



ECONOMIC CONTRIBUTIONS OF THE NORTH CAROLINA FOREST EXPORT CHAIN

Eric McConnell, Ph.D. and Clay Altizer, Ph.D.

ECONOMIC CONTRIBUTIONS OF THE NORTH CAROLINA FOREST EXPORT CHAIN

Eric McConnell, PhD
Louisiana Tech University
Ruston, LA

Clay Altizer, PhD
North Carolina Forest Service
Raleigh, NC

Summary

Exports bring new money into the economy, which recirculates many times over across hundreds of sectors before leaving the region to purchase imports. Exports were a key component of the United States economy coming out of the “Great Recession.” Forest products exports in 2016 were valued nationally at \$38.3 billion. The international shipment of forest products places North Carolina in a competitive position.

This report explores a unique approach to quantify the value of the forest export chain, including the manufacturing facilities that export, wholesalers/brokers, transporters, and port service providers. In this executive summary, we’ll describe North Carolina’s forest resource, our forest products manufacturing capacity, the economic contribution of North Carolina’s forestry exports, and opportunities for export growth.

The Forest Resource

The USDA Forest Service recently reported timberland covers more than half- in fact 58%- of North Carolina’s total land area, or 18.13 million acres in 2016. This was an increase of nearly a quarter-million acres compared to the previously conducted inventory in 2013. Timberland volume across all species summed to 40.89 billion cubic feet. Net annual growth of timber on timberland was 1.63 billion cubic feet. Conversely, 877 million cubic feet were removed via harvesting or land conversion. The growth-to-drain ratio for 2016, therefore, was 1.86. Mortality removed an additional 340 million cubic feet of timber from the inventory.

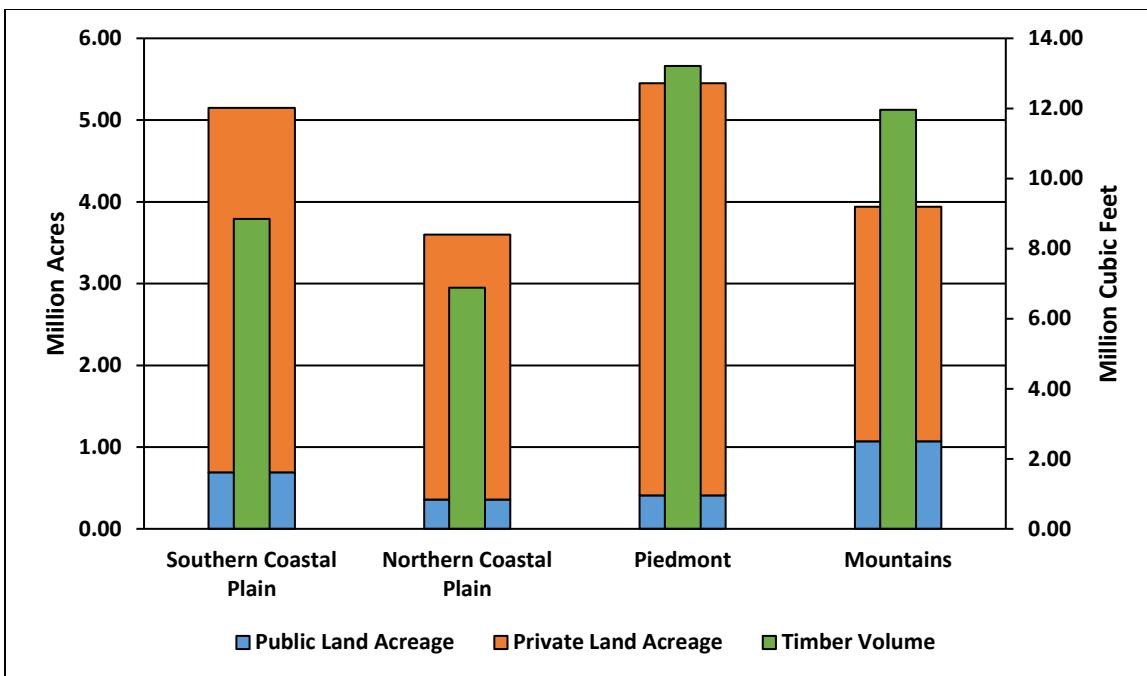


Figure 1. North Carolina timberland area and volume by survey region.

