



Industry News

■ **Chinese logging ban boosts demand for foreign logs**

(Dec 14th)

China remains the top recipient of U.S. hardwood logs, boosting its imports by 19 percent. With an increased Chinese interest, removing logs from an already tight U.S. market could raise lumber prices inside the country. Some Chinese buyers are paying up to 50% more than the typical sawmill price for logs. This, overall, will increase lumber prices within our country due to the shortage of logs.

— Woodworking Network

■ **Softwood duties take effect, legal challenges underway**

(Jan 4th)

Anti-dumping and countervailing duties on Canadian lumber imported to the U.S. went into effect on Jan. 3. The duties are the latest step in the ongoing trade dispute of over softwood lumber. The Canadian government has already begun legal challenges of these duties under NAFTA and through the World Trade Organization, where Canadian litigation has proven successful in the past.

— The Working Forest Newspaper

Industry Overview

Forestland Operations

Winter season is now wrapped up and the snow is melting in the Northeast. With the fast pace of winter behind us and the proverbial “mud season” now underway, it is always a time of reflection on how successful everyone’s planning efforts were for the most hectic time of year. The forest products supply chain did have some curveballs thrown at us this quarter, particularly as it relates to weather, however our in-woods operations and our trucking seemed to stay fairly consistent.



Hardwood logs being piled and sorted by a logging crew in northern Maine.

Thankfully, because of extreme cold weather we had a solid rolling start to winter activity, and the momentum that was built up in the movement of forest products during the fourth quarter was easily maintained throughout the following months. There was a brief thaw in late January throughout the region, which led to posted roads and widespread nervousness for those buying and selling timber, but it turned out to be only a hiccup. For most of the winter, other than when they were plowing snow, our contractors were highly productive cutting & moving timber.

By early March, the region had seen enough sun & warmth to remind us that spring was on the way – and provide enough advance notice for our foresters and logging crews to start moving to drier areas of the forest. In retrospect, the winter stayed a little longer than average. As of the end of the first quarter, the forest floor still has a fair amount of snowpack in the northern areas, which is unusual but welcome. This extended winter allowed logging contractors to better manage the in-woods inventory – something we don’t need to pay much attention to in January, but in the springtime can be critical. With Mother Nature’s help, we were able to keep the mills well fed.

At this point it is too early to tell how quickly we'll be able to restart harvest operations. It is a delicate balance, and can be a precarious one for loggers who have to idle their equipment and send crews home. This is the time of year when cash flow is critical to their financial health. Accordingly, each year we try to find areas under our management where the ground conditions will allow contractors to keep busy for as long as possible in order to minimize the impact to them.

NUMBER 2 DIESEL FUEL PRICES - NEW ENGLAND

3 YEAR HISTORICAL MONTHLY AVERAGES

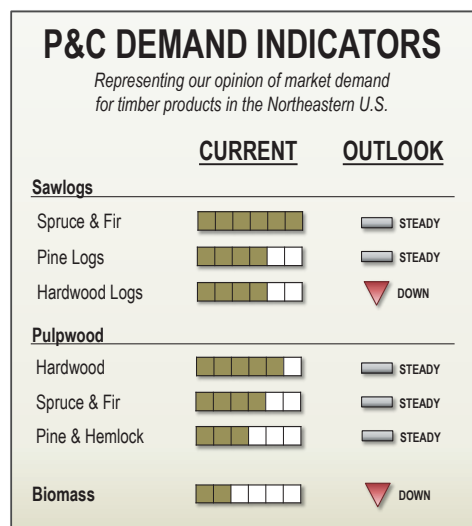


The cost of fuel continues its steady rise (see chart above) although it is still below the threshold where we begin to adjust our logging rates. Because the cost of diesel is such an important variable for logging contractors, when fuel rises it is difficult to insulate the landowner from feeling the pinch as well. Thankfully, both the market futures and projections from the U.S. Department of Energy would suggest that the short term outlook for diesel is stable.

