GEORGIA FORESTRY COMMISSION

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Economic Benefits of the Forestry Industry in Georgia 2010

Final Report

Economic Benefits of the Forestry Industry in Georgia: 2010

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 2010. Economic activity is measured by output (similar to sales revenue), employment, and compensation (defined as wages and salaries including benefits). These measures are traditionally used in this type of analysis.

Table E-1 shows the forestry industry employed 43,525 in all industry sectors combined, paid an annual compensation of over $2.6 billion, and had estimated total revenue of almost $14.5 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 2010

Sector	Output	Employment	Compensation
Forestry Management, Logging, and Misc. Forest Products	$901,611,429	5,050	$239,260,315
Lumber and Wood Preservation	$1,175,765,179	4,902	$237,566,082
Veneer, Plywood, Reconstituted, and Engineered Wood	$667,158,657	3,025	$162,897,921
Prefabricated Wood Buildings and Manufactured Housing	$188,563,707	1,409	$44,457,581
Pulp and Paper Products	$9,662,711,882	16,939	$1,412,486,022
Woodworking and Paper Industries Machinery	$112,815,060	473	$28,127,896
Wooden Furniture, Cabinets, Custom Arch. & Millwork	$872,492,396	5,905	$248,575,189
Windows and Doors	$390,227,522	2,252	$99,890,060
Containers, Showcases, Partitions, and Shelving	$523,979,272	3,470	$151,109,515
Total	$14,495,325,105	43,425	$2,624,370,581

The result of the multiplier effect, given by total impacts (which includes the economic activity in Table E-1[1]), is also measured by output, employment, and income and is

[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.

shown in Table E-2. Total economic activity supported by the forestry industry in Georgia (including the multiplier effect, forestry-related bioenergy firms and federal payments to landowners of about $35.6 million) is almost $23.7 billion. This activity employs 108,112 people whose compensation is almost $5.4 billion.

Table E-2: Total Benefits by Major Industry Sector 2010

Sector	Output	Employment	Compensation
Agriculture, Forestry, Fishing and Hunting	$978,785,060	6,761	$278,259,485
Mining	$13,972,631	63	$4,305,614
Utilities	$688,580,697	859	$96,866,397
Construction	$126,737,224	1,260	$39,419,713
Manufacturing	$14,043,694,978	39,479	$2,454,457,304
Wholesale Trade	$1,127,560,668	5,711	$428,173,249
Retail Trade	$406,343,900	7,113	$199,174,047
Transportation and Warehousing	$769,069,482	5,194	$233,841,151
Information	$486,694,239	1,358	$103,474,119
Finance and Insurance	$844,504,877	3,331	$200,363,890
Real Estate and Rental	$1,135,230,714	3,611	$52,028,267
Professional, Technical, and Scientific Services	$635,902,481	4,740	$250,874,962
Management of Companies	$381,254,780	1,837	$192,806,438
Administrative and Waste Services	$384,583,681	6,023	$163,187,087
Educational Services	$87,673,047	1,264	$46,381,554
Health and Social Services	$658,104,746	6,305	$309,103,671
Arts, Entertainment and Recreation	$76,370,972	1,357	$27,054,889
Accommodation and Food Services	$294,727,267	4,881	$100,020,777
Other Services	$326,935,400	6,010	$133,888,468
Government and Non-NAICS Industries	$176,177,531	954	$62,859,951
Total	$23,642,904,375	108,112	$5,376,541,034

Another way to examine the forestry industry in Georgia is to compare it with other manufacturing sectors. Table E-3 lists 2010 income and employment totals for each major industry sector sorted by employment. These data show that forestry ranks second in total employment and in total wages and salaries. Food processing ranks first in income and employment, and textiles (mostly carpet) is third in employment, but fifth in wages and salaries. Transportation equipment manufacturing is third in wages and salaries, and fourth in employment, reflecting the relatively higher salaries in this sector.

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 $448 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 almost $166 million for 2010.

Table E-3: Comparison of Georgia Industries 2010

Sector	Employment	Wages & Salaries
Food Processing	53,780	$2,749,794,288
Forestry Industry	43,425	$1,956,747,636
Textiles	30,809	$1,118,973,995
Transportation Equipment	29,089	$1,580,765,086
Fabricated Metal Products	21,348	$880,798,789
Machinery	18,940	$965,970,325
Chemicals	18,138	$1,194,823,336
Printing	14,103	$640,717,408
Electrical Equipment and Appliances	10,648	$625,673,868
Computers and Electronic Products	9,954	$840,770,606
Apparel	3,422	$97,791,055

Table E-4: Fiscal Impact Analysis 2010

Annual State Government Revenues	$447,793,754
Annual State Government Costs	$281,949,751
Net Annual Revenues	$165,844,002

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 2010. 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 2010								
(Dollars in millions; Employment in persons)								
Forestry Industry Economic Activity	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Output	$12,679	$14,163	$16,150	$17,760	$18,459	$18,270	16,906	$14,495
Employment	65,706	67,633	67,694	67,733	64,192	57,812	48,519	43,425
Compensation	$3,007	$3,299	$3,422	$3,513	$3,394	$3,131	2,770	$2,624
		Year to Year Percent Change						
Output		11.70%	14.04%	9.97%	3.93%	-1.02%	-7.47%	-14.26%
Employment		2.93%	0.09%	0.06%	-5.23%	-9.94%	-16.07%	-10.50%
Compensation		9.71%	3.71%	2.67%	-3.38%	-7.75%	-11.52%	-5.27%
Total Impacts	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Output	$20,199	$22,729	$25,972	$27,738	$28,547	$28,723	$27,200	$23,643
Employment	136,022	144,944	154,147	149,347	141,155	128,388	118,423	108,112
Compensation	$5,600	$6,276	$6,827	$6,773	$6,696	$6,514	$5,561	$5,377
		Year to Year Percent Change						
Output		12.53%	14.27%	6.80%	2.92%	0.61%	-5.30%	-13.08%
Employment		6.56%	6.35%	-3.11%	-5.49%	-9.04%	-7.76%	-8.71%
Compensation		12.07%	8.77%	-0.79%	-1.13%	-2.71%	-14.64%	-3.32%
Fiscal Impact	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
State Revenues	$514	$546	$591	$580	$566	$539	$472	$448
State Costs	$368	$392	$414	$400	$373	$333	$314	$282
Net Revenues	$147	$155	$176	$180	$193	$206	$158	$166
Source: EII 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 (2009-2010) show declines in all measures with the greatest declines seen in forestry activity employment (21percent) followed by activity output and compensation (about 25 and 16 percent, respectively). Total impacts also declined for the forestry industry, though by smaller percentages. Total output declined the most, at 13 percent followed by total employment at about 9 percent, and total compensation at about 3%.

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 came from 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. Also, firms tend to reduce inventory during economic contractions but because output is measured by firm revenues, their revenues are larger than their actual production.

As inventories are exhausted, production levels begin to reflect actual market demands, as reflected in the sharp decline (-14 percent) in output for 2009-2010. Total output declined by a lesser amount (-13 percent). Employment declined somewhat less (-10 percent and -9 percent for industry activity and total impacts, respectively) with compensation declining the least.

