

GEORGIA FORESTRY
COMMISSION



Economic Benefits of the Forestry Industry in Georgia

2009 - Final Report



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Executive Summary

Georgia's forestry industry has many components, which interact with all other sectors of the economy in complex ways. The purpose of this analysis is to: (1) quantify the level of economic activity conducted by the components of the forestry industry, (2) estimate economic activity supported in all Georgia sectors by the industry's activities, (3) compare the level of activity in the forestry industry with other industries, and (4) assess the degree of forestry dependence of Georgia's counties.

This report is the latest in a series that began in 2002, but underwent a significant restructuring in 2003 to reflect the change in industry classification systems (from SIC to NAICS) used by data collection agencies (primarily the Georgia Department of Labor) that provide much of the data used in these analyses.

The forestry industry components, and the level of economic activity represented by them, are shown in Table E-1 for 2009. Economic activity is measured by output (similar to sales revenue), employment, and compensation (defined as wages and salaries including benefits plus proprietor income). These measures are traditionally used in this type of analysis.

Table E-1 shows the forestry industry employed 48,519 in all industry sectors combined, paid an annual compensation of almost \$2.8 billion, and had estimated total revenue of over \$16.9 billion. The activities in the sectors bring dollars into the state, which recirculate in a process called the "multiplier effect." The recirculation touches all major industry sectors as goods and services are bought and sold to meet increased demands by businesses and households resulting from the new resources brought into the state by the forestry industry.

Table E-1: Georgia Forestry Industry Economic Activity 2009

<u>Sector</u>	<u>Output</u>	<u>Employment</u>	<u>Compensation</u>
Forestry Management, Logging, and Misc. Forest Products	\$1,454,449,184	5,119	\$237,826,360
Lumber and Wood Preservation	\$1,359,252,480	5,469	\$249,873,104
Veneer, Plywood, Reconstituted, and Engineered Wood	\$664,289,032	3,137	\$158,370,342
Prefabricated Wood Buildings and Manufactured Housing	\$251,605,408	1,949	\$66,110,338
Pulp and Paper Products	\$11,017,916,784	18,936	\$1,494,075,270
Woodworking and Paper Industries Machinery	\$86,010,384	300	\$17,121,898
Wooden Furniture, Cabinets, Custom Arch. & Millwork	\$996,312,851	6,827	\$270,507,879
Windows and Doors	\$497,071,008	2,973	\$126,073,024
Containers, Showcases, Partitions, and Shelving	<u>\$578,698,352</u>	<u>3,809</u>	<u>\$150,362,912</u>
Total	\$16,905,605,483	48,519	\$2,770,321,127

The result of the multiplier effect, given by total impacts (which includes the economic activity in Table E-1¹), is also measured by output, employment, and income and is shown in Table E-2. Total economic activity supported by the forestry industry in Georgia (including the multiplier effect and federal payments to landowners of about \$35.6 million) is almost \$27.2 billion. This activity employs 118,423 people whose compensation is almost \$5.6 billion.

Table E-2: Total Benefits by Major Industry Sector 2009

<u>Sector</u>	<u>Output</u>	<u>Employment</u>	<u>Compensation</u>
Agriculture, Forestry, Fishing and Hunting	\$1,916,024,141	9,924	\$359,608,981
Mining	\$16,197,021	66	\$4,629,613
Utilities	\$719,483,426	809	\$84,645,811
Construction	\$133,736,698	1,353	\$51,429,593
Manufacturing	\$15,980,706,206	44,668	\$2,605,892,302
Wholesale Trade	\$1,246,651,008	6,113	\$439,009,440
Retail Trade	\$568,951,748	8,268	\$210,639,060
Transportation and Warehousing	\$736,962,540	5,033	\$229,912,275
Information	\$655,479,444	1,352	\$98,673,904
Finance and Insurance	\$833,480,480	3,437	\$224,707,933
Real Estate and Rental	\$1,202,576,143	3,815	\$58,697,422
Professional, Technical, and Scientific Services	\$745,474,219	4,815	\$250,629,826
Management of Companies	\$426,079,328	1,806	\$173,316,512
Administrative and Waste Services	\$399,487,841	6,366	\$164,681,686
Educational Services	\$71,844,990	1,148	\$34,719,702
Health and Social Services	\$595,473,757	6,301	\$269,210,357
Arts, Entertainment and Recreation	\$95,396,343	1,300	\$25,025,330
Accommodation and Food Services	\$319,021,916	5,397	\$96,867,379
Other Services	\$363,078,404	5,534	\$124,060,317
Government and Non-NAICS Industries	<u>\$173,453,062</u>	<u>919</u>	<u>\$54,583,773</u>
Total	\$27,199,558,714	118,423	\$5,560,941,216

Another way to examine the forestry industry in Georgia is to compare it with other manufacturing sectors. Table E-3 lists 2009 income and employment totals for each major industry sector sorted by employment. These data show that forestry ranks second in total employment, and third in total wages and salaries. Food processing ranks first in income and employment and transportation equipment manufacturing ranks second in income and third in employment. Forestry's second rank in employment is very close to first-ranked food processing in income, reflecting forestry's relatively higher average wages.

¹ The economic activity in Table E-1 contains more than just the direct impacts because some of the inter-industry purchasing (indirect impacts) is necessarily contained in the estimates of economic activity.

Of particular importance to Georgia's state government is how the forestry industry affects its annual budget. This is investigated by estimating the revenues associated with the forestry industry's total economic activity and subtracting the costs associated with providing state services to Georgia's households and companies associated with that activity. Revenues include individual and corporate income tax, sales and use taxes, highway taxes, fees, and miscellaneous revenues. Costs include education, public health, safety and welfare, highways, administration, and miscellaneous. Table E-4 provides the fiscal impact estimates based on total impacts. The forestry industry generates an estimated \$472 million per year in revenues for the state budget. When the costs of providing services to all employees are deducted from these revenues, net annual state revenues are over \$158 million for 2009.

Table E-3: Comparison of Georgia Industries 2009		
<u>Sector</u>	<u>Employment</u>	<u>Wages & Salaries</u>
Food Processing	64,648	\$2,718,559,504
Forestry Industry	48,519	\$2,163,680,341
Transportation Equipment	36,520	\$2,250,421,107
Textiles	20,726	\$1,471,733,948
Fabricated Metal Products	23,434	\$1,094,925,756
Machinery	20,406	\$828,603,263
Chemicals	19,448	\$1,280,151,545
Printing	17,292	\$389,942,397
Electrical Equipment and Appliances	12,851	\$786,471,785
Computers and Electronic Products	12,649	\$813,888,148
Apparel	3,813	\$124,869,966

Table E-4: Fiscal Impact Analysis 2009	
Annual State Government Revenues	\$471,809,062
Annual State Government Costs	<u>\$313,707,467</u>
Net Annual Revenues	\$158,101,595

Table E-5 extracts information from several tables to present a comparison of the overall results obtained in each impact analysis conducted from 2003 through 2008. All measures show growth between 2003 and 2004 and between 2004 and 2005. The highest growth rates are in industry output which grew between 10 and 14 percent depending on the year and whether it is being calculated for forestry industry activity or total activity. Compensation also increased for these periods. In the 2003 to 2004 period, forestry industry compensation increased by 9.7 percent and total compensation increased by 12 percent without considering inflation. From 2004 to 2005, the rate of increase was somewhat lower – 4 percent for the forestry industry and 9 percent for total impacts. Employment increases are more modest, increasing 3 percent and 7 percent for forestry industry and total impacts, respectively, in the 2003 to 2004 period. Although

employment from total impacts grew an estimated 6 percent between 2004 and 2005, forestry industry employment was essentially flat.

In the 2006 to 2007 period, forestry industry employment declined by 5.2 percent and employment from total impacts fell by 5.5 percent. The two sectors which declined the most (in percentage terms) were prefabricated buildings and veneer, plywood, and reconstituted wood products. Productivity increases are apparent in forestry industry sectors (pulp and paper products, for example) as well as sectors stimulated by the multiplier effect which would serve to allow output increases with employment declines.

Table E-5: Comparison of Results 2003 to 2009

(Dollars in millions; Employment in persons)

Forestry Industry Economic Activity	2003	2004	2005	2006	2007	2008	2009
Output	\$12,679	\$14,163	\$16,150	\$17,760	\$18,459	\$18,270	\$16,906
Employment	65,706	67,633	67,694	67,733	64,192	57,812	48,519
Compensation	\$3,007	\$3,299	\$3,422	\$3,513	\$3,394	\$3,131	\$2,770
Year to Year Percent Change							
Output		11.70%	14.04%	9.97%	3.93%	-1.02%	-7.47%
Employment		2.93%	0.09%	0.06%	-5.23%	-9.94%	-16.07%
Compensation		9.71%	3.71%	2.67%	-3.38%	-7.75%	-11.52%
Total Impacts							
Output	\$20,199	\$22,729	\$25,972	\$27,738	\$28,547	\$28,723	\$27,200
Employment	136,022	144,944	154,147	149,347	141,155	128,388	118,423
Compensation	\$5,600	\$6,276	\$6,827	\$6,773	\$6,696	\$6,514	\$5,561
Year to Year Percent Change							
Output		12.53%	14.27%	6.80%	2.92%	0.61%	-5.30%
Employment		6.56%	6.35%	-3.11%	-5.49%	-9.04%	-7.76%
Compensation		12.07%	8.77%	-0.79%	-1.13%	-2.71%	-14.64%
Fiscal Impact							
State Revenues	\$514	\$546	\$591	\$580	\$566	\$539	\$472
State Costs	\$368	\$392	\$414	\$400	\$373	\$333	\$314
Net Revenues	\$147	\$155	\$176	\$180	\$193	\$206	\$158

Source: EI2 impact assessments and Georgia Department of Labor, Current Employment and Wages.