Forest Product Markets

One would expect that good logging conditions during an extended winter would result in an over-saturated marketplace and tepid demand for wood. This year, however, we have been

surprised by the continued call for wood from our regional markets. Despite the favorable weather, most mills found themselves slightly short of their inventory targets for mud season. In part this was because robust consumption during the last six months served to draw down wood piles quicker than usual, but it is also likely that overall regional supply was not what it used to be. Although contractors had a fairly productive winter, the overall size of the logging force in the region has diminished because of the large scale mill shutdowns several years ago. With fewer loggers producing wood, the total timber supply made available to the markets has moderated.



Constrained supply can also make sourcing wood more competitive, allowing landowners to demand a higher price for their logs. Accordingly, we've seen improved pricing in the last quarter for almost every product category.



LANDOWNER

update

1st Quarter 2018

- **LePage tells lawmakers he will oppose borrowing aimed at helping biomass industry** (Jan 10th)
Gov. Paul LePage told lawmakers he opposes a pair of bills that would have taxpayers fund a \$45 million subsidy to help Maine's foundering biomass industry. He said the Legislature should focus instead on ways of creating industries that bring greater value from the state's more than 18 million acres of forest lands.
— Press Herald

- **Low energy prices force New England wood heat pioneers to pivot** (Jan 16th)
For years, high energy prices were the driving force behind adoption of residential pellet stoves, but now in our third year in a row of low and stable fossil fuel heating prices, wood heat advocates moved from talking exclusively about energy savings to talking about benefits that would accrue to the building owner, the community and the forest, like creating local jobs, getting off oil, keeping energy dollars local and supporting working forests.
— Treasuresource

- **Lumber prices have timber mills cheering, but home builders passing costs to buyers** (Jan 22nd)
The relatively high and stable prices for lumber over the past year have the Montana wood products industry happy - but home builders are frustrated because they have to pass on those costs to consumers in the midst of already lofty housing prices.
— The Missoulian

Pulpwood Products

After the rapid loss of regional pulpwood consumption several years ago, the experience of most timber suppliers this winter would suggest a full recovery of the pulpwood markets. Certainly, there are fewer players on the board, but demand for hardwood pulpwood remains healthy and wood buyers have been challenged to supply the region's increasingly hungry mills. This past quarter, although none of the regional pulp markets seemed completely satisfied with the size of their spring wood inventory, only a select few have been willing to put extra dollars to acquiring the supplemental amount of wood needed to stay comfortable. What this tells us is that some mills planned well for winter, and others didn't.

Pulp and paper manufacturers aren't the only consumers in the region that have demonstrated an increased hunger for what we would traditionally call "pulpwood". There are a few regional consumers that use pulpwood-quality fiber in the production of structural panels (such as OSB) and engineered lumber products. Panelboard plants are running well and breaking production records, while consumption of wood at these facilities is the best it has been in years. These mills have been increasingly influential in the supply and demand of hardwood pulpwood. Poplar is the species of choice – more than 2/3 of the wood delivered to those facilities is in the poplar family. Because of increased consumption, local demand for hardwood pulpwood, specifically poplar, is vigorous.

A recent announcement by Verso offers encouraging news for suppliers of softwood pulpwood. The pulp & paper manufacturer, which has a paper mill in Jay, Maine, is now in the process of retooling an idled paper line so that it can begin to produce cardboard and boxboard packaging products. In addition to injecting needed life into a local mill-based economy, this new mill will represent a new significant regional draw for softwood pulpwood. The facility is expected to be running by late summer, but even now, before this facility has purchased its first ton, it has undoubtedly influenced the thought process for all regional softwood consumers.