Industry Structure and Production

There are 141 forest product mills in North Carolina producing over 673.6 million cubic feet of wood annually for primary products including pulp, paper, lumber, poles, panels, biomass and other commodity products. The majority of that volume, 52%, was comprised of higher valued timber products, including sawlogs and veneer logs. While the overall timber product output increased 2% from 2013, this was due to a 10% increase in the hardwood industry; softwood production fell by almost 1%. Both sawlog and pulpwood experienced production increases, but veneer log production declined. While bioenergy-based wood production decreased 30% from 2013 to 2015, the number of bioenergy mills increased from 3 to 8.

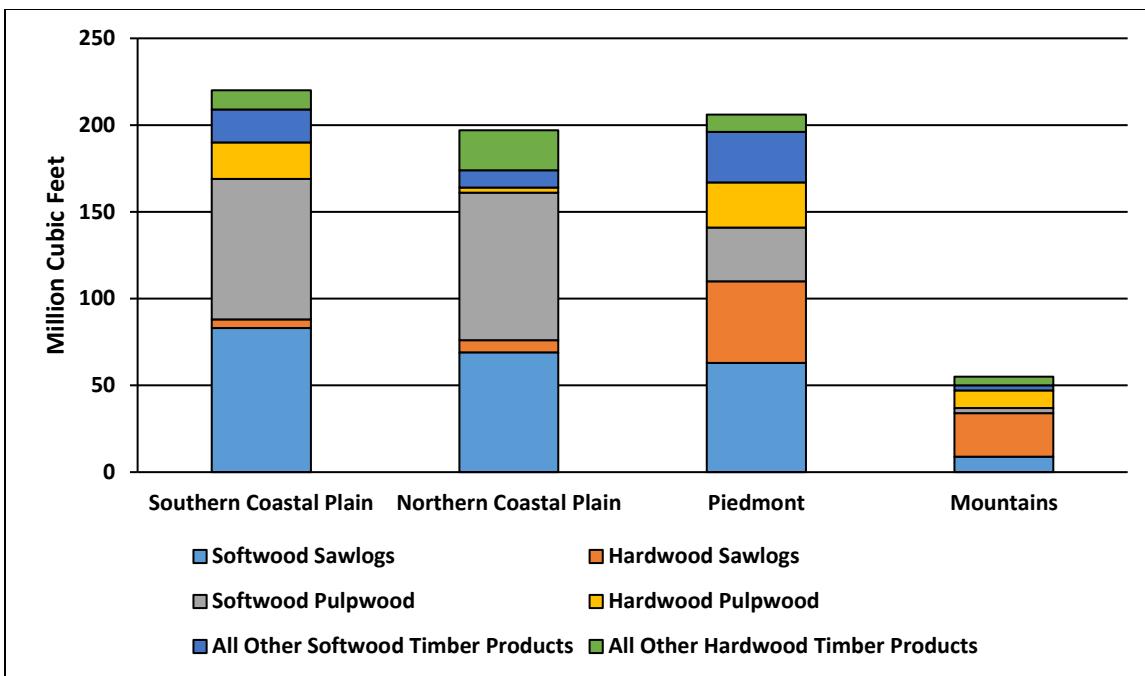


Figure 2. Timber product output by survey region.

Forestry's Economic Contributions

Forestry's contribution to North Carolina's economy has been estimated by North Carolina State University using the Impact Analysis for Planning (IMPLAN) system. IMPLAN produces a suite of relevant metrics including total industrial output, value-added, employment and labor income. The total economic contribution of forestry increased from \$29.4 billion in 2013 to \$32.8 billion in 2017.

