



**Wood Supply Chain Component Costs Analysis:
A Comparison of Wisconsin and U.S. Regional Costs –**
(Data Period: Q3 2013 through Q2 2015, 2015 Update)



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Objectives

- Evaluation of the costs of each link in Wisconsin's wood fiber supply chain and a comparison of these costs to other regions in the United States.
- Assessment of cost factors.
- Detailed comparative analysis is based on U.S. regions - Northeast, Lake States, Pacific Northwest, and the South.

Reporting Regions



Lake States (Wisconsin) Market Summary

- The majority of the material originates from NIPF – 60 percent.
- Majority of contractors purchase their timber on the open market.
- Contractors work cut-to-length and average about 5 loads per day.
- Trucking costs are perceived as being high.
- Rail transportation is unique.

Northeast U.S. Market Summary

- Reliant upon large private landowners.
- Most operations focused on whole-tree harvesting.
- Averages of 5 to 10 loads per day.
- Transportation costs are high and comparable to the Lake States.
- More geared toward even-aged management.

South U.S. Market Summary

- Reliant on private forestland owners (fewer, but own more acreage).
- Harvesting is almost entirely whole-tree, with fewer and larger contractors.
- Trucking costs are likely the lowest across the country.
- Most forest acreage is managed on an even-aged basis.
- Not as impacted by seasonal weather.
- Average logging crew produces about 11 loads per day.

Pacific Northwest U.S. Market Summary

- Large private and public ownership support industry.
- Typically even-aged.
- Freight costs in this region are quite high.
- Harvest production in this region is similar to the South.

Methods

- The F2M data is based on actual delivered raw material costs and component costs through the supply chain.
- Data originates from mills and wood producers.
- Directly from subscriber wood settlement systems.

Supply Chain Components

- Stumpage
 - Known on mill purchased deliveries.
 - Stumpage data from a variety of sources within each region.
- Harvesting
 - Known on loads where the mill pays harvesting directly.
 - Derived from data provided by a wood supplier.
- Freight
 - Known for loads where the mill pays freight directly.
 - Freight rates (\$/ton/mile) are calculated and applied in instances where freight is unknown, using the weighted average based on load miles.
 - In Wisconsin, freight includes loading.
 - In other regions, the loading cost is generally included in the harvesting component.
- Other
 - Includes procurement expenses, wood yard expense, wood yard freight and transfer expense.
- Margin
 - Left after all expenses have been paid.

Species Groups and Products

- Aspen, hardwood, and conifer, limited to pulpwood fiber.

Time Period Evaluation

- In the initial report, the quarterly data included the second half of 2013 and the first half of 2014.

Update Time Period

- Update includes an additional year of benchmarked cost data that spans eight quarters, beginning the third quarter of 2013 through the second quarter of 2015.

Results – Total Delivered Price Comparisons

Aspen

- Total delivered cost in the Northeast region continued to exceed the average delivered price in the Lake States.
- The price differential between the two regions decreased from 19 percent in the initial study period to only 10 percent for the extended study period.
- Relative to price in the initial study period, price in the extended study period increased by 9 percent in the Lake States, while delivered price decreased by about 1.5 percent in the Northeast.

Aspen Pulpwood by Region Total Delivered Price



Hardwood

- Hardwood pulpwood prices for the South and the Pacific Northwest were similar between the two study periods, at approximately \$40.00 per ton.
- The Lake States and Northeast regions averaged around \$52.00 a ton during the extended study period, an increase for both regions from the initial study period.
- The Lake States delivered price increased by over 9 percent for the expanded study period, whereas the Northeast region increased by about 3 percent.

Hardwood Pulpwood by Region Total Delivered Price



Conifer

- Relative differences in conifer pulpwood prices between regions were similar in the two study periods.
- Lake States delivered prices are the highest.