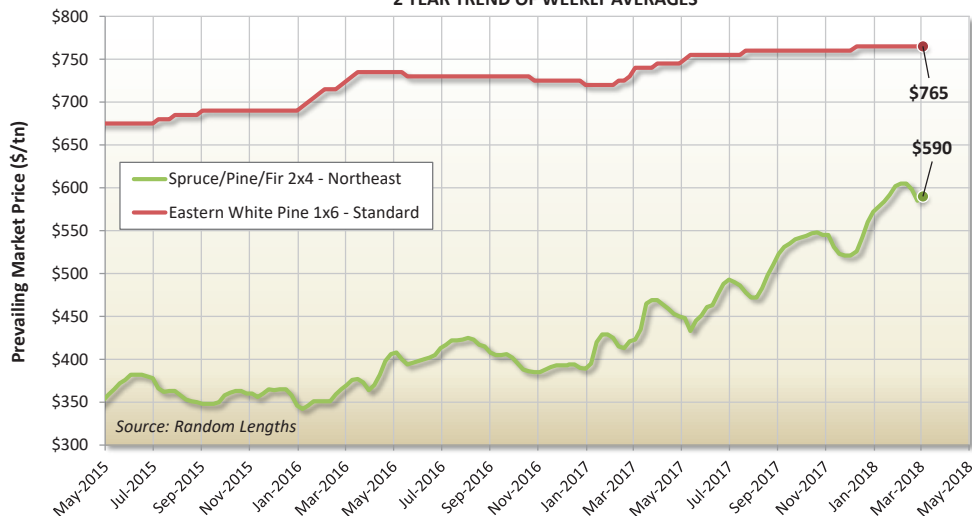
Sawn Products

Softwood

Regional demand for spruce & fir sawstock continues to be extremely good, supported by fervent lumber markets that have been on solid footing for at least the past two years. There is optimism at the sawmill and most of the predictions we hear forecast additional growth in demand for lumber. Times like these are when mills are most thinking about the best way to employ the capital in order to expand throughput and improve efficiency.

PRICE TRENDS IN SOFTWOOD LUMBER

2 YEAR TREND OF WEEKLY AVERAGES



LANDOWNER
update
1st Quarter 2018

■ Study: New England forests face more precipitation, milder winters; key tree species threatened (Feb 6th)

A team including Forest Service scientists, National Forest managers, state natural resource managers, other federal agencies, university researchers, and conservation organizations contributed to the report, "New England and Northern New York Forest Ecosystem Vulnerability Assessment and Synthesis: A Report from the New England Climate Change Response Framework Project." The report was published by the USDA Forest Service's Northern Research Station and is available at <https://www.nrs.fs.fed.us/pubs/55635>

— VT Digger

■ Latest bid to revive shuttered Katahdin mill promises 100 jobs (Feb 13th)

North Carolina manufacturer, LignaTerra Global LLC, announced plans to build a \$30 million, 300,000-square-foot factory to produce cross-laminated timber, creating more than 100 jobs. Planning to build on a 35-acre portion of Millinocket's 1,400-acre former Katahdin Paper Co. LLC site, the company hopes to break ground in July and start production in 12 months.

— Bangor Daily News

For the time being, the softwood lumber mills in the region are running well and the demand for wood is being fulfilled – inventories are about on par with what is expected this time of year. That said, because of the market appetite for lumber, we expect mills will be looking for ways to pad their wood piles during the spring months.



LANDOWNER

update

1st Quarter 2018

Cross Laminated Timber (CLT)



Detail on the construction of a CLT panel. Image: HYBRID Build Solutions.

One exciting development that could affect regional softwood markets is the proposed construction of two new initiatives to manufacture Cross-Laminated Timber (CLT) panels in the region. Popular in Europe for some time but relatively new to North America, CLT is an engineered wood-based building system designed to complement existing timber framing options.

Made from several layers of lumber, stacked and glued crosswise, these panels are pre-fabricated at a manufacturing facility, allowing for an accelerated and cost efficient construction process. Moreover, they are a more environmentally friendly alternative to concrete and steel in many situations.

It is too soon to tell what might be the resulting effect on regional demand of sawstock. While both of the newly announced manufacturing facilities are currently in the initial stages and likely several years away from production, it is refreshing to see the region will be home to an innovative new facility producing a new product out of wood.

The softwood lumber dispute between the governments of the United States and Canada continues to be in a stalemate phase, with no major progress having been announced and no particular light shining at the end of the tunnel. For now, Canadian lumber producers, including those who source their wood from the northeast and pay competitive prevailing market prices for it, are suffering under a 20% import penalty imposed by the U.S. Department of Commerce. With lumber prices so elevated and production at a peak, there is little incentive on the U.S. side to work things out through negotiation. Recently, this sting was made even stronger by the U.S. DOC announcement to expand the scope of the penalty to imported cedar products such as shingles and shakes. For the time being, it would appear that both sides are digging in and preparing to slog it out under the guise of protectionism. We feel this is an unproductive stance, and we hope to see at least some movement toward renewed Softwood Lumber Agreement negotiations in the near future.

