Maine Policy Review

Volume 26 | Issue 1

2017

Impacts of Recent Mill Closures and Potential Biofuels Development on Maine's Forest Products Industry

Mindy S. Crandall
University of Maine - Main, mindy.crandall@maine.edu

James L. Anderson
University of Maine, james.l.anderson@maine.edu

Jonathan Rubin
rubinj@maine.edu

Impacts of Recent Mill Closures and Potential Biofuels Development on Maine's Forest Products Industry

by Mindy S. Crandall, James L. Anderson III, and Jonathan Rubin

Abstract

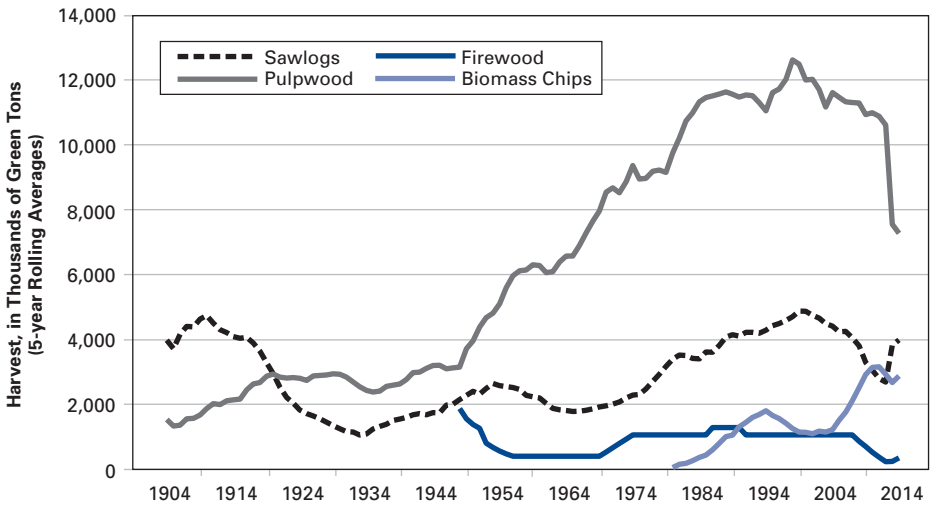
The economic contributions of a sector (i.e., employment, output, value added) are a measure of how money from that sector moves about a regional economy. Using 2014 estimates of economic contributions from the forest product industry in Maine, we estimate the 2016 contribution by considering the impacts from several recent mill closures (five pulp/paper, two bioelectric). The loss of these mills, particularly paper mills, reduces the economic contributions of the forest products industry relative to the state economy and distorts markets for low-value wood. We also explore a prospective opportunity to revive low-value wood markets by modeling the economic impacts from a hypothetical colocated biorefinery, where wood chips are turned into advanced fuels and chemical coproducts. The dollar value of economic impacts from such an investment are small relative to the total industry, but they may prove significant for some rural communities.

INTRODUCTION

As the most heavily forested state in the nation, Maine is well known for its iconic forests and its reliance on the forest products industry (Smith et al. 2009). From the King's Broad Arrow era, when prime white pine trees were marked for the exclusive use of the British king and navy, to the days when Bangor was the "lumber capital of the world," to the rise and dominance of pulp and paper, Maine's forest products industry has experienced significant changes, but has remained an important component of the state's economy (MFPC 2013). At the turn of the last century, sawtimber dominated the state harvest (Figure 1). In the second half of the 1800s, wood pulp began replacing fabric rag in paper production, and Maine's pulpwood harvest started to climb steadily. By 1890, Maine was the leading paper-producing state in the country, a position the state held until the 1960s (Ray Routhier, *Maine Sunday Telegram*, October 26, 2014).

As of 2013, Maine remained both the largest wood products and pulp and/or paper producer in terms of gross state product (GSP) in New England (BEA 2017). An estimate of the economic contribution of the

FIGURE 1: **Harvest by Product Class in Maine, 1904–2014**



Source: Maine Forest Service

forest products industry to Maine using data for 2011 put the total output contribution at close to $8 billion, or 6.4 percent of the GSP, while the employment contribution represented 1 out of every 20 jobs (MFPC 2013). Over the last decade, however, the forest-based economies of many states have seen downturns, and Maine's was no exception. Declines in many industries in the early 2000s were followed by sharp reductions in output in forest products due to the decline in the housing market and Great Recession of 2007–2009 (Woodall et al. 2011).

