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Timber Trends | April 2018
Newsletter by: David Haim, PhD, Forest Economist



Timber Trends

A [monthly publication](#) developed by Campbell Global. This production summarizes the applicable developments in the economy and forest products industry on a monthly basis.

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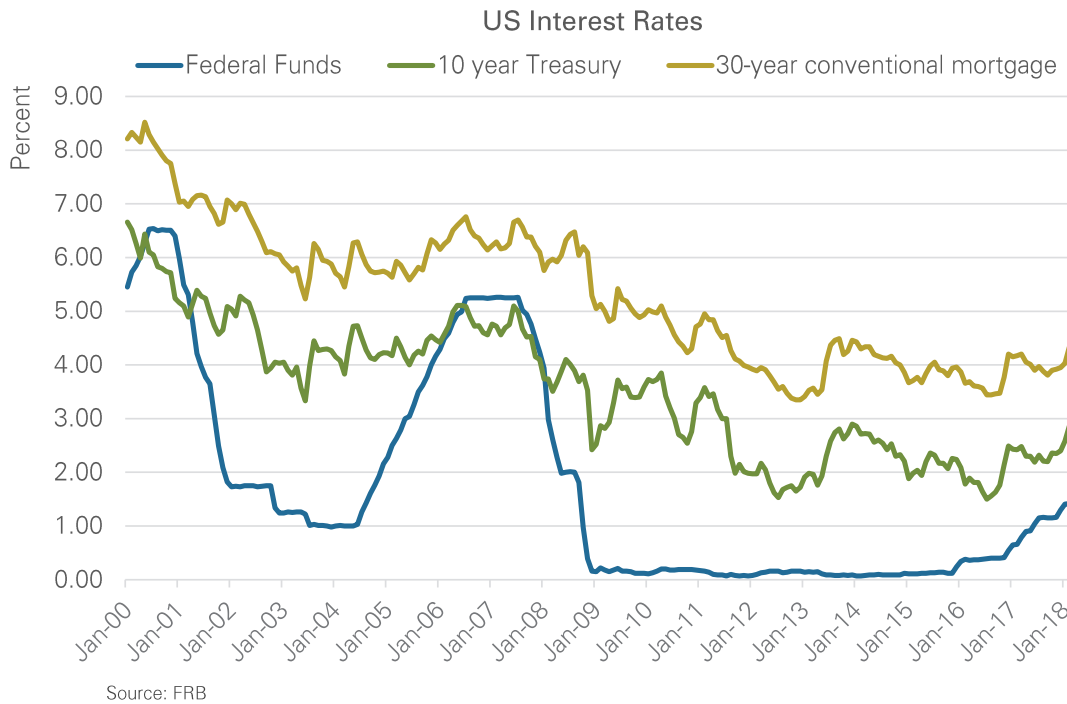
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Highlights

- Douglas-fir sawlog prices are leveling off across the Pacific Northwest after rising sharply since July
- Pine sawtimber stumpage shows modest improvements across the US South
- Softwood lumber exports from British Columbia to US fall 20 percent in March amid railway woes
- Softwood lumber production in the US has yet to return to pre-recession levels

The Economy in Graphs

Mortgage rates have climbed to a four-year high



International Trade

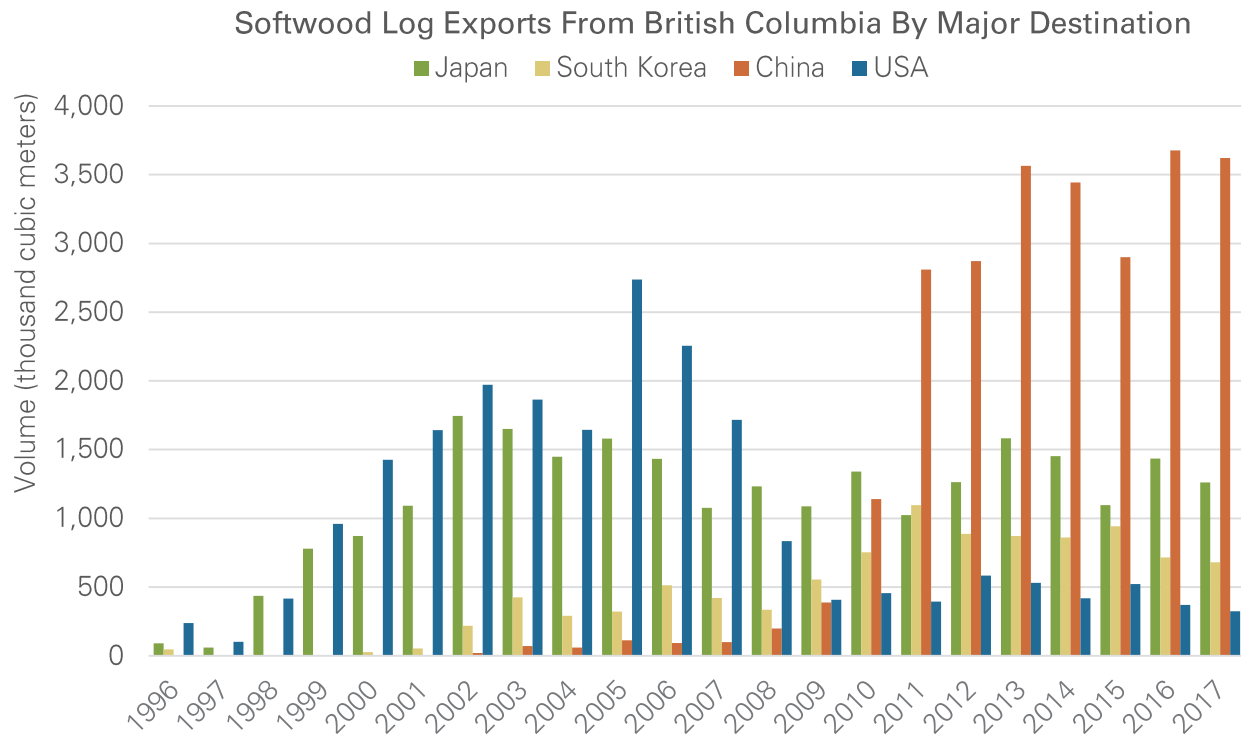
Exchange Rates

The Renminbi continues to strengthen against the US dollar, lowering the competitiveness of Chinese products in the US



Exports

British Columbia softwood log exports to China remained high in 2017



Sources: BC Stats, RL

Softwood lumber exports from British Columbia to US fall 20 percent in March amid railway woes¹

Softwood lumber shipments from British Columbia to the United States plunged 20 percent in March from a year ago amid railway transportation problems. Global Affairs Canada says the country's largest lumber-producing province exported 514.4 million board feet (MMbf) to the United States last month, down from 614.7 MMbf a year ago. 2018Q1 shipments from the BC Interior, which account for more than 90 percent of BC's lumber exports, were 18 percent weaker than a year ago, largely due to transportation issues. BC Coastal shipments were 36 percent lower.

Total Canadian shipments in 2018Q1 were down 17.4 percent. Shipments from Quebec — Canada's second-largest forestry producing region — were down 16.6 percent in 2018Q1, while Ontario was 8.6 percent lower. Canadian National Railway and Canadian Pacific Railway say western Canadian routes were more affected by cold winter weather and unexpected volume increases that slowed traffic.