The regional stock of hemlock logs is currently at a high and so demand has been lukewarm. Hemlock often grows in mixed forests alongside spruce, and so when there is high demand for spruce, the resulting hemlock also gets put onto the market. While there is currently a buyer for all the spruce coming out of the forest, regional markets for hemlock (both pulpwood and sawstock) are limited and thusly inventory has been built up to a point of excess.

Hardwood

There have been very few changes to the hardwood log market since the last edition of this newsletter. Demand for hardwood logs of nearly all grades remains healthy, and we are still receiving a fair amount of inquiries about the exports of logs to foreign markets for higher-end products.

Demand for hard maple logs – the dominant product grown in the northeastern forest – has increased over the winter and we have experienced moderate price gains. As always this

■ **Quarantine for emerald ash borer expands to Maine borders** (Feb 17th)

The quarantine area for the emerald ash borer, an invasive beetle killing ash trees throughout North America, was recently expanded to the Maine border, prompting state biologists to ramp up public outreach about the pest. A quarantine area for pests is an area with defined boundaries that limits the transportation of wood, allowing for wood to be moved within that quarantine area, but not transported outside the area. Its purpose is to prevent the spread of the pest, or at least slow it down.

— Bangor Daily News

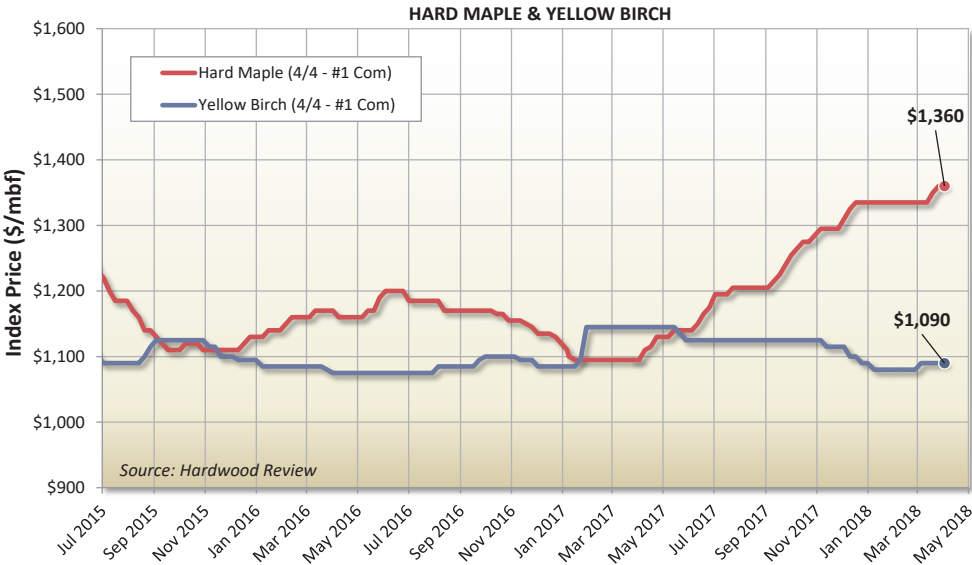
■ **Tokyo to build world's tallest timber tower** (Feb 20th)

A Tokyo skyscraper is set to become the world's tallest wooden building. Japanese company Sumitomo Forestry says its 70-story tower will be a hybrid structure made from 90% wooden materials and cost an estimated 600 billion yen (\$5.6 billion) to build. The 1,148 feet tall timber tower will be completed in 2041.

— CNN

time of year, the increasing temperatures and sap flow can be a concern to sawmills because the sugars in hard maple can serve to discolor and introduce blemishes on the wood. For this reason, winter-cut maple generally takes priority over other more resistant species such as oak, as sawmills are attempting to get the material dried & dressed before any stain can set in.

