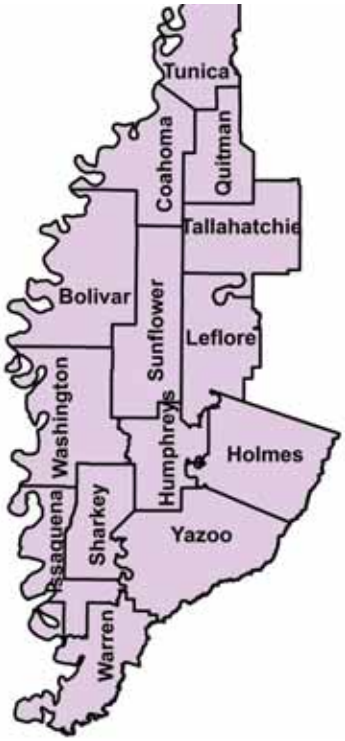
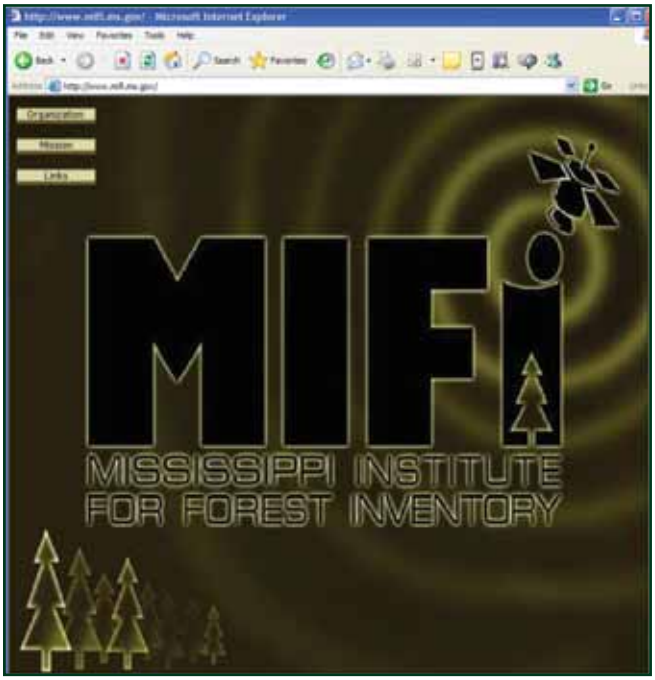


Figure 13. MIFI Delta Inventory District.

World Wide Web Data Access

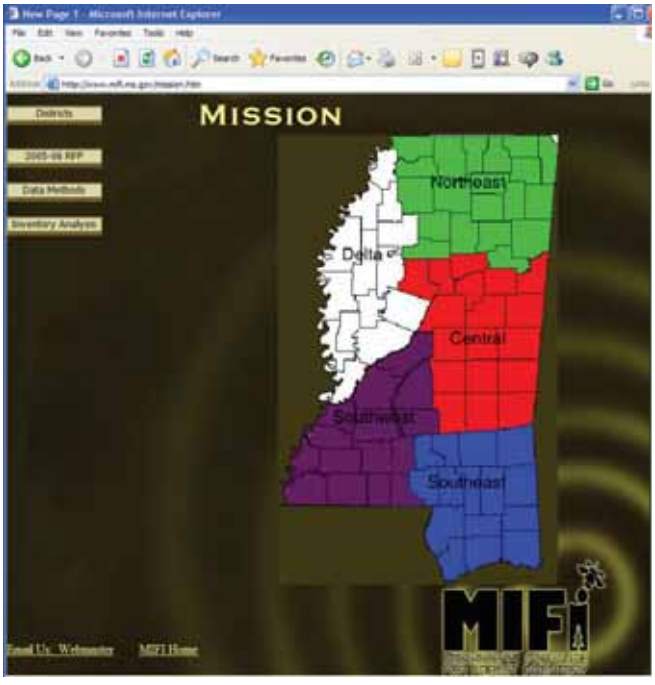
As stated in the Executive Summary the primary goal in publishing results is utilizing the internet to allow access to the inventory database and accessing reports. This brief explanation of the process to access the database analysis tools is designed to jump start your efforts in exploring the forest resources of the state.