However, previous studies defined industry contributions from the sole perspective of the forest sector, stopping at the point of sale at the producing mill. In 2017, for example, international exports from the North Carolina forest sector totaled about \$1.78 billion. Up until now, the number of additional enterprises required to move exports to alongside the port vessel had not been considered for analysis.

A Forest Export Chain

North Carolina's forest export chain includes not only the timber processing and manufacturing forest industries, but also the wholesalers or brokers, the transporters, and the port service providers. Traditionally thought of as forward linkages of the forest sector, these industries each sector provide a unique contributing link. The contribution of this chain to the state's economy has not been quantified previously.

A special study, funded by a USDA Forest Service grant, analyzed the importance of forest product exports in three Atlantic Coast states, Virginia, North Carolina, and South Carolina using 2015 IMPLAN data. Production and export data are averaged over a three-year period from 2014 to 2016. All values are expressed in 2015 constant dollars.

Origin of Movement vs. Origin of Production

Port activities at the state level are measured according to origin of movement, which is based upon where a product is declared for export. Origin of movement data, though, inadequately represent industry's production for export from its point source. The source of production is often lost as forest products for export move across state lines and to the port. An alternative approach was developed for this project using the origin of production to award export value based upon the state share of U.S. production for each product.

Where origin of movement values exceeded origin of production values, the difference was considered a trans-shipment, i.e. production that originated in another state but shipped through North Carolina for export. Where origin of production values exceeded origin of movement values, the difference in this case was considered value produced for export from North Carolina, but shipped overseas from an out-of-state port. The table below highlights the origin of production and origin of movement values for North Carolina as well as the difference between those two values.

Table 1. North Carolina export data, origin of production (OP) and origin of movement (OM) export data. All values are f.a.s. port values.

NAICS code	NAICS Industry	Origin of Production Exports	Origin of Movement Exports	Difference (OP – OM)	Type of Difference
1132	Forest Nurseries and Gathering of Forest Products	\$18,767,191	\$9,237,007	\$9,530,184	Local Production Shipped out of State for Later Export
1133	Logging	\$84,551,874	\$84,188,487	\$363,387	Local Production Shipped out of State for Later Export
3211	Sawmills and Wood Preservation	\$194,009,817	\$285,203,643	-\$91,193,826	Trans-shipment
3212	Veneer, Plywood, and Engineered Wood Product Manufacturing	\$103,034,800	\$46,422,303	\$56,612,497	Local Production Shipped out of State for Later Export
3219	Other Wood Product Manufacturing	\$106,846,900	\$25,472,030	\$81,374,869	Local Production Shipped out of State for Later Export
3221	Pulp, Paper, and Paperboard Mills	\$390,458,867	\$772,165,322	-\$381,706,456	Trans-shipment
3222	Converted Paper Product Manufacturing	\$550,213,741	\$301,280,927	\$248,932,814	Local Production Shipped out of State for Later Export
3251	Wood-based Chemical Manufacturing	\$4,744,722	\$2,684,247	\$2,060,475	Local Production Shipped out of State for Later Export
3371	Household and Institutional Furniture and Kitchen Cabinet Manufacturing	\$450,005,826	\$218,969,575	\$231,036,251	Local Production Shipped out of State for Later Export
3372	Wood Office Furniture Manufacturing	\$21,464,148	\$17,619,594	\$3,844,554	Local Production Shipped out of State for Later Export
3379	Other Wood Furniture Related Product Manufacturing	\$6,639,230	\$11,072,118	-\$4,432,888	Trans-shipment

Based on Table 1's findings, a total of \$633.8 million was paid by out-of-state buyers to purchase forest products produced in North Carolina for later overseas shipment through out-of-state ports. Further analysis revealed \$561 million was paid to forest products industries, with the remainder paid to brokers, transporters, and port service providers. The majority of products leaving North Carolina prior to export are household furniture and cabinetry along with converted paper products.