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 2010

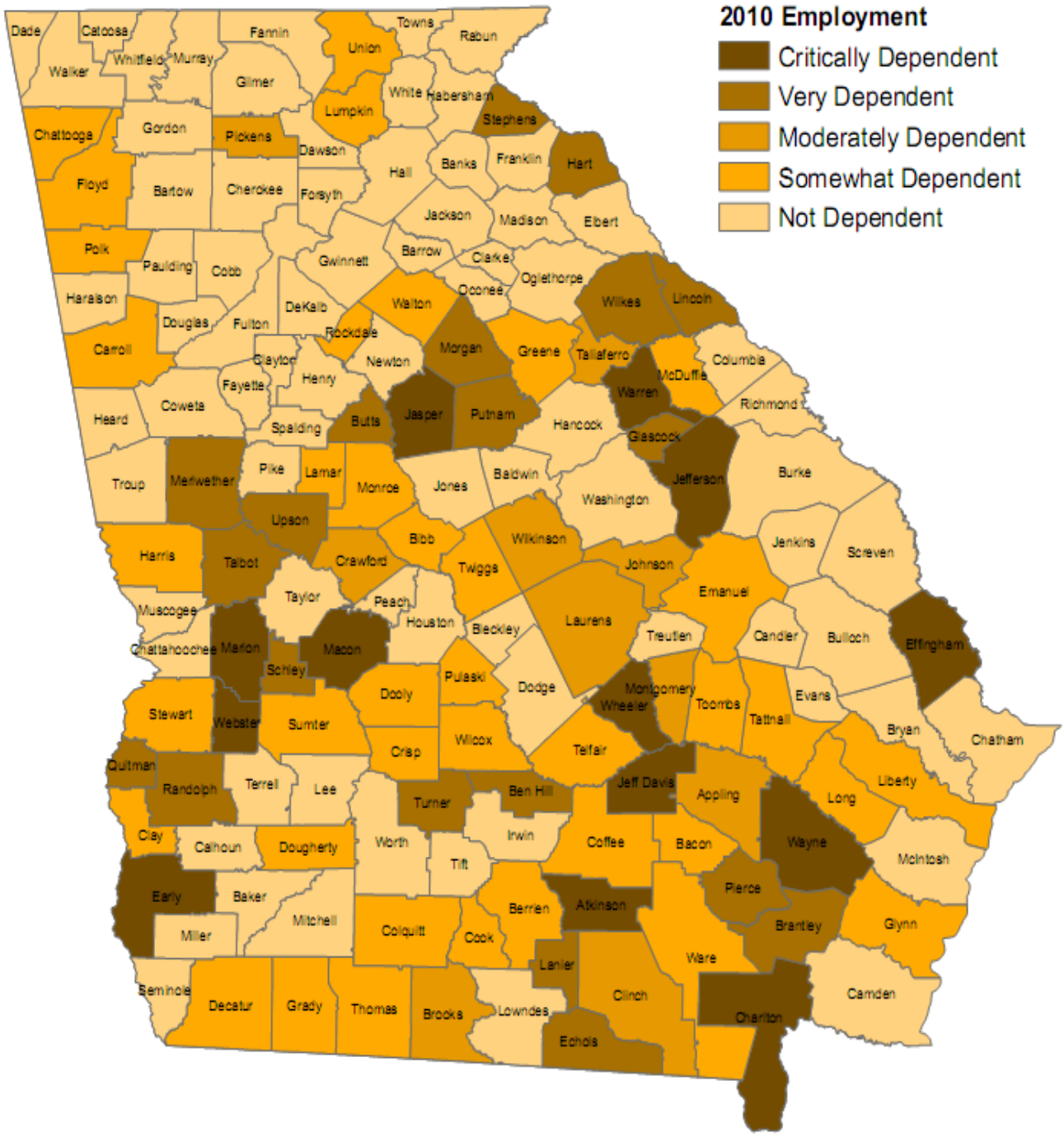
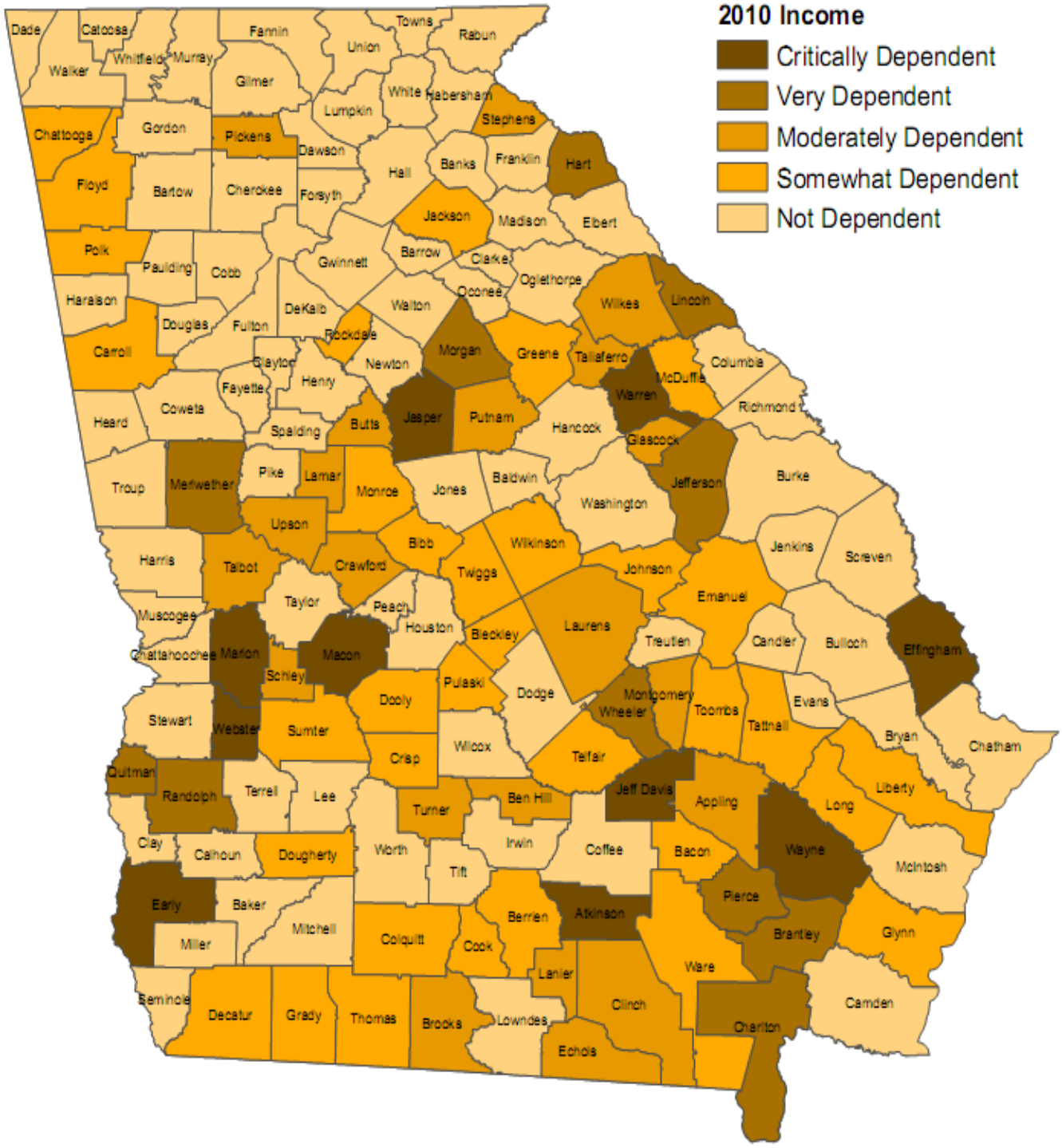


Figure E-2
Forestry Dependency Based on Income 2009



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

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	*Wood Kitchen Cabinet and Countertop Manufacturing*
33712	Household and Institutional Furniture Making
337121	*Upholstered Household Furniture Manufacturing*
337122	*Non-Upholstered Wood Household Furniture Manufacturing*
337127	*Institutional Furniture Manufacturing*
337129	*Wood Television, Radio, and Sewing Machine Cabinet Manufacturing*
337211	*Wood Office Furniture Manufacturing*
337212	*Custom Architectural Woodwork and Millwork Manufacturing*
337215	*Showcase, Partition, Shelving, and Locker Manufacturing*
333	Machinery Manufacturing
3332	Industrial Machinery Manufacturing
33321	*Sawmill and Woodworking Machinery Manufacturing*
33329	Other Industrial Machinery Manufacturing
333291	*Paper Industry Machinery Manufacturing*
339	Miscellaneous Manufacturing
3399	Other Miscellaneous Manufacturing
33999	All Other Miscellaneous Manufacturing
339995	*Burial Casket Manufacturing*

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.