The decline of pulp and paper due to combination of factors, including increased competition from plantation-grown trees in Brazil and other countries, strongly declining demand for printing and writing papers, the high cost of the US dollar, and internet adoption, has been even more precipitous and alarming (*The Economist* 2016; Johnston 2016). In 2010, 12 pulp and/or paper mills were operating in Maine; at the time of this writing (spring 2017), only six remain. Many of the closures were concentrated in central Maine, leaving the Penobscot River Valley without paper production for the first time in more than a century. These closures, along with recent closures of two biomass electricity-generating plants, have increased uncertainty about the current state and the future of the entire forest products industry.

The market for low-grade material, such as that traditionally consumed by pulp and paper mills or biomass generating plants, improves the economic feasibility of sawtimber cultivation and harvesting by providing additional revenue for forest operations. Forest managers in Maine often depend on the markets for low-grade wood to remove small trees that allow the total biological growth to be concentrated on the higher-quality sawtimber stems. Biomass harvesting also improves the economic returns from entering a stand to harvest any material.

Nationally, and in Maine, significant research attention is directed at alternative uses of low-grade wood, such as production of biofuels and chemical coproducts (Grebner et al. 2009). This research focus is driven in part by the desire to enhance economic activities in rural areas (Benjamin, Lilieholm, and Damery 2009). The Energy Independence and Security Act (EISA 2007) codifies the national push for increased energy security through a reduction in the use of fossil fuels for transportation by increasing the use of advanced, low-greenhouse-gas-emitting biofuels from sources such as woody biomass (Neupane and Rubin 2016).

Given the market uncertainties around the future viability of pulp and paper production in Maine and the importance of low-grade wood markets in supporting the forest industry, we set out to investigate two critical questions:

- Where is the forest products industry in terms of economic importance following these closures?
- What is the economic potential from emerging technologies, such as the use of woody biomass for advanced biofuels, to revive markets for low-value wood?

ECONOMIC CONTRIBUTION OF THE FOREST PRODUCTS INDUSTRY IN 2016

One useful metric for understanding the relative economic importance of an industry to a state or regional economy is looking at its economic contribution. Economic contribution differs from economic activity in one critical way: it expands the measure to include economic activity that is not only directly attributable to an industry, but also the economic activity generated because the industry exists. The economic contribution of a given industry is commonly estimated using a model of a region's economic activity. We use the IMPLAN model, an input-output model originally developed by the US Forest Service (IMPLAN Group LLC). IMPLAN is widely used for this purpose as it specifically addresses these indirect and induced effects (or multiplier effects) of the economic activity in each industry of interest (Henderson et al. 2017). In addition, it generates estimates of both direct and multiplier effects for several metrics of interest: employment, labor income, total output, and value added (a measure of contribution to GSP).

Estimating Economic Contribution

Direct contributions arise from an industry's employment of workers, wages paid to them, the value of the production (direct sales), and the value added to the inputs in the production process. Indirect contributions result from industry purchases of goods and services from supporting industries as a part of doing business, for example, the purchase of a piece of harvest equipment. As these supporting industries supply needed goods and services, they also generate indirect employment, wages, production, and value in the economy. Induced contributions are those generated by

the household purchases of goods and services by employees in both the primary and supporting industries. Induced contributions include things like restaurant meals that a sawmill worker purchases. The direct effect of production activity in an industry thus has additional effects that are larger and are collectively called multiplier effects. In this article, the industry of interest is any related to the primary use of the forest resource, including land management activities, logging and hauling of wood, biomass electricity generation, sawmills and other primary solid wood processing, and primary manufacturing of pulp and paper.

The economic contribution of the forest products industry in 2014 was updated using both public and proprietary IMPLAN data (Anderson and Crandall 2016). To estimate the 2016 contributions, we account for the closures of mills located in Millinocket (February 2014), Bucksport (Decemeber 2014), Lincoln (September 2015), Old Town (November 2015), and Madison (May 2016), along with the closures of two biomass electricity-generating plants in Jonesboro and West Enfield (March 2016) and significant cutbacks in production at the mill in Jay (October 2015).