The 2007-2008 period shows significant declines in both employment and compensation, and a small decrease in output for economic activity. The greater decline in employment indicates that more of the employment loss is at the bottom of the income scale. The

declines in employment and compensation are also seen in the total impacts, but the output estimate shows a slight increase in 2008 over 2007. The most recent observations (2007-2008) show declines in all measures with the greatest declines seen in forestry activity employment and total employment, and total compensation (all about 16 percent), with significant declines in forestry compensation (11.5 percent) and somewhat lesser declines in direct output (7.5 percent) and total output (4.7 percent)

The apparent increase in 2008 output (total impacts) given the significant decline in employment and the more moderate decline in compensation, however, deserves additional consideration. It should be noted that in estimating economic activity the core data (Department of Labor CEW statistics) only provide wage and employment information and do not include output measures. These must therefore be estimated and in any estimation there is some margin of error. It is not surprising, however, to see employment and compensation declines greater than output declines (as seen in the forest industry economic activity results) because firms, logically, would reduce their least productive activities first in a contraction. This explains why the output estimated for economic activity declined less than employment or compensation. It does not explain why output estimates of total impact show growth, albeit small growth.

A more detailed examination of where the output estimates for 2008 revealed higher than expected estimates of input demands (indirect impacts) in a number of sectors that have nothing to do with the forestry industry. A reorganization of industry sectors in the 2007 Implan data, and the accompanying production functions, make it impossible to identify all of the influences leading to the higher output estimates, but it appears that small changes were made in many places that accumulated to provide these results.

The 2008-2009 comparison continues the trend that has employment and compensation declines exceeding output declines. This is not unusual to see in economic contractions where, paradoxically, labor productivity actually increases during recessions. The standard explanation for this is that only the most productive labor paired with the best machines are retained during a contraction.

Forestry Dependent Communities

The economies of Georgia's counties are all dependent upon their ability to bring resources into their areas. There is no clear definition of "dependence" so two measures were developed. The first is based on employment where "critically dependent" counties have more than 10 percent of their total private-sector employment in the forestry industry. "Very dependent" counties have between 6 percent and 10 percent of their employment in forestry industries and "moderately dependent," "somewhat dependent," and "not dependent" have between 4 percent and 5.9 percent, 1.6 percent and 3.9 percent, and less than 1.6 percent of their employment in forestry industries, respectively. Figure E-1 depicts the degree of economic dependence on forestry, as measured by its proportion of total employment.

Another measure of dependence is provided by wages and salaries. For this measure, counties are considered "critically dependent" if more than 15 percent of total private-sector wages and salaries are from forestry-related industries. "Very dependent" counties

have between 10 percent and 15 percent of their employment in forestry industries and “moderately dependent,” “somewhat dependent,” and “not dependent” have between 5 percent and 10 percent, 2 percent and 5 percent, and less than 2 percent of their wages and salaries from forestry industries, respectively. Figure E-2 depicts the degree of economic dependence on forestry, as measured by its proportion of total wages and salaries.

Figure E-1
Forestry Dependency Based on Employment 2009

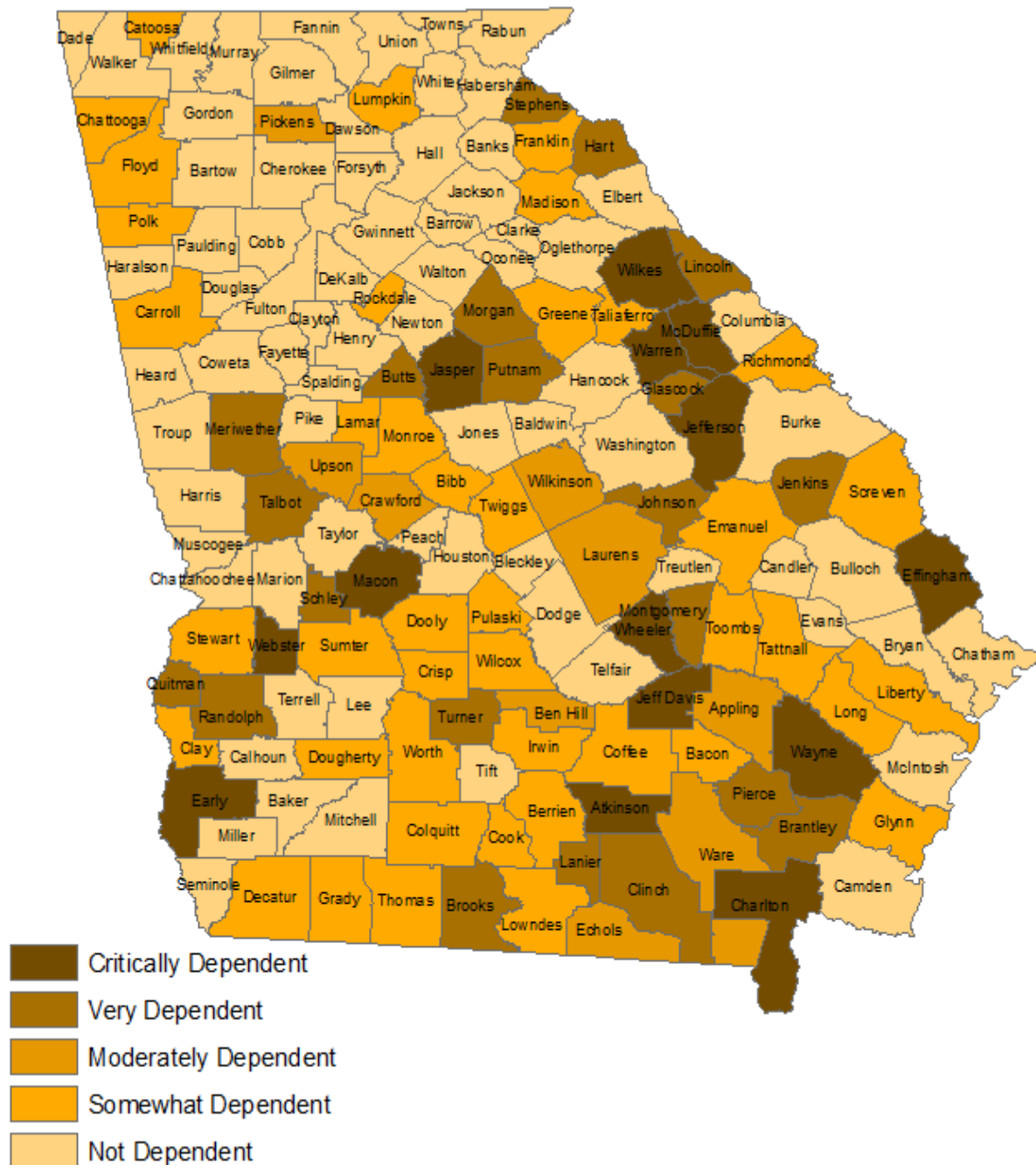
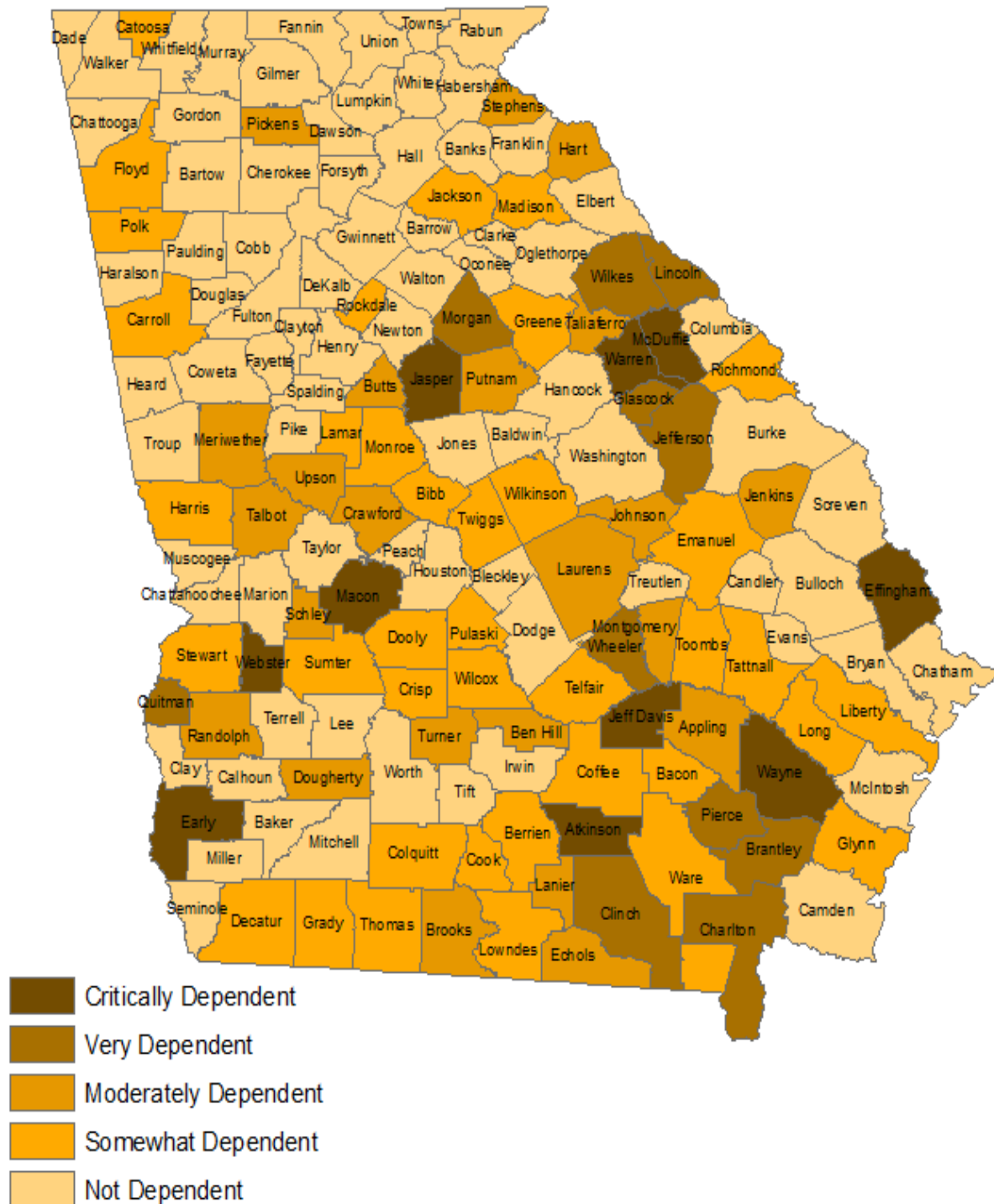


Figure E-2
Forestry Dependency Based on Income 2009



SECTION 1

Introduction

Georgia's forestry industry contains many components and supports a significant proportion of the state's economic activity. This analysis quantifies that activity in terms of economic output, employment, and employee compensation where economic output is defined as business revenues and employee compensation is defined as wages, salaries including benefits. Additional factors considered include how the manufacturing components in the forestry industry compare to other manufacturing sectors, and how the industry affects state government costs and revenues.