A new industry sector was added in this report. It is not a large sector (for now), but it has the potential to grow significantly. It includes all those firms producing products related to bioenergy that are derived from forest products. Eight firms were identified by GFC personnel that were included in the analysis. Of the eight firms, two were confirmed to be in existing forestry-related sectors, i.e., fuel pellets from forestry wastes, which is included in miscellaneous wood products. Two other firms could not be verified in the Department of Labor data, but their products (wood pellets, and briquettes and fireplace logs) should already include them in the data, perhaps under a different name or as a subsidiary of a larger firm which files its tax forms from a different location. The four remaining firms are in disparate industry sectors, so their impact is included under Miscellaneous Wood Products. The total employment for this sector is 130 persons, with 55 persons employed in sectors not previously included.

The level of economic activity in each forestry industry component is measured by output, employment, and income. Measures for the 2010 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 43,425 and these jobs earned annual compensation (total wages and salaries including benefits) of over $2.6 billion from estimated total revenue of almost $14.5 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 16,939 workers followed by wooden furniture and cabinets with 5,905.

Compensation, like employment, is dominated by pulp and paper with slightly over $1.4 billion (about half the total) followed distantly by wood furniture and cabinets at about $249 million and Forestry Management and Logging at almost $240 million. The largest outputs are produced by pulp and paper (about $9.7 billion, or about 2/3 of the total) followed by Lumber and Wood Preservation (almost $1.2 billion) Forestry Management and Logging, (about $902 million) and wooden furniture, cabinets and millwork at almost $873 million.

Table 2-2: Georgia Forestry Industry Economic Activity 2010

Sector	Output	Employment	Compensation
Forestry Management, Logging, and Misc. Forest Products	$901,611,429	5,050	$239,260,315
Lumber and Wood Preservation	$1,175,765,179	4,902	$237,566,082
Veneer, Plywood, Reconstituted, and Engineered Wood	$667,158,657	3,025	$162,897,921
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Pulp and Paper Products	$9,662,711,882	16,939	$1,412,486,022
Woodworking and Paper Industries Machinery	$112,815,060	473	$28,127,896
Wooden Furniture, Cabinets, Custom Arch. & Millwork	$872,492,396	5,905	$248,575,189
Windows and Doors	$390,227,522	2,252	$99,890,060
Containers, Showcases, Partitions, and Shelving	$523,979,272	3,470	$151,109,515
Total	$14,495,325,105	43,425	$2,624,370,581

Table 2-3 provides a comparison of the forestry industry activity for 2004 to 2010. 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.

For the most recent period, output was down in all sectors except Machinery, which showed a 31 percent increase, (albeit from a very small base) and Veneer, Plywood, Reconstituted and Engineered Wood Products, which shows small gains. The largest absolute decline was in Pulp and Paper, but the greatest percent decline in output was in Forestry Management and Logging. Employment, like output, declined in every sector except Machinery and, Veneer and Plywood . Also, like output, the greatest absolute decline was in Pulp and Paper, but the largest percentage decline (-28 percent) was in Prefab Wooden Buildings and Manufactured Housing.

Employee compensation was not quite as dismal as the other parameters in that four sectors showed increases, albeit quite small ones. Machinery showed the largest percentage increase but this was an increase on a very small base. The largest absolute decline was in Pulp and Paper (-$82 million) and the greatest percentage decline was seen in Prefab Wooden Buildings and Manufactured Housing (-33 percent).

Table 2-3: Forestry Industry Activity 2004 - 2010 Comparison

	Output (Millions of Dollars)						
Sector	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Forestry Management, Logging, and Misc. Forest Products	$1,384	$1,447	$1,846	$1,807	$1,698	$1,454	$902
Lumber and Wood Preservation	$1,482	$1,811	$2,057	$2,100	$1,732	$1,359	$1,176
Veneer, Plywood, Reconstituted, and Engineered Wood	$1,062	$1,290	$1,260	$1,322	$961	$664	$667
Prefabricated Wood Buildings and Manufactured Housing	$388	$561	$596	$523	$427	$252	$189
Pulp and Paper Products	$7,888	$8,808	$9,590	$10,131	$10,856	$11,018	$9,663
Woodworking and Paper Industries Machinery	$47	$53	$52	$61	$67	$86	$113
Wooden Furniture, Cabinets, Custom Arch. & Millwork	$1,115	$1,241	$1,366	$1,374	$1,153	$996	$872
Windows and Doors	$344	$406	$446	$517	$721	$497	$390
Containers, Showcases, Partitions, and Shelving	$454	$533	$548	$624	$654	$579	$524
Total	$14,163	$16,150	$17,760	$18,459	$18,270	$16,906	$14,495
	Employment						
	2004	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Forestry Management, Logging, and Misc. Forest Products	6,005	6,133	6,152	5,914	5,529	5,119	5,050
Lumber and Wood Preservation	8,505	8,839	8,957	8,773	6,477	5,469	4,902
Veneer, Plywood, Reconstituted, and Engineered Wood	6,588	7,110	6,963	6,004	4,448	3,137	3,025
Prefabricated Wood Buildings and Manufactured Housing	3,494	4,531	4,500	3,581	2,983	1,949	1,409
Pulp and Paper Products	25,032	23,150	22,861	21,651	20,816	18,936	16,939
Woodworking and Paper Industries Machinery	292	319	314	304	295	300	473
Wooden Furniture, Cabinets, Custom Arch. & Millwork	10,164	10,378	1,770	10,189	8,235	6,827	5,905
Windows and Doors	2,522	2,446	2,598	3,043	3,967	2,973	2,252
Containers, Showcases, Partitions, and Shelving	5,031	4,788	4,618	4,733	4,506	3,809	3,470
Total	67,633	67,694	67,733	64,192	57,812	48,519	43,425
	Compensation (Millions of Dollars)						
	2004	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Forestry Management, Logging, and Misc. Forest Products	$234	$254	$267	$273	$255	$238	$239
Lumber and Wood Preservation	$353	$385	$400	$391	$282	$250	$238
Veneer, Plywood, Reconstituted, and Engineered Wood	$312	$341	$353	$291	$211	$158	$163
Prefabricated Wood Buildings and Manufactured Housing	$122	$164	$165	$119	$99	$66	$44
Pulp and Paper Products	$1,616	$1,595	$1,630	$1,602	$1,565	$1,494	$1,412
Woodworking and Paper Industries Machinery	$18	$20	$18	$19	$18	$17	$28
Wooden Furniture, Cabinets, Custom Arch. & Millwork	$359	$389	$404	$393	$330	$271	$249
Windows and Doors	$104	$104	$100	$115	$173	$126	$100
Containers, Showcases, Partitions, and Shelving	$181	$169	$175	$191	$172	$150	$151
Total	$3,299	$3,422	$3,513	$3,394	$3,131	$2,770	$2,624