New Zealand log exports top 1 million m³ in January, second-highest level ever for the month²

New Zealand exported more than one million cubic metres of softwood logs in January, only the second time in the country's history that such a high volume has been shipped in the month. The country exported 1.1 million cubic metres of softwood logs overseas in January this year, up 32 percent on January 2017, according to data from Global Trade Information Services published in AgriHQ's monthly forestry market report. That's the highest level for the month since 2014 and only the second time volumes have exceeded 1 million for a January month. "New Zealand's softwood log exports started 2018 with a bang," AgriHQ analyst Reece Brick said in his March report under the heading 'Flying start for log exports'. "The strong start to 2018 bodes well for the coming year, as January is historically the weakest month each year."

The large export volumes in January were partly down to the later timing of Chinese New Year, which moved some of the heavy pre-Chinese New Year trading into January rather than December. New Zealand log exports in January fell 31 percent from December levels ahead of Chinese New Year celebrations, which ran from mid-February through to early March. However, the generally high level of exports this past 12 months were also a factor in lifting January volumes, AgriHQ noted.

New Zealand's strong presence in the Chinese log market continued in January, with imports of New Zealand logs jumping 43 percent from the same month a year earlier, and accounting for 40 percent of China's total log imports, significantly ahead of its closest rival Russia with a 21 percent share. "There's little to show there will be any deviation from what's been witnessed over the past 12 months and the general sentiment is for small price increases over the next two months" said Reece.

Brazilian exports of wood products increased 27 percent in value in February year-over-year³

In February 2018, Brazilian exports of wood-based products (except pulp and paper) increased 27 percent in value compared to February 2017, from US\$192.3 million to US\$244.0 million. Over the same period the value of pine sawnwood exports increased almost 26 percent from US\$30.8 million to US\$38.7 million. In terms of volume, exports increased 21 percent over the same period from 152,700 m³ to 185,600 m³. The value of pine plywood exports in February increased by 56 percent compared with February 2017 (US\$36.7). Increase in pine plywood volume was more modest at 27 percent, from 138,100 m³ to 175,200 m³.

Brazilian pulp exports in February boom 33.1 percent to 1.2 million tonnes⁴

The latest statistics released by the Brazilian Tree Paper Industry Association (Ibá) show that pulp exports surged 33.1 percent in February compared with the same month a year ago, totaling 1.2 million tonnes. Considering the first two months of 2018, Brazilian pulp sales overseas increased 9.3 percent to 2.5 million tonnes. Year-to-date, Brazilian pulp exports in value were at \$1.3 billion, 41 percent up annually, with Chinese purchases increasing by 40.7 percent to \$588 million. Sales to European countries were 37.3 percent higher at \$423 million, while to North America they totaled \$202 million, a 50.7 percent surge compared to the same months of 2017.

Brazilian pulp production also increased by 400,000 tonnes in the first two months of 2018, a 13.1 percent annual raise to 3.4 million tonnes, which can be explained by the ramp up of Fibria's Três Lagoas line No. 2. The line started up in August and has capacity to produce 1.95 million tonnes per year of bleached eucalyptus kraft (BEK) pulp.

US recovered paper exports to China decline year-over-year in January-February 2018⁵

As a result of China's new import regime, the country slashed its purchases of US mixed/ unsorted paper by 95.2 percent to 18,432 tonnes in the opening two months of 2018 from 384,887 tonnes in the same period last year, according to America's Census Bureau and International Trade Commission. Declines were also recorded for all other grades of recovered paper.

In revenue terms, China still represented the largest export market for US recovered fibre in the January-February 2018 period although the figure tumbled almost 39 percent year-over-year from nearly US\$ 339 million to around US\$ 207 million. India made up for some of the lost revenue in increasing its payments for US fibre by more than 130 percent- from a fraction over US\$ 42 million to approaching US\$ 98 million. Revenues from US recovered paper shipments to Indonesia and Vietnam also recorded triple-digit increases in the opening two months of this year, the former by 116.2 percent to US\$ 19.6 million and the latter by 245.4 percent to US\$ 13.3 million. To all destinations, US revenues slid 7.5 percent year-over-year to just over US\$ 494 million.

Trade Issues

The US will not launch a new investigation into plywood imports from China⁶

The US Department of Commerce (DOC) will not launch a new investigation into plywood imports from China for the time being. With this decision, the DOC dismissed a petition filed by four US plywood producers on 15 February.

In the petition, the plaintiffs called for more far-reaching reviews to complement the investigation completed at the end of 2017. Specifically, they aimed to expand the subject of the probe into plywood made with softwood veneer faces. The companies report that a variety of Chinese plywood

manufacturers have started to switch outer faces with softwood veneers in response to punitive duties imposed on hardwood plywood products at the start of the year.

Section 781c of the US Tariff Act of 1930 allows the investigation to be expanded as long as the new object of the investigation only varies slightly from the grades covered to date. The probes conducted to date addressed laminated and unlaminated plywood with two or more layers whose top face solely consists of hardwood veneers or bamboo. Against this backdrop, the DOC feels that plywood with softwood outer faces cannot be seen as a minor product change to the object of the investigation.

US Canadian Softwood Lumber Dispute

Canada escalates softwood lumber fight with US, asks WTO to step in⁷

Canada plans to ask the World Trade Organization (WTO) to set up an adjudication panel to judge its dispute with the United States over Canadian lumber exports, indicating that talks have failed to resolve the issue and Ottawa is pressing its case.

Canada has submitted the request for a meeting of the WTO's dispute settlement body on March 27, according to an agenda circulated by the WTO on Friday. Ottawa launched the complaint in November, saying it would forcefully defend its lumber industry against punitive US tariffs, which it said were "unfair, unwarranted and deeply troubling."

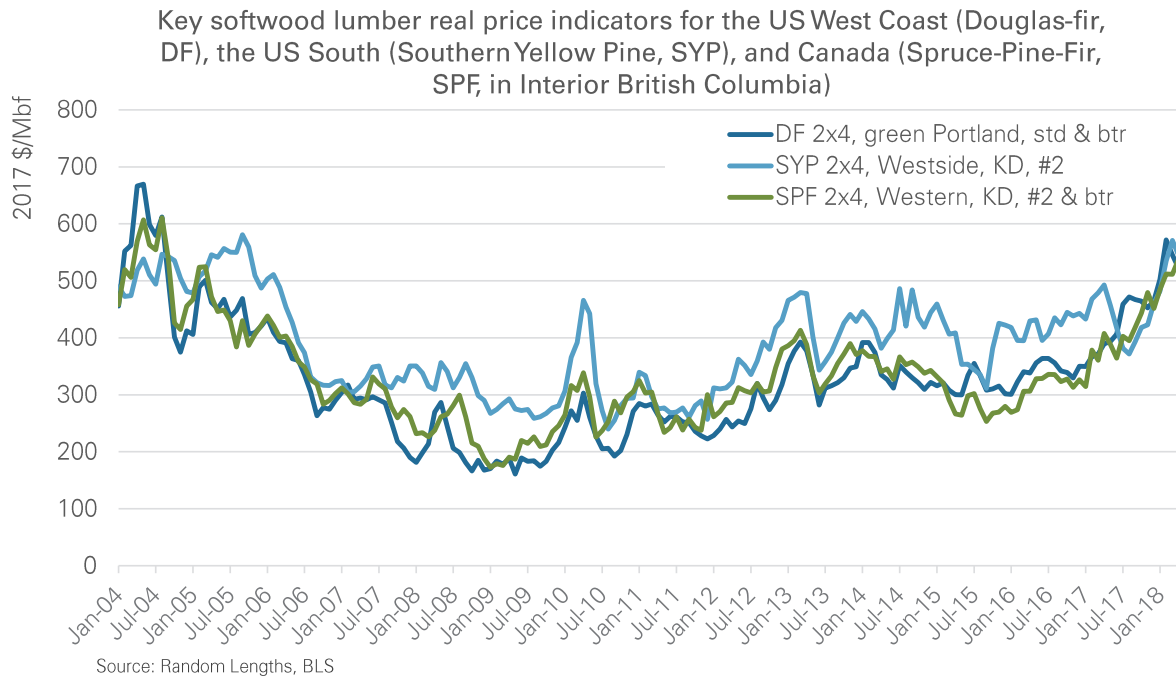
It had already started a challenge under the North American Free Trade Agreement's Chapter 19 dispute settlement mechanism, which the United States wants to remove as part of talks to modernize the regional trade pact the two countries share with Mexico.