Conifer Pulpwood by Region Total Delivered Price

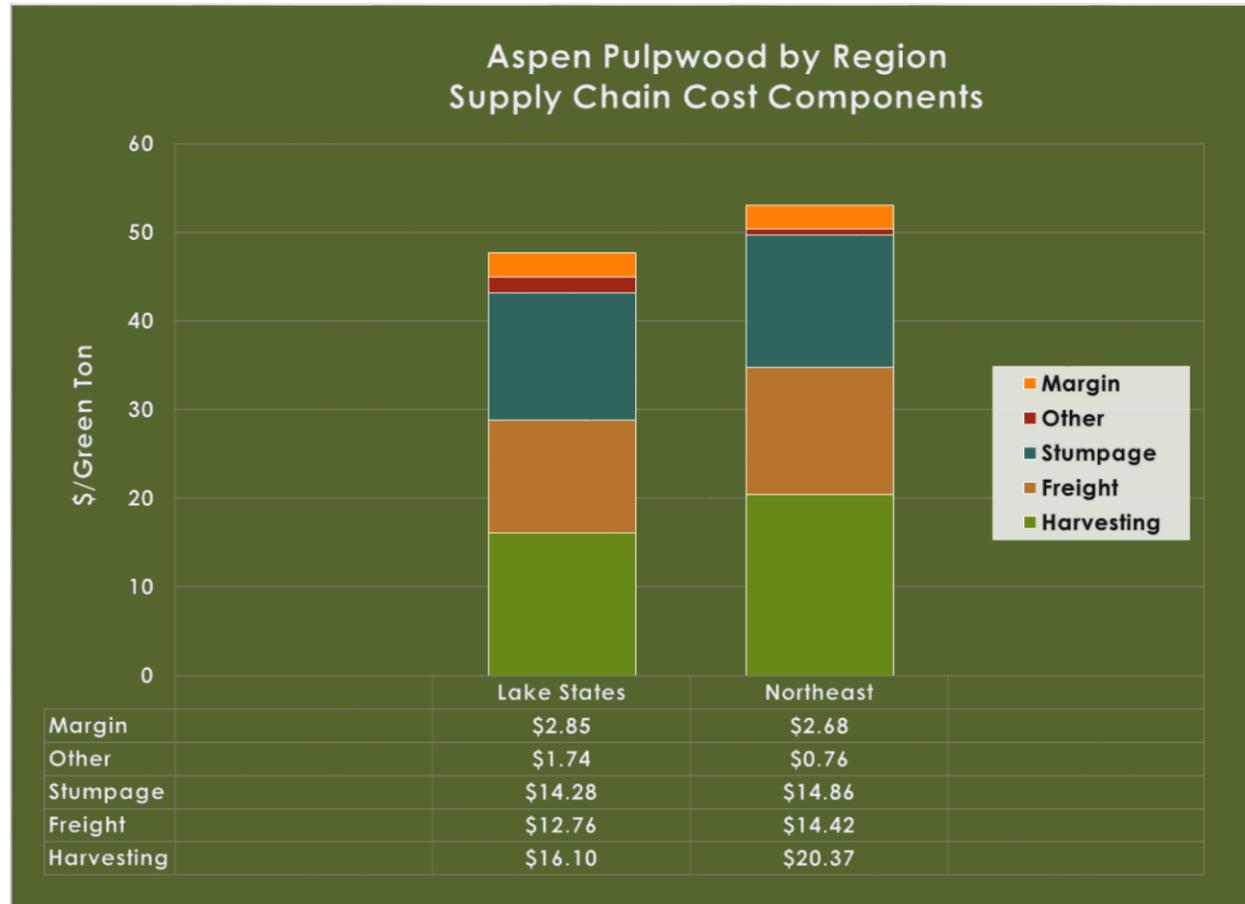


Supply Chain Regional Analysis