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

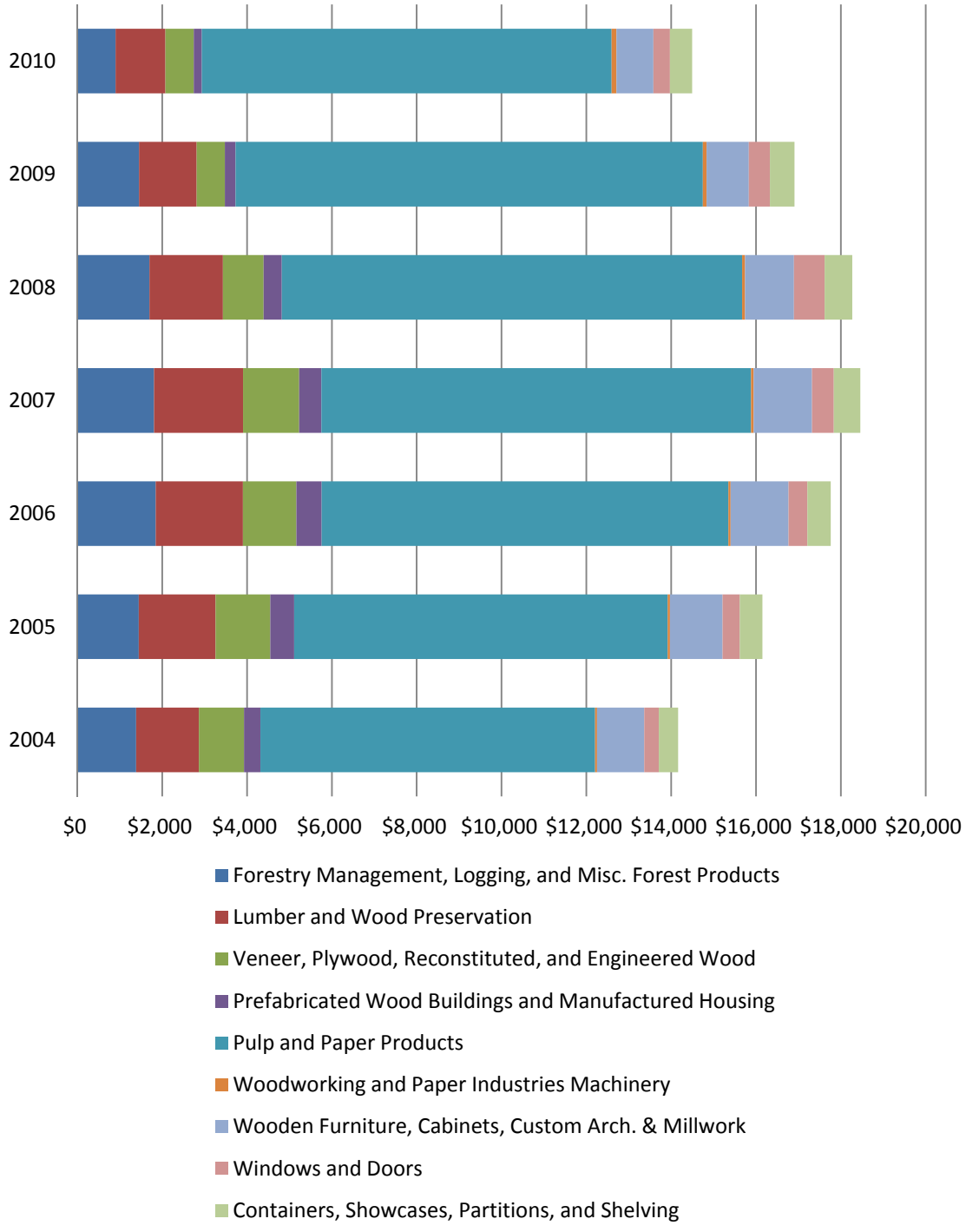


Figure 2-2 Forestry Industry Economic Activity: Employment by Sector

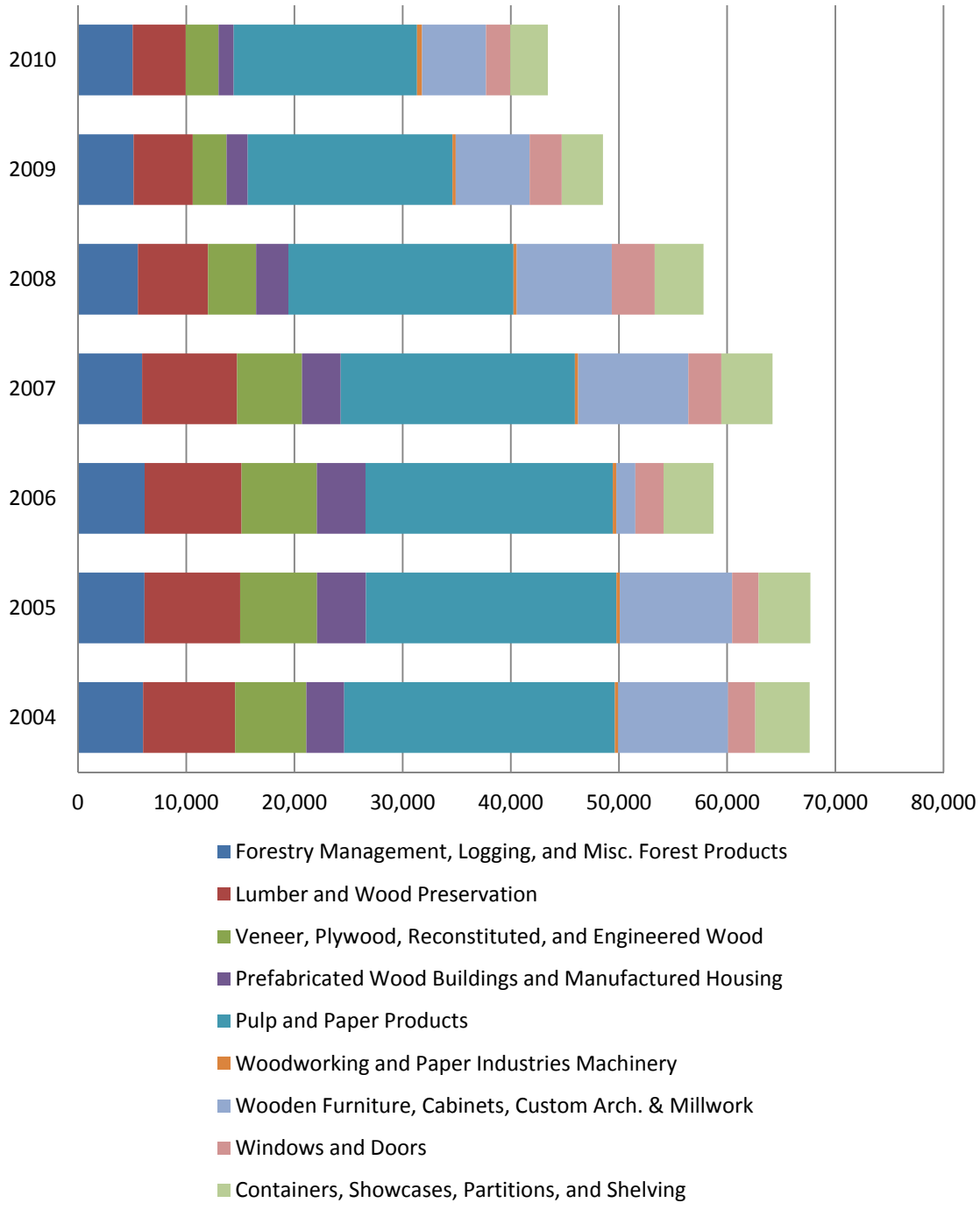
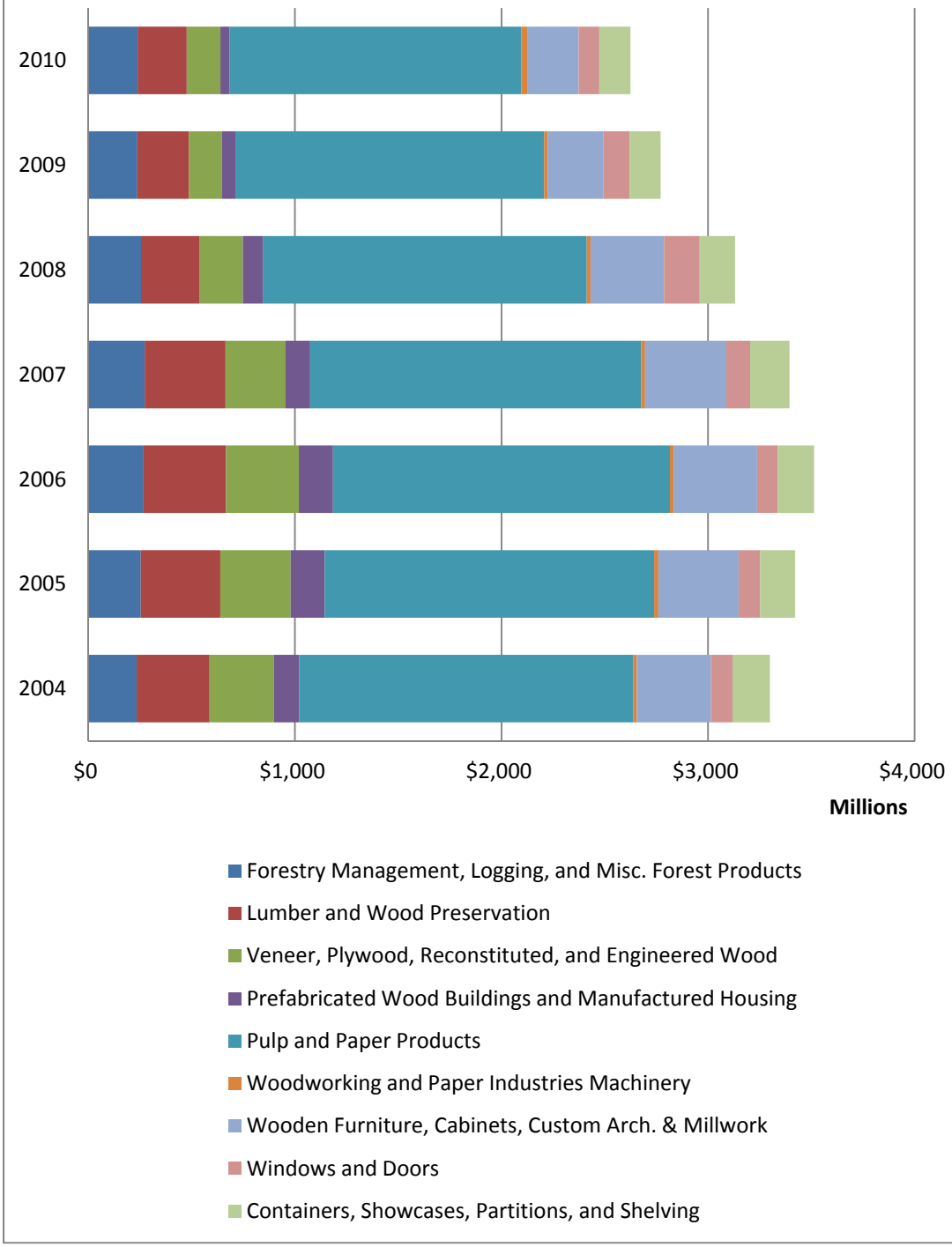