The US Commerce Department accuses Canada of unfairly subsidizing and dumping softwood lumber, which is commonly used in the construction of homes. It has said its duties affect about \$5.66 billion worth of imports.

Prices

US Lumber

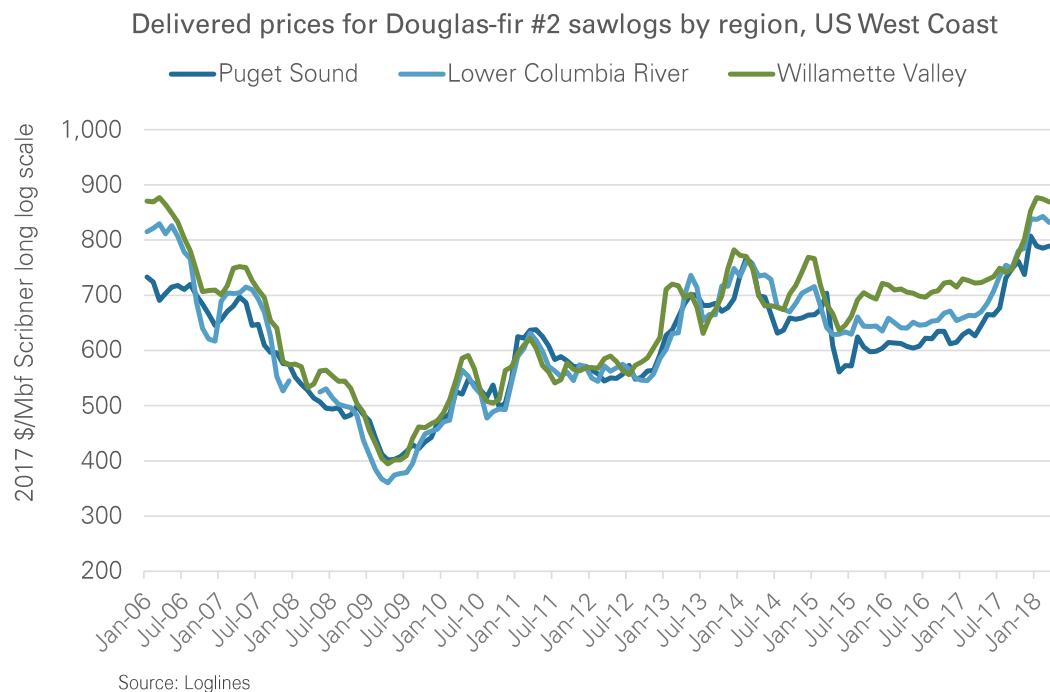
North American lumber markets remain volatile, with US lumber prices correcting downward and SPF moving upwards



Logs

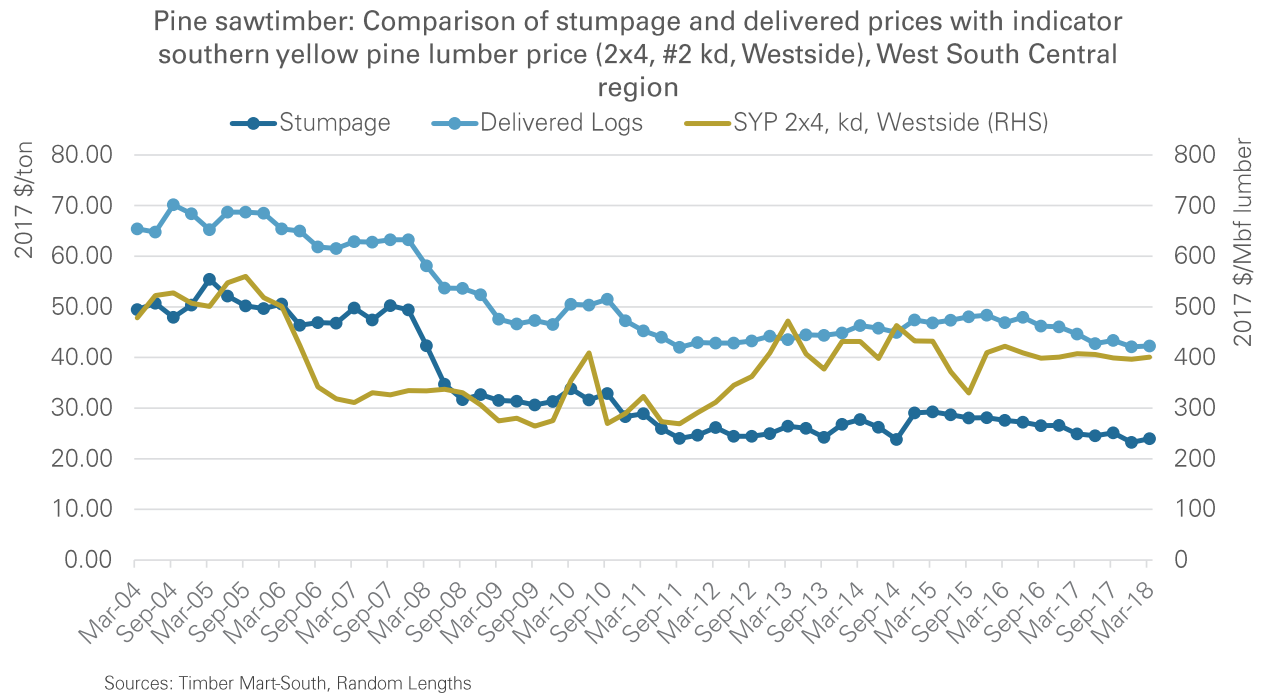
West Coast

Douglas-fir sawlog prices are leveling off across the Pacific Northwest after rising sharply since July