The first step in this process is to define the limits of what constitutes the "forestry industry." This is not as simple a task as it may appear because the borders of one industry overlap those of other industries. How this was done and its results appear in Section 2, which also contains estimates of how much economic activity is occurring in each component of the forestry industry.

After the industry was defined and activities quantified, the total economic activity supported by the forestry industry was estimated. Total activity is generally referred to as the "multiplier effect." This effect occurs whenever dollars are brought into the state's economy and recirculated before leaking out. Section 3 explains the methodology used to estimate total economic activity and provides perspective on how important these activities are in the overall Georgia economy.

Section 4 examines how important the forestry components are to the existing industry base in each of Georgia's counties and divides counties into five categories according to their degree of dependence on forestry.

This report is the latest of a series of reports begun with an analysis of the 2002 impacts and continues annually to the present analysis. The 2002 analysis is not comparable to the subsequent analyses, however, because of a significant change in the industry classification systems implemented in the 2003 data set. The 2002 analysis is based on the Standard Industry Classification system (SIC) and the later data sets use the North American Industrial Classification System (NAICS).

SECTION 2

Definition of the Forestry Industry in Georgia

The forestry industry in Georgia has many diverse components. A general definition would include all service and manufacturing activity related to the growth, harvesting, and use of forest materials that would not exist in Georgia without the presence of extensive forests or forest industries. For example, the papermaking industry would be a part of the forestry industry definition, but retail sales of that paper would not. States without commercial forests still sell paper within their borders.

Therefore, the forestry industry definition used in this analysis includes these broad sectors: forestry, logging, wood products (such as dimension lumber), paper products, manufactured housing, furniture, other miscellaneous wood products, and woodworking and papermaking machinery. The 2007 North American Industrial Classification System (NAICS) is used to define the components of the forestry industry. The NAICS codes and descriptions comprising the detailed definition appear in Table 2-1.

Table 2-1: Forestry Industry Definition Components: NAICS

NAICS Code	Description
113	<i>Forestry and Logging</i>
1131	<i>Timber Tract Operations</i>
11311	<i>Timber Tract Operations</i>
1132	<i>Forest Nurseries and Gathering of Forest Products</i>
11321	<i>Forest Nurseries and Gathering of Forest Products</i>
1133	<i>Logging</i>
11331	<i>Logging</i>
115	<i>Support Activities for Agriculture and Forestry</i>
1153	<i>Support Activities for Forestry</i>
115310	<i>Support Activities for Forestry</i>
321	<i>Wood Product Manufacturing</i>
3211	<i>Sawmills and Wood Preservation</i>
32111	<i>Sawmills and Wood Preservation</i>
321113	<i>Sawmills</i>
321114	<i>Wood Preservation</i>
3212	<i>Veneer, Plywood, and Engineered Wood Product Manufacturing</i>
32121	<i>Veneer, Plywood, and Engineered Wood Product Manufacturing</i>
321211	<i>Hardwood Veneer and Plywood Manufacturing</i>
321212	<i>Softwood Veneer and Plywood Manufacturing</i>
321213	<i>Engineered Wood Member (except Truss) Manufacturing</i>
321214	<i>Truss Manufacturing</i>
321219	<i>Reconstituted Wood Product Manufacturing</i>
3219	<i>Other Wood Product Manufacturing</i>

32191	Millwork
321911	Wood Window and Door Manufacturing
321912	Cut Stock, Resawing Lumber, and Planing
321918	Other Millwork (including Flooring)
32192	Wood Container and Pallet Manufacturing
32199	All Other Wood Product Manufacturing
321991	Mobile Homes
321992	Prefabricated Wood Building Manufacturing
321999	All Other Miscellaneous Wood Product Manufacturing
322	Paper Manufacturing
3221	Pulp, Paper, and Paperboard Mills
32211	Pulp Mills
32212	Paper Mills
322121	Paper (except Newsprint) Mills
322122	Newsprint Mills
32213	Paperboard Mills
3222	Converted Paper Product Manufacturing
32221	Paperboard Container Manufacturing
322211	Corrugated and Solid Fiber Box Manufacturing
322212	Folding Paperboard Box Manufacturing
322213	Setup Paperboard Box Manufacturing
322214	Fiber Can, Tube, Drum, and Similar Products Manufacturing
322215	Non-folding Sanitary Food Container Manufacturing
32222	Paper Bag and Coated and Treated Paper Manufacturing
322221	Coated and Laminated Packaging Paper and Plastics Film Manufacturing
322222	Coated and Laminated Paper Manufacturing
322223	Plastics, Foil, and Coated Paper Bag Manufacturing
322224	Uncoated Paper and Multiwall Bag Manufacturing
322225	Laminated with Foil for Flexible Packaging
322226	Surface-Coated Paperboard Manufacturing
32223	Stationery Product Manufacturing
322231	Die-Cut Paper and Paperboard Office Supplies Manufacturing
322232	Envelope Manufacturing
322233	Stationery, Tablet, and Related Product Manufacturing
32229	Other Converted Paper Product Manufacturing
322291	Sanitary Paper Product Manufacturing
322299	All Other Converted Paper Product Manufacturing
33321	Sawmill and Woodworking Machinery Manufacturing
333291	Paper Industry Machinery Manufacturing
337	Furniture & Related Product Manufacturing
3371	Household and Institutional Furniture and Kitchen Cabinet Manufacturing

33711	<i>Wood Kitchen Cabinet and Countertop Manufacturing</i>
33712	Household and Institutional Furniture Making
337121	<i>Upholstered Household Furniture Manufacturing</i>
337122	<i>Non-Upholstered Wood Household Furniture Manufacturing</i>
337127	<i>Institutional Furniture Manufacturing</i>
337129	<i>Wood Television, Radio, and Sewing Machine Cabinet Manufacturing</i>
337211	<i>Wood Office Furniture Manufacturing</i>
337212	<i>Custom Architectural Woodwork and Millwork Manufacturing</i>
337215	<i>Showcase, Partition, Shelving, and Locker Manufacturing</i>
333	Machinery Manufacturing
3332	Industrial Machinery Manufacturing
33321	<i>Sawmill and Woodworking Machinery Manufacturing</i>
33329	Other Industrial Machinery Manufacturing
333291	<i>Paper Industry Machinery Manufacturing</i>
339	Miscellaneous Manufacturing
3399	Other Miscellaneous Manufacturing
33999	All Other Miscellaneous Manufacturing
339995	<i>Burial Casket Manufacturing</i>
Source: North American Industrial Classification System, and Georgia Tech's Enterprise Innovation Institute	

The organization of industries on this list is hierarchical, that is, the NAICS code digits increase as the level of detail increases. The highest level of detail is the six-digit level. In some cases, however, the six-digit industry is the same as the five-digit industry, so these duplications are not presented in Table 2-1. For example, industry 11311 (timber tract operations) does not break down into smaller components, so the six-digit industry (which would be 113110) is omitted because it's redundant.

In some cases, the higher-level NAICS industries contain components that are not a part of the forestry industry. For example, metal furniture is included in NAICS 3371, but is not included at the six-digit level used to define the forestry industry. Each component containing only forestry-related industries is indicated by italicized text in the table. Non-forestry-related components have been eliminated.

The level of economic activity in each forestry industry component is measured by output, employment, and income. Measures for the 2009 calendar year appear in Table 2-2, which aggregates the numerous categories from Table 2-1 to a more manageable number. This table shows that total employment in all of the forestry industry sectors is 48,519 and these jobs earned annual compensation (total wages and salaries including benefits) of almost \$2.8 billion from estimated total revenue of over \$16.9 billion.

Within the industry, Georgia companies have representatives in each of the sectors and subsectors down to the NAICS six-digit level. Based on this aggregation scheme, the highest employment is seen in pulp and paper with 18,936 workers followed by wooden furniture and cabinets with 6,827. Several additional segments have employment exceeding 5,000, including wood lumber and wood preservation, and logging and

nurseries. Compensation, like employment, is dominated by pulp and paper with almost \$1.5 billion (about half the total) followed distantly by wood furniture and cabinets at about \$271 million and lumber and wood preservation at almost \$250 million. The largest outputs are produced by pulp and paper (about \$11 billion) followed by lumber and logging, (about \$1.5 billion, each) and wooden furniture, cabinets and millwork at almost \$1.0 billion.

Table 2-2: Georgia Forestry Industry Economic Activity 2009

Sector	Output	Employment	Compensation
Forestry Management, Logging, and Misc. Forest Products	\$1,454,449,184	5,119	\$237,826,360
Lumber and Wood Preservation	\$1,359,252,480	5,469	\$249,873,104
Veneer, Plywood, Reconstituted, and Engineered Wood	\$664,289,032	3,137	\$158,370,342
Prefabricated Wood Buildings and Manufactured Housing	\$251,605,408	1,949	\$66,110,338
Pulp and Paper Products	\$11,017,916,784	18,936	\$1,494,075,270
Woodworking and Paper Industries Machinery	\$86,010,384	300	\$17,121,898
Wooden Furniture, Cabinets, Custom Arch. & Millwork	\$996,312,851	6,827	\$270,507,879
Windows and Doors	\$497,071,008	2,973	\$126,073,024
Containers, Showcases, Partitions, and Shelving	<u>\$578,698,352</u>	<u>3,809</u>	<u>\$150,362,912</u>
Total	\$16,905,605,483	48,519	\$2,770,321,127

Table 2-3 provides a comparison of the forestry industry activity for 2004 to 2009. Three measures are included in the comparison: output, employment, and compensation. Output (an estimate of the firms' revenues) decreased slightly over the 2007-2008 period, but the decline was uneven across industry sectors with some showing an increase.