RECENT PRICES IN HARDWOOD LUMBER - NORTHEAST



Demand for ash remains about as strong as we have seen it, and interest in oak is picking up. Both of these have had significant interest from foreign buyers in the wake of logging bans instituted in China. This new market is putting strain on domestic hardwood mills, who have had to offer higher prices and leverage long-standing relationships to acquire their wood.

Veneer log markets – which slice high end logs into very thin sheets in order to laminate a surface – are very good right now as well. In particular, yellow birch is the species in favor right now for our veneer mills.

Biomass

The market for biomass material – residuals left over from topping off and merchandizing timber in the forest – continues to shrink. This year, more noticeably than in the past, loggers who have usually been interested in chipping and taking the material have been unwilling to extend themselves very far in order to acquire it. As has been discussed here before, while there are viable and cost-effective energy sources such as natural gas and oil for the traditional consumers of biomass, it is unlikely that biomass will become a significant market for landowners in the near term. In fact, biomass is becoming less and less likely to provide a return for the landowner, and less of a factor in our forestry team's operating decisions. It is much more likely to be left in the forest to provide nutrients to the soil and serve as an erosion control material.

Benjamin D. Carlisle
PRESIDENT

■ *Trump's Tariff Is Forcing Homebuilders to Cut Costs* (Mar 5th)

The Trump administration slapped punitive tariffs on Canadian softwood timber last year, claiming the industry is unfairly subsidized. The move has driven lumber prices to near record highs. Framing lumber, including installation costs, accounts for about 18 percent of the average home's selling price. The import duties leave companies paying \$1,360 more to build a single-family home. Many builders have started to raise their prices to keep profit margins stable.

— Bloomberg

■ *United States imposes more anti-dumping duties on Canadian newsprint* (Mar 13th)

The U.S. Department of Commerce says a preliminary investigation has found Canadian exporters underpriced uncoated groundwood paper by between 0 and 22.16%. The department says it's instructing U.S. Customs and Border Protection to collect cash deposits from Canadian newsprint importers based on the findings. This is the second round of U.S. antidumping duties on Canadian newsprint this year.

— CBC News

■ *Verso foresees better sales in 2018 amid plans to restart paper machine in Jay* (Mar 19th)

Verso Corp. expects sales to improve in 2018 as it gears up to restart the idled No. 3 paper machine at its Androscoggin Mill in Jay later this year and continue to explore strategic alternatives. The mill aims to remain the leader in graphic papers, grow its specialty business through new products and diversify in low-risk ways into packaging grades. The company will invest \$17 million to transition to linerboard to satisfy global demand for virgin fiber, creating 120 jobs in the process

— Mainebiz

Timberland Appraisal: The Comparable Sales Approach

by Sam Radcliffe, Vice President

The three standard real property appraisal techniques are the income, cost and comparable sales approaches. In past issues of this newsletter we have explored how the cost and income approaches are applied in timberland valuation¹. Here we round out the topic by examining the comparable sales approach ("CSA").

The comparable sales concept is probably the most intuitive of the three appraisal approaches. In fact, many non-appraisers casually employ it on a regular basis as they monitor home sales in their neighborhoods: "Joe's house sold for \$xxx last year but it's older and has only three bedrooms and a small lot so our house must be worth at least \$yyy." This statement perfectly captures the essence of the approach: estimate the value ("Syyy") of a subject property ("our house") by making adjustments to the price ("Sxxx") of a comparable property ("Joe's house") for certain transaction and property attributes ("last year", "older", "three bedrooms", "small lot"). Of course the homeowner is not an unbiased observer, and "Joe's house" is only one data point.

In application to investment grade timberland properties, the CSA is not nearly as straightforward as in application to residential properties:

- The timberland market is much thinner: there were more home transactions in my immediate neighborhood in the last year than there were large timberland transactions in all of Wisconsin over the last three years.
- In a given region, timberland properties are usually less homogenous than in the typical residential market. Variations in property size, timber types and volumes, accessibility, etc. typically give each property a unique character.
- Increasingly, as financial entities have come to dominate the market, timberland property interests are often not fee simple; they may be subject to conservation easements, timber supply agreements, carbon contracts, etc. They may be partial interests such as "common and undivided" interests in Maine. They may consist of timber rights only or surface rights only.
- Comparable timberland property and transactional information is much more difficult to develop than for residential markets. One cannot simply search MLS or the local assessor records. Certain states, e.g. Michigan, are "non-disclosure" states where sale prices are confidential information. Some buyers and sellers in the timberland market are remarkably secretive about transactions, given that they are often the consumers of appraisals.