To capture the impact of these recent plant closures, we used announced reductions in employment from the news media. While imperfect, this method allowed us to avoid a significant delay in waiting for updated official data. The mills that closed were some of the smaller ones in Maine and were not likely representative in terms of the productivity of the remaining mills. Thus, the loss of these mills represents a smaller than average loss to the industry in terms of output. To account for this, we adjusted the likely change in output sales by estimating a ratio of input to employment for select mills, using industry data. Overall, the output-to-employment ratio of these mill closures was reduced by 35 percent when calculating impacts; that is, we estimate the closed mills were 65 percent as productive as the remaining mills (Peter Triandafillou, personal communication, May 26, 2016). We applied this adjustment to the calculated 2014 economic contribution to estimate the contribution in 2016. This method allowed us to estimate the significant impacts from the closures. It also assumes no decreases or increases in the other non-pulp-and-paper firms between 2014 and 2016. Pulp and paper comprised 69 percent of the economic contribution of the forest products industry in 2014. That dominance suggests that

FIGURE 2: **Map of Maine Pulp/Paper and Bioelectric Mills by Operational Status**

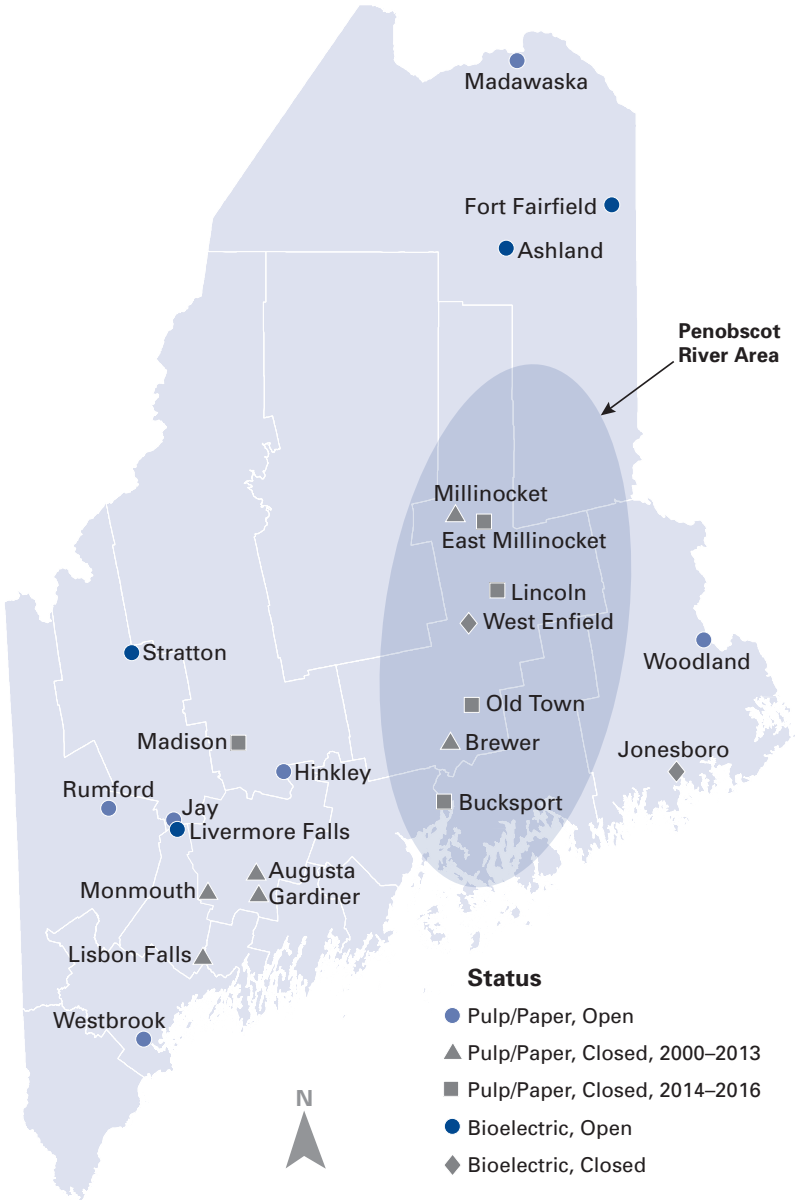


TABLE 1: **Estimated Economic Contribution of Maine's Forest Products Industry (FPI) in 2016 ($2016)**

Contribution	Direct Contribution	Total Multiplier (Indirect + Induced) Effects			Total Impact
	FPI	FPI	FPI Support	non-FPI	Total
Output ($ thousand)	$4,889,267	$617,575	$414,409	$2,620,051	$8,541,302
Jobs	12,572	1,990	1,040	17,935	33,538
Wages	$664,056,504	$93,717,637	$50,976,529	$748,919,925	$1,557,670,595
Proprietors' Income	$93,099,947	$54,106,618	$32,933,481	$95,226,720	$275,366,766

estimating the changes in pulp and paper in this way will capture the bulk of the recent decline.