Overall employment dropped between 2007 and 2008 with the largest number of jobs lost in the lumber and wood preservation sector, probably due to the precipitous decline in housing construction. The pulp and paper sector, which has shown consistent declines over the years shown, was the second largest employment decline. All other sectors also showed employment declines except for window and door employment which showed an unexpected increase.

Changes in employee compensation are generally negative over the most recent period, but with one exception. From 2007 to 2008, the largest declines are in the same sectors as the declines in employment (lumber and wood preservation, and pulp and paper) and the increase was in wooden windows and doors.

Another potential impact is the payment from the federal government to pulping operations for the use of black liquor (a residue of the pulping process comprised primarily of lignin) as an alternative fuel source. It is reported that a total of about \$6.5 billion was paid, with International Paper (a firm with several Georgia plants) receiving about \$2.06 billion. It cannot be said, however, how much of these resources benefited Georgia firms.

Table 2-3: Forestry Industry Activity 2004 - 2009 Comparison

Sector	Output (Millions of Dollars)					
	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>
Forestry Management, Logging, and Misc. Forest Products	\$1,384	\$1,447	\$1,846	\$1,807	\$1,698	\$1,454
Lumber and Wood Preservation	\$1,482	\$1,811	\$2,057	\$2,100	\$1,732	\$1,359
Veneer, Plywood, Reconstituted, and Engineered Wood	\$1,062	\$1,290	\$1,260	\$1,322	\$961	\$664
Prefabricated Wood Buildings and Manufactured Housing	\$388	\$561	\$596	\$523	\$427	\$252
Pulp and Paper Products	\$7,888	\$8,808	\$9,590	\$10,131	\$10,856	\$11,018
Woodworking and Paper Industries Machinery	\$47	\$53	\$52	\$61	\$67	\$86
Wooden Furniture, Cabinets, Custom Arch. & Millwork	\$1,115	\$1,241	\$1,366	\$1,374	\$1,153	\$996
Windows and Doors	\$344	\$406	\$446	\$517	\$721	\$497
Containers, Showcases, Partitions, and Shelving	<u>\$454</u>	<u>\$533</u>	<u>\$548</u>	<u>\$624</u>	<u>\$654</u>	<u>\$579</u>
Total	\$14,163	\$16,150	\$17,760	\$18,459	\$18,270	\$16,906
	Employment					
	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>
Forestry Management, Logging, and Misc. Forest Products	6,005	6,133	6,152	5,914	5,529	5,119
Lumber and Wood Preservation	8,505	8,839	8,957	8,773	6,477	5,469
Veneer, Plywood, Reconstituted, and Engineered Wood	6,588	7,110	6,963	6,004	4,448	3,137
Prefabricated Wood Buildings and Manufactured Housing	3,494	4,531	4,500	3,581	2,983	1,949
Pulp and Paper Products	25,032	23,150	22,861	21,651	20,816	18,936
Woodworking and Paper Industries Machinery	292	319	314	304	295	300
Wooden Furniture, Cabinets, Custom Arch. & Millwork	10,164	10,378	10,770	10,189	8,235	6,827
Windows and Doors	2,522	2,446	2,598	3,043	3,967	2,973
Containers, Showcases, Partitions, and Shelving	<u>5,031</u>	<u>4,788</u>	<u>4,618</u>	<u>4,733</u>	<u>4,506</u>	<u>3,809</u>
Total	67,633	67,694	67,733	64,192	57,812	48,519
	Compensation (Millions of Dollars)					
	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>
Forestry Management, Logging, and Misc. Forest Products	\$234	\$254	\$267	\$273	\$255	\$238
Lumber and Wood Preservation	\$353	\$385	\$400	\$391	\$282	\$250
Veneer, Plywood, Reconstituted, and Engineered Wood	\$312	\$341	\$353	\$291	\$211	\$158
Prefabricated Wood Buildings and Manufactured Housing	\$122	\$164	\$165	\$119	\$99	\$66
Pulp and Paper Products	\$1,616	\$1,595	\$1,630	\$1,602	\$1,565	\$1,494
Woodworking and Paper Industries Machinery	\$18	\$20	\$18	\$19	\$18	\$17
Wooden Furniture, Cabinets, Custom Arch. & Millwork	\$359	\$389	\$404	\$393	\$330	\$271
Windows and Doors	\$104	\$104	\$100	\$115	\$173	\$126
Containers, Showcases, Partitions, and Shelving	<u>\$181</u>	<u>\$169</u>	<u>\$175</u>	<u>\$191</u>	<u>\$172</u>	<u>\$150</u>
Total	\$3,299	\$3,422	\$3,513	\$3,394	\$3,131	\$2,770

Figure 2-1 Forestry Industry Economic Activity: Output by Sector (Dollars in Millions)