Figure 2-3 Forestry Industry Economic Activity: Compensation by Sector (Dollars in Millions)



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 2010, whereas the wage and salary data available to IMPLAN is from 2009.

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 2010. 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 2010 – 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 in employment and compensation, and about 71 percent of the industry in output . The entire forestry industry (totals in Table 3-1) is estimated to export (to a non-Georgia destination) almost $12.8 billion with this activity supporting 35,661 jobs with an employee compensation of over $2.2 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 2010

Sector	Output	Employment	Compensation
Forestry Management, Logging, and Misc. Forest Products	$168,586,448	414	$27,180,635
Lumber and Wood Preservation	$782,404,330	3,262	$158,086,622
Veneer, Plywood, Reconstituted, and Engineered Wood	$612,135,875	2,786	$149,287,483
Prefabricated Wood Buildings and Manufactured Housing	$187,631,454	1,402	$44,241,211
Pulp and Paper Products	$9,185,011,197	16,238	$1,347,460,507
Woodworking and Paper Industries Machinery	$107,329,348	450	$26,760,156
Wooden Furniture, Cabinets, Custom Arch. & Millwork	$728,605,435	4,976	$203,665,935
Windows and Doors	$506,656,201	2,975	$138,210,489
Containers, Showcases, Partitions, and Shelving	$481,280,613	3,158	$139,241,779
Total	$12,759,640,901	35,661	$2,234,134,818

The largest sector impacts are seen, not surprisingly, in the manufacturing sector, with some $14 billion in output, 39,479 employees, and about $2.5 billion in compensation. A distant second (in employment) is held by agriculture, forestry, fishing and hunting (which includes logging and nurseries), with almost 6,761 employees. The second largest sector in employee compensation is Health and Social Services, with about $309 million. Together, the economic activity supported by Georgia's forestry industry (including federal payments to landowners of about $35.6 million) totals over $23.6 billion, involving employment of 108,112 people whose compensation is about $5.4

billion. This employment represents about 2.73 percent and 2.9 percent of total Georgia employment, and wages and salaries, respectively.

Table 3-2: Total Benefits by Major Industry Sector 2010

Sector	Output	Employment	Compensation
Agriculture, Forestry, Fishing and Hunting	$978,785,060	6,761	$278,259,485
Mining	$13,972,631	63	$4,305,614
Utilities	$688,580,697	859	$96,866,397
Construction	$126,737,224	1,260	$39,419,713
Manufacturing	$14,043,694,978	39,479	$2,454,457,304
Wholesale Trade	$1,127,560,668	5,711	$428,173,249
Retail Trade	$406,343,900	7,113	$199,174,047
Transportation and Warehousing	$769,069,482	5,194	$233,841,151
Information	$486,694,239	1,358	$103,474,119
Finance and Insurance	$844,504,877	3,331	$200,363,890
Real Estate and Rental	$1,135,230,714	3,611	$52,028,267
Professional, Technical, and Scientific Services	$635,902,481	4,740	$250,874,962
Management of Companies	$381,254,780	1,837	$192,806,438
Administrative and Waste Services	$384,583,681	6,023	$163,187,087
Educational Services	$87,673,047	1,264	$46,381,554
Health and Social Services	$658,104,746	6,305	$309,103,671
Arts, Entertainment and Recreation	$76,370,972	1,357	$27,054,889
Accommodation and Food Services	$294,727,267	4,881	$100,020,777
Other Services	$326,935,400	6,010	$133,888,468
Government and Non-NAICS Industries	$176,177,531	954	$62,859,951
Total	$23,642,904,375	108,112	$5,376,541,034
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 2010. 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 2010

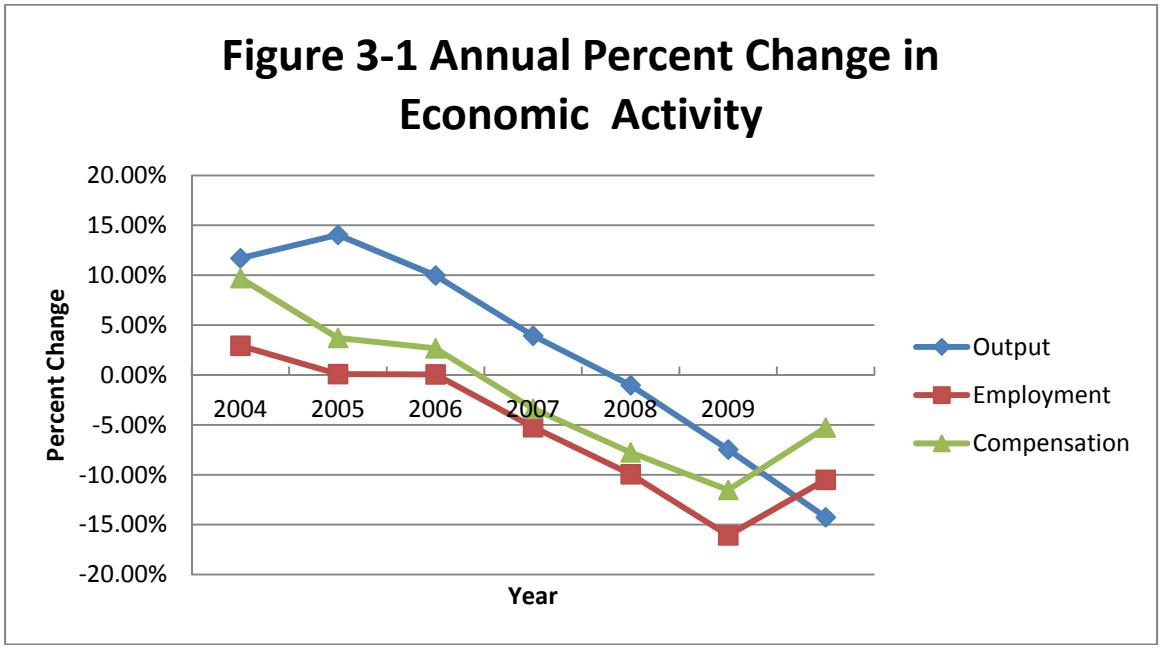
(Dollars in millions; Employment in persons)								
Forestry Industry Economic Activity	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Output	$12,679	$14,163	$16,150	$17,760	$18,459	$18,270	16,906	$14,495
Employment	65,706	67,633	67,694	67,733	64,192	57,812	48,519	43,425
Compensation	$3,007	$3,299	$3,422	$3,513	$3,394	$3,131	2,770	$2,624
		Year to Year Percent Change						
Output		11.70%	14.04%	9.97%	3.93%	-1.02%	-7.47%	-14.26%
Employment		2.93%	0.09%	0.06%	-5.23%	-9.94%	-16.07%	-10.50%
Compensation		9.71%	3.71%	2.67%	-3.38%	-7.75%	-11.52%	-5.27%
Total Impacts	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Output	$20,199	$22,729	$25,972	$27,738	$28,547	$28,723	$27,200	$23,643
Employment	136,022	144,944	154,147	149,347	141,155	128,388	118,423	108,112
Compensation	$5,600	$6,276	$6,827	$6,773	$6,696	$6,514	$5,561	$5,377
		Year to Year Percent Change						
Output		12.53%	14.27%	6.80%	2.92%	0.61%	-5.30%	-13.08%
Employment		6.56%	6.35%	-3.11%	-5.49%	-9.04%	-7.76%	-8.71%
Compensation		12.07%	8.77%	-0.79%	-1.13%	-2.71%	-14.64%	-3.32%
Fiscal Impact	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
State Revenues	$514	$546	$591	$580	$566	$539	$472	$448
State Costs	$368	$392	$414	$400	$373	$333	$314	$282
Net Revenues	$147	$155	$176	$180	$193	$206	$158	$166