First, accessing the www.mifi.ms.gov web site is recommended for users with a broadband connection. The web site can be explored using a dial-up connection but accessing the report installers and database will cause severe delays for dial-up connections.



1

The home screen has three buttons in the upper left corner which allow you to navigate through the remaining pages.



2

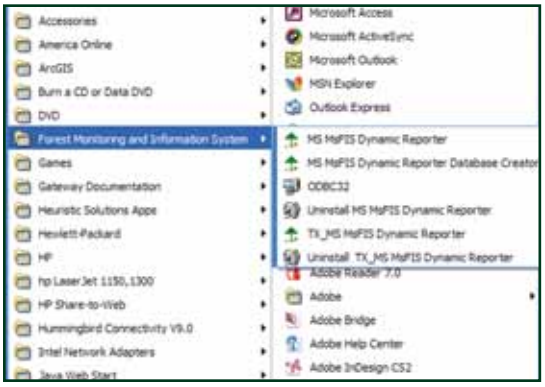
To access the database and reporter software click the mission button.

3

Clicking on the button titled Inventory Analysis will open up a download window. Click the save button and the setup files for accessing the database information will be downloaded to your computer to the location you specify just like any other computer download. The size of this file is approximately 30 mega-bytes so you can expect a moderate to lengthy download time depending on your connection speed.

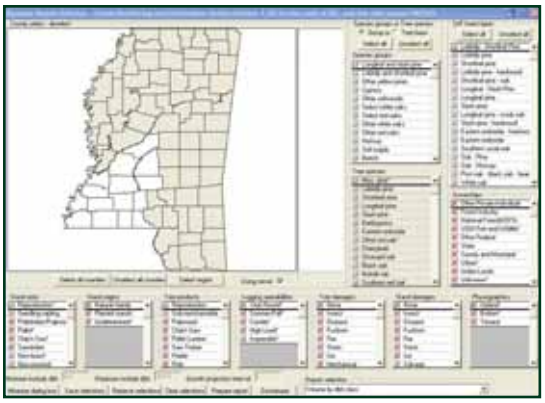
If you forget where the file was downloaded on your hard drive, you can perform a search for MSFMISServerOnlySetup.exe. Double clicking this file after you download it will cause the screen to the left to appear. Begin the installation procedure for the database interface by clicking on the Run button. Do not alter the installation path, location, or directories.

As you proceed through the installation procedure the next screen that requires attention asks which program group to put the icons for starting the database interface within, the default (Recommended) is Forest Monitoring and Information System as shown in this image.



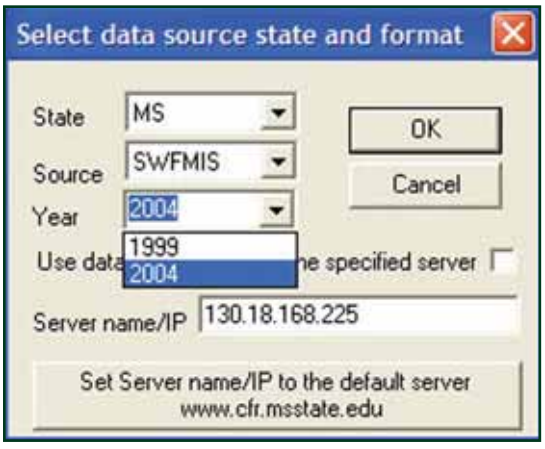
4

To begin accessing information through the Dynamic Reporter Interface, go to the Start bar and find the Forest Monitoring and Information System group on the program start menu. Click your mouse on the menu item that is shown to the right side labeled MS MsFMIS Dynamic Report. This will start the interface screen.



5

There are several tasks that need to be done to allow the interface to access the data in the correct manner. The first of these is to select the appropriate database to use and to make sure that the server option is checked. The right most menu item in the main window menu bar is called Select Data Source. Click on this and a pop-up window will appear.