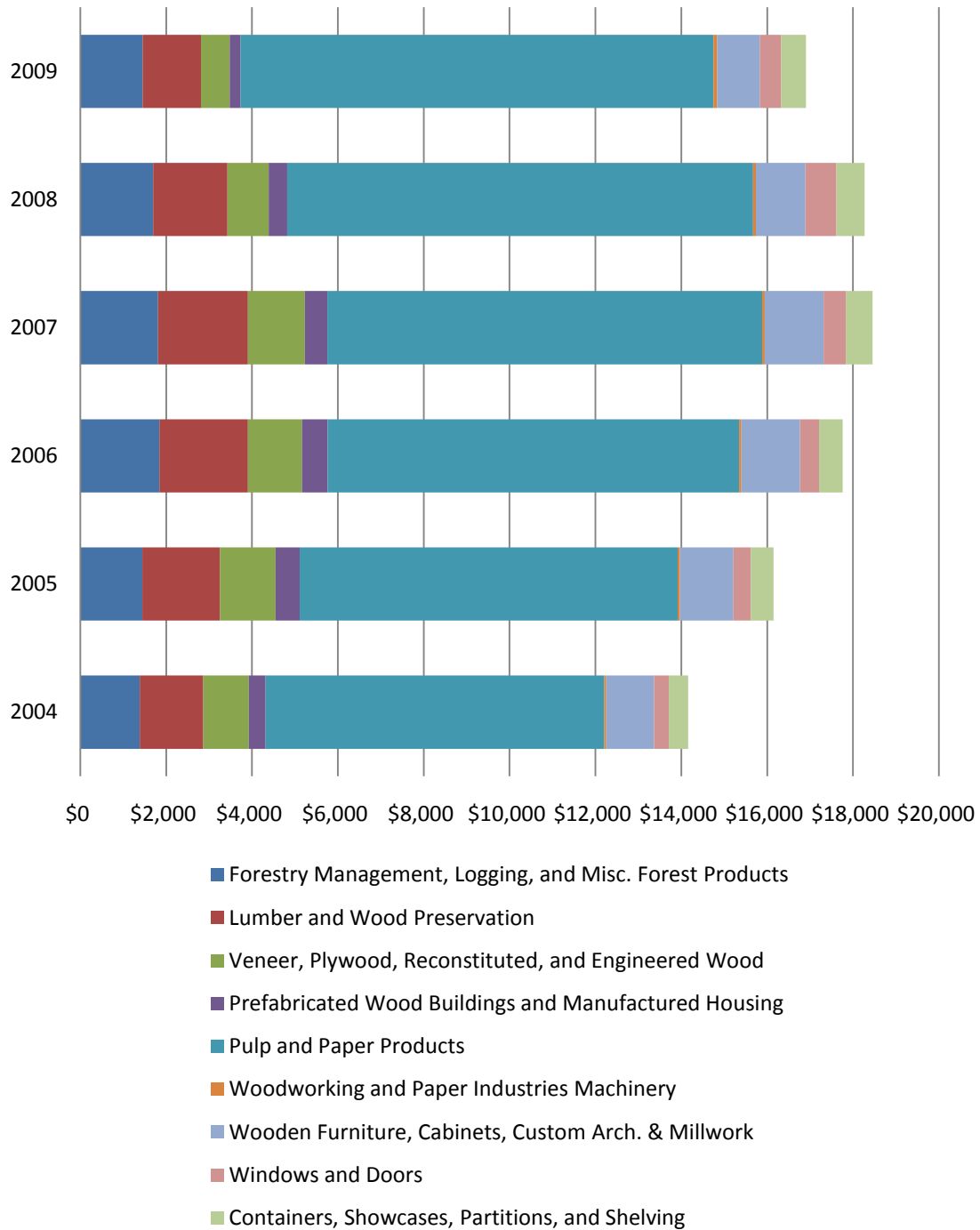


Figure 2-2 Forestry Industry Economic Activity: Employment by Sector

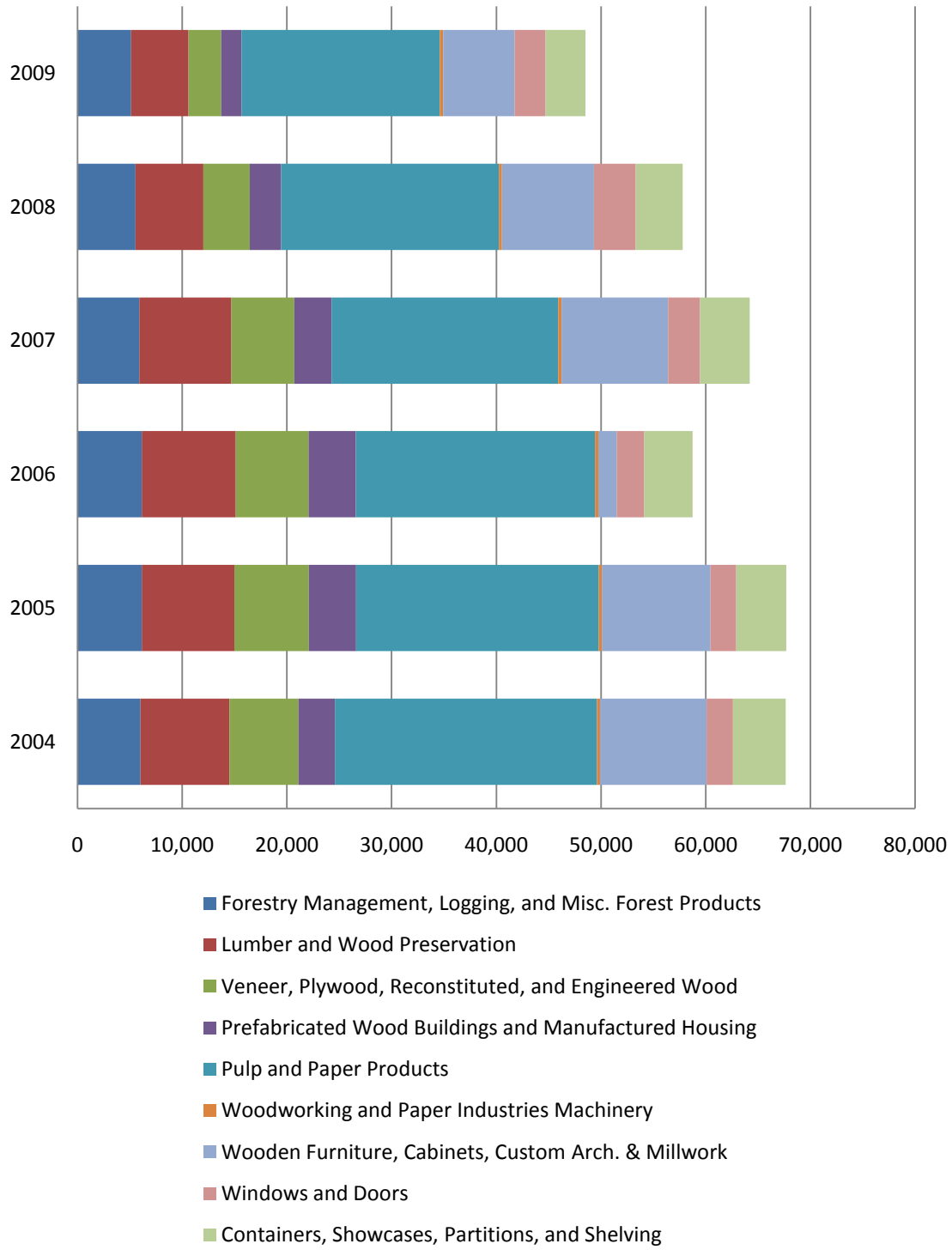


Figure 2-3 Forestry Industry Economic Activity: Compensation by Sector (Dollars in Millions)



SECTION 3

Economic Benefits

Economic impact analyses have used basically the same methods for over 40 years. The tools, although greatly improved in quality and ease of use, are also similar to those in long-time use.

The conceptual basis for estimating economic benefits of an industry is that resources brought into Georgia's economy by the industry raise the level of economic activity. This additional economic activity, commonly called the multiplier effect, supports increased employment, income, and business revenues. These increases are estimated from an input-output model (I/O).

The purpose of an I/O model is to estimate the flows of resources among various economic sectors by using the "recipes" followed by producers. These recipes provide the type and amount of goods and services purchased during production, which are produced by other firms. For example, a pulp mill purchases wood from a logger. The logger, in turn, purchases equipment and fuel from firms, that, in turn, purchase their raw materials from still other firms. Combined with estimates of what percentages of these items are supplied by Georgia firms, the recipes can be used to estimate how much of each item is purchased from Georgia firms and how much is purchased from outside Georgia.

Purchases from sources outside the Georgia economy are known as "leakage," which puts the brakes on the multiplier effect; the higher the leakage, the lower the multiplier effect.

The I/O model used in this analysis is called IMPLAN, devised by the Minnesota IMPLAN Group. It is a nationally recognized model that uses Georgia data to tailor its estimates to the state economy. Still, the model must be modified somewhat to account for differences in specific industry sectors revealed by more current data. For example, the wage and salary data used in this analysis is from 2008, whereas the wage and salary data available to IMPLAN is from 2007.

One area of uncertainty that persists, however, is the level of benefits provided to workers in each of the forestry industry sectors. The available wage and salary information does not include benefits, but the I/O model bases its analysis on wages and salaries that include benefits. An average of 28 percent was assumed for this analysis, based on the latest available U.S. Bureau of Labor Statistics compensation cost data for all civilian employment.

The analytical process includes three steps after the industry sectors are defined, as described in the previous section. The first step is to quantify employment, income, and output associated with each of the defined sectors. Several data sources are used to accomplish this.

The best source for employment and wages is the employment security data collected and maintained by the Georgia Department of Labor. Commonly called ES202 data or, more recently CEW (covered employment and wages) data, it has the advantage of being current, allowing an estimate of the economic benefits occurring in 2009. It has the drawback, however, of not including single-proprietorships (because they have no employees), and it also does not include employees not covered by unemployment insurance, such as some governmental employees.

The second task is to divide the forestry industry output into two categories, (1) output that is sold to another Georgia firm and (2) output sold outside the state. Another way to look at this is to recall that the multiplier effect starts from dollars brought into the Georgia economy. Output not sold to another Georgia firm is, by definition, bringing in resources from outside the Georgia economy, and it is these “exports” that fuel the multiplier effect. Forestry industry output used as an input to another Georgia forestry-industry firm is already accounted for in the multiplier effect; counting it again would result in double-counting and would imply a level of production from the input-supplying industry higher than actually observed. For example, if the multiplier effect is calculated for the paper industry, it will include some of the activities of Georgia logging operations. If the entire output from logging was then added to the multiplier effect for paper, it would double-count the logging output that went to the paper industry. The I/O model is used iteratively for these estimations, with the resulting estimates called “direct impacts.” Direct impacts are measures of the output from, in this case, forestry industries that is exported to entities outside Georgia (these are considered exports even if they only go to Alabama).

The third step is to use the I/O model to estimate total impacts, which are divided into three components. The first is the *direct* impacts (the value of resources brought into the state); the second is *indirect* impacts (impacts from recirculation of resources resulting from forestry industry purchases from other industries; and the third is *induced* impacts, which result from activities in the household sector. Adding direct, indirect, and induced impacts yields total impacts.

Three measures of economic impacts are provided. The first, output, is a measure of how much each industry or sector produced in 2009 – roughly equivalent to a measure of sales revenue. The second measure is compensation, including all household income and employee benefits. The third measure is employment, or number of jobs, in each forestry-related industry.

Results

Table 3-1 provides estimates of direct impacts for each of the forestry industry sectors contained in the industry’s definition. These differ from the level of economic activity shown in Tables 2-2 and 2-3 because Table 3-1 eliminates production consumed by another sector. This eliminates the double counting of production in the multiplier effect of the consuming industry sector. For example, Table 3-1 does not contain much output from the Forestry Management, Logging, and Misc. Forest Products industry segment because most of it appears to be consumed by the various Georgia wood-using industries

such as paper and lumber. Logging operations are included primarily as part of the multiplier effect by these consuming industries, not as a direct impact separate from them.

Another way to interpret Table 3-1 is to consider the direct impacts to be estimates of the exports of forestry-related industries. This exporting (to anyone outside Georgia) brings resources into the state to support the increase in economic activity estimated by the multiplier effect.

The largest industry segment by far is “Pulp and Paper”, which includes all pulping and paper-making activities representing about half of the total industry. The entire forestry industry (totals in Table 3-1) is estimated to export (to a non-Georgia destination) almost \$14.5 billion with this activity supporting 40,089 jobs with an employee compensation of almost \$2.4 billion.

Recirculation of dollars brought into Georgia’s economy (as measured by the direct impacts) support a higher level of economic activity. This higher level is estimated by applying the IMPLAN input-output model to the direct impacts provided in Table 3-1. The results of this analysis are presented in Table 3-2. Because all industries in Georgia are affected by the forestry industry, Table 3-2 summarizes the impacts by aggregated industry codes (used in the input-output model), which are roughly equivalent to two-digit NAICS codes.

Table 3-1: Direct Impacts by Forest Industry Sector 2009

<u>Sector</u>	<u>Output</u>	<u>Employment</u>	<u>Compensation</u>
Forestry Management, Logging, and Misc. Forest Products	\$187,147,456	301	\$20,948,698
Lumber and Wood Preservation	\$898,215,168	3,614	\$165,120,032
Veneer, Plywood, Reconstituted, and Engineered Wood	\$598,698,640	2,867	\$143,542,358
Prefabricated Wood Buildings and Manufactured Housing	\$250,436,416	1,940	\$65,802,280
Pulp and Paper Products	\$10,448,603,096	18,067	\$1,418,981,146
Woodworking and Paper Industries Machinery	\$80,276,360	280	\$15,980,439
Wooden Furniture, Cabinets, Custom Arch. & Millwork	\$811,448,260	5,882	\$228,407,976
Windows and Doors	\$635,076,257	3,638	\$156,392,088
Containers, Showcases, Partitions, and Shelving	<u>\$538,091,728</u>	<u>3,500</u>	<u>\$139,850,584</u>
Total	\$14,447,993,381	40,089	\$2,355,025,601

The largest sector impacts are seen, not surprisingly, in the manufacturing sector, with some \$16 billion in output, 44,668 employees, and about \$2.6 billion in compensation. A distant second is held by agriculture, forestry, fishing and hunting (which includes logging and nurseries), with almost \$1.9 billion in output, 9,924 employees, and almost \$360 million in compensation. Together, the economic activity supported by Georgia’s forestry industry (including federal payments to landowners of about \$35.6 million) totals almost \$27.2 billion, involving employment of 118,423 people whose compensation is about \$5.6 billion. This employment represents about 3 percent and 2.7 percent of total Georgia employment, and wages and salaries, respectively.