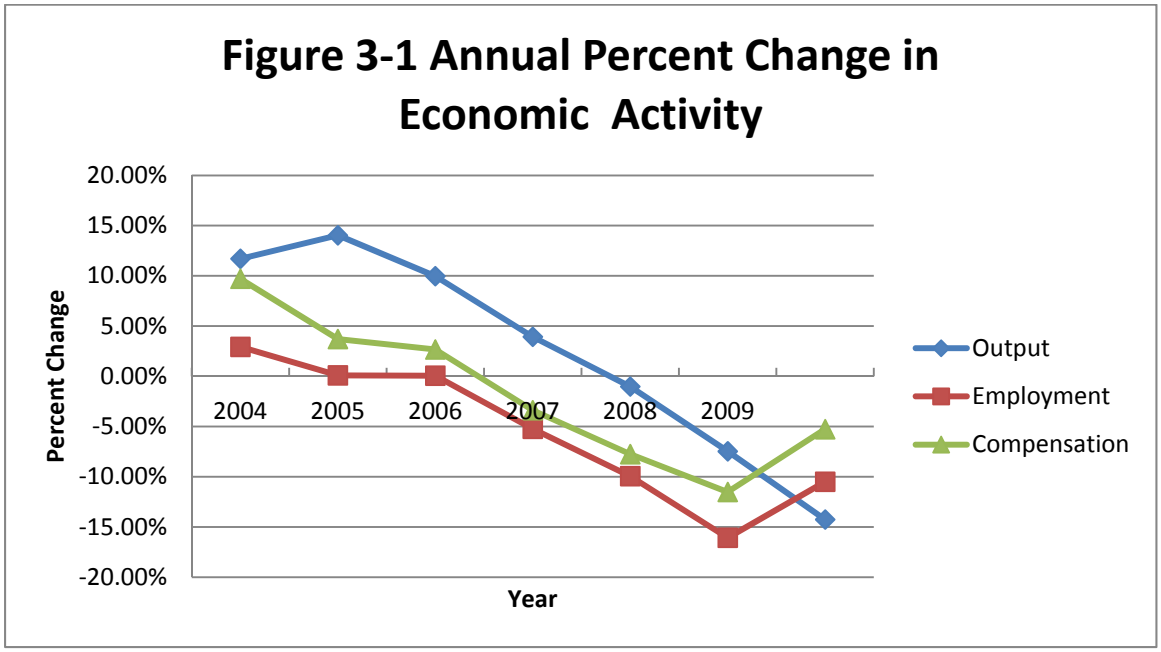
Source: EII impact assessments and Georgia Department of Labor, Current Employment and Wages.

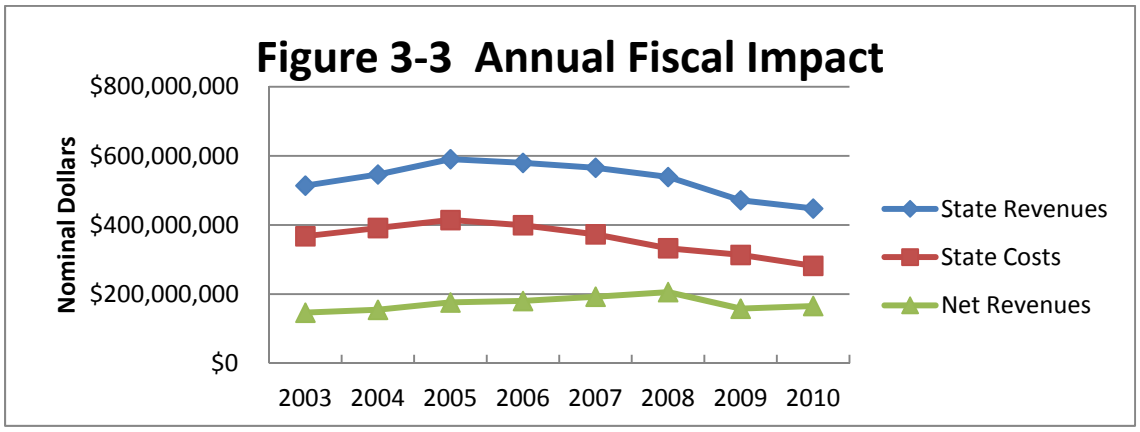
Comparing 2009 with 2010, the decline in industry activity accelerates with output declining by about 14 percent. Employment and compensation, however, declined by smaller percentages, compared to the previous year with declines of almost 11 percent and 5.3 percent, respectively. Total impacts did not decline as much in percentage terms in all parameters probably because compensation declined the least, and induced impacts are almost completely dependent on income. In the fiscal impact analysis, both revenues and costs declined, but because the cost decline was slightly larger than the revenue decline, net revenues actually increased slightly.

The annual percent change information in Table 3-3 is presented graphically below for output, employment, and compensation measuring levels of economic activity (Figure 3-1) followed by a similar graph measuring total economic impact (Figure 3-2). A graph of the fiscal impacts also included in Table 3-3 is provided in Figure 3-3. It should be noted

that these data are in nominal dollars and have not been adjusted for inflation. The oddest observation in these graphs is the sharp decline in output, but compensation and 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 and compensation, at least, have bottomed out.







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 in wages and salaries.

Table 3-4: Comparison of Georgia Industries 2010

Sector	Employment	Wages & Salaries
Food Processing	53,780	$2,749,794,288
Forestry Industry	43,425	$1,956,747,636
Textiles	30,809	$1,118,973,995
Transportation Equipment	29,089	$1,580,765,086
Fabricated Metal Products	21,348	$880,798,789
Machinery	18,940	$965,970,325
Chemicals	18,138	$1,194,823,336
Printing	14,103	$640,717,408
Electrical Equipment and Appliances	10,648	$625,673,868
Computers and Electronic Products	9,954	$840,770,606
Apparel	3,422	$97,791,055

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 2010

	Number of Counties	
	Employment	**Wages & Salaries**
Critically Dependent	18	11
Very Dependent	16	14
Moderately Dependent	13	22
Somewhat Dependent	49	41
Not Dependent	63	71
Total	159	159

Source: EII 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 seven years these statistics have been produced. Generally, the number of counties in each of the dependency categories has remained quite stable. For example, 2010 and 2008 are almost identical.