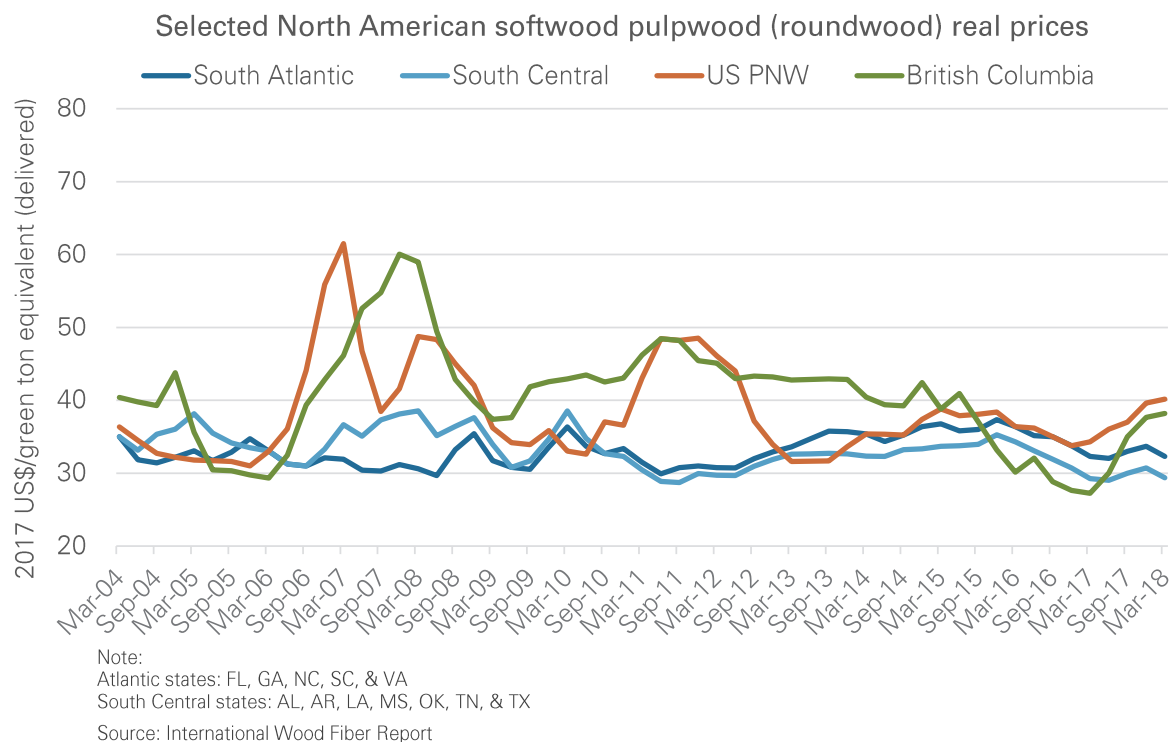
US South

Pine sawtimber stumpage shows modest improvements across the US South



Pulpwood and Chips

Softwood pulpwood prices in the South and the West Coast are moving in opposite directions



Global Wood Prices

Sawlog prices in Western US see 'spectacular increase' in less than two years, driven by wildfires, low inventories and strong lumber markets⁸

The Global Sawlog Price Index has increased by 9.8 percent during 2017, with the biggest increases in sawlog prices occurring in the Nordic countries, Eastern Europe and Western North America, reports the Wood Resource Quarterly (WRQ).

The Global Sawlog Price Index (GSPI) increased substantially, driven by strengthening lumber markets in both the US and Europe. The Euro-based ESPI sawlog price index fell in 2017Q4 after reaching a two-year peak in 2017Q3.

In 2017Q4, the GSPI rose one percent from 2017Q3 to reach just over \$76/m³. This was the fourth consecutive quarter-over-quarter rise, with the GSPI being up 9.8 percent in one year. Sawlog prices have gone up universally in US dollar terms in 2017, with the biggest growth occurring in Eastern Europe, the Nordic countries and in Western North America, while the price movements have been more modest in the US South, Latin America and Oceania.

Sawlog prices in the Western US have seen a spectacular increase in less than two years. A combination of restricted log flows due to wildfires, low sawlog inventories, and strong domestic lumber markets resulted in a substantial jump in sawlog prices in the western states in 2017Q4. This came at a time when prices had already been slowly trending upward for over a year. In 2017Q4, average prices for Douglas-fir and hemlock sawlogs were about 27 percent higher than in early 2016, making the current price levels the highest recorded since the WRQ started tracking sawlog prices in 1995.

Global softwood and hardwood fiber price indices in 2017Q4 reached highest levels in more than a year⁹

Pulp manufacturers in many countries have seen their wood fiber costs go up during 2017. In 2017Q4, both the global softwood and hardwood fiber price indices reached their highest levels in over a year, according to WRQ. However, market pulp prices increased even faster, resulting in a period of increased earnings by the pulp industry.

Pulp manufacturers in many countries have seen their wood fiber costs go up during 2017, with the biggest increases in US dollar terms occurring in Western North America, Europe, Russia and Australia. The Global Softwood Fiber Price Index (SFPI) increased for the third consecutive quarter to reach \$89.08/odmt in 2017Q4, four percent higher than in the same quarter in 2016.

Hardwood fiber prices have also trended upwards over the past year, with the Global Hardwood Fiber Price Index (HFPI) reaching its highest level in almost three years during 2017Q4. In US dollar terms, hardwood fiber prices have gone up the most in Europe, Russia and Indonesia during 2017. The only region that has experienced a decline in wood fiber costs has been the US South, where hardwood pulplog prices were 2.3 percent lower in 2017Q4 than in 2016Q4.

Wood fiber costs remain the single largest cost component in the manufacture of wood pulp, ranging between 40-60 percent of the total cash costs, depending on region and pulp grade. The wood fiber costs as a percentage of the price of Northern Bleached Softwood Kraft market pulp (NBSK) have been on a downward trajectory over the past eight years.

The substantial increases in market pulp prices during 2017Q4 and only small upward price adjustments of pulpwood resulted in the wood fiber cost percentage reaching a record low of 23.2 percent in 2017Q4 (down from 36 percent in 2012). Since wood fiber costs account for a majority of the pulp manufacturing costs, the low wood cost share has improved profitability for market pulp manufacturers throughout the world during 2017.

Costs

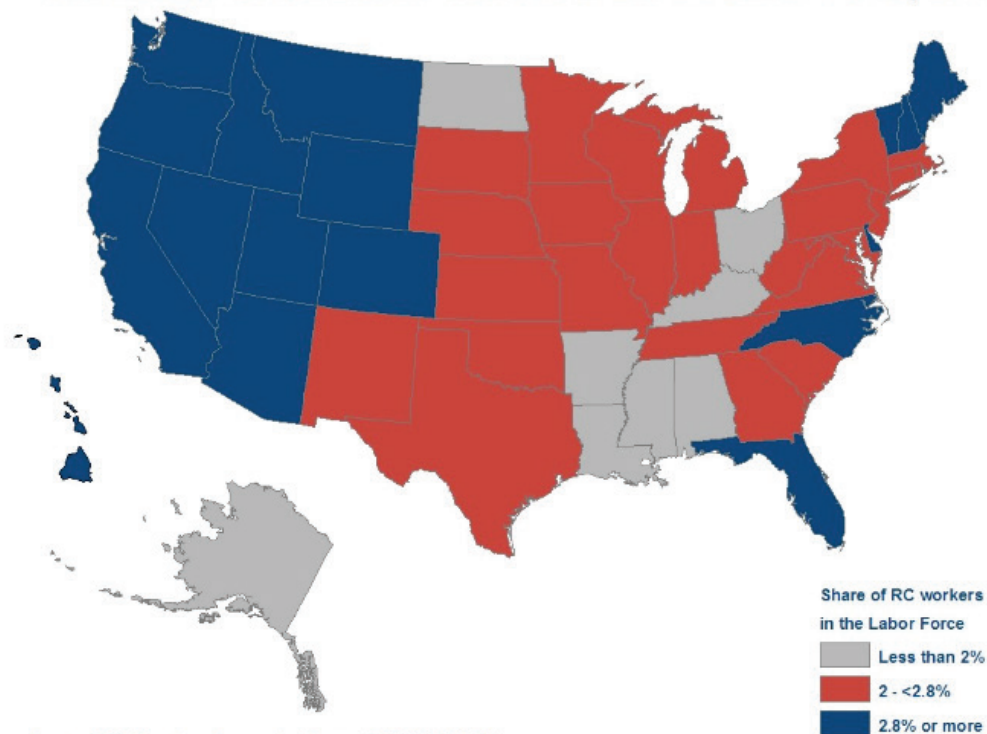
Labor

Of the 9.8 million US construction employees in 2016, more than 3.8 million worked in residential construction¹⁰

A new National Association of Home Builders (NAHB) study presents the most recent and comprehensive estimates of home building employment, including self-employed workers, by state. NAHB Economics estimates that out of 9.8 million people working in construction in 2016, more than 3.8 million people worked in residential construction, accounting for 2.5 percent of the US employed civilian labor force.