For the appraiser, these difficulties mean the search for comparable property transactions must go wider in time and geography. It is not unusual to compare properties across multiple states and to go back as many as five years. We have already hinted at timberland comparison attributes, but here is a more complete list:

While the non-appraiser implicitly lumps all the property differences into a single adjustment, the appraiser considers each property attribute individually and makes a series of adjustments.

- | | |
|--|-----------------------------------|
| ■ Market conditions (sale date) | ■ Property size |
| ■ Sale conditions (arm's length?) | ■ Timber value |
| ■ Location | ■ Higher and better use potential |
| ■ Real property interest (fee simple?) | ■ Operability and accessibility |

In the timberland market, making such adjustments truly walks the line between art and science. In the following paragraphs we discuss how some adjustments might be made for some example property attributes.



LANDOWNER
update

1st Quarter 2018

■ ***Verso strikes deal with Canadian companies that could net up to \$42 million*** (Mar 22nd)

According to a March 20, 2018 filing with the Securities and Exchange Commission, Verso has struck a deal with Port Hawkesbury Paper Limited Partnership and Irving Paper Limited, both producers of glossy supercalendered paper, which could result in the return of import taxes paid by the companies. Verso could receive up to \$42 million of the total return

— *CentralMaine.com*

■ ***Possible biomass shutdowns loom; \$27 million loss for Minnesota loggers*** (Mar 25th)

Blandin Paper Co. shut down its No. 5 machine and the Minnesota Legislature passed legislation last year allowing Xcel Energy to negotiate a shutdown of three renewable energy plants. Organizations that oppose the shutdown of these biomass plants believe the impacts will extend past the logging industry.

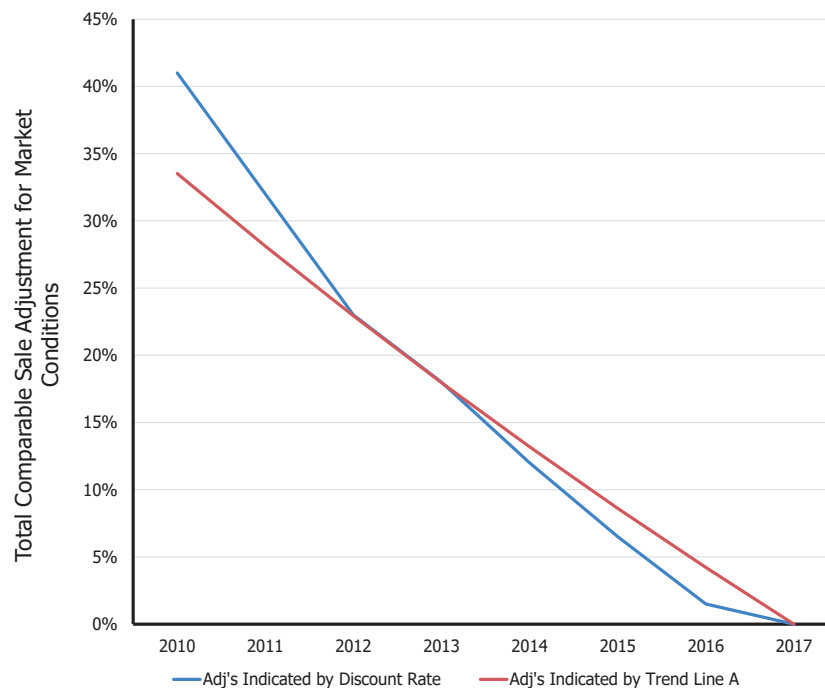
— *Duluth News Tribune*



Figure 1: Price Per Acre Trends for Large Timberland Sales in Wisconsin and Upper Michigan



Figure 2: Comparable Sale Adjustments for Market Conditions Indicated by Two Methods.