Economic Contribution of the Forest Products Industry in 2016

Using the methods we just described, we estimate that Maine's forest products industry has a total 2016 statewide economic contribution, including multiplier effects, of $8.5 billion in sales output, 33,538 supported full- or part-time positions, and $1.8 billion in labor income. The total employment in the forest products industry of 14,562.5 jobs supports an additional 18,975 jobs in Maine (Table 1).

The forest products industry provides just over 4 percent of the employment in Maine; put another way, just under 1 out of 24 jobs in Maine are associated with the forest product industry. This is a reduction from 1 in 20 jobs in 2011. Maine's forest products industry contributes an estimated $2.7 billion in value-added contribution, or just under 5 percent of GSP. Just under $1 out of every $20 of Maine's GSP is associated with the forest products industry (Table 2).

Although the recent mill closures have dominated news about the industry and had significant local impacts in some communities, the industry as a whole has not experienced such a sharp decline. Since 2011 (the time of the last study of Maine's forest products industry's economic contribution), the economic contribution of the forest products industry in dollars has fallen slightly, while Maine's employment has increased 2.1 percent and real GSP has decreased 0.5 percent (Table 2). In relative terms, the importance of Maine's forest products industry has declined somewhat, but it still represents an important component of Maine's economy. The forest products industry's direct employment and total employment contributions have fallen (-14.7 percent and -13.5 percent, respectively), but real per worker incomes related to the forest products industry have gone up approximately 6.1 percent. Thus, the impact of mill closures may be overstated by simply counting the mills that have closed or counting the number of jobs that have been lost. Nonetheless, the

TABLE 2: **Summary of Forest Products Industry (FPI) Contributions to Maine's Economy in 2011 Compared with 2016 ($2016))**

	2011	2016	Percentage Change
Maine Gross State Product	$55.7 billion	$55.4 billion	-0.5
FPI Value Added	$3.5 billion	$2.7 billion	-22.6
Percentage of Gross State Product	6.38% (1 out of 15.7)	4.96% (1 out of 20.2)	-22.2
FPI Total Sales Contribution	$8.6 billion	$8.5 billion	-1.2
All Maine Jobs	794,279	811,321	+2.1
FPI Jobs	38,789	33,538	-13.5
Percentage of Employment	4.88% (1 out of 20.5)	4.13% (1 out of 24.7)	-15.3
Total Payroll	$1,999 million	$1,833 million	-8.3
Total State and Local Taxes	$323.4 million	$278.4 million	-13.9

closures still represent significant absolute employment and output losses in the industry and a spatial consolidation. These losses also cause ripple effects throughout the forest products industry due to the decline in markets for low-grade wood previously used by those mills.

POTENTIAL ECONOMIC IMPACT OF EMERGING TECHNOLOGIES IN WOOD PROCESSING

The development of technologies or industries that use low-value material from Maine's forests has much appeal. By reviving demand for low-value material, new technologies and products may improve forest management options and enable the sustained production of sawtimber targeted for lumber production. Increased demand also would improve the economics of both harvesting and forest management and improve national energy independence. For all these reasons, research into emerging technologies for wood use has considered development of such technologies a potential economic win from both an industry and community perspective (Crandall et al. 2017). The presence of such a demand center in the Penobscot River Valley would also bring significant benefits for forest landowners and managers, as there are no longer markets for low-value material within economically feasible hauling distances.

Emerging technologies being explored for the use of wood include mechanical, chemical, and heat (pyrolosis) processing to create products ranging from refined fuel chips and biodiesels to biochar (charcoal that is used as a soil amendment) (Carrasco et al. 2017; Dickerson and Rubin 2010). The scale of these ideas range from small mobile processing centers to large integrated biorefinery centers; many are still in the demonstration phase. Producing advanced fuels from bio-based sources is more expensive than petroleum. Unless consumers are willing to pay a price premium, the economic feasibility of large-scale projects in a time of low oil and gas prices frequently rests on subsidies or energy policies.