These numbers reflect modest but steady job gains that took place since 2011 when construction employment bottomed out. Nevertheless, the industry employment levels remain far below the peaks reached during the housing boom when more than 11 million worked in construction, and home building employed more than 5 million people, including self-employed workers.

Residential Construction Workers in the US Labor Force, 2016



Source: 2016 American Community Survey, QCEW, NAHB Estimates

The NAHB residential construction employment estimates include self-employed workers. Counting self-employed is particularly important in the home building industry since they traditionally make up a larger share of the labor force. The new NAHB home building employment estimates only include workers directly employed by the industry and do not count jobs created in related industries— such as design and architecture, furniture making, building materials, landscaping, etc. As a result, the estimates underestimate the overall impact of home building on local employment.

Supply

North America Lumber

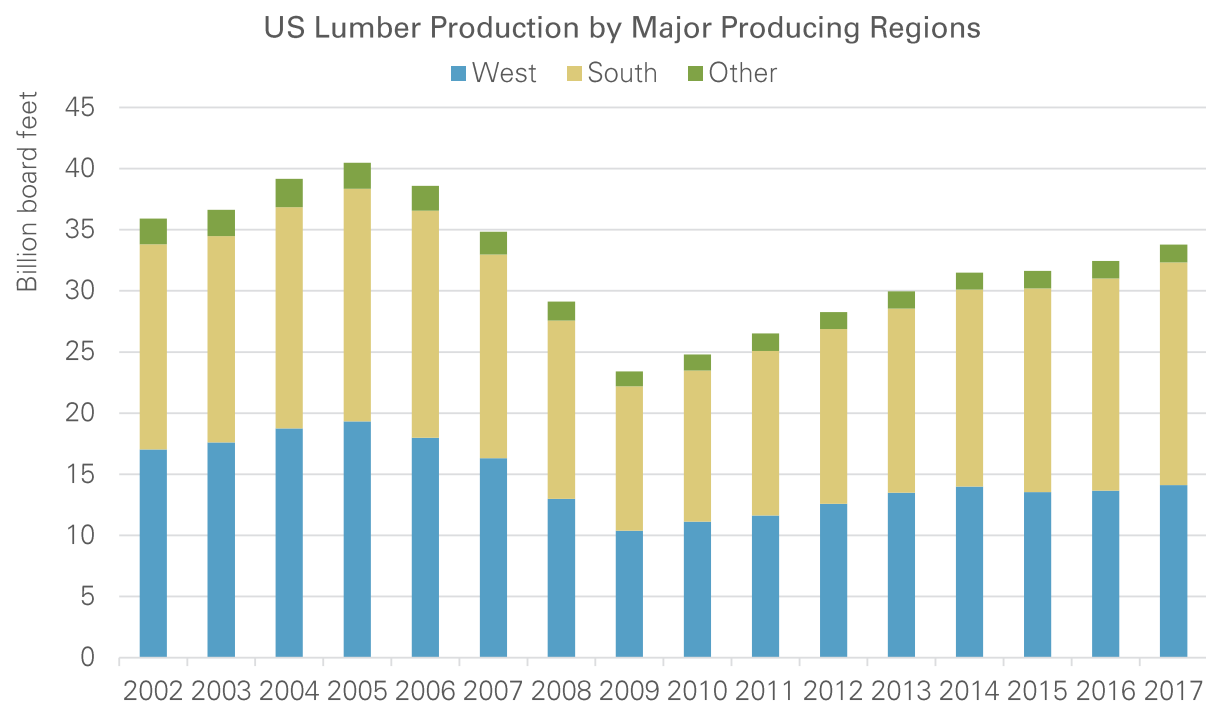
US lumber production up in January, Canada flat¹

US lumber production in January totaled 2.90 billion board feet (bbf), up 8.6 percent from the same month a year ago, according to the Western Wood Products Association's Lumber Track publication. Output in the West showed the biggest increase, gaining 16.7 percent to 1.27 bbf. Production in the South gained 2.5 percent to 1.49 bbf. Total Canadian production in January reached 2.43 bbf, up 0.3 percent. Output in British Columbia gained 1.1 percent to 1.12 bbf, while production East of the Rockies dropped 0.4 percent to 1.31 bbf. Total North American production in January hit 5.32 bbf, up 4.6 percent from January 2017.

Output (bbf)	Jan2018	Jan 2017	YOY % Change
US sawmills	2.90	2.67	8.6%
South	1.49	1.45	2.5%
West	1.27	1.09	16.7%
Canadian sawmills	2.43	2.42	0.3%
BC	1.12	1.11	1.1%
East of the Rockies	1.31	1.32	(0.4)%

US Lumber Production

Softwood lumber production in the US has yet to return to pre-recession levels



Source: Random Lengths, WWPA

Western Lumber Production

Western lumber production up 11.6 percent¹²

Through February, lumber production in the western US totaled 2.42 bbf, up 11.6 percent from the same period of 2017. Output in the Coast region reached 1.49 bbf, up 12.1 percent from the first two months of 2017. Inland output of 856 million board feet was up 9.7 percent. Production in February for the West was 1.15 bbf, down 9.1 percent from January, but 6.5 percent above the February 2017 total.

Output	Thru. Feb2018	Thru. Feb2017	YOY% Change
Western US sawmills (bbf)	2.42	2.17	11.6%
Coastal sawmills (bbf)	1.49	1.33	12.1%
Inland sawmills (MMbf)	856	780	9.7%

Structural Panels

Washington state lawmakers boost mass timber and rural communities¹³

Rural communities and forest landowners received a big boost from the Washington Legislature this session with the passage of legislation that will lead to an increase in the use of mass timber products in commercial and residential construction. Mass timber products like cross-laminated timber (CLT) have been on the upswing in Washington in recent years. Last year, Vaagen Brothers Lumber of Colville, Washington, and Katerra, a California company, each announced they were building CLT factories in Eastern Washington, and CLT is increasingly being used in buildings around the state.

However, one impediment to the wider use of mass timber products in construction has been that building codes have not been updated to account for the new building materials. Senate Bill 5450, passed overwhelmingly 45-2 in the Senate and 91-6 in the House, rectifies this, directing the Washington State Building Code Council to adopt rules allowing for the use of mass timber in construction. Including mass timber in the state building code will make it easier for developers to use CLT and other mass timber products by adding certainty to the permitting process, said Jason Callahan, Director of Governmental Relations for the Washington Protection Association.

More certainty in the permitting process will mean more building projects using mass timber, which in turn will lead to more mass timber production facilities, more demand for timber from sustainably managed forests and more jobs in the rural communities where the forests and production facilities are located.