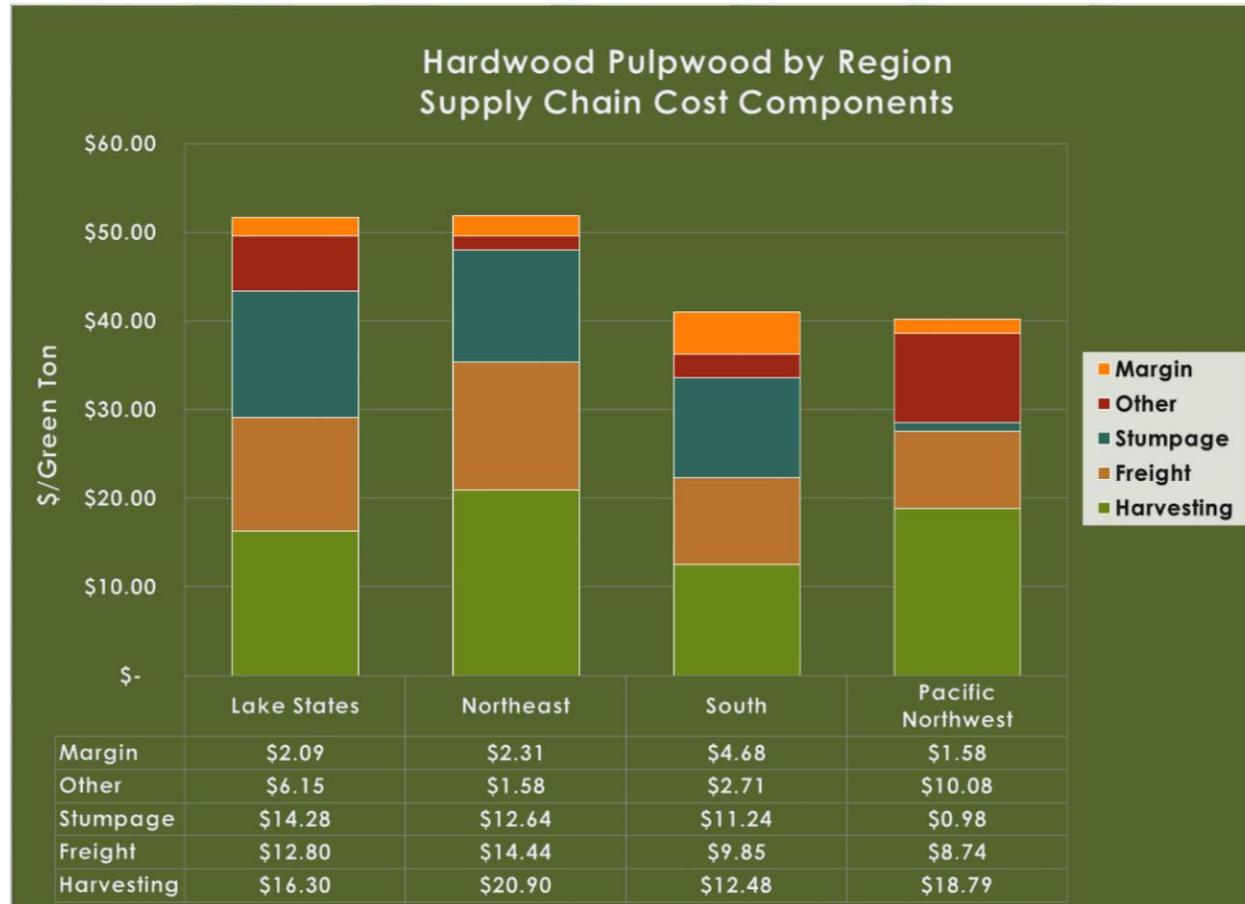
Cost Components as a Percent of Total Delivered Cost Q3 2013 through Q2 2015