6

You will have the option of selecting which year to access in the database, currently either 1999 or 2004. After you select the year of the database be sure to check the little box following "Use database residing on the specific server." Then you can click the OK button. Whenever you change the Year of the data, the map in the main interface window changes to reflect the counties that were inventoried during that year. For 1999, the four counties that were included in the pilot project are displayed in white and the rest of the counties are grayed out. For 2004, the 15 counties that are part of the Southwest inventory district are white with the rest of the state grayed out.

7

The next task that needs to be done is telling the interface which counties or regions you want to look at. There are 3 buttons directly under the map that allow you select all counties, unselect all counties, or select a region. You can select an individual county by clicking the mouse within the boundary of that county and deselect the same county by clicking the mouse again. You can select as many counties as are available in this manner. If you want to select an area that includes small pieces of several counties then you click on the select region button.

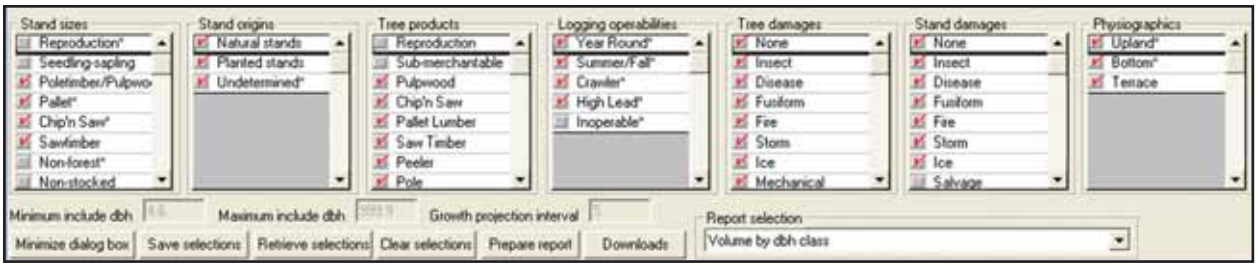
There are help buttons on the left side of the screen that explain in detail all the options available with this screen but the primary functions you need to perform are right click on the map and the cursor will change to a crosshair. Left clicking will place a point on the map that marks one corner of the area to be defined. After tracing out the region of interest another right click of the mouse will close the polygon and then you can select the OK button.

8

The next item to check is the type of report you want to generate. This is done by selecting the report type in the lower right portion of the interface screen. There are 9 different types of reports to select from:

- Volume by dbh class
- Selected Acres by GIS cover class
- Selected Acres by GIS age class
- Selected Acres by GIS cover-age class
- Acres by GIS cover class
- Acres by GIS age class
- Acres by GIS cover-age class
- Five year growth potential
- Sub-merchantable distribution.

The report most commonly used is the Volume by dbh class and is default.



The portion of the interface screen above allows you to select the individual species or species groups (left portion of the image), the Society of American Foresters forest cover types, and the broad class ownership category where the inventory plot was taken. Each box marked with a red check is included in the query sent to the data base. The other selection criteria are included along the bottom of the interface screen and include:

Stand Sizes	Logging Operabilities	Physiographies
Stand Origin	Tree Damages	
Tree Products	Stand Damages	

The best way to think of these check boxes are as a series of yes-no questions that are sent to the database. If the data answers yes to each of the questions then it is included in the analysis otherwise it is ignored. After you have the interface setup to perform the database query the next to last thing to do is to save the query structure. This will allow you to repeat the process and make changes without having to re-select every item. This is done with the Save selections button in the lower left portion of the window. Likewise previously saved selections can be retrieved with the Retrieve selection button. The last thing to do is submit the data selections or query to the database by clicking on the Prepare report button in the bottom center of the screen.

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
P.O. Box 6350
Miss. State, MS 39762
662-312-5954
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

Patrick Glass, author
Matt Ladner, designer
Karen Brasher, editor
Photos by Patrick Glass

MIFI

MISSISSIPPI INSTITUTE
FOR FOREST INVENTORY