Conversely, \$477 million in forest products processed or manufactured in other states move through North Carolina's transportation network for shipment out of either the Port of Wilmington or Morehead City. Primary paper products and lumber are the principal trans-shipments originating from other states. North Carolina businesses were paid \$60 million to move these products to alongside the port vessel.

Table 2. Potential capture opportunities for North Carolina ports revealed by defining the origin of production of North Carolina's forest products exports.

NAICS code	NAICS Industry	Leaving NC for International Export Elsewhere	Produced in NC, Exported from NC	Potential Capture Opportunity
1132	Forest Nurseries and Gathering of Forest Products	\$8,382,106	\$7,971,049	105%
1133	Logging	\$339,715	\$77,589,538	0.44%
3212	Veneer, Plywood, and Engineered Wood Product Manufacturing	\$47,585,224	\$37,742,993	126%
3219	Other Wood Product Manufacturing	\$73,117,818	\$22,453,517	325%
3222	Converted Paper Product Manufacturing	\$225,204,786	\$267,789,048	84%
3251	Wood-based Chemical Manufacturing	\$1,907,404	\$2,443,068	78%
3371	Household and Institutional Furniture and Kitchen Cabinet Manufacturing	\$201,089,786	\$186,437,073	107%
3372	Wood Office Furniture Manufacturing	\$3,405,151	\$15,288,325	22%

Economic Contribution of the Forest Export Chain to North Carolina

The economic contribution of the forest export chain to the state's economy to date has not been quantified. Like other IMPLAN analyses, export contributions can be attributed to the direct foreign export sales by forest industry as well as the indirect and induced impacts of those sales as they ripple through the local economy. IMPLAN supplies a suite of metrics, including total economic impact, value-added and employment to describe an industry's impact to the local economy.

The total economic output of the forest products export cluster in North Carolina was \$3.49 billion in 2015 dollars. Of that total, \$1.95 billion is directly associated with business transactions conducted by the forest products export cluster. The difference \$1.55 billion, is attributed to the impact of these business transactions as they ripple through the local economy. For every \$1 million of forest industry exports, sales generated an additional \$800,000 of economic activity across North Carolina.

The total value-added contribution of North Carolina's forest export cluster was \$1.44 billion in 2015 dollars. The direct value-added contribution of the cluster was \$603.0 million. The remaining \$837 million is attributed to indirect and induced economic activity. \$1 million dollars of forest industry export related value-added generated an additional \$1.39 million contribution to North Carolina GDP.

The total employment of North Carolina's forest export cluster was 16,636 in 2015. Direct employment by the forest products export cluster was 6,868 with the remaining 9,768 jobs

accounted for by associated industry sectors. Forest industry exports supported 1,420 jobs in other sectors for every 1,000 forest industry jobs.