The Forest Bioproducts Research Institute (FBRI) at the University of Maine has focused on demonstrating technologies to produce advanced biofuels and coproducts from low-value woody biomass. Chemical engineers, economists, and others have quantified the available biomass feedstock supply, patented conversion processes to turn wood chips into refined fuel and coproducts, and assessed the potential acceptance of the development of such an industry in central Maine (McGuire et al. 2017; Rubin et al. 2015; Whalley, Klein, and Benjamin 2017). However, at least one key question remained: What might be the local economic impact of the operation of such a facility on a community?

To estimate the potential economic impact of a new plant producing wood-based biofuels in Maine, we used recent results from the FBRI that modeled hypothetical plant operations, along with our economic contribution estimate for the forest products industry in 2016. The scenario reported here is a static analysis of the marginal contribution of such an operation colocated with existing pulp or paper mill infrastructure and does not include construction period impacts. The assumption of colocation is consistent with a techno-economic study that estimated the cost and inputs of the plant (Langton 2016). We converted the techno-economic analysis into a production function for use in IMPLAN and adjusted down our initial estimates of the effect of the plant on increases in harvesting employment to account for the known excess capacity in the harvesting sector. This scenario provides insight into the potential additional effects that such development might have on the wider forestry economy and local communities.

What Would a Biorefinery Look Like?

Our analysis assumed a biorefinery that produces biofuels and organic chemicals, employs 40 workers, and consumes 2,000 dry metric tonnes (4,000 green tonnes) of biomass each day—just slightly smaller, in terms of fiber use, than an average pulp mill in Maine. We assumed that the plant earns enough revenue to support its operation costs and upkeep without contracting or expanding its production. Because the economic impacts of the plant's estimated $550 million construction cost will not generate sustained impacts in the local economy, we remove interest and depreciation from our operational analysis (Langton 2016).

A production function indicates how much the plant must spend on each input to achieve a dollar in sales. Typically, a production function is a fixed set of ratios that scales linearly with changing revenue (quantity) under a fixed price. Our analysis assumes constant production under a variable price, resulting in fixed expenditures and not a fixed production function. This means that the owners maintain constant production of biofuels without regard to maximizing profit. Thus, our analysis looks only at base impacts from the biorefinery breaking even.

Since we assumed the biorefinery will make use of woody biomass residuals instead of roundwood, our analysis changed the predicted increase in harvesting jobs from the biofuel plant, given current excess supply in the low-value wood markets. The cost of delivered biomass varies significantly depending on the proportion of a harvest that is biomass and how contractors apportion their total harvesting costs between roundwood, pulpwood, and biomass chipping during harvest (Rubin et al. 2015; Whalley et al. 2017). If the total harvesting cost of an operation is split proportionally by amount of each product received (roundwood, pulpwood, biomass), the market price for biomass is approximately $30–35 per green ton, the price used in our analysis. An operation that solely havests biomass, where all the costs are attributed to biomass, would probably require a market price higher than is supportable by current demand. Thus, loggers cannot effectively expand biomass-only harvesting in a fiscally feasible way. Currently in an area without demand, low-value material is left on site when pulpwood and roundwood are harvested for other uses; hence, the addition of demand for the low-value residuals will limit the impacts a new biofuel facility could have on harvesting jobs. In other words, we expect that the plant's demand for biomass would not go far towards increasing the overall demand for biomass in Maine. In our scenario, currently operating harvesters with excess capacity could see an approximately 449 job-equivalent increase in activity in total. These harvesters are unlikely to hire many more loggers, but would be spared the pressure to downsize from reduced demand.

Economic Impacts of a Biorefinery

Given the production values just detailed and making the adjustment for known capacity and economic feasibility in the biomass supply chain, we estimated the additional annual economic impact of a biorefinery at roughly $88 million (Table 3). In addition, the operation of such a facility has the potential to increase total employment attributed to the new activity by over 160 jobs.