Table 3-2: Total Benefits by Major Industry Sector 2009

Sector	Output	Employment	Compensation
Agriculture, Forestry, Fishing and Hunting	\$1,916,024,141	9,924	\$359,608,981
Mining	\$16,197,021	66	\$4,629,613
Utilities	\$719,483,426	809	\$84,645,811
Construction	\$133,736,698	1,353	\$51,429,593
Manufacturing	\$15,980,706,206	44,668	\$2,605,892,302
Wholesale Trade	\$1,246,651,008	6,113	\$439,009,440
Retail Trade	\$568,951,748	8,268	\$210,639,060
Transportation and Warehousing	\$736,962,540	5,033	\$229,912,275
Information	\$655,479,444	1,352	\$98,673,904
Finance and Insurance	\$833,480,480	3,437	\$224,707,933
Real Estate and Rental	\$1,202,576,143	3,815	\$58,697,422
Professional, Technical, and Scientific Services	\$745,474,219	4,815	\$250,629,826
Management of Companies	\$426,079,328	1,806	\$173,316,512
Administrative and Waste Services	\$399,487,841	6,366	\$164,681,686
Educational Services	\$71,844,990	1,148	\$34,719,702
Health and Social Services	\$595,473,757	6,301	\$269,210,357
Arts, Entertainment and Recreation	\$95,396,343	1,300	\$25,025,330
Accommodation and Food Services	\$319,021,916	5,397	\$96,867,379
Other Services	\$363,078,404	5,534	\$124,060,317
Government and Non-NAICS Industries	<u>\$173,453,062</u>	<u>919</u>	<u>\$54,583,773</u>
Total	\$27,199,558,714	118,423	\$5,560,941,216

Source: Georgia Tech's Enterprise Innovation Institute

Table 3-3 extracts information from several tables to present a comparison of the overall results obtained in each impact analysis conducted from 2003 through 2008. All measures show growth between 2003 and 2004 and between 2004 and 2005. The highest growth rates are in industry output which grew between 10 and 14 percent depending on the year and whether it is being calculated for forestry industry activity or total activity. Compensation also increased for these periods. In the 2003 to 2004 period, forestry industry compensation increased by 9.7 percent and total compensation increased by 12 percent without considering inflation. From 2004 to 2005, the rate of increase was somewhat lower – 4 percent for the forestry industry and 9 percent for total impacts. Employment increases are more modest, increasing 3 percent and 7 percent for forestry industry and total impacts, respectively, in the 2003 to 2004 period. Although employment from total impacts grew an estimated 6 percent between 2004 and 2005, forestry industry employment was essentially flat.

In the 2008 to 2009 period, forestry industry output declined by 7.5 percent and employment from total impacts fell by 16 and 11.5 percent, respectively. The two sectors

which declined the most (in percentage terms) were prefabricated buildings and veneer, plywood, and reconstituted wood products. Productivity increases are apparent in forestry industry sectors (pulp and paper products, for example) as well as sectors stimulated by the multiplier effect which would serve to allow output increases with employment declines.

Table 3-3: Comparison of Results 2003 to 2009

(Dollars in millions; Employment in persons)

Forestry Industry Economic Activity	2003	2004	2005	2006	2007	2008	2009
Output	\$12,679	\$14,163	\$16,150	\$17,760	\$18,459	\$18,270	\$16,906
Employment	65,706	67,633	67,694	67,733	64,192	57,812	48,519
Compensation	\$3,007	\$3,299	\$3,422	\$3,513	\$3,394	\$3,131	\$2,770
Year to Year Percent Change							
Output		11.70%	14.04%	9.97%	3.93%	-1.02%	-7.47%
Employment		2.93%	0.09%	0.06%	-5.23%	-9.94%	-16.07%
Compensation		9.71%	3.71%	2.67%	-3.38%	-7.75%	-11.52%
Total Impacts							
Output	\$20,199	\$22,729	\$25,972	\$27,738	\$28,547	\$28,723	\$27,200
Employment	136,022	144,944	154,147	149,347	141,155	128,388	118,423
Compensation	\$5,600	\$6,276	\$6,827	\$6,773	\$6,696	\$6,514	\$5,561
Year to Year Percent Change							
Output		12.53%	14.27%	6.80%	2.92%	0.61%	-5.30%
Employment		6.56%	6.35%	-3.11%	-5.49%	-9.04%	-7.76%
Compensation		12.07%	8.77%	-0.79%	-1.13%	-2.71%	-14.64%
Fiscal Impact							
State Revenues	\$514	\$546	\$591	\$580	\$566	\$539	\$472
State Costs	<u>\$368</u>	<u>\$392</u>	<u>\$414</u>	<u>\$400</u>	<u>\$373</u>	<u>\$333</u>	<u>\$314</u>
Net Revenues	\$147	\$155	\$176	\$180	\$193	\$206	\$158

Source: EI2 impact assessments and Georgia Department of Labor, Current Employment and Wages.

The annual percent change information in Table 3-3 is presented graphically below for output, employment, and compensation measuring levels of economic activity followed by a similar graph measuring total economic impact. A graph of the fiscal impacts also included in Table 3-3 is provided next. It should be noted that these data are in nominal dollars and have not been adjusted for inflation. The most odd observation in these graphs is the sharp decline in compensation with employment declining at a lesser rate than last year. If there is a silver lining anywhere in these numbers, it is the possibility that employment, at least, has bottomed out.

Figure 3-1 Annual Percent Change in Economic Activity

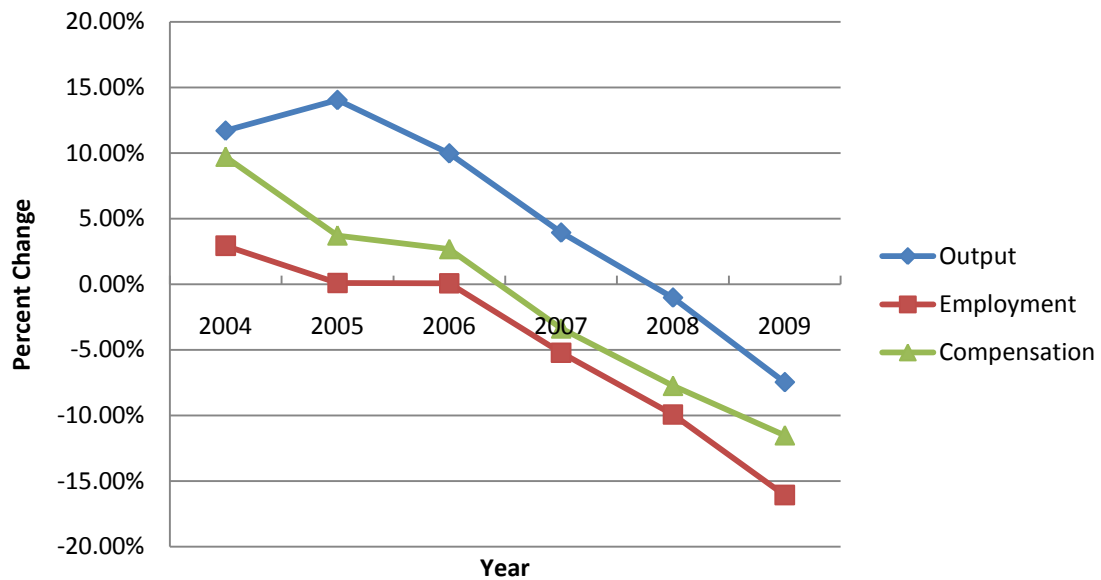
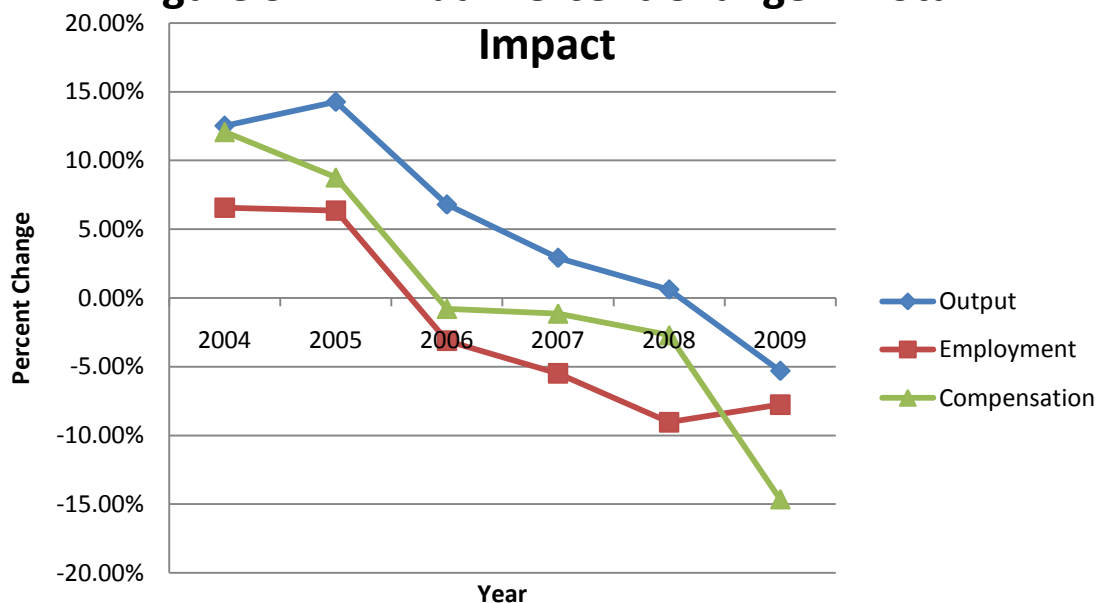
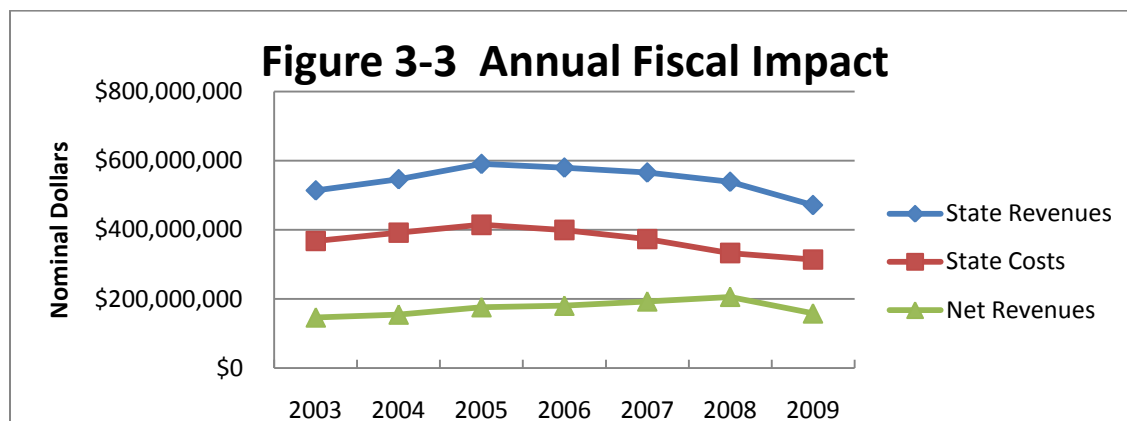