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	2010
Critically Dependent	19	19	22	20	18	14	18
Very Dependent	18	18	15	17	16	21	16
Moderately Dependent	20	20	18	12	13	9	13
Somewhat Dependent	49	49	50	48	49	42	49
Not Dependent	53	53	54	62	63	73	63

Table 4-4 Forestry Dependency Over Time: Income							
	Number of Counties						
	2004	2005	2006	2007	2008	2009	2010
Critically Dependent	14	14	16	12	11	10	11
Very Dependent	17	17	13	21	14	11	14
Moderately Dependent	26	26	26	17	22	23	22
Somewhat Dependent	42	42	42	40	40	38	41
Not Dependent	60	60	62	69	72	77	71

Figure 4-1
Forestry Dependency Based on Employment 2010

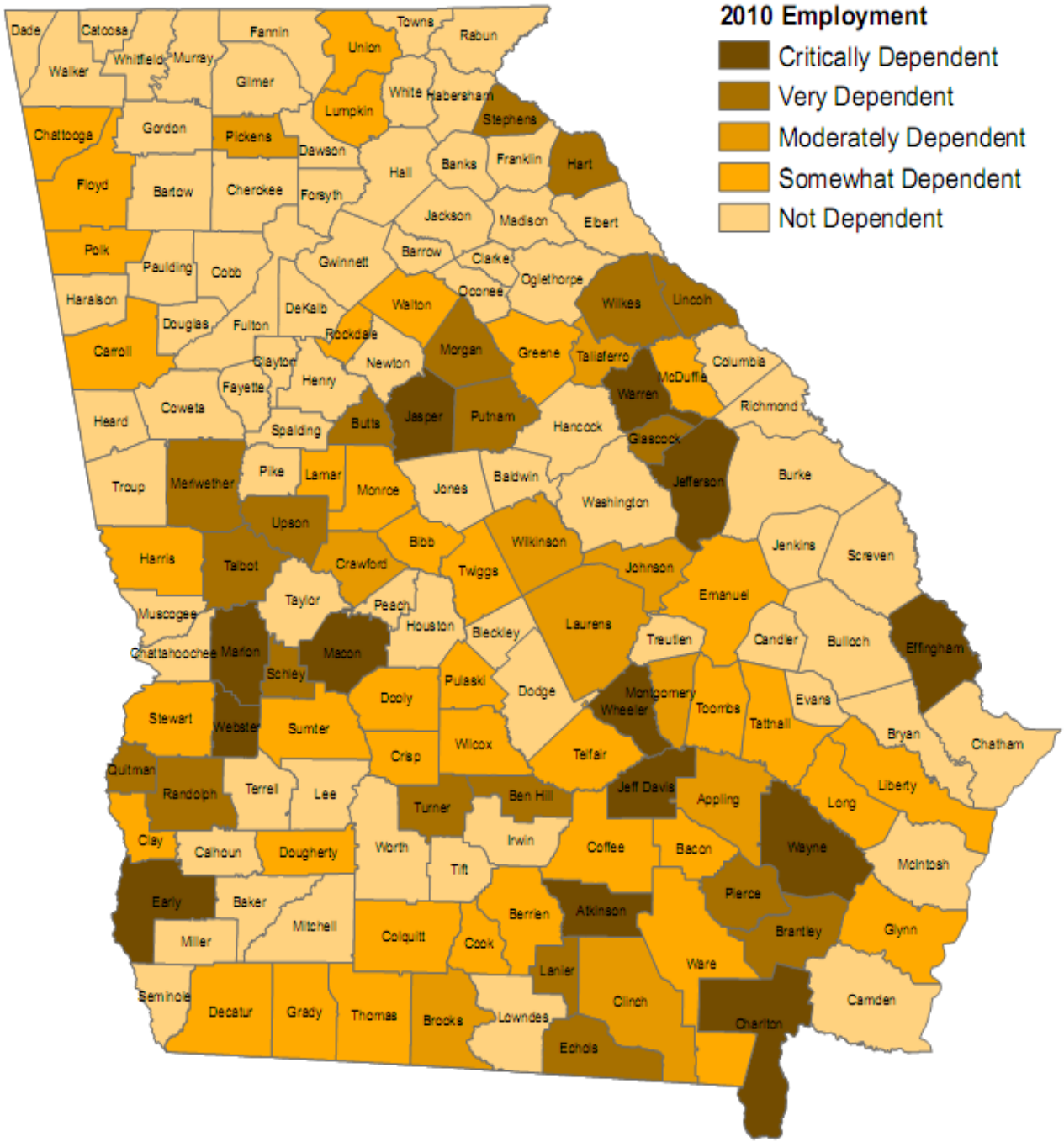


Figure 4-2
Forestry Dependency Based on Income 2010

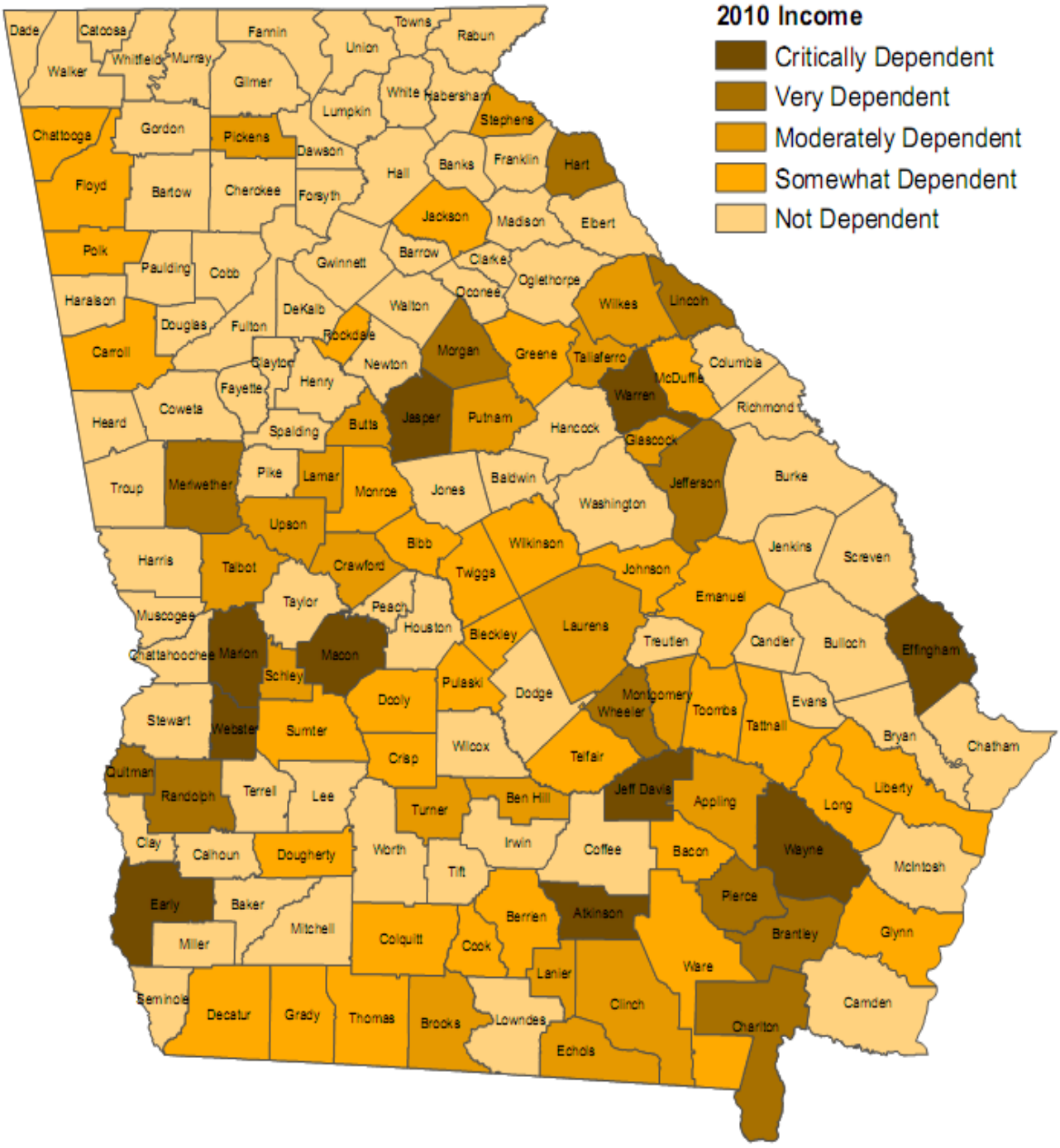


Table 4-5: Level and Percent of Forestry in County Economies				
Based on Employment and Income: 2010				
	Level of Forestry:		**Percent of Forestry to Total:**	
County	**Employment**	**Wages and Salaries**	**Employment**	**Wages and Salaries**
Appling	331	14,150,977	5.1%	6.1%
Atkinson	346	11,520,078	23.5%	25.9%
Bacon	67	2,364,276	1.9%	2.6%
Baldwin	69	2,421,933	0.4%	0.5%
Banks	46	1,119,590	1.0%	0.9%
Barrow	124	6,807,257	0.8%	1.4%
Bartow	269	11,747,063	0.9%	1.1%
Berrien	95	2,347,412	2.4%	2.1%
Bibb	1,325	77,544,297	1.7%	2.7%
Bleckley	46	1,834,353	1.3%	2.1%
Brantley	166	5,549,501	8.3%	10.5%
Brooks	171	6,076,318	5.9%	8.1%
Bryan	73	2,778,526	1.2%	1.6%
Bulloch	266	8,695,238	1.2%	1.3%
Butts	345	11,366,588	6.0%	6.7%
Camden	143	5,597,952	1.1%	1.1%
Carroll	848	43,862,509	2.4%	3.4%
Catoosa	211	6,791,960	1.6%	1.6%
Charlton	275	8,222,772	13.1%	13.8%
Chatham	1,247	80,509,863	1.0%	1.6%
Chattooga	111	3,823,720	1.9%	2.2%
Cherokee	237	7,629,356	0.5%	0.5%
Clarke	352	18,153,750	0.5%	0.8%
Clayton	330	15,471,534	0.3%	0.4%
Clinch	120	4,952,023	4.9%	7.6%
Cobb	1,622	79,056,984	0.6%	0.6%
Coffee	314	7,170,168	2.3%	1.8%
Colquitt	567	16,639,289	3.7%	4.1%
Cook	116	4,363,375	2.6%	3.9%
DeKalb	1,169	55,052,412	0.4%	0.4%
Douglas	195	11,131,639	0.5%	1.0%
Echols	56	1,541,063	7.1%	8.8%
Effingham	1,447	89,470,470	15.4%	28.0%
Elbert	23	731,153	0.4%	0.4%
Evans	35	1,700,109	0.8%	1.4%
Fannin	36	835,248	0.7%	0.6%
Floyd	1,047	62,226,579	2.8%	4.6%
Forsyth	260	9,914,631	0.5%	0.4%
Franklin	58	1,777,569	0.8%	0.9%
Fulton	2,176	122,853,943	0.3%	0.3%
Gilmer	124	3,074,212	1.6%	1.4%
Glynn	745	58,622,968	2.1%	4.6%

Gordon	94	2,466,014	0.5%	0.4%
Grady	165	5,298,704	3.0%	3.4%
Greene	116	4,074,447	2.2%	2.5%
Gwinnett	1,995	90,007,996	0.7%	0.7%
Habersham	98	2,472,748	0.7%	0.6%
Hall	326	10,538,864	0.5%	0.4%
Haralson	57	1,517,672	0.8%	0.7%
Harris	64	1,620,514	1.7%	1.6%
Hart	397	21,313,724	6.6%	11.0%
Henry	230	7,512,195	0.5%	0.5%
Houston	224	8,753,635	0.4%	0.4%
Jackson	266	14,099,498	1.5%	2.4%
Jasper	270	11,615,262	13.2%	19.8%
Jeff Davis	692	21,065,322	16.8%	18.4%
Jefferson	570	22,294,611	12.0%	14.6%