Market conditions. Ideally, we would like to have a time series of prices to unambiguously indicate how the market has changed over time. But with the paucity of transactions and uniqueness of properties, a clear picture of short-term trends does not emerge. Consider Figure 1, which shows long-term price trends for large properties in Wisconsin and Upper Michigan. The two trend lines have approximately equal statistical explanatory power, yet for the last several years one line indicates rising prices while the other indicates falling prices. These are the years in which we are most interested, the years in which our comparable sales occurred.

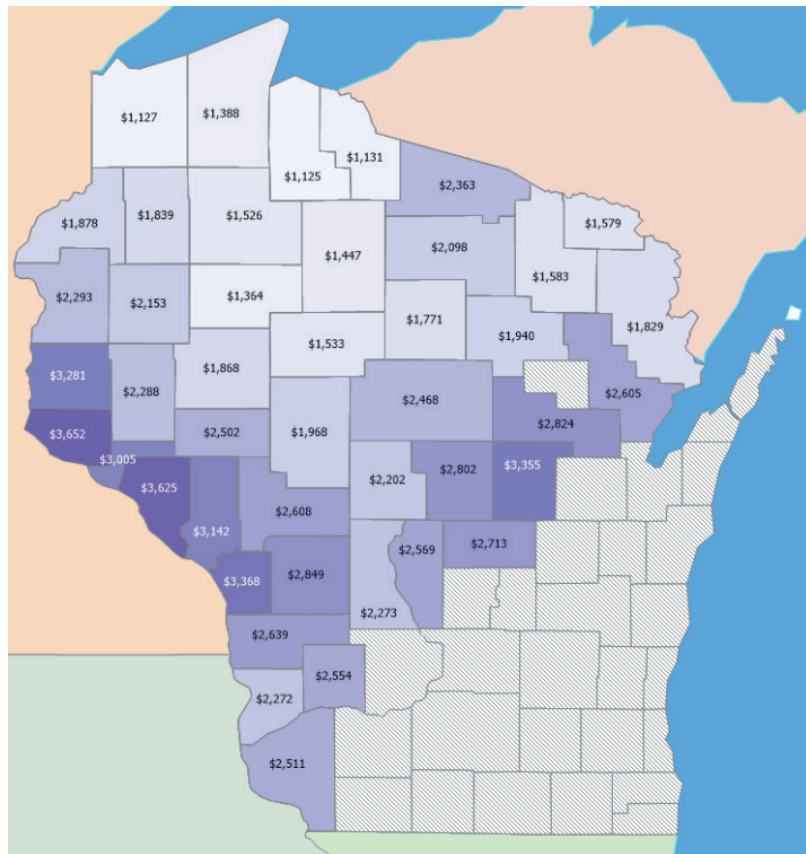
A second approach helps to clarify the situation. We know that discount rates have been compressing over the last several years, resulting in higher timberland (as well as other financial asset) prices. By estimating discount rates as a function of risk-free rates², we can approximate the annual change in timberland values by considering the change in each year's discount rate. The results are shown in Figure 2. One line shows the adjustments indicated by the discount rate approach, while the other shows the adjustments indicated by Trend Line A in Figure 1. Both approaches indicate that a 2012 sale would be adjusted upward by about 23% to reflect a 2017 valuation date. Sales in other years would have different adjustments depending on the method chosen, but they are in relative agreement.

Timber value. The difference in timber value between the subject and comparable sales is often the largest adjustment to be made. It is not unusual to see price adjustments of 50-100%. The process starts with estimation of the Gross Timber Value ("GTV", also called Timber Capital Value), for the subject property and for each comparable sale. This calculation requires a detailed inventory and relevant stumpage prices for each property. GTV is simply the inventory (volumes by species and product) multiplied by the appropriate prices. If this information is lacking for a comparable sale, the sale often becomes unusable. The adjustment amount is not simply the GTV difference between the subject and the comparable sale; properties are typically traded at a multiple of GTV and at a multiple of total compositional value, which is the sum of GTV and bare land value. This Compositional Value Multiplier times the GTV differential indicates the timber value adjustment. For example, if properties such as the subject typically sell at 50% of compositional value, and the GTV differential between the subject

and comparable sale is \$200 per acre, the appropriate adjustment would be $.5 * \$200 = \100 .