Conclusion

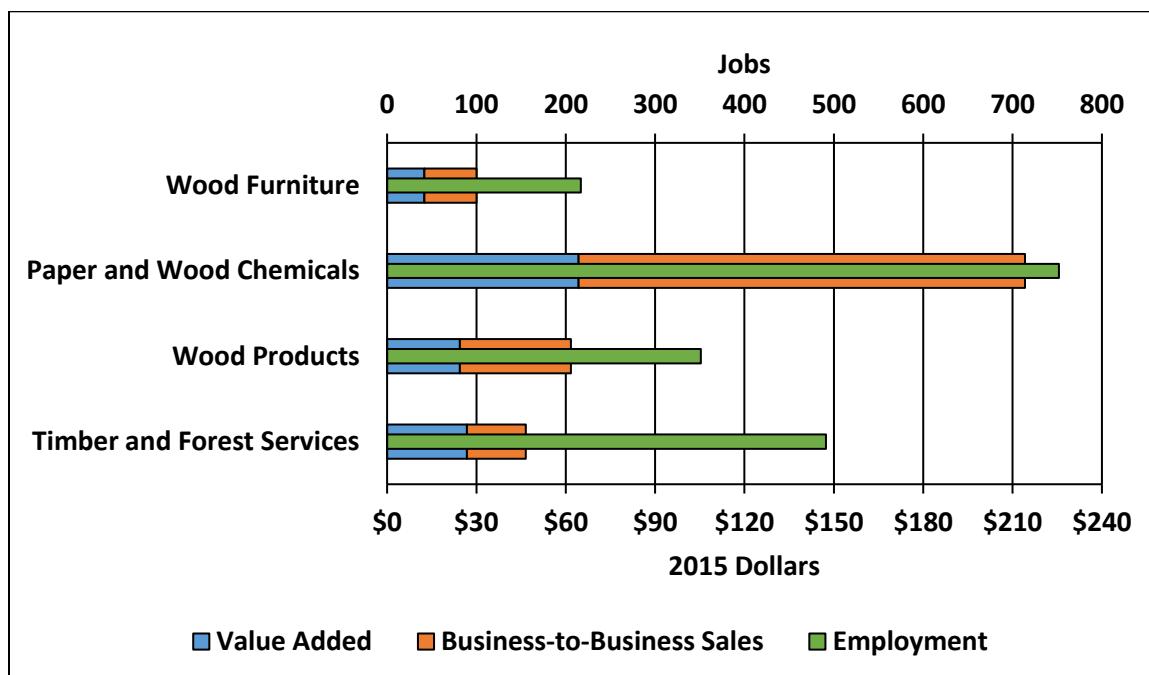
Forestry is a critical component of North Carolina's economy- both rural *and* urban. The forest products export chain contributes almost \$3.50 billion to North Carolina's economy each year. The primary avenues for forest product exports in the state are via the deep water ports of Wilmington and Morehead City. Two of the top five American ports exporting forest products, Savannah, GA and Norfolk, VA, are located in near geographic proximity. Thus, a significant percentage of forest products manufactured in North Carolina are not exported through North Carolina ports. A unique approach of comparing the origin of movement to the origin of production for export data quantified \$561 million in forest products manufactured North Carolina that are exported from outside the state, with an additional \$72.8 million paid to move those products out of the state. These products include furniture, cabinets, as well as paper and wood products. Additional research could develop strategies to help grow North Carolina's forest products export chain via the identified opportunities highlighted in Table 2. Subsequent opportunities to expand markets for North Carolina forest products globally could potentially emerge.

Regional Findings

Southern Coastal Plain



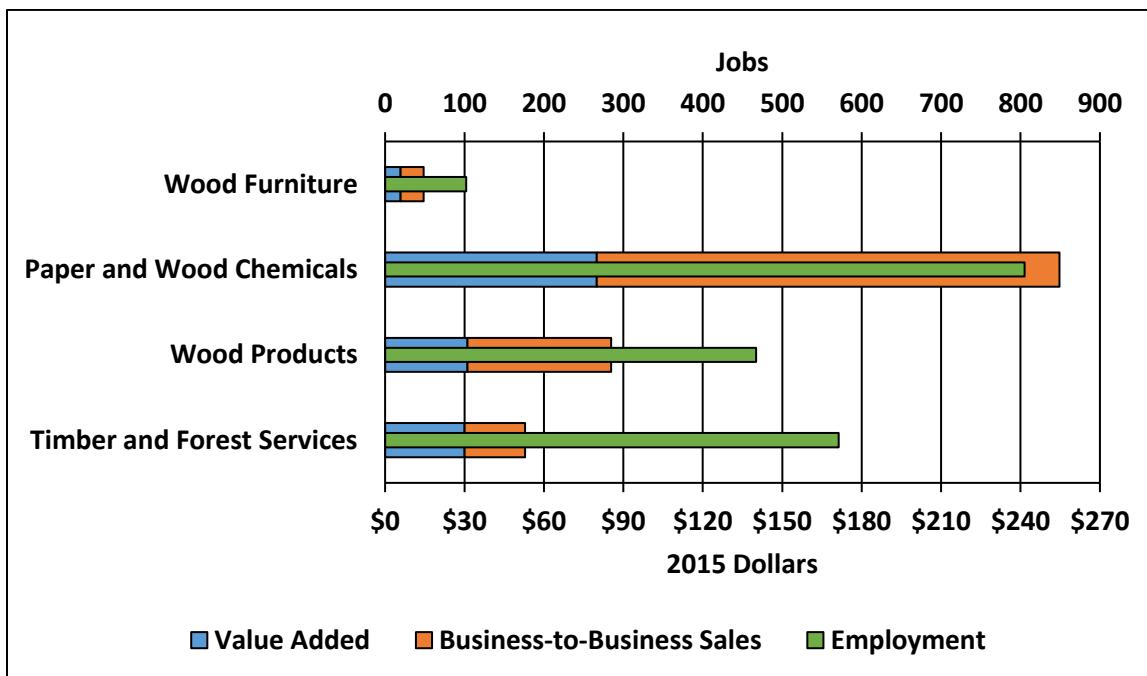
Total Contributions from Exporting in the Southern Coastal Plain