Jenkins	19	270,130	1.5%	0.9%
Johnson	99	2,094,829	5.8%	4.7%
Jones	45	1,365,475	1.3%	1.3%
Lanier	93	2,799,747	6.7%	7.6%
Laurens	1,056	45,898,110	5.9%	7.6%
Lowndes	696	19,434,008	1.5%	1.4%
Lumpkin	136	3,446,304	2.2%	1.8%
Madison	29	731,372	0.9%	0.8%
Mitchell	29	826,273	0.4%	0.4%
Monroe	136	5,560,355	2.2%	2.7%
Montgomery	77	2,846,821	4.7%	6.2%
Morgan	461	19,868,293	8.1%	11.6%
Murray	74	2,078,246	0.7%	0.6%
Muscogee	338	13,513,588	0.4%	0.4%
Newton	185	8,326,721	0.9%	1.2%
Oconee	88	2,384,486	1.1%	0.9%
Oglethorpe	11	238,659	0.6%	0.6%
Paulding	181	7,393,085	1.0%	1.3%
Pickens	300	14,503,832	4.3%	6.6%
Pierce	349	11,408,733	9.4%	10.9%
Pike	33	1,015,545	1.6%	1.7%
Polk	177	7,459,344	1.6%	2.2%
Putnam	400	11,735,048	6.3%	6.5%
Quitman	33	1,284,241	8.1%	12.4%
Richmond	1,119	56,847,482	1.1%	1.5%
Rockdale	991	47,262,888	3.4%	4.1%
Screven	36	1,122,267	1.1%	1.2%
Spalding	88	2,541,675	0.4%	0.4%
Stephens	584	19,900,140	6.3%	6.8%
Sumter	379	10,352,100	3.5%	3.3%
Tattnall	148	3,916,491	2.6%	2.5%
Thomas	498	15,326,811	2.4%	2.2%

Tift	152	5,421,571	0.8%	1.0%
Toombs	266	9,132,816	2.4%	2.7%
Turner	148	4,980,330	7.7%	9.5%
Upson	432	14,368,445	6.1%	6.8%
Walton	300	11,259,220	1.6%	1.9%
Ware	482	12,960,238	3.2%	2.9%
Washington	75	2,203,783	1.1%	1.0%
Wayne	869	55,747,024	10.7%	19.2%
Webster	143	5,107,771	30.7%	37.1%
Wheeler	167	5,444,080	12.2%	13.5%
White	69	1,579,480	1.2%	1.0%
Whitfield	452	14,419,332	0.8%	0.8%
Wilkinson	157	4,432,621	5.2%	3.6%
Worth	41	955,995	1.2%	1.0%
Group 1	141	4,469,896		
Group 2	1,130	47,134,799		
Group 3	1,161	41,298,371		
Group 4	914	39,079,838		
Group 5	211	7,485,663		
Group 6	521	27,851,988		
Group 7	2,036	130,543,169		
Group 8	342	9,385,647		
Group 9	912	29,811,704		
Group 10	23	654,753		
Non-County	233	15,835,386		
State Total	43,425	1,957,468,883		

Table 4-6: Counties Included in Each Group		
Group 1	**Group 2**	**Group 3**
Rabun	Coweta	Columbia
Towns	Fayette	Glascock
Union	Heard	Hancock
Dawson	Lamar	Lincoln
	Meriwether	McDuffie
	Troup	Taliaferro
		Warren
		Wilkes
Group 4	**Group 5**	**Group 6**
Chattahoochee	Burke	Liberty
Crawford	Candler	Long
Macon	Emanuel	McIntosh
Marion	Treutlen	
Peach		
Schley		
Stewart		
Talbot		
Taylor		
Group 7	**Group 8**	**Group 9**
Calhoun	Baker	Ben Hill
Clay	Decatur	Crisp
Dougherty	Miller	Dodge
Early	Seminole	Dooly
Lee		Irwin
Randolph		Pulaski
Terrell	**Group 10**	Telfair
	Dade	Twiggs
	Walker	Wilcox

References

Bureau of Economic Analysis Input-Output Sectors as contained in "IMPLAN Pro: Data Guide," Minnesota IMPLAN Group, Inc., Stillwater, Minn., 2009.

Georgia Department of Labor, ES202 Wage and Employment Data: 2010.

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

USDA, Conservation Reserve Program, "Monthly Summary December 2010," 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

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