Supply Chain Cost Component (%)						
Aspen Pulpwood						
Region	Total Delivered (\$ per ton)	Other	Harvesting	Freight	Margin	Stumpage
Lake States	\$ 47.74	4%	34%	27%	6%	30%
Northeast	\$ 53.08	1%	38%	27%	5%	28%
Hardwood Pulpwood						
Region	Total Delivered (\$ per ton)	Other	Harvesting	Freight	Margin	Stumpage
Lake States	\$ 51.62	12%	32%	25%	4%	28%
Northeast	\$ 51.87	3%	40%	28%	4%	24%
South	\$ 40.95	7%	30%	24%	11%	27%
Pacific Northwest	\$ 40.17	25%	47%	22%	4%	2%
Conifer Pulpwood						
Region	Total Delivered (\$ per ton)	Other	Harvesting	Freight	Margin	Stumpage
Lake States	\$ 49.67	10%	34%	25%	5%	26%
Northeast	\$ 43.75	2%	48%	31%	5%	15%
South	\$ 33.63	2%	35%	24%	5%	33%
Pacific Northwest	\$ 46.48	22%	38%	21%	5%	15%

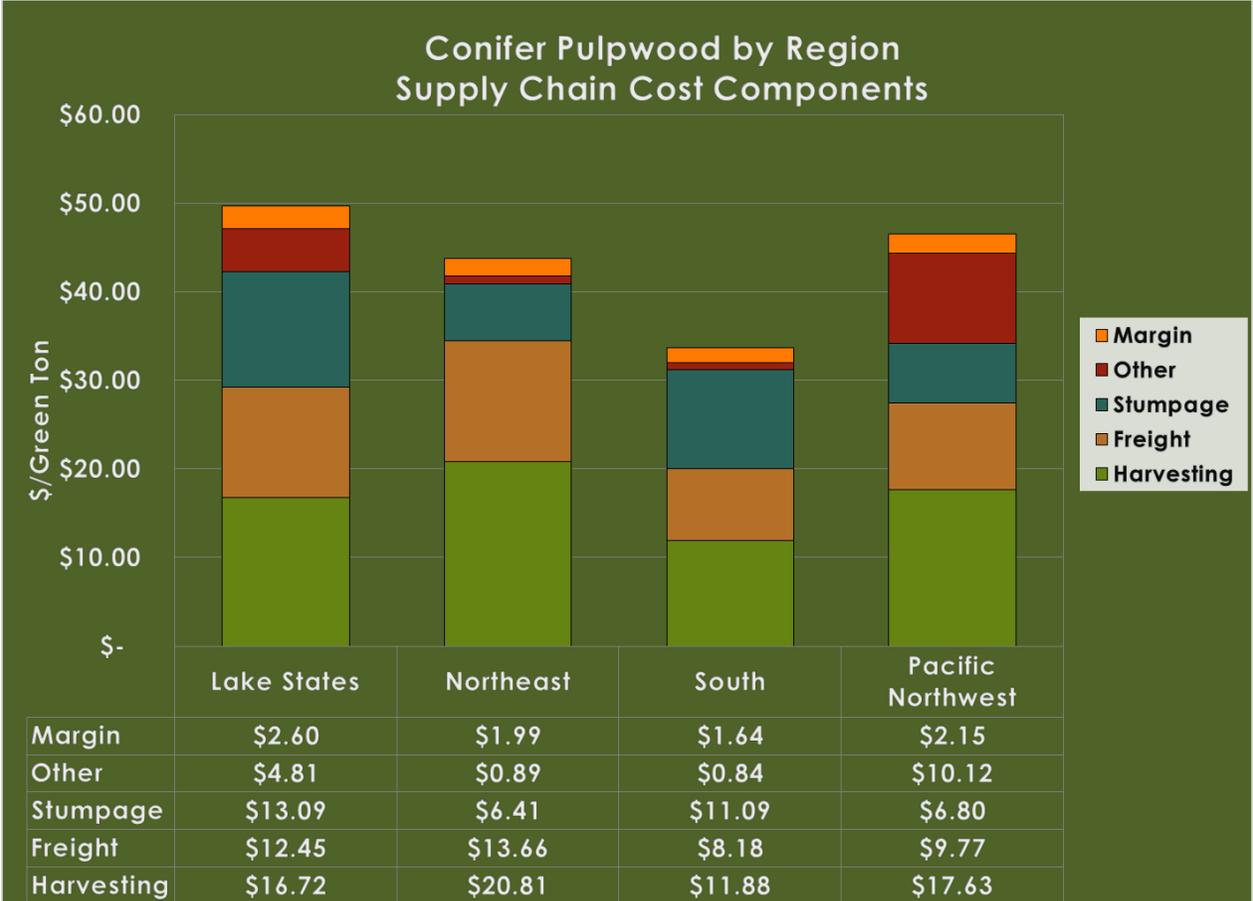
Aspen Pulpwood Cost Component Summary, Q3 2013 through Q2 2015



Hardwood Pulpwood Cost Component Summary Q3 2013 through Q2 2015



Conifer Pulpwood Cost Component Summary Q3 2013 through Q2 2015



Discussion

- Stumpage
 - Lake States Stumpage was lowest for aspen pulpwood, but highest for hardwood pulpwood and conifer pulpwood.
 - As a percent of total delivered cost, pulpwood stumpage costs in the Lake States exhibited little difference between the initial and extended study periods for conifer and aspen.
- Harvesting
 - Harvesting costs in the Lake States were quite competitive when compared to the other regions studied.
- Freight
 - The Lake States region had some of the highest transportation costs.
 - Haul trucks without on-board loaders result in loading costs being included in the Harvesting cost component.

Discussion (Cont.)

F2M Derived Average Haul Distance by Region and Product Grouping Q3 2013 through Q2 2015

Average Haul Distance			
Region	Conifer	Hardwood	Aspen
Lake States	106	115	71
Northeast	76	90	77
South	54	66	-
Pacific Northwest	48	41	-

Discussion (Cont.)

- Margin
 - Margin costs increased between the two periods in the Lake States region.
 - Lake States region now has the highest margin for aspen pulpwood.
- Other
 - Variation between reporting mills for this supply chain component is expected.
 - In both study periods, the Pacific Northwest and the Lake States regions had the highest costs for this component.
 - Wood yard transfers and direct yard costs are believed to be high in the Lake States due to seasonal supply constraints.
 - The primary cost in the Pacific Northwest is the transfer of chips.

Conclusions

- Efficiencies in Freight and Other costs are not easy to address.
- Other costs may be lowered if double handling of wood was reduced, haul trucks were reconfigured without loaders, and mills (including new industry) could accept tree-length segments.
- During the extended study period, Wisconsin's total delivered costs were 18 percent higher for aspen, 19 percent higher for hardwood, and 12 percent higher for conifer pulpwood relative to the initial study period.
 - Most of this additional cost in Wisconsin occurred in the Stumpage and Margin cost components, likely related to roundwood availability and the resulting supply pressures that occurred during the 2014/2015 winter and 2015 spring period.

Conclusions (Cont.)

- Strategic placement of new industry could reduce Freight and Other costs. The average haul distance in the Lake States region provides evidence that the average mill in this region is not well placed, especially when compared to the South and Pacific Northwest.
- This study found that Wisconsin continues to have a slight overall delivered cost advantage over the Northeast, the region most similar in forest cover, seasonality issues, and harvest operations.
- Lake States and Northeast regions are less competitive when compared to the South. This disadvantage will be difficult to overcome given inherent differences in weather and forest and operational characteristics.