Logs Canada

West Fraser expects to continue processing logs salvaged from sites of 2017 British Columbia wildfires for next 2-3 years¹⁴

To date West Fraser has delivered approximately 3,350 truckloads of burned timber to Williams Lake and another 1,000 truckloads to 100 Mile Lumber, the company's woods manager Mark Runge said Wednesday. The 3,350 truckloads, or 184,000 m³, is enough supply the Williams Lake sawmill for 52 days, he said. "Most of this volume has come from log purchase arrangements with deeded private properties in the Williams Lake area, the UBC Research Forest and the Military Reserve at Riske Creek with deliveries from our own license starting up in February." Almost immediately West Fraser began receiving burned wood taken from local ranches around Williams Lake. "Some of the ranchers allowed us to put our logging contractors that would normally operate on our license onto their private property," Runge said.

West Fraser is also purchasing burned timber from three burned BC Timber Sales in the Slater Mountain and Hawks Creek areas after break up and will be submitting more cutting permits in burned timber at the Hanceville-Riske Creek Fire area after break up as well and will continue to harvest there. Since October the company has been processing the salvaged wood in the sawmill. A few logs made their way to the plywood plant too, he said. "We made sure the waste veneer was made into hog fuel, which we do anyway, so it wasn't going into chips," Runge explained, noting there are risks to milling the burned timber because the charcoal in the residual wood is not usable for pulp.

Most of the burned timber coming in is Douglas-fir and so far it has been OK to process because the wood was alive on July 7 when the wildfires broke out all over the Cariboo Chilcotin. "The trees were all full of water when the fire came so they had moisture in them. They dried out a little bit, but the moisture was still there. We've been running them through the sawmill and getting good results with the lumber," Runge said.

Eventually the wood will start to degrade as time unfolds because the burned, dead trees still standing won't be able to draw water and the wood will start to crack. "We will be able to recover less lumber out of it [as times goes by]," Runge said. "We won't even attempt to get plywood out of it after break up. The plywood process is very sensitive to moisture content." In the long-term, Runge anticipates West Fraser will continue processing burned timber for two to three years. "Right now we are trying to accumulate about three months' worth of timber in our log yards, which we have. By mid-June we will have to start accumulating wood again."

Demand

US construction spending barely up in February¹⁵

US construction spending rose less than expected in February amid a steep decline in investment in public construction projects. According to the Commerce Department construction spending edged up 0.1 percent after being unchanged in January. Economists polled by Reuters had forecast construction spending accelerating 0.5 percent in February. Construction spending increased three percent on a year-over-year basis.

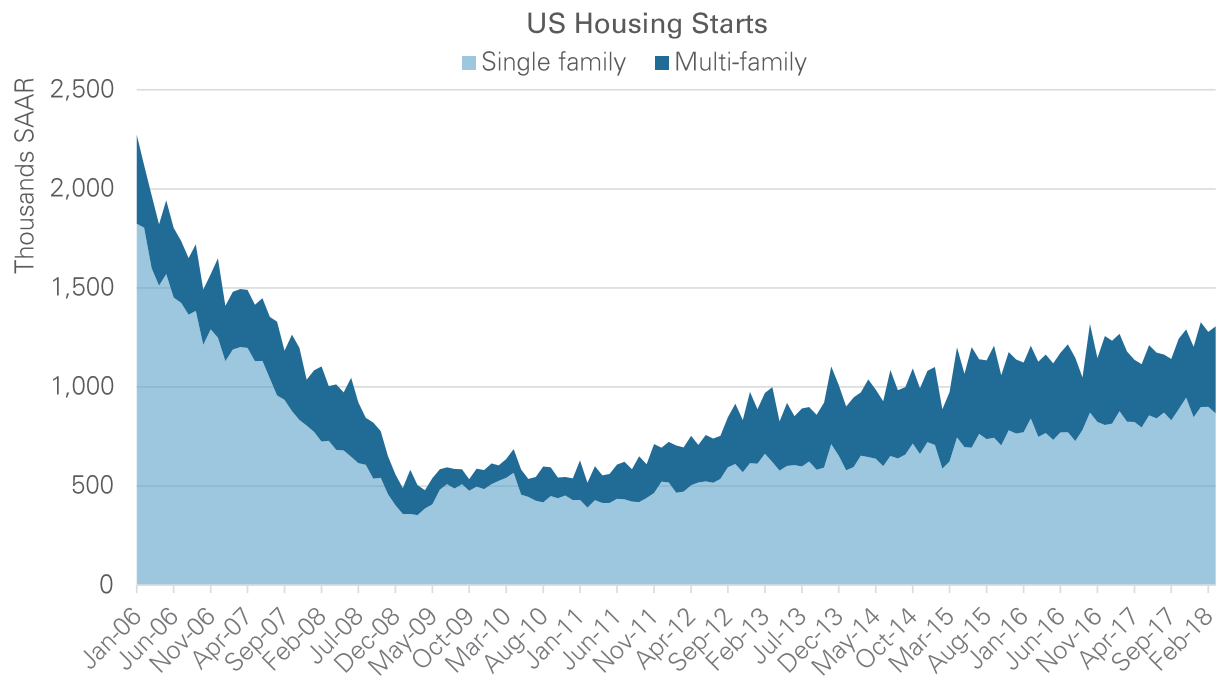
Housing

US

US housing starts in March total 1,319,000, up 1.9 percent over February and up 10.9 percent year-over-year¹⁶

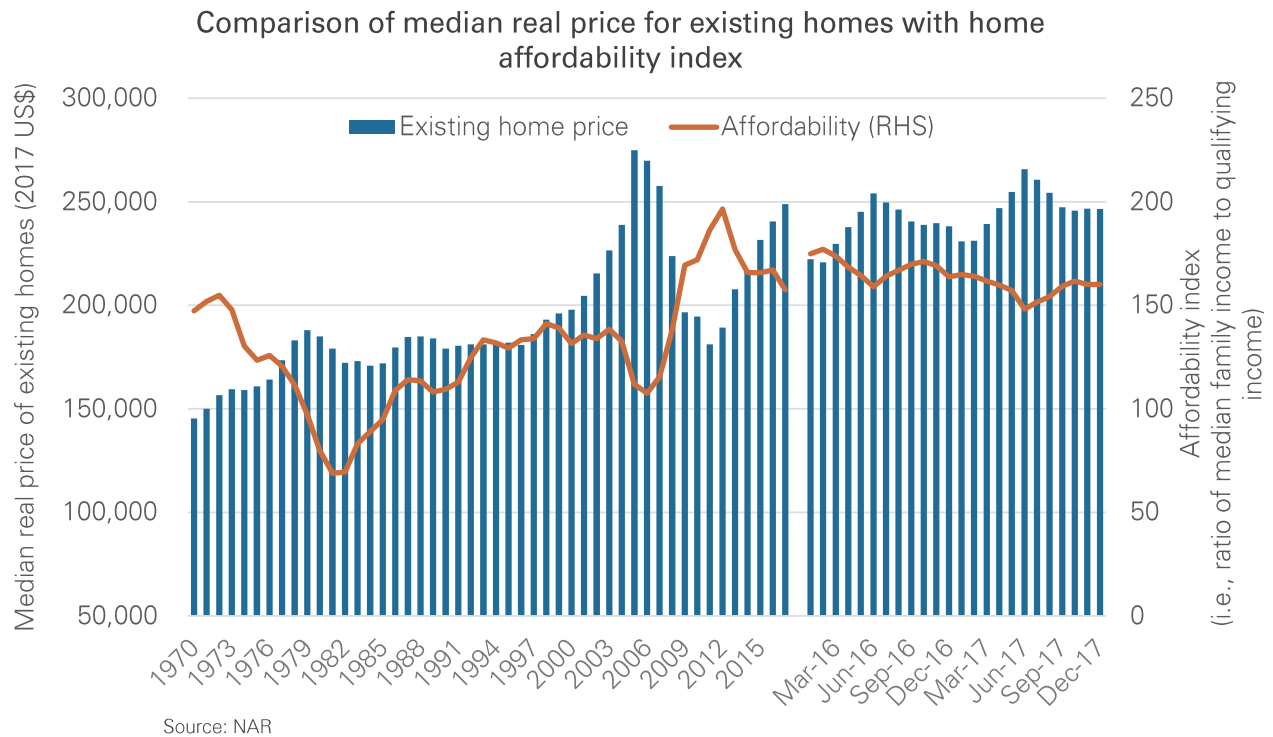
Privately-owned housing units authorized by building permits in March were at a seasonally adjusted annual rate (SAAR) of 1,354,000. This is 2.5 percent above the revised February rate of 1,321,000 and is 7.5 percent above the March 2017 rate of 1,260,000. Single-family authorizations in March were at a rate of 840,000; this is 5.5 percent below the revised February figure of 889,000.