DISCUSSION AND CONCLUSIONS

Maine's forest products industry remains important to the state, but it is facing several challenges. Although its economic impact is about the same as it was in 2011, the importance of Maine's forest products industry, as a percentage of GSP, has fallen. This decrease is largely due to the decline in pulp and paper, as some other parts of the industry, such as primary wood processing, have grown. The major issue facing Maine's forest products industry is the closing of five paper mills and two bioelectric plants between 2014 and 2016. These closures caused immediate loss of jobs and outputs through direct and multiplier effects, mostly concentrated in the Penobscot River Valley. However, these closures pose a larger challenge than just immediate job losses because the market for low-value material is shrinking. Access to markets for low-quality material can often define the profit margins for a forestry interest or harvest operation, especially if there has been any previous investment in the land. Without a market for lower-quality products, there is less incentive to manage forestlands and no financial incentive to remove poor-quality trees. This creates an environment where high-grading—the removal of only quality trees—is attractive to harvesters. In a region dominated by natural regeneration, this creates a long-term problem in forest stocking and composition. Healthy and quality forest products in the future directly depend on what we leave behind in the forest today and how we tend it over the coming decades.

TABLE 3: **$550M Hypothetical Biofuel Plant (Biorefinery) Impacts, after Adjustments for Harvesting**

Impacts	Direct Contribution	Multiplier Effects			Total Impact
		FPI	FPI Support	non-FPI	Total
Output	$68,982,104	$2,269,137	$1,076,954	$15,820,216	$88,148,411
Employment	40.0	23.4	4.7	92.0	160.1
Compensation	$2,600,000	$558,610	$176,712	$4,339,034	$7,674,356
Proprietors' Income	$0	$388,402	$100,134	$528,966	$1,017,502

Because of these economic and management concerns, new technologies that use biomass and residuals, such as a biorefineries, are potentially important. Development of these technologies would help support the entire forest industry in the area, improving the economic outlook for harvesters and forest managers producing other forest products. Our analysis indicated that one such plant could add $88 million and 160 jobs to the overall industrial impact across the state. In an industry that generates $8.5 billion in economic impact and over 33,500 jobs, these numbers may seem small. However, such a plant could represent significant injections of economic activity in some of the most depressed areas of Maine. In addition, this analysis does not capture the overall support for the interdependent industries that such development provides.

Technologies to better use raw forest material have the potential to benefit the state, the industry, and particularly the rural communities where such a facility might be located. Because Maine has both extensive forest resources and an active forest industry, investments based on these potential technologies will support the continued health of both industrial and small landowner management activity and the forest itself. Furthermore, although small compared to paper mills, such biorefineries could play an important role in diversifying the overall forest industry by broadening the types of end-product uses to more than pulp and paper or solid wood products. Although significant hurdles remain in economic feasibility of such projects, particularly in times of low petroleum prices, the development of such emerging technologies for low-value wood can better sustain the forest products industry and rural communities in the state.

ACKNOWLEDGMENTS

This work was supported in part by NSF SEP Award 1230908 and the Maine Agricultural and Forest Experiment Station. The authors wish to thank as well an anonymous reviewer for constructive suggestions.

REFERENCES

Anderson III, James L., and Mindy S. Crandall. 2016. Economic Contributions of Maine's Forest Products Industry in 2014, with Adjustments to 2016. A Report for the Maine Forest Products Council. University of Maine, Orono.

BEA (Bureau of Economic Analysis). 2017. Annual Gross Domestic Product (GDP) by State: GDP in Current Dollars. http://www.bea.gov/iTable/iTableHtml.cfm?reqid=70&step=4&isuri=1&7003=200&7001=1200&7002=1&7090=70 [Accessed January 1, 2017]

Benjamin, Jeffrey, Robert J. Lilieholm, and David Damery. 2009. "Challenges and Opportunities for the Northeastern Forest Bioindustry." Journal of Forestry 107(3): 125–131.

Carrasco, Jose L., Sampath Gunukula, Akwasi A. Boateng, Charles A. Mullen, William J. DeSisto, and M. Clayton Wheeler. 2017. "Pyrolysis of Forest Residues: An Approach to Techno-Economics for Bio-Fuel Production." Fuel 193(1 April): 477–484. doi:10.1016/j.fuel.2016.12.063

Crandall, Mindy S., Darius M. Adams, Claire A. Montgomery, and David Smith. 2017. "The Potential Rural Development Impacts of Utilizing Non-Merchantable Forest Biomass." Forest Policy and Economics 74(January): 20–29. doi:10.1016/j.forpol.2016.11.002

Dickerson, Catherine, and Jonathan Rubin. 2010. "Bioproducts Process Pathways for Kraft Paper Mills." Journal of ASTM International (JAI) 7(3). doi:10.1520/JAI102571

The Economist. 2016. "Pulp Producers in Brazil: Money That Grows on Trees." The Economist (March 26). http://www.economist.com/news/business/21695530-brazils-economy-crumbling-its-giant-pulp-firms-are-booming-money-grows-trees

Grebner, Donald L., Gustavo Perez-Verdin, James E. Henderson, and Andrew J. Londo. 2009. "Bioenergy from Woody Biomass, Potential for Economic Development, and the Need for Extension." Journal of Extension 47(6): 8.