Location. The thin market in large timberland properties again limits the extent to which we can empirically observe the differences in property value due to location. However, in some areas there is significant data on timberland sales at the retail level to generate some indication of locational value differences. For example, Figure 3 shows that there is considerable variability in values from county to county within Wisconsin. Prices are higher toward the south and west as the property gets closer to the population centers of Milwaukee, Madison, and Minneapolis/St. Paul. These retail differences can be used to estimate locational adjustments between two Wisconsin properties. Price adjustments are based on the differences in per acre values but scaled so that the maximum absolute adjustment is 15%. This scaling is introduced because prices for larger timber-oriented properties are not as location-sensitive as for the smaller properties that are reflected by Figure 3.

Figure 3: Average 2007-2014 Retail Timberland Prices in Wisconsin, by County..



These are just three examples of property attributes that require price adjustments. Each property attribute is addressed in turn, and adjustments are estimated using empirical data where available, but often relying on the appraiser's experience and judgment. Typically the adjustment process is summarized in a matrix such as Figure 4. In this example the average unadjusted price was \$1,109 per acre, with a wide range of \$912 to \$1,787 per acre. After adjustment the average is \$1,172 per acre, with a much narrower range of \$1,077 to \$1,249 per acre. This narrowing of the range is what would be expected when each sale is adjusted to reflect the subject property attributes.

Figure 4: Example Comparable Sale Adjustment Matrix

	SALE NUMBER				
	[1]	[2]	[3]	[4]	[5]
Date	Dec-16	Oct-15	Apr-16	Sep-17	Feb-16
Seller	A	B	C	D	E
Buyer	F	G	H	I	J
Unadjusted \$/Acre	\$912	\$1,787	\$945	\$950	\$950
Market Conditions	0%	1%	0%	0%	0%
Sale Conditions	0%	5%	5%	5%	5%
Size	15%	9%	14%	12%	14%
Timber Value	9%	-54%	-13%	3%	-11%
HBU	2%	2%	2%	0%	0%
Property Interest	0%	0%	0%	0%	0%
Legal Access	0%	0%	0%	0%	3%
Location	8%	7%	12%	2%	2%
Net Adjustment	35%	-30%	20%	23%	13%
Adjusted \$/Acre	\$1,231	\$1,249	\$1,137	\$1,165	\$1,077



This array of five indicated values must be reconciled by the appraiser to a single value. A simple average is not considered good practice; the values should be weighted reflecting not only their similarity to the subject but also the confidence the appraiser has in the data describing each sale.

After completing the CSA, its result must be reconciled with the results from the income and cost approaches to arrive at a final appraised value. In the investment timberland market, the income approach is often given the greatest weight because it directly indicates the property's operating potential and is the approach most favored by sophisticated investors. The CSA may be given more weight if the comparable sales are very similar to the subject. It is often the favored approach when the subject is smaller and does not have significant near-term cash flow capability.

1 "Cost Approach and the Timber Value Multiplier", Prentiss & Carlisle Quarterly Update, 2nd Quarter, 2010; "Timberland Appraisal FAQ's: The Income Approach", Prentiss & Carlisle Quarterly Update, 2nd Quarter, 2015.

2. See "Timberland Return on Investment and the Discount Rate", Prentiss & Carlisle Quarterly Update, 2nd Quarter, 2013.



©2018 by **Prentiss & Carlisle**. Reproduction of this report by any means in whole or in part without express permission of the authors is a violation of federal law.

Please note: This report is intended to be an unbiased and accurate source of information on timber markets and timberland investments. However, timber market conditions and the forest products industry vary greatly within and across regions and depend on a substantial number of factors that this publication does not cover. Therefore, anyone using information published in this report for any specific purpose, sale or contract does so at his or her own risk. Information included in this report and provided by other sources is believed to be reliable and accurate. Prentiss & Carlisle assumes no responsibility for errors or omissions.