Privately-owned housing starts in March were at a 1,319,000 SAAR. This is 1.9 percent above the revised February estimate of 1,295,000 and is 10.9 percent above the March 2017 rate of 1,189,000. Single-family housing starts in March were at a rate of 867,000; this is 3.7 percent below the revised February figure of 900,000. The March rate for units in buildings with five units or more was 439,000.



Source: US Census Bureau

Housing affordability inches down, still high in historical terms



Rising Home Prices Push Borrowers Deeper Into Debt¹⁷

More Americans are stretching to buy homes, the latest sign that rising prices are making homeownership more difficult for a broad swath of potential buyers. Roughly one in five conventional mortgage loans made this winter went to borrowers spending more than 45 percent of their monthly incomes on their mortgage payment and other debts, the highest proportion since the housing crisis, according to new data from mortgage-data tracker CoreLogic Inc. That was almost triple the proportion of such loans made in 2016 and 2017H1, CoreLogic said.

Economists said rising debt levels are a symptom of a market in which home prices are rising sharply in relation to incomes, driven in part by a historic lack of supply that is forcing prices higher. Real-estate agents worry that buyers' weariness from being priced out of the market could make this one of the weakest spring selling seasons in recent years. Consumers are growing more optimistic about the economy and their personal financial prospects but less hopeful that now is the right time to buy a home, according to results of a survey released in late March by the National Association of Realtors.

At the same time, the average rate for a 30-year, fixed-rate mortgage has risen to 4.40 percent as of early April from 3.95 percent at the beginning of the year, according to Freddie Mac, FMCC-0.37 percent putting still more pressure on affordability. These factors "are working against affordability and that's why you get the pressure to ease credit standards," said Doug Duncan, chief economist at Fannie Mae. He said that pressure has to be balanced against the potential toll if underqualified buyers eventually default on their mortgages.

Economists warn that lenders must tread carefully in making credit more available, given the role easy mortgages played in creating the last housing bubble. The share of new buyers with debt-to-income levels in the 46 percent to 50 percent range remains well below the peak of just under 37 percent registered in 2007, but is nearing the levels of 2004-05, the years leading up to the bubble, CoreLogic data show.

So far lenders are making most of these loans to borrowers who have a history of good credit, though that could change. In 2017Q4, about 78 percent of the loans with debt-to-income ratios above 45 percent were made to borrowers with credit scores of 700 or more, according to Inside Mortgage Finance. Although standards vary by lender, usually any borrower below 650 is considered subprime. "The problem," said Guy Cecala, chief executive of Inside Mortgage Finance, "is you're going to run out of [prime] borrowers."

The Urban Institute found that the share of borrowers with Fannie Mae-backed mortgages who had high debt-to-income ratios and had credit scores below 700 jumped to nearly 25 percent in the first two months of this year from 19 percent a year earlier. "It's not a problem today, but it may be a problem tomorrow," said Stan Middleman, chief executive of Freedom Mortgage, a home lender.

New-home sales fall for third straight month in February¹⁸

Sales of new US single-family homes unexpectedly fell for a third straight month in February, weighed down by steep declines in the Midwest and West. According to the Commerce Department new home sales dropped 0.6 percent to a seasonally adjusted annual rate of 618,000 units in February. January's sales pace was revised up to 622,000 units from the previously reported 593,000 units.

Existing-Home Sales Rebound three Percent in February¹⁹

Despite consistently low inventory levels and faster price growth, existing-home sales bounced back in February after two straight months of declines, according to the National Association of Realtors. Sizable sales increases in the South and West offset declines in the Northeast and Midwest. Total existing-home sales, which are completed transactions that include single-family homes, townhomes, condominiums and co-ops, grew three percent to a seasonally adjusted annual rate of 5.54 million in February from 5.38 million in January. After last month's increase, sales are now 1.1 percent above a year ago.

Products

Lumber

US consumption of softwood lumber is likely to reach record-highs by 2030²⁰

A newly released study by ForestEdge and Wood Resources International forecasts that US softwood lumber demand will grow at an annual rate of 2.3 percent through 2030, which will be higher than the reports projection of real GDP. The study's Base Case demand scenario suggests that US lumber consumption will reach an all-time high by 2030. A detailed analysis of the future consumption of softwood lumber in each of the five end-use categories reveals that the category "Non-Residential Construction" will grow at the fastest rate and will increase its share of the total softwood lumber usage from just over 11 percent in 2016 to almost 14 percent by 2030. Lumber consumed by the residential housing sector, including repair and remodeling, will continue to account for the almost 70 percent of the end-use market.

At an estimated softwood lumber production cost of less than US\$200/m³ in 2016, the US South is one of the lowest cost suppliers of softwood lumber to the US market. This, combined with a significant "overhang" supply of softwood

sawtimber as a result of the Global Financial Crisis in 2008-09 and a mature plantation resource, is expected to continue to facilitate a major expansion of sawmill capacity in the region.

The Canadian lumber producers market share in the US is expected to decline in the coming years, with the biggest reduction occurring between 2017 and 2025. The outlook for available log supply to the sawmilling sector will be different in the two major lumber producing regions in Canada, with harvest levels falling substantially in British Columbia over the next ten years.

Overseas supply of lumber to the US is forecasted to increase both in volume and market share by 2025, followed by a decline until 2030. Based on the study's lumber supply curve analysis, the major supplying regions are likely to include Brazil, Chile, Germany and the Nordic countries.

After nearly two decades of real price declines of sawlogs in North America and elsewhere, the combination of a rebounding US softwood lumber demand, constraints on log supply and export production in Western Canada, and continued strong demand for softwood lumber from markets in Europe, Asia and the Middle East/North Africa (MENA) region, is expected to push conifer log prices higher in real US dollar terms in many timberland investment regions by 2030.

Announcements

Westervelt plans to build 250 MMbf per year lumber mill in Alabama²¹

The Westervelt Company is completing plans for expansion of its lumber manufacturing capacity in south Alabama. Specific location and design of the new Westervelt lumber facility are being prepared for final approval by Westervelt's Board of Directors. The new mill will produce approximately 250 million board feet annually and create more than 100 new jobs.