Figure 3-2 Annual Percent Change in Total Impact





Comparison of the Forestry Industry with Other Industry Sectors

It is difficult to appreciate the significance of the impacts generated by the forestry industry without some basis of comparison. This comparison is provided in Table 3-4, which shows that the forestry industry is the second largest industry sector in Georgia, (behind food processing) in employment and the third largest in wages and salaries.

Table 3-4: Comparison of Georgia Industries 2009

<u>Sector</u>	<u>Employment</u>	<u>Wages & Salaries</u>
Food Processing	64,648	\$2,718,559,504
Forestry Industry	48,519	\$2,163,680,341
Transportation Equipment	36,520	\$2,250,421,107
Textiles	20,726	\$1,471,733,948
Fabricated Metal Products	23,434	\$1,094,925,756
Machinery	20,406	\$828,603,263
Chemicals	19,448	\$1,280,151,545
Printing	17,292	\$389,942,397
Electrical Equipment and Appliances	12,851	\$786,471,785
Computers and Electronic Products	12,649	\$813,888,148
Apparel	3,813	\$124,869,966

SECTION 4

Economic Dependence

What Is Economic Dependence?

Economies are interwoven in a complex web. In general, however, a local economy's economic health depends on the inflow and outflow of resources. Economic base theory calls those sectors within an economy that are responsible for bringing resources in "basic" or "traded" sectors. The resources that are brought in are then (at least partially) recirculated within the local economy to support the "non-basic" sectors. For example, a saw mill will generally sell its products to builders or lumber supply houses outside the local economy. The revenue it receives from these sales is then used to purchase logs from, perhaps, a local logging firm, and it also pays wages to its employees who spend their wages in local restaurants, grocery stores, and the like. As the basic sector grows or declines, so does the non-basic sector.

Forestry industry components are very much part of Georgia's basic industry sector, with products sold worldwide. As such, it is one of the key sources of funds flowing into many local Georgia economies. Where the local economy has many sources of such flows, the growth or decline of any specific sector, such as forestry, may not have significant effects. However, in those communities where forestry is a large proportion of the local basic industry, all economic support activities, such as retail, are likewise generally dependent.

Approach

There is no clear delineation between economic dependence and non-dependence, and there are many possible facets that can be examined to depict the spectrum that describes the degree of dependence. This analysis examines the proportion of the county-level employment and income (as defined by wages and salaries) indicated by the ES202 data that is attributable directly to forestry industries. Multiplier effects are difficult to distribute to individual counties, and were therefore not included in the definition of forestry-related industries. This exclusion serves to underestimate the true proportion of the county economy supported by forestry.

The ranges of county employment attributable to forestry-related industries used to define the degree of dependence is provided in Table 4-1, which also provided the definitions of dependence according to the percentage of income (wages and salaries) attributable to forestry-related industries. These ranges were developed judgmentally, and are intended to define "dependence" in a very general sense.

Applying these criteria to Georgia's counties results in a distribution of counties as depicted in Table 4-2 for employment and income. While most counties are considered either not, or somewhat, dependent on forestry industries, the remaining counties, concentrated in South Georgia, owe significant proportions of their livelihood to forestry.

Figure 4-1 depicts the degree of forestry-related dependence based on employment and Figure 4-2 depicts the degree of dependence based on income. Table 4-3 provides the percentages of forestry to county employment and wages and salaries used to assign the degree of dependence.

Table 4-1: Definitions of Levels of Dependence

	Forestry Employment	Forestry Wages & Salaries
Critically Dependent	> 10%	> 15%
Very Dependent	6% - 9.9%	10% - 14.9%
Moderately Dependent	4% - 5.9%	9.9% - 5%
Somewhat Dependent	1.6% - 3.9%	2% - 4.9%
Not Dependent	< 1.6%	< 2%

Table 4-2: Distribution of Georgia Counties by Level of Dependence 2009

	Number of Counties	
	Employment	Wages & Salaries
Critically Dependent	14	10
Very Dependent	21	11
Moderately Dependent	9	23
Somewhat Dependent	42	38
Not Dependent	<u>73</u>	<u>77</u>
Total	159	159

Source: E12 estimates using Georgia Department of Labor, Current Employment and Wages data.

Tables 4-3 and 4-4 show how overall dependency has changed (for dependency based on employment and income, respectively) over the five years these statistics have been produced. Generally, the number of counties in each of the dependency categories has remained quite stable. The year 2006, however, shows an increase in those counties considered critically dependent largely at the expense of counties considered very dependent.

Table 4-5 (following Figures 4-1 and 4-2) provides county-level detail of forestry dependency, except where those counties do not sufficient numbers of firms to ensure protection of confidentiality. Those counties were combined with larger counties into ten groups, which are listed in Table 4-6.

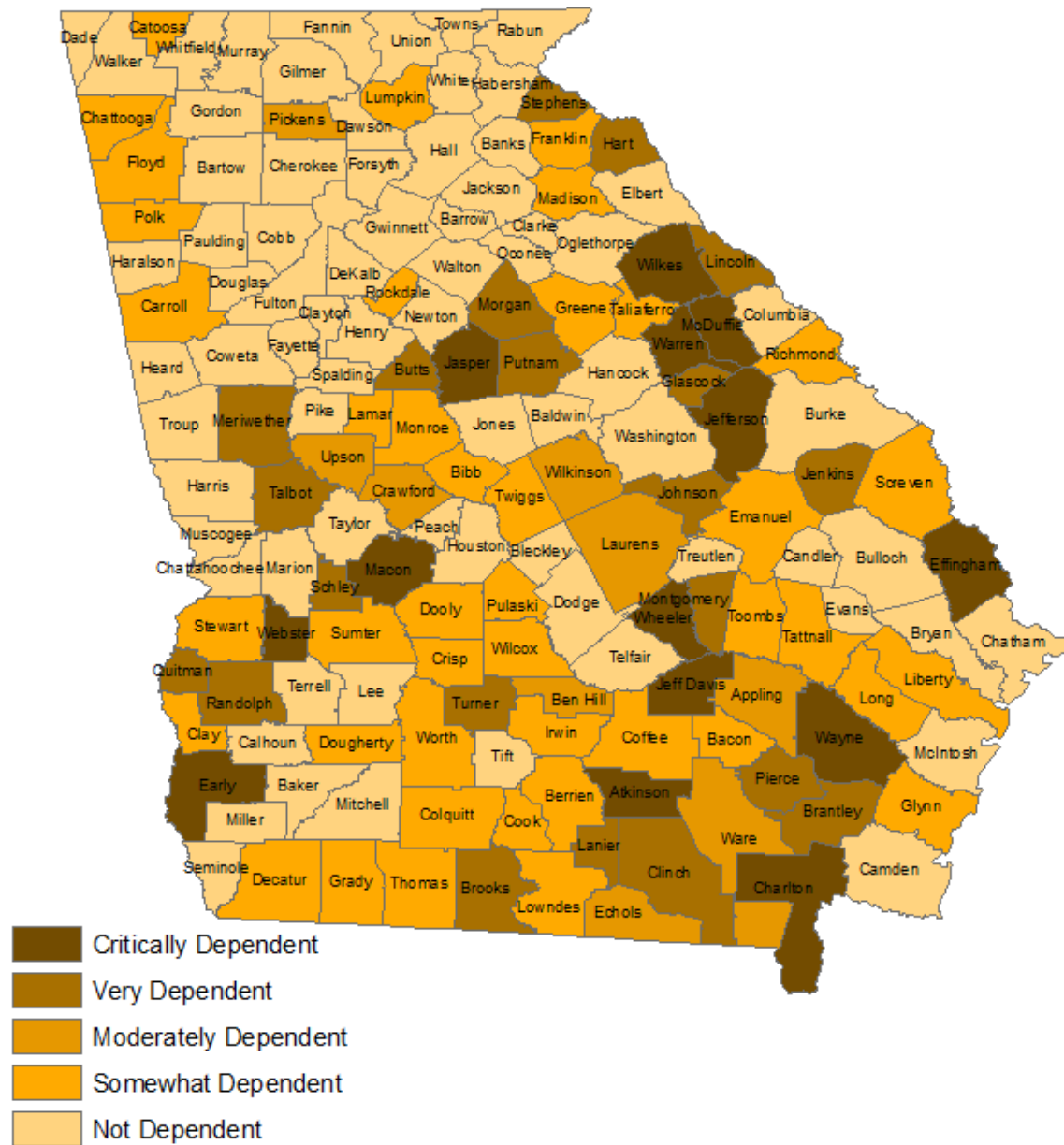
Table 4-3 Forestry Dependency Over Time: Employment