Henderson, James E., Omkar Joshi, Shaun Tanger, Leslie Boby, William Hubbard, Matthew Pelkki, Hughes, David, W., T. Eric McConnell, Wayne Miller, Jarek Nowak, Charles Becker, Tim Adams, Clay Altizer, Rick Cantrell, Jesse Daystar, Ben Jackson, James Jeuck, Mehmood Sayeed, and Phil Tappe. 2017. "Standard Procedures and Methods for Economic Impact and Contribution Analysis in the Forest Products Sector." Journal of Forestry 115(2): 112–116. doi:10.5849/jof.16-041

Johnston, Craig M.T. 2016. "Global Paper Market Forecasts to 2030 under Future Internet Demand Scenarios." Journal of Forest Economics 25:14–28.

Langton, Robert. 2016. A Techno-Economic Analysis of the Acid Hydrolysis Dehydration Process (AHDH) for the Production of Drop-in Biodiesel. Master's thesis, University of Maine. http://digitalcommons.library.umaine.edu/etd/2551

MFPC (Maine Forest Products Council). 2013. Maine's Forest Economy. Augusta.

McGuire, Julia B., Jessica E. Leahy, Mindy S. Crandall, James A. Marciano, and Robert J. Lilieholm. 2017. "What's Next for Maine's Forests? Mill Town and Statewide Community Perspectives on the Value, Management, and Future of Maine's Forests." Spire: The Maine Journal of Conservation and Sustainability (May 4).

Neupane, Binod, and Jonathan Rubin. 2016. "Implications of U.S. Biofuels Policy for Sustainable Transportation Energy in Maine and the Northeast." Renewable & Sustainable Energy Reviews (December). doi:10.1016/j.rser.2016.11.253

Rubin, Jonathan, Binod Neupane, Stephanie Whalley, and Sharon Klein. 2015. "Woody Biomass Supply, Economics, Biofuel Policy: Maine and Northeastern Forests." Transportation Research Record: Journal of the Transportation Research Board 2502(Jan): 108–115.

Smith, W. Brad, Patrick D. Miles, Charles H. Perry, and Scott A. Pugh. 2009. Forest Resources of the United States, 2007: A Technical Document Supporting the Forest Service 2010 RPA Assessment. General Technical Report, USDA Forest Service, no. WO-78.

Whalley, Stephanie, Sharon J.W. Klein, and Jeffrey Benjamin. 2017. "Economic Analysis of Woody Biomass Supply Chain in Maine." Biomass and Bioenergy 96(January): 38–49. doi:10.1016/j.biombioe.2016.10.015

Woodall, Christopher W., William G. Luppold, Peter J. Ince, Ronald J. Piva, and Kenneth E. Skog. 2011. "An Assessment of the Downturn in the Forest Products Sector in the Northern Region of the United States." Forest Products Journal 61(8): 604–613.

Mindy S. Crandall is an assistant professor of forest management and economics at the University of Maine, where she joined the faculty in the School of Forest Resources in 2014. She holds degrees in forest management and applied economics. Her research is focused on the forest products industry, forest management, and rural forest-located communities, and the interactions between them.

James L. Anderson III is a PhD student in the University of Maine's School of Forest Resources. With a degree in statistics from Virginia Tech, Anderson became interested in forest products through carpentry and construction. His research interests are forest resource markets and market modelling, statistical and machine learning applications in forestry research, and forest product development.

Jonathan Rubin is the director of the Margaret Chase Smith Policy Center and professor of economics at the University of Maine. He was a Fulbright Scholar at the Clean Energy Research Center, University of Botswana, and a visiting fellow at the Cambridge Center for Climate Change Mitigation Research, University of Cambridge. He is the chair of the Environment and Energy Section of US Transportation Research Board. Rubin's research focuses on using economic mechanisms to assist with the attainment of environmental goals.