Charles Ingram Lumber to expand operations at 120 MMbf per year in its lumber mill at Effingham, South Carolina²²

Charles Ingram Lumber Co. is expanding its existing operations. With \$33 million of capital investment, the company is expected to create 22 new jobs. The company operates a lumber mill, which produces approximately 120 million board feet of southern yellow pine annually.

Located at 4930 Planer Road in Effingham, S.C., the company will be adding a new dry kiln this year, which will enable them to dry an estimated 70 million board feet of lumber. The company will also begin construction on a new manufacturing line which, over the next several years, will provide a significant amount of the required additional production.

Vaagen indefinitely curtails Midway mill²³

Beginning March 30, the Vaagen Midway (British Columbia) Mill will be curtailed for an indefinite period due to log shortages stemming from the 2017 fire season. The operation was running one-and-a-half shifts and produces 120 MMbf annually with this schedule. The mill will resume production upon sufficient log flow and inventory. Shipping of inventory will continue during this period.

Twin Rivers Paper agrees to buy Mondi's 140,000 tons per year unbleached kraft paper mill in Pine Bluff, Arkansas²⁴

Twin Rivers Paper Company LLC announced today that it has entered into a definitive agreement to acquire the paper mill located in Pine Bluff, Arkansas owned by Mondi Group. Twin Rivers, headquartered in Madawaska, Maine, produces specialty packaging, label, publishing, and technical specialty papers as well as dimensional lumber. It is owned jointly by Atlas Holdings LLC and Blue

Wolf Capital. The acquisition is anticipated to be completed in 2018Q2. Terms were not disclosed. The mill to be acquired under this agreement produces Multiwall, Converting and Grocery Bag grade unbleached kraft papers.

“We are excited to add Pine Bluff to the Twin Rivers portfolio,” said Adam Blumenthal, Managing Partner of Blue Wolf Capital. “The strategic acquisition positions the company well to grow with and better serve its customers and other stakeholders.” Clemens Willee, CEO Packaging Paper, Mondi Group, said, “We believe that the interests of the mill and its employees are better served by the new owners where there is a closer long-term strategic alignment.”

Katerra receives \$865 million to fund massive cross-laminated timber plant²⁵

Katerra, a high-tech construction firm, has secured \$865 million in funding from SoftBank Vision Fund. That money will go toward ongoing projects in the US, like the company's planned cross-laminated timber plant in Washington, as well as research & development activities. Katerra says its upcoming 250,000-square-foot Washington plant will help scale up US production of CLT so that the material can be more broadly adopted across the construction industry. Katerra's manufacturing presence in the region will provide hundreds of jobs and stimulate additional jobs through the larger supply chain and associated industries, including design, engineering, and construction. More than 150 construction-specific jobs will be created to build the CLT factory.

Red Rock Biofuels has received final approval to start building a renewable-biofuels plant in south-central Oregon²⁶

The Herald and News reports the facility in Lakeview is expected to convert forestry waste into renewable fuels for the aviation industry. The firm has contracts with FedEx, Southwest Airlines and the US military. Red Rock Biofuels identified Lakeview as a target location in 2013 because of

its proximity to rail, highways, the Ruby natural gas pipeline and an abundance of forest debris to be collected and converted to jet fuel. Construction is estimated to take 18 months, with operations planned to start in 2020.

Timberlands Transactions

The drought continues with only a few private deals in works²⁷

The few transactions identified since last RISI's Timber Markets report include privately negotiated dispositions from FIA to Hancock. One plantation package of about 70,000 acres in southern Alabama closed in late March for an undetermined price. The other FIA to Hancock trade involved two pine pieces in Georgia, north and south, of about 16,000 acres.

Molpus reported a mid-sized acquisition involving 26,700 acres across four Southern states. Little is so-far known, but the seller appears to be another TIMO and a ballpark price is mentioned in the \$1,650/acre range. Other fresh but low-interest deals occur in remote Tennessee (hardwood and planted pine): BTG reportedly has about 20,000 acres under contract to MCB, a private player.

Background Reading

Robotic collaboration in new timber construction²⁸

Digitalization has found its way into timber construction, with entire elements already being fabricated by computer-aided systems. The raw material is cut to size by the machines, but in most cases, it still has to be manually assembled to create a plane frame. In the past, this fabrication process came with many geometric restrictions. Under the auspices of the National Centre of Competence in Research (NCCR) Digital Fabrication, researchers from ETH Zurich's Chair of Architecture and Digital Fabrication have developed a new, digital timber construction method that

expands the range of possibilities for traditional timber frame construction by enabling the efficient construction and assembly of geometrically complex timber modules.

The robot first takes a timber beam and guides it while it is sawed to size. After an automatic tool change, a second robot drills the required holes for connecting the beams. In the final step, the two robots work together and position the beams in the precise spatial arrangement based on the computer layout. To prevent collisions when positioning the individual timber beams, the researchers have developed an algorithm that constantly recalculates the path of motion for the robots according to the current state of construction. Workers then manually bolt the beams together.

Unlike traditional timber frame construction, Spatial Timber Assemblies can manage without reinforcement plates because the required rigidity and load-bearing result from the geometric structure. Not only does this save material; it also opens up new creative possibilities. A total of six spatial, geometrically unique timber modules will be prefabricated in this way for the first time. Lorries will then transport them to the DFAB HOUSE construction site at the NEST in Dübendorf, where they will be joined to build a two-story residential unit with more than 100 m² of floor space. The complex geometry of the timber construction will remain visible behind a transparent membrane façade.

The robots use information from a computer-aided design model to cut and arrange the timber beams. This method was specially developed during the project and uses various input parameters to create a geometry consisting of 487 timber beams in total. The fact that Spatial Timber Assemblies is being used for digital fabrication and also in design and planning offers a major advantage according to Matthias Kohler, Professor of Architecture and Digital Fabrication at ETH Zurich and the man spearheading the DFAB HOUSE project: "If any change is made to the project overall, the computer model can be constantly adjusted to

meet the new requirements. This kind of integrated digital architecture is closing the gap between design, planning and execution."

New tech can automatically identify & separate wood species²⁹

Canadian forestry research non-profit FPInnovations has shown that it is possible to automatically separate softwood lumber species with a high rate of success, boosting productivity at a dry kiln. Working with Autolog, a Canadian maker of sawmill automation machinery, FPInnovations created a real-time automated system for identifying and separating wood species based on near infra-red (NIR) spectroscopy. FP says the NIR tech has an efficiency rate of over 95 percent.

Advantages include reduced costs compared to manual classification, says FP, in addition to improving value, volume, and recovery during sawmilling operations. Drying costs would also be improved through a better separation of species presenting variations in drying schedules.

Both the design and technical evaluation in a controlled environment have been successfully carried out, mostly with Western species. Based on the results of a few tests conducted on Eastern species, the technology's potential was demonstrated in planing operations; however, additional conditions must still be subject to more detailed validation (juvenile wood, moisture and temperature variation, multiple species, rough green lumber).

The proper separation of wood species at the various stages of log processing into lumber is a complex process, but one that could be advantageous to many sawmills. The development of an automated technology to identify and separate wood species at the stages of primary and secondary sawing as well as edging, trimming, and sorting, says FP, would make it possible to extract greater value from each log processed, taking the species into account at the time of processing.

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