	Number of Counties					
	2004	2005	2006	2007	2008	2009
Critically Dependent	19	19	22	20	18	14
Very Dependent	18	18	15	17	16	21
Moderately Dependent	20	20	18	12	13	9
Somewhat Dependent	49	49	50	48	49	42
Not Dependent	53	53	54	62	63	73

Table 4-4 Forestry Dependency Over Time: Income

	Number of Counties					
	2004	2005	2006	2007	2008	2009
Critically Dependent	14	14	16	12	11	10
Very Dependent	17	17	13	21	14	11
Moderately Dependent	26	26	26	17	22	23
Somewhat Dependent	42	42	42	40	40	38
Not Dependent	60	60	62	69	72	77

Figure 4-1
Forestry Dependency Based on Employment 2009



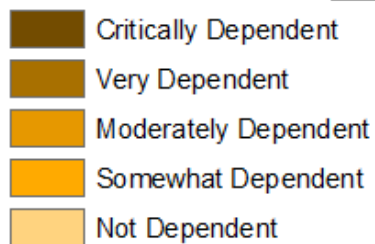
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Table 4-5: Level and Percent of Forestry in County Economies
Based on Employment and Income: 2009

	Level of Forestry:		Percent of Forestry to Total:	
<u>County</u>	<u>Employment</u>	<u>Wages and Salaries</u>	<u>Employment</u>	<u>Wages and Salaries</u>
Appling	339	13,922,035	5.2%	6.1%
Atkinson	406	13,207,730	26.5%	31.3%
Bacon	125	3,966,728	3.5%	4.4%
Baldwin	87	3,172,059	0.5%	0.6%
Banks	38	846,831	0.8%	0.7%
Barrow	125	7,037,582	0.8%	1.5%
Bartow	323	12,854,089	1.0%	1.1%
Berrien	99	2,412,056	2.3%	2.2%
Bibb	1,505	86,665,247	1.9%	3.0%
Bleckley	46	1,716,091	1.3%	2.0%
Brantley	170	5,164,963	9.0%	10.6%
Brooks	172	5,804,636	6.2%	8.0%
Bryan	80	3,028,673	1.3%	1.7%
Bulloch	282	8,834,448	1.2%	1.3%
Burke	20	623,570	0.3%	0.3%
Butts	352	11,025,579	6.4%	6.8%
Camden	158	6,269,131	1.1%	1.3%
Carroll	806	42,916,671	2.2%	3.3%
Catoosa	313	11,555,680	2.2%	2.7%
Charlton	280	8,001,767	13.1%	13.0%
Chatham	1,243	77,668,025	0.9%	1.6%
Chattooga	107	3,032,879	1.8%	1.8%
Cherokee	567	18,569,757	1.2%	1.2%
Clarke	373	18,338,500	0.6%	0.8%
Clayton	313	15,630,945	0.3%	0.4%
Clinch	233	7,214,379	9.5%	11.2%
Cobb	1,940	95,626,466	0.6%	0.7%
Coffee	432	12,444,632	3.0%	2.9%
Colquitt	544	15,846,746	3.6%	3.9%
Cook	137	4,629,922	3.0%	4.1%
DeKalb	1,718	79,714,959	0.6%	0.6%
Douglas	215	12,555,947	0.6%	1.1%
Early	574	44,625,174	14.2%	30.4%
Echols	39	1,423,588	5.7%	9.0%
Effingham	1,484	89,511,518	15.4%	27.5%
Elbert	24	701,804	0.4%	0.4%
Evans	33	1,756,369	0.8%	1.5%

Fannin	37	779,611	0.7%	0.5%
Fayette	234	12,312,121	0.6%	0.9%
Floyd	1,094	59,842,421	2.8%	4.4%
Forsyth	423	12,703,205	0.8%	0.6%
Franklin	125	3,286,564	1.8%	1.7%
Fulton	2,699	139,949,036	0.4%	0.3%
Gilmer	124	2,933,091	1.5%	1.3%
Glynn	785	55,997,209	2.1%	4.3%
Gordon	103	2,811,873	0.5%	0.5%
Grady	191	5,608,682	3.4%	3.6%
Greene	122	4,058,892	2.3%	2.5%
Gwinnett	2,168	93,397,949	0.7%	0.7%
Habersham	125	3,110,942	0.9%	0.8%
Hall	417	13,400,373	0.6%	0.5%
Haralson	65	1,801,974	0.9%	0.8%
Harris	61	2,014,900	1.6%	2.0%
Hart	361	17,560,492	6.1%	10.0%
Henry	249	7,748,382	0.5%	0.5%
Houston	217	7,531,103	0.4%	0.3%
Jackson	238	13,065,279	1.4%	2.4%
Jasper	303	11,729,444	14.0%	19.6%
Jeff Davis	546	17,720,381	12.2%	16.4%
Jefferson	562	19,594,625	11.3%	12.7%
Jenkins	105	2,249,612	7.8%	6.5%
Johnson	117	3,269,931	6.6%	7.3%
Jones	48	1,369,797	1.4%	1.4%
Lamar	104	4,914,197	2.8%	4.7%
Lanier	88	2,364,204	6.1%	6.5%
Laurens	1,032	48,976,387	5.2%	7.9%
Lowndes	1,111	48,491,226	2.3%	3.4%
Lumpkin	121	3,609,298	2.0%	1.9%
Madison	35	835,724	1.1%	0.9%
Mitchell	44	1,018,419	0.5%	0.5%
Monroe	147	5,341,593	2.4%	2.7%
Montgomery	139	4,146,860	8.1%	9.2%
Morgan	450	18,967,036	7.2%	11.2%
Murray	78	2,075,277	0.7%	0.6%
Muscogee	379	15,166,108	0.4%	0.4%
Newton	231	10,402,433	1.1%	1.4%
Oconee	92	2,528,805	1.1%	0.9%
Oglethorpe	14	327,643	0.8%	0.8%
Paulding	229	9,251,781	1.2%	1.6%
Pickens	306	13,365,913	4.2%	6.1%

Pierce	371	11,425,622	9.7%	11.0%
Pike	36	1,009,442	1.6%	1.6%
Polk	185	7,477,763	1.6%	2.2%
Putnam	492	13,694,833	7.3%	7.2%
Quitman	38	1,477,507	9.7%	14.6%
Richmond	1,878	115,120,724	1.8%	3.0%
Rockdale	1,036	48,637,184	3.5%	4.4%
Screven	62	1,657,927	1.8%	1.8%
Spalding	89	2,152,278	0.4%	0.3%
Stephens	614	20,085,572	6.3%	6.7%
Stewart	23	825,617	1.8%	2.2%
Sumter	388	10,737,348	3.3%	3.3%
Tattnall	123	3,906,365	2.2%	2.6%
Thomas	547	14,964,803	2.6%	2.2%
Tift	159	5,745,987	0.9%	1.0%
Toombs	283	9,863,997	2.4%	3.0%
Turner	140	4,621,807	6.9%	8.8%
Upton	360	11,463,942	4.8%	5.1%
Walton	281	10,414,815	1.6%	1.7%
Ware	601	17,371,638	4.2%	4.0%
Washington	85	2,957,376	1.2%	1.4%
Wayne	1,038	67,914,058	12.5%	23.7%
Webster	159	4,479,119	33.8%	35.7%
Wheeler	153	4,823,026	11.2%	12.5%
White	80	1,787,983	1.3%	1.1%
Whitfield	529	17,561,177	1.0%	0.9%
Wilkinson	156	4,842,394	5.4%	4.2%
Worth	58	1,214,026	1.7%	1.2%
Group 1	78	1,839,280		
Group 2	674	22,601,797		
Group 3	1,253	42,112,526		
Group 4	903	38,954,606		
Group 5	180	6,259,078		
Group 6	507	26,131,055		
Group 7	1,643	97,368,402		
Group 8	293	7,808,417		
Group 9	871	29,248,906		
Group 10	33	881,124		
Non-County	303	16,292,851		
State Total	48,519	2,163,680,341		

Table 4-6: Counties Included in Each Group

<u>Group 1</u>	<u>Group 2</u>	<u>Group 3</u>
Rabun	Coweta	Columbia
Towns	Heard	Glascok
Union	Meriwether	Hancock
Dawson	Troup	Lincoln
		McDuffie
		Taliaferro
		Warren
		Wilkes
<u>Group 4</u>	<u>Group 5</u>	<u>Group 6</u>
Chattahoochee	Candler	Liberty
Crawford	Emanuel	Long
Macon	Treutlen	McIntosh
Marion		
Peach		
Schley		
Talbot		
Taylor		
<u>Group 7</u>	<u>Group 8</u>	<u>Group 9</u>
Calhoun	Baker	Ben Hill
Clay	Decatur	Crisp
Dougherty	Miller	Dodge
Lee	Seminole	Dooly
Randolph		Irwin
Terrell		Pulaski
		Telfair
		Wilcox
<u>Group 10</u>		Twiggs
Dade		
Walker		

References

Bureau of Economic Analysis Input-Output Sectors as contained in “IMPLAN Pro: Data Guide,” Minnesota IMPLAN Group, Inc., Stillwater, Minn., 2007.

Georgia Department of Labor, ES202 Wage and Employment Data: 2009.

Koehler, Mathew, “Black Liquor Scorecard: Pulp and Paper Companies Take \$6.5 Billion from U.S. Taxpayers in 2009,” NewWest.Net, March 17, 2010
http://www.newwest.net/main/article/black_liquor_scorecard_pulp_amp_paper_companies_take_65_billion_from_us_tax/

North American Industrial Classification System (NAICS),
<http://www.census.gov/epcd/www/naicstab.htm>

USDA, Conservation Reserve Program, “Monthly Summary December 2009,”
<http://www.fsa.usda.gov/FSA/webapp?area=home&subject=copr&topic=rns-css>

USDA, Biomass Crop Assistance Program,”BCAP CHST Summary Report,”
http://www.fsa.usda.gov/Internet/FSA_File/bcap_chst_summary_report.pdf

U.S. Department of Labor, Bureau of Labor Statistics, “Employer Costs for Employee Compensation,” <http://data.bls.gov/cgi-bin/surveymost>