Northern Coastal Plain



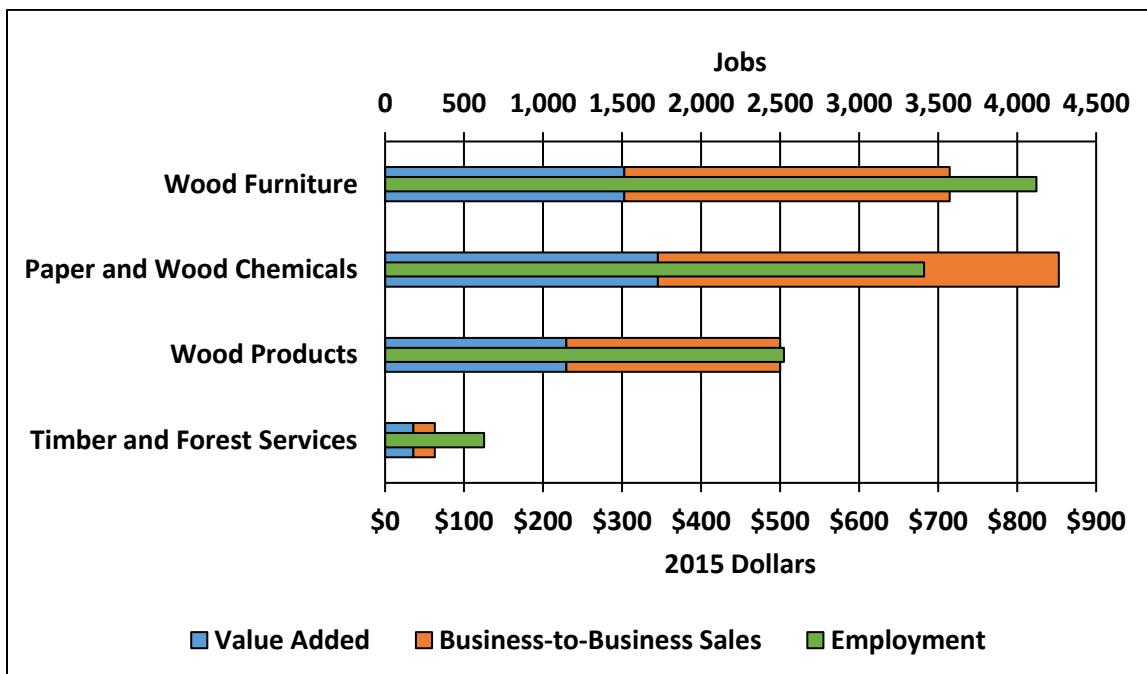
Total Contributions from Exporting in the Northern Coastal Plain



Piedmont



Total Contributions from Exporting in the Piedmont



Mountains



Total Contributions from Exporting in the Mountains

